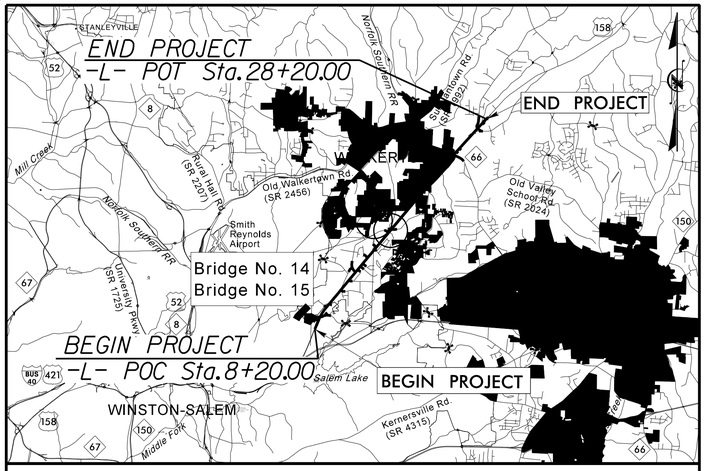
TIP PROJECT: R-2577A

CONTRACT: C204913



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

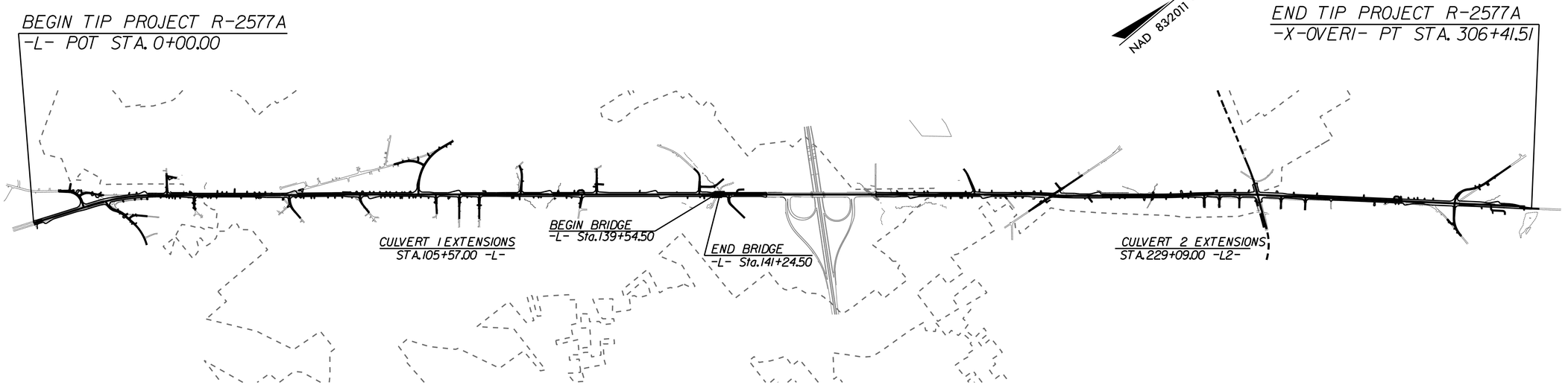
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2577A	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
37405.1.2		PE
37405.2.4		R/W
37405.2.5		UTIL.
37405.3.1		CONST.

LOCATION: *US 158 (REIDSVILLE RD.) FROM NORTH OF US 421/SALEM PARKWAY TO SR 1965 (BELEWS CREEK RD.)*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, STRUCTURES & SIGNALS*



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2024 = 23,620
ADT 2040 = 35,000
DHV = 8%
DIR = 60%
T = 14%
V = 50 MPH
* TTST 8 % DUAL 6 %
FUNC CLASS =
ARTERIAL STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2577A = 5.728 MILES
LENGTH STRUCTURE TIP PROJECT R-2577A = 0.032 MILES

TOTAL LENGTH OF PROJECT R-2577A = 5.803 MILES

Prepared for the Office of:

DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE :
MAY 28, 2024

Scott D. Blevins, P.E.
PROJECT ENGINEER

Ondine J. Paitel, P.E.
PROJECT STRUCTURE ENGINEER

NCDOT CONTACT:
Connie James, P.E.

PLANS PREPARED BY:

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Raleigh, North Carolina 27615 | NC License No. F-0112
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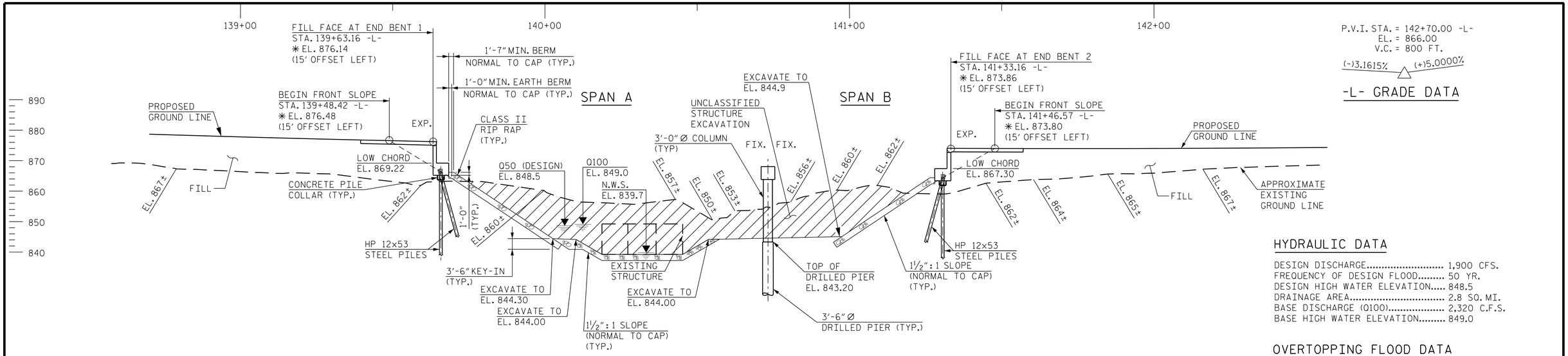
NORTH CAROLINA PROFESSIONAL SEAL 40850 ENGINEER ONDINE J. PAITEL
DocuSigned by: Ondine Paitel

4/1/2024

tboyd
4/1/2024 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_TSH_330814.dgn



P.V.I. STA. = 142+70.00 -L-
EL. = 866.00
V.C. = 800 FT.
(-)3.1615% (+)5.0000%

-L- GRADE DATA

SECTION ALONG LEFT LANE WORK LINE

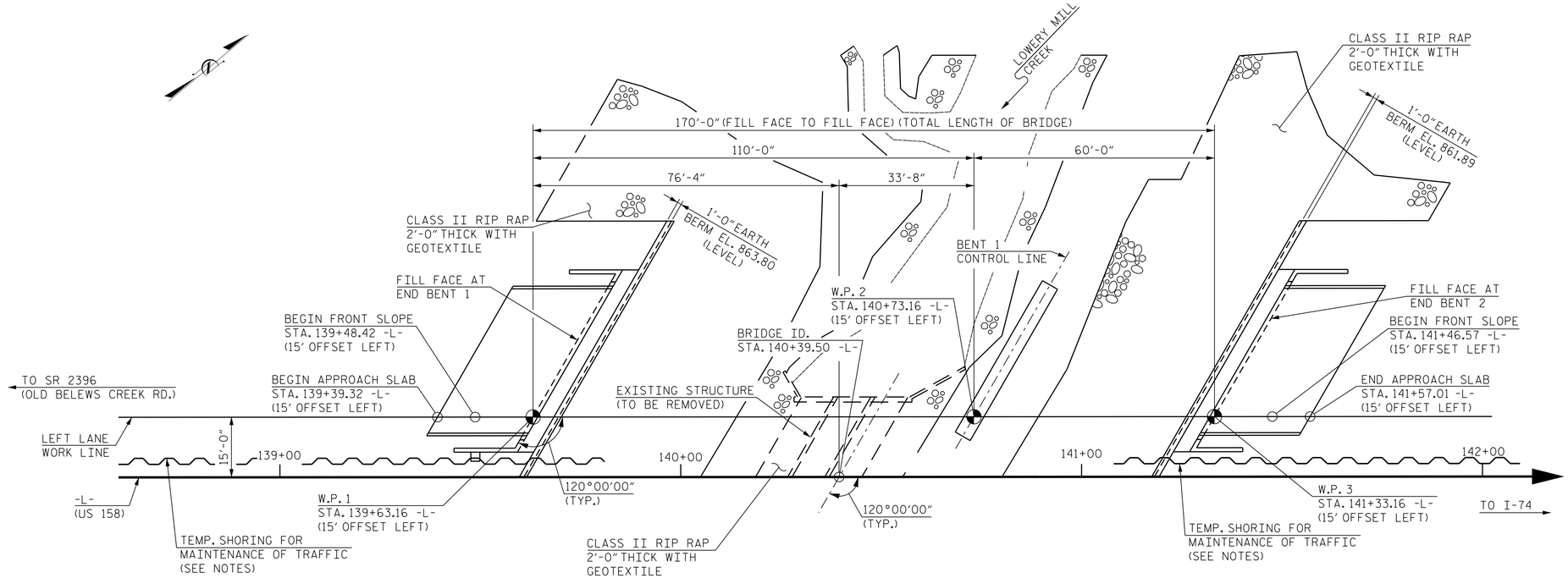
(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)
℀ ELEVATIONS CALCULATED ALONG LEFT LANE WORK LINE

HYDRAULIC DATA

DESIGN DISCHARGE..... 1,900 CFS.
FREQUENCY OF DESIGN FLOOD..... 50 YR.
DESIGN HIGH WATER ELEVATION..... 848.5
DRAINAGE AREA..... 2.8 SQ. MI.
BASE DISCHARGE (Q100)..... 2,320 C.F.S.
BASE HIGH WATER ELEVATION..... 849.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... 32,000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD.... 500+ YR.
OVERTOPPING FLOOD ELEVATION..... 873.7
OVERTOPPING STATION..... STA. 141+79.90 -L-



PLAN

(PILES AND DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

I HEREBY CERTIFY THESE
PLANS ARE THE AS-BUILT PLANS

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-
BRIDGE NO. 330815
SHEET 1 OF 5 REPLACES CULVERT NO. 330140

RK&K
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Raleigh, North Carolina 27615 | NC License No. F-0112
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DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
Docusigned by: Odine Paitel
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

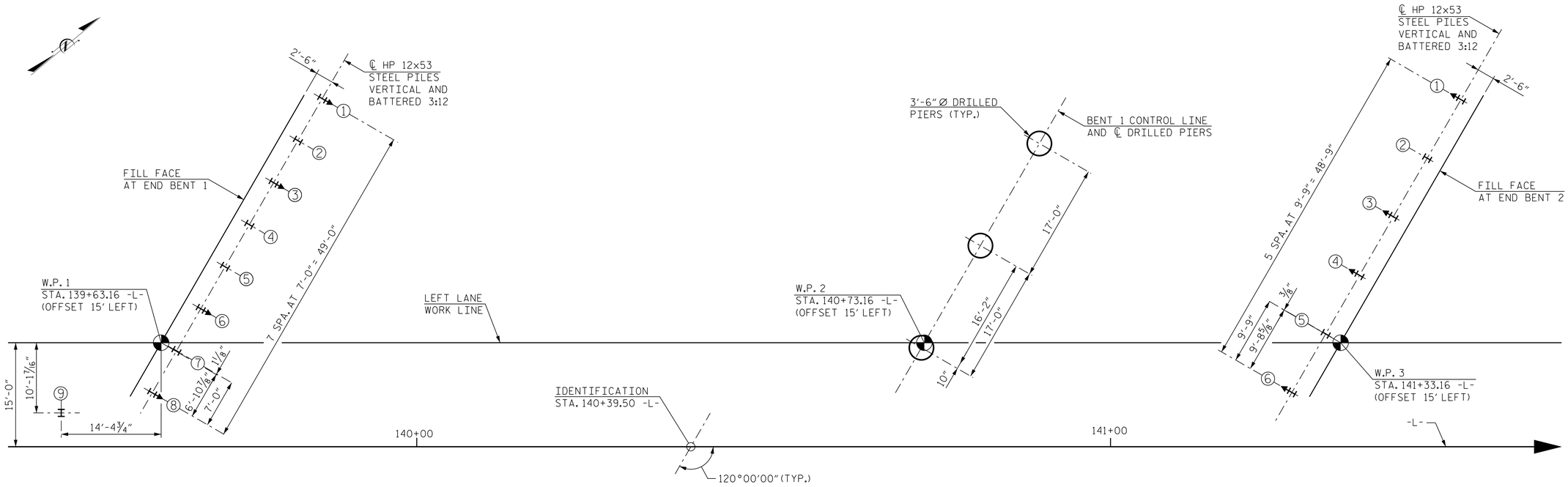
FOR BRIDGE ON US 158 (REIDSVILLE RD.) OVER LOWERY MILL CREEK BETWEEN SR 2396 (OLD BELEWS CREEK RD.) AND I-74

LEFT LANE

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

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_GD_330814.dgn



FOUNDATION LAYOUT

ALL PILES AT END BENTS 1 AND 2 ARE HP 12x53 STEEL PILES.
DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES AT BOTTOM OF CAP.

FOUNDATION NOTES:

FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

FILL HOLES FOR PILE EXCAVATION AT END BENT 1 AND 2 WITH CONCRETE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THE QUANTITY SHOWN FOR FOUNDATION EXCAVATION IS BASED ON PLACING FILL BEFORE CONSTRUCTING END BENT 1 AND END BENT 2. IF THE CONTRACTOR CHOOSES TO CONSTRUCT END BENT 1 AND END BENT 2 BEFORE PLACING FILL, THE QUANTITY FOR FOUNDATION EXCAVATION WILL BE MEASURED FROM THE GROUND LINE AT THE TIME OF BENT CONSTRUCTION.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT 1.

LEGEND:

HP 12x53 VERTICAL STEEL PILES

HP 12x53 STEEL PILES
BATTERED 3:12

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

LEFT LANE

BRIDGE NO. 330815

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Docusigned by: Ondine Paitel
11/10/2023

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

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_FL1_330814.dgn

SUMMARY OF PILE INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

					DRIVEN PILES			PREDRILLING FOR PILES *			DRILLED-IN PILES		
	FACTORED RESISTANCE PER PILE	PILE CUT-OFF (TOP OF PILE) ELEVATION	ESTIMATED PILE LENGTH PER PILE	SCOUR CRITICAL ELEVATION	MIN. PILE TIP (TIP NO HIGHER THAN) ELEV.	REQUIRED DRIVING RESISTANCE (RDR) ** PER PILE	TOTAL PILE REDRIVES QUANTITY	PREDRILLING LENGTH PER PILE	PREDRILLING ELEVATION (ELEV. NOT TO PREDRILL BELOW)	MAXIMUM PREDRILLING DIAMETER	PILE EXCAVATION BOTTOM OF HOLE) ELEV.	PILE EXCAVATION NOT IN SOIL PER PILE	PILE EXCAVATION IN SOIL PER PILE
	TONS	FT.	FT.	FT.	FT.	TONS	EA.	LIN.FT.	FT.	INCHES	FT.	LIN.FT.	LIN.FT.
END BENT 1, PILES 1, 2, 3, 8 & 9	113	866.80	20	-	-	190	0	-	-	-	-	-	-
END BENT 1, PILES 4, 5, 6 & 7	113	866.80	15	-	-	-		-	-	-	853.0	7.0	5.0
END BENT 2, PILES 1, 2 & 3	105	864.89	20	-	-	175		-	-	-	-	-	-
END BENT 2, PILES 4, 5 & 6	105	864.89	15	-	-	-		-	-	-	849.0	6.0	8.0

* 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 = (FACTORED RESISTANCE + FACTORED DOWNDRAG LOAD + FACTORED DEAD LOAD) / DYNAMIC RESISTANCE FACTOR + NOMINAL DOWNDRAG RESISTANCE + NOMINAL SCOUR RESISTANCE / SCOUR RESISTANCE FACTOR

PILE DESIGN INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	FACTORED AXIAL LOAD PER PILE	FACTORED DOWNDRAG LOAD PER PILE	FACTORED DEAD LOAD * PER PILE	DYNAMIC RESISTANCE FACTOR	NOMINAL DOWNDRAG RESISTANCE PER PILE	NOMINAL SCOUR RESISTANCE PER PILE	SCOUR RESISTANCE FACTORE (DEFAULT = 1.00)
	TONS	TONS	TONS		TONS	TONS	
END BENT 1, PILES 1, 2, 3, 8 & 9	113	-	-	0.6	-	-	
END BENT 1, PILES 4, 5, 6 & 7	113	-	-	-	-	-	
END BENT 2, PILES 1, 2 & 3	105	-	-	0.6	-	-	
END BENT 2, PILES 4, 5 & 6	105	-	-	-	-	-	

* FACTORED DEAD LOAD IS FACTORED WEIGHT OF PILE ABOVE THE GROUND LINE.

SUMMARY OF PDA/PILE ORDER LENGTHS

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	PILE DRIVING ANALYZER (DYNAMIC PILE TEST)			PILE ORDER LENGTHS	
	DYNAMIC PILE TESTING REQUIRED	DYNAMIC PILE TEST PILE LENGTH	TOTAL DYNAMIC PILE TESTING QUANTITY		PILE ORDER LENGTH BASIS *
	YES/MAYBE	FEET	EA.		EST./DPT
END BENT 1	MAYBE	20	1		
END BENT 2	MAYBE	20			

* EST = PILE ORDER LENGTHS FROM ESTIMATED PILE LENGTHS; DPT = PILE ORDER LENGTHS BASED ON DYNAMIC PILE TESTING. FOR GROUPS OF END BENTS/BENTS WITH PILE ORDER LENGTHS BASED ON DYNAMIC PILE TESTING, THE FIRST END BENT/BENT NO. LISTED FOR EACH GROUP IS THE REPRESENTATIVE END BENT/BENT WITH THE DYNAMIC PILE TESTING.

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	FACTORED RESISTANCE PER PILE	MINIMUM PIER TIP (TIP NO HIGHER THAN) ELEVATION	REQUIRED TIP RESISTANCE PER PIER	SCOUR CRITICAL ELEVATION	MINIMUM DRILLED PIER PENETRATION INTO ROCK PER PIER	DRILLED PIER LENGTH * PER PIER	DRILLED PIER LENGTH* NOT IN SOIL PER PIER	DRILLED PIER LENGTH * IN SOIL PER PIER	PERMANENT STEEL CASING REQUIRED?	PERMANENT STEEL CASING TIP ELEVATION (ELEV. NOT TO EXTEND CASING BELOW)	PERMANENT STEEL CASING LENGTH ** PER PIER
	TONS	FT.	TSF.	FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN.FT.	YES/MAYBE	FT.	LIN. FT.
BENT 1, PIERS 1-3	475	828.5	50	834.4	8	-	8	7			

* DRILLED PIER LENGTH, DRILLED PIER LENGTH NOT IN SOIL AND DRILLED PIER LENGTH IN SOIL REPRESENT ESTIMATED DRILLED PIER QUANTITIES AND ARE MEASURED AND PAID FOR AS "42" DIA. DRILLED PIERS" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.

** PERMANENT STEEL CASING LENGTH EQUALS THE DIFFERENCE BETWEEN THE GROUND LINE OR TOP OF DRILLED PIER ELEVATION, WHICHEVER IS HIGHER, AND THE PERMANENT CASING TIP ELEVATION AND IS MEASURED AND PAID FOR AS "PERMANENT STEEL CASING FOR 42" DIA. DRILLED PIER" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.

SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

		STEEL PILE POINTS			
	PIPE PILE PLATES REQUIRED?	PIPE PILE CUTTING SHOES REQUIRED?	PIPE PILE CONICAL POINTS REQUIRED?	H-PILE POINTS REQUIRED?	STEEL PILE TIPS REQUIRED?
	YES/MAYBE	YES	YES	YES	YES
END BENT 1, PILES 1-9				YES	
END BENT 2, PILES 1-6				YES	
TOTAL QTY.:				7	

FOUNDATION NOTES:

THE PILE AND DRILLED PIER FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (ATEFEH ASOUDEH, PE #043747) ON 07-19-2023.

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.

THE ENGINEER WILL DETERMINE THE NEED FOR DYNAMIC PILE TESTING, SPTS, CSL TESTING, AND SID INSPECTIONS WHEN THESE ITEMS MAY BE REQUIRED.

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	STANDARD PENETRATION TEST (SPT) REQUIRED?	CROSSHOLE SONIC LOGGING (CSL) REQUIRED? *	TOTAL CSL TUBE LENGTH (FOR ALL TUBES) PER PIER	SHAFT INSPECTION DEVICE (SID) REQUIRED?	PILE INTEGRITY TEST (PIT) REQUIRED?
	YES/MAYBE	YES/MAYBE	LIN. FT.	YES/MAYBE	MAYBE
BENT 1, PIERS 1-3	MAYBE	MAYBE	65.0	MAYBE	
TOTAL QTY.:	1	1	195	1	

* 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.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 5

BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONDINE J. PAITEL
12/19/2023

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DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
PILE AND DRILLED PIER FOUNDATION TABLES

LEFT LANE

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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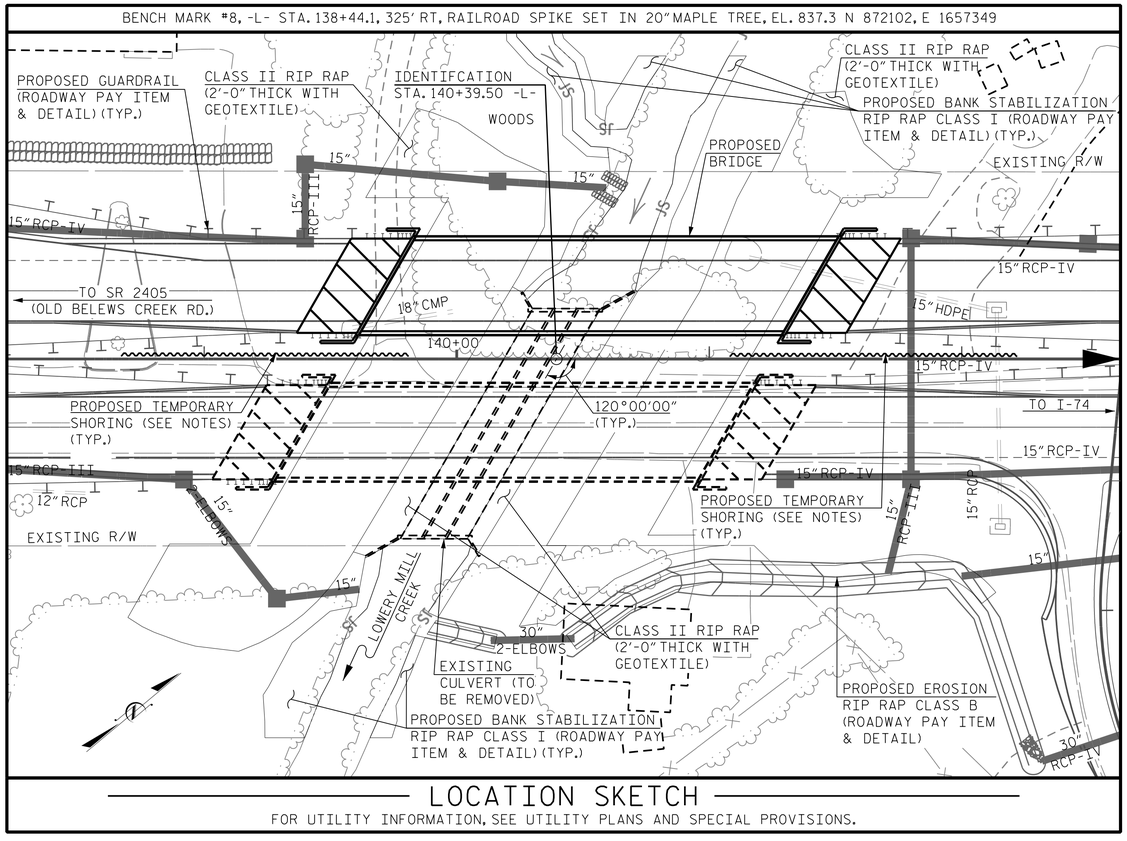
12/19/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_FL2_330814.dgn

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6"Ø DRILLED PIERS IN SOIL	3'-6"Ø DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	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 SET UP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	NO.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	———	———	———	———	———	———	———	LUMP SUM	6,573	7,073	———	LUMP SUM	———	———	10	824.17	———	———	———	———	———	376.78	———	———	LUMP SUM	LUMP SUM
END BENT 1	———	20	28	———	———	———	———	———	———	———	———	71.4	———	8,186	———	———	———	9	9	160	———	———	———	640	715	———	———
BENT 1	———	———	———	21	24	———	———	———	———	———	———	49.6	———	13,843	2,287	———	———	———	———	———	———	———	———	✳ 200	✳ 225	———	———
END BENT 2	———	24	18	———	———	———	———	———	———	———	———	67.7	———	7,956	———	———	———	6	6	105	———	———	———	650	720	———	———
TOTAL	LUMP SUM	44	46	21	24	1	1	1	LUMP SUM	6,573	7,073	188.7	LUMP SUM	29,985	2,287	10	824.17	15	15	265	7	1	376.78	1,490	1,660	LUMP SUM	LUMP SUM

✳ STREAMBED



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL 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 THE SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SL-35.

FOR SUBMITAL 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE MATERIAL SHOWN IN THE HATCHED AREA ON SHEET SL-1 SHALL BE EXCAVATED FOR A DISTANCE OF 107 FT LEFT AND 116 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

REMOVAL OF THE EXISTING CULVERT SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING IN TO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE CULVERT IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."

THE EXISTING CULVERT CONSISTING OF TRIPLE 7 FT. X 10 FT. BOTTOMLESS REINFORCED CONCRETE BARREL CULVERT SHALL BE REMOVED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE EXISTING CULVERT DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CLASS AA CONCRETE IN THE BIRDGE 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.

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 834.4. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, TOTAL BILL OF MATERIAL AND GENERAL NOTES

LEFT LANE

BRIDGE NO. 330815

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DocuSigned by: Odine Paitel
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-4
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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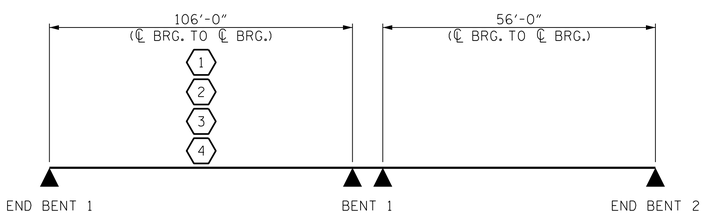
12/19/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_LS_330814.dgn

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
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.16	--	1.75	0.713	1.64	A	E	53.0	0.925	1.49	A	I	10.0	0.80	0.811	1.16	A	E	53.0	
		HL-93 (OPERATING)	N/A		1.97	--	1.35	0.713	2.12	A	E	53.0	0.925	1.97	A	I	10.0	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.64	59.04	1.75	0.713	2.32	A	E	53.0	0.925	2.07	A	I	10.0	0.80	0.811	1.64	A	E	53.0	
		HS-20 (OPERATING)	36.000		2.72	97.92	1.35	0.713	3.00	A	E	53.0	0.925	2.72	A	I	10.0	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.93	53.06	1.40	0.713	6.92	A	E	53.0	0.925	6.67	A	I	10.0	0.80	0.811	3.93	A	E	53.0	
		SNGARBS2	20.000		2.83	56.60	1.40	0.713	4.99	A	E	53.0	0.925	4.62	A	I	10.0	0.80	0.811	2.83	A	E	53.0	
		SNAGRIS2	22.000		2.64	58.08	1.40	0.713	4.66	A	E	53.0	0.925	4.25	A	I	10.0	0.80	0.811	2.64	A	E	53.0	
		SNCOTTS3	27.250		1.95	53.14	1.40	0.713	3.44	A	E	53.0	0.925	3.25	A	I	10.0	0.80	0.811	1.95	A	E	53.0	
		SNAGGRS4	34.925		1.59	55.53	1.40	0.713	2.81	A	E	53.0	0.925	2.62	A	I	10.0	0.80	0.811	1.59	A	E	53.0	
		SNS5A	35.550		1.56	55.46	1.40	0.713	2.75	A	E	53.0	0.925	2.63	A	I	10.0	0.80	0.811	1.56	A	E	53.0	
		SNS6A	39.950		1.42	56.73	1.40	0.713	2.50	A	E	53.0	0.925	2.36	A	I	10.0	0.80	0.811	1.42	A	E	53.0	
		SNS7B	42.000		1.35	56.70	1.40	0.713	2.38	A	E	53.0	0.925	2.29	A	I	10.0	0.80	0.811	1.35	A	E	53.0	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.76	1.40	0.713	3.04	A	E	53.0	0.925	2.85	A	I	10.0	0.80	0.811	1.72	A	E	53.0	
		TNT4A	33.075		1.73	57.22	1.40	0.713	3.04	A	E	53.0	0.925	2.80	A	I	10.0	0.80	0.811	1.73	A	E	53.0	
		TNT6A	41.600		1.40	58.24	1.40	0.713	2.46	A	E	53.0	0.925	2.40	A	I	10.0	0.80	0.811	1.40	A	E	53.0	
		TNT7A	42.000		1.40	58.80	1.40	0.713	2.46	A	E	53.0	0.925	2.36	A	I	10.0	0.80	0.811	1.40	A	E	53.0	
		TNT7B	42.000		1.43	60.06	1.40	0.713	2.52	A	E	53.0	0.925	2.25	A	I	10.0	0.80	0.811	1.43	A	E	53.0	
		TNAGRIT4	43.000		1.37	58.91	1.40	0.713	2.42	A	E	53.0	0.925	2.19	A	I	10.0	0.80	0.811	1.37	A	E	53.0	
		TNAGT5A	45.000		1.30	58.50	1.40	0.713	2.29	A	E	53.0	0.925	2.14	A	I	10.0	0.80	0.811	1.30	A	E	53.0	
		TNAGT5B	45.000	⟨3⟩	1.29	58.05	1.40	0.713	2.27	A	E	53.0	0.925	2.08	A	I	10.0	0.80	0.811	1.29	A	E	53.0	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.99	57.21	1.30	0.713	3.78	A	E	53.0	0.925	3.45	A	I	10.0	0.80	0.811	1.99	A	E	53.0	
		EV3	43.000	⟨4⟩	1.31	56.33	1.30	0.713	2.49	A	E	53.0	0.925	2.27	A	I	10.0	0.80	0.811	1.31	A	E	53.0	



LRFR SUMMARY

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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.

COMMENTS:

1.
2.
3.
4.

⟨#⟩ 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
E - EXTERIOR GIRDER

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 5 OF 5

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CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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DocuSigned by: Odine J. Paitel
11/10/2023

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

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

LEFT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			35

STD. NO. LRFR1

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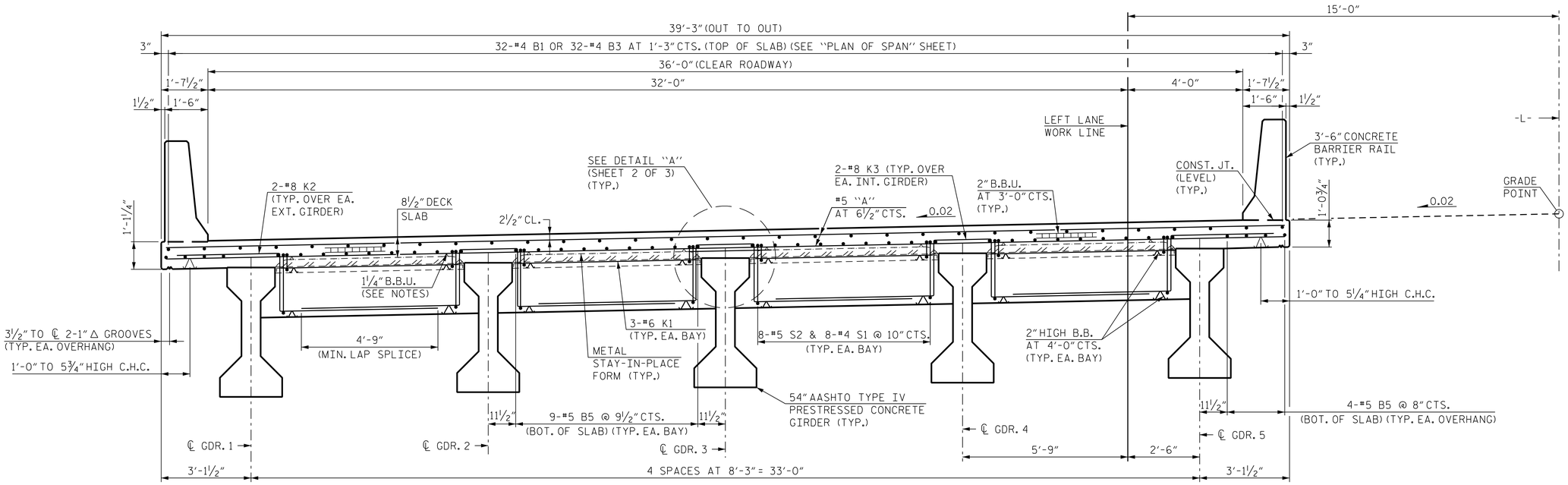
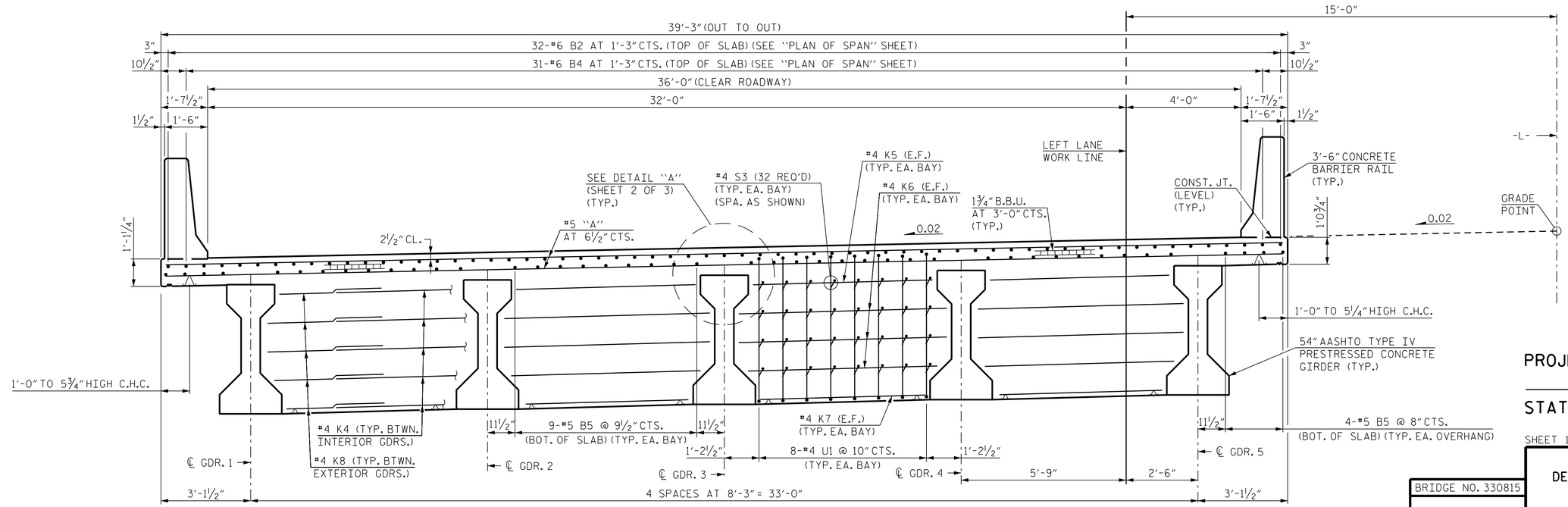


TYPICAL SECTION AT END BENTS



TYPICAL SECTION AT BENT

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.

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 OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT A "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 3

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SUPERSTRUCTURE
TYPICAL SECTIONS

LEFT LANE

BRIDGE NO. 330815

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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1			3		
2			4		

SHEET NO. SL-6
TOTAL SHEETS 35

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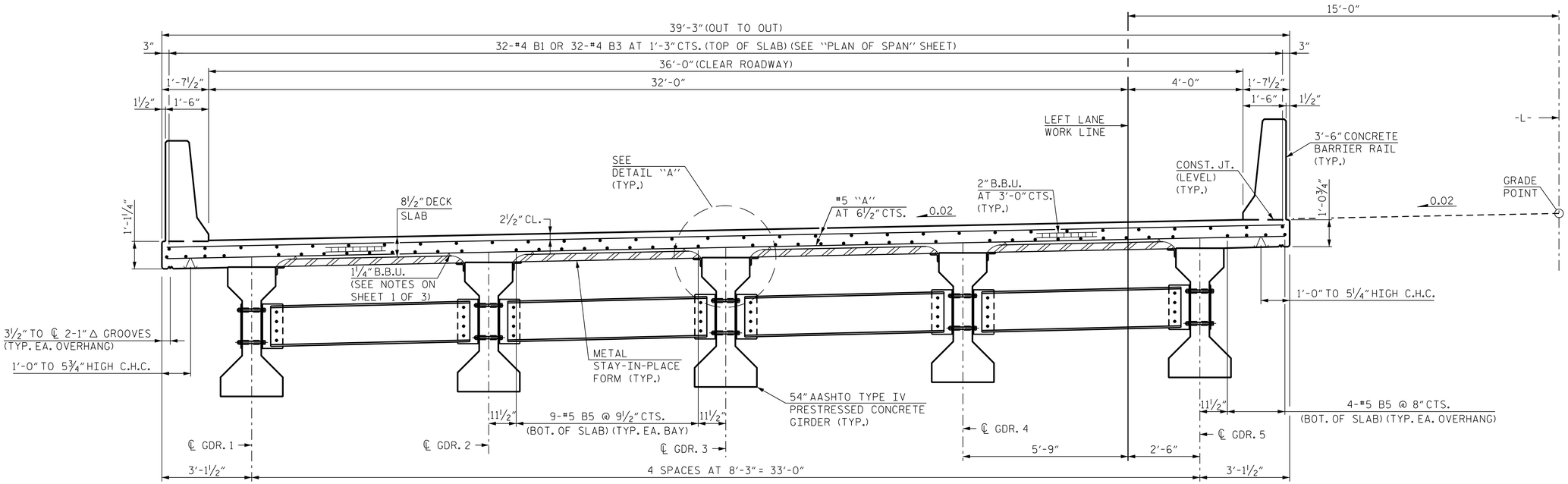
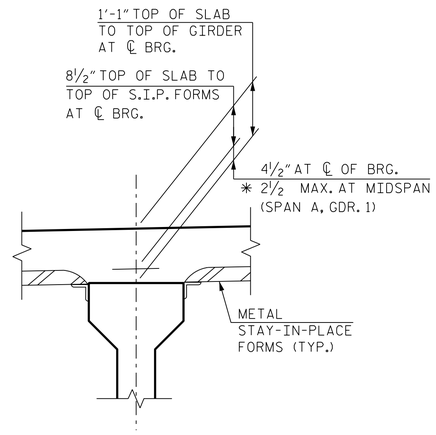


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS



DETAIL "A"

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
TYPICAL SECTIONS

LEFT LANE

BRIDGE NO. 330815

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1			3			TOTAL SHEETS
2			4			35

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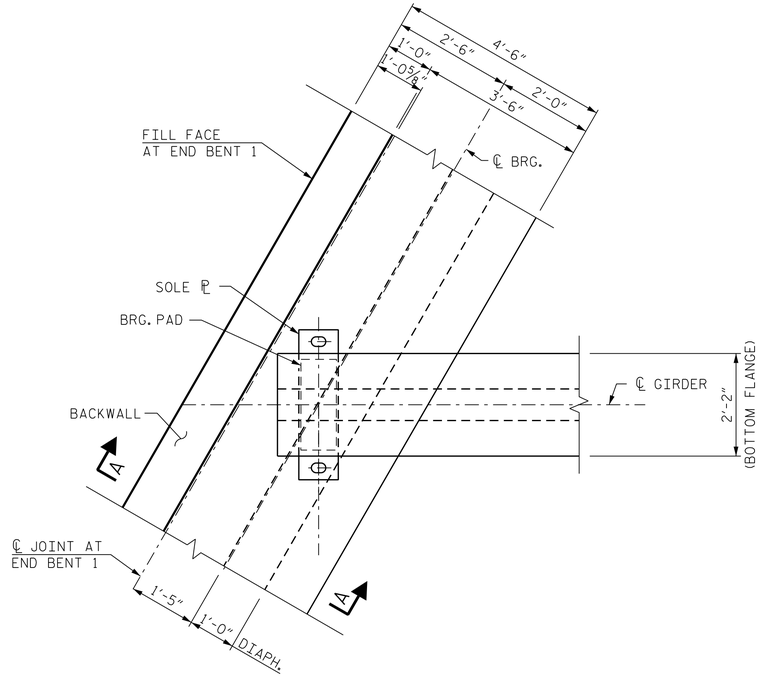
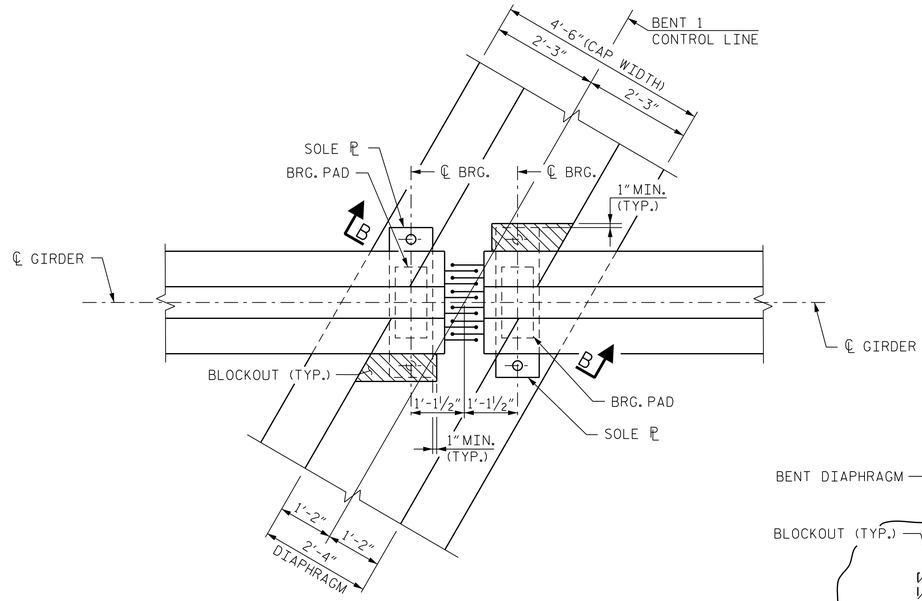


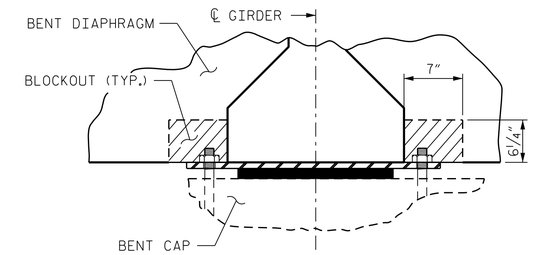
PLAN DETAIL OF END BENT 1

(DECK SLAB NOT SHOWN FOR CLARITY)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

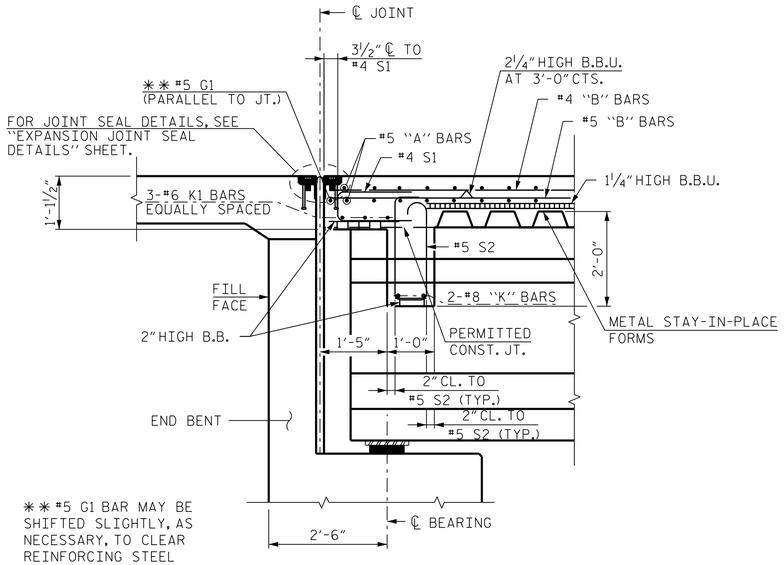


PLAN DETAIL OF BENT 1

(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)



BENT SECTION
DIAPHRAGM BLOCKOUT DETAIL



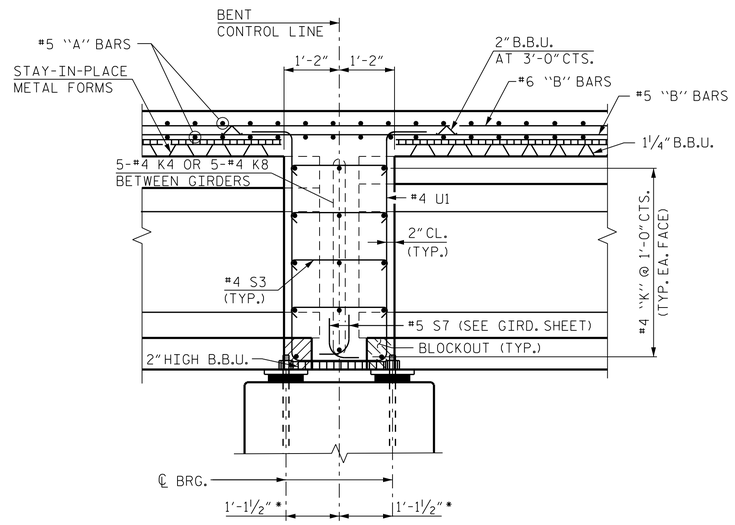
✱✱#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO END BENT)

END BENT DETAILS

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION B-B

SECTION THROUGH BENT DIAPHRAGM

✱MEASURED ALONG ℄ GIRDER

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 3

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
TYPICAL SECTION DETAILS

LEFT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			35

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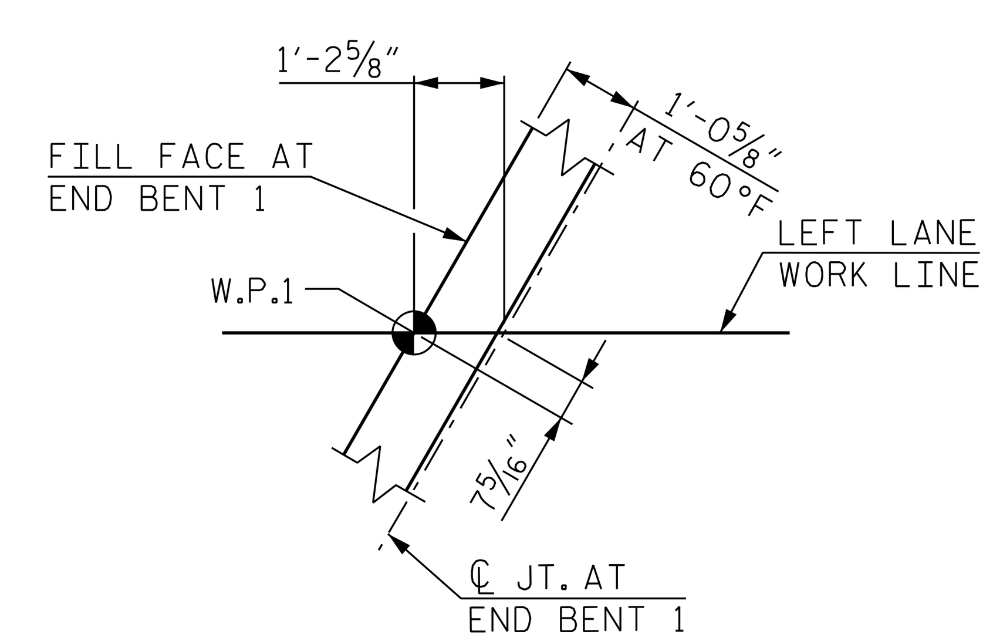
PLAN OF SPAN A

FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

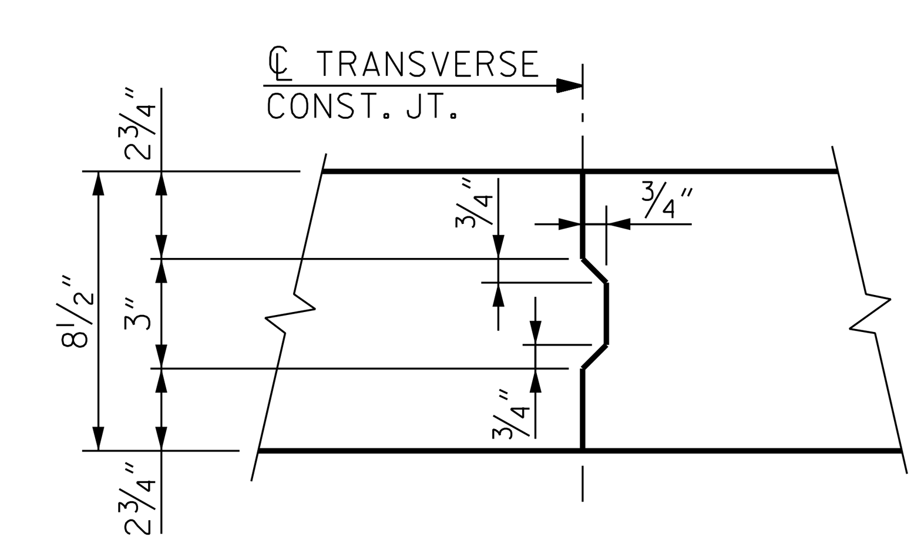
END BENT 1 DIAPHRAGM DETAILS	
EB1-1	3-#6 K1 (TYP. EA. BAY)
EB1-2	2-#8 K2 (OVER EA. EXT. GDR.) (4'-9" MIN. SPLICE)
EB1-3	2-#8 K3 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB1-4	8-#4 S1 AND 8-#5 S2 AT 10" CTS. (TYP. EA. BAY)
EB1-5	42-#4 J1 AT 1'-0" CTS. (SEE EXPANSION JOINT SEAL DETAILS FOR LOCATION OF BARS)
EB1-6	#5 G1 PARALLEL TO JOINT

1. 32-#4 B1 (2 BAR RUN) (TOP OF SLAB) (MIN. LAP SPLICE = 1'-11") (SEE TYPICAL SECTION FOR SPACING)
2. 32-#6 B2 (TOP OF SLAB) (SPLICE WITH #4 B1 AND #4 B3) (MIN. LAP SPLICE = 2'-2") (SEE TYPICAL SECTION FOR SPACING)
3. 31-#6 B4 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)

BENT 1 DIAPHRAGM DETAILS	
B1-1	8-#4 U1 AT 10" CTS. AND 32-#4 S3 (TYP. EA. BAY)
B1-2	#4 K5, 3-#4 K6 AND #4 K7 (TYP. EA. FACE) (TYP. EA. BAY)
B1-3	5-#4 K4 BETWEEN INTERIOR GIRDERS
B1-4	5-#4 K8 BETWEEN EXTERIOR GIRDERS



DETAIL "A"



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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE
PLAN OF SPAN A

LEFT LANE

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2			4				35

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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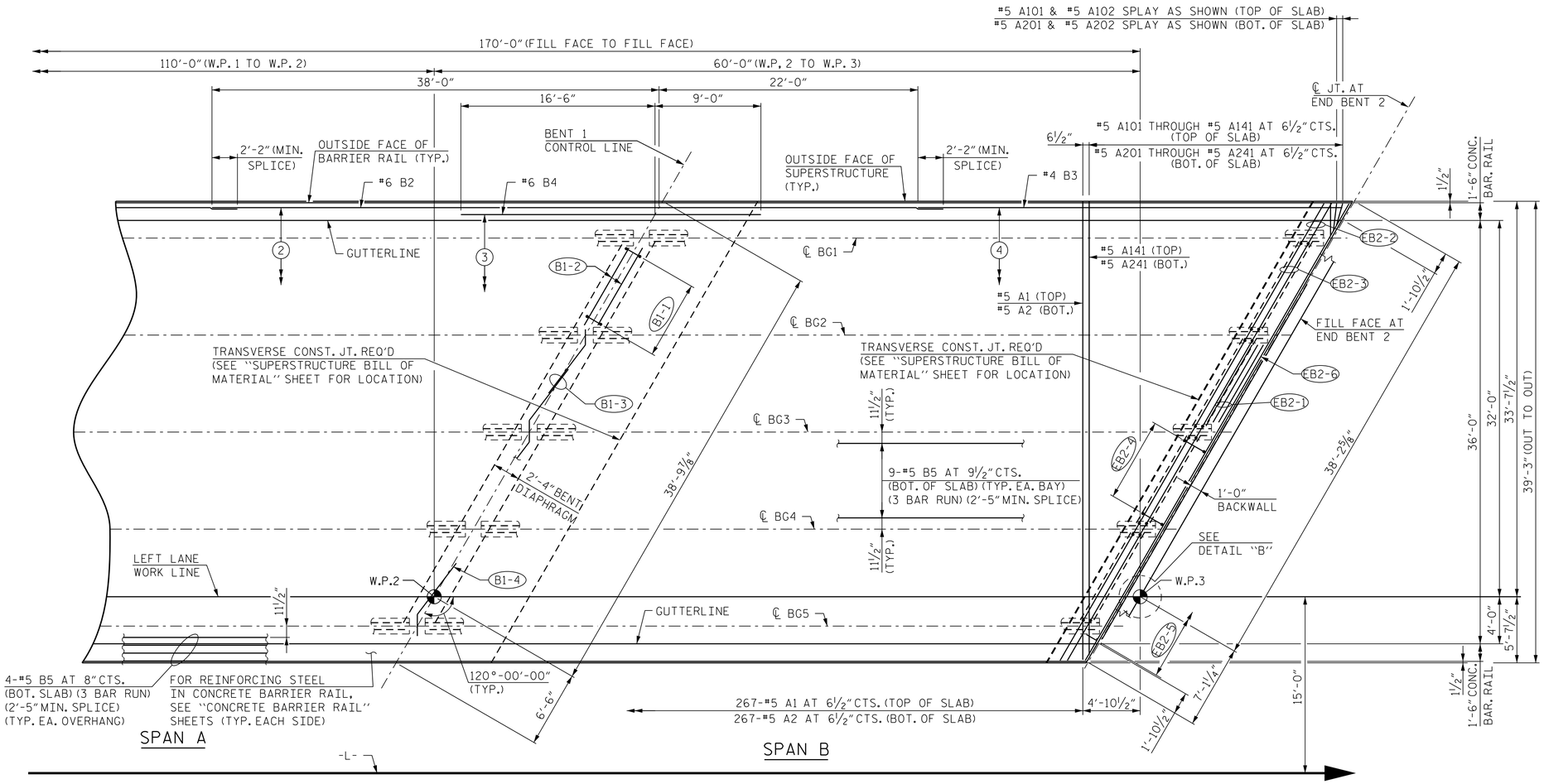


PLAN OF SPAN B

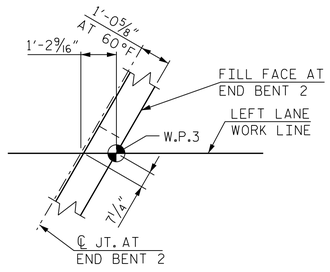
FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

BENT 1 DIAPHRAGM DETAILS	
B1-1	8-#4 U1 AT 10" CTS. AND 32-#4 S3 (TYP. EA. BAY)
B1-2	#4 K5, 3-#4 K6 AND #4 K7 (TYP. EA. FACE) (TYP. EA. BAY)
B1-3	5-#4 K4 BETWEEN INTERIOR GIRDERS
B1-4	5-#4 K8 BETWEEN EXTERIOR GIRDERS

(2) 32-#6 B2 (TOP OF SLAB) (SPLICE WITH #4 B1 AND #4 B3) (MIN. LAP SPLICE = 2'-2") (SEE TYPICAL SECTION FOR SPACING)

(3) 31-#6 B4 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)

(4) 32-#4 B3 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)



DETAIL "B"

END BENT 2 DIAPHRAGM DETAILS	
EB2-1	3-#6 K1 (TYP. EA. BAY)
EB2-2	2-#8 K2 (OVER EA. EXT. GDR.) (4'-9" MIN. SPLICE)
EB2-3	2-#8 K3 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB2-4	8-#4 S1 AND 8-#5 S2 AT 10" CTS. (TYP. EA. BAY)
EB2-5	42-#4 J1 AT 1'-0" CTS. (SEE EXPANSION JOINT SEAL DETAILS FOR LOCATION OF BARS)
EB2-6	#5 G1 PARALLEL TO JOINT

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B

LEFT LANE

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Digitally signed by Ondine Paitel
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2			4			35

