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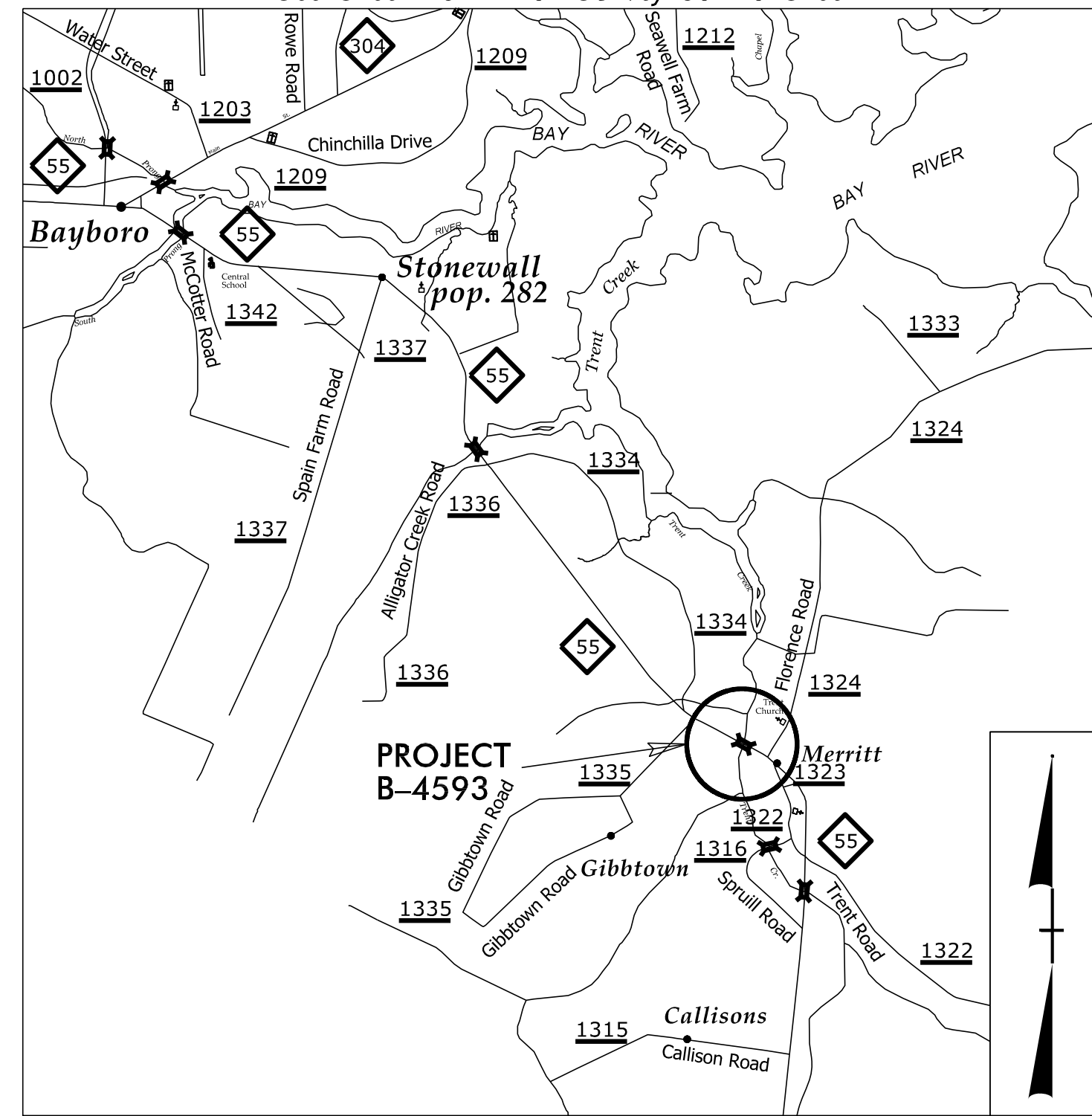
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**TIP PROJECT: B-4593**

**CONTRACT: C204217**

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Plan Sheet Symbols  
See Sheet 1C-1 For Survey Control Sheet



**VICINITY MAP**

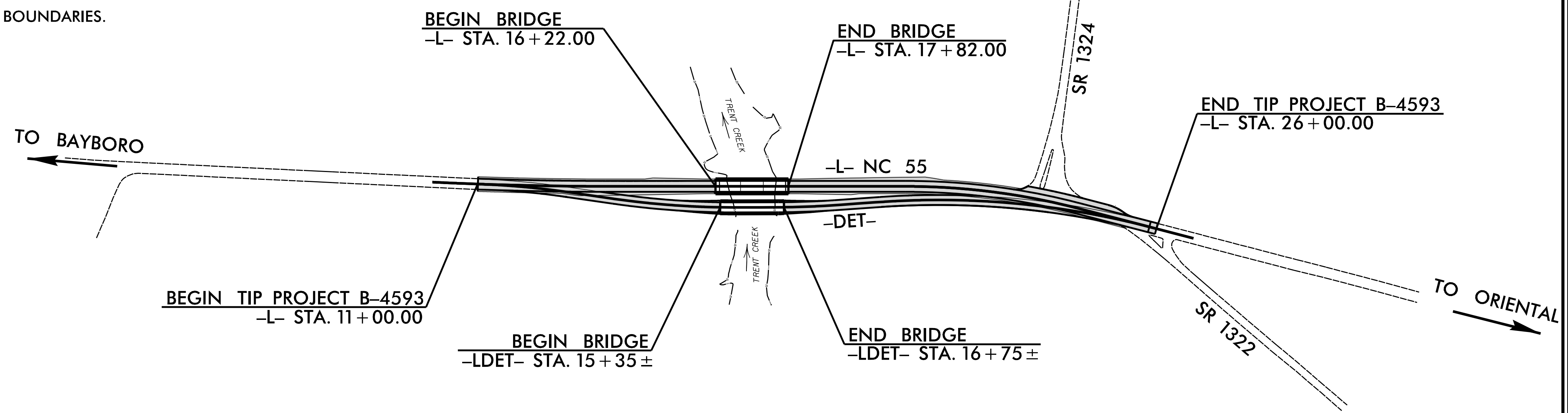
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**PAMLICO COUNTY**

**LOCATION: BRIDGE NO. 38 ON NC 55 OVER TRENT CREEK**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4593	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38422.1.2	BRSTP-55(34)	PE	
38422.2.1	-	ROW & UTILITIES	
38422.3.1	0055071	CONSTRUCTION	



**STRUCTURES**

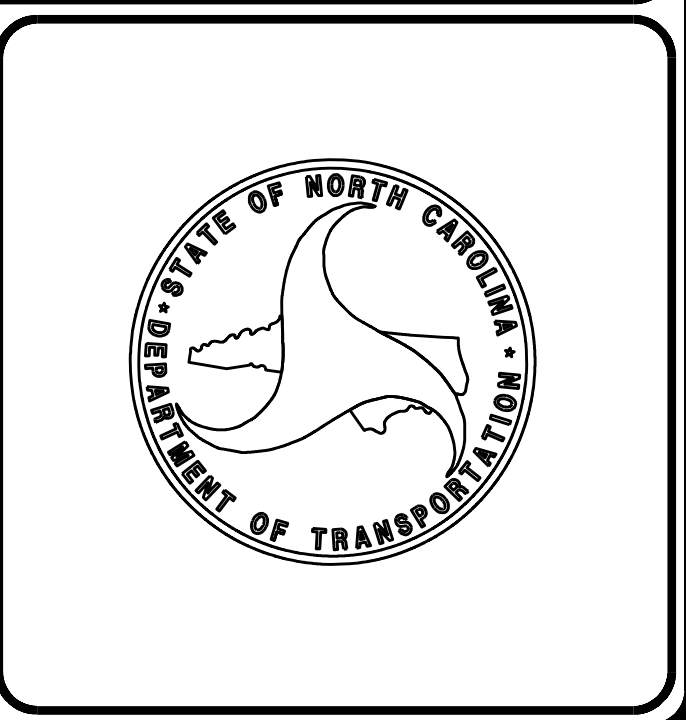
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

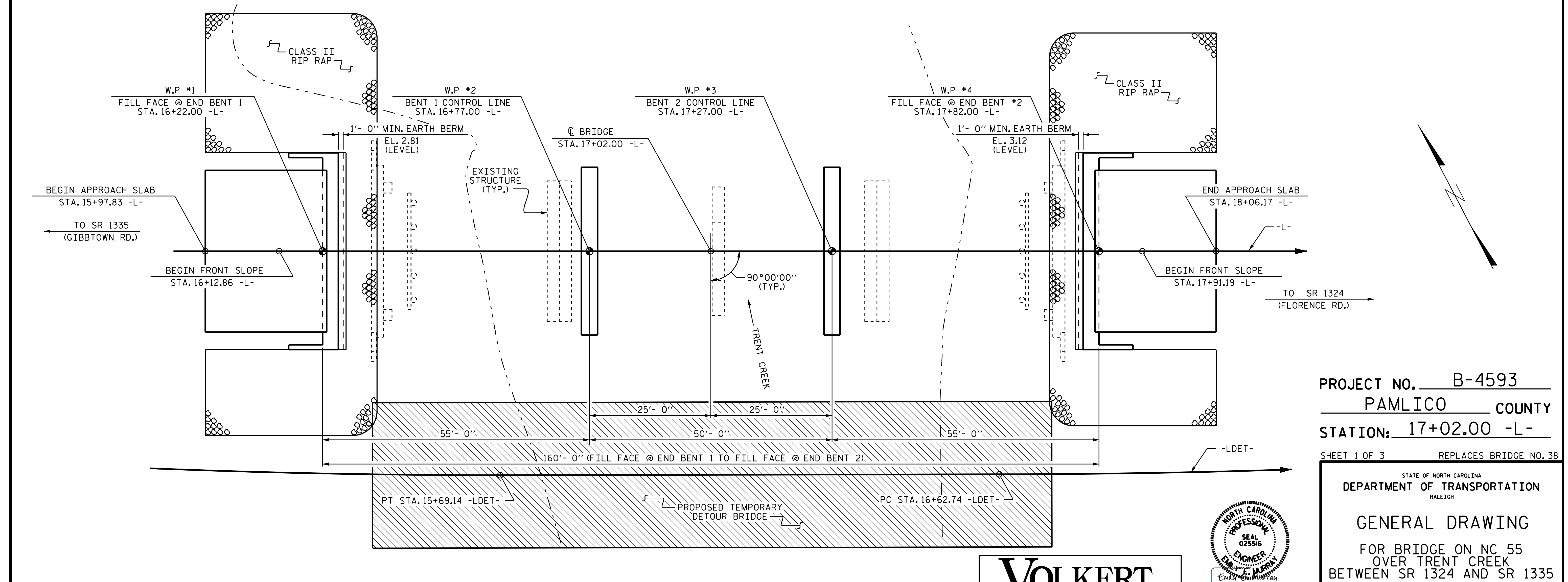
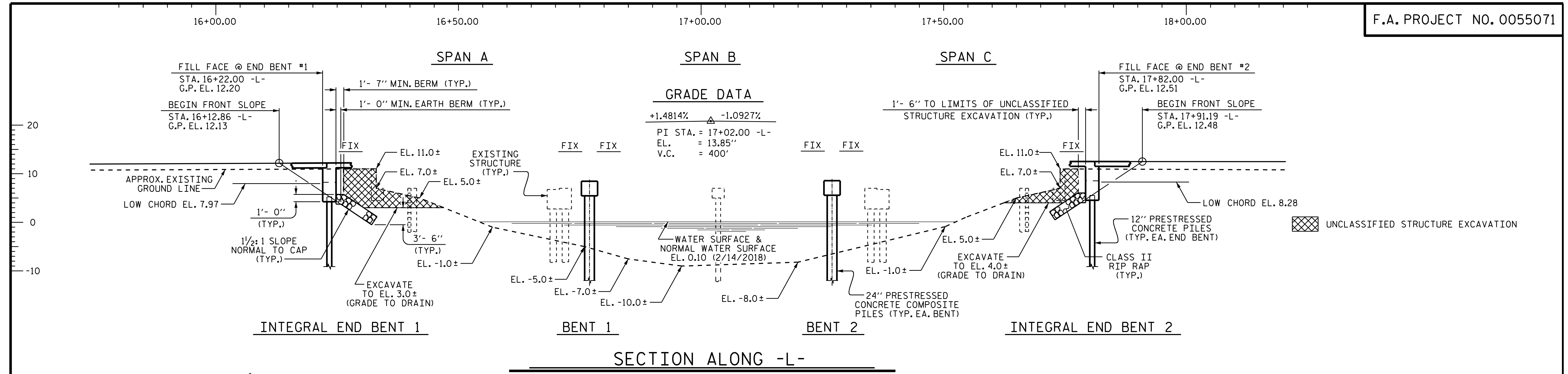
DESIGN DATA
ADT 2019 = 5576
ADT 2040 = 8600
K = 8 %
D = 55 %
T = 9 % *
V = 60 MPH
V <sub>DET</sub> = 50 MPH
* TTST = 2% DUAL = 7%
FUNC CLASS = MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH
LENGTH ROADWAY TIP PROJECT B-4593 = 0.254 MILES
LENGTH STRUCTURE TIP PROJECT B-4593 = 0.030 MILES
TOTAL LENGTH OF TIP PROJECT B-4593 = 0.284 MILES
<b>NCDOT CONTACT:</b> DAVID STUTTS, PE

Prepared for:
<b>STRUCTURES MANAGEMENT UNIT</b> NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS
DONALD R. SMITH JR, PE PROJECT ENGINEER
EMILY E. MURRAY, PE PROJECT DESIGN ENGINEER
DAVID STUTTS, PE NCDOT CONTACT
<b>LETTING DATE:</b> JULY 19, 2022

Prepared in the Office of:
<b>VOLKERT</b> 5430 Wade Park Blvd., Suite 410 Raleigh, NC 27607 Tel. 919-854-0344 Fax. 919-854-0355 NC License No. F-0765



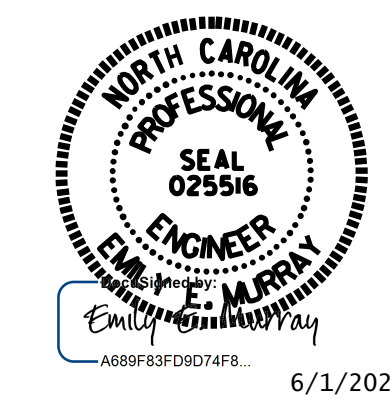


PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 38

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON NC 55  
 OVER TRENT CREEK  
 BETWEEN SR 1324 AND SR 1335

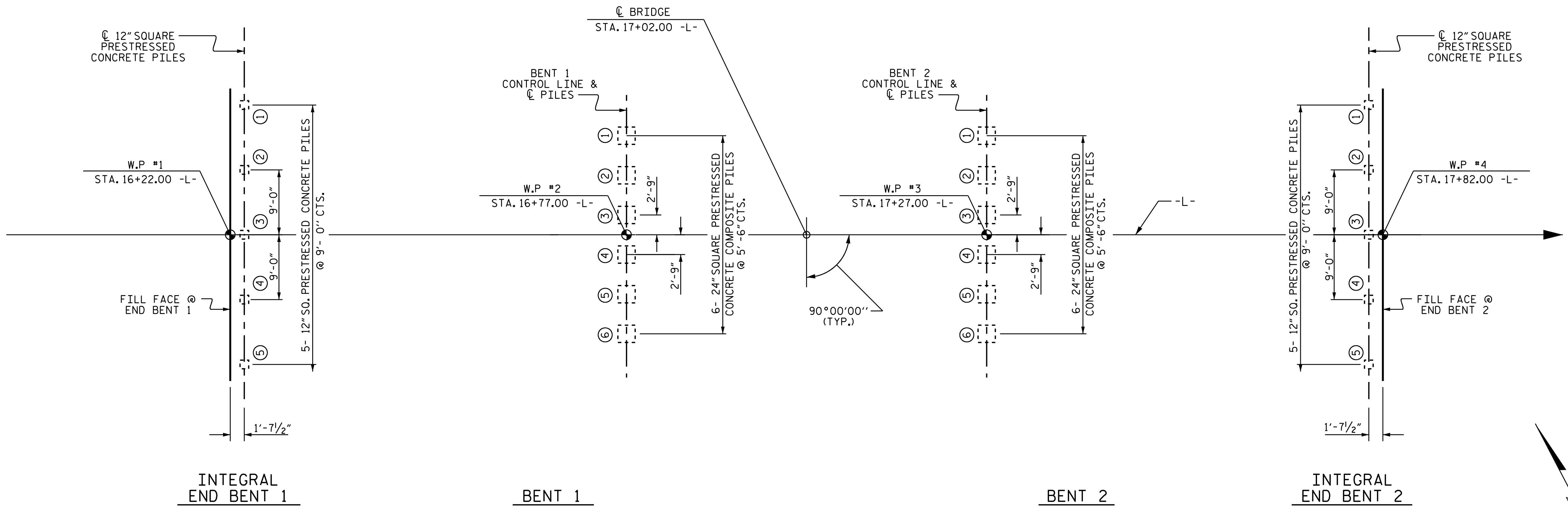


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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: D. A. GLADDEN DATE: 11/18  
 CHECKED BY: P. N. HOLDER DATE: 12/18  
 DESIGN ENGINEER OF RECORD: J. R. McROY DATE: 12/18



**FOUNDATION LAYOUT**

(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINES.)

**NOTES**

- FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- INSTALL PRESTRESSED CONCRETE AND STEEL H-PILE SECTIONS OF COMPOSITE PILES AT BENT NO.1 TO TIP ELEVATIONS NO HIGHER THAN -20.5 FT. AND -40 FT., RESPECTIVELY.
- INSTALL PRESTRESSED CONCRETE AND STEEL H-PILE SECTIONS OF COMPOSITE PILES AT BENT NO.2 TO TIP ELEVATIONS NO HIGHER THAN -20.5 FT. AND -40 FT., RESPECTIVELY.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55-120 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO.1 AND BENT NO.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. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON NC 55  
 OVER TRENT CREEK  
 BETWEEN SR 1324 AND SR 1335

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

DRAWN BY :	J.R. MCROY	DATE :	12/18
CHECKED BY :	P. N. HOLDER	DATE :	12/18
DESIGN ENGINEER OF RECORD:	J.R. MCROY	DATE :	12/18

**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 Lenth 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 1-5	100	5.81	35			170							
Bent 1, Piles 1-6	150	6.01	30 (PSC) and 20 (HP)	-22	-20.5 (PSC), -40.0 (HP)	290							
Bent 2, Piles 1-6	150	6.11	30 (PSC) and 20 (HP)	-22	-20.5 (PSC), -40.0 (HP)	290							
End Bent 2, Piles 1-5	100	6.12	35			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 =  $\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \text{Nominal Downdrag Resistance} + \frac{\text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$

**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 or 2	Maybe	35		End Bent 1 & 2	EST
Bent 1 or 2	Yes	35 (PSC) and 20 (HP)	2	Bent 1 & 2	PDA

\*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 1-5	100			0.60			1.00
Bent 1, Piles 1-6	149		3	0.60		33	1.00
Bent 2, Piles 1-6	149		4	0.60		33	1.00
End Bent 2, Piles 1-5	100			0.60			1.00

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

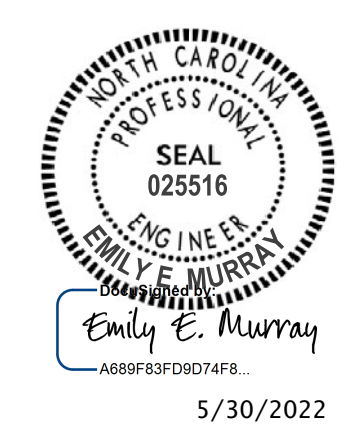
PROJECT NO. B-4593

Pamlico COUNTY

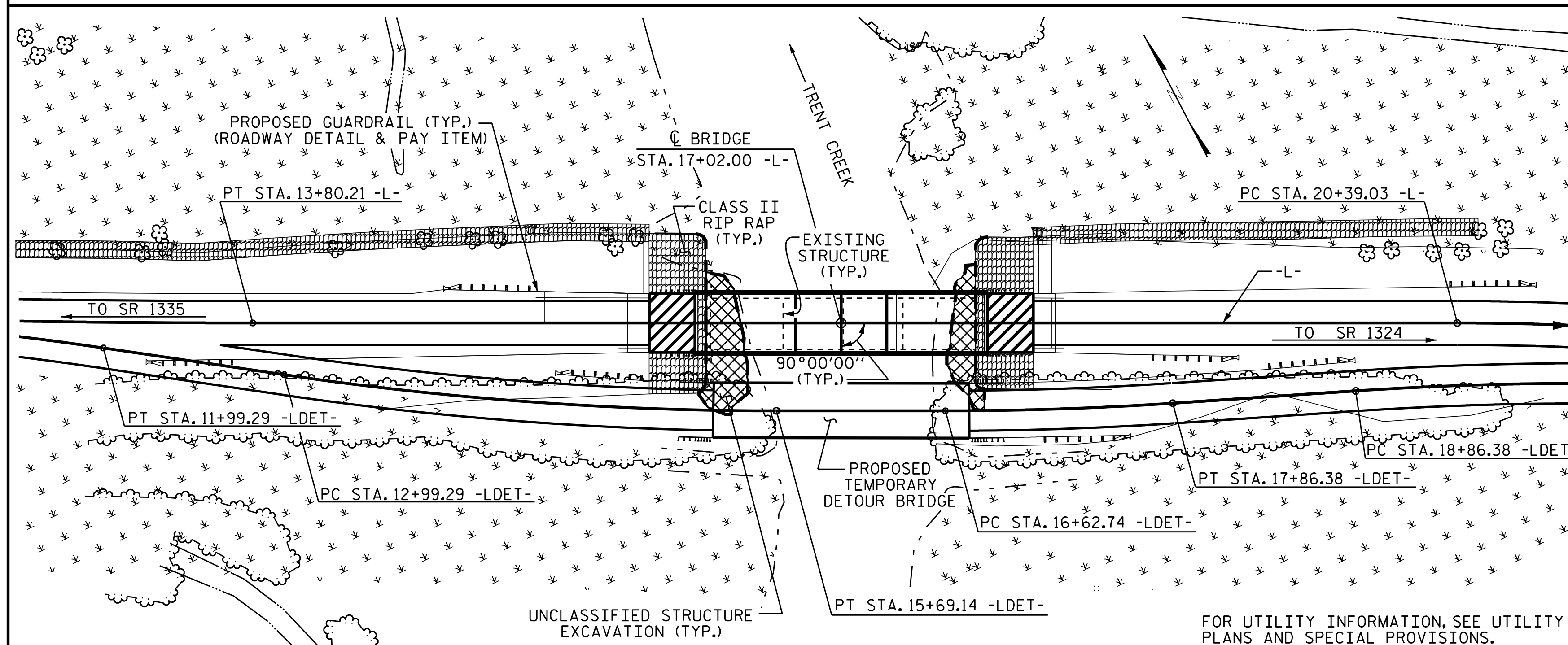
STATION: 17+02.00 -L-

**NOTES:**

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Jinyoung Park, PE # 032171) on 6-14-2021.
- 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 when PDAs may be required.

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
	<b>PILE FOUNDATION TABLES</b>	
SIGNATURE	DATE	
REVISIONS		
NO.	BY:	DATE:
1		3
2		4
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		SHEET NO. S-2A TOTAL SHEETS 42

BM: NCGS MONUMENT, 19' LT. OF STA. 18+09.00 -L-, ELEV. = 9.54, DATUM: NAVD 88



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.  
 THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.  
 CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE COLUMNS, BENT CAPS, PILE CAPS, AND FOOTINGS, AND SHALL CONTAIN CALCIUM NITRATE CORROSION INHIBITOR. FOR CALCIUM NITRATE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.  
 ALL METALLIZED SURFACES SHALL RECEIVE SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).  
 ALL BAR SUPPORTS USED IN THE PARAPET, DECK, PRESTRESSED CONCRETE GIRDERS, END BENTS, BENT CAPS, PRESTRESSED CONCRETE PILES, AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 28 FT. LEFT OF CENTERLINE ROADWAY AND 50 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 1 AND 32 FT. RIGHT OF CENTERLINE ROADWAY AND 48 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 2 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 16+05.00 -LDET- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.  
 THE EXISTING STRUCTURE CONSISTING OF 1 @ 40', 2 @ 32.7', 1 @ 40' SPANS OF REINFORCED CONCRETE FLOOR ON STEEL I-BEAMS ON REINFORCED CONCRETE ABUTMENT END BENTS AND BENTS WITH 28'-0" CLEAR ROADWAY WIDTH LOCATED AT THE SAME LOCATION AS THE PROPOSED BRIDGE, 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.  
 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 17+02.00 -L-".  
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."  
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.  
 PILE DRIVING EQUIPMENT SETUP FOR 24" SQUARE PRESTRESSED CONCRETE PILES INCLUDES ENTIRE COMPOSITE PILE. SEE "24" PRESTRESSED CONCRETE COMPOSITE PILE" SHEET.

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS	
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.
SUPERSTRUCTURE						5,533	6,003		LUMP SUM		12	629.7
END BENT NO. 1								26.6		4302		
BENT NO. 1								18.4		2307		
BENT NO. 2								18.4		2307		
END BENT NO. 2								26.6		4302		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	LUMP SUM	5,533	6,003	90.0	LUMP SUM	13218	12	629.7

THE CONCRETE IN THE PRESTRESSED CONCRETE PILES SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH TO 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.  
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_y = 60\text{ksi}$ .

ALL REMNANT PILES FROM THE EXISTING BRIDGE OR ANY PREVIOUS BRIDGES SHALL BE REMOVED. IN THE EVENT THAT A PILE CANNOT BE REMOVED COMPLETELY, THE PILE SHALL BE CUT OFF AT THE MUD LINE.

	PILE DRIVING EQUIPMENT SETUP FOR 12" PRESTRESSED CONCRETE PILES	PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES	12" PRESTRESSED CONCRETE PILES	24" PRESTRESSED CONCRETE PILES	HP 12 X 84 STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	1'- 2" X 2'- 6" CONCRETE PARAPET	RIP RAP CLASS II (2'- 0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS			
	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	TONS	SO. YDS.	LUMP SUM			
SUPERSTRUCTURE								301.17	316.67		LUMP SUM			
END BENT NO. 1	5		5	175			3		263	292				
BENT NO. 1		6		6	150	6	120	3						
BENT NO. 2		6		6	150	6	120	3						
END BENT NO. 2	5		5	175			3		237	263				
TOTAL	10	12	10	350	12	300	12	240	12	301.17	316.67	500	555	LUMP SUM

HYDRAULIC DATA

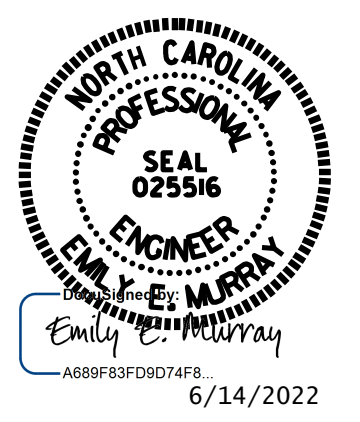
DESIGN DISCHARGE = N/A C.F.S.  
 FREQUENCY OF DESIGN FLOOD = N/A YEARS  
 DESIGN HIGH WATER ELEVATION = N/A FT.  
 DRAINAGE AREA = 16.5 SO. MI.  
 BASE DISCHARGE (Q100) = N/A C.F.S.  
 BASE HIGH WATER ELEVATION = N/A FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 3450 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YEARS  
 OVERTOPPING FLOOD ELEVATION = 4.6 FT.  
 OVERTOPPING OCCURS 403' PAST STATION 26+00.00 -L- (ALONG NC 55)

DRAWN BY : J.R. MCROY DATE : 12/18  
 CHECKED BY : P. N. HOLDER DATE : 12/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/18

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PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON NC 55  
 OVER TRENT CREEK  
 BETWEEN SR 1324 AND SR 1335

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.36	--	1.75	0.819	2.02	A	EL	31.5	0.925	1.36	A	I	4.7	0.80	0.819	1.96	A	EL	26.1		
	HL-93 (OPERATING)	N/A		1.78	--	1.35	0.819	2.62	A	EL	31.5	0.925	1.78	A	I	4.7	N/A	0.819	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.65	59.400	1.75	0.819	2.53	A	EL	31.5	0.925	1.65	A	I	4.7	0.80	0.819	2.46	A	EL	26.1		
	HS-20 (OPERATING)	36.000		2.16	77.760	1.35	0.819	3.28	A	EL	31.5	0.925	2.16	A	I	4.7	N/A	0.819	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.21	56.835	1.40	0.819	7.37	A	EL	26.1	0.925	5.24	A	I	4.7	0.80	0.819	4.21	A	EL	26.1	
		SNGARBS2	20.000		3.23	64.600	1.40	0.819	5.53	A	EL	31.5	0.925	3.77	A	I	4.7	0.80	0.819	3.23	A	EL	26.1	
		SNAGRIS2	22.000		3.06	67.320	1.40	0.819	5.24	A	EL	31.5	0.925	3.52	A	I	4.7	0.80	0.819	3.06	A	EL	26.1	
		SNCOTTS3	27.250		2.06	56.135	1.40	0.819	3.61	A	EL	26.1	0.925	2.58	A	I	4.7	0.80	0.819	2.06	A	EL	26.1	
		SNAGGRS4	34.925		1.77	61.817	1.40	0.819	3.09	A	EL	26.1	0.925	2.18	A	I	4.7	0.80	0.819	1.77	A	EL	26.1	
		SNS5A	35.550		1.73	61.502	1.40	0.819	3.03	A	EL	26.1	0.925	2.23	A	I	4.7	0.80	0.819	1.73	A	EL	26.1	
		SNS6A	39.950		1.60	63.920	1.40	0.819	2.80	A	EL	26.1	0.925	2.05	A	I	4.7	0.80	0.819	1.60	A	EL	26.1	
	SNS7B	42.000		1.53	64.260	1.40	0.819	2.67	A	EL	26.1	0.925	2.04	A	I	4.7	0.80	0.819	1.53	A	EL	26.1		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.98	65.340	1.40	0.819	3.46	A	EL	26.1	0.925	2.44	A	I	4.7	0.80	0.819	1.98	A	EL	26.1	
		TNT4A	33.075		1.99	65.819	1.40	0.819	3.46	A	EL	31.5	0.925	2.35	A	I	4.7	0.80	0.819	1.99	A	EL	26.1	
		TNT6A	41.600		1.63	67.808	1.40	0.819	2.85	A	EL	26.1	0.925	2.23	A	I	4.7	0.80	0.819	1.63	A	EL	26.1	
		TNT7A	42.000		1.65	69.300	1.40	0.819	2.88	A	EL	26.1	0.925	2.10	A	I	4.7	0.80	0.819	1.65	A	EL	26.1	
		TNT7B	42.000		1.72	72.240	1.40	0.819	2.95	A	EL	31.5	0.925	1.97	A	I	4.7	0.80	0.819	1.72	A	EL	26.1	
		TNAGRIT4	43.000		1.63	70.090	1.40	0.819	2.82	A	EL	31.5	0.925	1.90	A	I	4.7	0.80	0.819	1.63	A	EL	26.1	
TNAGT5A		45.000		1.53	68.850	1.40	0.819	2.68	A	EL	26.1	0.925	1.92	A	I	4.7	0.80	0.819	1.53	A	EL	26.1		
TNAGT5B	45.000	③	1.50	67.500	1.40	0.819	2.63	A	EL	26.1	0.925	1.80	A	I	4.7	0.80	0.819	1.50	A	EL	26.1			

**LOAD FACTORS:**

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

**NOTES:**

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

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

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

**Ⓝ CONTROLLING LOAD RATING**

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

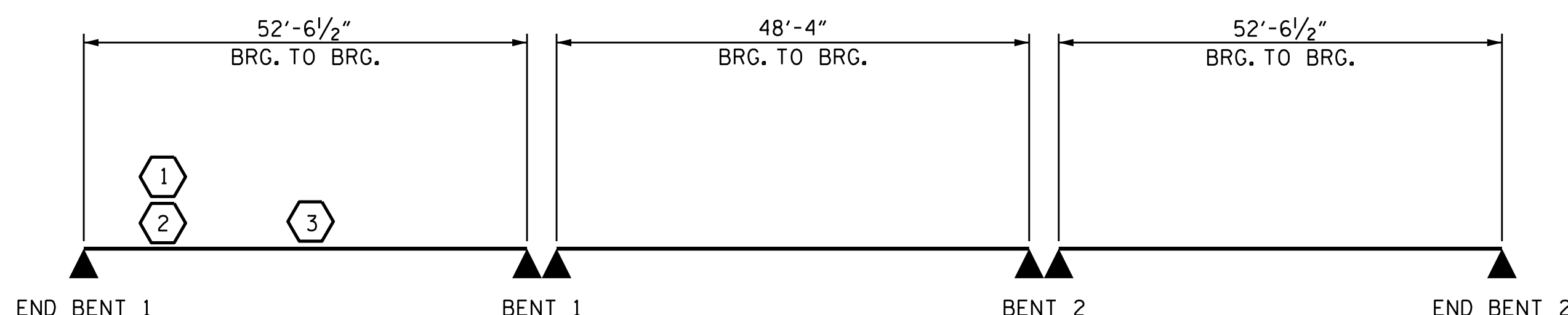
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

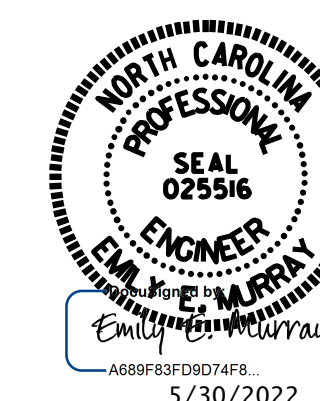
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**GIRDER LOCATION**

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



PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-



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

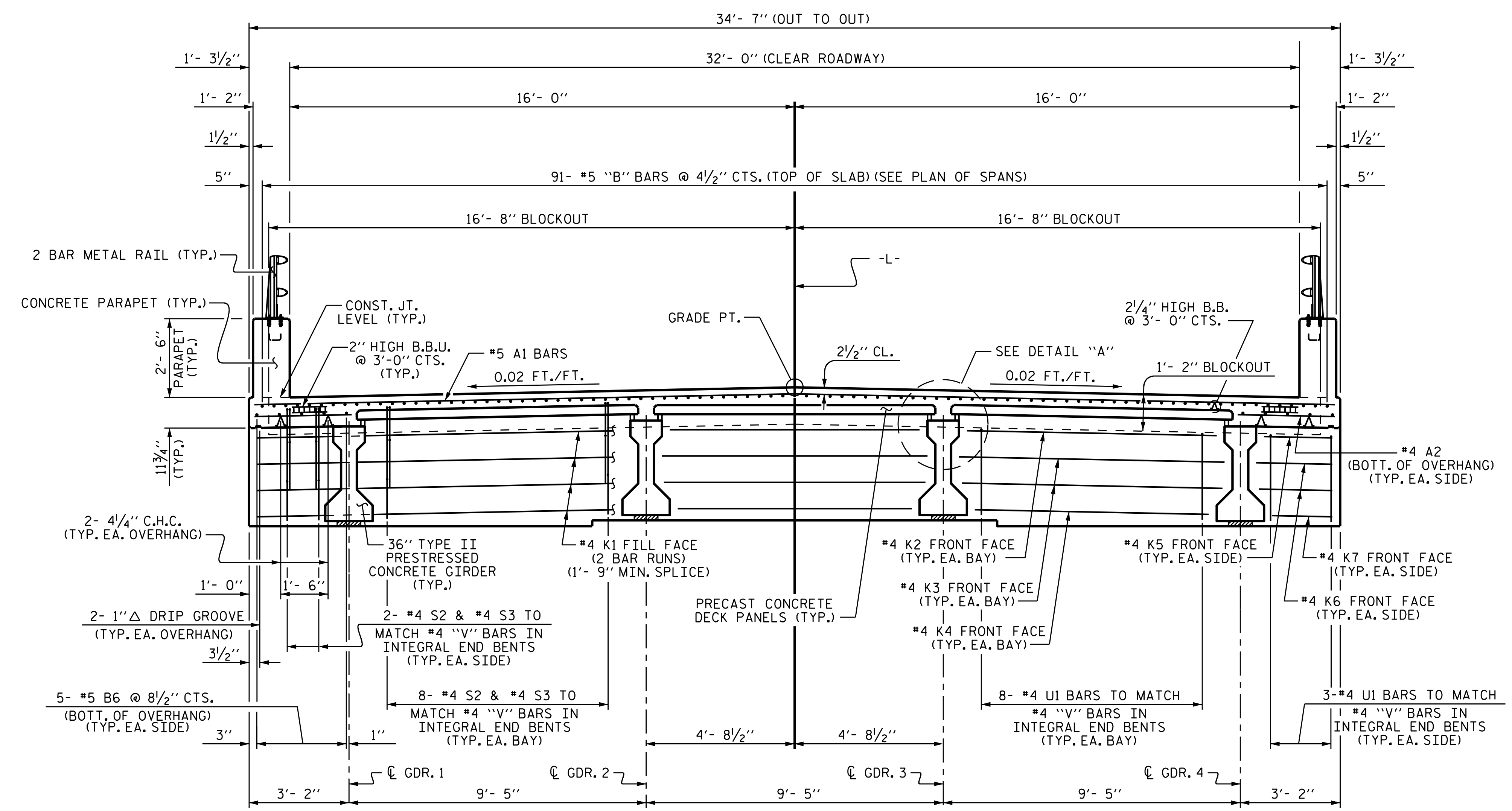
ASSEMBLED BY: D.R. SMITH DATE: 11/18  
 CHECKED BY: J.B. MCROY DATE: 11/18  
 DESIGN ENGINEER OF RECORD: D.R. SMITH DATE: 11/18

**VOLKERT**

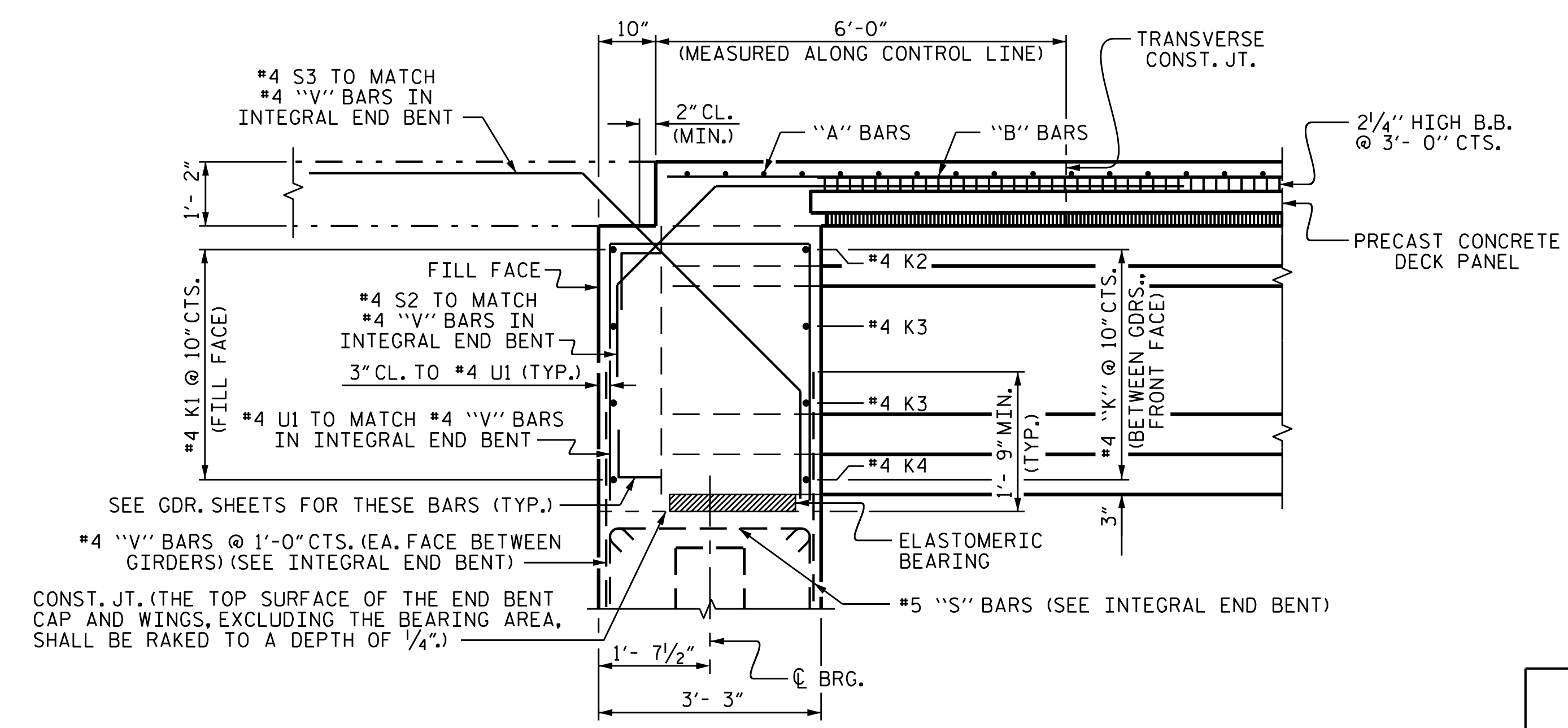
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 Raleigh, NC 27607  
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			42
2			4			



**TYPICAL SECTION AT INTEGRAL END BENT**



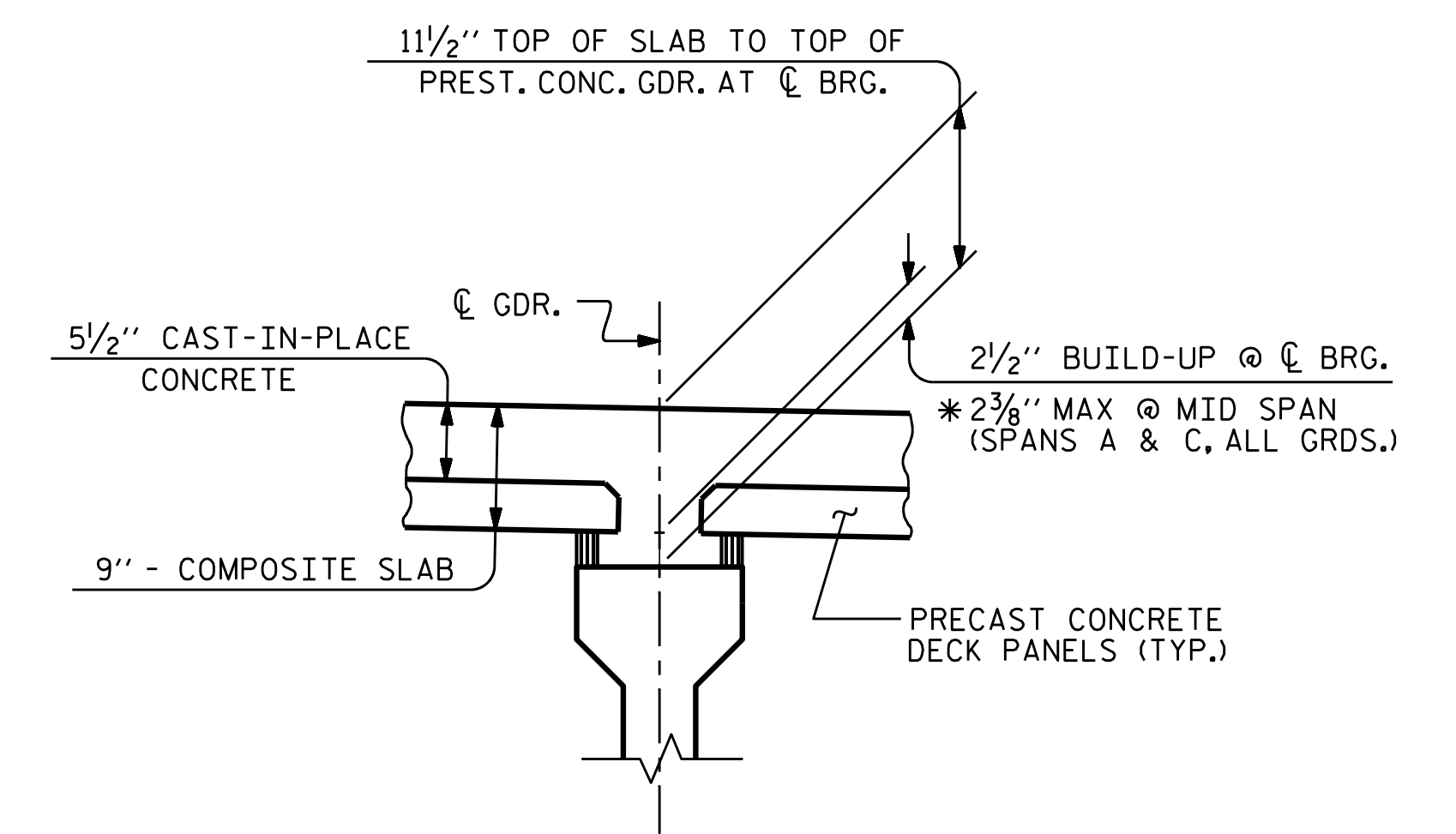
**SECTION THROUGH INTEGRAL END BENT**

**NOTES:**

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

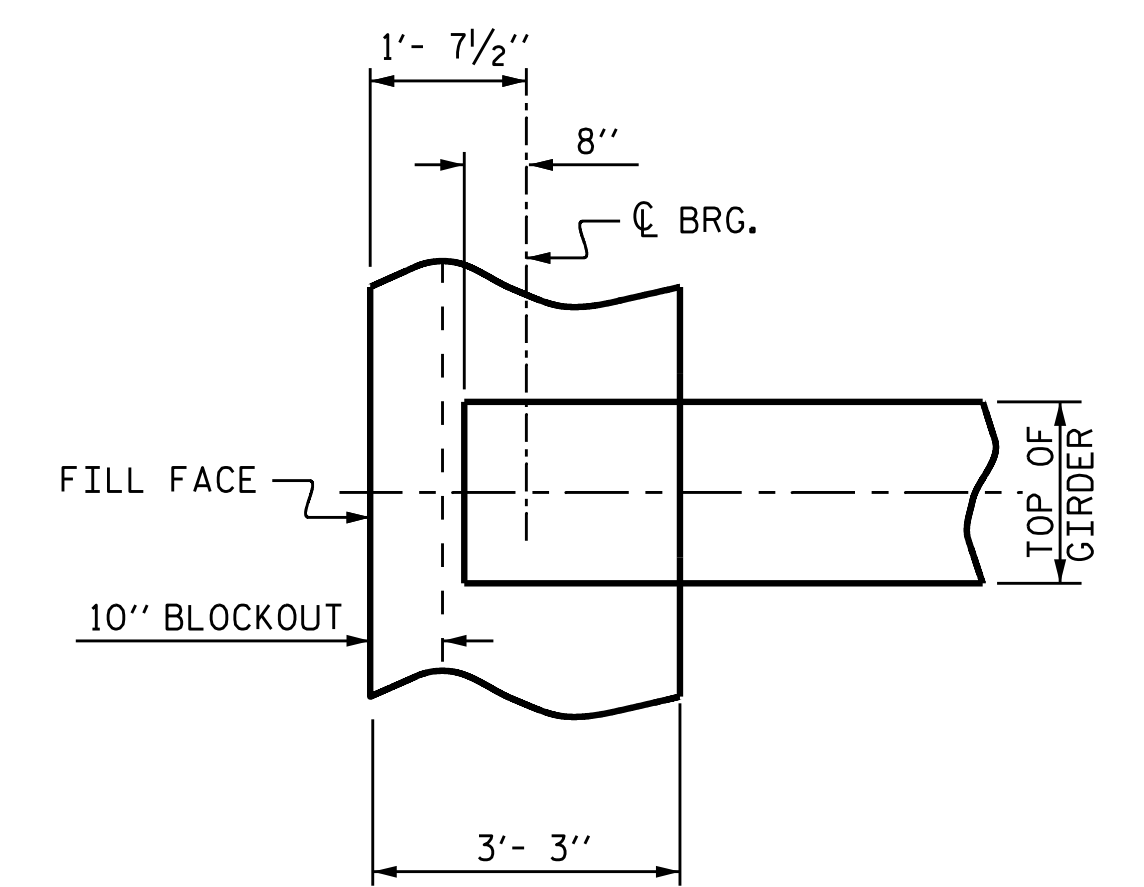
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

CONCRETE PARAPET 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.



**DETAIL "A"**

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



**PLAN OF GIRDER AT INTEGRAL END BENT**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**

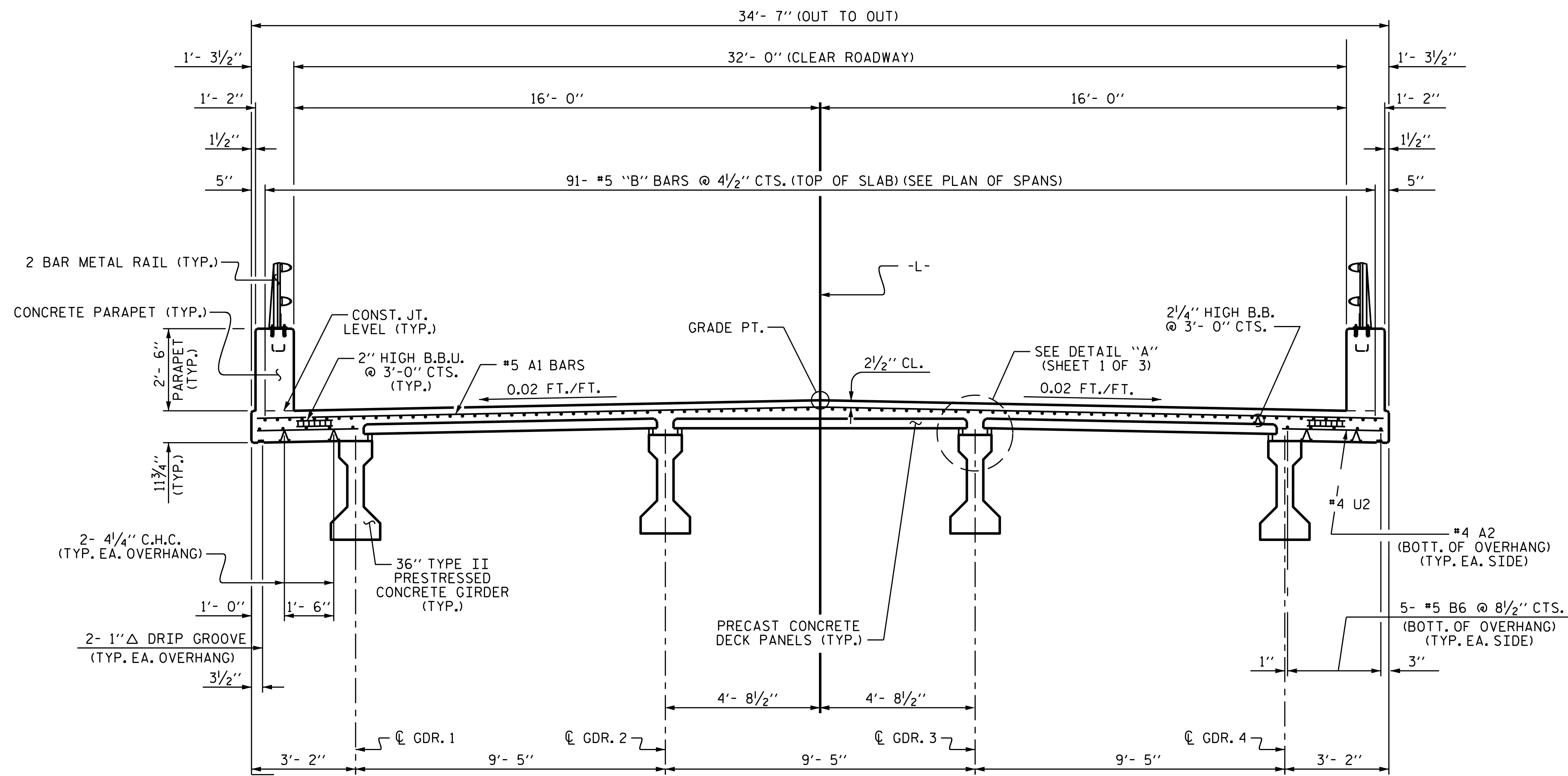
DRAWN BY: D. A. GLADDEN DATE: 11/18  
 CHECKED BY: D. R. SMITH DATE: 11/18  
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 11/18

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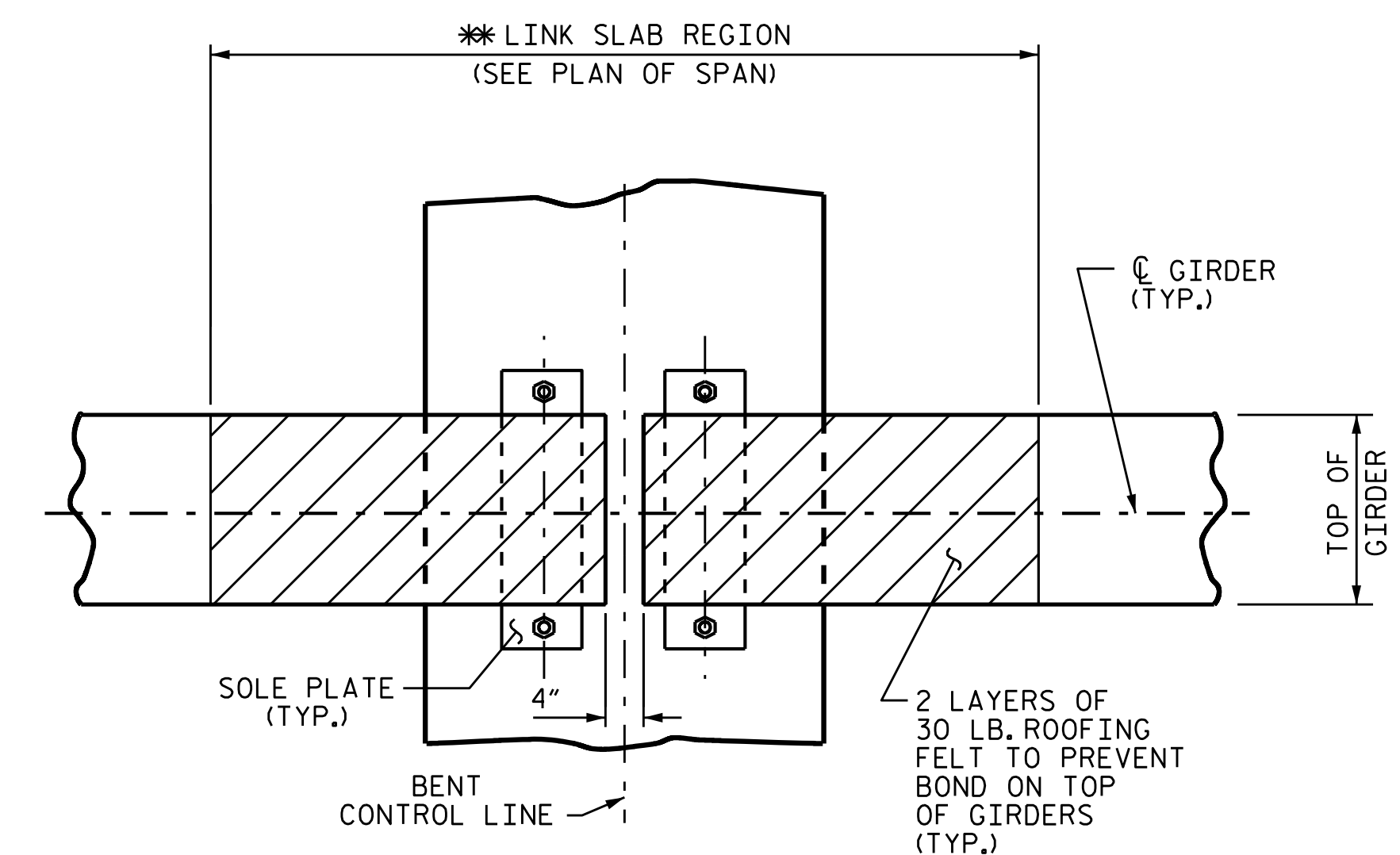
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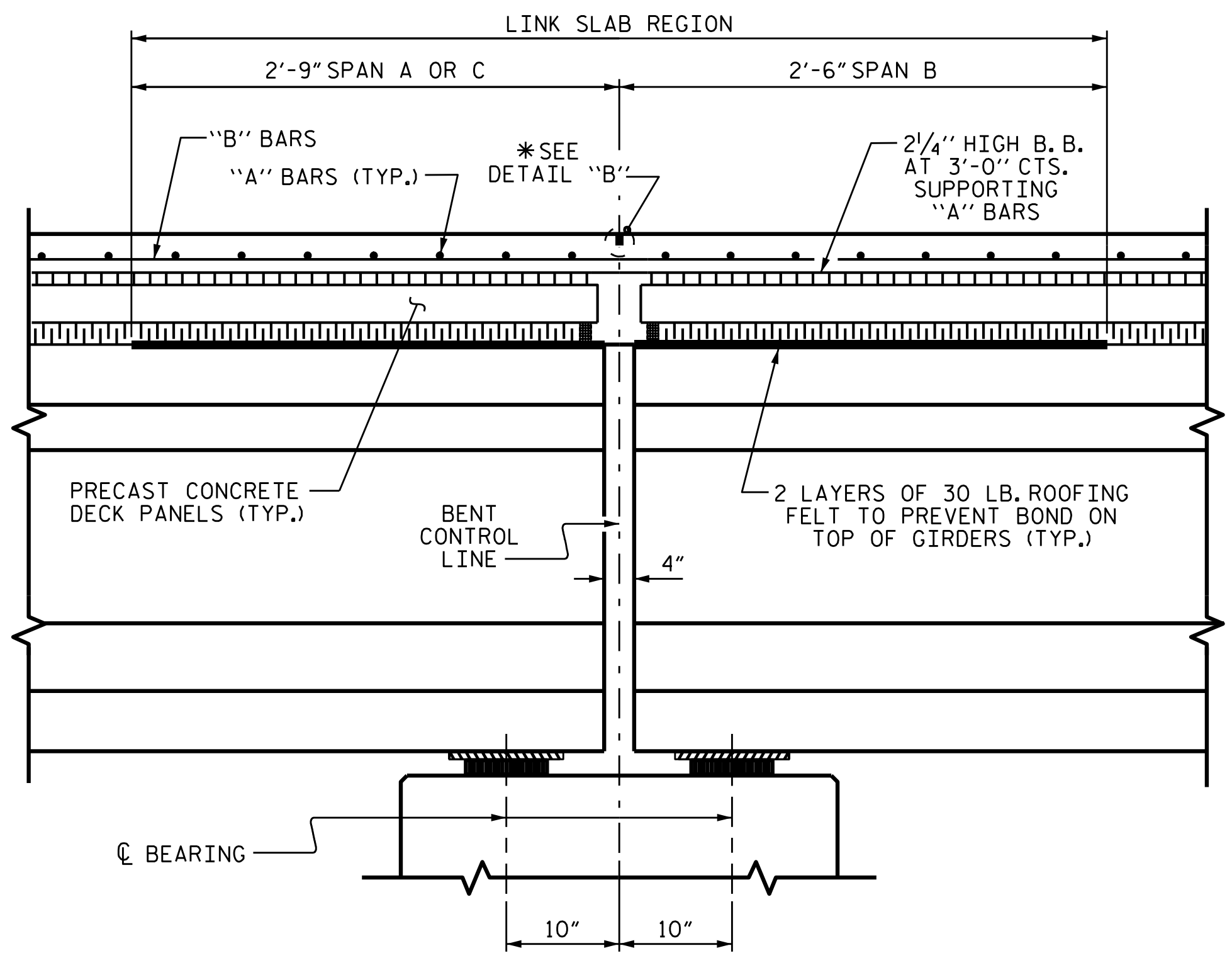


TYPICAL SECTION AT LINK SLAB



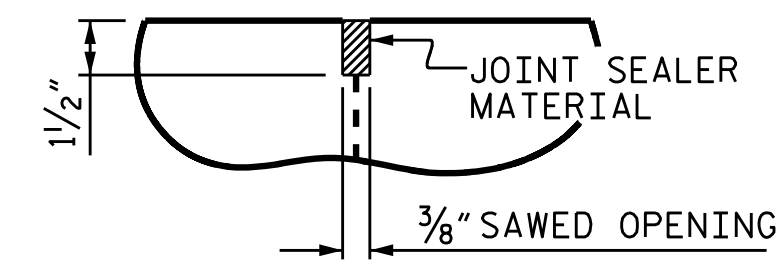
PLAN OF GIRDERS AT LINK SLAB BENT

\* THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.



SECTION AT LINK SLAB

\* MEASURED ALONG GIRDER



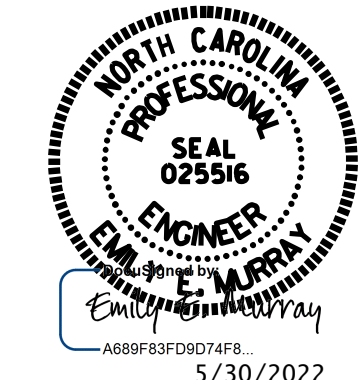
\* A 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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SUPERSTRUCTURE  
 TYPICAL SECTION

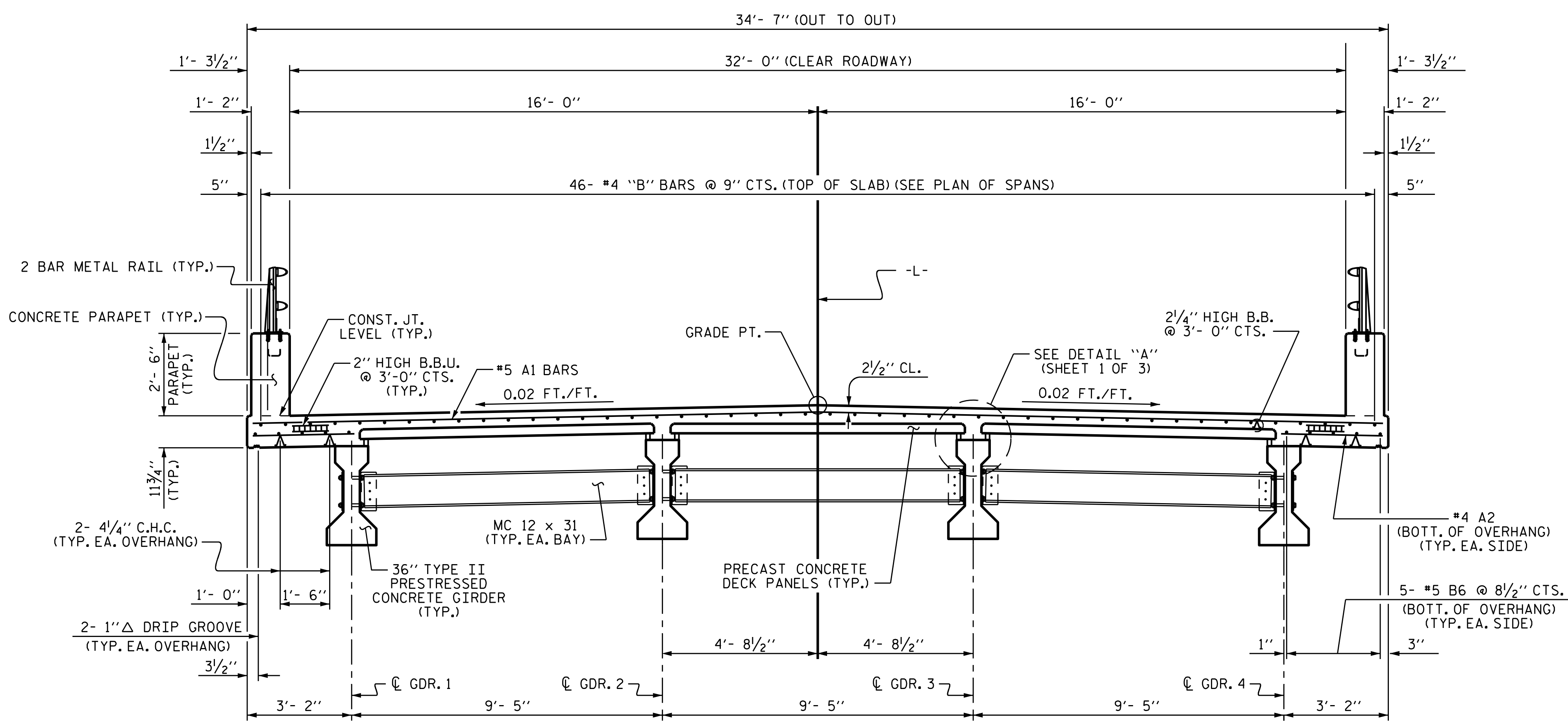


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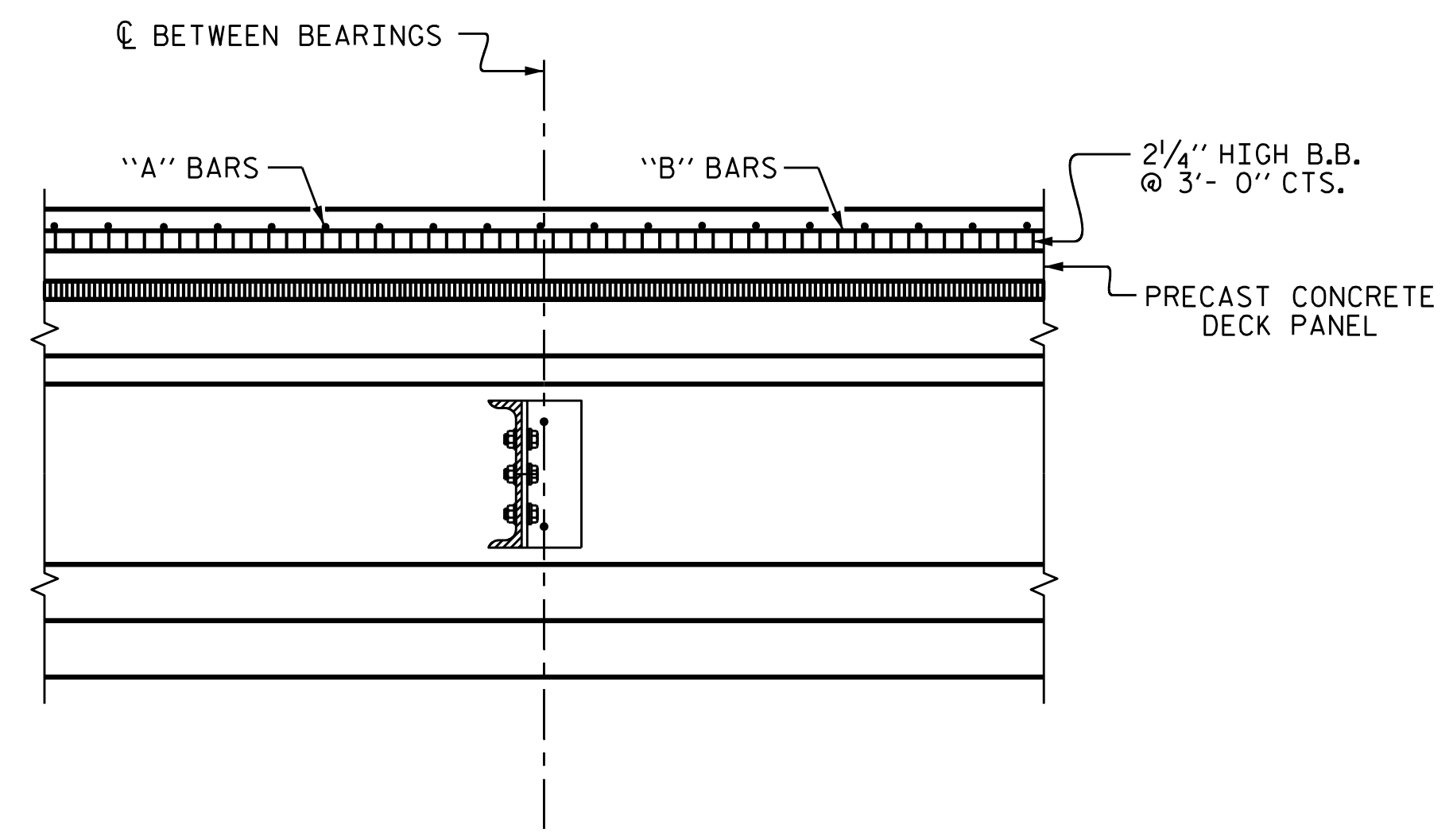
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**TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM**



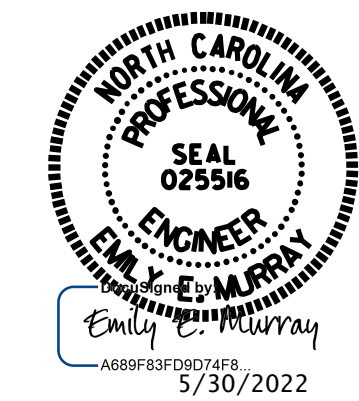
**SECTION THRU INTERMEDIATE DIAPHRAGM**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

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STATE OF NORTH CAROLINA  
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**SUPERSTRUCTURE  
 TYPICAL SECTION**



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2			4			42

DRAWN BY: D. A. GLADDEN DATE: 11/18  
 CHECKED BY: D. R. SMITH DATE: 11/18  
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 11/18

## DECK PANEL SUPPORTS

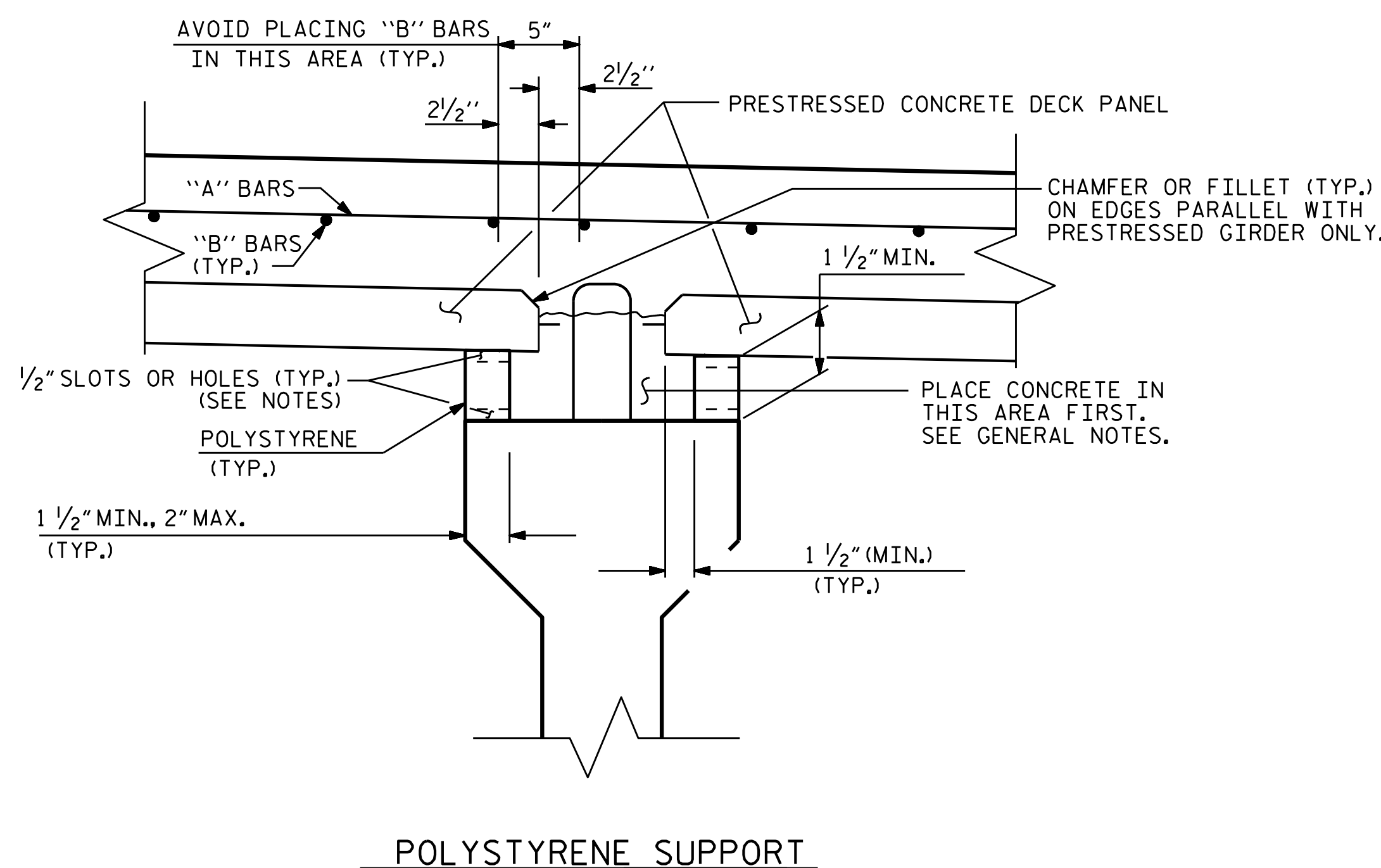
THE CONTRACTOR SHALL PROVIDE THE DECK PANEL SUPPORT SYSTEM SHOWN OR HE MAY SUBMIT A DECK PANEL SUPPORT SYSTEM OF HIS OWN DESIGN TO THE ENGINEER FOR APPROVAL.

