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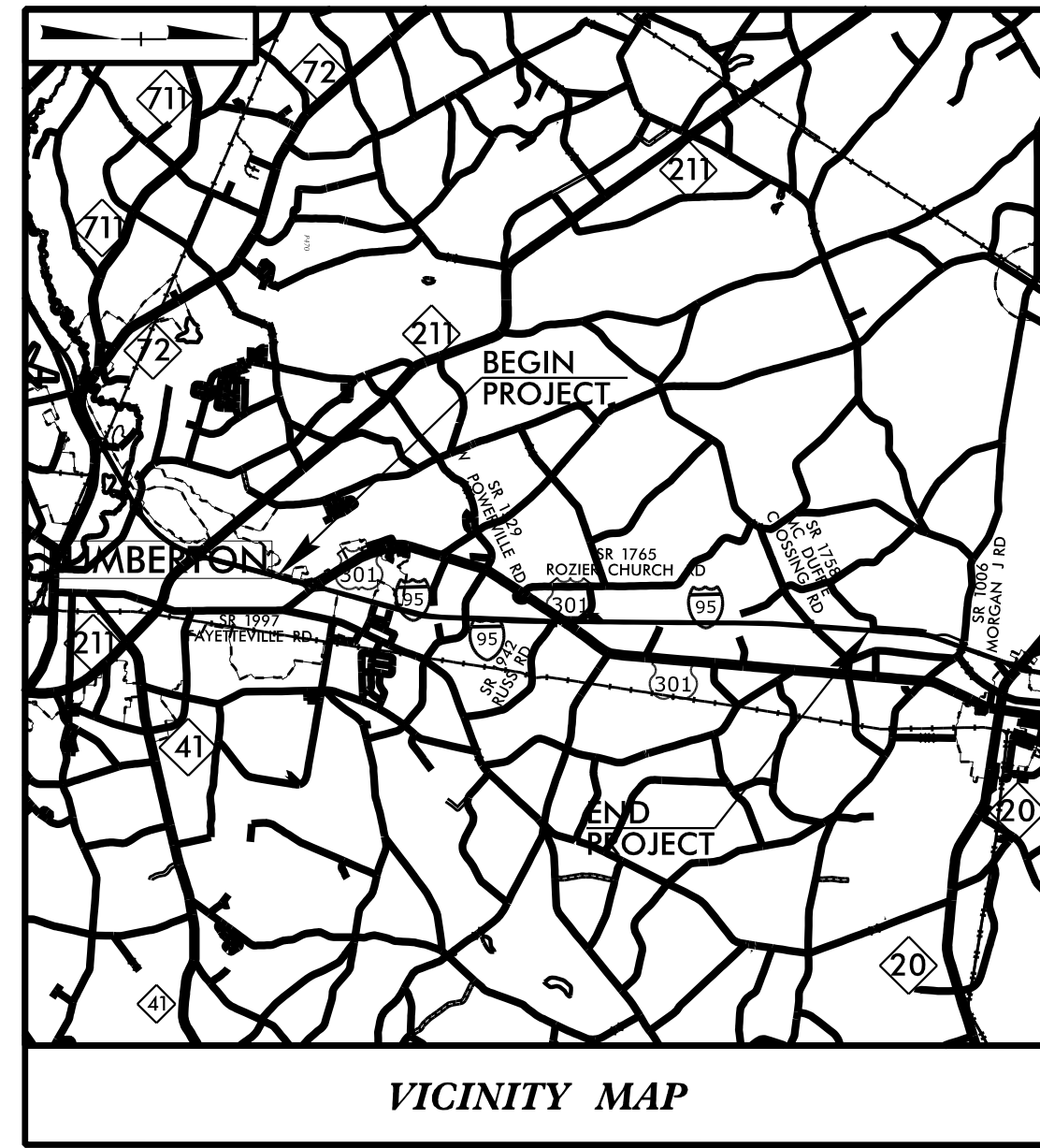
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09/08/2019

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47533.1.2		PE	
47533.2.2		R/W	
47533.2.6		UTIL	
47533.3.2		CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROBESON COUNTY

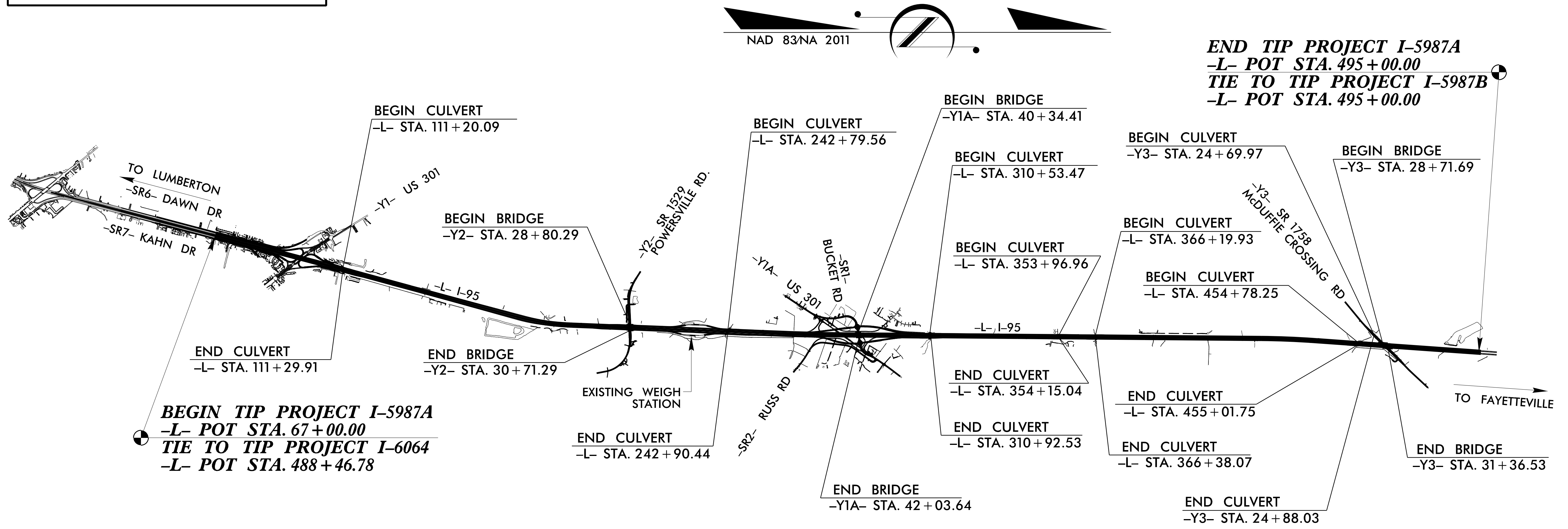
LOCATION: I-95 IMPROVEMENTS
FROM SOUTH OF US 301 TO
SOUTH OF NC 20. WIDEN TO EIGHT LANES
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES,
CULVERTS, AND RETAINING WALLS



TIP PROJECT: I-5987A

STRUCTURES

CONTRACT: C204727



7/13/2022 G:\Projects\2019\2019217.02\CLIENT\Structures\I-5987A (YIA)\I5987A_STR_TSH.dgn 9:41:28 AM

DESIGN DATA

ADT 2022 =	69,300
ADT 2042 =	101,750
DHV =	8 %
D =	55 %
T =	16 % *
V =	75 MPH
* TTST =	11% DUAL 3%
FUNC CLASS =	INTERSTATE STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5987A	=	8.097 MILES
LENGTH STRUCTURES TIP PROJECT I-5987A	=	0.009 MILES
TOTAL LENGTH TIP PROJECT I-5987A	=	8.106 MILES

PREPARED IN THE OFFICE OF:

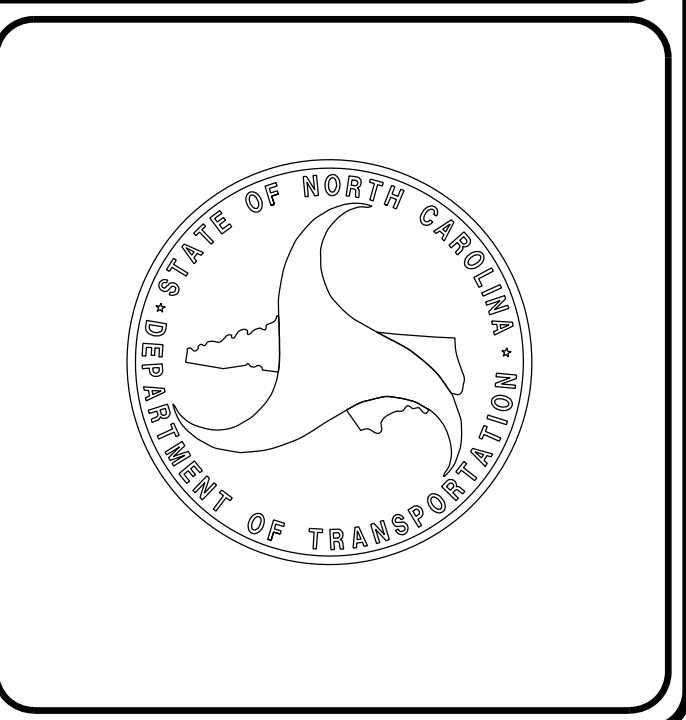
NIVIS

2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	STEVE A. DRUM, P.E. PROJECT ENGINEER
MAY 28, 2021	
LETTING DATE:	CHRIS D. ANDERSON, PE PROJECT DESIGN ENGINEER
SEPTEMBER 20, 2022	
NCDOT CONTACT:	CRAIG A. FREEMAN JR., PE DIVISION PROJECT ENGINEER

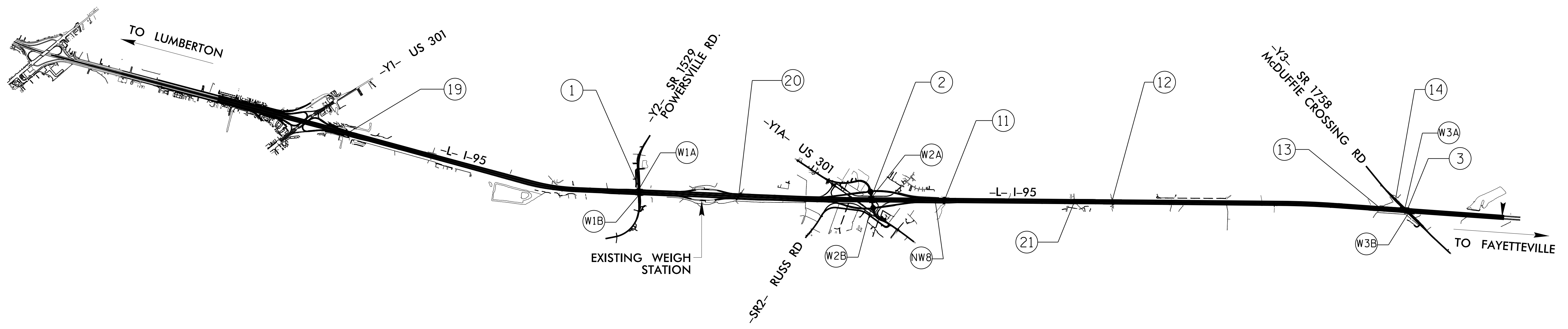
STRUCTURE DESIGN ENGINEER

DocuSigned by:
L. Kevin Austin
727B7320EA46B
SIGNATURE:

7/13/2022
P.E.



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INDEX

STR. NO.	STATION	DESCRIPTION	SHEETS
①	STA. 29+75.79 -Y2- STA. 210+10.00 -L-	BRIDGE ON SR 1529 OVER I-95 BETWEEN US 301 AND SR 1005	S1-1 THRU S1-36
②	STA. 41+19.02 -Y1A- STA. 286+75.00 -L-	BRIDGE ON US 301 OVER I-95 BETWEEN SR 1765 AND SR 1935	S2-1 THRU S2-31
③	STA. 30+04.11 -Y3- STA. 463+53.11 -L-	BRIDGE ON SR 1758 OVER I-95 BETWEEN SR 1763 AND HWY 301	S3-1 THRU S3-29
⑪	STA. 310+73.00 -L-	TRIPLE 12' X 12' REINFORCED CONCRETE BOX CULVERT	C11-1 THRU C11-14
⑫	STA. 366+29.00 -L-	DOUBLE 8' X 9' REINFORCED CONCRETE BOX CULVERT	C12-1 THRU C12-8
⑬	STA. 454+90.00 -L-	DOUBLE 8' X 7' REINFORCED CONCRETE BOX CULVERT	C13-1 THRU C13-8
⑭	STA. 24+79.00 -Y3-	DOUBLE 8' X 7' REINFORCED CONCRETE BOX CULVERT	C14-1 THRU C14-10
⑰	STA. 111+25.00 -L-	SINGLE 7' X 7' REINFORCED CONCRETE BOX CULVERT	C19-1 THRU C19-8
⑳	STA. 242+85.00 -L-	SINGLE 8' X 7' REINFORCED CONCRETE BOX CULVERT	C20-1 THRU C20-8
㉑	STA. 354+06.00 -L-	DOUBLE 7' X 7' REINFORCED CONCRETE BOX CULVERT	C21-1 THRU C21-13
W1A, W1B, W2A, W2B, W3A, W3B		RETAINING WALLS	W-1 THRU W-11
NW8		NOISE WALL	W8-1 THRU W8-4

NOTE: STRUCTURES 4 THRU 10 AND 15 THRU 18 ARE ON THE I-5987B PROJECT

PLANS PREPARED BY:

NIV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27515
P: 919.851.1912 www.NIV5.com
NC License # F-1333

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PROJECT NO. I-5987A
ROBESON COUNTY

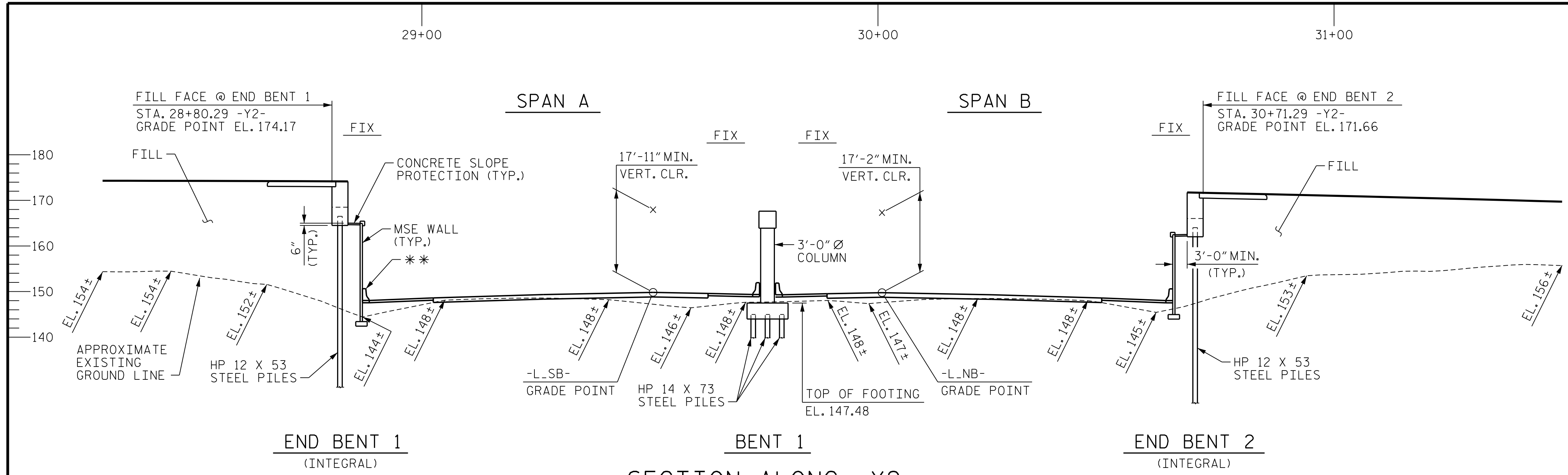
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX SHEET

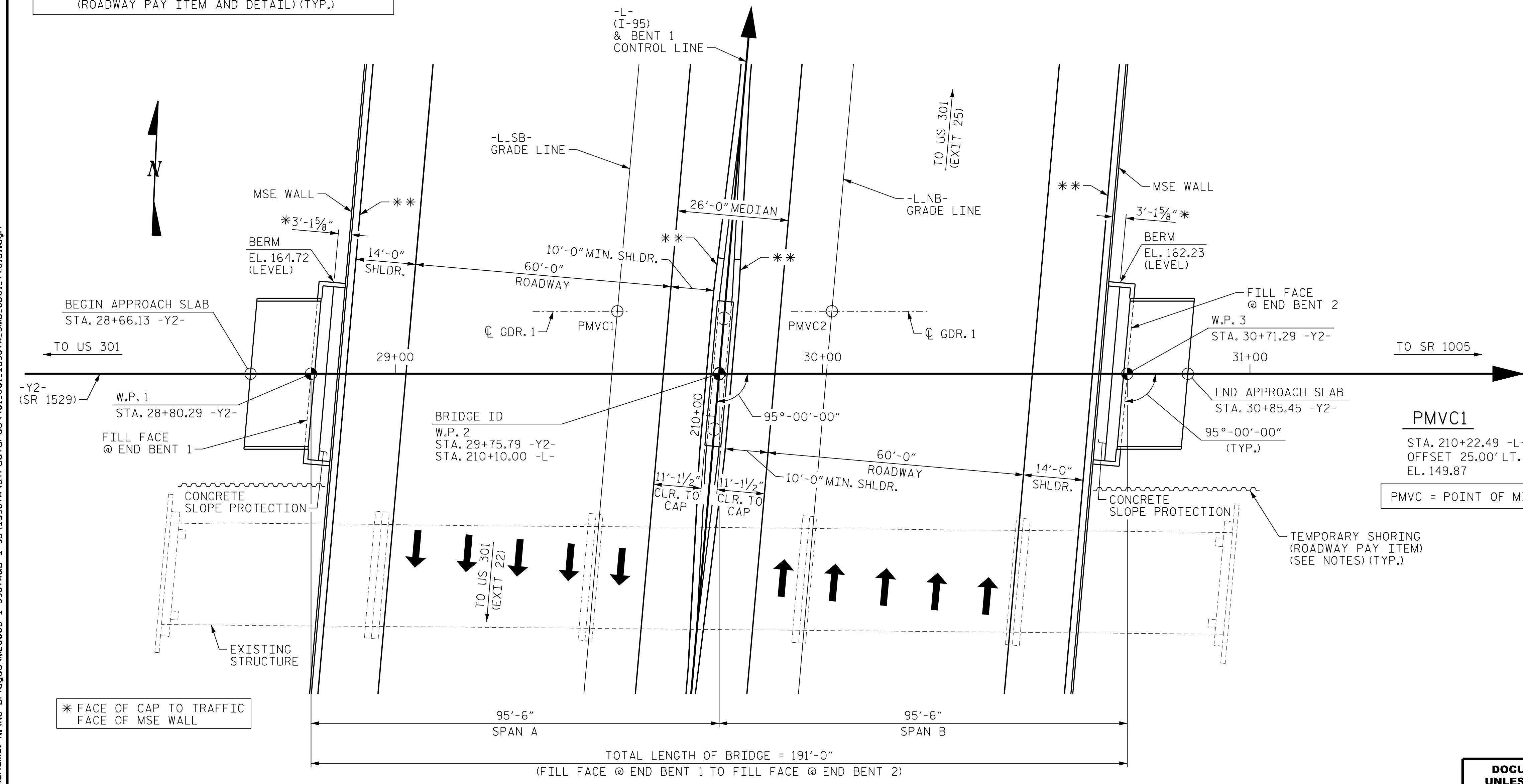


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2			4		

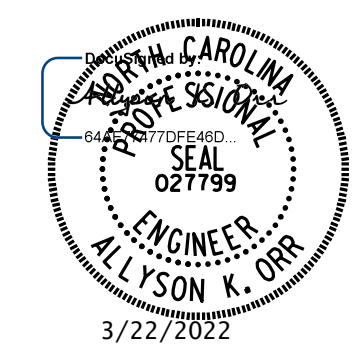
5/10/2022 3:48:02 PM G:\Projects\2019\2019\7\02\CLIENT\Structures\I-5987A (YIAN)\5987A_STR.IS.dgn



** 1'-5" WIDE, 41" SINGLE FACED PRECAST CONCRETE BARRIER RAIL WITH 1" EXP. JT. MAT'L. (ROADWAY PAY ITEM AND DETAIL) (TYP.)



PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-
210+10.00 -L-
SHEET 1 OF 2 REPLACES BRIDGE NO. 770151



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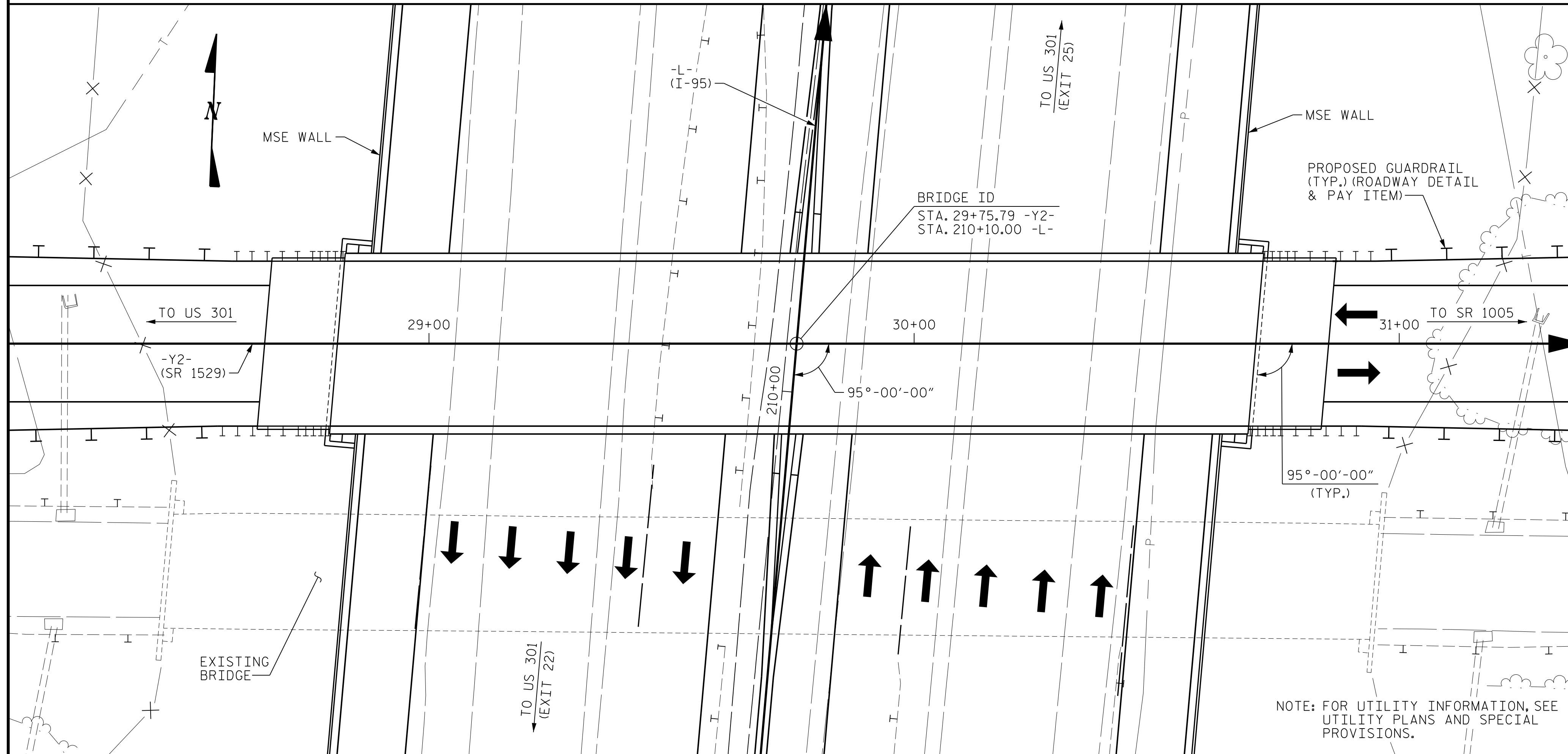
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING					
FOR BRIDGE ON SR 1529 (POWERSVILLE ROAD) OVER I-95 BETWEEN US 301 & SR 1005					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-1
TOTAL SHEETS					36

DRAWN BY: B.E. LANNING DATE: 06/2021
CHECKED BY: A.K. ORR DATE: 06/2021
DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/2022

3/22/2022 1:14:53 PM User: blanning
 Filename: N:\NC Bridges\20003 I-5987A\B I-5987A\Structures\401.001.I5987A.SMU.GD01.770151.dgn

B.M. #9: BENCH NAIL SET IN BASE OF 18" SWEET GUM; 124.27' RIGHT OF STA. 212+40.74 -L-, EL. 146.42



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 2.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- 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.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- ALL FALSEWORK AND FORMS SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST AND CURED. CONTRACTOR SHALL BE RESPONSIBLE FOR MODIFICATIONS IN THE LINK SLAB REGION.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.
- AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 5 SPANS (1 @ 50'-4", 3 @ 50'-0" AND 1 @ 50'-4") REINFORCED CONCRETE DECK WITH CLEAR ROADWAY OF 24'-0" WIDE; ON REINFORCED PRESTRESSED CONCRETE GIRDERS AND REINFORCED CONCRETE CORED SLAB UNITS; ON REINFORCED CONCRETE END BENTS AND BENTS AND LOCATED AT 47 FT. SOUTH OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING THE CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- 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 FOUNDATION NOTES, SEE "PILE FOUNDATION TABLES" SHEET.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

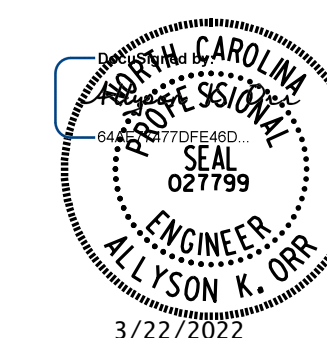
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 29+75.79 -Y2-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.
SUPERSTRUCTURE	LUMP SUM				6,988	6,759				
END BENT 1							27.0	LUMP SUM	3,504	
BENT 1			LUMP SUM				56.2	LUMP SUM	10,348	1,749
END BENT 2							27.1	LUMP SUM	3,524	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	6,988	6,759	110.3	LUMP SUM	17,376	1,749

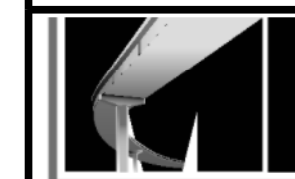
TOTAL BILL OF MATERIAL

	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LIN. FT.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	SO. YDS.	LUMP SUM
SUPERSTRUCTURE	754.24						363.44	378.65		LUMP SUM
END BENT 1		6		6	600.0				12	
BENT 1			18		18	1170.0				
END BENT 2		6		6	510.0				12	
TOTAL	754.24	12	18	12	1110.0	18	1170.0	15	24	LUMP SUM

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-
210+10.00 -L-
 SHEET 2 OF 2



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

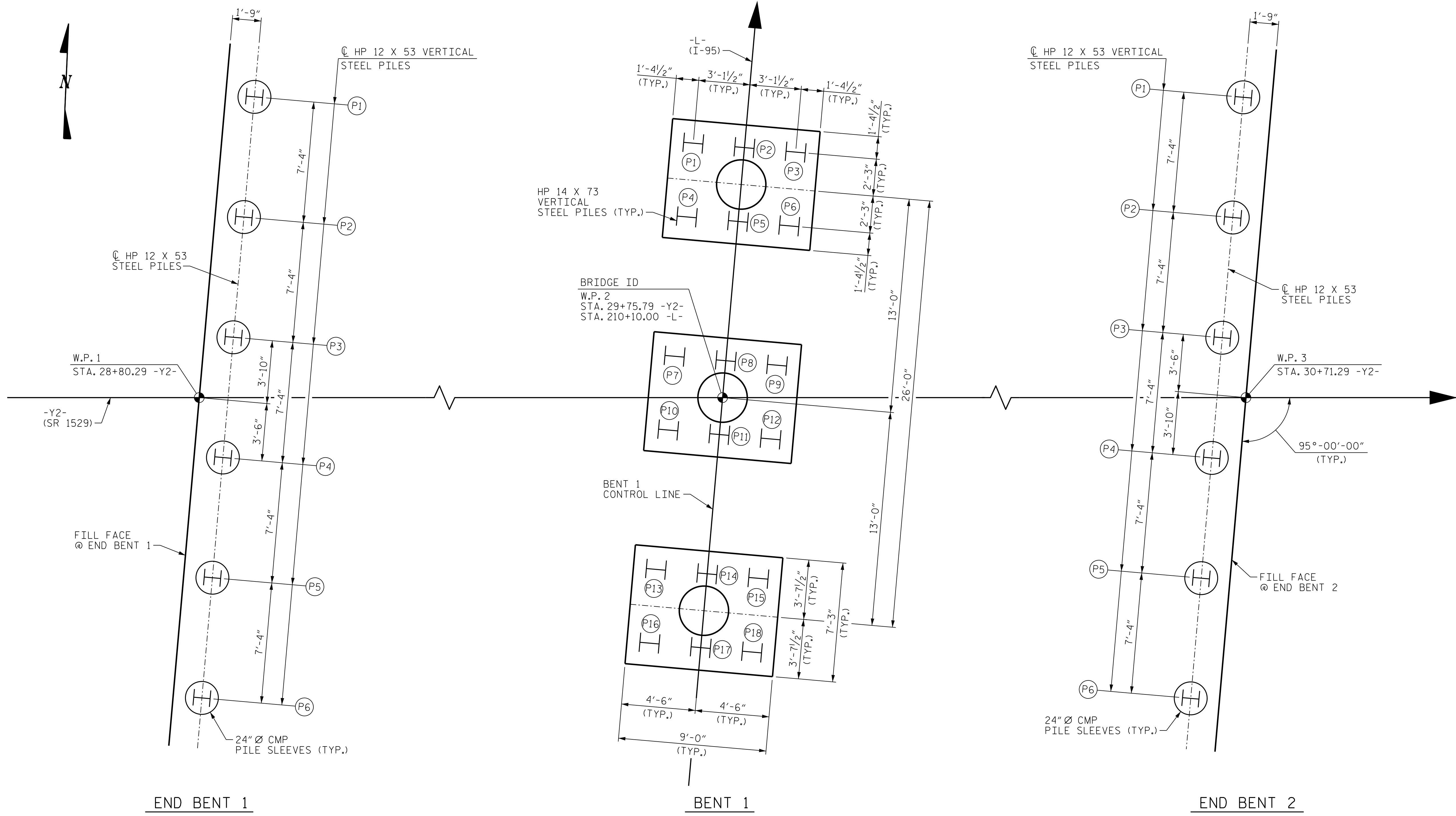
FOR BRIDGE ON SR 1529
 (POWERSVILLE ROAD)
 OVER I-95 BETWEEN
 US 301 & SR 1005

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-2 TOTAL SHEETS 36
2			4			

DRAWN BY : B.E. LANNING DATE : 06/2021
 CHECKED BY : A.K. ORR DATE : 06/2021
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

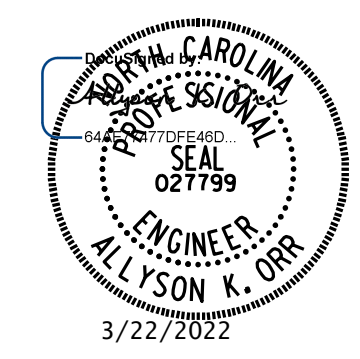
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FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP OR FOOTING.
 FOR FOUNDATION NOTES, SEE "PILE FOUNDATION TABLES" SHEET.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
FOUNDATION LAYOUT

DRAWN BY : B.E. LANNING DATE : 06/2021
 CHECKED BY : A.K. ORR DATE : 11/2021
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-3 TOTAL SHEETS 36
2			4			

SUMMARY OF PILE INFORMATION/ INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) # (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
END BENT 1, Piles 1-6	120	166.22	100		160	3							
BENT 1, Piles 1-18	150	144.98	65		200	9							
END BENT 2, Piles 1-6	120	163.73	85		160	3							

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

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

SUMMARY OF PDA/ PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
END BENT 1, Piles 1-6	YES	105	2		
BENT 1, Piles 1-18	YES	70			
END BENT 2, Piles 1-6	MAYBE	90			

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

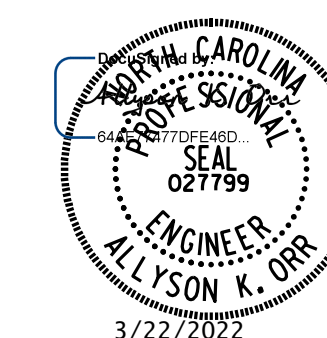
End Bent/ Bent No, Pile(s) # (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
END BENT 1, Piles 1-6	120			0.75			1.00
BENT 1, Piles 1-18	150			0.75			1.00
END BENT 2, Piles 1-6	120			0.75			1.00

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

NOTES:

1. THE PILE FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (ABNER F. RIGGS 014155) ON 11-04-2021.
2. TOTAL PILE DRIVING EQUIPMENT SETUP QUANTITY (NOT SHOWN IN PILE FOUNDATION TABLES) EQUALS THE NUMBER OF DRIVEN PILES, I.E., THE NUMBER OF PILES WITH A REQUIRED DRIVING RESISTANCE.
3. FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
4. SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 1 AND END BENT 2.
5. INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT 1 AND END BENT 2. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE REINFORCED BRIDGE APPROACH FILL TO WITHIN 1 FT OF THE FINAL GRADE ELEVATION. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PIPES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS. FOR PILE SLEEVES, SEE MSE RETAINING WALL PLANS AND PROVISION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
6. FOR REINFORCED BRIDGE APPROACH FILL, SEE APPROACH FILL FOR INTEGRAL ABUTMENT AT MSE WALLS (SPECIAL) PROVISION.

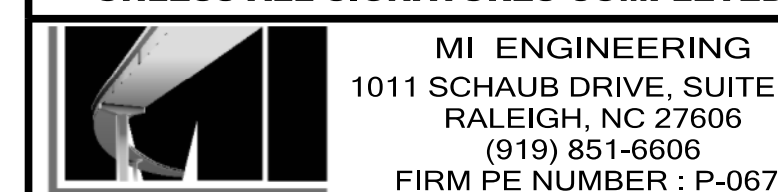
PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PILE FOUNDATION TABLES

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-4
2			4			TOTAL SHEETS 36

DRAWN BY : B.E. LANNING	DATE : 11/2021
CHECKED BY : A.K. ORR	DATE : 11/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

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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			
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.39	--	1.75	0.877	1.58	A	E	42.1	0.962	1.61	A	I	16.8	0.80	0.877	1.39	A	E	42.1		
	HL-93 (OPERATING)	N/A		2.05	--	1.35	0.877	2.05	A	E	42.1	0.962	2.14	A	I	16.8	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.00	2	1.91	68.76	1.75	0.877	2.18	A	E	42.1	0.962	2.12	A	I	16.8	0.80	0.877	1.91	A	E	42.1		
	HS-20 (OPERATING)	36.00		2.79	100.44	1.35	0.877	2.82	A	E	42.1	0.962	2.79	A	I	16.8	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		4.51	60.89	1.40	0.877	6.44	A	E	42.1	0.962	6.73	A	I	16.8	0.80	0.877	4.51	A	E	42.1		
		SNGARBS2	20.00		3.27	65.40	1.40	0.877	4.67	A	E	42.1	0.962	4.70	A	I	16.8	0.80	0.877	3.27	A	E	42.1	
		SNAGRIS2	22.00		3.05	67.10	1.40	0.877	4.36	A	E	42.1	0.962	4.34	A	I	16.8	0.80	0.877	3.05	A	E	42.1	
		SNCOTTS3	27.25		2.23	60.77	1.40	0.877	3.18	A	E	42.1	0.962	3.28	A	I	16.8	0.80	0.877	2.23	A	E	42.1	
		SNAGGRS4	34.93		1.83	63.91	1.40	0.877	2.62	A	E	42.1	0.962	2.67	A	I	16.8	0.80	0.877	1.83	A	E	42.1	
		SNS5A	35.55		1.80	63.99	1.40	0.877	2.56	A	E	42.1	0.962	2.69	A	I	16.8	0.80	0.877	1.80	A	E	42.1	
		SNS6A	39.95		1.64	65.52	1.40	0.877	2.33	A	E	42.1	0.962	2.43	A	I	16.8	0.80	0.877	1.64	A	E	42.1	
	SNS7B	42.00		1.56	65.52	1.40	0.877	2.22	A	E	42.1	0.962	2.37	A	I	16.8	0.80	0.877	1.56	A	E	42.1		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.00		1.99	65.67	1.40	0.877	2.84	A	E	42.1	0.962	2.93	A	I	16.8	0.80	0.877	1.99	A	E	42.1	
		TNT4A	33.08		1.99	65.82	1.40	0.877	2.85	A	E	42.1	0.962	2.86	A	I	16.8	0.80	0.877	1.99	A	E	42.1	
		TNT6A	41.60		1.62	67.39	1.40	0.877	2.31	A	E	42.1	0.962	2.52	A	I	16.8	0.80	0.877	1.62	A	E	42.1	
		TNT7A	42.00		1.62	68.04	1.40	0.877	2.31	A	E	42.1	0.962	2.47	A	I	16.8	0.80	0.877	1.62	A	E	42.1	
		TNT7B	42.00		1.66	69.72	1.40	0.877	2.36	A	E	42.1	0.962	2.32	A	I	16.8	0.80	0.877	1.66	A	E	42.1	
		TNAGRIT4	43.00		1.59	68.37	1.40	0.877	2.27	A	E	42.1	0.962	2.25	A	I	16.8	0.80	0.877	1.59	A	E	42.1	
TNAGRT5A		45.00		1.51	67.95	1.40	0.877	2.15	A	E	42.1	0.962	2.22	A	I	16.8	0.80	0.877	1.51	A	E	42.1		
TNAGRT5B	45.00		3	1.49	67.05	1.40	0.877	2.13	A	E	42.1	0.962	2.13	A	I	16.8	0.80	0.877	1.49	A	E	42.1		

LOAD FACTORS:

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

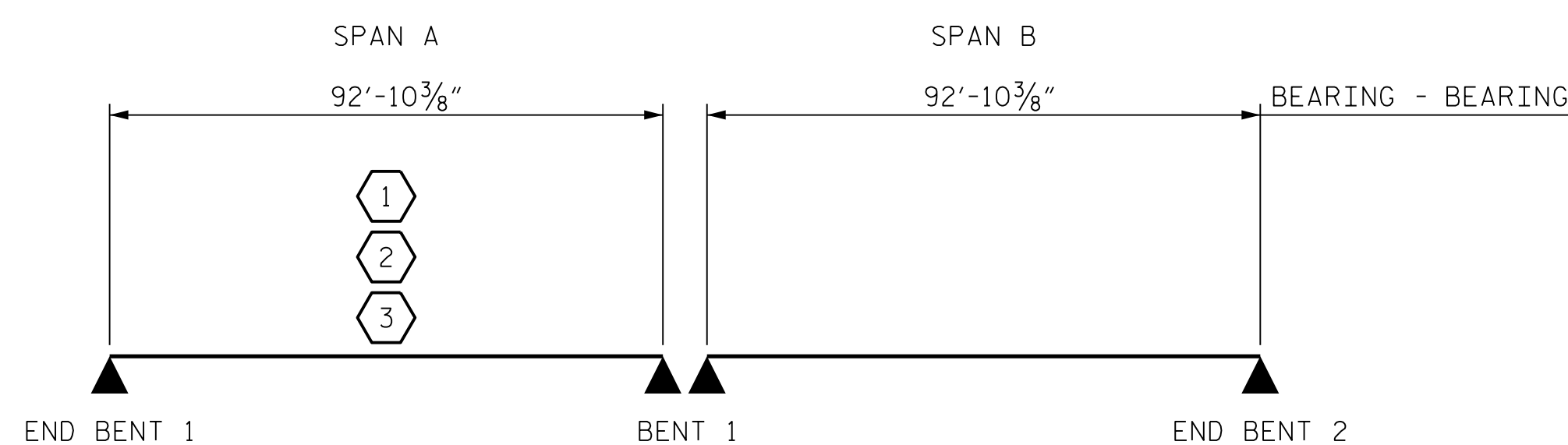
NOTES:

- MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
- ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.
- DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM C BEARING.

COMMENTS:

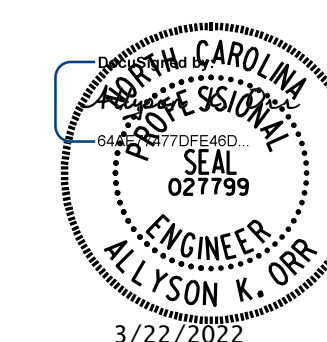
- BARRIER LOADS DISTRIBUTED ACCORDING TO NCDOT DESIGN MANUAL SECTION 2.1.2.1.
- THE GIRDERS ARE ASSUMED TO BE SIMPLY SUPPORTED. FIXITY AT INTEGRAL END BENTS IS NOT CONSIDERED.
- SPANS ARE EQUAL. RATINGS FOR SPAN B ARE SIMILAR TO SPAN A.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
**	SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION	
I	INTERIOR GIRDER
E	EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-5					TOTAL SHEETS 36

ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 06/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY: GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES:

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

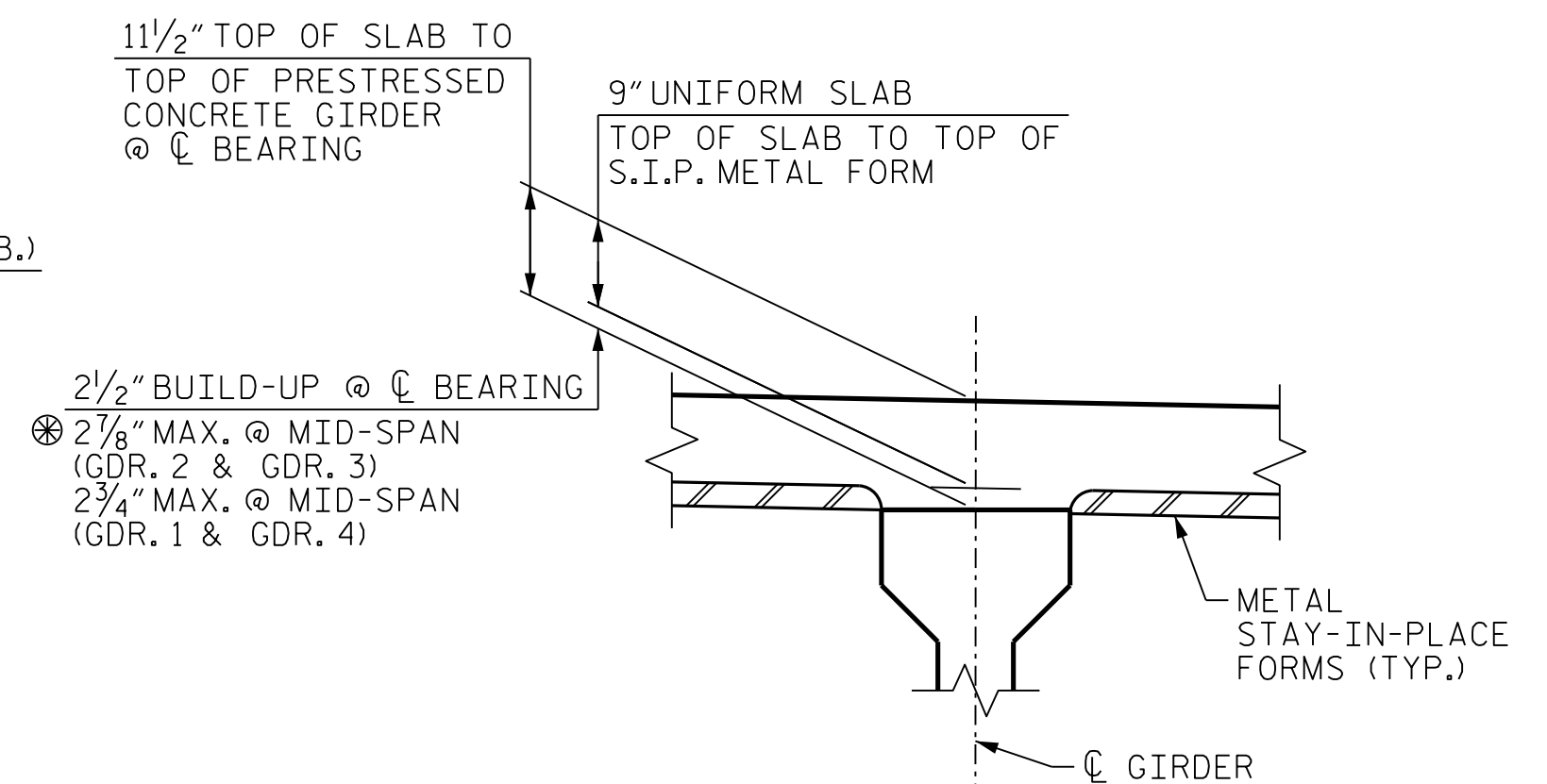
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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 DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

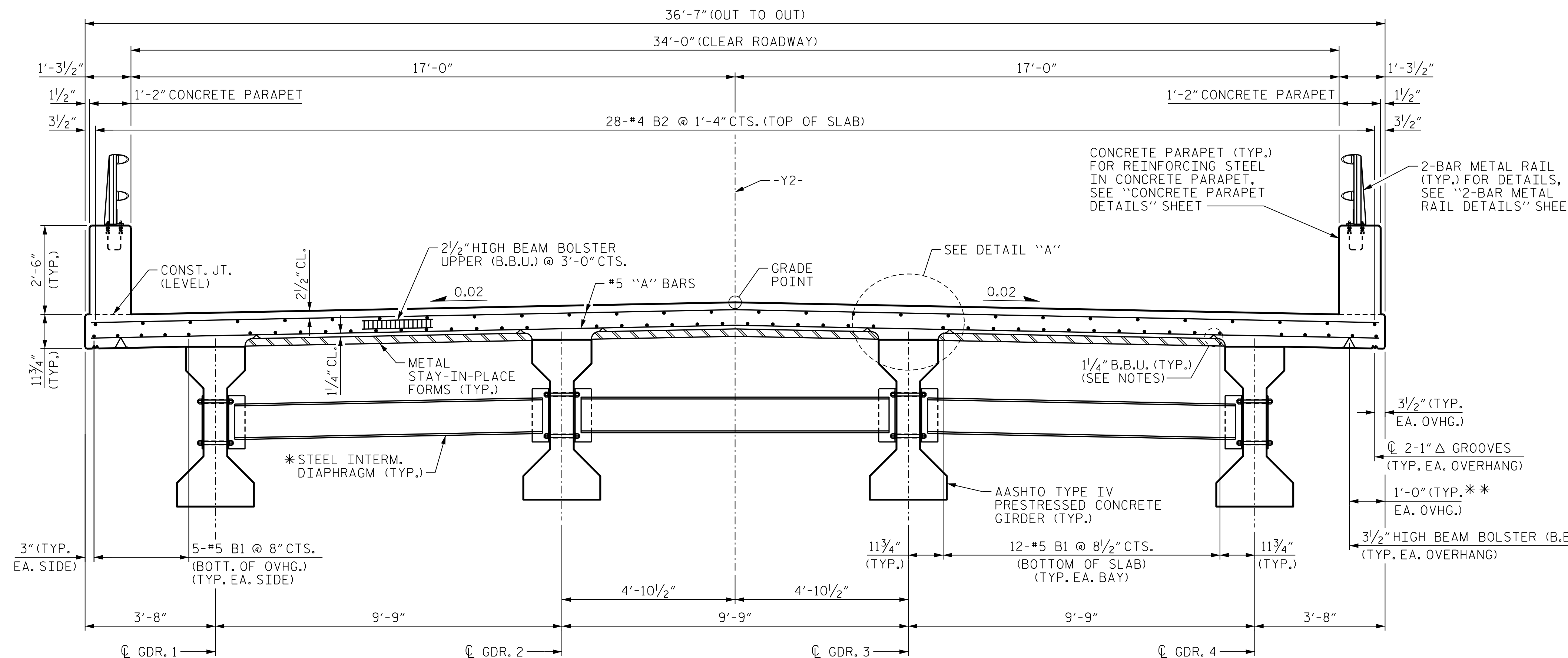
* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.

** ADJUST LOCATION OF MID-SPAN BEAM BOLSTERS AS NEEDED TO MAINTAIN BAR CLEARANCES.

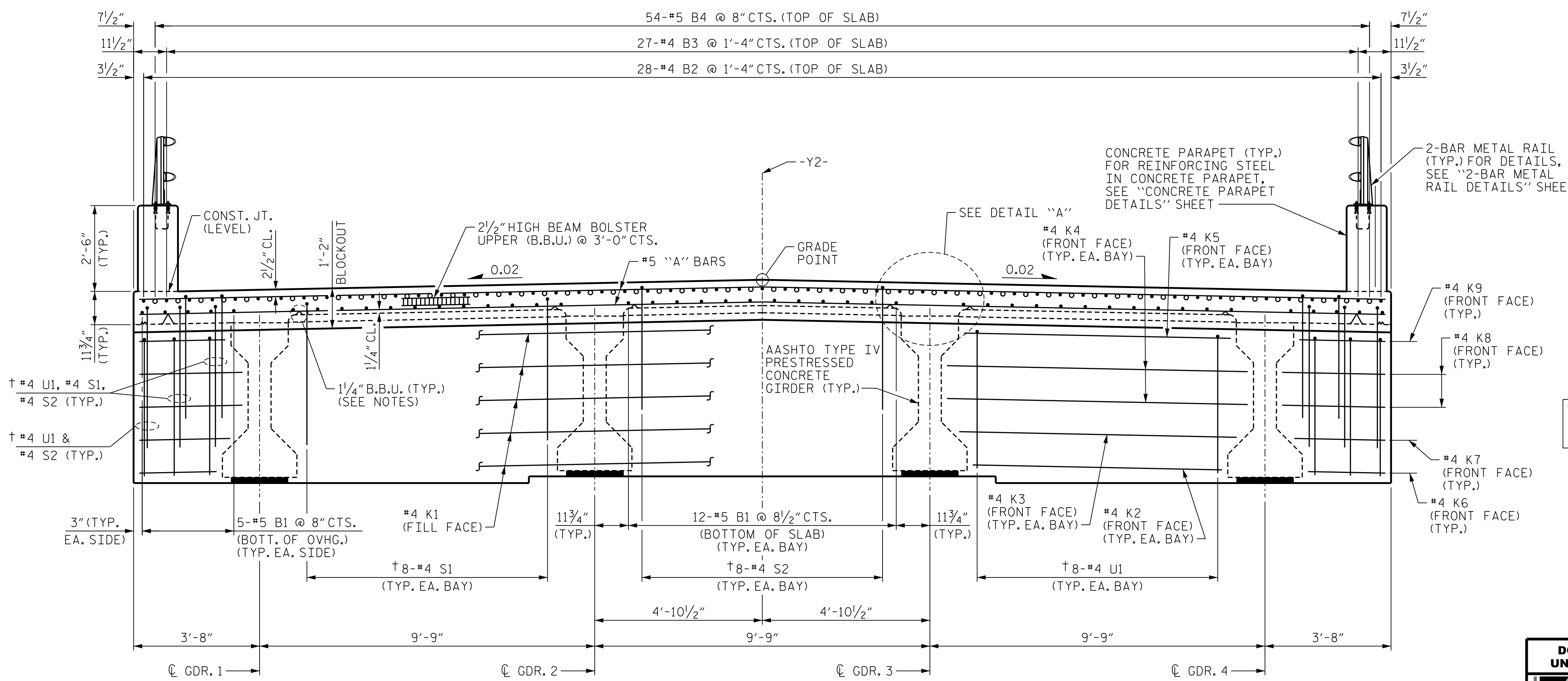


DETAIL "A"

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



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



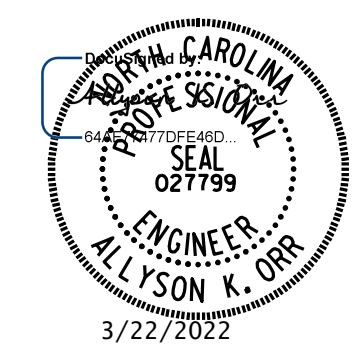
TYPICAL SECTION AT INTEGRAL END BENT

(FOR ADDITIONAL DIMENSIONS, SEE TYPICAL SECTION ABOVE)

† #4 S1, #4 S2, AND #4 U1 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 3



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
 1011 SCHAUH DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION AT
 INTERMEDIATE DIAPHRAGM
 AND INTEGRAL END BENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-6 TOTAL SHEETS 36
2			4			

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DRAWN BY: B.E. LANNING DATE: 02/2021
 CHECKED BY: A.K. ORR DATE: 03/2021
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/2022

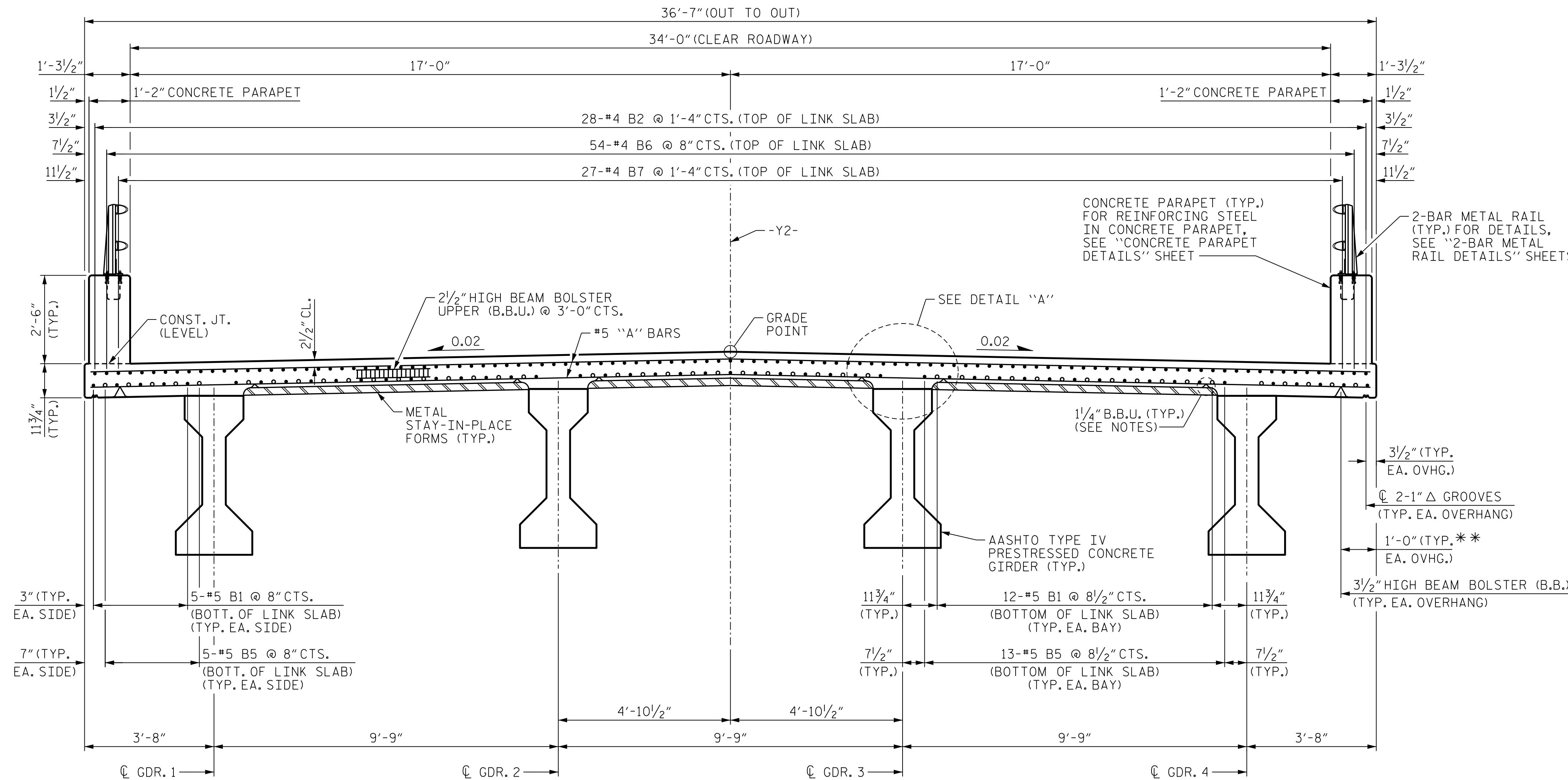
NOTES:

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 3.

** ADJUST LOCATION OF MID-SPAN BEAM BOLSTERS AS NEEDED TO MAINTAIN BAR CLEARANCES.

FOR DETAIL "A", SEE SHEET 1 OF 3.

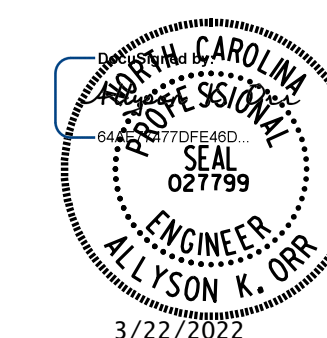
NO WELDING OF FORMS OR FALSEWORK WILL BE PERMITTED IN THE LINK SLAB AREA.



TYPICAL SECTION AT LINK SLAB REGION OVER INTERIOR BENT

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 AT LINK SLAB REGION
 OVER INTERIOR BENT

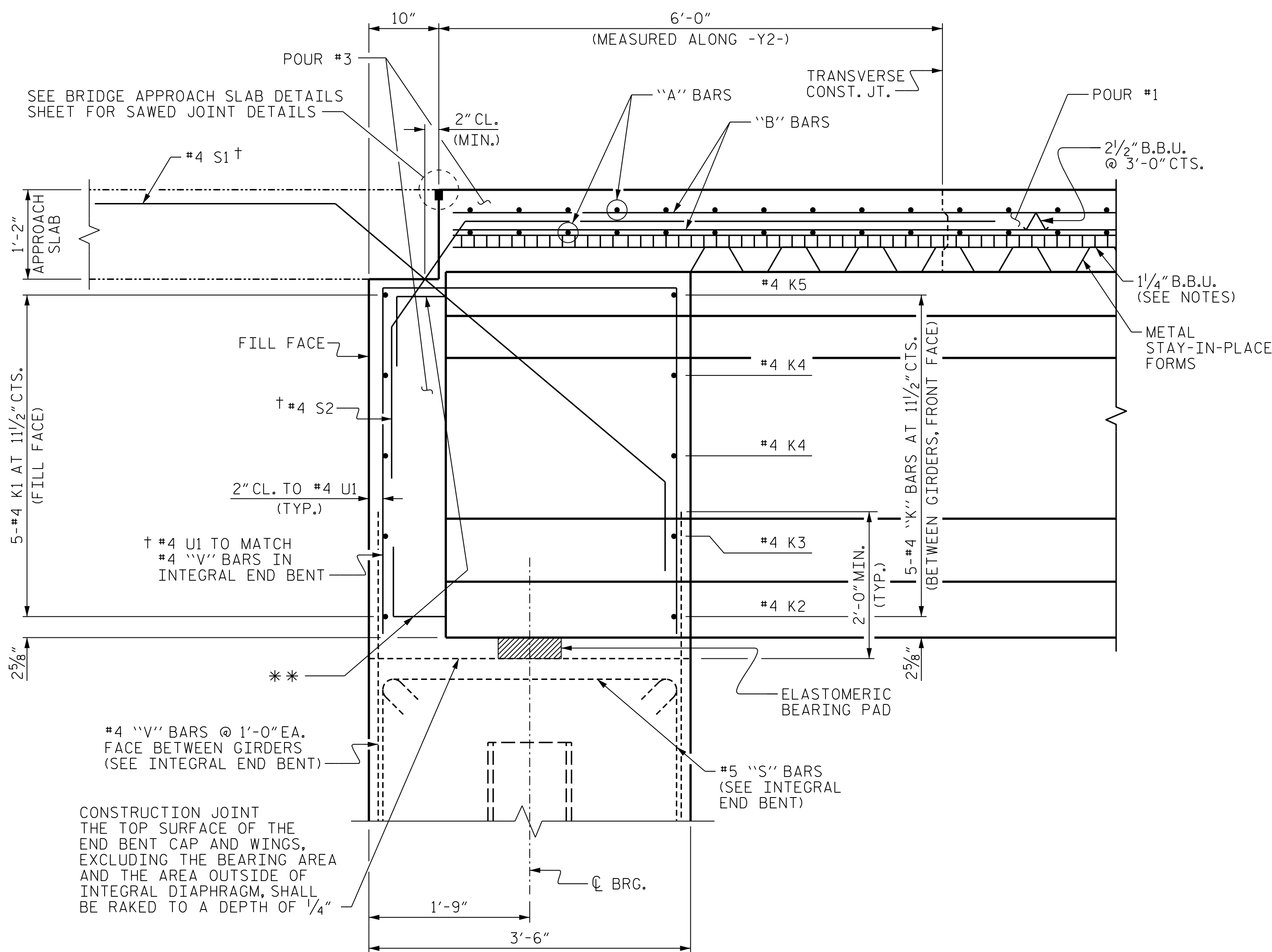
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-7
1			3			TOTAL SHEETS
2			4			36

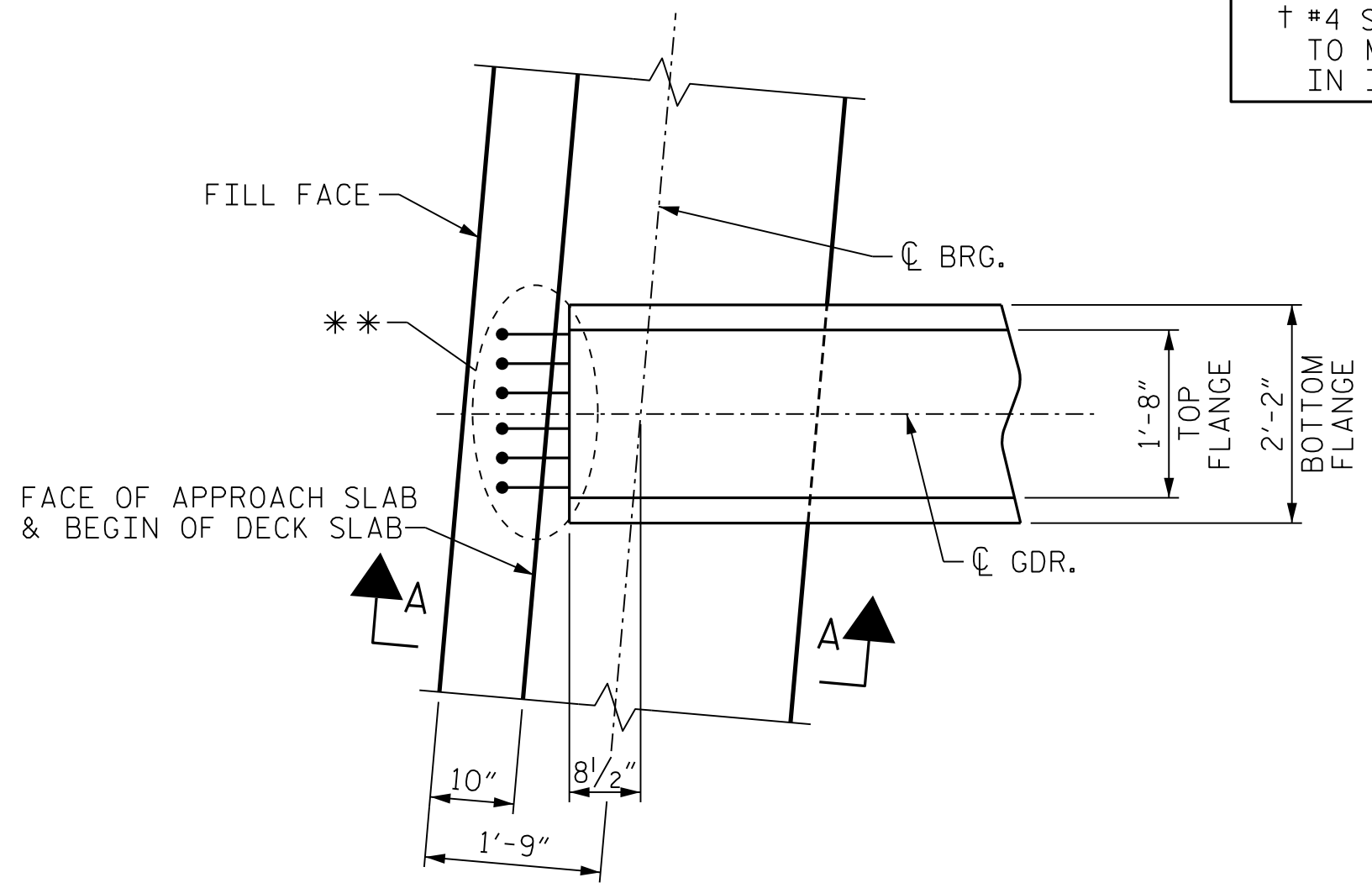
DRAWN BY : B.E. LANNING DATE : 02/2021
 CHECKED BY : A.K. ORR DATE : 03/2021
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

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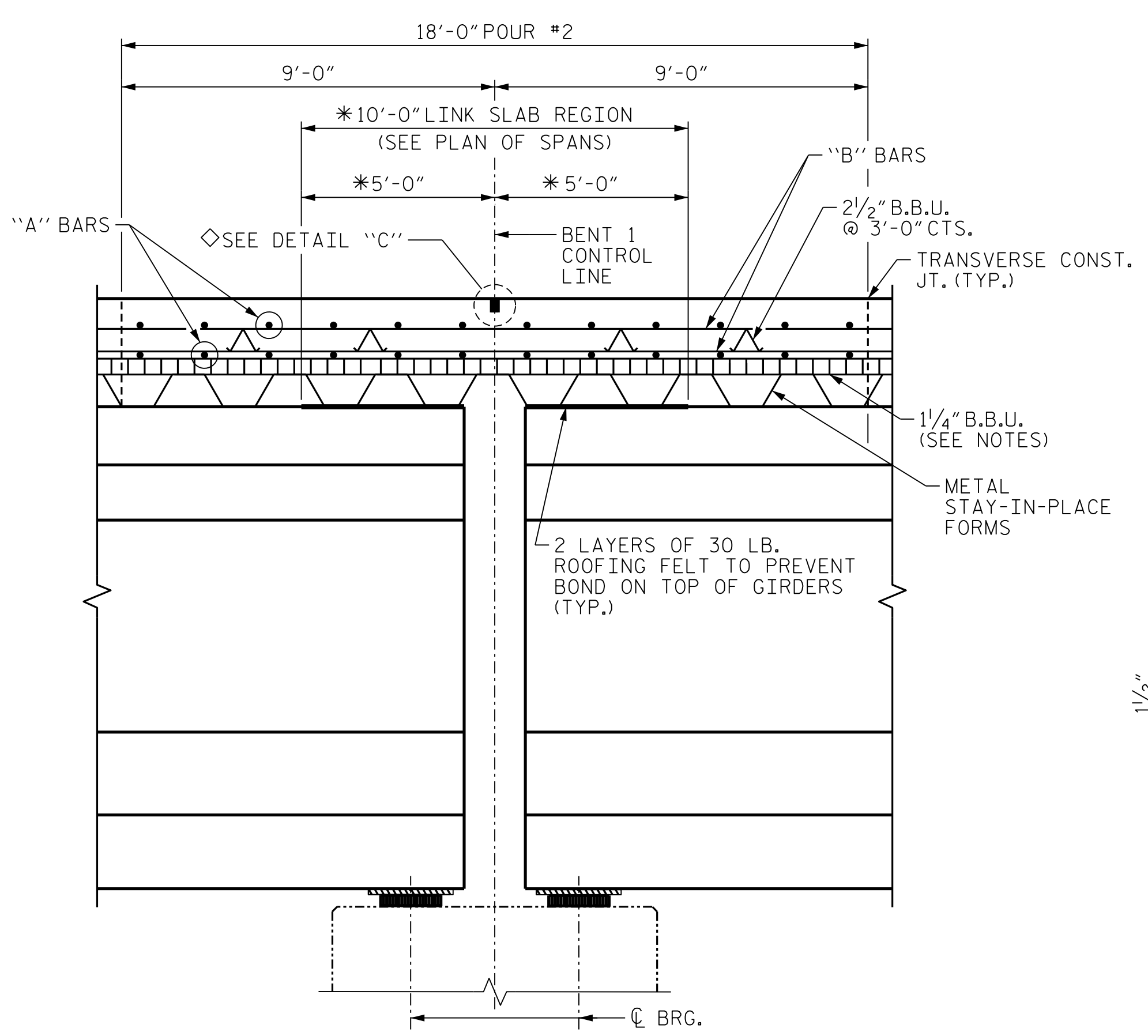


SECTION A-A
INTEGRAL END BENT

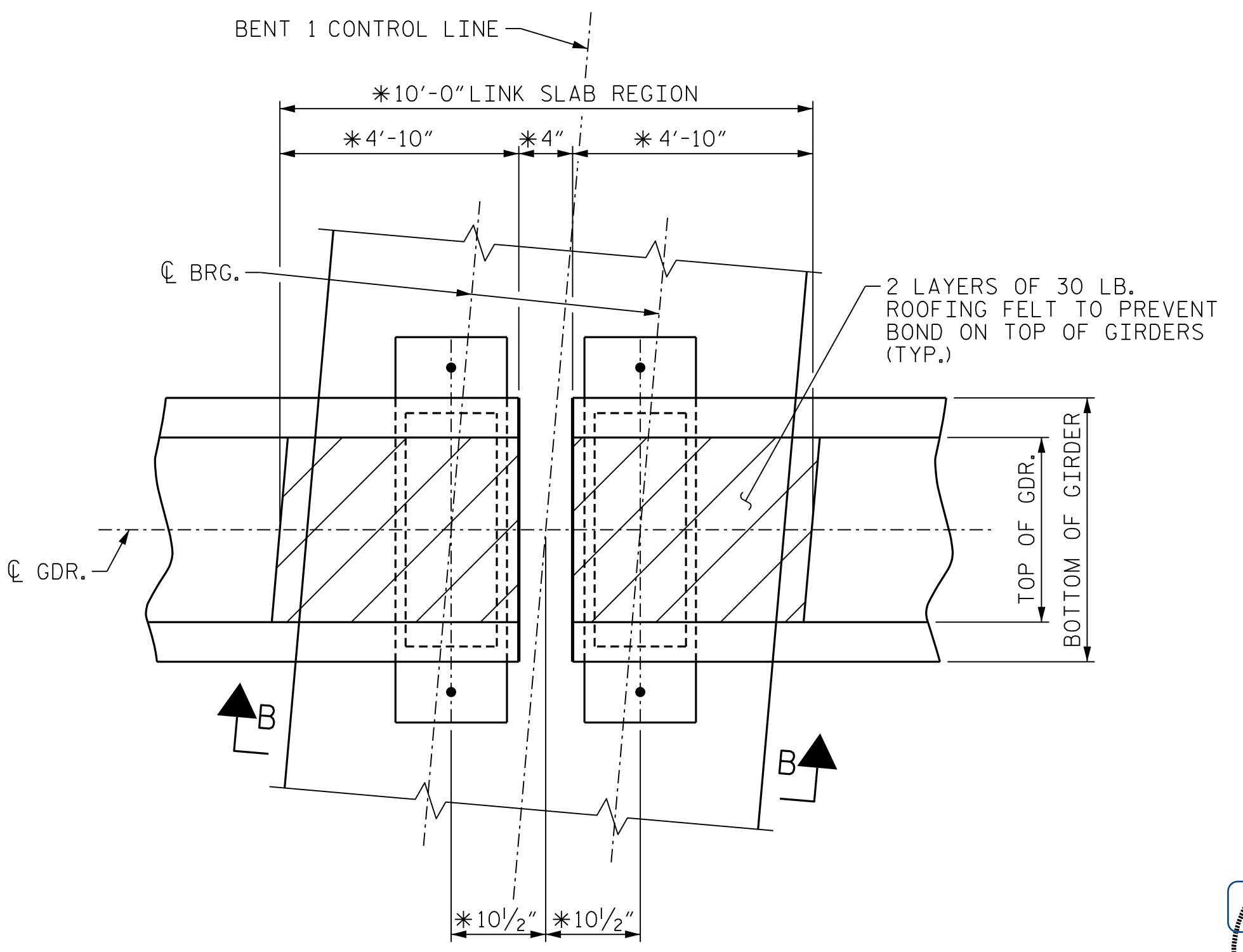
* MEASURED ALONG C GIRDER
 ** #5 "S" BARS (TYP.) (SEE GIRDER SHEETS)
 † #4 S1, #4 S2, AND #4 U1 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.



PLAN OF GIRDER AT INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



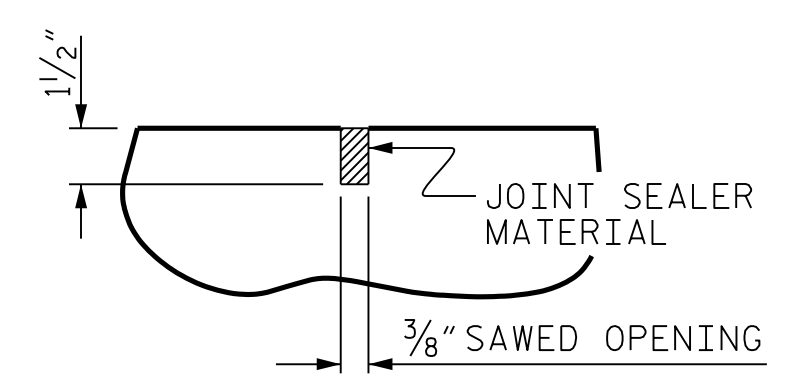
SECTION B-B
SECTION SHOWN ALONG GIRDER



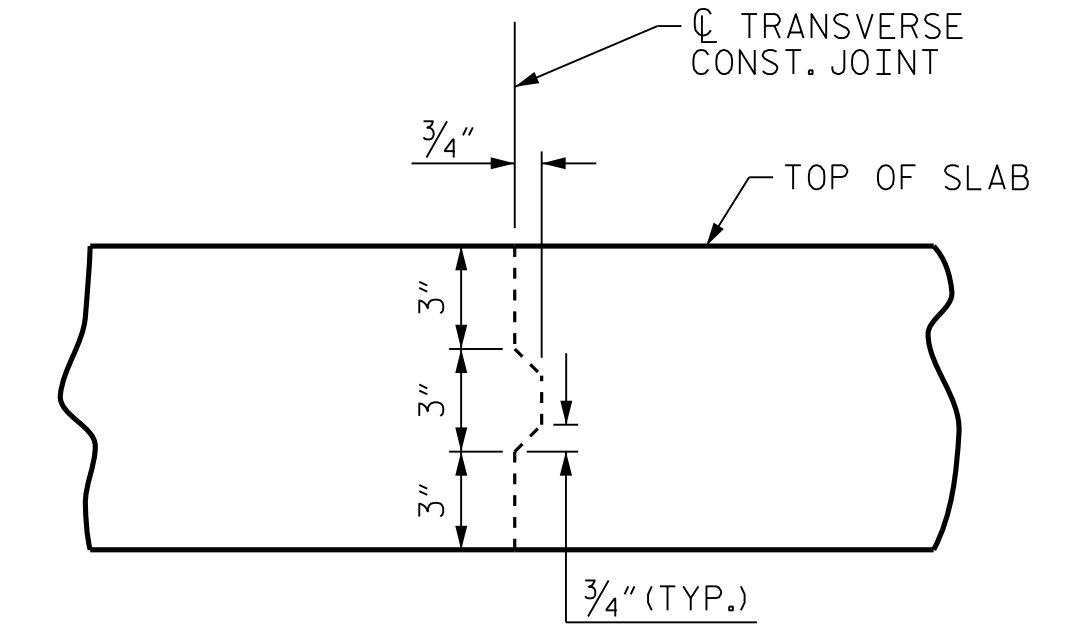
PLAN OF GIRDER AT INTERIOR BENT

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.

◊ 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.



DETAIL "C"

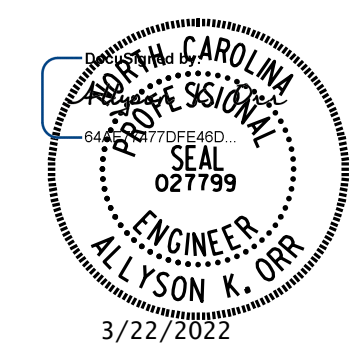


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 3



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

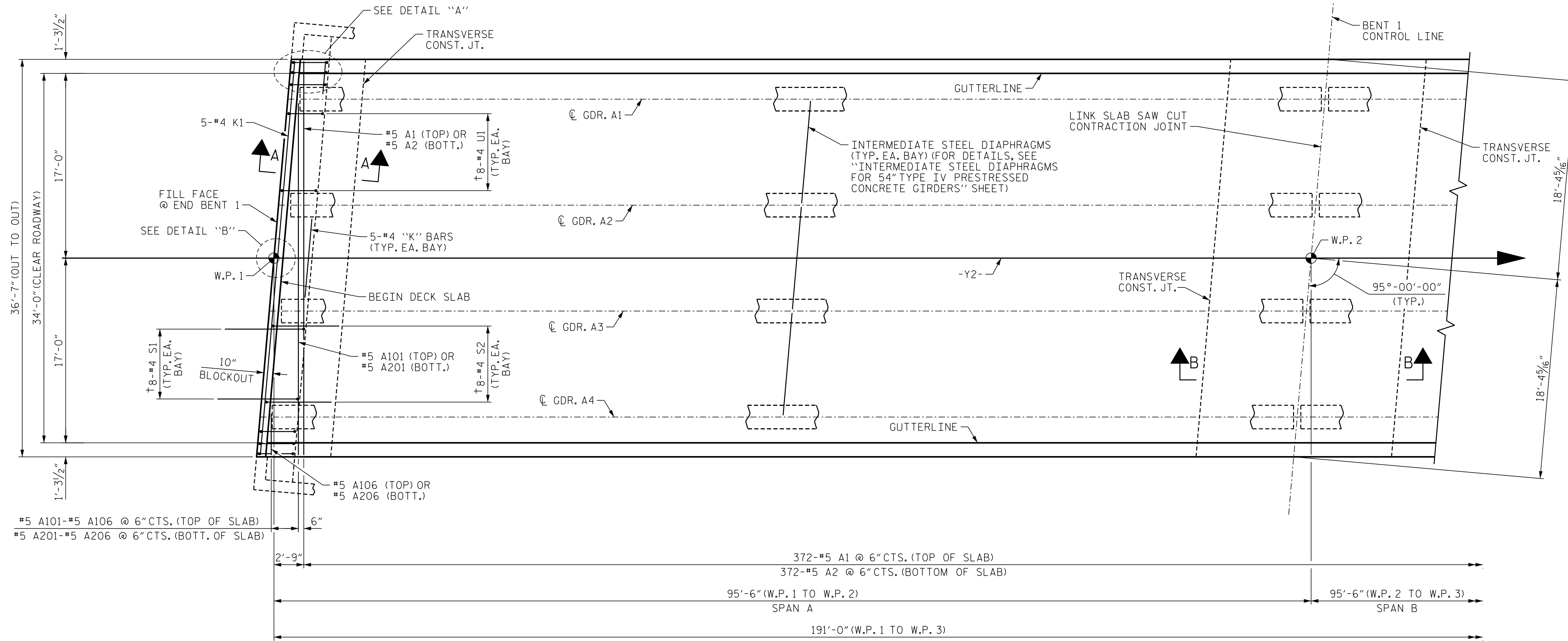
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-8
1			3			TOTAL SHEETS
2			4			36

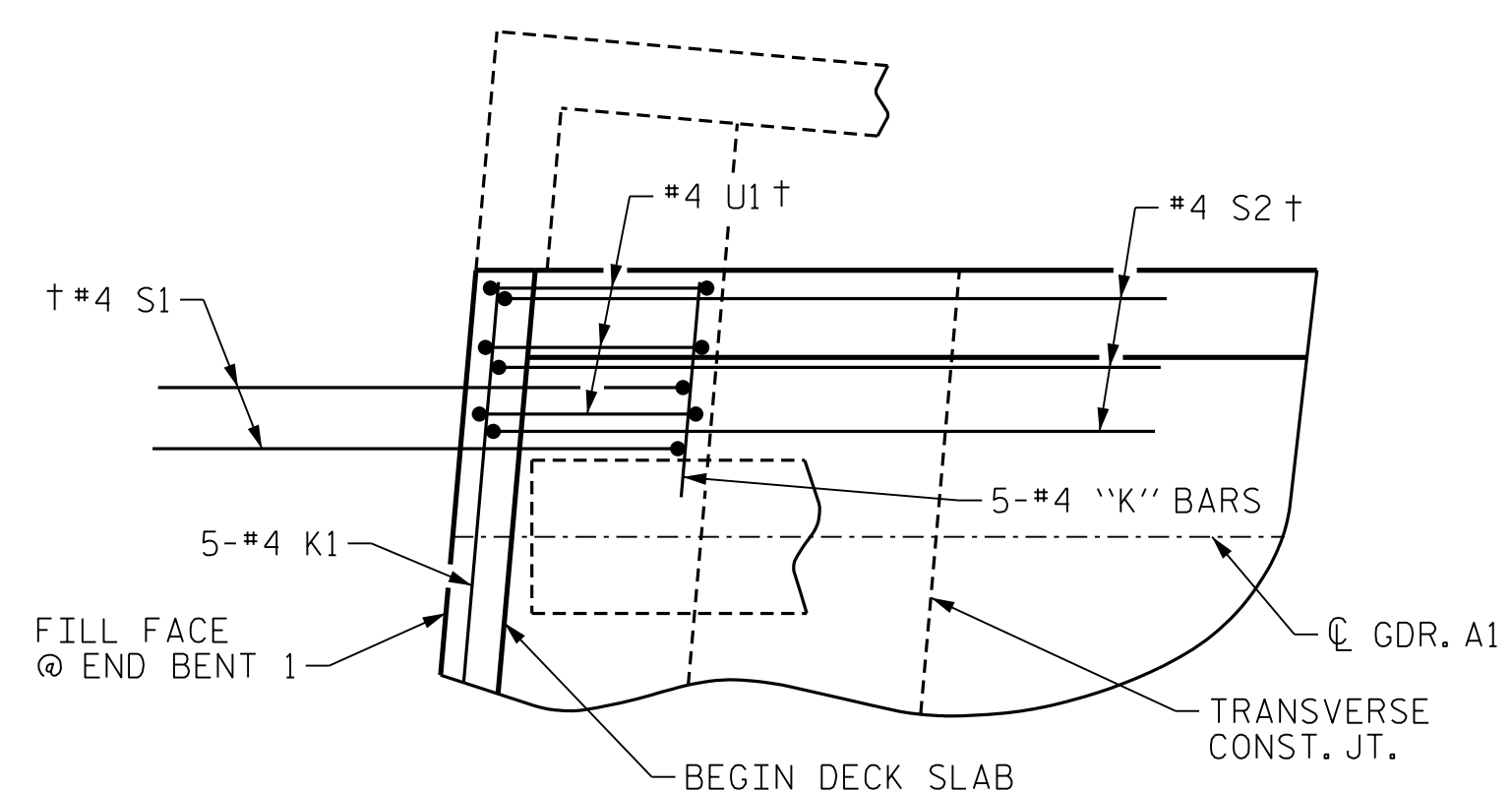
DRAWN BY : B.E. LANNING	DATE : 02/2021
CHECKED BY : A.K. ORR	DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

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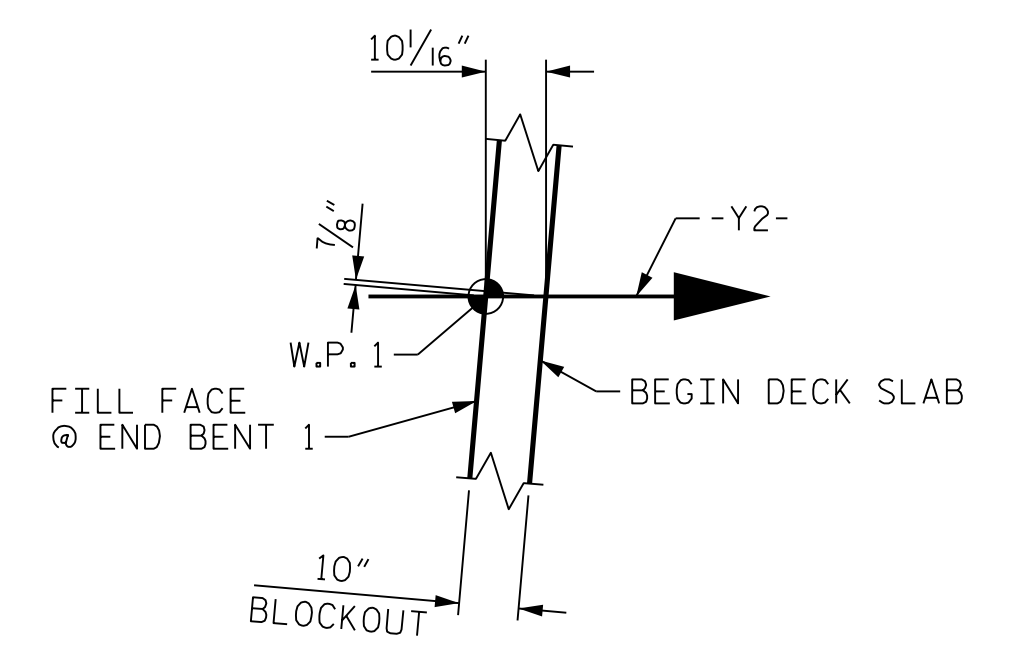
PLAN OF SPAN A

- NOTES:**
- FOR REINFORCING STEEL IN CONCRETE PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
 - FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.
 - FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
 - FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.
 - † #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
 - FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 3 OF 3.
 - FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
 - FOR LOCATION OF LINK SLAB SAW CUT CONTRACTION JOINT, SEE SECTION B-B ON "SUPERSTRUCTURE TYPICAL SECTION, SHEET 3 OF 3".
 - LINK SLAB SAW CUT CONTRACTION JOINT EXTENDS TO THE EDGE OF DECK ON BOTH SIDES.



DETAIL "A"

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

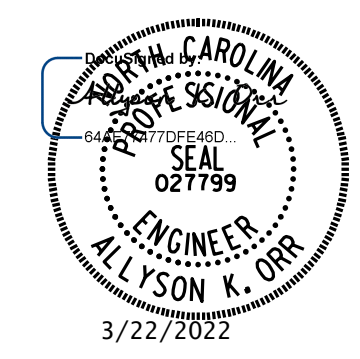


DETAIL "B"

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-

SHEET 1 OF 3

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



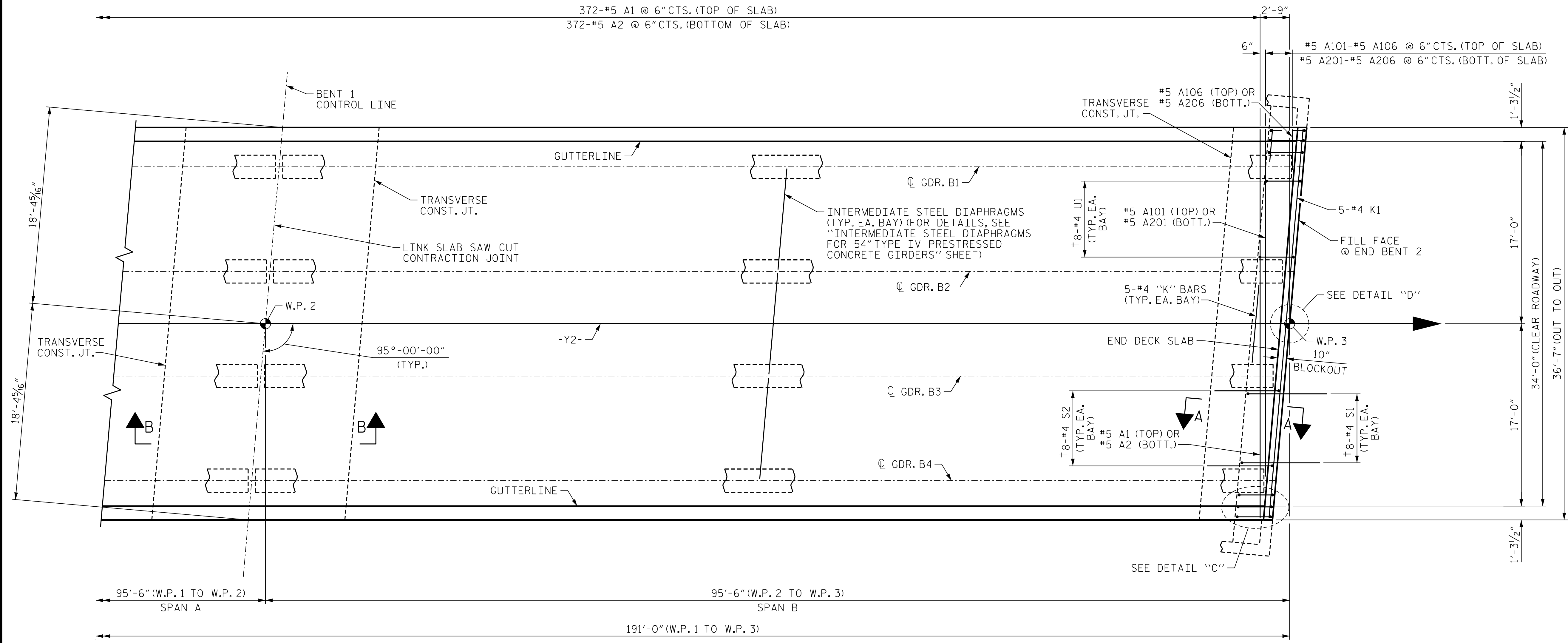
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-9
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : B.E. LANNING	DATE : 02/2021
CHECKED BY : A.K. ORR	DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

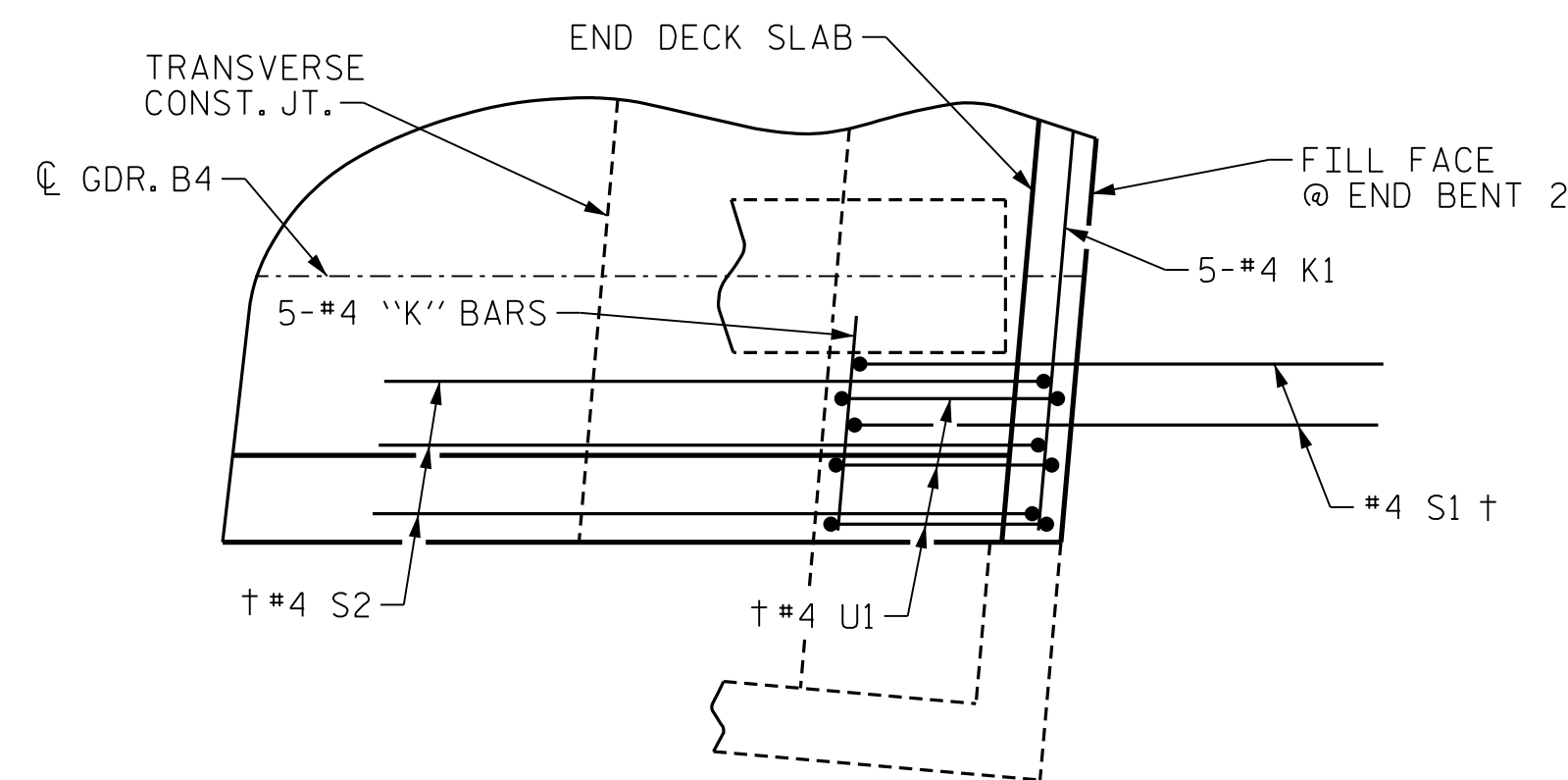
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PLAN OF SPAN B

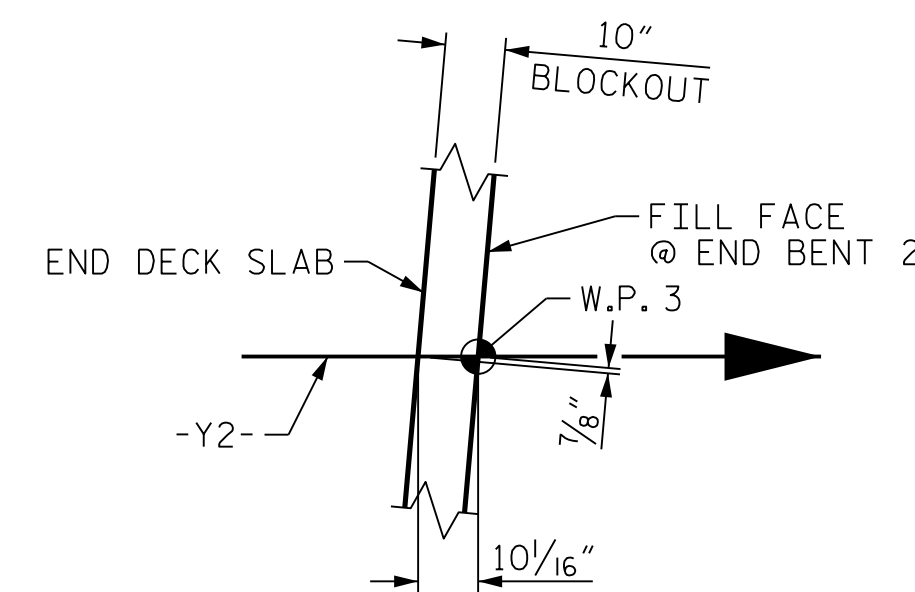
NOTES:

- FOR REINFORCING STEEL IN CONCRETE PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
- FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.
- † #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 3 OF 3.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.
- FOR LOCATION OF LINK SLAB SAW CUT CONTRACTION JOINT, SEE SECTION B-B ON "SUPERSTRUCTURE TYPICAL SECTION, SHEET 3 OF 3".
- LINK SLAB SAW CUT CONTRACTION JOINT EXTENDS TO THE EDGE OF DECK ON BOTH SIDES.



DETAIL "C"

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

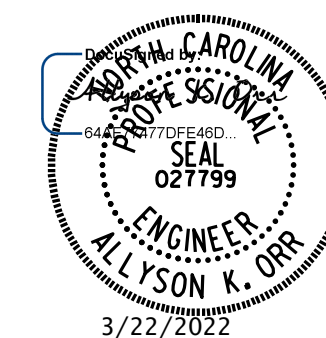


DETAIL "D"

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 SPAN B



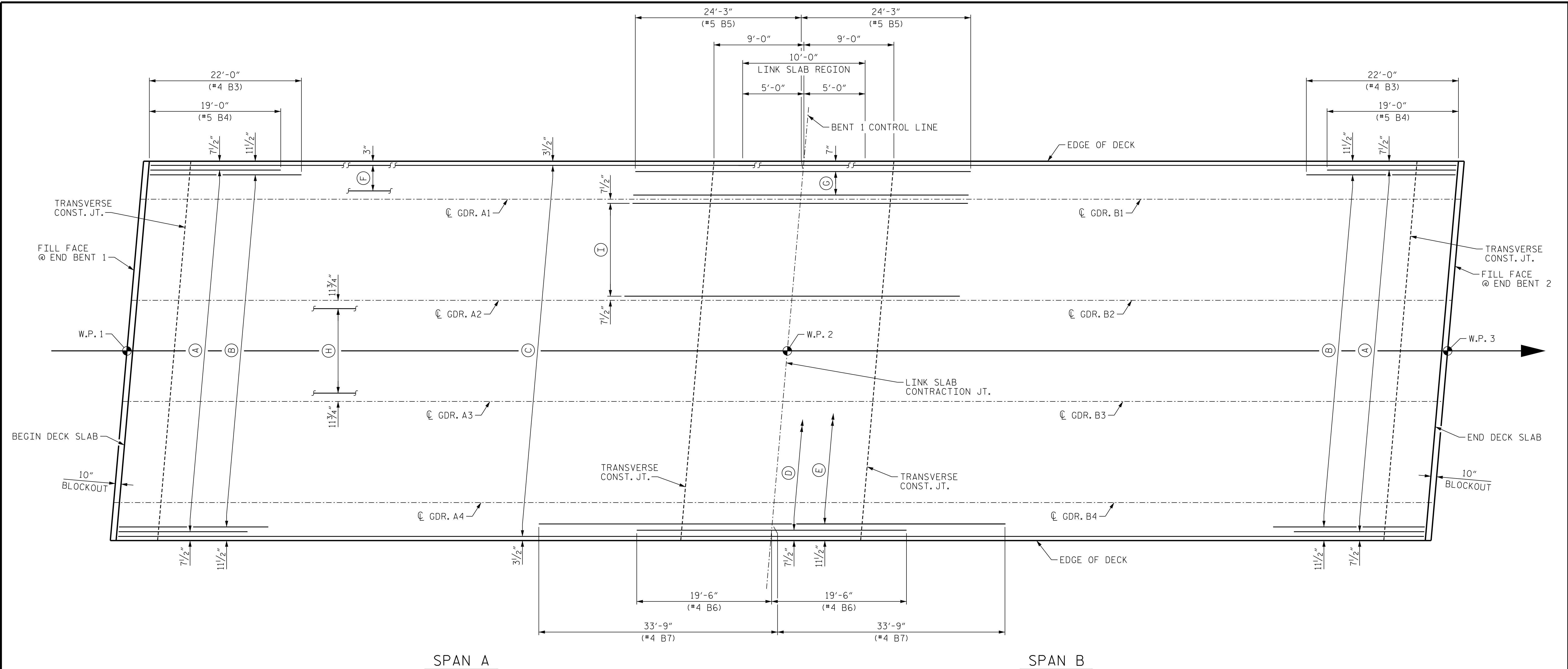
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-10 TOTAL SHEETS 36
2			4			

DRAWN BY : B.E. LANNING	DATE : 02/2021
CHECKED BY : A.K. ORR	DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

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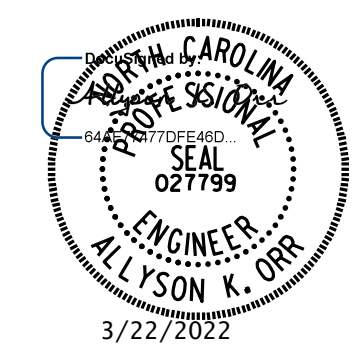
PLAN - "B" BAR LAYOUT

(GUTTERLINE NOT SHOWN FOR CLARITY)

- (A) 54-#5 B4 @ 8" CTS. (TOP OF SLAB)
- (B) 27-#4 B3 @ 1'-4" CTS. (TOP OF SLAB)
- (C) 28-#4 B2 @ 1'-4" CTS. (TOP OF SLAB) (5 BAR RUN) (1'-11" MIN. SPLICE)
- (D) 54-#4 B6 @ 8" CTS. (TOP OF LINK SLAB)
- (E) 27-#4 B7 @ 1'-4" CTS. (TOP OF LINK SLAB) (3 BAR RUN) (1'-11" MIN. SPLICE)
- (F) 5-#5 B1 @ 8" CTS. (BOTTOM OF SLAB) (5 BAR RUN) (2'-0" MIN. SPLICE) (TYP. EACH OVERHANG)
- (G) 5-#5 B5 @ 8" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH OVERHANG)
- (H) 12-#5 B1 @ 8 1/2" CTS. (BOTTOM OF SLAB) (5 BAR RUN) (2'-0" MIN. SPLICE) (TYP. EACH BAY)
- (I) 13-#5 B5 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 "B" BAR LAYOUT

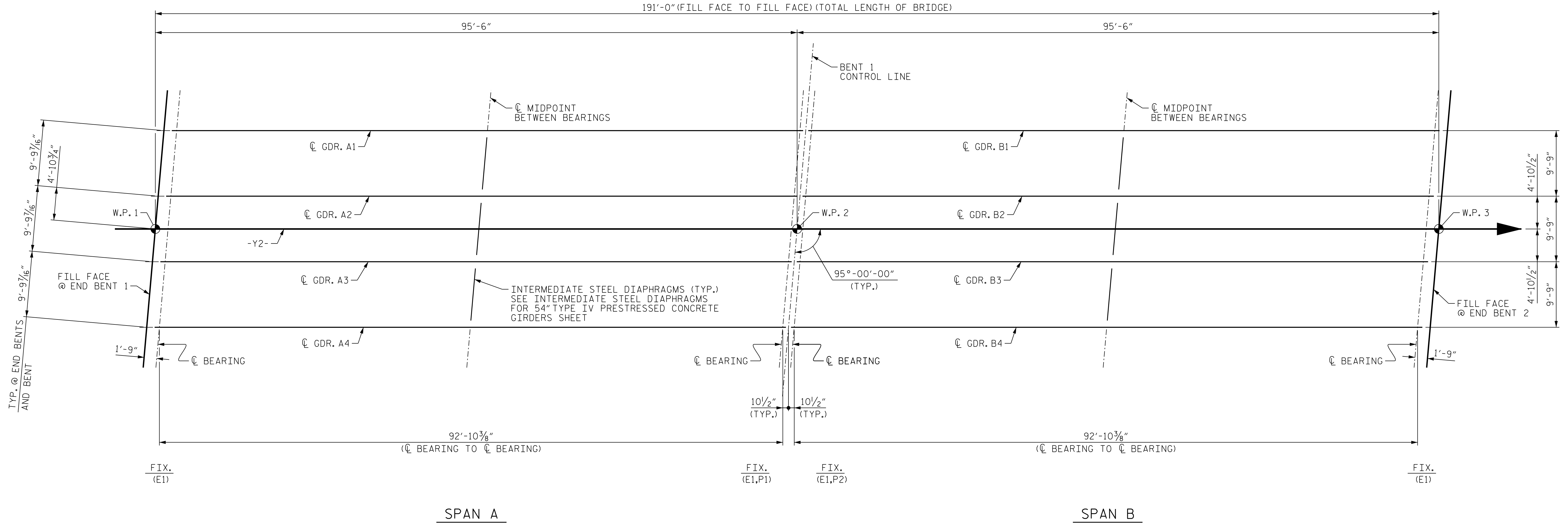
**DOCUMENT NOT CONSIDERED FINAL
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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

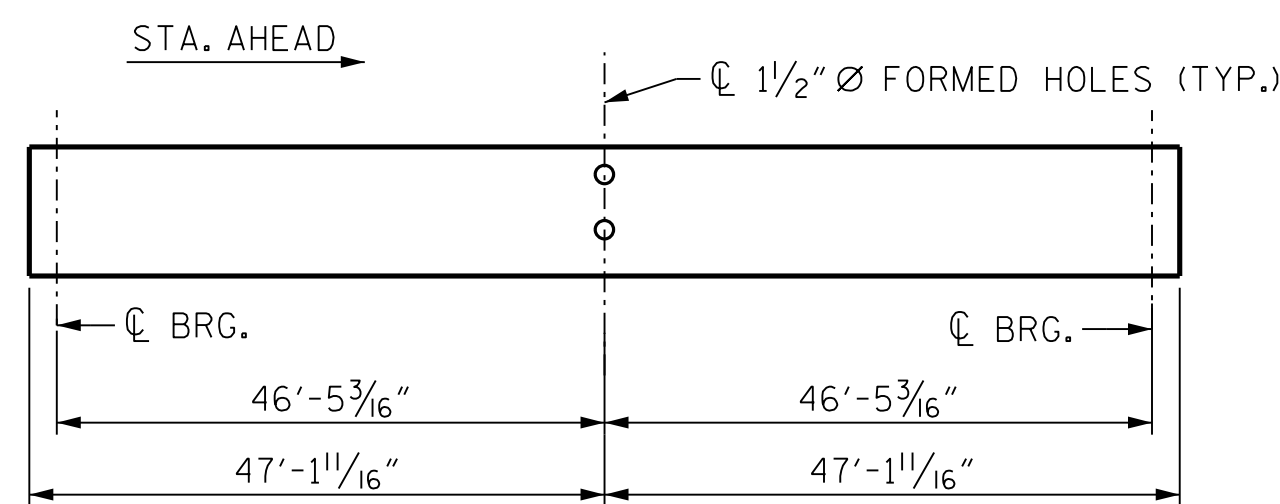
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-11 TOTAL SHEETS 36
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DRAWN BY : B.E. LANNING	DATE : 02/2021
CHECKED BY : A.K. ORR	DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

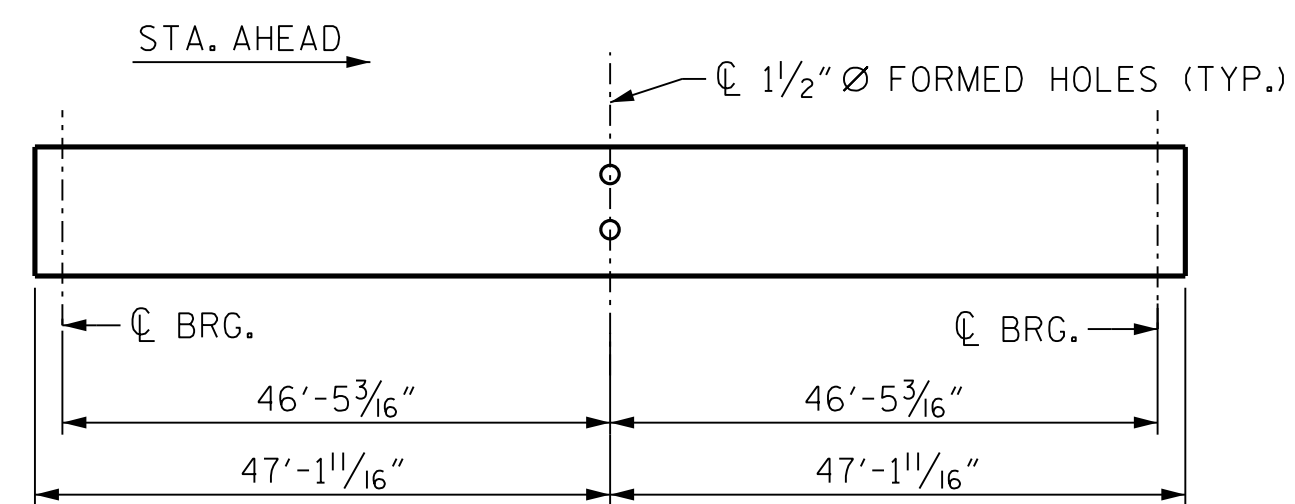
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FRAMING PLAN
ALL DIMENSIONS HORIZONTAL U.O.N.

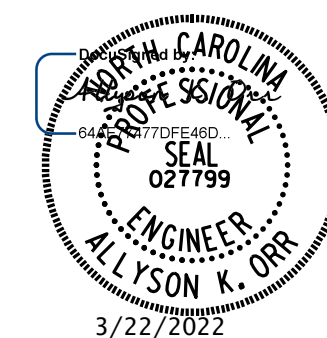


GIRDER ELEVATION - SPAN A
MEASUREMENTS GIVEN ALONG BOTTOM OF GIRDER



GIRDER ELEVATION - SPAN B
MEASUREMENTS GIVEN ALONG BOTTOM OF GIRDER

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-



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

**DOCUMENT NOT CONSIDERED FINAL
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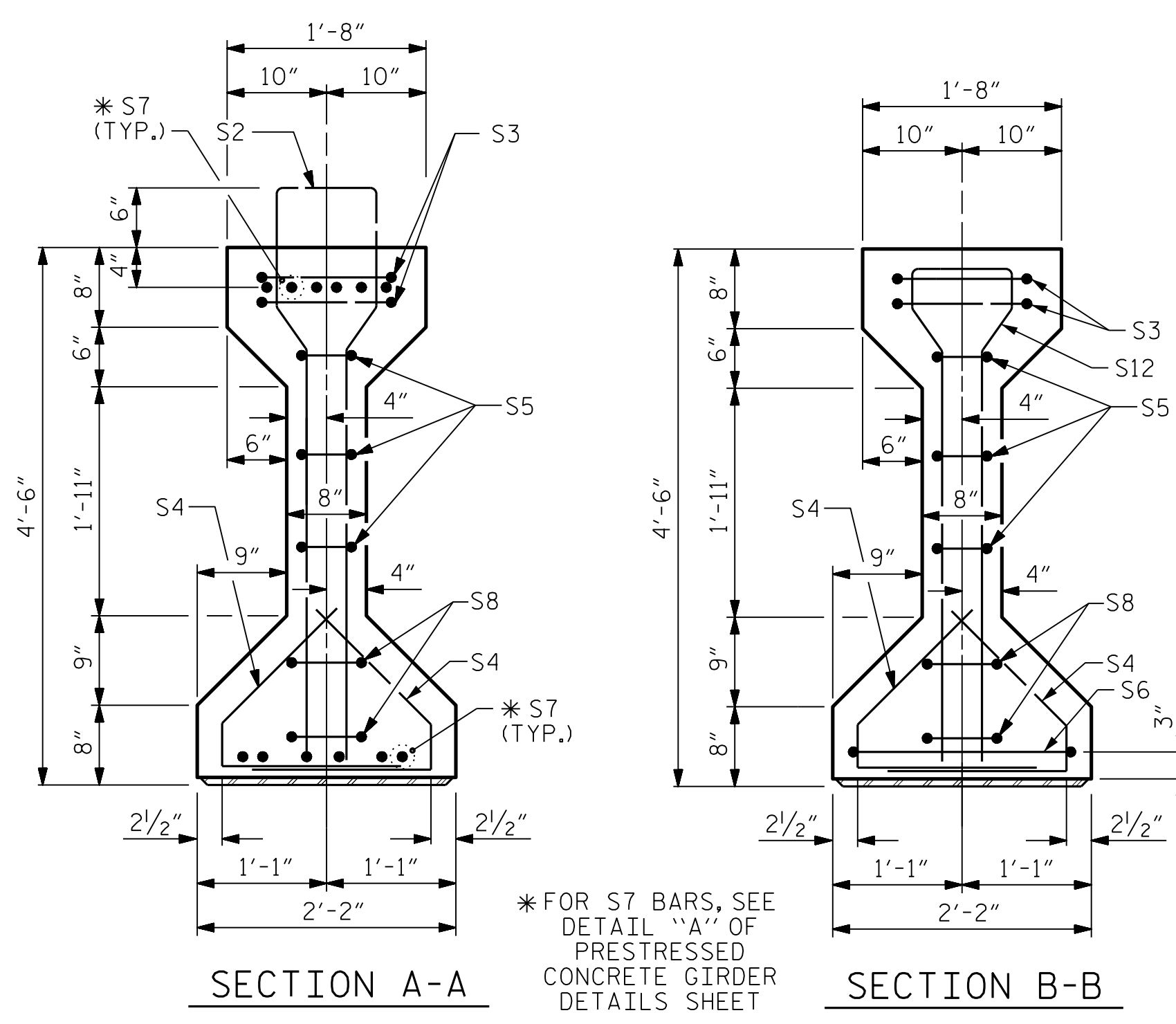
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

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

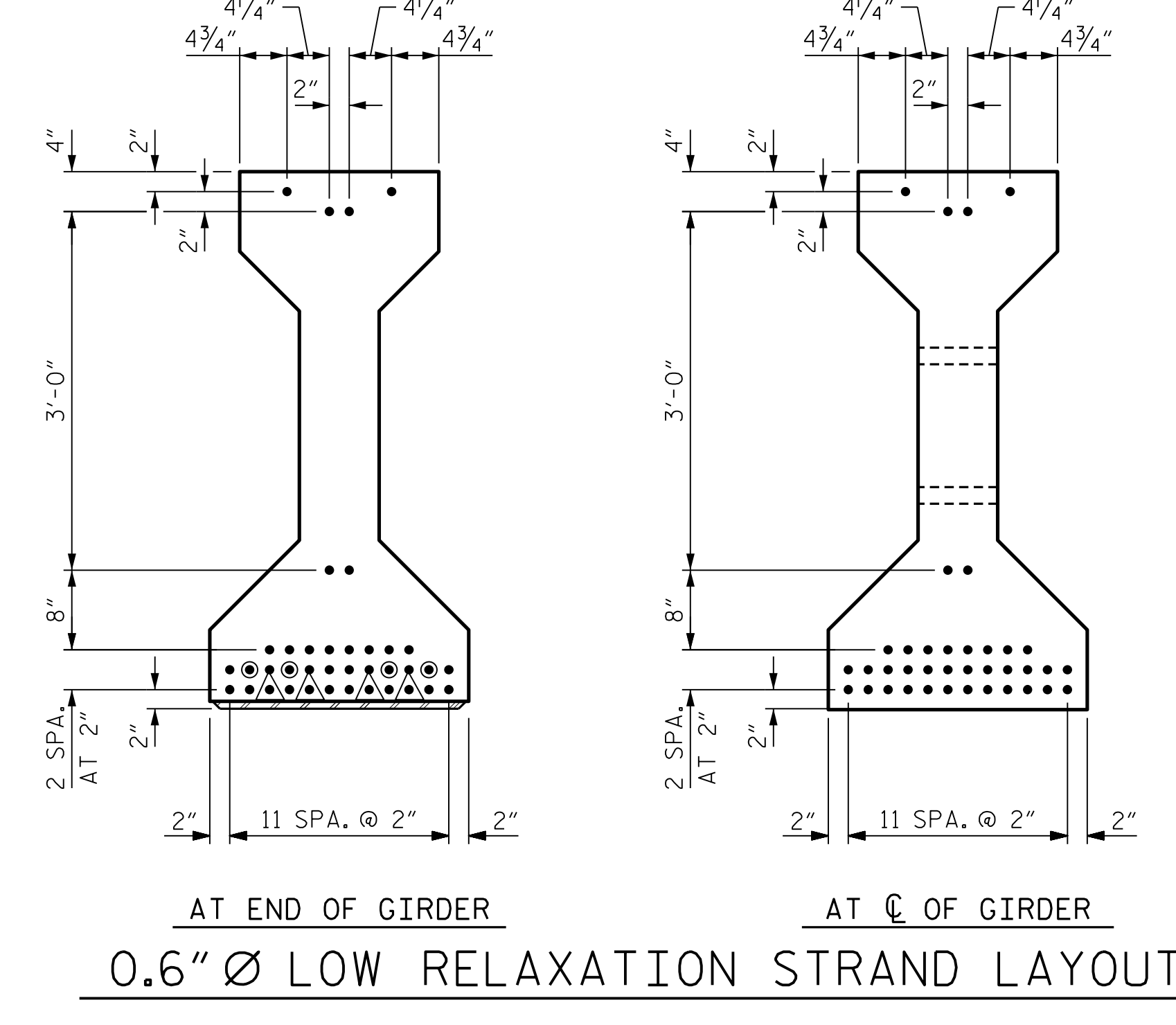
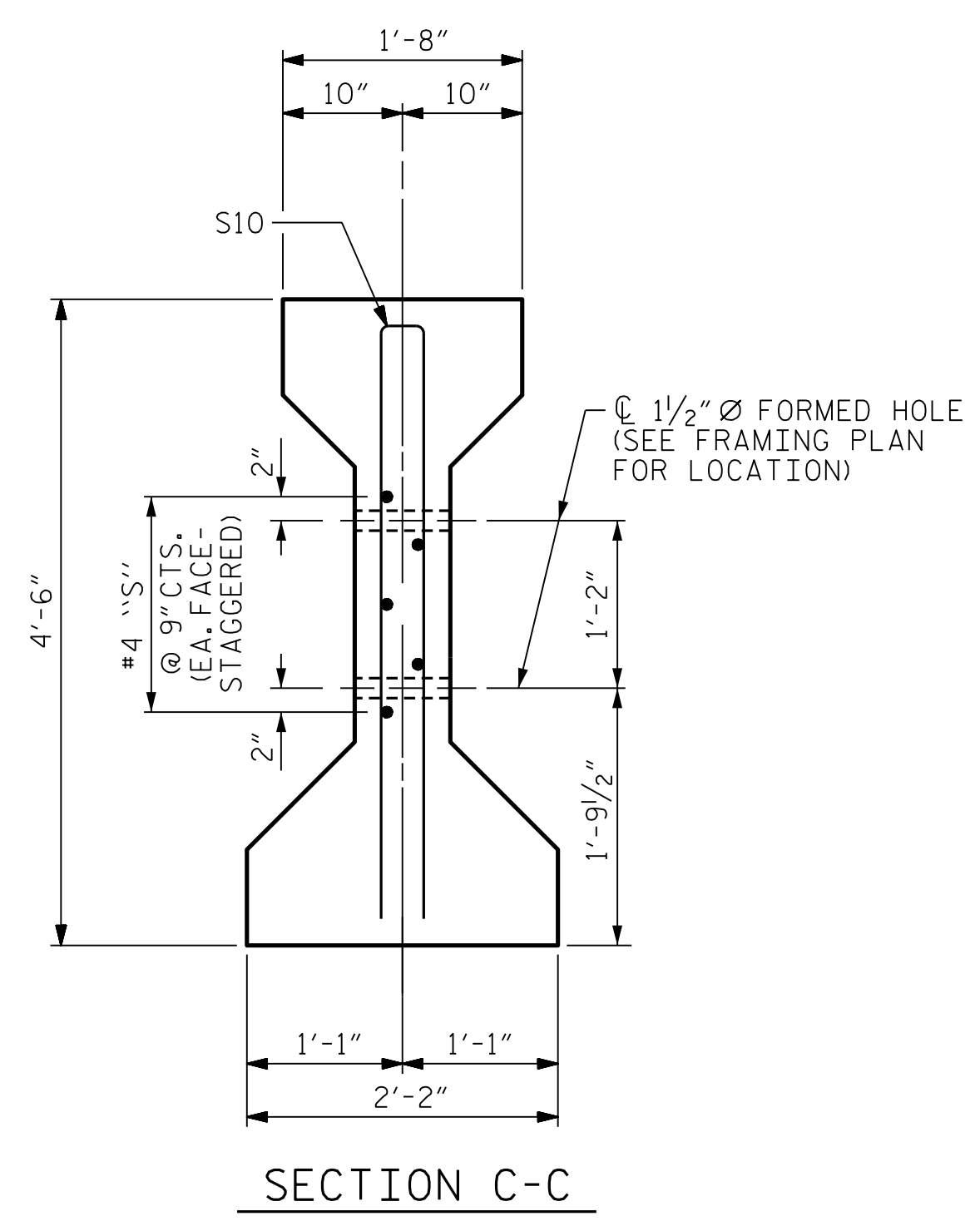
SHEET NO.
S1-12
TOTAL SHEETS
36

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CHECKED BY : A.K. ORR DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

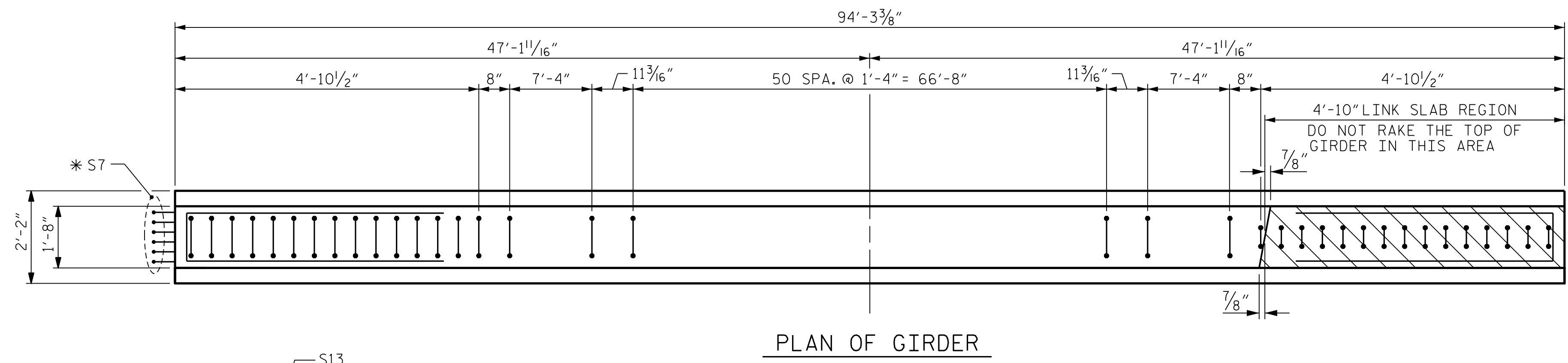
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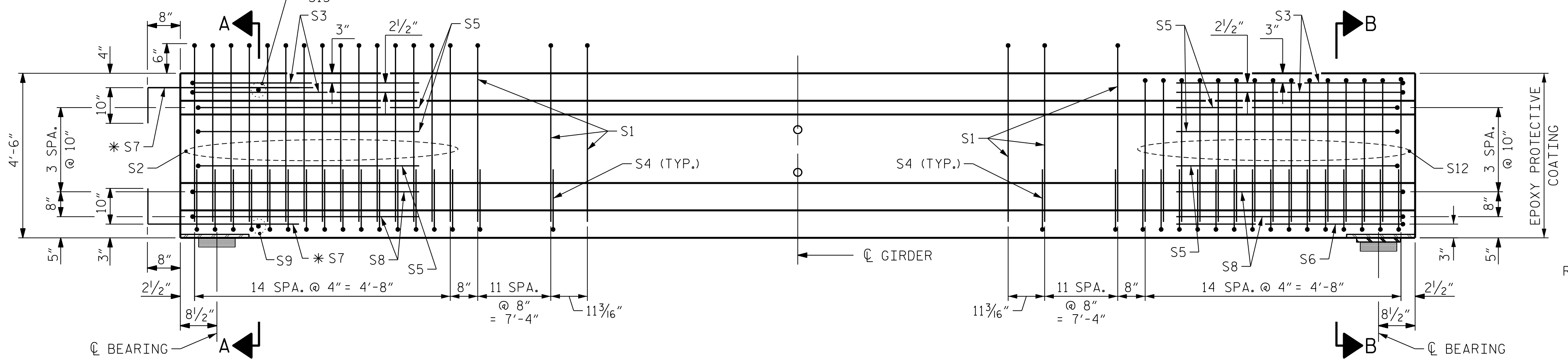
* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
DETAILS SHEET



0.6" Ø LOW RELAXATION STRAND LAYOUT



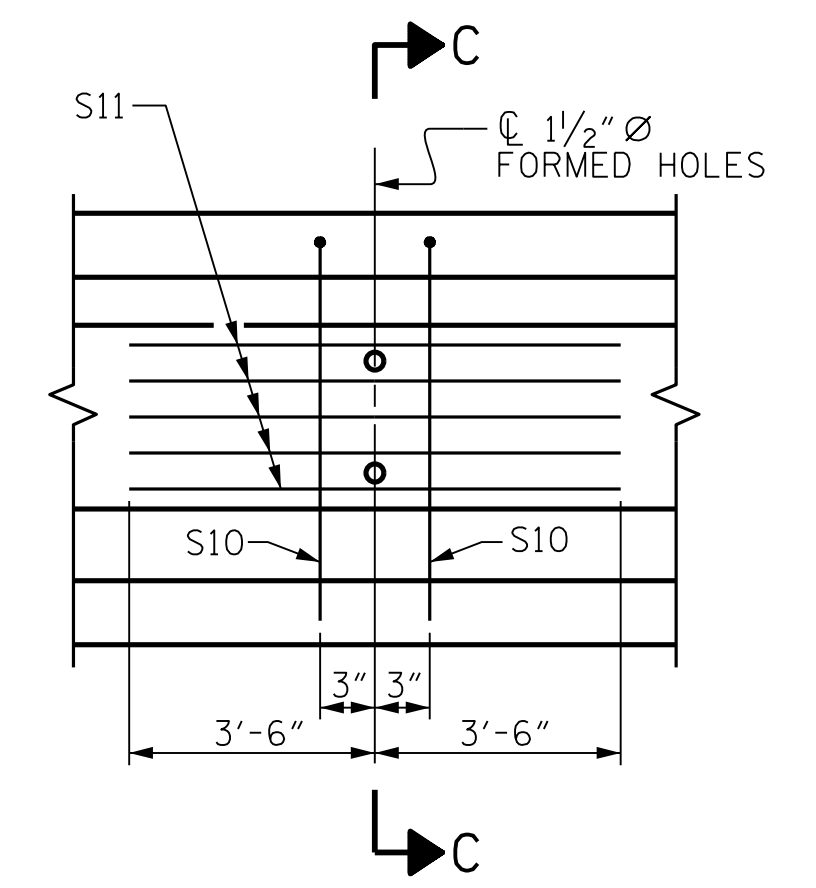
PLAN OF GIRDER



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

DEBONDING LEGEND

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GDR. A1 - GDR. A4

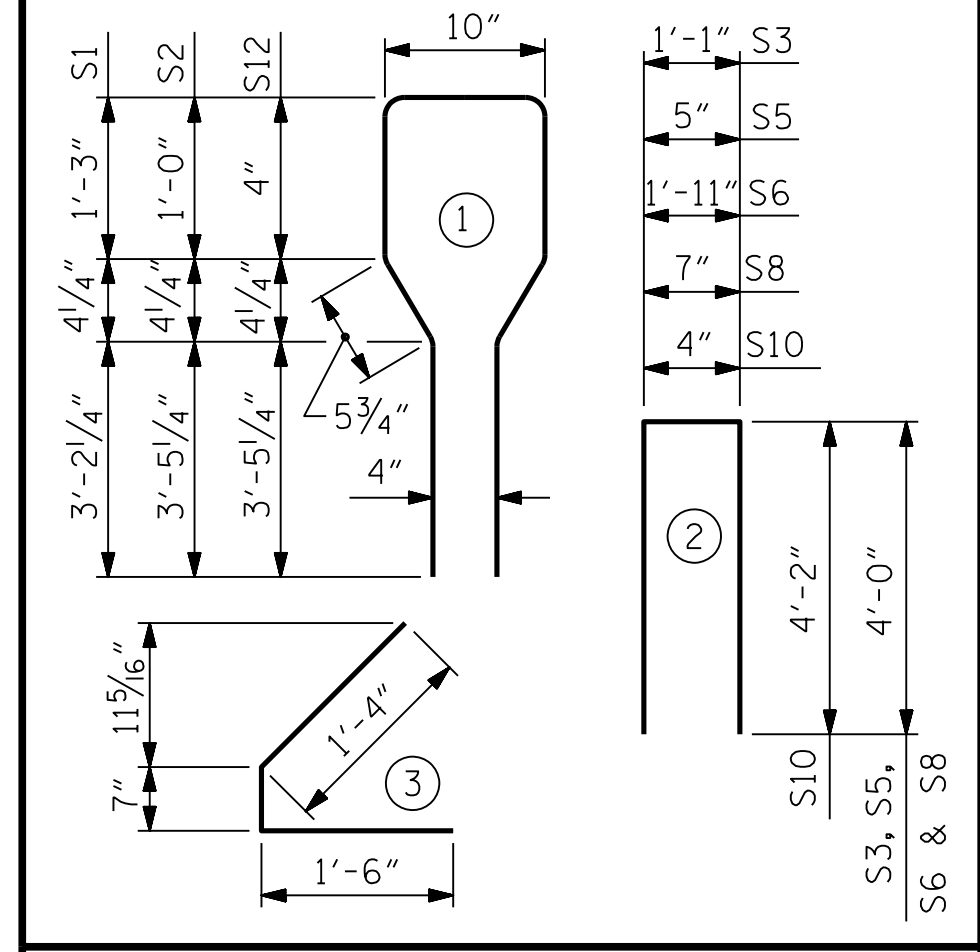
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	75	#4	1	10'-8"	534
S2	15	#6	1	10'-8"	240
S3	4	#4	2	9'-1"	24
S4	108	#4	3	3'-5"	246
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	15	#6	1	9'-4"	210
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT.



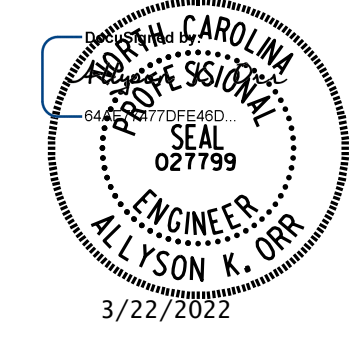
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDR. A1-GDR. A4	1407	19.1	38

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	94.28'	377.12'

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 4



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MI ENGINEERING
1011 SCHAUH DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

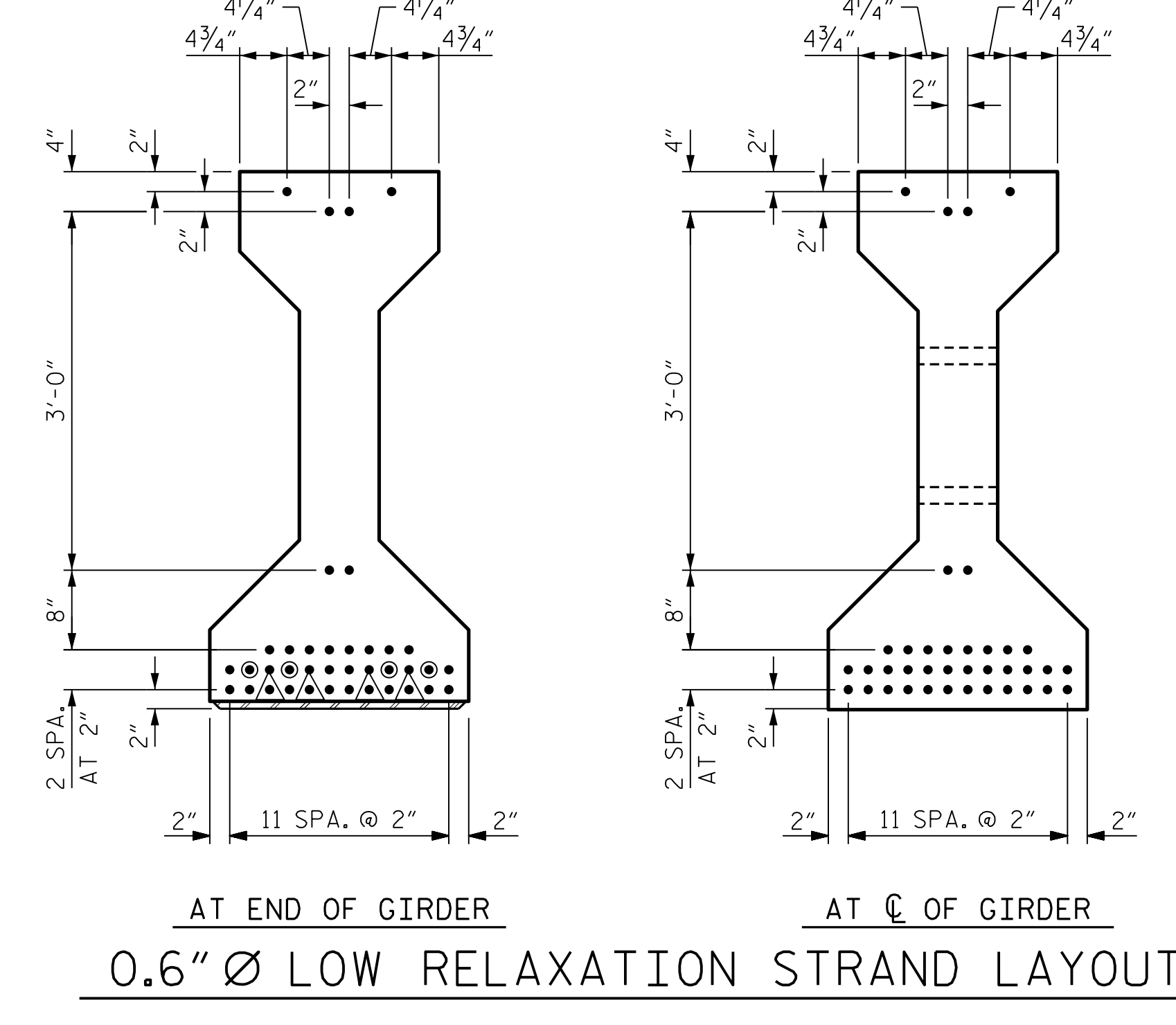
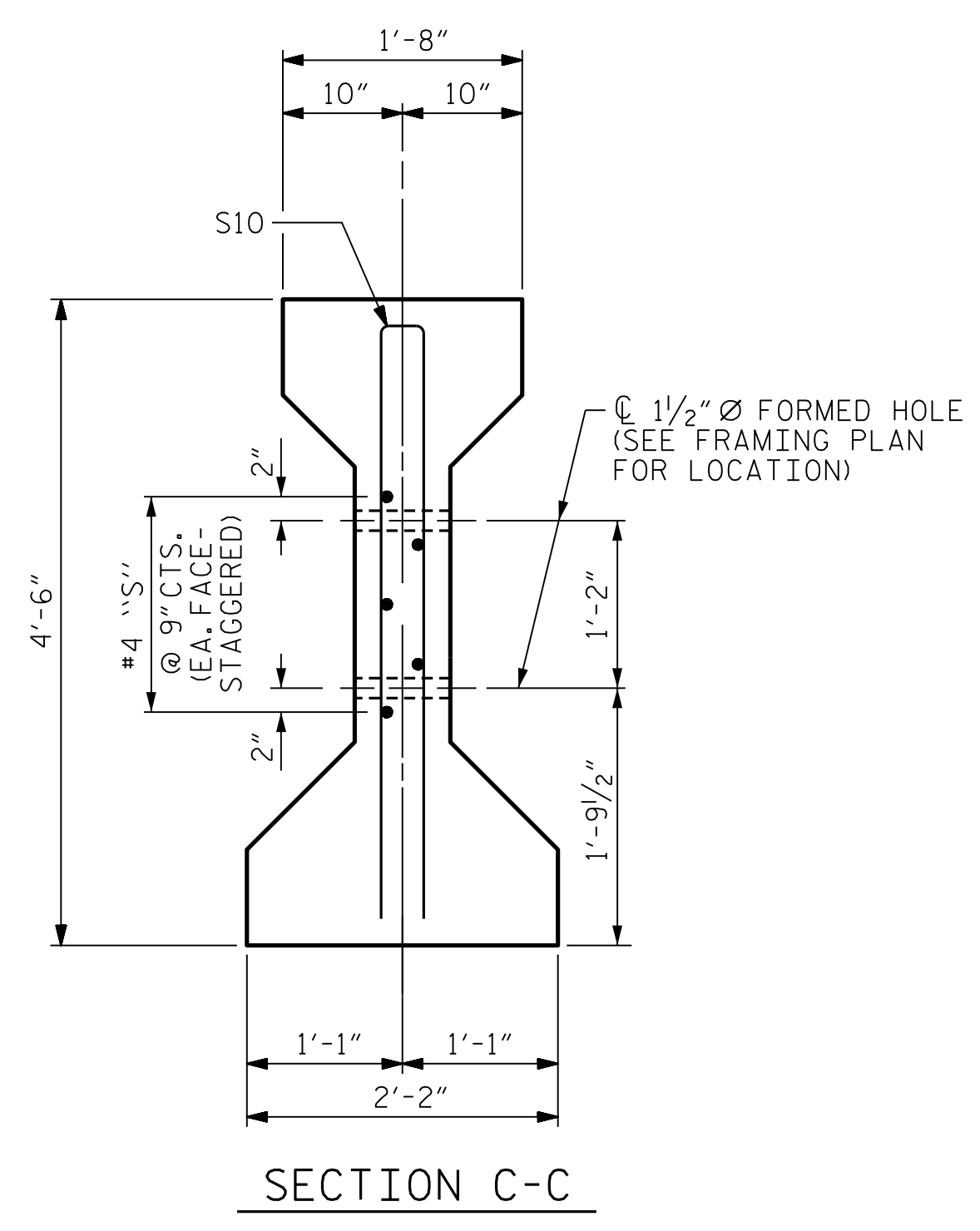
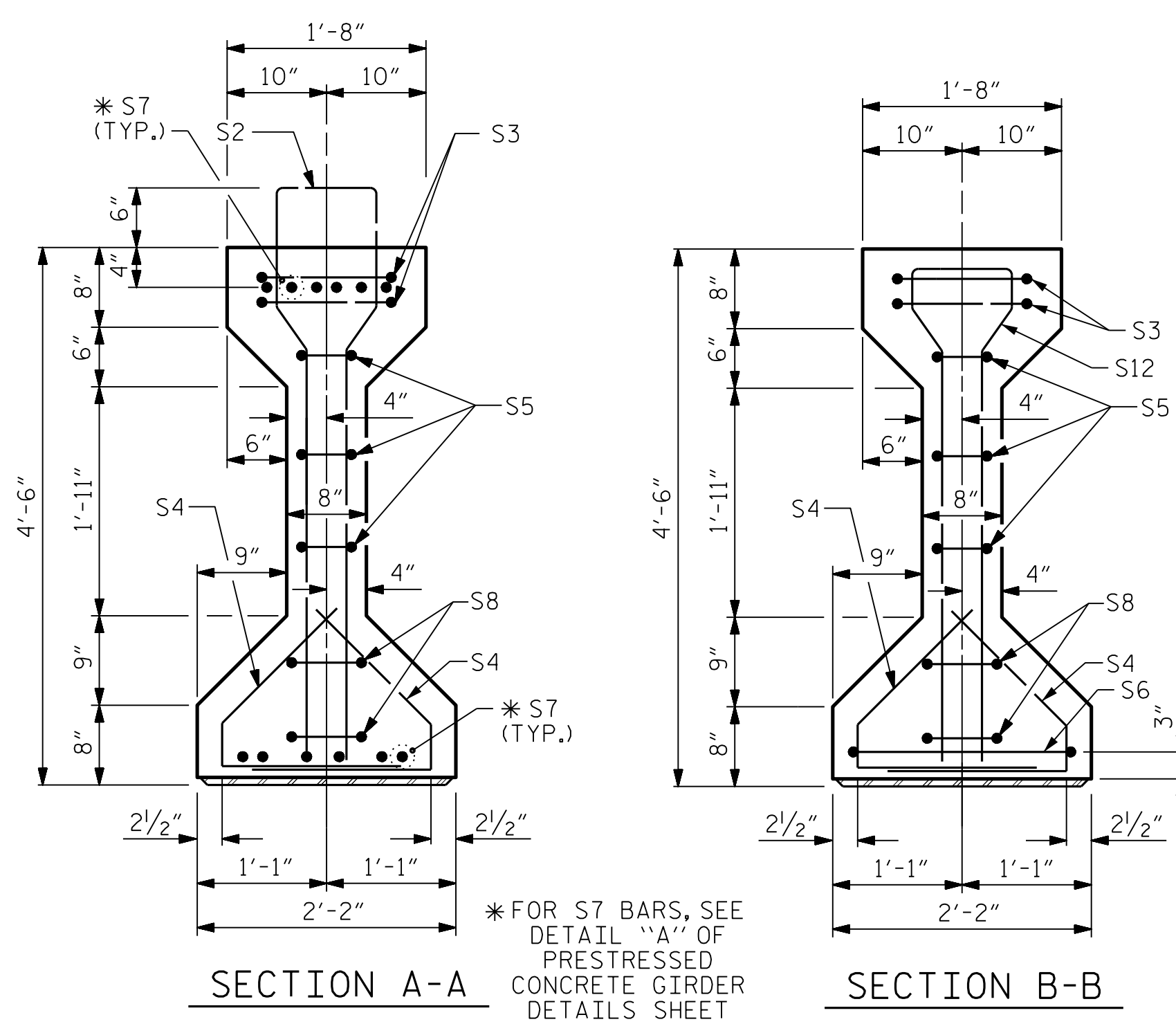
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
AASHTO TYPE IV
PRESTRESSED CONCRETE
GIRDER - LINK SLAB
SPAN A

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

SHEET NO.
S1-13
TOTAL SHEETS
36

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DRAWN BY: B.E. LANNING DATE: 03/2021
 CHECKED BY: A.K. ORR DATE: 03/2021
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/2022

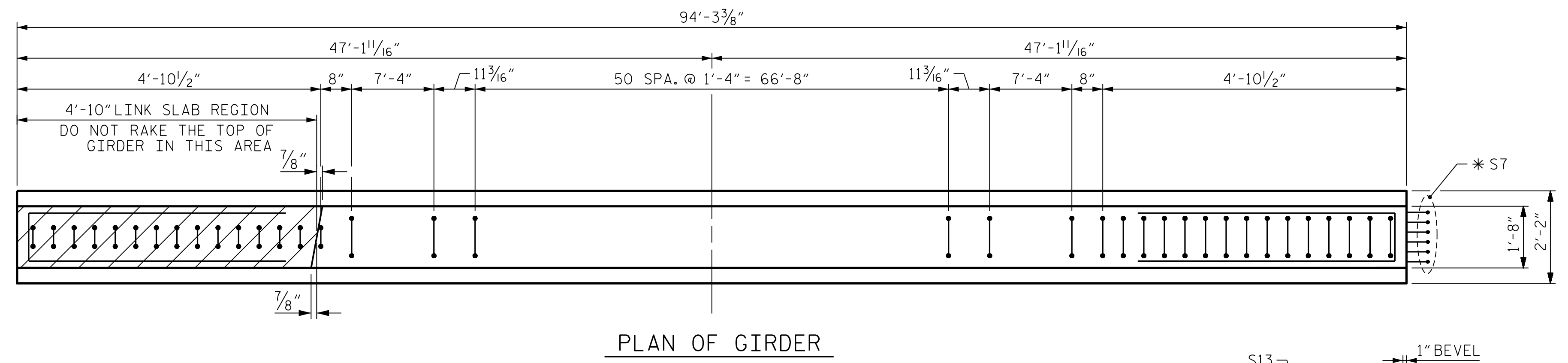
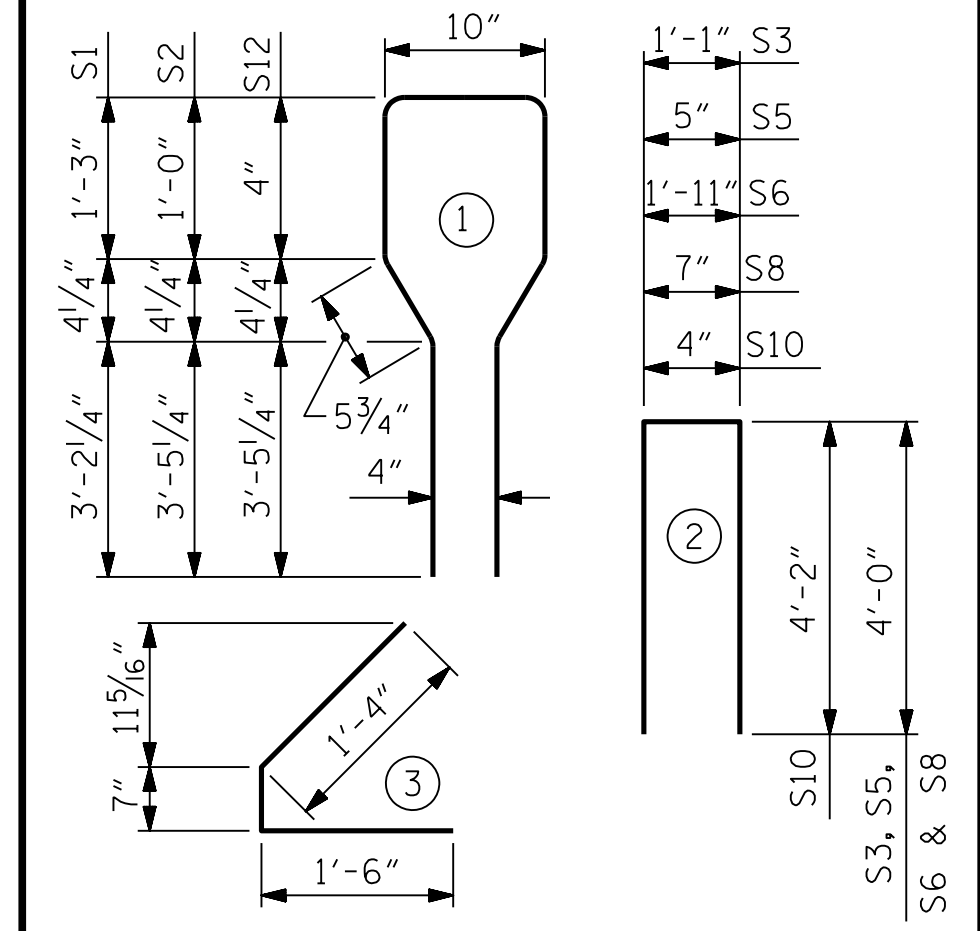


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

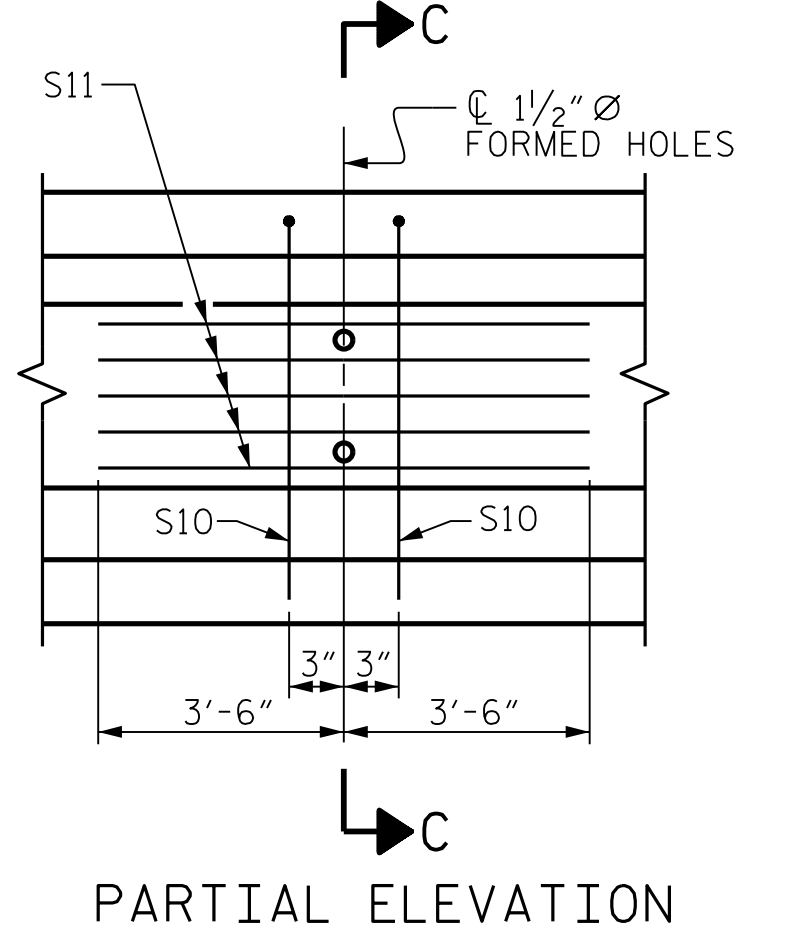
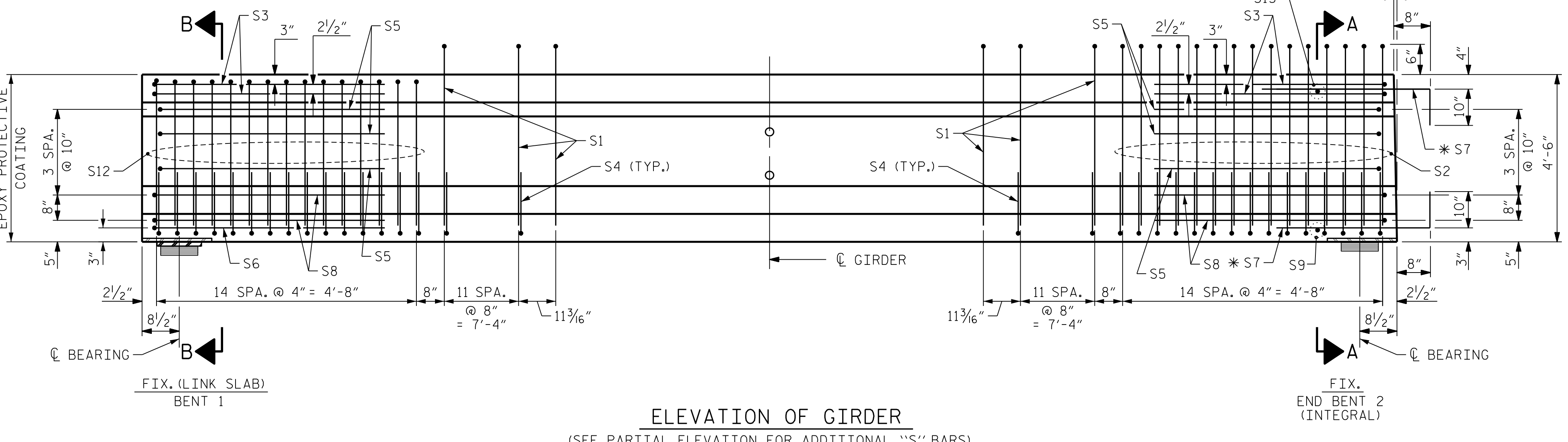
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	75	#4	1	10'-8"	534
S2	15	#6	1	10'-8"	240
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*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	15	#6	1	9'-4"	210
S13	1	#3	STR	1'-4"	1

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

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT.