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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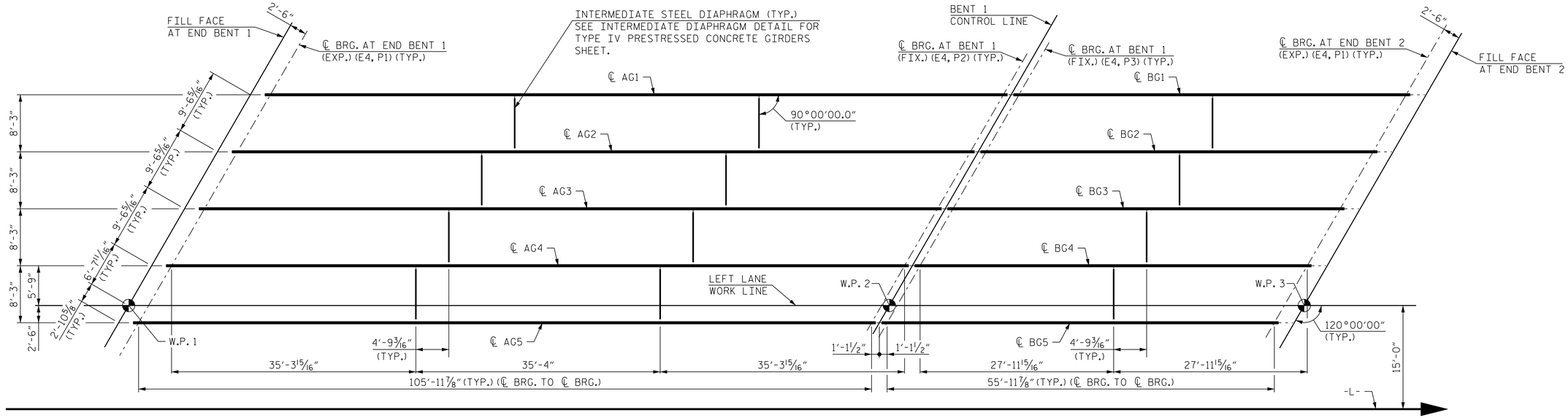

FRAMING PLAN

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN
SPANS A & B

LEFT LANE

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
DocuSigned by: Odine Paitel C1E5...
11/10/2023

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-11
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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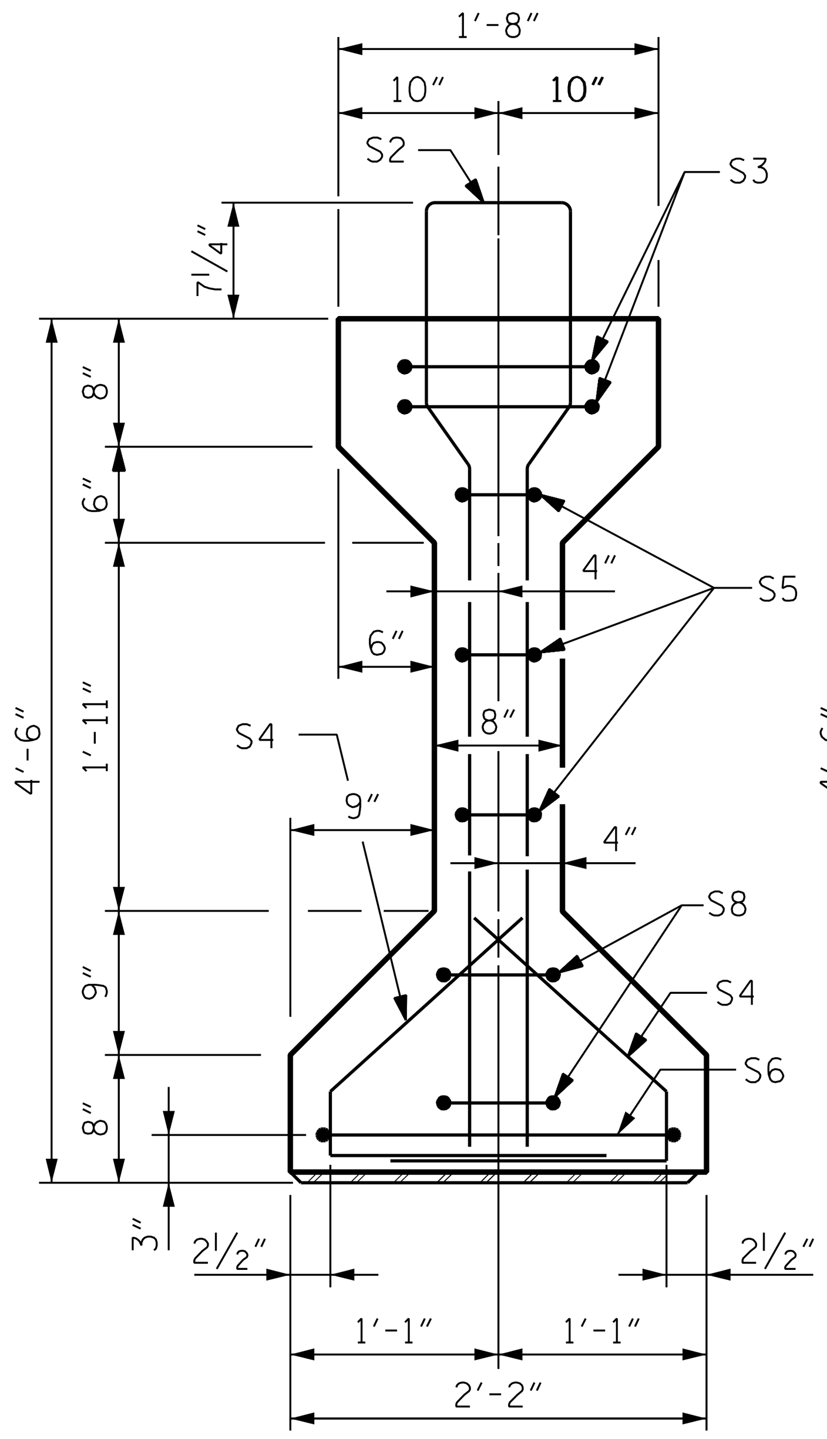
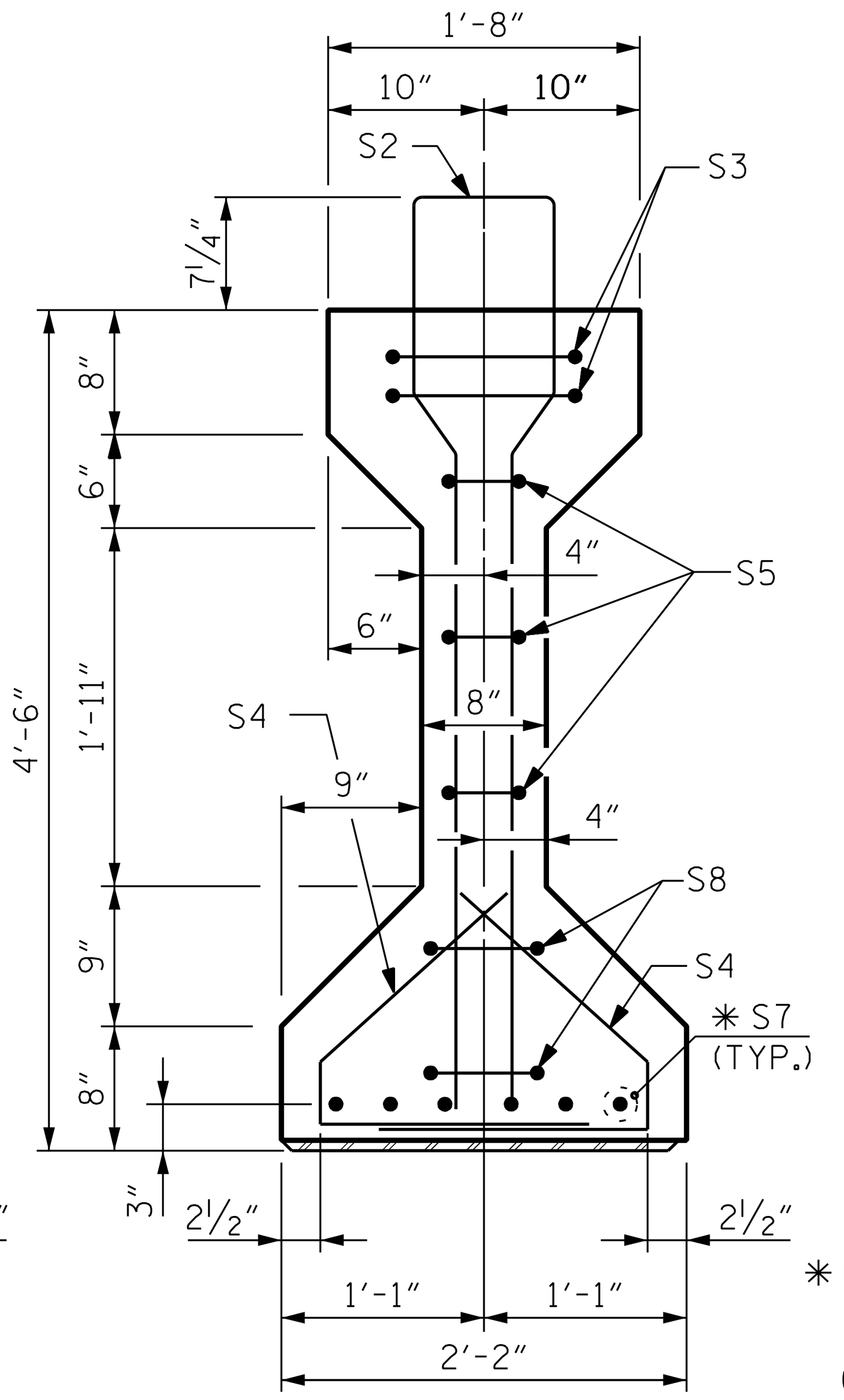
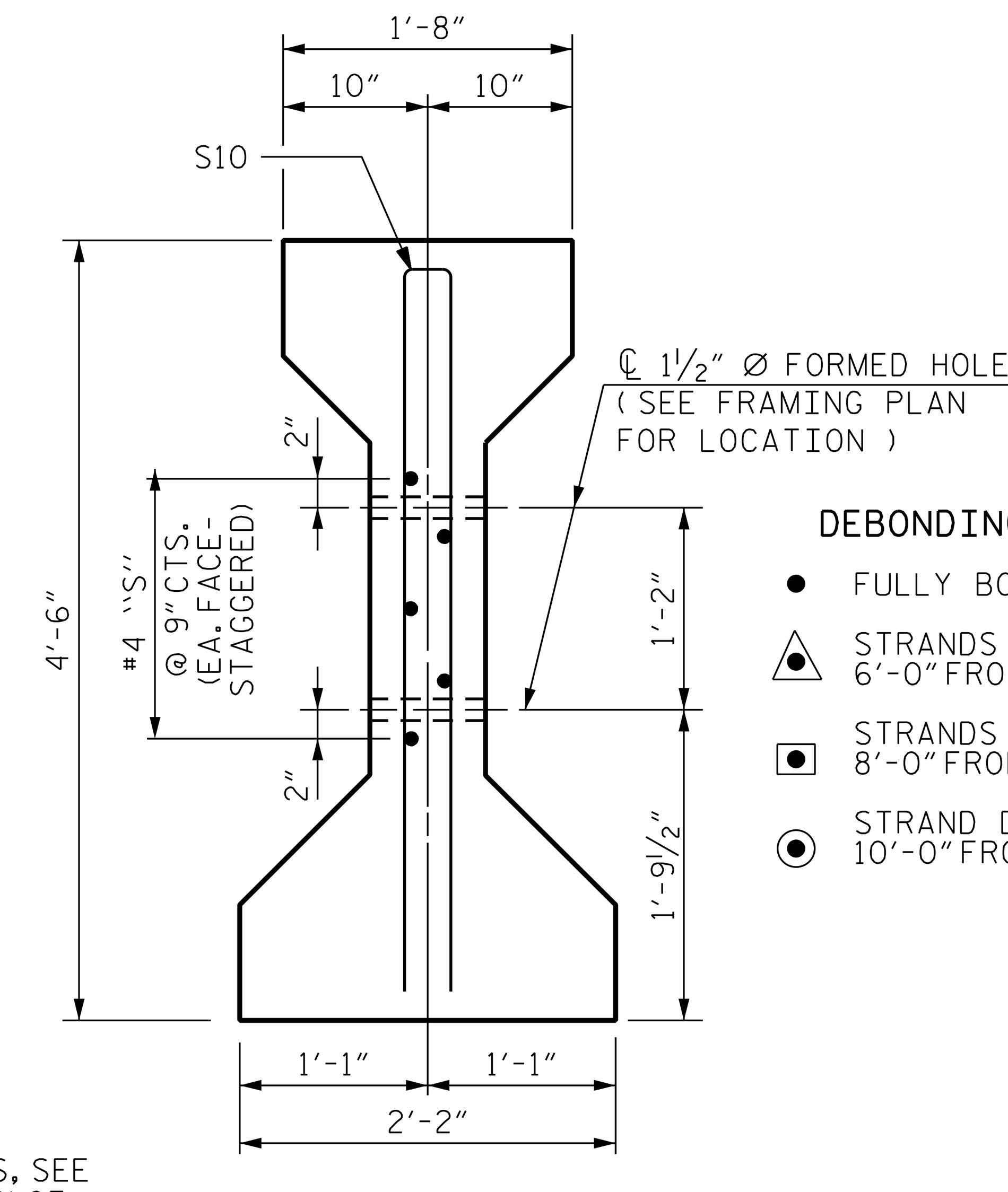


SECTION A-A



SECTION B-B

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

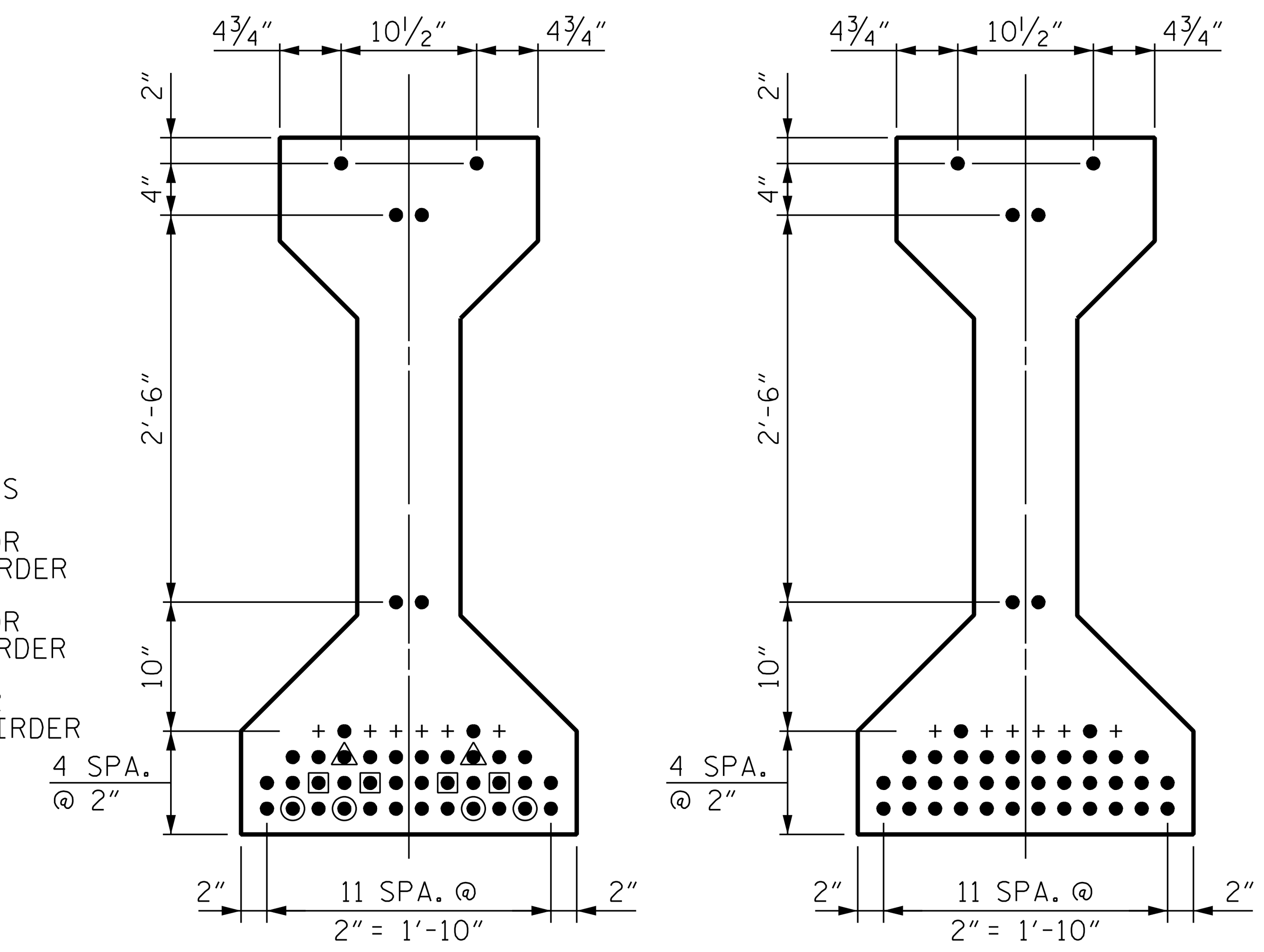


SECTION C-C

(S1 BARS NOT SHOWN)

DEBONDING LEGEND

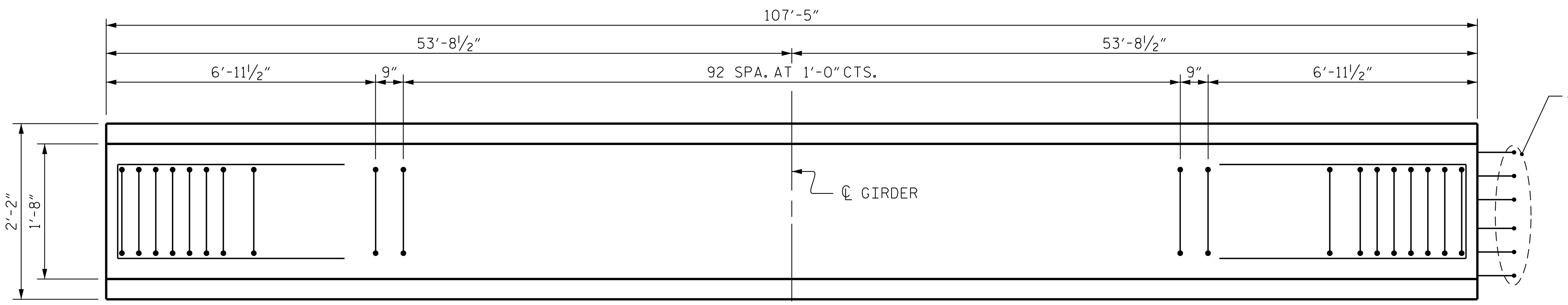
- ● FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ■ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ◉ STRAND DEBONDED FOR 10'-0" FROM END OF GIRDER



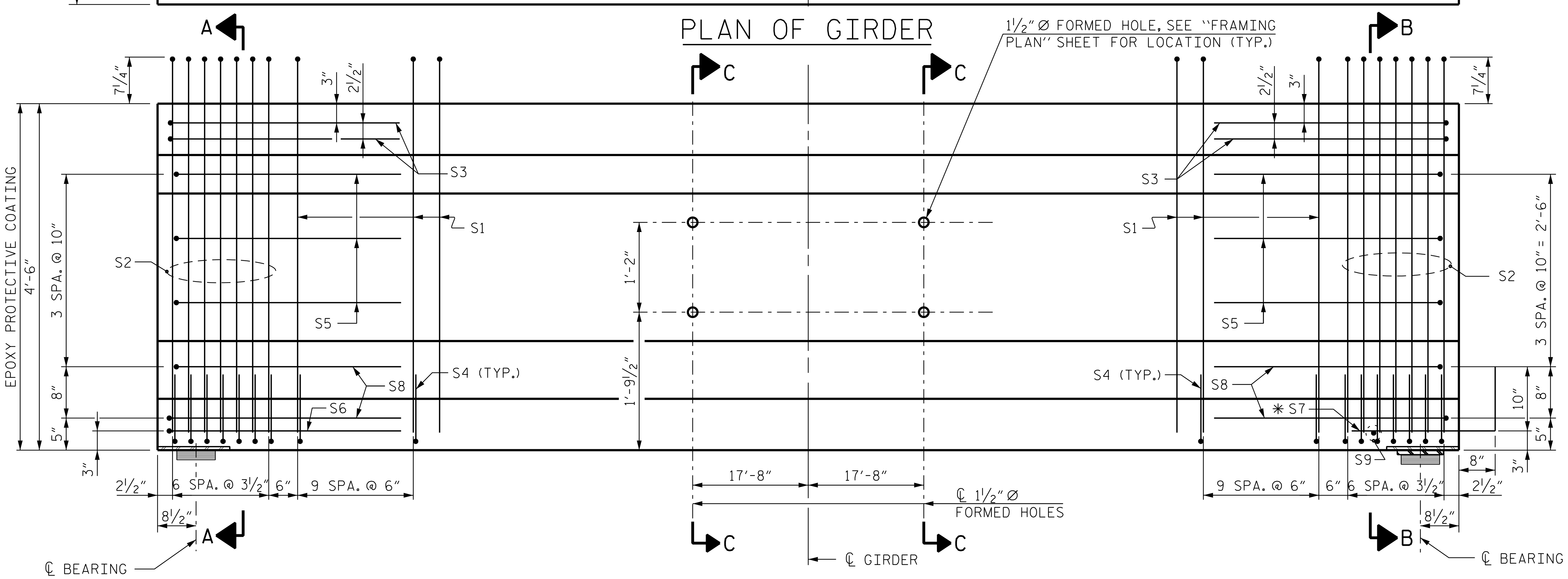
AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

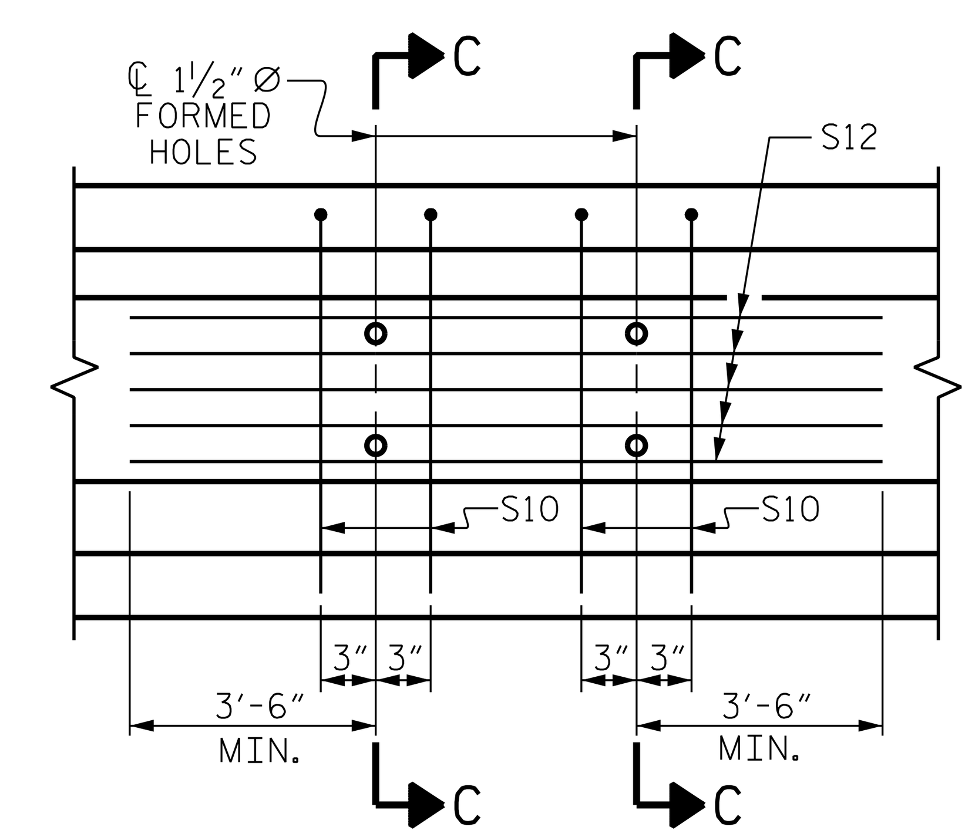


PLAN OF GIRDER



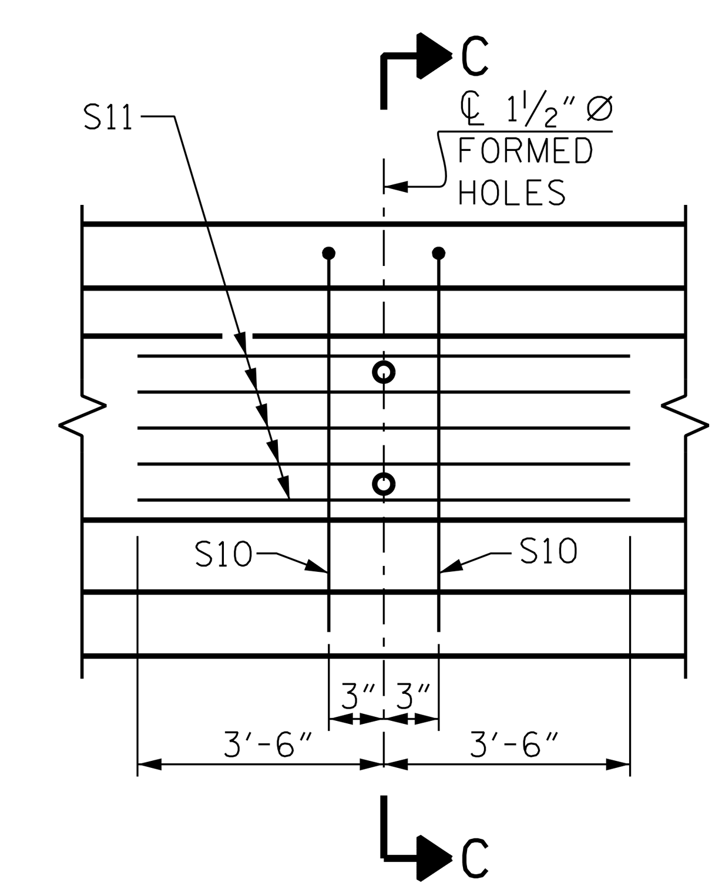
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 2 THRU 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 1 & 5

0.6" Ø L. R. GRADE 270 STRANDS

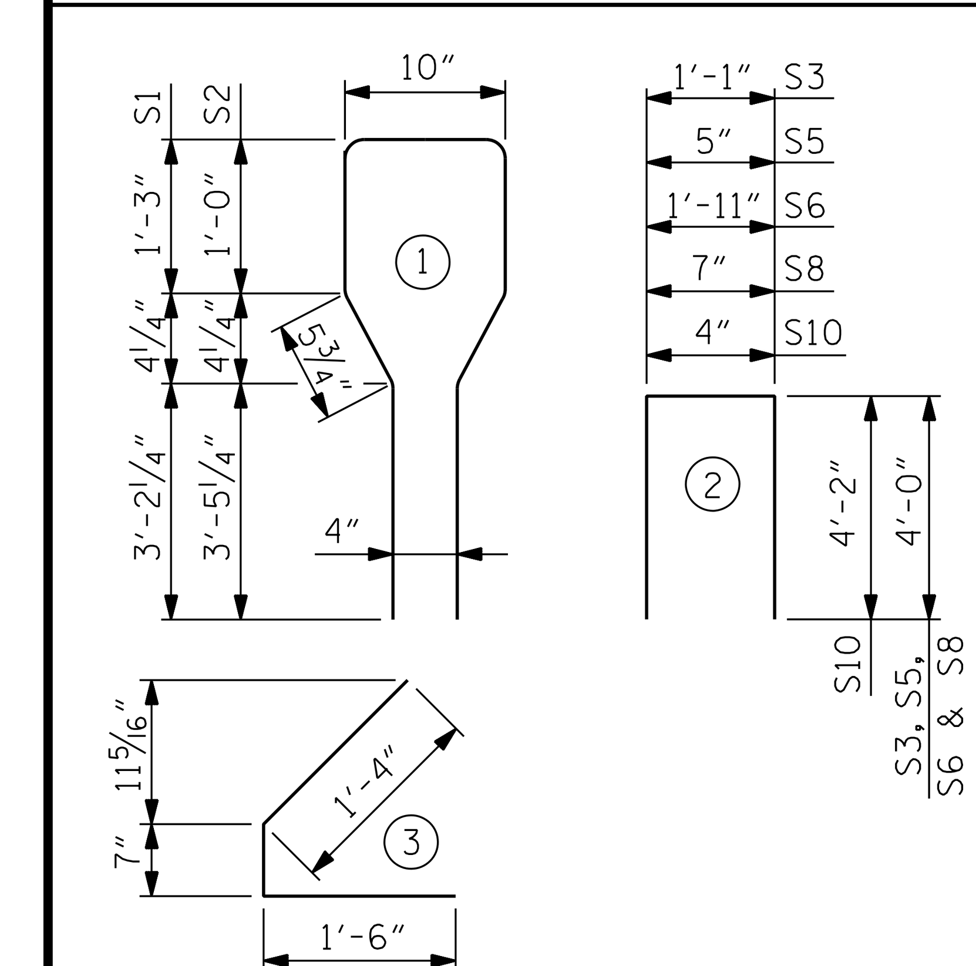
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	113	#4	1	10'-8"	805
	S2	14	#6	1	10'-8"	225
	S3	4	#4	2	9'-1"	24
	S4	68	#4	3	3'-5"	155
	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
EXTERIOR GDR.	S10	4	#5	2	8'-8"	36
INTERIOR GDR.	S10	8	#5	2	8'-8"	72
EXTERIOR GDR.	S11	10	#4	STR.	7'-0"	47
INTERIOR GDR.	S12	10	#4	STR.	11'-10"	79

∗ 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	7,500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDRS. 2-4	1,448	21.8	42
GDRS. 1 & 5	1,380	21.8	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	107'-5"	537'-1"

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 4

BRIDGE NO. 330815

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11/10/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN A
LEFT LANE

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			SL-12
1			3					TOTAL SHEETS
2			4					35

STD. NO. PCG6

DRAWN BY : T. K. BOYD	DATE :	SEP 2023
CHECKED BY : L. K. AUSTIN	DATE :	SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE :	SEP 2023

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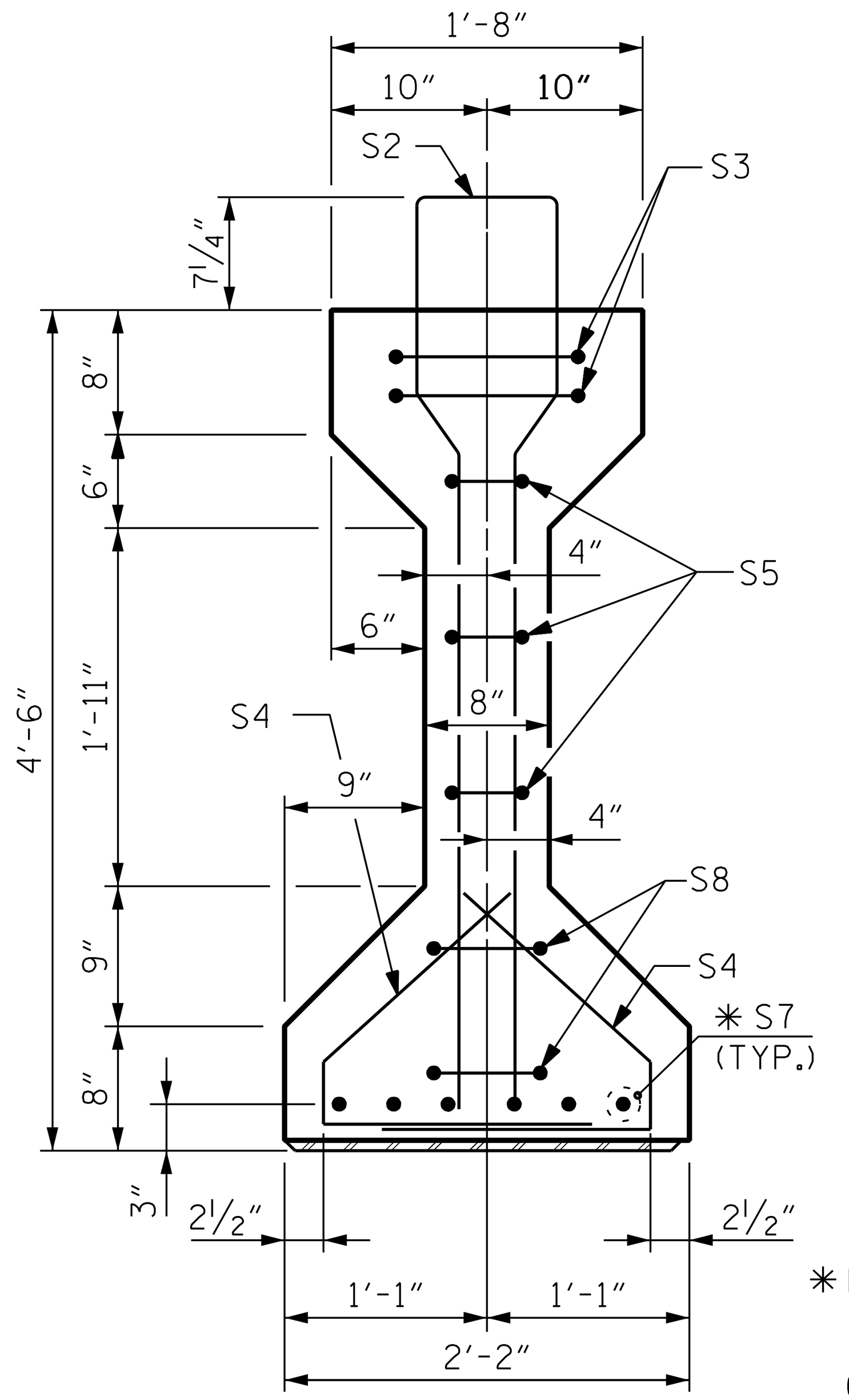
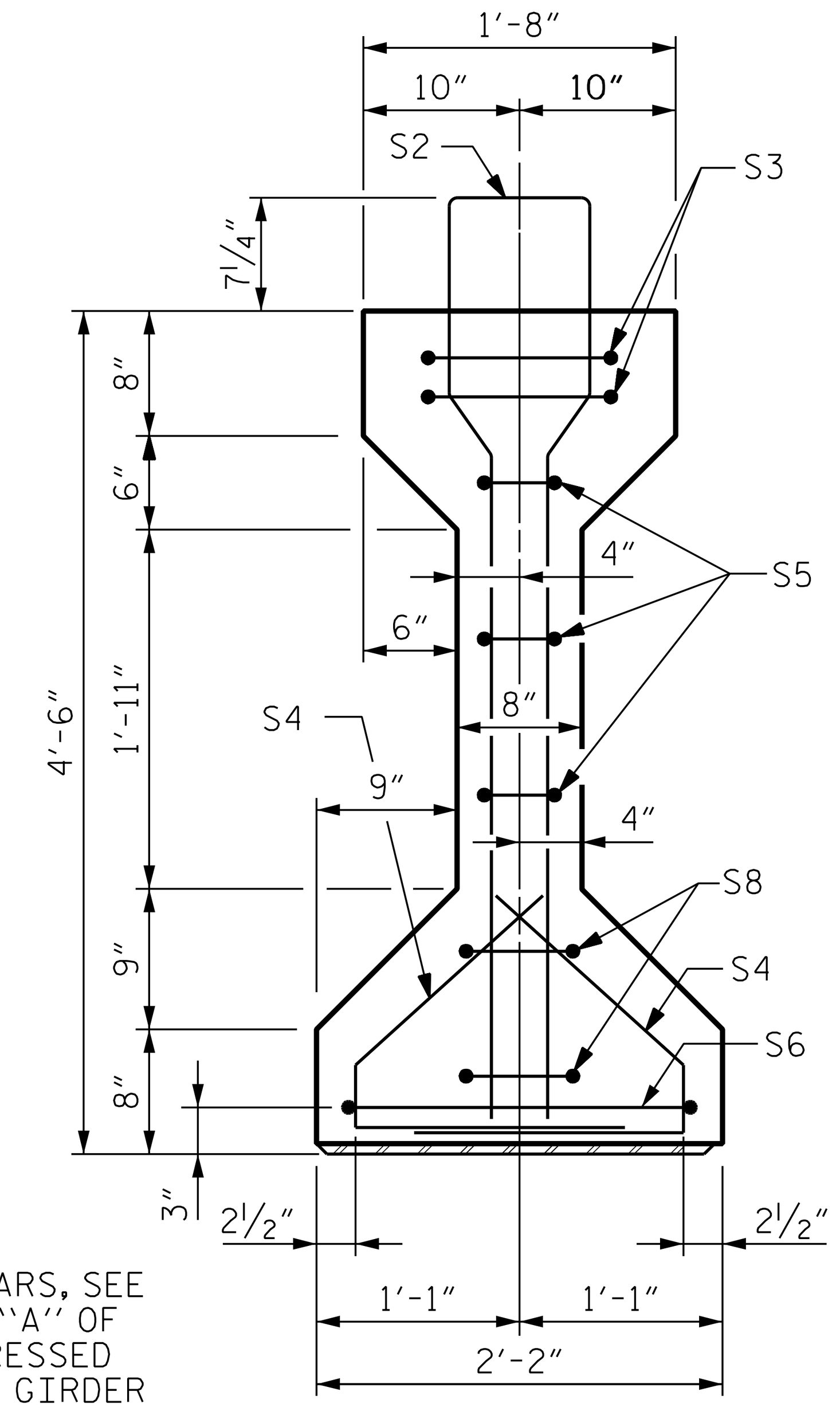
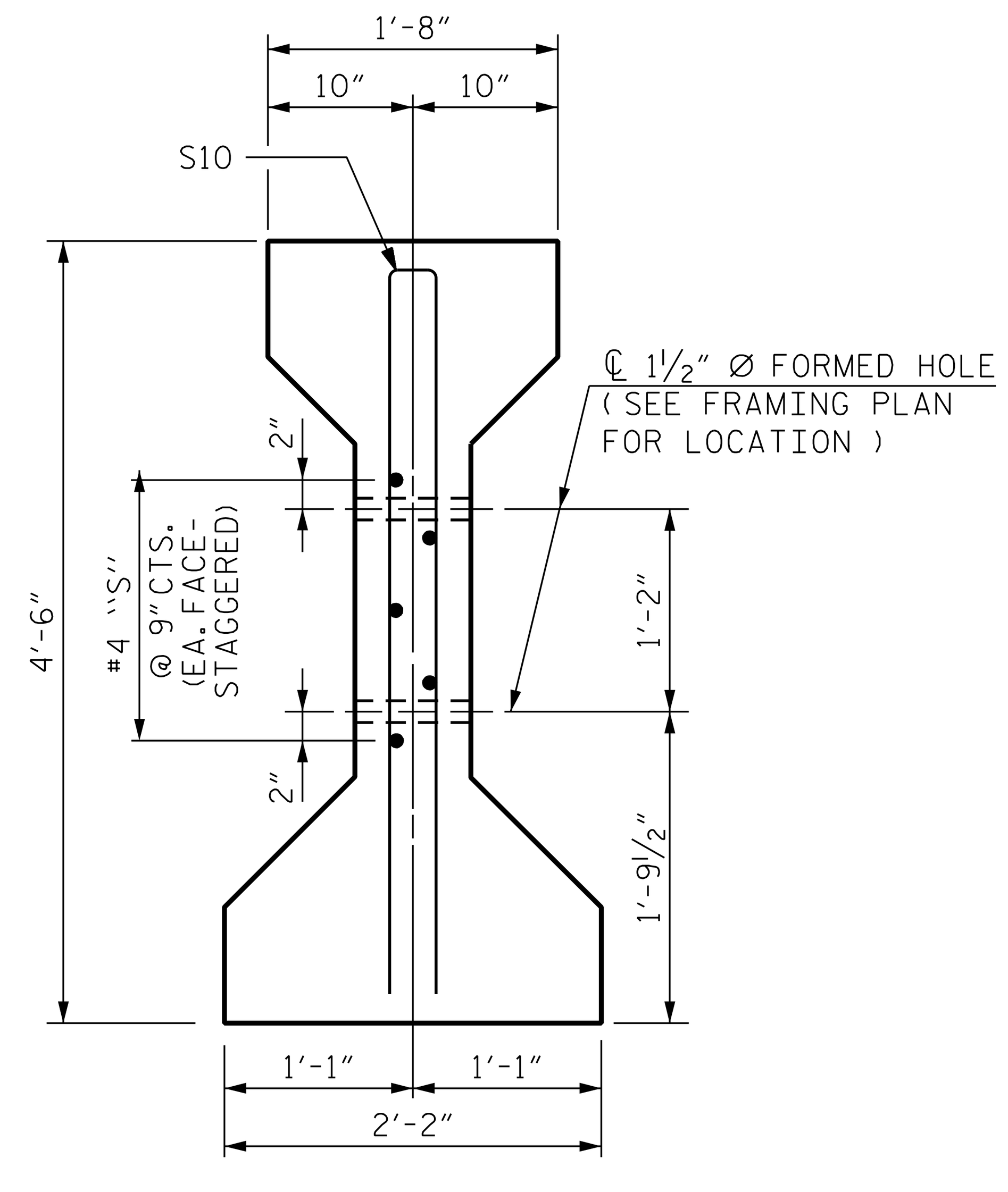


SECTION B-B

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

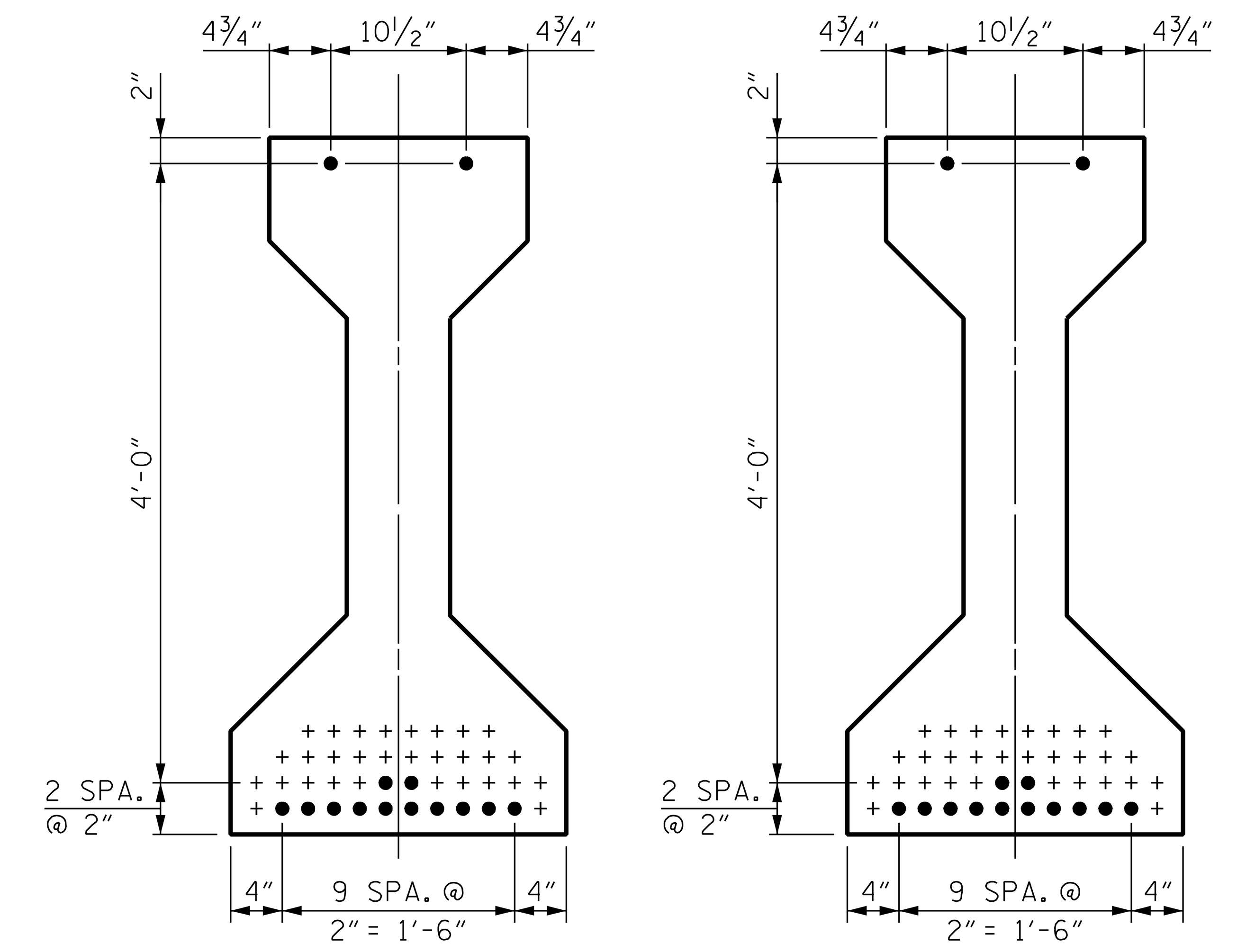


SECTION A-A



SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

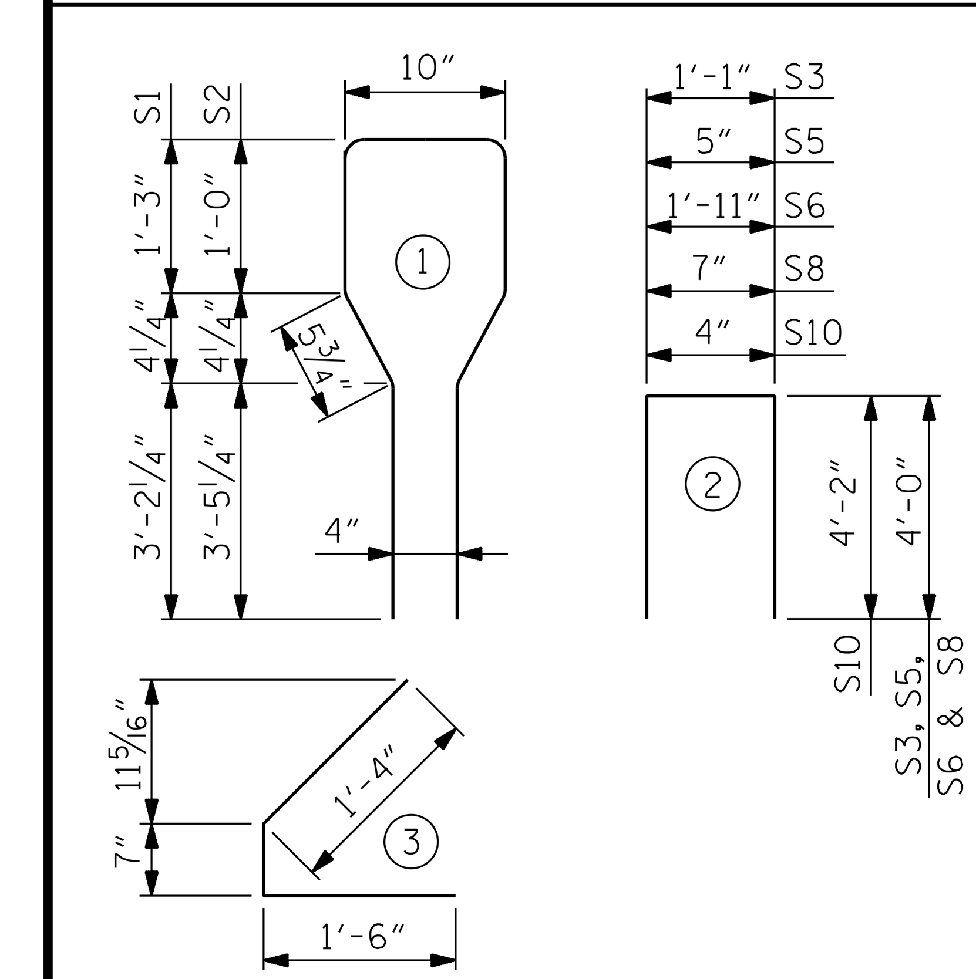
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

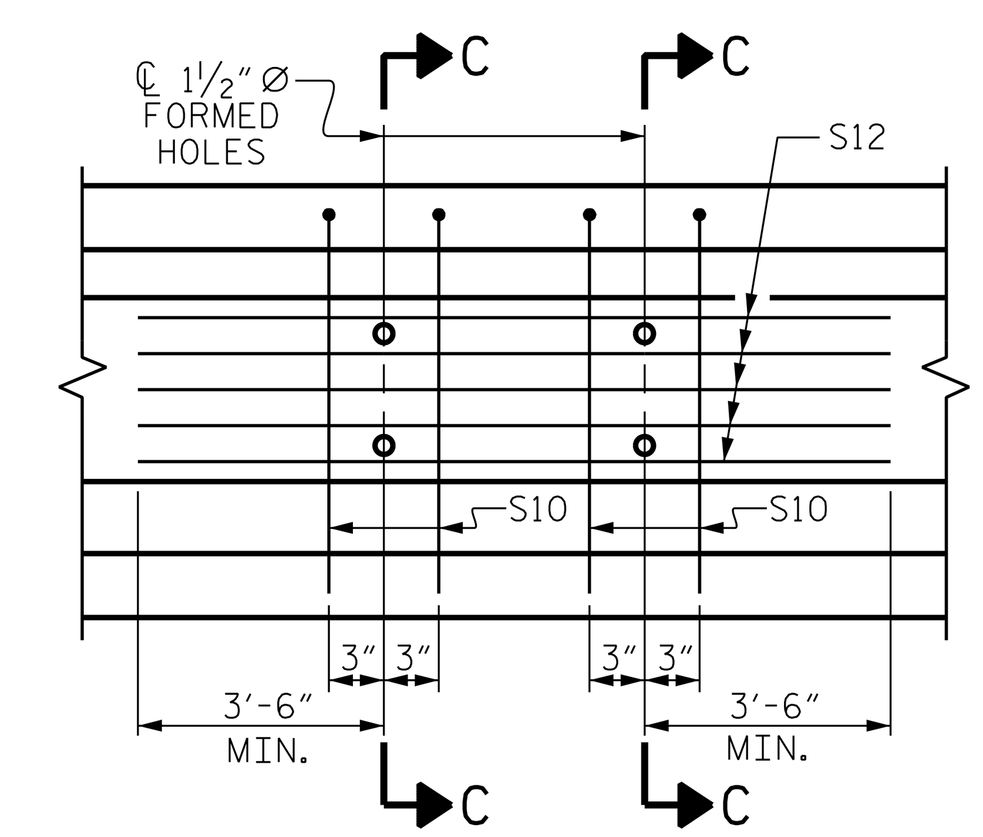
	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	43	#4	1	10'-8"	306
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	∗ S7	6	#5	STR.	3'-8"	23
	S8	4	#4	2	8'-7"	23
	S9	1	#3	STR.	1'-10"	1
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR.	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR.	11'-10"	40

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

BAR TYPES

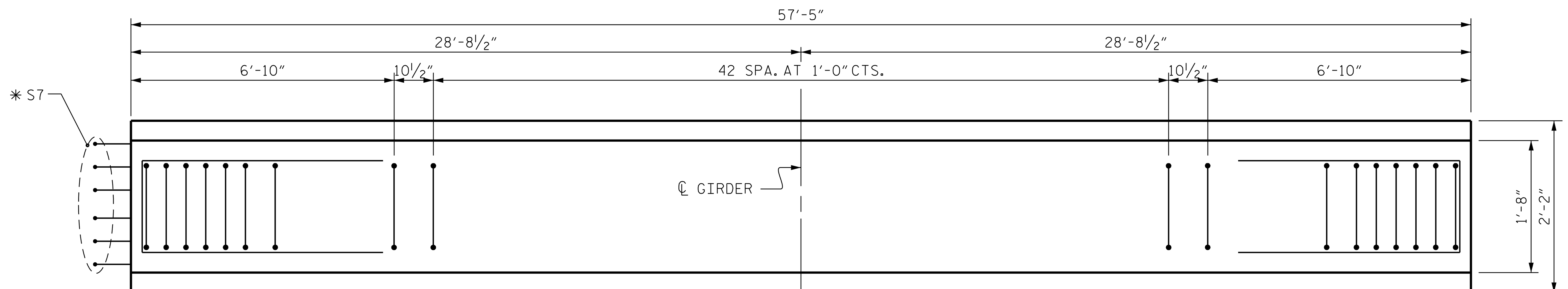


ALL BAR DIMENSIONS ARE OUT-TO-OUT

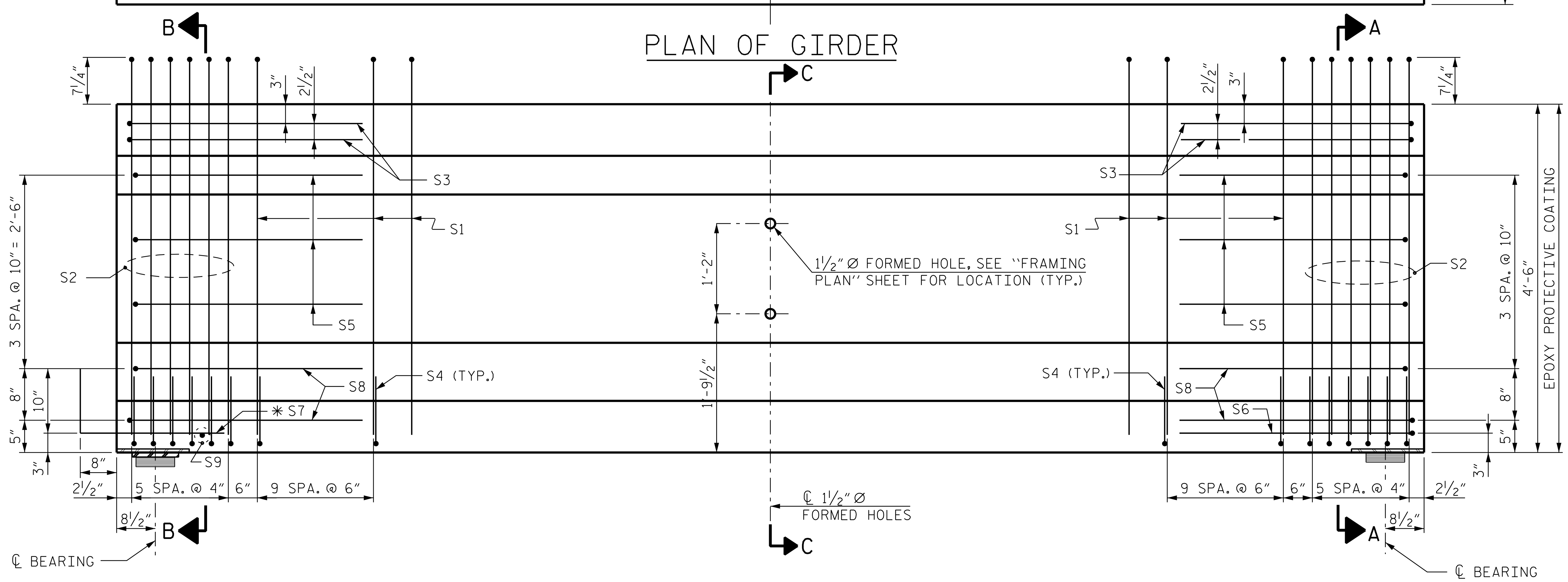


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 2 THRU 4

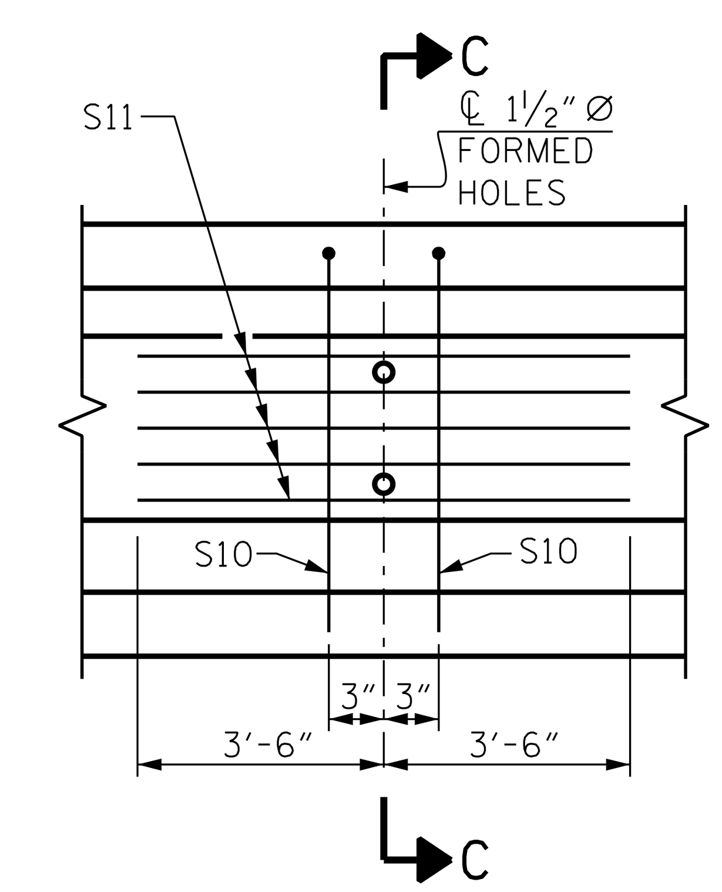


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 1 & 5

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6,700 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDRS. 1 & 5	797	11.7	14
GDRS. 2-4	832	11.7	14

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	57'-5"	287'-1"

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 4

BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONDINE J. PAITEL

11/10/2023

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RALEIGH

SUPERSTRUCTURE

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

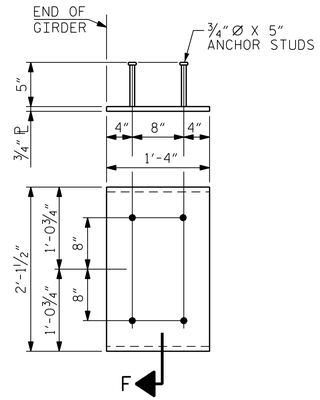
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-13
1			3			TOTAL SHEETS
2			4			35

STD. NO. PCG6

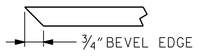
DRAWN BY : T. K. BOYD	DATE : SEP 2023
CHECKED BY : L. K. AUSTIN	DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_G2_330814.dgn



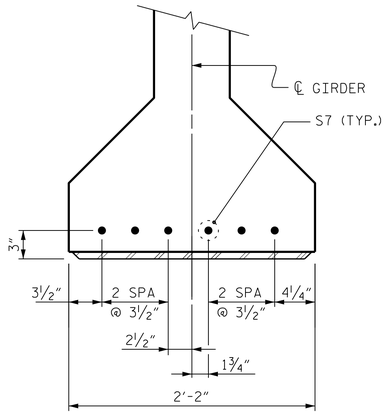
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "A"

NOTES:

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 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 6,000 PSI (SPAN A) AND 5,300 PSI (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 ¼".

