

1/31/2023 10:08:29 AM
 p:\w\7\dec-com-na-pw-bentley.com\AECOM_DS2\NA_2020\Documents\60581578-NC00T_SMU_BR-0043\900-CAD_GIS\910-CAD\70_NCD0T_TIP\Structures\04 Drawings\401_000_BR-0043_SMU_TSH.dgn
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TIP PROJECT: BR-0043

CONTRACT: C204793

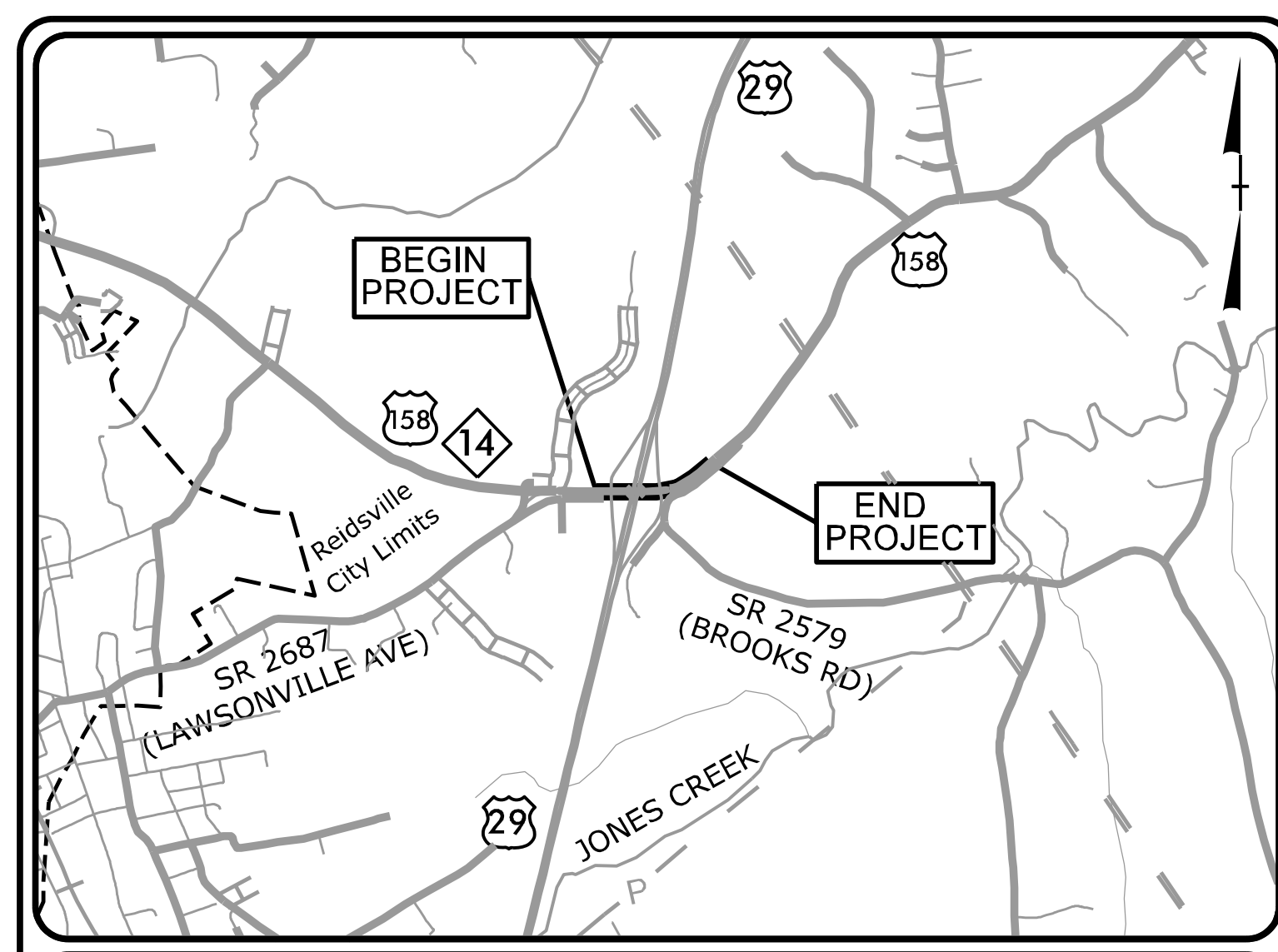
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

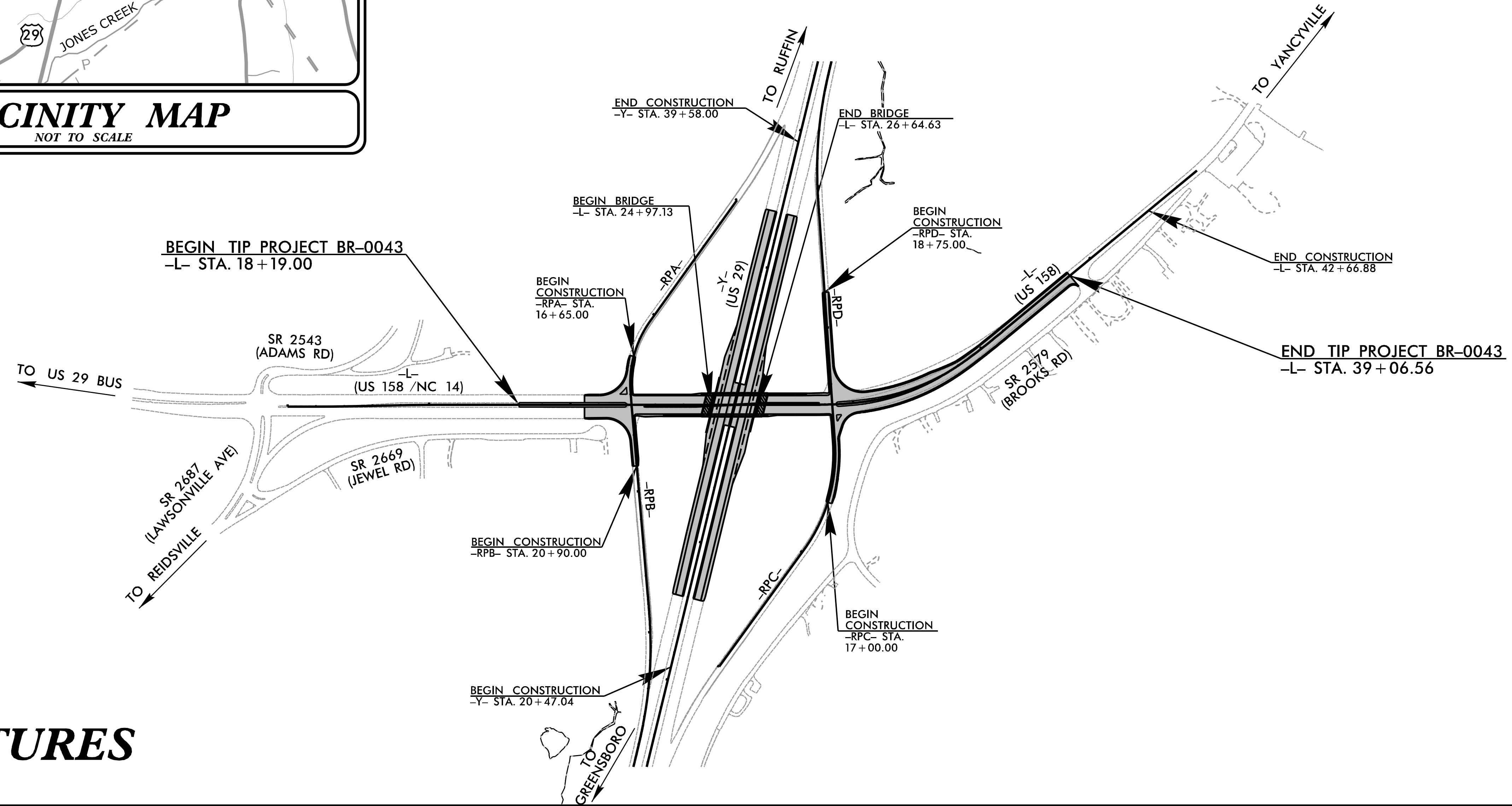
**LOCATION: REPLACE BRIDGE 780151 ON US 158 /NC 14
OVER US 29 NEAR REIDSVILLE**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNAL, STRUCTURE, AND WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0043		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67043.1.1		PE	
67043.2.1		RW/Utility	
67043.3.1		CONSTR.	



VICINITY MAP
NOT TO SCALE



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2023 =	15,718
ADT 2043 =	17,109
K =	9 %
D =	55 %
T =	6 % *
V =	50 MPH
* TTST =	4% DUAL 2%
FUNC CLASS =	PRINCIPAL ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0043 =	0.363 MI
LENGTH STRUCTURE TIP PROJECT BR-0043 =	0.032 MI
TOTAL LENGTH TIP PROJECT BR-0043 =	0.395 MI

Prepared in the Office of:
AECOM
2018 STANDARD SPECIFICATIONS

NC FIRM LICENSE No: F-0342
5438 Wade Park Blvd., Suite 200
Raleigh, NC 27607
(919) 461-1100

RIGHT OF WAY DATE:
AUGUST 31, 2022

LETTING DATE:
APRIL 18, 2023

JOHN C. MORRISON, P.E.
PROJECT ENGINEER

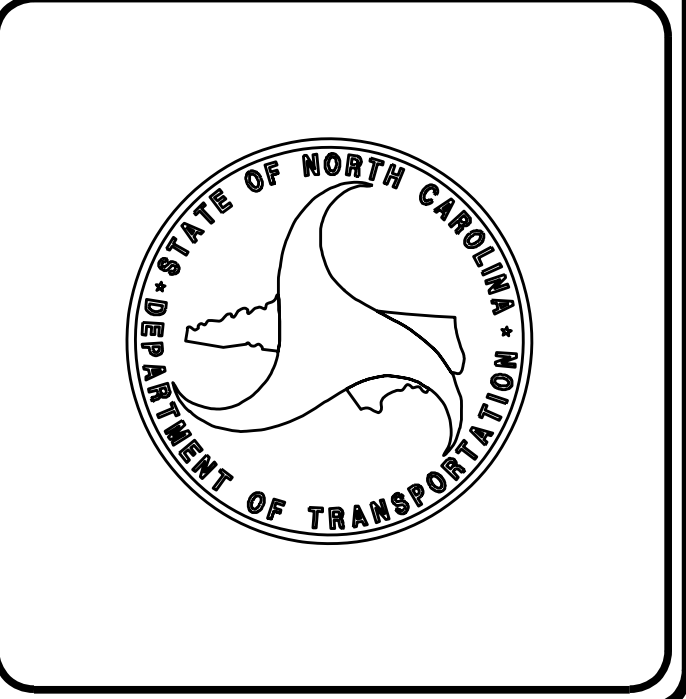
EDWARD G. EDENS, P.E.
PROJECT DESIGN ENGINEER

DAVID STUTTS, P.E.
NCDOT PROJECT MANAGER

STRUCTURE DESIGN ENGINEER

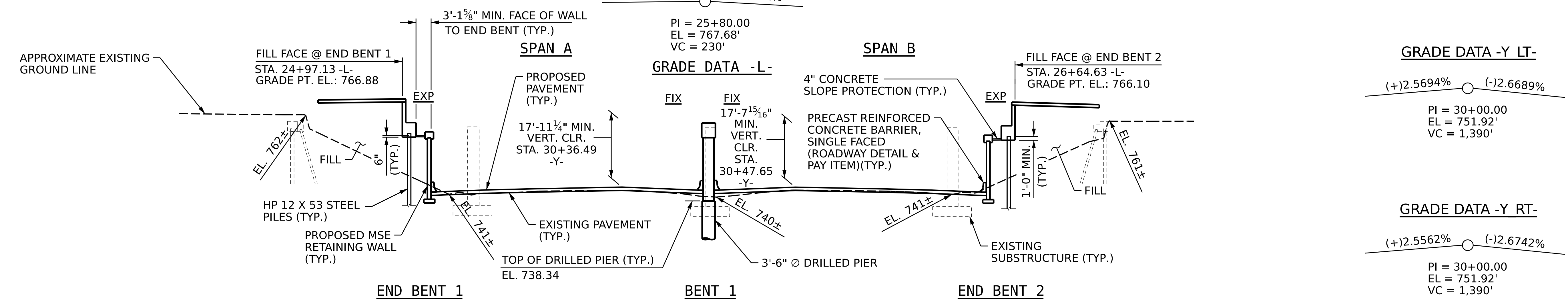
DocuSigned by:
John C. Morrison 3/10/2023
A2FDE142082F4AB

JOHN C. MORRISON, P.E.
SIGNATURE



24+00 24+50 25+00 25+50 26+00 26+50 27+00 27+50

(+)0.8990% (-)1.8082%



GRADE DATA -Y LT-

(+)2.5694% (-)2.6689%

PI = 30+00.00
EL = 751.92'
VC = 1,390'

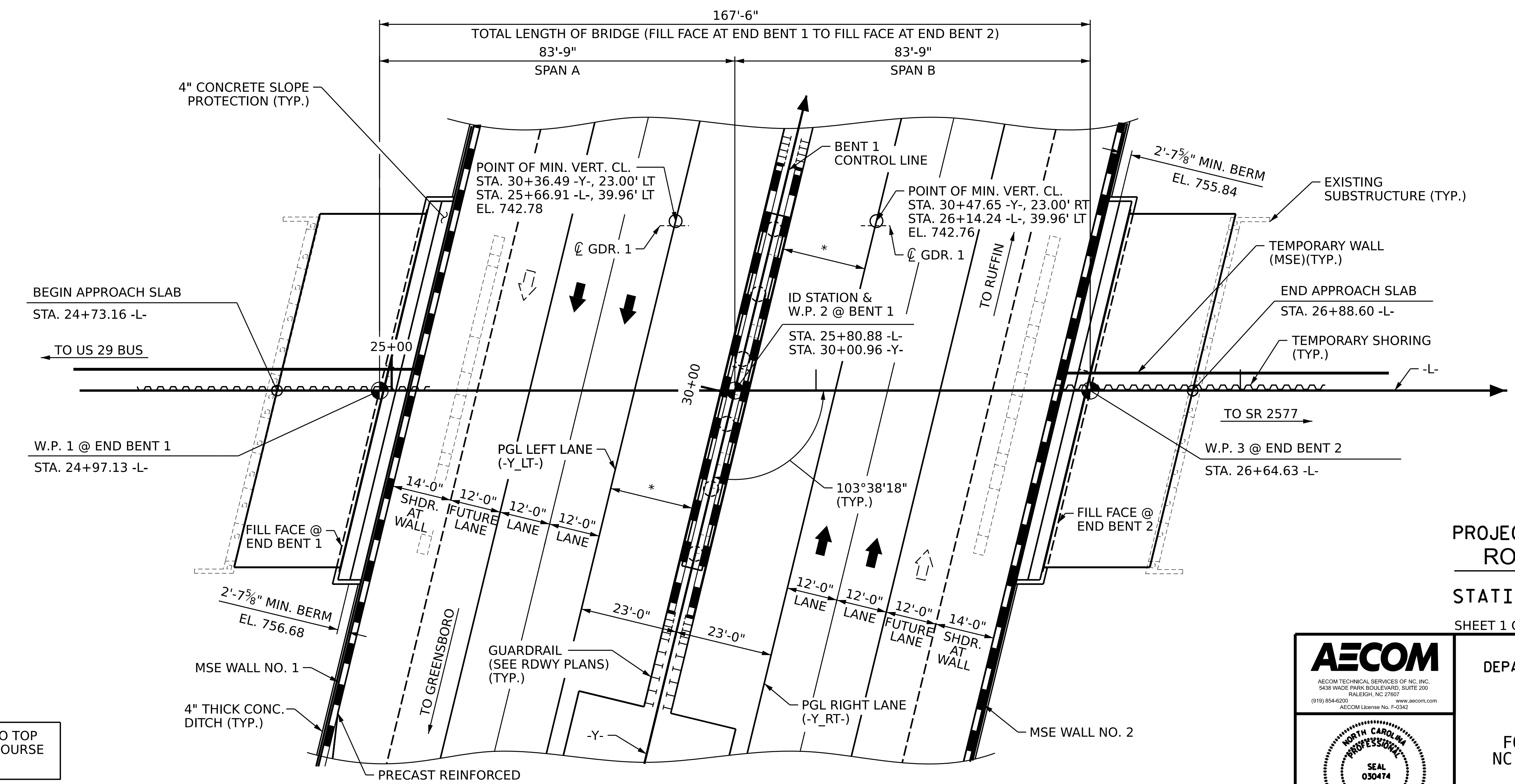
GRADE DATA -Y RT-

(+)2.5562% (-)2.6742%

PI = 30+00.00
EL = 751.92'
VC = 1,390'

SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLE TO BENT AND END BENTS)



PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. BR-0043
 ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 30+00.96 -Y-
 SHEET 1 OF 4 REPLACES BRIDGE NO. 780151

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-0200 www.aecom.com
 AECOM License No. F02642

DocuSigned by:
 John C. Morrison 1/31/2023
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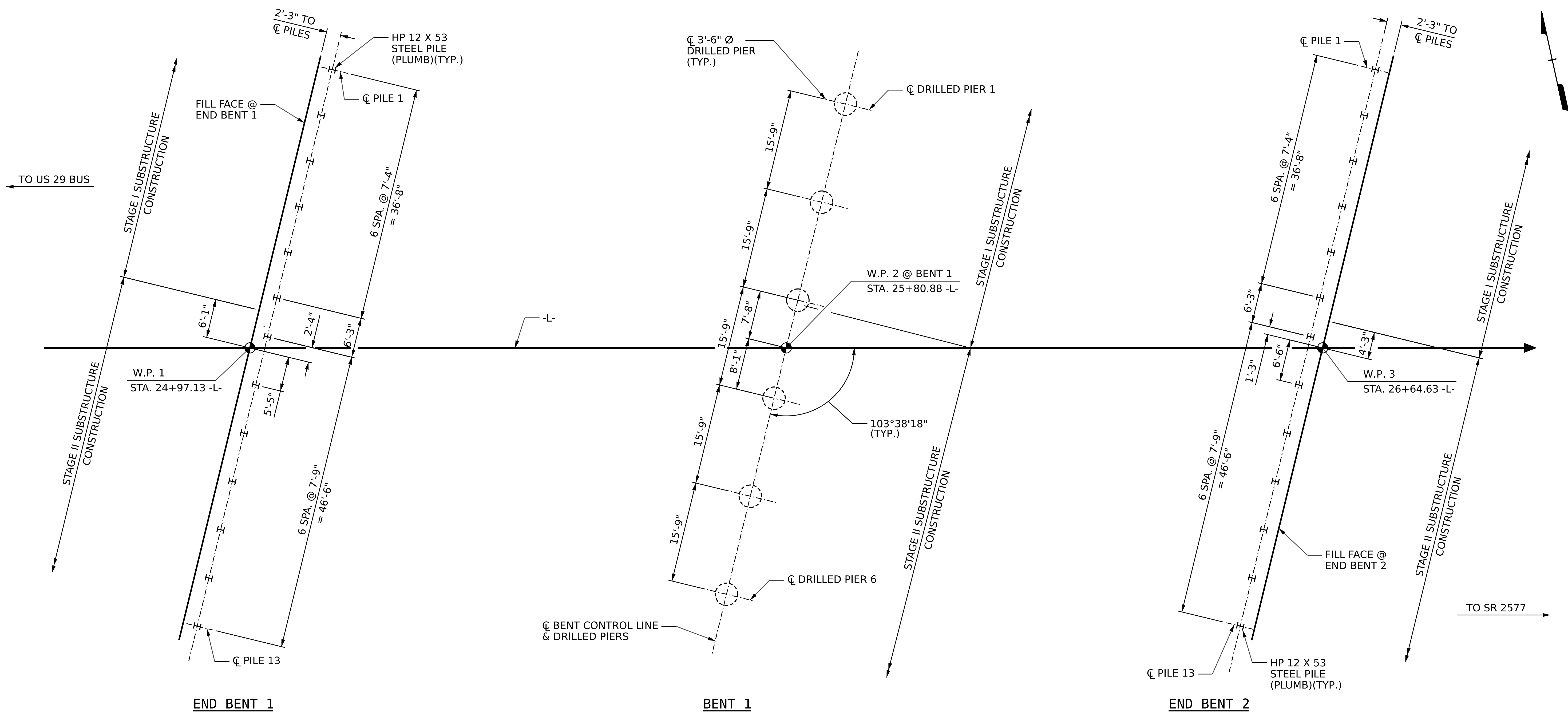
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING					
FOR BRIDGE ON US 158 / NC 14 OVER US 29 BETWEEN US 29 BUS & SR 2577					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-01
TOTAL SHEETS					45

*** MIN. VERT. CLR. SHOWN TO TOP OF OPEN-GRADED FRICTION COURSE (SEE ROADWAY PLANS)

DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	J.C. MORRISON	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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* 20'-0" MIN. HORIZ. CLR. TO SINGLE-FACED CONCRETE BARRIER; 20'-7" MIN. HORIZ. CLR. TO FACE OF CAP.



FOUNDATION LAYOUT
 (DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE TO CENTERLINE OF PILES AND DRILLED PIERS)

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 2 OF 4

FOUNDATION NOTES:

- 1) FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) INSTALL PILE SLEEVES BEFORE CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AT END BENT No. 1 AND No. 2. OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE MSE ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP 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.
- 3) FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRAWN BY : B.T. LEROY DATE : 10/2022
 CHECKED BY : J.C. MORRISON DATE : 10/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022

DOCUMENT NOT CONSIDERED
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 AECOM License No. F02642

DocuSigned by:
John C. Morrison 1/31/2023
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON US 158 /
 NC 14 OVER US 29 BETWEEN
 US 29 BUS & SR 2577

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			45

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 Exc 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 1-4	105	757.39	55			155								
End Bent 1, Piles 5-9	105	757.39	45			155								
End Bent 1, Piles 10-13	105	757.39	50			155								
End Bent 2, Piles 1-4	105	756.55	45			155								
End Bent 2, Piles 5-9	105	756.55	55			155								
End Bent 2, Piles 10-13	105	756.55	50			155								

*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.

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

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 1-13	105	7		0.75	5		
End Bent 2, Piles 1-13	105	7		0.75	5		

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length* per Pier Lin FT	Drilled Pier Length Not In Soil* per Pier Lin FT	Drilled Pier Length In Soil* per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier Lin FT
Bent 1, Pier 1	530	699.0	90			3.0	37.0				
Bent 1, Pier 2	530	699.0	90			3.0	37.0				
Bent 1, Pier 3	530	703.0	115			3.0	34.0				
Bent 1, Pier 4	530	703.0	115			3.0	34.0				
Bent 1, Pier 5	530	696.0	90			5.0	39.0				
Bent 1, Pier 6	530	696.0	90			5.0	39.0				
TOTAL QTY:						22.0	220.0				

*Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "___ Dia. Drilled Piers" or "___ Dia. Drilled Piers Not in Soil" and "___ Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications.

**Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casing for ___ Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

NOTES:

- The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Cheng Wang #048123) on 12-16-2022.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

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 1-13	YES	60	1		
End Bent 2, Piles 1-13	YES	60	1		

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

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Pier 1	MAYBE	MAYBE	166.0	MAYBE	MAYBE
Bent 1, Pier 2			166.0		
Bent 1, Pier 3			154.0		
Bent 1, Pier 4			154.0		
Bent 1, Pier 5			182.0		
Bent 1, Pier 6			182.0		
TOTAL QTY:	1	1	1004.0	1	1

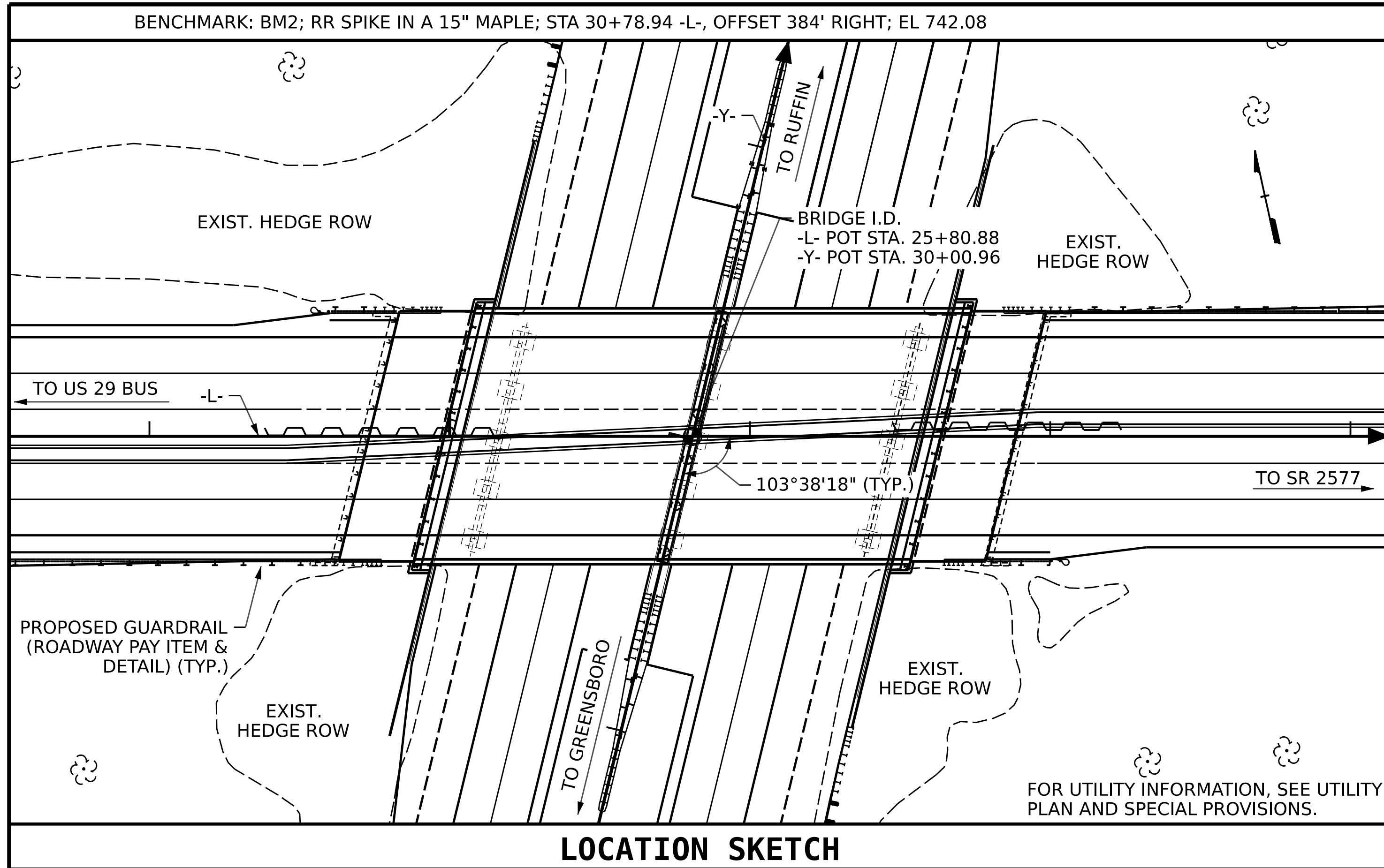
*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. BR-0043

Rockingham COUNTY

STATION: -L- 25+80.88

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					<h2>PILE AND DRILLED PIER FOUNDATION TABLES</h2>
	REVISIONS					
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
	2			4		



GENERAL NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, 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.
- TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW.
- 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.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR MSE WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.
- 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 MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD FOR THE EXISTING STRUCTURE, 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 25+80.88 -L-".

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

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING DUAL STRUCTURES CONSISTING OF A 4 SPAN (43.625' - 64.25' - 64.25' - 40.125') CONCRETE DECK ON ROLLED STEEL W-SHAPE GIRDERS, WITH 76.0 FT CLEAR ROADWAY WIDTH, SUPPORTED BY PILE BENT CONCRETE END BENTS AND CONCRETE POST AND BEAM BENTS ON ISOLATED SPREAD FOOTINGS, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGES 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. 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.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

LOCATION SKETCH

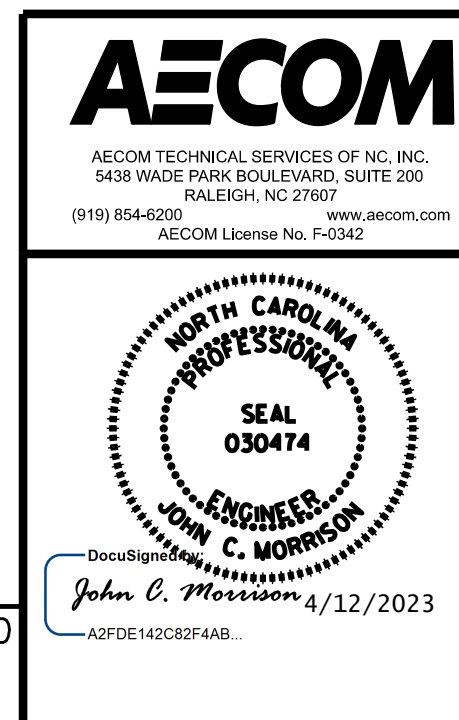
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 25+80.88 -L-	ASEBESTOS ASSESSMENT	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE									14,089	16,926		
END BENT 1											76.2	
BENT 1			220.0	22.0							94.9	
END BENT 2											77.1	
TOTAL	LUMP SUM	LUMP SUM	220.0	22.0	2	1	1	1	14,089	16,926	248.2	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDER	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS
	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			18 1476.00			370.5			
END BENT 1	10,385			13	13 645		26.9		
BENT 1	22,919	7,302							
END BENT 2	10,638			13	13 655		26.9		
TOTAL	43,942	7,302	18 1476.00	26	26 1,300	370.5	53.8	LUMP SUM	LUMP SUM

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 158 /
 NC 14 OVER US 29 BETWEEN
 US 29 BUS & SR 2577

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY : A.R. VAN VUREN DATE : 12/2022
 CHECKED BY : J.C. MORRISON DATE : 12/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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 (Y _{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 (Y _{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	1.25	--	1.75	0.870	1.36	A	EL	40.3	1.030	1.50	A	I	73.1	0.80	0.830	1.25	A	I	40.3		
	HL-93 (OPERATING)	N/A		1.77	--	1.35	0.870	1.77	A	EL	40.3	1.030	1.97	A	I	73.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.67	60.12	1.75	0.870	1.82	A	EL	40.3	1.030	1.94	A	I	73.1	0.80	0.830	1.67	A	I	40.3		
	HS-20 (OPERATING)	36.000		2.35	84.60	1.35	0.870	2.35	A	EL	40.3	1.030	2.55	A	I	73.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.84	51.84	1.40	0.870	5.22	A	EL	40.3	1.030	6.03	A	I	73.1	0.80	0.830	3.84	A	I	40.3	
		SNGARBS2	20.000		2.83	56.60	1.40	0.870	3.85	A	EL	40.3	1.030	4.24	A	I	73.1	0.80	0.830	2.83	A	I	40.3	
		SNAGRIS2	22.000		2.67	58.74	1.40	0.870	3.63	A	EL	40.3	1.030	3.92	A	I	73.1	0.80	0.830	2.67	A	I	40.3	
		SNCOTTS3	27.250		1.91	52.05	1.40	0.870	2.60	A	EL	40.3	1.030	2.96	A	I	73.1	0.80	0.830	1.91	A	I	40.3	
		SNAGGRS4	34.925		1.59	55.53	1.40	0.870	2.15	A	EL	40.3	1.030	2.43	A	I	73.1	0.80	0.830	1.59	A	I	40.3	
		SNS5A	35.550		1.55	55.10	1.40	0.870	2.11	A	EL	40.3	1.030	2.45	A	I	73.1	0.80	0.830	1.55	A	I	40.3	
		SNS6A	39.950		1.42	56.73	1.40	0.870	1.93	A	EL	40.3	1.030	2.22	A	I	73.1	0.80	0.830	1.42	A	I	40.3	
		SNS7B	42.000		1.35	56.70	1.40	0.870	1.83	A	ER	40.3	1.030	2.17	A	I	73.1	0.80	0.830	1.35	A	I	40.3	
	TRUCK TRAILOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.73	57.09	1.40	0.870	2.35	A	EL	40.3	1.030	2.67	A	I	73.1	0.80	0.830	1.73	A	I	40.3	
		TNT4A	33.075		1.73	57.22	1.40	0.870	2.36	A	EL	40.3	1.030	2.61	A	I	73.1	0.80	0.830	1.73	A	I	40.3	
		TNT6A	41.600		1.41	58.66	1.40	0.870	1.92	A	EL	40.3	1.030	2.31	A	I	73.1	0.80	0.830	1.41	A	I	40.3	
		TNT7A	42.000		1.42	59.64	1.40	0.870	1.93	A	EL	40.3	1.030	2.26	A	I	73.1	0.80	0.830	1.42	A	I	40.3	
		TNT7B	42.000		1.46	61.32	1.40	0.870	1.99	A	EL	40.3	1.030	2.13	A	I	73.1	0.80	0.830	1.46	A	I	40.3	
		TNAGRIT4	43.000		1.39	59.77	1.40	0.870	1.89	A	ER	40.3	1.030	2.06	A	I	73.1	0.80	0.830	1.39	A	I	40.3	
		TNAGT5A	45.000		1.32	59.40	1.40	0.870	1.79	A	EL	40.3	1.030	2.04	A	I	73.1	0.80	0.830	1.32	A	I	40.3	
		TNAGT5B	45.000	③	1.30	58.50	1.40	0.870	1.77	A	EL	40.3	1.030	1.96	A	I	73.1	0.80	0.830	1.30	A	I	40.3	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	Y _{DC}	Y _{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:

CONTROLLING LOAD RATING

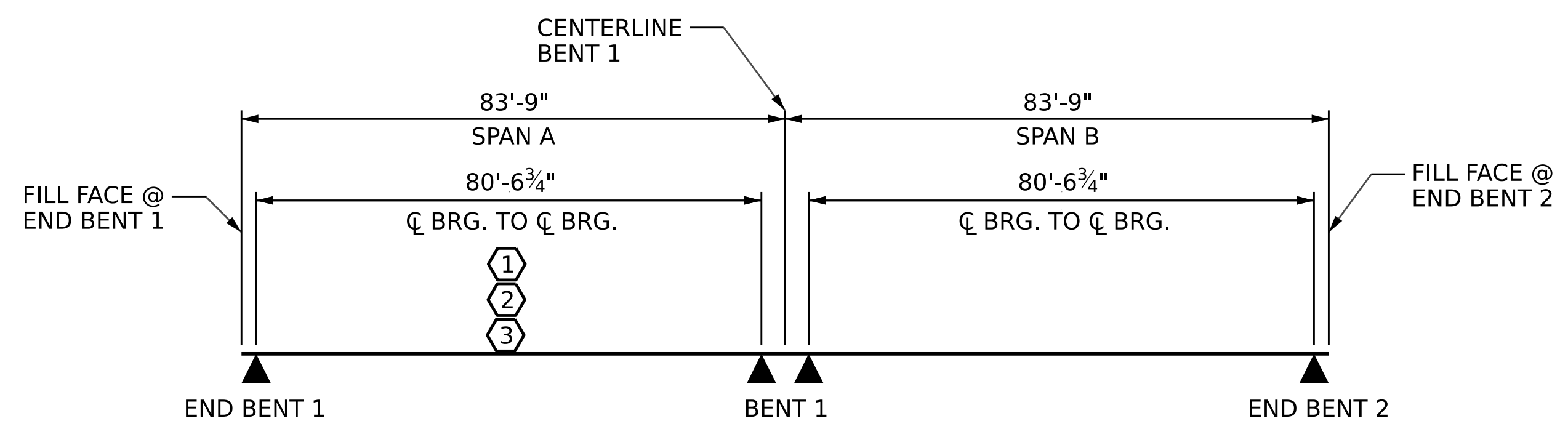
① DESIGN LOAD RATING (HL-93)

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. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

AECOM

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 AECOM License No. F92642

NORTH CAROLINA
PROFESSIONAL
SEAL
030474
ENGINEER
JOHN C. MORRISON

DocuSigned by:
John C. Morrison 1/31/2023
 AZPDE142C82F44B

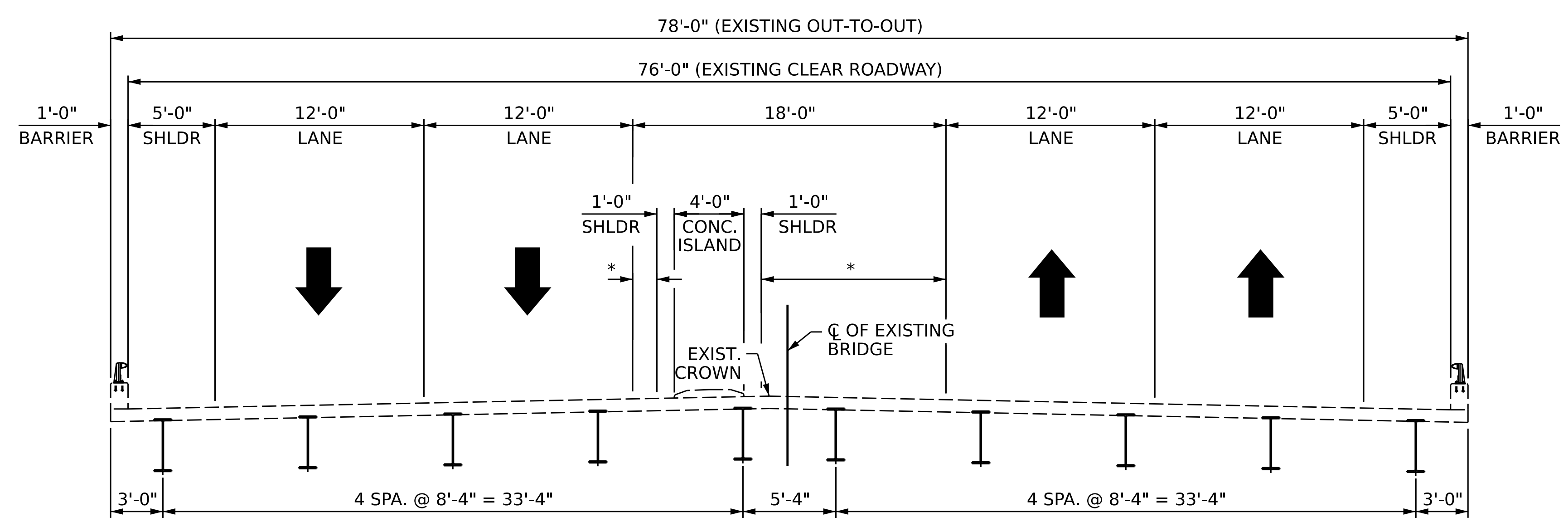
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-05
2			4			45

DRAWN BY : S. NATARAJAN DATE : 11/2022
 CHECKED BY : D.S. TUTTLE DATE : 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

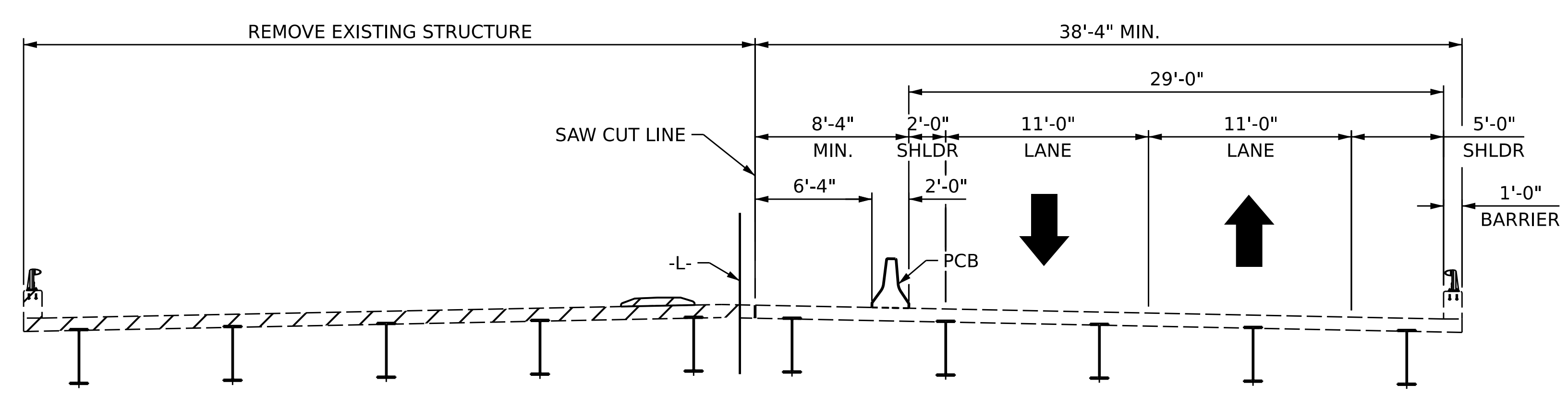
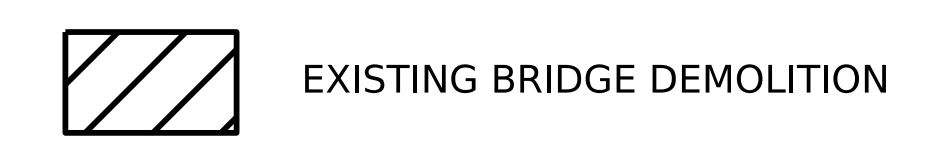


EXISTING BRIDGE

* TURN LANE VARIES 0'-0" TO 12'-0"

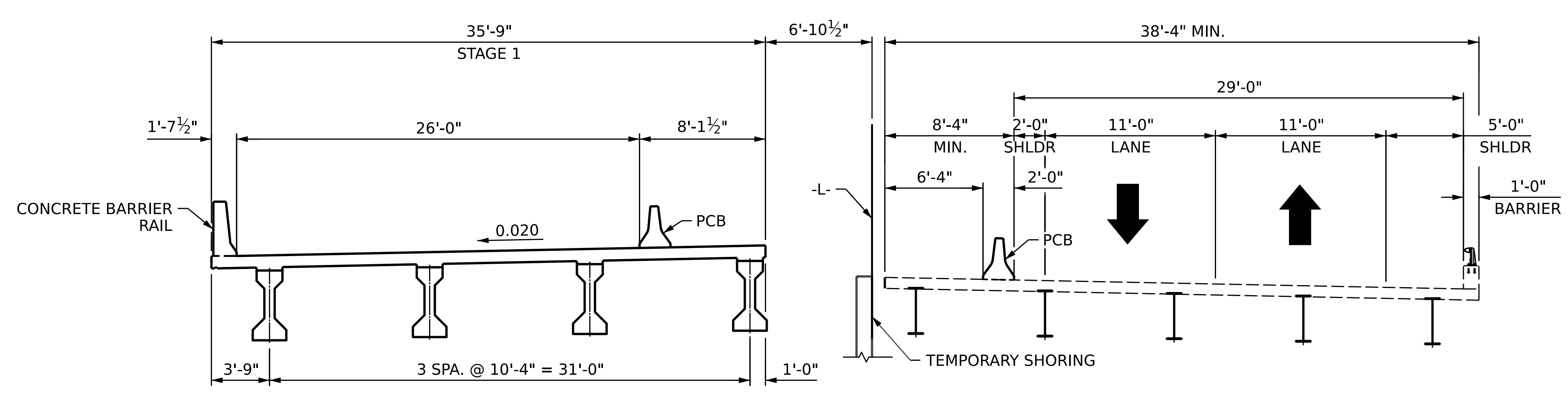
NOTES:

EXISTING BRIDGE DATA IS BASED ON THE BEST INFORMATION AVAILABLE.
PCB: PORTABLE CONCRETE BARRIER
FOR MANAGEMENT OF TRAFFIC AND LIMITS OF PCB, SEE TRANSPORTATION MANAGEMENT PLANS.



STAGE I DEMOLITION

REMOVE ALL OF EXISTING CONCRETE ISLAND
TRANSFER TRAFFIC TO RIGHT SIDE OF EXISTING BRIDGE



STAGE I CONSTRUCTION

CONSTRUCT TEMPORARY SHORING & LEFT SIDE OF PROPOSED BRIDGE

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 1 OF 2

AECOM
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RALEIGH, NC 27607
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DocuSigned by:
John C. Morrison 1/31/2023
AZPDE142C82F44B

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

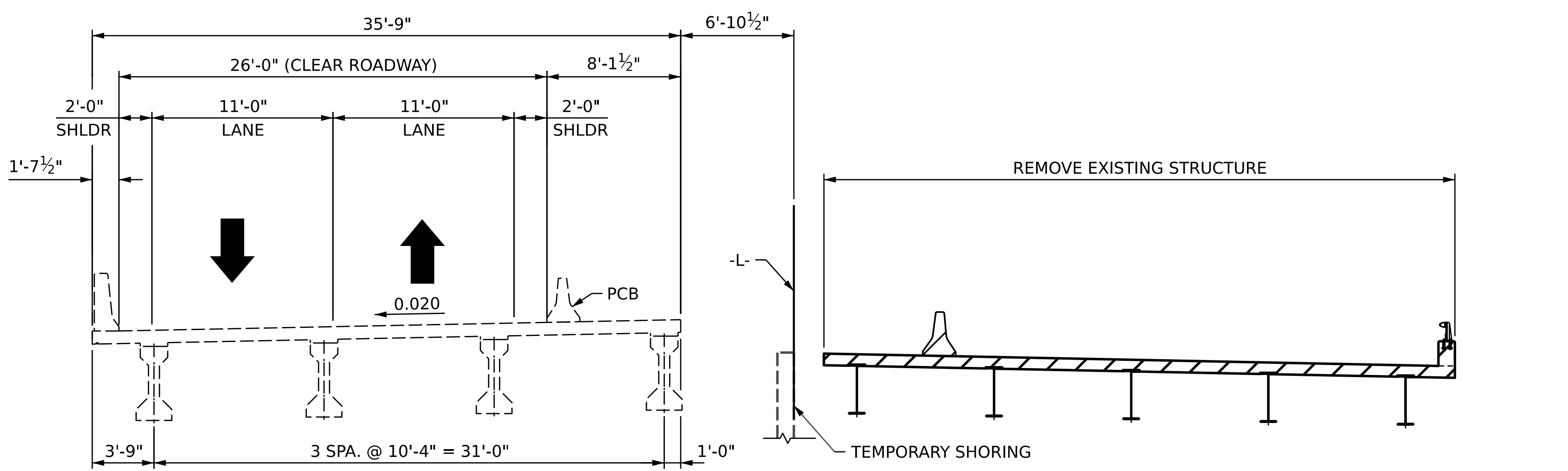
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			45
2			4			

S-06

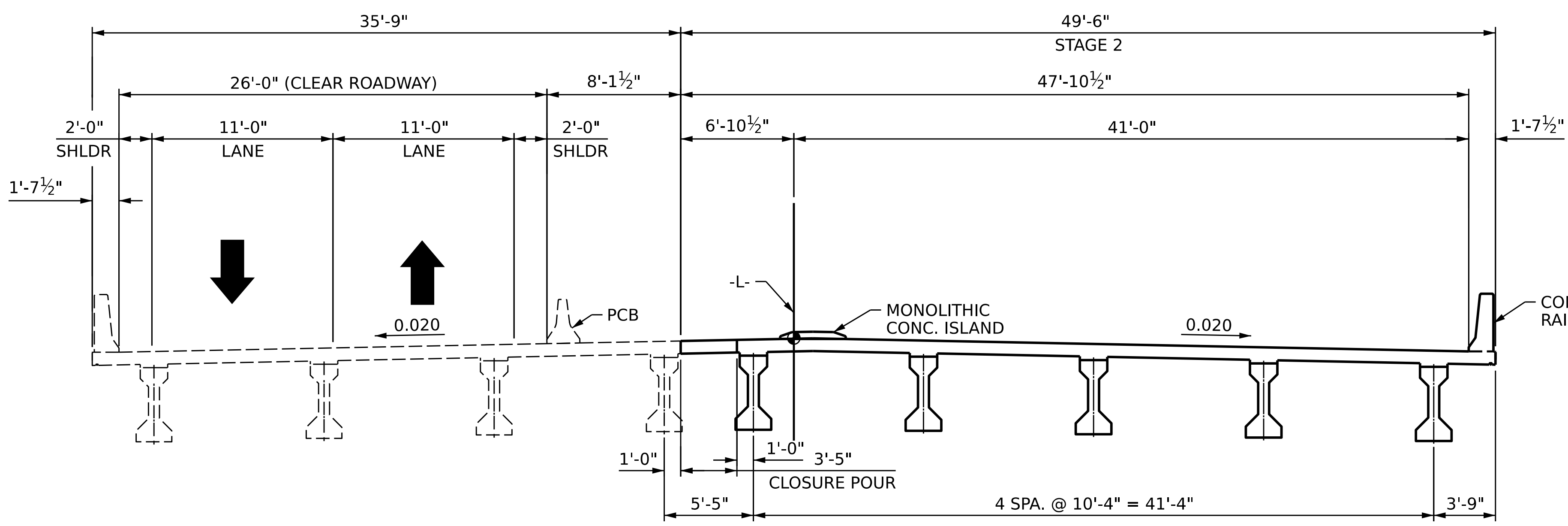
DRAWN BY: B.T. LEROY DATE: 11/2022
CHECKED BY: J.C. MORRISON DATE: 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

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SIGNATURES COMPLETED



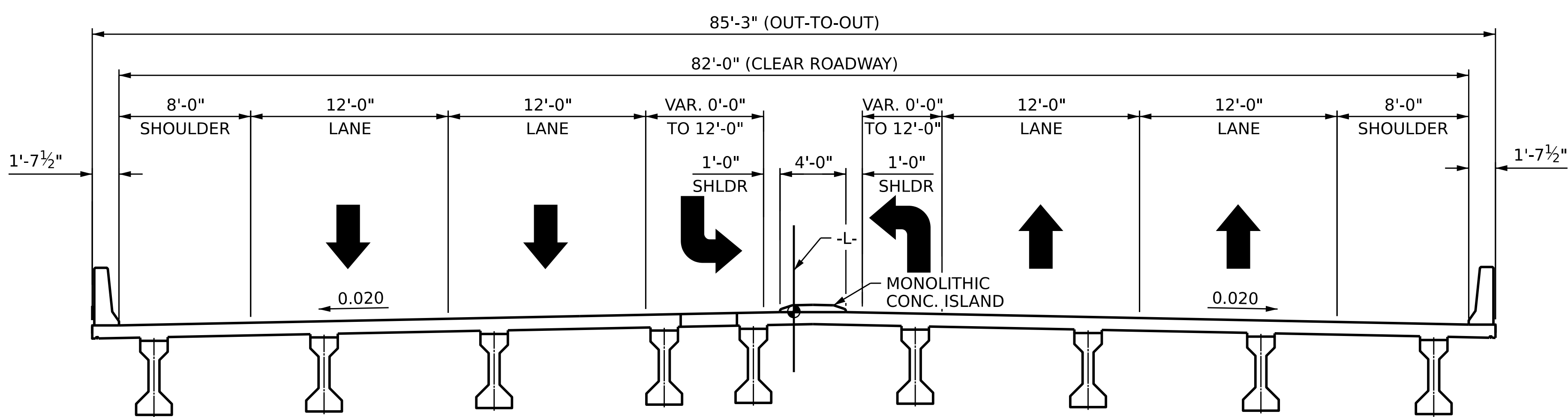
STAGE II DEMOLITION

TRANSFER TRAFFIC TO LEFT SIDE OF PROPOSED BRIDGE



STAGE II CONSTRUCTION

CONSTRUCT RIGHT SIDE OF PROPOSED BRIDGE, CLOSURE POUR AND MONOLITHIC CONCRETE ISLAND



FINAL CONSTRUCTION

NOTES:

EXISTING BRIDGE DATA IS BASED ON THE BEST INFORMATION AVAILABLE.

PCB: PORTABLE CONCRETE BARRIER

FOR MANAGEMENT OF TRAFFIC AND LIMITS OF PCB, SEE TRANSPORTATION MANAGEMENT PLANS.



PROJECT NO. BR-0043

ROCKINGHAM COUNTY

STATION: POT 25+80.88 -L-

SHEET 2 OF 2

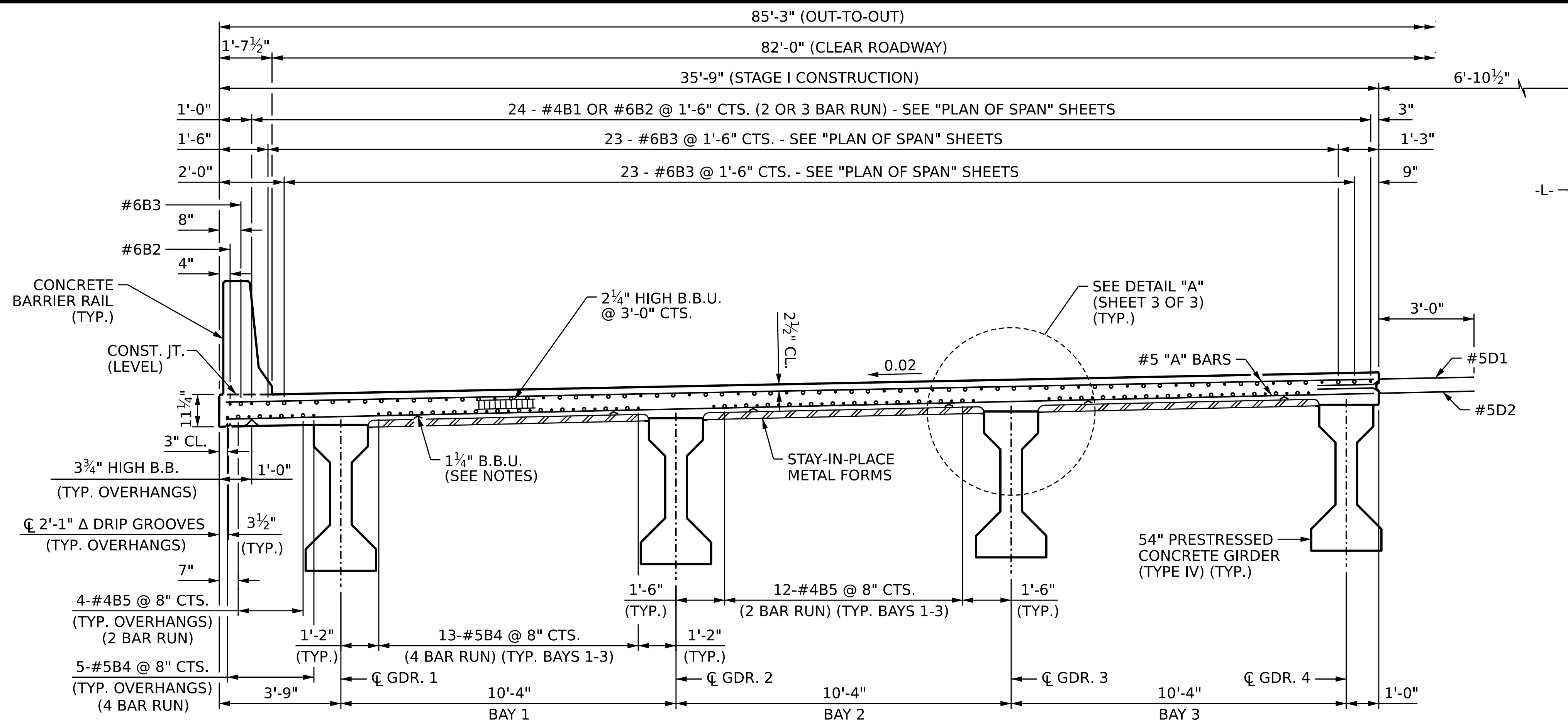
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

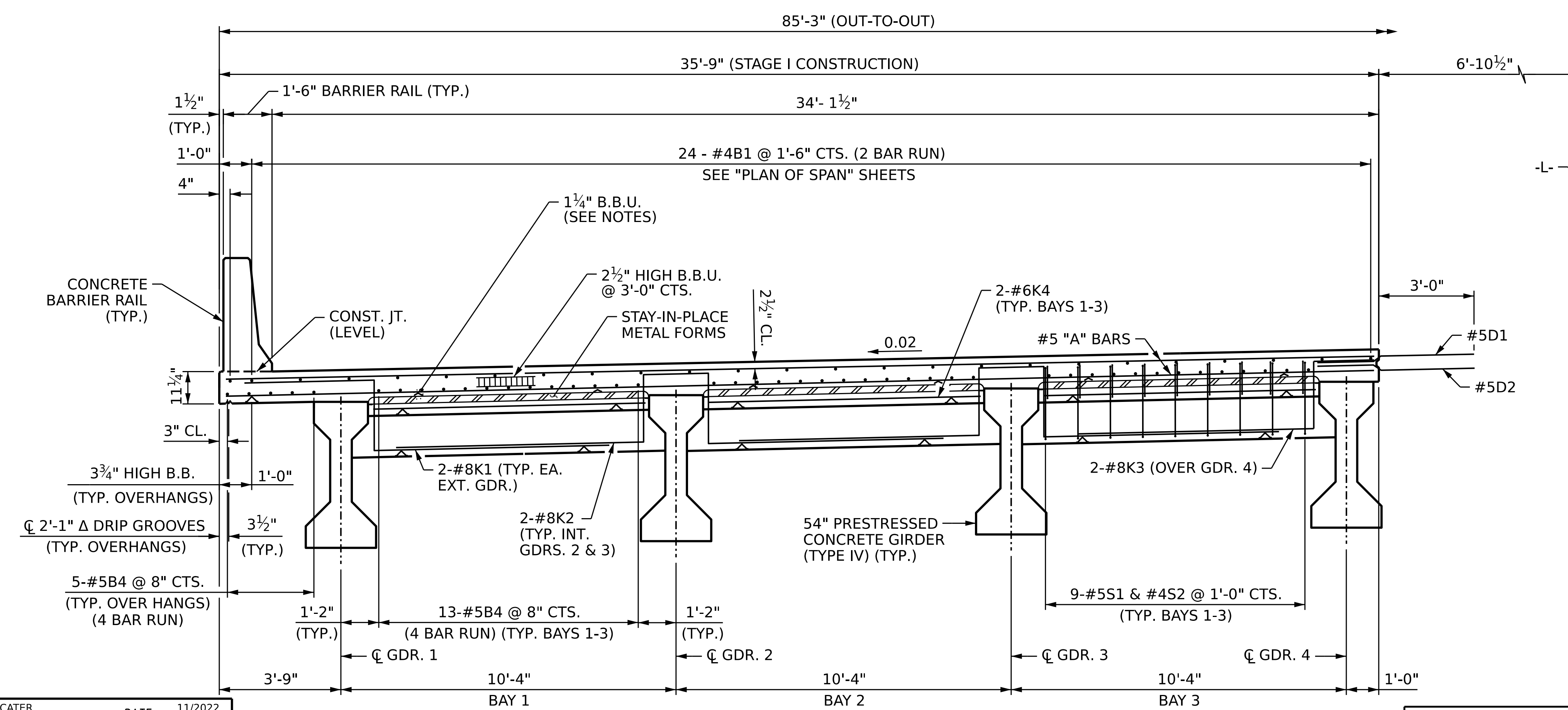
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			45
2			4			

DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	J.C. MORRISON	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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TYPICAL SECTION AT LINK SLAB



TYPICAL SECTION AT END BENT

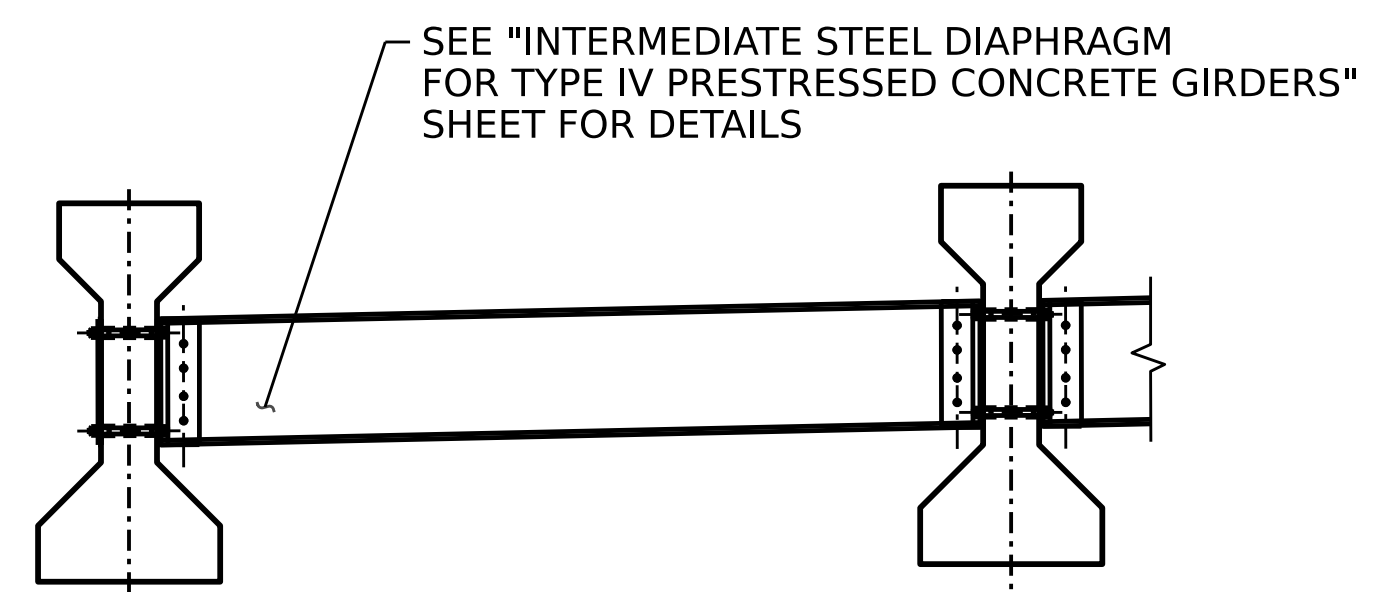
NOTES

PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY IN PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) 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.

BARRIER RAIL 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.