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ▲ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
 - ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS	
	LB.	C.Y.	No.
GDR. B1-GDR. B4	1407	19.1	38

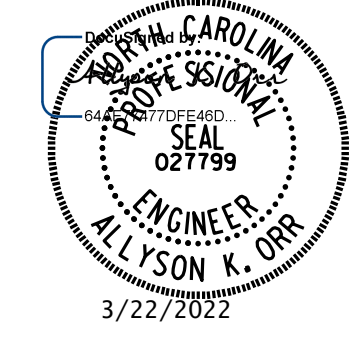
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	94.28'	377.12'

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 AASHTO TYPE IV
 PRESTRESSED CONCRETE
 GIRDER - LINK SLAB
 SPAN B



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

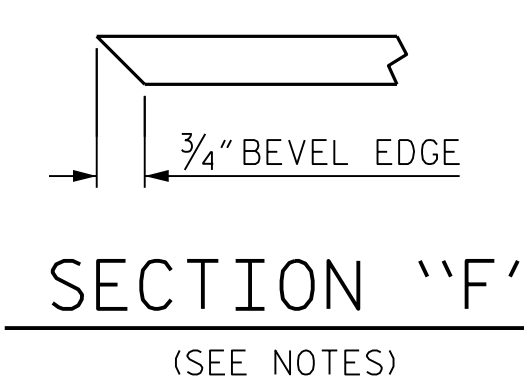
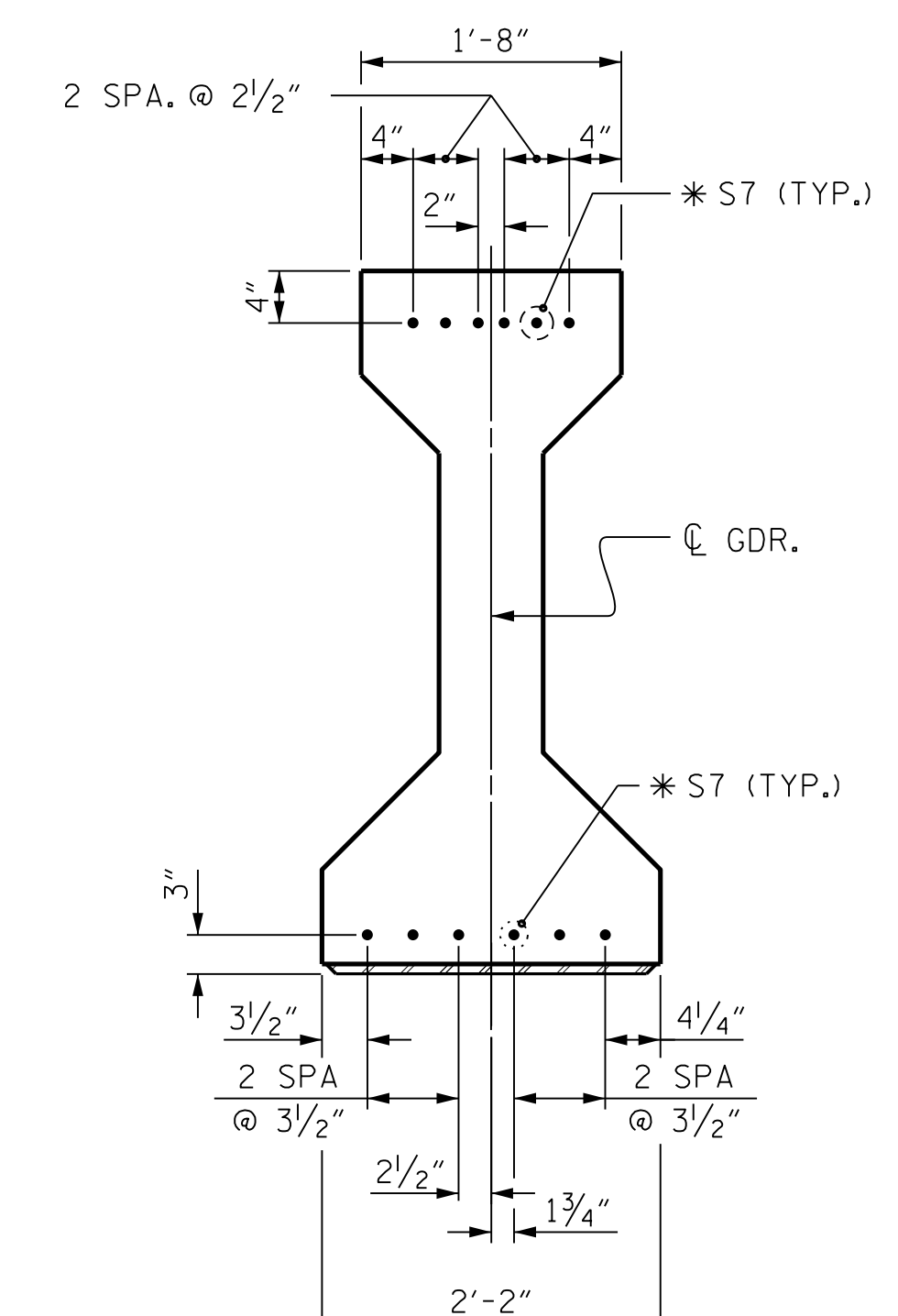
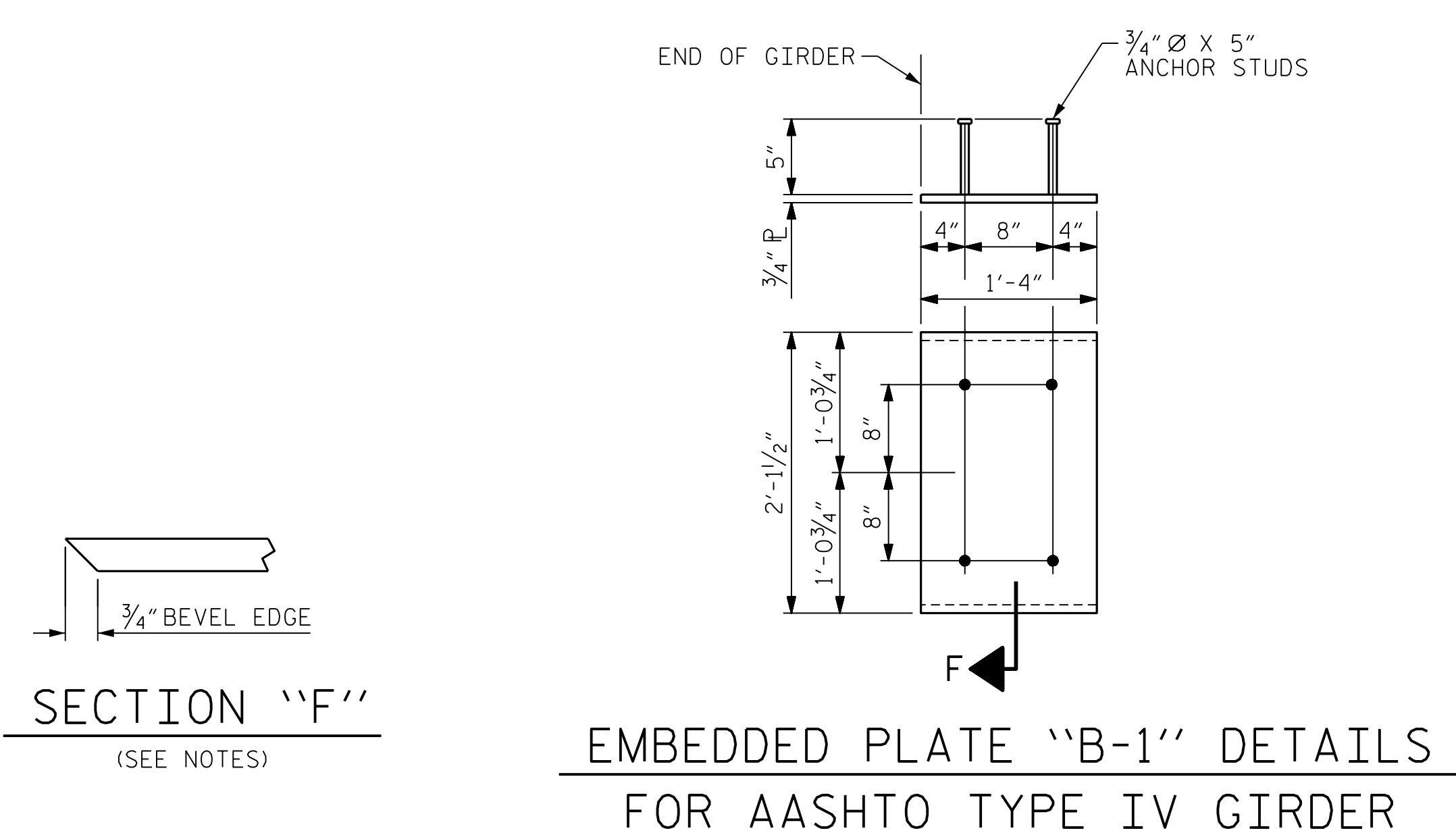
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: B.E. LANNING	DATE: 03/2021
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DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/2022

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.60" Ø LOW RELAXATION STRANDS		GIRDERS 1 & 4																				
		SPAN A																				
TWENTIETH POINTS	↑	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.032	0.063	0.093	0.120	0.144	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.144	0.120	0.093	0.063	0.032	0
** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.020	0.040	0.060	0.079	0.095	0.110	0.120	0.129	0.133	0.136	0.133	0.130	0.120	0.110	0.095	0.080	0.060	0.041	0.020	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	3/4"	3/4"	13/16"	13/16"	13/16"	3/4"	3/4"	5/8"	9/16"	1/2"	3/8"	1/4"	1/8"	0
0.60" Ø LOW RELAXATION STRANDS		GIRDERS 2 & 3																				
		SPAN A																				
TWENTIETH POINTS	↑	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.032	0.063	0.093	0.120	0.144	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.144	0.120	0.093	0.063	0.032	0
** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.022	0.043	0.064	0.085	0.102	0.118	0.129	0.139	0.143	0.146	0.143	0.139	0.129	0.118	0.102	0.086	0.065	0.044	0.022	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	11/16"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	5/16"	1/4"	1/8"	0
0.60" Ø LOW RELAXATION STRANDS		GIRDERS 1 & 4																				
		SPAN B																				
TWENTIETH POINTS	↑	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.032	0.063	0.093	0.120	0.144	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.144	0.120	0.093	0.063	0.032	0
** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.020	0.041	0.060	0.080	0.095	0.110	0.120	0.130	0.133	0.136	0.133	0.129	0.120	0.110	0.095	0.079	0.060	0.040	0.020	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	3/4"	3/4"	13/16"	13/16"	13/16"	3/4"	3/4"	5/8"	9/16"	1/2"	3/8"	1/4"	1/8"	0
0.60" Ø LOW RELAXATION STRANDS		GIRDERS 2 & 3																				
		SPAN B																				
TWENTIETH POINTS	↑	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.032	0.063	0.093	0.120	0.144	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.144	0.120	0.093	0.063	0.032	0
** DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.022	0.044	0.065	0.086	0.102	0.118	0.129	0.139	0.143	0.146	0.143	0.139	0.129	0.118	0.102	0.085	0.064	0.043	0.022	0
FINAL CAMBER	↑	0	1/8"	1/4"	5/16"	7/16"	1/2"	9/16"	5/8"	5/8"	11/16"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	1/4"	1/8"	0

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



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 6000 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" AND THE SHADED AREA NEAR BENT 1, SHALL BE RAKED TO A DEPTH OF 1/4".

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

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW ON SHEETS 1 AND 2 OF 4.

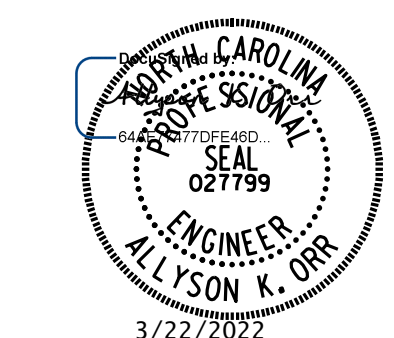
THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS/STUDS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 PRESTRESSED CONCRETE
 GIRDER DETAILS

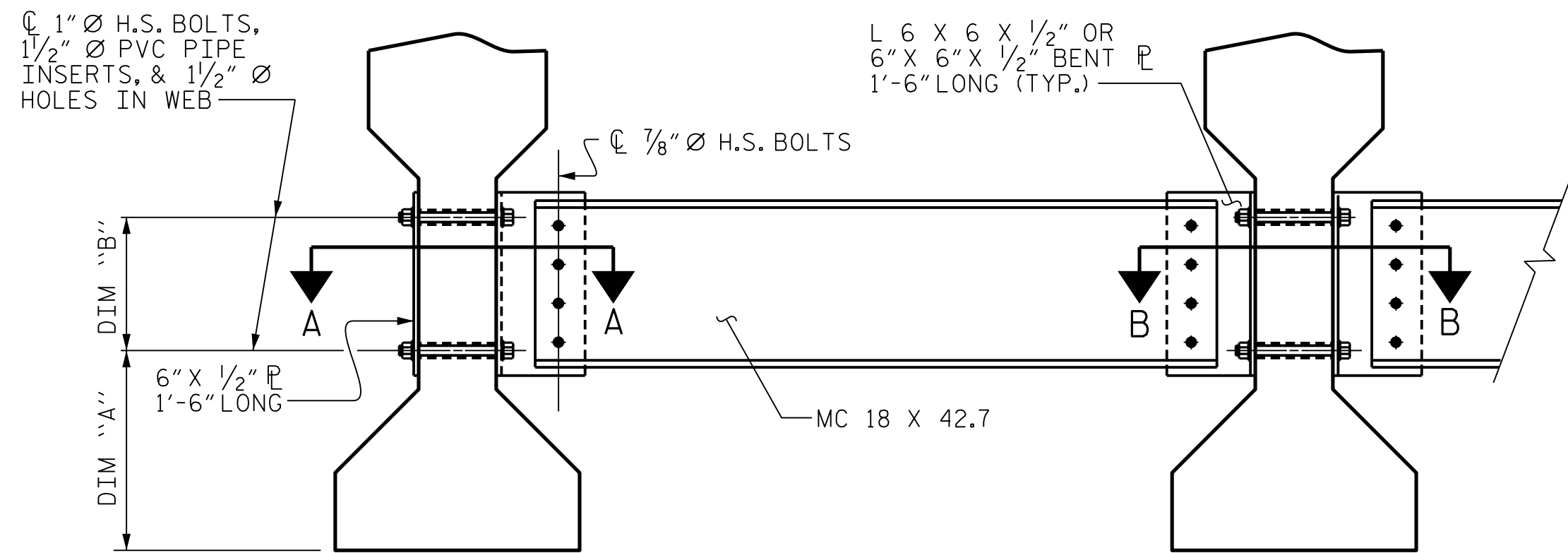


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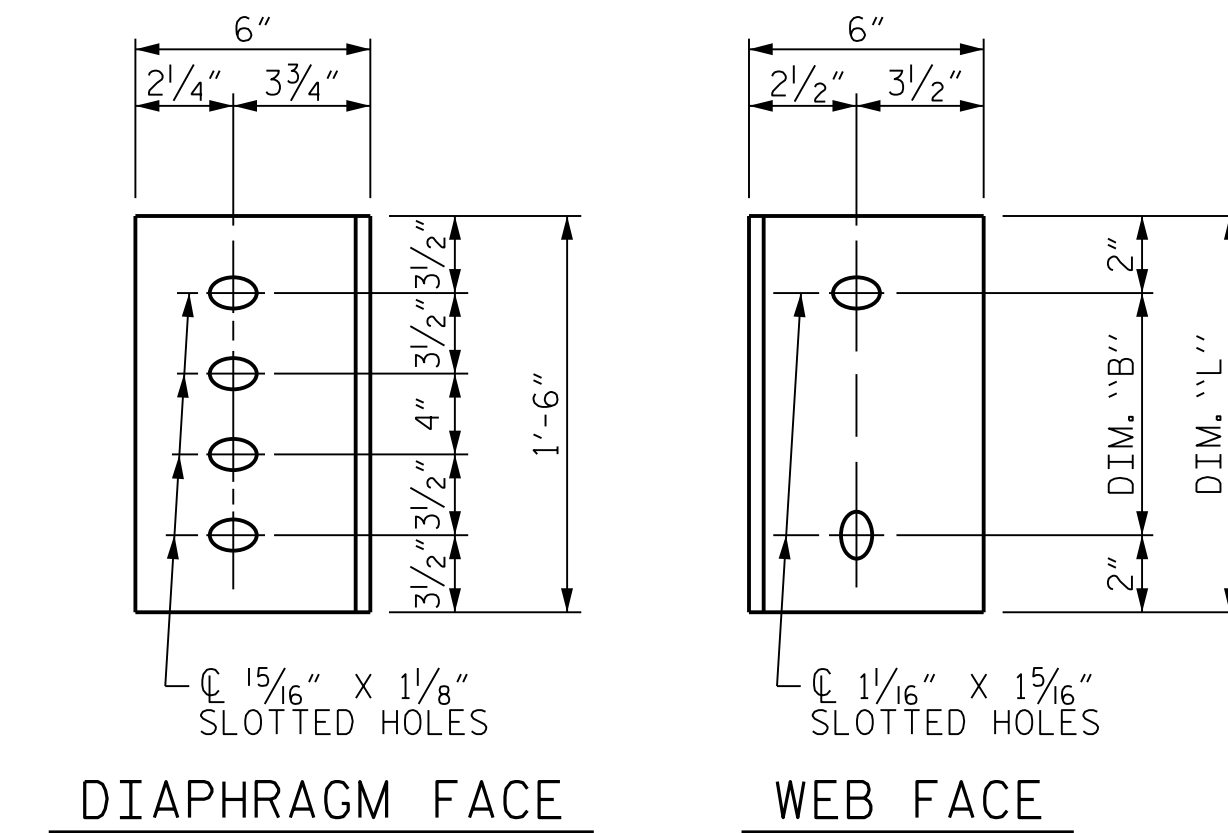
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

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EXTERIOR GIRDER INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE
CONNECTOR PLATE DETAILS

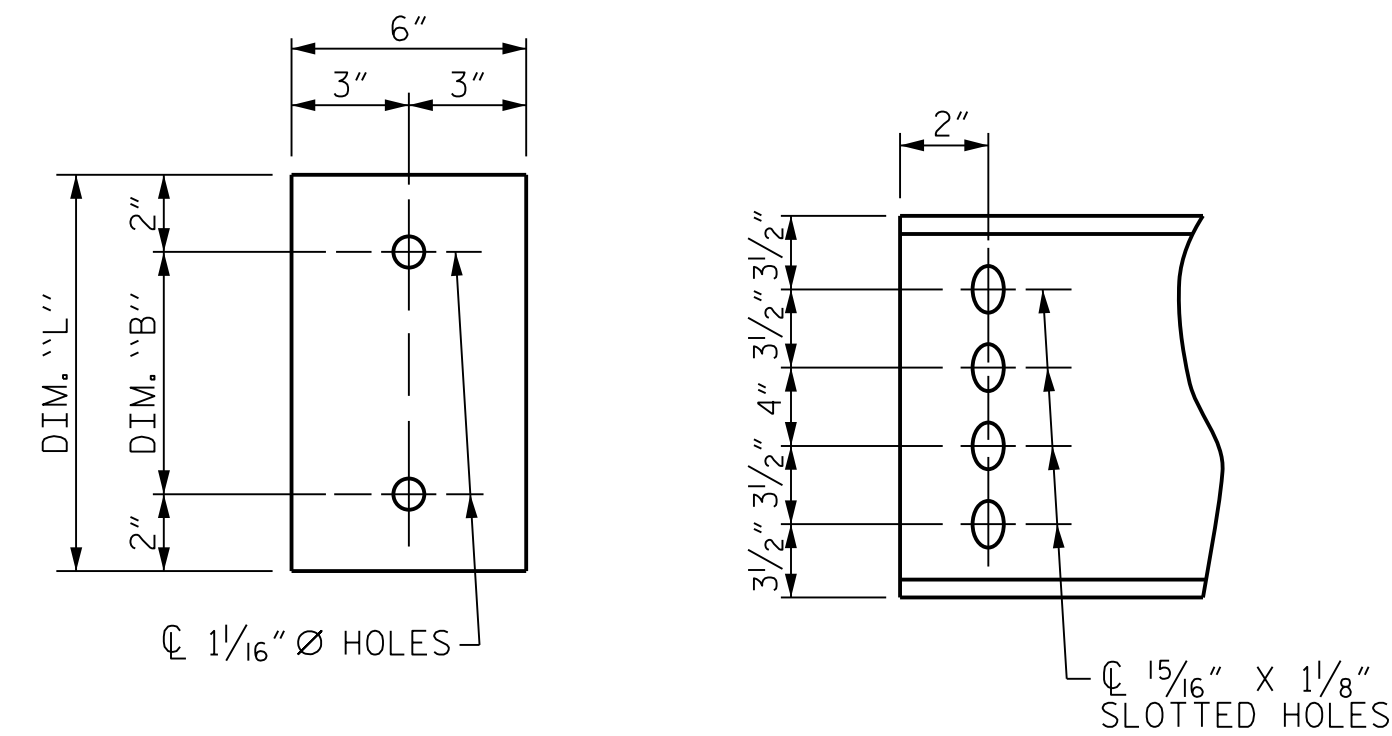


PLATE DETAILS CHANNEL END

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

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

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

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

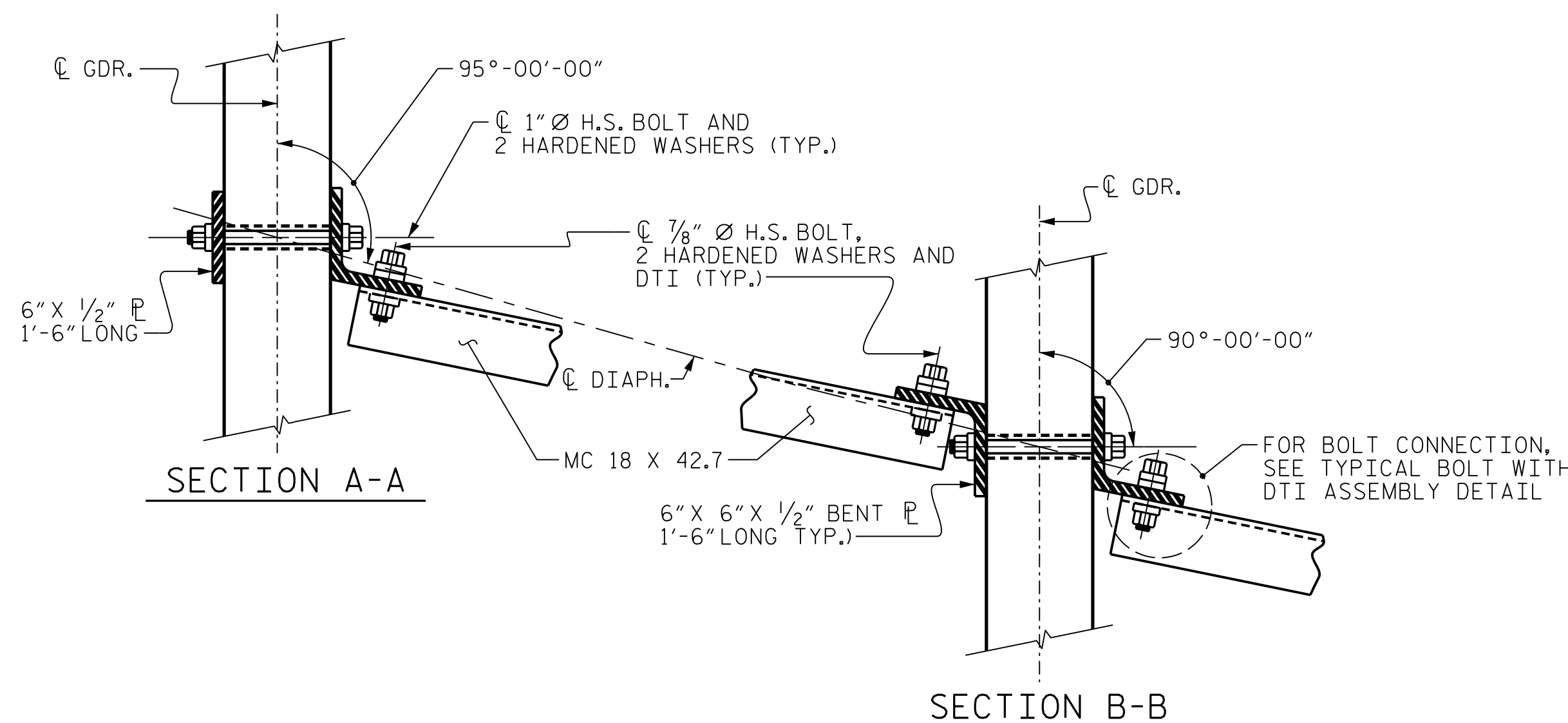
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

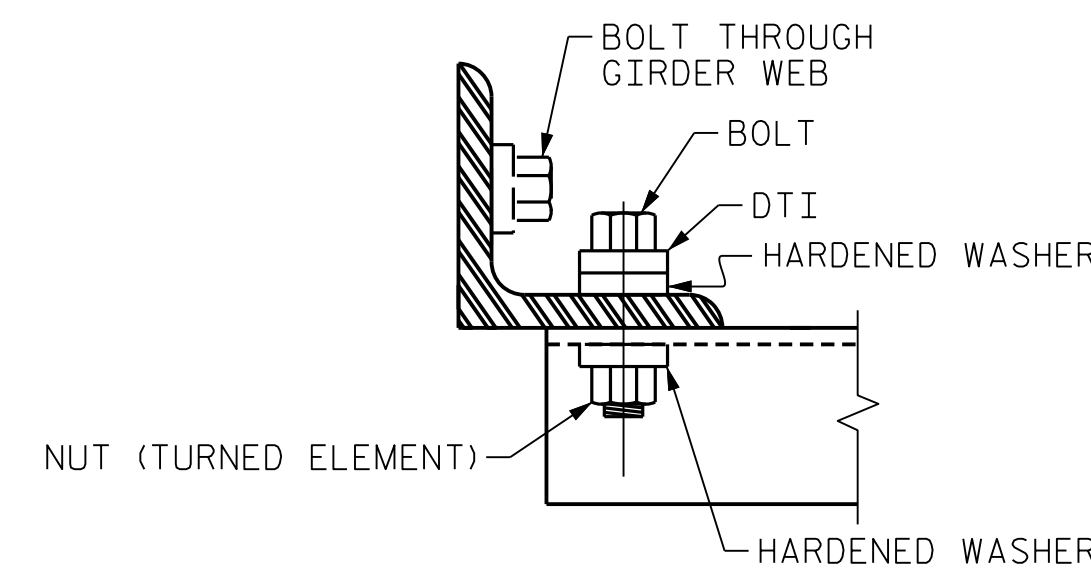
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



CONNECTION DETAILS



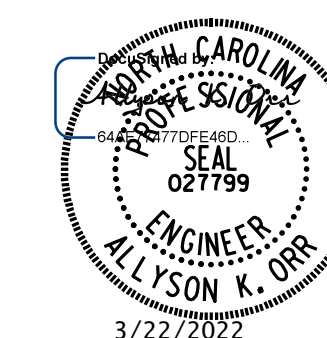
BOLT WITH DTI ASSEMBLY DETAIL

TABLE

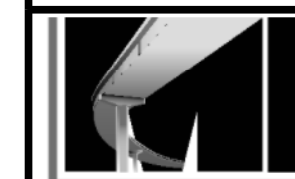
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-

SHEET 4 OF 4



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RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

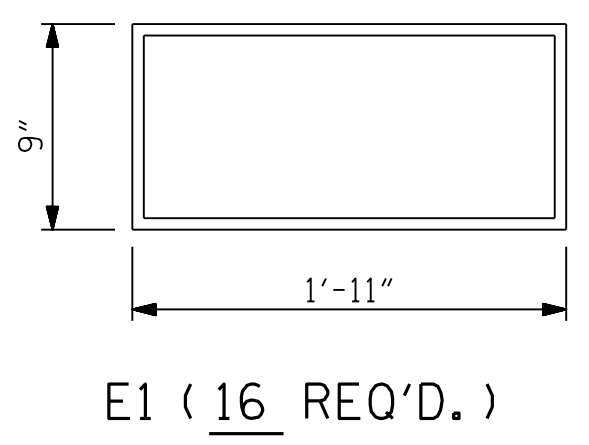
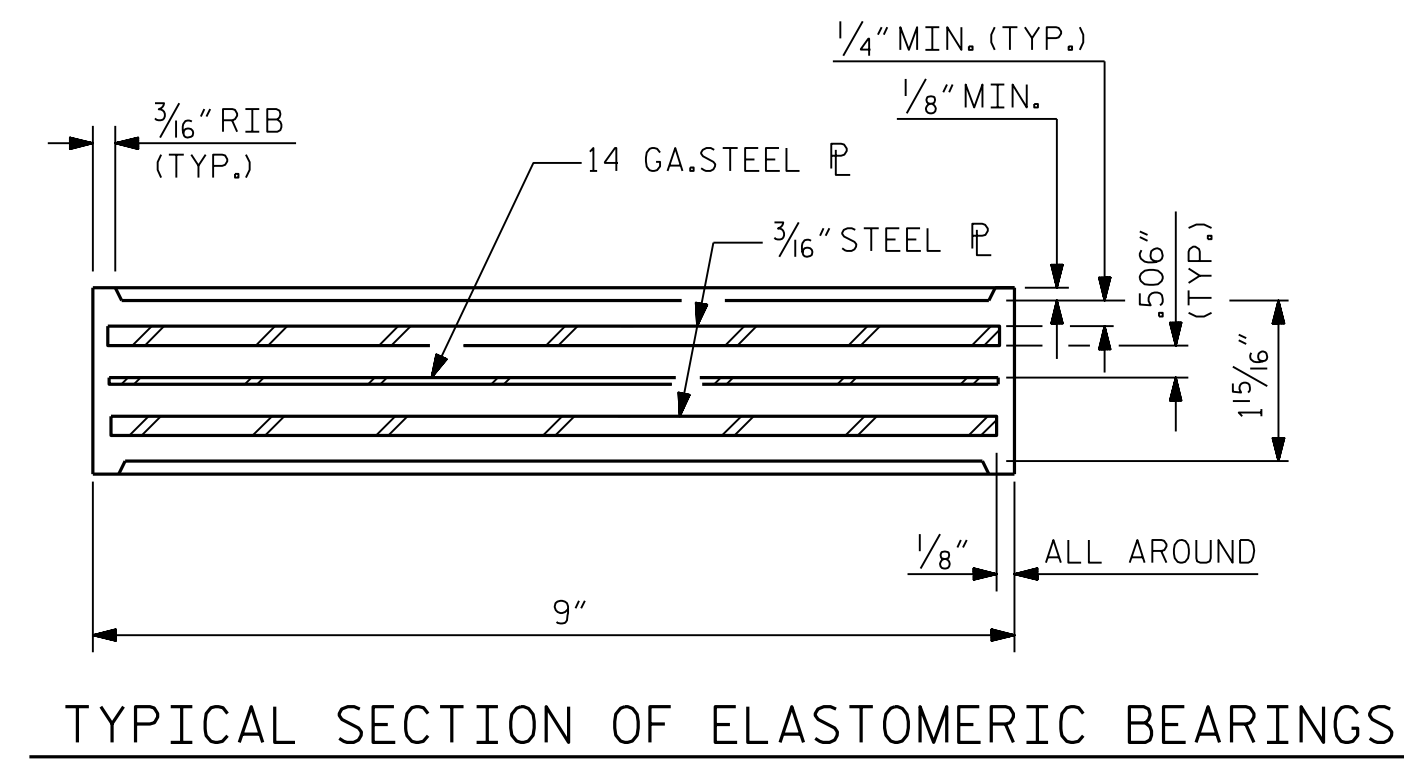
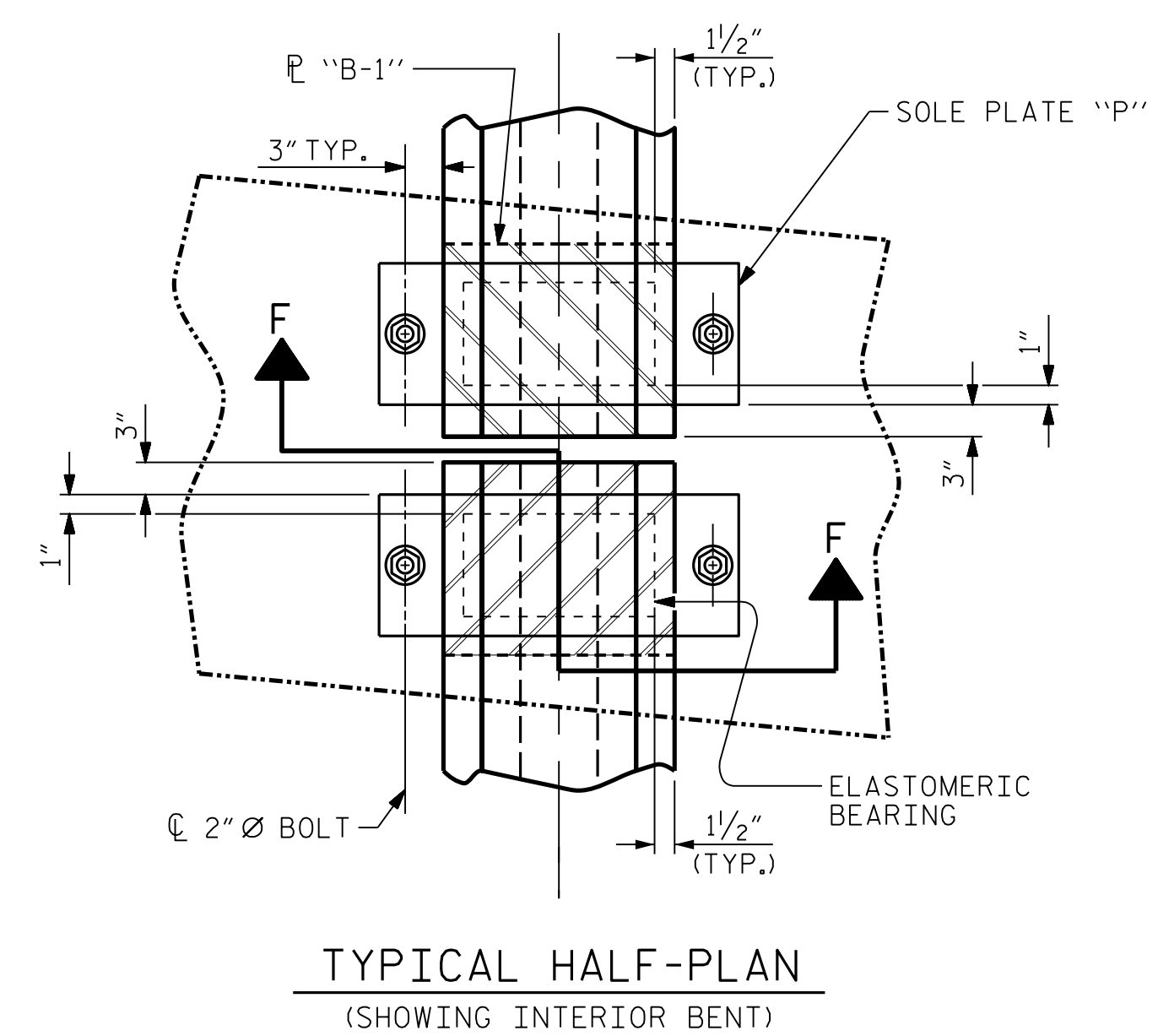
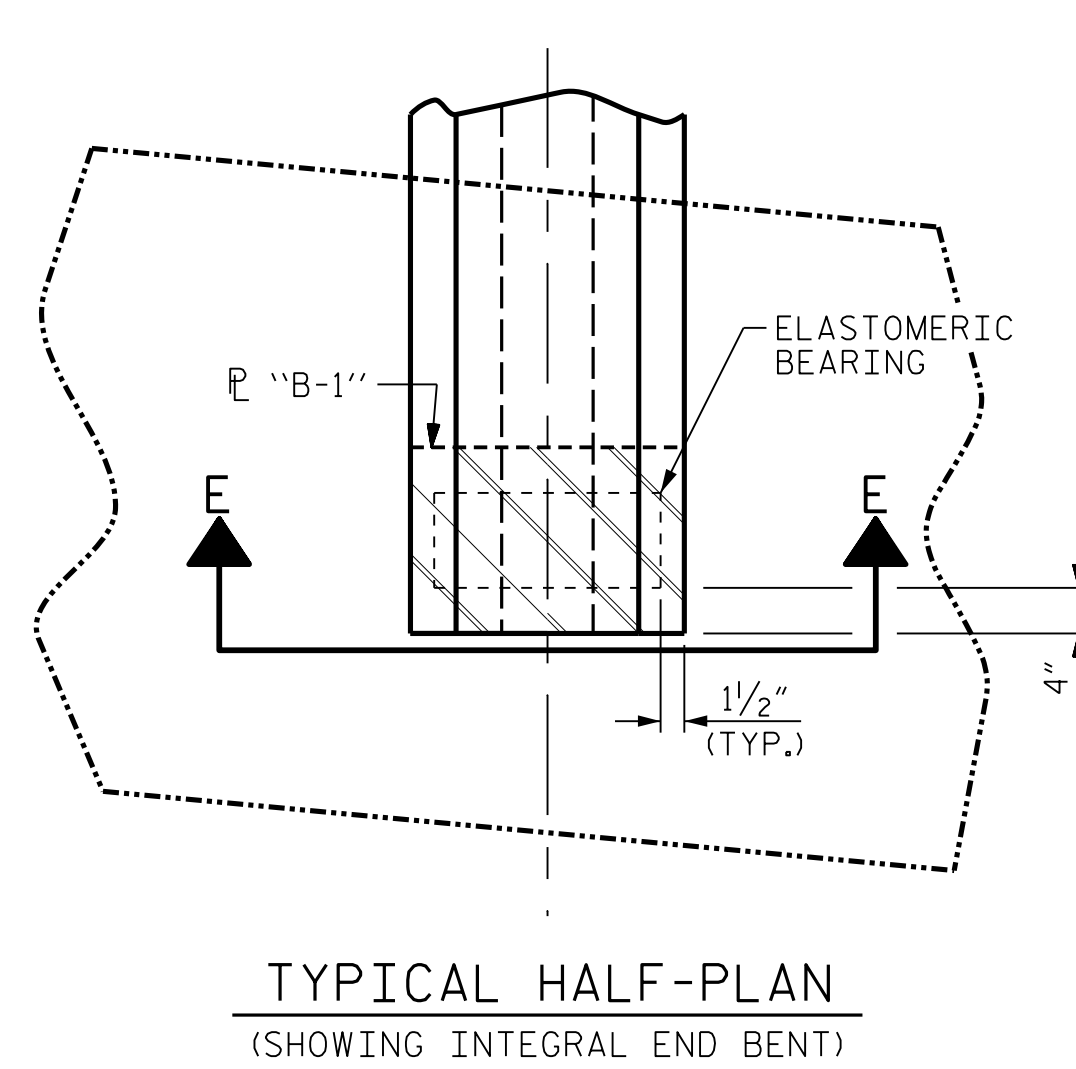
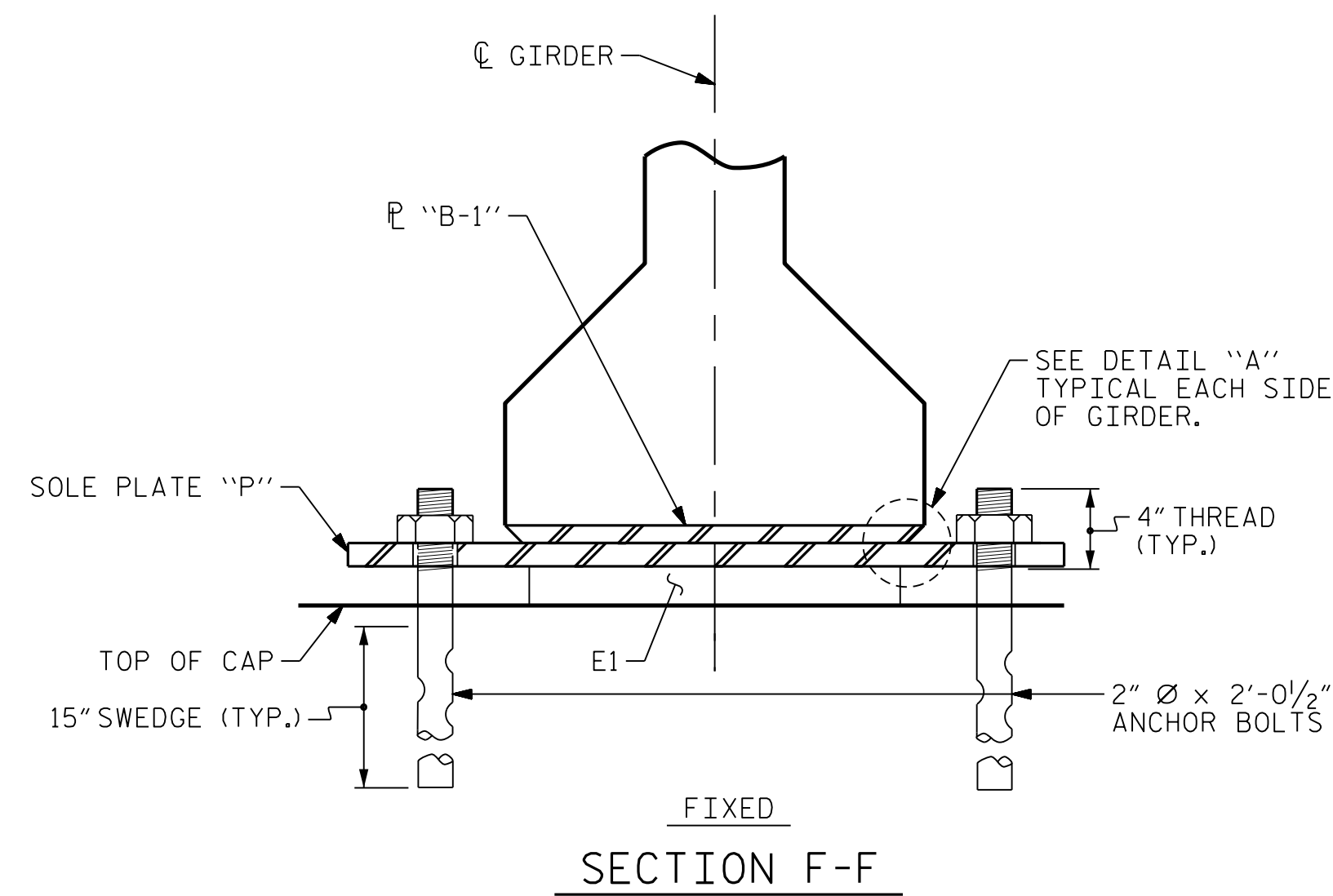
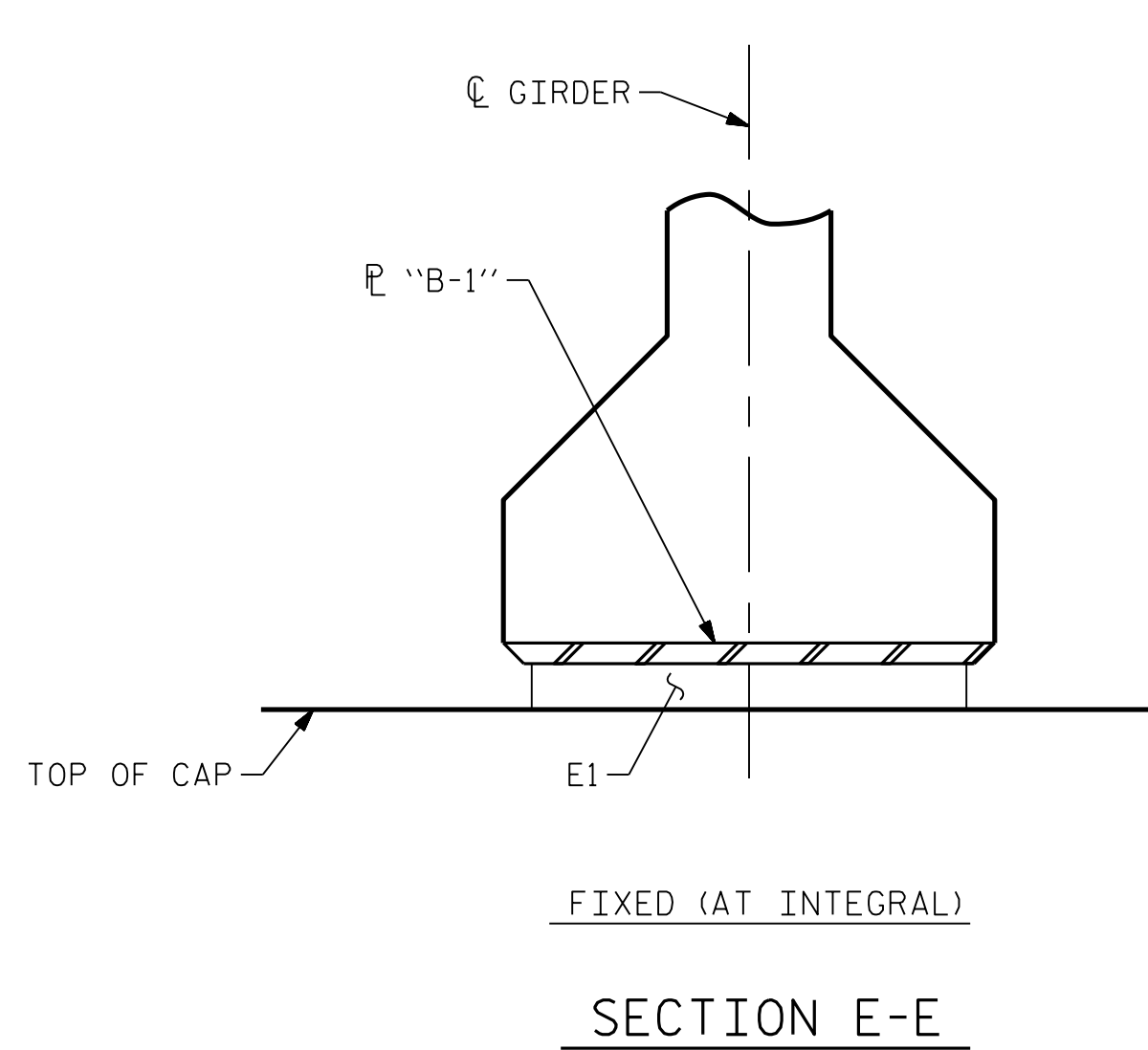
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-16
TOTAL SHEETS 36

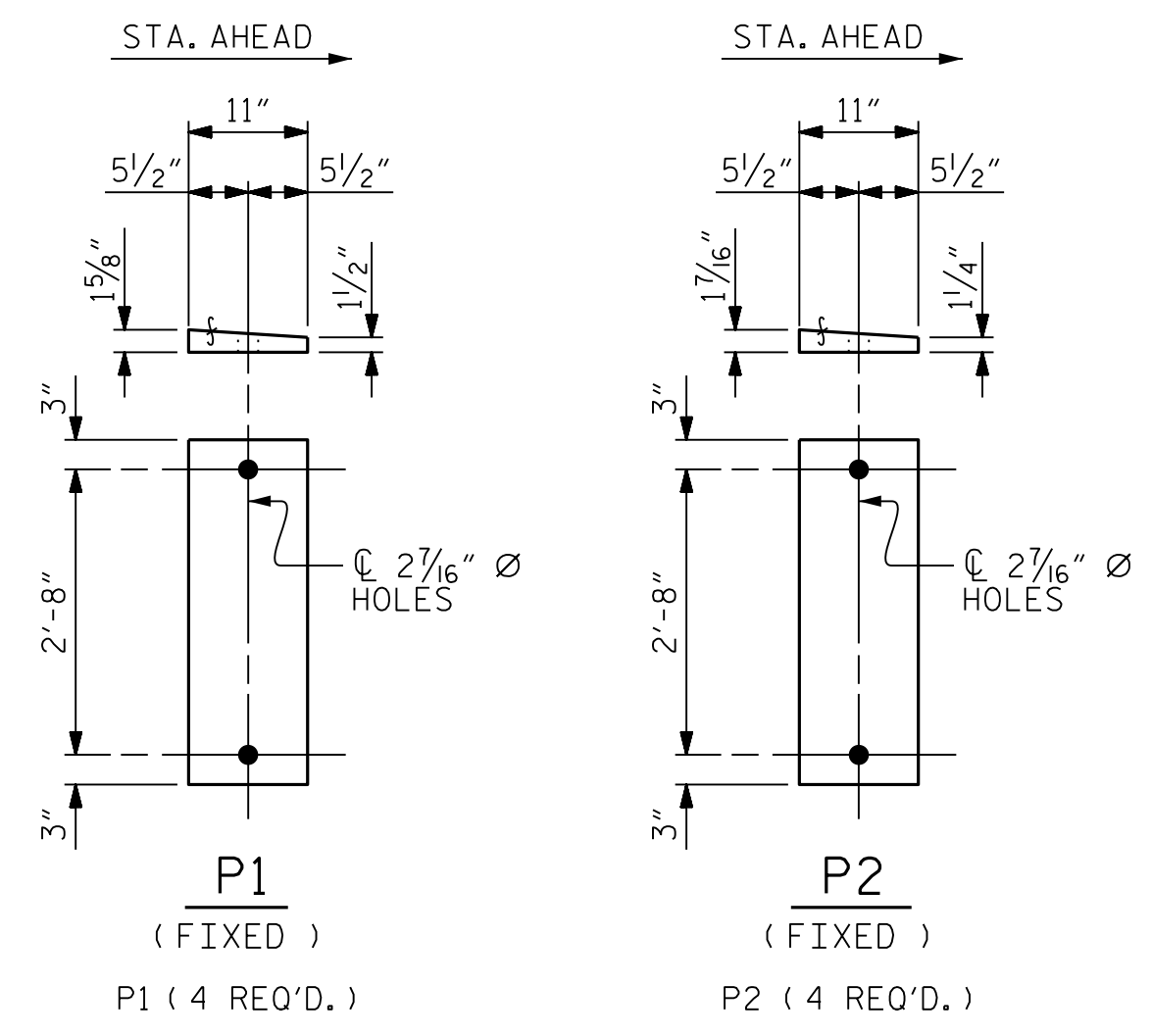
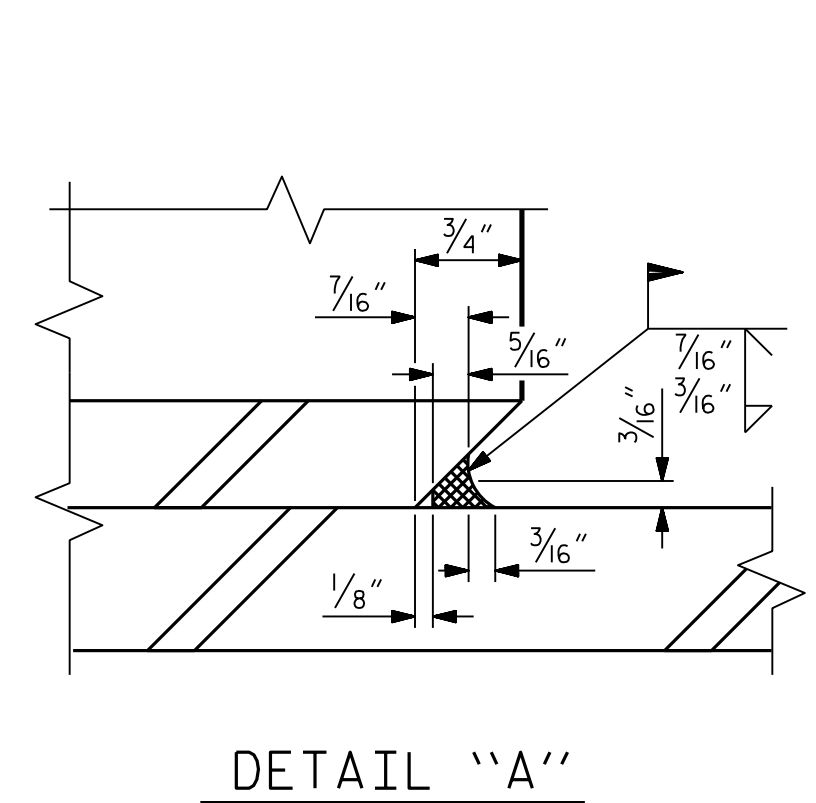
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ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY: VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



SOLE PLATE DETAILS ("P")

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

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 AND WASHERS, 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.

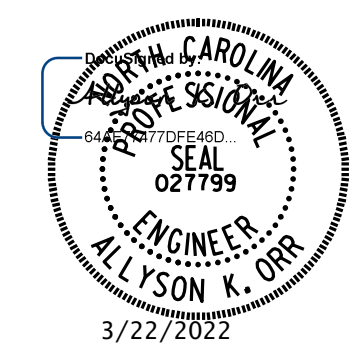
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



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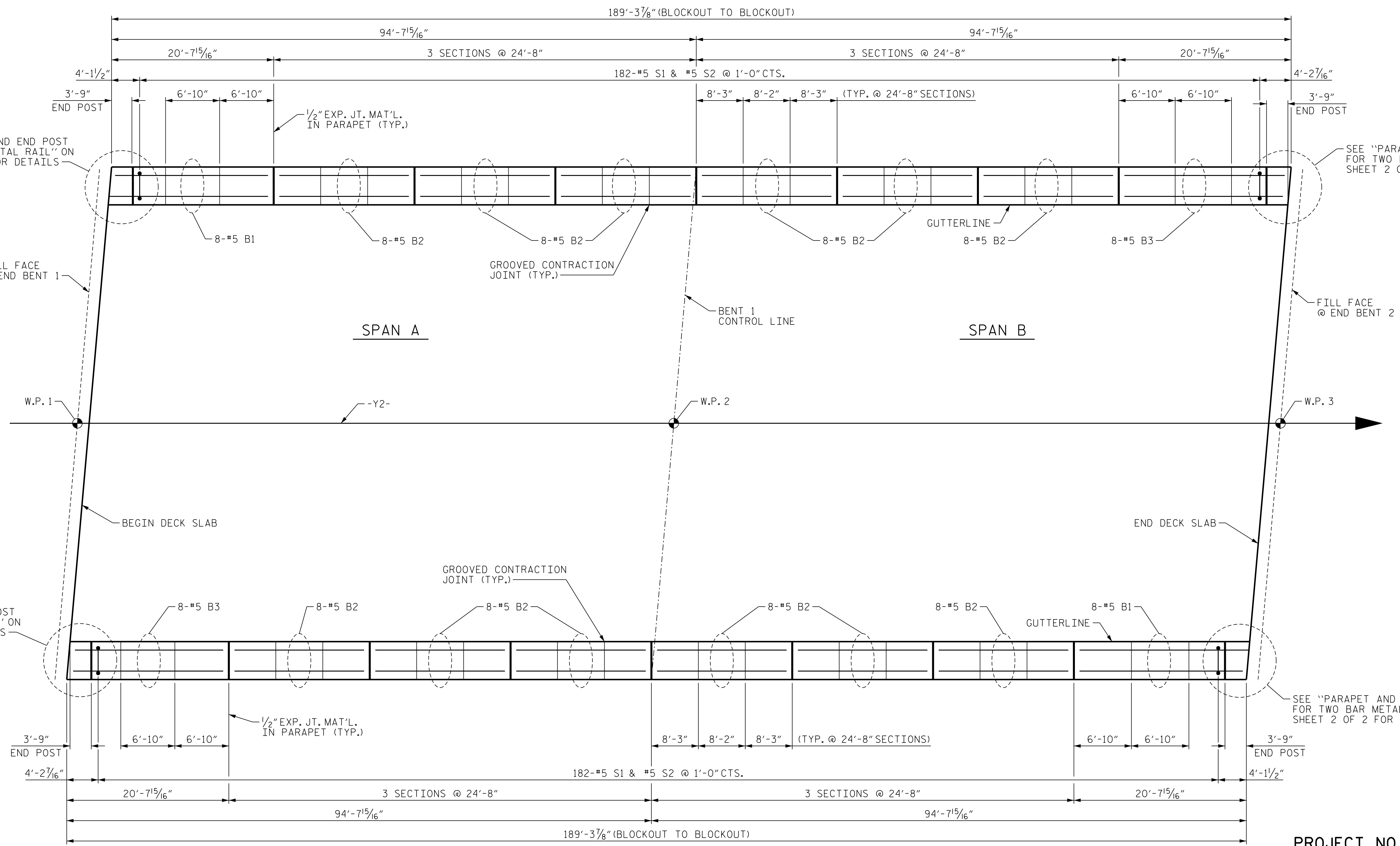
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17 TOTAL SHEETS 36
1			3			
2			4			

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CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
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CHECKED BY: CRK 8/89	REV. 12/17 MAA/THC
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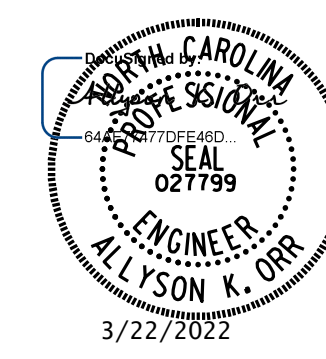


PLAN OF CONCRETE PARAPET

FOR NOTES OF CONCRETE PARAPET, AND
ADDITIONAL REINFORCEMENT, SEE SHEET 2 OF 2

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 PLAN FOR
 2 BAR METAL RAIL

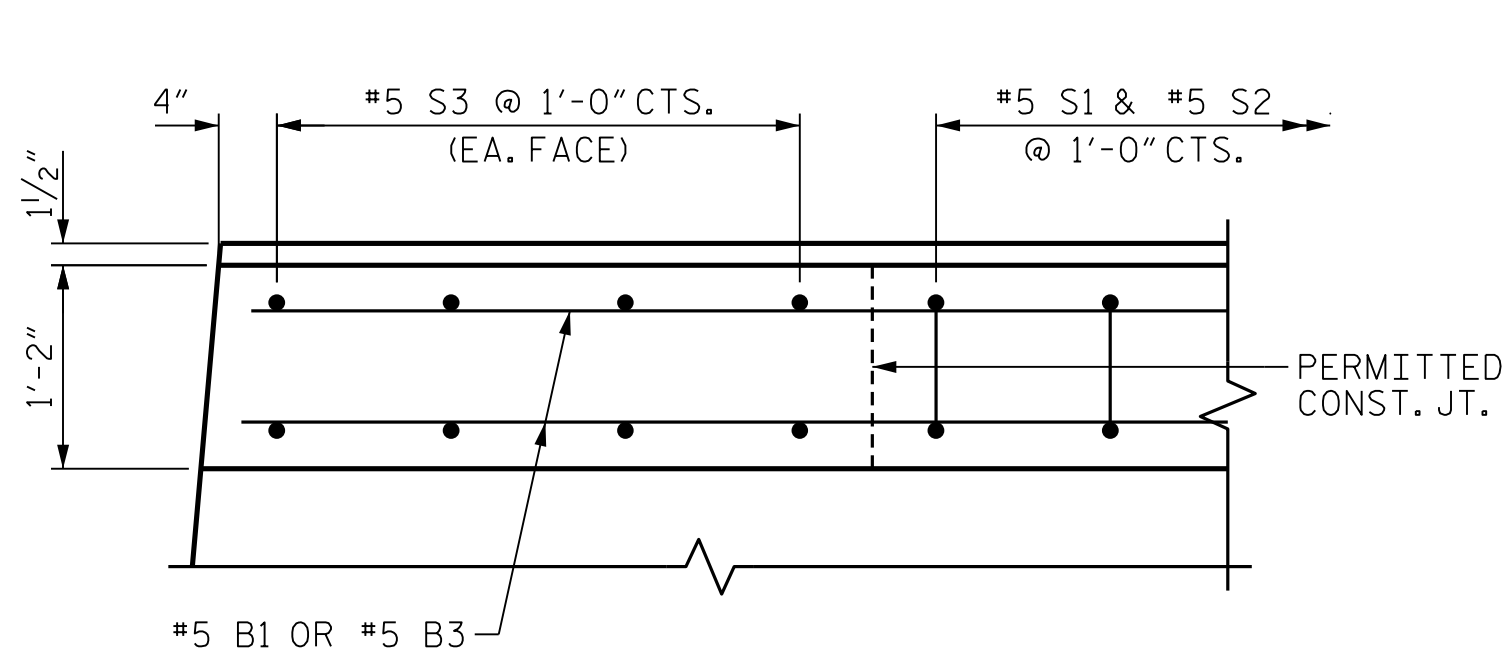
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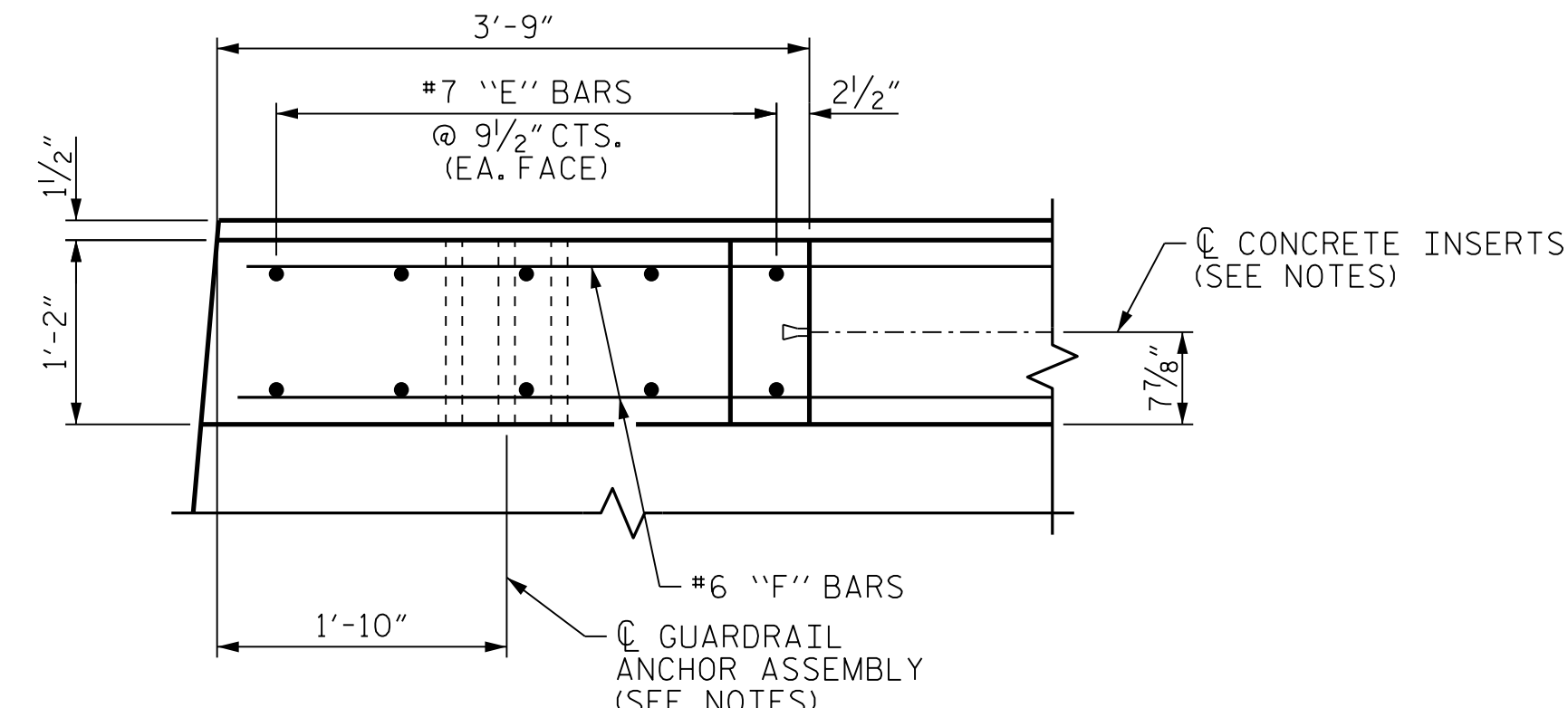
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2			4			

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CHECKED BY : A.K. ORR	DATE : 03/2021
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/2022

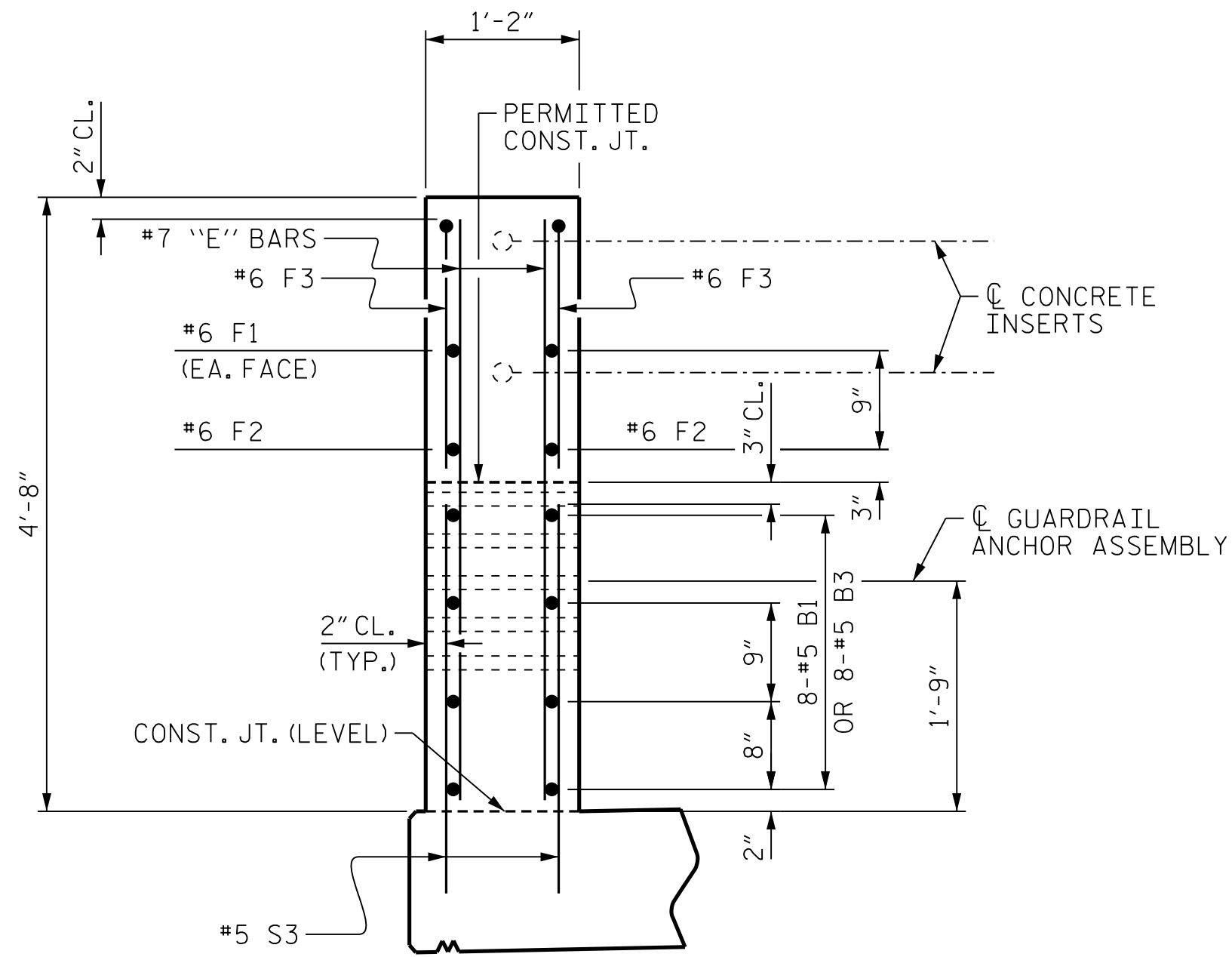
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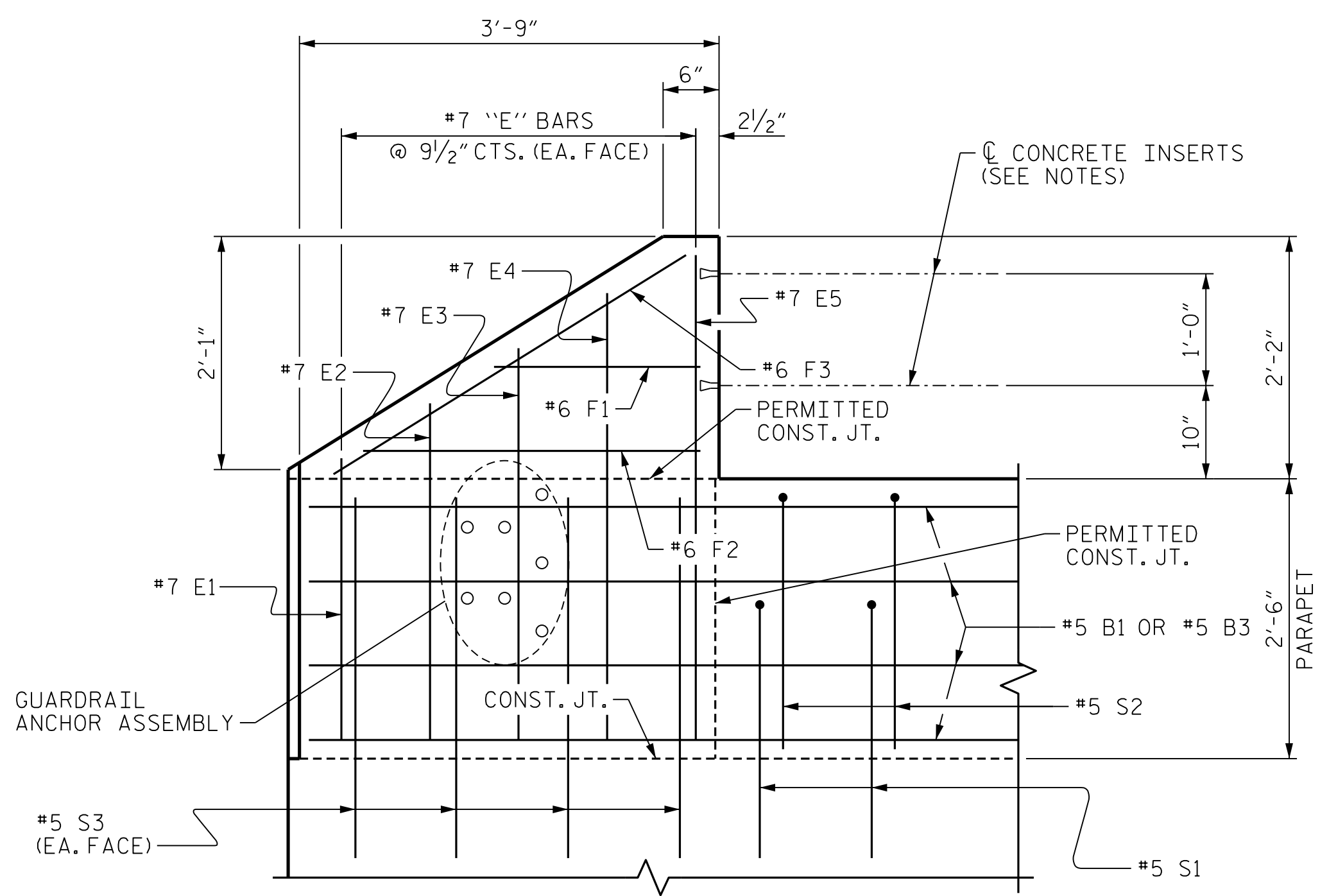
PLAN OF PARAPET



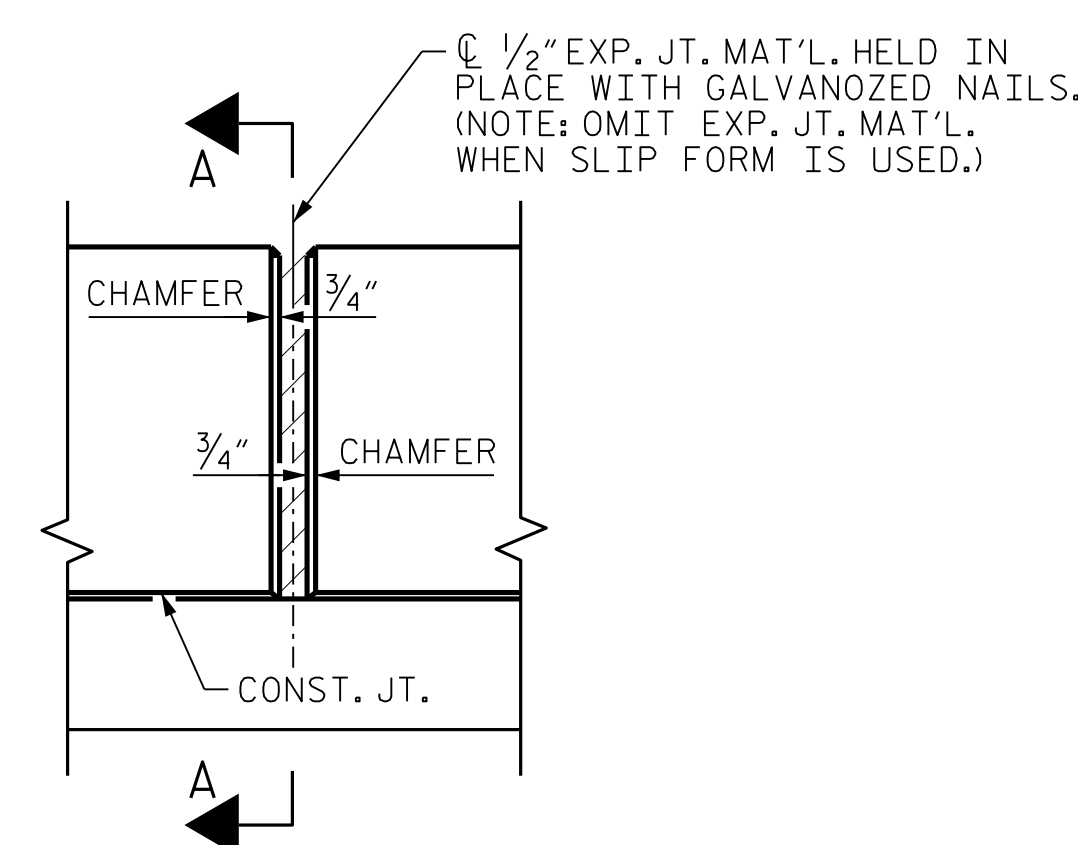
PLAN OF END POST



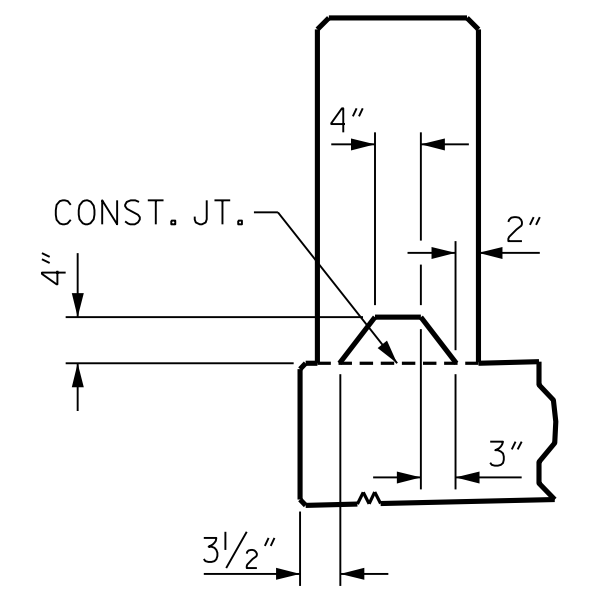
END VIEW



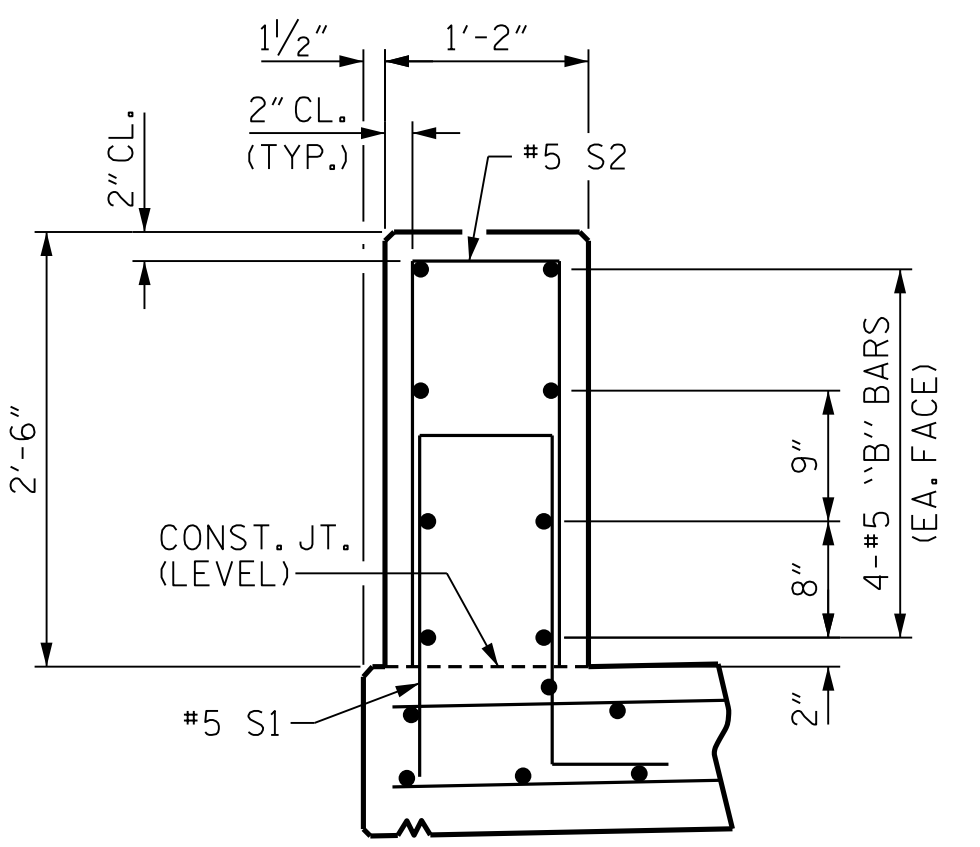
ELEVATION



ELEVATION AT EXPANSION JOINTS



SECTION A-A
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED.)
PARAPET DETAILS



SECTION THRU PARAPET

NOTES:

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

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

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

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

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. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN 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 AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEETS.

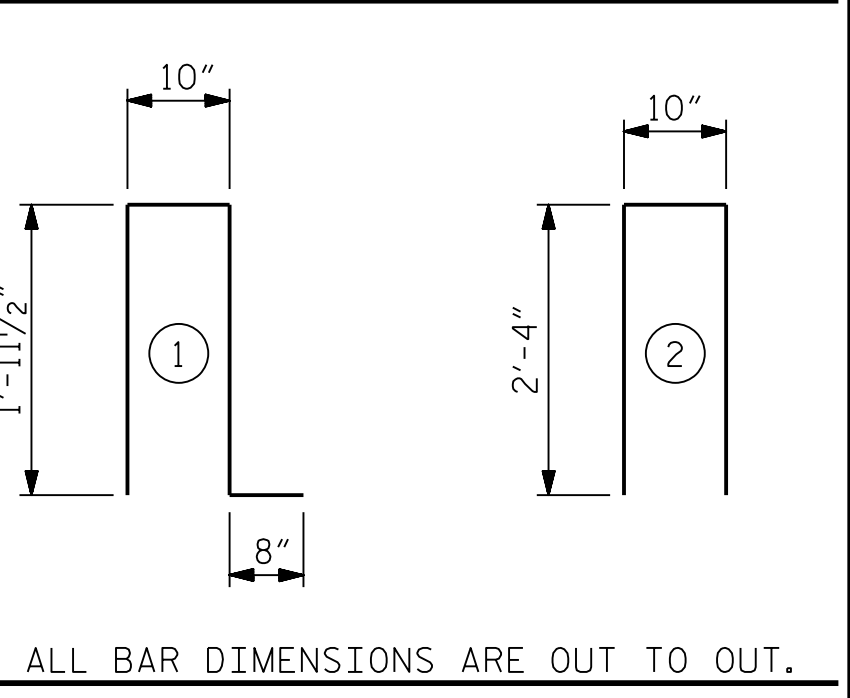
THE JOINT AT ENDS OF DECK AND LINK SLAB SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

THE #5 S3 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. AFTER SAWING THE JOINT, THE YIELD LOAD FOR THE #5 S3 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BILL OF MATERIAL

PARAPET AND END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#5	STR	20'-3"	338
B2	96	#5	STR	28'-3"	2,829
B3	16	#5	STR	20'-2"	337
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'-9"	21
F2	8	#6	STR	2'-9"	33
F3	8	#6	STR	3'-8"	44
S1	364	#5	1	5'-5"	2,056
S2	364	#5	2	5'-6"	2,088
S3	32	#5	STR	3'-0"	100
EPOXY COATED REINFORCING STEEL				8,129	LBS.
CLASS AA CONCRETE				43.4	C. Y.
1'-2" x 2'-6" CONCRETE PARAPET				378.65	LIN. FT.

BAR TYPES

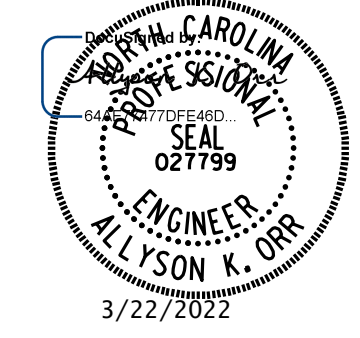


ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 DETAILS AND
 BILL OF MATERIAL



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 RALEIGH, NC 27606
 (919) 851-6606
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1			3			S1-19
2			4			TOTAL SHEETS 36

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DRAWN BY : B.E. LANNING DATE : 03/2021
 CHECKED BY : A.K. ORR DATE : 03/2021
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

NOTES

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

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFB 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.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

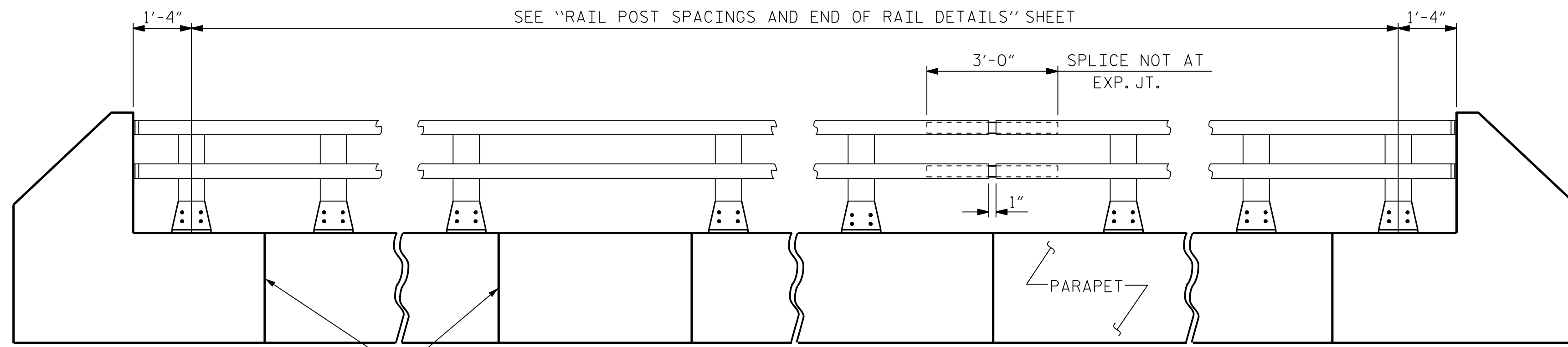
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

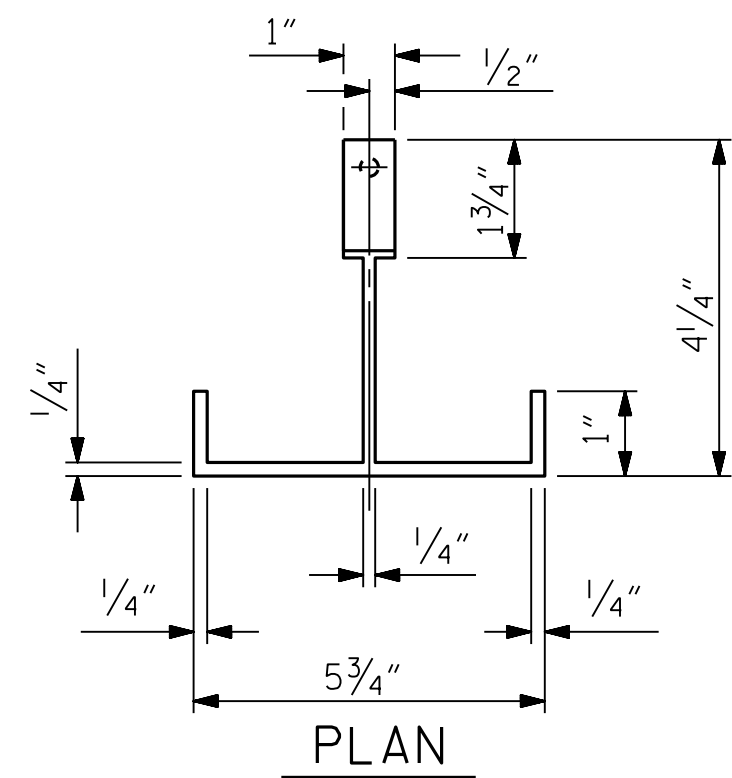
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT 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 = 363.44 LIN. FT.

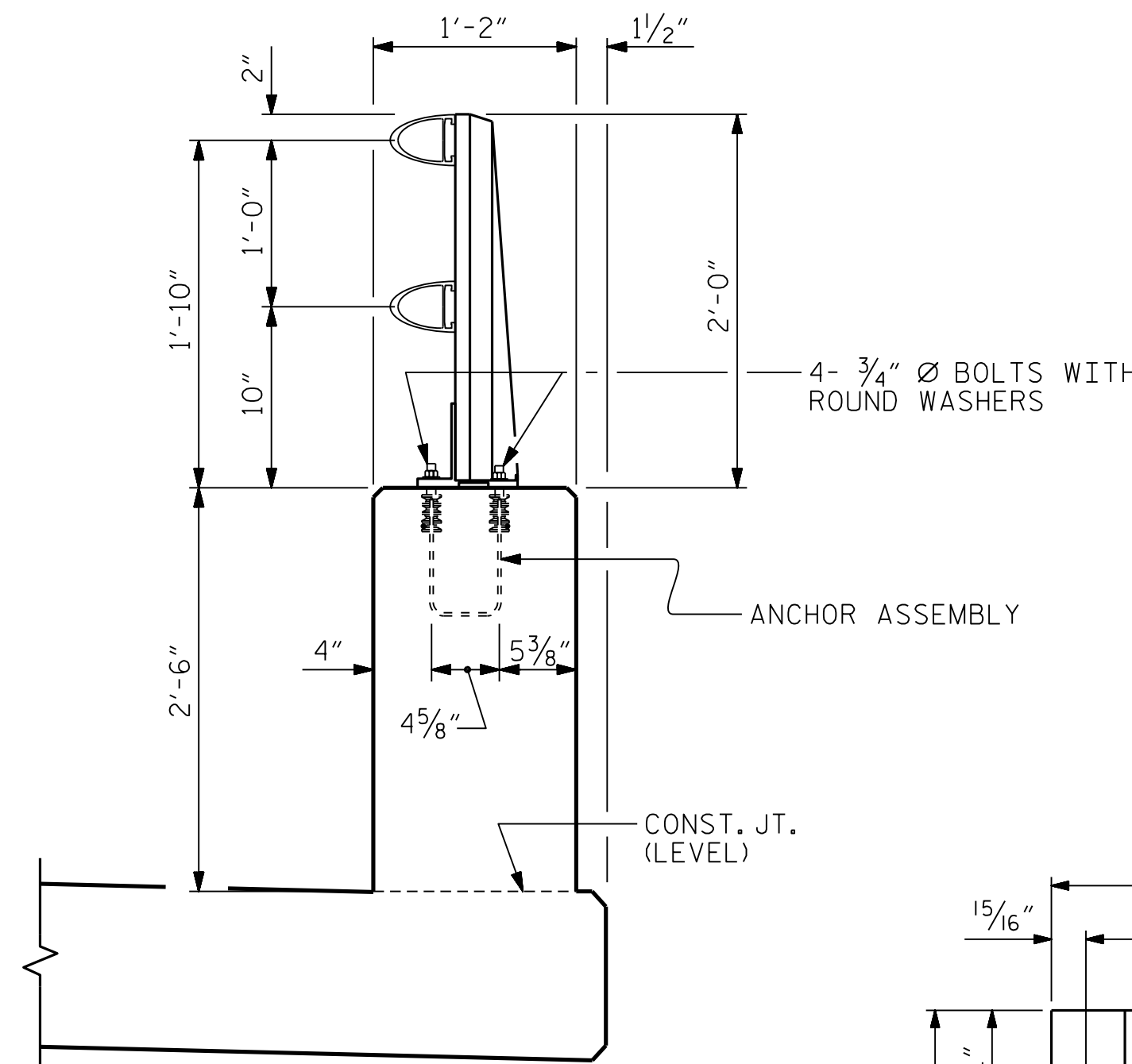


ELEVATION

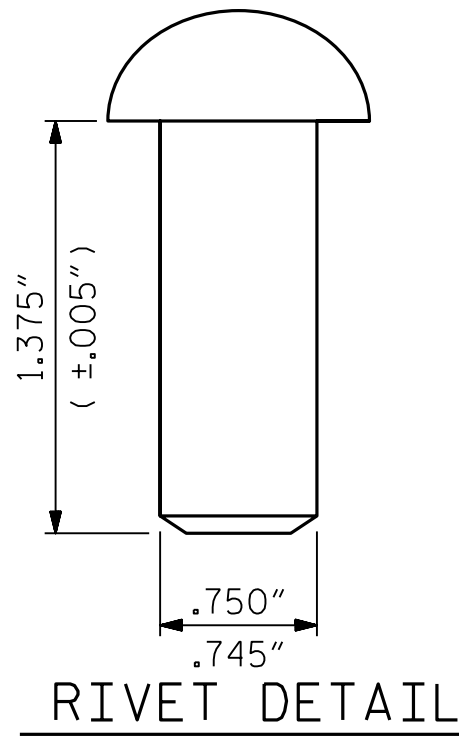
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 3.



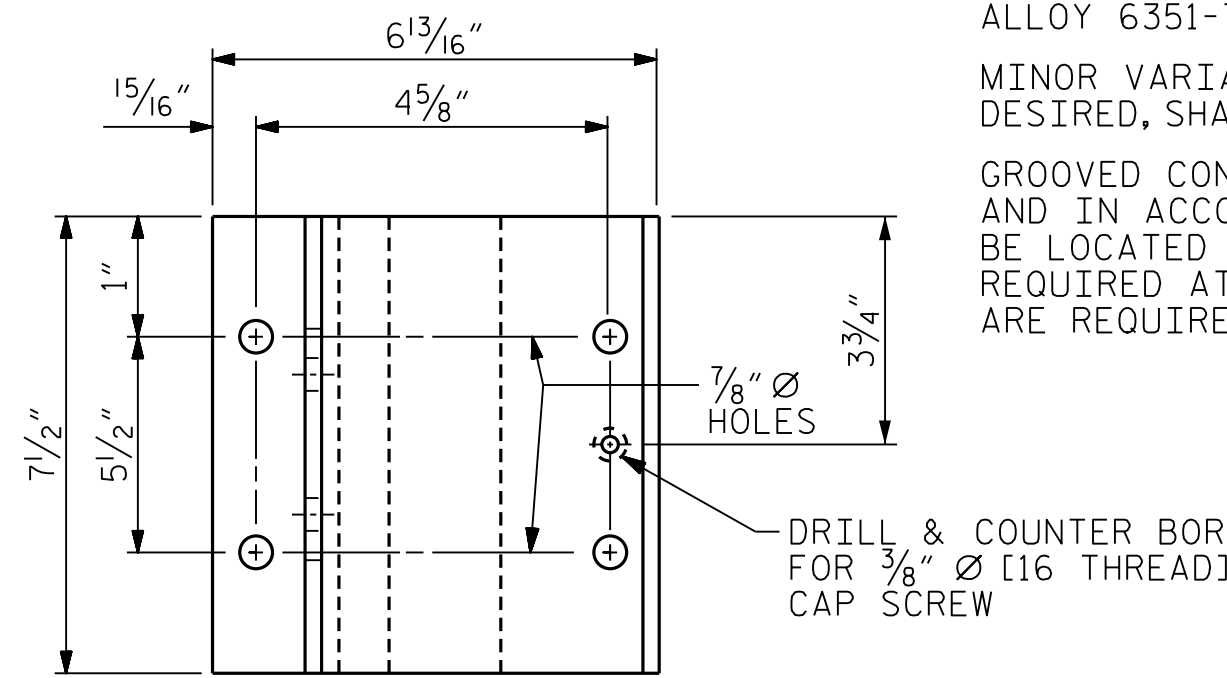
PLAN



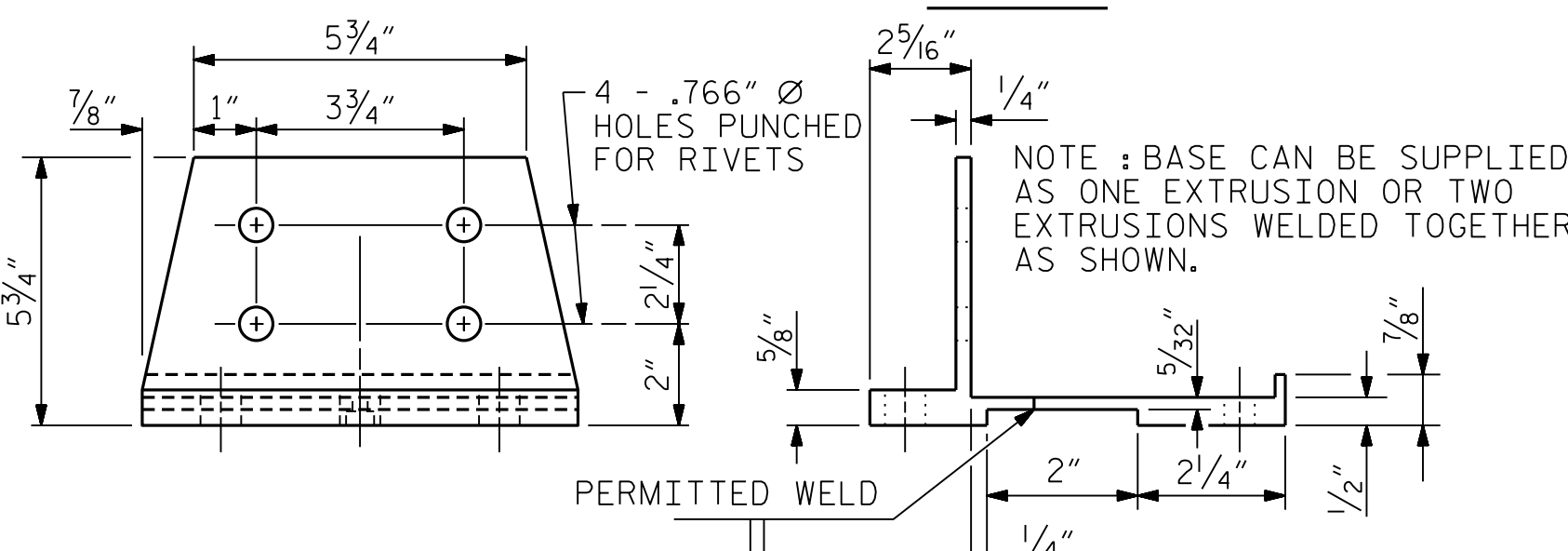
SECTION THRU PARAPET AND RAIL



RIVET DETAIL



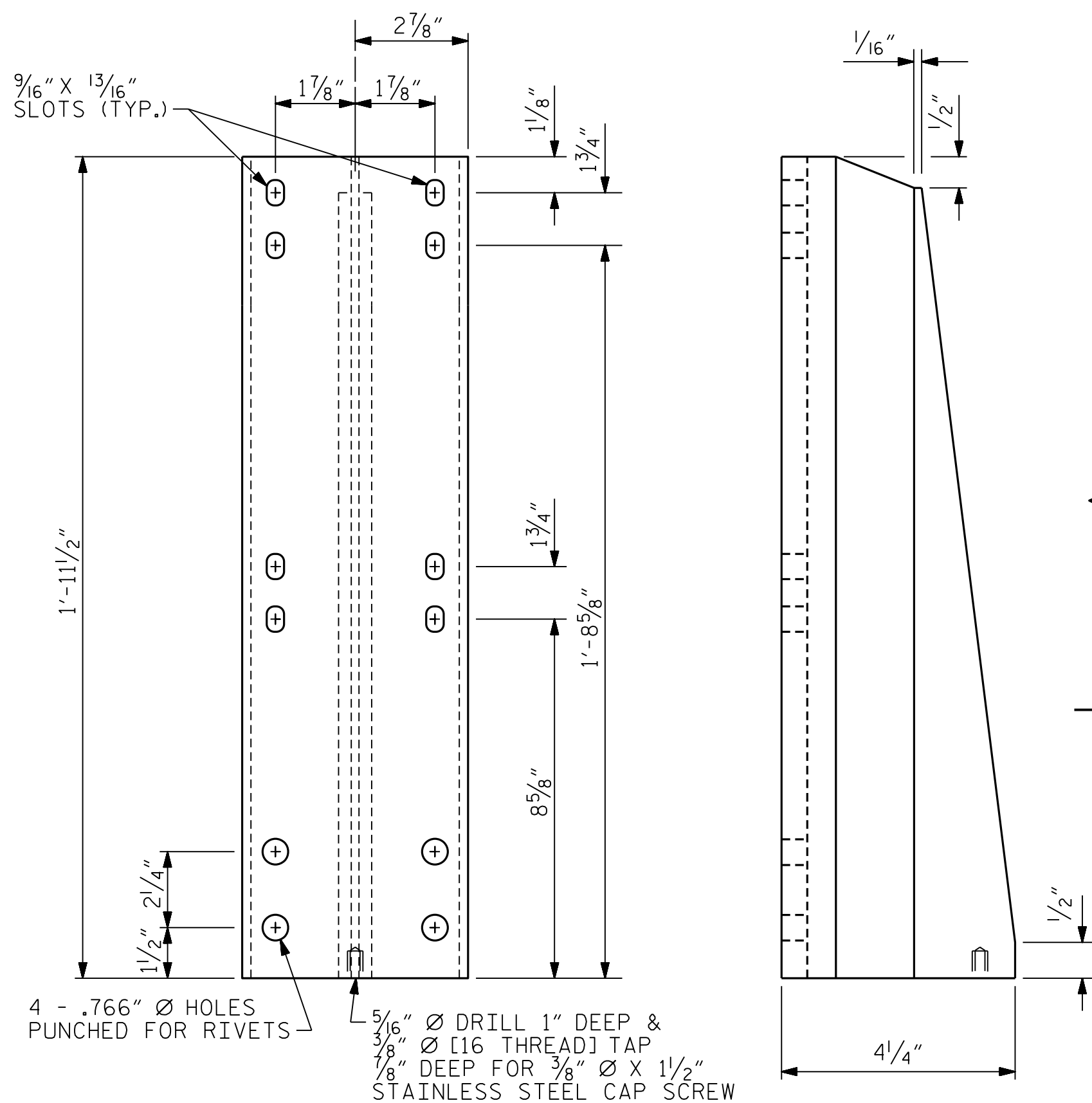
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

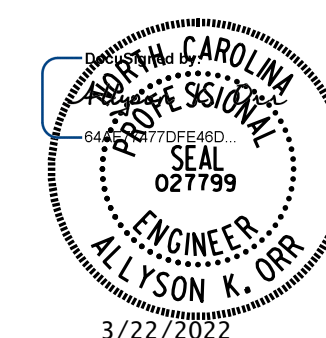


FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

4 - .766" Ø HOLES PUNCHED FOR RIVETS
 5/16" X 13/16" SLOTS (TYP.)
 3/8" Ø DRILL 1" DEEP & 1/8" Ø [16 THREAD] TAP 7/8" DEEP FOR 3/8" Ø X 1 1/2" STAINLESS STEEL CAP SCREW



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PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-20
TOTAL SHEETS					36

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CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: EEM 6/94	REV. 10/1/11 MAA/GM
CHECKED BY: RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NOTES

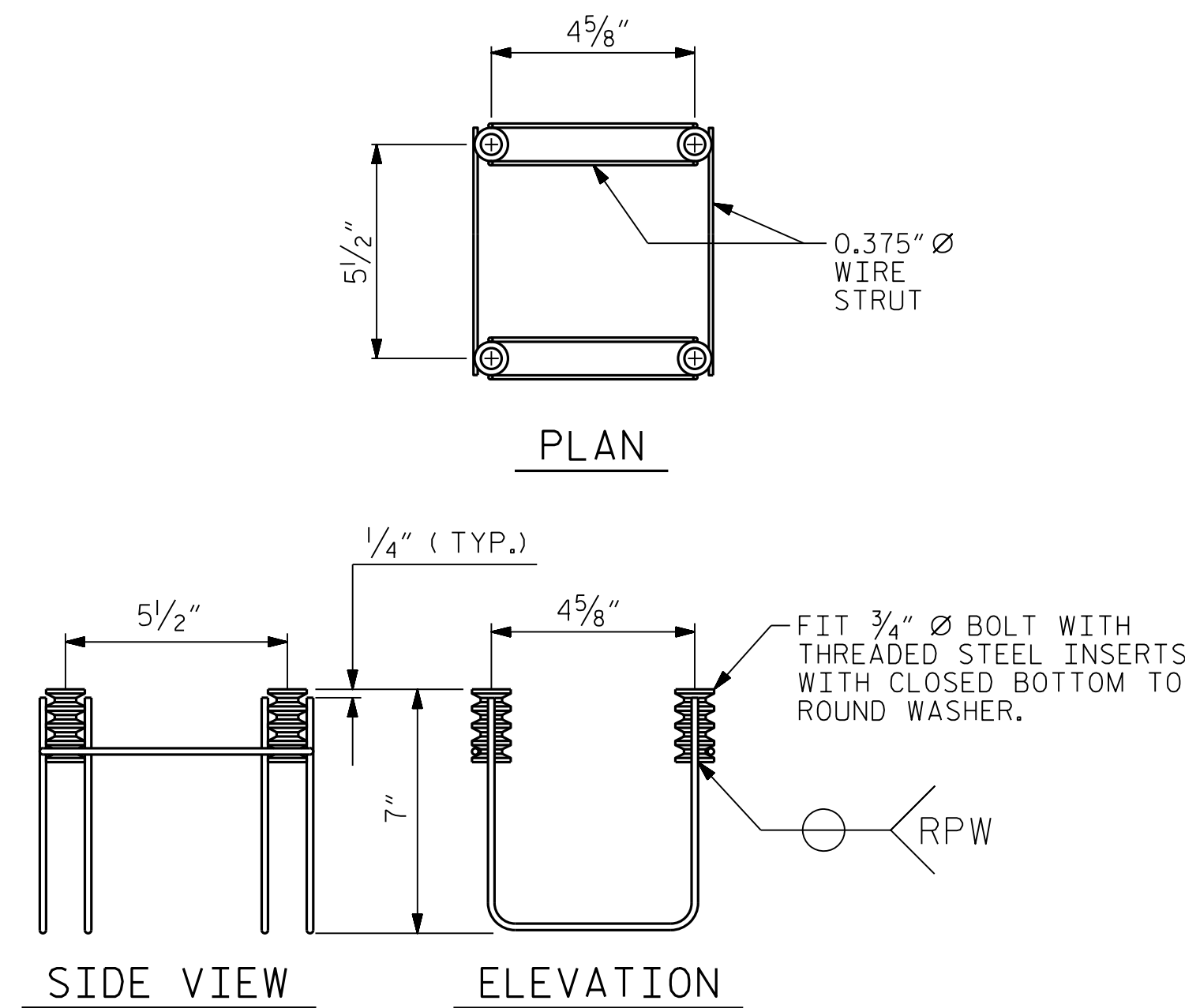
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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.

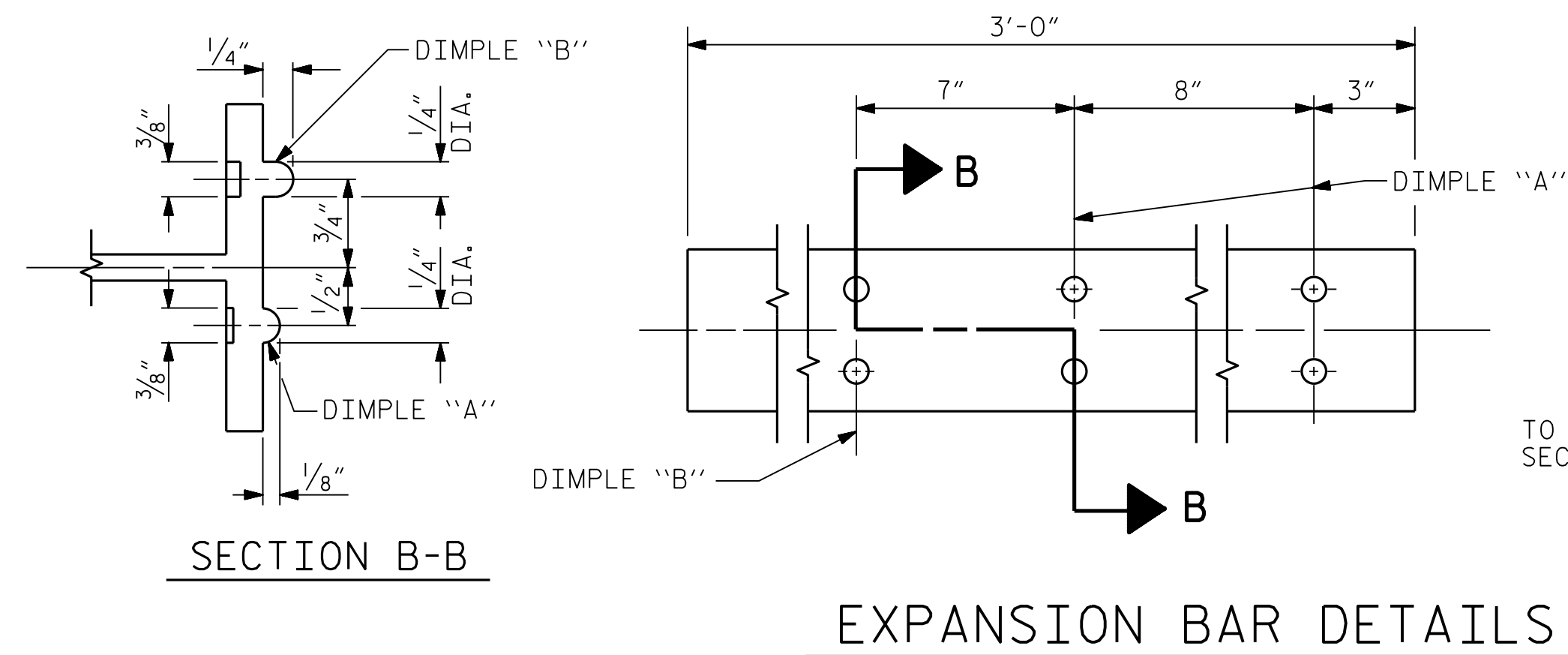
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.

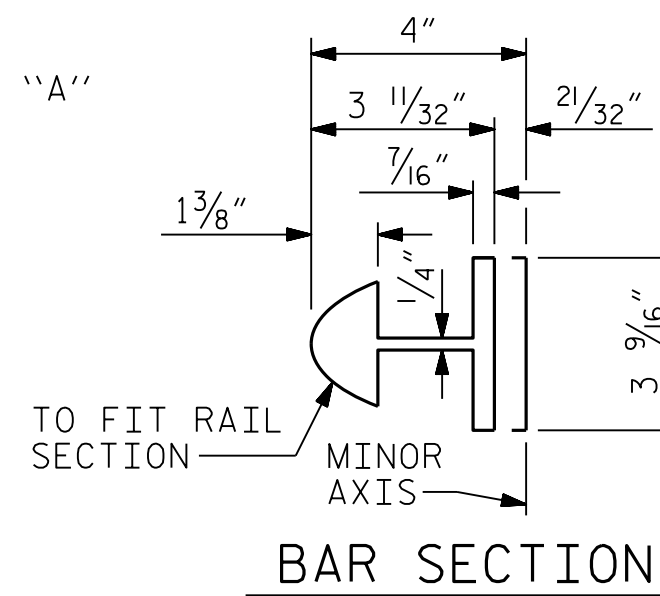


4-BOLT METAL RAIL ANCHOR ASSEMBLY

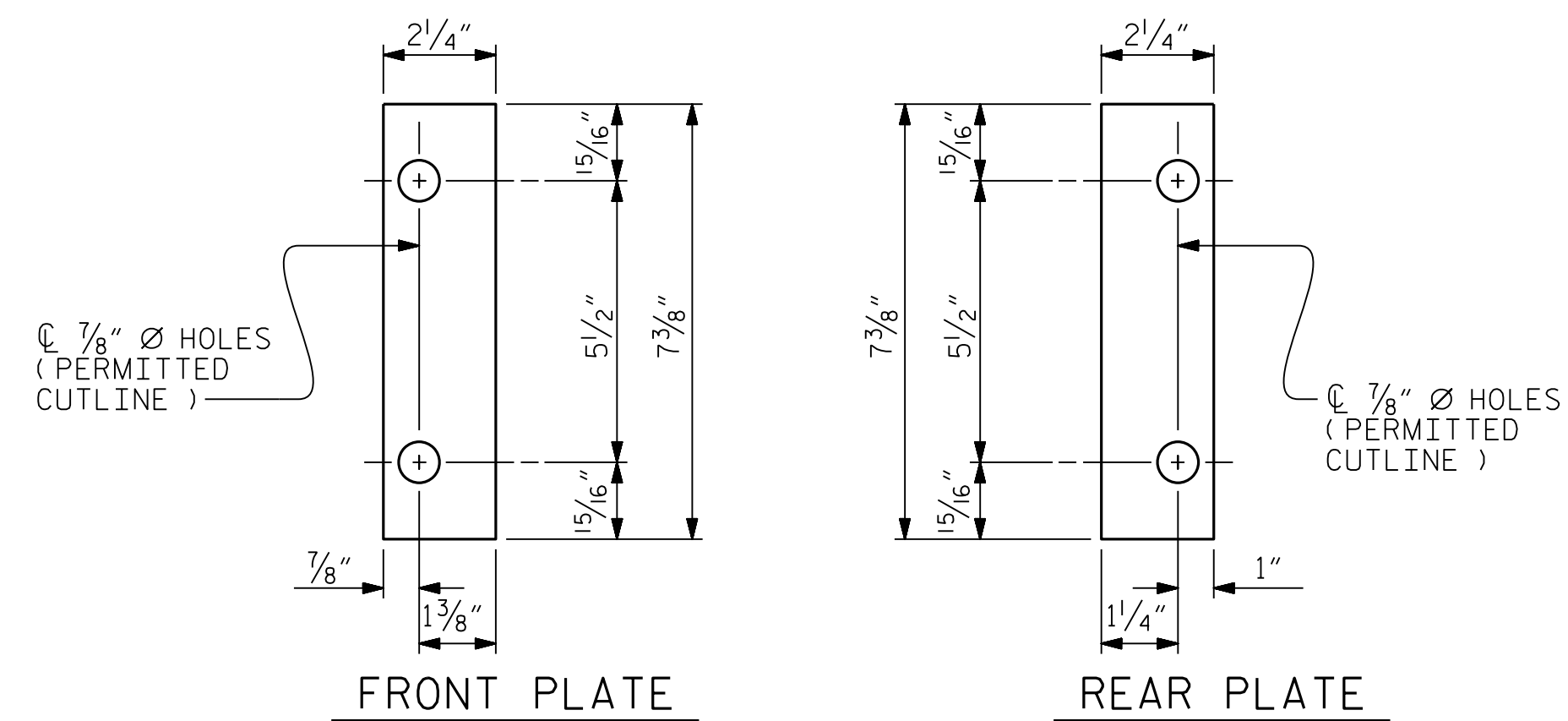
(64 ASSEMBLIES REQUIRED)



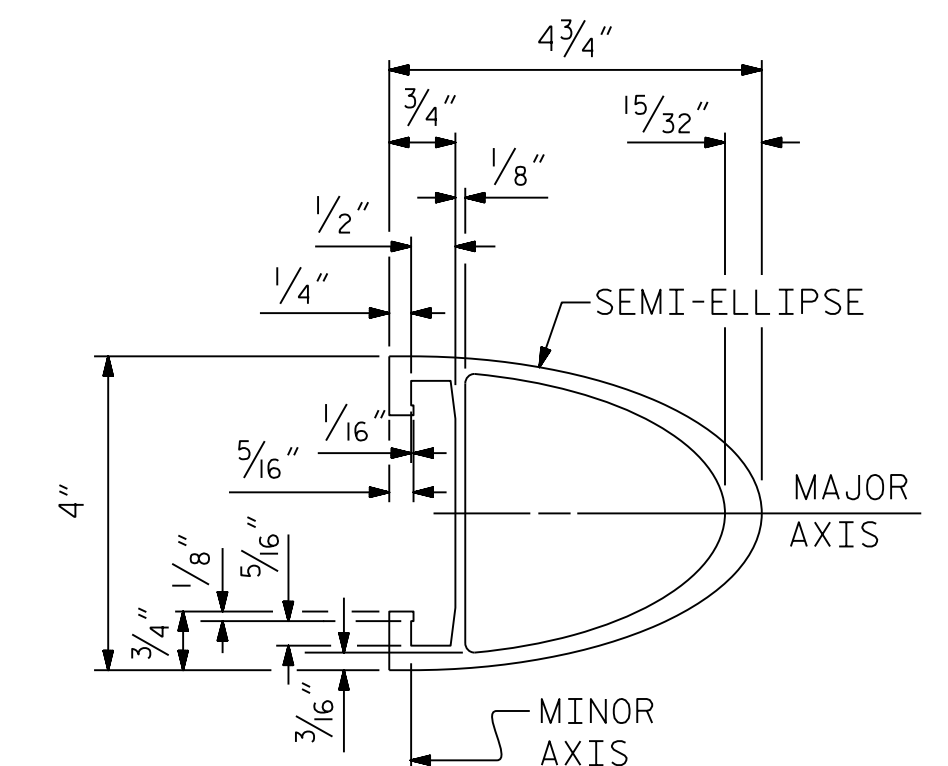
EXPANSION BAR DETAILS



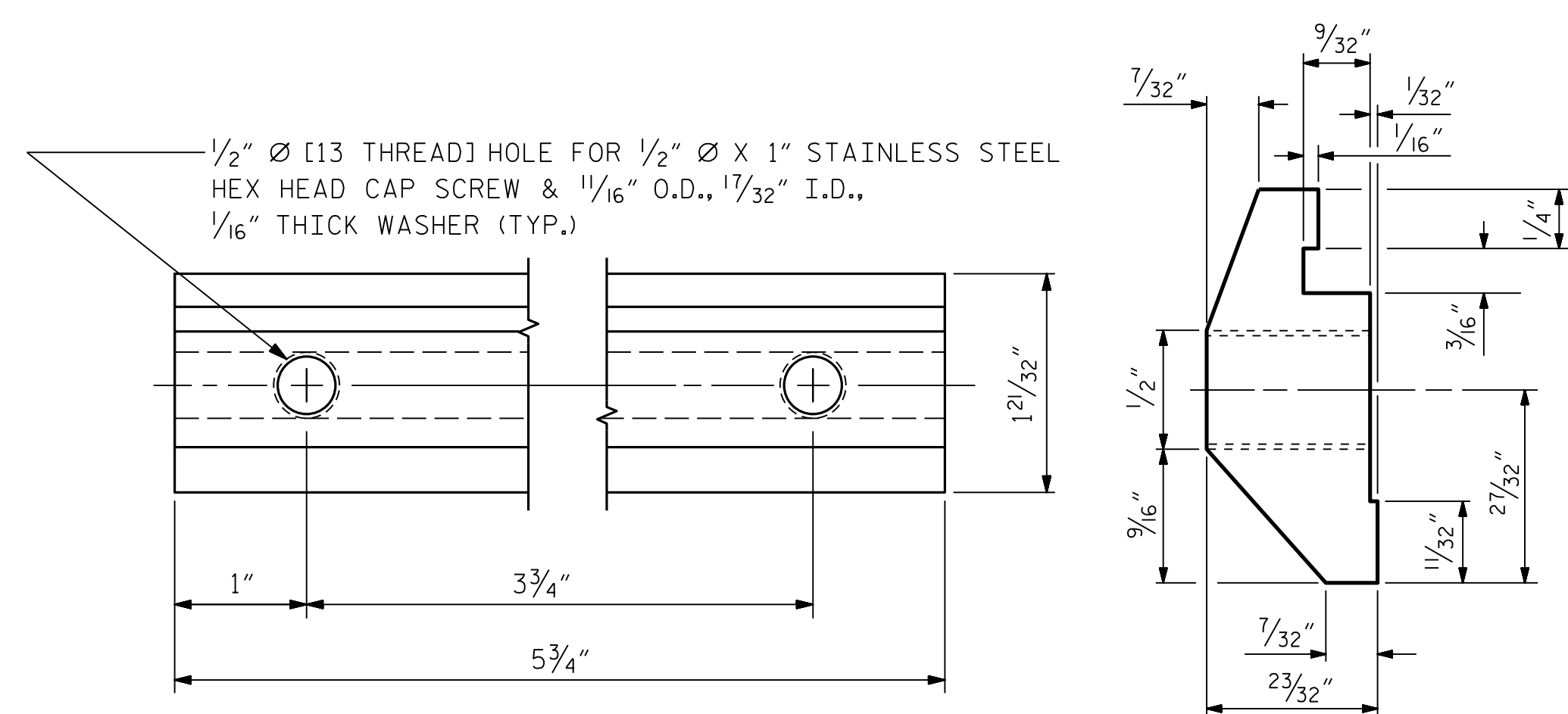
BAR SECTION



SHIM DETAILS

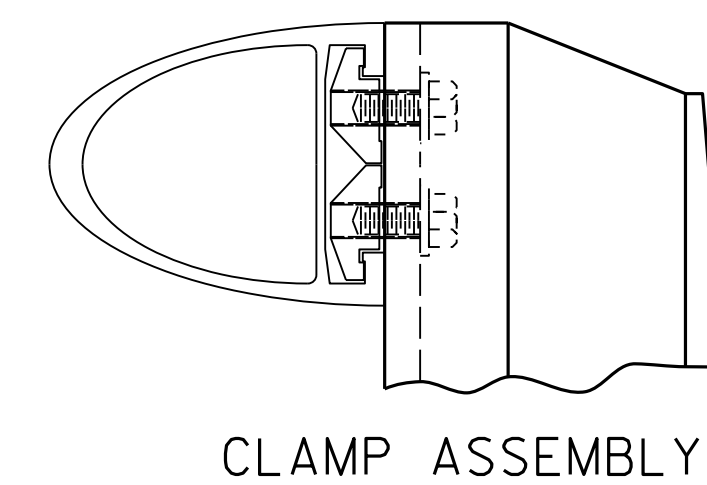


RAIL SECTION

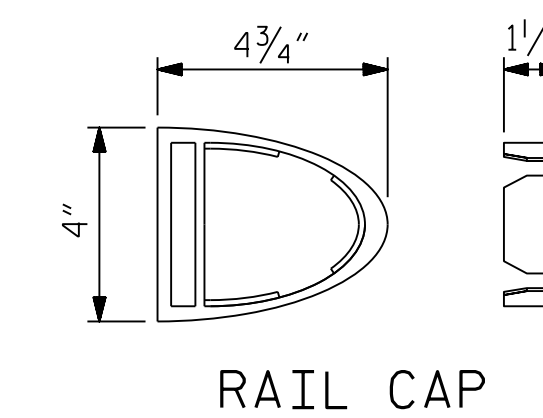


CLAMP BAR DETAIL

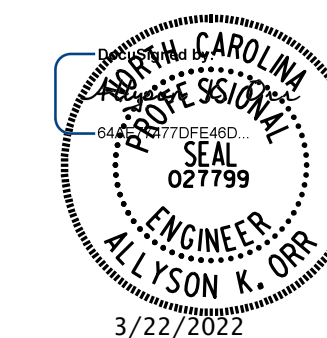
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-

SHEET 2 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-21
2			4			TOTAL SHEETS 36

STD. NO. BMR4

3/22/2022 1:15:29 PM

User: blanning

Filename: N:\NC Bridges\M20003 I-5987A&B I-5987A Structures\401_041_I5987A_SMU_BMR2_T70151.dgn

ASSEMBLED BY: B.E LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY: RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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 1/8" 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 1/8" 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

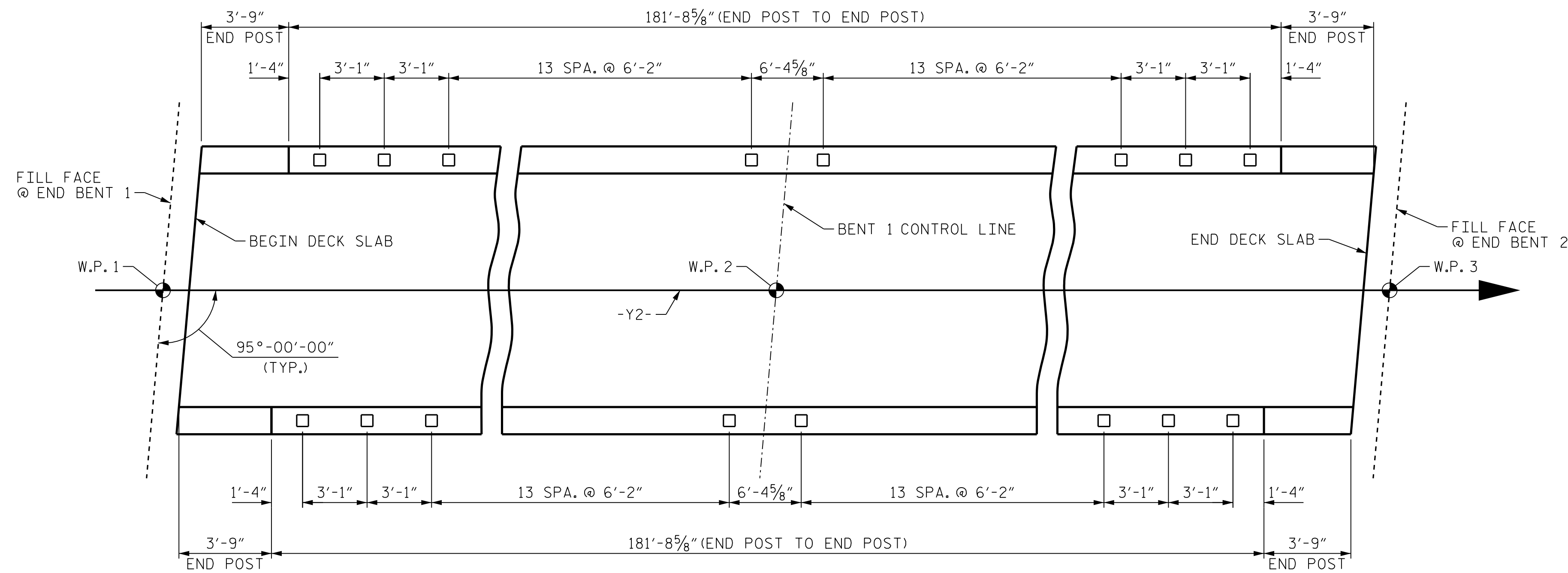
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" 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 2 BAR METAL RAILS.

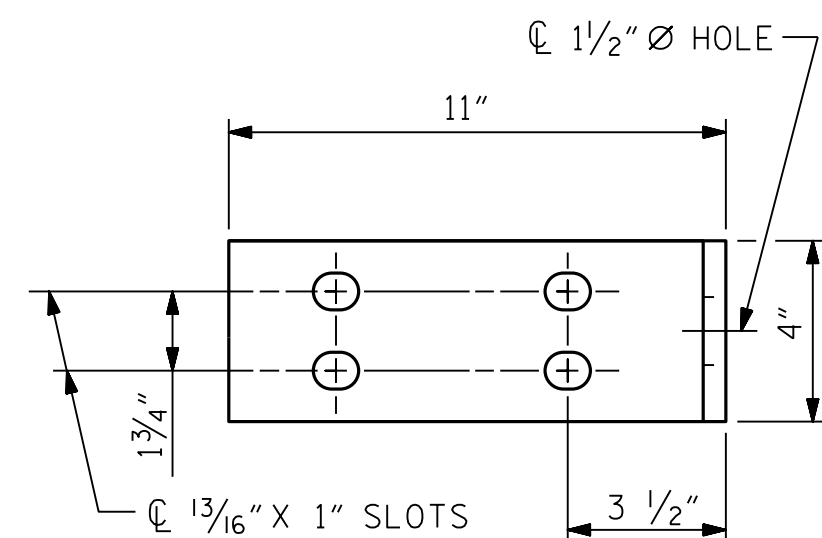
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.

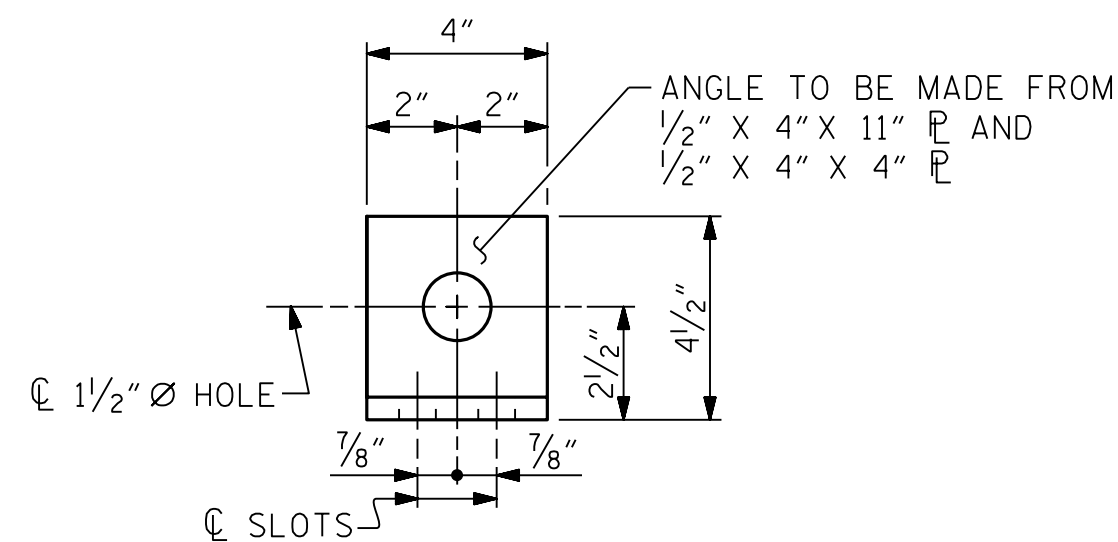
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



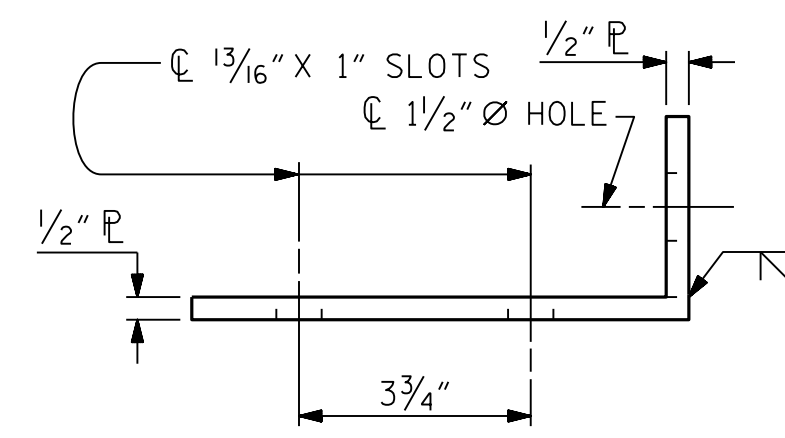
PLAN OF RAIL POST SPACINGS



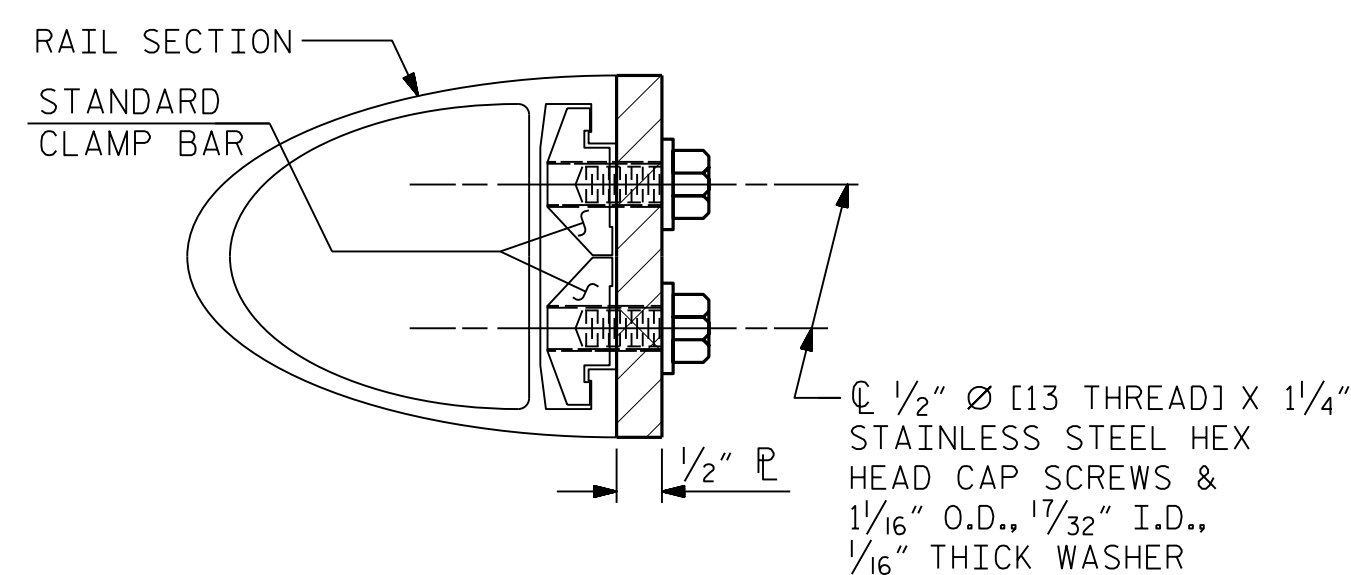
ELEVATION



END VIEW

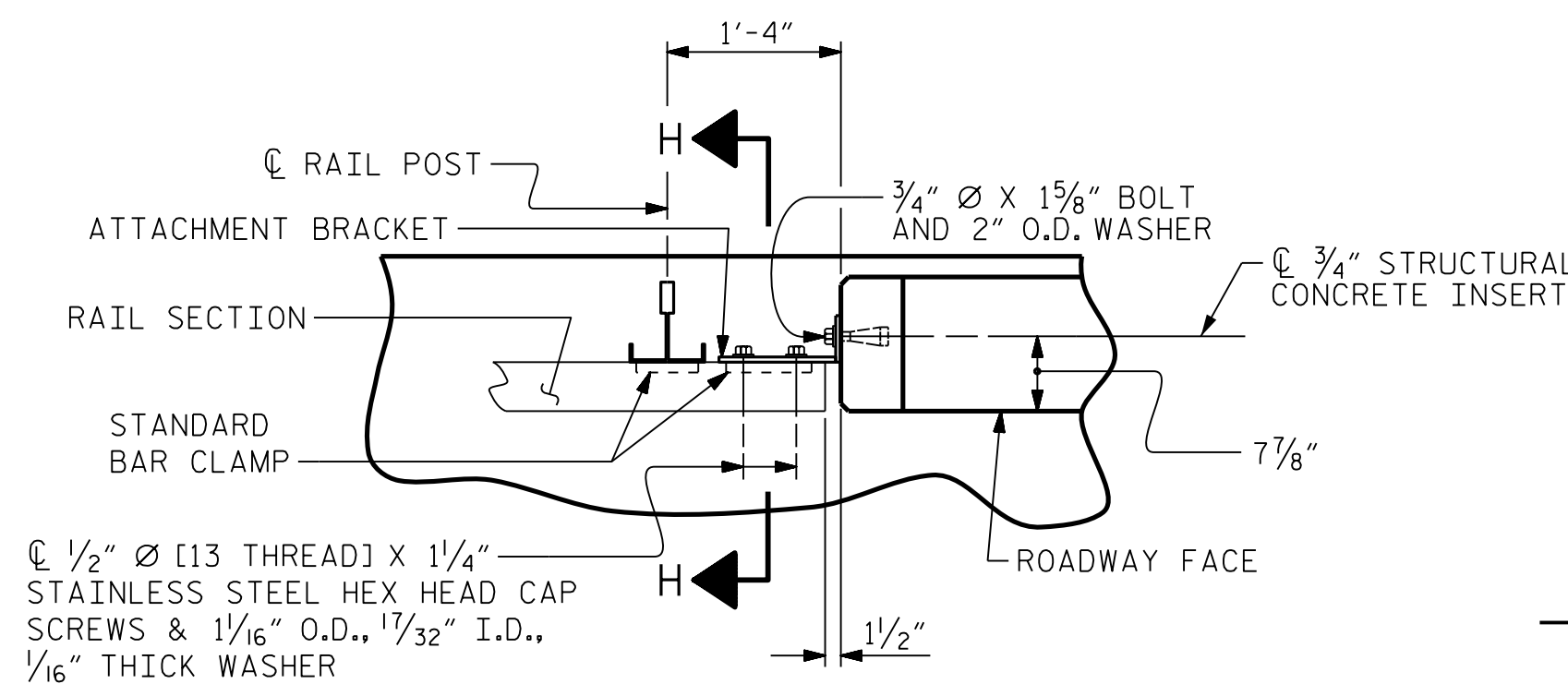


TOP VIEW

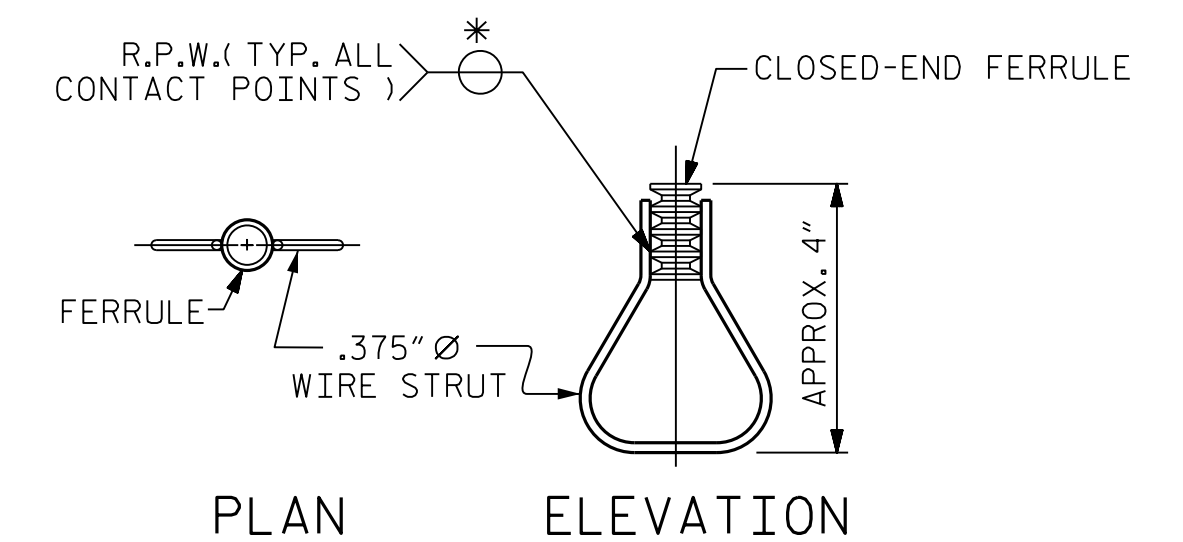


SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST

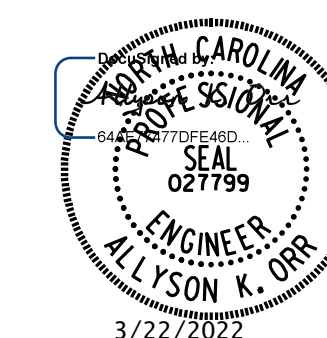


STRUCTURAL CONCRETE INSERT

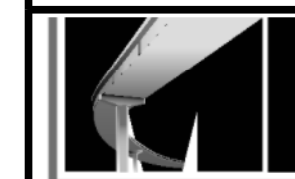
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 3



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
RAIL POST SPACINGS AND END OF RAIL DETAILS FOR ONE OR TWO BAR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-22
TOTAL SHEETS					36

STD. NO. BMR2

3/22/2022 1:15:30 PM User: blanning
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 I-5987A&B I-95\I5987A\Structures\401_043_I5987A_SMU_BMR3_770151.dgn

ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY: CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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.

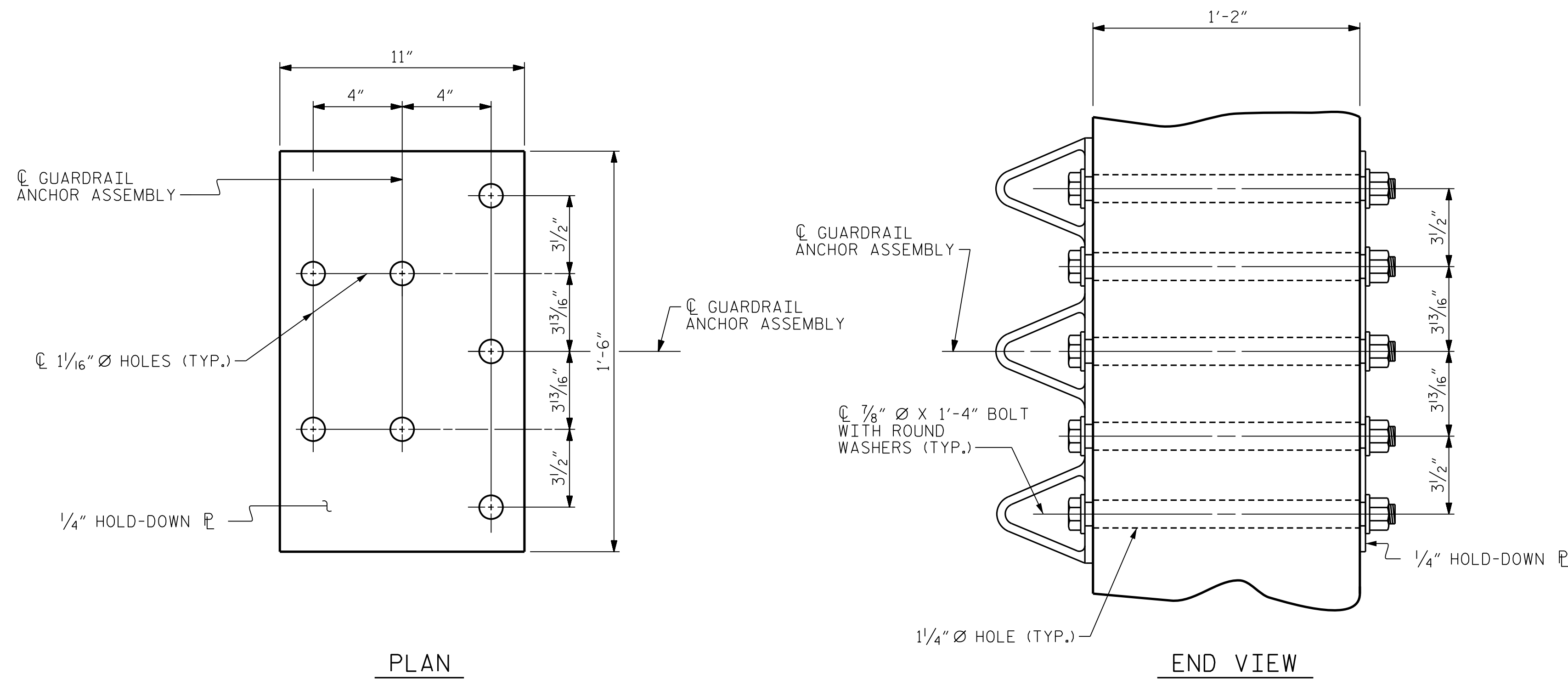
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

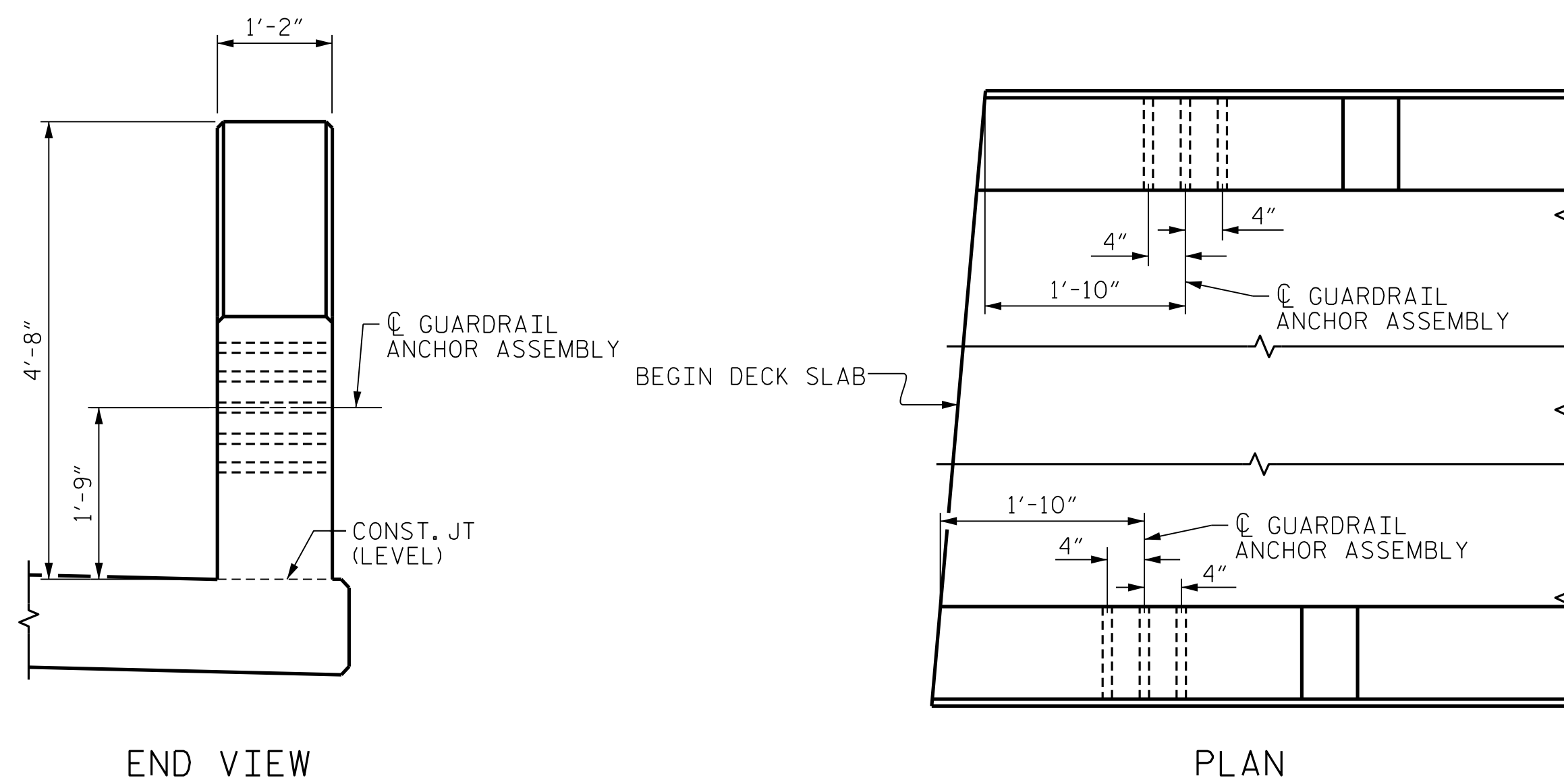


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

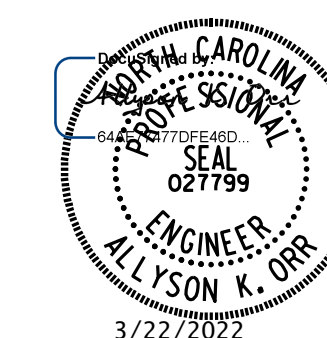
* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



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

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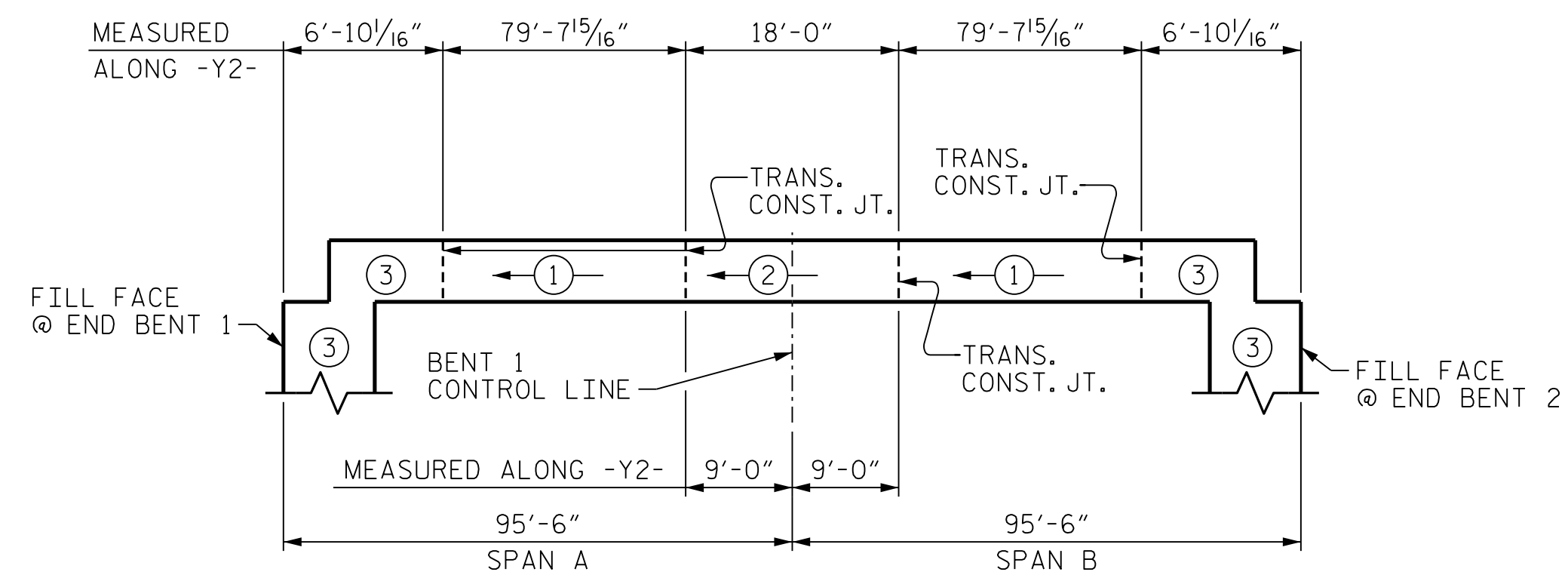
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-23 TOTAL SHEETS 36
2			4			

(SHT 2a) STD. NO. GRA3

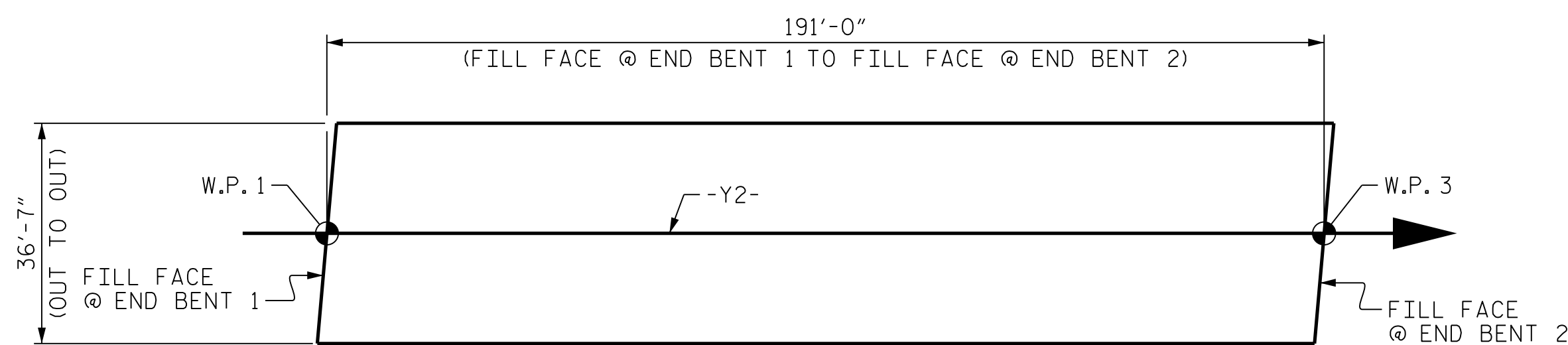
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ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY: GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC



POURING SEQUENCE

POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI.
 ③ INDICATES POUR NUMBER AND DIRECTION OF POUR



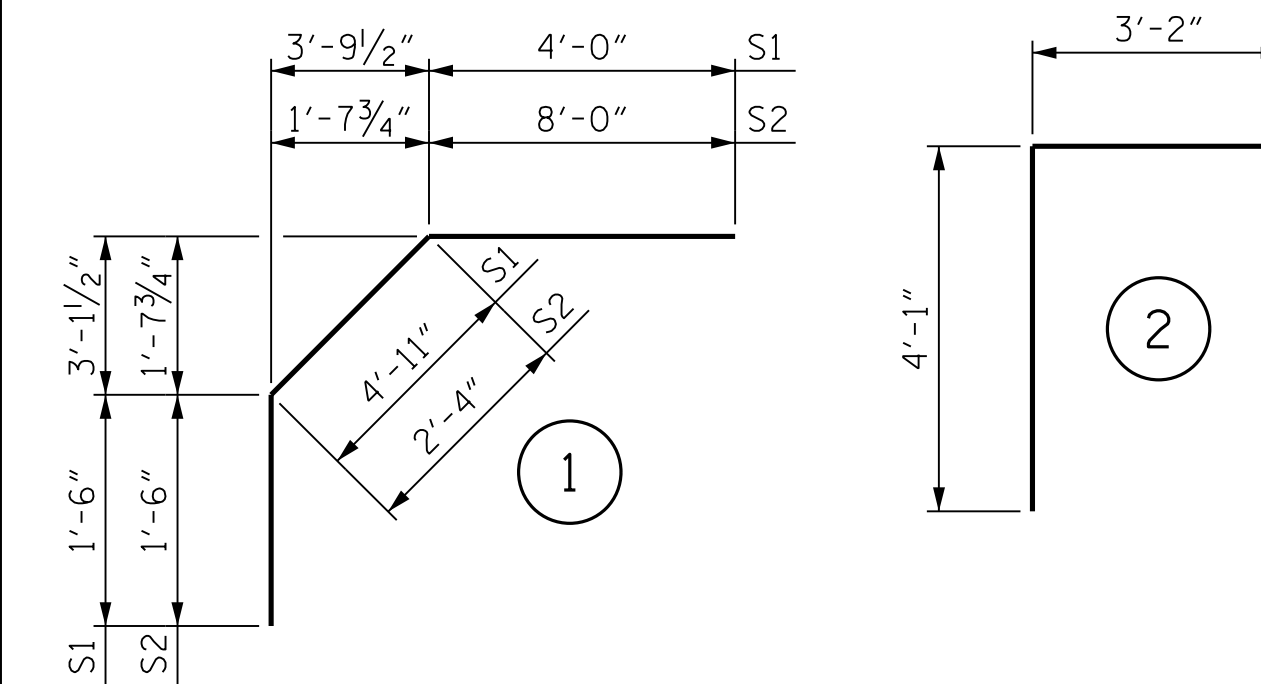
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB
 (SQ. FT. = 6,988)

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	372	#5	STR	36'-3"	14,065
A2	372	#5	STR	36'-3"	14,065
*A101	2	#5	STR	32'-0"	67
*A102	2	#5	STR	26'-3"	55
*A103	2	#5	STR	20'-7"	43
*A104	2	#5	STR	14'-10"	31
*A105	2	#5	STR	9'-2"	19
*A106	2	#5	STR	3'-5"	7
A201	2	#5	STR	32'-0"	67
A202	2	#5	STR	26'-3"	55
A203	2	#5	STR	20'-7"	43
A204	2	#5	STR	14'-10"	31
A205	2	#5	STR	9'-2"	19
A206	2	#5	STR	3'-5"	7
B1	230	#5	STR	39'-5"	9,456
*B2	140	#4	STR	39'-4"	3,678
*B3	54	#4	STR	21'-10"	788
*B4	108	#5	STR	18'-10"	2,121
B5	49	#5	STR	48'-6"	2,479
*B6	54	#4	STR	39'-0"	1,407
*B7	81	#4	STR	23'-10"	1,290
K1	10	#4	STR	36'-4"	243
K2	6	#4	STR	7'-3"	29
K3	6	#4	STR	8'-1"	32
K4	12	#4	STR	8'-9"	70
K5	6	#4	STR	7'-9"	31
K6	4	#4	STR	2'-3"	6
K7	4	#4	STR	2'-7"	7
K8	8	#4	STR	3'-0"	16
K9	4	#4	STR	2'-6"	7
*S1	56	#4	1	10'-5"	390
*S2	60	#4	1	11'-10"	474
U1	60	#4	2	11'-4"	454

*EPOXY COATED REINFORCING STEEL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	189.8	-	-
POUR #2	21.4	-	-
POUR #3	54.8	-	-
TOTALS**	266.0	27,117	24,435

*QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED.