### POLYSTYRENE SUPPORT SYSTEM

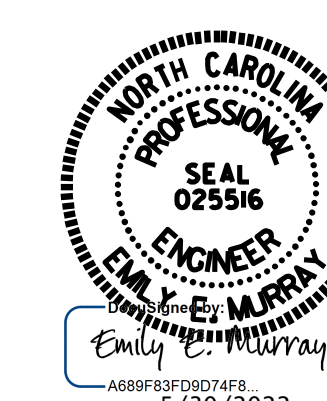
1. ALL POLYSTYRENE SHALL BE DOW STYROFOAM 60 HIGH-LOAD, UC INDUSTRIES FOAMULAR 600 OR APPROVED EQUAL.
2. THE POLYSTYRENE SUPPORT SYSTEM SHALL CONSIST OF ONE LAYER WITH A MINIMUM WIDTH OF 1 1/2" AND A MAXIMUM WIDTH OF 2"; THE POLYSTYRENE SHALL HAVE 1/2" X 1/2" WIDE SLOTS OR 1/2" DIAMETER HOLES AT 4'-0" CENTERS STAGGERED ALONG THE TOP AND BOTTOM.
3. THE POLYSTYRENE MAY BE CUT AND PLACED ON EDGE AS NECESSARY TO MATCH THE REQUIRED BUILDUP PROFILE ALONG THE GIRDER.
4. ADHESIVE, AS APPROVED BY THE ENGINEER, SHALL BE APPLIED TO THE TOP OF THE GIRDER IN A CONTINUOUS BEAD AND IN SUFFICIENT AMOUNT TO PREVENT THE POLYSTYRENE FROM BLOWING OUT AND TO PREVENT GAPS FROM FORMING BETWEEN THE POLYSTYRENE AND THE GIRDER. PRIOR TO PLACEMENT OF THE DECK PANELS, THE ADHESIVE SHALL ALSO BE APPLIED TO THE TOP OF THE POLYSTYRENE.
5. CONCRETE-FILLED BUCKETS, STACKS OF DECK PANELS, BUNDLED REINFORCING BARS OR OTHER HEAVY CONCENTRATED LOADS WILL NOT BE PERMITTED ON THE DECK PANEL ONCE THE PANEL HAS BEEN PLACED ON THE POLYSTYRENE SUPPORT SYSTEM.

## GENERAL NOTES

1. THE DESIGN COMPRESSIVE STRENGTH (f'c) FOR THE CONCRETE IN PRESTRESSED PANELS SHALL BE 5000 PSI MINIMUM AT 28 DAYS. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF RELEASE OF STRANDS SHALL BE 4000 PSI MINIMUM.
2. THE PRECAST PRESTRESSED PANEL SHALL HAVE A THICKNESS OF 3 1/2" WITH THE PRESTRESSED STRANDS LOCATED AT HALF THE DEPTH OF THE PANEL.
3. FOR SKEWED SPANS, TRAPEZOIDAL CLOSURE PANELS SHALL HAVE A MINIMUM WIDTH OF 2 FEET ON THE SHORT SIDE.
4. ALL PRESTRESSING STRANDS SHALL EXTEND 2" BEYOND THE PANEL EDGES.
5. SHEAR REINFORCING OF 0.60 SQ. INCHES OF REINFORCING STEEL PER 10 SQ. FEET OF PANEL SURFACE SHALL BE PROVIDED IN THE PANEL TO ENSURE COMPOSITE ACTION BETWEEN PANEL AND THE CAST-IN-PLACE CONCRETE. SHEAR REINFORCEMENT SHALL BE MADE OF WELDED WIRE HAVING A MINIMUM YIELD STRENGTH OF 60 KSI.
6. SHEAR REINFORCEMENT AND LIFTING DEVICES SHALL BE CONSTRUCTED AND PLACED SO AS TO AVOID ANY INTERFERENCE WITH REINFORCING STEEL IN THE CAST-IN-PLACE DECK SLAB AND TO ALLOW FOR PROPER CONCRETE CONSOLIDATION IN THE DECK PANEL.
7. SHIFT LONGITUDINAL "B" BARS AS NECESSARY TO OBTAIN A MINIMUM CLEAR DISTANCE OF 2 1/2" TO THE RIGHT OR LEFT OF THE EDGE OF THE DECK PANEL. IF, IN SHIFTING TO OBTAIN THIS CLEARANCE, THE "B" BAR INTERFERES WITH THE STIRRUP IN THE TOP OF THE GIRDER THE "B" BAR MAY BE ELIMINATED.
8. WHEN CASTING THE DECK, PLACE CONCRETE FIRST OVER THE GIRDERS IN CONTINUOUS STRIPS A MINIMUM OF THREE PANEL LENGTHS AHEAD OF THE REST OF THE CONCRETE. CAREFULLY VIBRATE THE CONCRETE OVER THE GIRDERS SO THAT CONCRETE COMPLETELY FILLS THE AREA UNDER THE DECK PANEL OVERHANGS. THEN PLACE AND VIBRATE THE REMAINING DECK CONCRETE.
9. PRECAST PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.
10. PRESTRESSED CONCRETE PRECAST DECK PANELS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.



PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 PRECAST PRESTRESSED  
 CONCRETE DECK PANELS

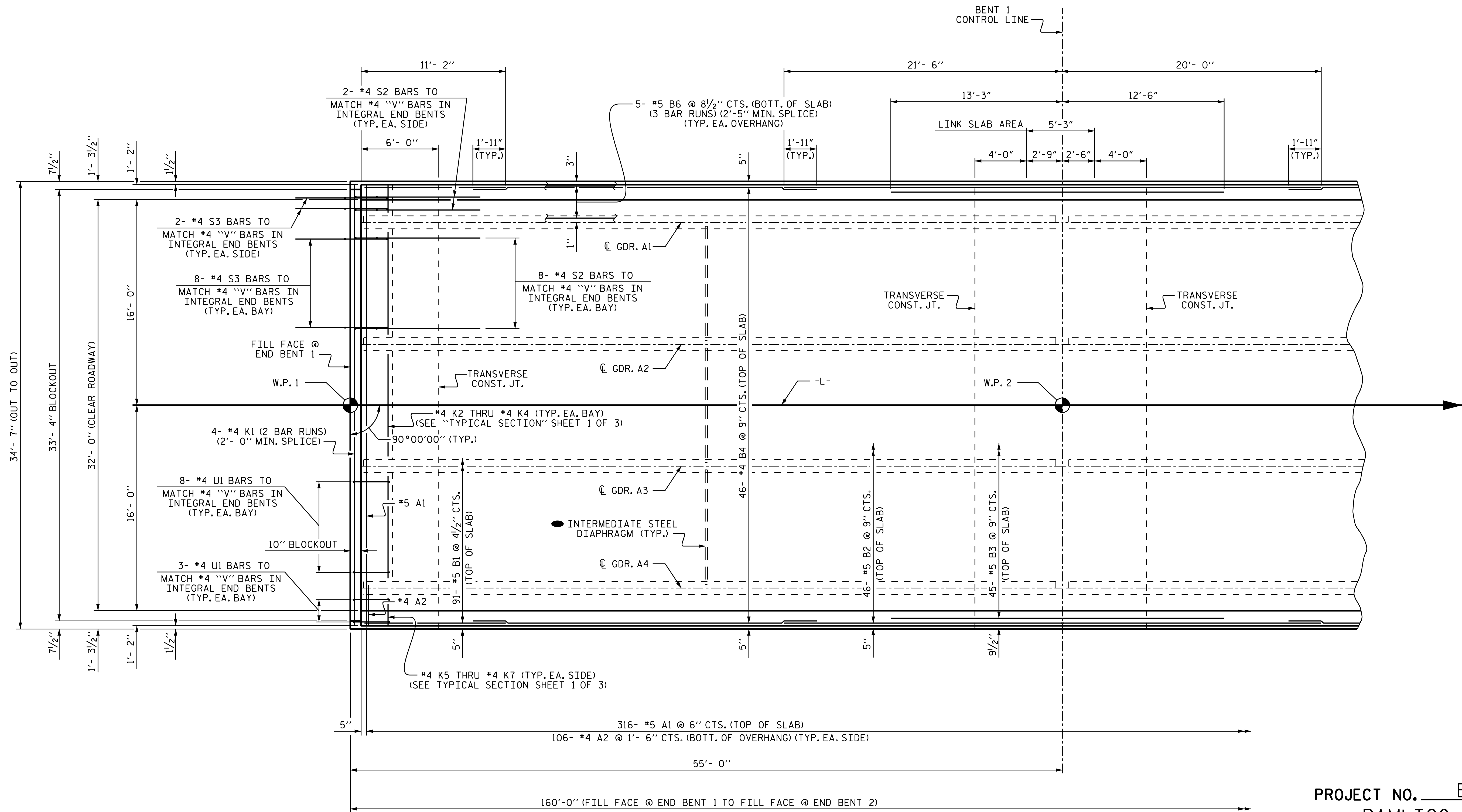
ASSEMBLED BY : <u>D. A. GLADDEN</u>	DATE : <u>11/18</u>
CHECKED BY : <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DESIGN ENGINEER OF RECORD: <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DRAWN BY : <u>ELR 1/92</u>	REV. 5/1/06R TLA/GM
CHECKED BY : <u>GRP 4/92</u>	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			42



### PLAN OF SPAN A

SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN A



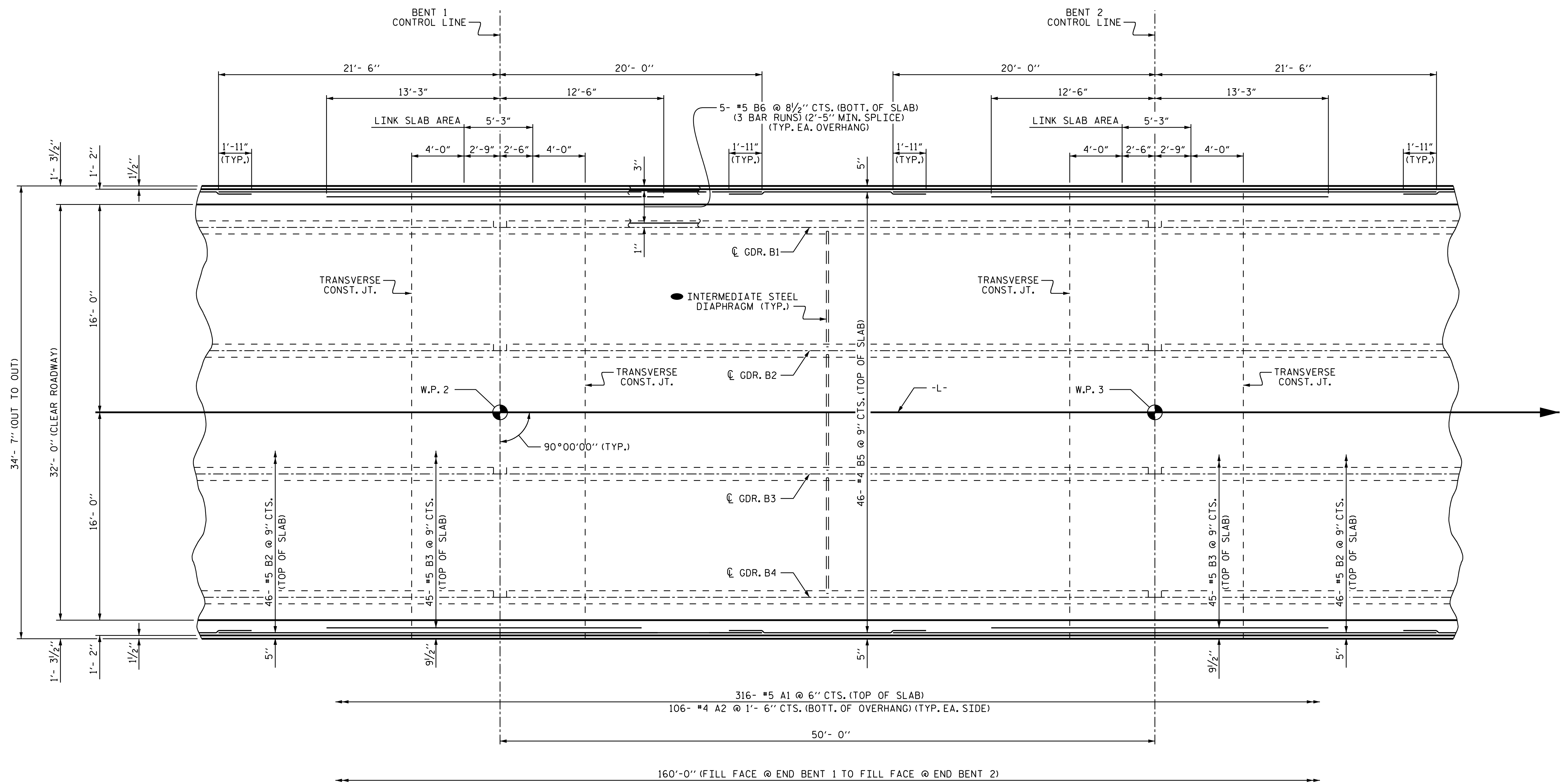
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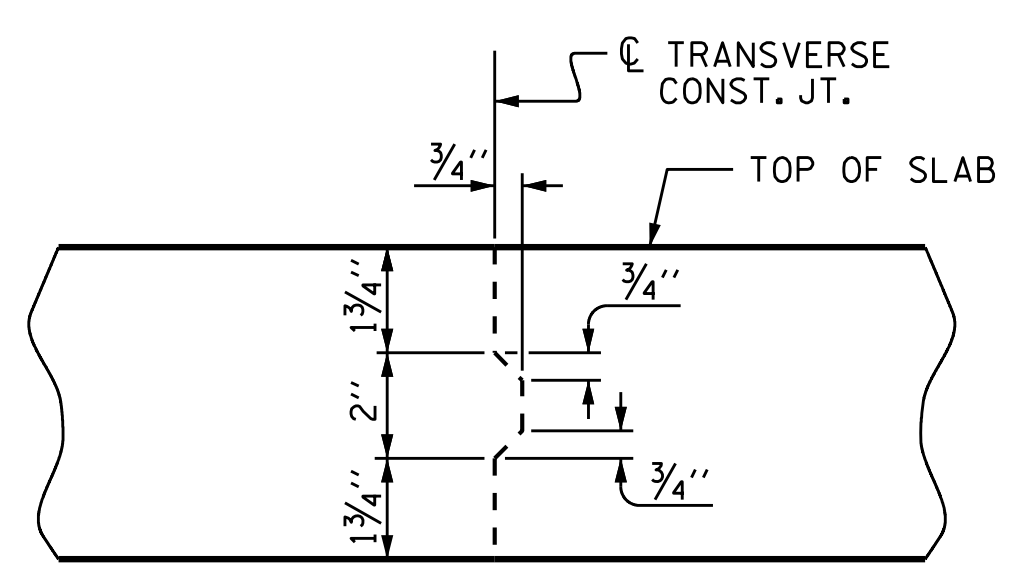
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CHECKED BY:	D. R. SMITH	DATE:	11/18
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**PLAN OF SPAN B**

● SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDERS".



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN B**

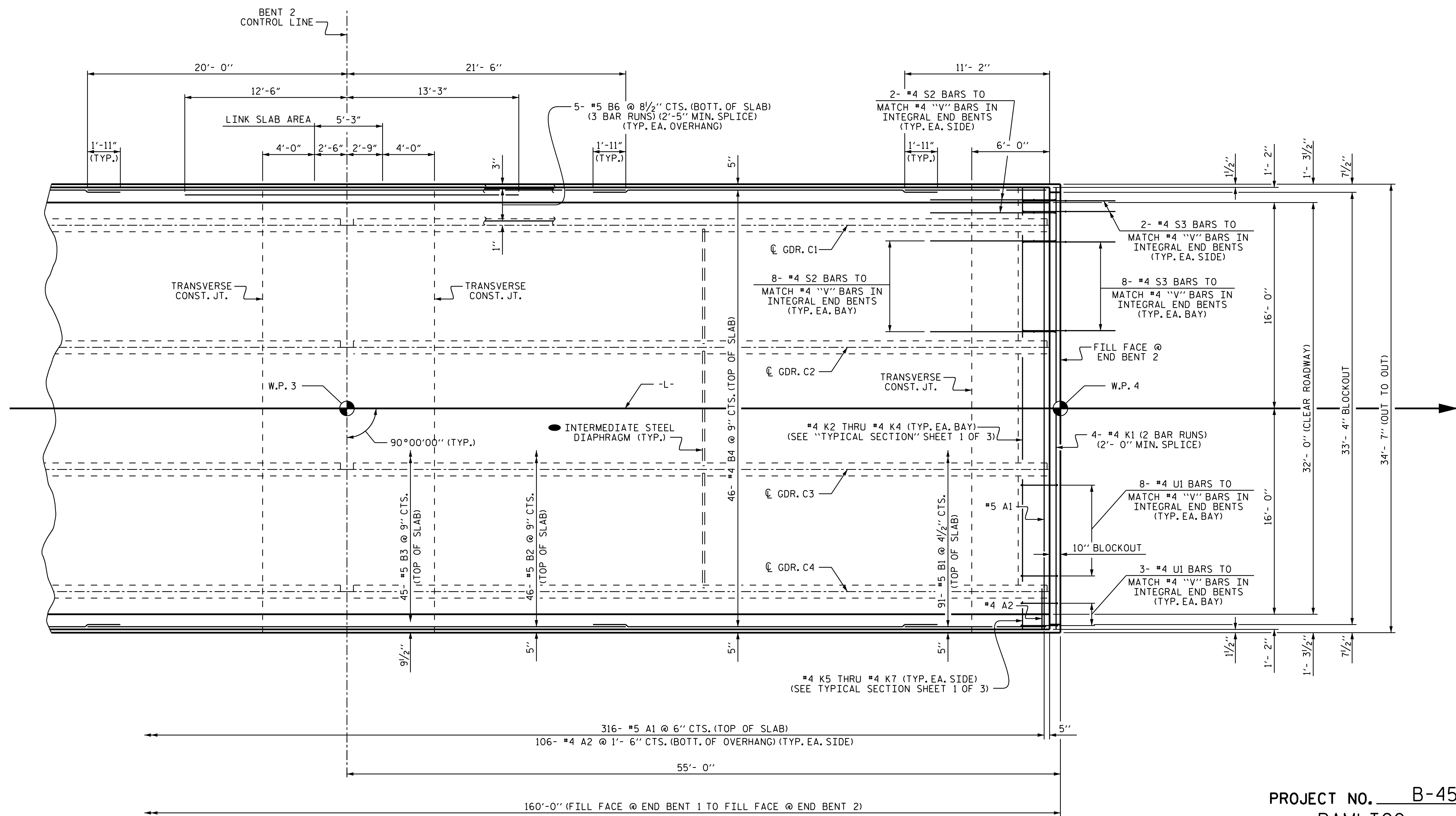


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DRAWN BY: D. A. GLADDEN DATE: 11/18  
 CHECKED BY: D. R. SMITH DATE: 11/18  
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 11/18



### PLAN OF SPAN C

SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SUPERSTRUCTURE PLAN OF SPAN C

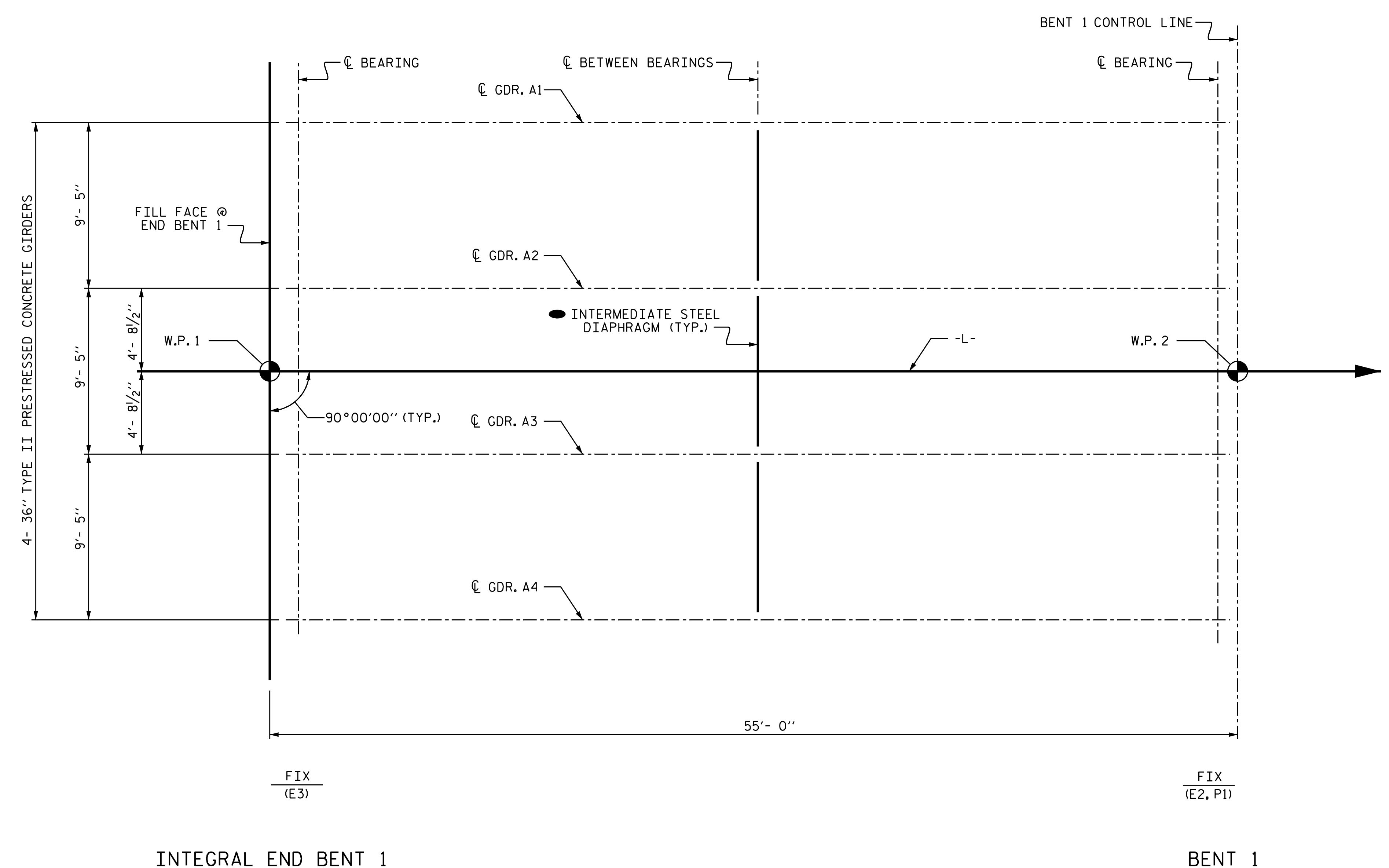


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 CHECKED BY: D. R. SMITH DATE: 11/18  
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 11/18



**GIRDER LAYOUT (SPAN A)**

SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 GIRDER LAYOUT**



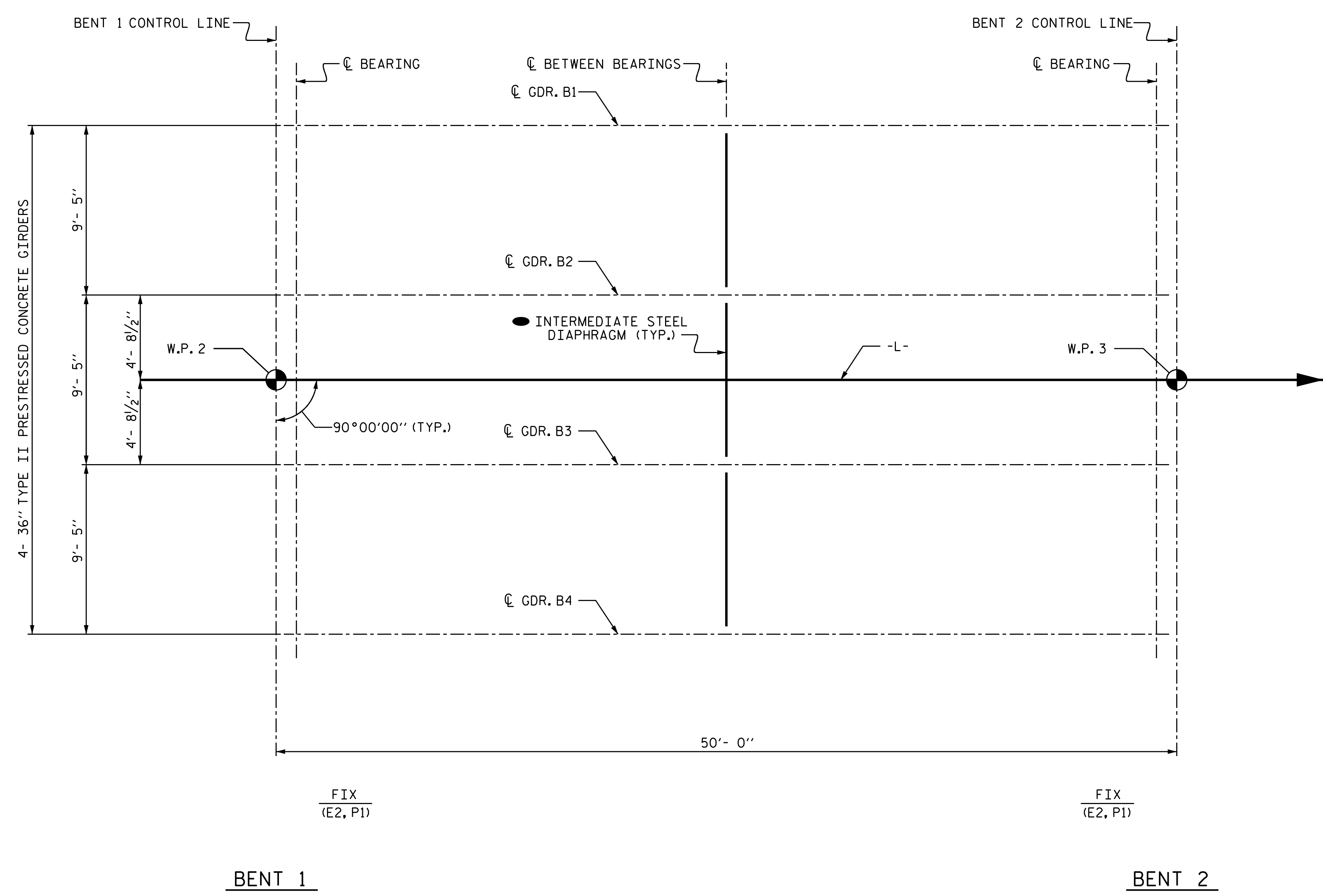
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**GIRDER LAYOUT (SPAN B)**

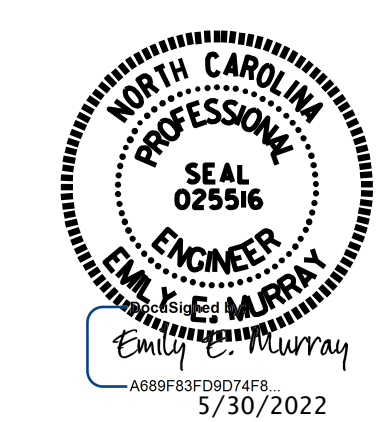
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PROJECT NO. B-4593  
PAMLICO COUNTY  
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SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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**SUPERSTRUCTURE  
 GIRDER LAYOUT**



**VOLKERT**

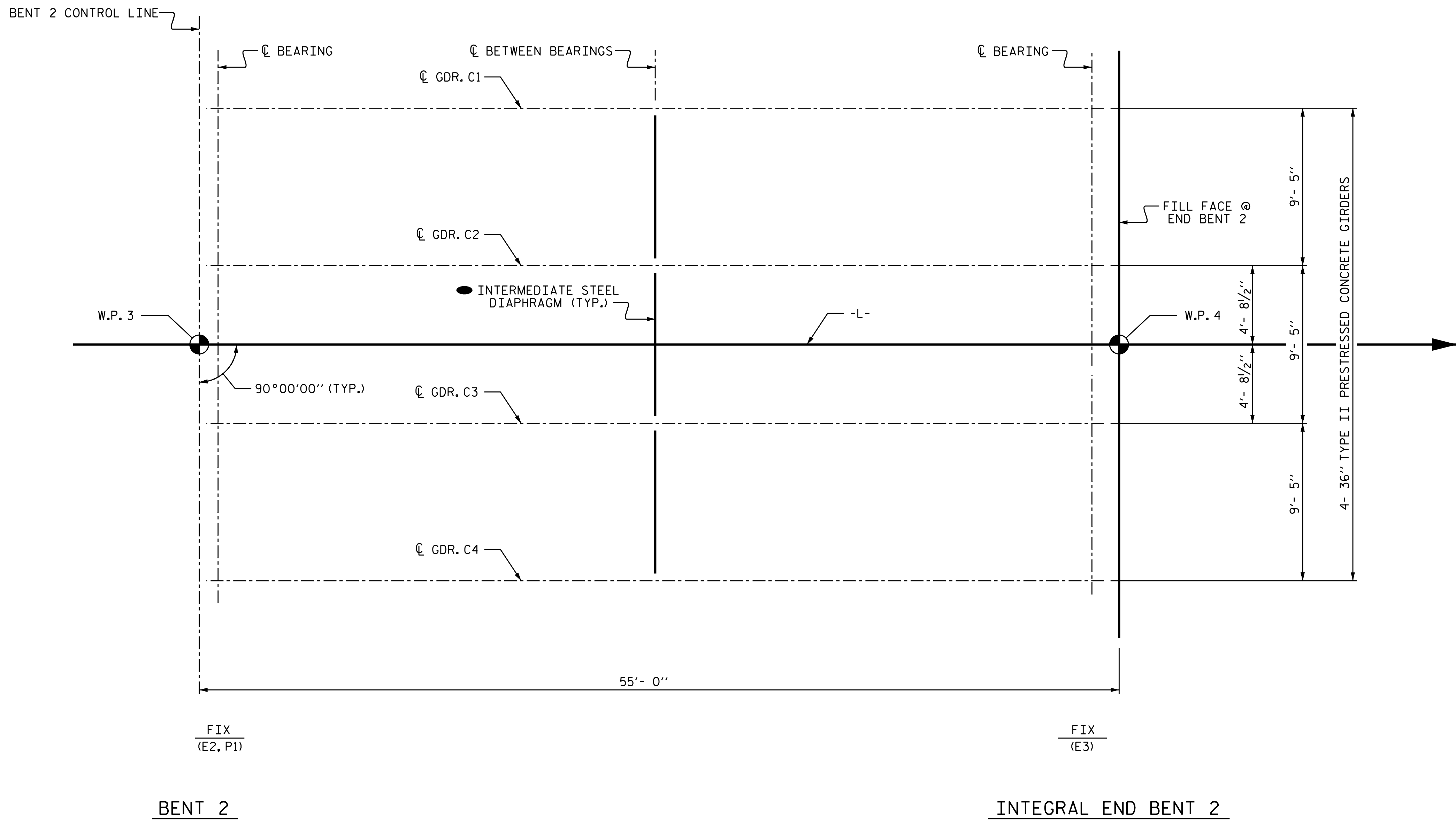
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2			4			

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BENT 2

INTEGRAL END BENT 2

**GIRDER LAYOUT (SPAN C)**

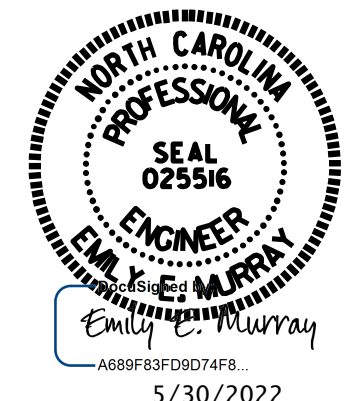
● SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDERS".

PROJECT NO. B-4593  
PAMLICO COUNTY  
STATION: 17+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
GIRDER LAYOUT**

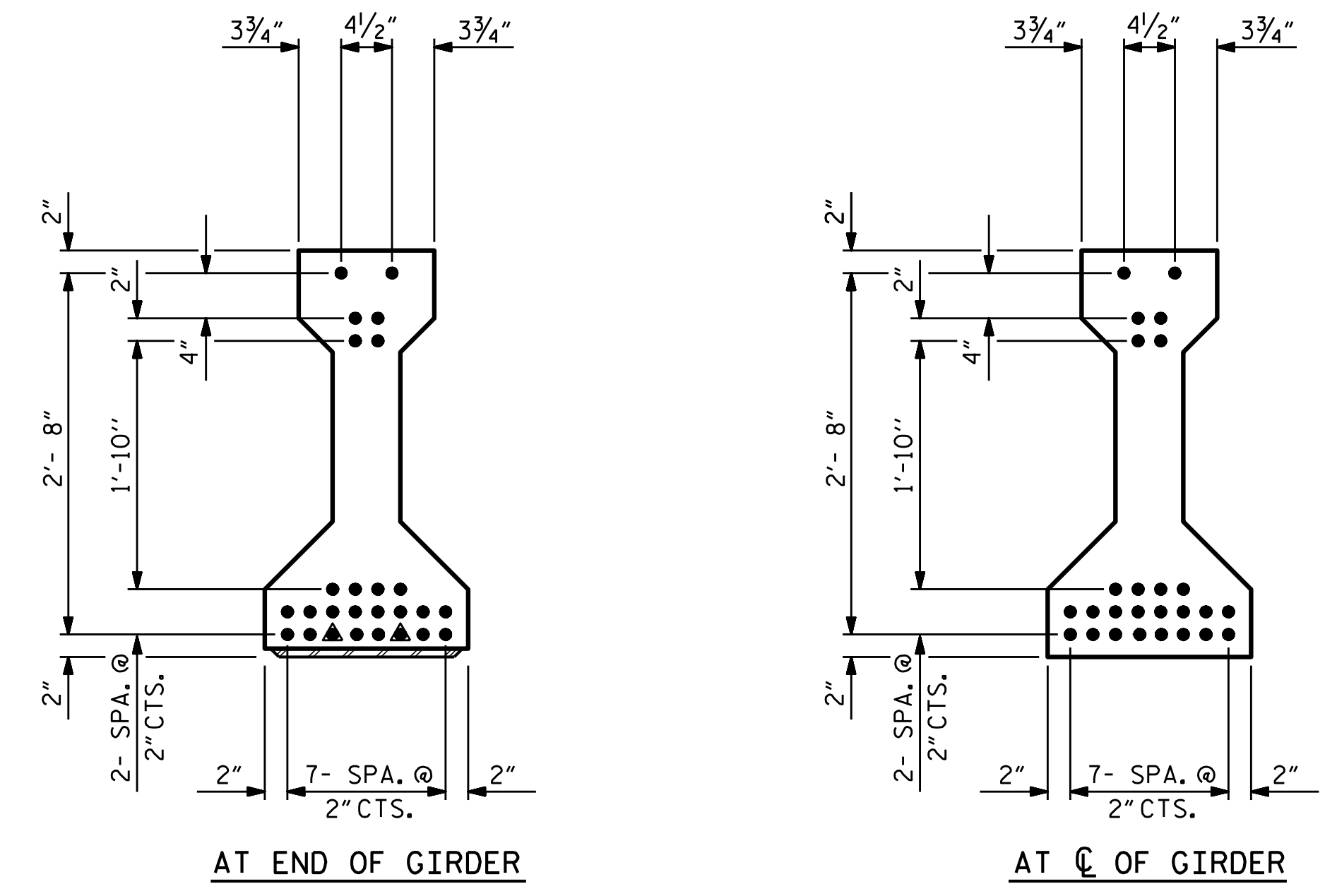
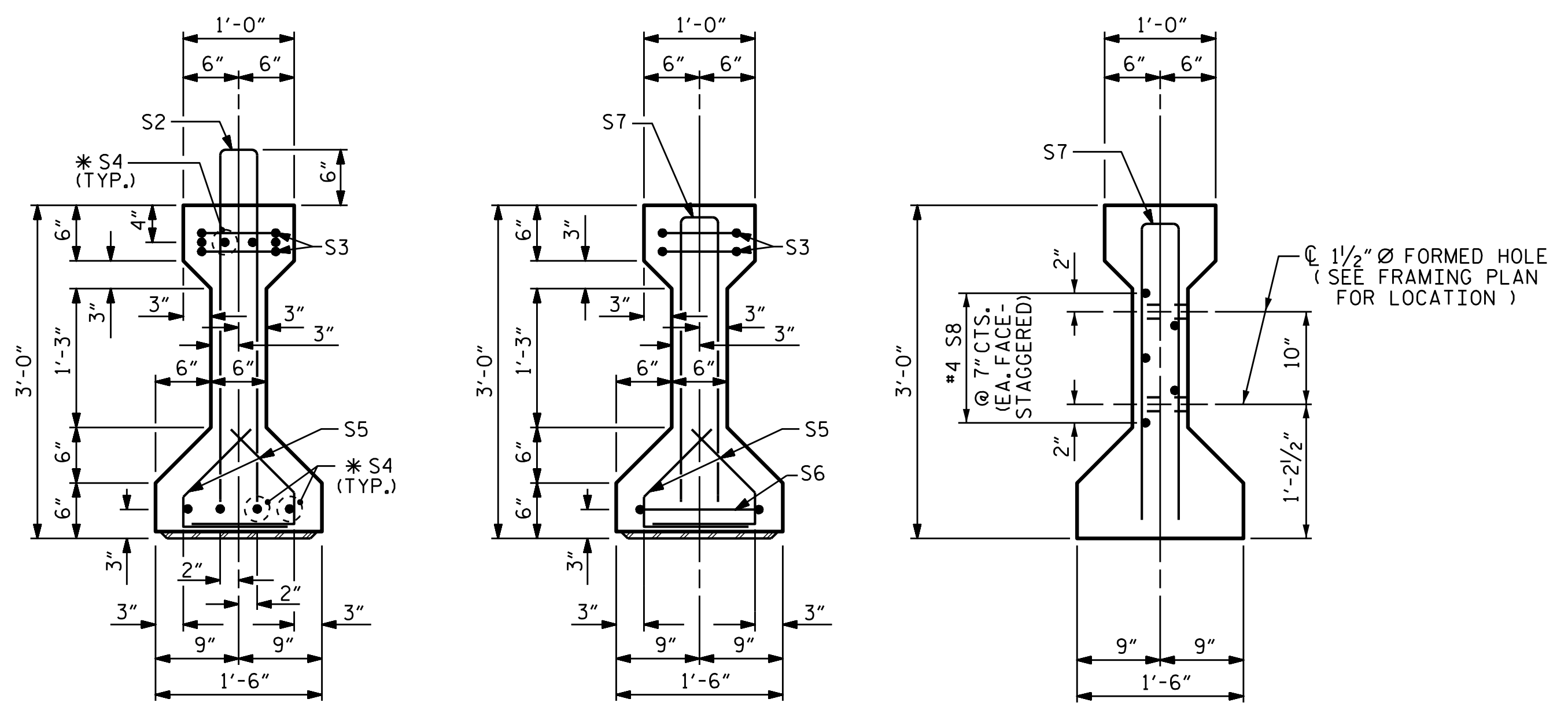


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			42

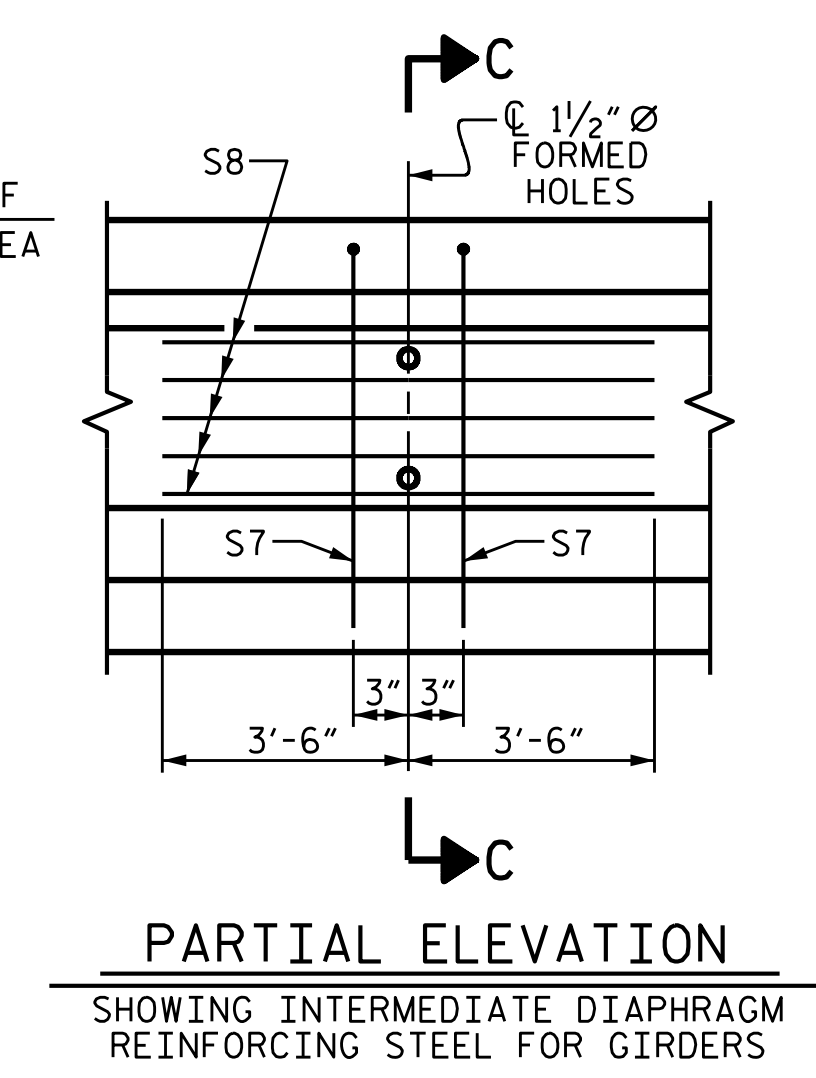
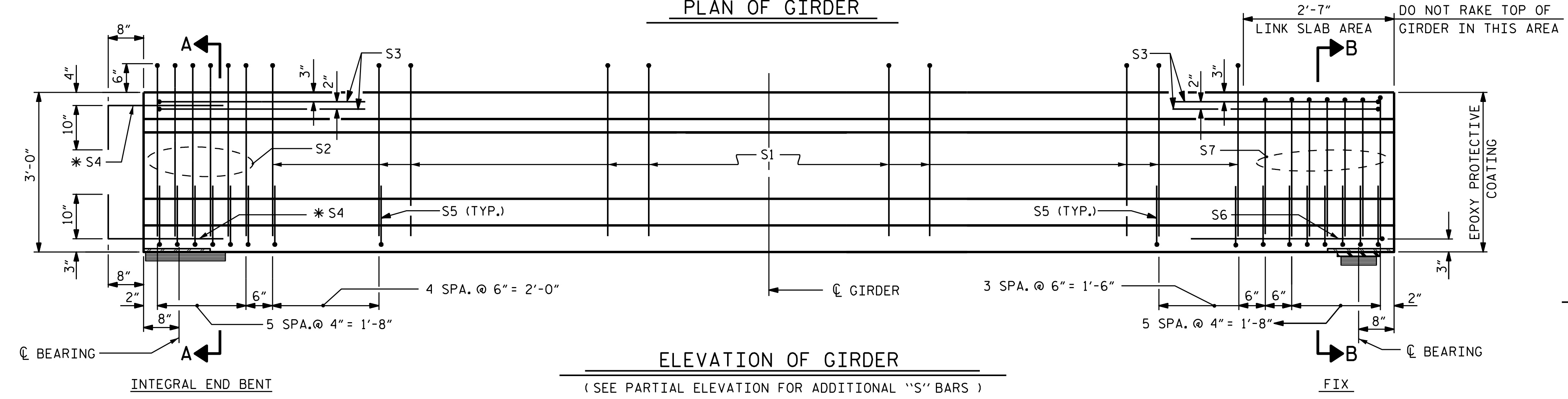
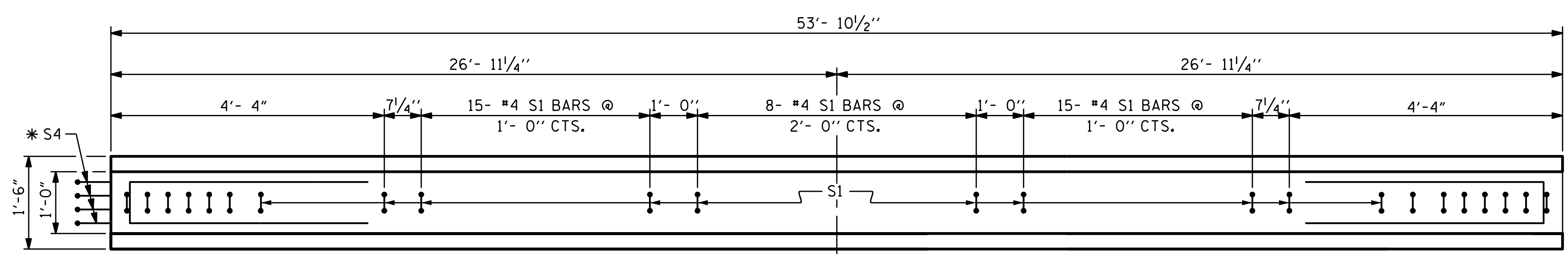
DRAWN BY :	D. A. GLADDEN	DATE :	11/18
CHECKED BY :	D. R. SMITH	DATE :	11/18
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0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

▲ STRANDS DEBONDED FOR 12'- 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

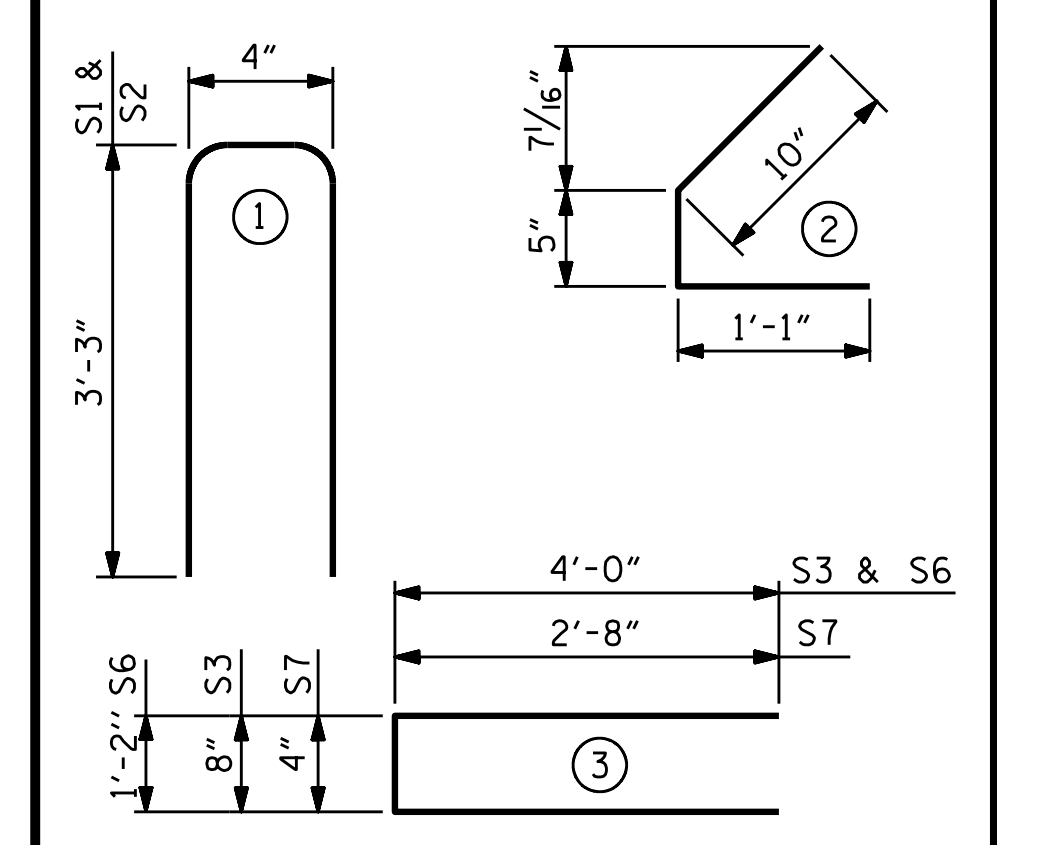
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	46	#4	1	6'-10"	210
S2	6	#5	1	6'-10"	43
S3	4	#4	3	8'-8"	23
*S4	6	#5	STR	3'-8"	23
S5	44	#4	2	2'-4"	69
S6	1	#4	3	9'-2"	6
S7	9	#5	3	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	7500 PSI CONCRETE	0.6" Ø L. R. STRANDS
LBS.	C.Y.	No.
450	5.1	26

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	53'- 10 1/2"	215'- 6"

PROJECT NO. B-4593

PAMLICO COUNTY

STATION: 17+02.00 -L-

STATE OF NORTH CAROLINA  
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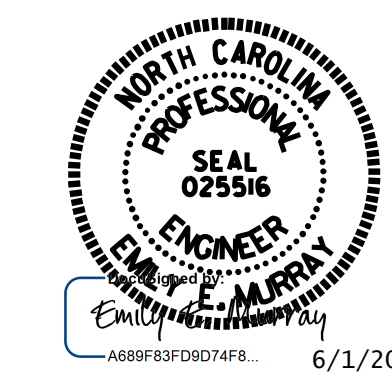
STANDARD  
AASHTO TYPE II  
PRESTRESSED CONCRETE GIRDER  
LINK SLAB  
(SPAN A)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			42

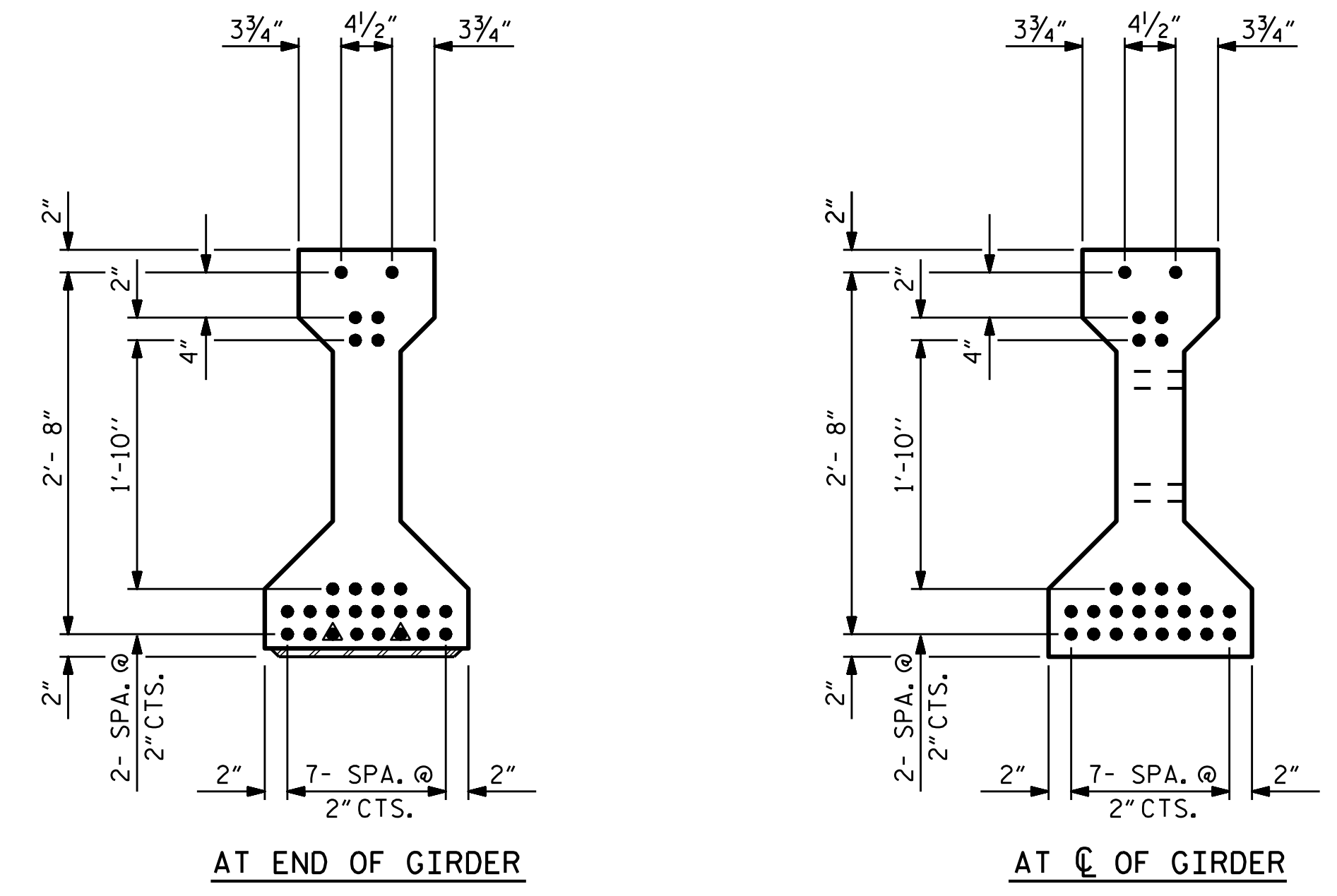
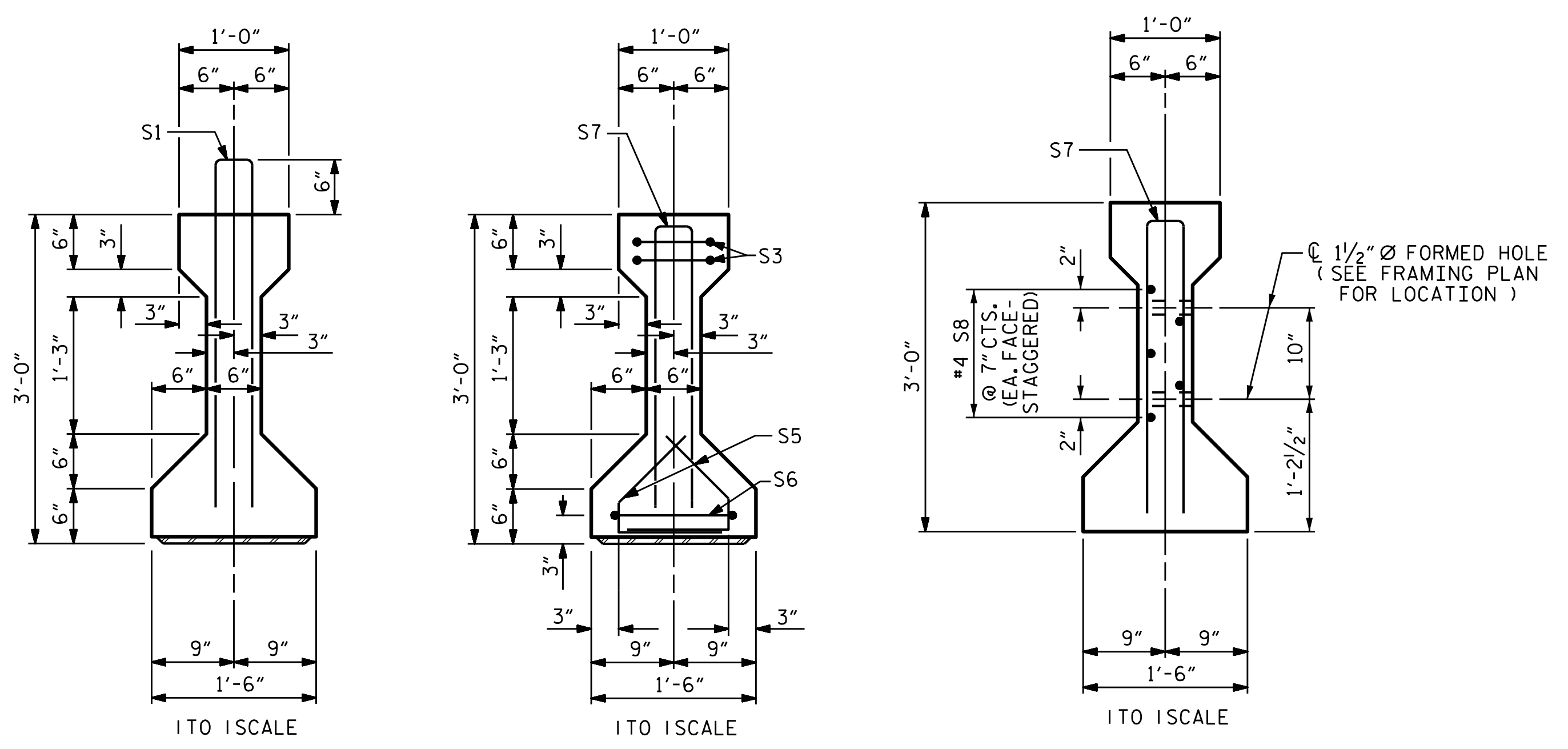
ASSEMBLED BY :	D. A. GLADDEN	DATE :	11/18
CHECKED BY :	D. R. SMITH	DATE :	11/18
DESIGN ENGINEER OF RECORD :	D. R. SMITH	DATE :	11/18
DRAWN BY :	ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY :	GRP 8/91	REV. 1/15	MAA/TMG
		REV. 12/17	MAA/THC

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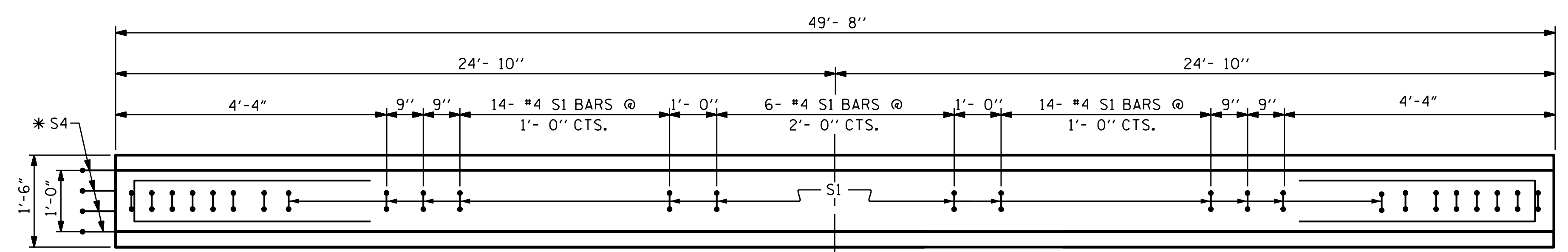
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND  
 ▲ STRANDS DEBONDED FOR 12'- 0" FROM END OF GIRDER

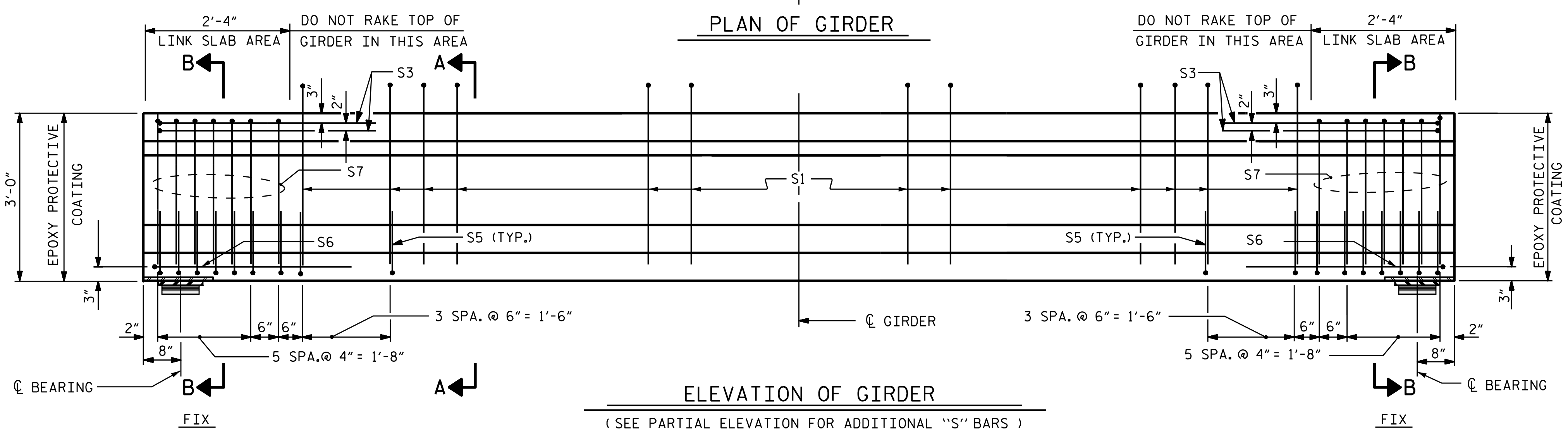
SECTION A-A

SECTION B-B

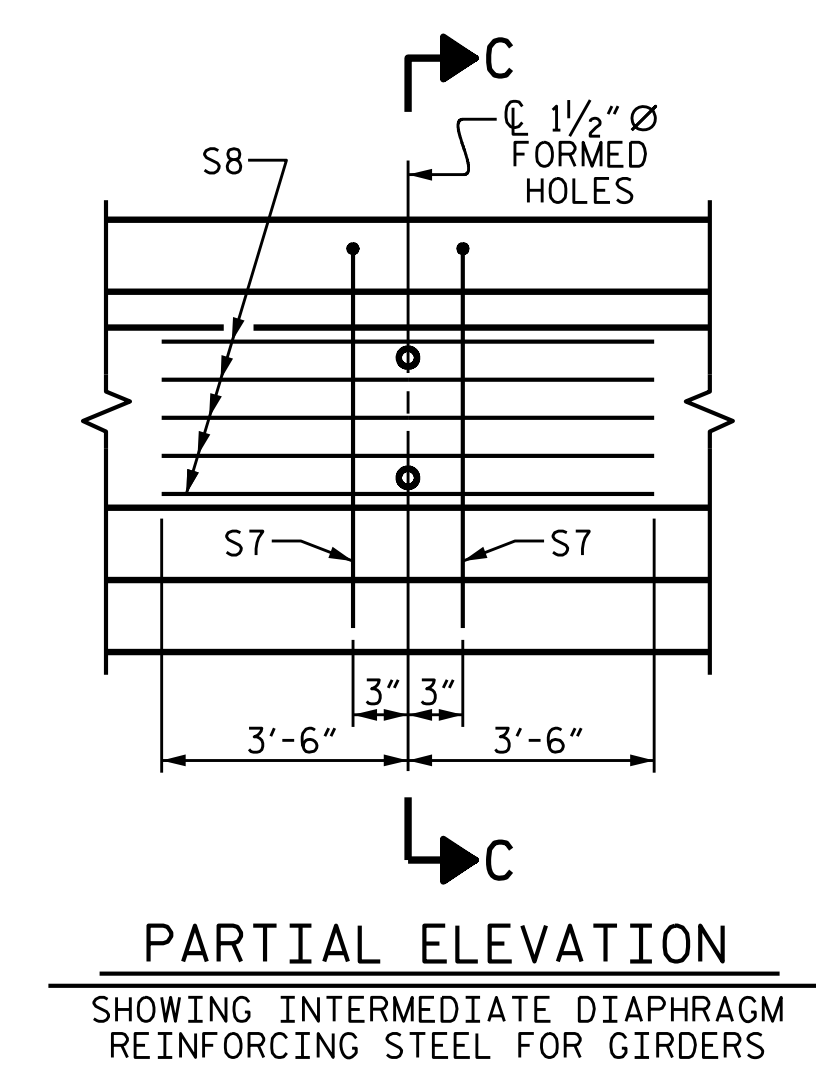
SECTION C-C  
 (S1 BARS NOT SHOWN)



PLAN OF GIRDER



ELEVATION OF GIRDER  
 (SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION  
 SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

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

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	44	#4	1	6'-10"	201
S3	4	#4	3	8'-8"	23
S5	44	#4	2	2'-4"	69
S6	2	#4	3	9'-2"	12
S7	16	#5	3	5'-8"	95
S8	5	#4	STR	7'-0"	23

BAR TYPES					
ALL BAR DIMENSIONS ARE OUT-TO-OUT					

QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL (LBS.)	7500 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
423	4.7	26

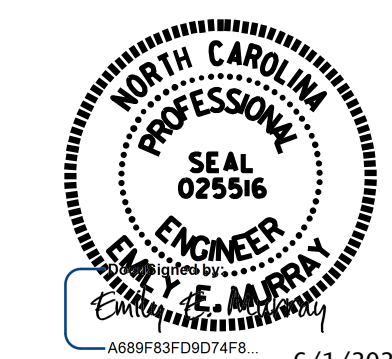
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	49'- 8"	198'- 8"

