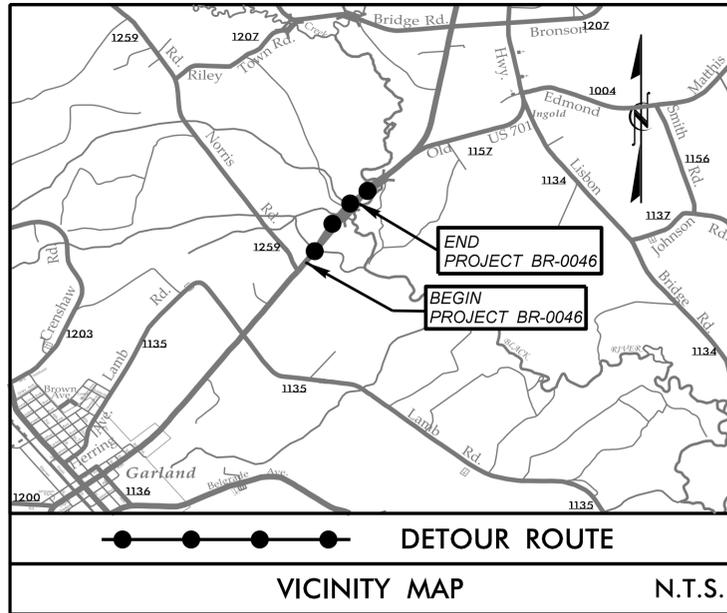


TIP PROJECT: BR-0046

CONTRACT: C204831

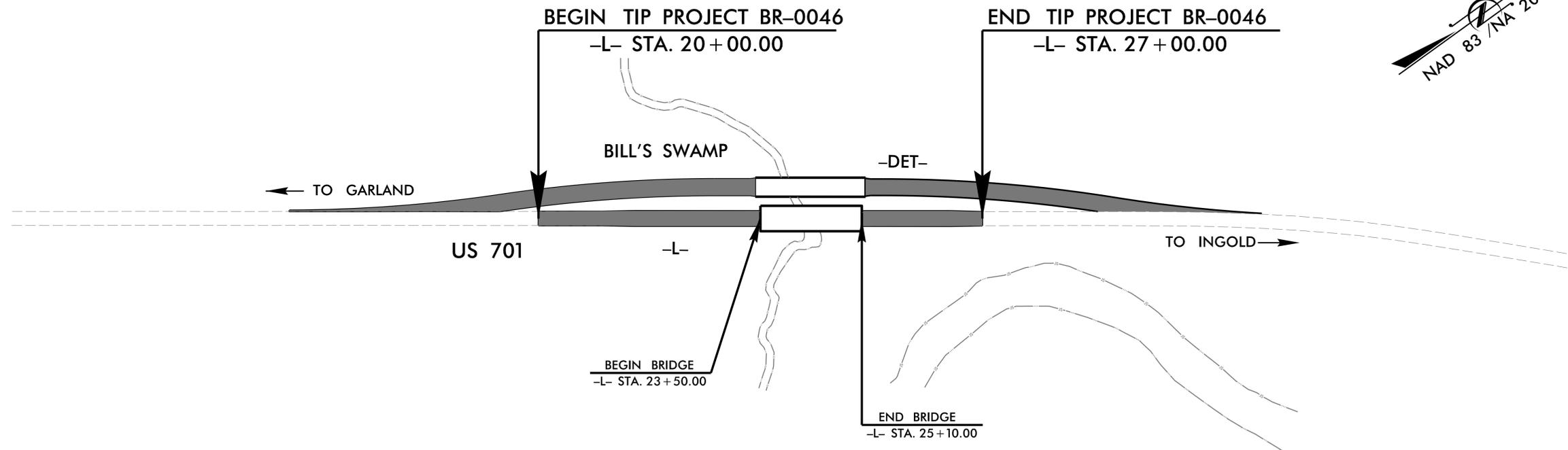


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**SAMPSON COUNTY**

**LOCATION: BRIDGE NO. 810022 ON US 701 OVER  
BILL'S SWAMP**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0046		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
67046.1.1		P.E.	
67046.2.1		R / W & UTIL	
67046.3.1		CONST.	



**STRUCTURES**



**DESIGN DATA**

ADT 2023 =	5,535
ADT 2042 =	6,165
K =	9 %
D =	55 %
T =	12 % **
* V =	60 MPH
** (TTST 8%, DUAL 4%)	
FUNC CLASS = MINOR ARTERIAL	
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT BR-0046	=	0.103 MILE
LENGTH OF STRUCTURE TIP PROJECT BR-0046	=	0.030 MILE
<b>TOTAL LENGTH OF TIP PROJECT BR-0046</b>	<b>=</b>	<b>0.133 MILE</b>

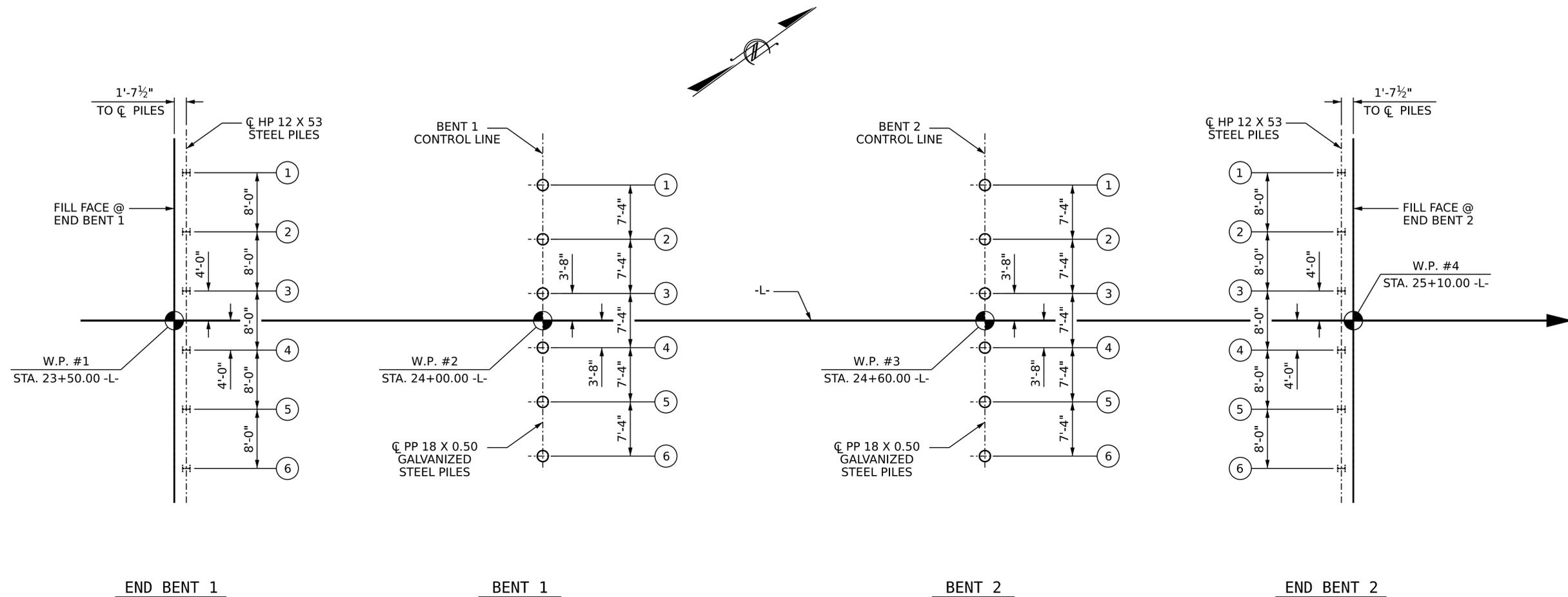
Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
STRUCTURES MANAGEMENT UNIT  
1000 BIRCH RIDGE DR.  
RALEIGH, N.C. 27610

---

*2018 STANDARD SPECIFICATIONS*

<p>LETTING DATE :</p> <p style="text-align: center;">DECEMBER 19, 2023</p>	<p style="text-align: center;">KRISTY W. ALFORD, P.E. <small>PROJECT ENGINEER</small></p> <p style="text-align: center;">P. KOREY NEWTON, P.E. <small>PROJECT DESIGN ENGINEER</small></p>
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**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

**NOTES**

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

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 43,000 - 60,000 FT-LBS. PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 AND BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 2 OF 4



DocuSigned by:  
*P. Corey Newton*  
10/09/2023

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON US 701 OVER  
GREAT COHARIE CREEK OVERFLOW  
BETWEEN SR 1259 & SR 1157

DRAWN BY : S. T. SANDOR DATE : 7/27/22  
CHECKED BY : D. SHACKELFORD DATE : 2/7/23  
DESIGN ENGINEER OF RECORD: P.D. BRYANT DATE : 9/5/23

10/9/2023  
R:\Structures\Plans\401.003.BR-0046\_SMU\_FL\_S-2\_810022.dgn  
pknewton

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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

**SUMMARY OF PILE INFORMATION/INSTALLATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1 (Piles 1-6)	100	52.19	60			170							
Bent 1 (Piles 1-6)	145	52.18	55	29	11	200	12						
Bent 2 (Piles 1-6)	145	52.09	55	29	11	200							
End Bent 2 (Piles 1-6)	100	51.96	55			170							

\*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.

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

**SUMMARY OF PDA/PILE ORDER LENGTHS**

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1 (Piles 1-6)	MAYBE	65	3		
Bent 1 (Piles 1-6)	YES	60			
Bent 2 (Piles 1-6)	YES	60			
End Bent 2 (Piles 1-6)	MAYBE	60			

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

**PILE DESIGN INFORMATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1 (Piles 1-6)	100			0.60			1.00
Bent 1 (Piles 1-6)	142.9			0.75		5	1.00
Bent 2 (Piles 1-6)	143.0			0.75		5	1.00
End Bent 2 (Piles 1-6)	100			0.60			1.00

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

PROJECT NO. BR-0046

SAMPSON COUNTY

STATION: 24+30.00 -L-

**NOTES:**

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thein Tun Zan, PE Seal #030943) on 12-02-2021.
- 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 PDA Testing and Pipe Pile Plates when PDAs or plates may be required.

10/09/2023

 DocuSigned by: <i>P. Corey Newton</i>	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH  <b>PILE FOUNDATION TABLES</b>		SHEET NO. S-3																	
	REVISIONS	TOTAL SHEETS 31																		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4			
NO.	BY:	DATE:	NO.	BY:	DATE:															
1			3																	
2			4																	

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 18X0.50 GALVANIZED STEEL PILES		HP 12X53 STEEL PILES		PP 18X0.50 GALVANIZED STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	
											LBS.	NO.		LIN. FT.	EACH	EACH	NO.	LIN. FT.	NO.						LIN. FT.
SUPERSTRUCTURE						6996	7708				15	787.08									316.67				
END BENT 1								26.7		3875			6			6	360						265	295	
BENT 1								14.5		2569					6			6	330						
BENT 2								14.5		2569					6			6	330						
END BENT 2								26.7		3875			6		6	330							260	290	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	3	LUMP SUM	6996	7708	82.4	LUMP SUM	12,888	15	787.08	12		12	690	12	660		12	316.67	525	585	LUMP SUM	

**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 24 + 30.00 -L".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50'-0" EACH SIDE 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.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 24 + 30.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 6 SPANS: 1 @ 20'-3", 4 @ 20'-0" AND 1 @ 20'-3", WITH A CLEAR ROADWAY WIDTH OF 28'-1" AND REINFORCED CONCRETE DECK ON W 16X40 STEEL BEAMS ON END BENTS AND BENTS CONSISTING OF REINFORCED CONCRETE CAPS ON TIMBER PILES AND STEEL CRUTCH BENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE 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.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

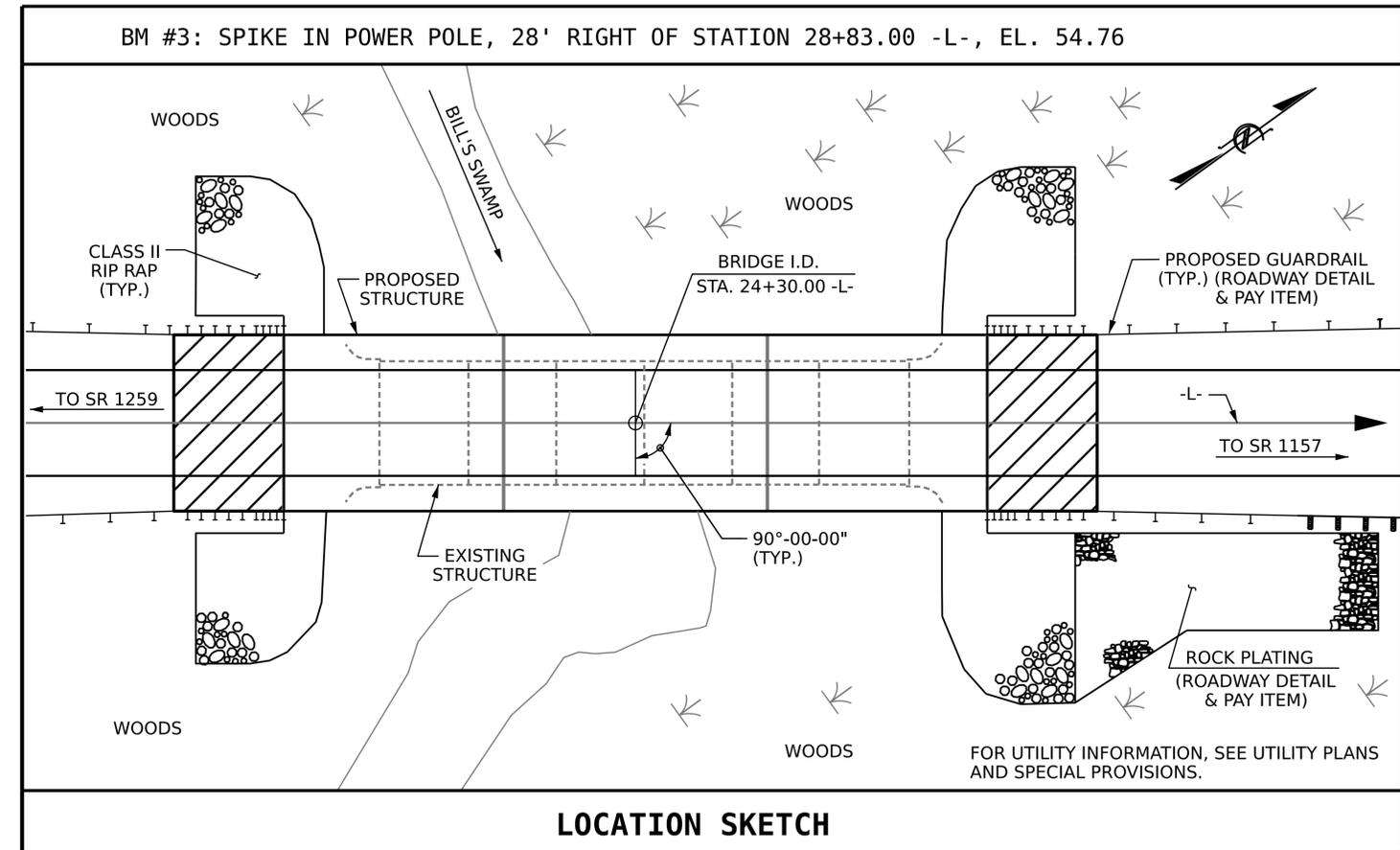
REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

FOR INTERIOR BENTS, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.



**LOCATION SKETCH**

**HYDRAULIC DATA**

DESIGN DISCHARGE	= 10,720 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 55.5 FT.
DRAINAGE AREA	= 363 SQ.MI.
BASE DISCHARGE (Q100)	= 13,170 CFS.
BASE HIGH WATER ELEVATION	= 56.4 FT.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	= 16,000 CFS.
FREQUENCY OF OVERTOPPING FLOOD	= < 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 56.8 FT. *

\* LOCATION OF OVERTOPPING IS APPROXIMATELY STATION 15+00.00 -L-

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON US 701 OVER GREAT COHARIE CREEK OVERFLOW BETWEEN SR 1259 & SR 1157



Designed by:  
**P. Corey Newton**  
Professional Engineer  
No. 26445  
10/09/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY :	M.K. BEARD	DATE :	6/22/21
CHECKED BY :	D. SHACKELFORD	DATE :	2/7/23
DESIGN ENGINEER OF RECORD:	P.D. BRYANT	DATE :	9/5/23

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMAMRY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS ( $\gamma_{LL}$ )	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)	LIVELOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL93(Inv)	N/A	1	1.052	--	1.75	0.776	1.27	A	I	19.02	0.901	1.05	A	I	36.21	0.8	0.740	1.11	B	I	29.17		
	HL93(Opr)	N/A	--	1.364	--	1.35	0.776	1.65	A	I	19.02	0.901	1.36	A	I	36.21	N/A	--	--	--	--	--		
	HS20(Inv)	36.00	2	1.235	44.461	1.75	0.776	1.56	A	I	19.02	0.901	1.24	A	I	36.21	0.8	0.740	1.40	B	I	29.17		
	HS20(Opr)	36.00	--	1.601	57.635	1.35	0.776	2.03	A	I	19.02	0.901	1.60	A	I	36.21	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.50	--	2.860	38.607	1.4	0.776	4.01	A	I	19.02	0.901	3.29	A	I	36.21	0.8	0.776	2.86	A	I	23.77	
		SNGARBS2	20.00	--	2.260	45.204	1.4	0.776	3.09	A	I	19.02	0.901	2.45	A	I	36.21	0.8	0.776	2.26	A	I	21.39	
		SNAGRIS2	22.00	--	2.186	48.096	1.4	0.776	2.97	A	I	19.02	0.901	2.32	A	I	36.21	0.8	0.776	2.19	A	I	21.39	
		SNCOTTS3	27.25	--	1.427	38.884	1.4	0.776	2.03	A	I	19.02	0.901	1.65	A	I	36.21	0.8	0.776	1.43	A	I	23.77	
		SNAGGRS4	34.93	--	1.245	43.497	1.4	0.776	1.75	A	I	19.02	0.901	1.45	A	I	36.21	0.8	0.776	1.25	A	I	23.77	
		SNS5A	35.55	--	1.214	43.164	1.4	0.776	1.74	A	I	19.02	0.901	1.52	A	I	36.21	0.8	0.776	1.21	A	I	23.77	
		SNS6A	39.95	--	1.138	45.443	1.4	0.776	1.61	A	I	19.02	0.901	1.42	A	I	36.21	0.8	0.776	1.14	A	I	23.77	
		SNS7B	42.00	--	1.084	45.534	1.4	0.776	1.54	A	I	19.02	0.901	1.45	A	I	36.21	0.8	0.776	1.08	A	I	23.77	
	T1ST	TNAGRIT3	33.00	--	1.394	46.010	1.4	0.776	2.03	A	I	19.02	0.901	1.66	A	I	36.21	0.8	0.776	1.39	A	I	23.77	
		TNT4A	33.08	--	1.407	46.538	1.4	0.776	1.96	A	I	19.02	0.901	1.58	A	I	36.21	0.8	0.776	1.41	A	I	23.77	
		TNT6A	41.60	--	1.171	48.708	1.4	0.776	1.66	A	I	19.02	0.901	1.57	A	I	36.21	0.8	0.740	1.17	B	I	29.17	
		TNT7A	42.00	--	1.182	49.658	1.4	0.776	1.68	A	I	19.02	0.901	1.45	A	I	36.21	0.8	0.740	1.18	B	I	29.17	
		TNT7B	42.00	--	1.235	51.864	1.4	0.776	1.70	A	I	19.02	0.901	1.38	A	I	36.21	0.8	0.740	1.23	B	I	29.17	
		TNAGRIT4	43.00	--	1.167	50.160	1.4	0.776	1.62	A	I	19.02	0.901	1.32	A	I	36.21	0.8	0.740	1.17	B	I	29.17	
		TNAGT5A	45.00	--	1.095	49.276	1.4	0.776	1.56	A	I	19.02	0.901	1.37	A	I	36.21	0.8	0.740	1.10	B	I	29.17	
		TNAGT5B	45.00	3	1.078	48.488	1.4	0.776	1.51	A	I	19.02	0.901	1.25	A	I	36.21	0.8	0.740	1.08	B	I	29.17	
EV LOAD RATING	EV2	28.75	--	1.611	46.308	1.3	0.776	2.36	A	I	19.02	0.901	1.87	A	I	36.21	0.8	0.776	1.61	A	I	21.39		
	EV3	43.00	4	1.048	45.066	1.3	0.776	1.59	A	I	19.02	0.901	1.27	A	I	36.21	0.8	0.776	1.05	A	I	23.77		

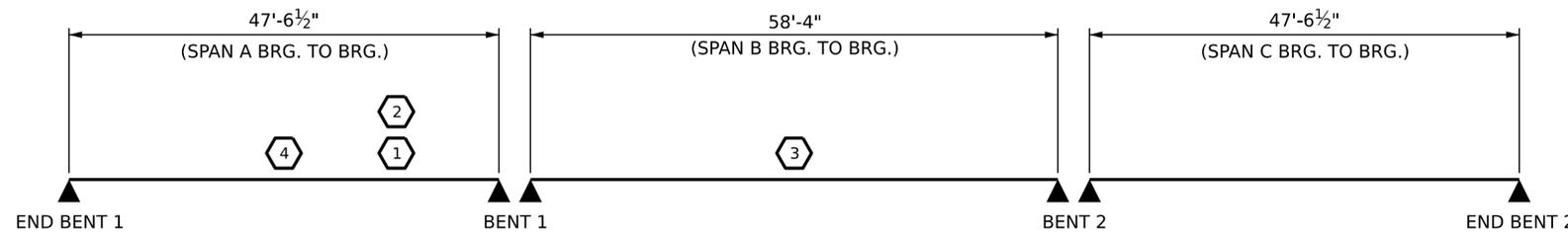
NOTES:

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:

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

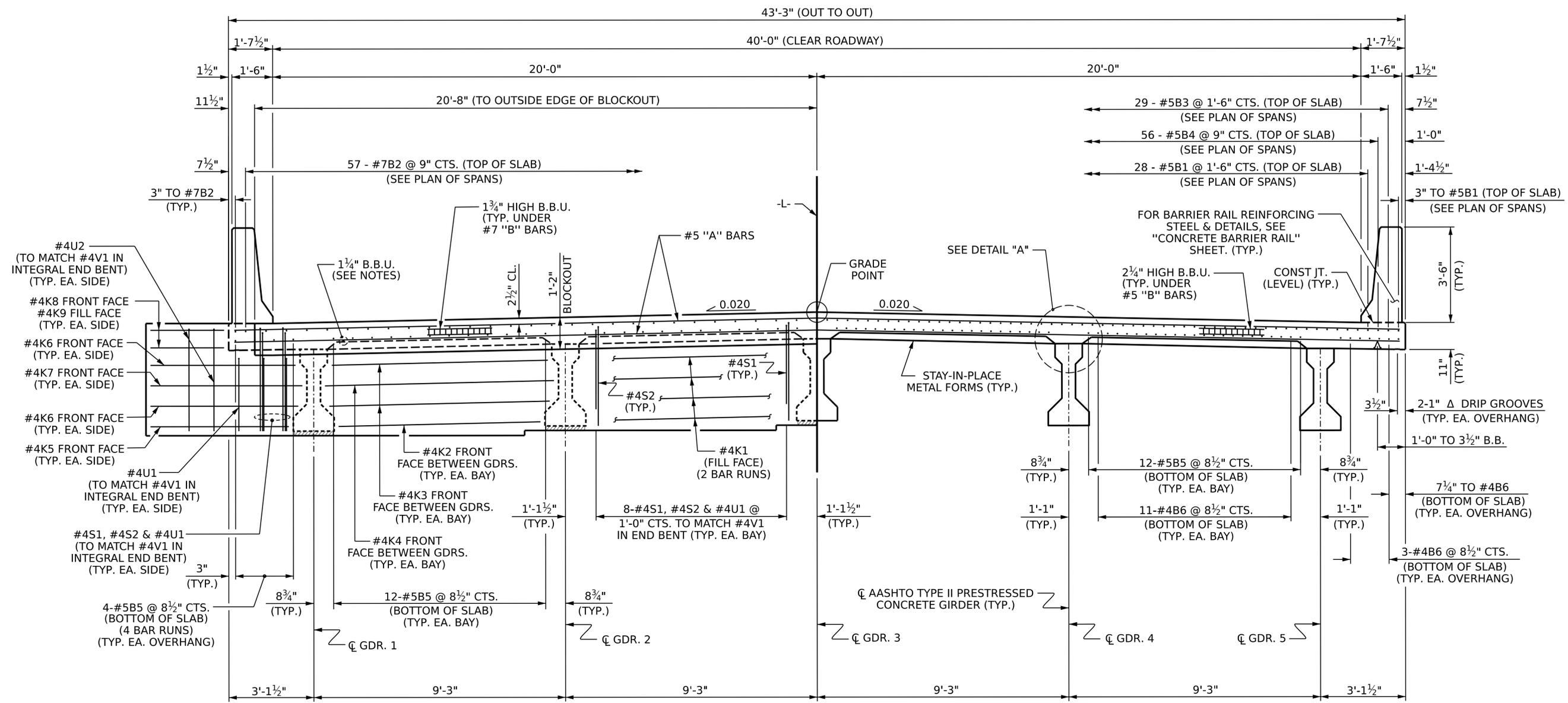


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**LRFR SUMAMRY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS**  
 (NON-INTERSTATE TRAFFIC)