PART TYPICAL SECTION
(SHOWING INTERMEDIATE STEEL DIAPHRAGMS)

- "B" BAR KEY**
- = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS. SEE "PLAN OF SPANS" SHEET
 - = CONTINUOUS BAR RUN. SEE "PLAN OF SPANS" SHEET

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 1 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
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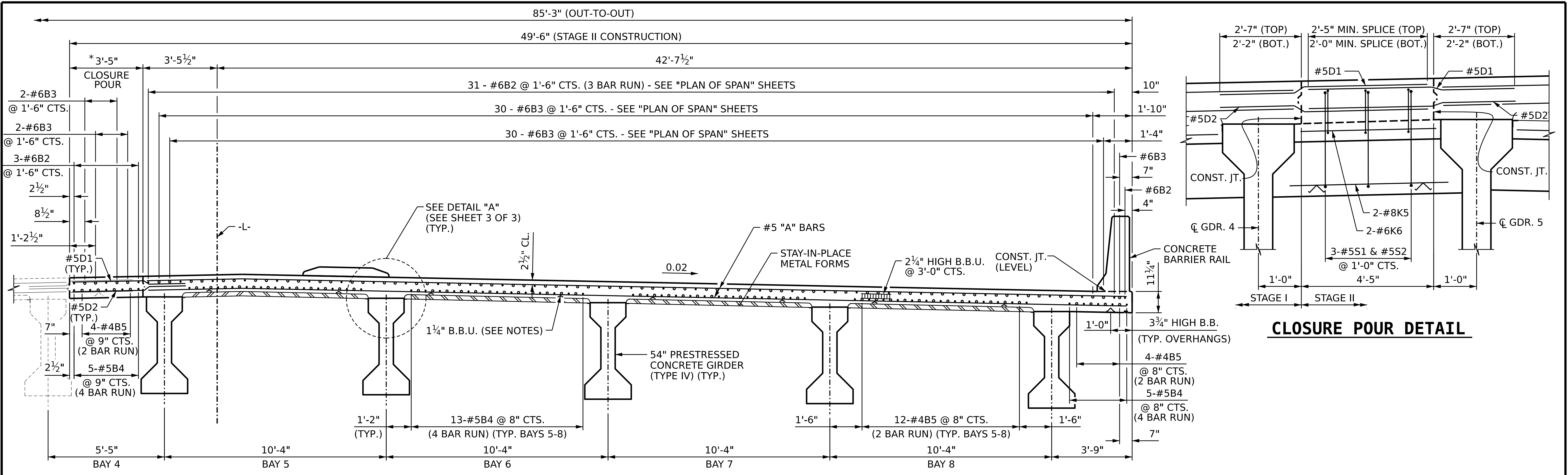
SEAL
 030474
 JOHN C. MORRISON
 ENGINEER

DocuSigned by:
 John C. Morrison
 AZFDE142C82F44B...
 1/31/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-08 TOTAL SHEETS 45
SUPERSTRUCTURE TYPICAL SECTION STAGE I						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

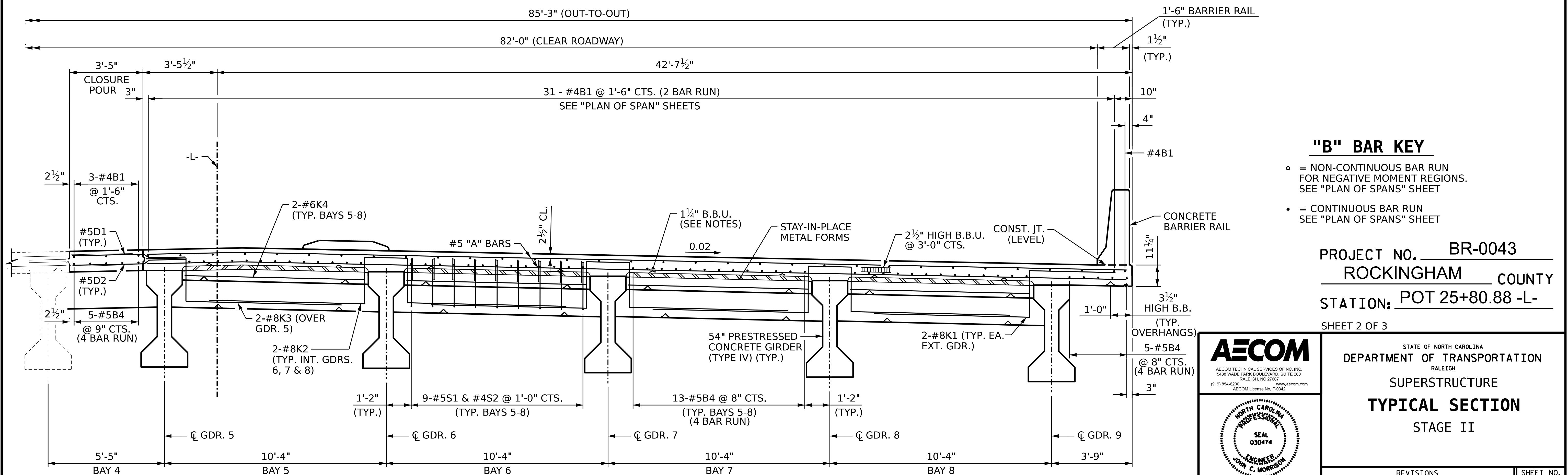
DRAWN BY: M.L. CATER DATE: 11/2022
 CHECKED BY: J.C. MORRISON DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

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TYPICAL SECTION AT LINK SLAB

* SEE CLOSURE POUR DETAIL



TYPICAL SECTION AT END BENT

- "B" BAR KEY**
- = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS. SEE "PLAN OF SPANS" SHEET
 - = CONTINUOUS BAR RUN SEE "PLAN OF SPANS" SHEET

PROJECT NO. **BR-0043**
ROCKINGHAM COUNTY
 STATION: **POT 25+80.88 -L-**
 SHEET 2 OF 3

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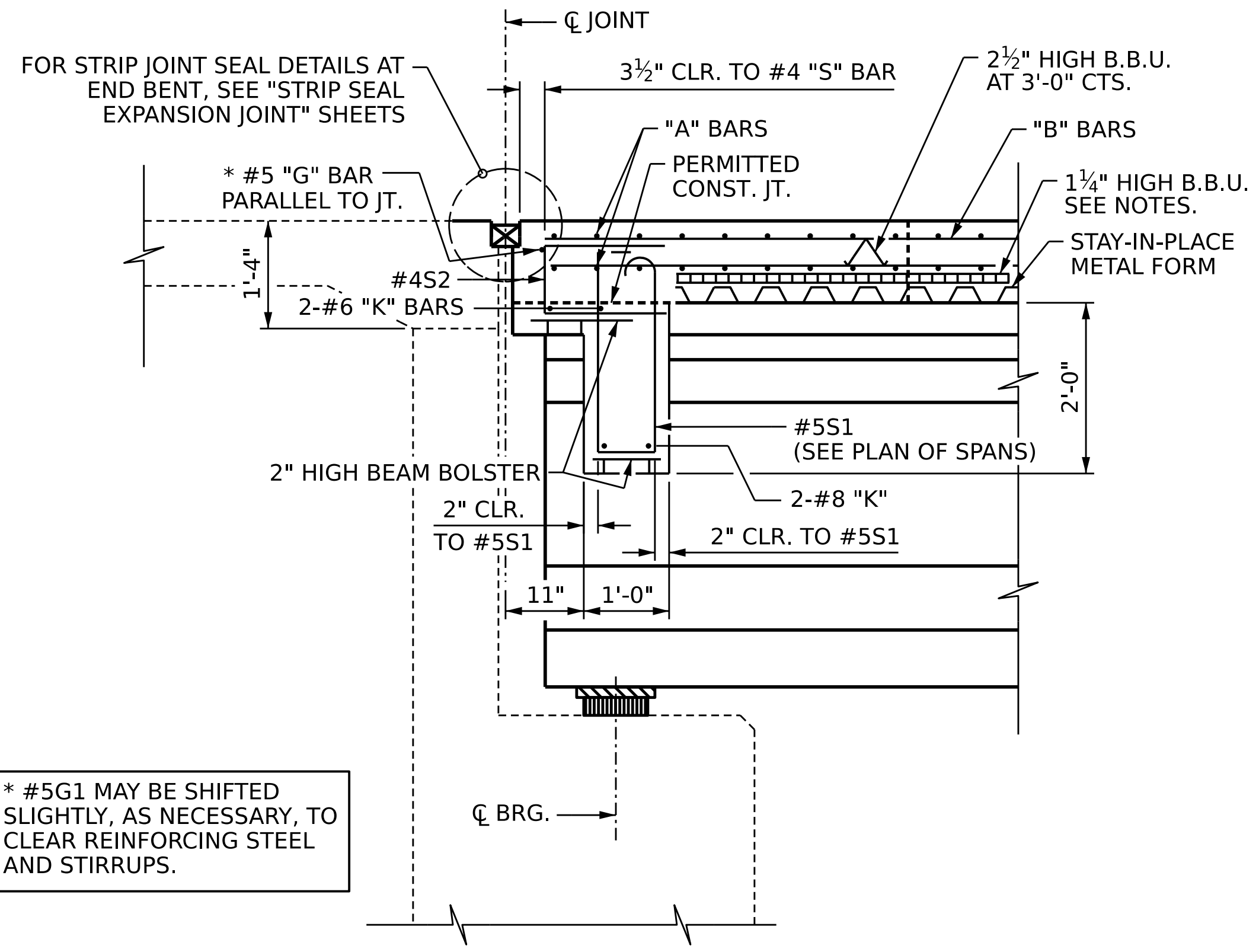
John C. Morrison
Professional Engineer
 SEAL 030474
 JOHN C. MORRISON

1/31/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-09
TOTAL SHEETS					45

DRAWN BY: M.L. CATER DATE: 11/2022
 CHECKED BY: J.C. MORRISON DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

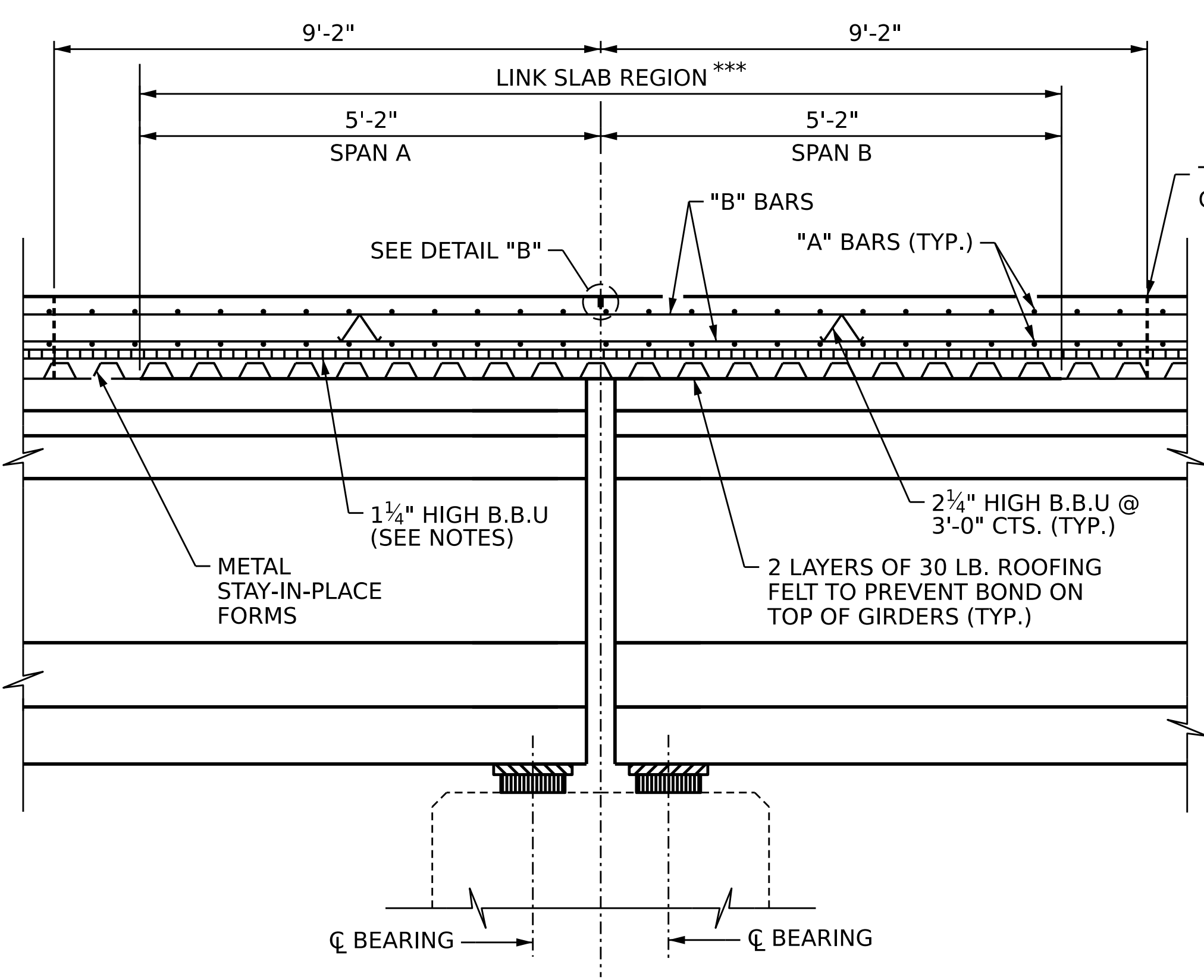
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



SECTION THRU END BENT DIAPHRAGMS

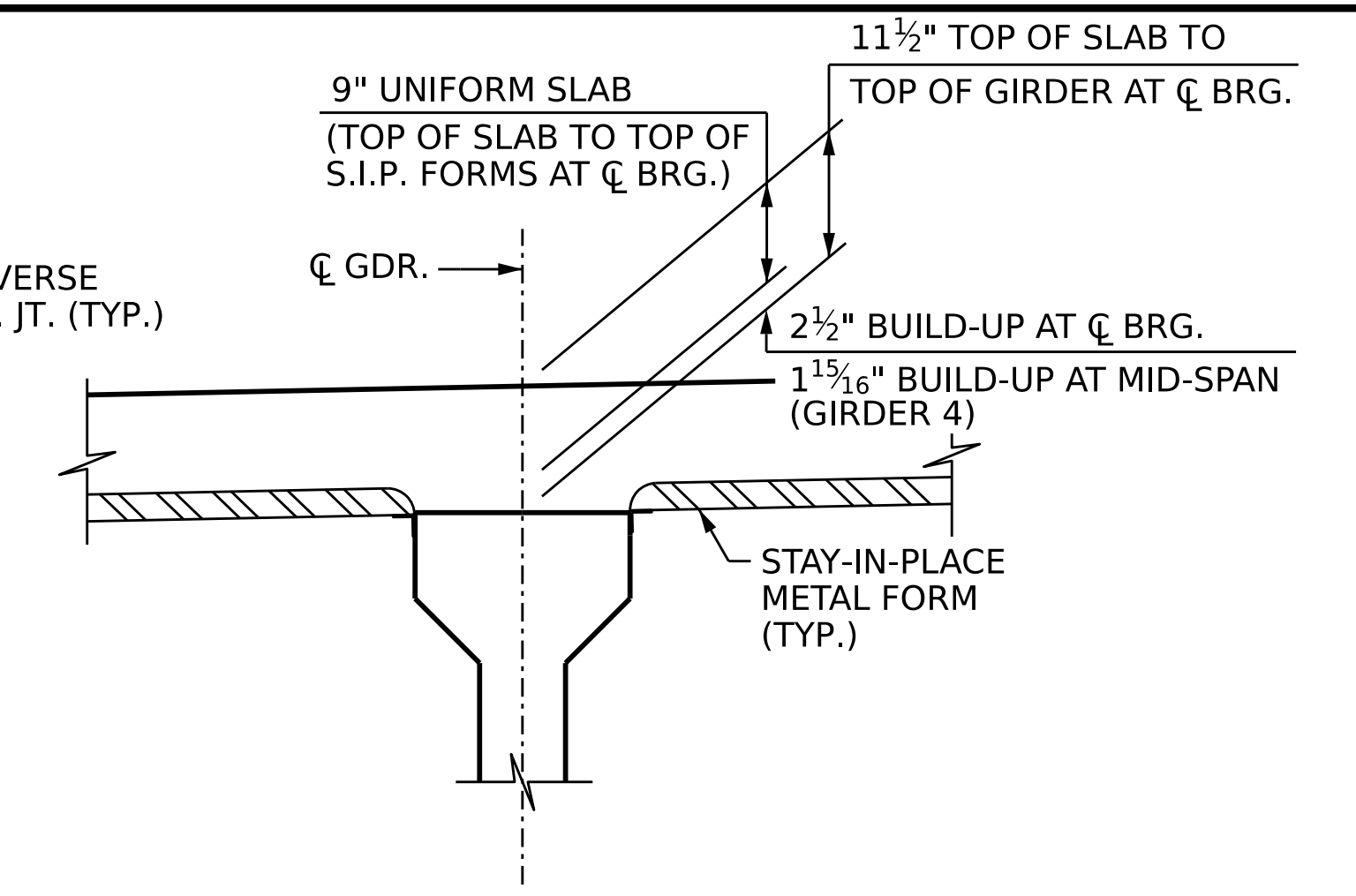
(DIMENSIONS SHOWN ARE NORMAL TO END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

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

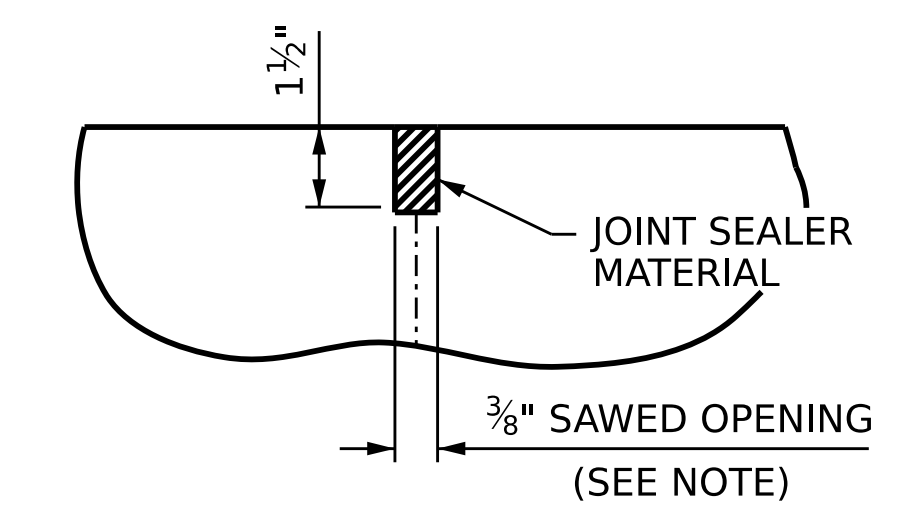


SECTION @ LINK SLAB

(DIMENSIONS MEASURED ALONG C GIRDERS)

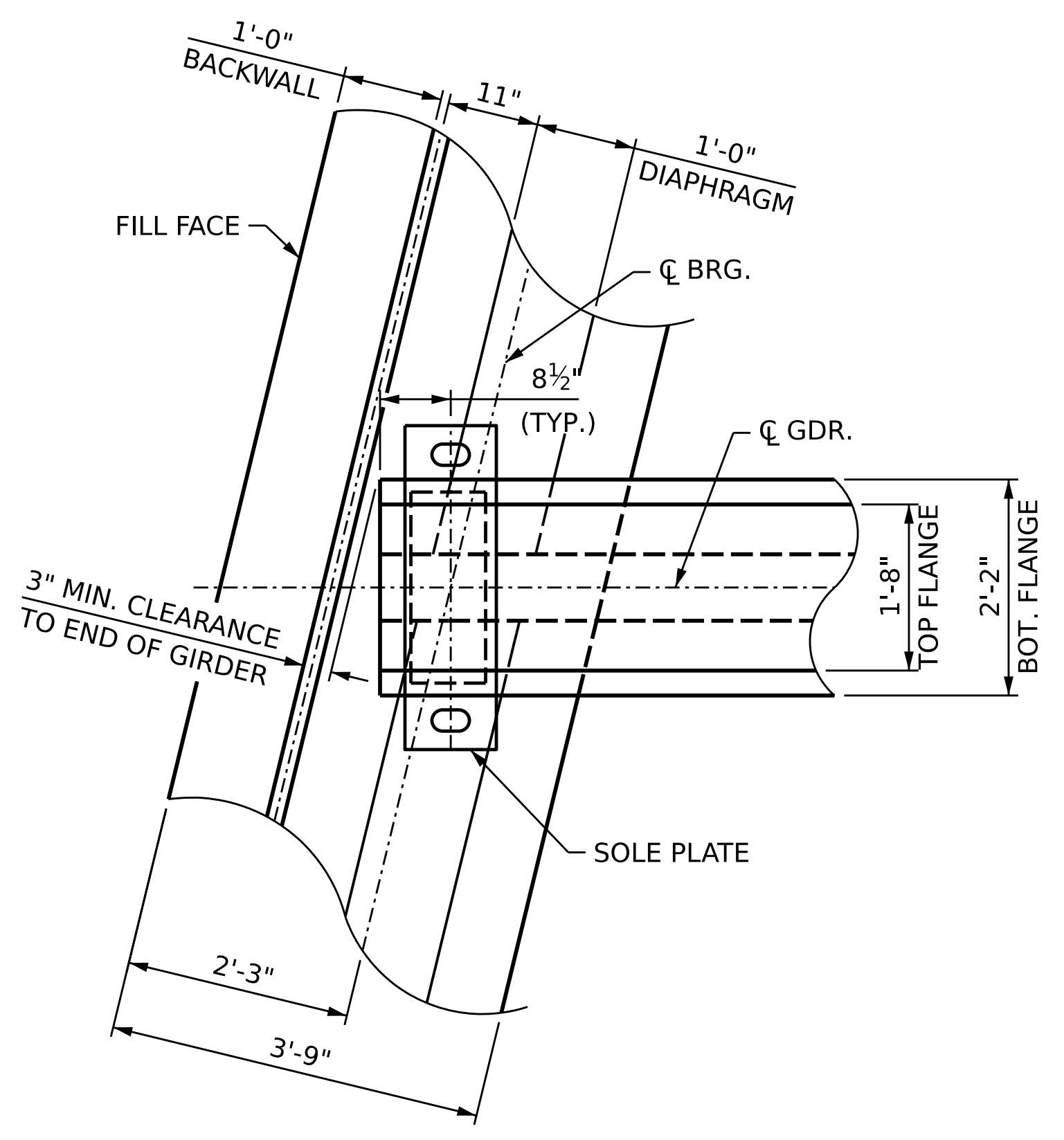


DETAIL "A"

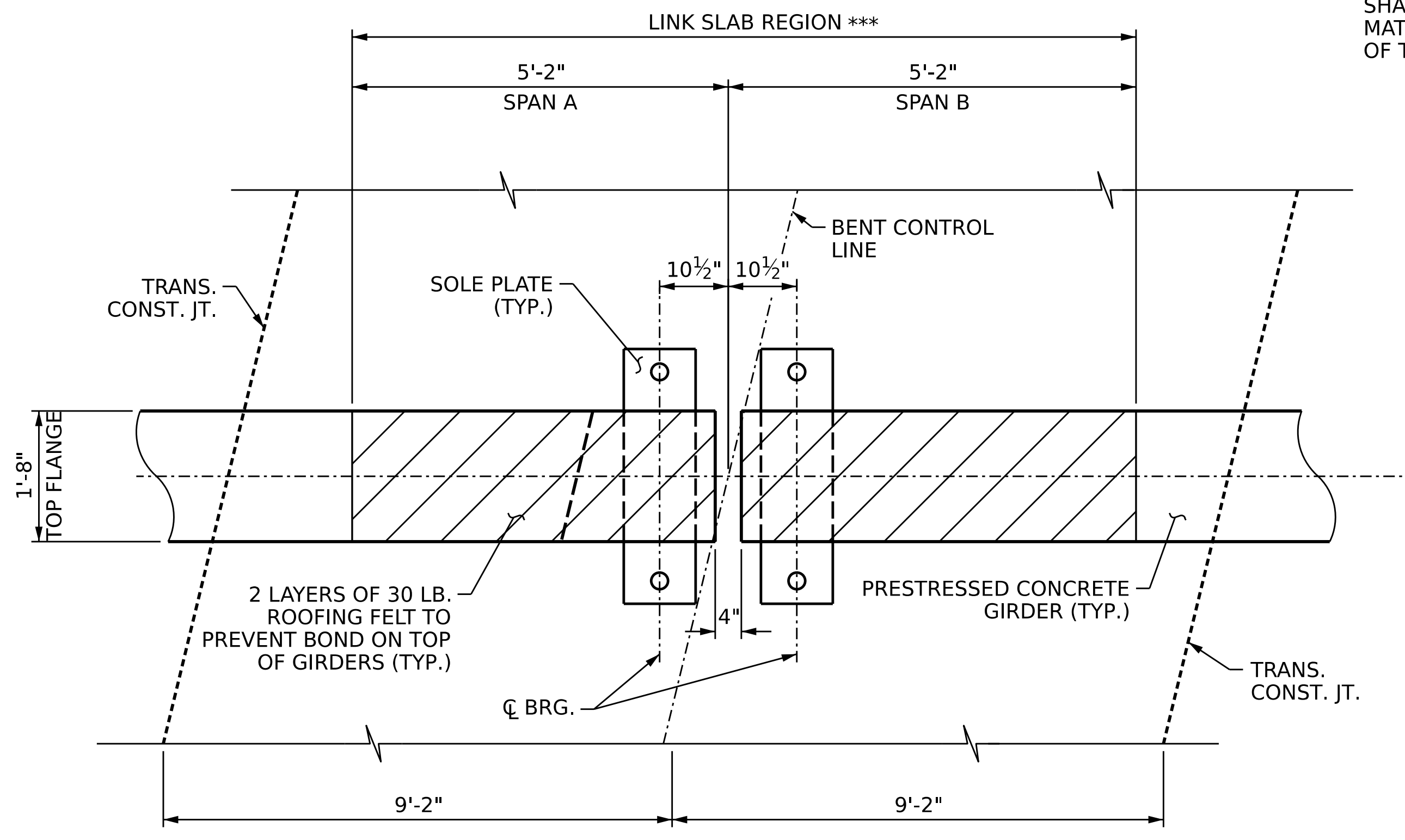


DETAIL "B"

A 1 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.



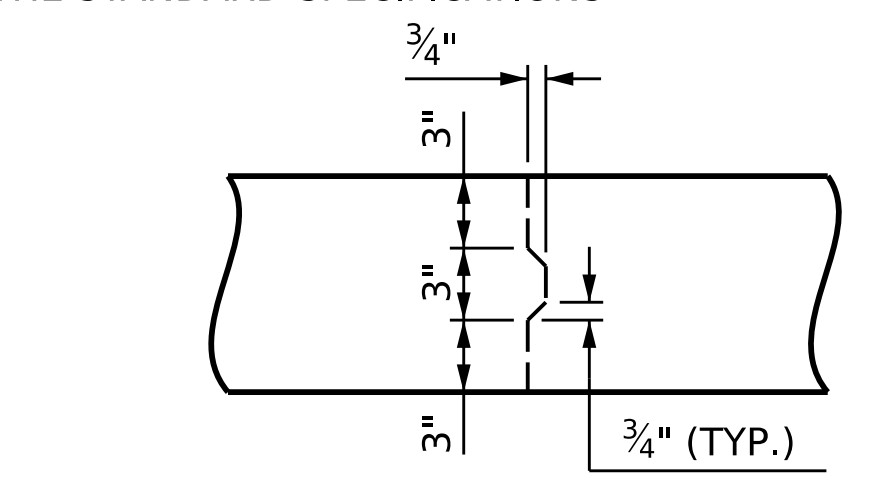
PLAN OF GIRDER AT END BENT DIAPHRAGM



PLAN @ 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.

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



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

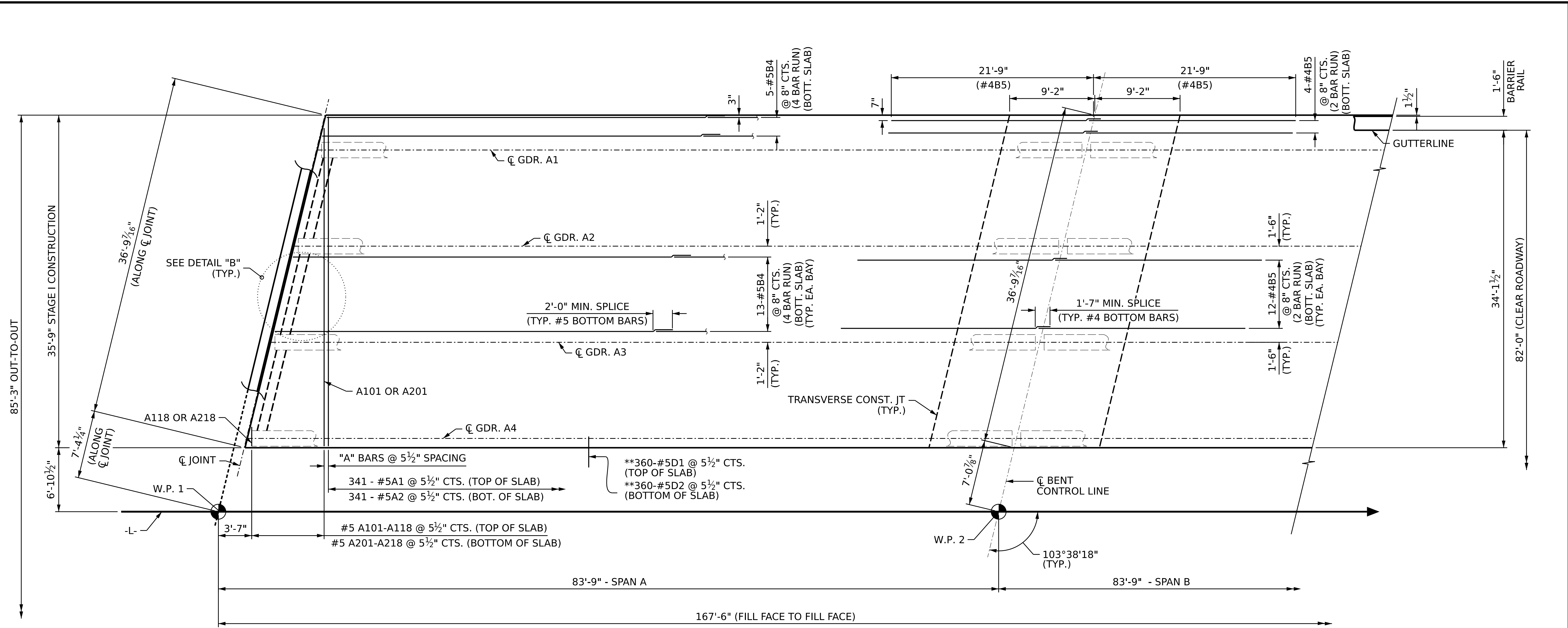
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-10
TOTAL SHEETS					45

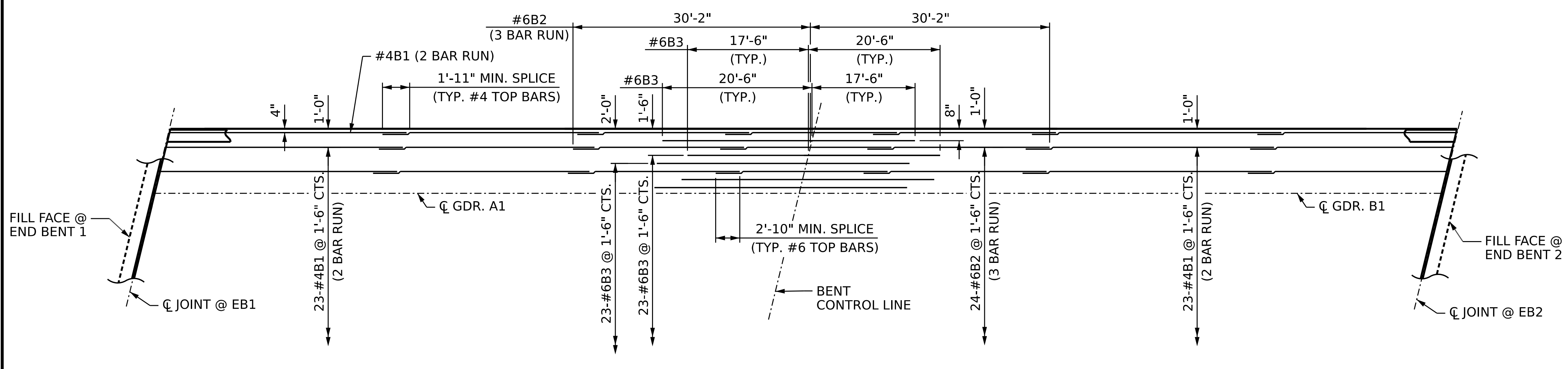
DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	J.C. MORRISON	DATE :	11/2022
DESIGN ENGINEER OF RECORD :	J.C. MORRISON	DATE :	12/2022

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SPAN A - STAGE I

FOR NOTES, SEE SHEET 5 OF 5



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB (NOT DRAWN TO SCALE)

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. BR-0043
 ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 1 OF 5

AECOM
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 RALEIGH, NC 27607
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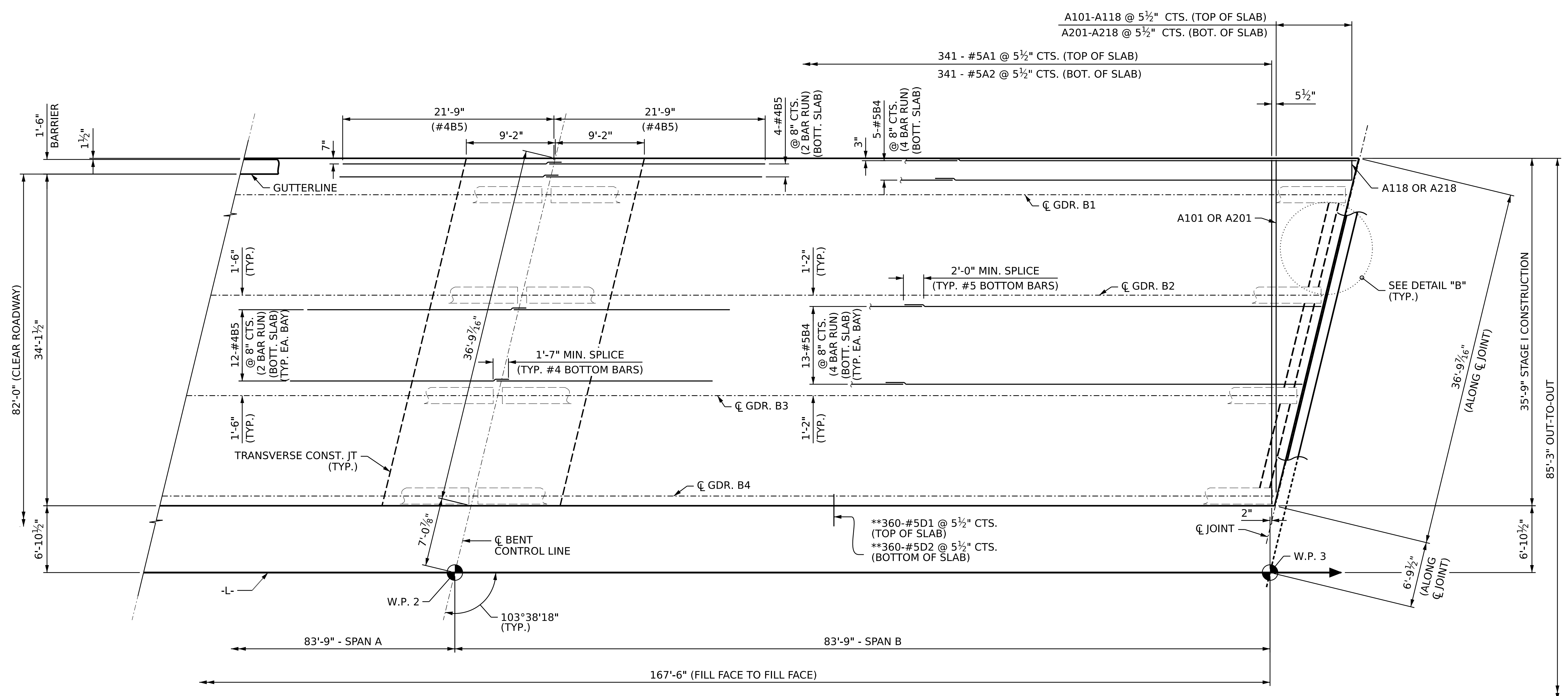
SEAL
 030474
 JOHN C. MORRISON
 ENGINEER

DocuSigned by:
 John C. Morrison 1/31/2023
A2FDE142C82F44B

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-11
TOTAL SHEETS					45

DRAWN BY :	M.L. CATER	DATE :	11/2022
CHECKED BY :	J.C. MORRISON	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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SPAN B - STAGE I
FOR NOTES, SEE SHEET 5 OF 5

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 2 OF 5

AECOM
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John C. Morrison 1/31/2023
A2FDE142C82F44B...

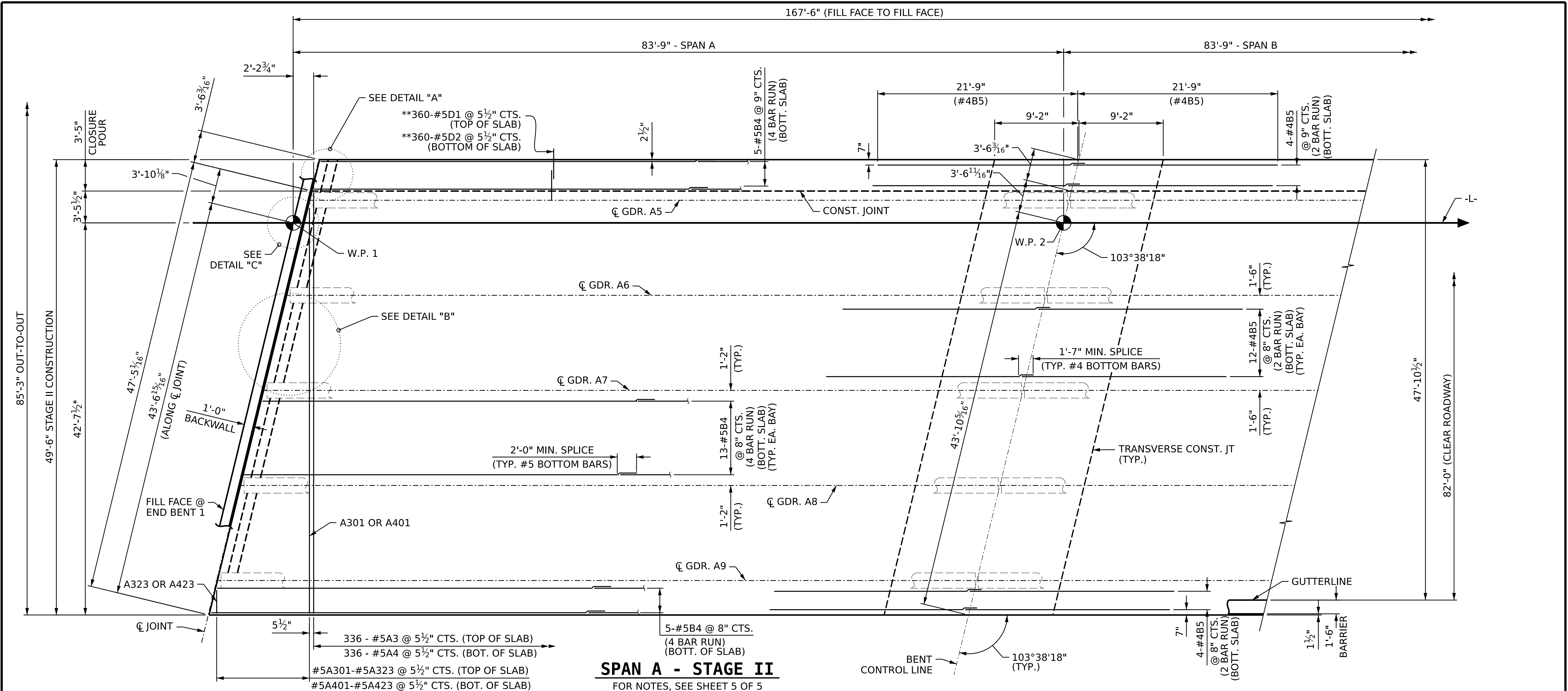
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN B
 STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			45

DRAWN BY: M.L. CATER DATE: 11/2022
 CHECKED BY: J.C. MORRISON DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

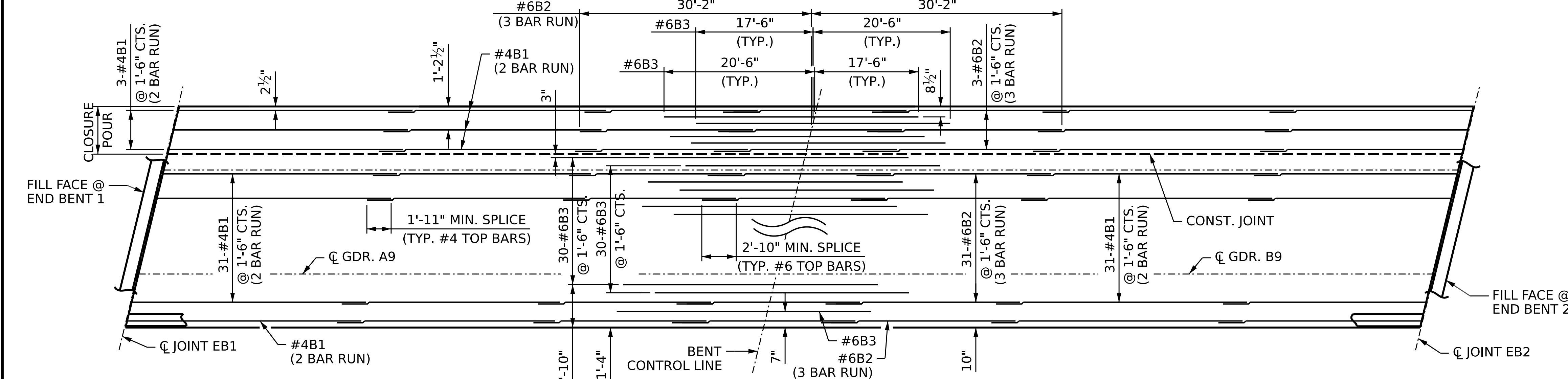
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



SPAN A - STAGE II
FOR NOTES, SEE SHEET 5 OF 5

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 3 OF 5



TOP REINFORCING STEEL LAYOUT
SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)

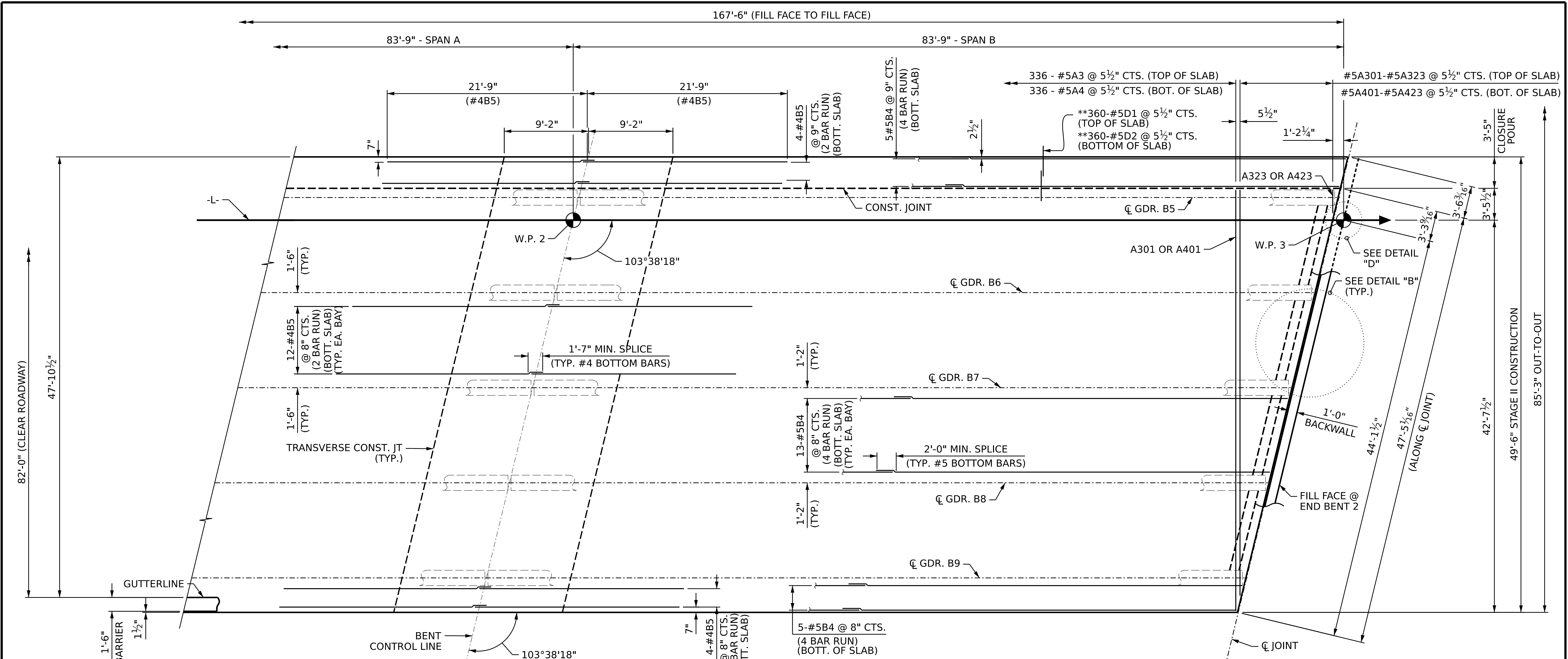


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
PLAN OF SPAN A
 STAGE II

DRAWN BY: M.L. CATER DATE: 11/2022
 CHECKED BY: J.C. MORRISON DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

DOCUMENT NOT CONSIDERED
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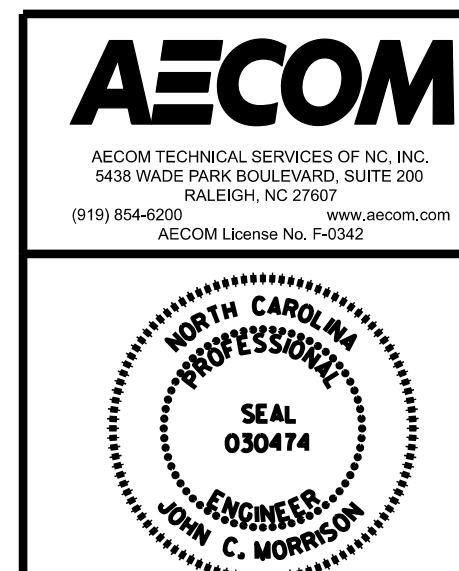
REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			



SPAN B - STAGE II
FOR NOTES, SEE SHEET 5 OF 5

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 4 OF 5



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

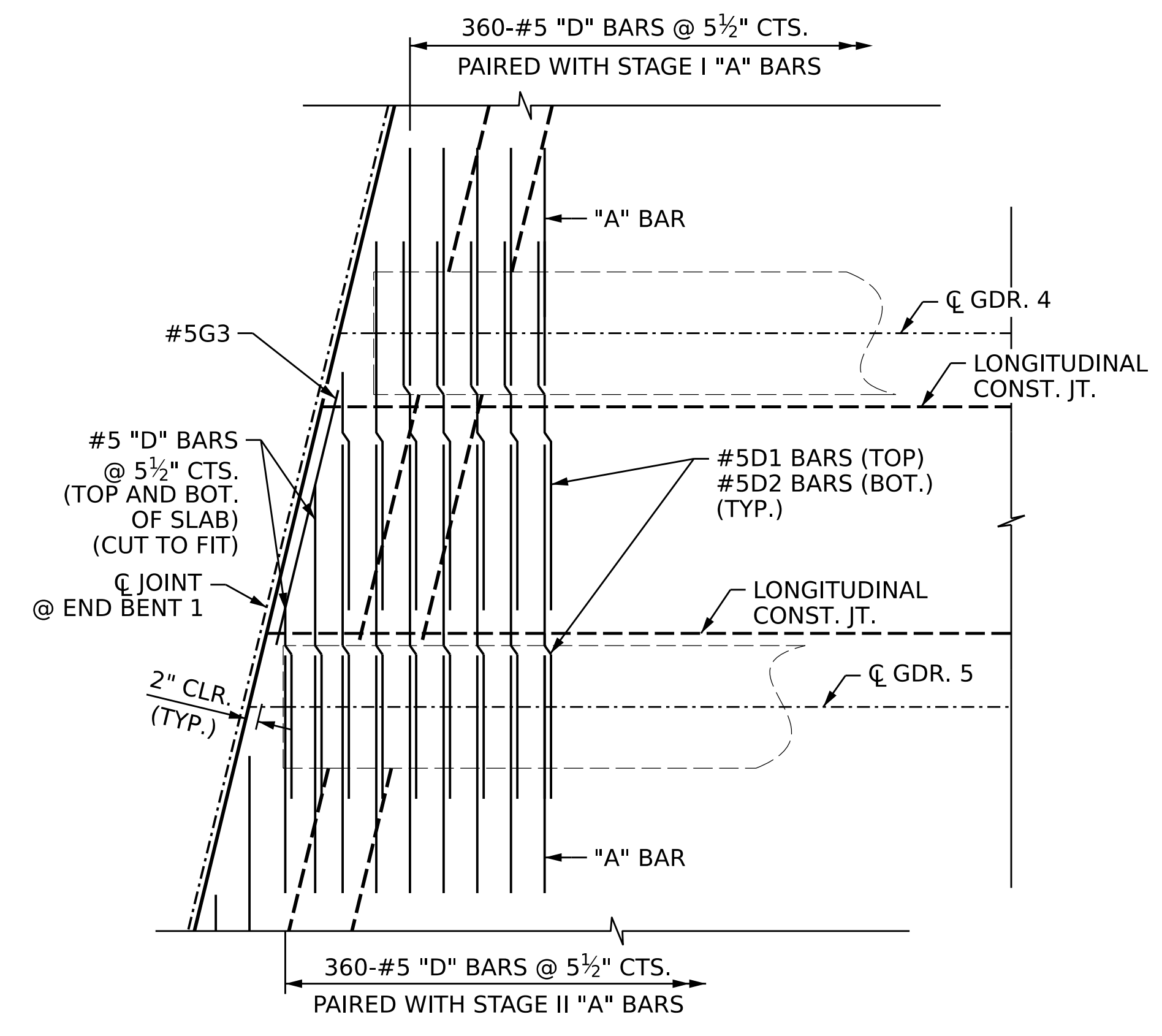
DRAWN BY: M.L. CATER DATE: 11/2022
 CHECKED BY: J.C. MORRISON DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

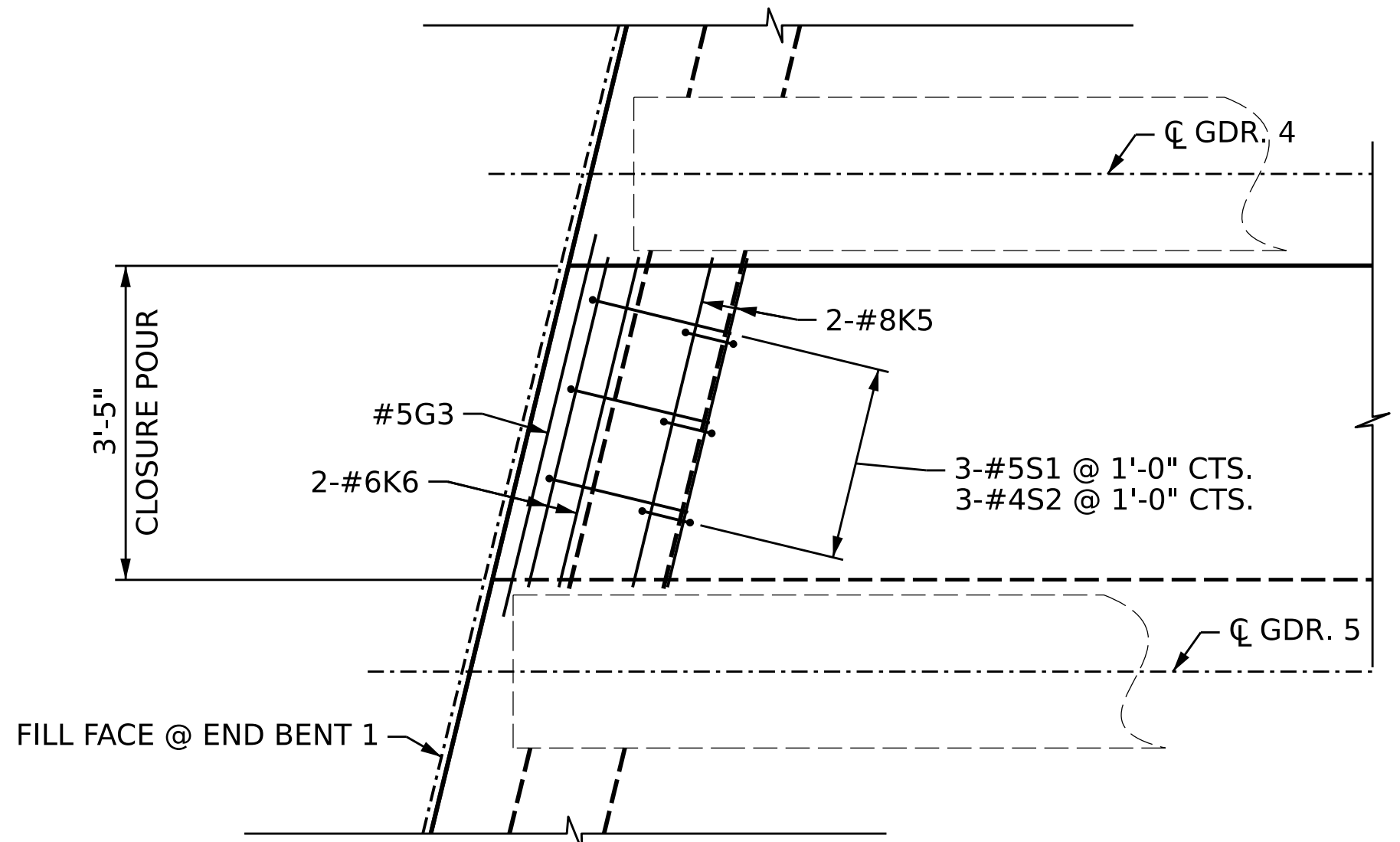
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 John C. Morrison
 1/31/2023
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			45

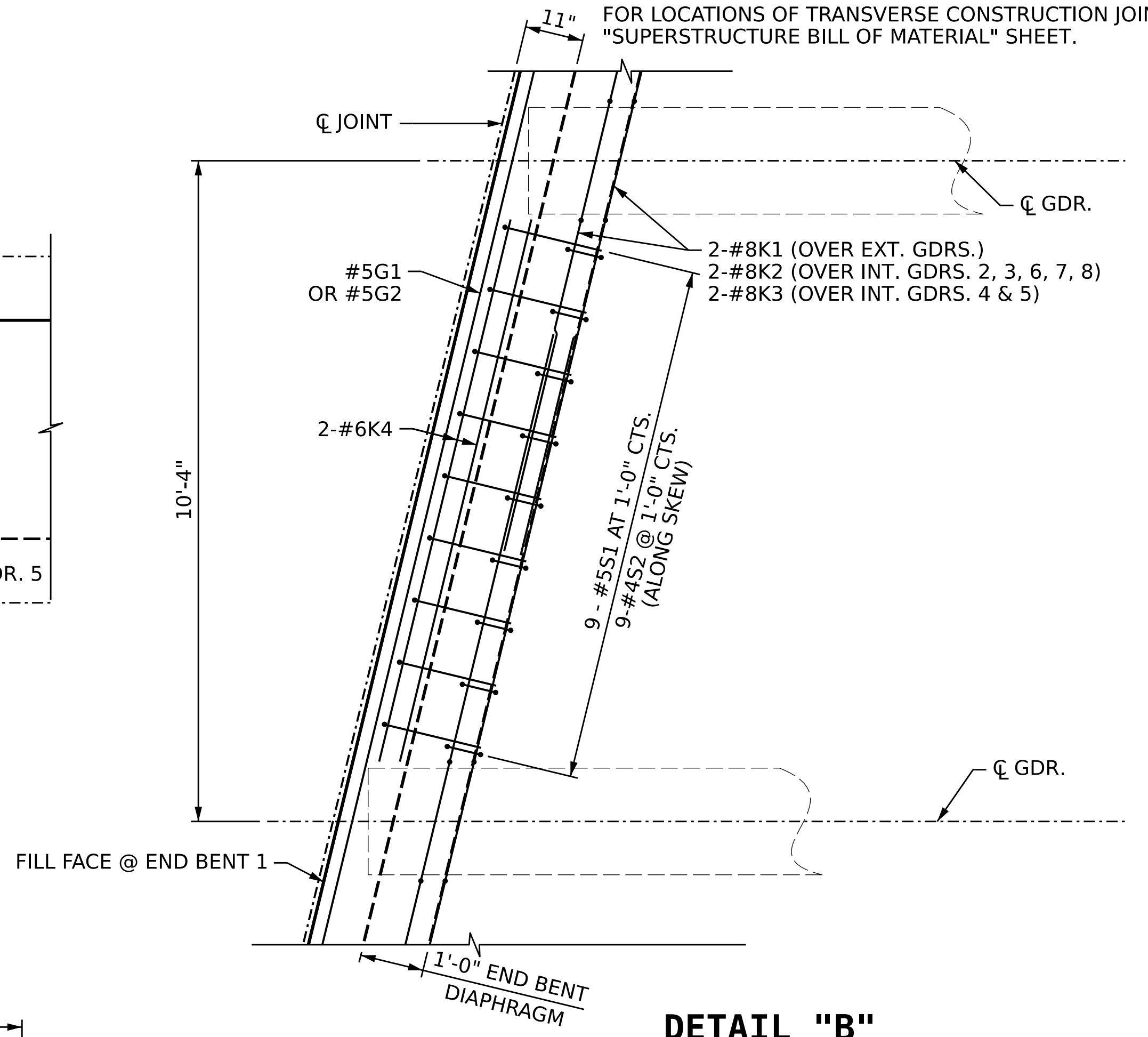
NOTES:
 #5 "G" BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.
 FOR REINFORCING STEEL IN MEDIAN, SEE CONCRETE MEDIAN DETAILS SHEET.
 FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.
 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
 LINK SLAB SAW CUT SHALL EXTEND TO EDGE OF DECK.
 FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



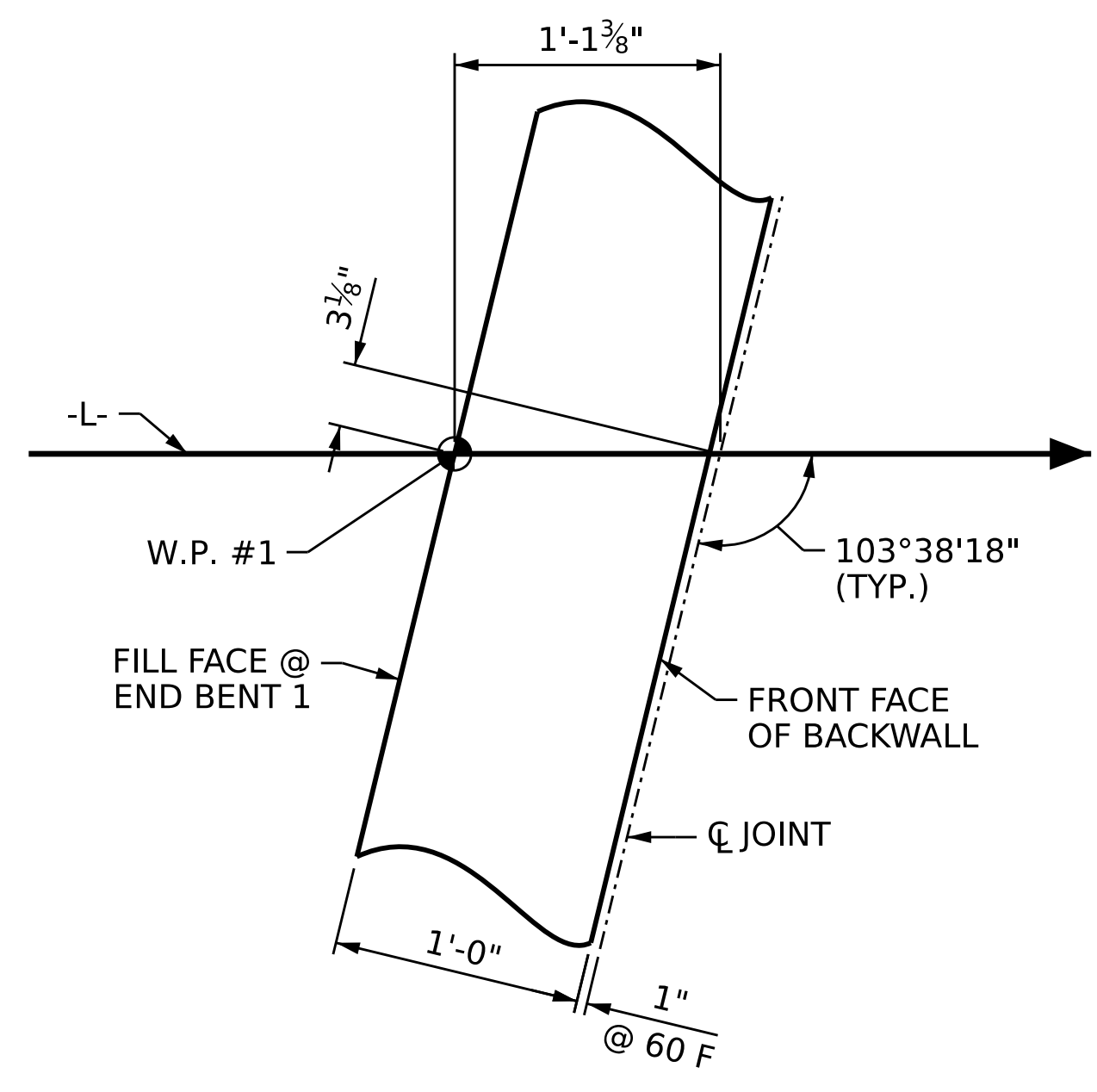
DECK REINFORCEMENT



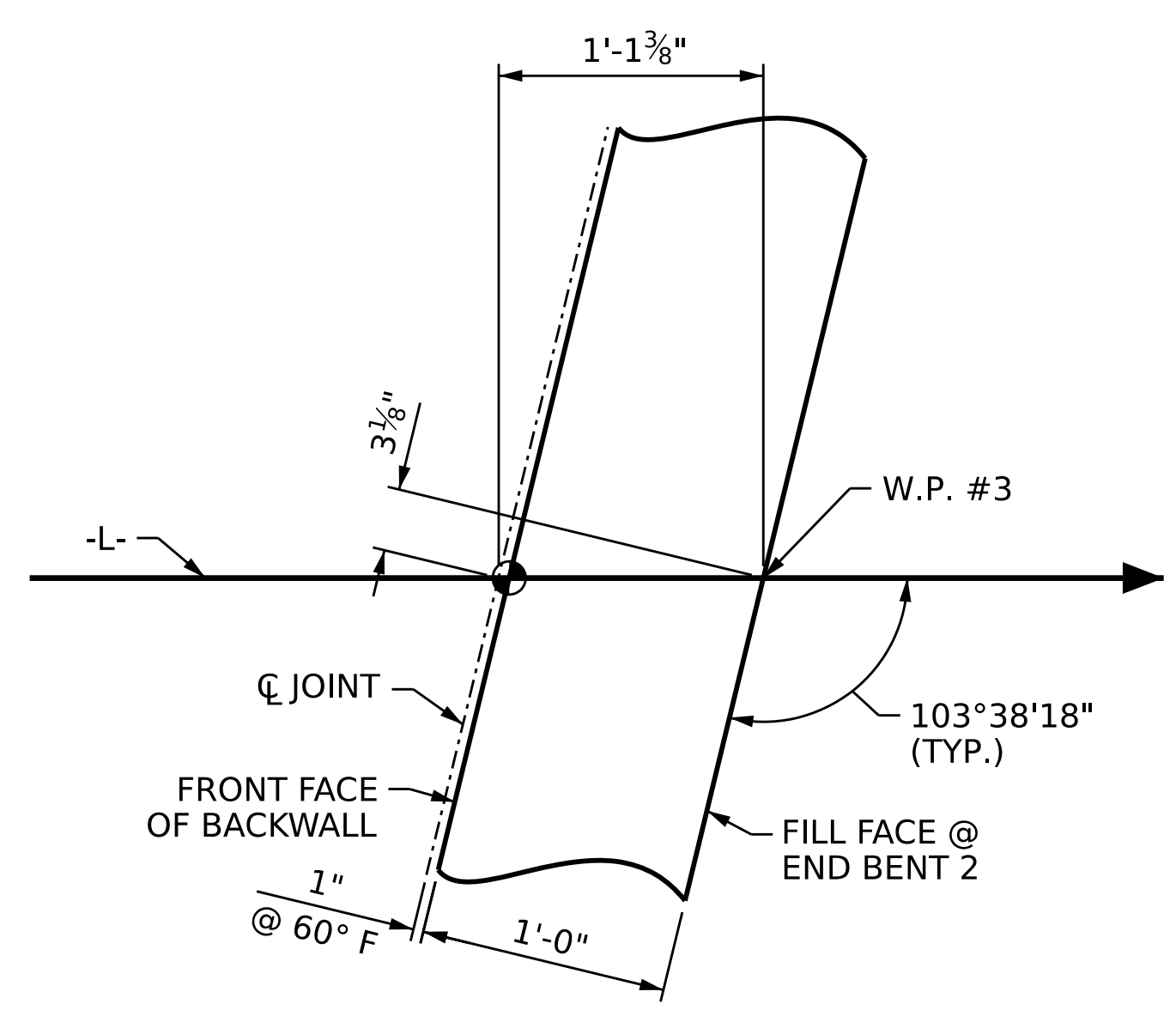
END BENT DIAPHRAGM
(TYP. BAY 4)



DETAIL "B"
(TYP. BAYS 1-3 & 5-8)



DETAIL "C"



DETAIL "D"

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 5 OF 5

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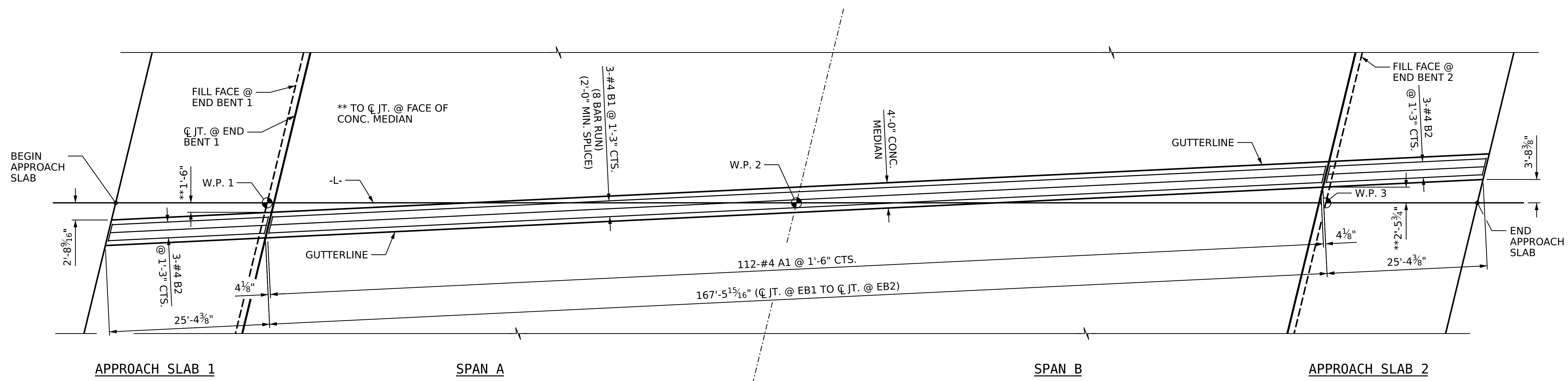
SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

DocuSigned by:
 John C. Morrison 1/31/2023
A2FDE142C82F448

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-15
PLAN OF SPAN DETAILS						TOTAL SHEETS
REVISIONS						45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY:	M.L. CATER	DATE:	11/2022
CHECKED BY:	J.C. MORRISON	DATE:	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE:	12/2022

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PLAN OF CONCRETE MEDIAN

NOTES:

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF CONCRETE MEDIAN 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 BEGIN AND END DECK SLAB. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

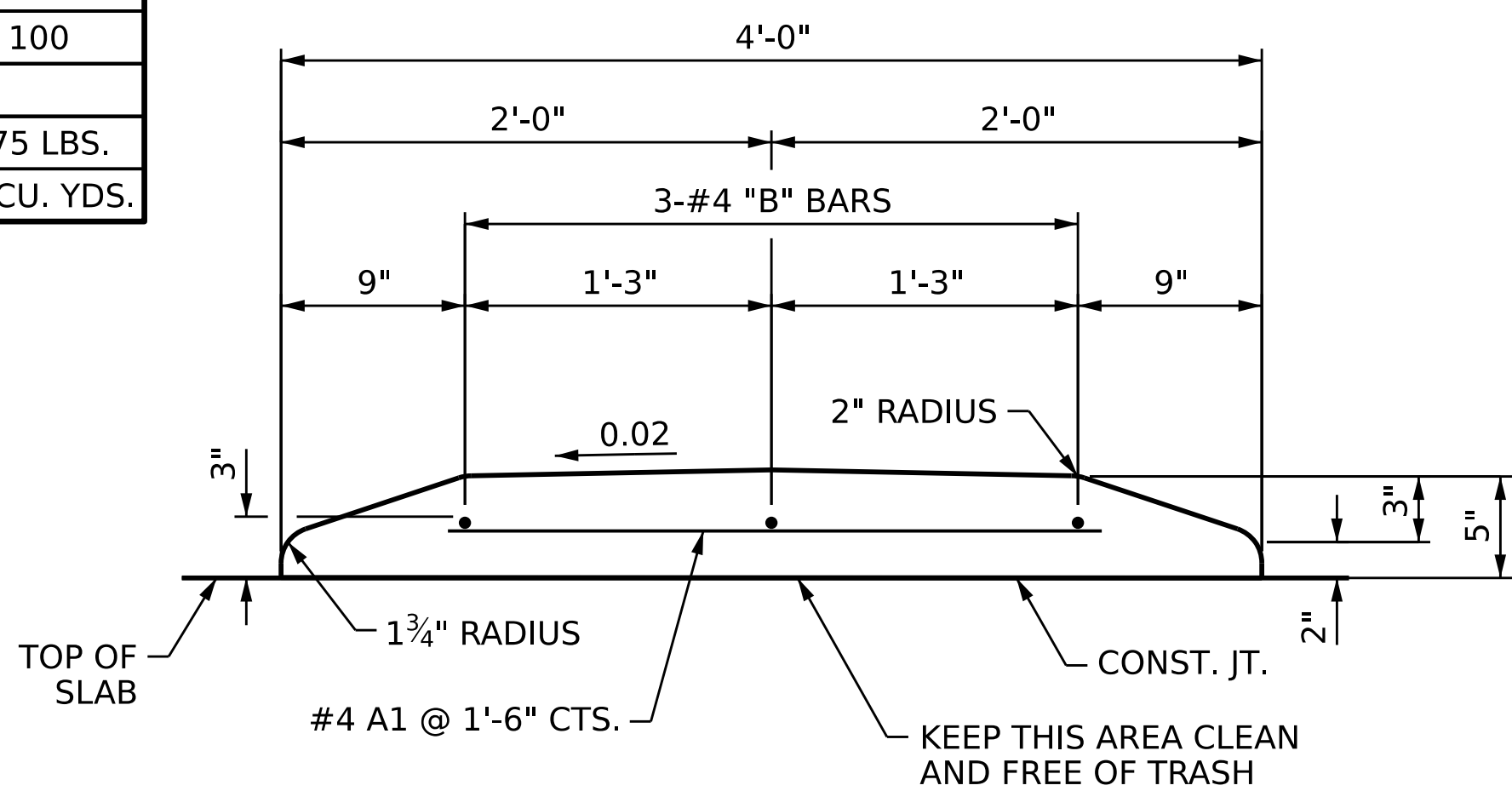
THE CONCRETE MEDIAN IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE REINFORCED CONCRETE DECK SLAB.

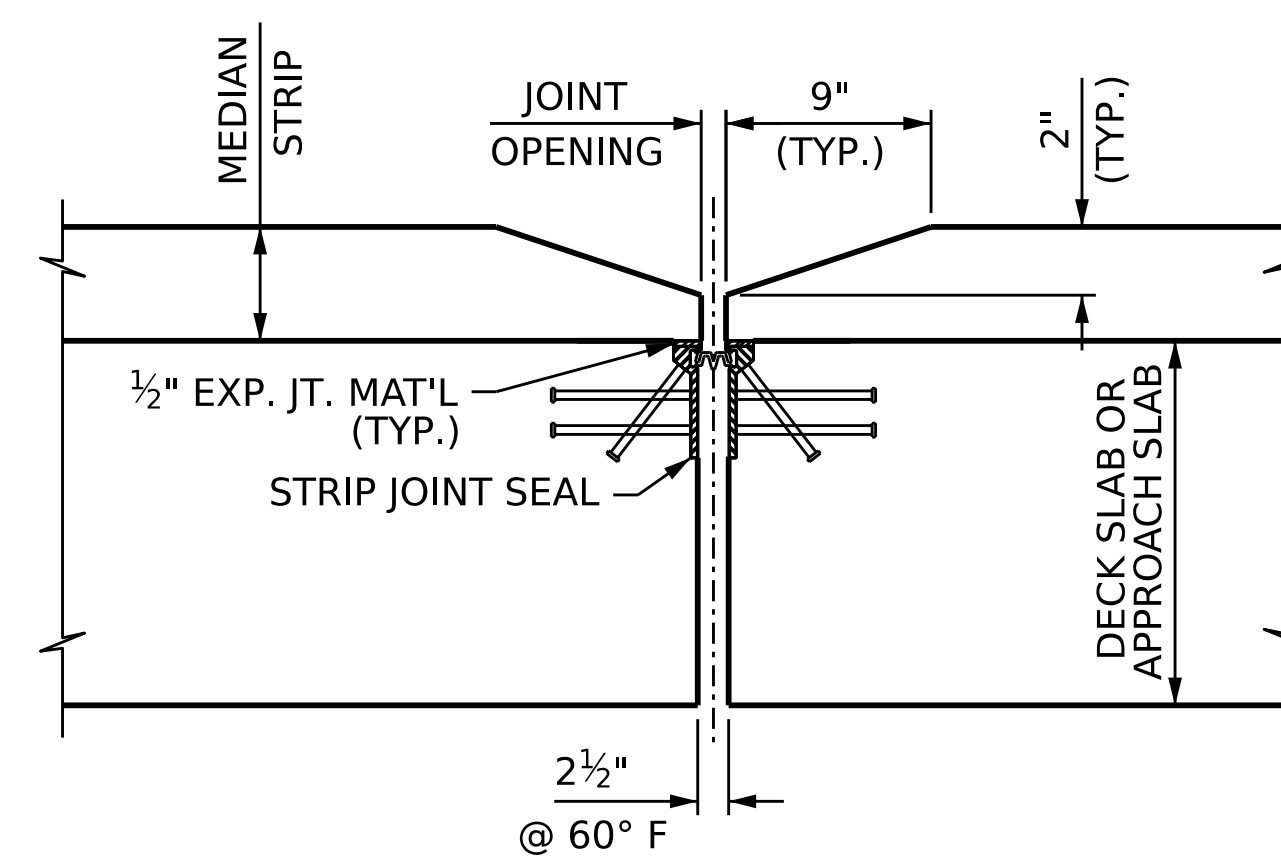
ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

BILL OF MATERIAL					
FOR CONCRETE MEDIAN ONLY (INCLUDES ON APPR. SLABS)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	112	4	STR	3'-0"	225
* B1	24	4	STR	21'-10"	350
* B2	6	4	STR	24'-10"	100
* EPOXY COATED REINFORCING STEEL					675 LBS.
CLASS AA CONCRETE					12.0 CU. YDS.