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

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

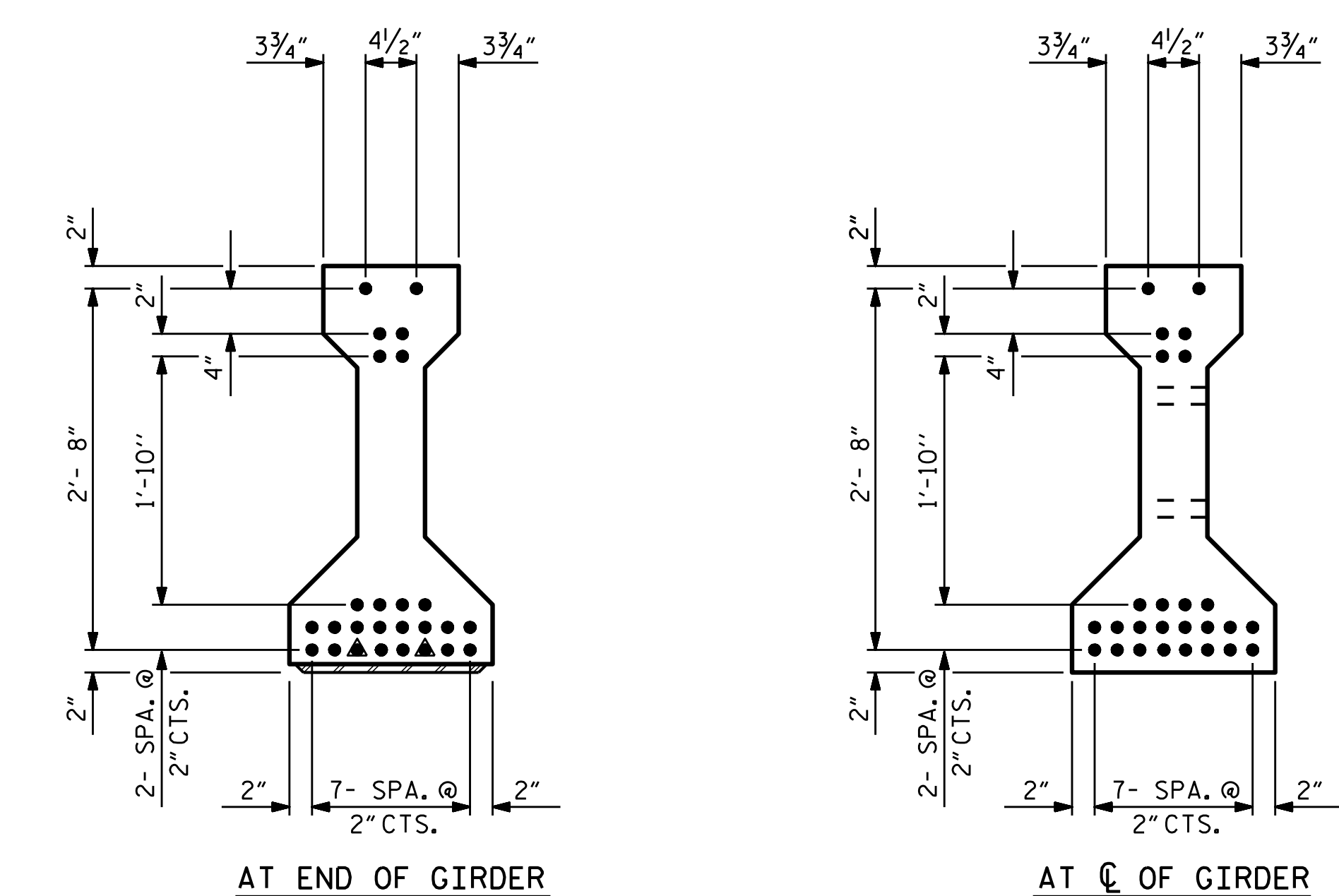
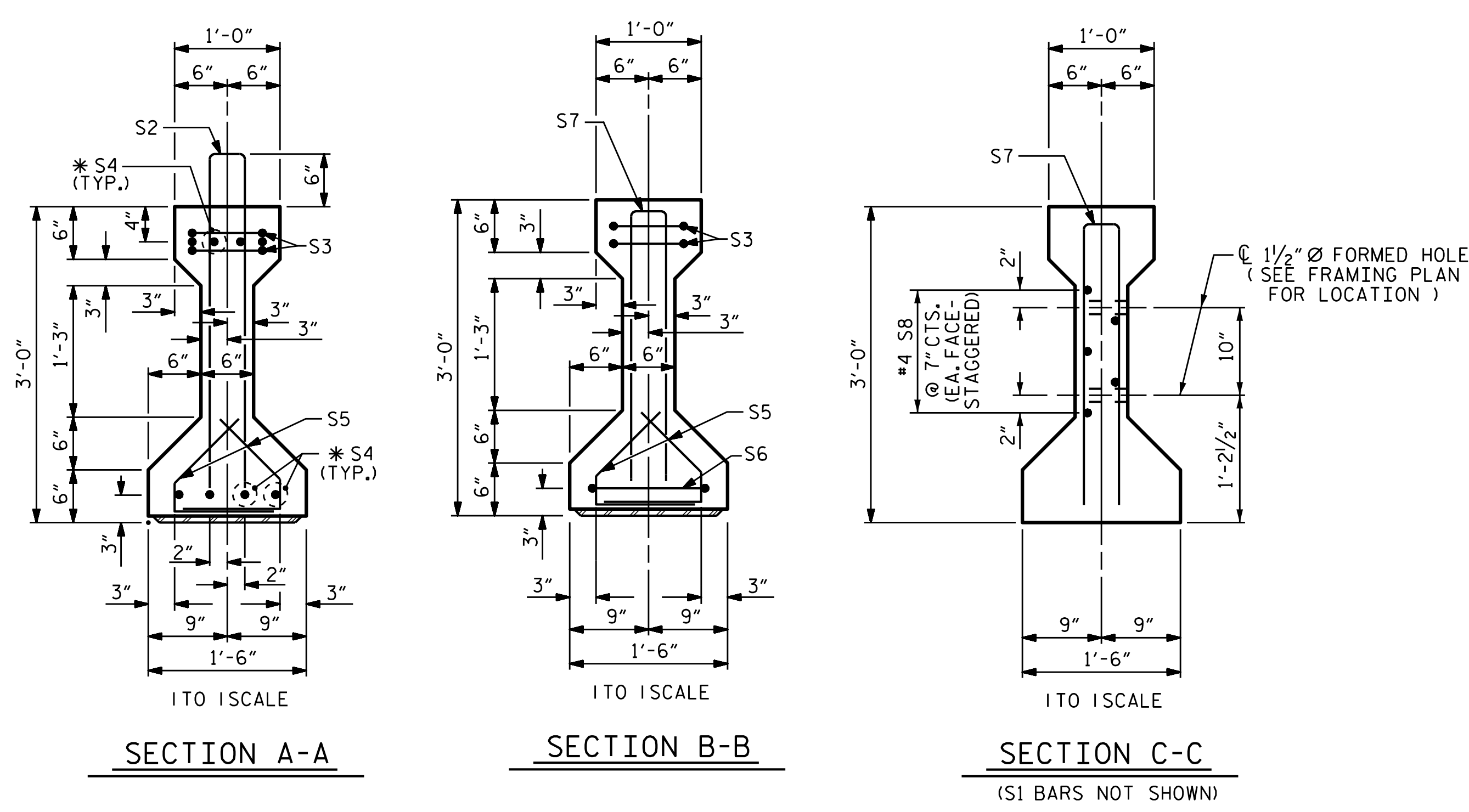
ASSEMBLED BY : D. A. GLADDEN	DATE : 11/18
CHECKED BY : D. R. SMITH	DATE : 11/18
DESIGN ENGINEER OF RECORD : D. R. SMITH	DATE : 11/18
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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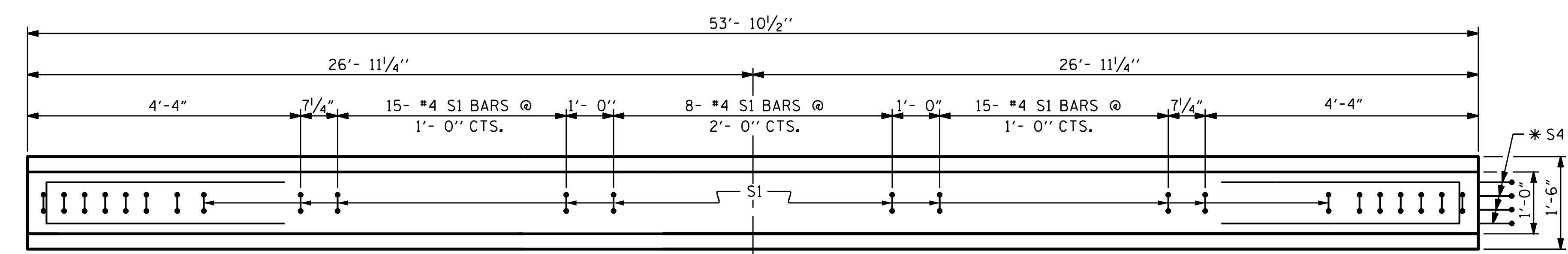
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2			4			

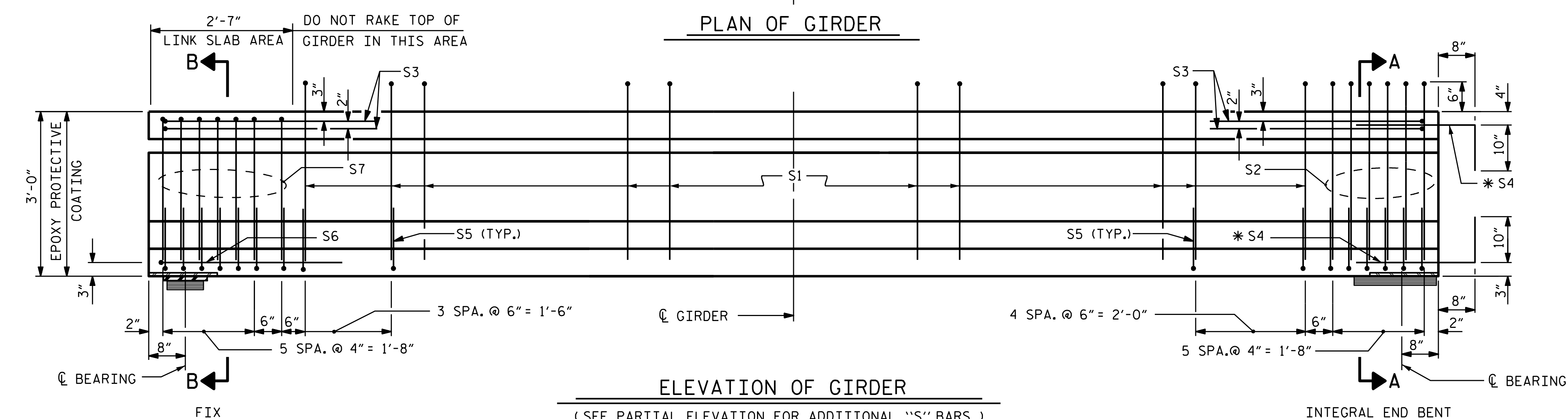


0.6" Ø LOW RELAXATION STRAND LAYOUT

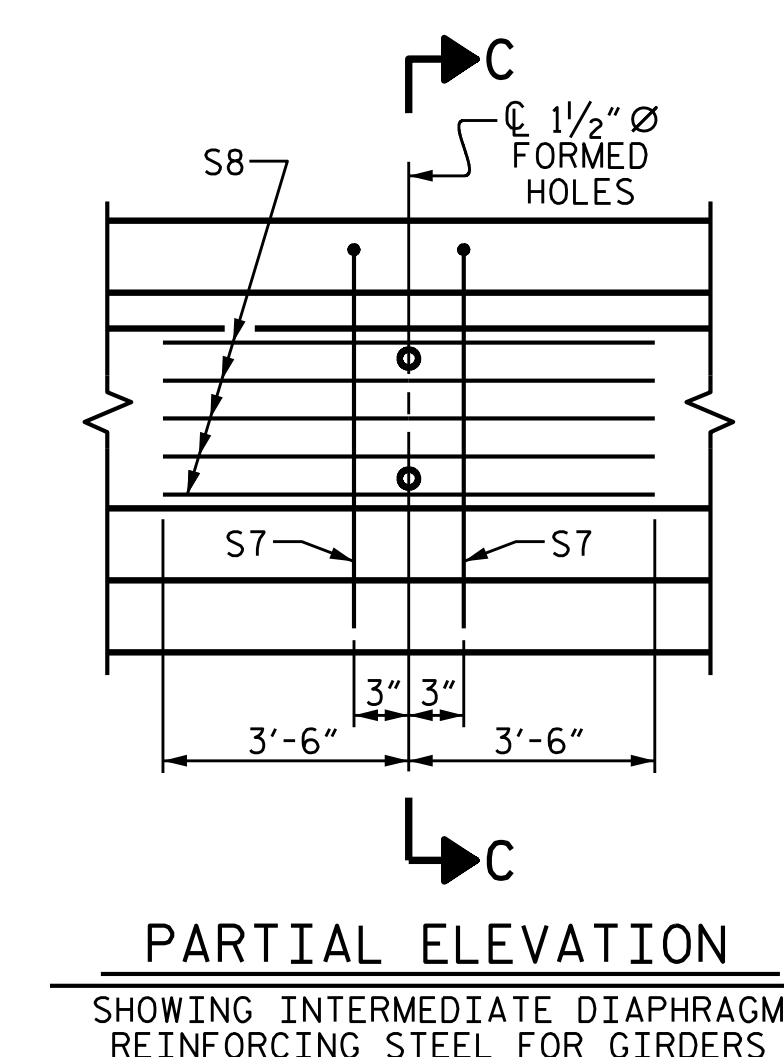
DEBONDING LEGEND  
 ▲ STRANDS DEBONDED FOR 12'- 0" FROM END OF GIRDER



PLAN OF GIRDER



ELEVATION OF GIRDER  
 (SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION  
 SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

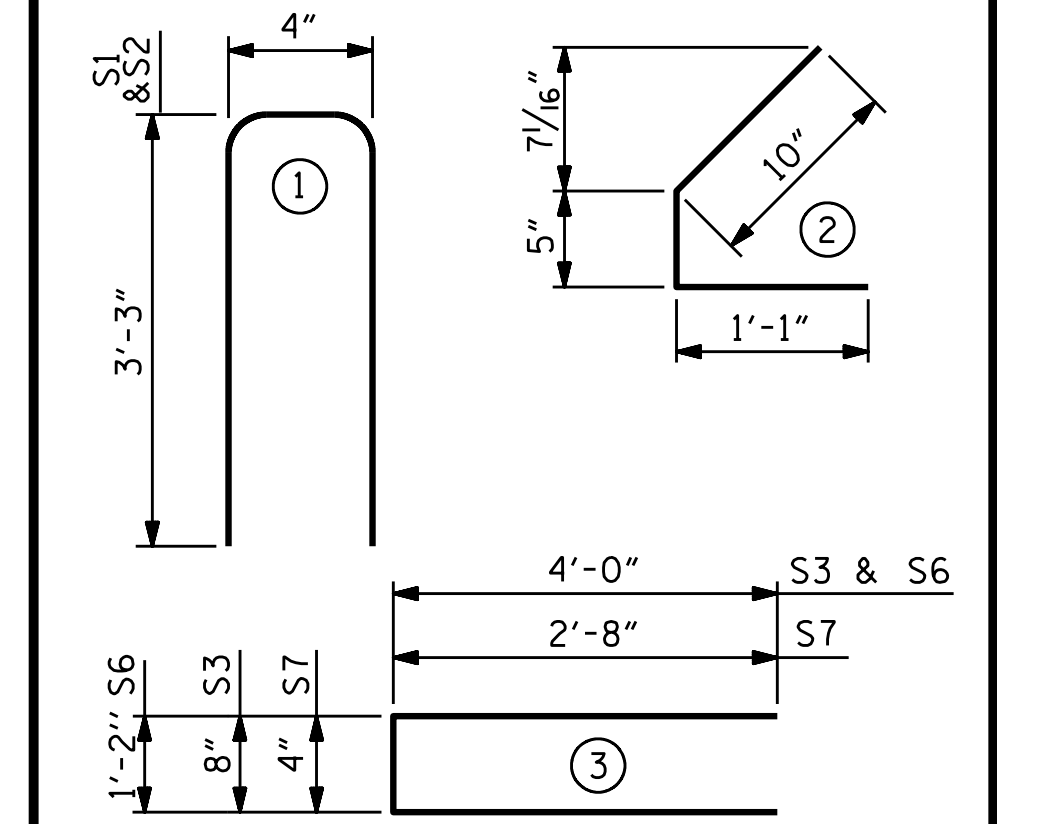
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
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S5	44	#4	2	2'-4"	69
S6	1	#4	3	9'-2"	6
S7	9	#5	3	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	7500 PSI CONCRETE	0.6" Ø L. R. STRANDS
LBS.	C.Y.	No.
450	5.1	26

GIRDERS REQUIRED

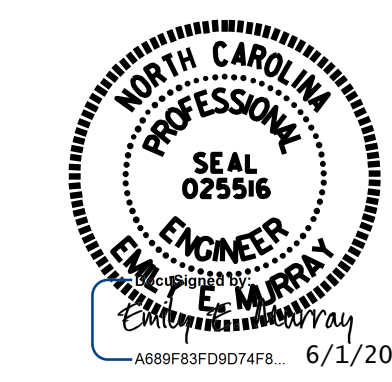
NUMBER	LENGTH	TOTAL LENGTH
4	53'- 10 1/2"	215'- 6"

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

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

ASSEMBLED BY :	D. A. GLADDEN	DATE :	11/18
CHECKED BY :	D. R. SMITH	DATE :	11/18
DESIGN ENGINEER OF RECORD :	D. R. SMITH	DATE :	11/18
DRAWN BY :	ELR 8/91	MAA/GM	
CHECKED BY :	GRP 8/91	REV. 1/15	MAA/TMG
		REV. 12/17	MAA/THC

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1			3			TOTAL SHEETS 42
2			4			

**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.

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 6700 PSI.

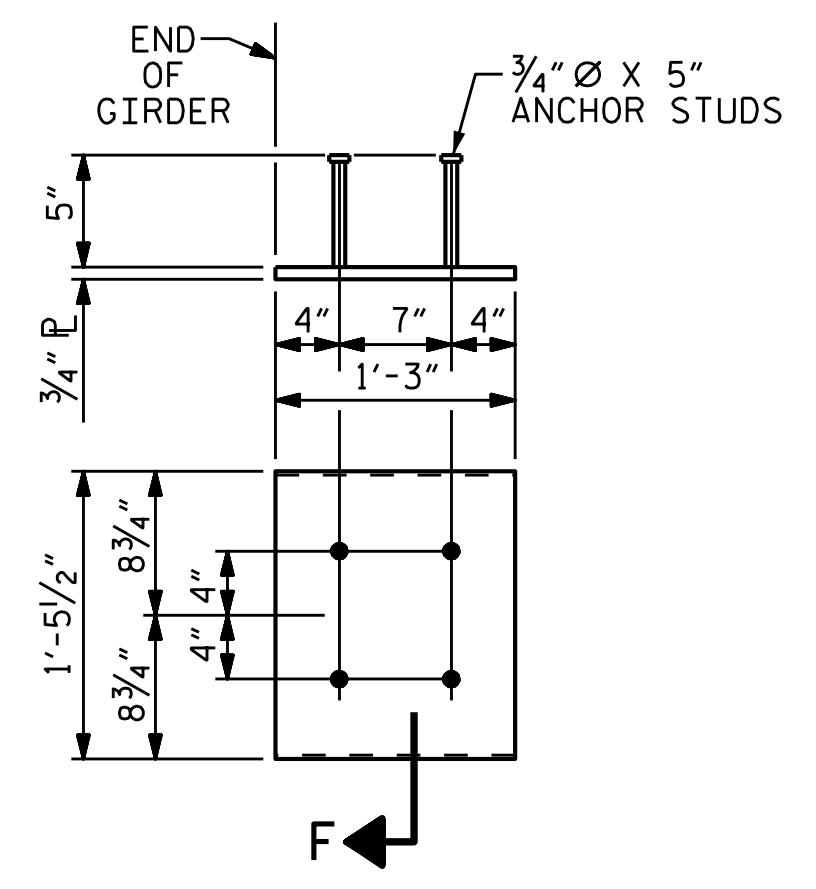
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT AS INDICATED ON PLANS.

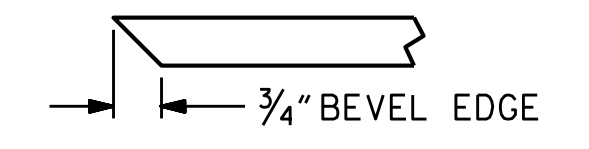
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.



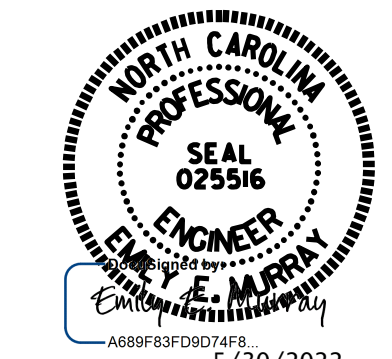
**EMBEDDED PLATE "B-1" DETAILS  
FOR AASHTO TYPE II GIRDER**  
(2 REQ'D PER GIRDER)



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

PROJECT NO. B-4593  
PAMLICO COUNTY  
STATION: 17+02.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
LINK SLAB  
DETAILS



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2			4			

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CHECKED BY :	D. R. SMITH	DATE :	11/18
DESIGN ENGINEER OF RECORD :	D. R. SMITH	DATE :	11/18
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 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE 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.

APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT ON THE EDGES AND THE WEB FACE OF THE CONNECTOR PLATE WHICH COMES IN CONTACT WITH THE CONCRETE GIRDER IN ACCORDANCE WITH 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.

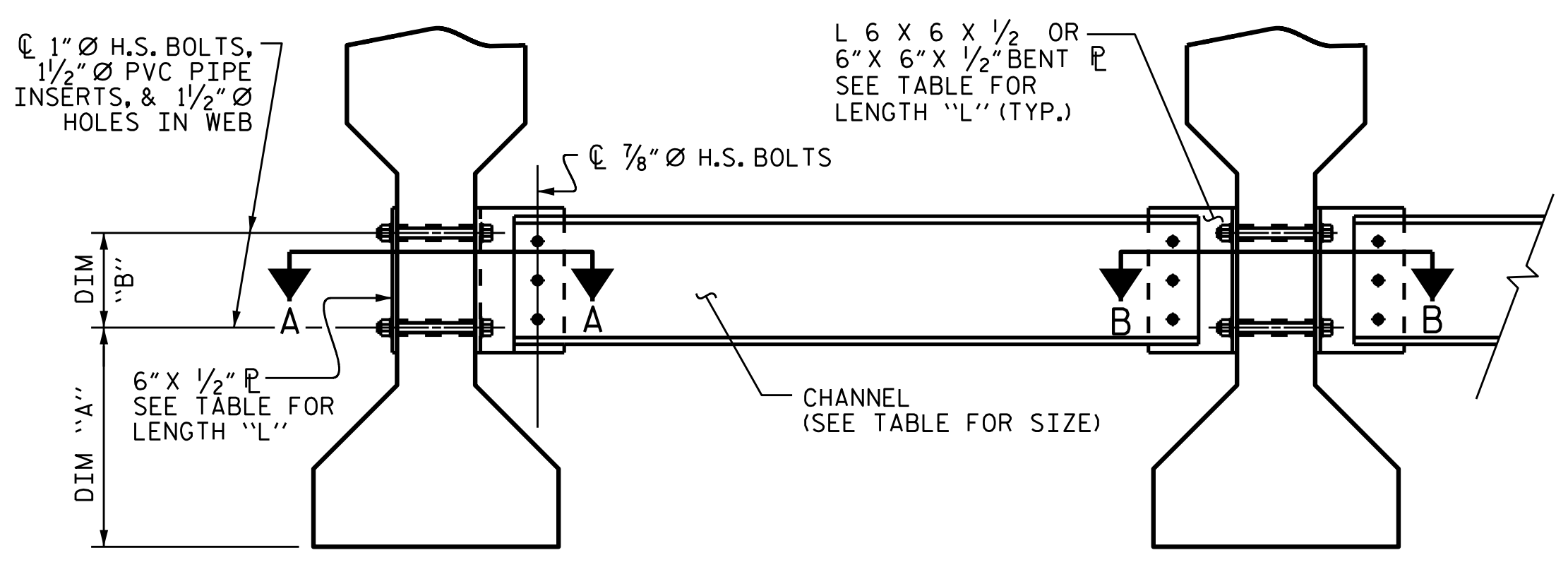
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

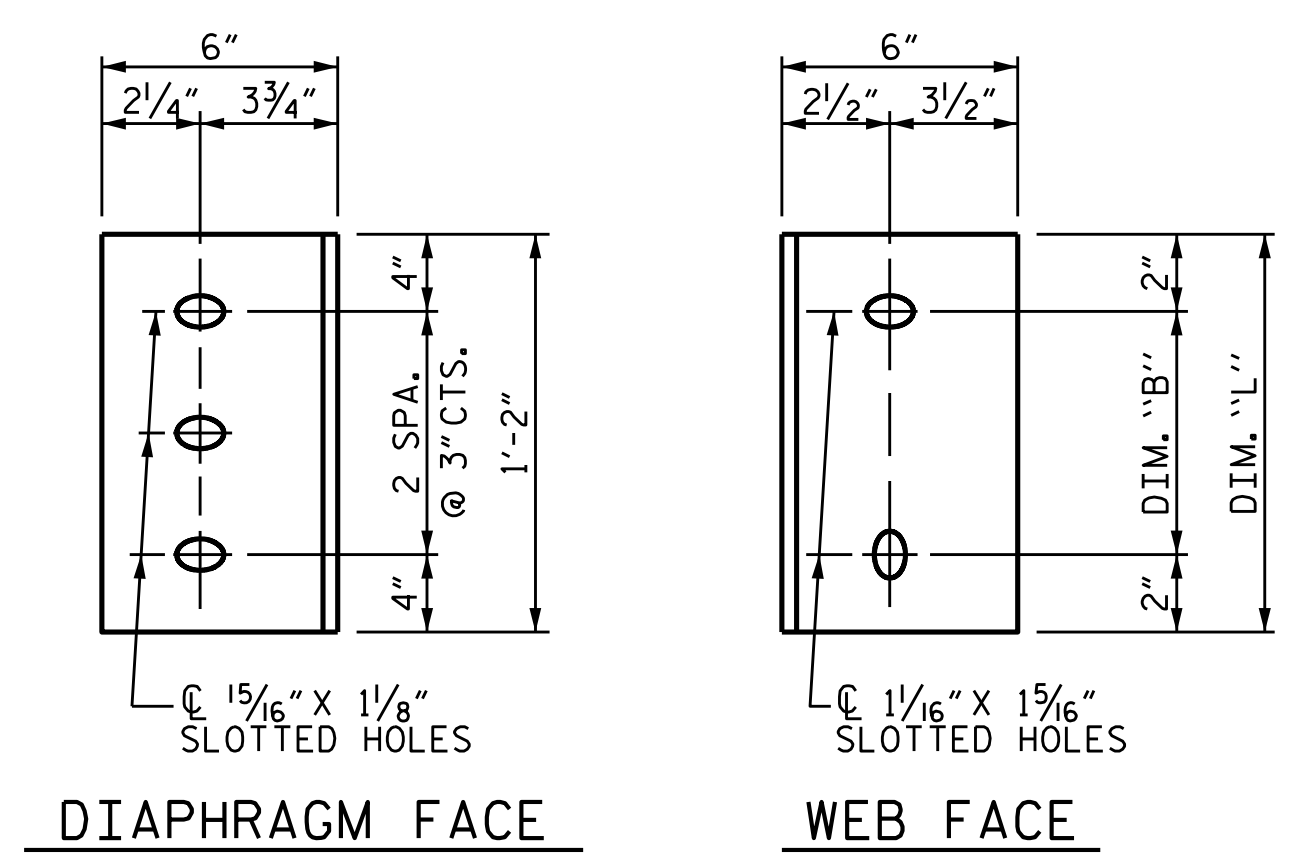
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

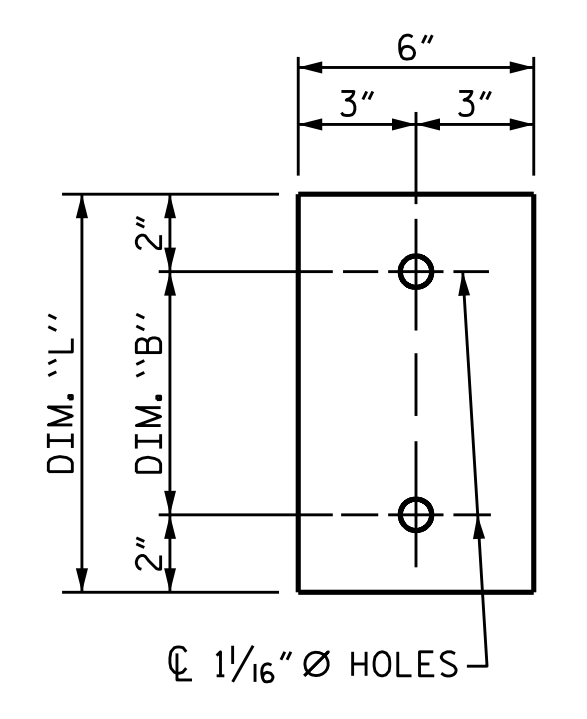
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



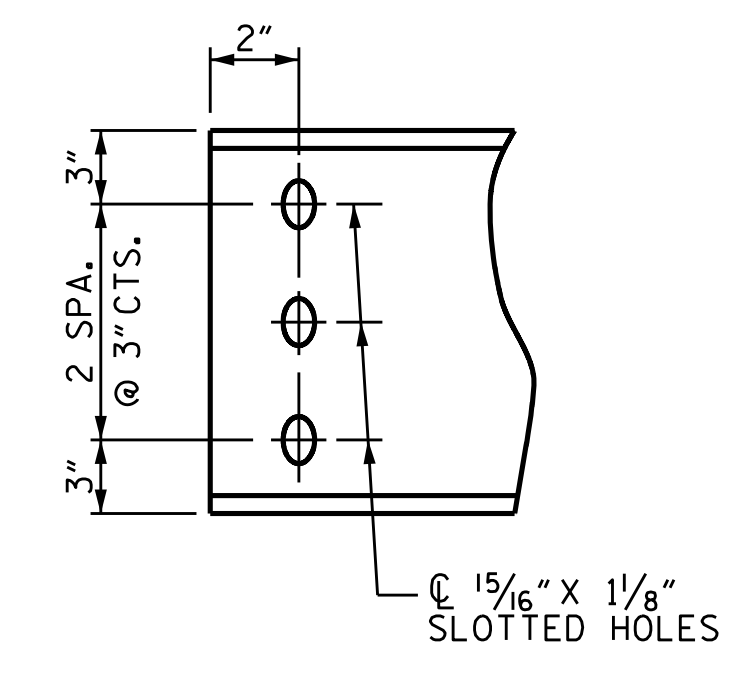
**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



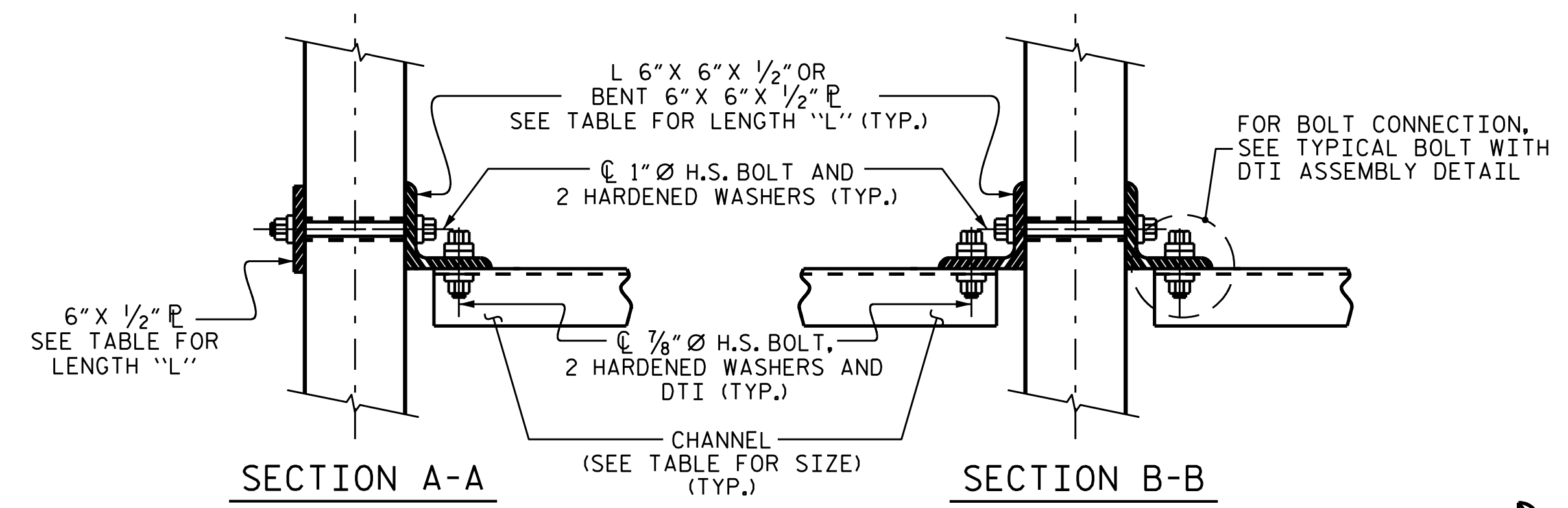
**CONNECTOR PLATE DETAILS**



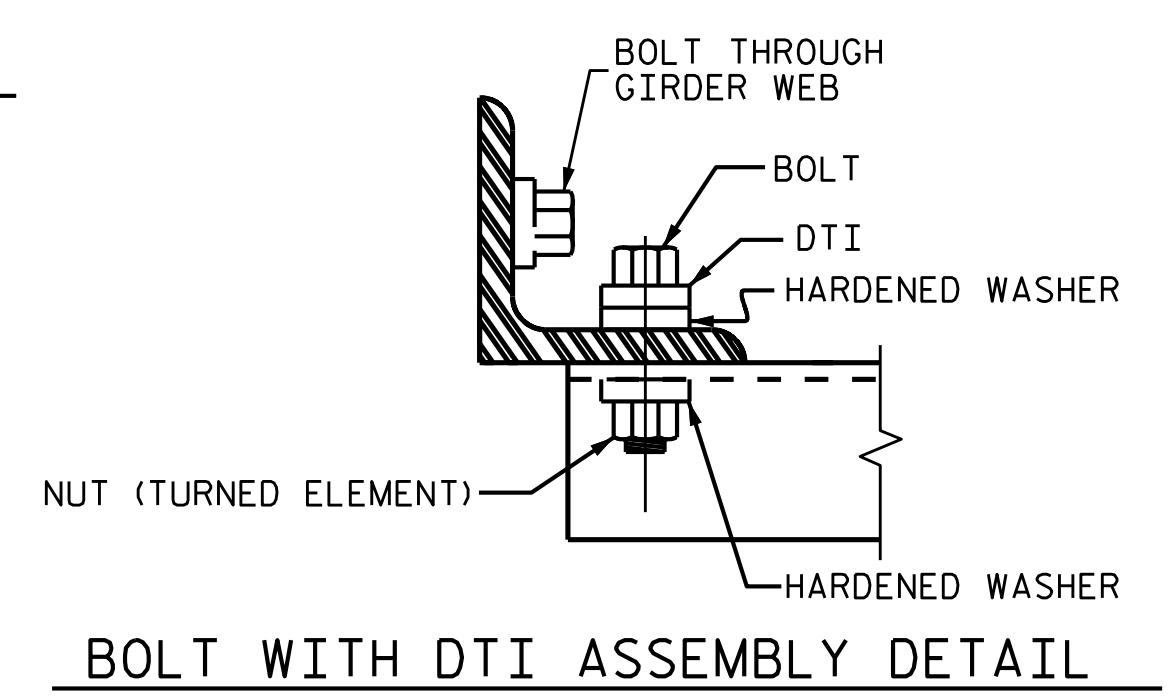
**PLATE DETAILS**



**CHANNEL END**



**CONNECTION DETAILS**



**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

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

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

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



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ASSEMBLED BY : <u>D. A. GLADDEN</u>	DATE : <u>11/18</u>
CHECKED BY : <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DESIGN ENGINEER OF RECORD : <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DRAWN BY : <u>TLA 6/05</u>	REV. <u>5/1/06RRR KMM/GM</u>
CHECKED BY : <u>VC 6/05</u>	REV. <u>10/1/11 MAA/GM</u>
	REV. <u>12/17 MAA/THC</u>

**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.

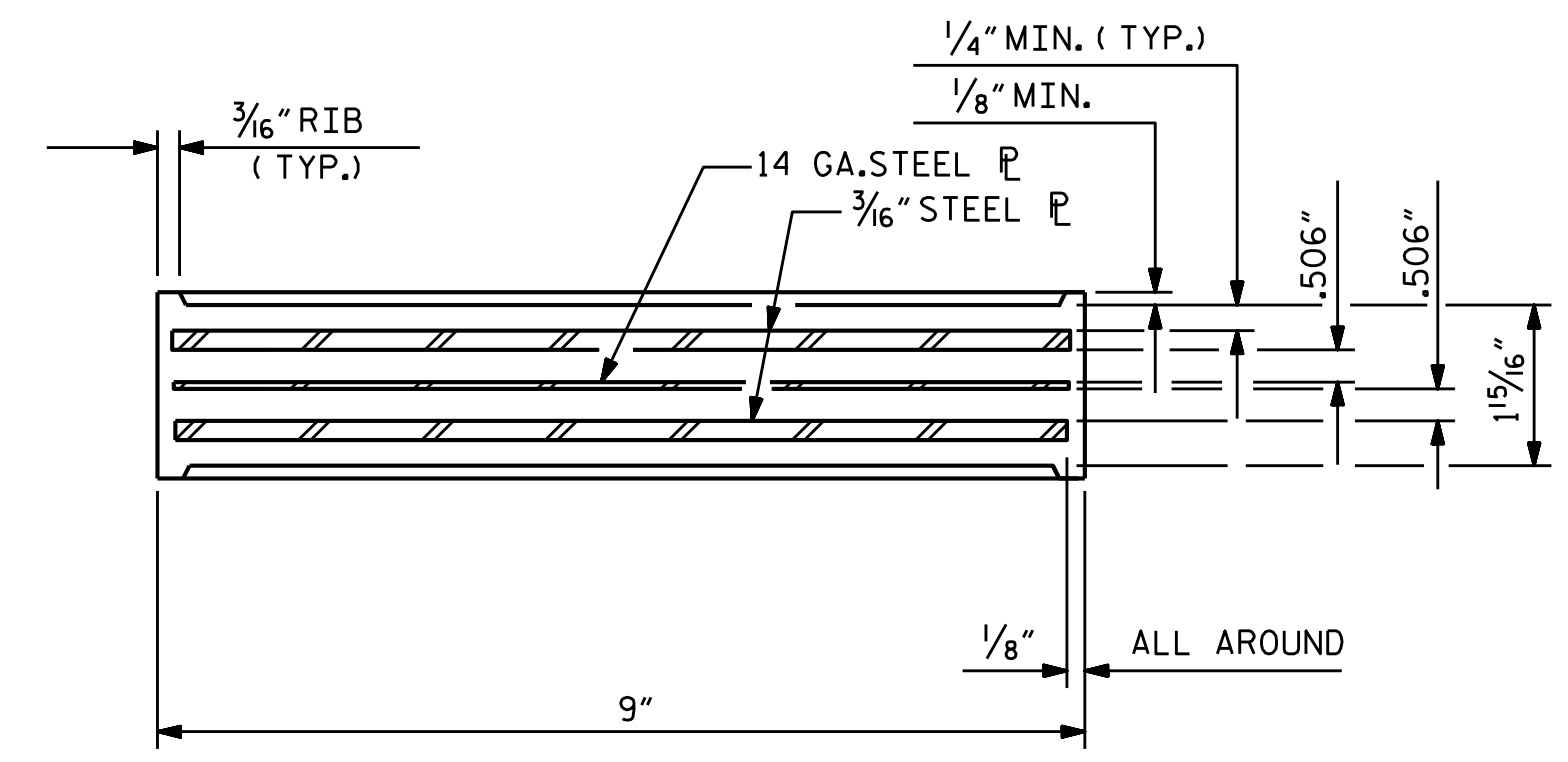
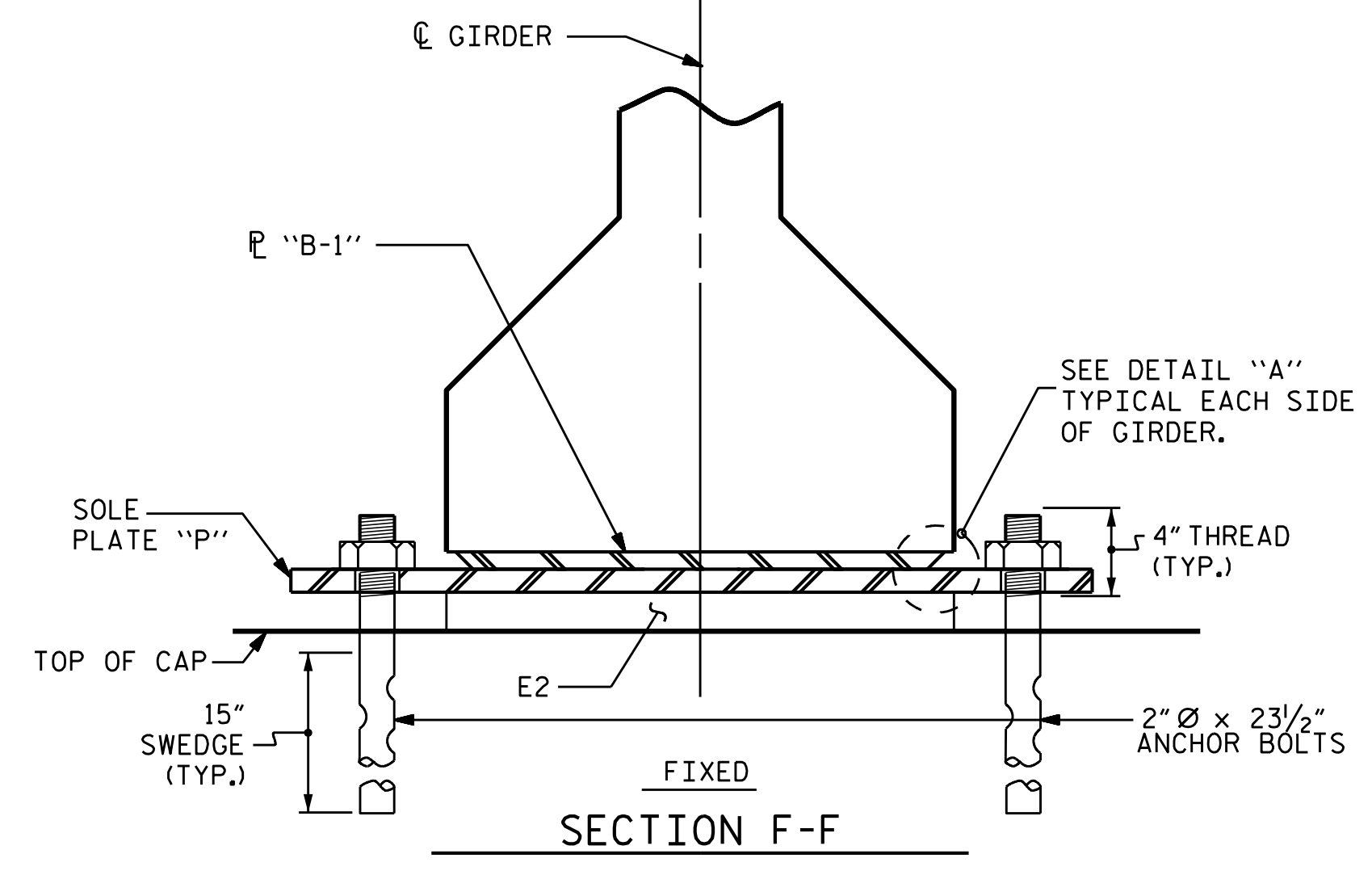
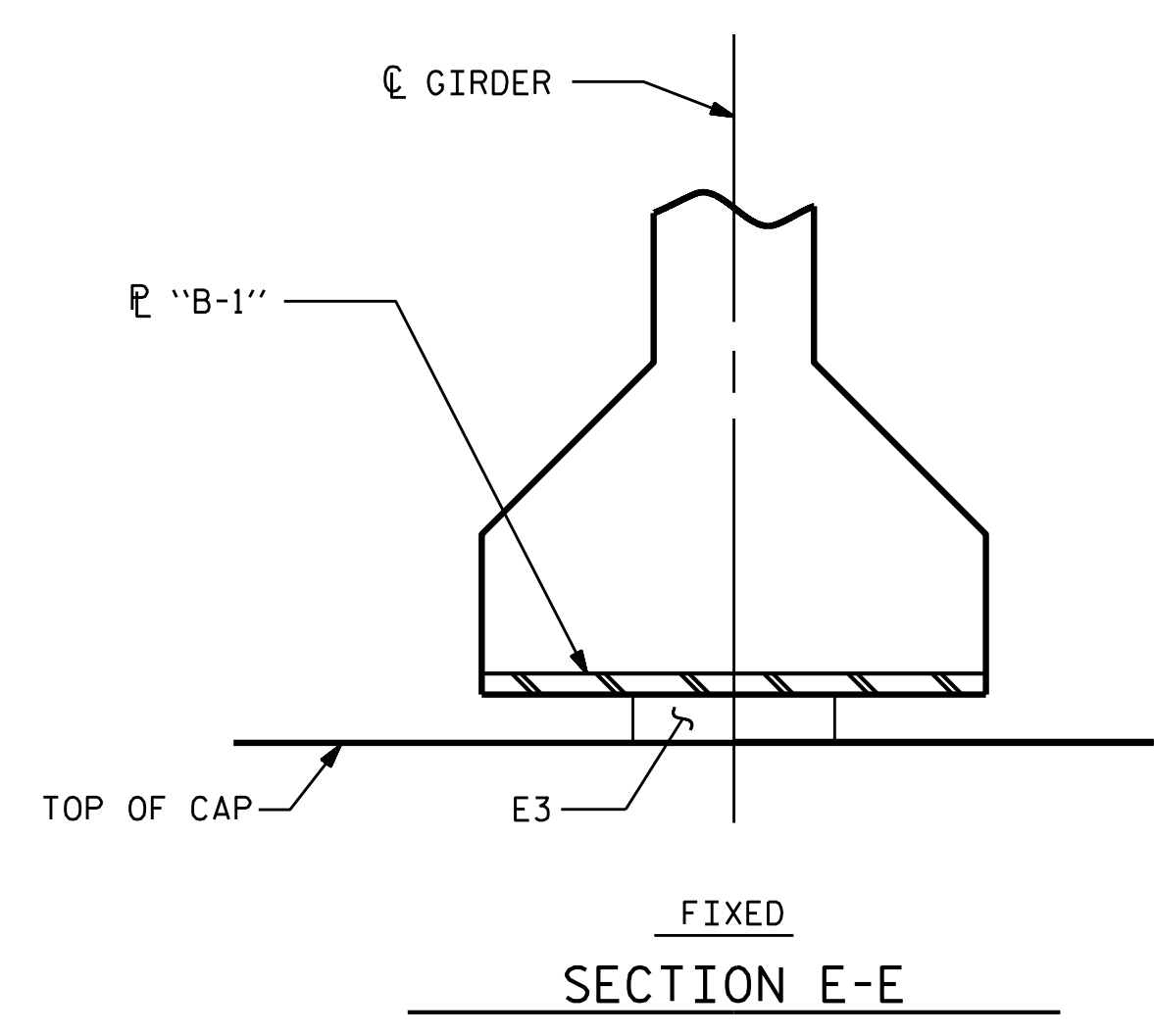
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

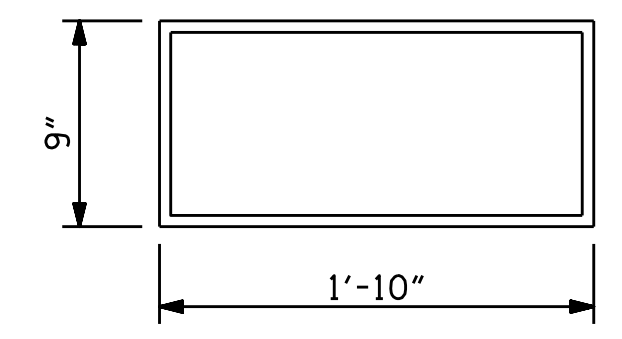
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

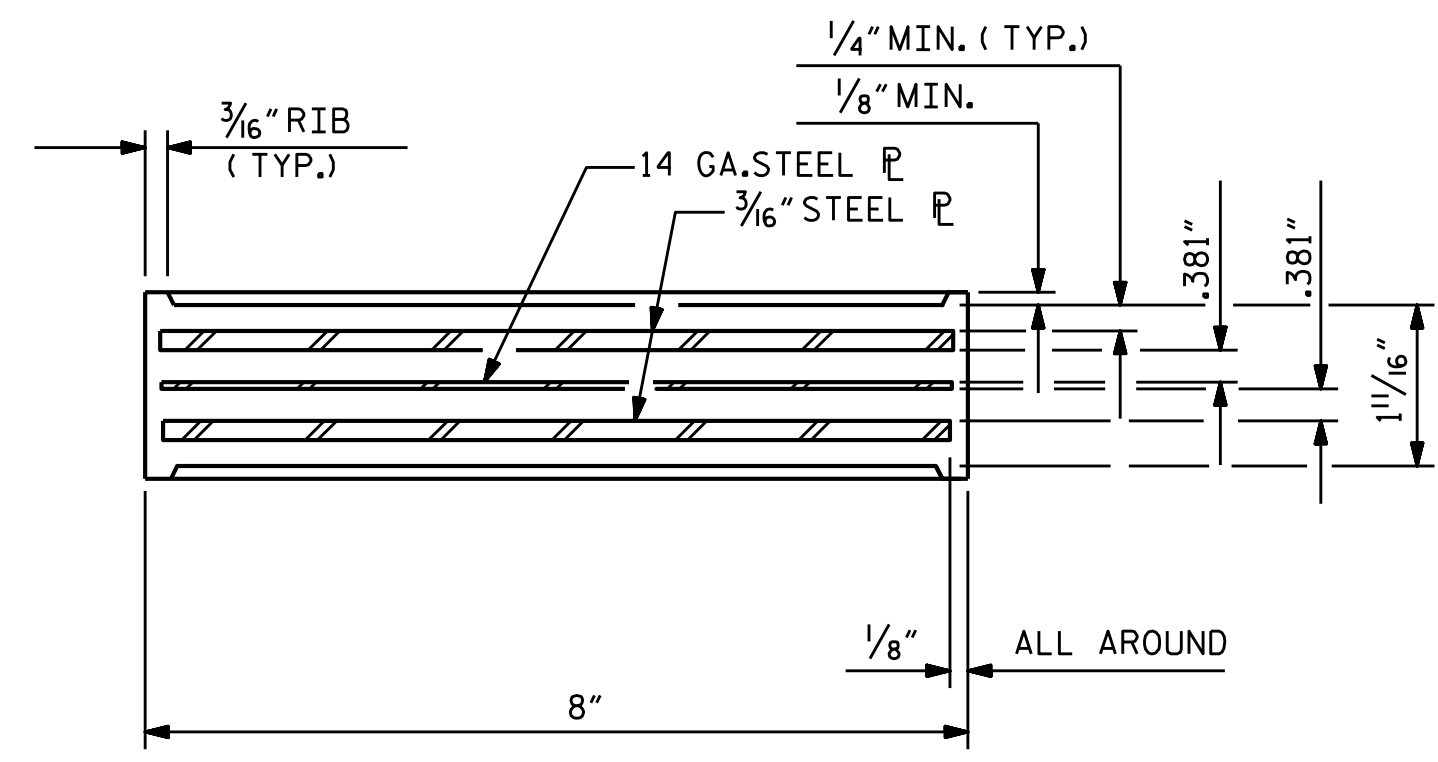
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



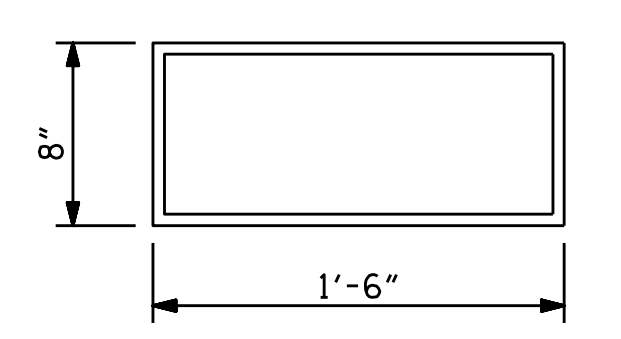
TYPICAL SECTION OF ELASTOMERIC BEARINGS



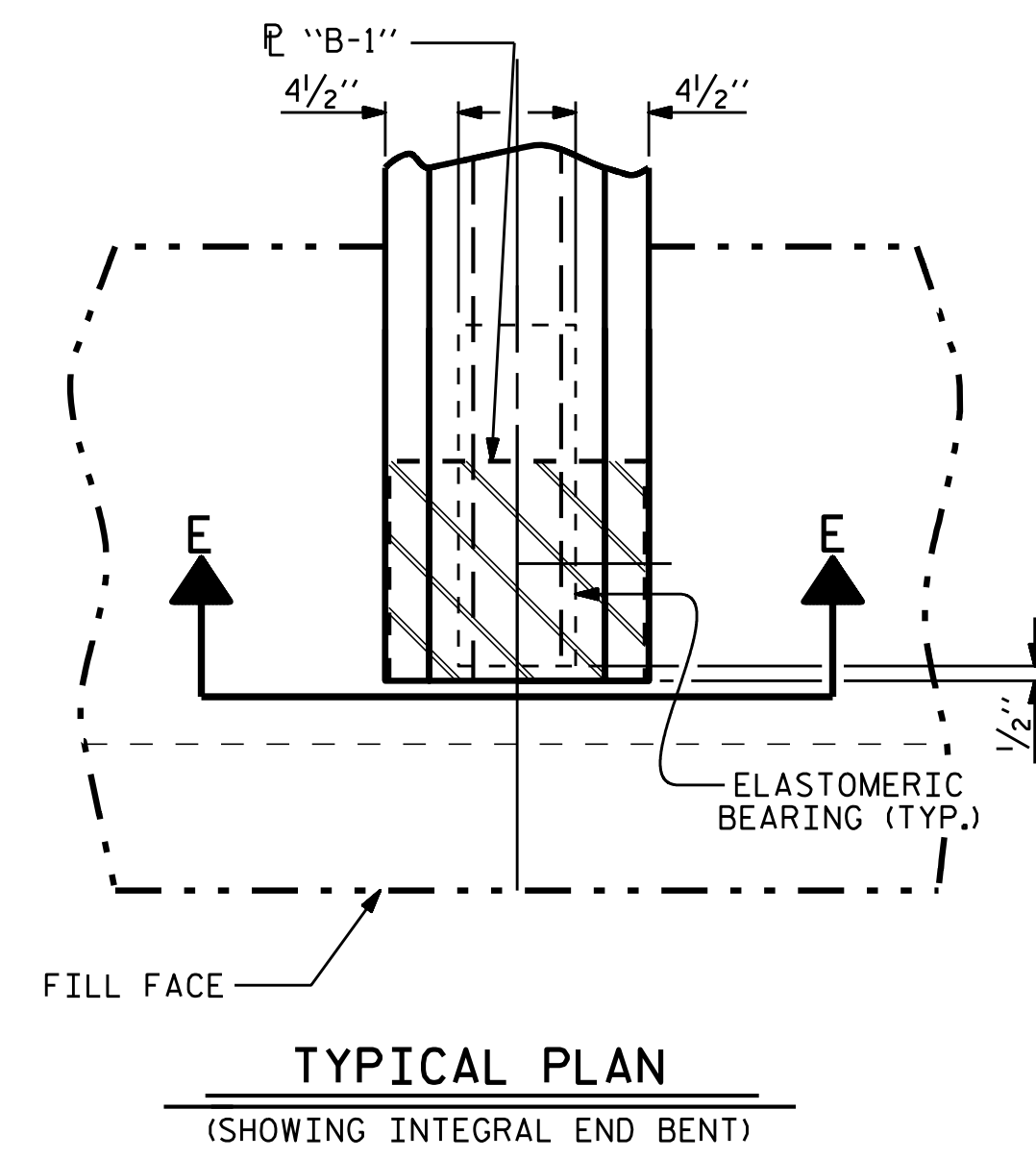
E3 (8 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
**TYPE IV**



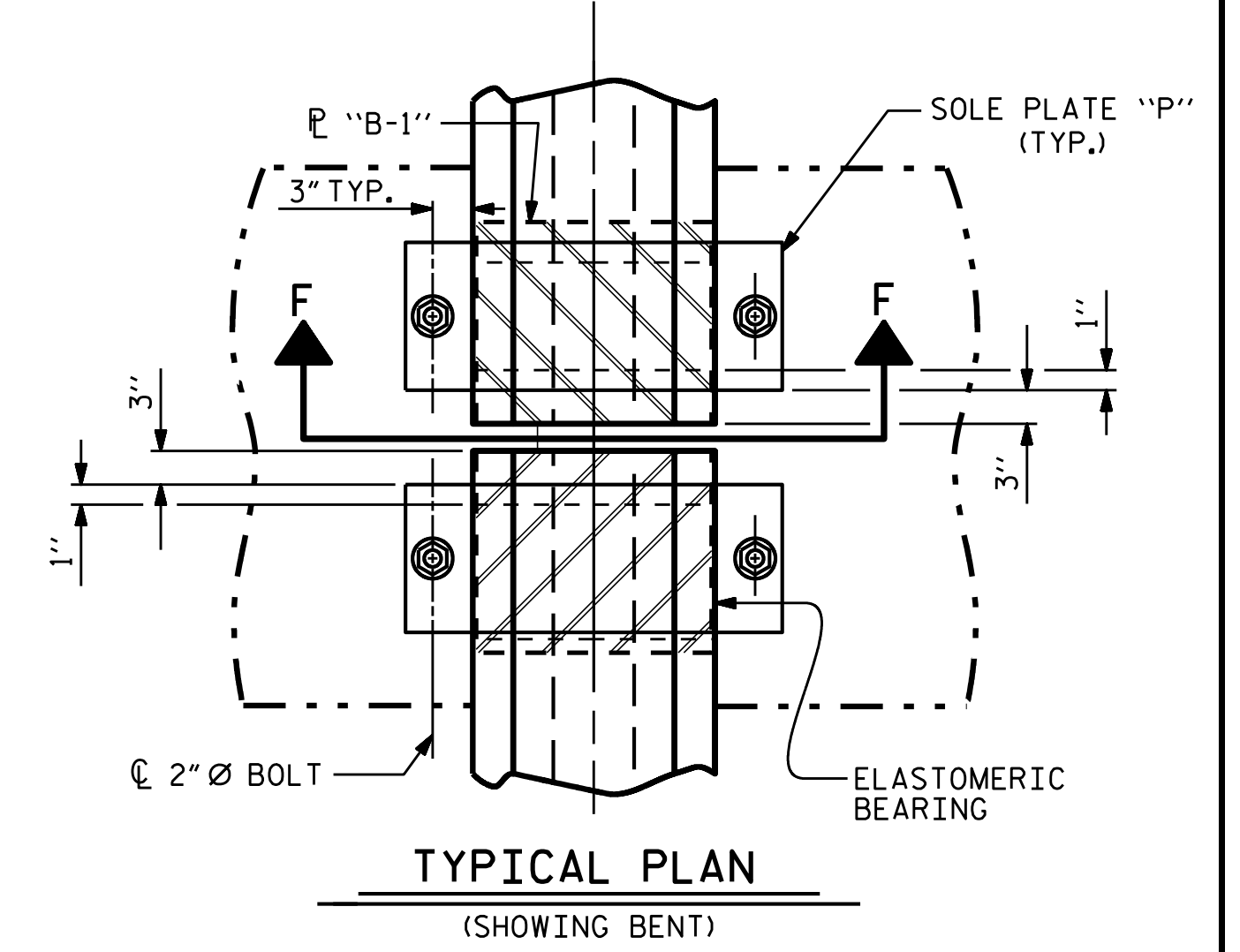
TYPICAL SECTION OF ELASTOMERIC BEARINGS



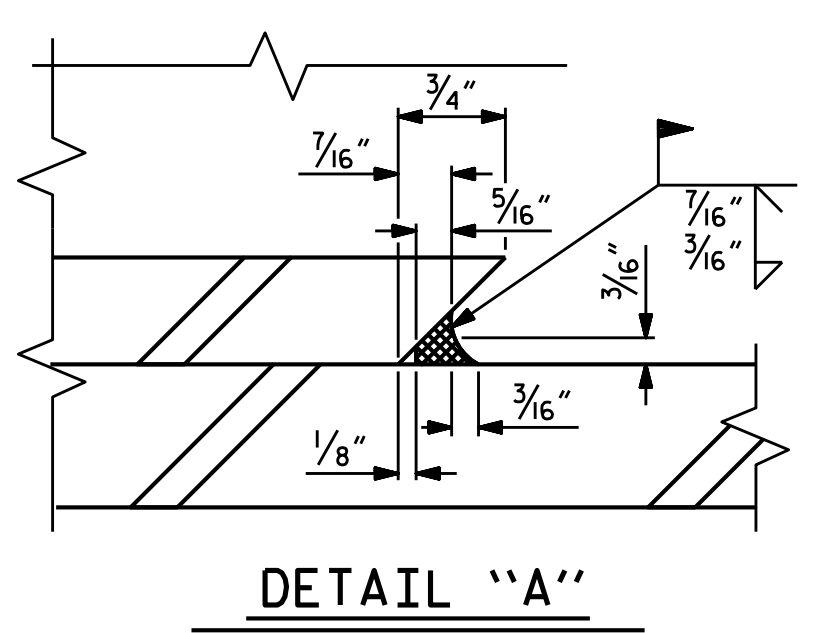
E2 (16 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
**TYPE III**



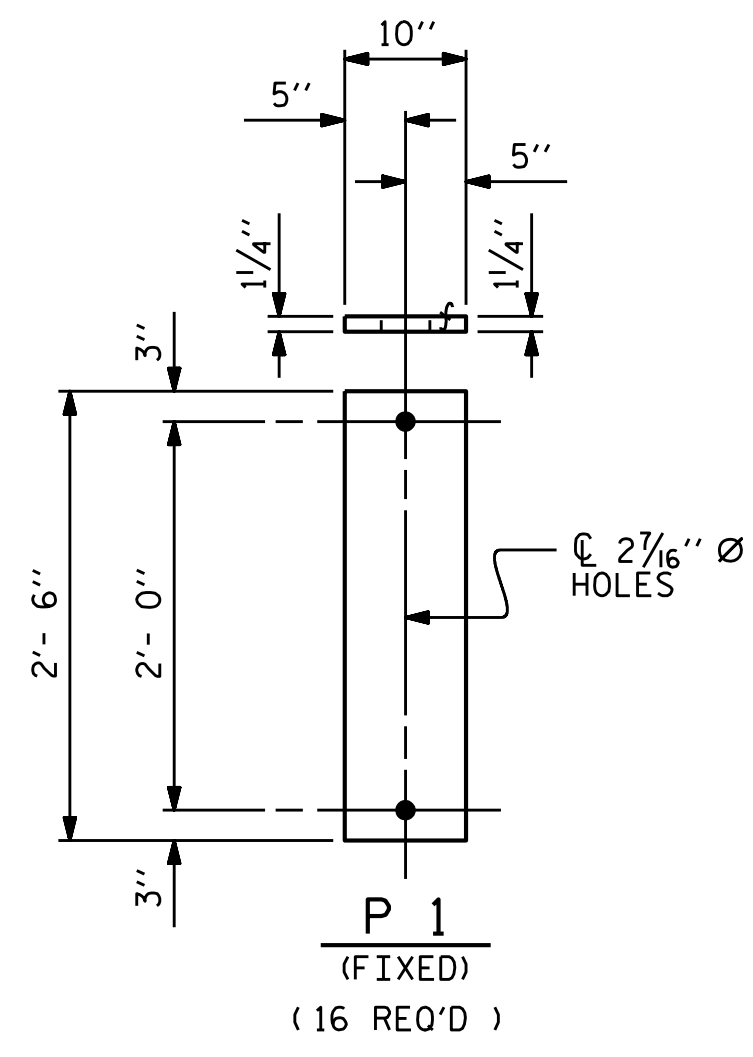
TYPICAL PLAN  
(SHOWING INTEGRAL END BENT)



TYPICAL PLAN  
(SHOWING BENT)



DETAIL "A"

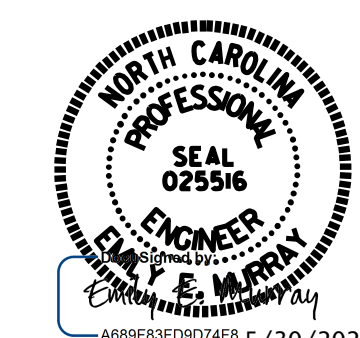


SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k
TYPE IV	225 k

PROJECT NO. B-4593  
PAMLICO COUNTY  
STATION: 17+02.00 -L-

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



**VOLKERT**  
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NC License No. F-0765

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ASSEMBLED BY : <u>D. A. GLADDEN</u>	DATE : <u>11/18</u>
CHECKED BY : <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DESIGN ENGINEER OF RECORD : <u>D. R. SMITH</u>	DATE : <u>11/18</u>
DRAWN BY : <u>WJH 8/89</u>	REV. 6/13 AAC/MAA
CHECKED BY : <u>CRK 8/89</u>	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN A & SPAN C																				
	GIRDERS 1 & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.016	0.031	0.045	0.058	0.070	0.080	0.088	0.093	0.097	0.098	0.097	0.093	0.088	0.080	0.070	0.058	0.045	0.031	0.016	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.009	0.017	0.026	0.034	0.041	0.048	0.053	0.056	0.059	0.059	0.059	0.056	0.053	0.048	0.041	0.034	0.026	0.017	0.009	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	5/16"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	5/16"	5/16"	1/4"	3/16"	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 A & SPAN C																				
	GIRDERS 2 & 3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.016	0.031	0.045	0.058	0.070	0.080	0.088	0.093	0.097	0.098	0.097	0.093	0.088	0.080	0.070	0.058	0.045	0.031	0.016	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.009	0.019	0.029	0.038	0.046	0.053	0.058	0.062	0.065	0.066	0.065	0.062	0.058	0.053	0.046	0.038	0.029	0.019	0.009	0.000
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	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																				
	GIRDERS 1 & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.014	0.027	0.039	0.051	0.061	0.069	0.076	0.081	0.084	0.085	0.084	0.081	0.076	0.069	0.061	0.051	0.039	0.027	0.014	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.006	0.012	0.018	0.024	0.029	0.034	0.037	0.040	0.042	0.042	0.042	0.040	0.037	0.034	0.029	0.024	0.018	0.012	0.006	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0

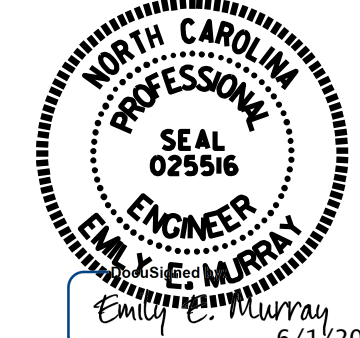
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN B																				
	GIRDERS 2 & 3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.014	0.027	0.039	0.051	0.061	0.069	0.076	0.081	0.084	0.085	0.084	0.081	0.076	0.069	0.061	0.051	0.039	0.027	0.014	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.007	0.013	0.020	0.027	0.032	0.037	0.041	0.044	0.046	0.046	0.046	0.044	0.041	0.037	0.032	0.027	0.020	0.013	0.007	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	5/16"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	5/16"	5/16"	1/4"	3/16"	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 ).