DESIGN ENGINEER OF RECORD :  
P. D. BRYANT DATE : 8/2/23  
 ASSEMBLED BY : P. K. NEWTON DATE : 8/2/23  
 CHECKED BY : P. D. BRYANT DATE : 8/2/23  
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA / GM  
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA / GM  
 REV. 12/17 MAA / THC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS 31
2			4			

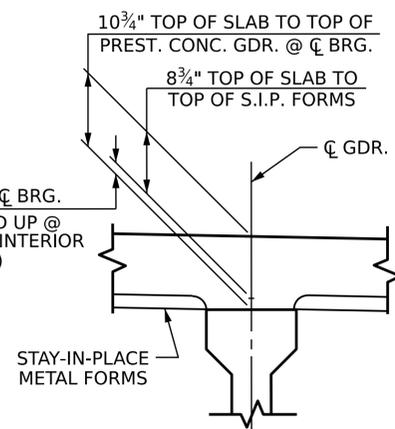
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



HALF SECTION @ INTEGRAL END BENT  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

HALF SECTION @ LINK SLAB @ BENTS  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

**TYPICAL SECTION**



DETAIL "A"

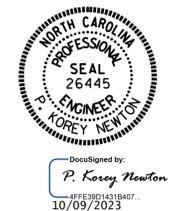
**NOTES**

- PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

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

DRAWN BY : M.K. BEARD DATE : 2/2/23  
 CHECKED BY : D. SHACKELFORD DATE : 2/7/23  
 DESIGN ENGINEER OF RECORD : P. BRYANT DATE : 6/25/21

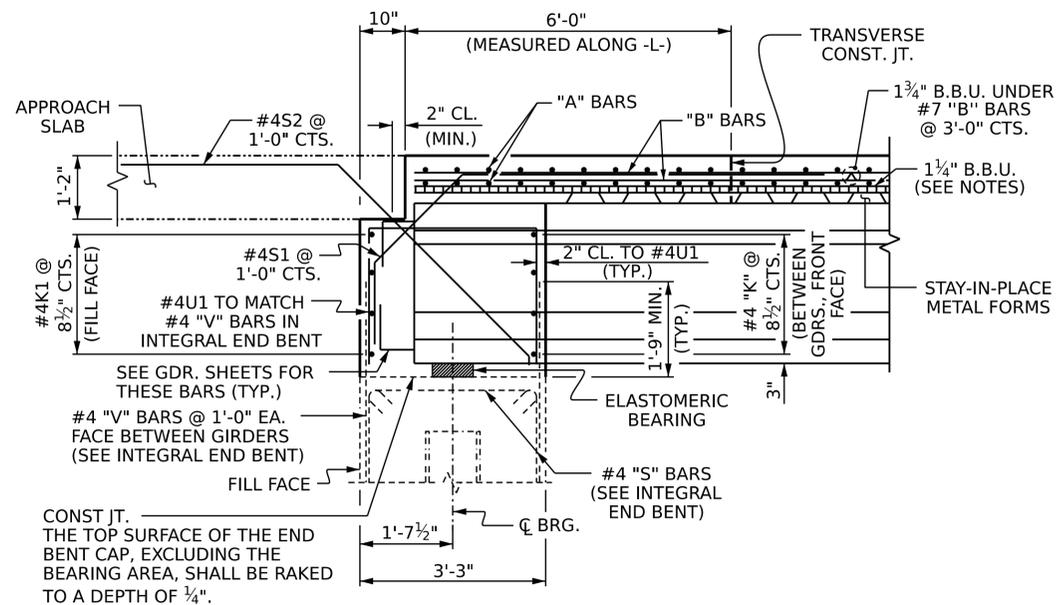
10/9/2023  
 R:\Structures\Plans\401.011.BR-0046.SMU.TS.S-6.810022.dgn  
 pknewton



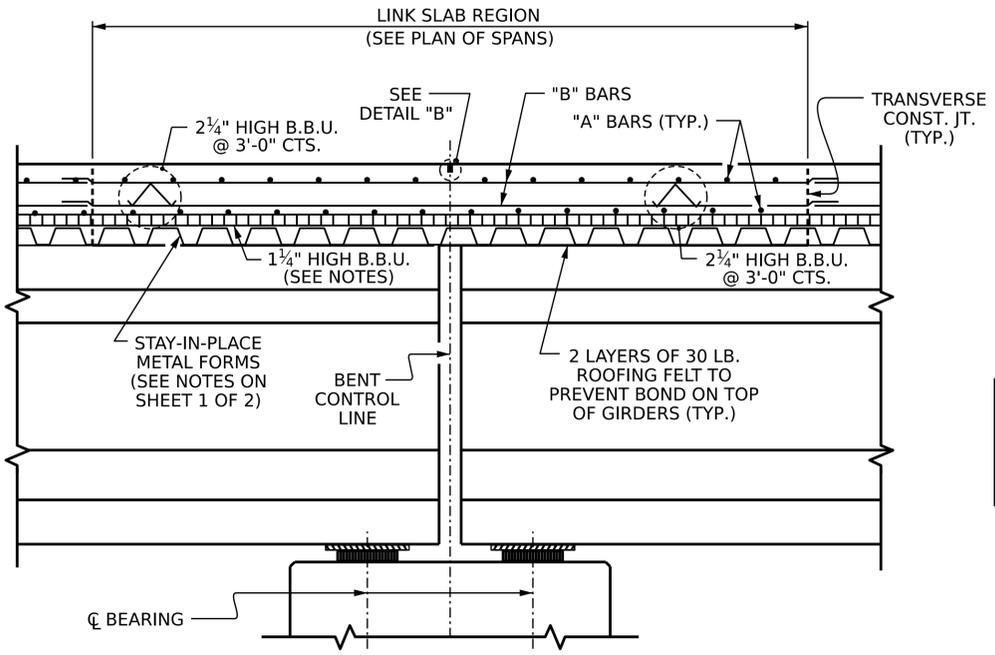
PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-6
TYPICAL SECTION						TOTAL SHEETS
REVISIONS						31
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

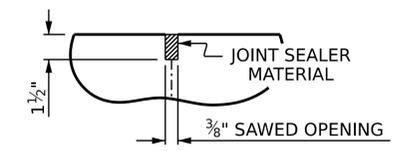
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED



**SECTION @ INTEGRAL END BENT**

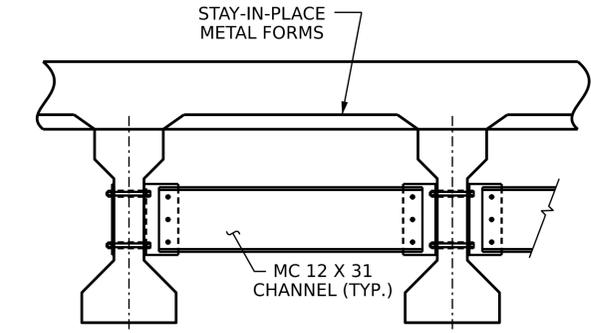


**SECTION @ LINK SLAB**



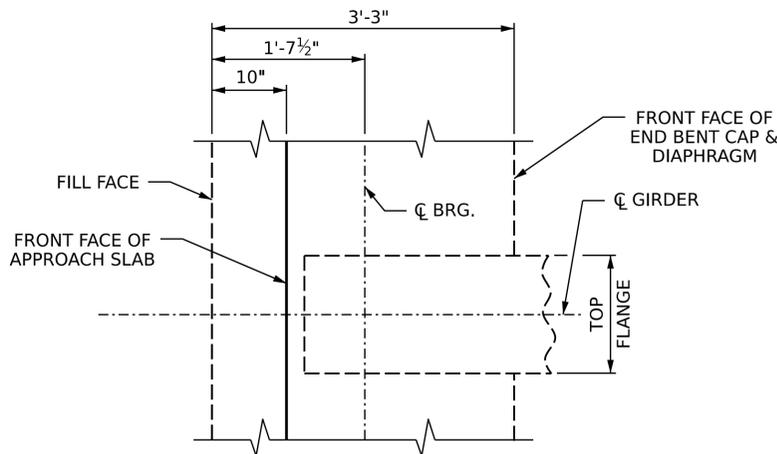
**DETAIL "B"**

A 1 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWED WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

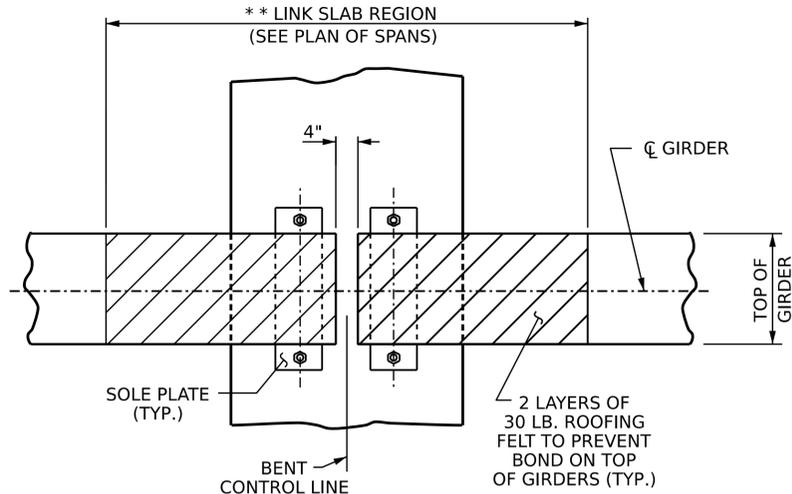


**TYPICAL INTERMEDIATE DIAPHRAGM**

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS.



**PLAN @ INTEGRAL END BENT**



**PLAN @ BENT**

\*\* THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH AND FREE OF STIRRUPS, DECK FORMWORK AND OVERHANG FALSEWORK ATTACHMENTS.

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

SHEET 2 OF 2



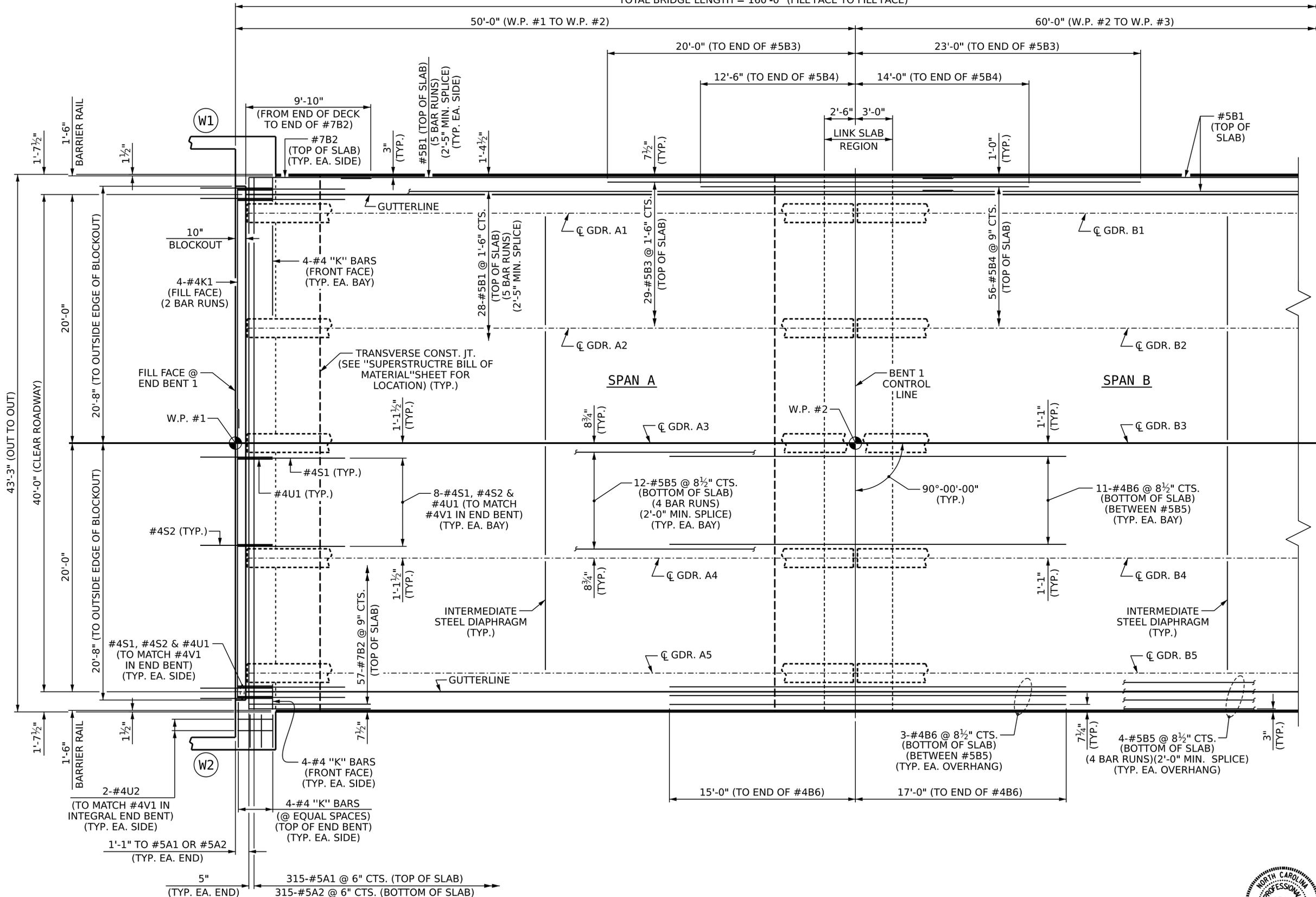
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**TYPICAL SECTION**

DRAWN BY: M.K. BEARD DATE: 2/2/23  
 CHECKED BY: D. SHACKELFORD DATE: 2/7/23  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE: 6/22/21

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			31

TOTAL BRIDGE LENGTH = 160'-0" (FILL FACE TO FILL FACE)



**PLAN OF SPAN A**

**PARTIAL PLAN OF SPAN B**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 1 OF 3



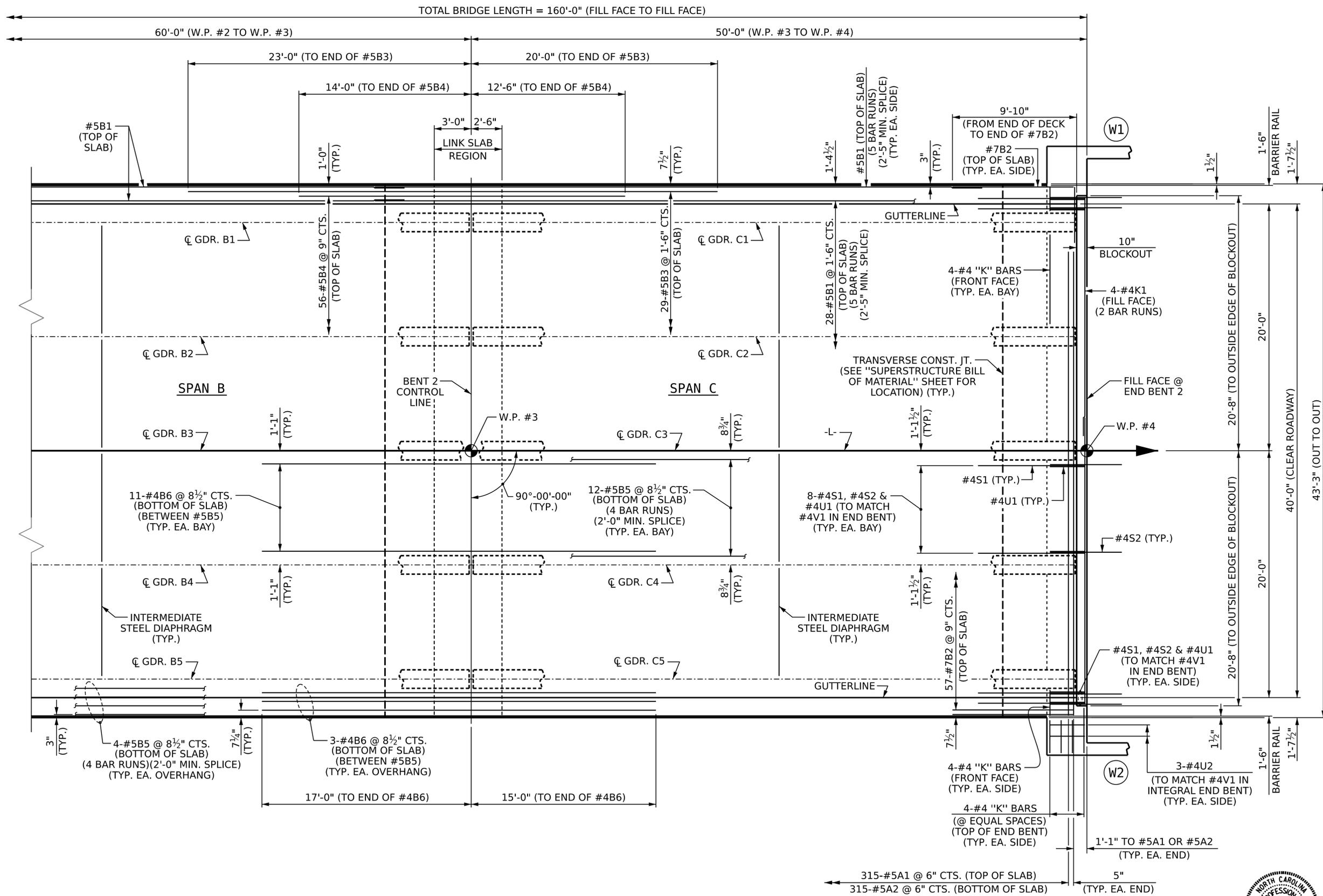
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**

DRAWN BY : M. K. BEARD DATE : 1/25/23  
 CHECKED BY : D. R. SHACKELFORD DATE : 2/7/23  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 6/21/23

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-8 TOTAL SHEETS 31
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

10/9/2023  
 R:\Structures\Plans\401.015.BR-0046.SMU.PS.5-8.810022.dgn  
 pknewton



**PARTIAL PLAN OF SPAN B**

**PLAN OF SPAN C**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**



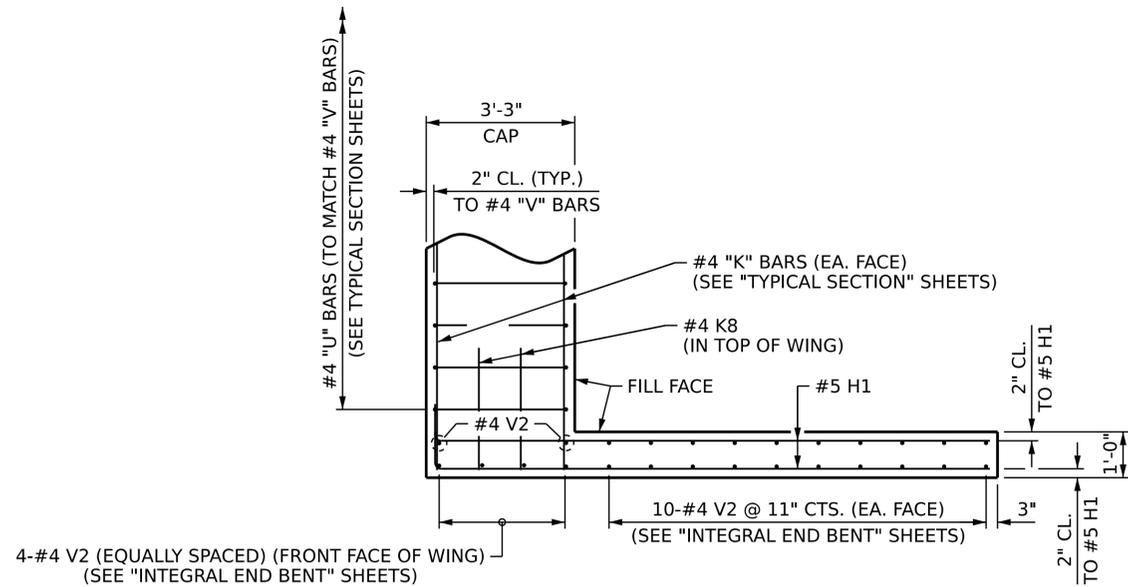
Designed by:  
**P. Corey Newton**  
 10/09/2023

DRAWN BY : M. K. BEARD DATE : 1/25/23  
 CHECKED BY : D. R. SHACKELFORD DATE : 2/7/23  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 6/21/23

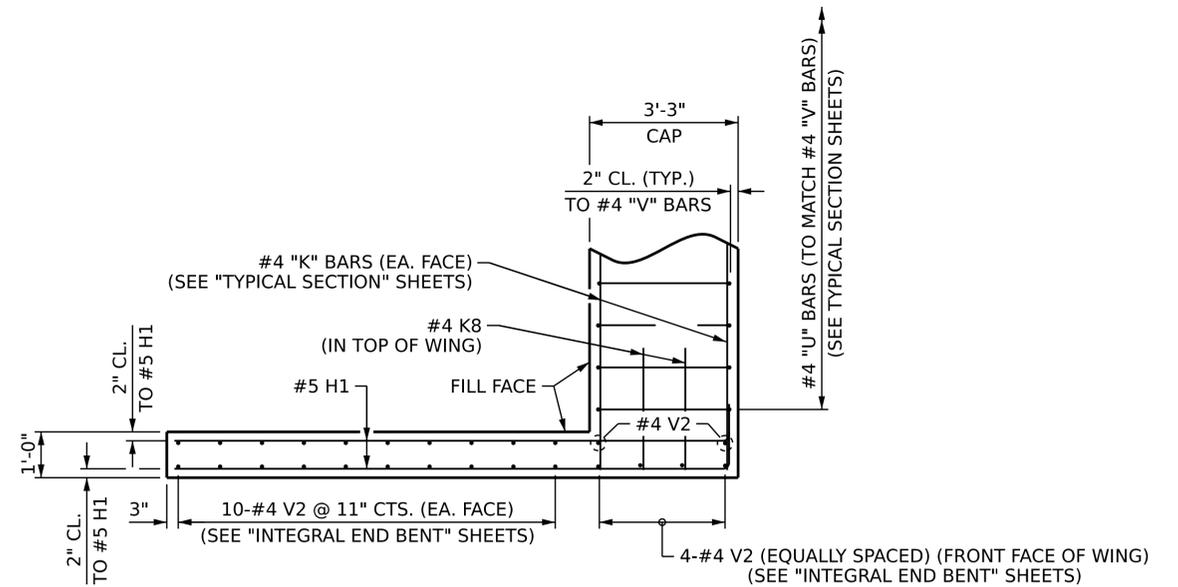
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			31

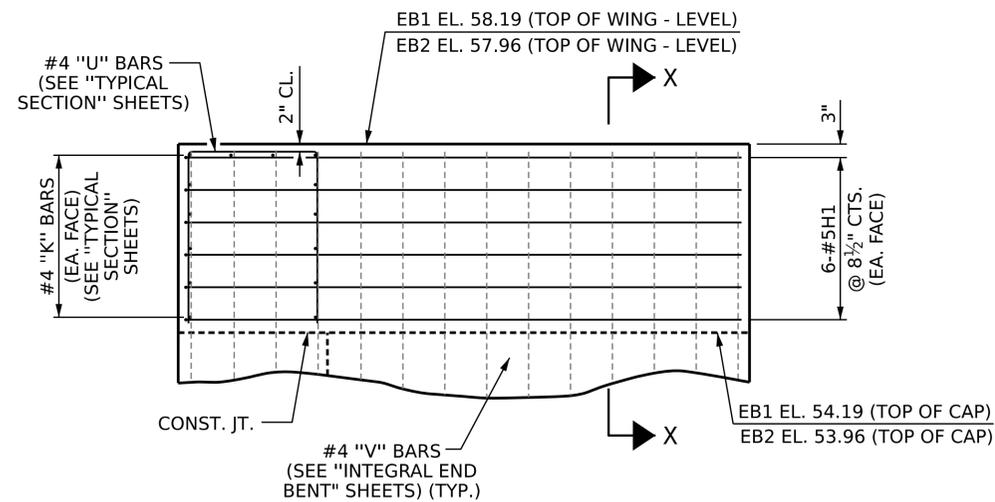
10/9/2023  
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 pknewton