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 4,500 LBS.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

LEFT LANE

BRIDGE NO. 330815

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2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

STD. NO. PCG9

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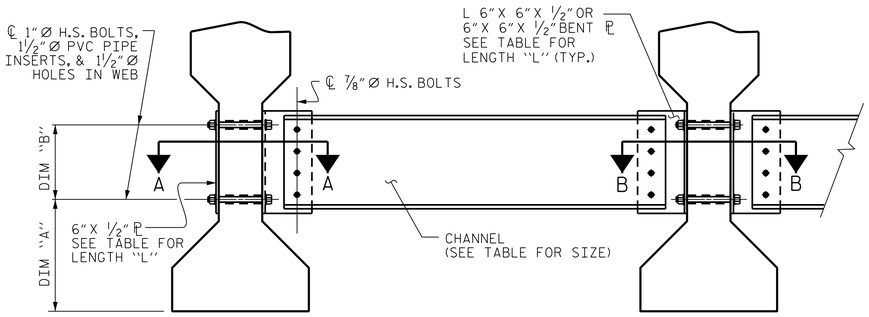
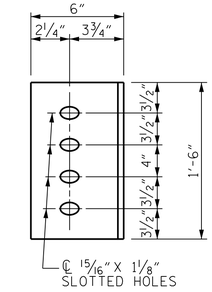
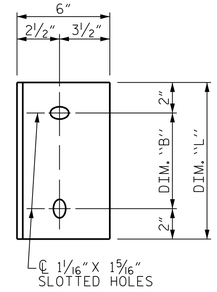


EXTERIOR GIRDER

INTERIOR GIRDER



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

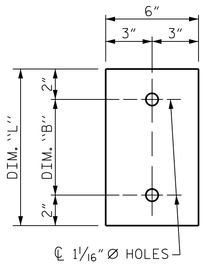
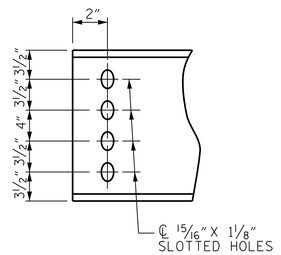


PLATE DETAILS



CHANNEL END

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.

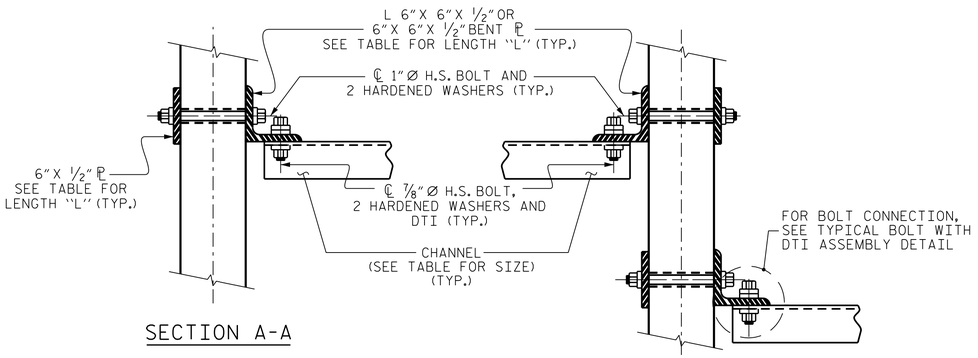
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

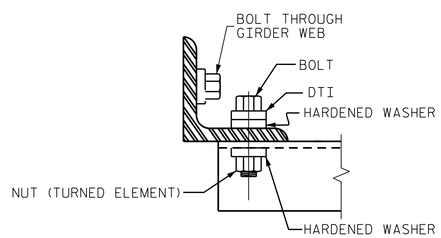
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS
LEFT LANE

BRIDGE NO. 330815

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODDINE J. PAITEL
Digitally signed by: Oddine Paitel
C1B0C...
11/10/2023

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REVISIONS

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

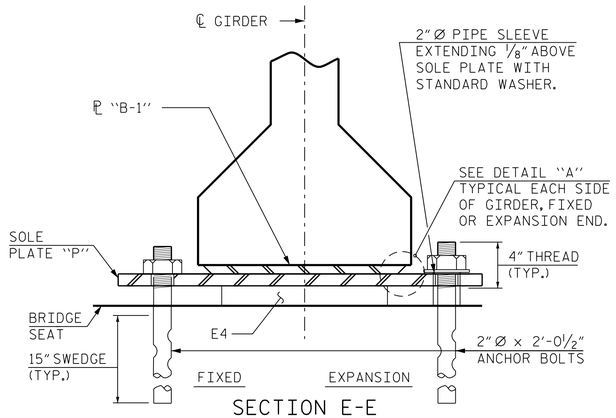
SHEET NO. SL-15

TOTAL SHEETS 35

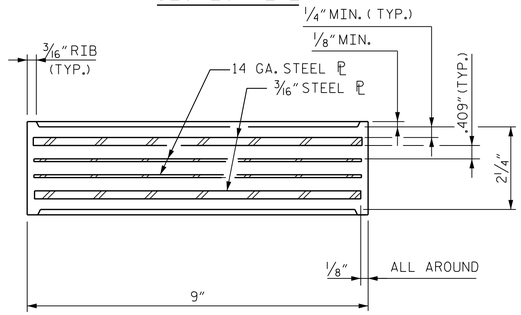
STD. NO. PCG10

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

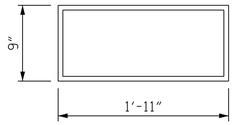
tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_G4_330814.dgn



SECTION E-E



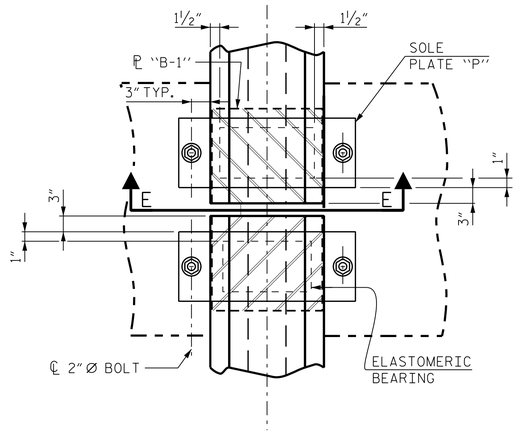
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (20 REQ'D)

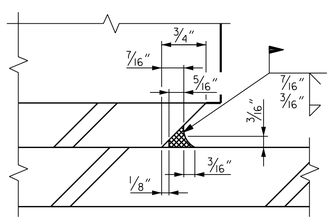
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



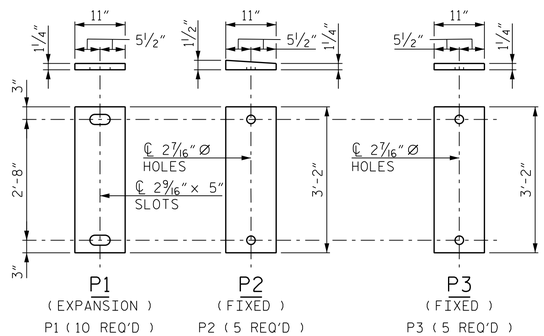
TYPICAL PLAN

(SHOWING CONTINUOUS BENT)



DETAIL "A"

DIRECTION OF INCREASING STATIONS



SOLE PLATE DETAILS ("P")

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.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 K

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

DRAWN BY : T. K. BOYD DATE : SEP 2023
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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 38850 ENGINEER ONDINE J. PAITEL
Docusigned by: Ondine Paitel
12/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
ELASTOMERIC BEARING DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-16
1			3			TOTAL SHEETS
2			4			35

opaitel
12/19/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_BG_330814.dgn

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN A

GIRDER		FORTIETH POINTS																					
		0	0.025	0.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
AG1 AND AG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.040	0.060	0.079	0.098	0.116	0.134	0.149	0.166	0.180	0.194	0.206	0.217	0.226	0.234	0.241	0.246	0.250	0.252	0.253
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.016	0.033	0.050	0.066	0.083	0.099	0.114	0.128	0.142	0.155	0.167	0.178	0.188	0.197	0.204	0.210	0.215	0.218	0.221	0.221
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
		FORTIETH POINTS																				
		0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.252	0.250	0.246	0.241	0.234	0.226	0.217	0.206	0.194	0.180	0.166	0.149	0.134	0.116	0.098	0.079	0.060	0.040	0.020	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.221	0.218	0.215	0.210	0.204	0.197	0.188	0.178	0.167	0.155	0.142	0.128	0.114	0.099	0.083	0.066	0.050	0.033	0.016	0.000	
	FINAL CAMBER ↑	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"	
		FORTIETH POINTS																				
		0	0.025	0.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
AG2, AG3 AND AG4	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.040	0.060	0.079	0.098	0.116	0.134	0.149	0.166	0.180	0.194	0.206	0.217	0.226	0.234	0.241	0.246	0.250	0.252	0.253
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.017	0.034	0.051	0.068	0.084	0.100	0.116	0.131	0.145	0.158	0.170	0.181	0.191	0.200	0.208	0.214	0.219	0.222	0.224	0.225
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"
		FORTIETH POINTS																				
		0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.252	0.250	0.246	0.241	0.234	0.226	0.217	0.206	0.194	0.180	0.166	0.149	0.134	0.116	0.098	0.079	0.060	0.040	0.020	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.224	0.222	0.219	0.214	0.208	0.200	0.191	0.181	0.170	0.158	0.145	0.131	0.116	0.100	0.084	0.068	0.051	0.034	0.017	0.000	
	FINAL CAMBER ↑	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"	

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN B

GIRDER		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
BG1, BG2, BG3, BG4 AND BG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.010	0.015	0.019	0.024	0.027	0.030	0.031	0.033	0.033	0.033	0.031	0.030	0.027	0.024	0.019	0.015	0.010	0.005	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.003	0.005	0.008	0.010	0.013	0.014	0.016	0.017	0.018	0.018	0.018	0.017	0.016	0.014	0.013	0.010	0.008	0.005	0.003	0.000
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	0"

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

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FORSYTH COUNTY
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DocuSigned by: Odine Paitel
C1B...
11/10/2023

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

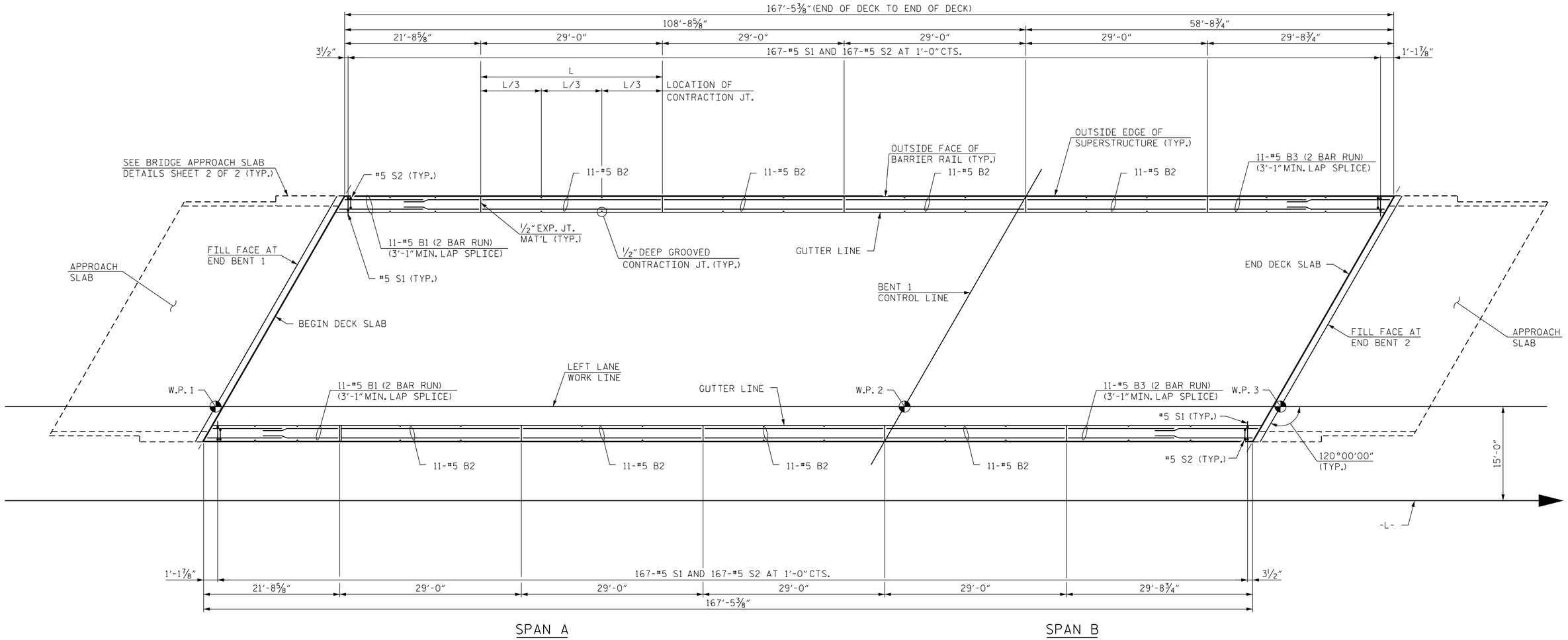
GIRDER DEFLECTION AND CAMBER DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-17
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_DL_330814.dgn



PLAN OF BARRIER RAIL

(ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL)
(FOR SECTIONS, NOTES AND QUANTITIES, SEE SHEET 2 OF 2)

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE
BARRIER RAIL
PLAN
LEFT LANE

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-18
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_BR1_330814.dgn

NOTES:

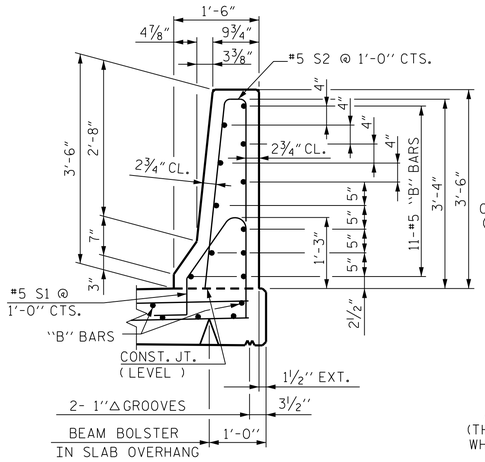
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

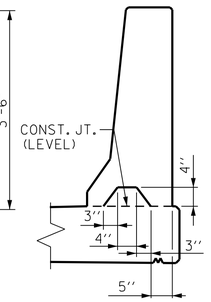
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

FOR END OF BARRIER RAIL DETAILS, SEE SHEET SL-34.

FOR BARRIER RAIL DETAILS ON APPROACH SLAB, SEE BRIDGE APPROACH SLAB SHEETS.

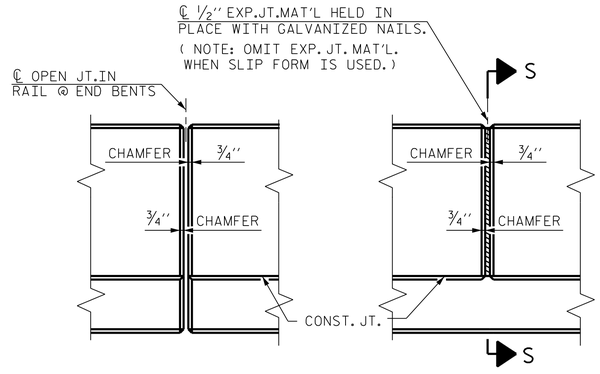


SECTION THRU RAIL



SECTION S-S

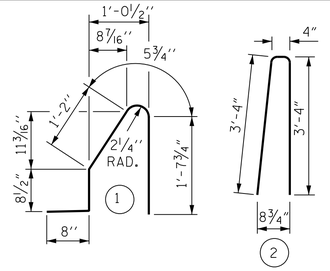
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	12'-8"	581
* B2	88	#5	STR.	28'-8"	2,631
* B3	44	#5	STR.	16'-8"	765
* S1	334	#5	1	4'-8"	1,626
* S2	334	#5	2	7'-0"	2,439

* EPOXY COATED REINFORCING STEEL	8,042 LBS.
CLASS AA CONCRETE	45.6 CU. YDS.
CONCRETE BARRIER RAIL	334.90 LIN. FT.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 2

BRIDGE NO. 330815

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DocuSigned by: Odine Paitel C1B2...
11/10/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

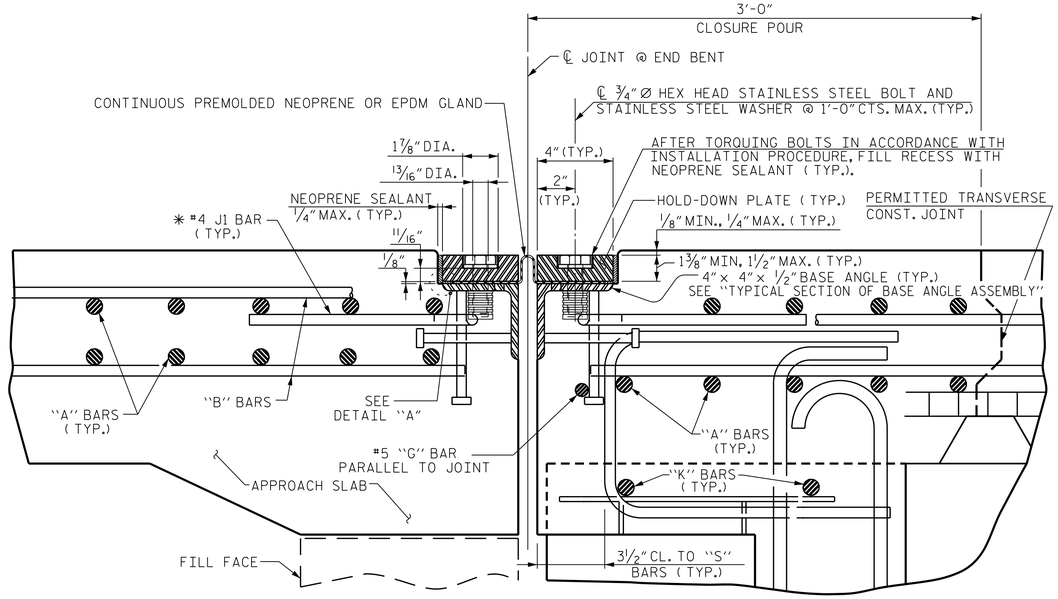
SUPERSTRUCTURE
CONCRETE BARRIER RAIL & BILL OF MATERIAL
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-19
1			3			TOTAL SHEETS
2			4			35

STD. NO. CBR1

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_BR2_330814.dgn



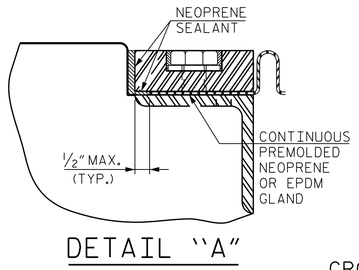
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

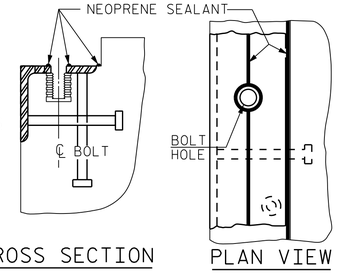
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.



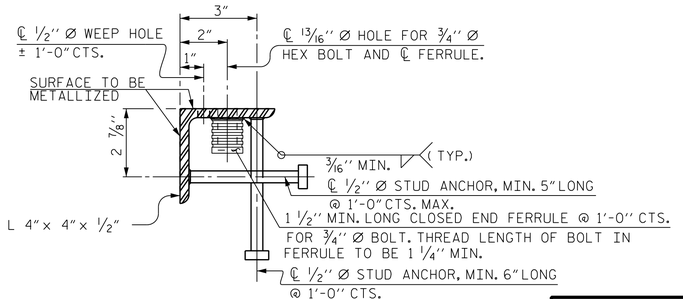
DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

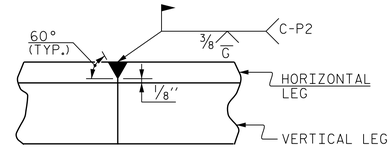
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	120°00'00"	11/16"	1 1/16"	1 5/16"	1 1/8"
2	120°00'00"	3/8"	1 1/4"	1 3/16"	1 1/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE ½" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE ¾" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODAINE J. PAITEL
Digitally signed by Odaine Paitel
11/10/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
EXPANSION JOINT SEAL DETAILS
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-20
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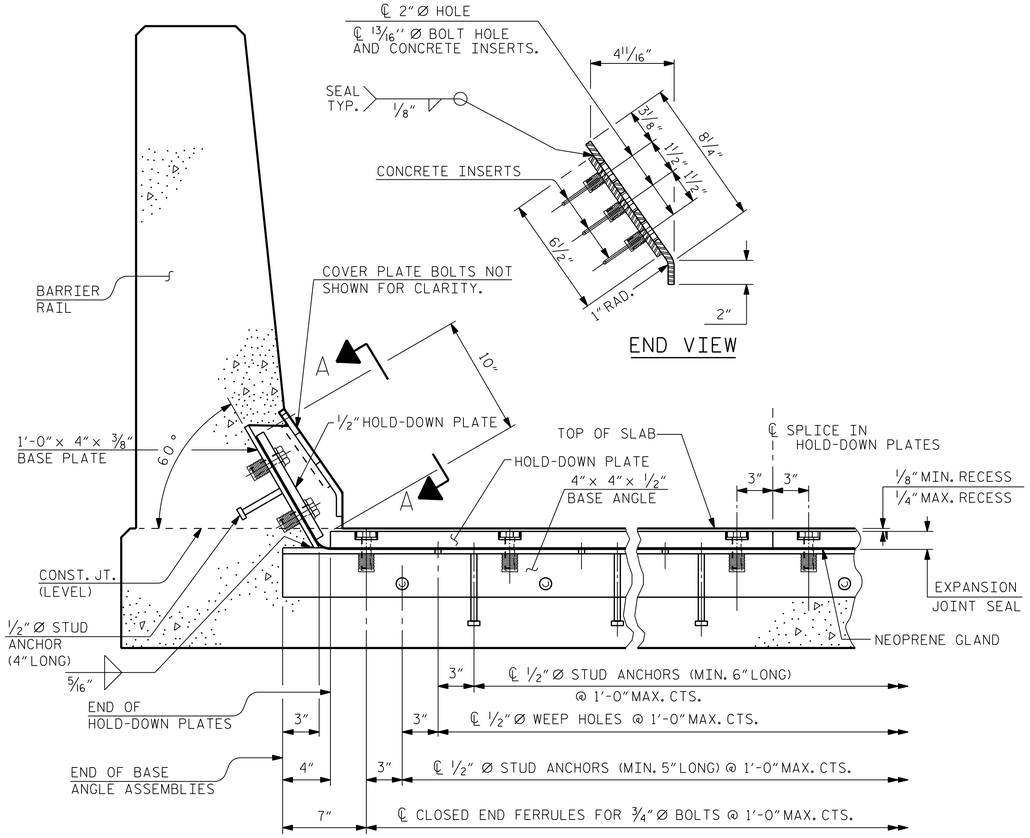
2			4			35

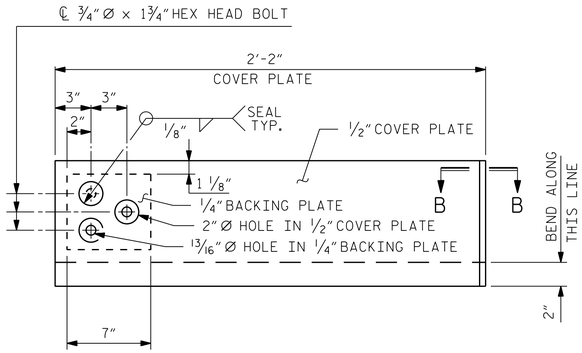
STD. NO. EJS1

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_EJS1_330814.dgn

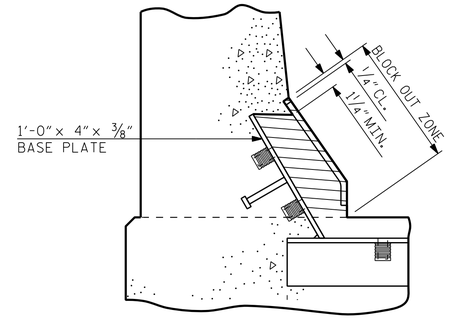


SECTION THRU RAIL NORMAL TO JOINT



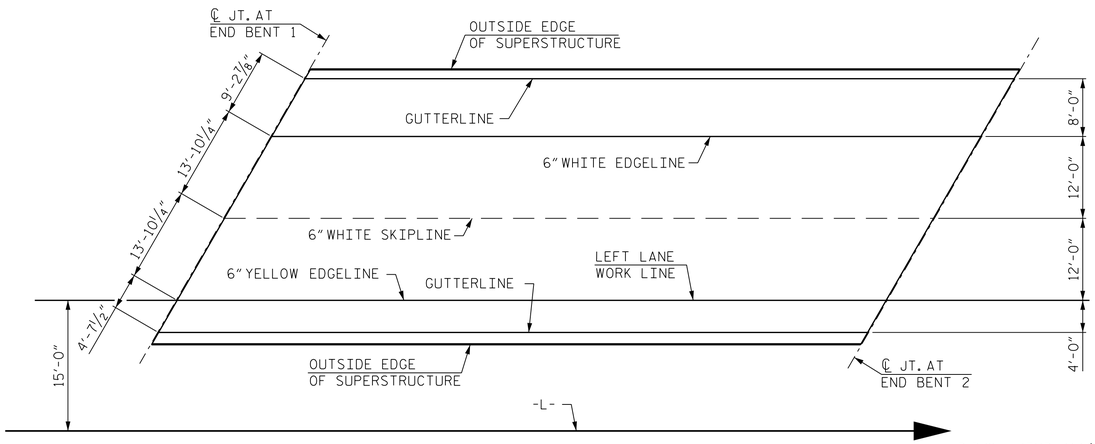
TYPE I - ELEVATION VIEW

COVER PLATE DETAILS

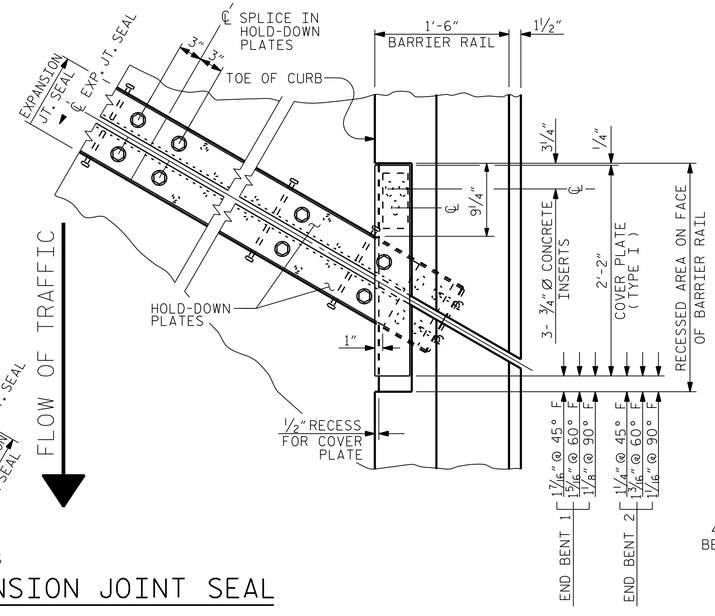


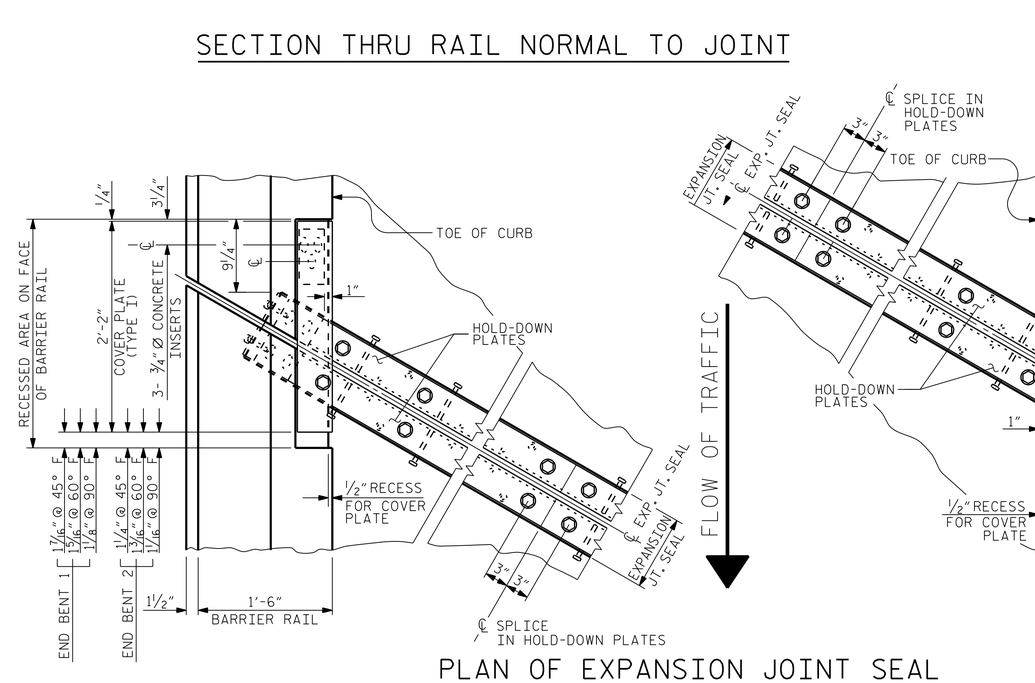
BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.

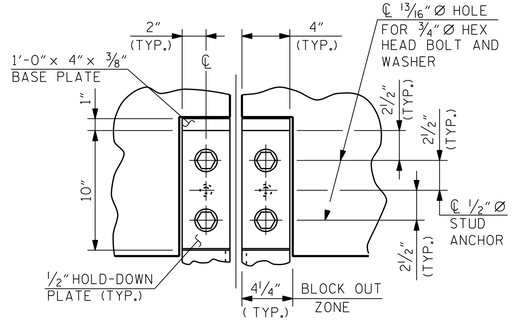


PAVEMENT MARKING ALIGNMENT

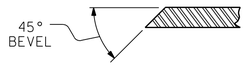




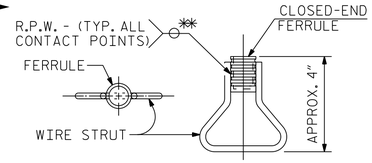
PLAN OF EXPANSION JOINT SEAL



SECTION A-A



SECTION B-B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL
LEFT LANE

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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11/10/2023

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STD. NO. EJS2

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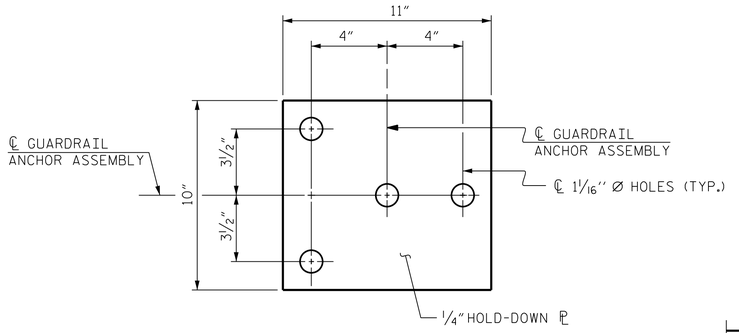
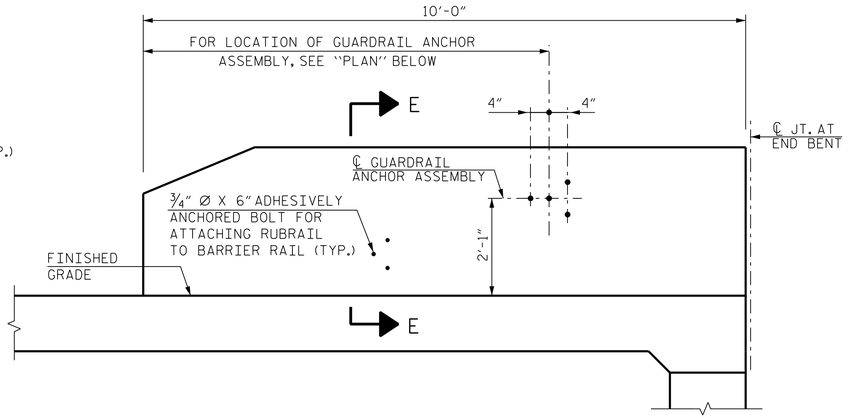


PLAN



ELEVATION

NOTES:

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

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.)

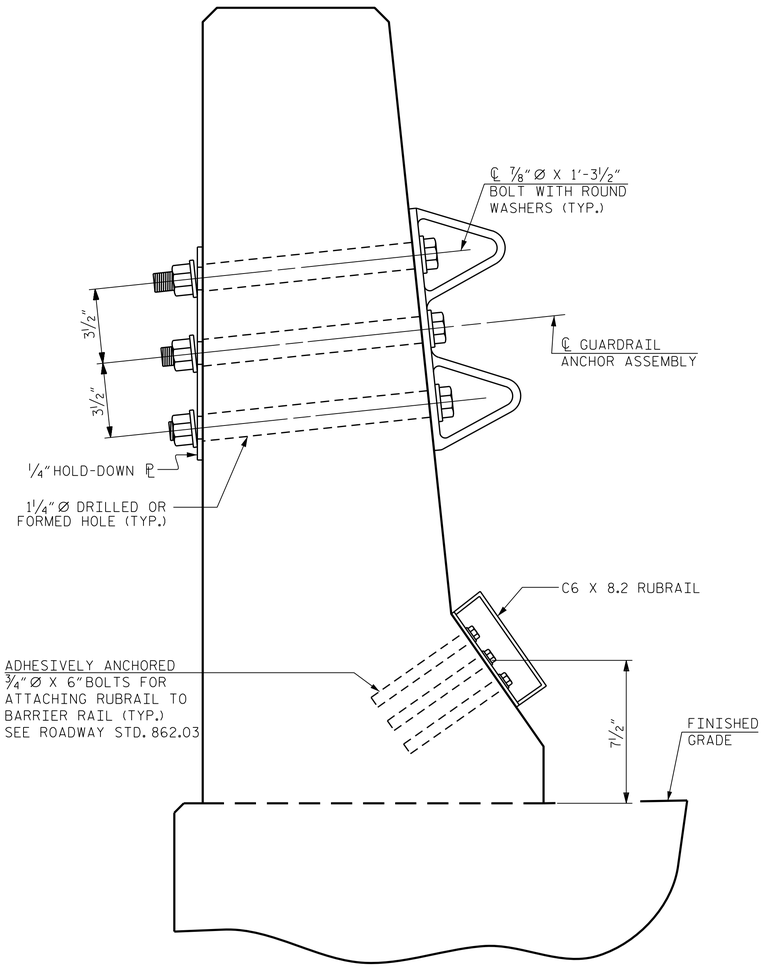
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

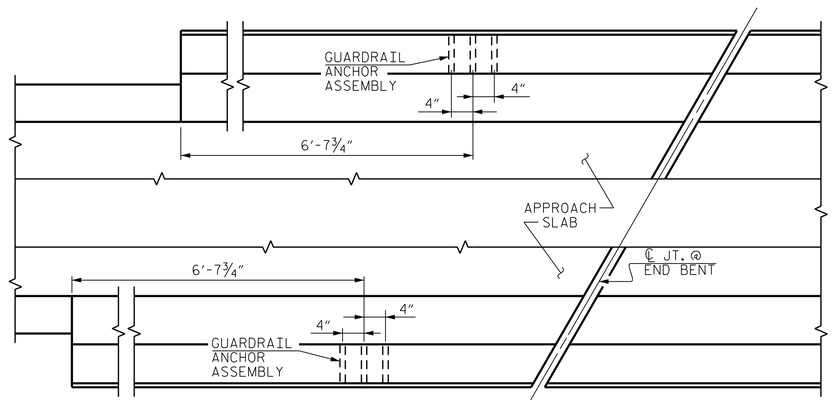
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E-E

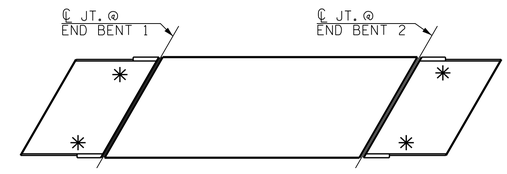
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2577A

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL

DocuSigned by: Odine Paitel C1B5...

11/10/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GUARDRAIL ANCHORAGE DETAILS

LEFT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			35

STD. NO. GRA2

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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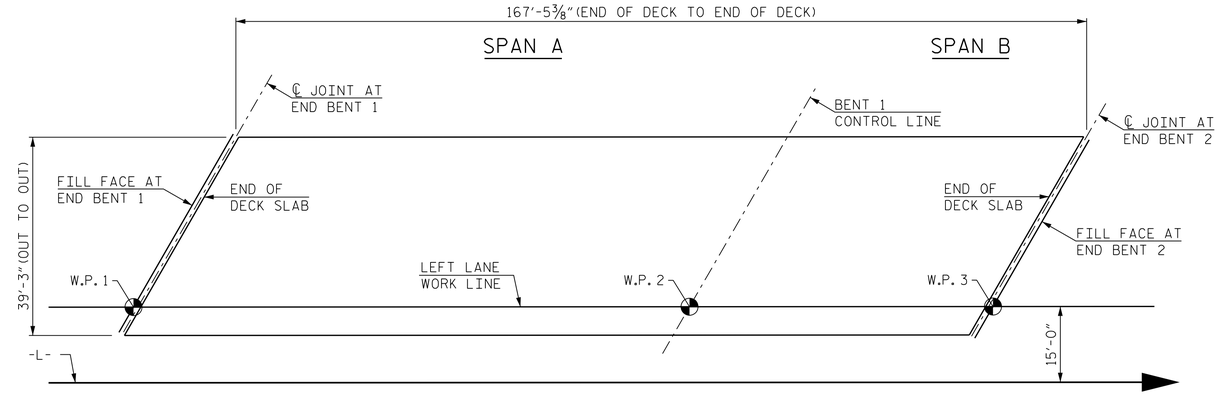
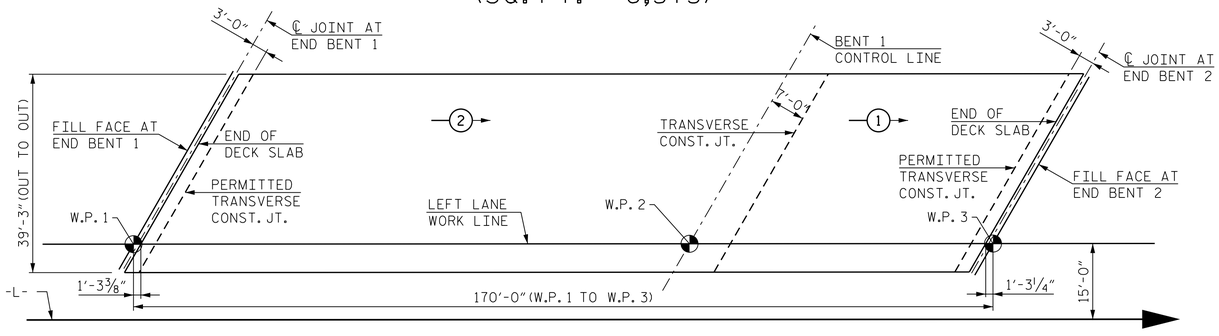
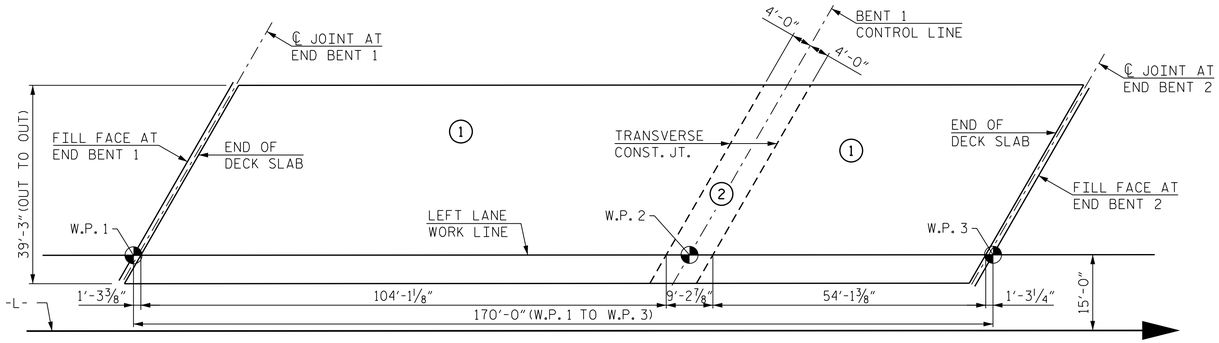


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6,573)



POURING SEQUENCE

INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

REINFORCING BAR SCHEDULE

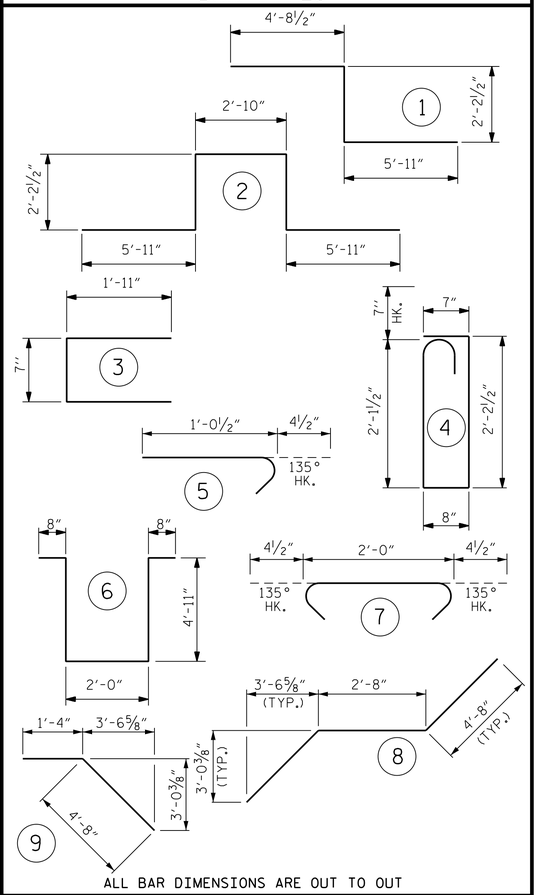
SPANS A AND B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	267	#5	STR.	38'-11"	10,838	A213	2	#5	STR.	12'-1"	25
						A214	2	#5	STR.	13'-1"	27
✳ A101	2	#5	STR.	1'-11"	4	A215	2	#5	STR.	14'-0"	29
✳ A102	2	#5	STR.	2'-4"	5	A216	2	#5	STR.	14'-11"	31
✳ A103	2	#5	STR.	2'-9"	6	A217	2	#5	STR.	15'-10"	33
✳ A104	2	#5	STR.	3'-8"	8	A218	2	#5	STR.	16'-10"	35
✳ A105	2	#5	STR.	4'-7"	10	A219	2	#5	STR.	17'-9"	37
✳ A106	2	#5	STR.	5'-7"	12	A220	2	#5	STR.	18'-8"	39
✳ A107	2	#5	STR.	6'-6"	14	A221	2	#5	STR.	19'-7"	41
✳ A108	2	#5	STR.	7'-5"	15	A222	2	#5	STR.	20'-7"	43
✳ A109	2	#5	STR.	8'-4"	17	A223	2	#5	STR.	21'-6"	45
✳ A110	2	#5	STR.	9'-4"	19	A224	2	#5	STR.	22'-5"	47
✳ A111	2	#5	STR.	10'-3"	21	A225	2	#5	STR.	23'-5"	49
✳ A112	2	#5	STR.	11'-2"	23	A226	2	#5	STR.	24'-4"	51
✳ A113	2	#5	STR.	12'-1"	25	A227	2	#5	STR.	25'-3"	53
✳ A114	2	#5	STR.	13'-1"	27	A228	2	#5	STR.	26'-2"	55
✳ A115	2	#5	STR.	14'-0"	29	A229	2	#5	STR.	27'-2"	57
✳ A116	2	#5	STR.	14'-11"	31	A230	2	#5	STR.	28'-1"	59
✳ A117	2	#5	STR.	15'-10"	33	A231	2	#5	STR.	29'-0"	60
✳ A118	2	#5	STR.	16'-10"	35	A232	2	#5	STR.	29'-11"	62
✳ A119	2	#5	STR.	17'-9"	37	A233	2	#5	STR.	30'-11"	64
✳ A120	2	#5	STR.	18'-8"	39	A234	2	#5	STR.	31'-10"	66
✳ A121	2	#5	STR.	19'-7"	41	A235	2	#5	STR.	32'-9"	68
✳ A122	2	#5	STR.	20'-7"	43	A236	2	#5	STR.	33'-8"	70
✳ A123	2	#5	STR.	21'-6"	45	A237	2	#5	STR.	34'-8"	72
✳ A124	2	#5	STR.	22'-5"	47	A238	2	#5	STR.	35'-7"	74
✳ A125	2	#5	STR.	23'-5"	49	A239	2	#5	STR.	36'-6"	76
✳ A126	2	#5	STR.	24'-4"	51	A240	2	#5	STR.	37'-5"	78
✳ A127	2	#5	STR.	25'-3"	53	A241	2	#5	STR.	38'-5"	80
✳ A128	2	#5	STR.	26'-2"	55						
✳ A129	2	#5	STR.	27'-2"	57	✳ B1	64	#4	STR.	37'-4"	1,596
✳ A130	2	#5	STR.	28'-1"	59	✳ B2	32	#6	STR.	60'-0"	2,884
✳ A131	2	#5	STR.	29'-0"	60	✳ B3	32	#4	STR.	38'-6"	823
✳ A132	2	#5	STR.	29'-11"	62	✳ B4	31	#6	STR.	25'-6"	1,187
✳ A133	2	#5	STR.	30'-11"	64	B5	132	#5	STR.	57'-4"	7,893
✳ A134	2	#5	STR.	31'-10"	66						
✳ A135	2	#5	STR.	32'-9"	68	✳ G1	2	#5	STR.	44'-11"	94
✳ A136	2	#5	STR.	33'-8"	70						
✳ A137	2	#5	STR.	34'-8"	72	✳ J1	84	#4	5	1'-5"	79
✳ A138	2	#5	STR.	35'-7"	74						
✳ A139	2	#5	STR.	36'-6"	76	✳ K1	24	#6	STR.	7'-3"	261
✳ A140	2	#5	STR.	37'-5"	78	✳ K2	8	#8	1	12'-10"	274
✳ A141	2	#5	STR.	38'-5"	80	✳ K3	12	#8	2	19'-1"	611
						K4	15	#4	8	12'-0"	120
A2	267	#5	STR.	38'-11"	10,838	K5	8	#4	STR.	7'-3"	39
						K6	24	#4	STR.	7'-7"	122
A201	2	#5	STR.	1'-11"	4	K7	8	#4	STR.	6'-8"	36
A202	2	#5	STR.	2'-4"	5	K8	10	#4	9	6'-0"	40
A203	2	#5	STR.	2'-9"	6						
A204	2	#5	STR.	3'-8"	8	✳ S1	64	#4	3	4'-5"	189
A205	2	#5	STR.	4'-7"	10	✳ S2	64	#5	4	6'-2"	412
A206	2	#5	STR.	5'-7"	12	S3	128	#4	7	2'-9"	235
A207	2	#5	STR.	6'-6"	14						
A208	2	#5	STR.	7'-5"	15	U1	32	#4	6	13'-2"	281
A209	2	#5	STR.	8'-4"	17						
A210	2	#5	STR.	9'-4"	19						
A211	2	#5	STR.	10'-3"	21						
A212	2	#5	STR.	11'-2"	23						

REINFORCING STEEL 21,285 LBS.

✳ EPOXY COATED REINFORCING STEEL 20,930 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	102.1		
POUR #2	149.4		
TOTALS**	251.5	21,285	20,930

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,580	SQ.FT.
BRIDGE DECK	5,493	SQ.FT.
TOTAL	7,073	SQ.FT.

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"			

PROJECT NO. R-2577A

FORSYTH COUNTY

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SUPERSTRUCTURE BILL OF MATERIALS

LEFT LANE

BRIDGE NO. 330815

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Docusigned by: Ondine Paitel C1E...

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REVISIONS						SHEET NO.
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2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023

CHECKED BY : L. K. AUSTIN DATE : SEP 2023

DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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SPAN A

PLAN

ELEVATION

✳ELEVATION AT FILL FACE

NOTES:

FOR SECTION A-A, SECTION B-B AND SECTION C-C, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE DETAILS, SEE END BENT 2 SHEET 3 OF 3 (SL-31).

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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.

STIRRUPS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICT WITH ANCHOR BOLTS.