PROJECT NO. B-4593  
PAMLICO COUNTY  
STATION: 17+02.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**SUPERSTRUCTURE  
DEAD LOAD  
DEFLECTIONS**



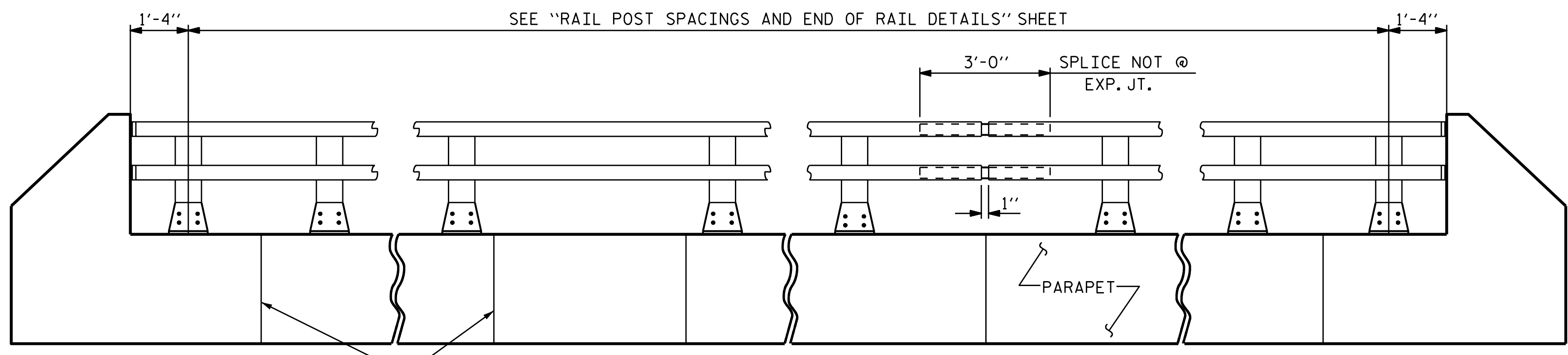
**VOLKERT**  
5430 Wade Park Blvd., Suite 410  
Raleigh, NC 27607  
Tel. 919-854-0344 Fax. 919-854-0355  
NC License No. F-0765

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

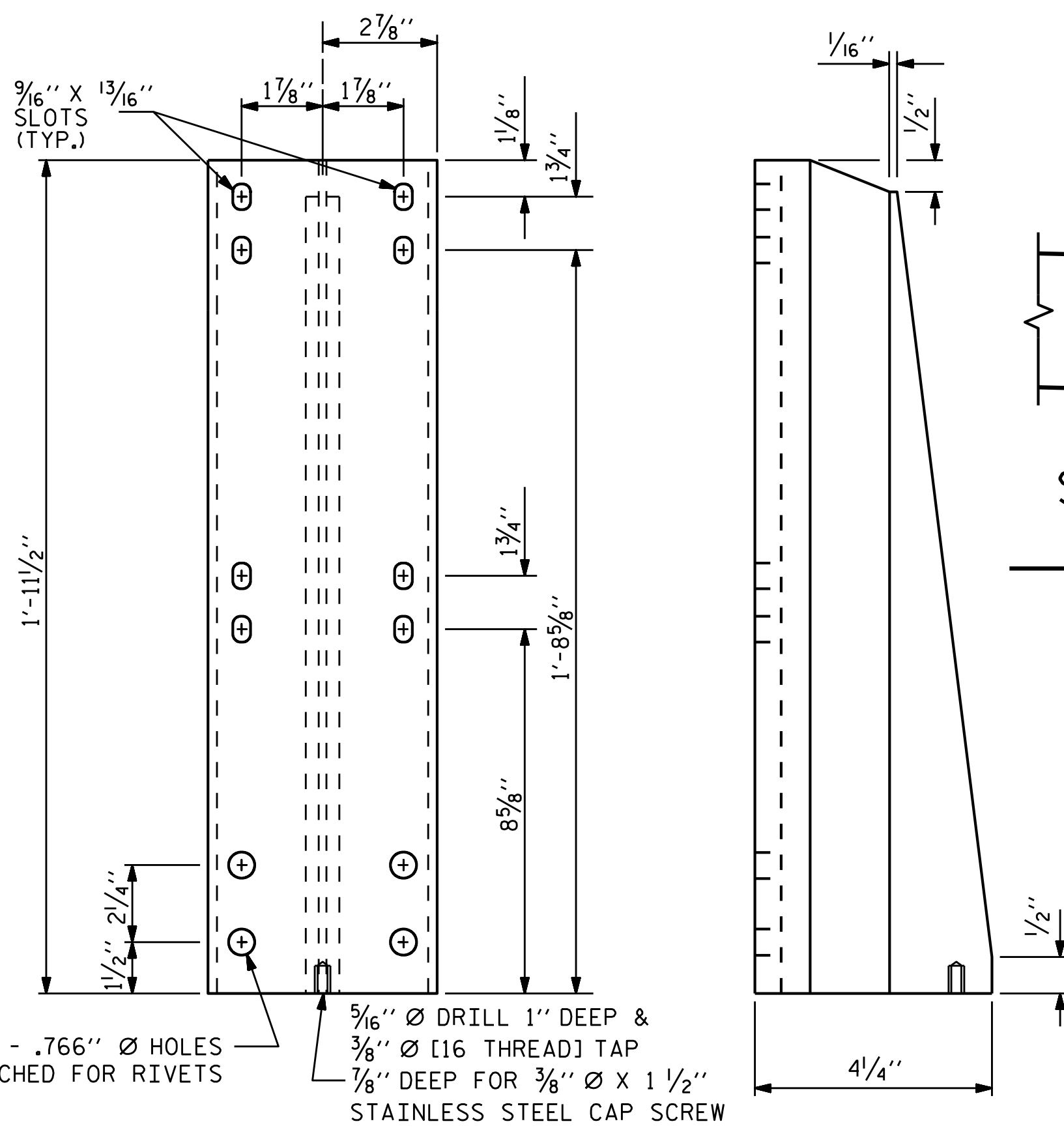
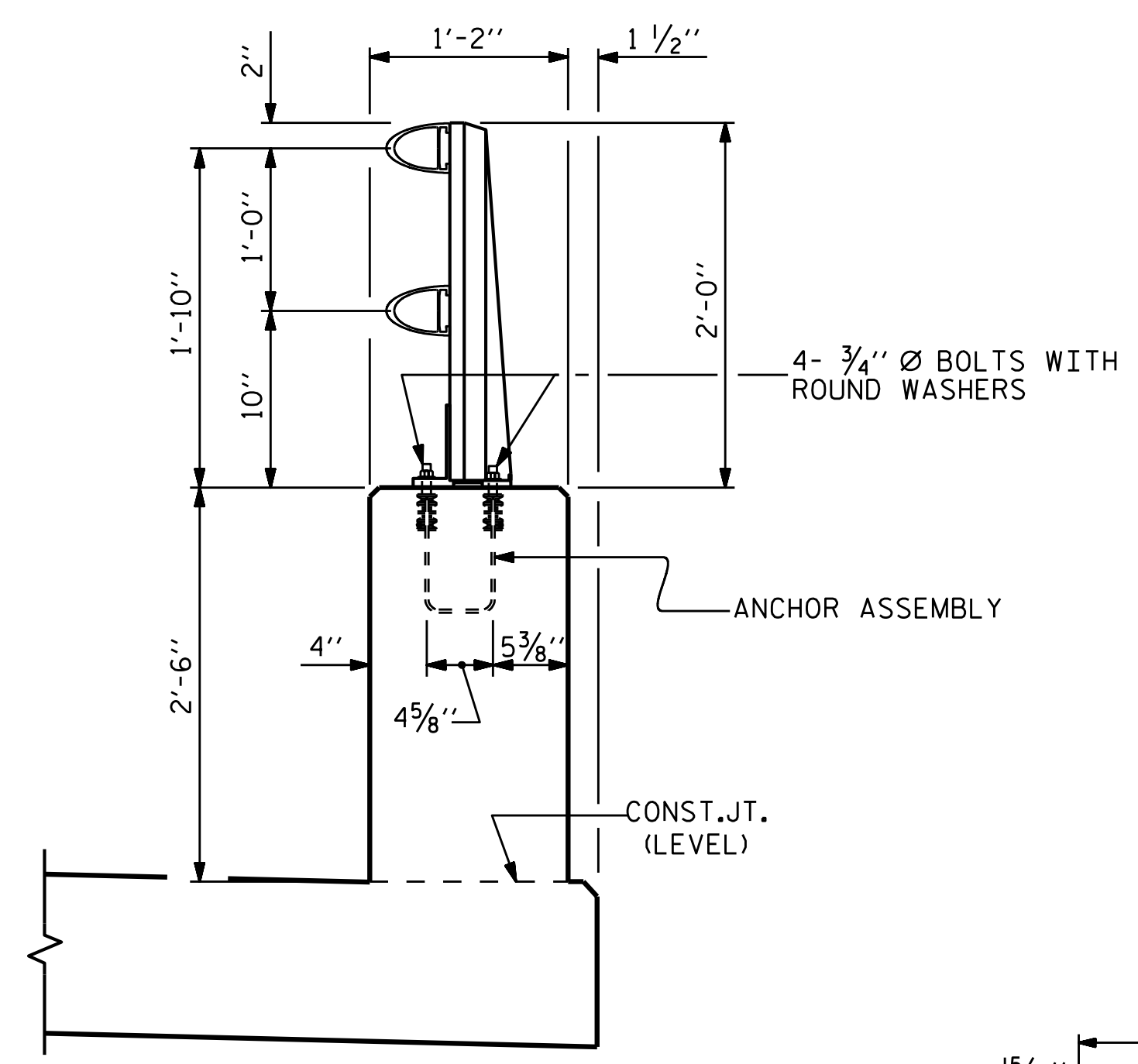
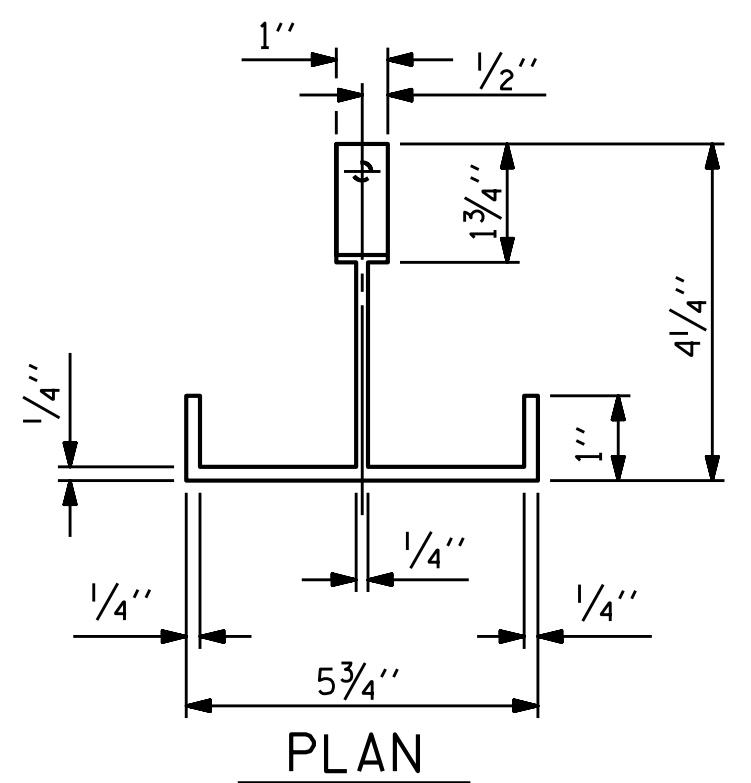
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			42

ASSEMBLED BY : D. A. GLADDEN DATE : 11/18  
CHECKED BY : D. R. SMITH DATE : 11/18  
DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 11/18

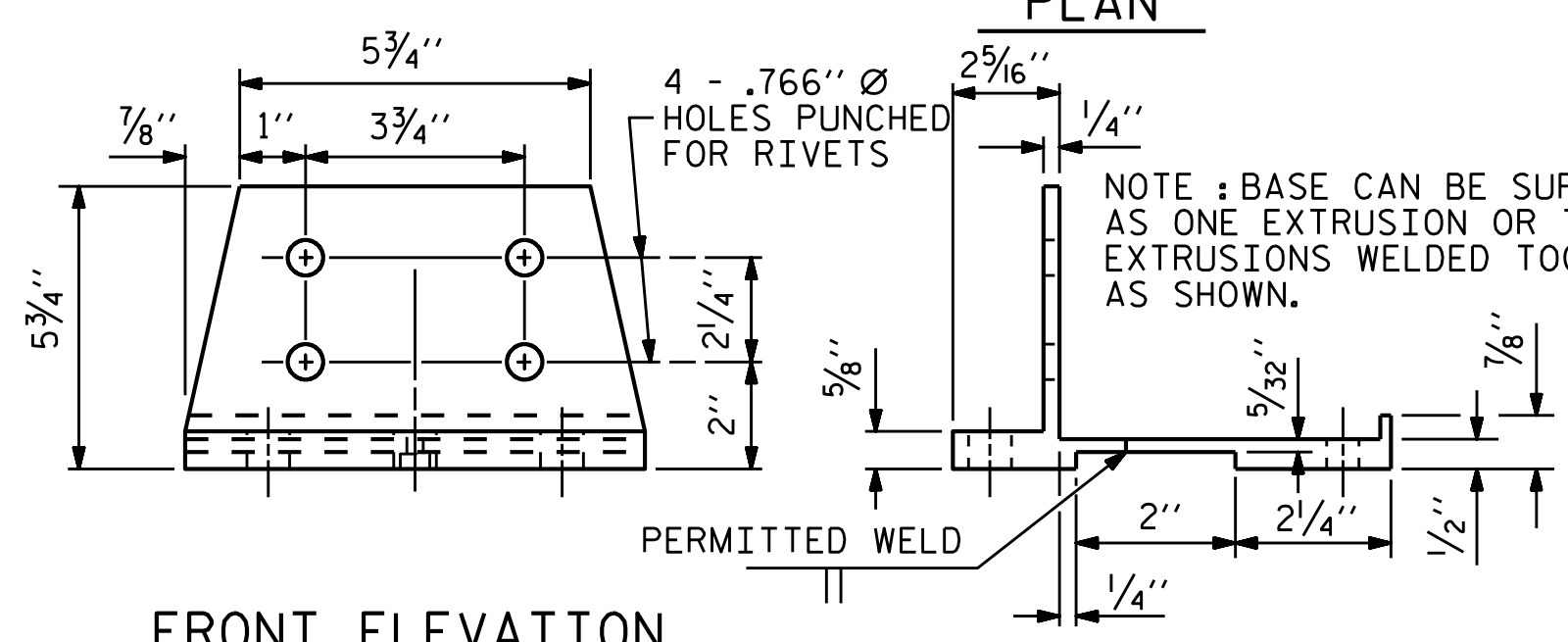
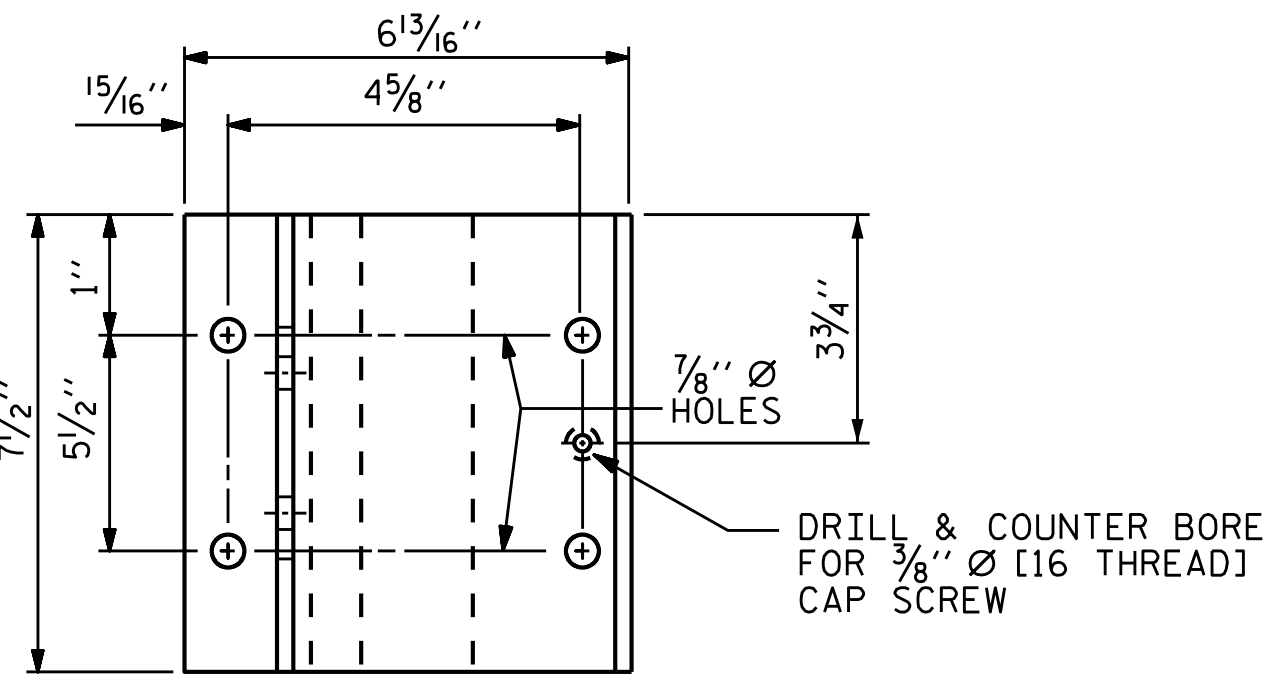




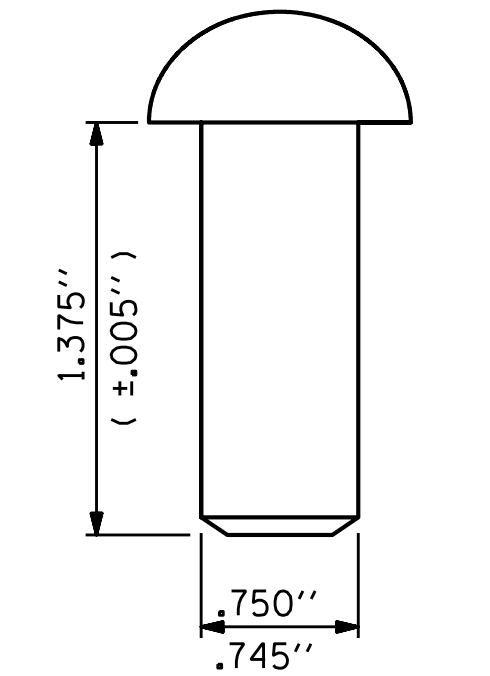
**ELEVATION**  
 SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET  
 TOOLED CONTRACTION JT. (SEE NOTES)  
 NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



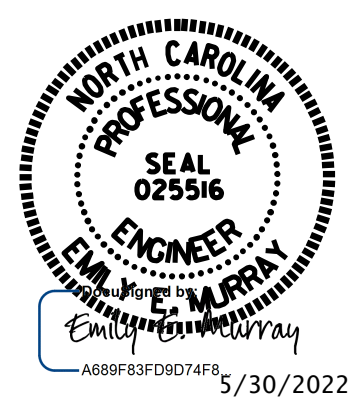
**DETAILS OF POST**



**POST BASE DETAILS**



**VOLKERT**  
 5430 Wade Park Blvd., Suite 410  
 Raleigh, NC 27607  
 Tel. 919-854-0344 Fax. 919-854-0355  
 NC License No. F-0765



**NOTES**

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

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

**GENERAL NOTES**

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 301.17 LIN. FT.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-22
STANDARD 2 BAR METAL RAIL						TOTAL SHEETS 42
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY: D. A. GLADDEN	DATE: 11/18
CHECKED BY: D. R. SMITH	DATE: 12/18
DRAWN BY: EEM 6/94	REV. 10/11 MAA/GM
CHECKED BY: RCW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NOTES

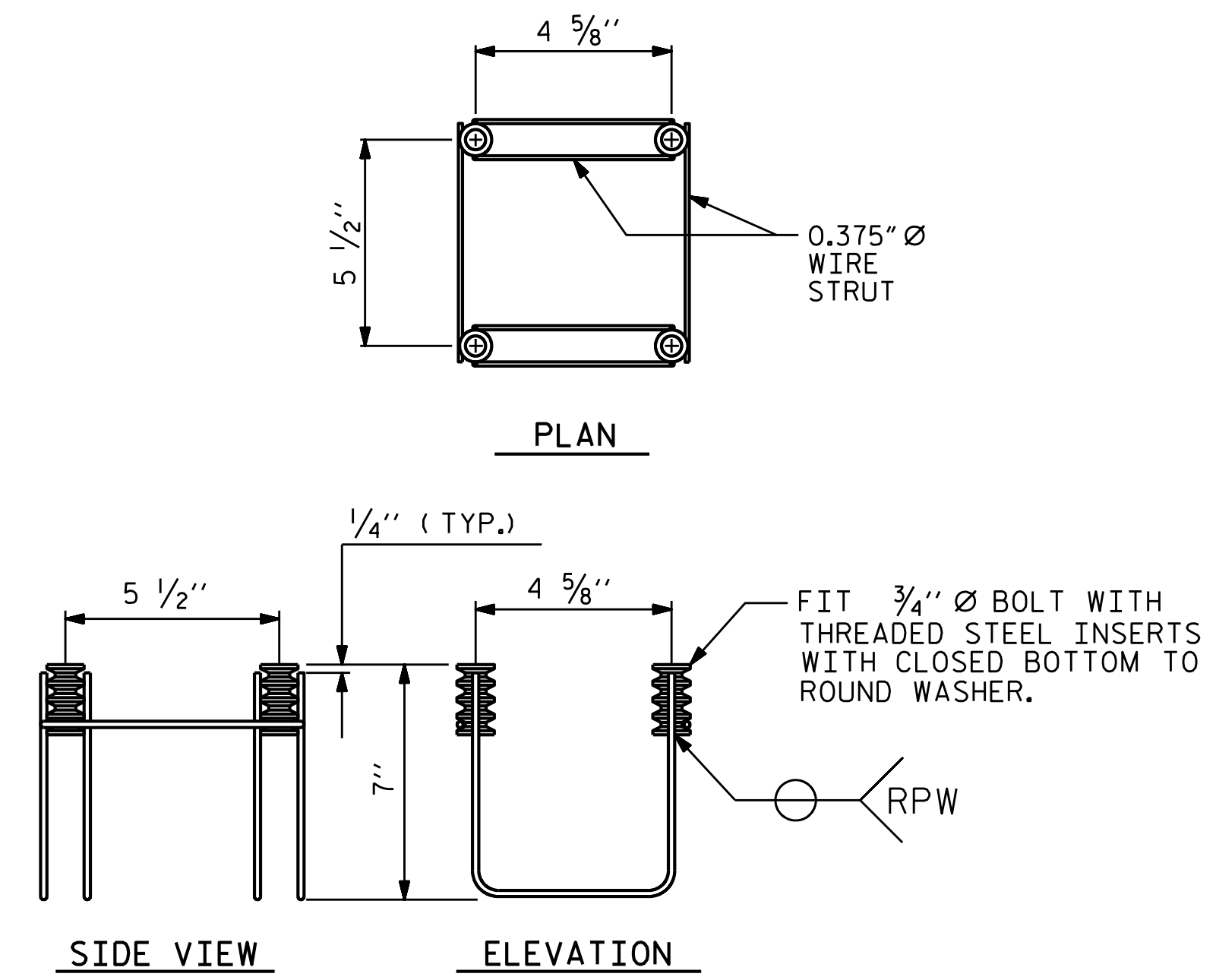
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

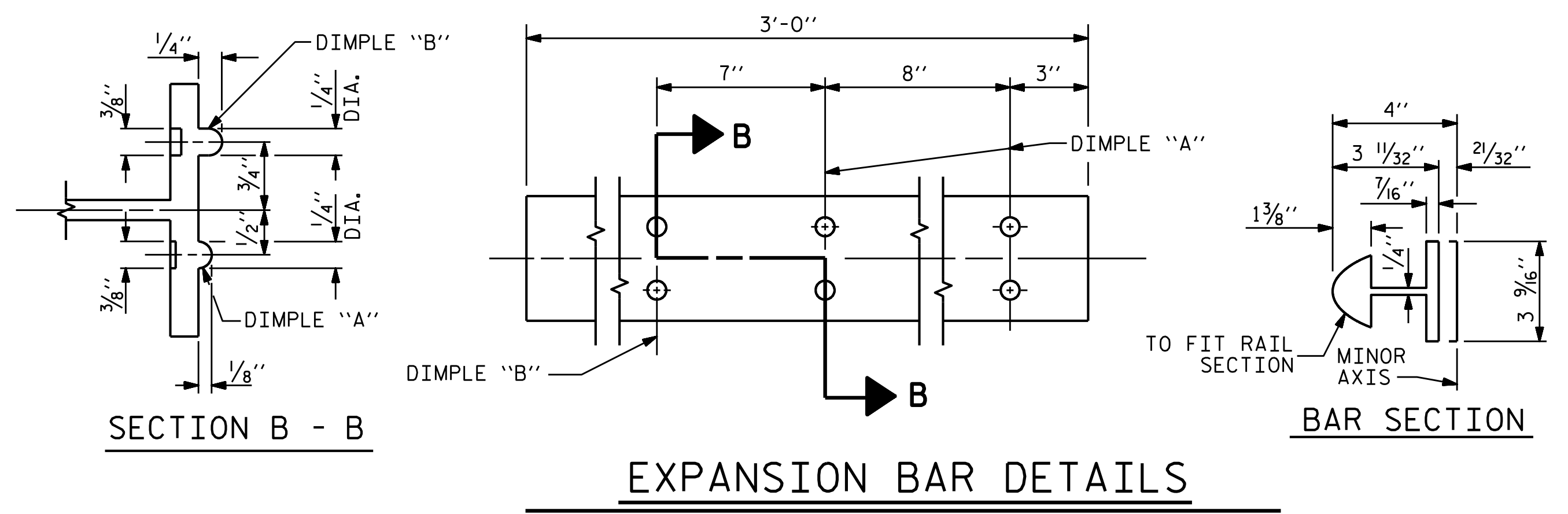
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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

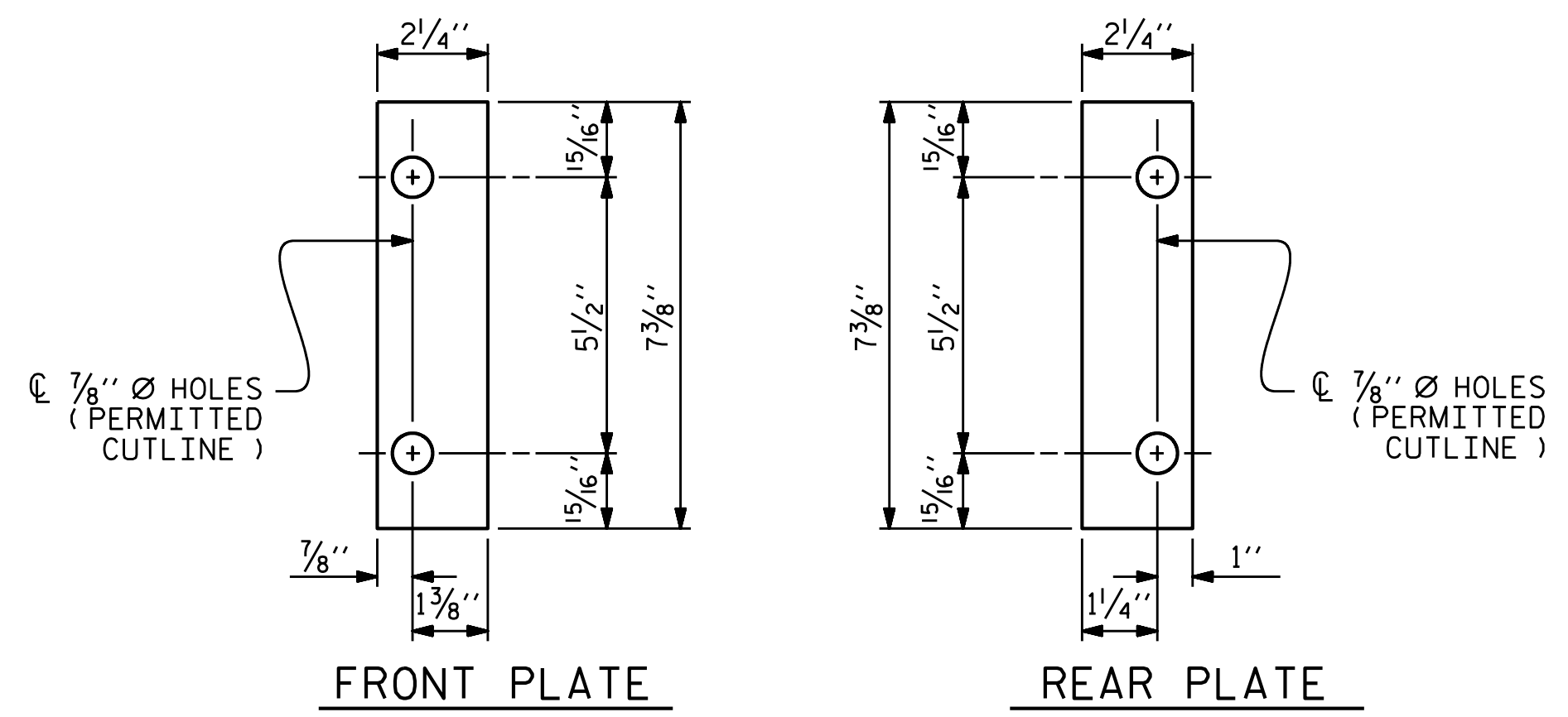


4-BOLT METAL RAIL ANCHOR ASSEMBLY

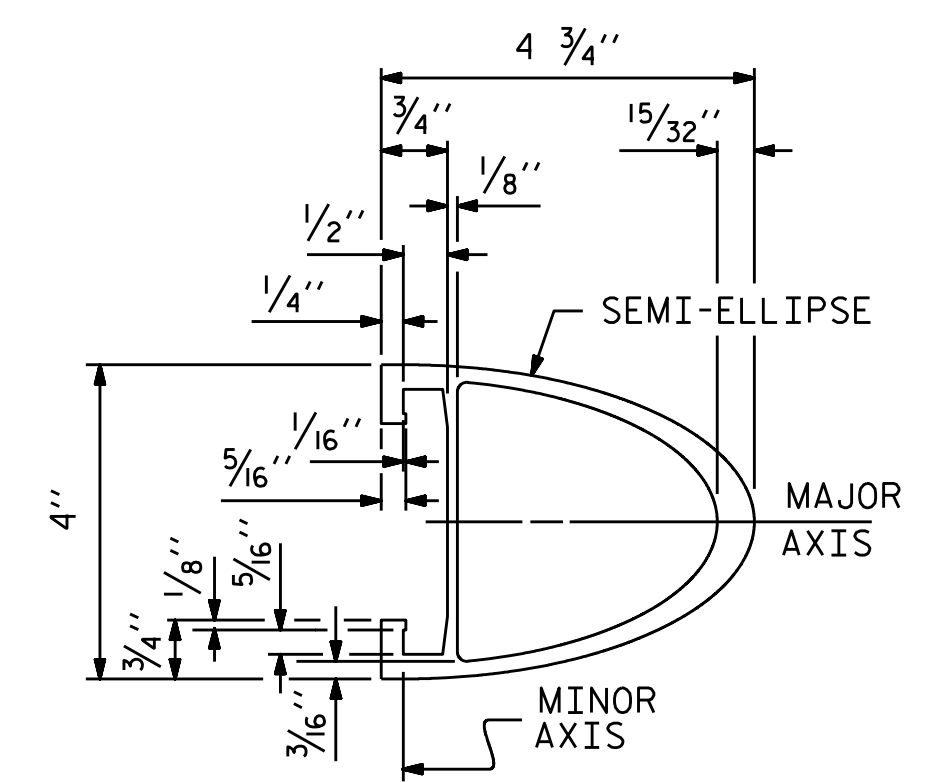
( 52 ASSEMBLIES REQUIRED )



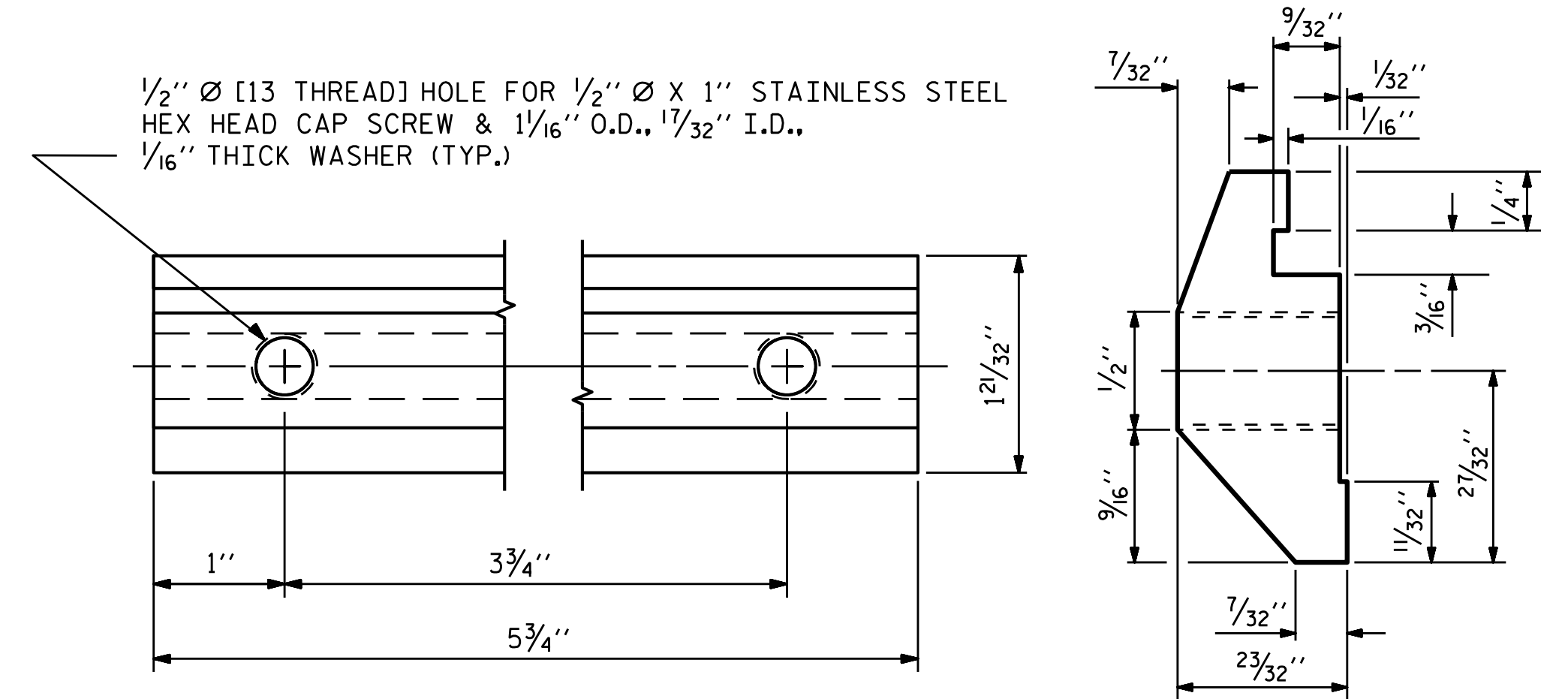
EXPANSION BAR DETAILS



SHIM DETAILS

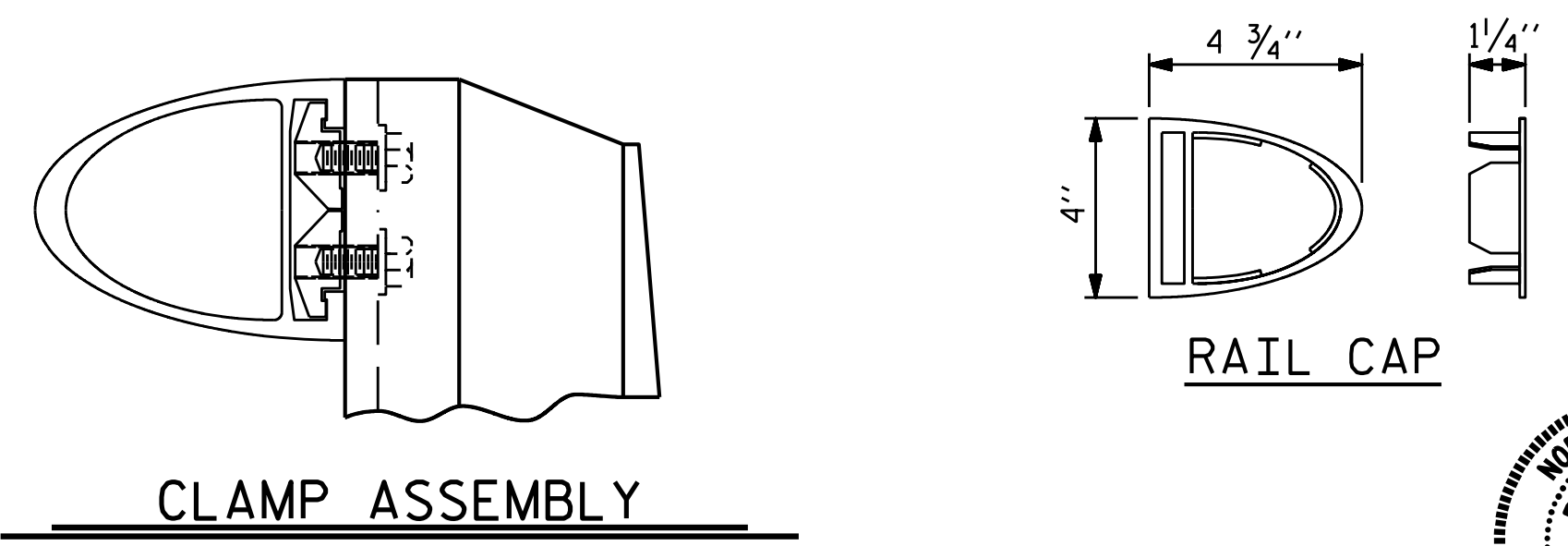


RAIL SECTION



CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



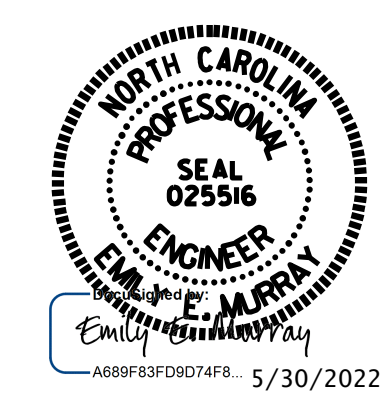
CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL



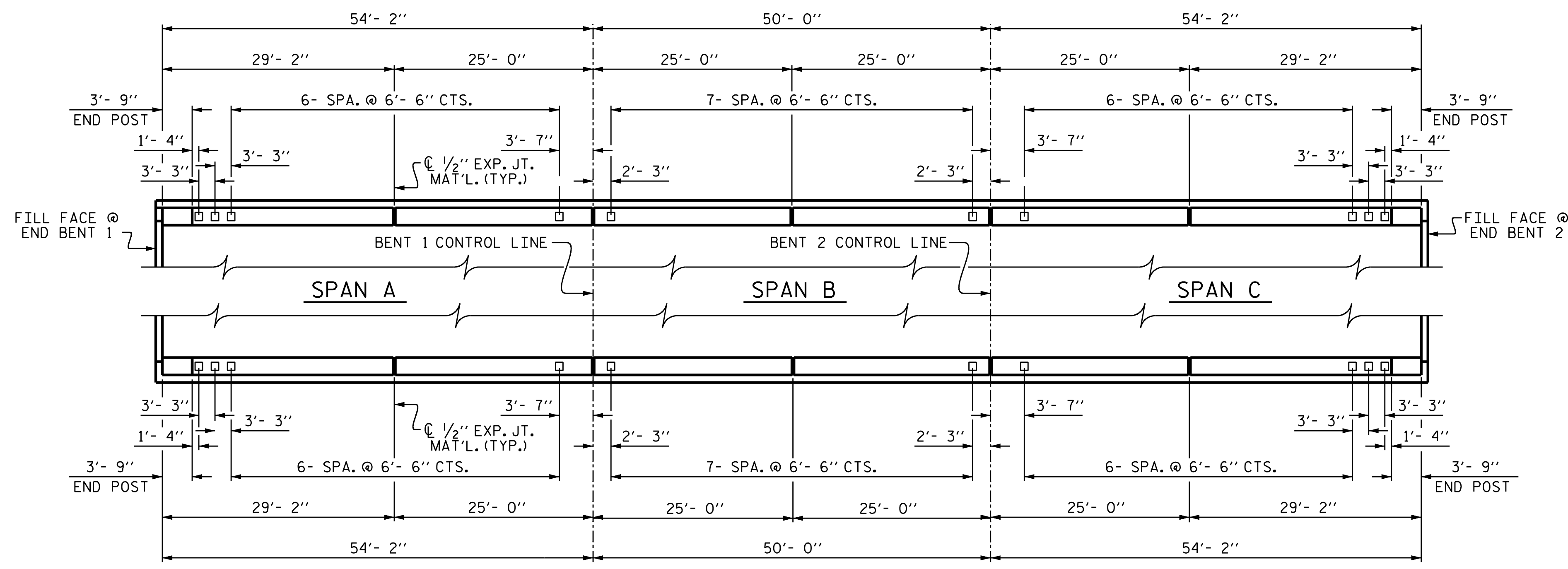
ASSEMBLED BY : D. A. GLADDEN	DATE : 11/18
CHECKED BY : D. R. SMITH	DATE : 12/18
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RCW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

**VOLKERT**  
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 Raleigh, NC 27607  
 Tel. 919-854-0344 Fax. 919-854-0355  
 NC License No. F-0765

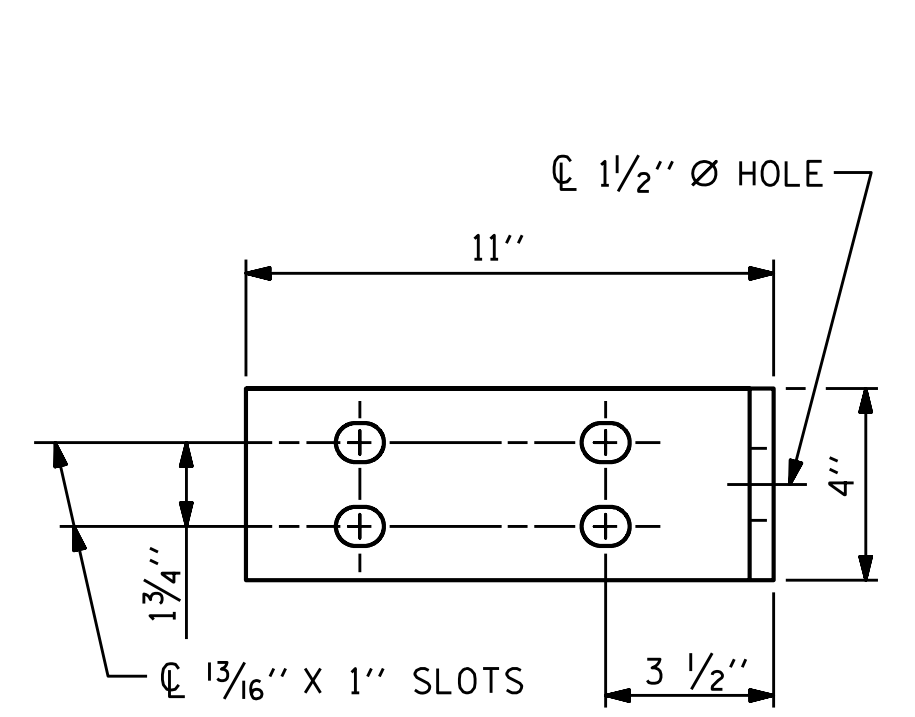
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1			3			TOTAL SHEETS
2			4			42

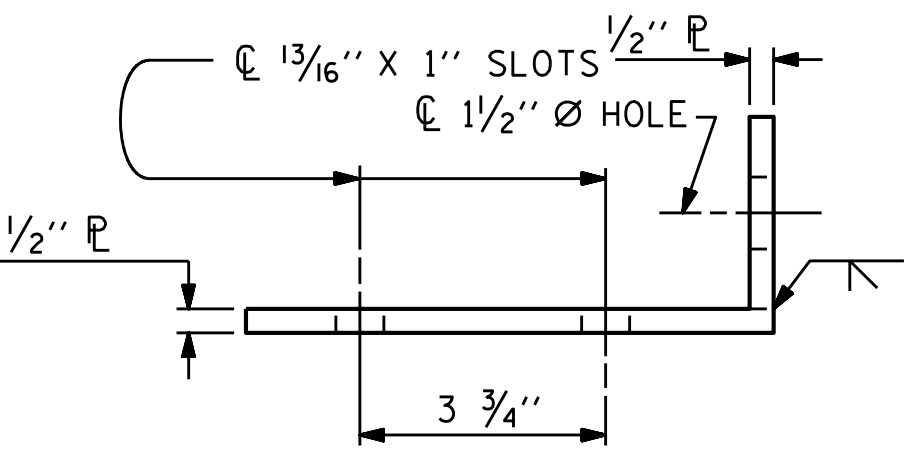
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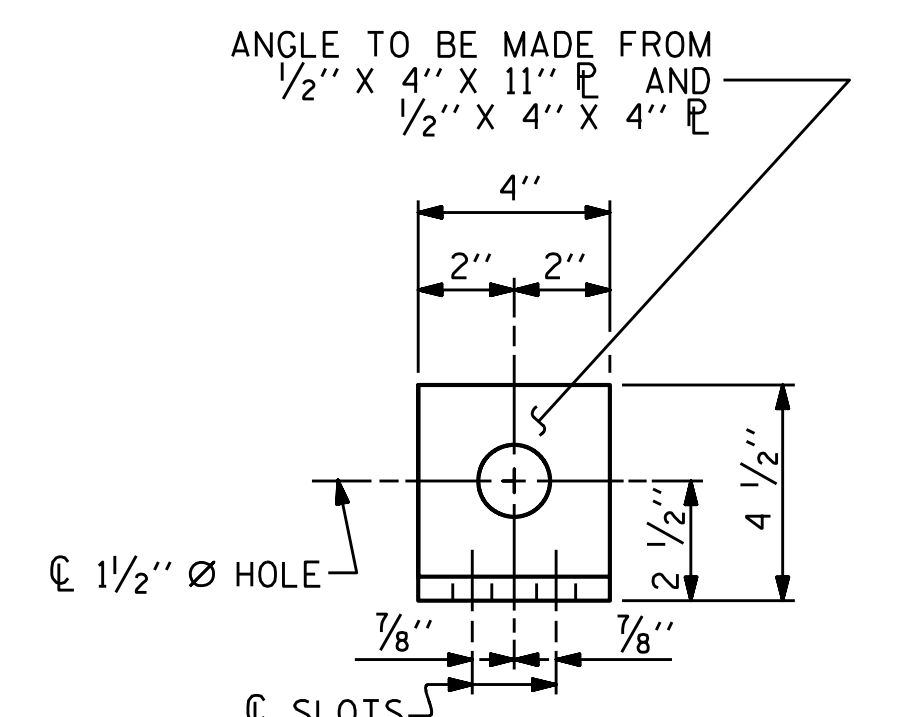
**PLAN OF RAIL POST SPACINGS**



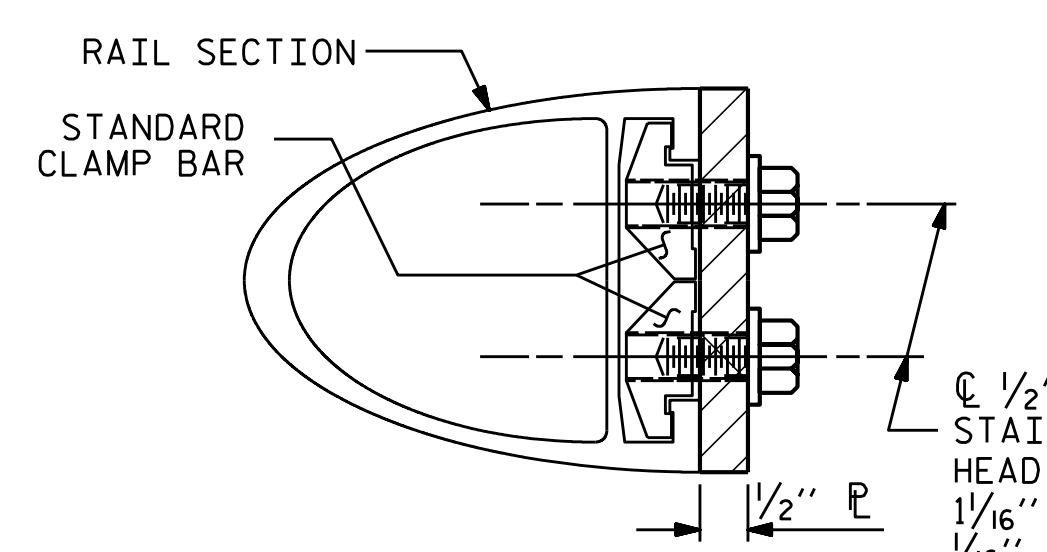
**ELEVATION**



**TOP VIEW**

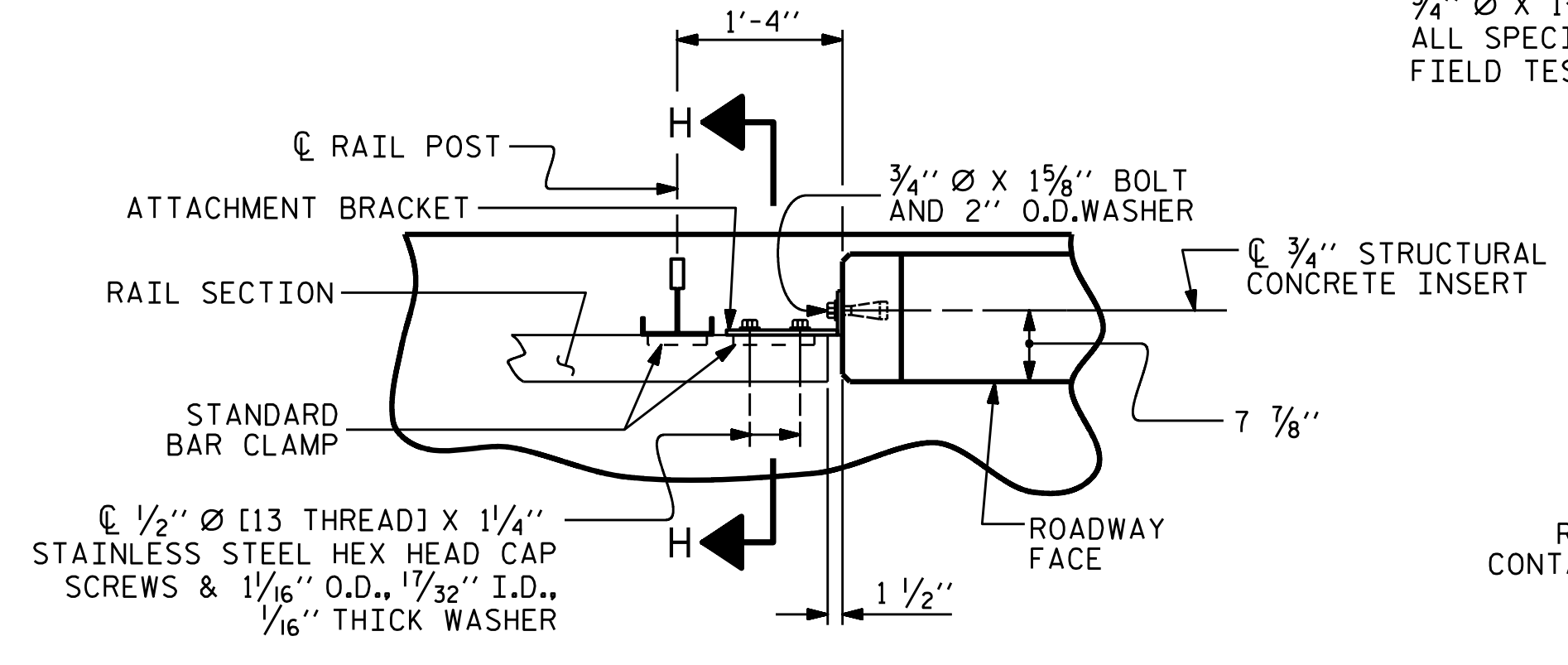


**END VIEW (FIX AND EXP.)**

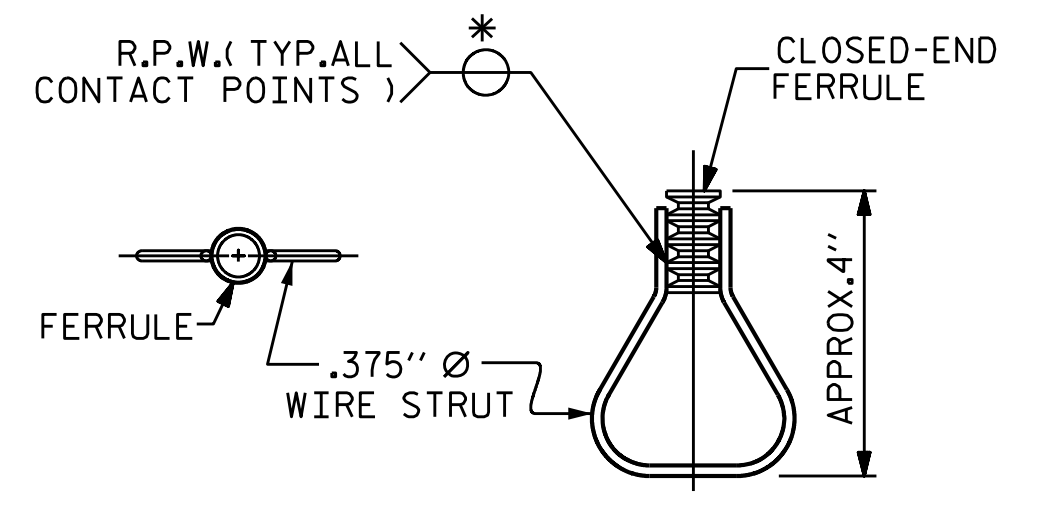


**SECTION H-H (FIX)**

**FIXED**



**PLAN - RAIL AND END POST**



**PLAN ELEVATION**

**STRUCTURAL CONCRETE INSERT**

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

**NOTES**

**STRUCTURAL CONCRETE INSERT**

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
  - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
  - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
  - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

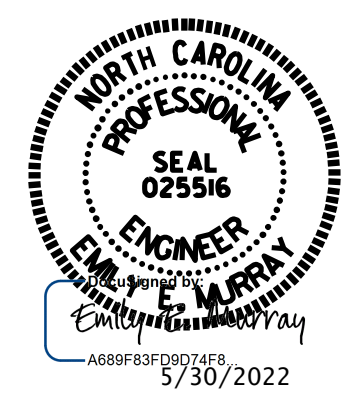
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

PROJECT NO. B-4593  
PAMLICO COUNTY  
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STATE OF NORTH CAROLINA  
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 RALEIGH  
 STANDARD  
**RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS**  
 FOR ONE OR TWO BAR METAL RAILS

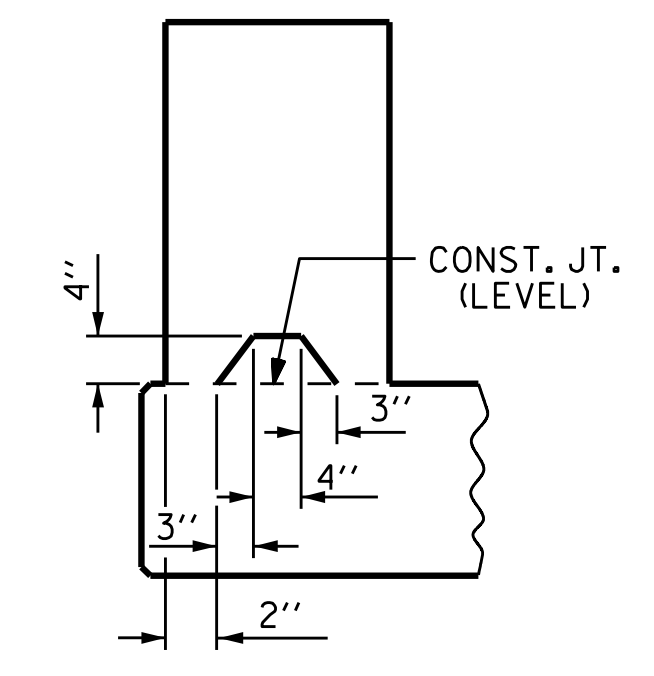
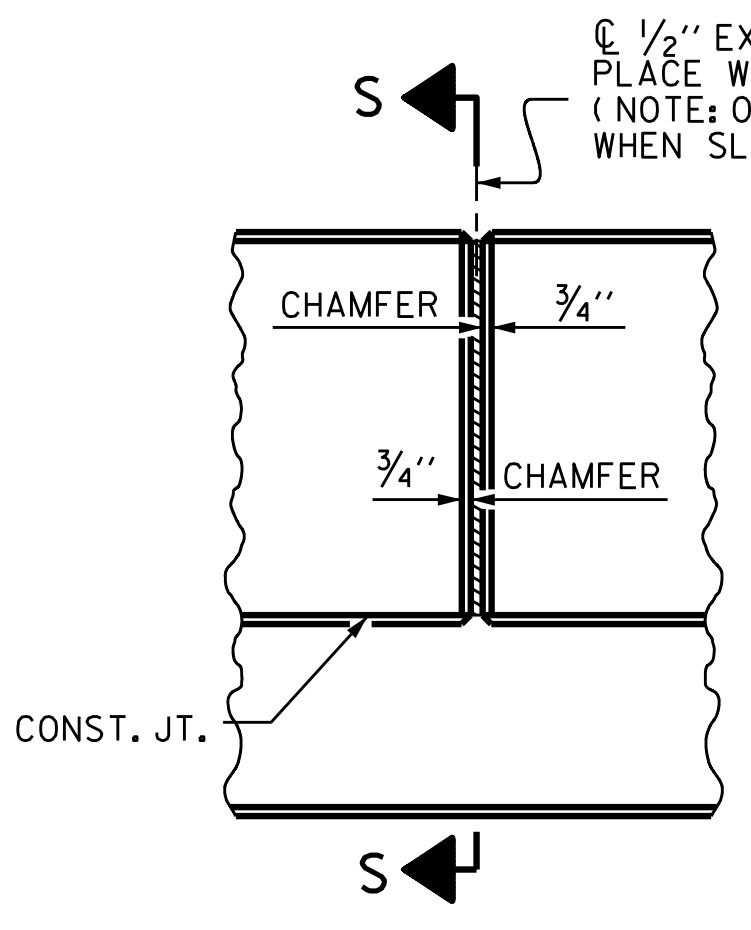
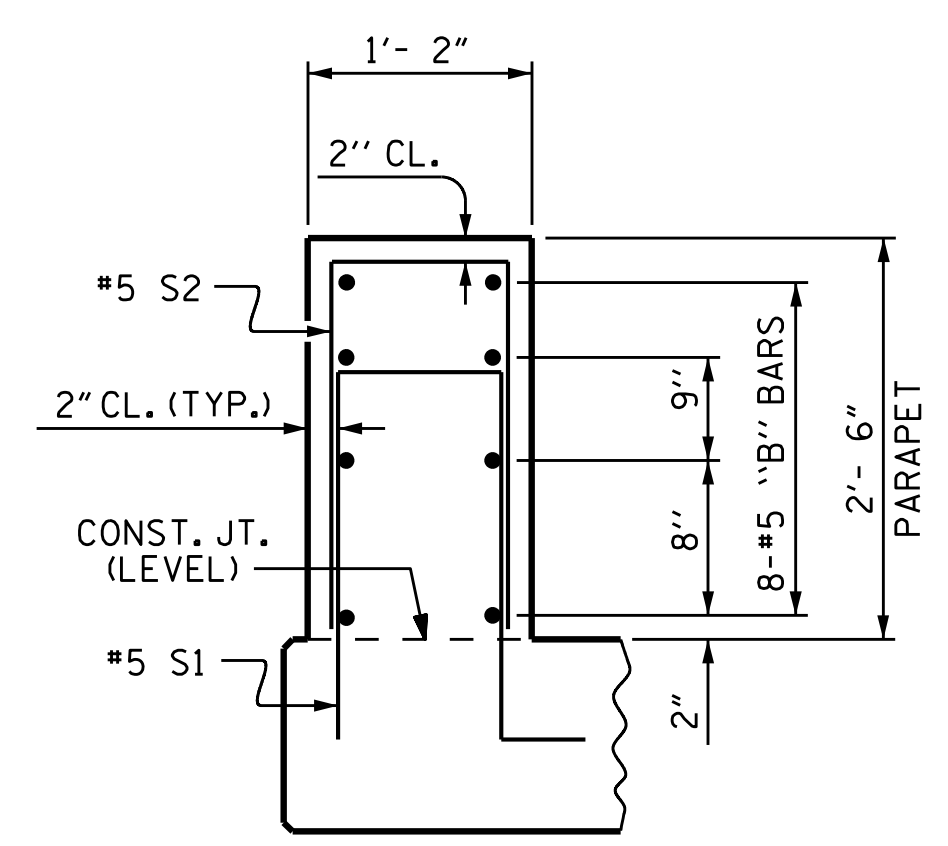
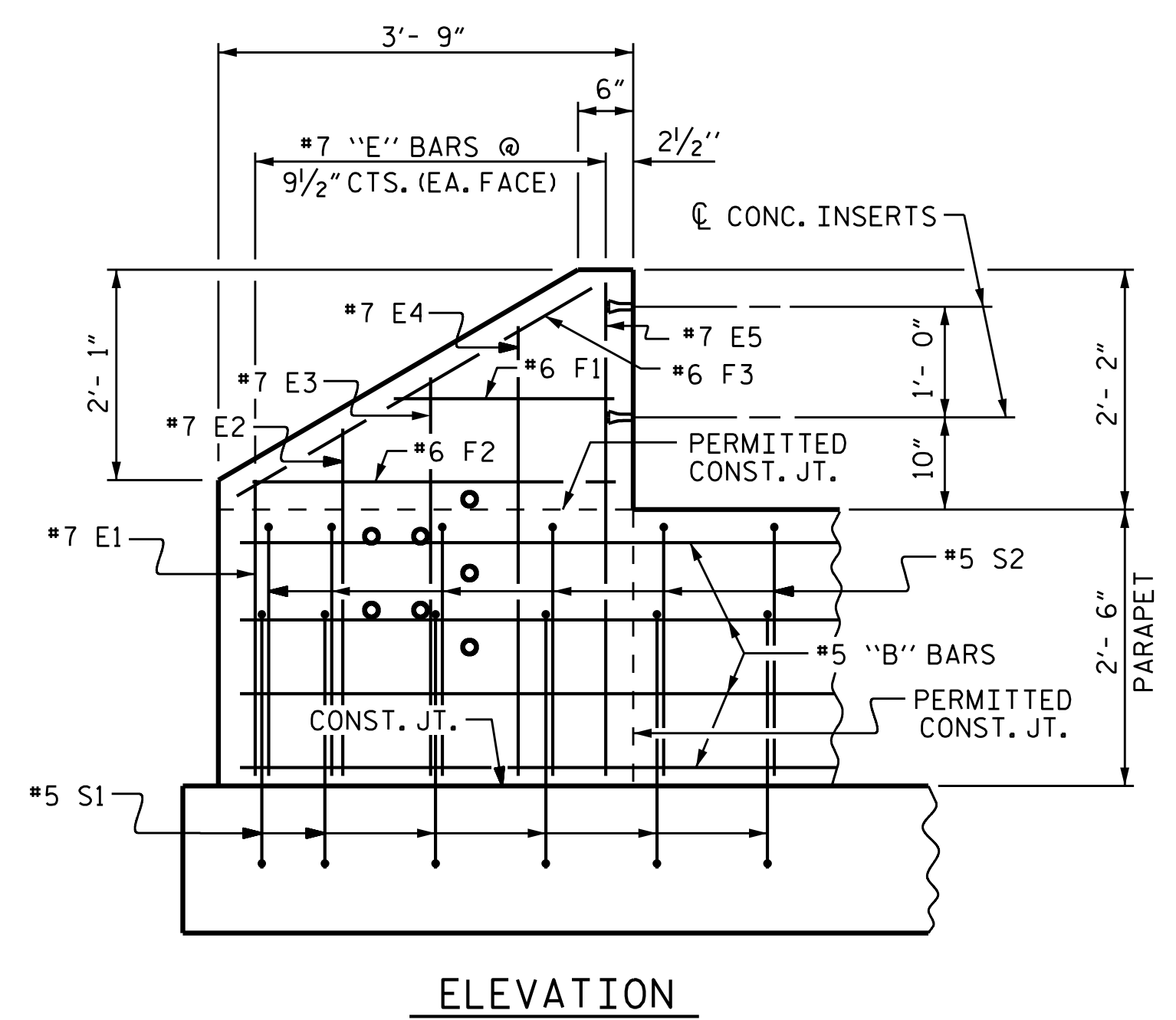
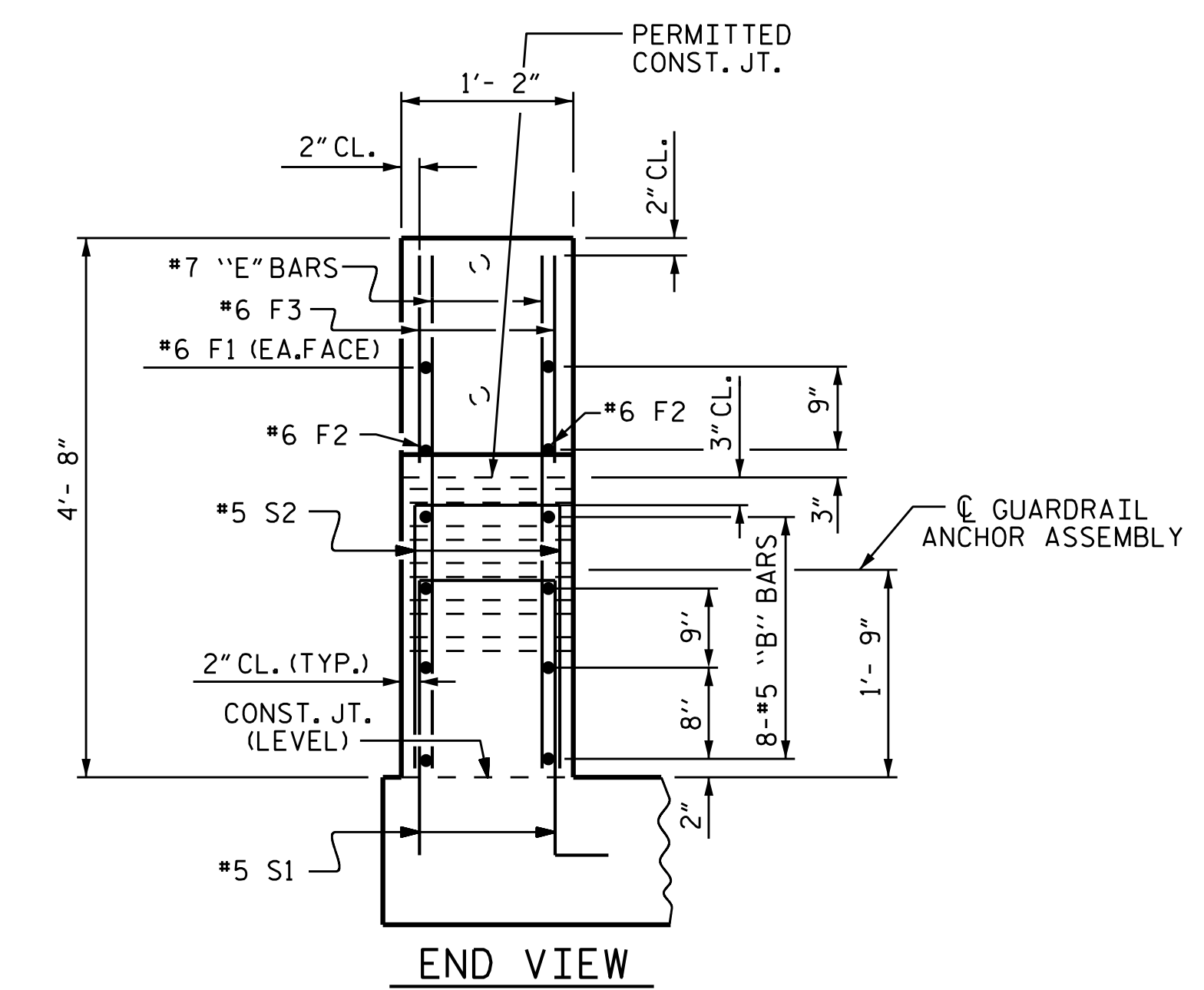
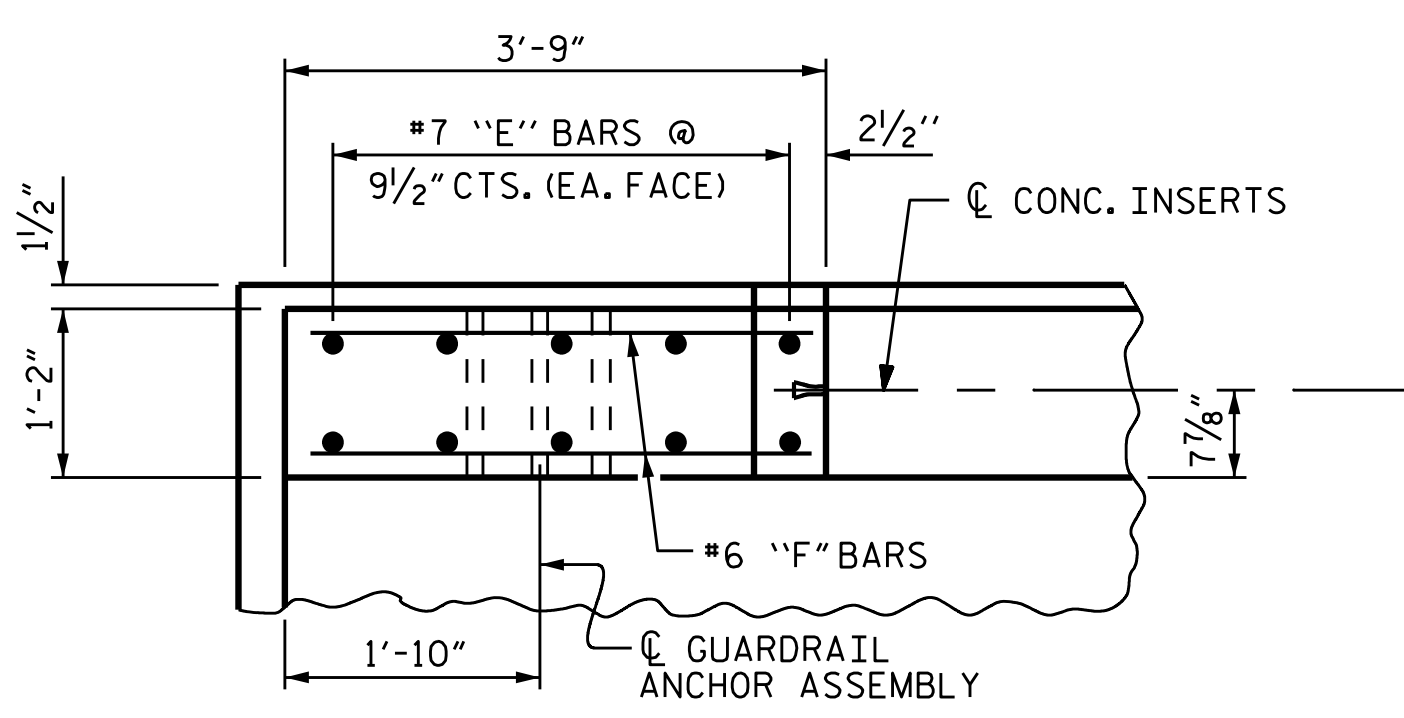
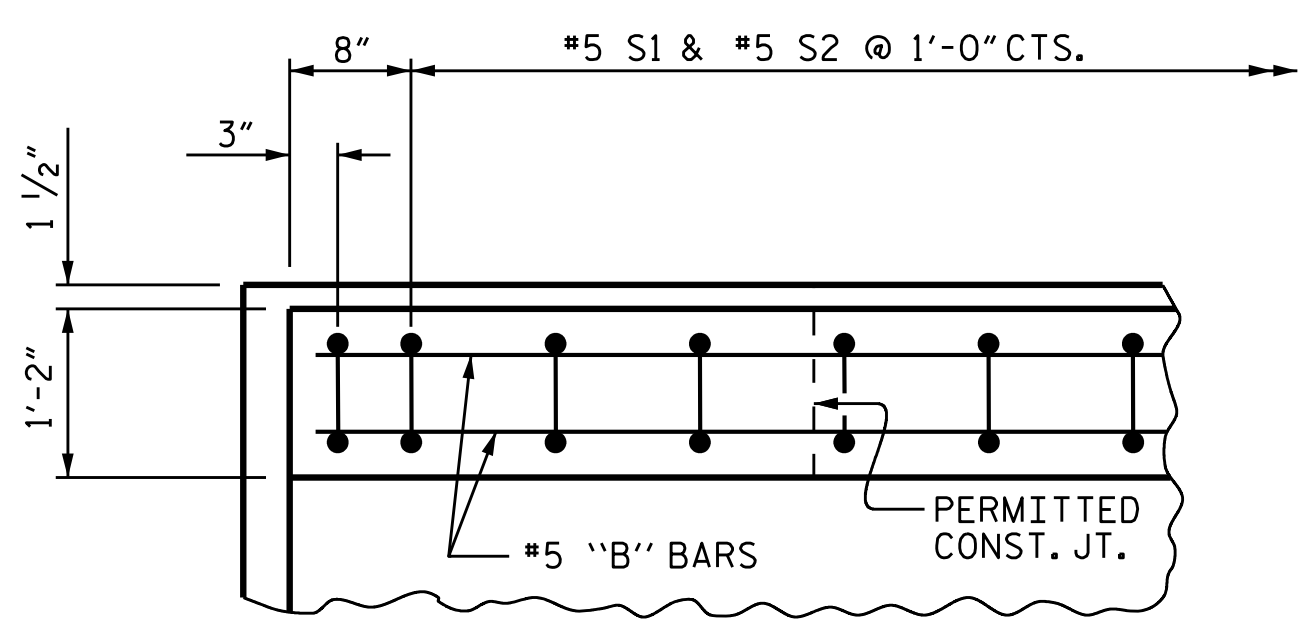
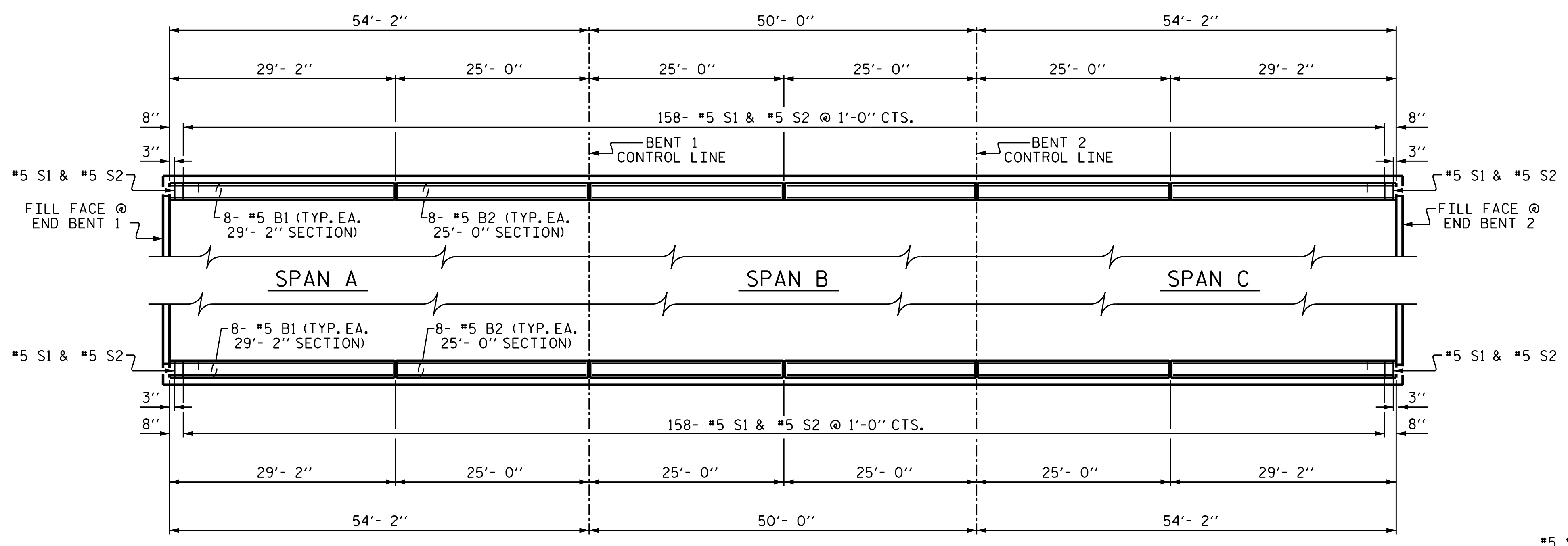


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ASSEMBLED BY : <u>D. A. GLADDEN</u> DATE : <u>11/18</u>
CHECKED BY : <u>D. R. SMITH</u> DATE : <u>12/18</u>
DRAWN BY : <u>FCJ</u> 1/88 TLA/GM
CHECKED BY : <u>CRK</u> 3/89 MAA/GM
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC



**NOTES**

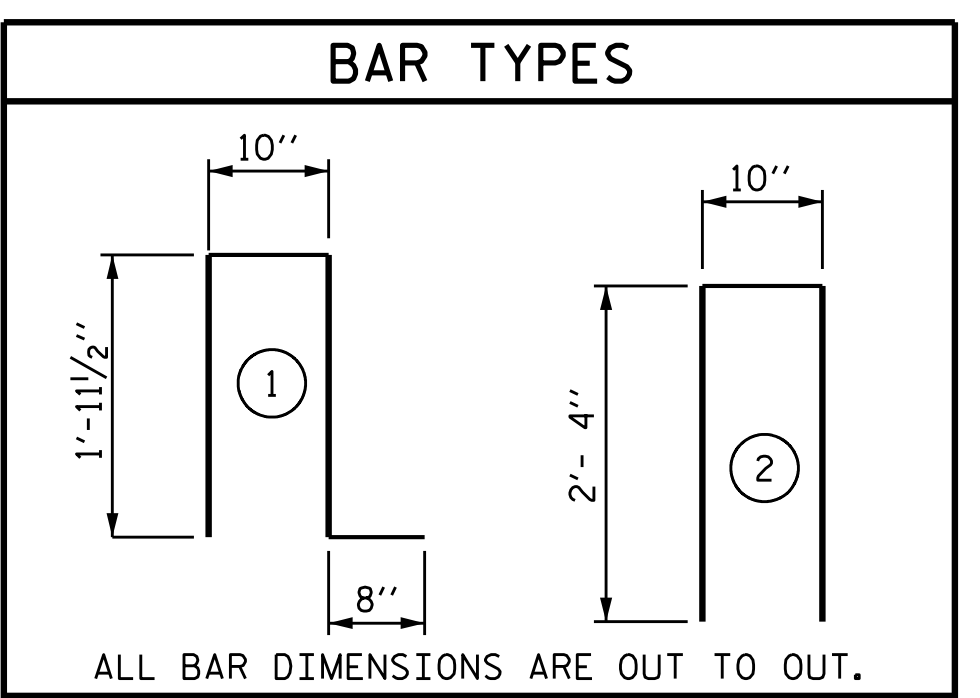
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN PARAPET AND END POSTS SHALL BE EPOXY COATED.