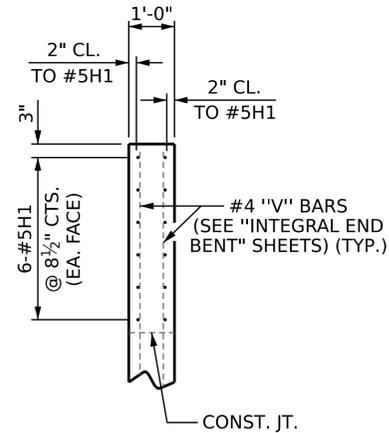
**PLAN OF WING W1**



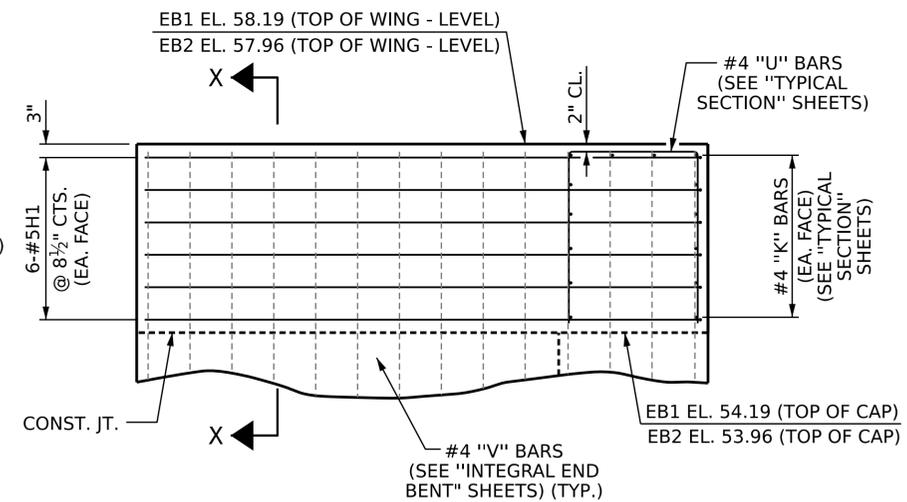
**PLAN OF WING W2**



**ELEVATION OF WING W1**



**SECTION X-X**



**ELEVATION OF WING W2**

**UPPER WINGS AT INTEGRAL END BENTS**

FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT" SHEETS

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE

**PLAN OF SPANS**  
(UPPER WINGS)

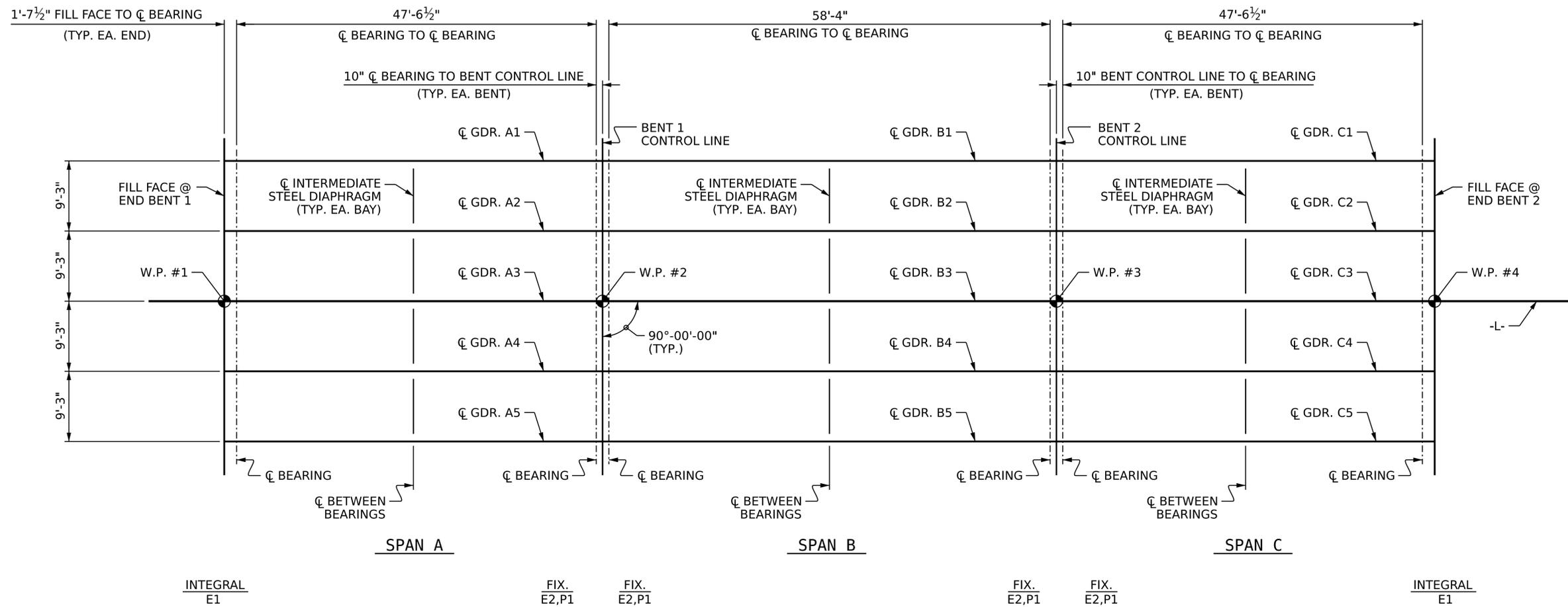


Drawn/Signed by:  
*P. Corey Newton*  
10/09/2023

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-10
2			4			TOTAL SHEETS 31

DRAWN BY : M. K. BEARD DATE : 2/15/23  
CHECKED BY : D. R. SHACKELFORD DATE : 2/16/23  
DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 9/6/23



**GIRDER LAYOUT**

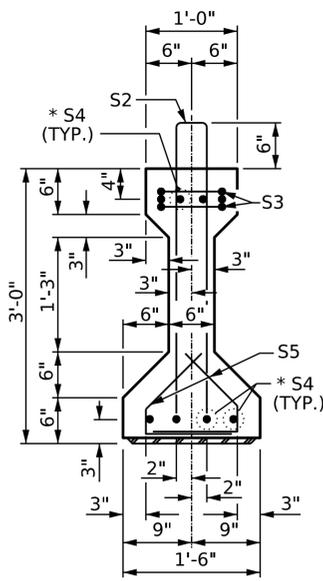
PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**



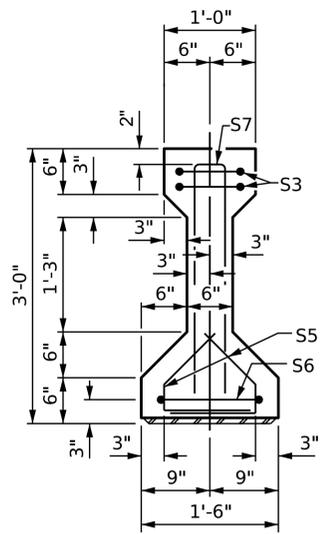
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**FRAMING PLAN**

DRAWN BY : P. D. BRYANT DATE : 12/22/22  
 CHECKED BY : P. K. NEWTON DATE : 12/28/22  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 6/20/23

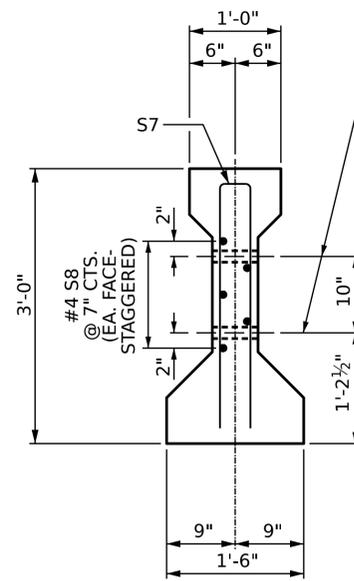
REVISIONS						SHEET NO. S-11 TOTAL SHEETS 31
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
2			4			



**SECTION A-A**

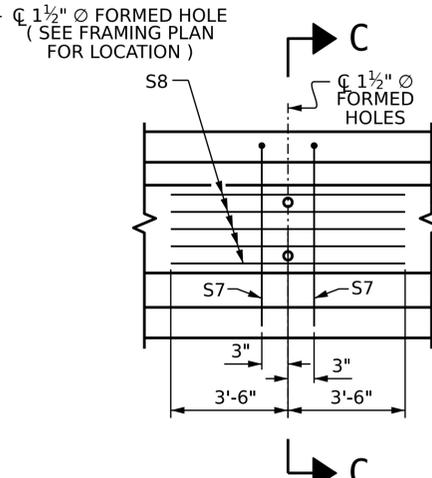


**SECTION B-B**



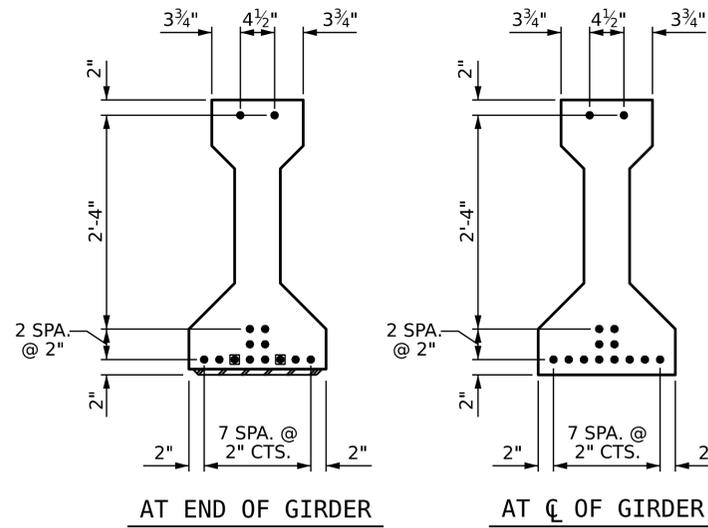
**SECTION C-C**

(S1 BARS NOT SHOWN)



**PARTIAL ELEVATION**

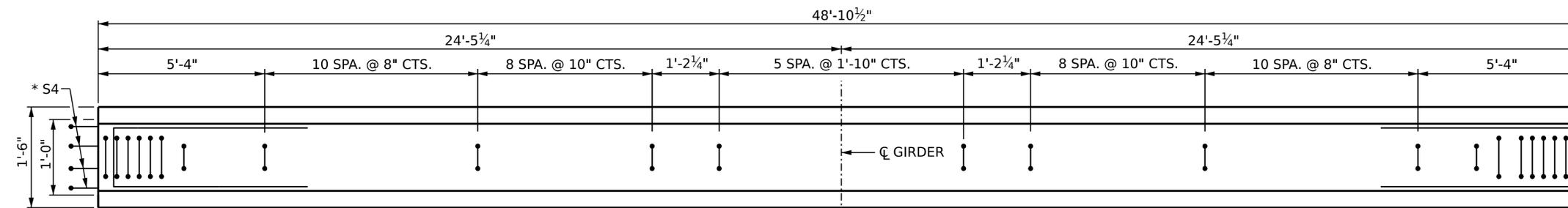
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-5



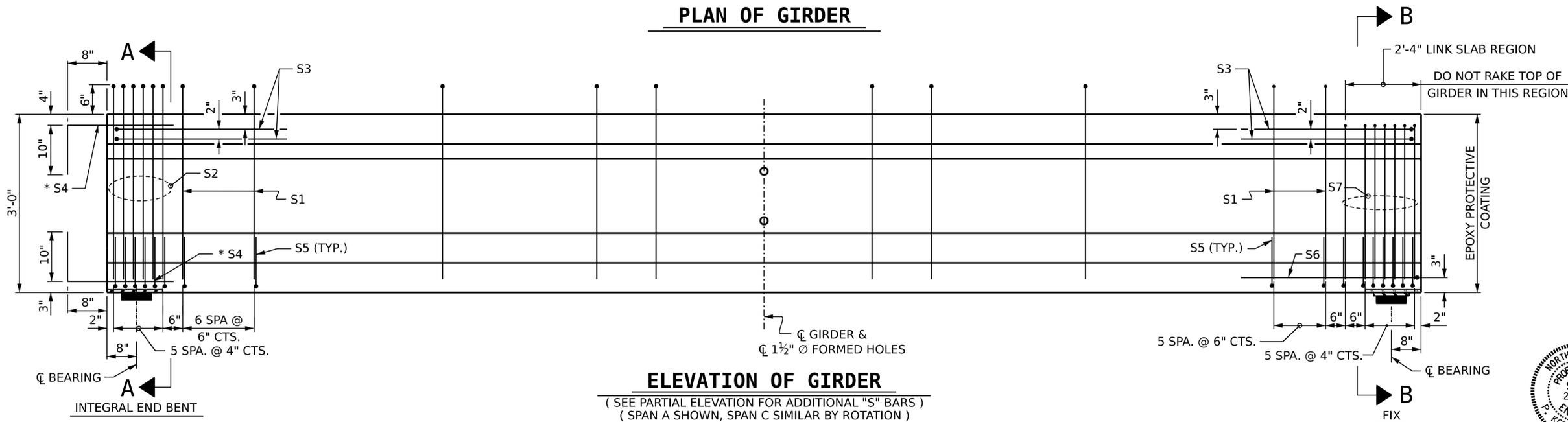
**0.6" Ø LOW RELAXATION STRAND LAYOUT**

**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



**PLAN OF GIRDER**



**ELEVATION OF GIRDER**

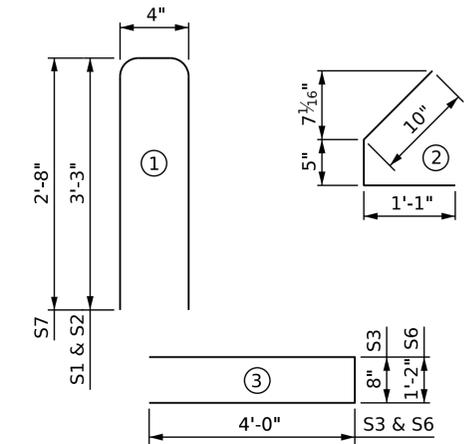
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS) (SPAN A SHOWN, SPAN C SIMILAR BY ROTATION)

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	55	#4	1	6'-10"	251
S2	6	#5	1	6'-10"	43
S3	4	#4	3	8'-8"	23
* S4	8	#5	STR	3'-8"	31
S5	52	#4	2	2'-4"	81
S6	1	#4	3	9'-2"	6
S7	9	#5	1	5'-8"	53
S8	5	#4	STR	7'-0"	23

\* NOTE: S4 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	6000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
511	4.6	14

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
10	48'-10 1/2"	488.75

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD

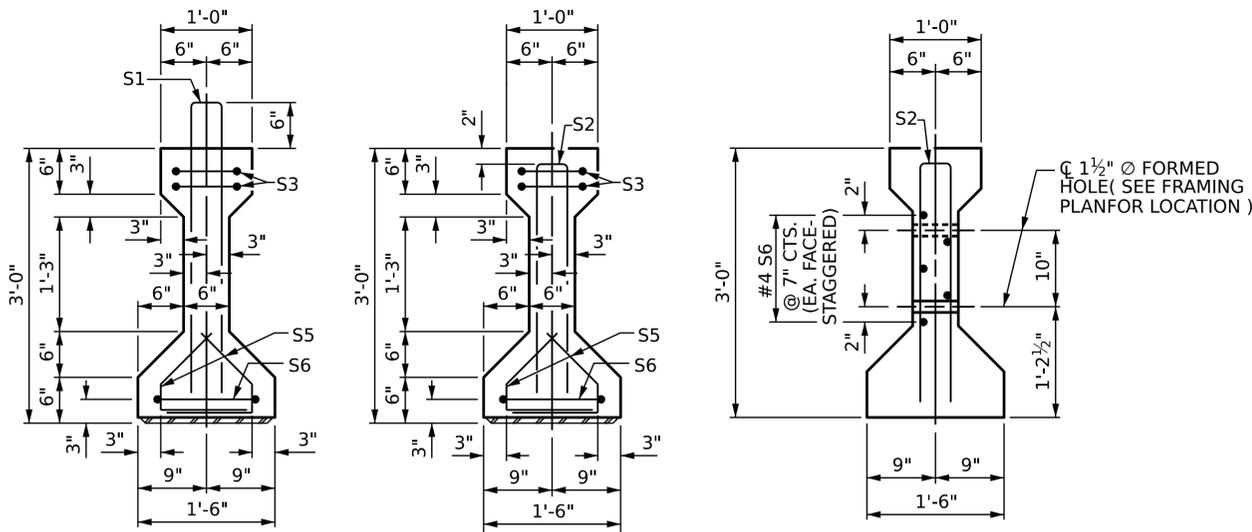
**AASHTO TYPE II  
PRESTRESSED CONCRETE  
GIRDER - LINK SLAB**  
(SPAN A & C)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

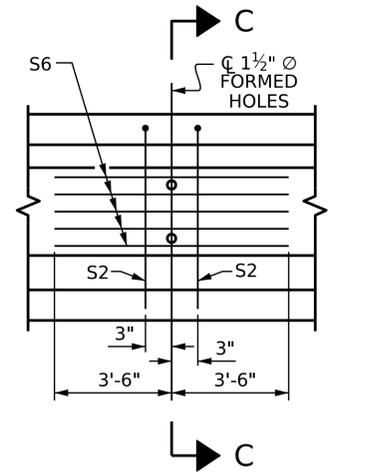
DESIGN ENGINEER OF RECORD: <b>P. BRYANT</b> DATE: <b>7/18/23</b>
ASSEMBLED BY: <b>D. R. SHACKELFORD</b> DATE: <b>1/25/23</b>
CHECKED BY: <b>M. K. BEARD</b> DATE: <b>3/7/23</b>
DRAWN BY: <b>BNB</b> 9/21
CHECKED BY: <b>AAI</b> 9/21



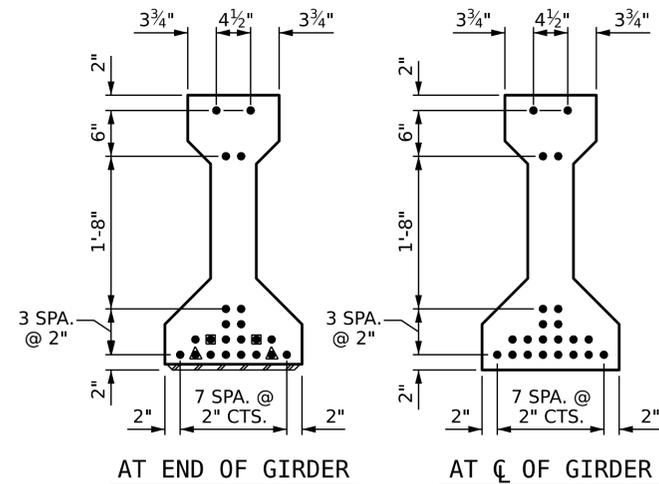
**SECTION A-A**

**SECTION B-B**

**SECTION C-C**  
(S1 BARS NOT SHOWN)



**PARTIAL ELEVATION**  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER Nos. 1-5



**0.6" Ø LOW RELAXATION STRAND LAYOUT**

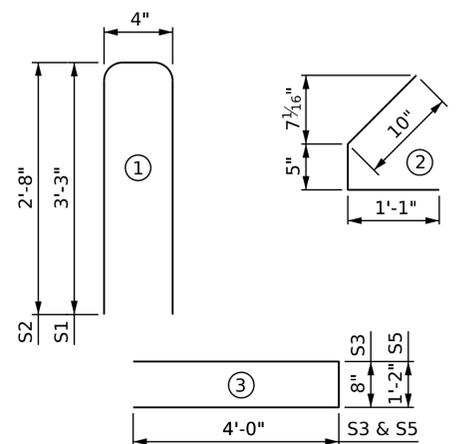
**DEBONDING LEGEND**

- FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ▴ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER

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	64	#4	1	6'-10"	292
S2	20	#5	1	5'-8"	118
S3	4	#4	3	8'-8"	23
S4	64	#5	2	2'-4"	100
S5	2	#4	3	9'-2"	12
S6	5	#4	STR	7'-0"	23

**BAR TYPES**



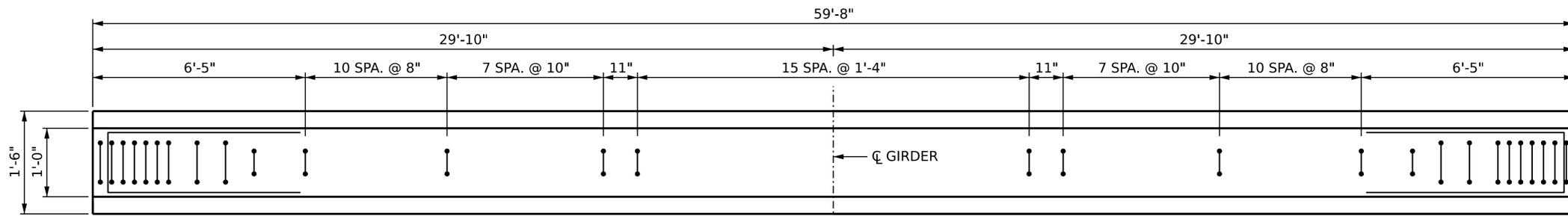
ALL BAR DIMENSIONS ARE OUT-TO-OUT

**QUANTITIES FOR ONE GIRDER**

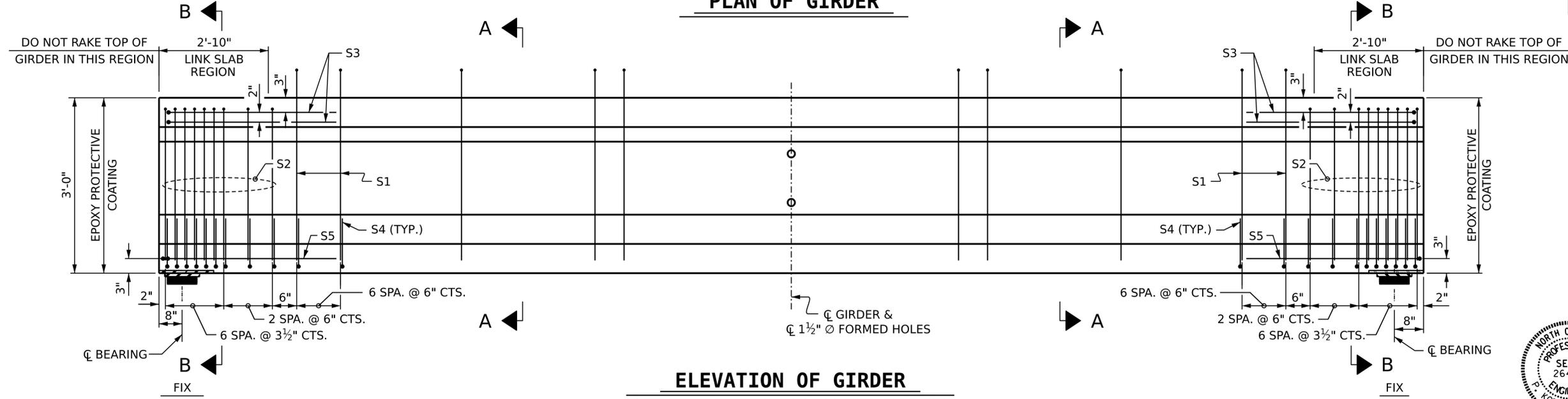
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
	568	5.7	22

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
5	59'-8"	298.33



**PLAN OF GIRDER**



**ELEVATION OF GIRDER**

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

DESIGN ENGINEER OF RECORD: <b>P. BRYANT</b> DATE: 7/18/23	
ASSEMBLED BY: D. R. SHACKELFORD DATE: 1/26/23	CHECKED BY: M. K. BEARD DATE: 3/7/23
DRAWN BY: BNB 09/21	CHECKED BY: AAI 09/21



PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**AASHTO TYPE II  
 PRESTRESSED CONCRETE  
 GIRDER - LINK SLAB**  
 (SPAN B)

REVISIONS				SHEET NO. S-13
NO.	BY:	DATE:	DATE:	
1				TOTAL SHEETS 31
2				

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**NOTES**

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,600 PSI FOR SPANS A & C AND NOT LESS THAN 6,400 PSI FOR 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.

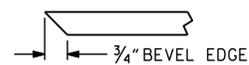
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4" AND THE LINK SLAB REGION, SHALL BE RAKED TO A DEPTH OF ¼".

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPANS A & C																				
	EXTERIOR GIRDERS 1 & 5																				
	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
CAMBER ( GIRDER ALONE IN PLACE )	0	0.012	0.024	0.034	0.044	0.053	0.061	0.067	0.071	0.074	0.075	0.074	0.071	0.067	0.061	0.053	0.044	0.034	0.024	0.012	0
* DEFLECTION DUE TO SUPERIMPOSED D. L.	0	0.007	0.014	0.020	0.026	0.031	0.035	0.039	0.042	0.043	0.044	0.043	0.042	0.039	0.035	0.031	0.026	0.0220	0.014	0.007	0
FINAL CAMBER	0	1/16"	1/8"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	1/4"	3/16"	1/8"	1/16"	0
0.6" Ø LOW RELAXATION	SPANS A & C																				
	INTERIOR GIRDERS 2, 3, & 4																				
	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
CAMBER ( GIRDER ALONE IN PLACE )	0	0.012	0.024	0.034	0.044	0.053	0.061	0.067	0.071	0.074	0.075	0.074	0.071	0.067	0.061	0.053	0.044	0.034	0.024	0.012	0
* DEFLECTION DUE TO SUPERIMPOSED D. L.	0	0.008	0.016	0.023	0.030	0.036	0.041	0.045	0.048	0.049	0.050	0.049	0.048	0.045	0.041	0.036	0.030	0.023	0.016	0.008	0
FINAL CAMBER	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0

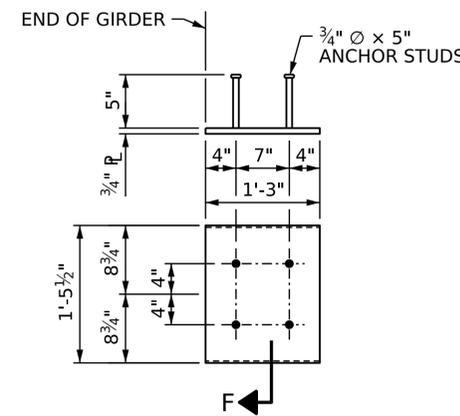
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN B																				
	EXTERIOR GIRDERS 1 & 5																				
	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
CAMBER ( GIRDER ALONE IN PLACE )	0	0.018	0.036	0.052	0.068	0.081	0.093	0.102	0.108	0.113	0.114	0.113	0.108	0.102	0.093	0.081	0.068	0.052	0.036	0.018	0
* DEFLECTION DUE TO SUPERIMPOSED D. L.	0	0.014	0.028	0.041	0.053	0.064	0.073	0.080	0.086	0.089	0.090	0.089	0.086	0.080	0.073	0.064	0.053	0.041	0.028	0.014	0
FINAL CAMBER	0	1/16"	1/16"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/16"	1/16"	0
0.6" Ø LOW RELAXATION	SPAN B																				
	INTERIOR GIRDERS 2, 3, & 4																				
	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
CAMBER ( GIRDER ALONE IN PLACE )	0	0.018	0.036	0.052	0.068	0.081	0.093	0.102	0.108	0.113	0.114	0.113	0.108	0.102	0.093	0.081	0.068	0.052	0.036	0.018	0
* DEFLECTION DUE TO SUPERIMPOSED D. L.	0	0.016	0.032	0.047	0.061	0.073	0.084	0.092	0.098	0.102	0.103	0.102	0.098	0.092	0.084	0.073	0.061	0.047	0.032	0.016	0
FINAL CAMBER	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0

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



**SECTION "F"**  
(SEE NOTES)



**EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE II GIRDER**

(2 REQ'D. PER GIRDER)

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
STATION: **24+30.00 -L-**

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD

**PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS**



Designed by:  
*P. Corey Newton*  
10/09/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 31
2			4			

DESIGN ENGINEER OF RECORD :	
P. D. BRYANT	DATE : 8/28/23
ASSEMBLED BY : P. K. NEWTON	DATE : 2/7/23
CHECKED BY : P. D. BRYANT	DATE : 8/28/23
DRAWN BY : ELR 11/91	REV. 1/15 MAA / TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA / TMG
	REV. 12/17 MAA / THC

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.