"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

LEGEND:

HP 12x53 VERTICAL STEEL PILES

HP 12x53 STEEL PILES BATTERED 3:12

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE
END BENT 1
PLAN AND ELEVATION
LEFT LANE

BRIDGE NO. 330815

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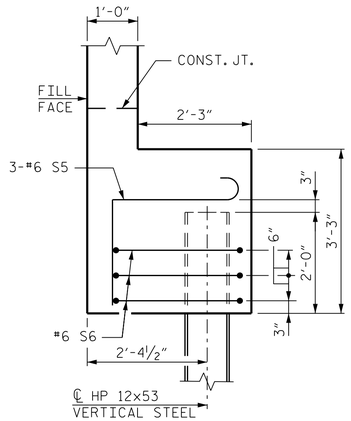
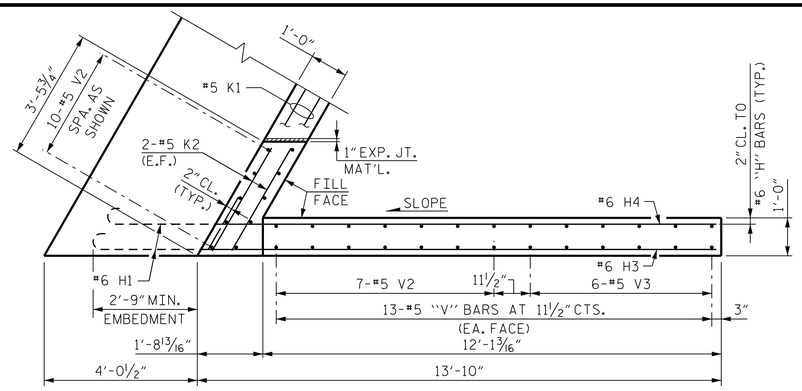
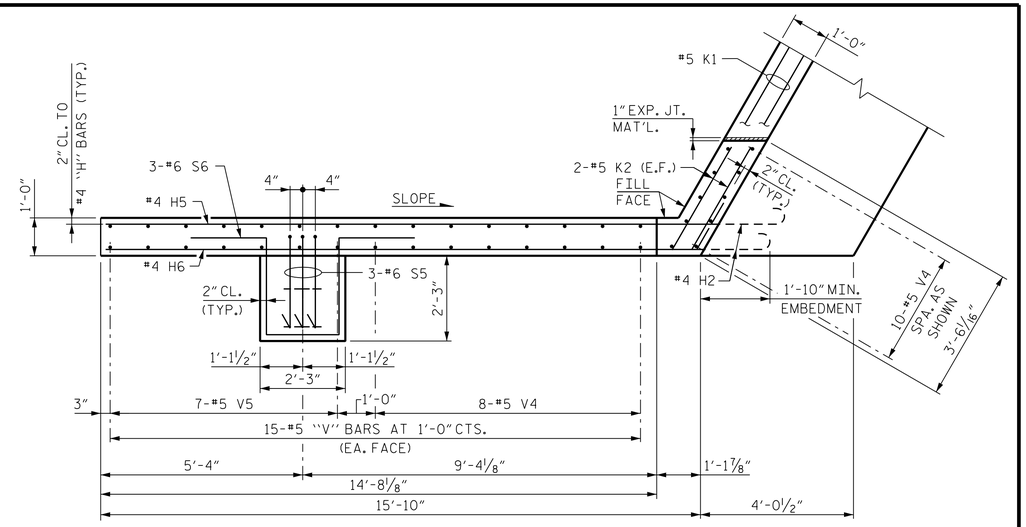


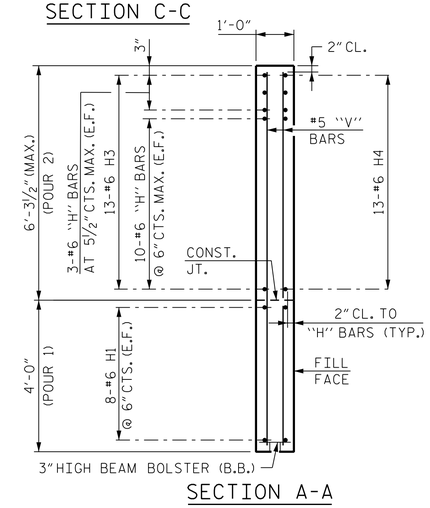
SECTION C-C



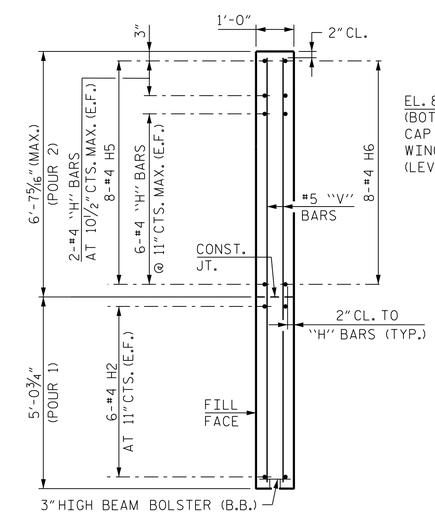
PLAN OF LEFT WINGWALL



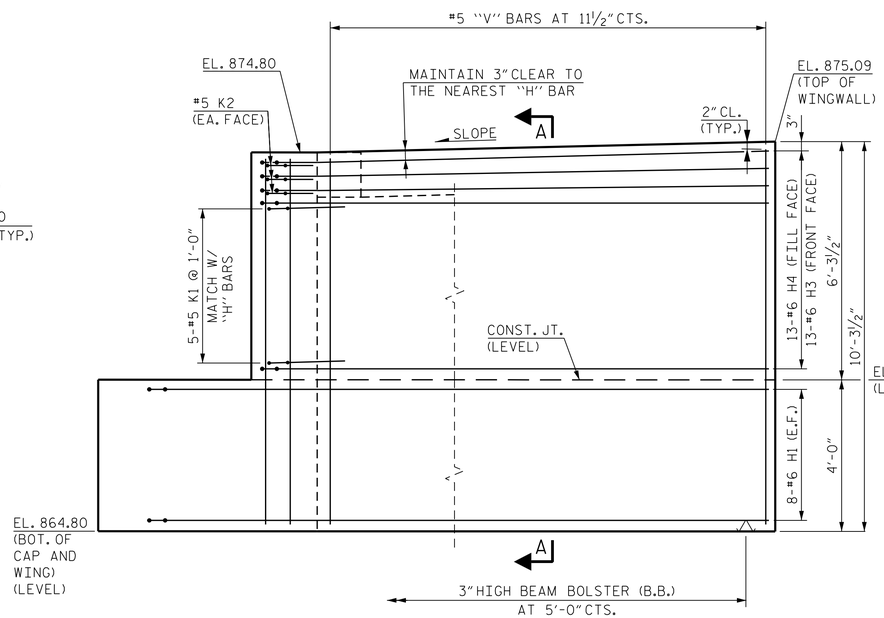
PLAN OF RIGHT WINGWALL



SECTION A-A

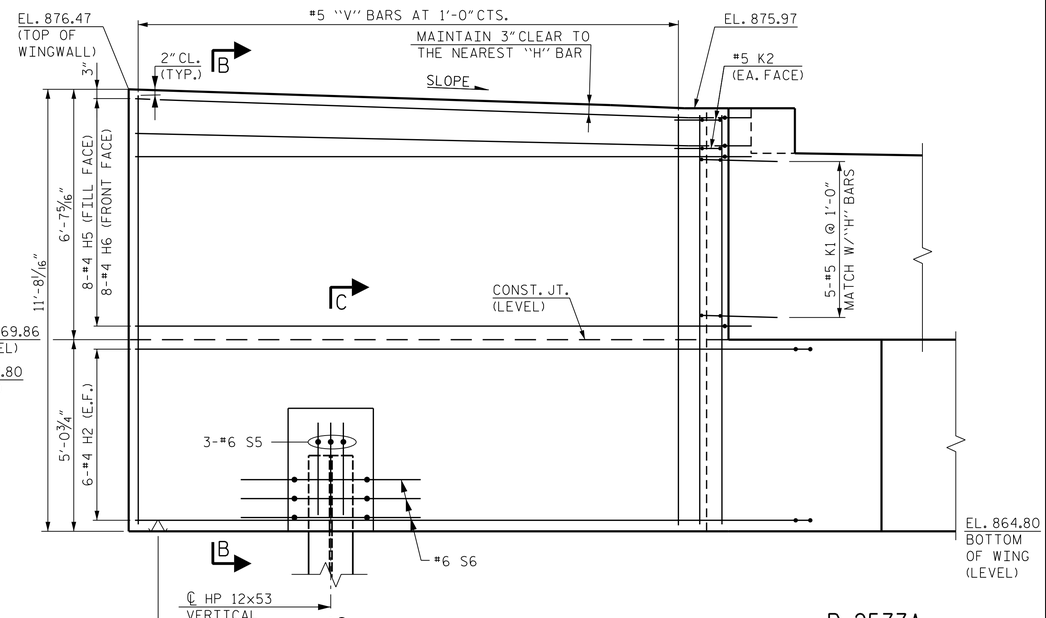


SECTION B-B



ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
END BENT 1
WINGWALL DETAILS

LEFT LANE

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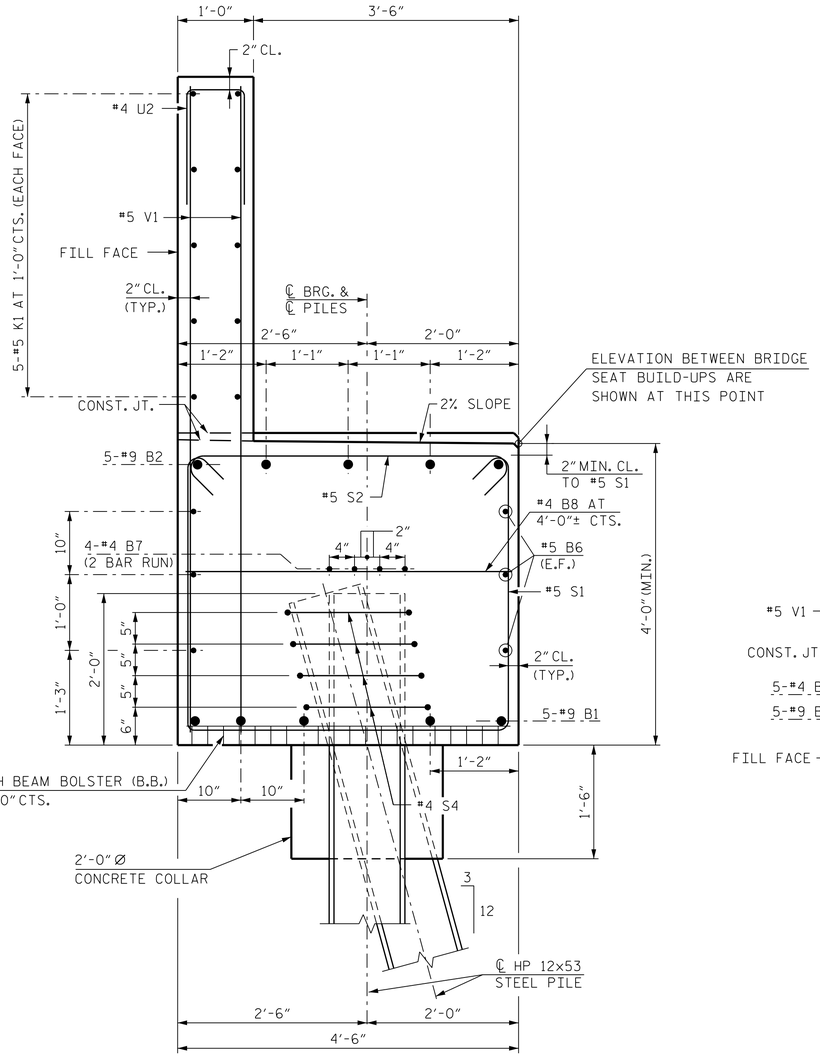
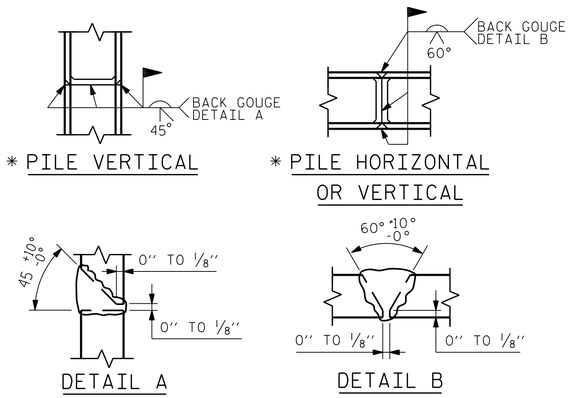


SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



* PILE VERTICAL

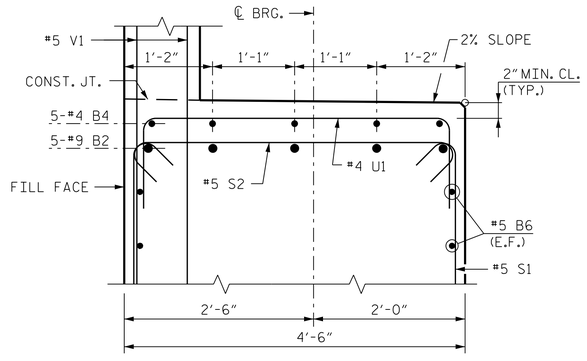
* PILE HORIZONTAL OR VERTICAL

DETAIL A

DETAIL B

PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



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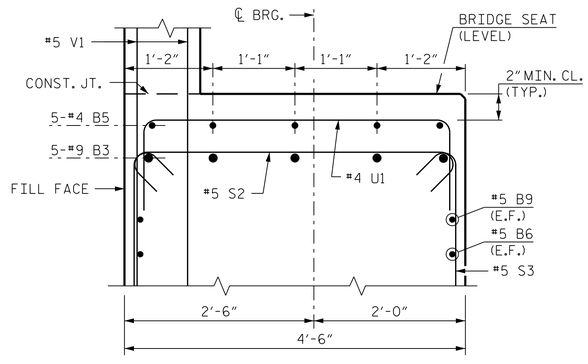
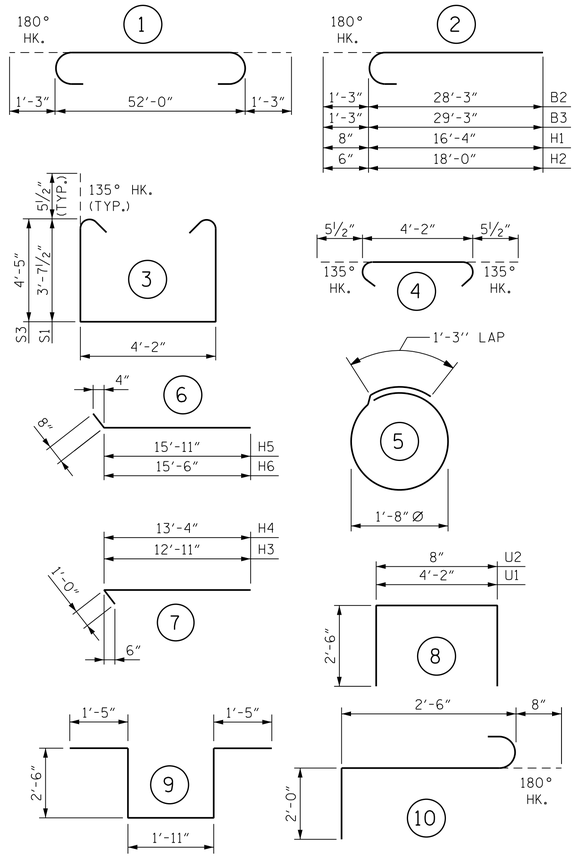


SECTION C-C

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	54'-6"	927
B2	5	#9	2	29'-6"	502
B3	5	#9	2	30'-6"	519
B4	5	#4	STR.	13'-0"	43
B5	5	#4	STR.	10'-2"	34
B6	6	#5	STR.	52'-0"	325
B7	8	#4	STR.	27'-4"	146
B8	14	#4	STR.	4'-2"	39
B9	2	#5	STR.	22'-11"	48
H1	16	#6	2	17'-0"	409
H2	12	#4	2	18'-6"	148
H3	13	#6	7	14'-4"	280
H4	13	#6	7	13'-11"	272
H5	8	#4	6	16'-7"	89
H6	8	#4	6	16'-2"	86
K1	10	#5	STR.	52'-2"	544
K2	10	#5	STR.	3'-1"	32
S1	39	#5	3	12'-4"	502
S2	86	#5	4	5'-1"	456
S3	47	#5	3	13'-11"	682
S4	32	#4	5	6'-6"	139
S5	3	#6	10	5'-2"	23
S6	3	#6	9	9'-9"	44
U1	14	#4	8	9'-2"	86
U2	46	#4	8	5'-8"	174
V1	92	#5	STR.	8'-6"	816
V2	24	#5	STR.	9'-8"	242
V3	12	#5	STR.	9'-10"	123
V4	26	#5	STR.	10'-10"	294
V5	14	#5	STR.	11'-1"	162

REINFORCING STEEL	8,186 LBS.
CLASS "A" CONCRETE	
POUR 1 (CAP, COLLARS & LOWER WINGS)	46.2 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	25.2 C.Y.
TOTAL	71.4 C.Y.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
MISELLANEOUS DETAILS AND BILL OF MATERIAL
LEFT LANE

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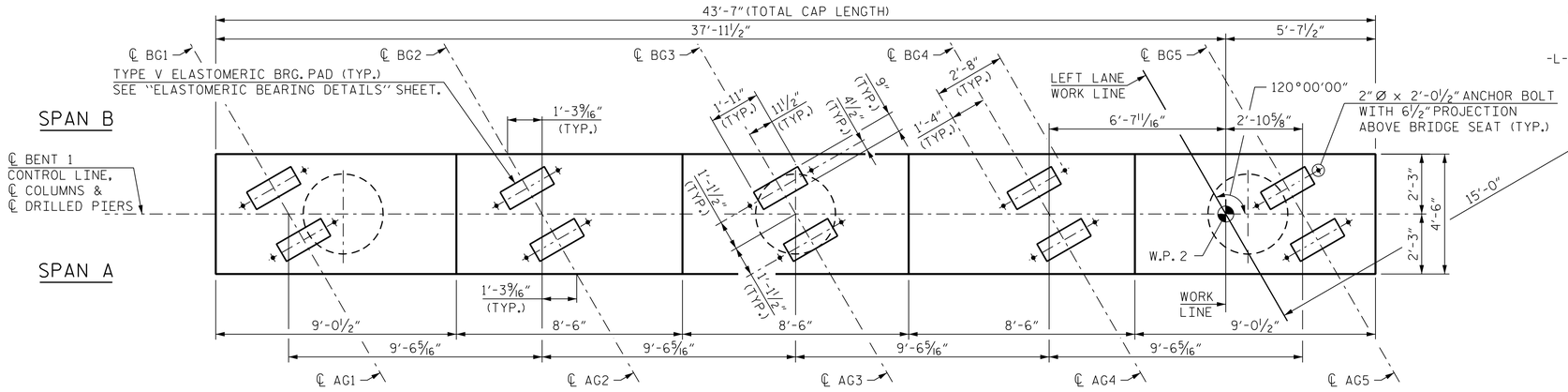
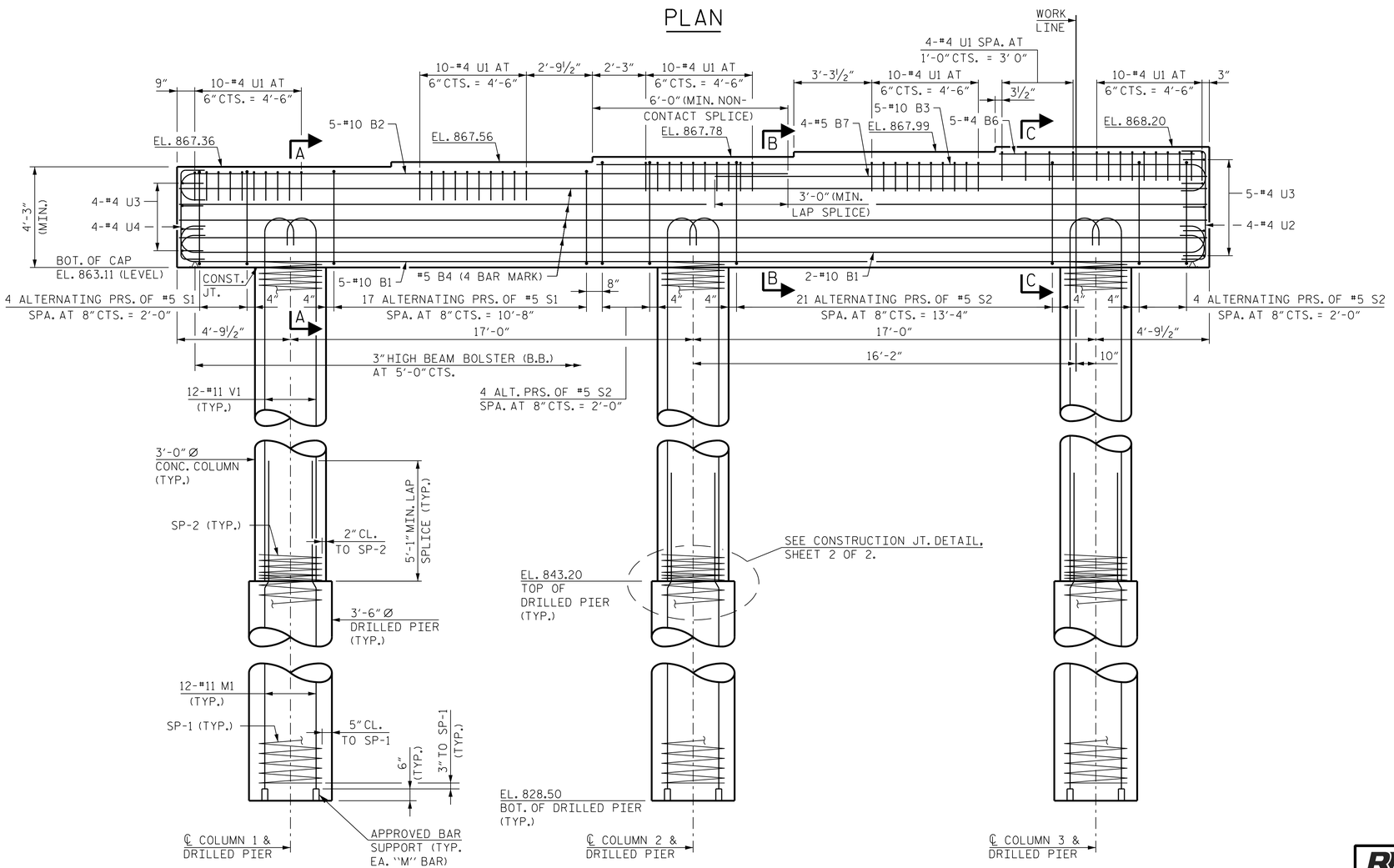


PLAN



ELEVATION

NOTES:

FOR SECTION A-A, SECTION B-B AND SECTION C-C, SEE SHEET 2 OF 2.

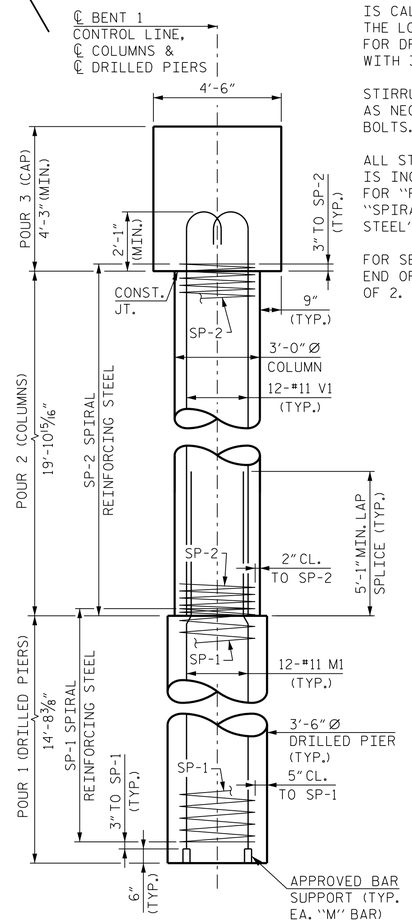
HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

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

FOR SECTION THROUGH COLUMN AND END OF CAP DETAILS, SEE SHEET 2 OF 2.



END ELEVATION

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 2

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
PLAN AND ELEVATION
LEFT LANE

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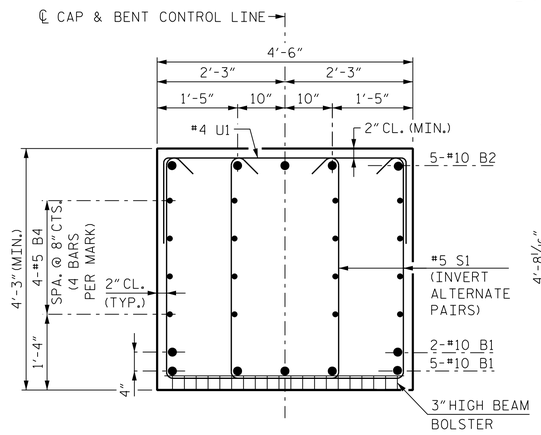
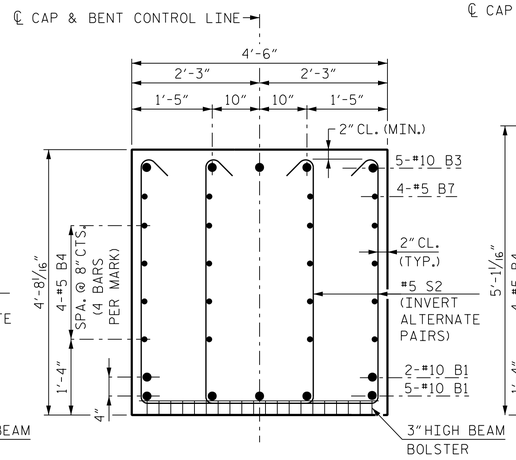
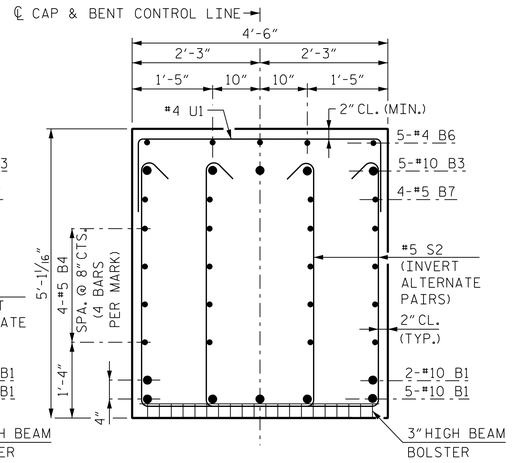


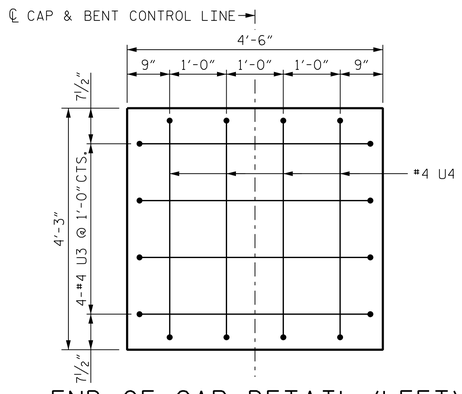
SECTION A-A



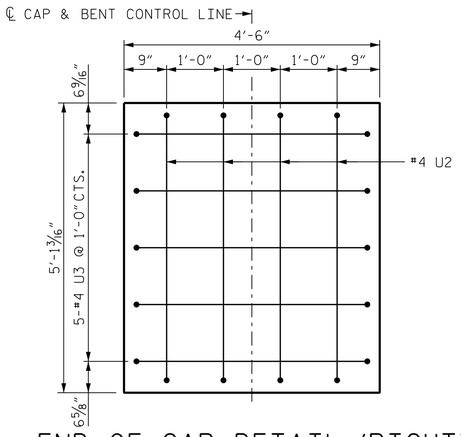
SECTION B-B



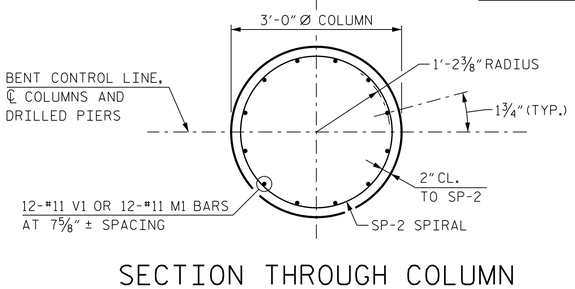
SECTION C-C



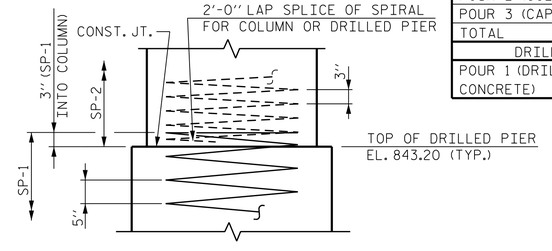
END OF CAP DETAIL (LEFT)



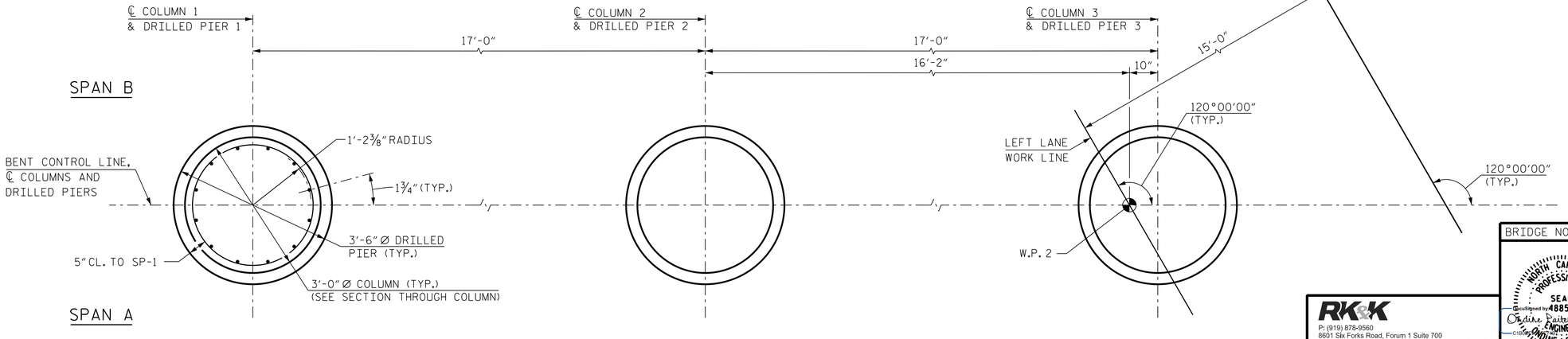
END OF CAP DETAIL (RIGHT)



SECTION THROUGH COLUMN



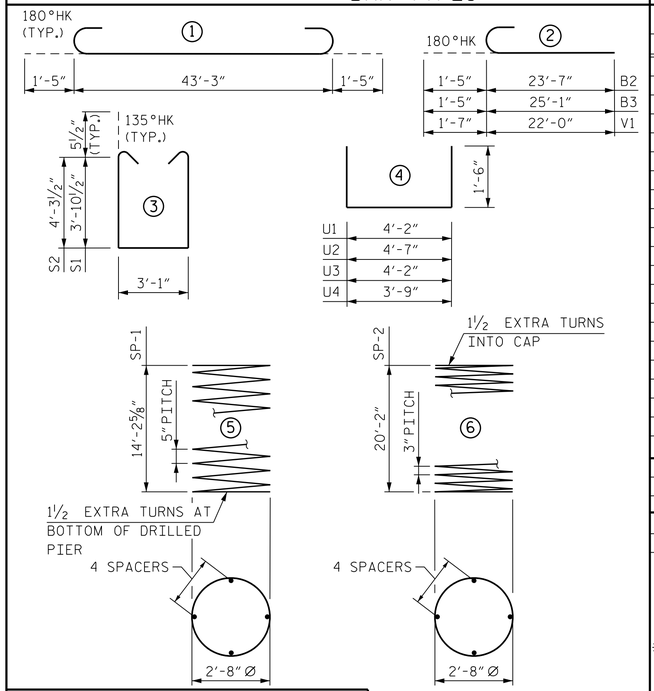
CONSTRUCTION JOINT DETAIL



PLAN OF DRILLED PIERS AND COLUMNS

(DETAILS ARE TYPICAL FOR DRILLED PIER AND COLUMN)

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	46'-1"	1,388
B2	5	#10	2	25'-2"	541
B3	5	#10	2	27'-4"	588
B4	16	#5	STR.	43'-3"	722
B6	5	#4	STR.	8'-8"	29
B7	4	#5	STR.	24'-0"	144
M1	36	#11	STR.	22'-6"	4,304
S1	42	#5	3	11'-9"	515
S2	58	#5	3	12'-7"	761
U1	54	#4	4	7'-2"	259
U2	4	#4	4	7'-7"	20
U3	9	#4	4	7'-2"	43
U4	4	#4	4	6'-9"	18
V1	36	#11	2	23'-7"	4,511

REINFORCING STEEL 13,843 LBS.

SP-1	3	*	5	292'-7"	915
SP-2	3	**	6	684'-10"	1,372

SPIRAL COLUMN REINFORCING STEEL 2,287 LBS.

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

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

CLASS "A" CONCRETE

POUR 2 (COLUMNS)	15.7 C.Y.
POUR 3 (CAP)	33.9 C.Y.
TOTAL	49.6 C.Y.

DRILLED PIERS

POUR 1 (DRILLED PIER CONCRETE)	15.8 C.Y.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE
BENT 1
DETAILS AND
BILL OF MATERIAL
LEFT LANE

BRIDGE NO. 330815

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1			3			TOTAL SHEETS
2			4			35

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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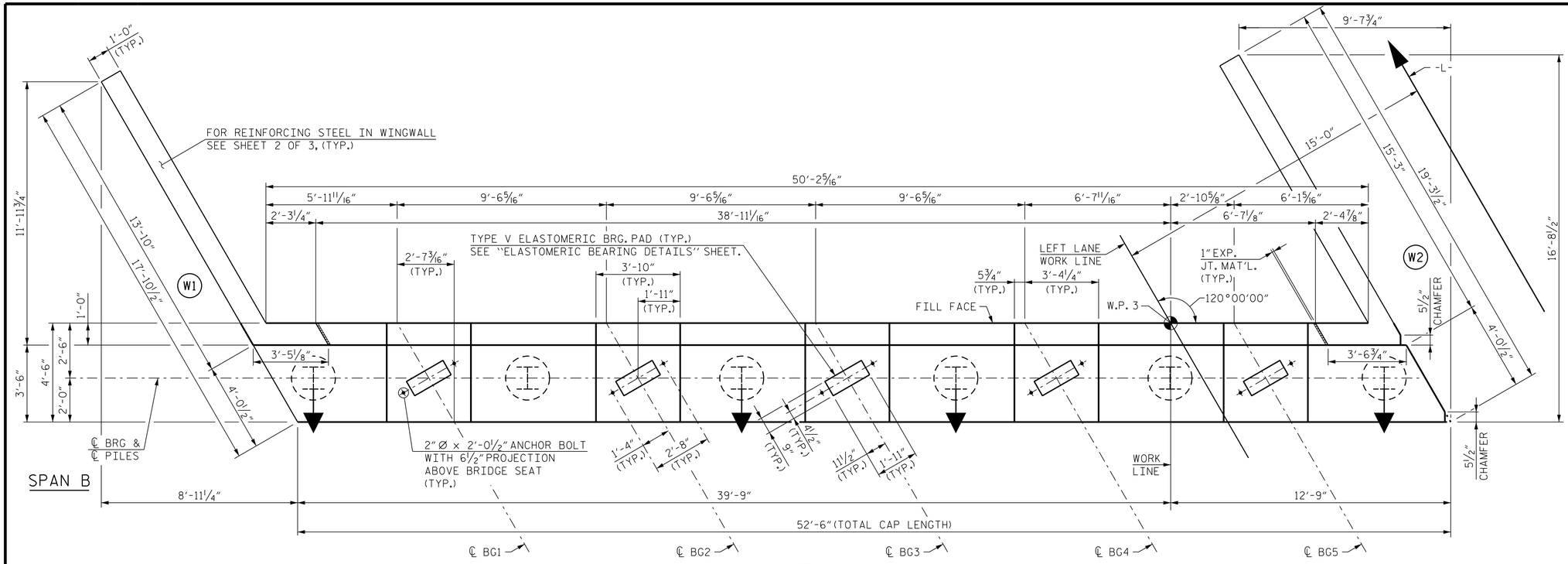
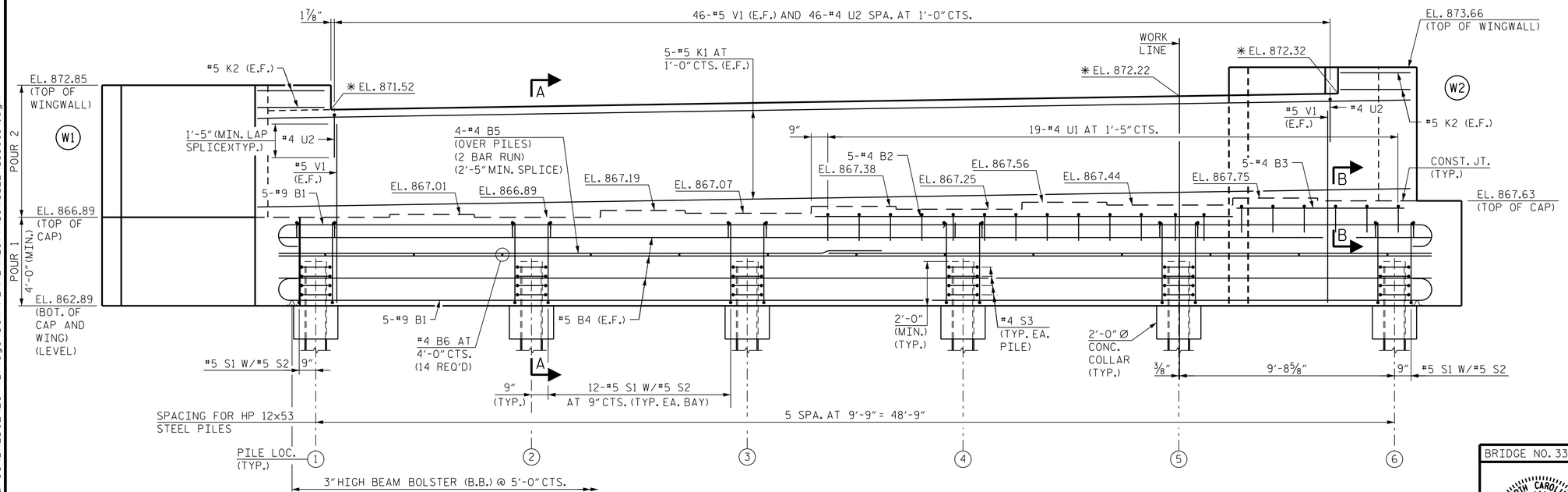
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_BIB_330814.dgn



PLAN



ELEVATION

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3 (SL-26).

FOR TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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.

STIRRUPS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICT WITH ANCHOR BOLTS.

"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

LEGEND:

HP 12x53 VERTICAL STEEL PILES

HP 12x53 STEEL PILES BATTERED 3:12

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
PLAN AND ELEVATION

LEFT LANE

BRIDGE NO. 330815

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ORDINE J. PAITEL
DocuSigned by: Ordine Paitel C1F...
11/10/2023

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-29
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2			4			35

DRAWN BY : B. A. HAAG DATE : SEP 2023
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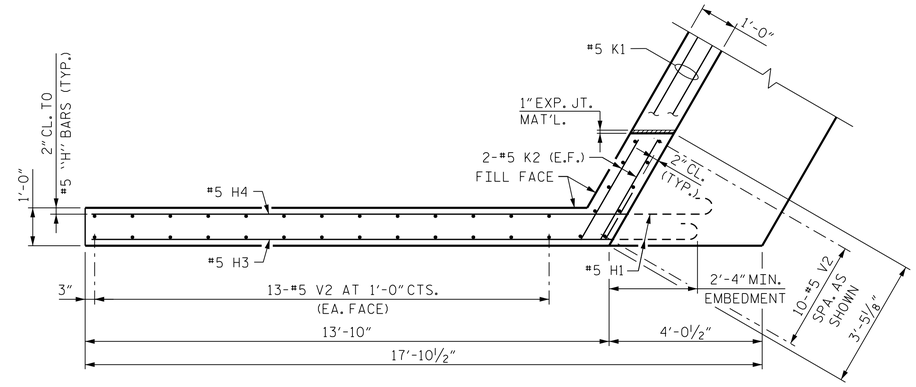
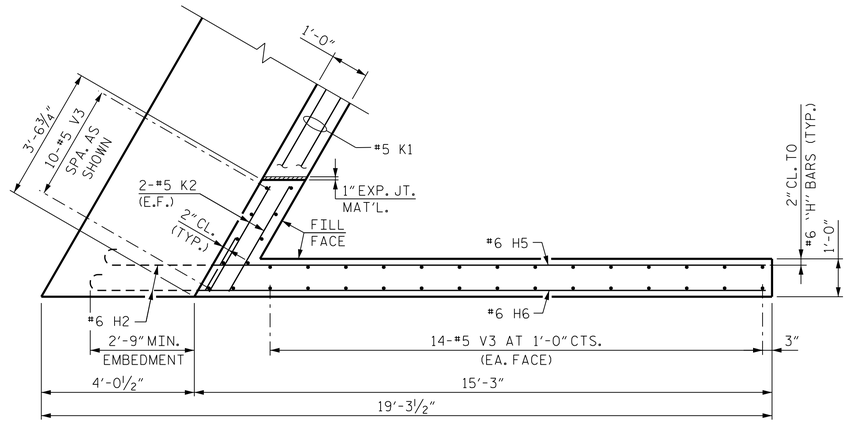
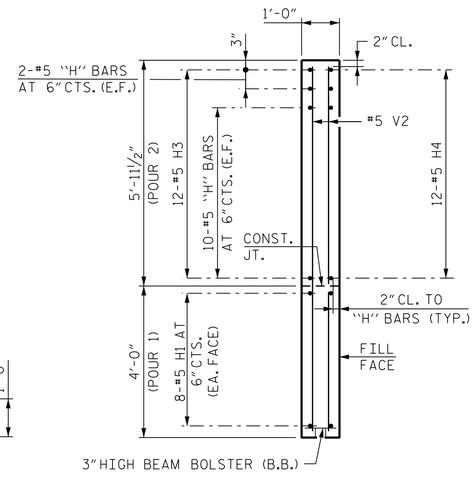


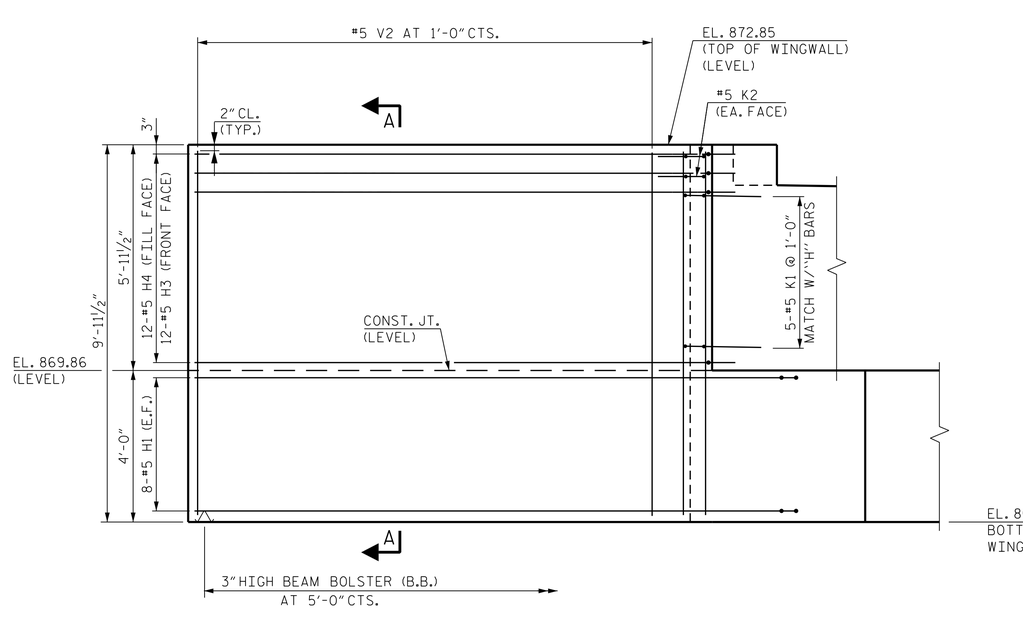
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

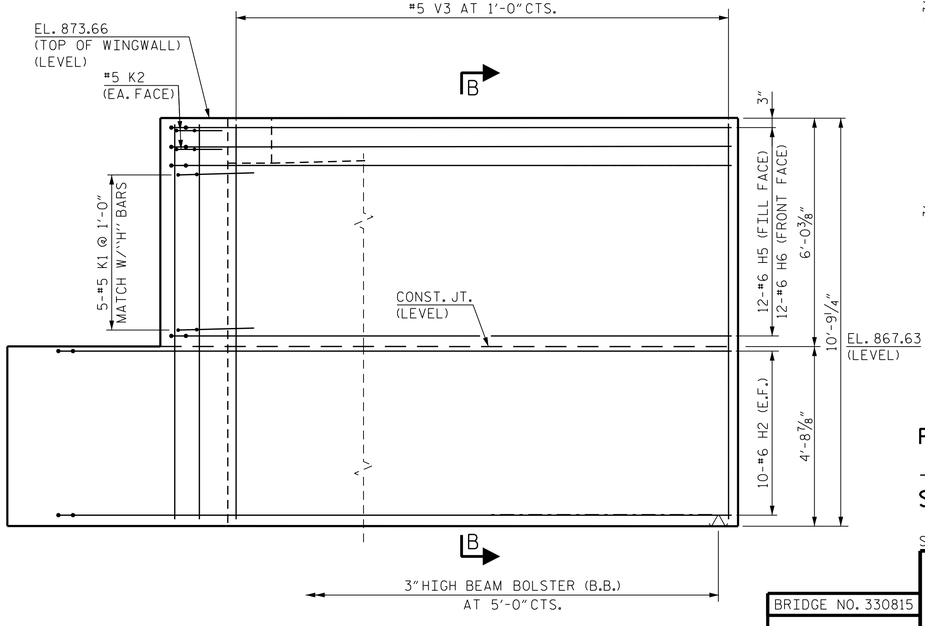


SECTION A-A



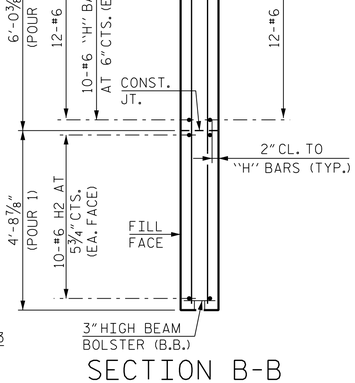
ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)



SECTION B-B

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WINGWALL DETAILS

LEFT LANE

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
Digitally signed by: Odine Paitel
C1605

11/10/2023

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-30
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : B. A. HAAG DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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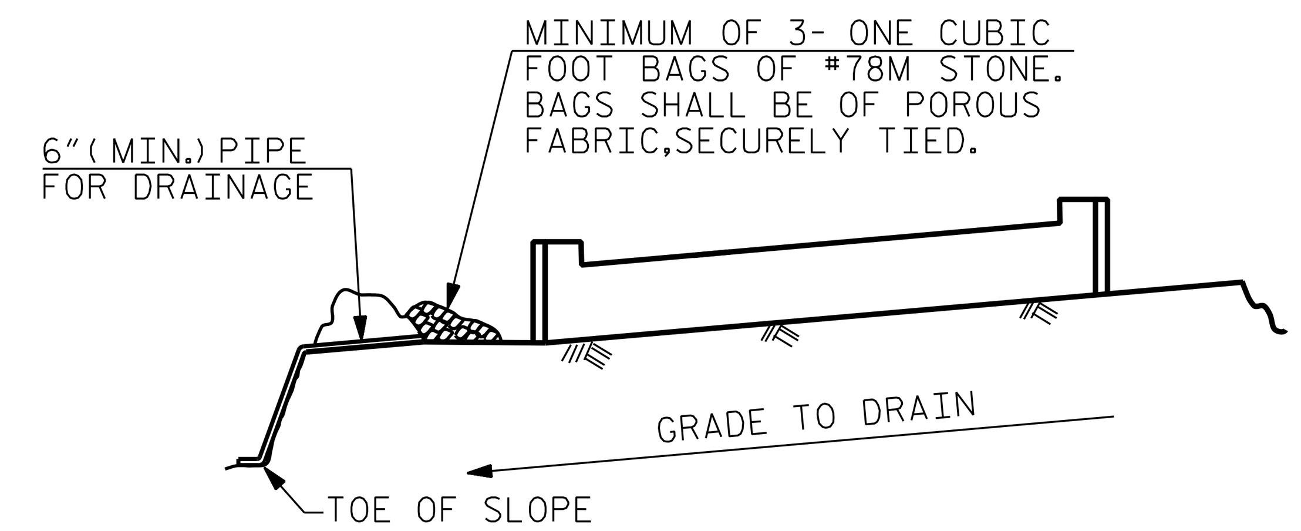
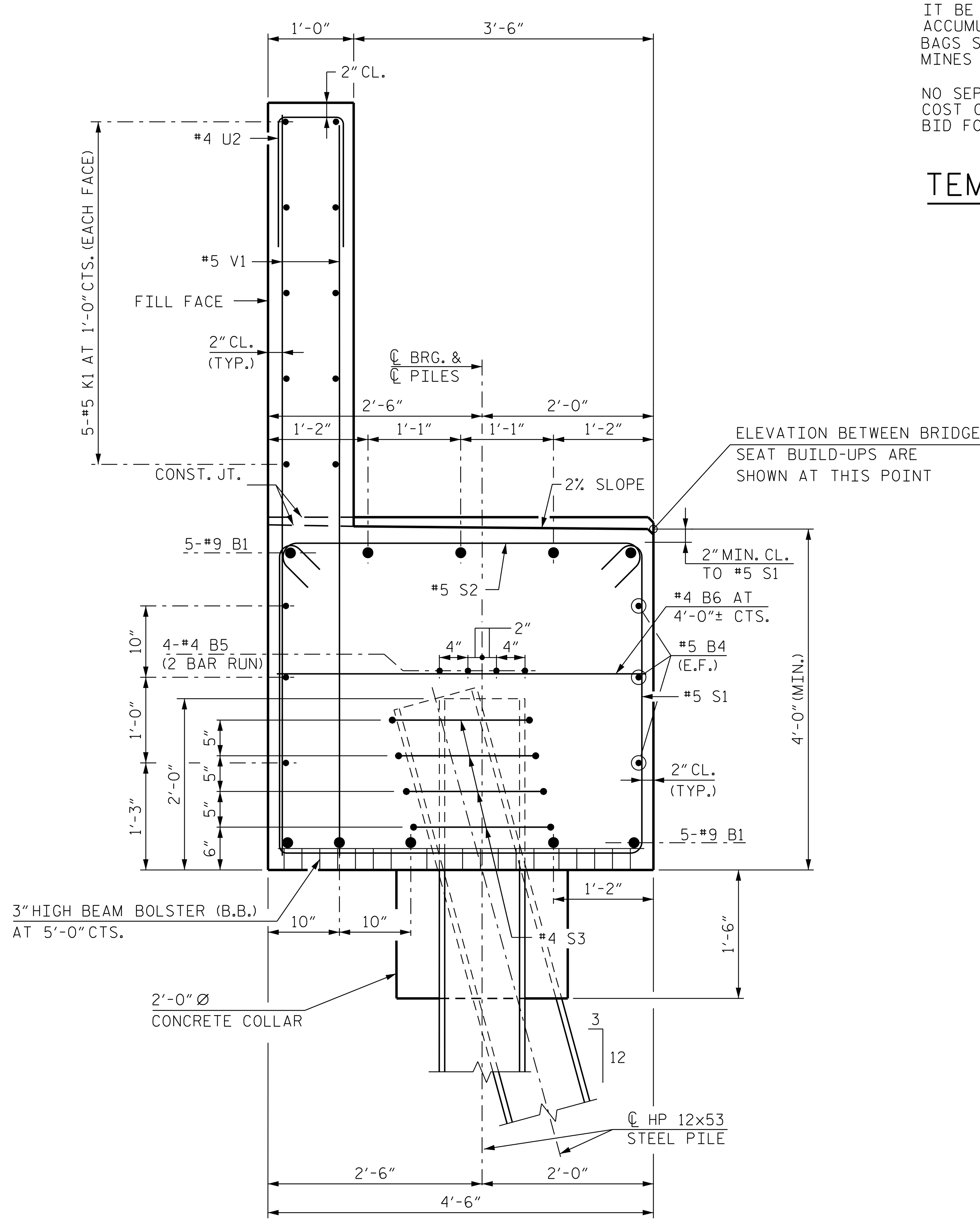


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

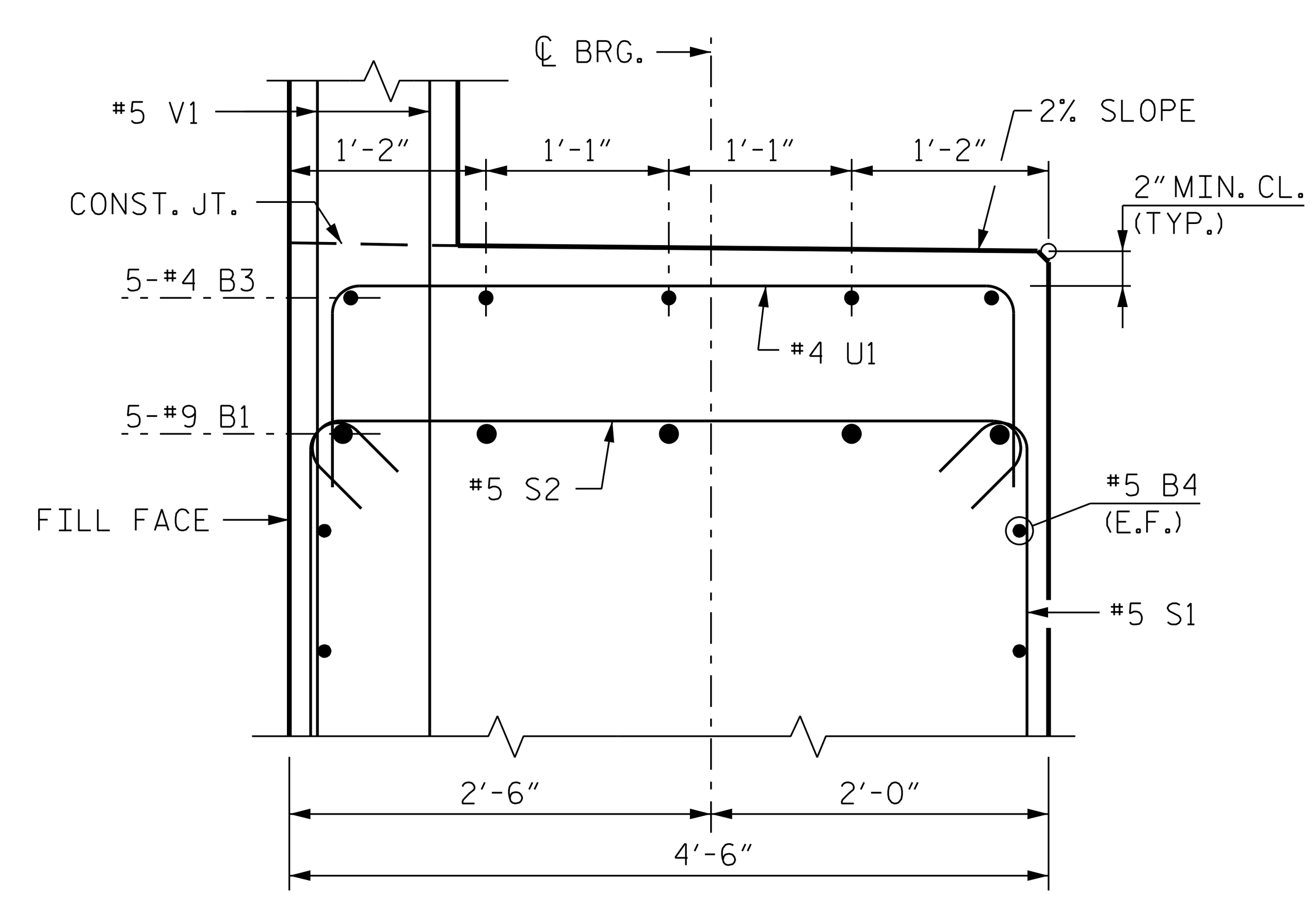
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



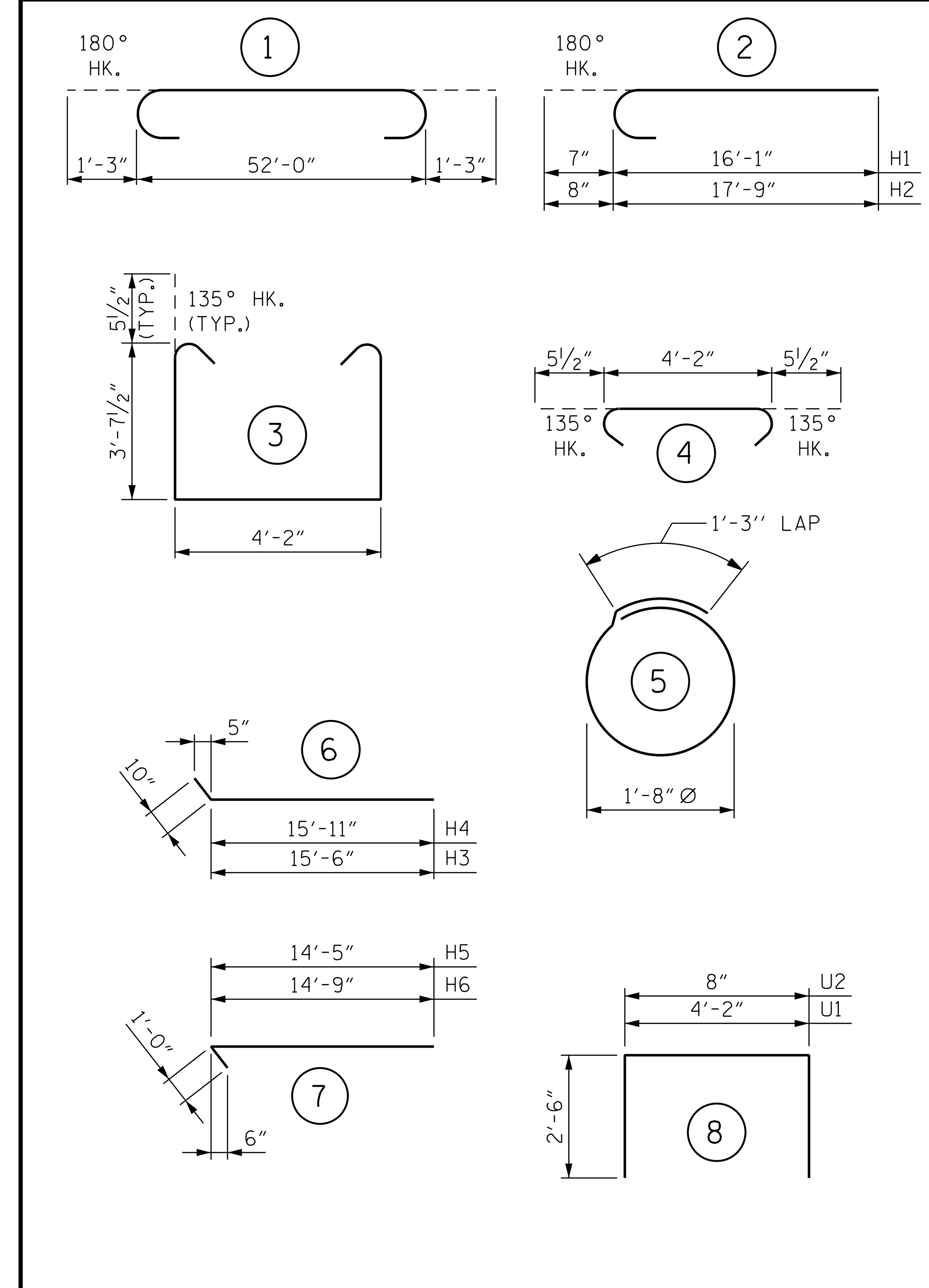
SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SECTION B-B

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	54'-6"	1,853
B2	5	#4	STR.	18'-10"	63
B3	5	#4	STR.	7'-7"	25
B4	6	#5	STR.	52'-0"	325
B5	8	#4	STR.	27'-4"	146
B6	14	#4	STR.	4'-2"	39
H1	16	#5	2	16'-8"	278
H2	20	#6	2	18'-5"	553
H3	12	#5	6	16'-4"	204
H4	12	#5	6	16'-9"	210
H5	12	#6	7	15'-5"	278
H6	12	#6	7	15'-9"	284
K1	10	#5	STR.	52'-2"	544
K2	8	#5	STR.	3'-1"	26
S1	62	#5	3	12'-4"	798
S2	62	#5	4	5'-1"	329
S3	24	#4	5	6'-6"	104
U1	19	#4	8	9'-2"	116
U2	46	#4	8	5'-8"	174
V1	92	#5	STR.	8'-5"	808
V2	38	#5	STR.	9'-8"	383
V3	38	#5	STR.	10'-6"	416

REINFORCING STEEL	7,956 LBS.
CLASS "A" CONCRETE	
POUR 1 (CAP, COLLARS & LOWER WINGS)	43.5 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	24.2 C.Y.
TOTAL	67.7 C.Y.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 3

BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONDINE J. PAITEL
11/10/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 MISELLANEOUS DETAILS AND BILL OF MATERIAL
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-31
1			3			TOTAL SHEETS
2			4			35

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DRAWN BY : B. A. HAAG DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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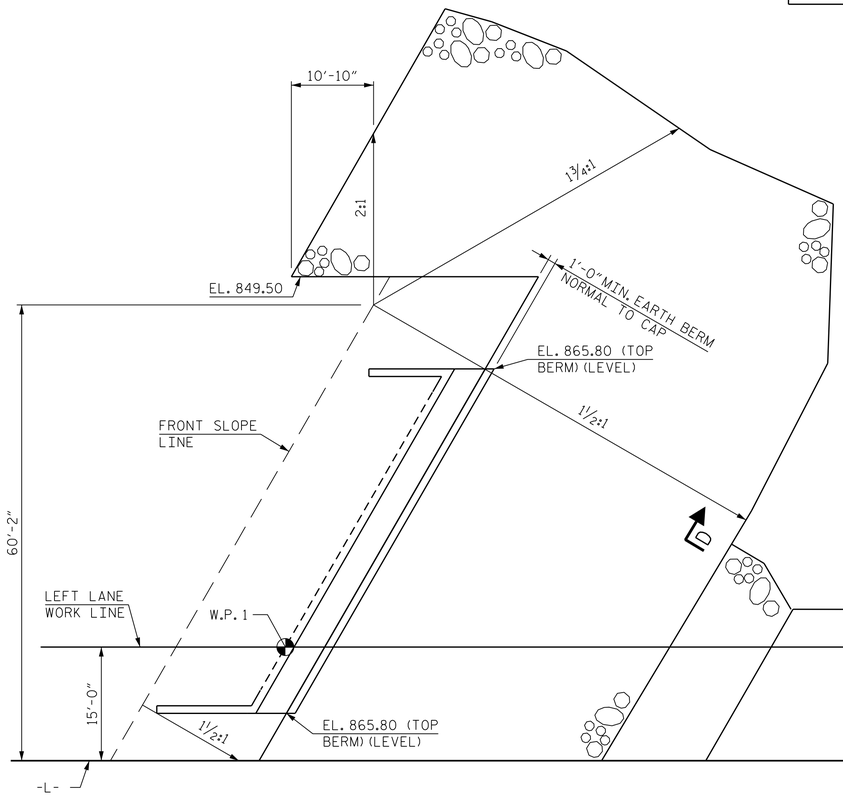
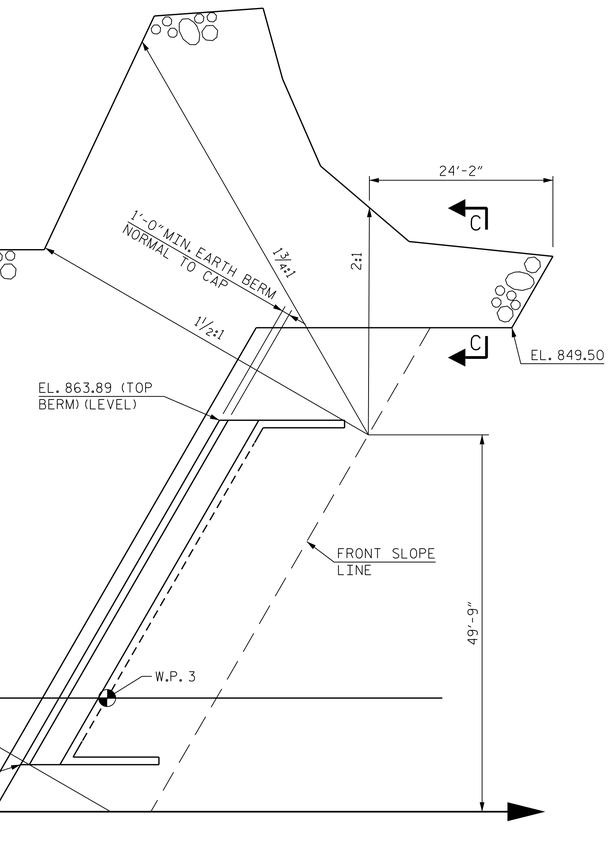
ESTIMATED QUANTITIES		
BRIDGE @ STA. 140+39.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	640	715
END BENT 2	650	720
STREAM BED	200	225

NOTES:

AFTER THE REMOVAL OF THE EXISTING CULVERT, CLASS II RIP RAP SHOULD BE PLACED WITHIN THE LIMITS OF THE EXISTING CULVERT, SEE SECTION D-D.