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

FOR DETAILS OF CONCRETE INSERTS IN END POST, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.



**BILL OF MATERIAL FOR PARAPET AND END POSTS**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	32	#5	STR	28'- 8"	957
* B2	64	#5	STR	24'- 6"	1635
* E1	8	#7	STR	2'- 6"	41
* E2	8	#7	STR	3'- 0"	49
* E3	8	#7	STR	3'- 6"	57
* E4	8	#7	STR	4'- 0"	65
* E5	8	#7	STR	4'- 4"	71
* F1	8	#6	STR	1'-11"	23
* F2	8	#6	STR	3'- 2"	38
* F3	8	#6	STR	3'- 6"	42
* S1	320	#5	1	5'- 5"	1808
* S2	320	#5	2	5'- 6"	1836
* EPOXY COATED REINFORCING STEEL					6,622 LBS.
CLASS AA CONCRETE					35.0 CU. YDS.
CONCRETE PARAPET					316.67 LIN. FT.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CONCRETE PARAPET AND END POST DETAILS**



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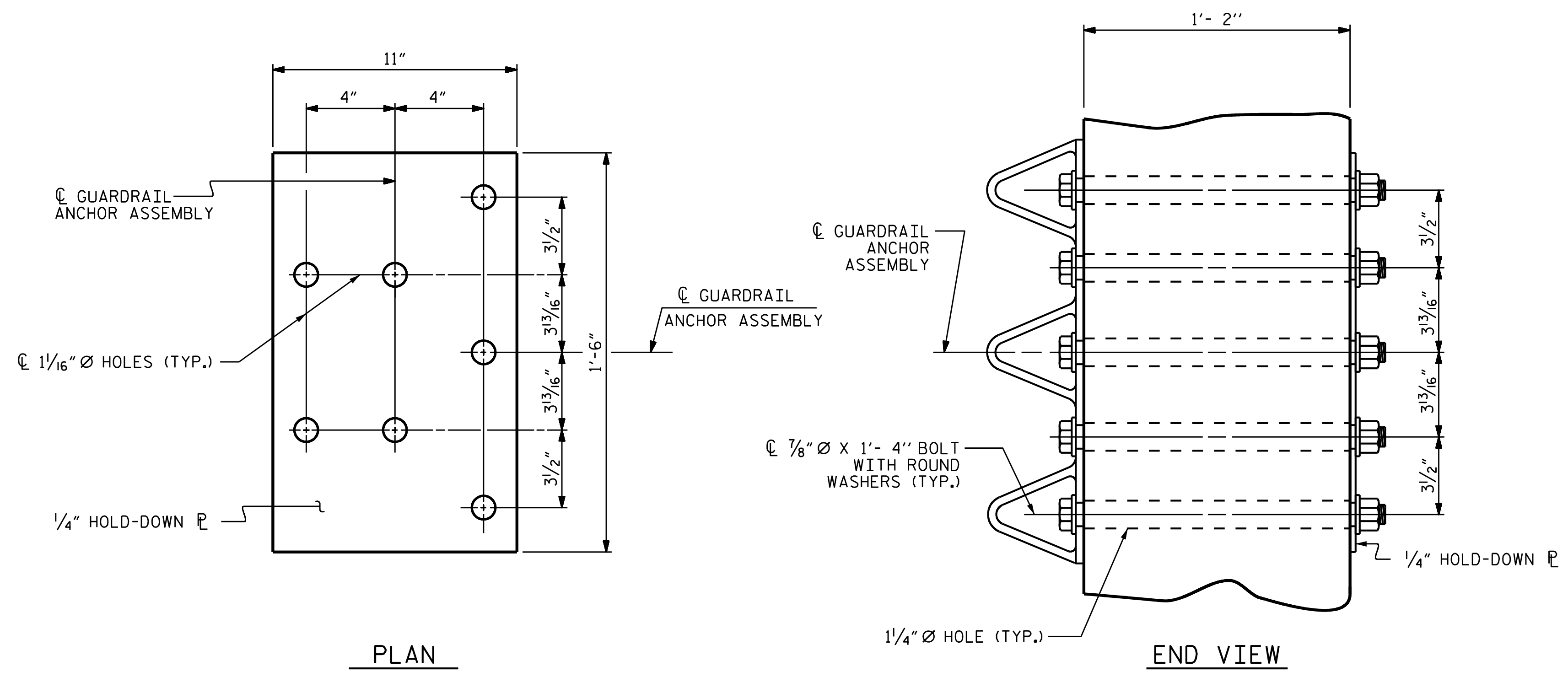
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DRAWN BY: D. A. GLADDEN DATE: 11/18  
 CHECKED BY: D. R. SMITH DATE: 12/18  
 DESIGN ENGINEER OF RECORD: D. R. SMITH DATE: 12/18

**NOTES**

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.
- THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

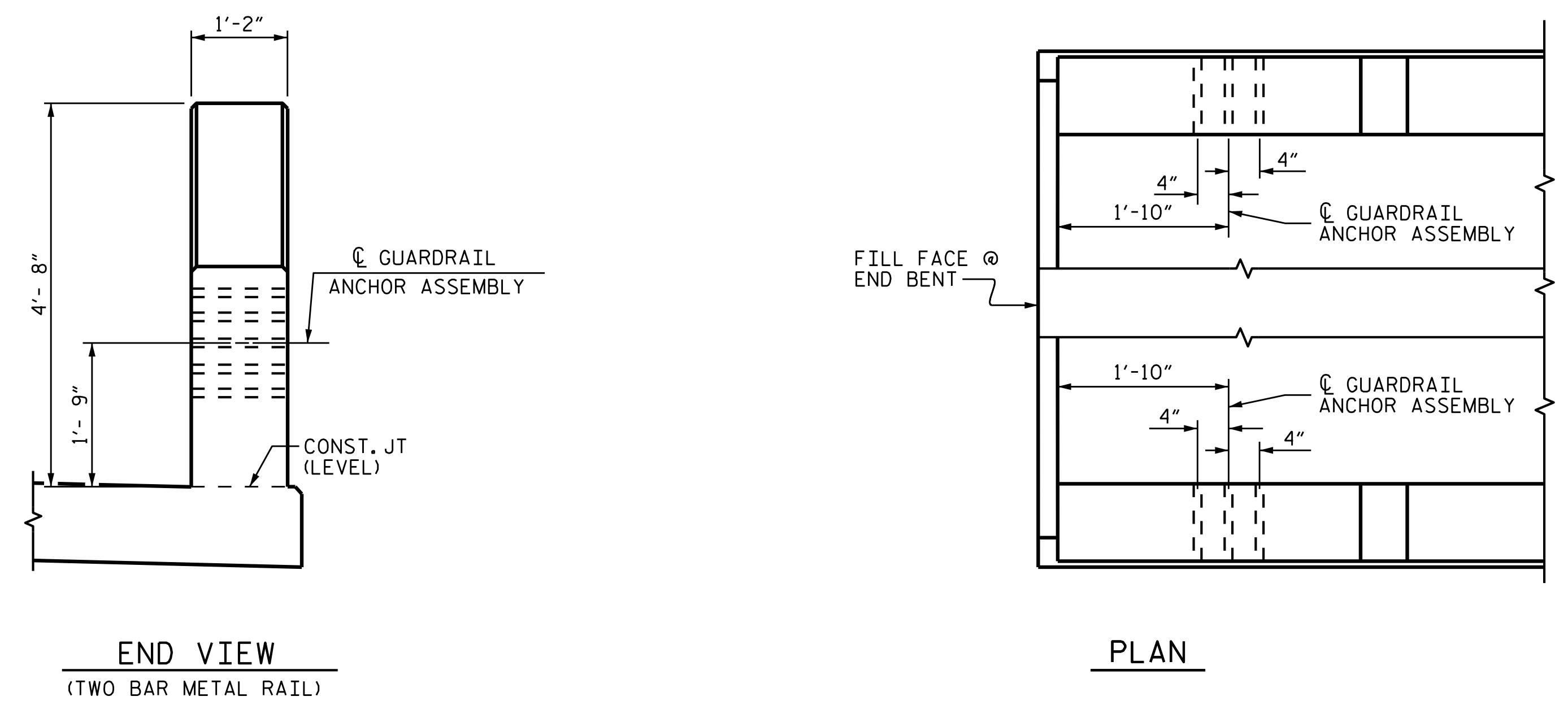


**GUARDRAIL ANCHOR ASSEMBLY DETAILS**



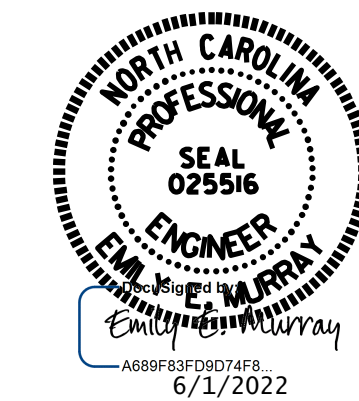
**SKETCH SHOWING POINTS OF ATTACHMENT**

\*LOCATION OF GUARDRAIL ATTACHMENT



**LOCATION OF GUARDRAIL ANCHOR AT END POST**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-



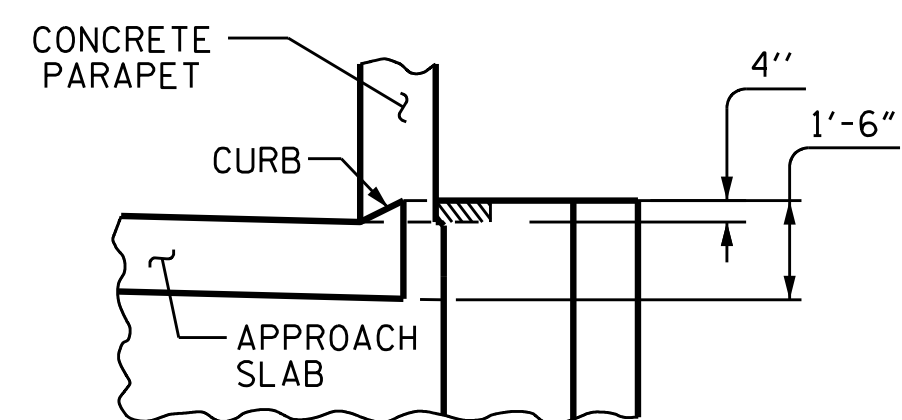
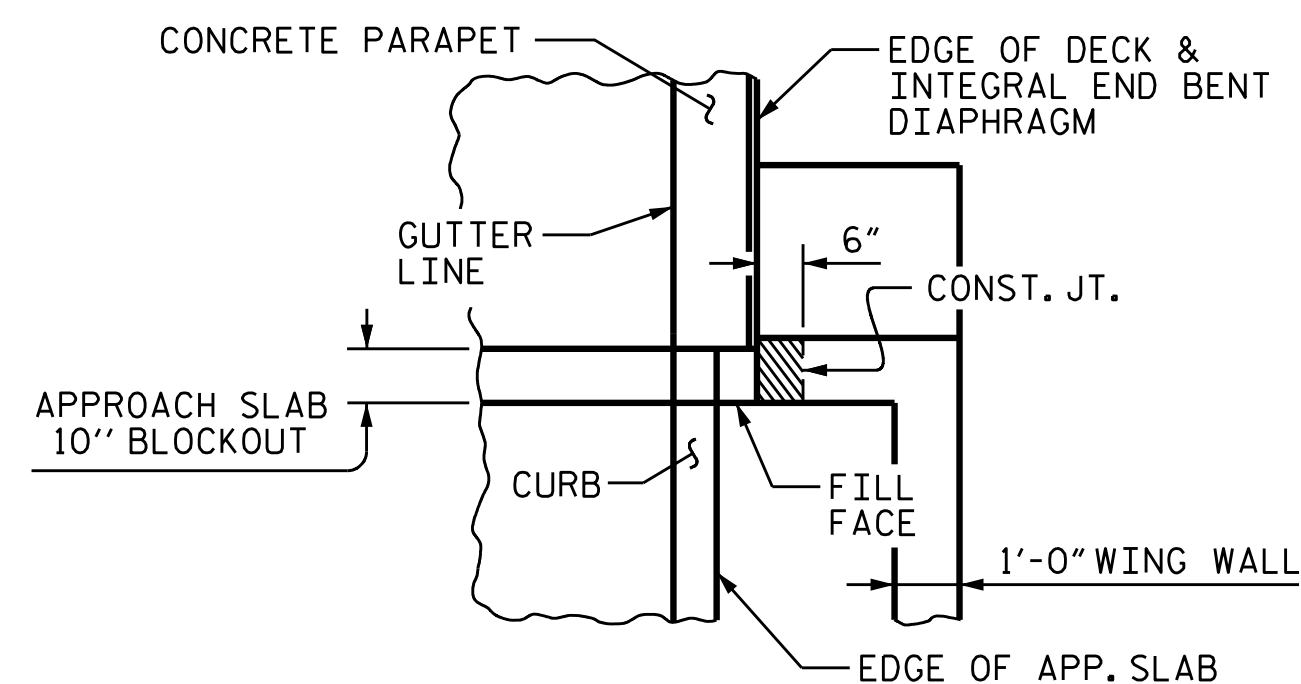
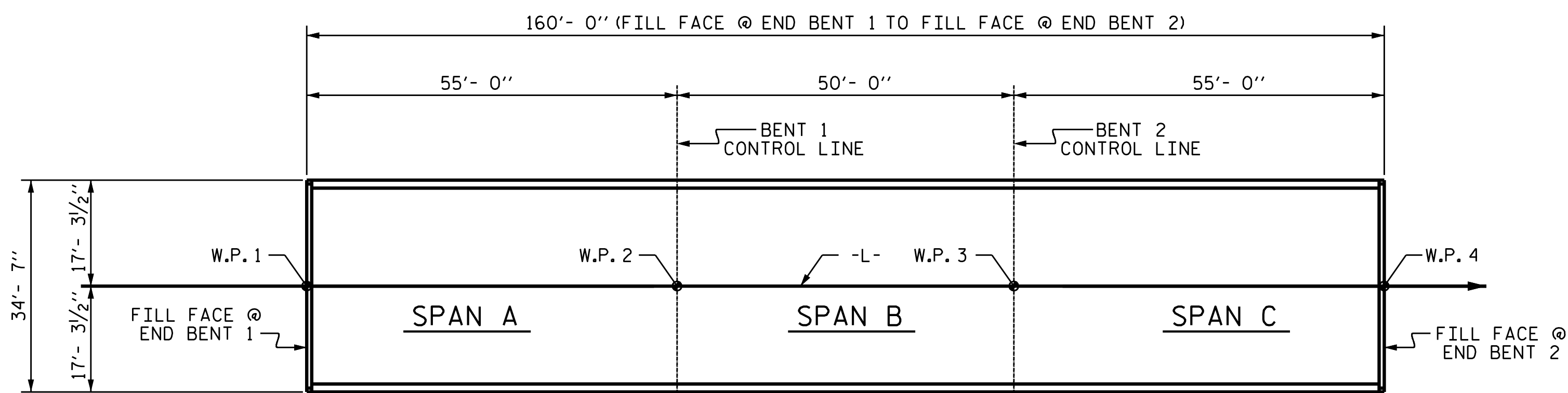
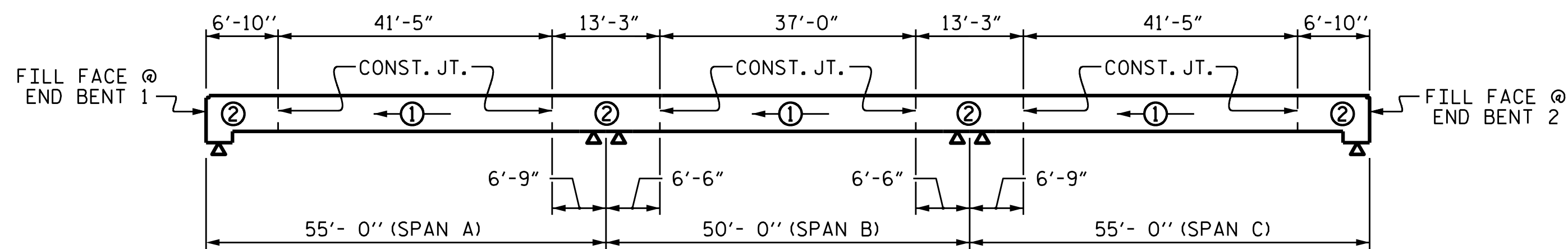
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

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CHECKED BY : <u>D. R. SMITH</u> DATE : <u>12/18</u>
DRAWN BY : MAA 5/10
CHECKED BY : GM 5/10
REV. 1/15 MAA/TMG
REV. 12/17 MAA/THC
REV. 5/18 MAA/THC



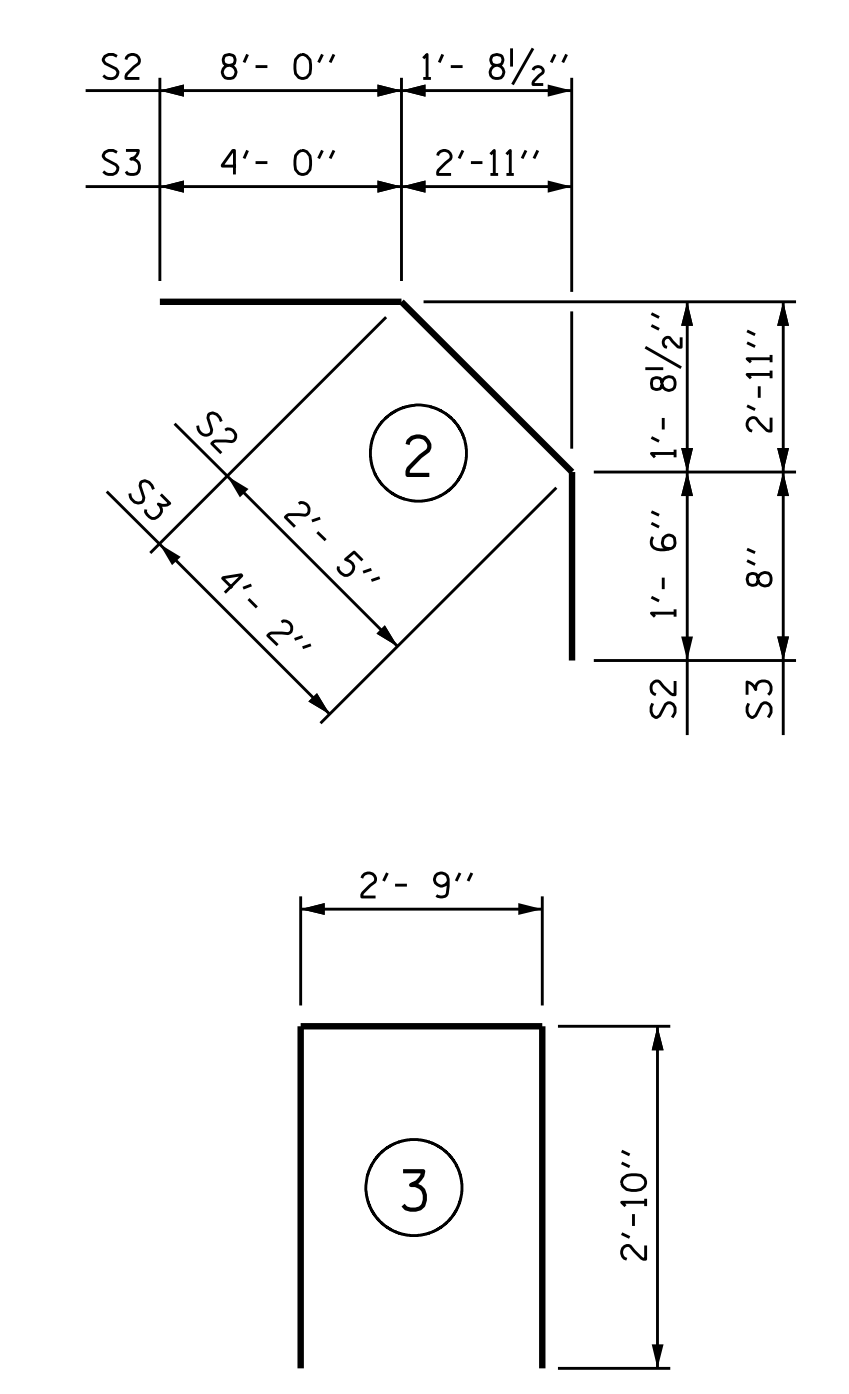
**BLOCKOUT IN WING WALL FOR INTEGRAL END BENT**

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

**BILL OF MATERIAL**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	316	5	STR 34'- 1"	11233
* A2	212	4	STR 3'- 0"	425
* B1	182	5	STR 11'- 0"	2088
* B2	92	5	STR 41'- 6"	3982
* B3	90	5	STR 25'- 9"	2417
* B4	92	4	STR 25'- 4"	1556
* B5	46	4	STR 13'- 8"	419
* B6	30	5	STR 54'- 4"	1700
* K1	16	4	STR 18'- 0"	192
* K3	12	4	STR 8'- 4"	66
* K4	6	4	STR 7'- 5"	30
* K5	4	4	STR 2'- 2"	6
* K6	8	4	STR 2'- 4"	12
* K7	4	4	STR 1'-11"	5
* S2	56	4	2 11'-11"	446
* S3	56	4	2 8'-10"	330
* U1	60	4	3 8'- 5"	337
* EPOXY COATED REINFORCING STEEL			LBS.	25,244

**BAR TYPES**



**— SUPERSTRUCTURE BILL OF MATERIAL —**

	CLASS AA CONCRETE ( CU.YDS.)	* EPOXY COATED REINFORCING STEEL ( LBS.)
POUR 1	90.6	
POUR 2	56.0	
TOTALS**	146.6	25,396

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

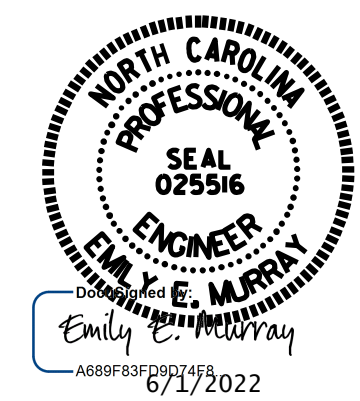
**SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS**

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

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1411	SQ.FT.
BRIDGE DECK	4592	SQ.FT.
TOTAL	6003	SQ.FT.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-



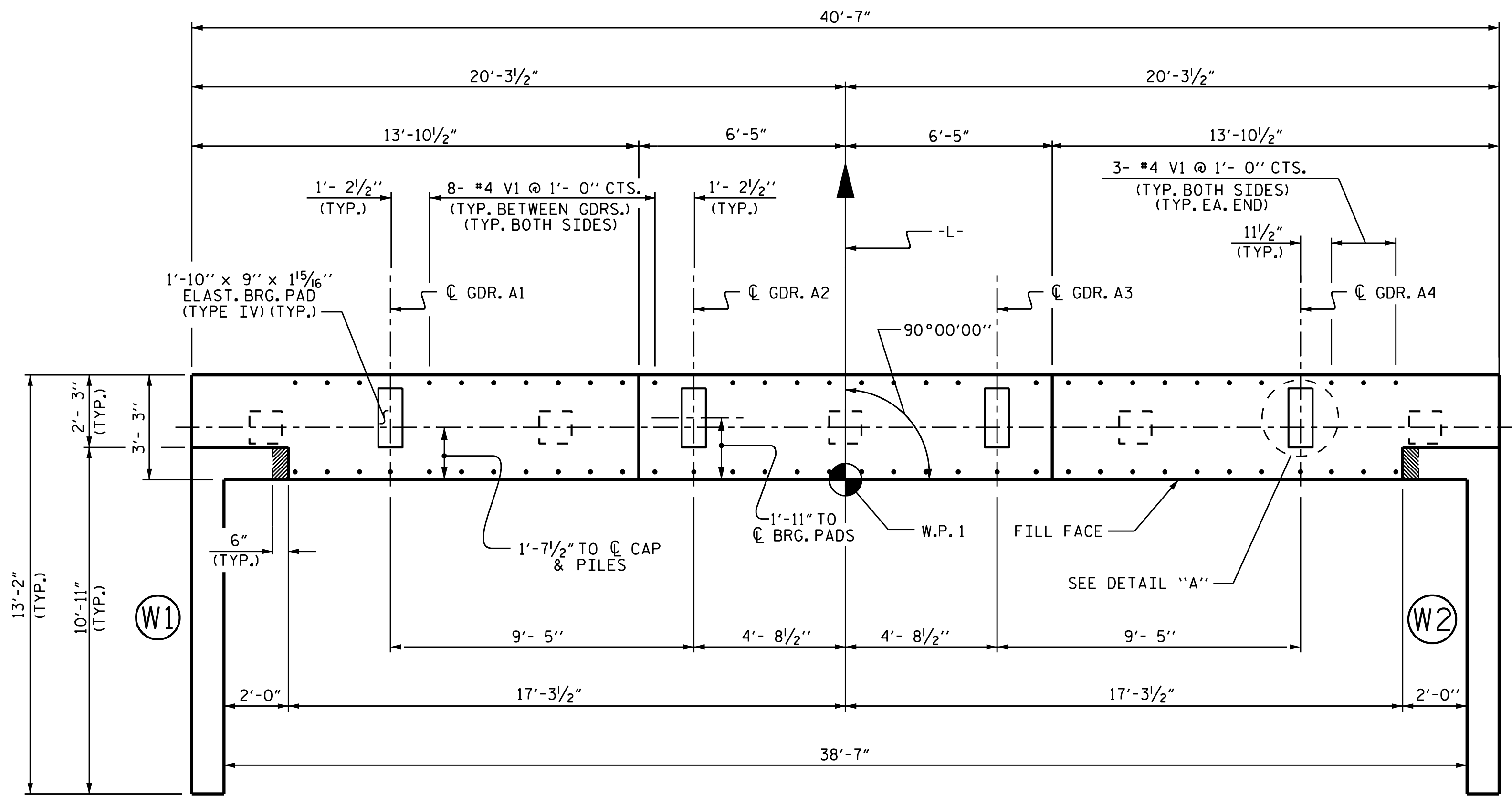
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SUPERSTRUCTURE  
 BILL OF MATERIAL

ASSEMBLED BY : D. A. GLADDEN DATE : 11/18  
 CHECKED BY : D. R. SMITH DATE : 12/18  
 DESIGN ENGINEER OF RECORD : D. R. SMITH DATE : 12/18

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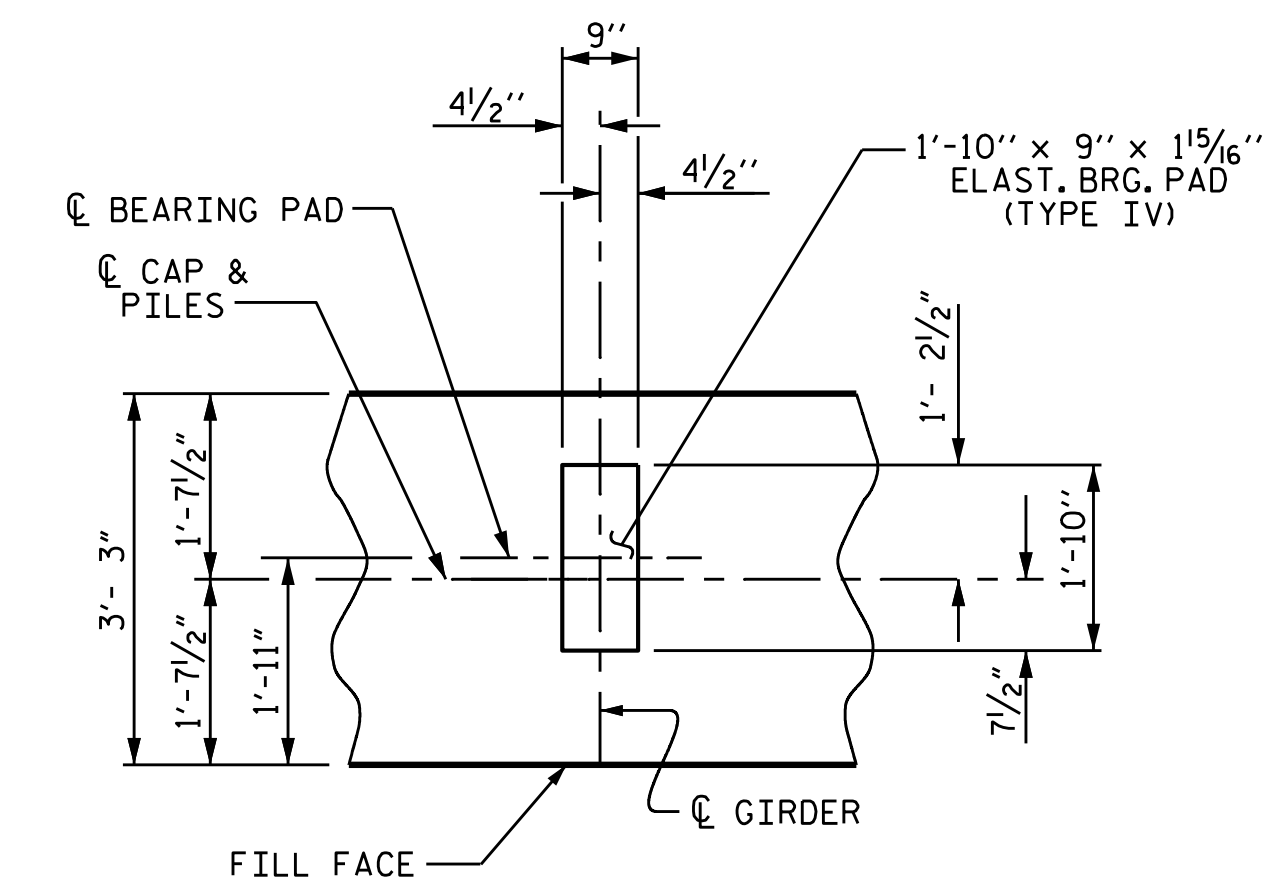
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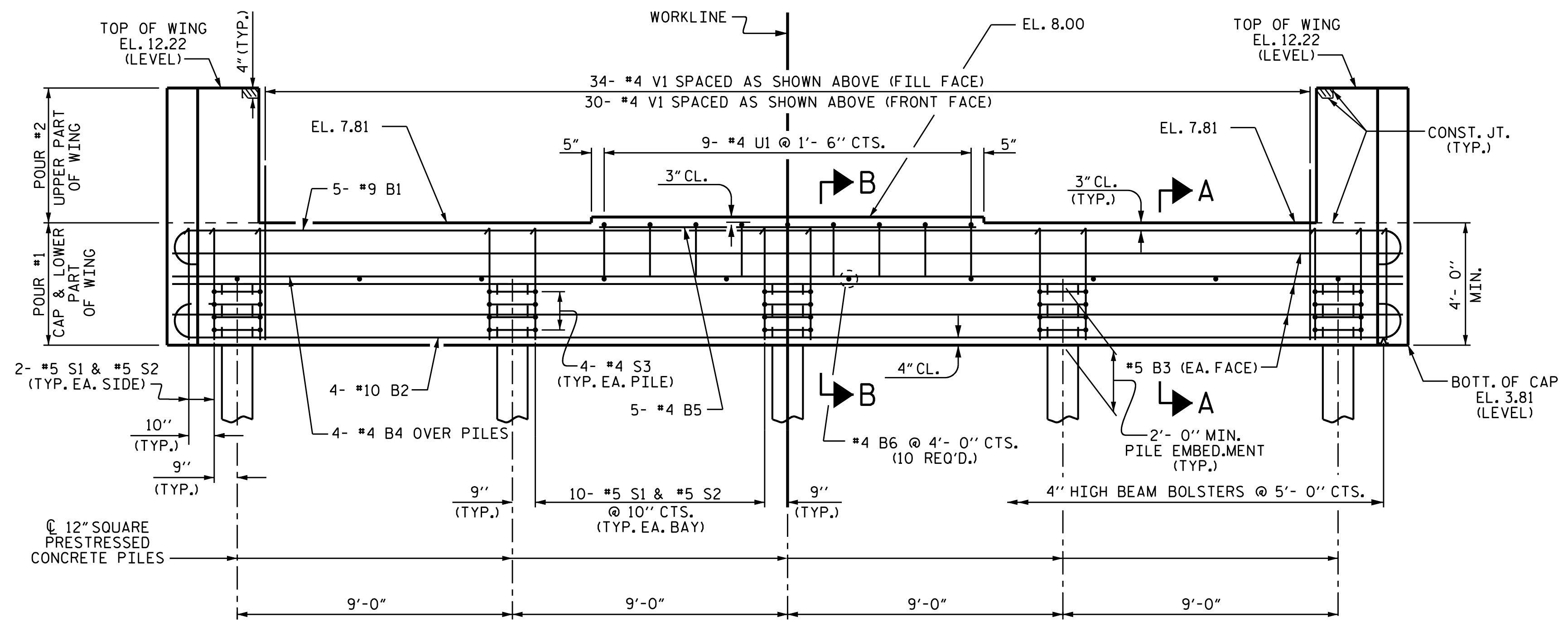


**PLAN**

**NOTES:**  
 THE TOP SURFACE AREA OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".  
 STIRRUPS AND UI BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID #4 V1 BARS IN CAP.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.  
 FOR PRESTRESSED CONCRETE PILES, SEE "12" PRESTRESSED CONCRETE PILE" SHEET.  
 ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.  
 FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.



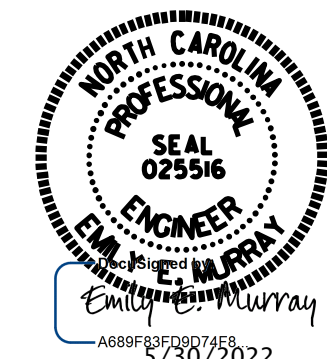
**DETAIL "A"**  
(TYP. EA. GIRDER)



**ELEVATION**

PROJECT NO. B-4563  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
**INTEGRAL**  
**END BENT 1**

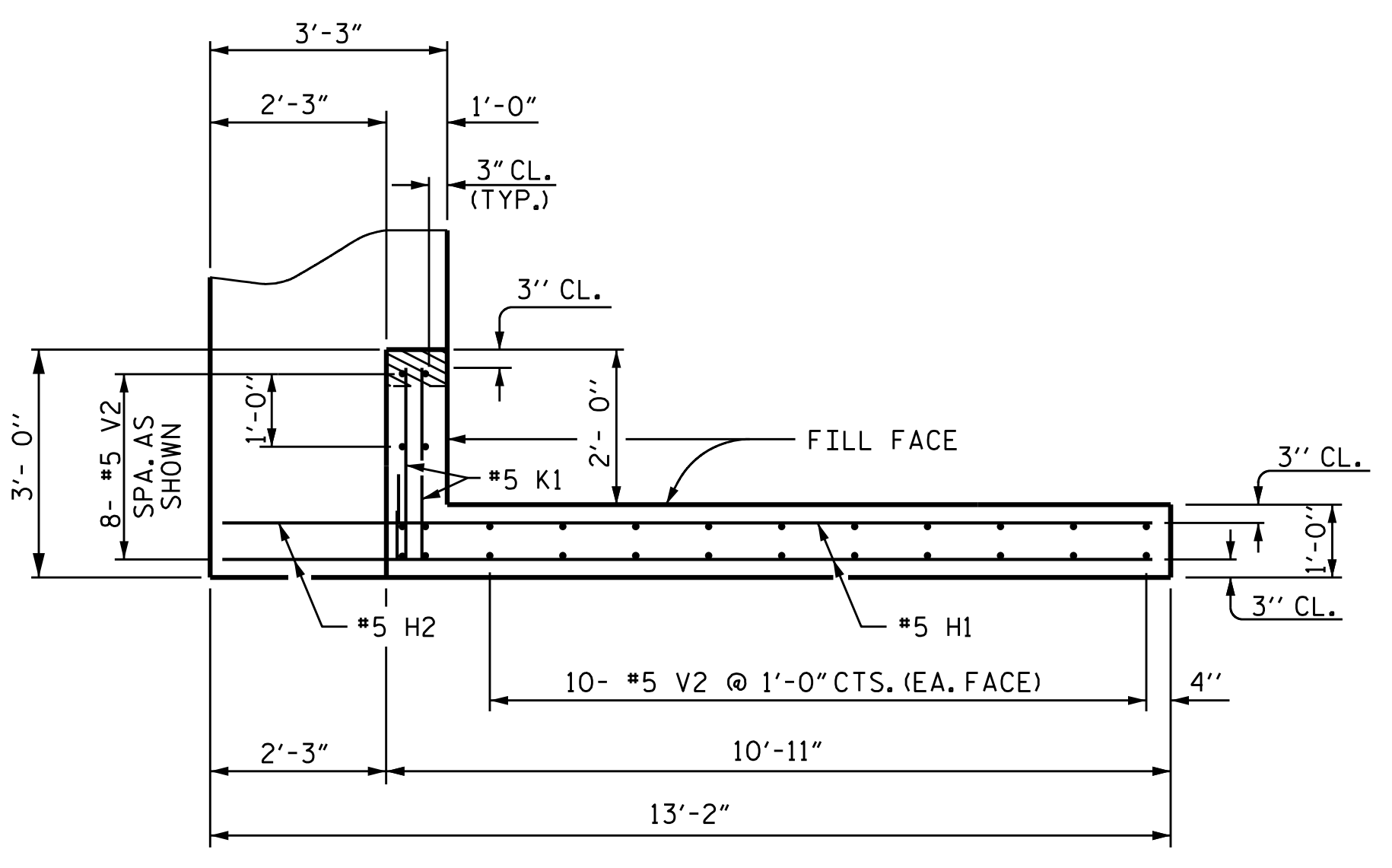


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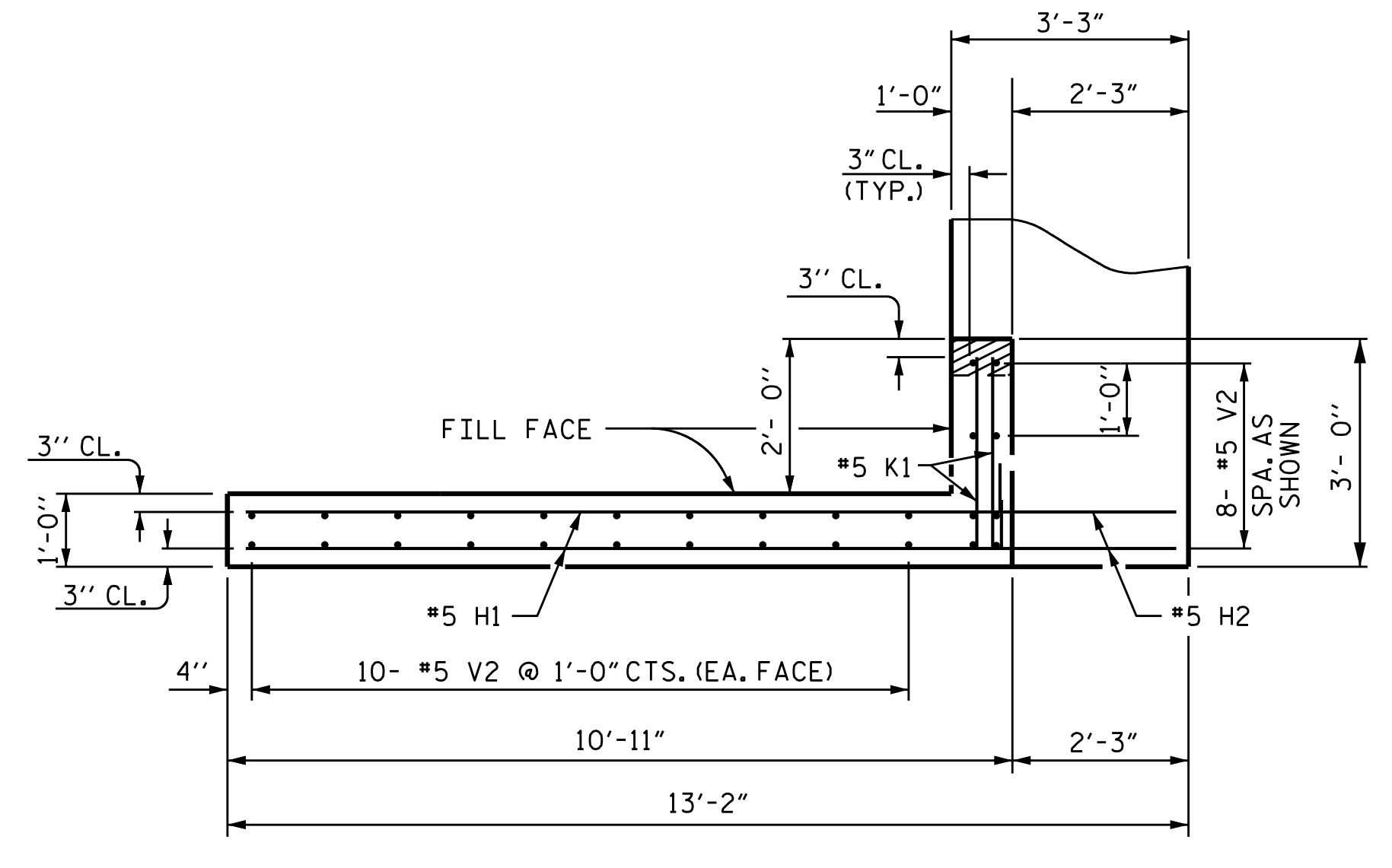
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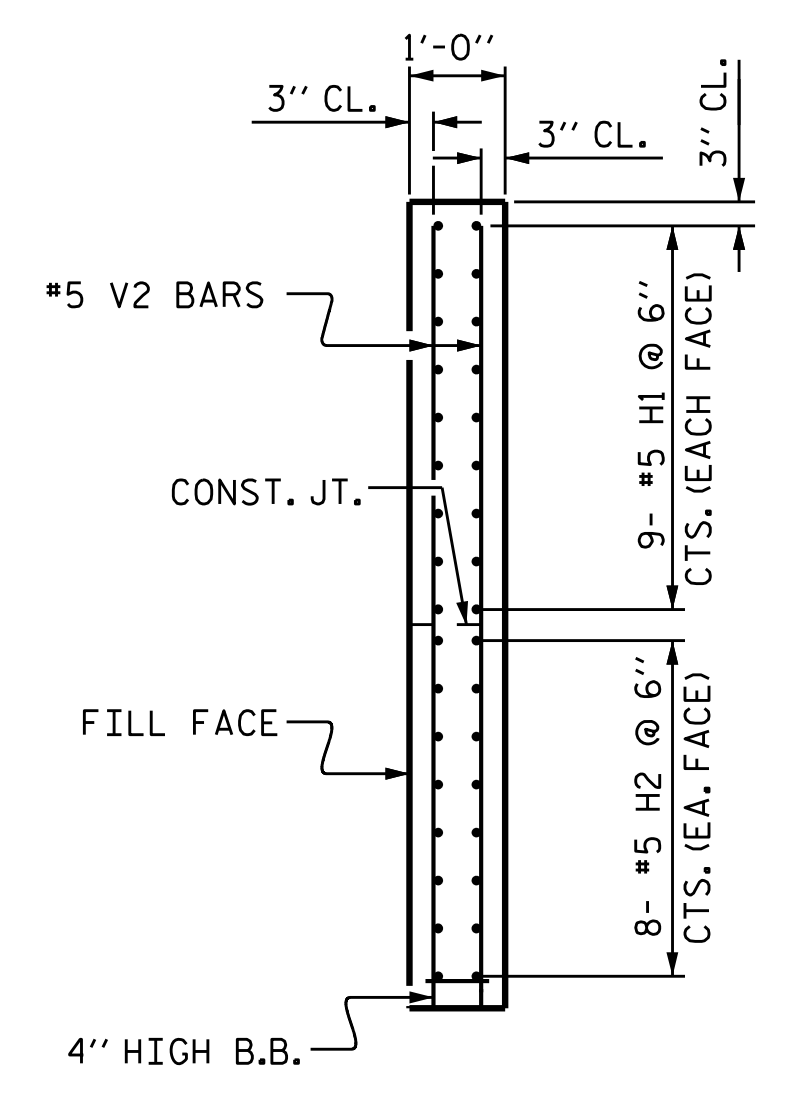
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 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18



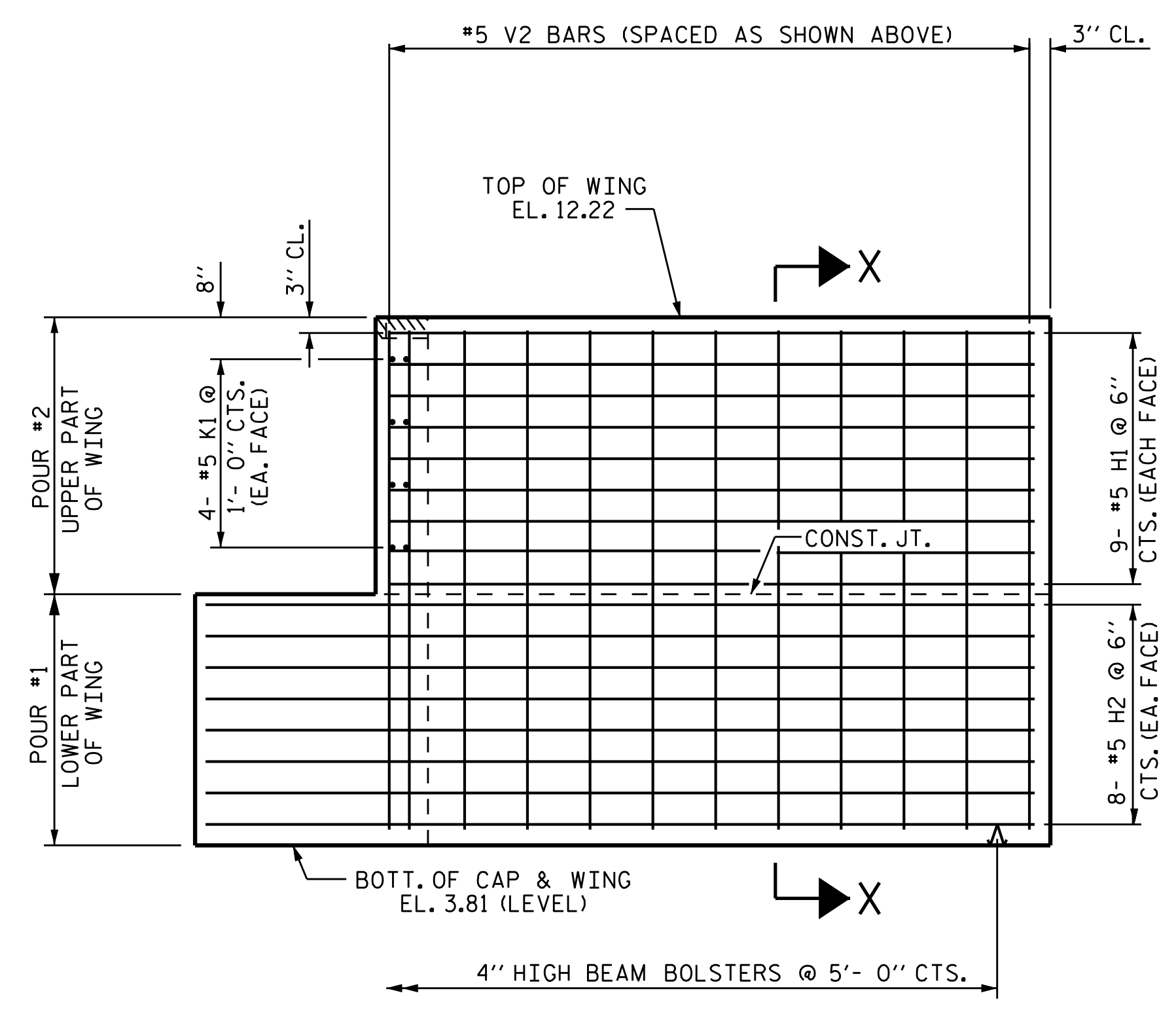
**PLAN OF WING 1**



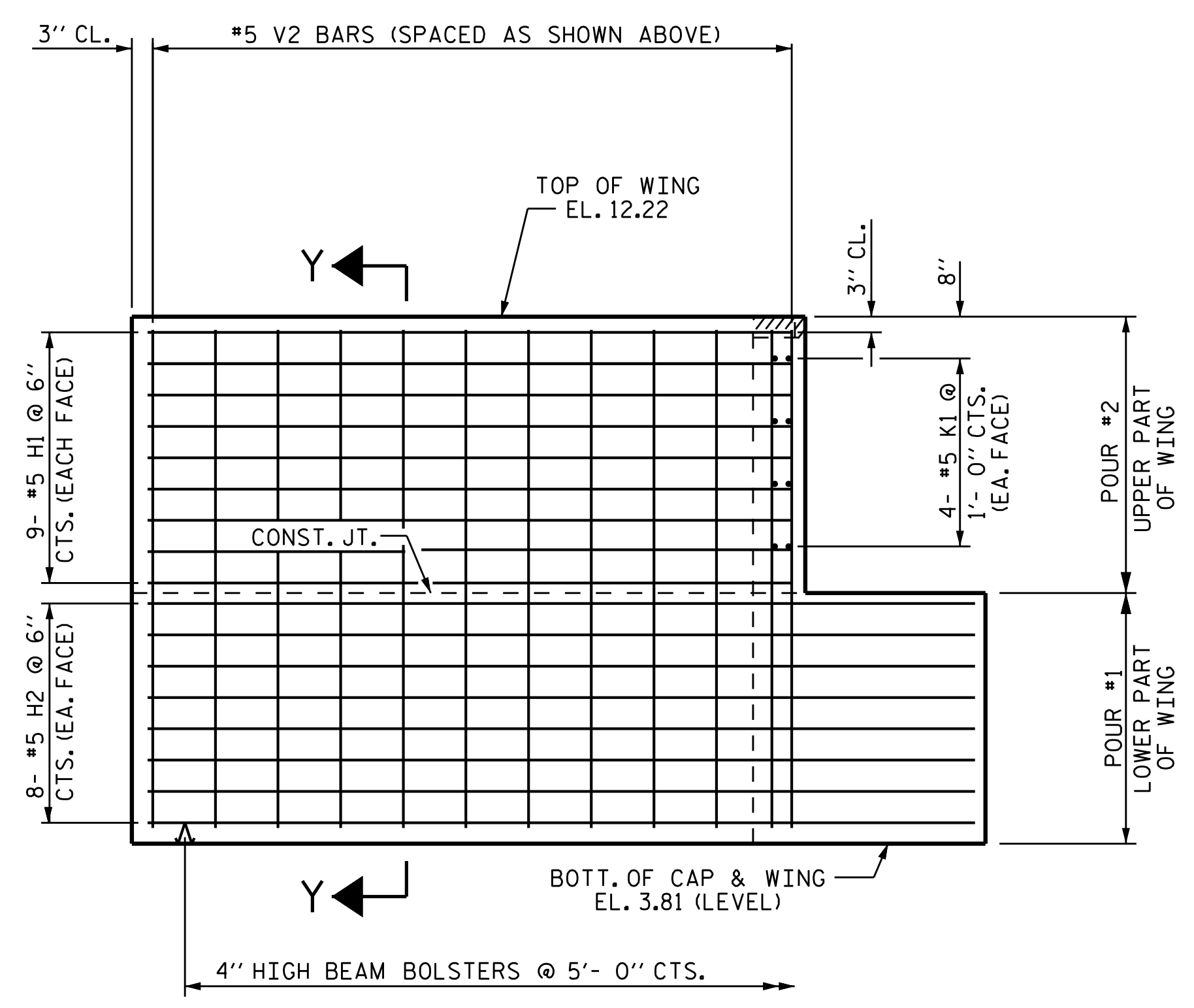
**PLAN OF WING 2**



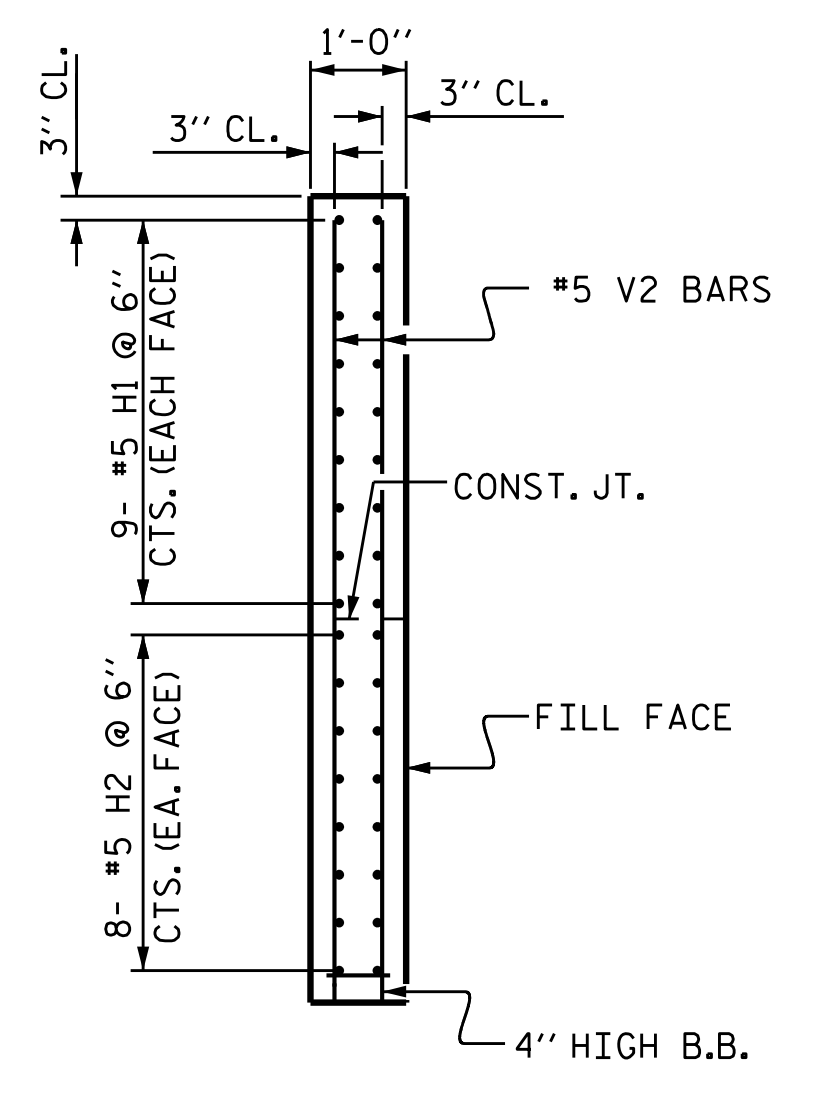
**SECTION X-X**



**ELEVATION OF WING 1**



**ELEVATION OF WING 2**



**SECTION Y-Y**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 INTEGRAL  
 END BENT 1**



**VOLKERT**  
 5430 Wade Park Blvd., Suite 410  
 Raleigh, NC 27607  
 Tel. 919-854-0344 Fax. 919-854-0355  
 NC License No. F-0765

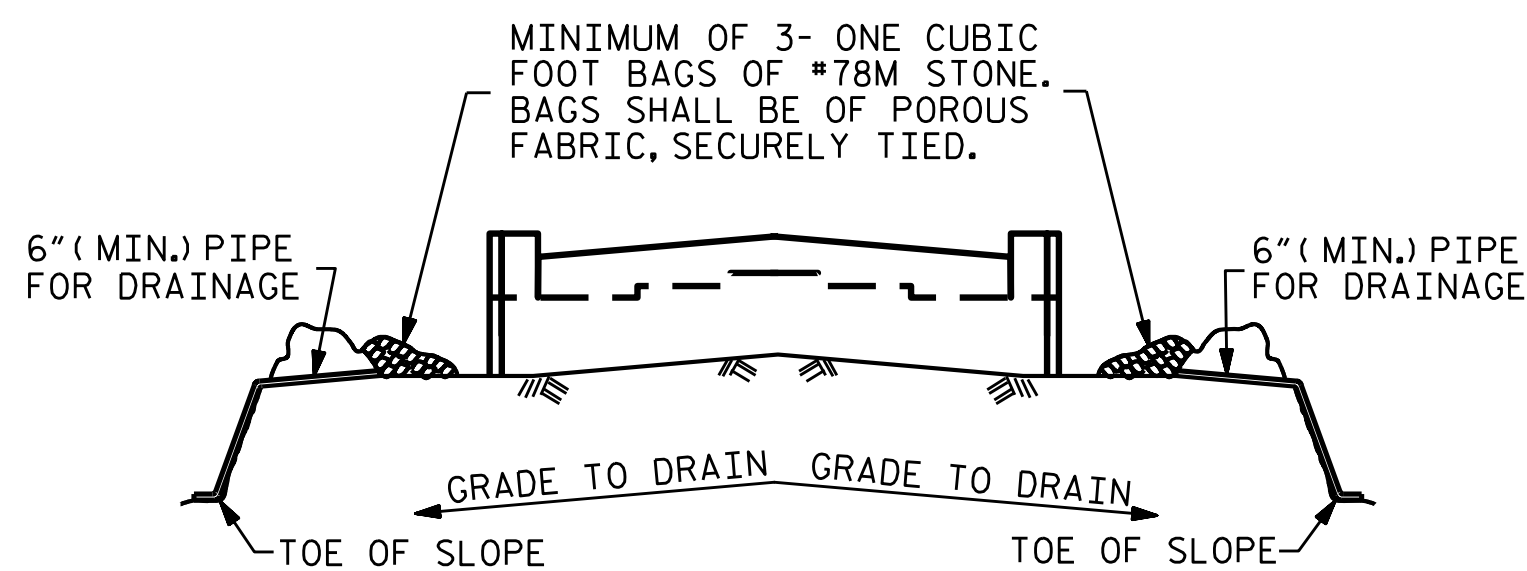
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-29
TOTAL SHEETS	42

DRAWN BY:	J.R. MCROY	DATE:	11/18
CHECKED BY:	P.N. HOLDER	DATE:	11/18
DESIGN ENGINEER OF RECORD:	J.R. MCROY	DATE:	10/18





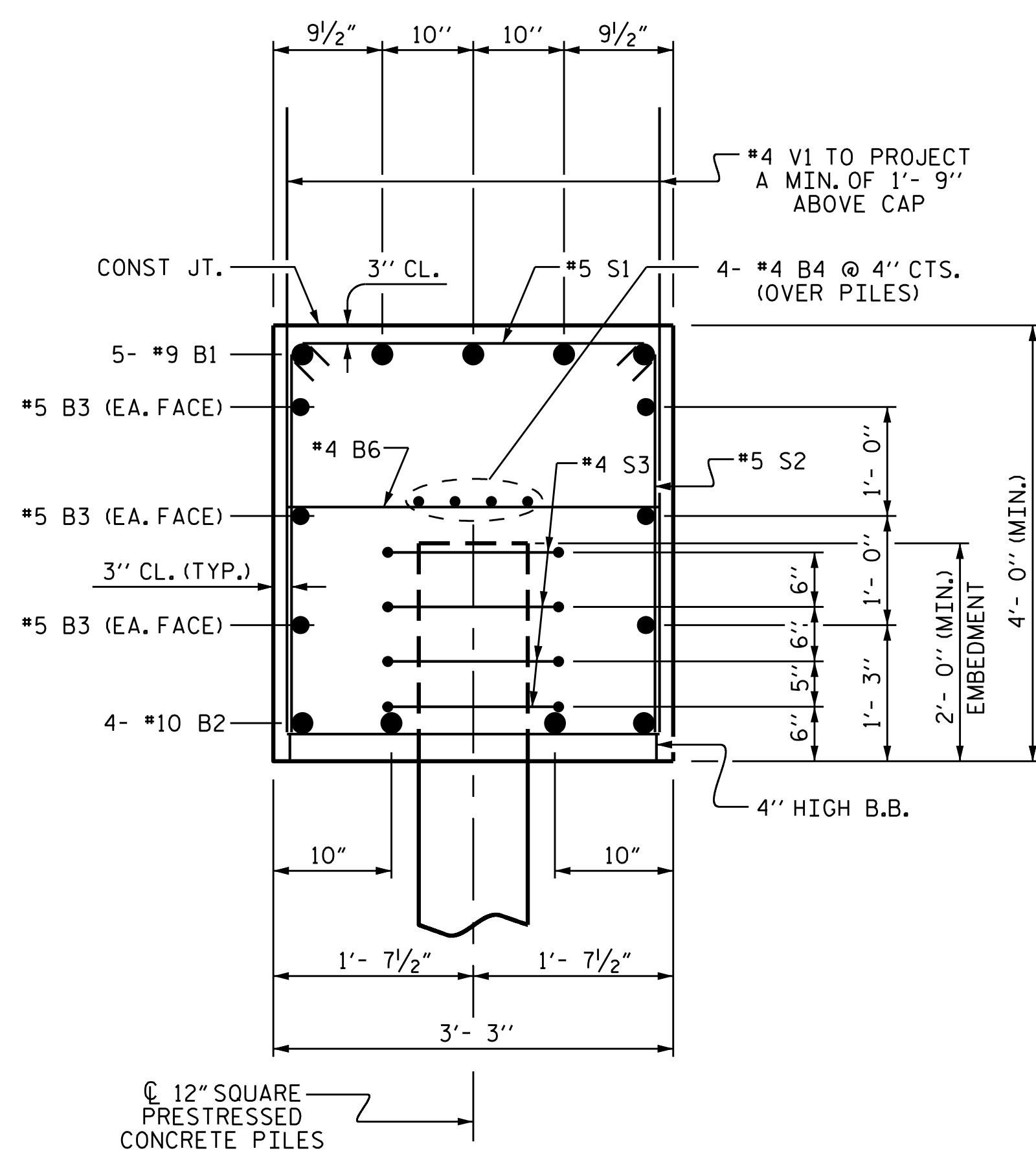
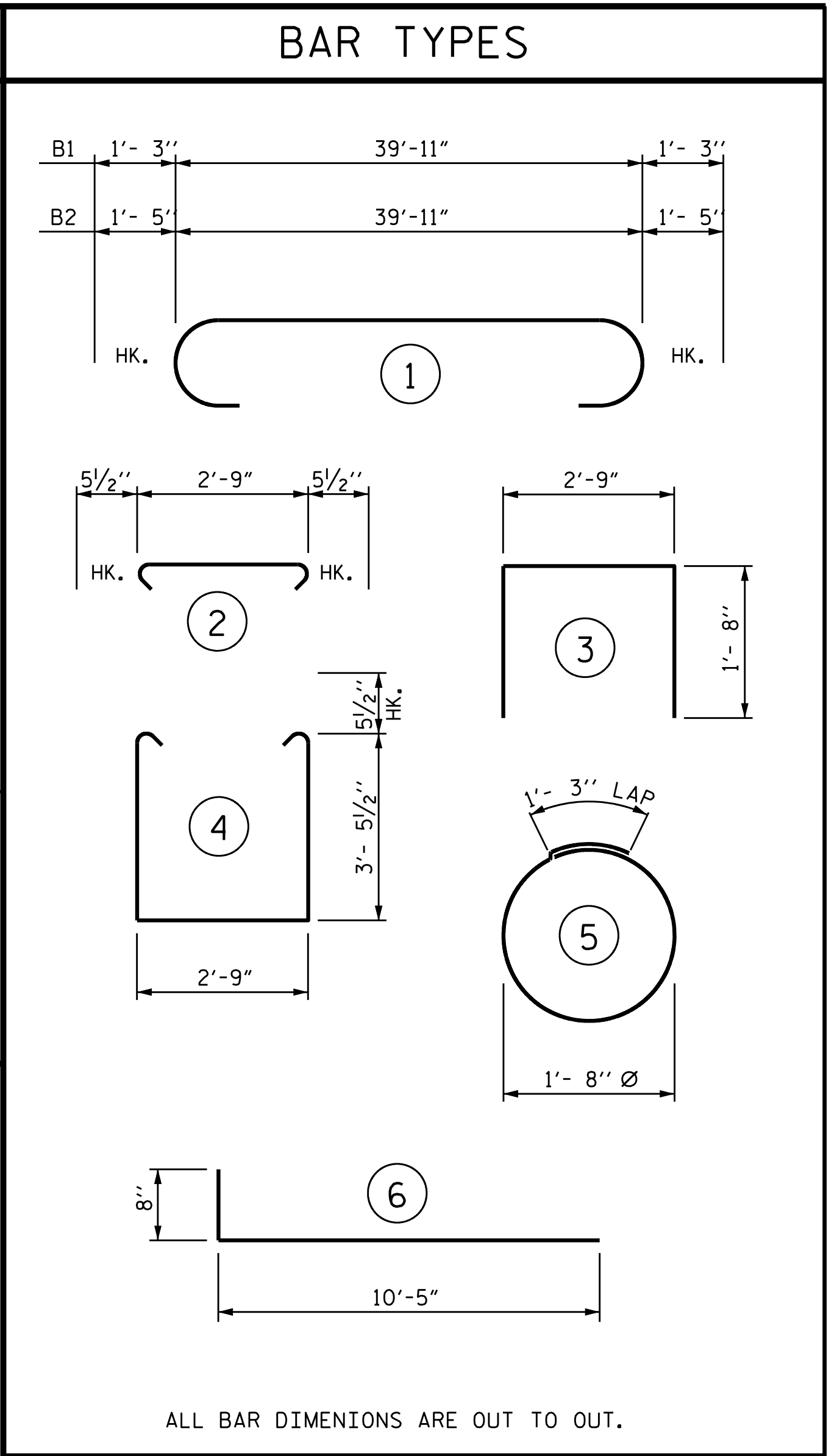
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

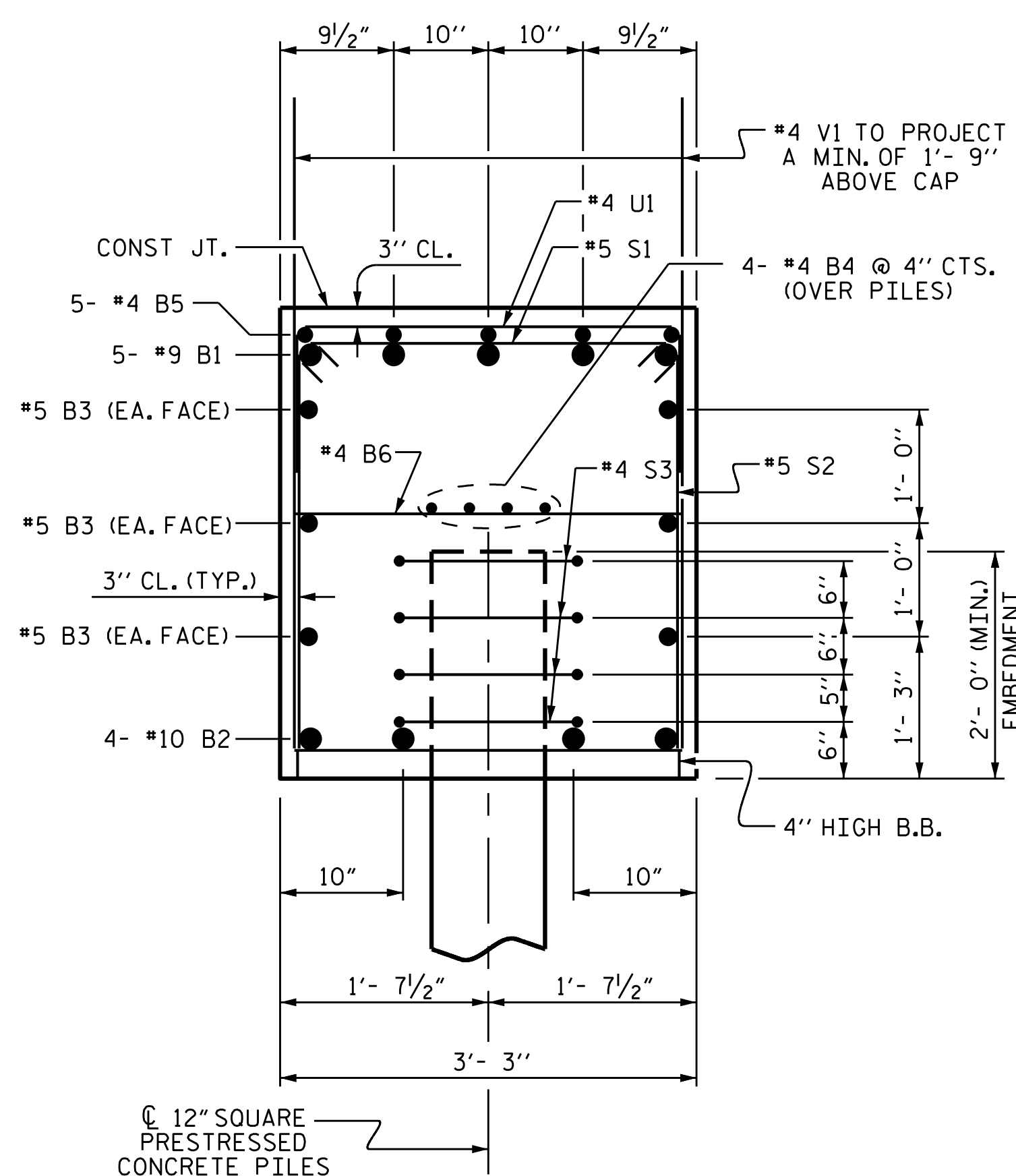
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	5	9		42'- 5"	721
* B2	4	10		42'- 9"	736
* B3	6	5	STR	40'- 1"	251
* B4	4	4	STR	40'- 0"	107
* B5	5	4	STR	12'- 4"	41
* B6	10	4	STR	2'- 9"	18
* H1	36	5	6	11'- 1"	416
* H2	32	5	STR	12'- 8"	423
* K1	16	5	STR	2'- 6"	42
* S1	44	5	2	3'- 8"	168
* S2	44	5	4	10'- 11"	501
* S3	20	4	5	10'- 7"	141
* U1	9	4	3	6'- 1"	37
* V1	64	4	STR	5'- 8"	242
* V2	56	5	STR	7'- 10"	458
* EPOXY COATED REINFORCING STEEL					4302 LBS.
CLASS AA CONCRETE					
POUR 1: CAP & LOWER PART OF WINGS					22.4 C.Y.
POUR 2: UPPER PART OF WINGS					4.2 C.Y.
TOTAL					26.6 C.Y.