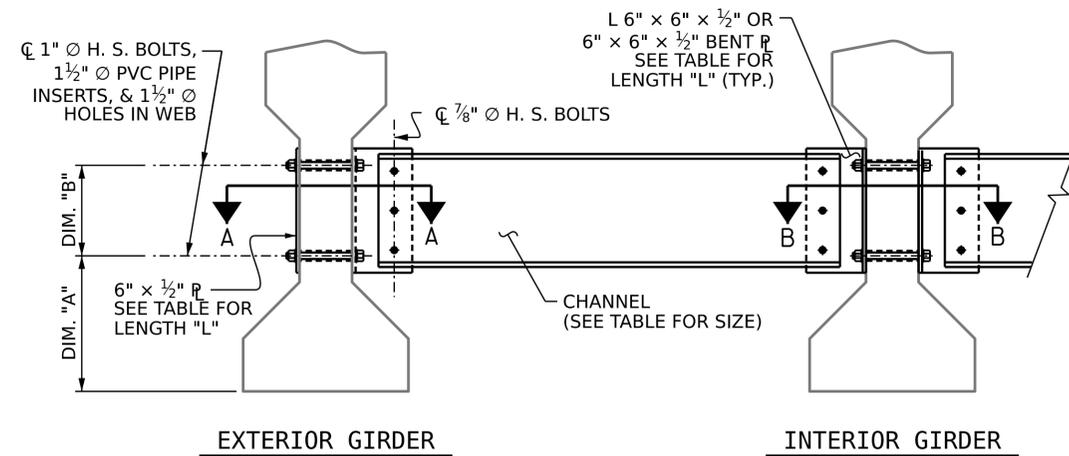
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

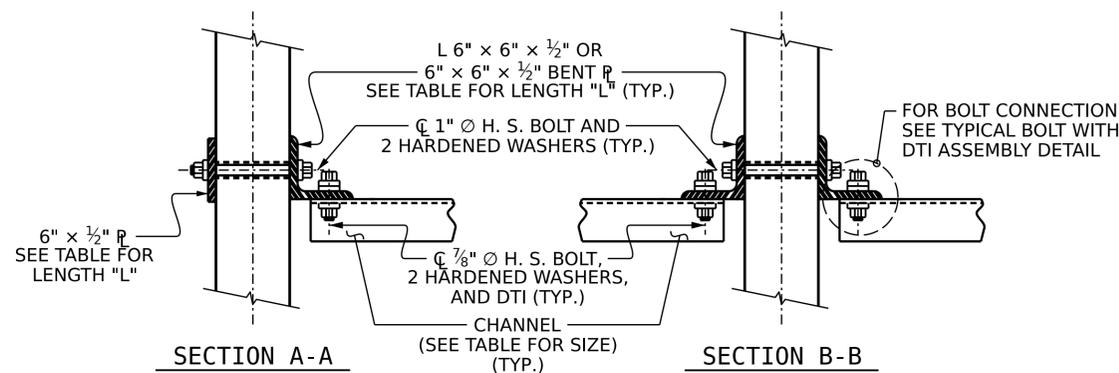
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

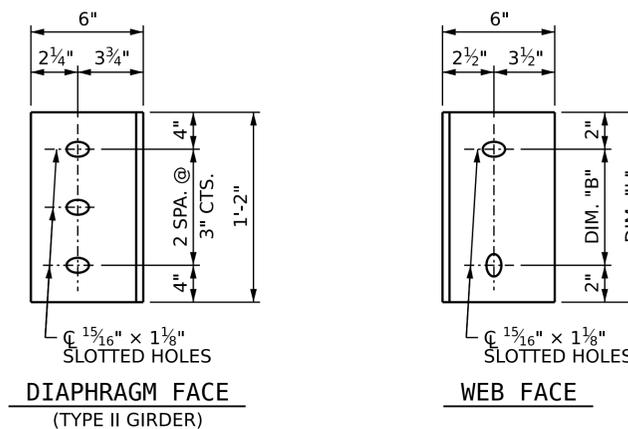
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



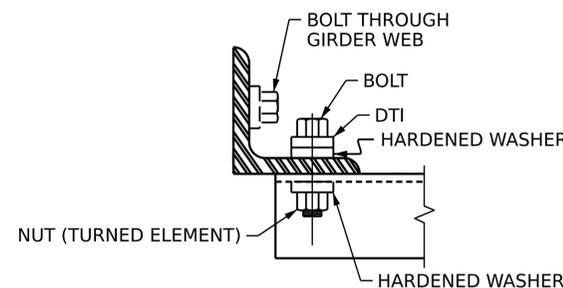
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



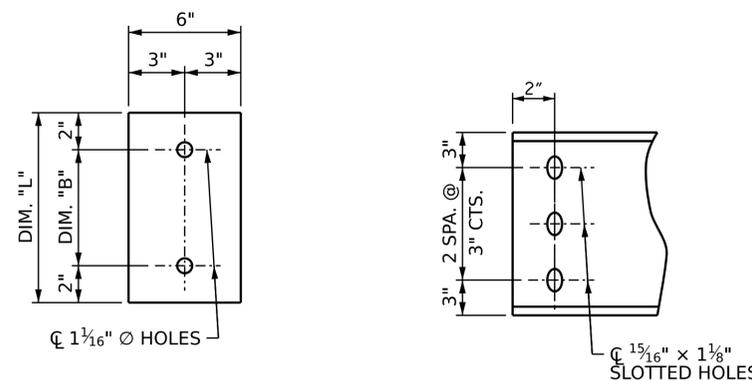
**CONNECTION DETAILS**



**CONNECTOR PLATE DETAILS**



**BOLT WITH DTI ASSEMBLY DETAIL**



**PLATE DETAILS**

**CHANNEL END**

(TYPE II GIRDER)

**TABLE**

GIRDER TYPE	CHANNEL SIZE	DIM. "A"	DIM. "B"	DIM. "L"
II	MC 12 x 31	1'-2½"	10"	1'-2"

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**



DocuSigned by:  
 P. Corey Newton  
 #F5E3B01431B407...  
 10/09/2023

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**INTERMEDIATE STEEL  
 DIAPHRAGMS FOR  
 TYPE II PRESTRESSED  
 CONCRETE GIRDERS**

DESIGN ENGINEER OF RECORD :  
 P. D. BRYANT DATE : 8/28/23

ASSEMBLED BY : P. K. NEWTON DATE : 2/7/23  
 CHECKED BY : P. D. BRYANT DATE : 8/28/23

DRAWN BY : TLA 6/05 REV. 5/1/06RRR KMM / GM  
 CHECKED BY : VC 6/05 REV. 10/1/11 MAA / GM  
 REV. 12/17 MAA / THC

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-15
2			4			TOTAL SHEETS 31

**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.

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.

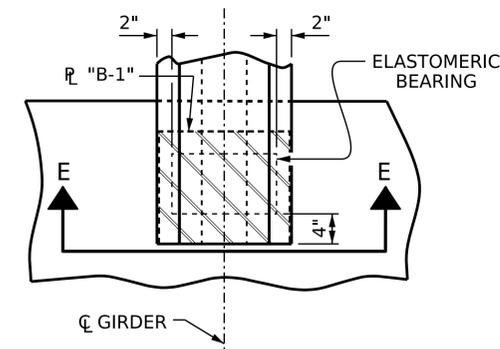
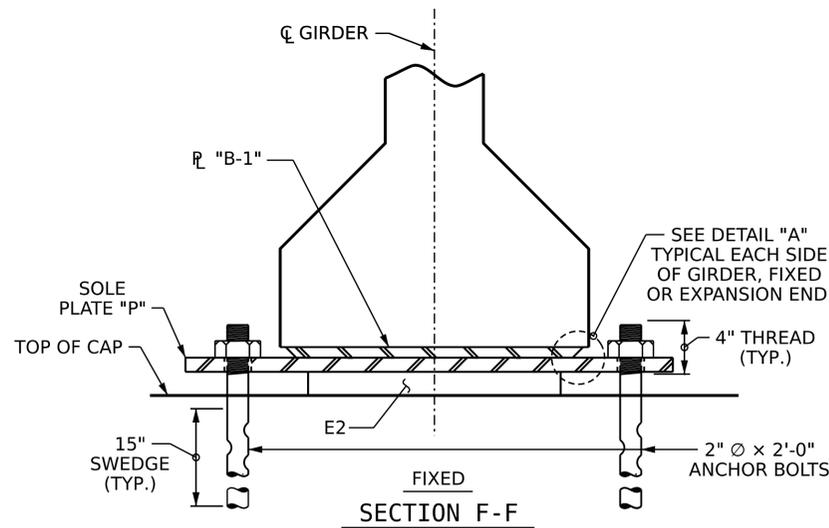
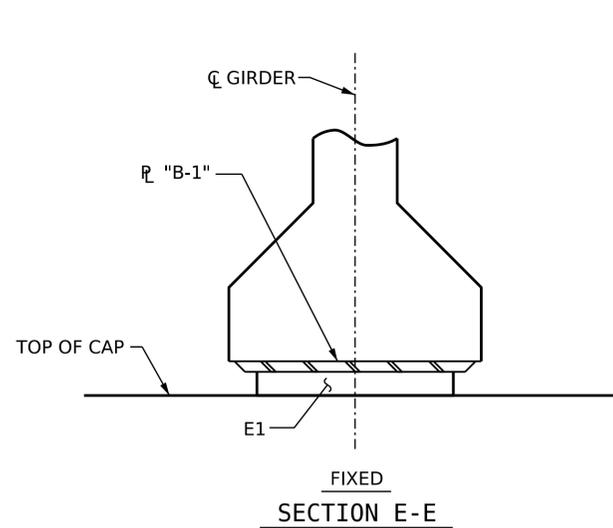
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

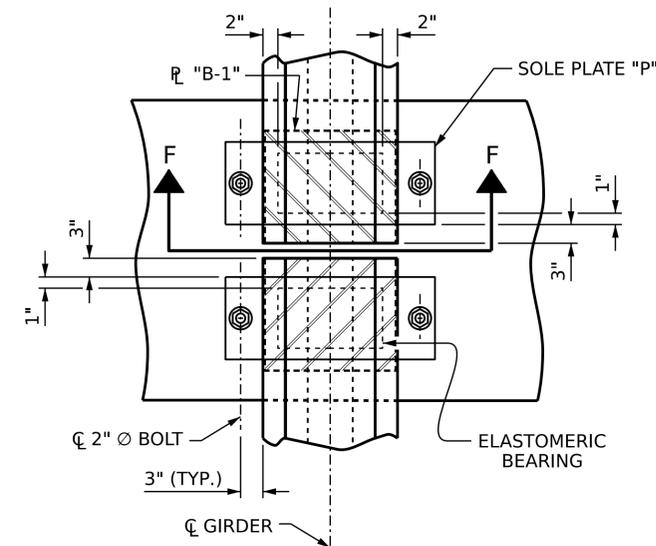
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

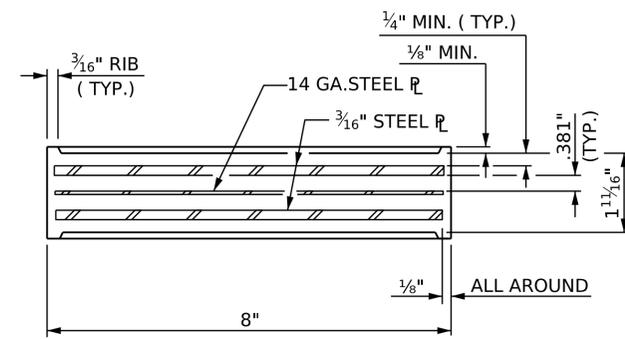
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



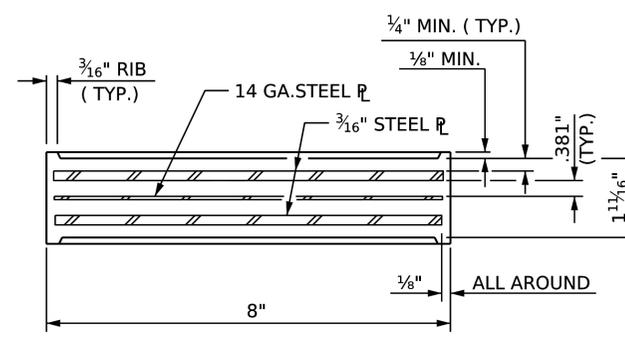
TYPICAL PART PLAN (SHOWING INTEGRAL END BENT)



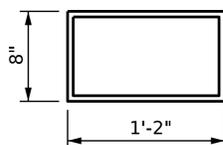
TYPICAL PART PLAN (SHOWING INTERIOR BENT)



TYPICAL SECTION OF ELASTOMERIC BEARINGS



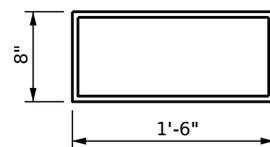
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

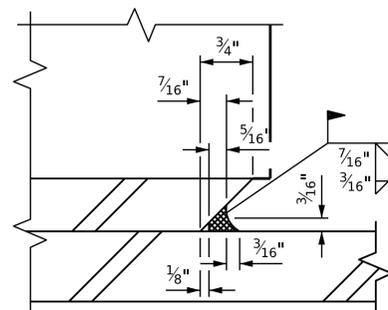
**TYPE II**



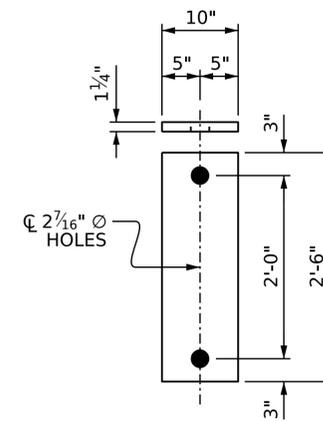
E2 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

**TYPE III**



DETAIL "A"



P1 (FIXED)

P1 (20 REQ'D)

**SOLE PLATE DETAILS ("P")**

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L. + L.L. (NO IMPACT)	
TYPE II	145 k
TYPE III	205 k



DocuSigned by:  
P. Corey Newton  
10/09/2023

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
STATION: **24+30.00 -L-**

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
**ELASTOMERIC BEARING DETAILS**  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

S-16	TOTAL SHEETS	31
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DESIGN ENGINEER OF RECORD:		
P. D. BRYANT		DATE: 8/28/23
ASSEMBLED BY: P. K. NEWTON		
DATE: 8/24/23		MAA / TMG
CHECKED BY: P. D. BRYANT		
DATE: 8/28/23		MAA / THC
DRAWN BY: WJH 8/89	REV. 1/15	MAA / TMG
CHECKED BY: CRK 8/89	REV. 12/17	MAA / THC
	REV. 10/21	BNB / AAI



NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" 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 1/8" 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.)

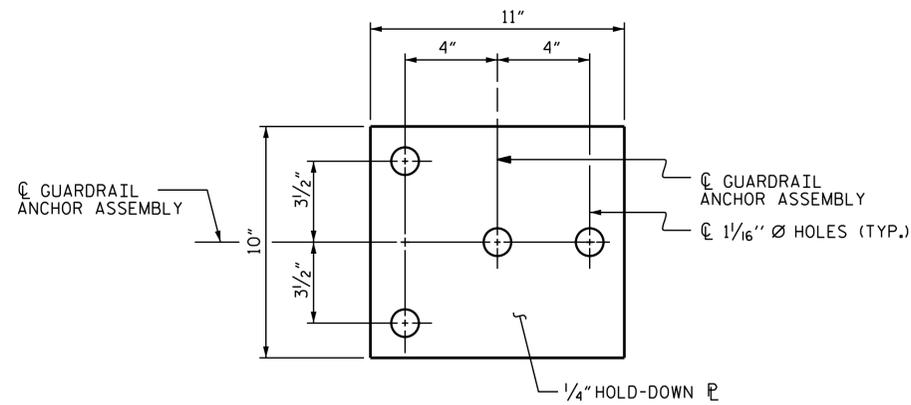
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

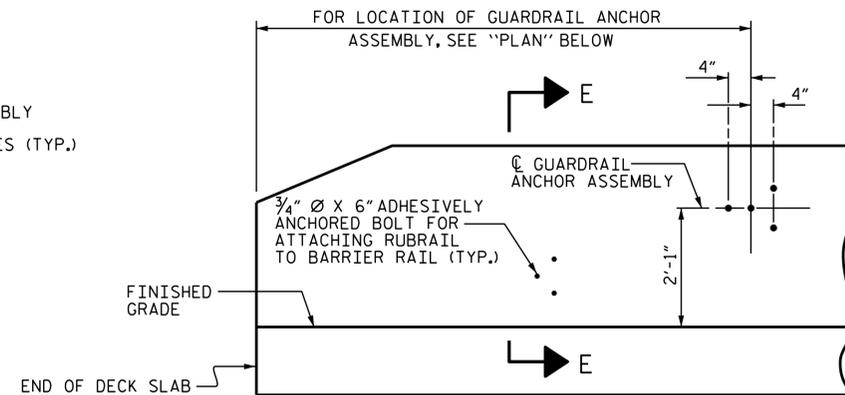
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

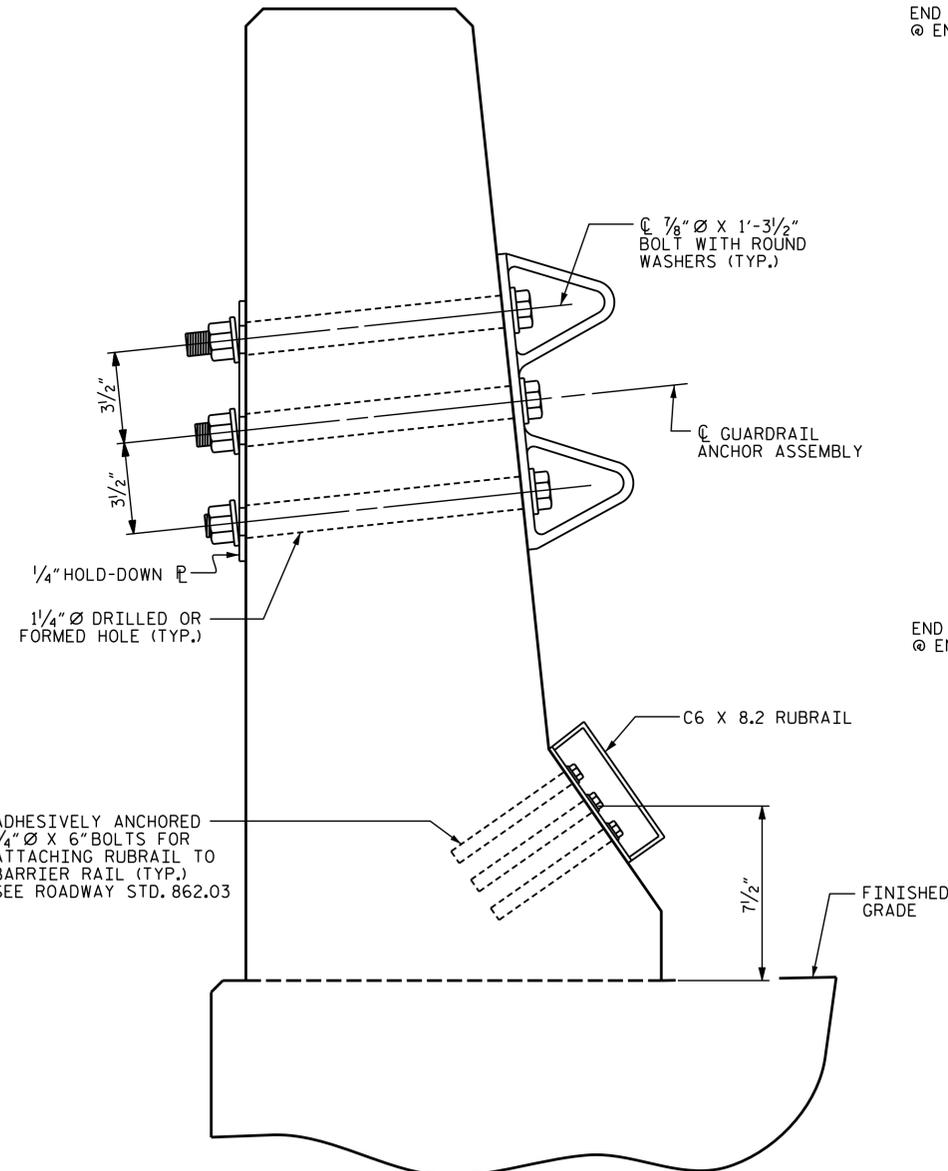
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



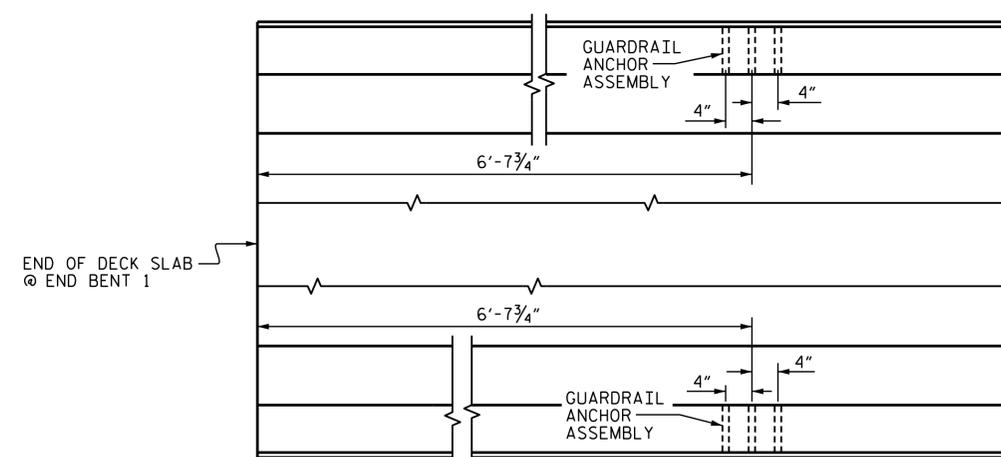
PLAN



ELEVATION



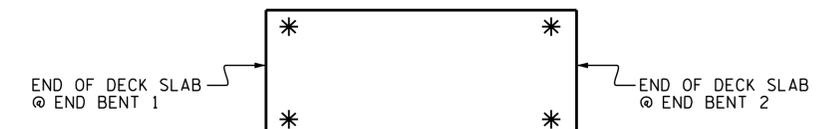
SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**