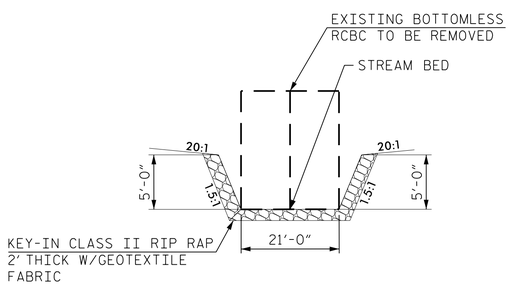


END BENT 1



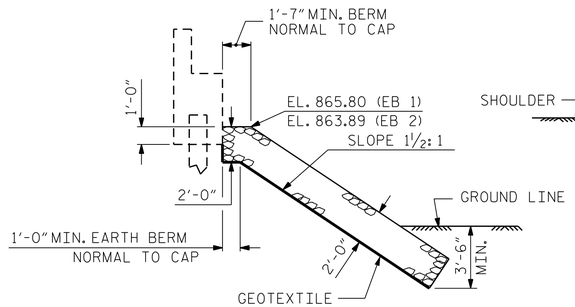
END BENT 2

BERM RIP RAPPED



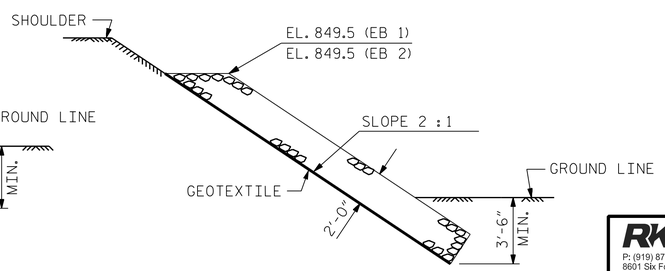
CHANNEL DETAIL

SECTION D-D



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD RIP RAP DETAILS

LEFT LANE

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DocuSigned by: Ondine Paitel C1CF...

11/10/2023

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1			3		
2			4		

SHEET NO. SL-32

TOTAL SHEETS 35

STD. NO. RR1

DRAWN BY : T. K. BOYD DATE : SEP 2023

CHECKED BY : L. K. AUSTIN DATE : SEP 2023

DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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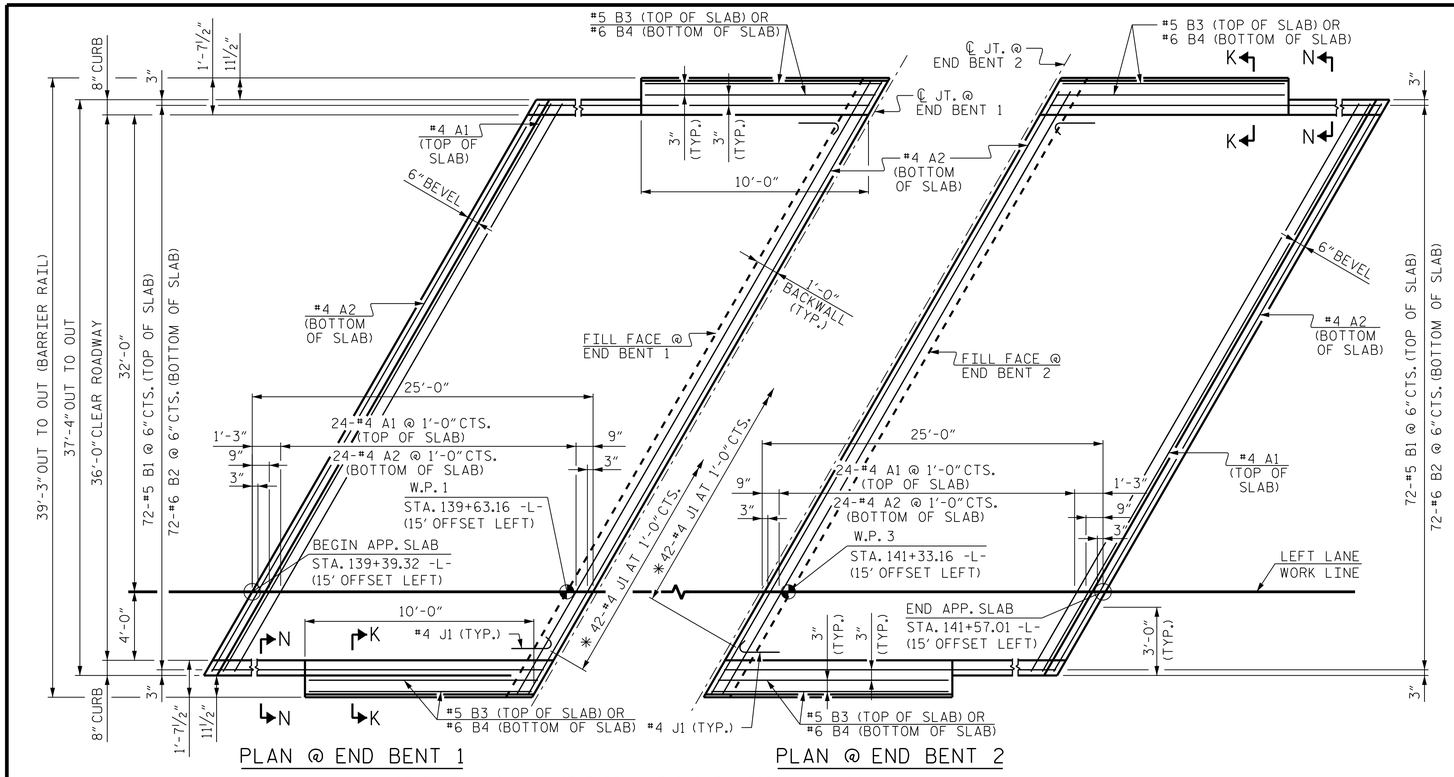


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES:

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6"Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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 EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	25	#4	STR	42'-9"	714
A2	26	#4	STR	42'-9"	742
* B1	72	#5	STR	24'-2"	1,815
B2	72	#6	STR	24'-8"	2,668
* J1	42	#4	1	1'-5"	40

REINFORCING STEEL	3,410 LBS.
* EPOXY COATED REINFORCING STEEL	2,569 LBS.
CLASS AA CONCRETE	40.7 C.Y.

APPROACH SLAB AT EB 2

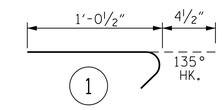
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	25	#4	STR	42'-9"	714
A2	26	#4	STR	42'-9"	742
* B1	72	#5	STR	24'-2"	1,815
B2	72	#6	STR	24'-8"	2,668
* J1	42	#4	1	1'-5"	40

REINFORCING STEEL	3,410 LBS.
* EPOXY COATED REINFORCING STEEL	2,569 LBS.
CLASS AA CONCRETE	40.7 C.Y.

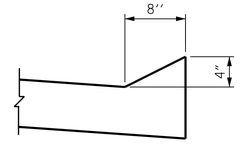
SPLICE LENGTHS

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

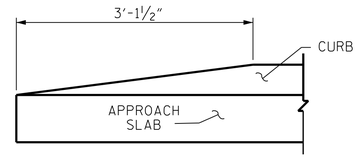
BAR TYPES



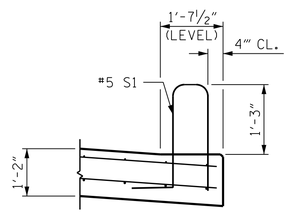
NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER



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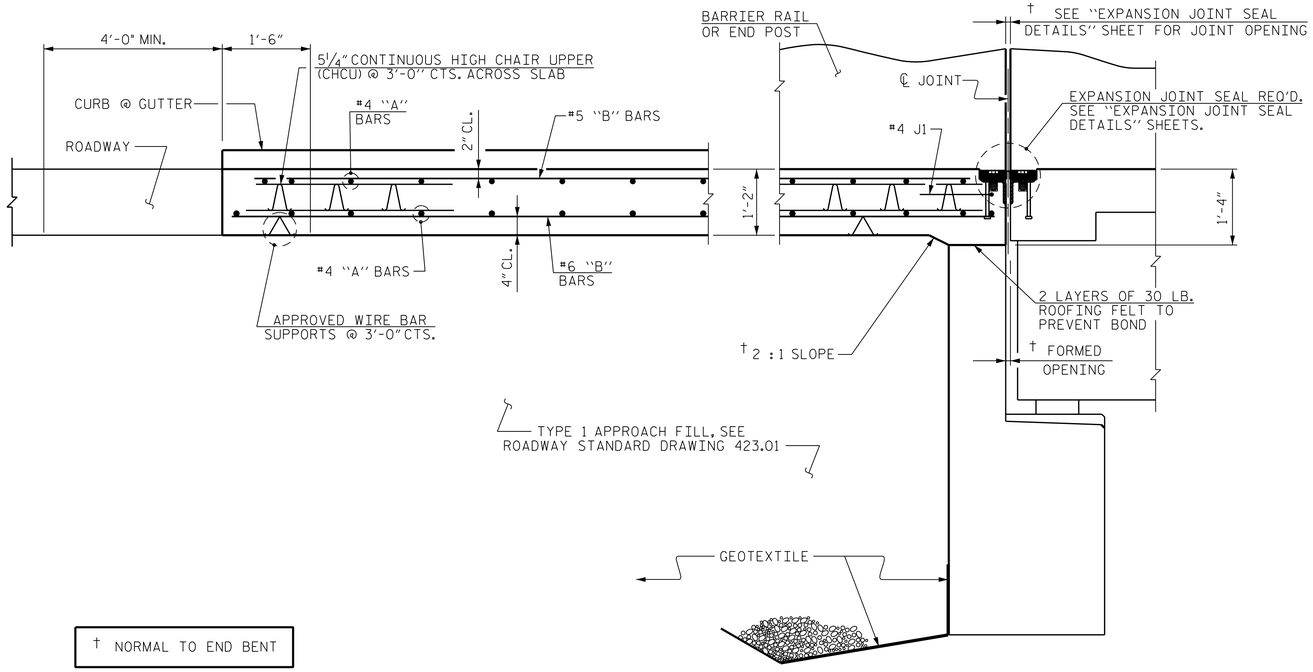

† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

CURB DETAILS

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 2

BRIDGE NO. 330815

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT
LEFT LANE

DRAWN BY :	T. K. BOYD	DATE :	SEP 2023
CHECKED BY :	L. K. AUSTIN	DATE :	SEP 2023
DESIGN ENGINEER OF RECORD :	O. J. PAITEL	DATE :	SEP 2023

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2			4		

SHEET NO. SL-33

TOTAL SHEETS 35

STD. NO. BAS2

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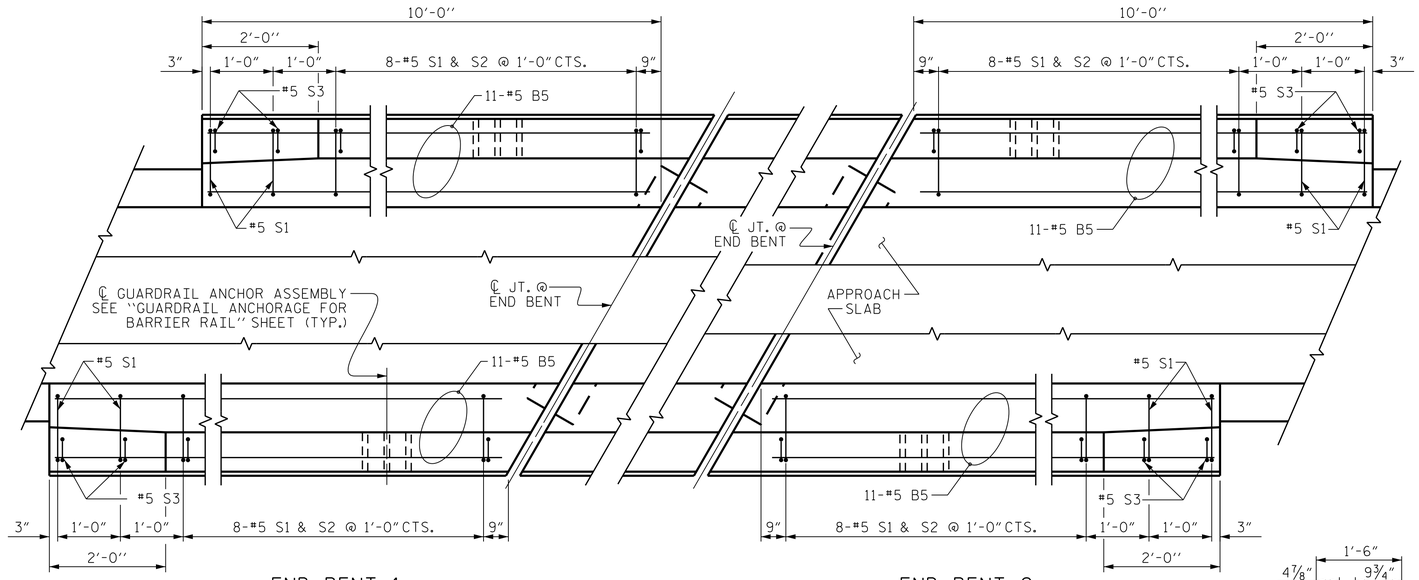


END BENT 1

END BENT 2

PLAN OF BARRIER RAIL

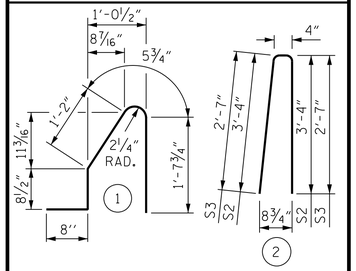
NOTES:

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR ''CONCRETE BARRIER RAIL''.

THE BARRIER RAIL 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 BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

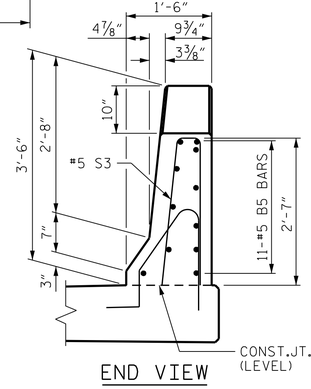


ALL BAR DIMENSIONS ARE OUT TO OUT

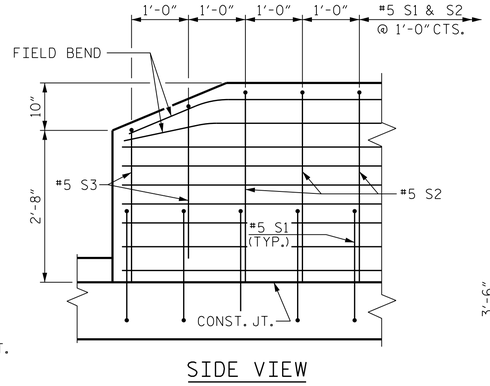
BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B5	44	#5	STR.	9'-8"	444
✳S1	40	#5	1	4'-8"	195
✳S2	32	#5	2	7'-0"	234
✳S3	8	#5	2	5'-6"	46
✳EPOXY COATED REINFORCING STEEL					919 LBS.
CLASS AA CONCRETE					5.7 C.Y.
CONCRETE BARRIER RAIL					41.88 LIN.FT.

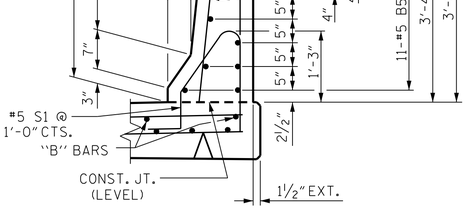


END VIEW

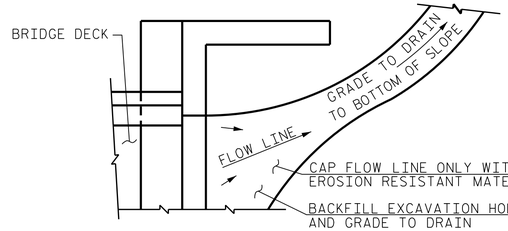


SIDE VIEW

END OF RAIL DETAILS

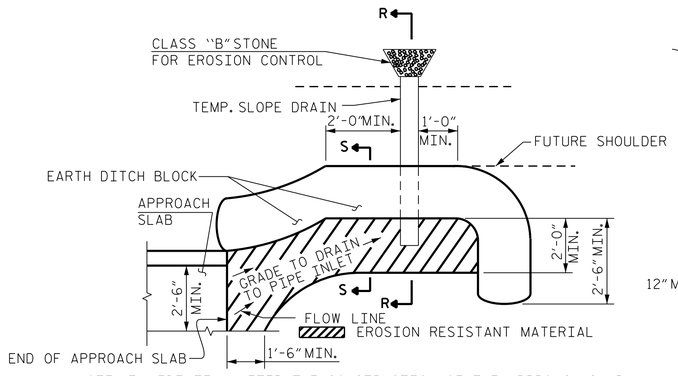


SECTION THRU RAIL



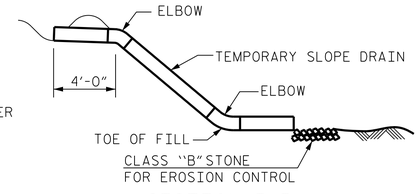
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

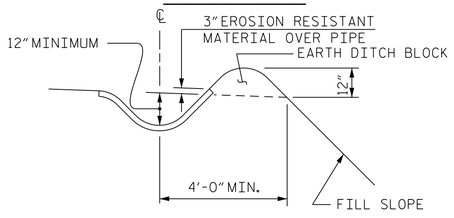


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODDINE J. PAITEL
DocuSigned by: Oddine Paitel C15E...
11/10/2023

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BRIDGE NO. 330815

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-34
1			3			TOTAL SHEETS
2			4			35

STD. NO. BAS4

tboyd
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_AS2_330814.dgn

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.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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BRIDGE NO. 330815

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODIE JAMES PAITEL
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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

STD. NO. SN

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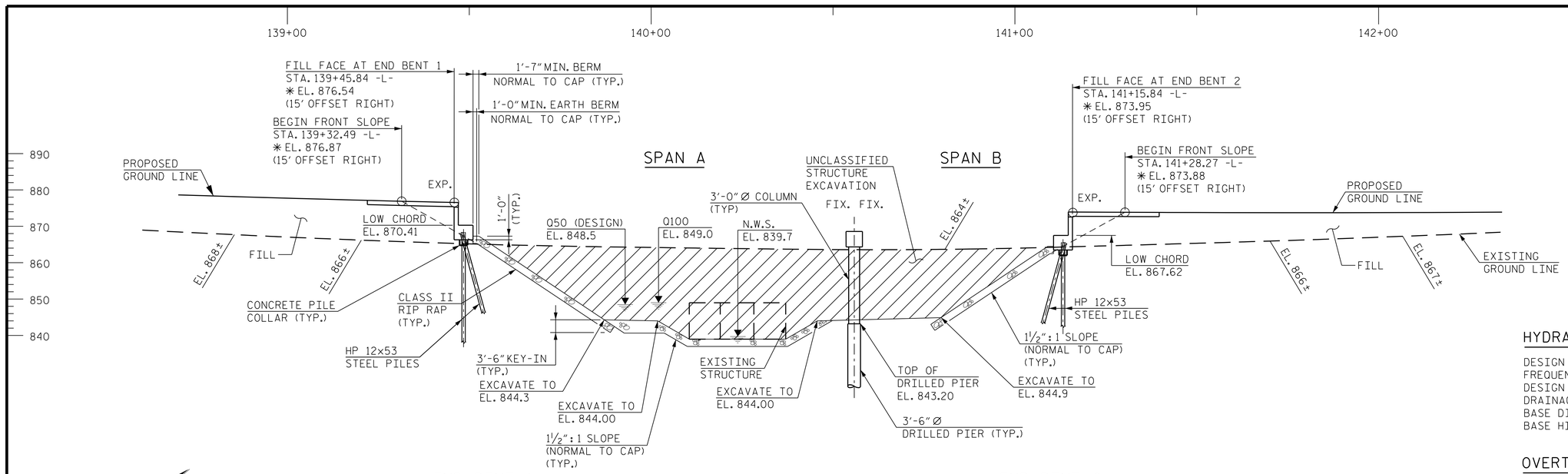
11/10/2023 R:\Structures\BRIDGE\LeftBridge\DGN\FINAL\R2577A_SMU_SN_330814.dgn



SECTION ALONG RIGHT LANE WORKLINE

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)
✳ELEVATIONS CALCULATED ALONG RIGHT LANE WORKLINE

P.V.I. STA. = 142+70.00 -L-
EL. = 866.00
V.C. = 800 FT.
(-)3.1615% (+)5.0000%

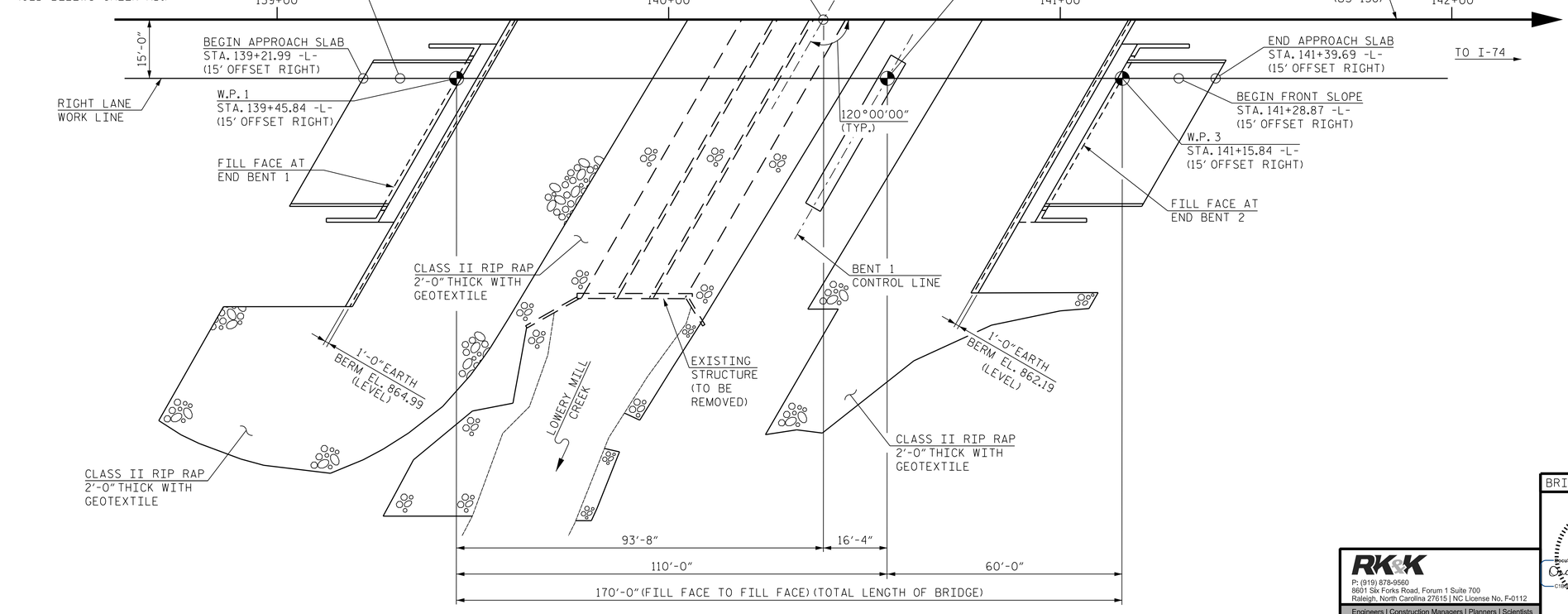
-L- GRADE DATA

HYDRAULIC DATA

DESIGN DISCHARGE..... 1,900 CFS.
FREQUENCY OF DESIGN FLOOD..... 50 YR.
DESIGN HIGH WATER ELEVATION..... 848.5
DRAINAGE AREA..... 2.8 SQ. MI.
BASE DISCHARGE (Q100)..... 2,320 C.F.S.
BASE HIGH WATER ELEVATION..... 849.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... 32,000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD.... 500+ YR.
OVERTOPPING FLOOD ELEVATION..... 873.7
OVERTOPPING STATION..... STA. 141+79.90 -L-



PLAN

(PILES AND DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-
BRIDGE NO. 330814
SHEET 1 OF 5 REPLACES CULVERT NO. 330140

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 158 (REIDSVILLE RD.) OVER LOWERY MILL CREEK BETWEEN SR 2396 (OLD BELEWS CREEK RD.) AND I-74

RIGHT LANE

BRIDGE NO. 330814

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODILINE J. PAITEL
Digitally signed by Odiline Paitel
11/10/2023

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

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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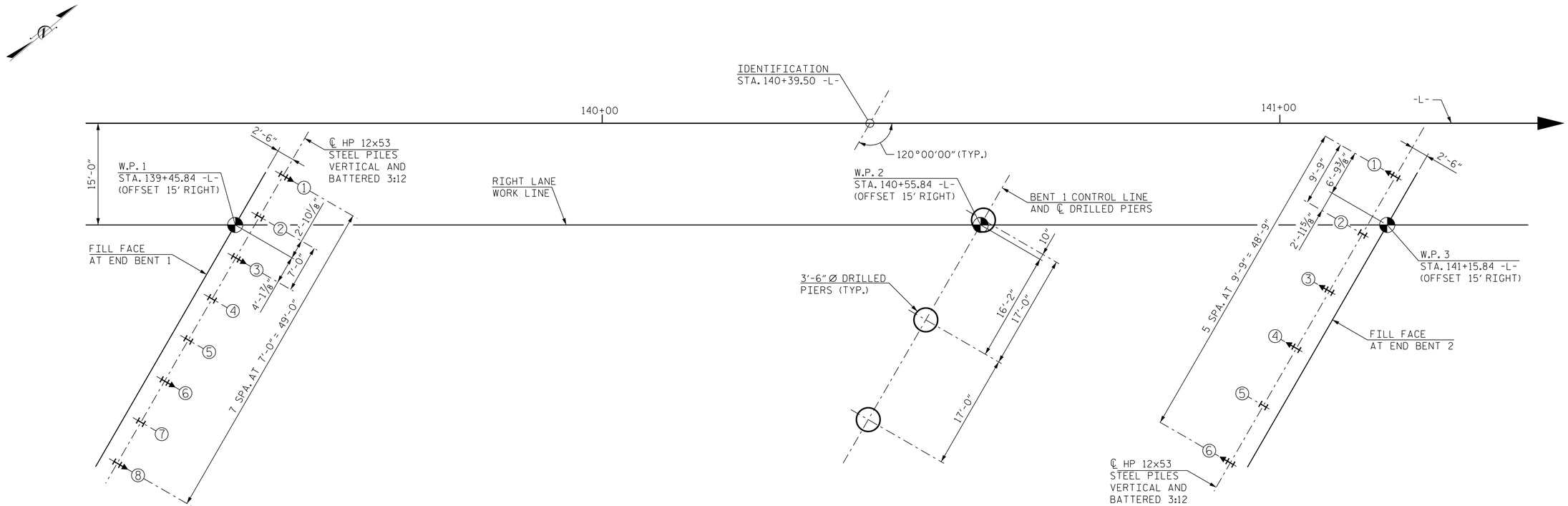
11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_GD_330815.dgn



END BENT 1 | BENT 1 | END BENT 2

FOUNDATION LAYOUT

ALL PILES AT END BENTS 1 AND 2 ARE HP 12x53 STEEL PILES.
DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES AT BOTTOM OF CAP.

LEGEND:

- HP 12x53 VERTICAL STEEL PILES
- HP 12x53 STEEL PILES BATTERED 3:12

FOUNDATION NOTES:

FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT 1.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

RIGHT LANE

BRIDGE NO. 330814

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

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J PAITEL
Docusigned by: Odine Paitel C1BF...
11/10/2023

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DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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SUMMARY OF PILE INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	FACTORED RESISTANCE PER PILE	PILE CUT-OFF (TOP OF PILE) ELEVATION	ESTIMATED PILE LENGTH PER PILE	SCOUR CRITICAL ELEVATION	DRIVEN PILES			PREDRILLING FOR PILES ✳			DRILLED-IN PILES		
					MIN. PILE TIP (TIP NO HIGHER THAN) ELEV.	REQUIRED DRIVING RESISTANCE (RDR) ✳✳ PER PILE	TOTAL PILE REDRIVES QUANTITY	PREDRILLING LENGTH PER PILE	PREDRILLING ELEVATION (ELEV. NOT TO PREDRILL BELOW)	MAXIMUM PREDRILLING DIAMETER	PILE EXCAVATION BOTTOM OF HOLE) ELEV.	PILE EXCAVATION NOT IN SOIL PER PILE	PILE EXCAVATION IN SOIL PER PILE
	TONS	FT.	FT.	FT.	FT.	TONS	EA.	LIN.FT.	FT.	INCHES	FT.	LIN.FT.	LIN.FT.
END BENT 1, PILES 1-8	113	868.00	25	-	-	190	7	-	-	-	-	-	-
END BENT 2, PILES 1-6	105	865.20	20	-	-	175		-	-	-	-	-	-

✳ 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 = $\frac{\text{FACTORED RESISTANCE + FACTORED DOWNDRAG LOAD + FACTORED DEAD LOAD}}{\text{DYNAMIC RESISTANCE FACTOR}}$ + NOMINAL DOWNDRAG RESISTANCE + $\frac{\text{NOMINAL SCOUR RESISTANCE}}{\text{SCOUR RESISTANCE FACTOR}}$

PILE DESIGN INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	FACTORED AXIAL LOAD PER PILE	FACTORED DOWNDRAG LOAD PER PILE	FACTORED DEAD LOAD ✳ PER PILE	DYNAMIC RESISTANCE FACTOR	NOMINAL DOWNDRAG RESISTANCE PER PILE	NOMINAL SCOUR RESISTANCE PER PILE	SCOUR RESISTANCE FACTORE (DEFAULT = 1.00)
	TONS	TONS	TONS		TONS	TONS	
END BENT 1, PILES 1-8	112.5	-	-	0.6	-	-	
END BENT 2, PILES 1-6	105	-	-	0.6	-	-	

✳ FACTORED DEAD LOAD IS FACTORED WEIGHT OF PILE ABOVE THE GROUND LINE.

SUMMARY OF PDA/PILE ORDER LENGTHS

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	PILE DRIVING ANALYZER (DYNAMIC PILE TEST)			PILE ORDER LENGTHS	
	DYNAMIC PILE TESTING REQUIRED	DYNAMIC PILE TEST PILE LENGTH	TOTAL DYNAMIC PILE TESTING QUANTITY		PILE ORDER LENGTH BASIS ✳
	YES/MAYBE	FT.	EA.		EST./DPT
END BENT 1	MAYBE	25	1		
END BENT 2	MAYBE	20			

✳ EST = PILE ORDER LENGTHS FROM ESTIMATED PILE LENGTHS; DTP = PILE ORDER LENGTHS BASED ON DYNAMIC PILE TESTING. FOR GROUPS OF END BENTS/BENTS WITH PILE ORDER LENGTHS BASED ON DYNAMIC PILE TESTING, THE FIRST END BENT/BENT NO. LISTED FOR EACH GROUP IS THE REPRESENTATIVE END BENT/BENT WITH THE DYNAMIC PILE TESTING.

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	FACTORED RESISTANCE PER PILE	MINIMUM PIER TIP (TIP NO HIGHER THAN) ELEVATION	REQUIRED TIP RESISTANCE PER PIER	SCOUR CRITICAL ELEVATION	MINIMUM DRILLED PIER PENETRATION INTO ROCK PER PIER	DRILLED PIER LENGTH ✳ PER PIER	DRILLED PIER LENGTH NOT IN SOIL PER PIER	DRILLED PIER LENGTH ✳ IN SOIL PER PIER	PERMANENT STEEL CASING REQUIRED?	PERMANENT STEEL CASING TIP ELEVATION (ELEV. NOT TO EXTEND CASING BELOW)	PERMANENT STEEL CASING LENGTH ✳✳ PER PIER
	TONS	FT.	TSF.	FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN.FT.	YES/MAYBE	FT.	LIN. FT.
BENT 1, PIERS 1-3	480	832.0	50	838.5	9	-	9	2			

✳ DRILLED PIER LENGTH, DRILLED PIER LENGTH NOT IN SOIL AND DRILLED PIER LENGTH IN SOIL REPRESENT ESTIMATED DRILLED PIER QUANTITIES AND ARE MEASURED AND PAID FOR AS "42" DIA. DRILLED PIERS" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.

✳✳ PERMANENT STEEL CASING LENGTH EQUALS THE DIFFERENCE BETWEEN THE GROUND LINE OR TOP OF DRILLED PIER ELEVATION, WHICHEVER IS HIGHER, AND THE PERMANENT CASING TIP ELEVATION AND IS MEASURED AND PAID FOR AS "PERMANENT STEEL CASING FOR 42" DIA. DRILLED PIER" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.

SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	PIPE PILE PLATES REQUIRED?	STEEL PILE POINTS			STEEL PILE TIPS REQUIRED?
		PIPE PILE CUTTING SHOES REQUIRED?	PIPE PILE CONICAL POINTS REQUIRED?	H-PILE POINTS REQUIRED?	
	YES/MAYBE	YES	YES	YES	YES
END BENT 1, PILES 1-8				YES	
END BENT 2, PILES 1-6				YES	
TOTAL QTY.:				14	

FOUNDATION NOTES:

THE PILE AND DRILLED PIER FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (ATEFEH ASOUDEH, PE #043747) ON 07-19-2023.

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.

THE ENGINEER WILL DETERMINE THE NEED FOR DYNAMIC PILE TESTING, SPTS, CSL TESTING, AND SID INSPECTIONS WHEN THESE ITEMS MAY BE REQUIRED.

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

	STANDARD PENETRATION TEST (SPT) REQUIRED?	CROSSHOLE SONIC LOGGING (CSL) REQUIRED? ✳	TOTAL CSL TUBE LENGTH (FOR ALL TUBES) PER PIER	SHAFT INSPECTION DEVICE (SID) REQUIRED?	PILE INTEGRITY TEST (PIT) REQUIRED?
	YES/MAYBE	YES/MAYBE	LIN. FT.	YES/MAYBE	MAYBE
BENT 1, PIERS 1-3	MAYBE	MAYBE	51.0	MAYBE	
TOTAL QTY.:	1	1	153	1	

✳ 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.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 3 OF 5

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12/19/2023

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
PILE AND DRILLED PIER FOUNDATION TABLES

RIGHT LANE

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

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	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 SET UP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	NO.	EA.	EA.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	———	———	———	———	———	LUMP SUM	6,573	7,073	———	LUMP SUM	———	———	10	824.17	———	———	———	———	———	———	———	376.78	———	———	LUMP SUM	LUMP SUM
END BENT 1	———	———	———	———	———	———	———	———	———	59.3	———	8,175	———	———	———	8	8	200	8	———	———	———	825	920	———	———	———
BENT 1	———	6	27	-	-	-	———	———	———	48.5	———	12,991	2,117	———	———	———	———	———	———	———	———	———	635 *	705 *	———	———	———
END BENT 2	———	———	———	———	———	———	———	———	———	60.4	———	7,803	———	———	———	6	6	120	6	———	———	———	605	675	———	———	———
TOTAL	LUMP SUM	6	27	1	1	1	LUMP SUM	6,573	7,073	168.2	LUMP SUM	28,969	2,117	10	824.17	14	14	320	14	7	1	376.78	2,065	2,300	LUMP SUM	LUMP SUM

* STREAMBED QUANTITIES

GENERAL 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 THE SEISMIC ZONE 1.

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

FOR SUBMITAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

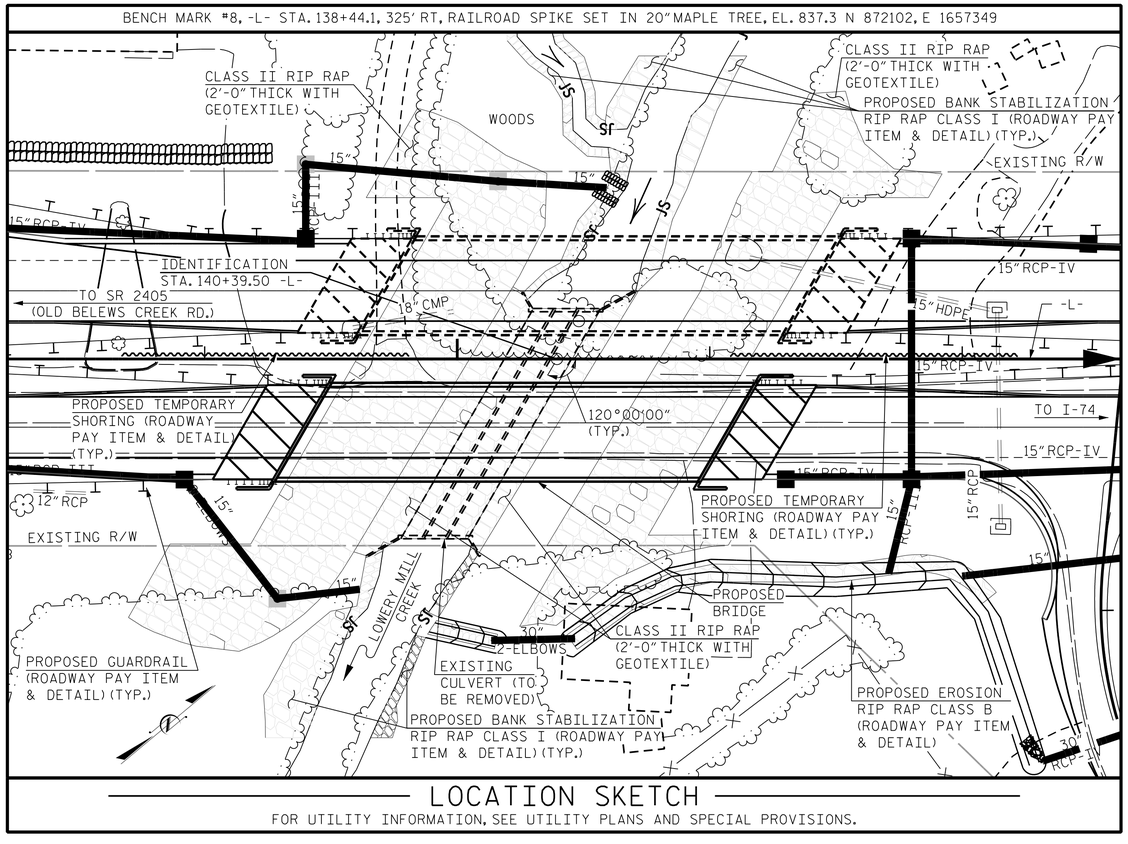
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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.



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE MATERIAL SHOWN IN THE HATCHED AREA ON SHEET SR-1 SHALL BE EXCAVATED FOR A DISTANCE OF 107 FT LEFT AND 116 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

REMOVAL OF THE EXISTING CULVERT SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING IN TO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE CULVERT IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."

THE EXISTING CULVERT CONSISTING OF TRIPLE 7 FT. X 10 FT. BOTTOMLESS REINFORCED CONCRETE BARREL CULVERT SHALL BE REMOVED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE EXISTING CULVERT DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CLASS AA CONCRETE IN THE BIRDGE 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.

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 838.5. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. R-2577A
FORSYTH COUNTY
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SHEET 4 OF 5

STATE OF NORTH CAROLINA
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GENERAL DRAWING

LOCATION SKETCH, TOTAL BILL OF MATERIAL AND GENERAL NOTES

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODDINE J. PAITEL
Digitally signed by: Oddine Paitel
C1B0...
12/19/2023

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CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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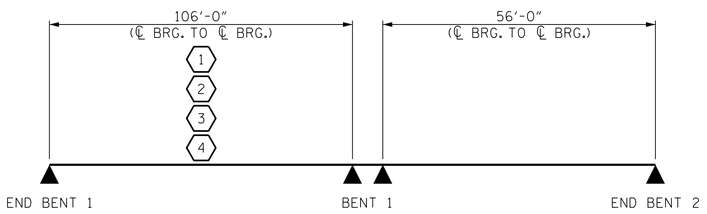
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

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
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.16	--	1.75	0.713	1.64	A	E	53.0	0.925	1.49	A	I	10.0	0.80	0.811	1.16	A	E	53.0	
		HL-93 (OPERATING)	N/A		1.97	--	1.35	0.713	2.12	A	E	53.0	0.925	1.97	A	I	10.0	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.64	59.04	1.75	0.713	2.32	A	E	53.0	0.925	2.07	A	I	10.0	0.80	0.811	1.64	A	E	53.0	
		HS-20 (OPERATING)	36.000		2.72	97.92	1.35	0.713	3.00	A	E	53.0	0.925	2.72	A	I	10.0	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.93	53.06	1.40	0.713	6.92	A	E	53.0	0.925	6.67	A	I	10.0	0.80	0.811	3.93	A	E	53.0	
		SNGARBS2	20.000		2.83	56.60	1.40	0.713	4.99	A	E	53.0	0.925	4.62	A	I	10.0	0.80	0.811	2.83	A	E	53.0	
		SNAGRIS2	22.000		2.64	58.08	1.40	0.713	4.66	A	E	53.0	0.925	4.25	A	I	10.0	0.80	0.811	2.64	A	E	53.0	
		SNCOTTS3	27.250		1.95	53.14	1.40	0.713	3.44	A	E	53.0	0.925	3.25	A	I	10.0	0.80	0.811	1.95	A	E	53.0	
		SNAGGRS4	34.925		1.59	55.53	1.40	0.713	2.81	A	E	53.0	0.925	2.62	A	I	10.0	0.80	0.811	1.59	A	E	53.0	
		SNS5A	35.550		1.56	55.46	1.40	0.713	2.75	A	E	53.0	0.925	2.63	A	I	10.0	0.80	0.811	1.56	A	E	53.0	
		SNS6A	39.950		1.42	56.73	1.40	0.713	2.50	A	E	53.0	0.925	2.36	A	I	10.0	0.80	0.811	1.42	A	E	53.0	
		SNS7B	42.000		1.35	56.70	1.40	0.713	2.38	A	E	53.0	0.925	2.29	A	I	10.0	0.80	0.811	1.35	A	E	53.0	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.72	56.76	1.40	0.713	3.04	A	E	53.0	0.925	2.85	A	I	10.0	0.80	0.811	1.72	A	E	53.0	
		TNT4A	33.075		1.73	57.22	1.40	0.713	3.04	A	E	53.0	0.925	2.80	A	I	10.0	0.80	0.811	1.73	A	E	53.0	
		TNT6A	41.600		1.40	58.24	1.40	0.713	2.46	A	E	53.0	0.925	2.40	A	I	10.0	0.80	0.811	1.40	A	E	53.0	
		TNT7A	42.000		1.40	58.80	1.40	0.713	2.46	A	E	53.0	0.925	2.36	A	I	10.0	0.80	0.811	1.40	A	E	53.0	
		TNT7B	42.000		1.43	60.06	1.40	0.713	2.52	A	E	53.0	0.925	2.25	A	I	10.0	0.80	0.811	1.43	A	E	53.0	
		TNAGRIT4	43.000		1.37	58.91	1.40	0.713	2.42	A	E	53.0	0.925	2.19	A	I	10.0	0.80	0.811	1.37	A	E	53.0	
		TNAGT5A	45.000		1.30	58.50	1.40	0.713	2.29	A	E	53.0	0.925	2.14	A	I	10.0	0.80	0.811	1.30	A	E	53.0	
		TNAGT5B	45.000	⟨3⟩	1.29	58.05	1.40	0.713	2.27	A	E	53.0	0.925	2.08	A	I	10.0	0.80	0.811	1.29	A	E	53.0	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.99	57.21	1.30	0.713	3.78	A	E	53.0	0.925	3.45	A	I	10.0	0.80	0.811	1.99	A	E	53.0	
		EV3	43.000	⟨4⟩	1.31	56.33	1.30	0.713	2.49	A	E	53.0	0.925	2.27	A	I	10.0	0.80	0.811	1.31	A	E	53.0	



LRFR SUMMARY

LOAD FACTORS:

	LIMIT STATE	γ_{DC}	γ_{DW}
DESIGN LOAD RATING FACTORS	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.

COMMENTS:

1.
2.
3.
4.

⟨#⟩ 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
E - EXTERIOR GIRDER

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 5 OF 5

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
Docusigned by: Odine Paitel
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

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

RIGHT LANE

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STD. NO. LRFR1

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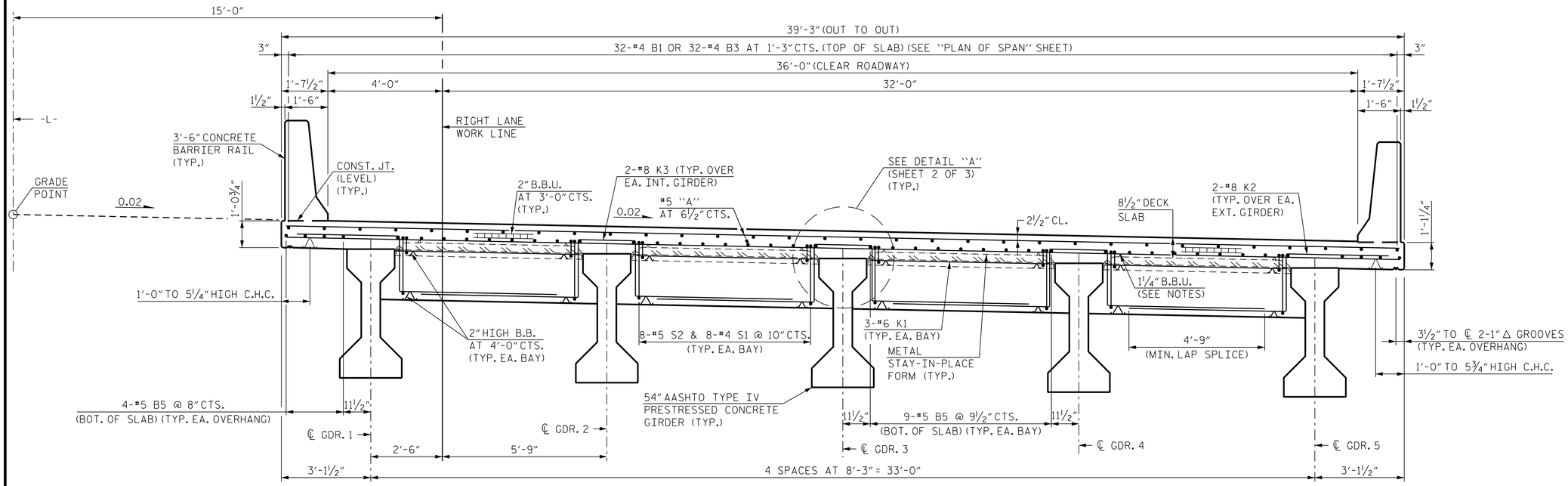
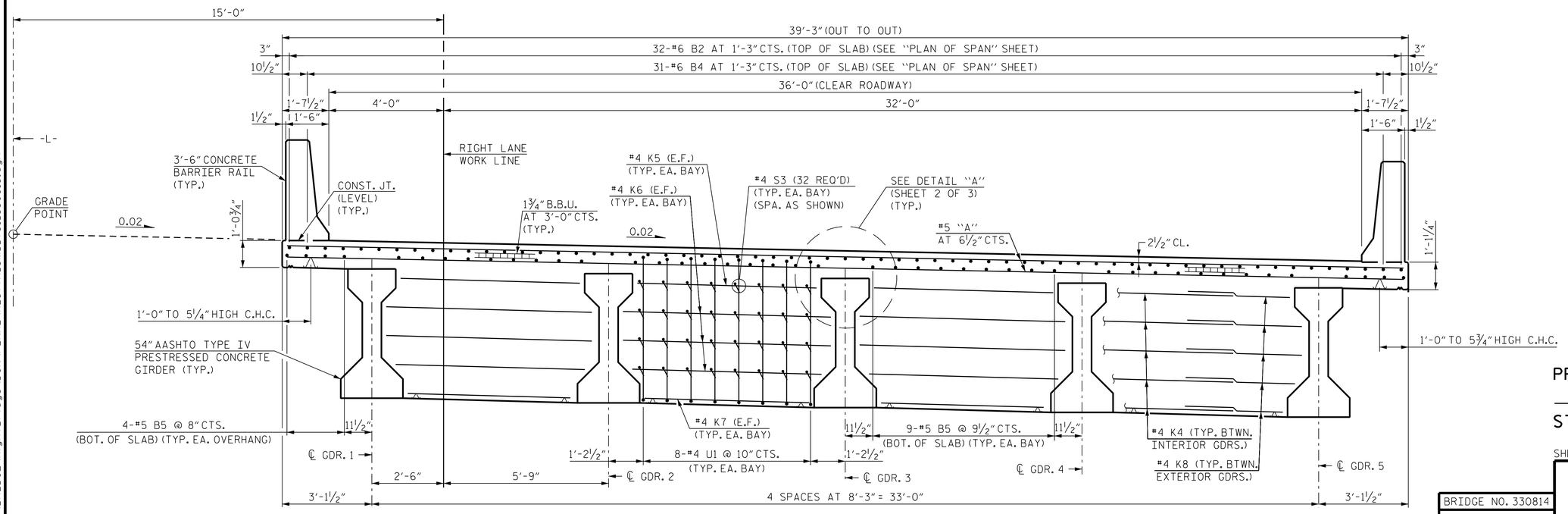


TYPICAL SECTION AT END BENTS



TYPICAL SECTION AT BENT

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.