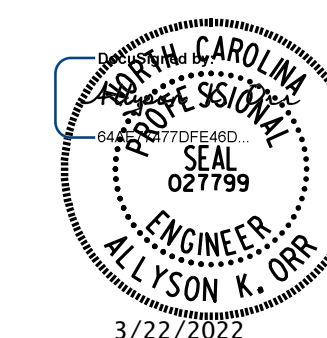
GROOVING BRIDGE FLOORS

APPROACH SLABS	889 SQ.FT.
BRIDGE DECK	5,870 SQ.FT.
TOTAL	6,759 SQ.FT.

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

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

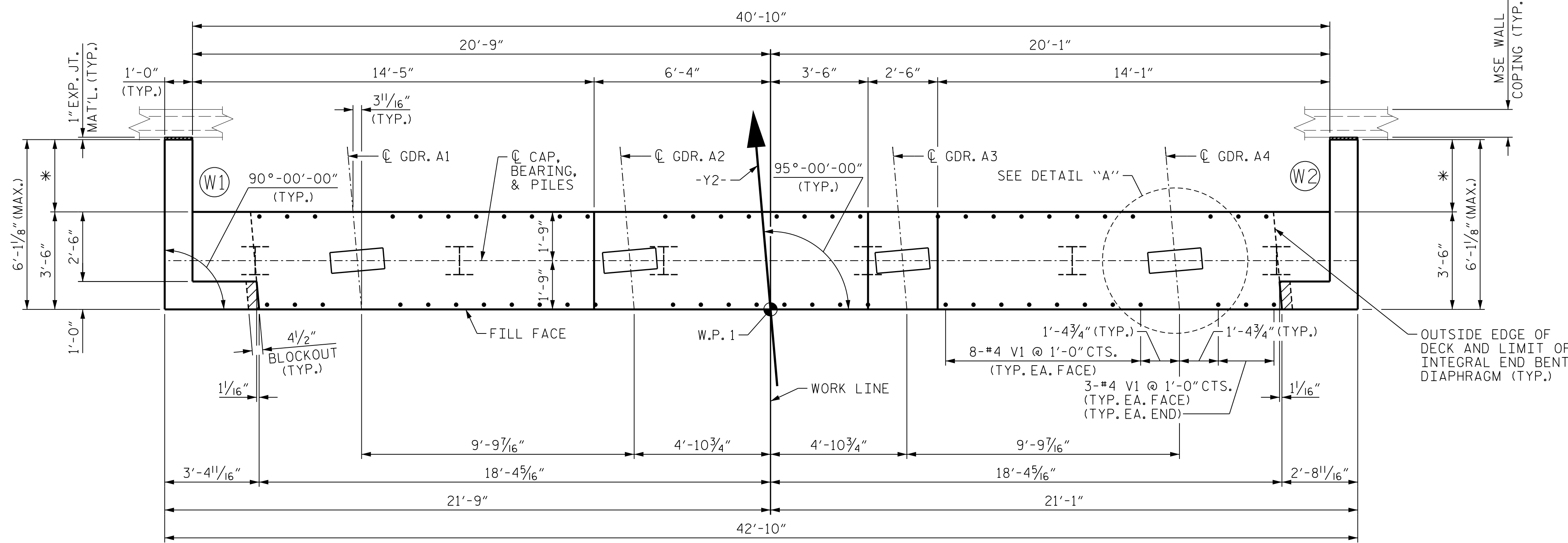
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SUPERSTRUCTURE
 BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-24
2			4			TOTAL SHEETS 36

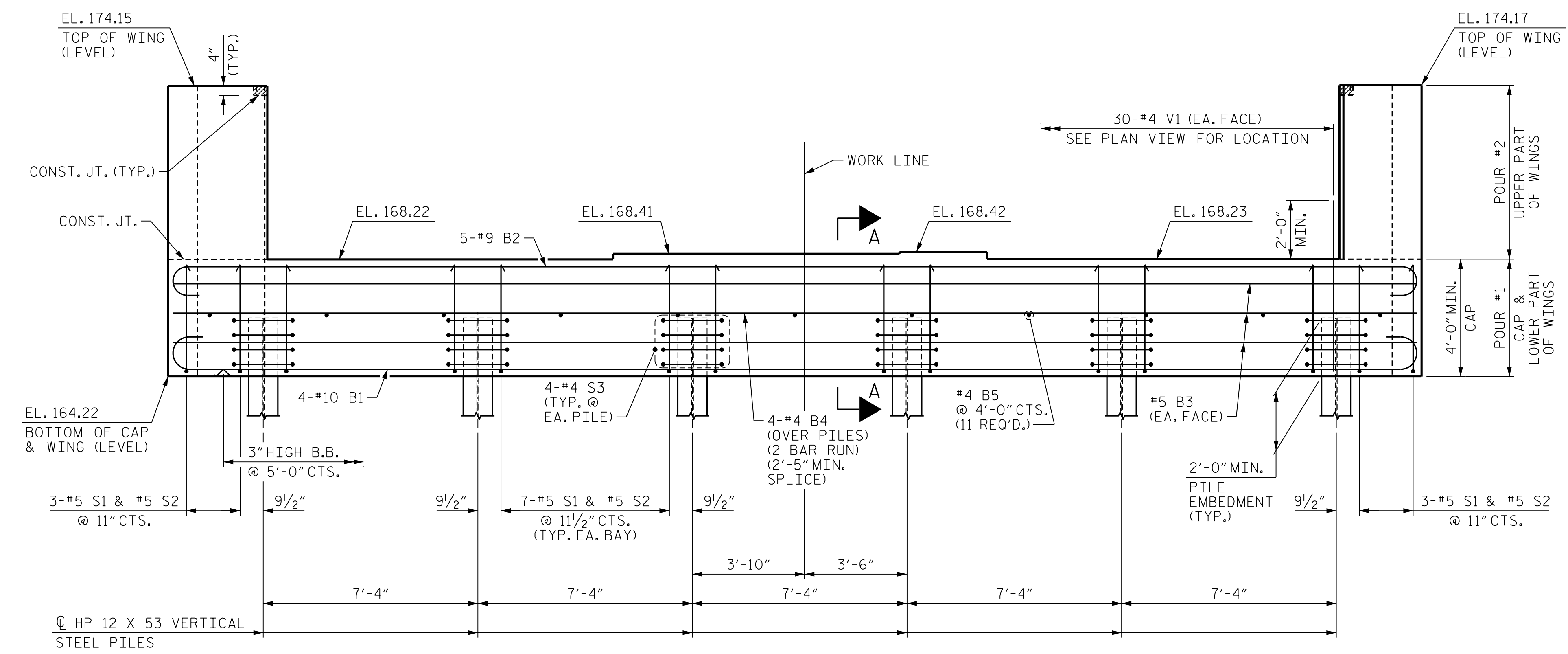
STD. NO. BOM2

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ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: EEM 3/95	REV. 5/7/03R RWW/JTE
CHECKED BY: VAP 3/95	REV. 5/1/06RR KMM/GM
	REV. 10/1/11 MAA/GM



PLAN

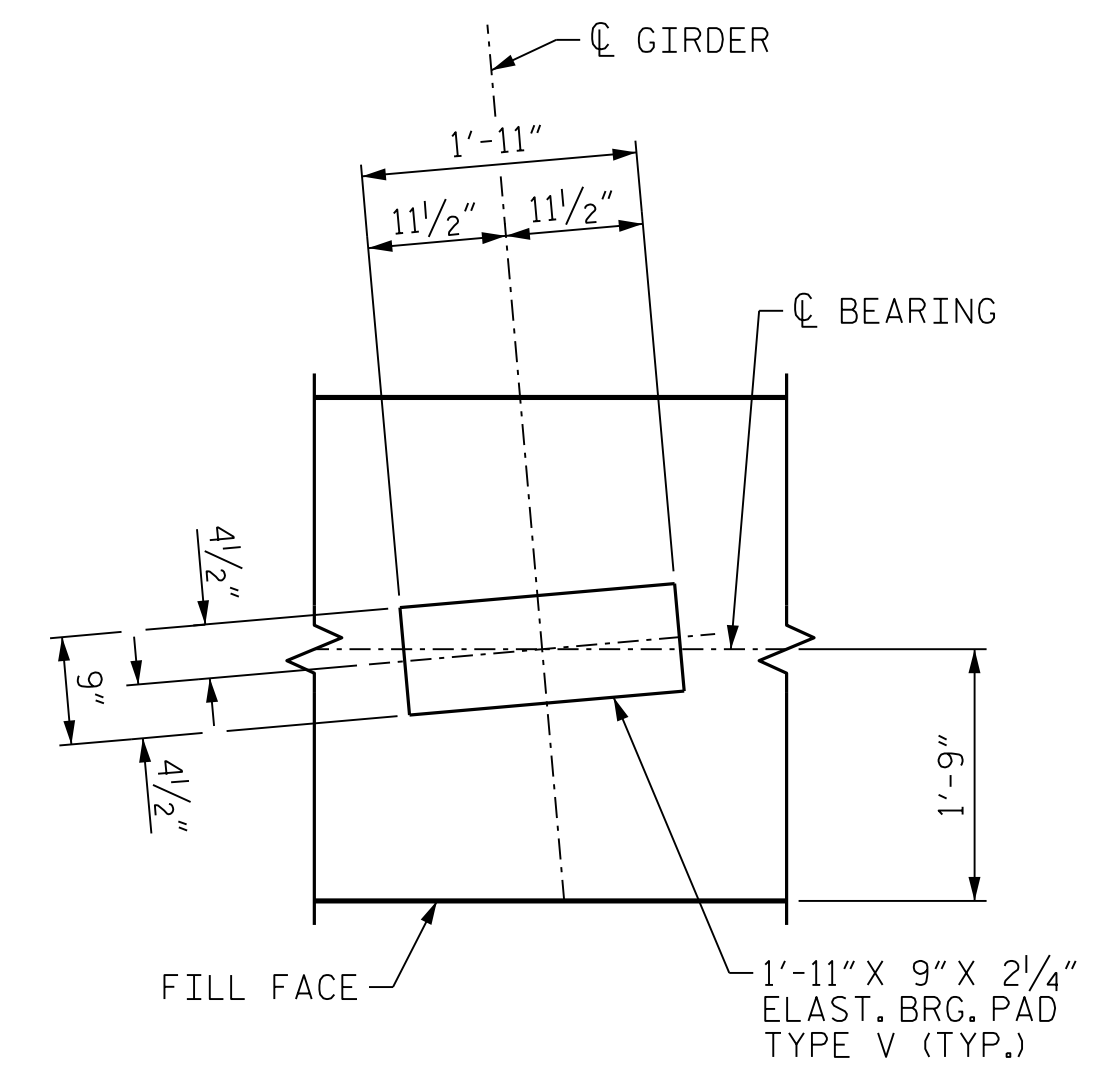


ELEVATION

PILE SLEEVES NOT SHOWN FOR CLARITY. SEE SECTION A-A.

NOTES:

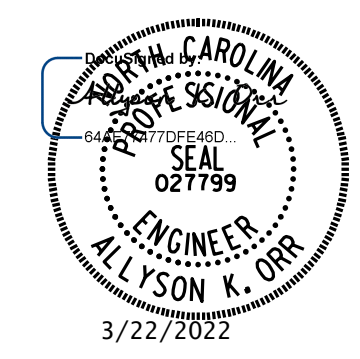
- THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCEPT THE BEARING AREAS AND THE NON-INTEGRAL AREAS AT CAP ENDS, SHALL BE RAKED TO A DEPTH OF 1/4".
- FOR SECTION A-A, PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.
- THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
- * LENGTH OF EACH WING SHALL BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1" EXPANSION JOINT MATERIAL AS SHOWN BETWEEN THE COMPONENT AND THE MSE WALL COPING. (2'-7 1/8" MAX.)



DETAIL "A"
(TYP. AT EACH BEARING)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 3



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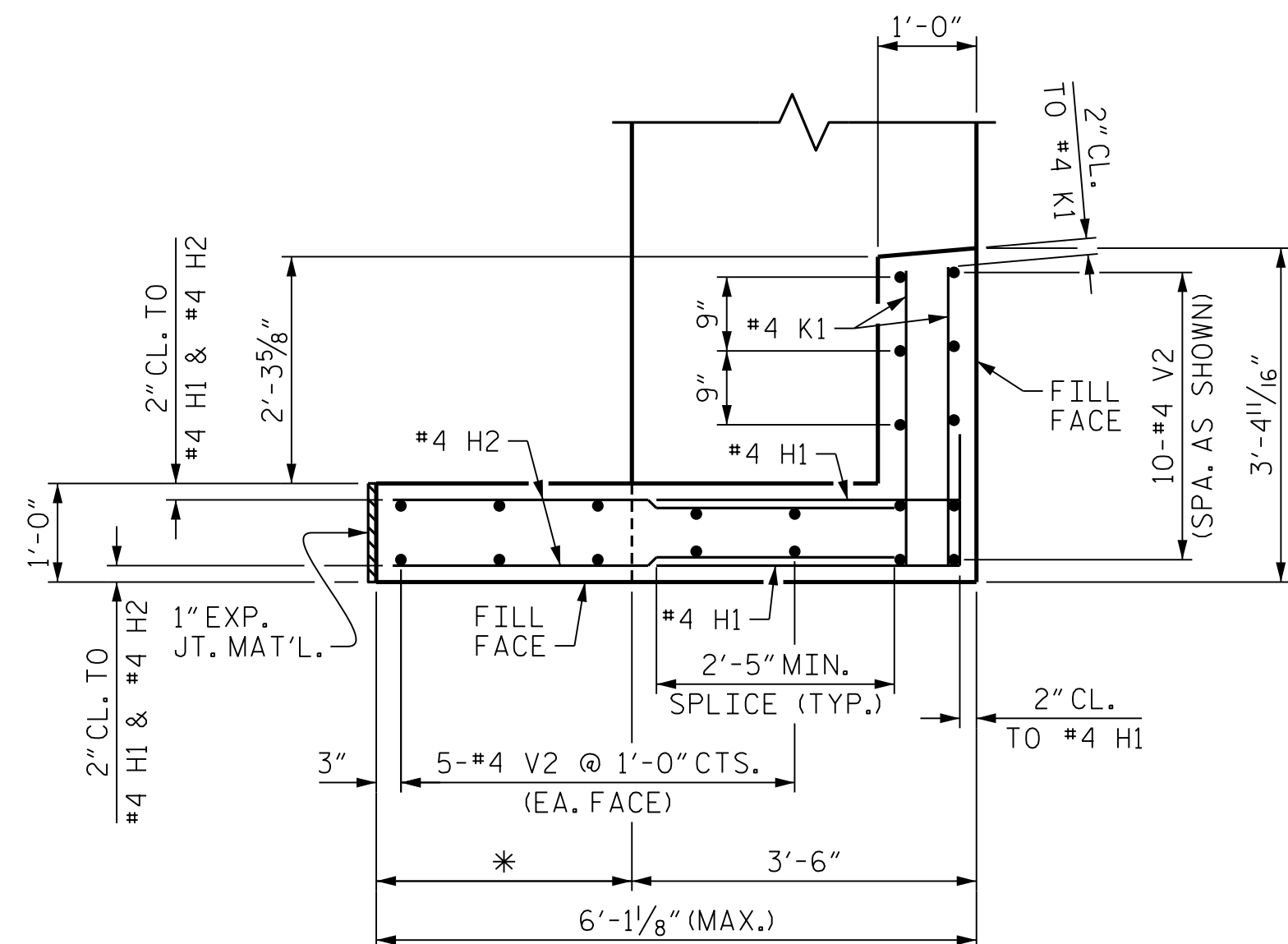
MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 PLAN AND ELEVATION

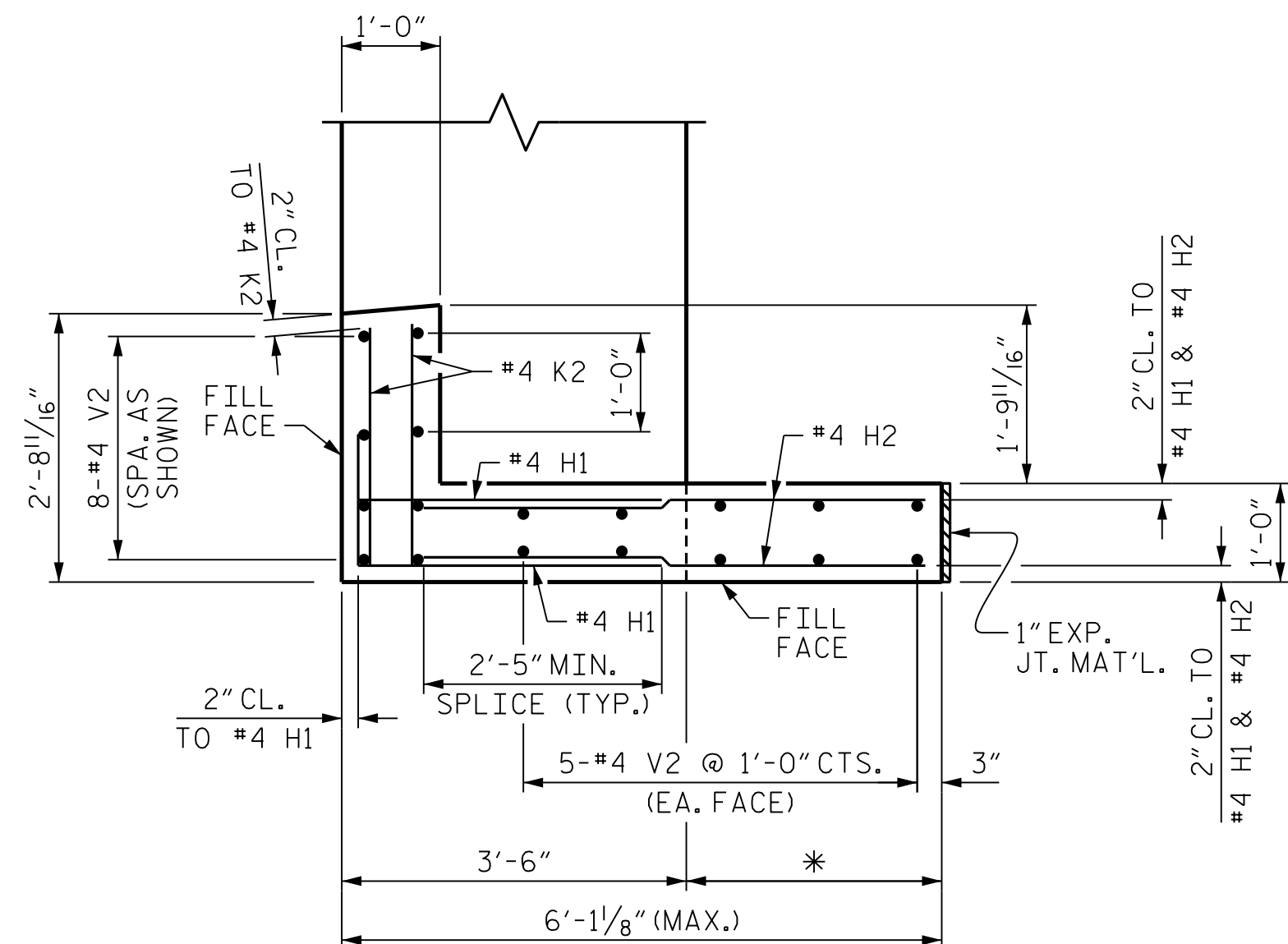
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-25
2			4			

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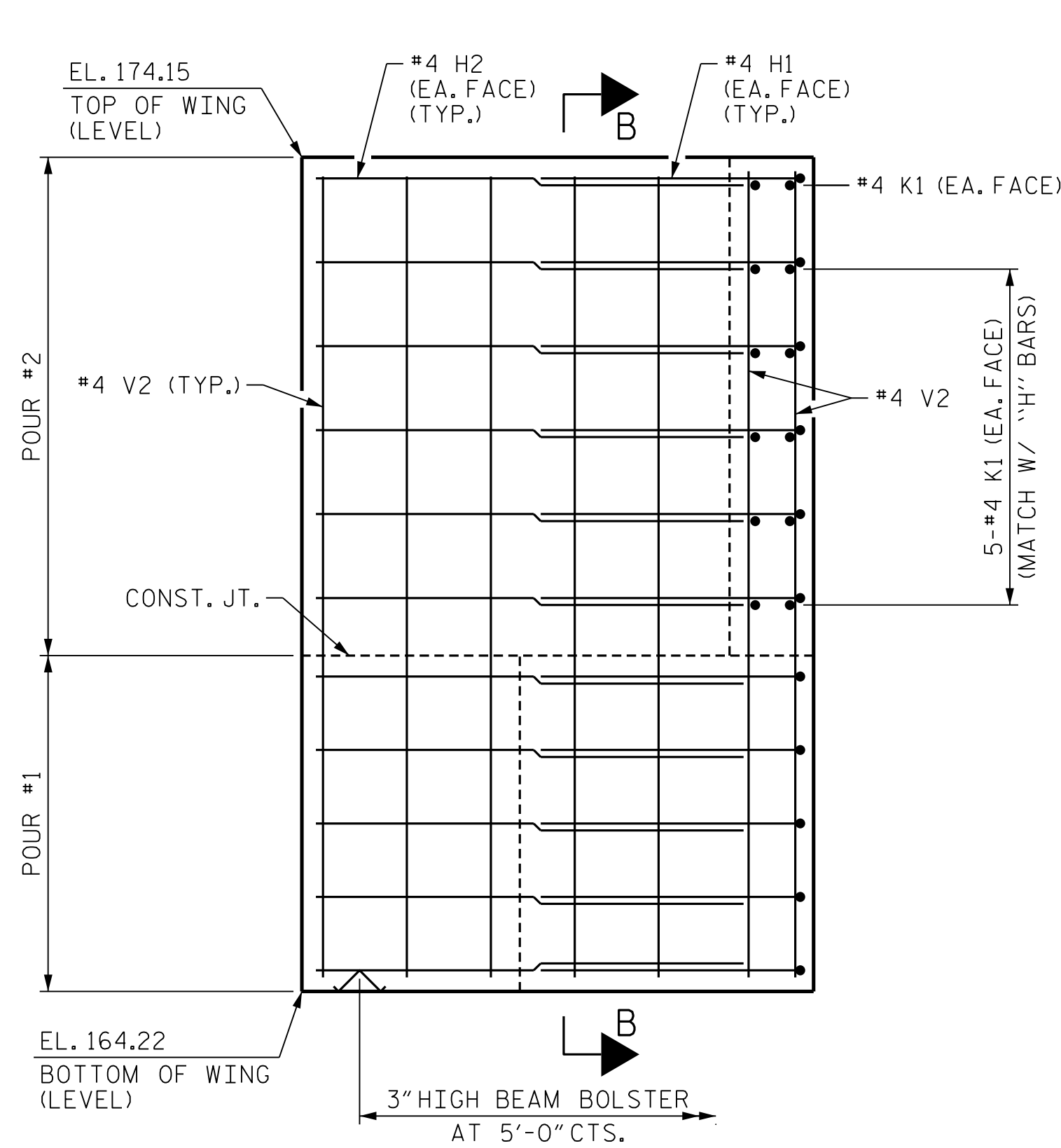


PLAN OF WING (W1)

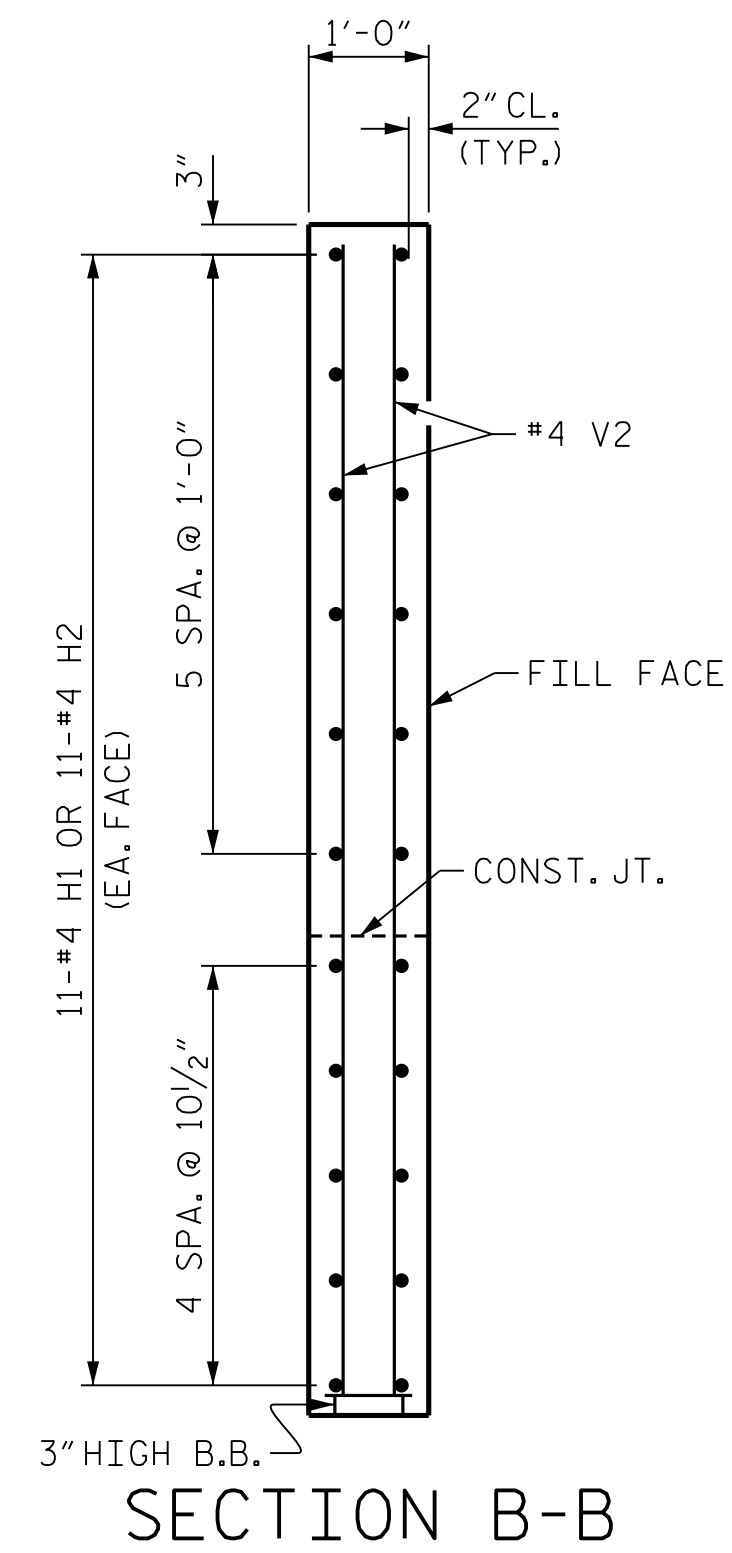


PLAN OF WING (W2)

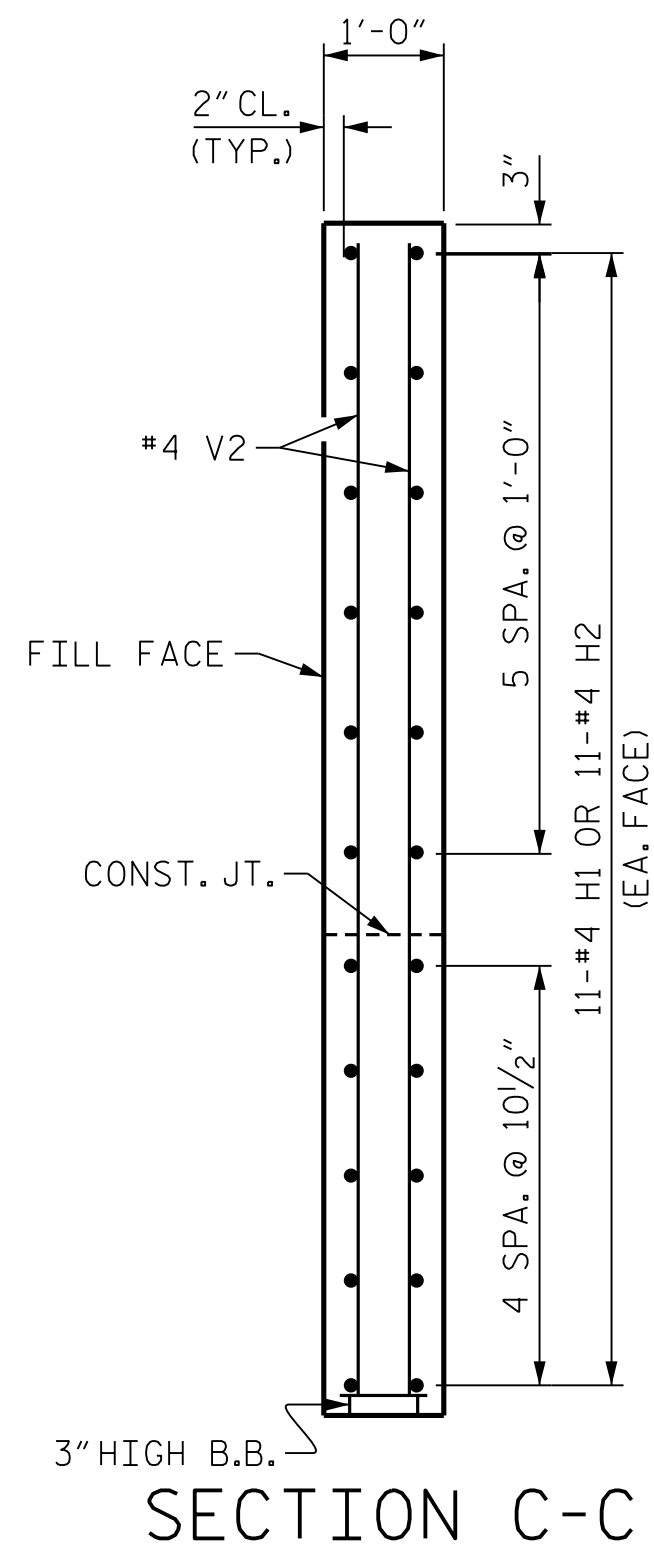
NOTE:
 * WINGWALL EXTENSION DISTANCE TO BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1" EXP. JT. MAT'L. BETWEEN THE MSE WALL COPING AND THE EXTENDED WINGWALL.



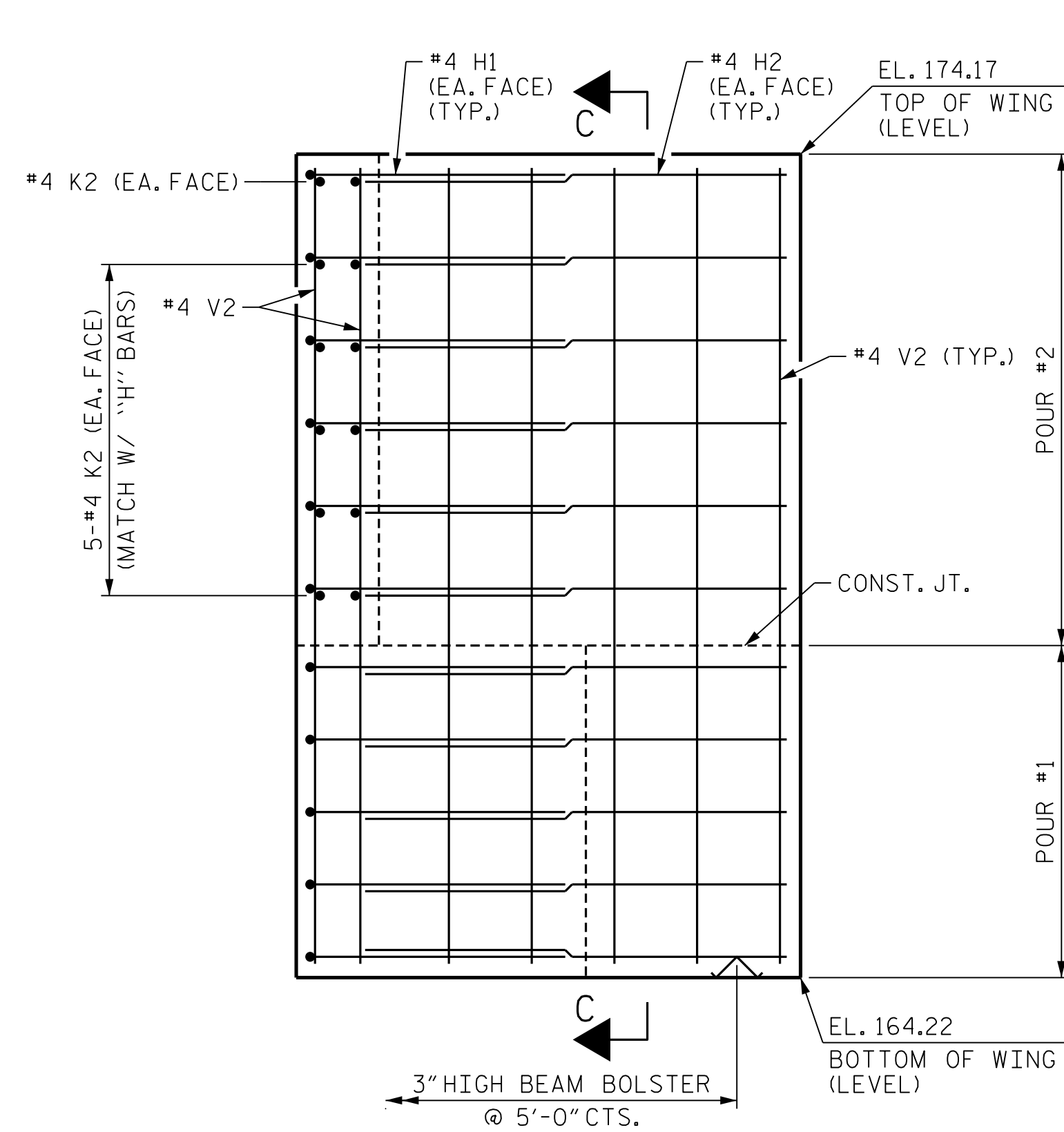
ELEVATION OF WING (W1)



SECTION B-B



SECTION C-C

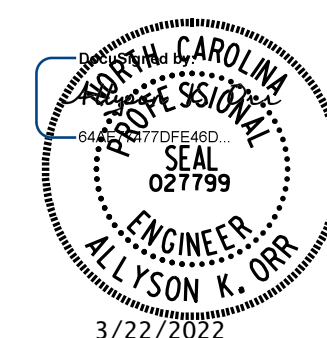


ELEVATION OF WING (W2)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 WINGWALL DETAILS



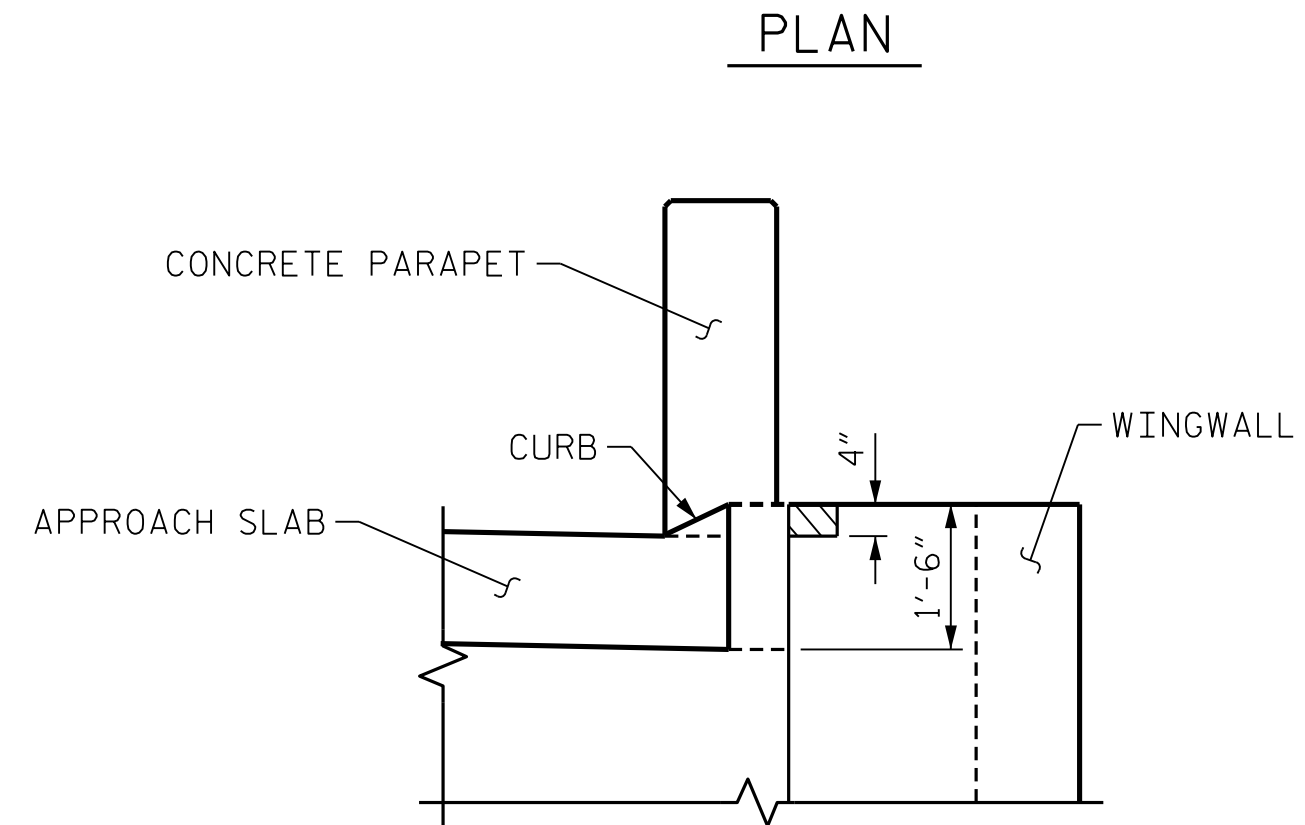
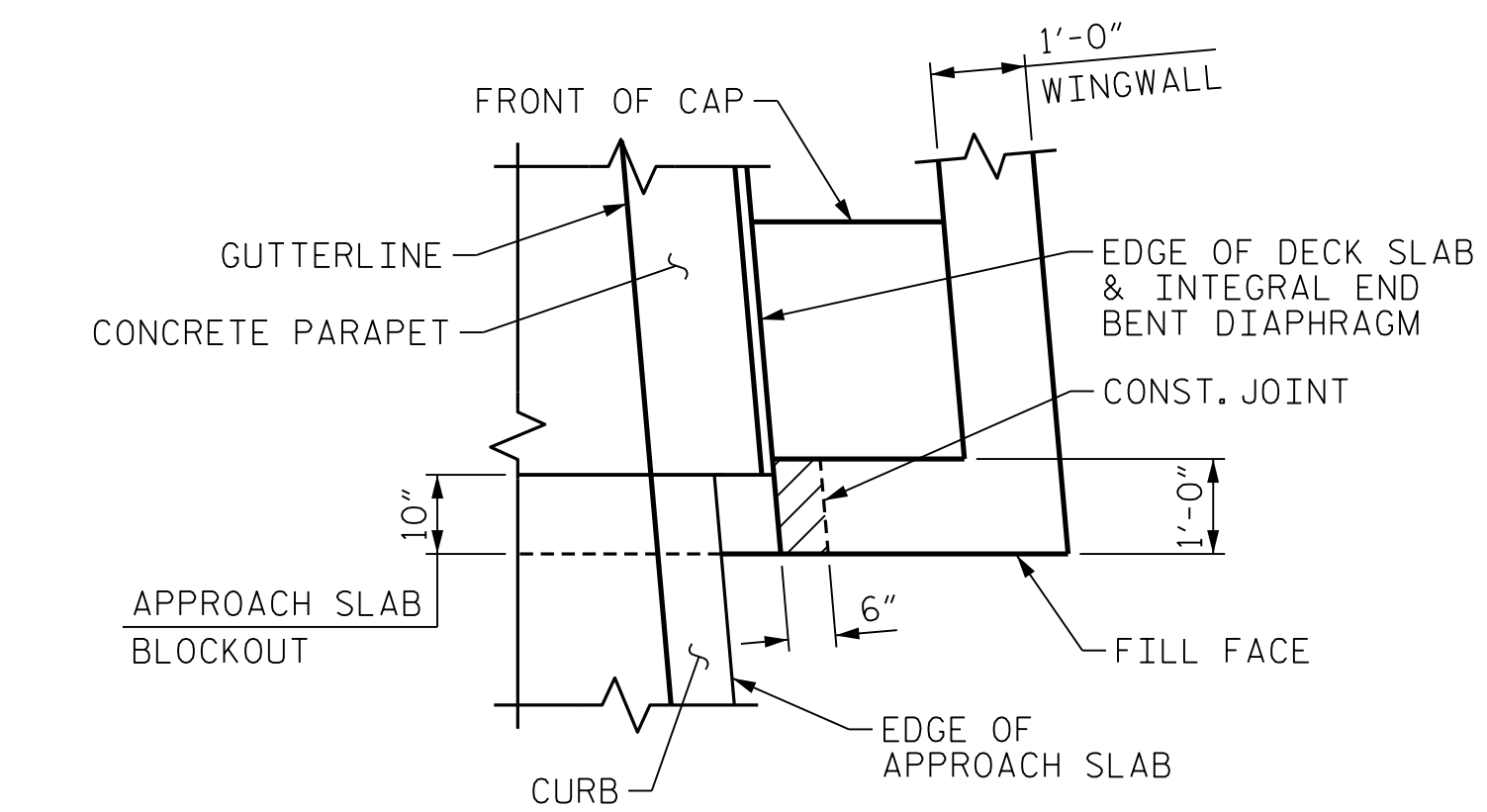
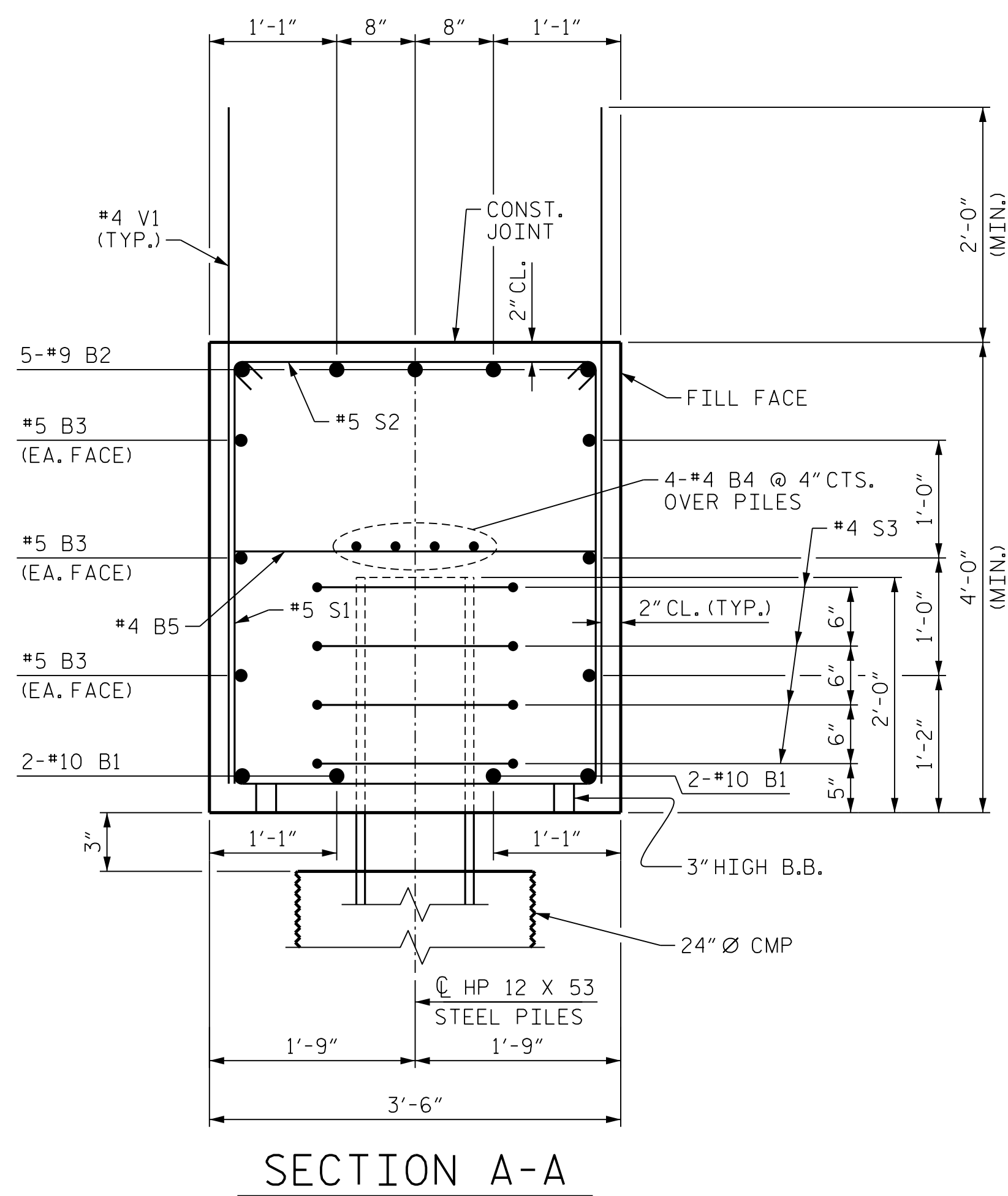
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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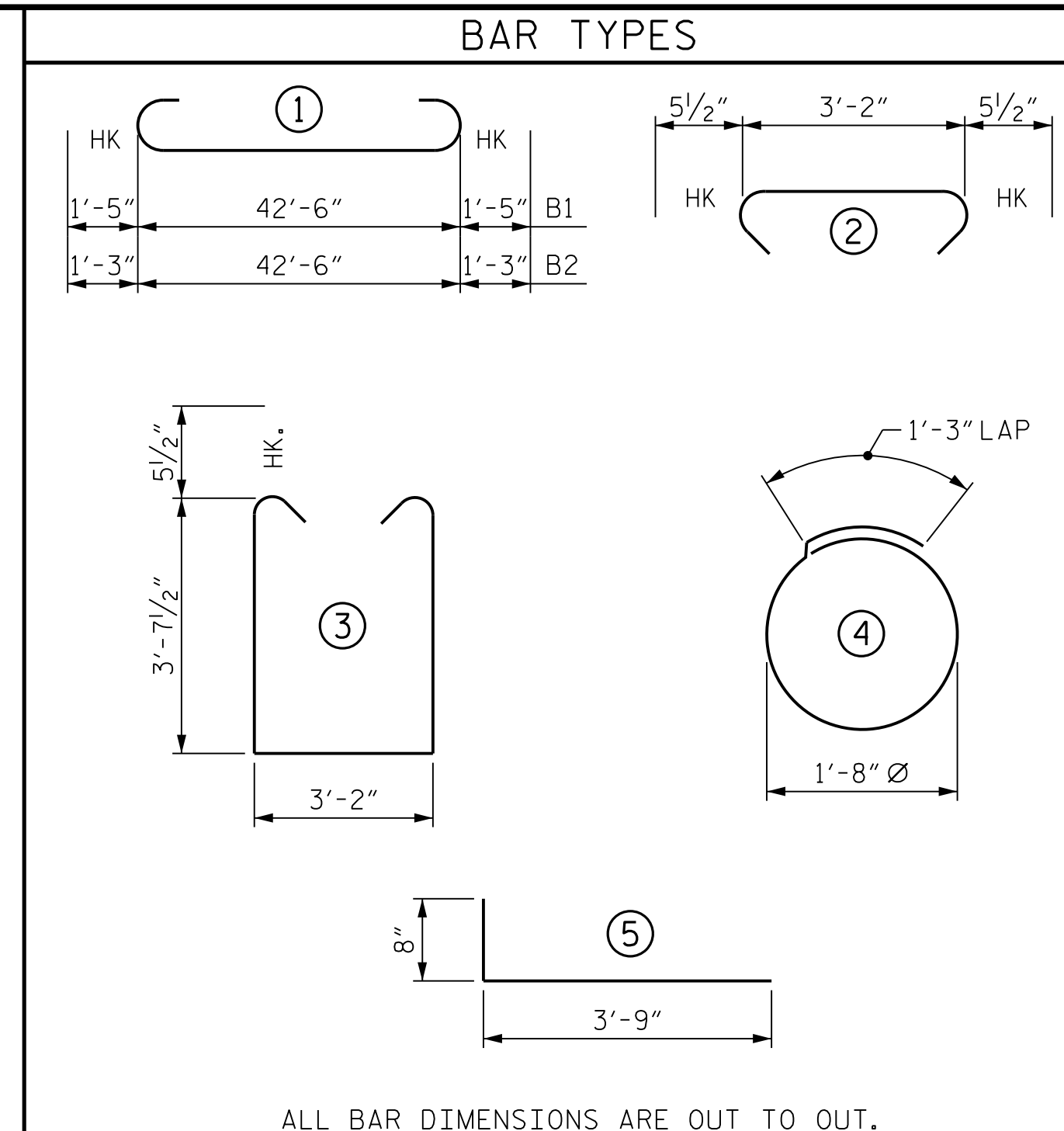
DRAWN BY: B.E. LANNING DATE: 06/2021
 CHECKED BY: A.K. ORR DATE: 06/2021
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/2022

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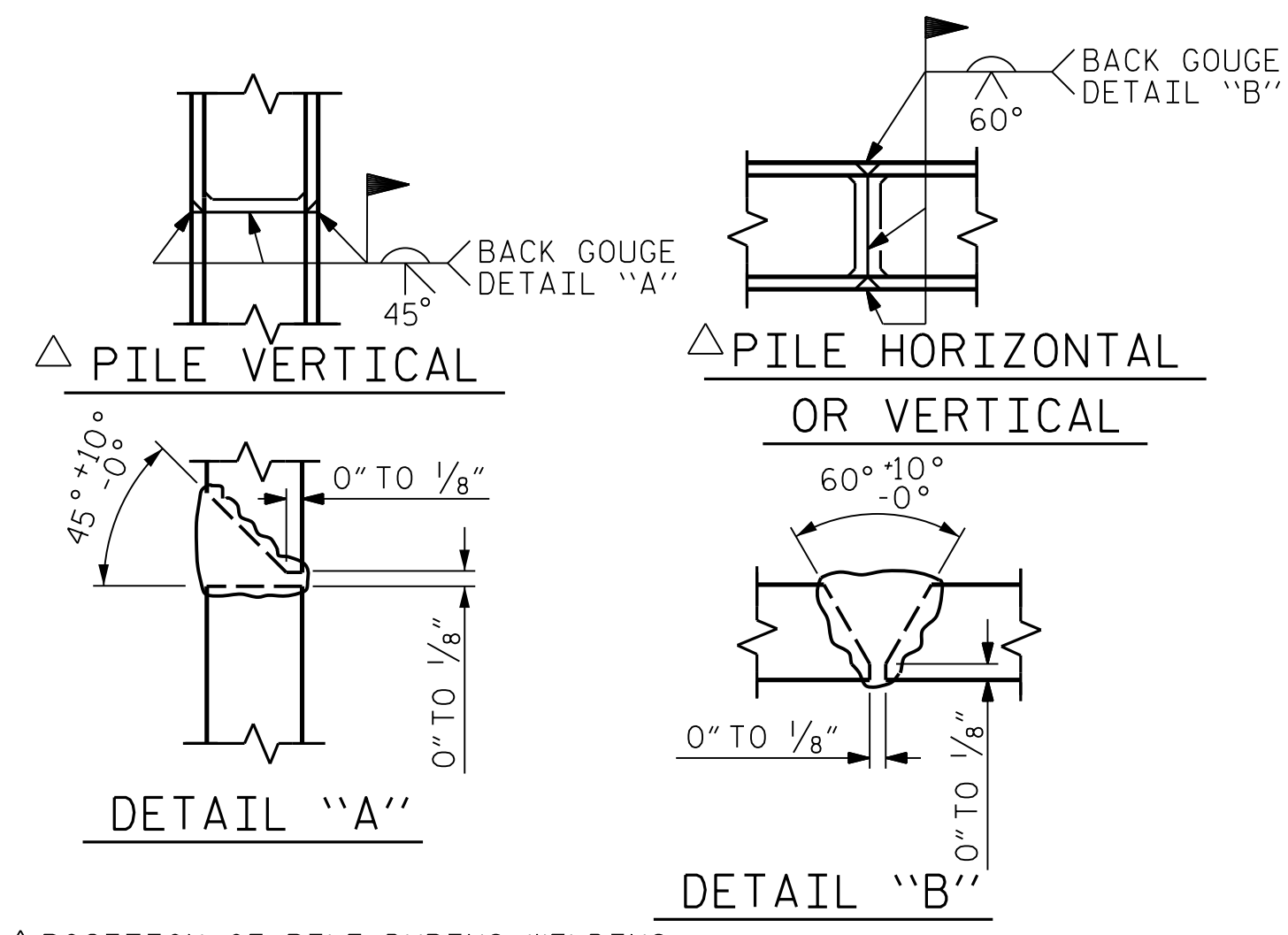
WINGWALL BLOCKOUT

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

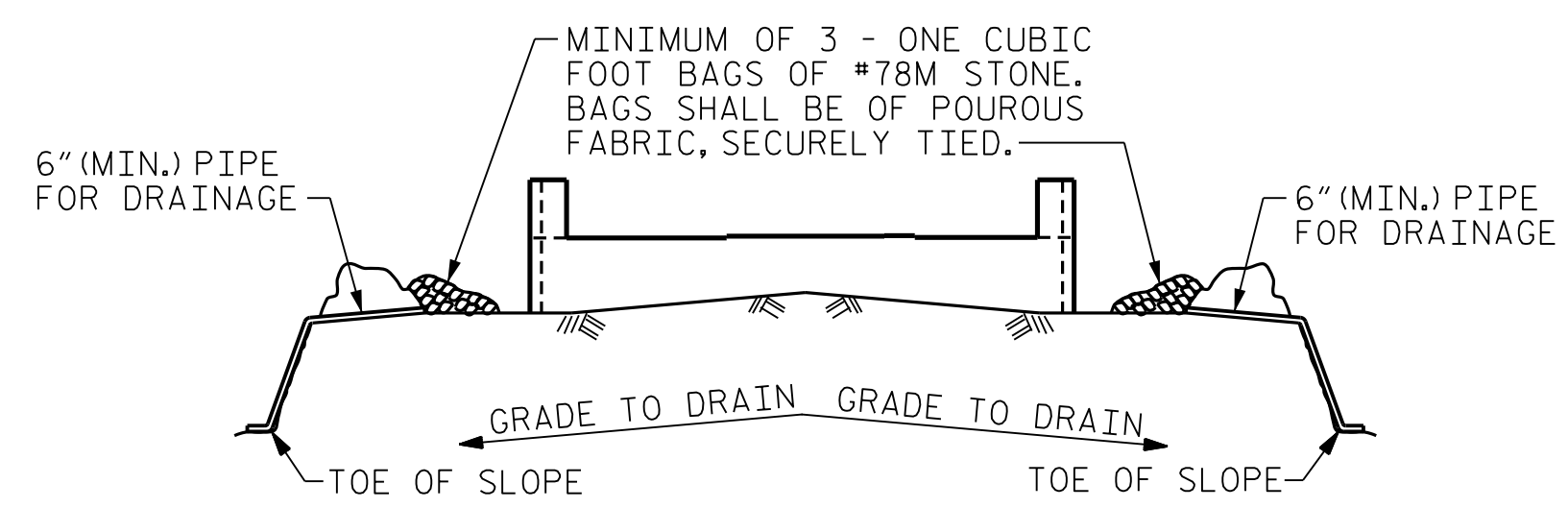


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#4		45'-4"	780	
B2	#9		45'-0"	765	
B3	#5	STR	42'-6"	266	
B4	#4	STR	22'-6"	120	
B5	#4	STR	3'-2"	23	
H1	#4		4'-5"	130	
H2	#4	STR	4'-6"	132	
K1	#4	STR	3'-0"	24	
K2	#4	STR	2'-5"	19	
S1	#5		11'-4"	485	
S2	#5		4'-1"	175	
S3	#4		6'-6"	104	
V1	#4	STR	6'-0"	240	
V2	#4	STR	9'-6"	241	
REINFORCING STEEL				3,504 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP & LOWER PART OF WINGS)				23.4 C.Y.	
POUR #2 (UPPER PART OF WINGS)				3.6 C.Y.	
TOTAL				27.0 C.Y.	



PILE SPLICE DETAILS



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

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

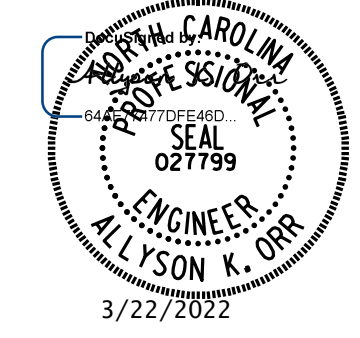
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 DETAILS AND
 BILL OF MATERIAL



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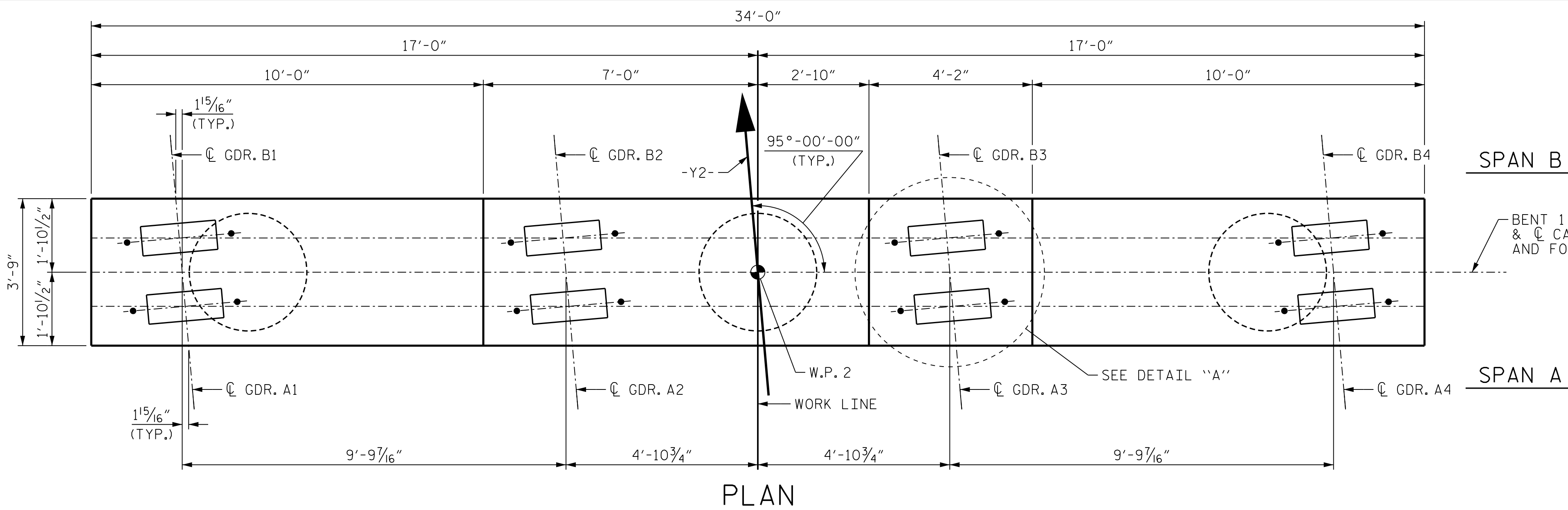
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 (919) 851-6606
 FIRM PE NUMBER: P-0671

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

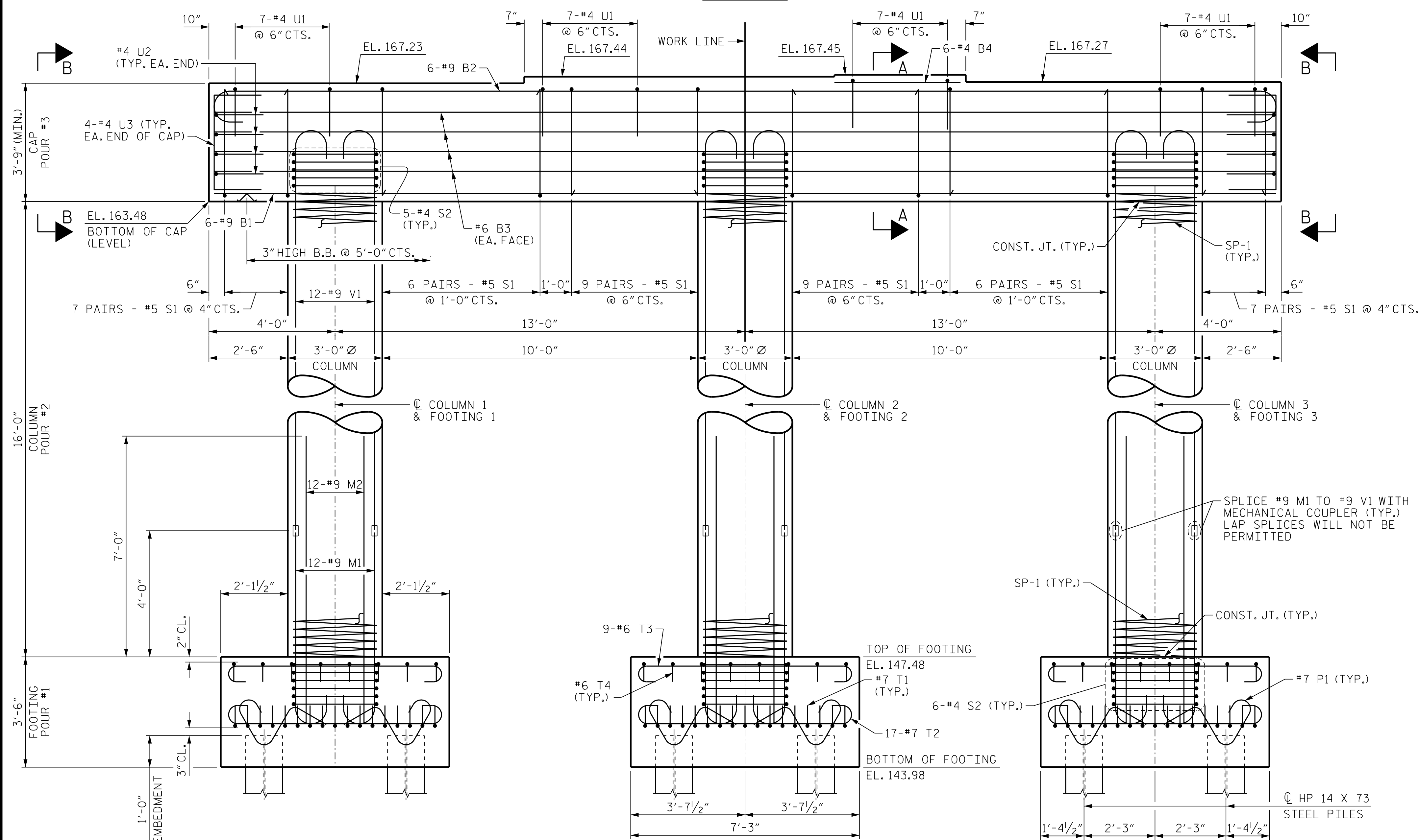
SHEET NO. **S1-27**
 TOTAL SHEETS **36**

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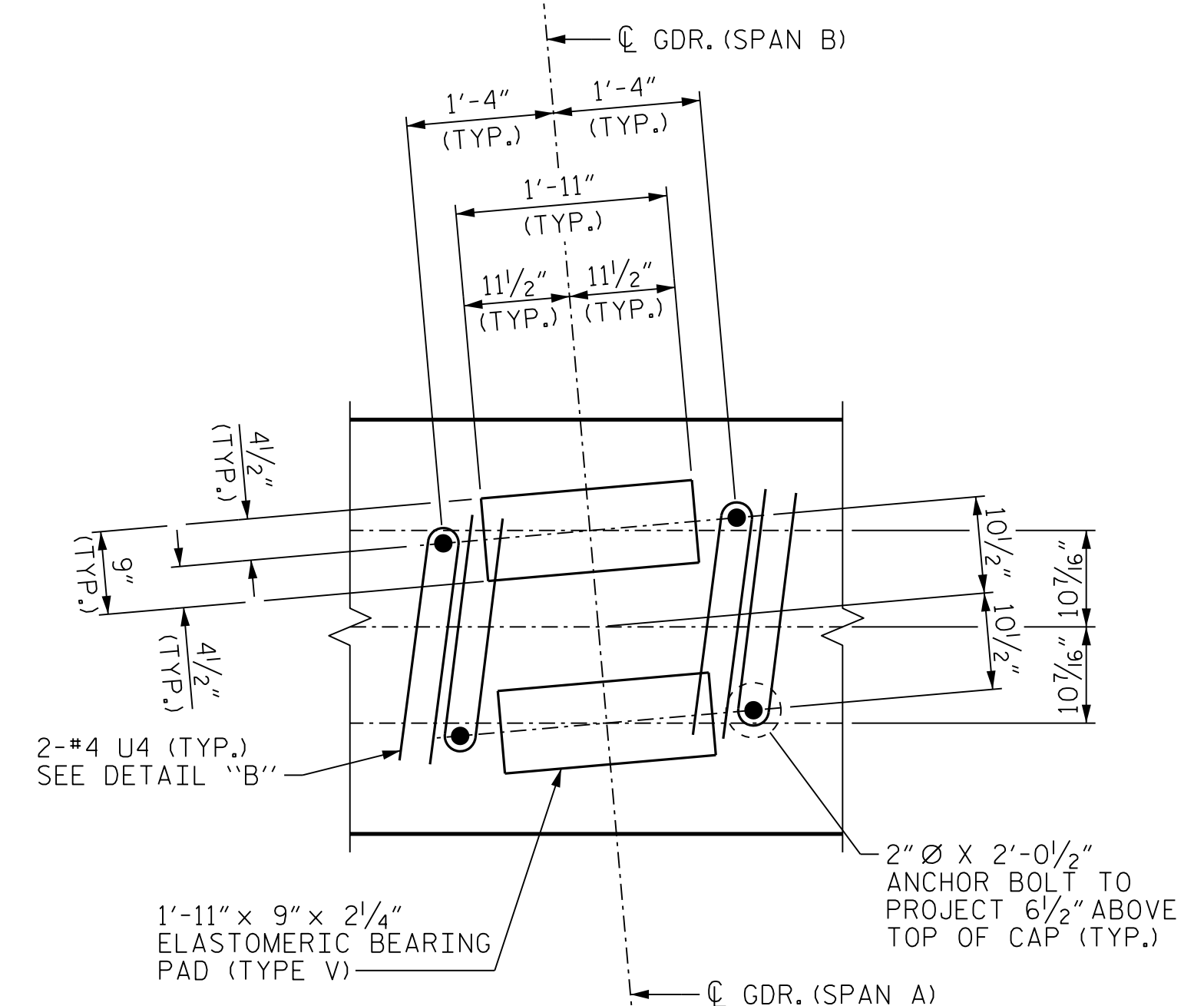
PLAN



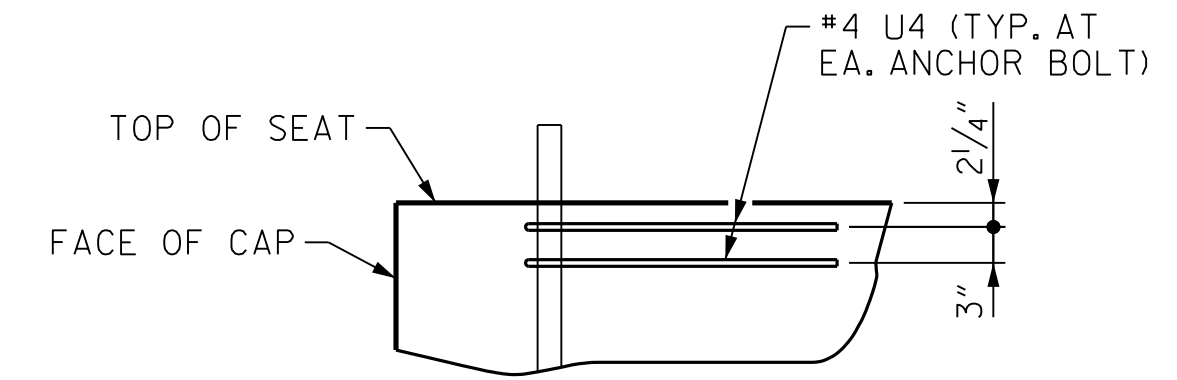
ELEVATION

NOTES:

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR SECTION A-A, VIEW B-B AND END ELEVATION SEE SHEET 2 OF 3.
- FOR FOOTING DETAILS, SEE SHEET 3 OF 3.
- ⊗ INVERT ALTERNATE PAIRS OF STIRRUPS.
- FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3.
- SPLICES IN SPIRAL REINFORCEMENT WITHIN 3'-0" FROM TOP OR BOTTOM OF COLUMN MUST BE FULLY WELDED OR MECHANICAL SPLICES. NO LAP SPLICES PERMITTED.



DETAIL "A"

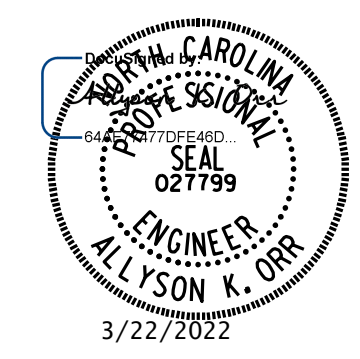


DETAIL "B"

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1
 PLAN AND ELEVATION



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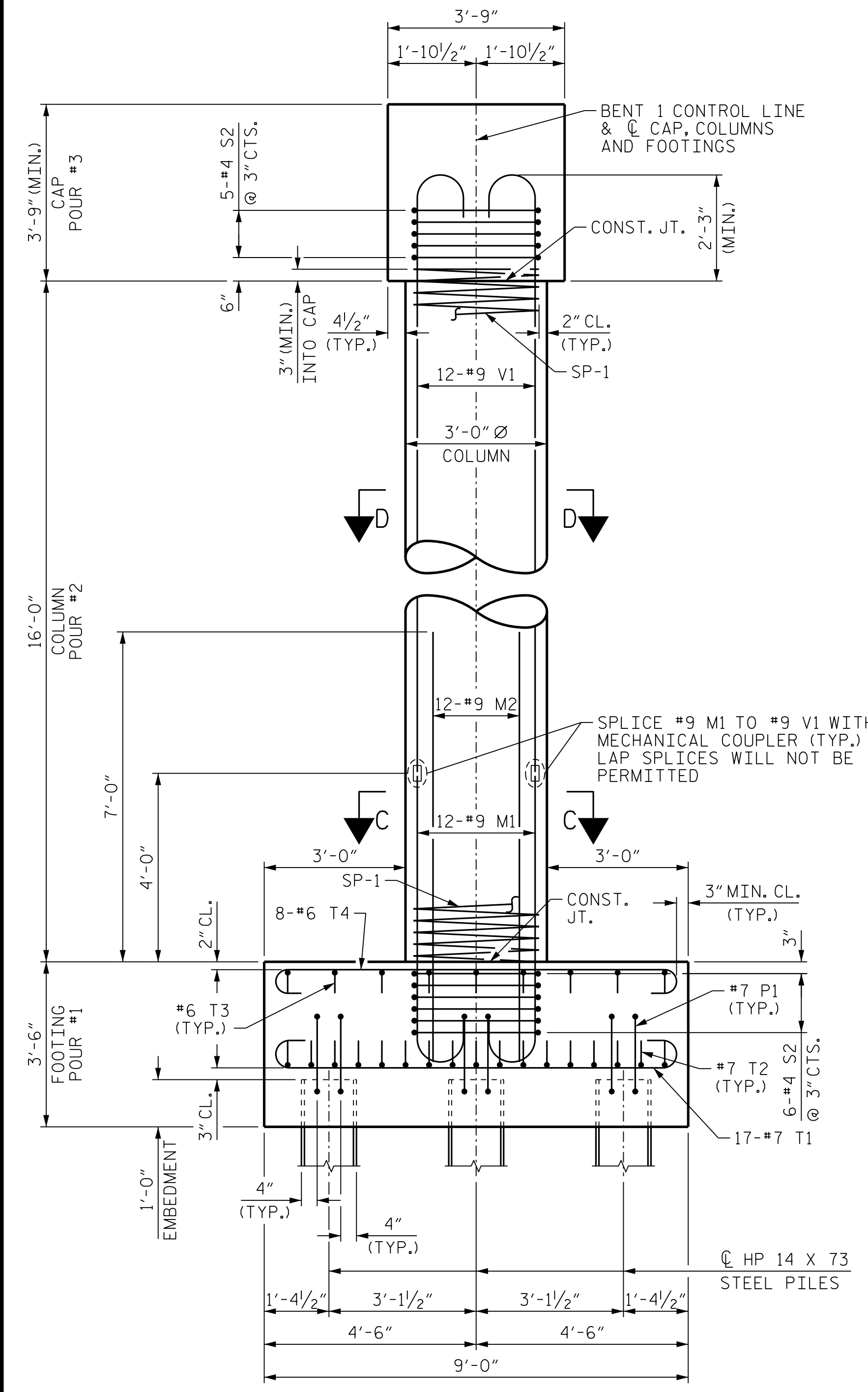
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1			3			TOTAL SHEETS
2			4			36

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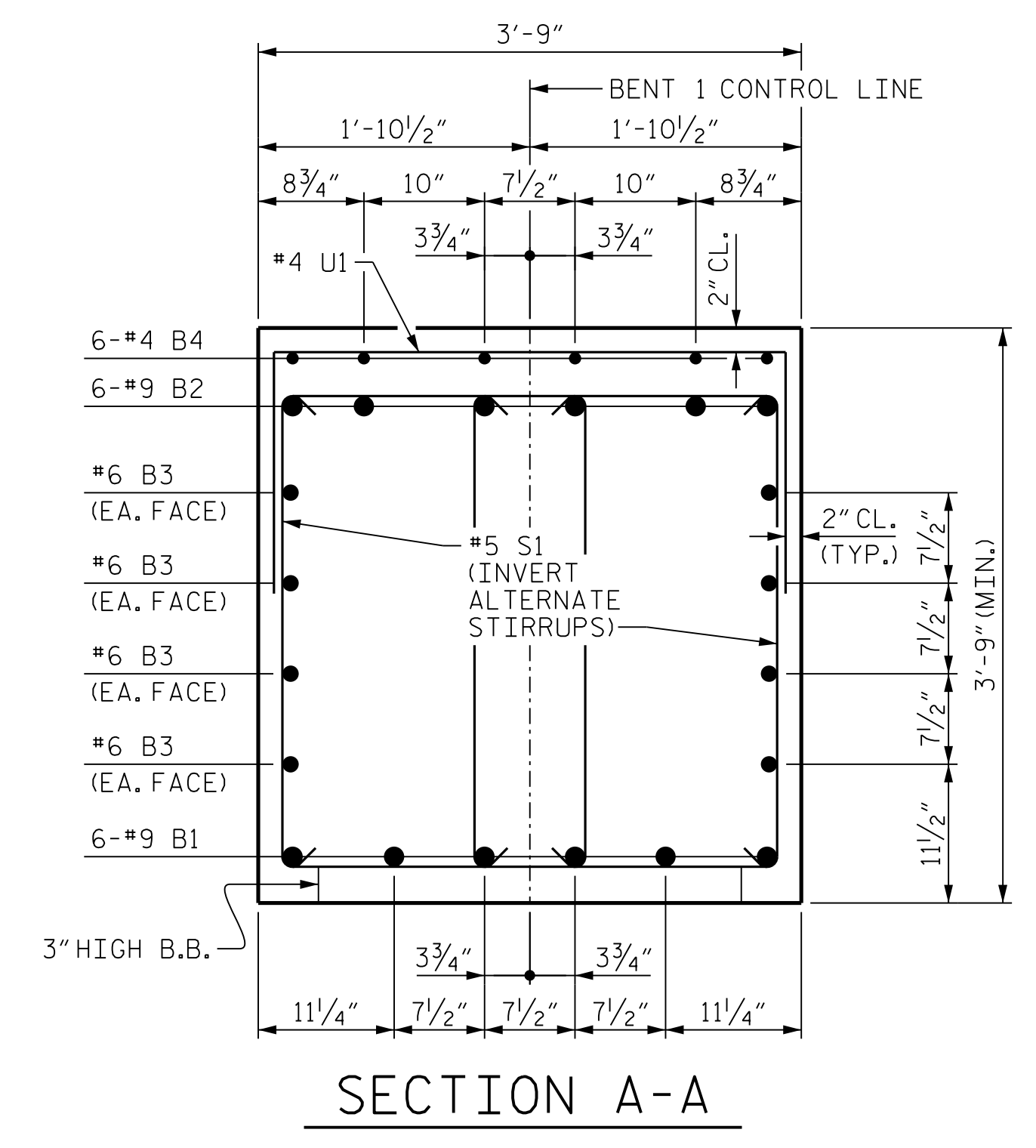
DIMENSIONS & REINFORCING STEEL ARE TYPICAL
 FOR EACH COLUMN & FOOTINGS UNLESS OTHERWISE NOTED

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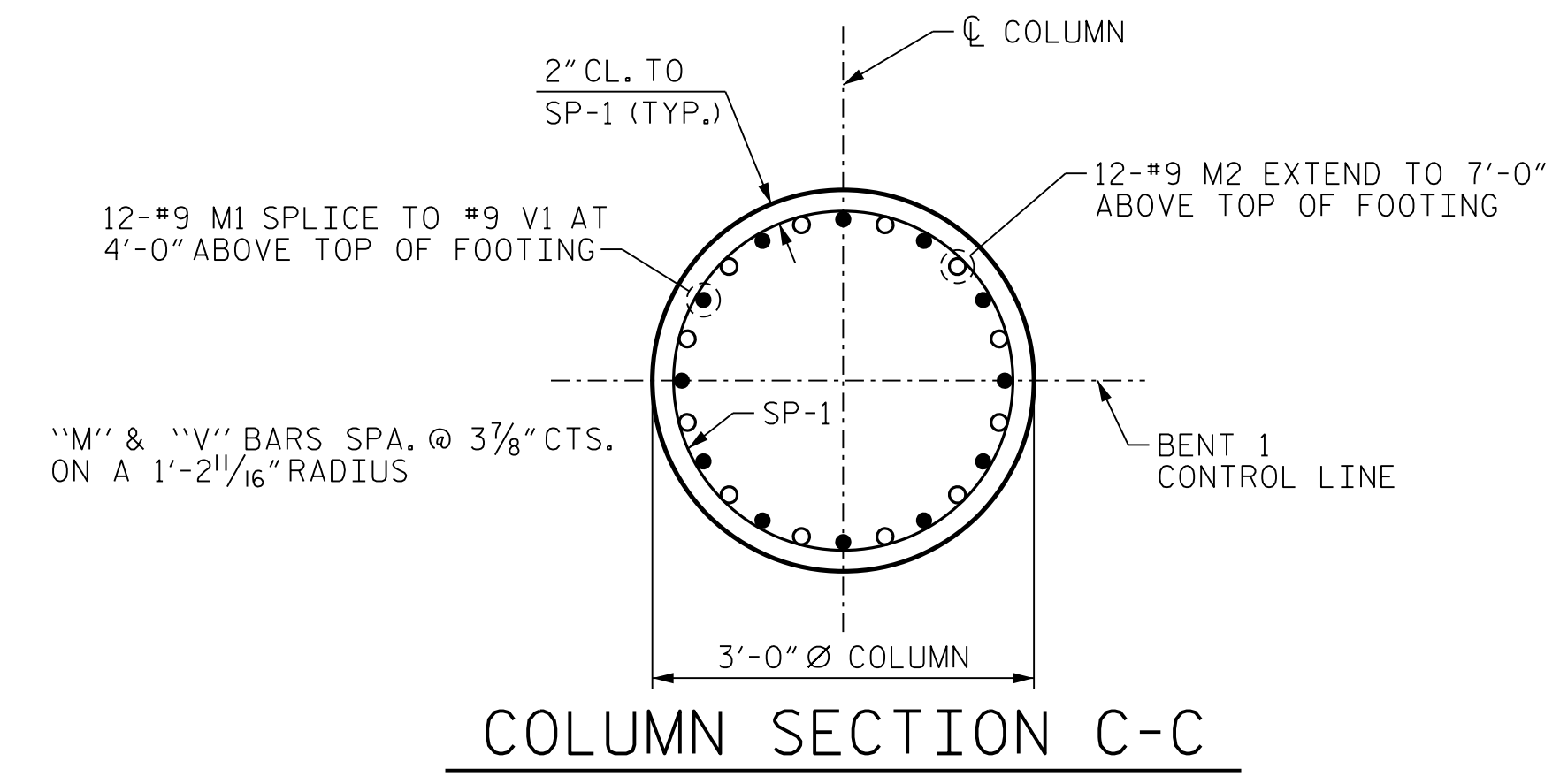
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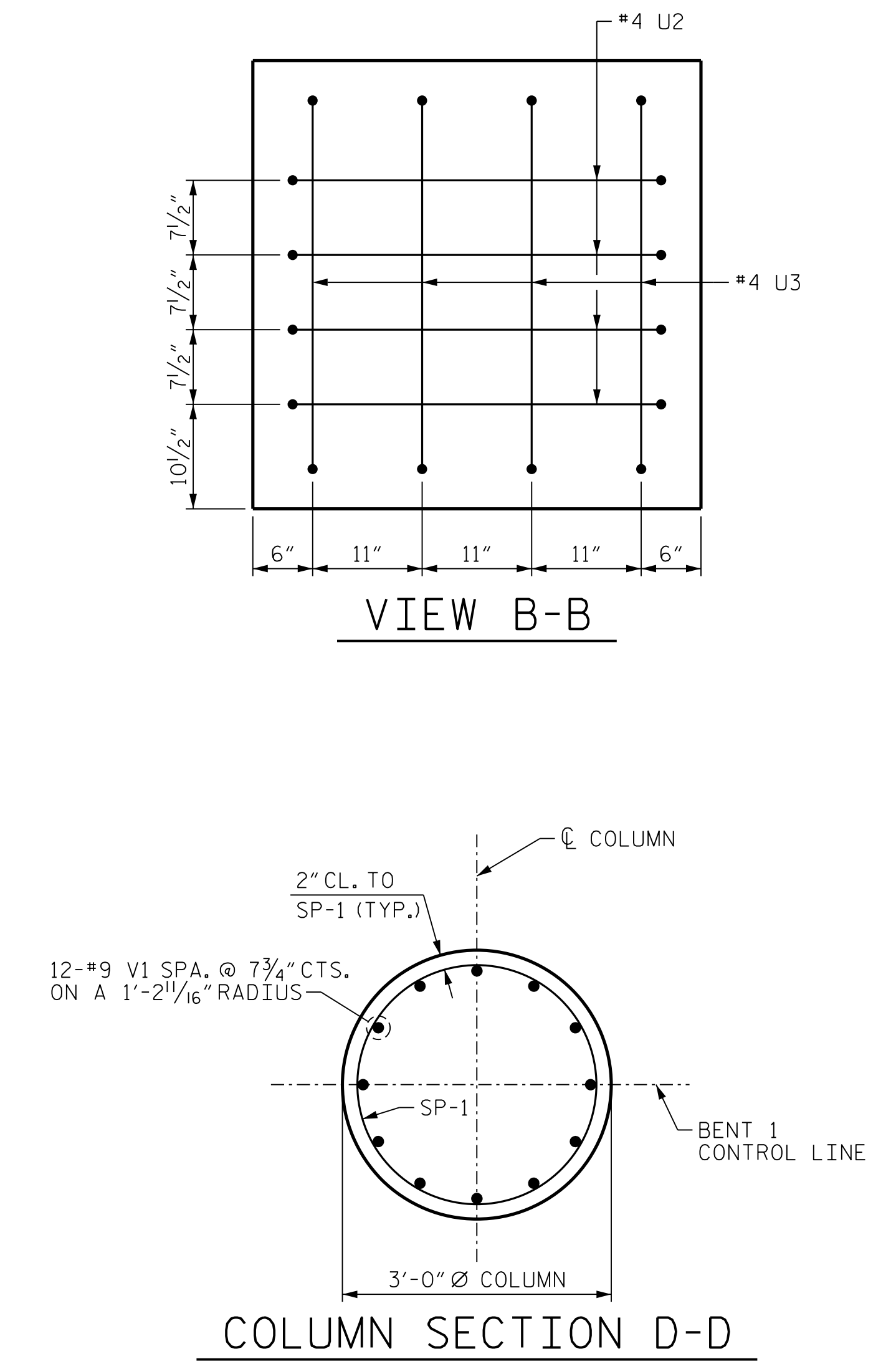
END ELEVATION



SECTION A-A



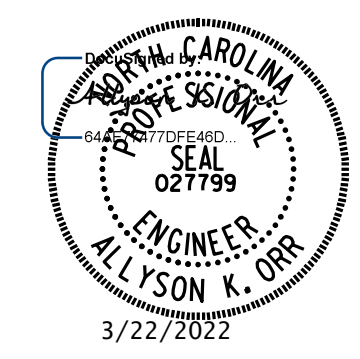
COLUMN SECTION C-C



COLUMN SECTION D-D

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 3



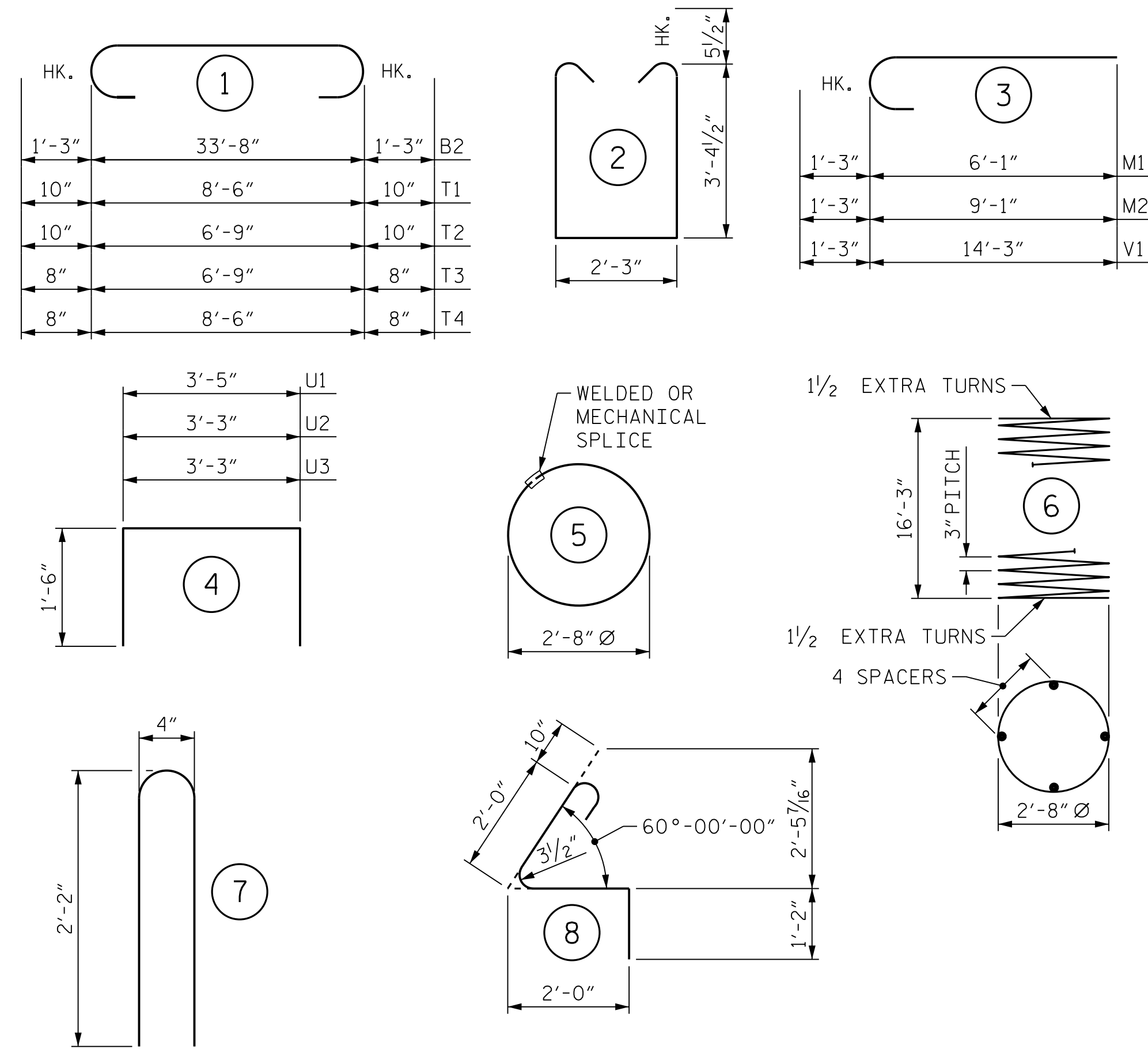
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. I-29					TOTAL SHEETS 36

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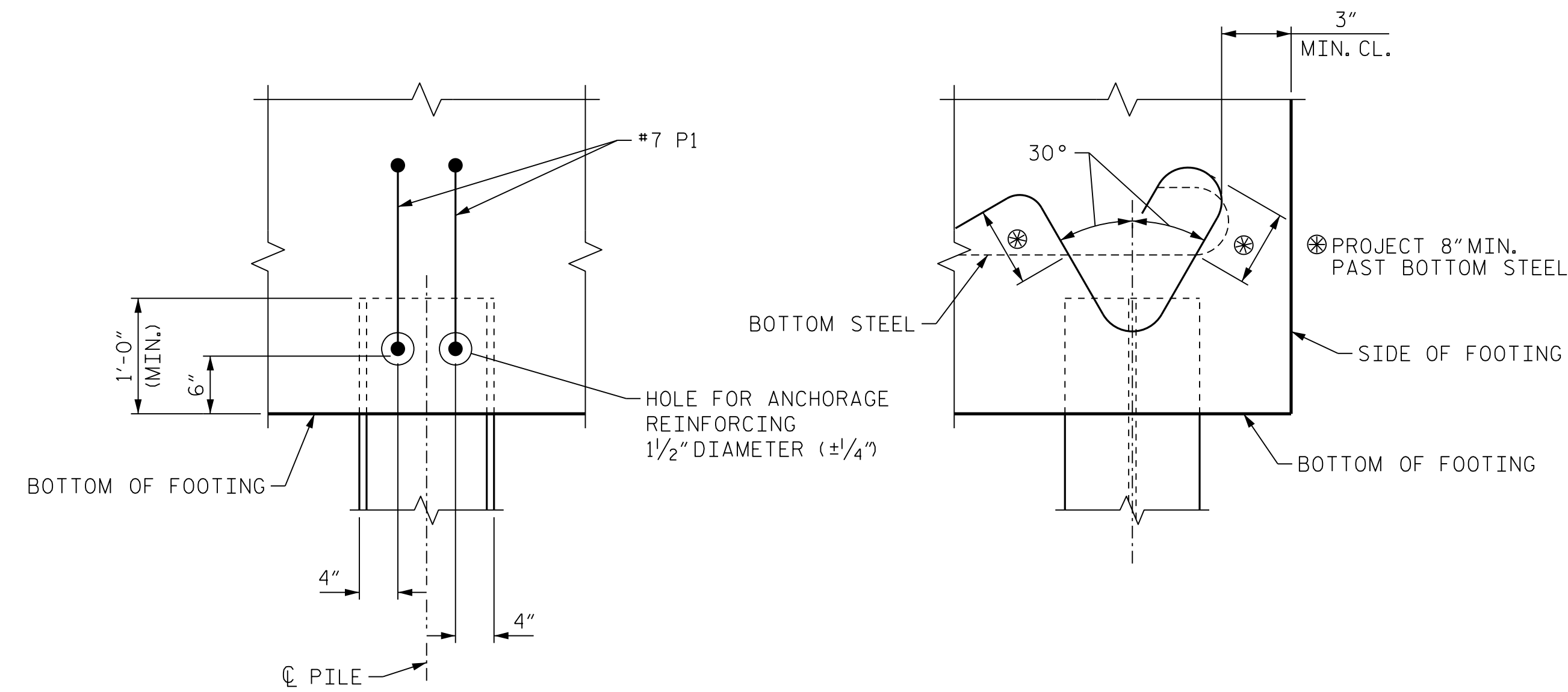
BAR TYPES



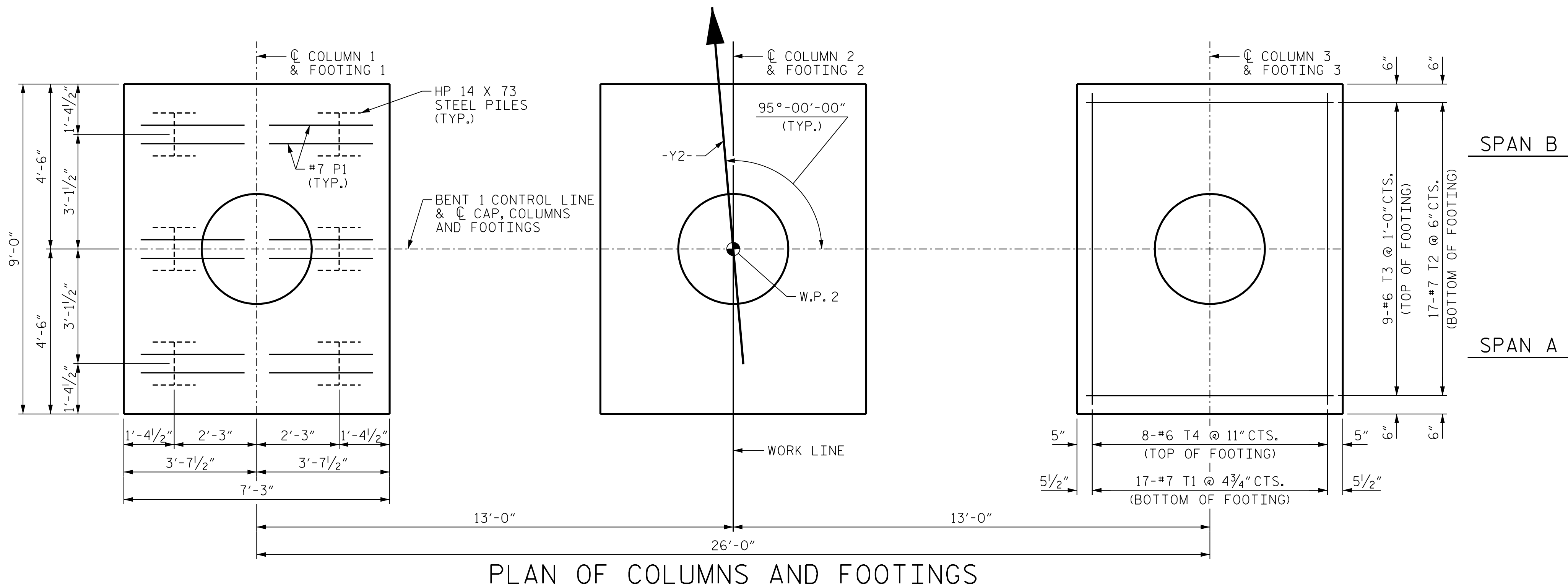
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	STR	33'-8"	687
B2	6	#9	1	36'-2"	738
B3	8	#6	STR	33'-8"	405
B4	6	#4	STR	3'-10"	15
M1	36	#9	3	7'-4"	898
M2	36	#9	3	10'-4"	1265
P1	36	#7	8	6'-0"	442
S1	88	#5	2	9'-11"	910
S2	33	#4	5	8'-5"	186
T1	51	#7	1	10'-2"	1060
T2	51	#7	1	8'-5"	877
T3	27	#6	1	8'-1"	328
T4	24	#6	1	9'-10"	354
U1	28	#4	4	6'-5"	120
U2	8	#4	4	6'-3"	33
U3	8	#4	4	6'-3"	33
U4	32	#4	7	4'-8"	100
V1	36	#9		15'-6"	1897
				3	
REINFORCING STEEL					10,348 LBS.
SPIRAL COLUMN REINFORCING STEEL 1,749 LBS.					
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.					
CLASS A CONCRETE BREAKDOWN					
POUR #1 (FOOTING)				25.4	C.Y.
POUR #2 (COLUMNS)				12.6	C.Y.
POUR #3 (CAP)				18.2	C.Y.
TOTAL				56.2	C.Y.



STEEL H-PILE ANCHORAGE DETAIL

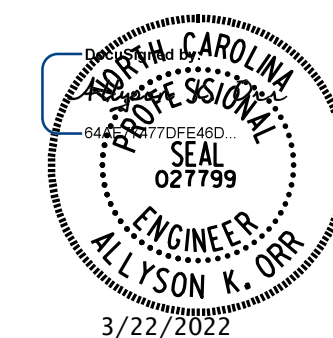


PLAN OF COLUMNS AND FOOTINGS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING, UNLESS OTHERWISE NOTED)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 3 OF 3



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 DETAILS AND BILL OF MATERIAL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-30	
TOTAL SHEETS 36	

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NOTES:

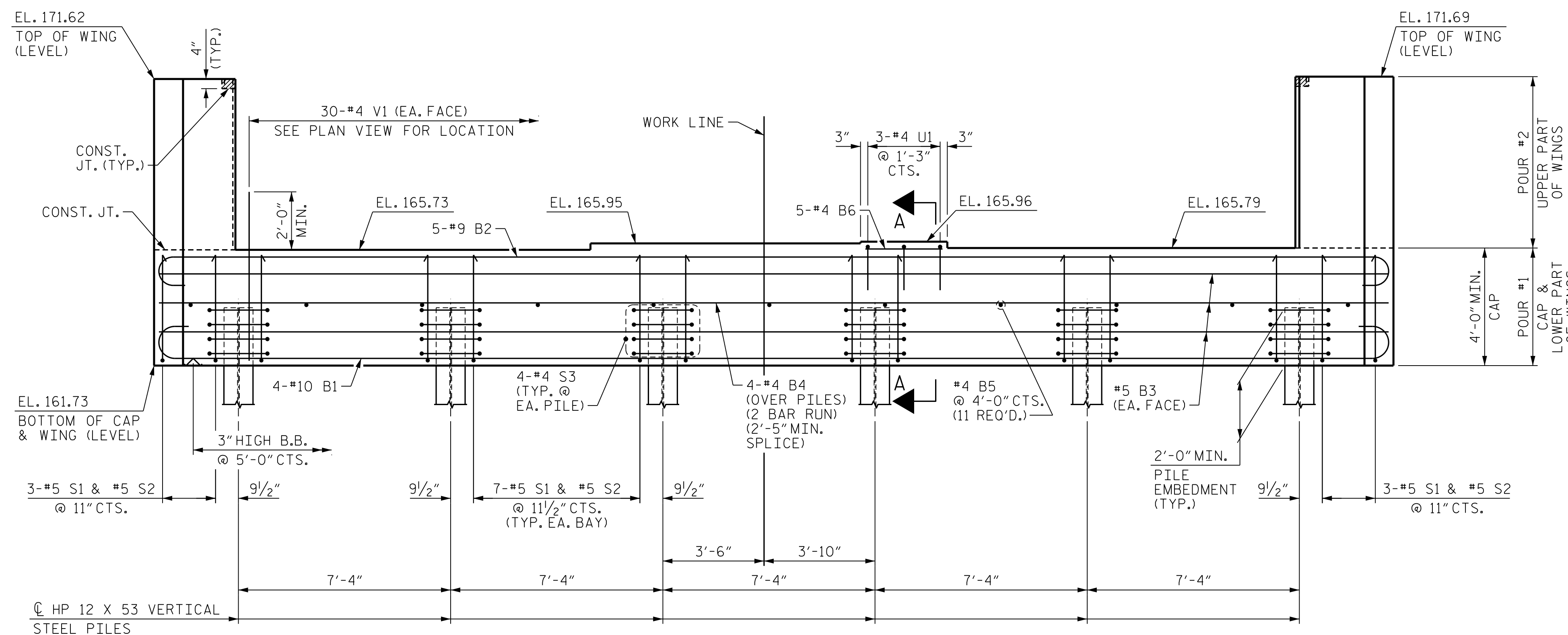
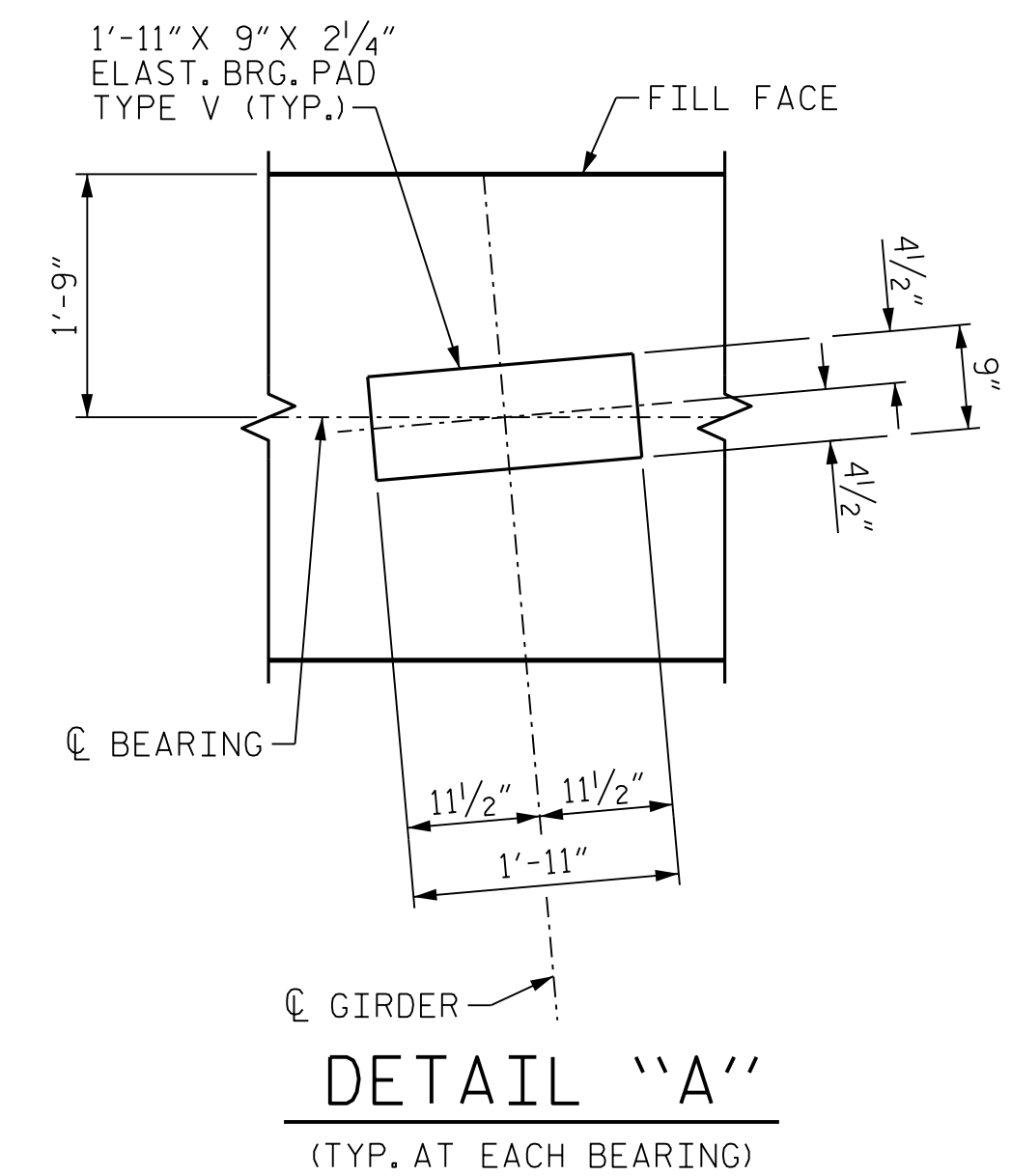
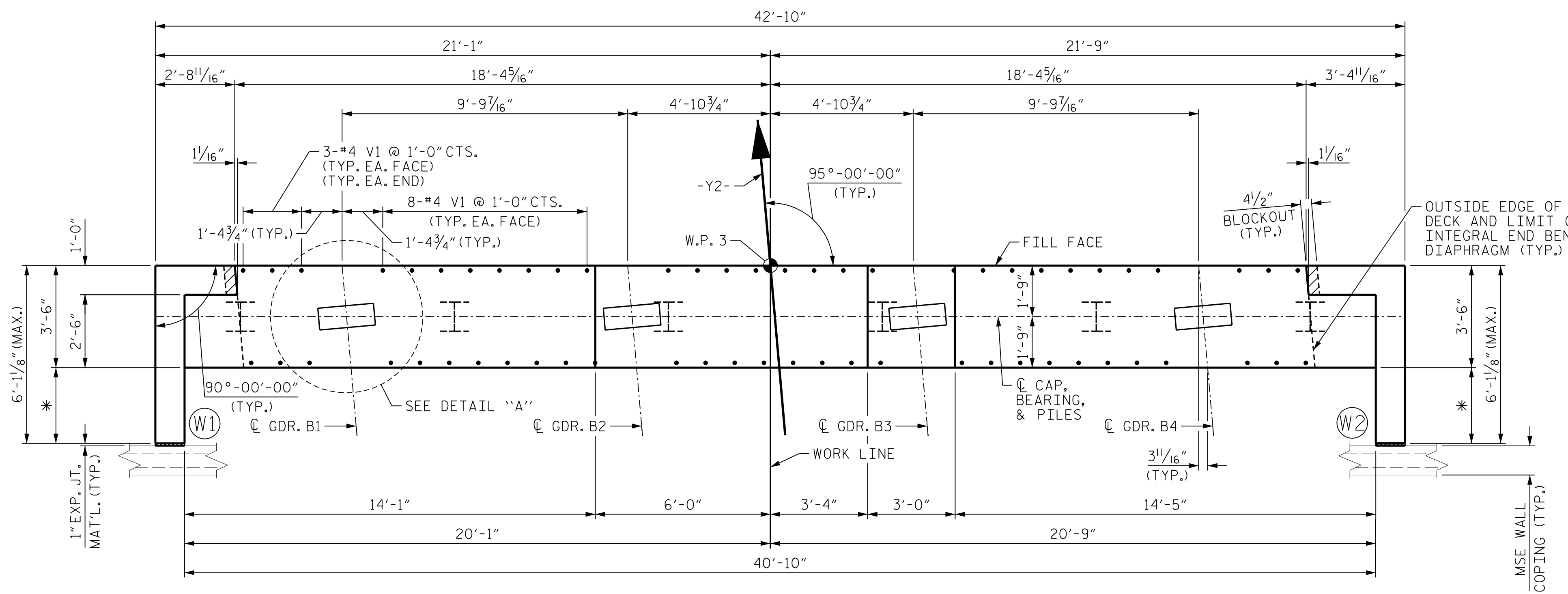
THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCEPT THE BEARING AREAS AND THE NON-INTEGRAL AREAS AT CAP ENDS, SHALL BE RAKED TO A DEPTH OF 1/4".

FOR SECTION A-A, PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.

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

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

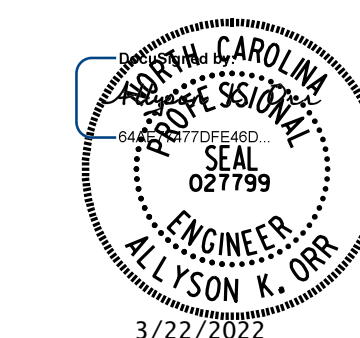
* LENGTH OF EACH WING SHALL BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1" EXPANSION JOINT MATERIAL AS SHOWN BETWEEN THE COMPONENT AND THE MSE WALL COPING. (2'-7/8" MAX.)



PILE SLEEVES NOT SHOWN FOR CLARITY. SEE SECTION A-A.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 PLAN AND ELEVATION

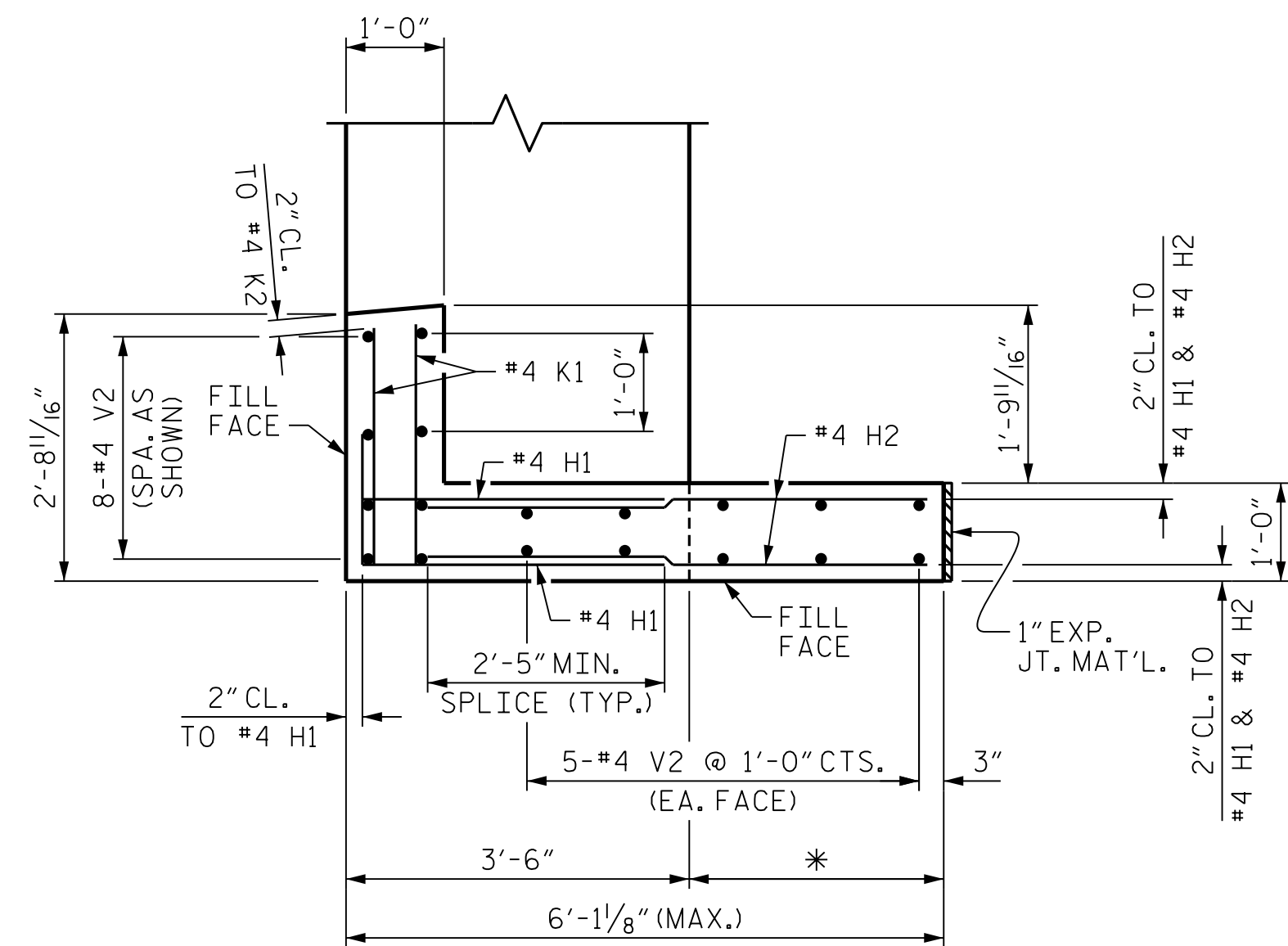
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1			3			S1-31 TOTAL SHEETS 36
2			4			

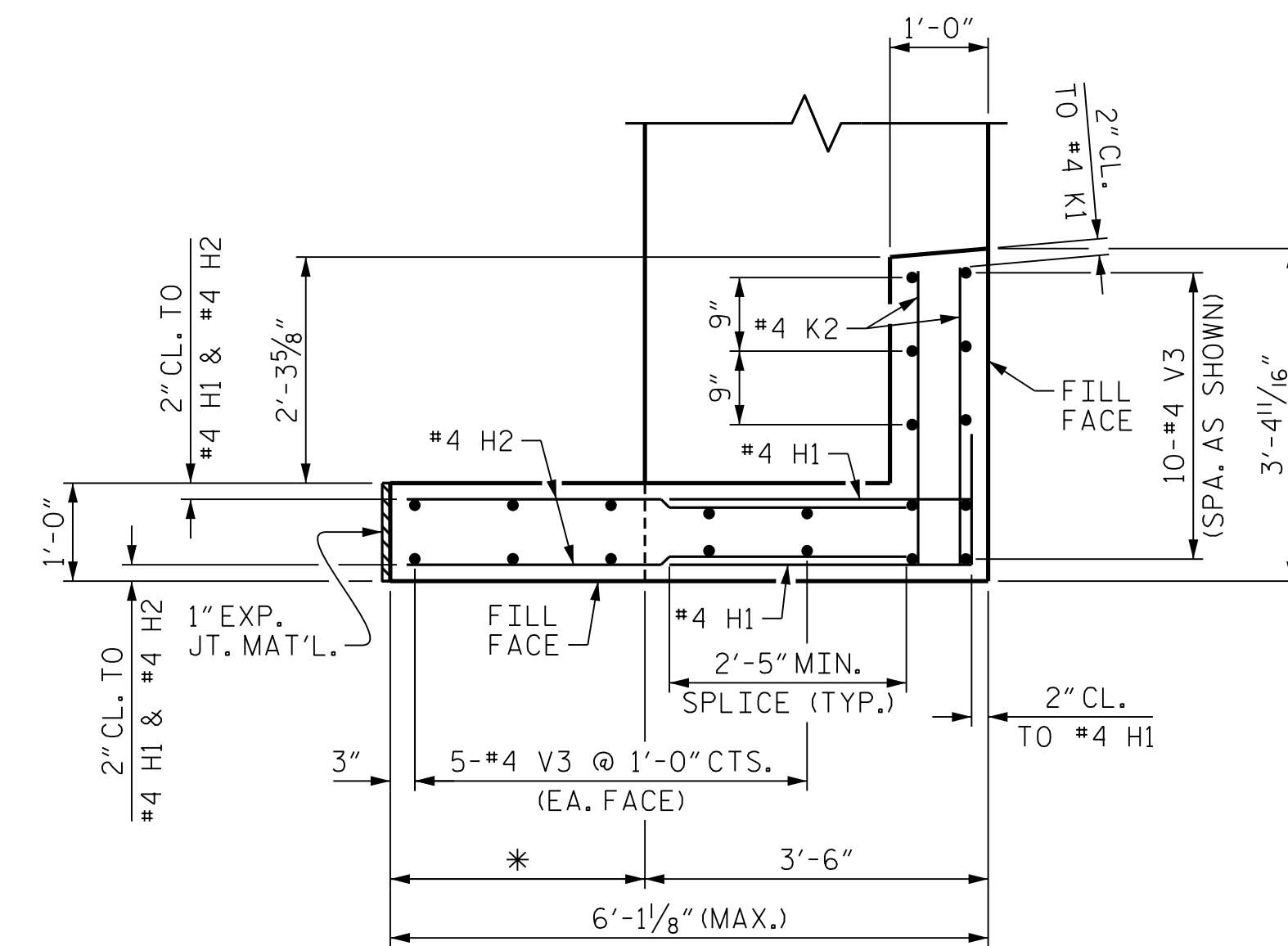
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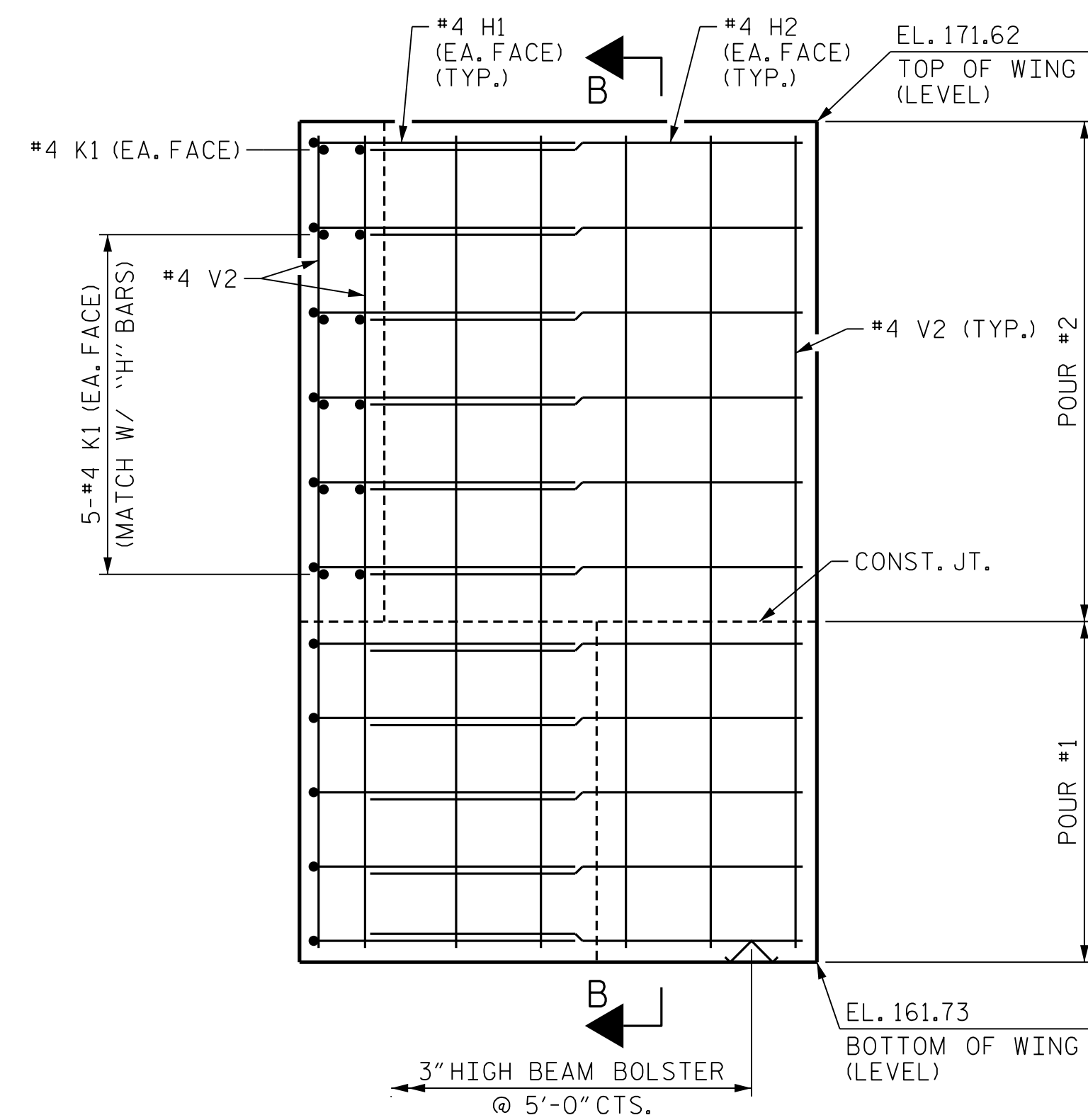


PLAN OF WING (W1)

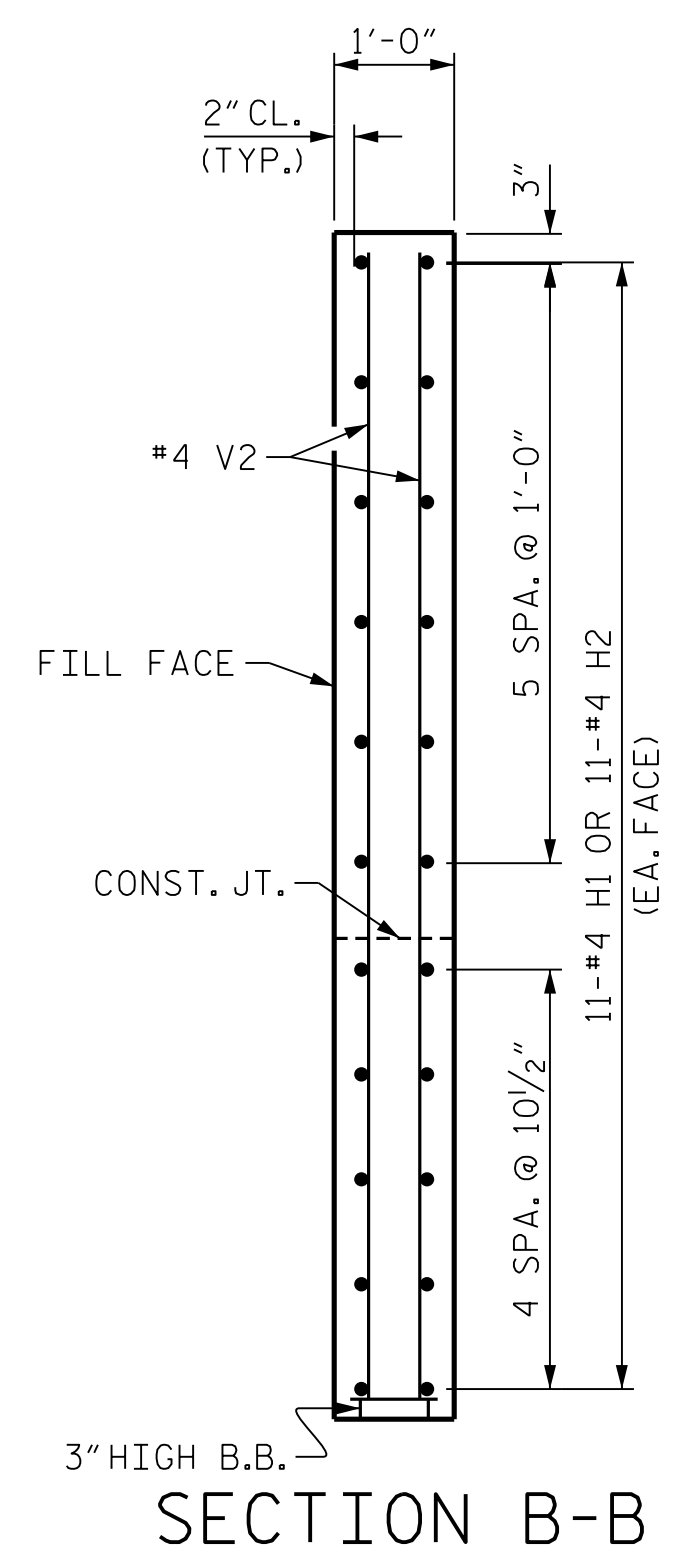
NOTE:
 * WINGWALL EXTENSION DISTANCE TO BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1" EXP. JT. MAT'L. BETWEEN THE MSE WALL COPING AND THE EXTENDED WINGWALL.



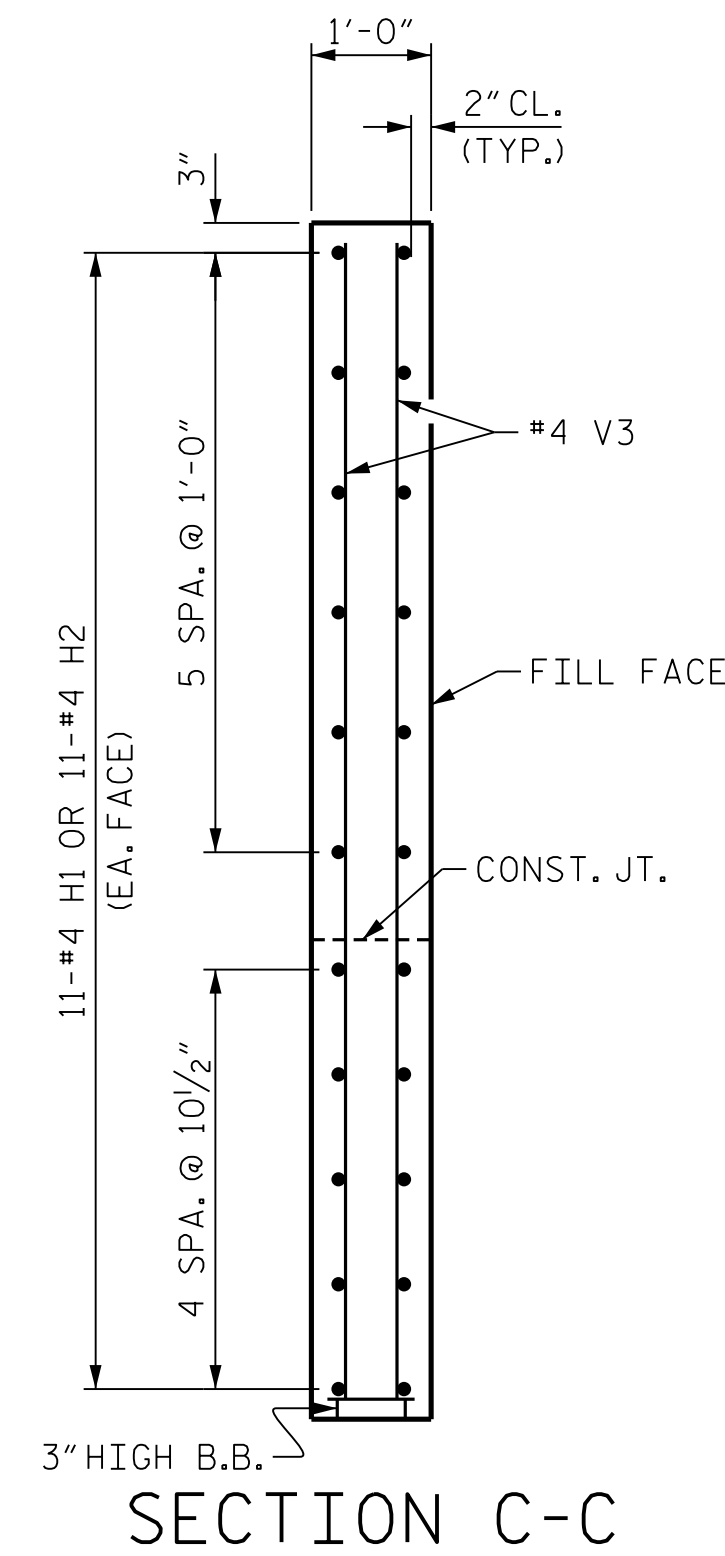
PLAN OF WING (W2)



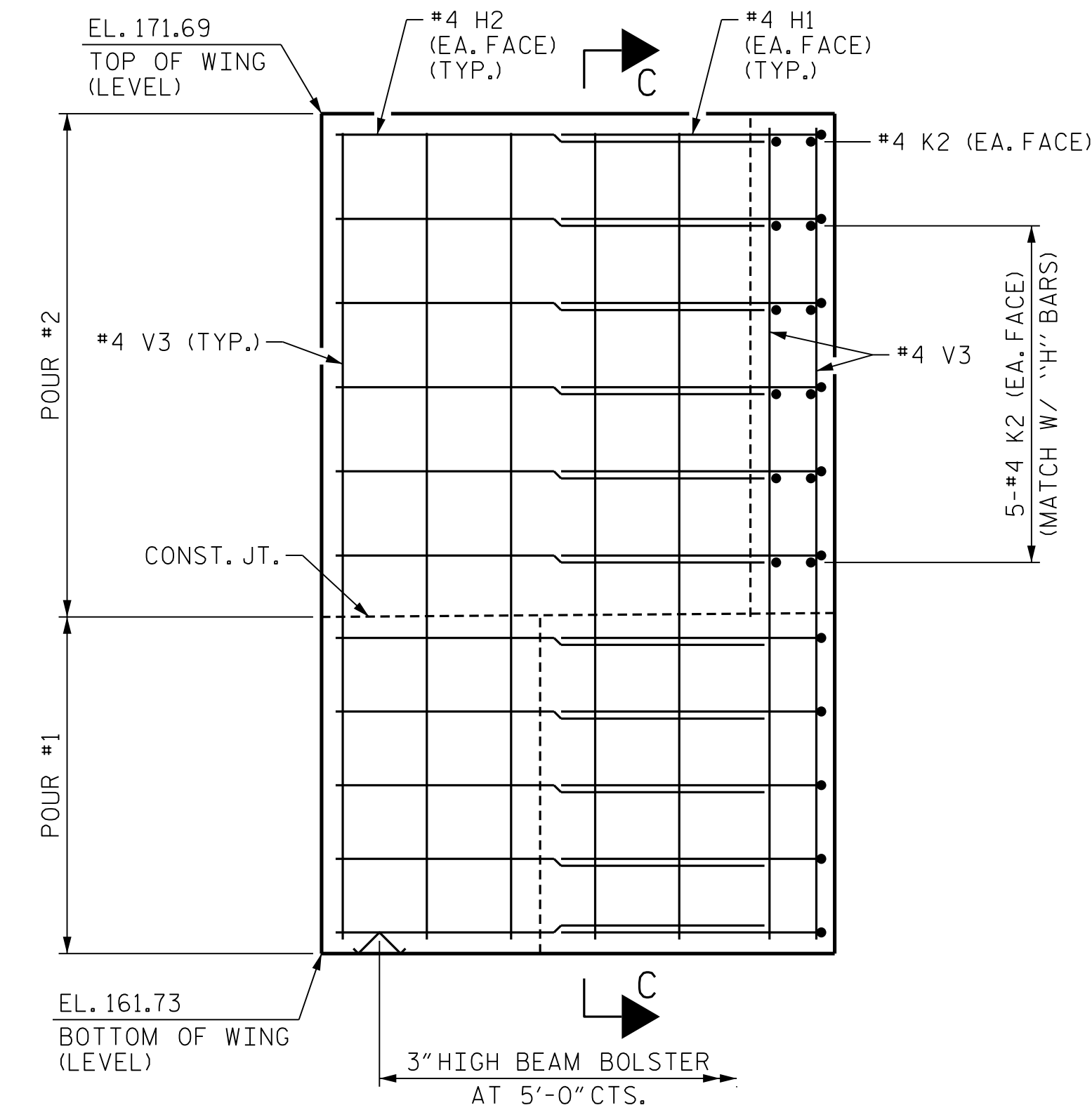
ELEVATION OF WING (W1)



SECTION B-B



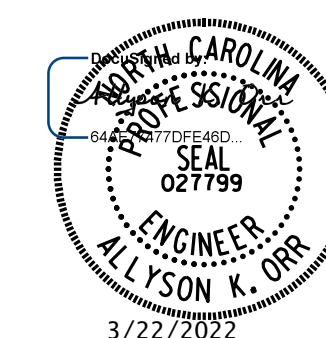
SECTION C-C



ELEVATION OF WING (W2)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 3



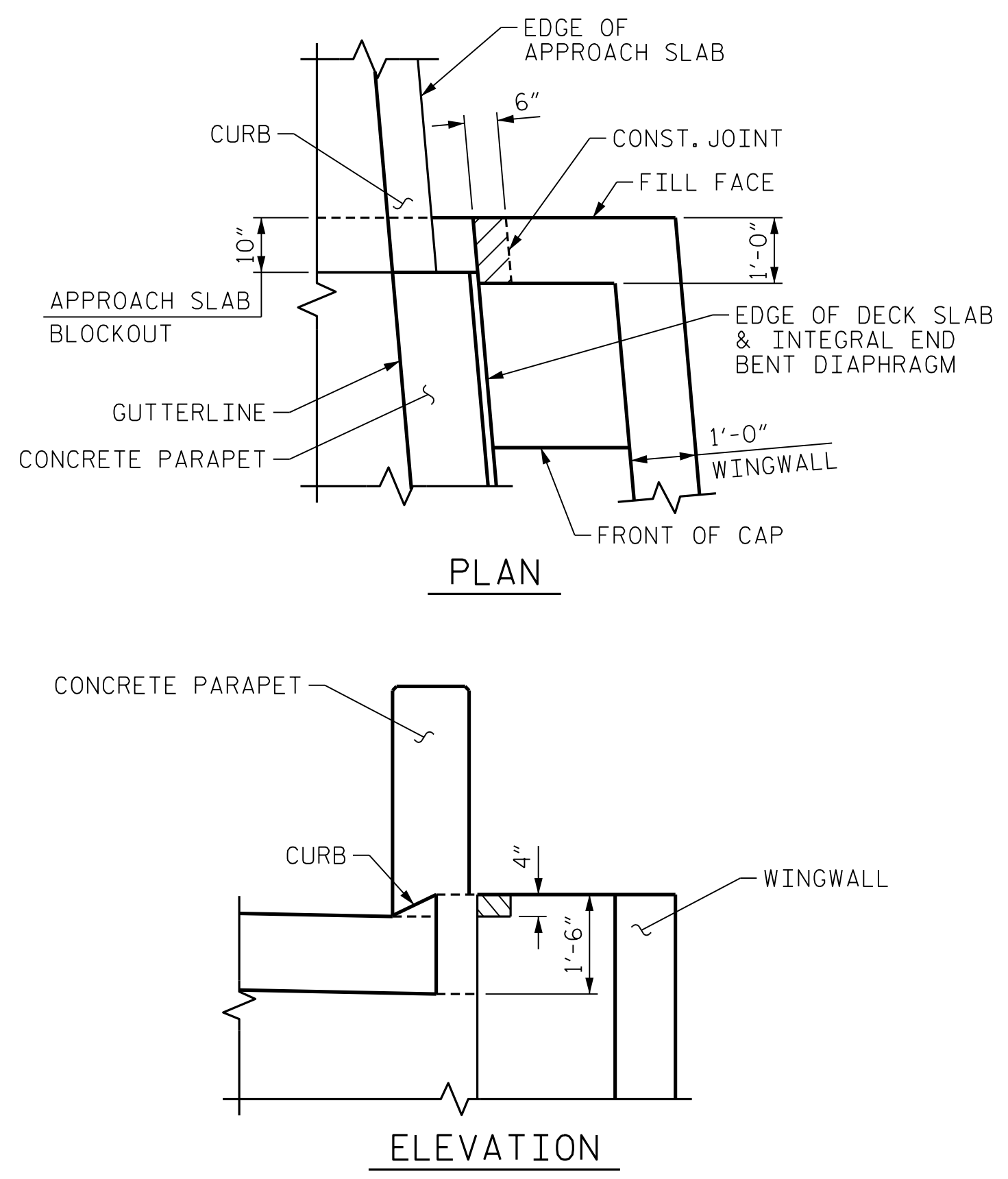
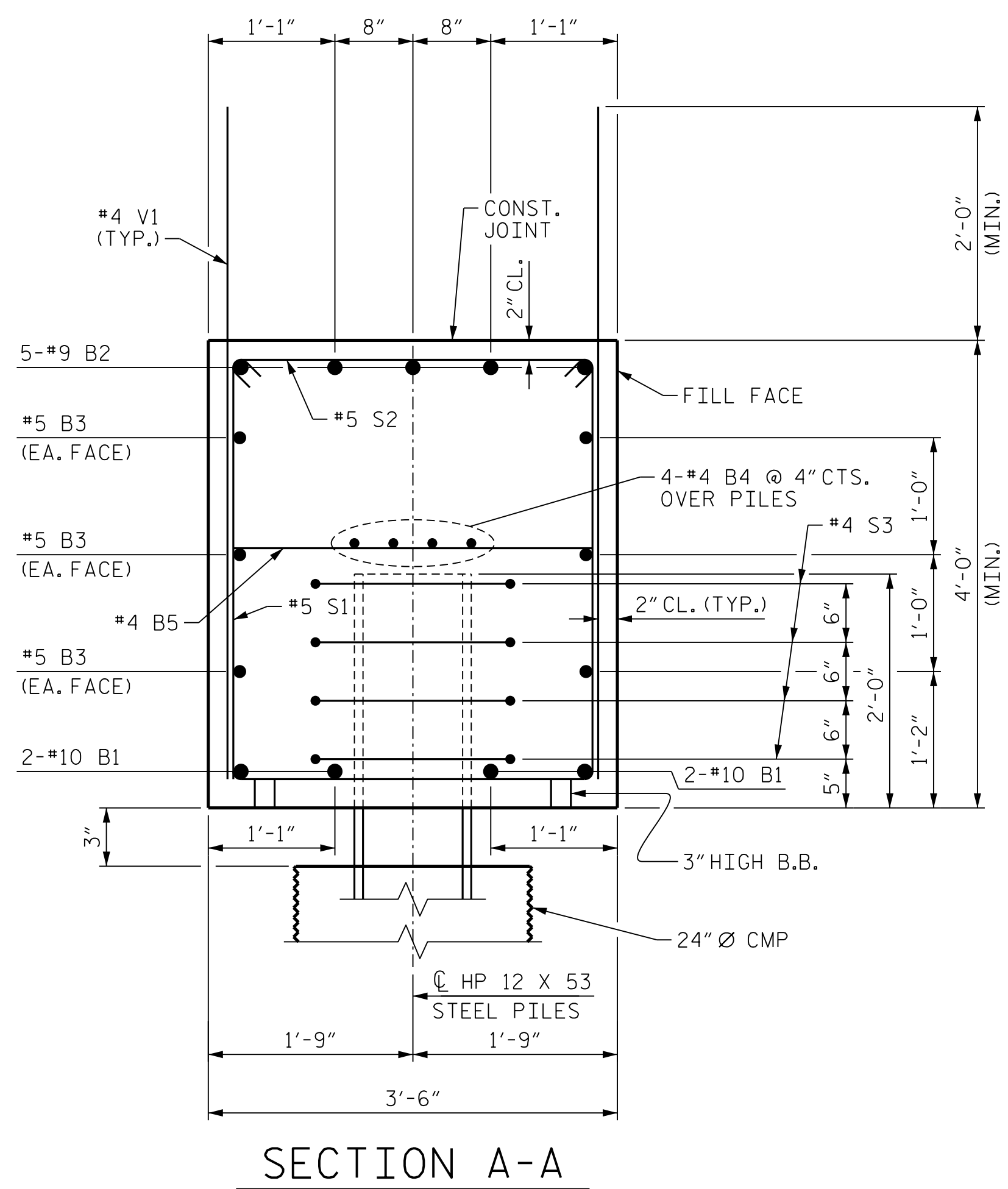
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 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

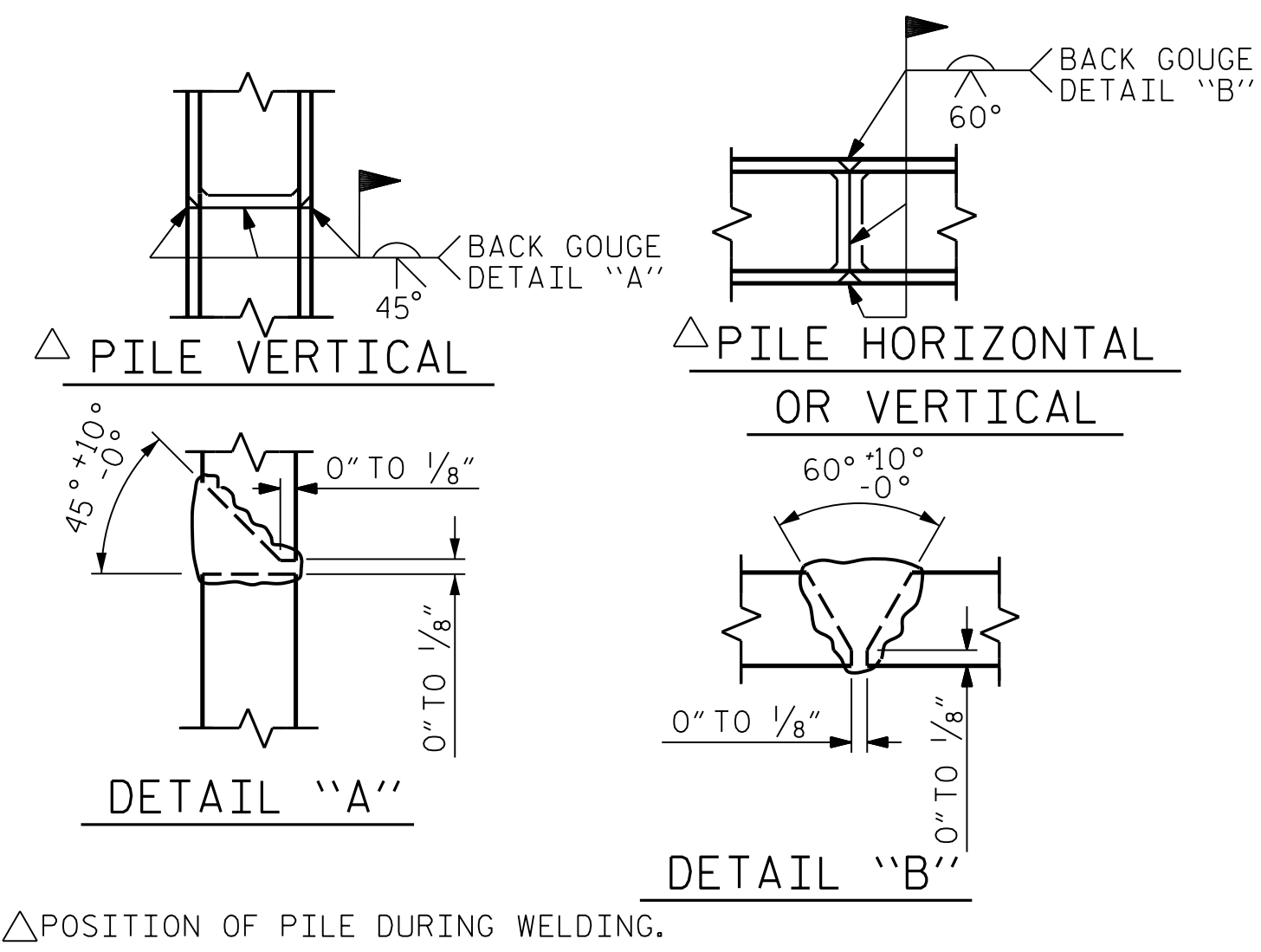
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 WINGWALL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-32					TOTAL SHEETS 36

DRAWN BY: B.E. LANNING DATE: 06/2021
 CHECKED BY: A.K. ORR DATE: 07/2021
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/2022

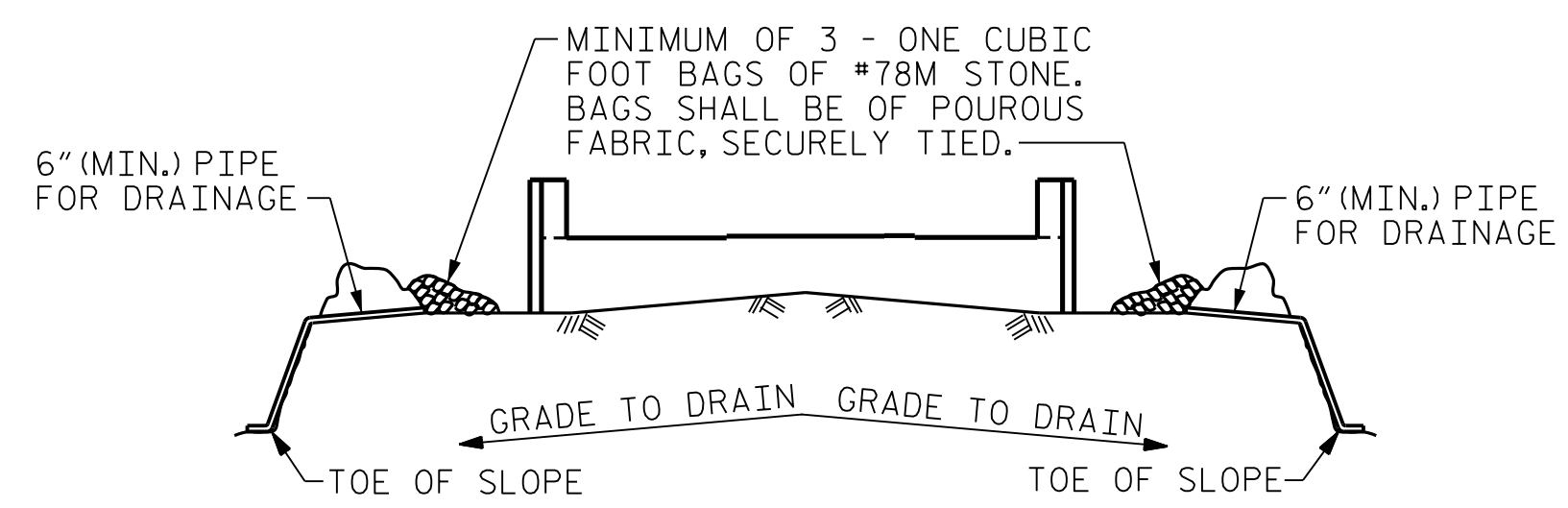
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THE CONCRETE IN THE SHADED AREA SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWS AND THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.



PILE SPLICE DETAILS



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					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	45'-4"	780
B2	5	#9	1	45'-0"	765
B3	6	#5	STR	42'-6"	266
B4	8	#4	STR	22'-6"	120
B5	11	#4	STR	3'-2"	23
B6	5	#4	STR	2'-8"	9
H1	44	#4	5	4'-5"	130
H2	44	#4	STR	4'-6"	132
K1	12	#4	STR	2'-5"	19
K2	12	#4	STR	3'-0"	24
S1	41	#5	3	11'-4"	485
S2	41	#5	2	4'-1"	175
S3	24	#4	4	6'-6"	104
U1	3	#4	6	6'-2"	12
V1	60	#4	STR	6'-0"	240
V2	18	#4	STR	9'-5"	113
V3	20	#4	STR	9'-6"	127
REINFORCING STEEL					3,524 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 (CAP & LOWER PART OF WINGS)					23.5 C.Y.
POUR #2 (UPPER PART OF WINGS)					3.6 C.Y.
TOTAL					27.1 C.Y.

ALL BAR DIMENSIONS ARE OUT TO OUT.

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DRAWN BY : B.E. LANNING DATE : 06/2021
 CHECKED BY : A.K. ORR DATE : 07/2021
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/2022

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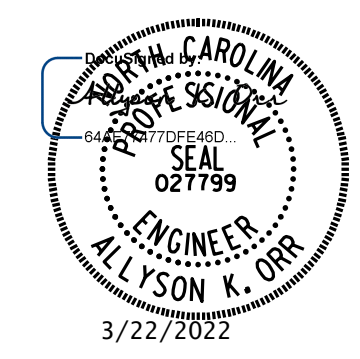
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

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

SHEET NO.
S1-33
TOTAL SHEETS
36

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

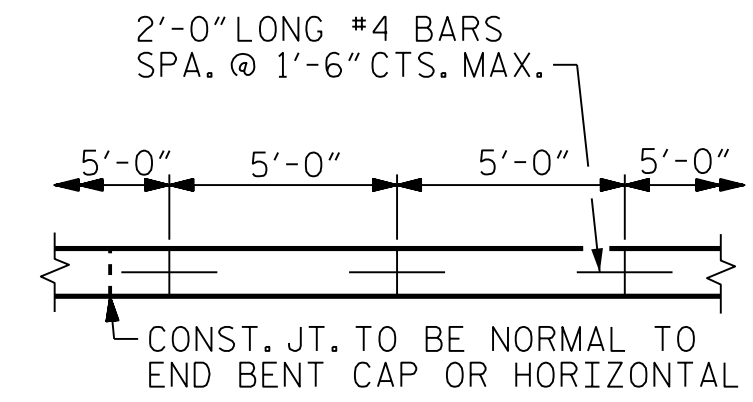
SHEET 3 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 DETAILS AND
 BILL OF MATERIAL



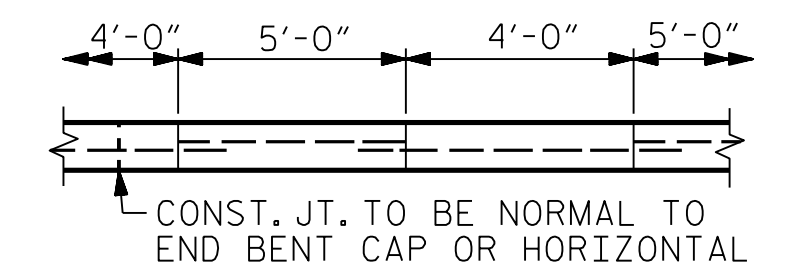
NOTES:

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN SECTION A-A. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

SLOPE PROTECTION SHALL CONSIST OF 4"POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE SECTIONS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60"WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0"LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

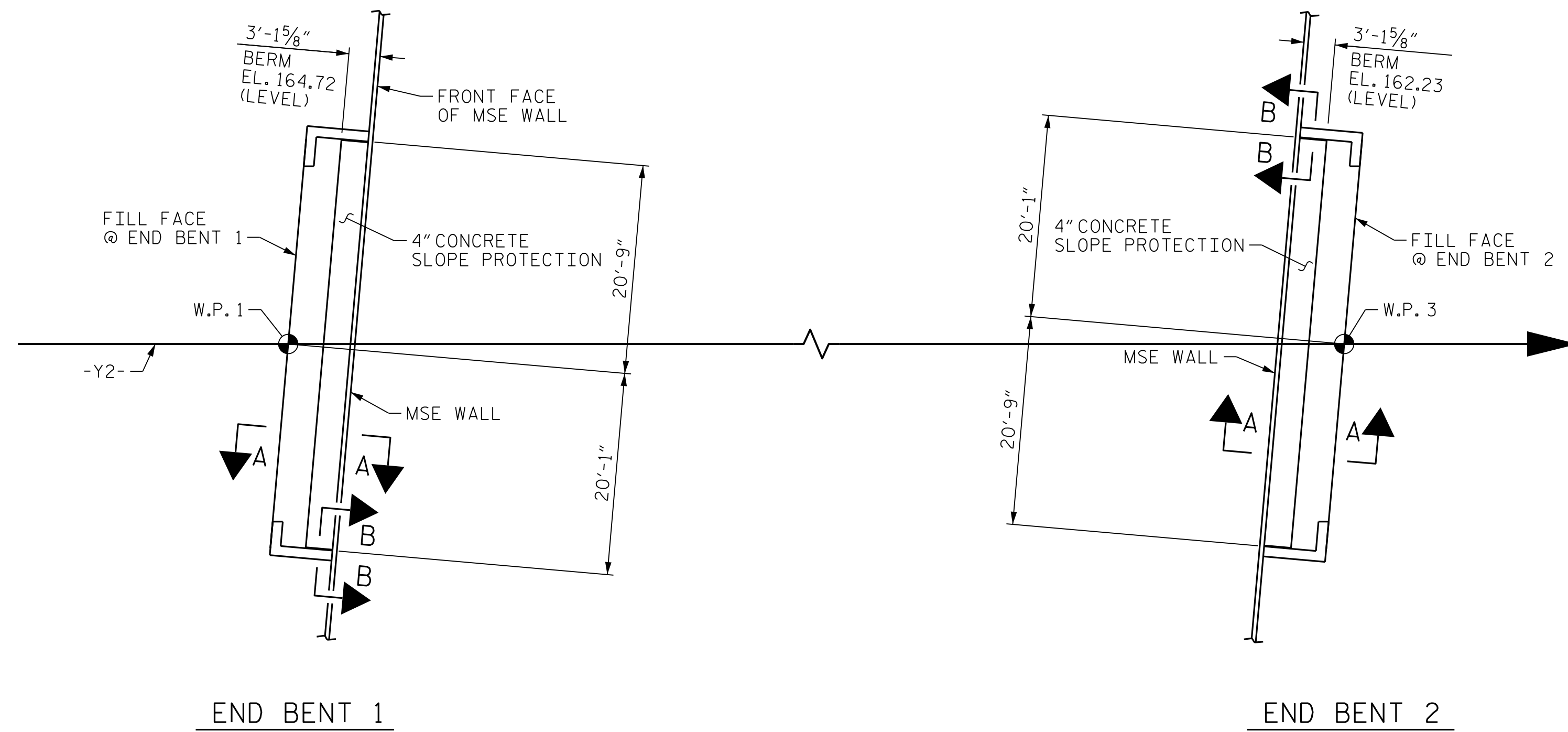


POURING DETAIL



OPTIONAL POURING DETAIL

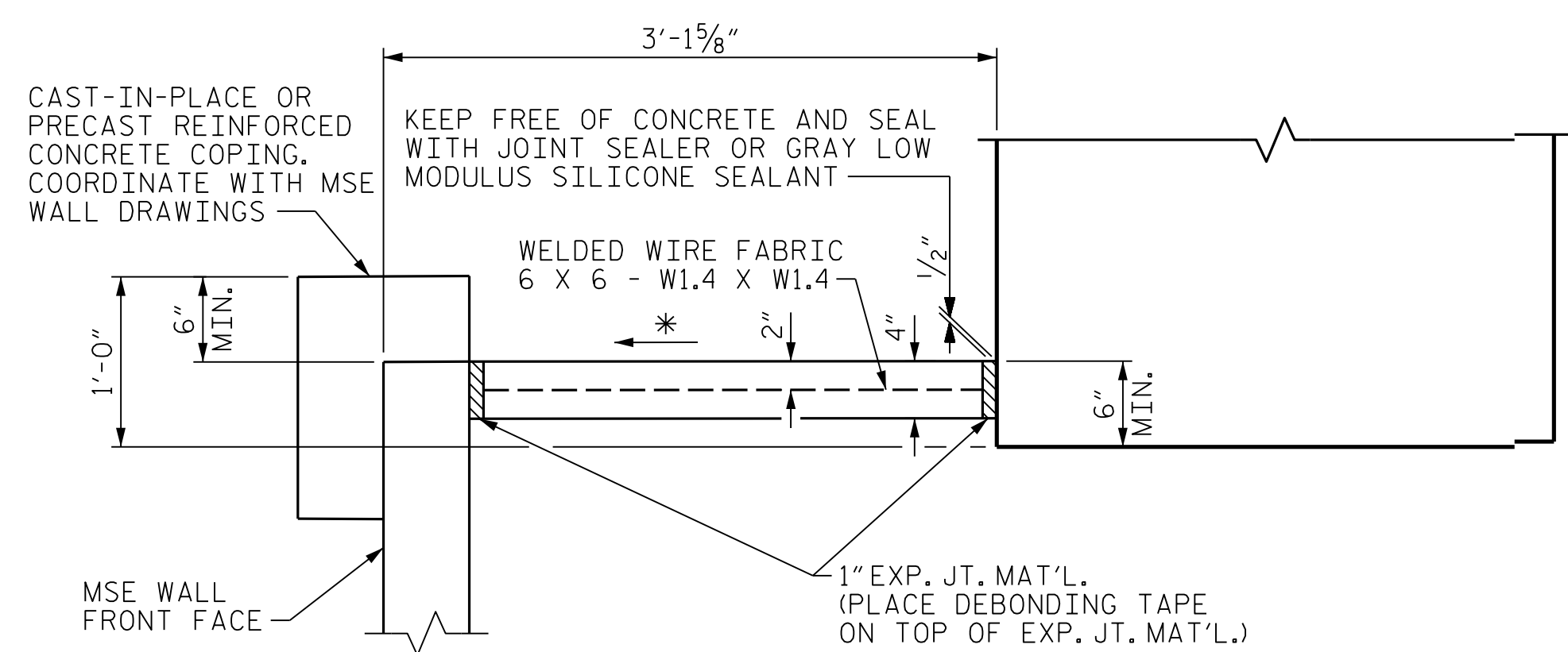
POUR A 4'-0" STRIP FIRST.