Designed by:  
 P. Corey Newton  
 10/09/2023

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

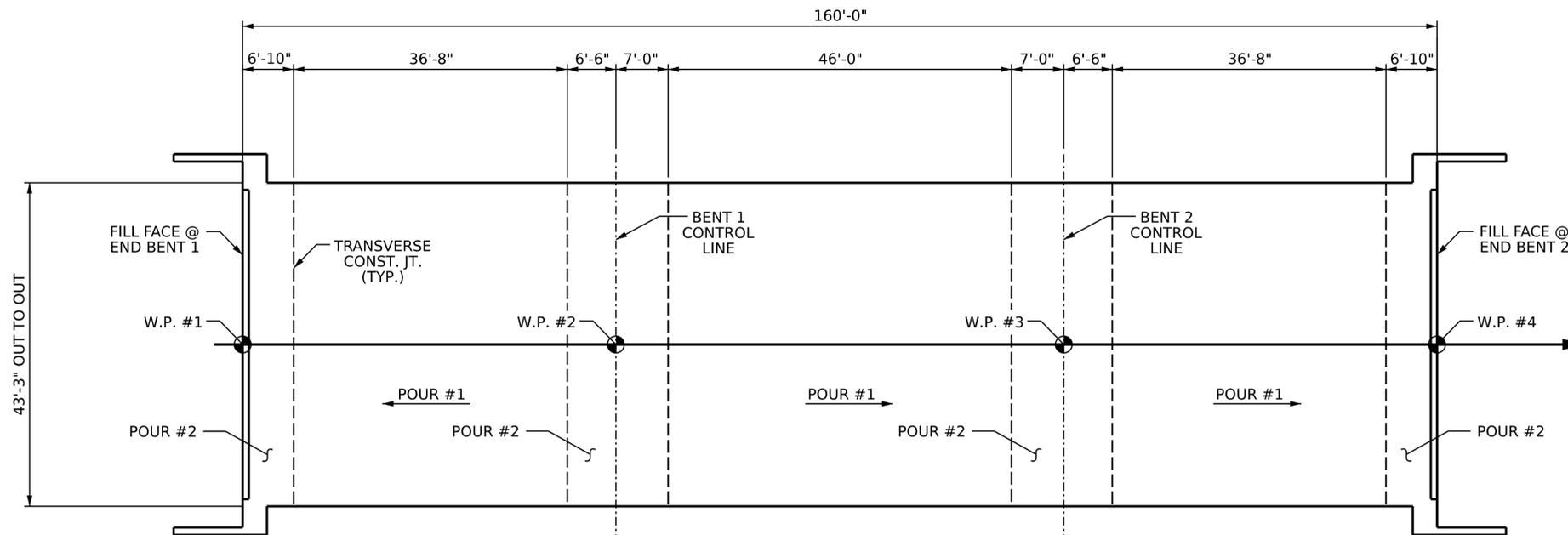
STANDARD  
**GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL**

ASSEMBLED BY : M. K. BEARD	DATE : 7/14/21
CHECKED BY : P. D. BRYANT	DATE : 1/12/23
DRAWN BY : TLA 5/06	REV. 7/12
CHECKED BY : GM 5/06	REV. 6/13
	REV. 12/17
	MAA/GM
	MAA/OM
	MAA/THC

10/9/2023  
 R:\Structures\Plans\401.037.BR-0046.SMU.GRA.S-18.810022.dgn  
 pknewton

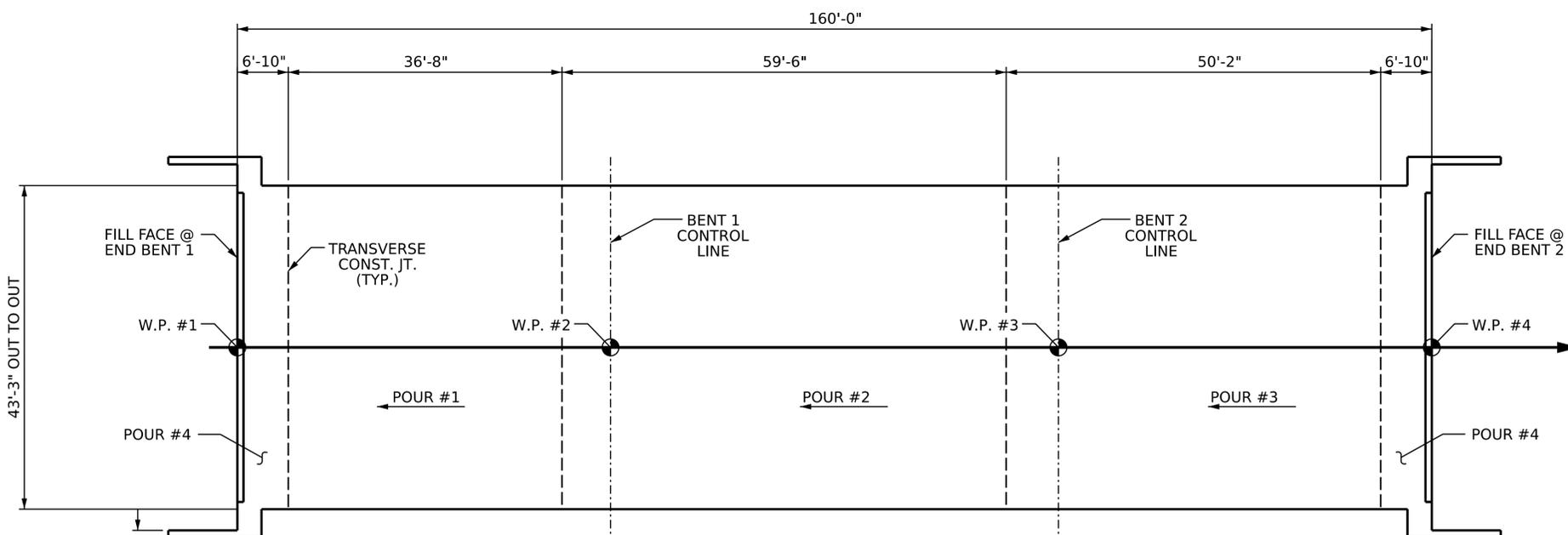
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			31



**OPTIONAL POURING SEQUENCE**

POUR #2 CANNOT BE STARTED UNTIL ADJACENT POUR #1 REACHES A MINIMUM OF 3,000 PSI



**POURING SEQUENCE**

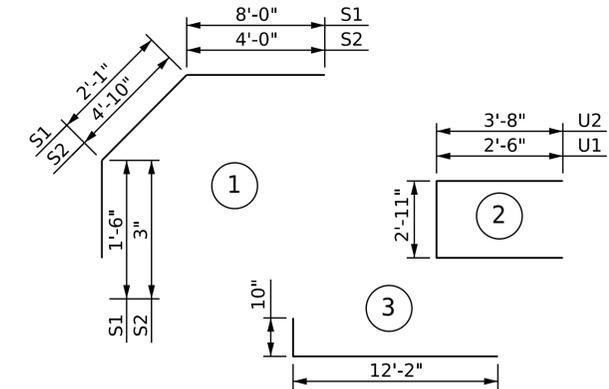
POURS CANNOT BE STARTED UNTIL AN ADJACENT POUR REACHES A MINIMUM OF 3,000 PSI

**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT. = 6996)**

**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	317	#5	STR	42'-11"	14190
A2	317	#5	STR	42'-11"	14190
* B1	150	#5	STR	30'-7"	4785
* B2	118	#7	STR	9'-10"	2372
* B3	58	#5	STR	43'-0"	2601
* B4	112	#5	STR	26'-6"	3096
B5	224	#5	STR	41'-0"	9579
B6	100	#5	STR	32'-0"	3338
H1	48	#5	3	13'-0"	651
K1	16	#4	STR	25'-3"	270
K2	8	#4	STR	7'-5"	158
K3	16	#4	STR	7'-11"	190
K4	8	#4	STR	8'-4"	45
K5	4	#4	STR	5'-1"	14
K6	8	#4	STR	5'-4"	29
K7	4	#4	STR	5'-7"	15
K8	16	#4	STR	2'-8"	29
K9	8	#4	STR	3'-8"	20
* S1	72	#4	1	11'-7"	557
* S2	72	#4	1	9'-1"	437
U1	76	#4	2	7'-11"	402
U2	8	#4	2	10'-3"	55
REINFORCING STEEL				28,747 LBS.	
* EPOXY COATED REINFORCING STEEL				28,011 LBS.	

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

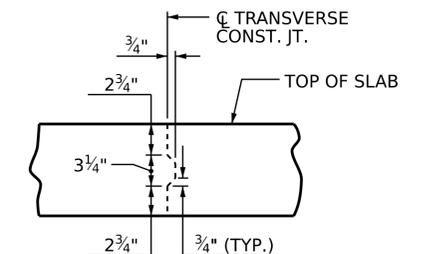
**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE ( CU.YDS.)	REINFORCING STEEL ( LBS.)	EPOXY COATED REINFORCING STEEL ( LBS.)
POUR 1	45.0	-	-
POUR 2	74.0	-	-
POUR 3	62.0	-	-
POUR 4	59.2	-	-
TOTALS**	240.2	28,747	28,011

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1850.0	SQ.FT.
BRIDGE DECK	5858.0	SQ.FT.
TOTAL	7708.0	SQ.FT.



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	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. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD SUPERSTRUCTURE BILL OF MATERIAL**

ASSEMBLED BY : D.SHACKELFORD	DATE : 8/25/23
CHECKED BY : K.W.ALFORD	DATE : 9/13/23
DRAWN BY : JMB 5/87	REV. 12/17 MAA/THC
CHECKED BY : SJD 9/87	REV. 06/19 BNB/THC
	REV. 11/22 BNB/THC

10/9/2023  
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 pknewton

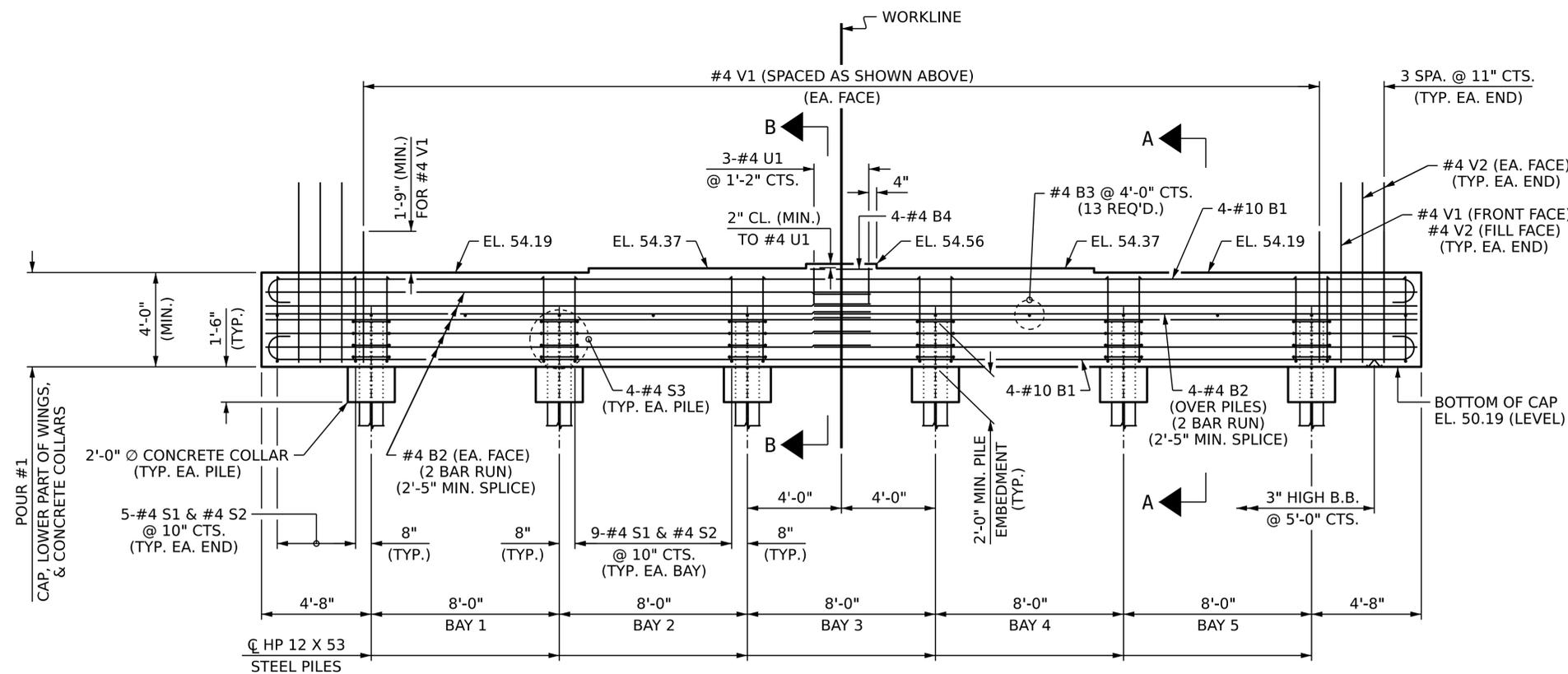
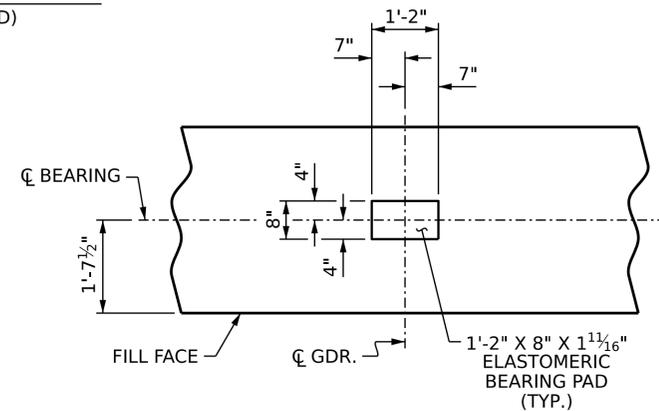
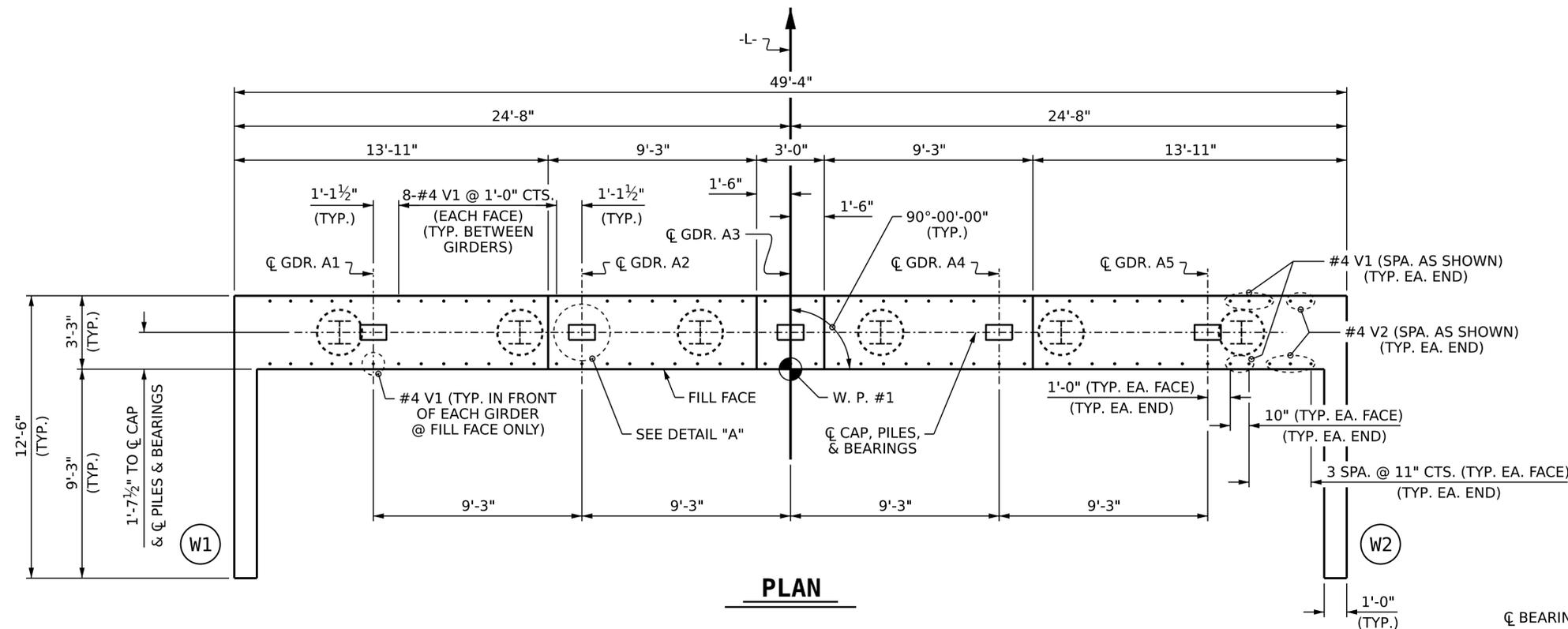
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STD. NO. BOM2

**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 "V" BARS.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREAS, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE INTEGRAL CAP AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE PLAN OF SPANS SHEETS FOR DETAILS.



WINGS NOT SHOWN FOR CLARITY.

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 1 OF 3

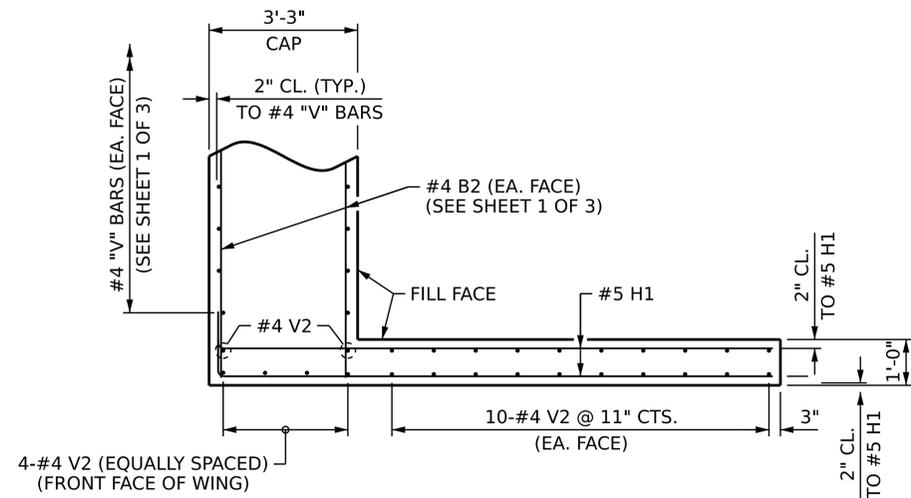


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL END BENT 1**

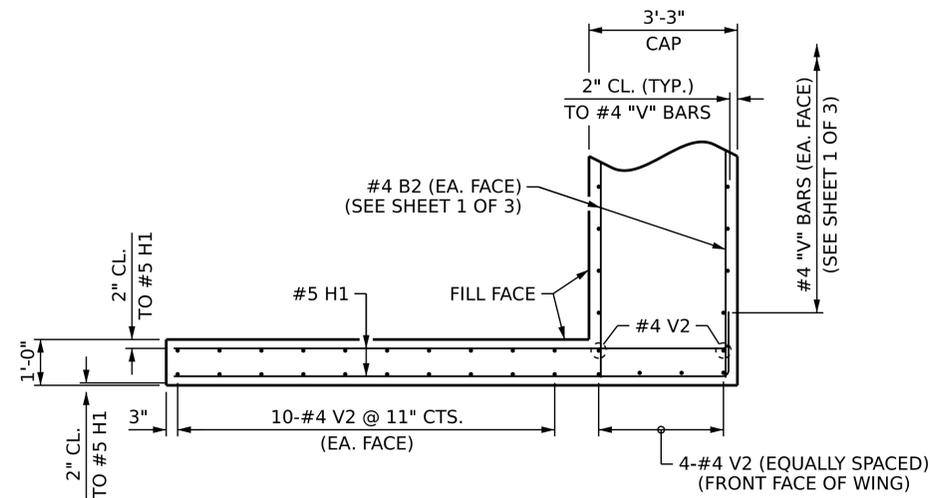
DRAWN BY : P. K. NEWTON DATE : 8/31/23  
 CHECKED BY : P. D. BRYANT DATE : 9/12/23  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 9/12/23

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

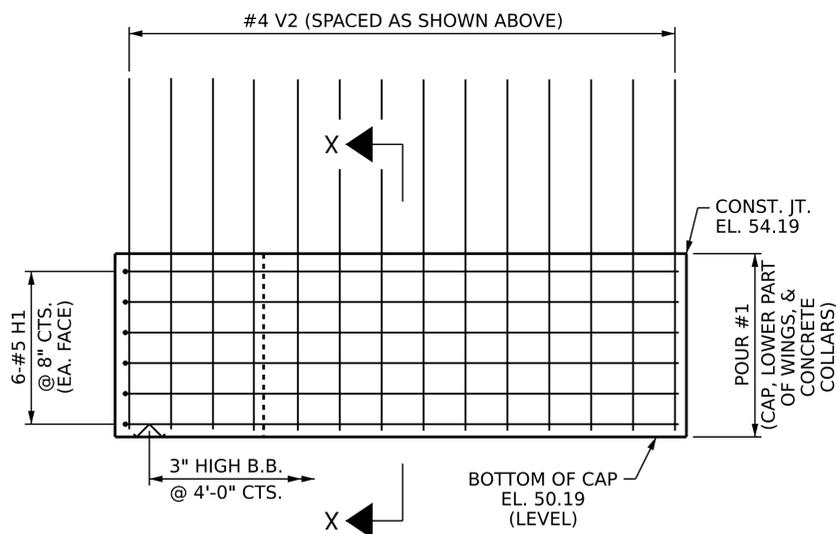
REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.
1			S-20
2			TOTAL SHEETS
			31



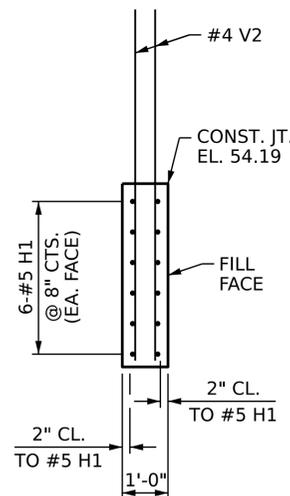
**PLAN OF WING W1**



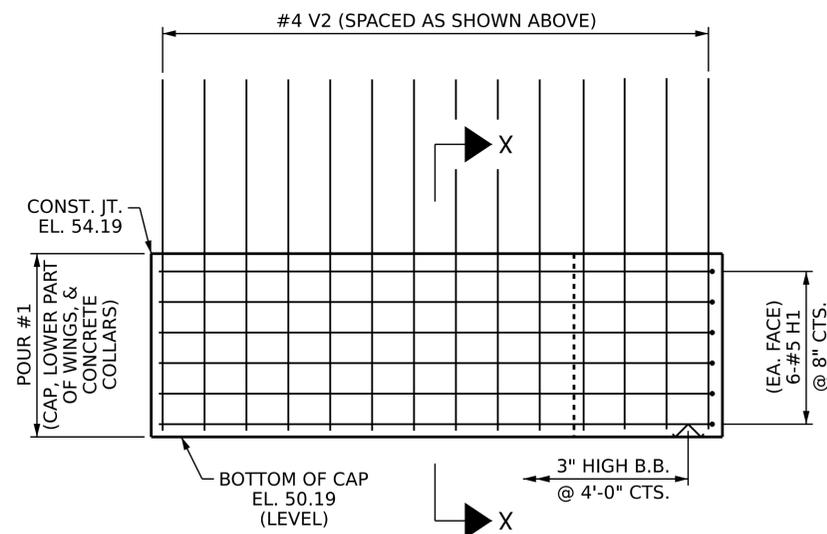
**PLAN OF WING W2**



**ELEVATION OF WING W1**



**SECTION X-X**



**ELEVATION OF WING W2**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

SHEET 2 OF 3



DocuSigned by:  
**P. Corey Newton**  
 4FEE38D14319407  
 10/09/2023

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

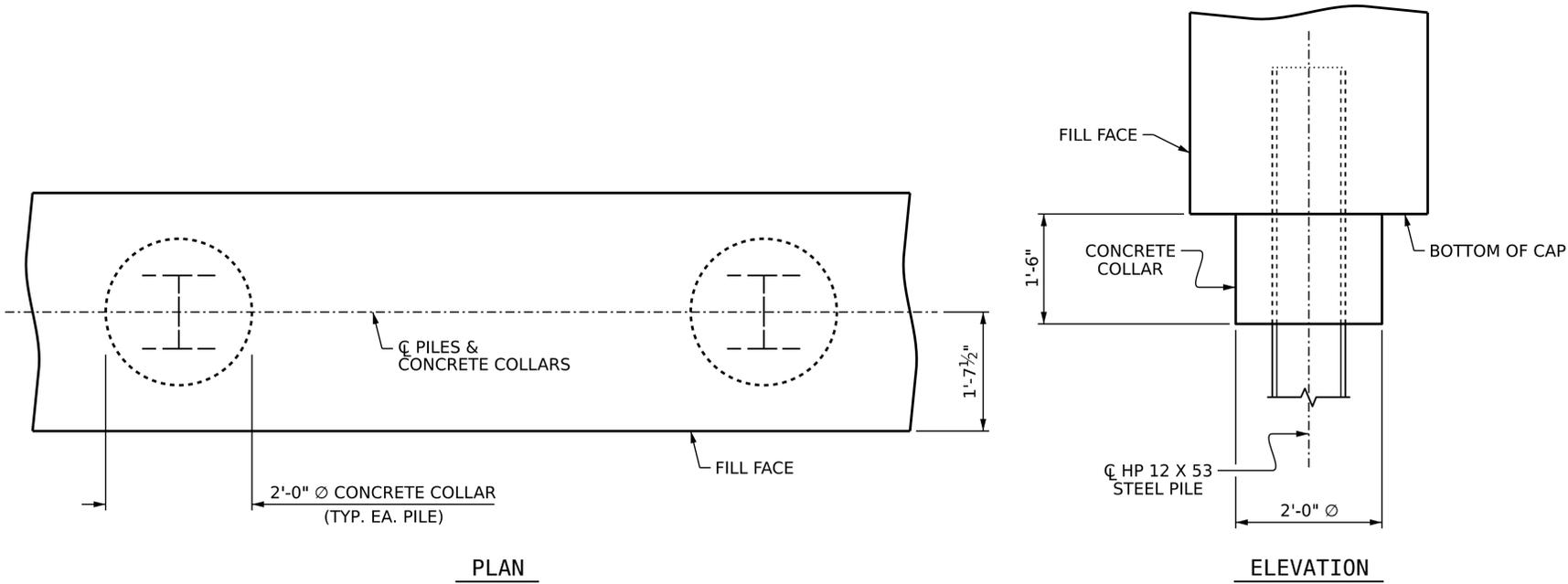
**INTEGRAL END BENT 1**

DRAWN BY : **P. K. NEWTON** DATE : **8/31/23**  
 CHECKED BY : **P. D. BRYANT** DATE : **9/12/23**  
 DESIGN ENGINEER OF RECORD : **P. D. BRYANT** DATE : **9/12/23**