SECTION A-A



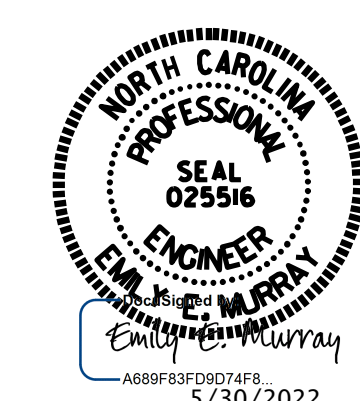
SECTION B-B

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 INTEGRAL  
 END BENT 1**

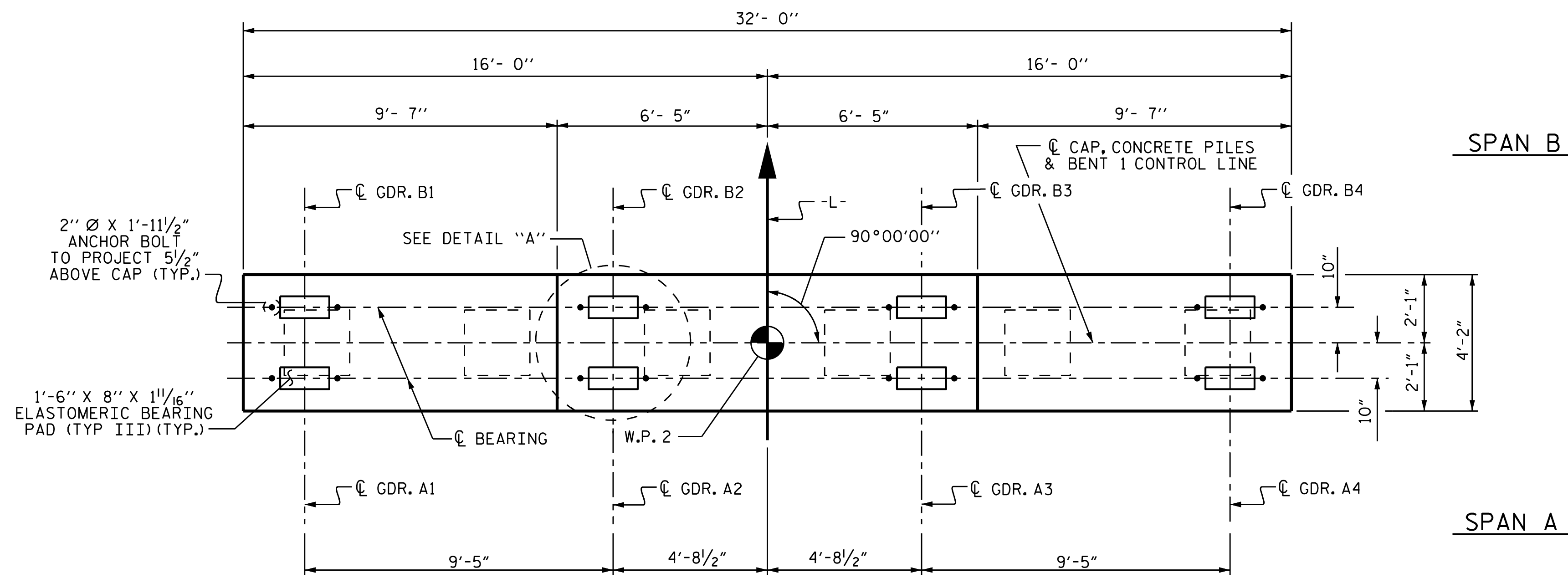


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 NC License No. F-0765

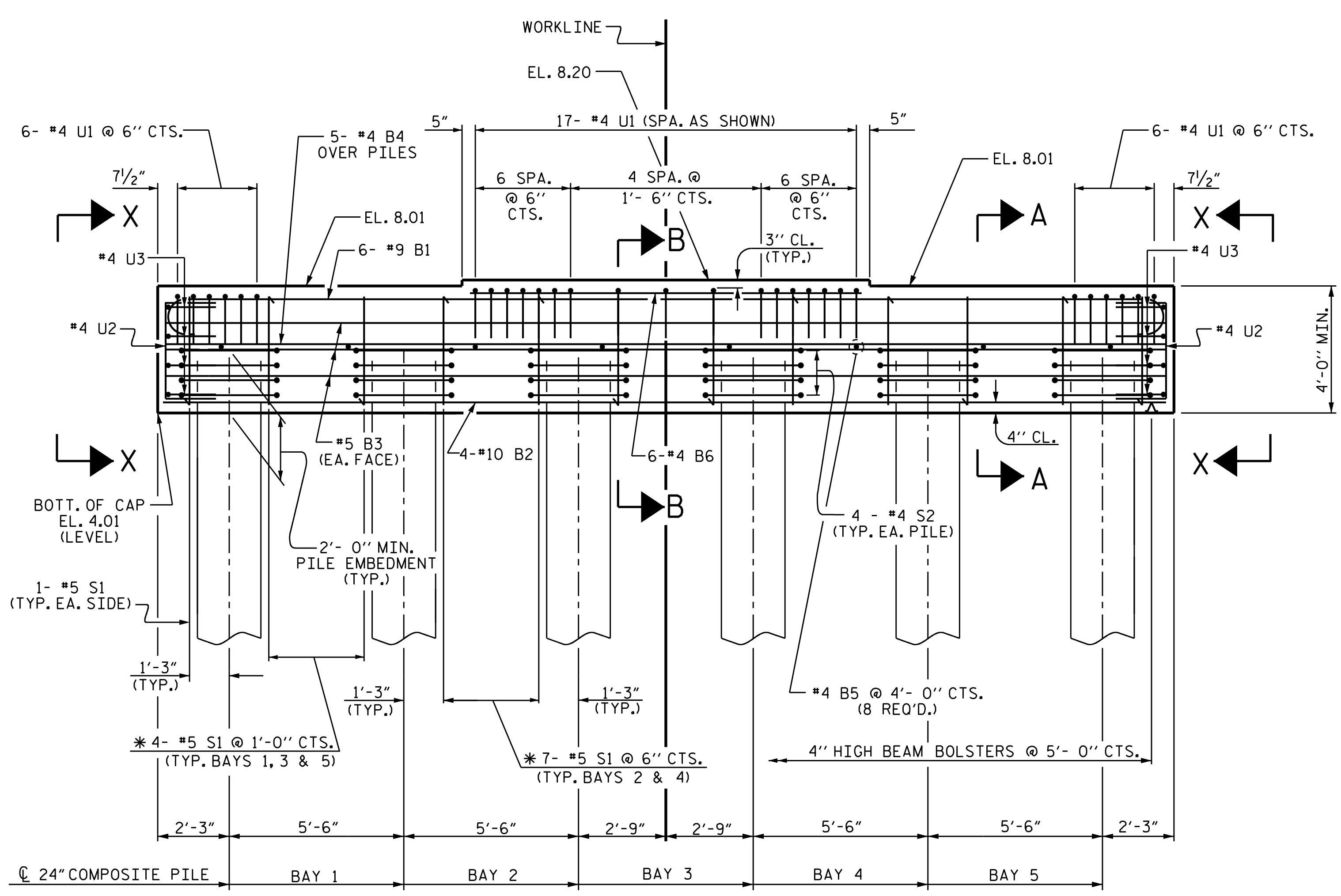
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS	42
2			4				

DRAWN BY: J.R. MCROY DATE: 11/18  
 CHECKED BY: P.N. HOLDER DATE: 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18



**PLAN**

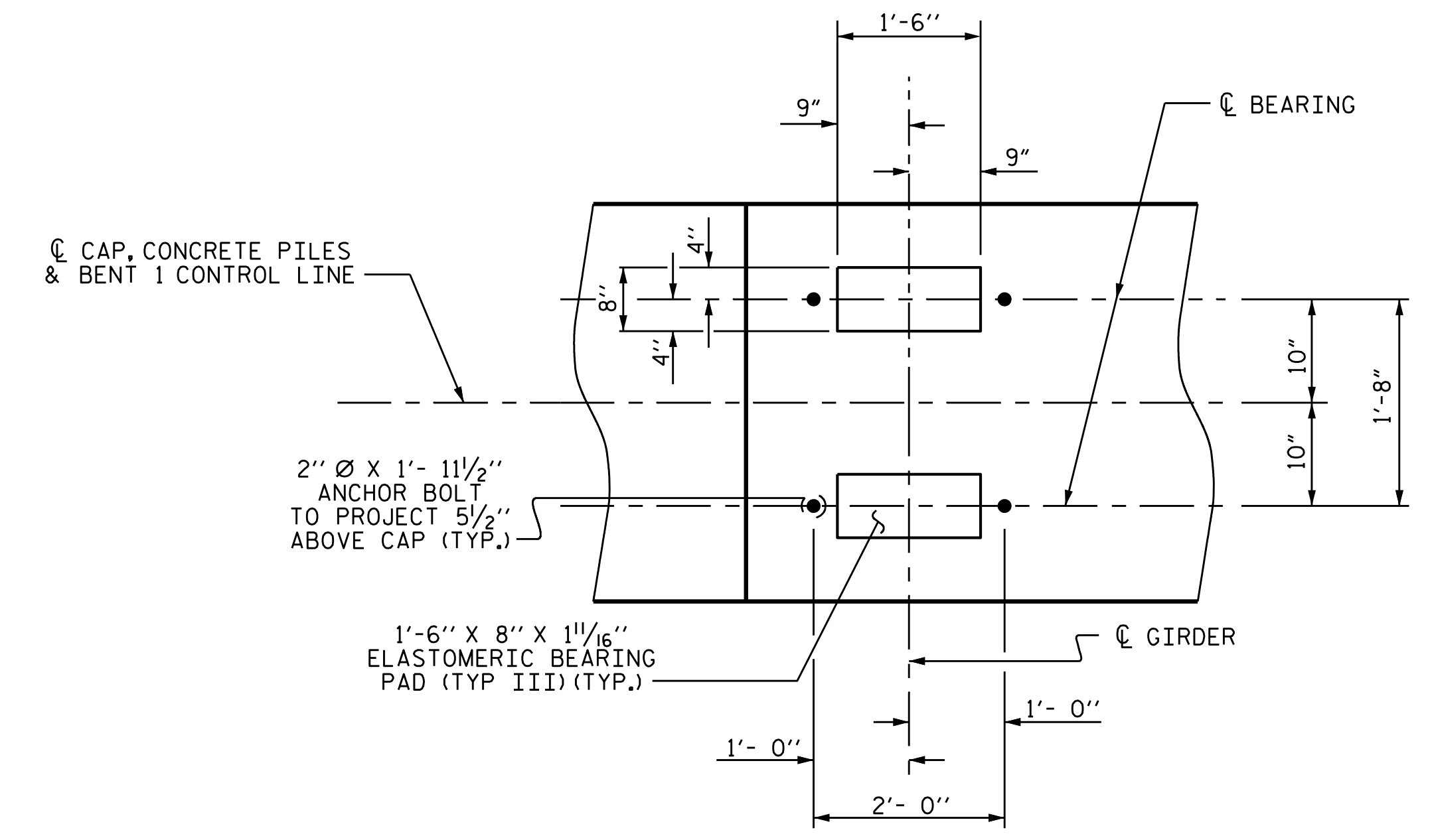


**ELEVATION**

\* - INVERT ALTERNATE STIRRUPS

**NOTES:**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- FOR COMPOSITE PILES, SEE "24"PRESTRESSED CONCRETE COMPOSITE PILE" SHEET.
- FOR SECTIONS A-A, B-B AND VIEW X-X, SEE SHEET 2 OF 2.

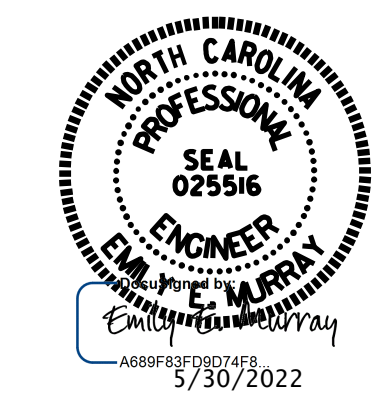


**DETAIL "A"**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

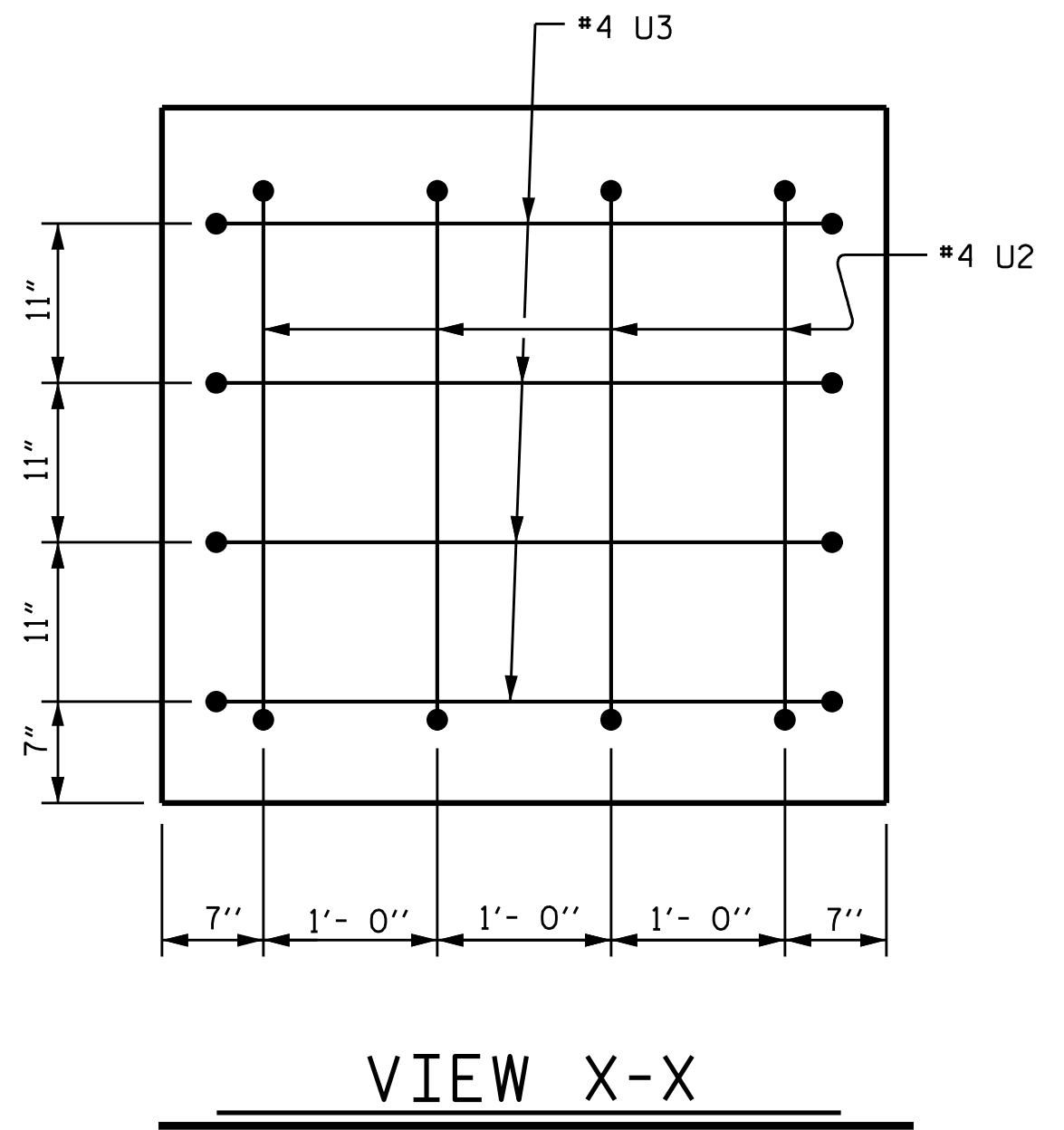
**SUBSTRUCTURE BENT 1**



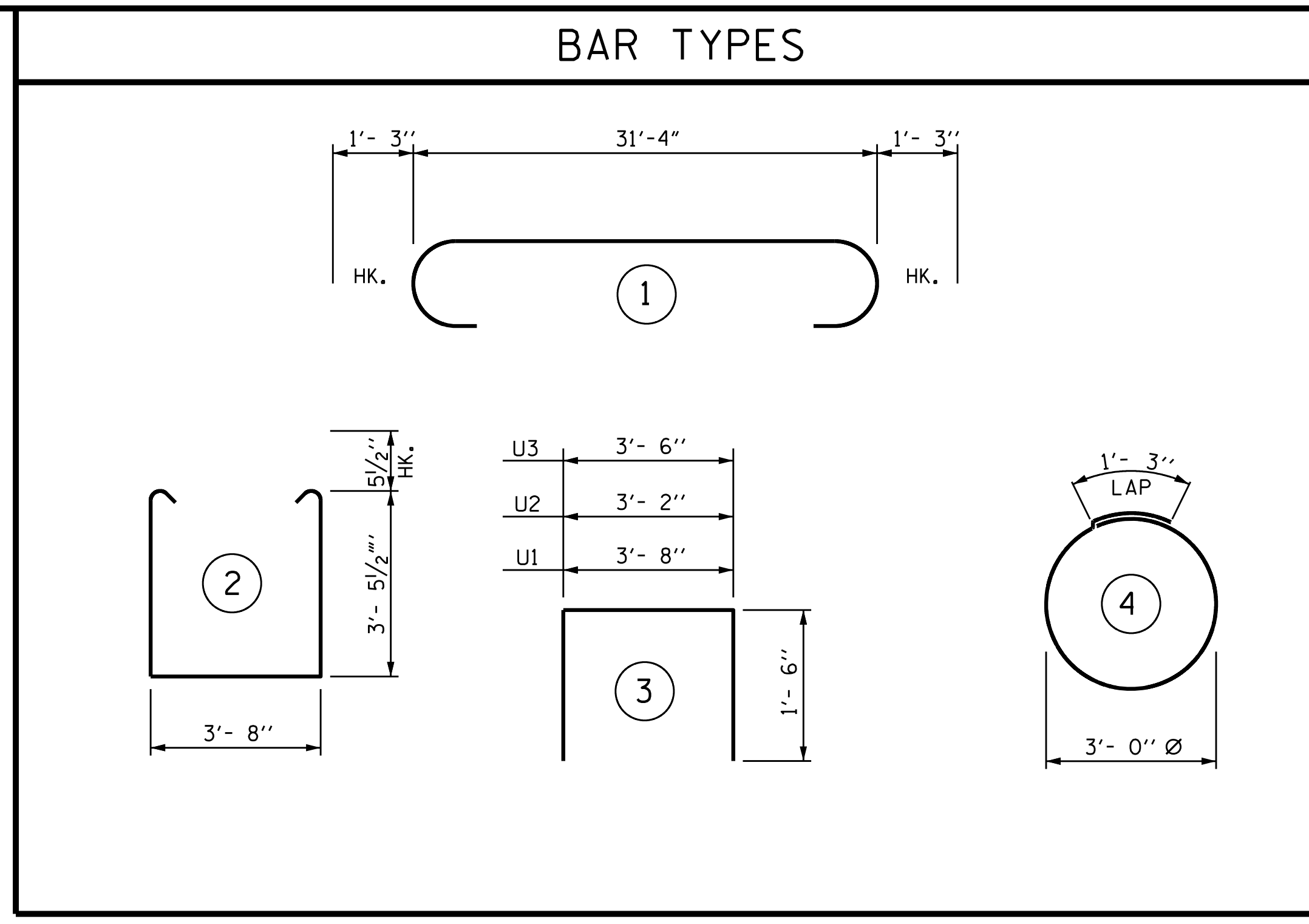
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			42

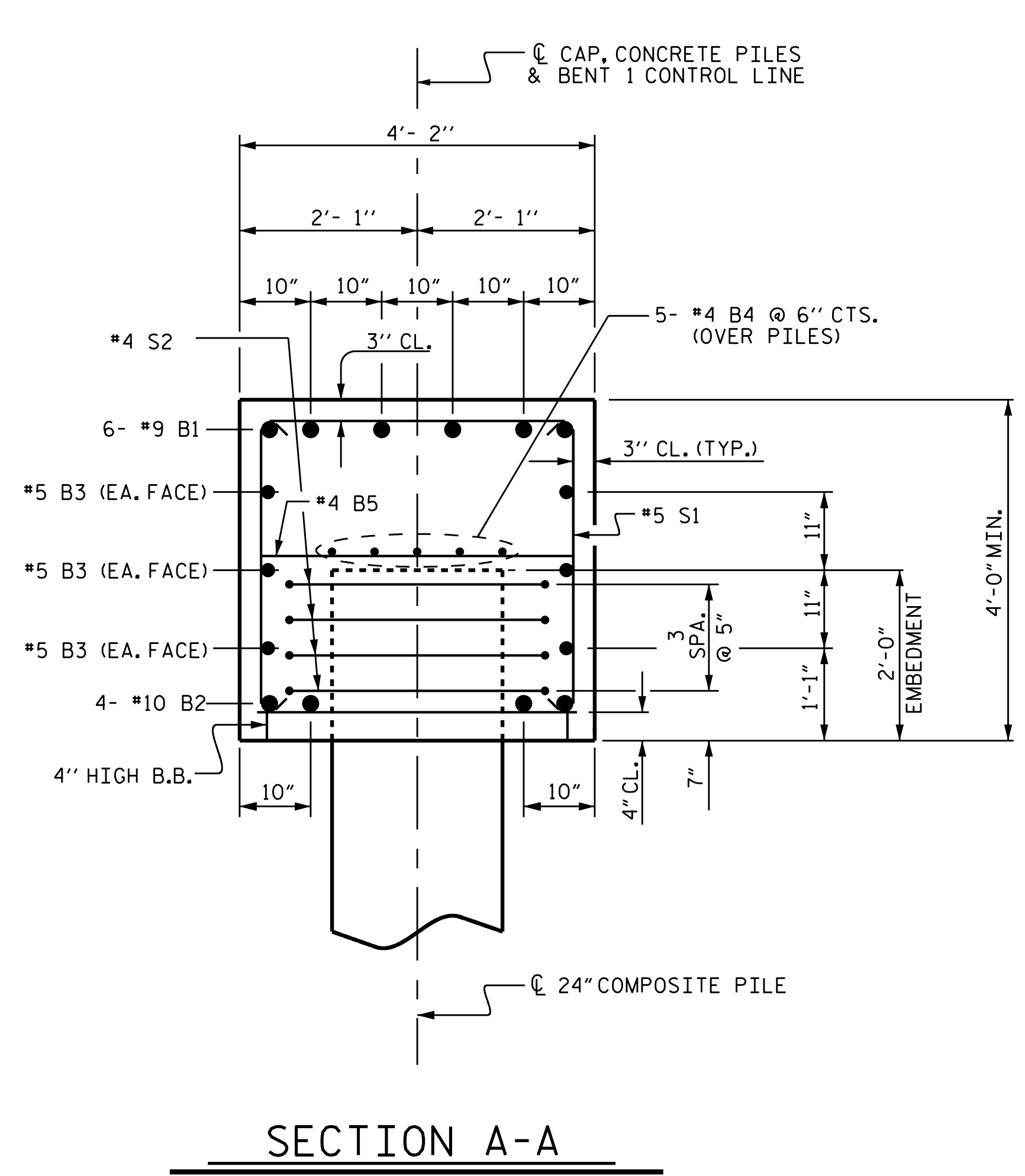
DRAWN BY :	J.R. MCROY	DATE :	11/18
CHECKED BY :	P.N. HOLDER	DATE :	11/18
DESIGN ENGINEER OF RECORD:	J.R. MCROY	DATE :	11/18



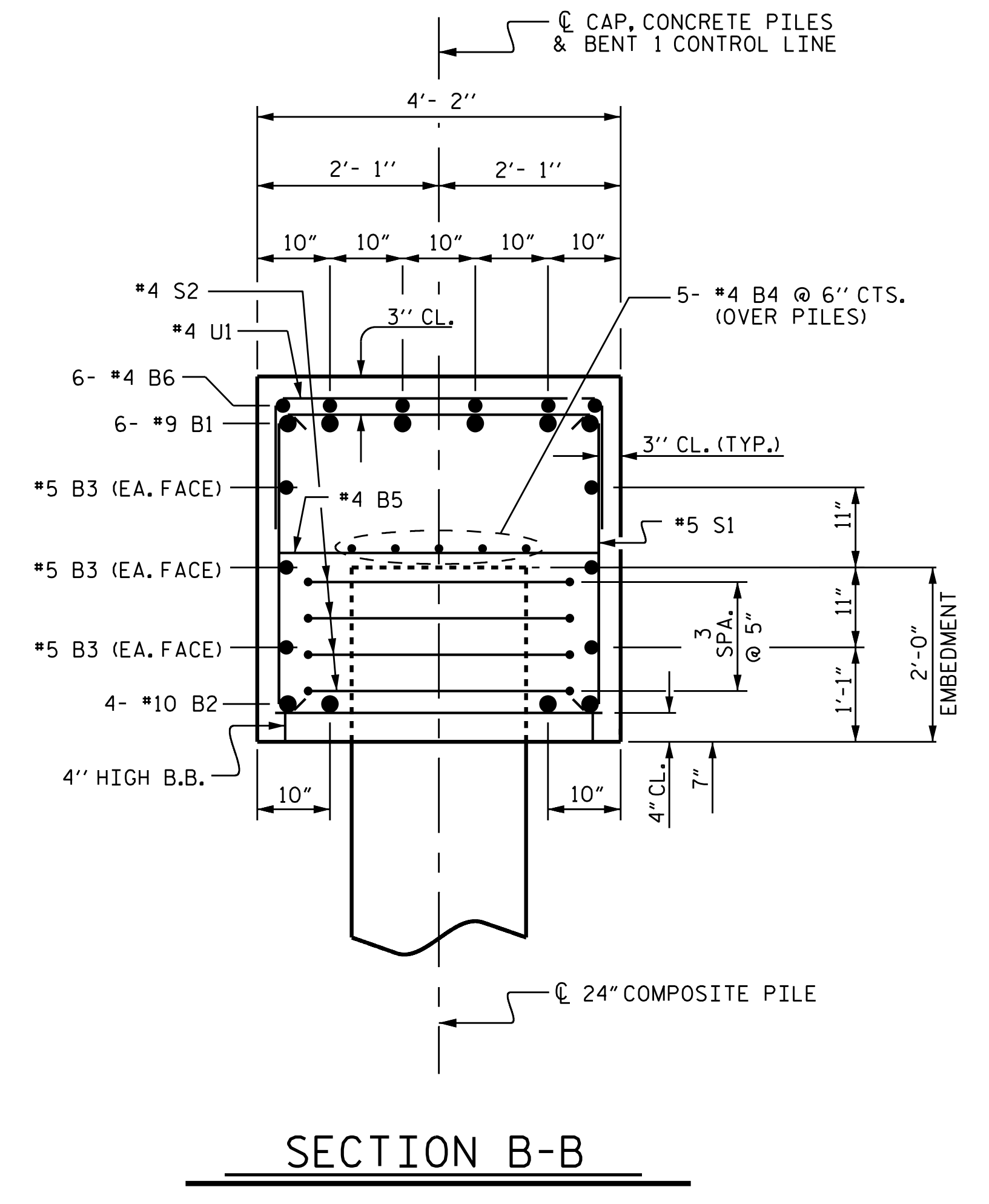
VIEW X-X



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	6	9	1	33'-10"	690
* B2	4	10	STR	31'- 6"	542
* B3	6	5	STR	31'- 6"	197
* B4	5	4	STR	31'- 6"	105
* B5	8	4	STR	3'- 8"	20
* B6	6	4	STR	12'- 4"	49
* S1	28	5	2	11'- 6"	336
* S2	24	4	4	10'- 8"	171
* U1	29	4	3	6'- 8"	129
* U2	8	4	3	6'- 2"	33
* U3	8	4	3	6'- 6"	35
* EPOXY COATED REINFORCING STEEL					2307 LBS.
TOTAL CLASS AA CONCRETE					18.4 C.Y.



SECTION A-A



SECTION B-B

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE BENT 1**

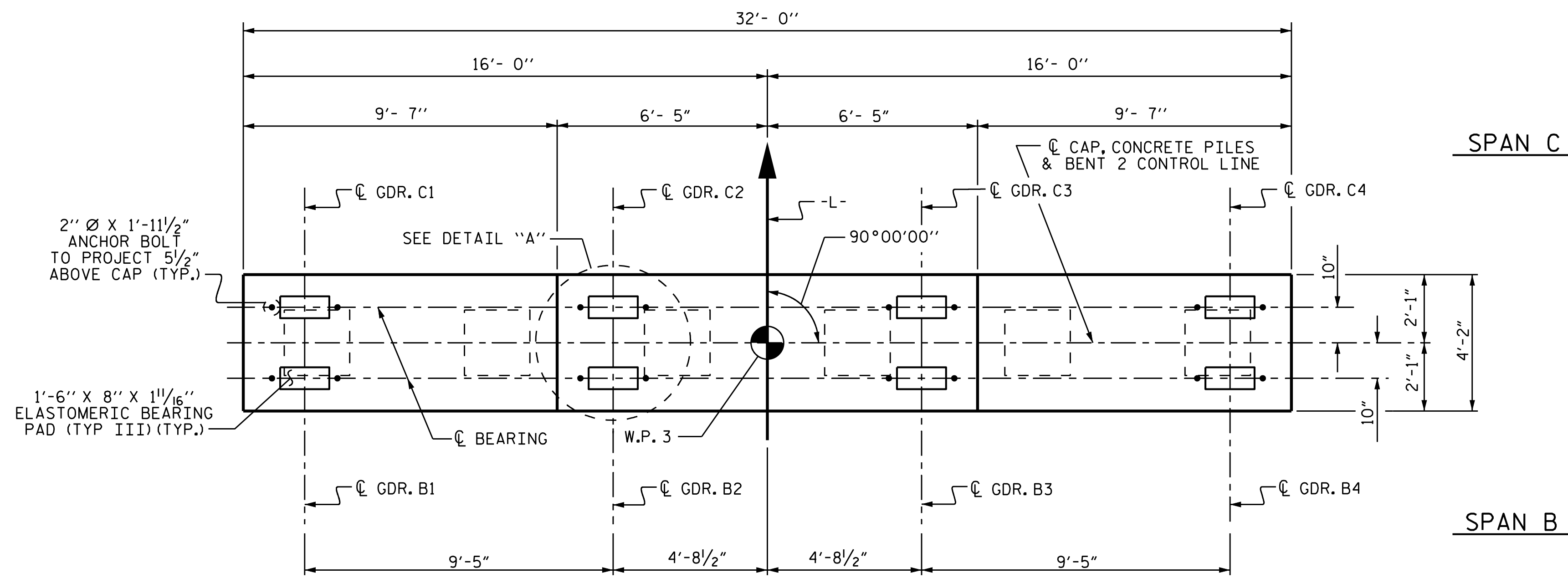


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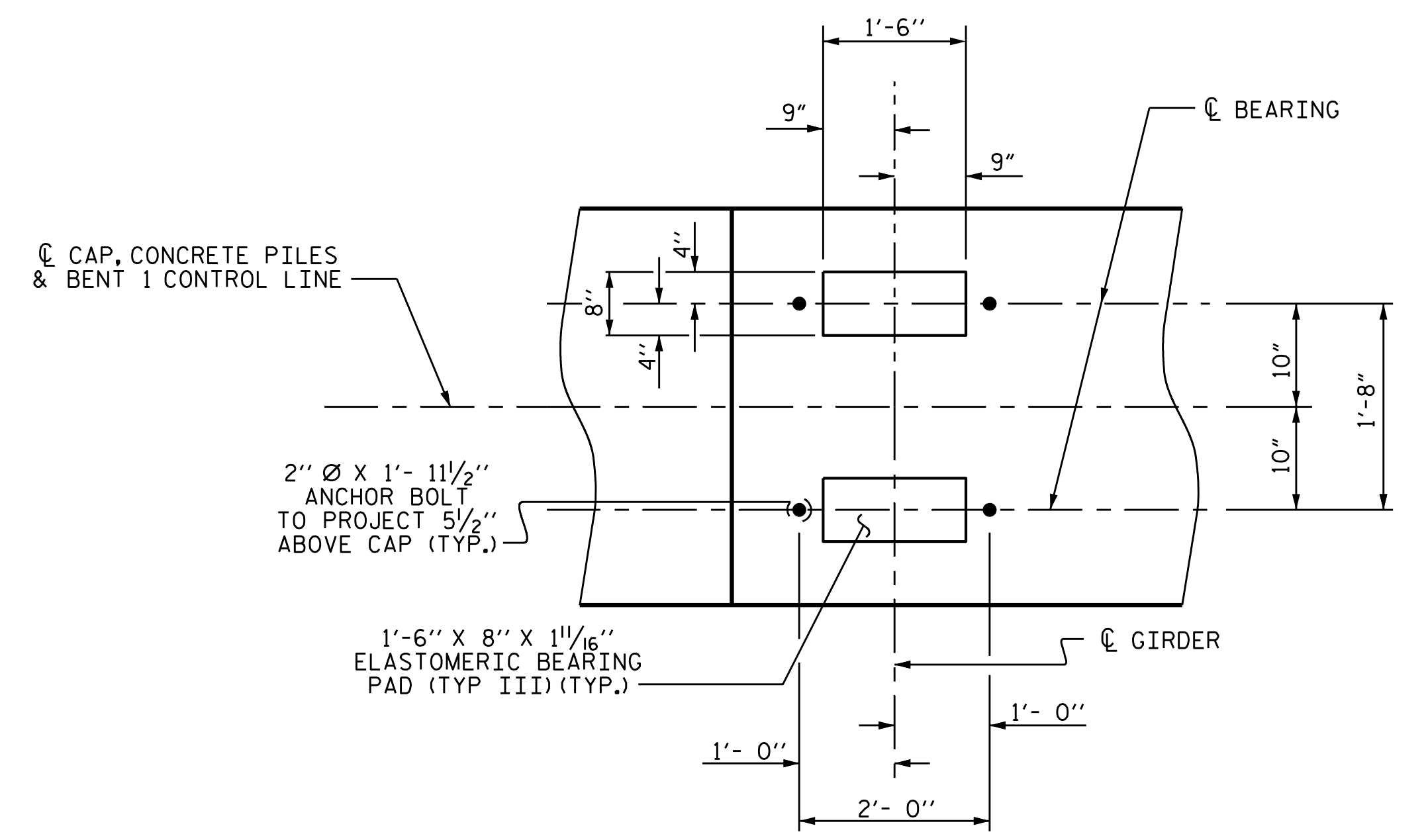
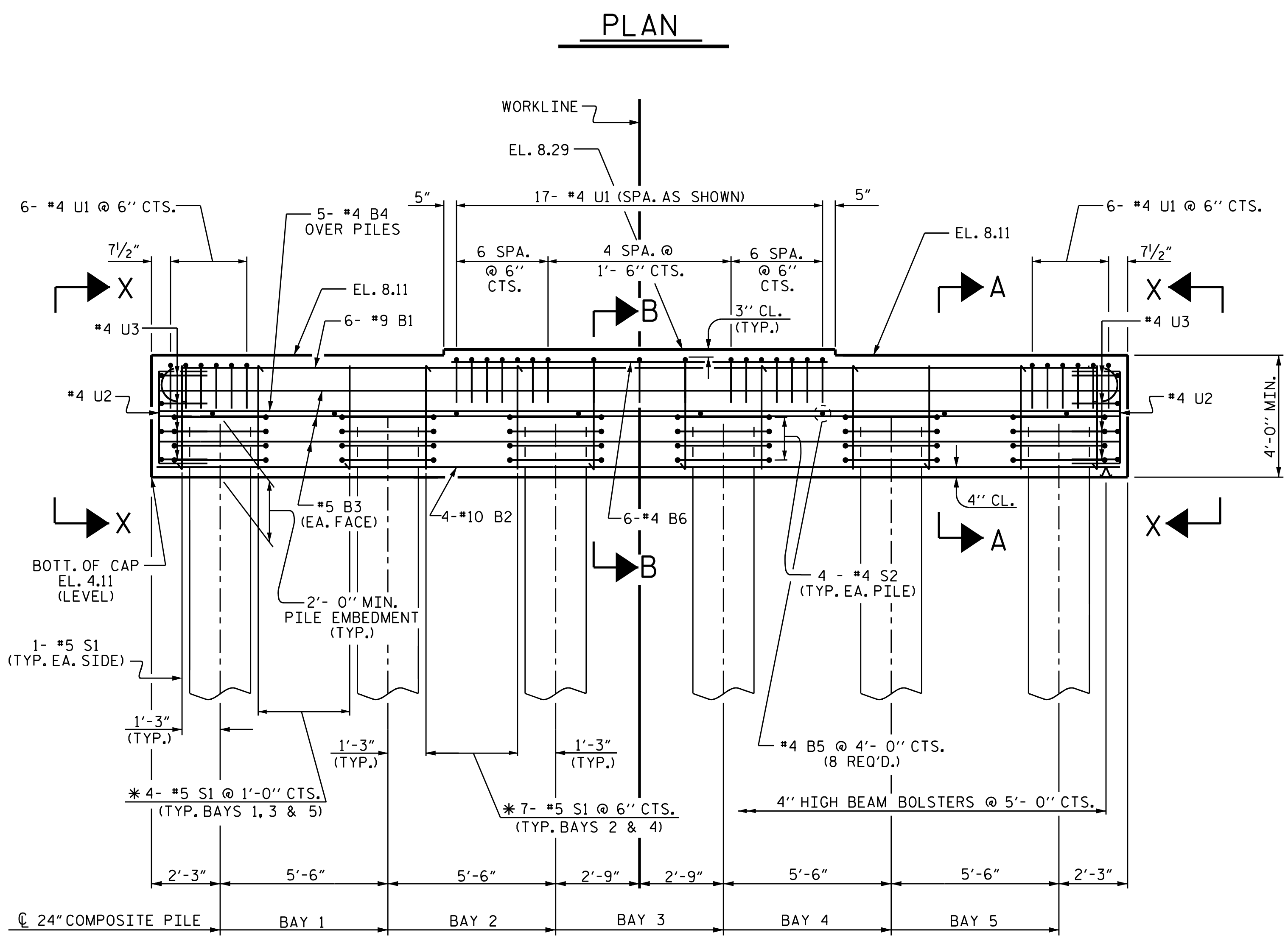
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-32
2			4			42

DRAWN BY: J.R. MCROY DATE: 11/18  
 CHECKED BY: P.N. HOLDER DATE: 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18



**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.  
 FOR COMPOSITE PILES, SEE "24" PRESTRESSED CONCRETE COMPOSITE PILE" SHEET.  
 FOR SECTIONS A-A, B-B AND VIEW X-X, SEE SHEET 2 OF 2.



PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE BENT 2**



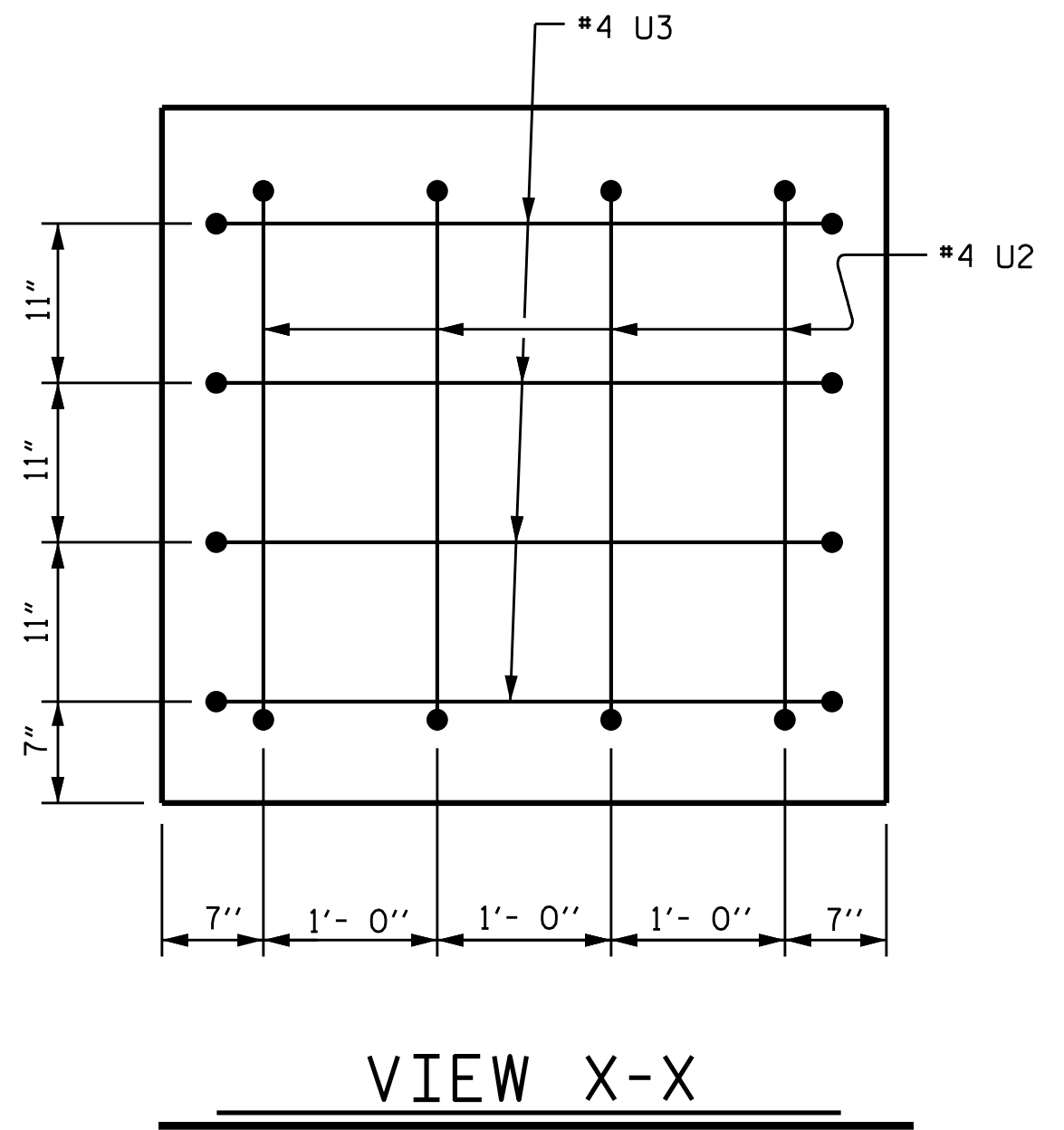
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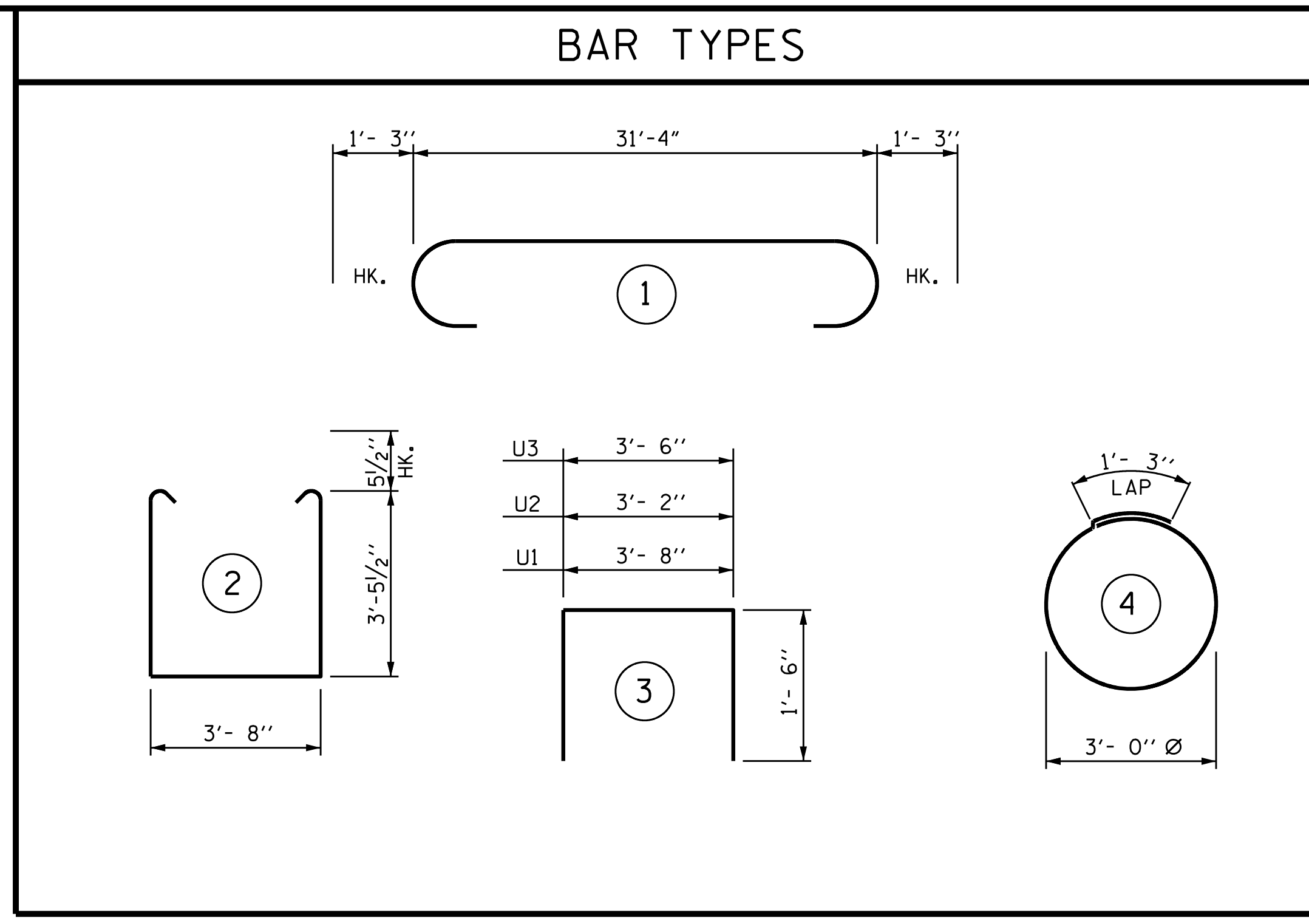
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: J.R. MCROY DATE: 11/18  
 CHECKED BY: P.N. HOLDER DATE: 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18

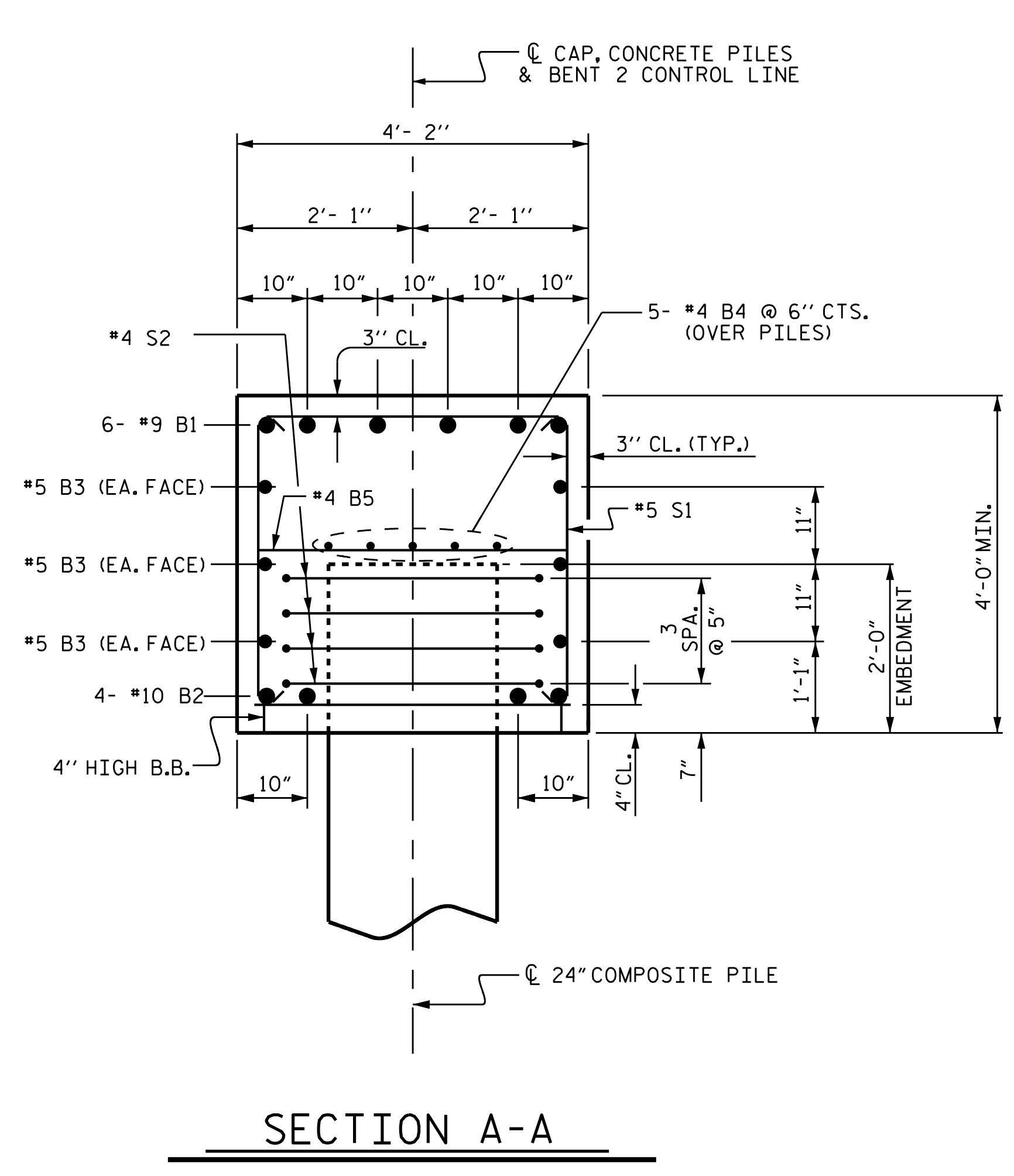
\* - INVERT ALTERNATE STIRRUPS



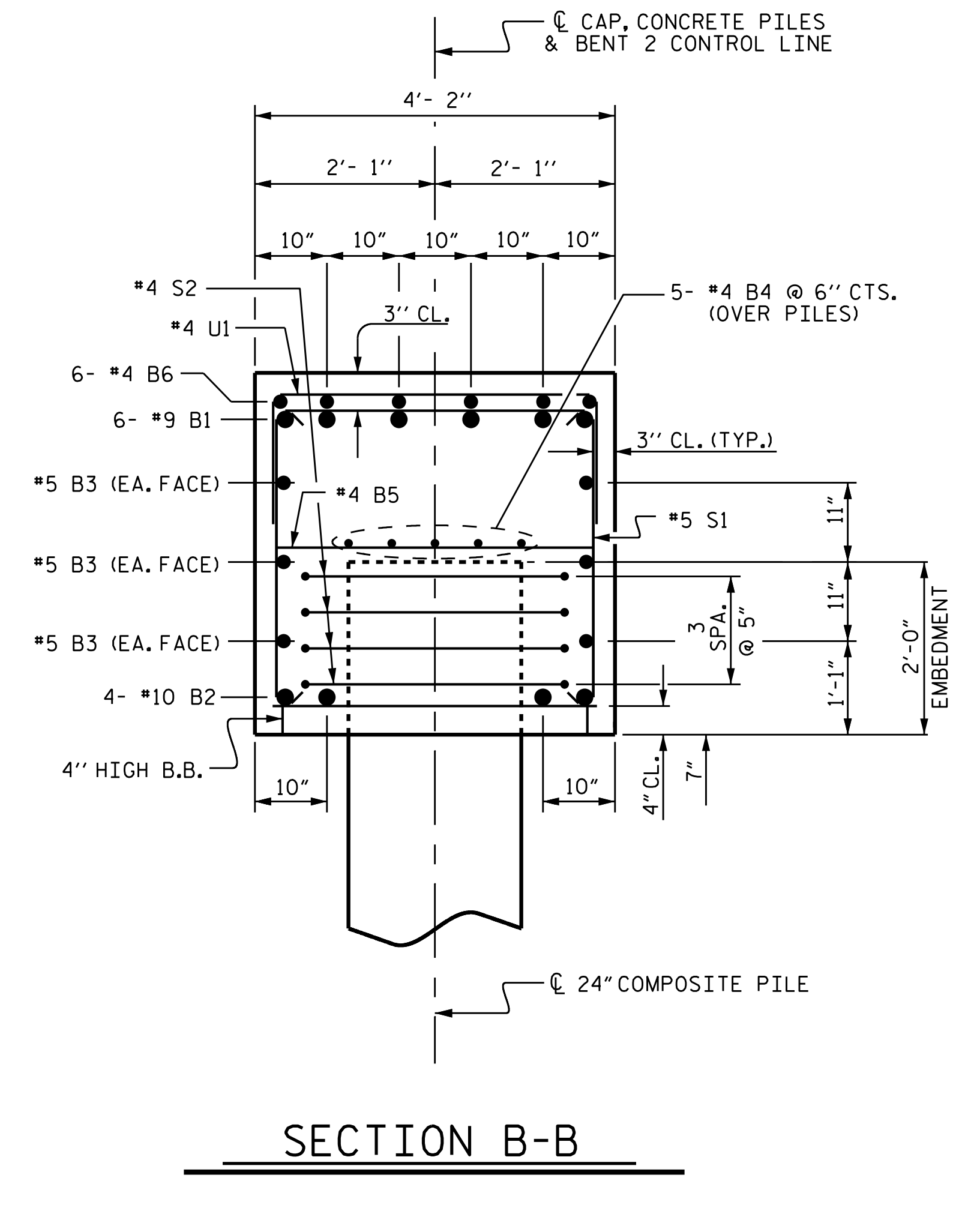
VIEW X-X



BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	6	9	1	33'-10"	690
* B2	4	10	STR	31'- 6"	542
* B3	6	5	STR	31'- 6"	197
* B4	5	4	STR	31'- 6"	105
* B5	8	4	STR	3'- 8"	20
* B6	6	4	STR	12'- 4"	49
* S1	28	5	2	11'- 6"	336
* S2	24	4	4	10'- 8"	171
* U1	29	4	3	6'- 8"	129
* U2	8	4	3	6'- 2"	33
* U3	8	4	3	6'- 6"	35
* EPOXY COATED REINFORCING STEEL					2307 LBS.
TOTAL CLASS AA CONCRETE					18.4 C.Y.



SECTION A-A



SECTION B-B

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE BENT 2**

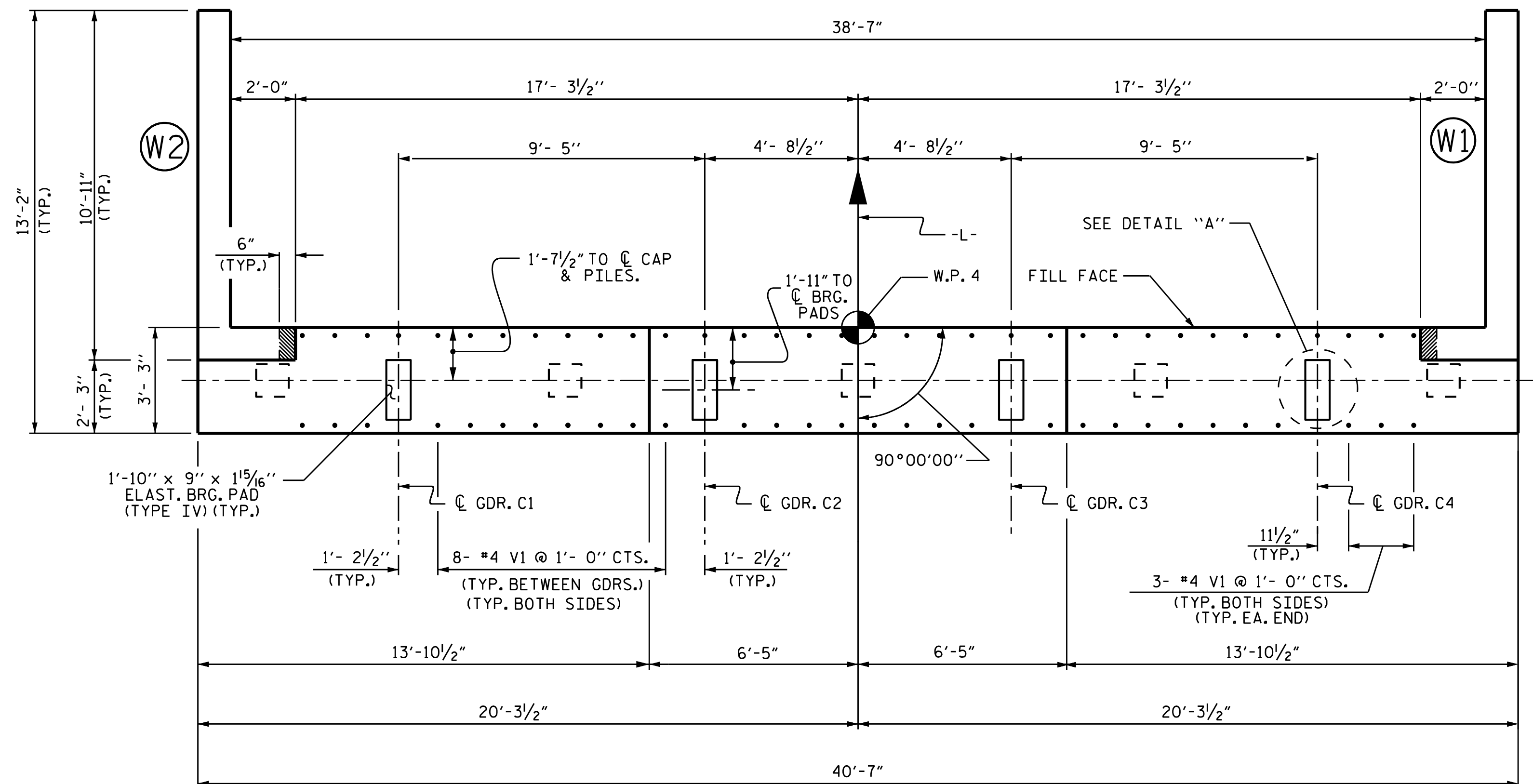


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 Tel. 919-854-0344 Fax. 919-854-0355  
 NC License No. F-0765

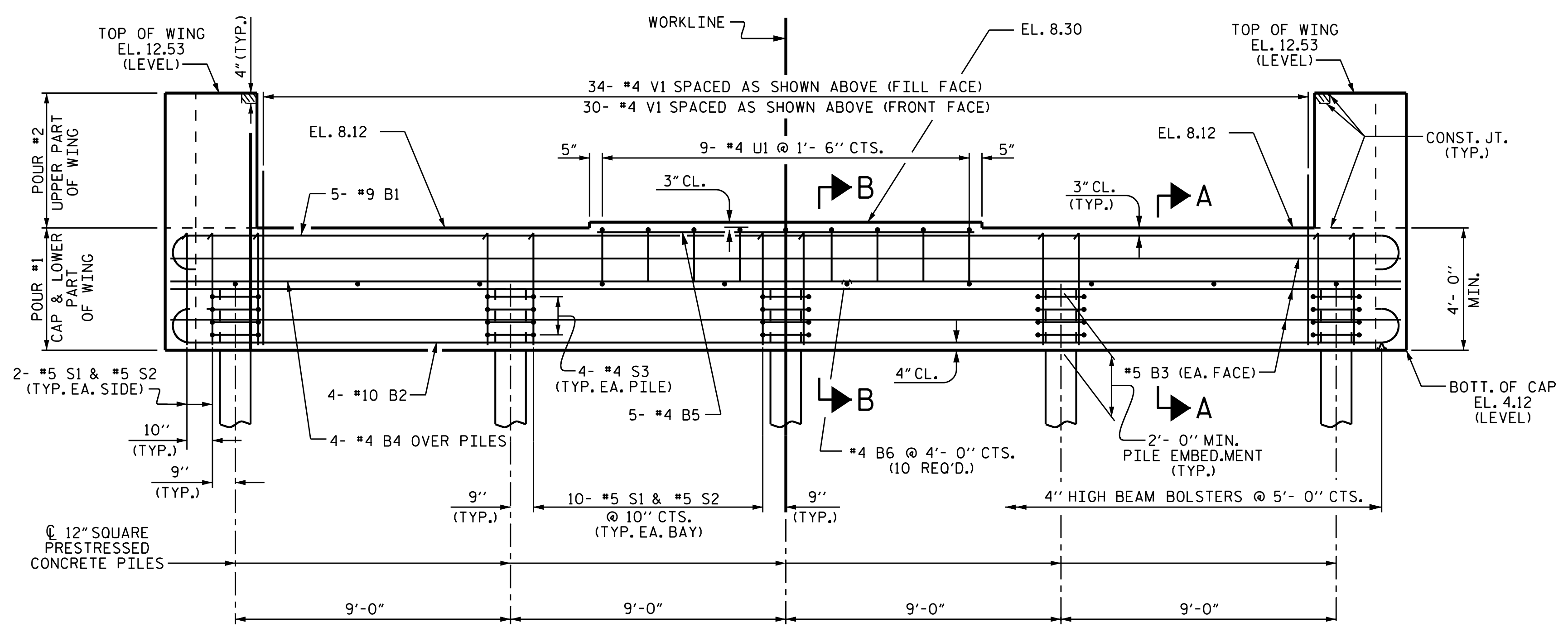
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-34
2			4			42

DRAWN BY: J.R. MCROY DATE: 11/18  
 CHECKED BY: P.N. HOLDER DATE: 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18



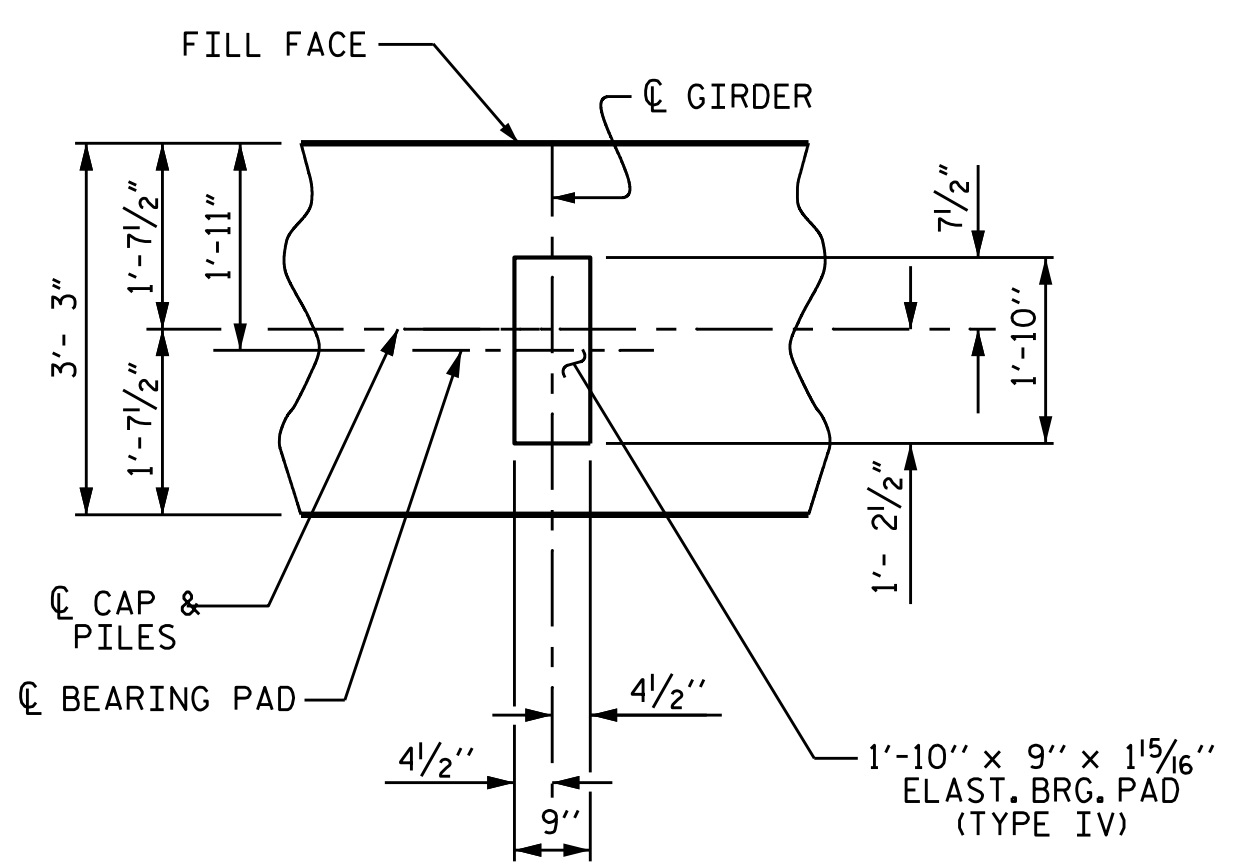
**PLAN**



**ELEVATION**

**NOTES:**

- THE TOP SURFACE AREA OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID #4 V1 BARS IN CAP.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.
- FOR PRESTRESSED CONCRETE PILES, SEE "12" PRESTRESSED CONCRETE PILE" SHEET.
- ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.



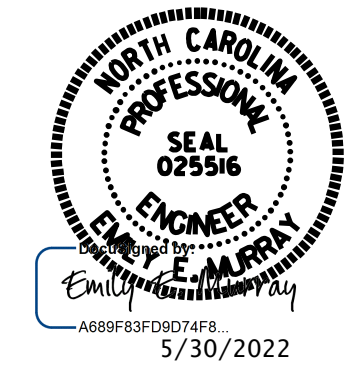
**DETAIL "A"**  
(TYP. EA. GIRDER)

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 INTEGRAL  
 END BENT 2**

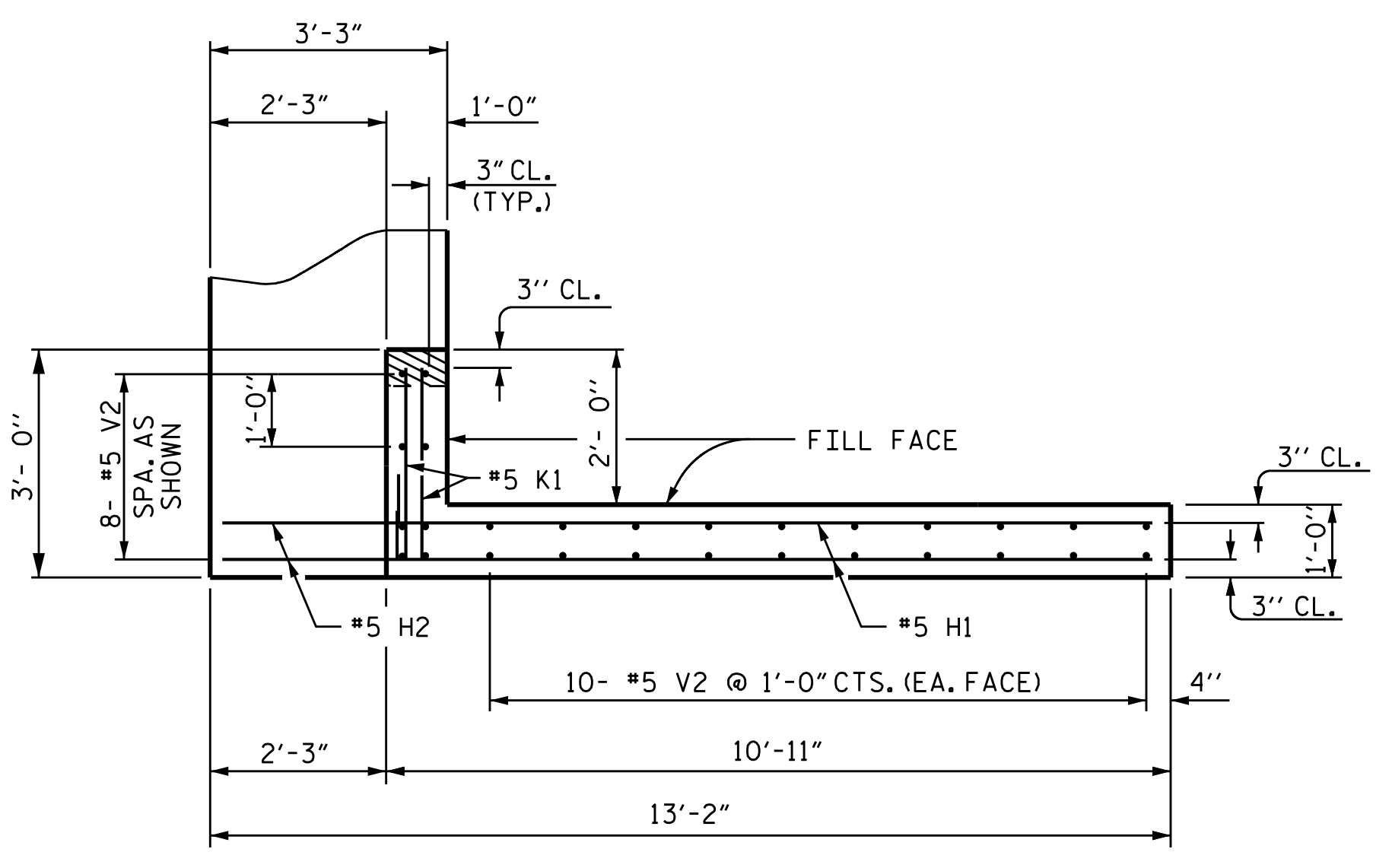


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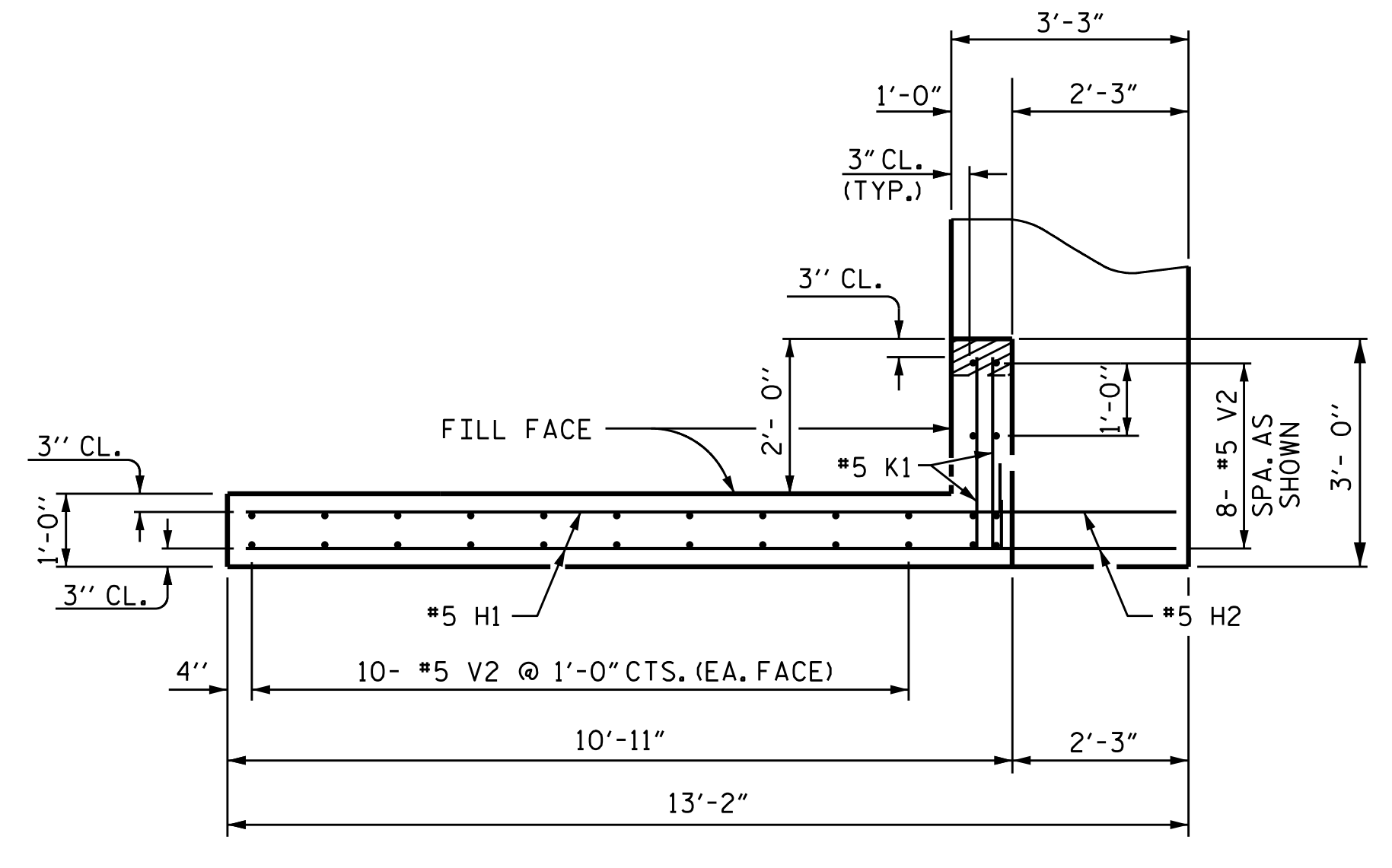
DRAWN BY: J.R. MCROY DATE: 11/18  
 CHECKED BY: P.N. HOLDER DATE: 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE: 11/18

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			42

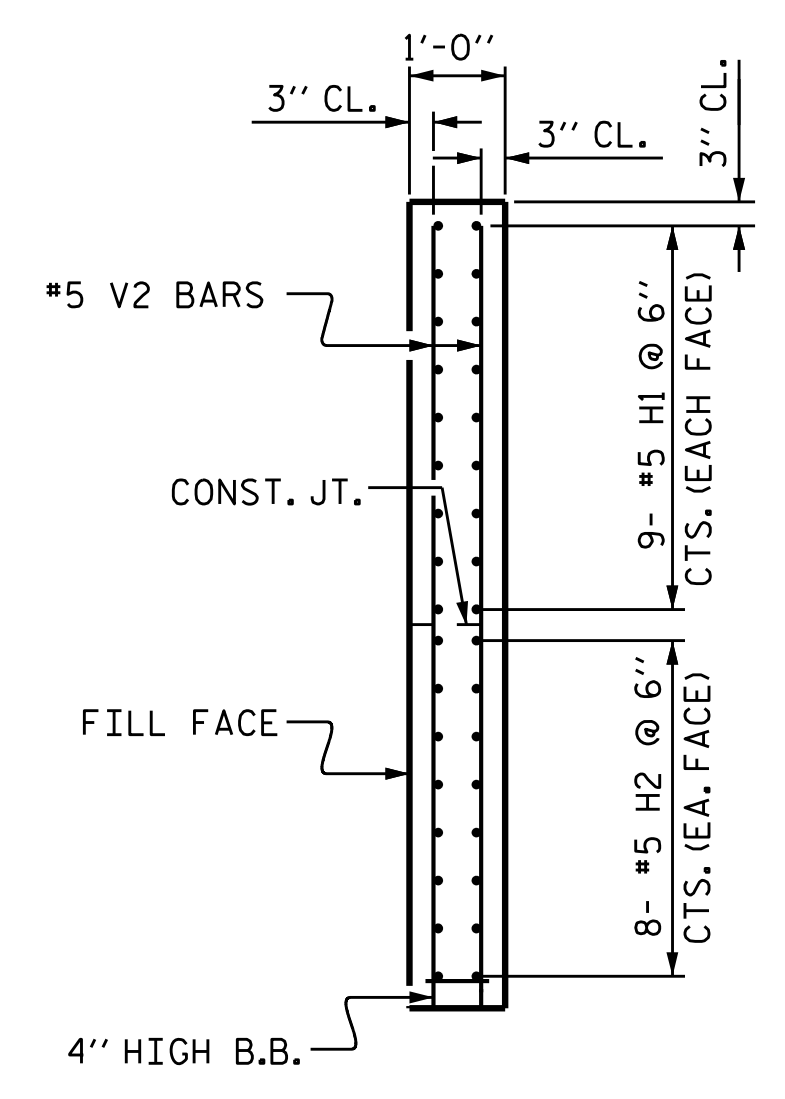
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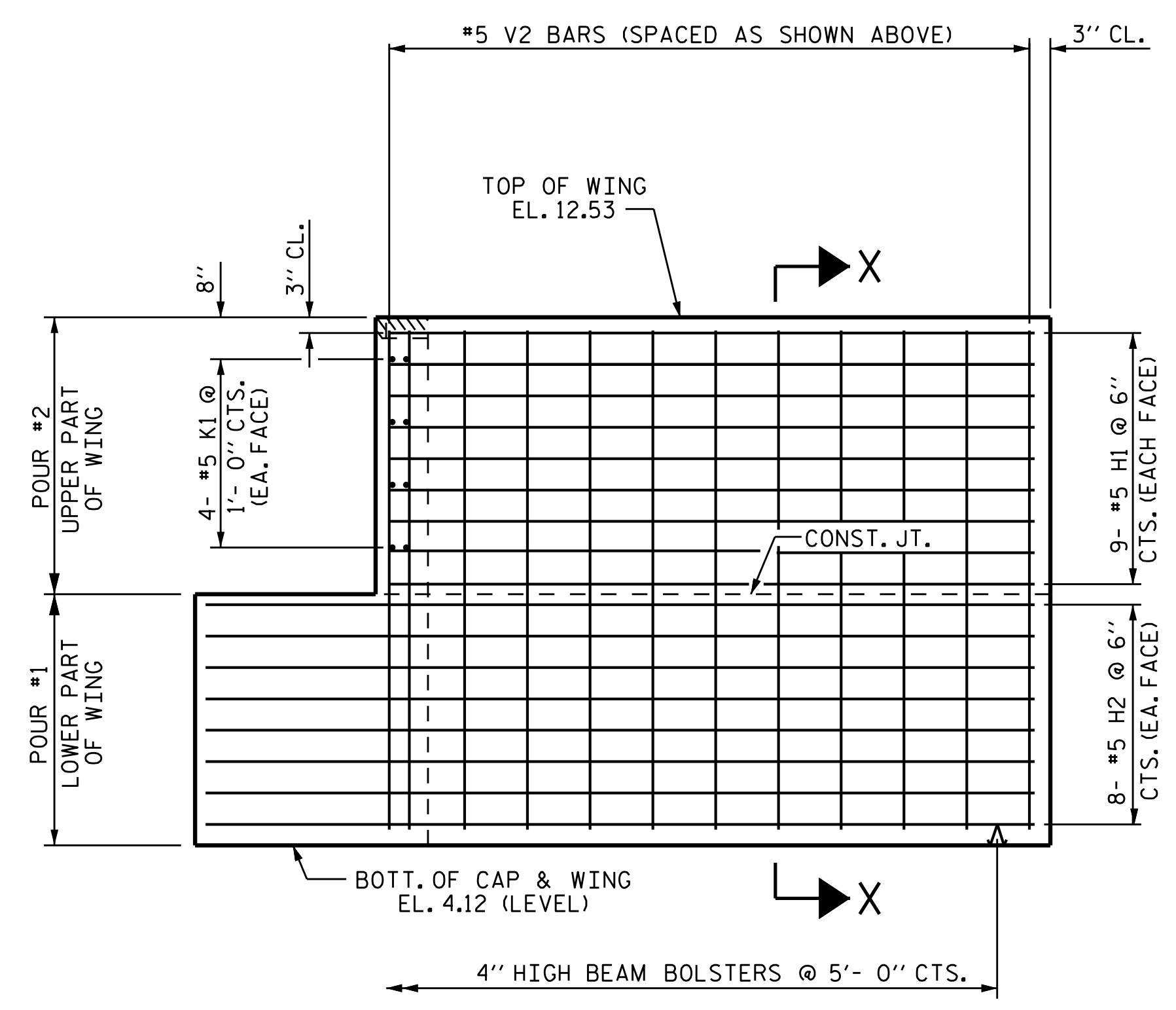
**PLAN OF WING 1**



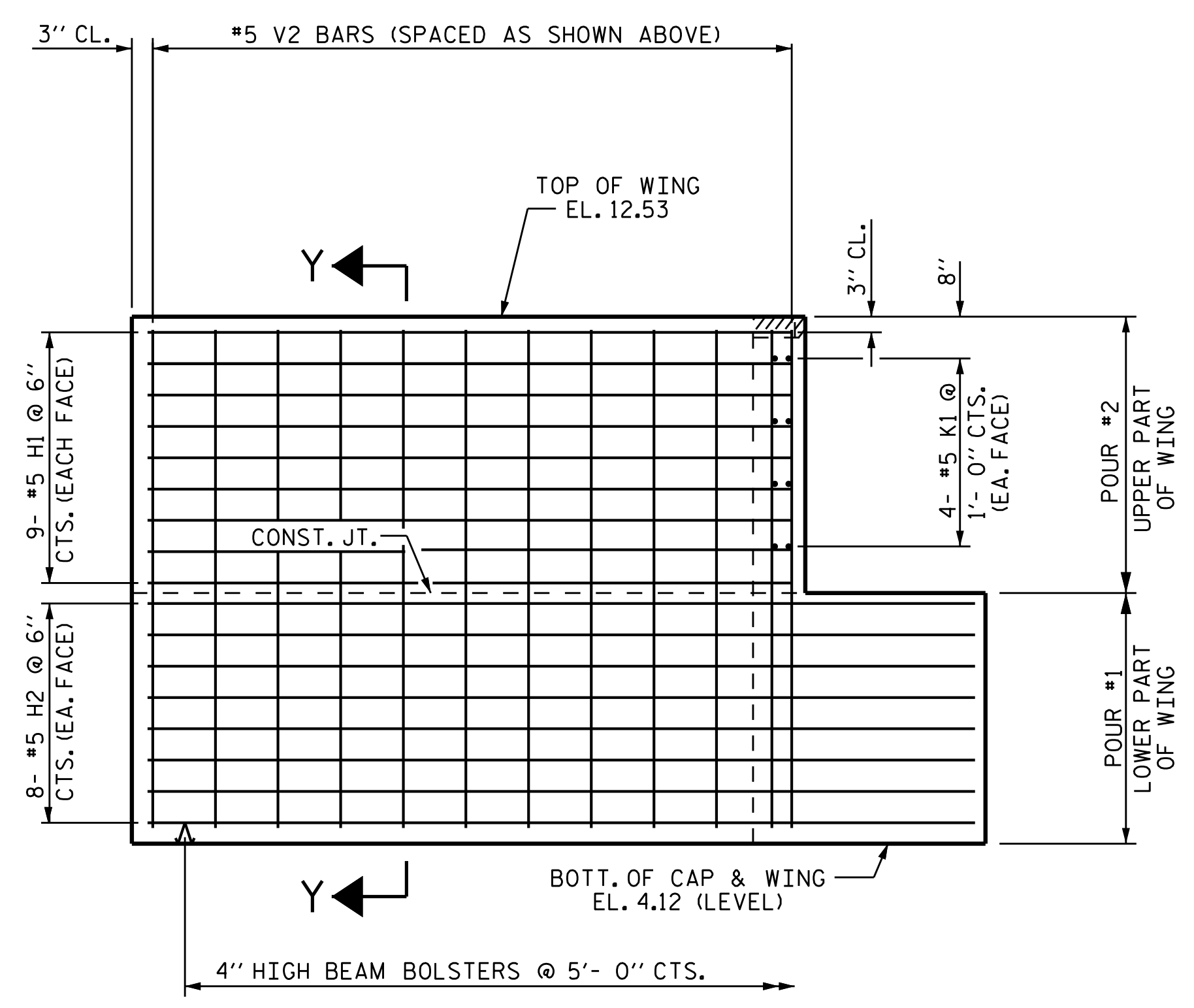
**PLAN OF WING 2**



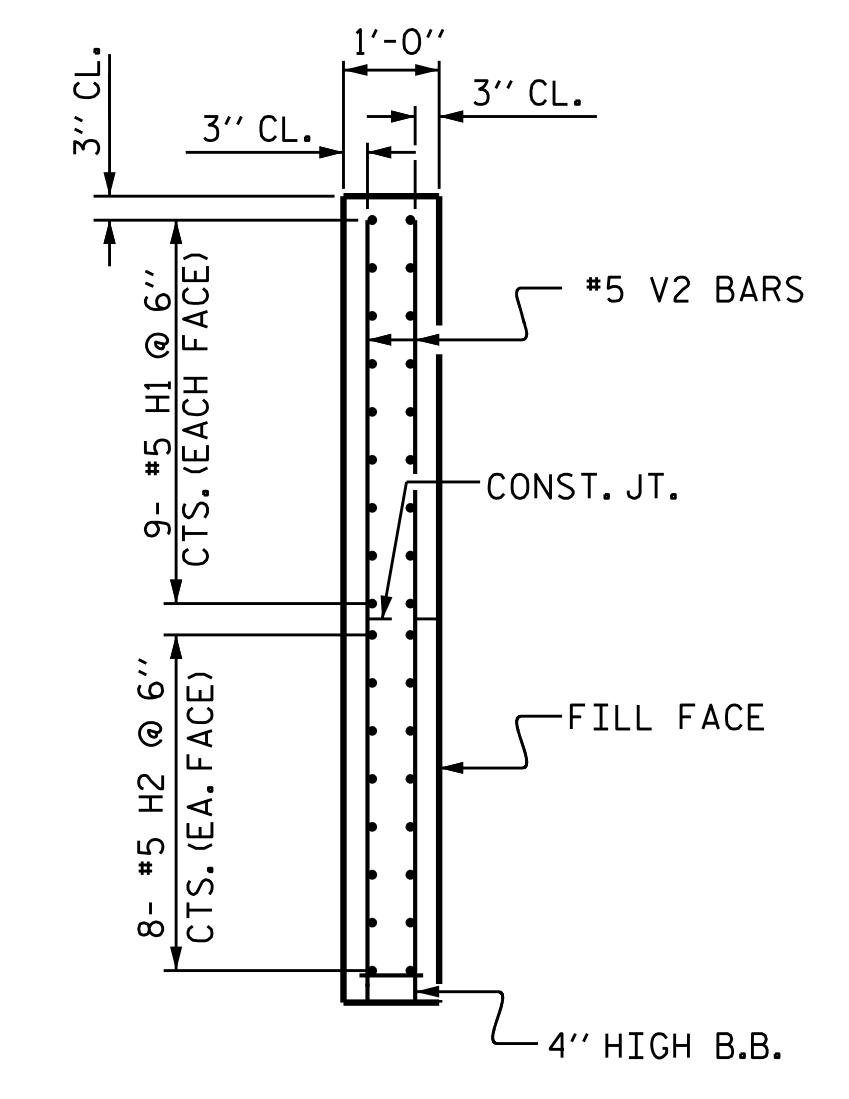
**SECTION X-X**



**ELEVATION OF WING 1**



**ELEVATION OF WING 2**



**SECTION Y-Y**

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 INTEGRAL  
 END BENT 2**



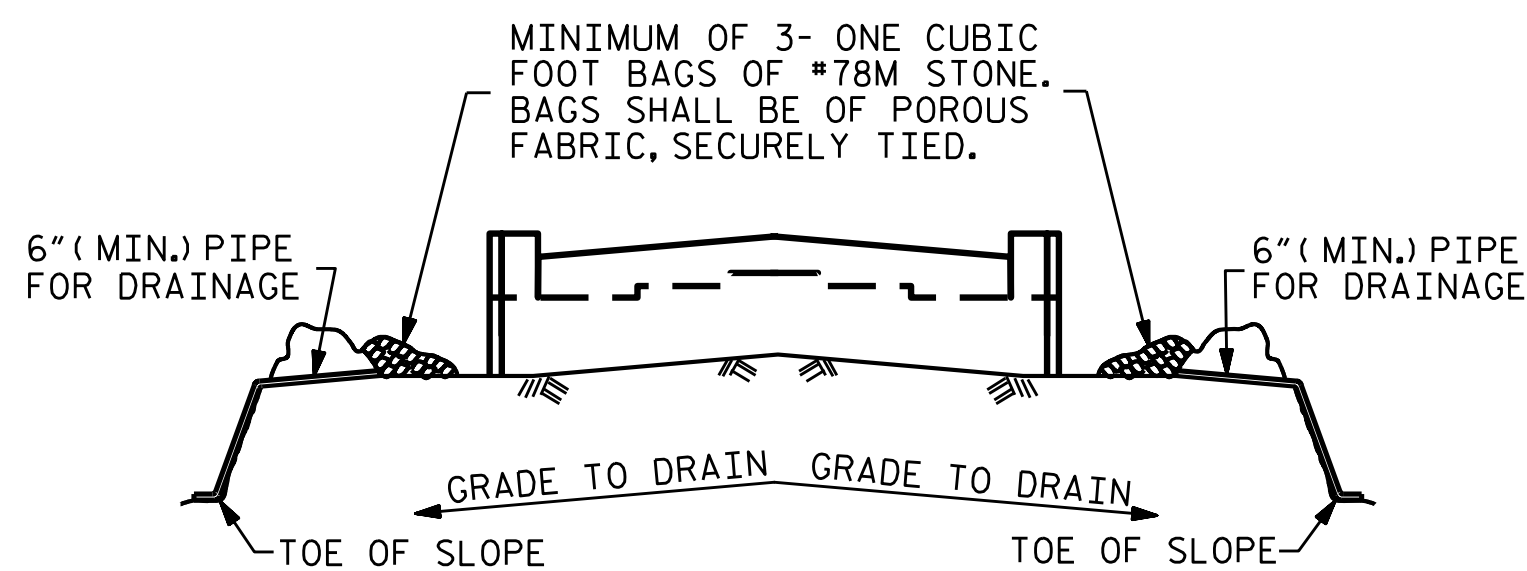
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

SHEET NO.	S-36
TOTAL SHEETS	42

DRAWN BY:	J.R. MCROY	DATE:	11/18
CHECKED BY:	P.N. HOLDER	DATE:	11/18
DESIGN ENGINEER OF RECORD:	J.R. MCROY	DATE:	10/18

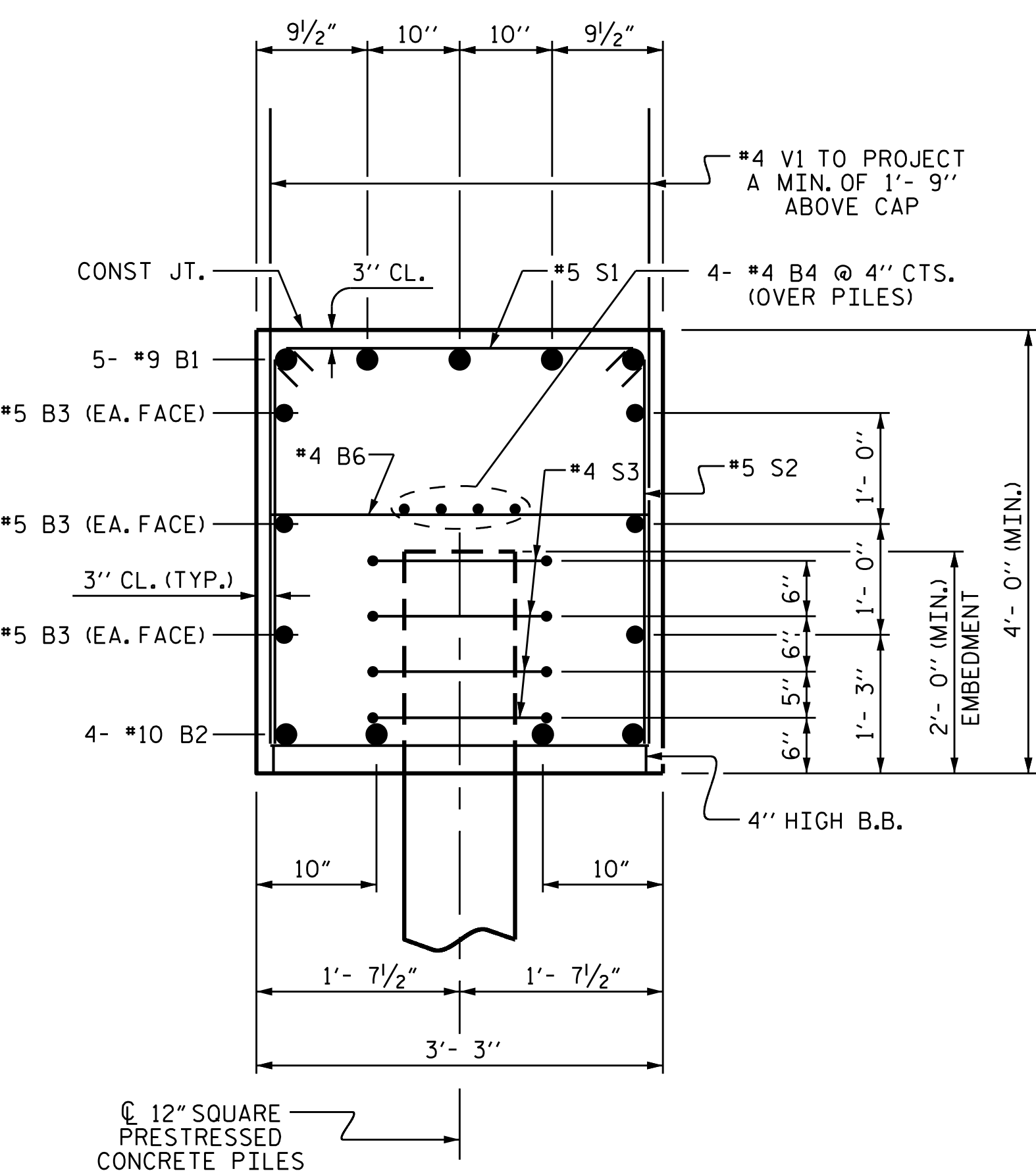


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

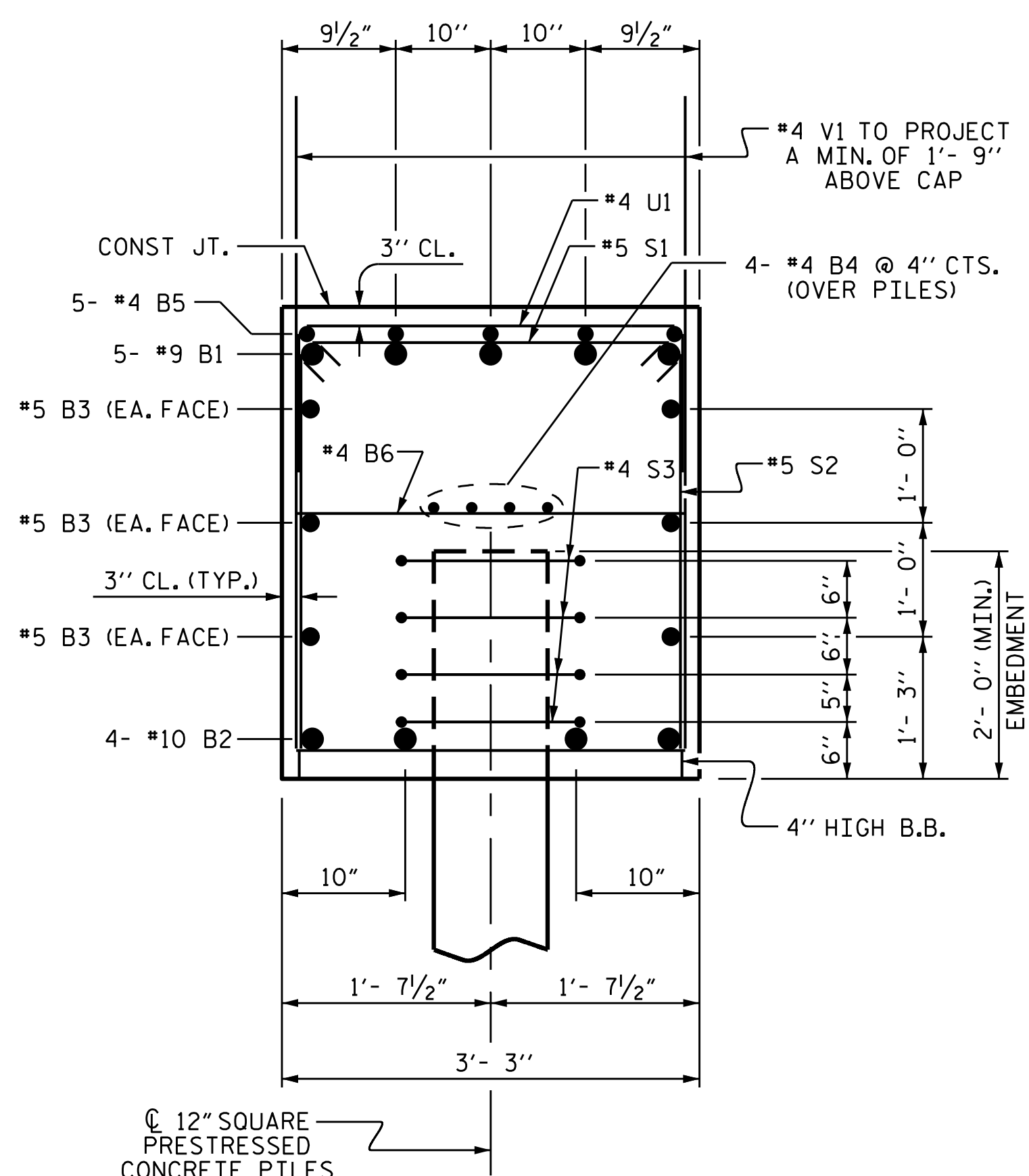
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT



SECTION A-A

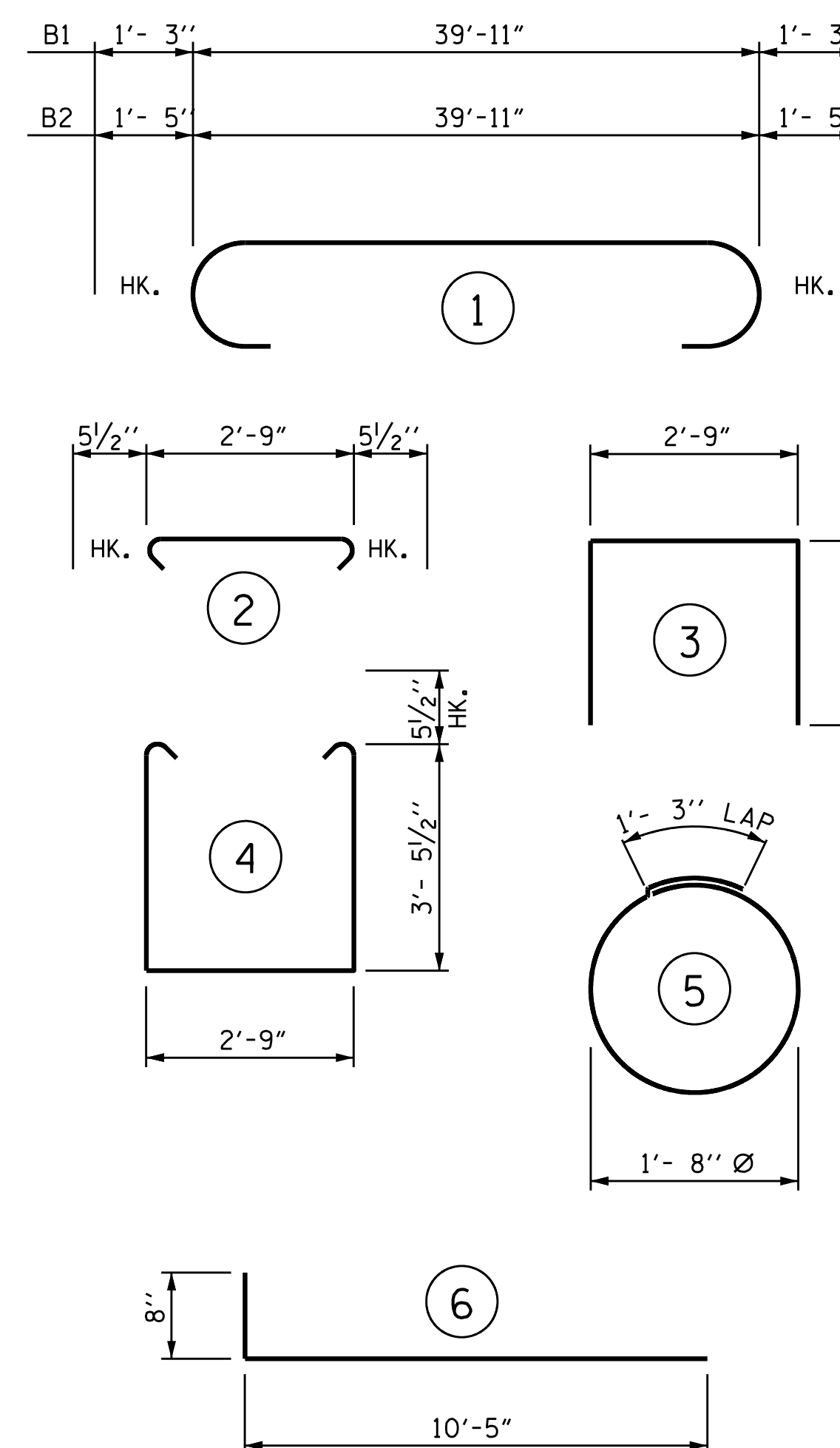


SECTION B-B

### BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	5	9		42'- 5"	721
* B2	4	10		42'- 9"	736
* B3	6	5	STR	40'- 1"	251
* B4	4	4	STR	40'- 0"	107
* B5	5	4	STR	12'- 4"	41
* B6	10	4	STR	2'- 9"	18
* H1	36	5	6	11'- 1"	416
* H2	32	5	STR	12'- 8"	423
* K1	16	5	STR	2'- 6"	42
* S1	44	5	2	3'- 8"	168
* S2	44	5	4	10'- 11"	501
* S3	20	4	5	10'- 7"	141
* U1	9	4	3	6'- 1"	37
* V1	64	4	STR	5'- 8"	242
* V2	56	5	STR	7'- 10"	458
* EPOXY COATED REINFORCING STEEL					4302 LBS.
CLASS AA CONCRETE					
POUR 1: CAP & LOWER PART OF WINGS					22.4 C.Y.
POUR 2: UPPER PART OF WINGS					4.2 C.Y.
TOTAL					26.6 C.Y.

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 INTEGRAL  
 END BENT 2



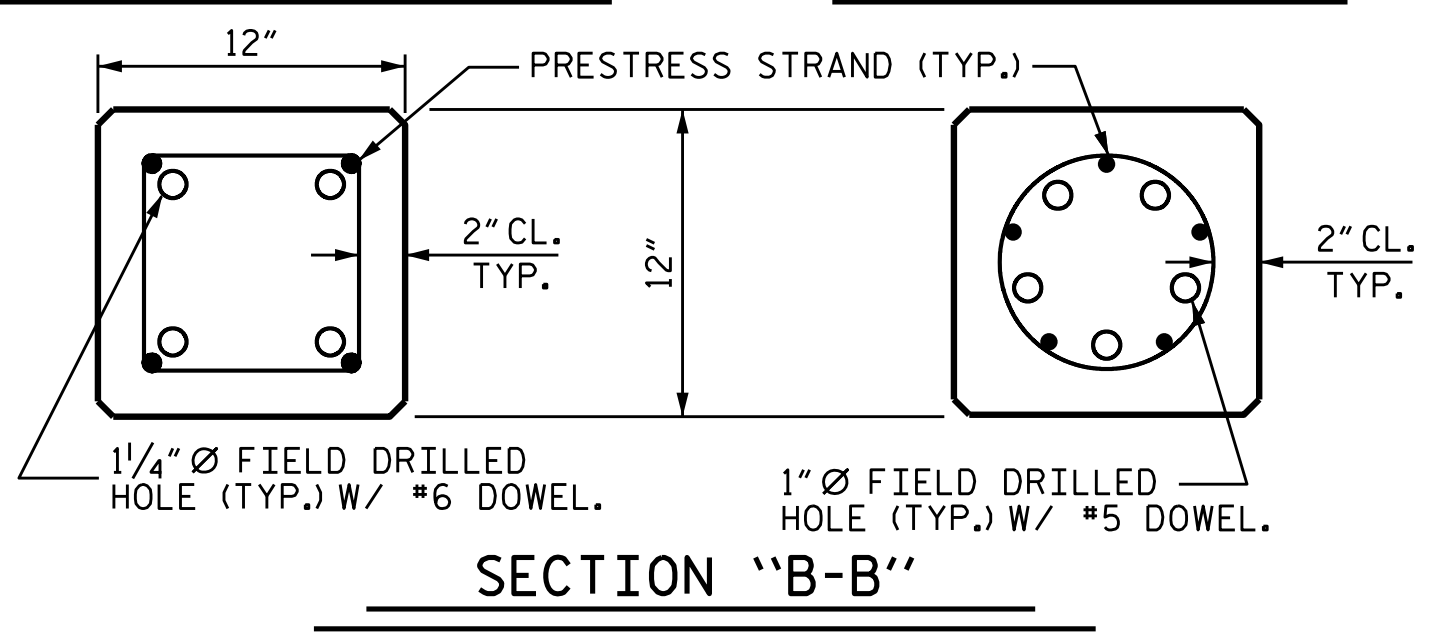
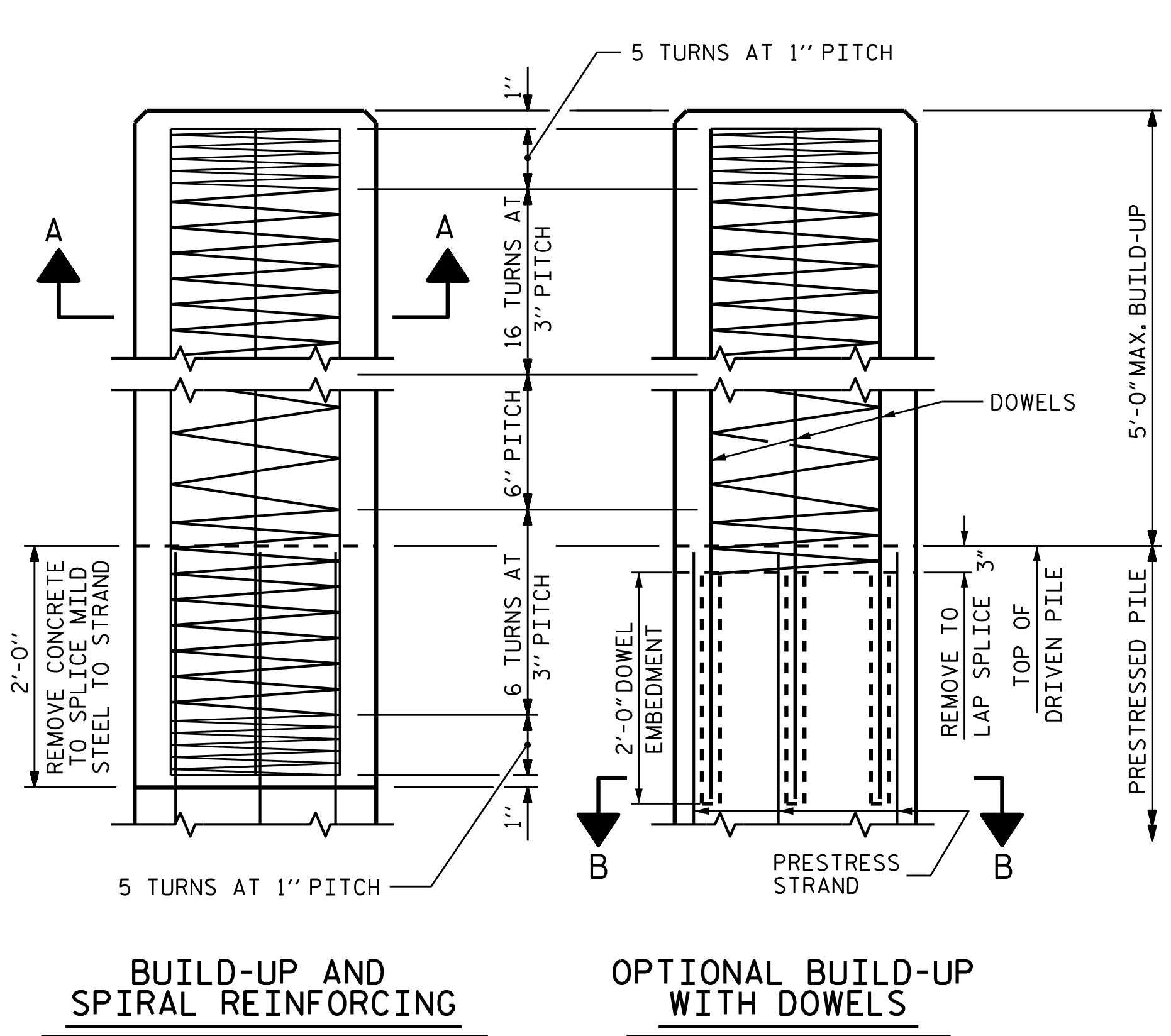
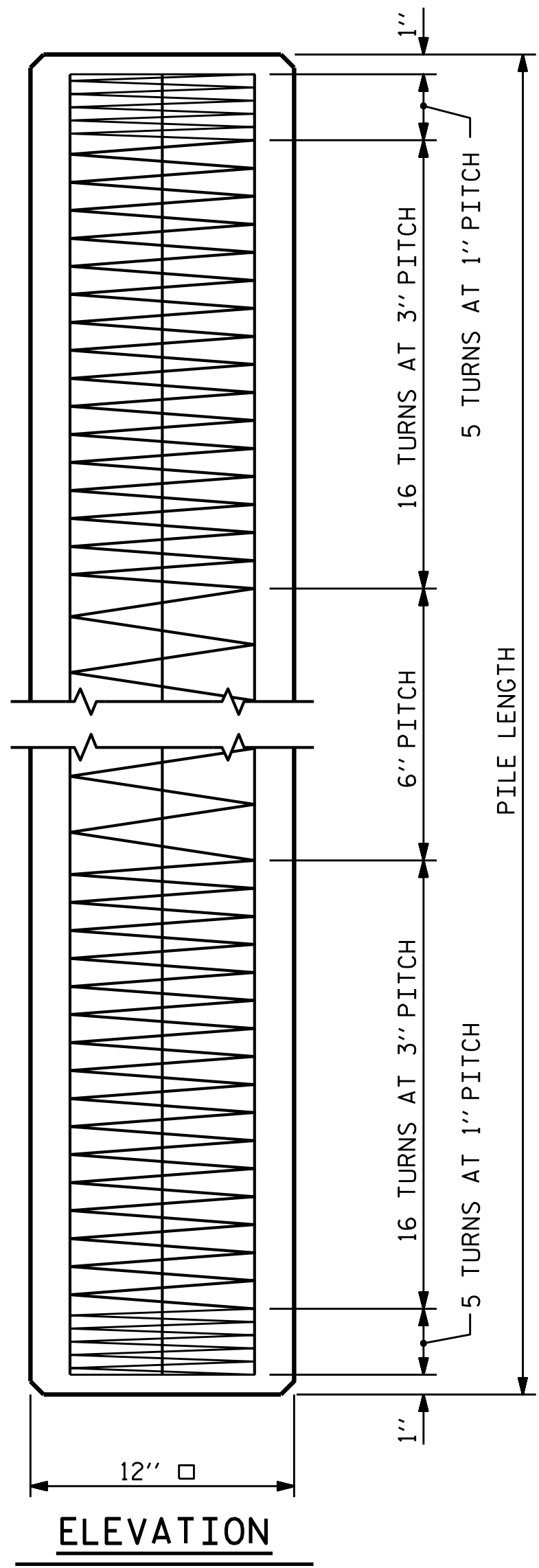
**VOLKERT**  
 5430 Wade Park Blvd., Suite 410  
 Raleigh, NC 27607  
 Tel. 919-854-0344 Fax. 919-854-0355  
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

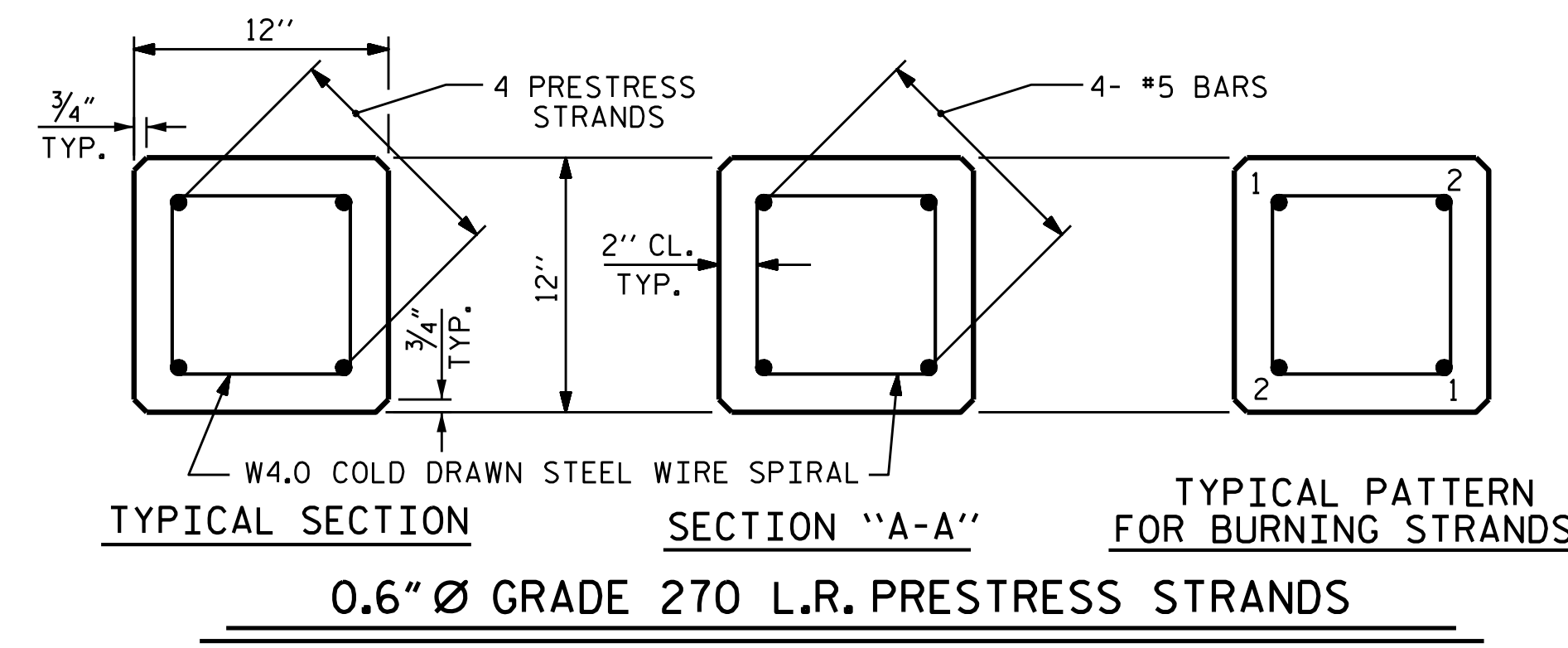
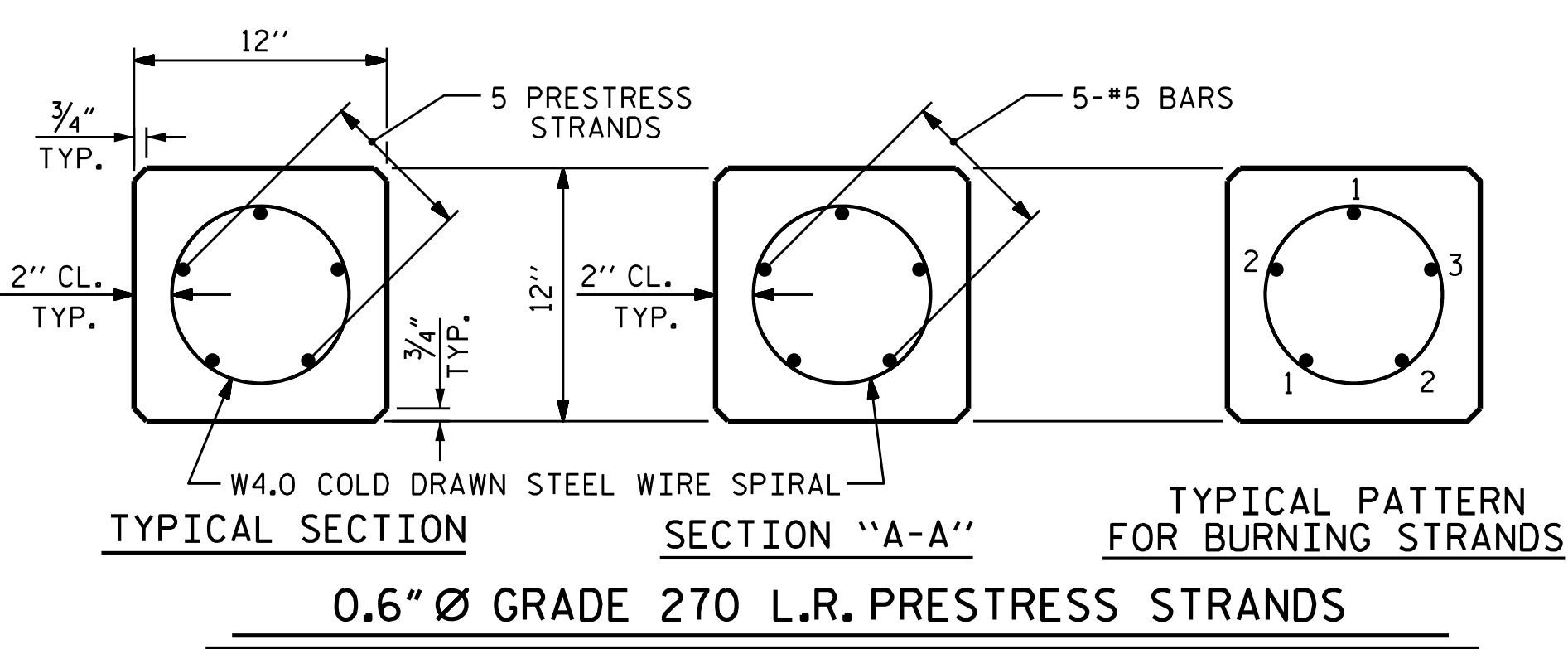
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37	
1			3			TOTAL SHEETS	42
2			4				

DRAWN BY : J.R. MCROY DATE : 11/18  
 CHECKED BY : P.N. HOLDER DATE : 11/18  
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 11/18





(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



**DOWEL INSTALLATION FOR OPTIONAL BUILD-UP**

GROUT COMPRESSIVE STRENGTH:  $f'_c = 5,000$  PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

**NOTES**

PRESTRESSED CONCRETE STRENGTH :  $f'_c = 7,500$  PSI  
 BUILD-UP CONCRETE STRENGTH :  $f'_c = 7,500$  PSI  
 STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600* PER STRAND	43,940* PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED, THE LAST STRAND MAY BE BURNED SINGLY ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

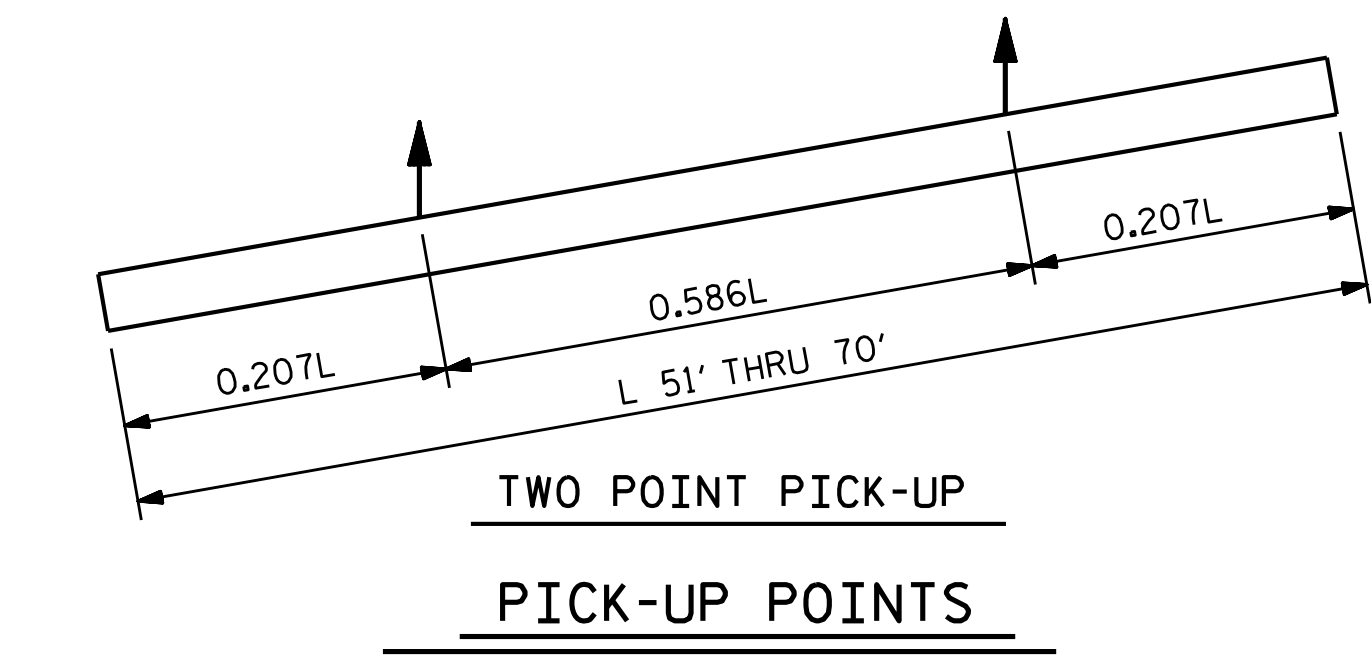
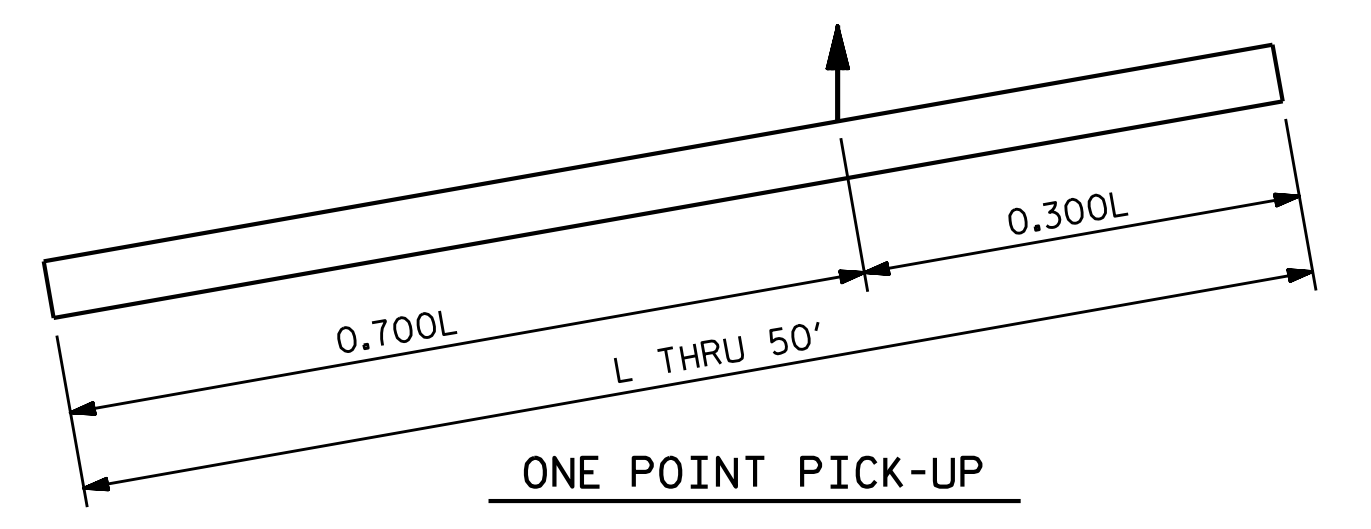
THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE PILES OF BENT 1 AND BENT 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH TO 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

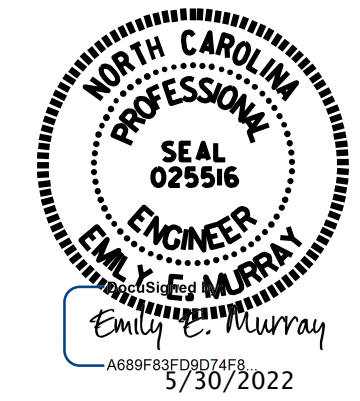
**QUANTITIES FOR ONE 12" PRESTRESSED PILE**

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP	
			0.300L	0.700L	0.207L	0.586L
25'-0"	0.91	1.85	7'-6"	17'-6"		
30'-0"	1.10	2.22	9'-0"	21'-0"		
35'-0"	1.28	2.59	10'-6"	24'-6"		
40'-0"	1.46	2.96	12'-0"	28'-0"		
45'-0"	1.64	3.33	13'-6"	31'-6"		
50'-0"	1.83	3.72	15'-0"	35'-0"		
55'-0"	2.01	4.09			11'-4 1/2"	32'-3"
60'-0"	2.19	4.46			12'-5"	35'-2"
65'-0"	2.38	4.81			13'-5 1/2"	38'-1"
70'-0"	2.57	5.18			14'-6"	41'-0"



PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

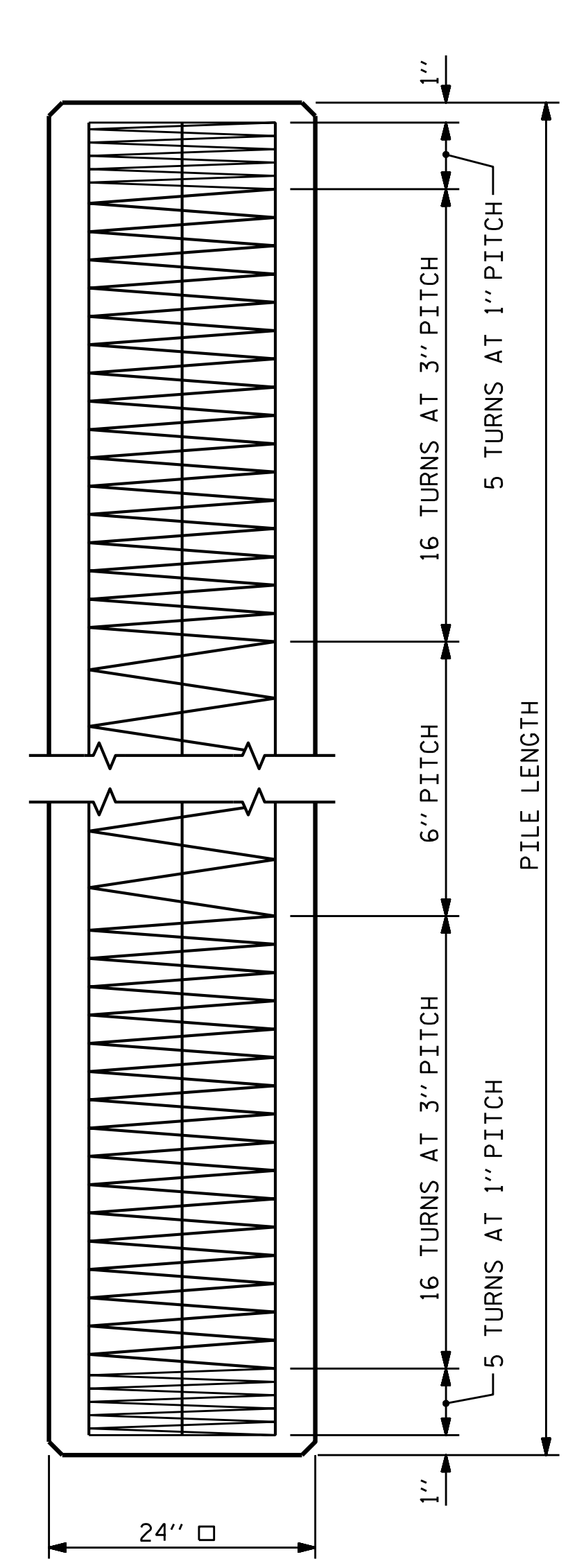
**12" PRESTRESSED CONCRETE PILE**

REVISIONS						SHEET NO. S-38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			