PLAN

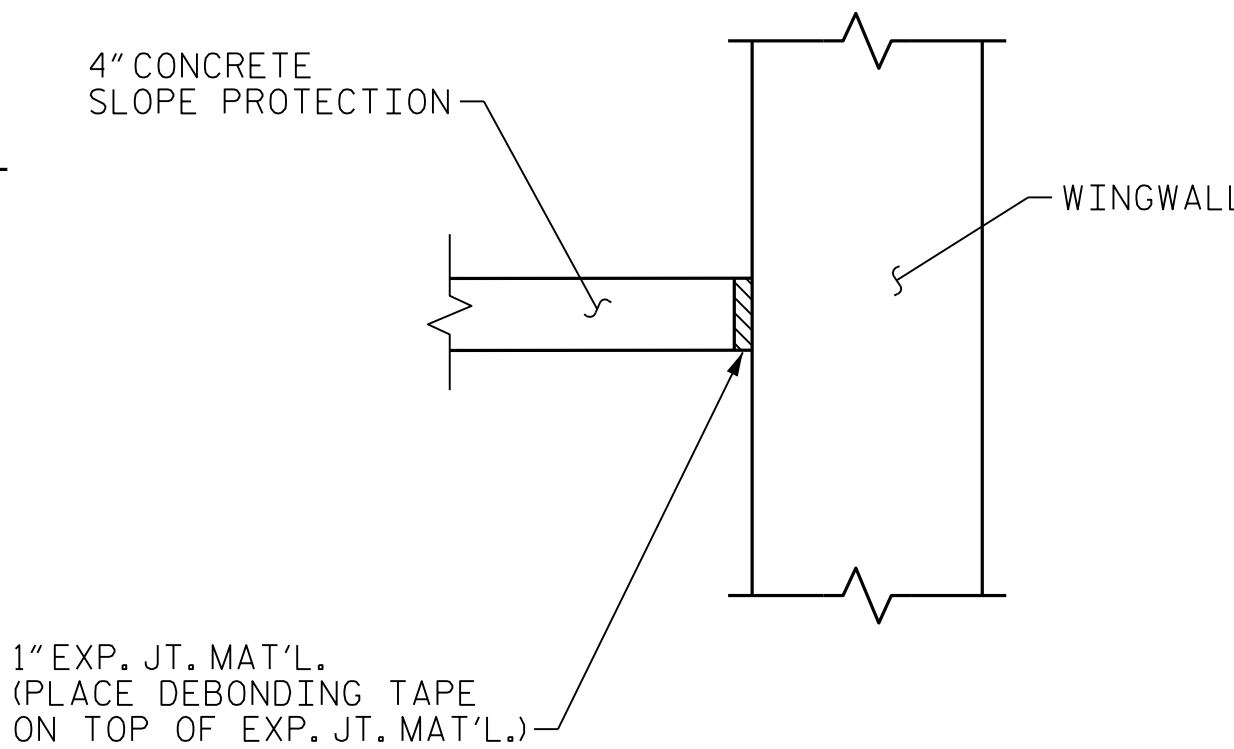
BRIDGE @ STA. 29+75.79 -Y2-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	12	24
END BENT 2	12	24

* QUANTITY SHOWN IS BASED ON 5' POURS.



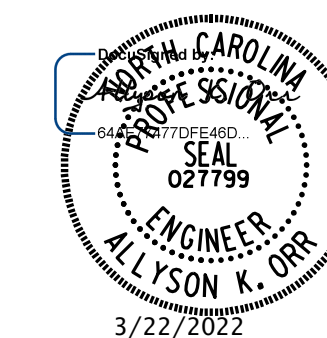
SECTION A-A

* 2% SLOPE (NORMAL TO CAP)



SECTION B-B

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION

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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER : P-0671

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

SHEET NO.
S1-34
 TOTAL SHEETS
36

DRAWN BY : <u>B.E. LANNING</u>	DATE : <u>03/2021</u>
CHECKED BY : <u>A.K. ORR</u>	DATE : <u>06/2021</u>
DESIGN ENGINEER OF RECORD : <u>A.K. ORR</u>	DATE : <u>03/2022</u>

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BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQ'D.)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	16	#4	STR	35'-1"	375
A2	16	#4	STR	35'-1"	375
*B1	70	#5	STR	14'-1"	1,028
B2	70	#6	STR	14'-7"	1,533
REINFORCING STEEL					1,908 LBS.
* EPOXY COATED REINFORCING STEEL					1,403 LBS.
CLASS AA CONCRETE					23.0 C.Y.

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

NOTES:

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

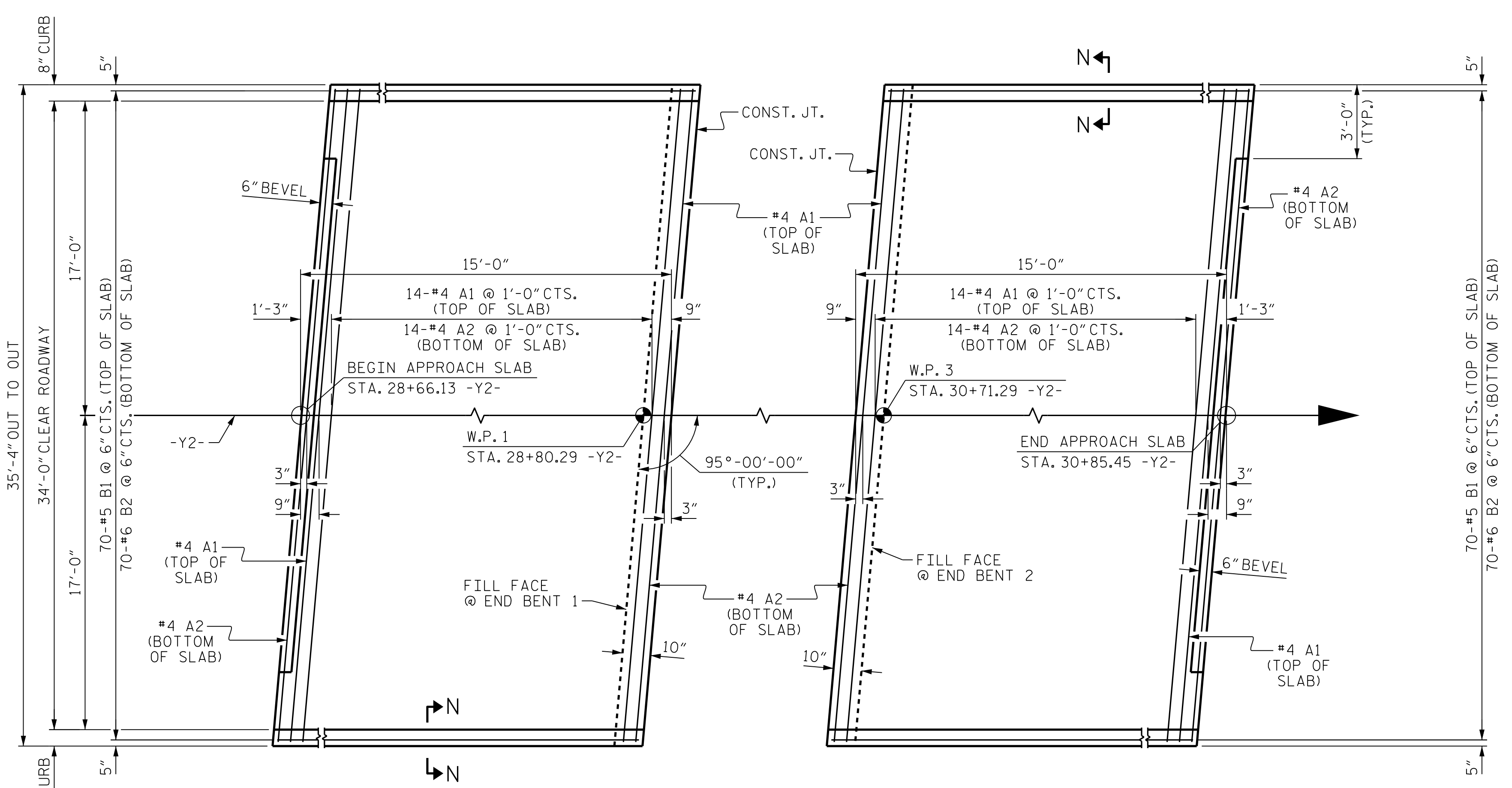
FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

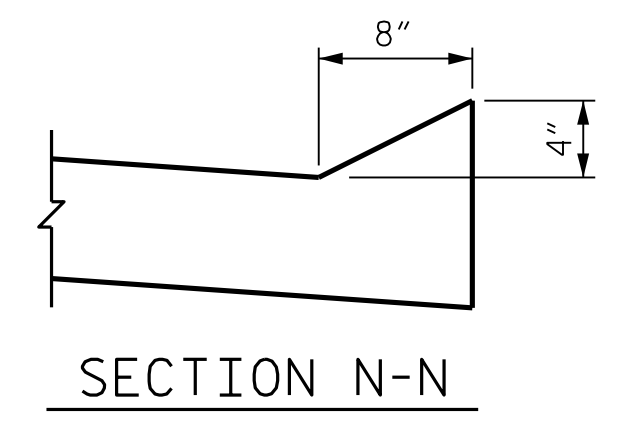
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

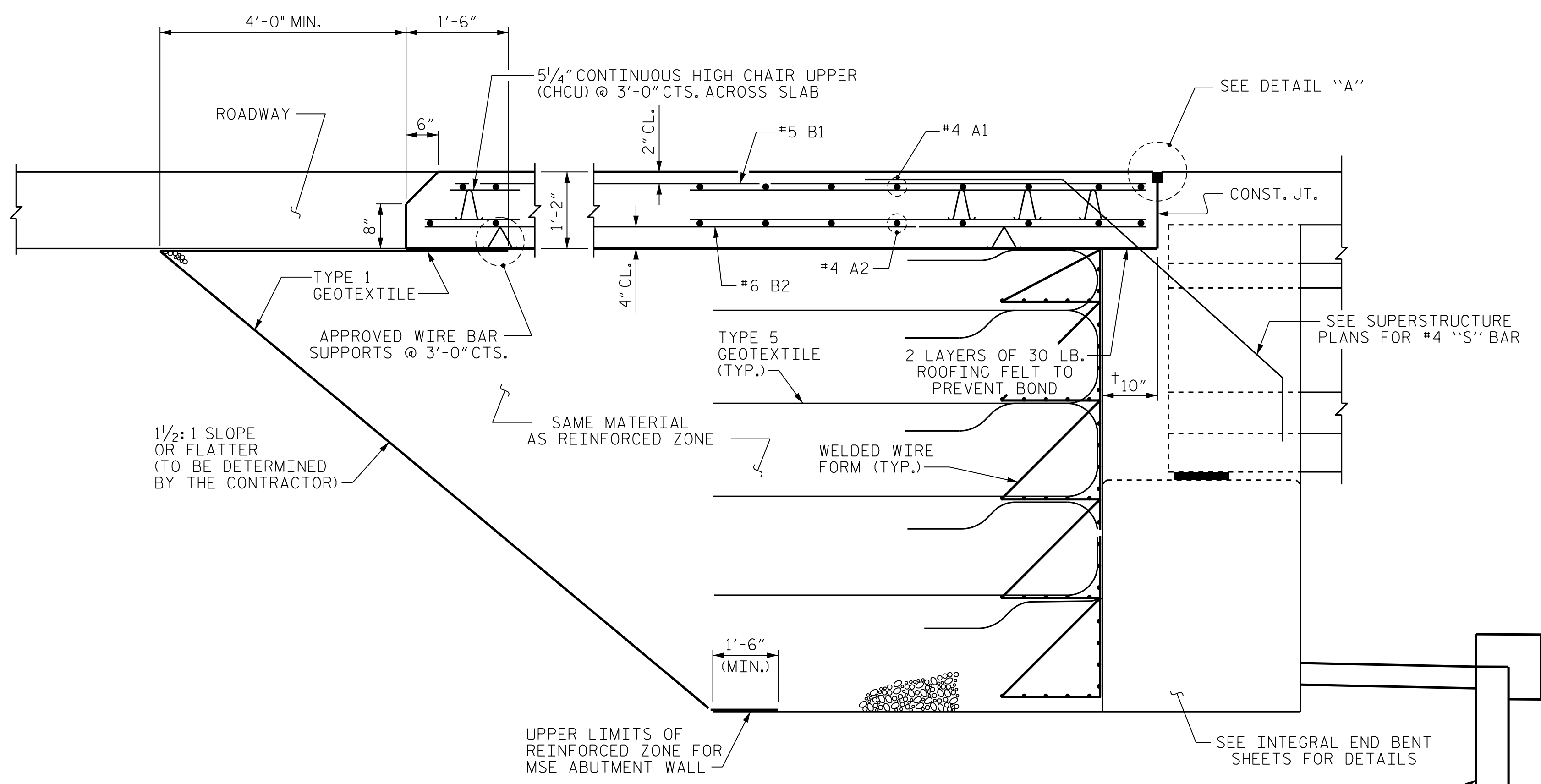
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



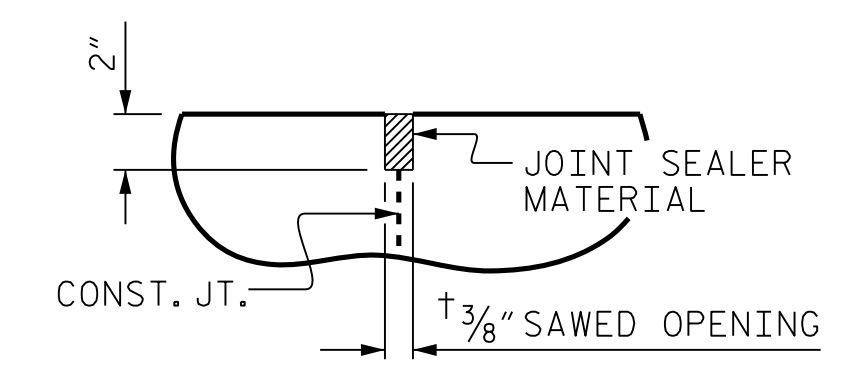
PLAN AT END BENT 1 PLAN AT END BENT 2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION N-N



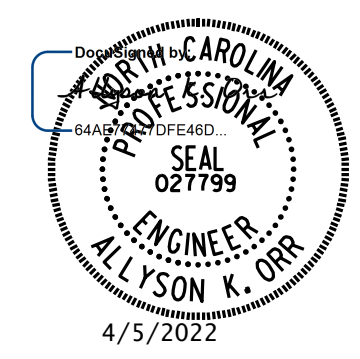
SECTION THRU SLAB
(SPECIAL BRIDGE APPROACH FILL)



DETAIL "A"
† NORMAL TO END BENT

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 29+75.79 -Y2-

SHEET 1 OF 2



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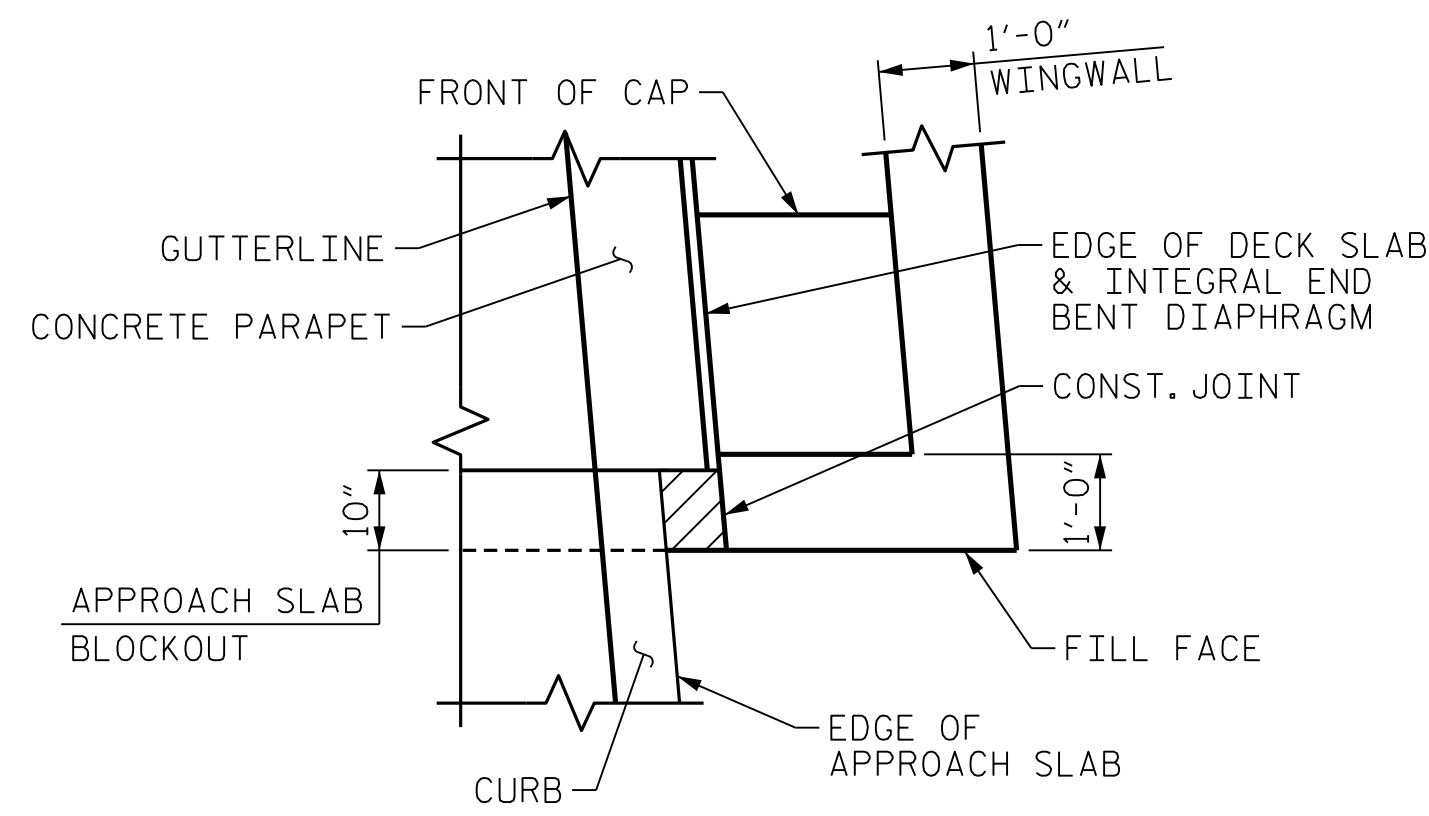
MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER: P-0671

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

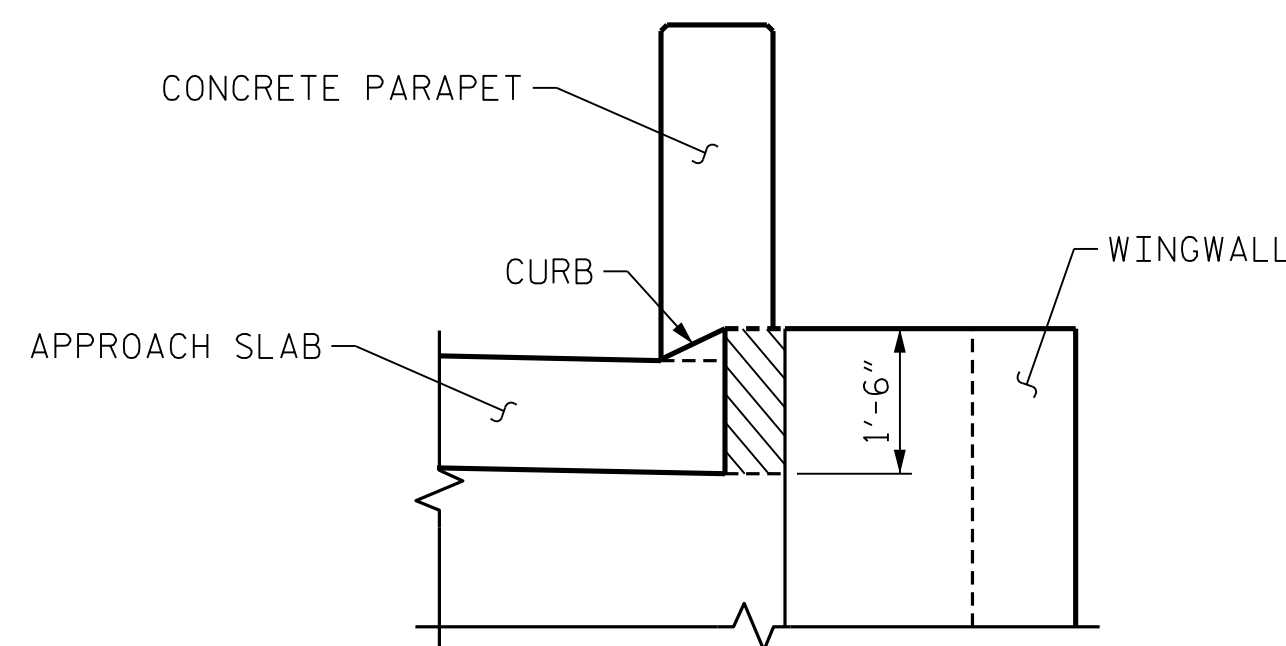
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-35	
1			3			TOTAL SHEETS 36	
2			4				

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ASSEMBLED BY:	B.E. LANNING	DATE:	02/2021
CHECKED BY:	A.K. ORR	DATE:	03/2021
DESIGN ENGINEER OF RECORD:	A.K. ORR	DATE:	12/2021
DRAWN BY:	TLA 10/05	REV. 6/13	MAA/GM
CHECKED BY:	GM 5/06	REV. 12/17	MAA/THC
		REV. 06/19	BNN/THC



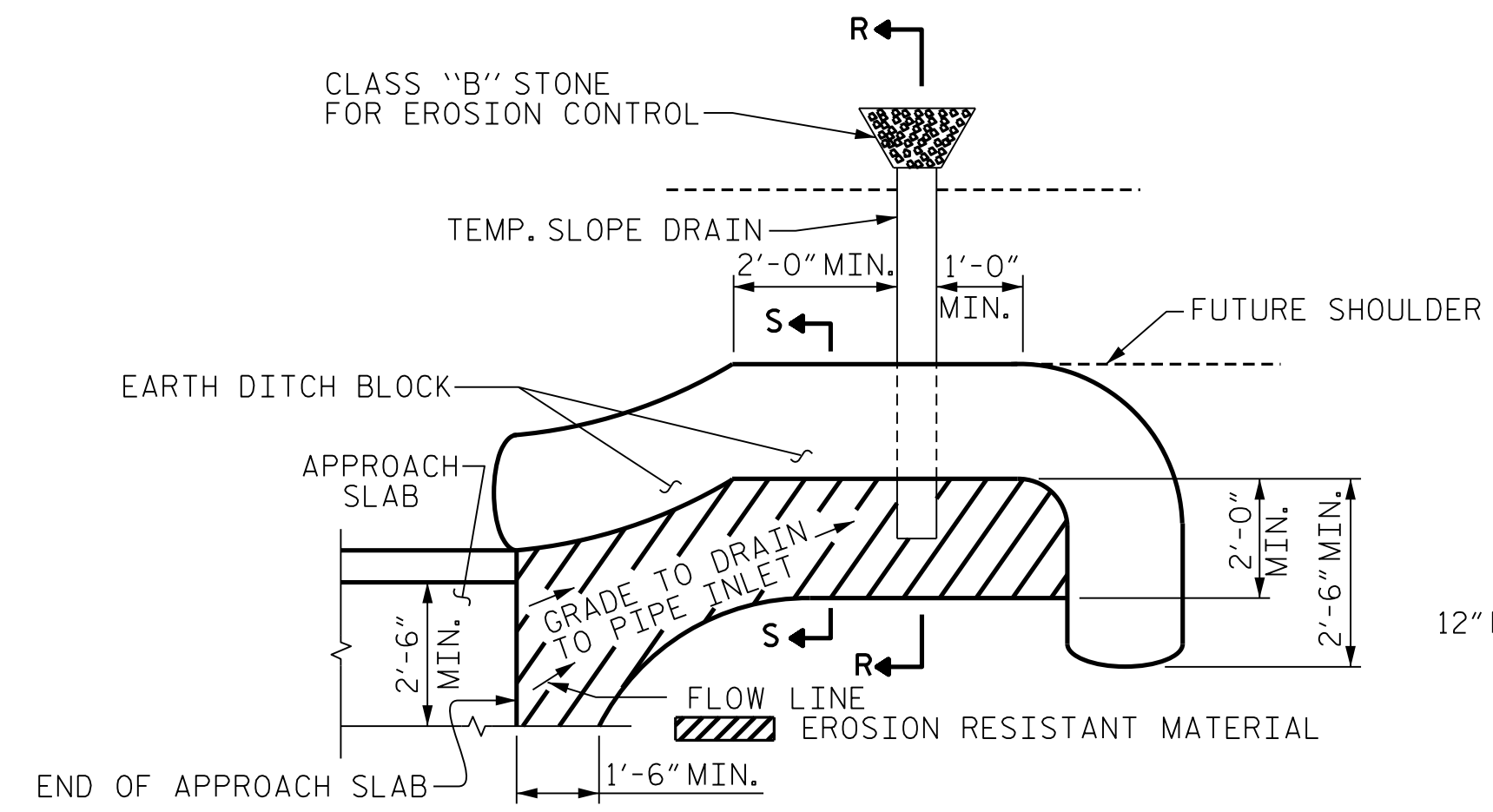
PLAN



ELEVATION

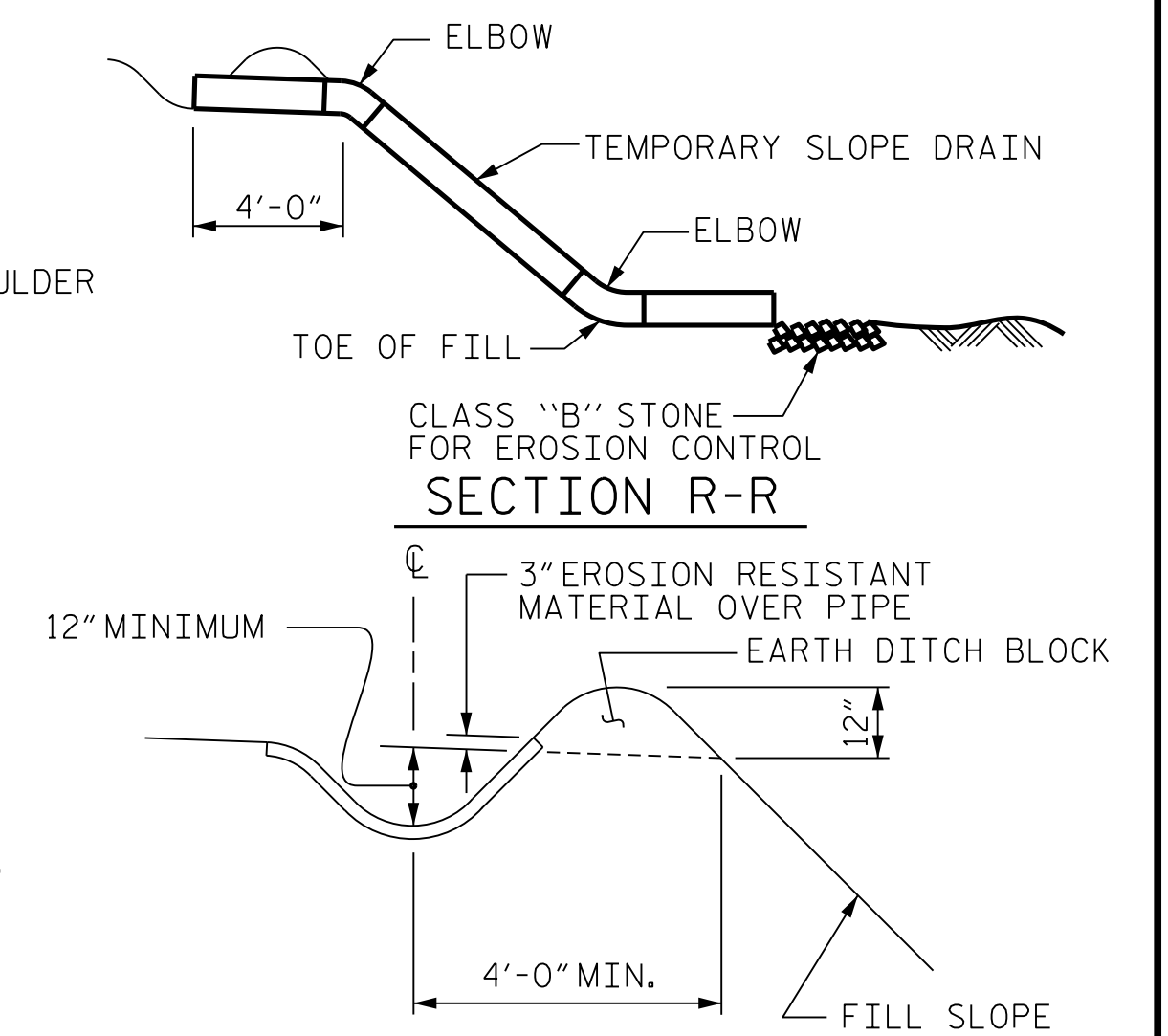
WINGWALL BLOCKOUT

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



PLAN VIEW

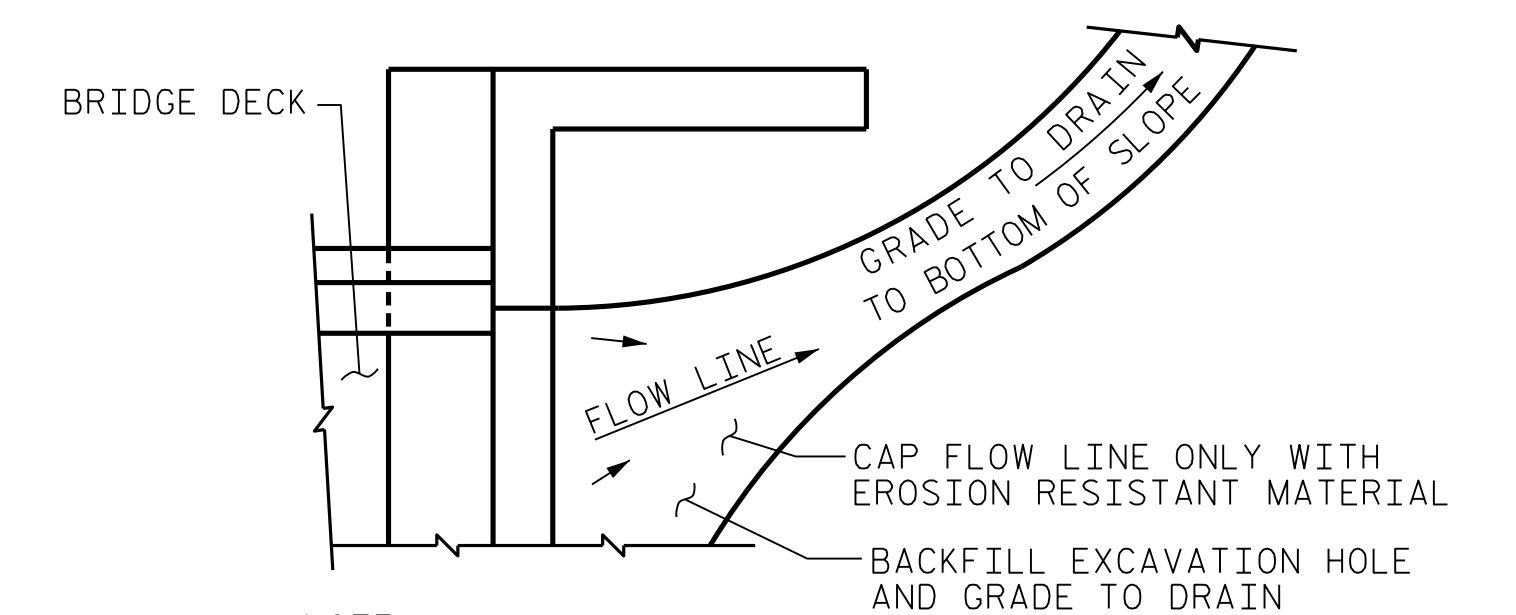
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

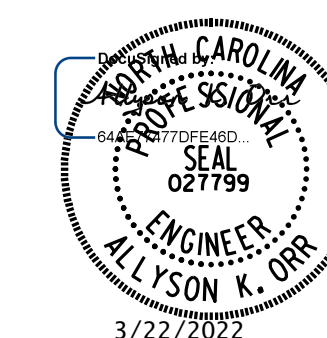


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 29+75.79 -Y2-

SHEET 2 OF 2



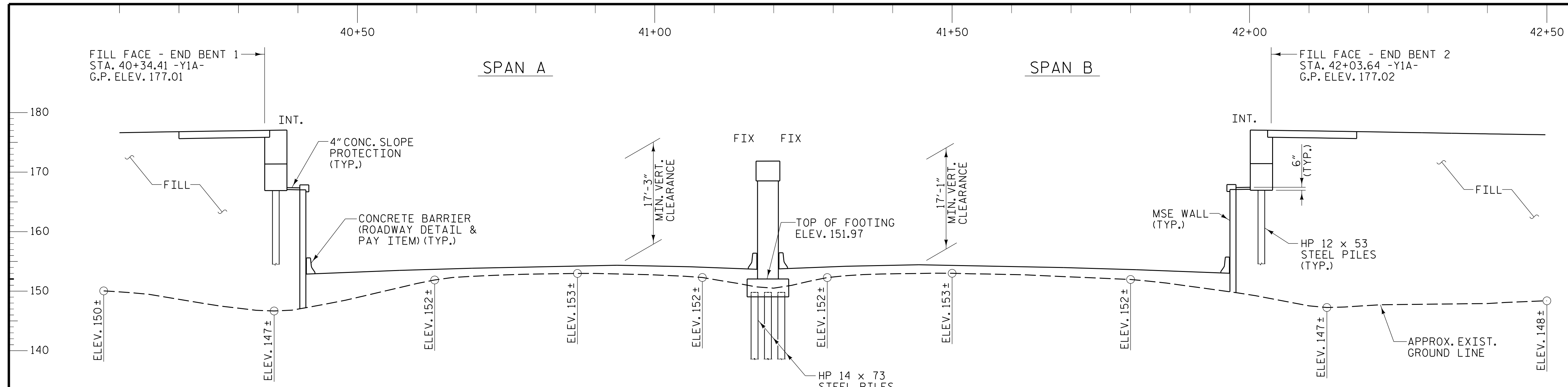
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MI ENGINEERING
 1011 SCHAUB DRIVE, SUITE 100
 RALEIGH, NC 27606
 (919) 851-6606
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-36
TOTAL SHEETS					36

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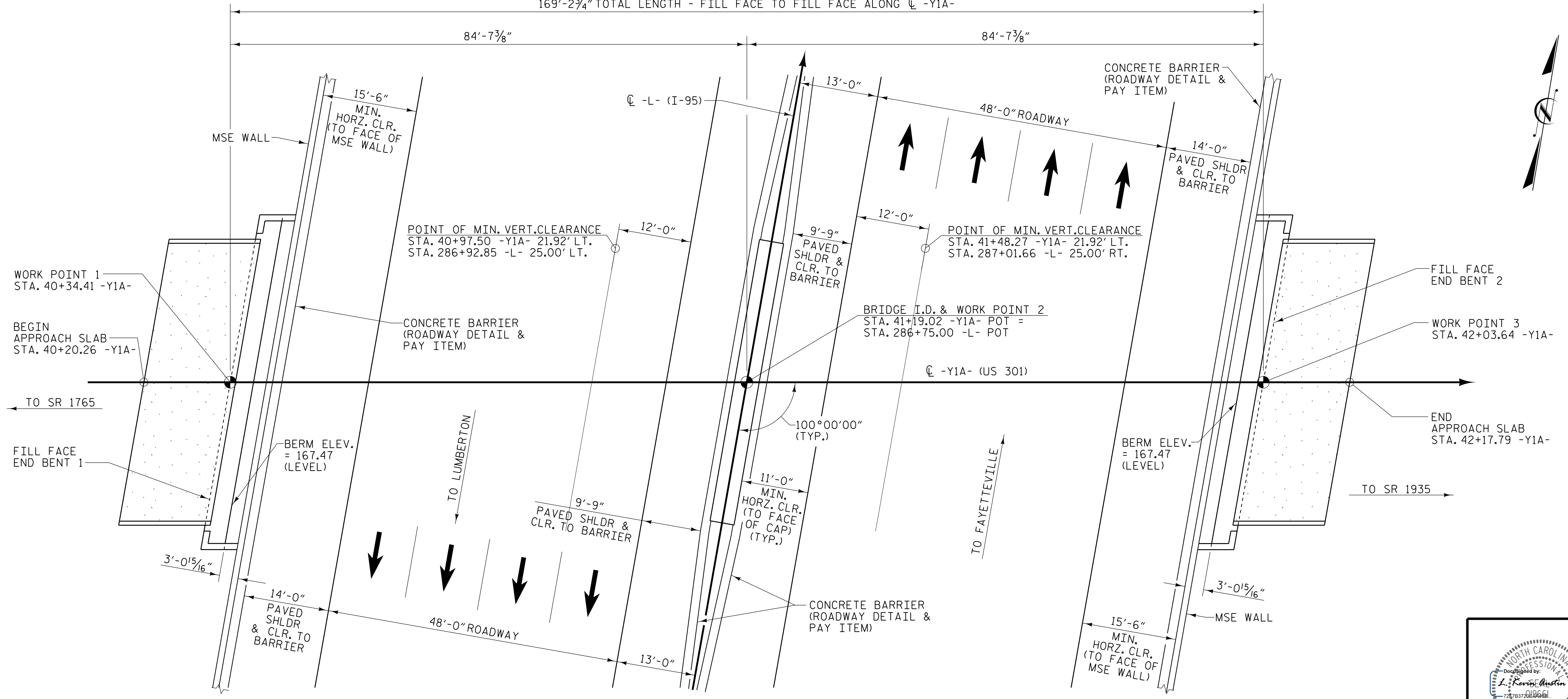
ASSEMBLED BY: B.E. LANNING	DATE: 02/2021
CHECKED BY: A.K. ORR	DATE: 03/2021
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 12/2021
DRAWN BY: TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY: GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



SECTION ALONG C -Y1A-

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

169'-2 3/4" TOTAL LENGTH - FILL FACE TO FILL FACE ALONG C -Y1A-



(NOTE: PILES, COLUMNS AND FOOTINGS NOT SHOWN IN PLAN VIEW)

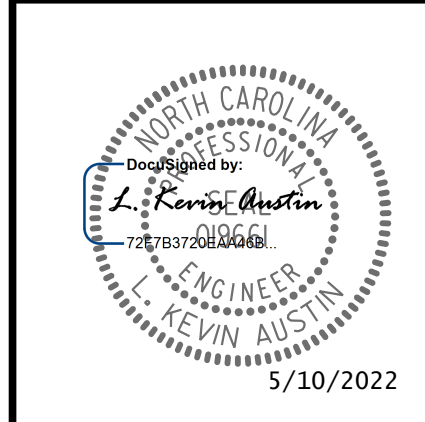
PROJECT NO. I-5987A
 COUNTY ROBESON
 STATION: 41+19.02 -Y1A- POT = 286+75.00 -L- POT
 SHEET 1 OF 3 REPLACES BRIDGE NO. 54

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON -Y1A- (US 301)
 OVER -L- (INTERSTATE 95)
 BETWEEN SR 1765 AND SR 1935

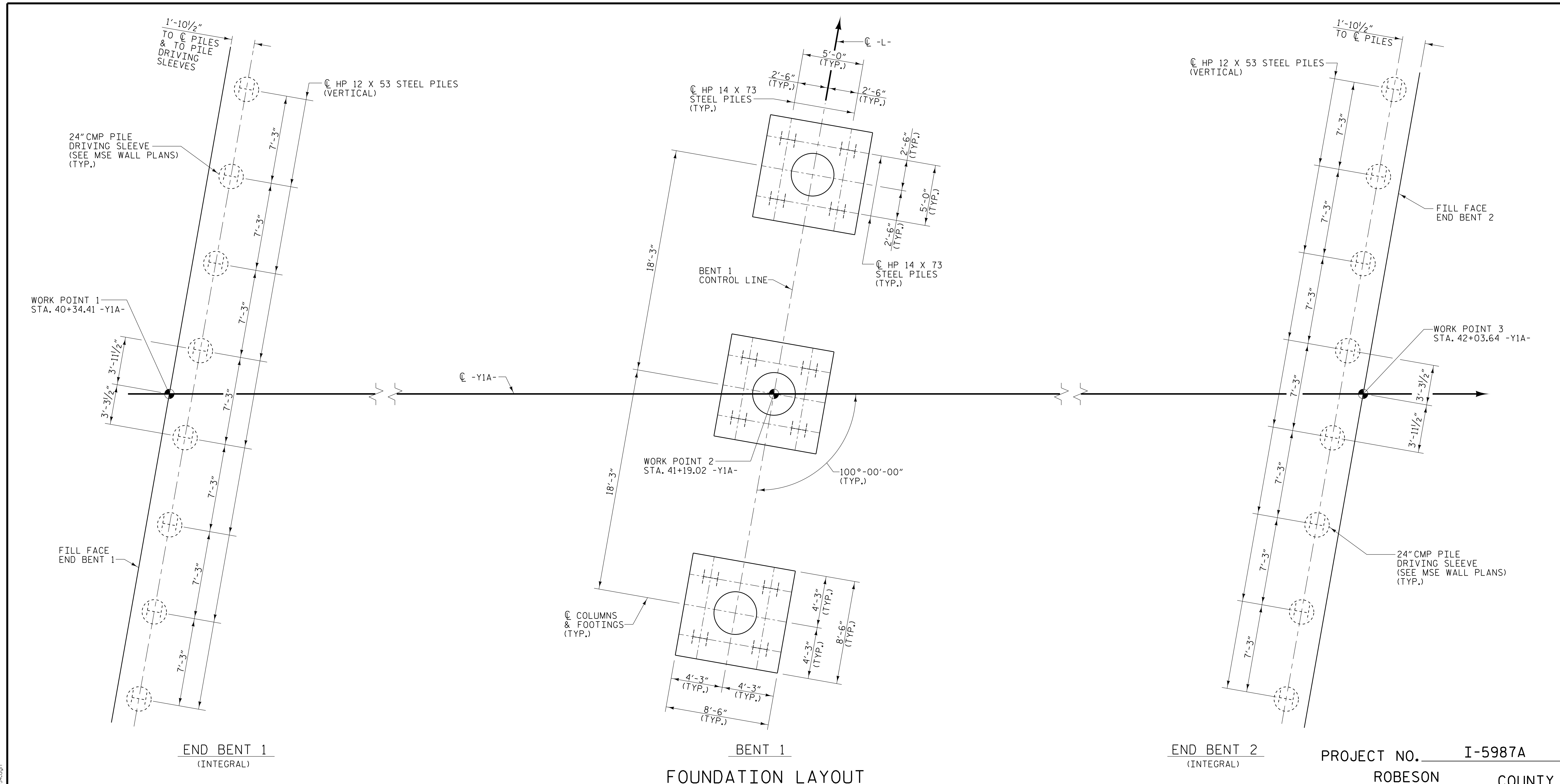
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			31



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DRAWN BY: W. B. ALLEN DATE: 1/21
 CHECKED BY: G. F. WILSON DATE: 9/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE: 12/21

5/5/2022 11:43:25 AM RA\Structures\I-5987A (Y1A)\I-5987A.SMU.GDW, 7/0054.dgn



FOUNDATION LAYOUT

NOTES

- ALL PILES AT END BENT NO.1 AND END BENT NO.2 ARE HP 12 X 53.
- ALL PILES AT BENT NO.1 ARE HP 14 X 73.
- DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
- FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT NO.1 AND END BENT NO.2.
- INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT NO.1 AND END BENT NO.2. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE REINFORCED BRIDGE APPROACH FILL TO WITHIN 1 FT. OF THE FINAL GRADE ELEVATION. THEN INSTALL PILES THROUGH THE CORRUGATED STEEL PIPES AND FILL PILES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS. FOR PILE SLEEVES, SEE MSE RETAINING WALL PLNS AND PROVISION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOR REINFORCED BRIDGE APPROACH FILL, SEE APPROACH FILL FOR INTEGRAL ABUTMENT AT MSE WALLS (SPECIAL PROVISION).

DRAWN BY : W. B. ALLEN DATE : 11/21
 CHECKED BY : G. F. WILSON DATE : 11/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

PLANS PREPARED BY:

NV5 ENGINEERS & CONSULTANTS, INC.
 3300 REGENCY PARKWAY, SUITE 100
 CARY, NC 27518
 P: 919.851.1912 www.nv5.com
 NC License # F-1333



PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON -Y1- (SR 1735)
 OVER -L- (US-74)
 BETWEEN NC 214 AND SR 1730

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			31

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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 Exc Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
EB1 (1-8)	115	168.97	100			155	4						
B1 (1-12)	143	149.47	70			190	6						
EB2 (1-8)	115	168.97	85			155	4						

*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, Pile 1-8	YES	105	2		
Bent 1, Pile 1-12	YES	75			
End Bent 2, Pile 1-8	MAYBE	90			

*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, Pile 1-8	115			0.75			1.00
Bent 1, Pile 1-12	143			0.75			1.00
End Bent 2, Pile 1-8	115			0.75			1.00

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

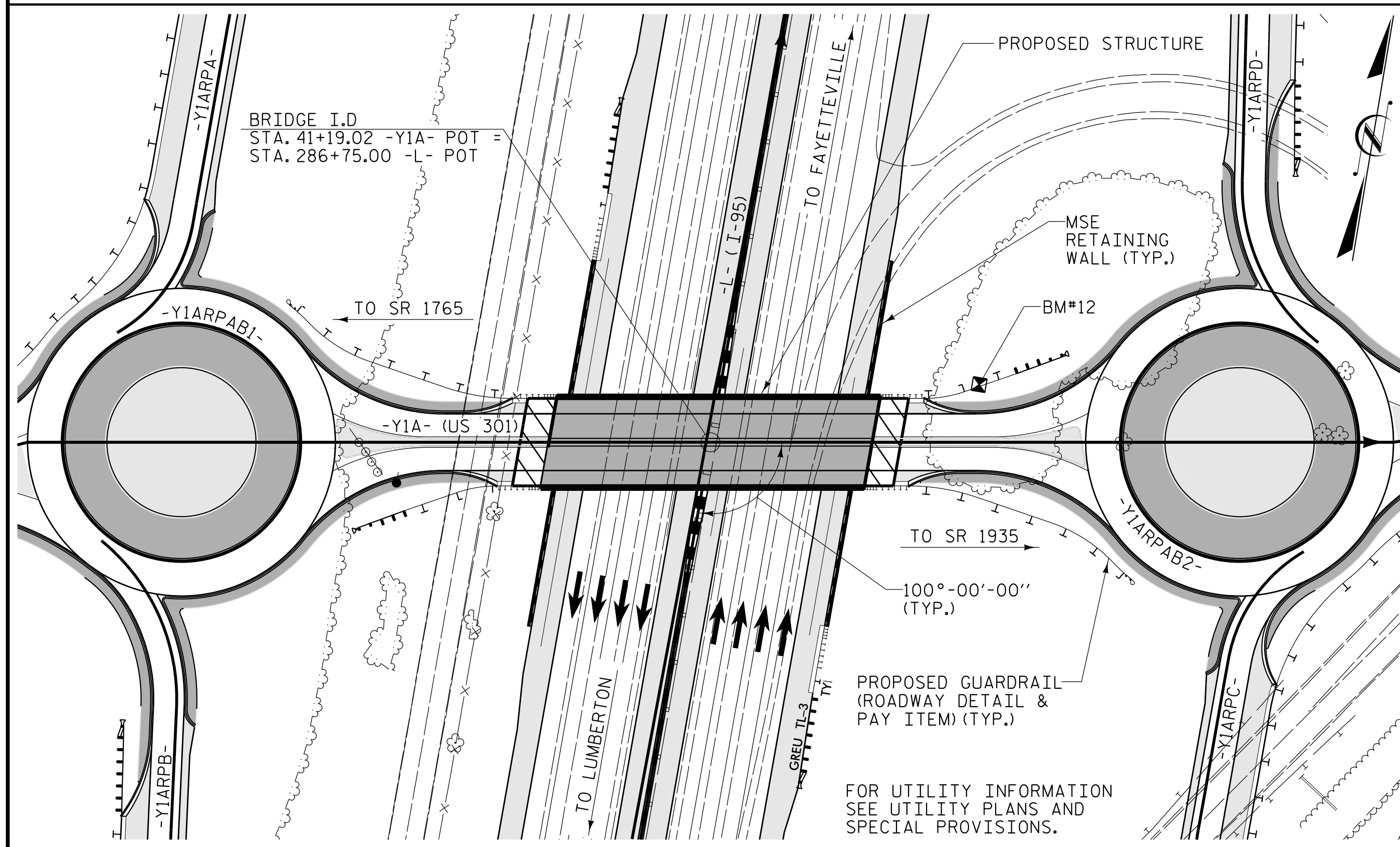
NOTES:

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Abner F. Riggs 014155) on 11-04-2021.
- 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.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A-; 286+75.00 -L-

 DocuSigned by: <i>L. Kevin Austin</i> 72E763722EAA6B8 SIGNATURE	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH <h2 style="text-align: center;">PILE FOUNDATION TABLES</h2>						SHEET NO. S2-3																	
	5/10/2022 DATE	REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>					NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
NO.	BY:	DATE:	NO.	BY:	DATE:																			
1			3																					
2			4																					

BM#12: BENCH NAIL SET IN BASE OF 18" PINE; 29.95' LT STA. 42+58.67 -Y1A- ELEV. 149.61



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.
SUPERSTRUCTURE					8250	6977		LUMP SUM		
END BENT 1							36.1		4600	
BENT 1			LUMP SUM				73.3		10148	2021
END BENT 2							36.1		4600	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	8250	6977	145.5	LUMP SUM	19348	2021

TOTAL BILL OF MATERIAL

	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES		HP 14 X 73 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	NO.	LIN. FT.			EACH	EACH	NO.	LIN. FT.				
SUPERSTRUCTURE	10	832.50								335.06		LUMP SUM
END BENT 1			8		8	800			4		13	
BENT 1				12		12	840		6			
END BENT 2			8		8	680			4		13	
TOTAL	10	832.50	16	12	16	1480	12	840	14	335.06	26	LUMP SUM

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 41+19.02 -Y1A-".

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 5 SPANS - 1 @ 72'-11", 1 @ 76'-0", 1 @ 36'-8", 1 @ 76'-0", 1 @ 72'-9"; 28'-0" CLEAR ROADWAY WIDTH AND REINFORCED CONCRETE FLOOR ON I-BEAMS AND LOCATED 560 FT FROM THE PROPOSED STRUCTURE 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.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

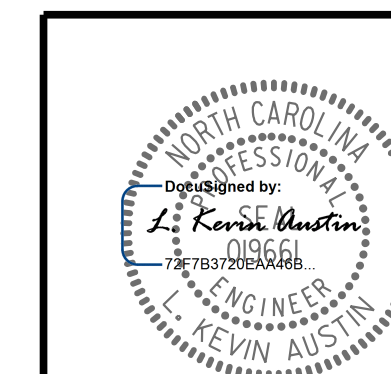
FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON -Y1A- (US 301)
 OVER -L- (INTERSTATE 95)
 BETWEEN SR 1765 AND SR 1935

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			31



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 UNLESS ALL SIGNATURES COMPLETED**

DRAWN BY : W. B. ALLEN DATE : 11/21
 CHECKED BY : G. F. WILSON DATE : 11/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

5/5/2022 11:48:53 AM RA:\Structures\I-5987A\Y1A\I-5987A_SMU.GD2_710054.dgn

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.20	--	1.75	0.824	1.59	A	I	40.92	1.022	1.20	A	I	7.62	0.80	0.824	1.23	A	I	40.92		
	HL-93 (OPERATING)	N/A		1.58	--	1.35	0.824	2.07	A	I	40.92	1.022	1.58	A	I	7.62	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.57	56.52	1.75	0.824	2.13	A	I	40.92	1.022	1.57	A	I	7.62	0.80	0.824	1.65	A	I	40.92		
	HS-20 (OPERATING)	36.000		2.06	74.16	1.35	0.824	2.76	A	I	40.92	1.022	2.06	A	I	7.62	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.80	51.30	1.40	0.824	6.15	A	I	40.92	1.022	4.92	A	I	7.62	0.80	0.824	3.80	A	I	40.92	
		SNGARBS2	20.000		2.80	56.00	1.40	0.824	4.52	A	I	40.92	1.022	3.45	A	I	7.62	0.80	0.824	2.80	A	I	40.92	
		SNAGRIS2	22.000		2.64	58.08	1.40	0.824	4.26	A	I	40.92	1.022	3.18	A	I	7.62	0.80	0.824	2.64	A	I	40.92	
		SNCOTTS3	27.250		1.89	51.50	1.40	0.824	3.06	A	I	40.92	1.022	2.40	A	I	7.62	0.80	0.824	1.89	A	I	40.92	
		SNAGGRS4	34.925		1.57	54.83	1.40	0.824	2.53	A	I	40.92	1.022	1.96	A	I	7.62	0.80	0.824	1.57	A	I	40.92	
		SNS5A	35.550		1.53	54.39	1.40	0.824	2.48	A	I	40.92	1.022	1.98	A	I	7.62	0.80	0.824	1.53	A	I	40.92	
		SNS6A	39.950		1.40	55.93	1.40	0.824	2.27	A	I	40.92	1.022	1.78	A	I	7.62	0.80	0.824	1.40	A	I	40.92	
	SNS7B	42.000		1.33	55.86	1.40	0.824	2.16	A	I	40.92	1.022	1.75	A	I	7.62	0.80	0.824	1.33	A	I	40.92		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.71	56.43	1.40	0.824	2.76	A	I	40.92	1.022	2.16	A	I	7.62	0.80	0.824	1.71	A	I	40.92	
		TNT4A	33.075		1.71	56.56	1.40	0.824	2.77	A	I	40.92	1.022	2.11	A	I	7.62	0.80	0.824	1.71	A	I	40.92	
		TNT6A	41.600		1.40	58.24	1.40	0.824	2.26	A	I	40.92	1.022	1.86	A	I	7.62	0.80	0.824	1.40	A	I	40.92	
		TNT7A	42.000		1.40	58.80	1.40	0.824	2.26	A	I	40.92	1.022	1.81	A	I	7.62	0.80	0.824	1.40	A	I	40.92	
		TNT7B	42.000		1.44	60.48	1.40	0.824	2.33	A	I	40.92	1.022	1.70	A	I	7.62	0.80	0.824	1.44	A	I	40.92	
		TNAGRIT4	43.000		1.38	59.34	1.40	0.824	2.22	A	I	40.92	1.022	1.66	A	I	7.62	0.80	0.824	1.38	A	I	40.92	
TNAGT5A		45.000		1.30	58.50	1.40	0.824	2.10	A	I	40.92	1.022	1.64	A	I	7.62	0.80	0.824	1.30	A	I	40.92		
TNAGT5B	45.000	③	1.29	58.05	1.40	0.824	2.08	A	I	40.92	1.022	1.58	A	I	7.62	0.80	0.824	1.29	A	I	40.92			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

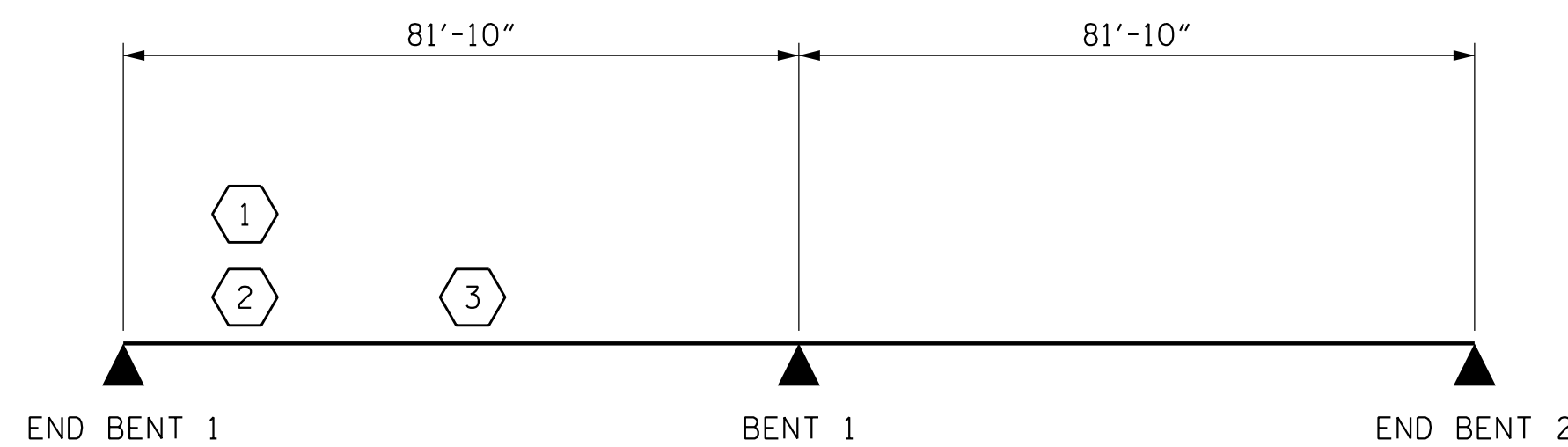
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			31

NVI5

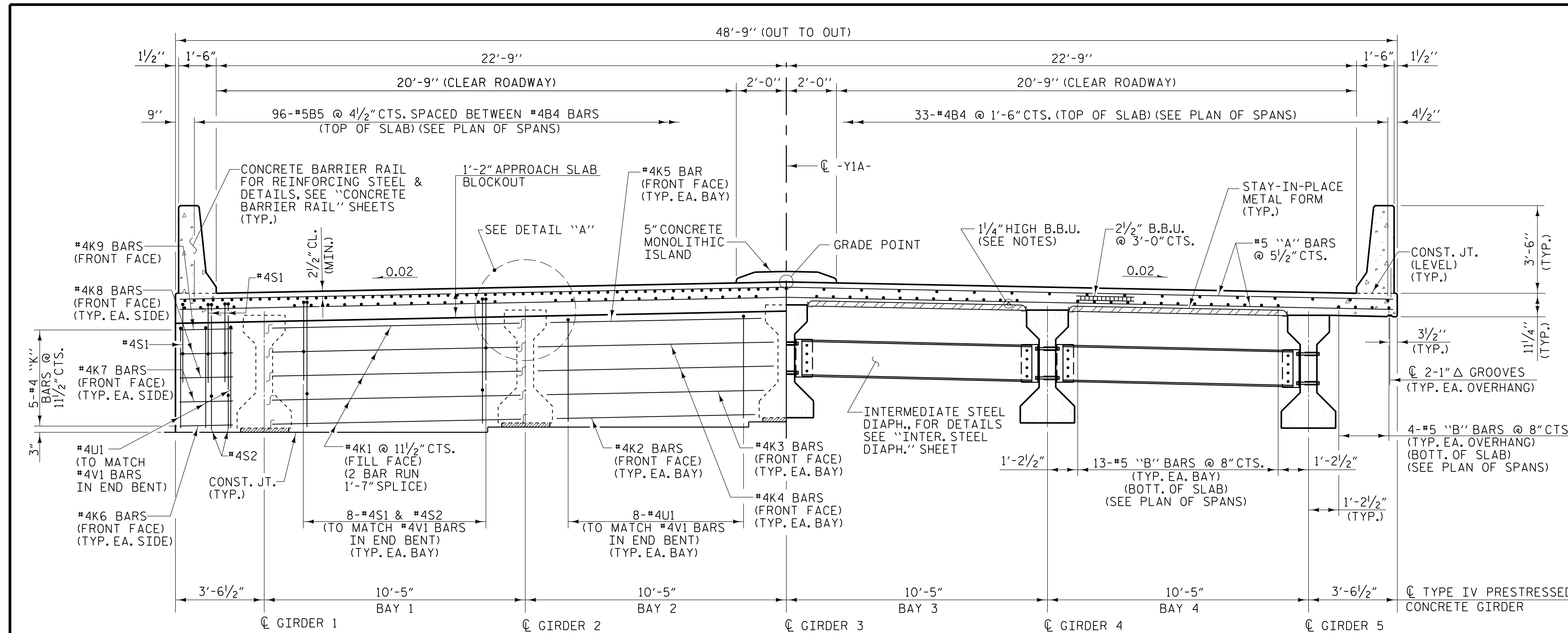
NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518
P: 919.851.1912 www.NV5.com
NC License # F-1333

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

5/10/2022

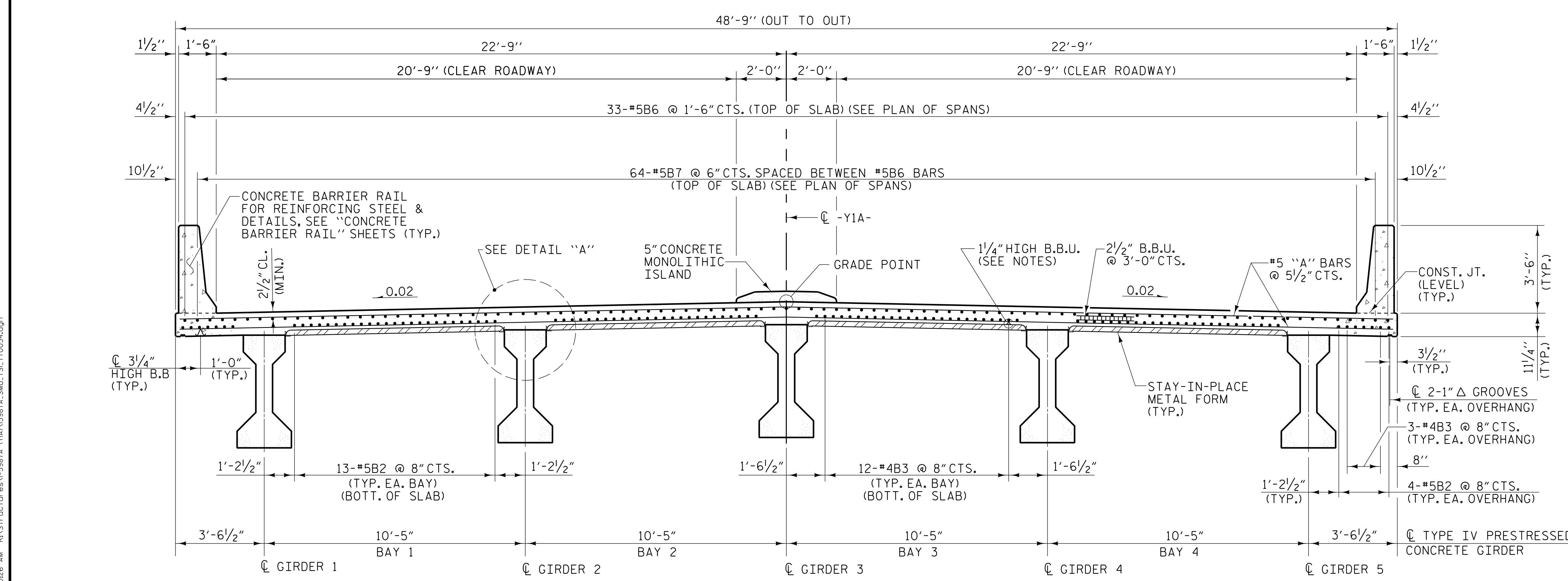
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ASSEMBLED BY : J. A. PANDOLI	DATE : 3/21
CHECKED BY : G. F. WILSON	DATE : 9/21
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



HALF TYPICAL SECTION
(SHOWING INTEGRAL END BENT DIAPHRAGM)

HALF TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGM)



TYPICAL SECTION
(SHOWING LINK SLAB)

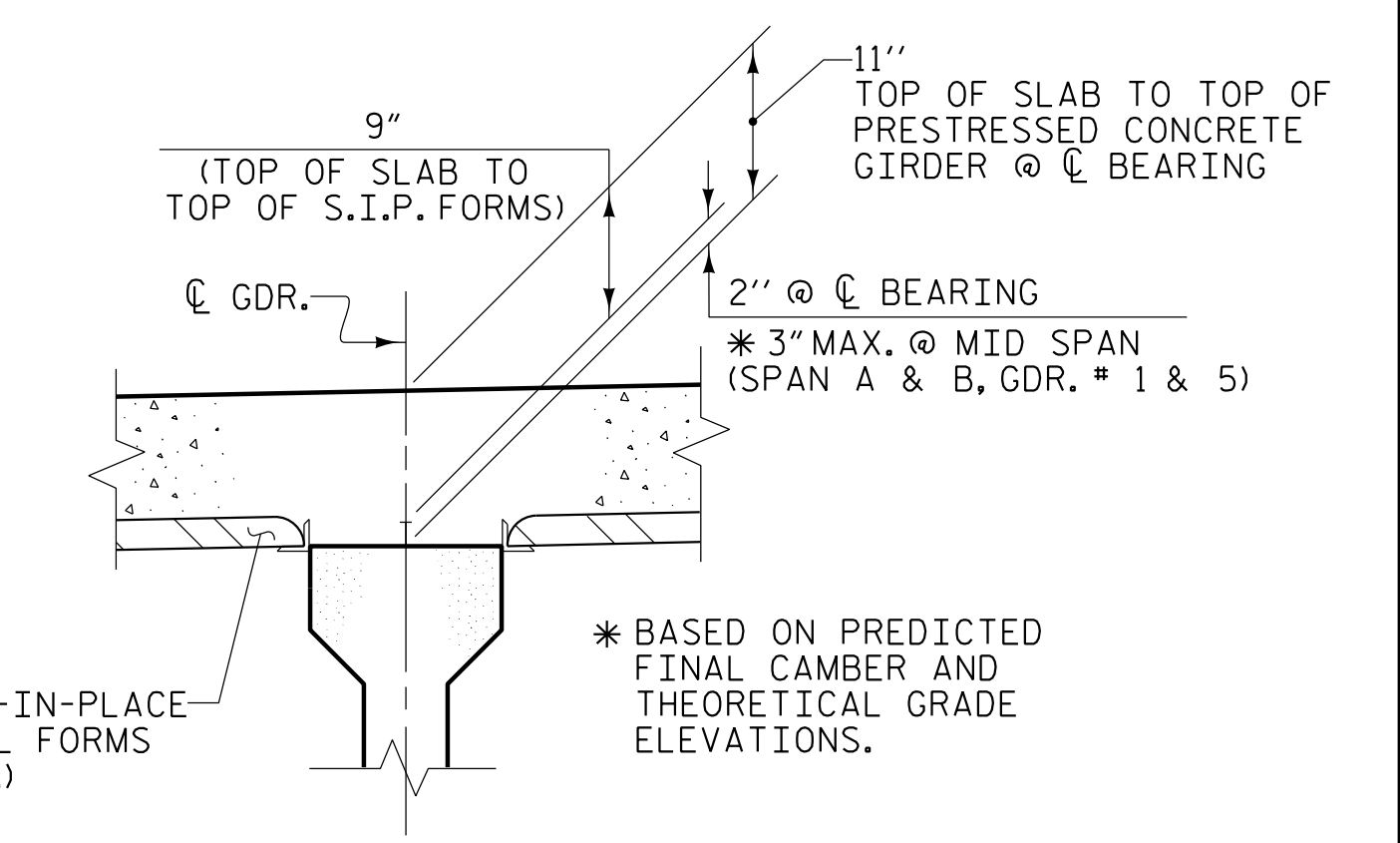
NOTES

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER (BBU) AT 4'-0" CENTERS ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE REGION OF THE LINK SLAB.



PROJECT NO. **I-5987A**
ROBESON COUNTY
 STATION: **41+19.02 -Y1A- POT**

SHEET 1 OF 2

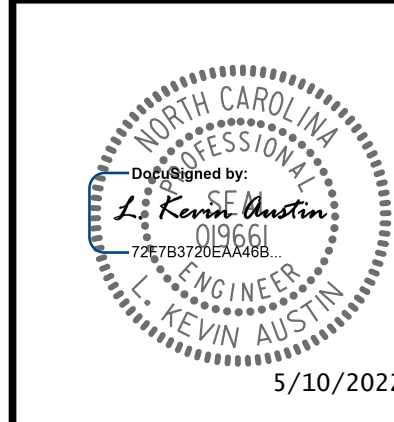
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

PLANS PREPARED BY:

NV5

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 3300 REGENCY PARKWAY, SUITE 100
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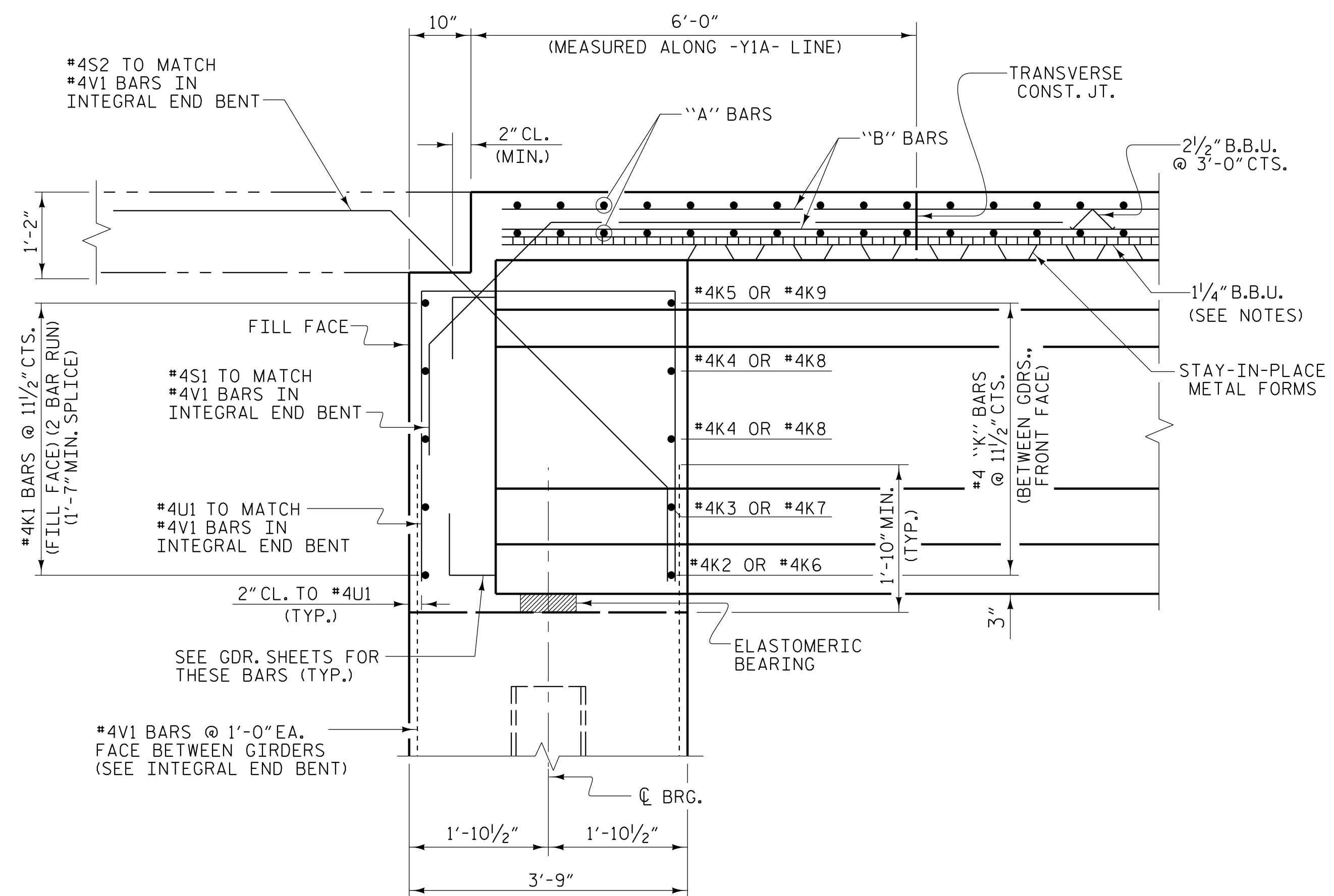


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			31

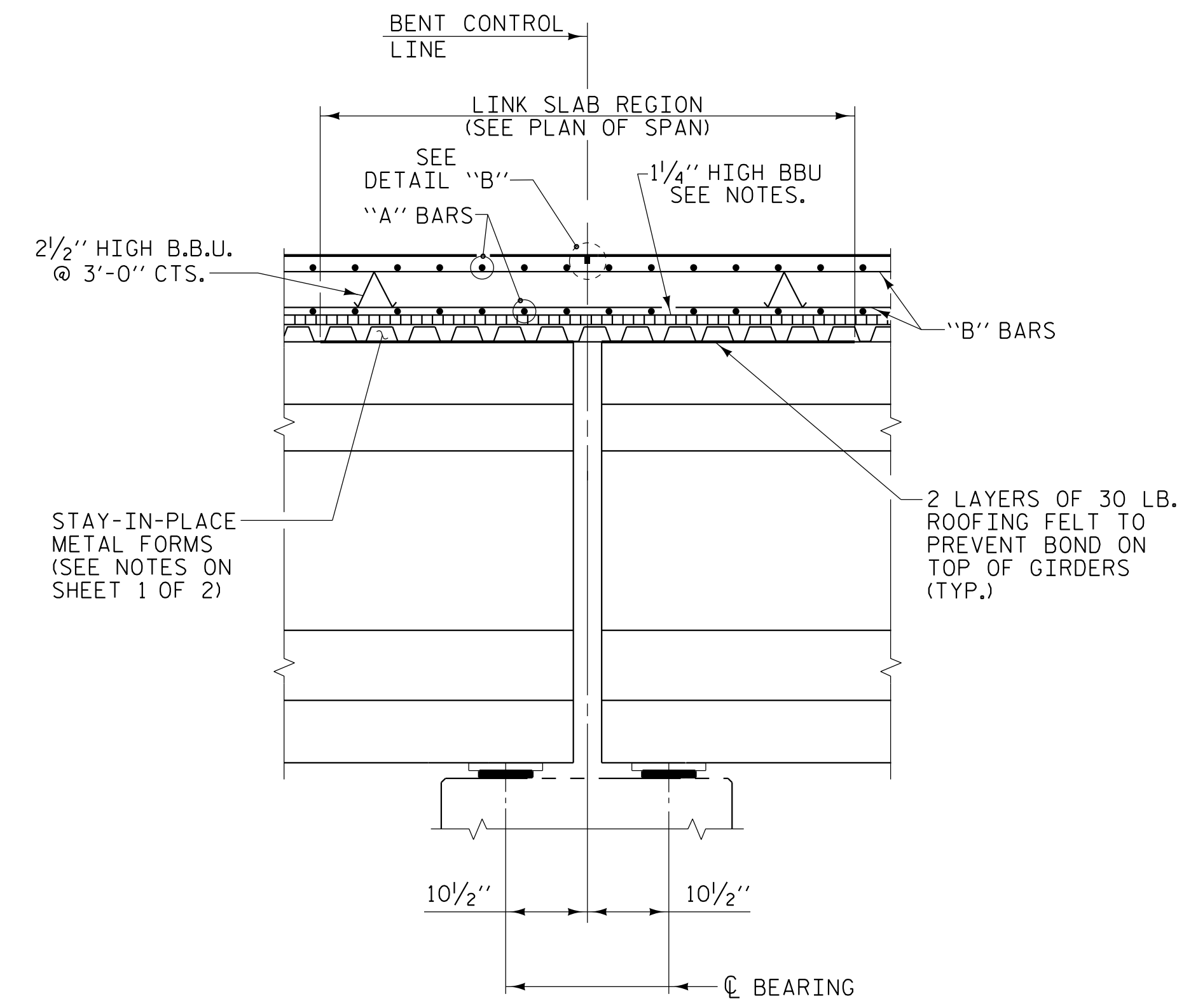
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DRAWN BY: **W. B. ALLEN** DATE: **4/21**
 CHECKED BY: **G. F. WILSON** DATE: **9/21**
 DESIGN ENGINEER OF RECORD: **L. K. AUSTIN** DATE: **12/21**

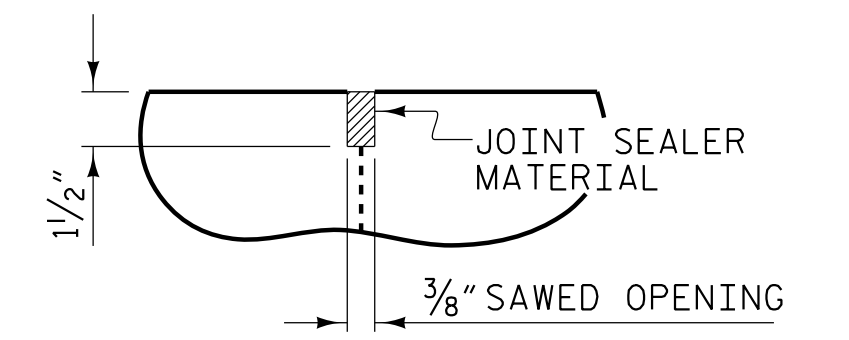
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SECTION THRU INTEGRAL END BENTS

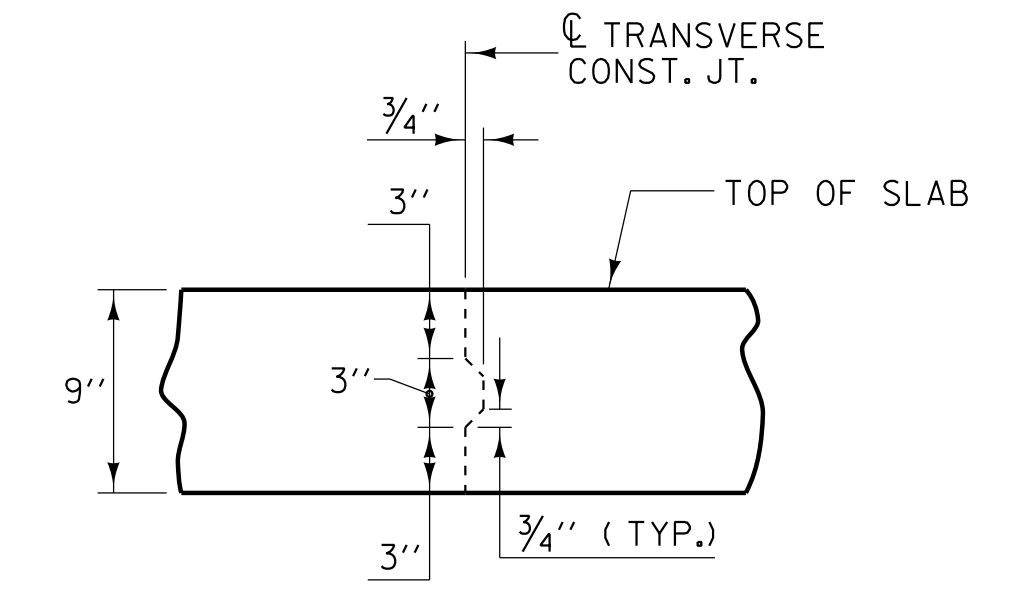


SECTION AT BENT



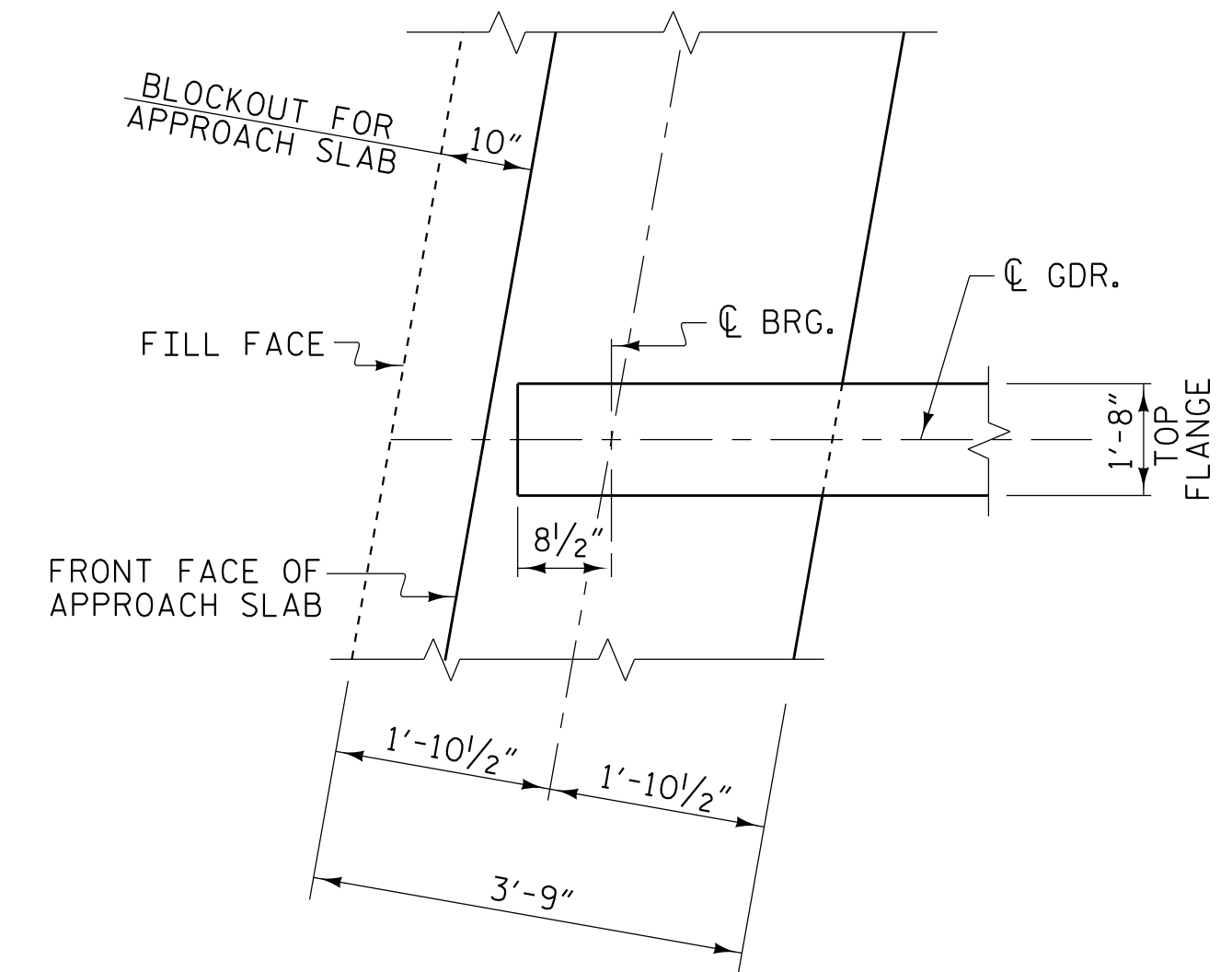
DETAIL "B"

A 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE LINK SLAB 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.

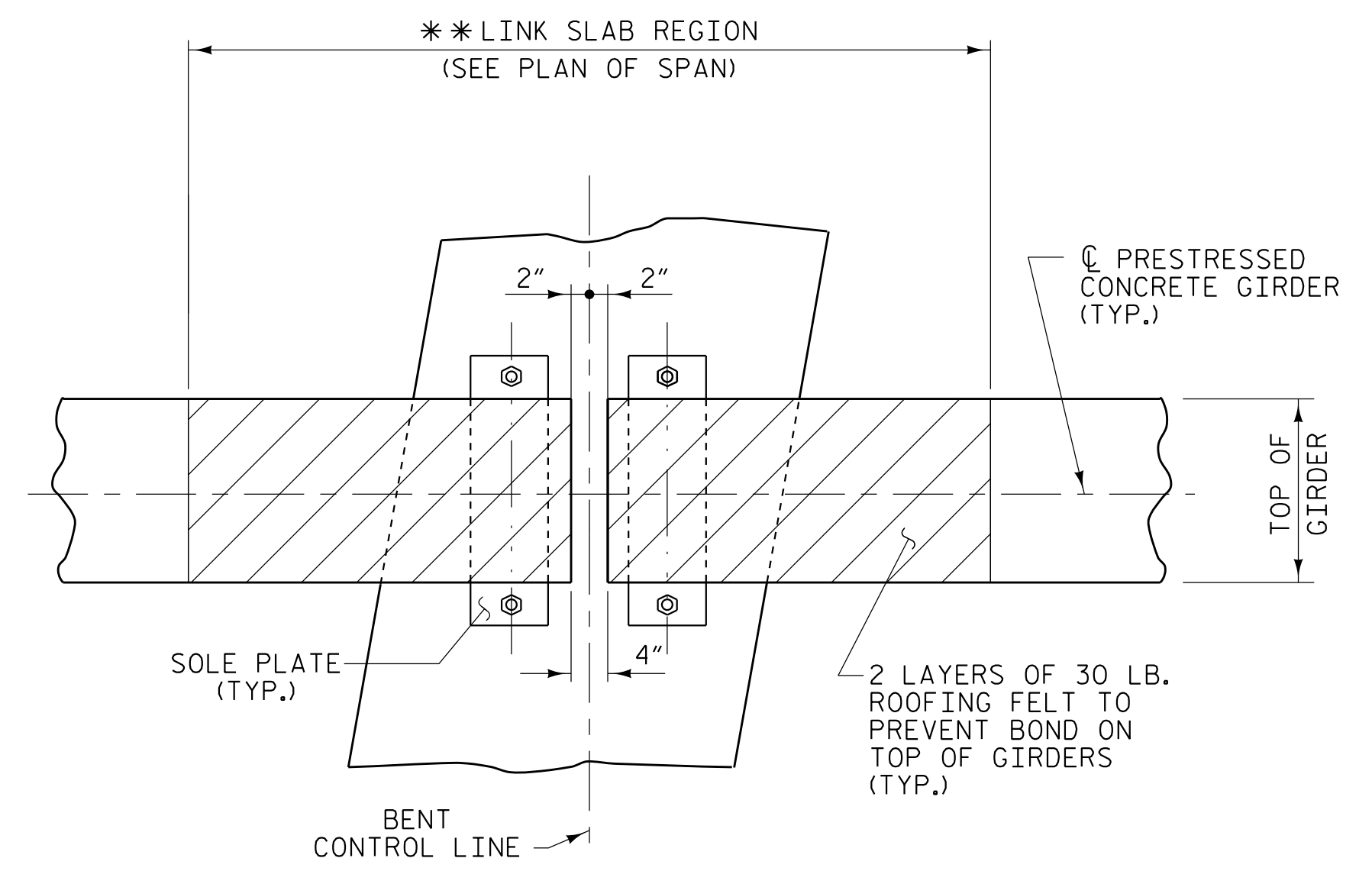


TRANSVERSE CONSTRUCTION JOINT DETAIL

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



PLAN OF GIRDER AT END BENT
END BENT 1 SHOWN, END BENT 2 SIMILAR



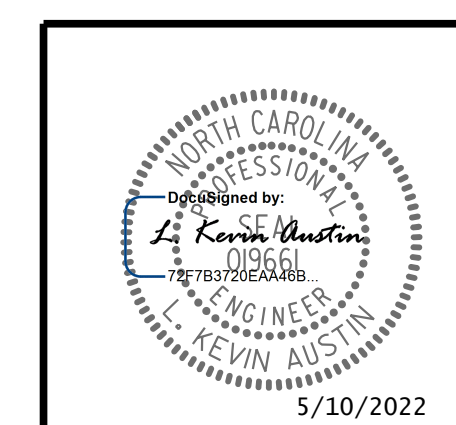
PLAN OF GIRDERS AT BENT

** THE TOP OF THE 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.

PLANS PREPARED BY:

NV5

NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
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PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

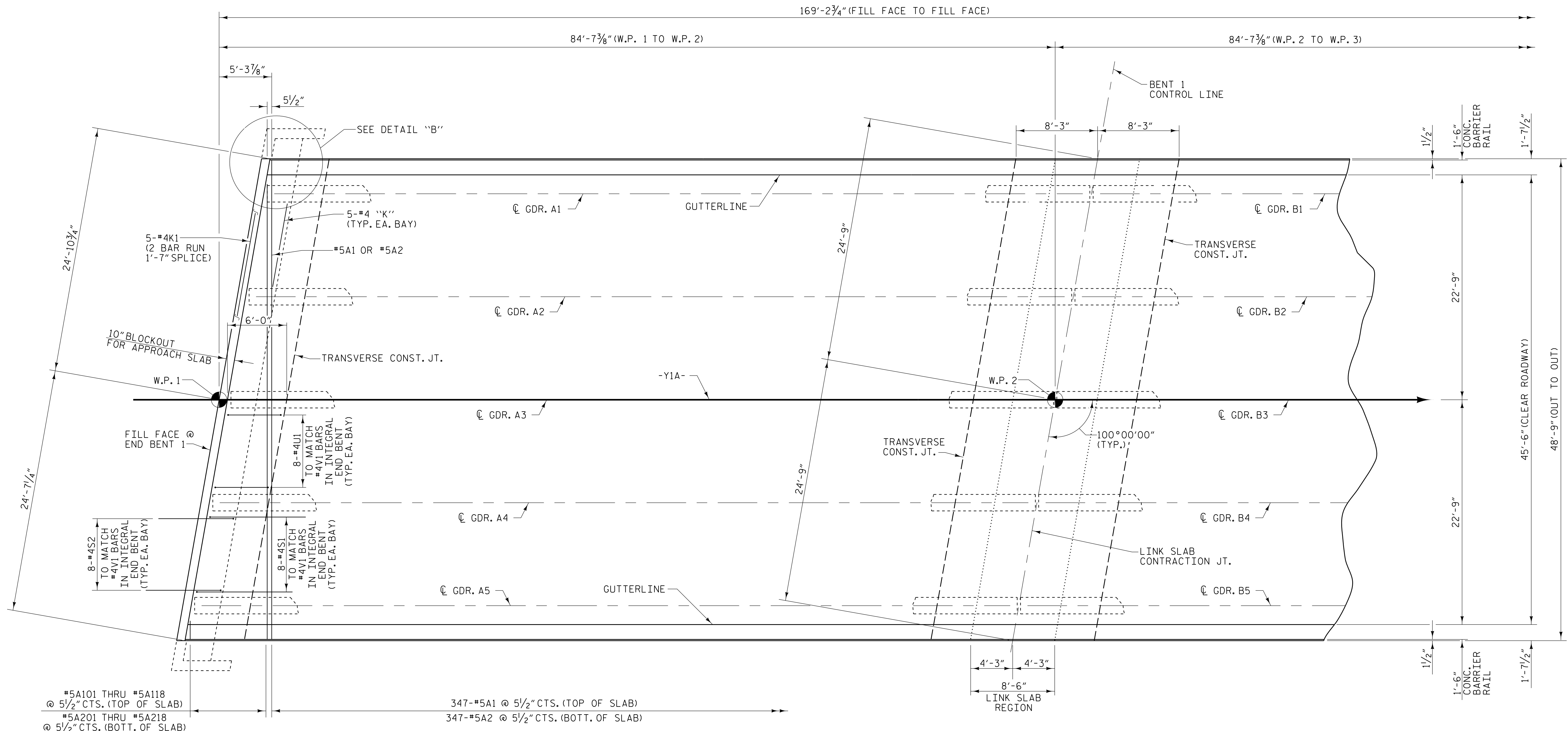
**SUPERSTRUCTURE
TYPICAL SECTION
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : W. B. ALLEN DATE : 3/21
CHECKED BY : G. F. WILSON DATE : 9/21
DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

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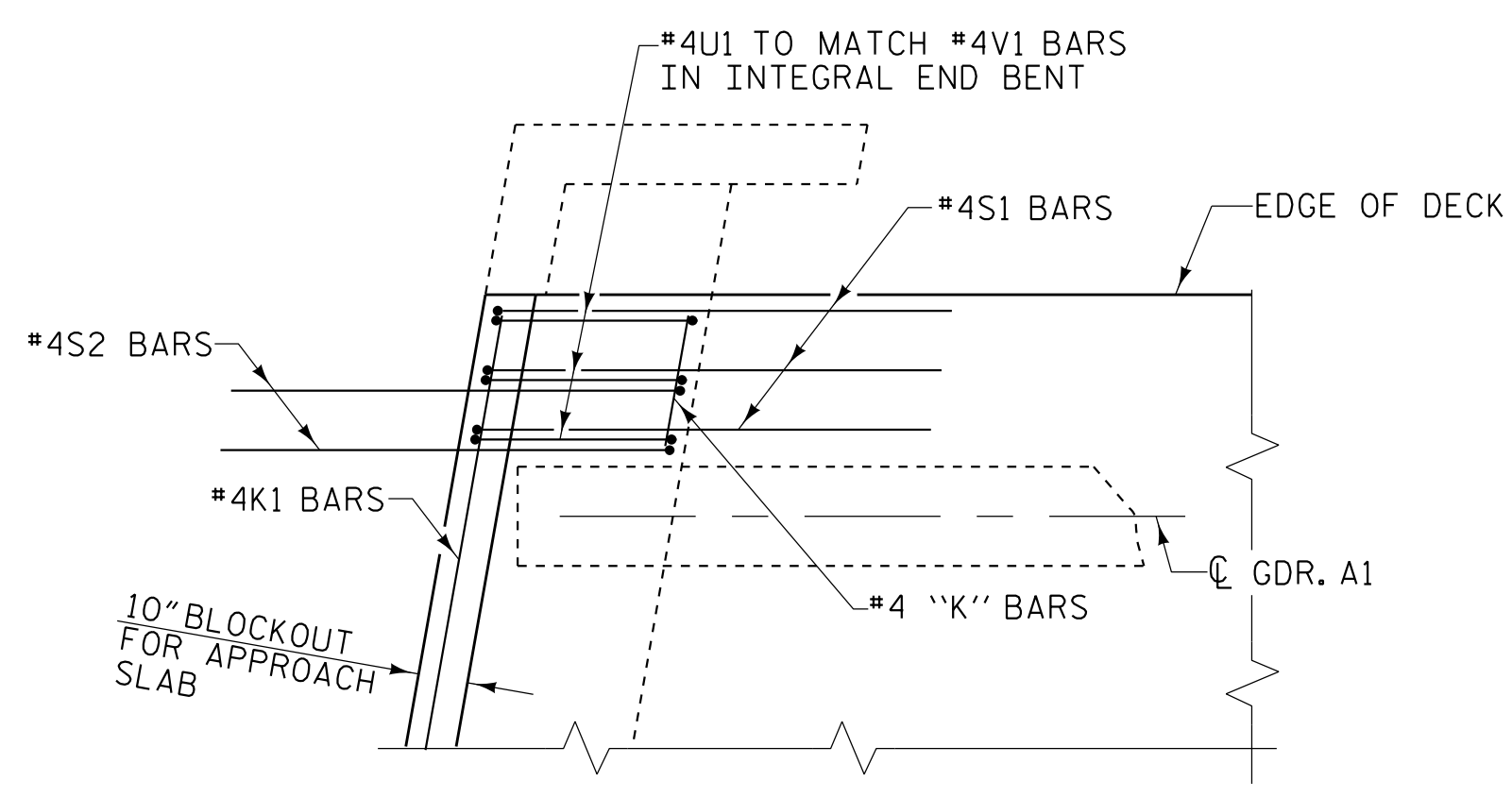


PLAN - SPAN A

MONOLITHIC ISLAND NOT SHOWN FOR CLARITY

NOTES

- FOR "B" BARS SEE "PLAN OF SPANS, "B" BAR LAYOUT" SHEET.
- FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 2 OF 2.
- FOR POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL". SHEET.



DETAIL "B"
(ALL CORNERS SIMILAR)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

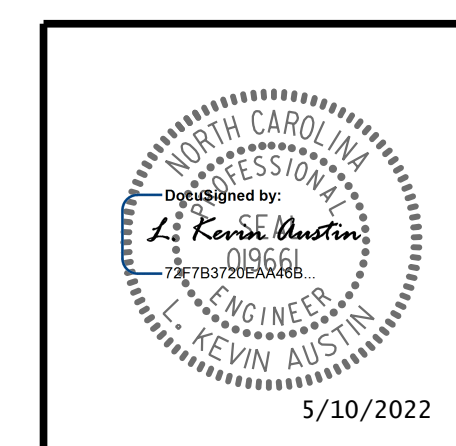
**SUPERSTRUCTURE
 PLAN OF SPAN A**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

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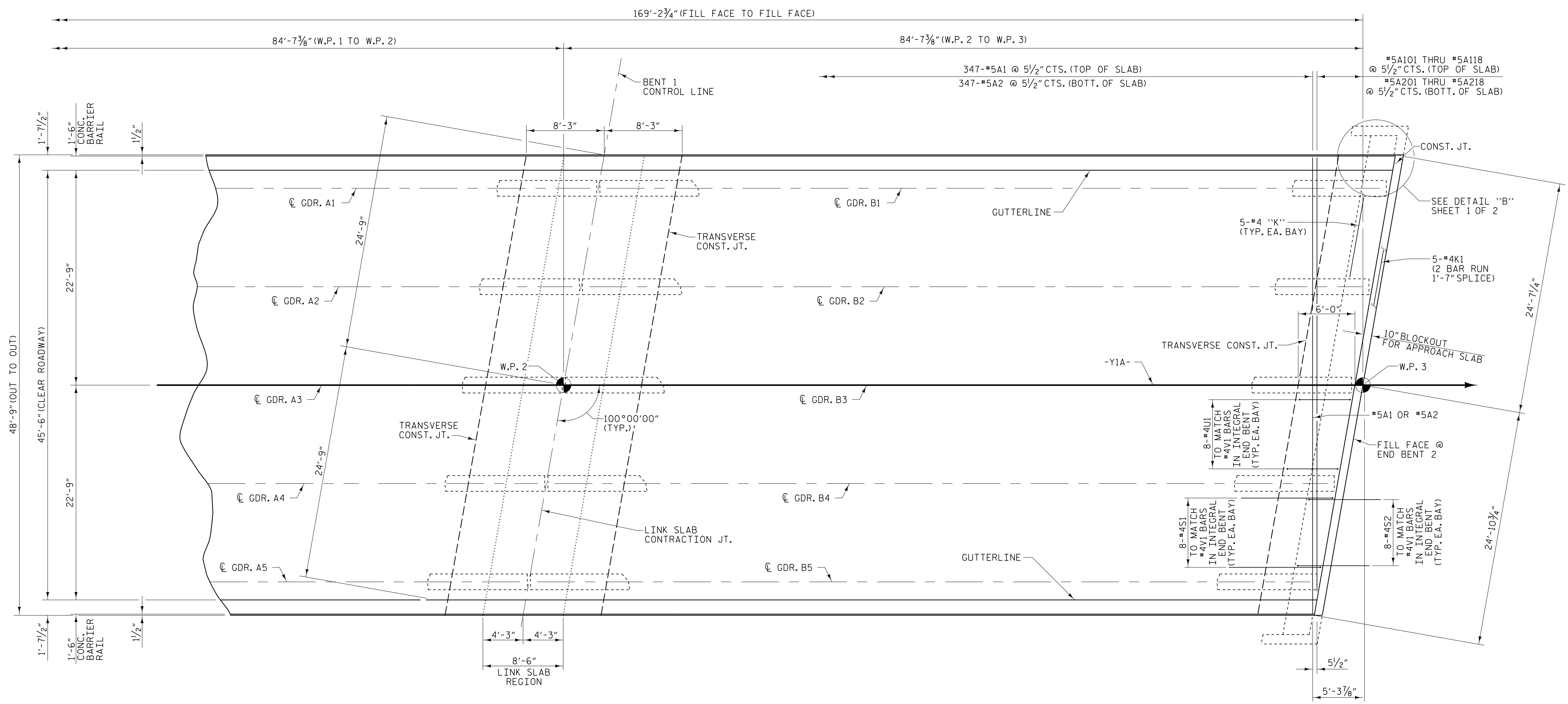
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 3300 REGENCY PARKWAY, SUITE 100
 CARY, NC 27518
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DRAWN BY : W. B. ALLEN DATE : 3/21
 CHECKED BY : G. F. WILSON DATE : 9/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21



PLAN - SPAN B

MONOLITHIC ISLAND NOT SHOWN FOR CLARITY

NOTES

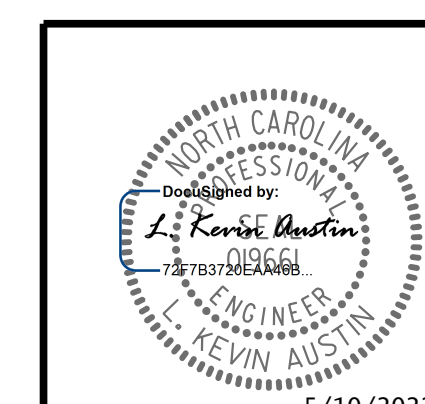
- FOR "B" BARS SEE "PLAN OF SPANS, "B" BAR LAYOUT" SHEET.
- FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 2 OF 2.
- FOR POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL", SHEET.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN B

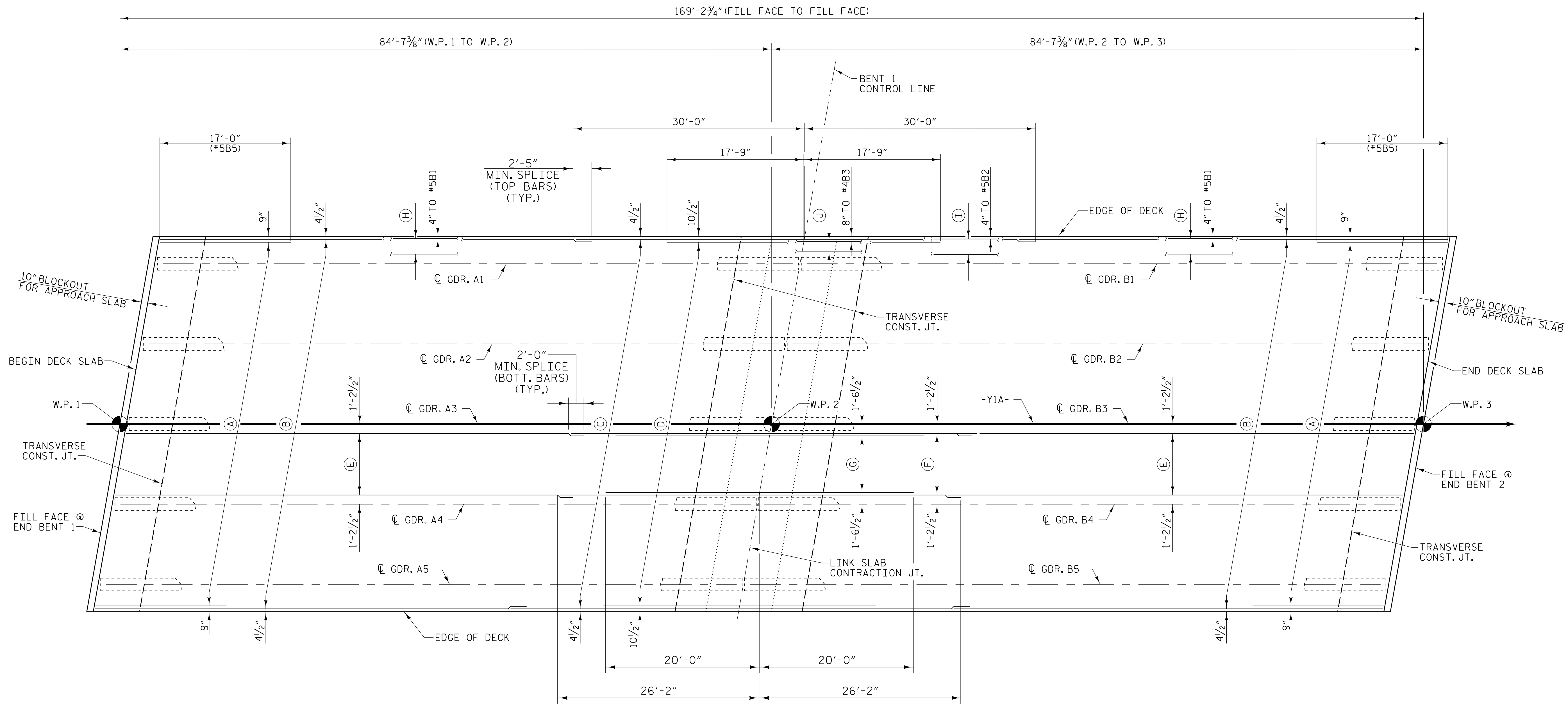
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-9
1			3			TOTAL SHEETS
2			4			31



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SPAN A

SPAN B

PLAN - "B" BAR LAYOUT

(BARRIER RAIL AND MONOLITHIC CONCRETE ISLAND NOT SHOWN FOR CLARITY)

- (A) 96-#5B5 @ 4 1/2" CTS. SPACED BETWEEN #4B4 BARS (TOP OF SLAB)
- (B) 33-#4B4 @ 1'-6" CTS. (TOP OF SLAB)
- (C) 33-#5B6 @ 1'-6" CTS. (TOP OF SLAB)
- (D) 64-#5B7 @ 6" CTS. SPACED BETWEEN #5B6 BARS (TOP OF SLAB)
- (E) 13-#5B1 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- (F) 13-#5B2 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- (G) 12-#4B3 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- (H) 4-#5B1 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. OVERHANG)
- (I) 4-#5B2 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. OVERHANG)
- (J) 3-#4B3 @ 8" CTS. (BOTTOM OF SLAB) (TYP. EA. OVERHANG)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPANS
 "B" BAR LAYOUT

PLANS PREPARED BY:

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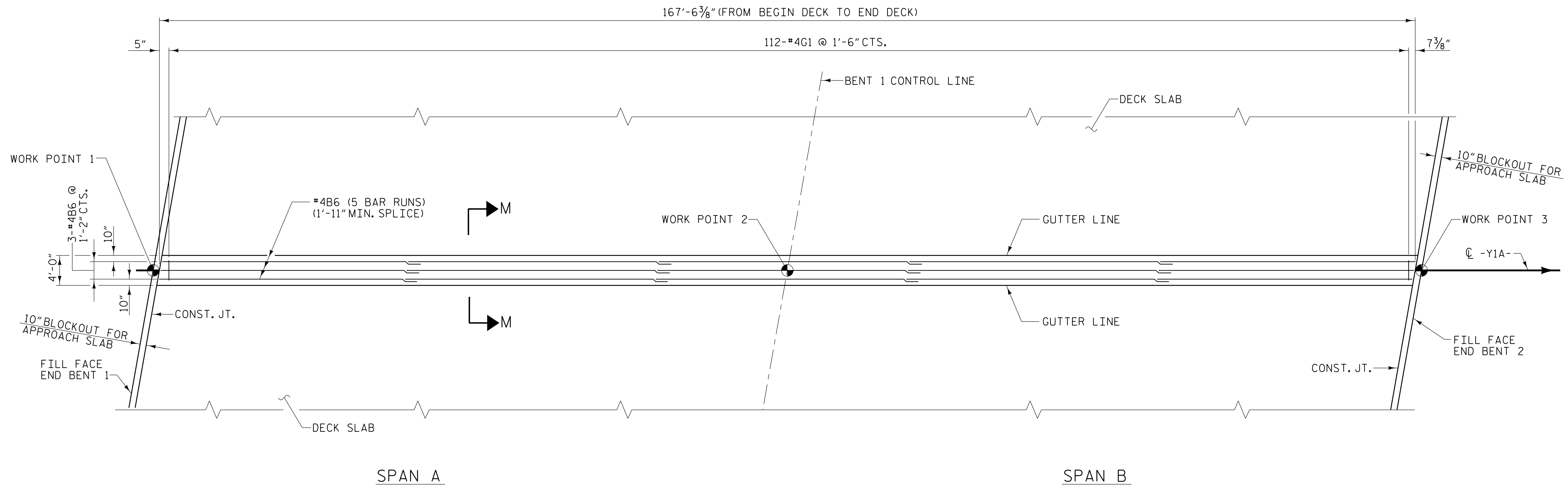


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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			31
2			4			

DRAWN BY : <u>W. B. ALLEN</u>	DATE : <u>6/21</u>
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PLAN OF MONOLITHIC CONCRETE ISLAND

NOTES

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

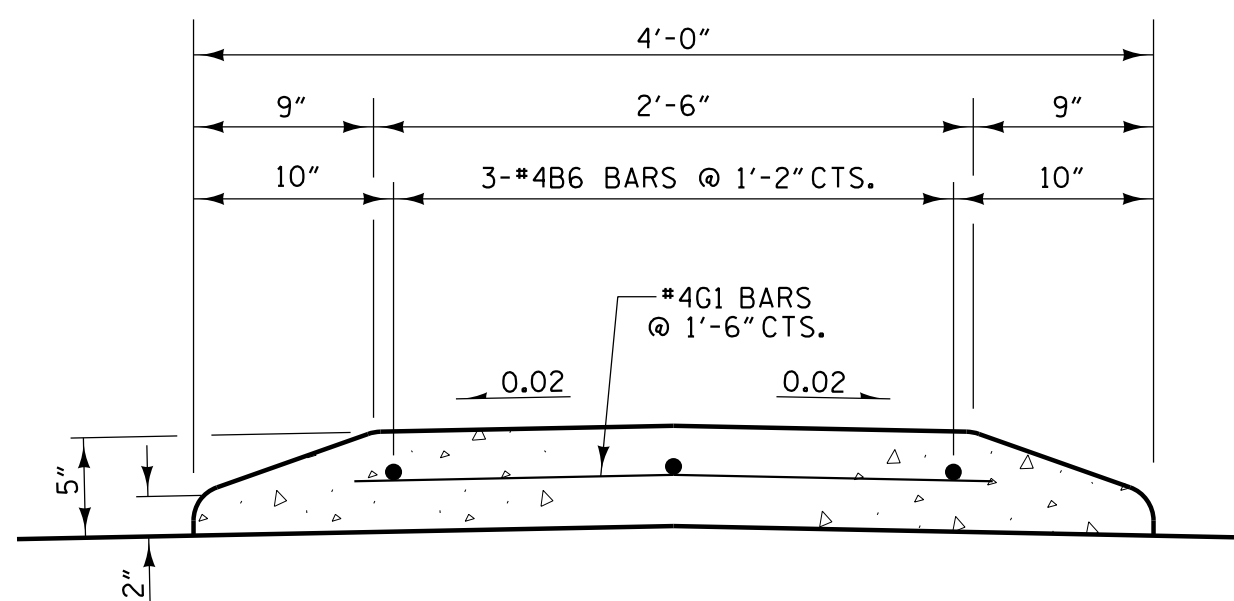
PAYMENT FOR THE MONOLITHIC CONCRETE ISLAND SHALL BE INCLUDED IN UNIT PRICE FOR "REINFORCED CONCRETE DECK SLAB"

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

THE MONOLITHIC CONCRETE ISLAND ON THE APPROACH SLAB IS INCLUDED IN THE APPROACH SLAB BILL OF MATERIAL AND PAID FOR AS PART OF THE APPROACH SLAB PAY ITEM.

FOR DETAIL AT JOINT BETWEEN APPROACH SLAB AND DECK, SEE APPROACH SLAB SHEET.

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



BILL OF MATERIAL					
MONOLITHIC CONCRETE ISLAND					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B6	15	#4	STR	35'-0"	351
* G1	112	#4	STR	2'-8"	199
* EPOXY COATED REINF. STEEL					550 LBS.
CLASS AA CONCRETE					8.9 CU. YDS.

* INDICATES EPOXY COATED REINF. STEEL

SECTION THRU MONOLITHIC CONCRETE ISLAND

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

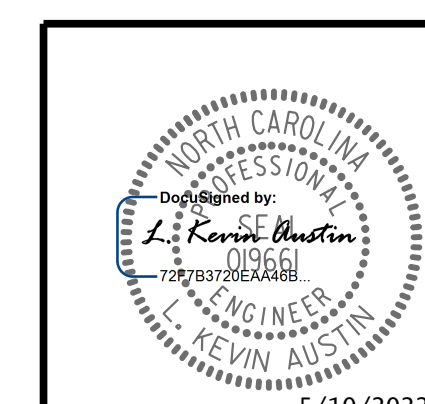
SUPERSTRUCTURE
 MONOLITHIC
 CONCRETE ISLAND
 PLAN AND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

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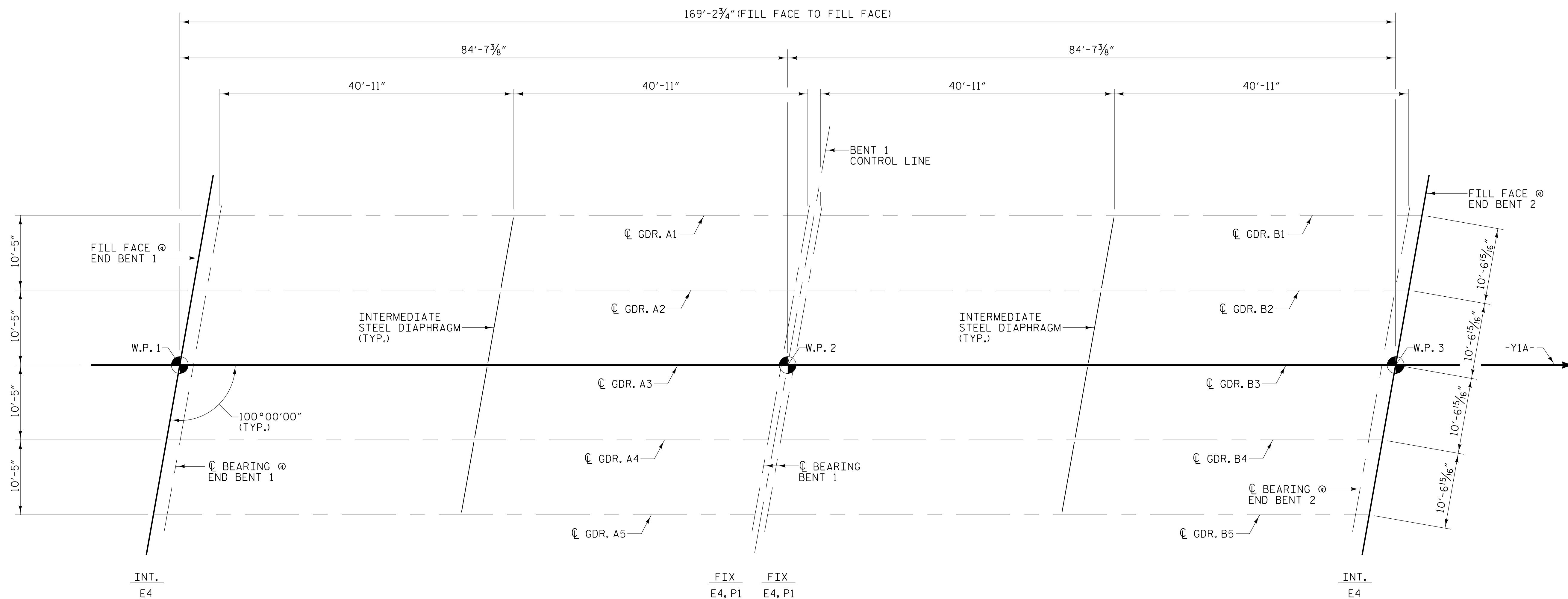
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5/10/2022

NOTES

FOR DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.



FRAMING PLAN

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

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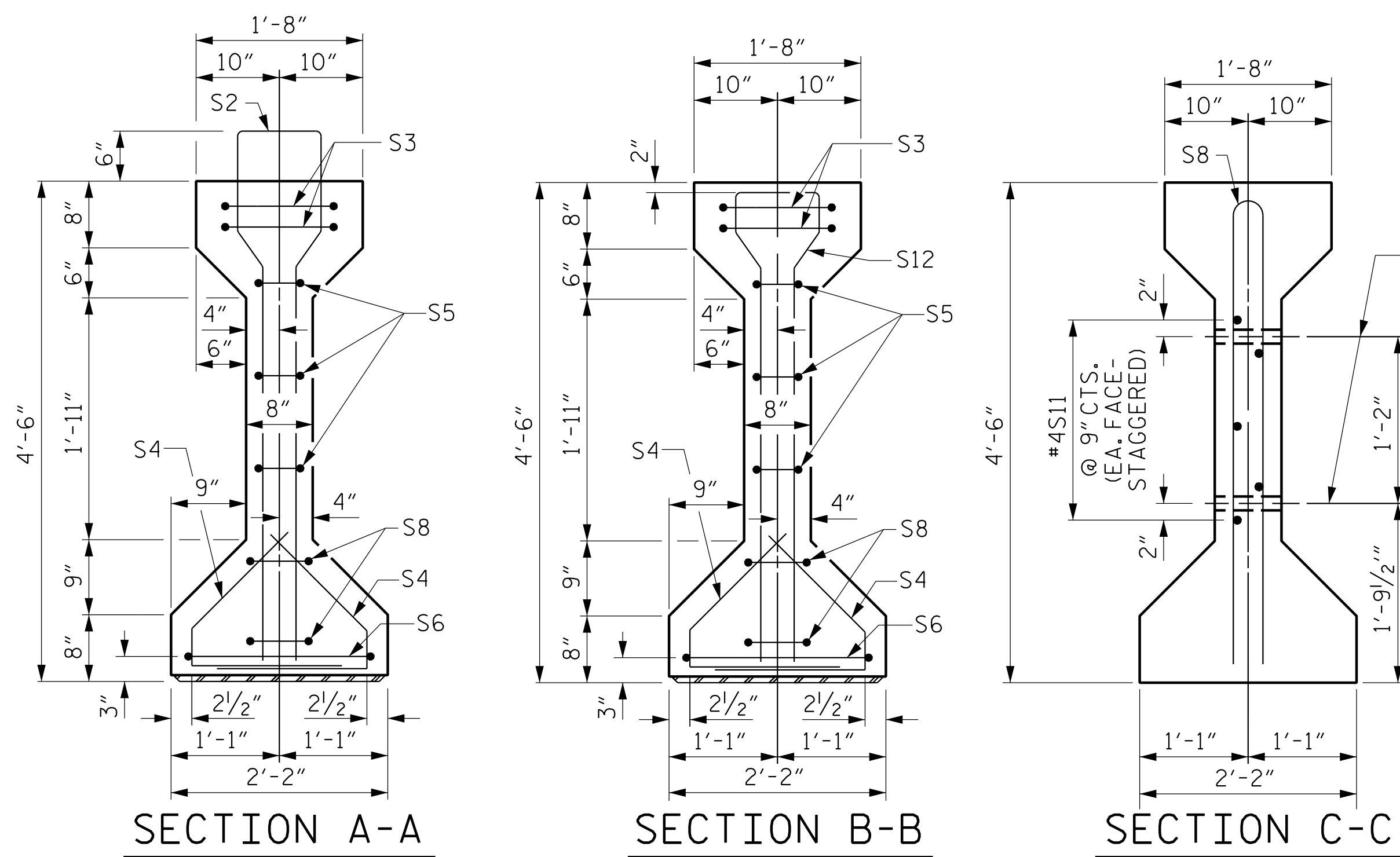
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Professional Engineer Seal for Kevin Austin, License # 72783, State of North Carolina, dated 5/10/2022.

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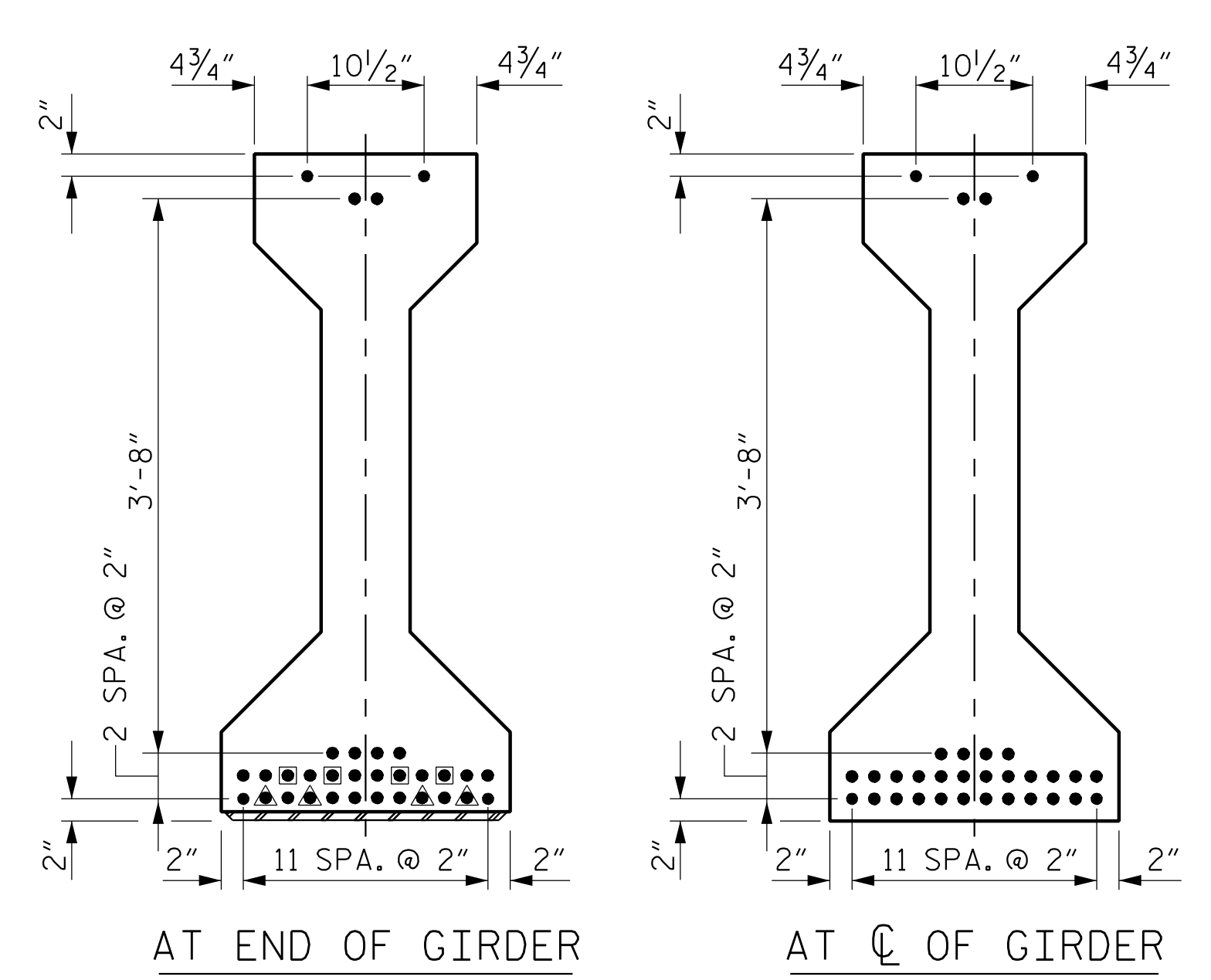
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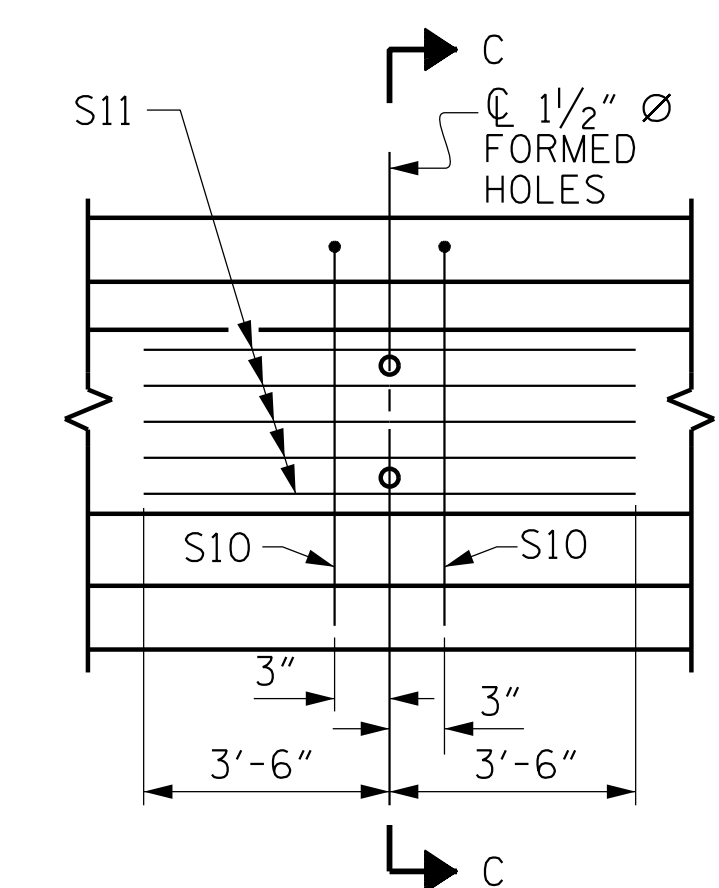
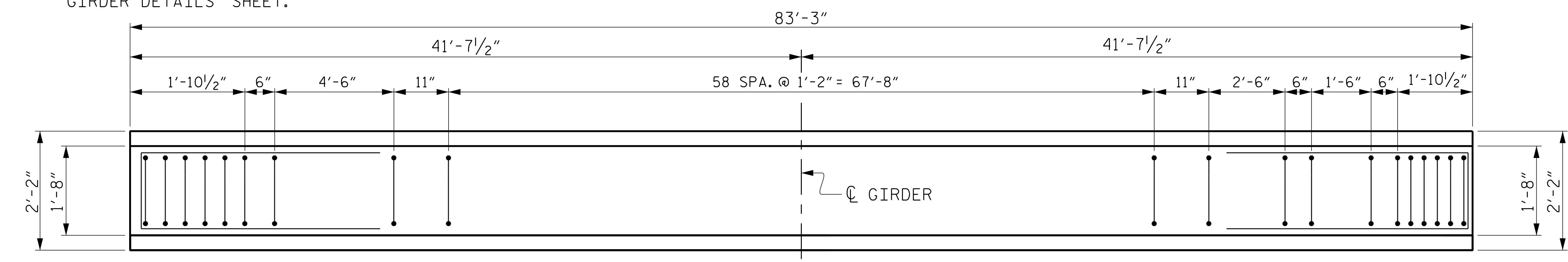


FOR S7 BARS SEE DETAIL "A" ON "PRESTRESSED CONCRETE GIRDER DETAILS" SHEET.

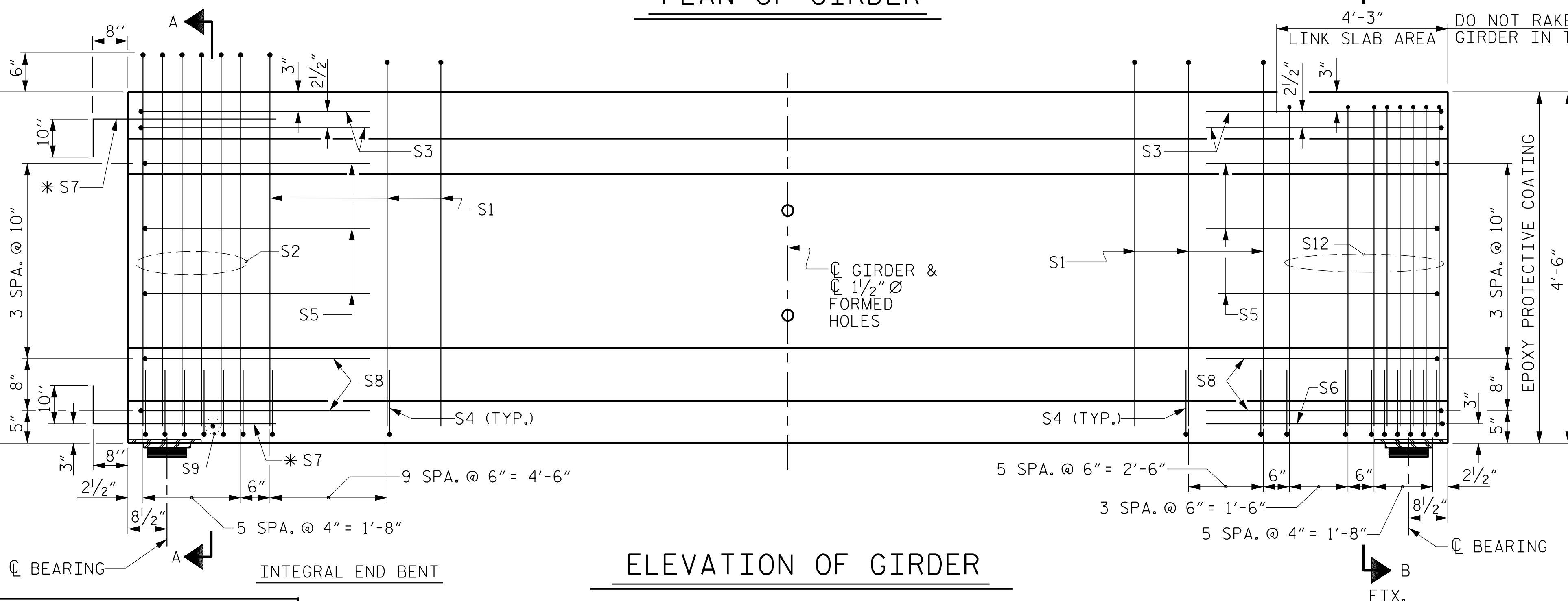
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - △ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



0.6" Ø LOW RELAXATION STRAND LAYOUT



GIRDERS REQUIRED



ASSEMBLED BY : W. B. ALLEN DATE : 11/21
 CHECKED BY : G. F. WILSON DATE : 11/21
 DRAWN BY : BNB 09/21
 CHECKED BY : AAI 09/21

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THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

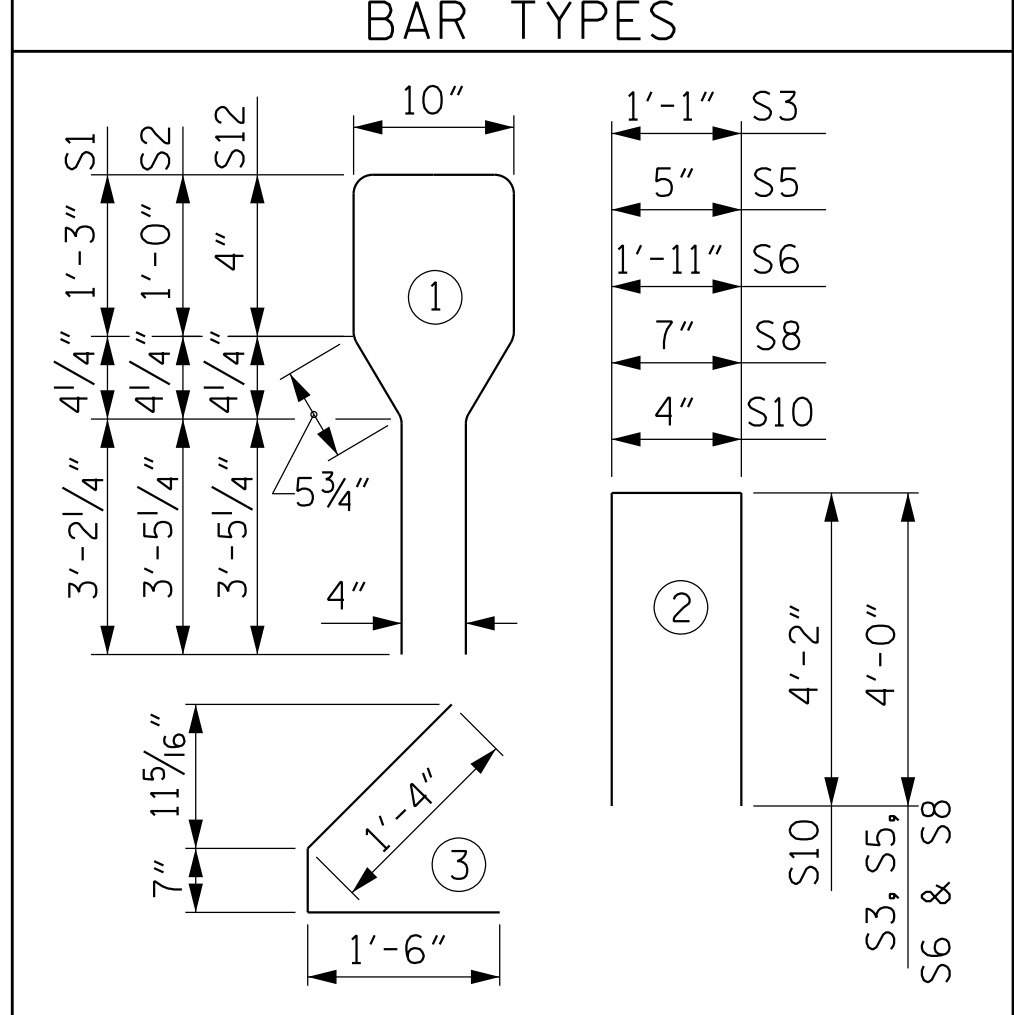


0.6" Ø L.R. GRADE 270 STRANDS

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	75	#4	1	10'-8"	534
S2	6	#6	1	10'-8"	96
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	13
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	10	#6	STR	9'-4"	140



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDRS. 1-5	1104	16.9	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	83'-3"	832'-6"

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

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE IV
 PRESTRESSED CONCRETE
 GIRDER - LINK SLAB
 (SPANS A AND B)

REVISIONS

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

SHEET NO. S2-13
 TOTAL SHEETS 31

STD. NO. PCG6 (SHT. 1)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

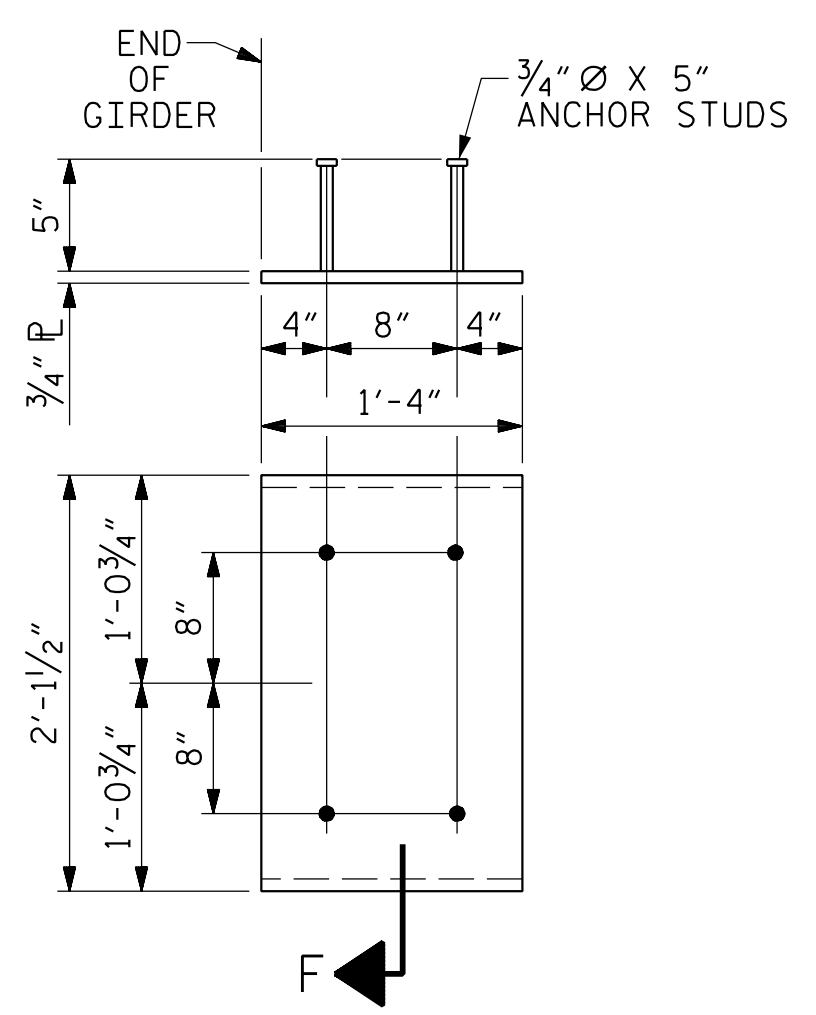
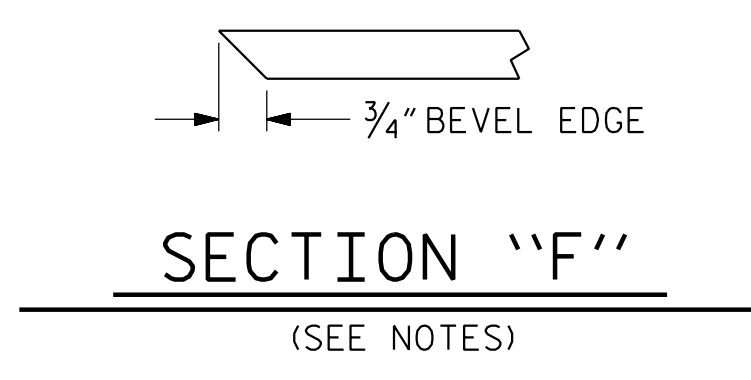
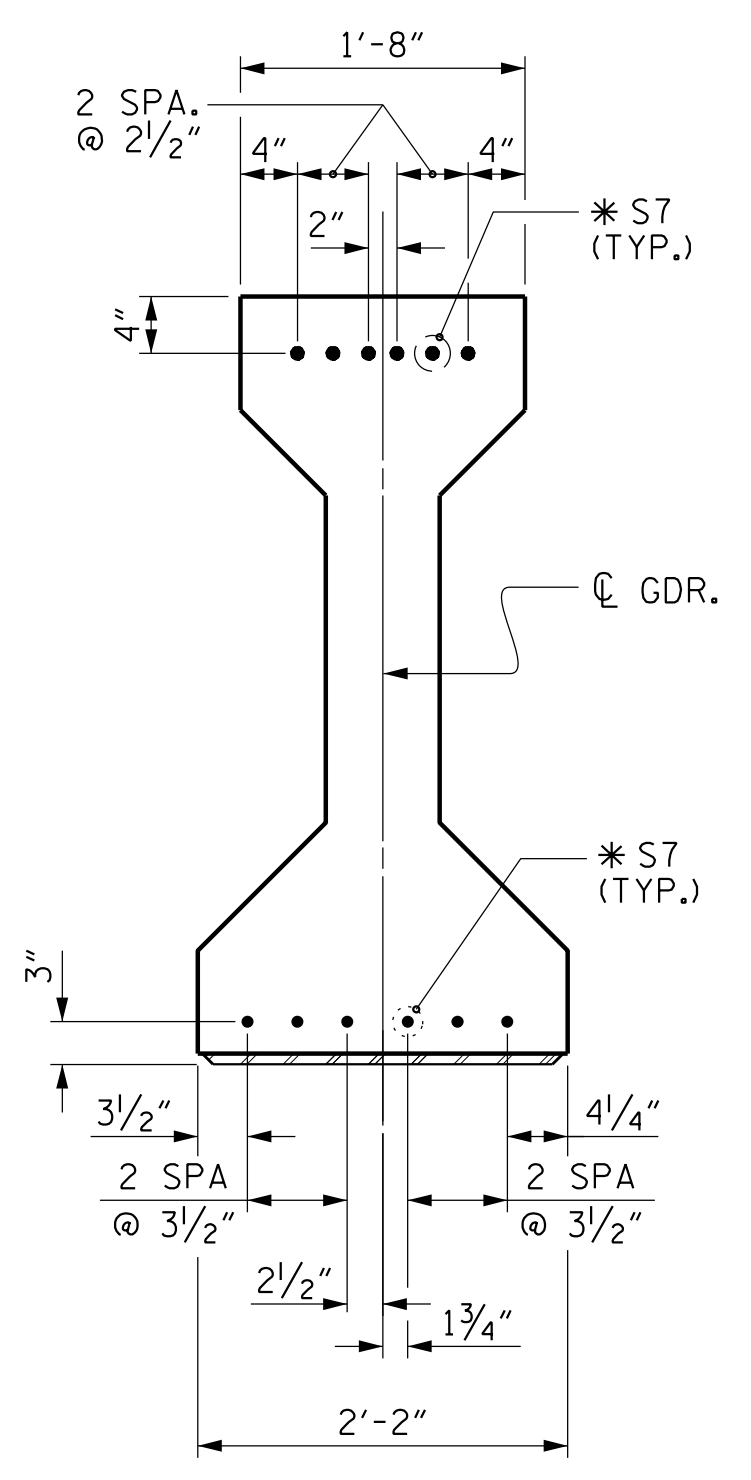
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 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" AND THE LINK SLAB REGION AS SHOWN ON SHEET 1 OF 3, SHALL BE RAKED TO A DEPTH OF 1/4".



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

DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS - SPANS A & B																						
0.6" Ø LOW RELAXATION		GIRDERS 1 & 5																				
TWENTIETH POINTS		0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑		0.0	0.024	0.048	0.070	0.091	0.109	0.124	0.136	0.145	0.151	0.153	0.151	0.145	0.136	0.124	0.109	0.091	0.070	0.048	0.024	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.0	0.014	0.029	0.043	0.057	0.068	0.079	0.086	0.093	0.095	0.098	0.095	0.093	0.086	0.079	0.068	0.057	0.043	0.029	0.014	0.0
FINAL CAMBER ↑		0.0	1/8"	1/4"	3/16"	1/2"	3/8"	3/8"	7/16"	1/2"	1/2"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	5/16"	1/4"	1/8"	0.0
0.6" Ø LOW RELAXATION		GIRDERS 2 & 4																				
TWENTIETH POINTS		0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑		0.0	0.024	0.048	0.070	0.091	0.109	0.124	0.136	0.145	0.151	0.153	0.151	0.145	0.136	0.124	0.109	0.091	0.070	0.048	0.024	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.0	0.016	0.033	0.049	0.065	0.078	0.090	0.098	0.106	0.109	0.112	0.109	0.106	0.098	0.090	0.078	0.065	0.049	0.033	0.016	0.0
FINAL CAMBER ↑		0.0	1/16"	3/16"	1/4"	3/16"	3/8"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	3/16"	1/4"	3/16"	1/16"	0.0
0.6" Ø LOW RELAXATION		GIRDER 3																				
TWENTIETH POINTS		0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑		0.0	0.024	0.048	0.070	0.091	0.109	0.124	0.136	0.145	0.151	0.153	0.151	0.145	0.136	0.124	0.109	0.091	0.070	0.048	0.024	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.0	0.017	0.033	0.050	0.066	0.079	0.092	0.100	0.108	0.111	0.114	0.111	0.108	0.100	0.092	0.079	0.066	0.050	0.033	0.017	0.0
FINAL CAMBER ↑		0.0	1/16"	3/16"	1/4"	3/16"	3/8"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	3/16"	1/4"	3/16"	1/16"	0.0

* INCLUDES FUTURE WEARING SURFACE.

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PRESTRESSED CONCRETE GIRDER
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

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 3300 REGENCY PARKWAY, SUITE 100
 CARY, NC 27518
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DESIGNED BY:
 L. Kevin Austin
 PROFESSIONAL ENGINEER
 727832050008
 L. KEVIN AUSTIN
 5/10/2022

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

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

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

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

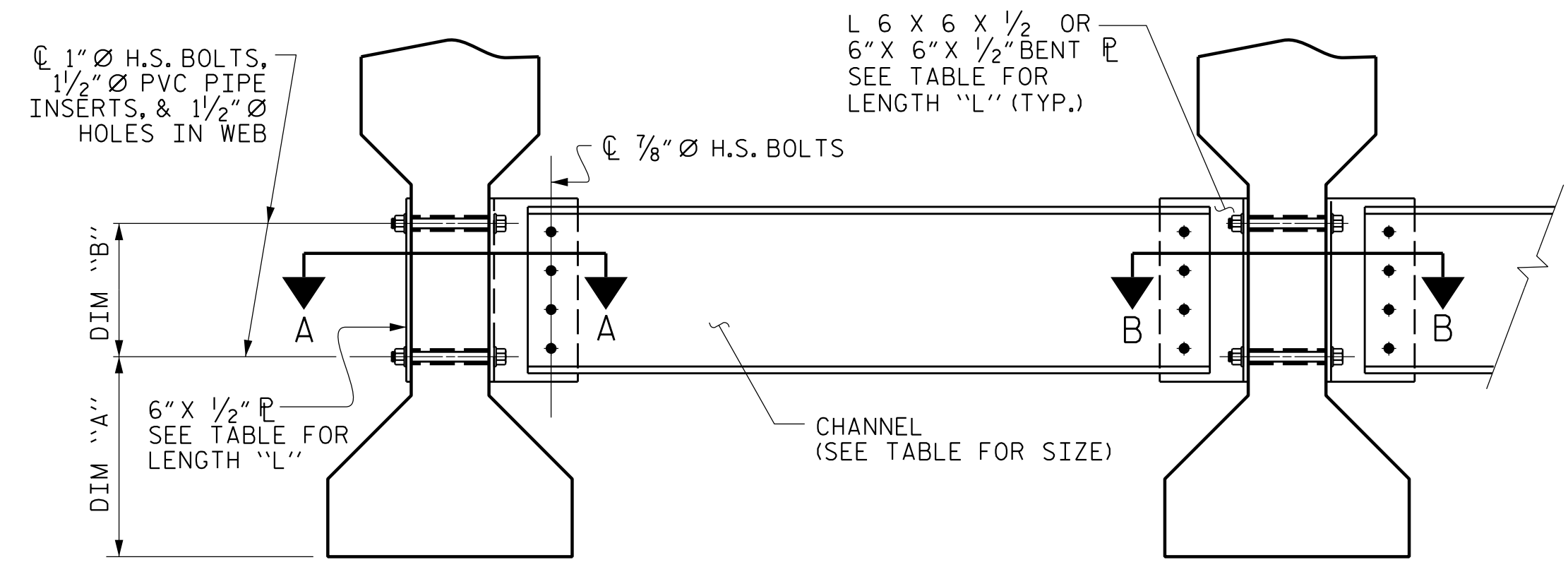
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

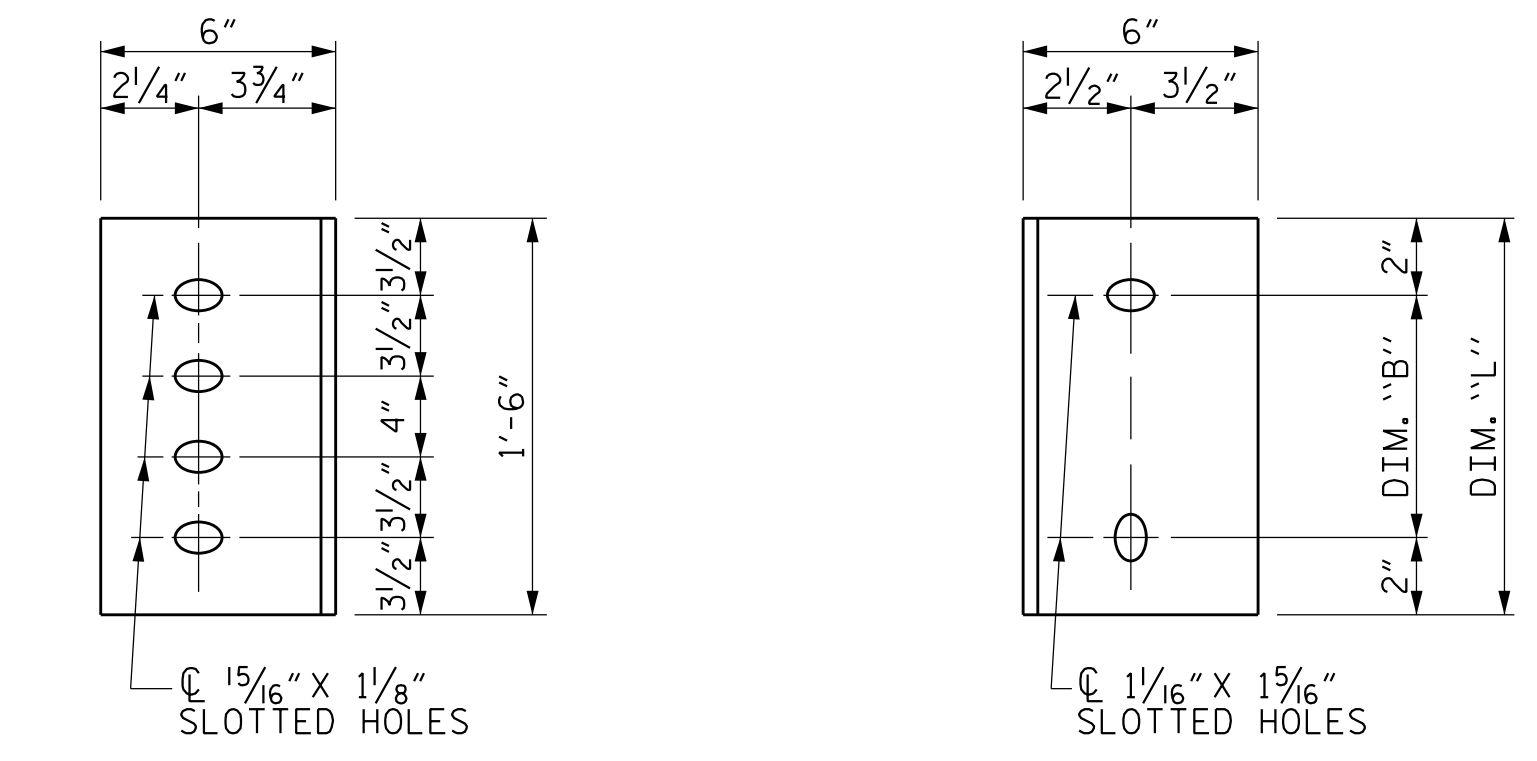
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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



DIAPHRAGM FACE
WEB FACE
CONNECTOR PLATE DETAILS

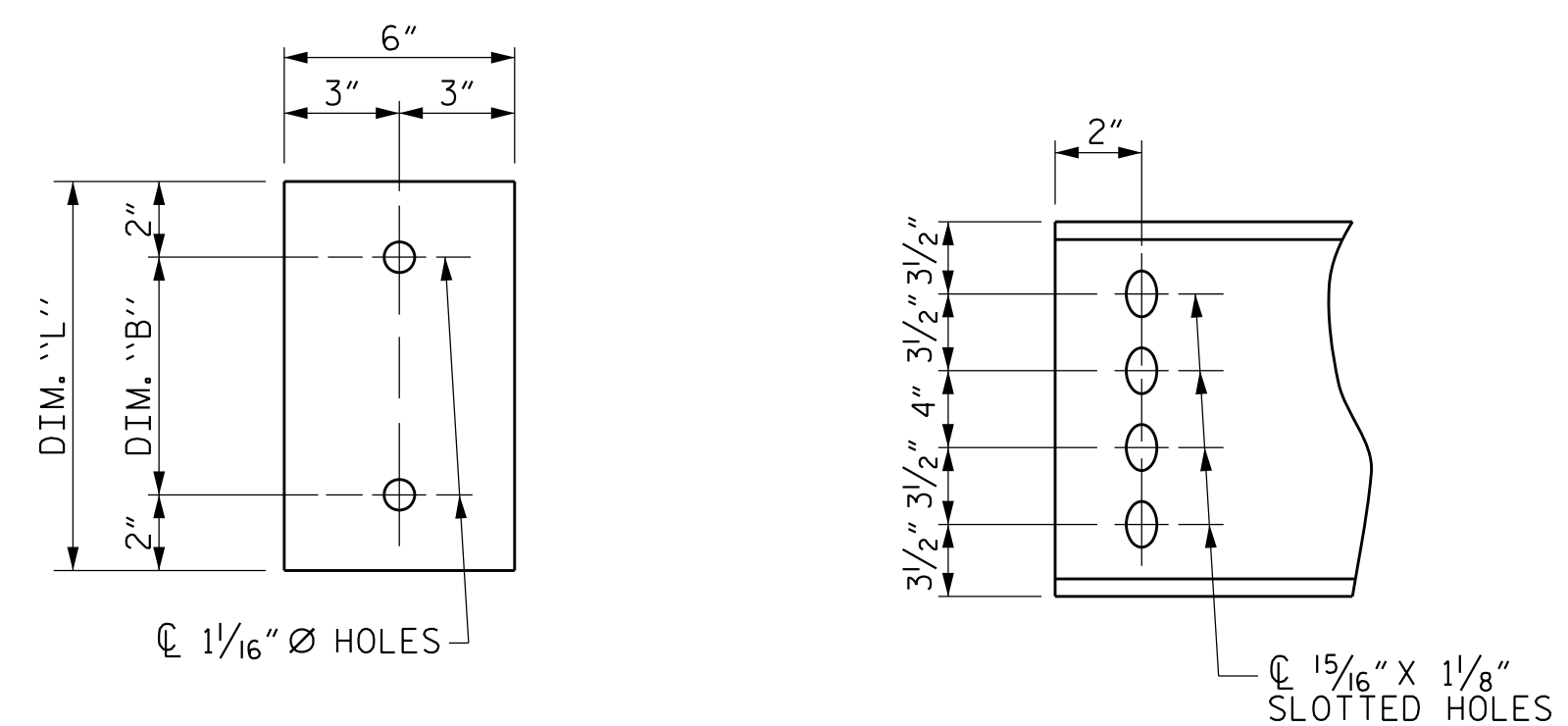
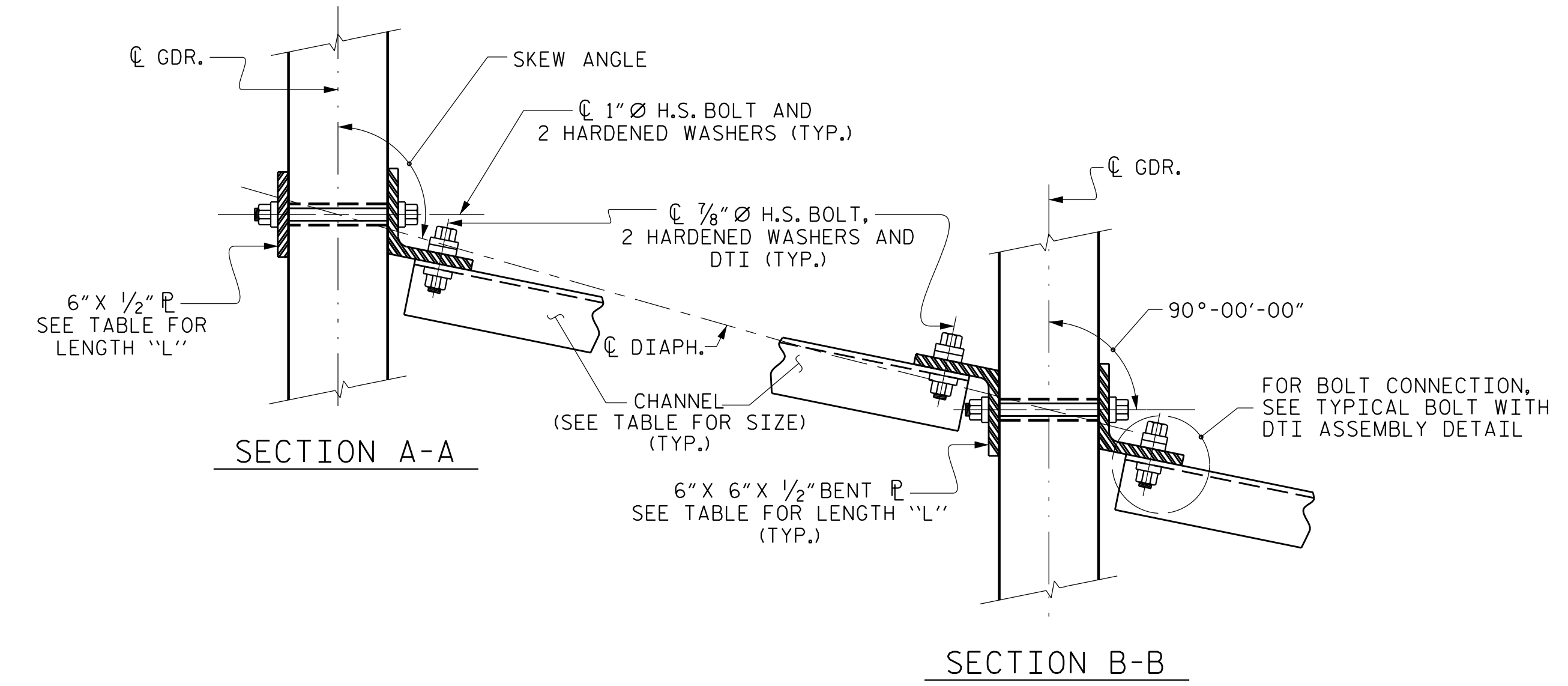
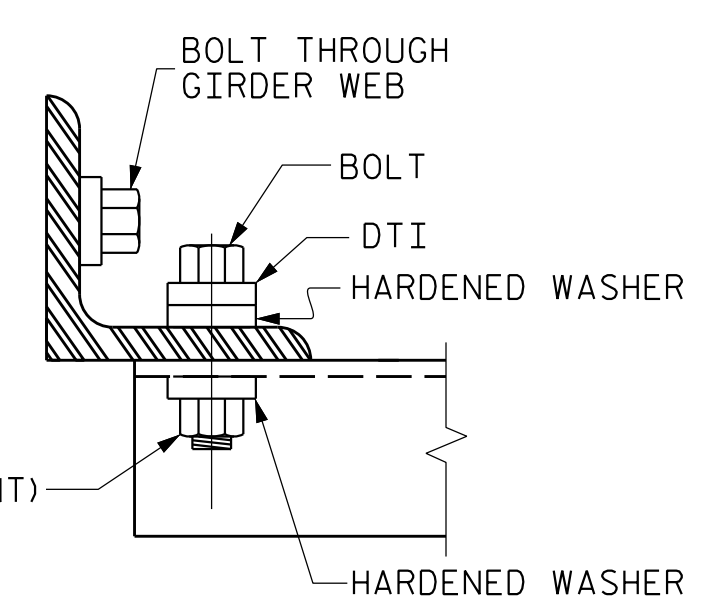


PLATE DETAILS
CHANNEL END



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. **I-5987A**
ROBESON COUNTY
 STATION: **41+19.02 -Y1A- POT**

SHEET 3 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:
NV5
 NV5 ENGINEERS & CONSULTANTS, INC.
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 CARY, NC 27518
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ASSEMBLED BY : W. B. ALLEN	DATE : 3/21
CHECKED BY : G. F. WILSON	DATE : 9/21
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES

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

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

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

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

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300 3/4 F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE P1, BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

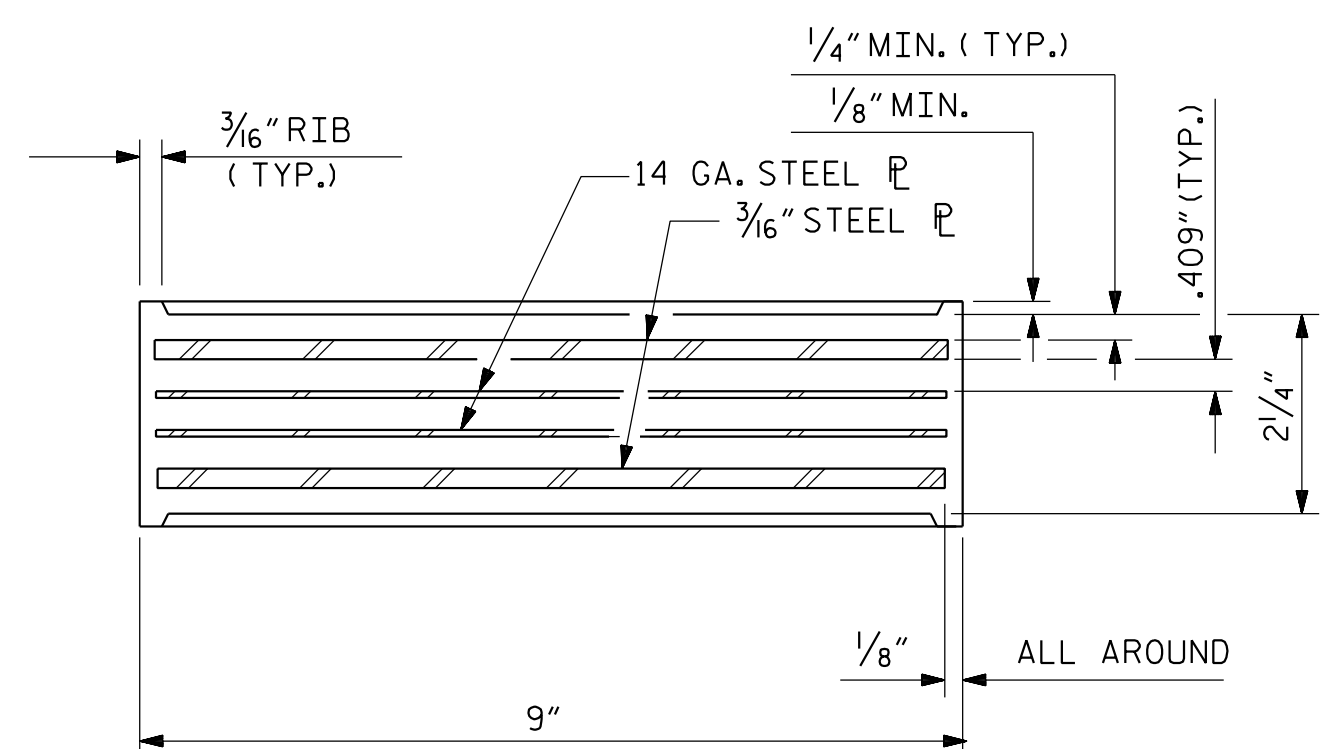
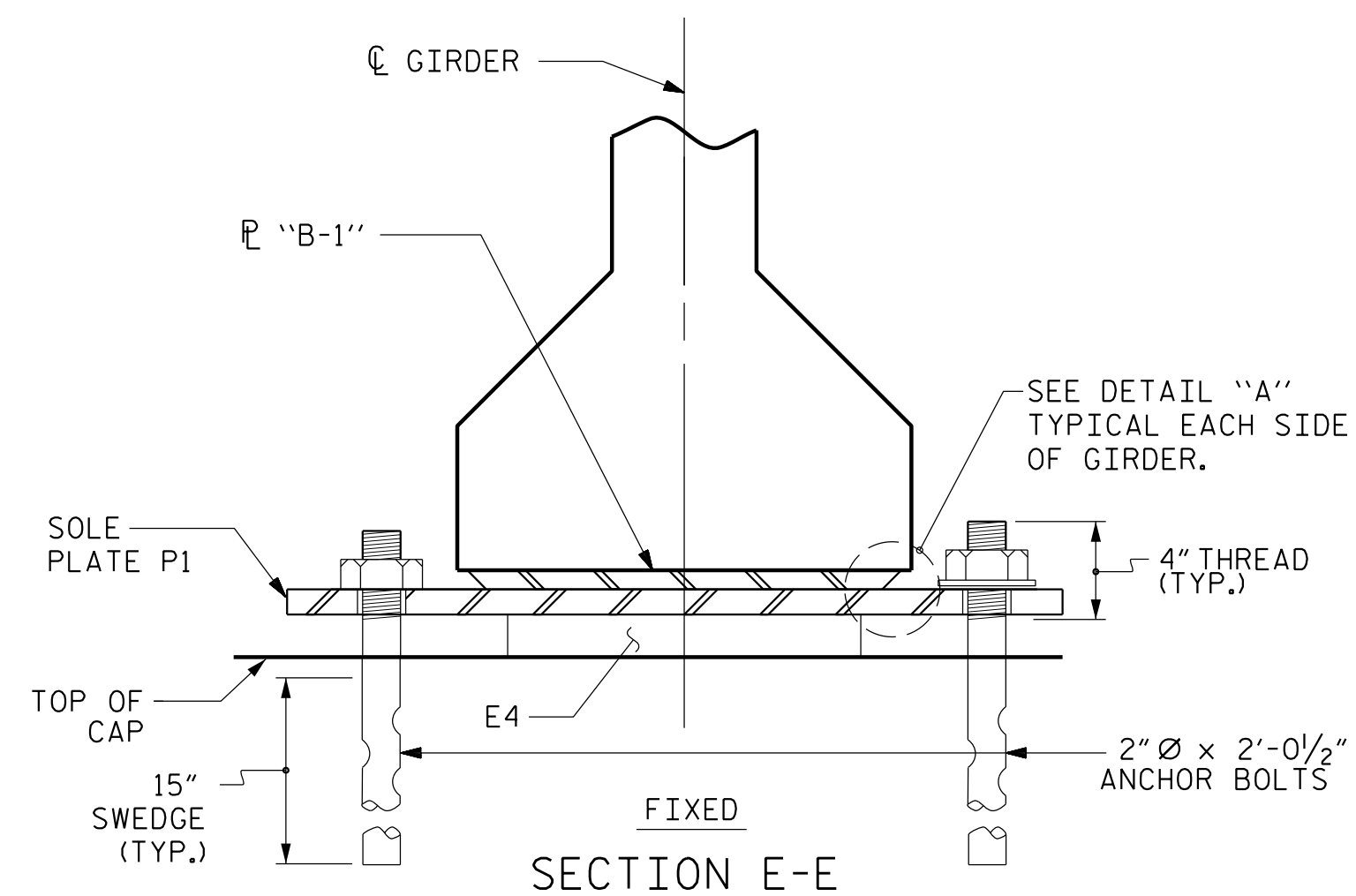
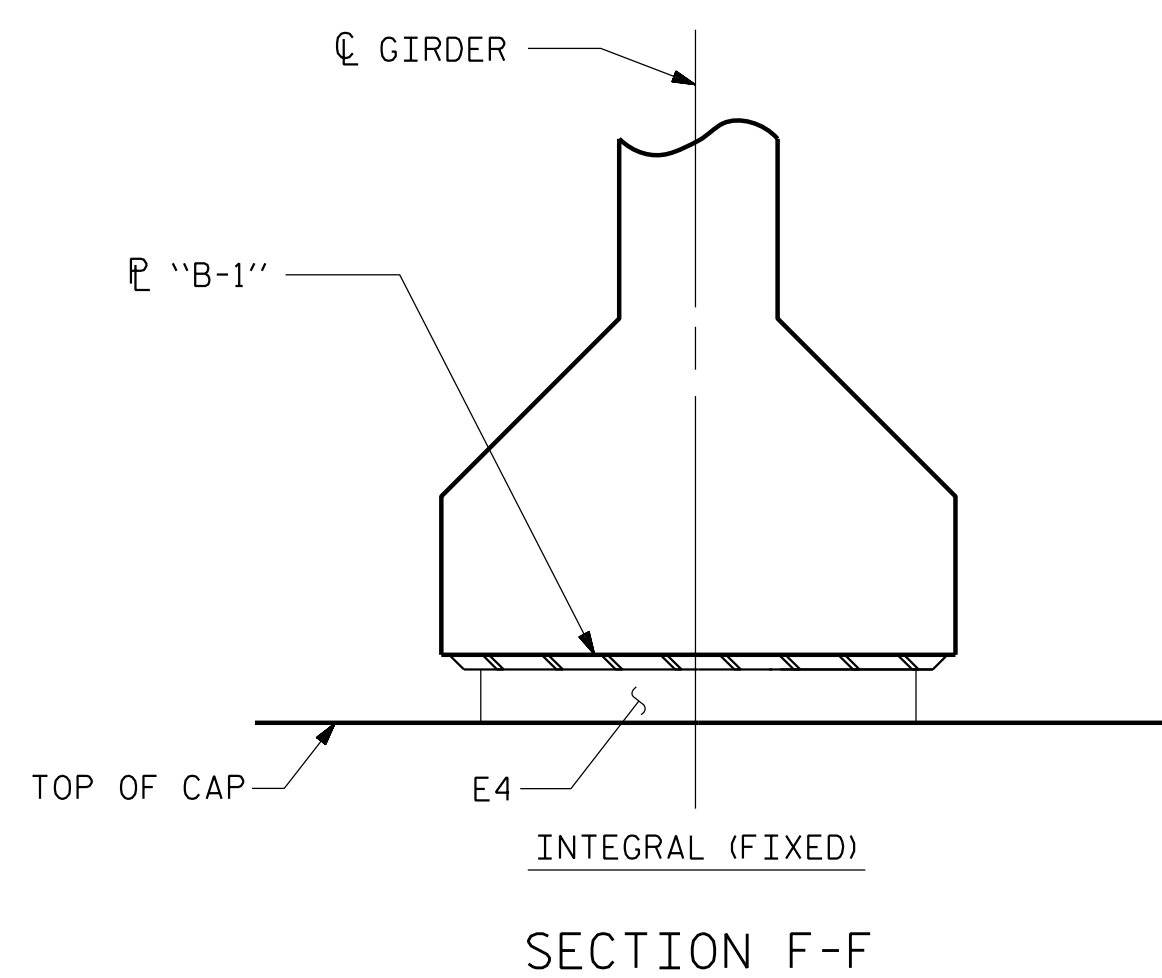
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

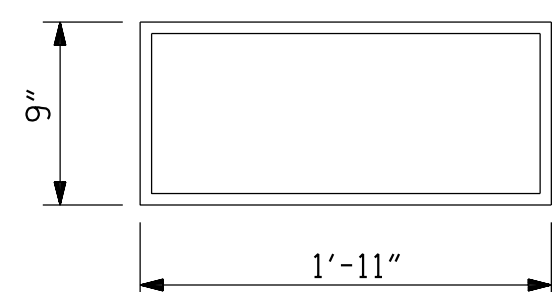
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

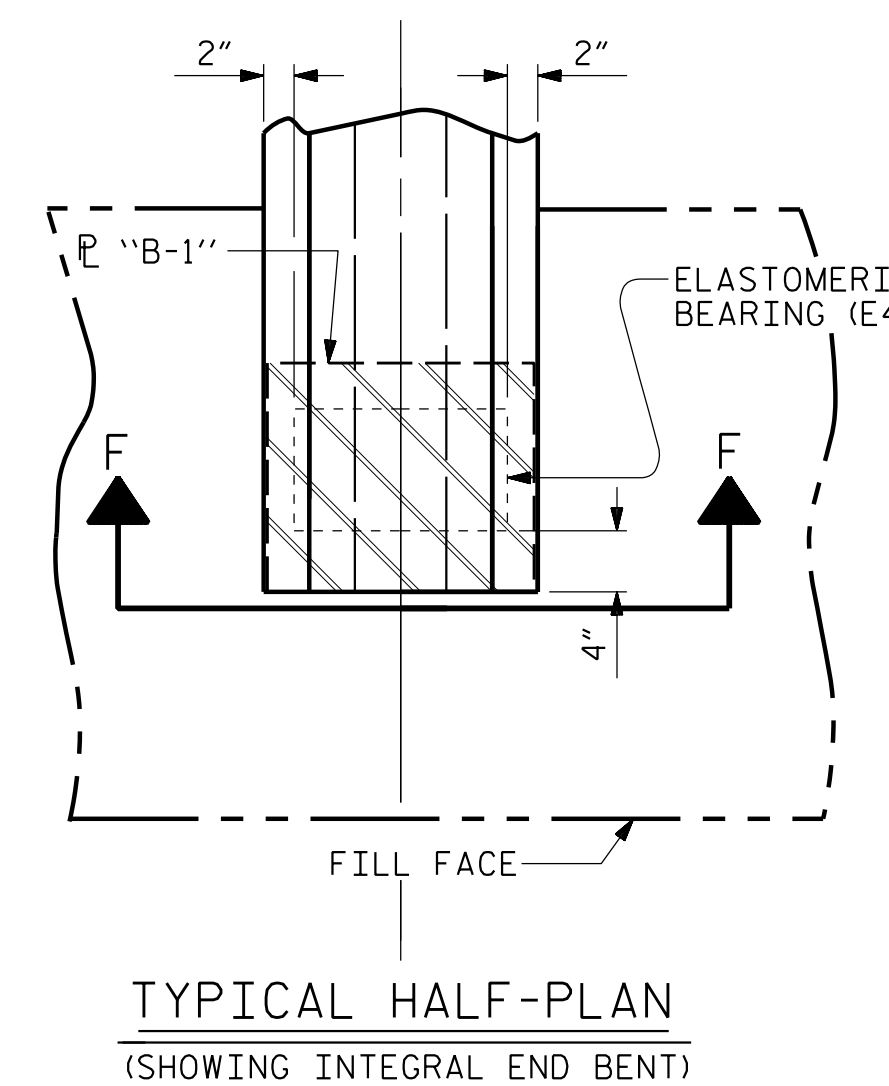
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



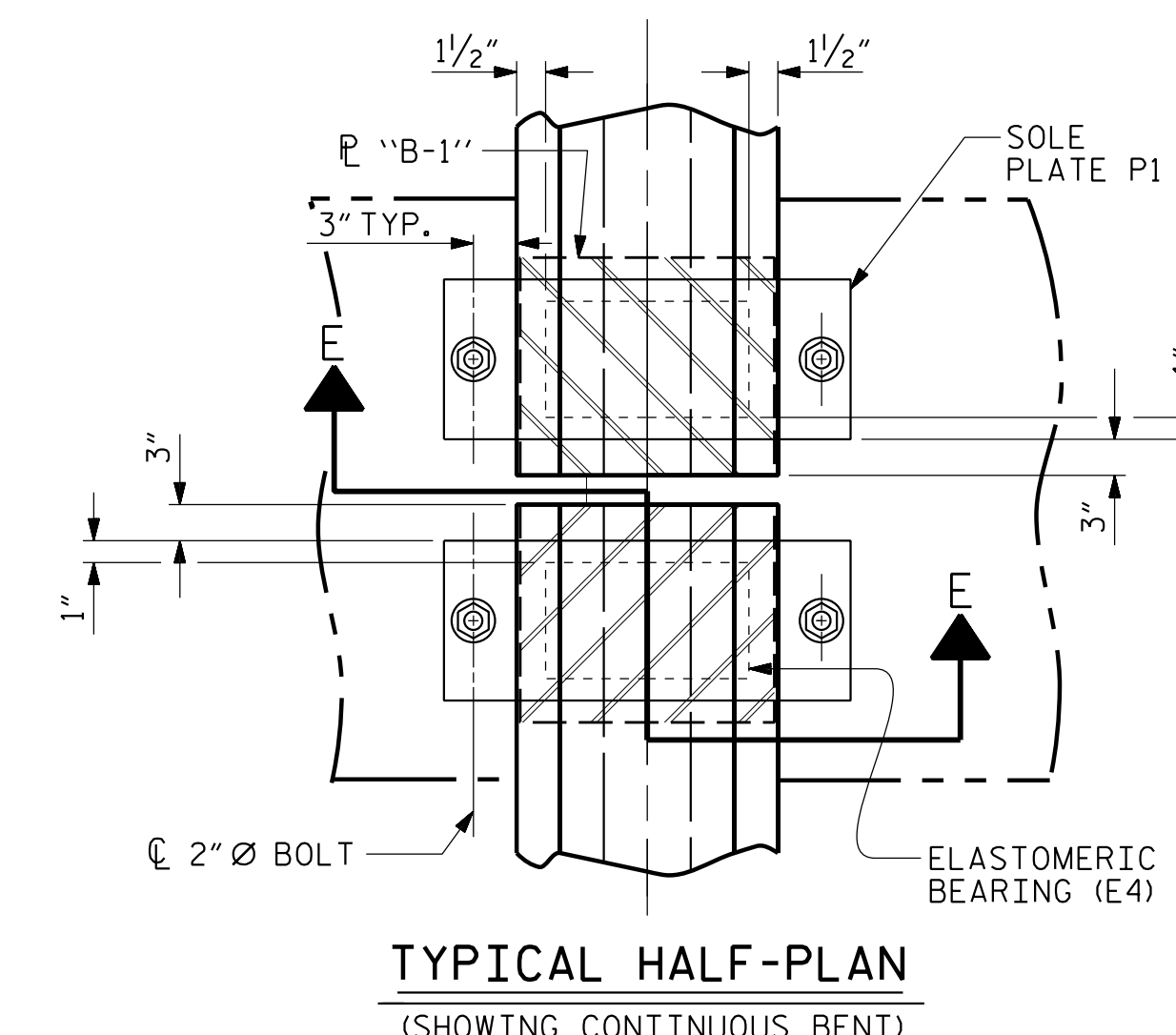
TYPICAL SECTION OF ELASTOMERIC BEARINGS



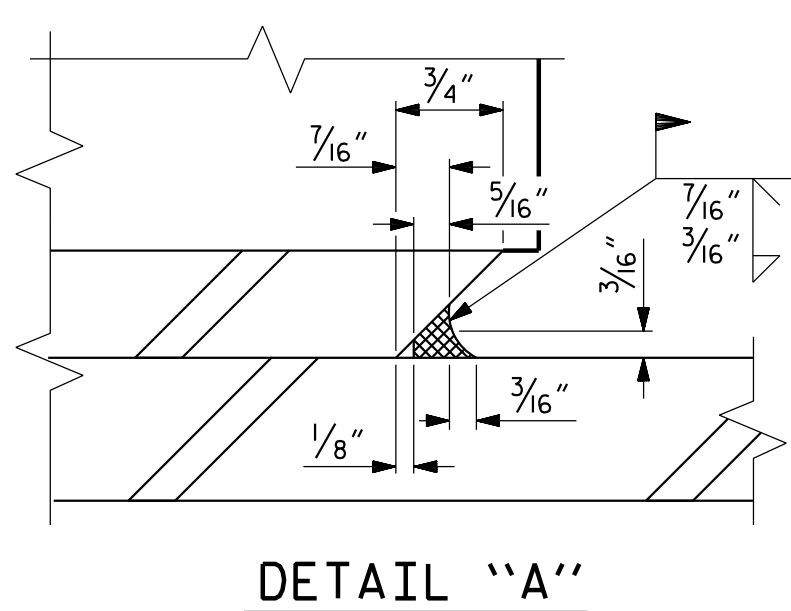
E4 (20 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



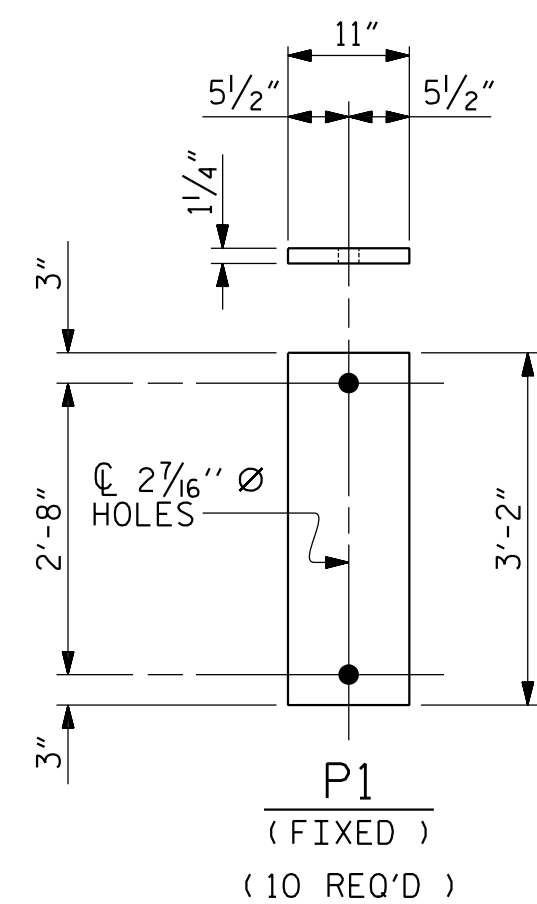
TYPICAL HALF-PLAN
(SHOWING INTEGRAL END BENT)



TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)



DETAIL "A"



SOLE PLATE (P1) DETAILS

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

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Professional Engineer Seal for Kevin Austin, State of North Carolina, License # 787832654RIB, dated 5/10/2022.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 ELASTOMERIC BEARING
 DETAILS
 PRESTRESSED CONCRETE GIRDER

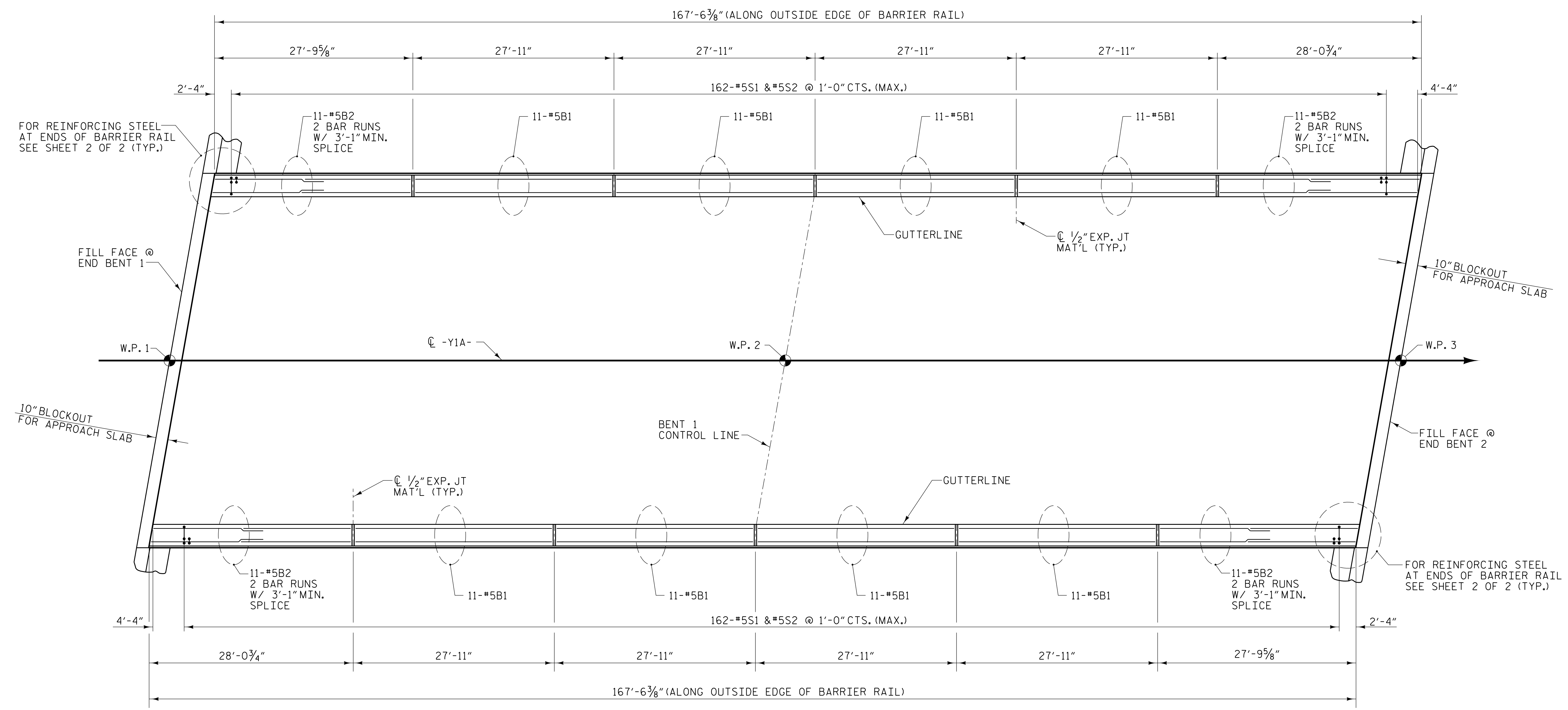
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-16
 TOTAL SHEETS 31

DRAWN BY : W. B. ALLEN DATE : 3/21
 CHECKED BY : G. F. WILSON DATE : 9/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

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SPAN A

SPAN B

PLAN OF BARRIER RAIL

(MONOLITHIC CONCRETE ISLAND NOT SHOWN)

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

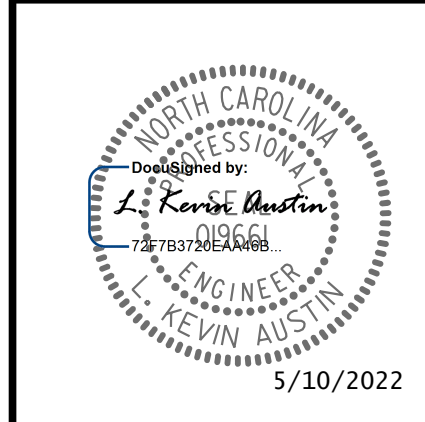
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

PLANS PREPARED BY:

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			31

DRAWN BY :	W. B. ALLEN	DATE :	3/21
CHECKED BY :	G. F. WILSON	DATE :	9/21
DESIGN ENGINEER OF RECORD:	L. K. AUSTIN	DATE :	12/21

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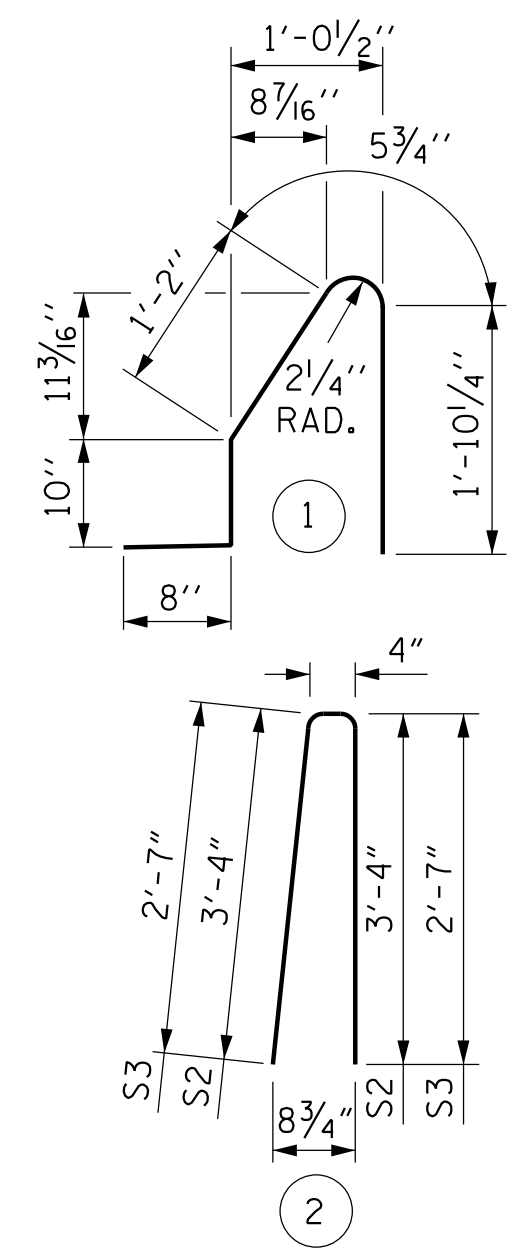
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

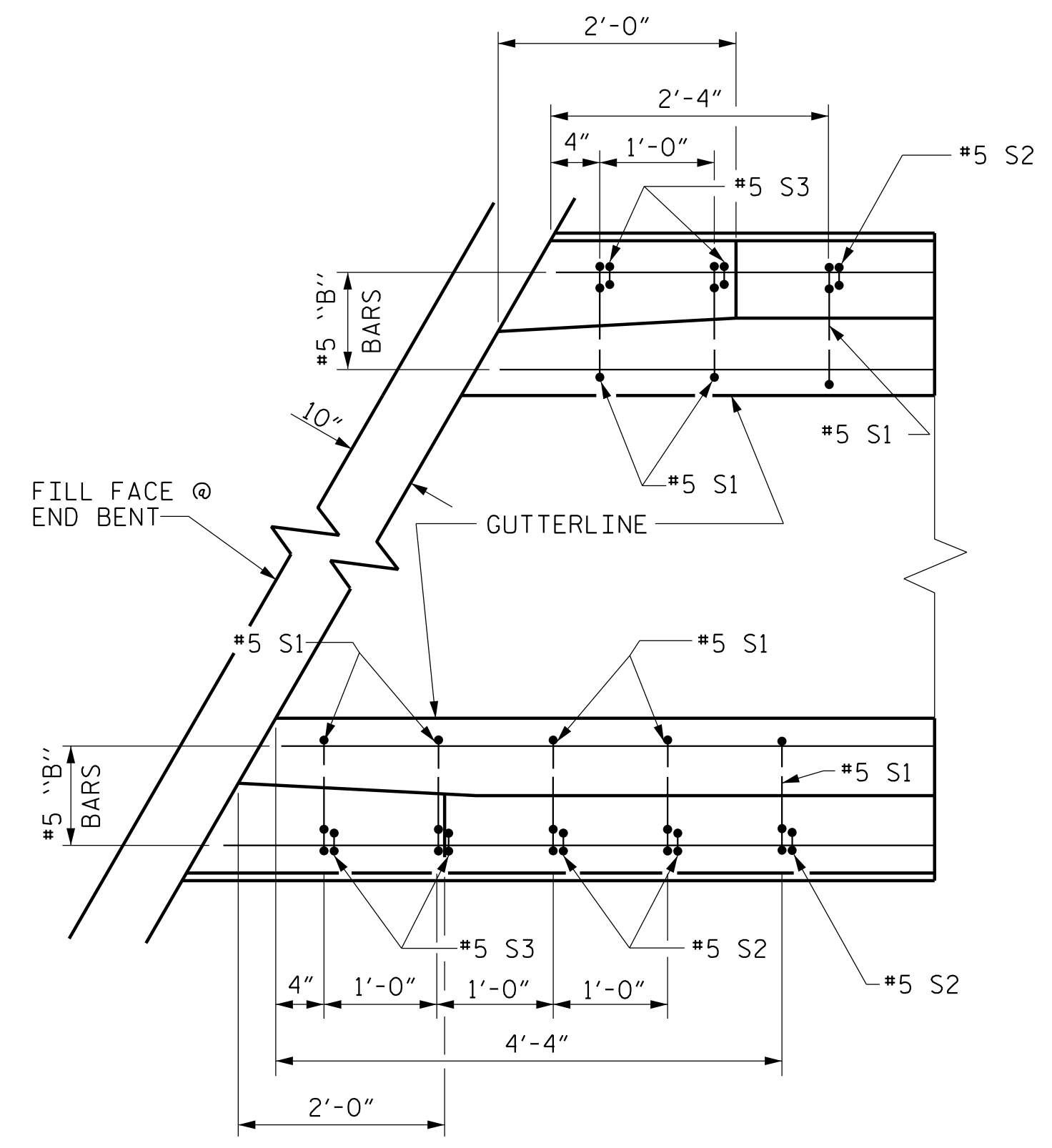
BAR TYPES



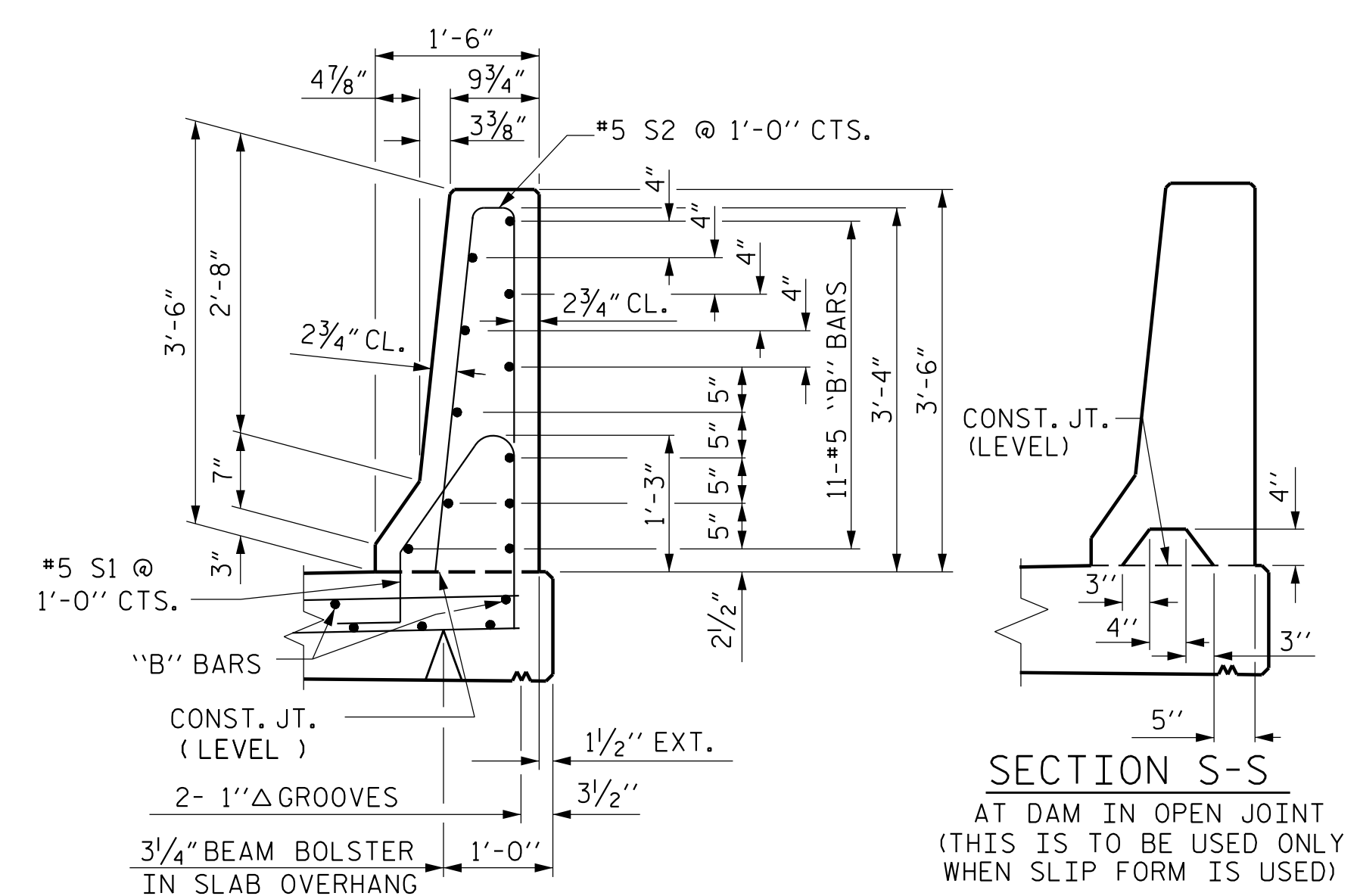
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR	27'-6"	2524
* B2	88	#5	STR	15'-5"	1415
* S1	336	#5	1	5'-0"	1752
* S2	328	#5	2	7'-0"	2395
* S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL					8132 LBS.
CLASS AA CONCRETE					45.6 CU. YDS.
CONCRETE BARRIER RAIL					335.06 LIN. FT.

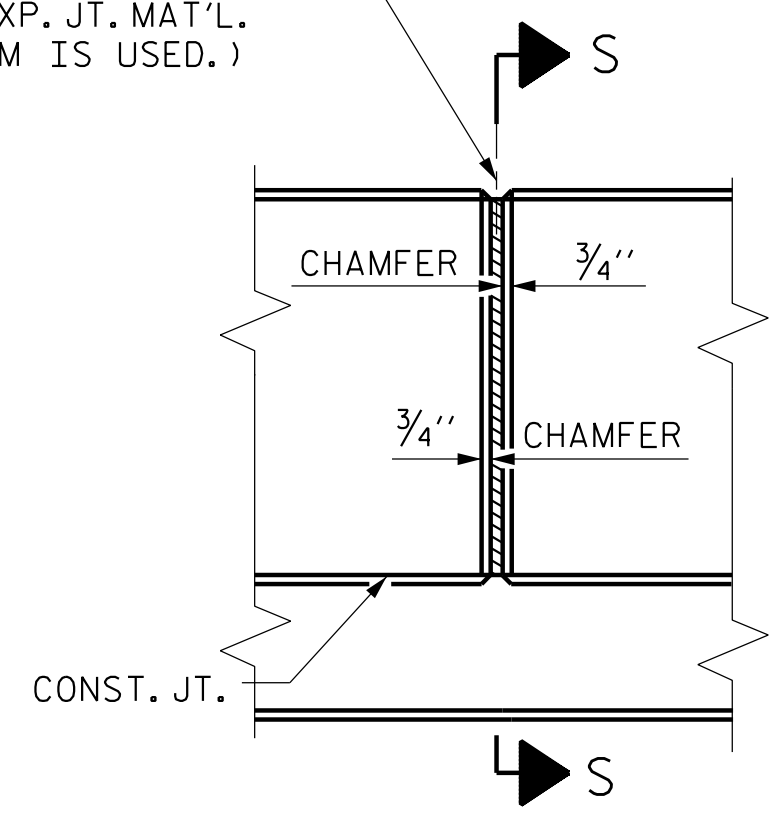


PLAN

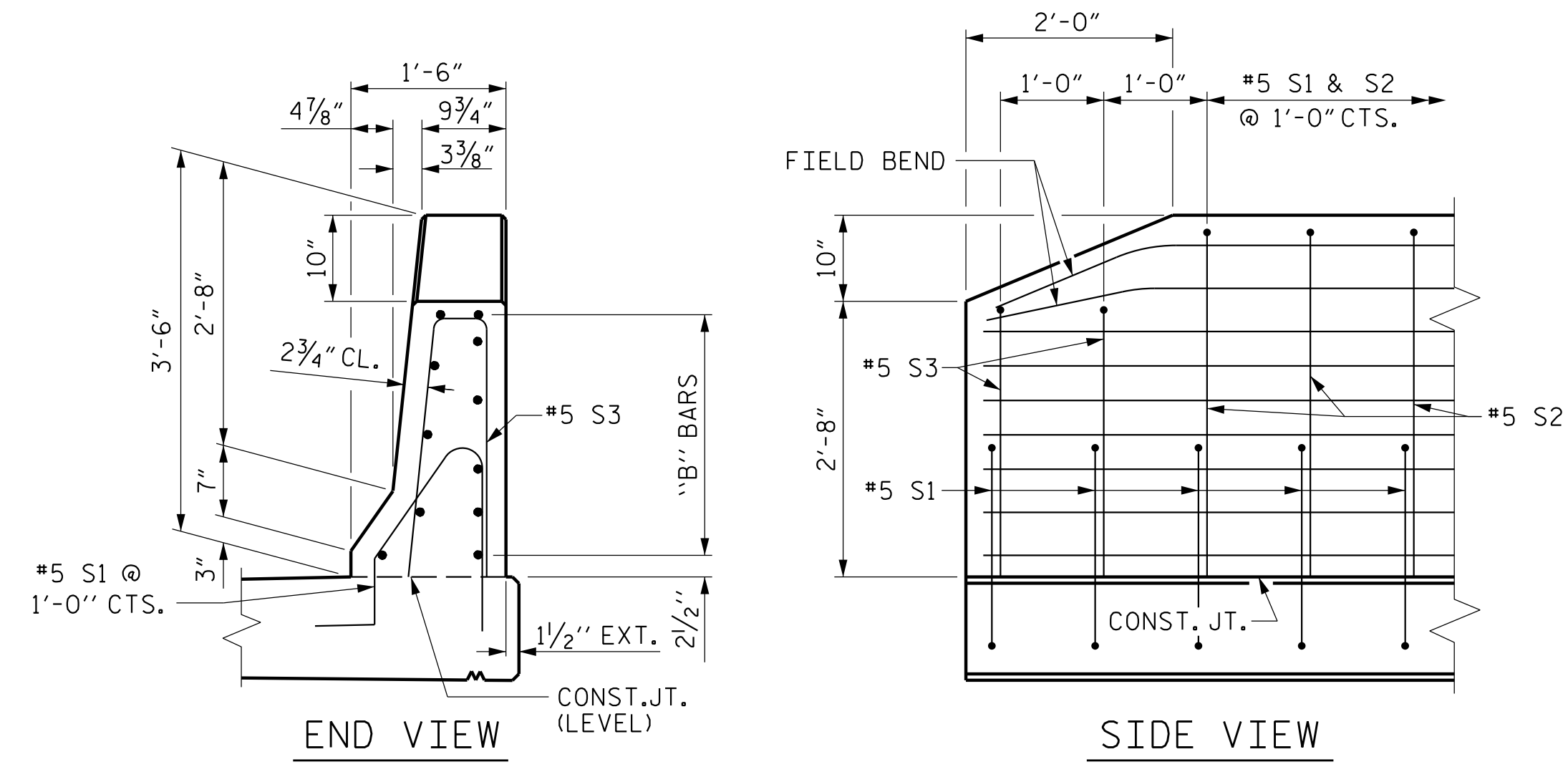


SECTION THRU RAIL

@ 1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

PLANS PREPARED BY:

NV5 ENGINEERS & CONSULTANTS, INC.
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CARY, NC 27518
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PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			31

STD. NO. CBR1 (SHT 2)

ASSEMBLED BY : W. B. ALLEN	DATE : 3/21
CHECKED BY : G. F. WILSON	DATE : 9/21
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

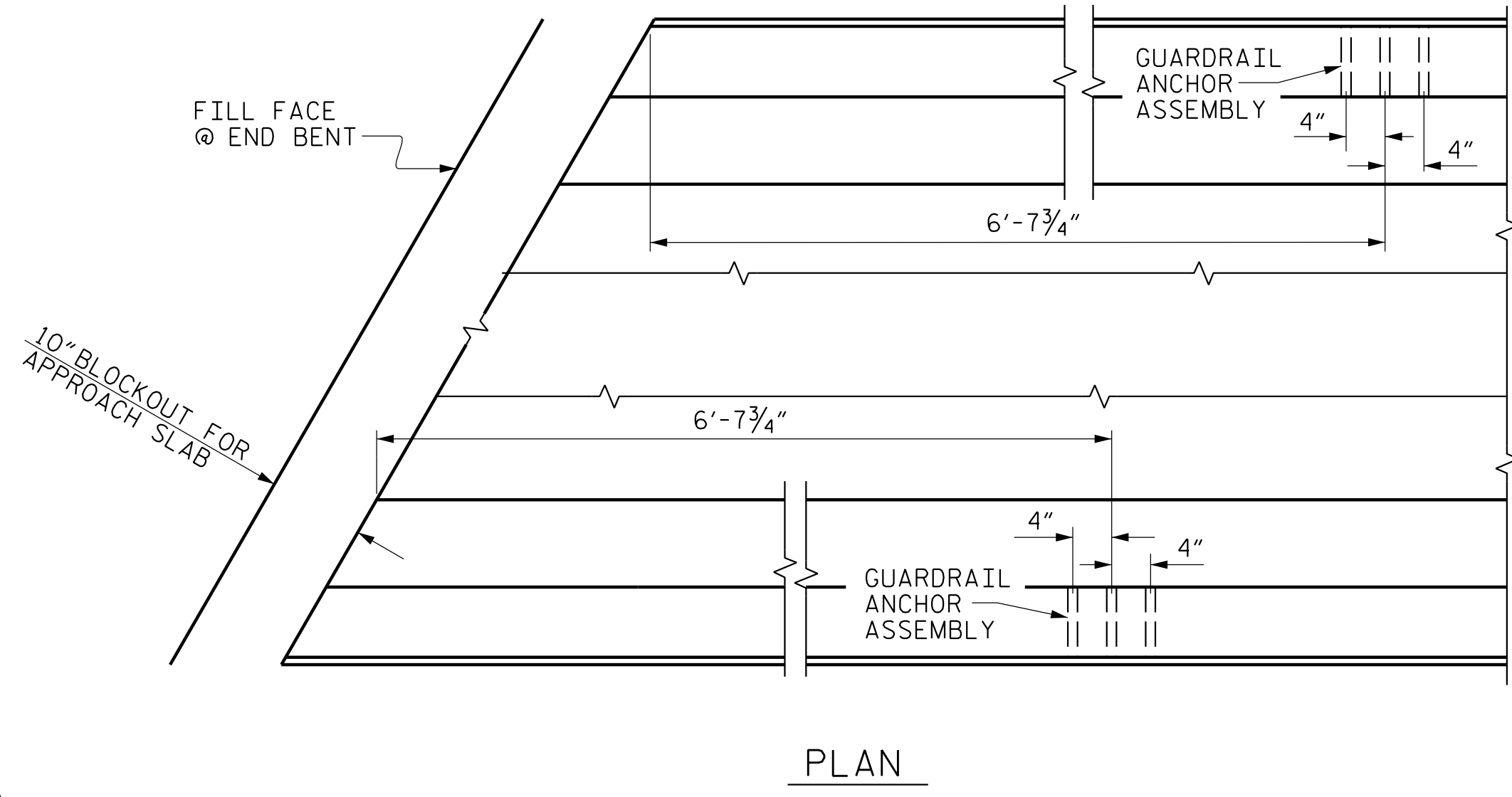
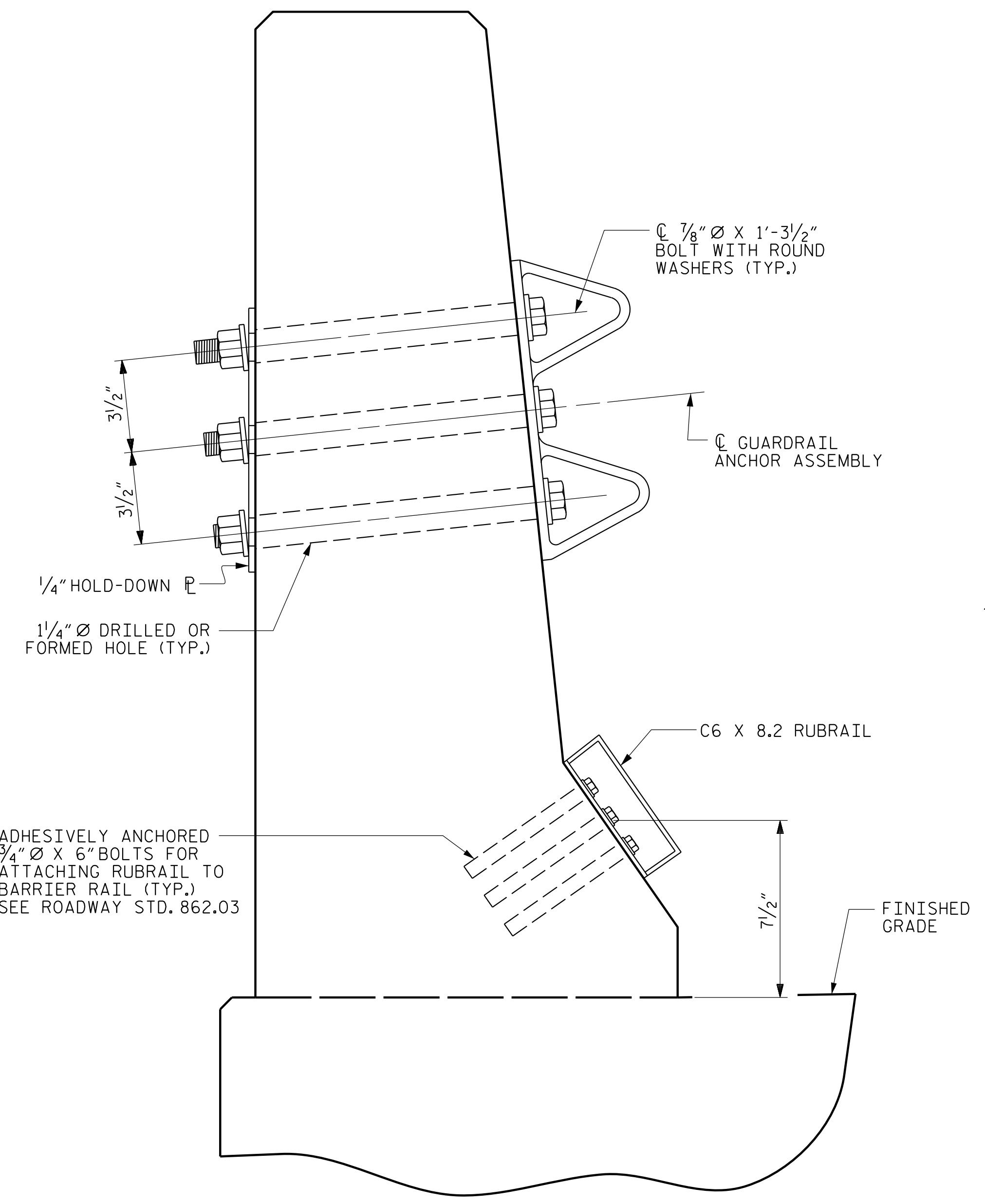
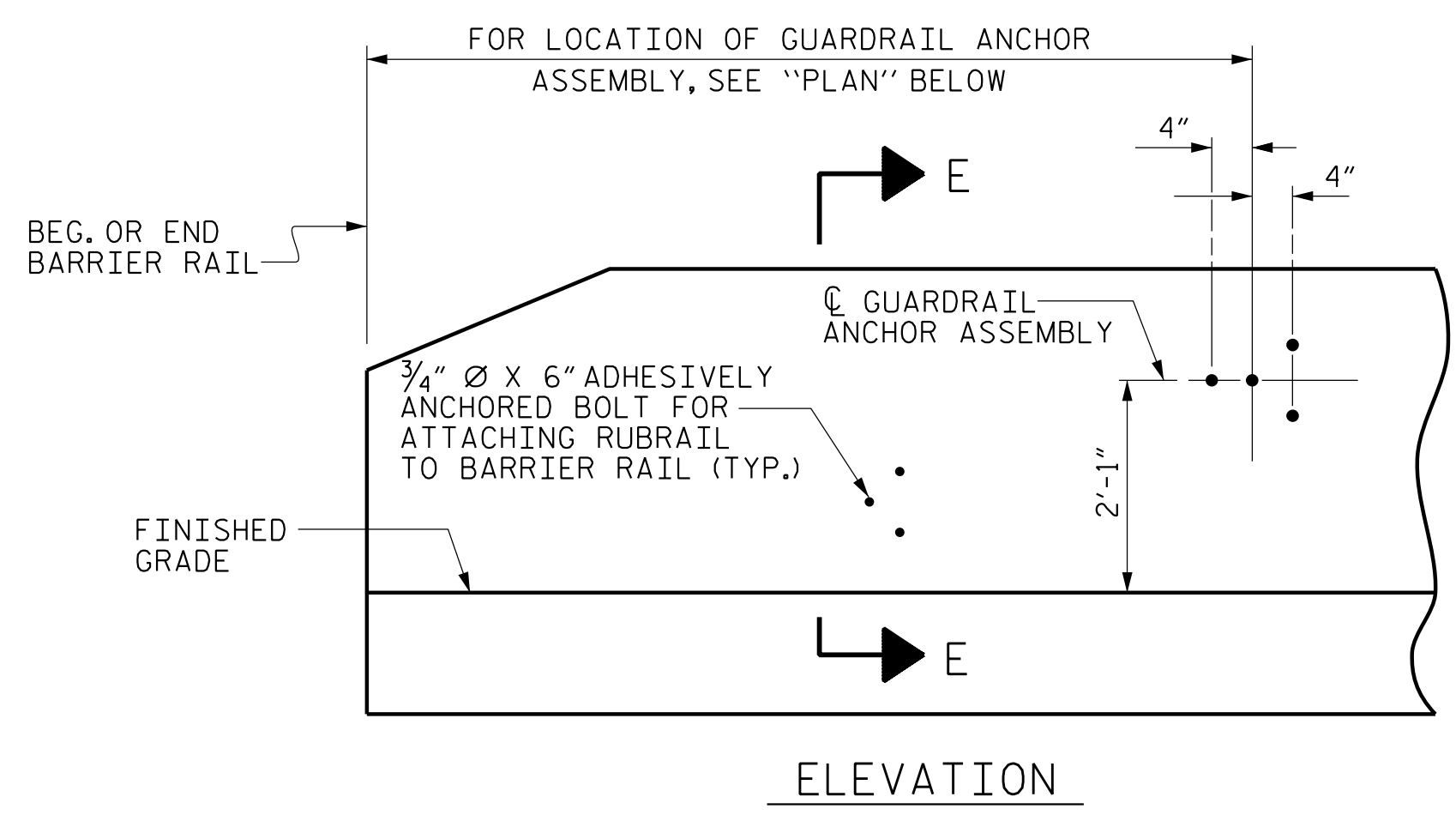
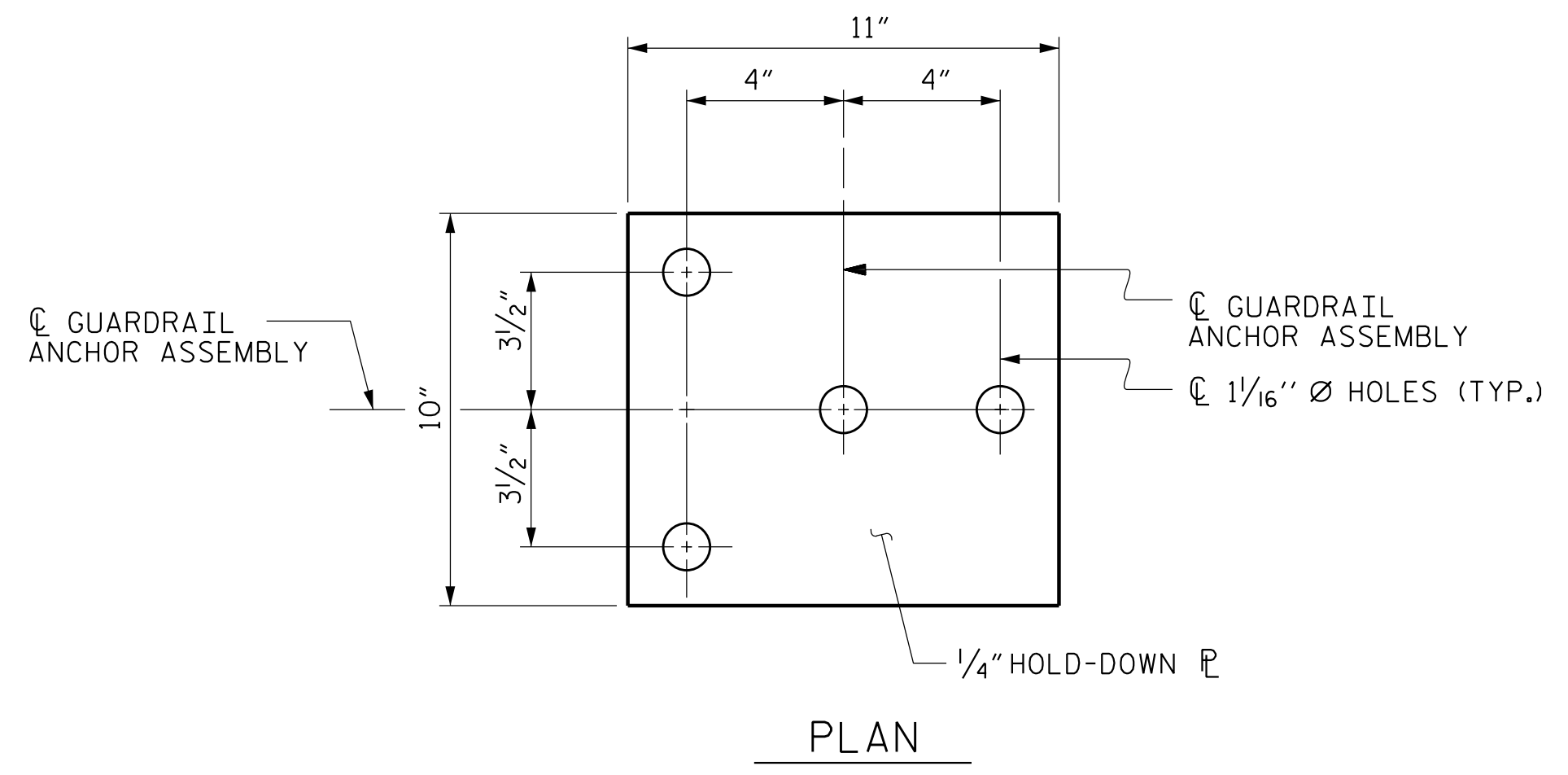
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

REVISIONS				SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19	
1			3			TOTAL SHEETS	
2			4			31	

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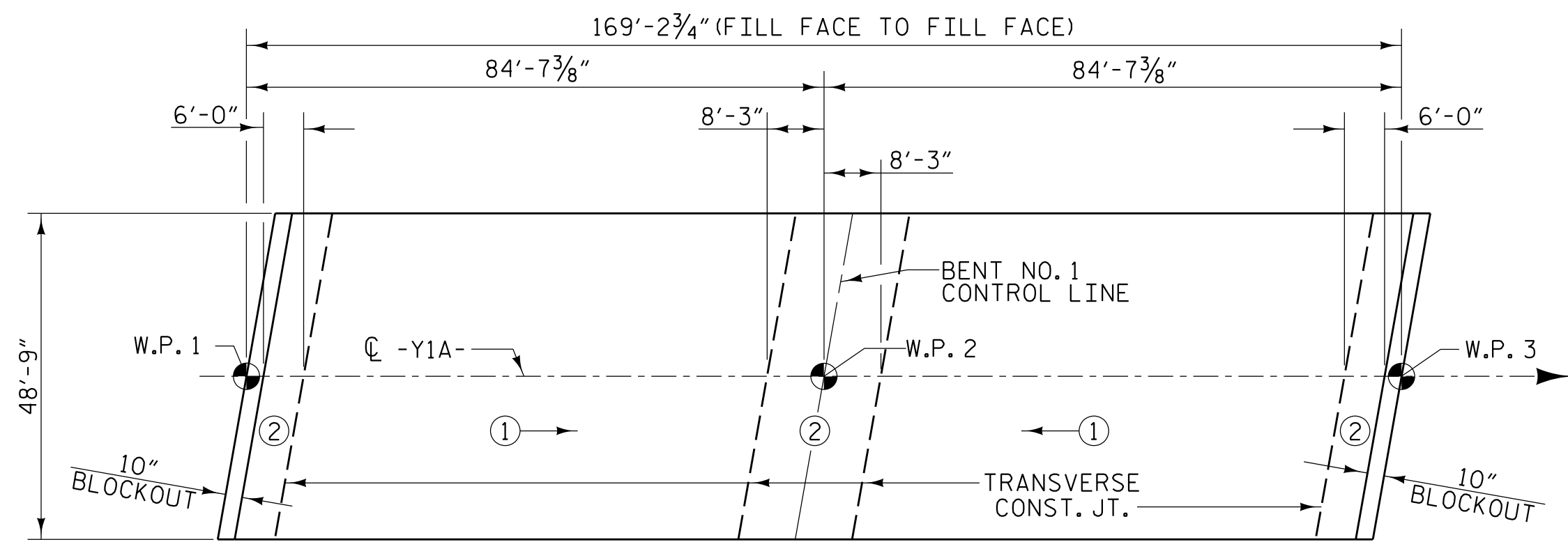
THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

L. Kevin Austin
 L. KEVIN AUSTIN
 PROFESSIONAL ENGINEER
 5/10/2022

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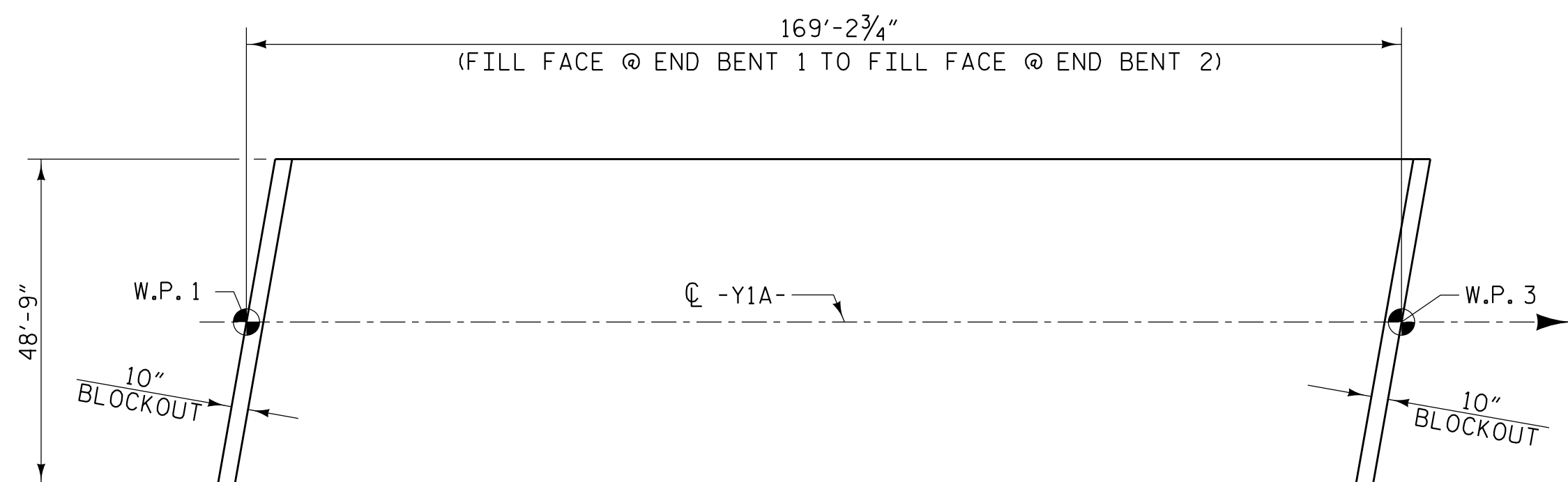
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ASSEMBLED BY : W. B. ALLEN	DATE : 3/21
CHECKED BY : G. F. WILSON	DATE : 9/21
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



POURING SEQUENCE SKETCH

⊕ INDICATES POUR SEQUENCE NUMBER AND DIRECTION OF POUR
 NOTE: POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS REACH MINIMUM OF 3000 PSI



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(TOTAL SQ. FT. = 8250)

BAR SIZE	SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS				PARAPET AND BARRIER RAIL
	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		
	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"			

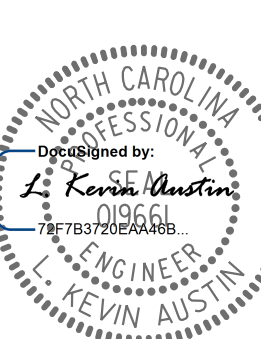
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	347	#5	STR	48'-5"	17523
A2	347	#5	STR	48'-5"	17523
* A101	2	#5	STR	46'-0"	96
* A102	2	#5	STR	43'-5"	91
* A103	2	#5	STR	40'-10"	85
* A104	2	#5	STR	38'-2"	80
* A105	2	#5	STR	35'-7"	74
* A106	2	#5	STR	33'-0"	69
* A107	2	#5	STR	30'-5"	63
* A108	2	#5	STR	27'-10"	58
* A109	2	#5	STR	25'-2"	52
* A110	2	#5	STR	22'-7"	47
* A111	2	#5	STR	20'-0"	42
* A112	2	#5	STR	17'-5"	36
* A113	2	#5	STR	14'-10"	31
* A114	2	#5	STR	12'-2"	25
* A115	2	#5	STR	9'-7"	20
* A116	2	#5	STR	7'-0"	15
* A117	2	#5	STR	4'-5"	9
* A118	2	#5	STR	1'-10"	4
A201	2	#5	STR	46'-0"	96
A202	2	#5	STR	43'-5"	91
A203	2	#5	STR	40'-10"	85
A204	2	#5	STR	38'-2"	80
A205	2	#5	STR	35'-7"	74
A206	2	#5	STR	33'-0"	69
A207	2	#5	STR	30'-5"	63
A208	2	#5	STR	27'-10"	58
A209	2	#5	STR	25'-2"	52
A210	2	#5	STR	22'-7"	47
A211	2	#5	STR	20'-0"	42
A212	2	#5	STR	17'-5"	36
A213	2	#5	STR	14'-10"	31
A214	2	#5	STR	12'-2"	25
A215	2	#5	STR	9'-7"	20
A216	2	#5	STR	7'-0"	15
A217	2	#5	STR	4'-5"	9
A218	2	#5	STR	1'-10"	4
B1	120	#5	STR	59'-6"	7447
B2	60	#5	STR	52'-4"	3275
B3	54	#4	STR	40'-0"	1443
* B4	66	#4	STR	56'-1"	2473
* B5	192	#5	STR	17'-0"	3404
* B6	33	#5	STR	60'-0"	2065
* B7	64	#5	STR	35'-6"	2370
K1	20	#4	STR	25'-5"	340
K2	8	#4	STR	8'-0"	43
K3	8	#4	STR	9'-1"	49
K4	16	#4	STR	9'-6"	102
K5	8	#4	STR	8'-6"	45
K6	4	#4	STR	2'-2"	6
K7	4	#4	STR	2'-8"	7
K8	8	#4	STR	2'-11"	16
K9	4	#4	STR	2'-5"	6
* S1	76	#4	1	11'-11"	605
* S2	72	#4	1	10'-9"	517
U1	76	#4	2	11'-9"	597
REINFORCING STEEL				LBS.	31796
EPOXY COATED REINFORCING STEEL				LBS.	30404

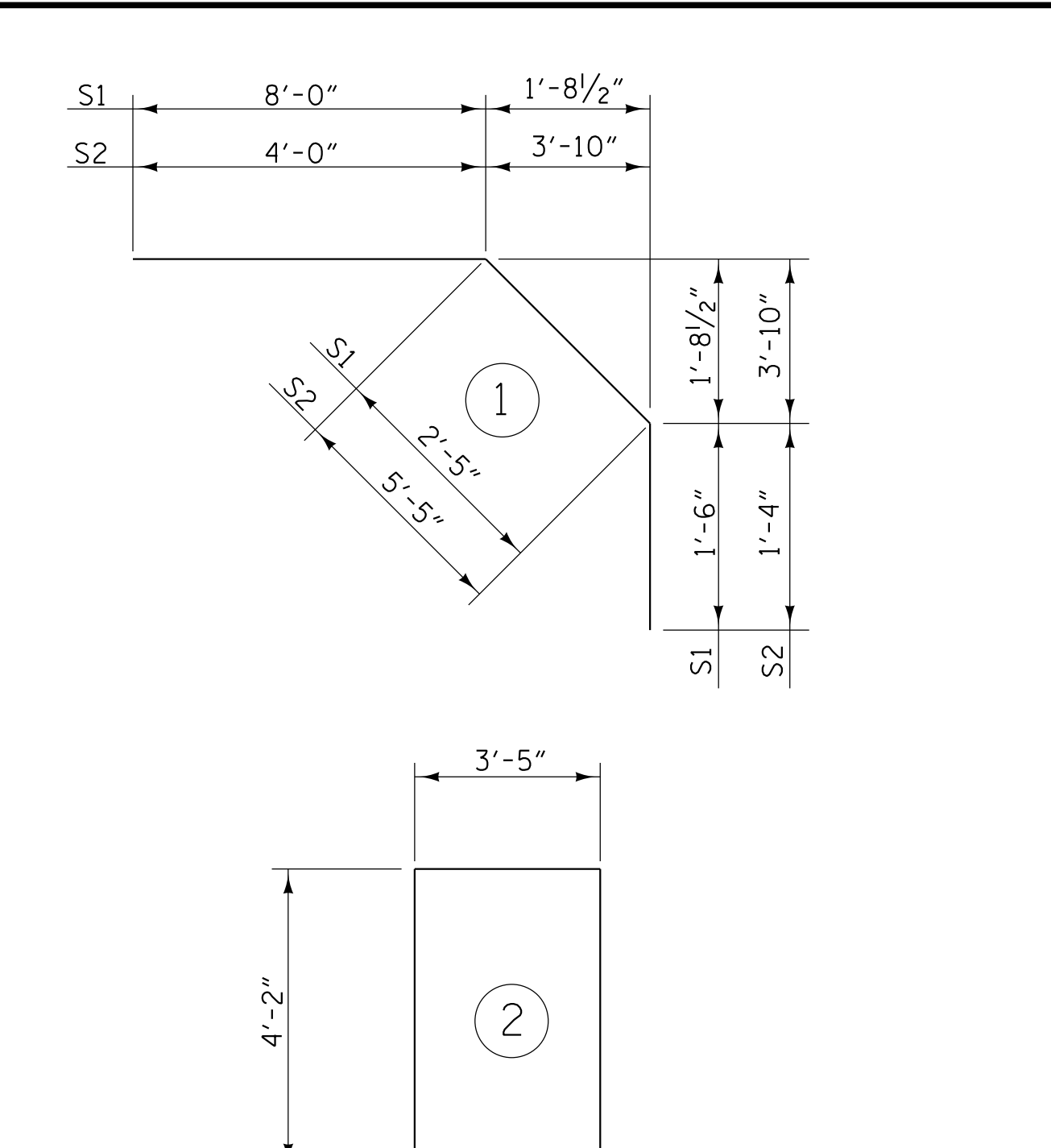
* INDICATES EPOXY COATED REINFORCING STEEL



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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	215.0		
POUR 2	103.6		
MONO. CONC. ISLAND	8.9		550
** TOTALS	327.5	31796	30404

* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. QUANTITIES FOR MONO. CONC. ISLAND ARE INCLUDED.

GROOVING BRIDGE FLOORS		
APPROACH SLABS	1029	SQ. FT.
BRIDGE DECK	5948	SQ. FT.
TOTAL	6977	SQ. FT.

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

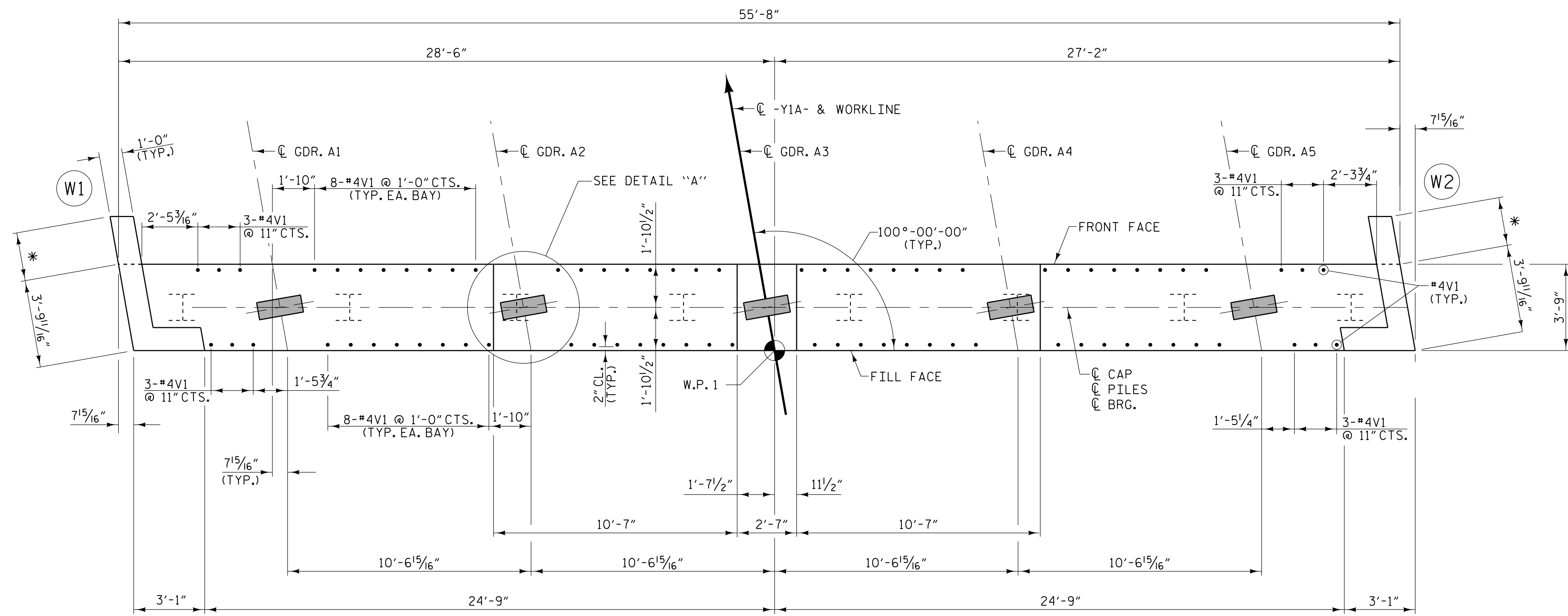
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

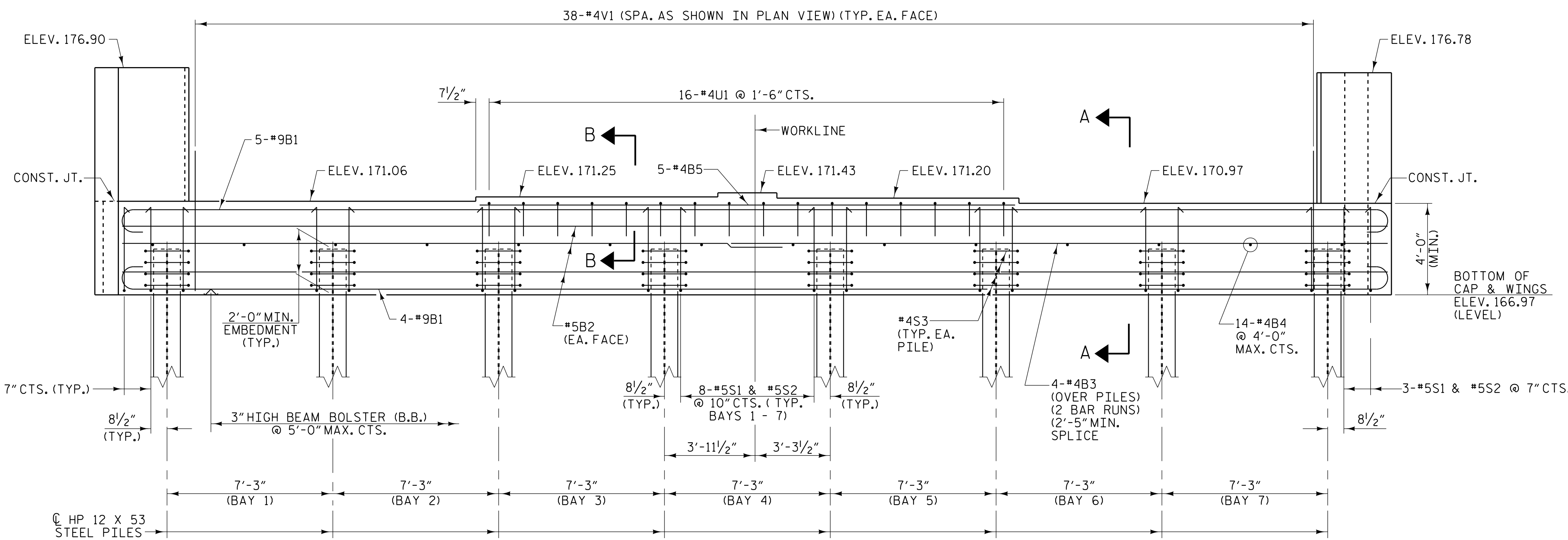
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

5/10/2022

DRAWN BY : W. B. ALLEN DATE : 3/21
 CHECKED BY : G. F. WILSON DATE : 9/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21



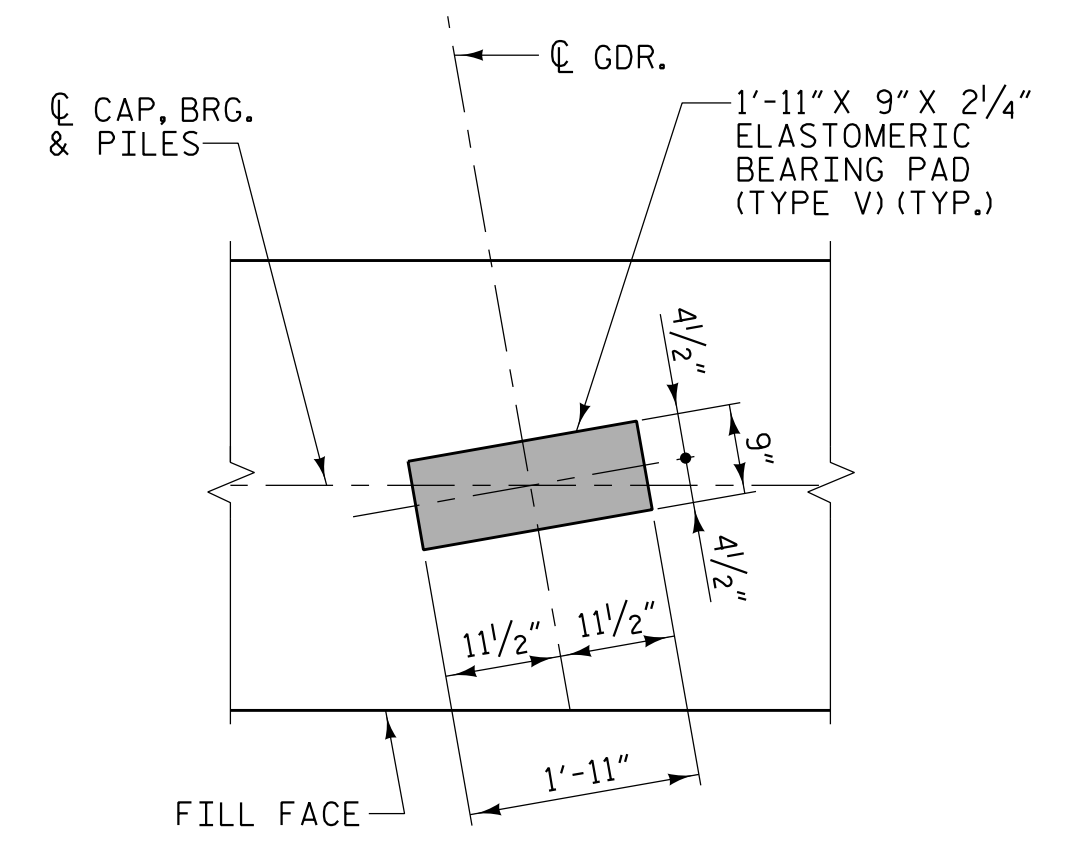
PLAN



ELEVATION

NOTES

- *#4V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN THE CAP.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- *-WINGWALL EXTENSION DISTANCE TO BE FIELD ADJUSTED AS REQUIRED TO PROVIDE FOR A 1" EXP. JT. BETWEEN THE MSE WALL COPING AND THE EXTENDED WINGWALL.
- FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.
- SEE "GENERAL DRAWING FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.
- FOR TEMPORARY DRAINAGE AT END BENT DETAIL SEE "SUBSTRUCTURE INTEGRAL END BENT 1" SHEET 3 OF 3.
- FOR PILE SPLICE DETAILS, SEE "SUBSTRUCTURE INTEGRAL END BENT 2" SHEET 3 OF 3.



DETAIL "A"
(TYP. EACH GIRDER)

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 41+19.02 -Y1A- POT

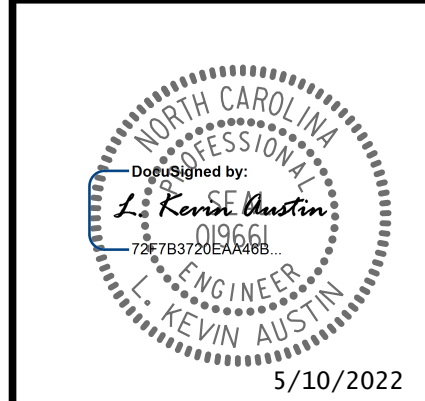
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1

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1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

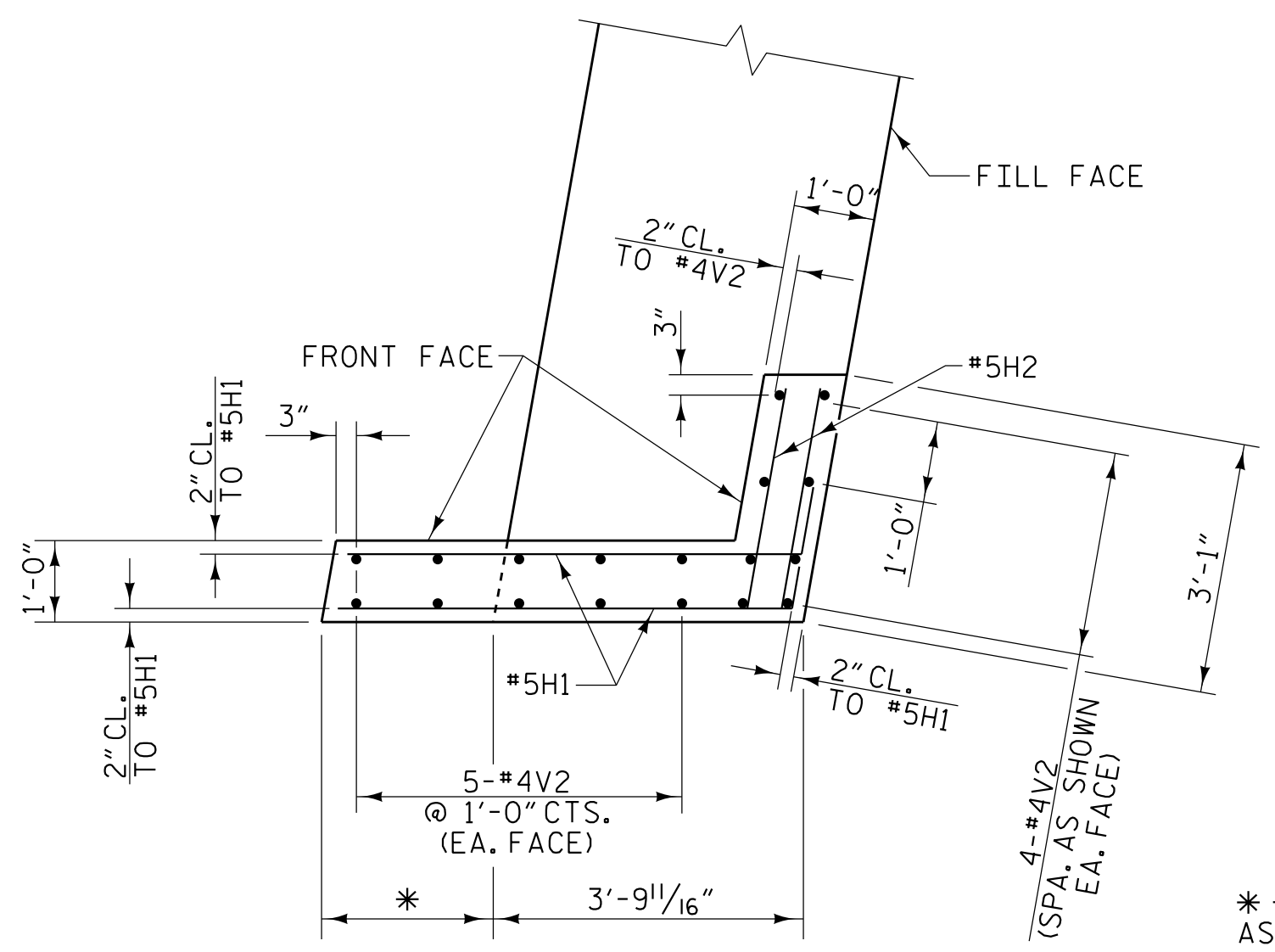
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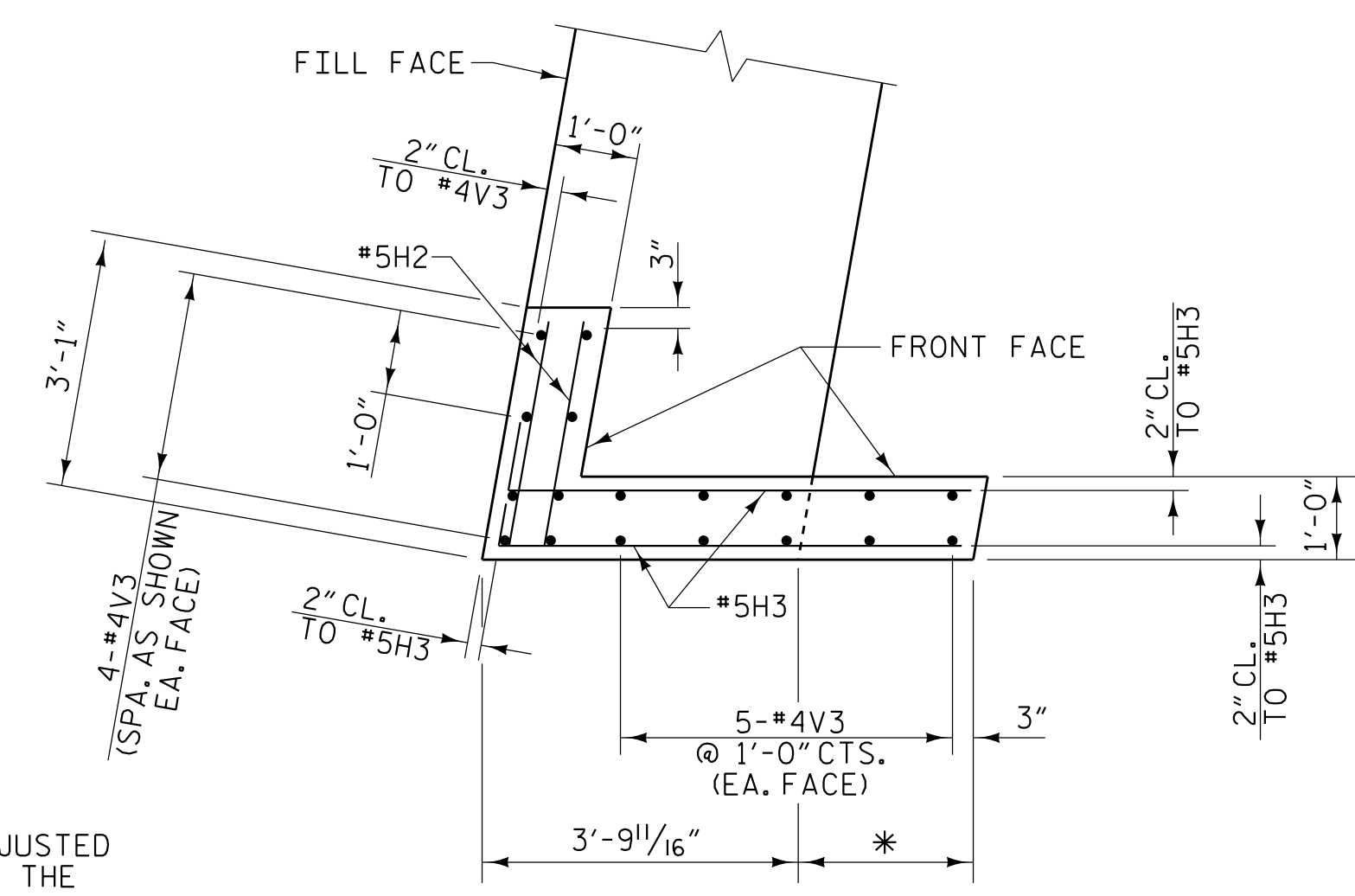
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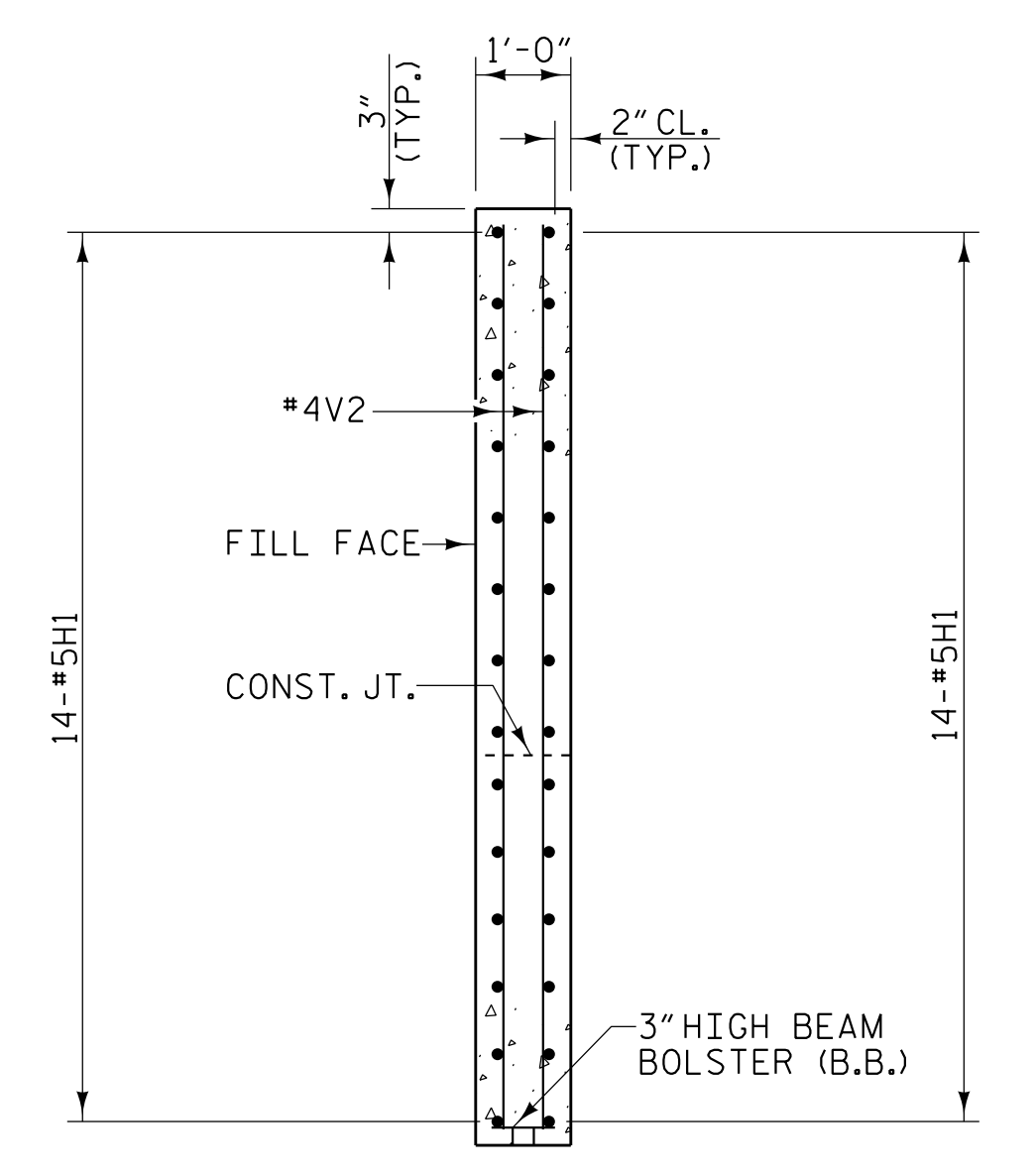
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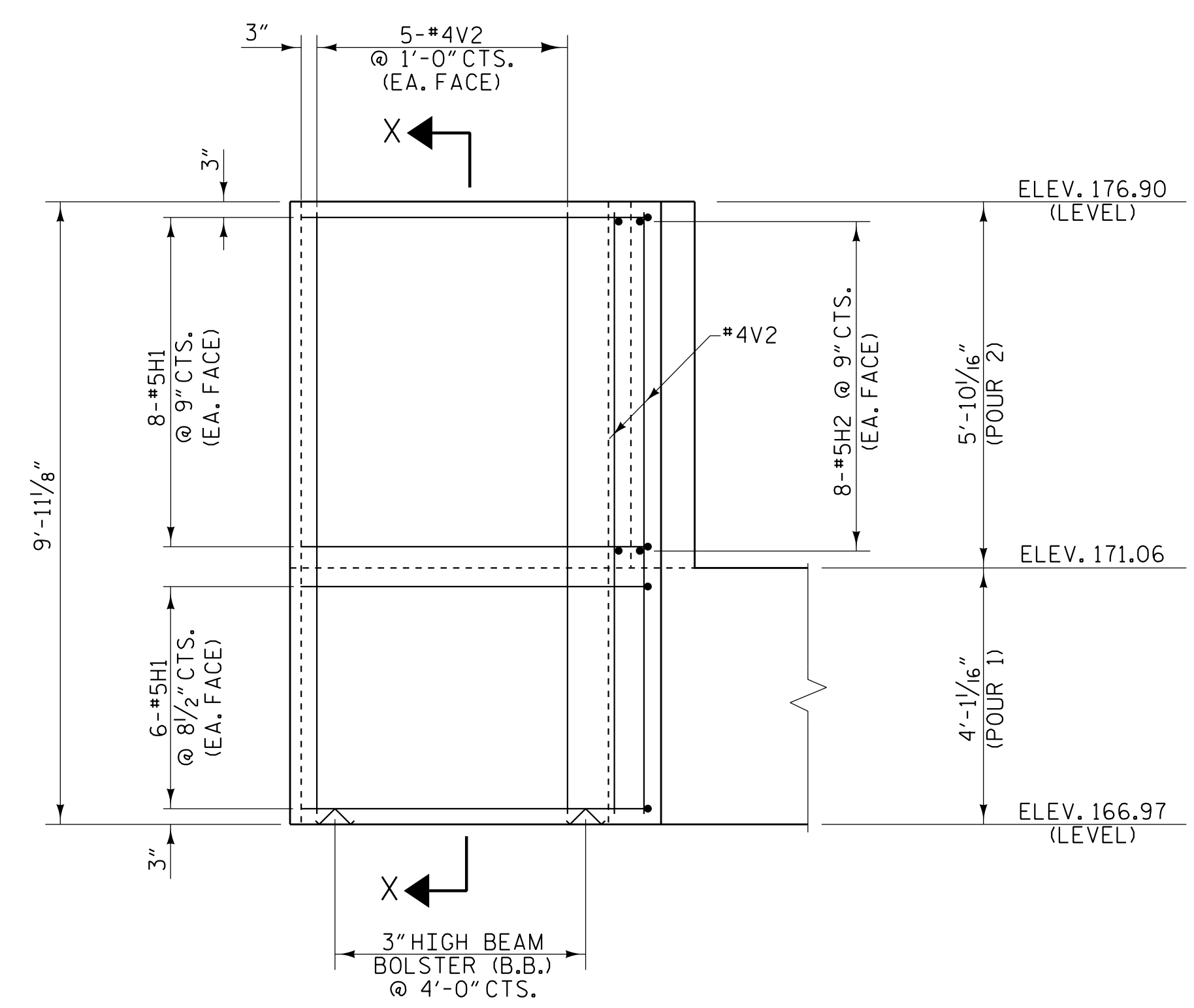
PLAN OF LEFT WING - W1



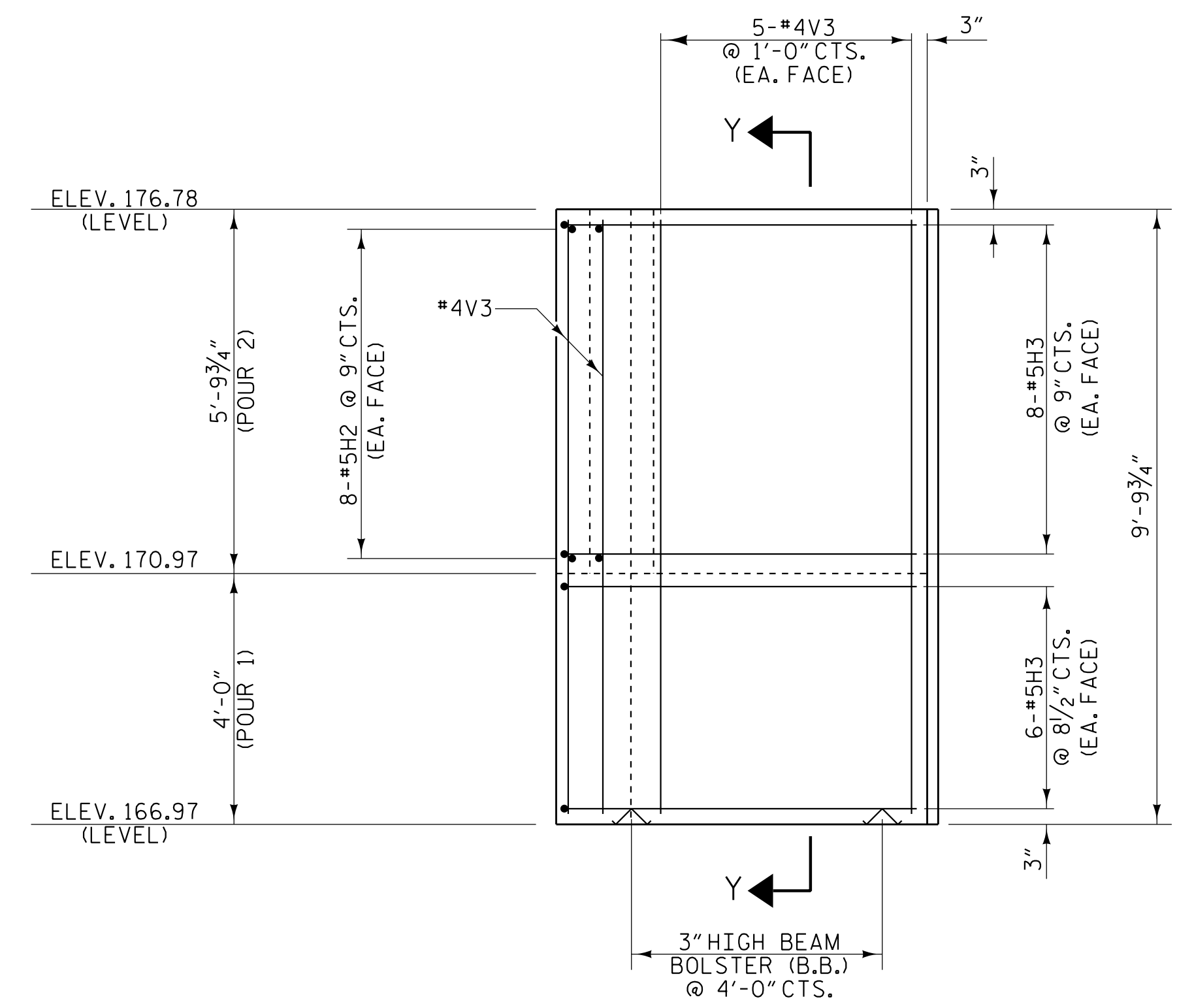
PLAN OF RIGHT WING - W2



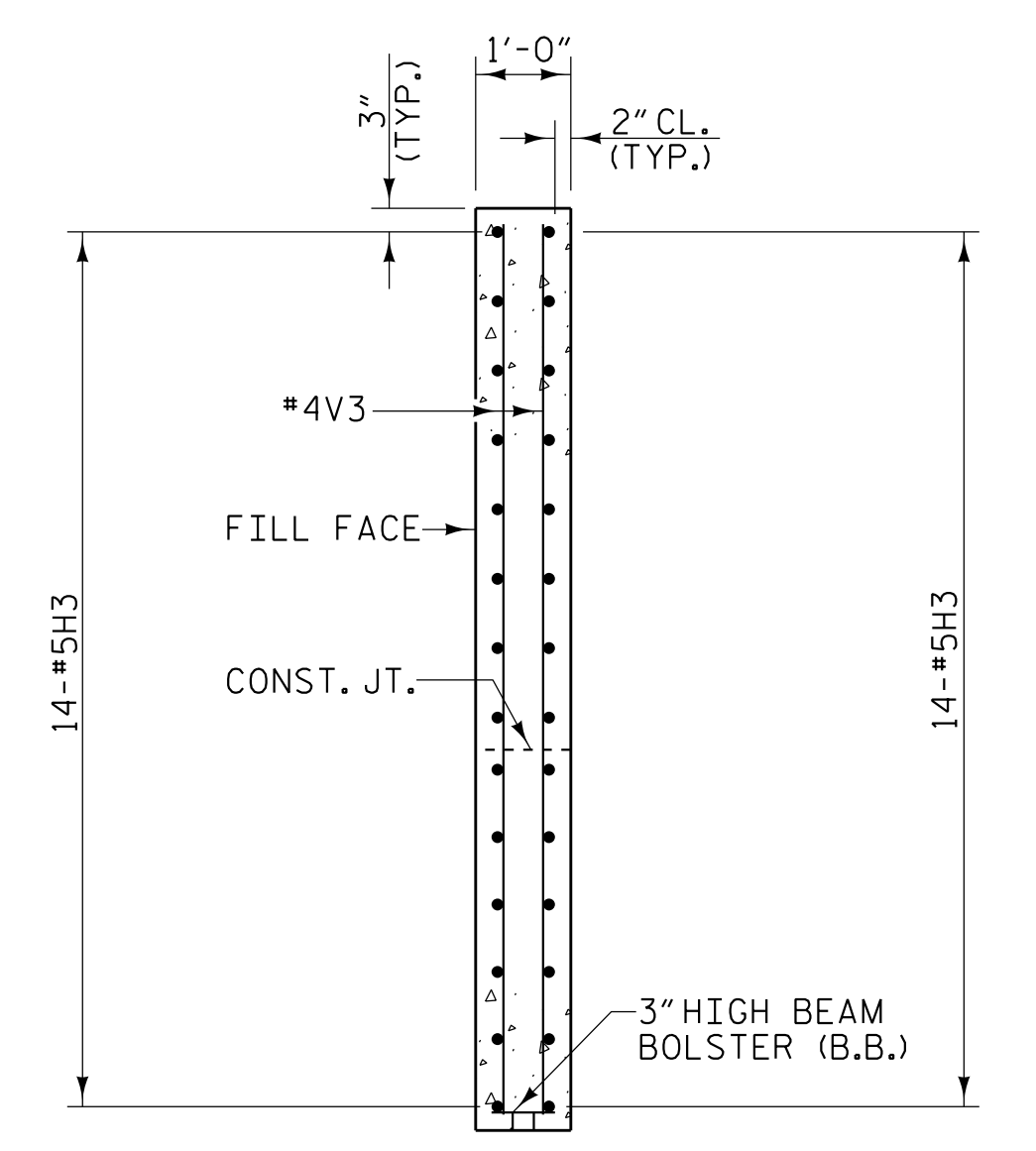
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 3

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

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1			3			TOTAL SHEETS
2			4			31

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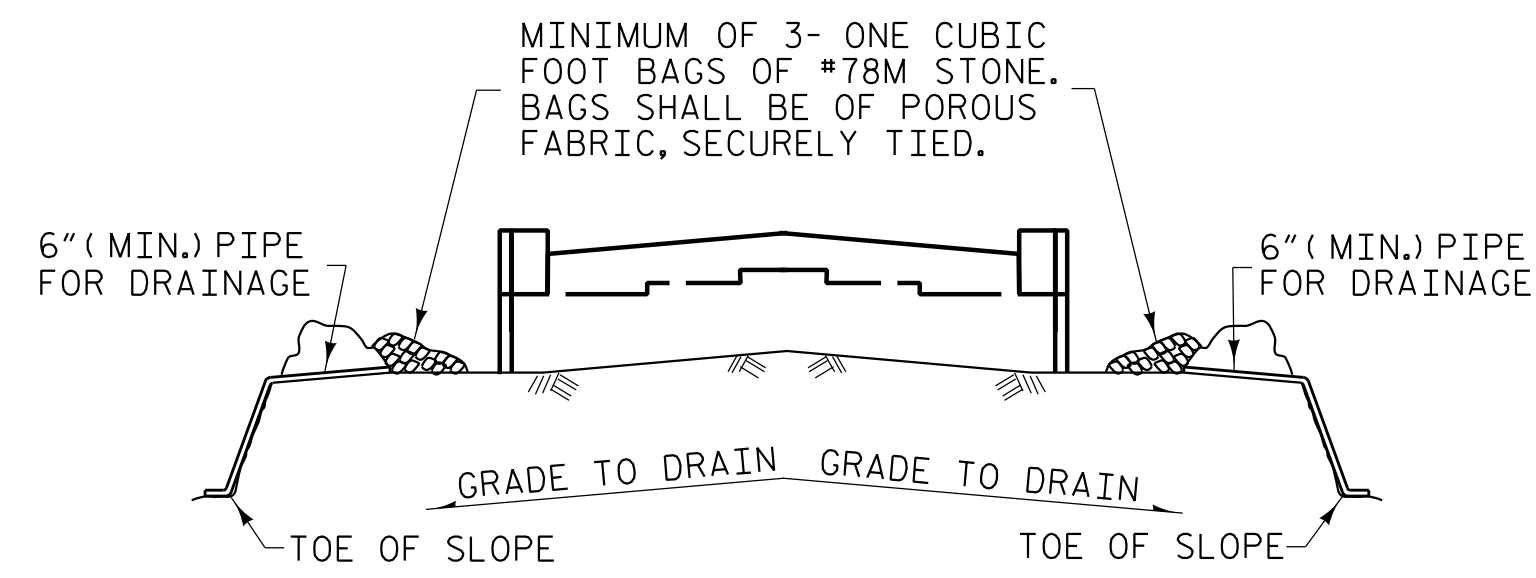
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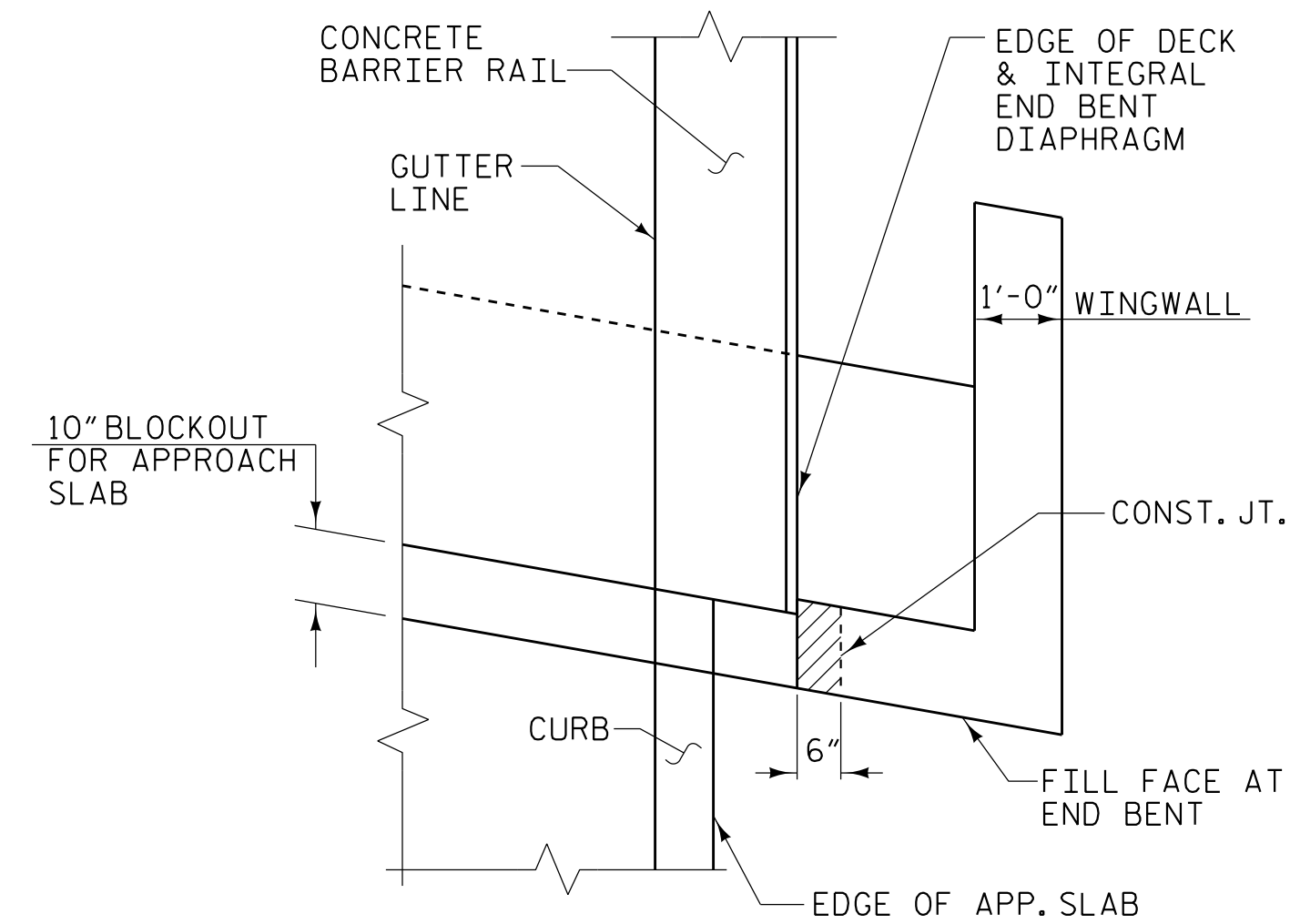


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

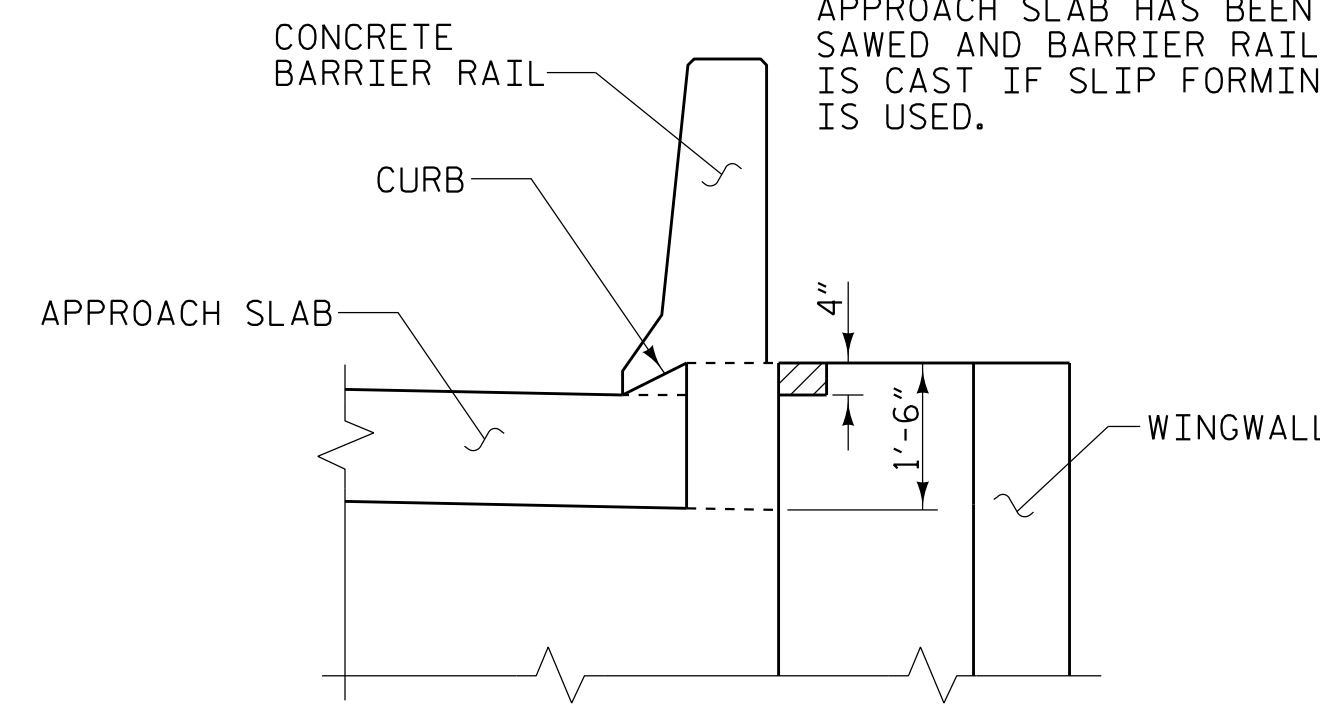
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PLAN

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

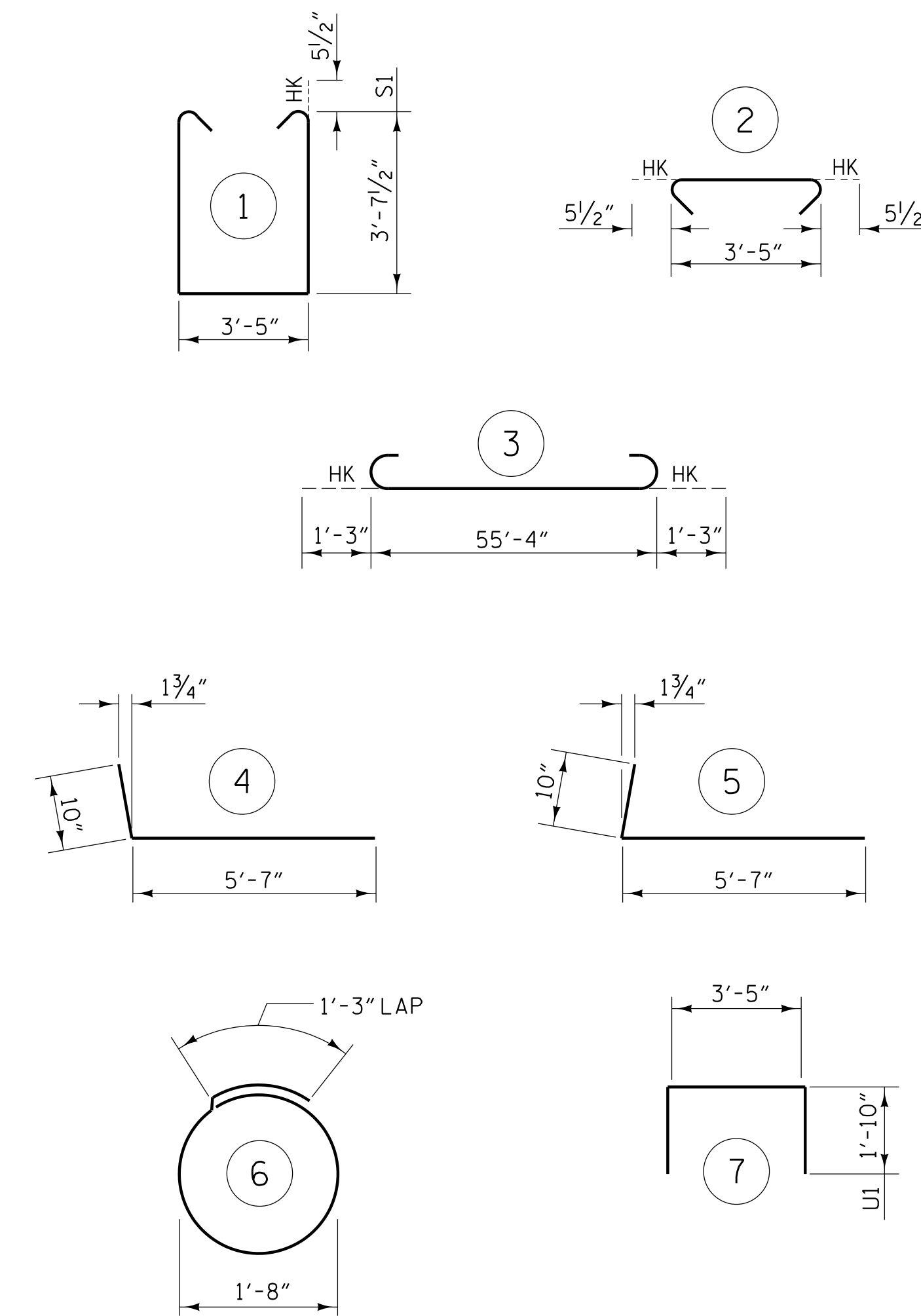


ELEVATION

WINGWALL BLOCKOUT

(RIGHT WINGWALL SHOWN, LEFT WINGWALL SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	3	57'-10"	1770
B2	6	#5	STR	55'-4"	346
B3	8	#4	STR	28'-11"	155
B4	14	#4	STR	3'-5"	32
B5	5	#4	STR	23'-5"	78
H1	28	#5	4	6'-5"	187
H2	32	#5	STR	2'-9"	92
H3	28	#5	5	6'-5"	187
S1	62	#5	1	11'-7"	749
S2	62	#5	2	4'-4"	280
S3	32	#4	6	6'-6"	139
U1	16	#4	7	7'-1"	76
V1	76	#4	STR	5'-7"	283
V2	18	#4	STR	9'-6"	114
V3	18	#4	STR	9'-4"	112

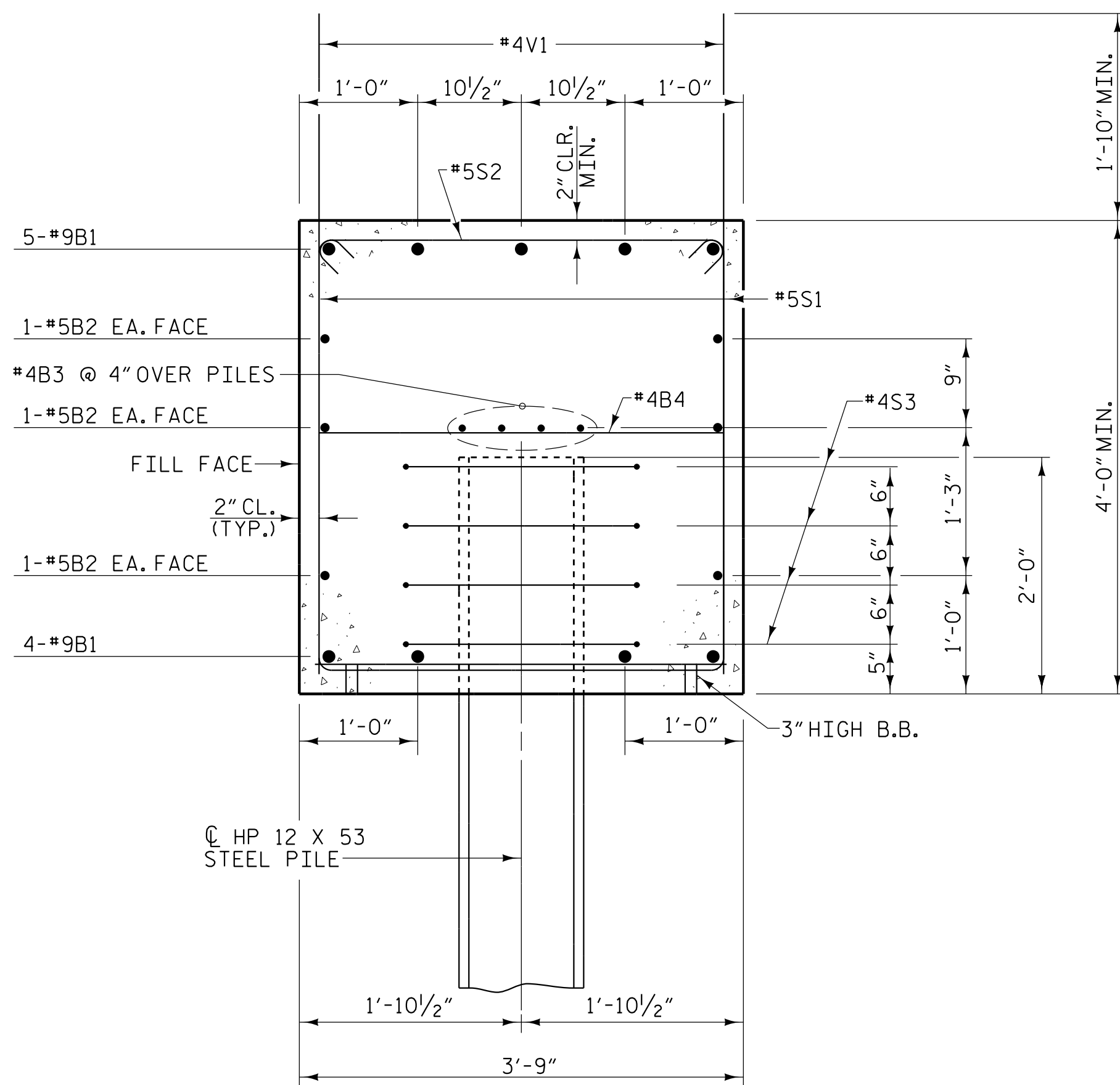
TOTAL REINFORCING STEEL 4600 lbs.

CLASS "A" CONCRETE - CU. YARDS

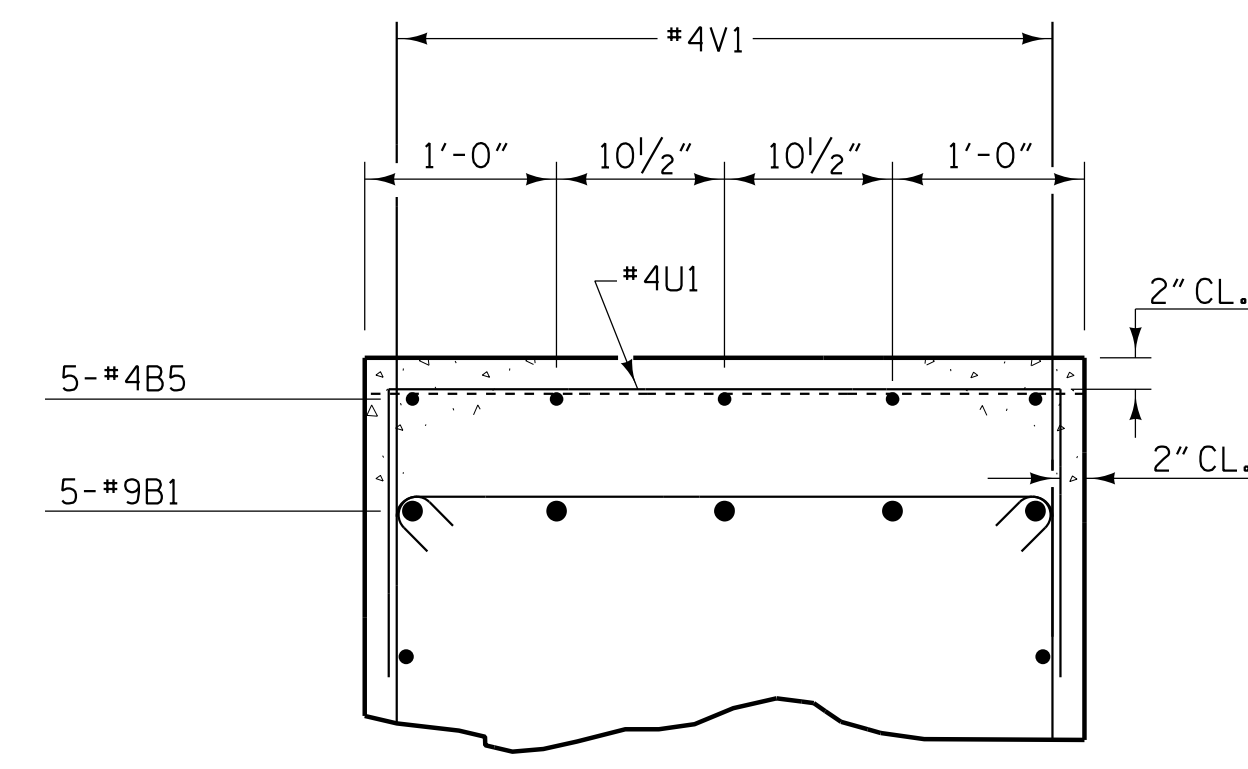
POUR 1 (CAP & LOWER WINGS) 32.7 cu. yds.

POUR 2 (UPPER WINGS) 3.4 cu. yds.

TOTAL 36.1 cu. yds.



SECTION A-A



PART SECTION B-B

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Professional Engineer Seal for Kevin Austin, State of North Carolina, License No. 7832.

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 41+19.02 -Y1A- POT

SHEET 3 OF 3

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

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SHEET NO.

S2-23

TOTAL SHEETS 31

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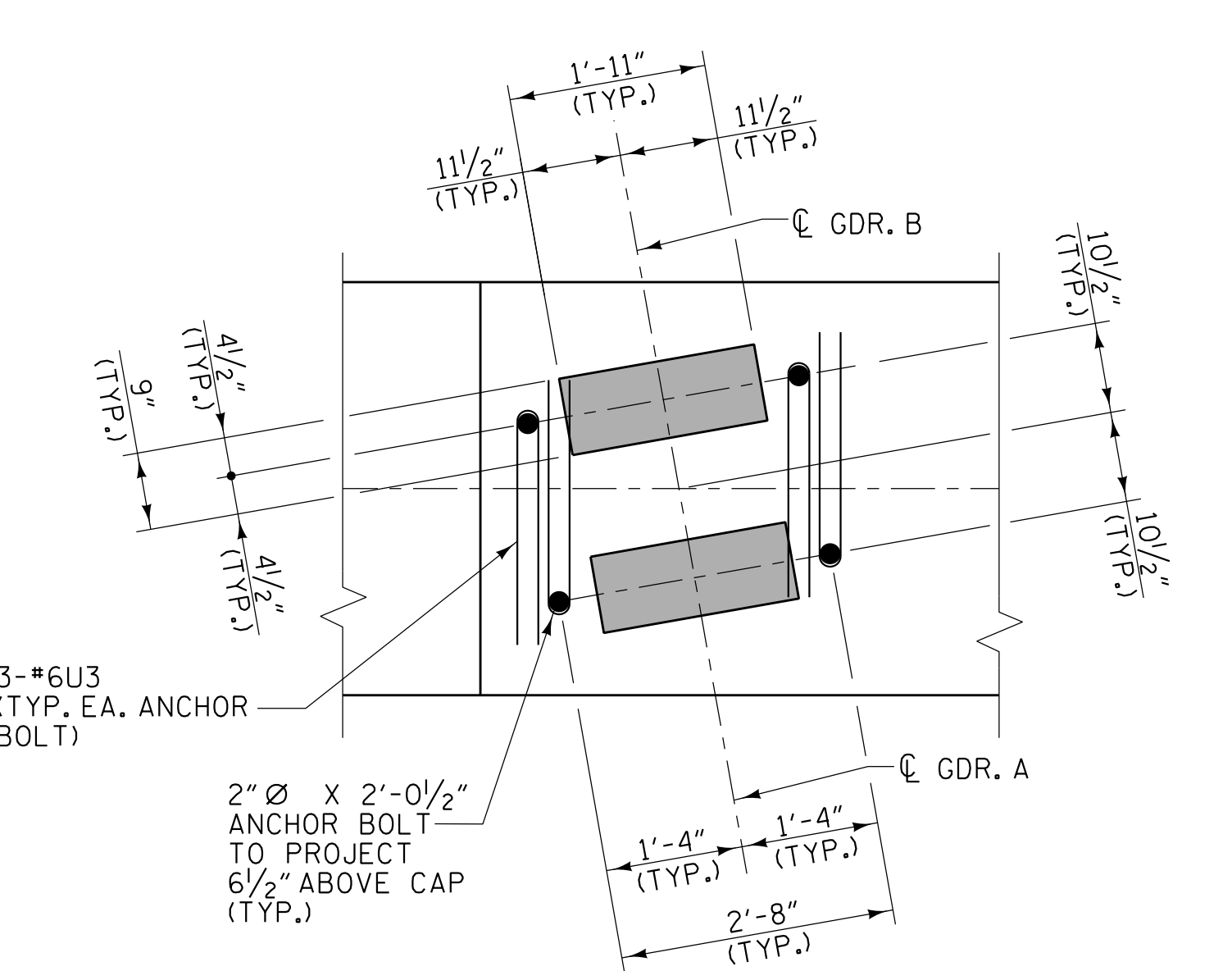
NOTES

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

LONGITUDINAL REINFORCING STEEL IN THE COLUMN SHALL BE SPLICED USING MECHANICAL BUTT SPLICES WHERE SHOWN IN THE ELEVATION VIEW. ADJACENT SPLICES TO BE OFFSET 2'-0". MECHANICAL BUTT SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. MECHANICAL BUTT SPLICES SHALL BE SUBMITTED FOR APPROVAL. NO EXTRA PAYMENT WILL BE MADE FOR USING MECHANICAL BUTT SPLICES OR MODIFYING BAR LENGTHS. THE COST WILL BE INCIDENTAL TO REINFORCING STEEL.

NO LAP SPLICES ALLOWED.



DETAIL "A"
(TYP. EACH GIRDER)

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ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

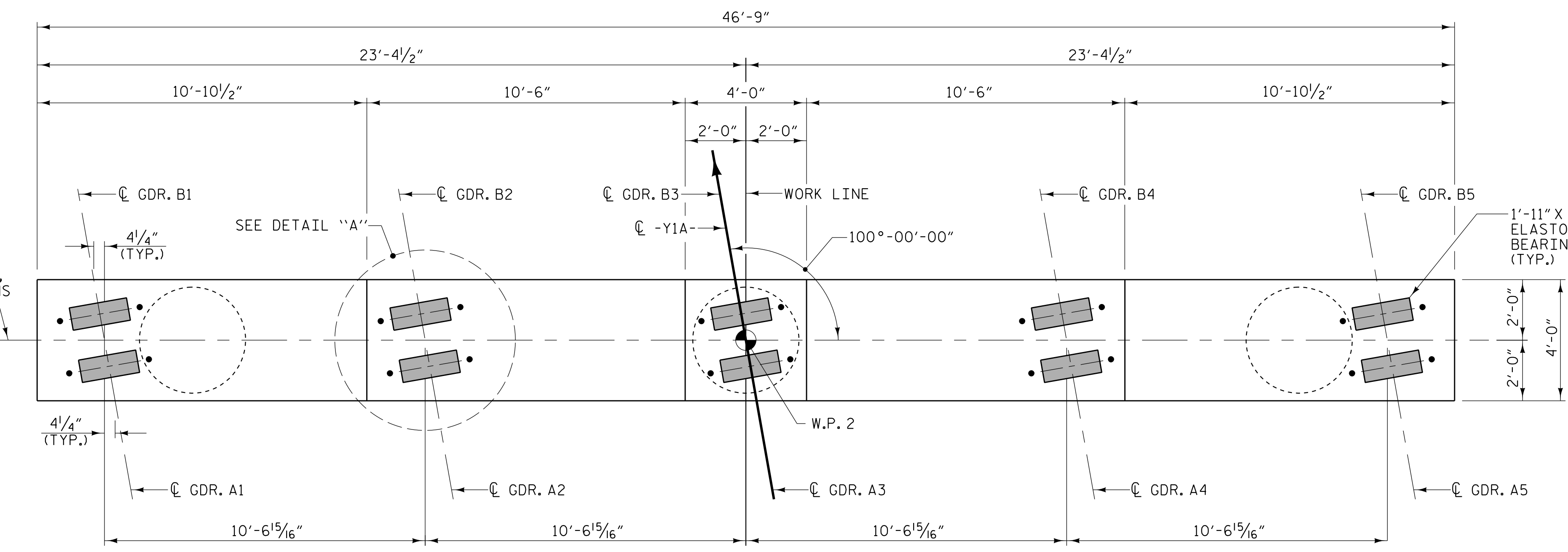
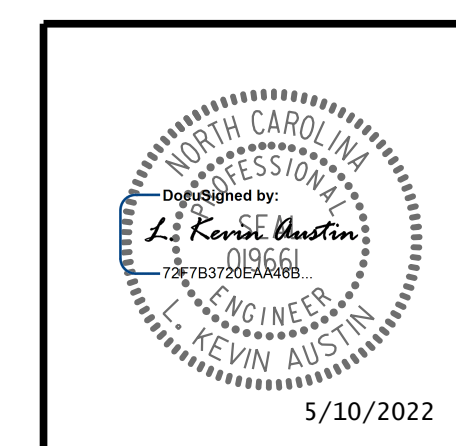
SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 1**

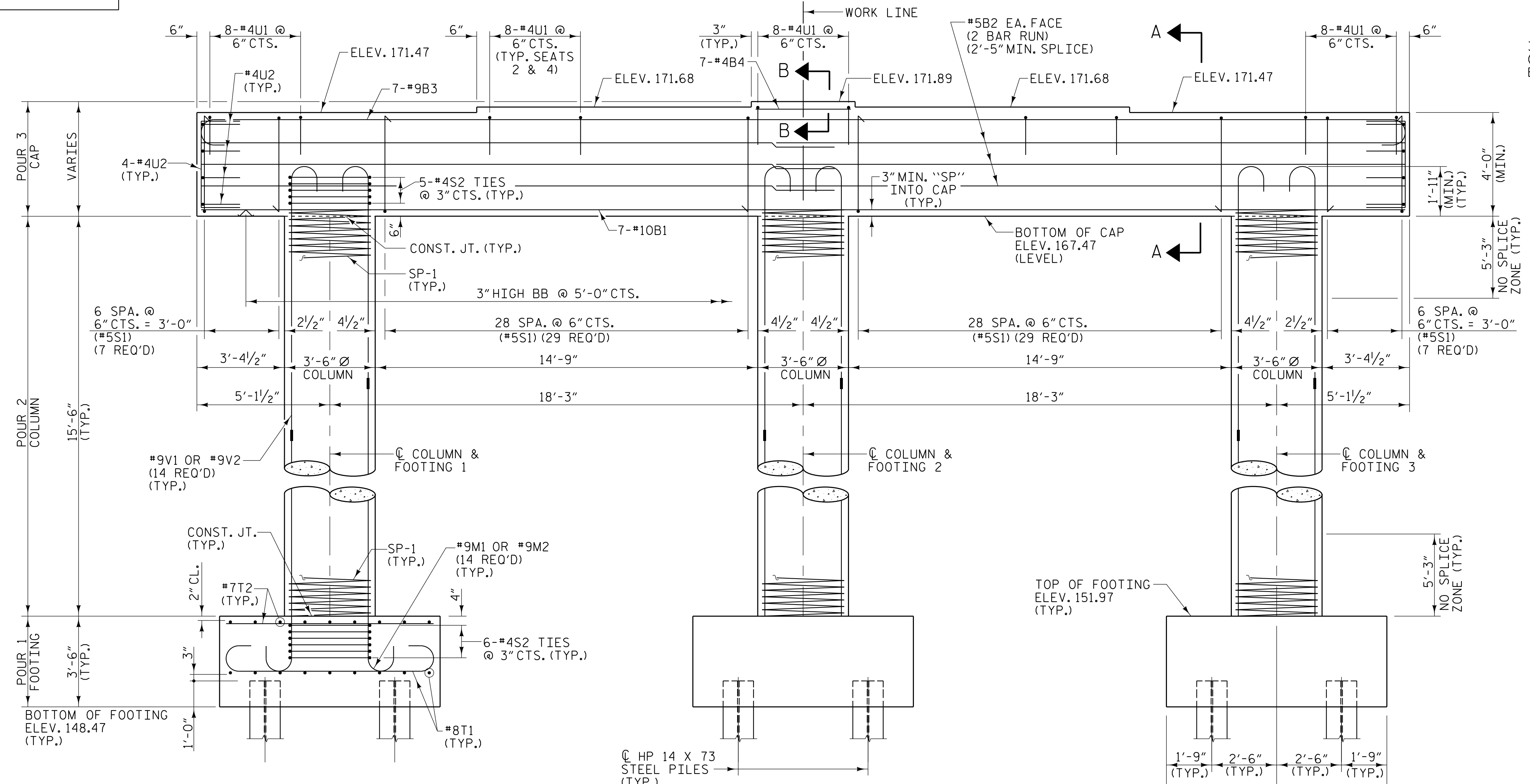
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. **S2-24**
 TOTAL SHEETS 31



PLAN

INVERT ALTERNATE
#5S1 STIRRUPS

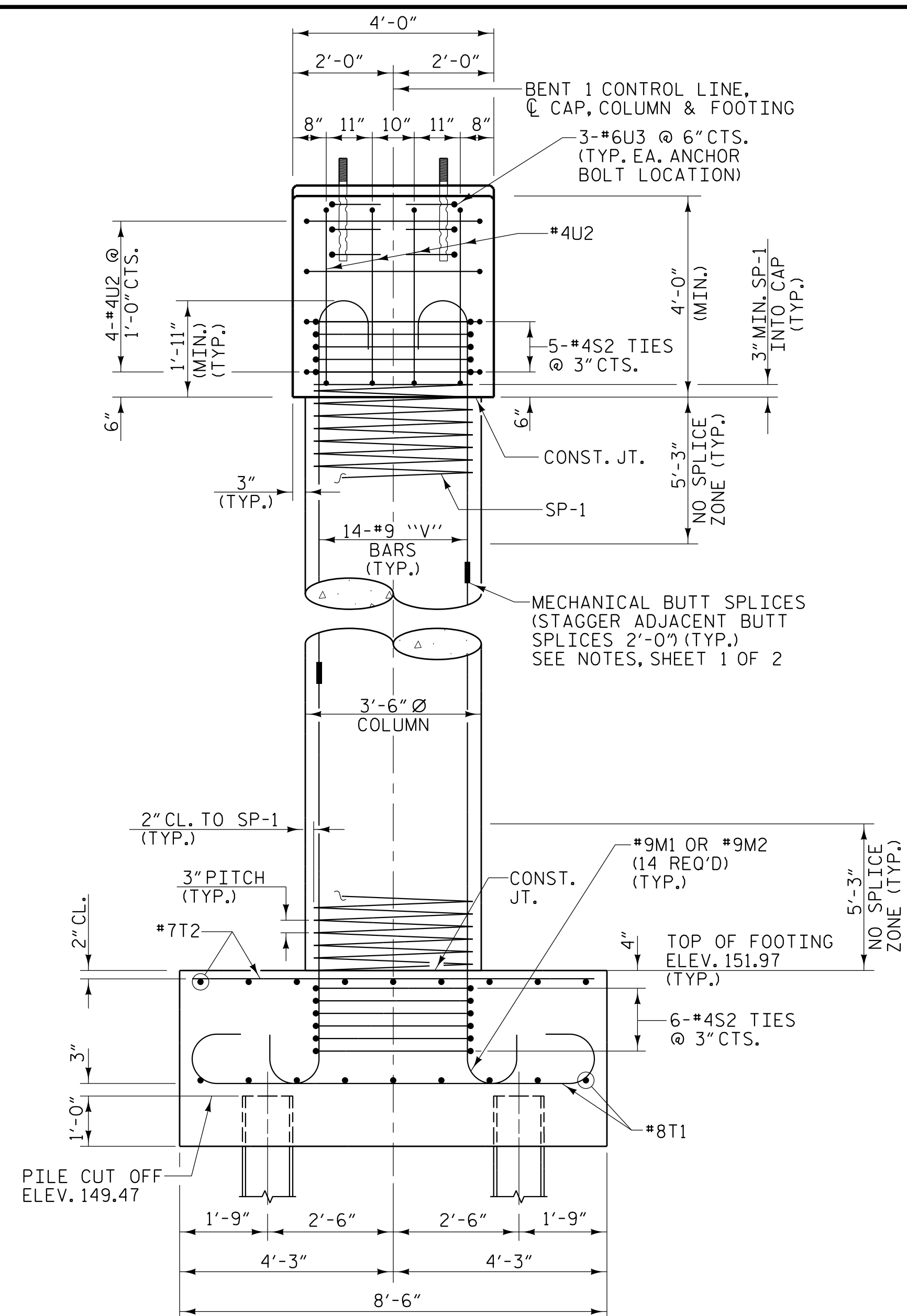


ELEVATION

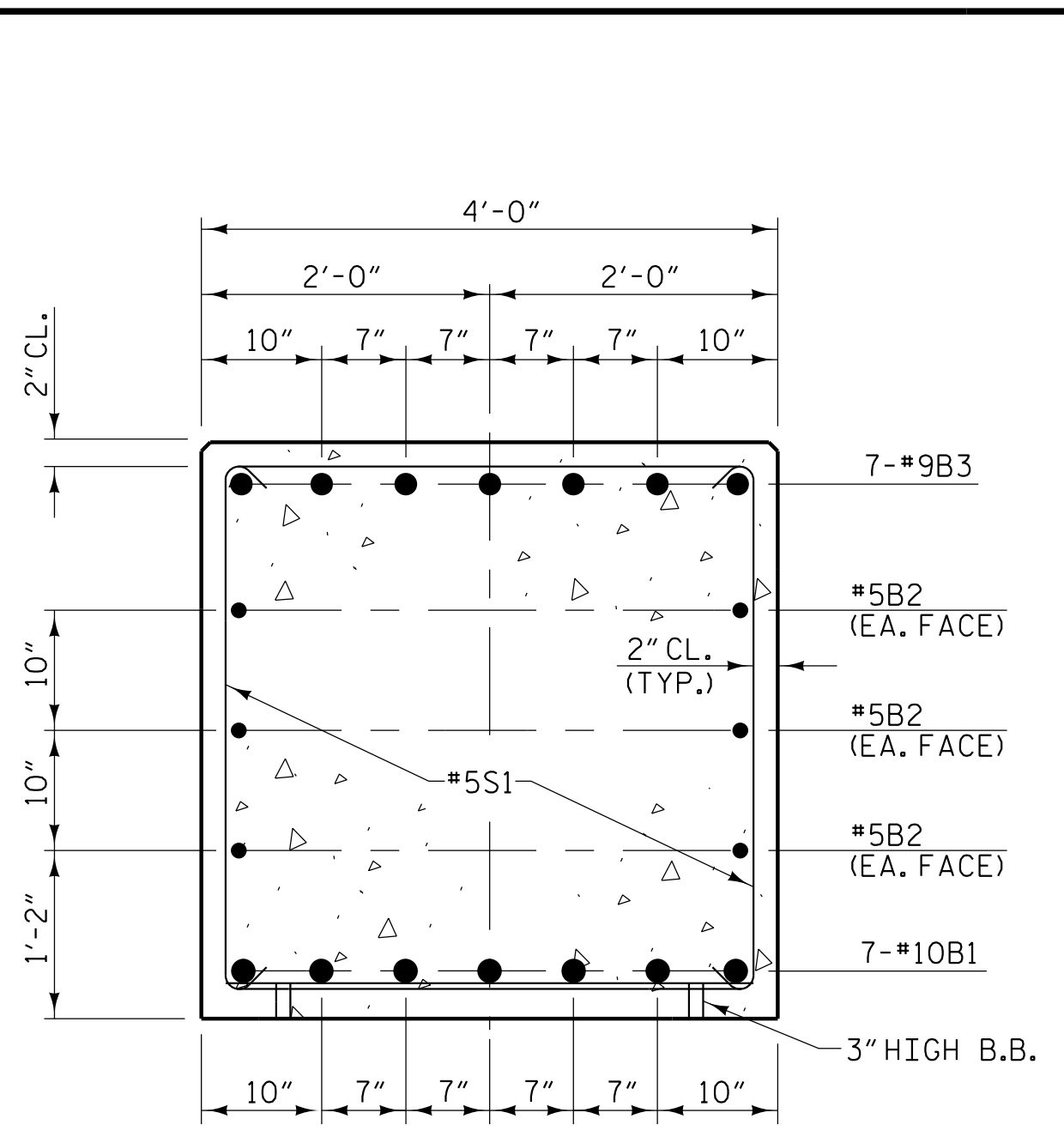
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 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

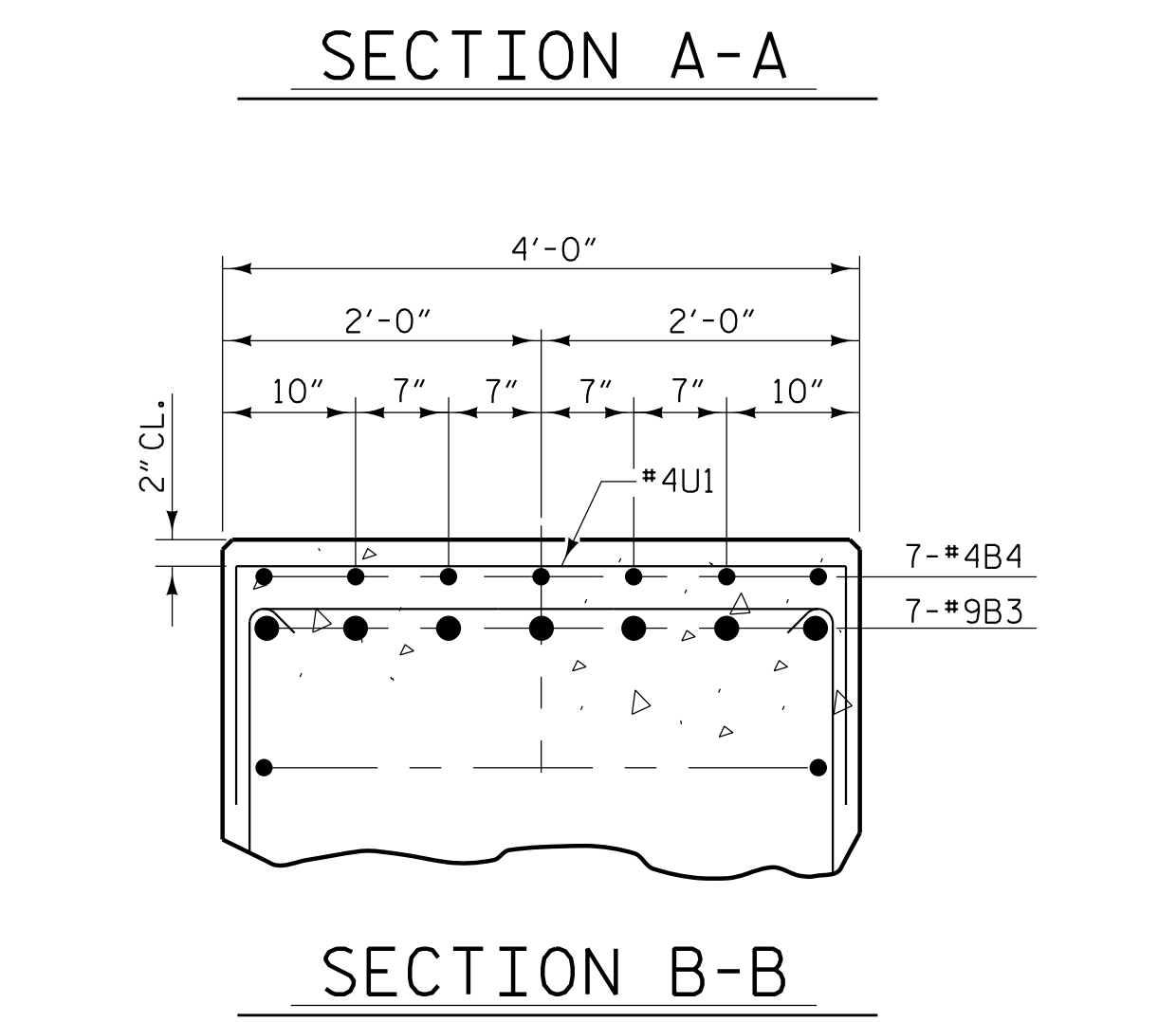
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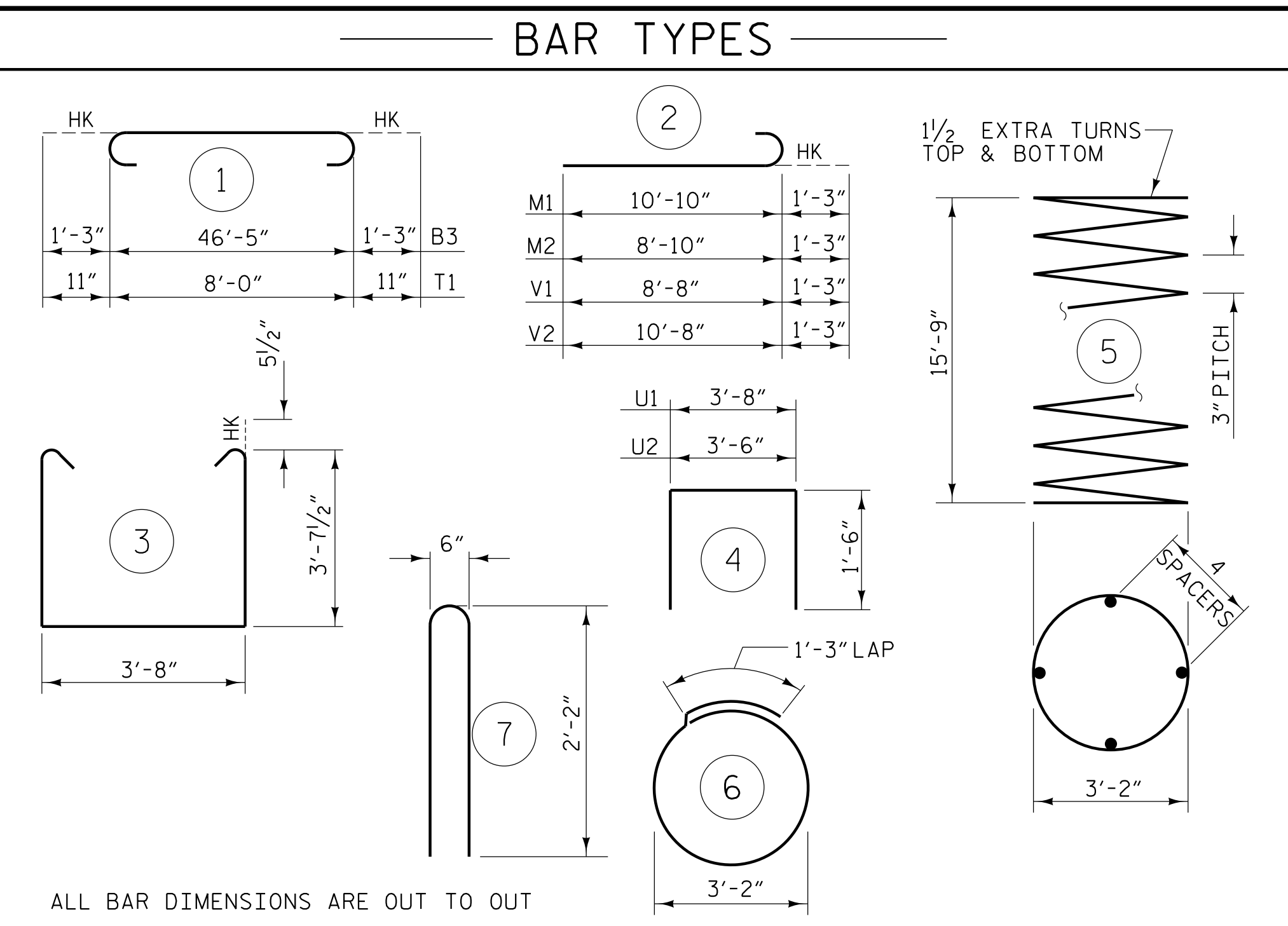
END ELEVATION



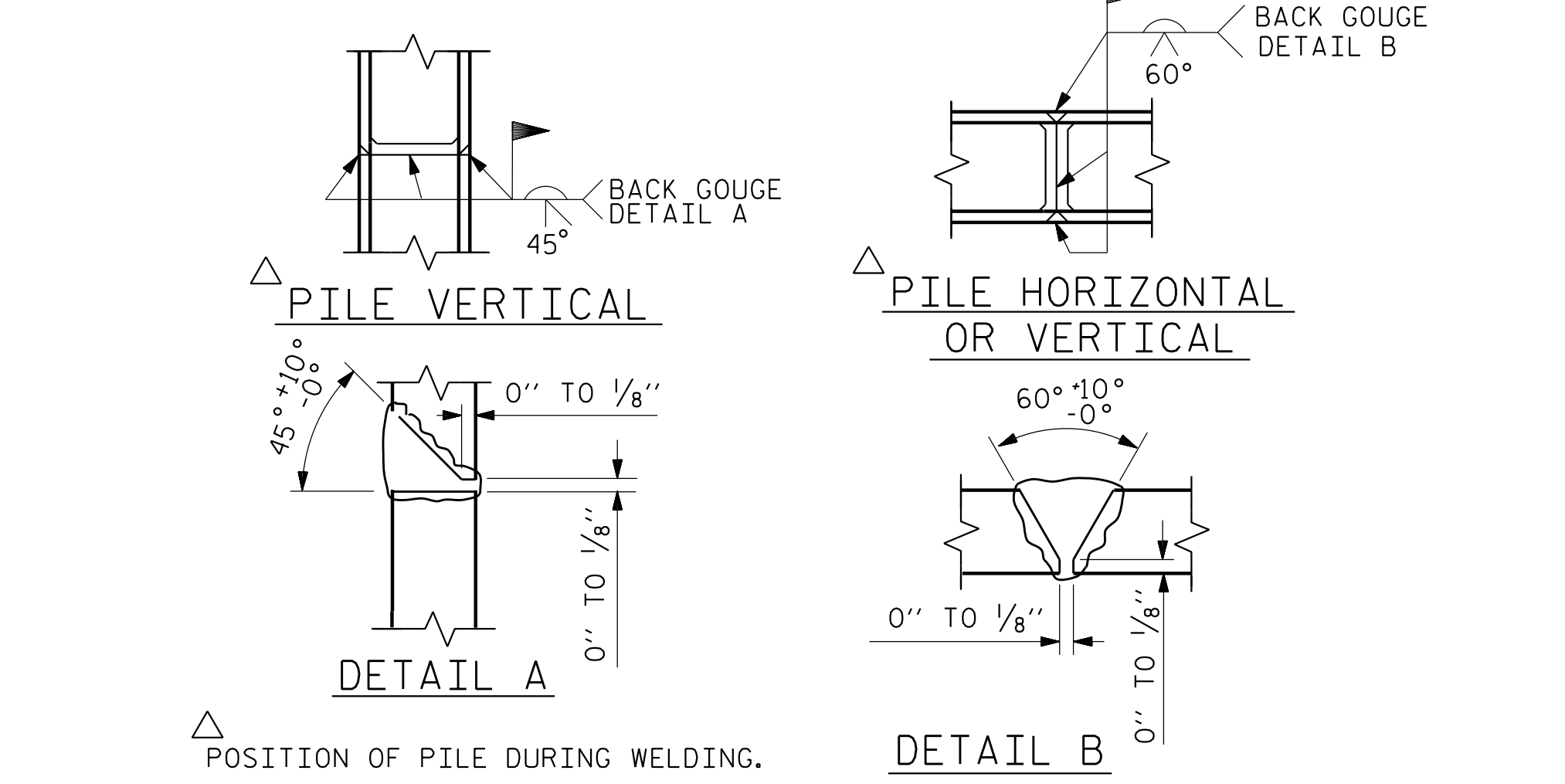
SECTION A-A



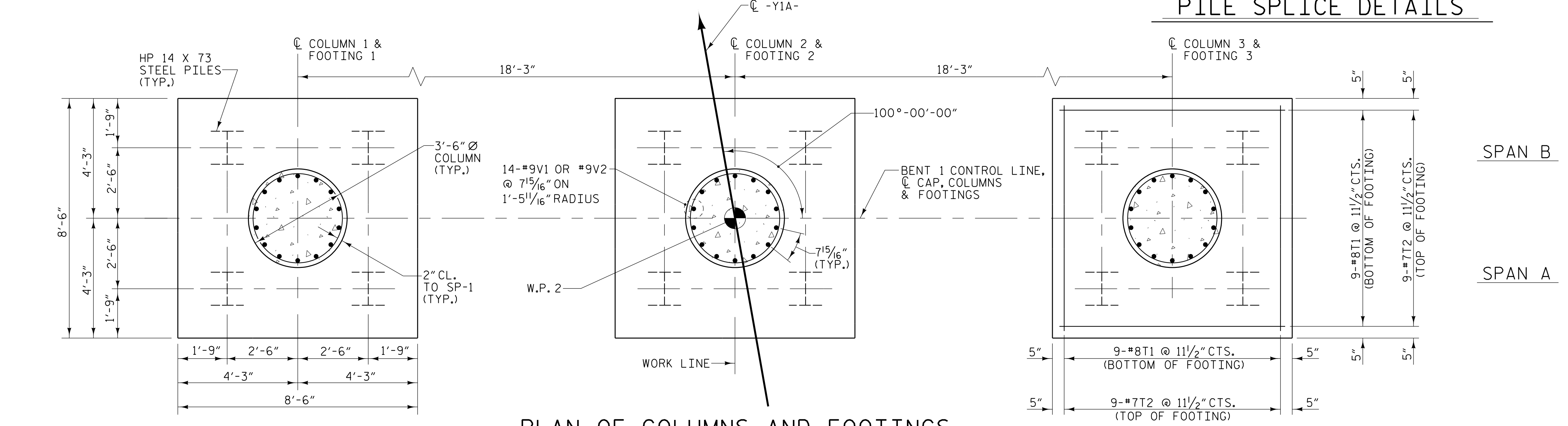
SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT
 ** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.



PILE SPLICE DETAILS



PLAN OF COLUMNS AND FOOTINGS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING)

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	46'-5"	1398
B2	12	#5	STR	24'-5"	306
B3	7	#9	1	48'-11"	1164
B4	7	#4	STR	3'-8"	17
M1	21	#9	2	12'-1"	863
M2	21	#9	2	10'-1"	720
S1	72	#5	3	11'-10"	889
S2	33	#4	6	11'-3"	248
U1	40	#4	4	6'-8"	178
U2	16	#4	4	6'-6"	69
U3	60	#6	7	4'-10"	436
V1	21	#9	2	9'-11"	708
V2	21	#9	2	11'-11"	851
T1	54	#8	1	9'-10"	1418
T2	54	#7	STR	8'-0"	883

TOTAL REINFORCING STEEL					10148 lbs.
SPIRAL COLUMN REINFORCING STEEL (SP)					
SP-1	3	**	5	646'-0"	2021
TOTAL SPIRAL COLUMN REINFORCING STEEL					2021 lbs.
CLASS "A" CONCRETE - CU. YARDS					
POUR 1 - FOOTINGS				28.1 CU. YDS.	
POUR 2 - COLUMNS				16.6 CU. YDS.	
POUR 3 - CAP				28.6 CU. YDS.	
TOTAL CLASS "A" CONCRETE					73.3 CU. YDS.

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SHEET 2 OF 2

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 RALEIGH

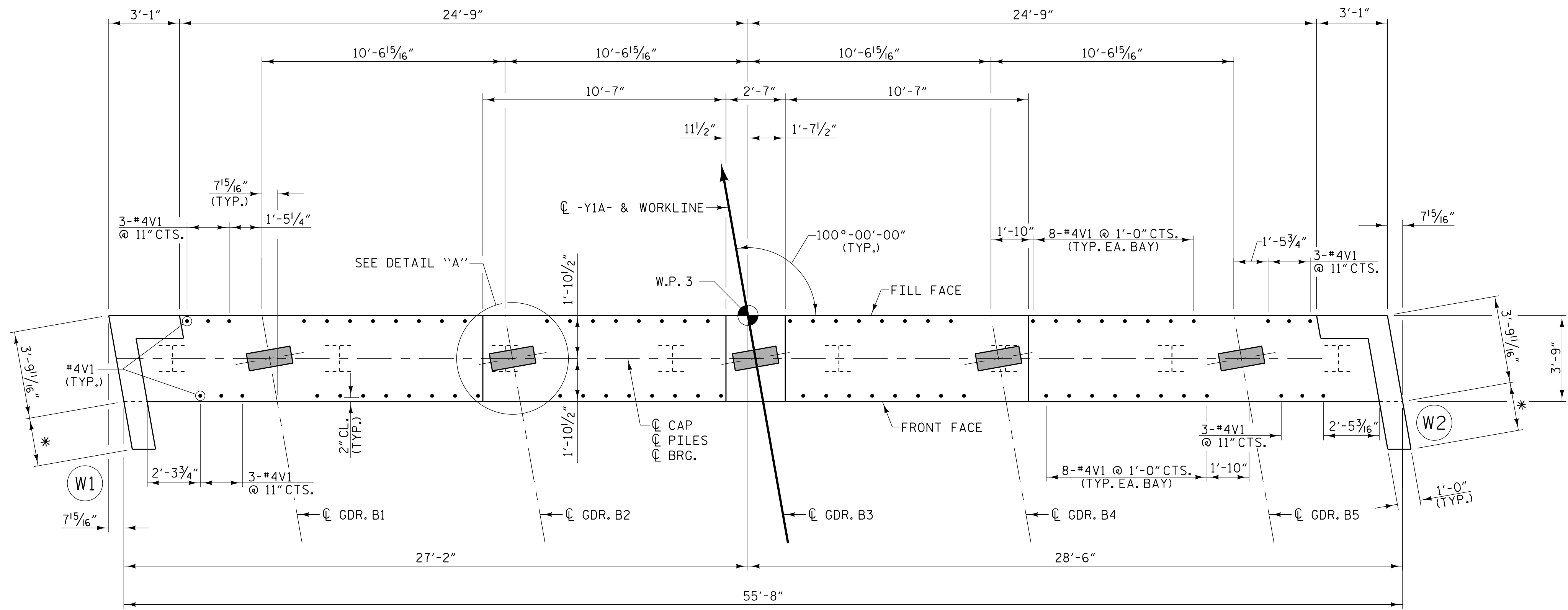
SUBSTRUCTURE
 BENT 1

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2			4			

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PLAN

NOTES

#4V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN THE CAP.

THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

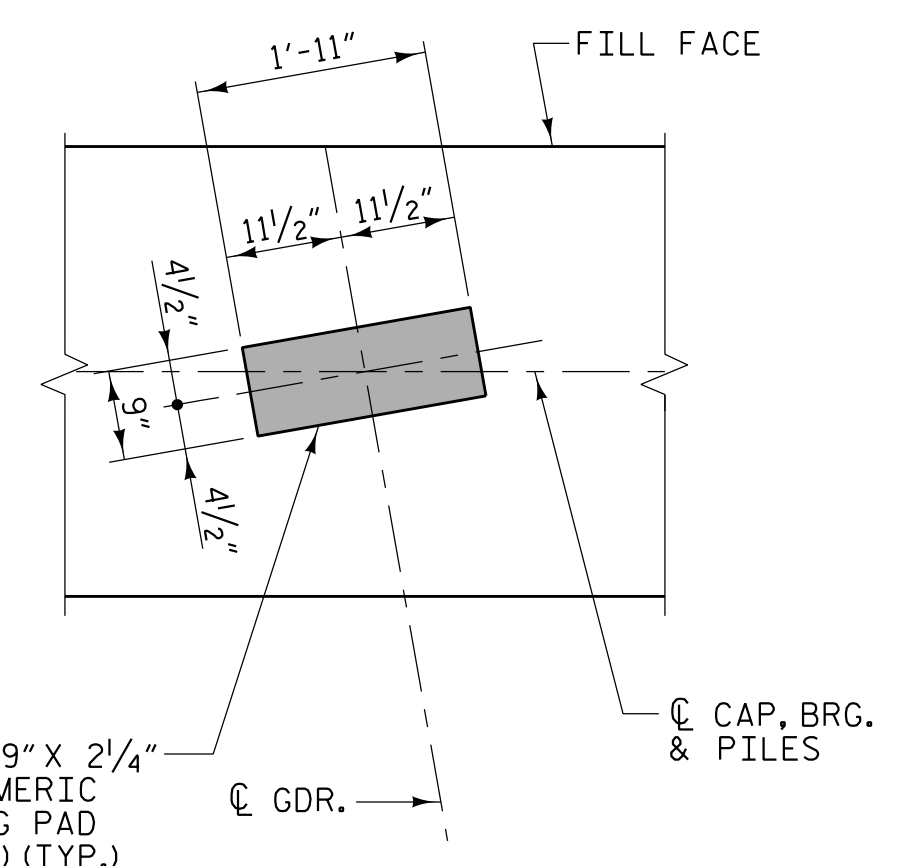
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FOR SECTION A-A AND SECTION B-B, SEE SHEET 3 OF 3.

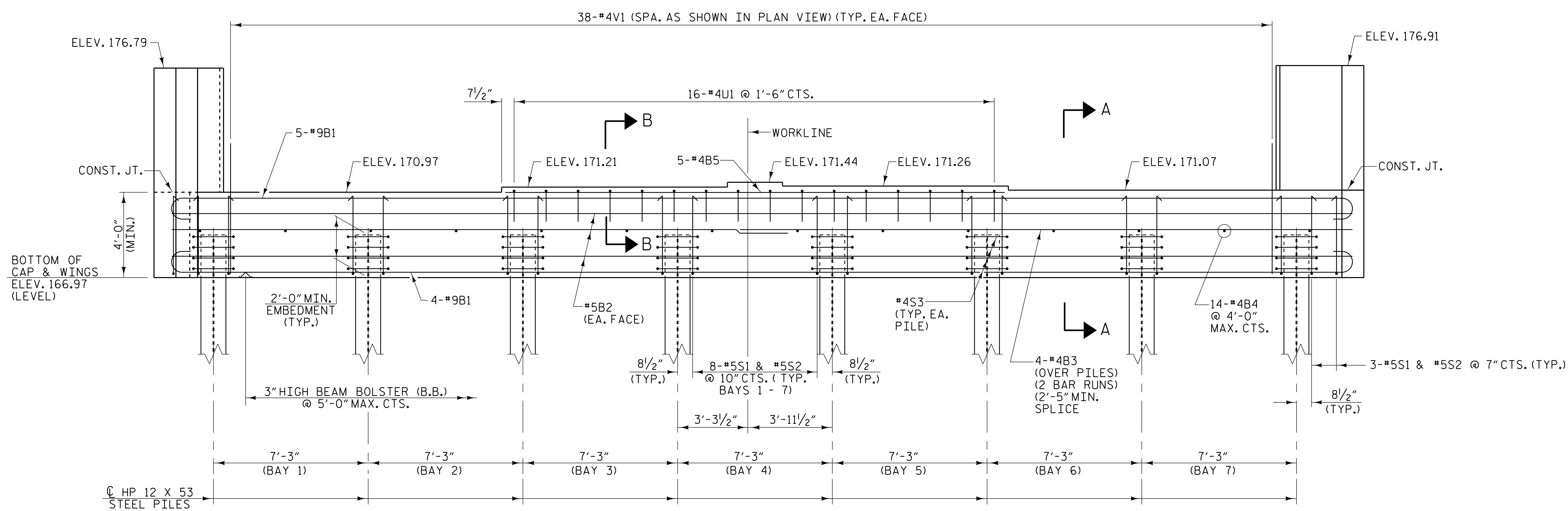
SEE "GENERAL DRAWING FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL SEE "SUBSTRUCTURE INTEGRAL END BENT 1" SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE "SUBSTRUCTURE INTEGRAL END BENT 2" SHEET 3 OF 3.



DETAIL "A"
(TYP. EACH GIRDER)



ELEVATION

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL END BENT 2

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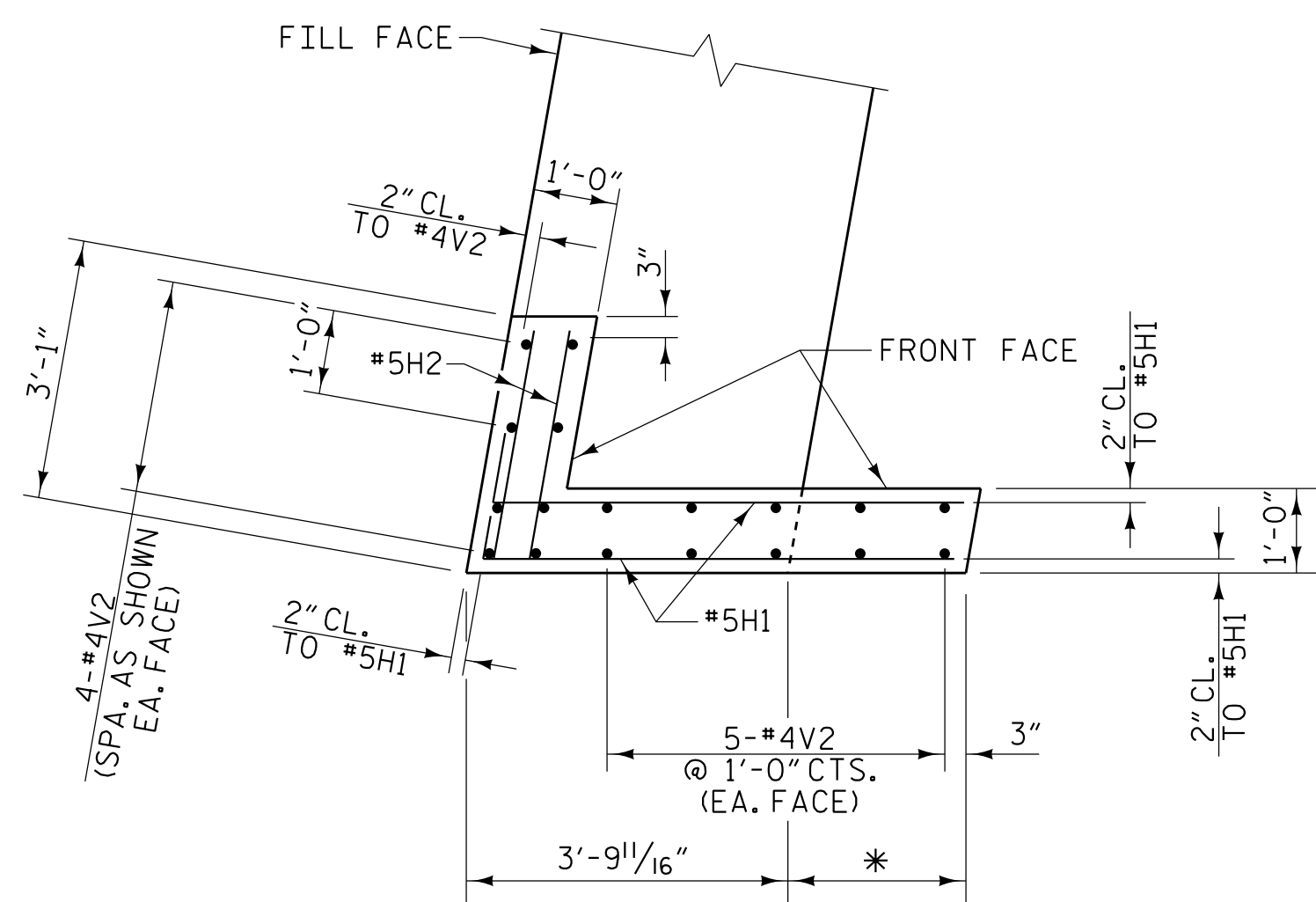


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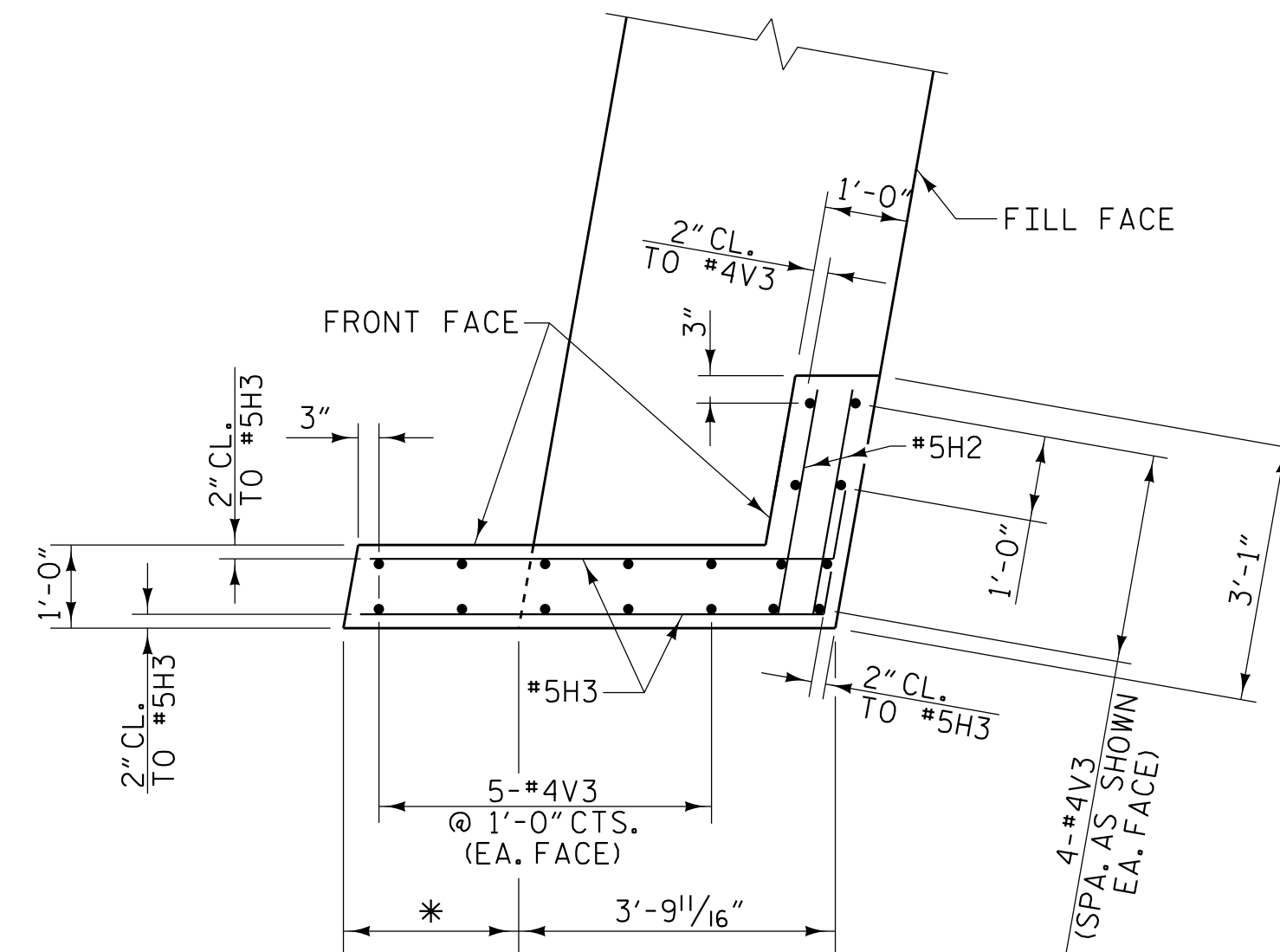
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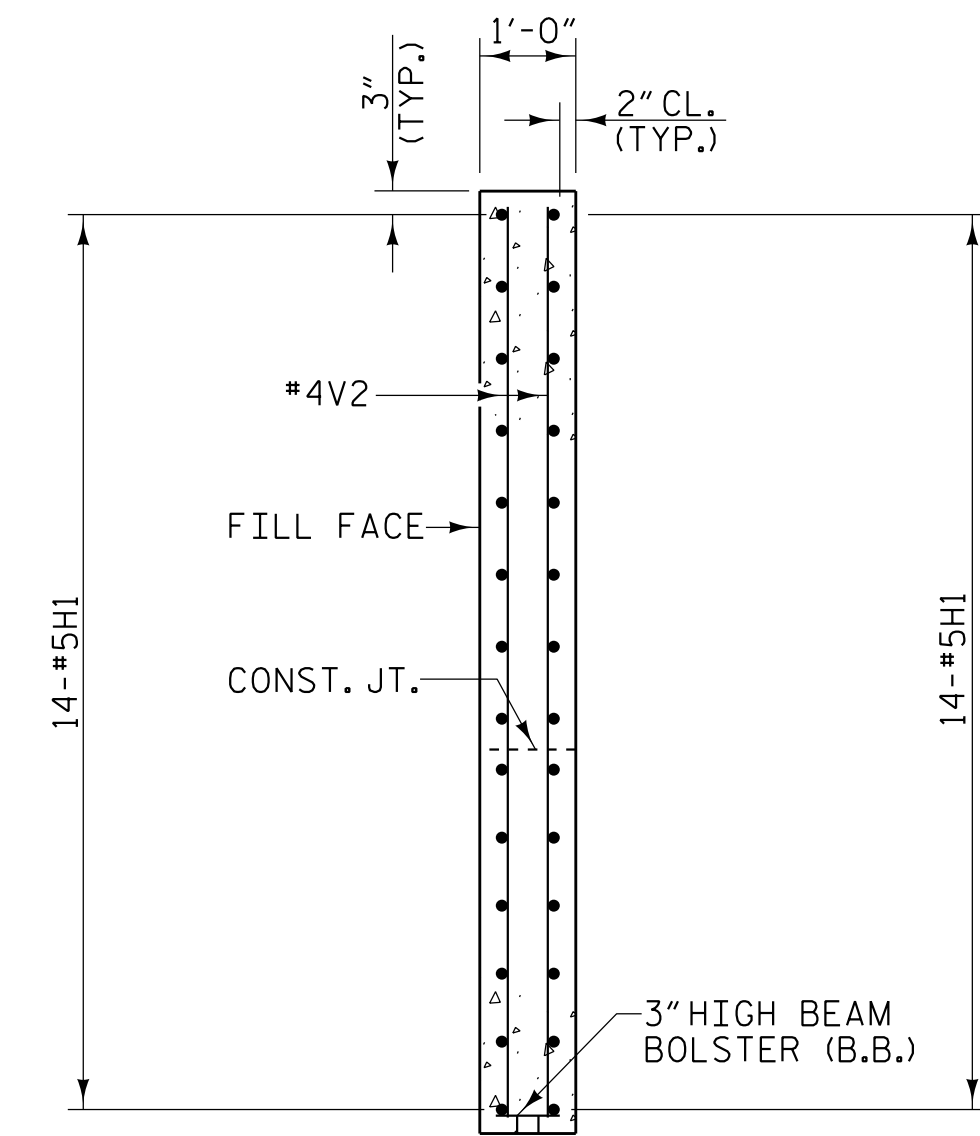


PLAN OF LEFT WING - W1

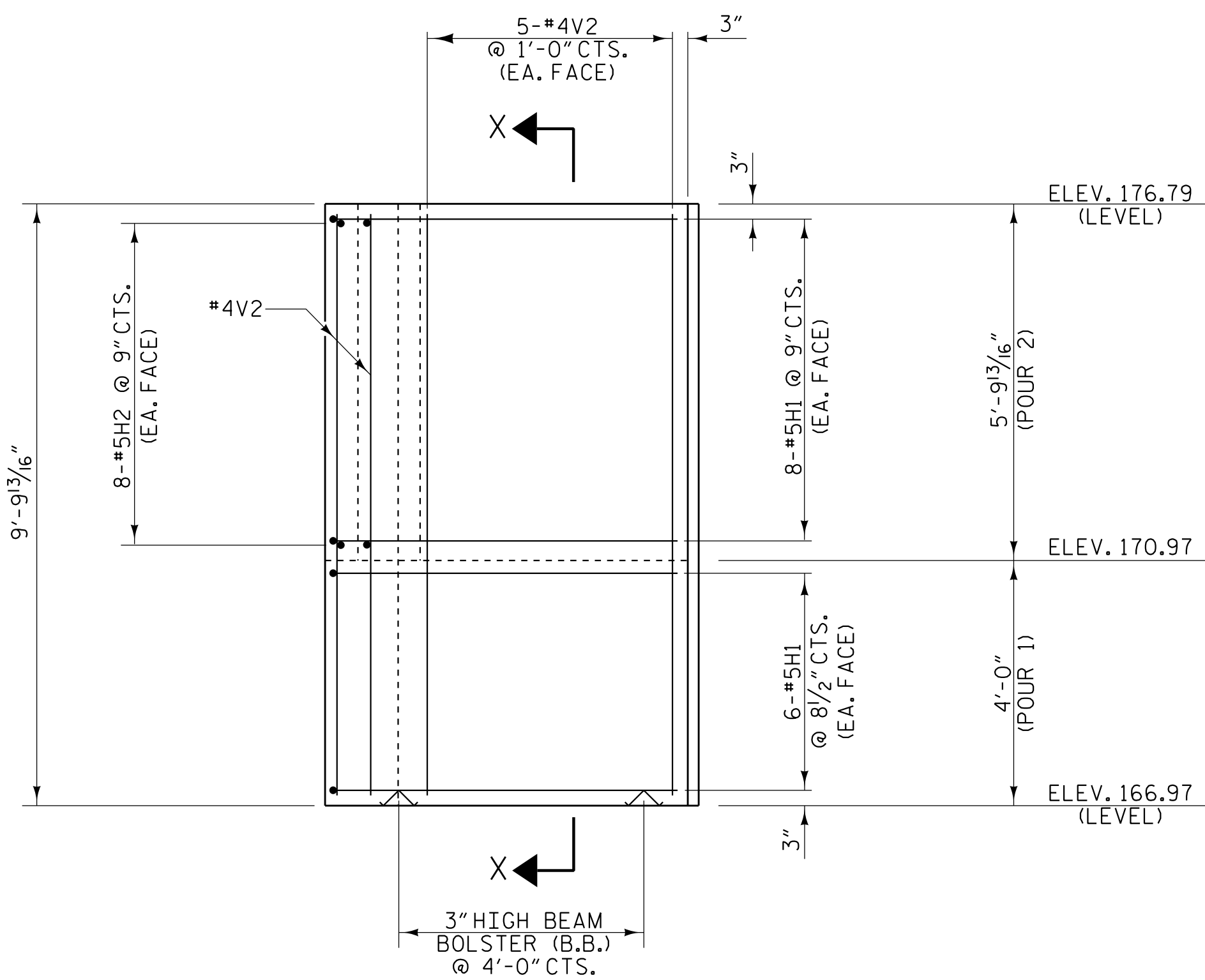
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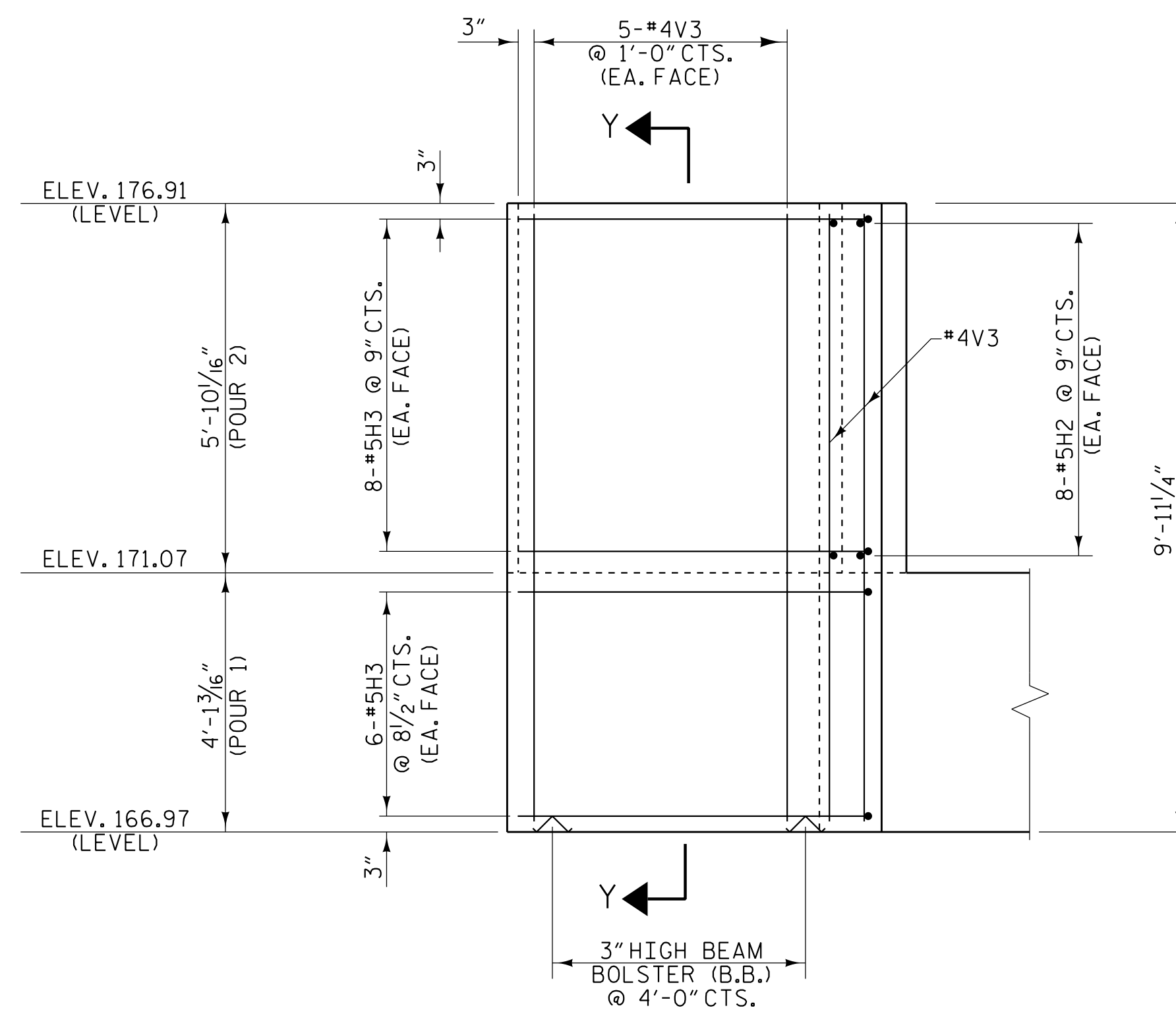
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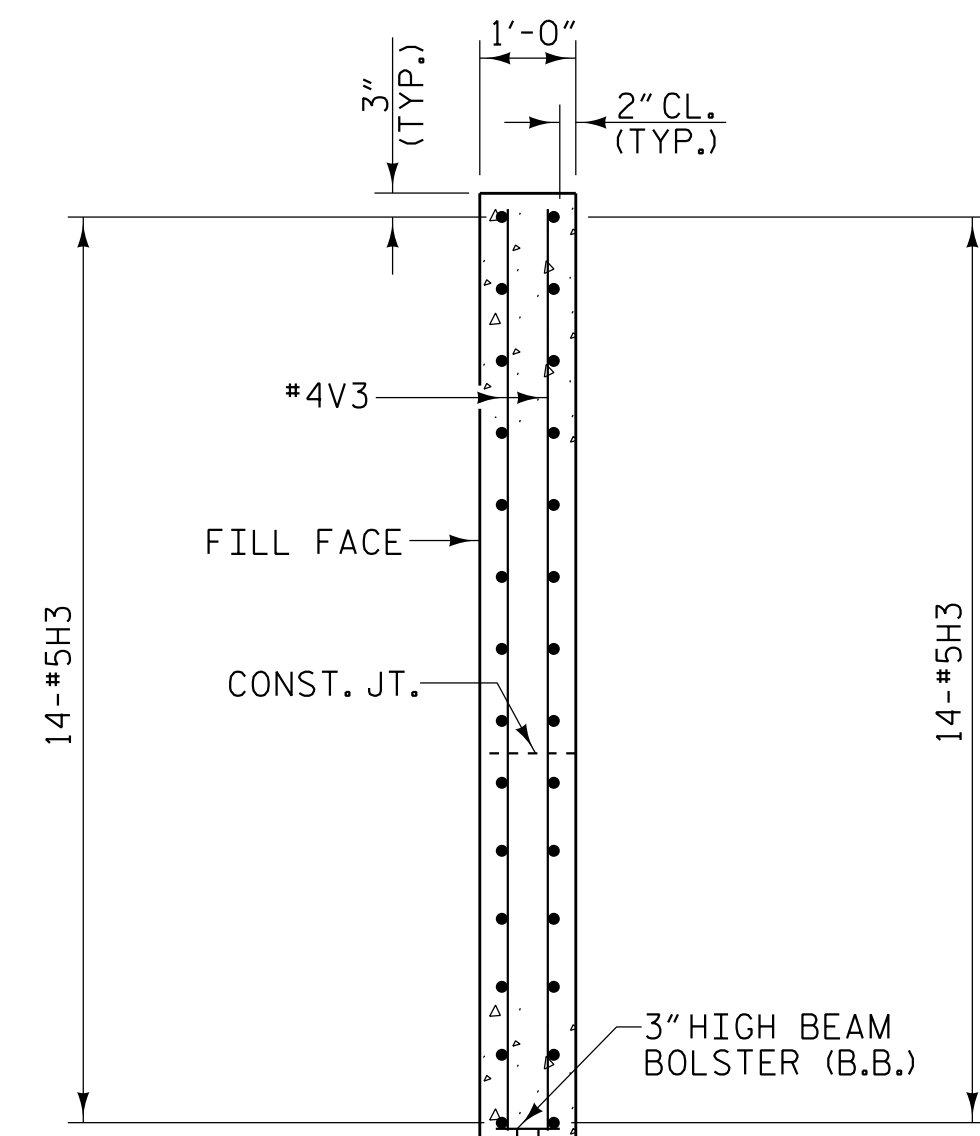
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 3

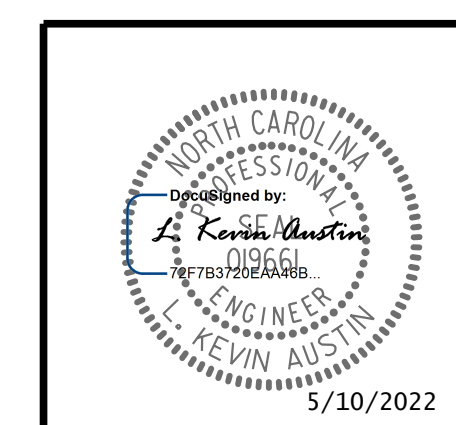
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 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 WING DETAILS

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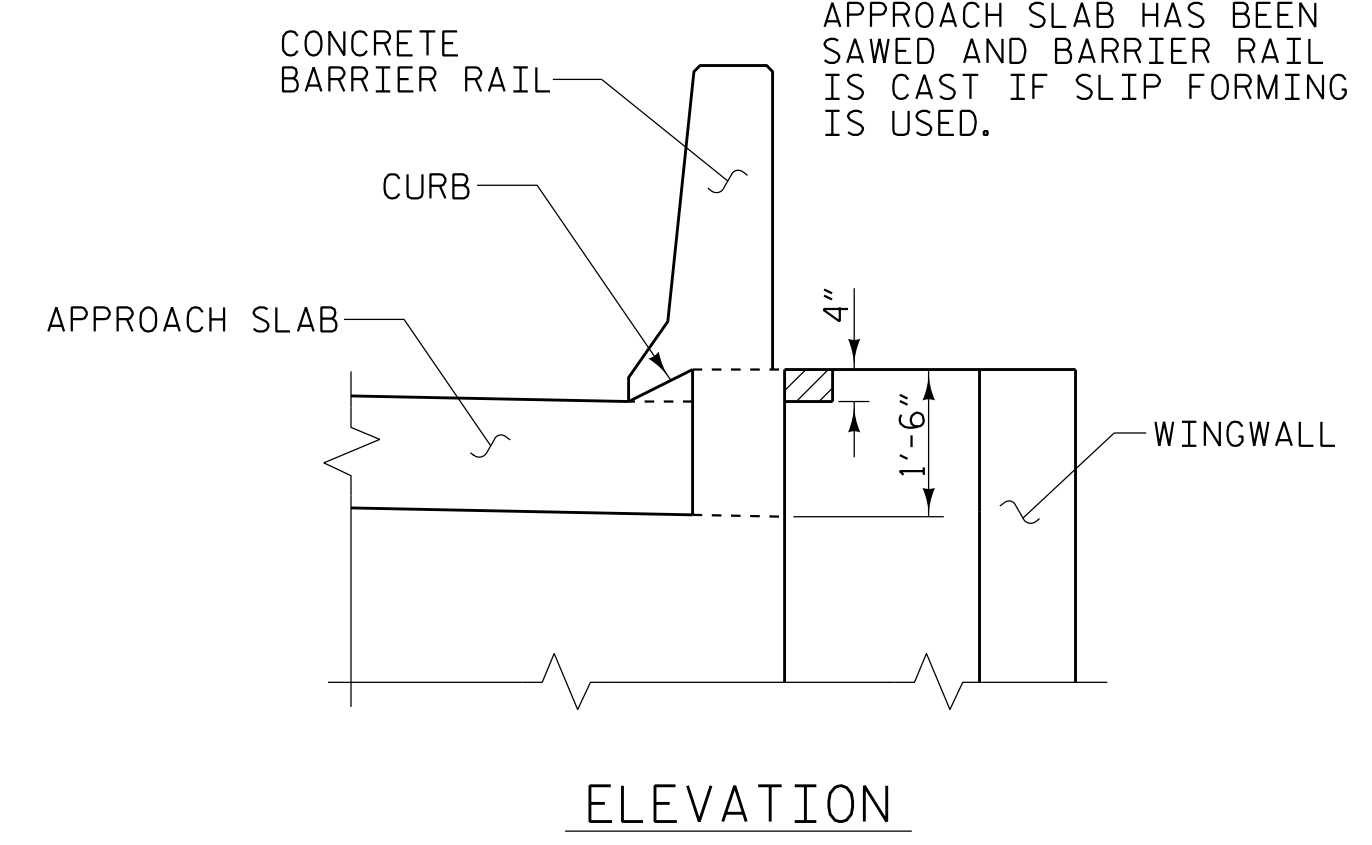
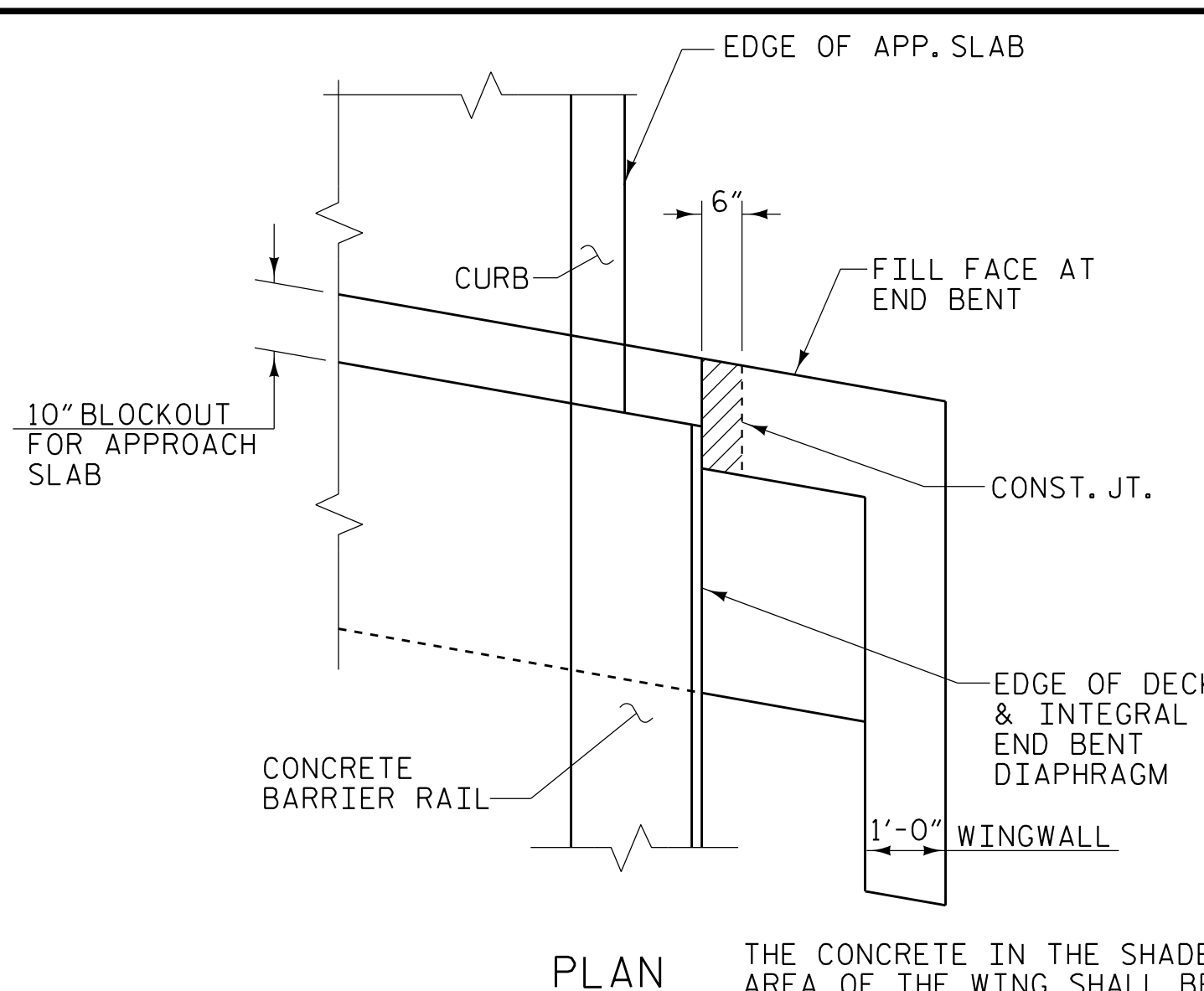
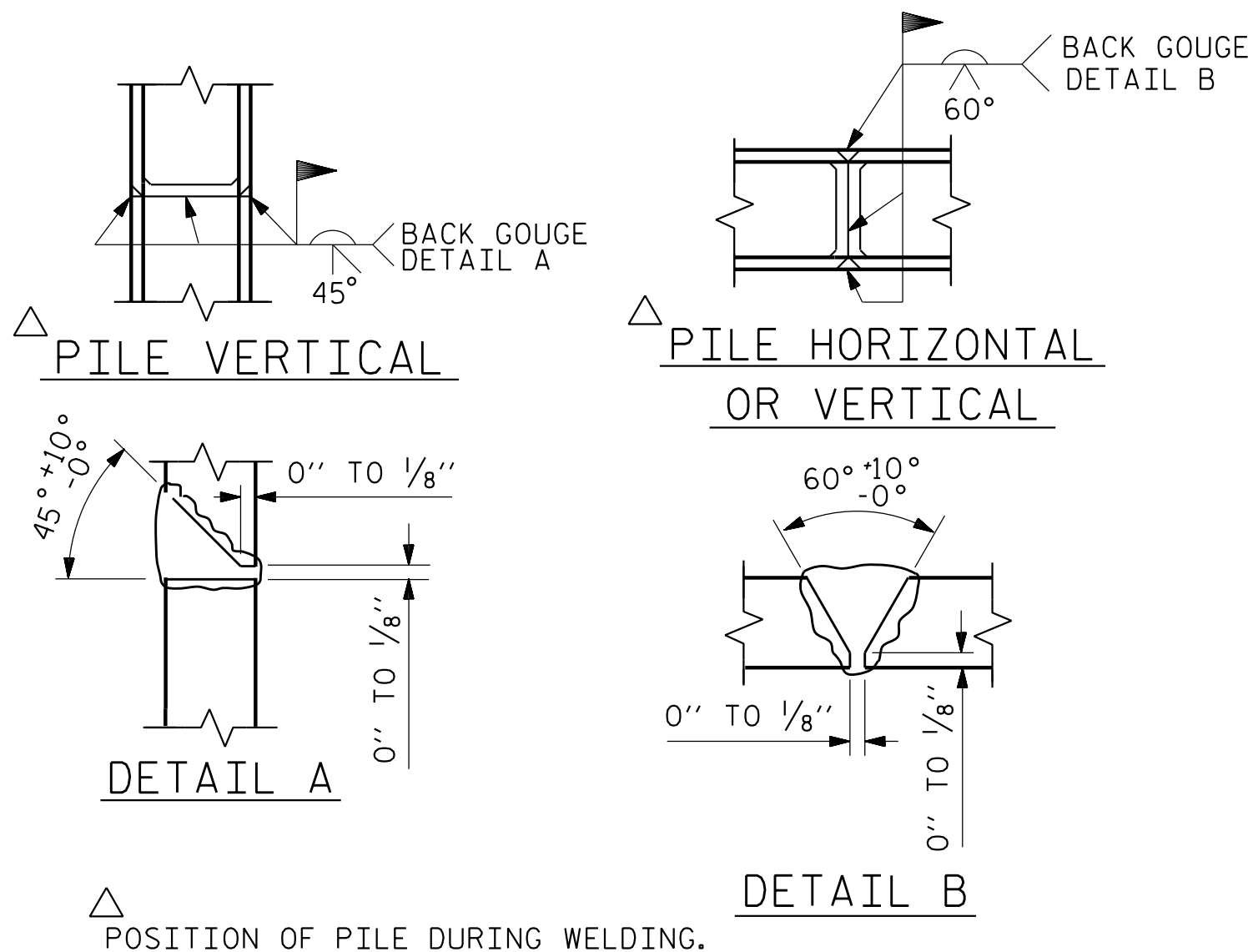
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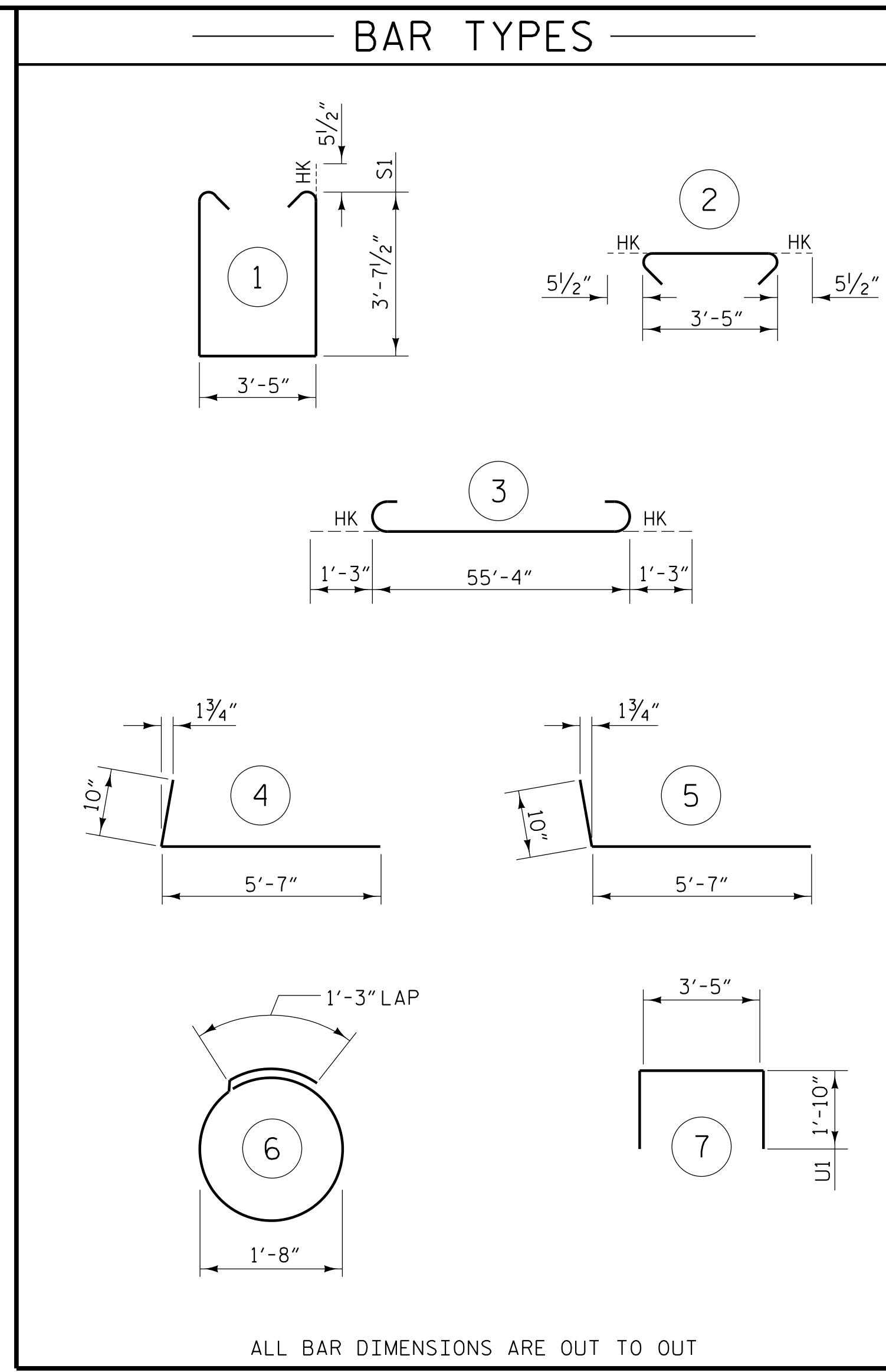
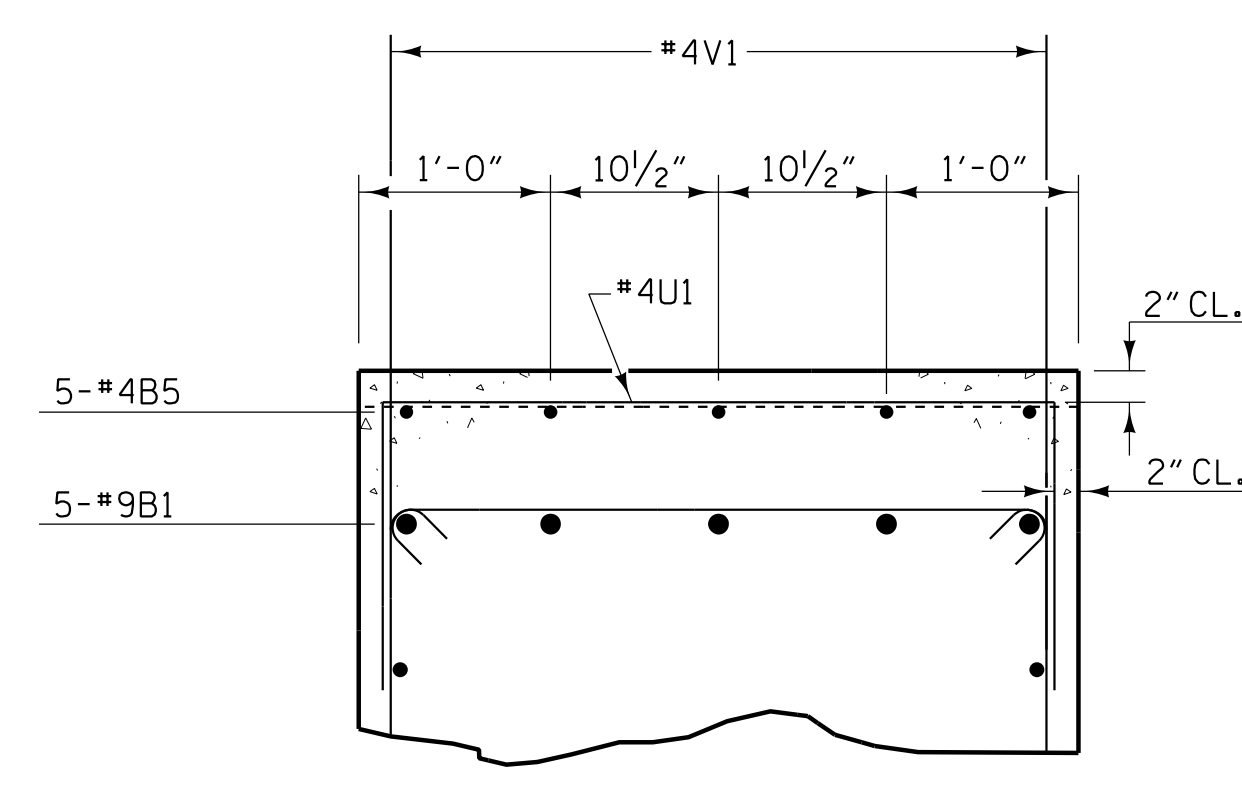
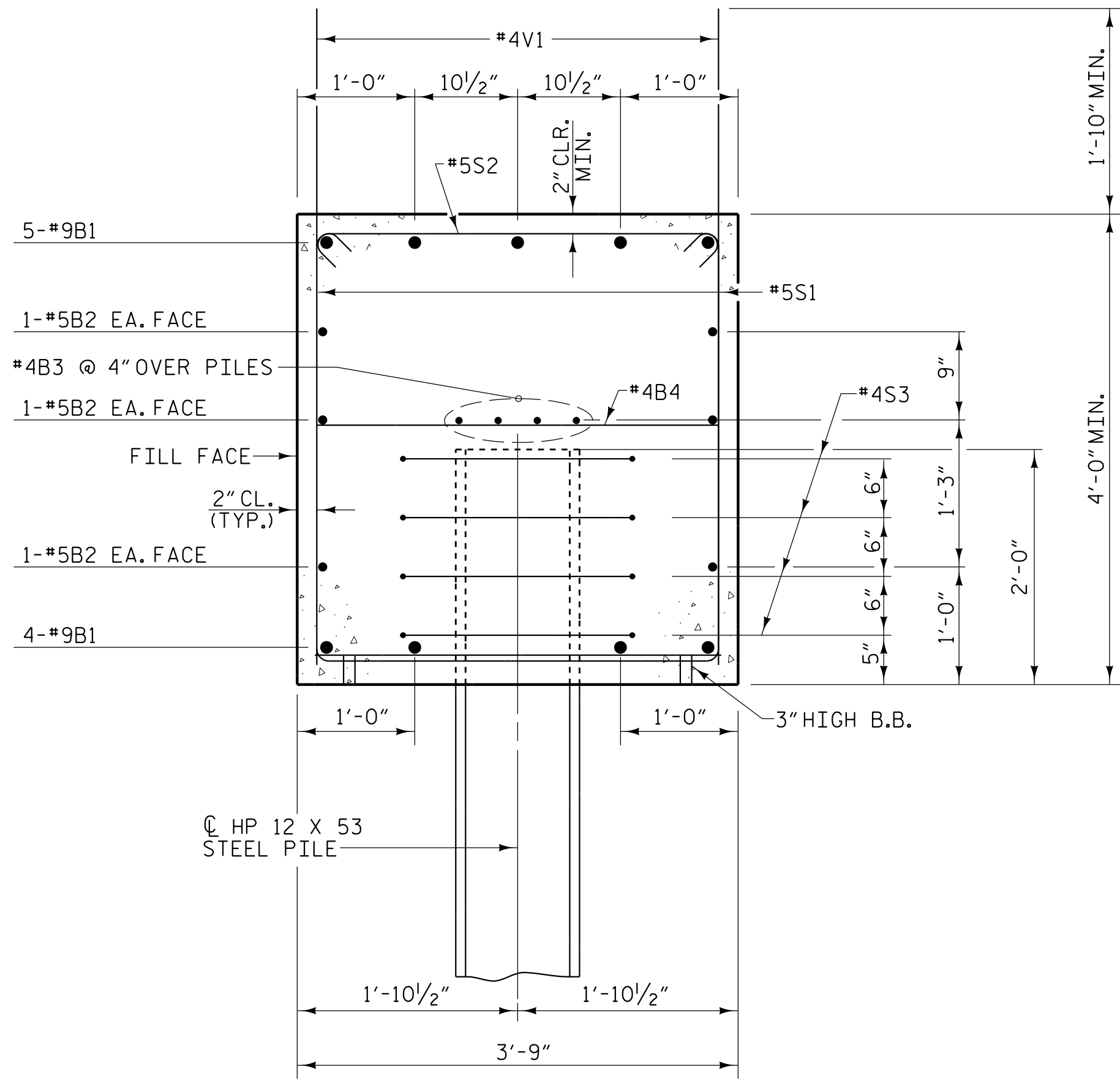
DRAWN BY : W. B. ALLEN DATE : 11/21
 CHECKED BY : G. F. WILSON DATE : 11/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

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WINGWALL BLOCKOUT
(RIGHT WINGWALL SHOWN, LEFT WINGWALL SIMILAR)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	3	57'-10"	1770
B2	6	#5	STR	55'-4"	346
B3	8	#4	STR	28'-11"	155
B4	14	#4	STR	3'-5"	32
B5	5	#4	STR	23'-5"	78
H1	28	#5	4	6'-5"	187
H2	32	#5	STR	2'-9"	92
H3	28	#5	5	6'-5"	187
S1	62	#5	1	11'-7"	749
S2	62	#5	2	4'-4"	280
S3	32	#4	6	6'-6"	139
U1	16	#4	7	7'-1"	76
V1	76	#4	STR	5'-7"	283
V2	18	#4	STR	9'-6"	114
V3	18	#4	STR	9'-4"	112
TOTAL REINFORCING STEEL					4600 lbs.
CLASS "A" CONCRETE - CU. YARDS					
POUR 1 (CAP & LOWER WINGS)					32.7 cu. yds.
POUR 2 (UPPER WINGS)					3.4 cu. yds.
TOTAL					36.1 cu. yds.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

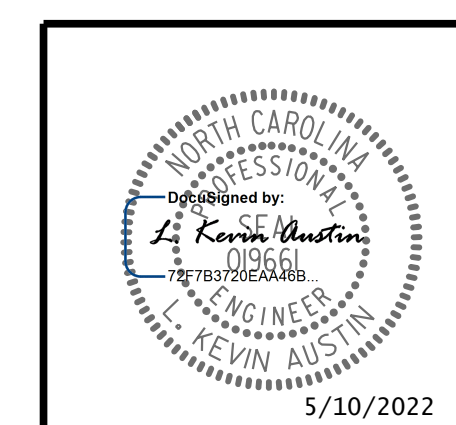
SUBSTRUCTURE
 INTEGRAL END BENT 2
 DETAILS

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

PLANS PREPARED BY:

NV5

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 3300 REGENCY PARKWAY, SUITE 100
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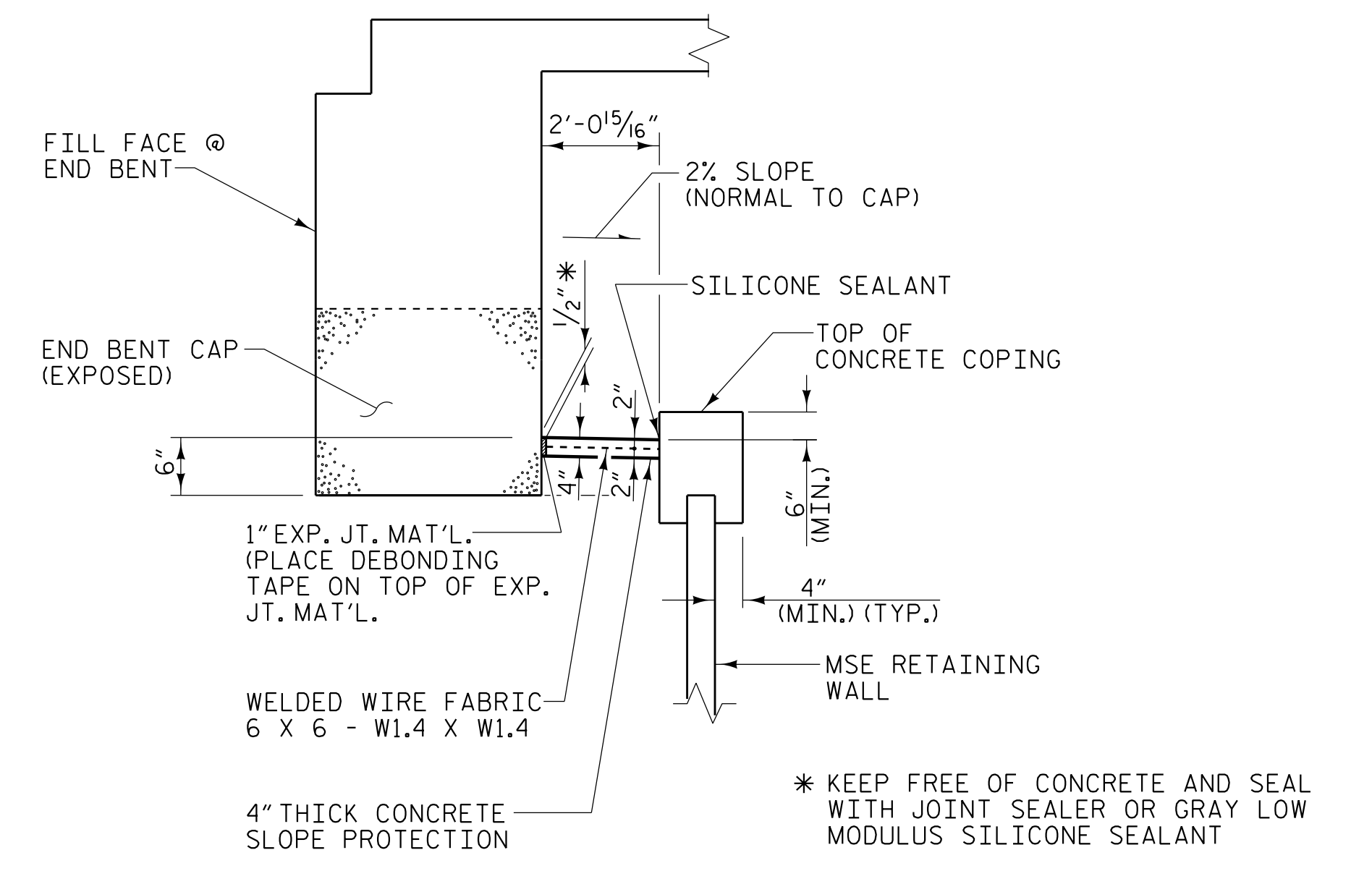
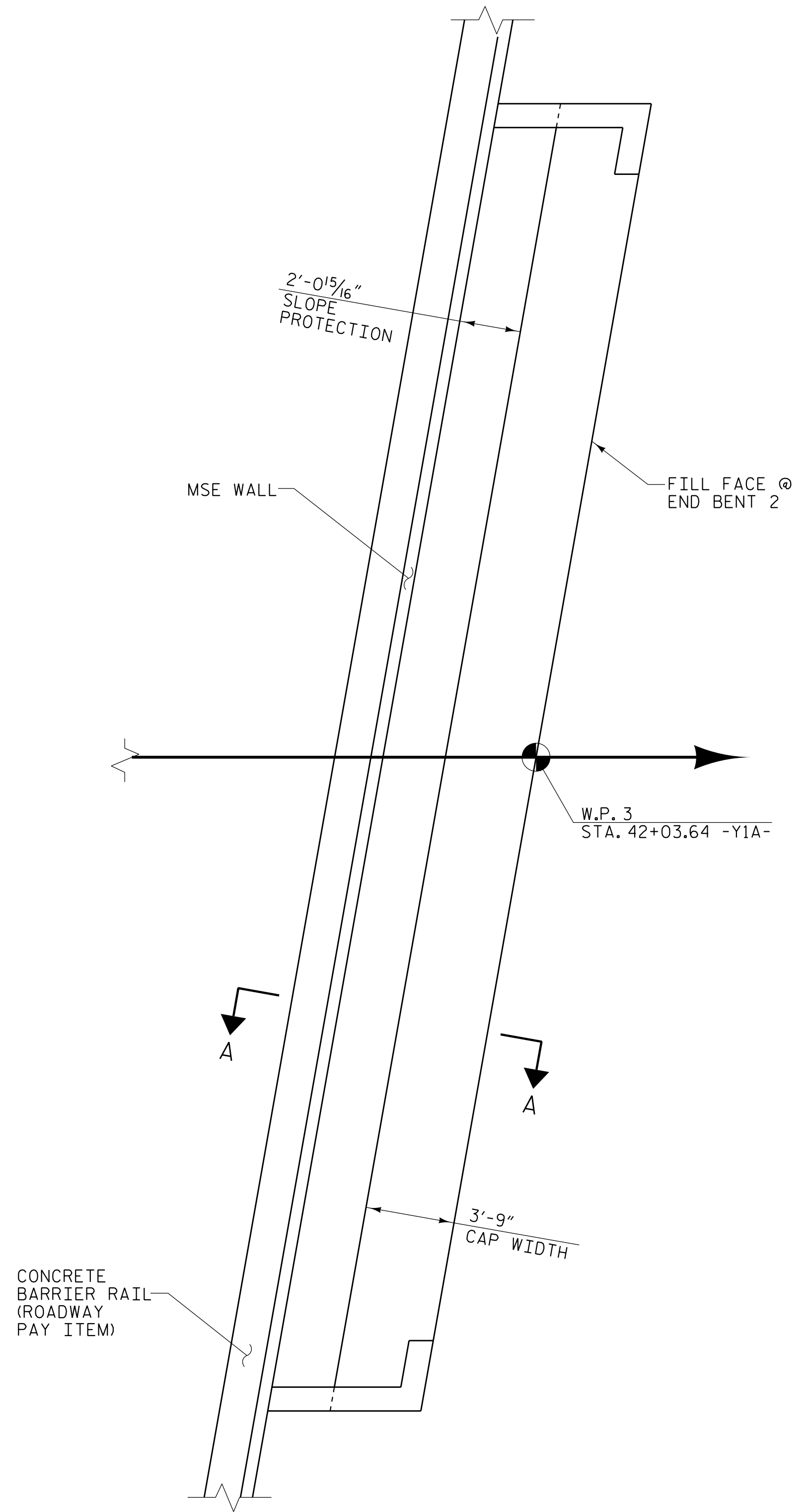
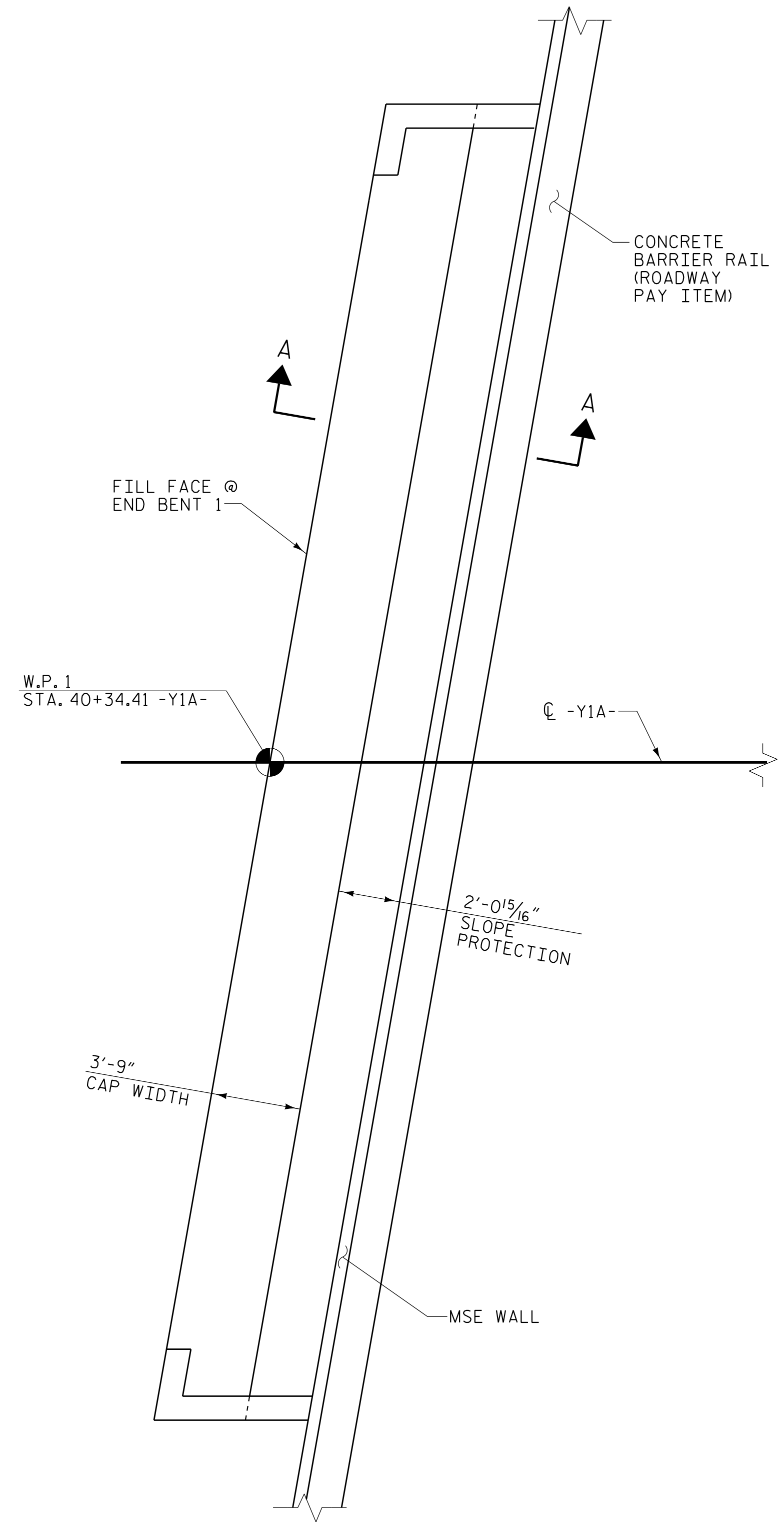
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DRAWN BY: W. B. ALLEN DATE: 11/21
 CHECKED BY: G. F. WILSON DATE: 11/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE: 12/21

NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B", THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE AND PLACED IN THE MIDDLE OF THE 4" CONCRETE SLOPE PROTECTION. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



SECTION A-A
(INTEGRAL END BENT PILES NOT SHOWN)

BRIDGE @ STA. 41+19.02 -Y1A-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 20 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	13	54
END BENT 2	13	54

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-29
2			4			TOTAL SHEETS 31

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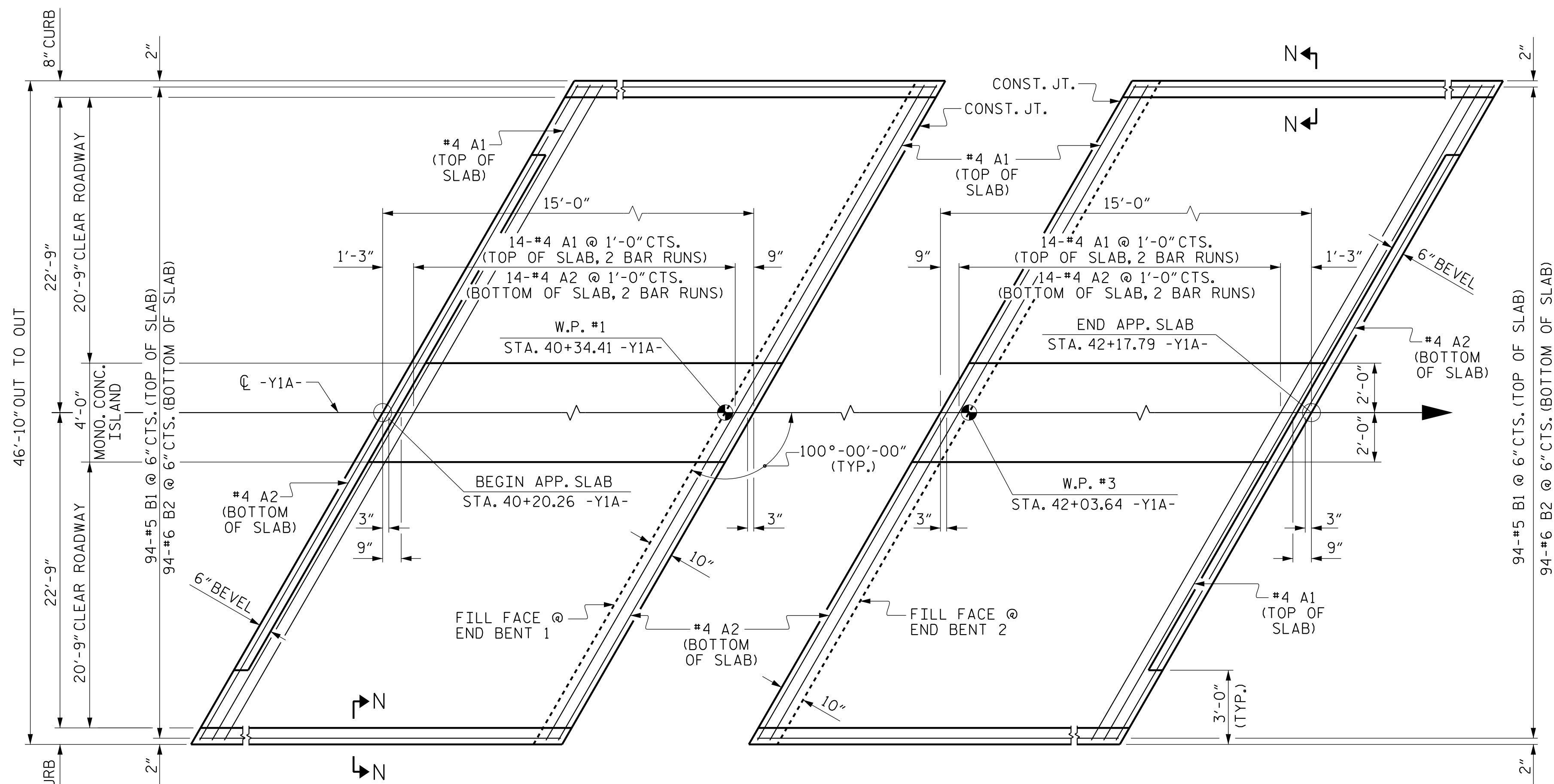
END BENT 1

END BENT 2

PLAN

DRAWN BY : W. B. ALLEN DATE : 4/21
 CHECKED BY : G. F. WILSON DATE : 9/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

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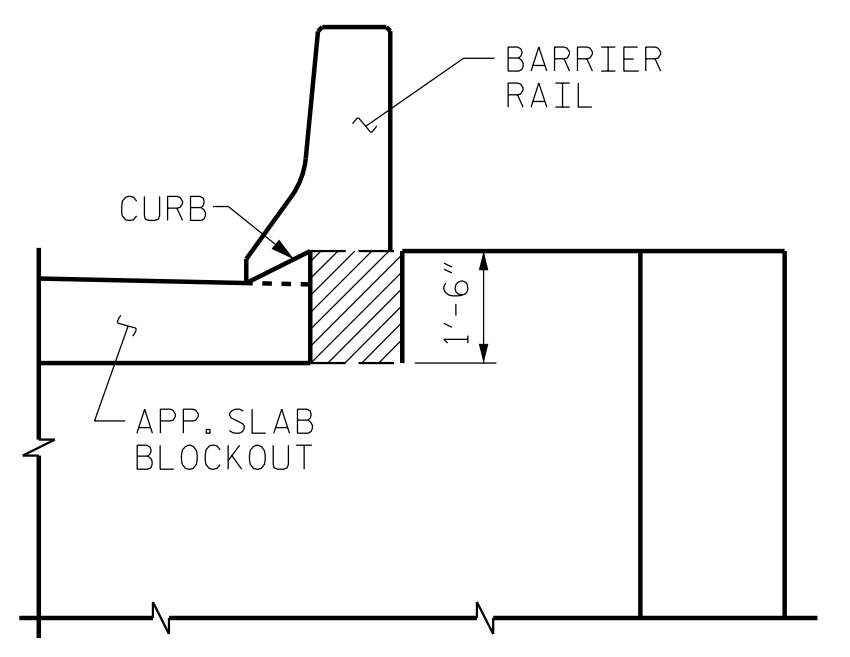
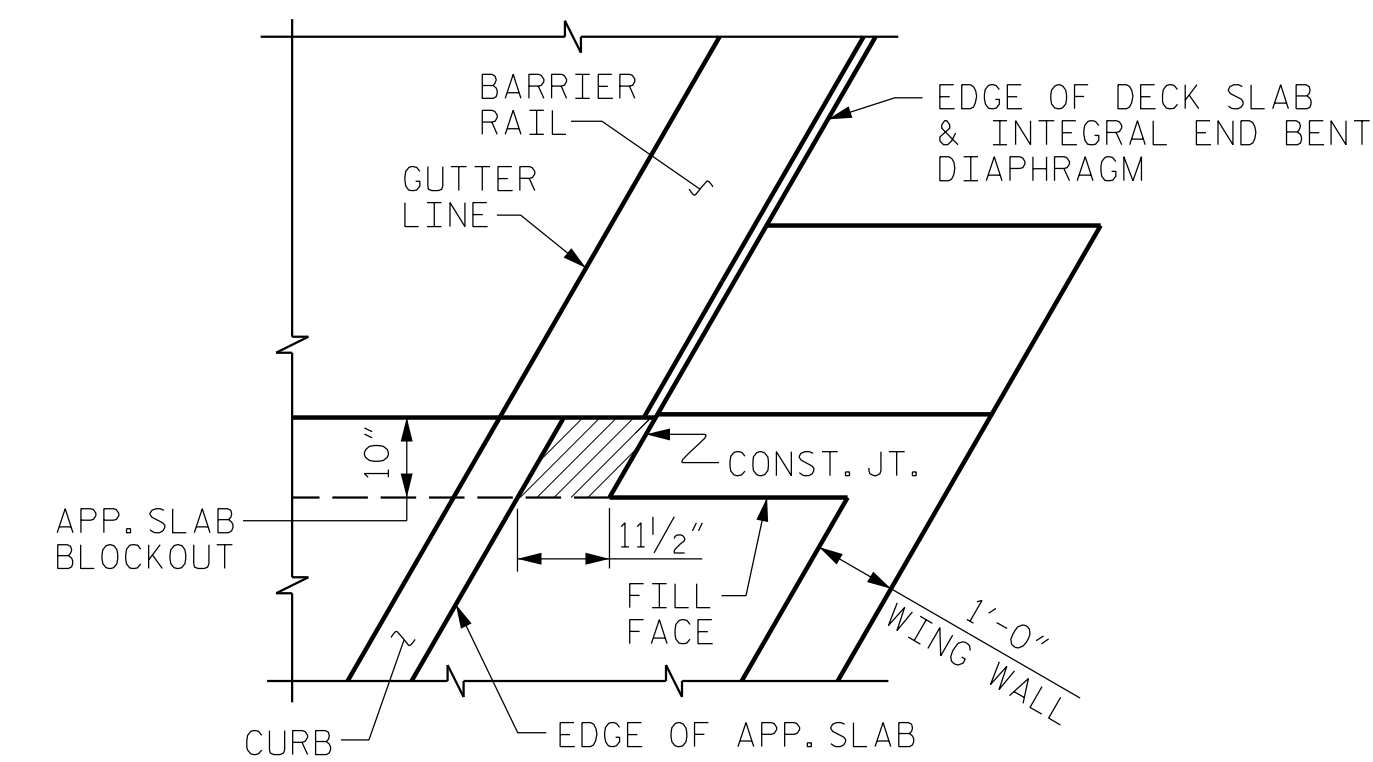


PLAN @ END BENT 1 PLAN @ END BENT 2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES
SEE SHEET 2 OF 2 FOR NOTES.

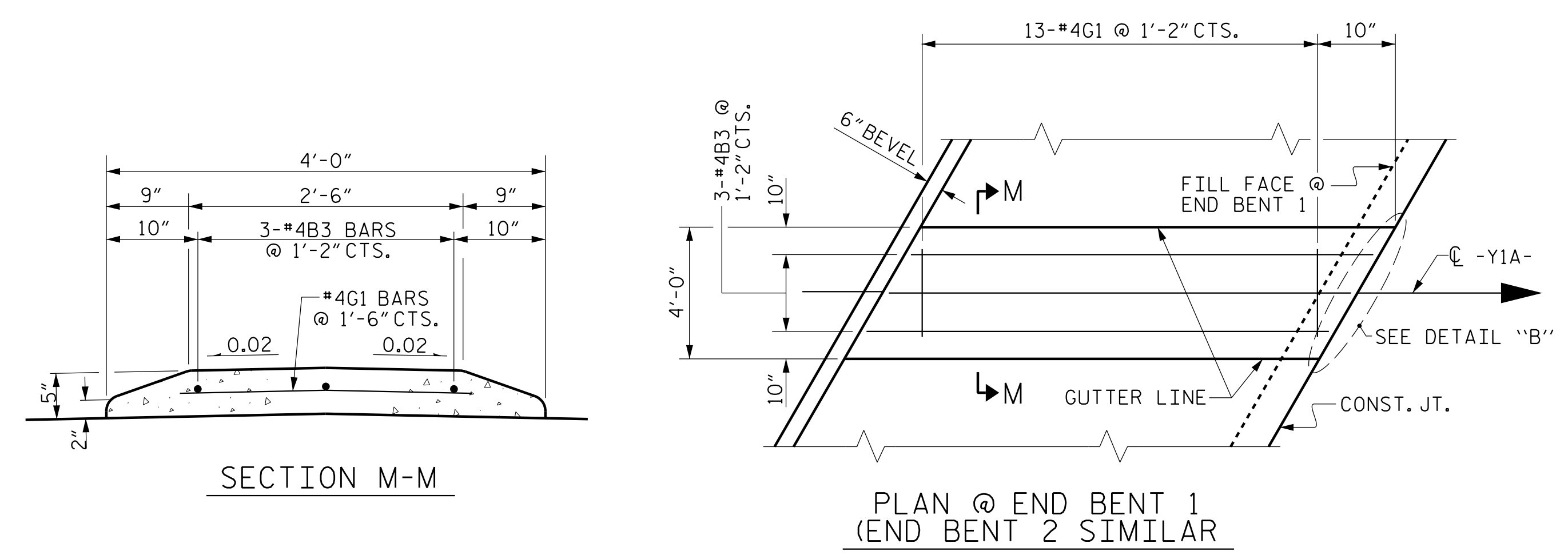
SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	24'-7"	525
A2	32	#4	STR	24'-5"	522
* B1	94	#5	STR	14'-1"	1381
B2	94	#6	STR	14'-8"	2071
REINFORCING STEEL					LBS. 2593
* EPOXY COATED REINFORCING STEEL					LBS. 1906
CLASS AA CONCRETE					C. Y. 30.3
FOR ONE MONO. CONC. ISLAND (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	3	#4	STR	14'-1"	28
* G1	13	#4	STR	2'-8"	23
* EPOXY COATED REINFORCING STEEL					LBS. 51
CLASS AA CONCRETE					C. Y. 0.8

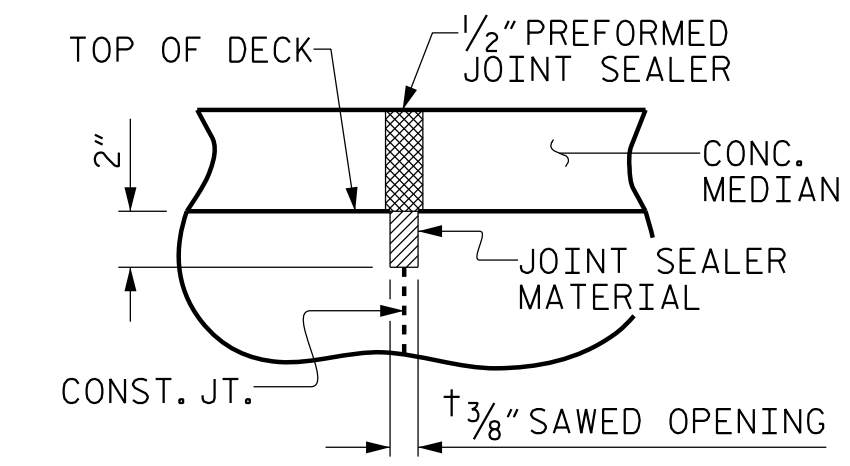


PLAN ELEVATION
APPROACH SLAB BLOCKOUT (WHEN APPROACH SLAB HAS CURB)

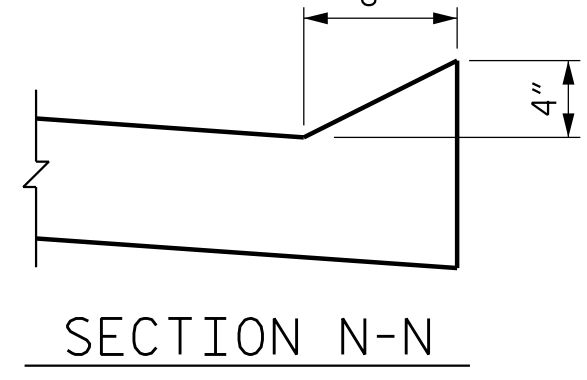
THE CONCRETE IN THE SHADED AREA SHALL BE POURED ALONG WITH APPROACH SLAB CONSTRUCTION AND AFTER BARRIER RAIL HAS BEEN CAST IF SLIP FORMING IS USED.



SECTION M-M PLAN @ END BENT 1 (END BENT 2 SIMILAR)



DETAIL "B"



SECTION N-N

DETAILS OF MONOLITHIC CONCRETE ISLAND ON APPROACH SLAB

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 41+19.02 -Y1A- POT

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

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

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P: 919.851.1912 www.nv5.com
NC License # F-1333

NORTH CAROLINA PROFESSIONAL ENGINEER

Designed by: **Kevin Austin**

Professional Engineer
No. 10666
L. KEVIN AUSTIN

5/10/2022

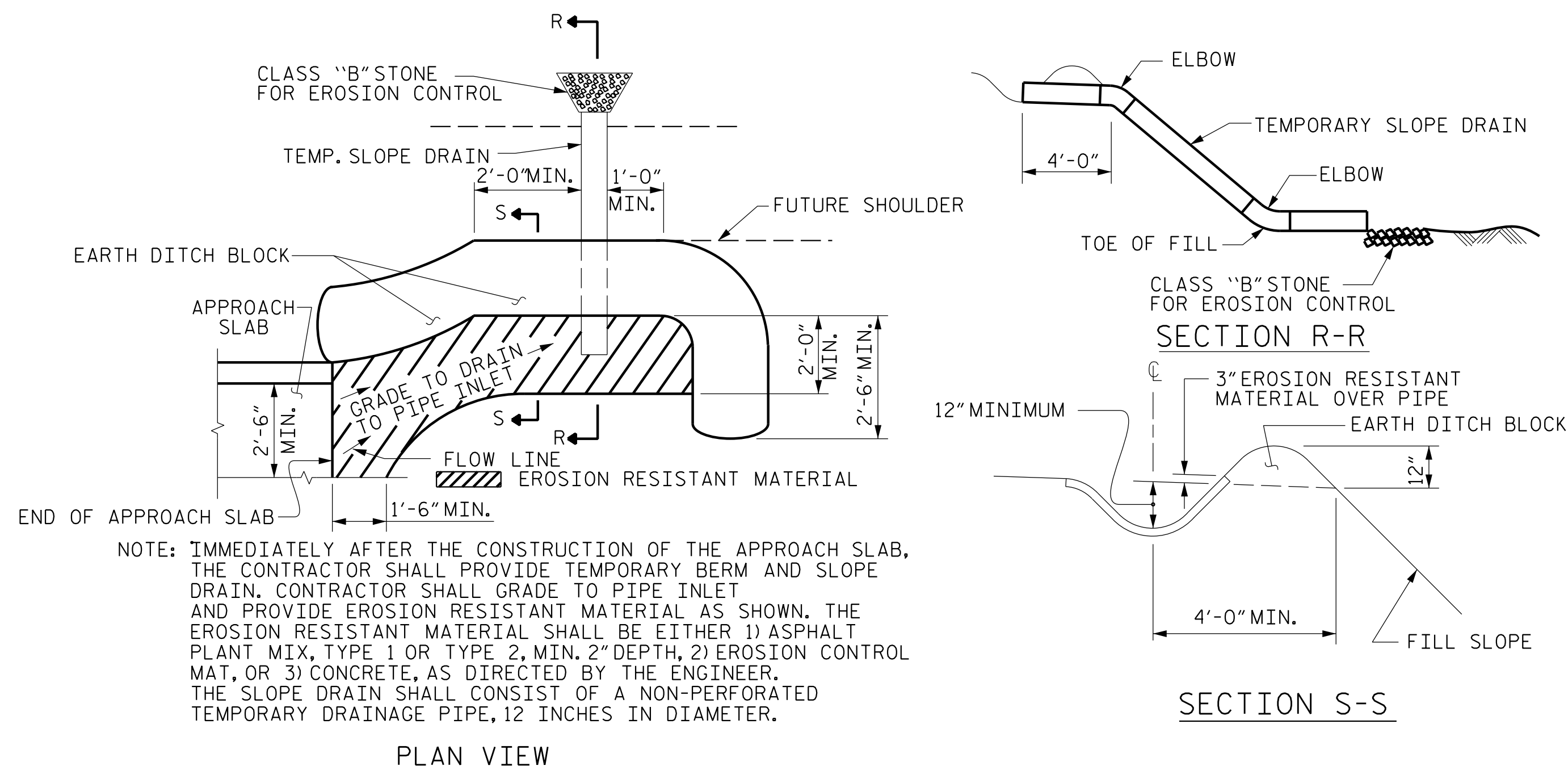
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DRAWN BY: W. B. ALLEN DATE: 3/21
CHECKED BY: G. F. WILSON DATE: 9/21
DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE: 12/21

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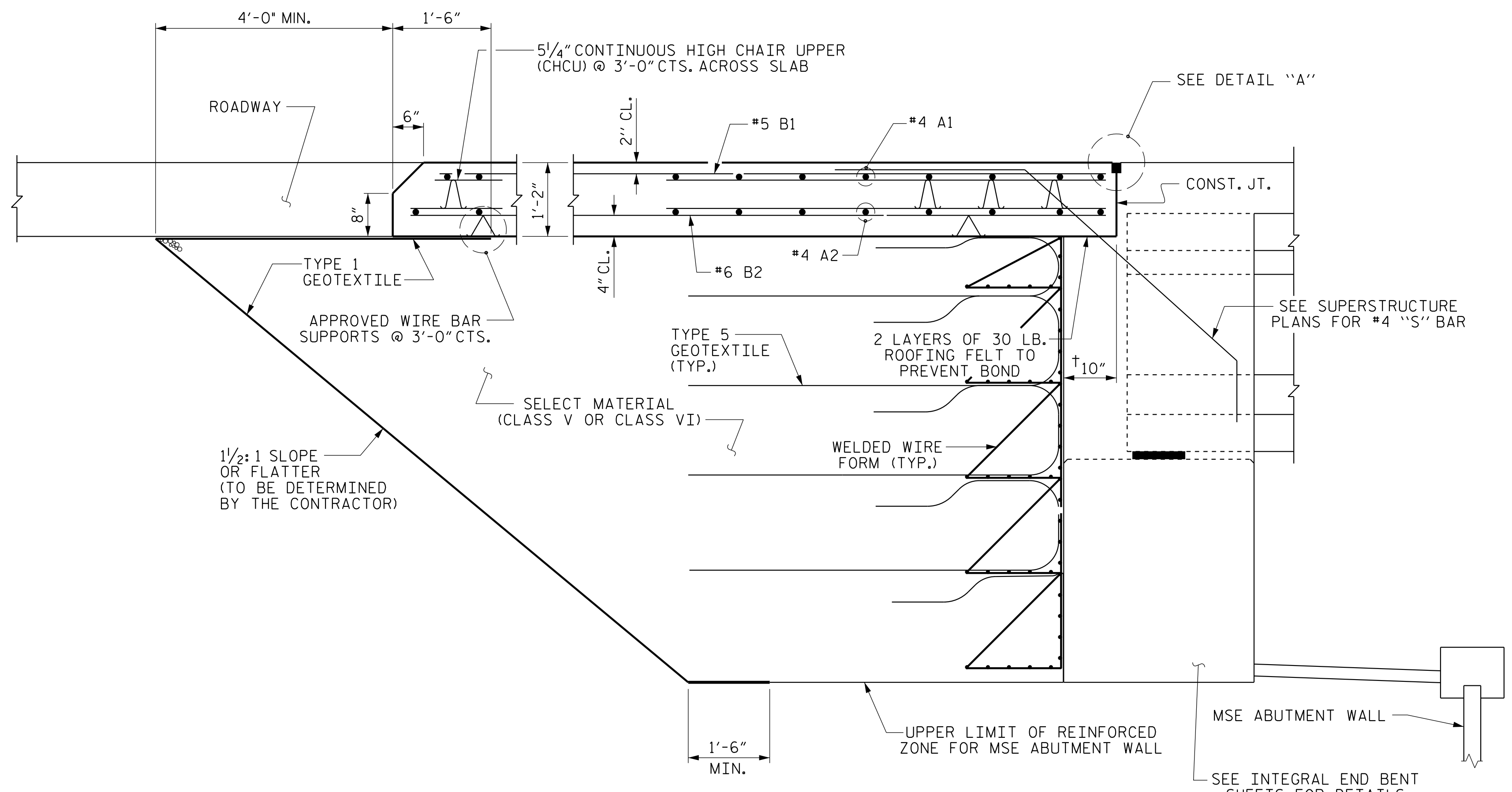
NOTES

- 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.

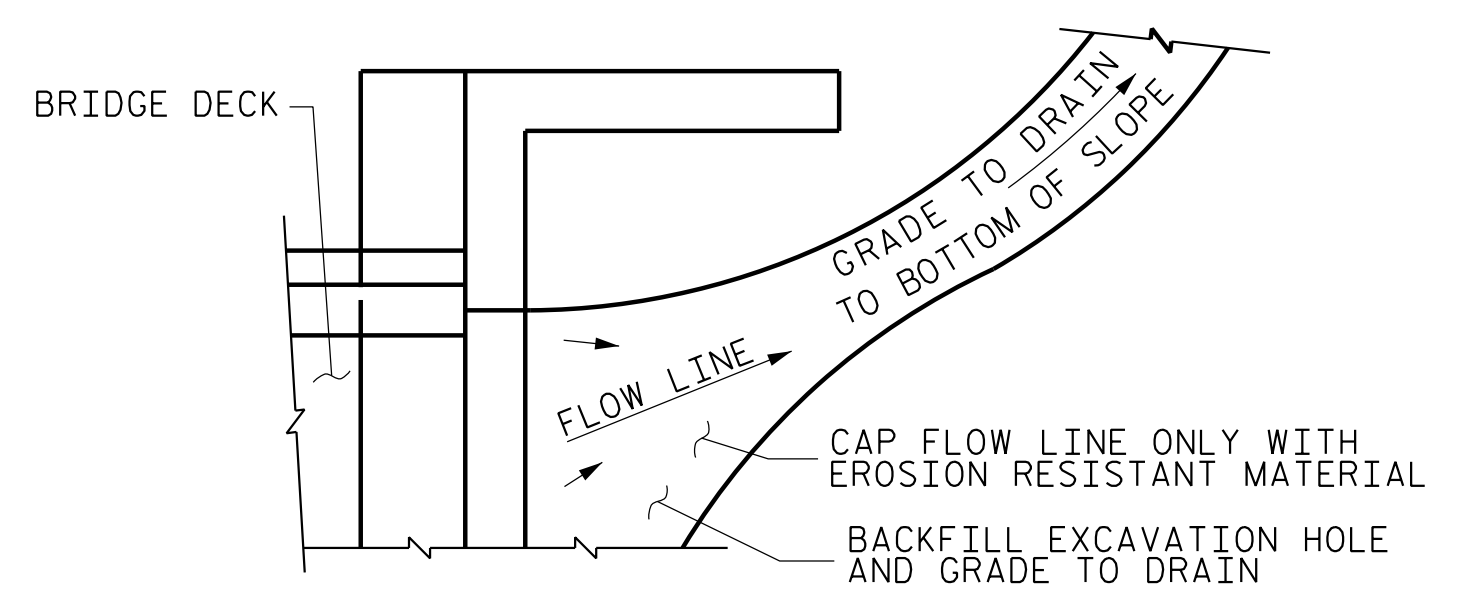


TEMPORARY BERM AND SLOPE DRAIN DETAILS

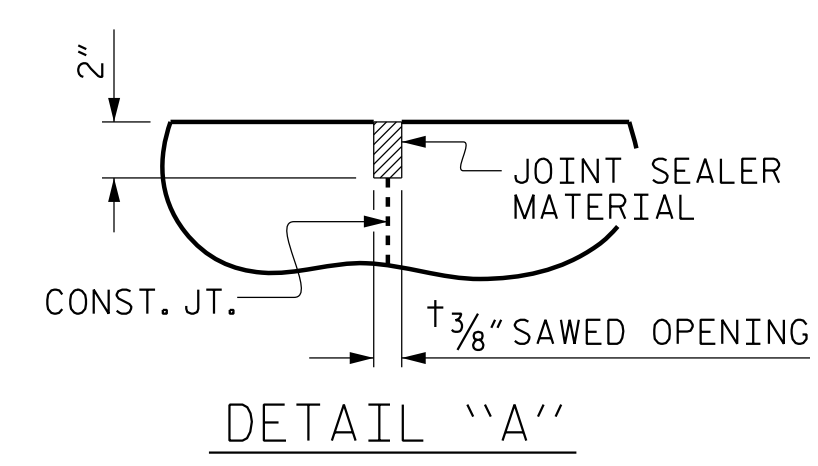
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB
(SPECIAL BRIDGE APPROACH FILL)



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.



DETAIL "A"

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 41+19.02 -Y1A- POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**BRIDGE APPROACH
 SLAB DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
2			4			31

PLANS PREPARED BY:

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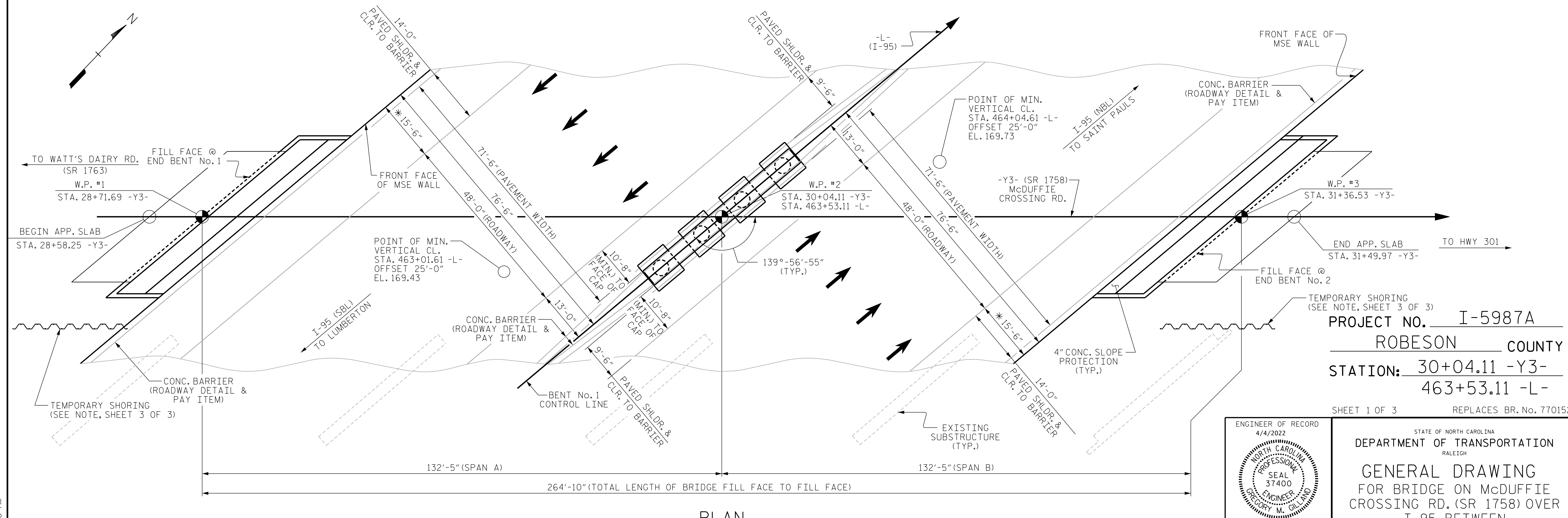
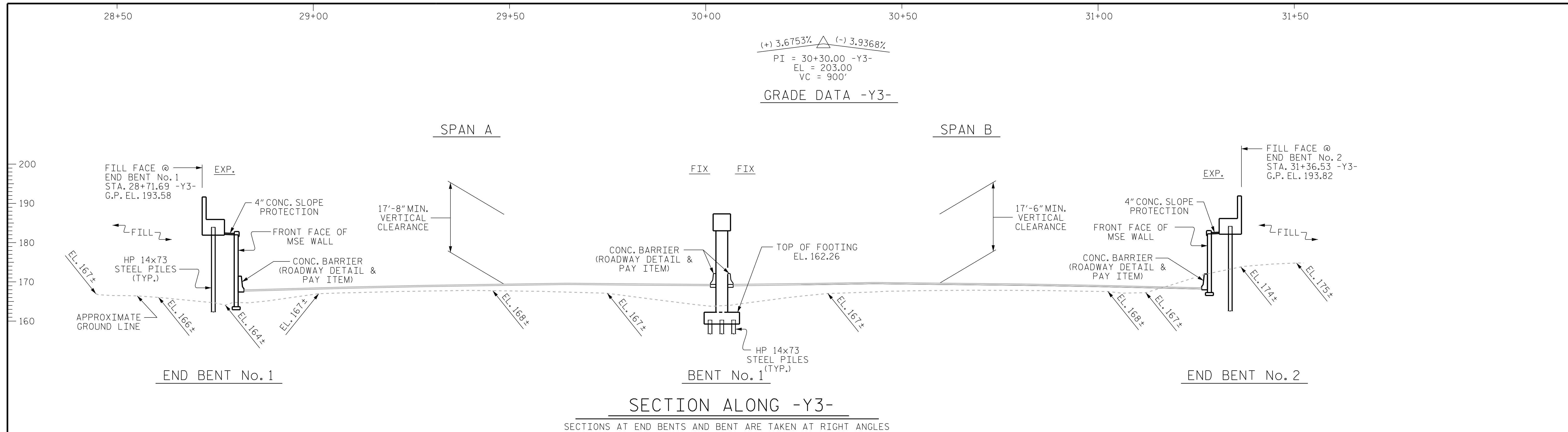
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 P: 919.851.1912 www.NV5.com
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PROFESSIONAL ENGINEER
 L. Kevin Austin
 5/10/2022

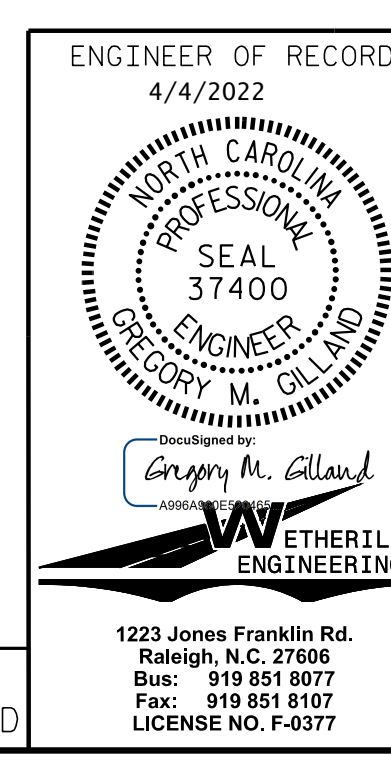
DRAWN BY : W. B. ALLEN DATE : 3/21
 CHECKED BY : G. F. WILSON DATE : 5/21
 DESIGN ENGINEER OF RECORD: L. K. AUSTIN DATE : 12/21

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PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
463+53.11 -L-
 SHEET 1 OF 3 REPLACES BR. No. 770152

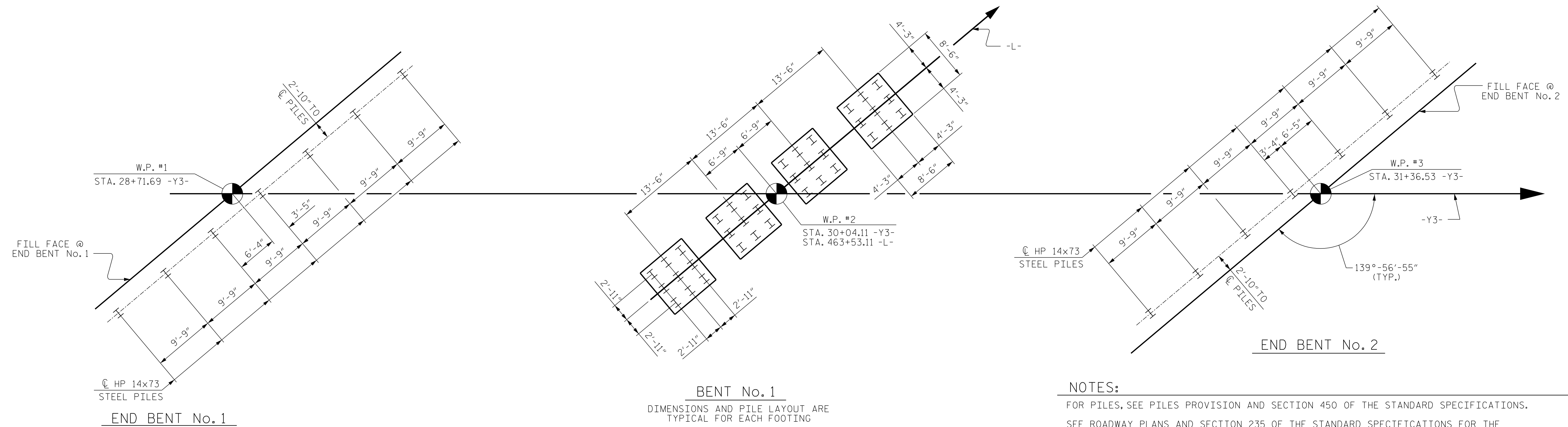


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON McDUFFIE CROSSING RD. (SR 1758) OVER I-95 BETWEEN SR 1763 AND HWY 301					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S3-1					TOTAL SHEETS 29

DRAWN BY: JP/DAH DATE: 11/21
 CHECKED BY: G. GILLAND DATE: 11/21

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NOTES:

THE PILE FOUNDATIONS TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (ABNER F. RIGGS 014155) ON 11-4-2021.

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.

BENT No. 1
DIMENSIONS AND PILE LAYOUT ARE TYPICAL FOR EACH FOOTING
ALL PILES ARE HP 14x73 STEEL PILES

FOUNDATION LAYOUT

NOTES:

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

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 1 AND END BENT 2.

INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT 1 AND END BENT 2. OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL AND THE REINFORCED BRIDGE APPROACH FILL TO WITHIN 1 FT OF THE FINAL GRADE ELEVATION. THEN, INSTALL PILES THROUGH THE CORRUGATED STEEL PILES AND FILL PILES WITH LOOSE UNCOMPACTED SAND BEFORE CONSTRUCTING END BENT CAPS. FOR PILE SLEEVES, SEE MSE RETAINING WALL PLANS AND PROVISION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOR REINFORCING BRIDGE APPROACH FILL, SEE TYPE A ALTERNATE APPROACH FILL AT MSE WALLS (SPECIAL) PROVISION.

SUMMARY OF PDA/PILE ORDER LENGTHS (BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)					
PILE DRIVING ANALYZER (PDA)			PILE ORDER LENGTHS		
END BENT/ BENT No.	PDA TESTING REQUIRED? (YES OR MAYBE)	PDA TEST PILE LENGTH (FT)	TOTAL PDA TESTING QUANTITY (EACH)	END BENT/ BENT No. (s)	PILE ORDER LENGTH BASIS* (EST OR PDA)
END BENT 1, PILES (1-7)	MAYBE	90	2		
BENT 1, PILES (1-36)	YES	85			
END BENT 2, PILES (1-7)	YES	95			

*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 DOWDRAG LOAD PER PILE (TONS)	FACTORED DEAD LOAD* PER PILE (TONS)	DYNAMIC RESISTANCE FACTOR	NOMINAL DOWDRAG RESISTANCE PER PILE (TONS)	NOMINAL SCOUR RESISTANCE PER PILE (TONS)	SCOUR RESISTANCE FACTOR (DEFAULT = 1.00)
END BENT 1, PILES (1-7)	137			0.75			1.00
BENT 1, PILES (1-36)	150			0.75			1.00
END BENT 2, PILES (1-7)	137			0.75			1.00

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

SUMMARY OF PILE INFORMATION/INSTALLATION (BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)													
END BENT/ BENT No., PILE(S) #-# (E.G., "BENT 1, PILES 1-5")	FACTORED RESISTANCE PER PILE (TONS)	PILE CUT-OFF (TOP OF PILE) ELEVATION (FT.)	ESTIMATED PILE LENGTH PER PILE (FT)	SCOUR CRITICAL ELEVATION (FT)	MIN. PILE TIP (TIP NO HIGHER THAN) ELEV. (FT)	DRIVEN PILES		PREDRILLING FOR PILES*			DRILLED IN PILES		
						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 (1-7)	137	183.90	85			185	4						
BENT 1, PILES (1-36)	150	159.76	80			200	18						
END BENT 2, PILES (1-7)	137	184.15	90			185	4						

*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 = $\frac{\text{FACTORED RESISTANCE} + \text{FACTORED DOWDRAG LOAD} + \text{FACTORED DEAD LOAD}}{\text{DYNAMIC RESISTANCE FACTOR}} + \text{NOMINAL DOWDRAG RESISTANCE} + \text{NOMINAL SCOUR RESISTANCE} \times \text{SCOUR RESISTANCE FACTOR}$

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-

SHEET 2 OF 3

DRAWN BY : D. HODGE DATE : 11/21
CHECKED BY : G. GILLAND DATE : 11/21

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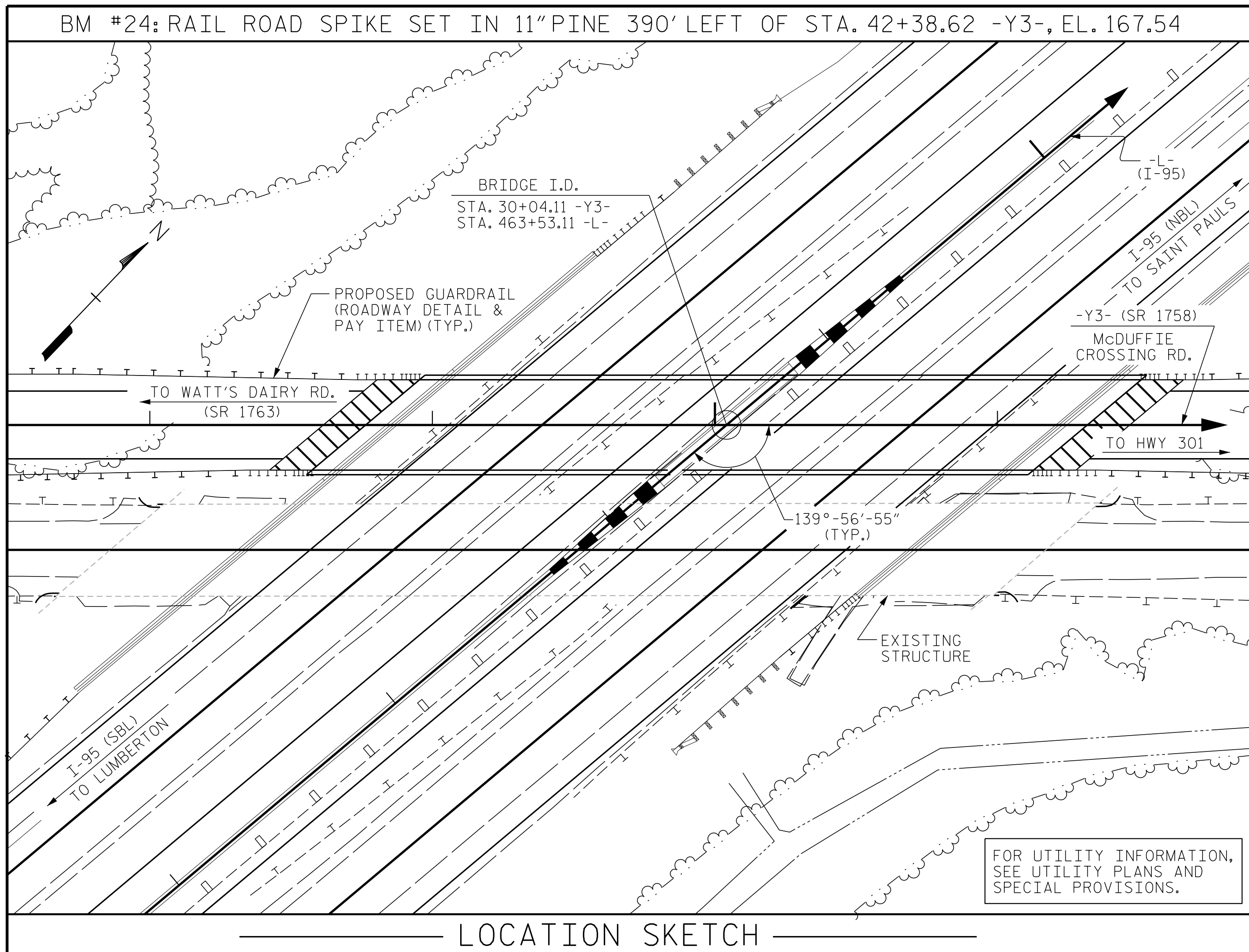
ENGINEER OF RECORD
3/24/2022

Gregory M. Gilland
ETHERILL ENGINEERING
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON McDUFFIE
CROSSING RD. (SR 1758) OVER
I-95 BETWEEN
SR 1763 AND HWY 301

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-2
1			3			TOTAL SHEETS
2			4			29

PA-2021-2 1331.02 I-5987A BridgeStructures.DGN\401_001_I-5987A_SMU_GD_001.dgn 3/8/2022 11:01:56 AM



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 2.
- 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 MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE".
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 1 SPAN AT 63'-6", 3 SPANS AT 68'-0" AND 1 SPAN AT 63'-6" WITH REINFORCED CONCRETE DECK ON 4 LINES OF W36x150 STEEL I-BEAMS AT 8' CENTERS WITH 33'-5" OUT TO OUT DECK ON REINFORCED CONCRETE CAP BENTS WITH PRECAST CONCRETE PILES AND LOCATED BESIDE PROPOSED STRUCTURE 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.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 14 x 73 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS			
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SO.FT.	SO.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	No.	LIN.FT.	EA.	NO.	LIN.FT.	EA.	LIN.FT.	SO. YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE					9,221	8,276					10	1,285.63			522.93						
END BENT 1							79.3		9,621				7	7	595	4		13.6			
BENT 1							110.3		16,623	4,123			36	36	2,880	18					
END BENT 2							79.3		9,617				7	7	630	4		13.6			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	9,221	8,276	268.9	LUMP SUM	35,861	4,123	10	1,285.63	50	50	4,105	26	522.93	27.2	LUMP SUM	LUMP SUM	

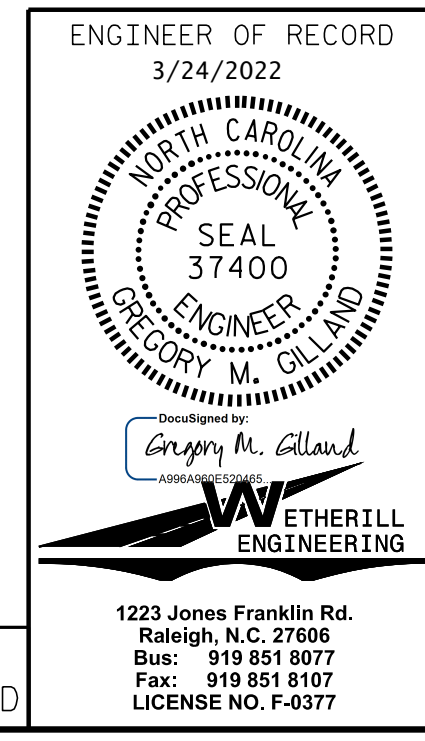
PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-

SHEET 3 OF 3

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 CHECKED BY : G. GILLAND DATE : 11/21

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON McDUFFIE
 CROSSING RD. (SR 1758) OVER
 I-95 BETWEEN
 SR 1763 AND HWY 301

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-3
1			3			TOTAL SHEETS 29
2			4			

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 Raleigh, N.C. 27606
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 LICENSE NO. F-0377

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 (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.08	--	1.75	0.610	1.330	A	EL	63.57	0.880	1.210	A	I	115.00	0.80	0.610	1.080	A	EL	63.570	1	
	HL-93 (OPERATING)	N/A		1.60	--	1.35	0.610	1.730	A	EL	63.57	0.880	1.600	A	I	115.00	N/A	--	--	--	--	--	1	
	HS-20 (INVENTORY)	36.000	②	1.60	57.600	1.75	0.610	1.980	A	EL	63.57	0.880	1.760	A	I	115.00	0.80	0.610	1.600	A	EL	63.570	1	
	HS-20 (OPERATING)	36.000		2.32	83.520	1.35	0.610	2.560	A	EL	63.57	0.880	2.320	A	I	115.00	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.90	52.650	1.40	0.610	6.030	A	EL	63.57	0.880	5.800	A	I	115.00	0.80	0.610	3.900	A	EL	63.570	1
		SNGARBS2	20.000		2.78	55.600	1.40	0.610	4.300	A	EL	63.57	0.880	3.990	A	I	115.00	0.80	0.610	2.780	A	EL	63.570	1
		SNAGRIS2	22.000		2.58	56.760	1.40	0.610	3.990	A	EL	63.57	0.880	3.660	A	I	115.00	0.80	0.610	2.580	A	EL	63.570	1
		SNCOTTS3	27.250		1.94	52.865	1.40	0.610	3.000	A	EL	63.57	0.880	2.820	A	I	115.00	0.80	0.610	1.940	A	EL	63.570	1
		SNAGGRS4	34.925		1.57	54.832	1.40	0.610	2.430	A	EL	63.57	0.880	2.250	A	I	115.00	0.80	0.610	1.570	A	EL	63.570	1
		SNS5A	35.550		1.54	54.747	1.40	0.610	2.380	A	EL	63.57	0.880	2.250	A	I	115.00	0.80	0.610	1.540	A	EL	63.570	1
		SNS6A	39.950		1.39	55.531	1.40	0.610	2.150	A	EL	63.57	0.880	2.020	A	I	115.00	0.80	0.610	1.390	A	EL	63.570	1
		SNS7B	42.000		1.33	55.860	1.40	0.610	2.050	A	EL	63.57	0.880	1.950	A	I	115.00	0.80	0.610	1.330	A	EL	63.570	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.69	55.770	1.40	0.610	2.610	A	EL	63.57	0.880	2.440	A	I	115.00	0.80	0.610	1.690	A	EL	63.570	1
		TNT4A	33.075		1.69	55.897	1.40	0.610	2.620	A	EL	63.57	0.880	2.400	A	I	115.00	0.80	0.610	1.690	A	EL	63.570	1
		TNT6A	41.600		1.37	56.992	1.40	0.610	2.110	A	EL	63.57	0.880	2.020	A	I	115.00	0.80	0.610	1.370	A	EL	63.570	1
		TNT7A	42.000		1.36	57.120	1.40	0.610	2.110	A	EL	63.57	0.880	1.990	A	I	115.00	0.80	0.610	1.360	A	EL	63.570	1
		TNT7B	42.000		1.39	58.380	1.40	0.610	2.140	A	EL	63.57	0.880	1.920	A	I	115.00	0.80	0.610	1.390	A	EL	63.570	1
		TNAGRIT4	43.000		1.34	57.620	1.40	0.610	2.070	A	EL	63.57	0.880	1.860	A	I	115.00	0.80	0.610	1.340	A	EL	63.570	1
TNAGT5A	45.000		1.27	57.150	1.40	0.610	1.960	A	EL	63.57	0.880	1.810	A	I	115.00	0.80	0.610	1.270	A	EL	63.570	1		
TNAGT5B	45.000		③	1.26	56.700	1.40	0.610	1.950	A	EL	63.57	0.880	1.760	A	I	115.00	0.80	0.610	1.260	A	EL	63.570	1	

LOAD FACTORS:

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

NOTES:
 MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
 ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:
 1. SPAN A AND SPAN B SIMILAR
 2.
 3.
 4.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

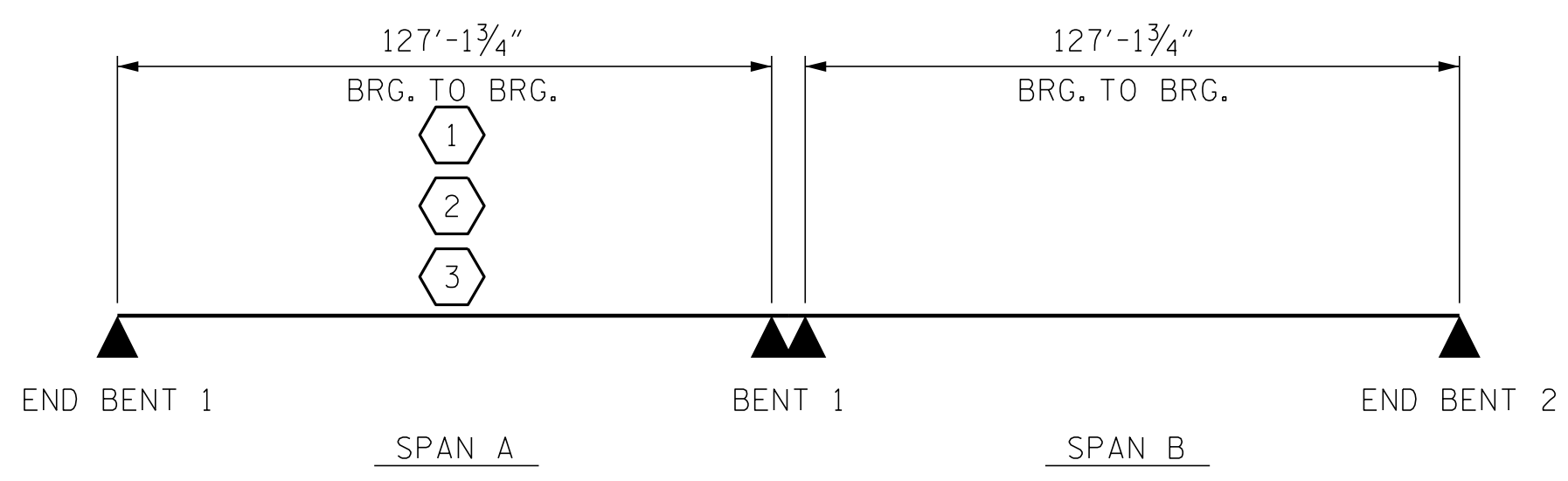
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-

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ASSEMBLED BY : D. HODGE	DATE : 10/21
CHECKED BY : J. DILWORTH	DATE : 10/21
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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ENGINEER OF RECORD
 3/24/2022

Gregory M. Gilland
 WETHERILL ENGINEERING

1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S3-4
					TOTAL SHEETS 29

STD. NO. LRFR1

NOTES

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

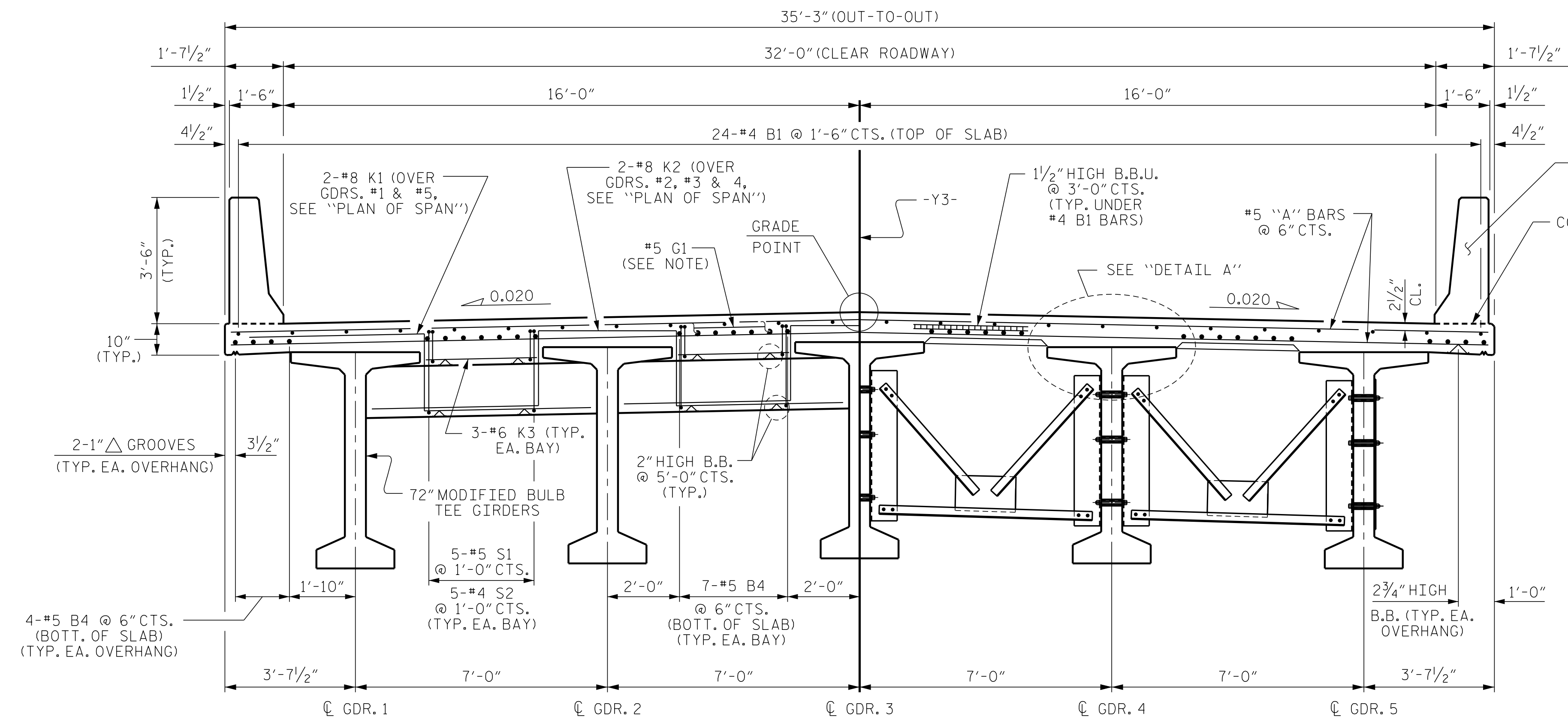
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

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

NO WELDING OF FORMS OR FALSEWORK TO THE TOP OF THE GIRDER WILL BE PERMITTED IN THE LINK SLAB AREA.

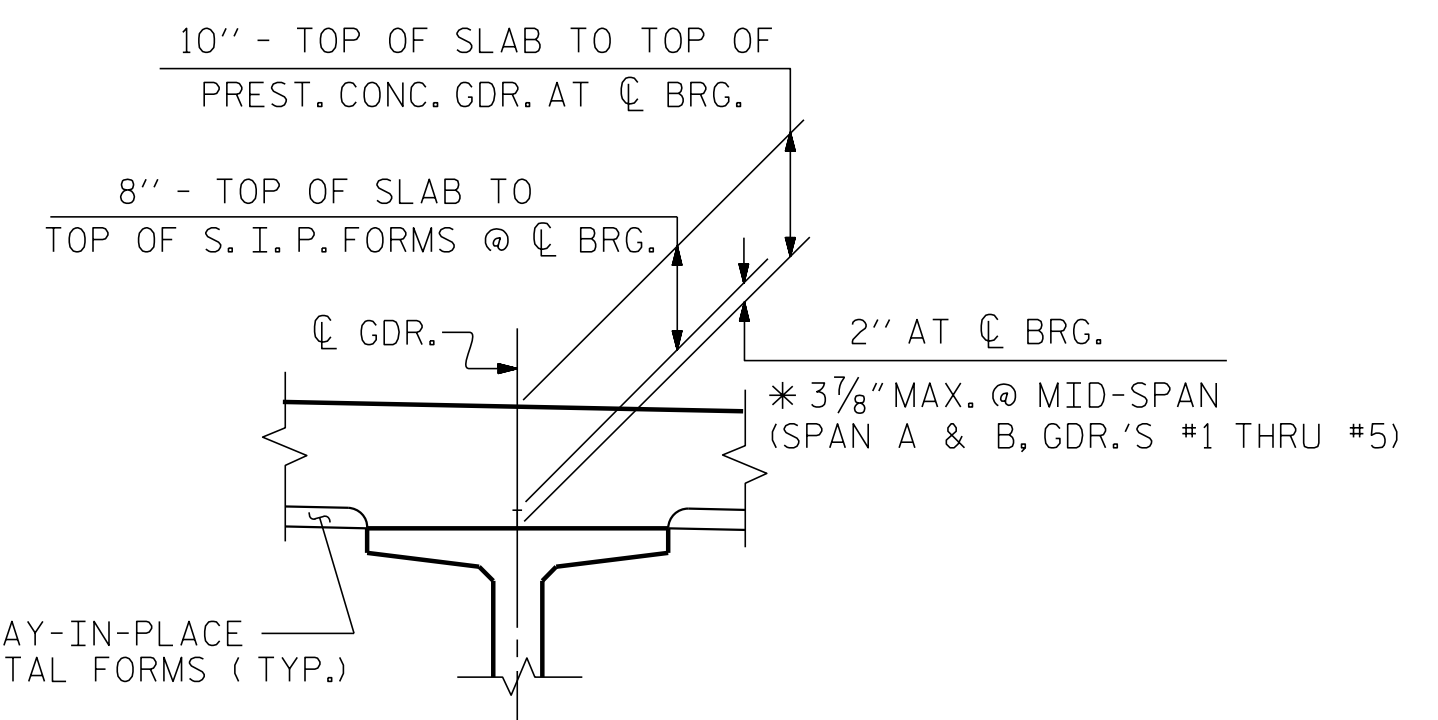


TYPICAL HALF SECTION

(SHOWING END BENT DIAPHRAGMS)

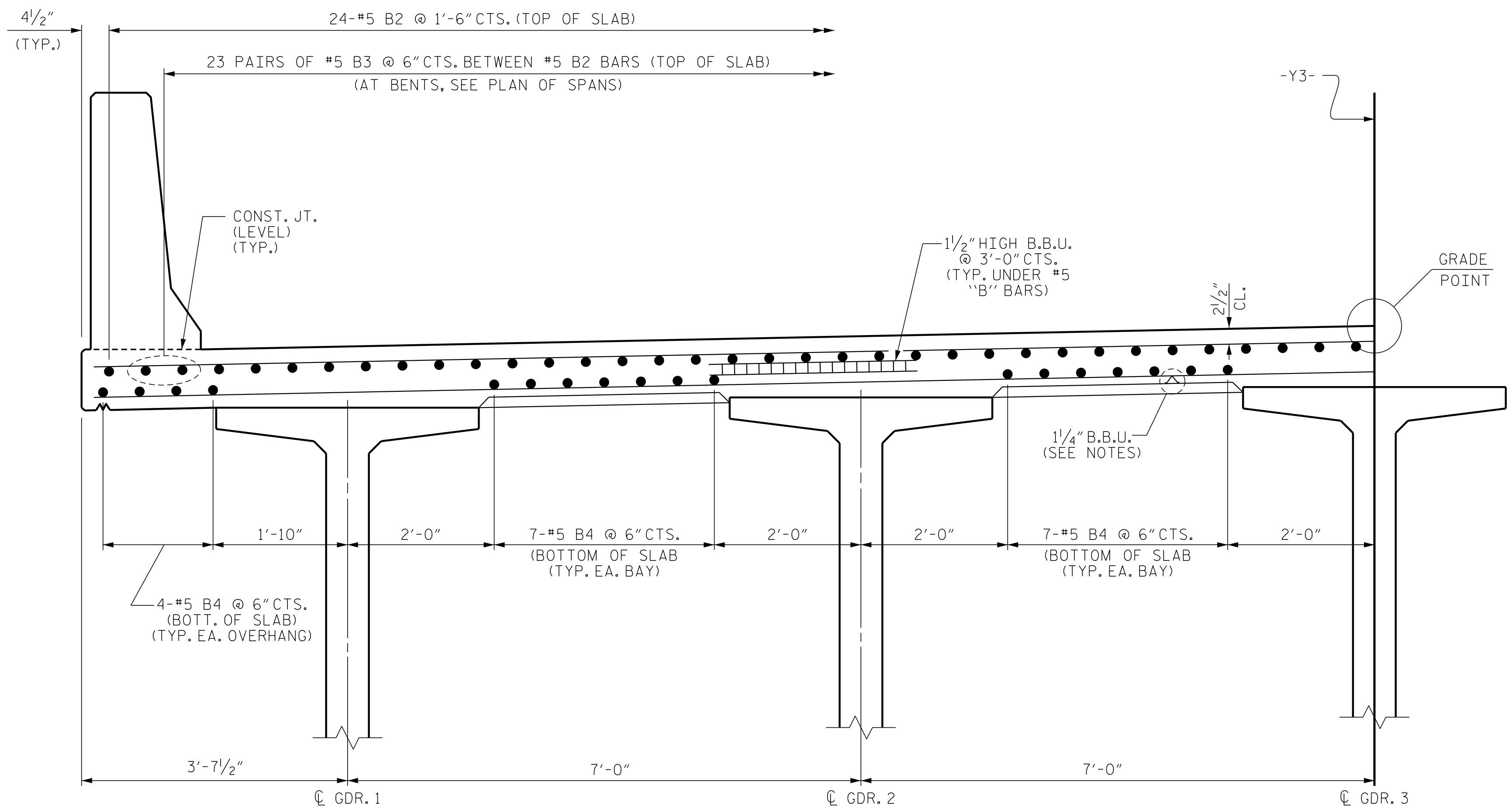
TYPICAL HALF SECTION

(SHOWING INTERMEDIATE STEEL DIAPHRAGMS)



DETAIL "A"

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



TYPICAL HALF SECTION THRU LINK SLAB @ BENT

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-
SHEET 1 OF 2

ENGINEER OF RECORD
3/24/2022

Gregory M. Gulland
ETHERILL ENGINEERING

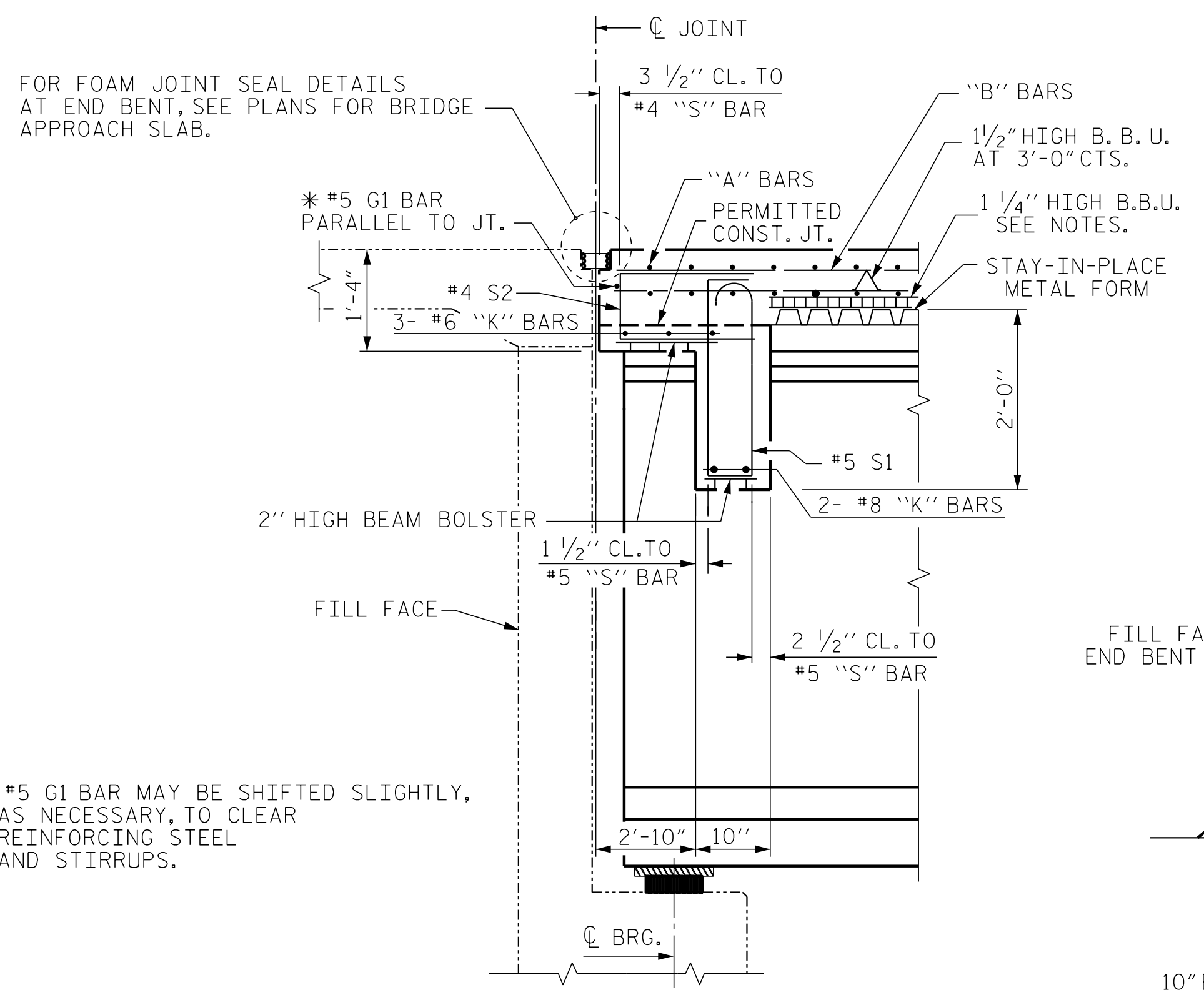
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S3-5					TOTAL SHEETS 29

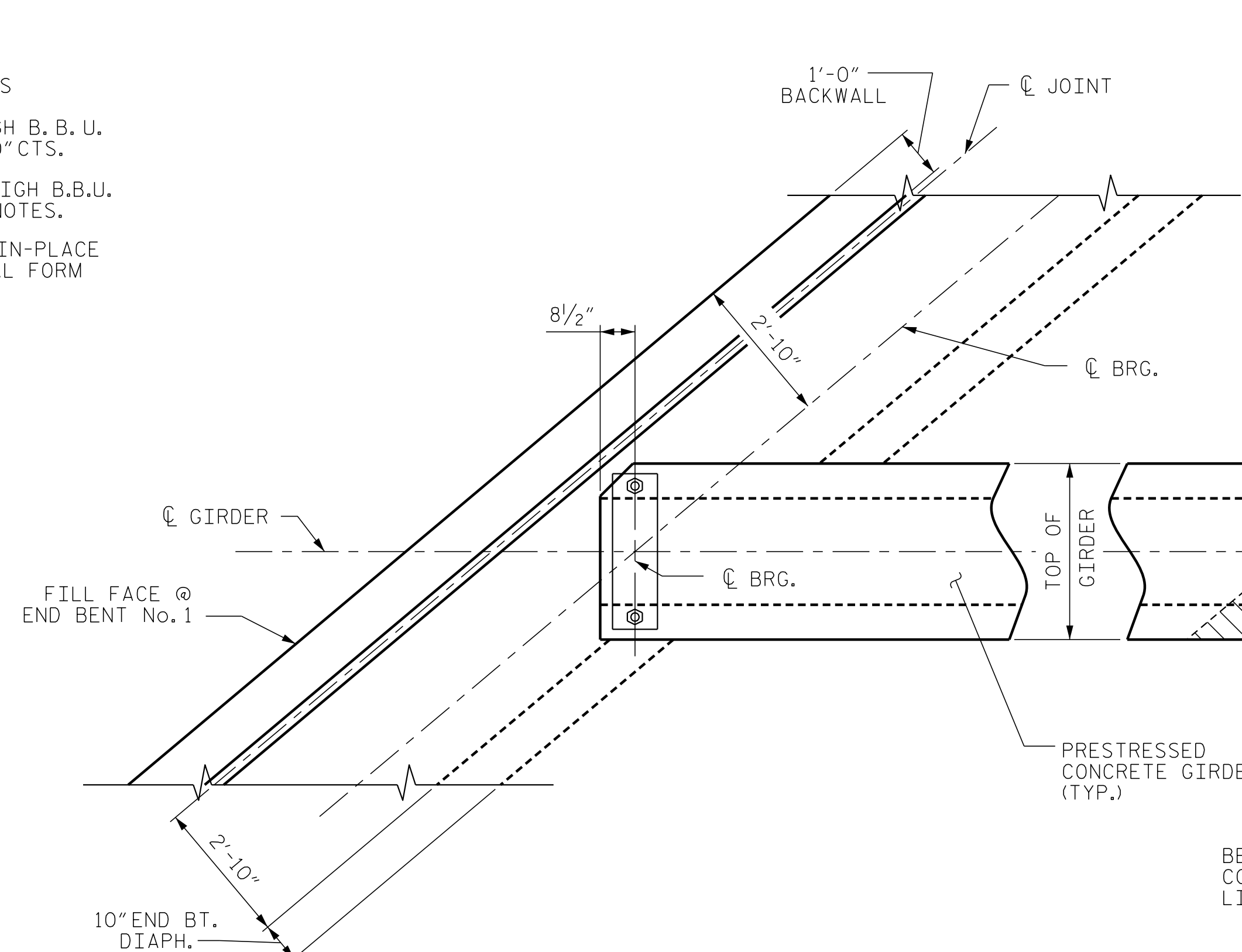
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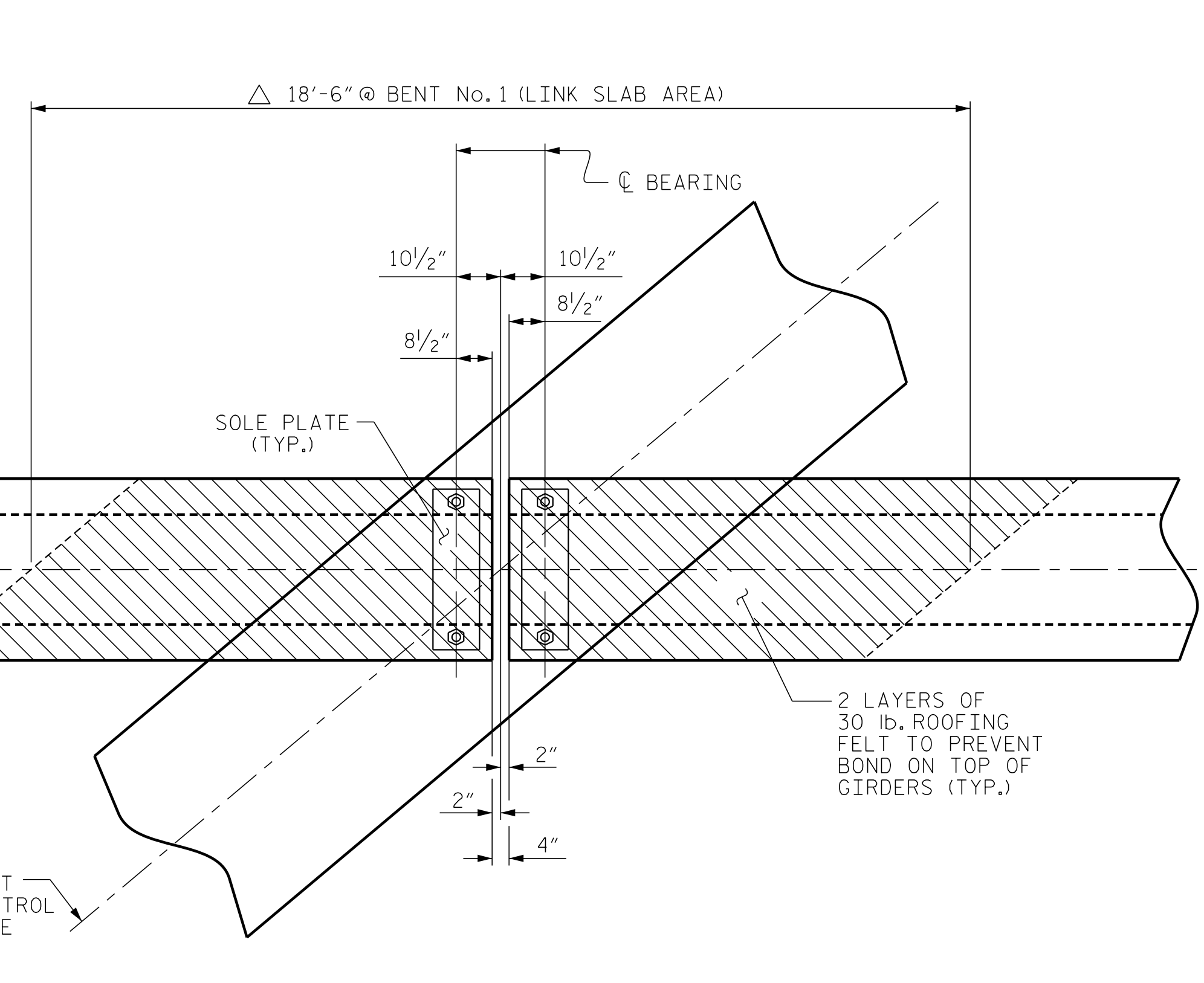
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SECTION THRU END BENT DIAPHRAGM

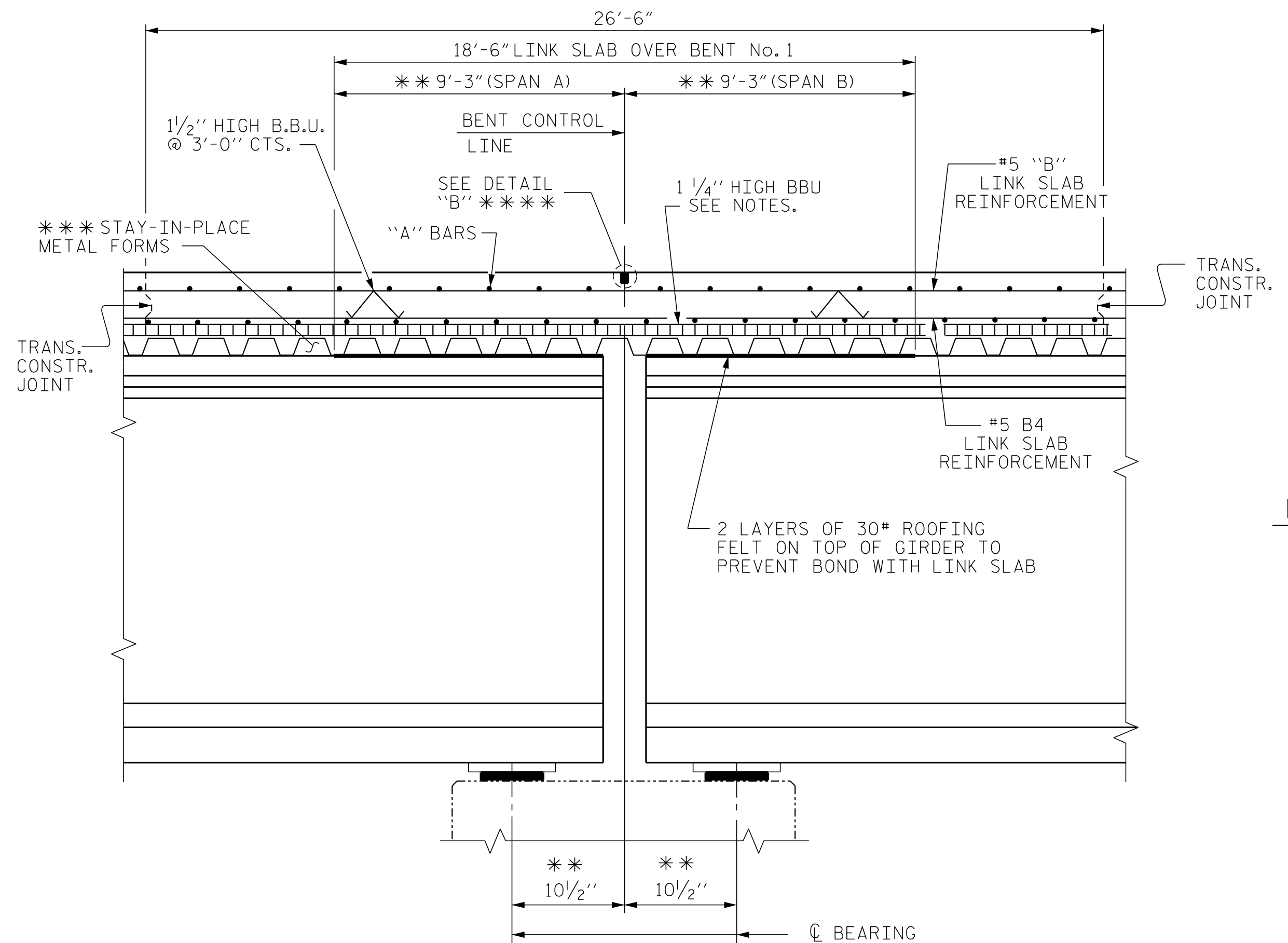


PLAN OF GIRDER @ END BENT



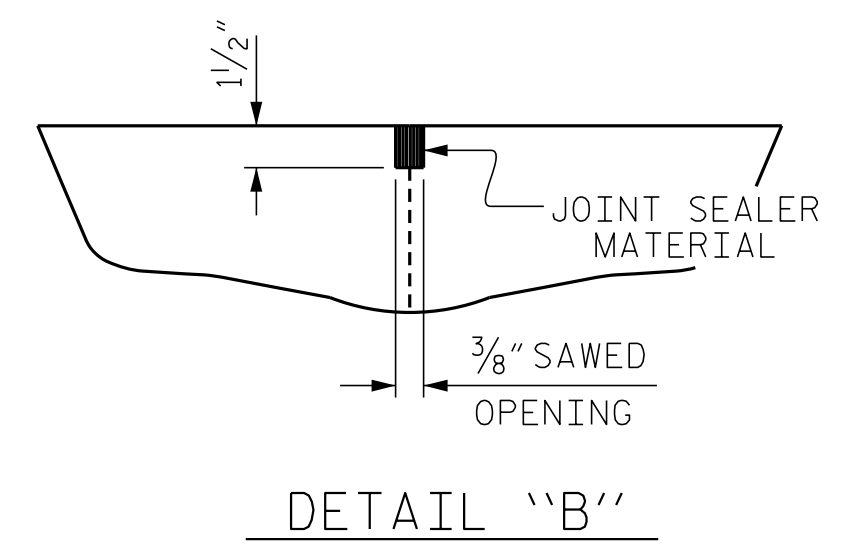
PLAN OF LINK SLAB @ BENT

△ THE TOP OF THE 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 THRU LINK SLAB @ BENT

(SHOWN PERPENDICULAR TO BENT CONTROL LINE)



LINK SLAB NOTES:

- *** METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.
- **** 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 SPECIFICATION.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 2

ENGINEER OF RECORD
 3/24/2022

 Gregory M. Gilland
 WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
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 LICENSE NO. F-0377

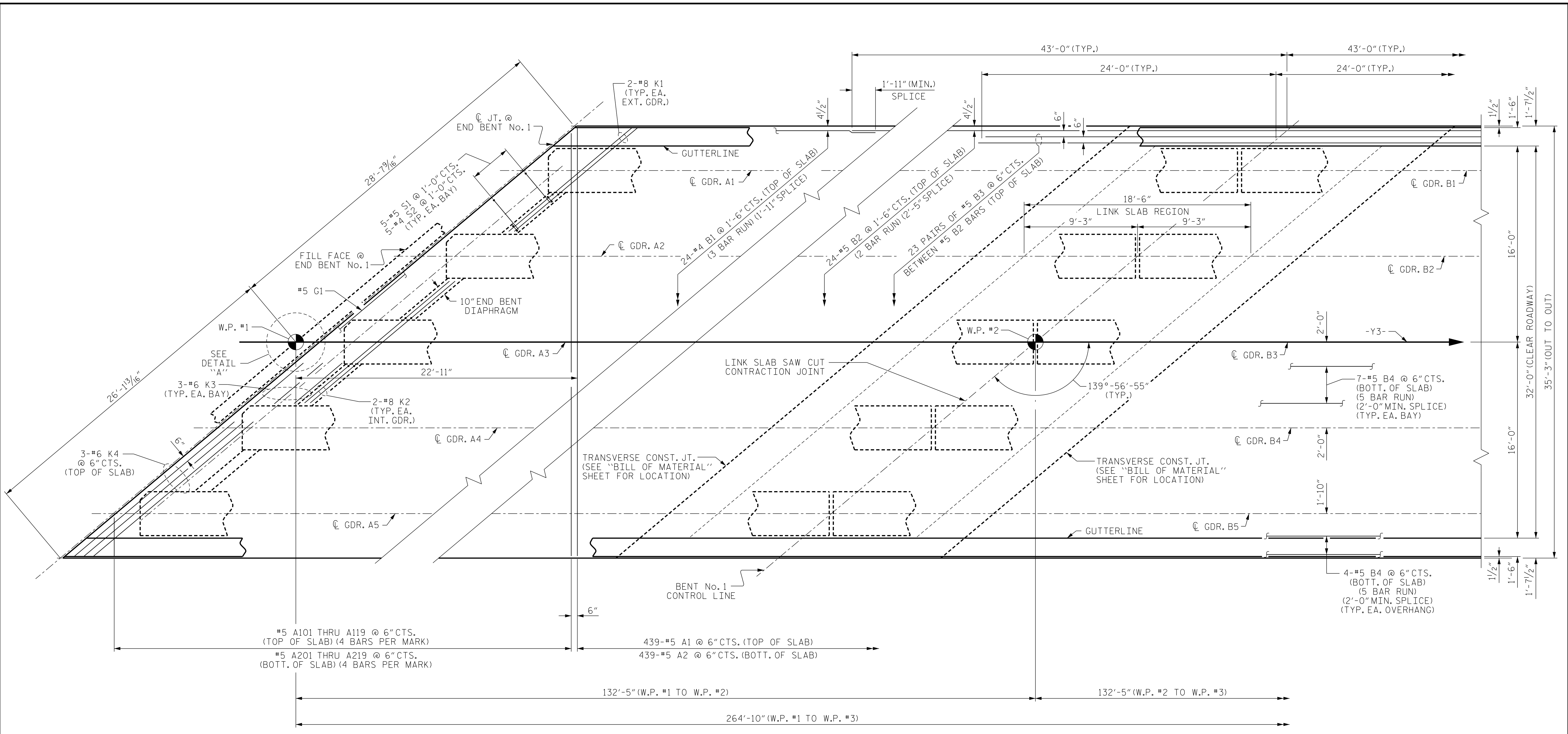
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SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S3-6					TOTAL SHEETS 29

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** DIMENSION IS MEASURED ALONG THE G GIRDER

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PLAN OF SPAN A

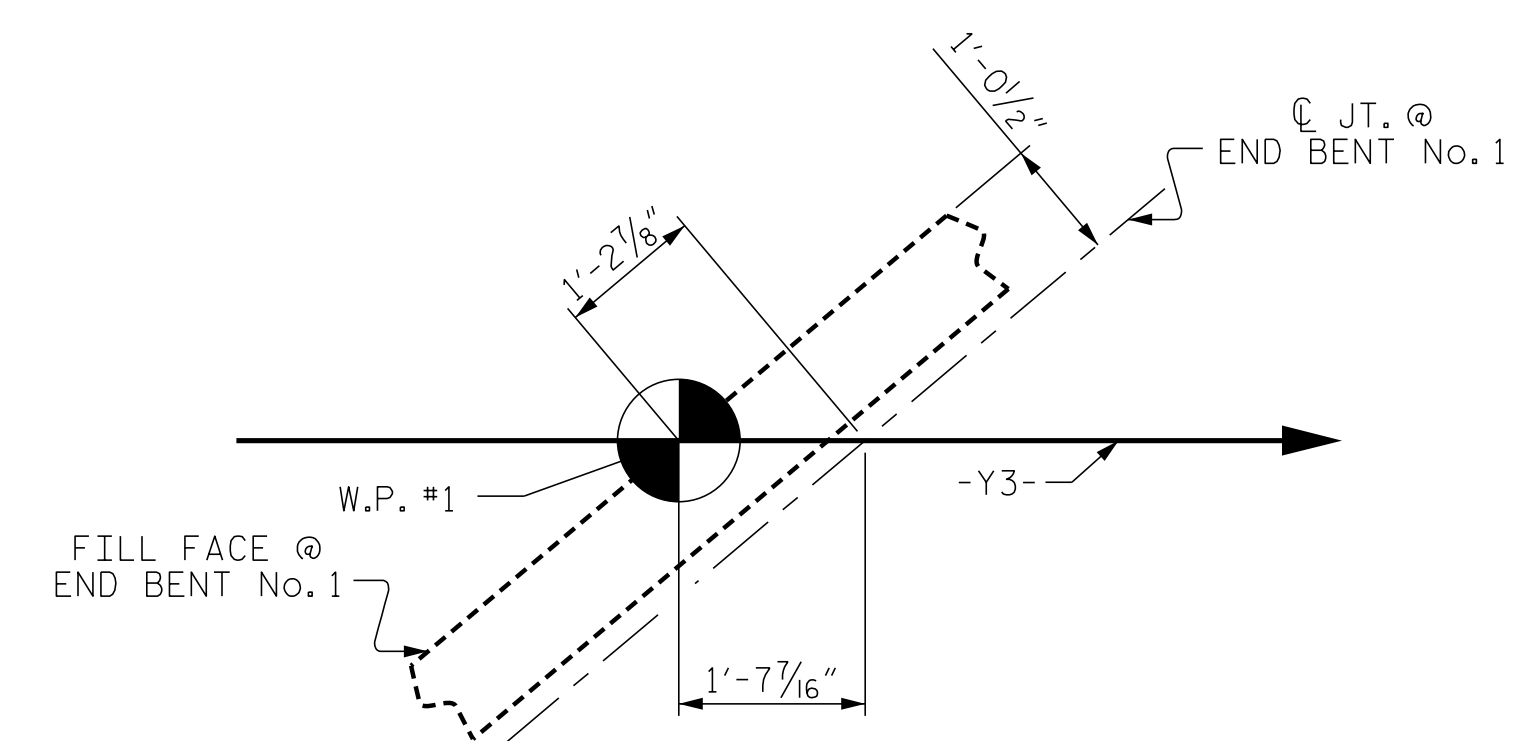
FOR LOCATIONS OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEET.

PROJECT NO. I-5987A

ROBESON COUNTY

STATION: 30+04.11 -Y3-

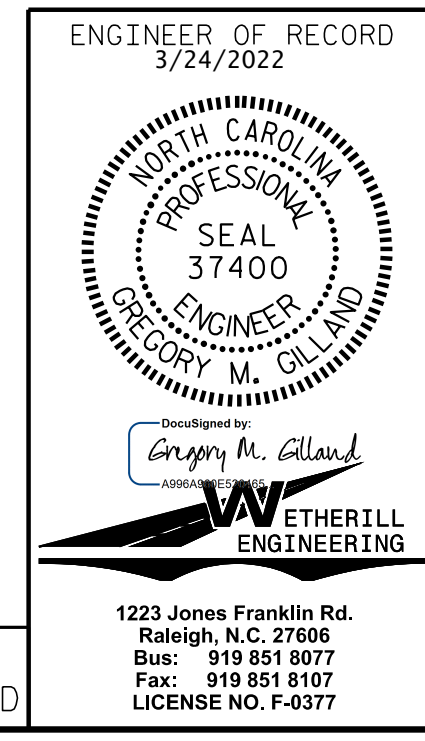
SHEET 1 OF 2



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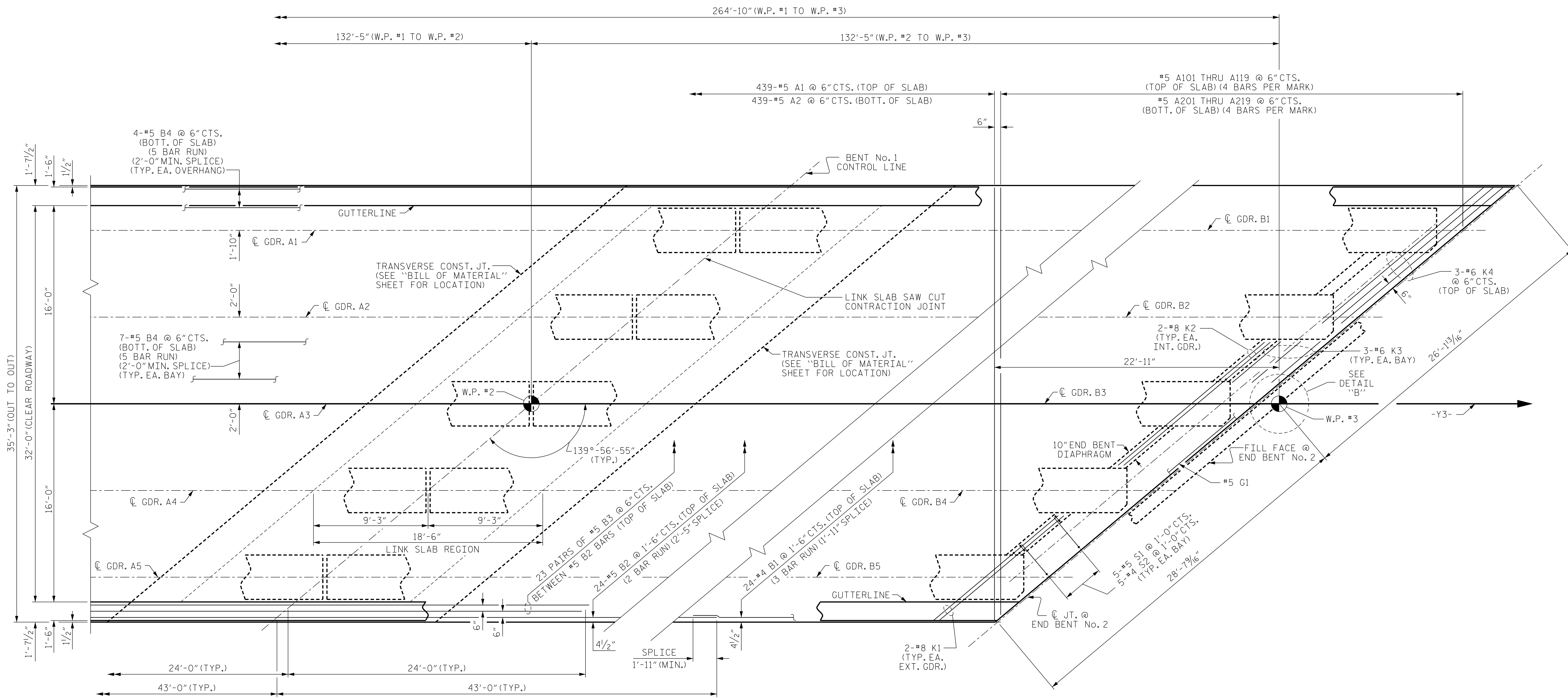
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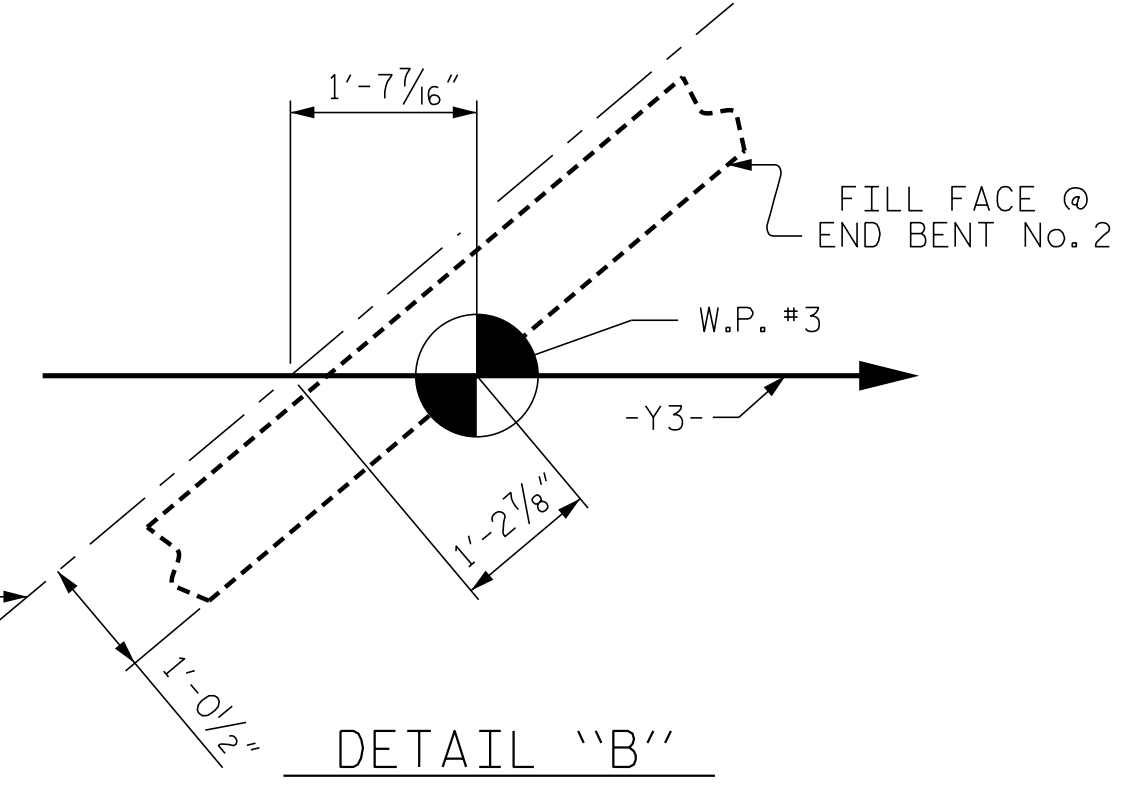
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS SPAN A					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S3-7
					TOTAL SHEETS 29

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PLAN OF SPAN B

FOR LOCATIONS OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEET.



PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 2

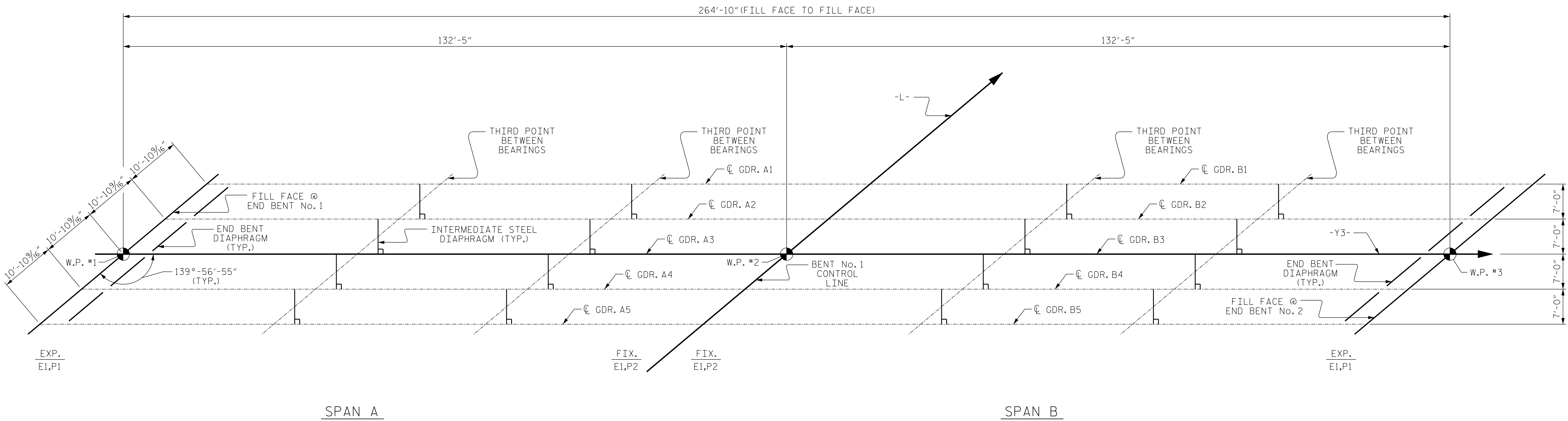
ENGINEER OF RECORD
 3/24/2022

 Gregory M. Gilland
 WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
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 Fax: 919 851 8107
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-8
1			3			TOTAL SHEETS
2			4			29

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GIRDER LAYOUT

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-

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 CHECKED BY : J. DILWORTH DATE : 10/21

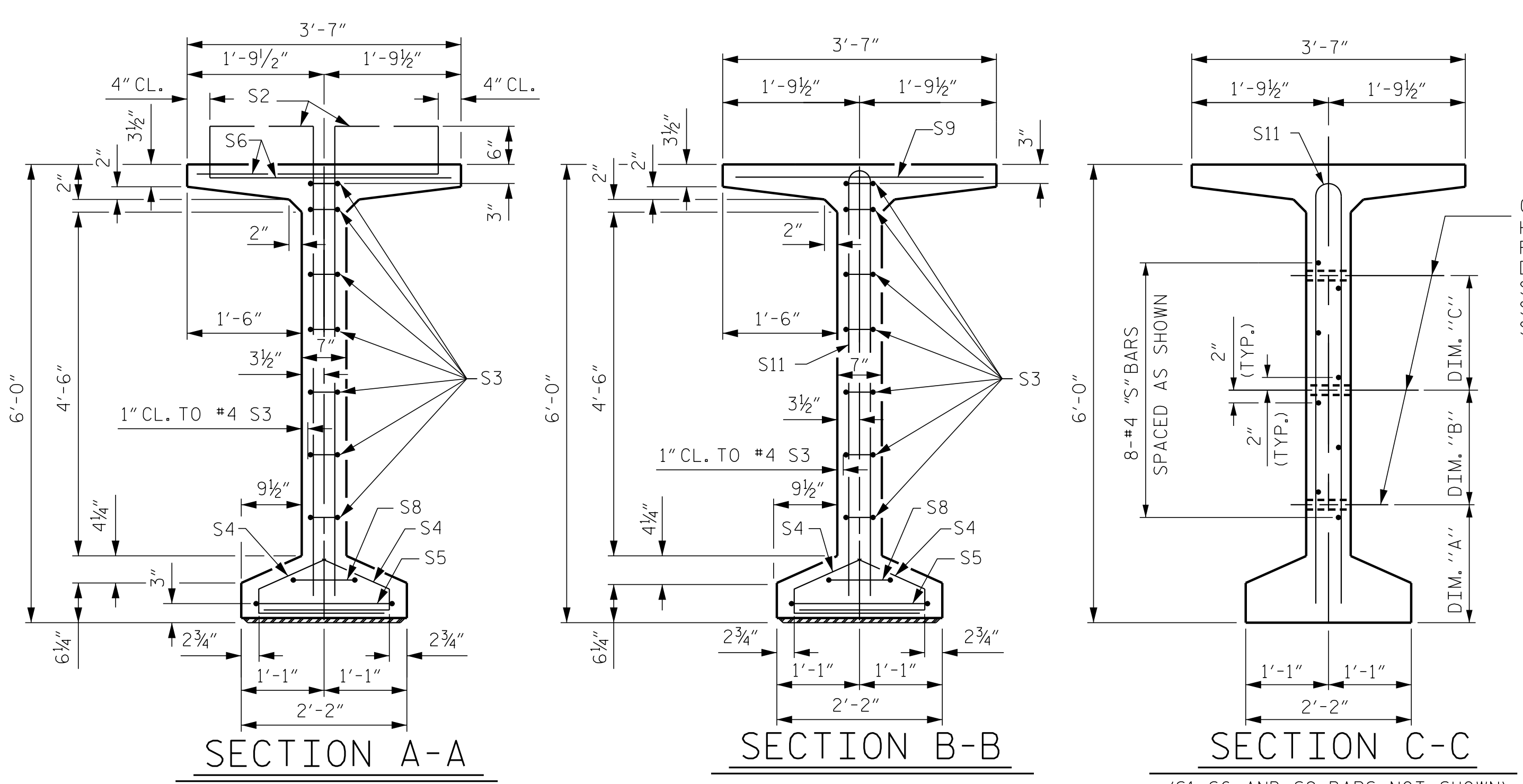
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

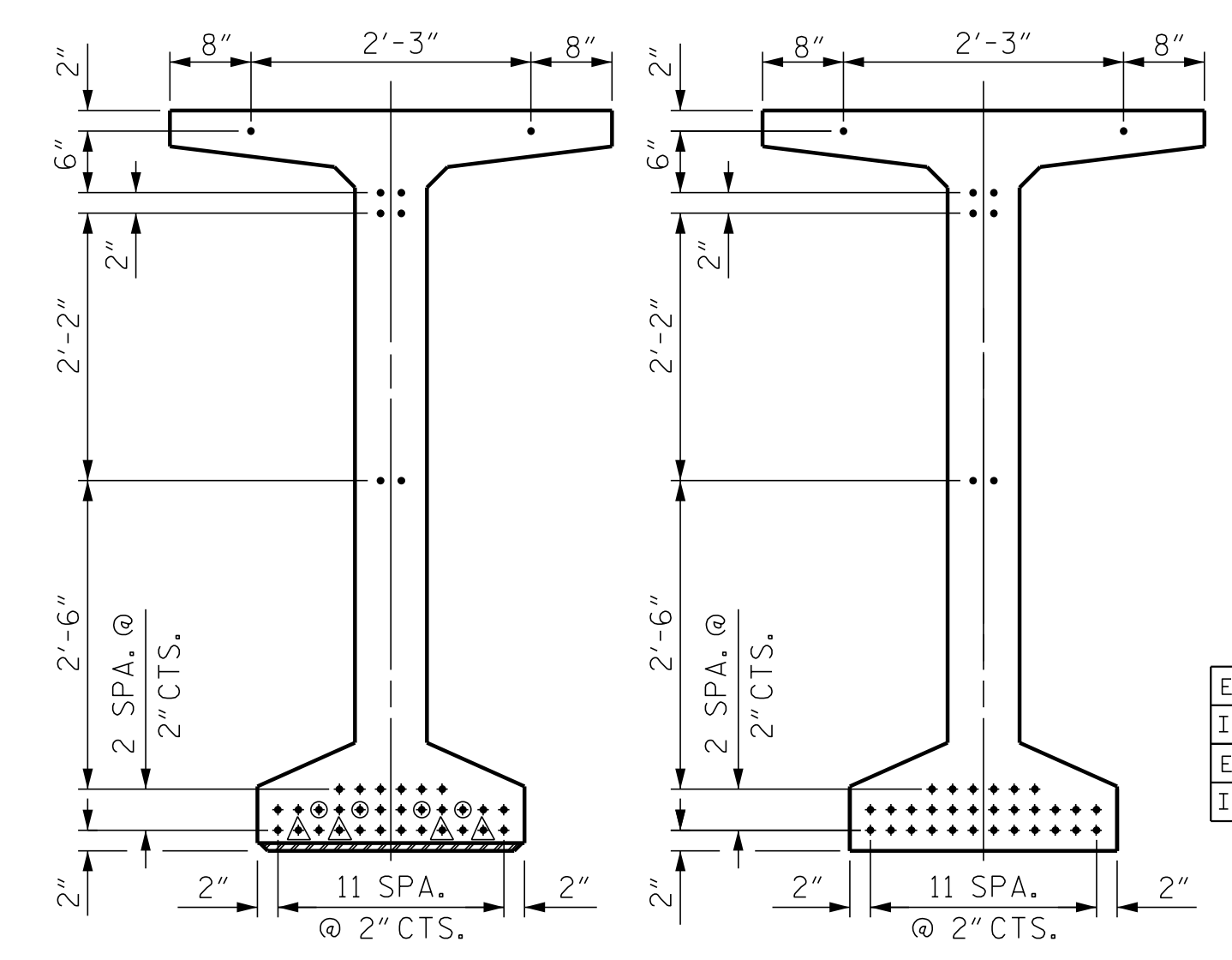
SUPERSTRUCTURE
 GIRDER LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-9
1			3			TOTAL SHEETS
2			4			29



1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

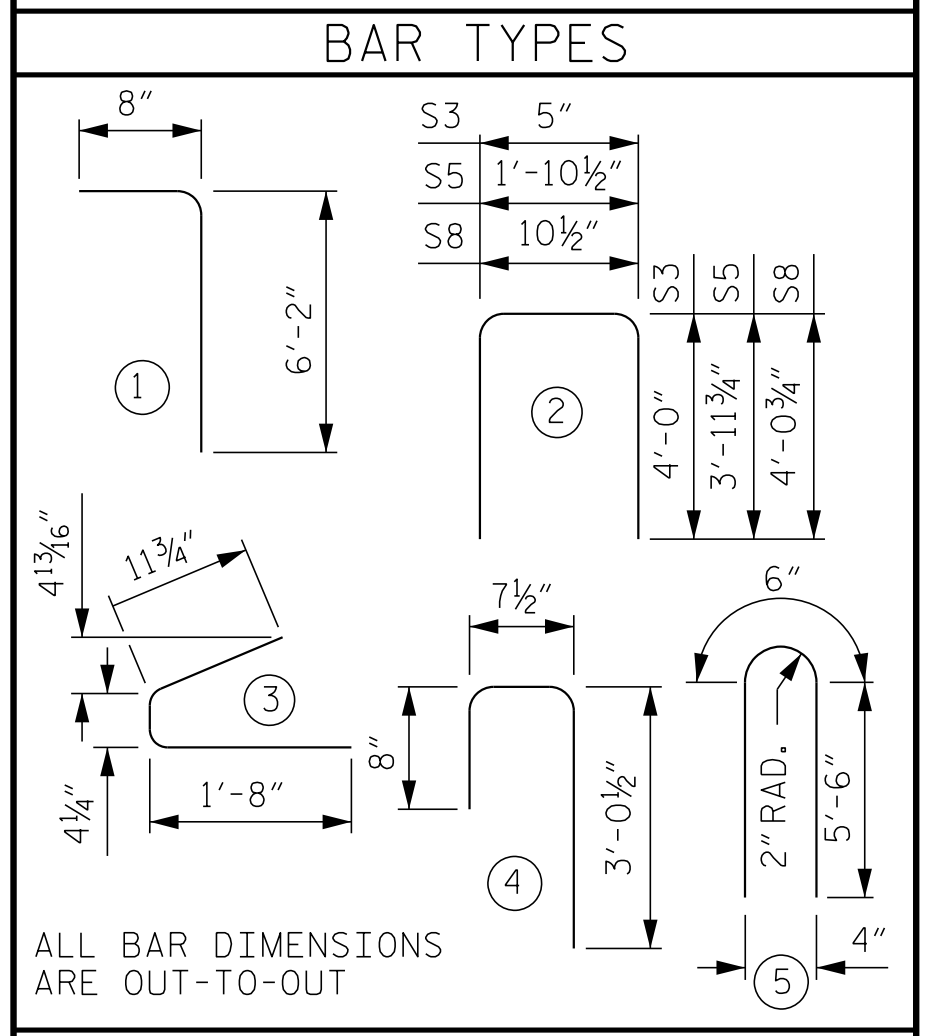
- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - △ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



AT END OF GIRDER AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

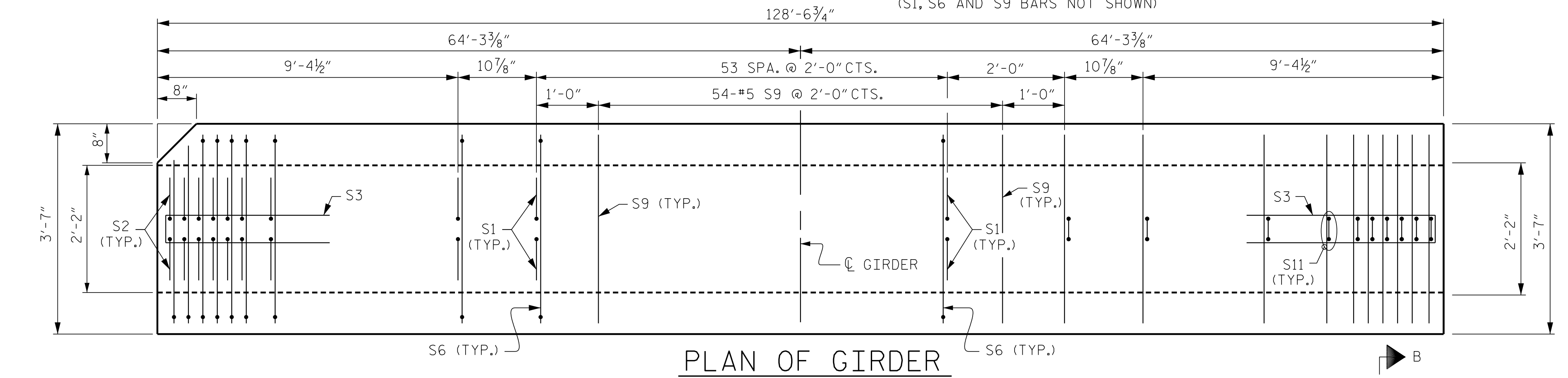
0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT		
S1	138	#4	1	6'-10"	630	
S2	12	#5	1	6'-10"	86	
S3	14	#4	2	8'-5"	79	
S4	84	#4	3	3'-0"	168	
S5	2	#5	2	9'-10"	21	
S6	150	#5	4	4'-4"	678	
S8	2	#5	2	9'-0"	19	
S9	76	#5	STR	3'-3"	258	
EXTERIOR GDR.	S11	30	#5	5	11'-6"	360
INTERIOR GDR.	S11	38	#5	5	11'-6"	456
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	16'-4"	175

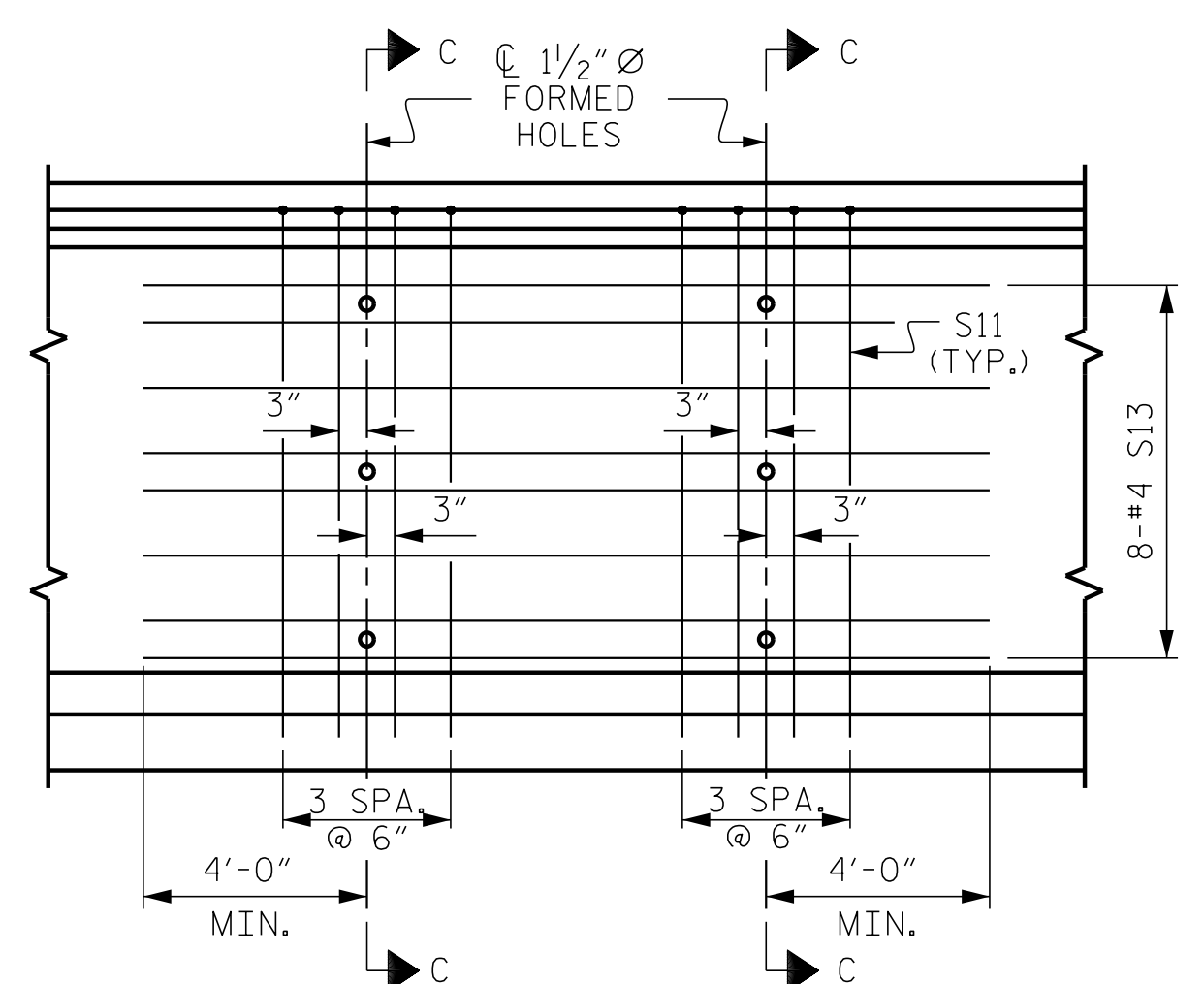


QUANTITIES FOR ONE GIRDER			
GIRDERS	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
INTERIOR	2570	27.5	38
EXTERIOR	2385	27.5	38

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	128'-6 3/4"	1,285.63'

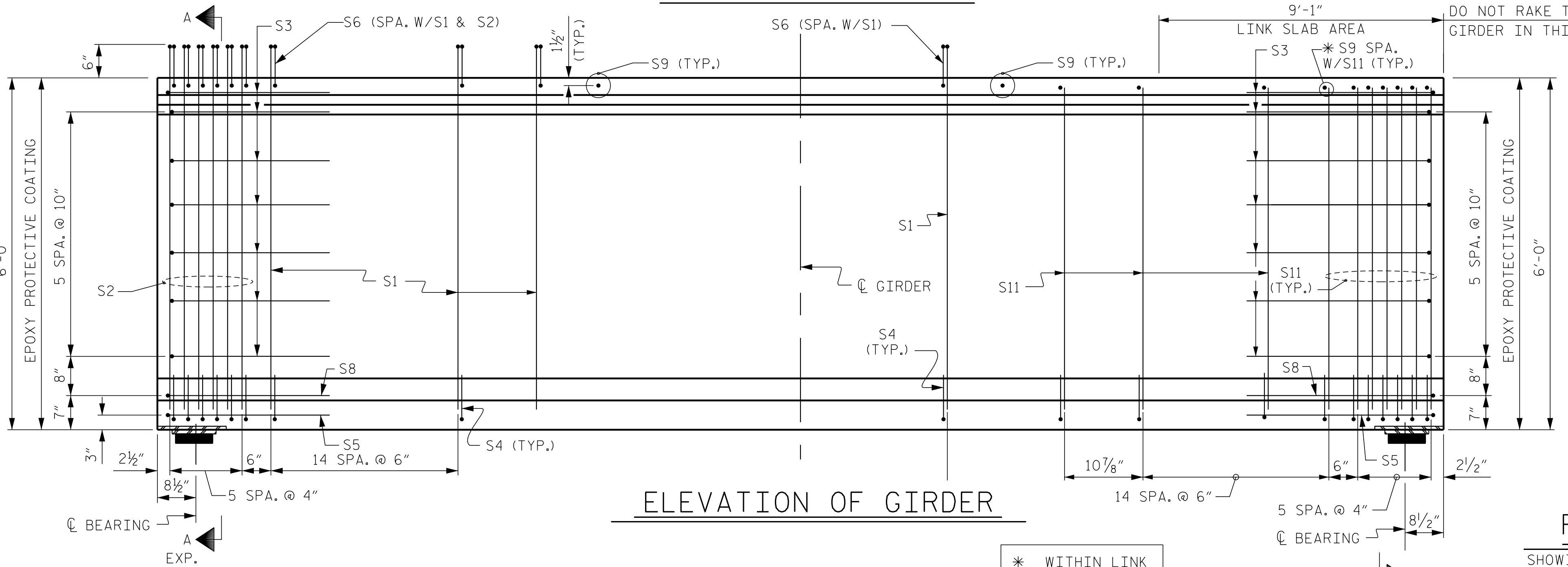


PLAN OF GIRDER



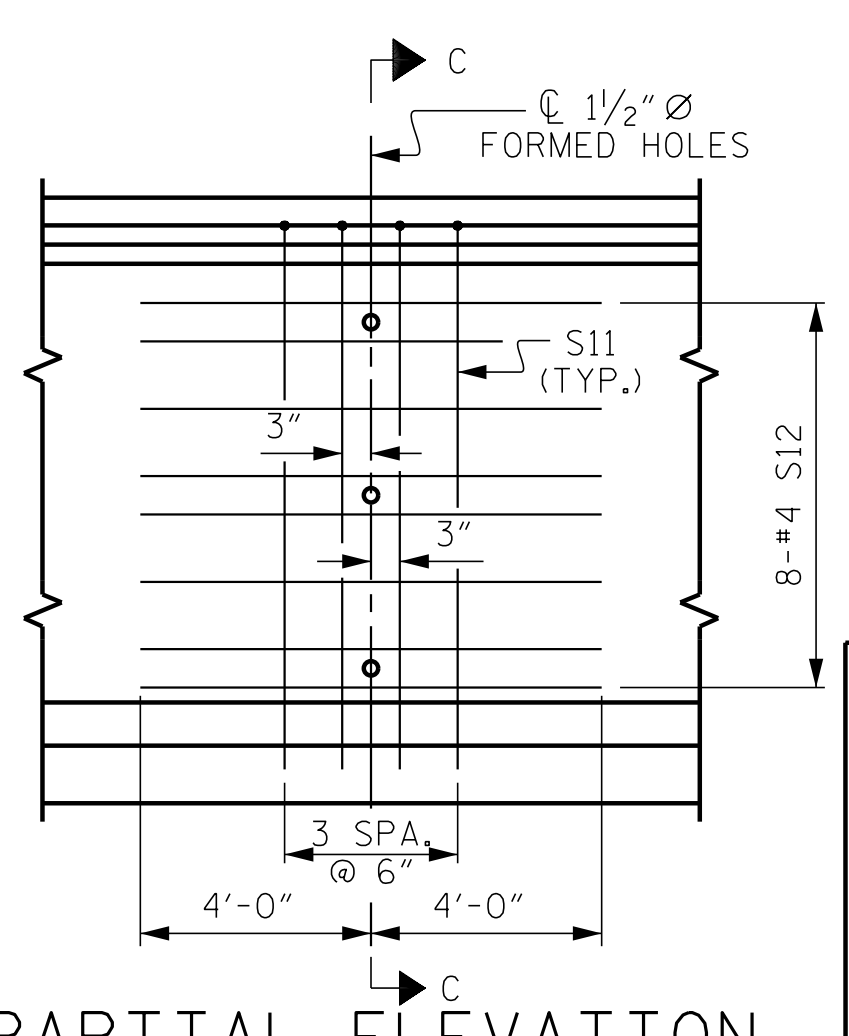
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4



ELEVATION OF GIRDER

* WITHIN LINK SLAB AREA ONLY



PARTIAL ELEVATION

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

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-
SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
72" PRESTRESSED
CONCRETE
MODIFIED BULB TEE
LINK SLAB

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

SHEET NO. S3-10
TOTAL SHEETS 29

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ASSEMBLED BY : D. HODGE	DATE : 11/21
CHECKED BY : JAD/GMG	DATE : 11/21
DRAWN BY : BNB 9/21	REV. REV.
CHECKED BY : AAI 9/21	REV. REV.

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Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

ALL PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

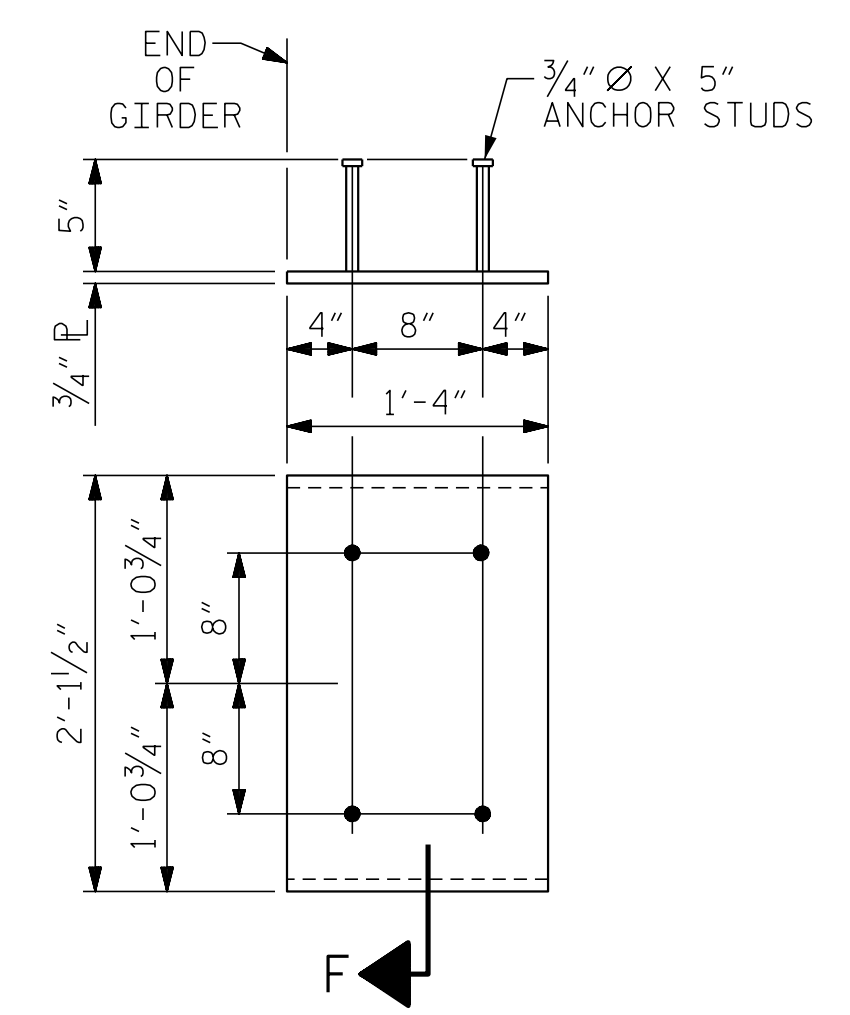
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 8,000 PSI.

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" AND THE AREA OF THE LINK SLAB, SHALL BE RAKED TO A DEPTH OF 1/4".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 72" MODIFIED BULB TEES ONLY.

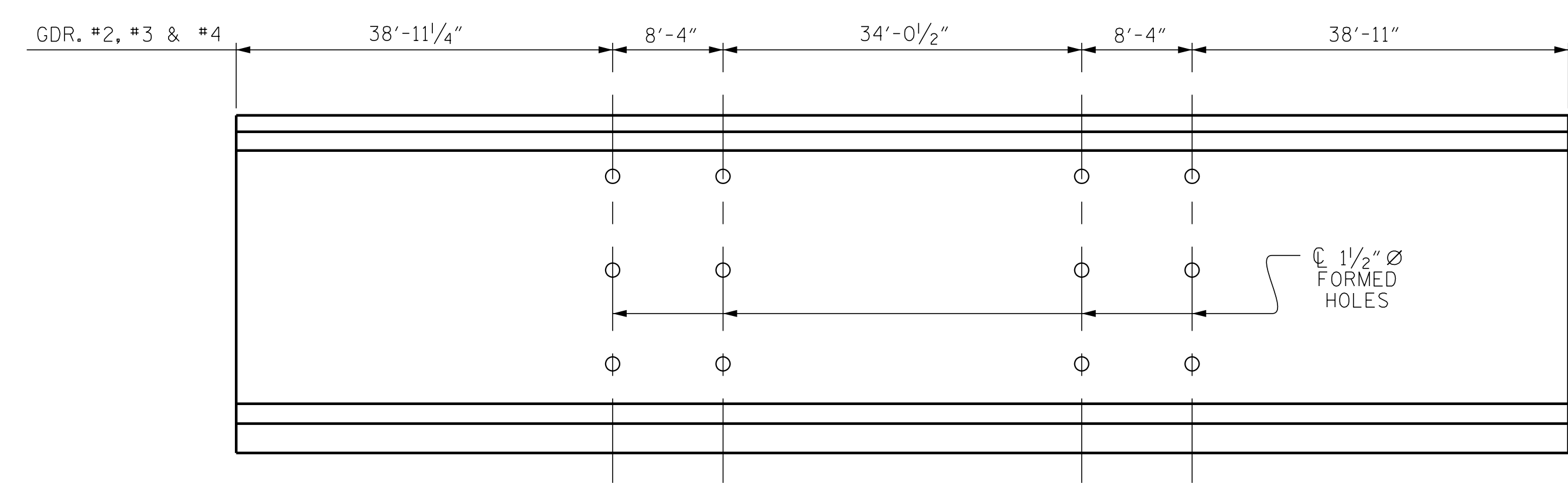
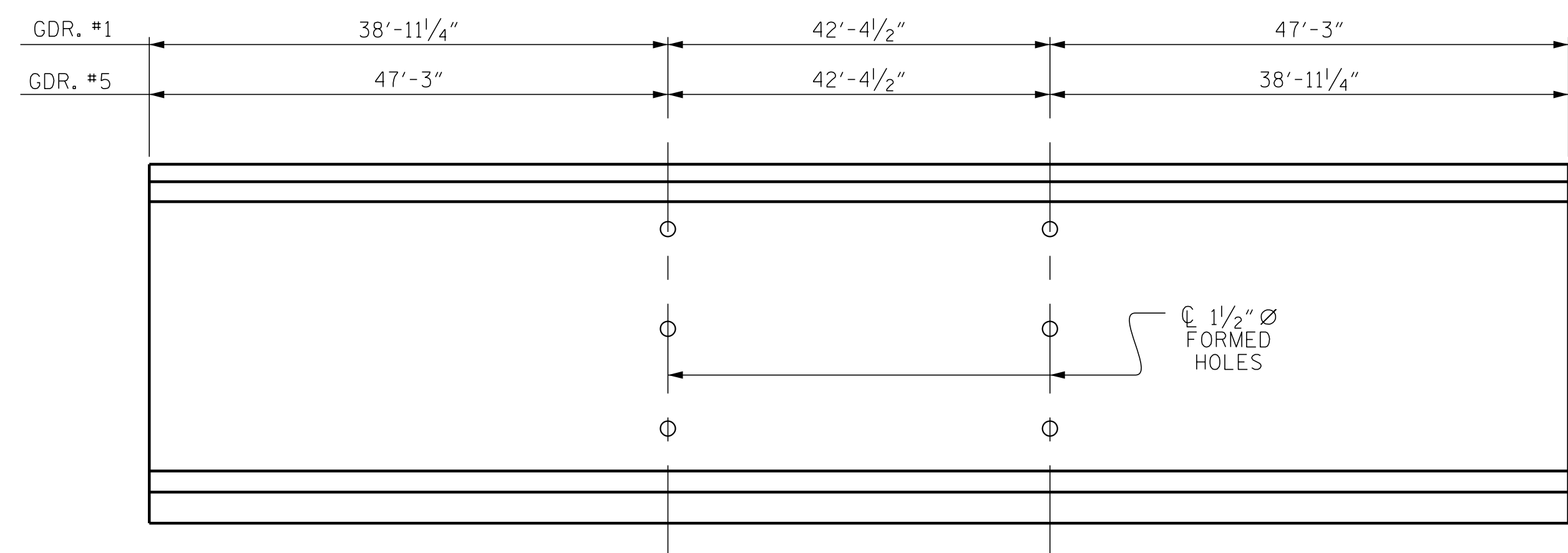
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



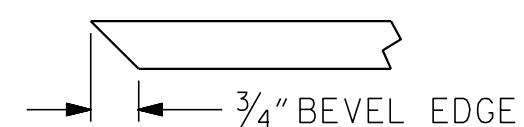
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

AHEAD STATION



LOCATION OF BOLT HOLES IN GIRDERS



SECTION "F"

(SEE NOTES)

PROJECT NO. I-5987A

ROBESON COUNTY

STATION: 30+04.11 -Y3-

SHEET 2 OF 3

ENGINEER OF RECORD
3/24/2022

Gregory M. Gilliam
ETHERILL ENGINEERING

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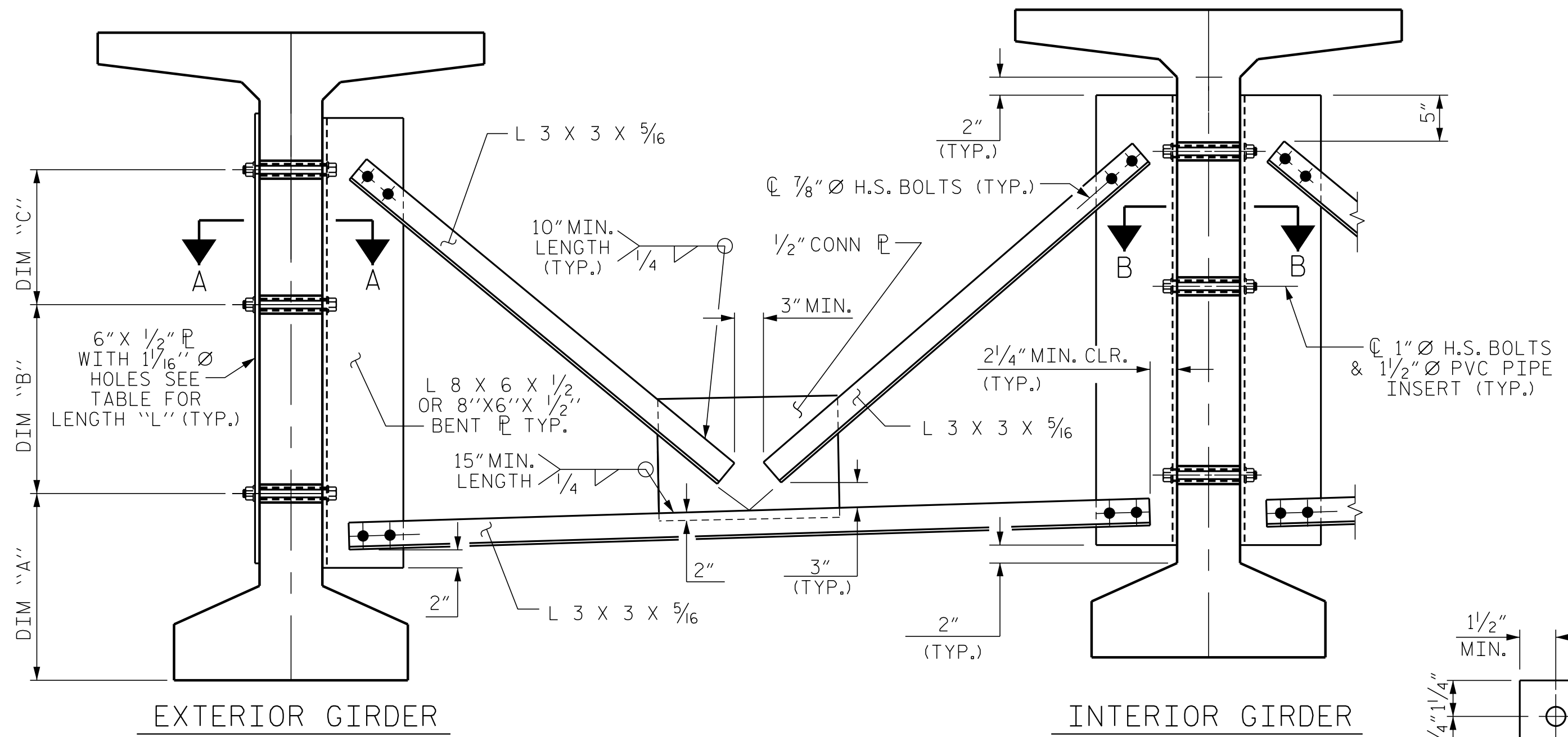
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

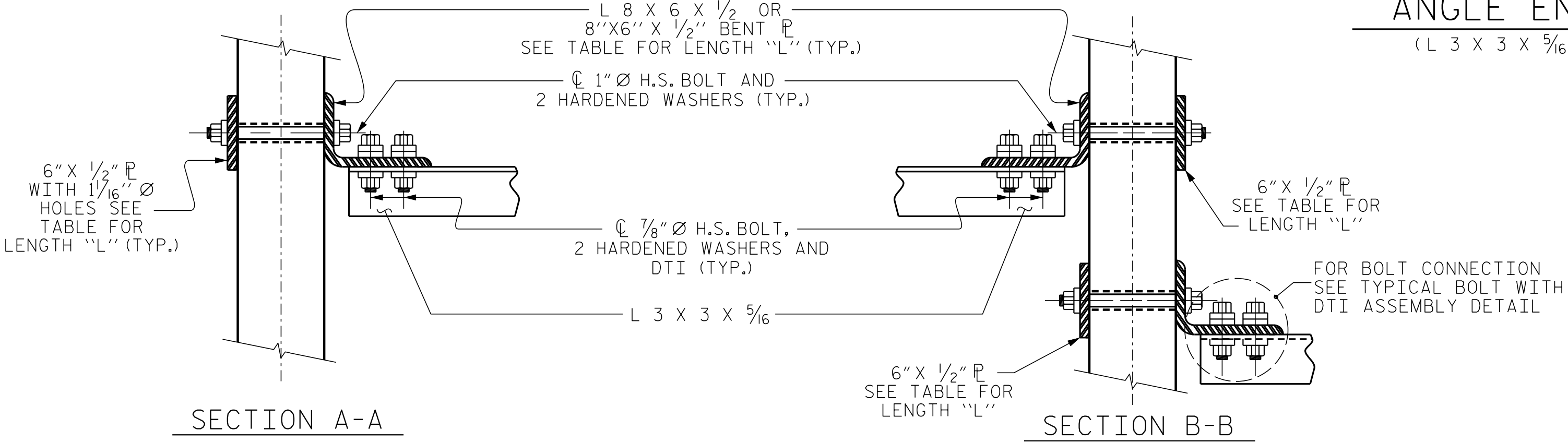
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-11
1			3			TOTAL SHEETS
2			4			29

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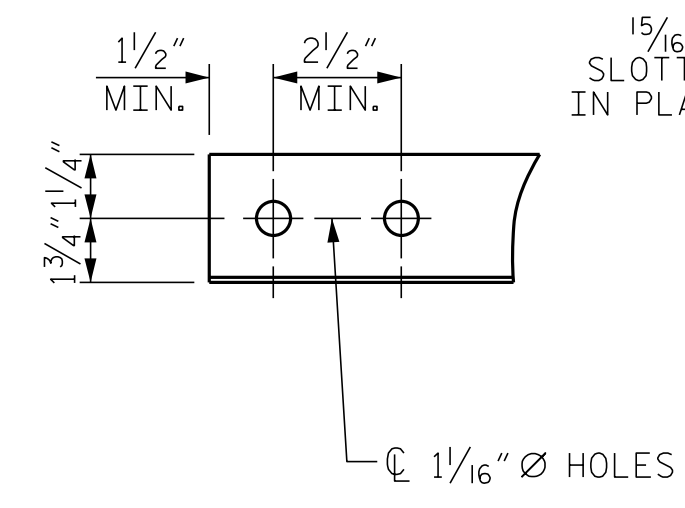
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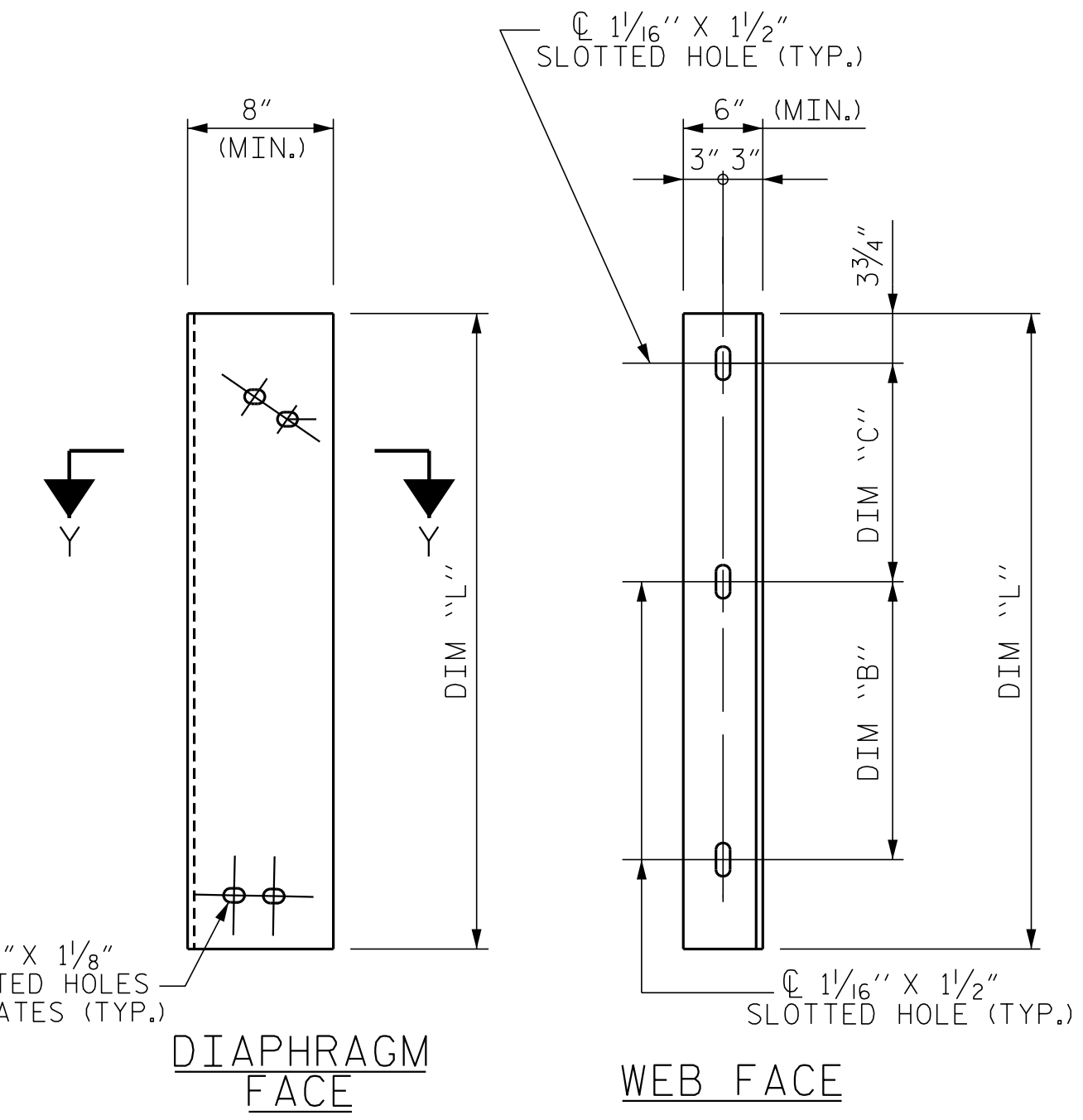
PART SECTION AT INTERMEDIATE DIAPHRAGM
(72" BULB TEE GIRDER SHOWN)



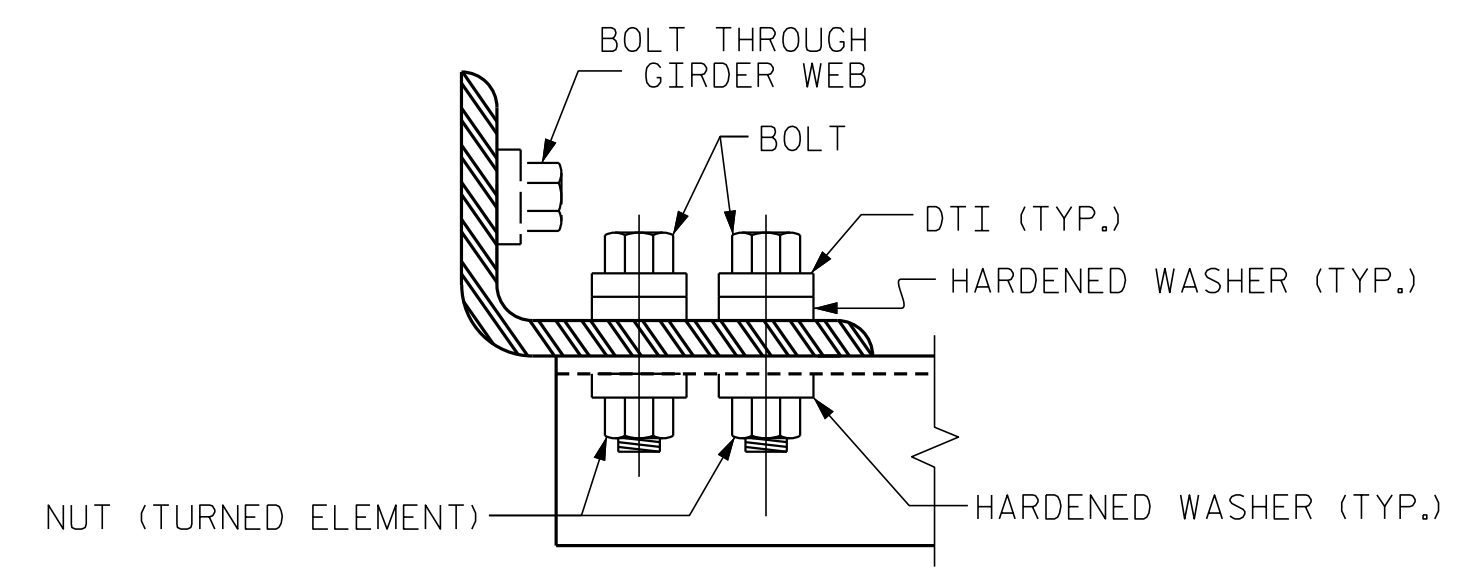
CONNECTION DETAILS



ANGLE END
(L 3 x 3 x 5/16)



CONNECTOR PLATE DETAIL



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE 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, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

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

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

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

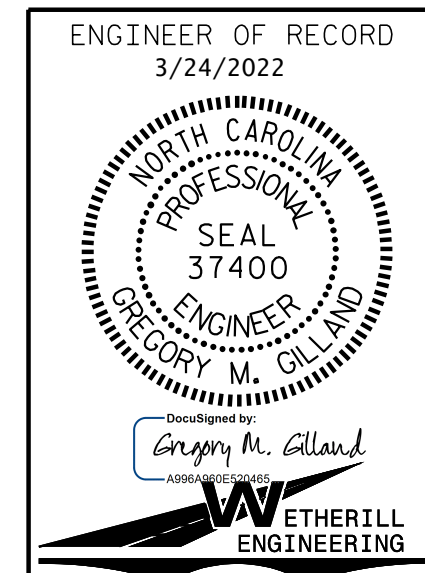
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-7"	1'-9"	1'-7"	4'-2"

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-12
1			3			TOTAL SHEETS
2			4			29

ASSEMBLED BY : D. HODGE DATE : 10/21
 CHECKED BY : J. DILWORTH DATE : 10/21
 DRAWN BY : RWW 11/09 REV. 10/11 MAA/GM
 CHECKED BY : GM 11/09 REV. 12/17 MAA/THC

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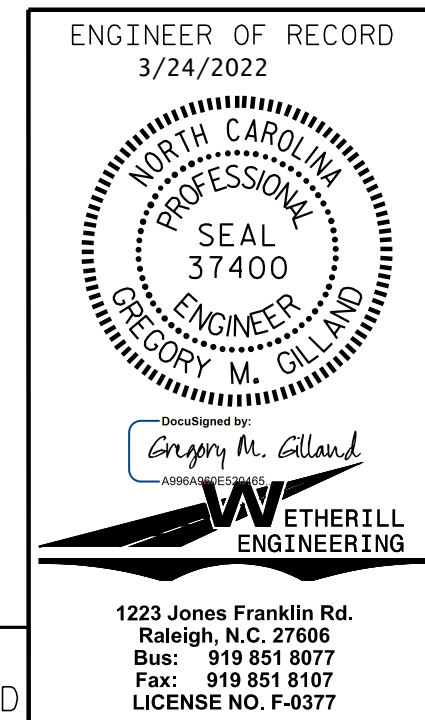
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																										
0.6" Ø LOW RELAXATION	SPAN A & SPAN B																																									
	GIRDERS 1 & 5																																									
	FORTIETH POINTS	0	.025	.050	.075	.100	.125	.150	.175	.200	.225	.250	.275	.300	.325	.350	.375	.400	.425	.450	.475	.500	.525	.550	.575	.600	.625	.650	.675	.700	.725	.750	.775	.800	.825	.850	.875	.900	.925	.950	.975	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.013	0.026	0.038	0.051	0.063	0.074	0.086	0.096	0.106	0.115	0.124	0.132	0.139	0.145	0.150	0.154	0.157	0.160	0.161	0.162	0.161	0.160	0.157	0.154	0.150	0.145	0.139	0.132	0.124	0.115	0.106	0.096	0.086	0.074	0.063	0.051	0.038	0.026	0.013	0	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.011	0.022	0.033	0.045	0.055	0.066	0.076	0.087	0.095	0.103	0.112	0.120	0.125	0.130	0.136	0.141	0.143	0.145	0.146	0.148	0.146	0.145	0.143	0.141	0.136	0.130	0.125	0.120	0.112	0.103	0.095	0.087	0.076	0.066	0.055	0.045	0.033	0.022	0.011	0	
FINAL CAMBER ↑	0	0"	1/16"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	1/16"	0"	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 B																																									
	GIRDERS 2, 3 & 4																																									
	FORTIETH POINTS	0	.025	.050	.075	.100	.125	.150	.175	.200	.225	.250	.275	.300	.325	.350	.375	.400	.425	.450	.475	.500	.525	.550	.575	.600	.625	.650	.675	.700	.725	.750	.775	.800	.825	.850	.875	.900	.925	.950	.975	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.013	0.026	0.038	0.051	0.063	0.074	0.086	0.096	0.106	0.115	0.124	0.132	0.139	0.145	0.150	0.154	0.157	0.160	0.161	0.162	0.161	0.160	0.157	0.154	0.150	0.145	0.139	0.132	0.124	0.115	0.106	0.096	0.086	0.074	0.063	0.051	0.038	0.026	0.013	0	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.011	0.022	0.033	0.044	0.055	0.065	0.076	0.087	0.095	0.103	0.111	0.120	0.125	0.130	0.135	0.141	0.142	0.144	0.146	0.148	0.146	0.144	0.142	0.141	0.135	0.130	0.125	0.120	0.111	0.103	0.095	0.087	0.076	0.065	0.055	0.044	0.033	0.022	0.011	0	
FINAL CAMBER ↑	0	0"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	0"	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. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE DEAD LOAD DEFLECTIONS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 29

DRAWN BY : J. PENDERGRAFT DATE : 10/21
CHECKED BY : J. DILWORTH DATE : 10/21

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NOTES

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

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

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

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

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

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

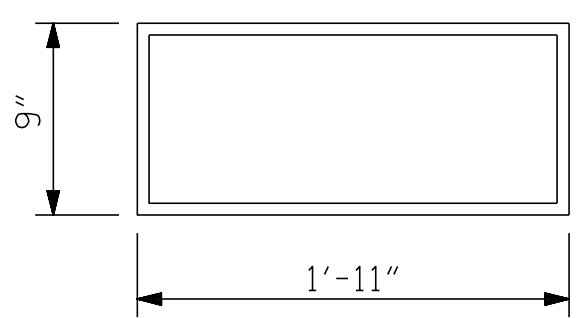
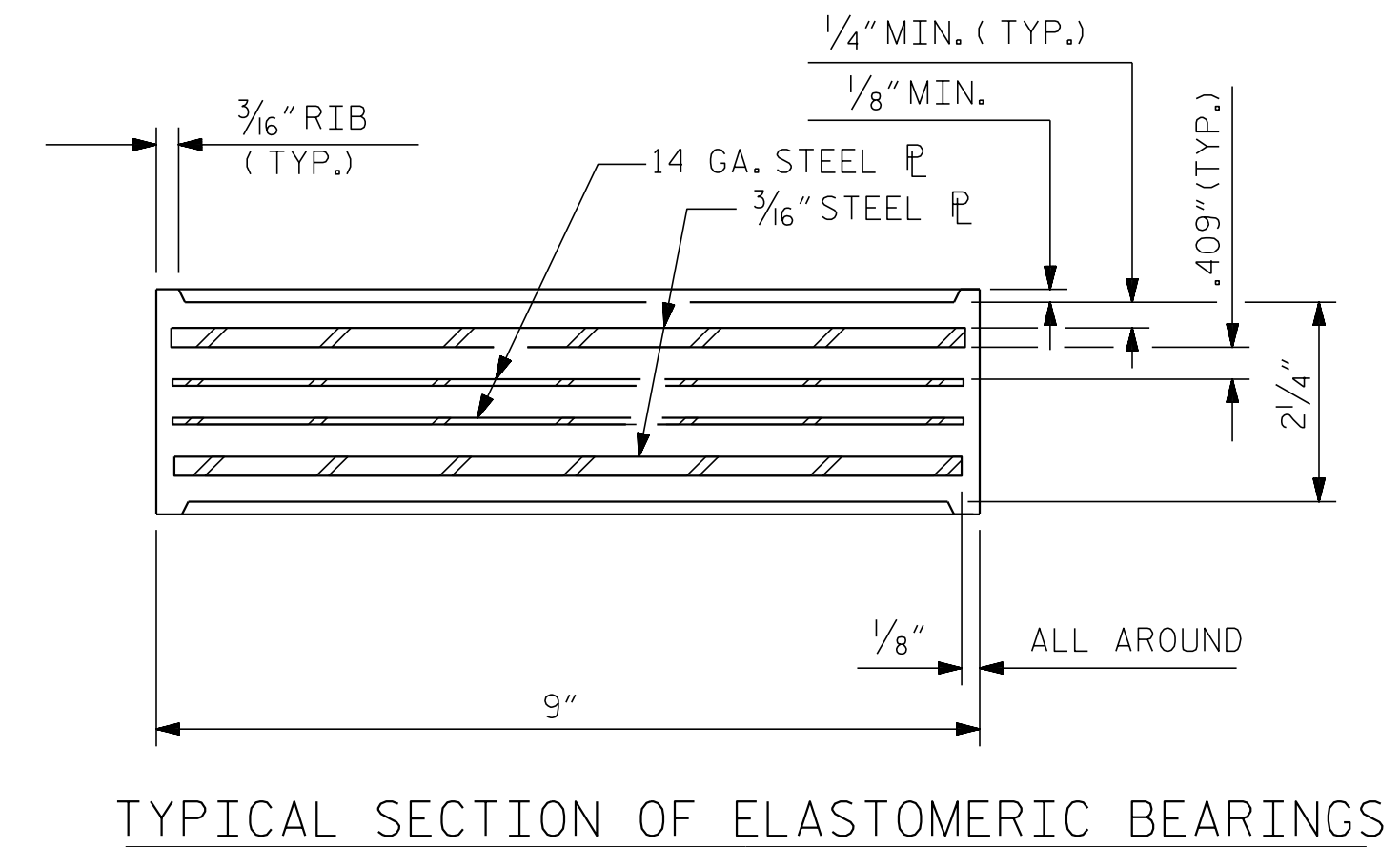
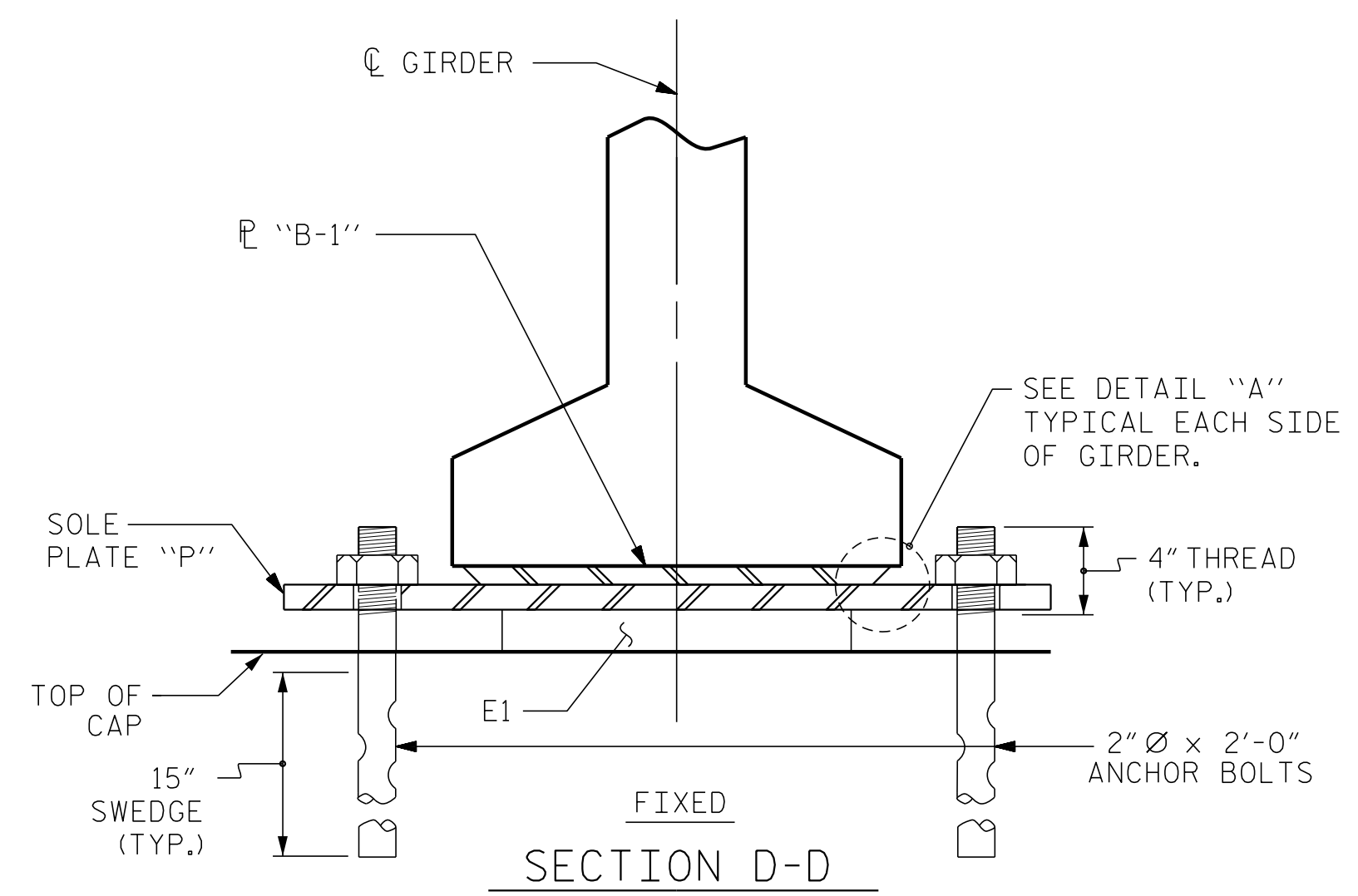
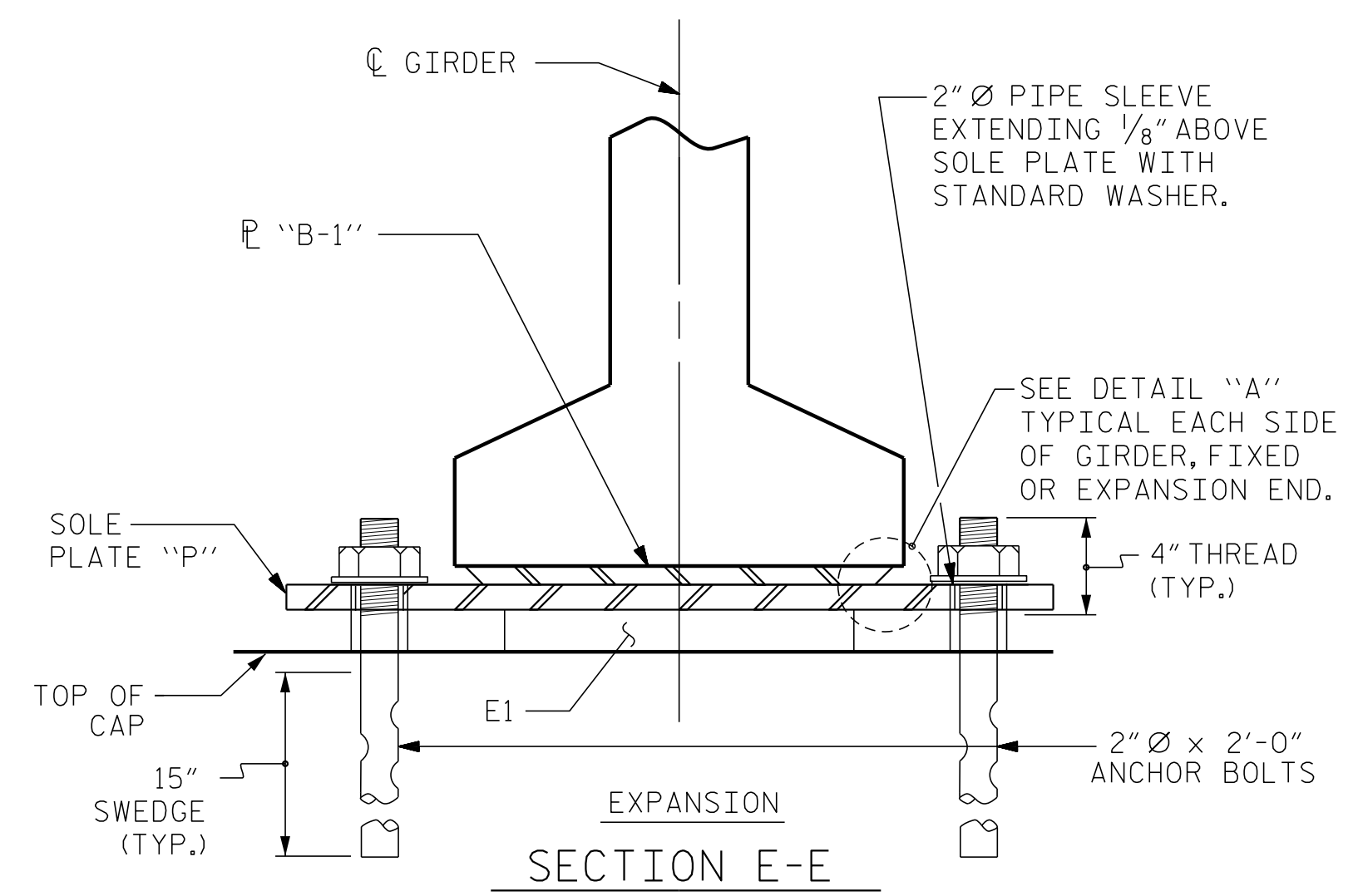
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

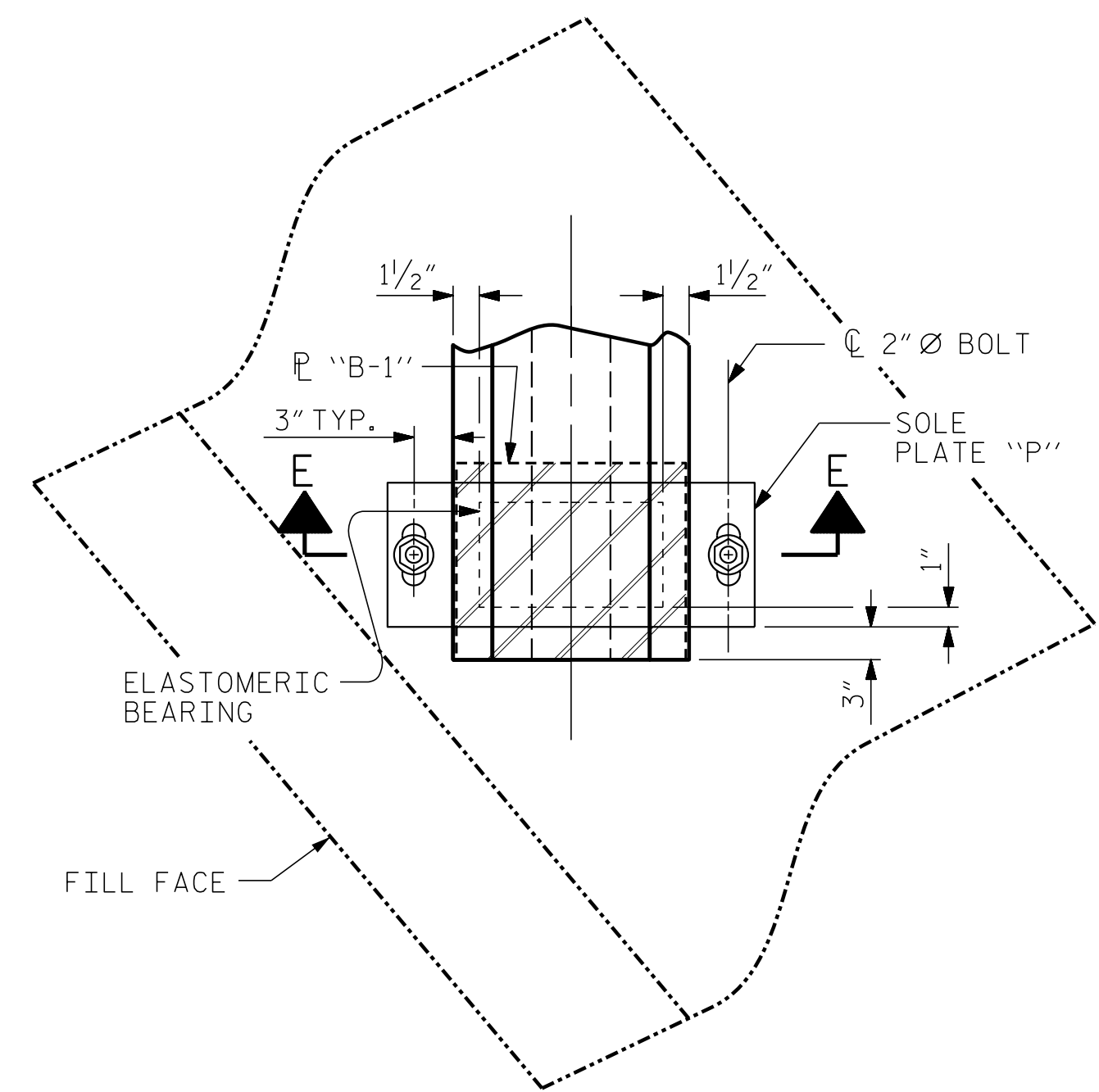
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



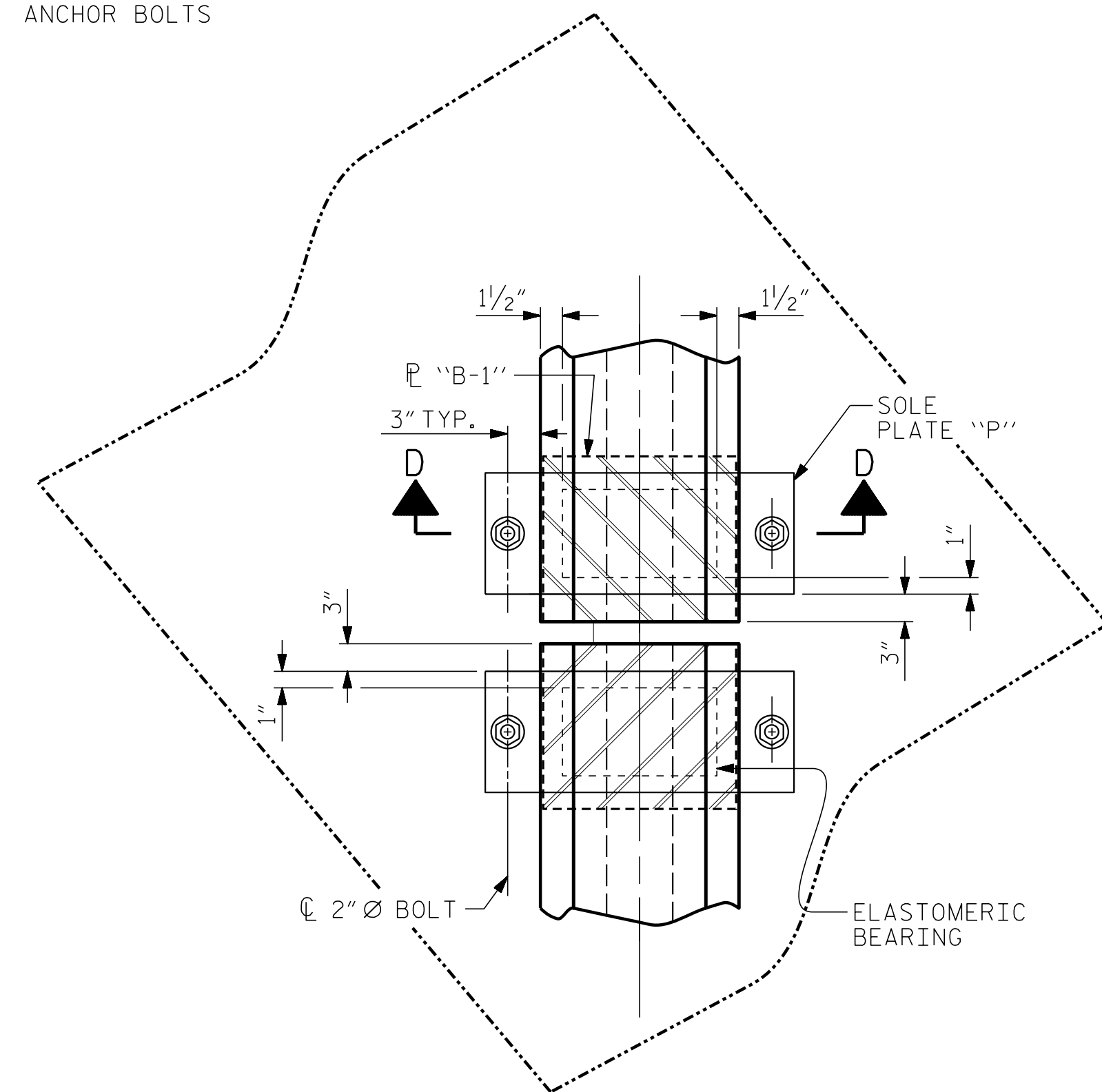
E1 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

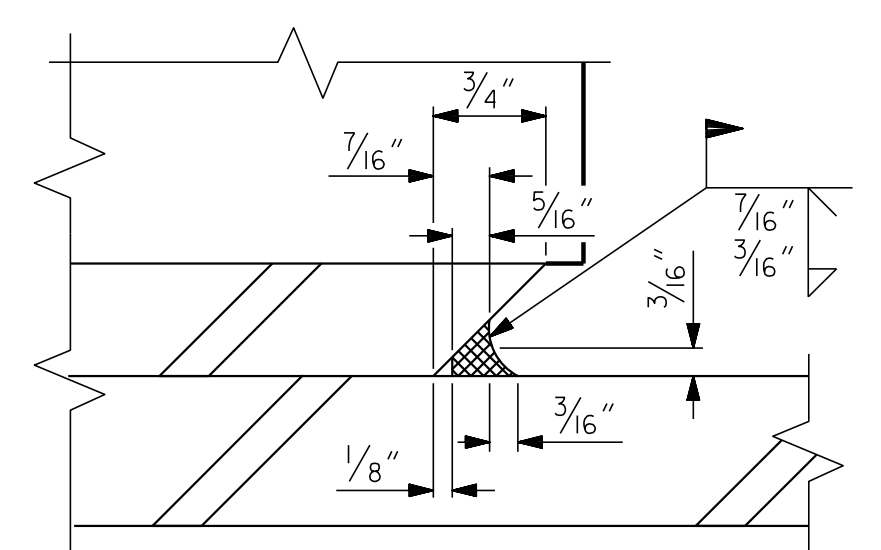
TYPE V



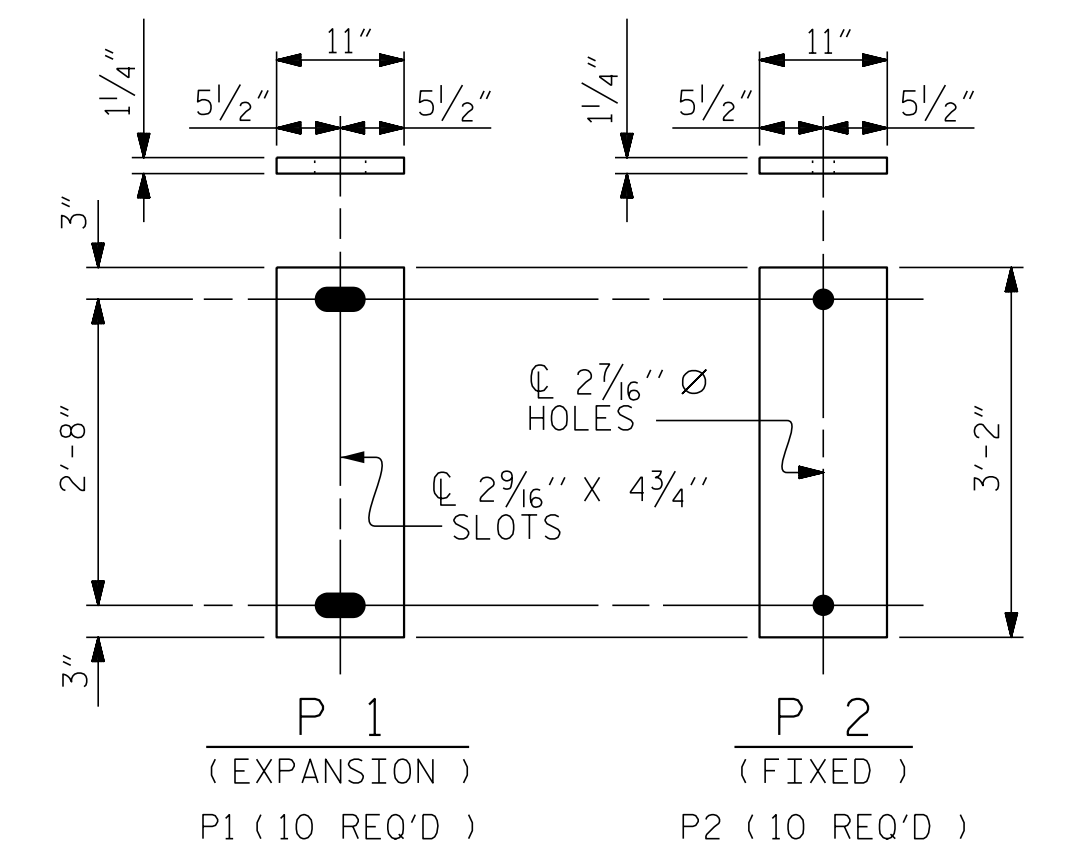
TYPICAL PLAN (SHOWING END BENT)



TYPICAL PLAN (SHOWING BENT)



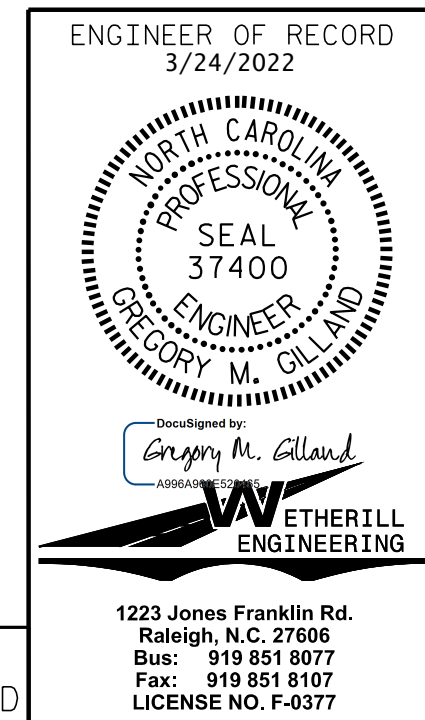
DETAIL "A"



SOLE PLATE DETAILS ("P")

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

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-



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

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

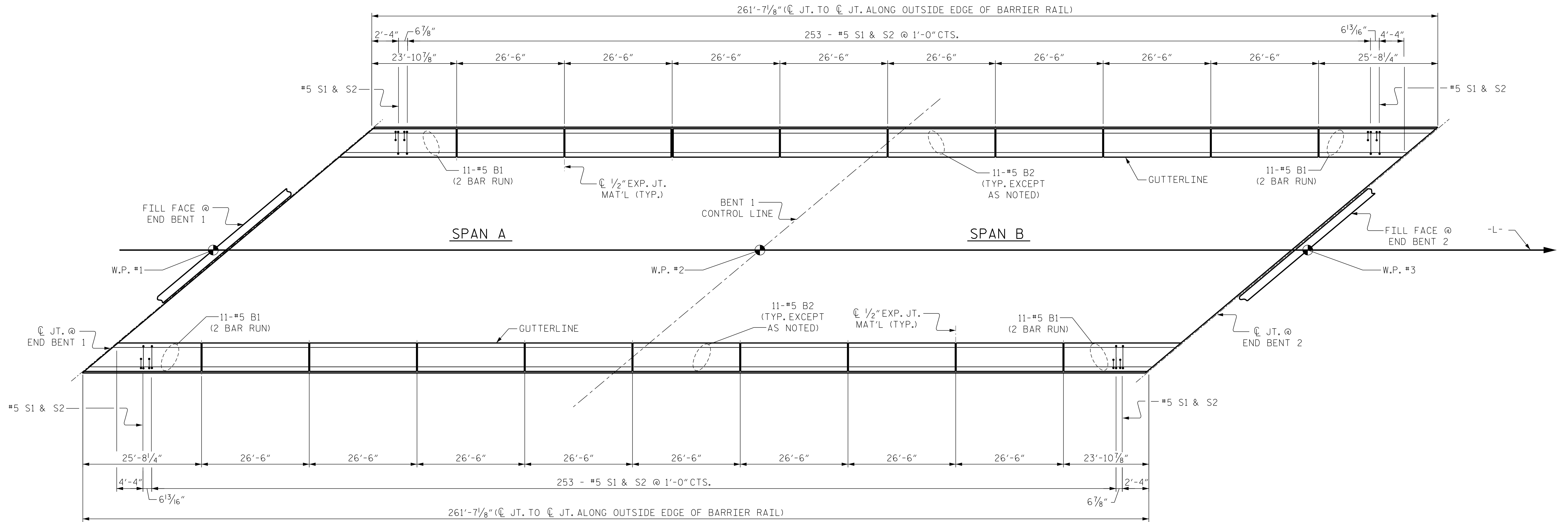
TOTAL SHEETS: 29

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ASSEMBLED BY : D. HODGE	DATE : 10/21
CHECKED BY : J. DILWORTH	DATE : 10/21
DRAWN BY : WJH 8/89	REV. 1/15 MAA/TMG
CHECKED BY : CRK 8/89	REV. 12/17 MAA/THC
	REV. 10/21 BNB/AAI

PA:202 121331.02 I-5987A BridgeStructures\DWG\401_001_I5987A_SMU_CBR_001.dgn
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PLAN OF CONCRETE BARRIER RAIL

NOTES

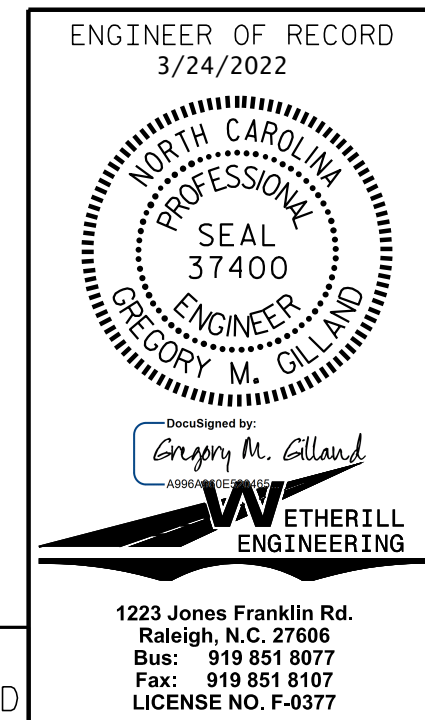
- THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO PROVIDE 2" CLEARANCE TO THE 1/2" EXPANSION JOINT.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-

SHEET 1 OF 2

DRAWN BY : J. PENDERGRAFT DATE : 6-21
 CHECKED BY : J. DILWORTH DATE : 6-21

DOCUMENT NOT CONSIDERED FINAL
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-15
1			3			TOTAL SHEETS
2			4			29

1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 Bus: 919 851 8077
 Fax: 919 851 8107
 LICENSE NO. F-0377

NOTES

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

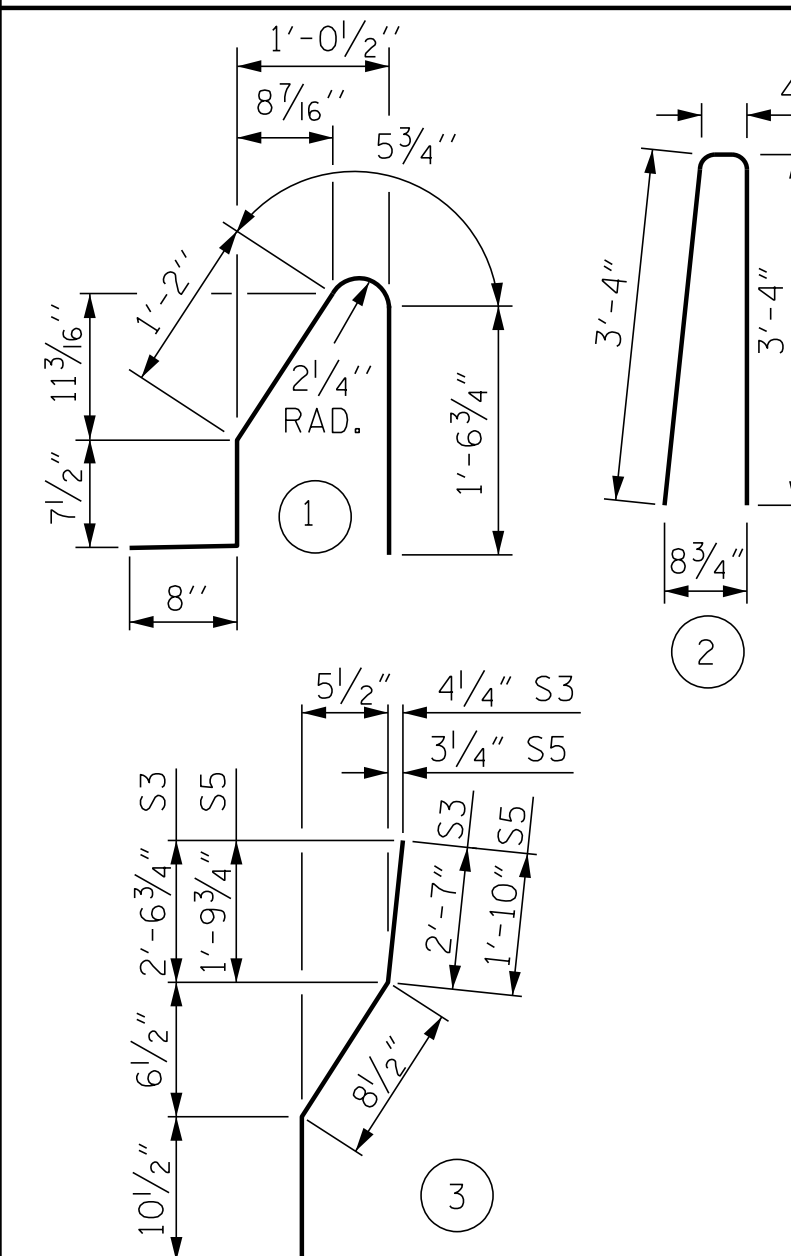
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWSD PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWSING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

BAR TYPES

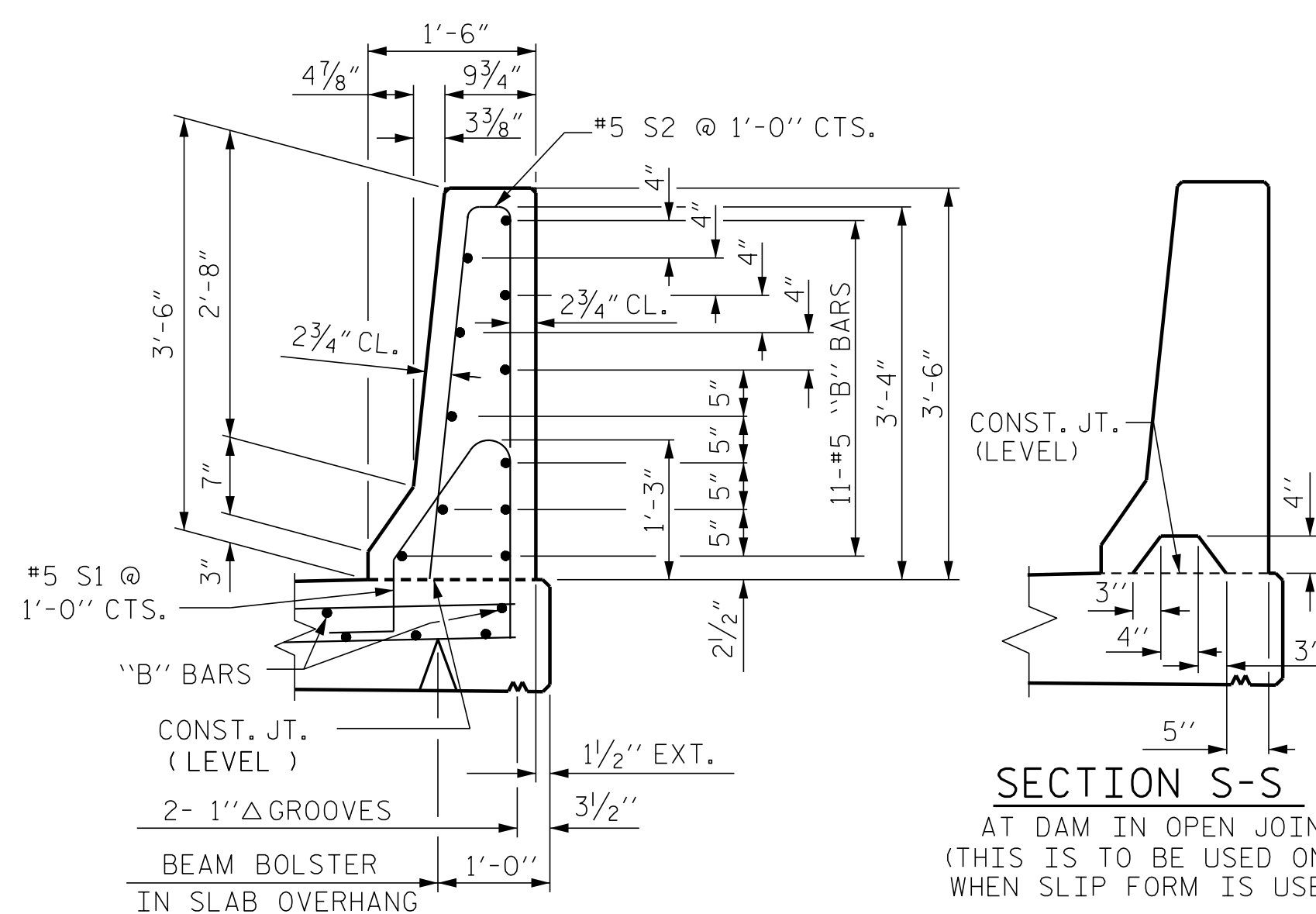
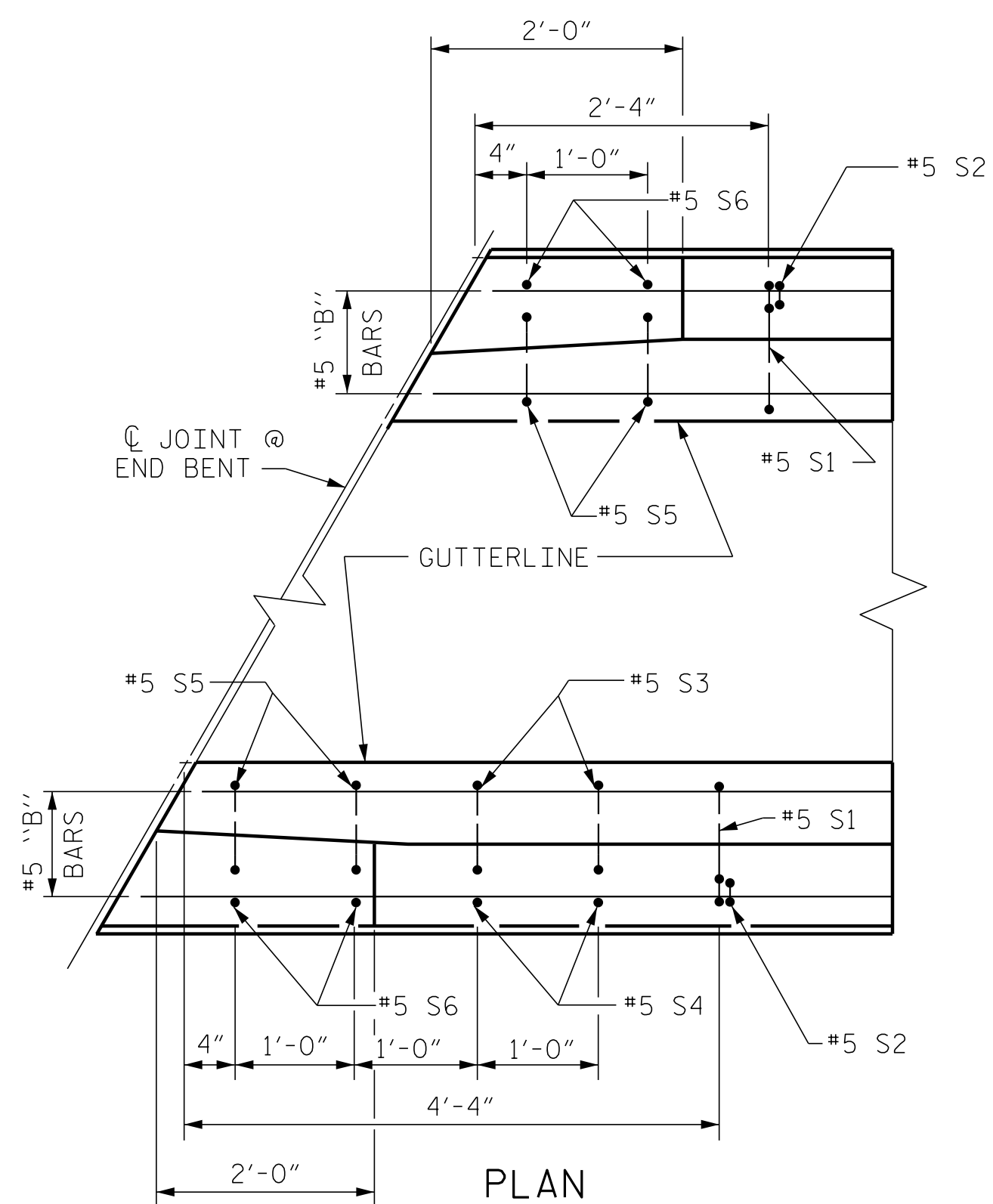


ALL BAR DIMENSIONS ARE OUT TO OUT

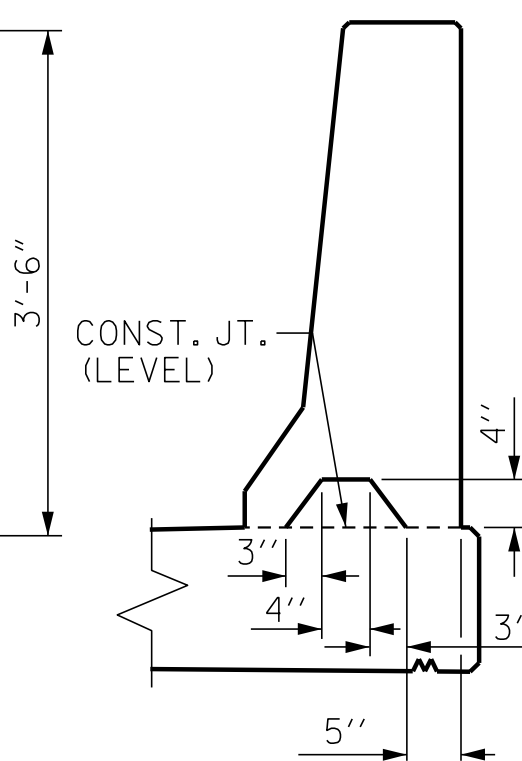
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B1	88	#5 STR	14'-3"	1308	
* B2	176	#5 STR	26'-1"	4788	
* S1	510	#5	1	4'-6"	2394
* S2	510	#5	2	7'-0"	3724
* S3	4	#5	3	4'-2"	17
* S4	4	#5 STR	4'-0"	17	
* S5	8	#5	3	3'-5"	29
* S6	8	#5 STR	3'-3"	27	
* EPOXY COATED REINFORCING STEEL				12,304 LBS.	
CLASS AA CONCRETE				71.0 CU. YDS.	
CONCRETE BARRIER RAIL				522.93 LIN. FT.	

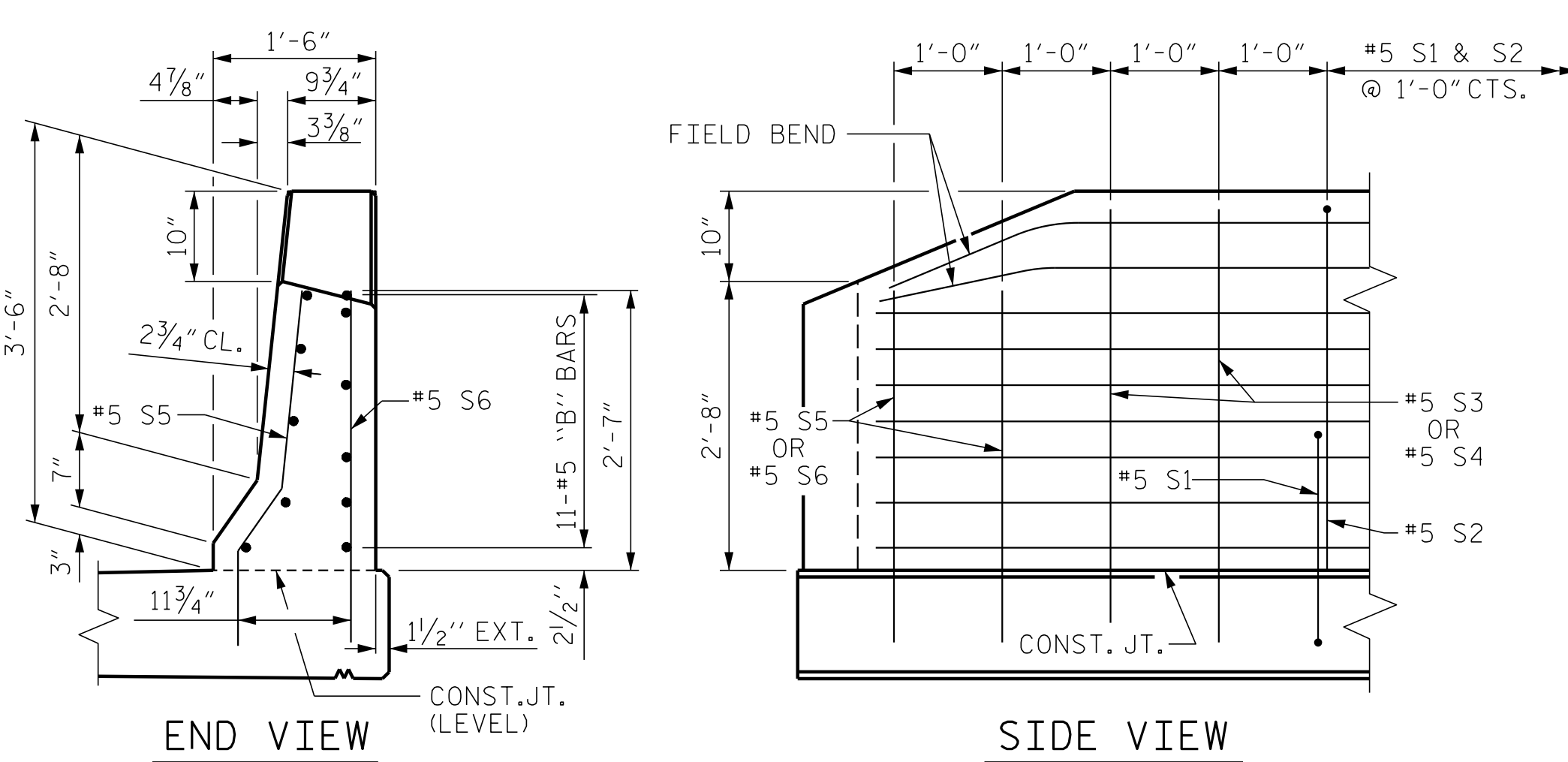


SECTION THRU RAIL



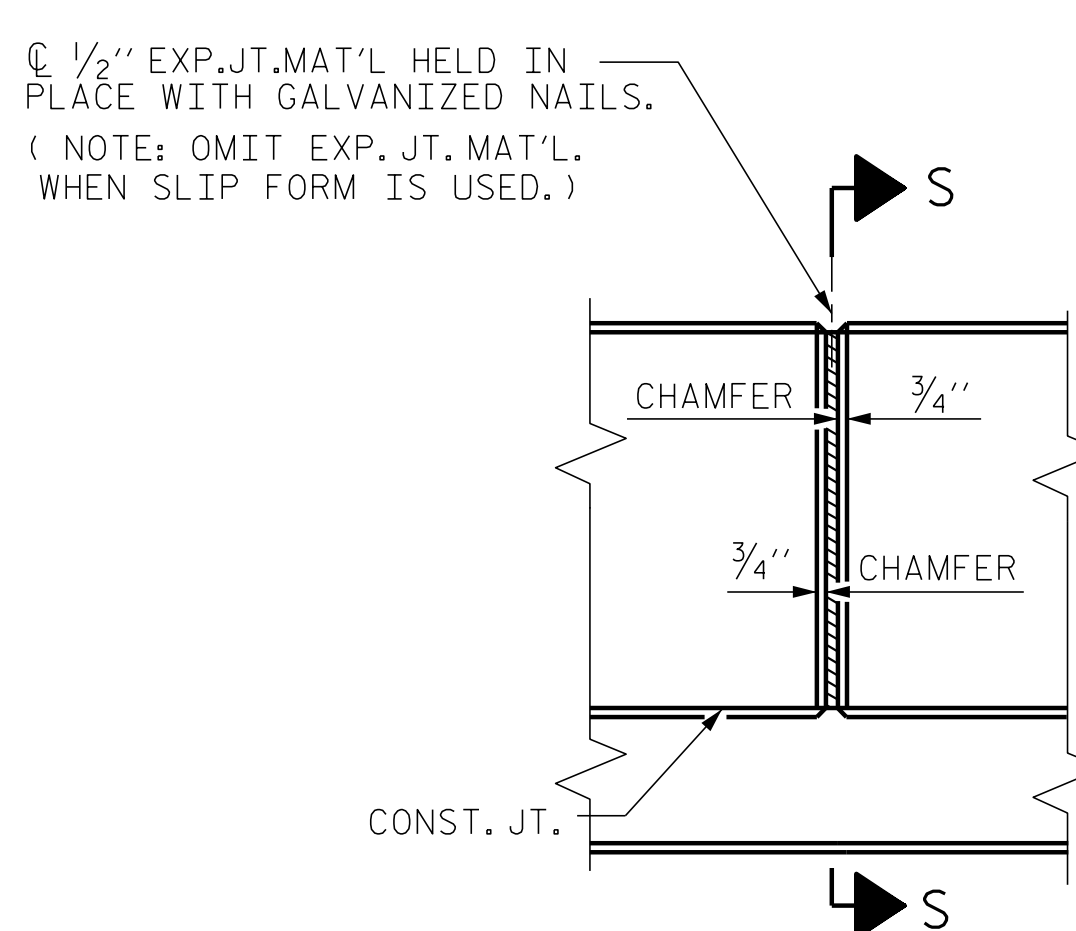
SECTION S-S

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



END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWSD JOINTS



ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS

PA-202 12 1331.02 I-5987A BridgeStructures\GMV401_001_I5987A_SMU_CBR_001.dgn
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ASSEMBLED BY : J. PENDERGRAFT	DATE : 6-21	
CHECKED BY : J. DILWORTH	DATE : 6-21	
DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD
3/24/2022

Gregory M. Gulland
ETHERILL ENGINEERING

1223 Jones Franklin Rd.
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107
LICENSE NO. F-0377

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-16
1			3			TOTAL SHEETS
2			4			29

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 CONCRETE
 BARRIER RAIL

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

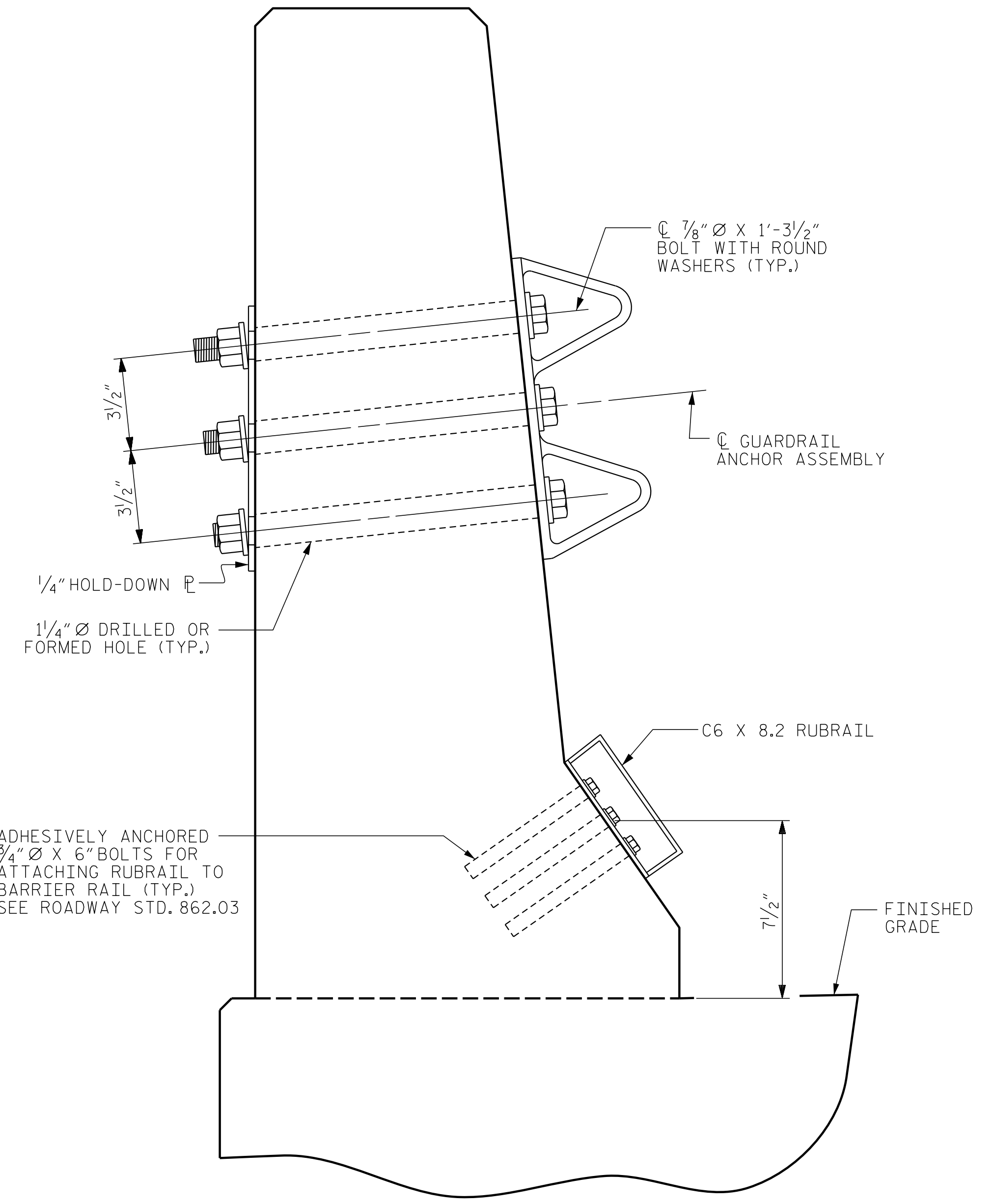
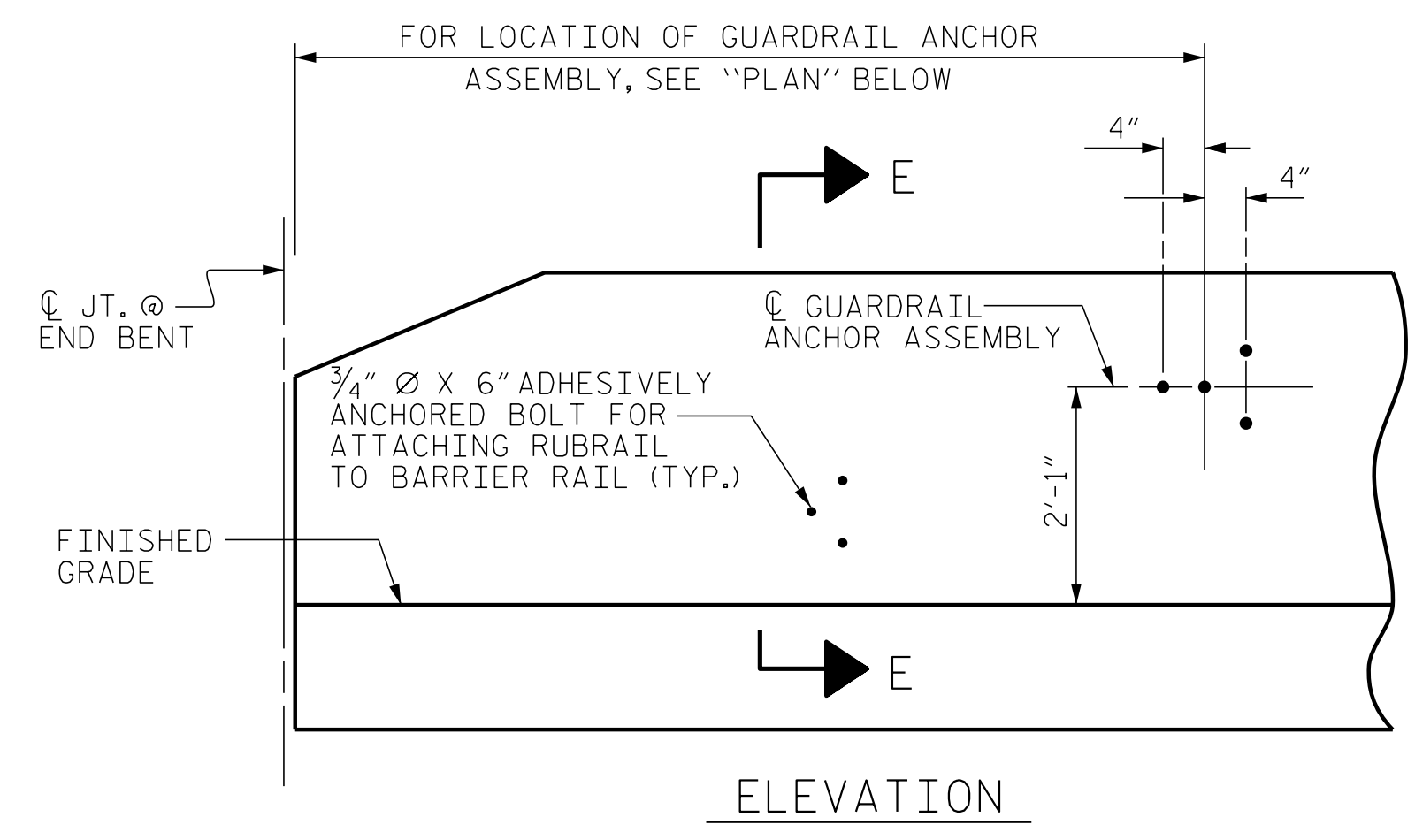
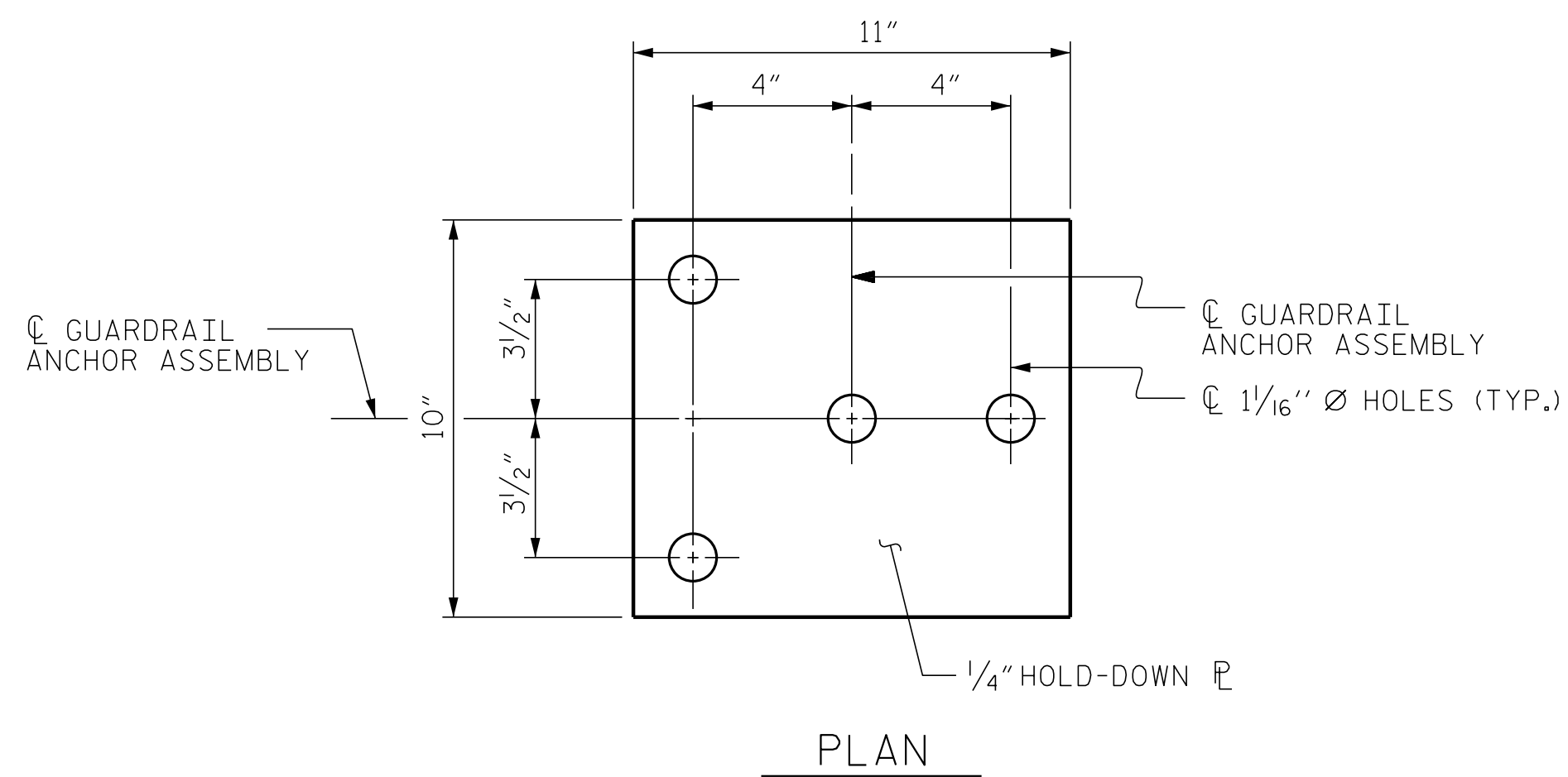
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

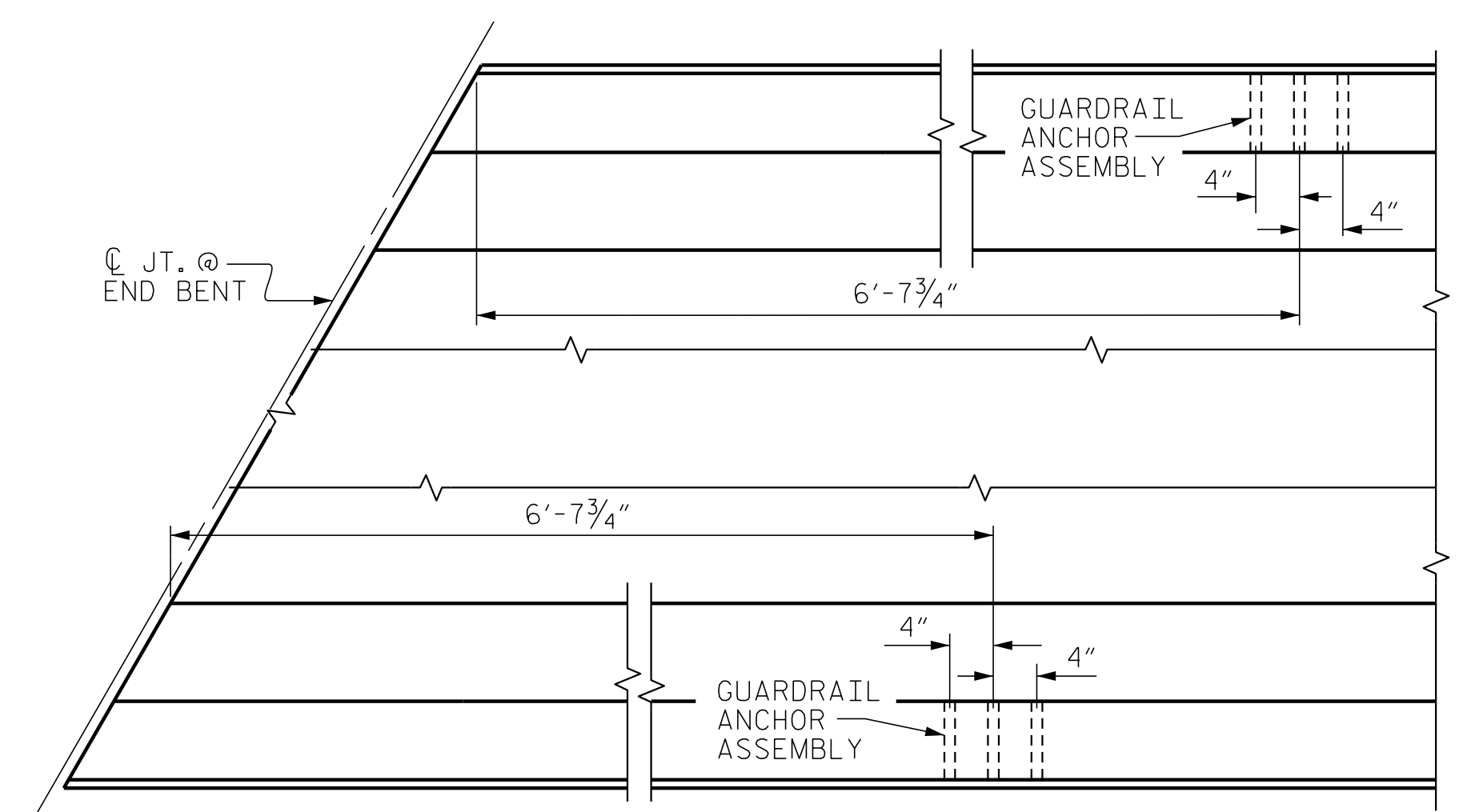
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

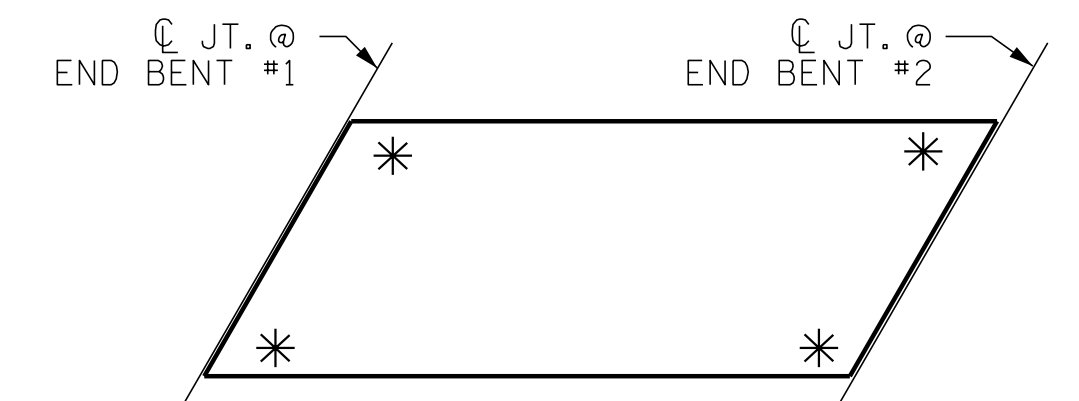


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

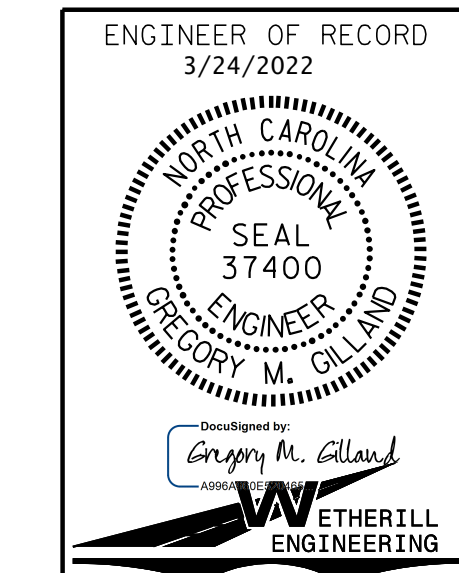
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-



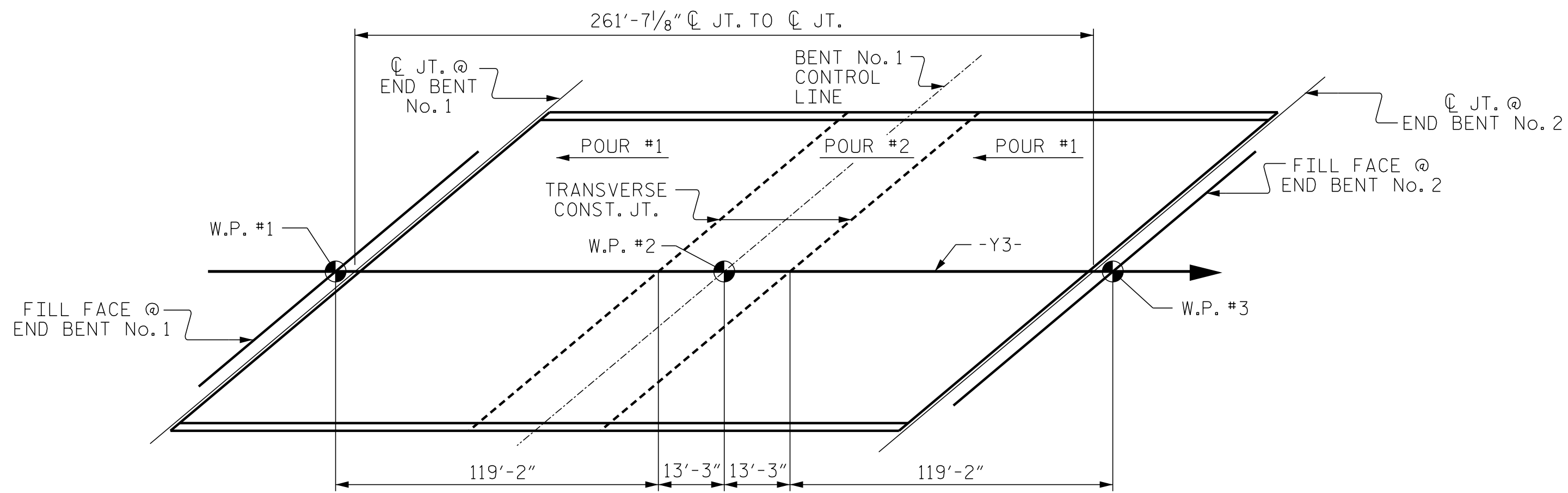
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-17
1			3			TOTAL SHEETS
2			4			29

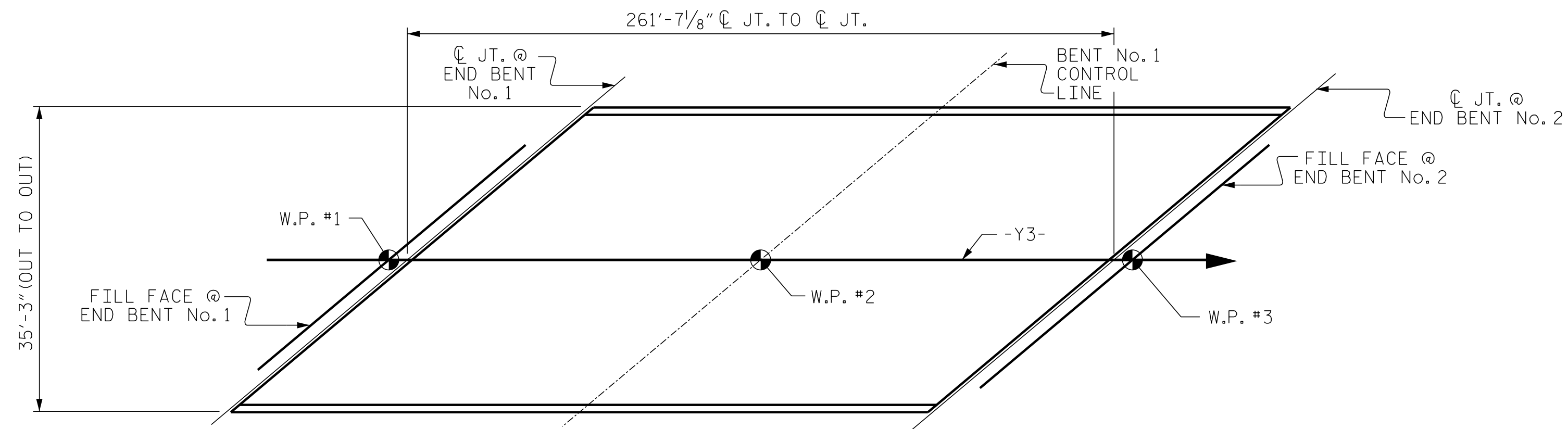
DOCUMENT NOT CONSIDERED FINAL
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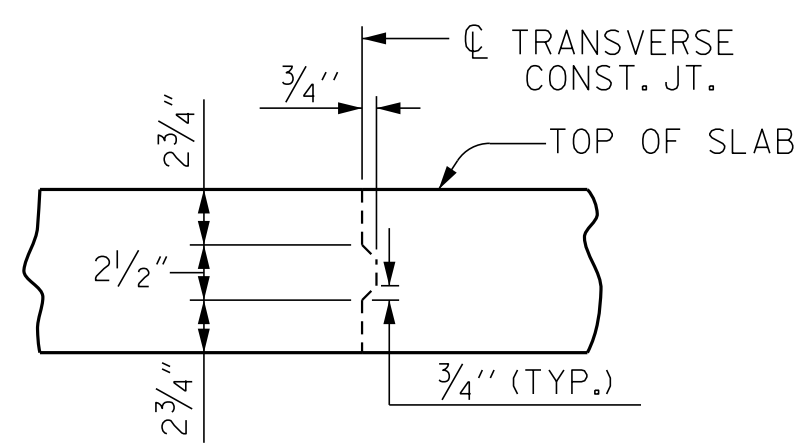
ASSEMBLED BY : D. HODGE	DATE : 10/21
CHECKED BY : J. DILWORTH	DATE : 10/21
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



CONCRETE DECK POUR DETAIL



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 9,221)



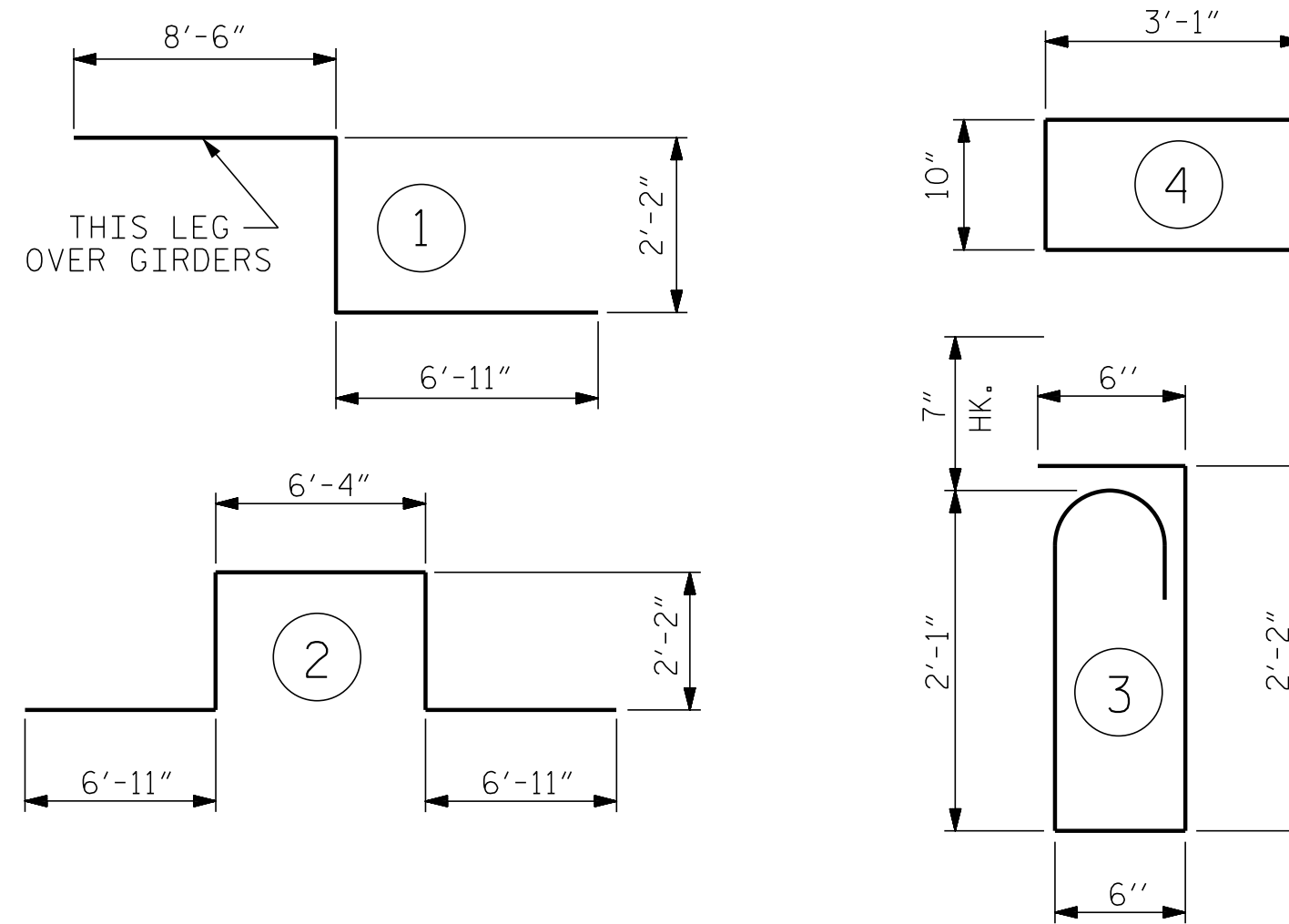
TRANSVERSE CONST. JOINT DETAIL

NOTE: SLAB REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
TOTALS**	286.7	29,309	28,098

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

CONCRETE BREAKDOWN

	CLASS AA CONCRETE (CU. YDS.)
POUR #1	258.5
POUR #2	28.2
TOTALS ***	286.7

*** QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

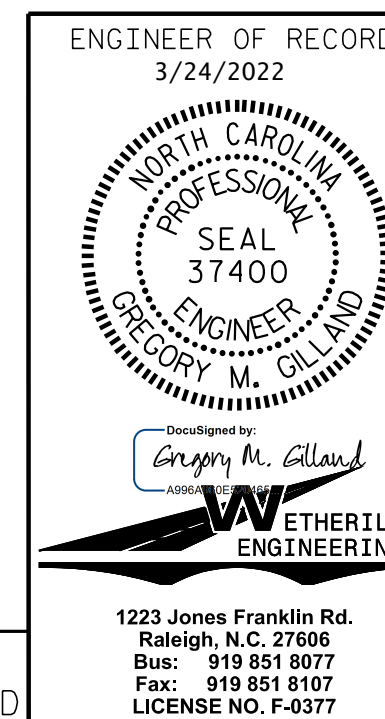
APPROACH SLABS	752 SQ.FT.
BRIDGE DECK	7,524 SQ.FT.
TOTAL	8,276 SQ.FT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	439	#5	STR	34'-11"	15,988
A2	439	#5	STR	34'-11"	15,988
* A101	8	#5	STR	33'-4"	278
* A102	8	#5	STR	31'-8"	264
* A103	8	#5	STR	30'-0"	250
* A104	8	#5	STR	28'-4"	236
* A105	8	#5	STR	26'-8"	223
* A106	8	#5	STR	25'-0"	209
* A107	8	#5	STR	23'-3"	194
* A108	8	#5	STR	21'-7"	180
* A109	8	#5	STR	19'-7"	166
* A110	8	#5	STR	18'-3"	152
* A111	8	#5	STR	16'-7"	138
* A112	8	#5	STR	14'-11"	124
* A113	8	#5	STR	13'-2"	110
* A114	8	#5	STR	11'-6"	96
* A115	8	#5	STR	9'-10"	82
* A116	8	#5	STR	8'-2"	68
* A117	8	#5	STR	6'-6"	54
* A118	8	#5	STR	4'-9"	40
* A119	8	#5	STR	3'-1"	26
A201	8	#5	STR	33'-4"	278
A202	8	#5	STR	31'-8"	264
A203	8	#5	STR	30'-0"	250
A204	8	#5	STR	28'-4"	236
A205	8	#5	STR	26'-8"	223
A206	8	#5	STR	25'-0"	209
A207	8	#5	STR	23'-3"	194
A208	8	#5	STR	21'-7"	180
A209	8	#5	STR	19'-11"	166
A210	8	#5	STR	18'-3"	152
A211	8	#5	STR	16'-7"	138
A212	8	#5	STR	14'-11"	124
A213	8	#5	STR	13'-2"	110
A214	8	#5	STR	11'-6"	96
A215	8	#5	STR	9'-10"	82
A216	8	#5	STR	8'-2"	68
A217	8	#5	STR	6'-6"	54
A218	8	#5	STR	4'-9"	40
A219	8	#5	STR	3'-1"	26
* B1	144	#4	STR	31'-2"	2,998
* B2	48	#5	STR	44'-3"	2,215
* B3	46	#5	STR	48'-0"	2,303
B4	180	#5	STR	53'-10"	10,107
* G1	2	#5	STR	54'-3"	113
* K1	8	#8	1	17'-7"	376
* K2	12	#8	2	24'-6"	785
K3	24	#6	STR	4'-9"	171
* K4	6	#6	STR	17'-0"	153
* S1	40	#5	3	5'-10"	243
* S2	40	#4	4	7'-0"	187
				REINFORCING STEEL	LBS. 29,309
				* EPOXY COATED REINFORCING STEEL	LBS. 28,098

* THESE BARS ARE EPOXY COATED.

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

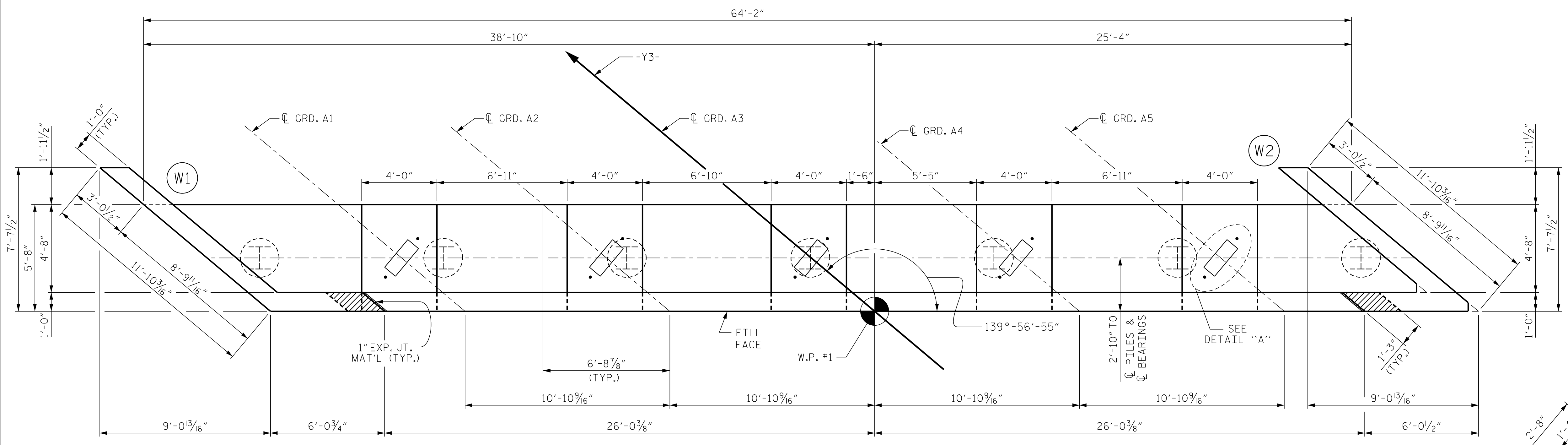
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS 29
2			4			S3-18

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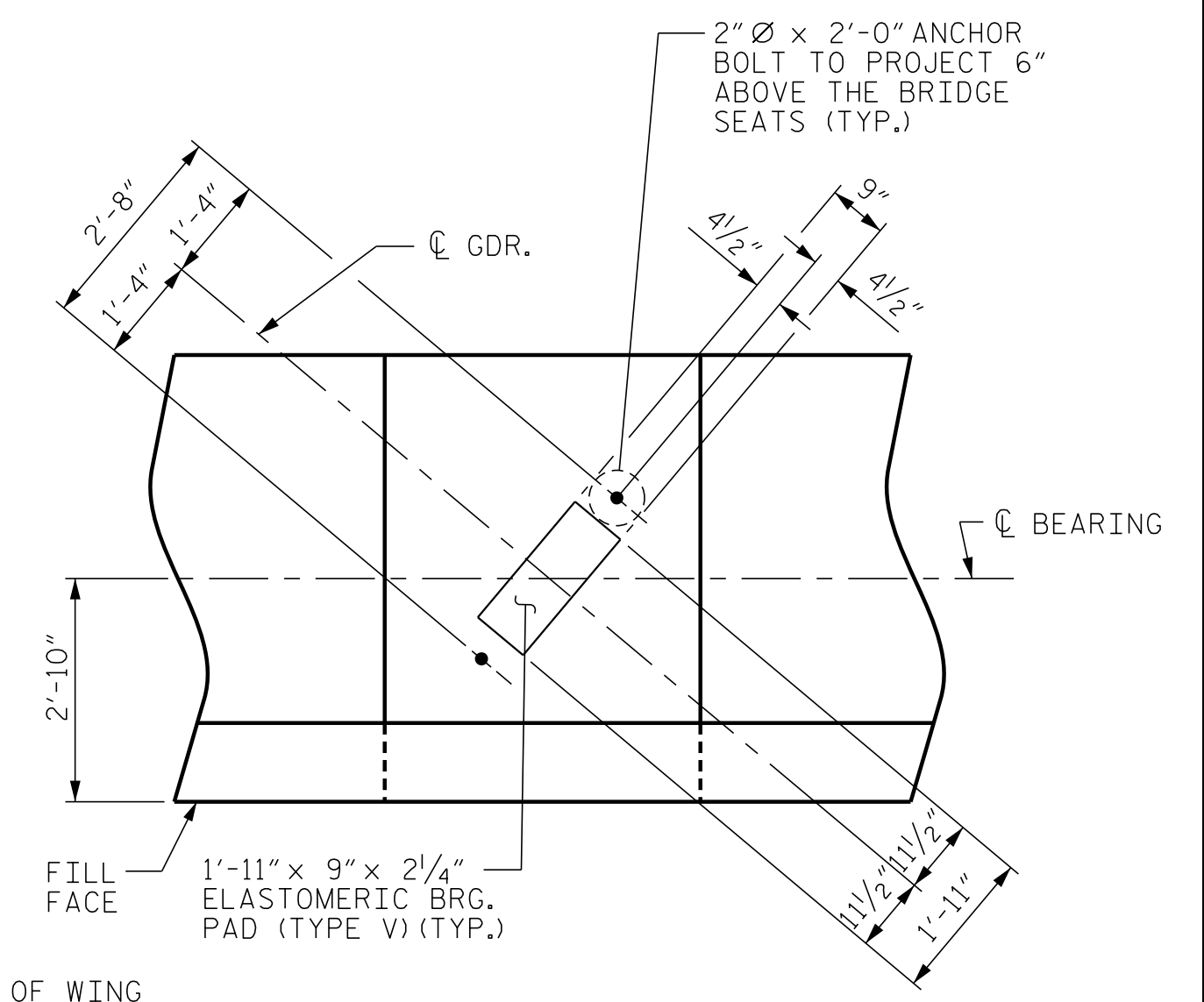
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CHECKED BY: J. DILWORTH DATE: 11/21



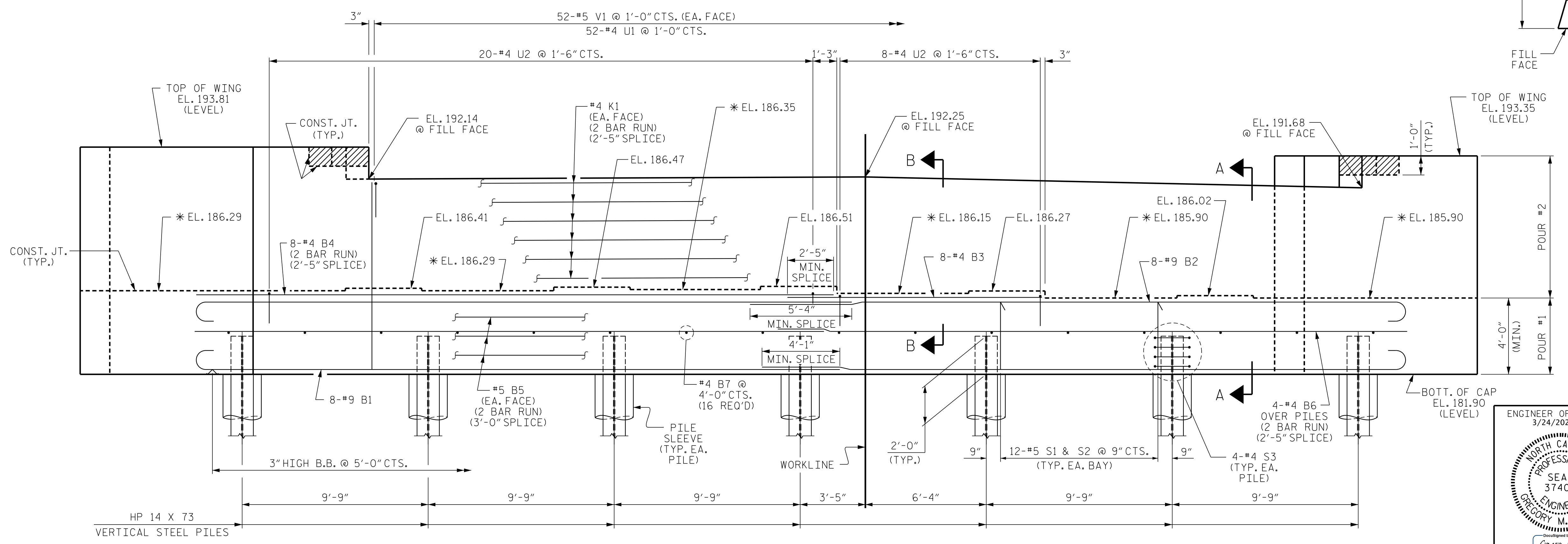
PLAN

NOTES:

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.



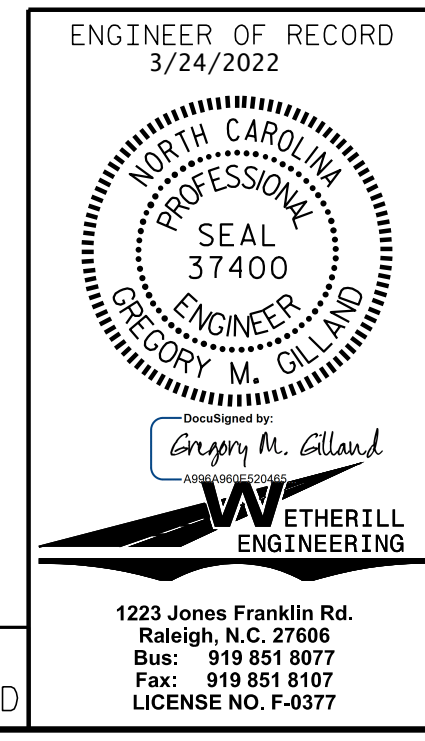
DETAIL "A"
(TYP. EA. GIRDER)



ELEVATION

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTIONS A-A & B-B, SHEET 3 OF 3.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 1 OF 3

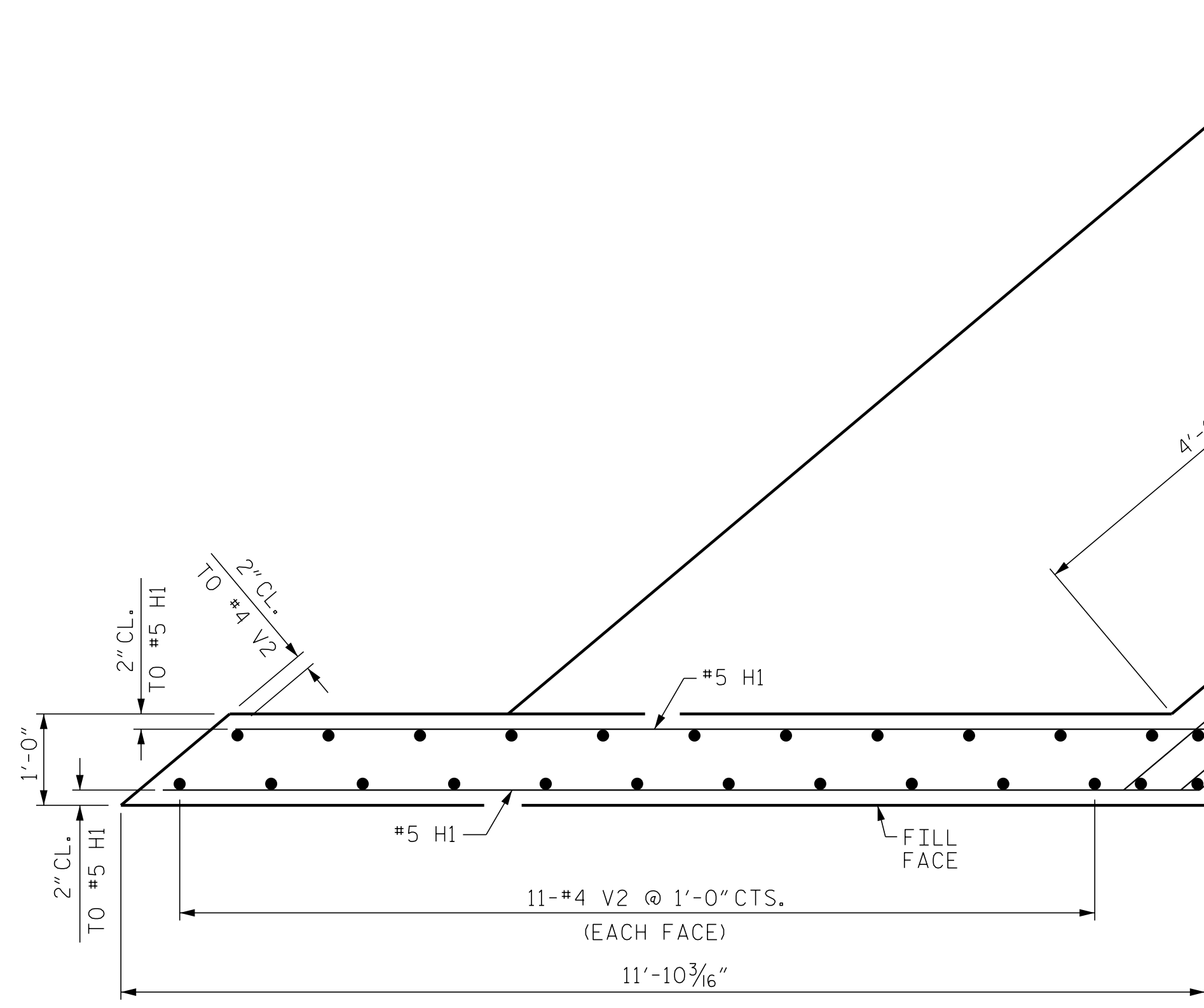


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S3-19
					TOTAL SHEETS 29

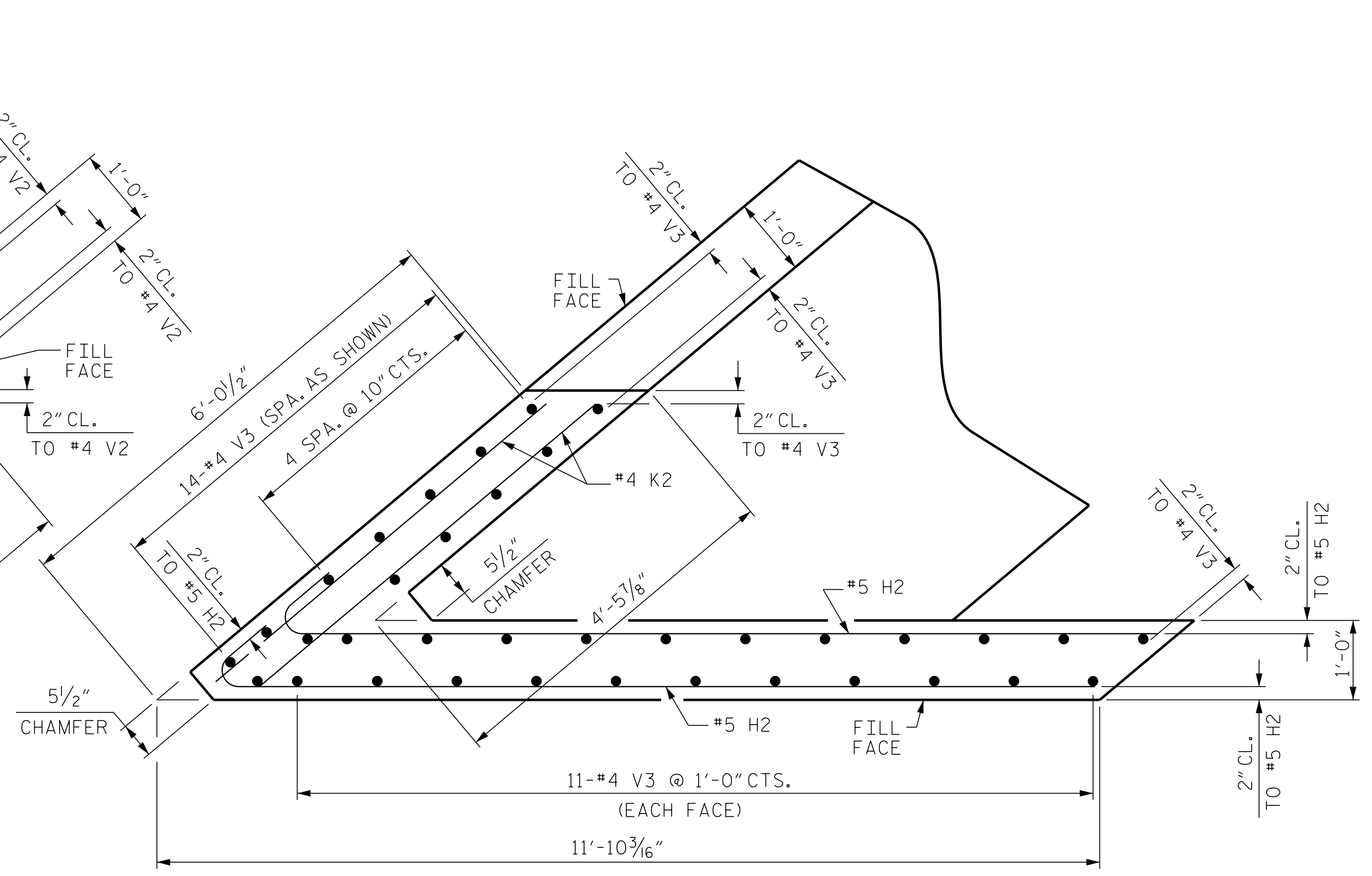
DRAWN BY: D. HODGE DATE: 10/21
 CHECKED BY: G. GILLAND DATE: 11/21

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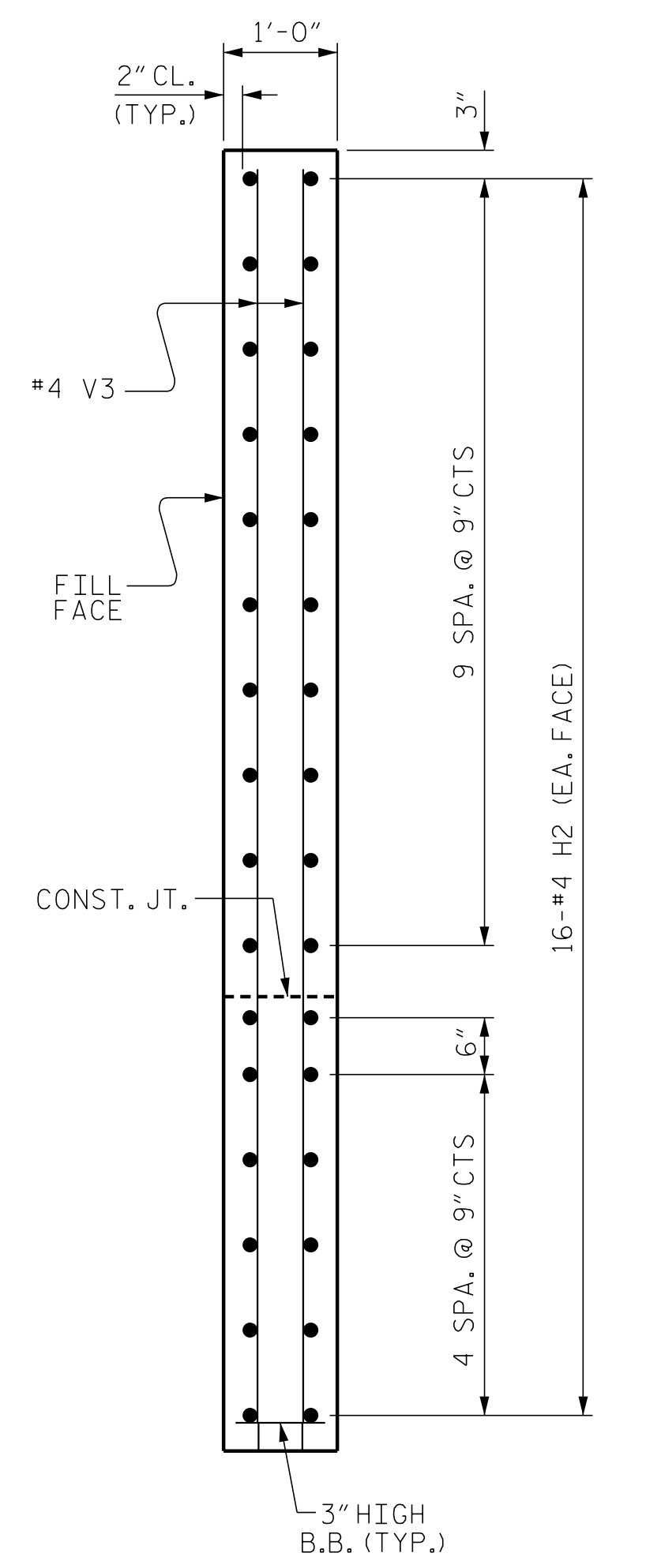
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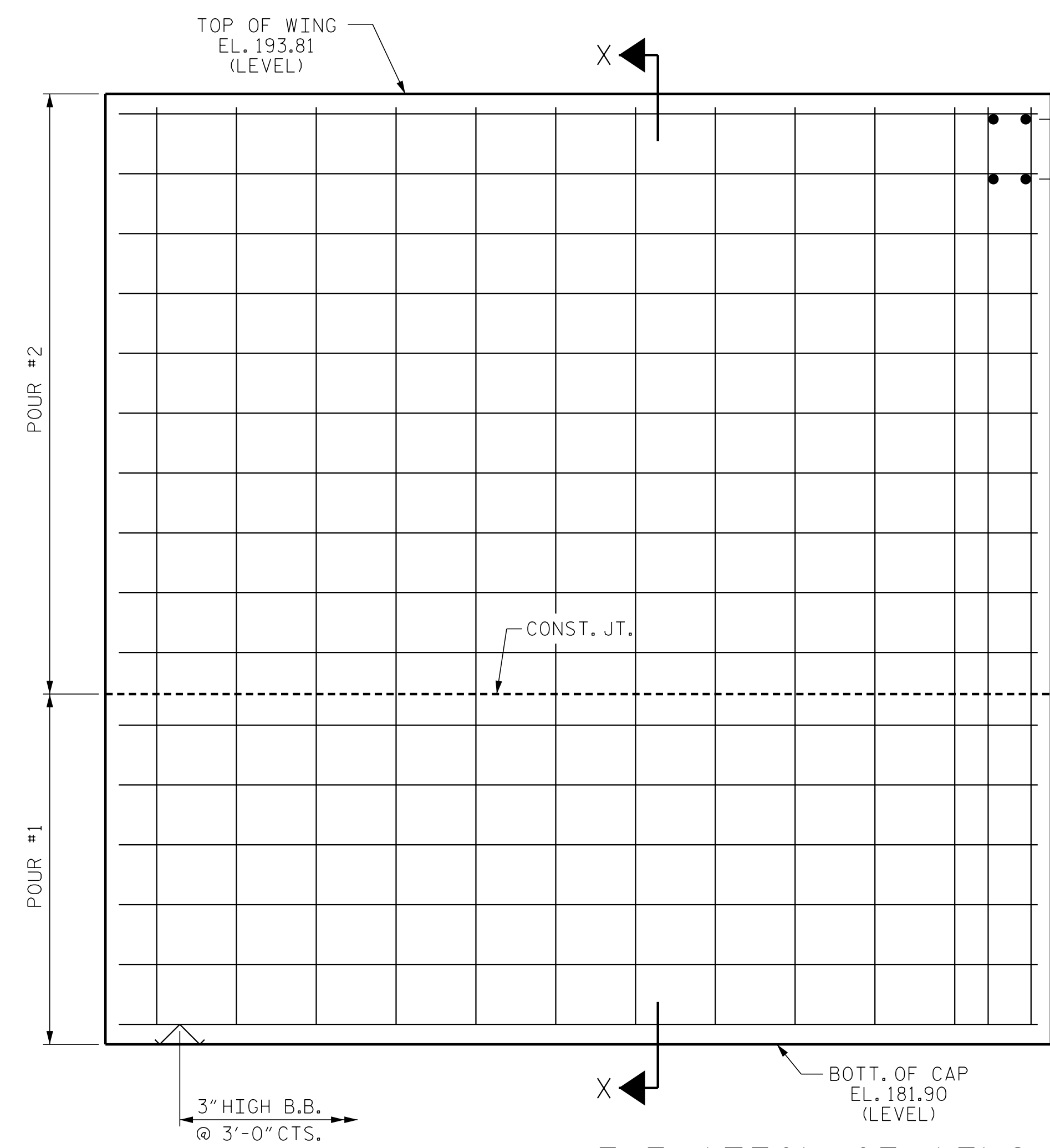
PLAN OF WING - (W1)



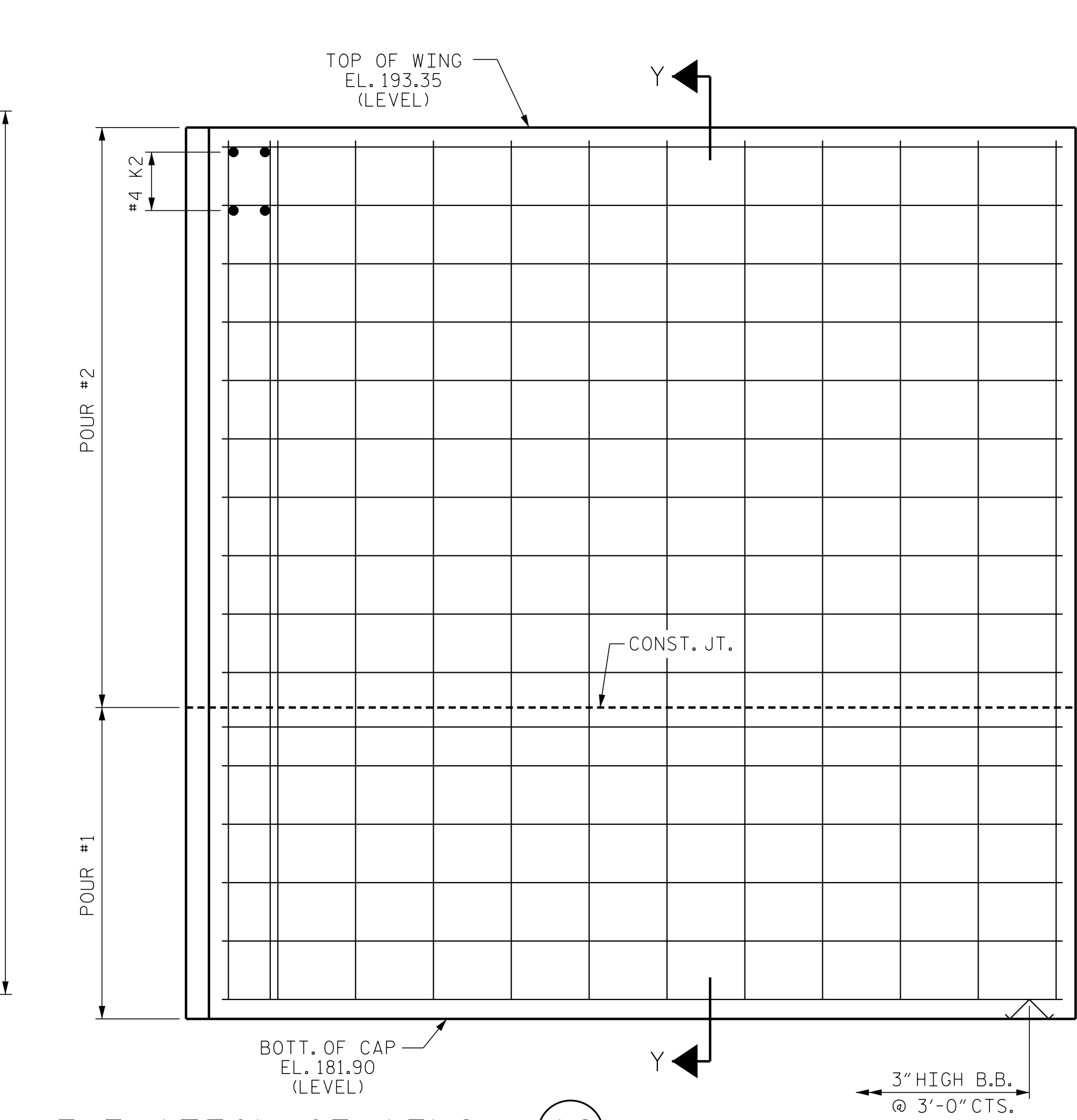
PLAN OF WING - (W2)



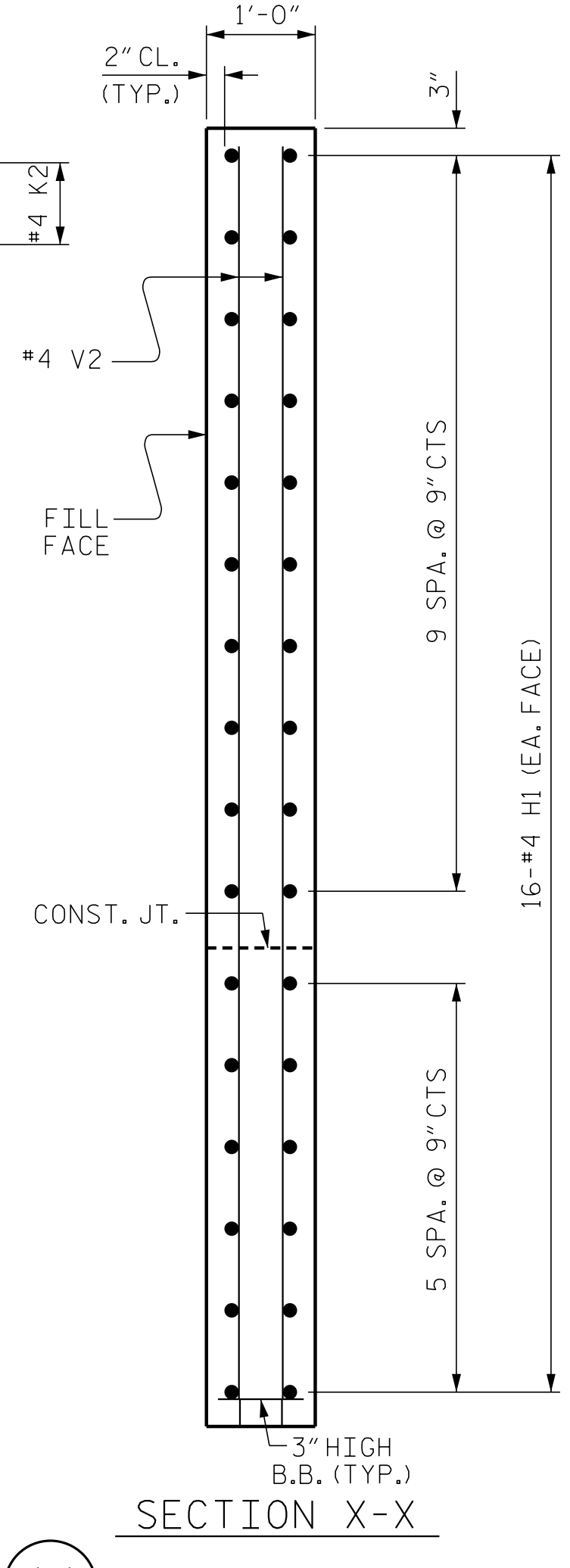
SECTION Y-Y



ELEVATION OF WING - (W1)

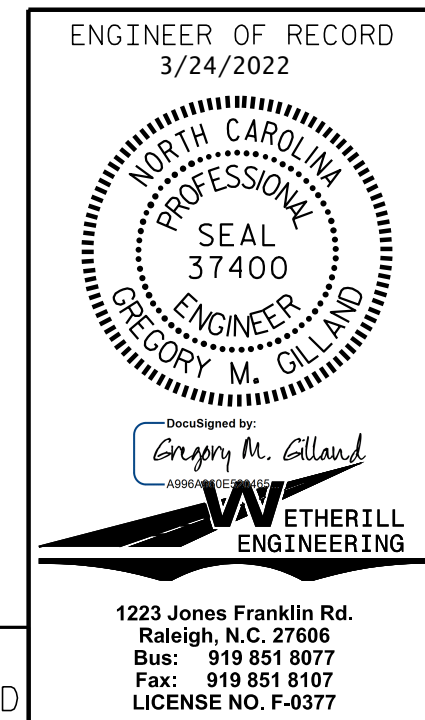


ELEVATION OF WING - (W2)



SECTION X-X

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 3

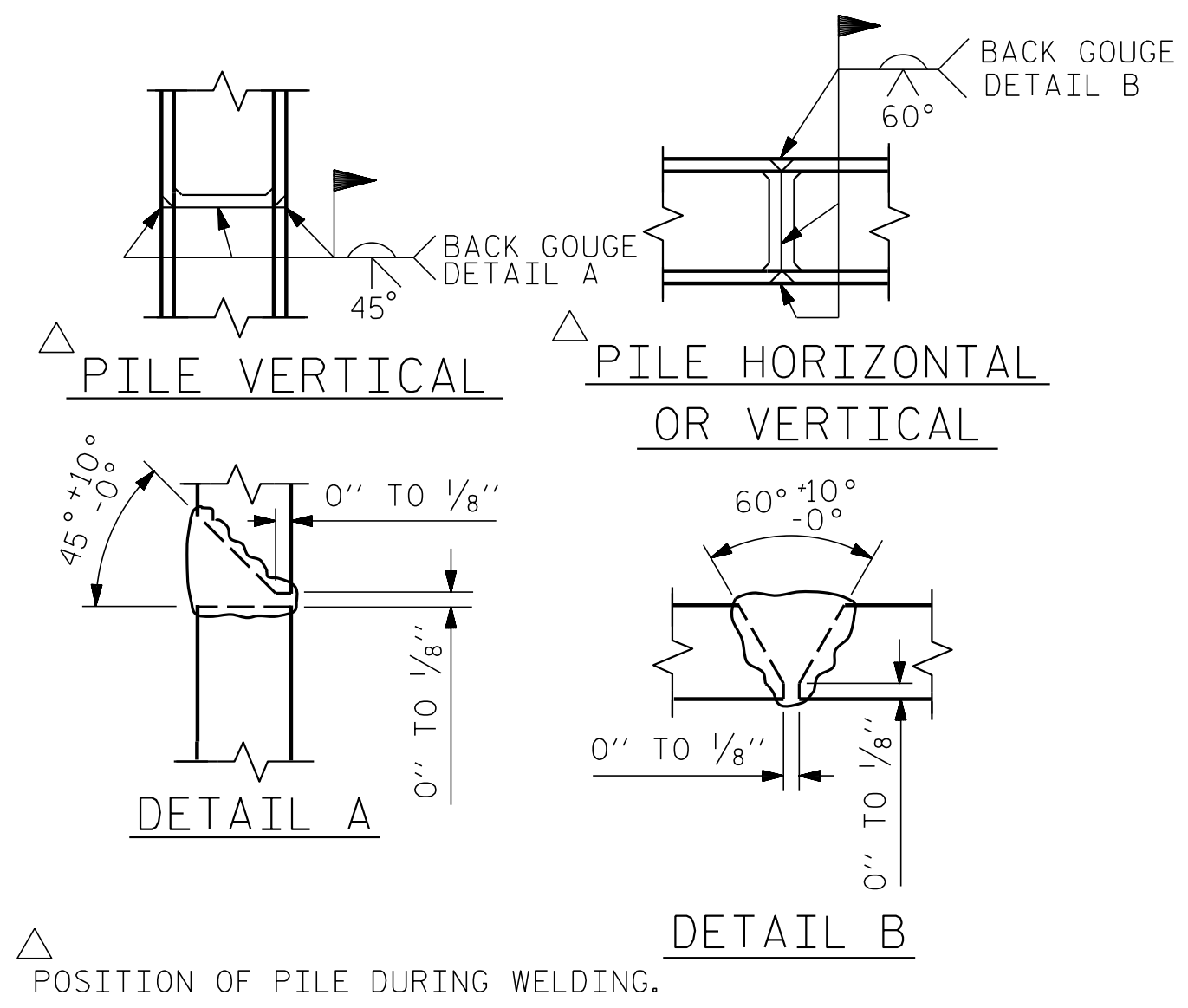


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S3-20 TOTAL SHEETS 29

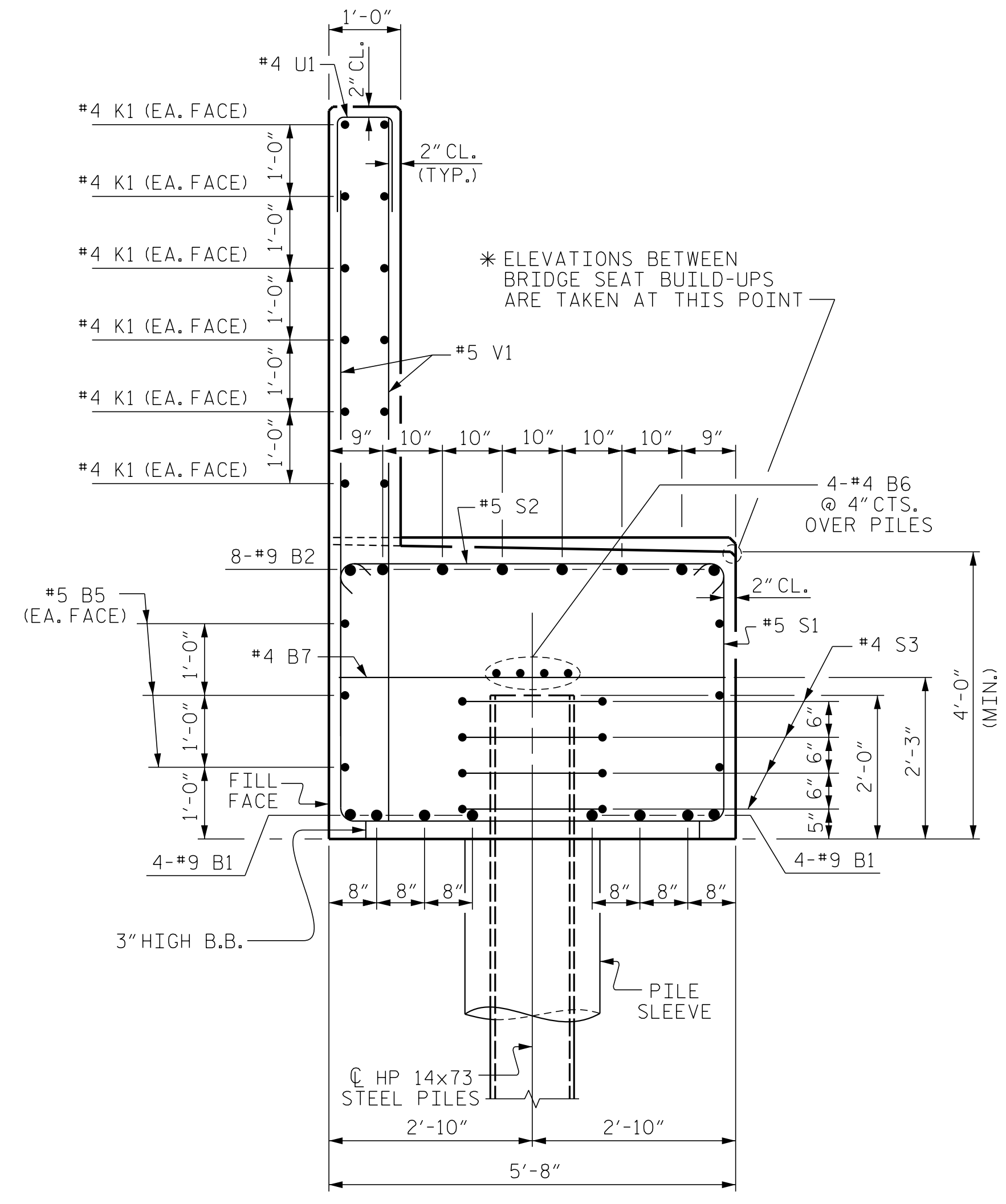
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 CHECKED BY: G. GILLAND DATE: 11/21

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

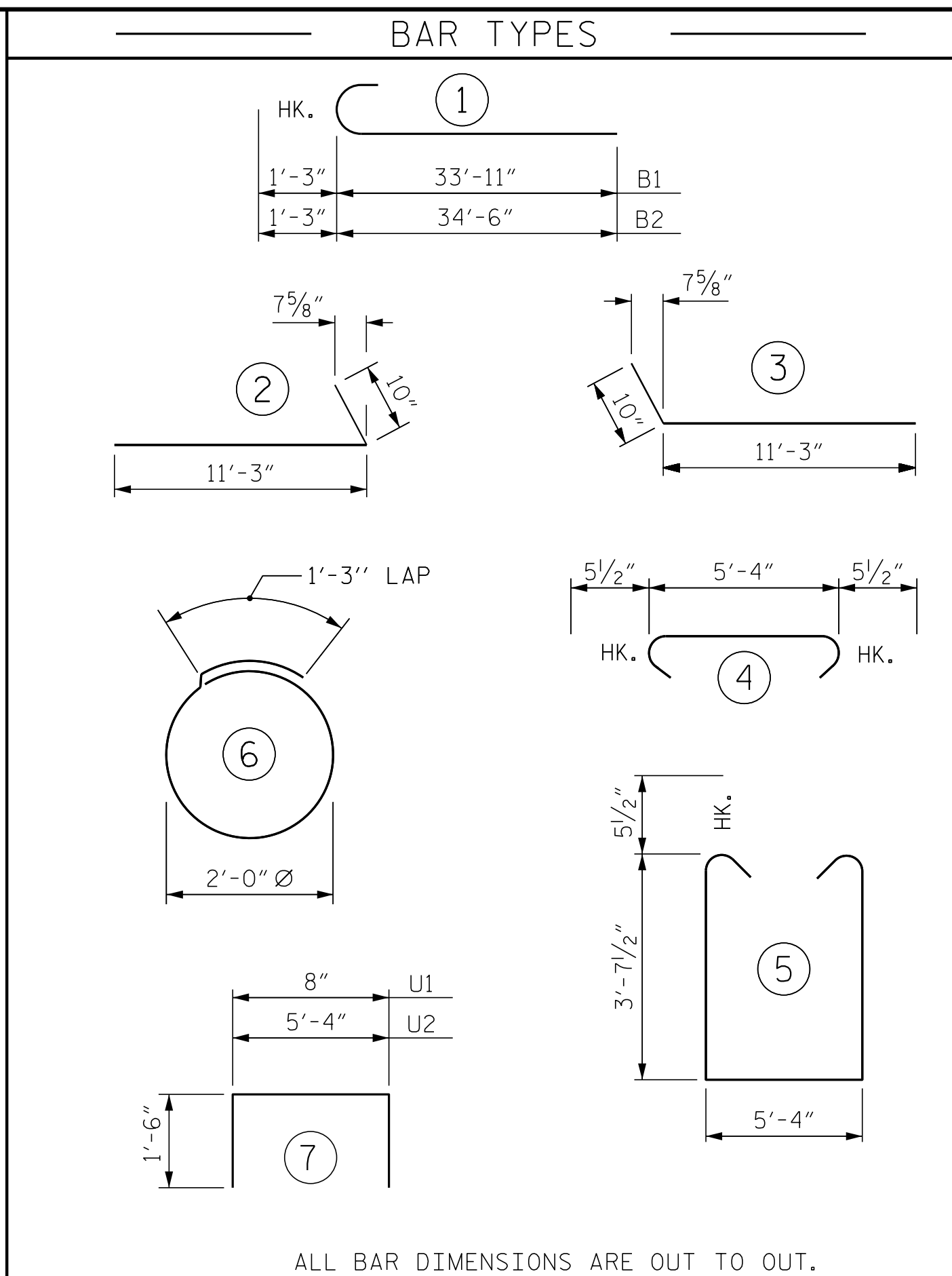
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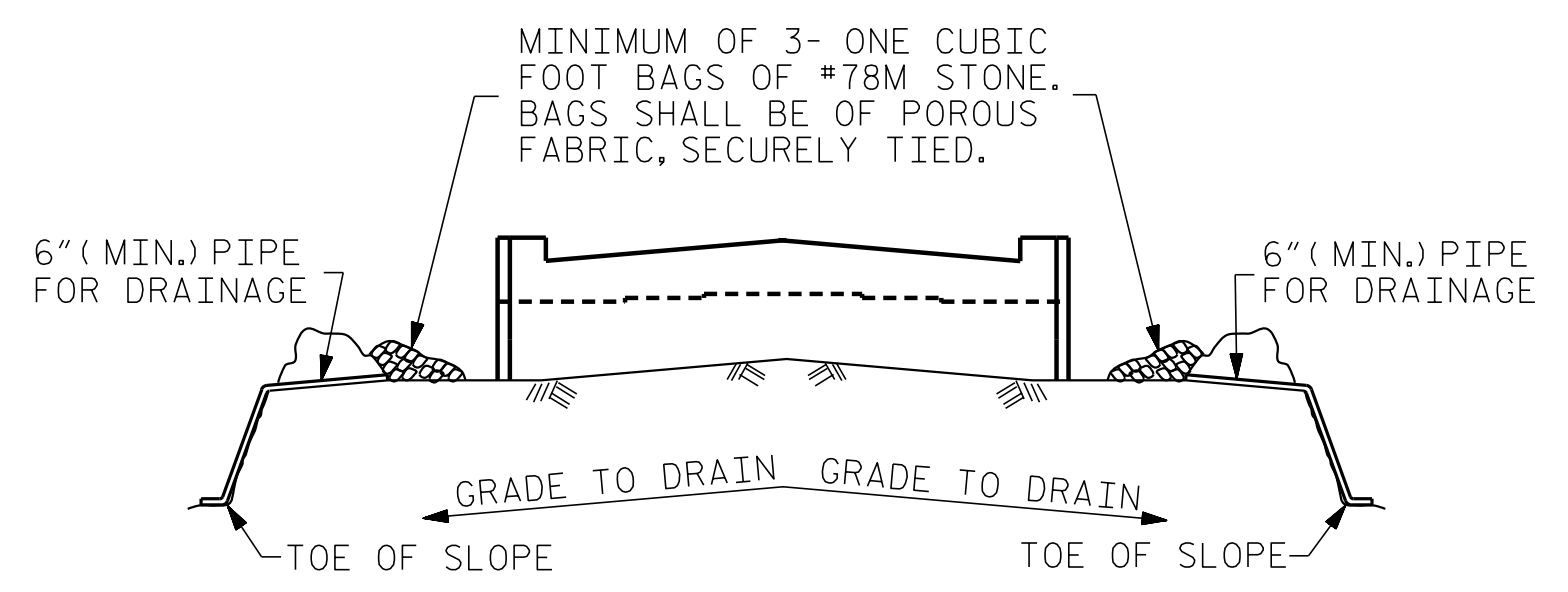
PILE SPLICE DETAILS



SECTION A-A



BILL OF MATERIAL					
END BENT No. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	16	#9	1	35'-2"	1,913
B2	16	#9	1	35'-9"	1,945
B3	8	#4	STR	13'-4"	71
B4	16	#4	STR	19'-7"	209
B5	12	#5	STR	33'-5"	418
B6	8	#4	STR	33'-2"	177
B7	16	#4	STR	5'-4"	57
H1	32	#5	3	12'-1"	403
H2	32	#5	2	12'-1"	403
K1	24	#4	STR	33'-2"	532
K2	8	#4	STR	5'-4"	29
S1	72	#5	5	13'-6"	1,014
S2	72	#5	4	6'-3"	469
S3	28	#4	6	7'-7"	142
U1	52	#4	7	3'-8"	127
U2	28	#4	7	8'-4"	156
V1	104	#5	STR	9'-4"	1,012
V2	36	#4	STR	11'-6"	277
V3	36	#4	STR	11'-1"	267
REINFORCING STEEL					9,621 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER PART OF WINGS				58.9 C.Y.	
POUR #2 BACKWALL AND UPPER PART OF WINGS				20.4 C.Y.	
TOTAL CLASS A CONCRETE				79.3 C.Y.	
HP 14 X 73 STEEL PILES					
NO: 7				595 L.F.	
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					7 EA.

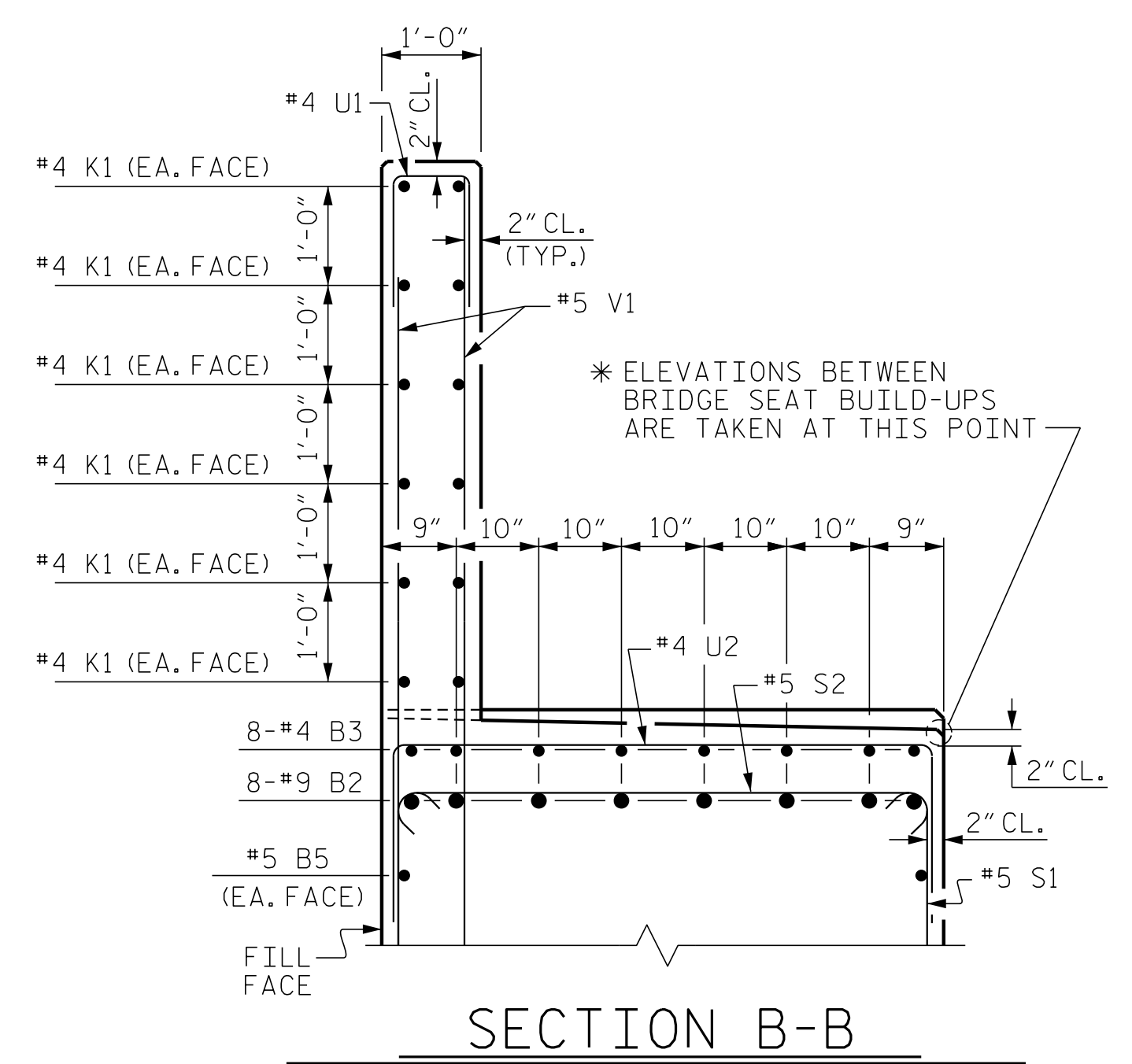


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

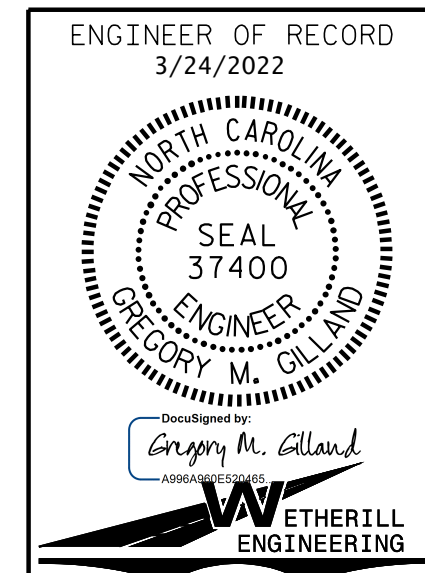
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION B-B

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-
SHEET 3 OF 3



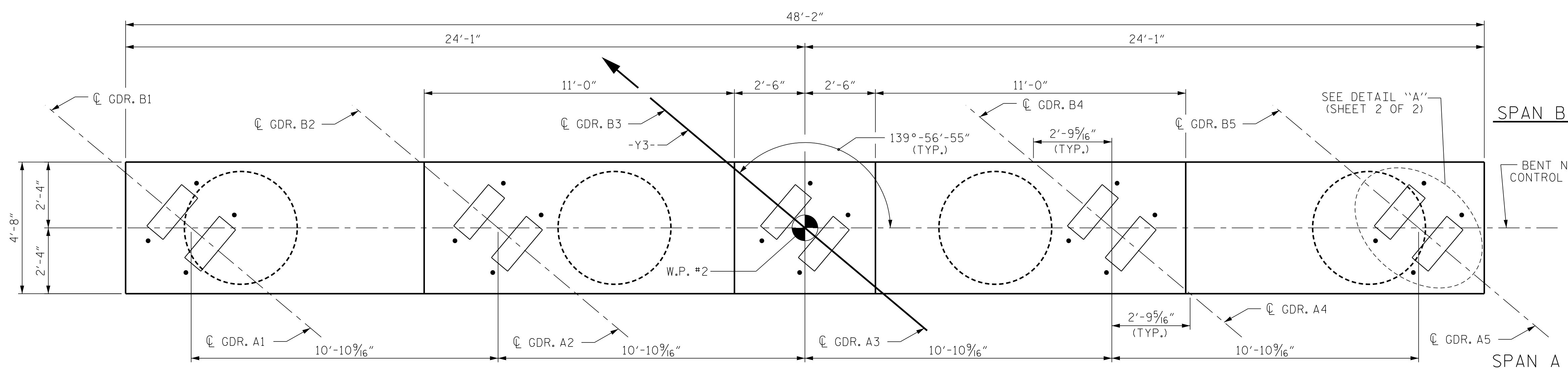
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 1

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

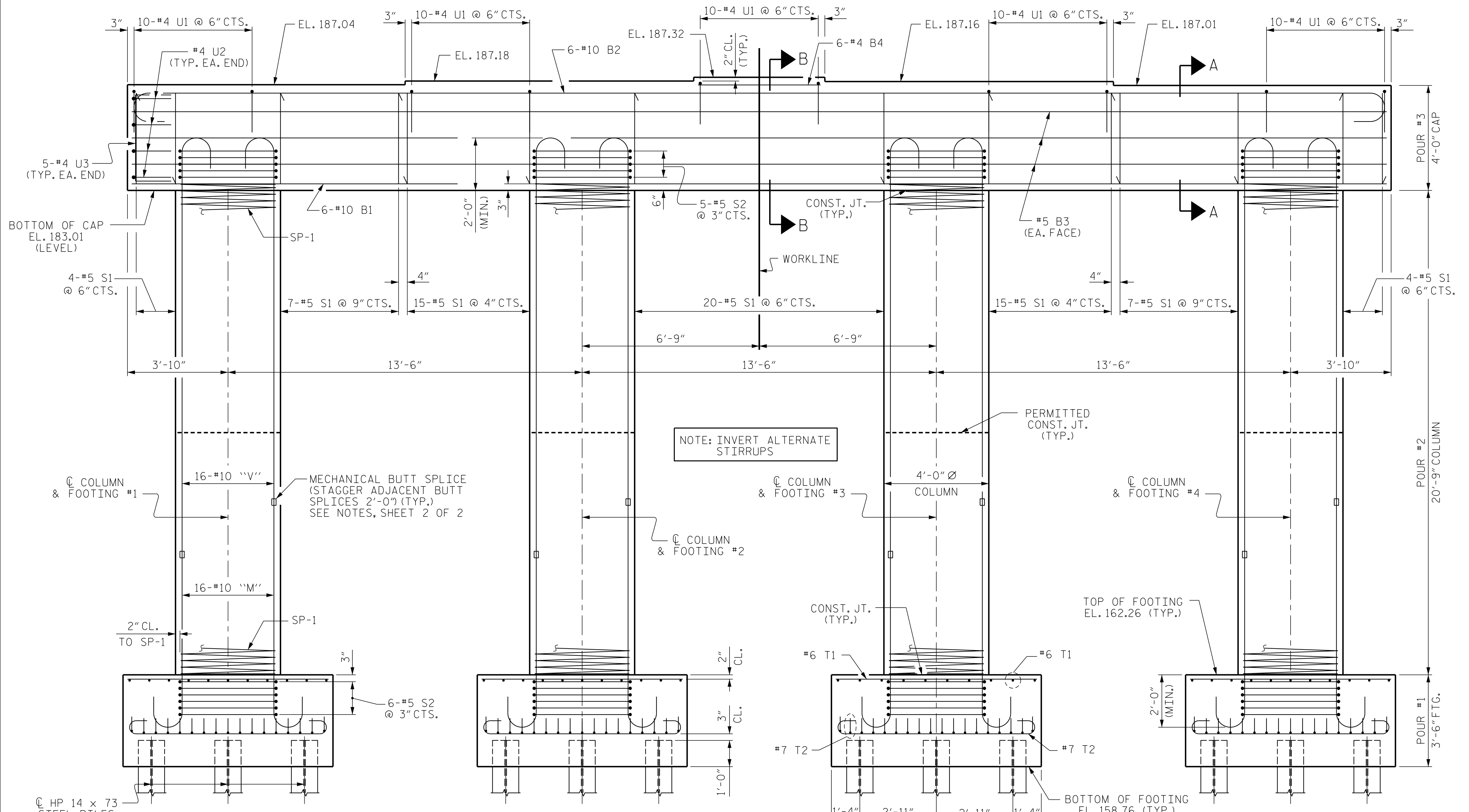
DOCUMENT NOT CONSIDERED FINAL
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DRAWN BY: D. HODGE DATE: 9/21
CHECKED BY: G. GILLAND DATE: 11/21

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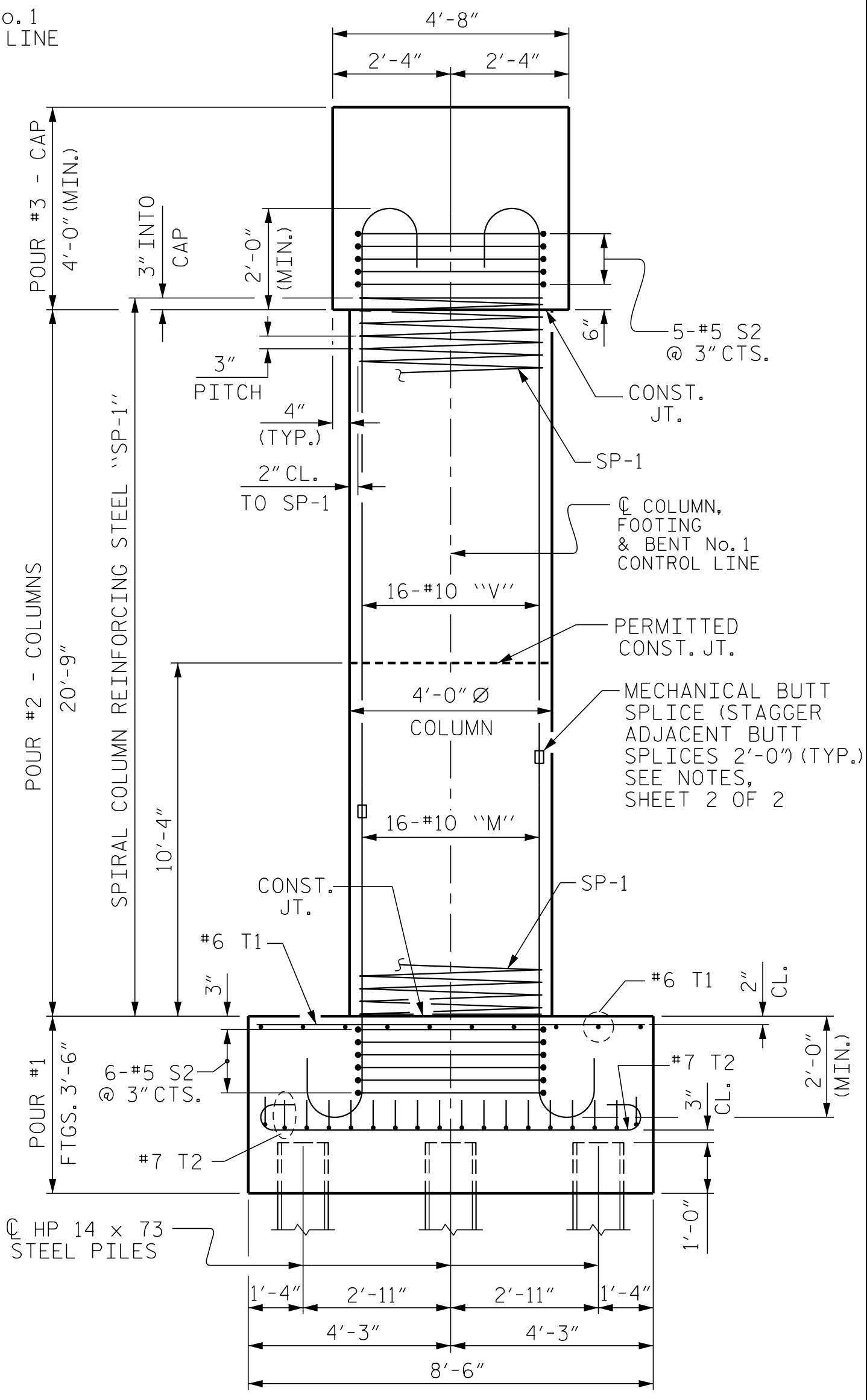


PLAN



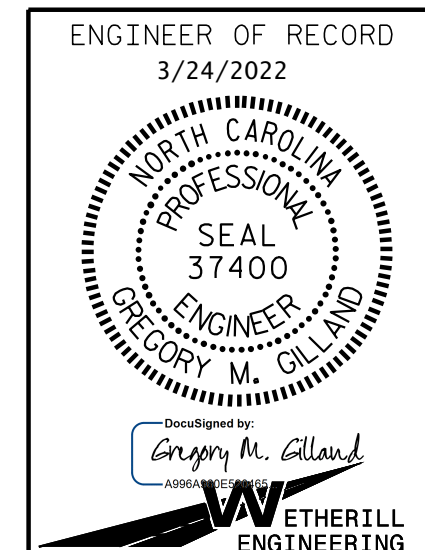
ELEVATION

PILE PLACEMENT, REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING AND COLUMN.



END ELEVATION

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

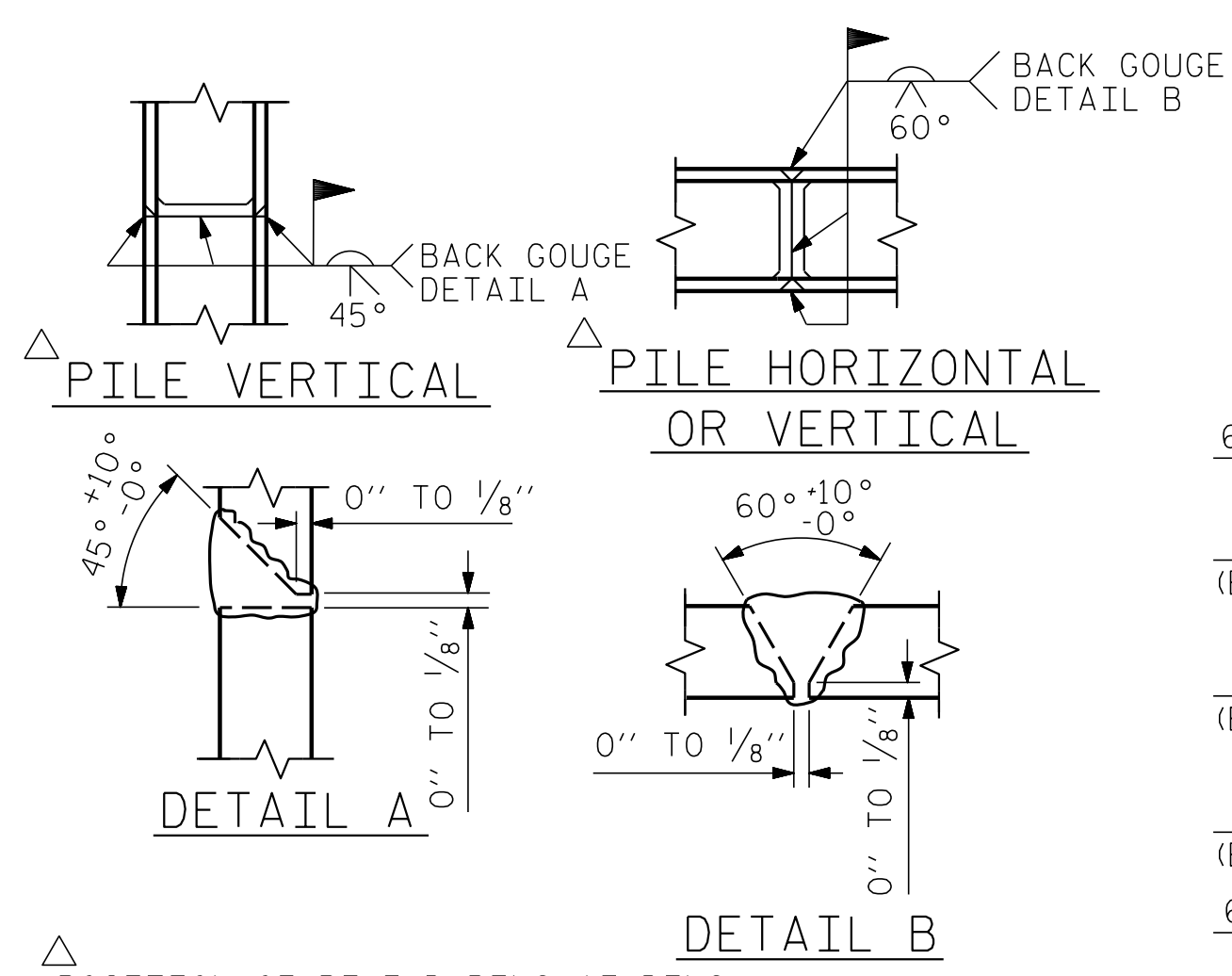
SUBSTRUCTURE
 BENT No. 1

DRAWN BY: D. HODGE DATE: 10/21
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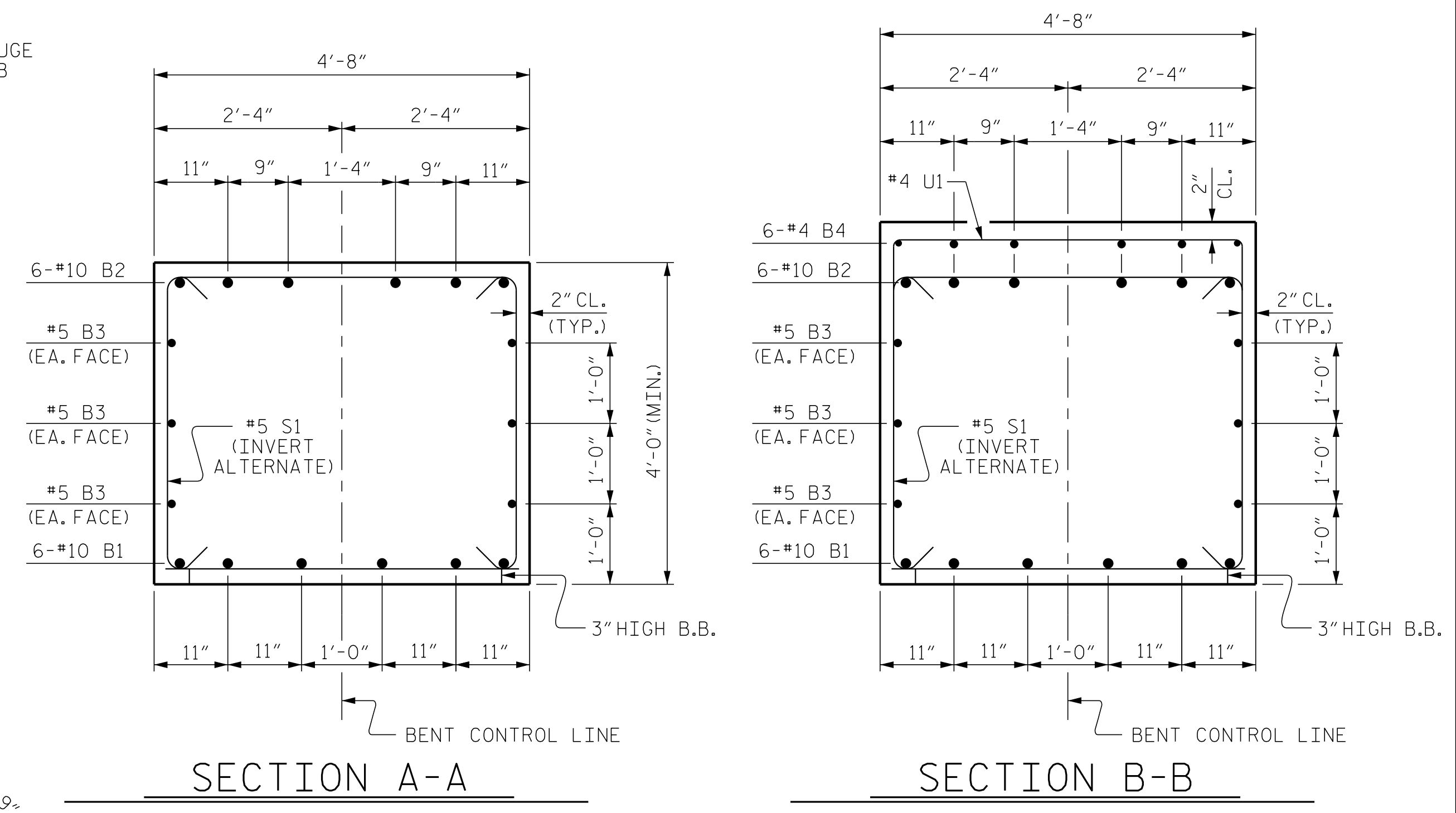
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-22	
1			3			TOTAL SHEETS	
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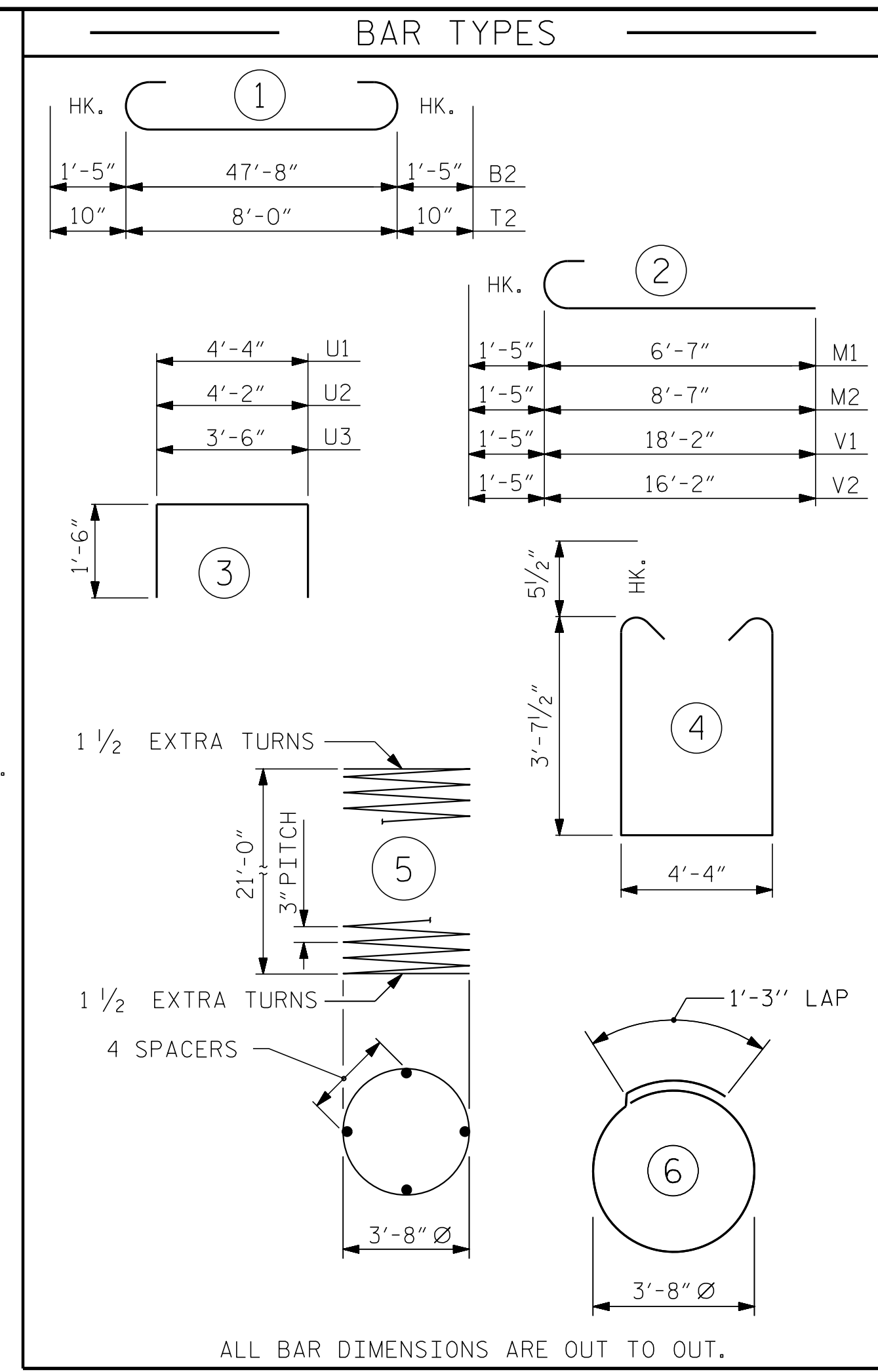


PILE SPlice DETAILS



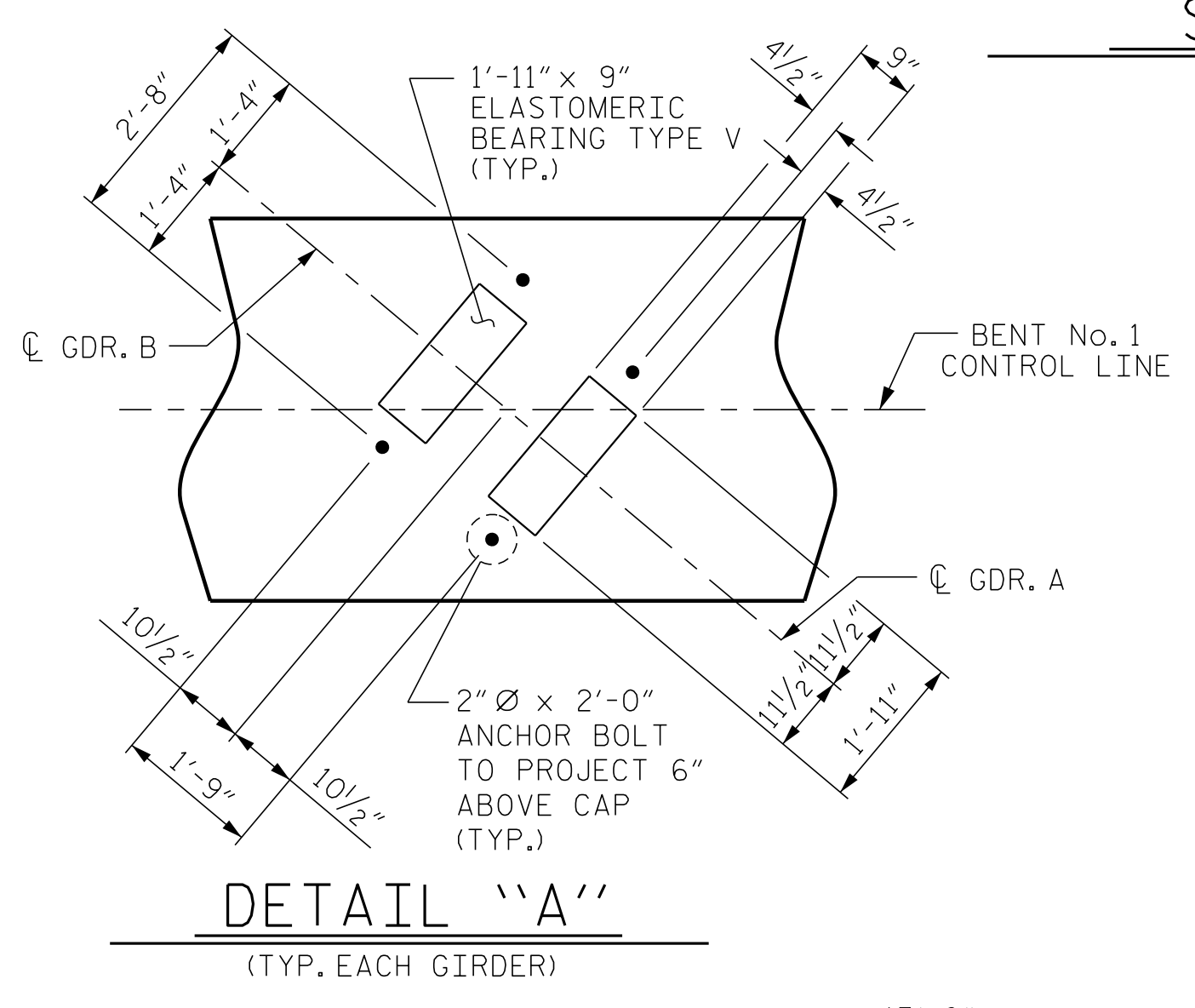
SECTION A-A

SECTION B-B

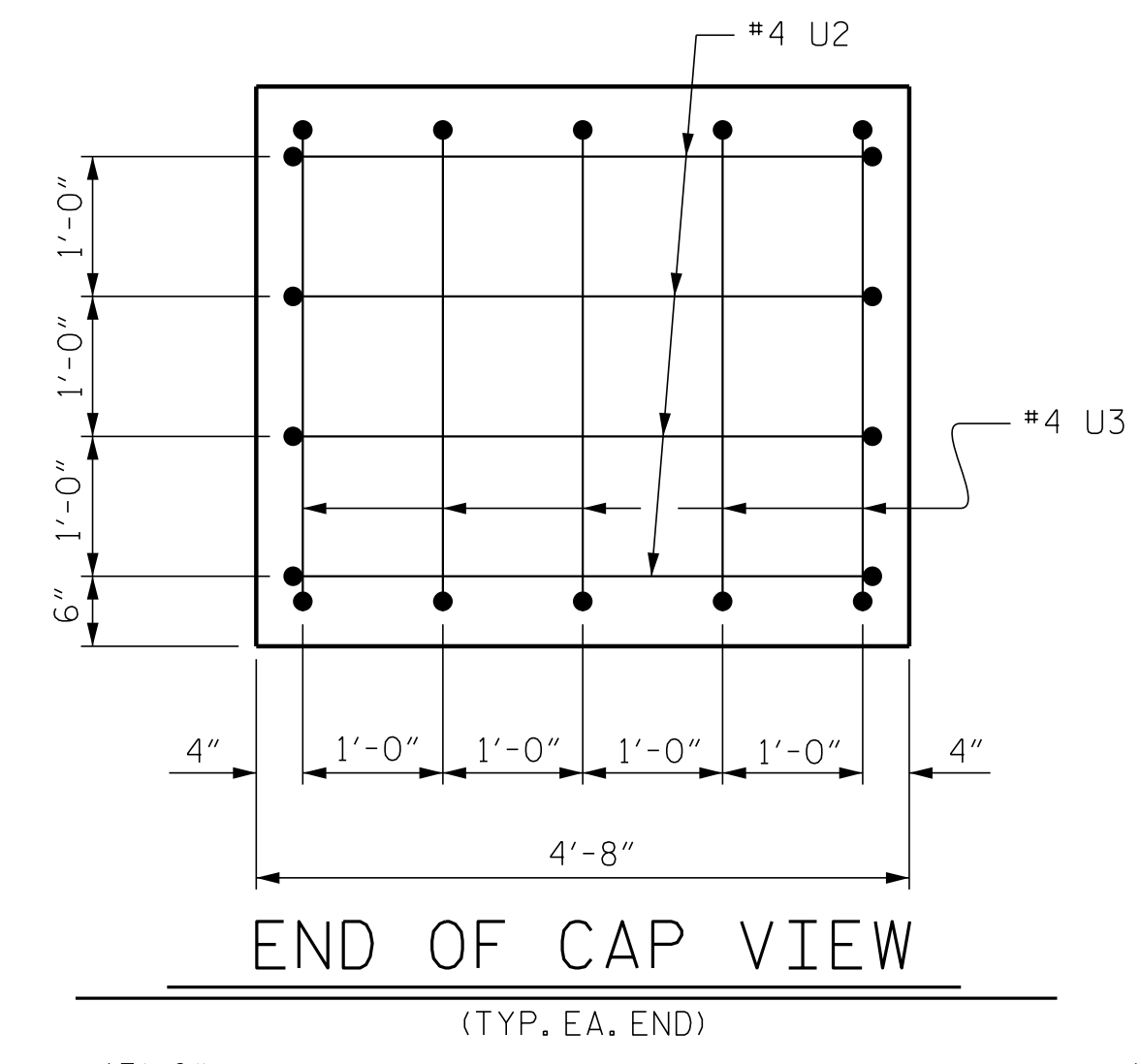


ALL BAR DIMENSIONS ARE OUT TO OUT.
 ** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

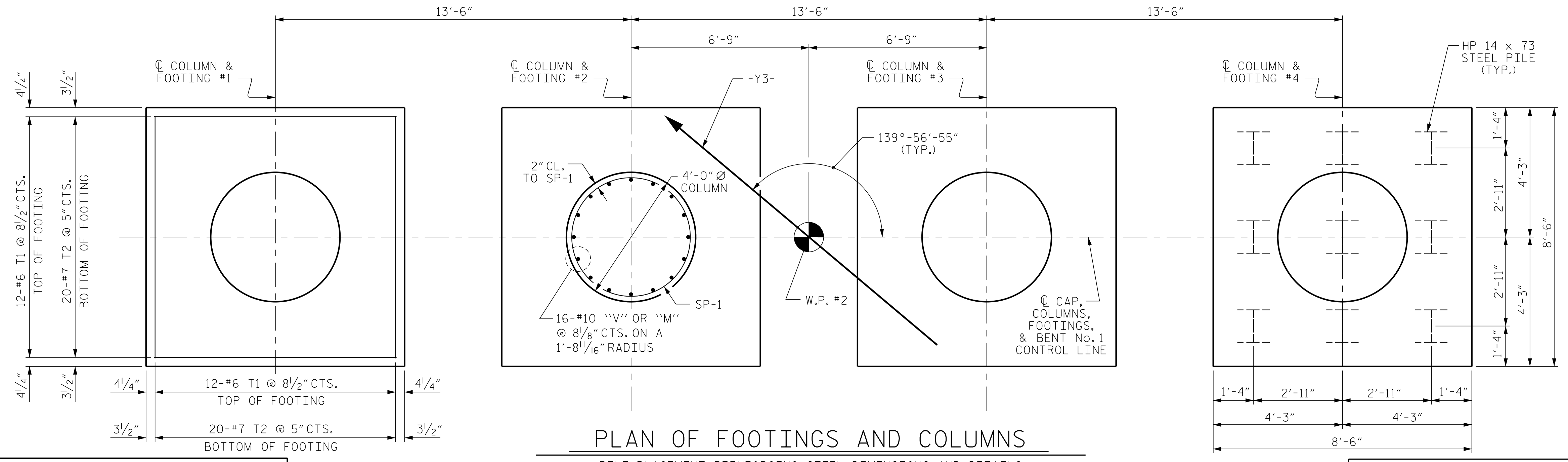
BILL OF MATERIAL					
BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	47'-10"	1,235
B2	6	#10	1	50'-6"	1,304
B3	6	#5	STR	47'-10"	299
B4	6	#4	STR	4'-8"	19
M1	32	#10	2	8'-0"	1,102
M2	32	#10	2	10'-0"	1,377
S1	72	#5	4	12'-6"	939
S2	44	#5	6	12'-10"	589
T1	96	#6	STR	8'-0"	1,154
T2	160	#7	1	9'-8"	3,161
U1	50	#4	3	7'-4"	245
U2	8	#4	3	7'-2"	38
U3	10	#4	3	6'-6"	43
V1	32	#10	2	19'-7"	2,697
V2	32	#10	2	17'-7"	2,421
REINFORCING STEEL					16,623 LBS.
SP-1	4	**	5	988'-3"	4,123
SPIRAL COLUMN REINFORCING STEEL					4,123 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTINGS					37.5 C.Y.
POUR #2 COLUMNS					38.6 C.Y.
POUR #3 CAP					34.2 C.Y.
TOTAL CLASS A CONCRETE					110.3 C.Y.
HP 14 X 73 STEEL PILES					
NO: 36					LIN. FT. = 2,880
FOUNDATION EXCAVATION					LUMP SUM
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					36 EA.



DETAIL "A" (TYP. EACH GIRDER)



END OF CAP VIEW (TYP. EA. END)

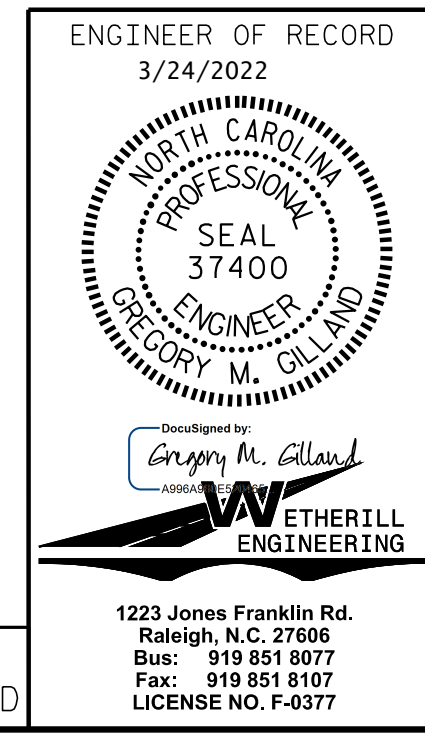


PLAN OF FOOTINGS AND COLUMNS

PILE PLACEMENT, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH FOOTING AND COLUMN.

NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 LONGITUDINAL COLUMN REINFORCING STEEL SHALL BE SPLICED USING MECHANICAL BUTT SPLICES. NO LAP SPLICES ALLOWED. MECHANICAL BUTT SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND SUBMITTED FOR APPROVAL. ADJACENT SPLICES SHALL BE STAGGERED AT 2'-0". NO EXTRA PAYMENT WILL BE MADE FOR USING MECHANICAL BUTT SPLICES OR MODIFYING BAR LENGTHS. THE COST WILL BE INCIDENTAL TO REINFORCING STEEL.

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 2



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

SHEET NO. S3-23
 TOTAL SHEETS 29

PA-202 121331.02 I-5987A BridgeStructures.DGN\401_001_I5987A_SMU_BT_001.dgn
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DRAWN BY: D. HODGE DATE: 10/21
 CHECKED BY: G. GILLAND DATE: 10/21

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NOTES:

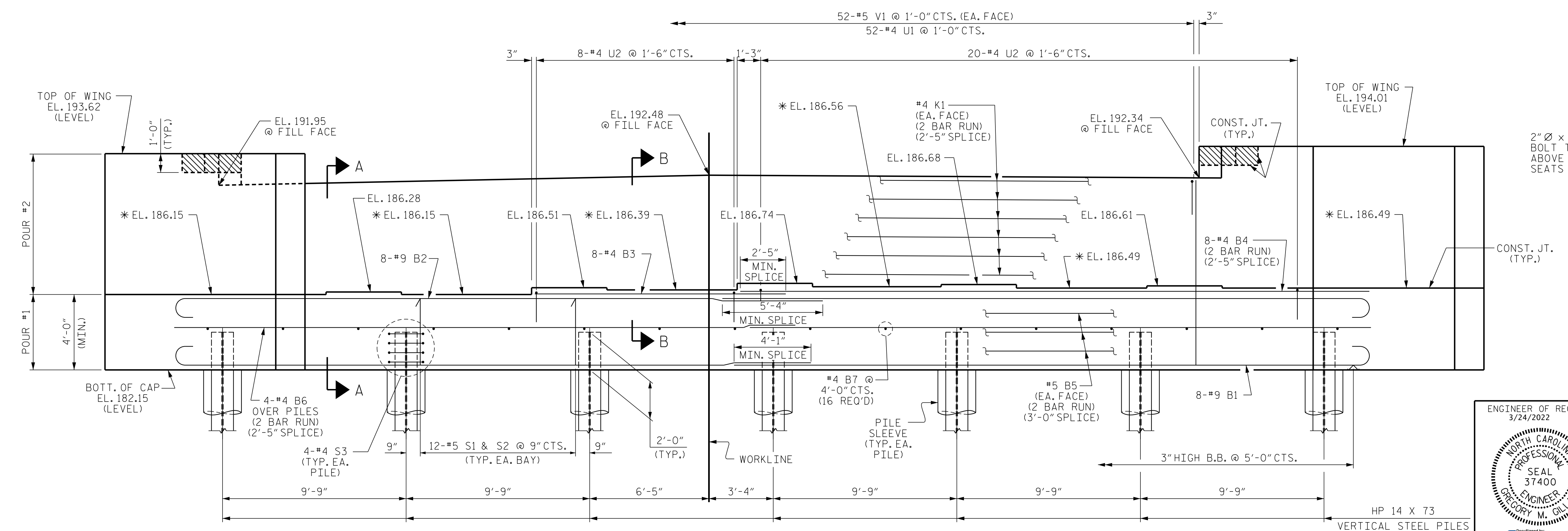
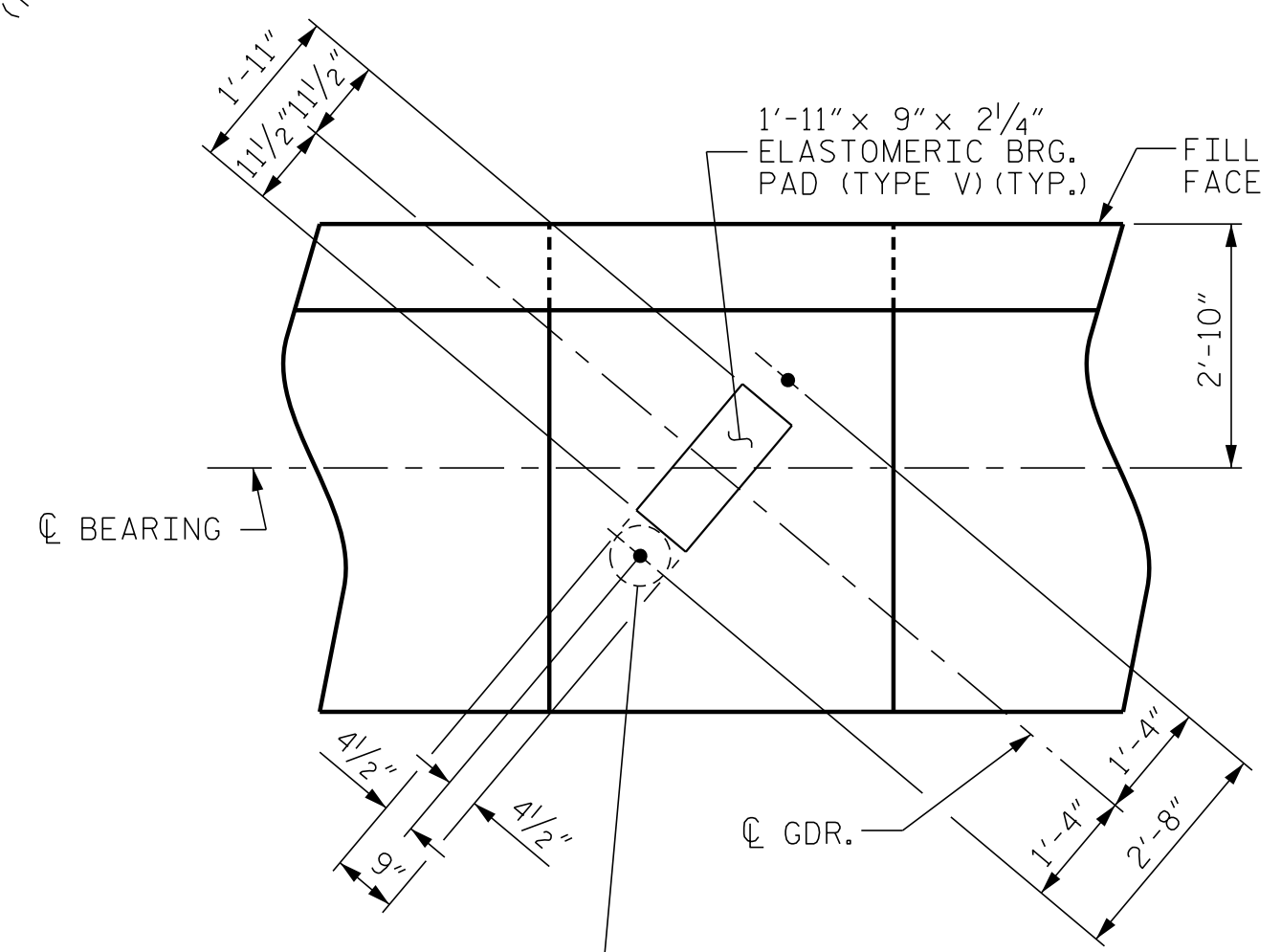
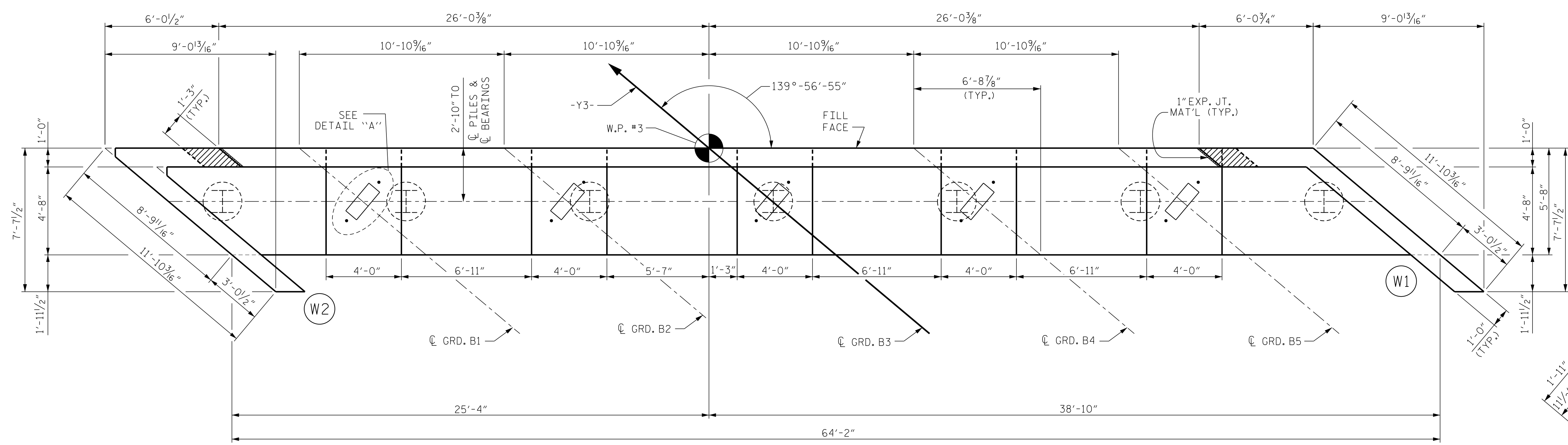
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

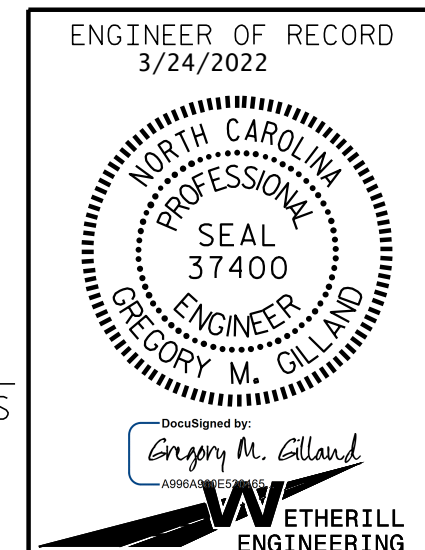
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.



* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTIONS A-A & B-B, SHEET 3 OF 3.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

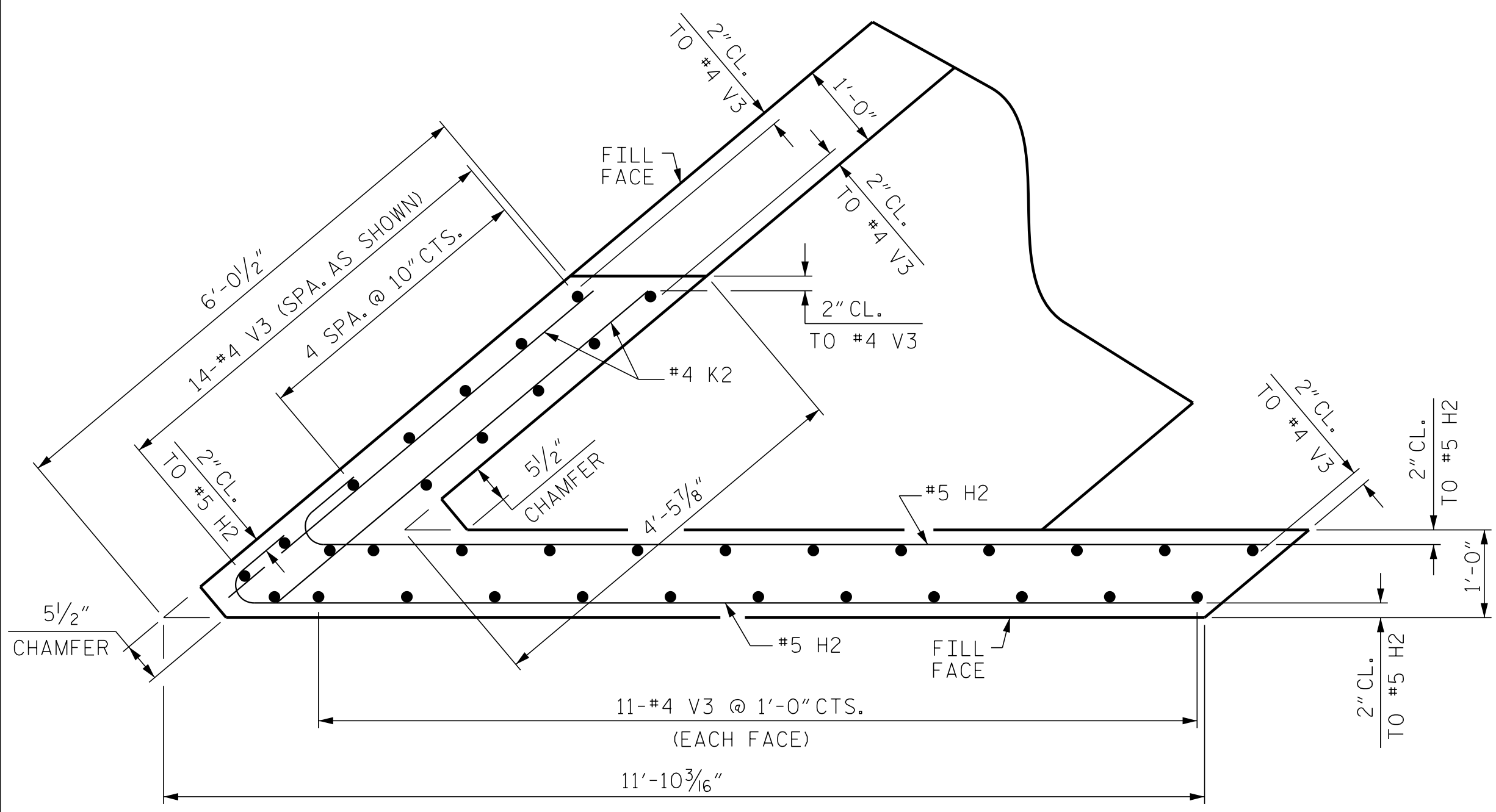
SUBSTRUCTURE
 END BENT No. 2

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

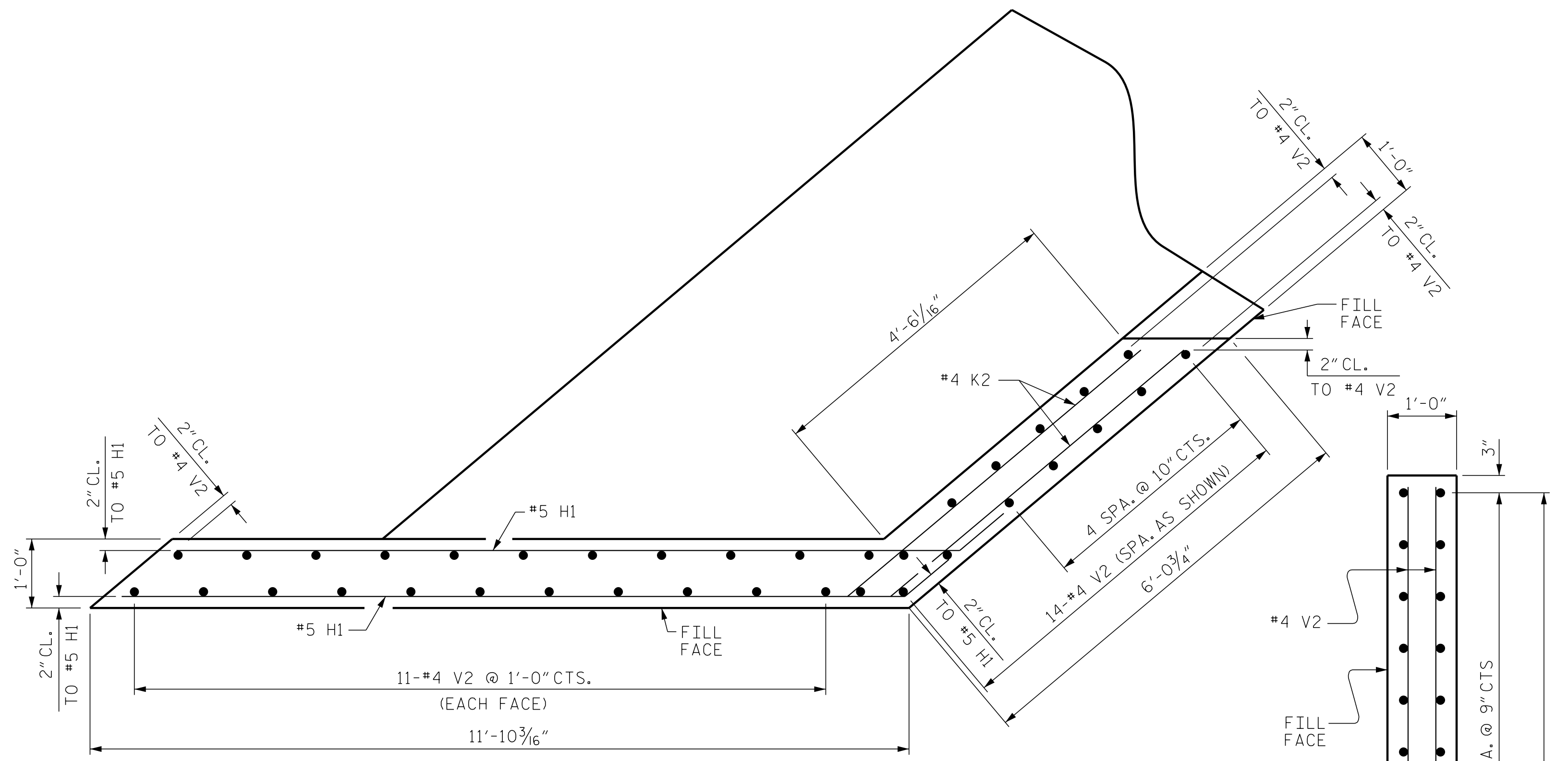
DRAWN BY: D. HODGE DATE: 10/21
 CHECKED BY: G. GILLAND DATE: 11/21

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

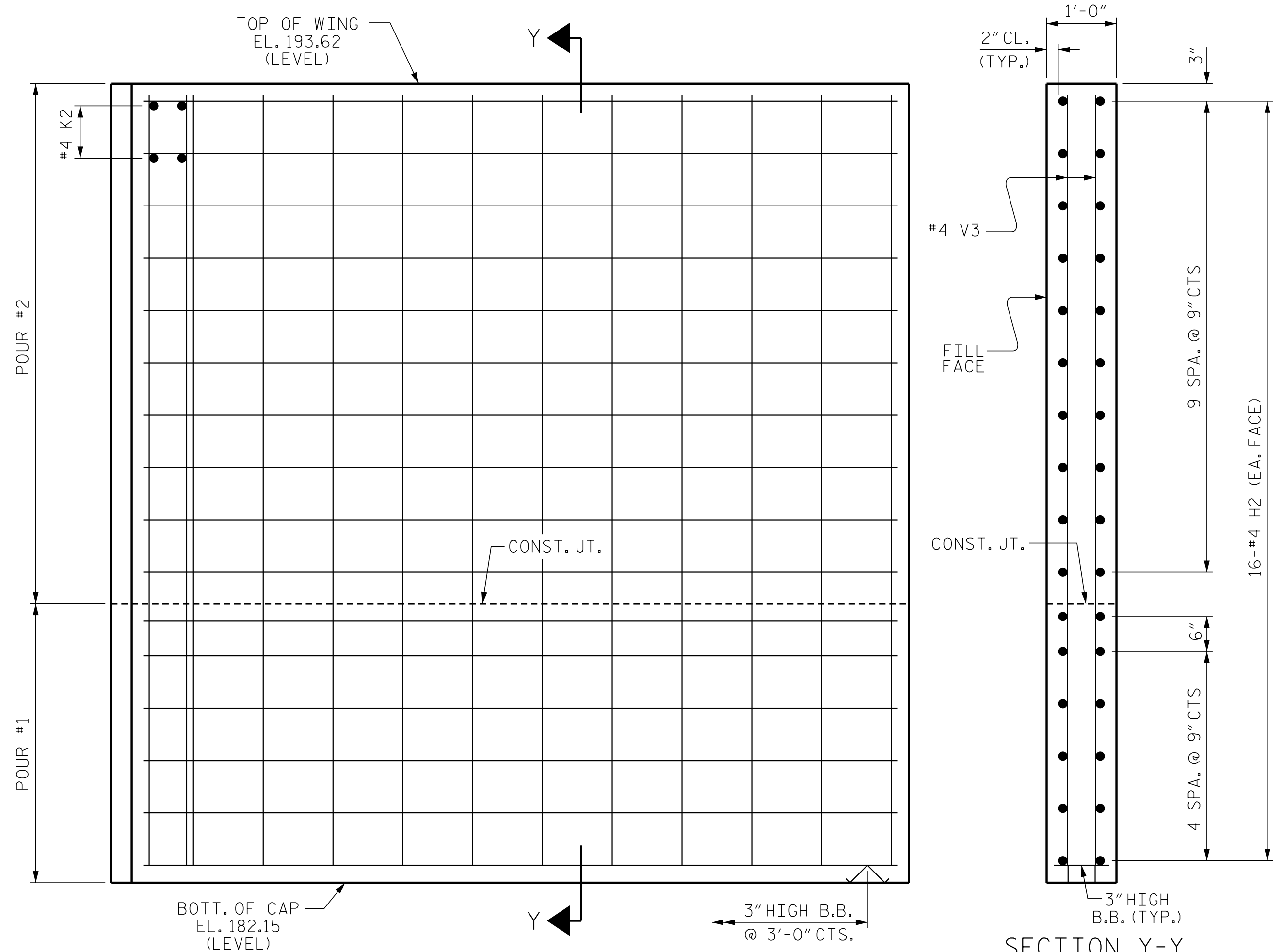
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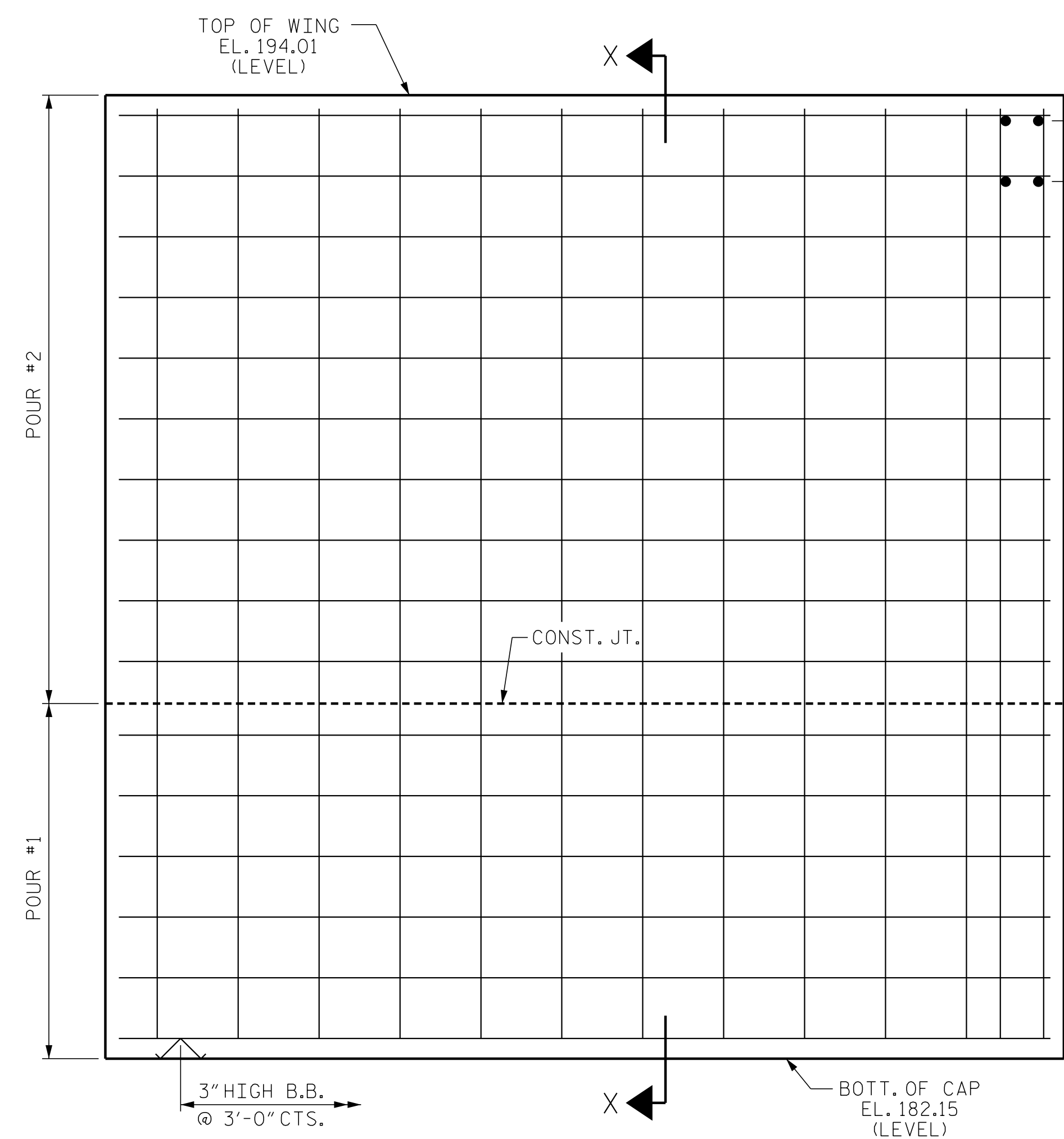
PLAN OF WING - (W2)



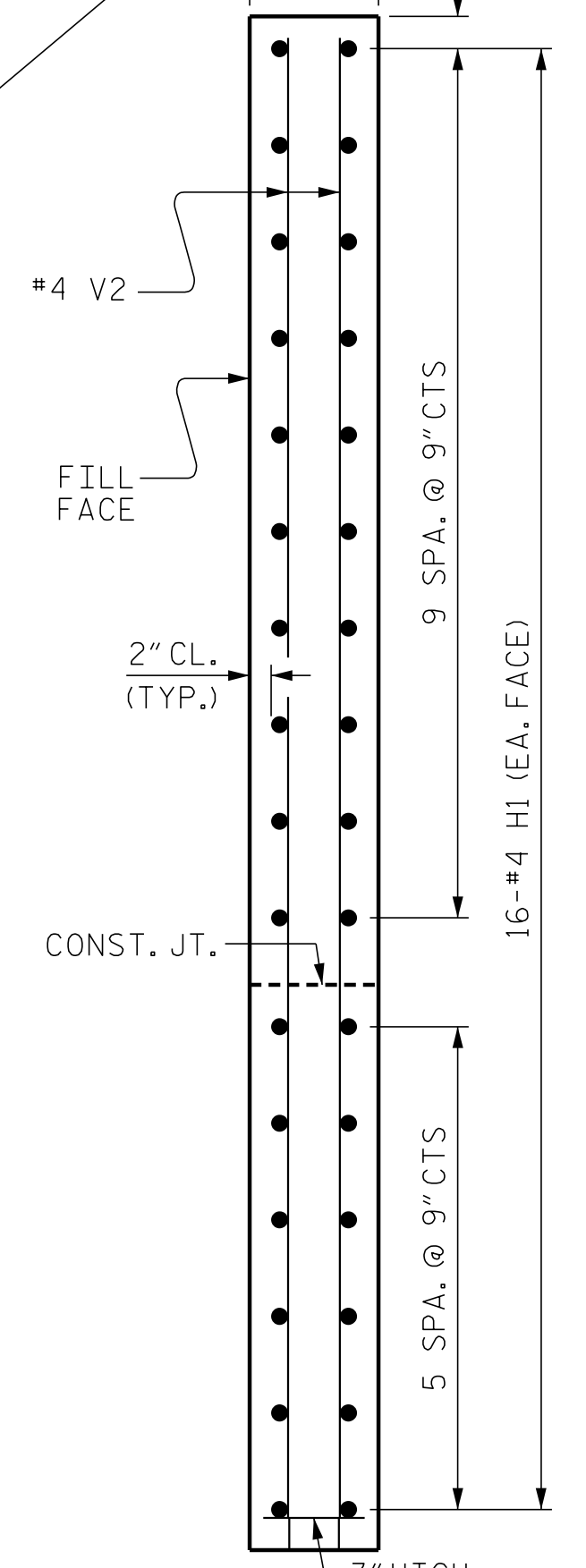
PLAN OF WING - (W1)



ELEVATION OF WING - (W2)

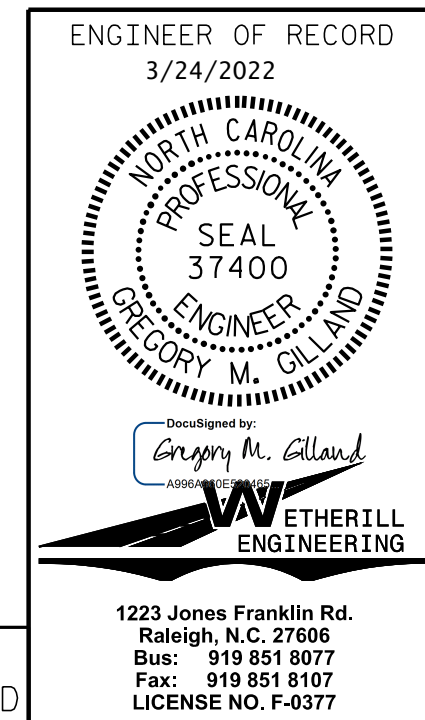


ELEVATION OF WING - (W1)



SECTION X-X

PROJECT NO. I-5987A
 ROBESON COUNTY
 STATION: 30+04.11 -Y3-
 SHEET 2 OF 3



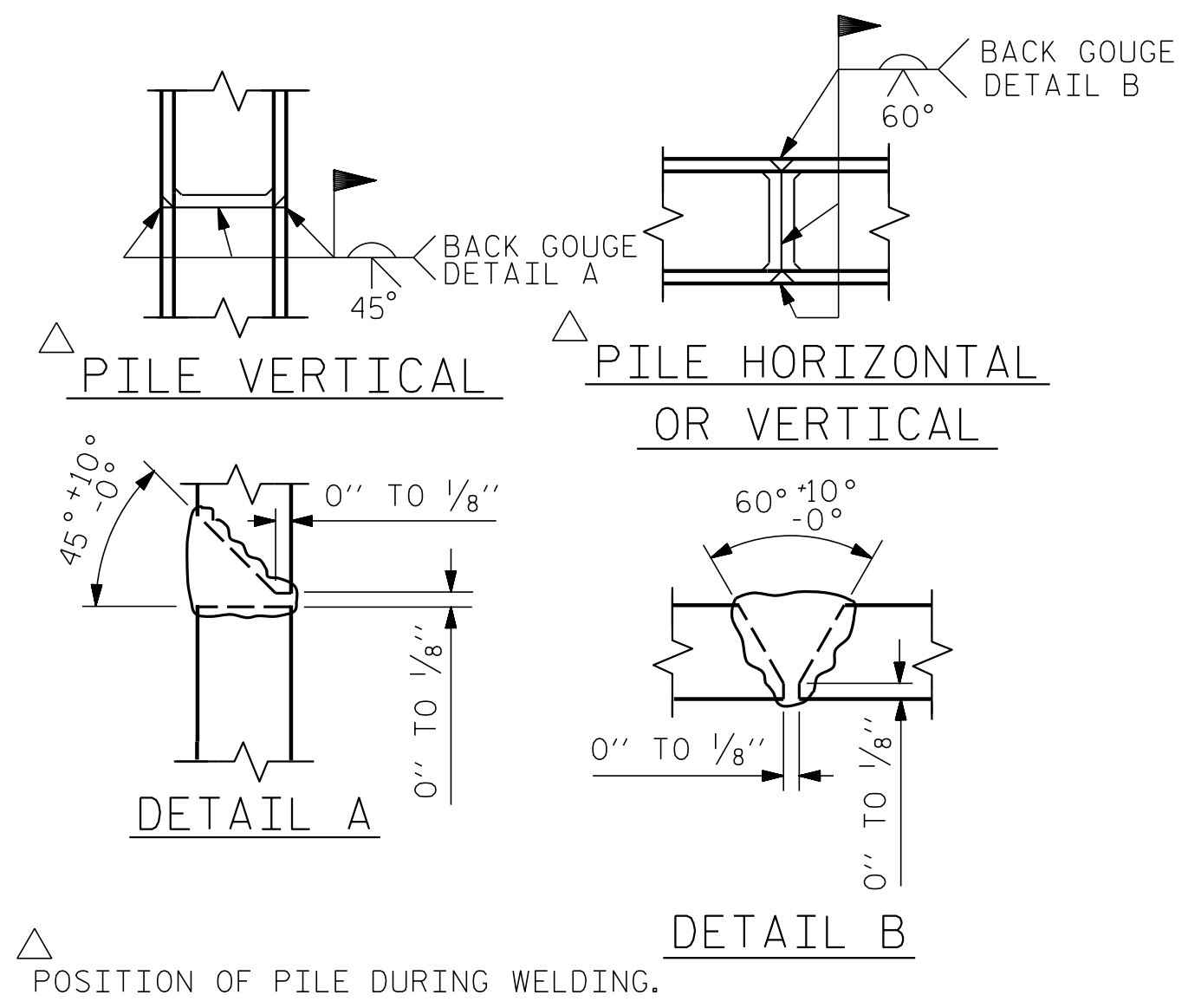
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
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					TOTAL SHEETS 29

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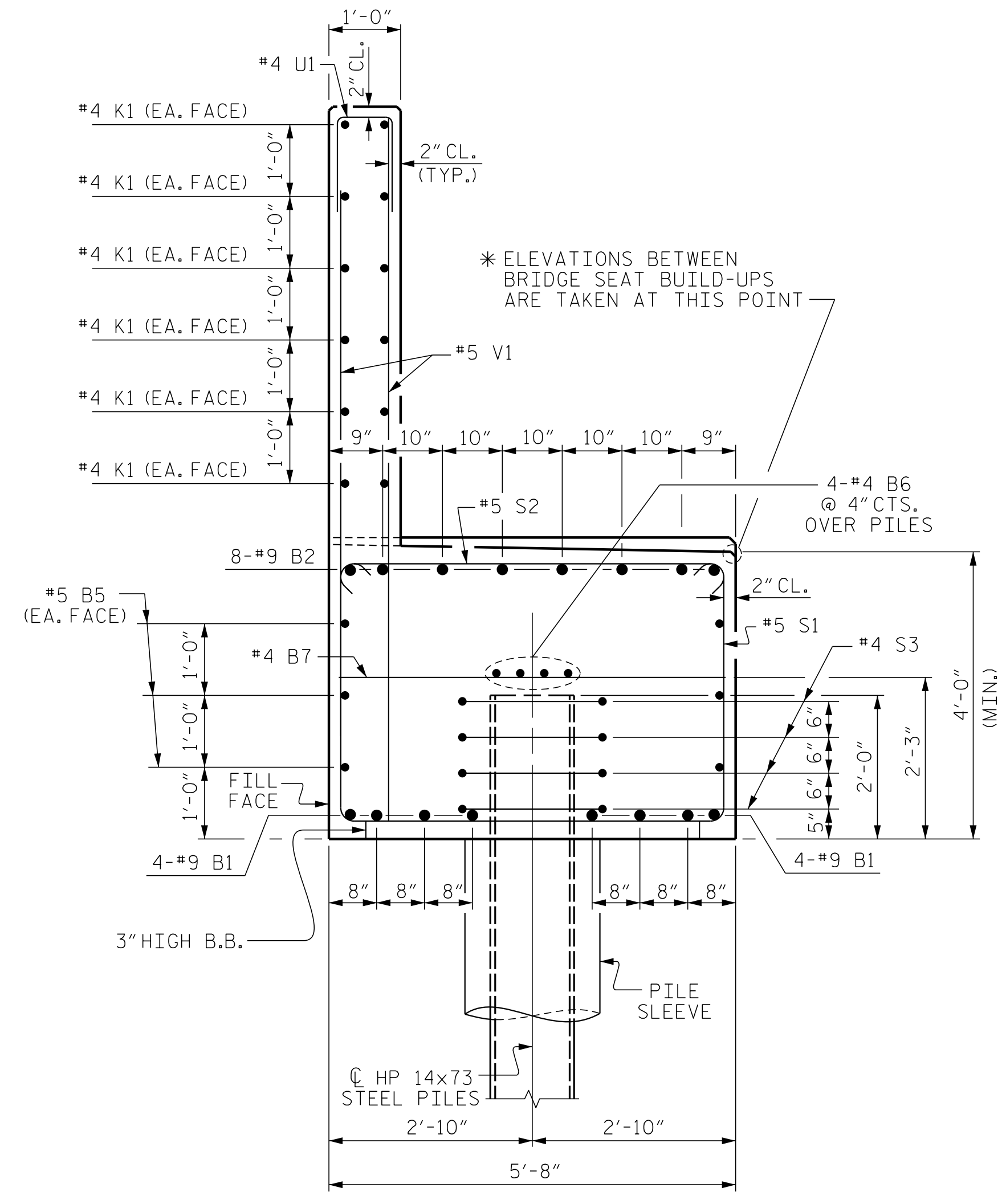
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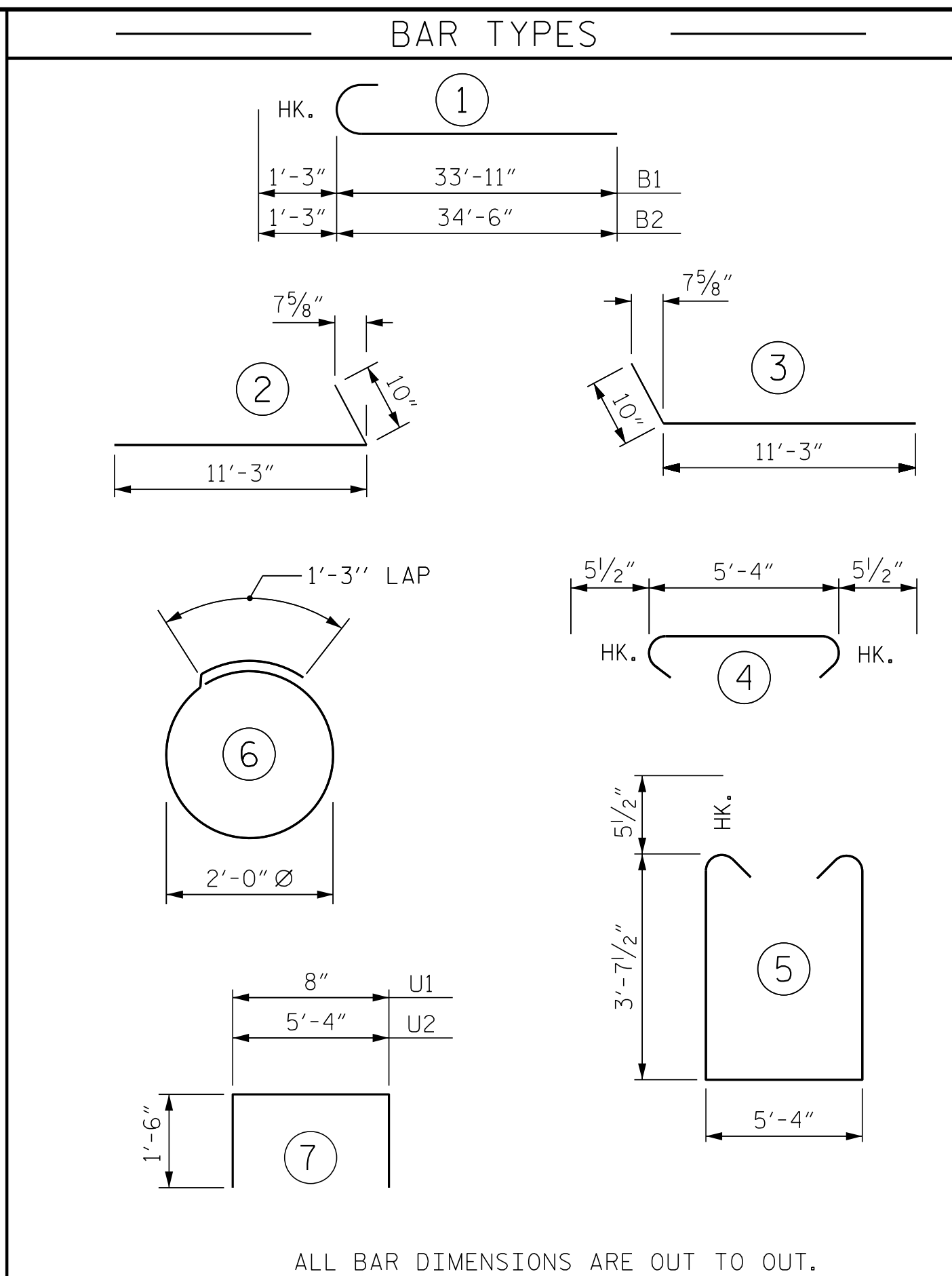
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 Raleigh, N.C. 27606
 Bus: 919 851 8077
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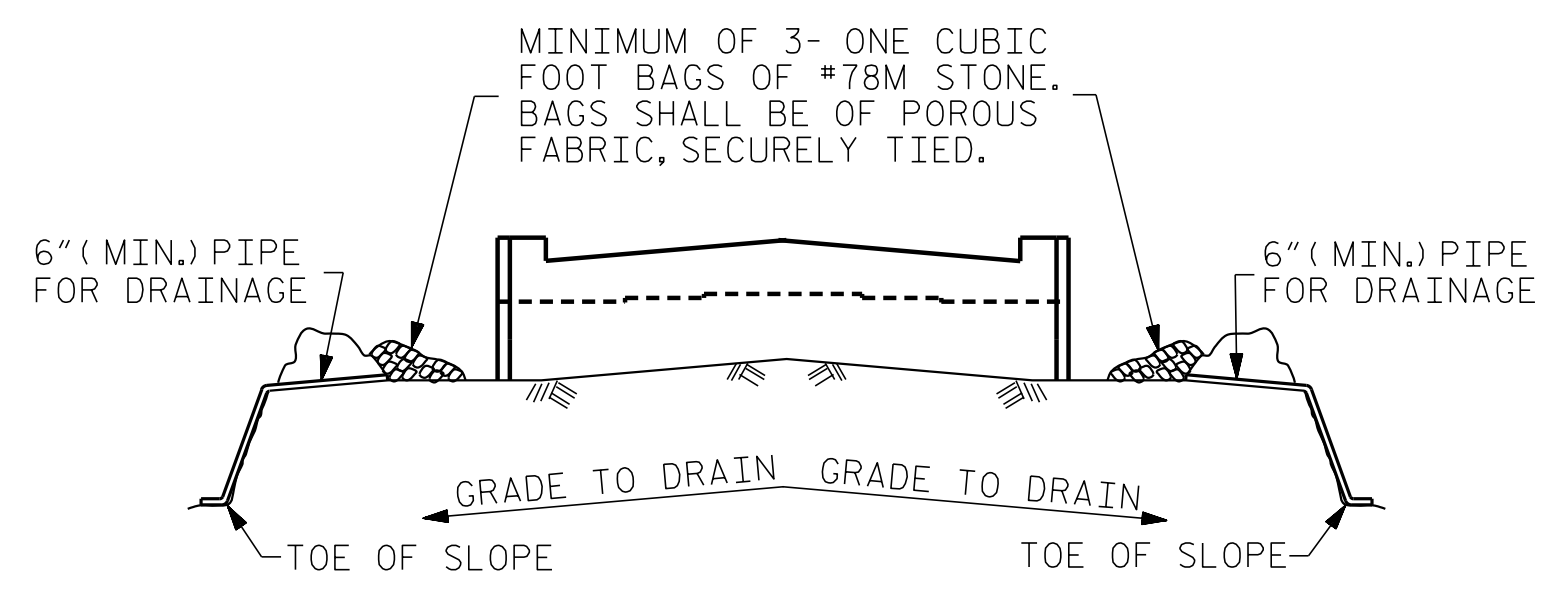
PILE SPLICE DETAILS



SECTION A-A



BILL OF MATERIAL					
END BENT No. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	35'-2"	1,913
B2	16	#9	1	35'-9"	1,945
B3	8	#4	STR	13'-4"	71
B4	16	#4	STR	19'-7"	209
B5	12	#5	STR	33'-5"	418
B6	8	#4	STR	33'-2"	177
B7	16	#4	STR	5'-4"	57
H1	32	#5	3	12'-1"	403
H2	32	#5	2	12'-1"	403
K1	24	#4	STR	33'-2"	532
K2	8	#4	STR	5'-4"	29
S1	72	#5	5	13'-6"	1,014
S2	72	#5	4	6'-3"	469
S3	28	#4	6	7'-7"	142
U1	52	#4	7	3'-8"	127
U2	28	#4	7	8'-4"	156
V1	104	#5	STR	9'-4"	1,012
V2	36	#4	STR	11'-5"	275
V3	36	#4	STR	11'-0"	265
REINFORCING STEEL					9,617 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER PART OF WINGS					58.9 C.Y.
POUR #2 BACKWALL AND UPPER PART OF WINGS					20.4 C.Y.
TOTAL CLASS A CONCRETE					79.3 C.Y.
HP 14 X 73 STEEL PILES					
NO: 7					630 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					7 EA.

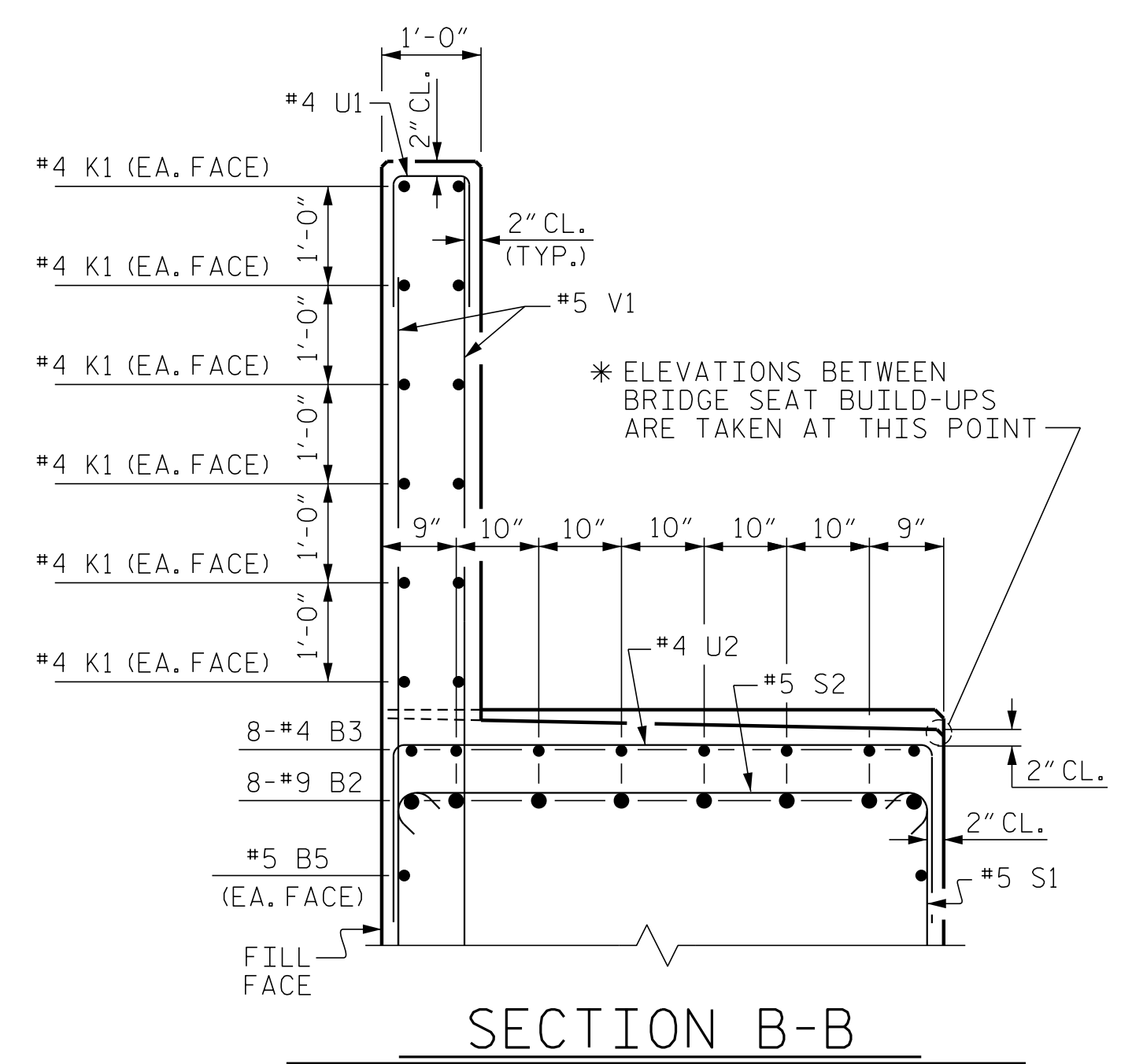


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

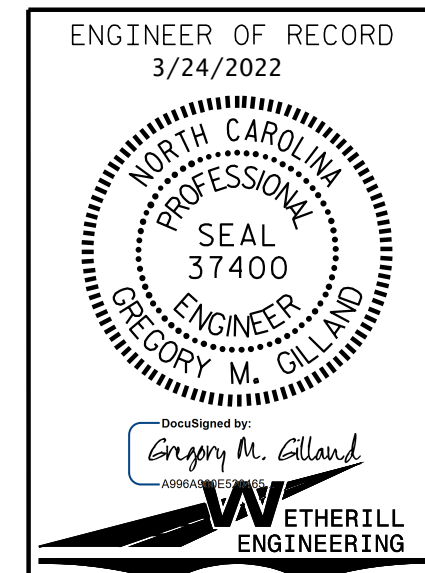
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION B-B

PROJECT NO. I-5987A
ROBESON COUNTY
STATION: 30+04.11 -Y3-
SHEET 3 OF 3



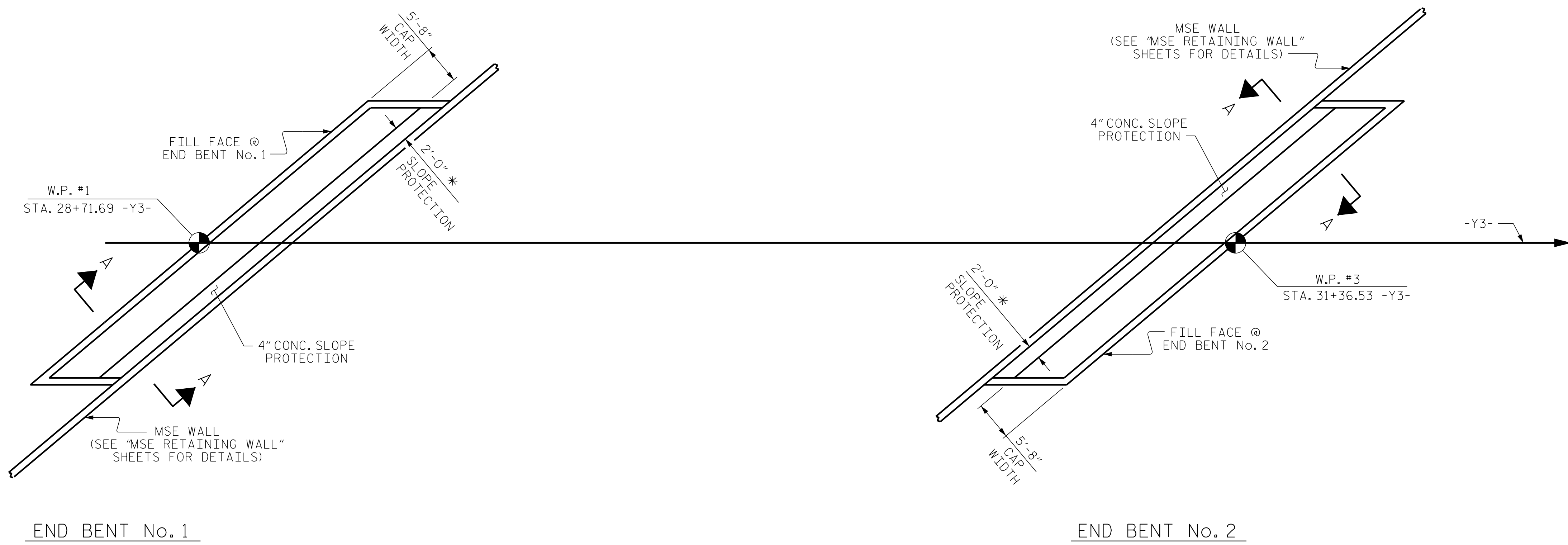
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			29

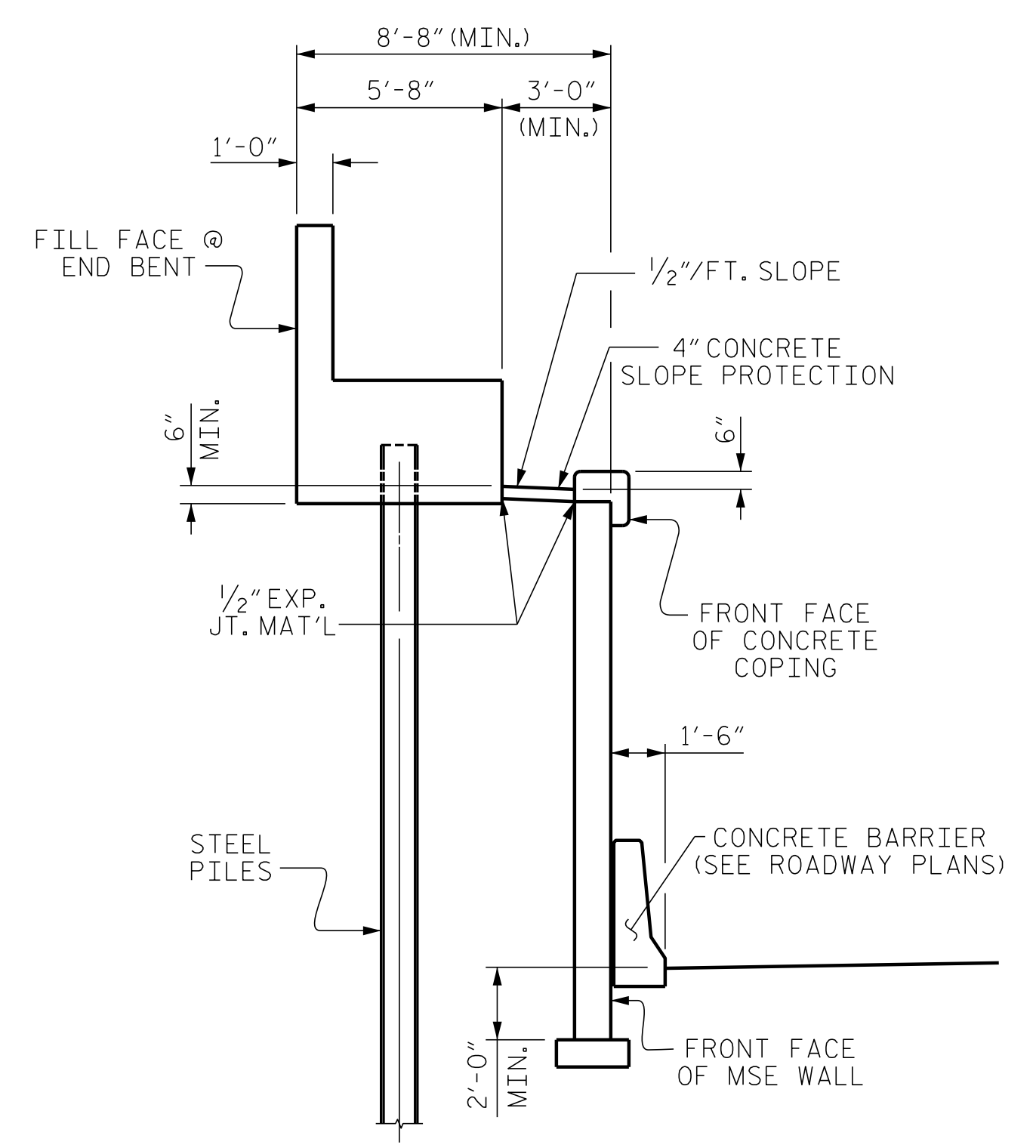
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CHECKED BY: G. GILLAND DATE: 11/21

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PLAN



SECTION A-A
(NORMAL TO FILL FACE)

NOTES

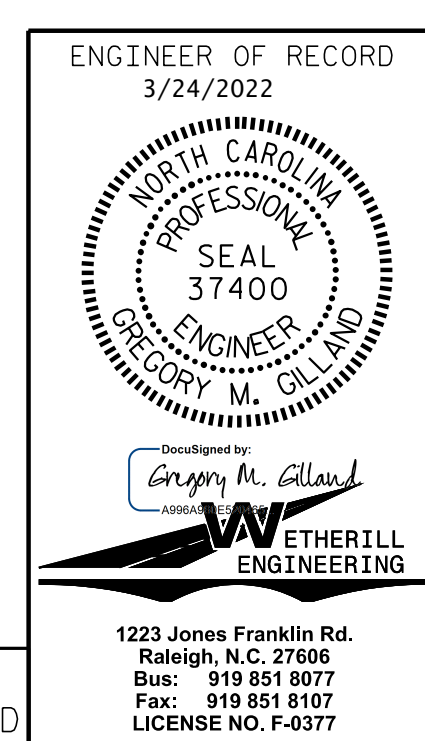
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE AND PLACED IN THE MIDDLE OF THE 4" CONCRETE SLOPE PROTECTION. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 30+04.11 -Y3- 463+53.11 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 20 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	13.6	63.1
END BENT 2	13.6	63.1
TOTAL	27.2	126.2

* QUANTITIES BASED ON DIMENSION SHOWN. FIELD ADJUST AS REQUIRED BASED ON WALL PANEL AND COPING USED.

PROJECT NO. I-5987A
ROBESON COUNTY
 STATION: 30+04.11 -Y3-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-27
1			3			TOTAL SHEETS
2			4			29

DRAWN BY : D. HODGE DATE : 11/21
 CHECKED BY : G. GILLAND DATE : 11/21

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