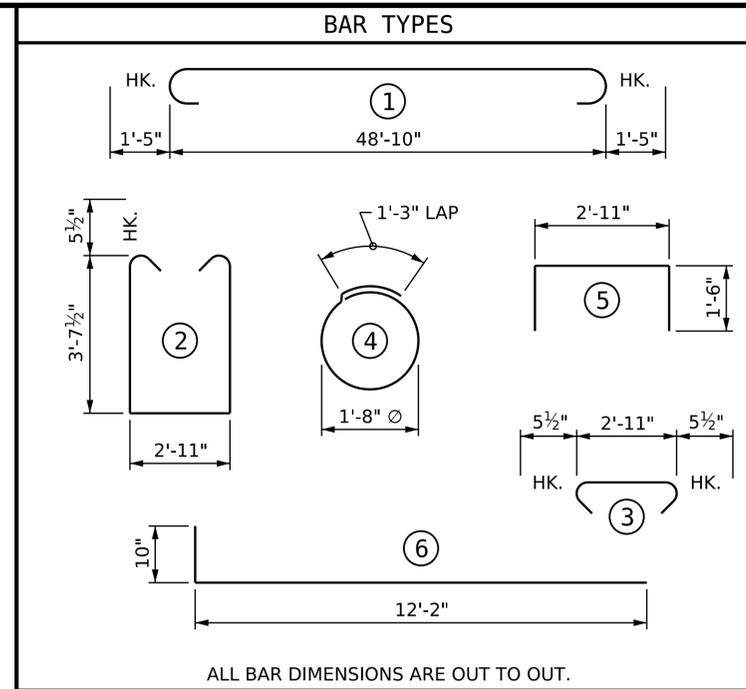
10/9/2023  
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 pknewton

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

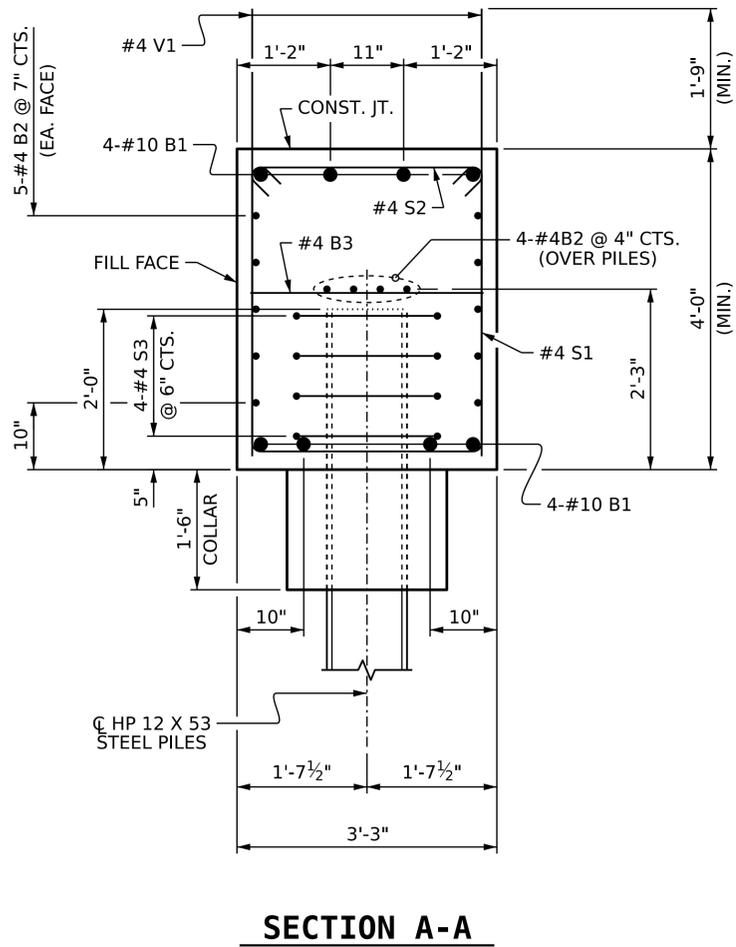
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			31



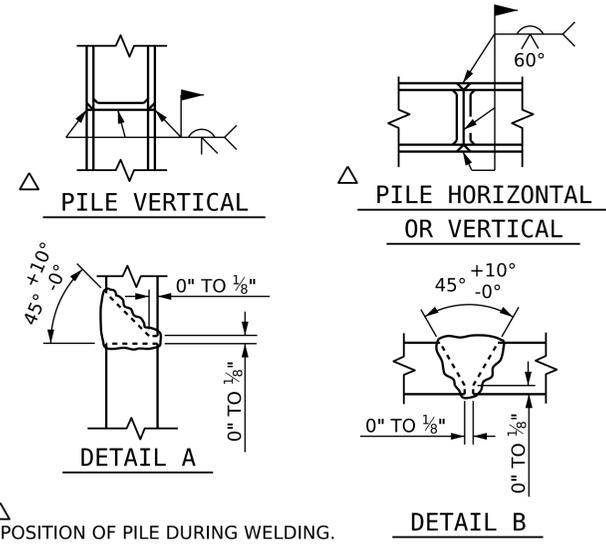
**CORROSION PROTECTION FOR STEEL PILES DETAIL**



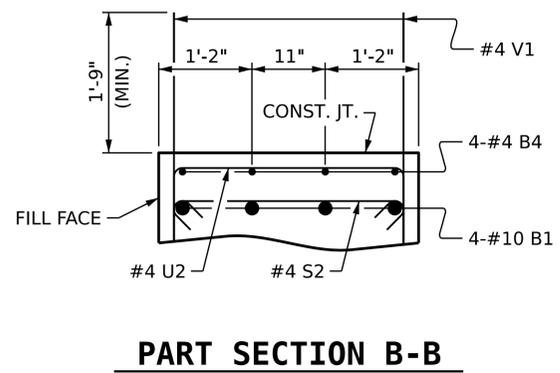
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10		51'-8"	1,779
B2	28	#4	STR	25'-9"	482
B3	13	#4	STR	2'-11"	25
B4	4	#4	STR	2'-8"	7
H1	24	#5	6	13'-0"	325
S1	53	#4	2	11'-1"	392
S2	53	#4	3	3'-10"	136
S3	24	#4	4	6'-6"	104
U1	3	#4	5	5'-11"	12
V1	79	#4	STR	5'-7"	295
V2	62	#4	STR	7'-8"	318
REINFORCING STEEL					3,875 LBS.
CLASS A CONCRETE					
POUR 1	(CAP, COLLARS & LOWER WINGS)				26.7 C. Y.
TOTAL					26.7 C. Y.



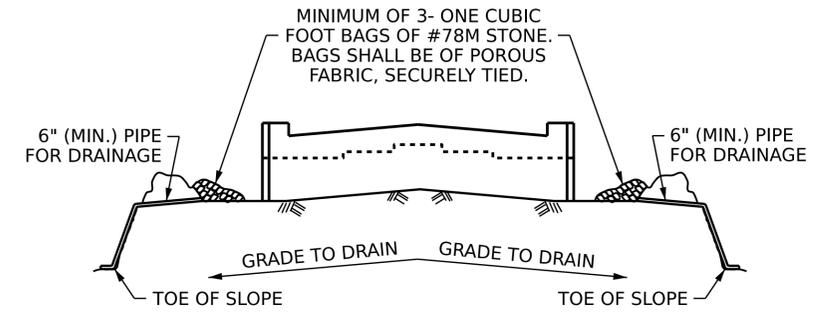
**SECTION A-A**



**PILE SPLICE DETAILS**



**PART SECTION B-B**



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**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL END BENT 1**

DRAWN BY : P. K. NEWTON DATE : 9/6/23  
 CHECKED BY : P. D. BRYANT DATE : 9/12/23  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 9/12/23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-22
2			4			31

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

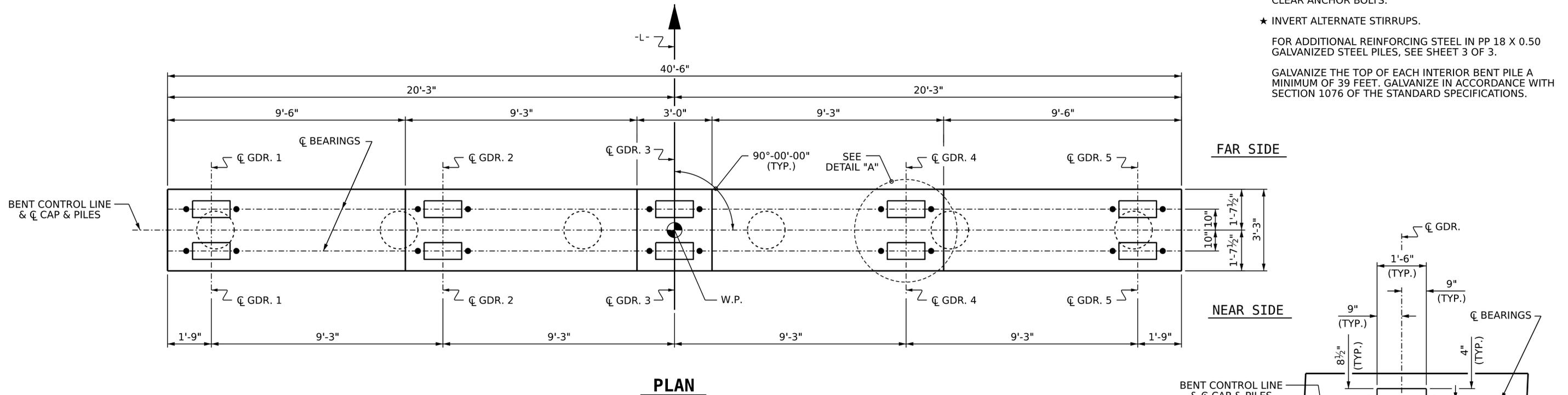
**NOTES**

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

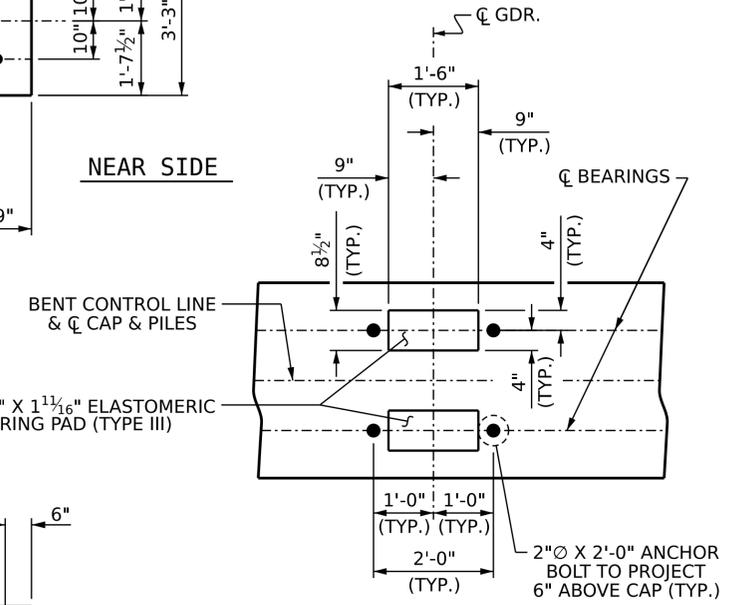
★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 X 0.50 GALVANIZED STEEL PILES, SEE SHEET 3 OF 3.

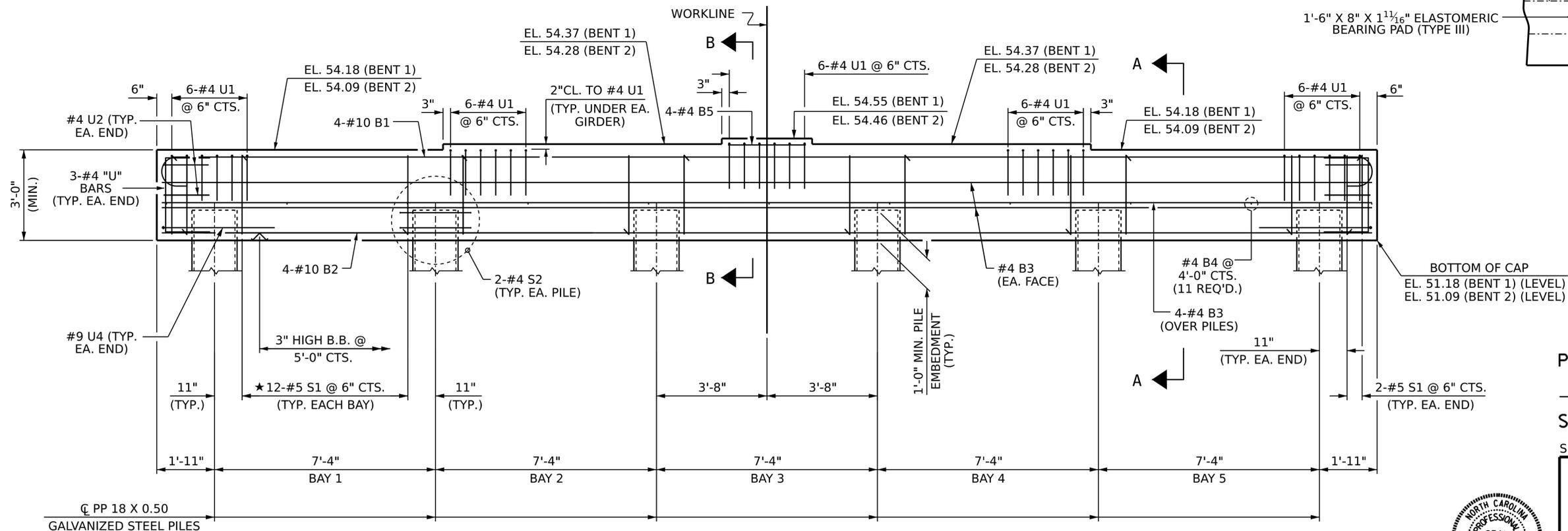
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 39 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



**PLAN**



**DETAIL "A"**  
(TYP. EA. GDR.)



**ELEVATION**

FOR SECTION A-A & B-B, SEE SHEET 2 OF 3

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**BENTS 1 & 2**

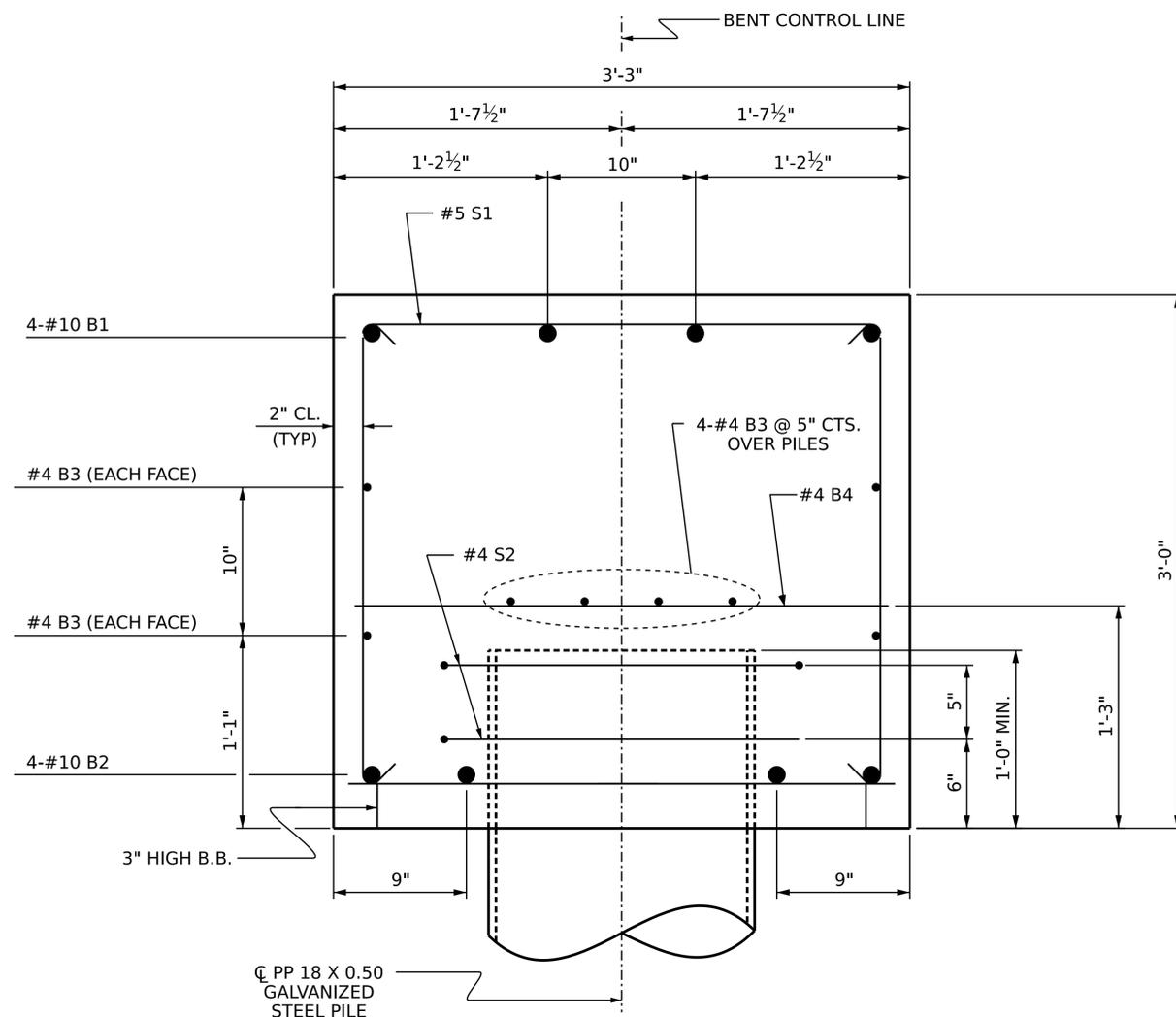


Designed by:  
 P. Corey Newton  
 10/09/2023

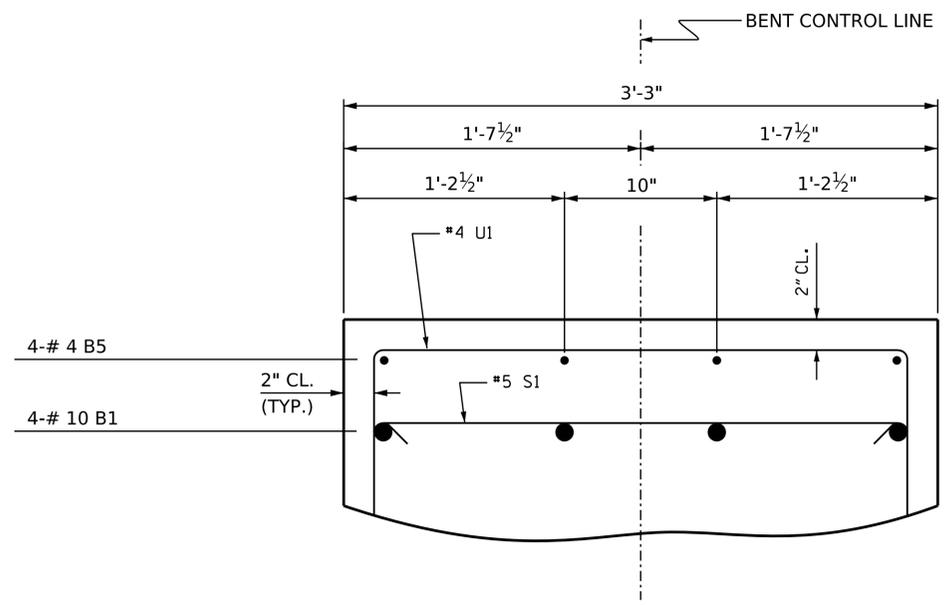
DRAWN BY : P. D. BRYANT DATE : 8/31/22  
 CHECKED BY : D. R. SHACKELFORD DATE : 8/31/22  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 9/13/23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			31

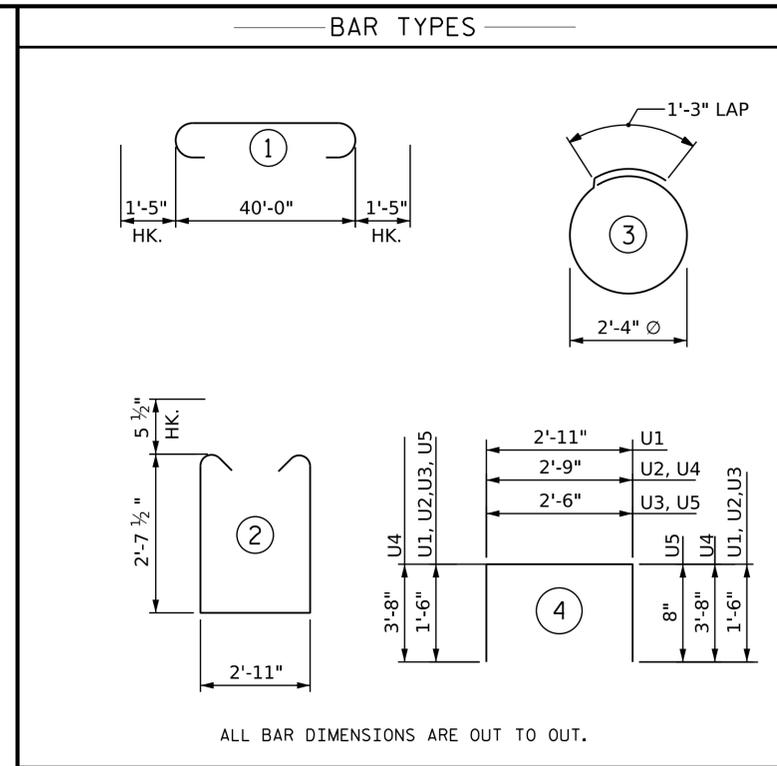
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**SECTION A-A**



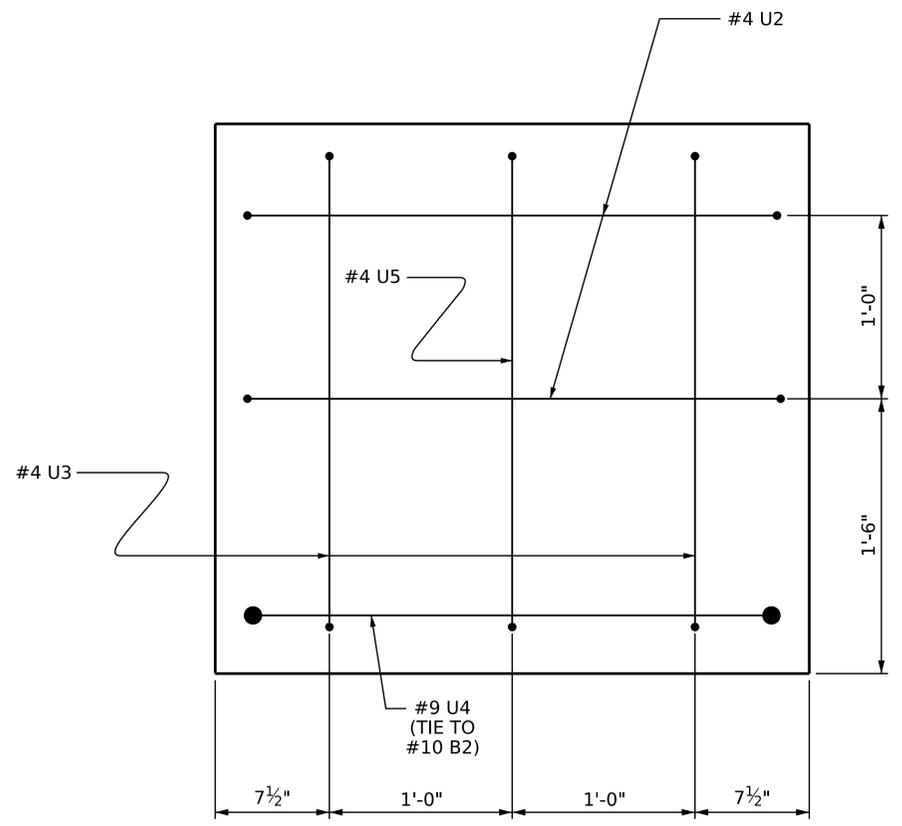
**SECTION B-B**



ALL BAR DIMENSIONS ARE OUT TO OUT.