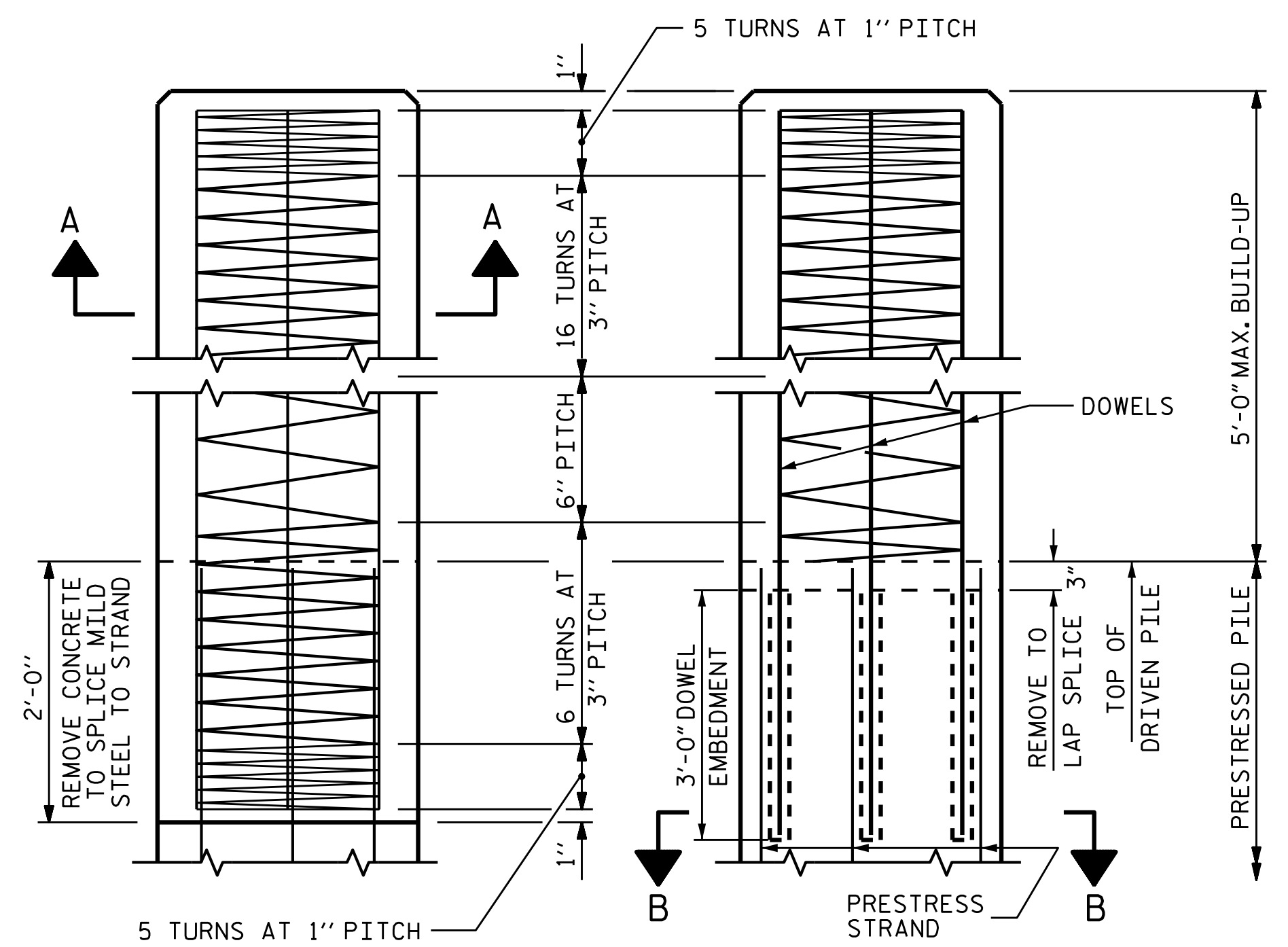
**VOLKERT**  
 5430 Wade Park Blvd., Suite 410  
 Raleigh, NC 27607  
 Tel. 919-854-0344 Fax. 919-854-0355  
 NC License No. F-0765

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : J.R. MCROY DATE : 11/18  
 CHECKED BY : P.N. HOLDER DATE : 11/18  
 DRAWN BY : FCJ 7/88  
 CHECKED BY : CRK 3/89  
 REV. 10/1/11 MAA/GM  
 REV. 12/14 MAA/TMG  
 REV. 12/17 MAA/THC

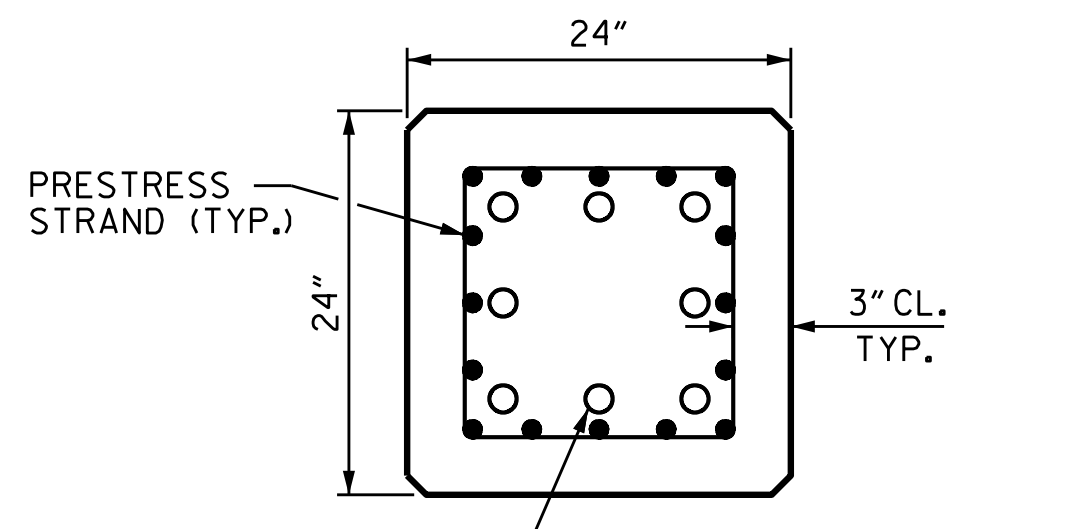


ELEVATION



BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

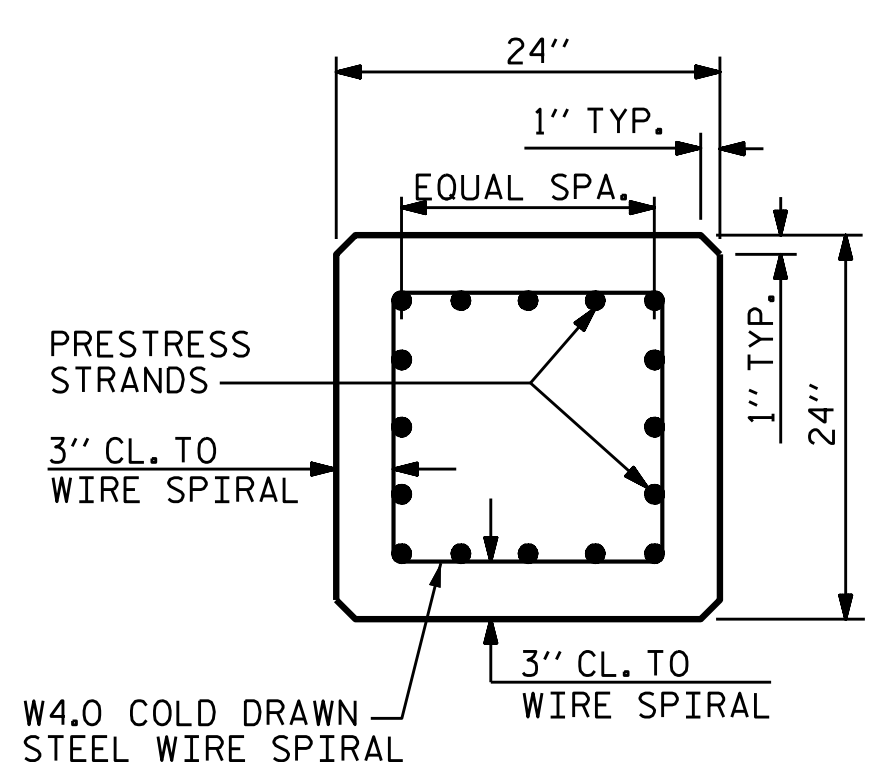


SECTION "B-B"

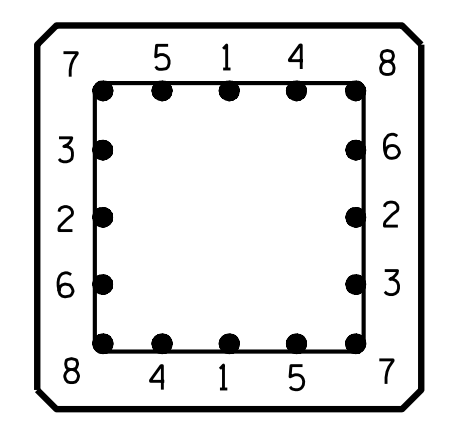
(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP	
			0.3L	0.7L
25'-0"	3.69	7.47	7'-6"	17'-6"
30'-0"	4.43	8.97	9'-0"	21'-0"
35'-0"	5.17	10.46	10'-6"	24'-6"
40'-0"	5.91	11.96	12'-0"	28'-0"
45'-0"	6.64	13.45	13'-6"	31'-6"
50'-0"	7.38	14.95	15'-0"	35'-0"
55'-0"	8.12	16.44	16'-6"	38'-6"
60'-0"	8.86	17.94	18'-0"	42'-0"
65'-0"	9.60	19.43	19'-6"	45'-6"
70'-0"	10.33	20.93	21'-0"	49'-0"

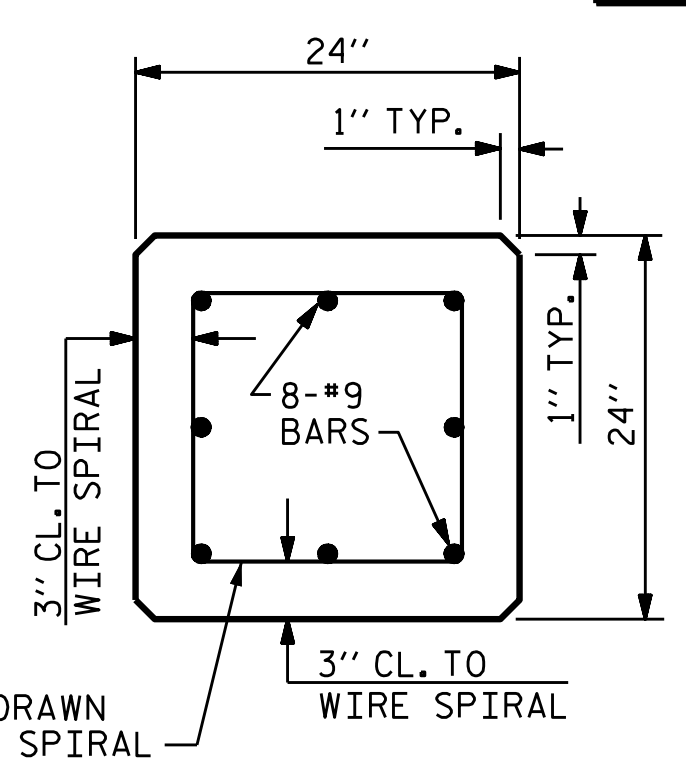
QUANTITIES FOR ONE 24" SQUARE PILE



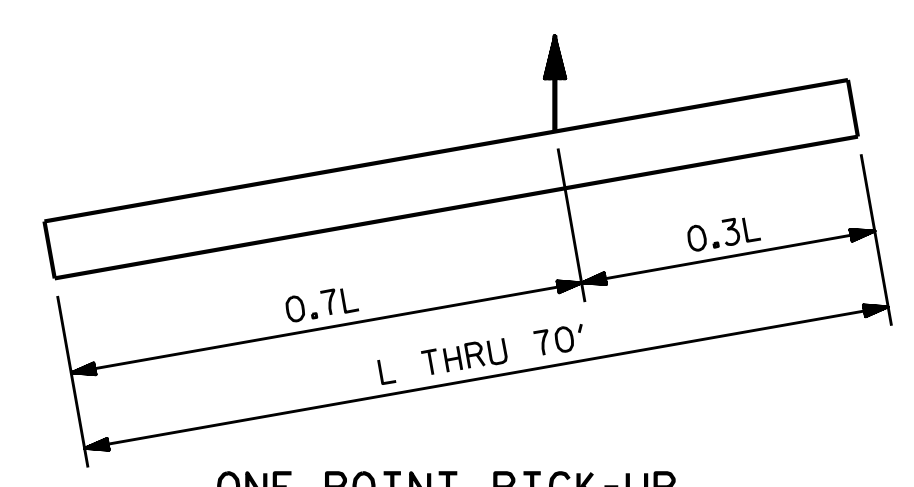
TYPICAL SECTION



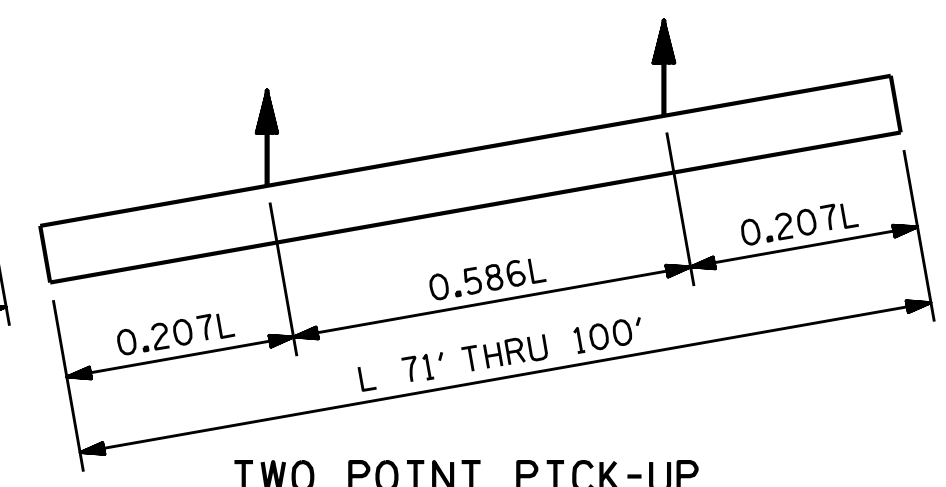
TYPICAL PATTERN FOR BURNING STRANDS



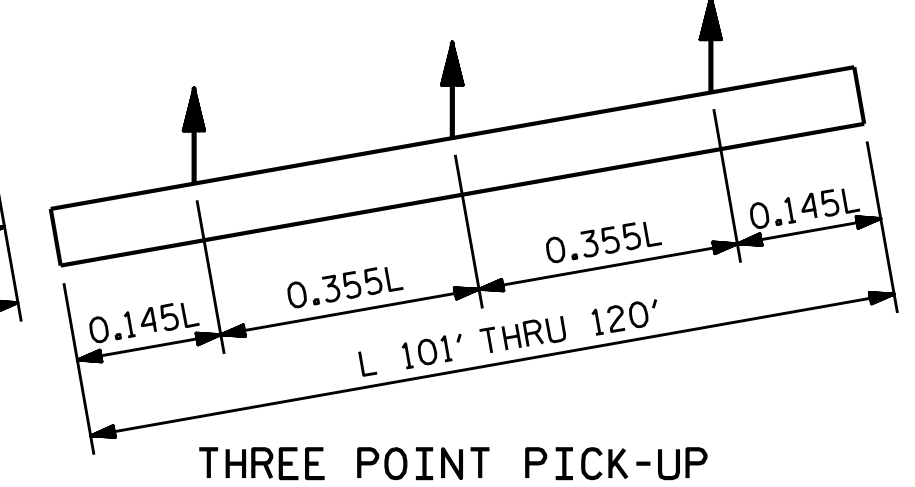
SECTION A-A



ONE POINT PICK-UP



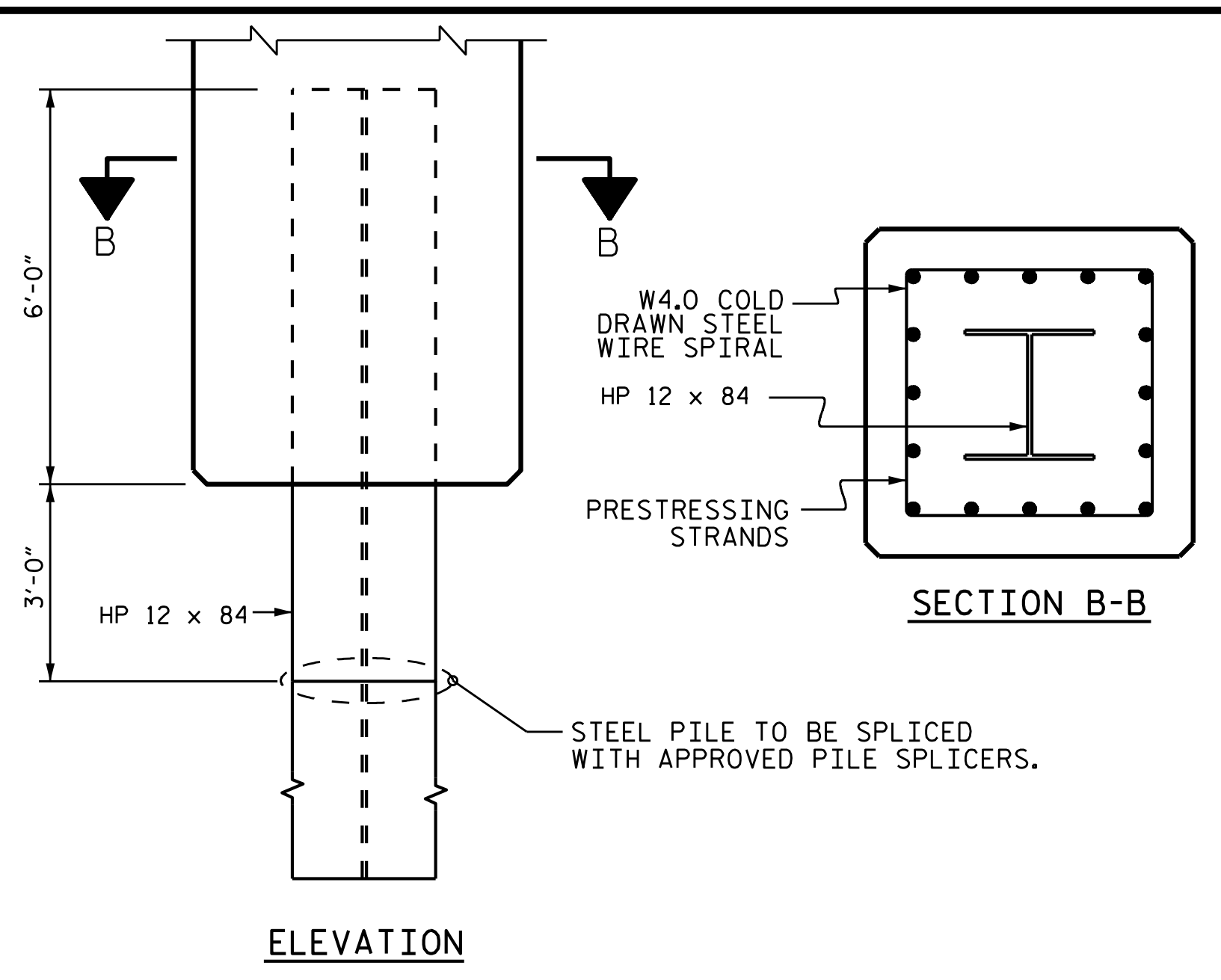
TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ELEVATION

SECTION B-B

PILE TIP DETAILS FOR 24" SQUARE PRESTRESSED CONCRETE PILE

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH:  $f'_c = 5,000$  PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

NOTES

PRESTRESSED CONCRETE STRENGTH :  $f'_c = 7,500$  PSI  
 BUILD-UP CONCRETE STRENGTH :  $f'_c = 7,500$  PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
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THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES. STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-AL-1350) THERMAL SPRAY COATING WITH 0.5 MIL THICK SEAL COAT TO THE PILES, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

FOR THE PILE TIP, APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

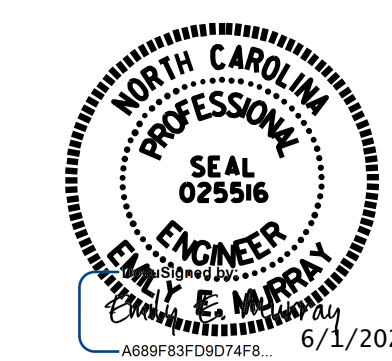
PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. FOR CONTAIN CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE PILES OF BENT 1 AND BENT 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH TO 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 24" PRESTRESSED  
 CONCRETE COMPOSITE  
 PILE



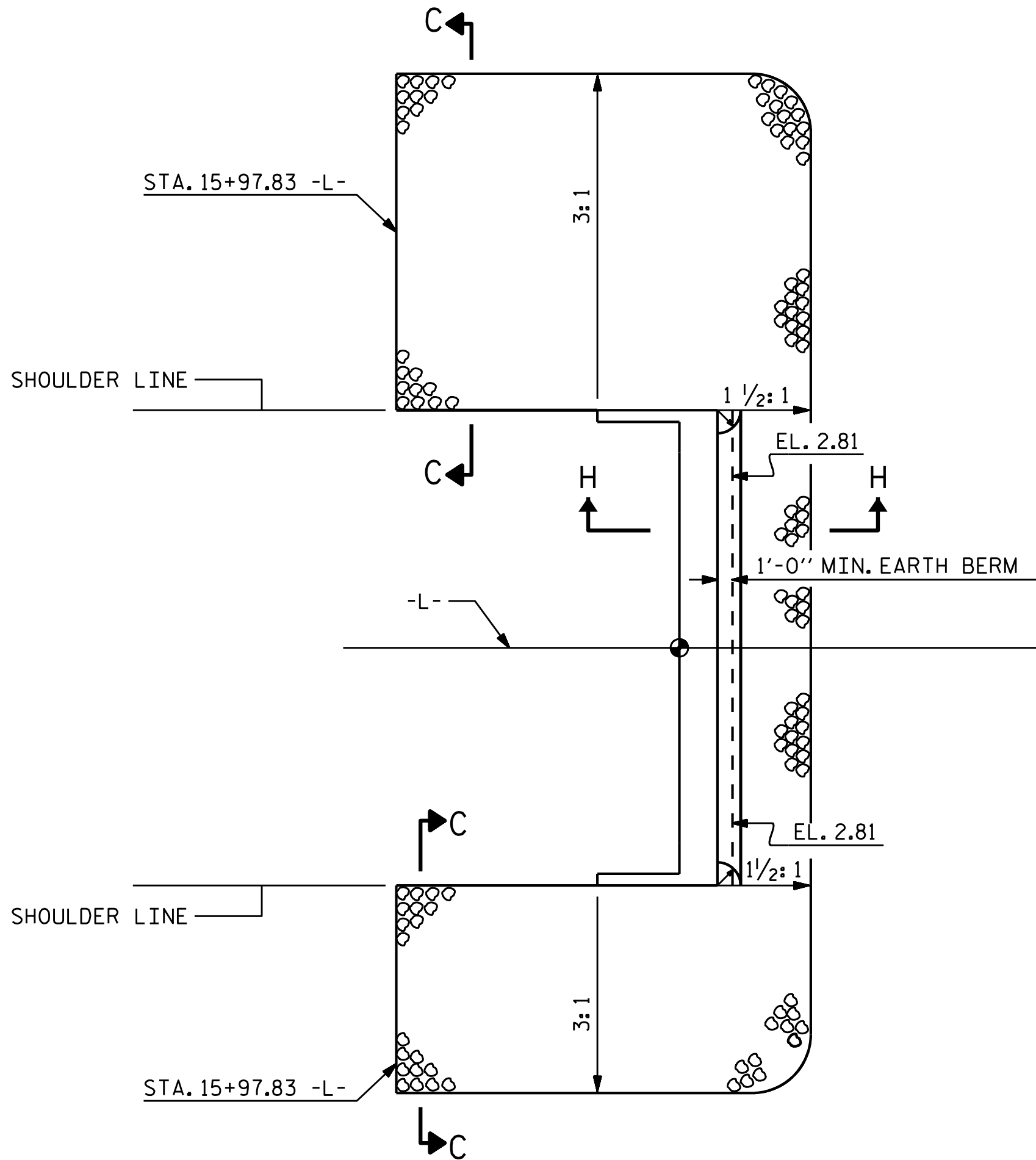
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			42

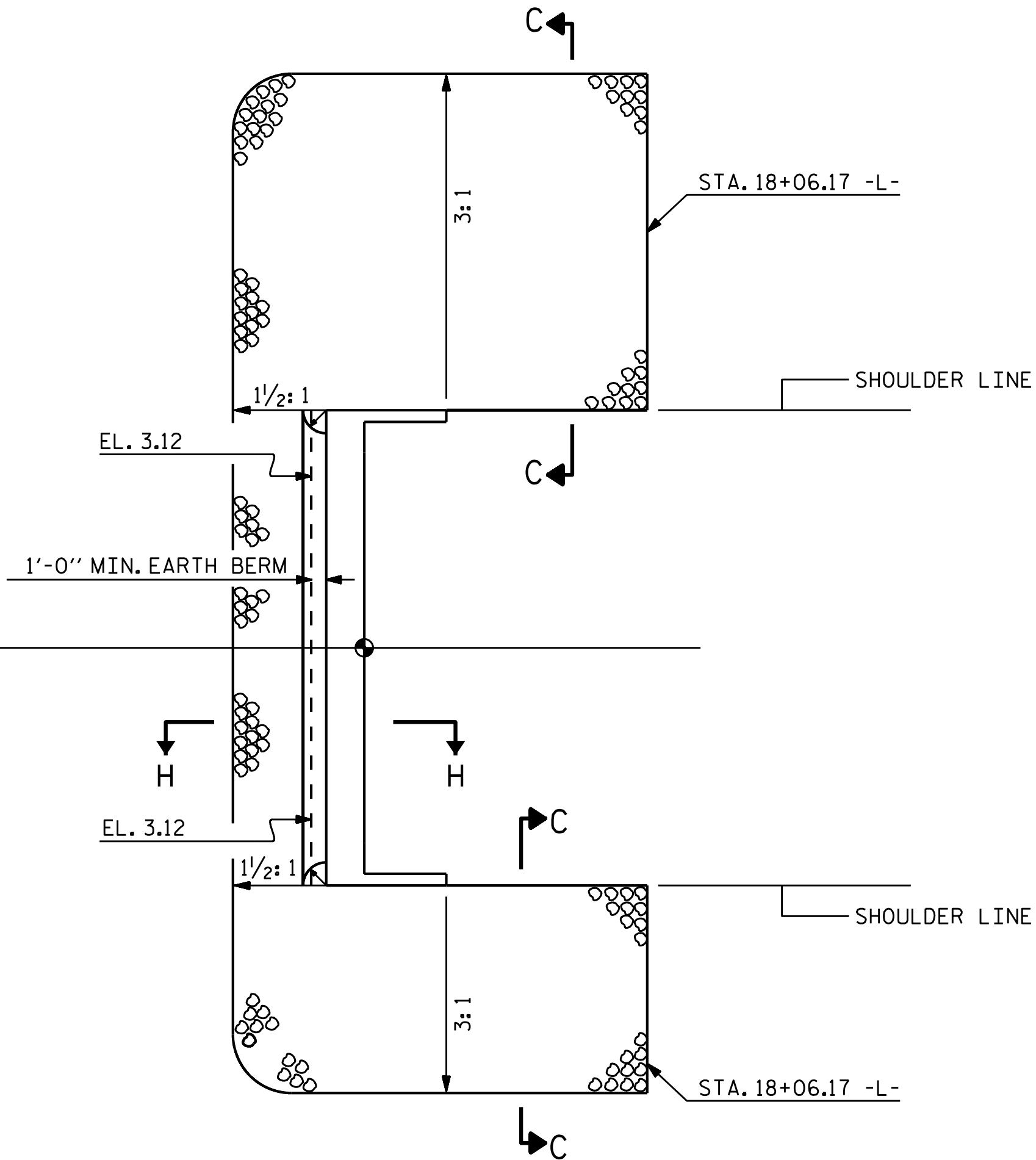
ASSEMBLED BY : J.R. MCROY DATE : 11/18  
 CHECKED BY : P.N. HOLDER DATE : 11/18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

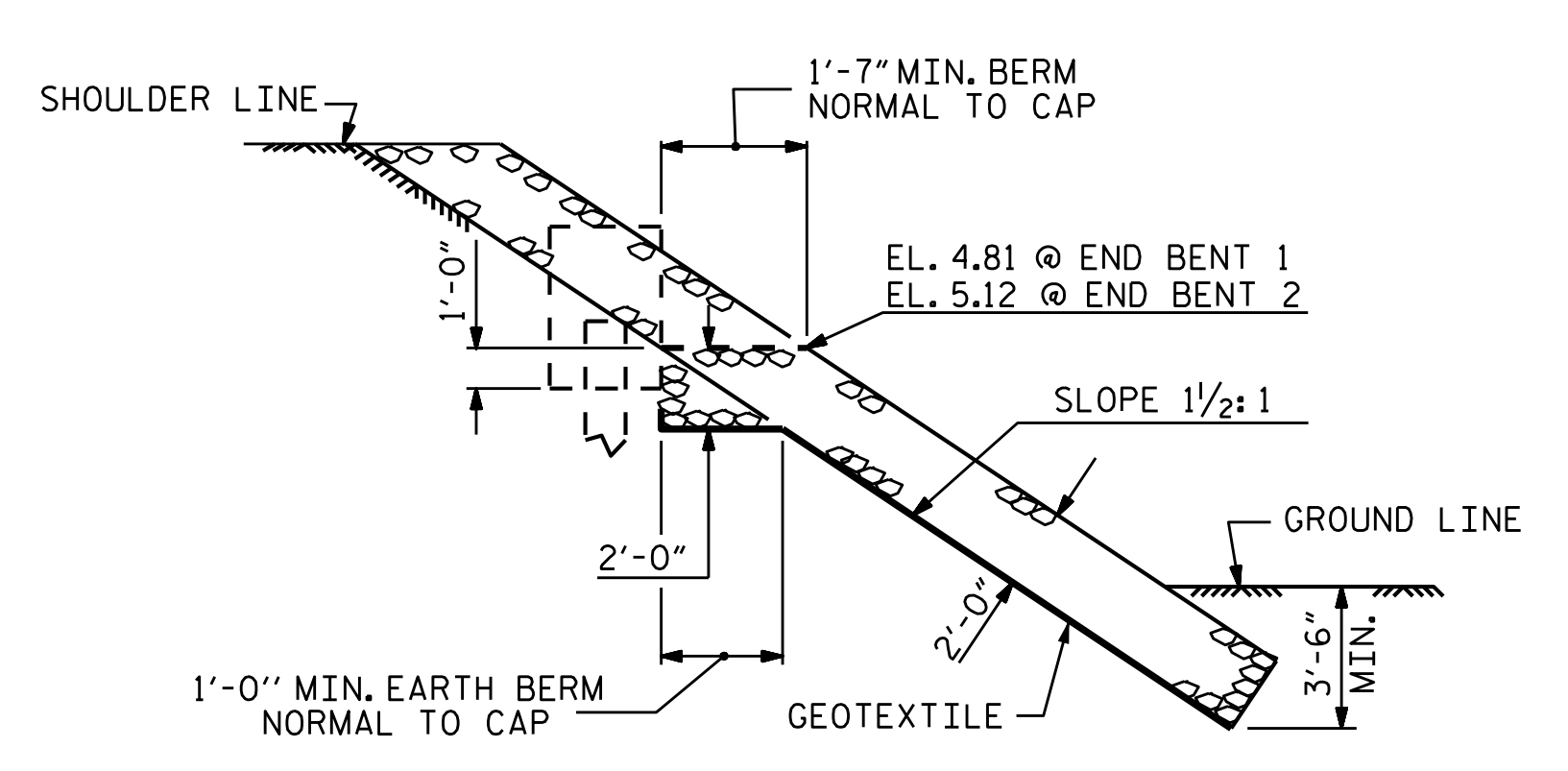


**INTEGRAL END BENT 1**

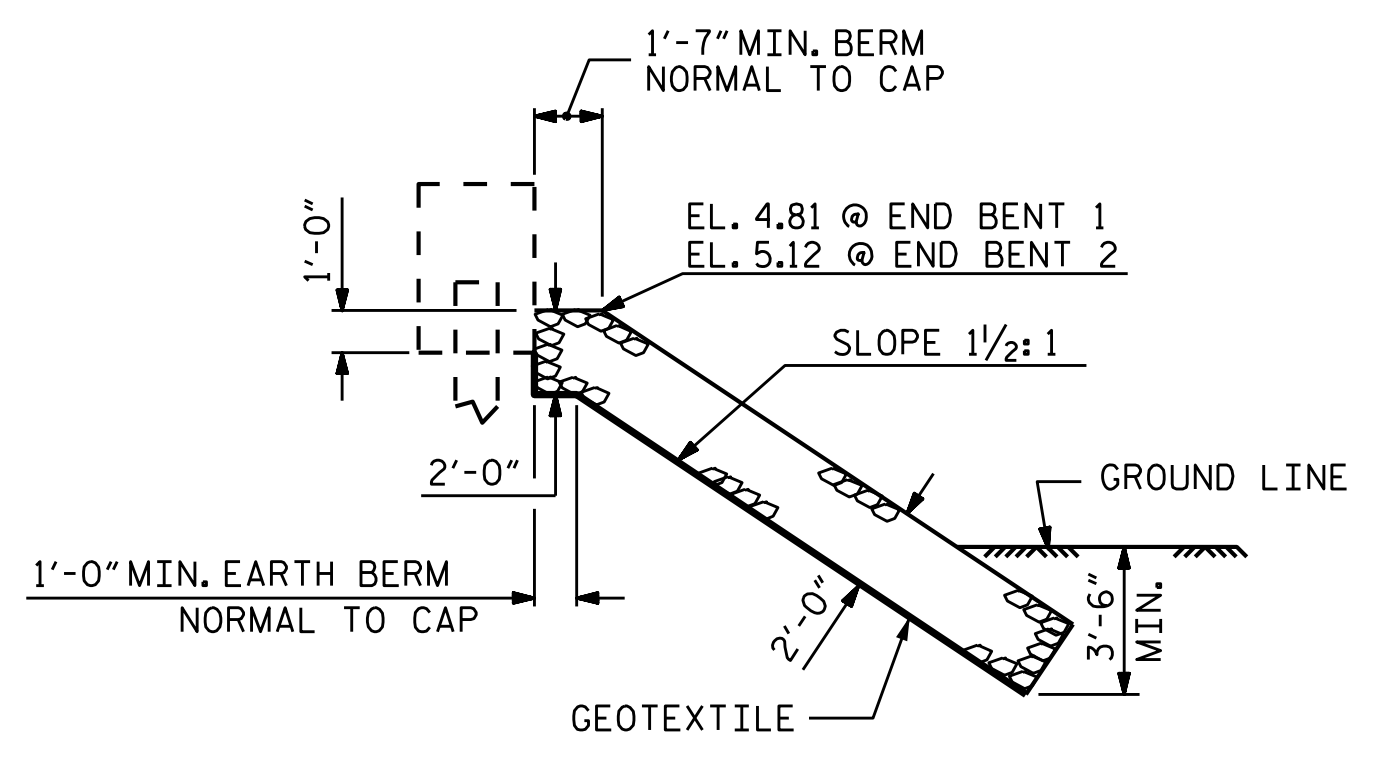


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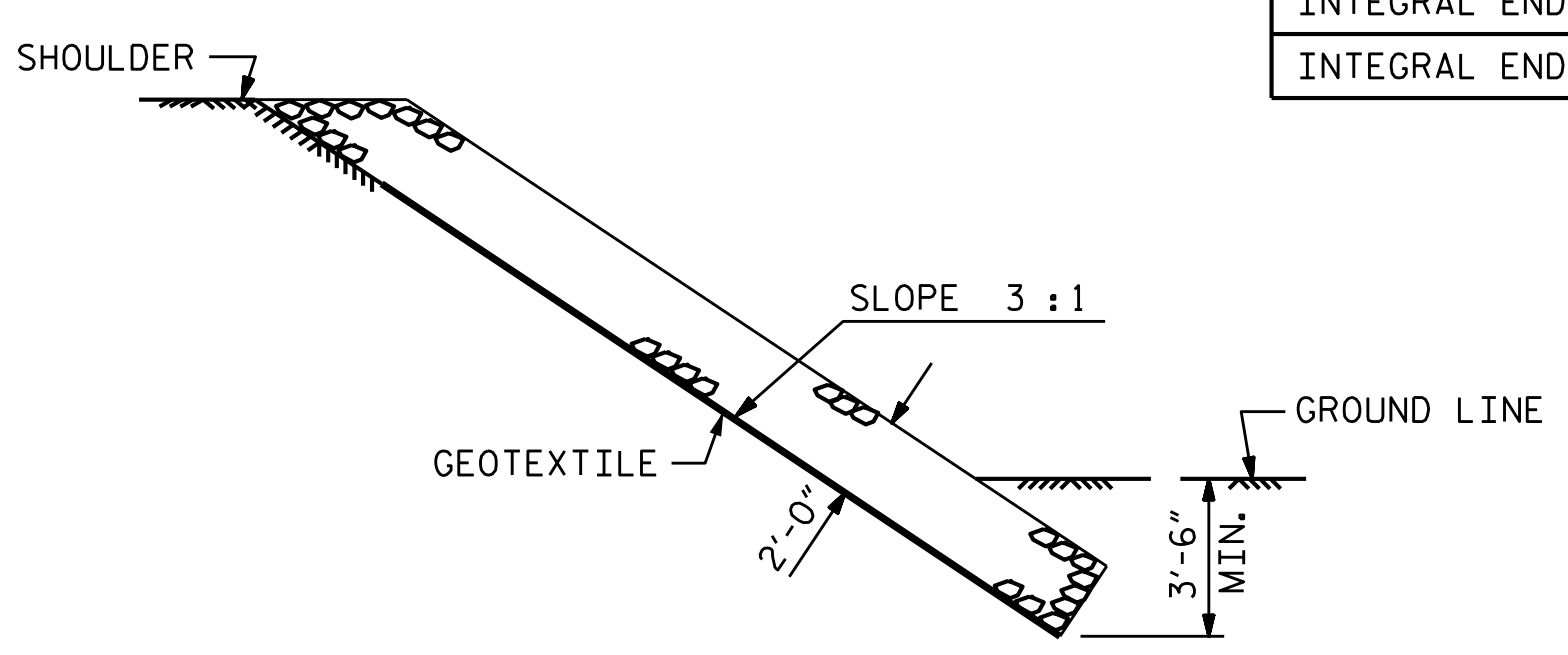
ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+02.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1	263	292
INTEGRAL END BENT 2	237	263



**SECTION H-H**

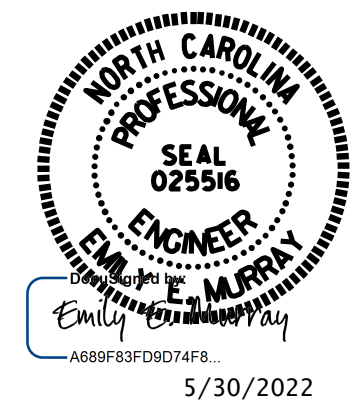


**SECTION C-C**



**SECTION C-C**

PROJECT NO. B-4593  
PAMLICO COUNTY  
STATION: 17+02.00 -L-



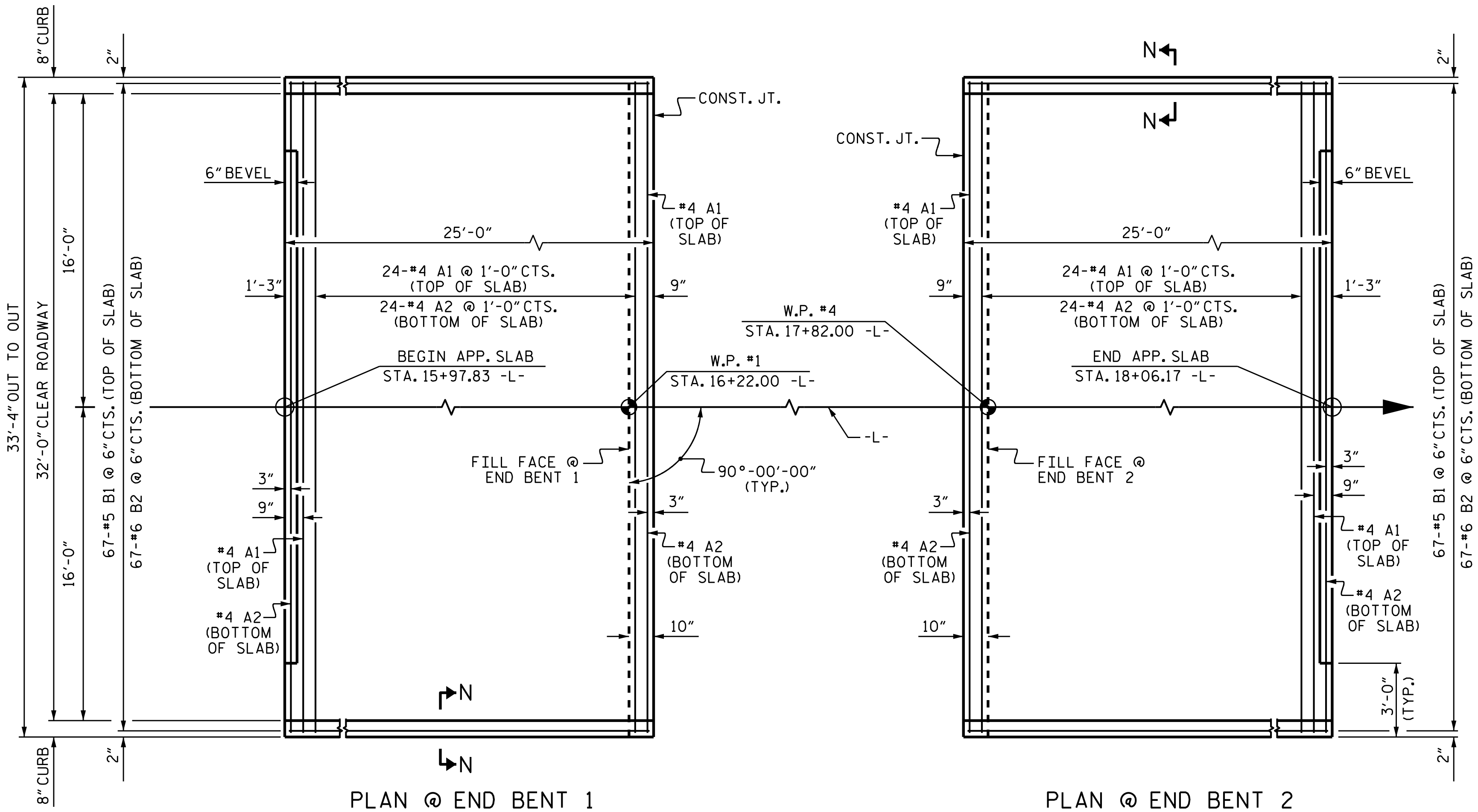
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
RIP RAP DETAILS

ASSEMBLED BY : R.G.BEAUCHAMP	DATE : 12/18
CHECKED BY : J.R.MCROY	DATE : 12/18
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

**VOLKERT**  
5430 Wade Park Blvd., Suite 410  
Raleigh, NC 27607  
Tel. 919-854-0344 Fax. 919-854-0355  
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SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			



### NOTES

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

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

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

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

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

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

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

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 A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

### BILL OF MATERIAL

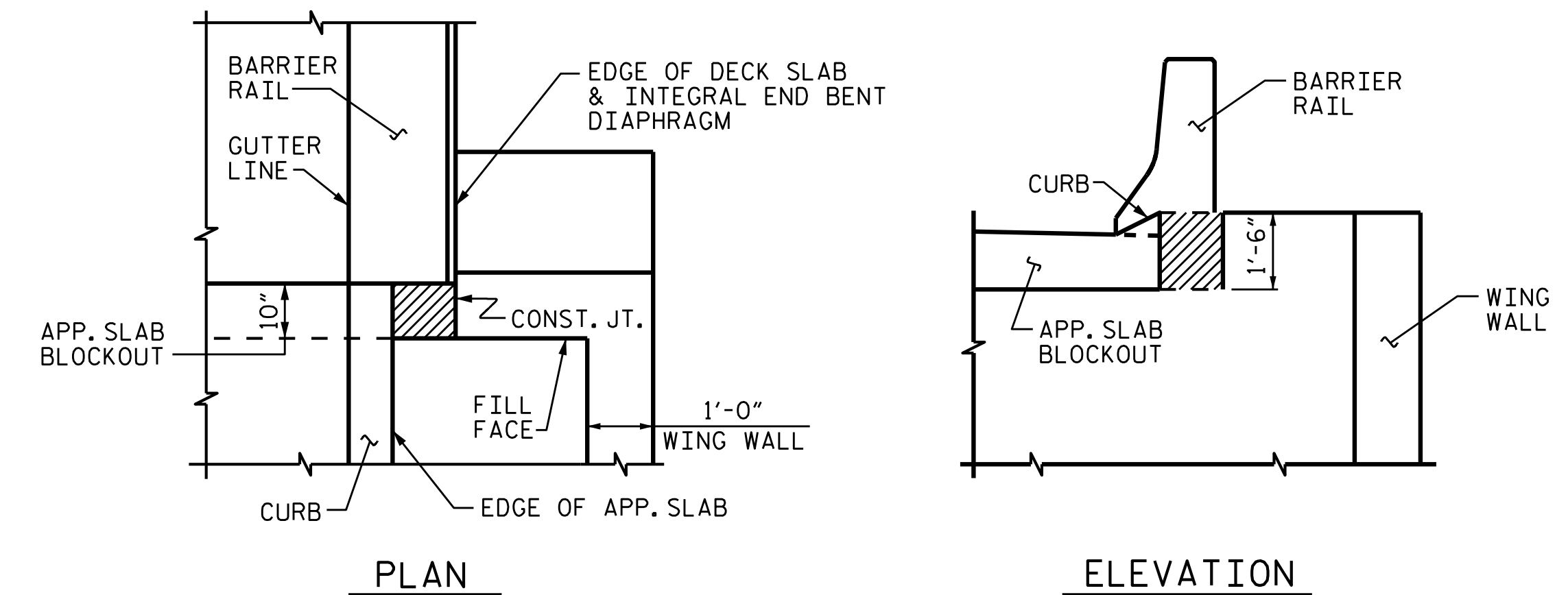
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	32'-10"	570
* A2	26	#4	STR	32'-10"	570
* B1	67	#5	STR	24'-2"	1689
* B2	67	#6	STR	24'-8"	2482

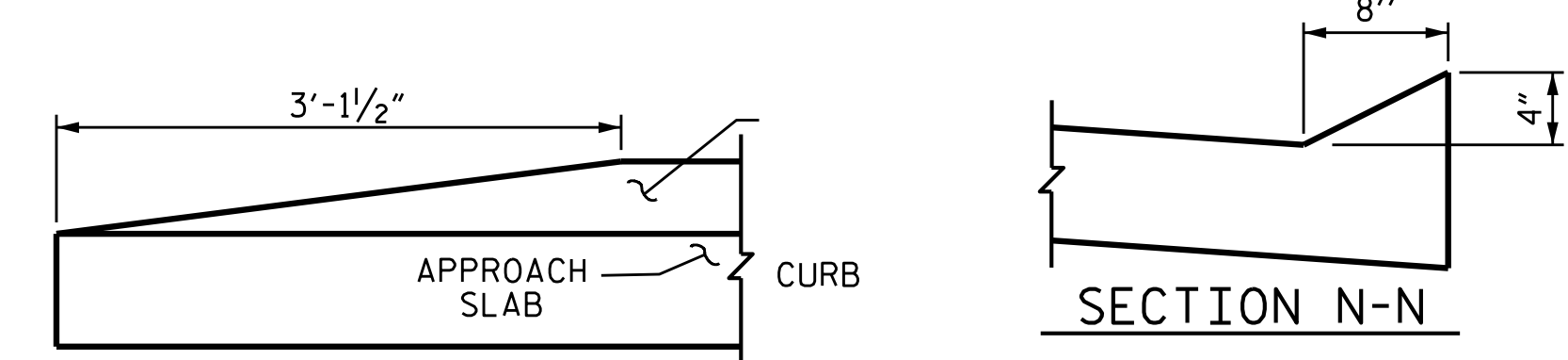
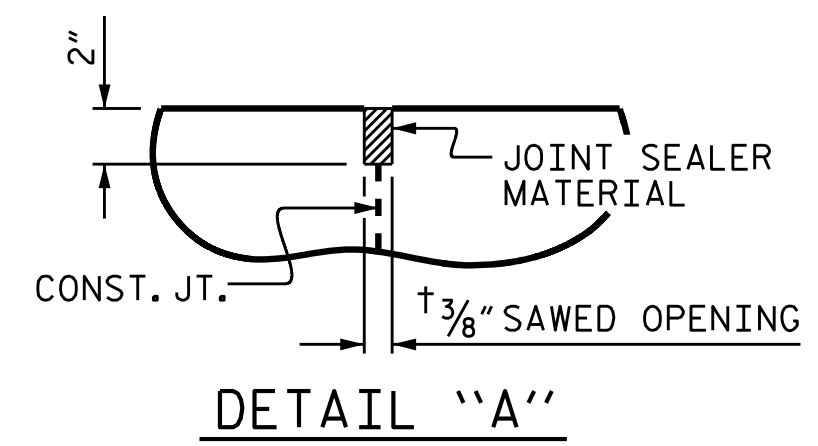
\* EPOXY COATED REINFORCING STEEL 5311 LBS.  
 CLASS AA CONCRETE 36.0 C. Y.

### SPLICE LENGTHS

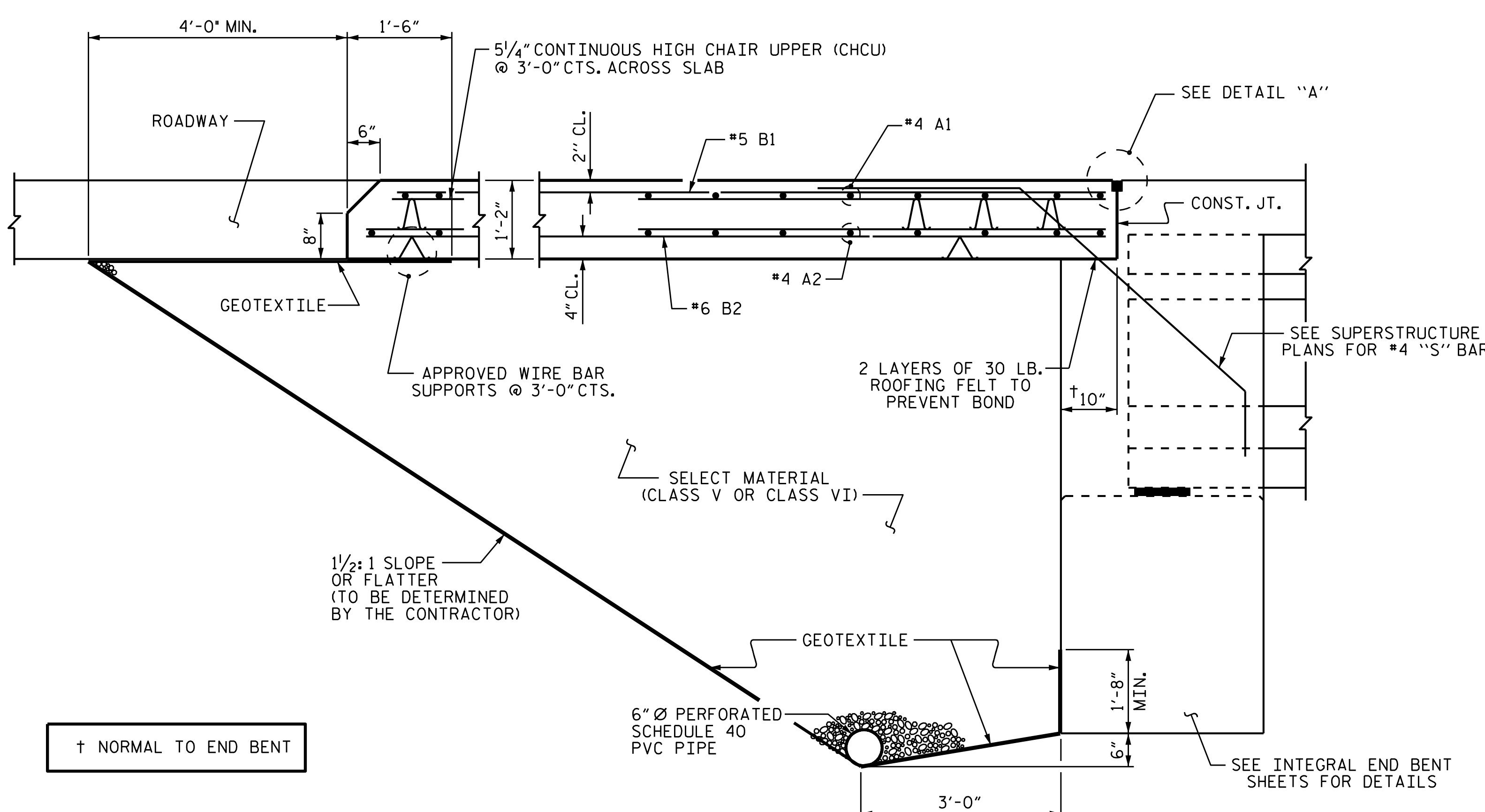
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



THE CONCRETE IN THE SHADED AREA SHALL BE POURED ALONG WITH APPROACH SLAB CONSTRUCTION AND AFTER BARRIER RAIL HAS BEEN CAST IF SLIP FORMING IS USED.



END OF CURB WITHOUT SHOULDER BERM GUTTER

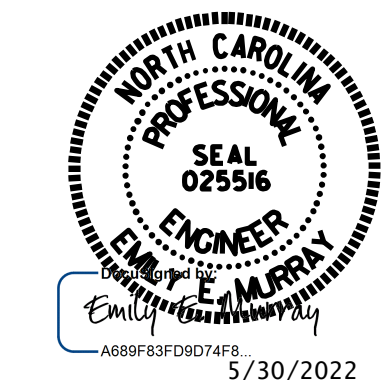


† NORMAL TO END BENT

ASSEMBLED BY : R. G. BEAUCHAMP DATE : 11/18  
 CHECKED BY : P. N. HOLDER DATE : 12/18

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

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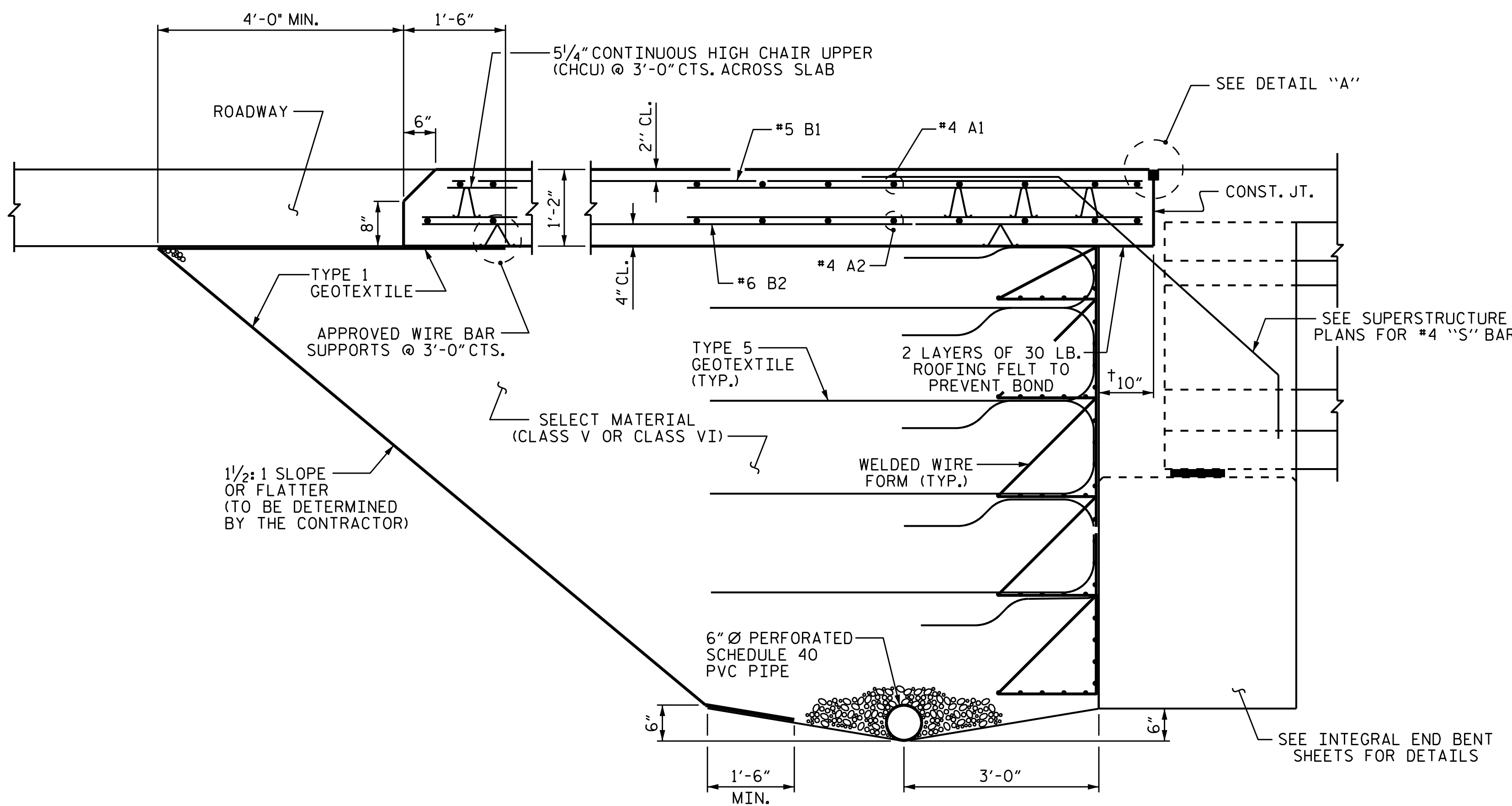


PROJECT NO. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 1 OF 2

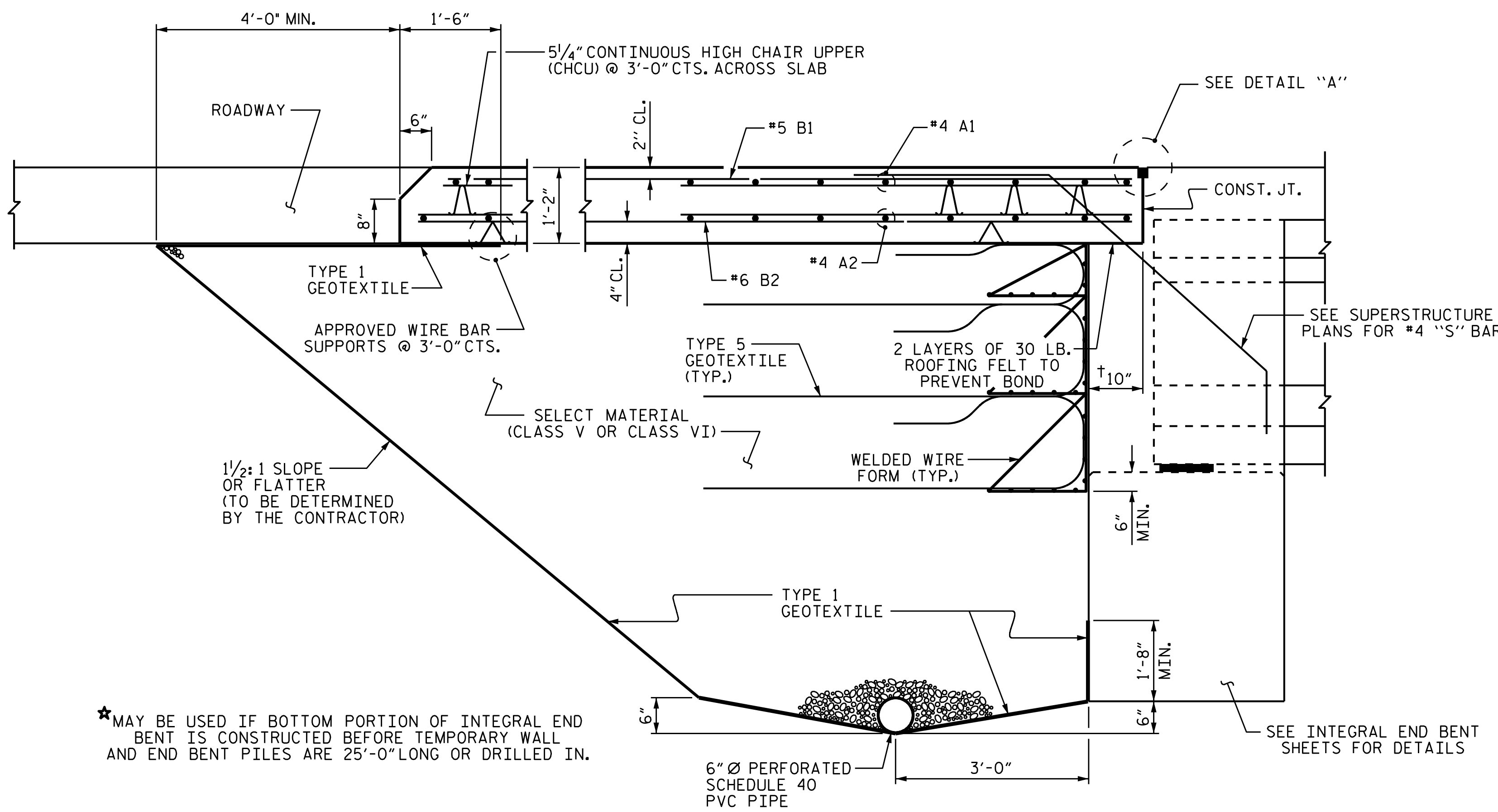
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR INTEGRAL ABUTMENT  
 WITH FLEXIBLE PAVEMENT

REVISIONS						SHEET NO. S-41
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 42
2			4			



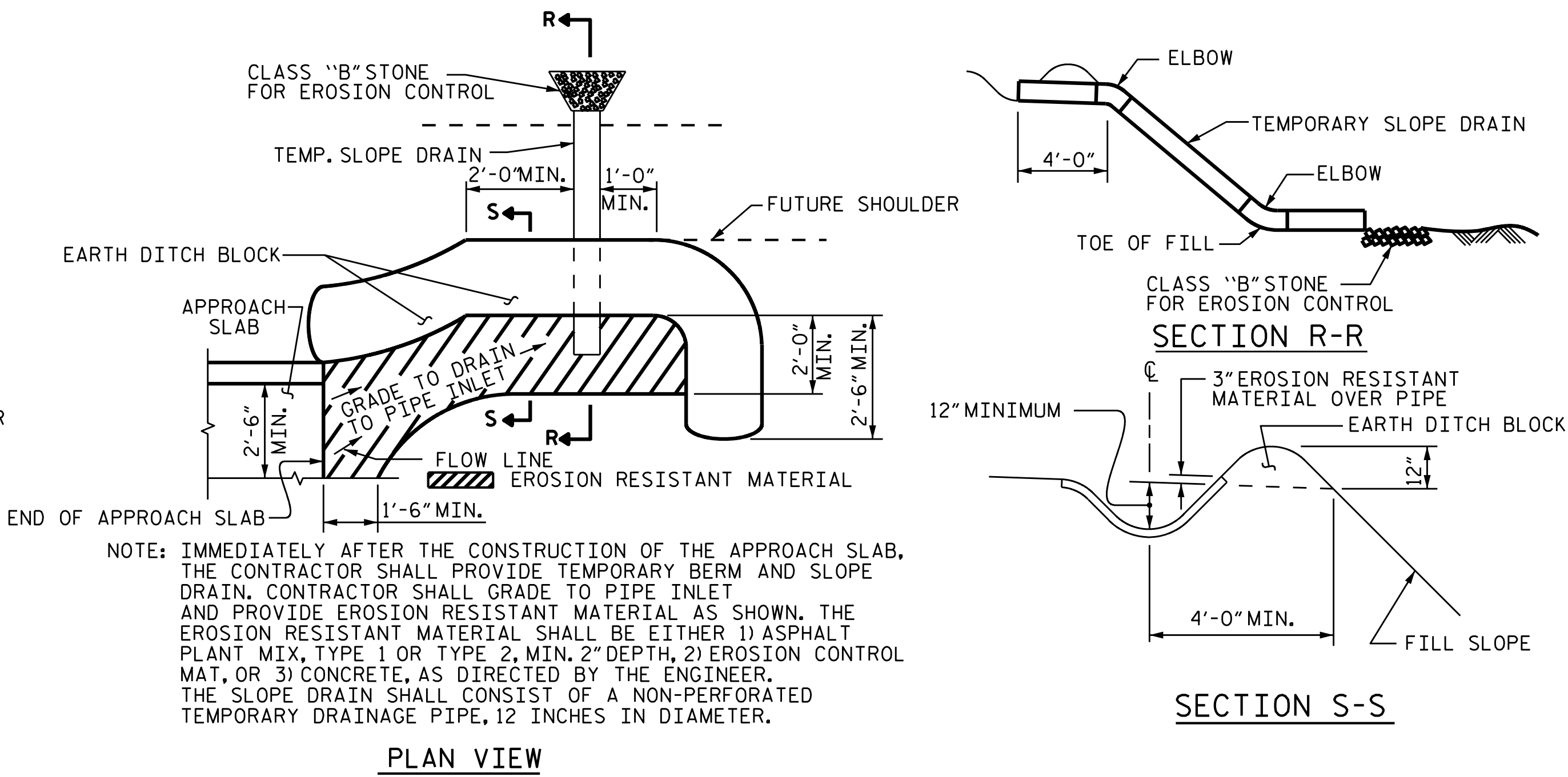
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



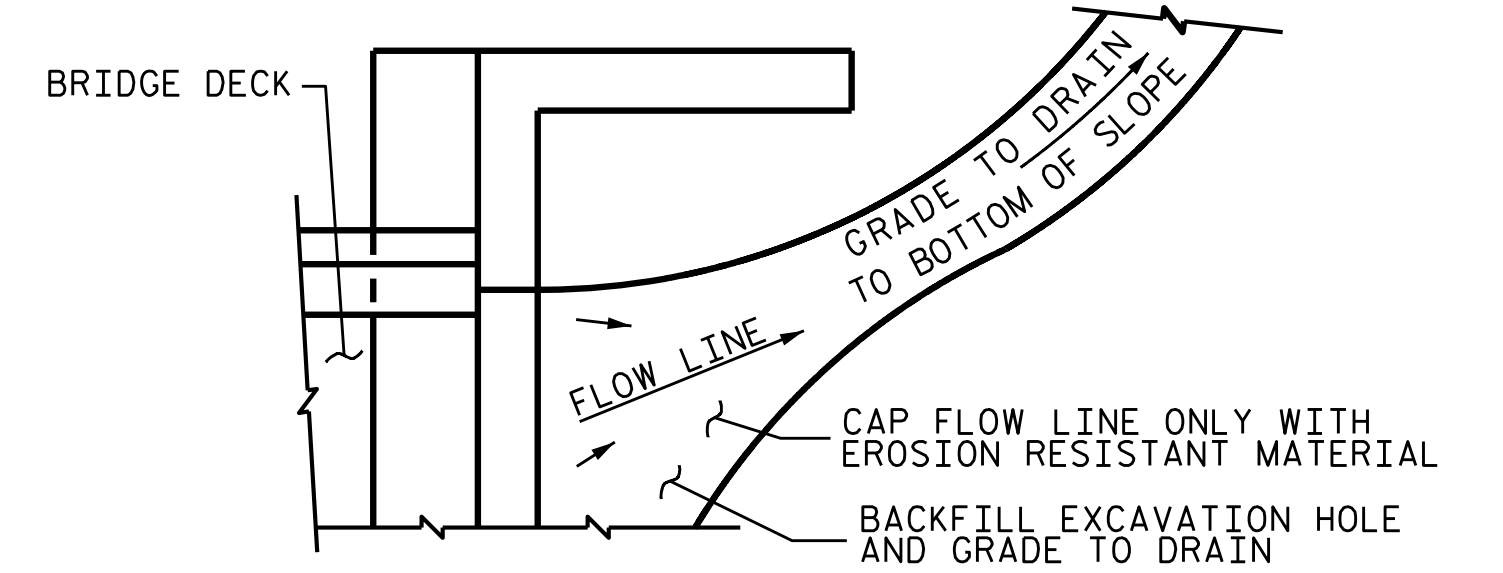
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



**NOTES**

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- 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.

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. B-4593  
PAMLICO COUNTY  
 STATION: 17+02.00 -L-

SHEET 2 OF 2

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



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DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

ASSEMBLED BY : R.G. BEAUCHAMP	DATE : 11/18
CHECKED BY : P.N. HOLDER	DATE : 12/18
DRAWN BY : TLA	10/05
CHECKED BY : CM	5/06
REV. 12/21/11	MAA/GM
REV. 6/13	MAA/GM
REV. 12/17	MAA/THC

## 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