SECTION THRU CONCRETE MEDIAN



DETAILS AT EXPANSION JOINT

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John C. Morrison
Professional Engineer
 License No. 22767

1/31/2023

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

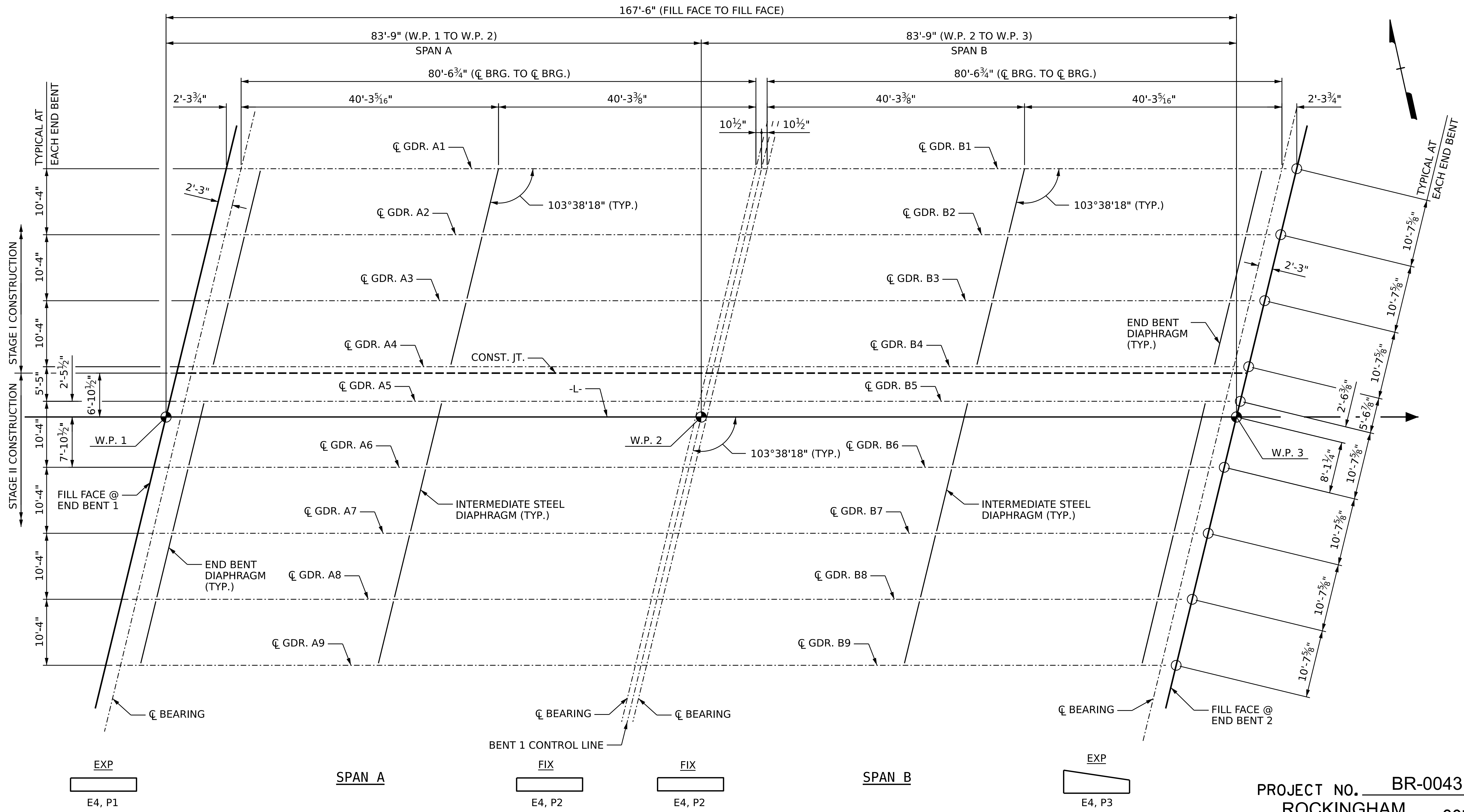
CONCRETE MEDIAN DETAILS

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

SHEET NO. **S-16**
 TOTAL SHEETS **45**

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FRAMING PLAN

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

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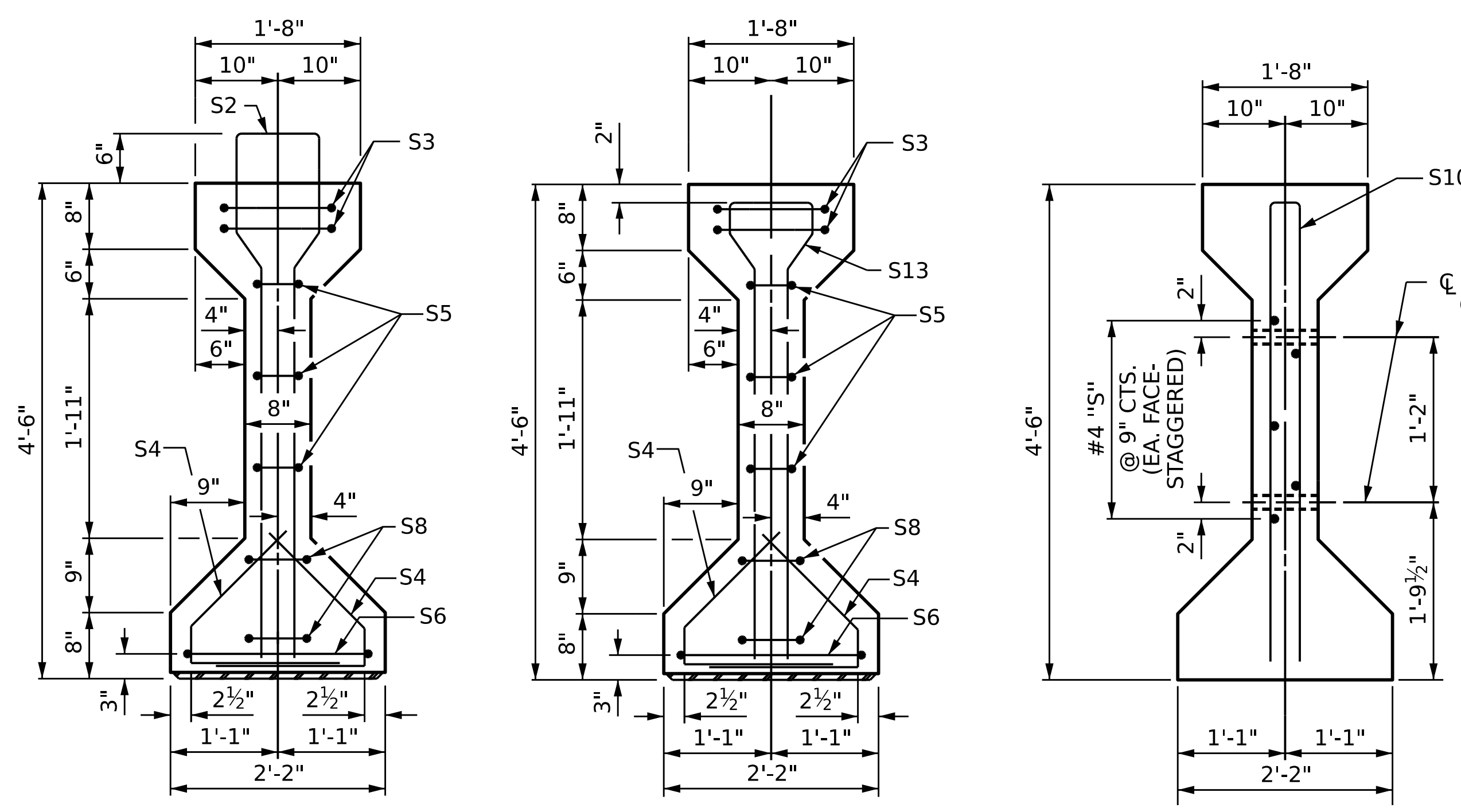
SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

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 John C. Morrison 1/31/2023
A2FDE142C82F44B...

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
FRAMING PLAN					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-17
TOTAL SHEETS					45

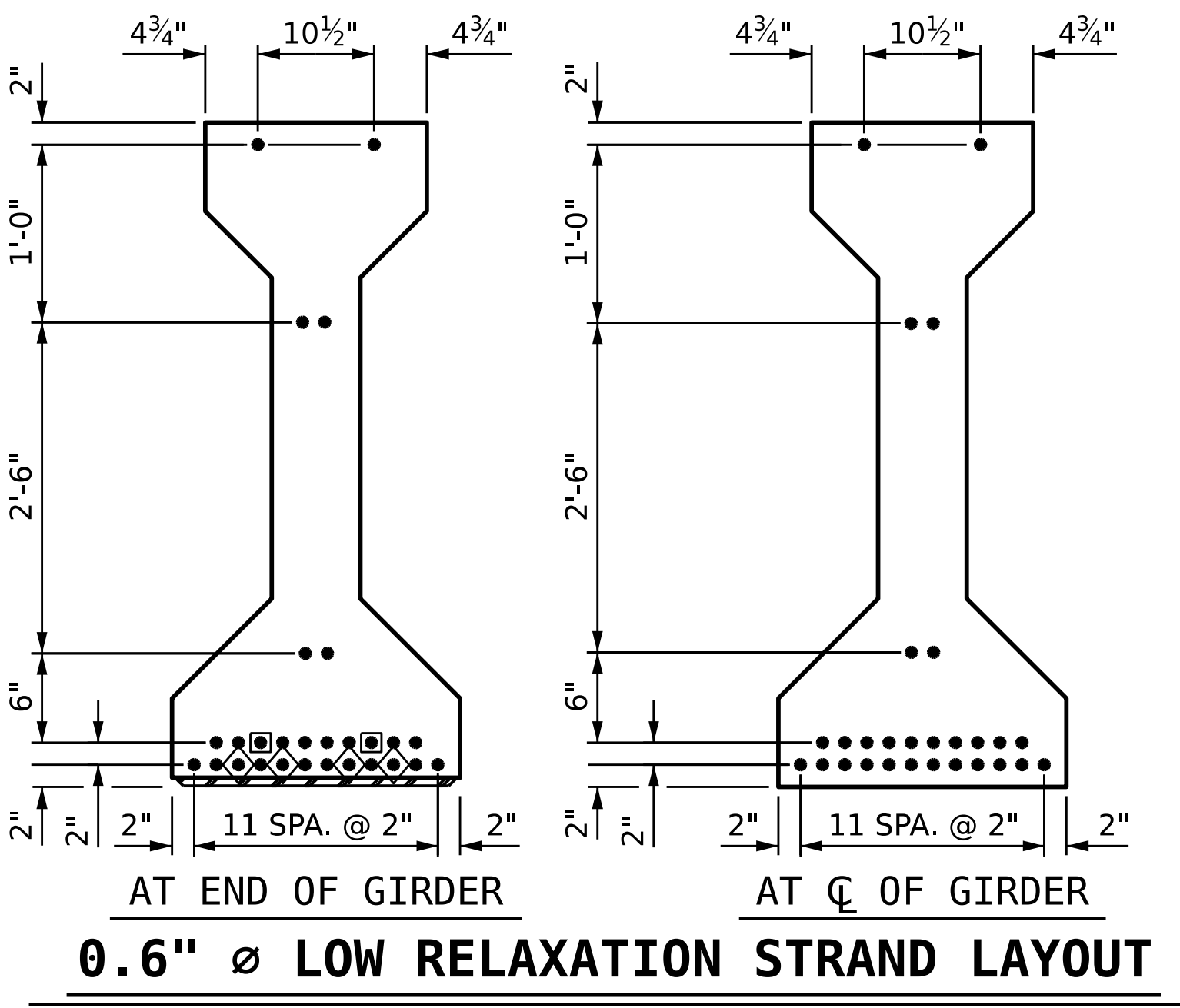
DRAWN BY: B.T. LEROY DATE: 11/2022
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DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◊ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

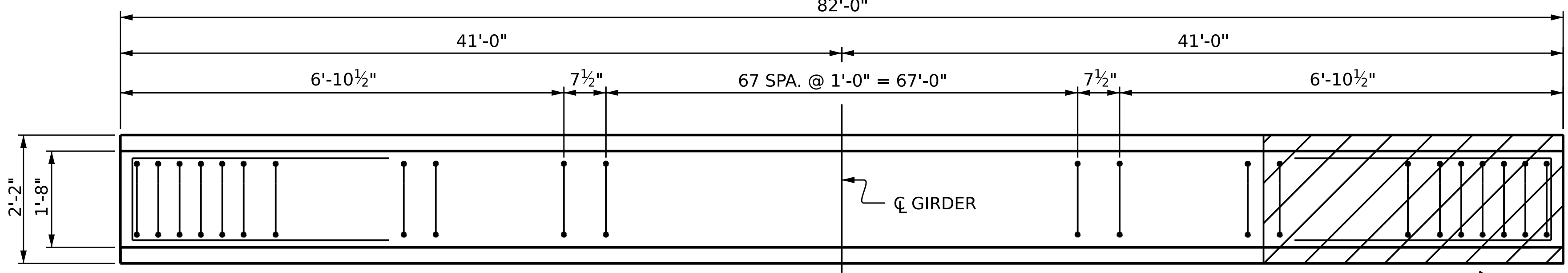


SECTION A-A

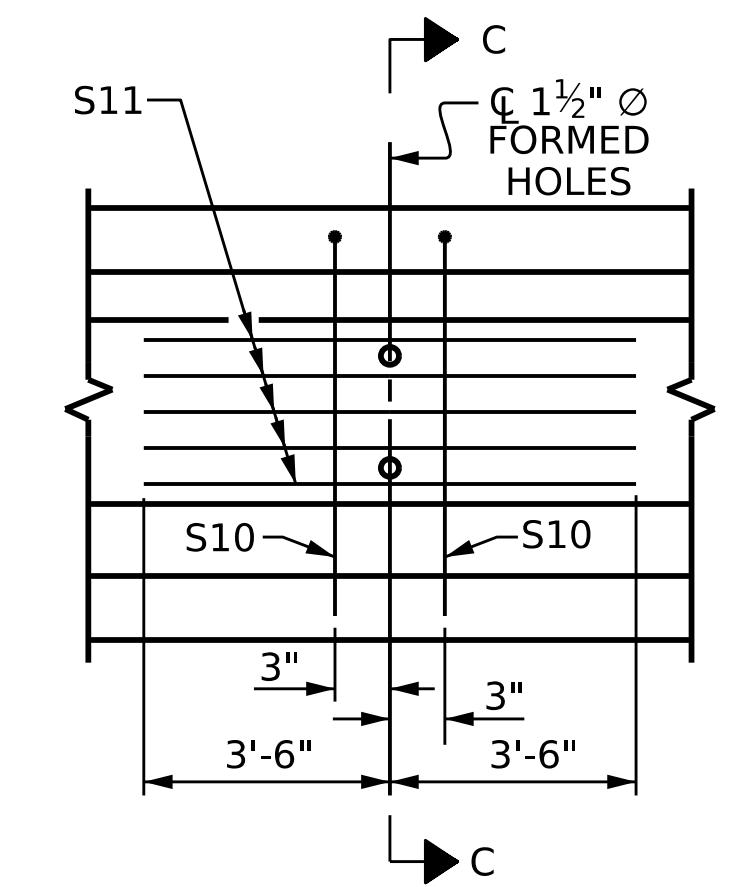
SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)

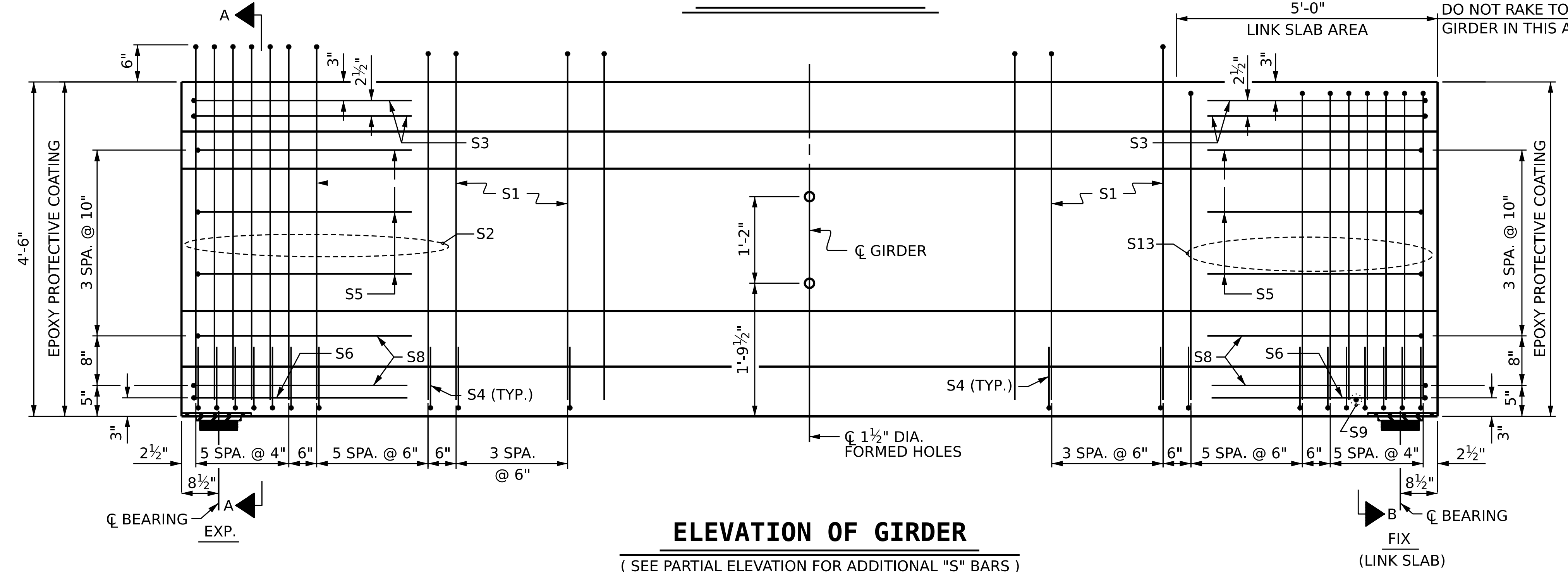
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

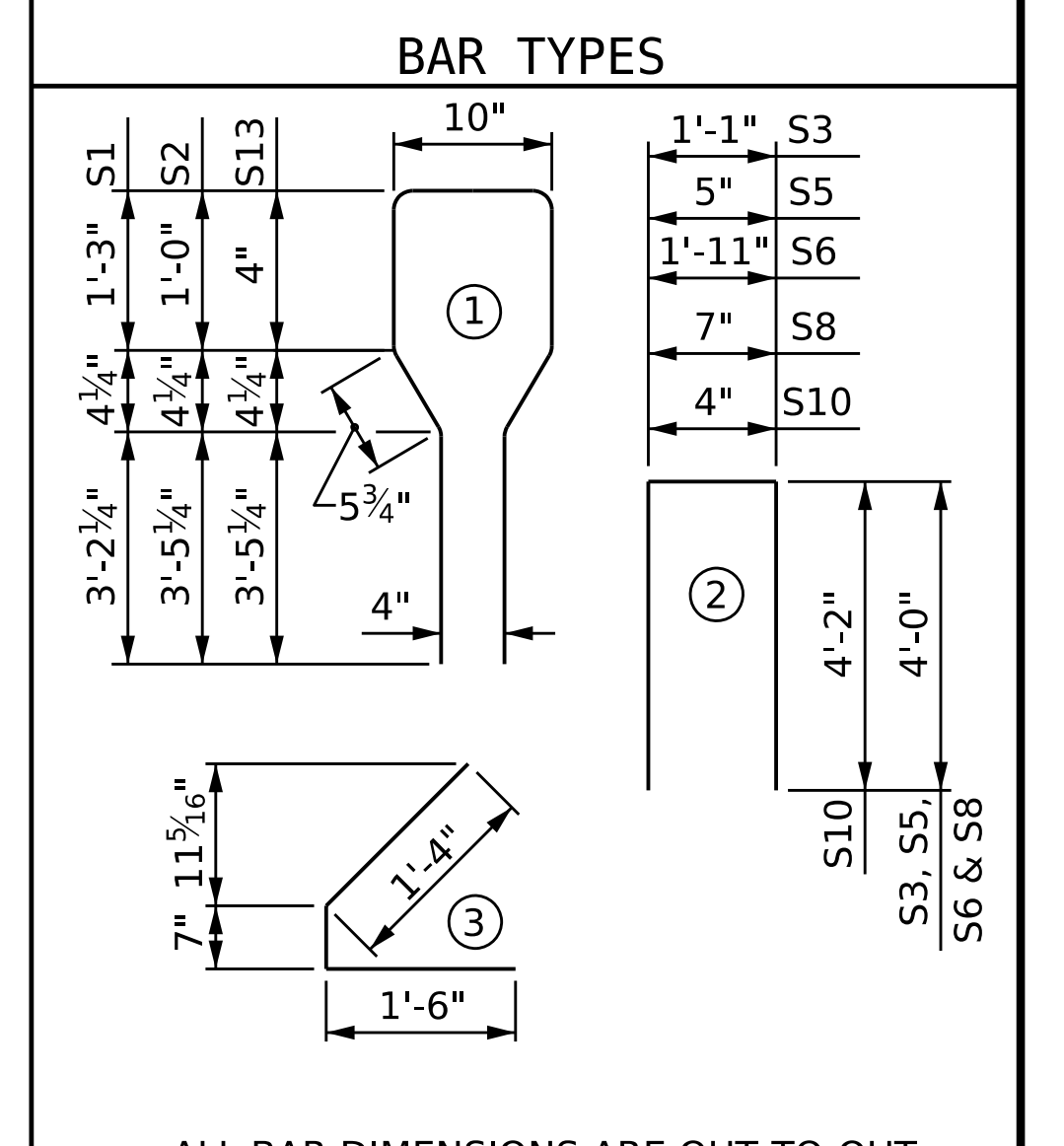


ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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	76	#4	1	10'-8"	542
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	14
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	12	#6	1	9'-4"	154



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.
EXT. GIRDER	1170	29.6	28
INT. GIRDER	1170	29.6	28

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
STAGE I SPAN A	5	82'-0"
STAGE I SPAN B	5	82'-0"
STAGE II SPAN A	4	82'-0"
STAGE II SPAN B	4	82'-0"
TOTAL	18	1476'-0"

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 1 OF 3

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A2PDE142CB2F44B...

SEAL 030474
 JOHN C. MORRISON
 ENGINEER

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL 45
2			4			45

DRAWN BY: L.A. SHIELDS DATE: 10/2022
 CHECKED BY: S. NATARAJAN DATE: 10/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

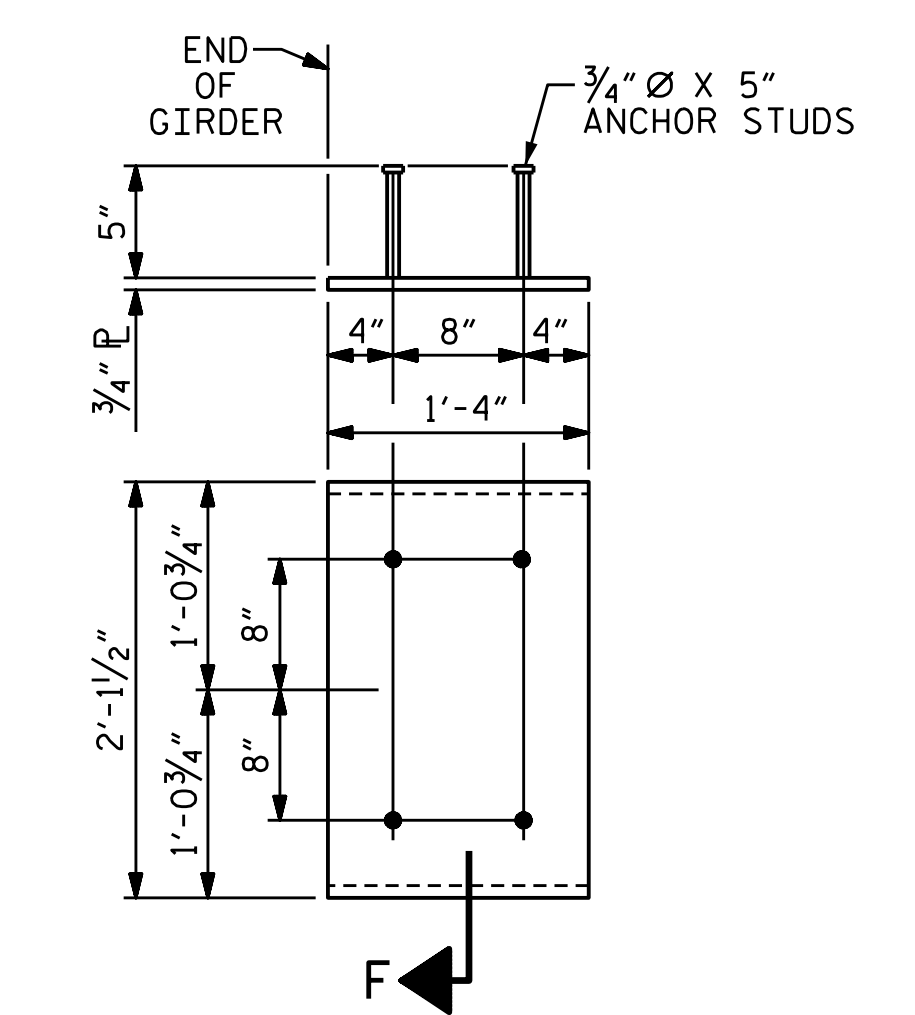
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" DIA. LOW-RELAXATION STRANDS	GIRDER 1																					
TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.085	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.017	0.033	0.049	0.062	0.075	0.086	0.095	0.101	0.105	0.106	0.105	0.101	0.095	0.086	0.075	0.063	0.049	0.033	0.017	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	↓	0.000	0.013	0.023	0.036	0.046	0.057	0.064	0.071	0.075	0.078	0.078	0.075	0.071	0.064	0.057	0.046	0.036	0.023	0.013	0.000	0.000
FINAL CAMBER	↑	0	1/16"	1/8"	1/8"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	1/8"	1/8"	1/16"	0	0

NOTES

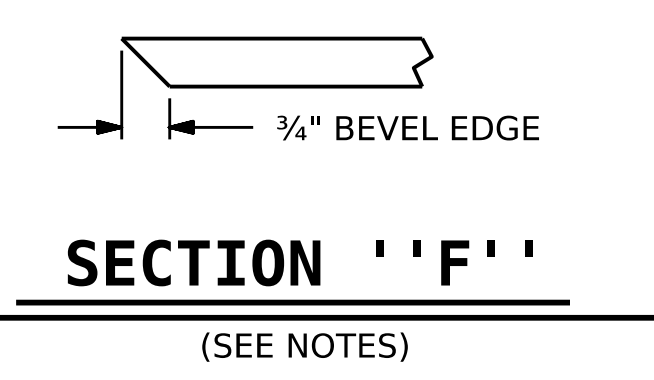
- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL SHALL BE GRADE 60.
- APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES 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 6400 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 SHADED AREA NEAR BENT, SHALL BE RAKED TO A DEPTH OF 1/4".
- WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.
- 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**
(2 REQ'D PER GIRDER)

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 2 OF 3

* 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)



DRAWN BY : L.A. SHIELDS DATE : 10/2022
 CHECKED BY : S. NATARAJAN DATE : 10/2022
 DESIGN ENGINEER OF RECORD : J.C. MORRISON DATE : 12/2022

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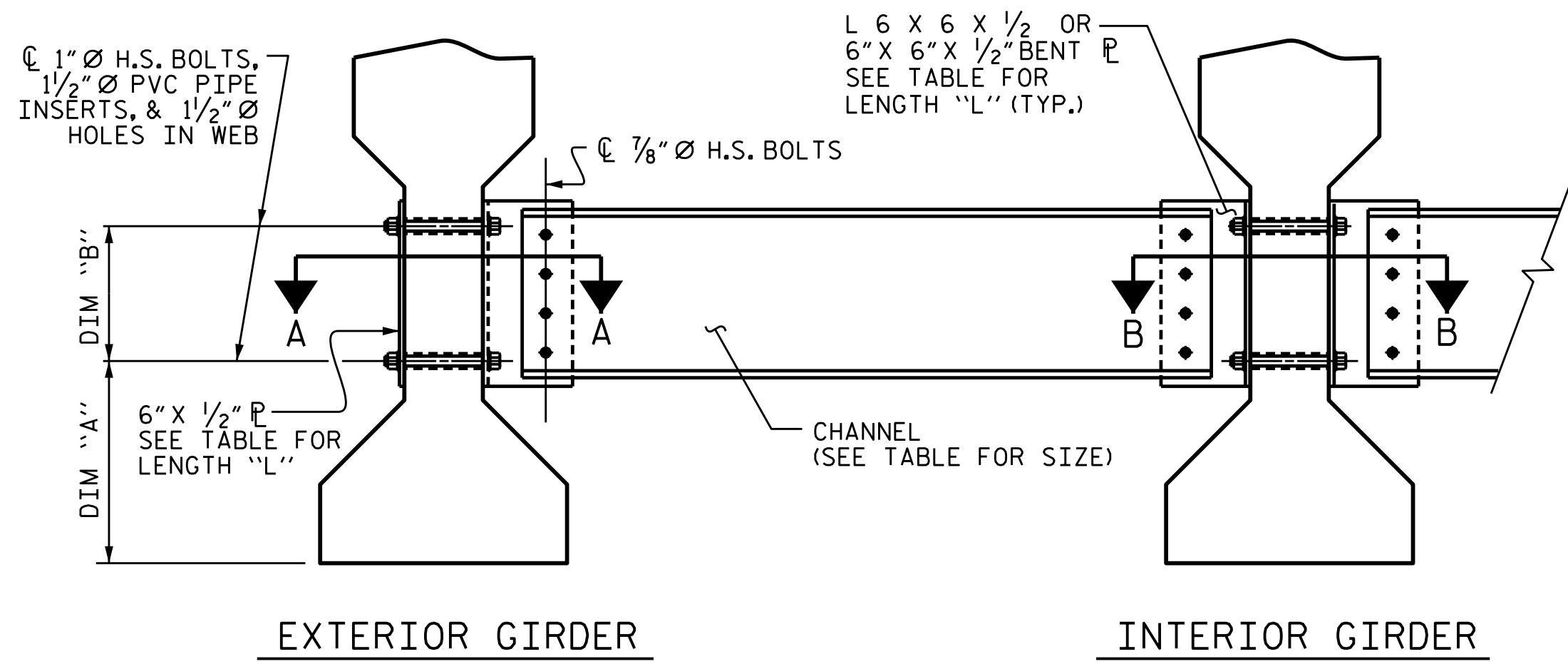
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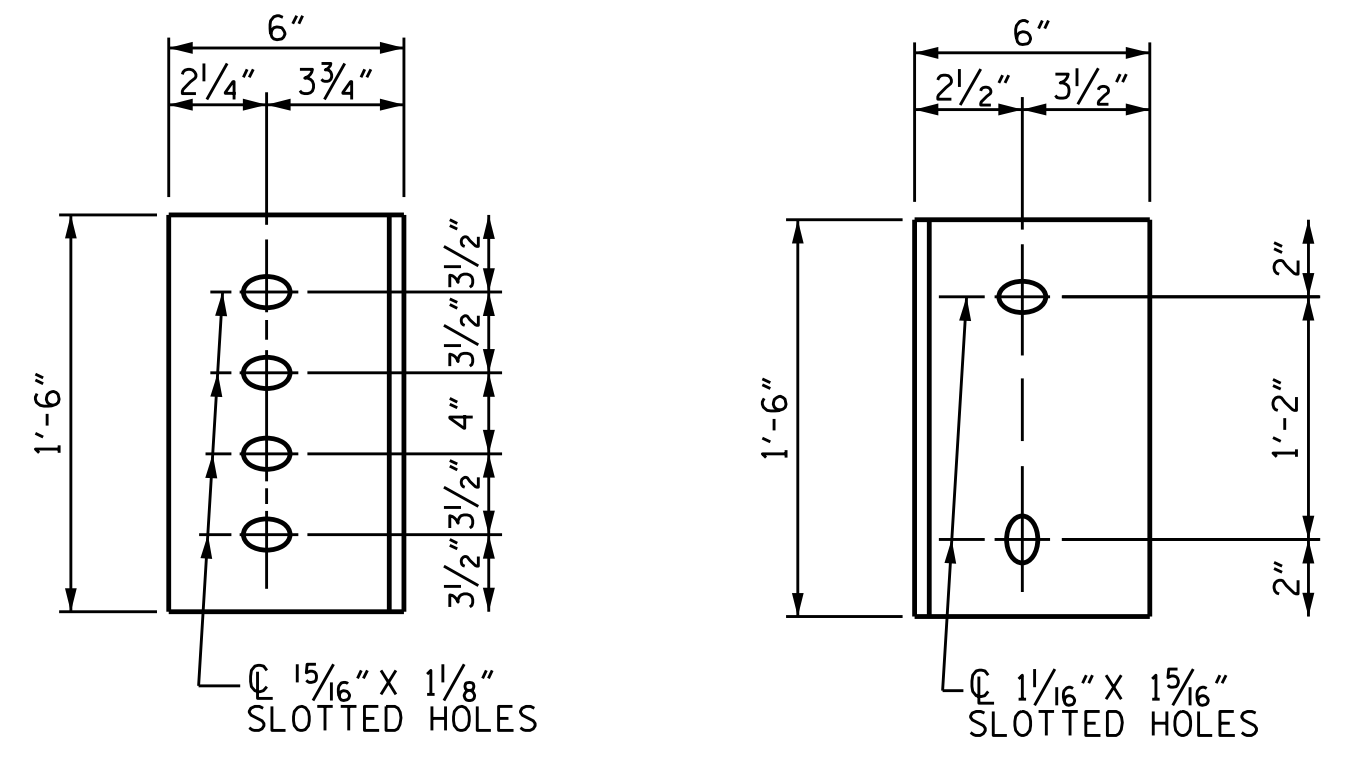
NORTH CAROLINA
 PROFESSIONAL
 SEAL
 030474
 ENGINEER
 JOHN C. MORRISON

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John C. Morrison 1/31/2023
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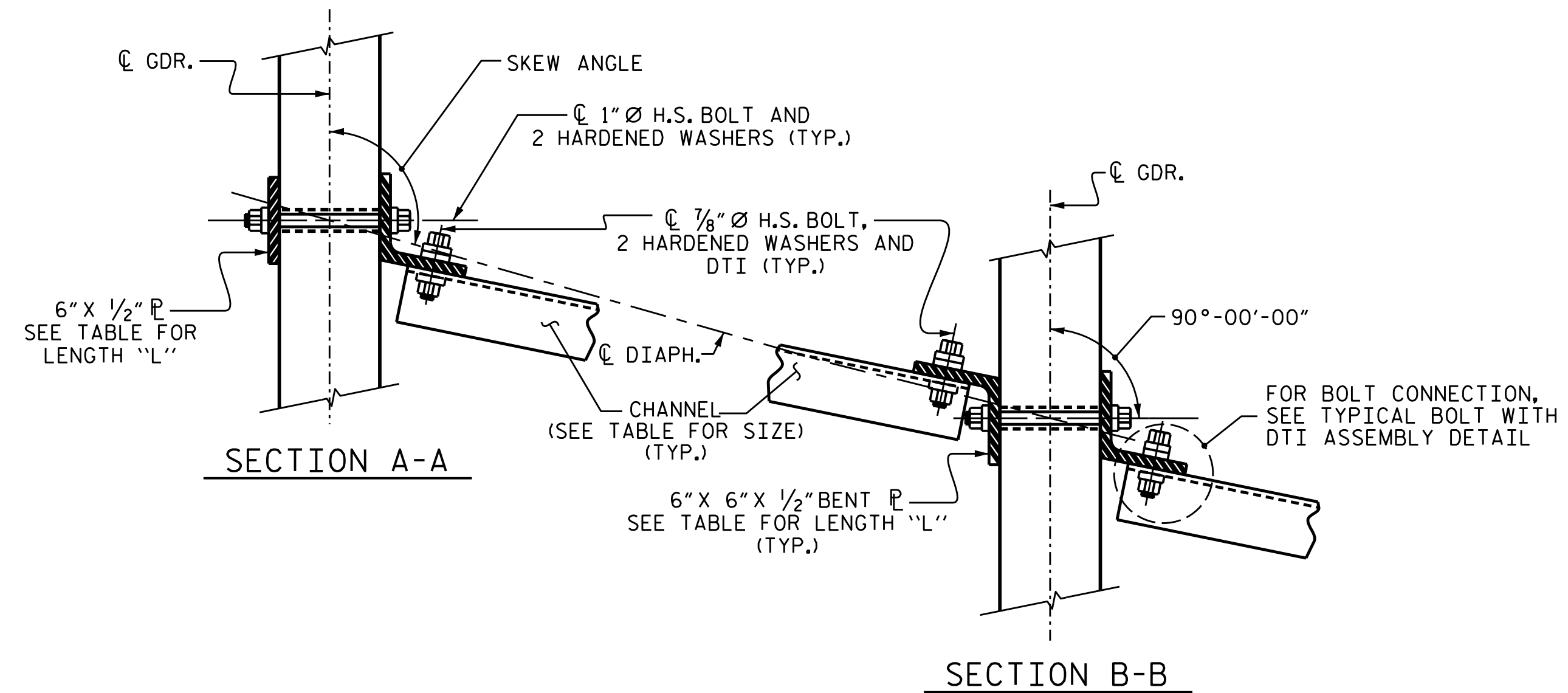
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						STANDARD
PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS						
REVISIONS						SHEET NO. S-19 TOTAL SHEETS 45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS



CONNECTION DETAILS

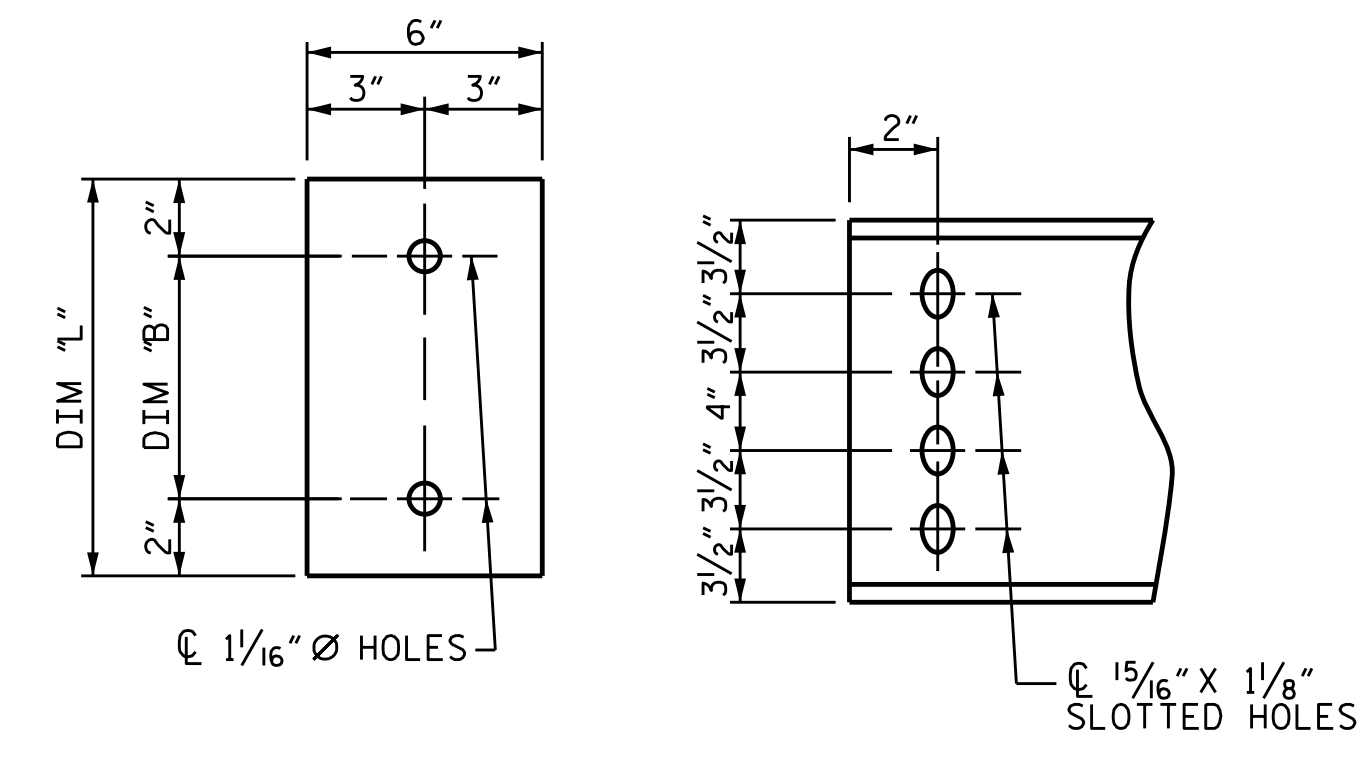
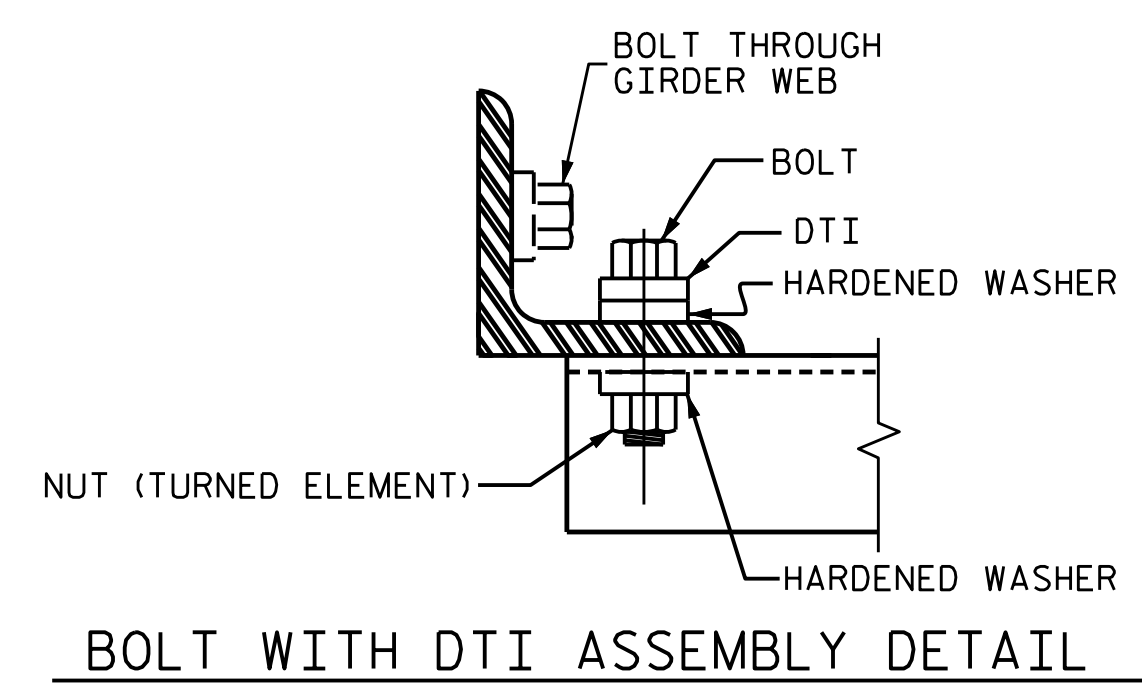


PLATE DETAILS CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 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 DEPARTMENT'S 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	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 3 OF 3

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 JOHN C. MORRISON
 ENGINEER
 030474

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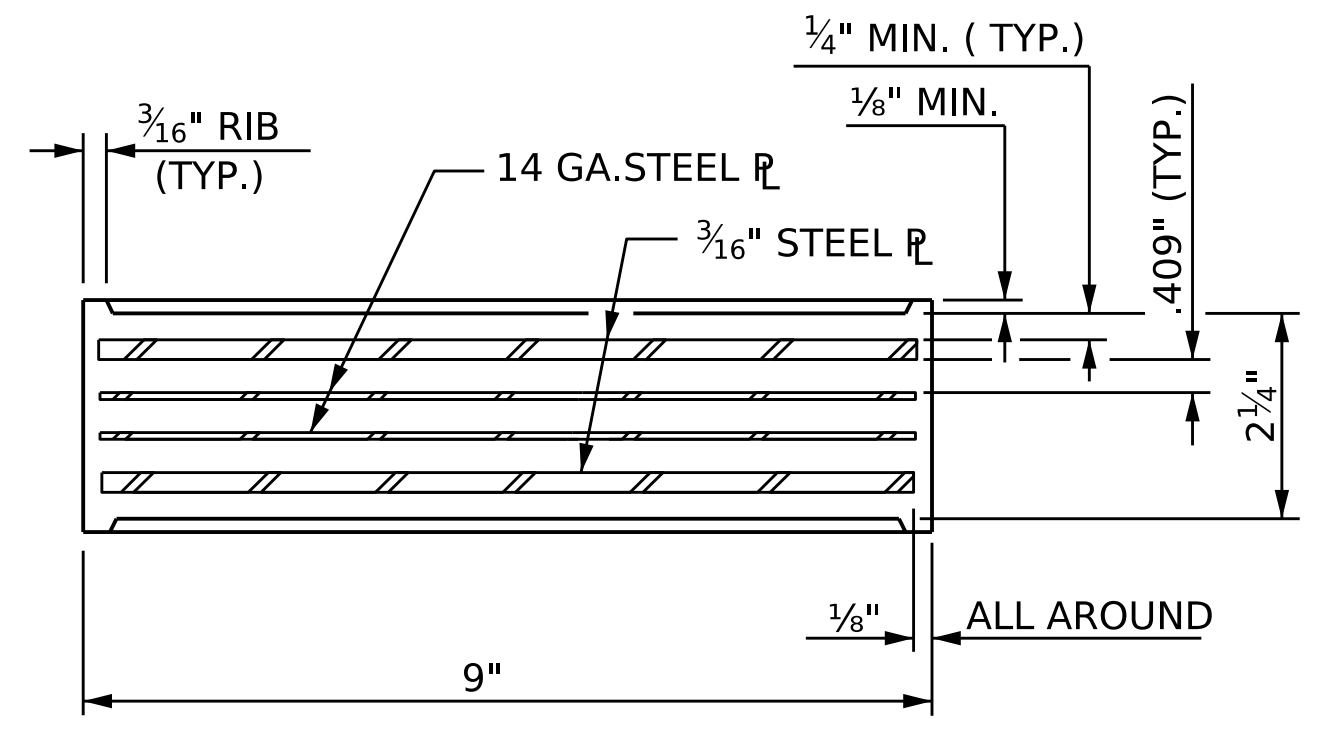
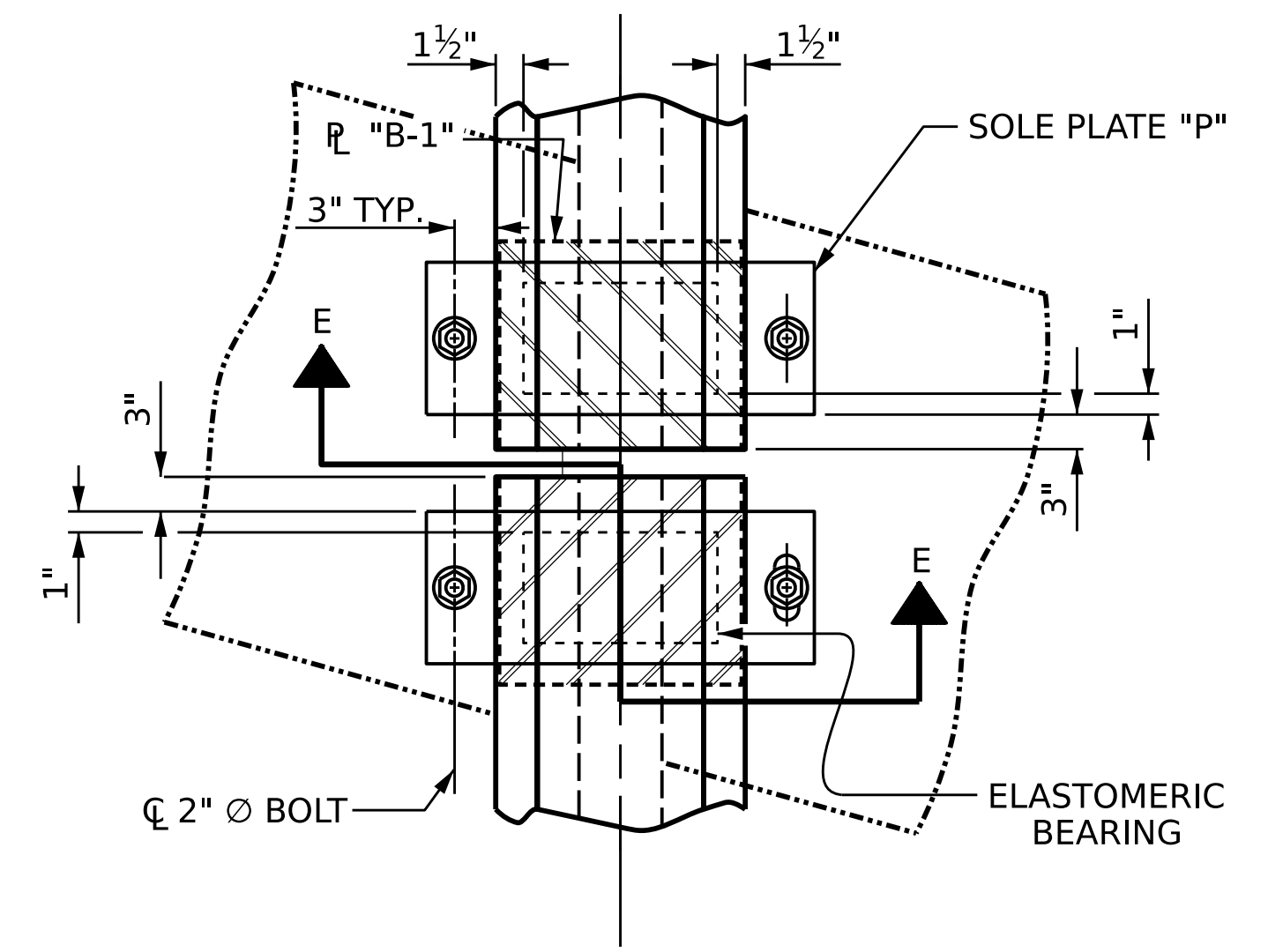
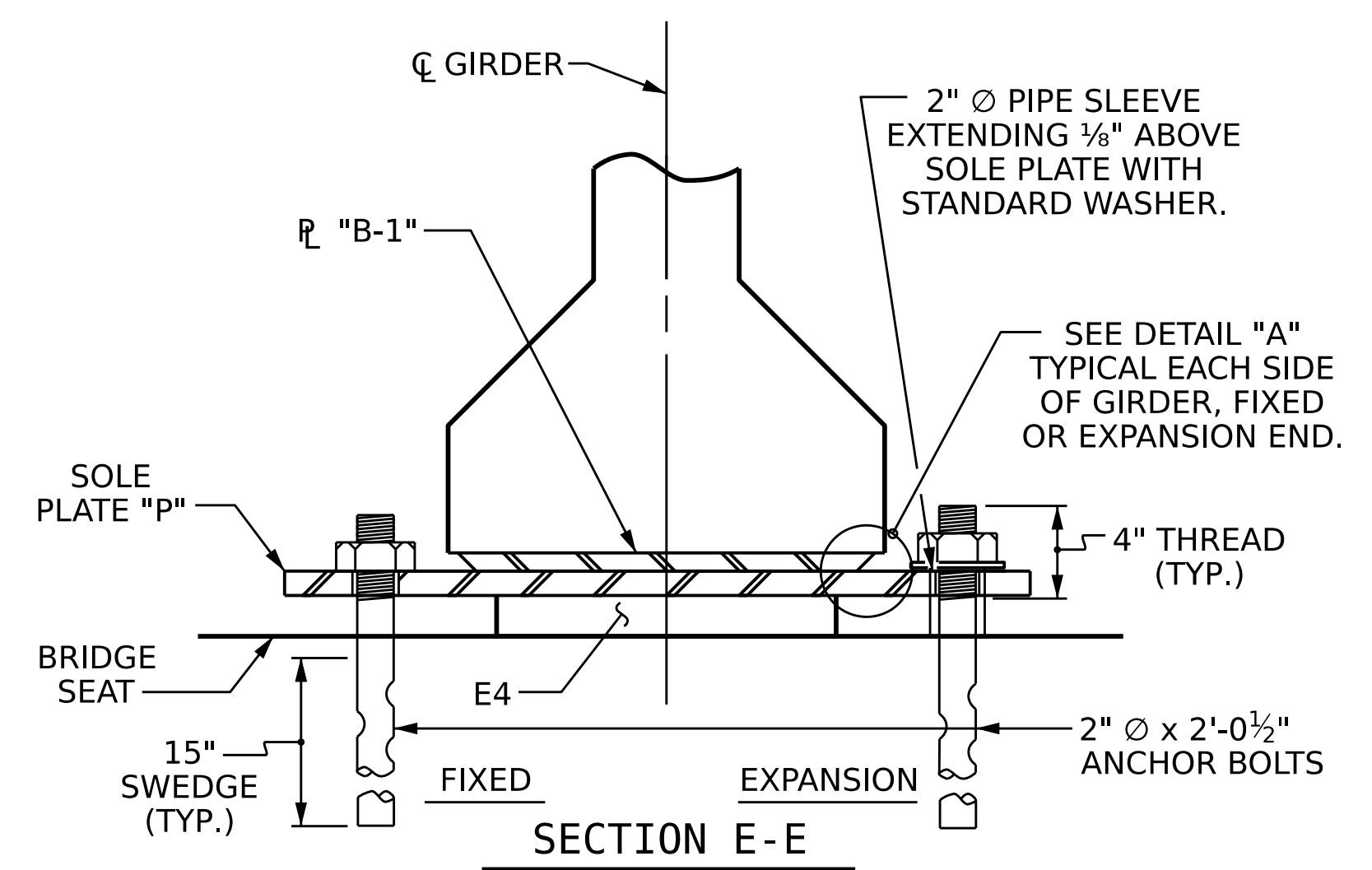
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS

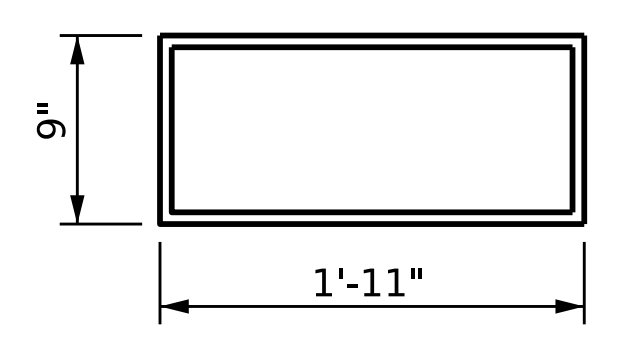
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			45

DRAWN BY: L.A. SHIELDS DATE: 10/2022
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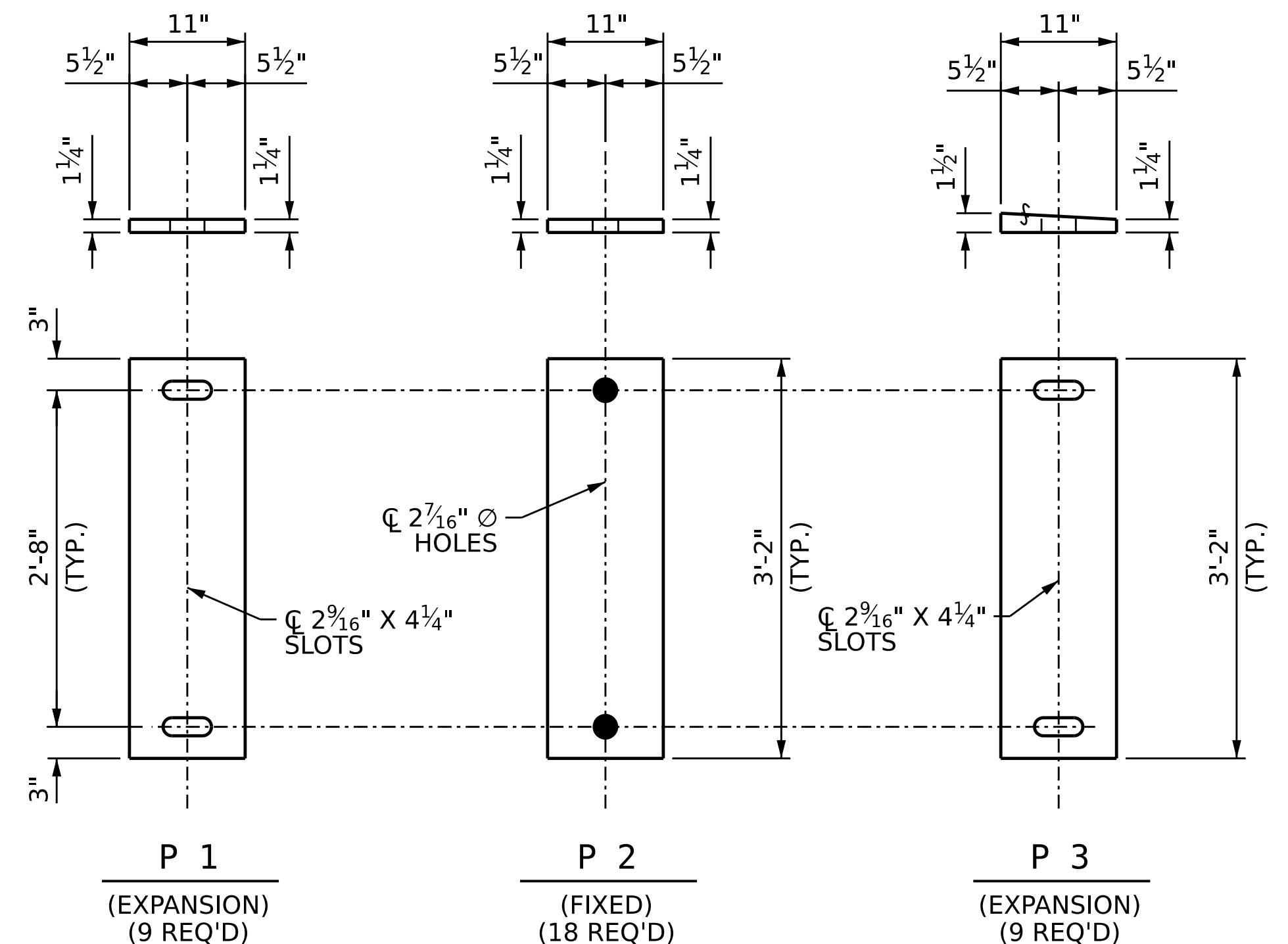


TYPICAL SECTION OF ELASTOMERIC BEARINGS

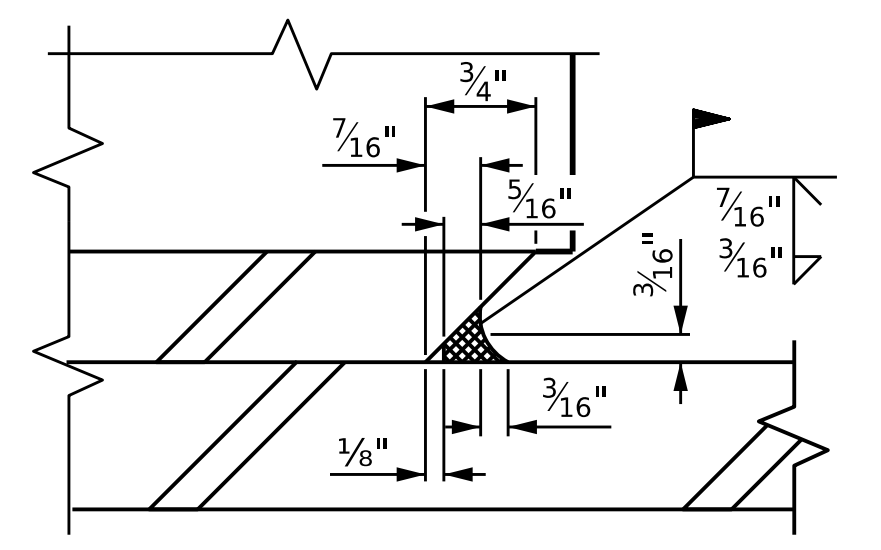


E4 (36 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V

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



SOLE PLATE DETAILS ("P")



DETAIL "A"

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

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. 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.

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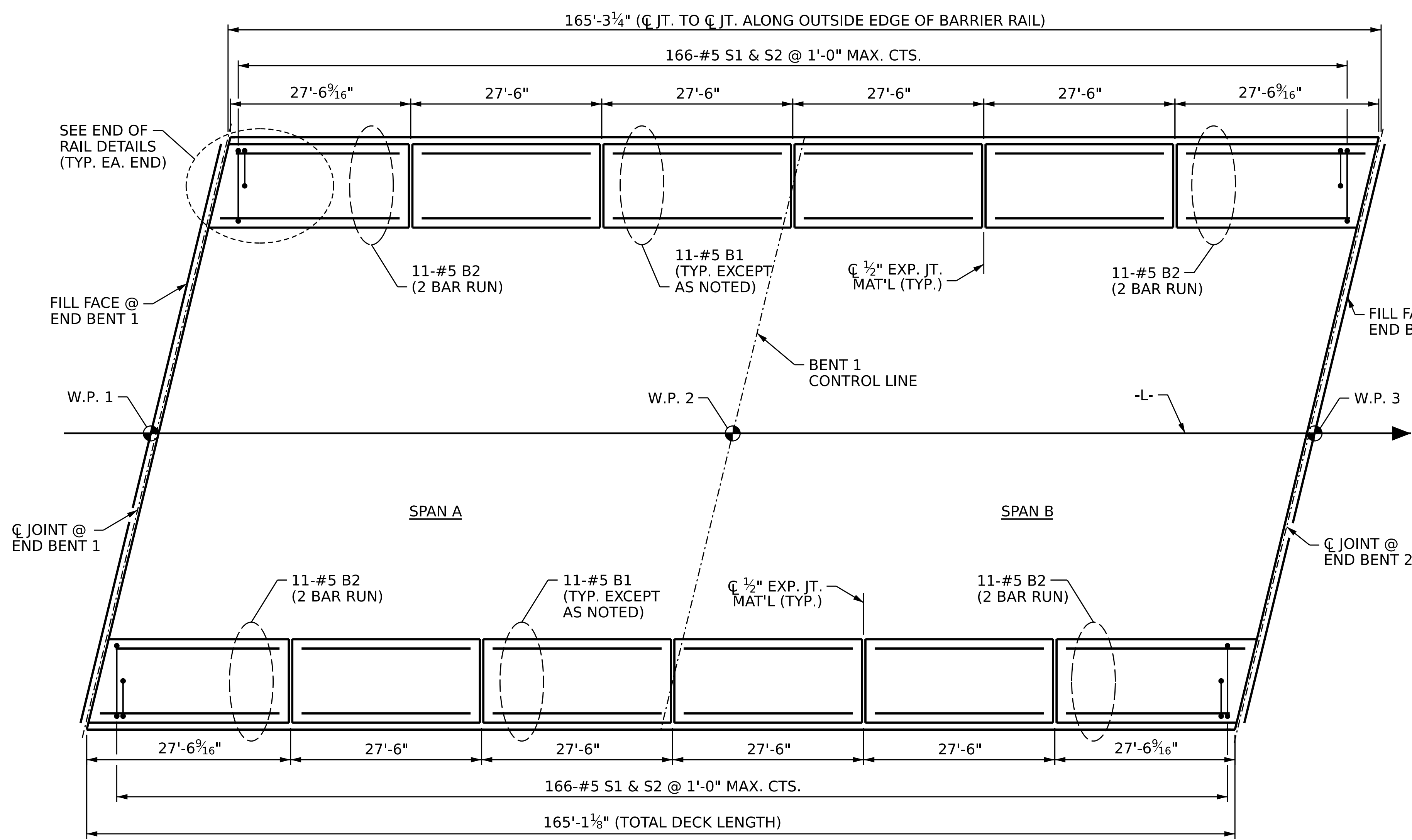
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-21
2			4			45

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DRAWN BY : L.A. SHIELDS DATE : 10/2022
 CHECKED BY : S. NATARAJAN DATE : 10/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022



PLAN OF CONCRETE BARRIER RAIL

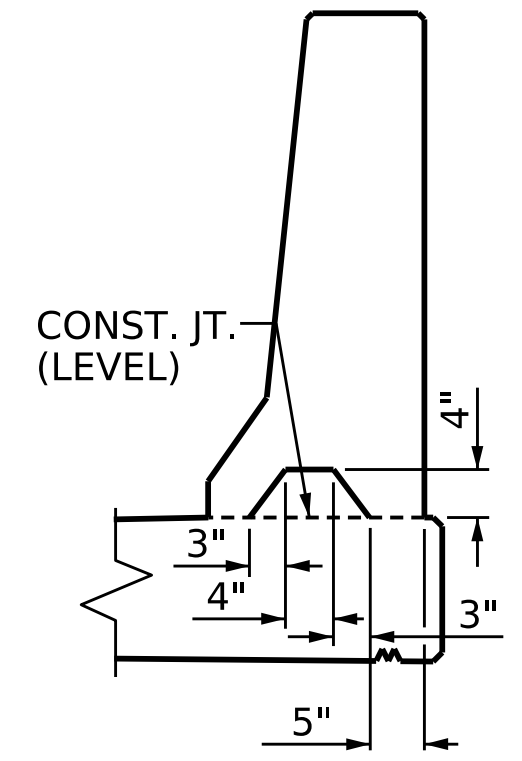
NOTES:

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.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL 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 THE 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.

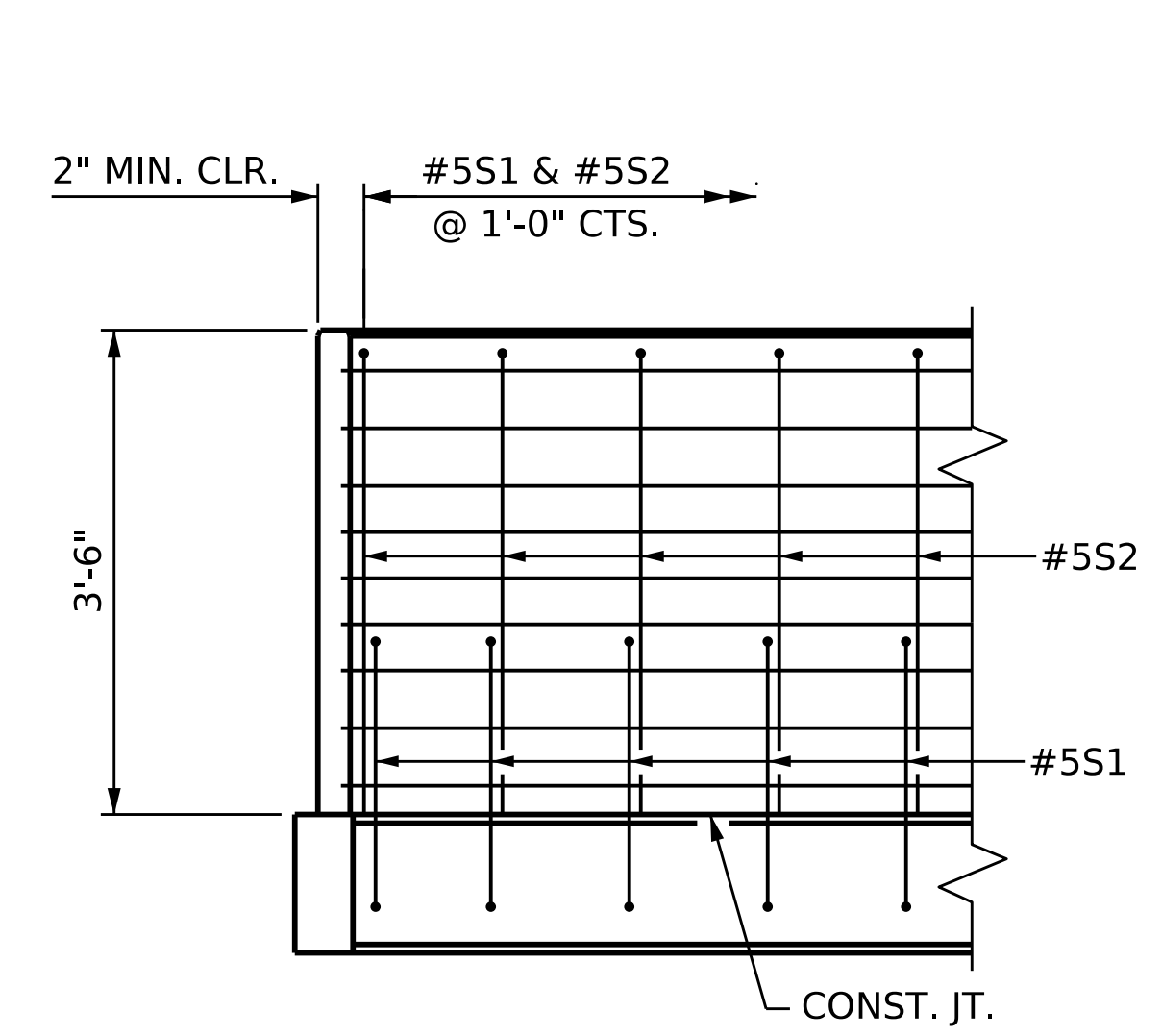
ALL REINFORCING STEEL IN THE CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO PROVIDE 2" CLEARANCE TO THE 1/2" EXPANSION JOINT.

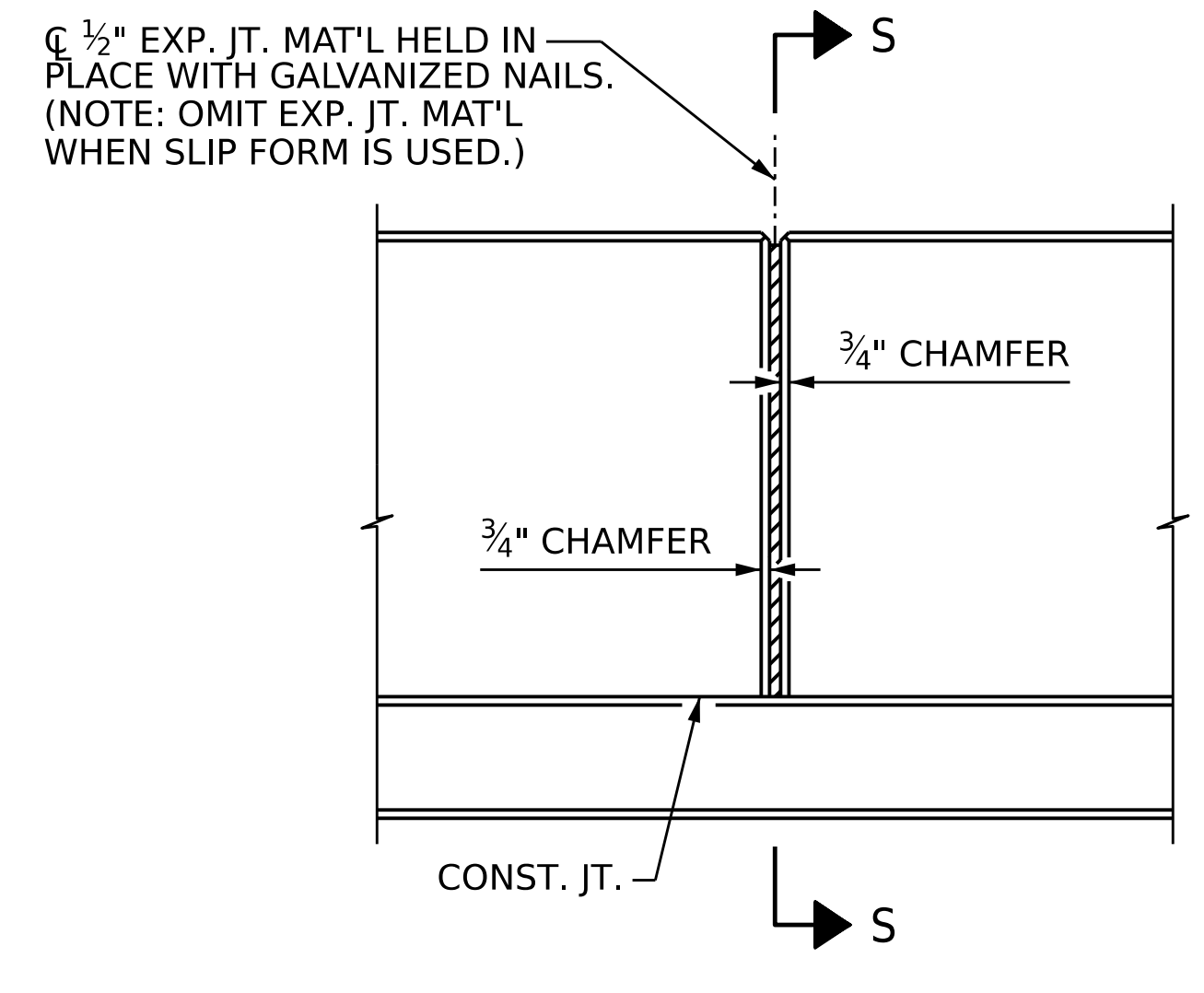


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

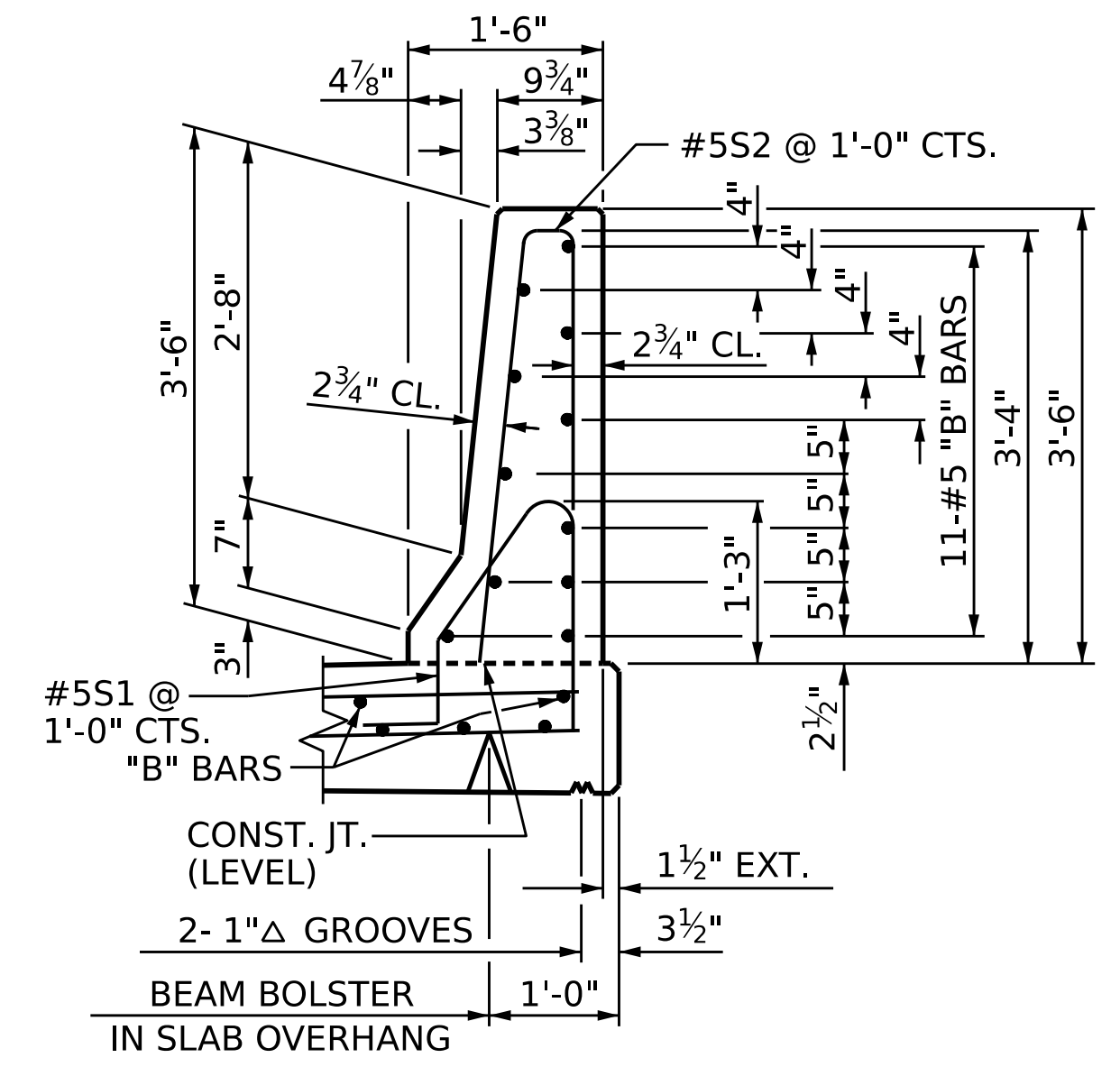
BILL OF MATERIAL					
CONCRETE BARRIER RAIL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	5	STR	27'-2"	2,493
* B2	88	5	STR	15'-3"	1,400
* S1	332	5	1	4'-7"	1,587
* S2	332	5	2	7'-0"	2,424
* EPOXY COATED REINFORCING STEEL					7,904 LBS.
CLASS AA CONCRETE					44.9 C.Y.
CONCRETE BARRIER RAIL					330.5 L.F.
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT.					



END OF RAIL DETAIL



ELEVATION AT EXPANSION JOINTS



SECTION THRU RAIL

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-

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SEAL
030474
ENGINEER
JOHN C. MORRISON

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
CONCRETE BARRIER RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-22
					TOTAL SHEETS 45

DRAWN BY : L.A. SHIELDS	DATE : 11/2022
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NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 3/8" 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 3/8" 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.)

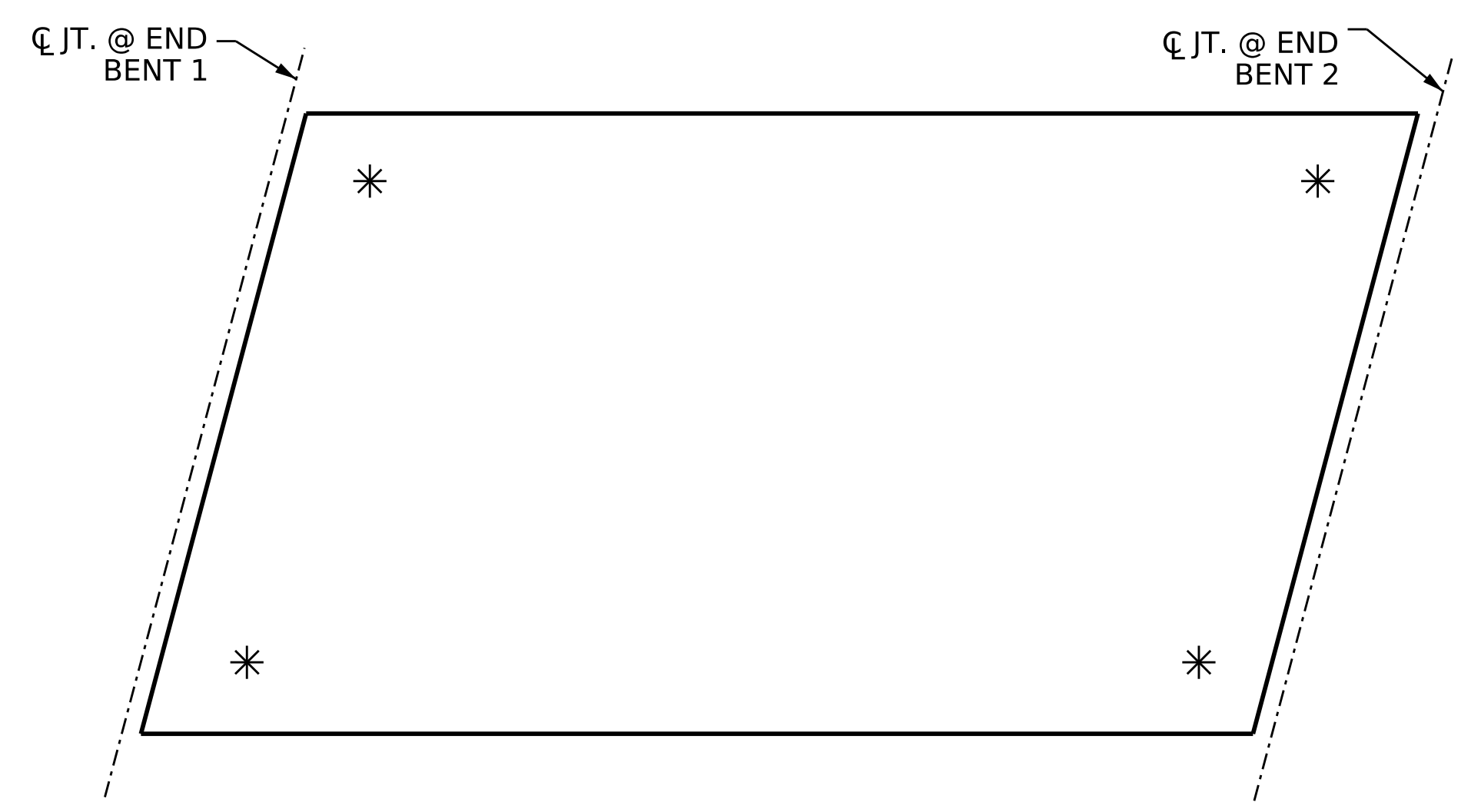
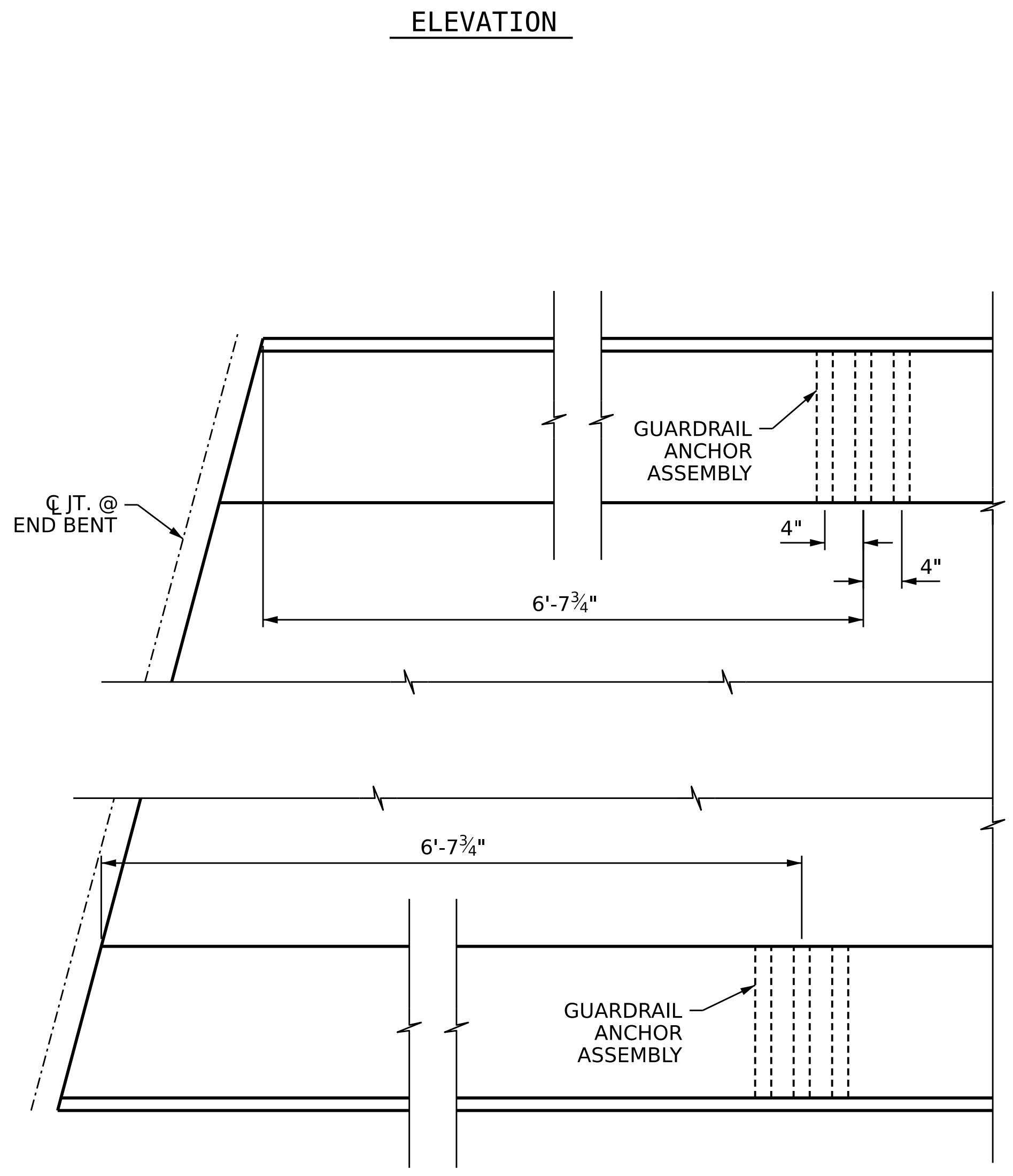
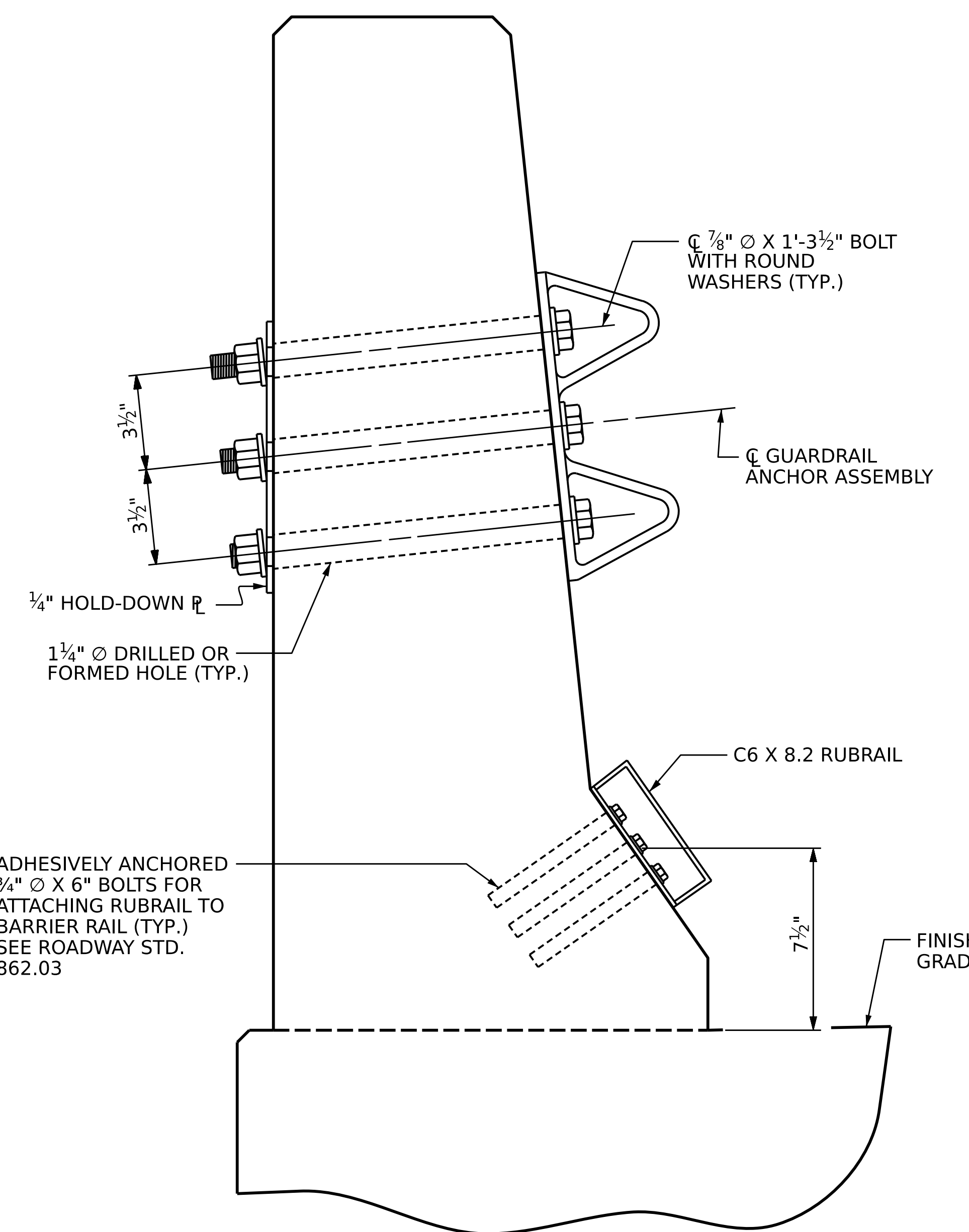
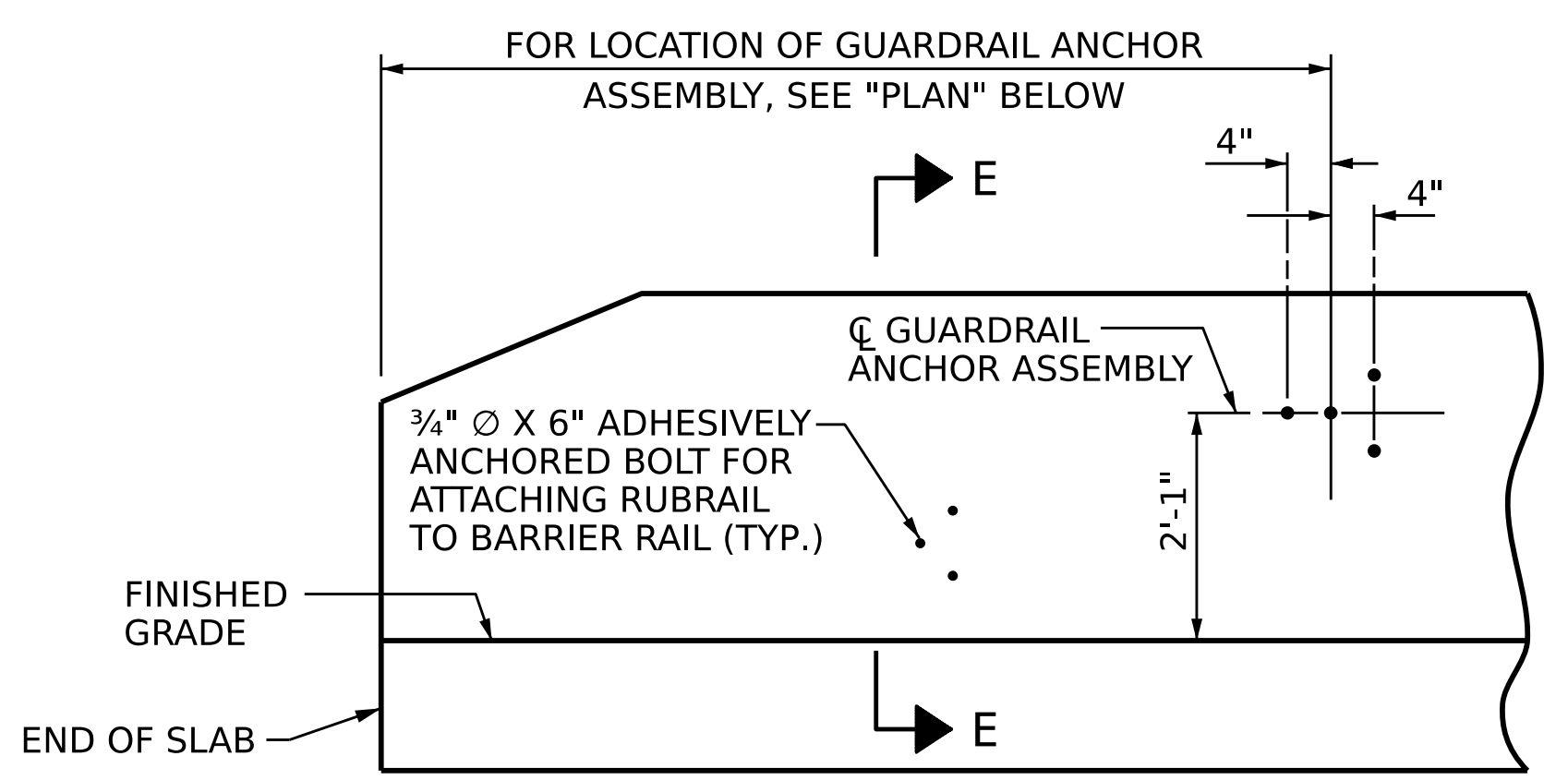
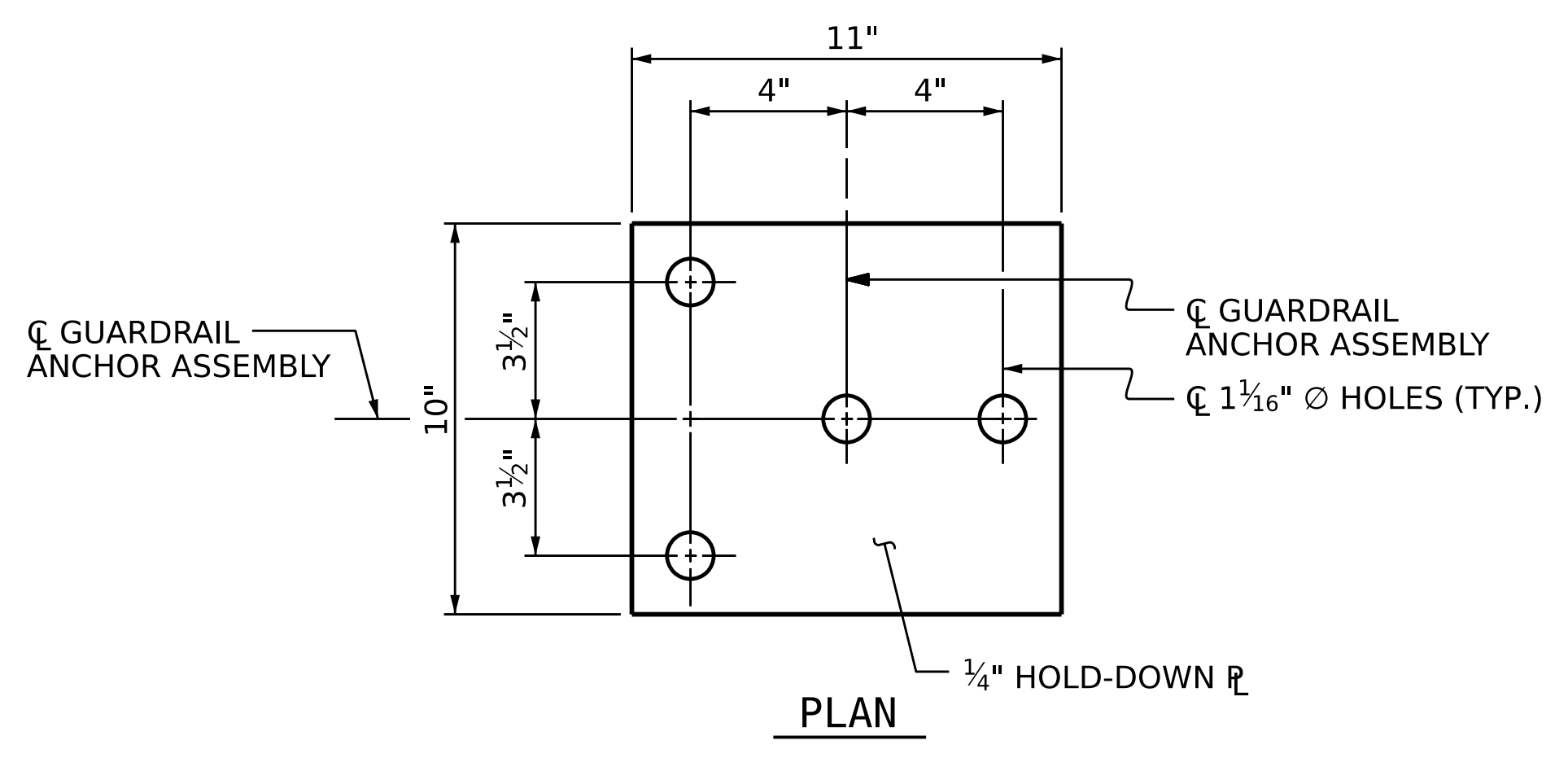
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 1/4" 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. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL
 END BENT #1 SHOWN, END BENT #2 SIMILAR.

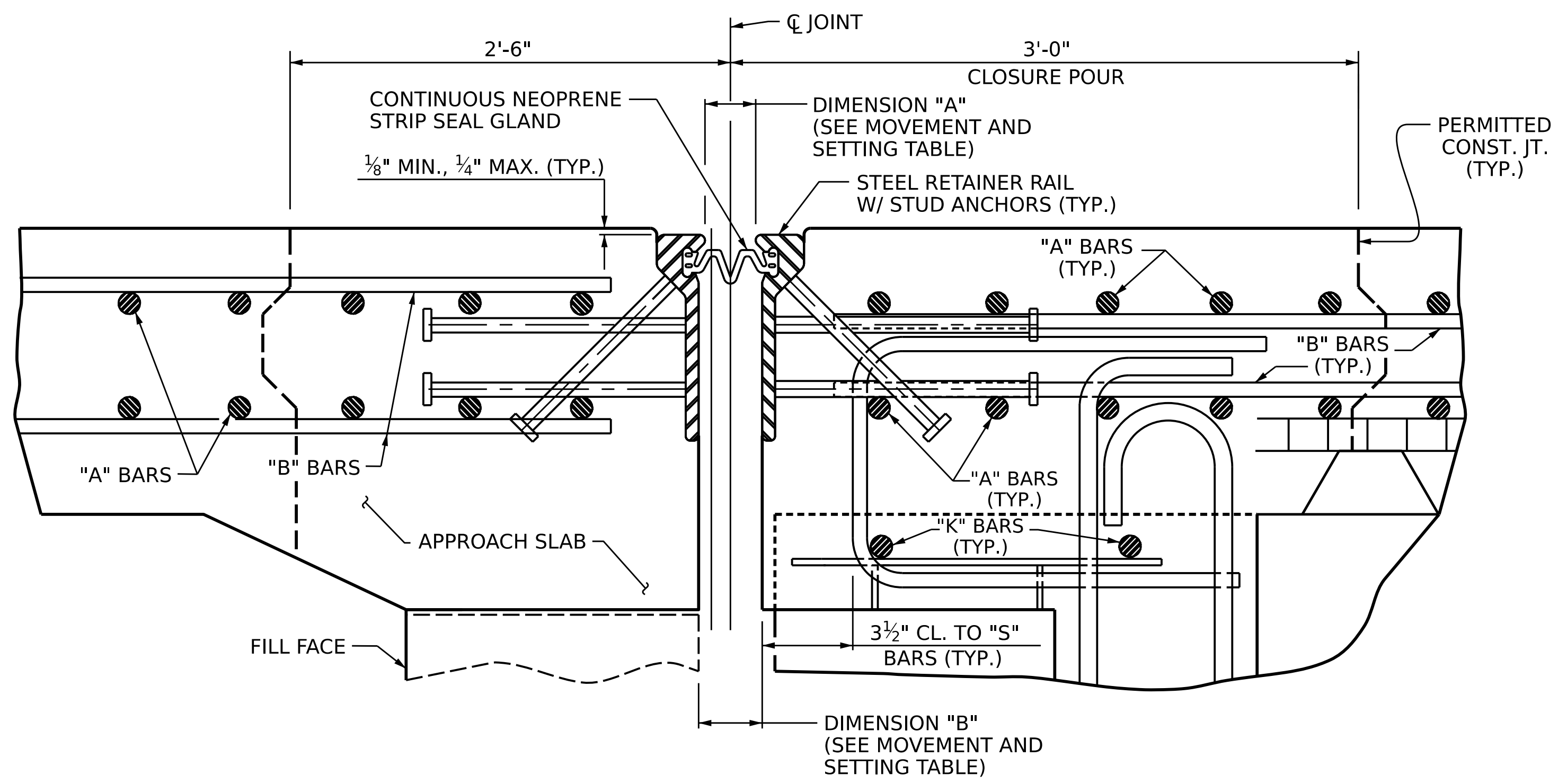
ASSEMBLED BY : L.A. SHIELDS	DATE : 11/2022
CHECKED BY : J.C. MORRISON	DATE : 11/2022
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
S-23					45



STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

JOINT INSTALLATION PROCEDURE

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH/DECK SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.
12. A TEMPORARY GLAND IS REQUIRED FOR STAGE I. NO SEPARATE PAYMENT WILL BE MADE FOR THE TEMPORARY GLANDS.

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

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

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

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

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

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

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

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

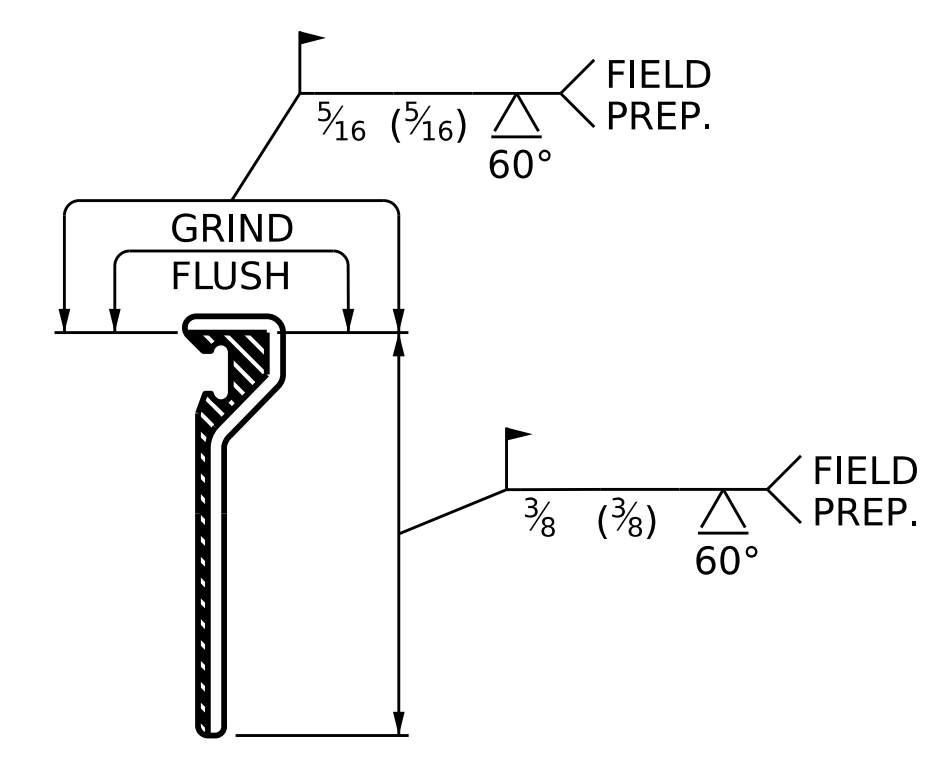
NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

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

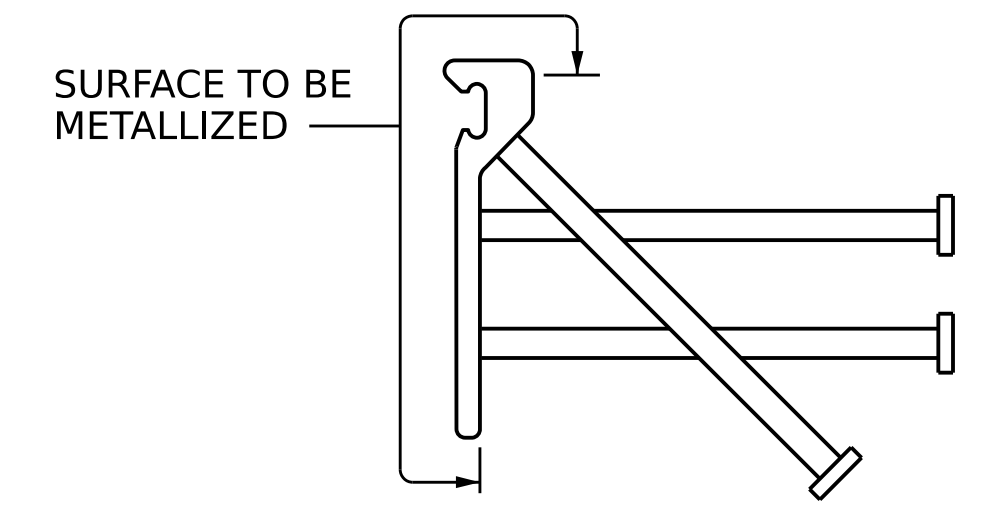
THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

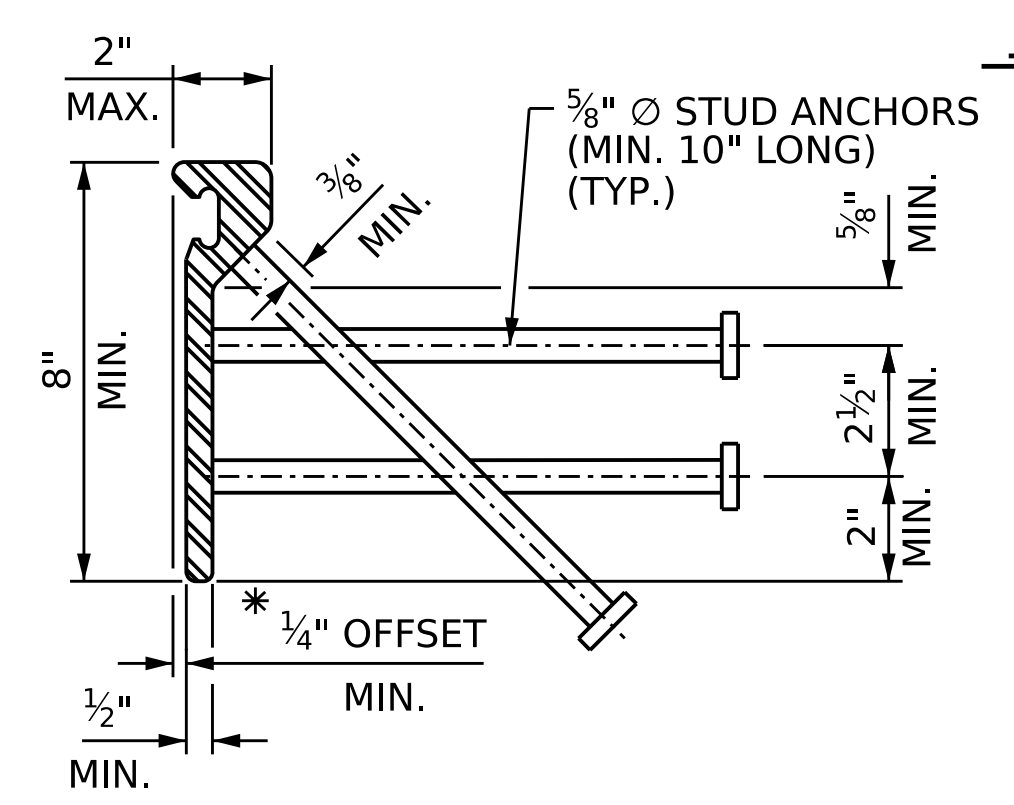
MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ϕ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	103°38'18"	1/2"	2 1/8"	2"	1 7/8"	2 5/8"	2 1/2"	2 3/8"
END BENT 2	103°38'18"	1/2"	2 1/8"	2"	1 7/8"	2 5/8"	2 1/2"	2 3/8"



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL



TYPICAL SECTION STEEL RETAINER RAIL

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

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 1 OF 2

DRAWN BY : D.R. DRUM DATE : 12/2022
 CHECKED BY : J.C. MORRISON DATE : 12/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022

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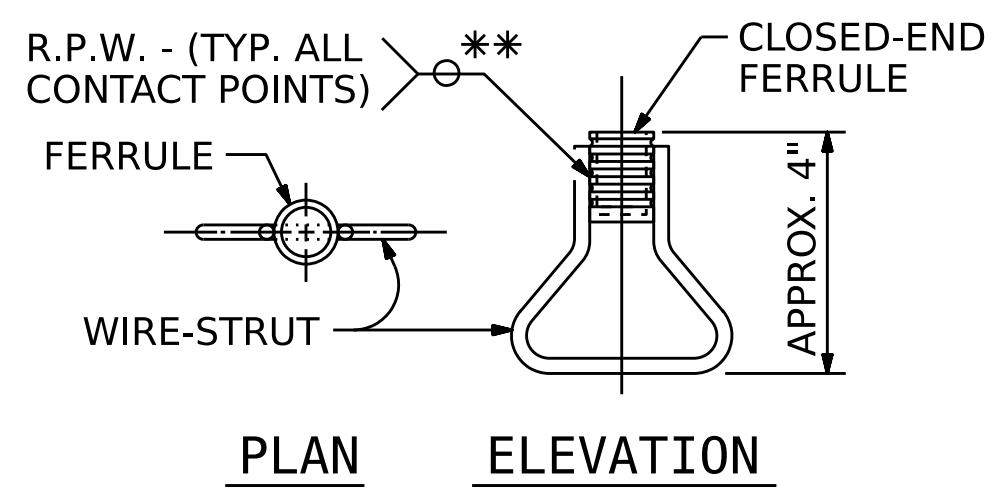
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

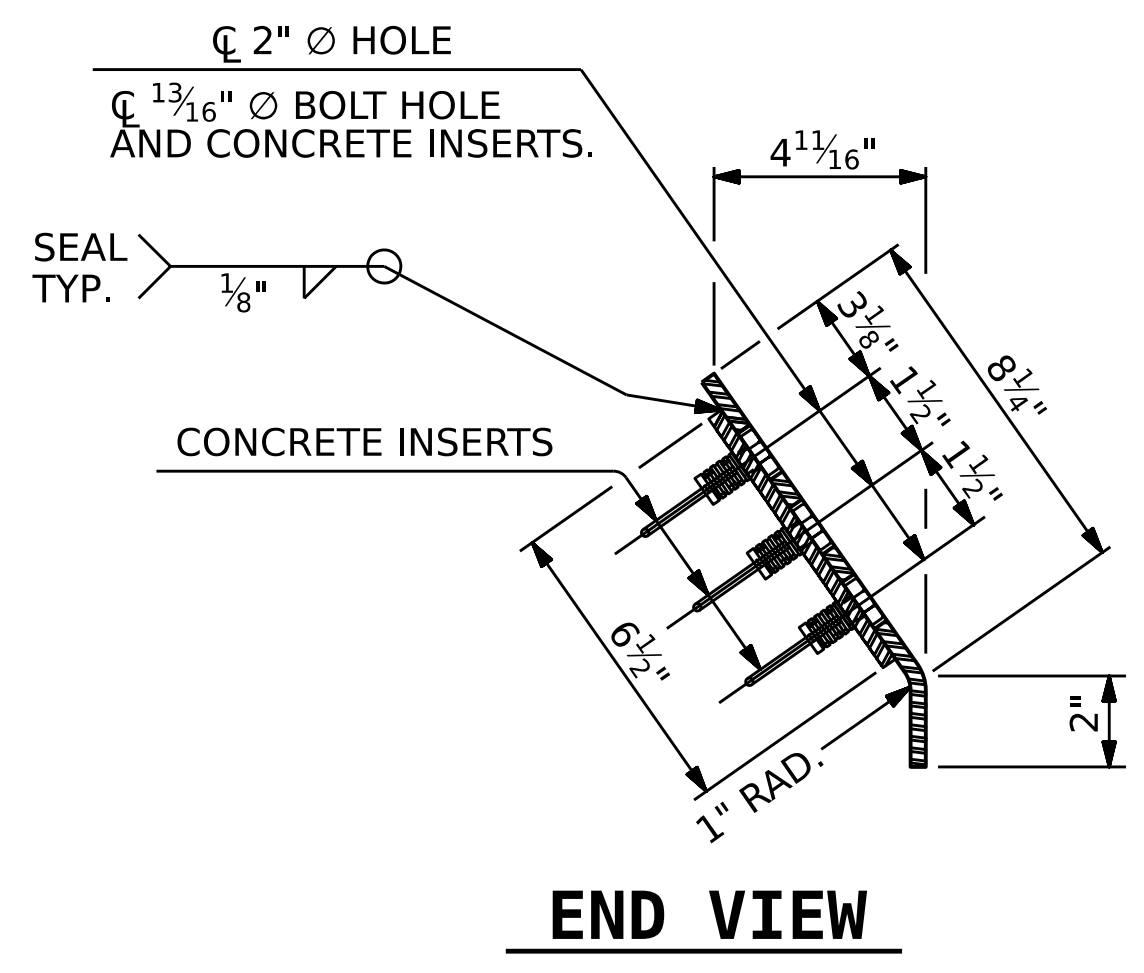
STANDARD
STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 45
2			4			

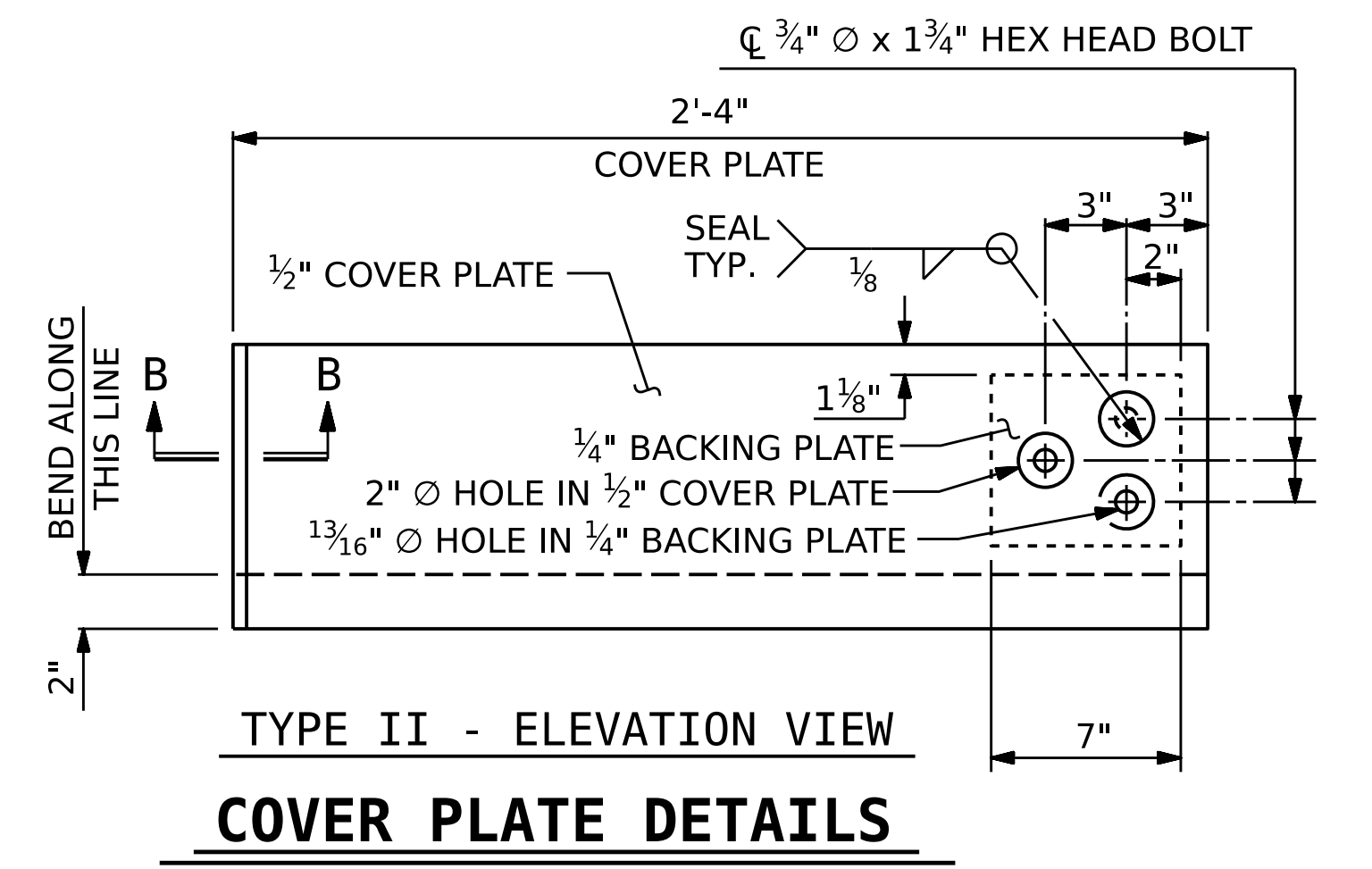


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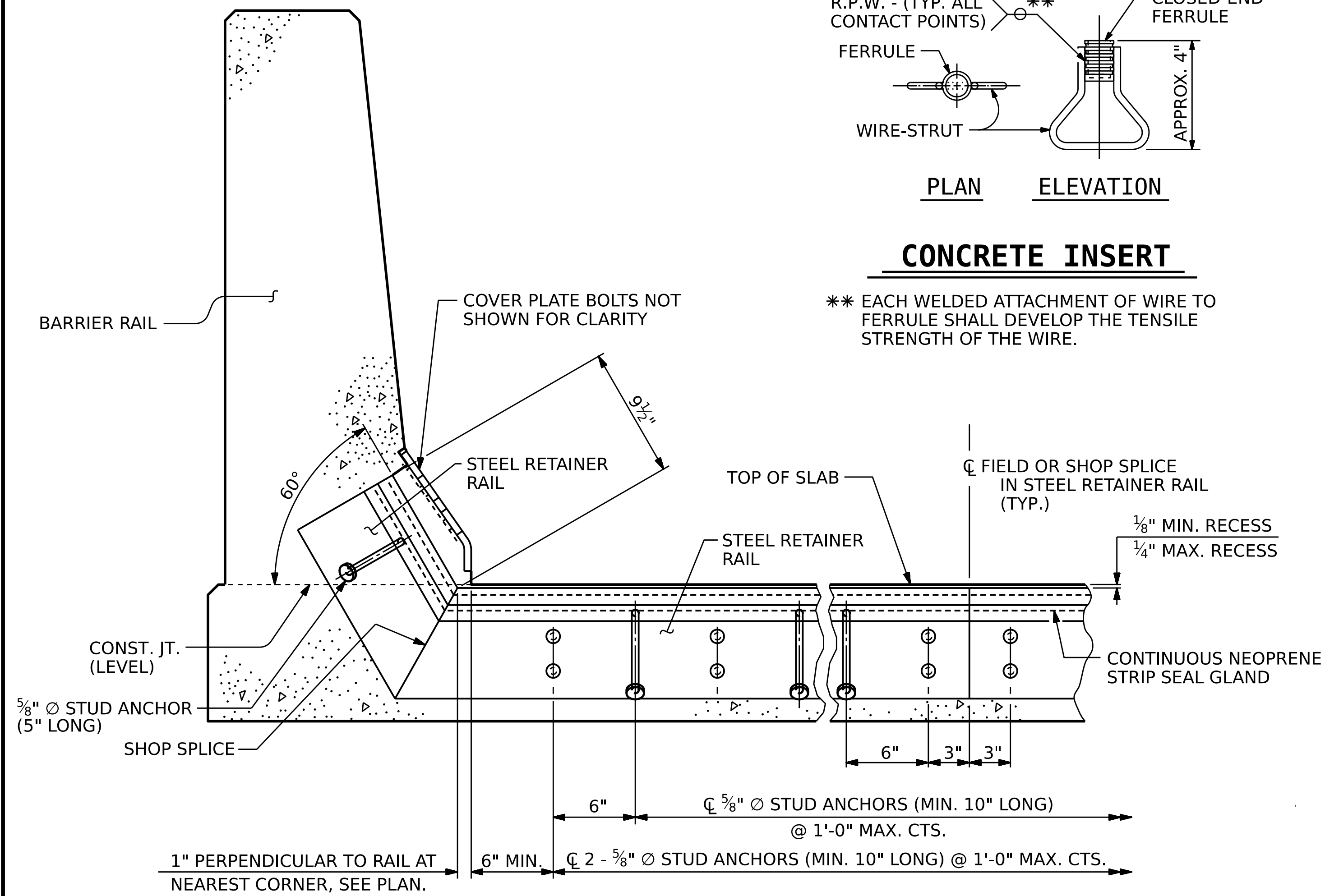
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



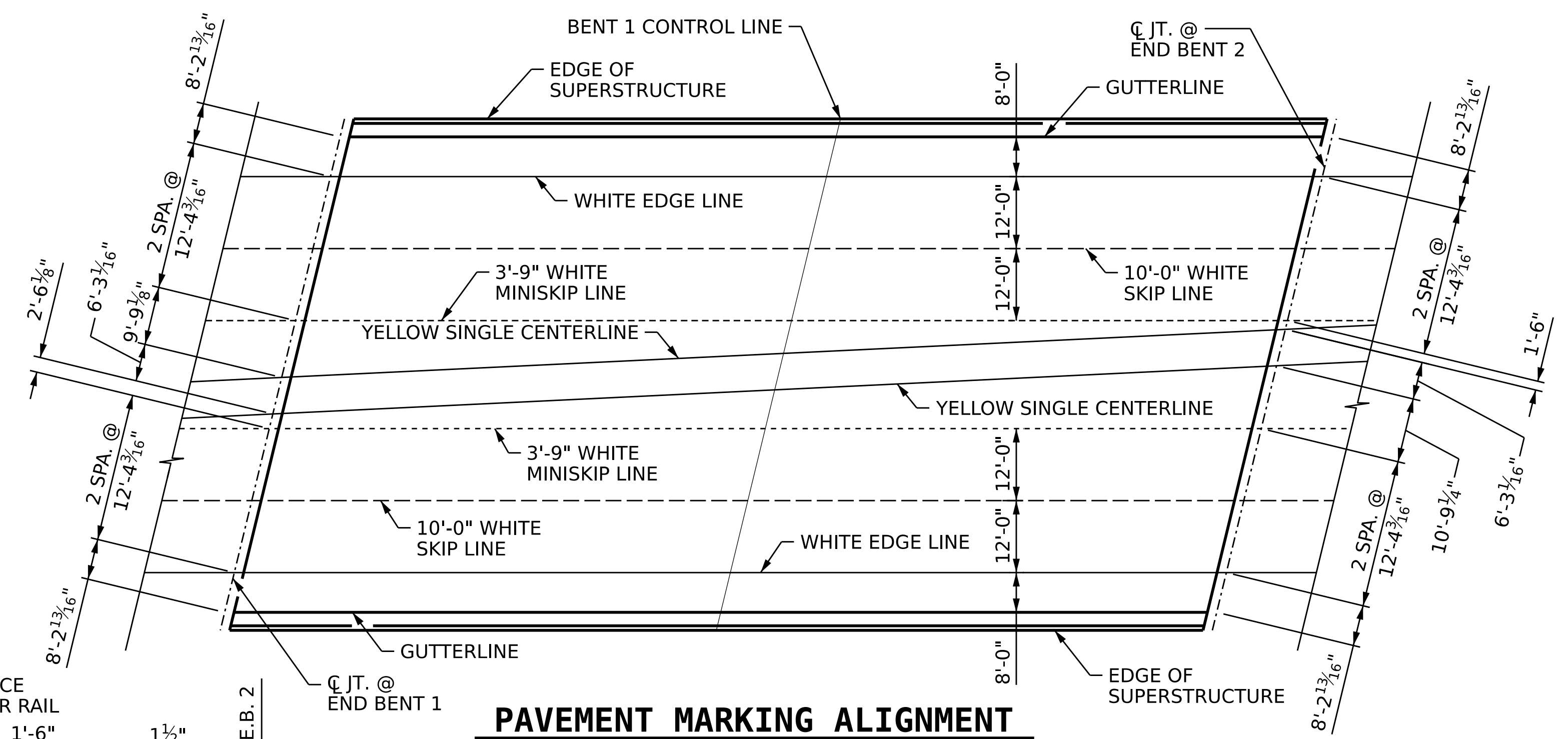
END VIEW



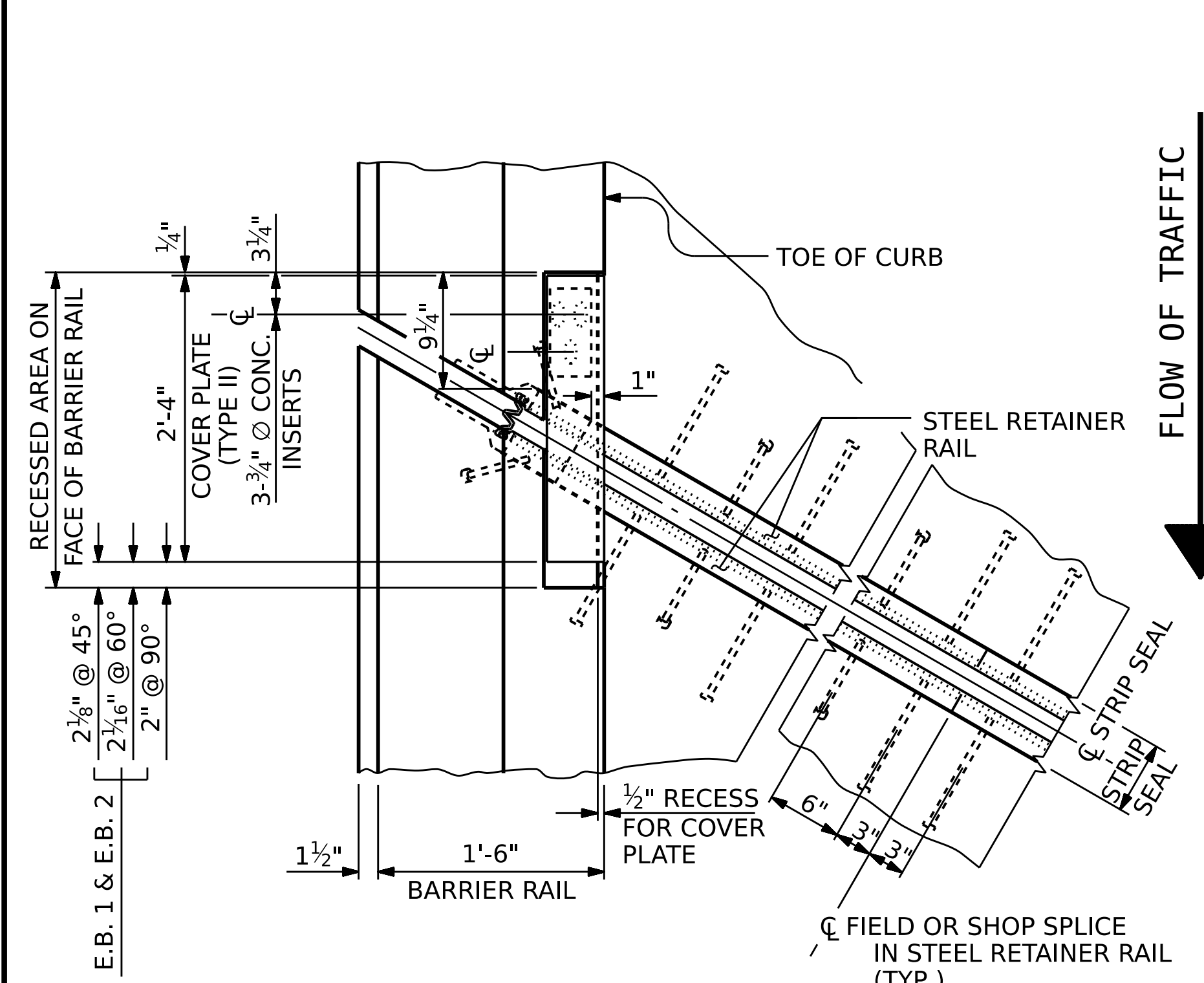
COVER PLATE DETAILS



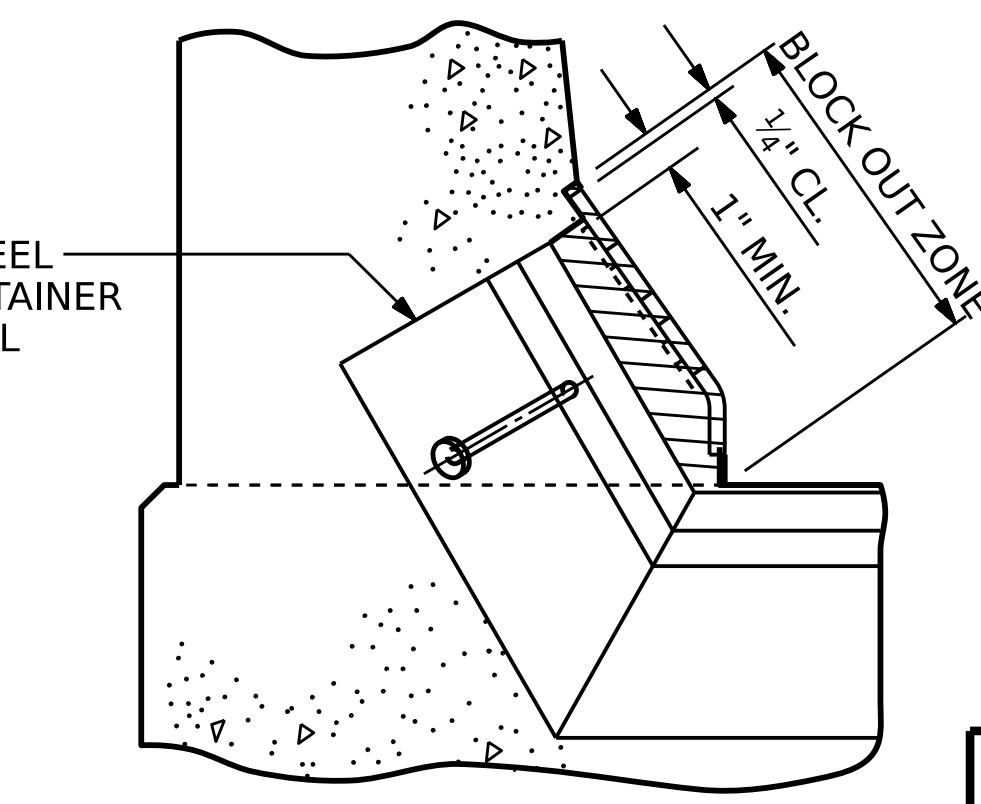
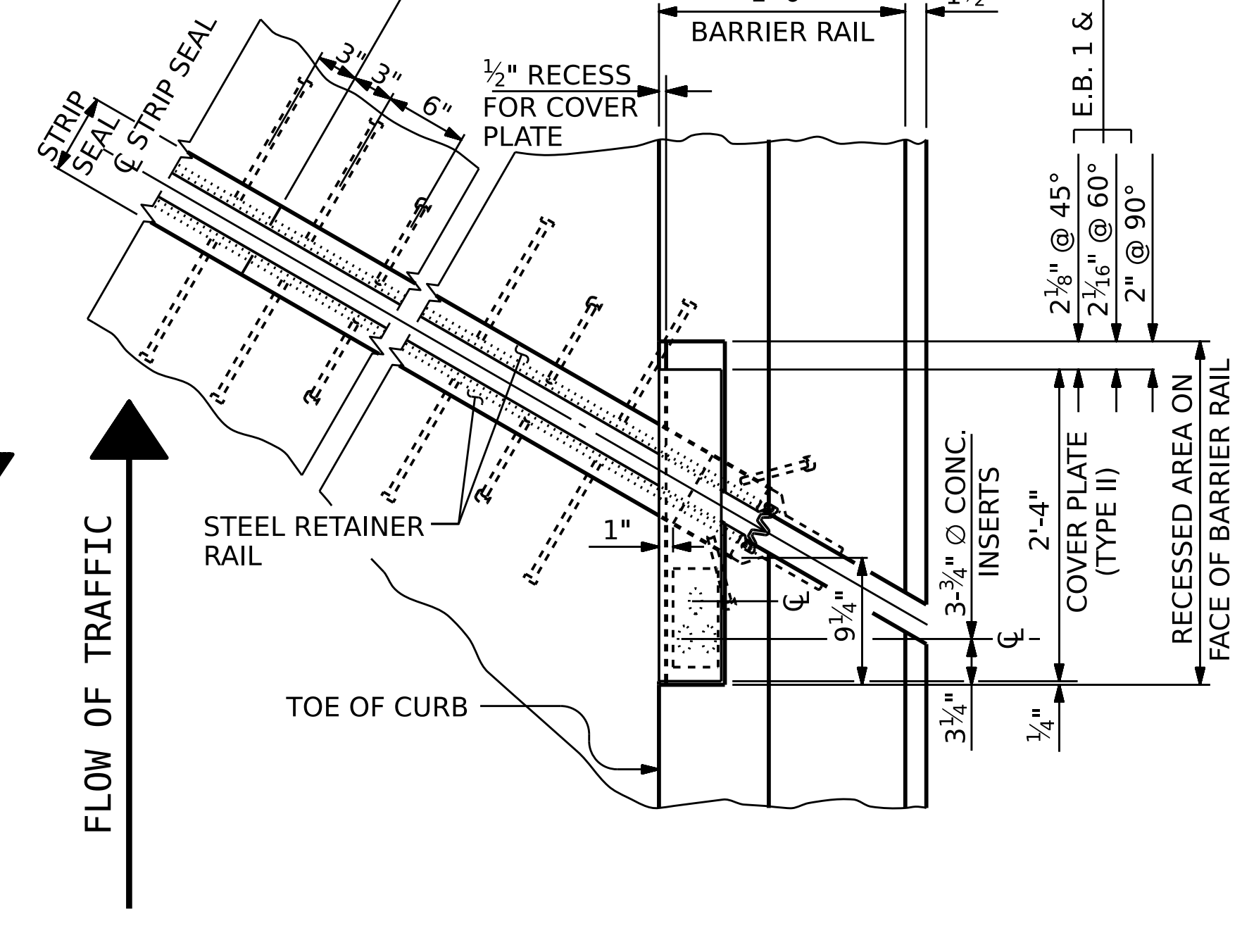
SECTION THRU RAIL NORMAL TO JOINT



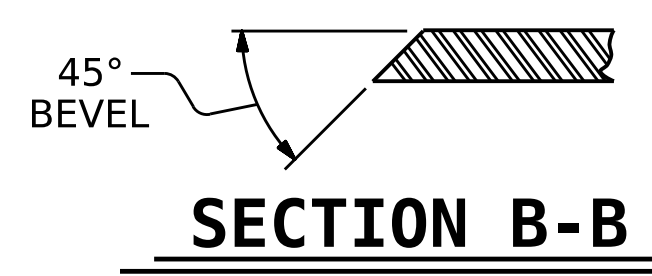
PAVEMENT MARKING ALIGNMENT



PLAN OF STRIP SEAL EXPANSION JOINT



BLOCK OUT DETAIL



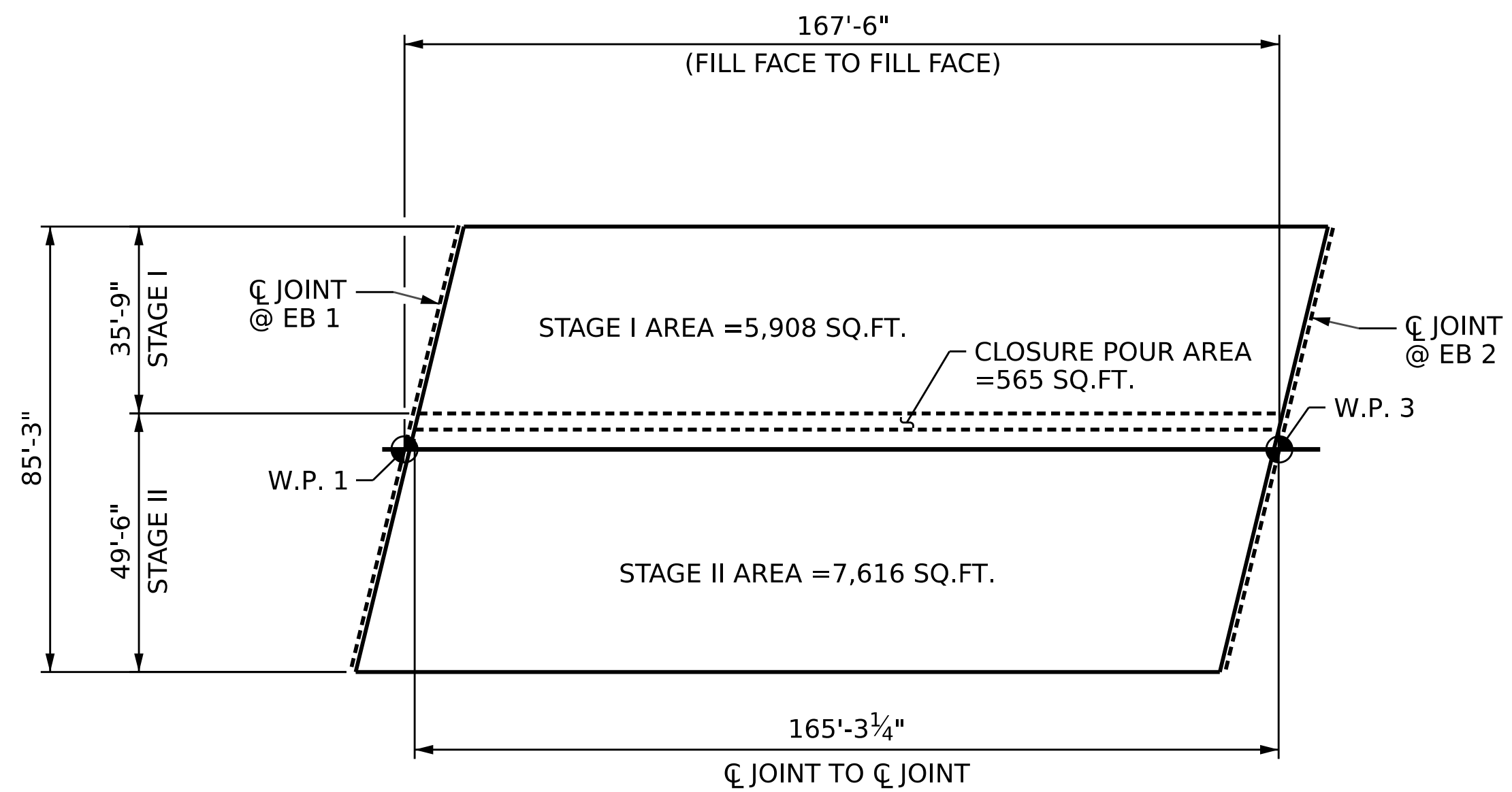
SECTION B-B

PROJECT NO. BR-0043
 ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-25
STANDARD STRIP SEAL EXPANSION JOINT DETAILS FOR BARRIER RAIL						
REVISIONS						TOTALS 45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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CHECKED BY :	J.C. MORRISON	DATE :	12/2022
DESIGN ENGINEER OF RECORD :	J.C. MORRISON	DATE :	12/2022

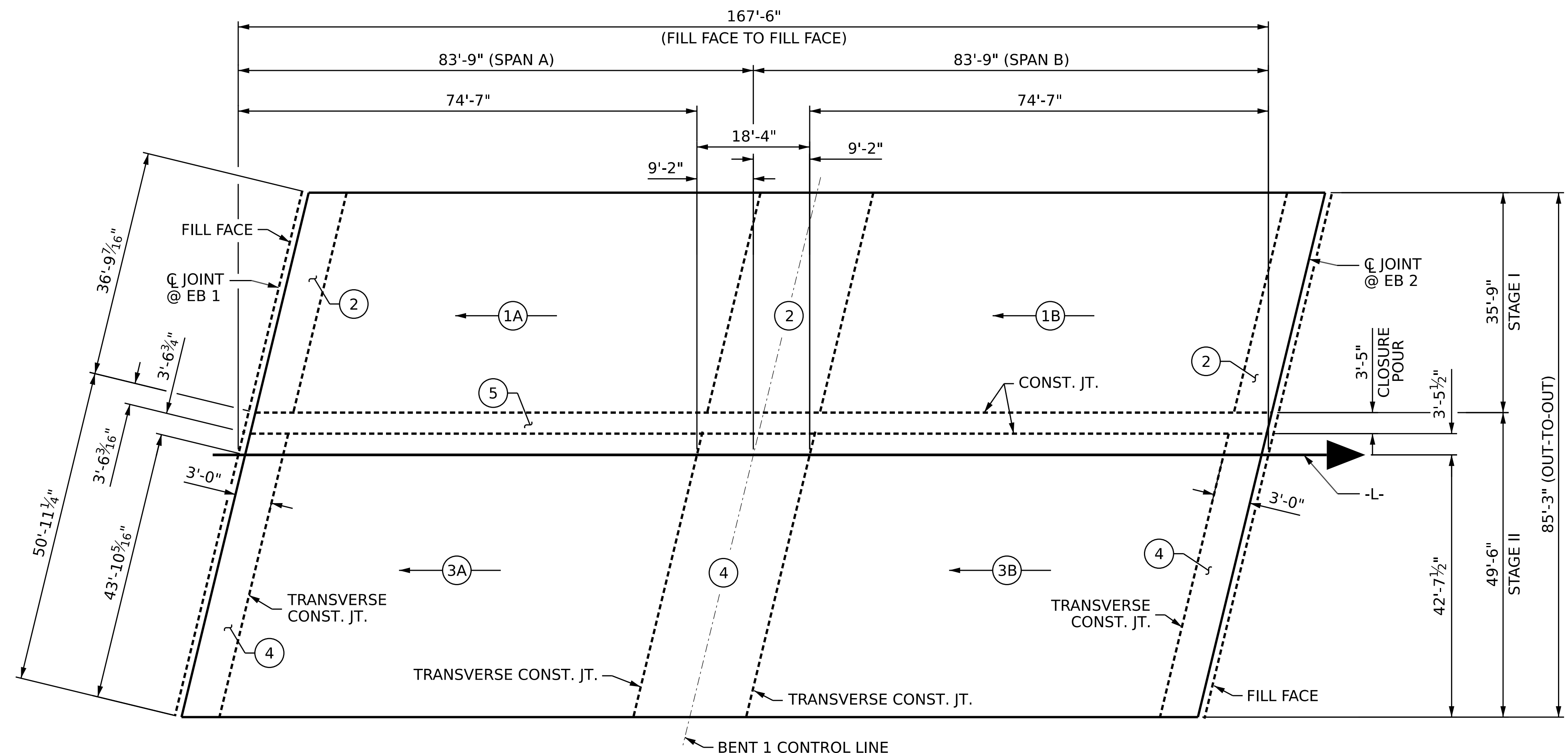
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LAYOUT OF COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 14,089)

GROOVING BRIDGE FLOORS	
STAGE I	
APPROACH SLABS	1,610 SQ.FT.
BRIDGE DECK	5,380 SQ.FT.
TOTAL	6,990 SQ. FT.
STAGE II	
APPROACH SLABS	2,288 SQ.FT.
BRIDGE DECK	7,648 SQ.FT.
TOTAL	9,936 SQ.FT.
TOTAL	
APPROACH SLABS	3,898 SQ.FT.
BRIDGE DECK	13,028 SQ.FT.
TOTAL	16,926 SQ.FT.



POURING SEQUENCE

FOR STAGE I, POUR #2 SHALL NOT BE POURED UNTIL BOTH ADJACENT POURS #1 REACH A MIN. OF 3,000 PSI. (STAGES I & II SIMILAR)

→ INDICATES POUR NUMBER AND DIRECTION

NOTE:
CONCRETE MEDIAN SHALL NOT BE POURED PRIOR TO COMPLETION OF THE ENTIRE DECK POUR FOR EACH STAGE.
FOR POUR QUANTITIES, SEE SHEET 2 OF 2

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 1 OF 2

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STATE OF NORTH CAROLINA
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 RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-26
2			4			45

DRAWN BY :	M.L. CATER	DATE :	11/2022
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DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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REINFORCING BAR SCHEDULE											
STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* D1	360	5	STR	5'-4"	2002	* D1	360	5	STR	5'-4"	2002
D2	360	5	STR	5'-4"	2002	D2	360	5	STR	5'-4"	2002
						* A3	336	5	STR	45'-9"	16033
* A1	341	5	STR	35'-5"	12596	A4	336	5	STR	45'-9"	16033
A2	341	5	STR	35'-5"	12596						
* A101	2	5	STR	34'-2"	71	* A301	2	5	STR	44'-7"	93
* A102	2	5	STR	32'-3"	67	* A302	2	5	STR	42'-8"	89
* A103	2	5	STR	30'-4"	63	* A303	2	5	STR	40'-9"	85
* A104	2	5	STR	28'-5"	59	* A304	2	5	STR	38'-10"	81
* A105	2	5	STR	26'-7"	55	* A305	2	5	STR	37'-0"	77
* A106	2	5	STR	24'-8"	51	* A306	2	5	STR	35'-1"	73
* A107	2	5	STR	22'-9"	47	* A307	2	5	STR	33'-2"	69
* A108	2	5	STR	20'-11"	44	* A308	2	5	STR	31'-4"	65
* A109	2	5	STR	19'-0"	40	* A309	2	5	STR	29'-5"	61
* A110	2	5	STR	17'-1"	36	* A310	2	5	STR	27'-6"	57
* A111	2	5	STR	15'-3"	32	* A311	2	5	STR	25'-8"	54
* A112	2	5	STR	13'-4"	28	* A312	2	5	STR	23'-9"	50
* A113	2	5	STR	11'-5"	24	* A313	2	5	STR	21'-10"	46
* A114	2	5	STR	9'-7"	20	* A314	2	5	STR	20'-0"	42
* A115	2	5	STR	7'-8"	16	* A315	2	5	STR	18'-1"	38
* A116	2	5	STR	5'-9"	12	* A316	2	5	STR	16'-2"	34
* A117	2	5	STR	3'-11"	8	* A317	2	5	STR	14'-4"	30
* A118	2	5	STR	2'-0"	4	* A318	2	5	STR	12'-5"	26
						* A319	2	5	STR	10'-6"	22
						* A320	2	5	STR	8'-7"	18
A201	2	5	STR	34'-1"	71	* A321	2	5	STR	6'-9"	14
A202	2	5	STR	32'-2"	67	* A322	2	5	STR	4'-10"	10
A203	2	5	STR	30'-3"	63	* A323	2	5	STR	2'-11"	6
A204	2	5	STR	28'-4"	59	A401	2	5	STR	44'-7"	93
A205	2	5	STR	26'-6"	55	A402	2	5	STR	42'-8"	89
A206	2	5	STR	24'-7"	51	A403	2	5	STR	40'-9"	85
A207	2	5	STR	22'-8"	47	A404	2	5	STR	38'-10"	81
A208	2	5	STR	20'-10"	43	A405	2	5	STR	37'-0"	77
A209	2	5	STR	18'-11"	39	A406	2	5	STR	35'-1"	73
A210	2	5	STR	17'-0"	35	A407	2	5	STR	33'-2"	69
A211	2	5	STR	15'-2"	32	A408	2	5	STR	31'-4"	65
A212	2	5	STR	13'-3"	28	A409	2	5	STR	29'-5"	61
A213	2	5	STR	11'-4"	24	A410	2	5	STR	27'-6"	57
A214	2	5	STR	9'-6"	20	A411	2	5	STR	25'-8"	54
A215	2	5	STR	7'-7"	16	A412	2	5	STR	23'-9"	50
A216	2	5	STR	5'-8"	12	A413	2	5	STR	21'-10"	46
A217	2	5	STR	3'-10"	8	A414	2	5	STR	20'-0"	42
						A415	2	5	STR	18'-1"	38
* B1	100	4	STR	28'-3"	1887	A416	2	5	STR	16'-2"	34
* B2	75	6	STR	21'-6"	2422	A417	2	5	STR	14'-4"	30
* B3	47	6	STR	37'-10"	2671	A418	2	5	STR	12'-5"	26
B4	176	5	STR	42'-9"	7848	A419	2	5	STR	10'-6"	22
B5	80	4	STR	22'-4"	1193	A420	2	5	STR	8'-7"	18
						A421	2	5	STR	6'-9"	14
* K1	4	8	1	15'-6"	166	A422	2	5	STR	4'-10"	10
* K2	8	8	2	23'-7"	504						
* K3	4	8	1	12'-6"	134	* B1	128	4	STR	28'-6"	2437
* K4	12	6	STR	8'-7"	155	* B2	96	6	STR	21'-6"	3100
						* B3	61	6	STR	37'-10"	3466
* S1	54	5	4	6'-5"	361	B4	248	5	STR	42'-9"	11058
* S2	54	4	3	3'-9"	135	B5	112	4	STR	22'-4"	1671
* G1	2	5	STR	36'-6"	76	* K1	4	1	STR	15'-6"	166
						* K2	12	2	STR	23'-7"	756
						* K3	4	1	STR	12'-6"	134
						* K4	16	STR	STR	8'-7"	206
						K5	4	STR	STR	4'-7"	49
						* K6	4	STR	STR	3'-7"	22
						* S1	78	5	4	6'-5"	522
						* S2	78	4	3	3'-9"	195
						* G2	2	5	STR	47'-6"	99
						* G3	2	5	STR	2'-9"	6

BILL OF MATERIAL				
		CLASS AA CONCRETE (CU. YDS)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
STAGE I	POUR #1	164.2	-	-
	POUR #2	31.7	-	-
	TOTAL	195.9	24,309	23,786
STAGE II	POUR #3	210.9	-	-
	POUR #4	41.0	-	-
	POUR #5	17.4	-	-
	TOTAL	269.3	31,947	30,284
	TOTALS **	465.2	56,256	54,070

** MEDIAN QUANTITIES ARE NOT INCLUDED

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

* EPOXY COATED REINFORCING STEEL	54,070 LBS.
REINFORCING STEEL	56,256 LBS.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MIN. SPLICE LENGTHS

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

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-

SHEET 2 OF 2

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RALEIGH

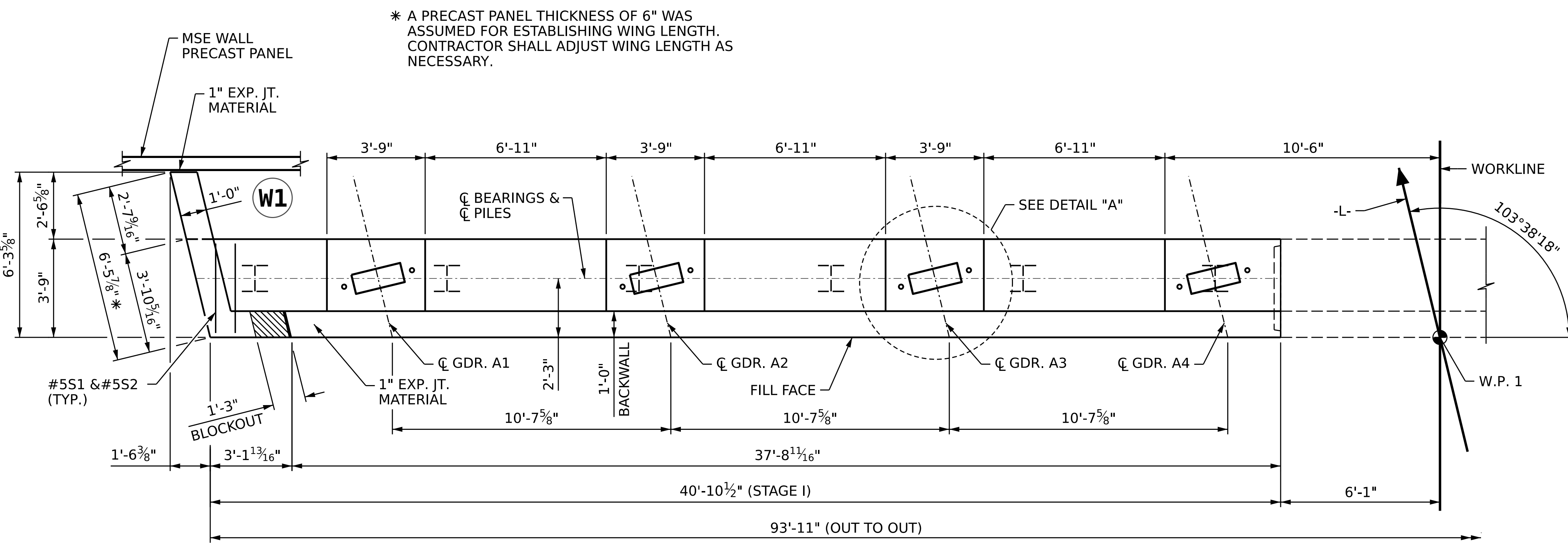
SUPERSTRUCTURE

BILL OF MATERIAL

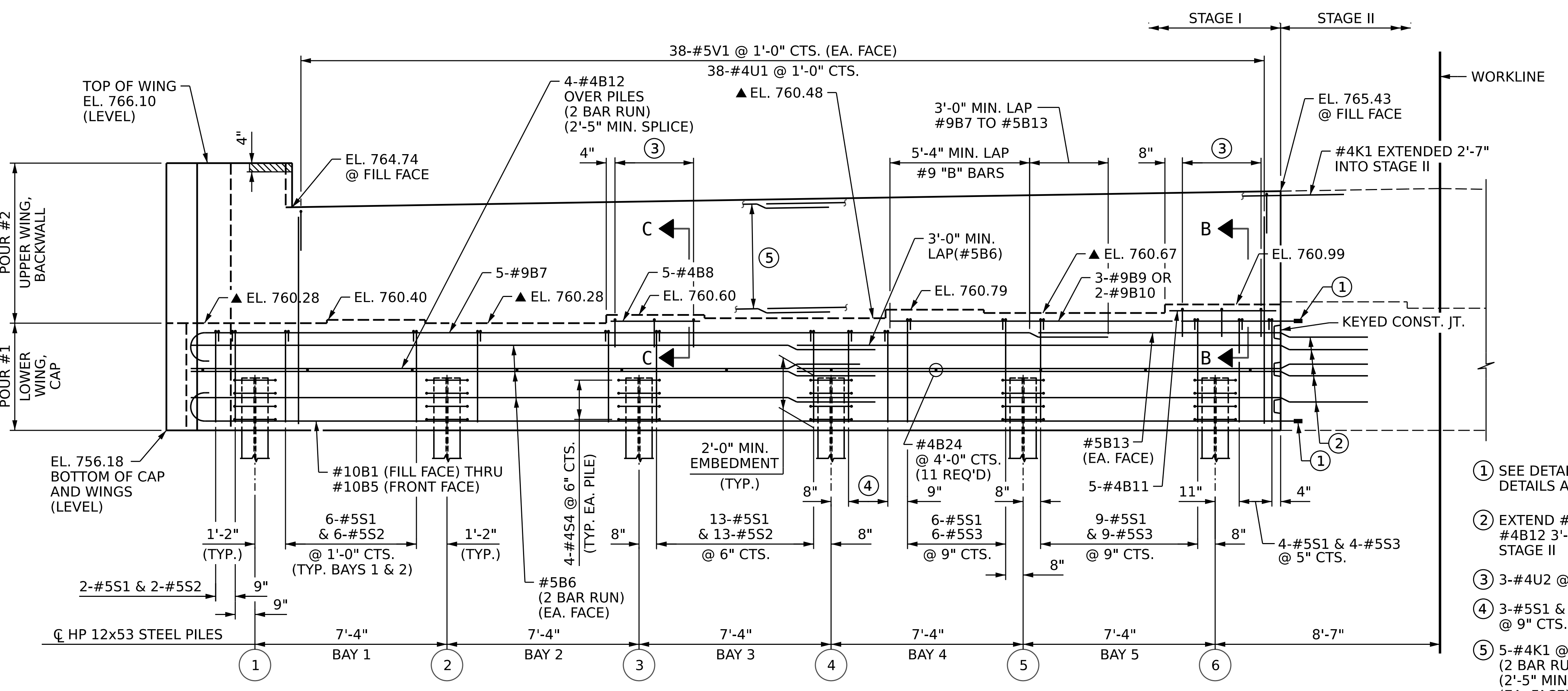
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 45

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DRAWN BY: M.L. CATER DATE: 11/2022
CHECKED BY: J.C. MORRISON DATE: 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022



PLAN



ELEVATION

NOTES:

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" OR #10 "B" BARS IN STAGE I WITH THE #9 "B" OR #10 "B" BARS, RESPECTIVELY, IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 OR #10 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

#5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

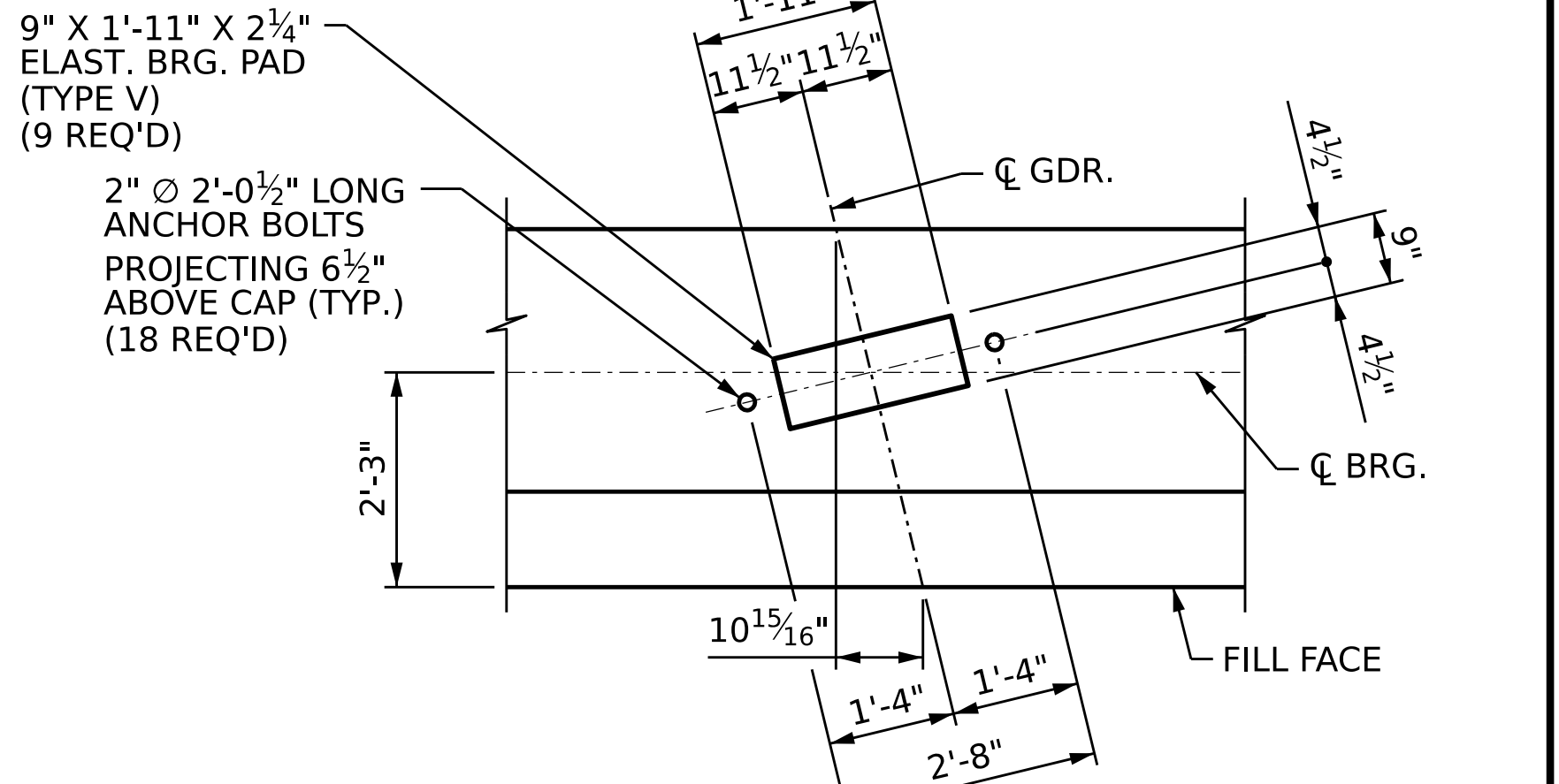
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 3 OF 5.

FOR DETAIL "B", PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 4 OF 5.

FOR CONSTRUCTION JOINT DETAILS, SEE "KEYED CONSTRUCTION JOINT DETAIL" ON SHEET 4 OF 5.

FOR SECTIONS B-B AND C-C, SEE SHEET 5 OF 5.



DETAIL "A"

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 1 OF 5

- ① SEE DETAIL "B" FOR REINF. DETAILS AT CONST. JT.
- ② EXTEND #5B6, #5B13, #4B12 3'-2" MIN. INTO STAGE II
- ③ 3-#4U2 @ 1'-6" CTS.
- ④ 3-#5S1 & 3-#5S2 @ 9" CTS.
- ⑤ 5-#4K1 @ 1'-0" CTS. (2 BAR RUN) (2'-5" MIN. LAP) (EA. FACE)

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1/31/2023
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1
STAGE I

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

SHEET NO.	S-28
TOTAL SHEETS	45

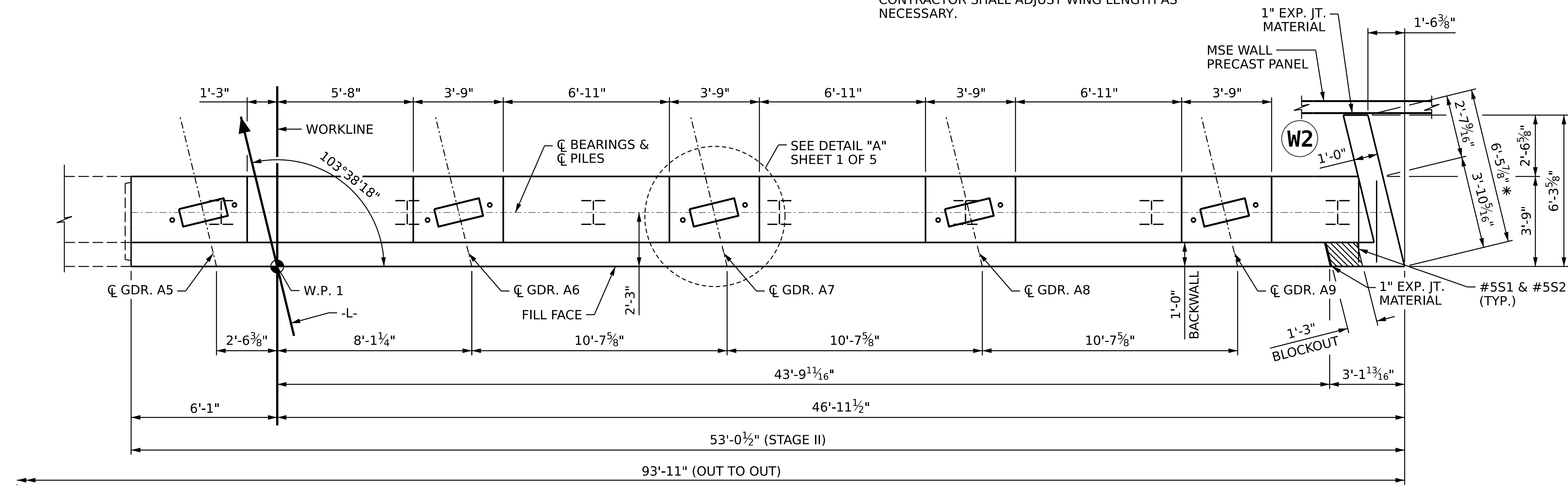
DRAWN BY: D.R. DRUM DATE: 11/2022
CHECKED BY: D. RITACCO DATE: 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 5.

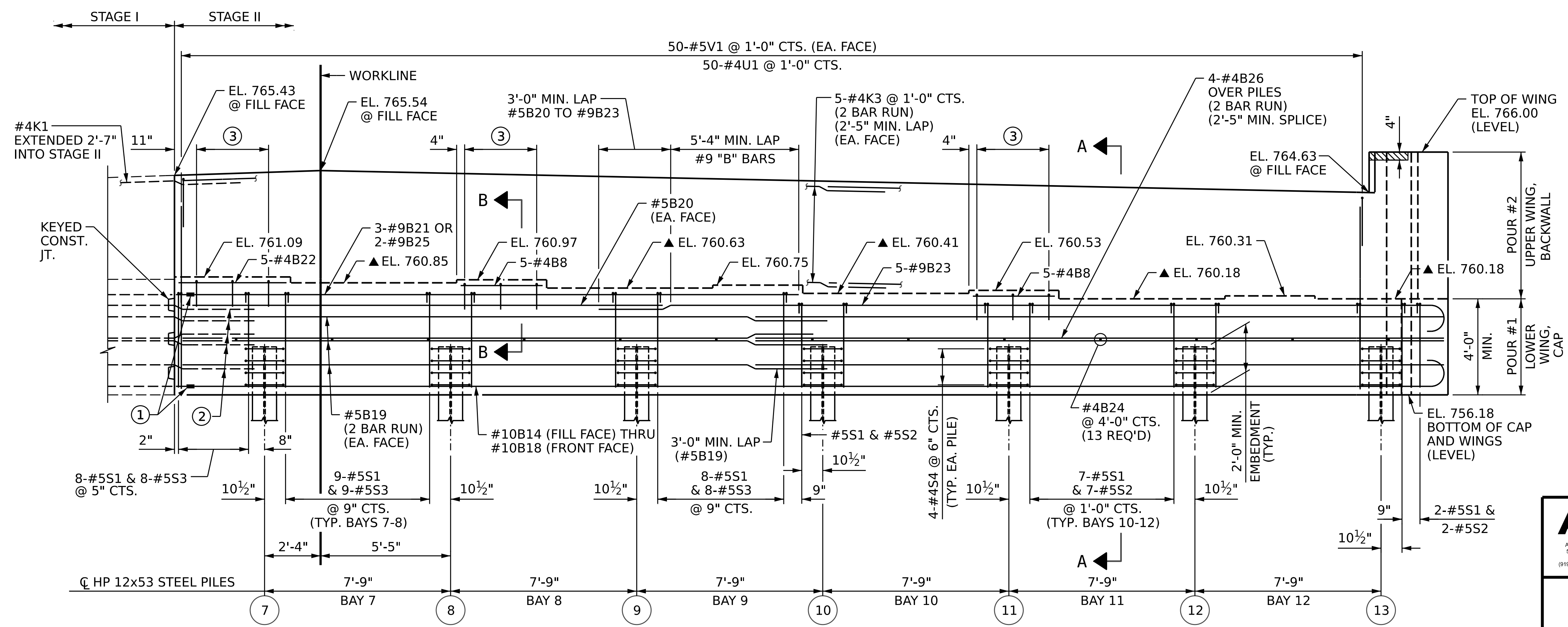
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* A PRECAST PANEL THICKNESS OF 6" WAS ASSUMED FOR ESTABLISHING WING LENGTH. CONTRACTOR SHALL ADJUST WING LENGTH AS NECESSARY.

NOTES:
FOR NOTES AND DETAIL "A", SEE SHEET 1 OF 5.
FOR SECTIONS A-A AND B-B, SEE SHEET 5 OF 5.



PLAN



ELEVATION

- ① SEE DETAIL "B" FOR REINF. DETAILS AT CONST. JT.
- ② #5B6, #5B13, #4B12 EXTENDED 3'-2" MIN. INTO STAGE II
- ③ 3-#4U2 @ 1'-6" CTS.

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 5.

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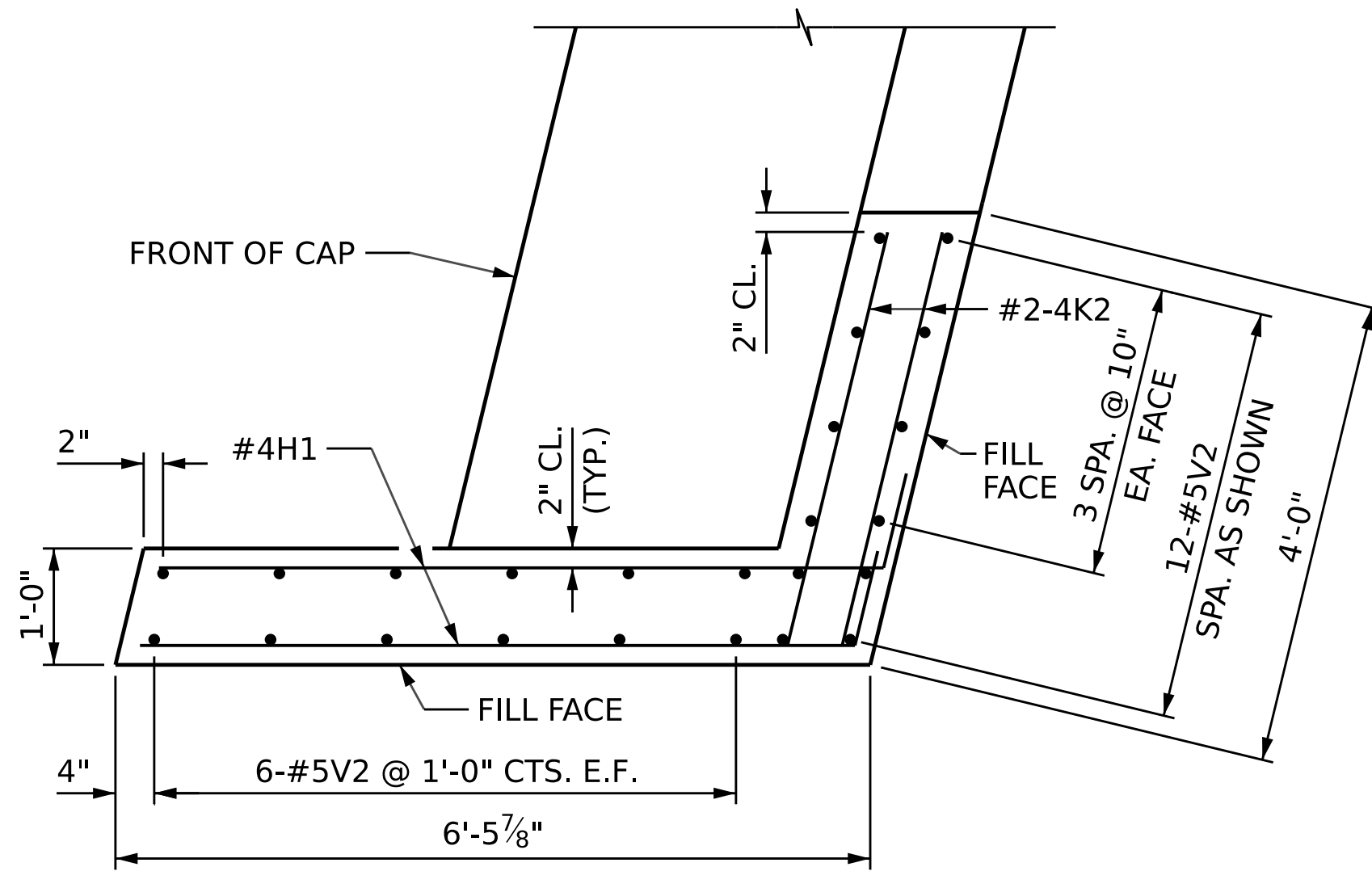
PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 2 OF 5

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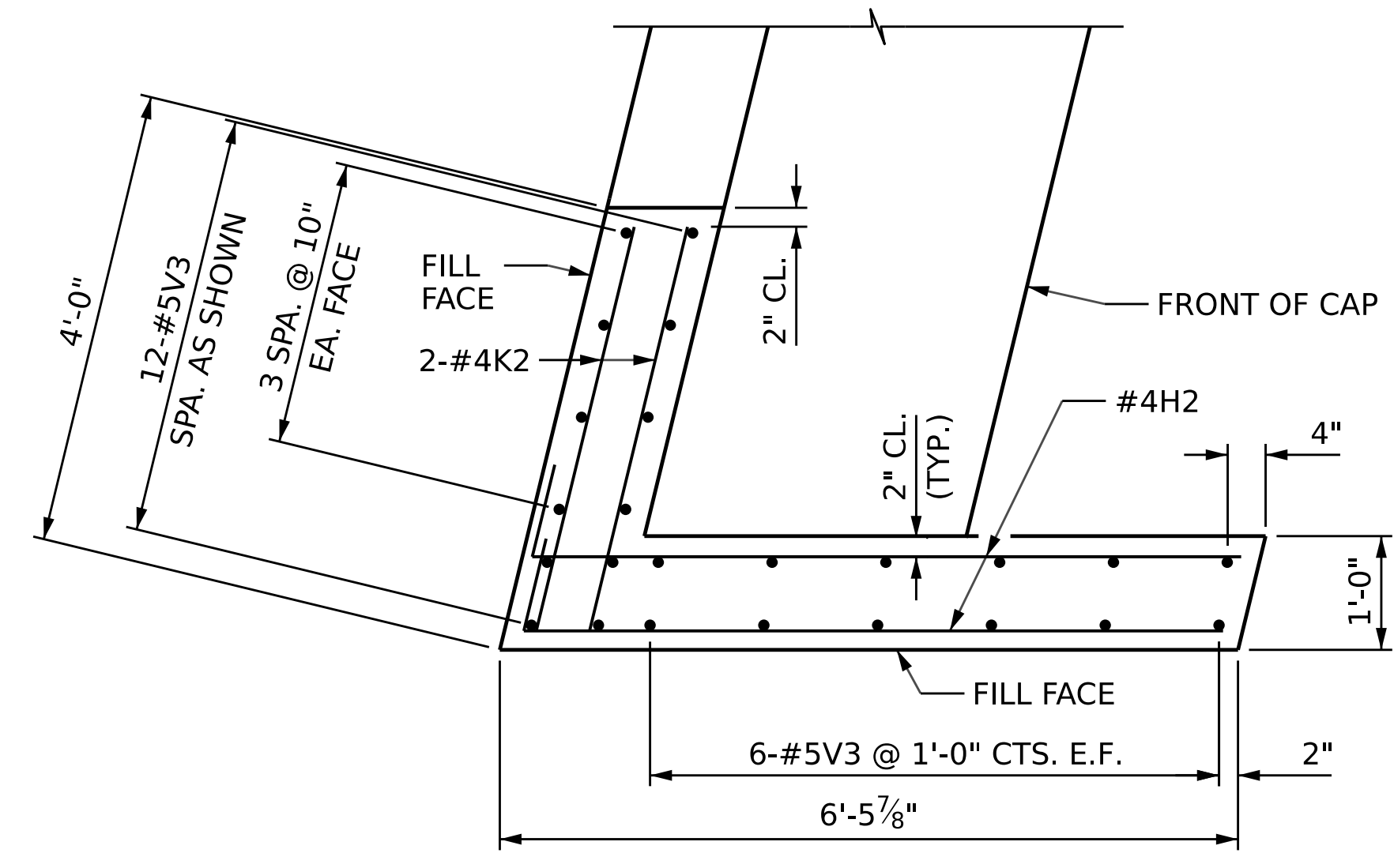
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-29
					TOTAL SHEETS 45

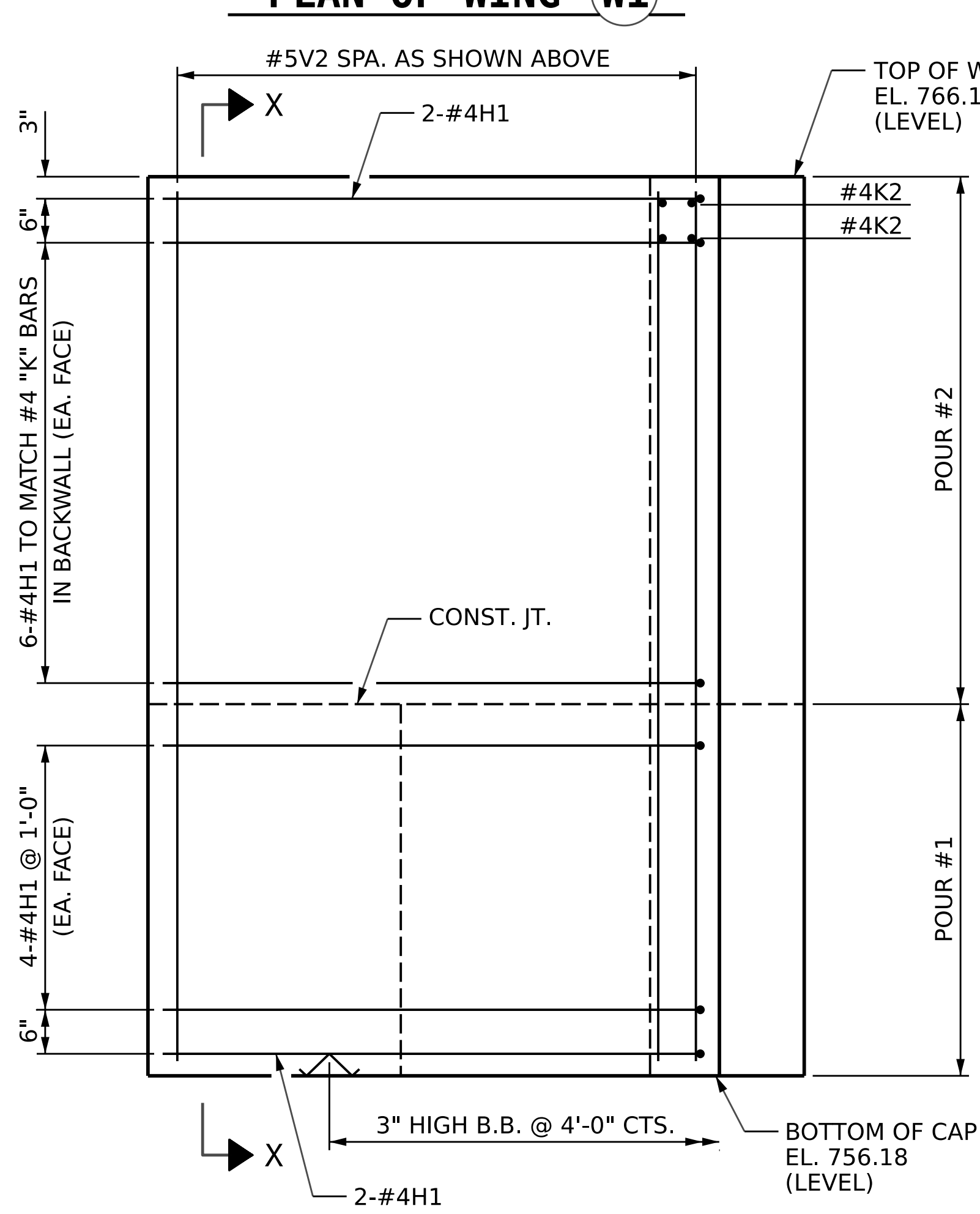
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 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022



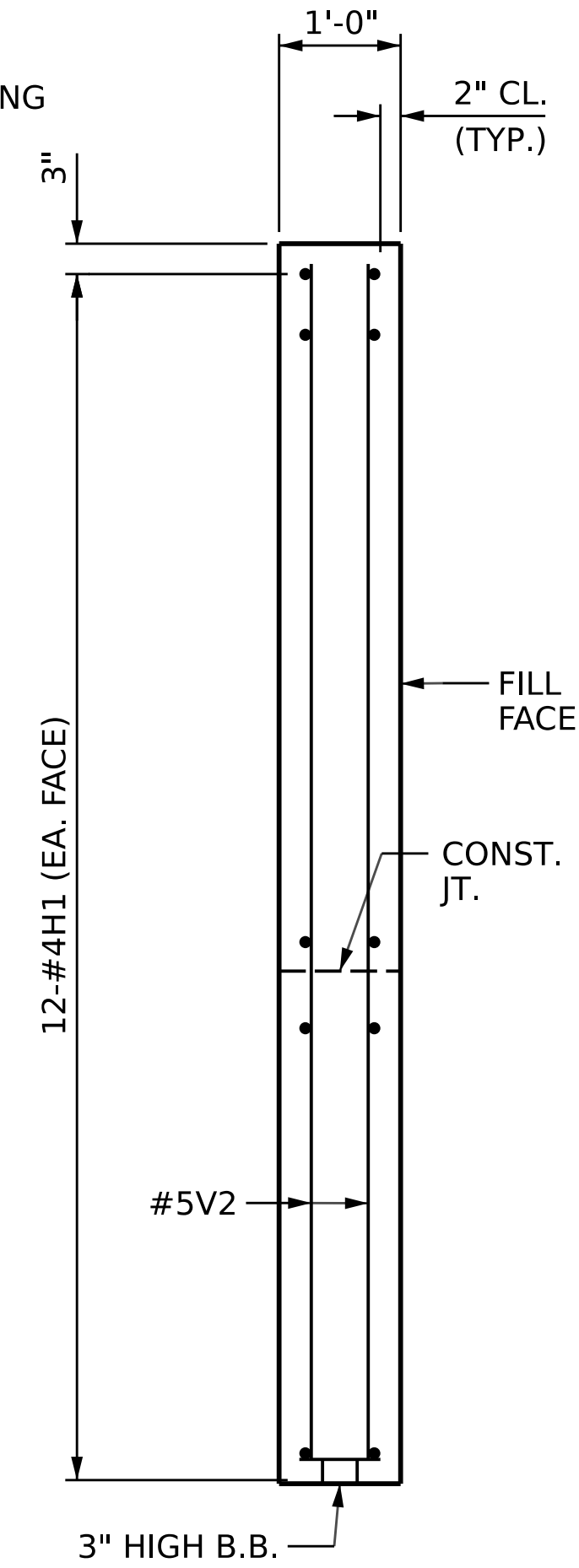
PLAN OF WING W1



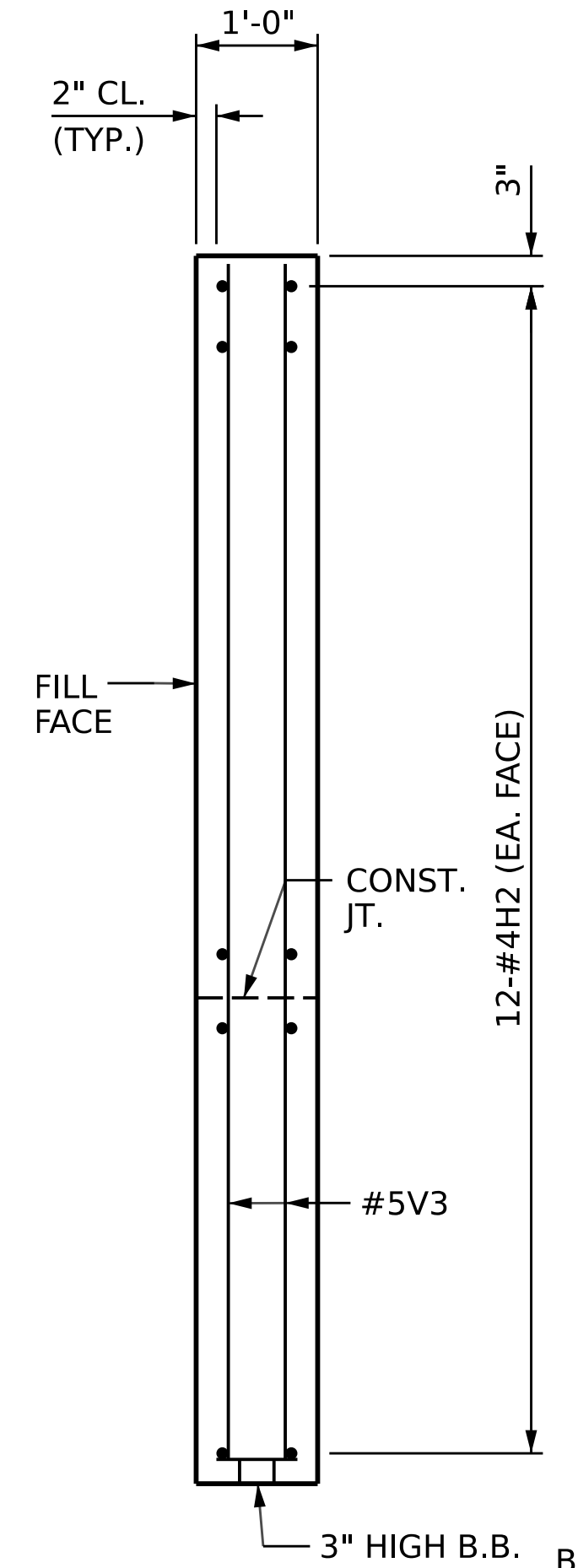
PLAN OF WING W2



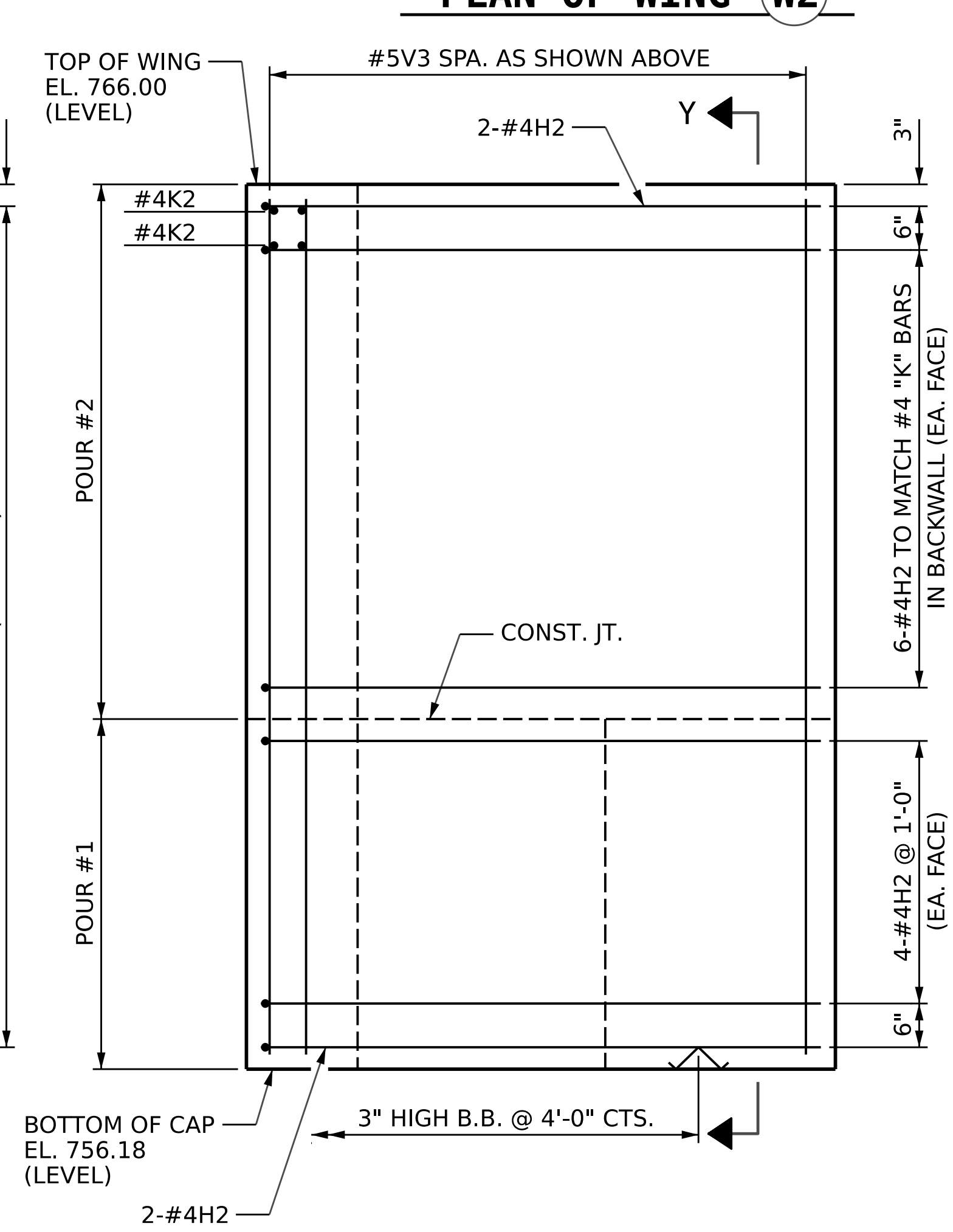
ELEVATION OF WING W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING W2

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 3 OF 5

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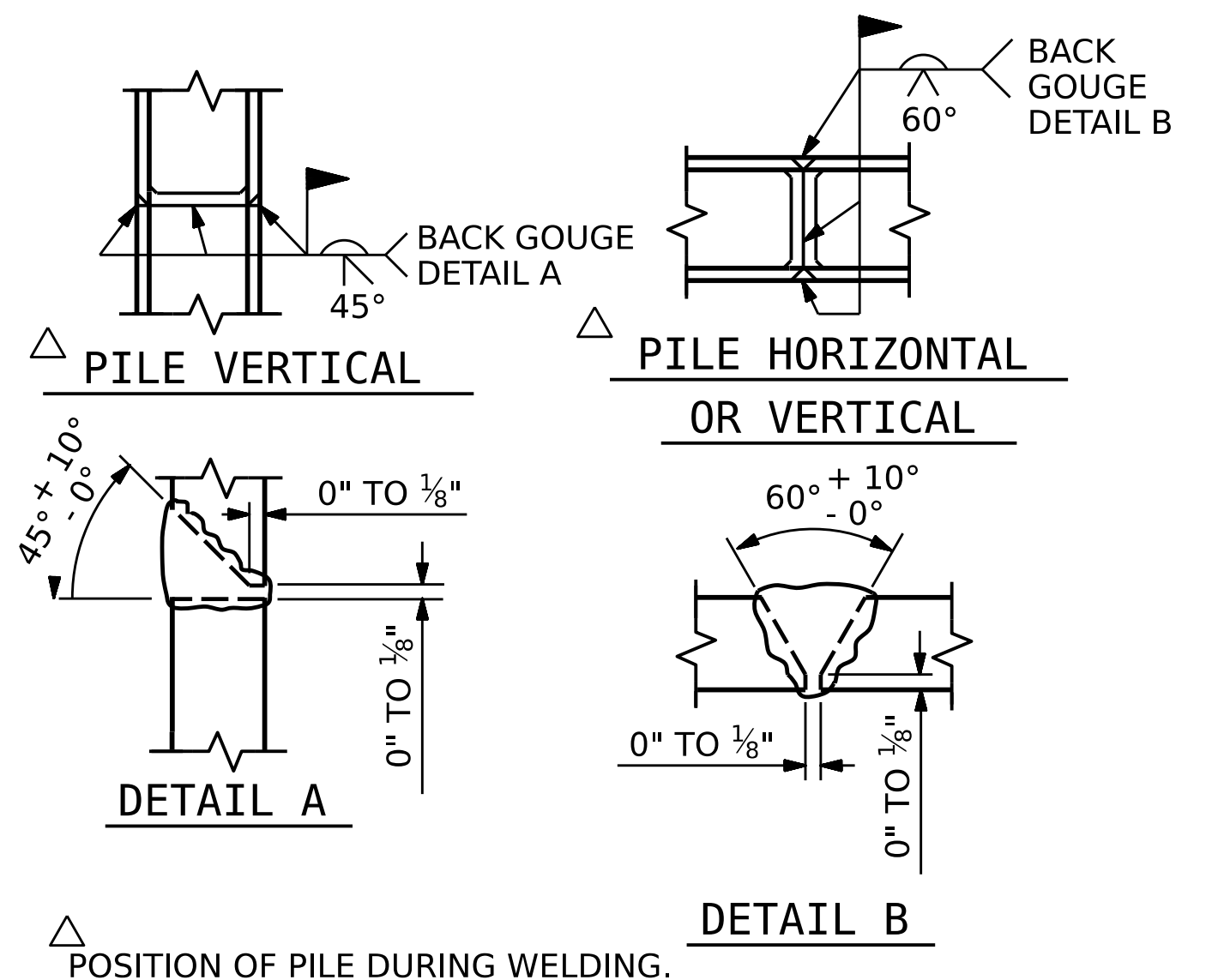
SEAL
 JOHN C. MORRISON
 ENGINEER
 030474

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 John C. Morrison
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 1/31/2023

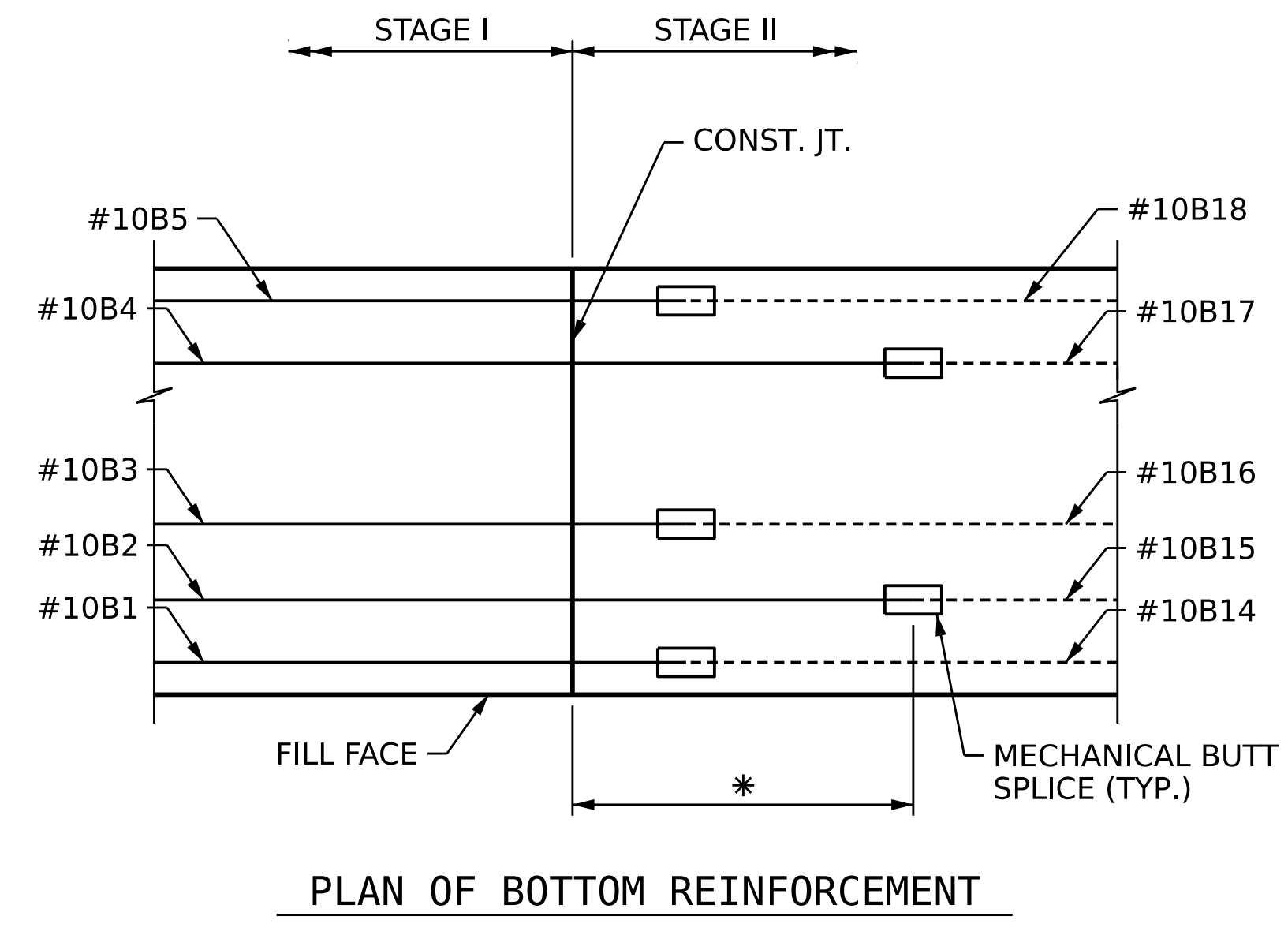
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 WINGWALLS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-30
TOTAL SHEETS					45

DRAWN BY: D.R. DRUM DATE: 10/2022
 CHECKED BY: D. RITACCO DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

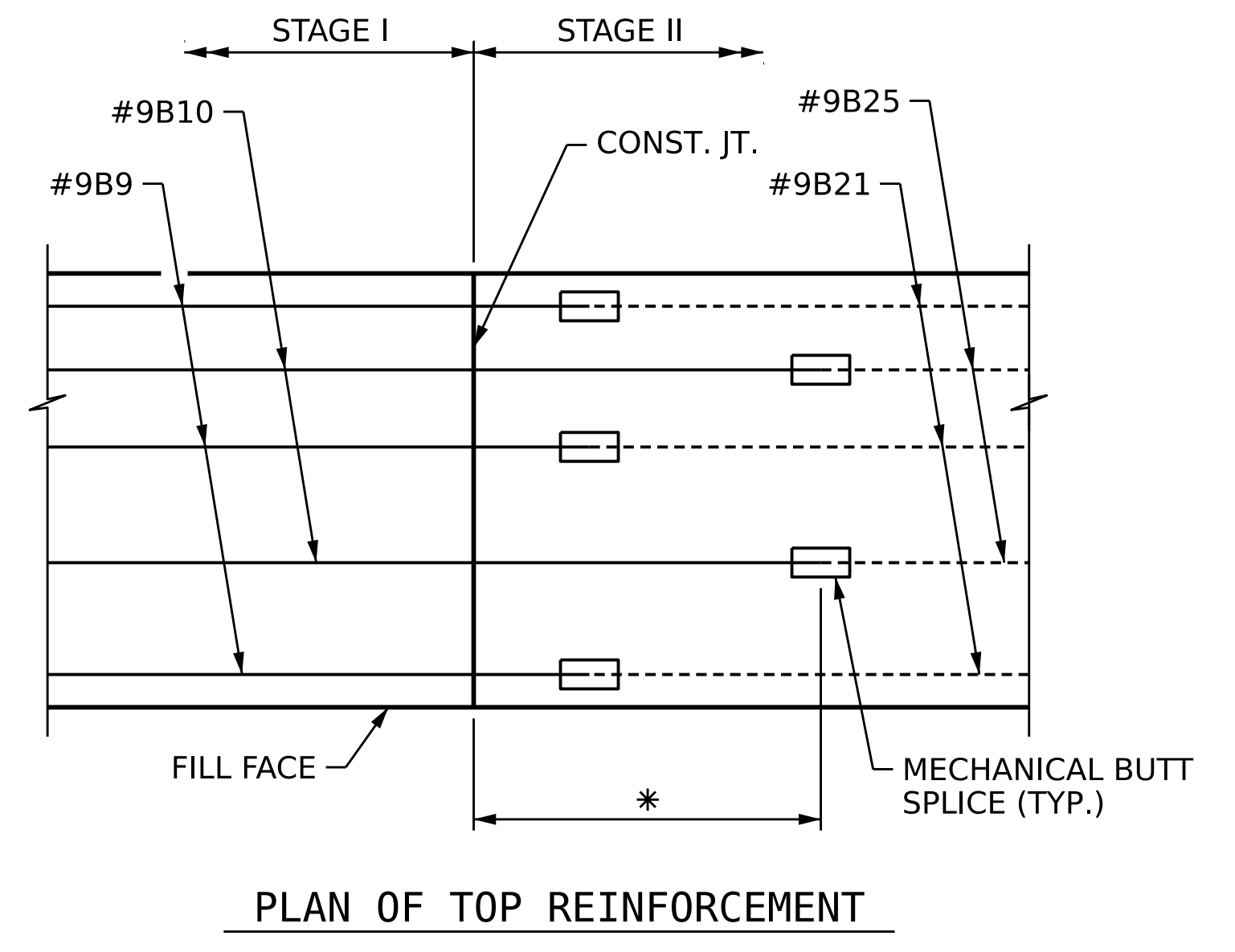
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PILE SPLICE DETAILS



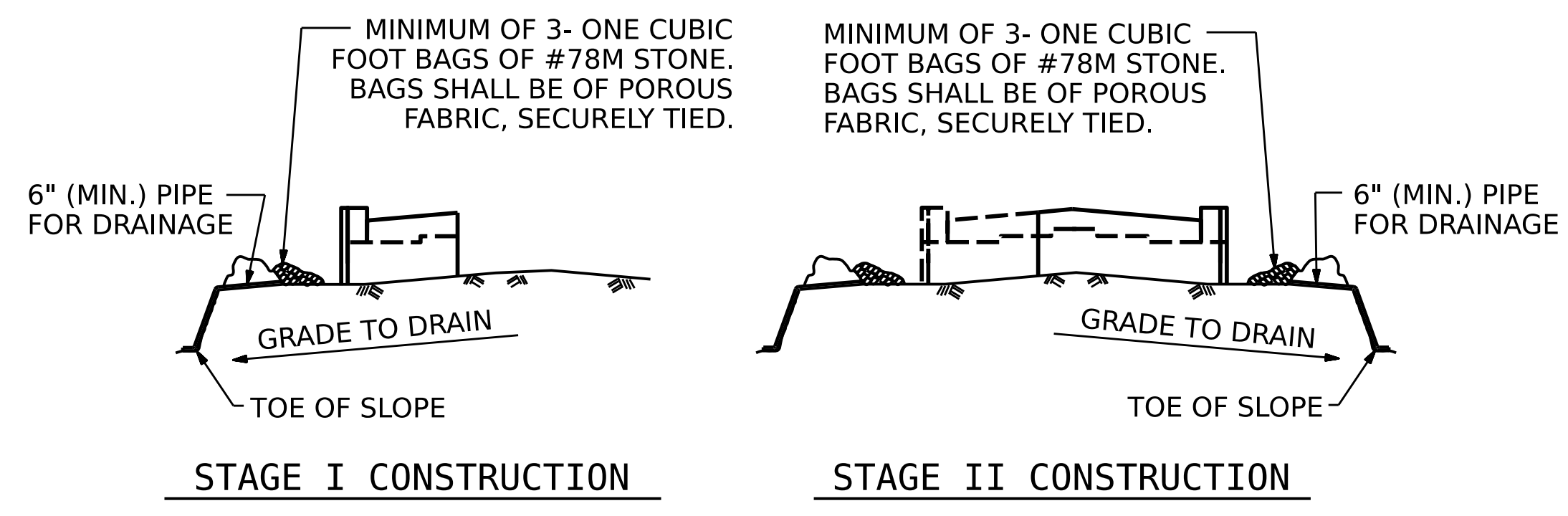
PLAN OF BOTTOM REINFORCEMENT



PLAN OF TOP REINFORCEMENT

DETAIL "B"

* STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 3'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT

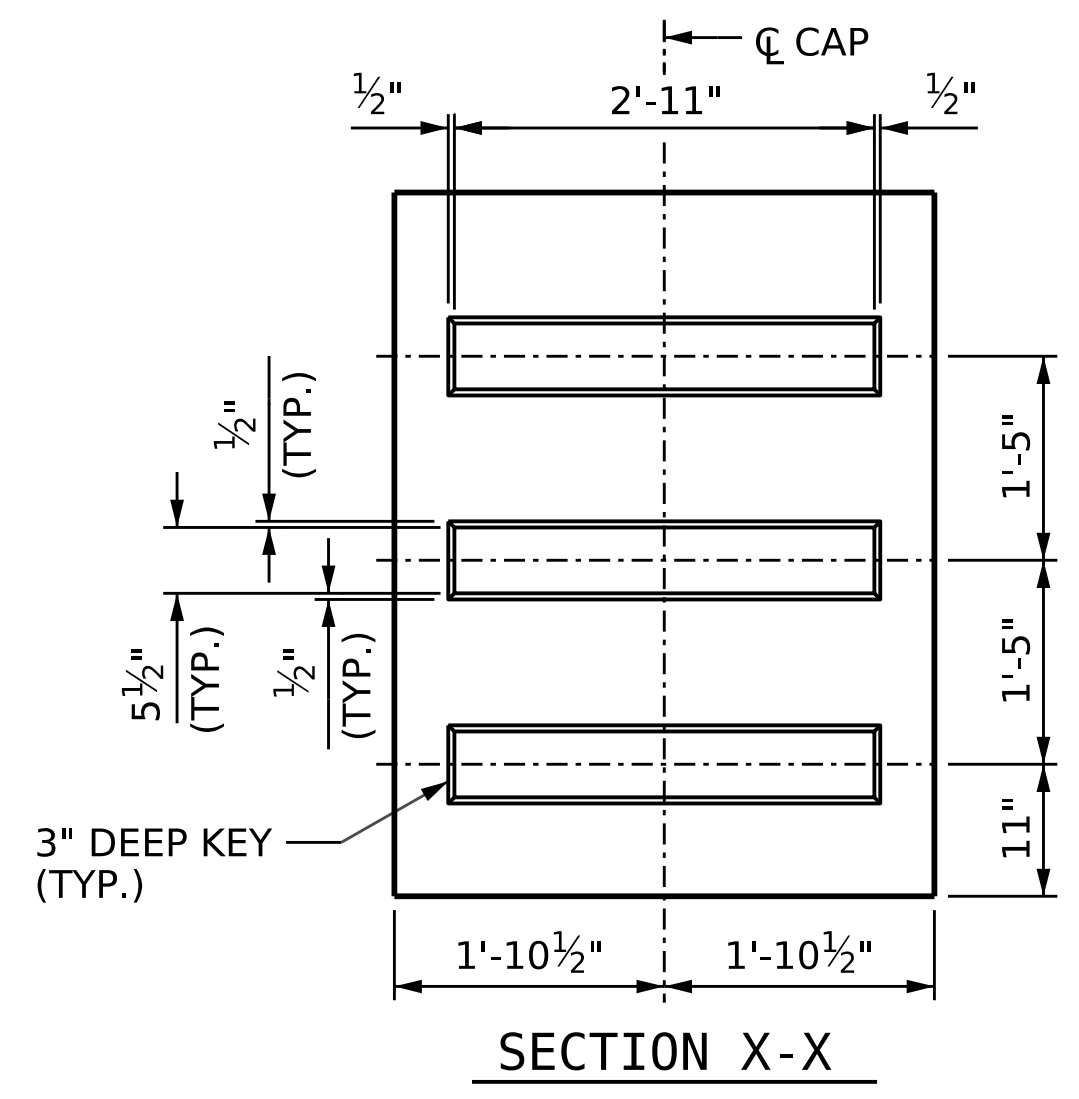


TEMPORARY DRAINAGE AT END BENT

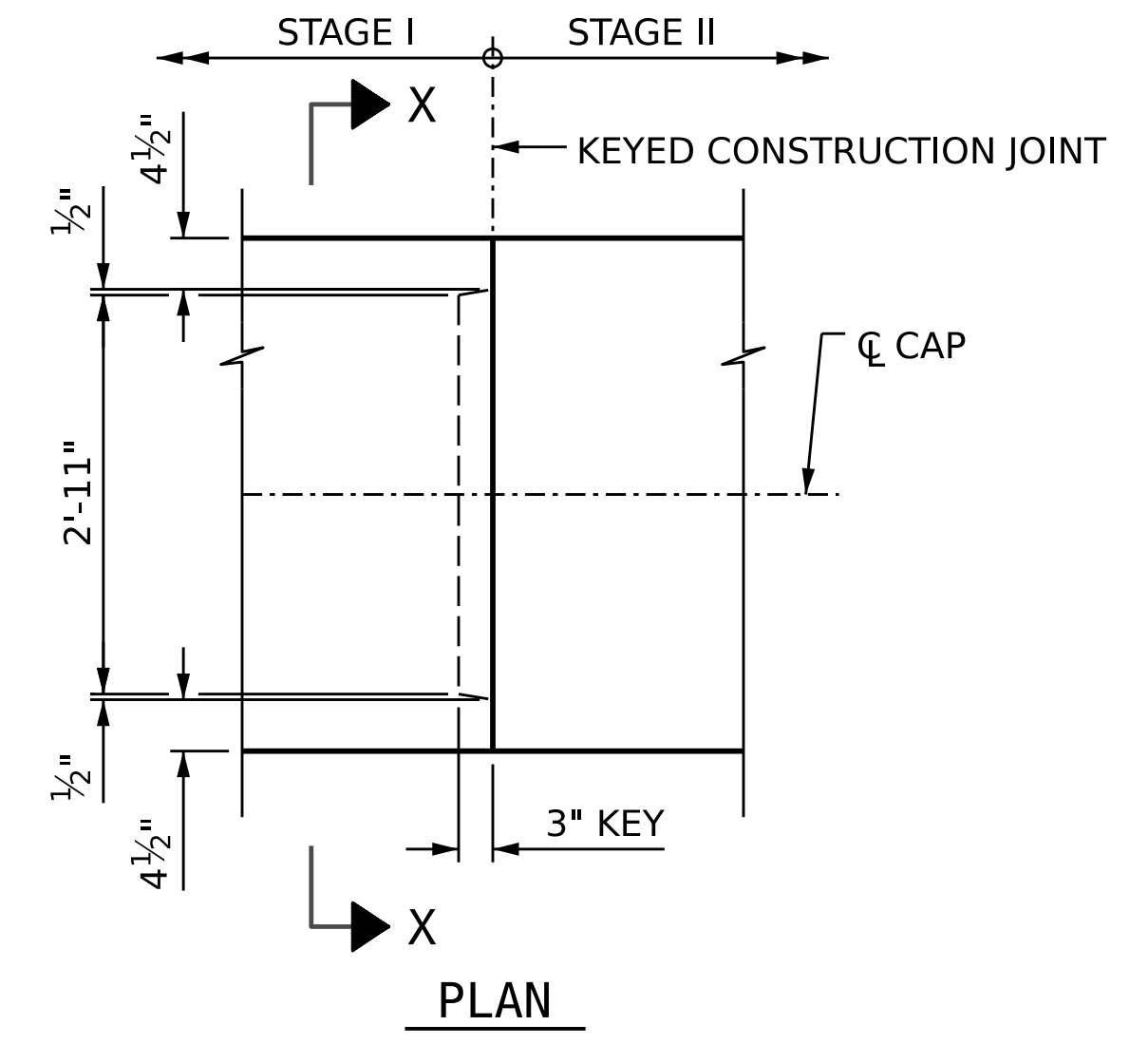
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.



SECTION X-X



PLAN

KEYED CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 4 OF 5

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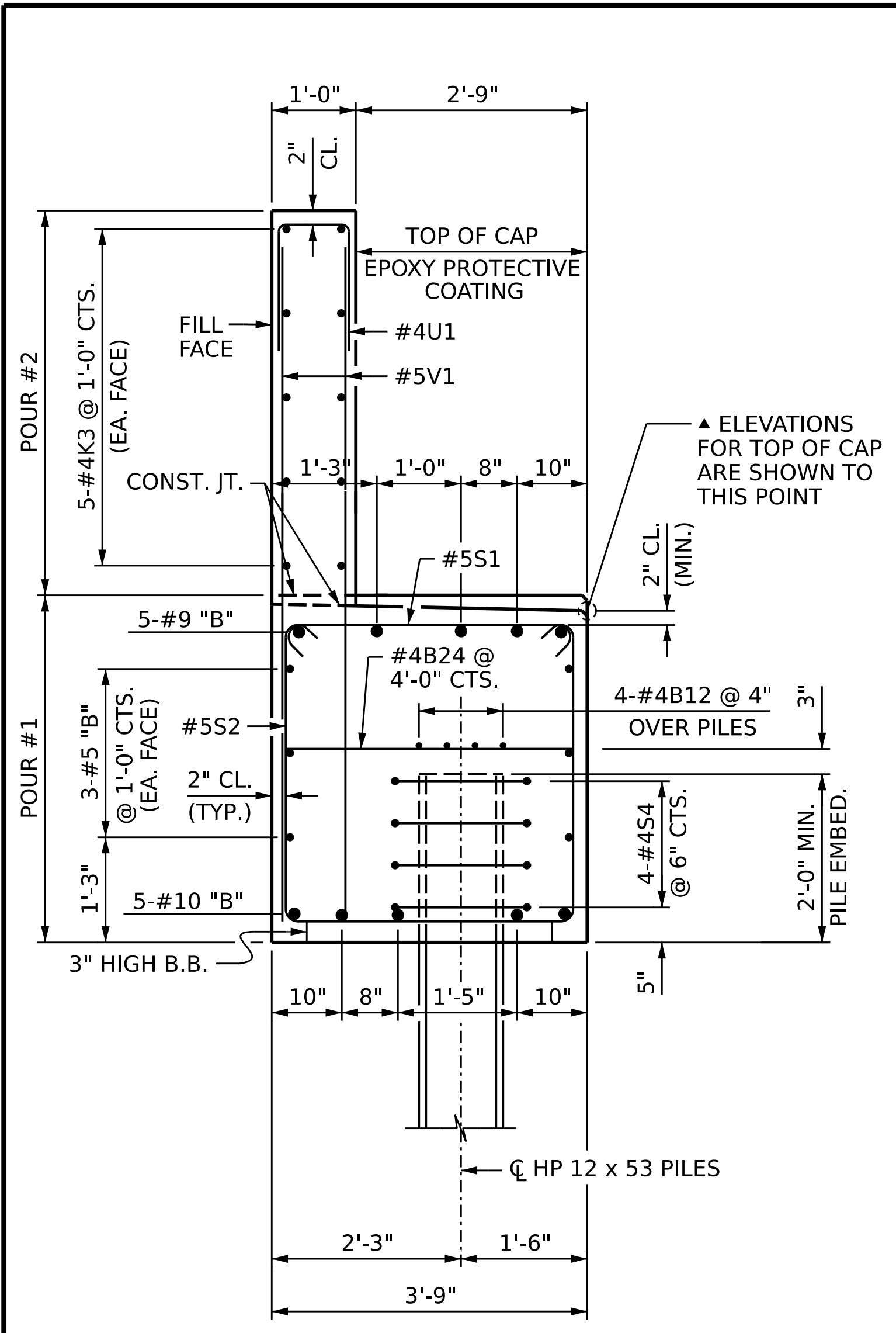
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1
 DETAILS**

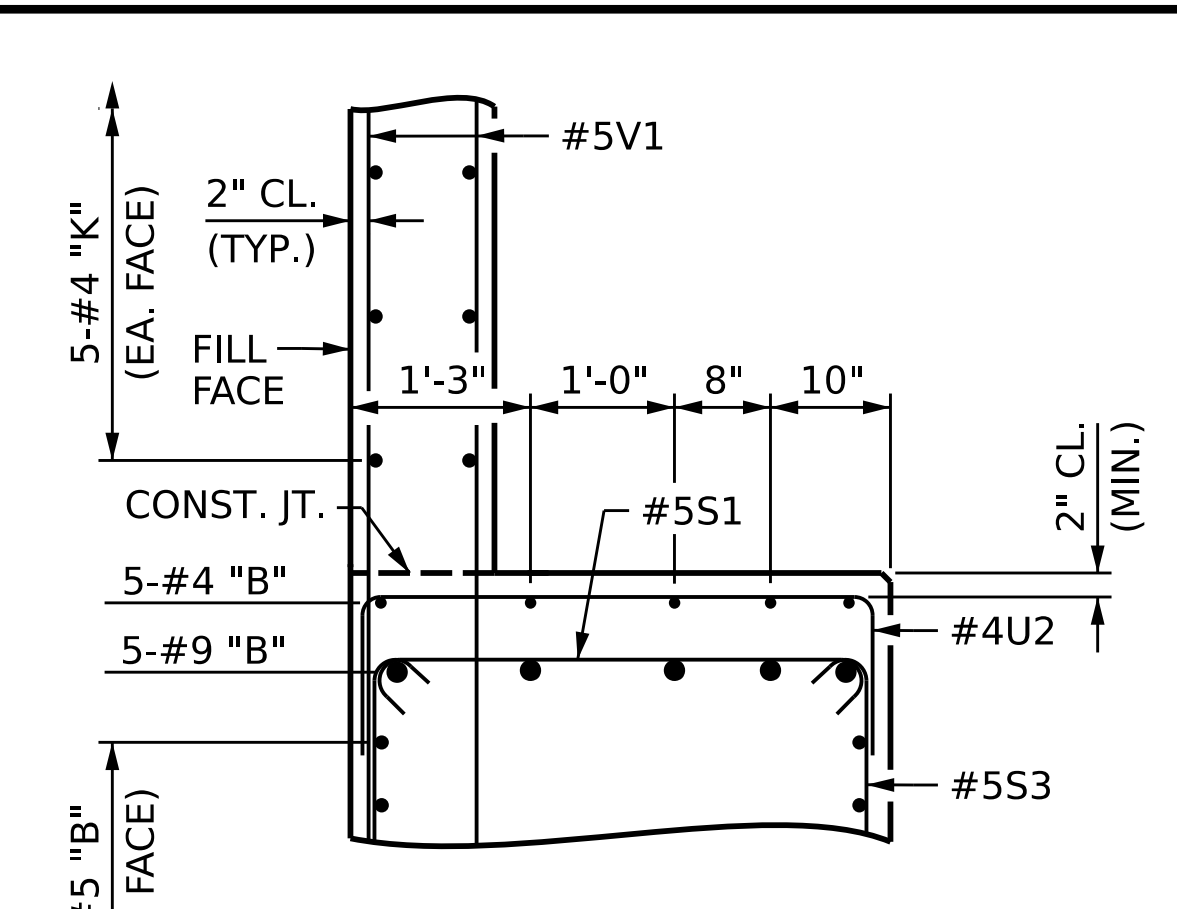
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			45

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

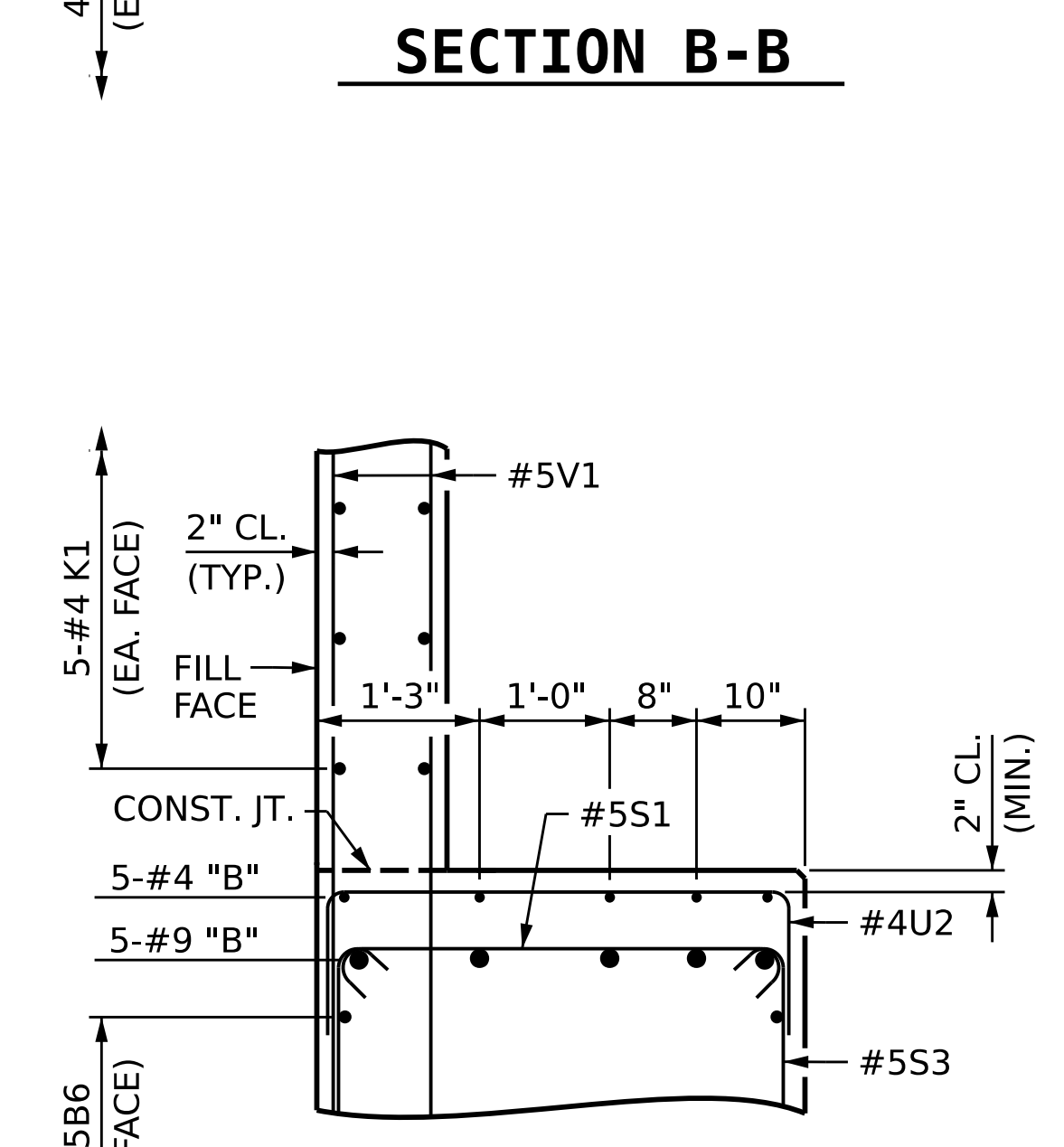
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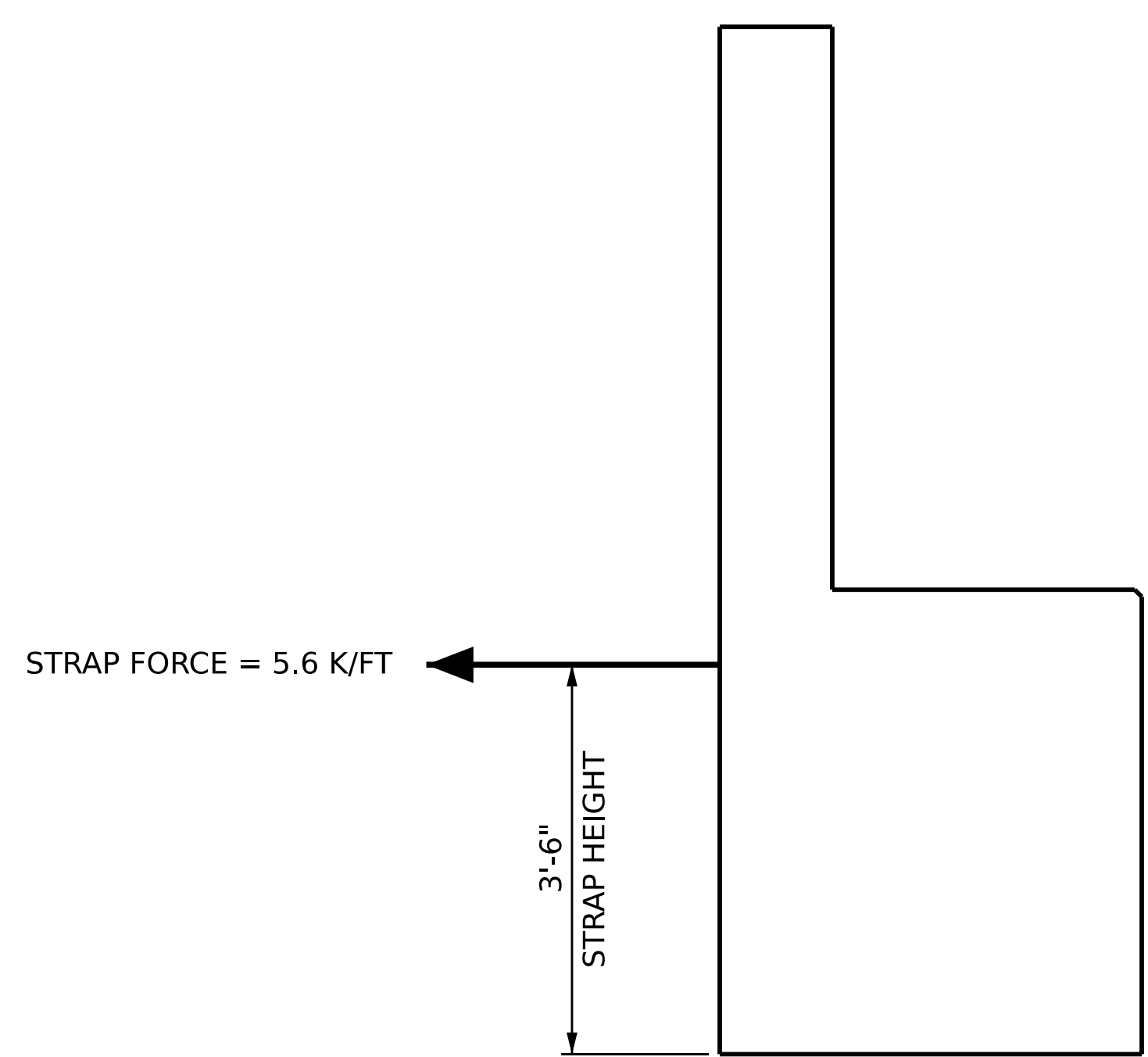
SECTION A-A



SECTION B-B



SECTION C-C



STRAP FORCE

BAR TYPES

BAR	DIM. "X"
B1	41'-10"
B2	43'-11"
B3	42'-1"
B4	44'-5"
B5	42'-7"
B7	35'-0"
B14	51'-9"
B15	49'-8"
B16	51'-6"
B17	49'-1"
B18	51'-0"
B23	35'-4"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL												
END BENT 1												
STAGE I					STAGE II							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	1	10	1	43'-3"	186	B8	10	4	STR	3'-5"	23	
B2	1	10	1	45'-4"	195	B14	1	10	1	53'-2"	229	
B3	1	10	1	43'-6"	187	B15	1	10	1	51'-1"	220	
B4	1	10	1	45'-10"	197	B16	1	10	1	52'-11"	228	
B5	1	10	1	44'-0"	189	B17	1	10	1	50'-6"	217	
B6	12	5	STR	24'-0"	300	B18	1	10	1	52'-5"	226	
B7	5	9	1	36'-3"	616	B19	12	5	STR	27'-11"	349	
B8	5	4	STR	3'-5"	11	B20	2	5	STR	20'-8"	43	
B9	3	9	STR	15'-11"	162	B21	3	9	STR	25'-0"	255	
B10	2	9	STR	17'-11"	122	B22	5	4	STR	4'-6"	15	
B11	5	4	STR	4'-1"	14	B23	5	9	1	36'-7"	622	
B12	8	4	STR	23'-7"	126	B24	13	4	STR	3'-5"	30	
B13	2	5	STR	12'-9"	27	B25	2	9	STR	23'-0"	156	
B24	11	4	STR	3'-5"	25	B26	8	4	STR	27'-8"	148	
H1	24	4	2	7'-0"	112	H2	24	4	3	7'-0"	112	
K1	20	4	STR	22'-11"	306	K2	4	4	STR	3'-8"	10	
K2	4	4	STR	3'-8"	10	K3	20	4	STR	27'-7"	369	
S1	49	5	4	4'-4"	221	S1	58	5	4	4'-4"	262	
S2	30	5	5	11'-6"	360	S2	24	5	5	11'-6"	288	
S3	19	5	5	12'-4"	244	S3	34	5	5	12'-4"	437	
S4	24	4	6	6'-6"	104	S4	28	4	6	6'-6"	122	
U1	38	4	7	4'-8"	118	U1	50	4	7	4'-8"	156	
U2	6	4	7	5'-11"	24	U2	9	4	7	5'-11"	36	
V1	76	5	STR	8'-1"	641	V1	100	5	STR	8'-1"	843	
V2	24	5	STR	9'-11"	248	V3	24	5	STR	9'-9"	244	
REINFORCING STEEL					4,745 LBS.	REINFORCING STEEL						5,640 LBS.
CLASS A CONCRETE						CLASS A CONCRETE						
POUR #1 (CAP & LOWER WINGWALL)					25.4 C.Y.	POUR #1 (CAP & LOWER WINGWALL)					32.5 C.Y.	
POUR #2 (BACKWALL & UPPER WINGWALL)					8.1 C.Y.	POUR #2 (BACKWALL & UPPER WINGWALL)					10.2 C.Y.	
TOTAL = 33.5 C.Y.						TOTAL = 42.7 C.Y.						
HP 12X53 STEEL PILES No.: 6					LIN. FT. = 310	HP 12X53 STEEL PILES No.: 7					LIN. FT. = 335	
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					EA. 6	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					EA. 7	

NOTE: SEE GEOTECHNICAL FOUNDATION TABLES FOR ADDITIONAL PILE INFORMATION

PROJECT NO. BR-0043
 ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

SHEET 5 OF 5

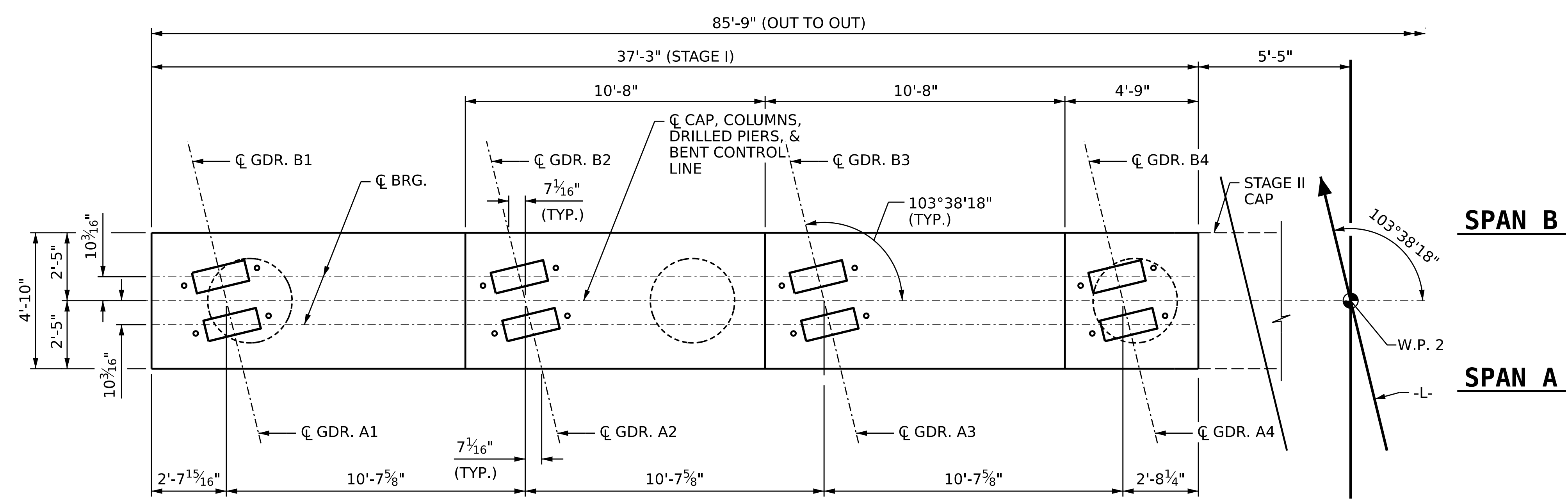
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 AECOM License No. F0342

JOHN C. MORRISON
 PROFESSIONAL ENGINEER
 SEAL 030474
 1/31/2023

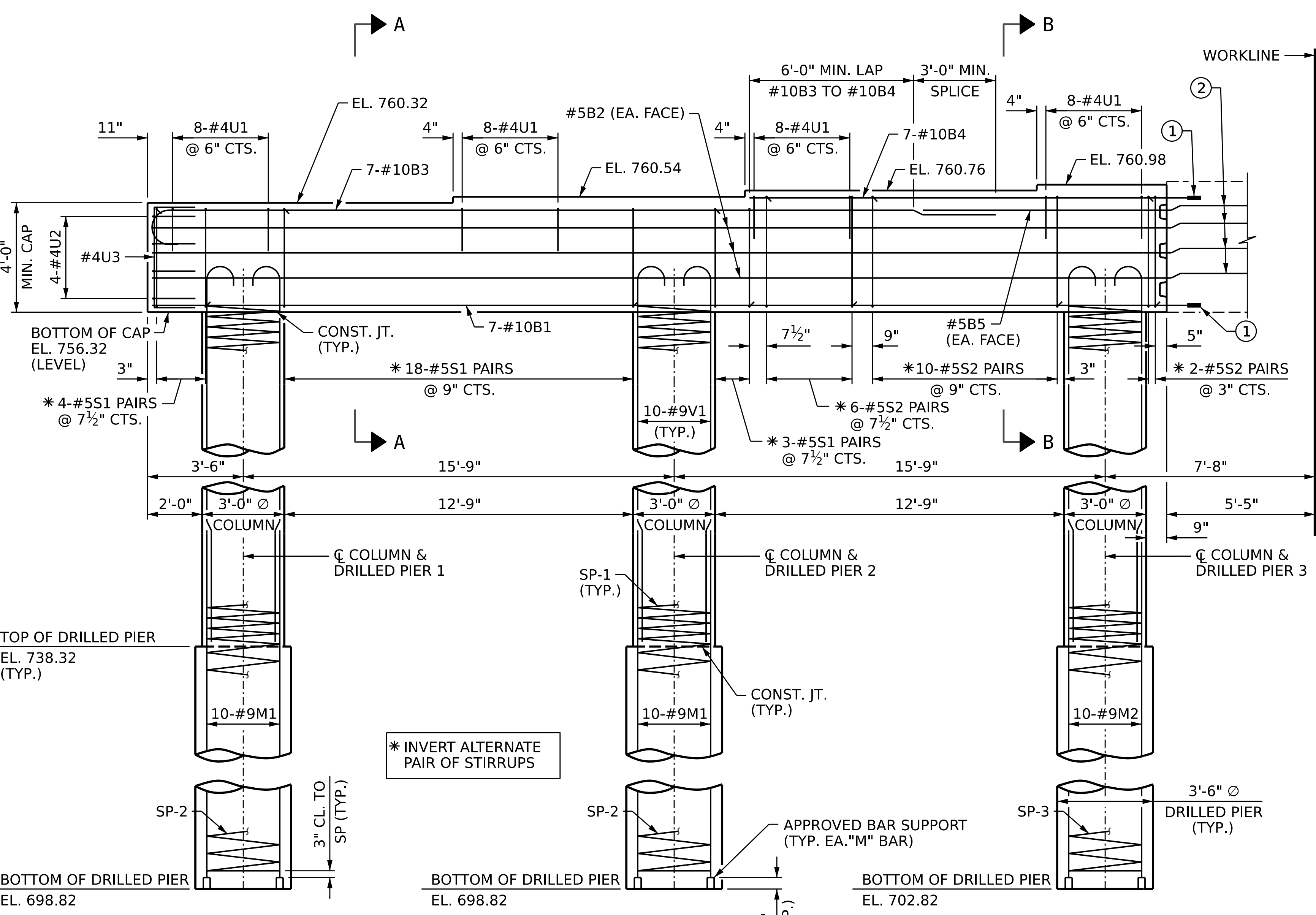
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY: D.R. DRUM DATE: 09/2022
 CHECKED BY: D. RITACCO DATE: 11/2022
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

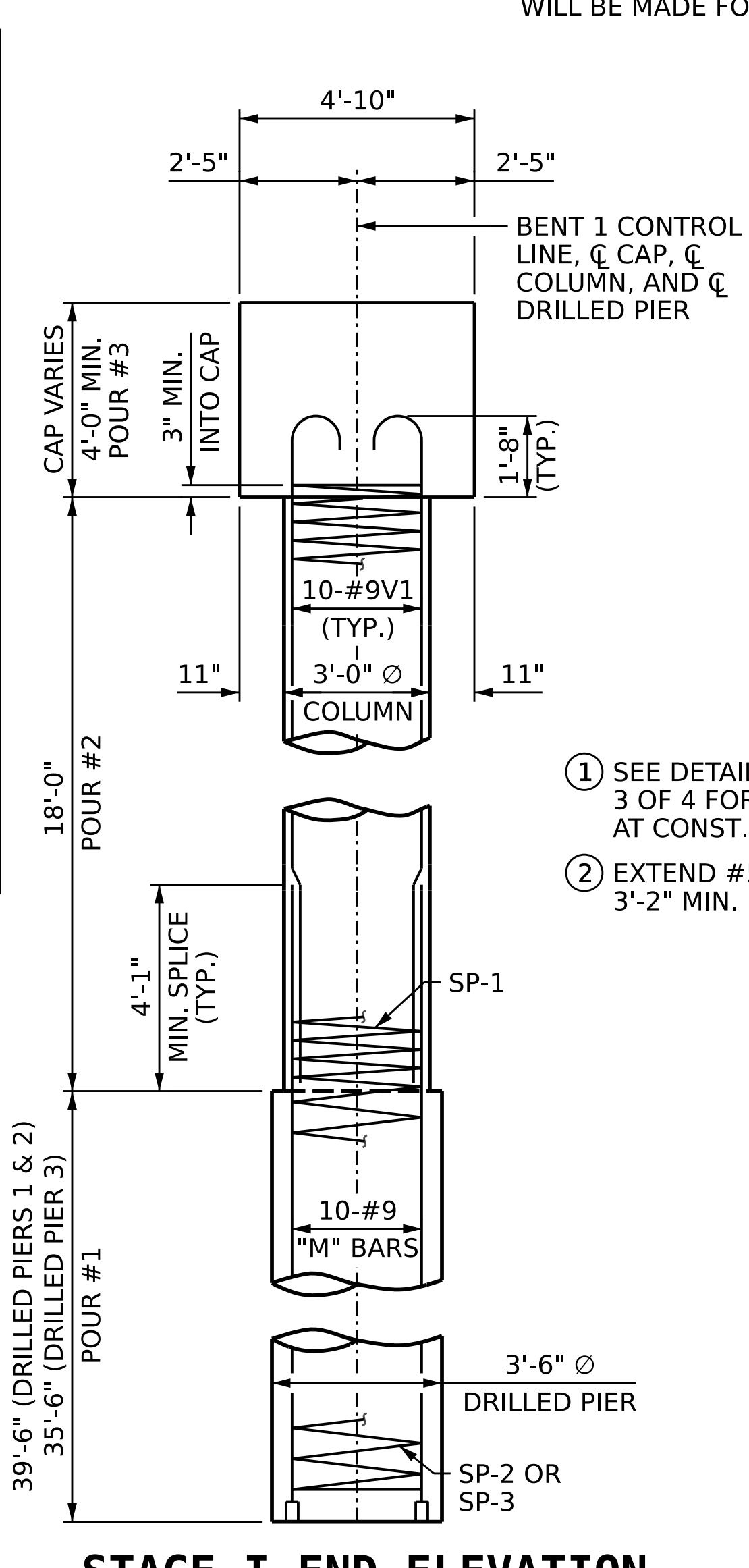
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN



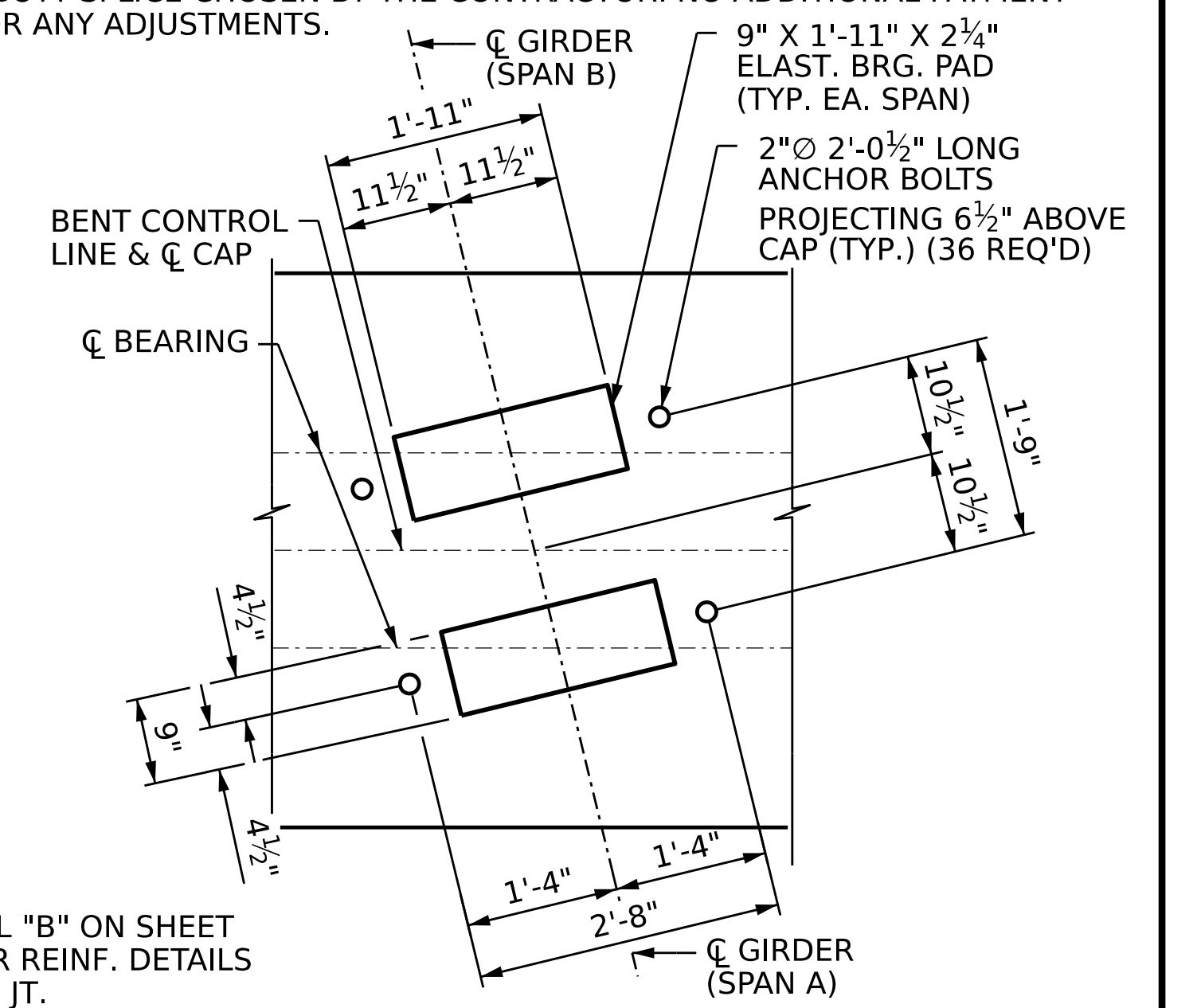
ELEVATION



STAGE I END ELEVATION

NOTES:

- FOR CONSTRUCTION JOINT DETAIL, SECTIONS A-A AND B-B, SECTION THRU COLUMN, CAP END VIEW, DETAIL "B", AND SHEAR KEY DETAIL, SEE SHEET 3 OF 4.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR DRILLED PIERS AND PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE LOCATION OF THE CONSTRUCTION JOINT AT BENT 1 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- SEE PILE AND DRILLED PIER FOUNDATION TABLES FOR DRILLED PIER FOUNDATION DATA.
- MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 "B" BARS IN STAGE I WITH THE #10 "B" BARS, RESPECTIVELY, IN STAGE II. THE STAGE I BARS SHALL BE CUT TO ALLOW A MINIMUM OF 1'-0" EXTENSION INTO STAGE II CONSTRUCTION.
- FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #10 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.



DETAIL "A"
 DIMENSIONS ARE TYPICAL FOR EACH BEARING FOR EACH GIRDER

PROJECT NO. **BR-0043**
 ROCKINGHAM COUNTY
 STATION: **POT 25+80.88 -L-**
 SHEET 1 OF 4

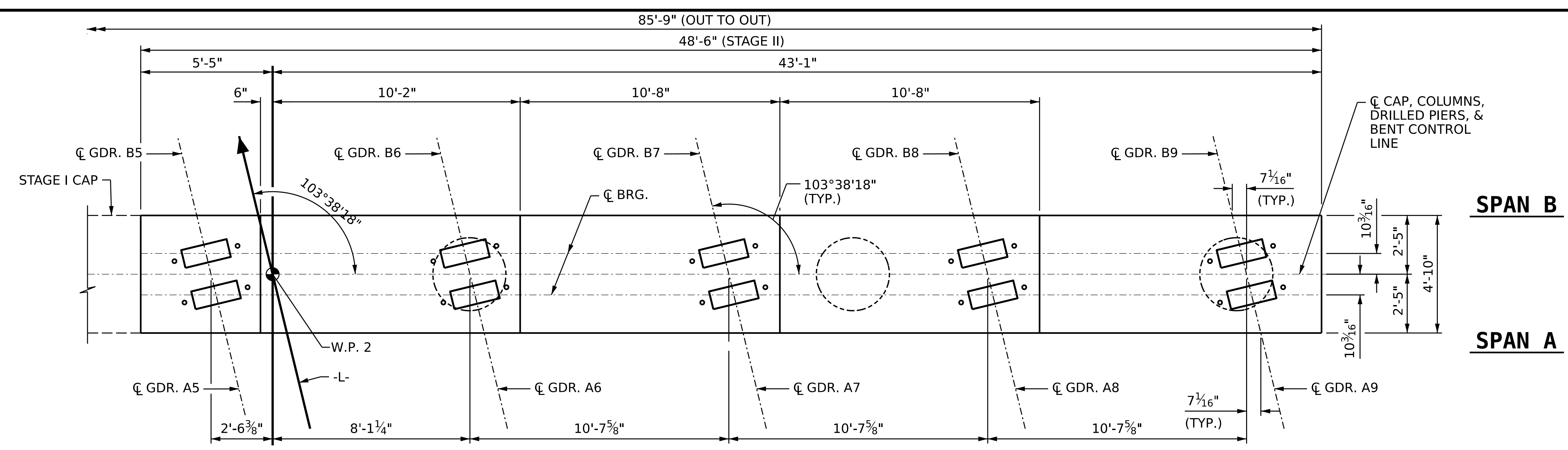
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DocuSigned by:
John C. Morrison 1/31/2023
 A2FDE142C82F448

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-33
TOTAL SHEETS					45

DRAWN BY: **D.R. DRUM** DATE: **11/2022**
 CHECKED BY: **D. RITACCO** DATE: **11/2022**
 DESIGN ENGINEER OF RECORD: **J.C. MORRISON** DATE: **12/2022**

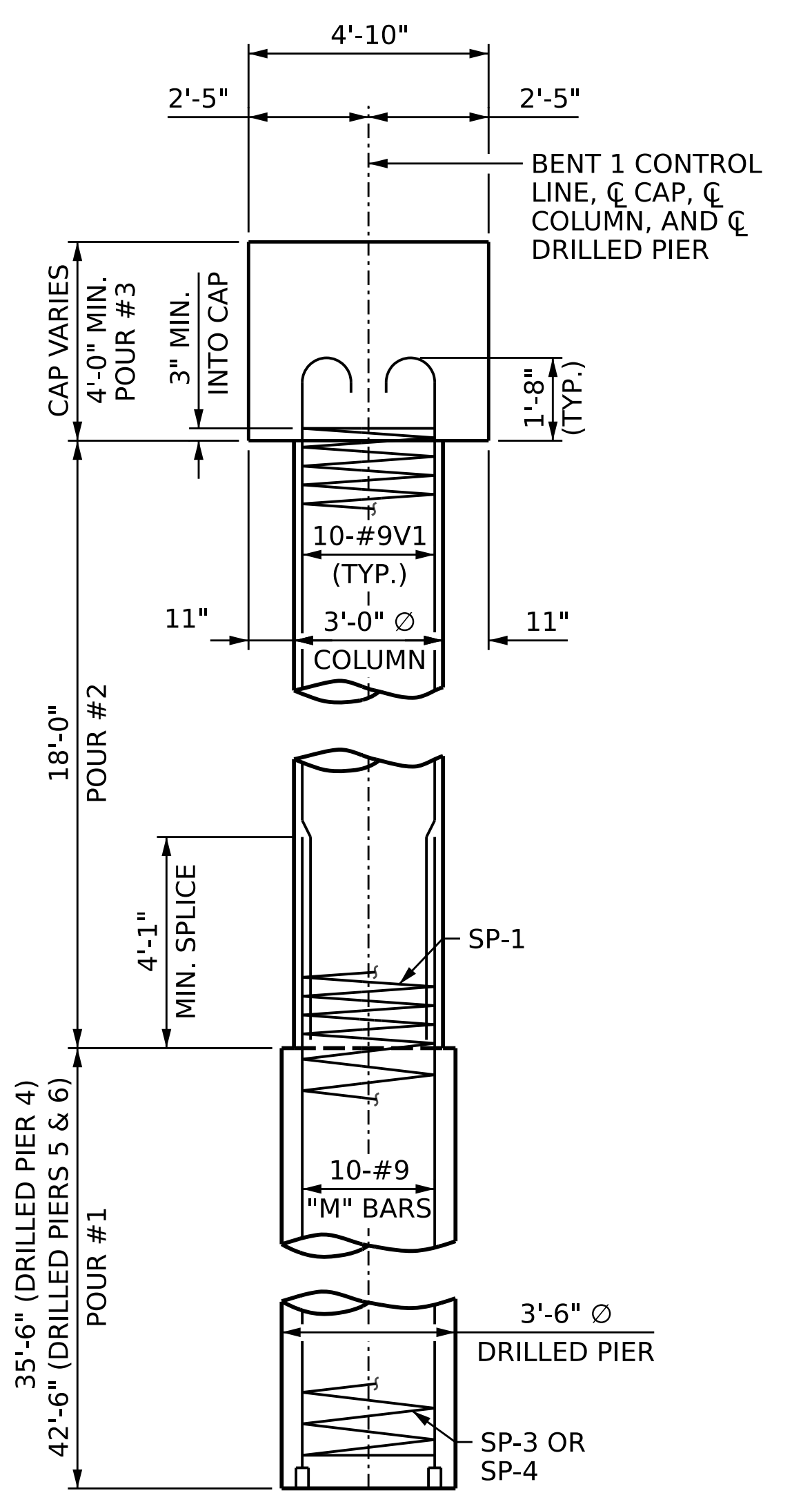
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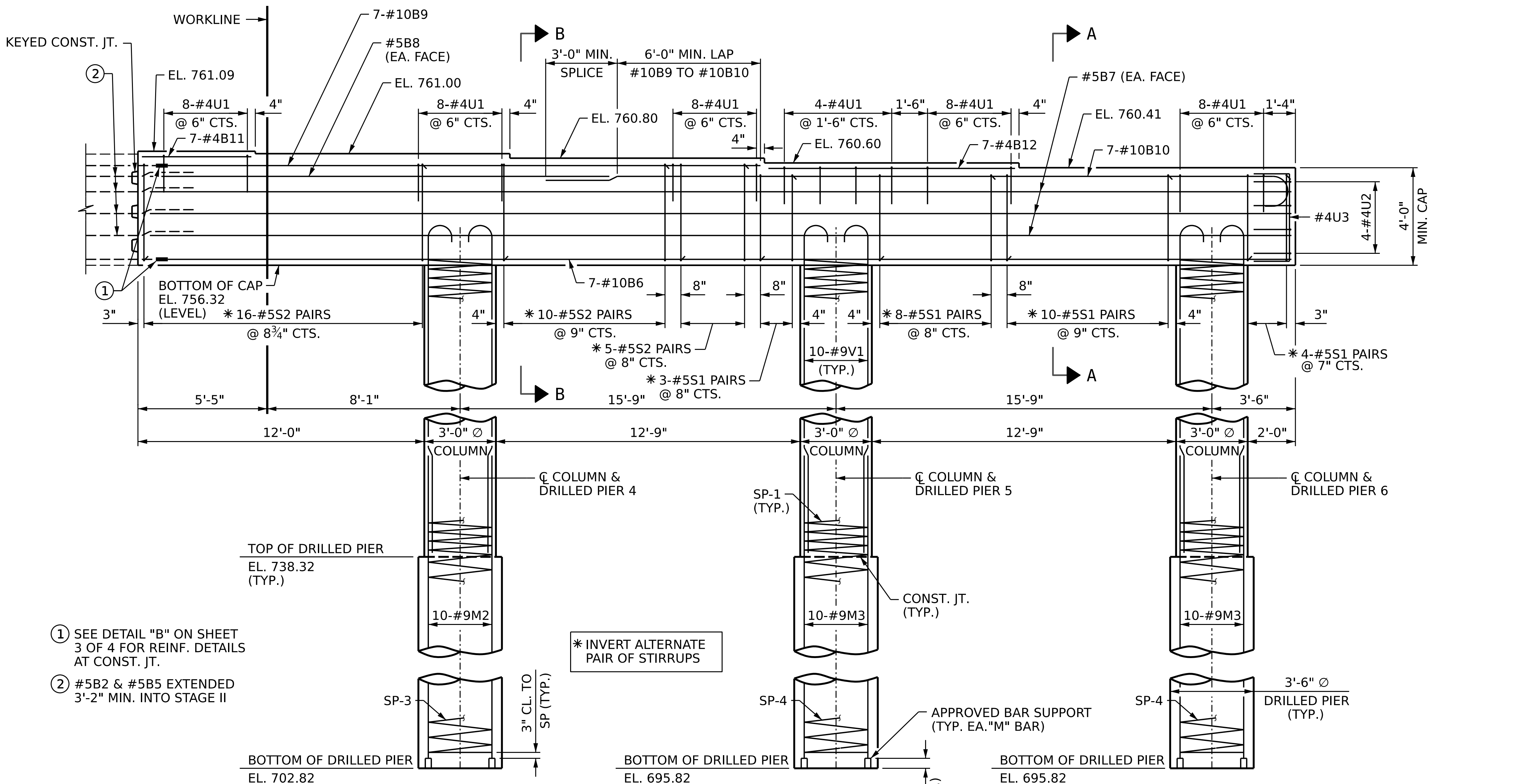
PLAN

NOTES:

FOR NOTES AND DETAIL "A", SEE SHEET 1 OF 4.
 FOR CONSTRUCTION JOINT DETAIL, SECTIONS A-A AND B-B, SECTION THRU COLUMN, CAP END VIEW, DETAIL "B", AND SHEAR KEY DETAIL, SEE SHEET 3 OF 4.



STAGE II END ELEVATION



ELEVATION

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 2 OF 4

- ① SEE DETAIL "B" ON SHEET 3 OF 4 FOR REINF. DETAILS AT CONST. JT.
- ② #5B2 & #5B5 EXTENDED 3'-2" MIN. INTO STAGE II

* INVERT ALTERNATE PAIR OF STIRRUPS

APPROVED BAR SUPPORT (TYP. EA. "M" BAR)

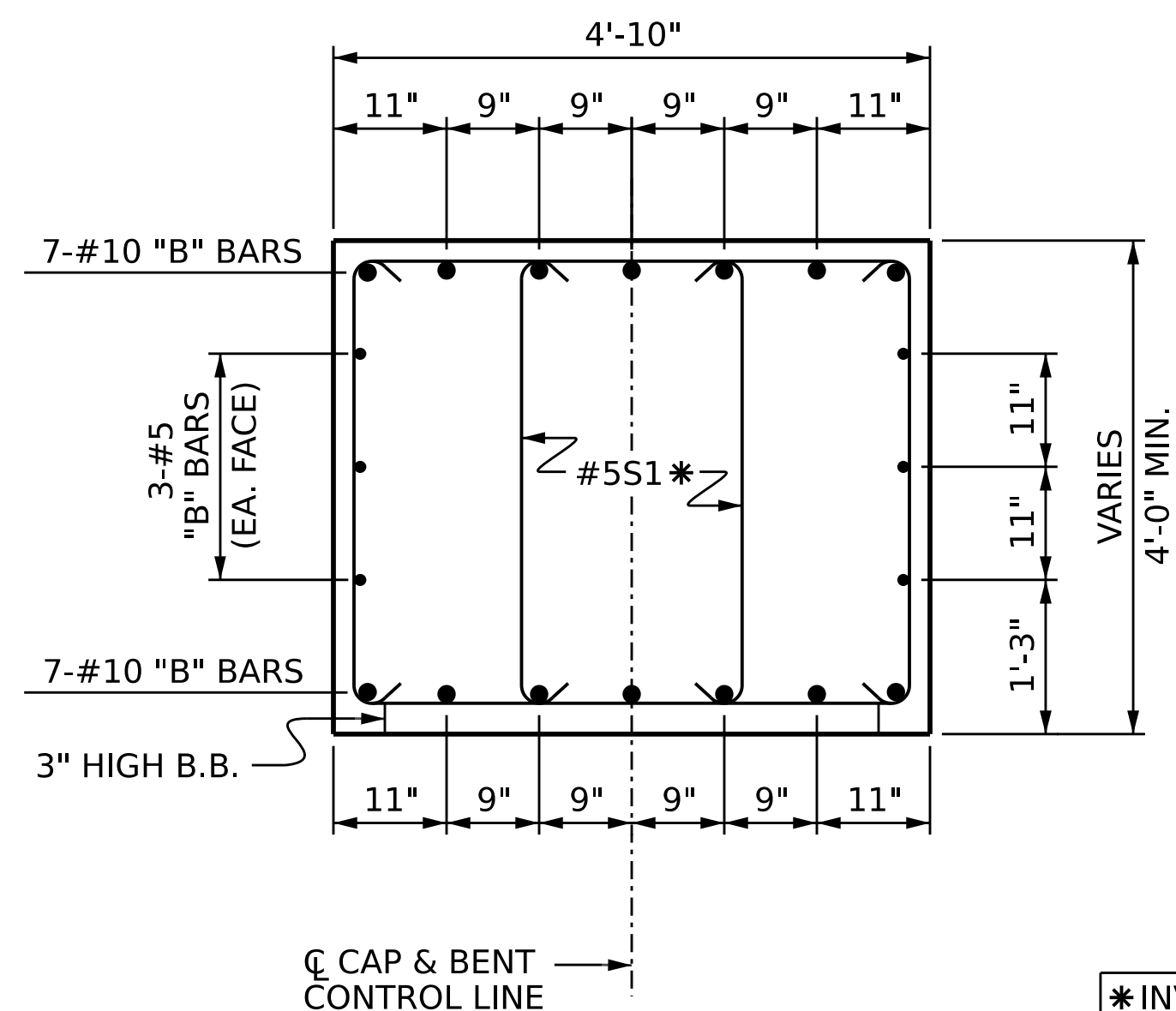
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John C. Morrison
1/31/2023
 A2PDE142C82F44B

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-34
TOTAL SHEETS					45

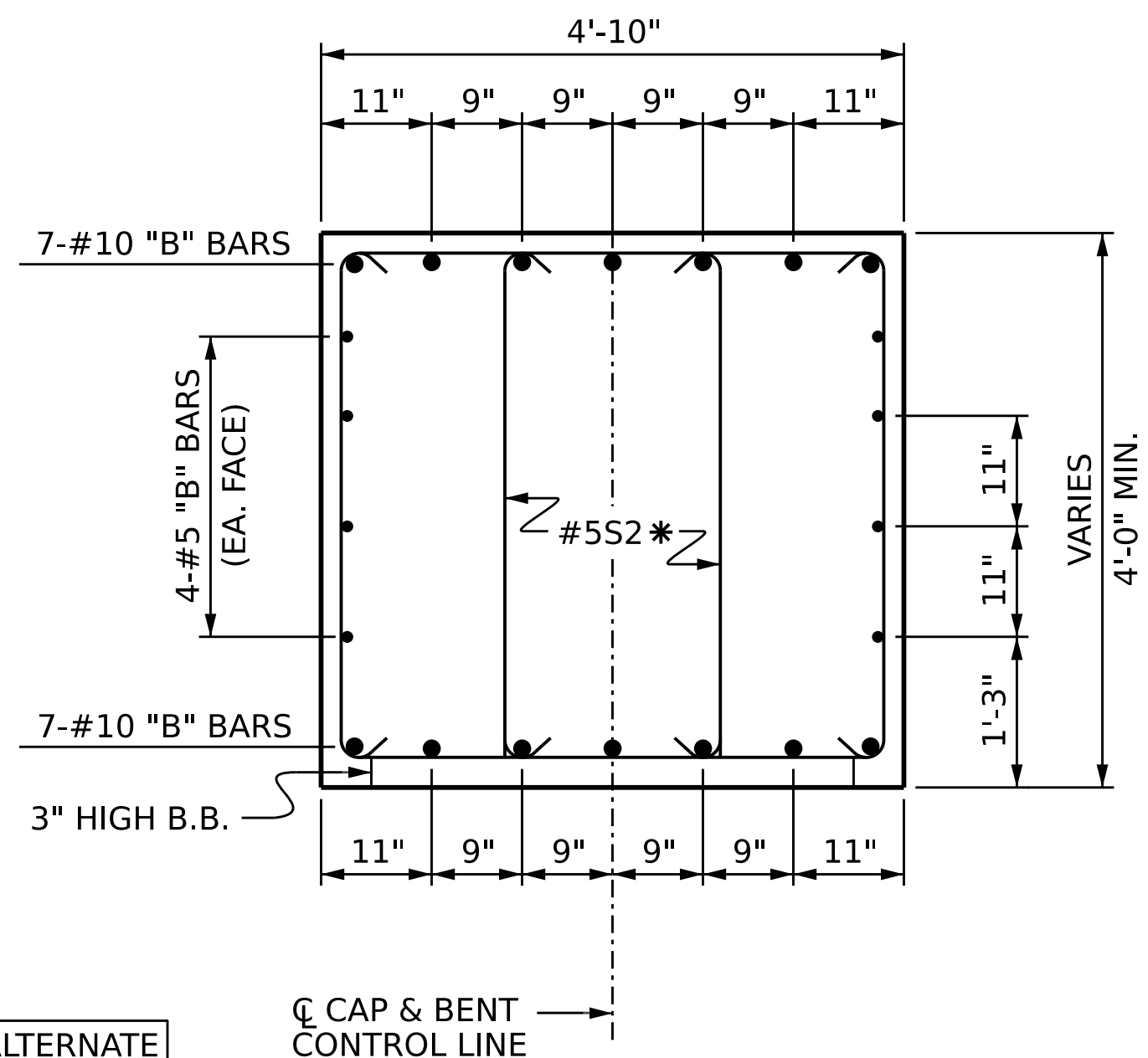
DRAWN BY :	D.R. DRUM	DATE :	11/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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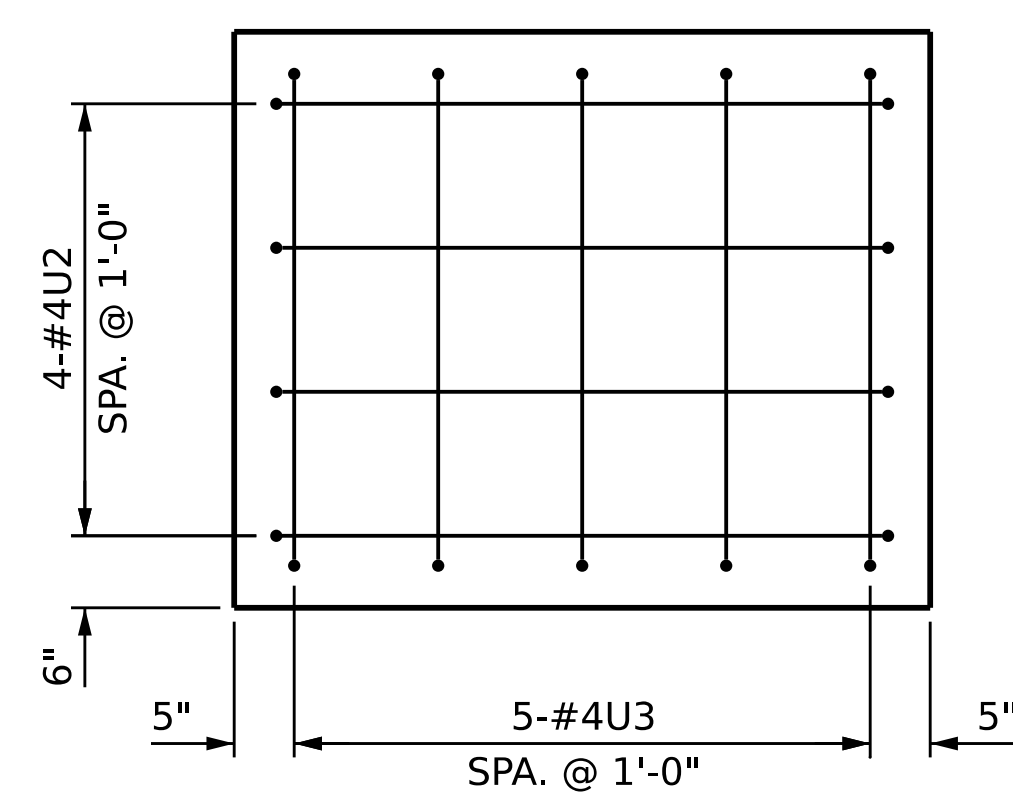


SECTION A-A

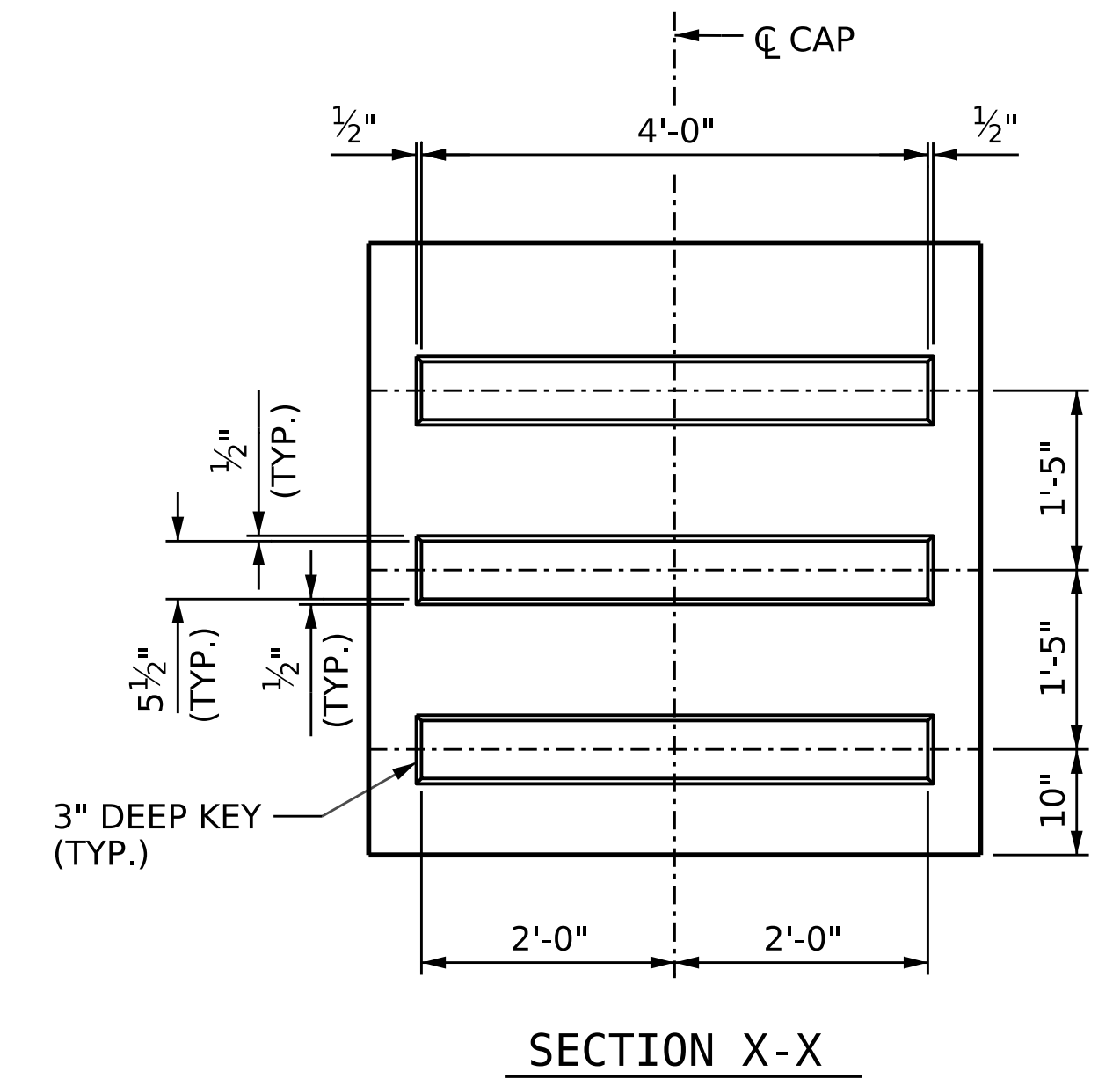
*INVERT ALTERNATE PAIR OF STIRRUPS



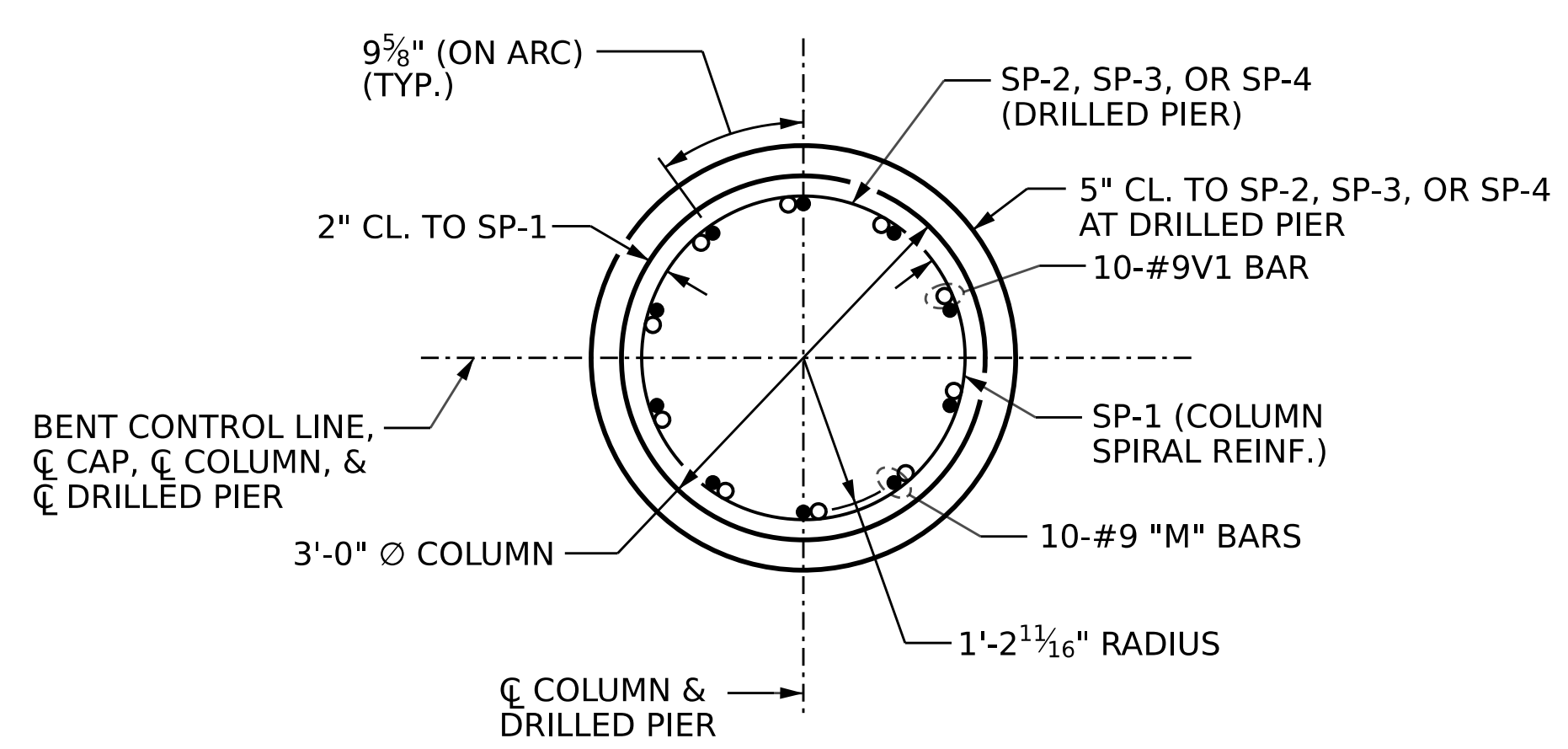
SECTION B-B



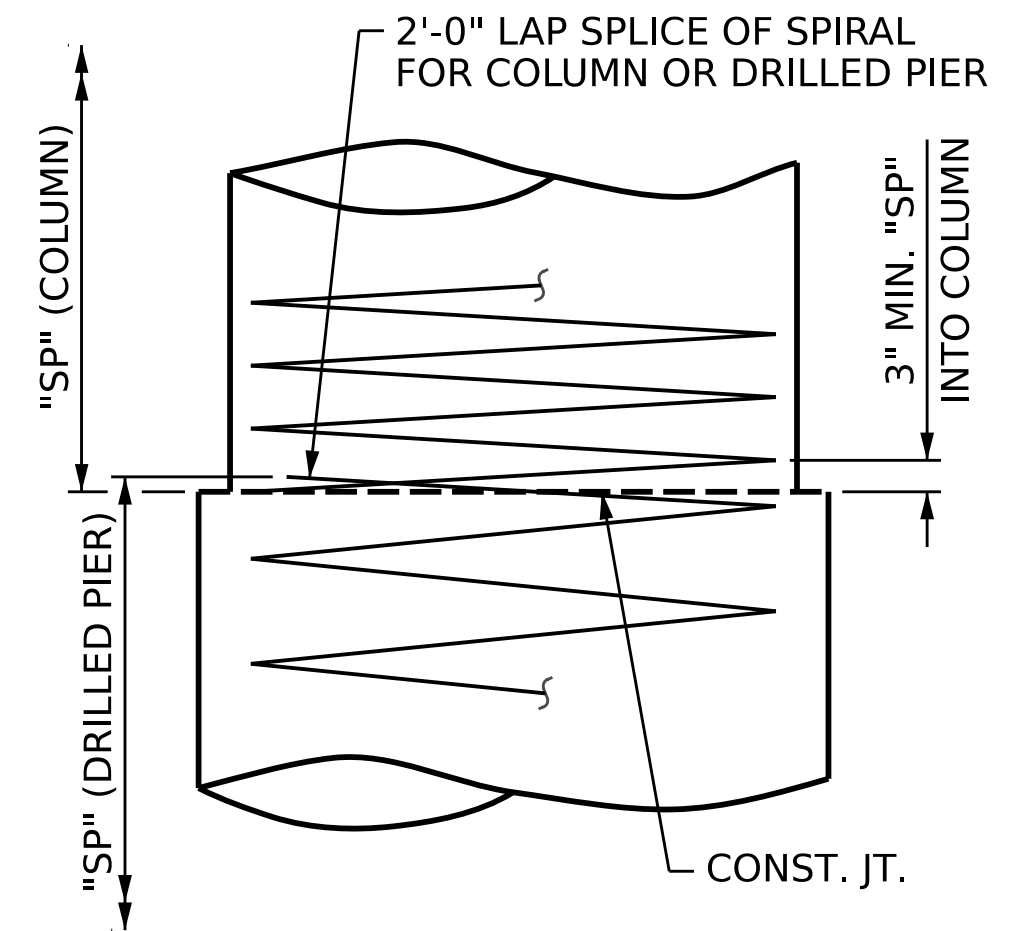
CAP END VIEW



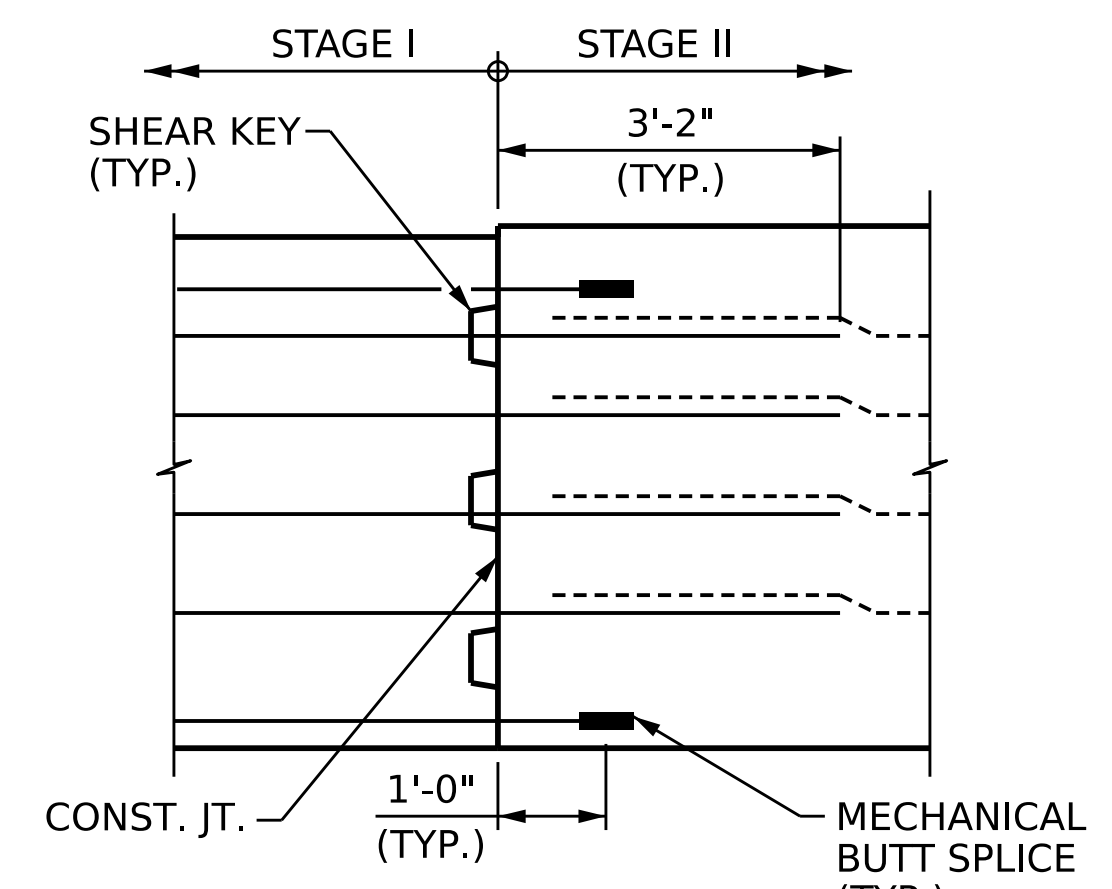
SECTION X-X



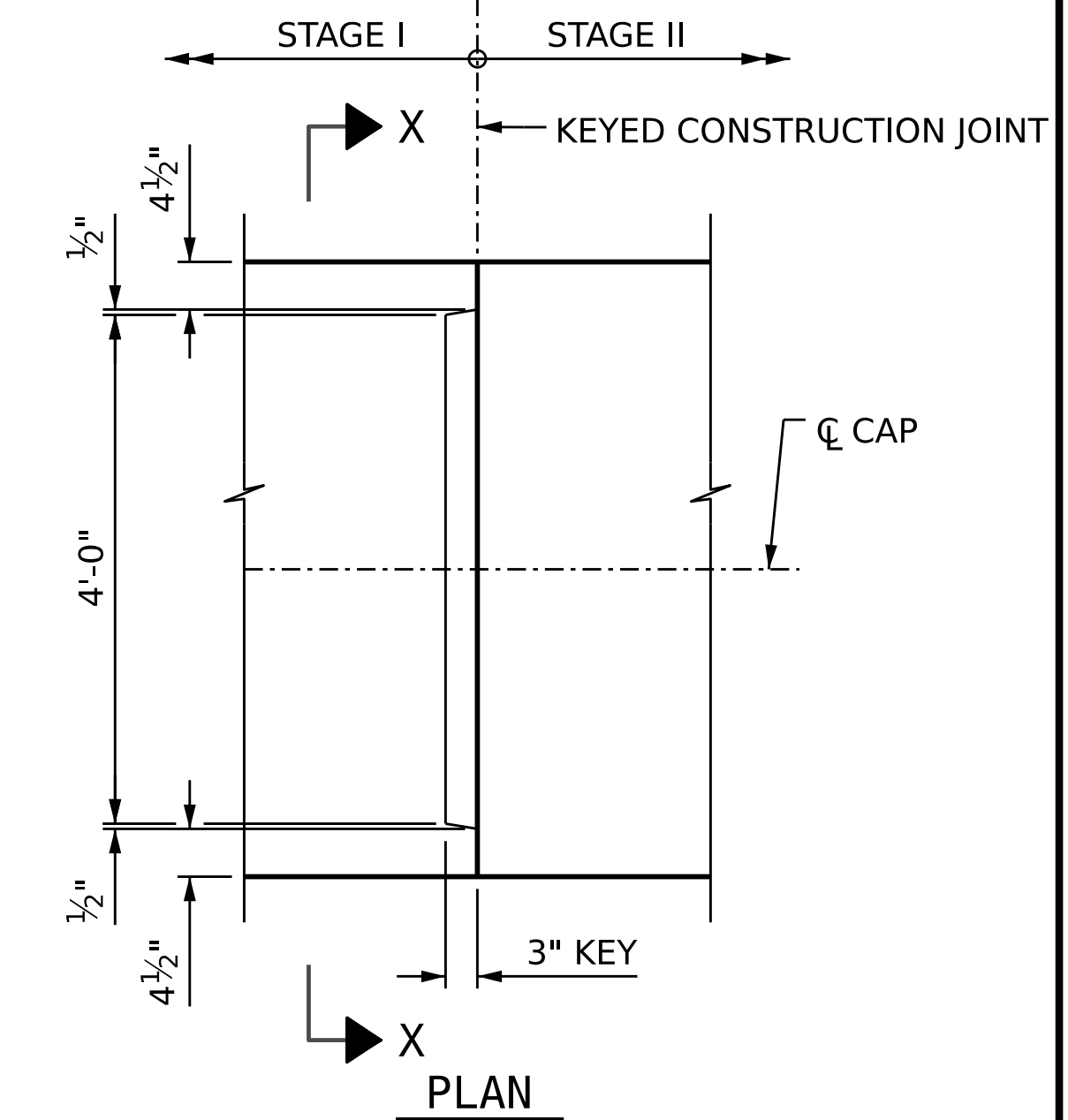
SECTION THRU COLUMN & DRILLED PIER



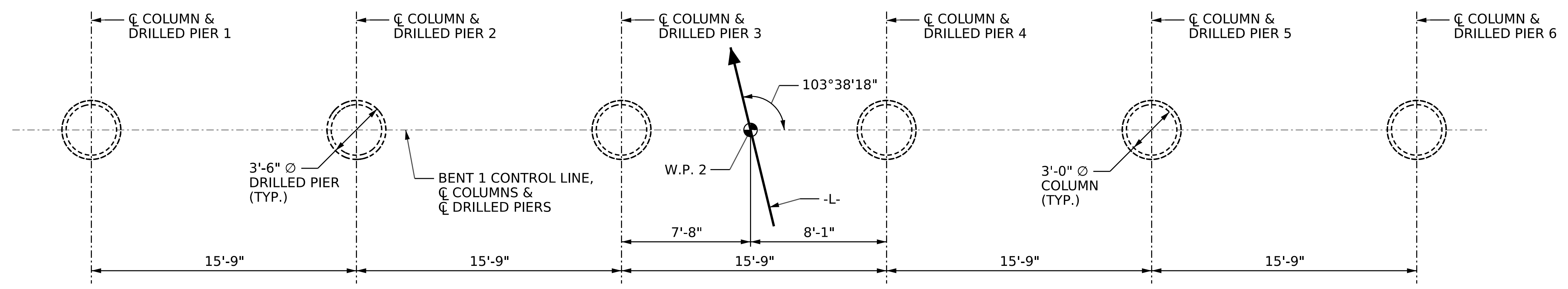
CONSTRUCTION JOINT DETAIL



DETAIL "B"



KEYED CONSTRUCTION JOINT DETAIL



PLAN OF DRILLED PIERS AND COLUMNS

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 3 OF 4

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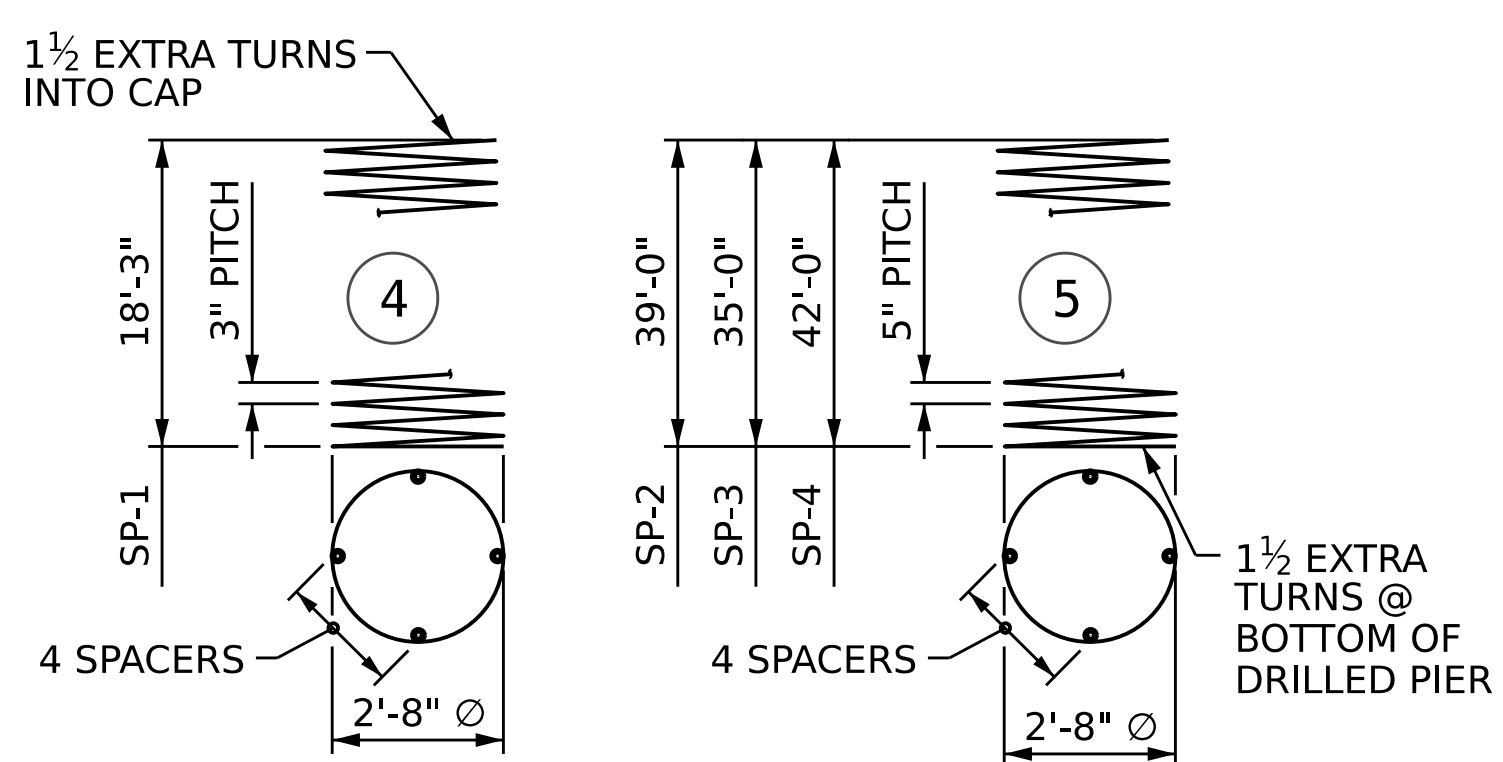
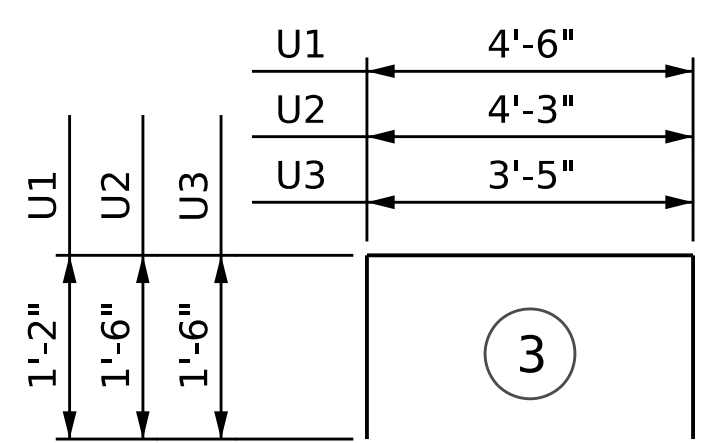
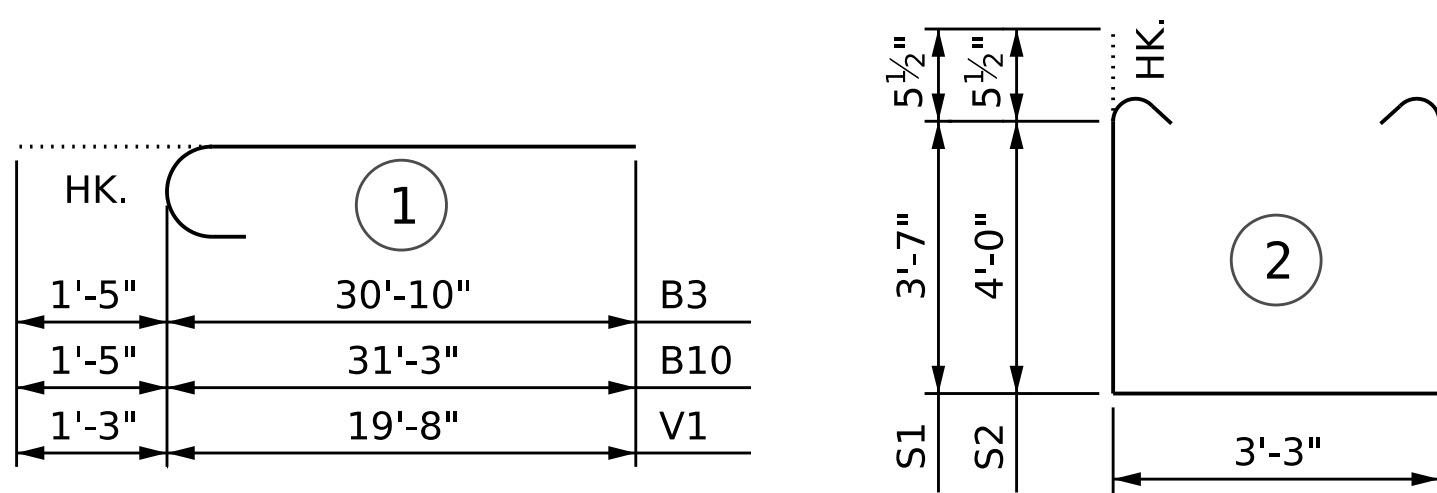
DocuSigned by:
 John C. Morrison 1/31/2023
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-35
TOTAL SHEETS					45

DRAWN BY :	D.R. DRUM	DATE :	11/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	10	STR	38'-1"	1147	B6	7	10	STR	47'-4"	1426
B2	6	5	STR	40'-3"	252	B7	6	5	STR	48'-4"	302
B3	7	10	1	32'-3"	971	B8	2	5	STR	20'-1"	42
B4	7	10	STR	16'-3"	489	B9	7	10	STR	25'-1"	756
B5	2	5	STR	12'-5"	26	B10	7	10	1	32'-8"	984
						B11	7	4	STR	4'-7"	21
M1	20	9	STR	46'-1"	3134	B12	7	4	STR	10'-4"	48
M2	10	9	STR	42'-1"	1431						
						M2	10	9	STR	42'-1"	1431
S1	50	5	2	11'-4"	591	M3	20	9	STR	49'-1"	3338
S2	36	5	2	12'-2"	457						
						S1	50	5	2	11'-4"	591
U1	32	4	3	6'-10"	146	S2	62	5	2	12'-2"	787
U2	4	4	3	7'-3"	19						
U3	5	4	3	6'-5"	21	U1	44	4	3	6'-10"	201
						U2	4	4	3	7'-3"	19
V1	30	9	1	20'-11"	2134	U3	5	4	3	6'-5"	21
						V1	30	9	1	20'-11"	2134

REINFORCING STEEL 10,818 LBS. REINFORCING STEEL 12,101 LBS.

SP-1	3	*	4	613'-5"	1229	SP-1	3	*	4	613'-5"	1229
SP-2	2	**	5	780'-7"	1628	SP-3	1	**	5	701'-9"	732
SP-3	1	**	5	701'-9"	732	SP-4	2	**	5	839'-8"	1752

SPIRAL COLUMN REINFORCING STEEL 3,589 LBS. SPIRAL COLUMN REINFORCING STEEL 3,713 LBS.

- * THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR
- ** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR
- * THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR
- ** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN			CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)	14.1 C.Y.		POUR #2 (COLUMNS)	14.1 C.Y.	
POUR #3 (CAP)	28.4 C.Y.		POUR #3 (CAP)	38.3 C.Y.	
TOTAL CLASS A CONCRETE	42.5 C.Y.		TOTAL CLASS A CONCRETE	52.4 C.Y.	
DRILLED PIERS:			DRILLED PIERS:		
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	40.8 C.Y.		DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	42.9 C.Y.	

PROJECT NO. BR-0043

ROCKINGHAM COUNTY

STATION: POT 25+80.88 -L-

SHEET 4 OF 4

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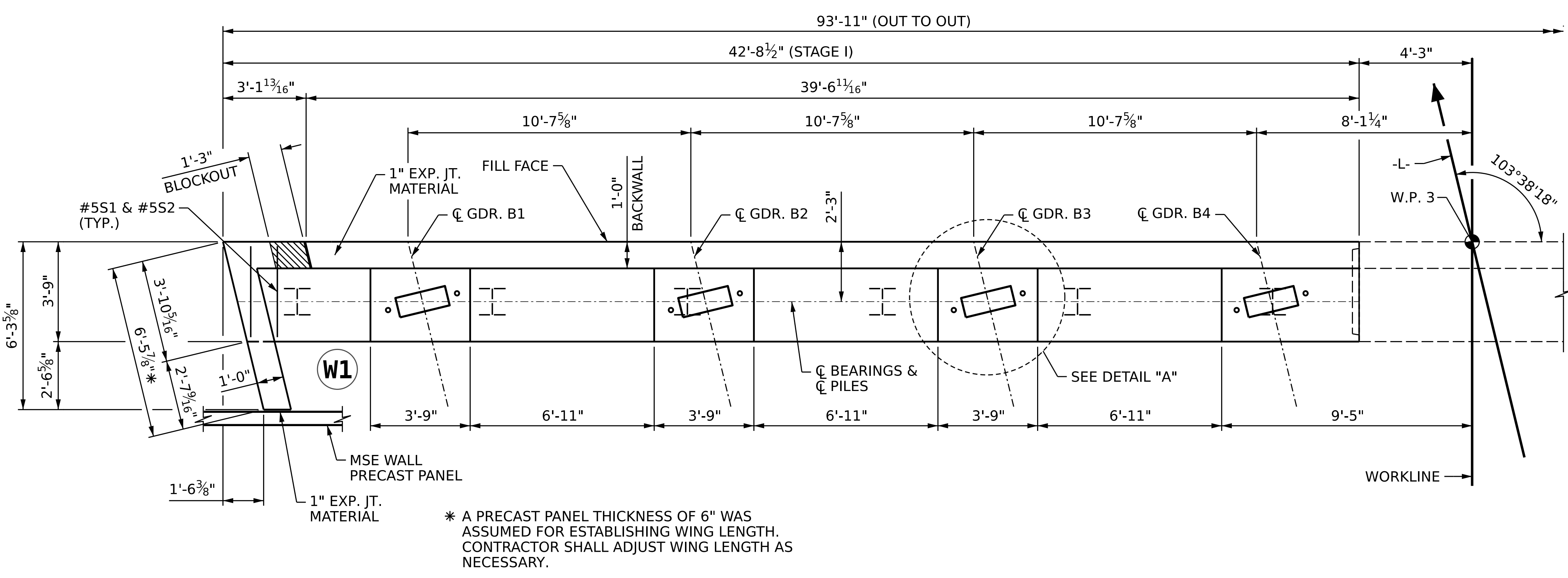
SEAL 030474 ENGINEER JOHN C. MORRISON

DocuSigned by: John C. Morrison 1/31/2023

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			45

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CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022



PLAN

NOTES:

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" OR #10 "B" BARS IN STAGE I WITH THE #9 "B" OR #10 "B" BARS, RESPECTIVELY, IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 OR #10 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

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

#5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

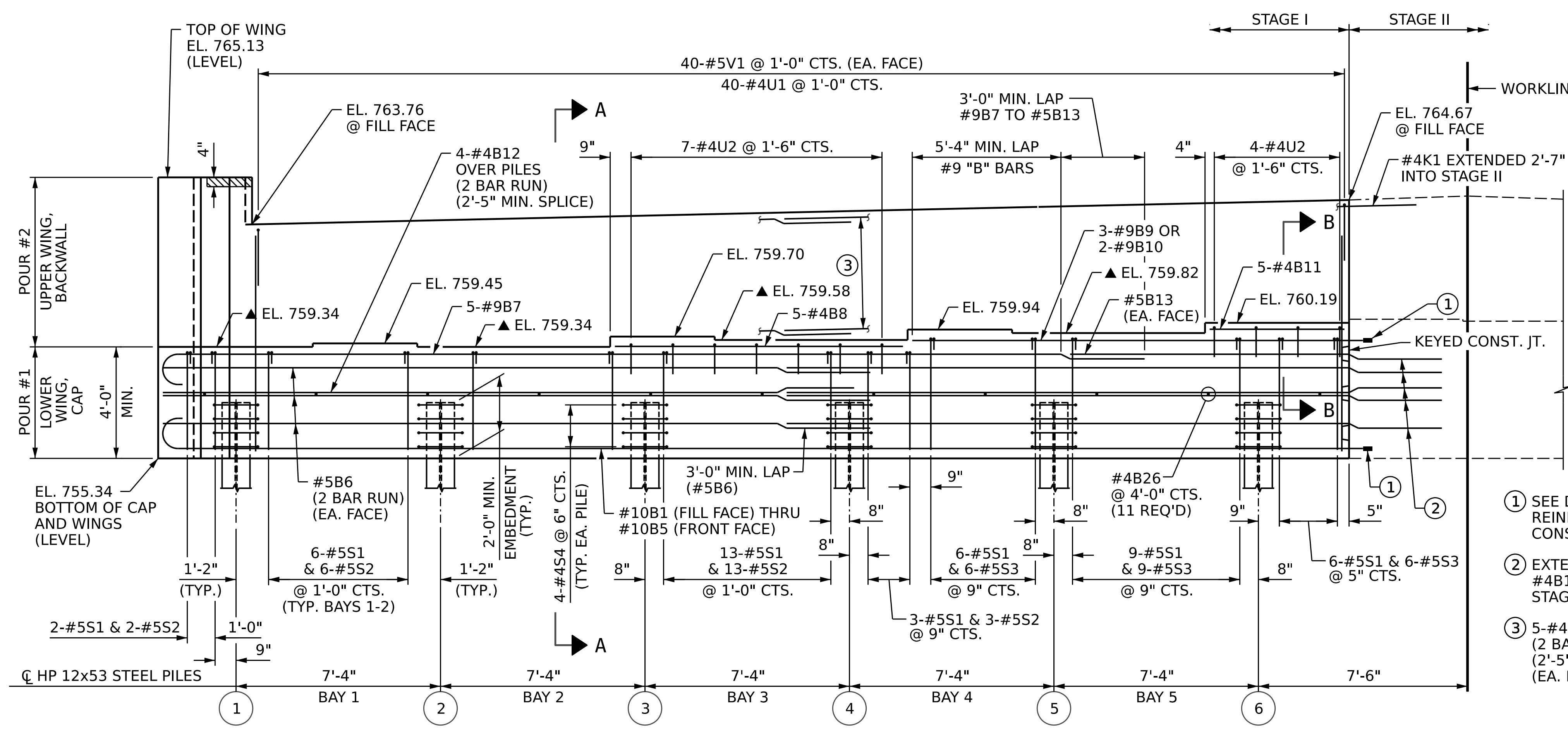
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 3 OF 5.

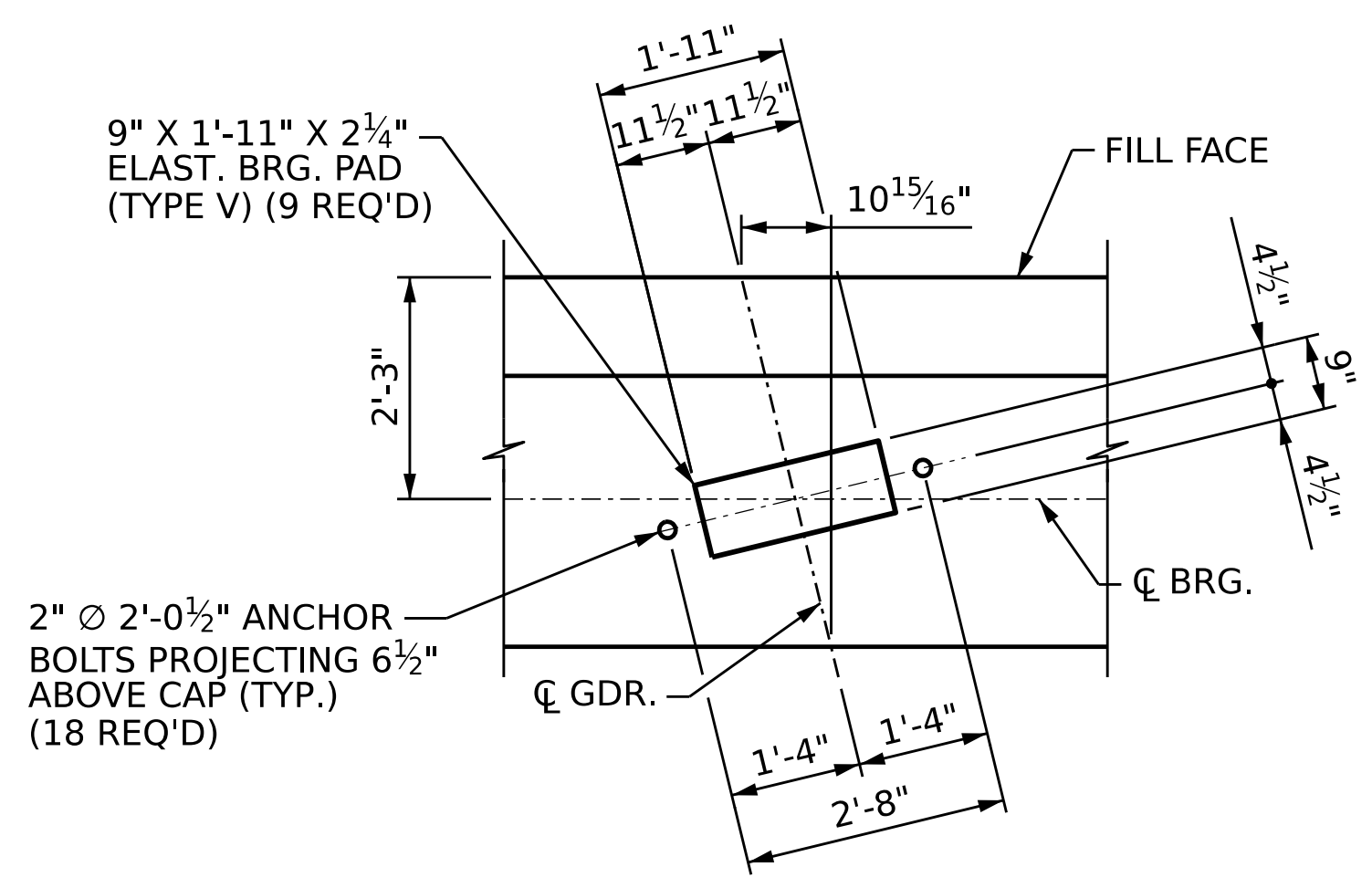
FOR DETAIL "B", PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 4 OF 5.

FOR CONSTRUCTION JOINT DETAILS, SEE "KEYED CONSTRUCTION JOINT DETAIL" ON SHEET 4 OF 5.

FOR SECTIONS A-A AND B-B, SEE SHEET 5 OF 5.



ELEVATION



DETAIL "A"

PROJECT NO. BR-0043

ROCKINGHAM COUNTY

STATION: POT 25+80.88 -L-

SHEET 1 OF 5

- ① SEE DETAIL "B" FOR REINF. DETAILS AT CONST. JT.
- ② EXTEND #5B6, #5B13, #4B12 3'-2" MIN. INTO STAGE II
- ③ 5-#4K1 @ 1'-0" CTS. (2 BAR RUN) (2'-5" MIN. LAP) (EA. FACE)

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DocuSigned by:
John C. Morrison
A2FDE142C82F4AB

1/31/2023

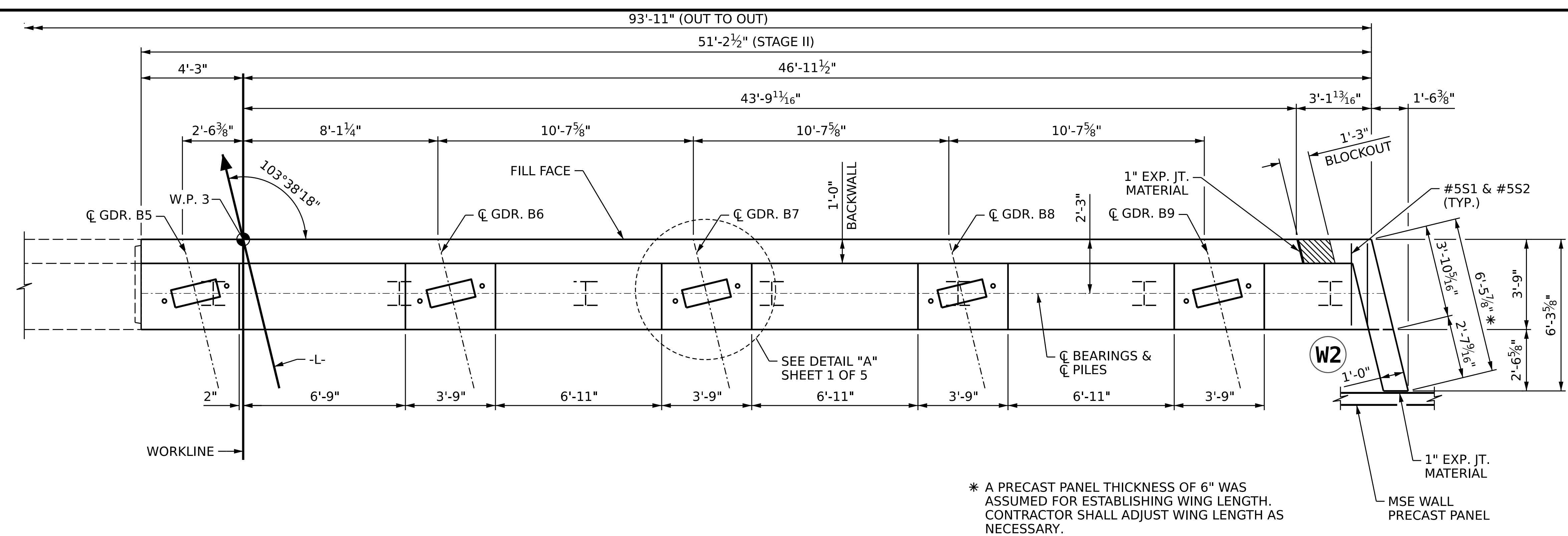
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE END BENT 2 STAGE I	
REVISIONS			
NO.	BY:	DATE:	NO.
1		3	
2		4	
SHEET NO.			S-37
TOTAL SHEETS			45

DRAWN BY :	D.R. DRUM	DATE :	10/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

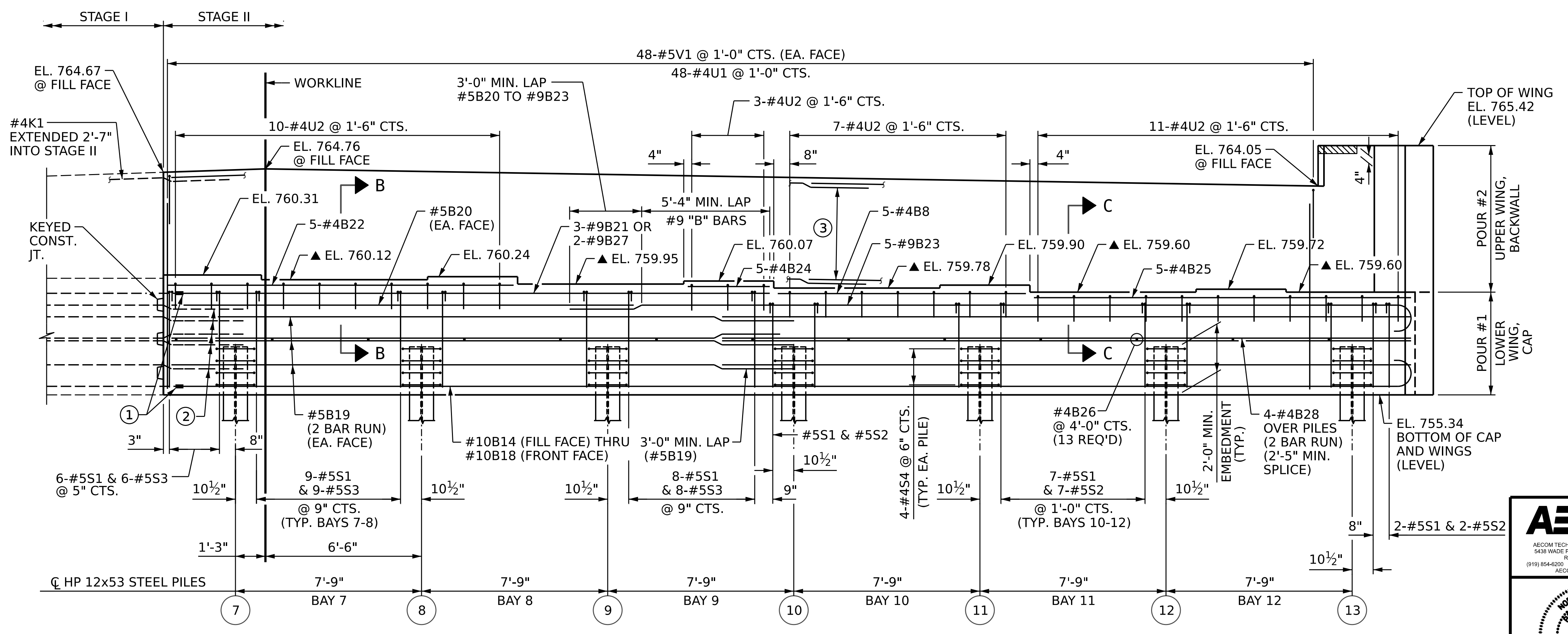
▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 5.

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NOTES:
FOR NOTES AND DETAIL "A", SEE SHEET 1 OF 5.
FOR SECTIONS B-B AND C-C, SEE SHEET 5 OF 5.



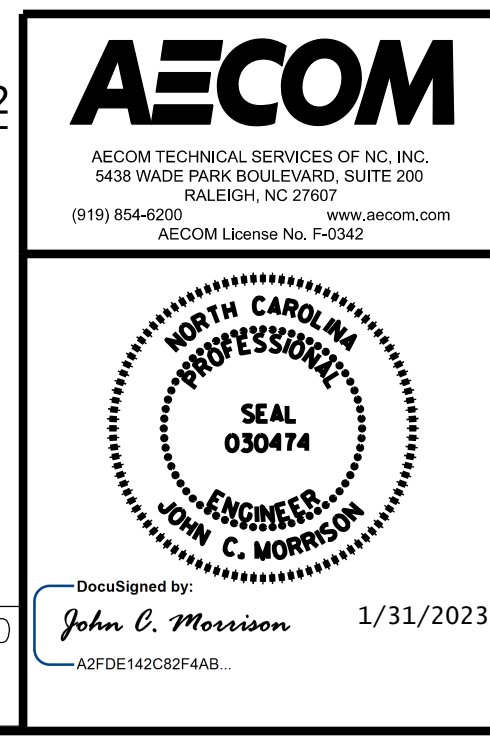
PLAN



ELEVATION

- ① SEE DETAIL "B" FOR REINF. DETAILS AT CONST. JT.
 - ② #5B6, #5B13, #4B12 EXTENDED 3'-2" MIN. INTO STAGE II
 - ③ 5-#4K3 @ 1'-0" CTS. (2 BAR RUN) (2'-5" MIN. LAP) (EA. FACE)
- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 5.

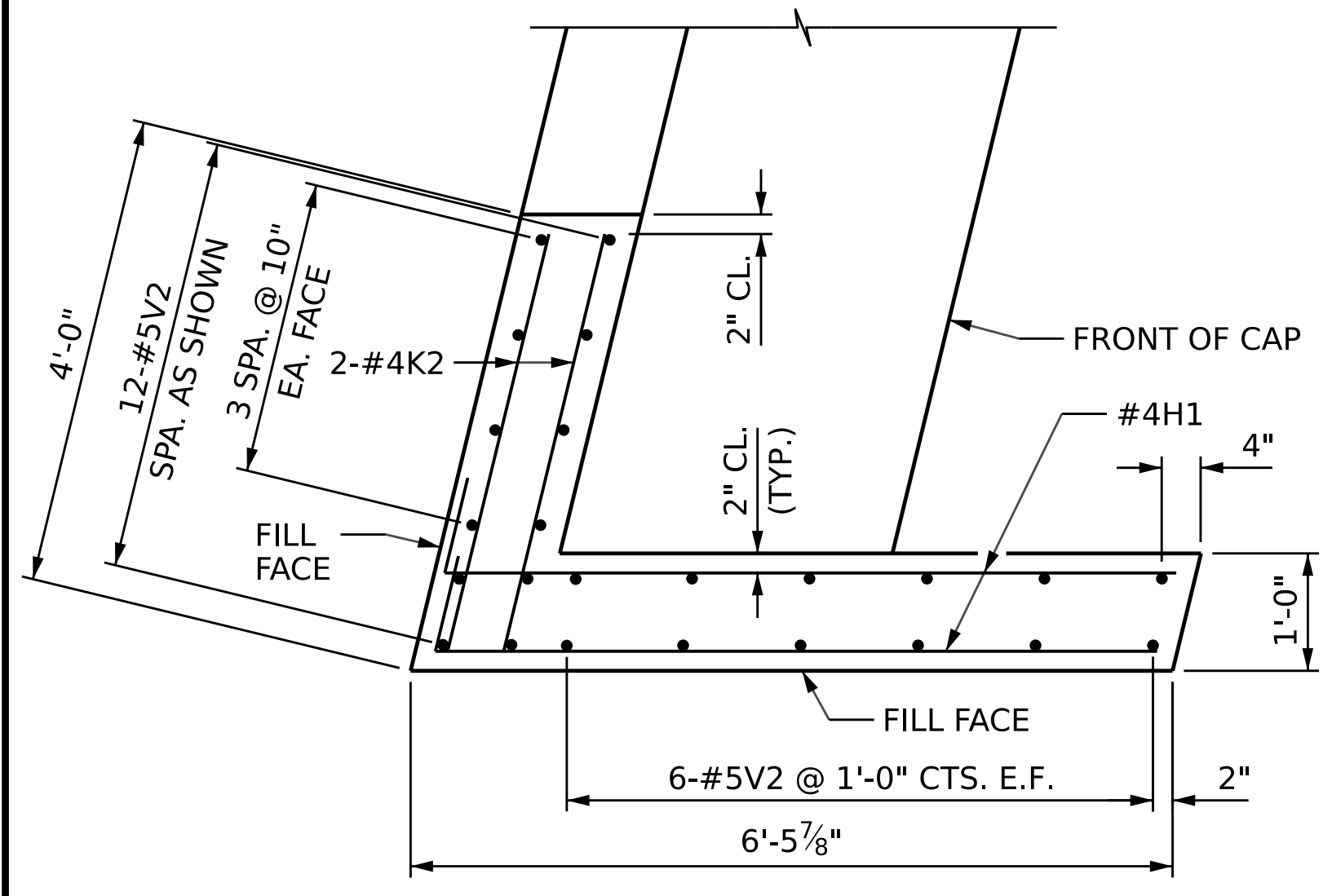
PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 2 OF 5



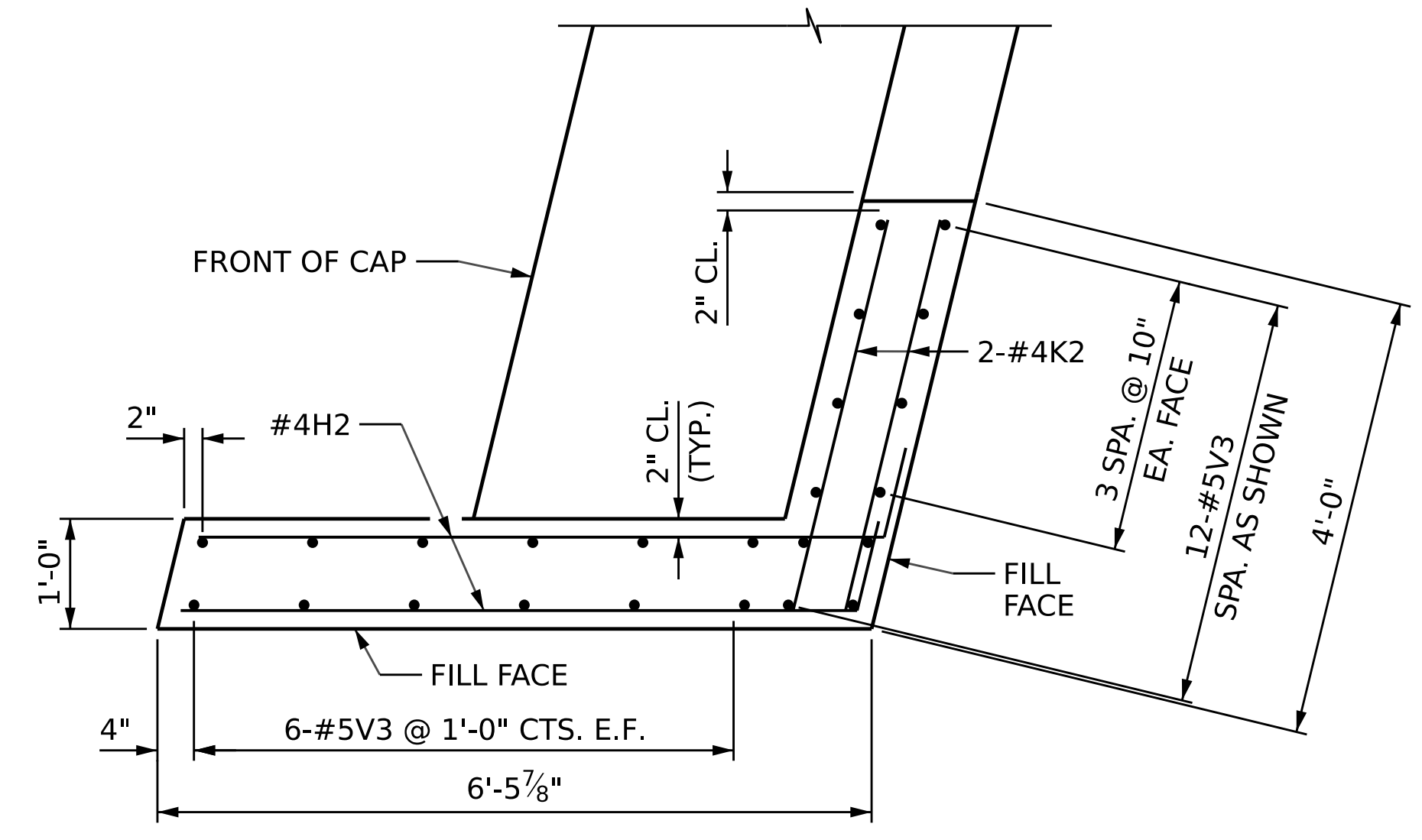
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE END BENT 2 STAGE II	
REVISIONS			
NO.	BY:	DATE:	NO.
1		3	
2		4	
SHEET NO.			5-38
TOTAL SHEETS			45

DRAWN BY: D.R. DRUM DATE: 10/2022
CHECKED BY: D. RITACCO DATE: 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

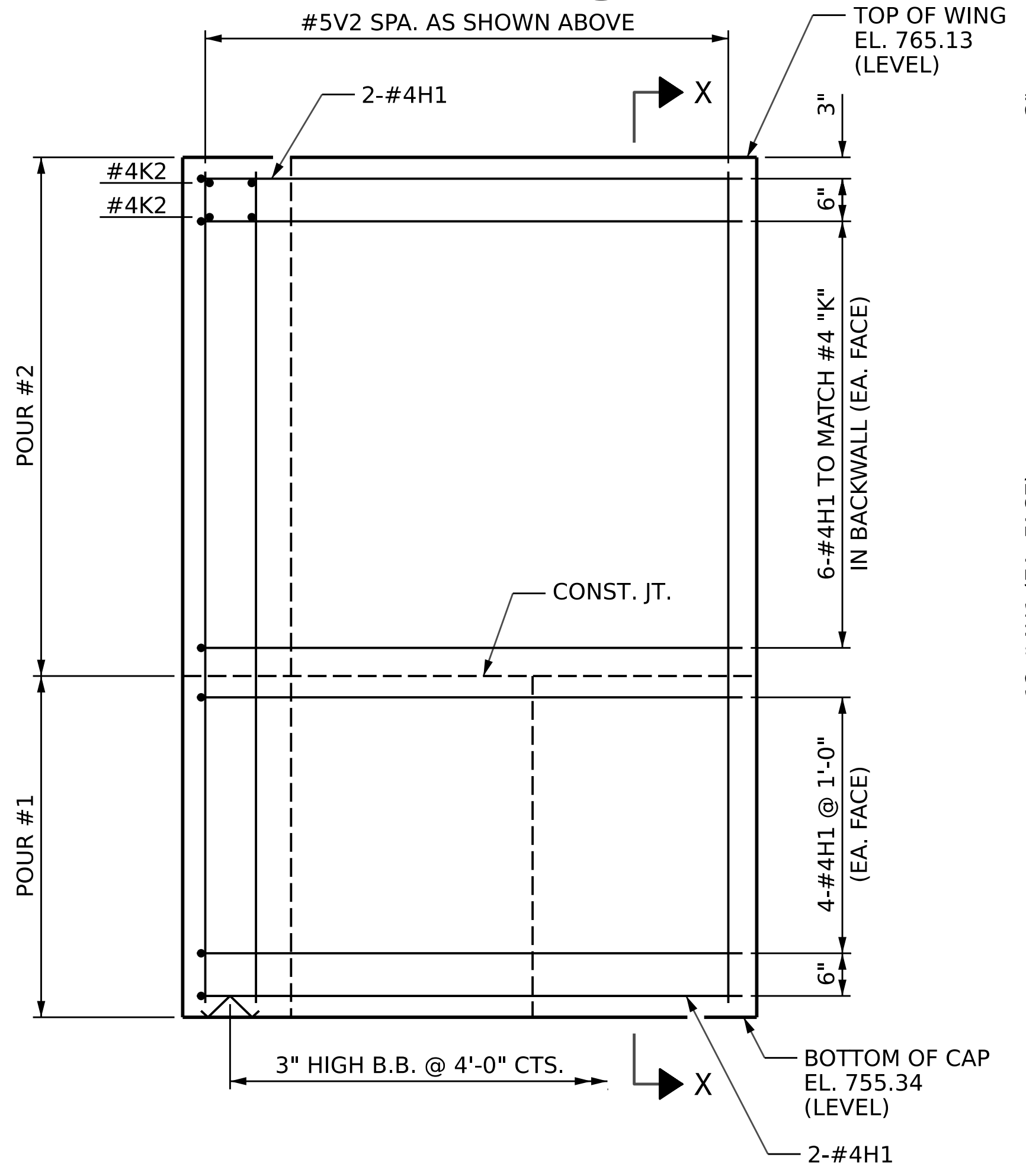
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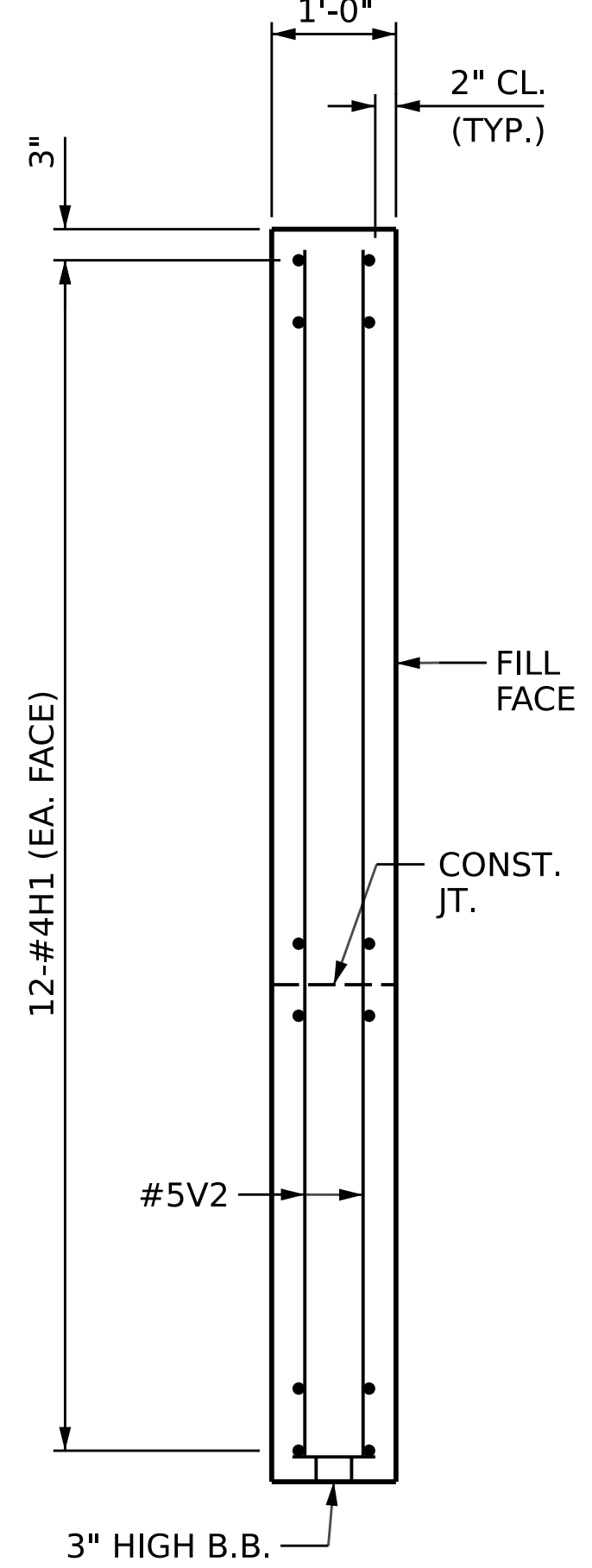
PLAN OF WING W1



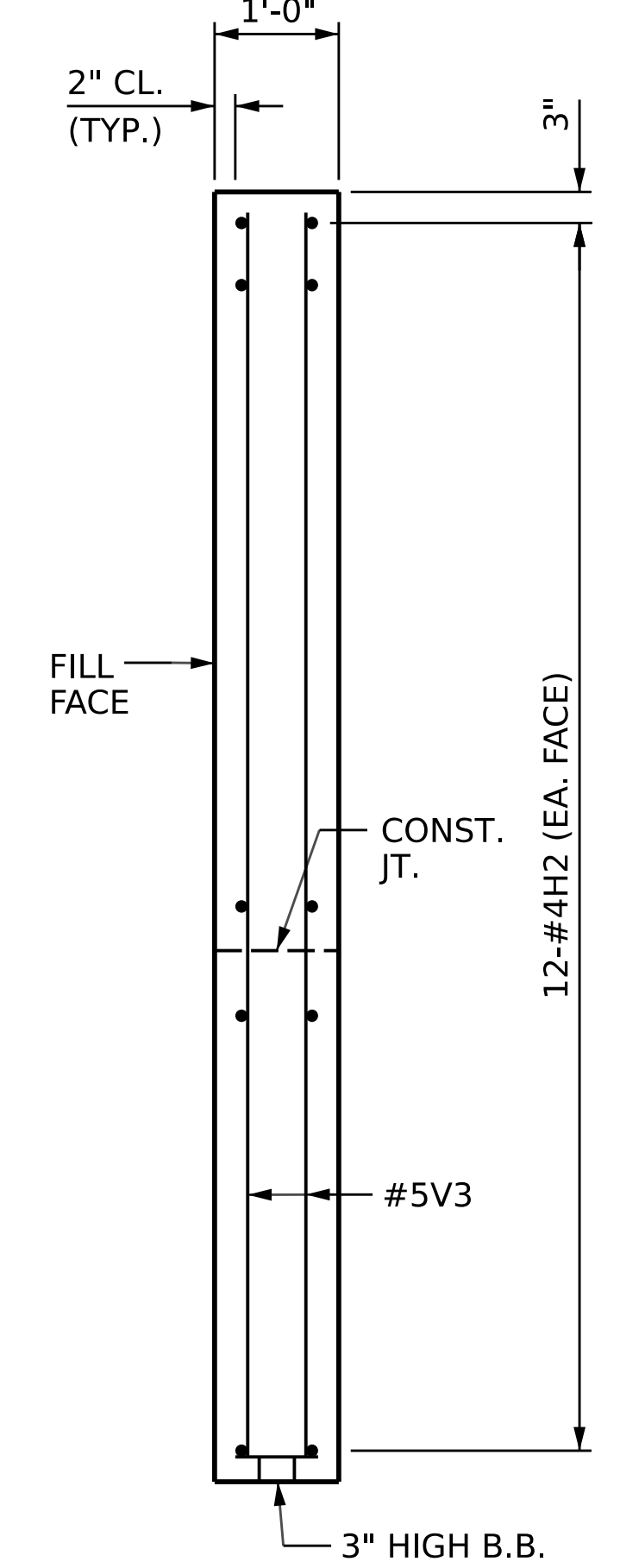
PLAN OF WING W2



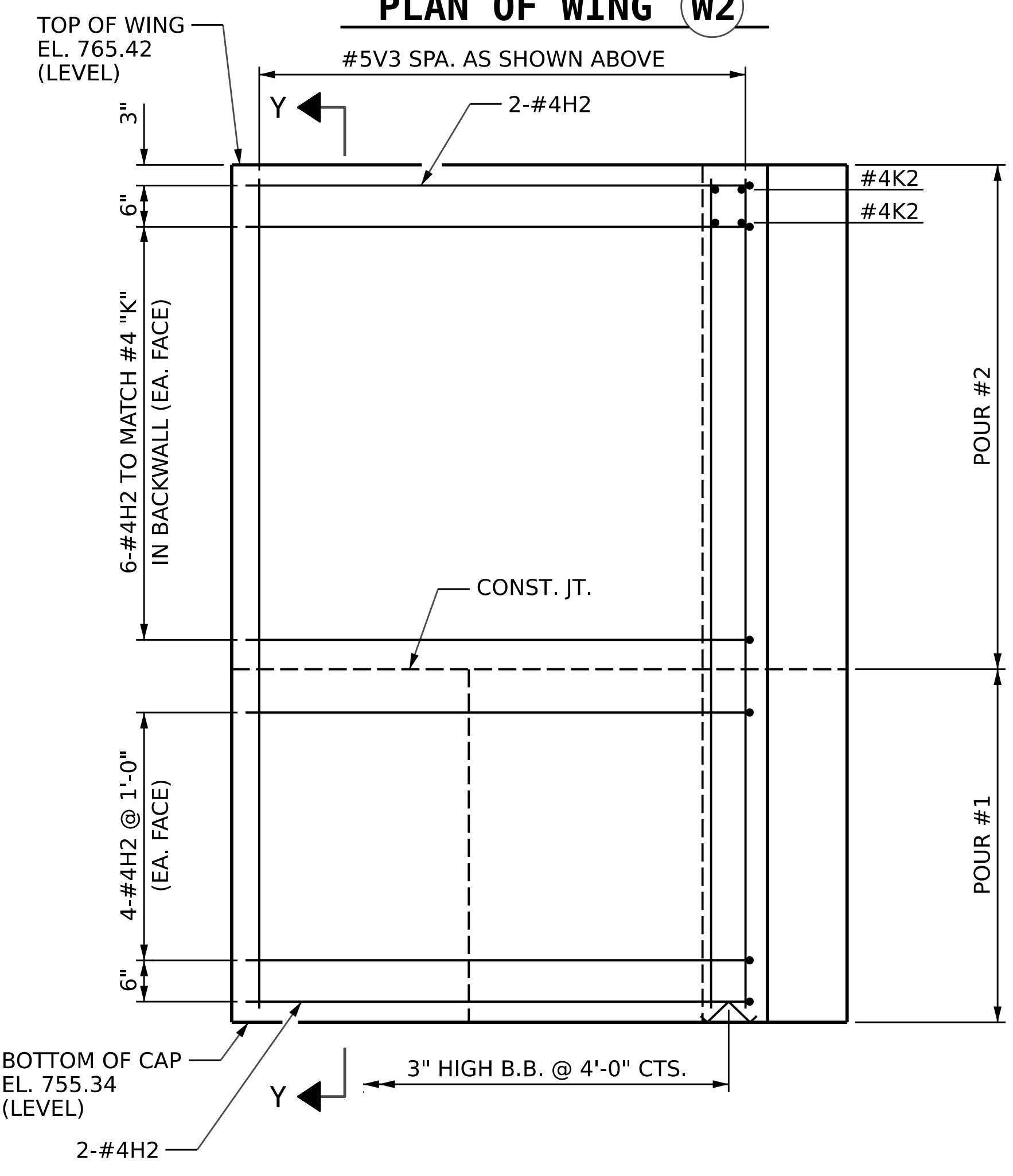
ELEVATION OF WING W1



SECTION X-X



SECTION Y-Y



ELEVATION OF WING W2

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-
 SHEET 3 OF 5

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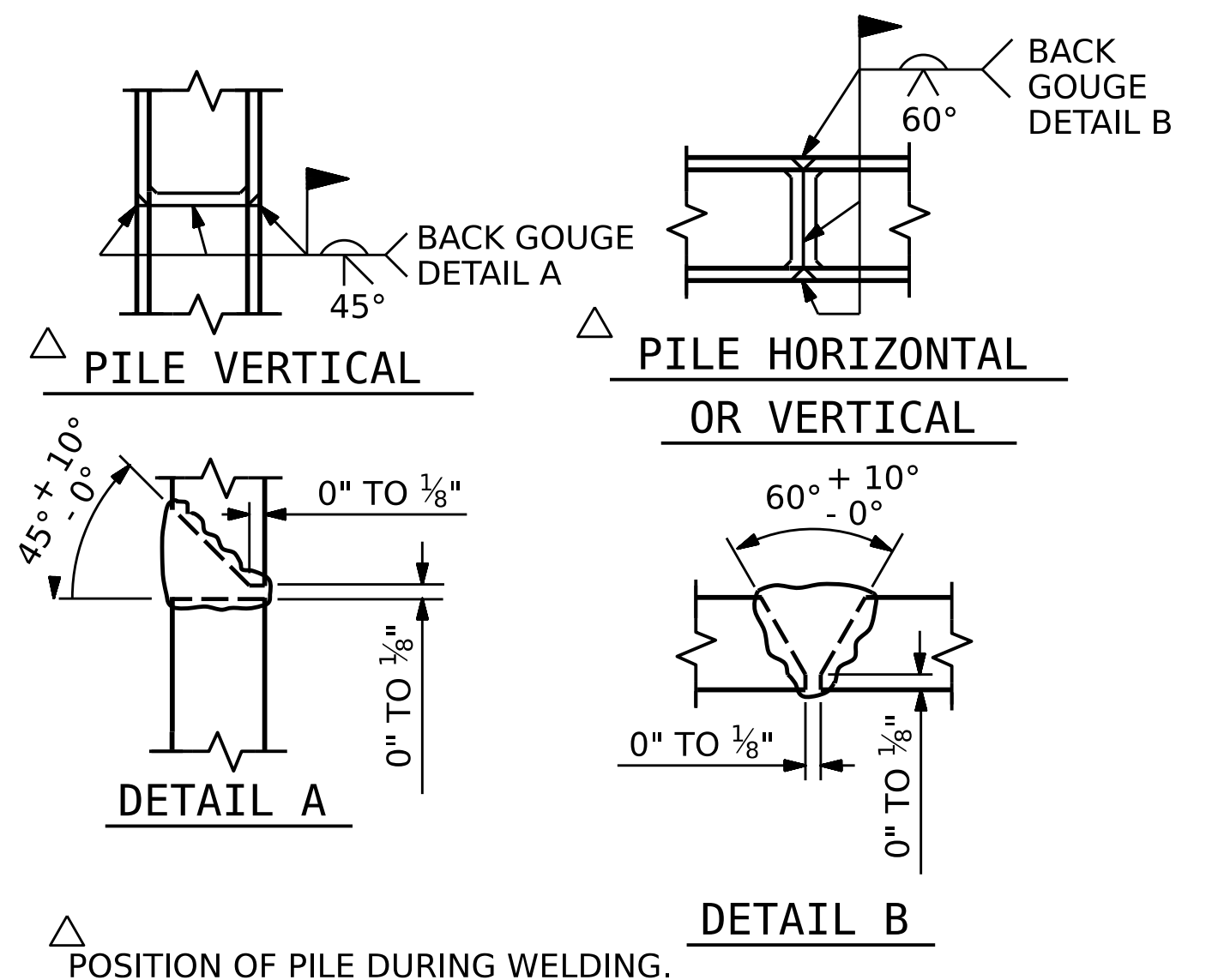
SEAL
 030474
 JOHN C. MORRISON
 ENGINEER

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John C. Morrison 1/31/2023
A2FDE142C82F4A8...

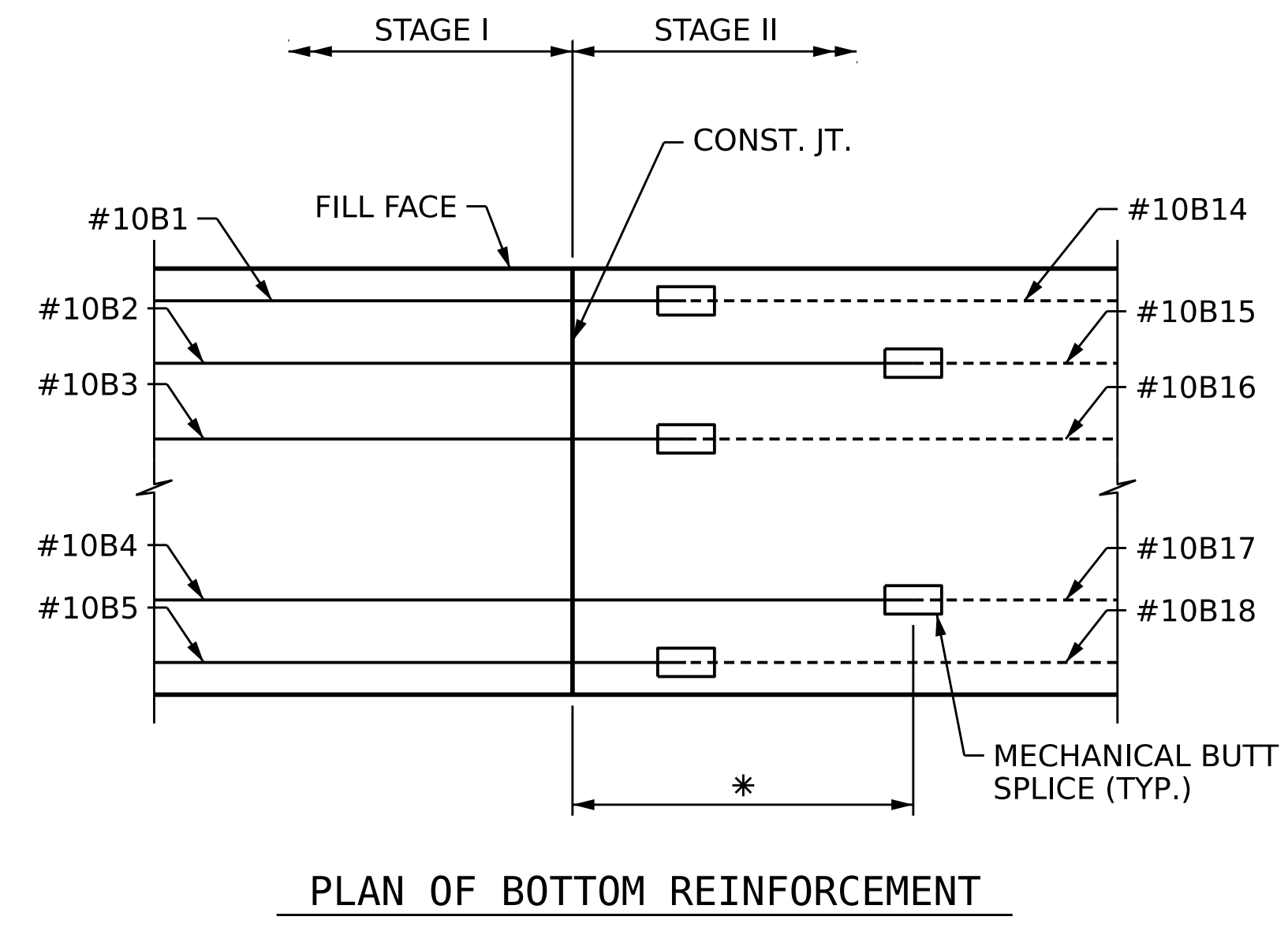
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 WINGWALLS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-39
TOTAL SHEETS					45

DRAWN BY: <u>D.R. DRUM</u>	DATE: <u>10/2022</u>
CHECKED BY: <u>D. RITACCO</u>	DATE: <u>11/2022</u>
DESIGN ENGINEER OF RECORD: <u>J.C. MORRISON</u>	DATE: <u>12/2022</u>

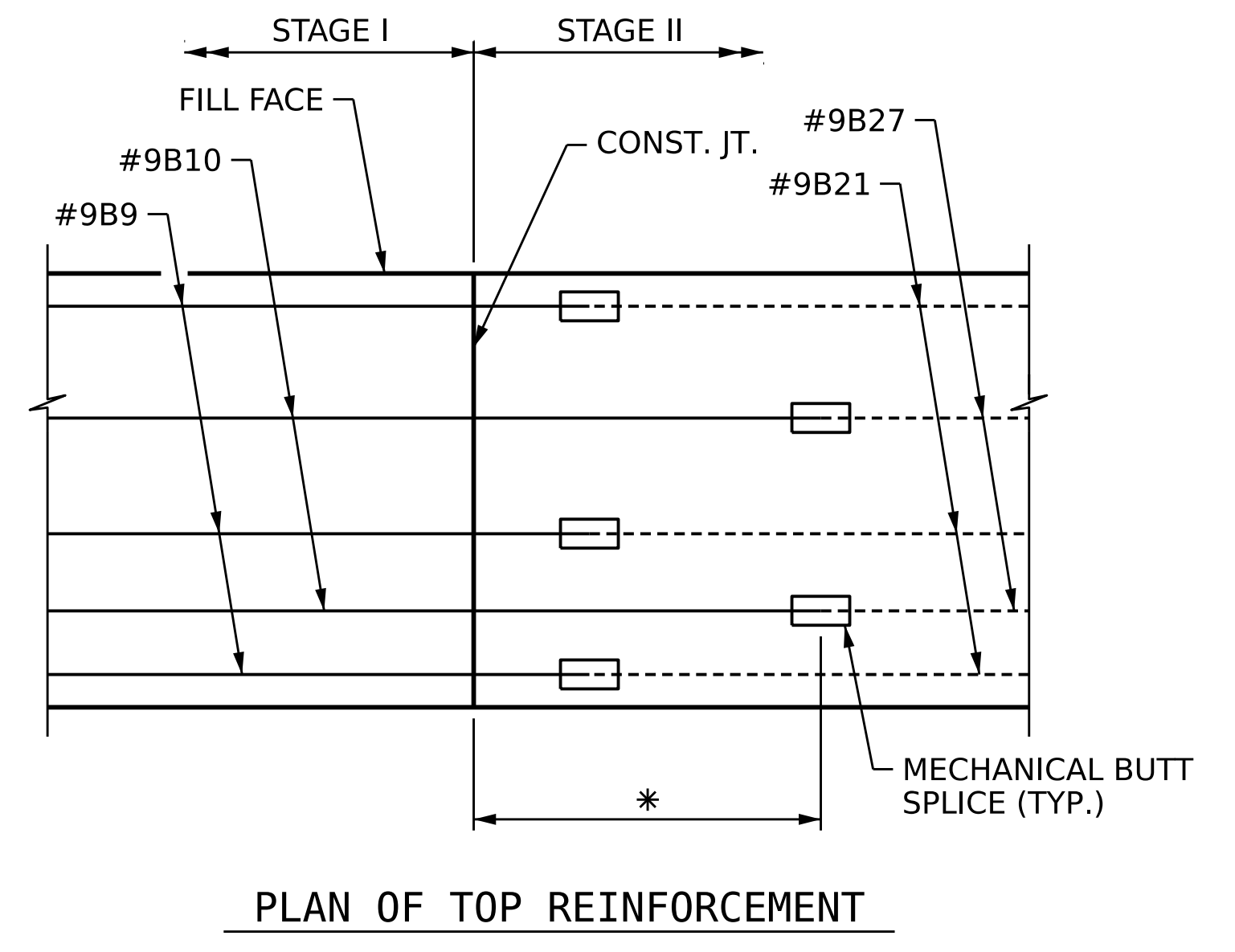
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PILE SPLICE DETAILS



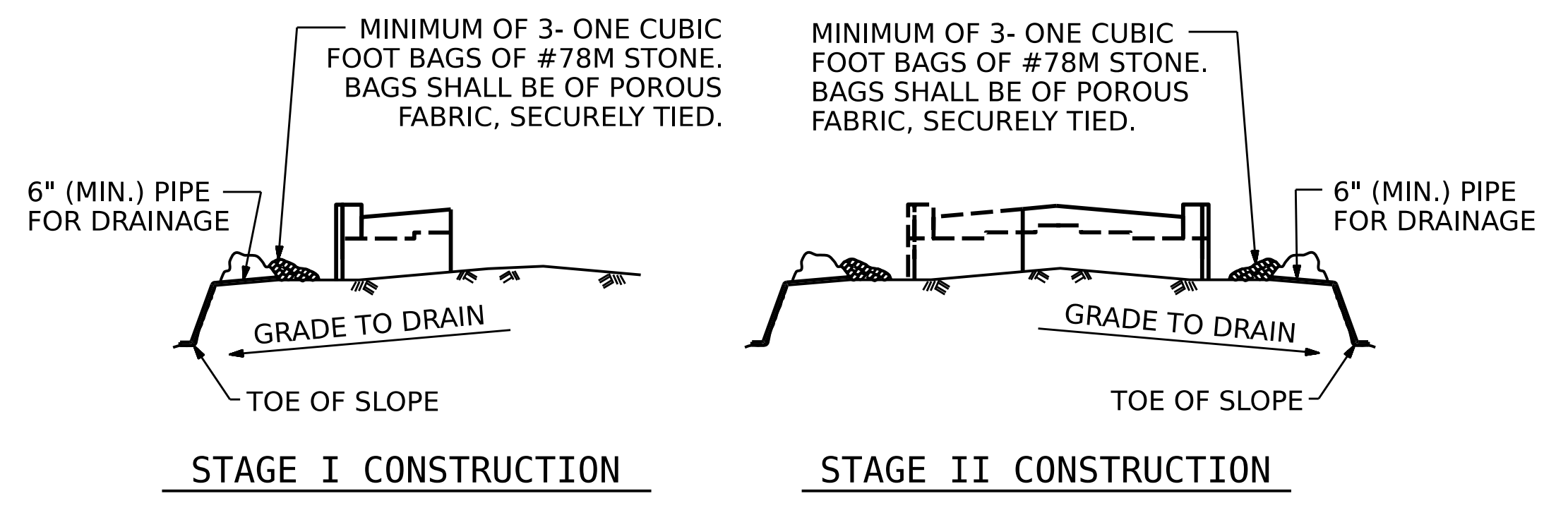
PLAN OF BOTTOM REINFORCEMENT



PLAN OF TOP REINFORCEMENT

DETAIL "B"

* STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 3'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT

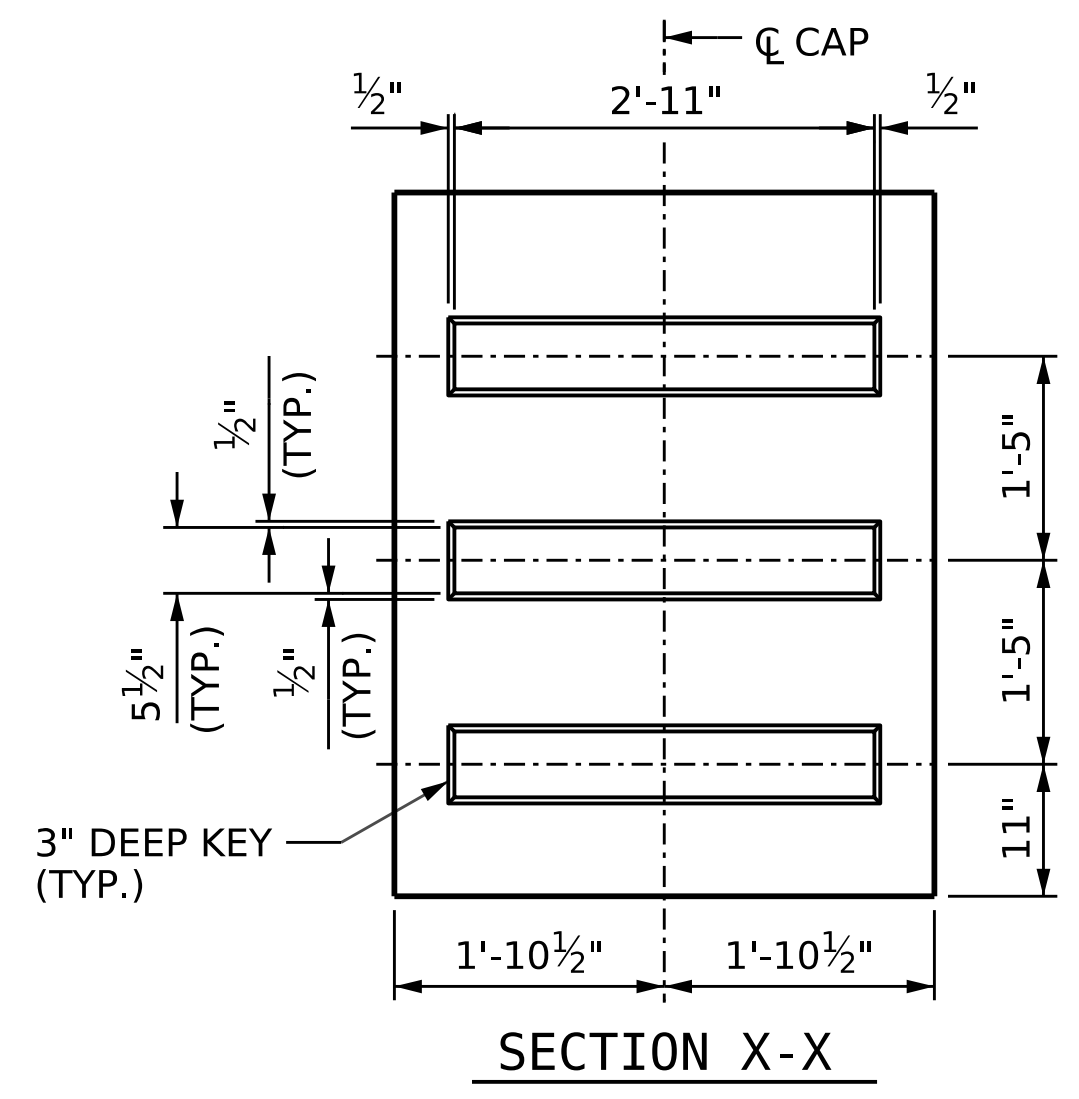


TEMPORARY DRAINAGE AT END BENT

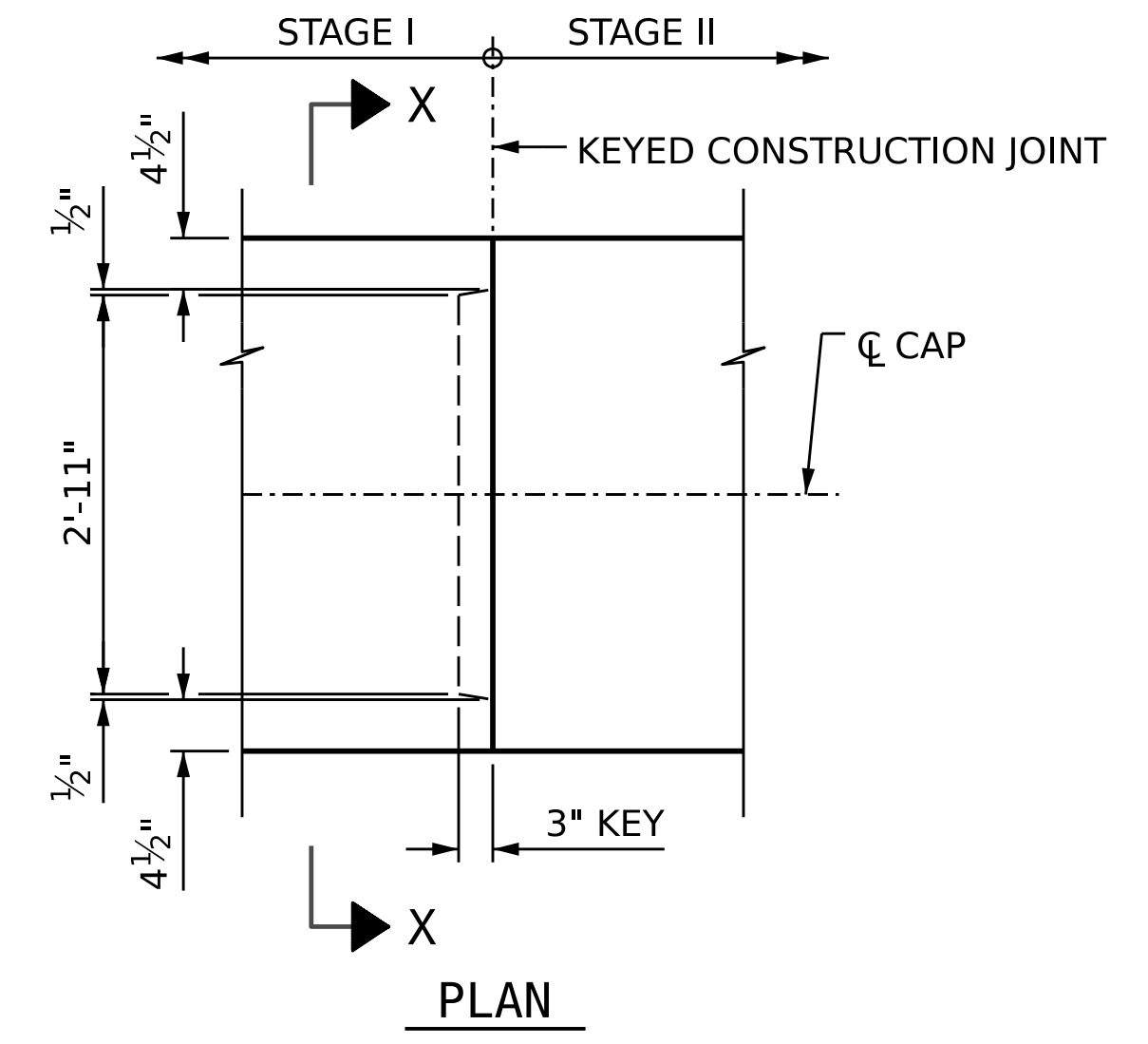
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.



SECTION X-X



PLAN

KEYED CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 4 OF 5

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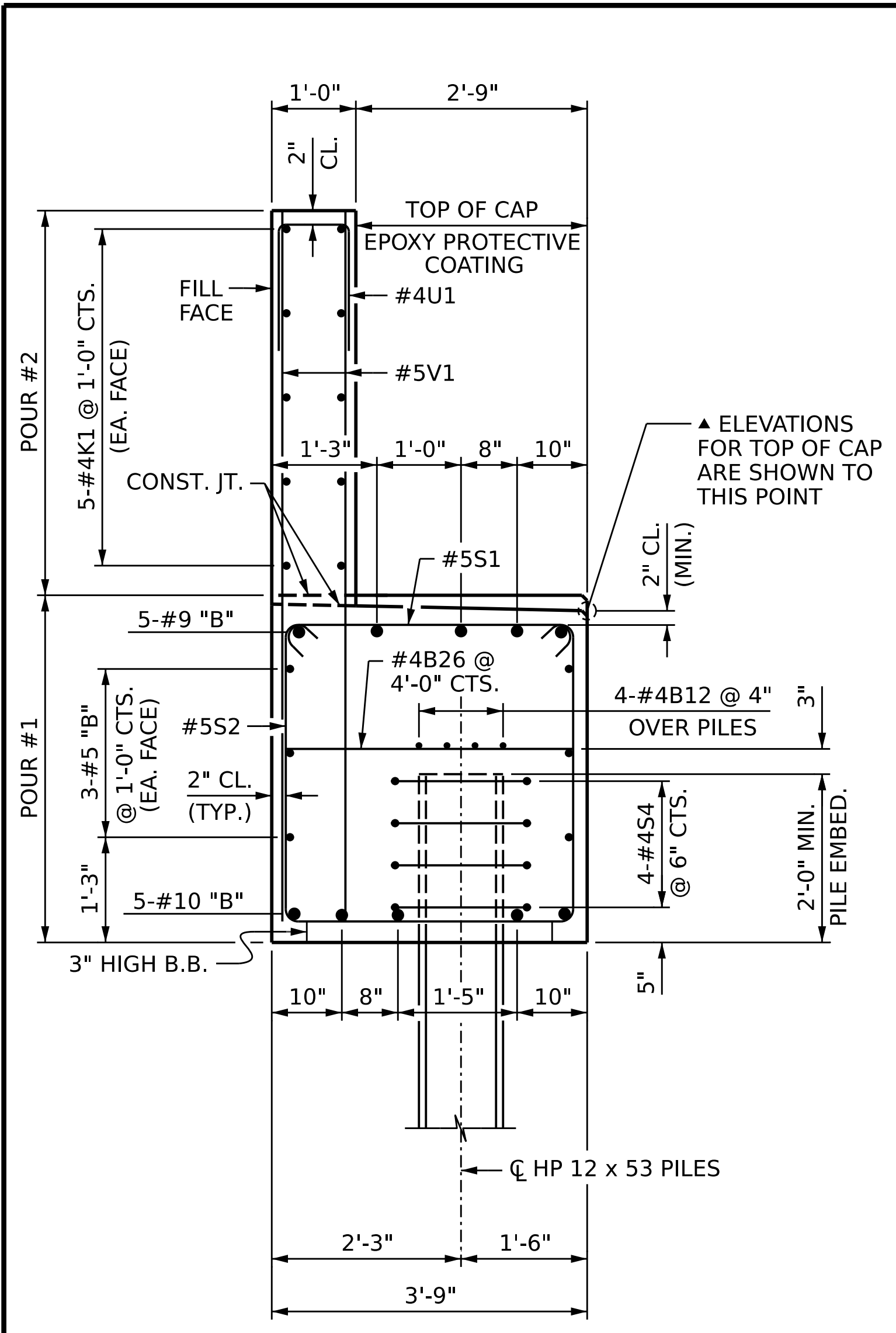
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
END BENT 2
DETAILS**

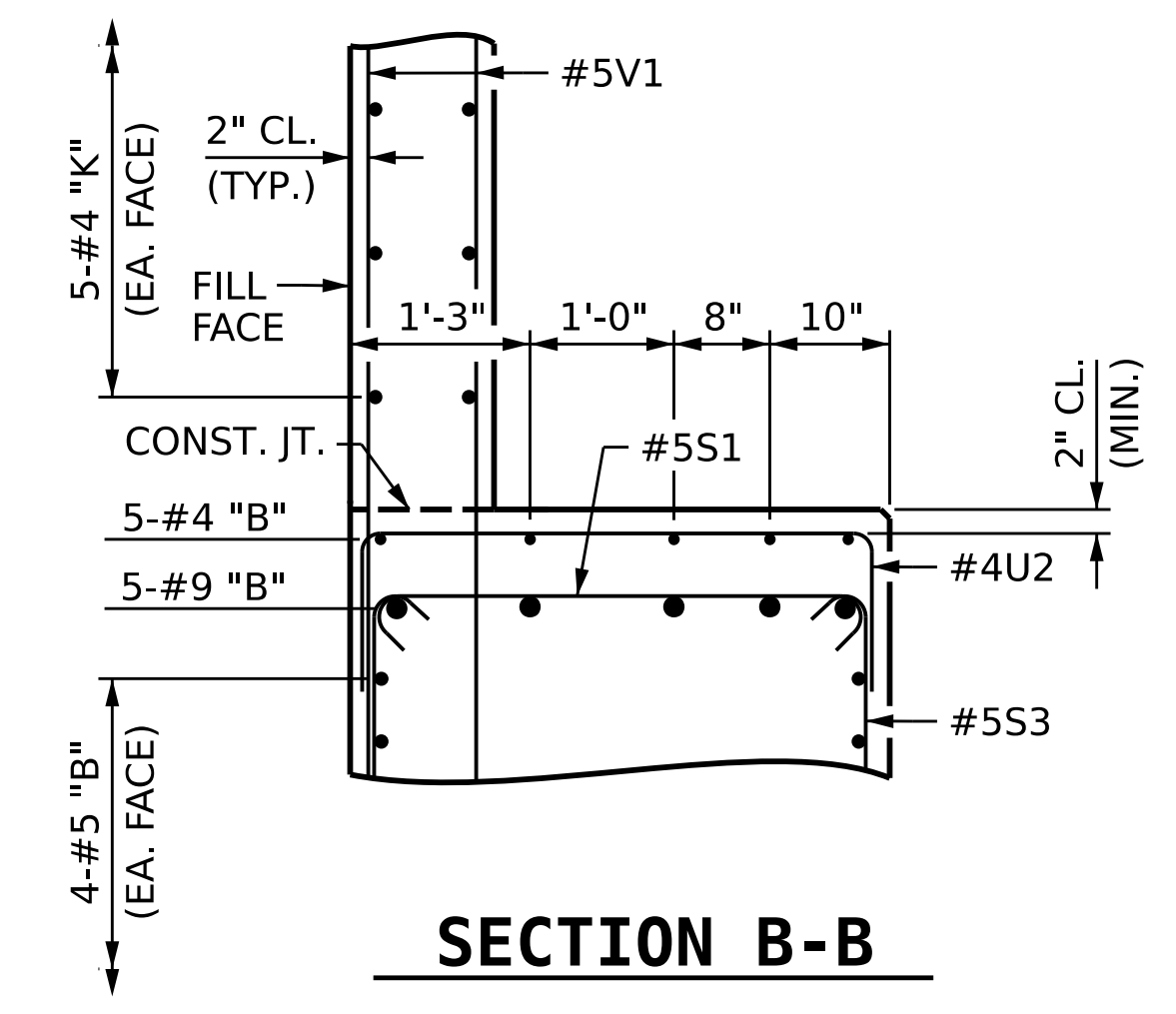
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			45

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

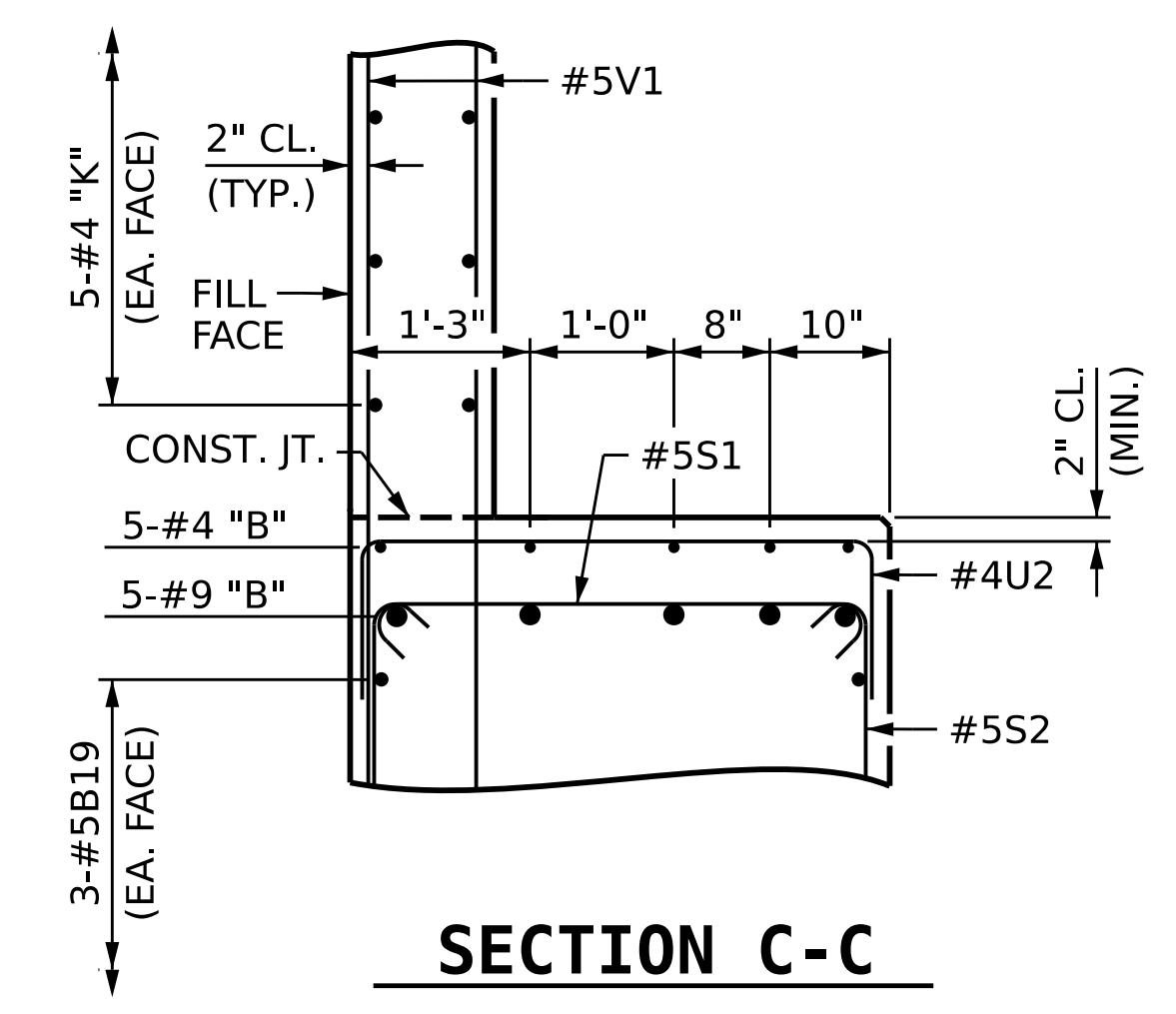
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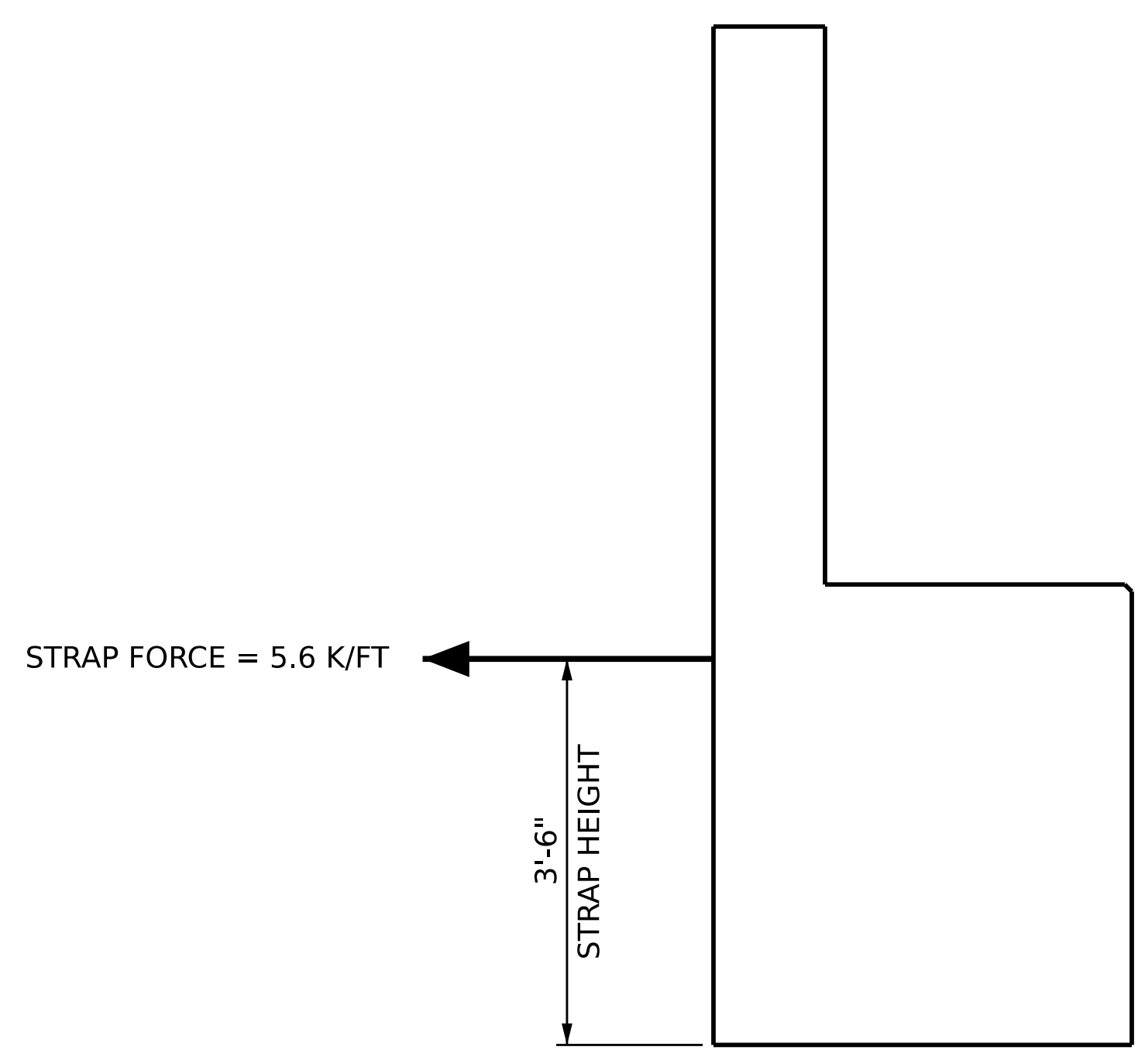
SECTION A-A



SECTION B-B



SECTION C-C



STRAP FORCE

BAR TYPES

BAR	DIM. "X"
B1	43'-6"
B2	45'-5"
B3	43'-3"
B4	44'-10"
B5	42'-9"
B7	35'-2"
B14	50'-1"
B15	48'-2"
B16	50'-4"
B17	48'-8"
B18	50'-10"
B23	35'-2"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL											
END BENT 2											
STAGE I					STAGE II						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	10	1	44'-11"	193	B8	5	4	STR	10'-4"	35
B2	1	10	1	46'-10"	202	B14	1	10	1	51'-6"	222
B3	1	10	1	44'-8"	192	B15	1	10	1	49'-7"	213
B4	1	10	1	46'-3"	199	B16	1	10	1	51'-9"	223
B5	1	10	1	44'-2"	190	B17	1	10	1	50'-1"	216
B6	12	5	STR	24'-5"	306	B18	1	10	1	52'-3"	225
B7	5	9	1	36'-5"	619	B19	12	5	STR	27'-6"	344
B8	5	4	STR	10'-4"	35	B20	2	5	STR	19'-11"	42
B9	3	9	STR	16'-8"	170	B21	3	9	STR	24'-3"	247
B10	2	9	STR	18'-8"	127	B22	5	4	STR	14'-5"	48
B11	5	4	STR	4'-10"	16	B23	5	9	1	36'-5"	619
B12	8	4	STR	24'-1"	129	B24	5	4	STR	3'-5"	11
B13	2	5	STR	13'-6"	28	B25	5	4	STR	14'-10"	50
B26	11	4	STR	3'-5"	25	B26	13	4	STR	3'-5"	30
						B27	2	9	STR	22'-3"	151
						B28	8	4	STR	27'-2"	145
H1	24	4	2	7'-0"	112	H2	24	4	3	7'-0"	112
K1	20	4	STR	23'-9"	317	K2	4	4	STR	3'-8"	10
K2	4	4	STR	3'-8"	10	K3	20	4	STR	26'-10"	358
S1	51	5	4	4'-4"	231	S1	56	5	4	4'-4"	253
S2	30	5	5	11'-6"	360	S2	24	5	5	11'-6"	288
S3	21	5	5	12'-6"	274	S3	32	5	5	12'-6"	417
S4	24	4	6	6'-6"	104	S4	28	4	6	6'-6"	122
U1	40	4	7	4'-8"	125	U1	48	4	7	4'-8"	150
U2	11	4	7	5'-11"	43	U2	31	4	7	5'-11"	123
V1	80	5	STR	8'-1"	674	V1	96	5	STR	8'-1"	809
V2	24	5	STR	9'-9"	244	V3	24	5	STR	10'-0"	250
REINFORCING STEEL					4,925 LBS.	REINFORCING STEEL					5,713 LBS.
CLASS A CONCRETE						CLASS A CONCRETE					
POUR #1 (CAP & LOWER WINGWALL)					25.7 C.Y.	POUR #1 (CAP & LOWER WINGWALL)					33.2 C.Y.
POUR #2 (BACKWALL & UPPER WINGWALL)					8.4 C.Y.	POUR #2 (BACKWALL & UPPER WINGWALL)					9.8 C.Y.
TOTAL = 34.1 C.Y.						TOTAL = 43.0 C.Y.					
HP 12X53 STEEL PILES						HP 12X53 STEEL PILES					
No.: 6					LIN. FT. = 290	No.: 7					LIN. FT. = 365
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					EA. 6	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES					EA. 7

NOTE: SEE GEOTECHNICAL FOUNDATION TABLES FOR ADDITIONAL PILE INFORMATION

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

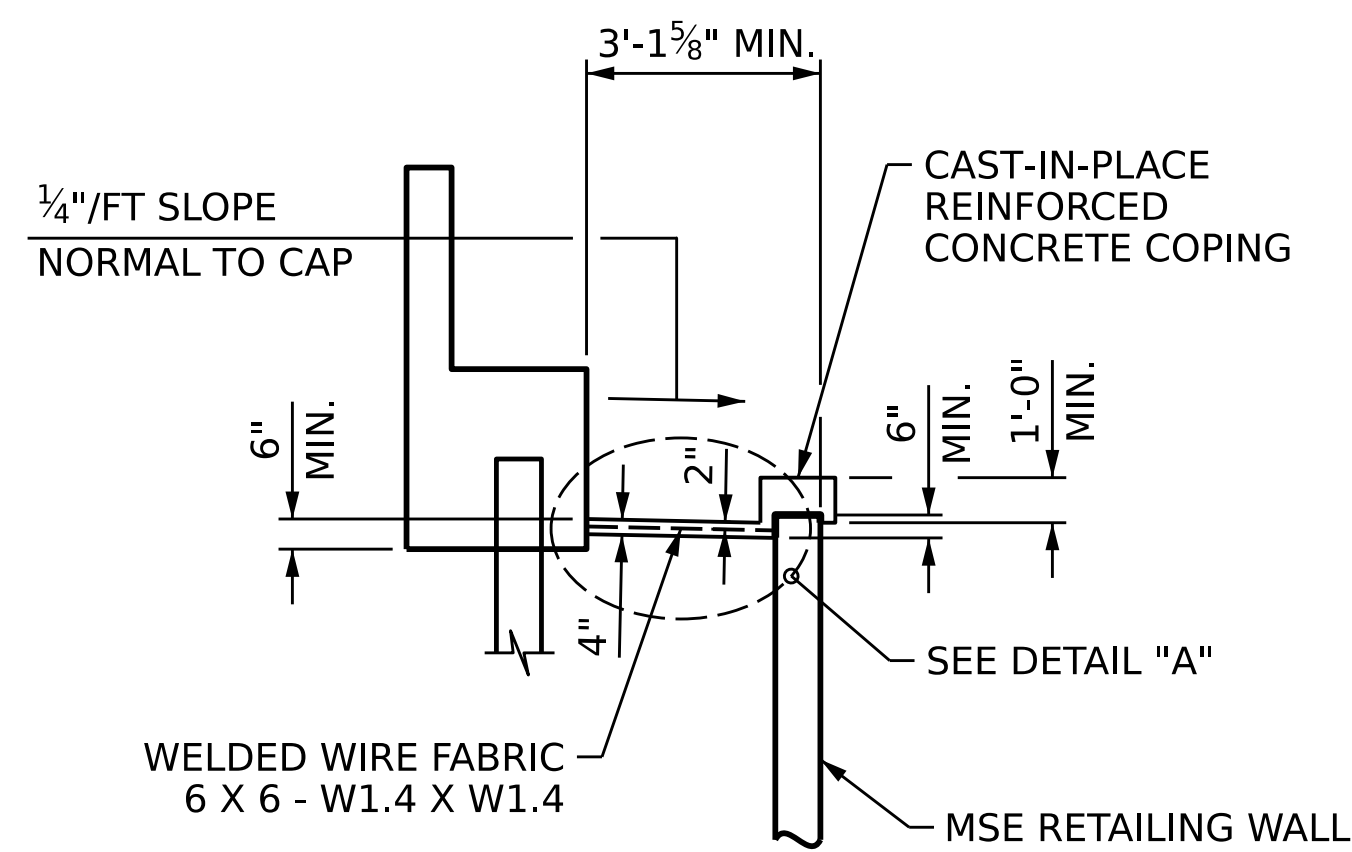
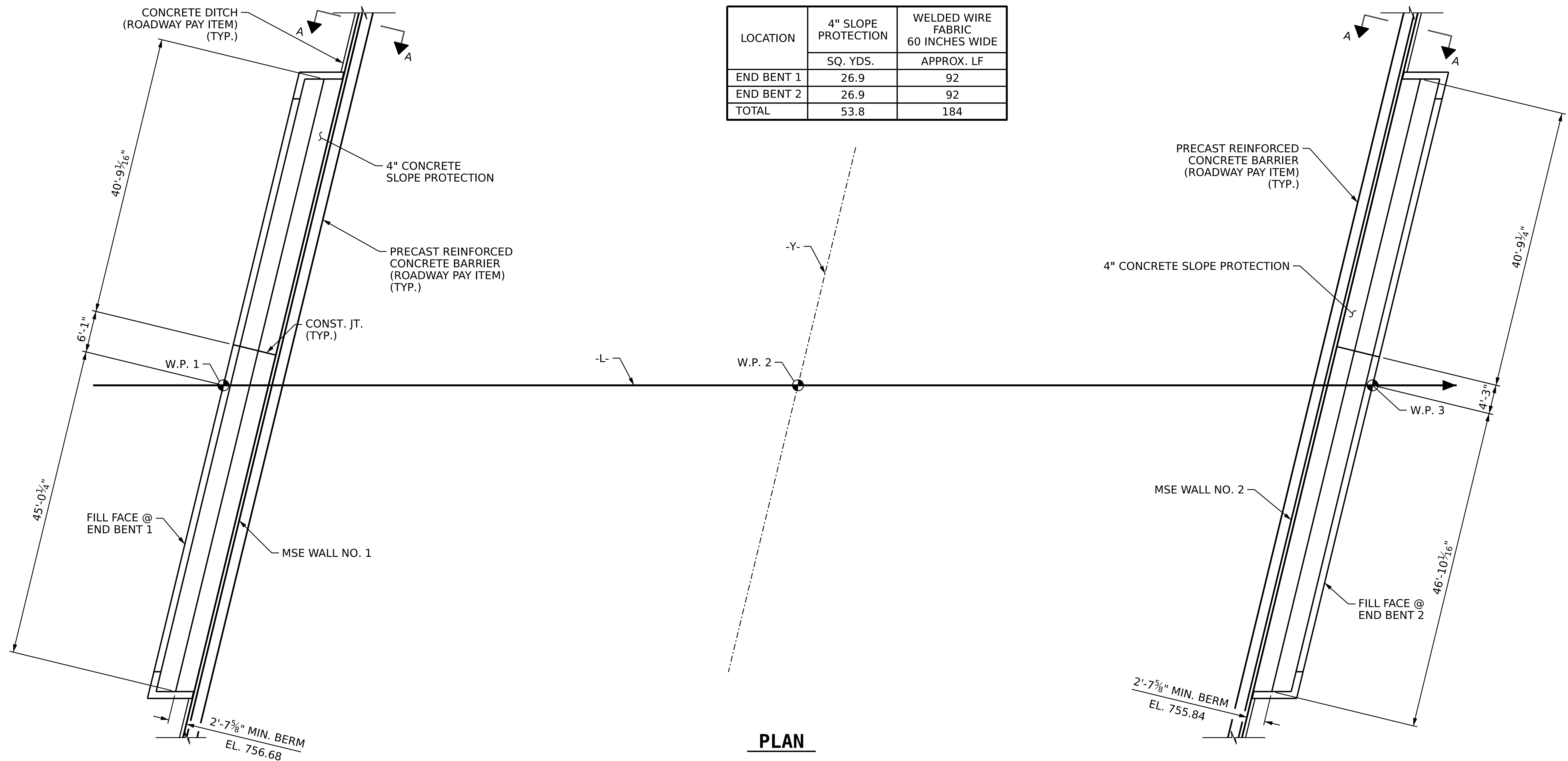
SHEET 5 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 SECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
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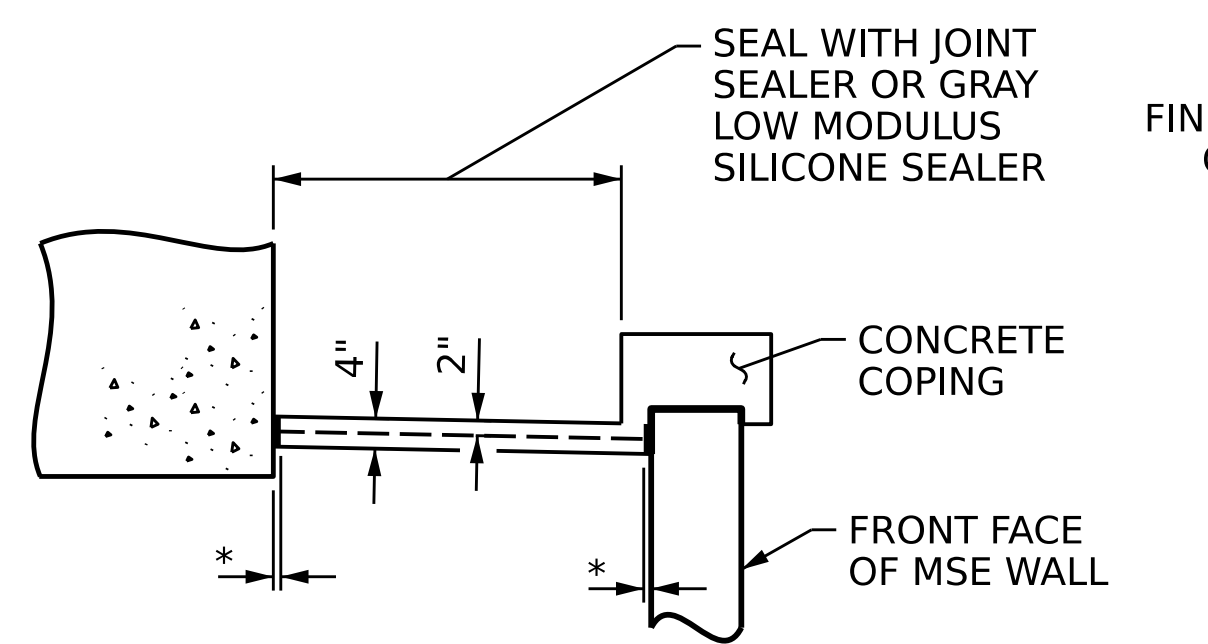
DRAWN BY :	D.R. DRUM	DATE :	11/2022
CHECKED BY :	D. RITACCO	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	12/2022

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LOCATION	4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQ. YDS.	APPROX. LF
END BENT 1	26.9	92
END BENT 2	26.9	92
TOTAL	53.8	184

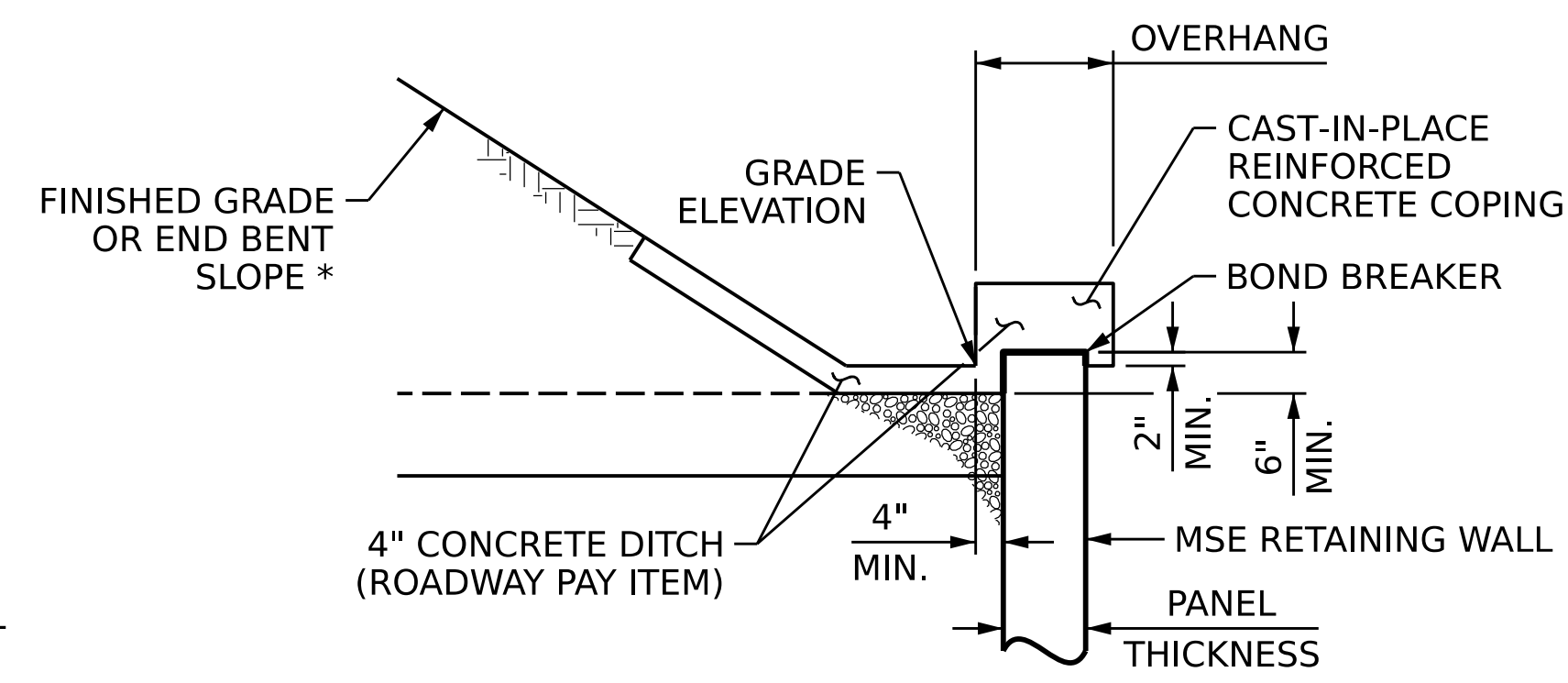


SECTION ALONG -L-



DETAIL "A"

* 1" EXP. JT. MAT'L (PLACE DEBONDING TAPE ON TOP OF EXP. JT. MAT'L)



SECTION A-A

PROJECT NO. BR-0043
 ROCKINGHAM COUNTY
 STATION: POT 25+80.88 -L-

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 RALEIGH

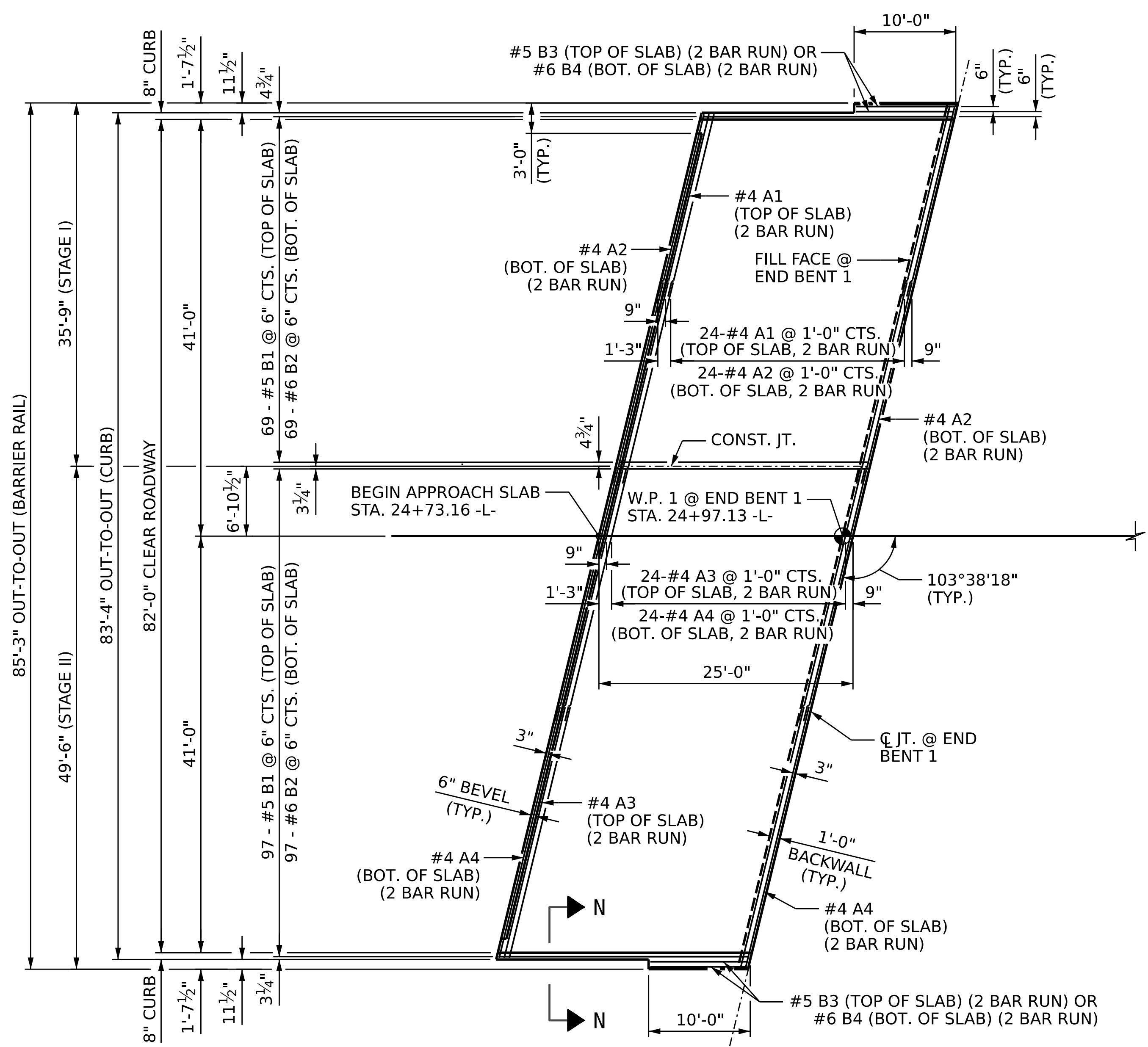
SLOPE PROTECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			45

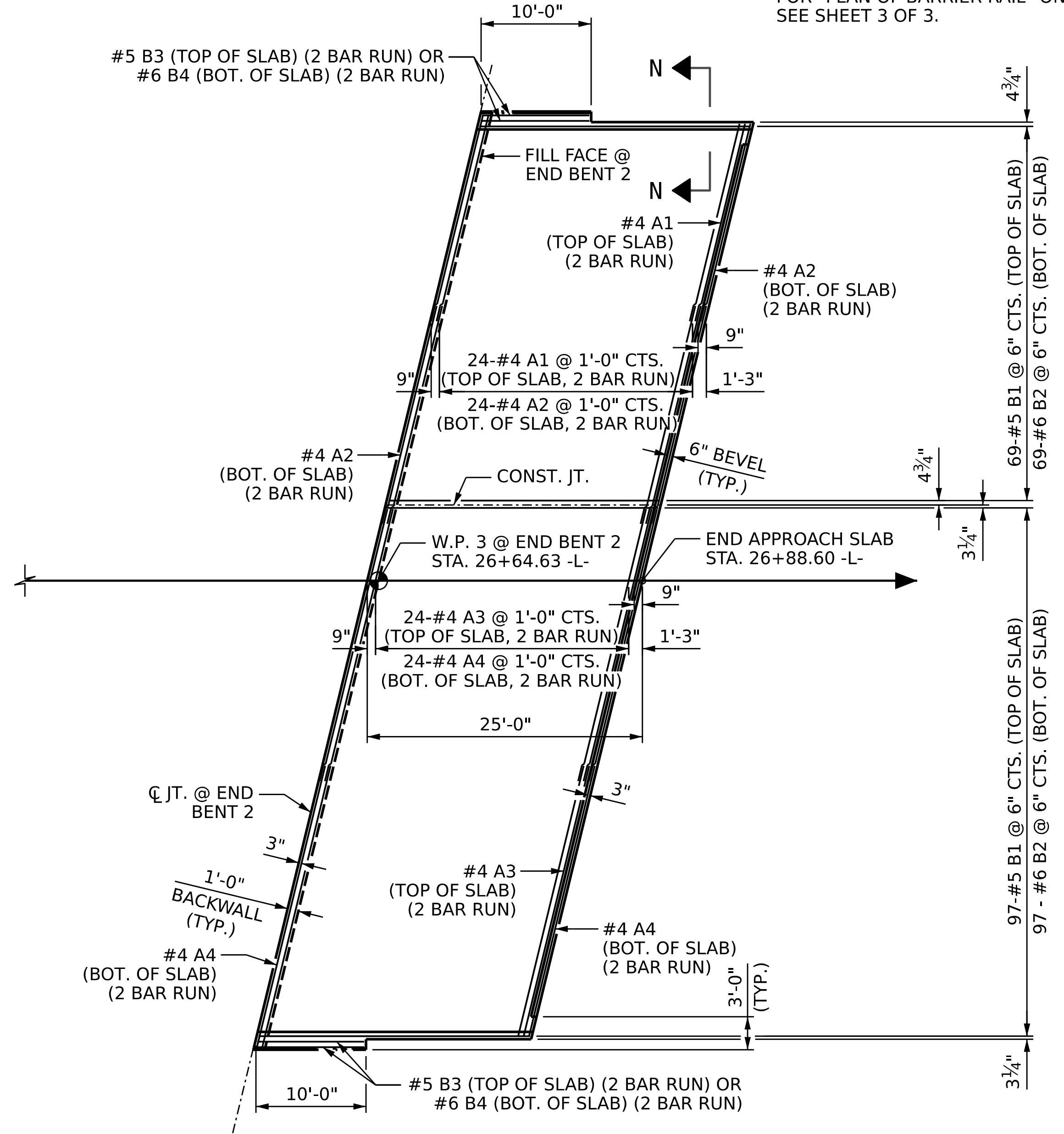
DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	J.C. MORRISON	DATE :	11/2022
DESIGN ENGINEER OF RECORD :	J.C. MORRISON	DATE :	12/2022

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NOTE:
FOR "PLAN OF BARRIER RAIL" ON APPROACH SLAB,
SEE SHEET 3 OF 3.



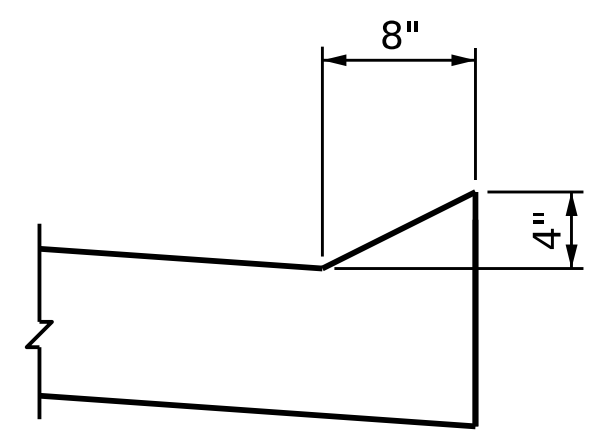
@ END BENT 1



@ END BENT 2

PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



**SECTION N-N
APPROACH SLAB CURB**

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 1 OF 3

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RALEIGH

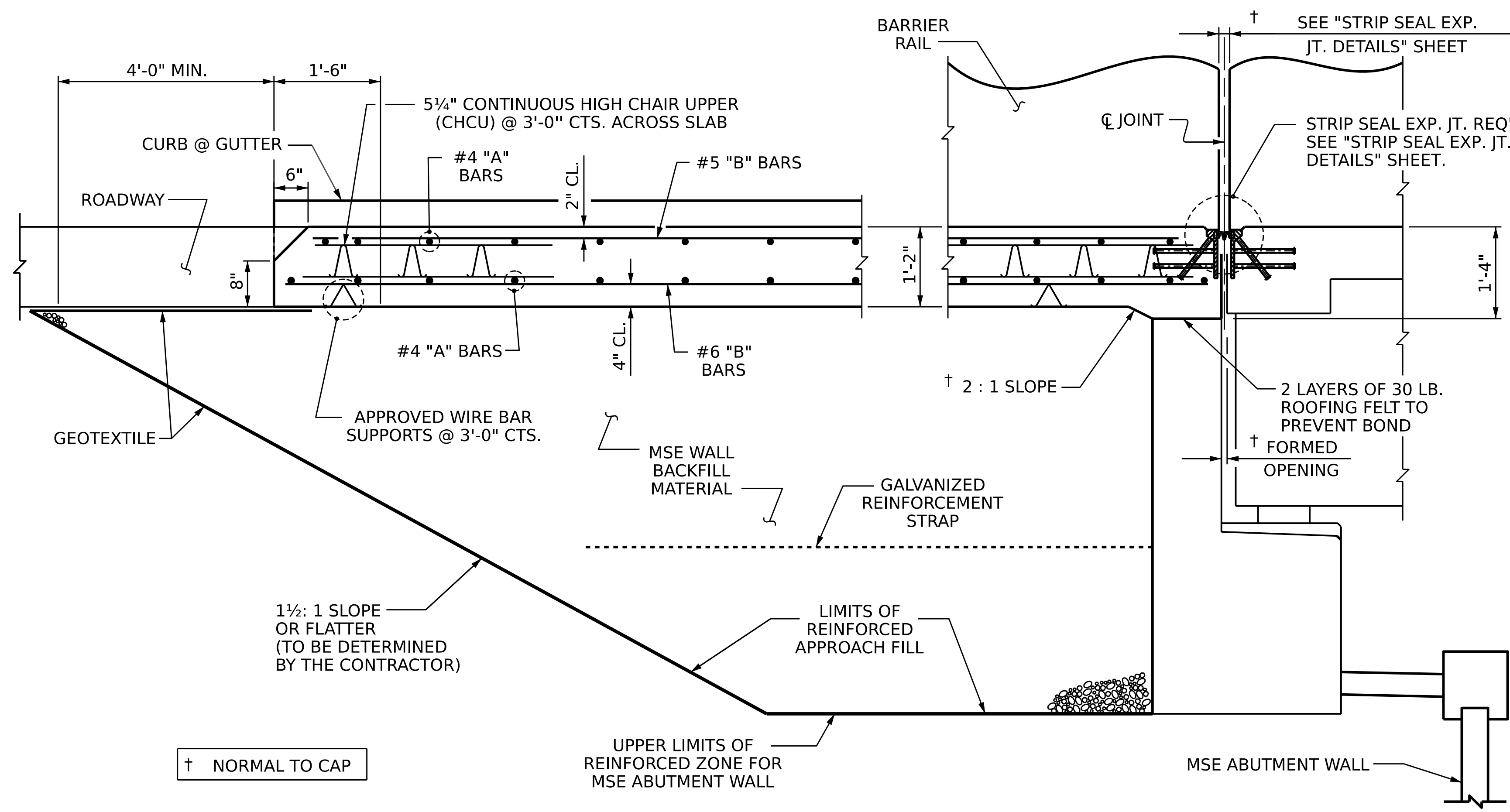
**BRIDGE
APPROACH SLAB**

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

SHEET NO.
S-43
TOTAL SHEETS
45

DRAWN BY: B.T. LEROY DATE: 11/2022
CHECKED BY: J.C. MORRISON DATE: 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 12/2022

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SECTION THRU SLAB
(TYPE III - REINFORCED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT, AND BACK FILL MATERIAL, SEE ROADWAY PLANS.

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

BACKFILL MATERIAL IS GOING TO BE THE AGGREGATE USED IN THE REINFORCED ZONE FOR THE MSE RETAINING WALL.

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

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

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

SPLICE LENGTHS

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

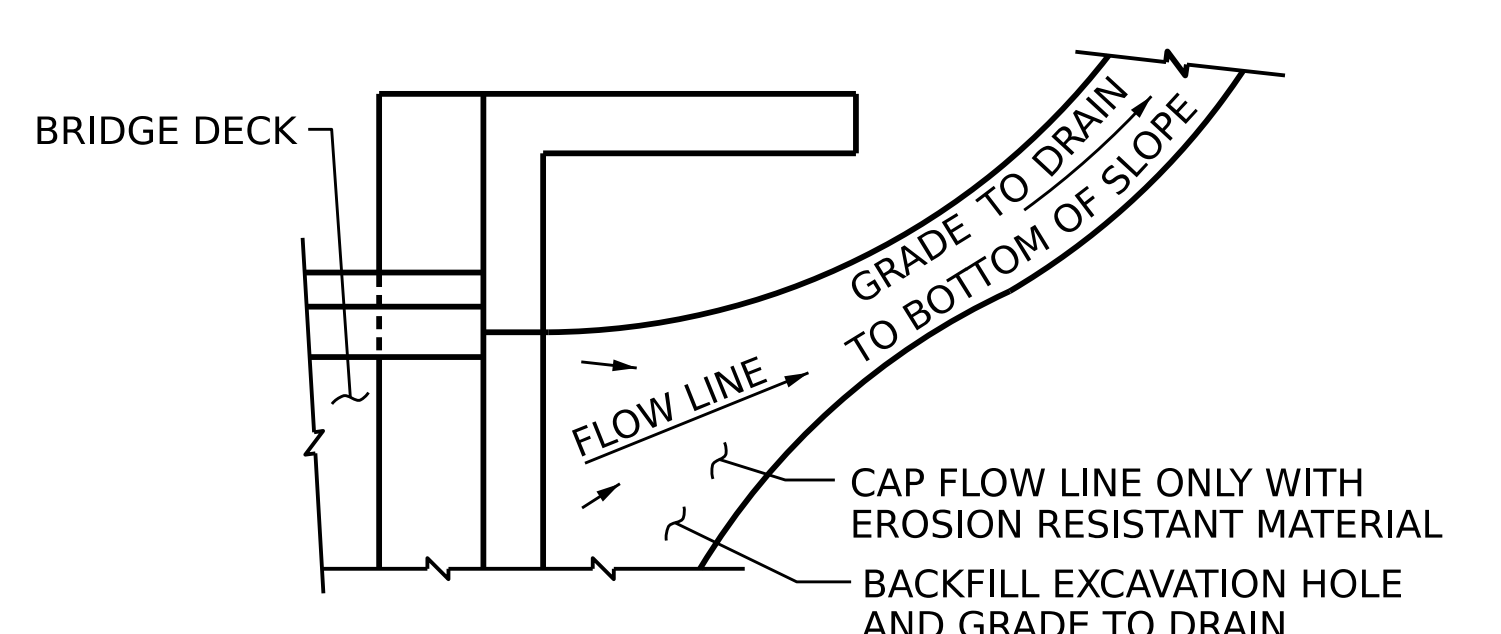
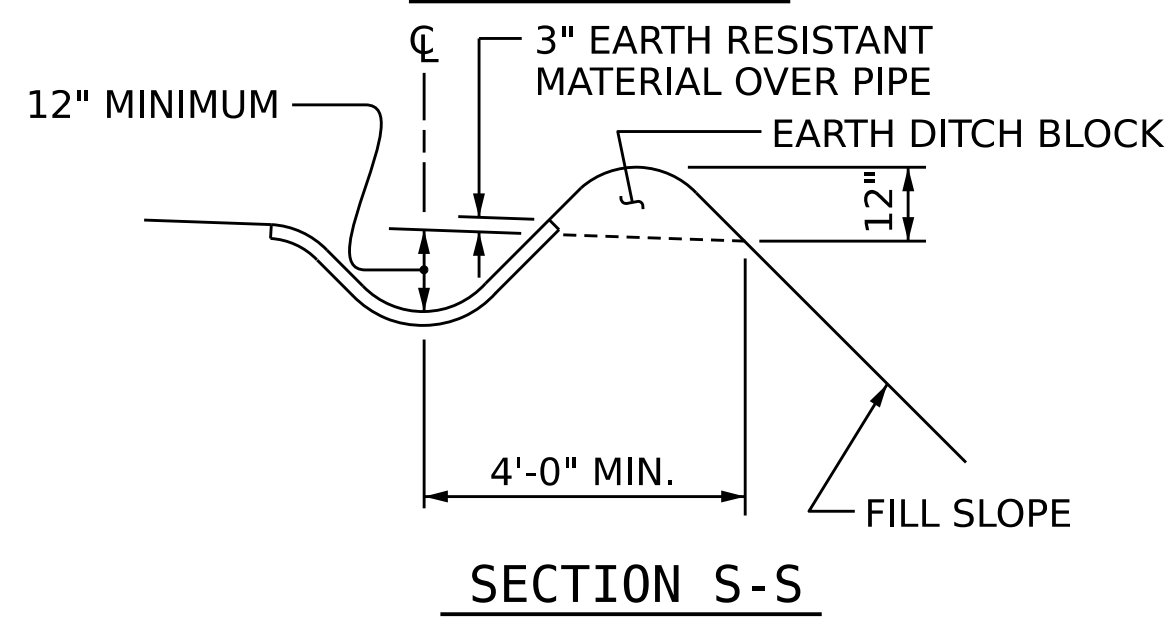
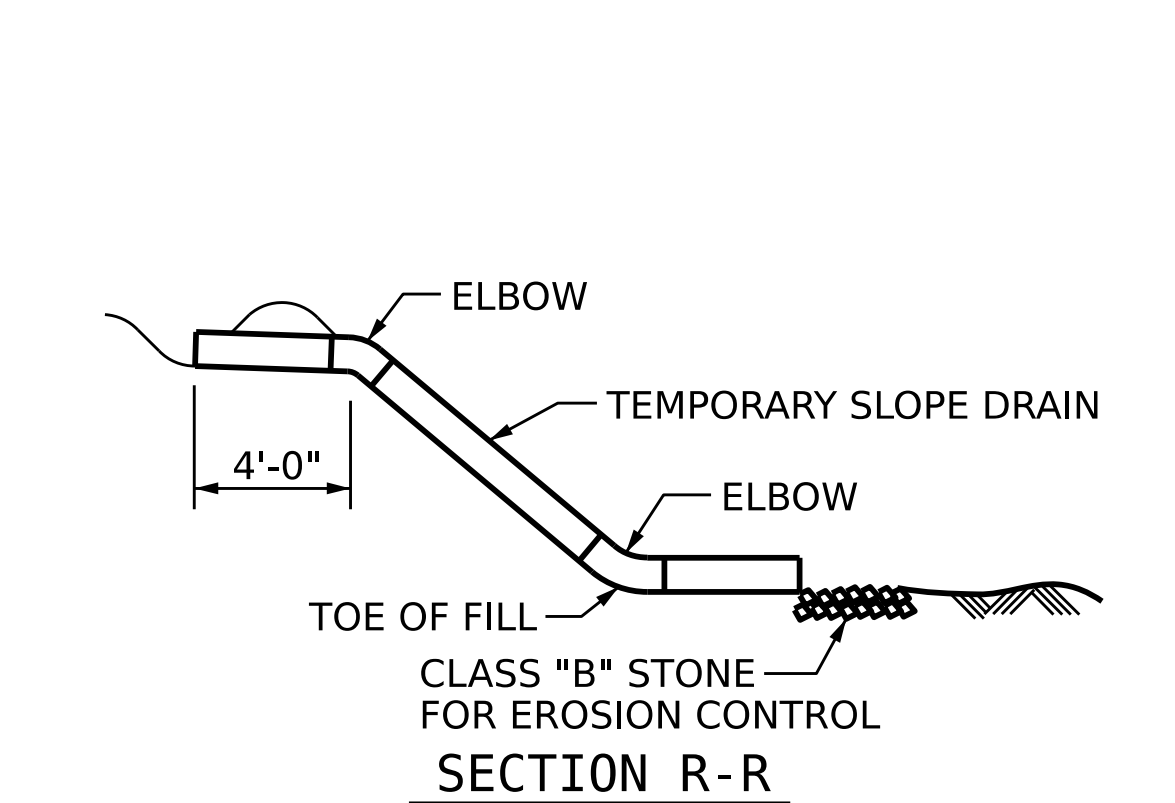
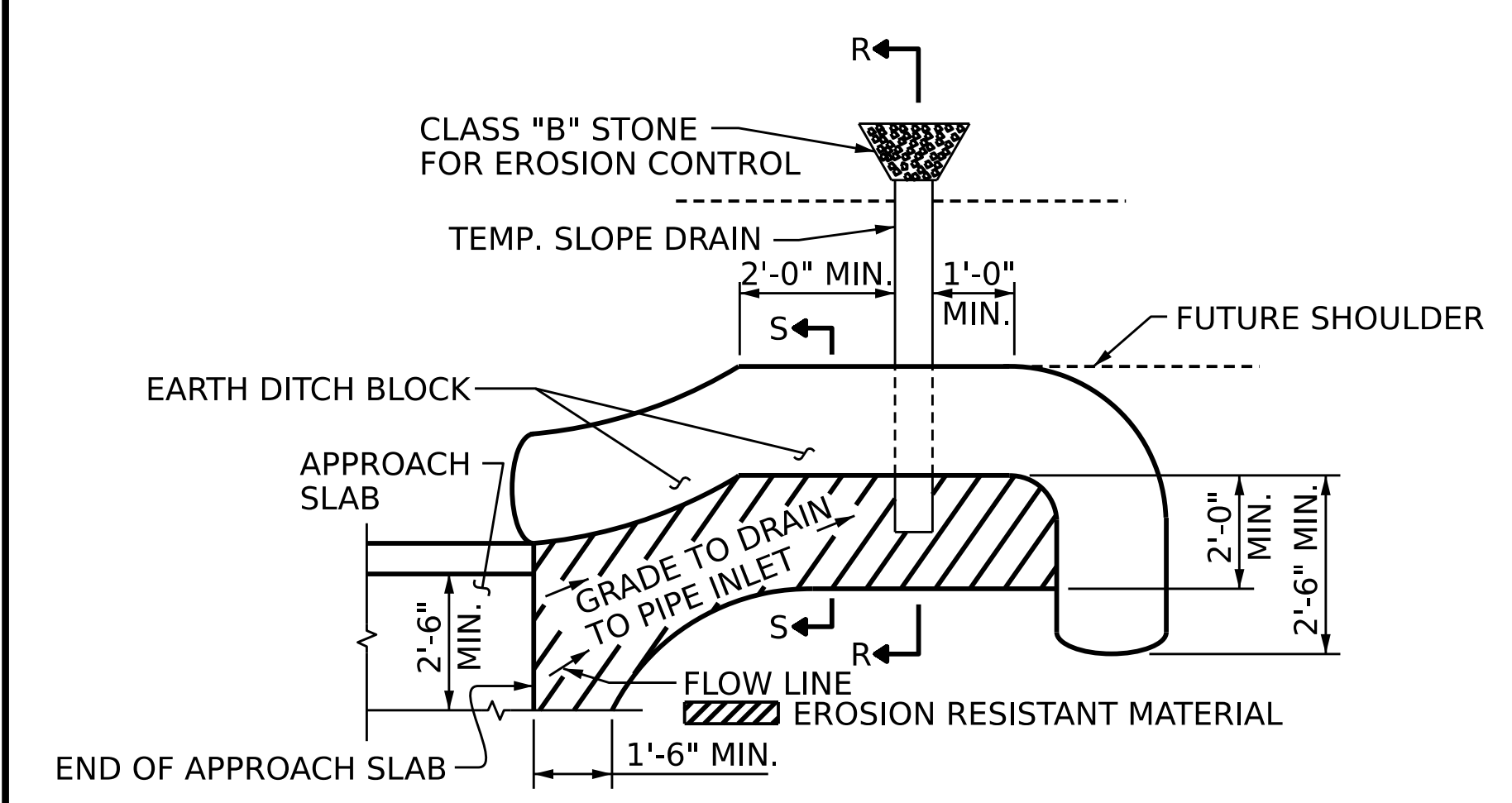
BILL OF MATERIAL

STAGE I
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	48	#4	STR	19'-10"	636
A2	52	#4	STR	19'-6"	677
* B1	69	#5	STR	24'-8"	1775
B2	69	#6	STR	24'-8"	2556
* B3	4	#5	STR	6'-6"	27
B4	4	#6	STR	6'-6"	39
REINFORCING STEEL					3,272 LBS.
* EPOXY COATED REINFORCING STEEL					2,438 LBS.
CLASS AA CONCRETE					38.4 C.Y.

STAGE II
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	48	#4	STR	25'-10"	828
A4	52	#4	STR	25'-8"	892
* B1	97	#5	STR	24'-8"	2496
B2	97	#6	STR	24'-8"	3594
* B3	4	#5	STR	6'-6"	27
B4	4	#6	STR	6'-6"	39
REINFORCING STEEL					3,351 LBS.
* EPOXY COATED REINFORCING STEEL					4,525 LBS.
CLASS AA CONCRETE					53.0 C.Y.



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.

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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. BR-0043
ROCKINGHAM COUNTY
STATION: POT 25+80.88 -L-
SHEET 2 OF 3

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AECOM License No. F02642

DocuSigned by:
John C. Morrison 1/31/2023
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SEAL
030474
ENGINEER
JOHN C. MORRISON

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			45

DRAWN BY : B.T. LEROY DATE : 11/2022
CHECKED BY : J.C. MORRISON DATE : 11/2022
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 12/2022

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NOTES

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

SHIFT, BEND, OR CUT REINFORCING STEEL AS NECESSARY TO CLEAR JOINT BLOCKOUT.

BILL OF MATERIAL

CONCRETE BARRIER RAIL ON APPROACH SLABS

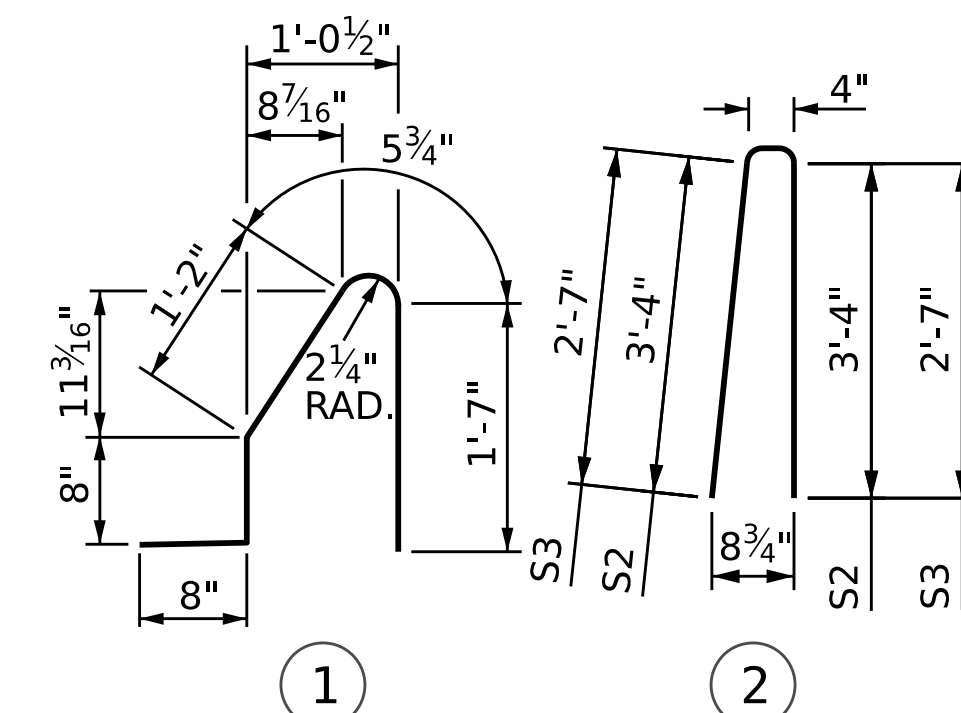
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	5	STR	7'-1"	650
* S1	40	5	1	5'-1"	212
* S2	32	5	2	7'-0"	234
* S3	8	5	2	5'-6"	46

* EPOXY COATED REINFORCING STEEL 1,142 LBS.

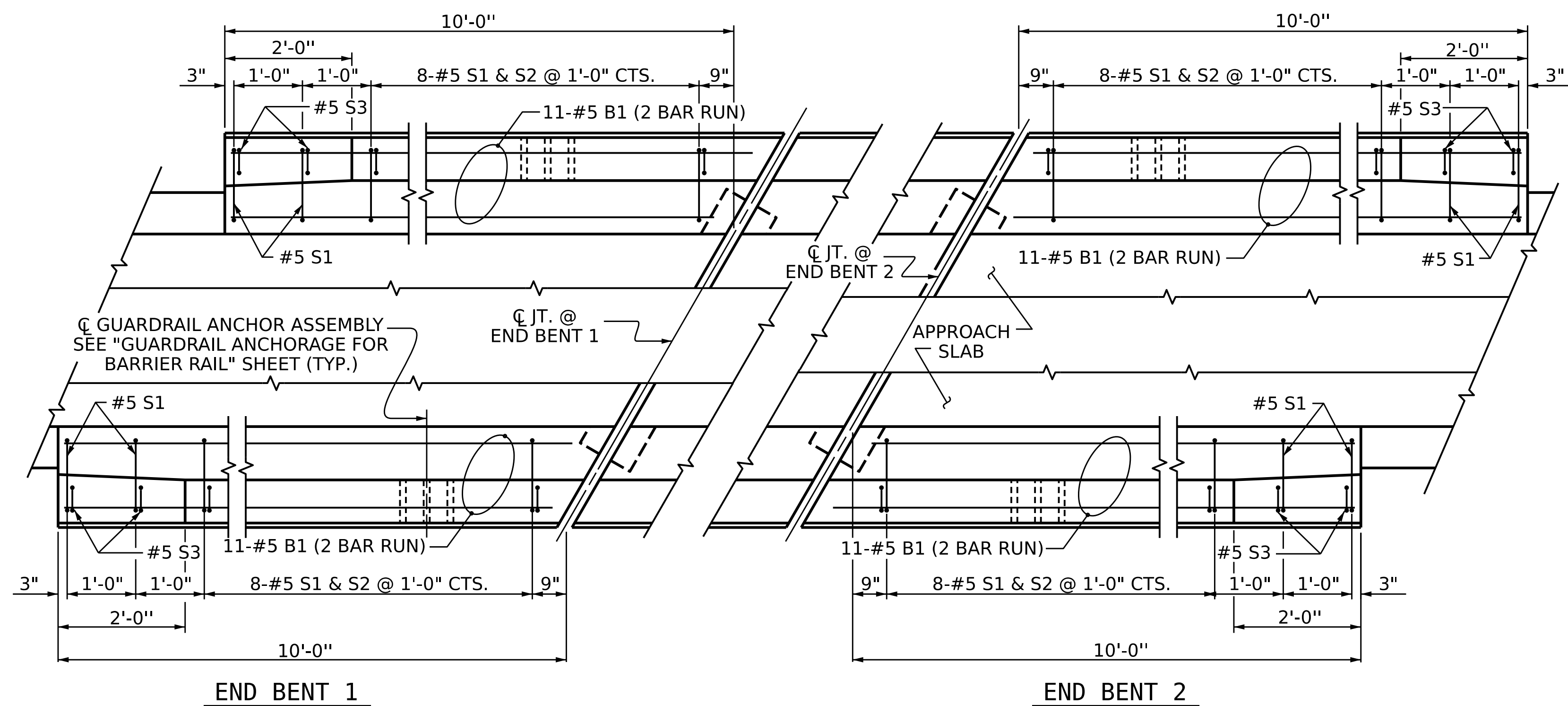
CLASS AA CONCRETE 5.7 C.Y.

CONCRETE BARRIER RAIL 40 L.F.

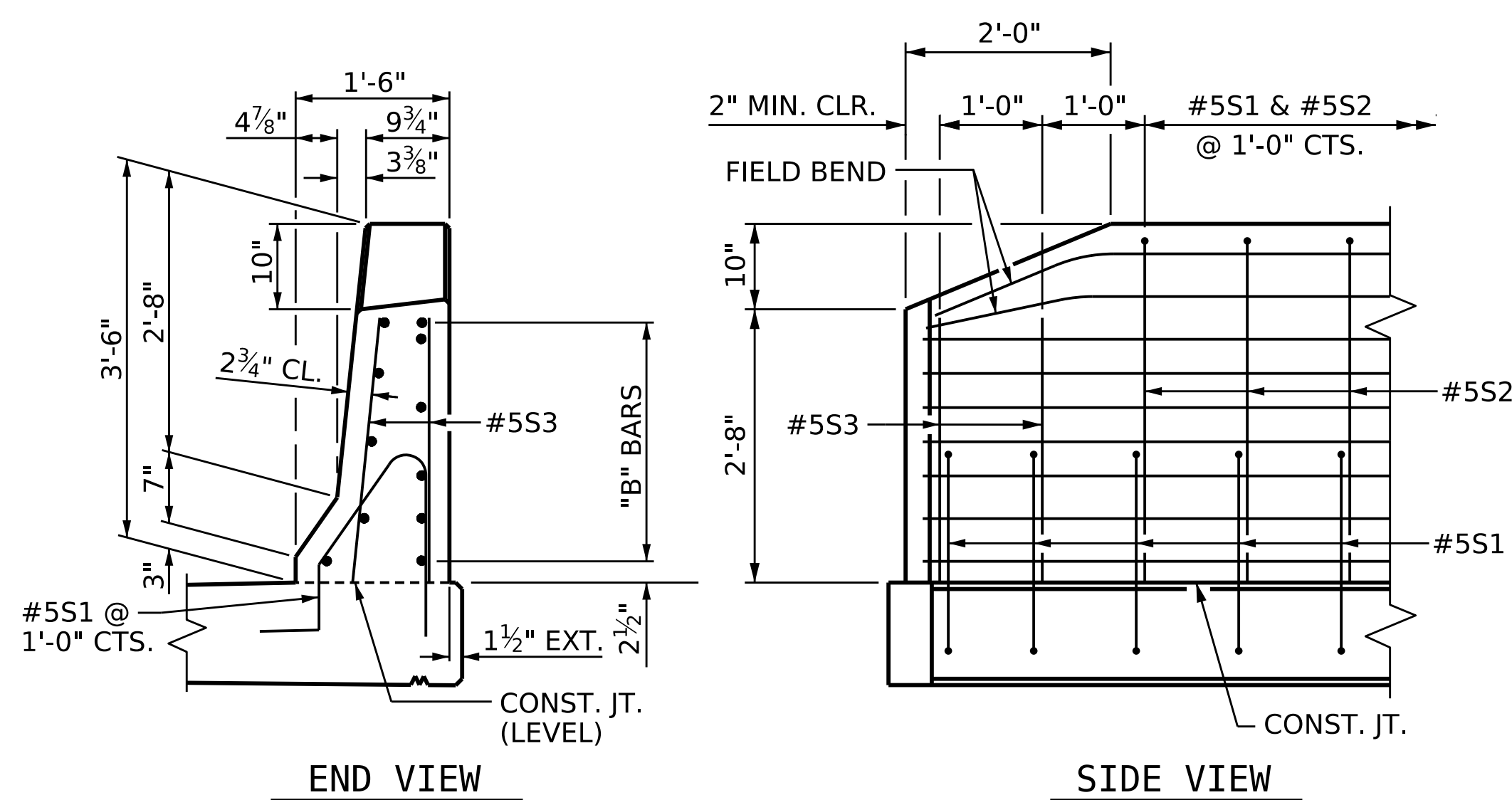
BAR TYPES



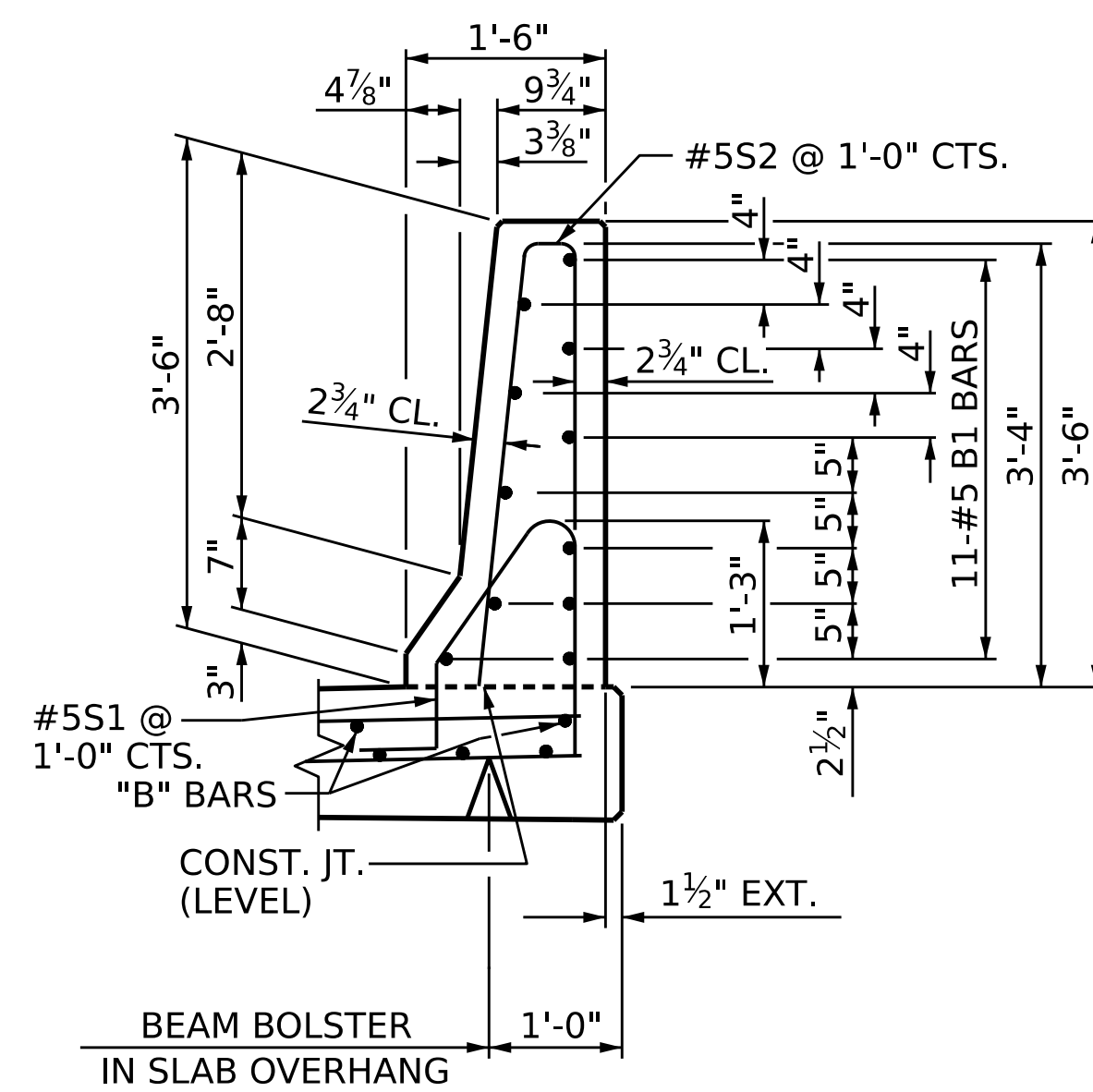
ALL BAR DIMENSIONS ARE OUT TO OUT.



PLAN OF BARRIER RAIL



END OF RAIL DETAILS



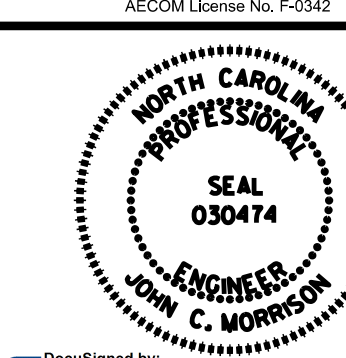
SECTION THRU RAIL

PROJECT NO. BR-0043

ROCKINGHAM COUNTY

STATION: POT 25+80.88 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			45

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 3/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 3/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS " BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

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