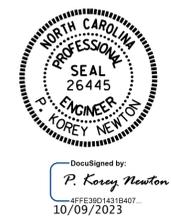
BILL OF MATERIAL					
FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	42'-10"	737
B2	4	#10	STR	40'-2"	691
B3	8	#4	STR	40'-0"	214
B4	11	#4	STR	2'-11"	21
B5	4	#4	STR	2'-8"	7
S1	64	#5	2	9'-1"	606
S2	12	#4	3	8'-7"	69
U1	30	#4	4	5'-11"	119
U2	4	#4	4	5'-9"	15
U3	4	#4	4	5'-6"	15
U4	2	#9	4	10'-1"	69
U5	2	#4	4	4'-8"	6
REINFORCING STEEL (FOR ONE BENT)					2569 LBS
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
TOTAL CLASS A CONCRETE					▲ 14.5 C.Y.

▲ CONCRETE DISPLACED BY THE 18" STEEL PIPE PILE HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



**END OF CAP VIEW**  
(TYPICAL BOTH ENDS)

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 2 OF 3

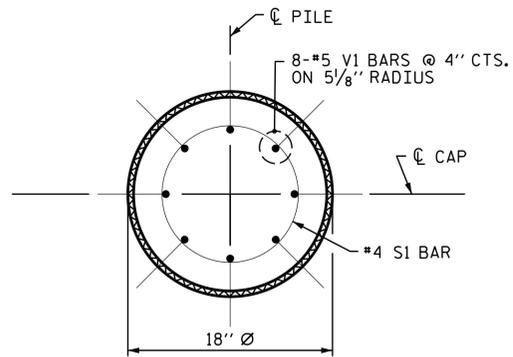


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENTS 1 & 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

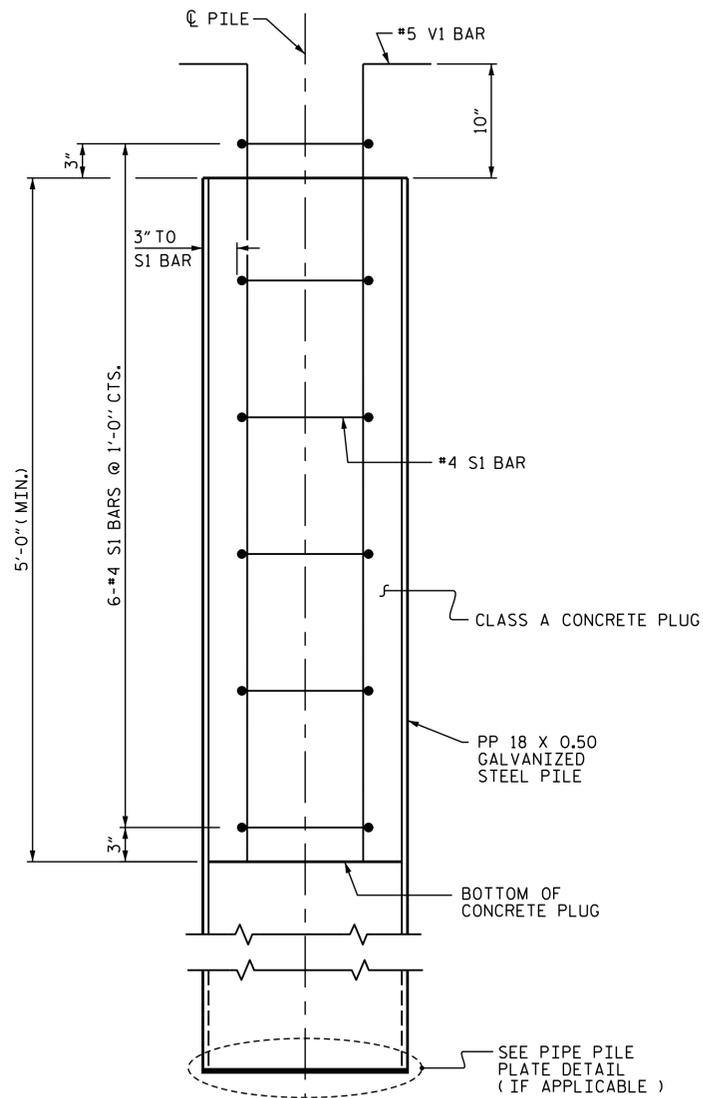
DRAWN BY : P. D. BRYANT DATE : 8/31/22  
 CHECKED BY : D. R. SHACKELFORD DATE : 8/31/22  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 9/13/23

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

SHEET NO.	
S-24	31

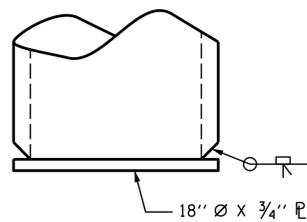


PLAN

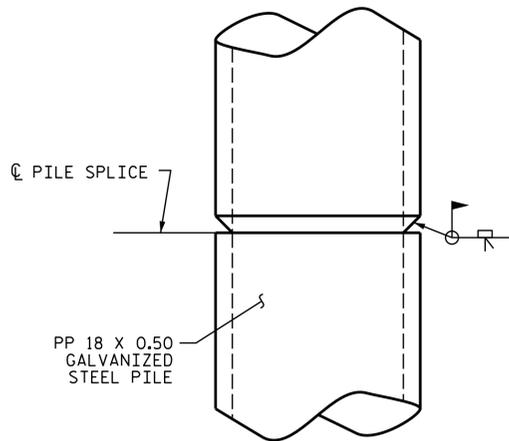


ELEVATION

PP 18 X 0.50 GALVANIZED STEEL PILE  
(CLOSED END)



PIPE PILE PLATE DETAIL  
(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

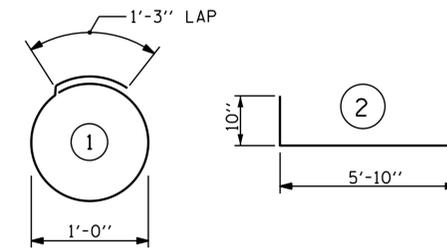
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE  
PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =				74	lbs

CLASS A CONCRETE	
5'-0" MINIMUM PLUG	0.3 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
**18" STEEL PIPE PILE**



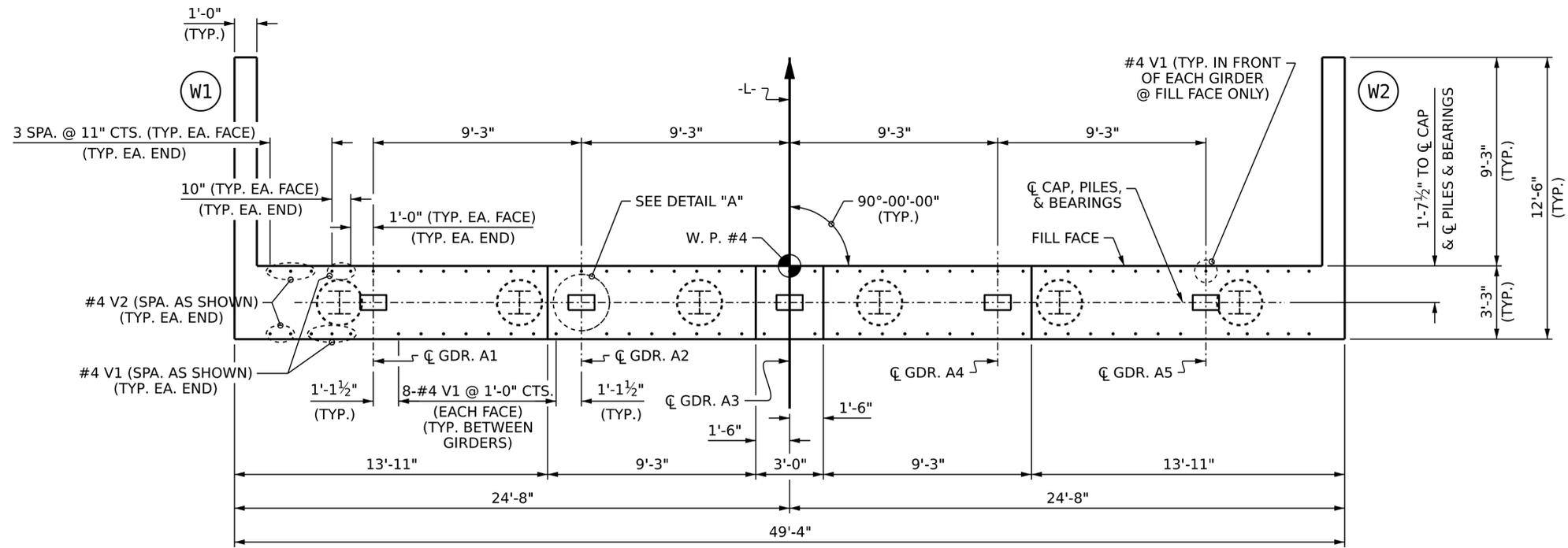
DocuSigned by:  
P. Corey Newton  
#F9E3B01431B407...  
10/09/2023

ASSEMBLED BY : P, D. BRYANT DATE : 9/27/22  
CHECKED BY : M, K. BEARD DATE : 2/20/23

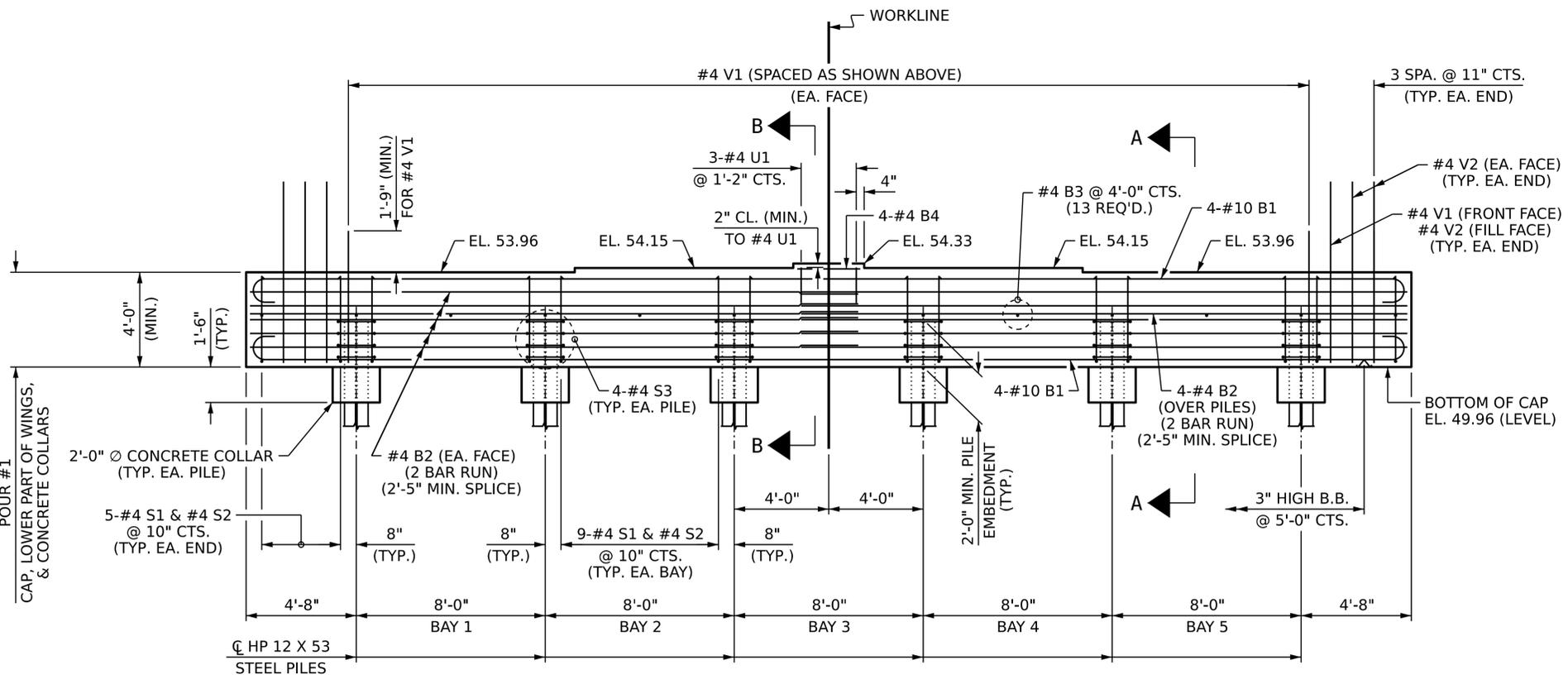
DRAWN BY : RWW 1/01 REV. 5/1/06R MAA/KMM  
CHECKED BY : LES 1/01 REV. 10/1/11 MAA/GM  
REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			31



**PLAN**

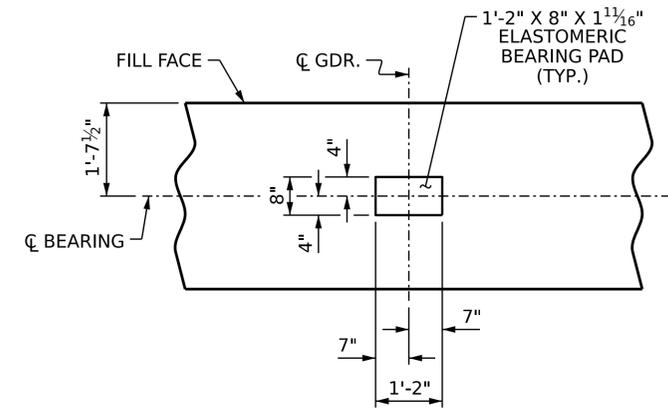


**ELEVATION**

WINGS NOT SHOWN FOR CLARITY.

**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 "V" BARS.
- THE TOP SURFACE OF THE END BENT CAP WINGS, EXCEPT THE BEARING AREAS, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE INTEGRAL CAP AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE PLAN OF SPANS SHEETS FOR DETAILS.



**DETAIL "A"**  
(TYP. EA. GDR.)

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**  
 SHEET 1 OF 3



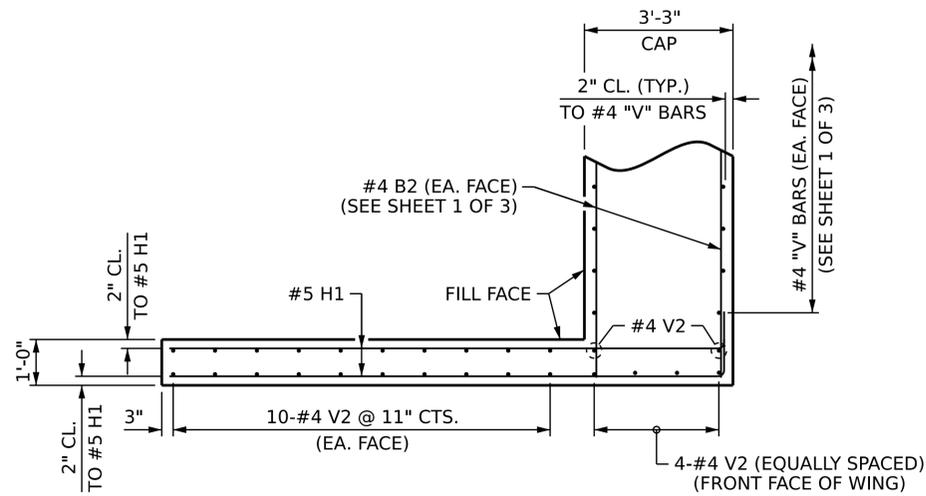
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL END BENT 2**

DRAWN BY : P. K. NEWTON DATE : 8/31/23  
 CHECKED BY : P. D. BRYANT DATE : 9/12/23  
 DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 9/12/23

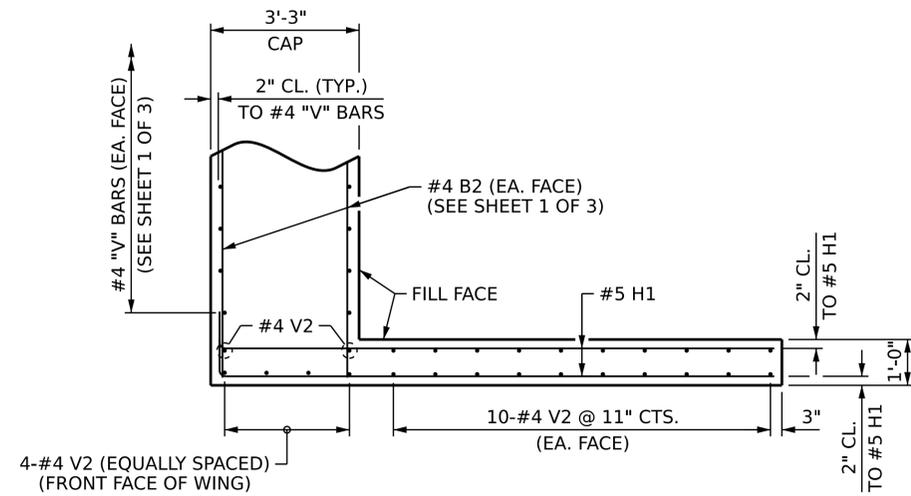
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 SIGNATURES COMPLETED

REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.
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2			4

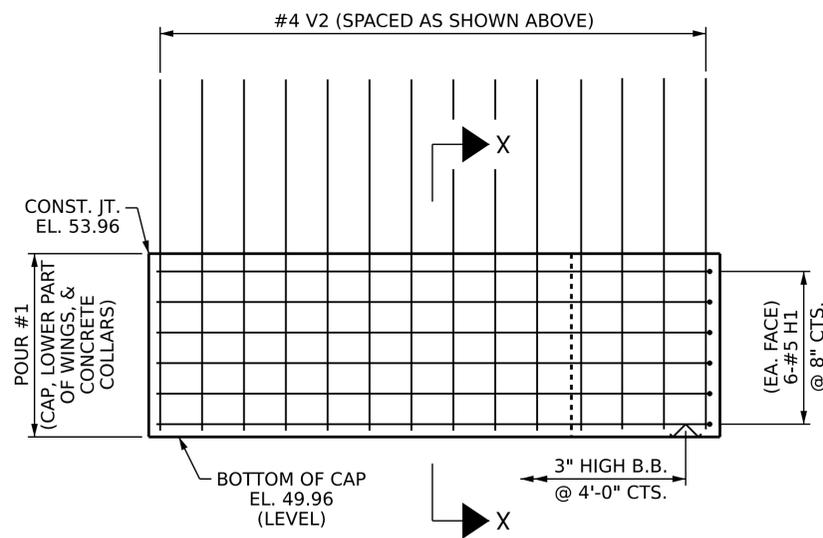
TOTAL SHEETS	
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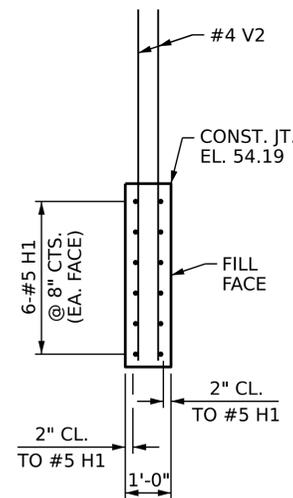
**PLAN OF WING W1**



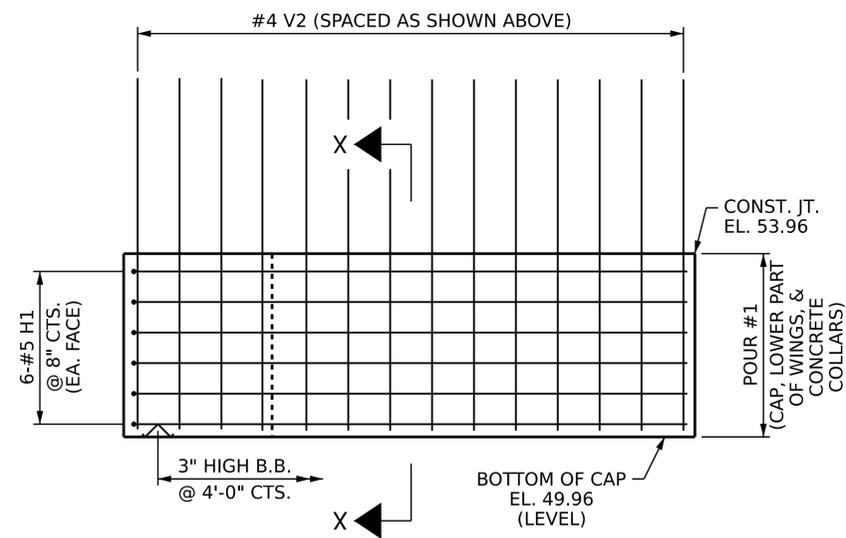
**PLAN OF WING W2**



**ELEVATION OF WING W1**



**SECTION X-X**



**ELEVATION OF WING W2**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

SHEET 2 OF 3



Drawn/Checked by:  
**P. Corey Newton**  
 10/09/2023

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

**INTEGRAL END BENT 2**

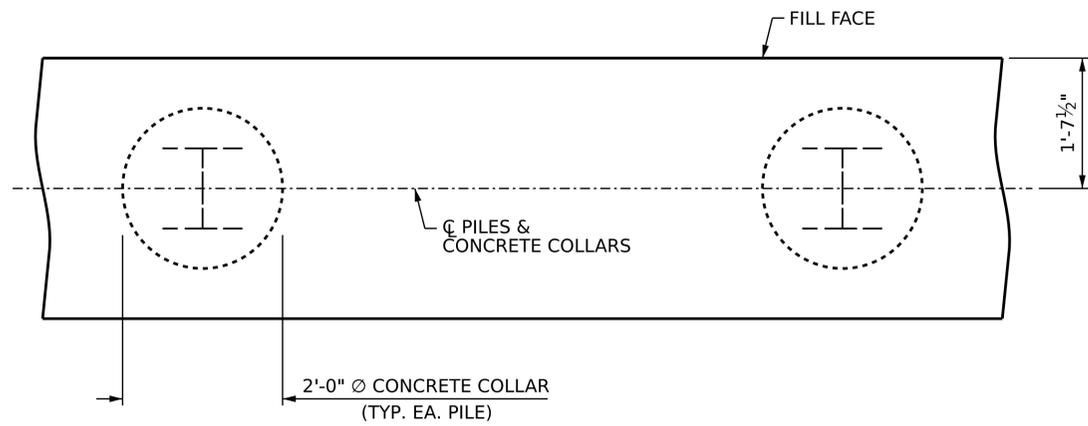
DRAWN BY : **P. K. NEWTON** DATE : **8/31/23**  
 CHECKED BY : **P. D. BRYANT** DATE : **9/12/23**  
 DESIGN ENGINEER OF RECORD : **P. D. BRYANT** DATE : **9/12/23**

10/9/2023  
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 pknewton

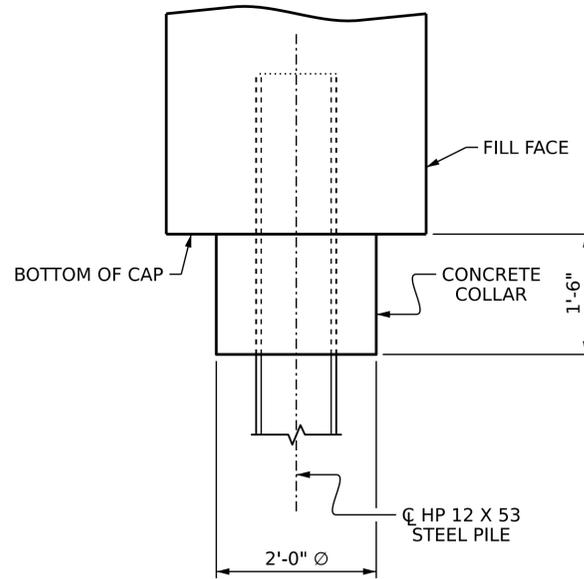
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:
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TOTAL SHEETS: 31

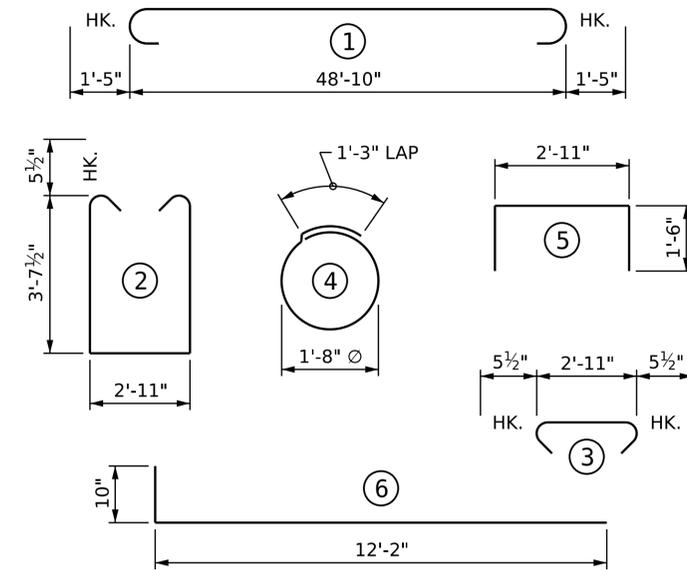


PLAN



ELEVATION

BAR TYPES

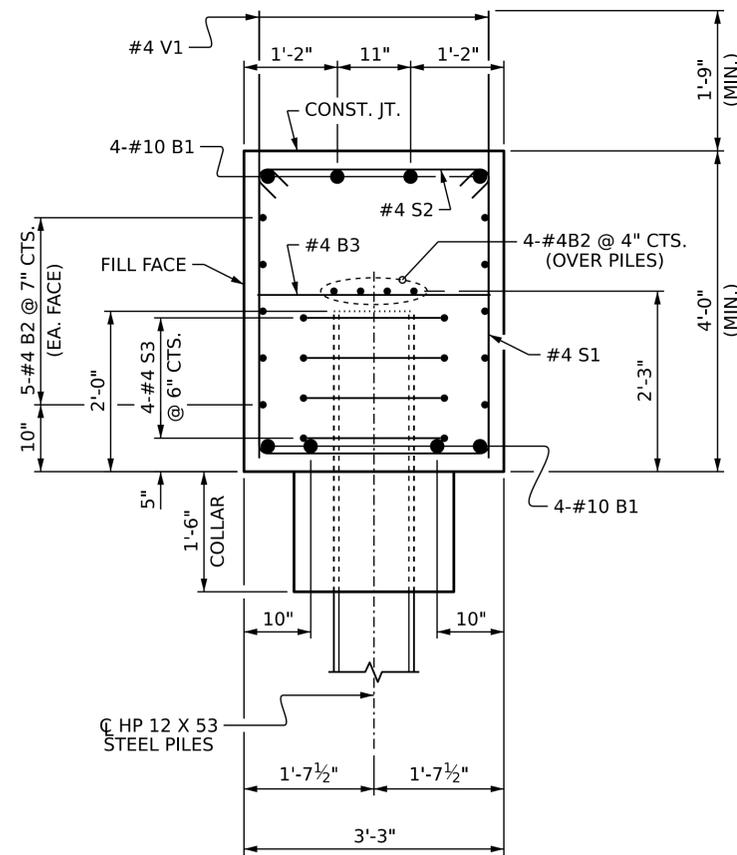


ALL BAR DIMENSIONS ARE OUT TO OUT.