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 OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT A "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

PROJECT NO. R-2577A

FORSYTH COUNTY

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SHEET 1 OF 3

DRAWN BY : T. K. BOYD DATE : SEP 2023

CHECKED BY : L. K. AUSTIN DATE : SEP 2023

DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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Digitally signed by Ondine J. Paitel
11/10/2023

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

RIGHT LANE

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1			3			TOTAL SHEETS
2			4			34

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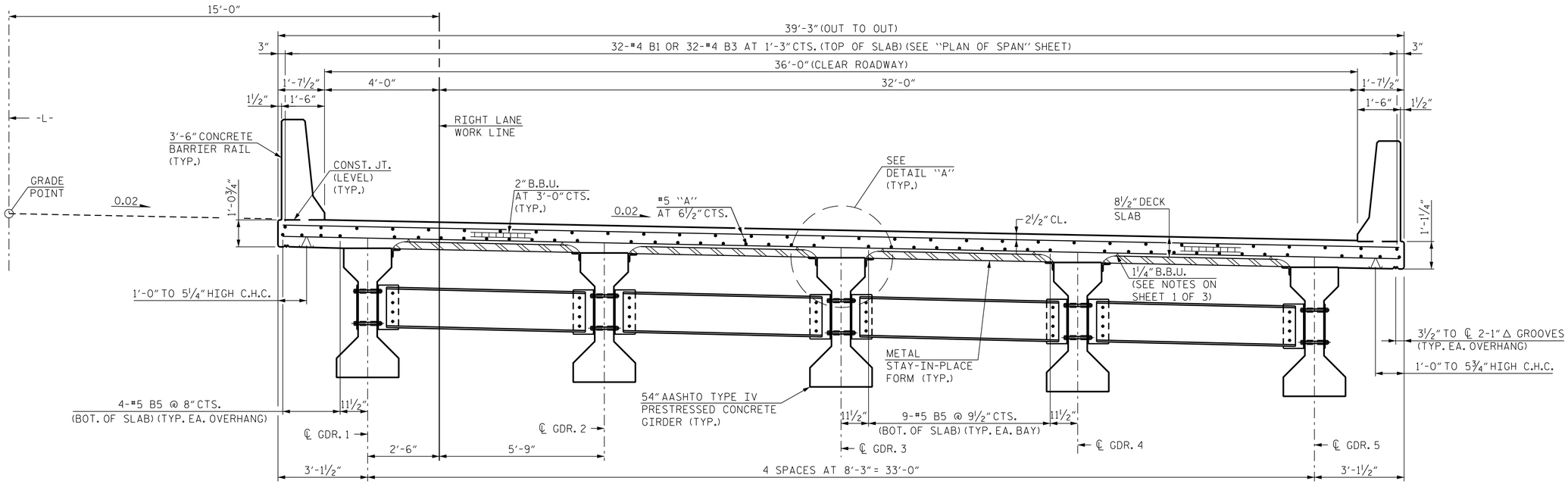
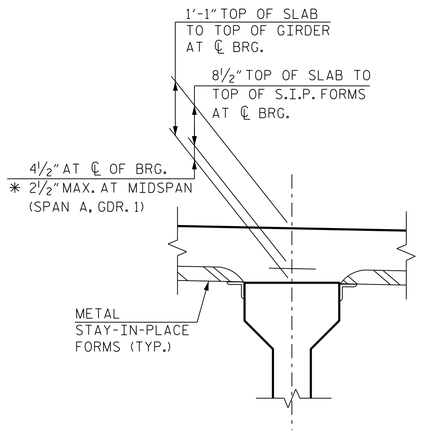


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS



DETAIL "A"

*BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
TYPICAL SECTIONS

RIGHT LANE

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DocuSigned by: Odine Paitel
11/10/2023

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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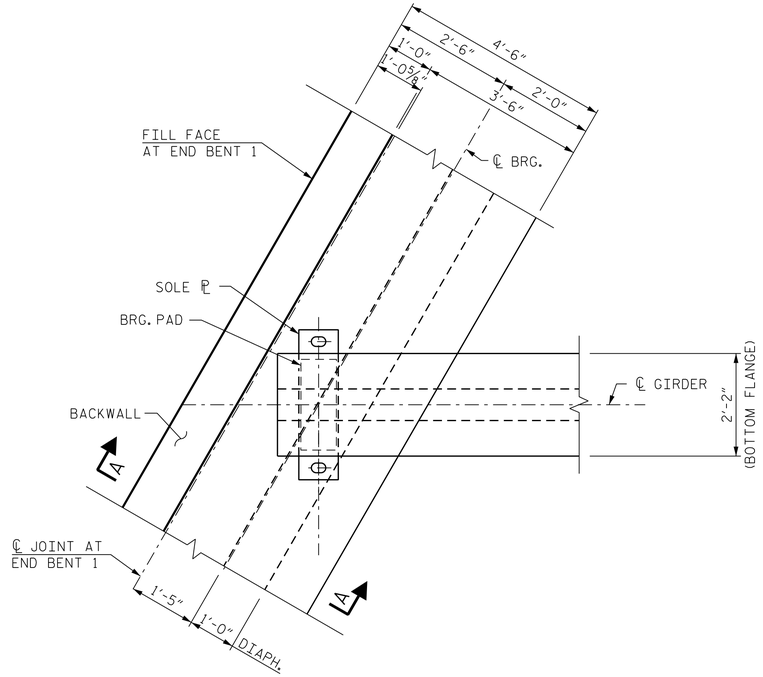
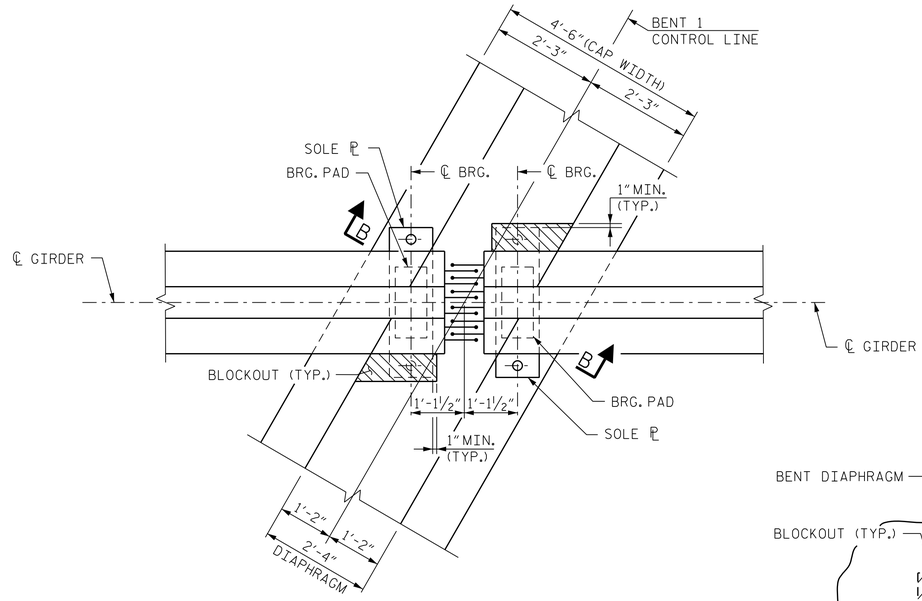


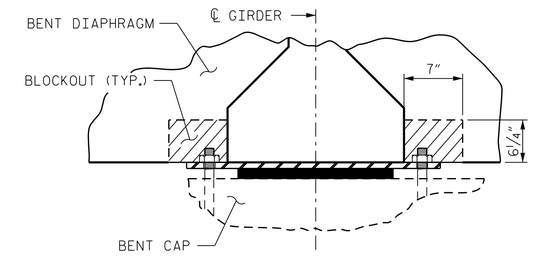
PLAN DETAIL OF END BENT 1

(DECK SLAB NOT SHOWN FOR CLARITY)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

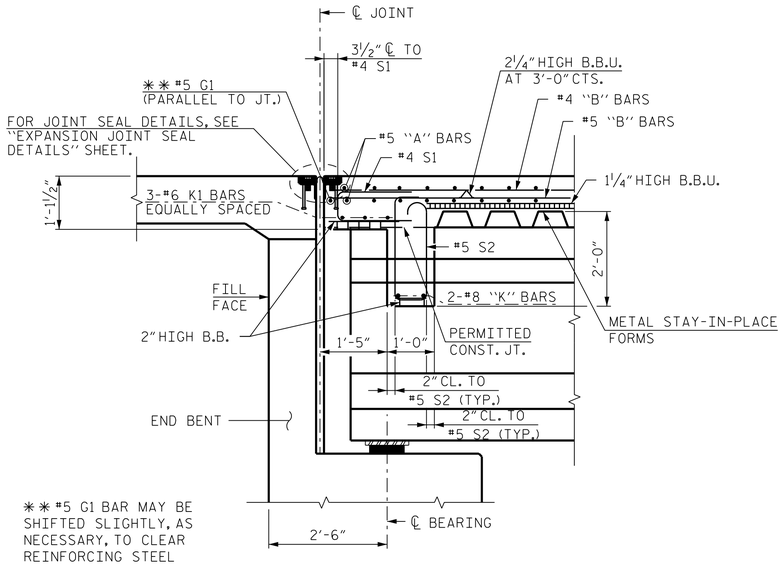


PLAN DETAIL OF BENT 1

(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)



BENT SECTION
DIAPHRAGM BLOCKOUT DETAIL



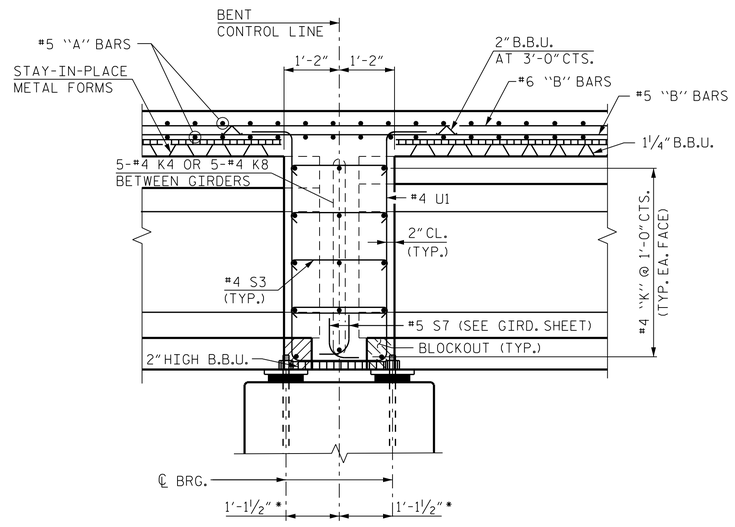
✱✱#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO END BENT)

END BENT DETAILS

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION B-B

SECTION THROUGH
BENT DIAPHRAGM

*MEASURED ALONG ℄ GIRDER

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 3

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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BRIDGE NO. 330814

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ORDINE J. PAITEL
DocuSigned by: Ordine Paitel
C1B7...
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			34

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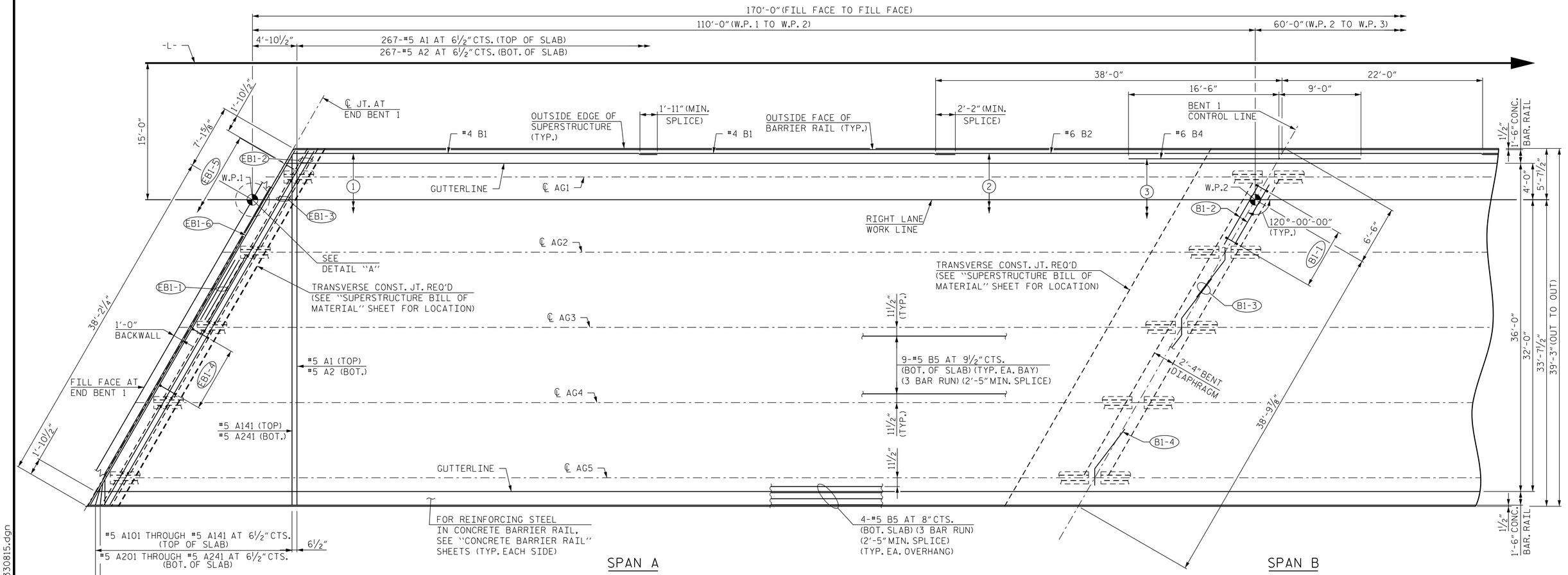


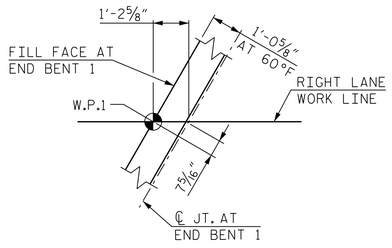
PLAN OF SPAN A

FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

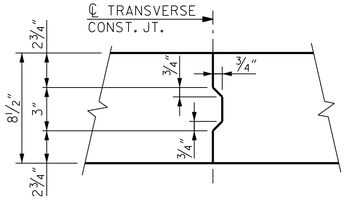
END BENT 1 DIAPHRAGM DETAILS	
EB1-1	3-#6 K1 (TYP. EA. BAY)
EB1-2	2-#8 K2 (OVER EA. EXT. GDR.) (4'-9" MIN. SPLICE)
EB1-3	2-#8 K3 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB1-4	8-#4 S1 AND 8-#5 S2 AT 10" CTS. (TYP. EA. BAY)
EB1-5	42-#4 J1 AT 1'-0" CTS. (SEE EXPANSION JOINT SEAL DETAILS FOR LOCATION OF BARS)
EB1-6	#5 G1 PARALLEL TO JOINT

1. 32-#4 B1 (2 BAR RUN) (TOP OF SLAB) (MIN. LAP SPLICE = 1'-11") (SEE TYPICAL SECTION FOR SPACING)
2. 32-#6 B2 (TOP OF SLAB) (SPLICE WITH #4 B1 AND #4 B3) (MIN. LAP SPLICE = 2'-2") (SEE TYPICAL SECTION FOR SPACING)
3. 31-#6 B4 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)

BENT 1 DIAPHRAGM DETAILS	
B1-1	8-#4 U1 AT 10" CTS. AND 32-#4 S3 (TYP. EA. BAY)
B1-2	#4 K5, 3-#4 K6 AND #4 K7 (TYP. EA. FACE) (TYP. EA. BAY)
B1-3	5-#4 K4 BETWEEN INTERIOR GIRDERS
B1-4	5-#4 K8 BETWEEN EXTERIOR GIRDERS



DETAIL "A"



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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN A

RIGHT LANE

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
Digitally signed by Odine Paitel
11/10/2023

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2			4			34

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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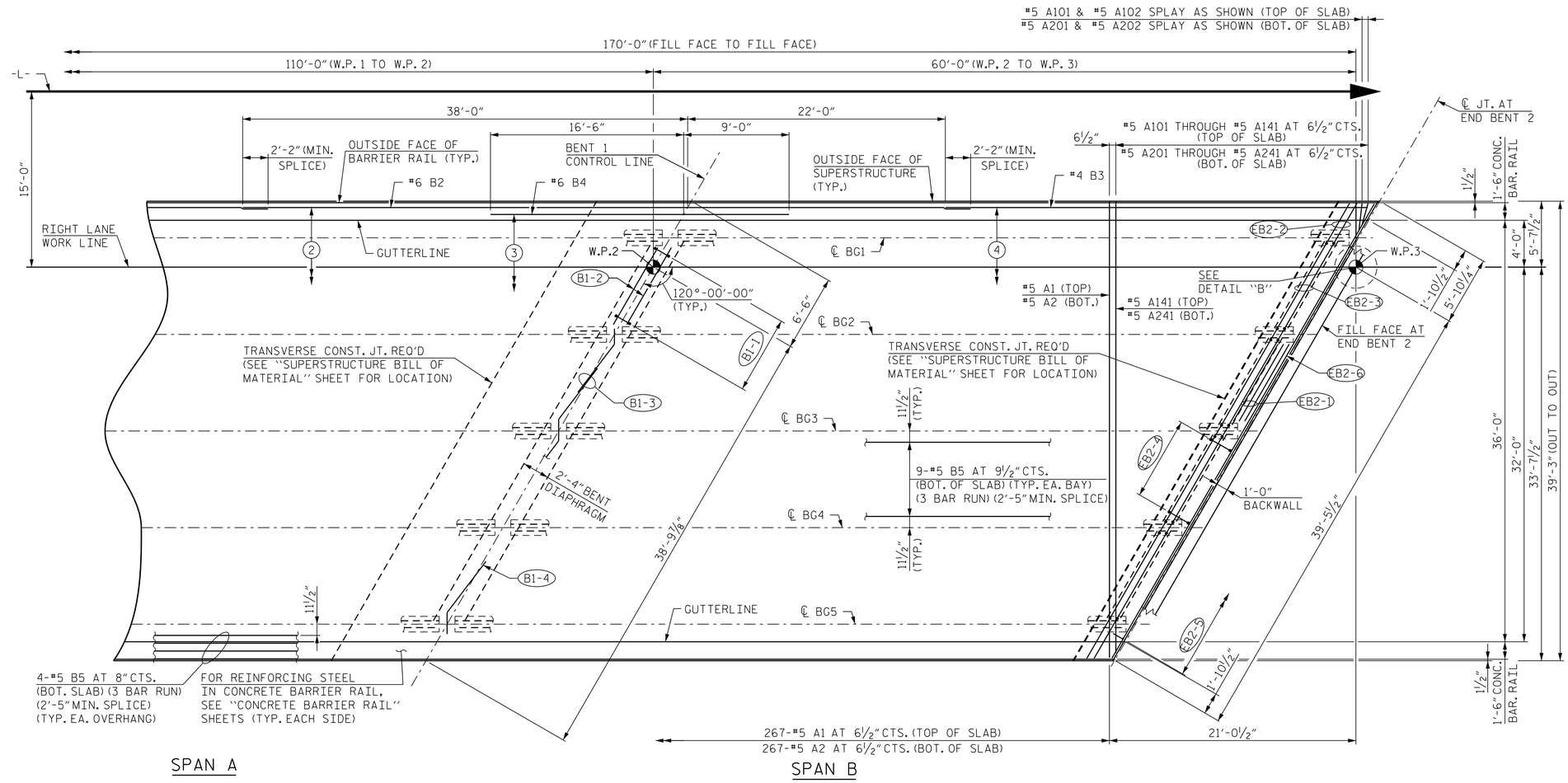


SPAN A

SPAN B

PLAN OF SPAN B

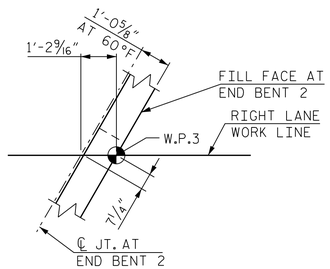
FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

BENT 1 DIAPHRAGM DETAILS	
B1-1	8-#4 U1 AT 10" CTS. AND 32-#4 S3 (TYP. EA. BAY)
B1-2	#4 K5, 3-#4 K6 AND #4 K7 (TYP. EA. FACE) (TYP. EA. BAY)
B1-3	5-#4 K4 BETWEEN INTERIOR GIRDERS
B1-4	5-#4 K8 BETWEEN EXTERIOR GIRDERS

(2) 32-#6 B2 (TOP OF SLAB) (SPLICE WITH #4 B1 AND #4 B3) (MIN. LAP SPLICE = 2'-2") (SEE TYPICAL SECTION FOR SPACING)

(3) 31-#6 B4 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)

(4) 32-#4 B3 (TOP OF SLAB) (SEE TYPICAL SECTION FOR SPACING)



DETAIL "B"

END BENT 2 DIAPHRAGM DETAILS	
EB2-1	3-#6 K1 (TYP. EA. BAY)
EB2-2	2-#8 K2 (OVER EA. EXT. GDR.) (4'-9" MIN. SPLICE)
EB2-3	2-#8 K3 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB2-4	8-#4 S1 AND 8-#5 S2 AT 10" CTS. (TYP. EA. BAY)
EB2-5	42-#4 J1 AT 1'-0" CTS. (SEE EXPANSION JOINT SEAL DETAILS FOR LOCATION OF BARS)
EB2-6	#5 G1 PARALLEL TO JOINT

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B

RIGHT LANE

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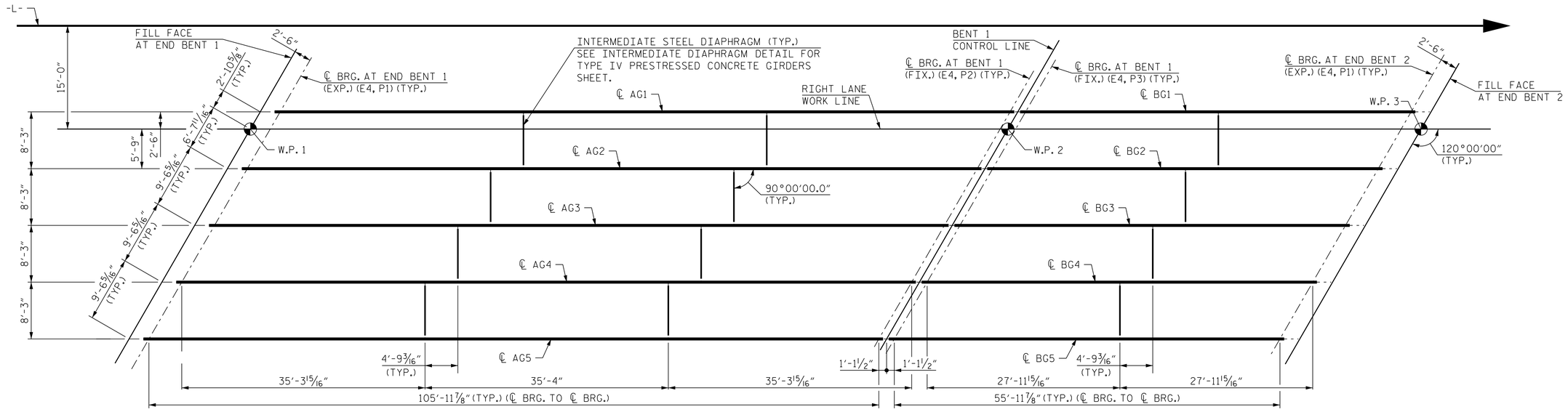

SPAN A

SPAN B

FRAMING PLAN

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE

FRAMING PLAN
SPANS A & B

RIGHT LANE

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1			3			TOTAL SHEETS
2			4			34

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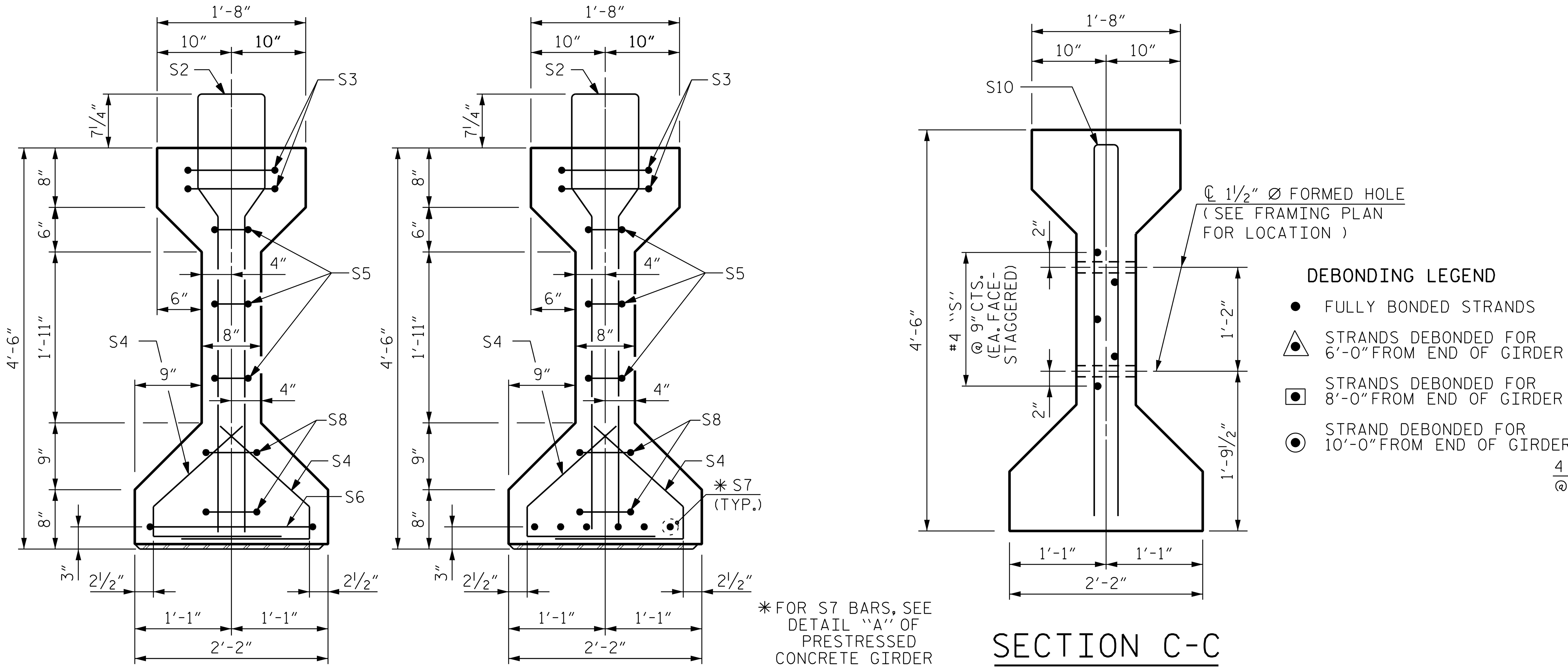


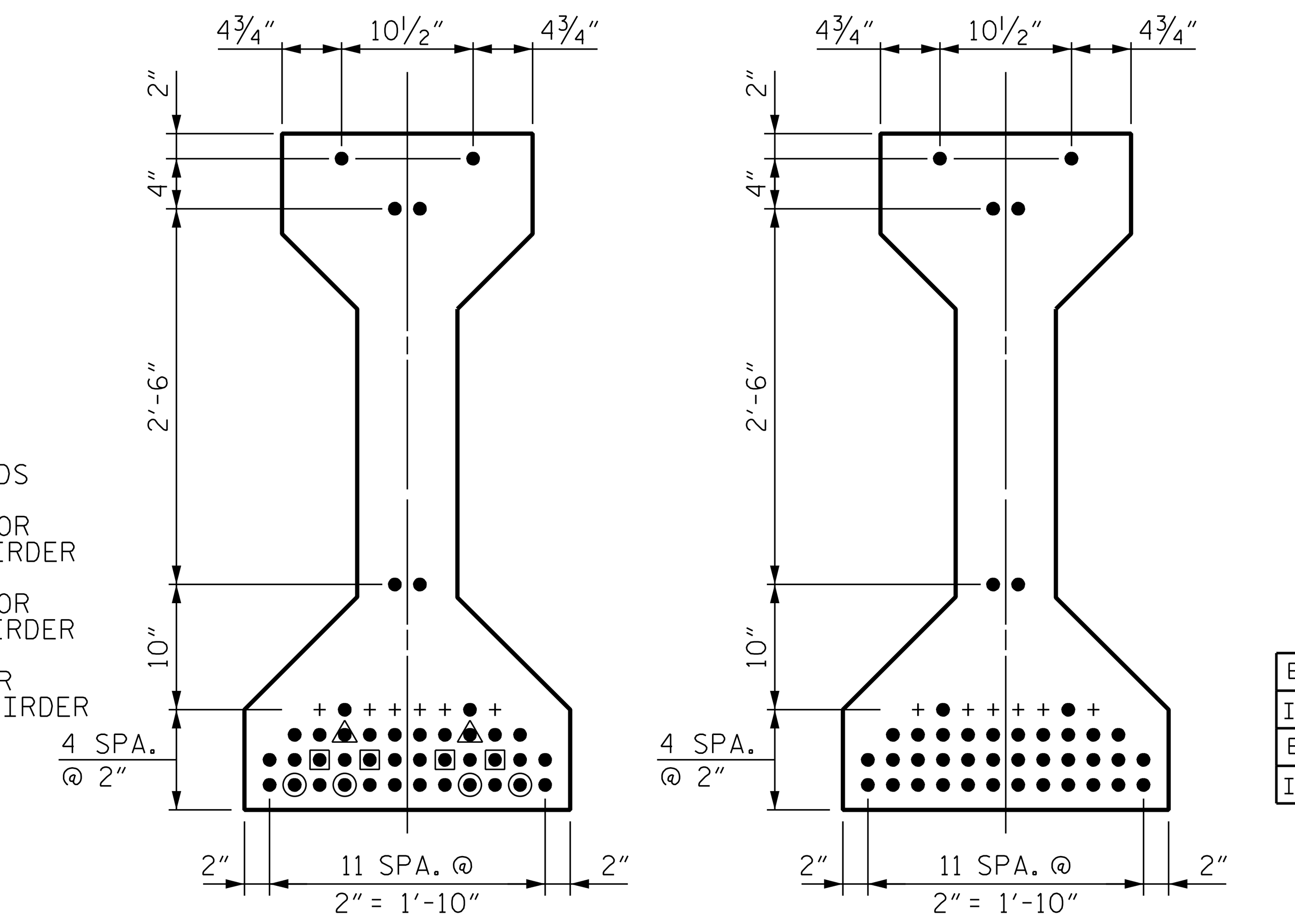
SECTION A-A

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

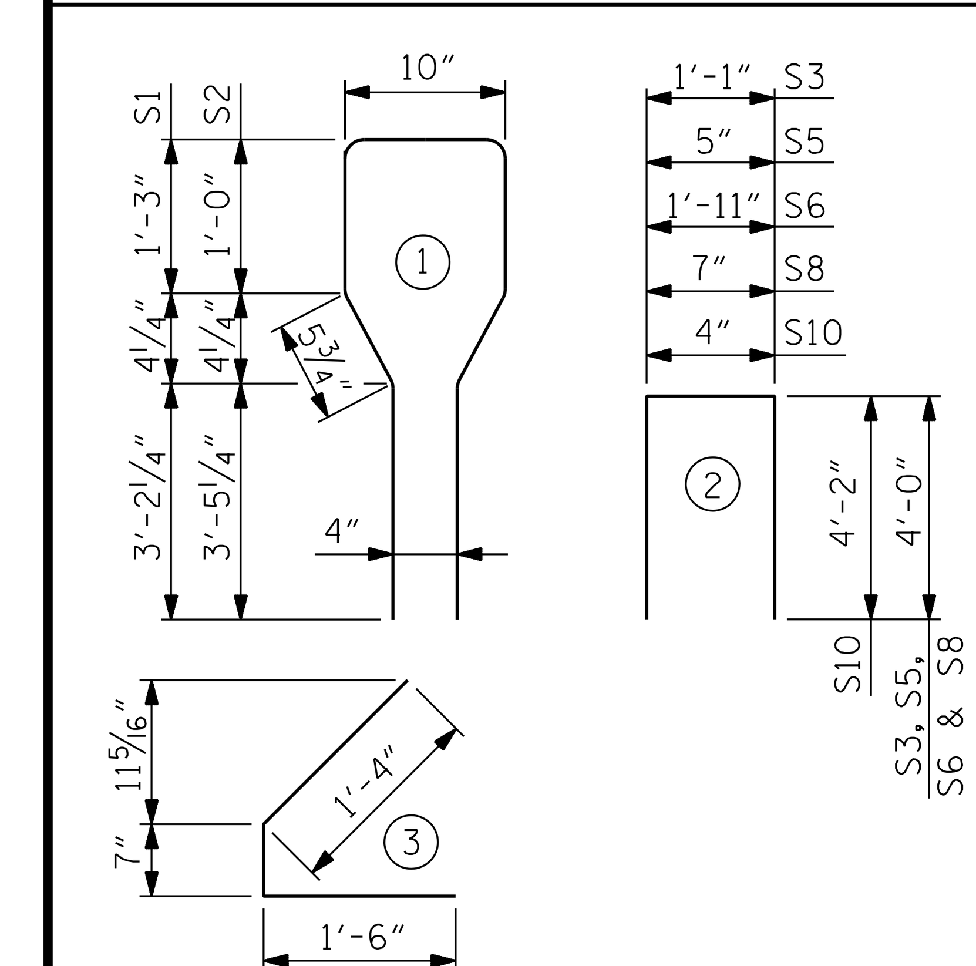
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

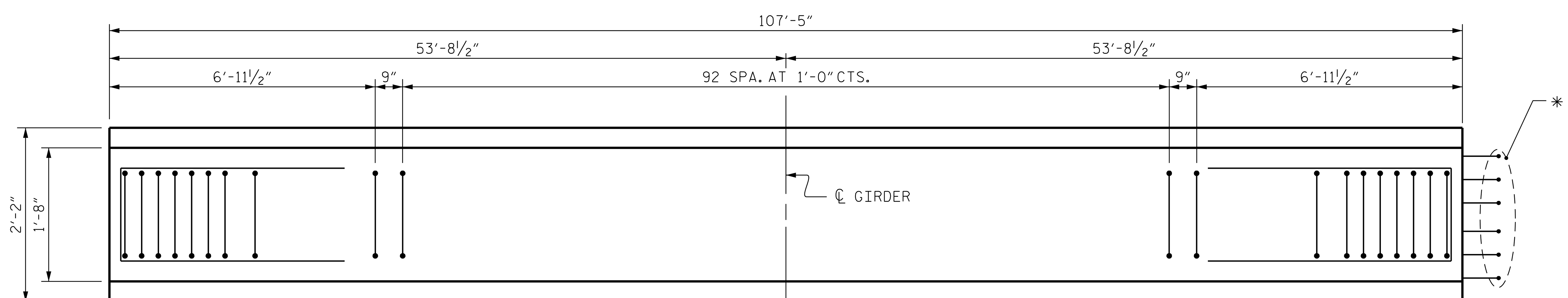
	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	113	#4	1	10'-8"	805
	S2	14	#6	1	10'-8"	225
	S3	4	#4	2	9'-1"	24
	S4	68	#4	3	3'-5"	155
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	* S7	6	#5	STR.	3'-8"	23
	S8	4	#4	2	8'-7"	23
	S9	1	#3	STR.	1'-10"	1
EXTERIOR GDR.	S10	4	#5	2	8'-8"	36
INTERIOR GDR.	S10	8	#5	2	8'-8"	72
EXTERIOR GDR.	S11	10	#4	STR.	7'-0"	47
INTERIOR GDR.	S12	10	#4	STR.	11'-10"	79

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

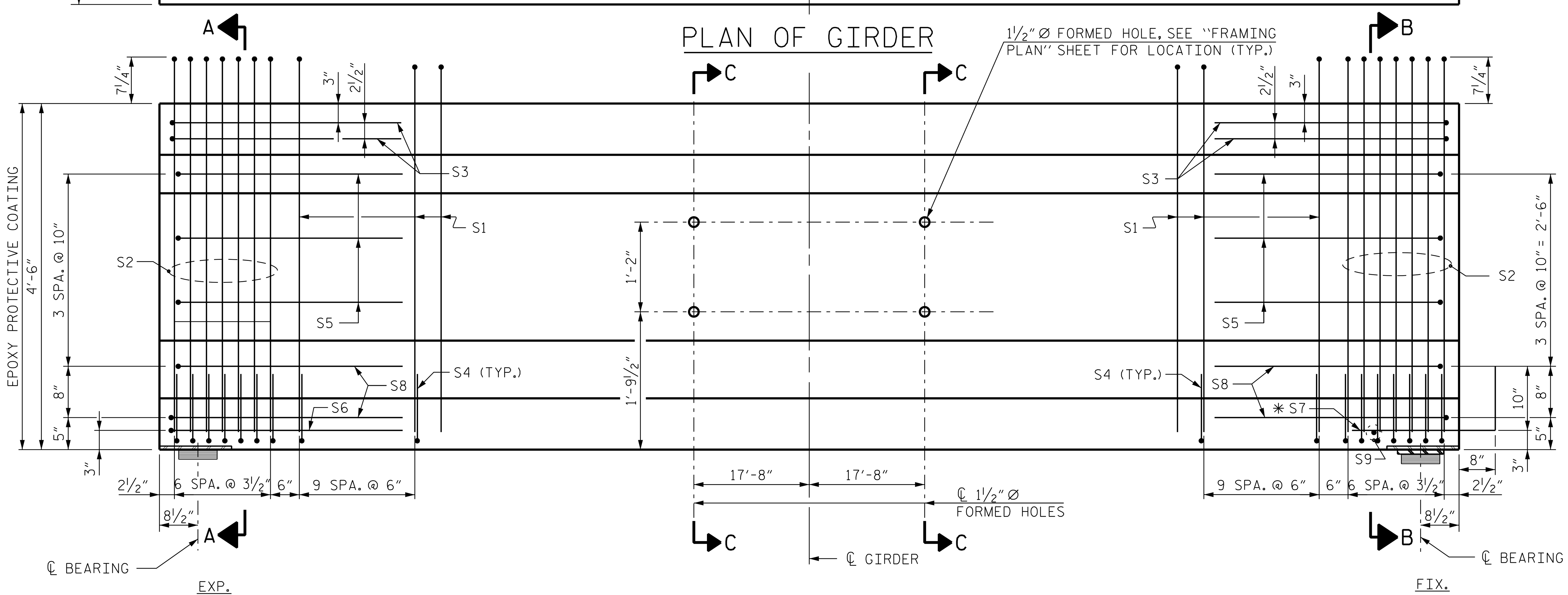
BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

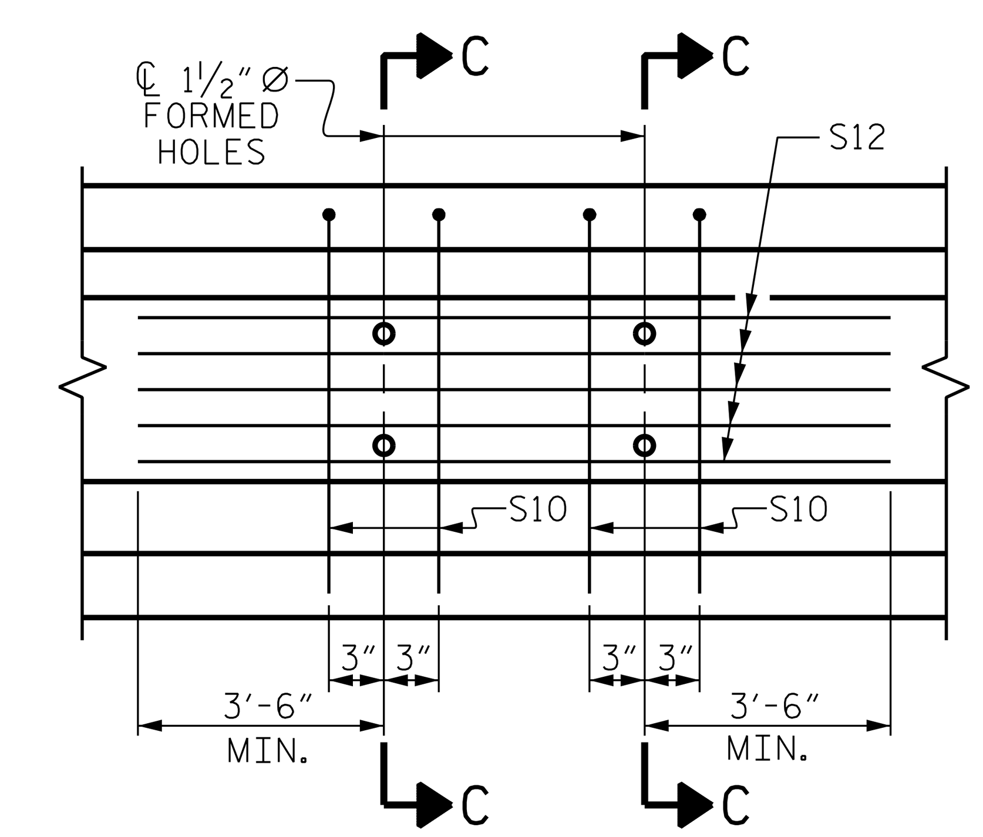


PLAN OF GIRDER



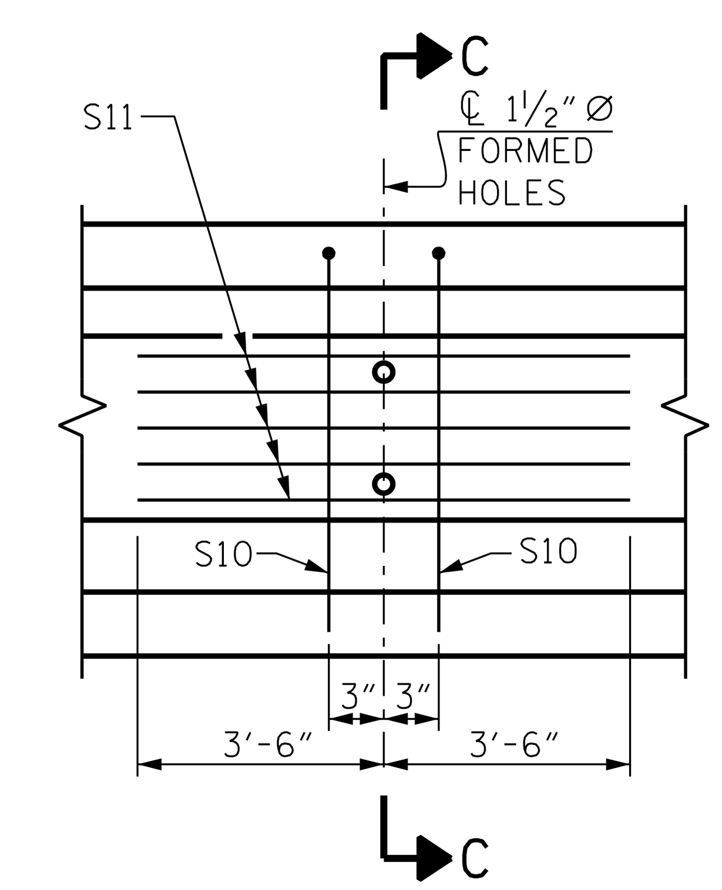
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 2 THRU 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 1 & 5

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7,500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDRS. 2-4	1,448	21.8	42
GDRS. 1 & 5	1,380	21.8	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	107'-5"	537'-1"

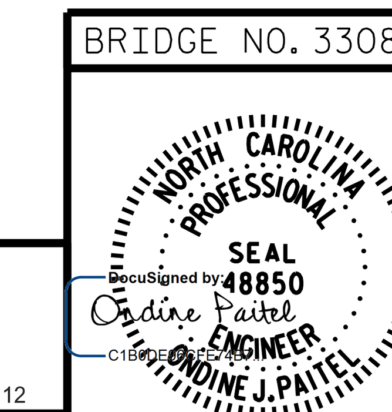
PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 4

BRIDGE NO. 330814



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RALEIGH

SUPERSTRUCTURE

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

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

SHEET NO. SR-12

TOTAL SHEETS 34

STD. NO. PCG6

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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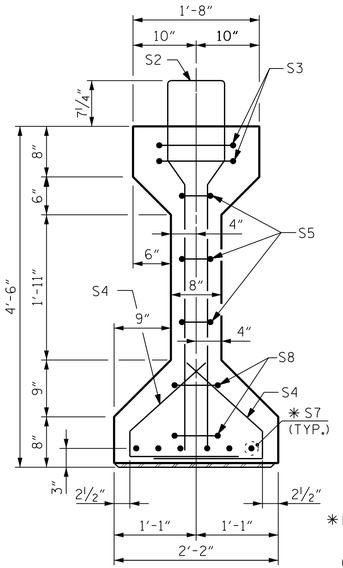
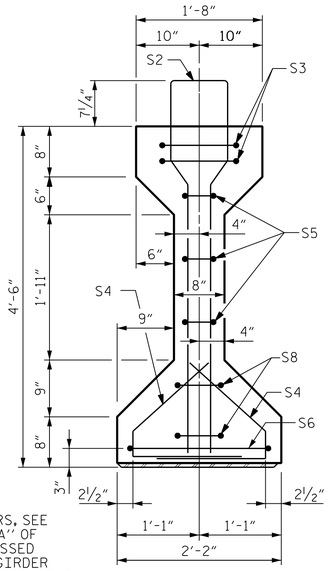
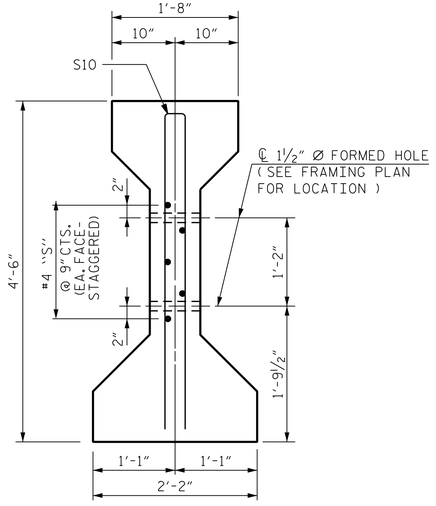


SECTION B-B

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

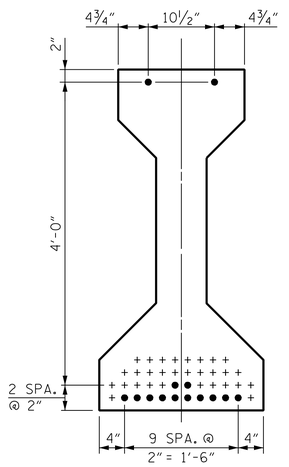


SECTION A-A

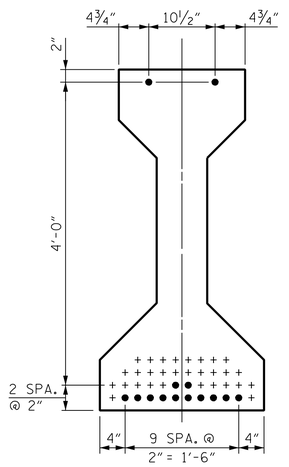


SECTION C-C

(S1 BARS NOT SHOWN)

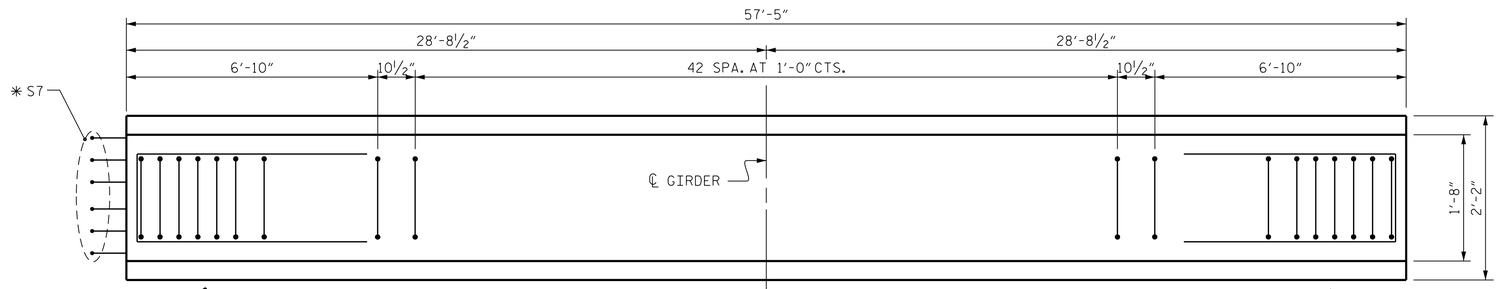


AT END OF GIRDER

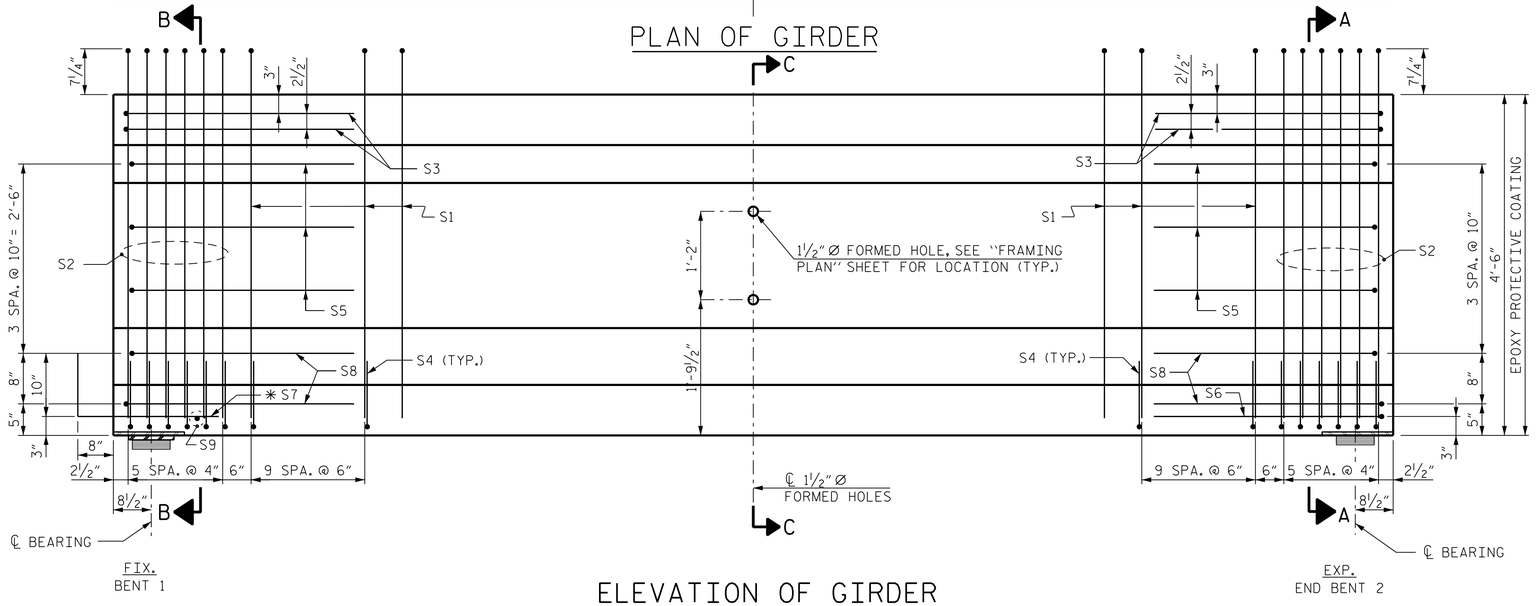


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

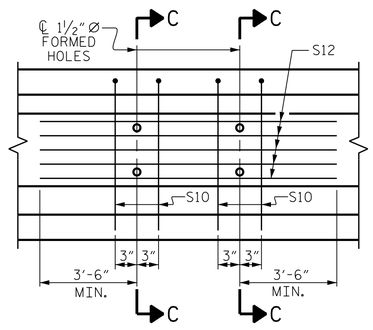


PLAN OF GIRDER



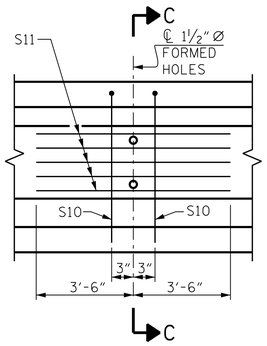
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 2 THRU 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDRS. 1 & 5

0.6" Ø L. R. GRADE 270 STRANDS

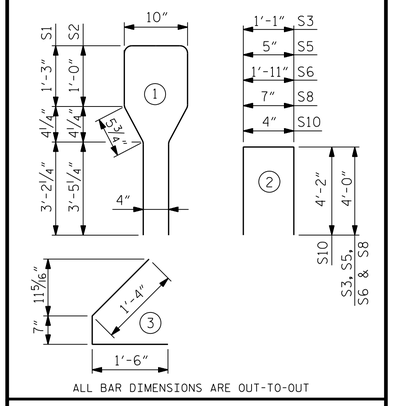
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	43	#4	1	10'-8"	306
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	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
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR.	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR.	11'-10"	40

✳ 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	6,700 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDRS. 1 & 5	797	11.7	14
GDRS. 2-4	832	11.7	14

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	57'-5"	287'-1"

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

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

RIGHT LANE

BRIDGE NO. 330814

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
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NORTH CAROLINA PROFESSIONAL SEAL 18850 ENGINEER ONDINE J. PAITEL
11/10/2023

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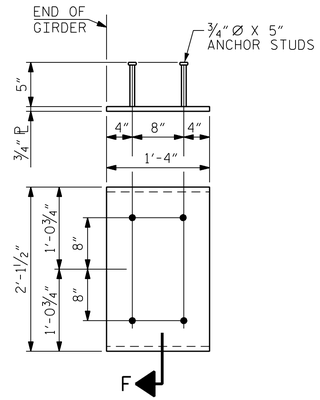
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-13
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

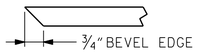
STD. NO. PCG6

tboyd
11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_G2_330815.dgn



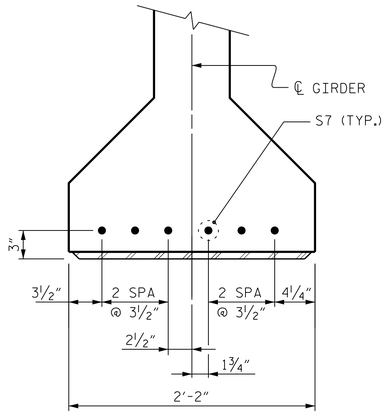
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "A"

NOTES:

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 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 6,000 PSI (SPAN A) AND 5,300 PSI (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 ¼".

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 4,500 LBS.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

RIGHT LANE

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
DocuSigned by: Odine Paitel C1F...
11/10/2023

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-14
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

STD. NO. PCG9

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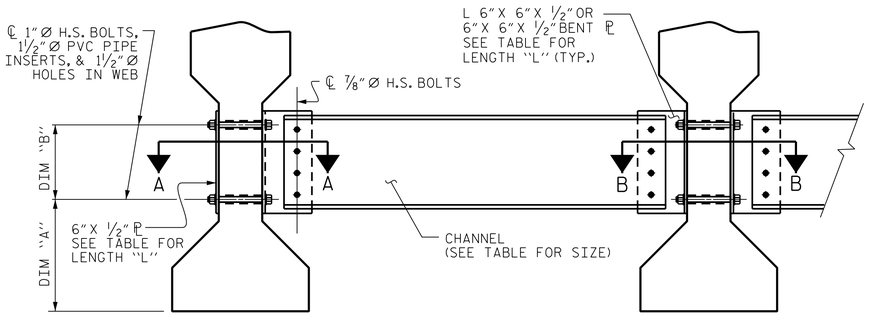
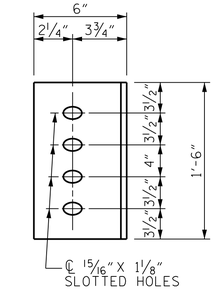
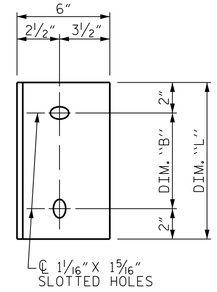


EXTERIOR GIRDER

INTERIOR GIRDER



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

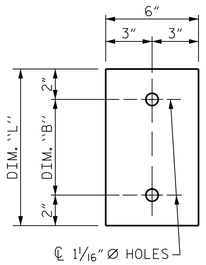
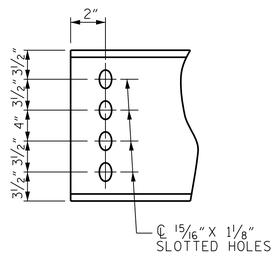
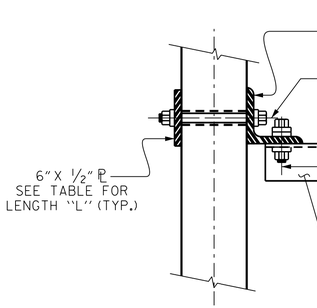


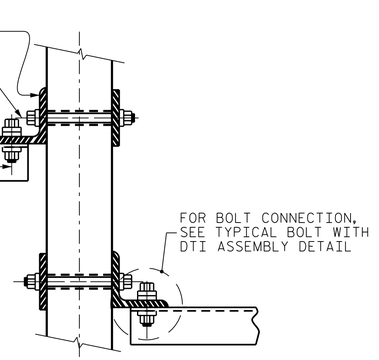
PLATE DETAILS



CHANNEL END

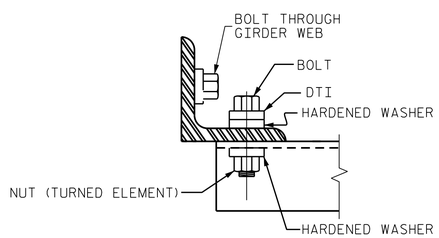


SECTION A-A



SECTION B-B

CONNECTION DETAILS



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"

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 4 OF 4

DRAWN BY : T. K. BOYD DATE : SEP 2023

CHECKED BY : L. K. AUSTIN DATE : SEP 2023

DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODIENE J. PAITEL

Docusigned by: Odiene Paitel

11/10/2023

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

RIGHT LANE

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2			4			34

STD. NO. PCG10

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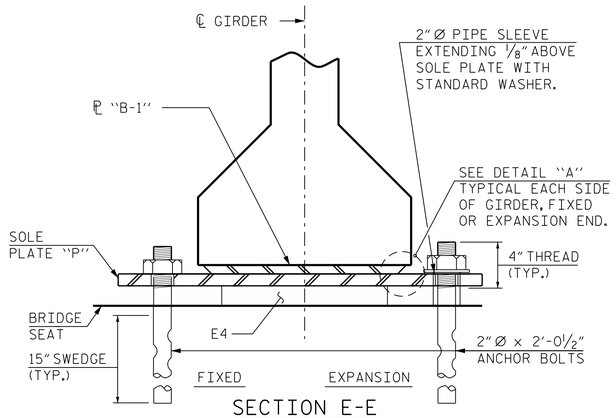
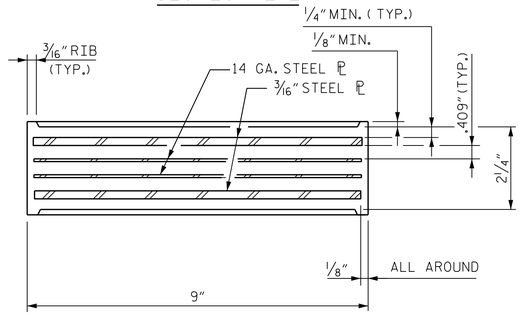
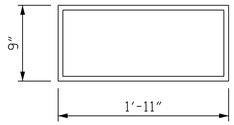


SECTION E-E



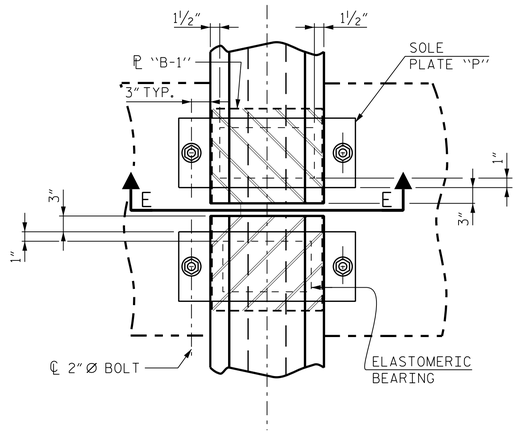
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (20 REQ'D)

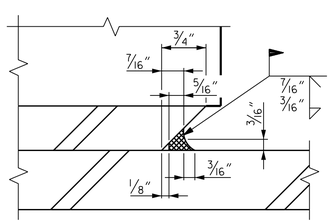
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



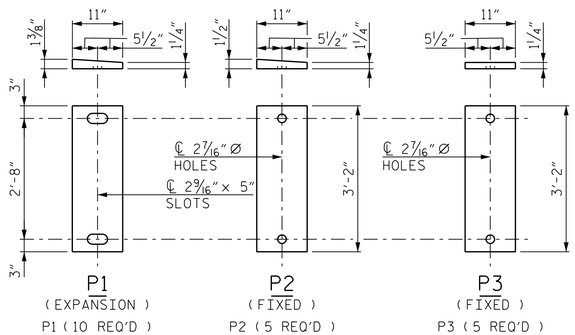
TYPICAL PLAN

(SHOWING CONTINUOUS BENT)



DETAIL "A"

DIRECTION OF INCREASING STATIONS



SOLE PLATE DETAILS ("P")

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.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 K

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

DRAWN BY : T. K. BOYD DATE : SEP 2023
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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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DocuSigned by: Ordine Paitel C1B0...

12/19/2023

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
ELASTOMERIC BEARING DETAILS
RIGHT LANE

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2			4			34

opaitel
12/19/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_BG_330815.dgn

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN A

GIRDER		FORTIETH POINTS																					
		0	0.025	0.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
AG1 AND AG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.040	0.060	0.079	0.098	0.116	0.134	0.149	0.166	0.180	0.194	0.206	0.217	0.226	0.234	0.241	0.246	0.250	0.252	0.253
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.016	0.033	0.050	0.066	0.083	0.099	0.114	0.128	0.142	0.155	0.167	0.178	0.188	0.197	0.204	0.210	0.215	0.218	0.221	0.221
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
		FORTIETH POINTS																				
		0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.252	0.250	0.246	0.241	0.234	0.226	0.217	0.206	0.194	0.180	0.166	0.149	0.134	0.116	0.098	0.079	0.060	0.040	0.020	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.221	0.218	0.215	0.210	0.204	0.197	0.188	0.178	0.167	0.155	0.142	0.128	0.114	0.099	0.083	0.066	0.050	0.033	0.016	0.000	
	FINAL CAMBER ↑	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"	
		FORTIETH POINTS																				
		0	0.025	0.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
AG2, AG3 AND AG4	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.040	0.060	0.079	0.098	0.116	0.134	0.149	0.166	0.180	0.194	0.206	0.217	0.226	0.234	0.241	0.246	0.250	0.252	0.253
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.017	0.034	0.051	0.068	0.084	0.100	0.116	0.131	0.145	0.158	0.170	0.181	0.191	0.200	0.208	0.214	0.219	0.222	0.224	0.225
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"
		FORTIETH POINTS																				
		0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.252	0.250	0.246	0.241	0.234	0.226	0.217	0.206	0.194	0.180	0.166	0.149	0.134	0.116	0.098	0.079	0.060	0.040	0.020	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.224	0.222	0.219	0.214	0.208	0.200	0.191	0.181	0.170	0.158	0.145	0.131	0.116	0.100	0.084	0.068	0.051	0.034	0.017	0.000	
	FINAL CAMBER ↑	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"	

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN B

GIRDER		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
BG1, BG2, BG3, BG4 AND BG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.010	0.015	0.019	0.024	0.027	0.030	0.031	0.033	0.033	0.033	0.031	0.030	0.027	0.024	0.019	0.015	0.010	0.005	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L.* ↓	0.000	0.003	0.005	0.008	0.010	0.013	0.014	0.016	0.017	0.018	0.018	0.018	0.017	0.016	0.014	0.013	0.010	0.008	0.005	0.003	0.000
	FINAL CAMBER ↑	0"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	0"

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

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FORSYTH COUNTY
STATION: 140+39.50 -L-

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BRIDGE NO. 330814

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONDINE J. PAITEL
DocuSigned by: Ondine Paitel
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER DEFLECTION AND CAMBER DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-17
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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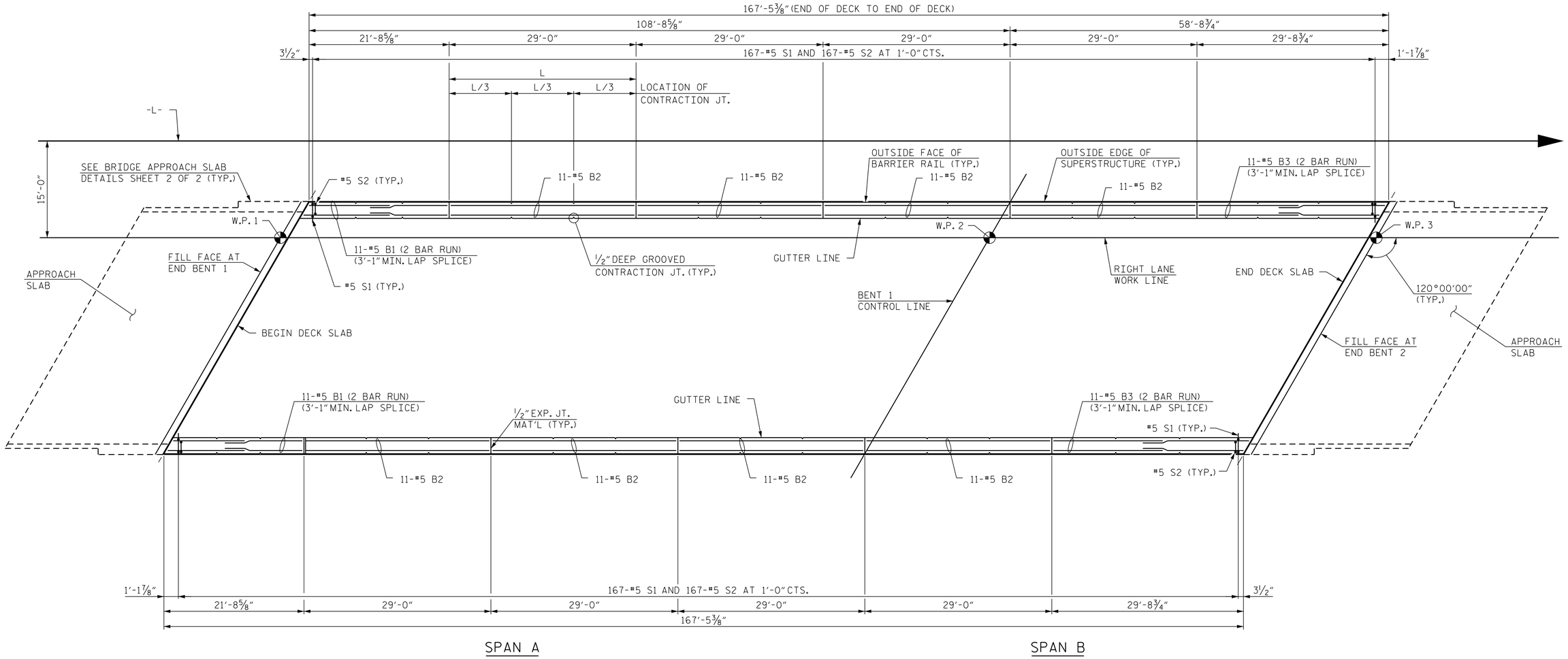

PLAN OF BARRIER RAIL

(ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL)
(FOR SECTIONS, NOTES AND QUANTITIES, SEE SHEET 2 OF 2)

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE
BARRIER RAIL
PLAN
RIGHT LANE

BRIDGE NO. 330814

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_BR1_330815.dgn

NOTES:

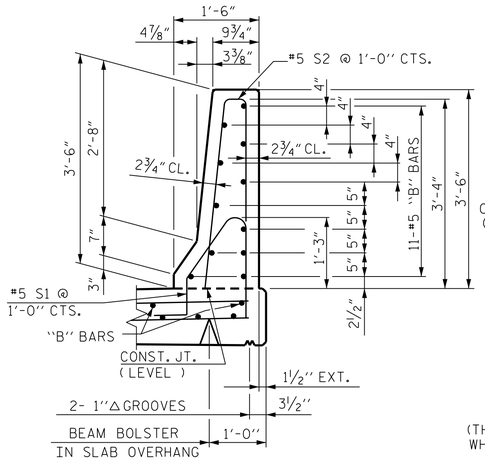
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

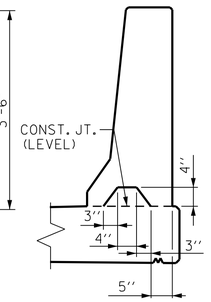
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

FOR END OF BARRIER RAIL DETAILS, SEE SHEET SR-34.

FOR BARRIER RAIL DETAILS ON APPROACH SLAB, SEE BRIDGE APPROACH SLAB SHEETS.

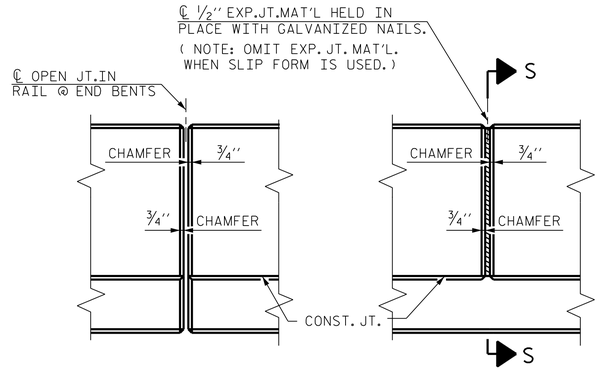


SECTION THRU RAIL



SECTION S-S

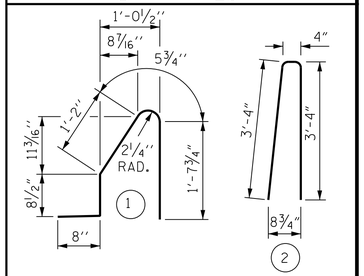
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	12'-8"	581
* B2	88	#5	STR.	28'-8"	2,631
* B3	44	#5	STR.	16'-8"	765
* S1	334	#5	1	4'-8"	1,626
* S2	334	#5	2	7'-0"	2,439

* EPOXY COATED REINFORCING STEEL	8,042 LBS.
CLASS AA CONCRETE	45.6 CU. YDS.
CONCRETE BARRIER RAIL	334.90 LIN. FT.

PROJECT NO. R-2577A

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SHEET 2 OF 2

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DocuSigned by: Ondine Paitel C1F...

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL & BILL OF MATERIAL
RIGHT LANE

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STD. NO. CBR1

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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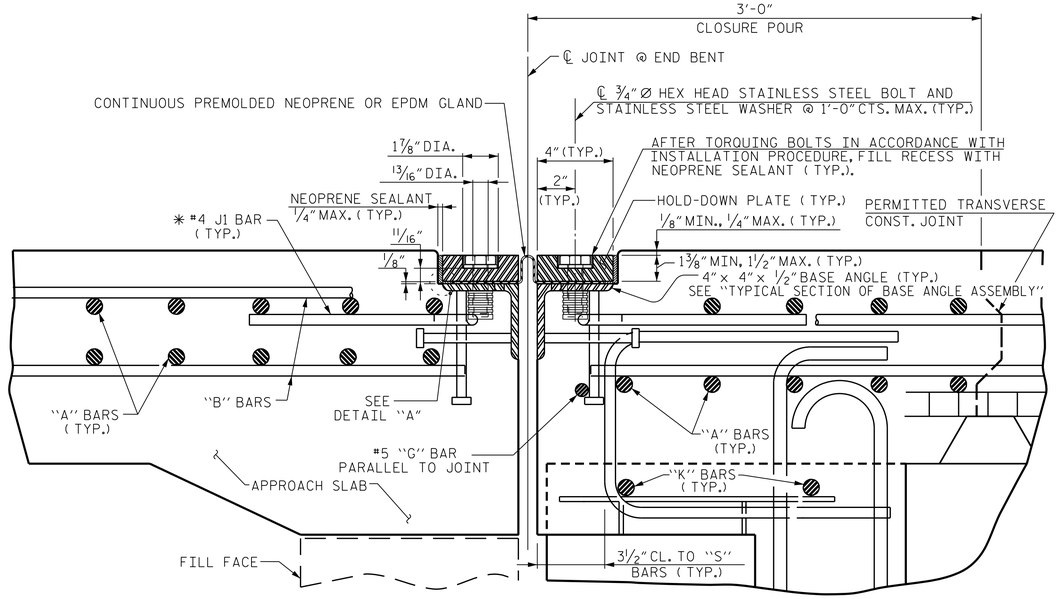


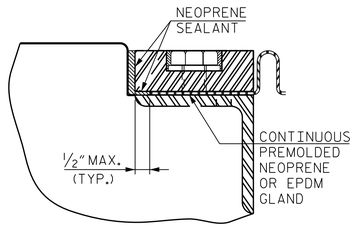
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

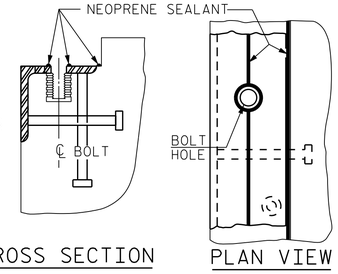
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅛" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.



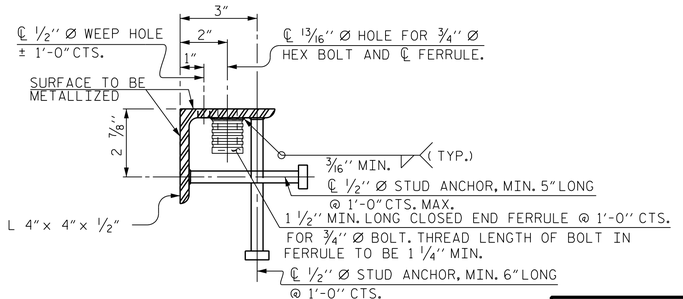
DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

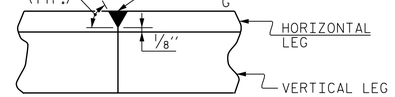
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	120°00'00"	11/16"	1 1/16"	1 5/16"	1 1/8"
2	120°00'00"	3/8"	1 1/4"	1 3/16"	1 1/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE ½" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE ¾" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
EXPANSION JOINT SEAL DETAILS
RIGHT LANE

BRIDGE NO. 330814

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
Docusigned by: Odine Paitel
11/10/2023

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DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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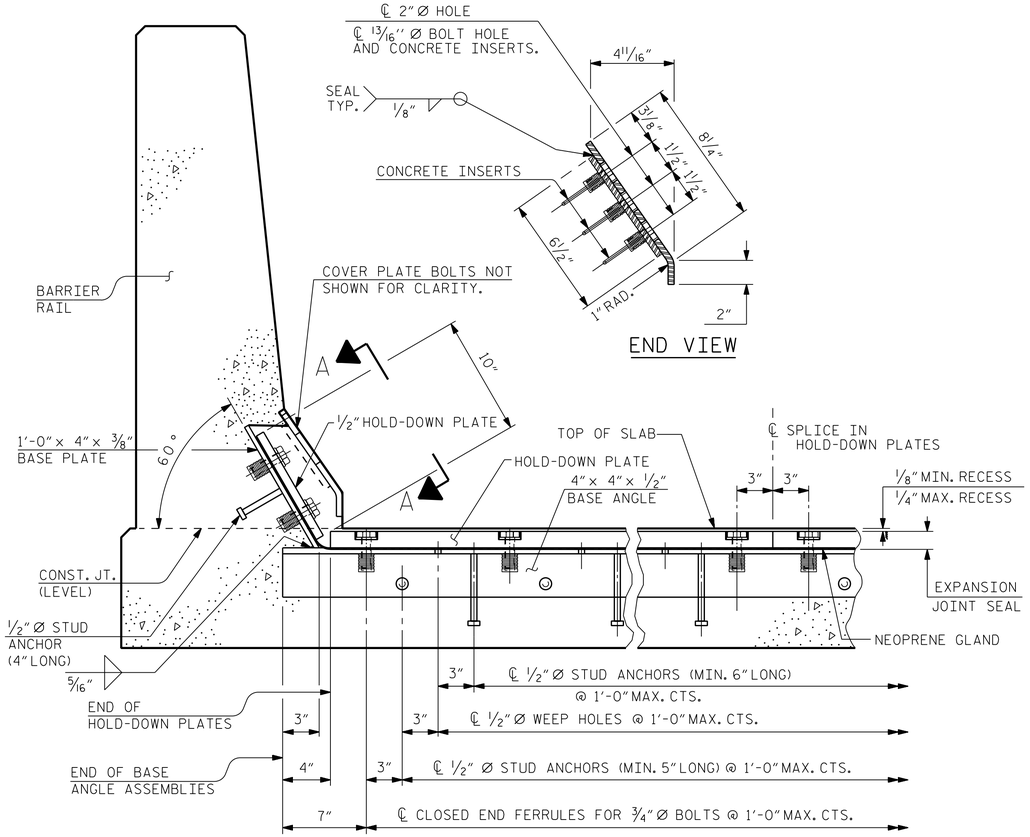
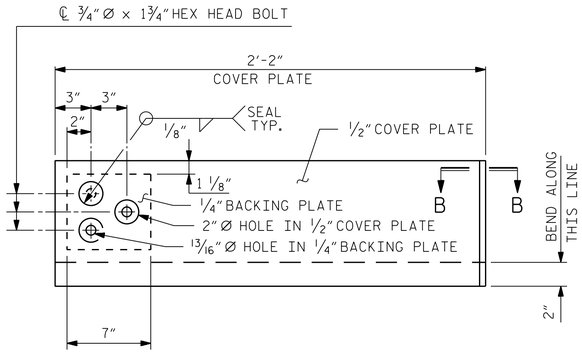
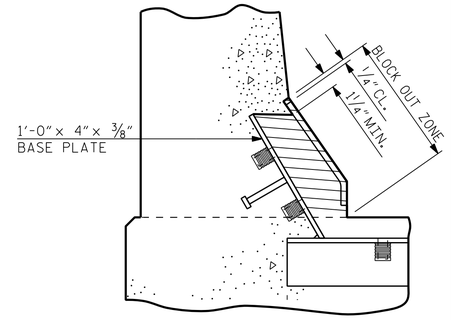


SECTION THRU RAIL NORMAL TO JOINT



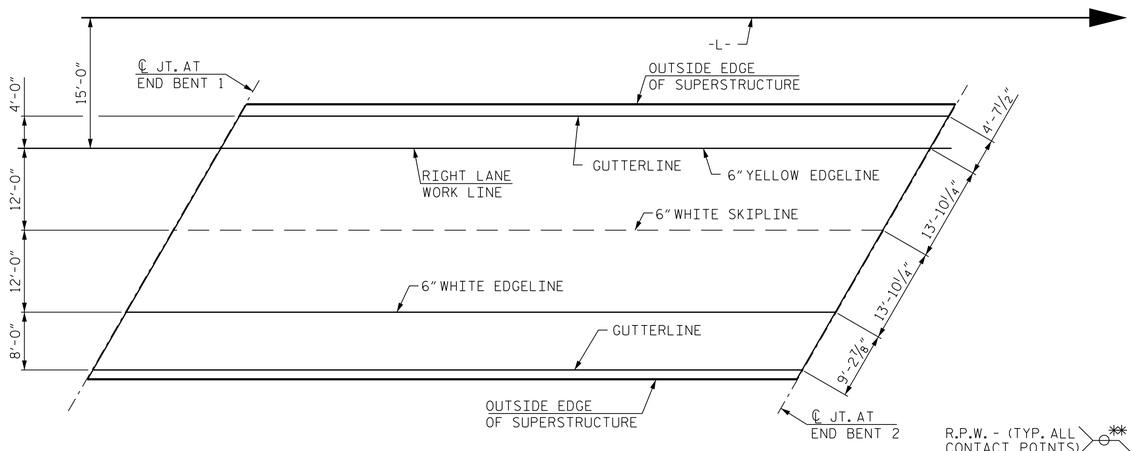
TYPE I - ELEVATION VIEW

COVER PLATE DETAILS

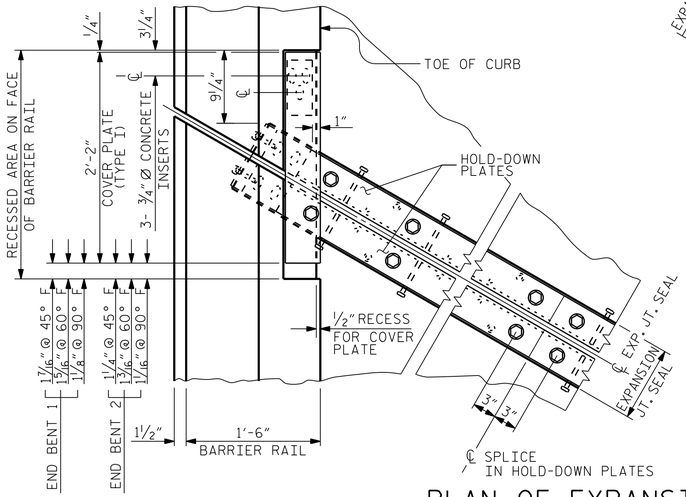


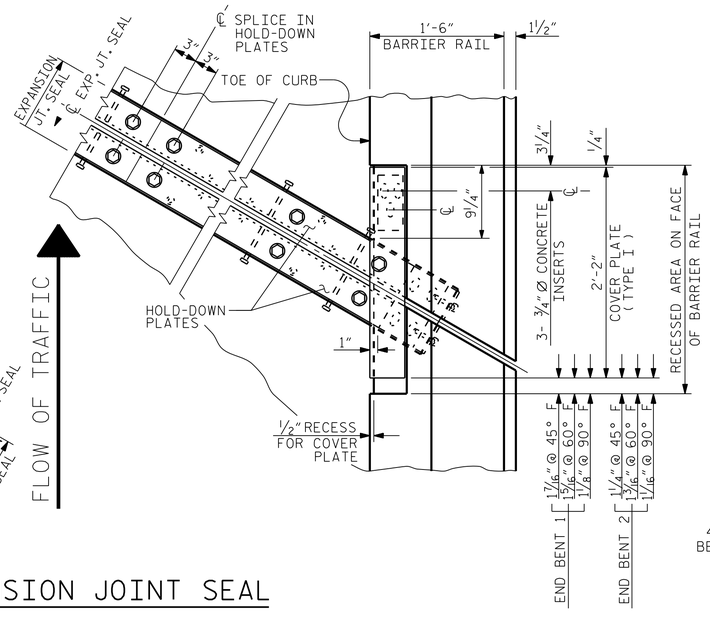
BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



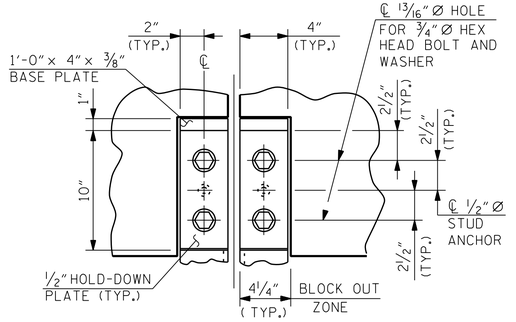
PAVEMENT MARKING ALIGNMENT



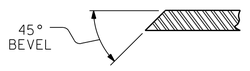


FLOW OF TRAFFIC

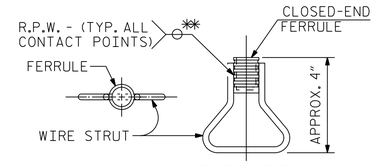
PLAN OF EXPANSION JOINT SEAL



SECTION A-A



SECTION B-B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

DRAWN BY :	T. K. BOYD — DATE : SEP 2023
CHECKED BY :	L. K. AUSTIN — DATE : SEP 2023
DESIGN ENGINEER OF RECORD :	O. J. PAITEL — DATE : SEP 2023

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BRIDGE NO. 330814

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
DocuSigned by: Odine Paitel
11/10/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL
RIGHT LANE

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2			4			34

STD. NO. EJS2

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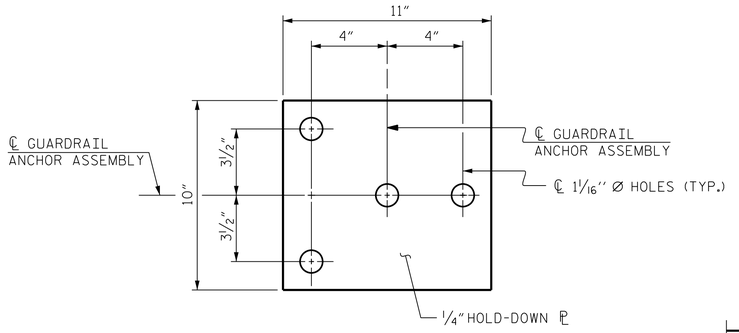
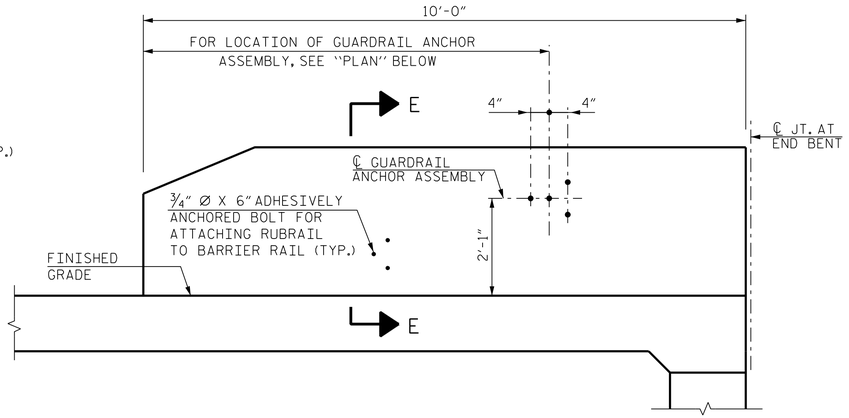


PLAN



ELEVATION

NOTES:

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

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.)

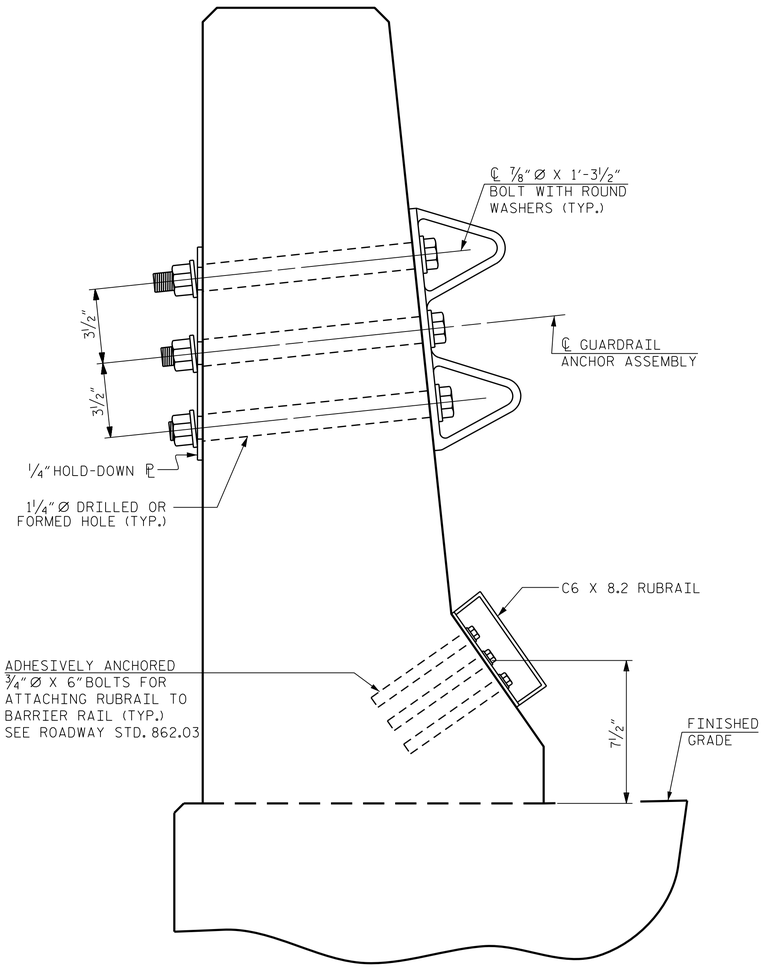
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

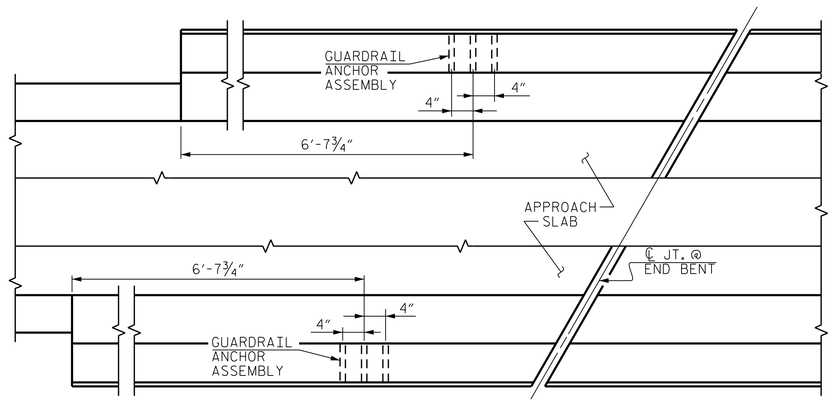
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E-E

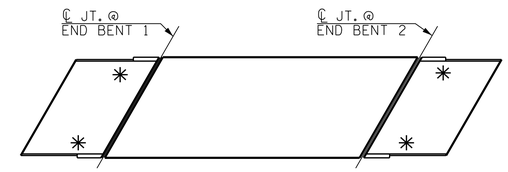
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

BRIDGE NO. 330814

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONLINE J. PAITEL
DocuSigned by: Online Paitel C1F...
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GUARDRAIL ANCHORAGE DETAILS

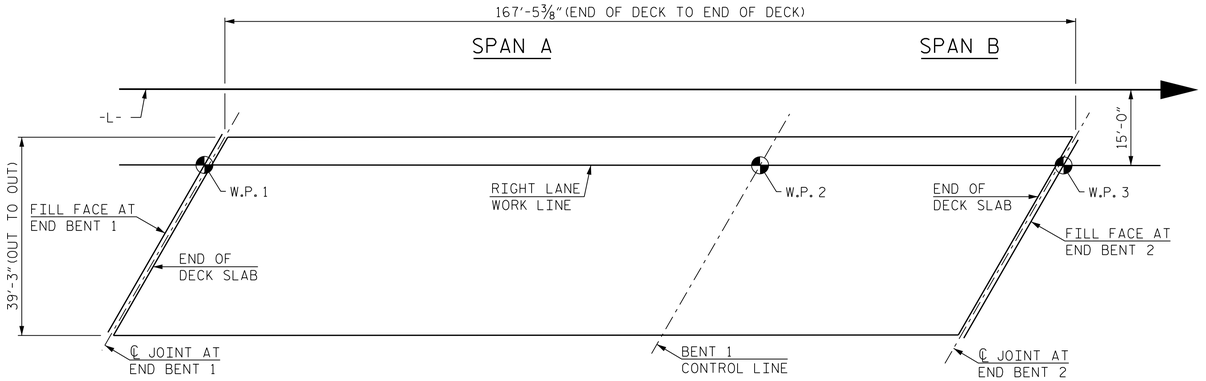
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-22
1			3			TOTAL SHEETS
2			4			34

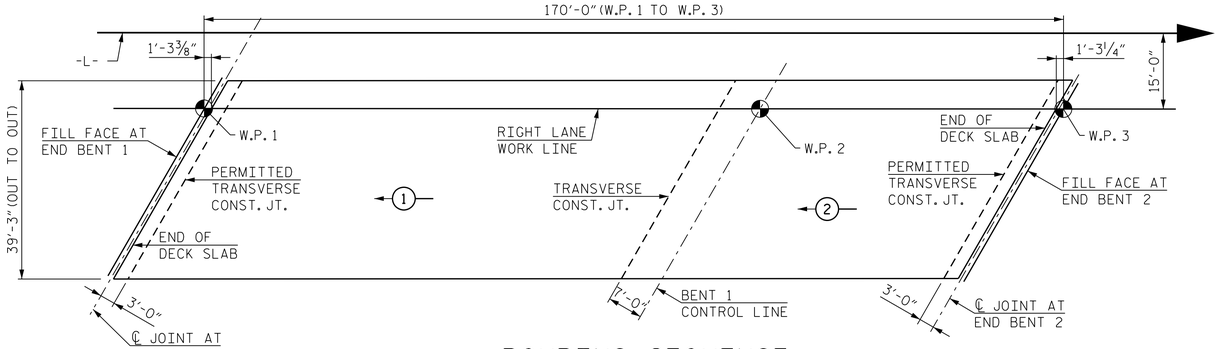
STD. NO. GRA2

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_GR_330815.dgn

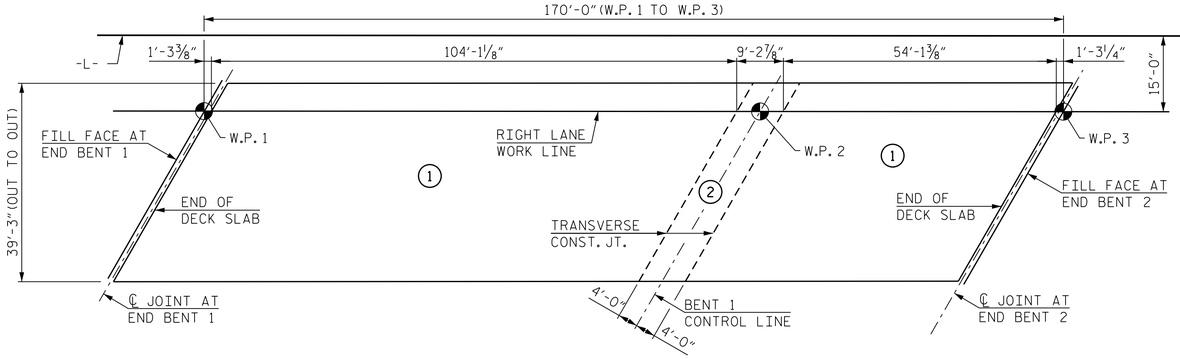


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6,573)



POURING SEQUENCE

(#) INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

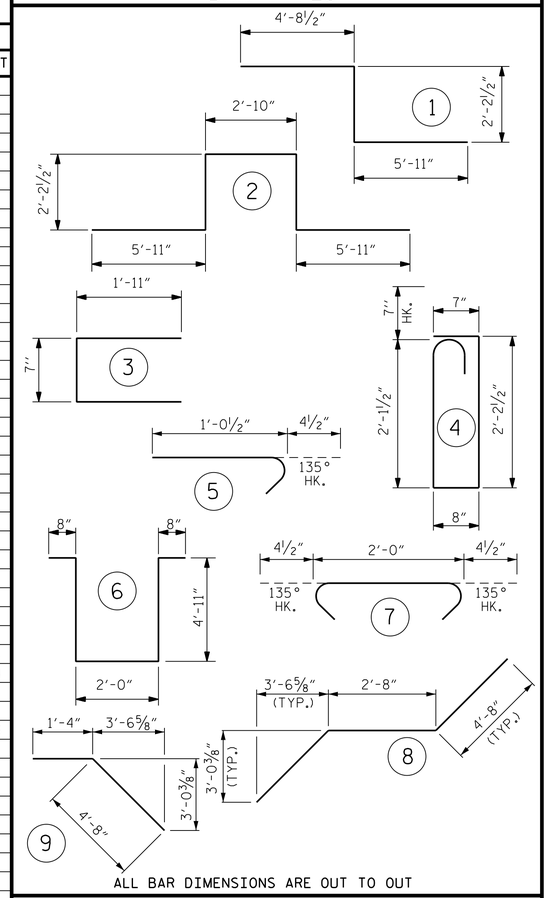
REINFORCING BAR SCHEDULE

SPANS A AND B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	267	#5	STR.	38'-11"	10,838	A213	2	#5	STR.	12'-1"	25
						A214	2	#5	STR.	13'-1"	27
✳ A101	2	#5	STR.	1'-11"	4	A215	2	#5	STR.	14'-0"	29
✳ A102	2	#5	STR.	2'-4"	5	A216	2	#5	STR.	14'-11"	31
✳ A103	2	#5	STR.	2'-9"	6	A217	2	#5	STR.	15'-10"	33
✳ A104	2	#5	STR.	3'-8"	8	A218	2	#5	STR.	16'-10"	35
✳ A105	2	#5	STR.	4'-7"	10	A219	2	#5	STR.	17'-9"	37
✳ A106	2	#5	STR.	5'-7"	12	A220	2	#5	STR.	18'-8"	39
✳ A107	2	#5	STR.	6'-6"	14	A221	2	#5	STR.	19'-7"	41
✳ A108	2	#5	STR.	7'-5"	15	A222	2	#5	STR.	20'-7"	43
✳ A109	2	#5	STR.	8'-4"	17	A223	2	#5	STR.	21'-6"	45
✳ A110	2	#5	STR.	9'-4"	19	A224	2	#5	STR.	22'-5"	47
✳ A111	2	#5	STR.	10'-3"	21	A225	2	#5	STR.	23'-5"	49
✳ A112	2	#5	STR.	11'-2"	23	A226	2	#5	STR.	24'-4"	51
✳ A113	2	#5	STR.	12'-1"	25	A227	2	#5	STR.	25'-3"	53
✳ A114	2	#5	STR.	13'-1"	27	A228	2	#5	STR.	26'-2"	55
✳ A115	2	#5	STR.	14'-0"	29	A229	2	#5	STR.	27'-2"	57
✳ A116	2	#5	STR.	14'-11"	31	A230	2	#5	STR.	28'-1"	59
✳ A117	2	#5	STR.	15'-10"	33	A231	2	#5	STR.	29'-0"	60
✳ A118	2	#5	STR.	16'-10"	35	A232	2	#5	STR.	29'-11"	62
✳ A119	2	#5	STR.	17'-9"	37	A233	2	#5	STR.	30'-11"	64
✳ A120	2	#5	STR.	18'-8"	39	A234	2	#5	STR.	31'-10"	66
✳ A121	2	#5	STR.	19'-7"	41	A235	2	#5	STR.	32'-9"	68
✳ A122	2	#5	STR.	20'-7"	43	A236	2	#5	STR.	33'-8"	70
✳ A123	2	#5	STR.	21'-6"	45	A237	2	#5	STR.	34'-8"	72
✳ A124	2	#5	STR.	22'-5"	47	A238	2	#5	STR.	35'-7"	74
✳ A125	2	#5	STR.	23'-5"	49	A239	2	#5	STR.	36'-6"	76
✳ A126	2	#5	STR.	24'-4"	51	A240	2	#5	STR.	37'-5"	78
✳ A127	2	#5	STR.	25'-3"	53	A241	2	#5	STR.	38'-5"	80
✳ A128	2	#5	STR.	26'-2"	55						
✳ A129	2	#5	STR.	27'-2"	57	✳ B1	64	#4	STR.	37'-4"	1,596
✳ A130	2	#5	STR.	28'-1"	59	✳ B2	32	#6	STR.	60'-0"	2,884
✳ A131	2	#5	STR.	29'-0"	60	✳ B3	32	#4	STR.	38'-6"	823
✳ A132	2	#5	STR.	29'-11"	62	✳ B4	31	#6	STR.	25'-6"	1,187
✳ A133	2	#5	STR.	30'-11"	64	B5	132	#5	STR.	57'-4"	7,893
✳ A134	2	#5	STR.	31'-10"	66						
✳ A135	2	#5	STR.	32'-9"	68	✳ G1	2	#5	STR.	44'-11"	94
✳ A136	2	#5	STR.	33'-8"	70						
✳ A137	2	#5	STR.	34'-8"	72	✳ J1	84	#4	5	1'-5"	79
✳ A138	2	#5	STR.	35'-7"	74						
✳ A139	2	#5	STR.	36'-6"	76	✳ K1	24	#6	STR.	7'-3"	261
✳ A140	2	#5	STR.	37'-5"	78	✳ K2	8	#8	1	12'-10"	274
✳ A141	2	#5	STR.	38'-5"	80	✳ K3	12	#8	2	19'-1"	611
						K4	15	#4	8	12'-0"	120
A2	267	#5	STR.	38'-11"	10,838	K5	8	#4	STR.	7'-3"	39
						K6	24	#4	STR.	7'-7"	122
A201	2	#5	STR.	1'-11"	4	K7	8	#4	STR.	6'-8"	36
A202	2	#5	STR.	2'-4"	5	K8	10	#4	9	6'-0"	40
A203	2	#5	STR.	2'-9"	6						
A204	2	#5	STR.	3'-8"	8	✳ S1	64	#4	3	4'-5"	189
A205	2	#5	STR.	4'-7"	10	✳ S2	64	#5	4	6'-2"	412
A206	2	#5	STR.	5'-7"	12	S3	128	#4	7	2'-9"	235
A207	2	#5	STR.	6'-6"	14						
A208	2	#5	STR.	7'-5"	15	U1	32	#4	6	13'-2"	281
A209	2	#5	STR.	8'-4"	17						
A210	2	#5	STR.	9'-4"	19						
A211	2	#5	STR.	10'-3"	21						
A212	2	#5	STR.	11'-2"	23						

REINFORCING STEEL 21,285 LBS.
✳ EPOXY COATED REINFORCING STEEL 20,930 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	139.1		
POUR #2	112.4		
TOTALS**	251.5	21,285	20,930

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,580	SQ.FT.
BRIDGE DECK	5,493	SQ.FT.
TOTAL	7,073	SQ.FT.

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"			

PROJECT NO. R-2577A
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Odine Paitel
11/10/2023

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIALS

RIGHT LANE

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2			4			34

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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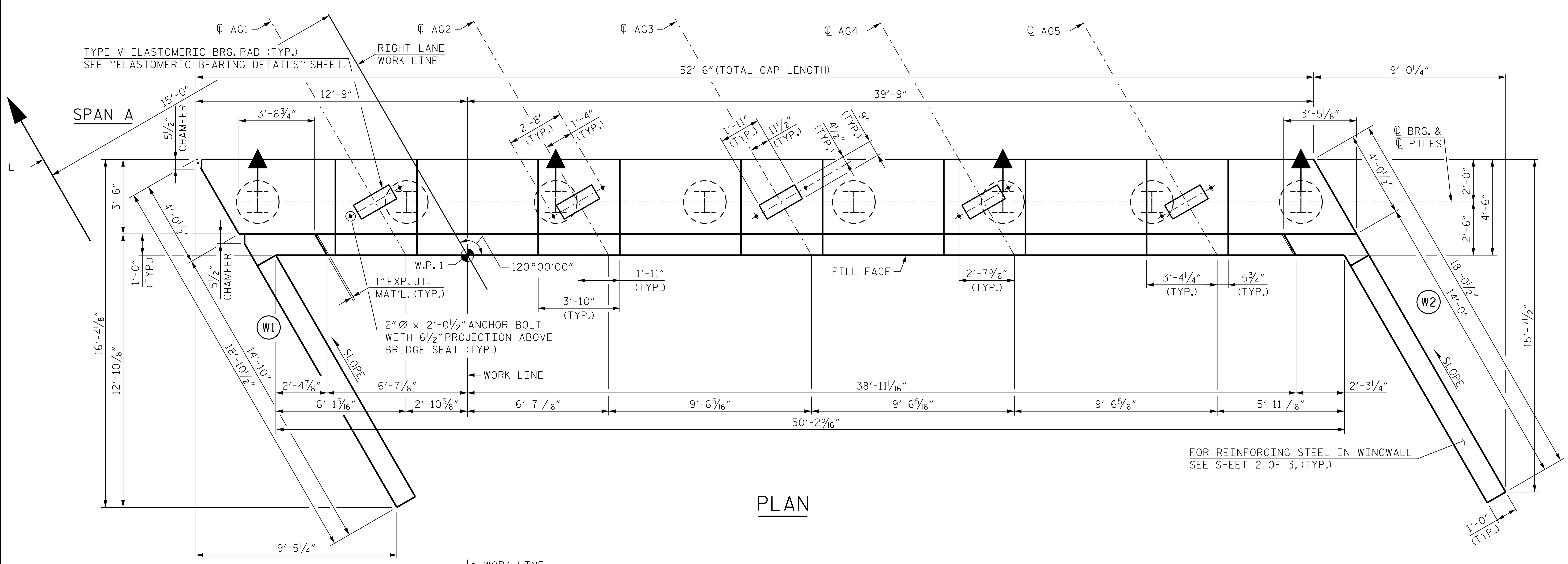
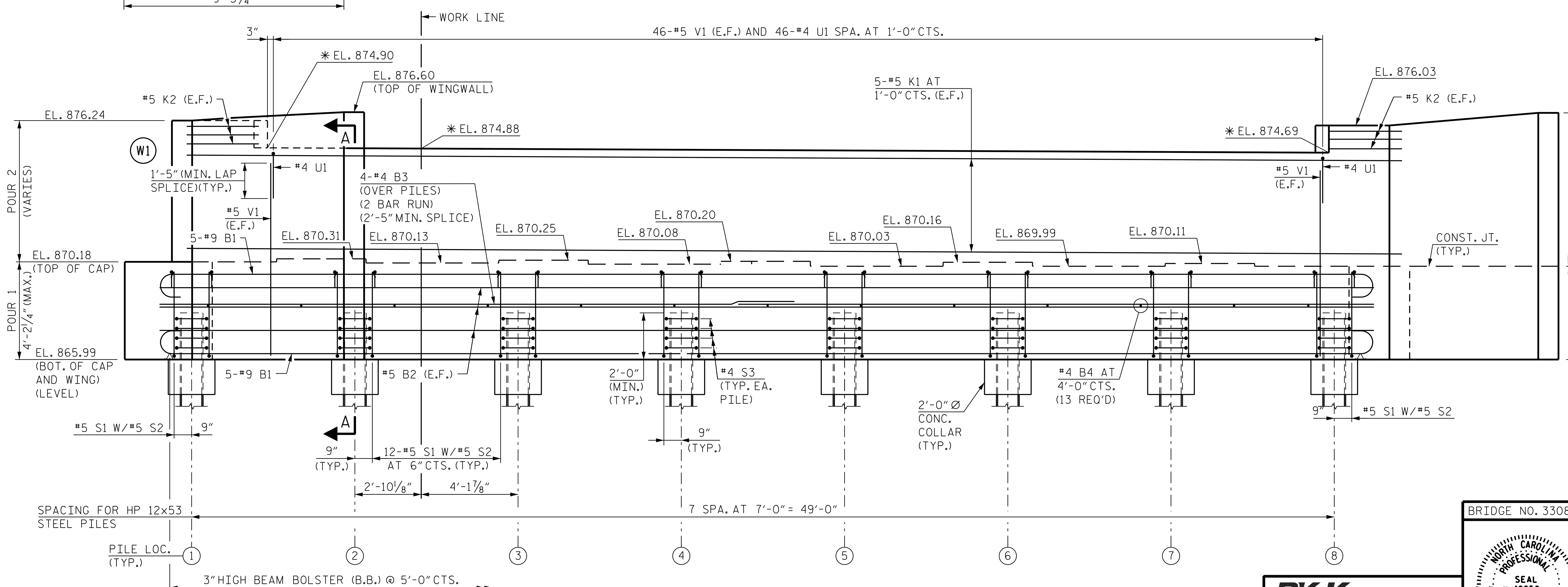


PLAN



ELEVATION

∗ ELEVATION AT FILL FACE

NOTES:

FOR SECTION A-A, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE DETAILS, SEE END BENT 2 SHEET 3 OF 3 (SR-31).

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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.

STIRRUPS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICT WITH ANCHOR BOLTS.

"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

LEGEND:

- HP 12x53 VERTICAL STEEL PILES
- HP 12x53 STEEL PILES BATTERED 3:12

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 PLAN AND ELEVATION

RIGHT LANE

BRIDGE NO. 330814

NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ONDINE J. PAITEL
11/10/2023

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DRAWN BY :	B. A. HAAG	DATE :	SEP 2023
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DESIGN ENGINEER OF RECORD :	O. J. PAITEL	DATE :	SEP 2023

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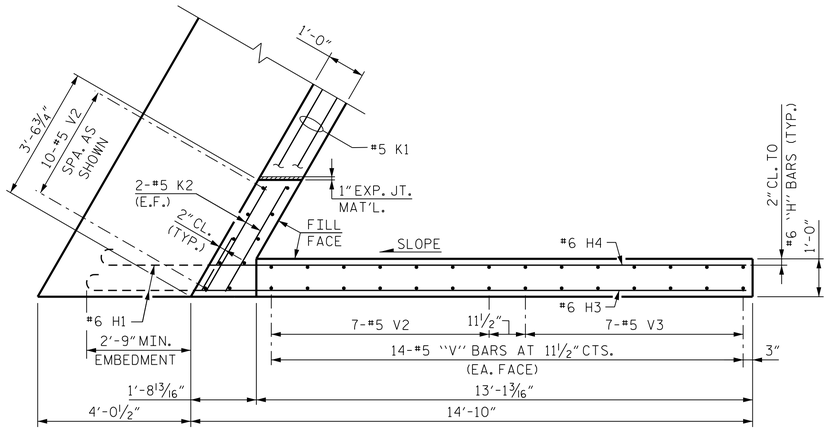
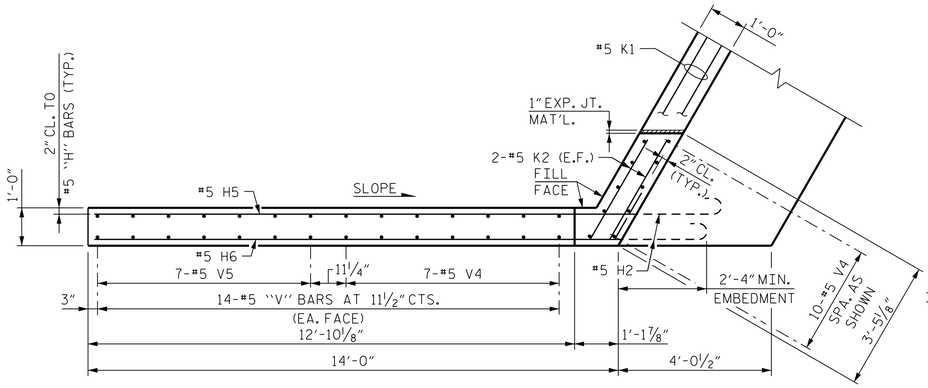
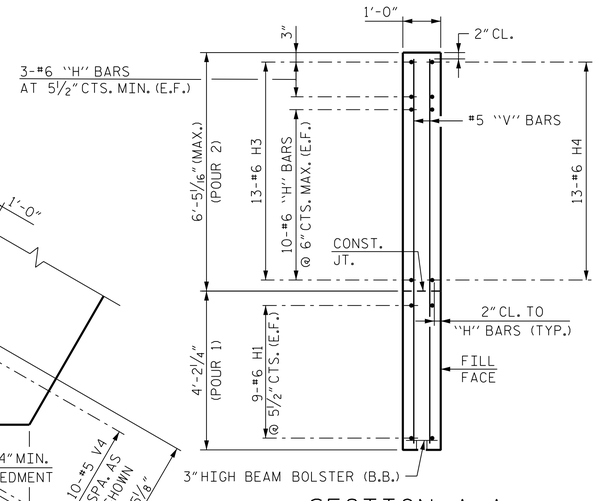


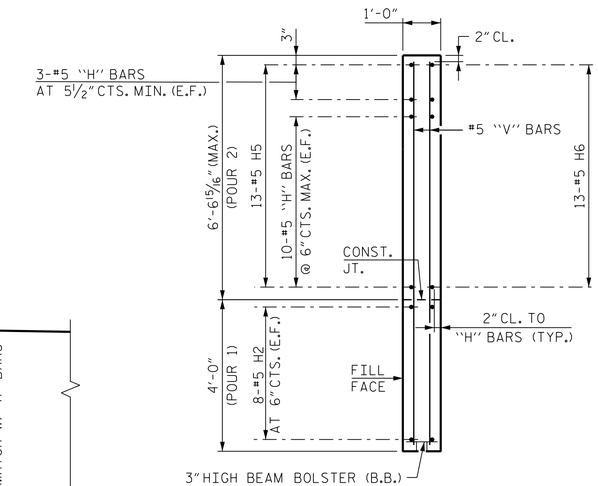
PLAN OF LEFT WINGWALL



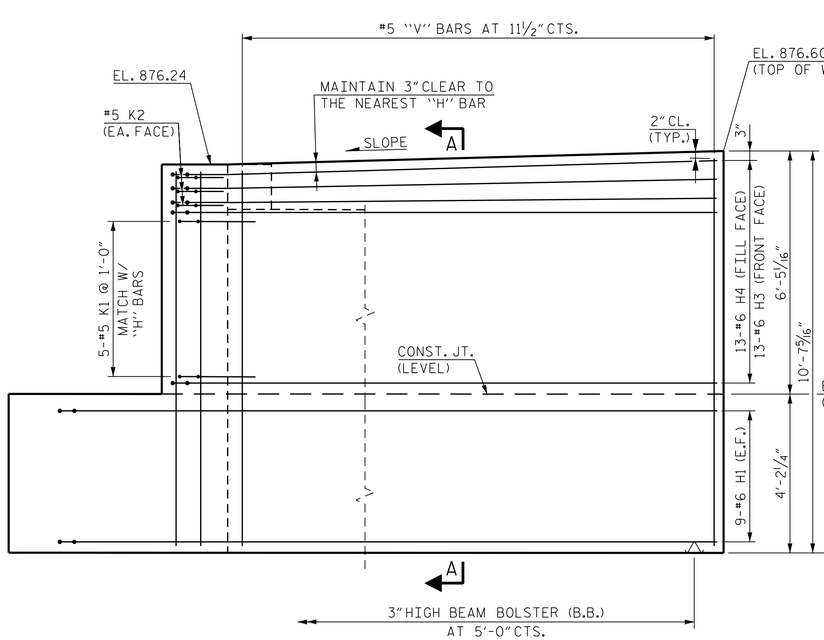
PLAN OF RIGHT WINGWALL



SECTION A-A

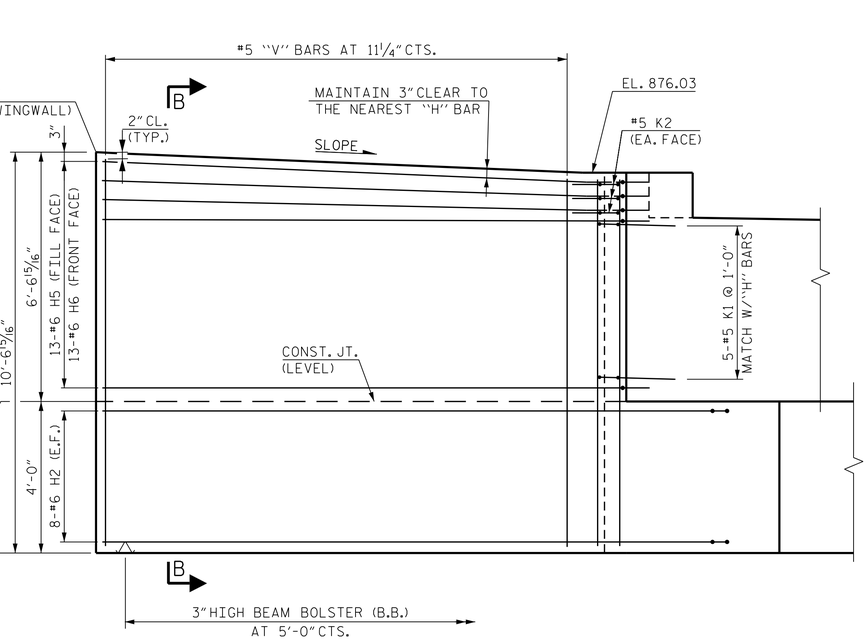


SECTION B-B



ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
WINGWALL DETAILS

RIGHT LANE

BRIDGE NO. 330814

DRAWN BY : B. A. HAAG DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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Digitally signed by Odine Paitel
11/10/2023

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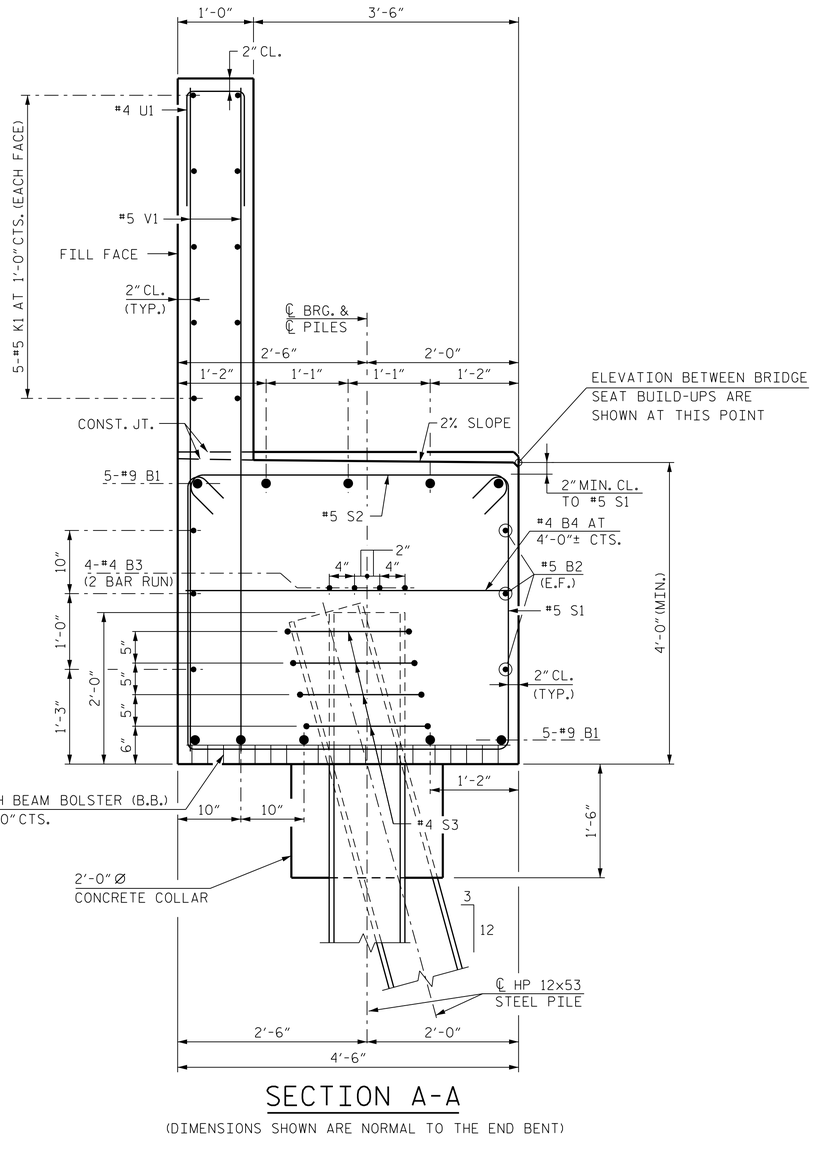
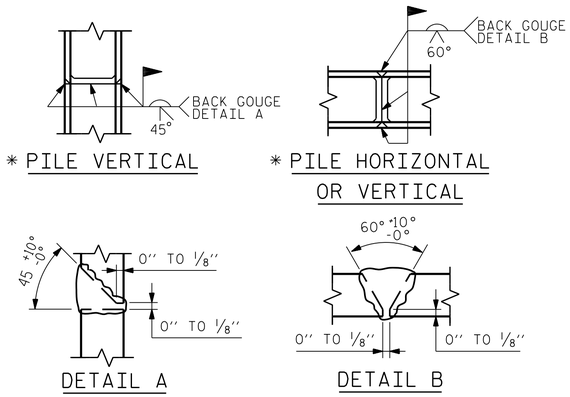


SECTION A-A

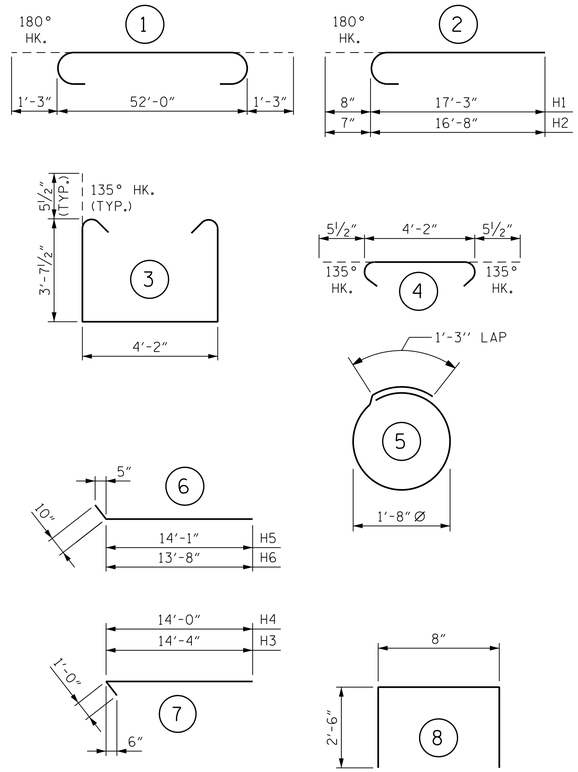
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	54'-6"	1,853
B2	6	#5	STR.	52'-0"	325
B3	8	#4	STR.	27'-4"	146
B4	13	#4	STR.	4'-2"	36
H1	18	#6	2	17'-9"	480
H2	16	#5	2	17'-3"	288
H3	13	#6	7	15'-4"	299
H4	13	#6	7	15'-0"	293
H5	13	#5	6	14'-11"	202
H6	13	#5	6	14'-6"	197
K1	10	#5	STR.	52'-2"	544
K2	12	#5	STR.	3'-1"	39
S1	86	#5	3	12'-4"	1,106
S2	86	#5	4	5'-1"	456
S3	32	#4	5	6'-6"	139
U1	46	#4	8	5'-8"	174
V1	92	#5	STR.	8'-6"	816
V2	24	#5	STR.	9'-11"	248
V3	14	#5	STR.	10'-1"	147
V4	24	#5	STR.	9'-8"	242
V5	14	#5	STR.	9'-11"	145

REINFORCING STEEL	8,175 LBS.
CLASS "A" CONCRETE	
POUR 1 (CAP, COLLARS & LOWER WINGS)	43.0 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	16.3 C.Y.
TOTAL	59.3 C.Y.

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 3 OF 3

DRAWN BY : B. A. HAAG DATE : SEP 2023

CHECKED BY : L. K. AUSTIN DATE : SEP 2023

DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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11/10/2023

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BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
MISELLANEOUS DETAILS AND BILL OF MATERIAL
RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			34

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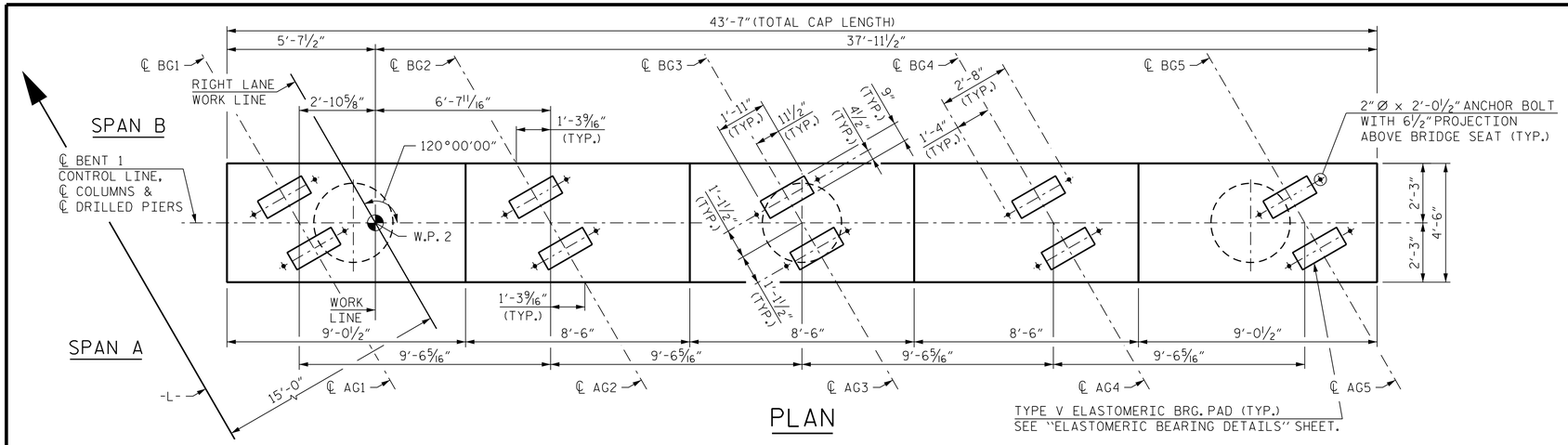
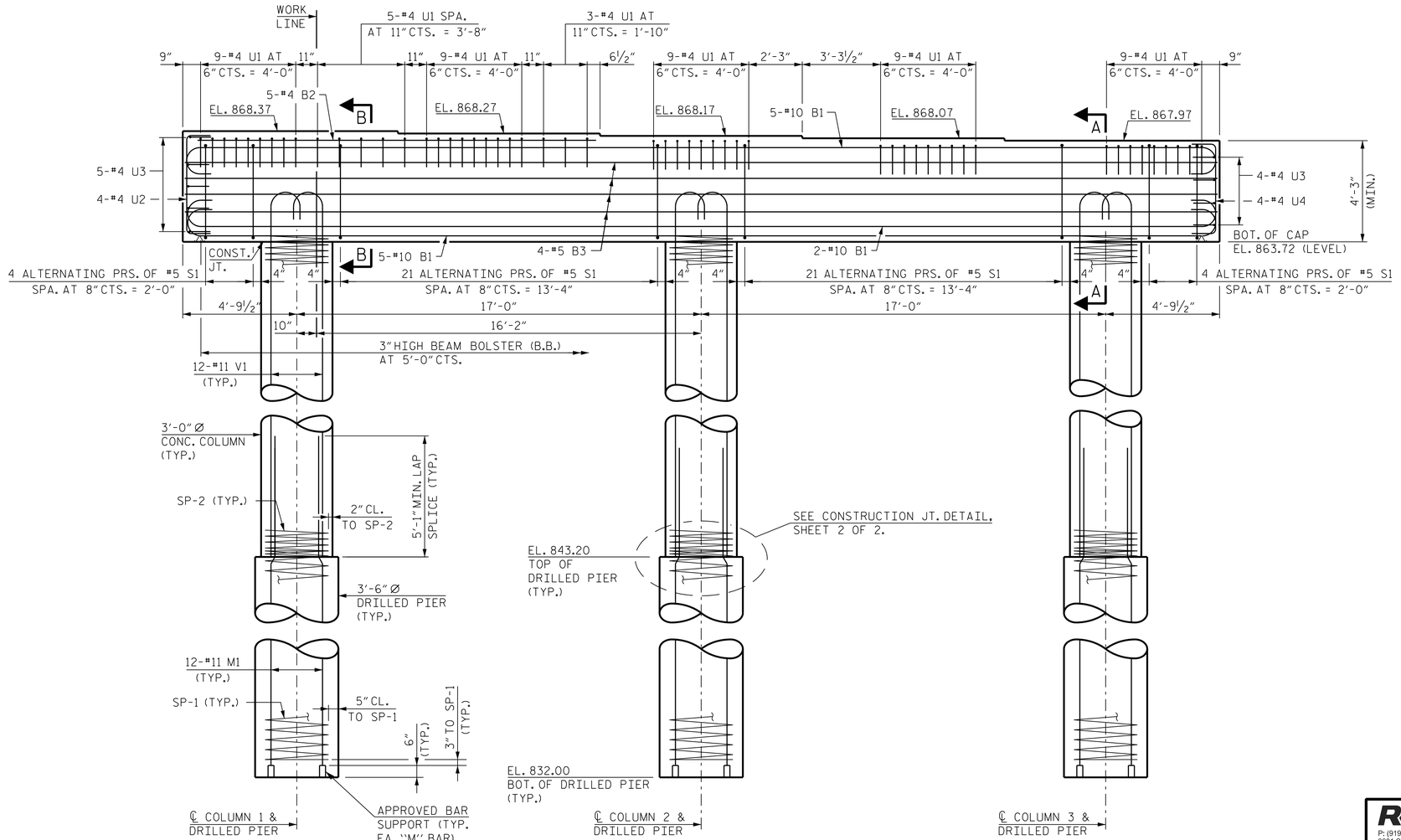
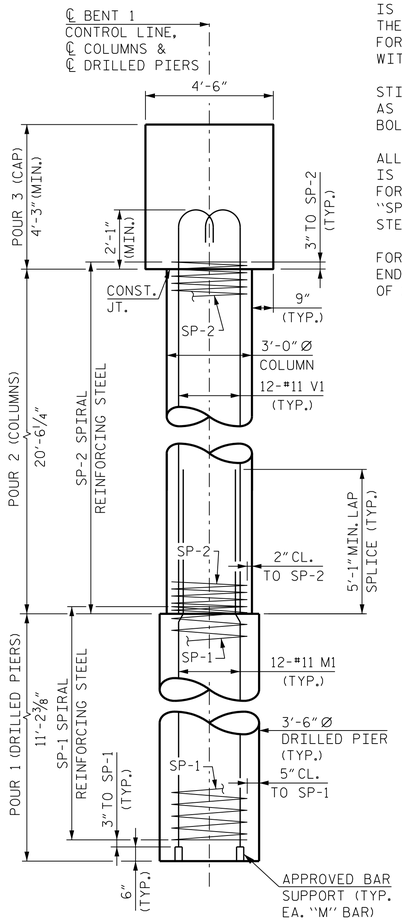


PLAN



ELEVATION



END ELEVATION

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE SHEET 2 OF 2.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

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

FOR SECTION THROUGH COLUMN AND END OF CAP DETAILS, SEE SHEET 2 OF 2.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 2

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
PLAN AND ELEVATION

RIGHT LANE

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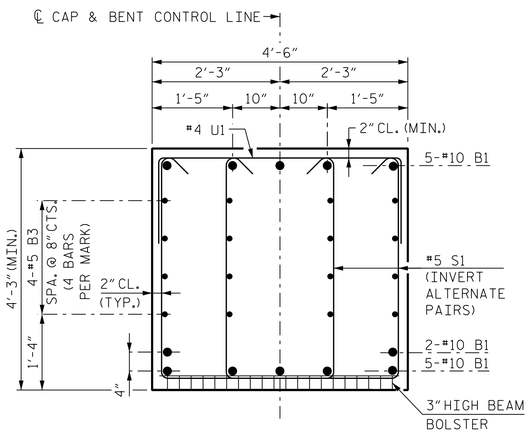
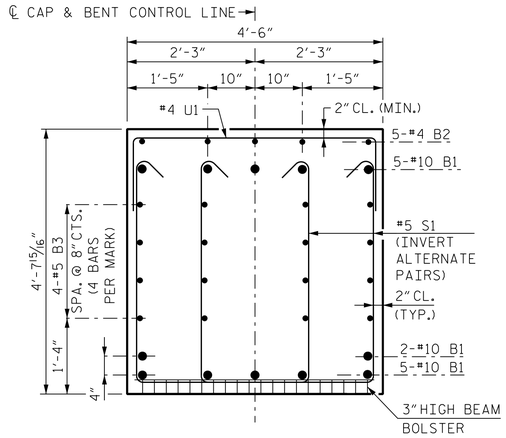
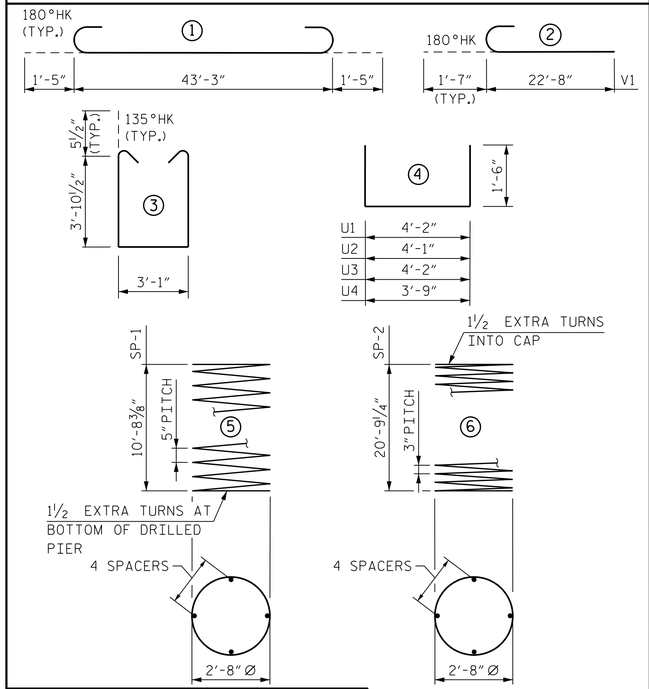


SECTION A-A



SECTION B-B

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

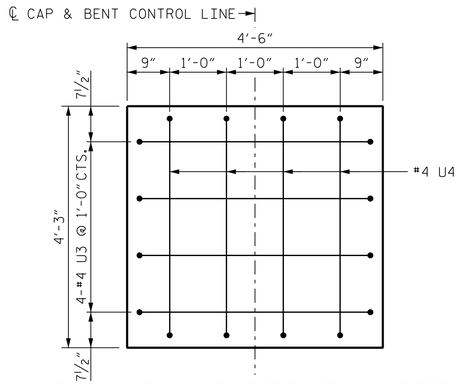
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	46'-1"	2,380
B2	5	#4	STR.	17'-2"	57
B3	16	#5	STR.	43'-3"	722
M1	36	#11	STR.	19'-0"	3,634
S1	100	#5	3	11'-9"	1,226
U1	53	#4	4	7'-2"	254
U2	4	#4	4	7'-1"	19
U3	9	#4	4	7'-2"	43
U4	4	#4	4	6'-9"	18
V1	36	#11	2	24'-3"	4,638
REINFORCING STEEL					12,991 LBS.
SP-1	3	✳	5	227-7"	712
SP-2	3	✳✳	6	701'-4"	1,405
SPIRAL COLUMN REINFORCING STEEL					2,117 LBS.

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

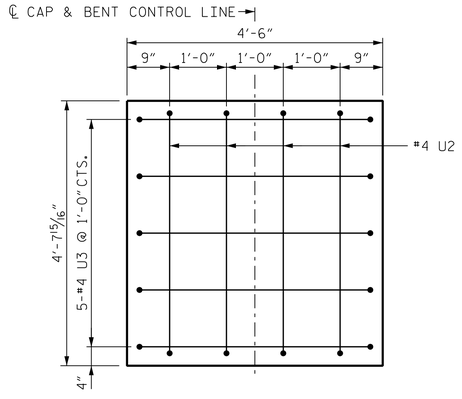
✳✳ SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS "A" CONCRETE	
POUR 2 (COLUMNS)	16.2 C.Y.
POUR 3 (CAP)	32.3 C.Y.
TOTAL	48.5 C.Y.

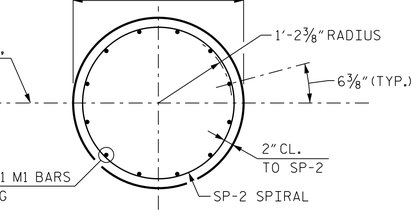
DRILLED PIERS	
POUR 1 (DRILLED PIER CONCRETE)	12.0 C.Y.



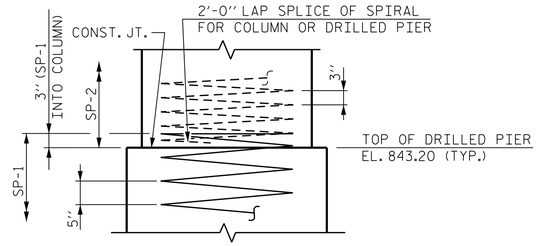
END OF CAP DETAIL (LEFT)



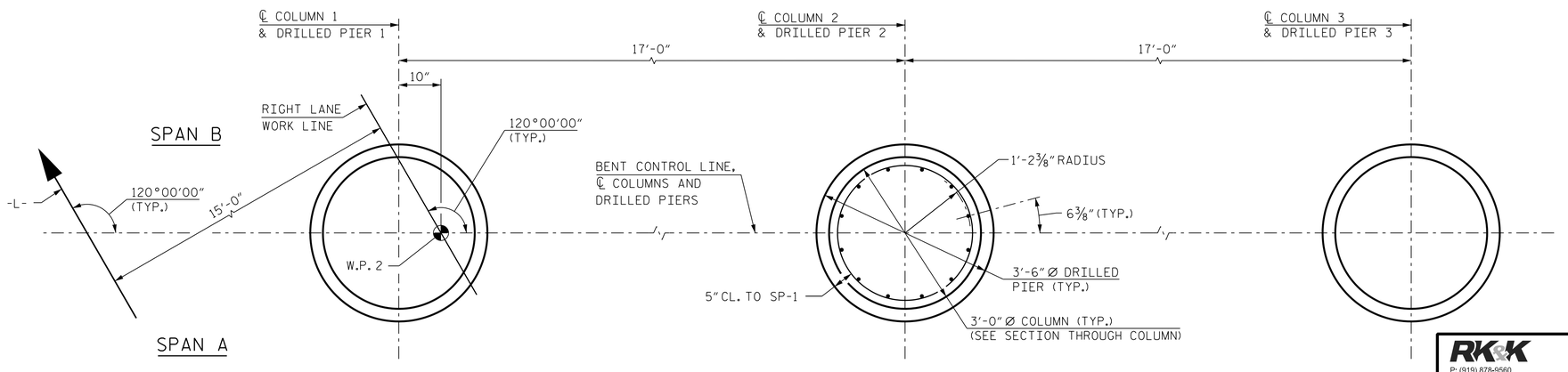
END OF CAP DETAIL (RIGHT)



SECTION THROUGH COLUMN



CONSTRUCTION JOINT DETAIL



PLAN OF DRILLED PIERS AND COLUMNS

(DETAILS ARE TYPICAL FOR DRILLED PIER AND COLUMN)

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
DETAILS AND BILL OF MATERIAL
RIGHT LANE

BRIDGE NO. 330814

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CHECKED BY : L. K. AUSTIN DATE : SEP 2023
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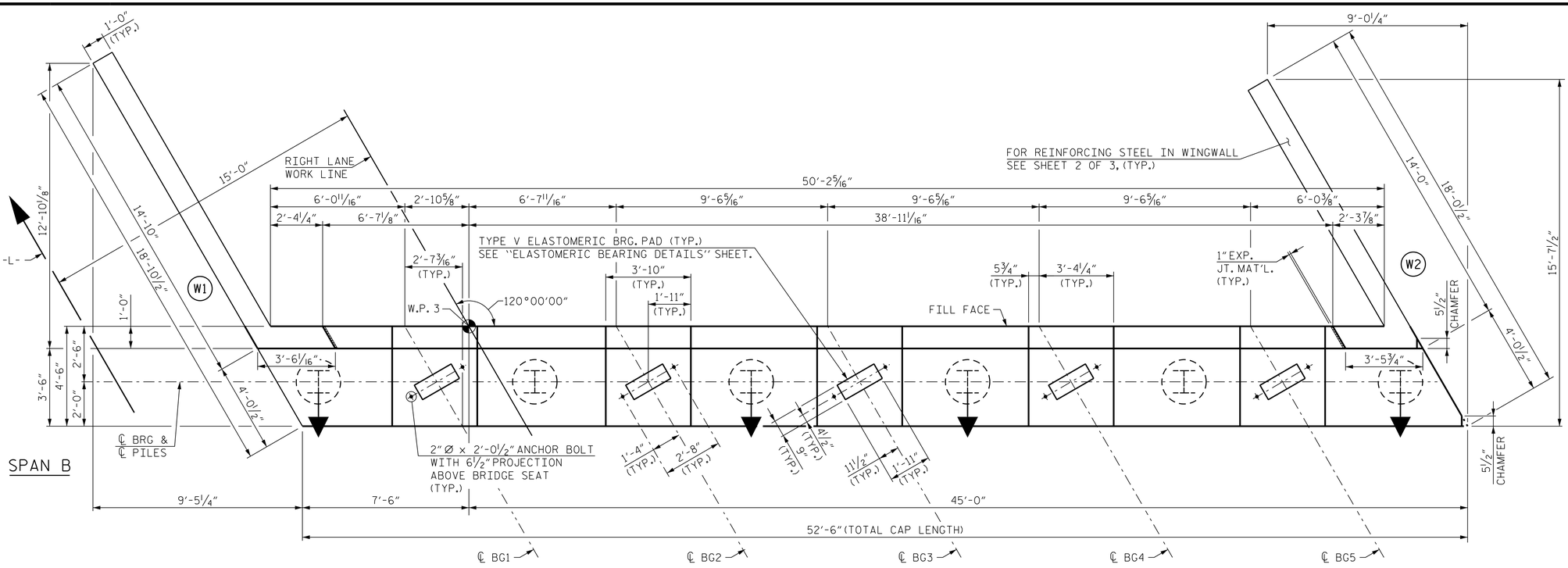

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3 (SR-26).

FOR TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BRIDGE SEAT BUILD-UPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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.

STIRRUPS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICT WITH ANCHOR BOLTS.

"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

LEGEND:

- HP 12x53 VERTICAL STEEL PILES
- HP 12x53 STEEL PILES BATTERED 3:12

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
PLAN AND ELEVATION

RIGHT LANE

BRIDGE NO. 330814

REVISIONS						SHEET NO.
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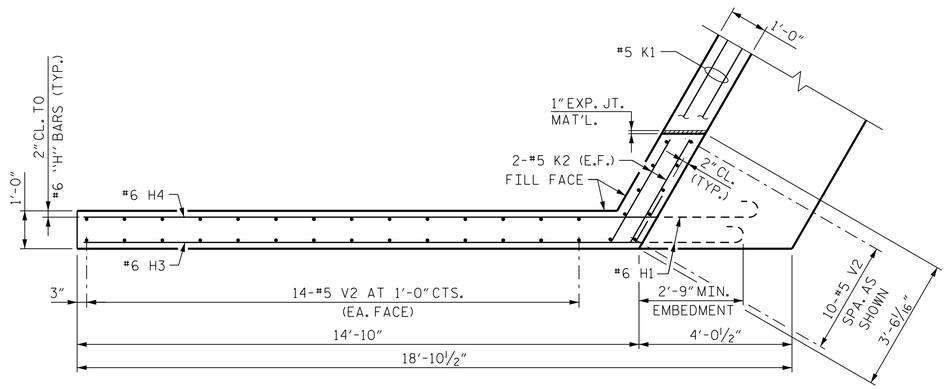
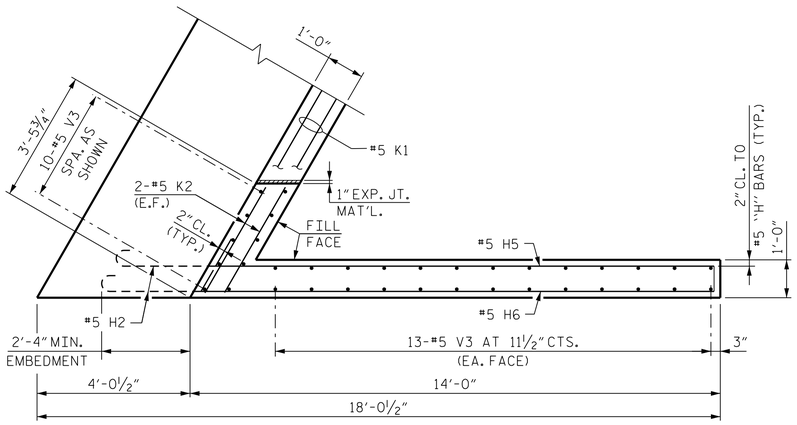
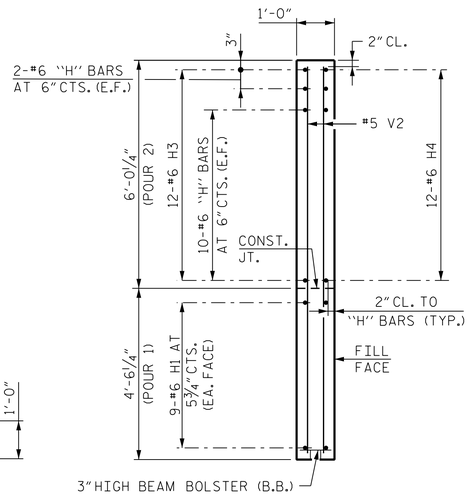


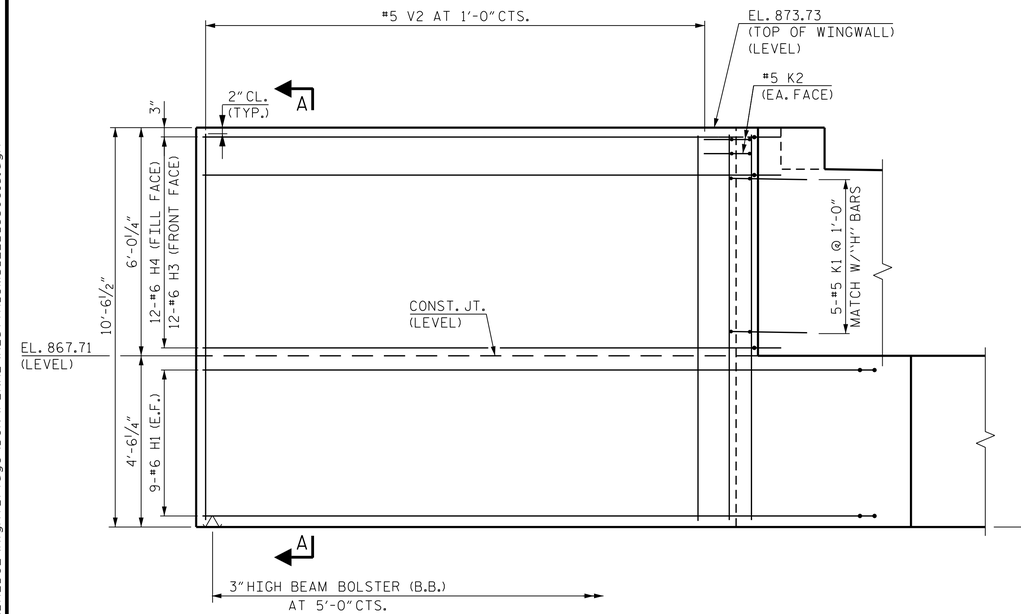
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL



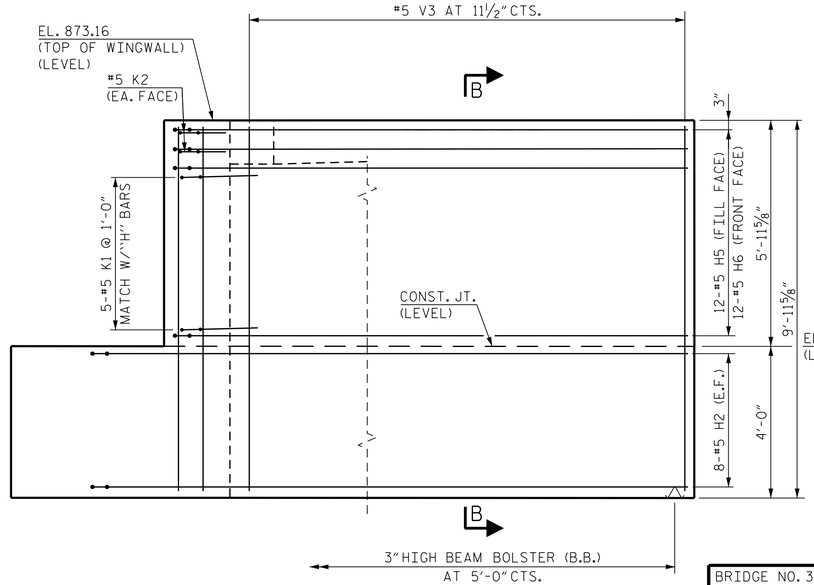
SECTION A-A



ELEVATION OF LEFT WINGWALL

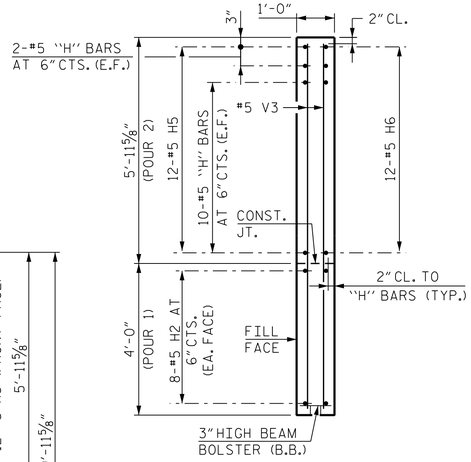
LEFT WINGWALL DETAILS (W1)

EL. 863.19 BOTTOM OF WING (LEVEL)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)



SECTION B-B

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 3

BRIDGE NO. 330814

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RALEIGH

SUBSTRUCTURE
END BENT 2
WINGWALL DETAILS

RIGHT LANE

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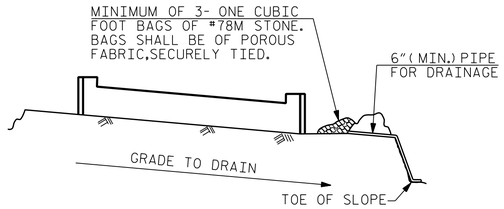
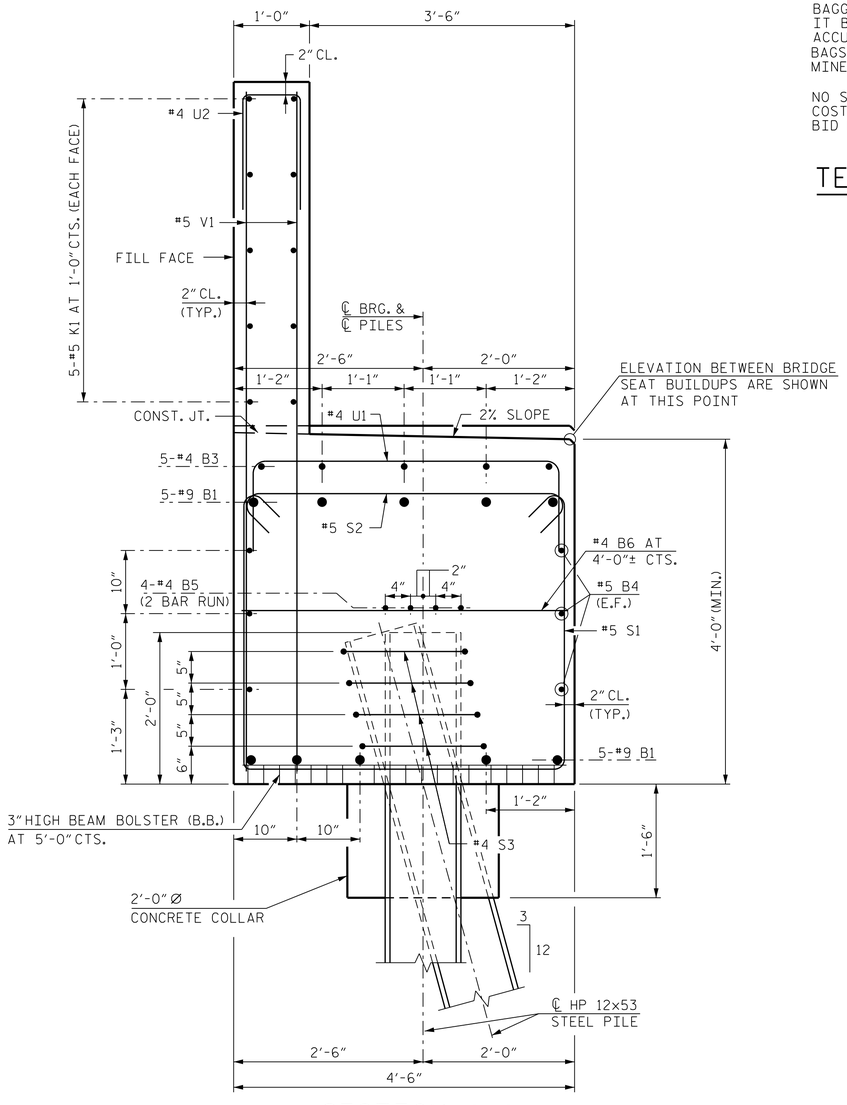


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

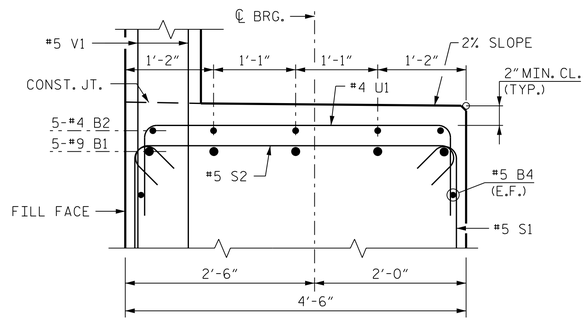
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

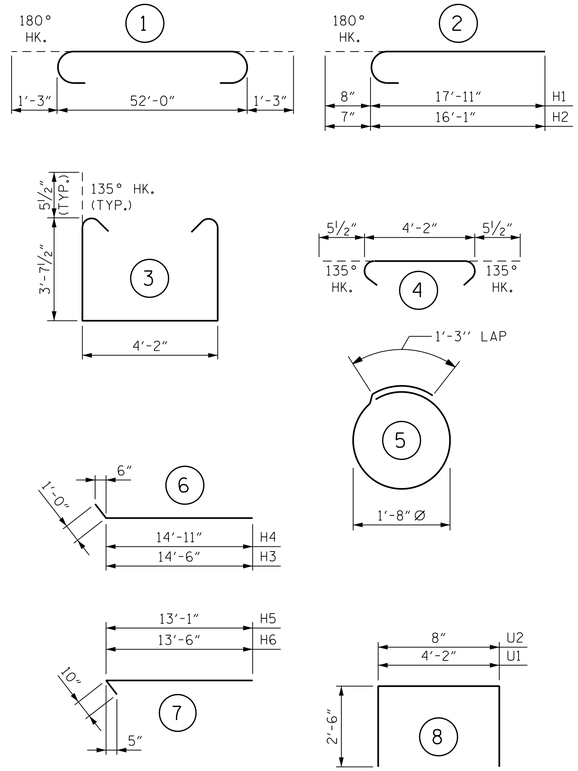


SECTION A-A



SECTION B-B

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	54'-6"	1,853
B2	5	#4	STR.	18'-10"	63
B3	5	#4	STR.	7'-7"	25
B4	6	#5	STR.	52'-0"	325
B5	8	#4	STR.	27'-4"	146
B6	13	#4	STR.	4'-2"	36
H1	18	#6	2	18'-7"	502
H2	16	#5	2	16'-8"	278
H3	12	#6	6	15'-6"	279
H4	12	#6	6	15'-11"	287
H5	12	#5	7	13'-11"	174
H6	12	#5	7	14'-4"	179
K1	10	#5	STR.	52'-2"	544
K2	8	#5	STR.	3'-1"	26
S1	62	#5	3	12'-4"	798
S2	62	#5	4	5'-1"	329
S3	24	#4	5	6'-6"	104
U1	19	#4	8	9'-2"	116
U2	46	#4	8	5'-8"	174
V1	92	#5	STR.	8'-5"	808
V2	38	#5	STR.	10'-1"	400
V3	36	#5	STR.	9'-6"	357

REINFORCING STEEL	7,803 LBS.
CLASS "A" CONCRETE	
POUR 1 (CAP, COLLARS & LOWER WINGS)	42.8 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)	17.6 C.Y.
TOTAL	60.4 C.Y.

PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE
END BENT 2
MISELLANEOUS DETAILS AND BILL OF MATERIAL
RIGHT LANE

BRIDGE NO. 330814

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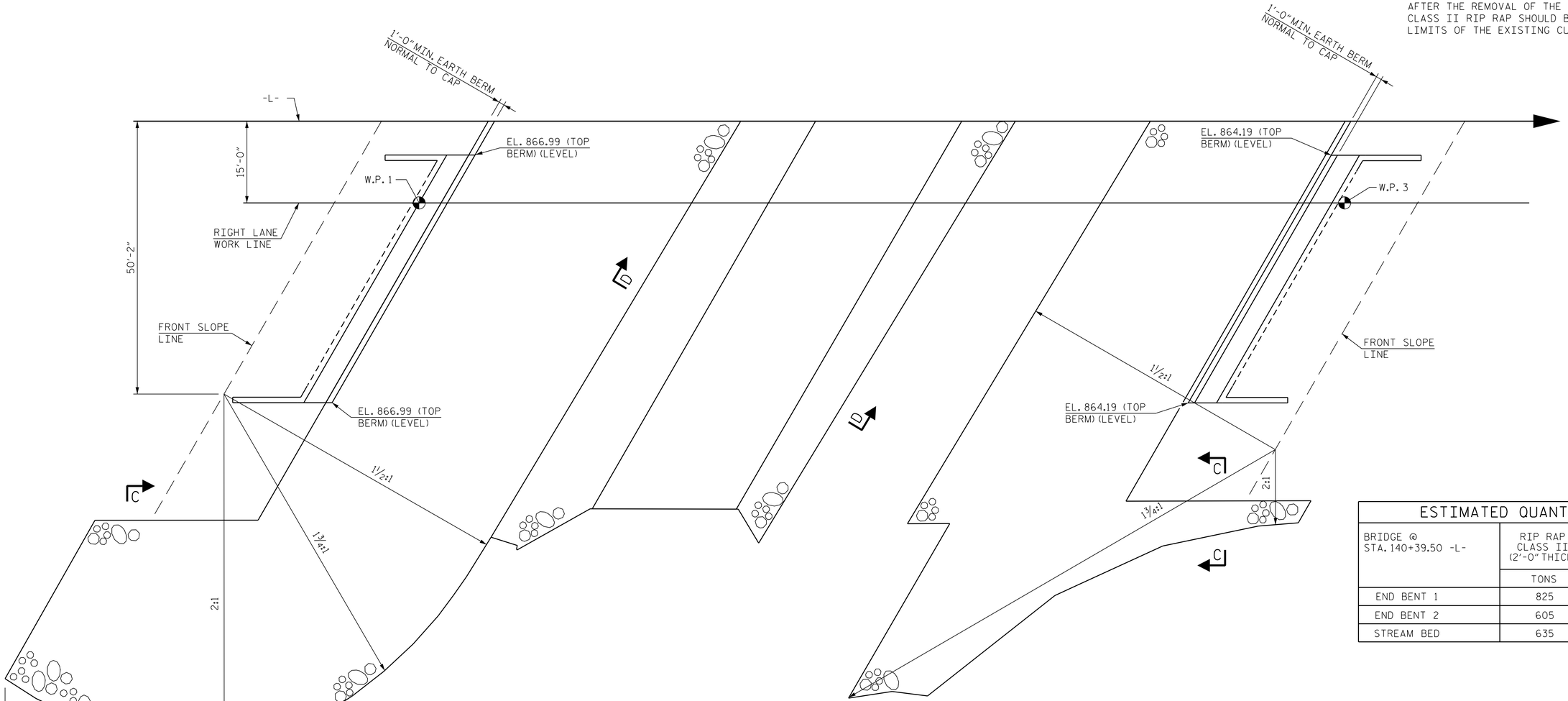
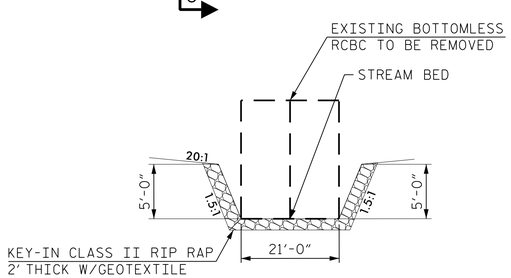
NOTES:

AFTER THE REMOVAL OF THE EXISTING CULVERT, CLASS II RIP RAP SHOULD BE PLACED WITHIN THE LIMITS OF THE EXISTING CULVERT, SEE SECTION D-D.



END BENT 1

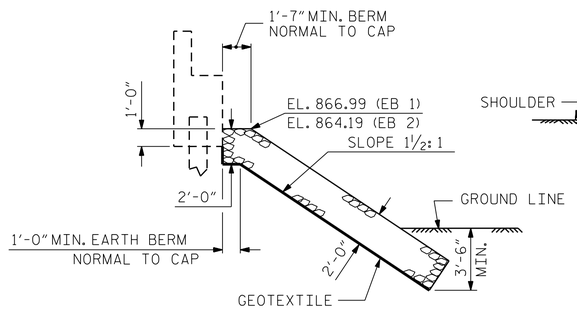
END BENT 2



CHANNEL DETAIL

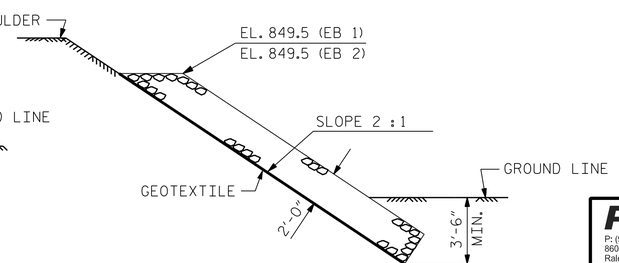
SECTION D-D

BERM RIP RAPPED



℄ SECTION

BERM RIP RAPPED



SECTION C-C

ESTIMATED QUANTITIES

BRIDGE @ STA. 140+39.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	825	920
END BENT 2	605	675
STREAM BED	635	705

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

BRIDGE NO. 330814

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP
DETAILS

RIGHT LANE

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

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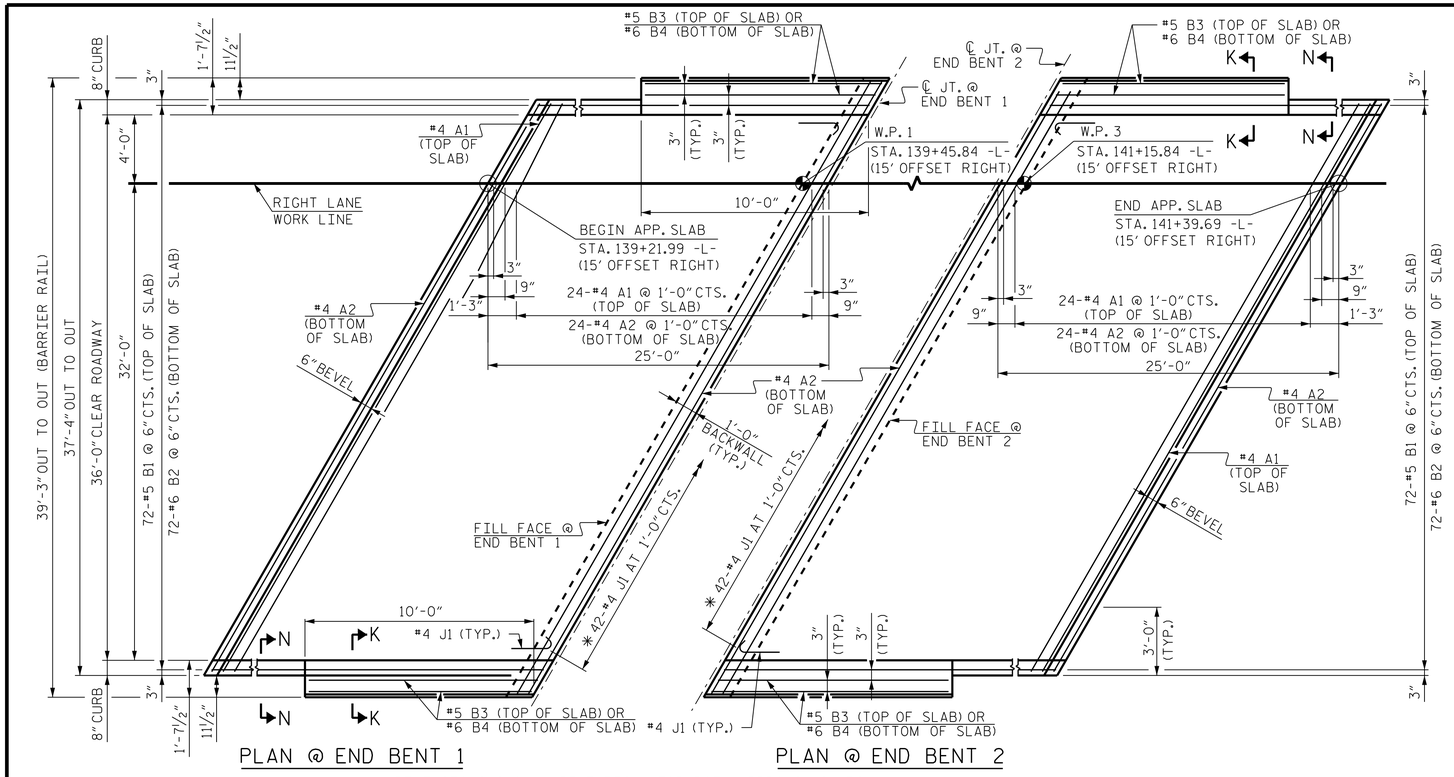
NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODIENE J. PAITEL
Docusigned by: Odiene Paitel
11/10/2023

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-32
1			3			TOTAL SHEETS
2			4			34

STD. NO. RR1

tboyd
11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_RR_330815.dgn



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES:

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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 EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	25	#4	STR	42'-9"	714
A2	26	#4	STR	42'-9"	742
* B1	72	#5	STR	24'-2"	1,815
B2	72	#6	STR	24'-8"	2,668
* J1	42	#4	1	1'-5"	40

REINFORCING STEEL	3,410 LBS.
* EPOXY COATED REINFORCING STEEL	2,569 LBS.
CLASS AA CONCRETE	40.7 C.Y.

APPROACH SLAB AT EB 2

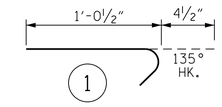
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	25	#4	STR	42'-9"	714
A2	26	#4	STR	42'-9"	742
* B1	72	#5	STR	24'-2"	1,815
B2	72	#6	STR	24'-8"	2,668
* J1	42	#4	1	1'-5"	40

REINFORCING STEEL	3,410 LBS.
* EPOXY COATED REINFORCING STEEL	2,569 LBS.
CLASS AA CONCRETE	40.7 C.Y.

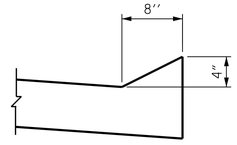
SPLICE LENGTHS

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

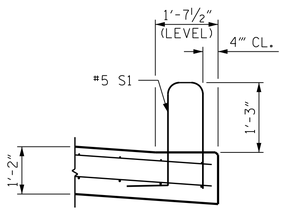
BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION N-N



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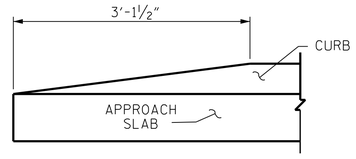
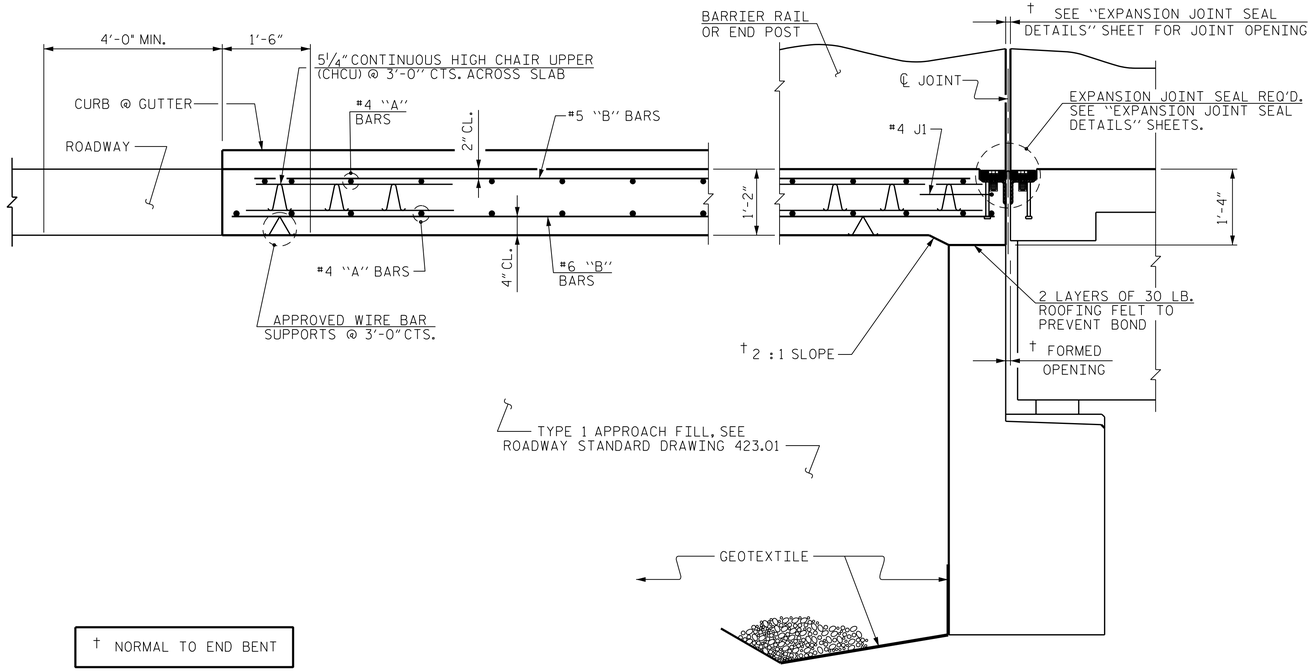


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

PROJECT NO. R-2577A

FORSYTH COUNTY

STATION: 140+39.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT
RIGHT LANE

BRIDGE NO. 330814

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-33
1			3			TOTAL SHEETS
2			4			34

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DocuSigned by: 48850 Orline Paitel ENGINEER ORLINE J. PAITEL C187

11/10/2023

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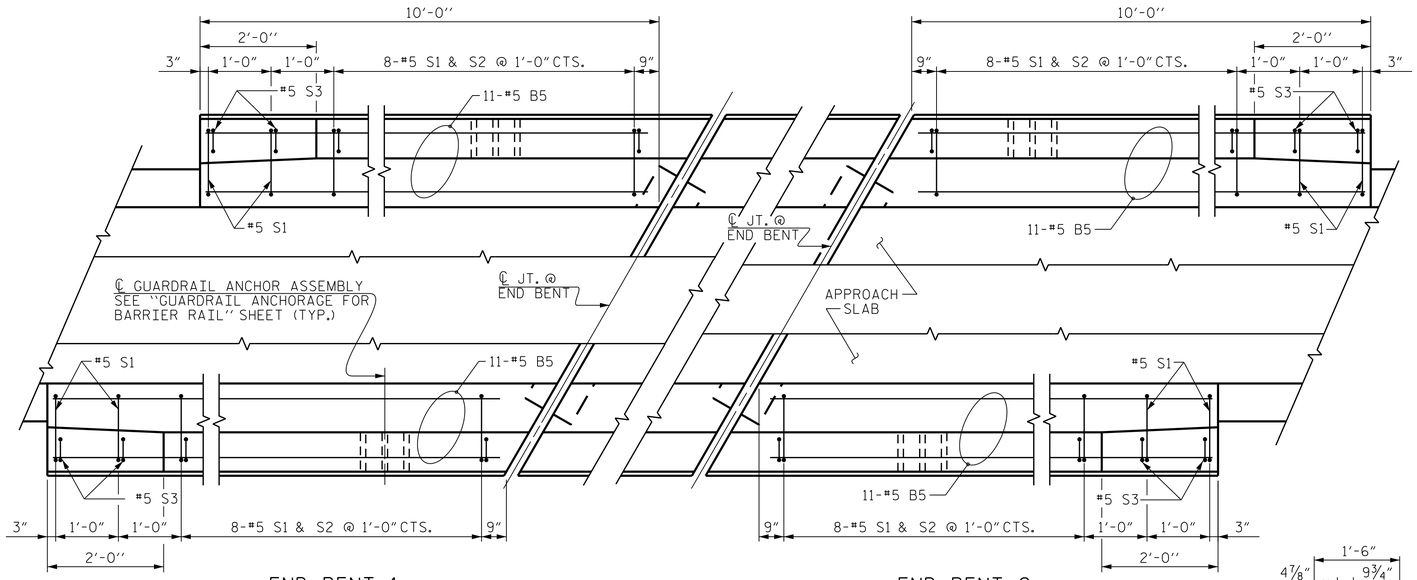
DRAWN BY :	T. K. BOYD	DATE :	SEP 2023
CHECKED BY :	L. K. AUSTIN	DATE :	SEP 2023
DESIGN ENGINEER OF RECORD :	O. J. PAITEL	DATE :	SEP 2023

tboyd
11/10/2023 R:\Structures\BRIDGE\RightBridge\DGN\FINAL\R2577A_SMU_AS1_330815.dgn



END BENT 1

END BENT 2

PLAN OF BARRIER RAIL

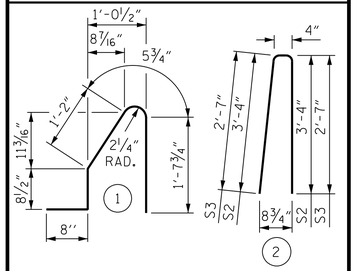
NOTES:

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

THE BARRIER RAIL 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 BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

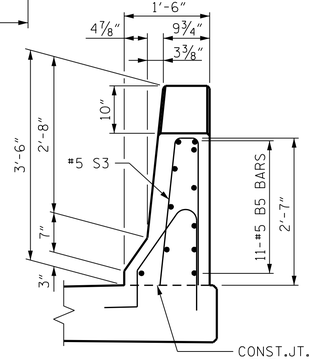


ALL BAR DIMENSIONS ARE OUT TO OUT

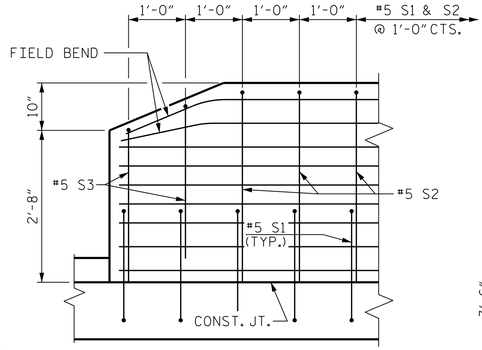
BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B5	44	#5	STR.	9'-8"	444
✳S1	40	#5	1	4'-8"	195
✳S2	32	#5	2	7'-0"	234
✳S3	8	#5	2	5'-6"	46
✳EPOXY COATED REINFORCING STEEL					919 LBS.
CLASS AA CONCRETE					5.7 C.Y.
CONCRETE BARRIER RAIL					41.88 LIN.FT.

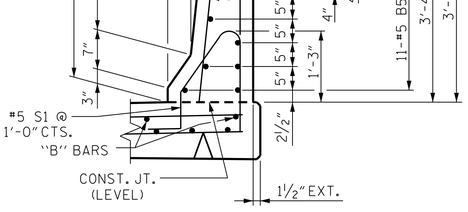


END VIEW

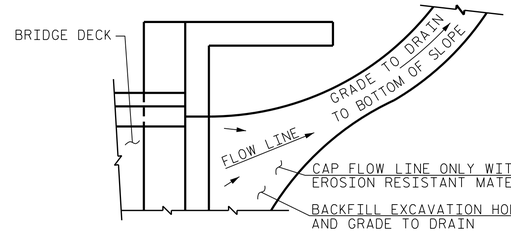


SIDE VIEW

END OF RAIL DETAILS

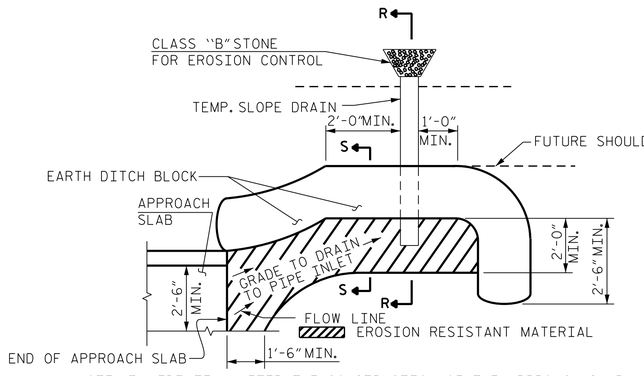


SECTION THRU RAIL



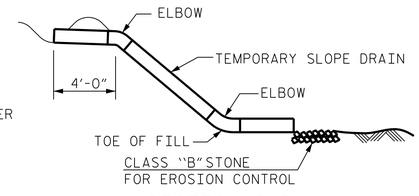
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

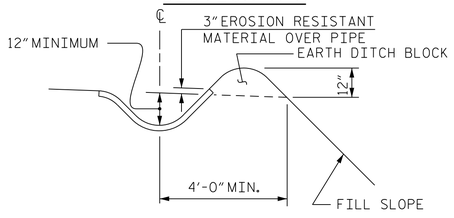


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

DRAWN BY : T. K. BOYD DATE : SEP 2023
CHECKED BY : L. K. AUSTIN DATE : SEP 2023
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : SEP 2023

BRIDGE NO. 330814

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NORTH CAROLINA PROFESSIONAL SEAL 48850 ENGINEER ODINE J. PAITEL
DocuSigned by: Odine Paitel C1F...
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PROJECT NO. R-2577A
FORSYTH COUNTY
STATION: 140+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-34
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2			4			34

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