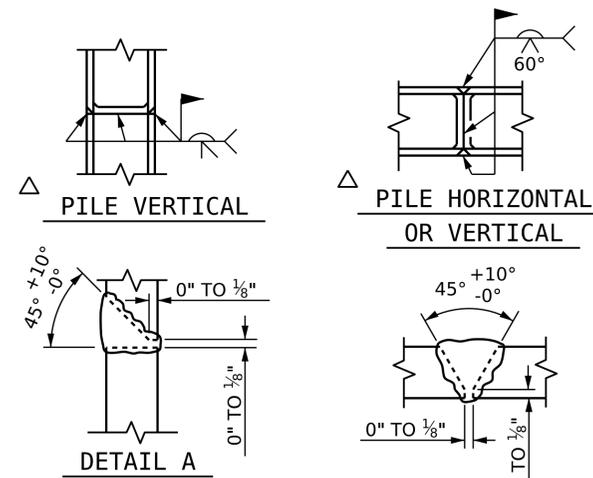
BILL OF MATERIAL

END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10		51'-8"	1,779
B2	28	#4	STR	25'-9"	482
B3	13	#4	STR	2'-11"	25
B4	4	#4	STR	2'-8"	7
H1	24	#5	6	13'-0"	325
S1	53	#4	2	11'-1"	392
S2	53	#4	3	3'-10"	136
S3	24	#4	4	6'-6"	104
U1	3	#4	5	5'-11"	12
V1	79	#4	STR	5'-7"	295
V2	62	#4	STR	7'-8"	318
REINFORCING STEEL					3,875 LBS.
CLASS A CONCRETE					
POUR 1	(CAP, COLLARS & LOWER WINGS)				27.6 C. Y.
TOTAL					27.6 C. Y.

**CORROSION PROTECTION FOR STEEL PILES DETAIL**

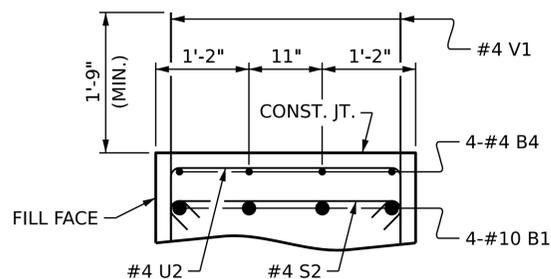


SECTION A-A

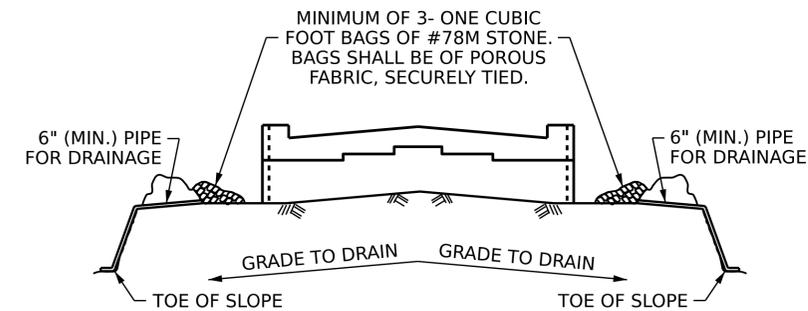


**PILE SPLICE DETAILS**

POSITION OF PILE DURING WELDING.



PART SECTION B-B



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**

PROJECT NO. **BR-0046**

**SAMPSON** COUNTY

STATION: **24+30.00 -L-**

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

**INTEGRAL END BENT 2**

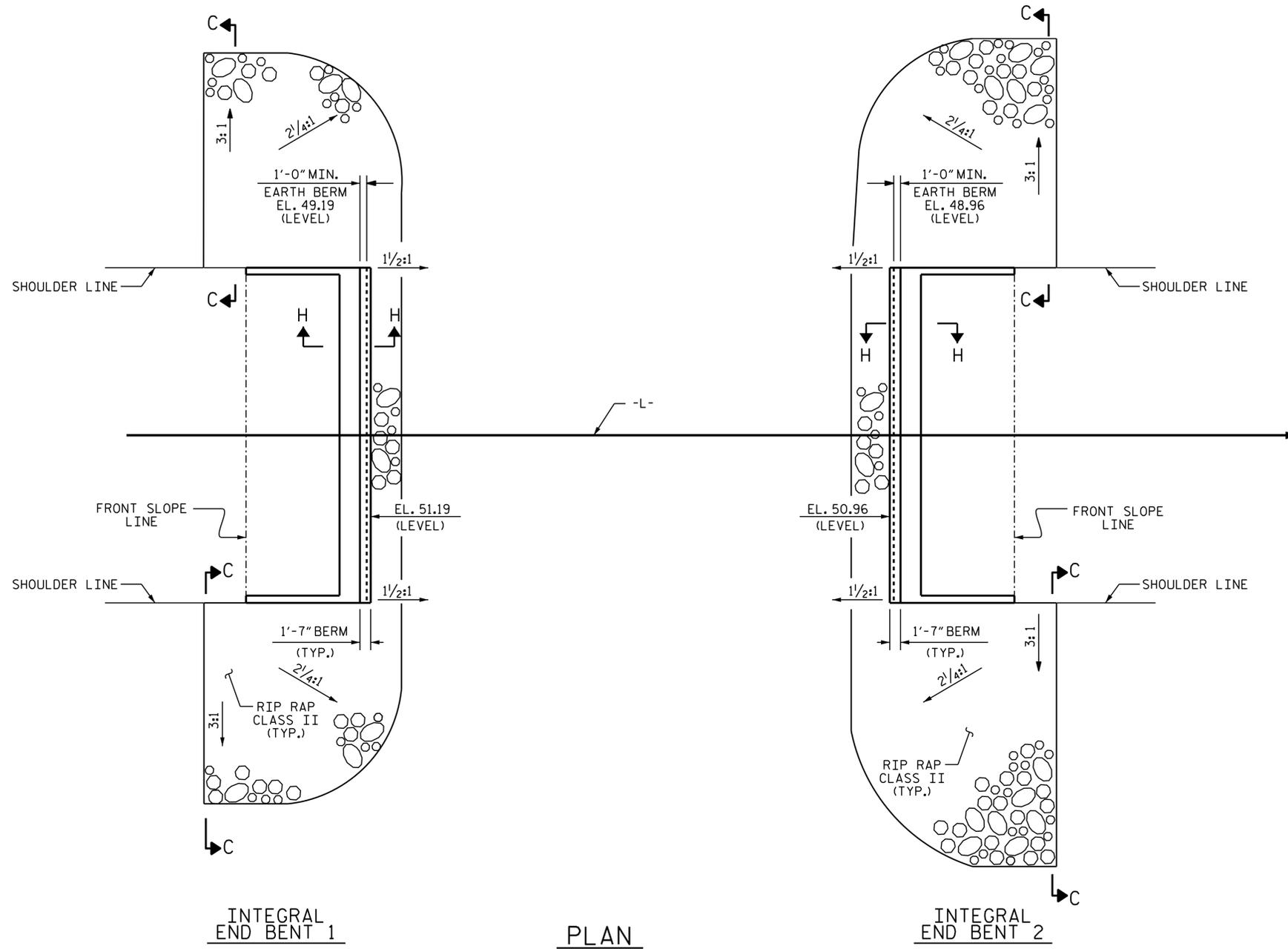
DRAWN BY : P. K. NEWTON DATE : 9/6/23  
CHECKED BY : P. D. BRYANT DATE : 9/12/23  
DESIGN ENGINEER OF RECORD : P. D. BRYANT DATE : 9/12/23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

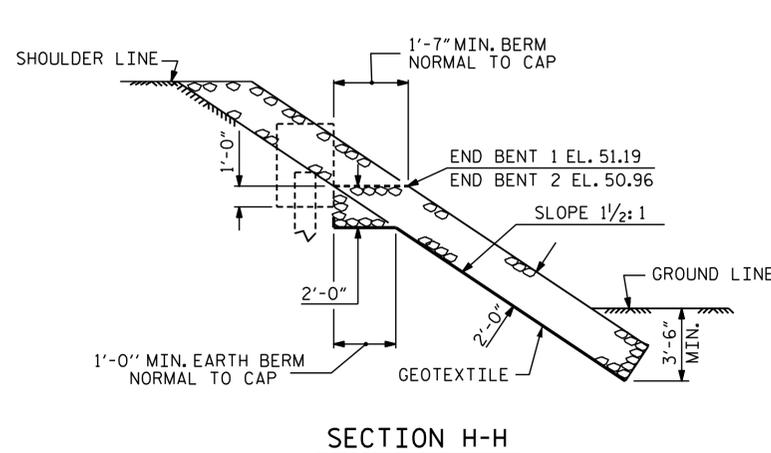
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NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

S-28  
TOTAL SHEETS  
31

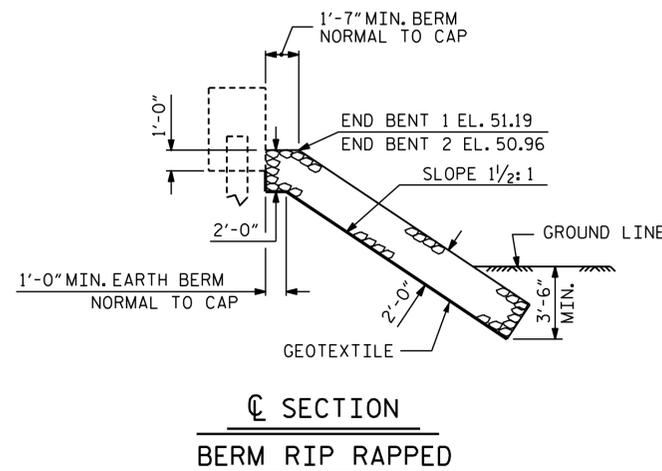
NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



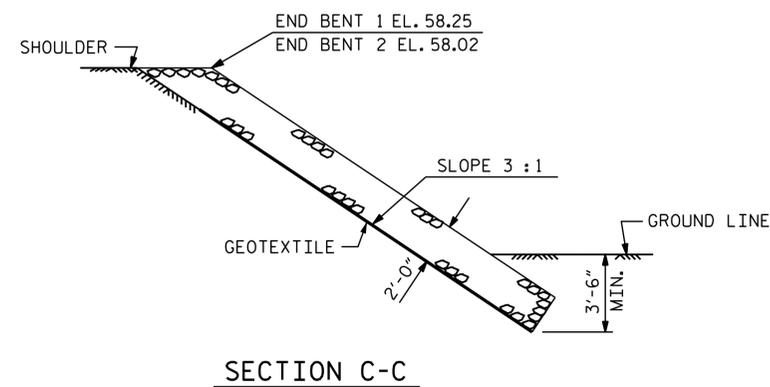
ESTIMATED QUANTITIES		
BRIDGE @ STA. 24+30.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	265	295
END BENT 2	260	290



SECTION H-H



SECTION C-C  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
STATION: **24+30.00 -L-**



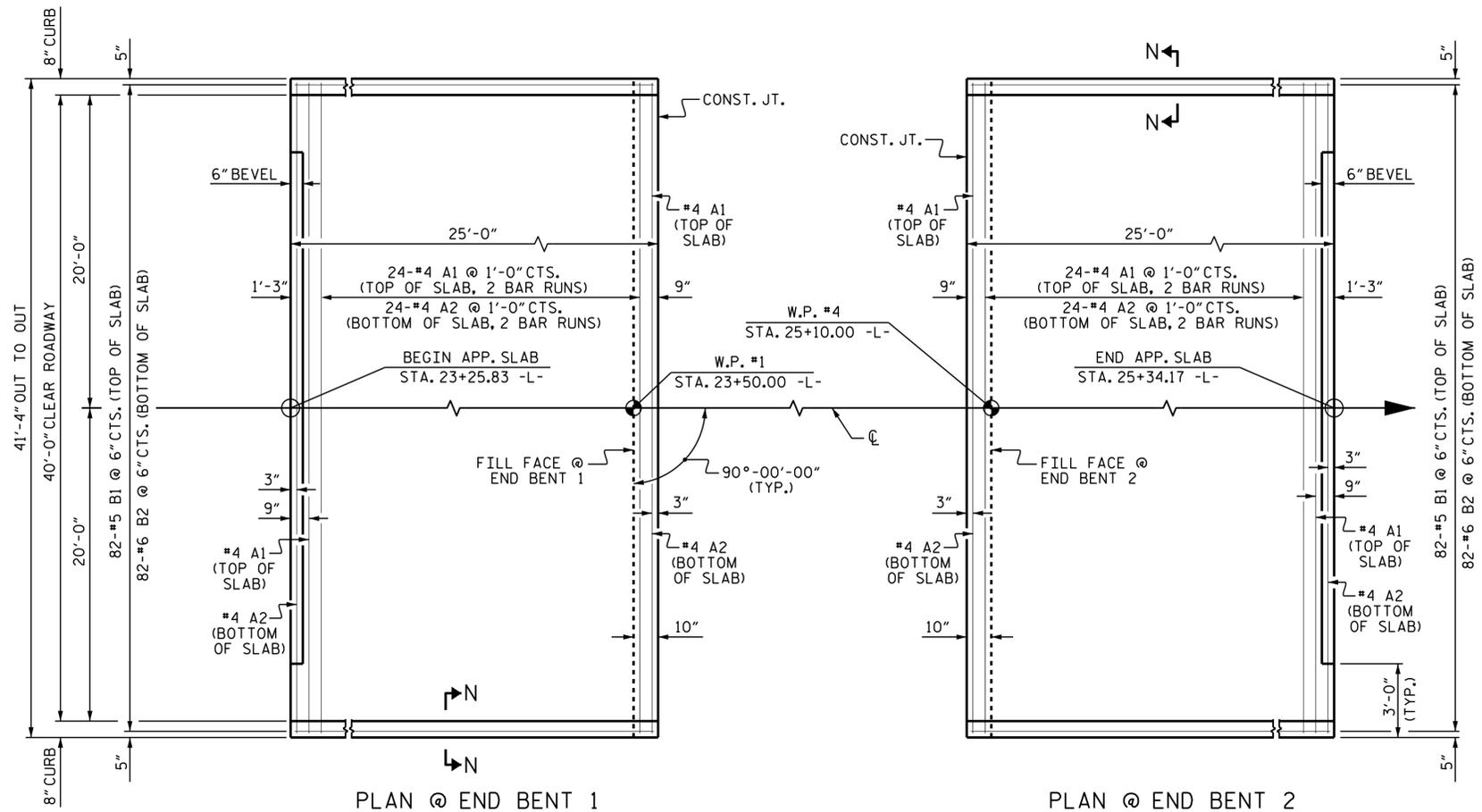
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**RIP RAP DETAILS**

DRAWN BY : S. T. SANDOR DATE : 7/20/22  
CHECKED BY : M. K. BEARD DATE : 1/4/23  
DESIGN ENGINEER OF RECORD: DATE :

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

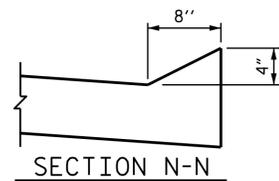
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1			3			
2			4			



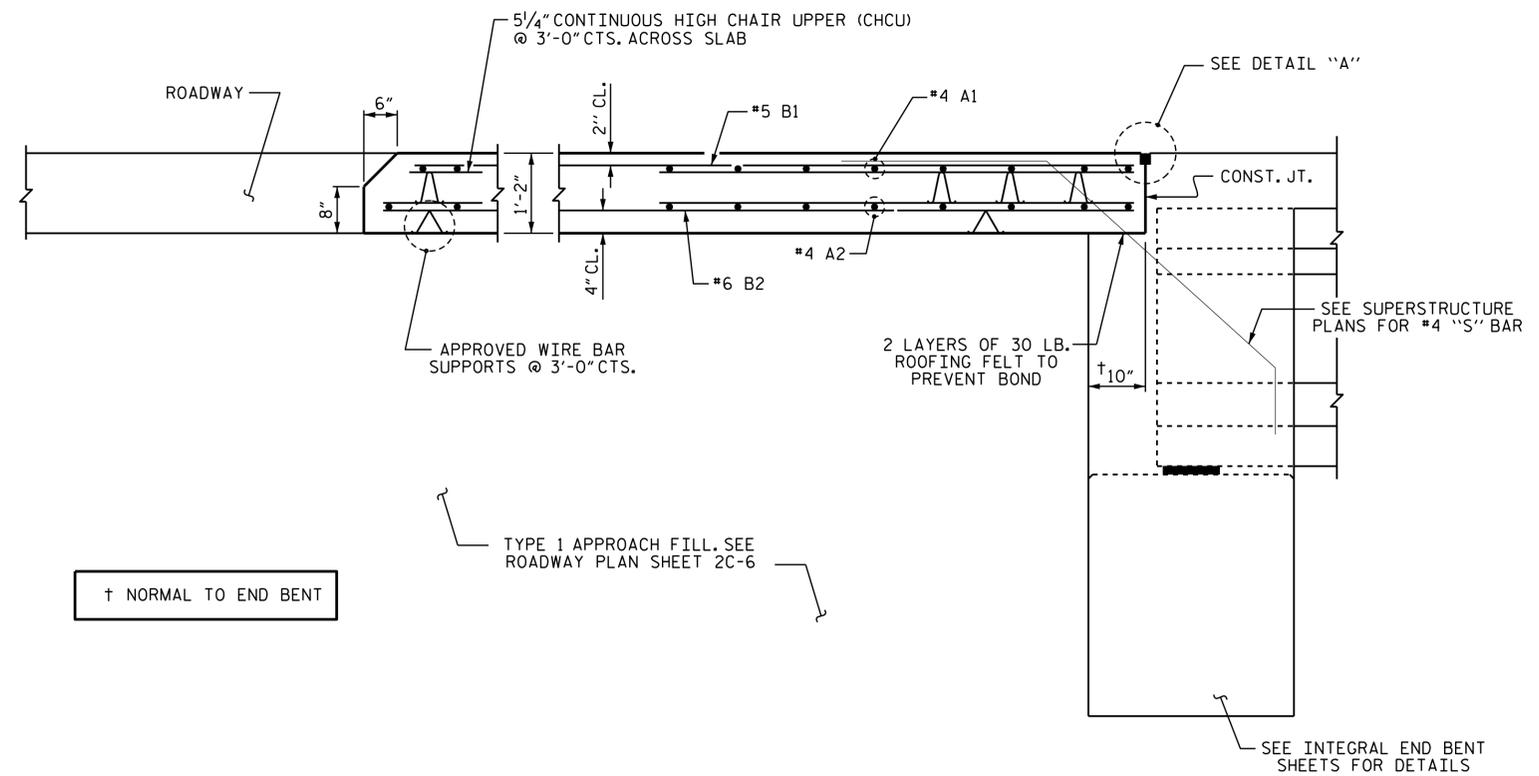
PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

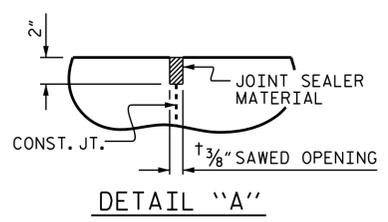


SECTION N-N

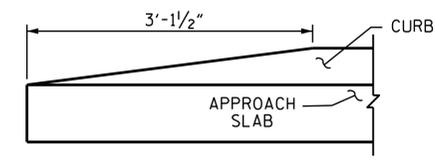


SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

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.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTORS OPTION, "TYPE 1A - ALTERNATE APPROACH FILL" (ROADWAY PLAN 2C-6) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	21'-6"	747
A2	52	#4	STR	21'-6"	747
* B1	82	#5	STR	24'-2"	2067
B2	82	#6	STR	24'-8"	3038
REINFORCING STEEL				LBS.	3785
* EPOXY COATED REINFORCING STEEL				LBS.	2814
CLASS AA CONCRETE				C. Y.	45.0

SPLICE LENGTHS

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

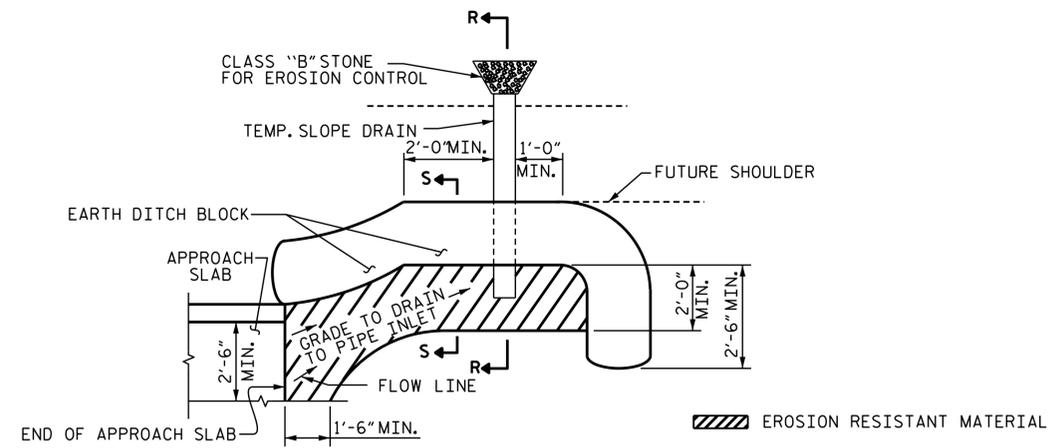
ASSEMBLED BY : S. T. SANDOR	DATE : 9/15/23
CHECKED BY : P. D. BRYANT	DATE : 9/15/23
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			31



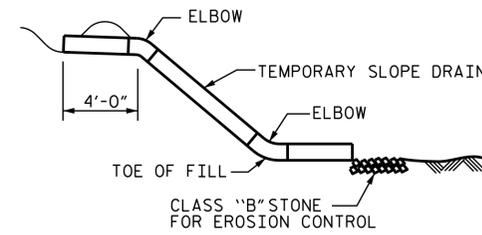
PROJECT NO. BR-0046  
SAMPSON COUNTY  
STATION: 24+30.00-L-

SHEET 1 OF 2  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

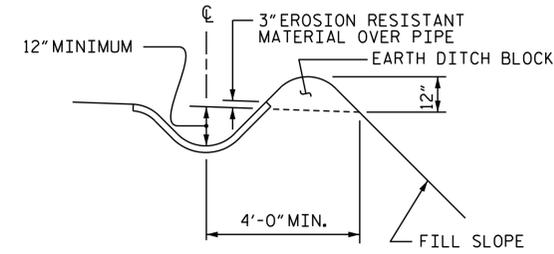


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



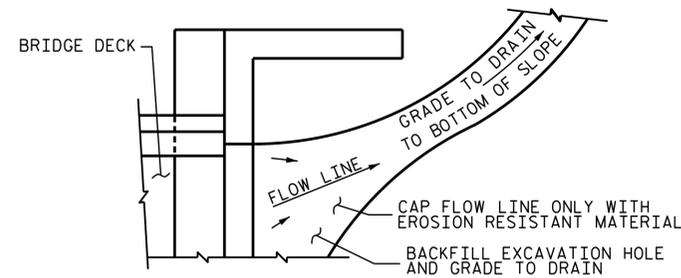
SECTION R-R



SECTION S-S

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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**

PROJECT NO. **BR-0046**  
**SAMPSON** COUNTY  
 STATION: **24+30.00 -L-**

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**BRIDGE APPROACH  
 SLAB DETAILS**

ASSEMBLED BY : S. T. SANDOR	DATE : 9/15/23
CHECKED BY : P. D. BRYANT	DATE : 9/15/23
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

## 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.
	--	27,000 LBS. PER SQ. IN.
	--	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  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " 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  $\frac{1}{4}$ " 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  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  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  $\frac{3}{16}$ " 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  $\frac{1}{16}$ " 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. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN