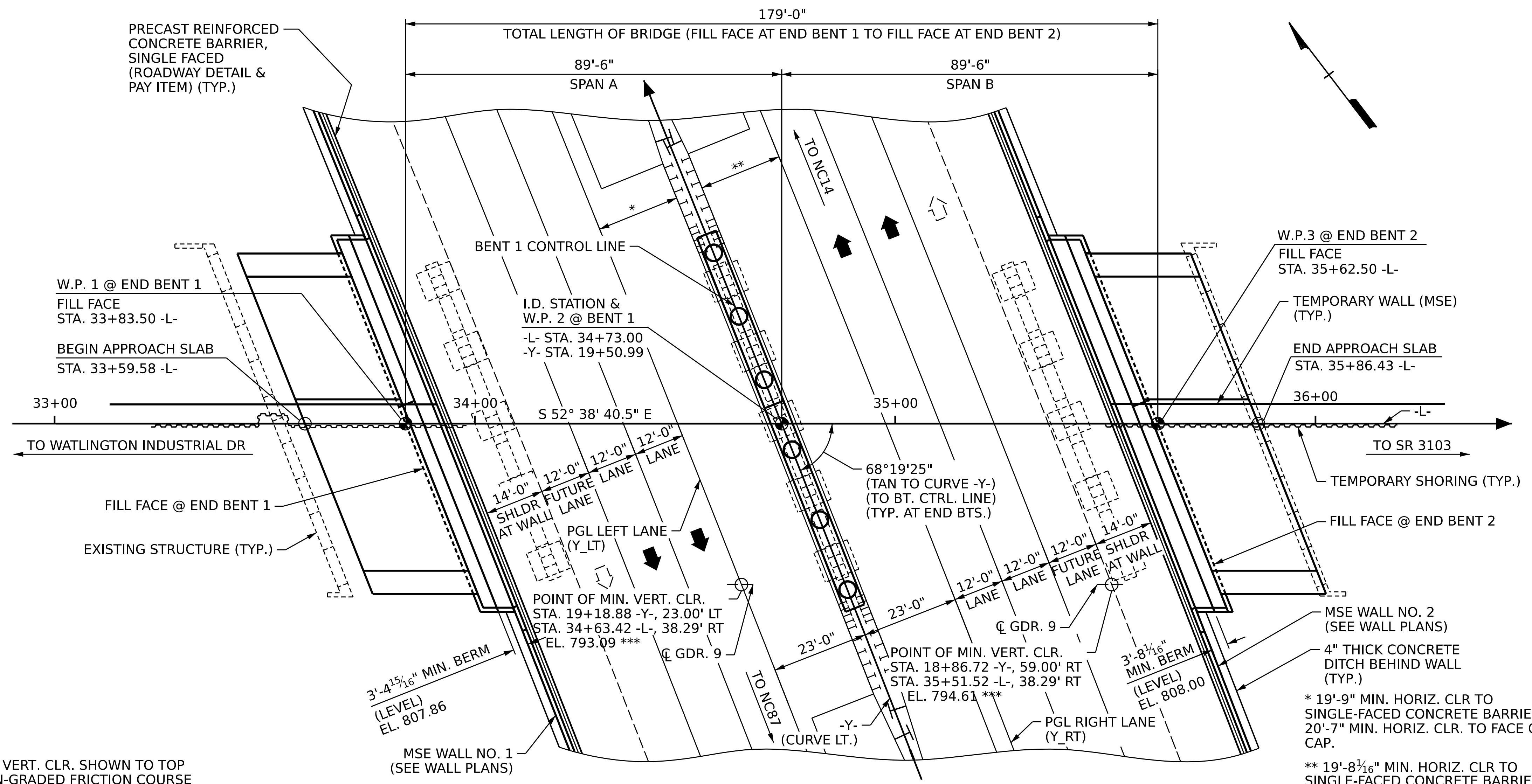


Pls Sta 18+01.07 Δs = 0° 28' 38.9" Ls = 200.00' LT = 133.33' ST = 66.67'	Pls Sta 26+67.93 Δs = 7° 37' 47.9" (LT) Ds = 0° 28' 38.9" L = 1,598.02' T = 800.19' R = 12,000.00' e = 0.02 FT/FT R.O. = 98'	Pls Sta 35+32.42 Δs = 0° 28' 38.9" Ls = 200.00' LT = 133.33' ST = 66.67'
--	---	--

HORIZONTAL CURVE DATA -Y-



PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
POC 19+50.99 -Y-
 SHEET 1 OF 4 REPLACES BRIDGE NO. 780001

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F02342

PROFESSIONAL ENGINEER
SEAL 04343
 CHERYL R. COLS
 2/19/2023

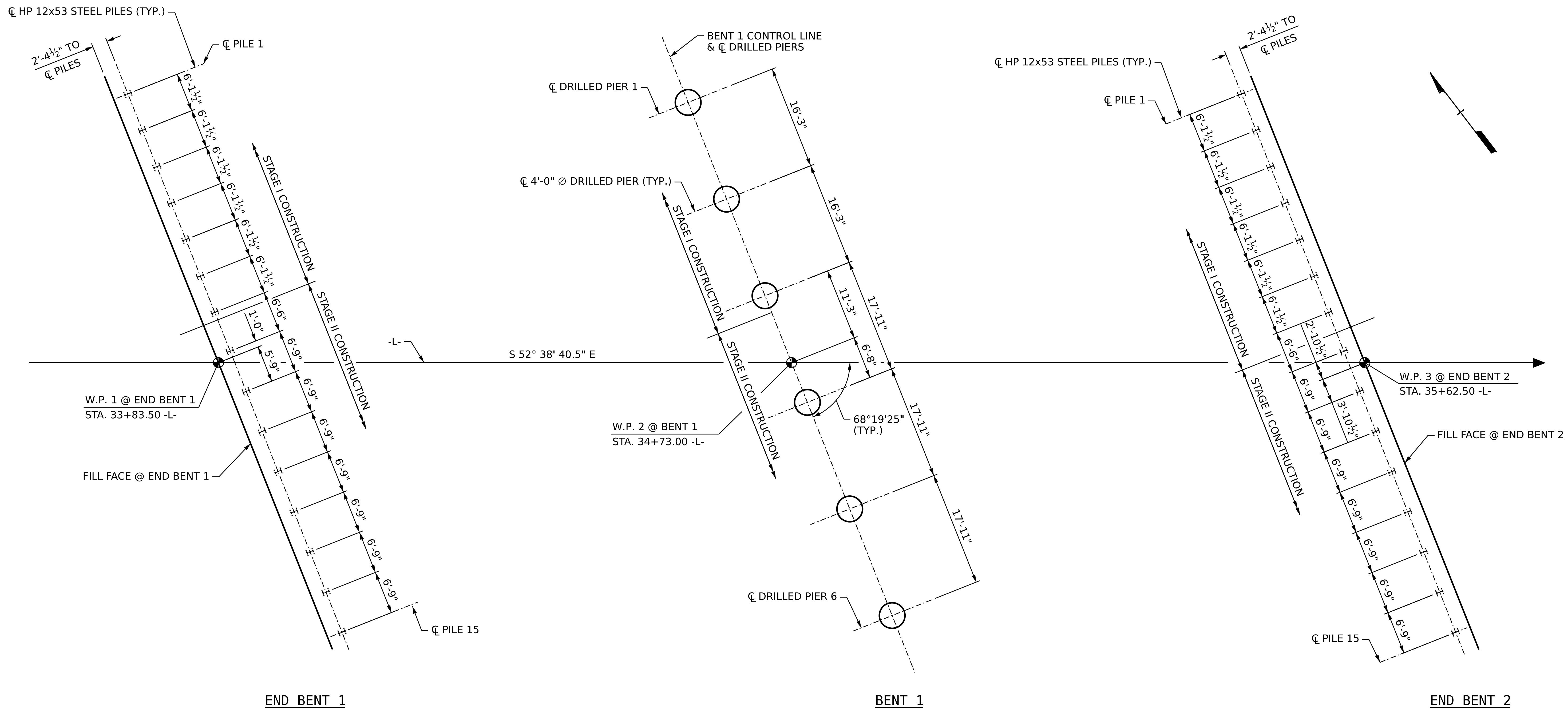
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 2817
 (BARNES ST) OVER US 29
 BETWEEN WATLINGTON
 INDUSTRIAL DR AND SR 3103

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS 48
2			4			

DRAWN BY : B.T. LEROY	DATE : 11/2022
CHECKED BY : S. NATARAJAN	DATE : 11/2022
DESIGN ENGINEER OF RECORD: G. COLS	DATE : 12/2022

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



FOUNDATION LAYOUT

DIMENSIONS LOCATIONS PILES AND DRILLED PIER ARE TO CENTERLINES OF PILES AND DRILLED PIERS

FOUNDATION NOTES

- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- FOR PILES, SEE PILES SPECIAL PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 30,000-50,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- PILES P-1 THROUGH P-4 AT END BENT NO. 1 SHOULD INCLUDE PILE EXCAVATION WITH A MINIMUM PENETRATION INTO CRYSTALLINE ROCK EQUAL TO 2 FEET.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 2 OF 4

DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	S. NATARAJAN	DATE :	11/2022
DESIGN ENGINEER OF RECORD :	G. COLS	DATE :	12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 2817
 (BARNES ST) OVER US 29
 BETWEEN WATLINGTON
 INDUSTRIAL DR AND SR 3103

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Pile 1	100	809.40	30		See Special Note						779.0	6.0	5.0
End Bent 1, Pile 2	100	809.40	30		See Special Note						779.0	4.0	7.0
End Bent 1, Pile 3	100	809.40	30		See Special Note						779.0	2.0	9.0
End Bent 1, Pile 4	100	809.40	30		See Special Note						779.0	2.0	9.0
End Bent 1, Piles 5-7	100	809.40	40										
End Bent 1, Piles 8-15	100	809.40	50										
End Bent 2, Piles 1-7	100	809.50	50										
End Bent 2, Piles 8-15	100	809.50	55										

*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 1-7	100			0.60			1.00
End Bent 1, Piles 8-15	100	1		0.60	2		1.00
End Bent 2, Piles 1-8	100	5		0.60	9		1.00
End Bent 2, Piles 9-15	100	5		0.60	9		1.00

*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, Piers 1-3	575	772.0	0				14.4	2.0	NO		
Bent 1, Piers 4-6	575	746.0	10				20.3	22.1	NO		

*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.

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 (Matthew Mark Lattin #052709) on 11-22-2022.
- 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, Permanent Steel Casing, CSL Testing, 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	MAYBE	50	1		
End Bent 2	MAYBE	55			

*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?+ YES or MAYBE	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, Piers 1-3		MAYBE	72		MAYBE
Bent 1, Piers 4-6		MAYBE	176		MAYBE
TOTAL QTY:		6	744		2

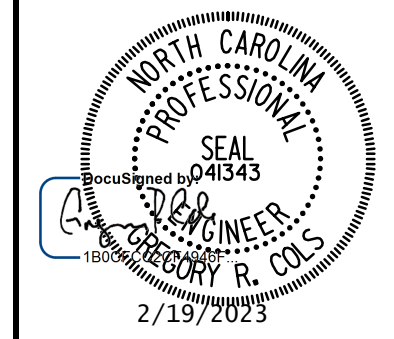
*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. BR-0041

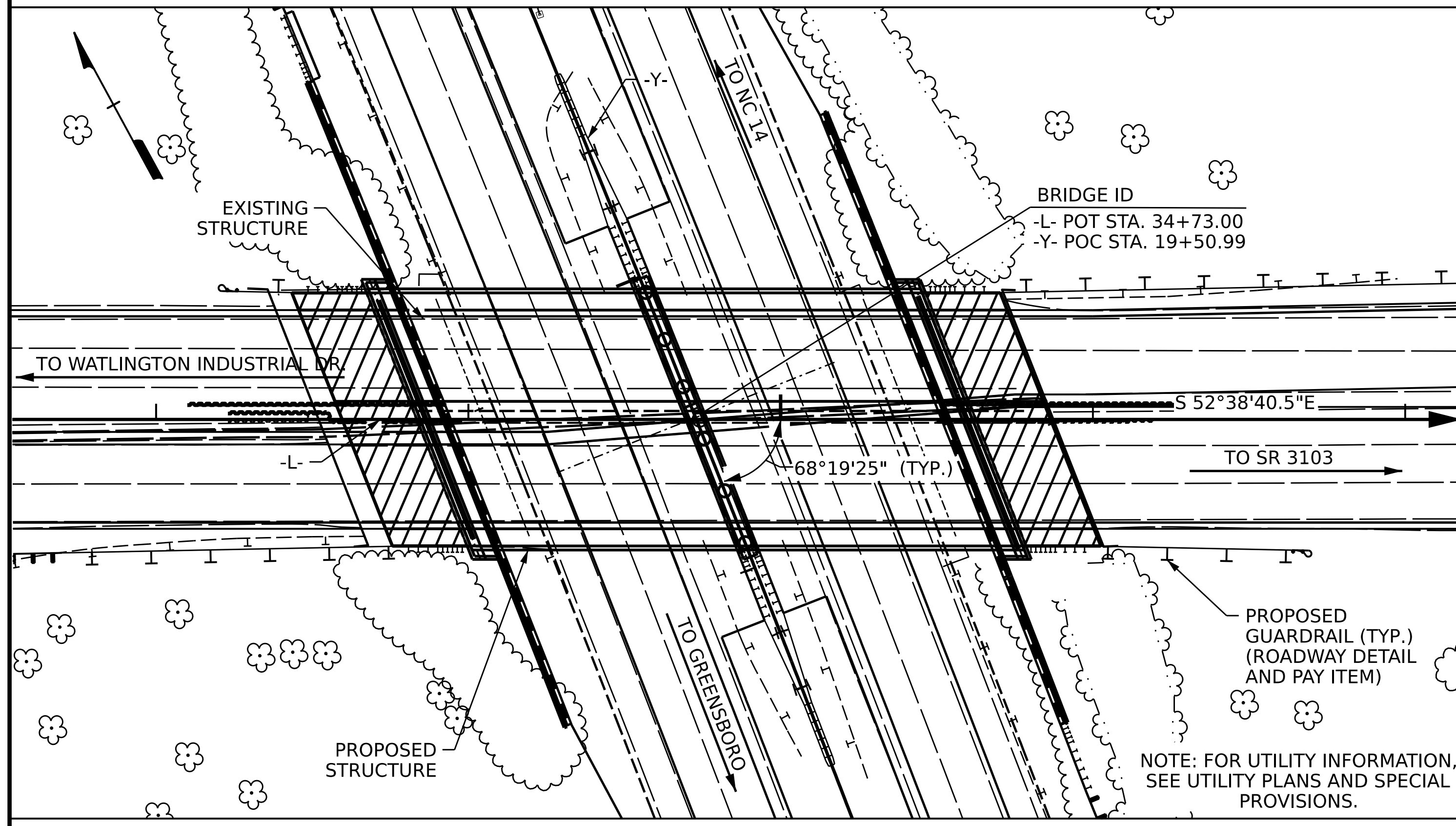
ROCKINGHAM COUNTY

STATION: 34+73.00 -L-

SHEET 3 OF 4

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						<h2>PILE AND DRILLED PIER FOUNDATION TABLES</h2>		SHEET NO. S-03
	SIGNATURE _____ DATE _____						REVISIONS		TOTAL SHEETS 48
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			NO. 1	BY: MML	DATE: 10/25/22	NO. 3	BY: MML	DATE: 11/22/22	
			NO. 2	BY: MML	DATE: 10/31/22	NO. 4	BY:	DATE:	

BENCHMARK: BM-2; RR SPIKE IN A 12" OAK; STA. 43+63.00 -L-, OFFSET 82' RT; N 937,516 E 1,811,764 EL. 775.87



LOCATION SKETCH

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 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.
 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 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 34+73.00 -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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 4 SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT. LEFT AND RIGHT OF CENTERLINE -L-AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF A 4 SPAN (52.5' - 68.5' - 68.5' - 46') 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.

FOR FALSEWORK AND FORMWORK, SEE 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 CAP END AESTHETIC, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

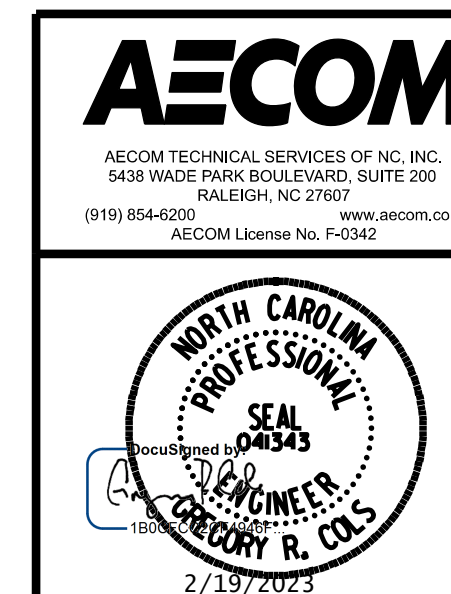
	REMOVAL OF EXISTING STRUCTURE	ASEBESTOS ASSESSMENT	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PDA TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 34+73.00	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDER	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE								14,774	14,923					18	1574.81	30	14
END BENT 1										85.5		12,138					
BENT 1			72.3	104.1		6				130.6		29,165	7,397				
END BENT 2										85.5		12,125					
TOTAL	LUMP SUM	LUMP SUM	72.3	104.1	1	6	LUMP SUM	14,774	14,923	301.6	LUMP SUM	53,428	7,397	18	1574.81	30	14

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	3 BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	CAP END AESTHETIC
	EACH	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE					337.39		
END BENT 1	15	15	640		35.8		
BENT 1							2
END BENT 2	15	15	790		38.5		
TOTAL	30	30	1430	337.39	74.3	LUMP SUM	LUMP SUM

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 2817 (BARNES ST) OVER US 29 BETWEEN WATLINGTON INDUSTRIAL DR AND SR 3103

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: S. NATARAJAN DATE: 03/2022
 CHECKED BY: G. COLS DATE: 05/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

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	1.40	--	1.75	0.880	1.51	A	EL	43.0	1.060	1.43	A	I	78.0	0.80	0.880	1.40	A	EL	43.0		
	HL-93 (OPERATING)	N/A		1.89	--	1.35	0.880	1.95	A	EL	43.0	1.060	1.89	A	I	78.0	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.89	68.04	1.75	0.880	2.04	A	EL	43.0	1.060	1.89	A	I	78.0	0.80	0.820	1.89	A	I	43.0		
	HS-20 (OPERATING)	36.000		2.47	88.92	1.35	0.880	2.64	A	EL	43.0	1.060	2.47	A	I	78.0	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.38	59.13	1.40	0.880	5.91	A	EL	43.0	1.060	5.90	A	I	78.0	0.80	0.820	4.38	A	I	43.0	
		SNGARBS2	20.000		3.21	64.20	1.40	0.880	4.33	A	EL	43.0	1.060	4.13	A	I	78.0	0.80	0.820	3.21	A	I	43.0	
		SNAGRIS2	22.000		3.02	66.44	1.40	0.880	4.07	A	EL	43.0	1.060	3.82	A	I	78.0	0.80	0.820	3.02	A	I	43.0	
		SNCOTTS3	27.250		2.18	59.41	1.40	0.880	2.94	A	EL	43.0	1.060	2.90	A	I	78.0	0.80	0.820	2.18	A	I	43.0	
		SNAGGRS4	34.925		1.80	62.87	1.40	0.880	2.43	A	EL	43.0	1.060	2.36	A	I	78.0	0.80	0.820	1.80	A	I	43.0	
		SNS5A	35.550		1.76	62.57	1.40	0.880	2.38	A	EL	43.0	1.060	2.38	A	I	78.0	0.80	0.820	1.76	A	I	43.0	
		SNS6A	39.950		1.61	64.32	1.40	0.880	2.17	A	EL	43.0	1.060	2.16	A	I	78.0	0.80	0.820	1.61	A	I	43.0	
	SNS7B	42.000		1.53	64.26	1.40	0.880	2.07	A	EL	43.0	1.060	2.10	A	I	78.0	0.80	0.820	1.53	A	I	43.0		
	TRUCK TRAILER SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.96	64.68	1.40	0.880	2.64	A	EL	43.0	1.060	2.57	A	I	78.0	0.80	0.820	1.96	A	I	43.0	
		TNT4A	33.075		1.96	64.83	1.40	0.880	2.65	A	EL	43.0	1.060	2.53	A	I	78.0	0.80	0.820	1.96	A	I	43.0	
		TNT6A	41.600		1.60	66.56	1.40	0.880	2.16	A	EL	43.0	1.060	2.22	A	I	78.0	0.80	0.820	1.60	A	I	43.0	
		TNT7A	42.000		1.60	67.20	1.40	0.880	2.16	A	EL	43.0	1.060	2.18	A	I	78.0	0.80	0.820	1.60	A	I	43.0	
		TNT7B	42.000		1.65	69.30	1.40	0.880	2.22	A	EL	43.0	1.060	2.06	A	I	78.0	0.80	0.820	1.65	A	I	43.0	
		TNAGRIT4	43.000		1.57	67.51	1.40	0.880	2.12	A	EL	43.0	1.060	2.00	A	I	78.0	0.80	0.820	1.57	A	I	43.0	
TNAGT5A		45.000		1.49	67.05	1.40	0.880	2.01	A	EL	43.0	1.060	1.96	A	I	78.0	0.80	0.820	1.49	A	I	43.0		
TNAGT5B	45.000	③	1.47	66.15	1.40	0.880	1.99	A	EL	43.0	1.060	1.89	A	I	78.0	0.80	0.820	1.47	A	I	43.0			

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

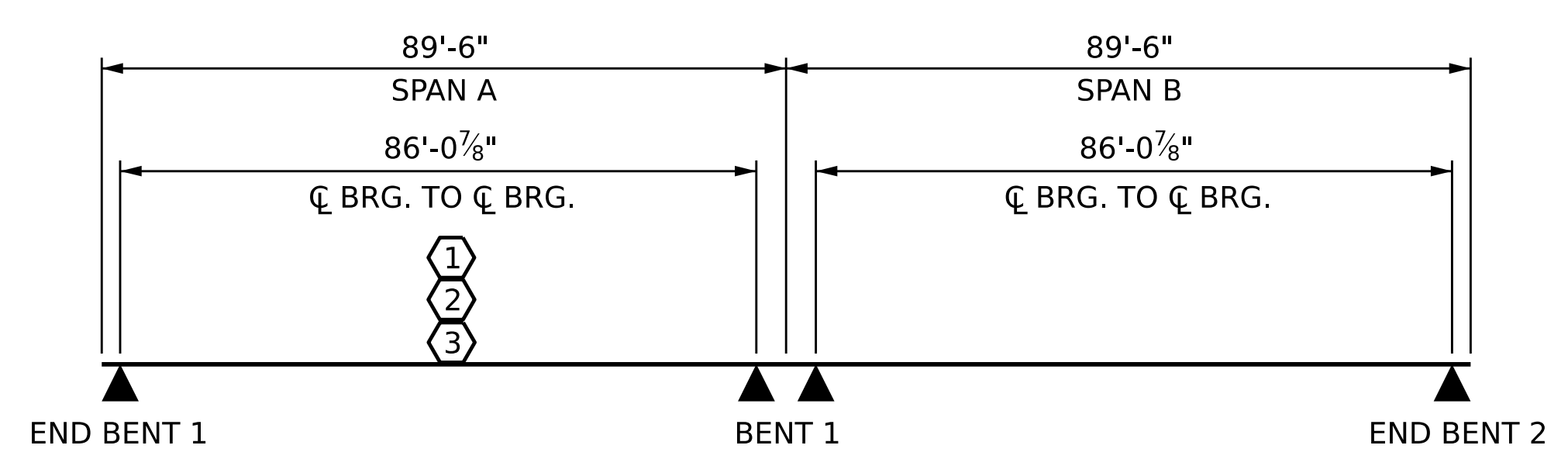
① DESIGN LOAD RATING (HL-93)

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



LRFR SUMMARY

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

ASSEMBLED BY : S. NATARAJAN	DATE : 11/20/2022
CHECKED BY : D. TUTTLE	DATE : 11/20/2022
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/11/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

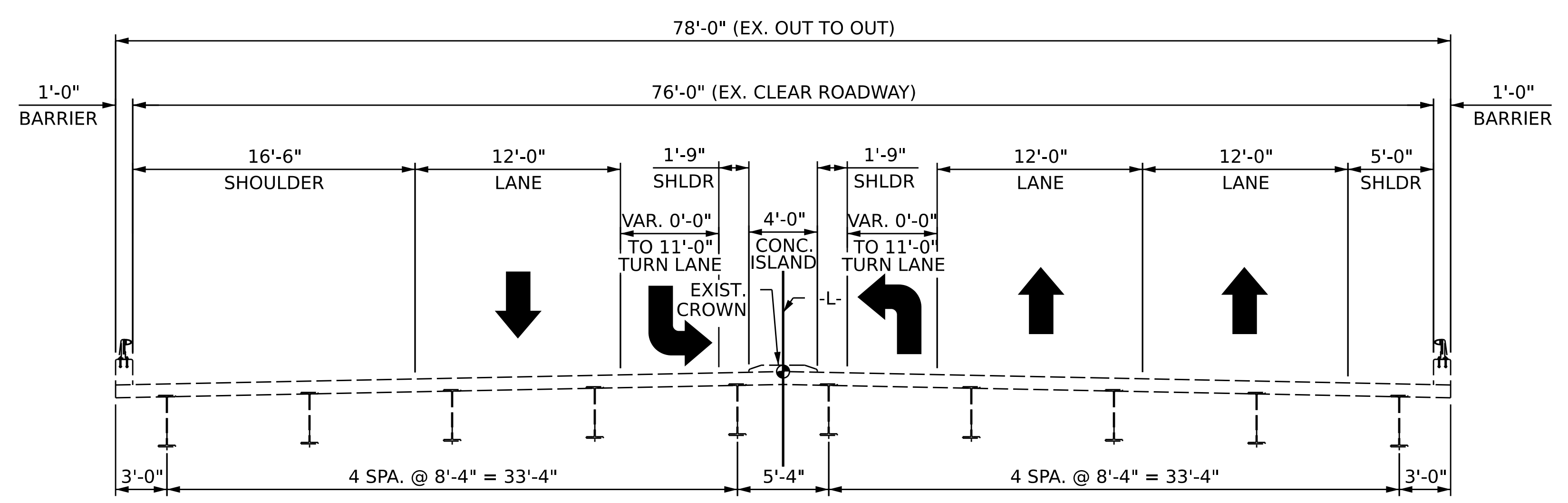
AECOM

AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F0242

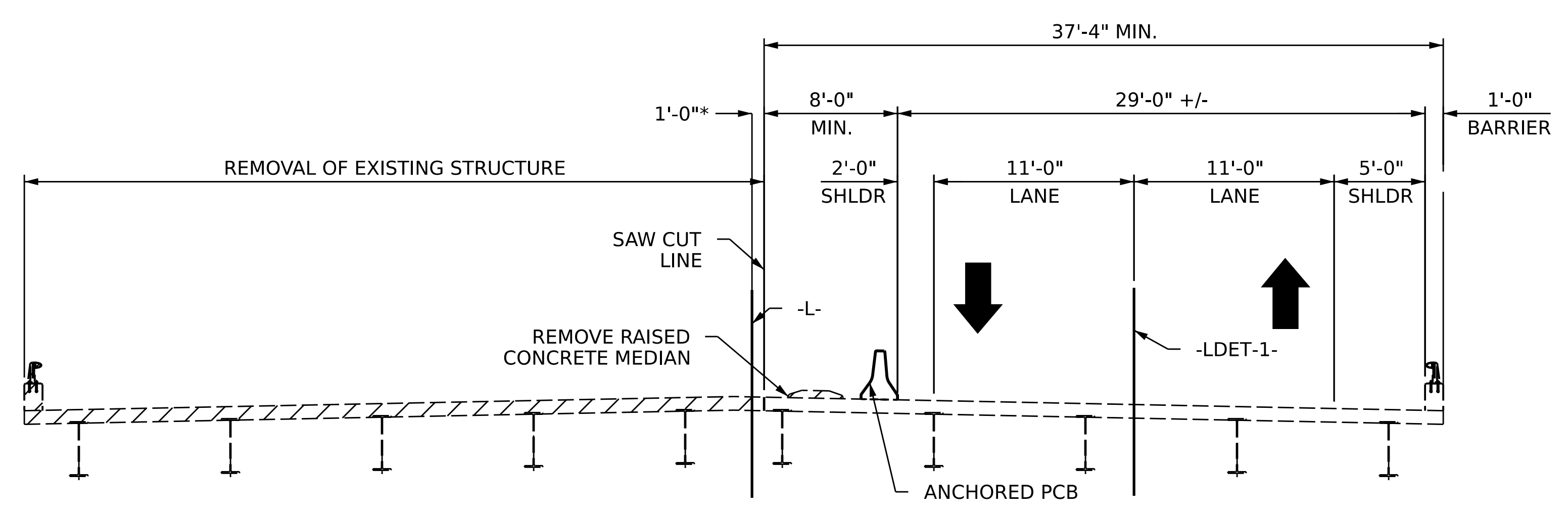
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

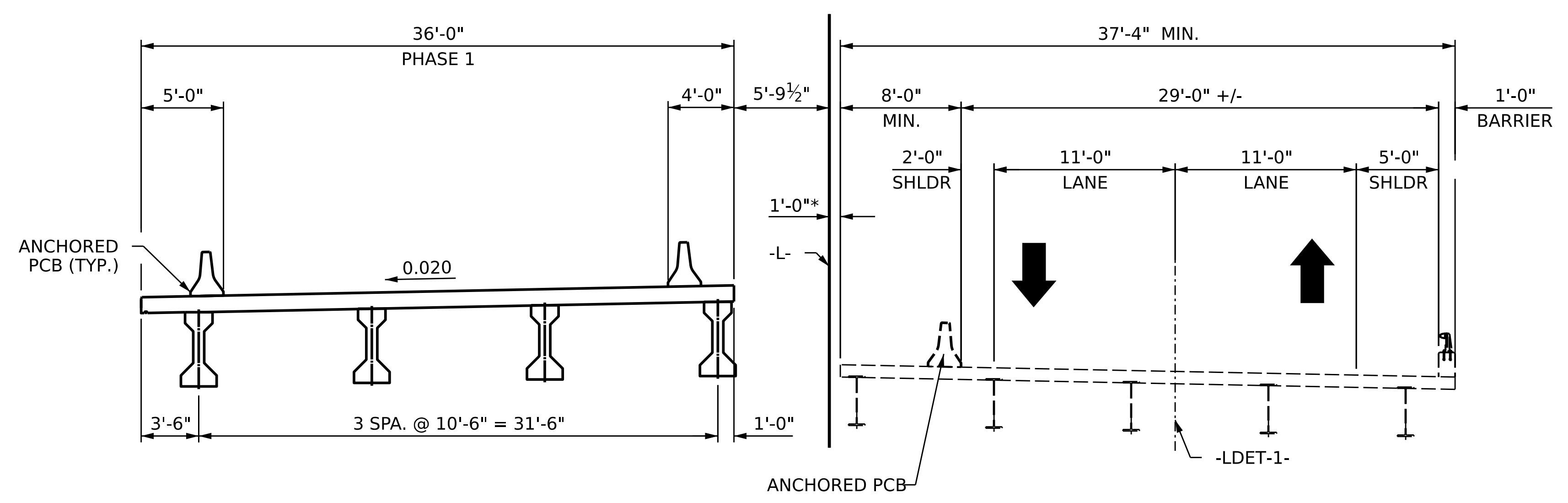
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			48



EXISTING BRIDGE



STAGE 1 DEMOLITION



STAGE 1 CONSTRUCTION
CONSTRUCT LEFT SIDE OF BRIDGE

NOTES:

- EXISTING BRIDGE DATA IS BASED ON THE BEST INFORMATION AVAILABLE.
- PCB: PORTABLE CONCRETE BARRIER
- FOR MANAGEMENT OF TRAFFIC, SEE TRANSPORTATION MANAGEMENT PLANS.
- EXISTING BRIDGE DEMOLITION
- * THIS VALUE IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR AND SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY FOR THE EXISTING STRUCTURE.
- THE CONTRACTOR SHALL DETERMINE THIS VALUE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 1 OF 3

AECOM
 AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 GREGORY R. COLS
 2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING					
CONSTRUCTION SEQUENCE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-06
TOTAL SHEETS					48

DRAWN BY : B.T. LEROY DATE : 11/2022
 CHECKED BY : S. NATARAJAN DATE : 11/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE : 12/2022

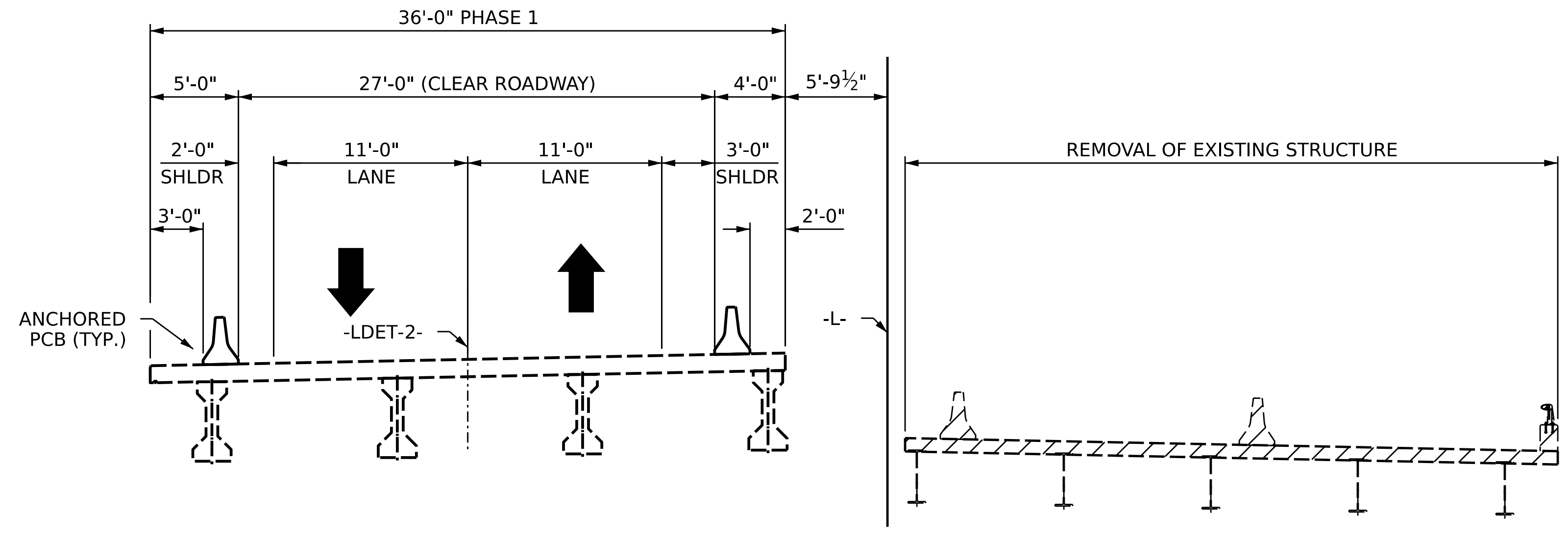
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

NOTES:

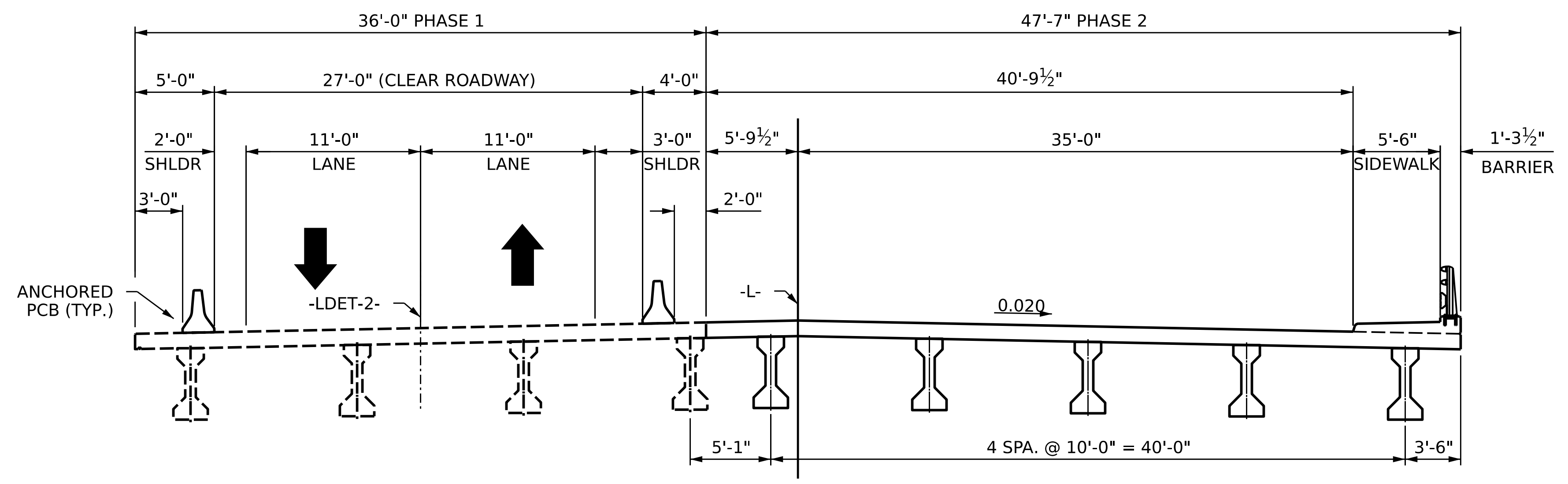
EXISTING BRIDGE DATA IS BASED ON THE BEST INFORMATION AVAILABLE

PCB: PORTABLE CONCRETE BARRIER

FOR MANAGEMENT OF TRAFFIC, SEE TRANSPORTATION MANGEMENT PLANS.



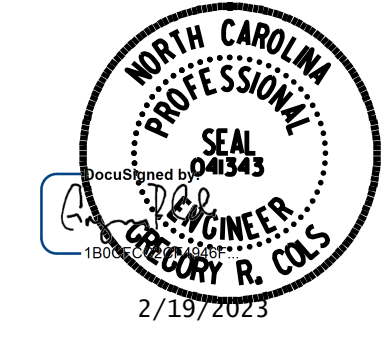
STAGE 2 DEMOLITION



STAGE 2 CONSTRUCTION
CONSTRUCT RIGHT SIDE OF BRIDGE

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-

SHEET 2 OF 3



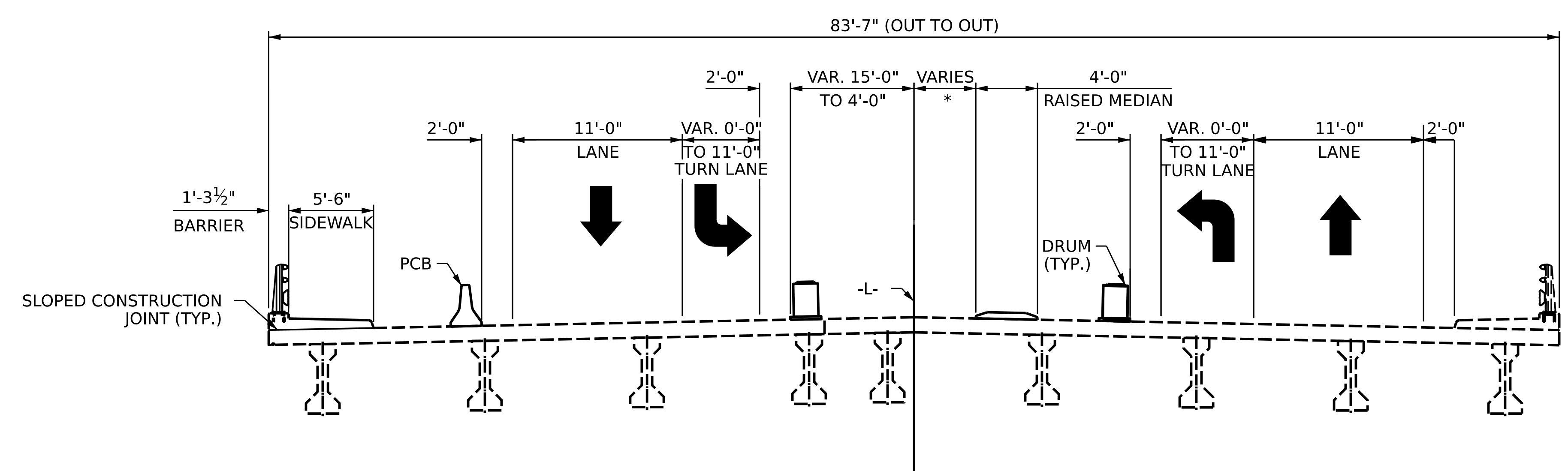
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : B.T. LEROY DATE : 11/2022
CHECKED BY : S. NATARAJAN DATE : 11/2022
DESIGN ENGINEER OF RECORD: G. COLS DATE : 12/2022

NOTES:
 FOR MANAGEMENT OF TRAFFIC, SEE TRANSPORTATION
 MANAGEMENT PLANS.



STAGE 3 CONSTRUCTION

CONSTRUCT LEFT SIDEWALK AND BARRIER.
 CONSTRUCT RAISED CONCETERE MEDIAN.

* MEDIAN LOCATION VARIES. SEE MEDIAN DETAILS SHEET.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 3 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

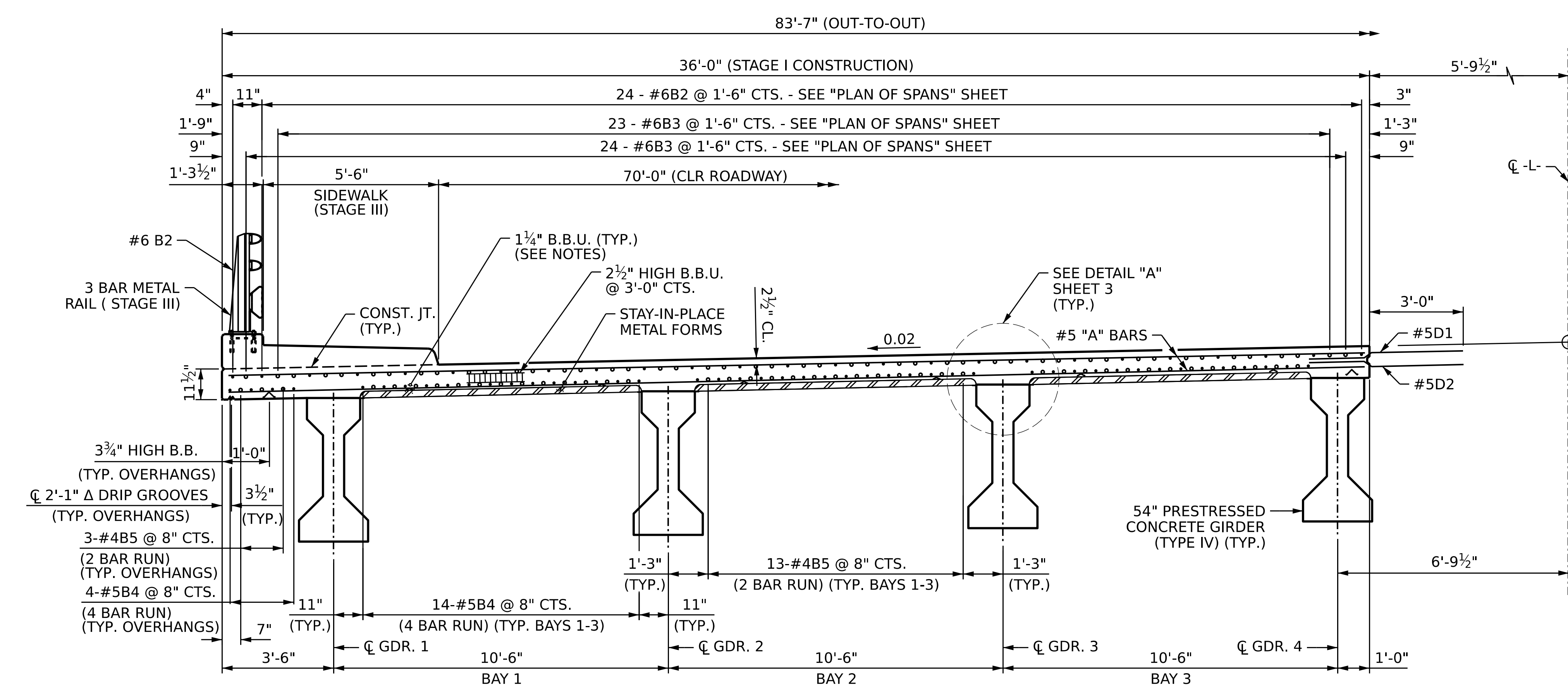
CONSTRUCTION SEQUENCE

SEAL
 REGISTERED PROFESSIONAL ENGINEER
 DANIEL DRUM
 2/19/2023

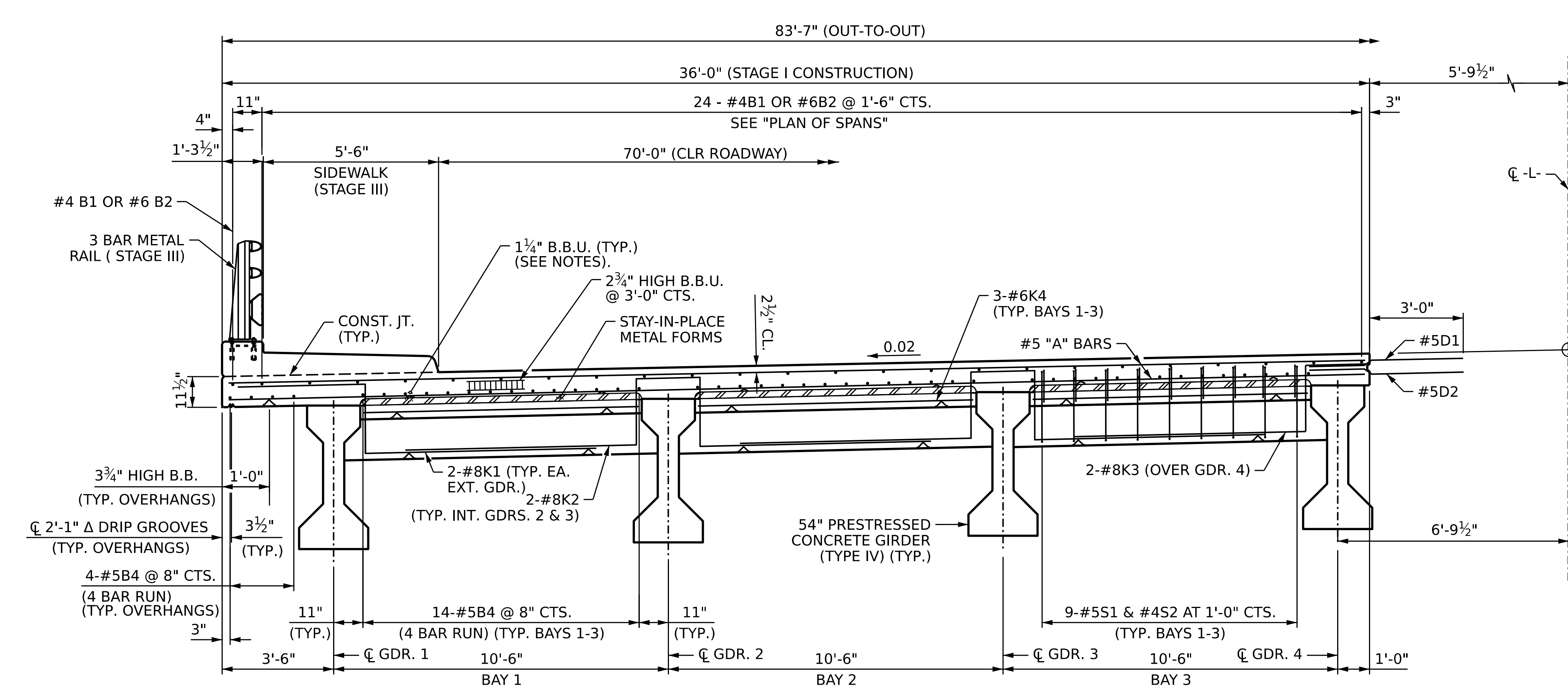
DRAWN BY : B.T. LEROY DATE : 11/2022
 CHECKED BY : S. NATARAJAN DATE : 11/2022
 DESIGN ENGINEER OF RECORD : G. COLS DATE : 12/2022

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48



TYPICAL SECTION AT LINK SLAB



TYPICAL SECTION
SECTION SHOWN AT END BENT, SIMILAR AT MIDSPAN

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.

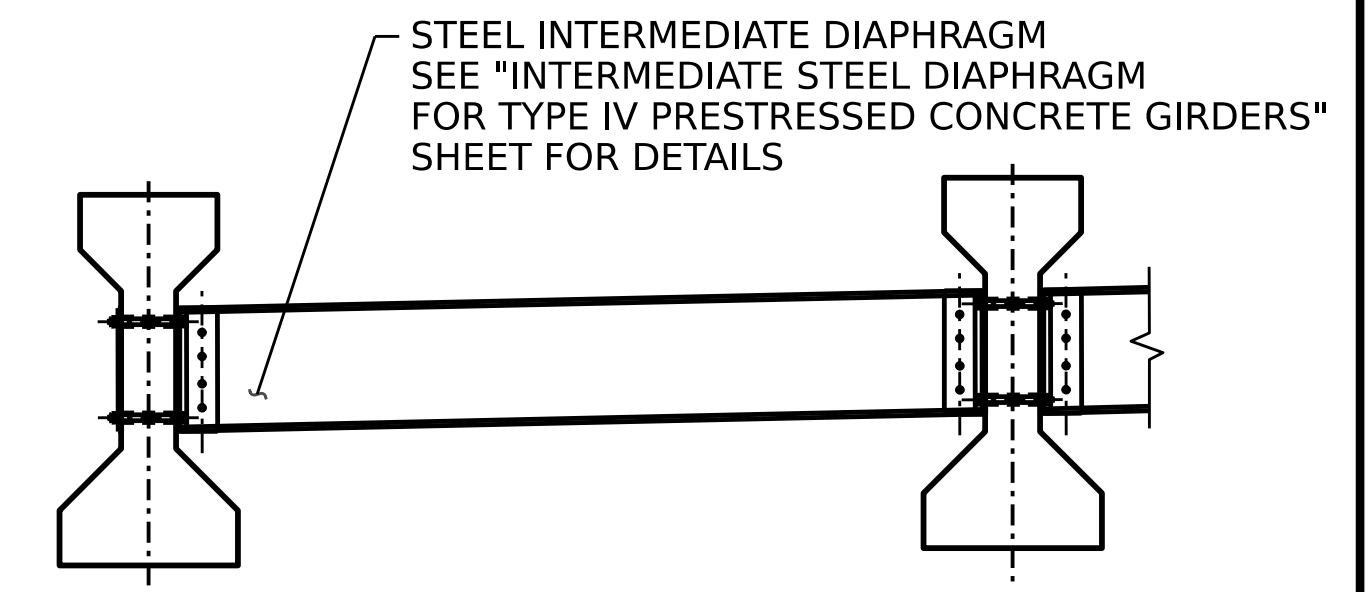
BARRIER RAIL OR SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

SEE CONSTRUCTION SEQUENCE SHEETS FOR LOCATION OF TEMPORARY PORTABLE CONCRETE BARRIER (ANCHORED)

FOR SIDEWALK, MEDIAN AND 3 BAR METAL RAIL, SEE DETAIL SHEETS.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO CASTING OF SIDEWALK



EXTERIOR GIRDER **INTERIOR GIRDER**

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-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 1 OF 3

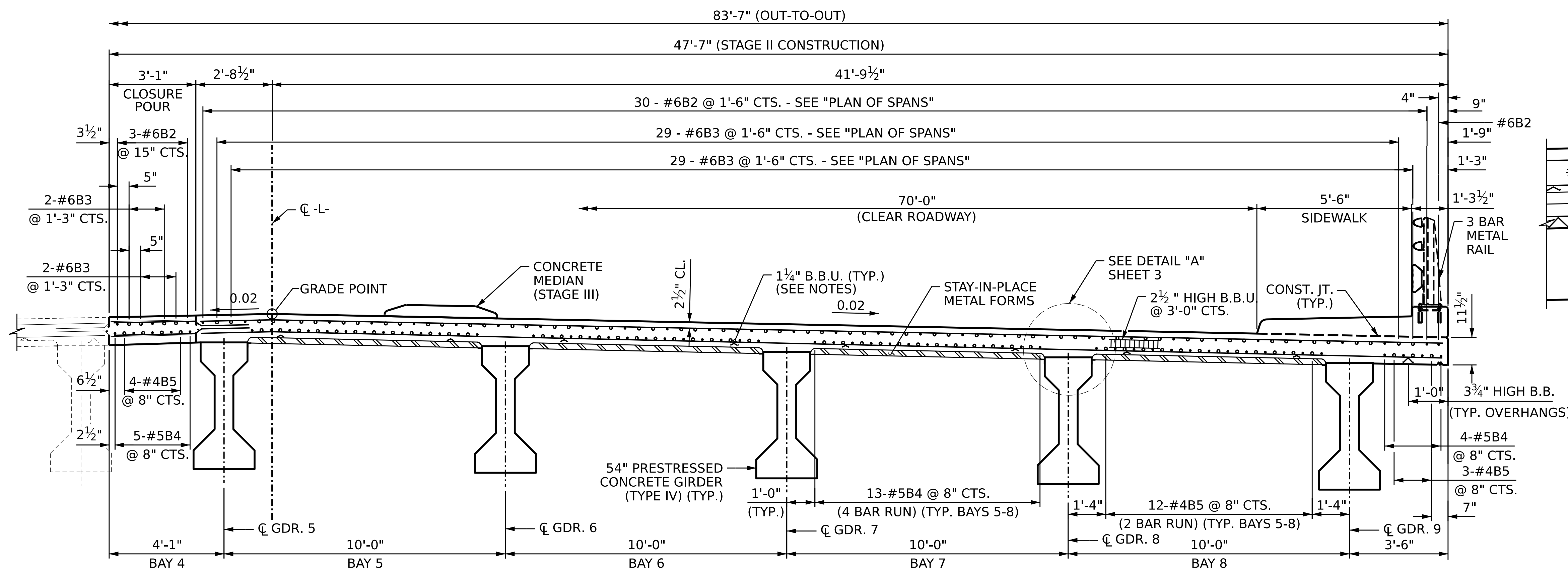
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

SEAL
STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 DANIEL DRUM
 2/19/2023

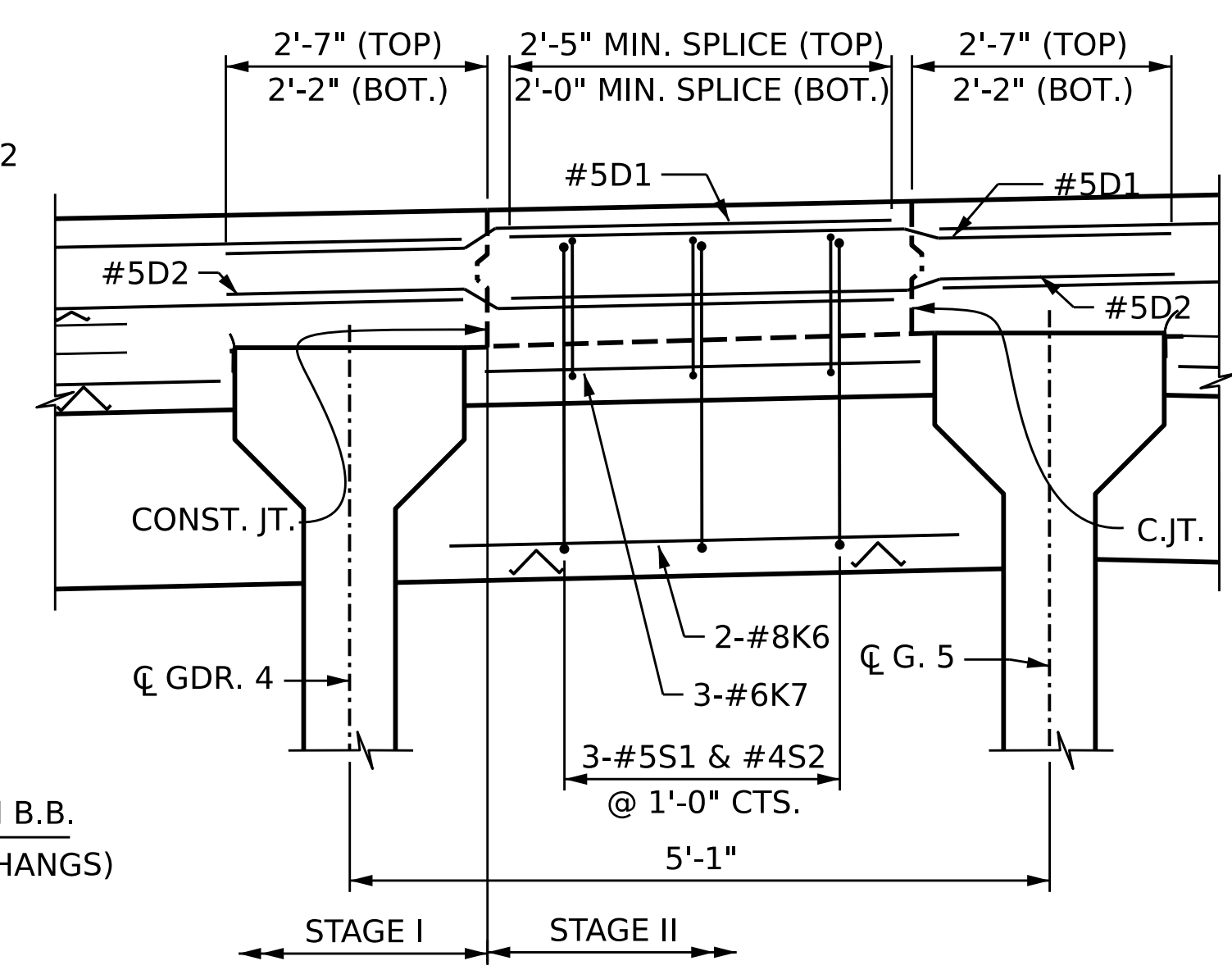
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION STAGE I AND PART STAGE III					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-09
TOTAL SHEETS					48

DRAWN BY : M.L. CATER	DATE : 10/2022
CHECKED BY : G.R. COLS	DATE : 10/2022
DESIGN ENGINEER OF RECORD : G. COLS	DATE : 12/2022

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



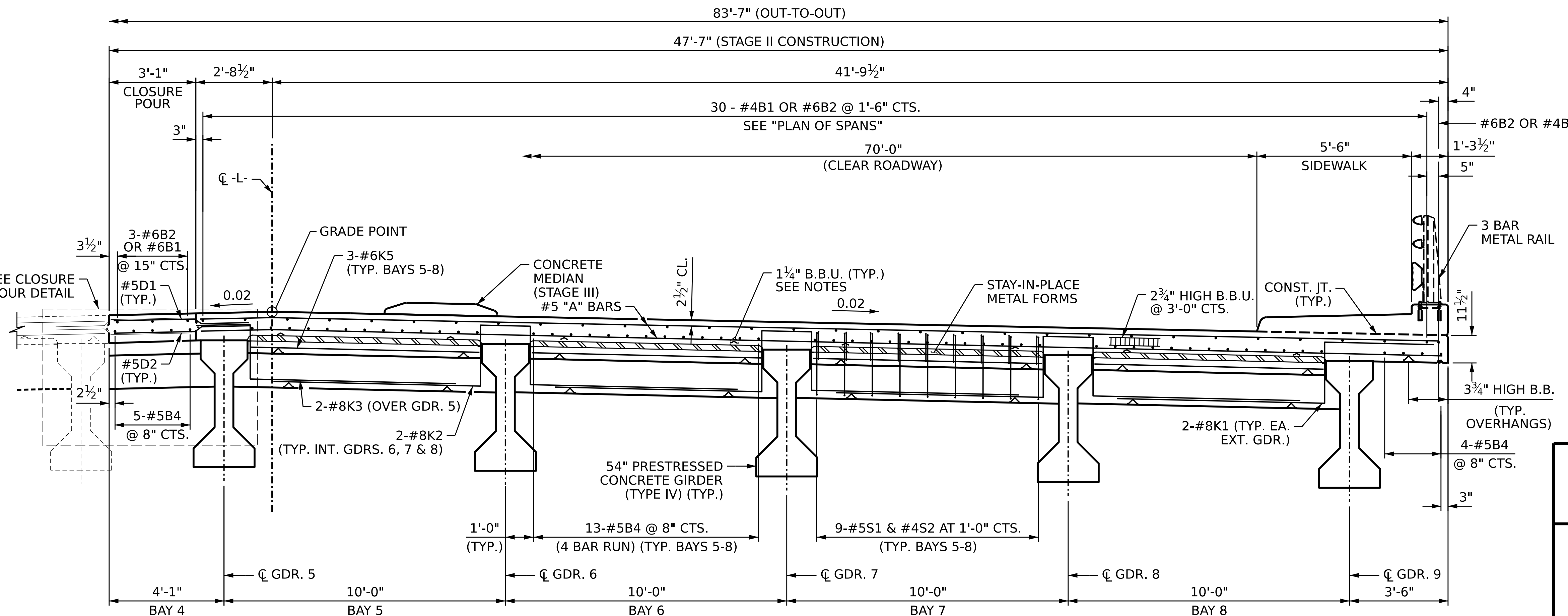
TYPICAL SECTION AT LINK SLAB



CLOSURE POUR DETAIL
DECK CLOSURE POUR DETAIL @ END BENT

NOTES:

- FOR PART TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM, SEE SHEET 1
- FOR NOTES, SEE SHEET 1



TYPICAL SECTION
SECTION SHOWN AT END BENT, SIMILAR AT MIDSPAN

"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-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-
SHEET 2 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200
www.aecom.com
AECOM License No. F0242

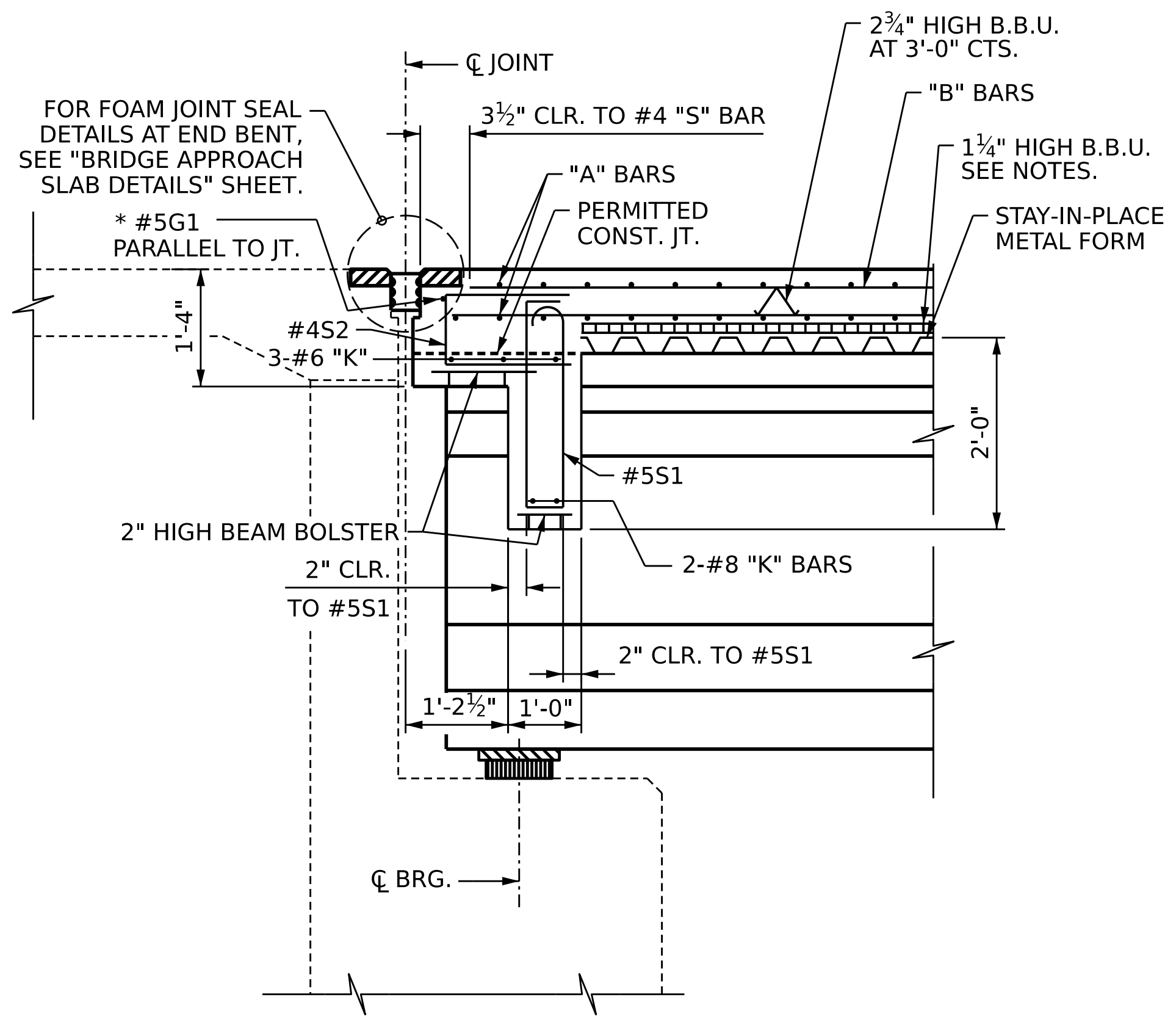
PROFESSIONAL ENGINEER
SEAL 04343
DANIEL DRUM
CARRRY R. COLS.

2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION					
STAGE II AND PART STAGE III					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-10
TOTAL SHEETS					48

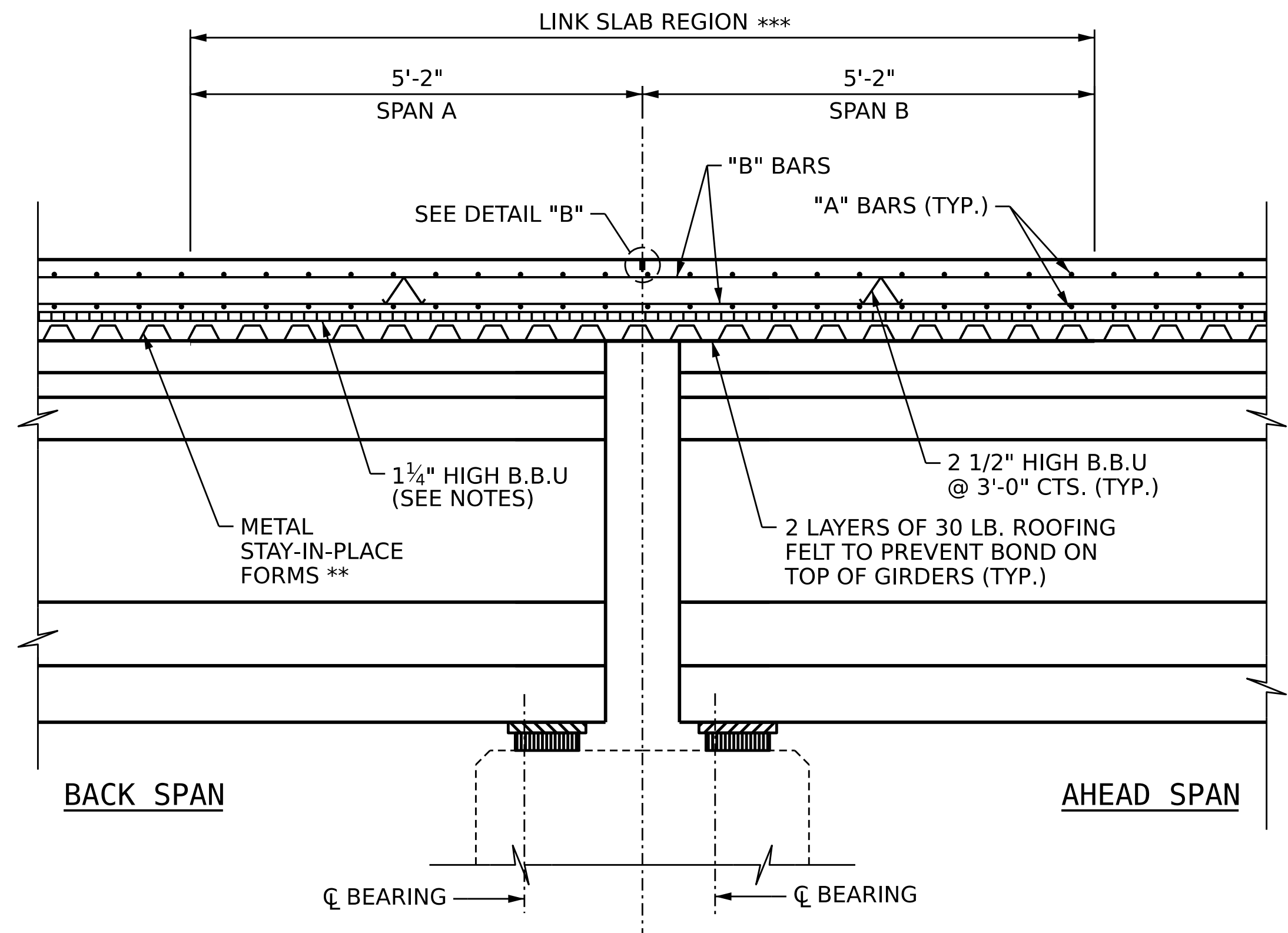
DRAWN BY:	M.L. CATER	DATE:	10/2022
CHECKED BY:	G.R. COLS	DATE:	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE:	12/2022

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

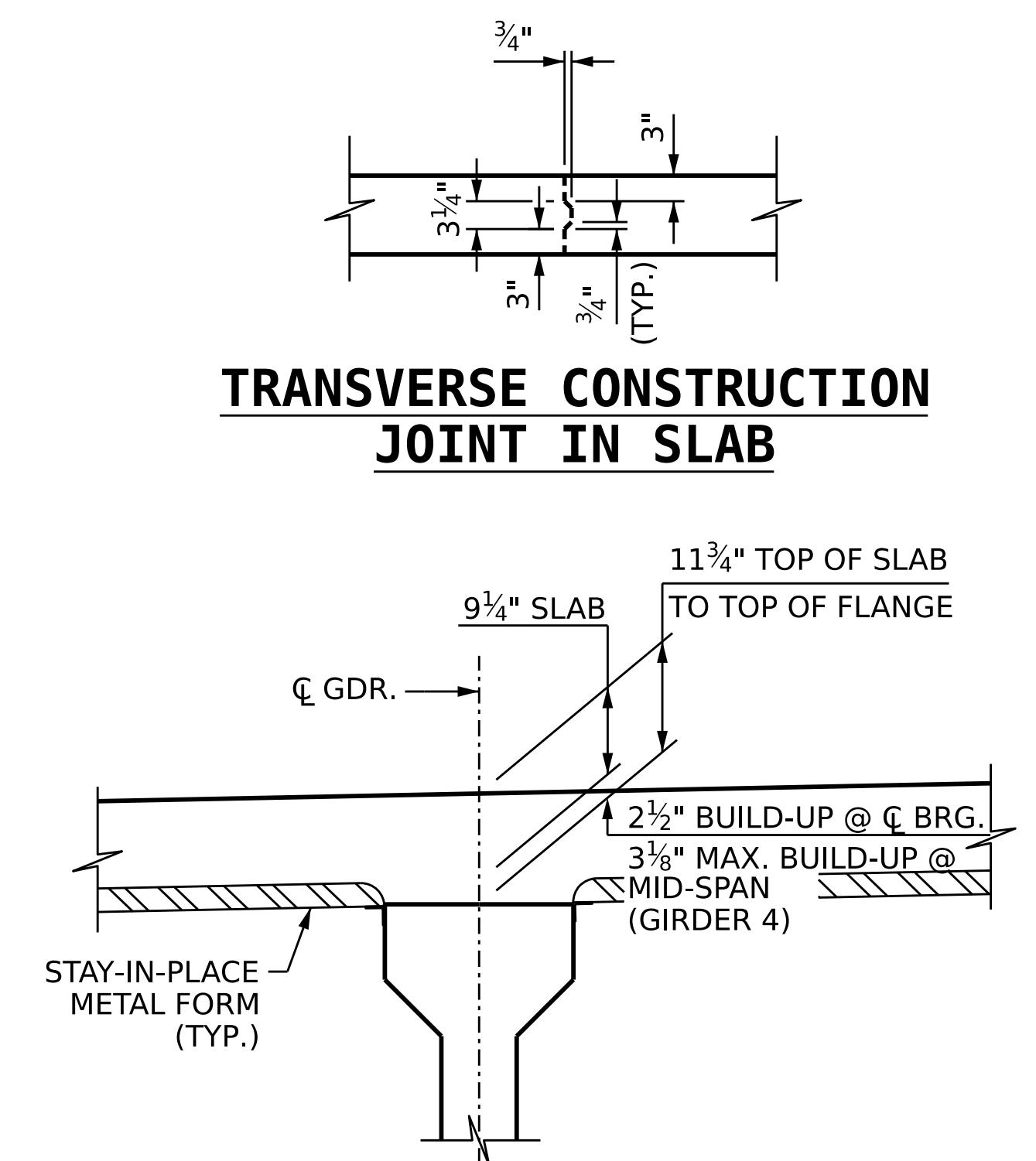


SECTION THRU END BENT DIAPHRAGMS

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

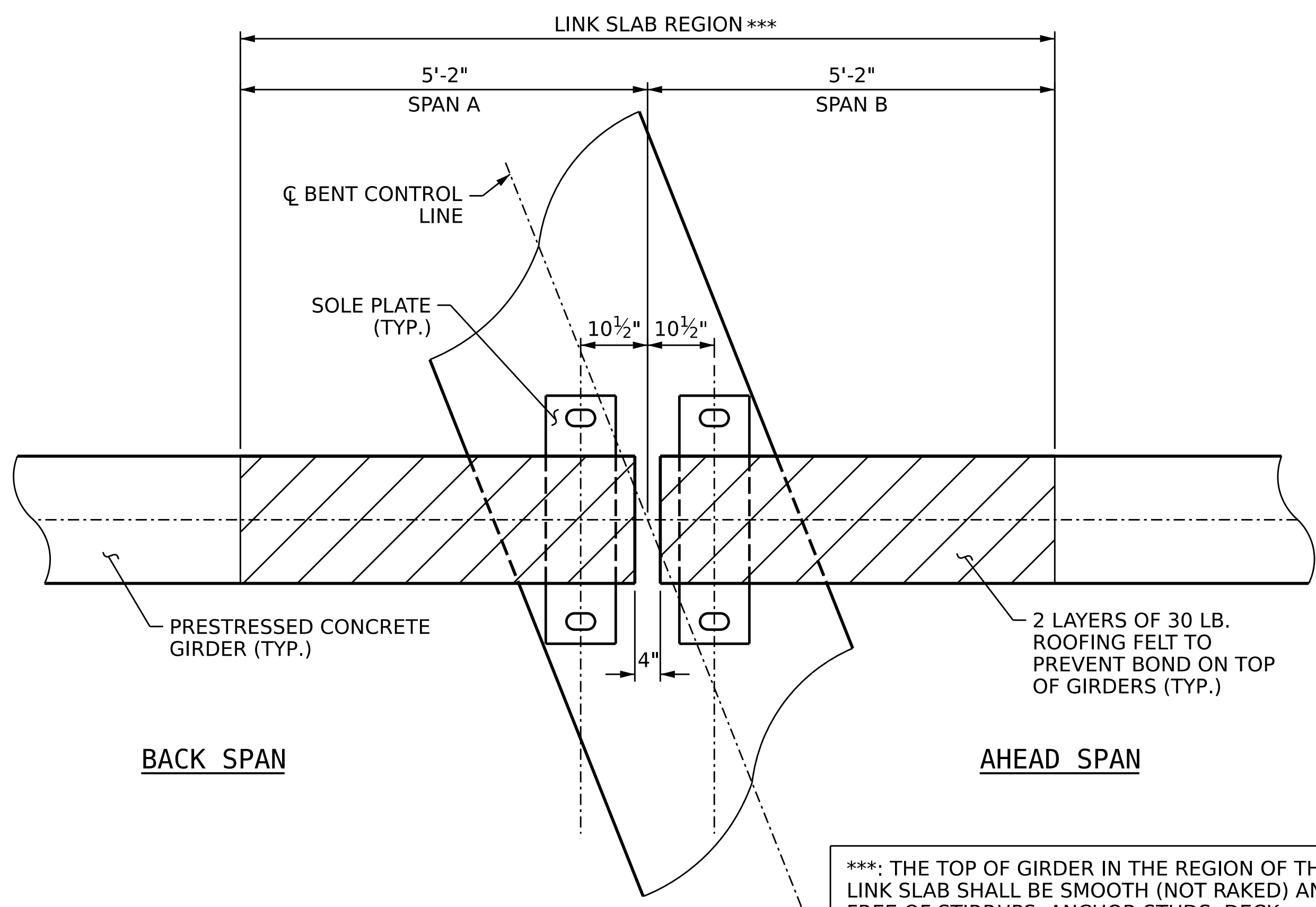


SECTION @ LINK SLAB

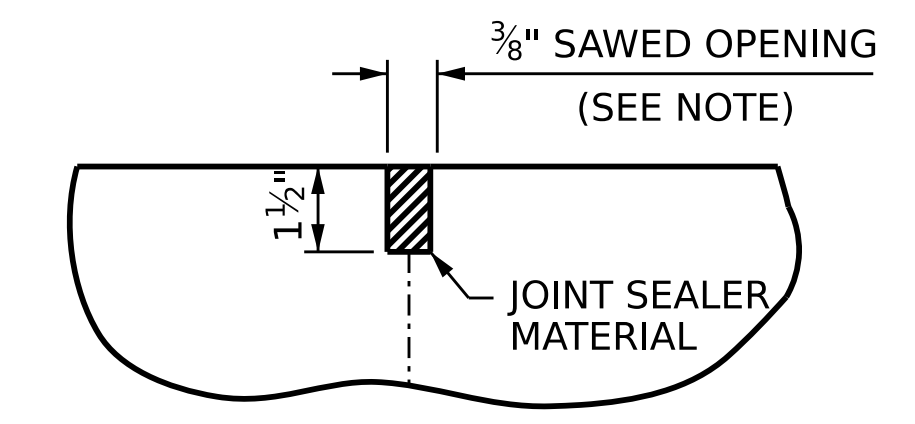


TRANSVERSE CONSTRUCTION JOINT IN SLAB

DETAIL "A"

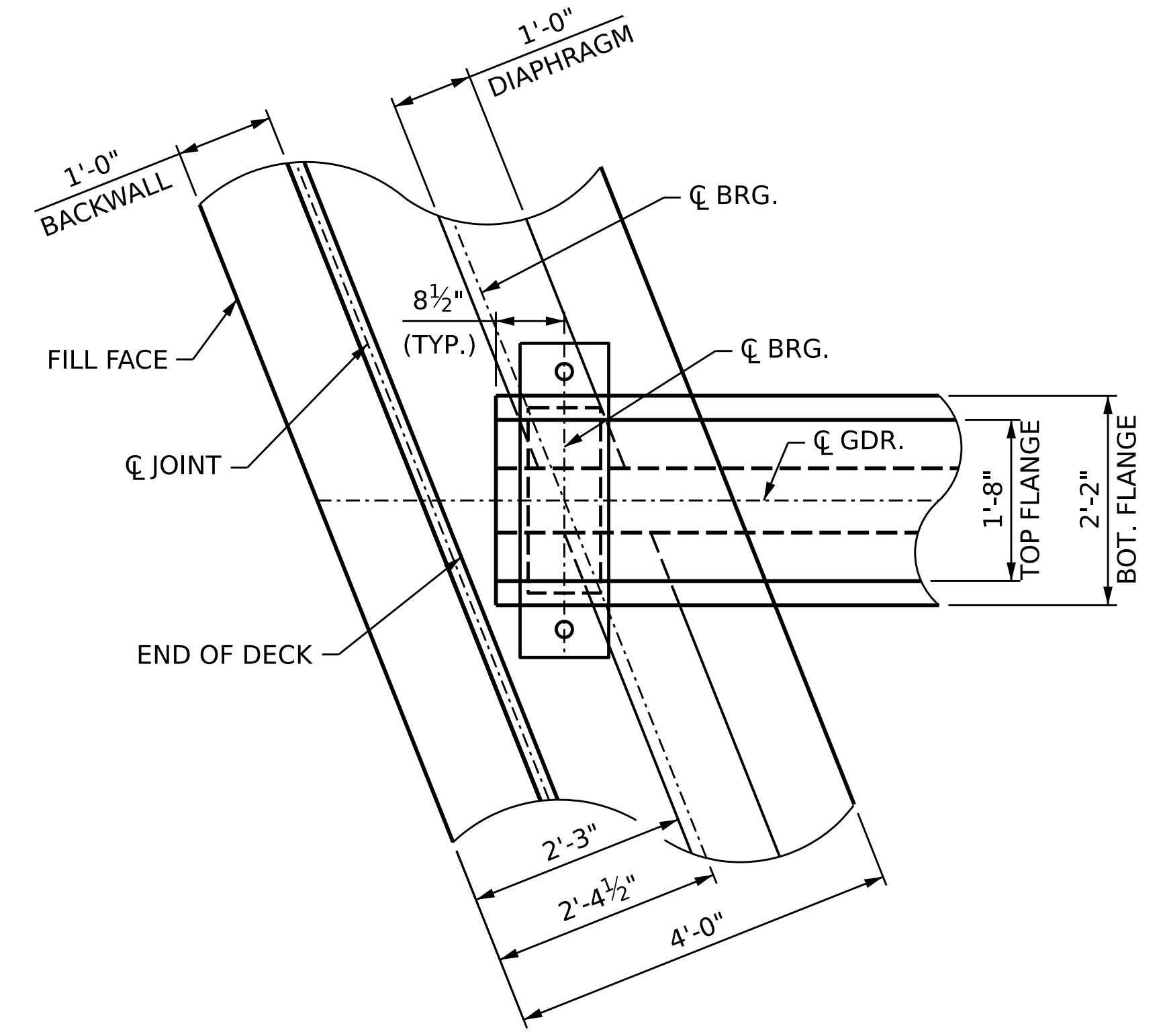


PLAN @ BENT



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

***: 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-PALCE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

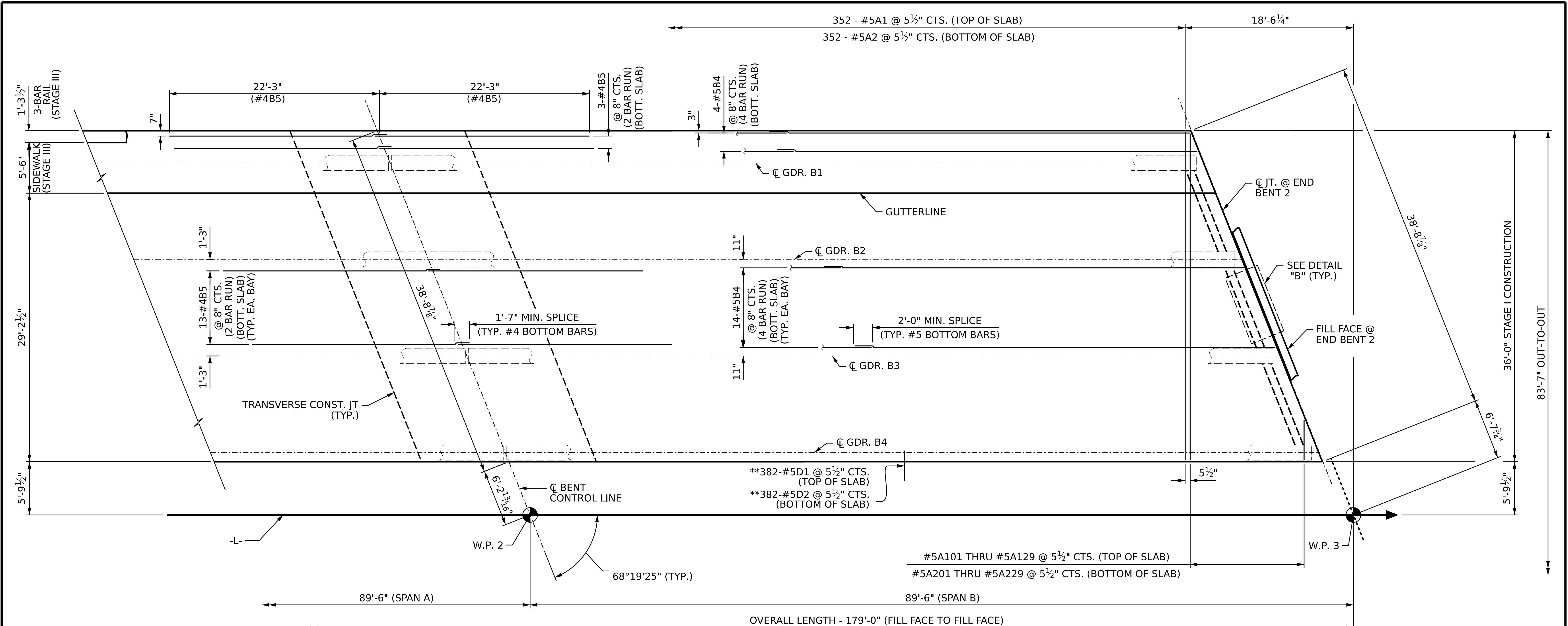
PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 3 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

PROFESSIONAL SEAL
 04343
 DANIEL DRUM
 CIVIL ENGINEER
 ROCKINGHAM, N.C.
 2/19/2023

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-11
TOTAL SHEETS					48

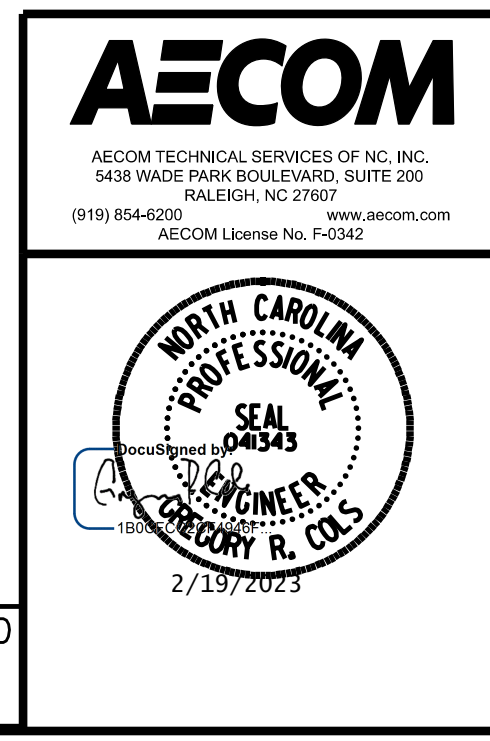
DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	S. NATARAJAN	DATE :	11/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022



SPAN B
 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).
 FOR NOTES, SEE SHEET 5

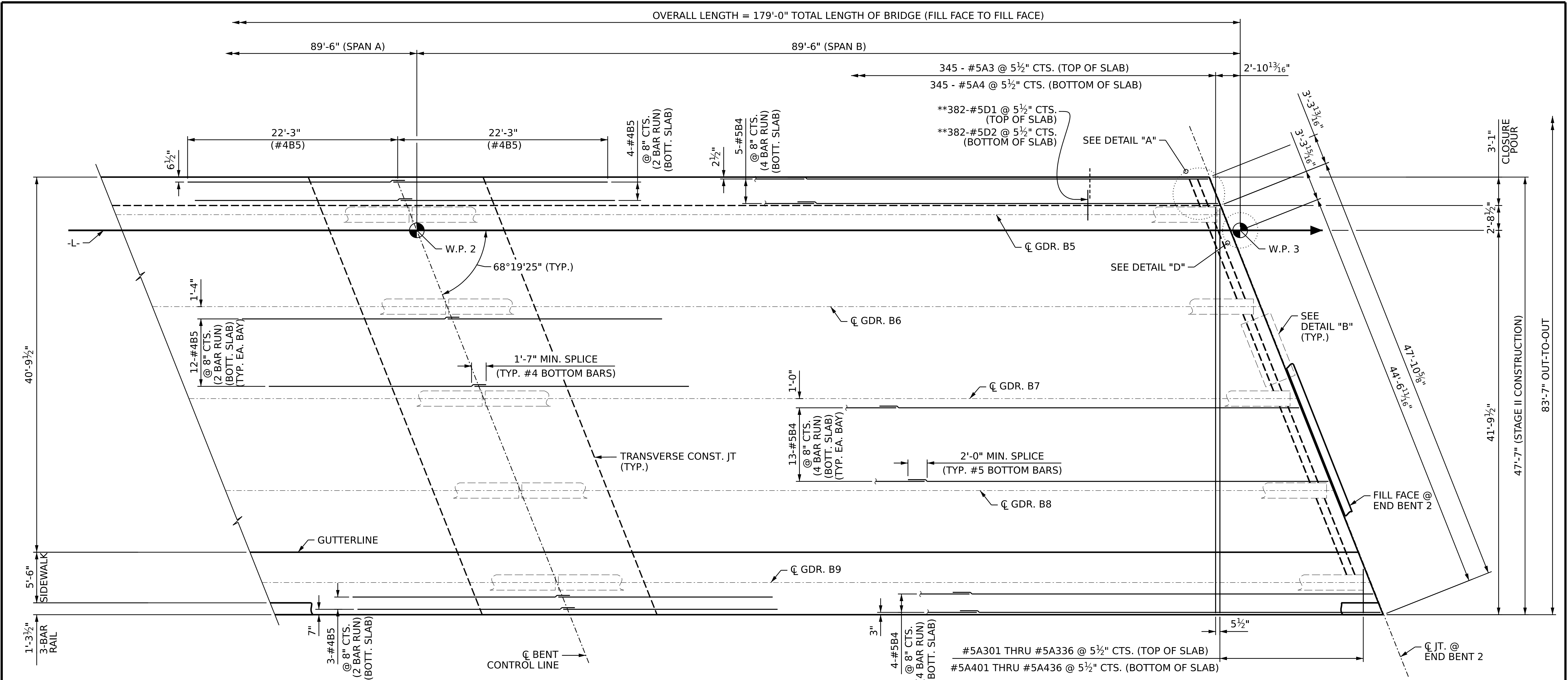
PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 2 OF 5



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B STAGE I AND STAGE III					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-13
TOTAL SHEETS					48

DRAWN BY :	M.L. CATER	DATE :	10/2022
CHECKED BY :	G.R. COLS	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022

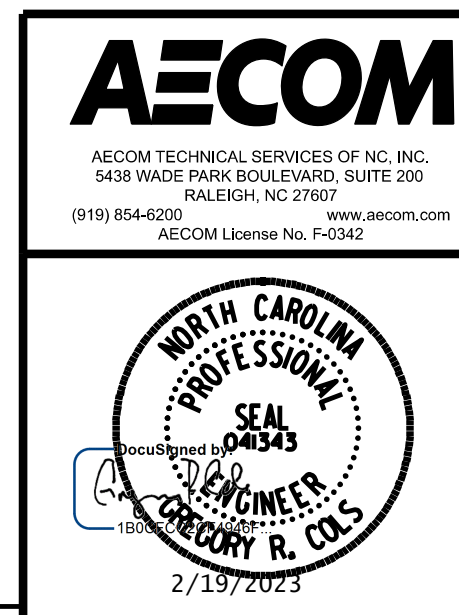
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



SPAN B
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).
FOR NOTES, SEE SHEET 5

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -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 :	10/2022
CHECKED BY :	G.R. COLS	DATE :	10/2022
DESIGN ENGINEER OF RECORD :	G. COLS	DATE :	12/2022

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48

NOTES:

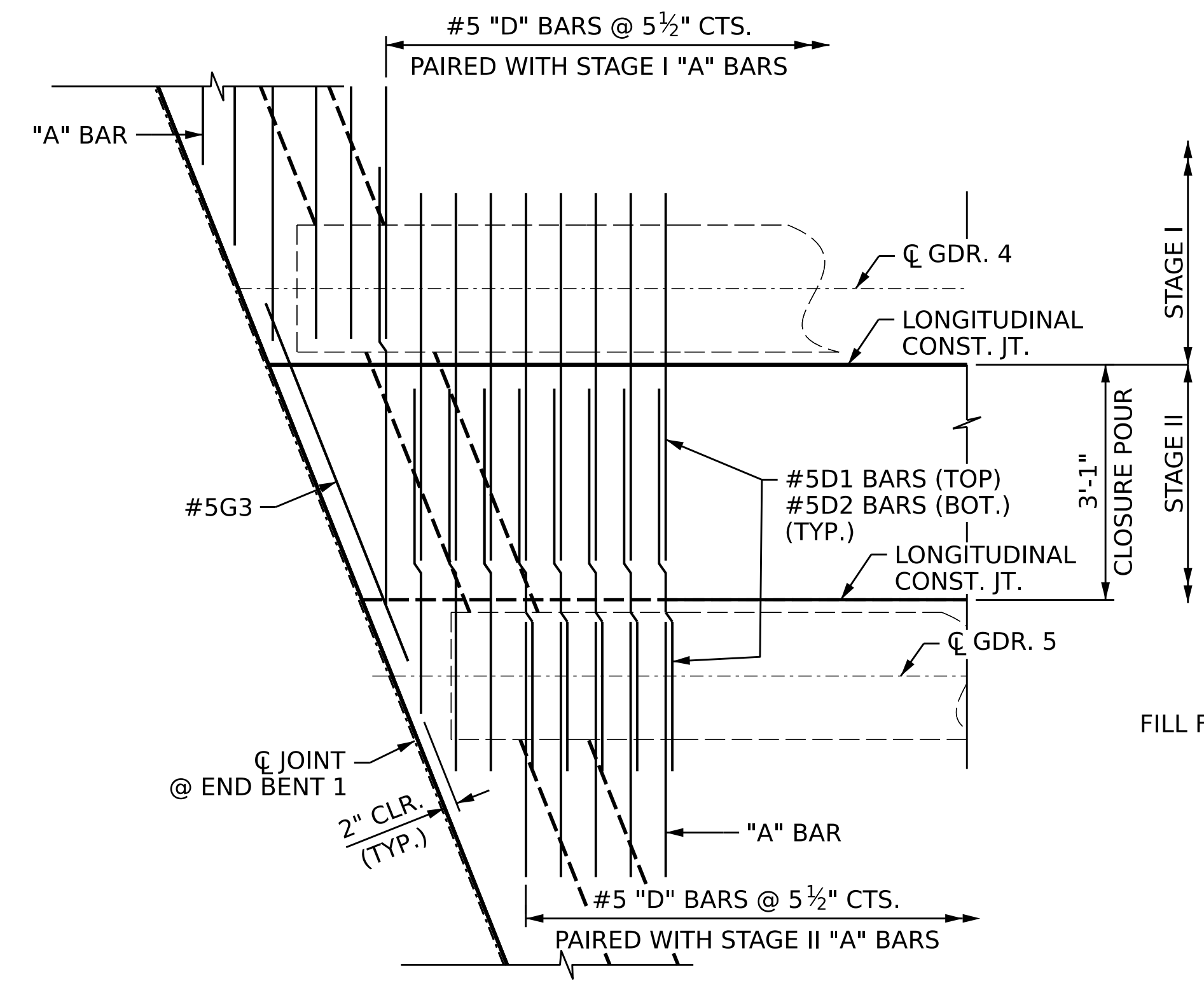
FOR REINFORCING STEEL IN SIDEWALK & MEDIAN, SEE RESPECTIVE DETAIL SHEETS.

FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.

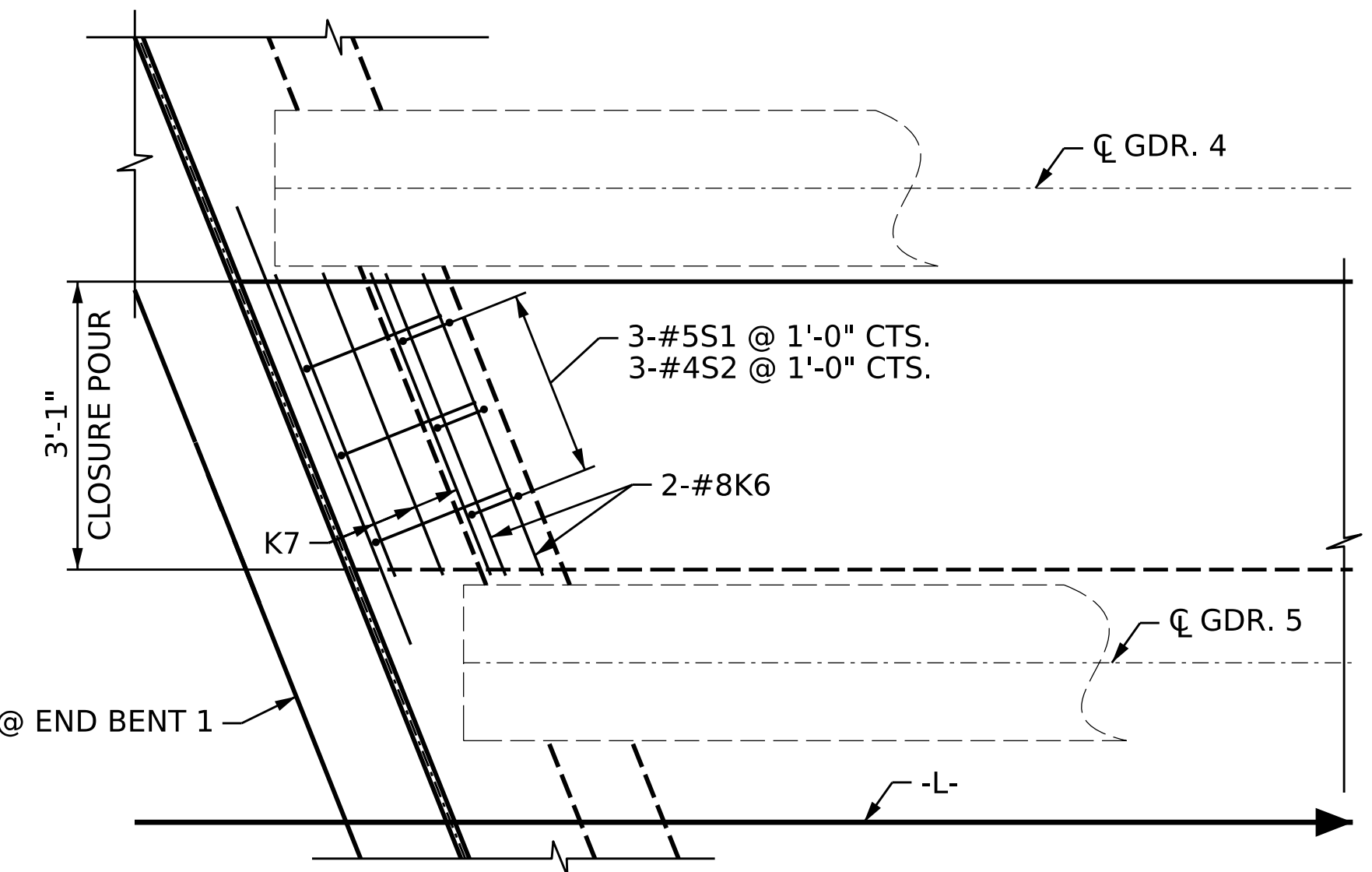
FOR TRANSVERSE CONSTRUCTION JOINT DETAIL SEE "TYPICAL SECTION DETAILS" SHEET.

LINK SLAB SAW CUT SHALL EXTEND TO EDGE OF DECK.

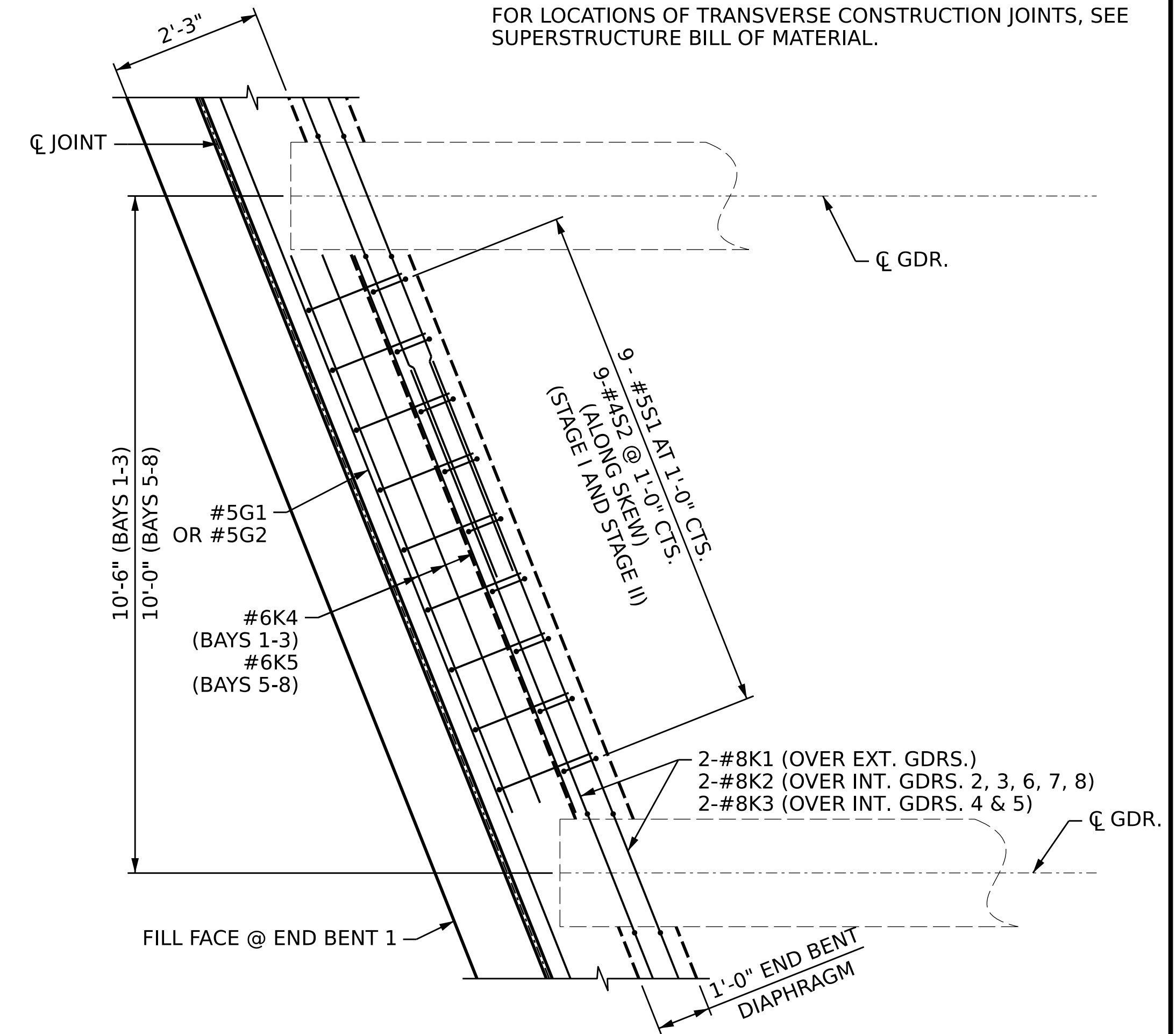
FOR LOCATIONS OF TRANSVERSE CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE BILL OF MATERIAL.



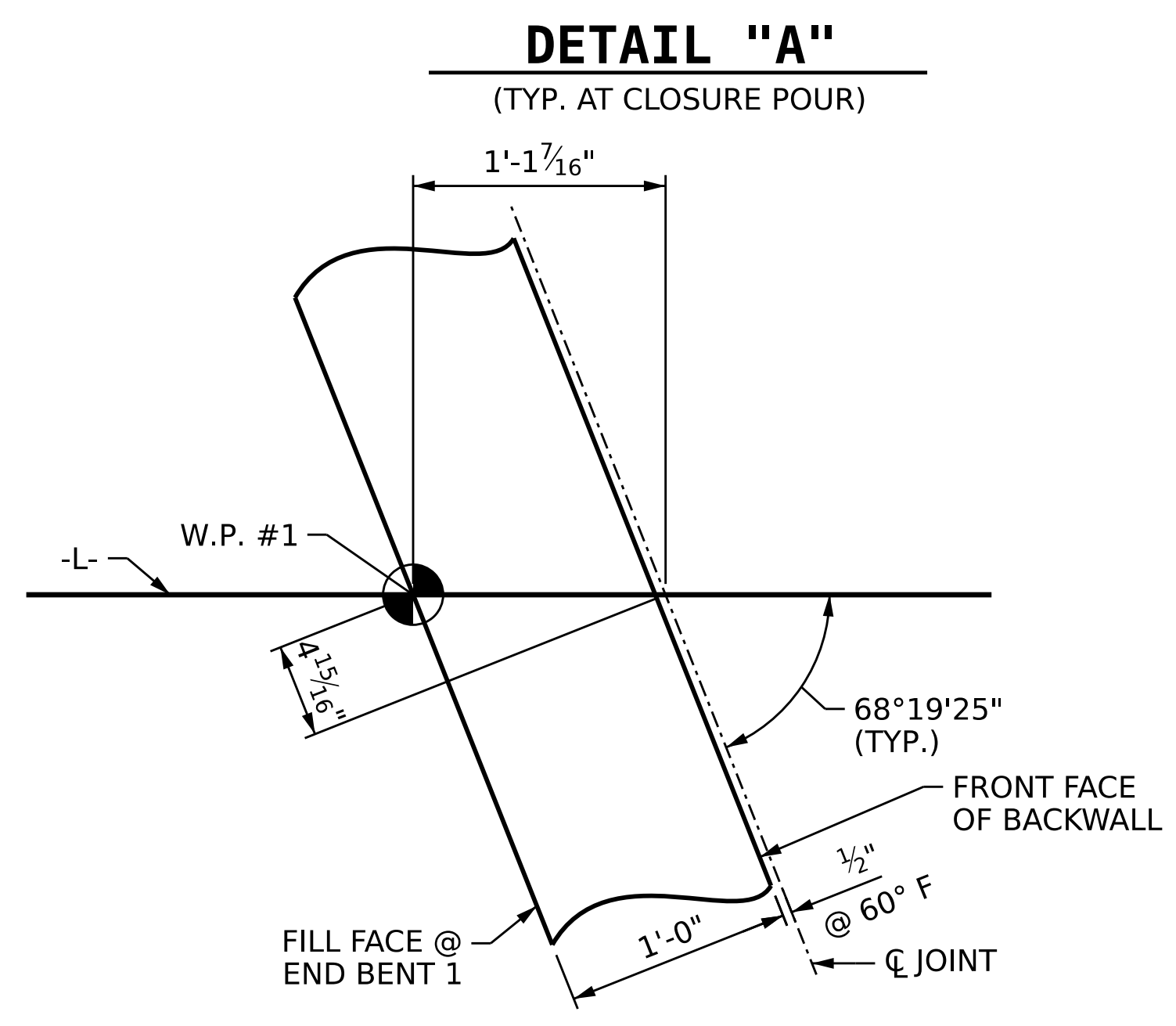
DECK REINFORCEMENT



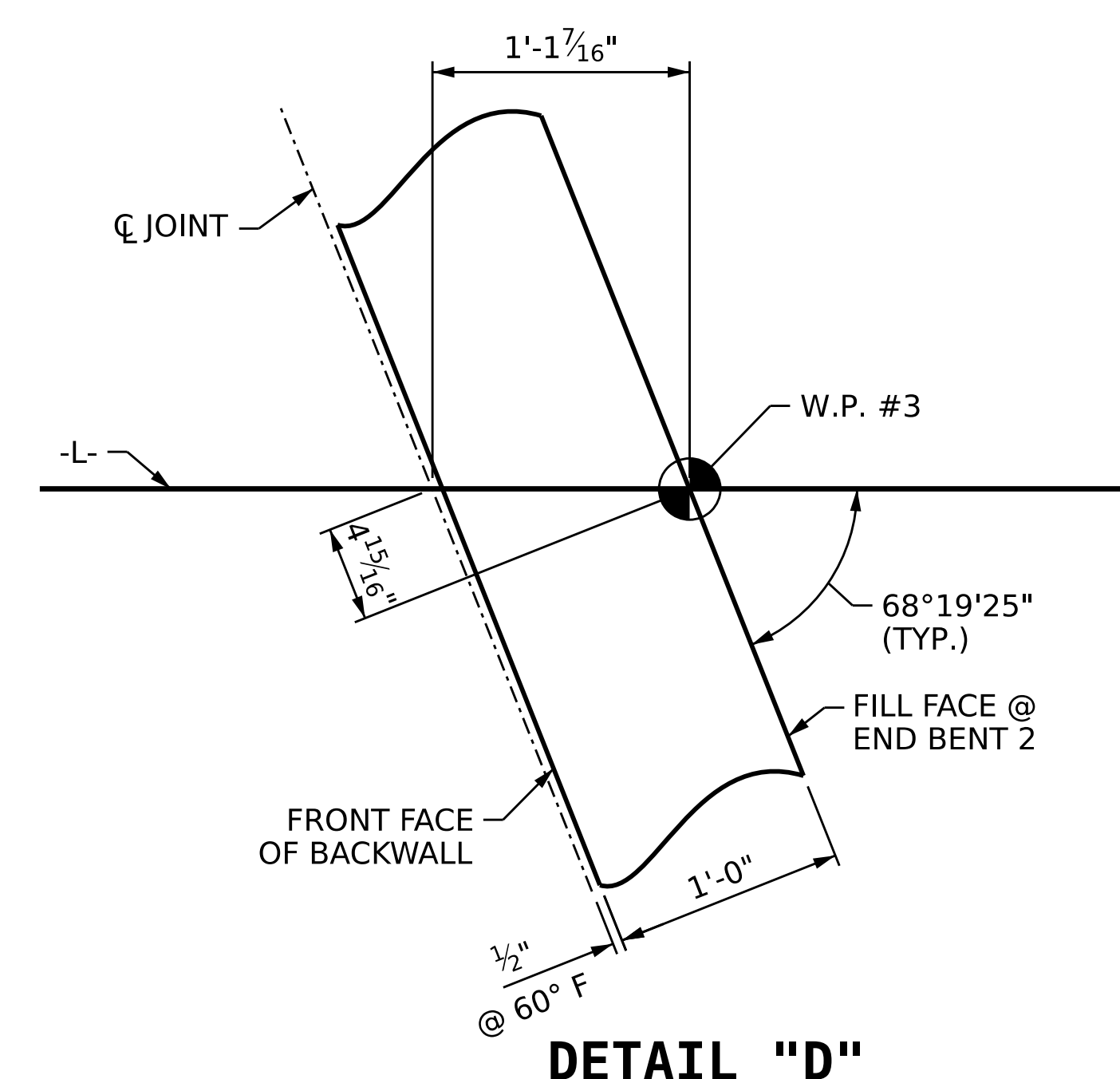
END BENT DIAPHRAGM
(TYP. BAY 4)



DETAIL "B"
(BAYS 1-3, 5-8)



DETAIL "A"
(TYP. AT CLOSURE POUR)



DETAIL "D"

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 5 OF 5

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

NORTH CAROLINA PROFESSIONAL SEAL
 04343
 ENGINEER
 GREGORY R. COLS
 2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-16
PLAN OF SPAN DETAILS						TOTAL SHEETS 48
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: M.L. CATER DATE: 10/2022
 CHECKED BY: G.R. COLS DATE: 10/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

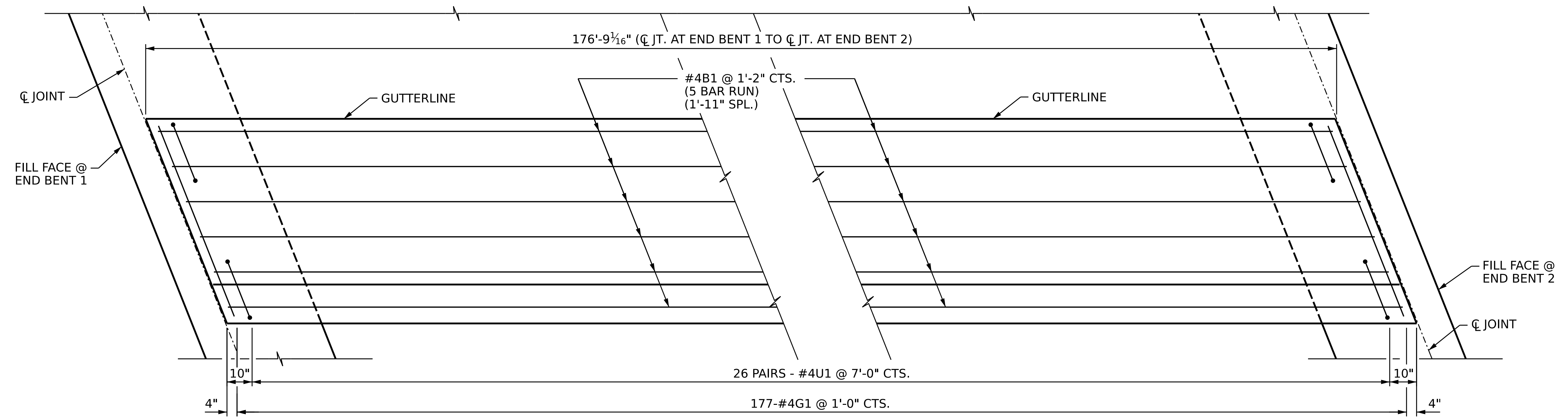
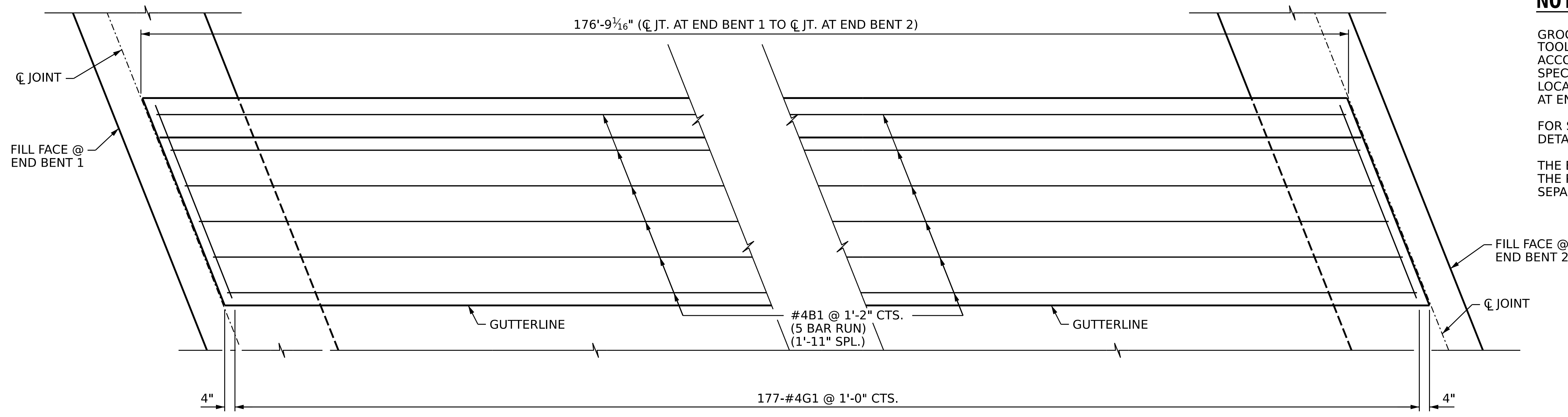
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES:

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 TO 10 FEET BETWEEN FILL FACE AT END BENT 1 AND FILL FACE AT END BENT 2.

FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DETAILS.

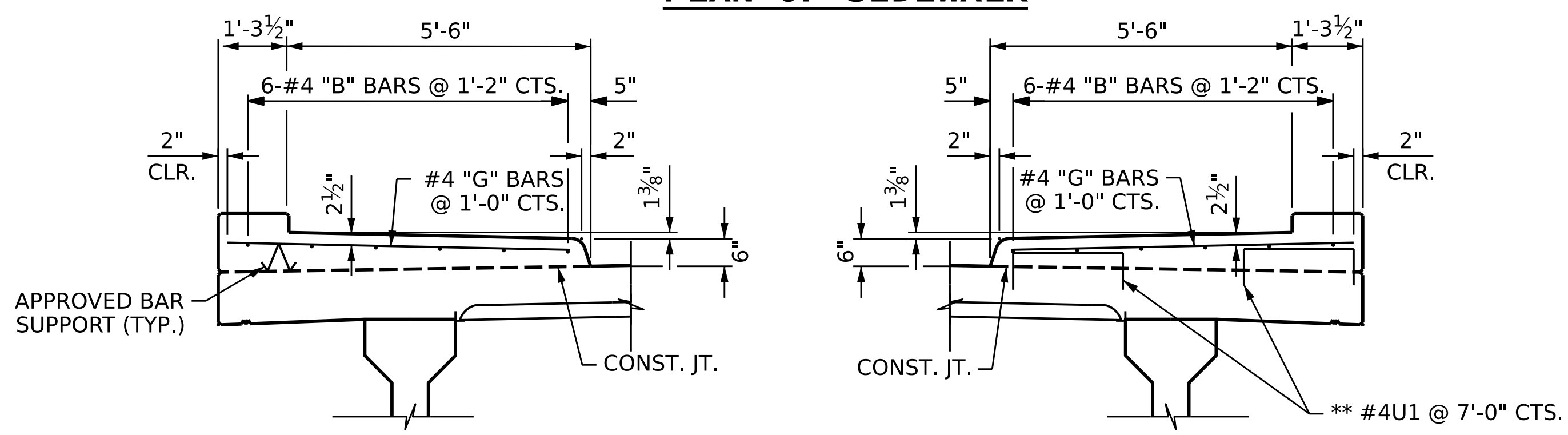
THE ENTIRE COST OF THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB". NO SEPARATE PAYMENT SHALL BE MADE.



SPAN A

PLAN OF SIDEWALK

SPAN B



SECTION THRU SIDEWALK - STAGE III

SECTION THRU SIDEWALK - STAGE II

** #4U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

DECK REINFORCEMENT NOT SHOWN FOR CLARITY.

FOR ADDITIONAL DETAILS, SEE 3-BAR METAL RAIL SHEETS.

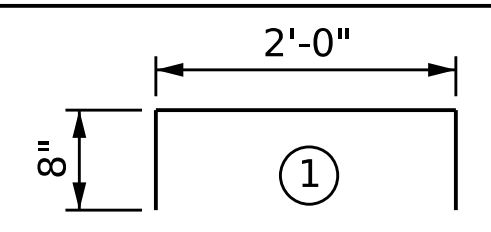
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BILL OF MATERIAL

FOR SIDEWALKS ONLY (STAGE II AND III)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	60	4	STR	37'-1"	1486
* G1	354	4	STR	6'-8"	1577
* U1	52	4	1	3'-4"	116

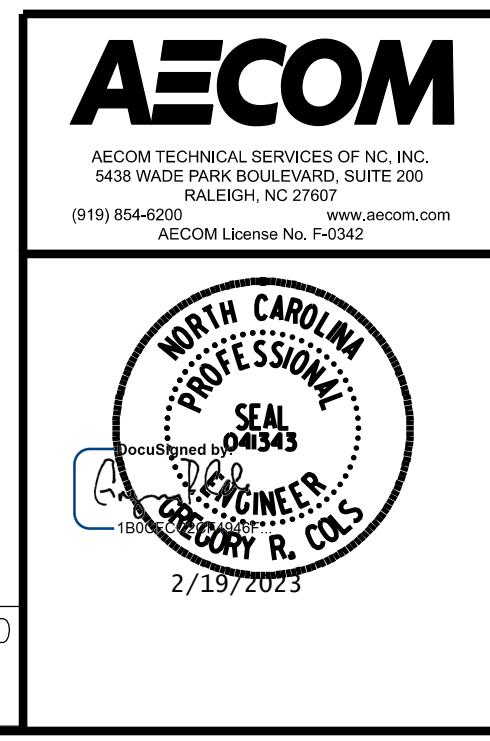
* EPOXY COATED REINFORCING STEEL 3179 LBS.
CLASS AA CONCRETE 63 CU. YDS.



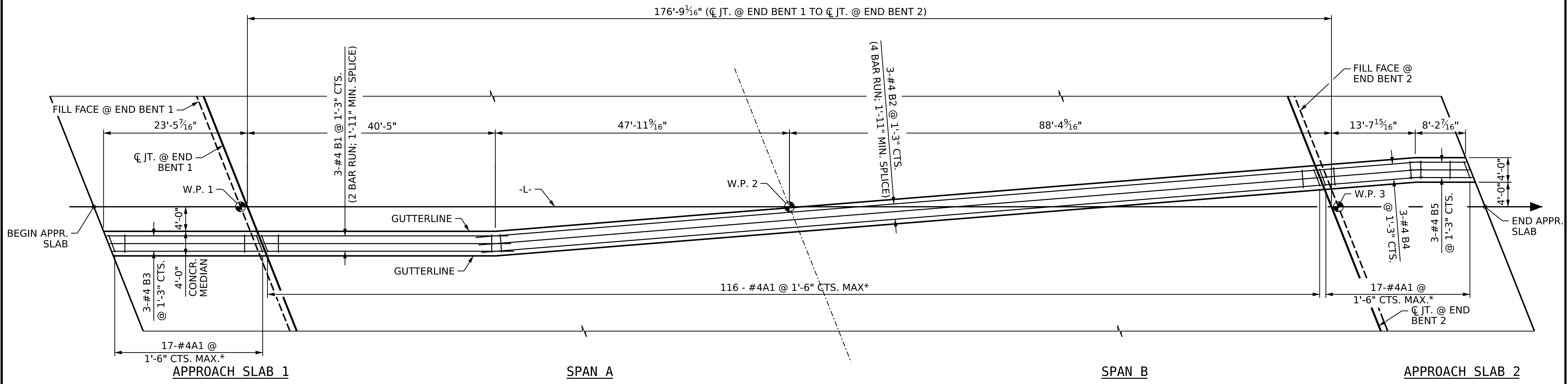
ALL BAR DIMENSIONS ARE OUT TO OUT

DRAWN BY : B.T. LEROY DATE : 11/2022
CHECKED BY : S. NATARAJAN DATE : 11/2022
DESIGN ENGINEER OF RECORD : G. COLS DATE : 12/2022

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 48
2			4			



* PLACE #4A1 BARS AT 1'-6" CTS. MAX. THROUGHOUT CONCRETE MEDIAN NORMAL TO THE MEDIAN. AT ENDS AND EXPANSION JOINTS, PLACE THE LAST BAR AT 2" CLEAR TO THE END ALONG THE SKEW, AS SHOWN.

PLAN OF CONCRETE MEDIAN

NOTES:

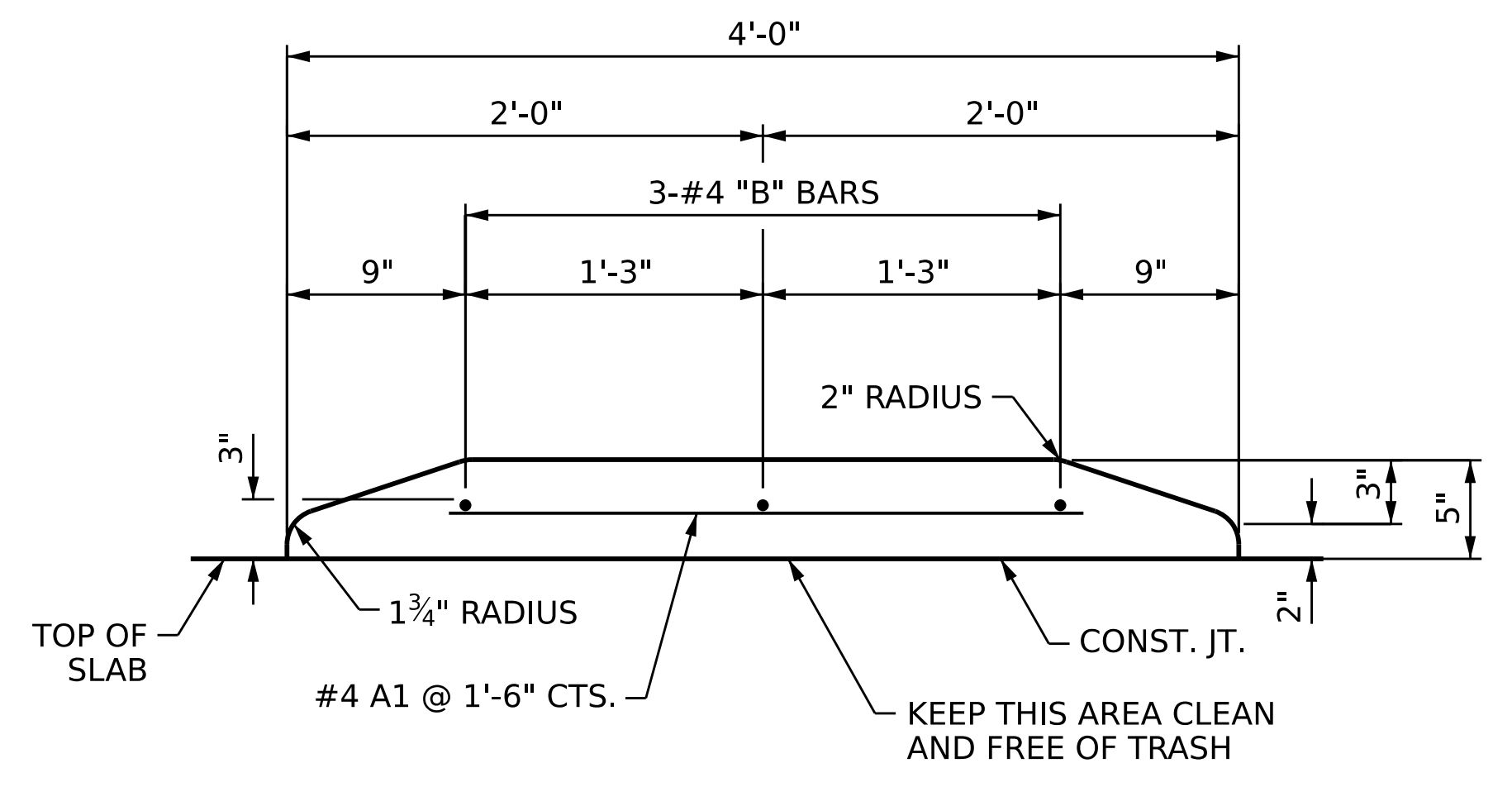
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN BEGIN AND END DECK SLAB. NO CONTRACTION JOINTS WILL 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.

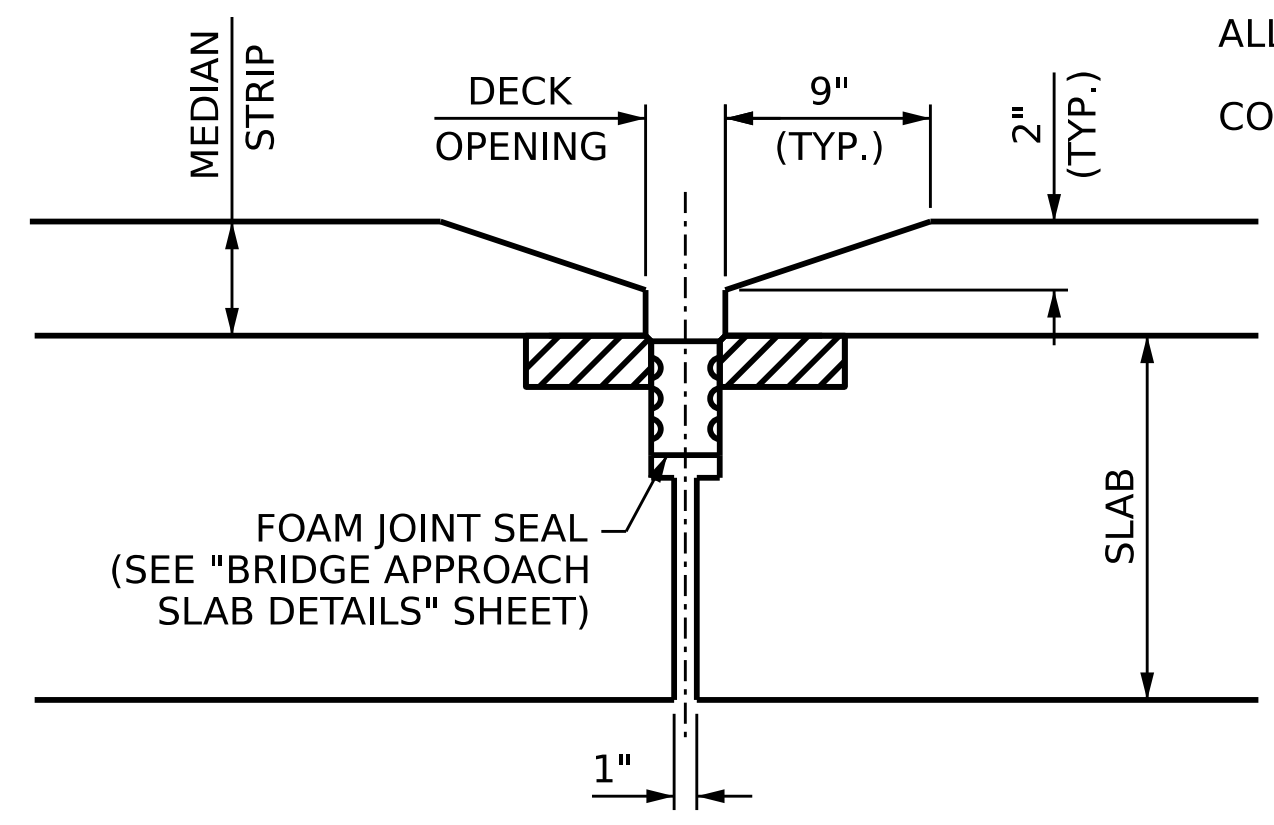
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE AS FOLLOWS:
 MEDIAN BUILT OVER APPROACH SLAB: BRIDGE APPROACH SLABS (LUMP SUM)
 MEDIAN BUILT OVER BRIDGE DECK: REINFORCED CONCRETE DECK SLAB (SQUARE FEET)

ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

CONCRETE MEDIAN SHALL BE INSTALLED IN STAGE III.



SECTION THRU CONCRETE MEDIAN - STAGE III

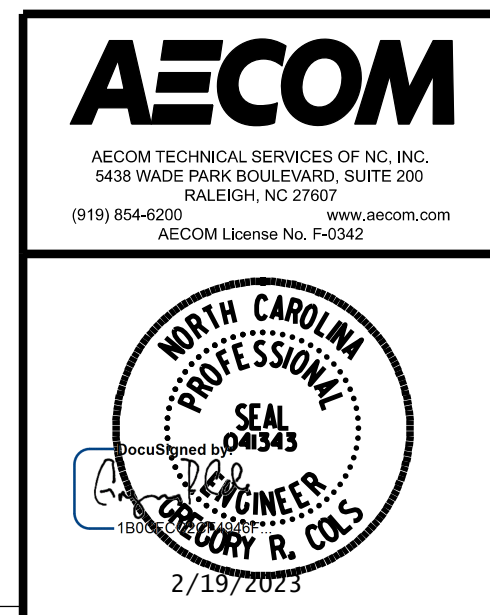


DETAILS AT EXPANSION JOINT

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

BILL OF MATERIAL					
FOR CONCRETE MEDIAN ONLY (INCLUDES ON APPR. SLABS)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	150	4	STR	3'-0"	301
* B1	6	4	STR	21'-3"	85
* B2	12	4	STR	35'-4"	283
* B3	3	4	STR	23'-6"	47
* B4	3	4	STR	16'-6"	33
* B5	3	4	STR	9'-10"	20
* EPOXY COATED REINFORCING STEEL					769 LBS.
CLASS AA CONCRETE					12.2 CU. YDS.

DRAWN BY: B.T. LEROY DATE: 11/2022
 CHECKED BY: S. NATARAJAN DATE: 11/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022



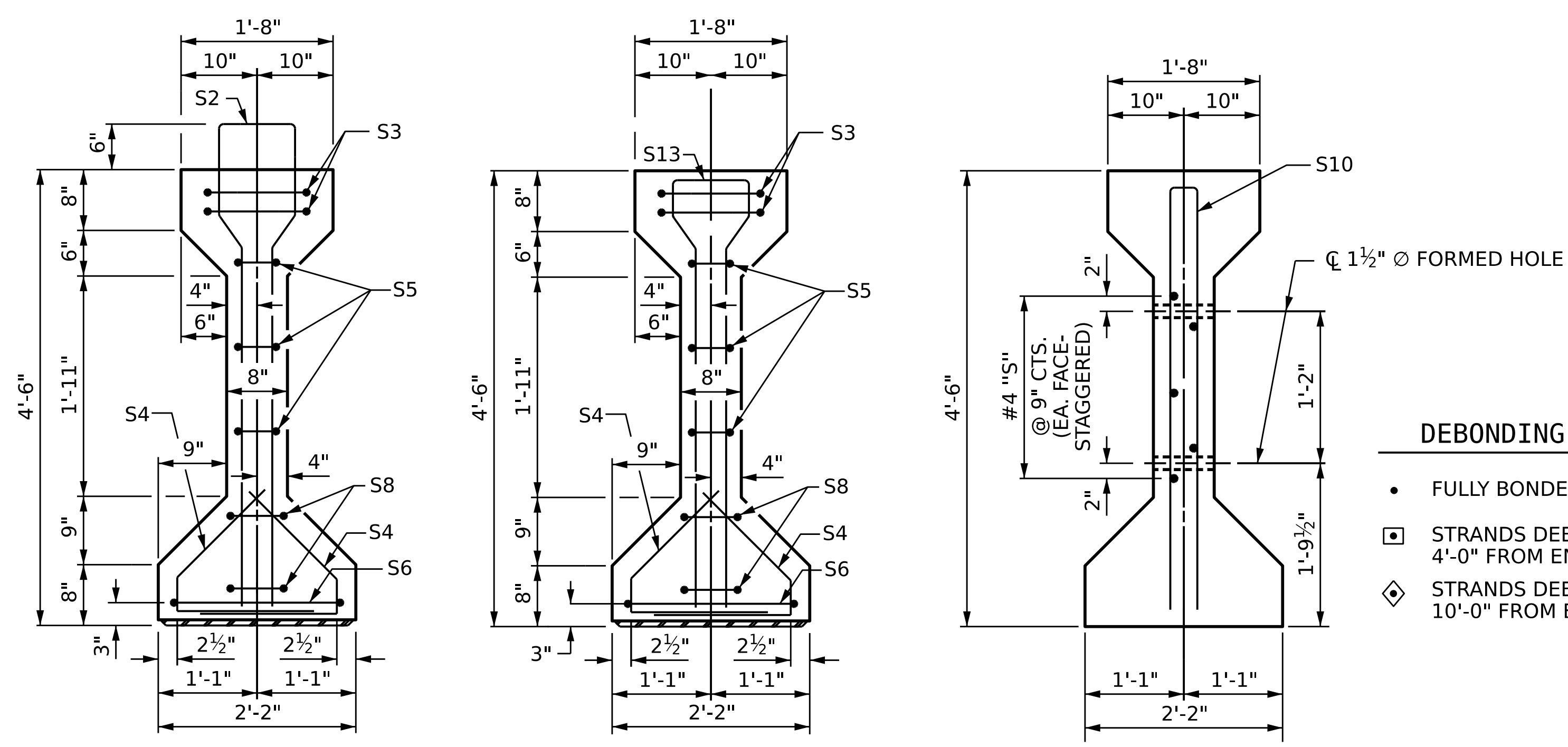
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

**CONCRETE MEDIAN
 DETAILS**

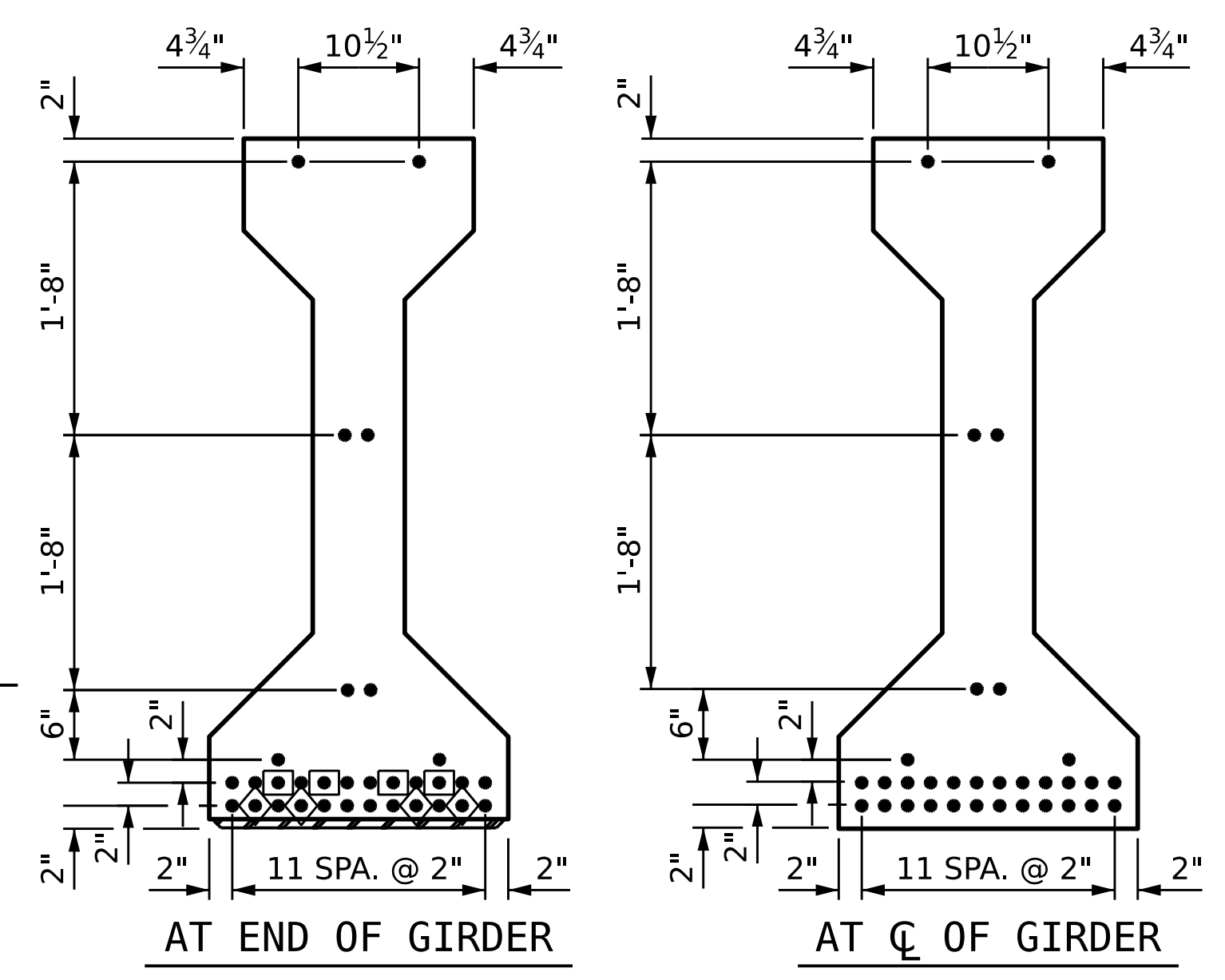
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-18
 TOTAL SHEETS 48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



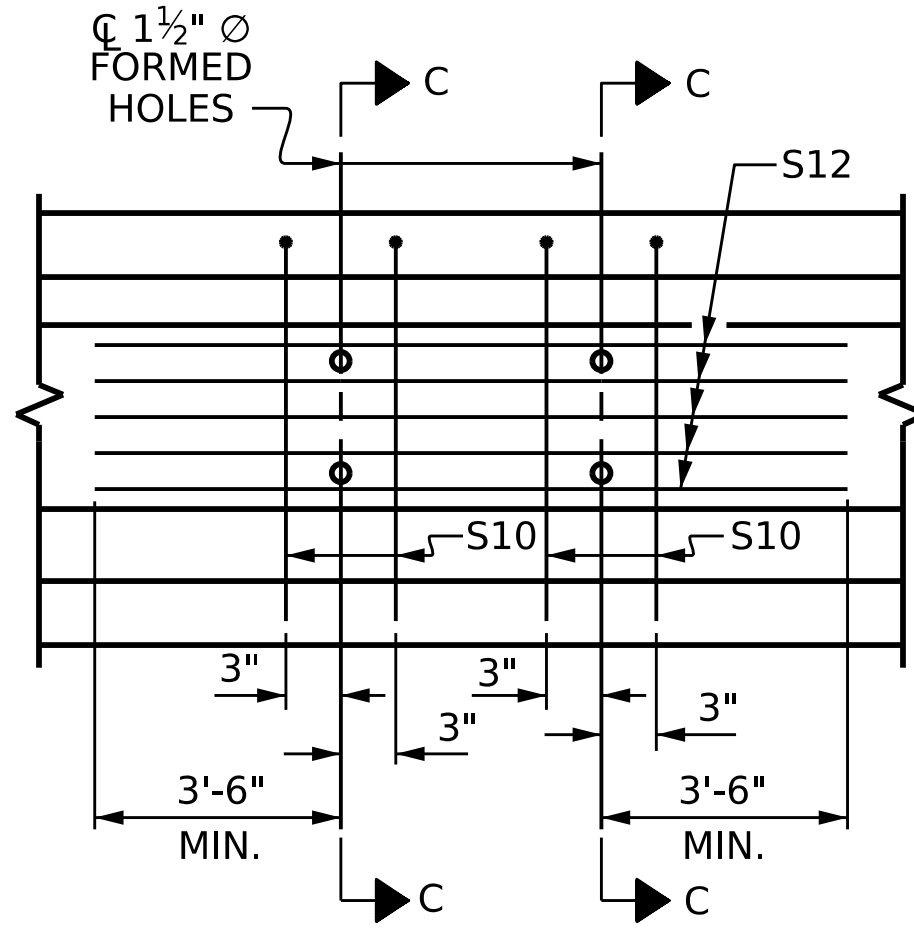
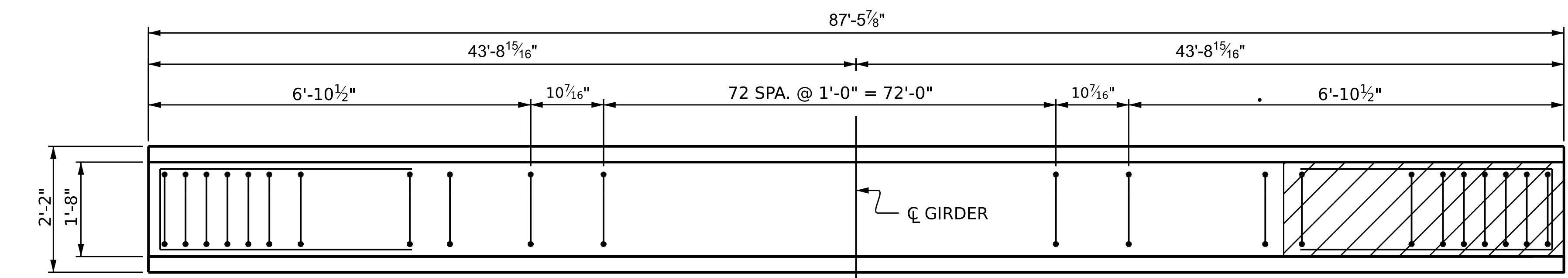
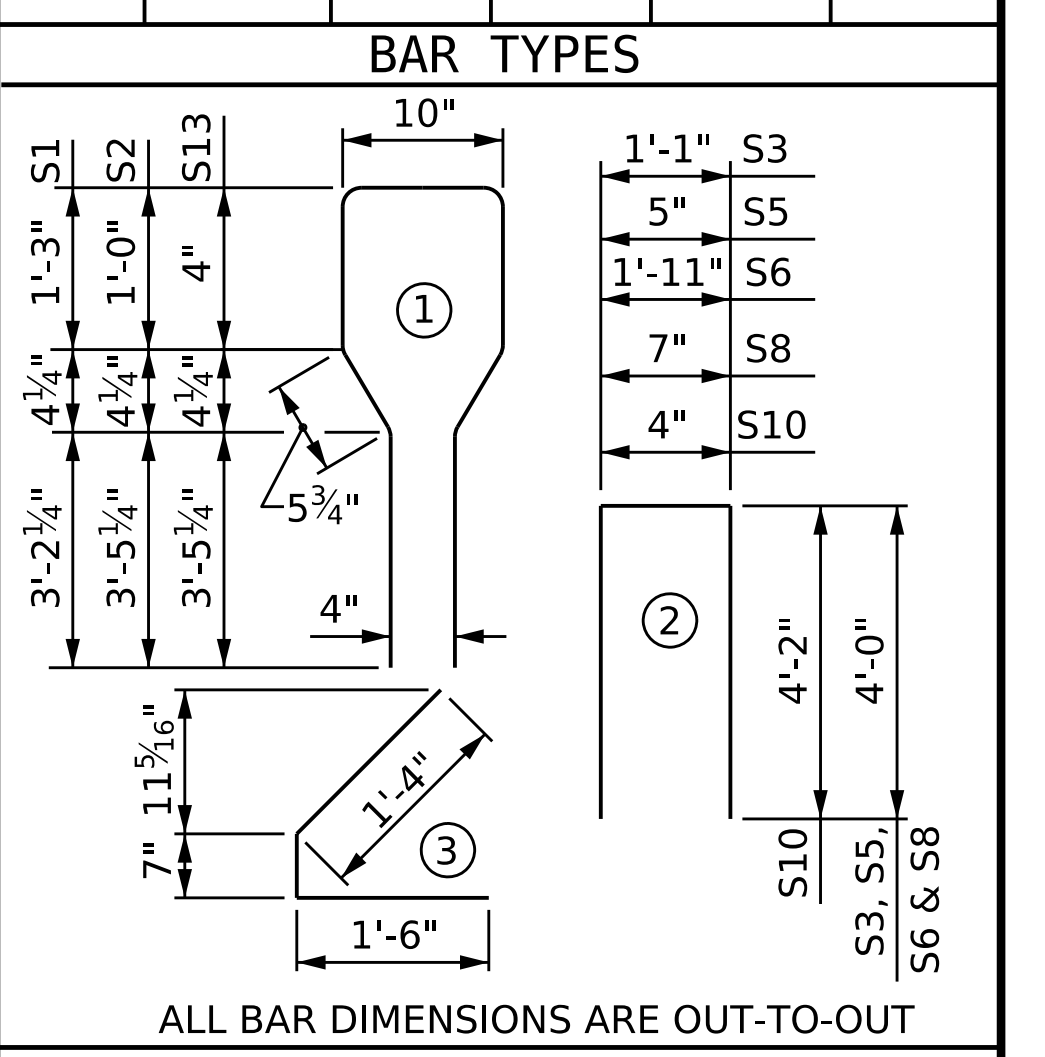
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END GIRDER
 - STRANDS DEBONDED FOR 10'-0" FROM END GIRDER



GDR. 1,4,5,9	S10	2	#5	2	8'-8"	18
GDR. 2,3,6-8	S10	4	#5	2	8'-8"	36
GDR. 1,4,5,9	S11	5	#4	STR	7'-0"	23
GDR. 2,3,6-8	S12	5	#4	STR	11'-3"	38
	S13	12	#6	1	9'-4"	168

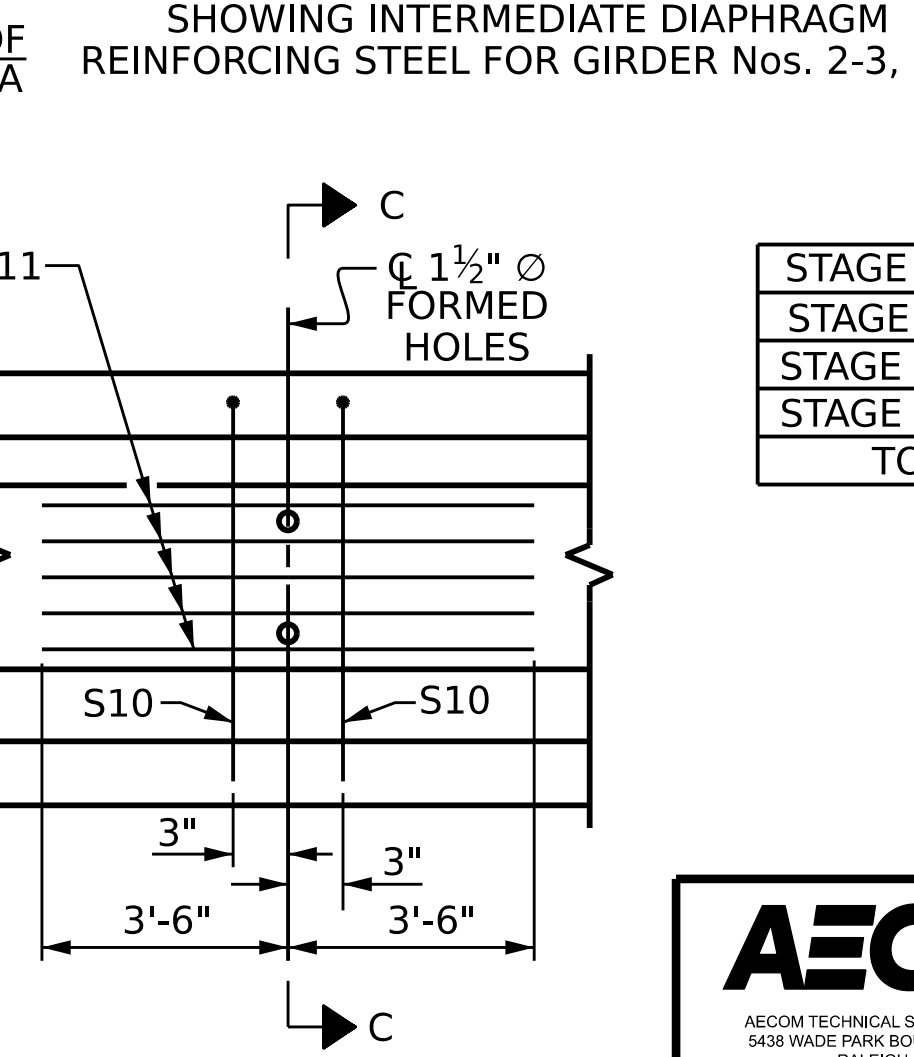
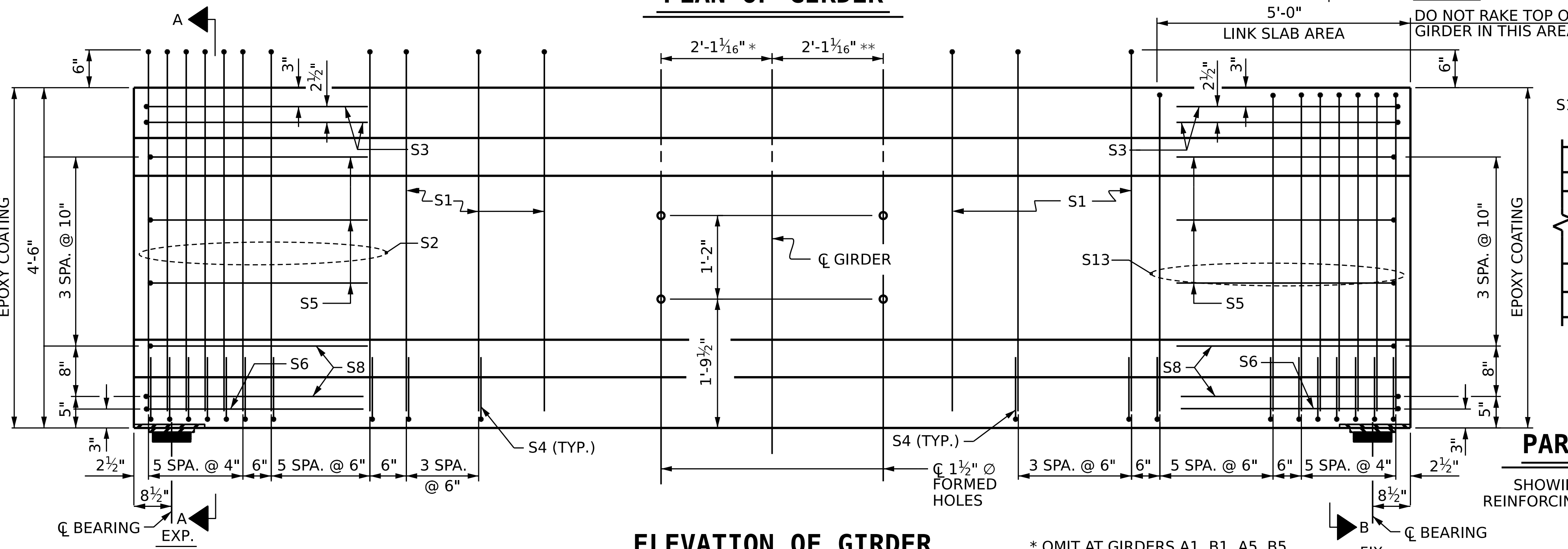
0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	81	#4	1	10'-8"	577
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"	13
S8	4	#4	2	8'-7"	23



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDR. 1,4,5,9	1218	17.8	32
GDR. 2,3,6-8	1251	17.8	32

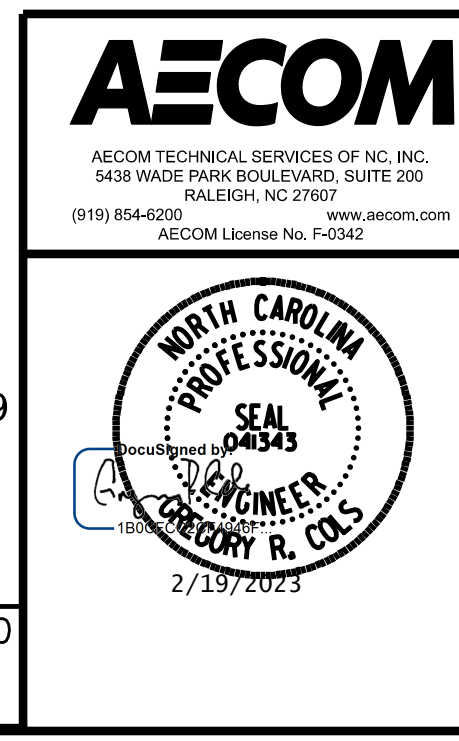
GIRDERS REQUIRED			
NUMBER	LENGTH	TOTAL LENGTH	
STAGE I SPAN A	4	87'-5 7/8"	349'-11 1/2"
STAGE I SPAN B	4	87'-5 7/8"	349'-11 1/2"
STAGE II SPAN A	5	87'-5 7/8"	437'-5 3/8"
STAGE II SPAN B	5	87'-5 7/8"	437'-5 7/8"
TOTAL	18		1574'-9 3/4"



ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : ELR 8/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 8/91	REV. 12/17 MAA/THC
	REV. 11/21 BNB/AAI

* OMIT AT GIRDERS A1, B1, A5, B5
 ** OMIT AT GIRDERS A4, B4, A9, B9

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 1 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS 48
2			4			

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPANS A & B

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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.017	0.031	0.048	0.061	0.075	0.085	0.093	0.099	0.103	0.105	0.103	0.099	0.093	0.085	0.075	0.061	0.048	0.031	0.017	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 2																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.018	0.034	0.053	0.067	0.083	0.094	0.104	0.110	0.115	0.116	0.115	0.110	0.104	0.094	0.083	0.067	0.053	0.034	0.018	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 3																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.018	0.034	0.053	0.066	0.082	0.092	0.102	0.109	0.113	0.114	0.113	0.109	0.102	0.092	0.082	0.066	0.053	0.034	0.018	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 4																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.012	0.022	0.035	0.044	0.044	0.061	0.067	0.071	0.074	0.075	0.074	0.071	0.067	0.061	0.044	0.044	0.035	0.022	0.012	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 5																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.013	0.023	0.036	0.046	0.056	0.064	0.070	0.075	0.078	0.079	0.078	0.075	0.070	0.064	0.056	0.046	0.036	0.023	0.013	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 6																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.017	0.032	0.051	0.062	0.076	0.087	0.096	0.102	0.106	0.107	0.106	0.102	0.096	0.087	0.076	0.062	0.051	0.032	0.017	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 7 AND 8																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.018	0.032	0.051	0.064	0.078	0.089	0.098	0.105	0.109	0.110	0.109	0.105	0.098	0.089	0.078	0.064	0.051	0.032	0.018	0.000
FINAL CAMBER	0	1/16"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000

GIRDER 9																					
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	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.025	0.048	0.071	0.091	0.110	0.125	0.138	0.147	0.152	0.154	0.152	0.147	0.138	0.125	0.110	0.091	0.071	0.048	0.025	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL	0.000	0.016	0.030	0.047	0.060	0.073	0.083	0.092	0.098	0.101	0.102	0.101	0.098	0.092	0.083	0.073	0.060	0.047	0.030	0.016	0.000
FINAL CAMBER	0	1/16"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/16"	1 1/8"	1 1/4"	1 1/2"	1 3/8"	1 1/2"	1 1/4"	3/4"	1/2"	1/8"	0.000	

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.

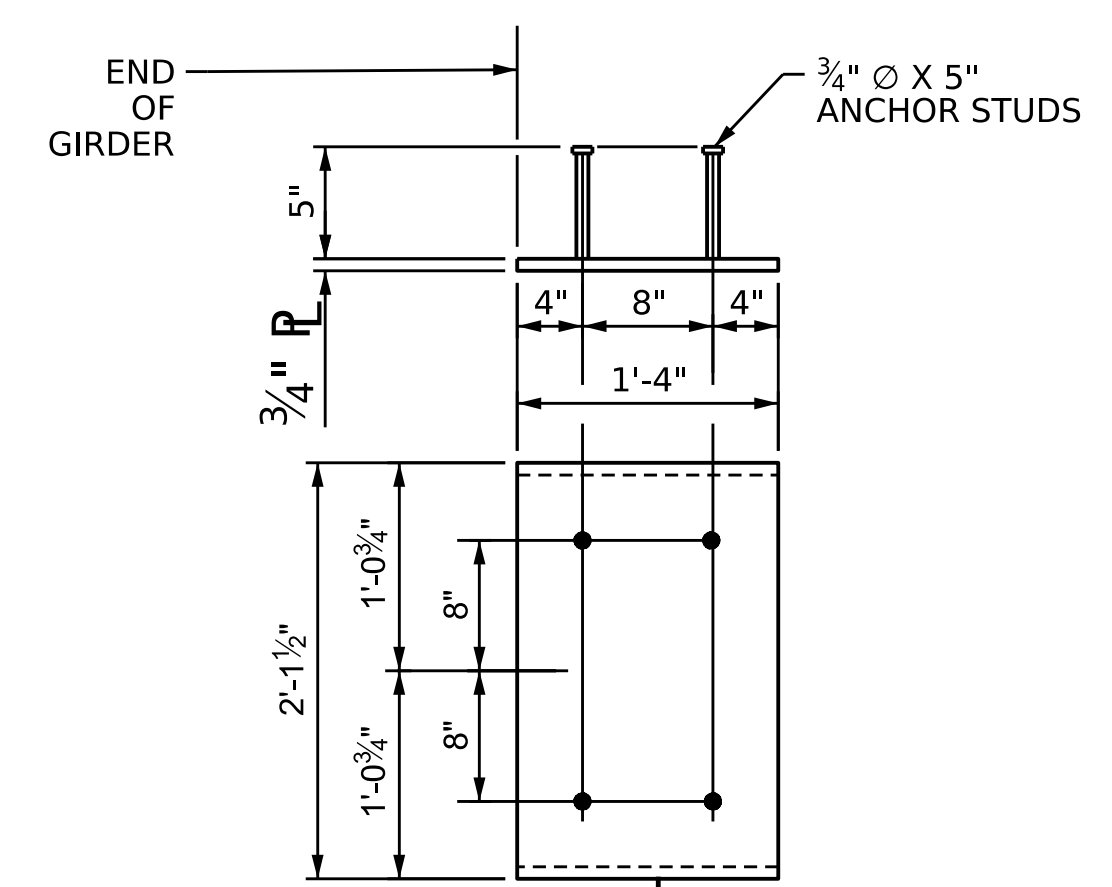
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6400 PSI.

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".

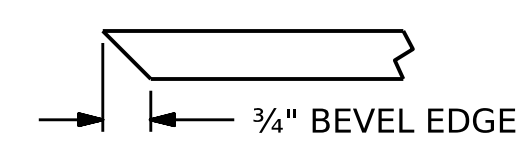
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

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)



SECTION 'F'

(SEE NOTES)

ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F0242

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-
SHEET 2 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21 TOTAL SHEETS 48
1			3			
2			4			

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

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

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

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

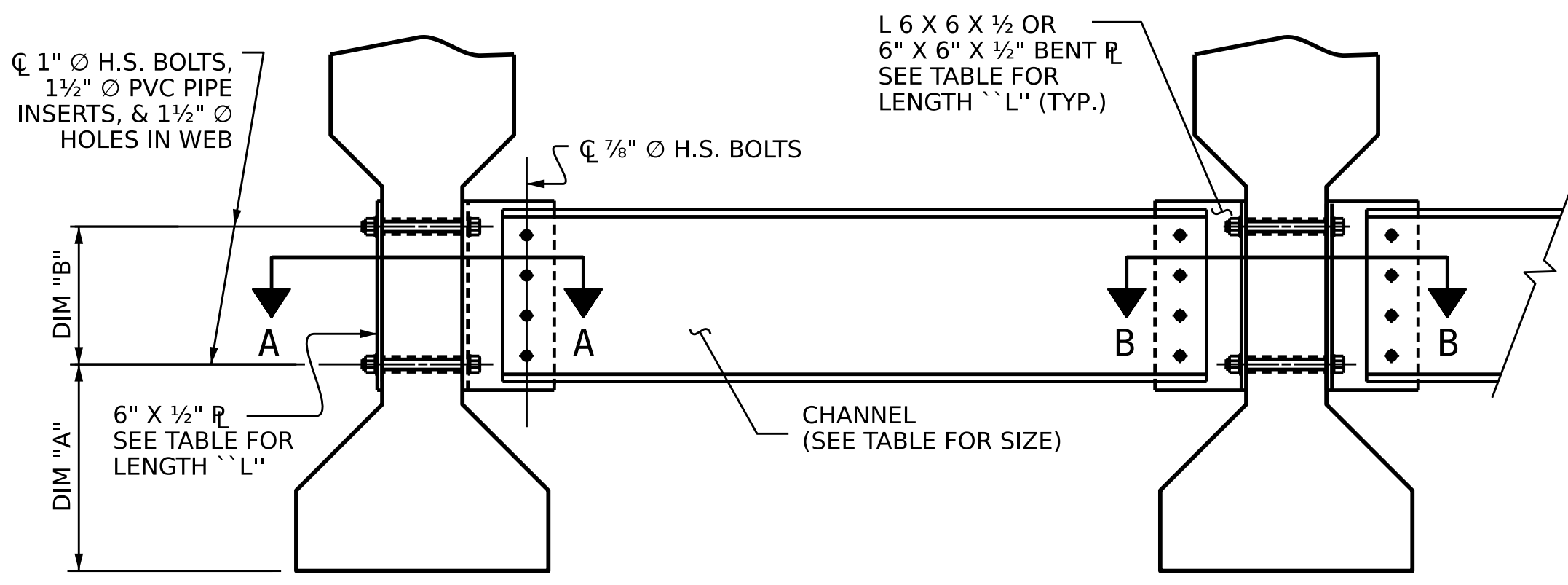
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

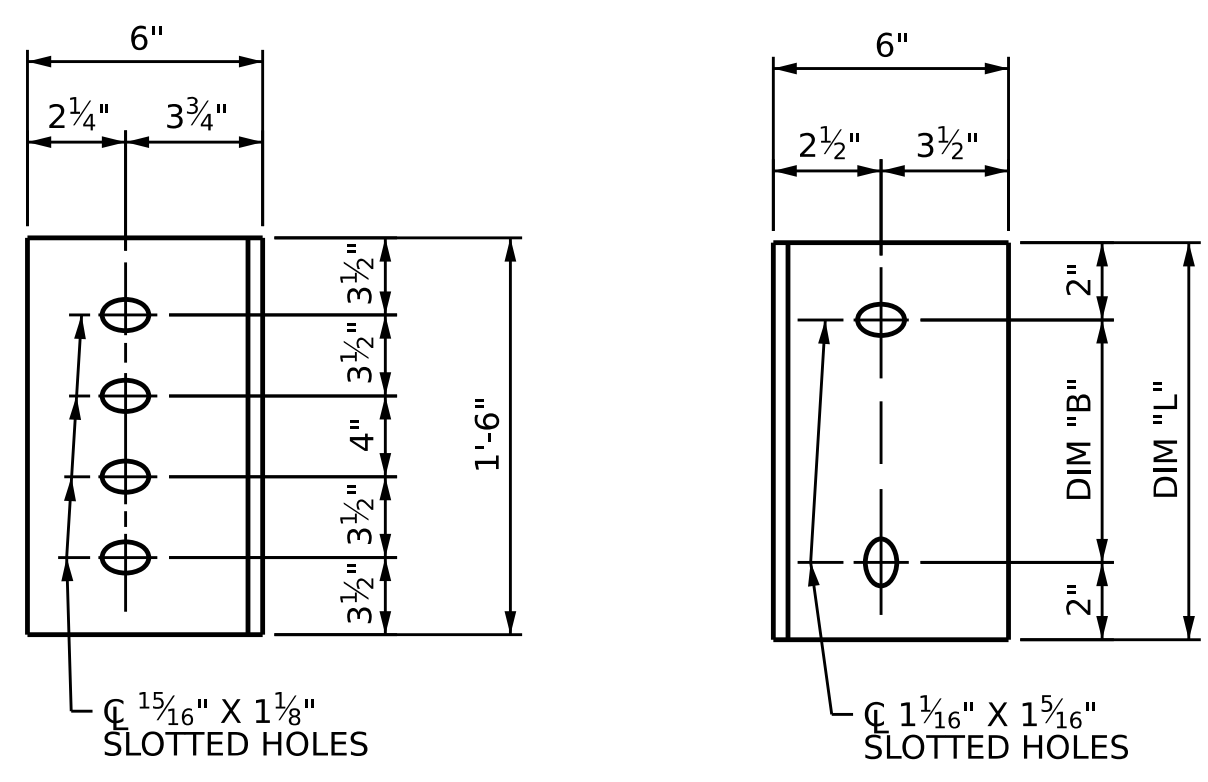
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

(TYPE IV GDR.)

CONNECTOR PLATE DETAILS

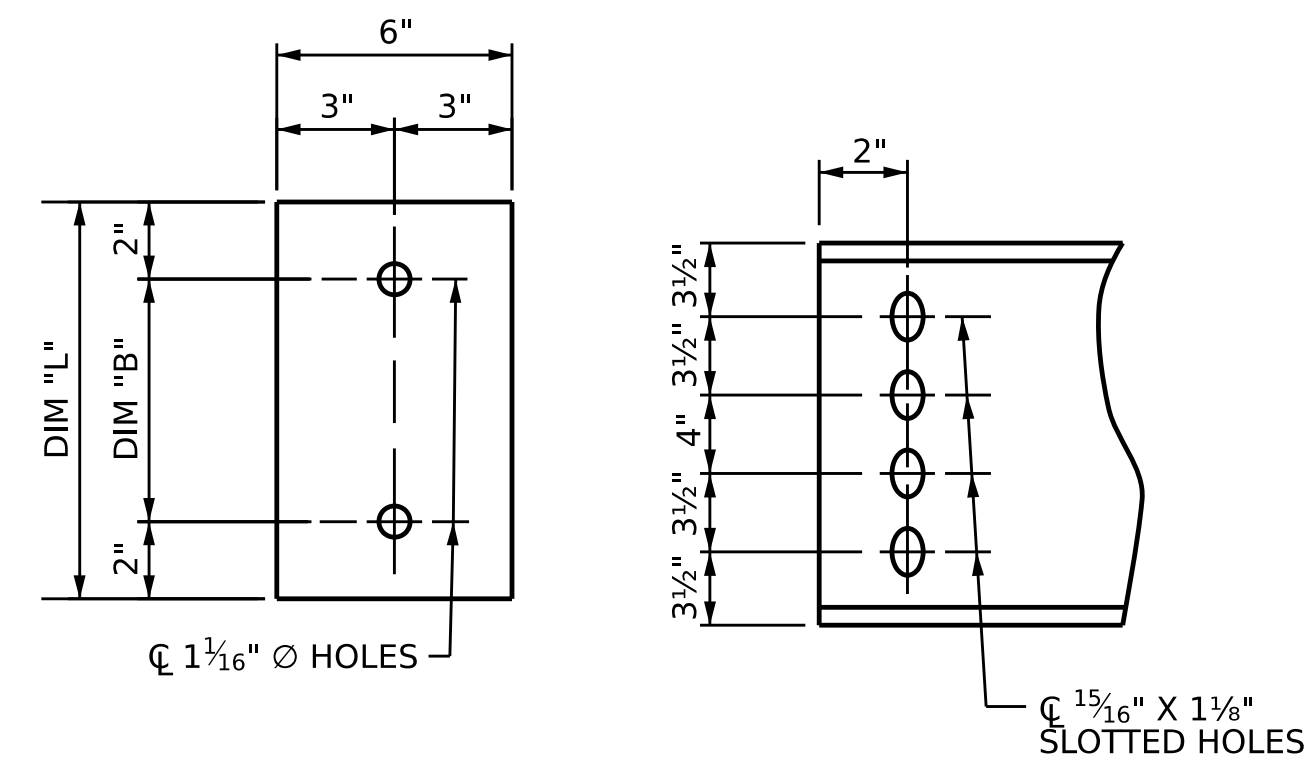
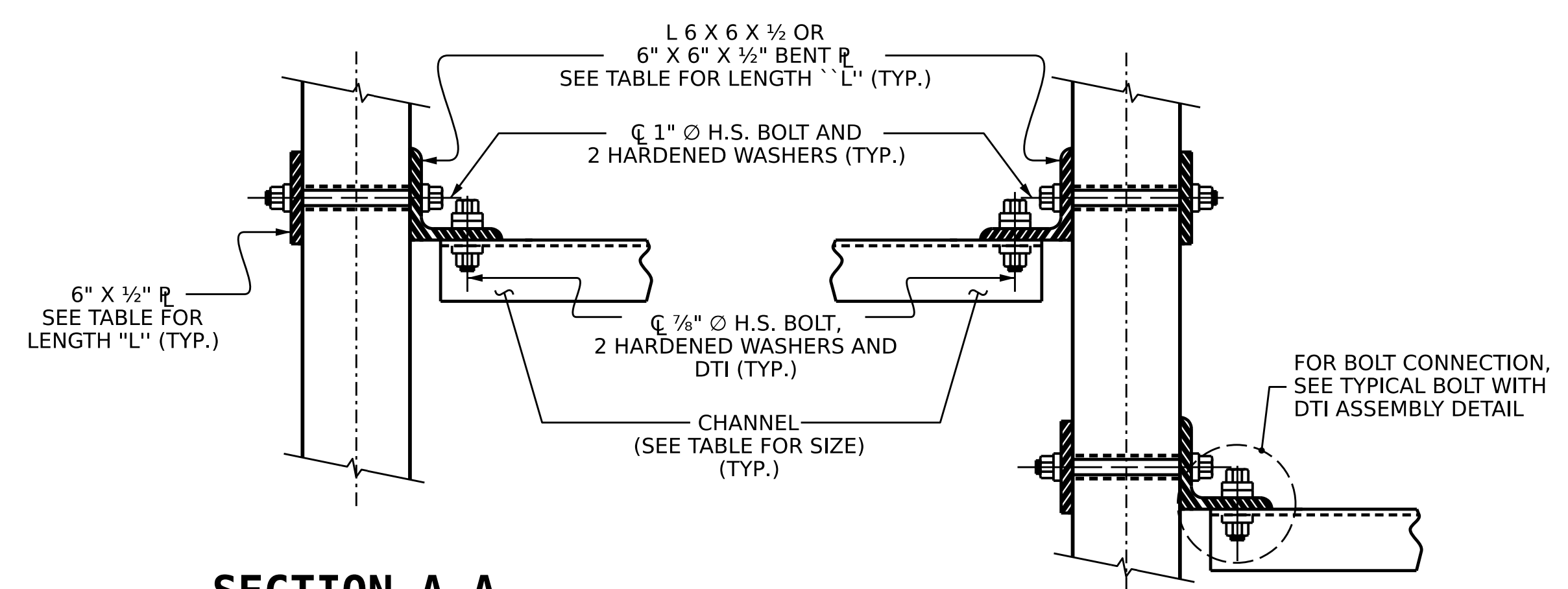


PLATE DETAILS CHANNEL END

(TYPE IV GDR.)

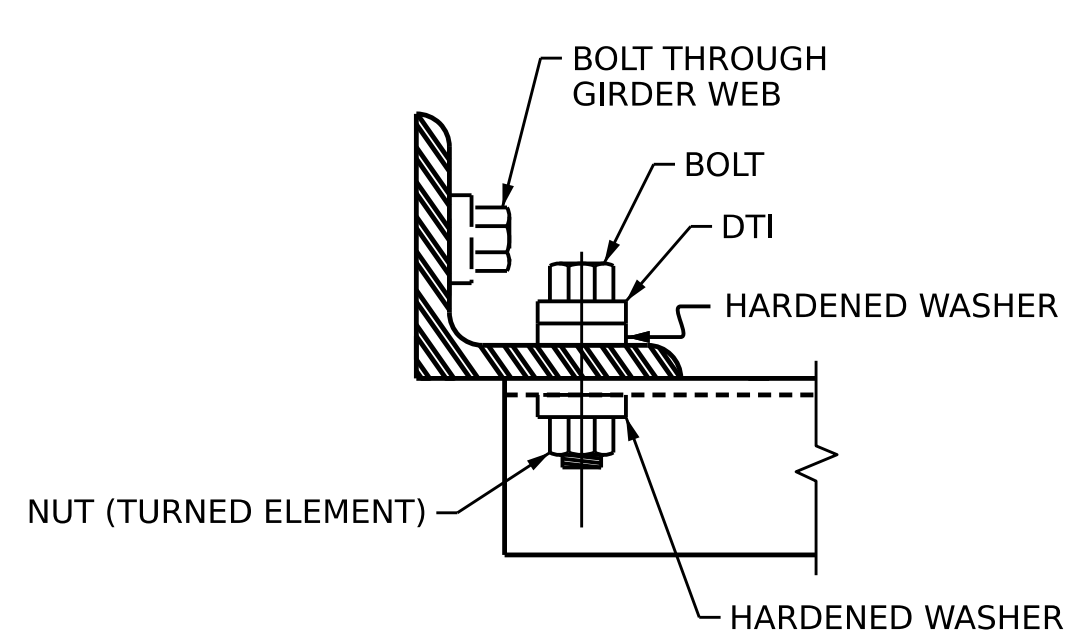


SECTION A-A

SECTION B-B

CONNECTION DETAILS

(SKEW < 70° SIM.)



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

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

PROJECT NO. BR-0041

ROCKINGHAM COUNTY

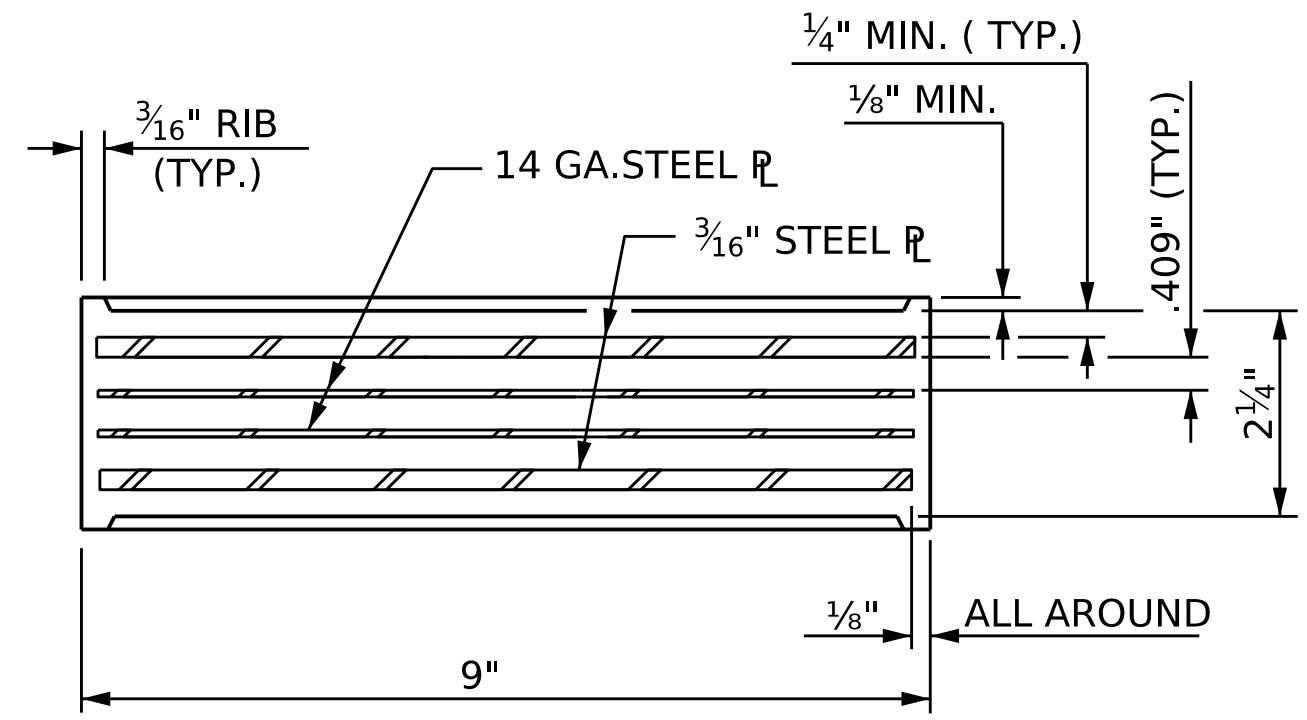
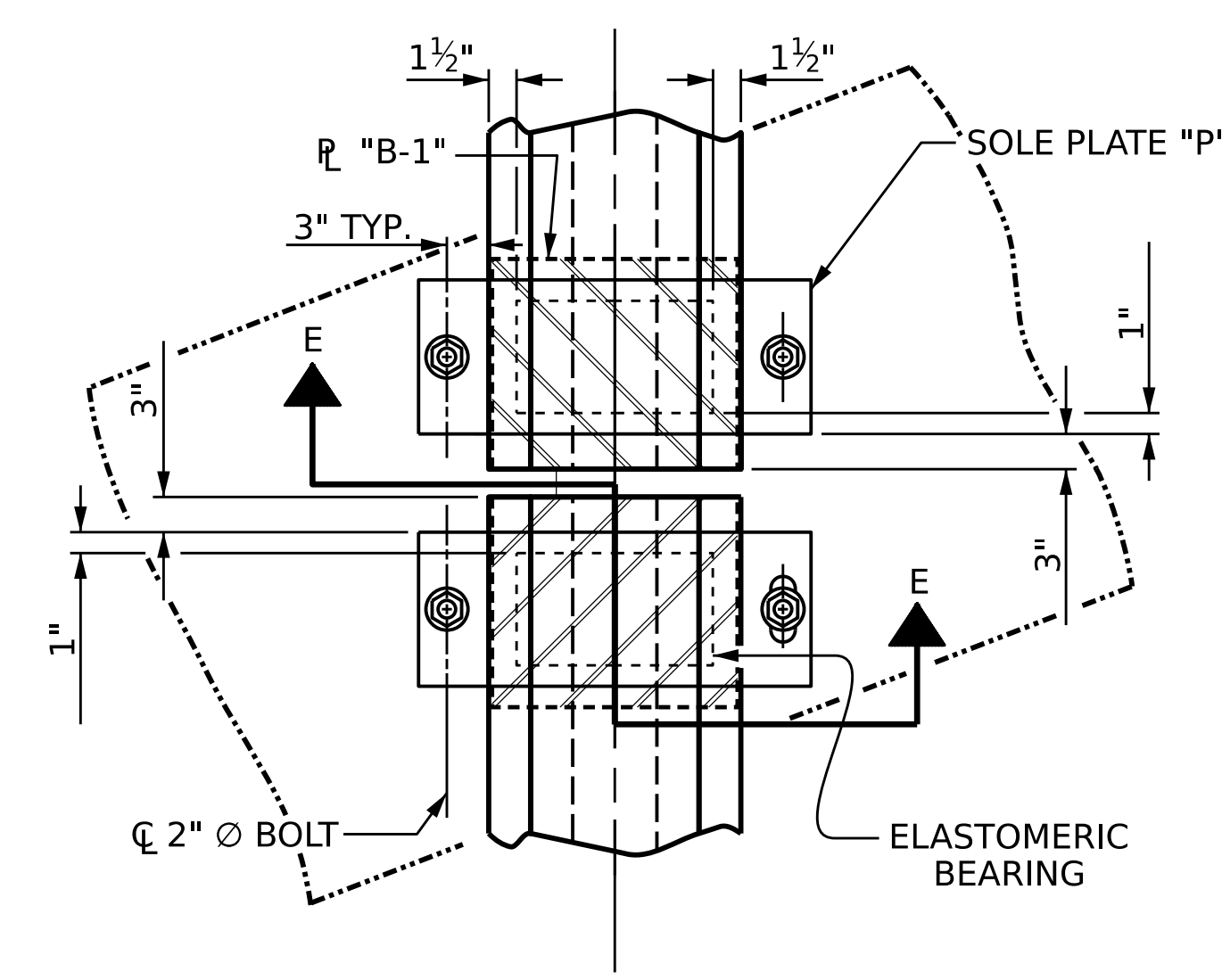
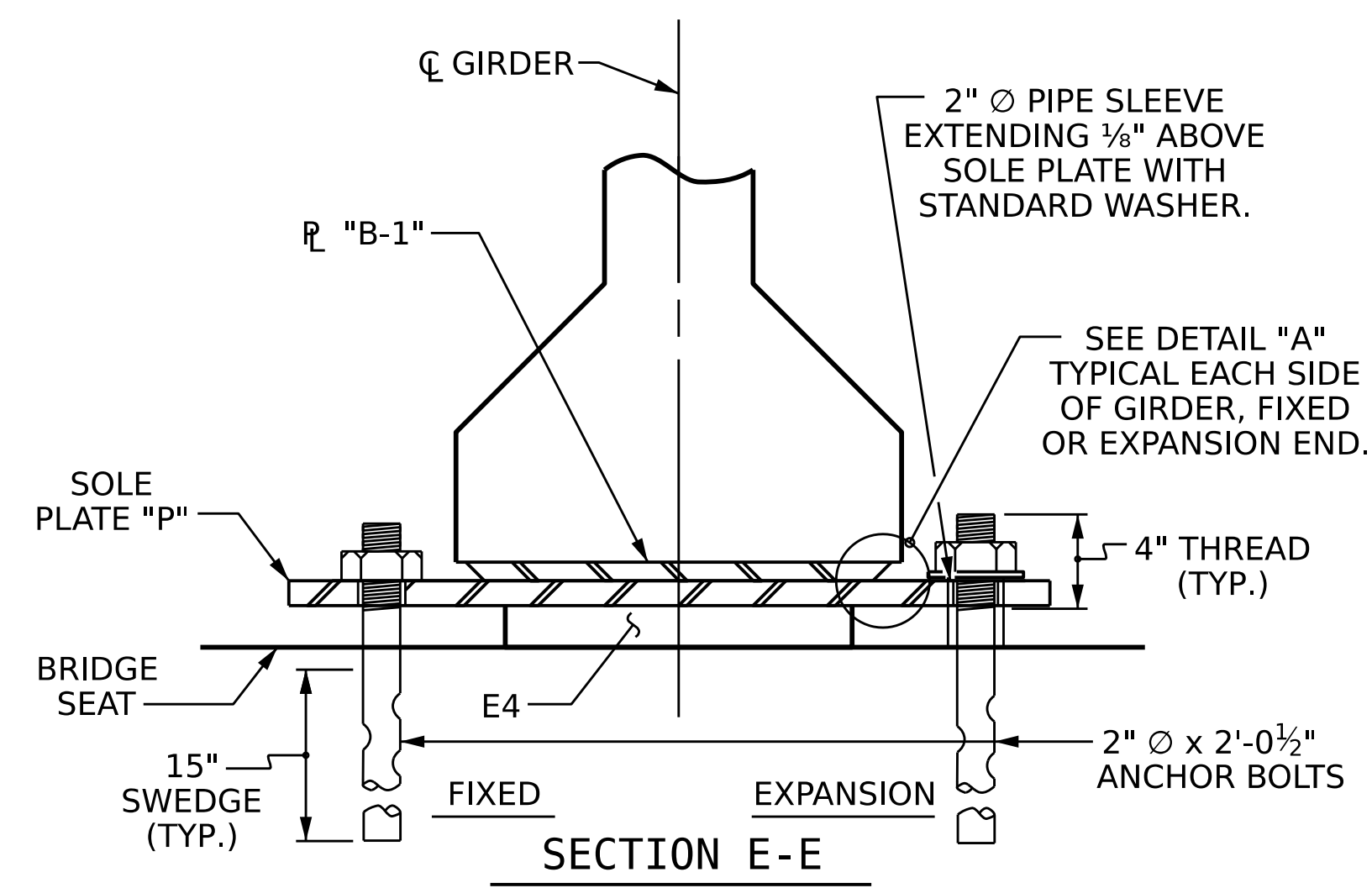
STATION: POT 34+73.00 -L-

SHEET 3 OF 3

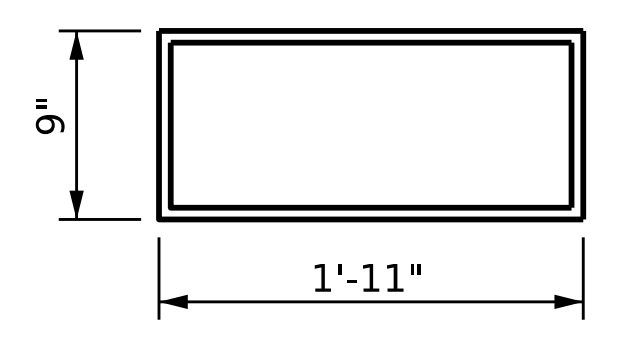
ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-22
					TOTAL SHEETS 48

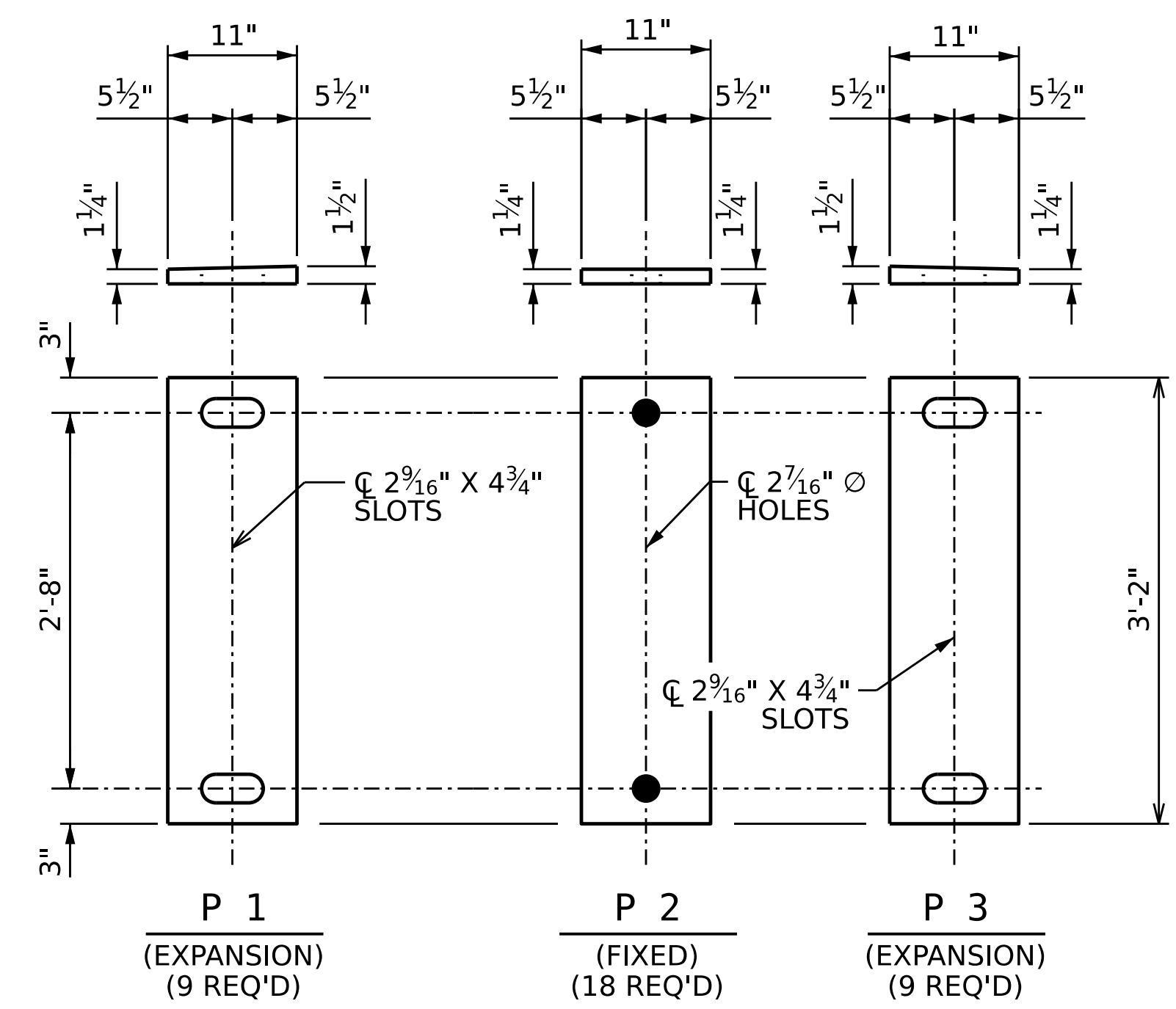


TYPICAL SECTION OF ELASTOMERIC BEARINGS

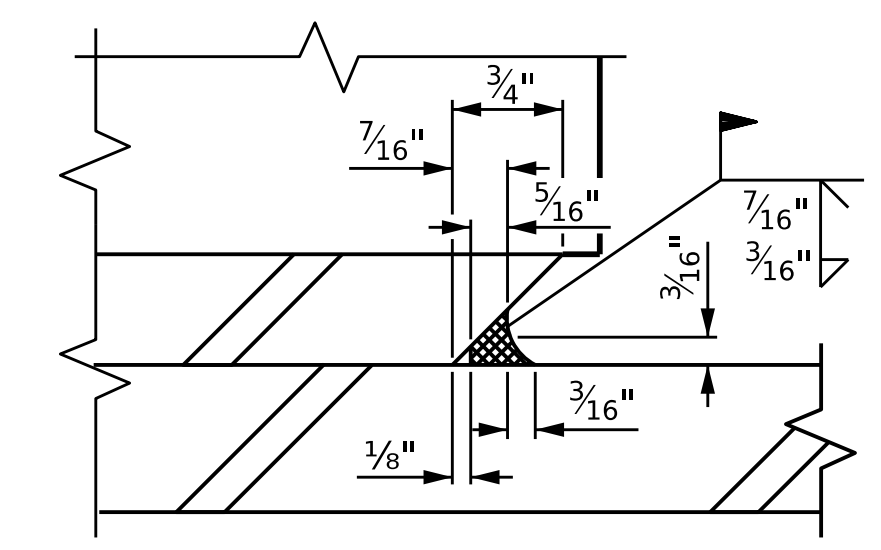


PLAN VIEW OF ELASTOMERIC BEARING
TYPE V

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



SOLE PLATE DETAILS ("P")



DETAIL "A"

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.

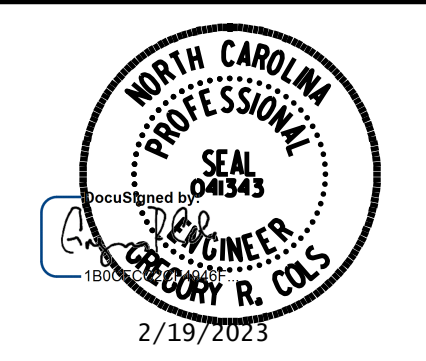
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-



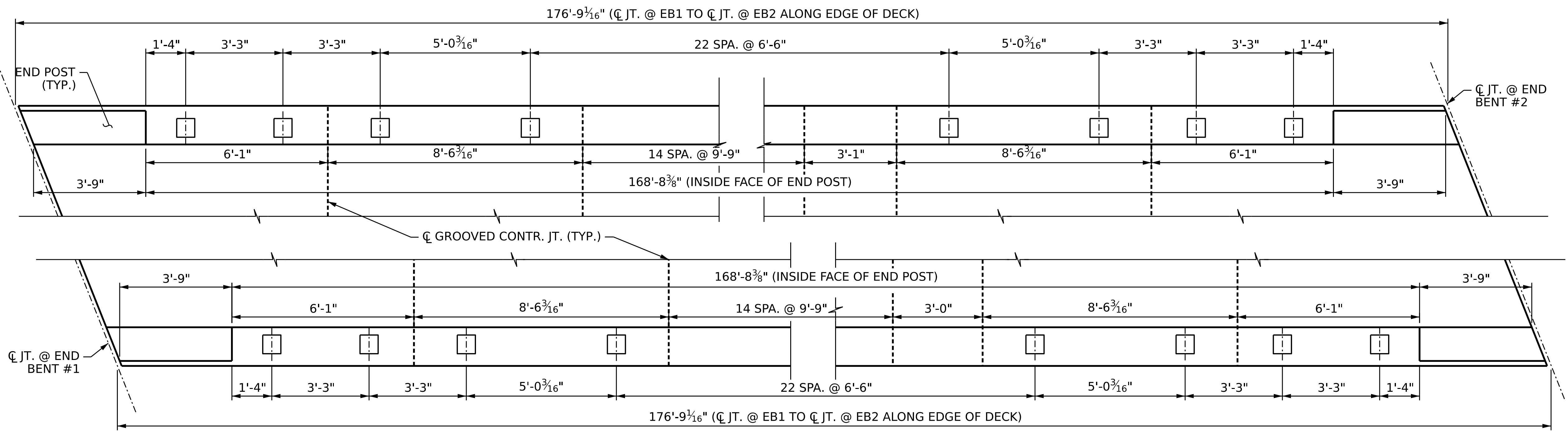
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING DETAILS
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE



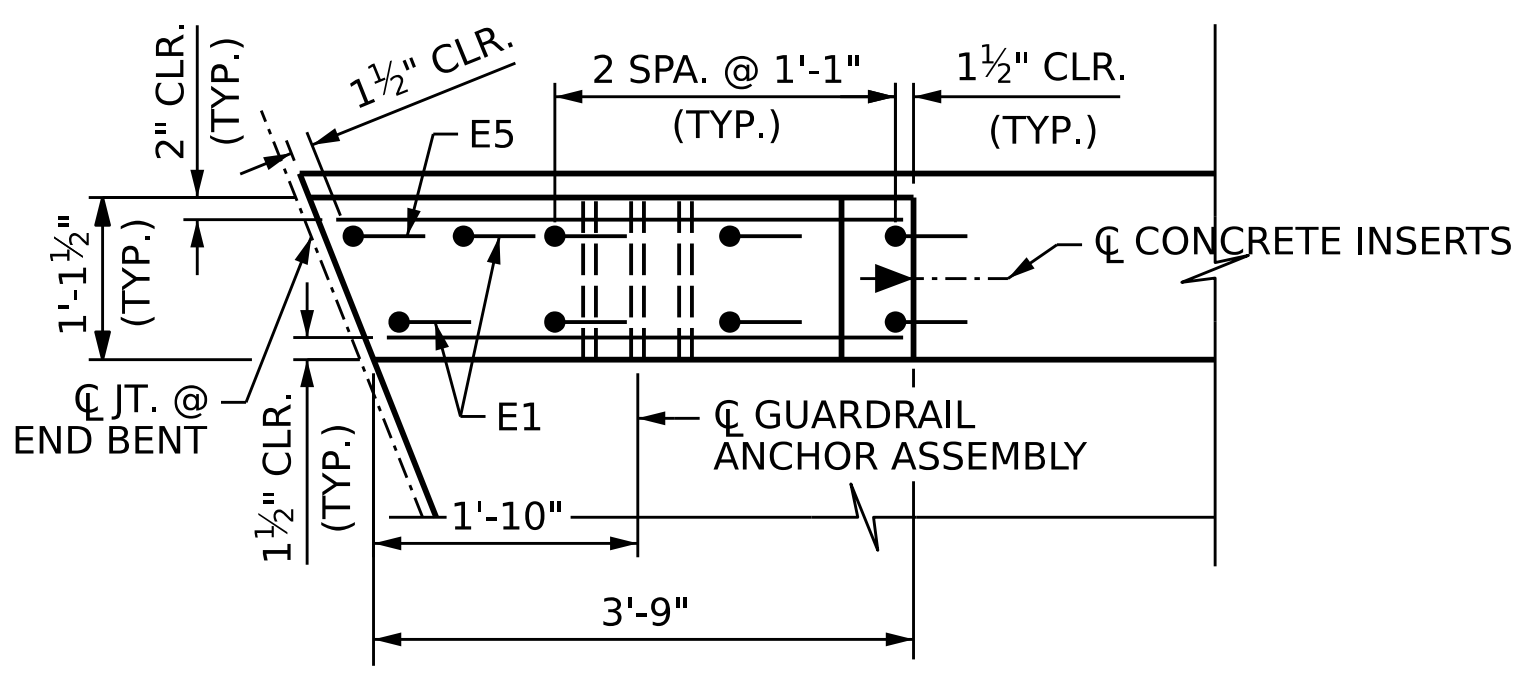
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			48
2			4			48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

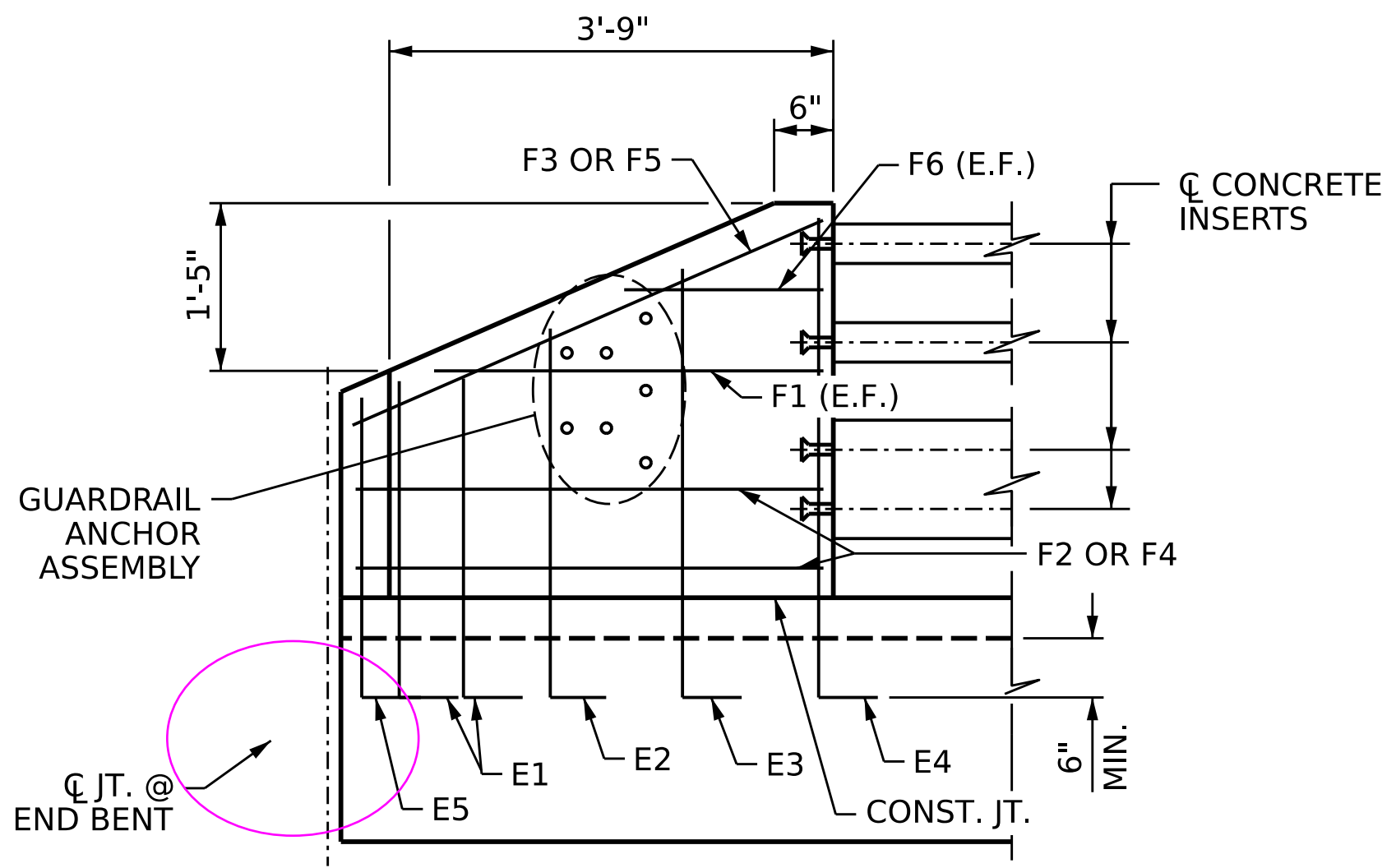
ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : WJH 8/89	REV. 1/15 MAA/TMG
CHECKED BY : CRK 8/89	REV. 12/17 MAA/THC
	REV. 10/21 BNB/AAI



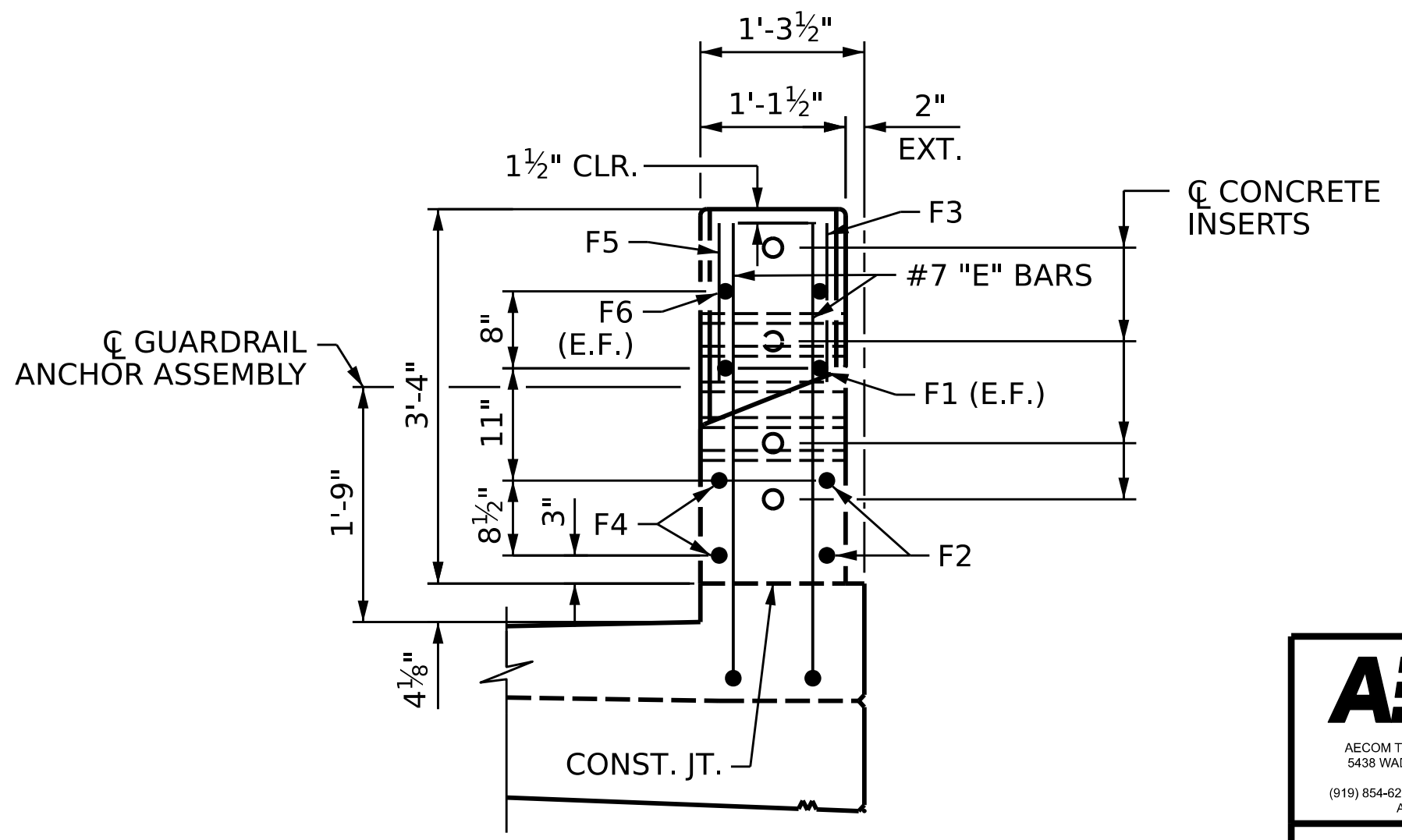
PLAN OF RAIL POST SPACING



PLAN



ELEVATION



END VIEW

END POST DETAILS

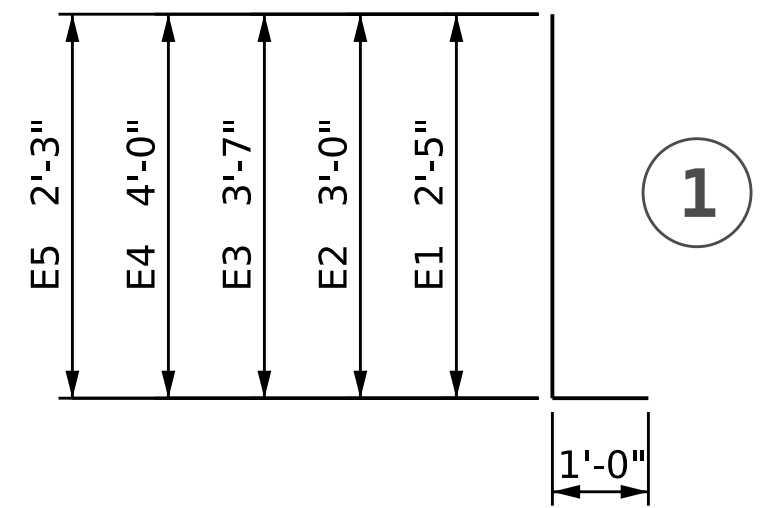
BILL FOR ONE END POST

(4 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* E1	2	#7	1	3'-5"	14
* E2	2	#7	1	4'-0"	16
* E3	2	#7	1	4'-7"	19
* E4	2	#7	1	5'-0"	20
* E5	1	#7	1	3'-3"	7
* F1	2	#6	STR	3'-3"	10
* F2	2	#6	STR	3'-5"	10
* F3	1	#6	STR	3'-9"	6
* F4	2	#6	STR	3'-10"	12
* F5	1	#6	STR	4'-4"	7
* F6	2	#6	STR	1'-8"	5

*EPOXY COATED REINFORCING STEEL 126 LBS
CLASS AA CONCRETE 0.5 CY.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "3 BAR METAL RAIL" SHEETS.

NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE CONCRETE END POST AS THIS IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE 3 BAR METAL RAIL.

E.F.: EACH FACE

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F0242

PROFESSIONAL SEAL
304 ENGINEER
COURTNEY R. COLS
2/19/2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

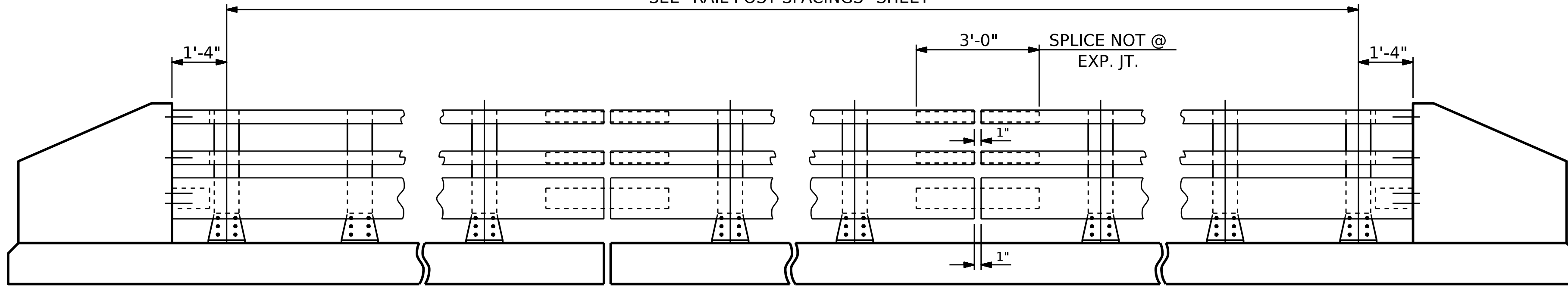
RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 48
2			4			

DRAWN BY : B.T. LEROY DATE : 11/2022
CHECKED BY : S. NATARAJAN DATE : 11/2022
DESIGN ENGINEER OF RECORD : G. COLS DATE : 12/2022

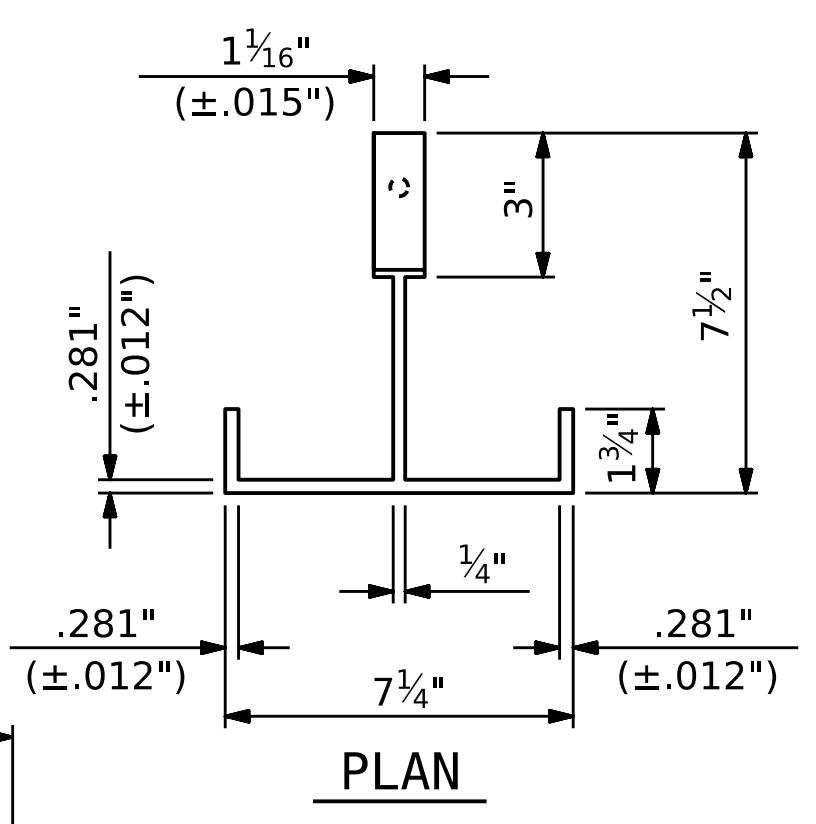
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE "RAIL POST SPACINGS" SHEET

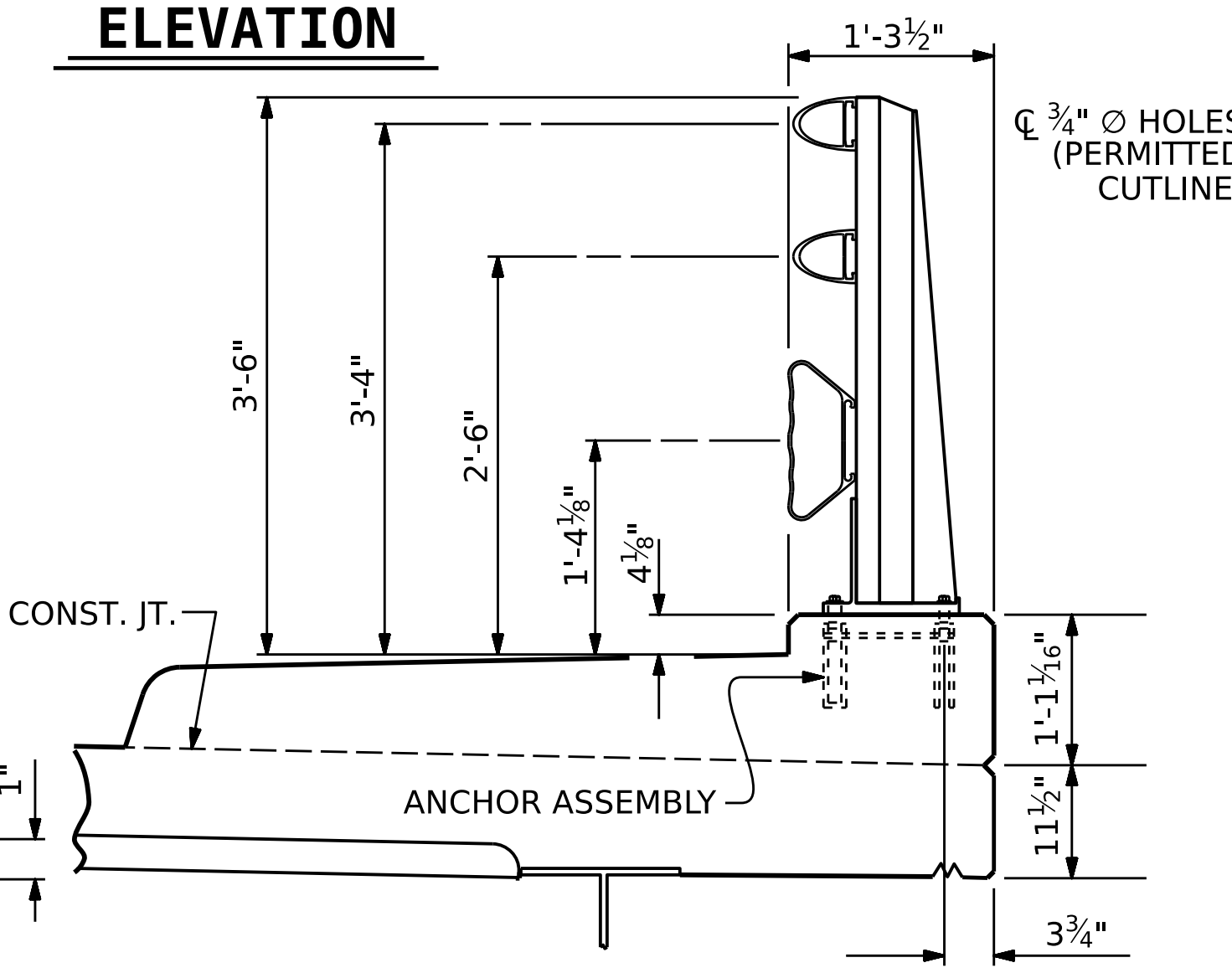


ELEVATION

NOTE:
FOR ATTACHMENT OF METAL RAIL TO END
POST, SEE STANDARD NO. BMR7

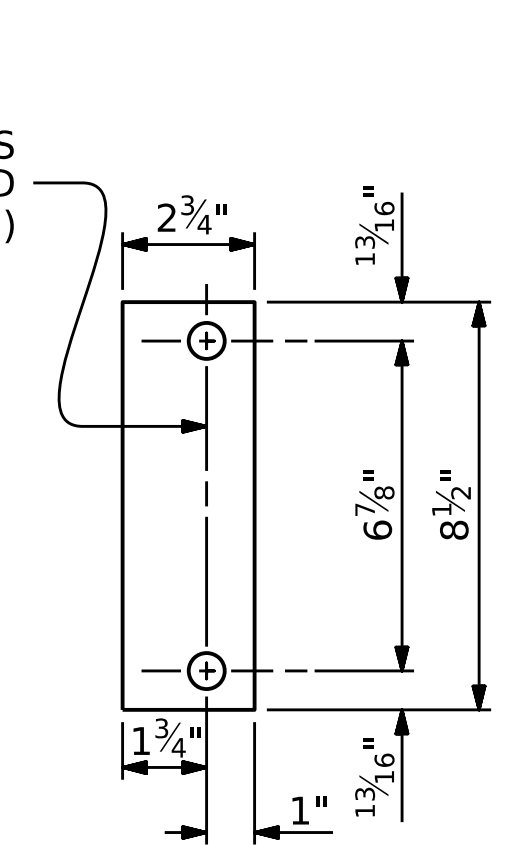


PLAN

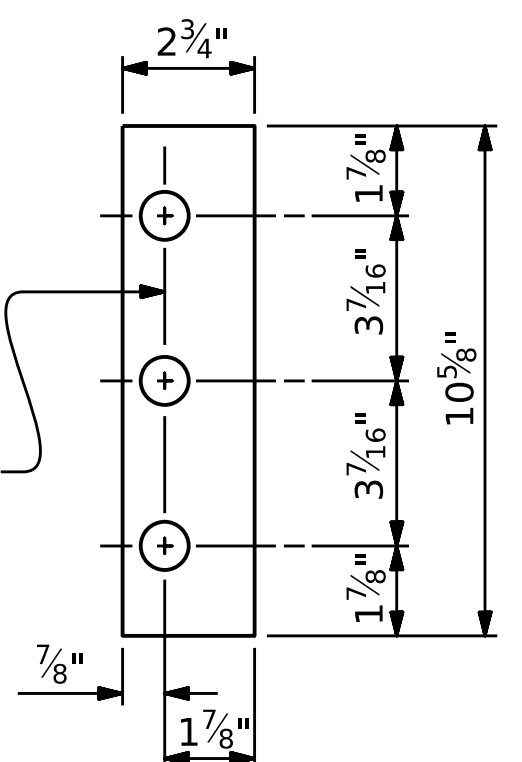


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL"
STD.No.BMR6



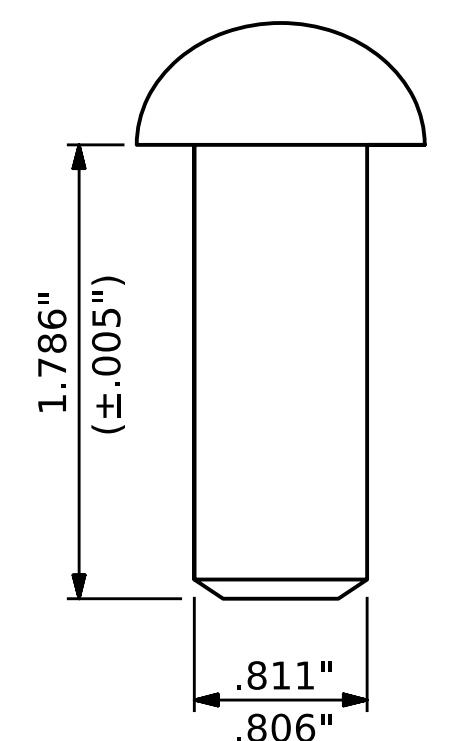
REAR PLATE



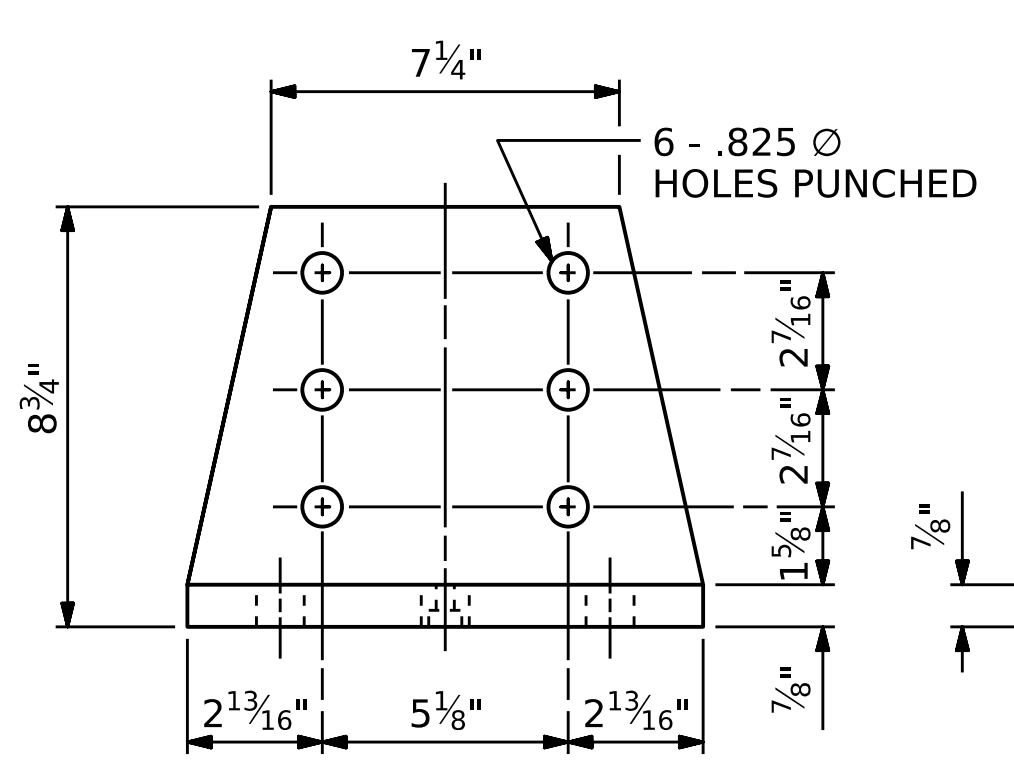
**FRONT PLATE
SHIM DETAILS**

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR
SLOTTED TO EDGE OF PLATE TO FACILITATE
PLACEMENT.

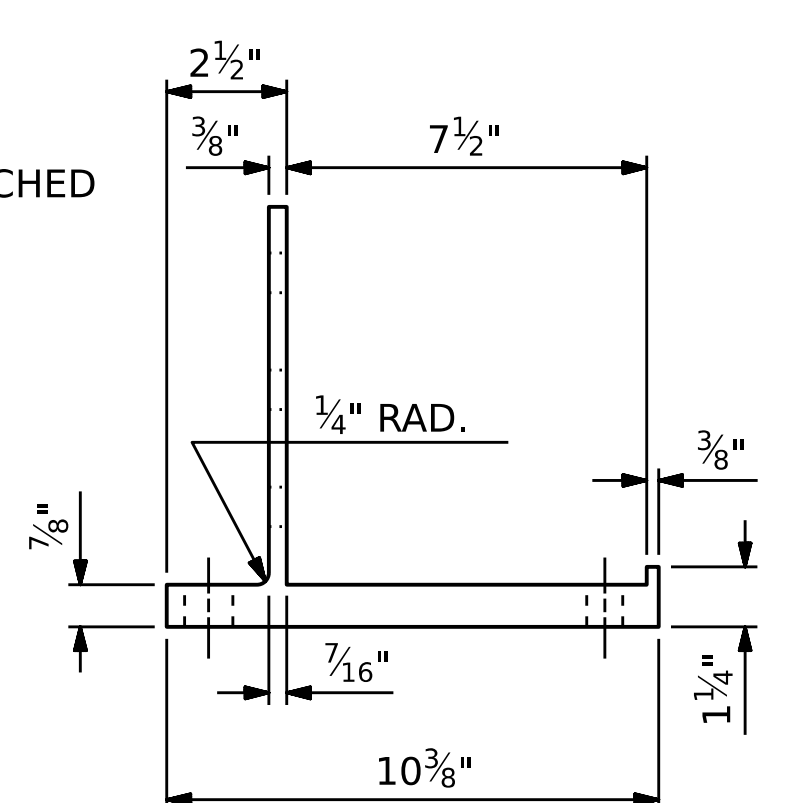
PAY LENGTH = 337.39 LIN. FT.



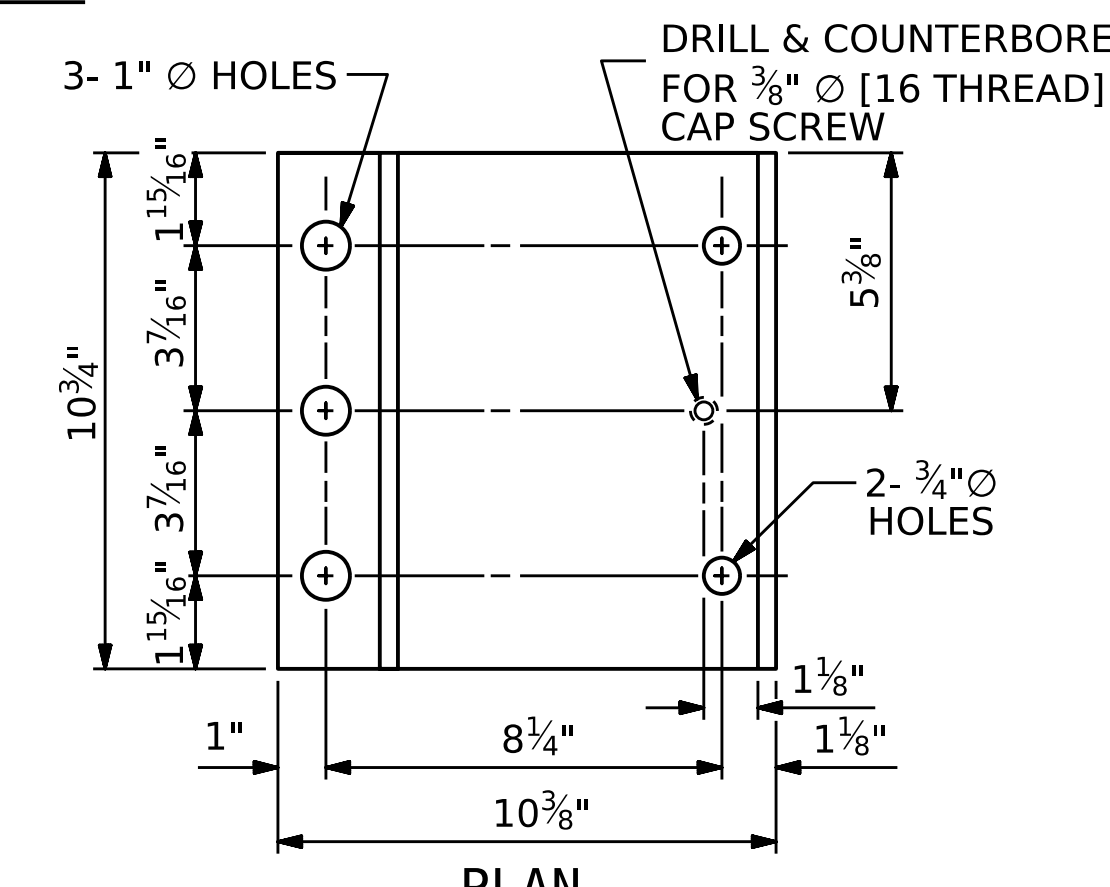
RIVET DETAIL



FRONT ELEVATION



SIDE ELEVATION



PLAN

POST BASE DETAILS

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PROJECT NO. **BR-0041**

ROCKINGHAM COUNTY

STATION: **POT 34+73.00 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-25
STANDARD						TOTAL SHEETS 48
3 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

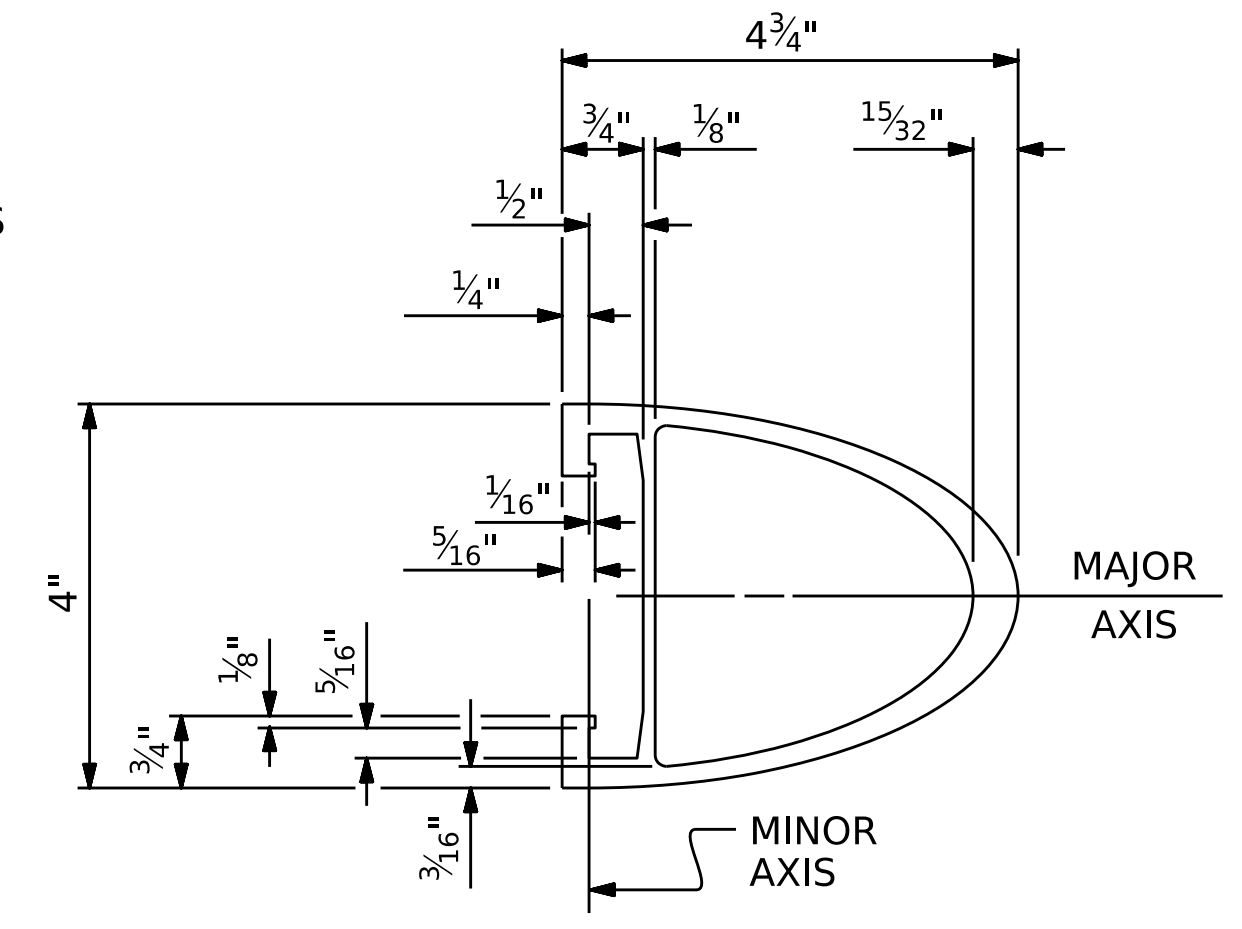
ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : JMB 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : GCH 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

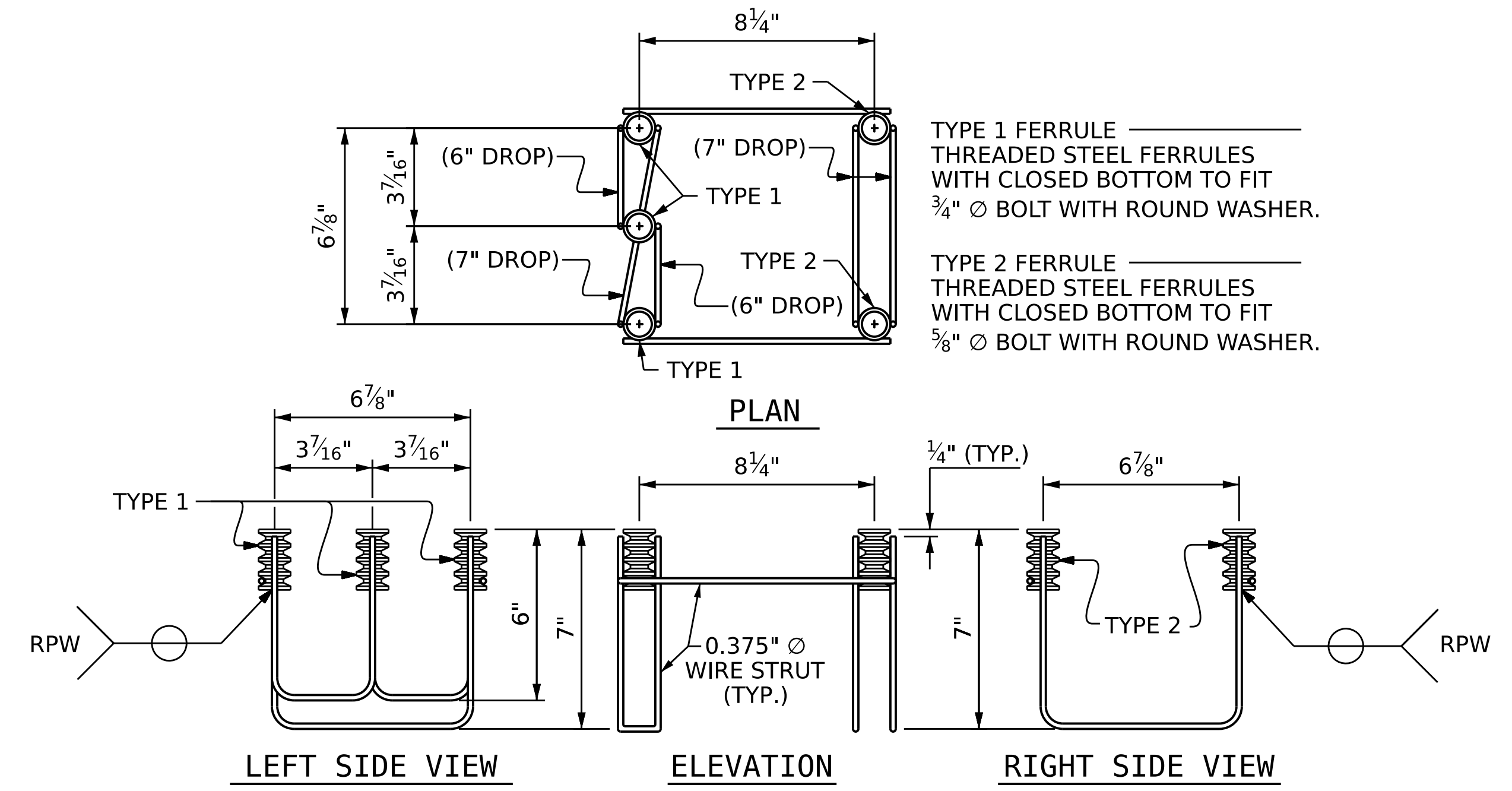
NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

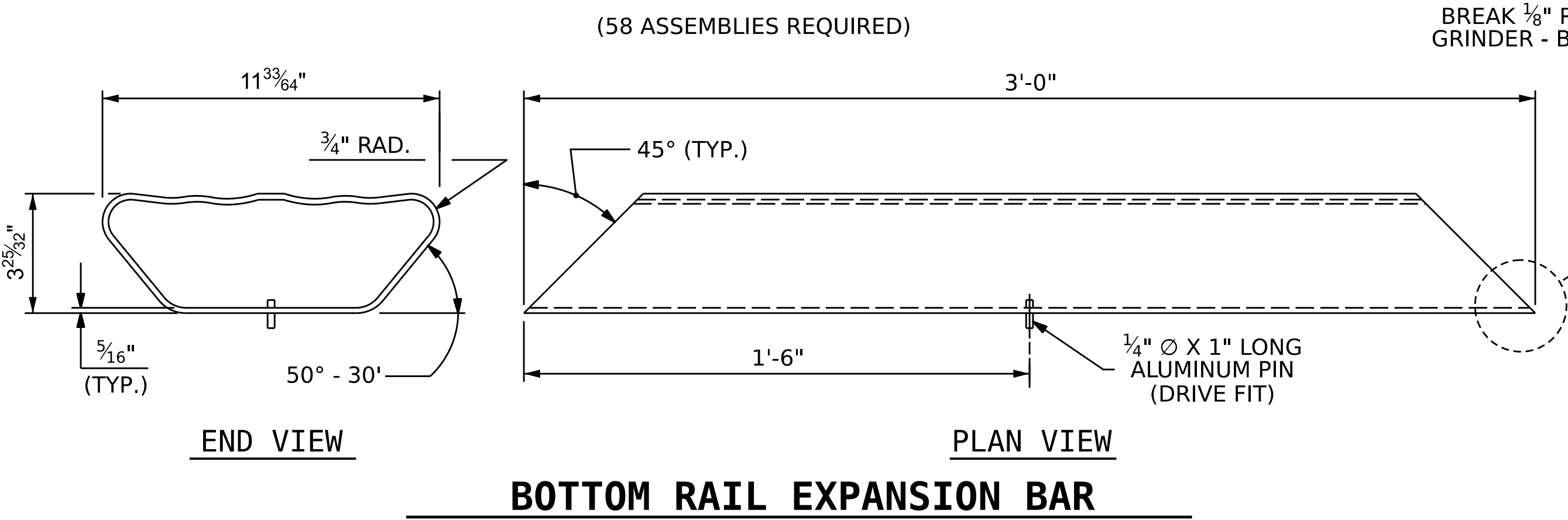
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.
- B. 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



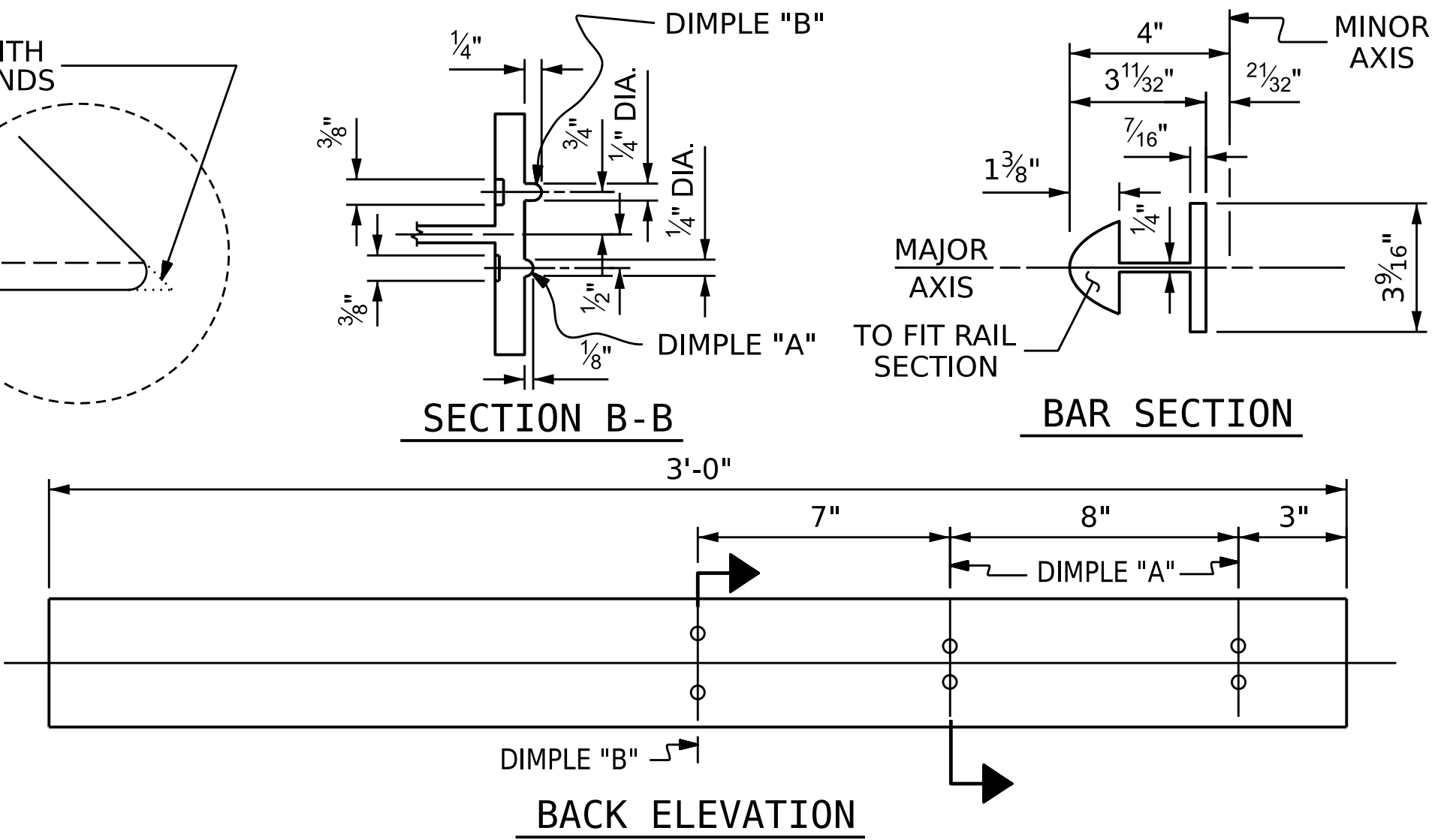
TOP & MIDDLE RAIL SECTION



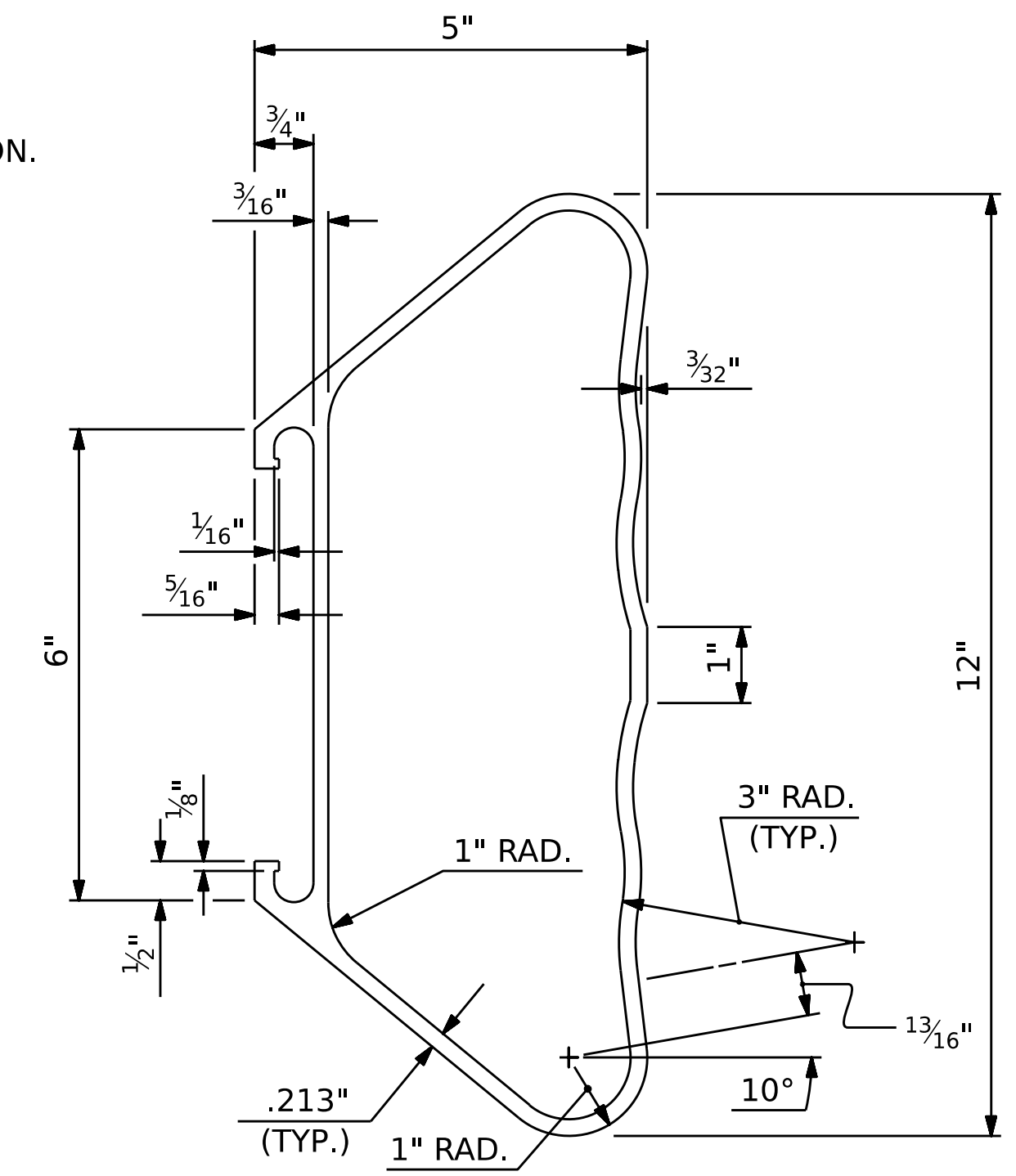
5-BOLT METAL RAIL ANCHOR ASSEMBLY



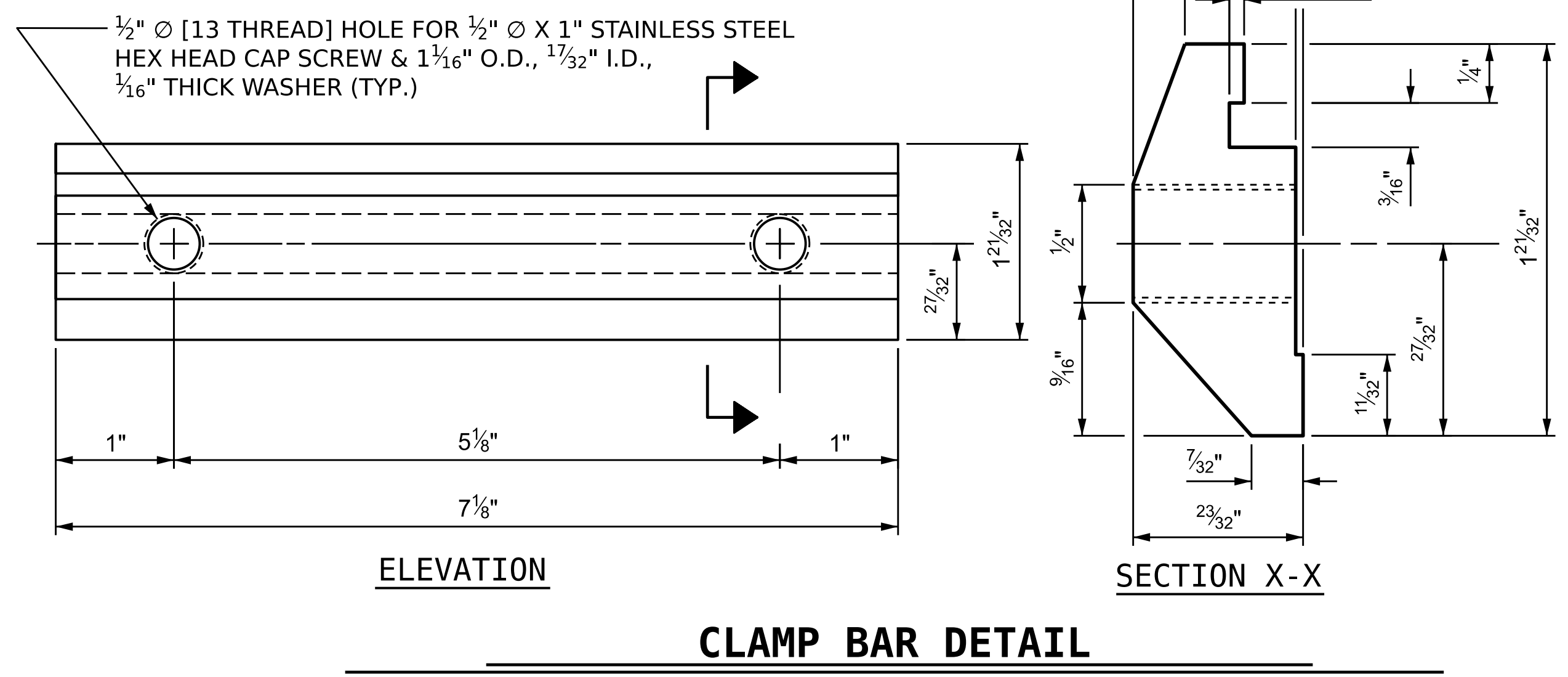
BOTTOM RAIL EXPANSION BAR



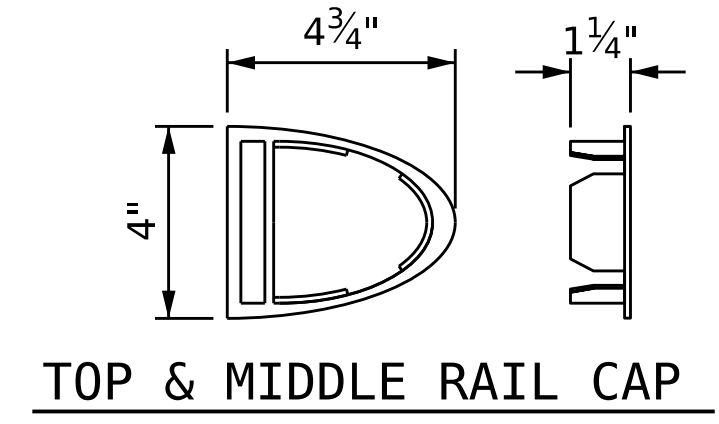
TOP & MIDDLE RAIL EXPANSION BAR



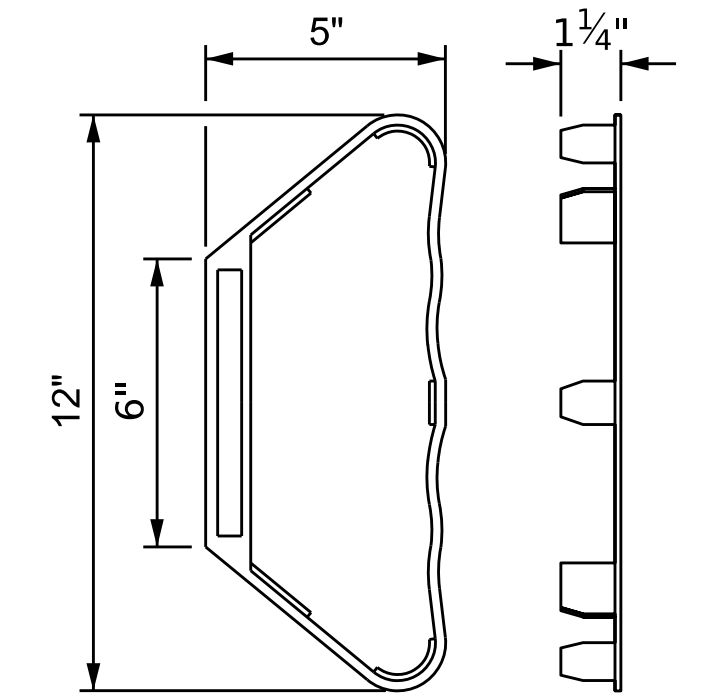
BOTTOM RAIL SECTION



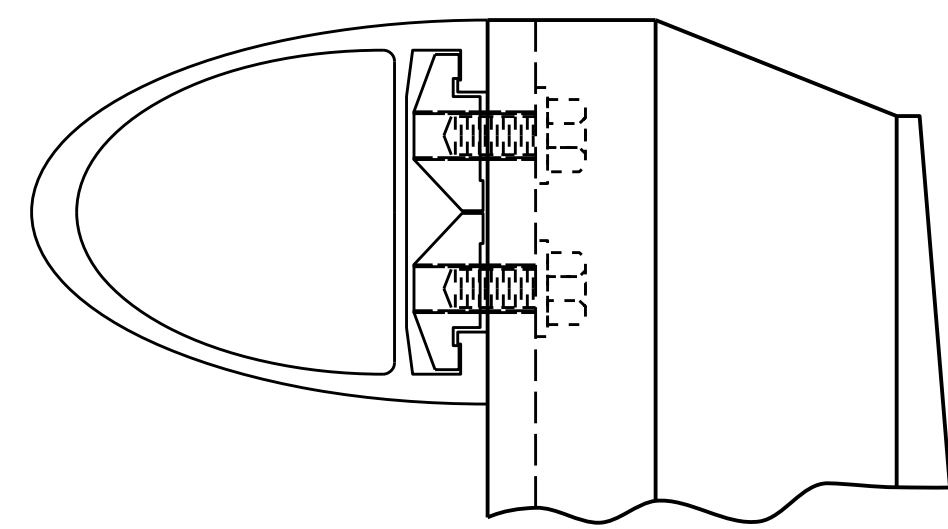
CLAMP BAR DETAIL



TOP & MIDDLE RAIL CAP



BOTTOM RAIL CAP



CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-
SHEET 2 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F0242

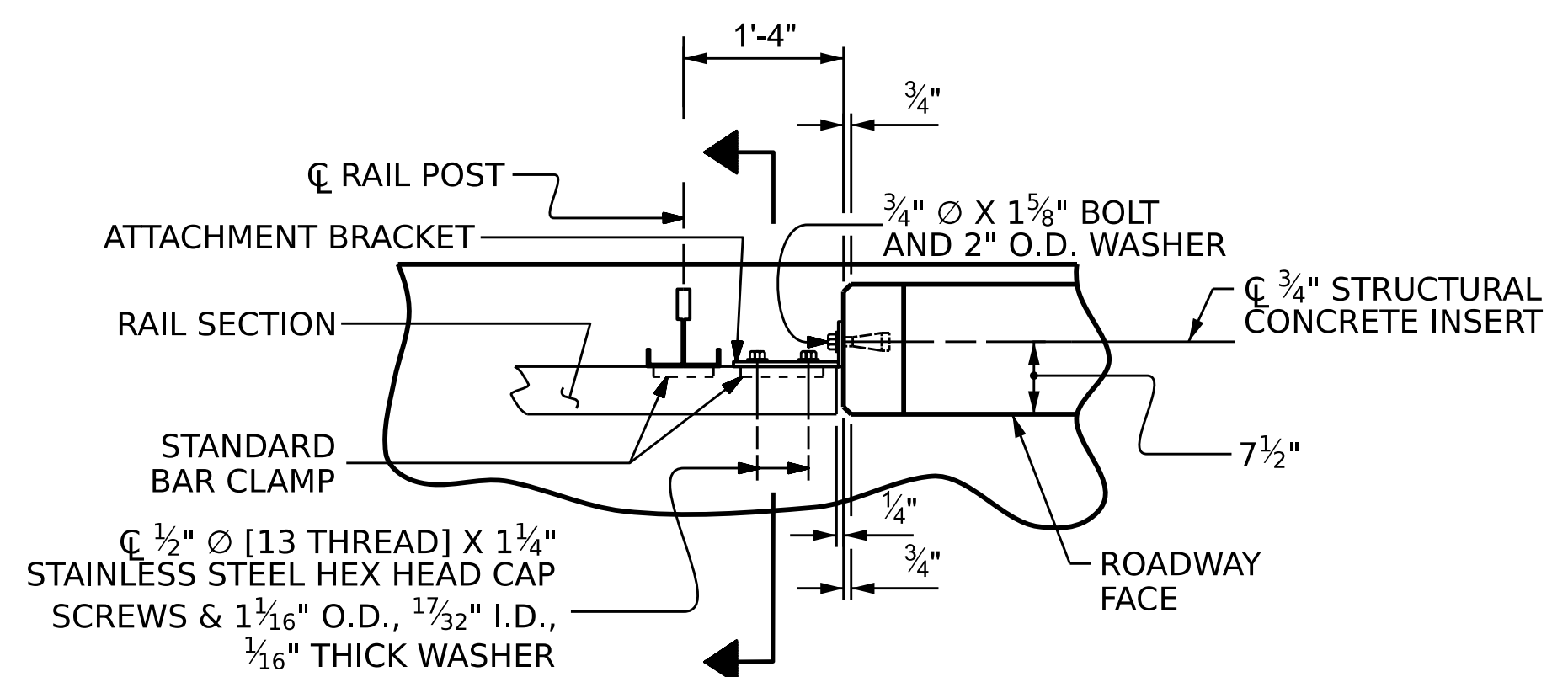
NORTH CAROLINA PROFESSIONAL SEAL
REGISTERED PROFESSIONAL ENGINEER
COURTNEY R. COLS
2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-26					TOTAL SHEETS 48

ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : JMB 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : GCH 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

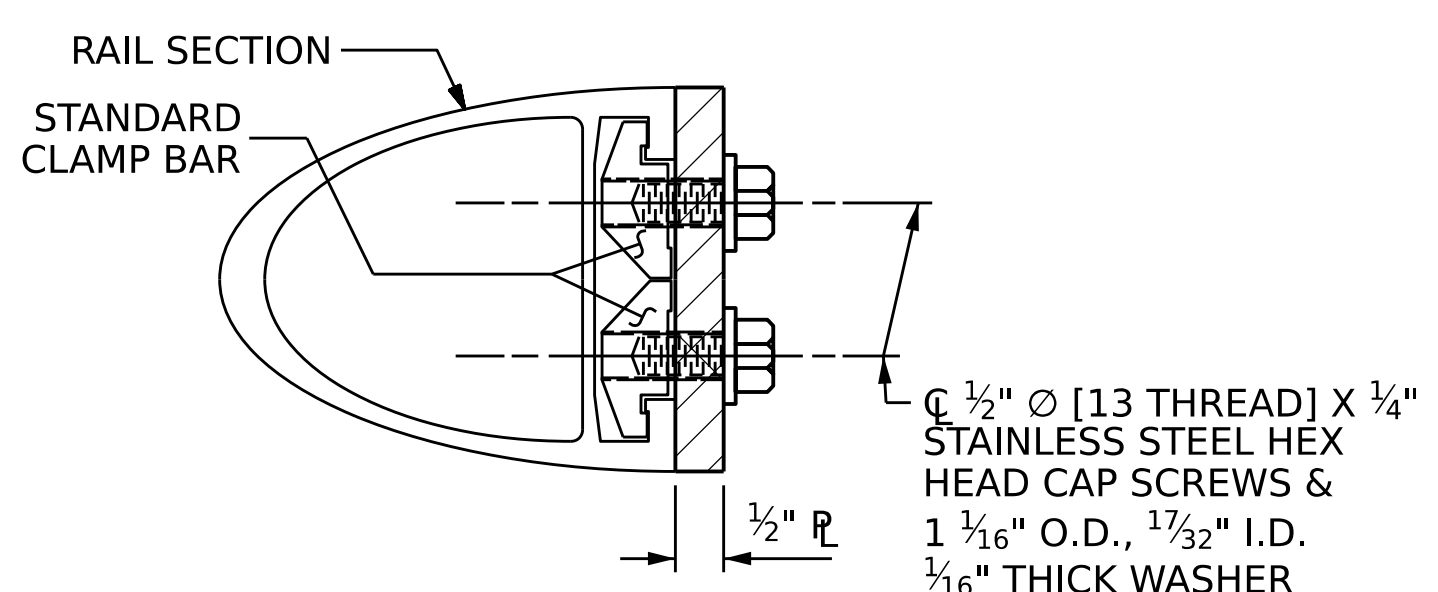
(6 REQUIRED PER POST)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



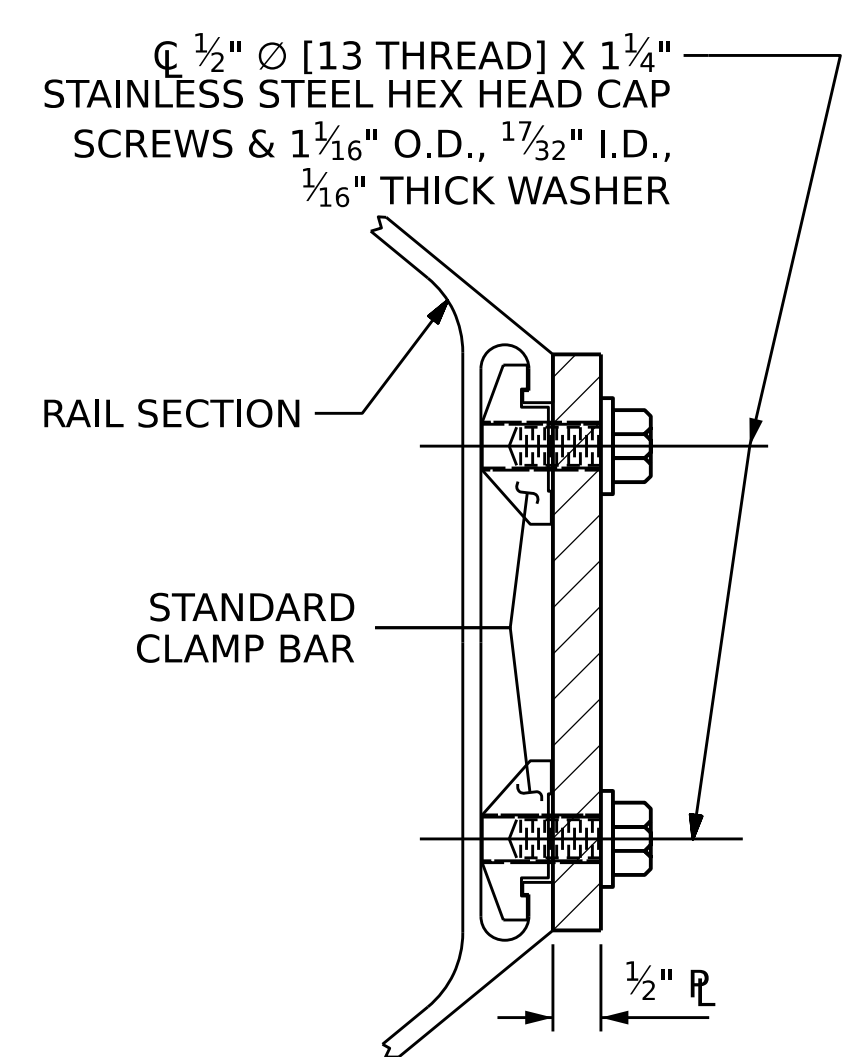
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" R NOT SHOWN FOR CLARITY)



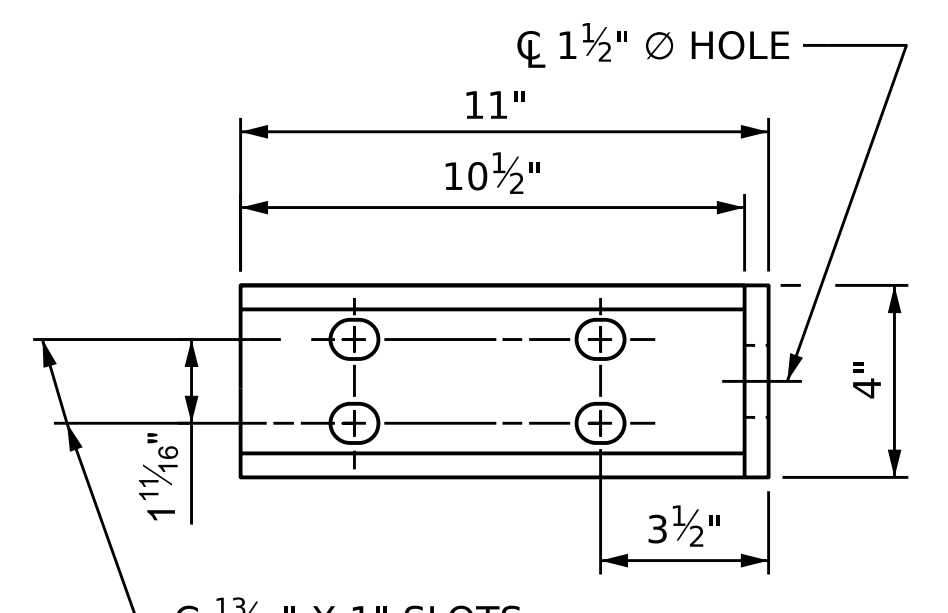
SECTION H-H

(FOR TOP & MIDDLE RAIL)

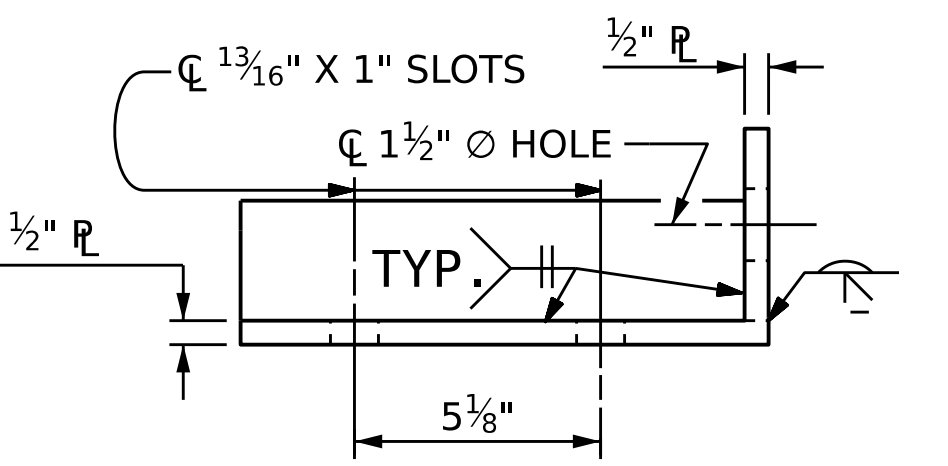


SECTION H-H

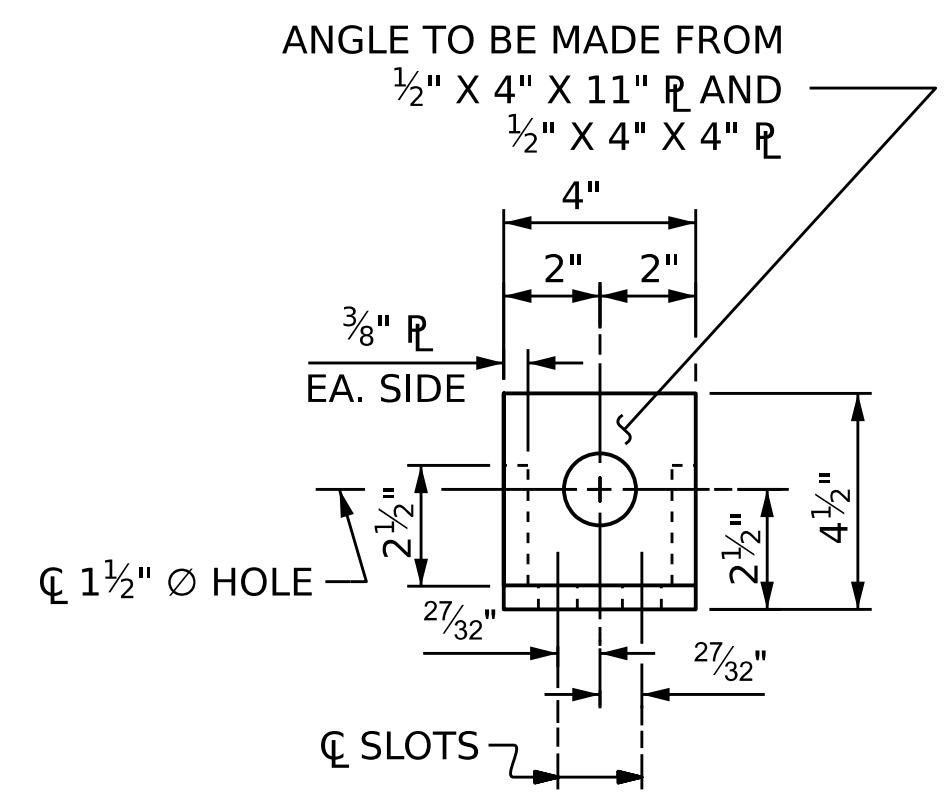
(FOR BOTTOM RAIL)



ELEVATION



PLAN

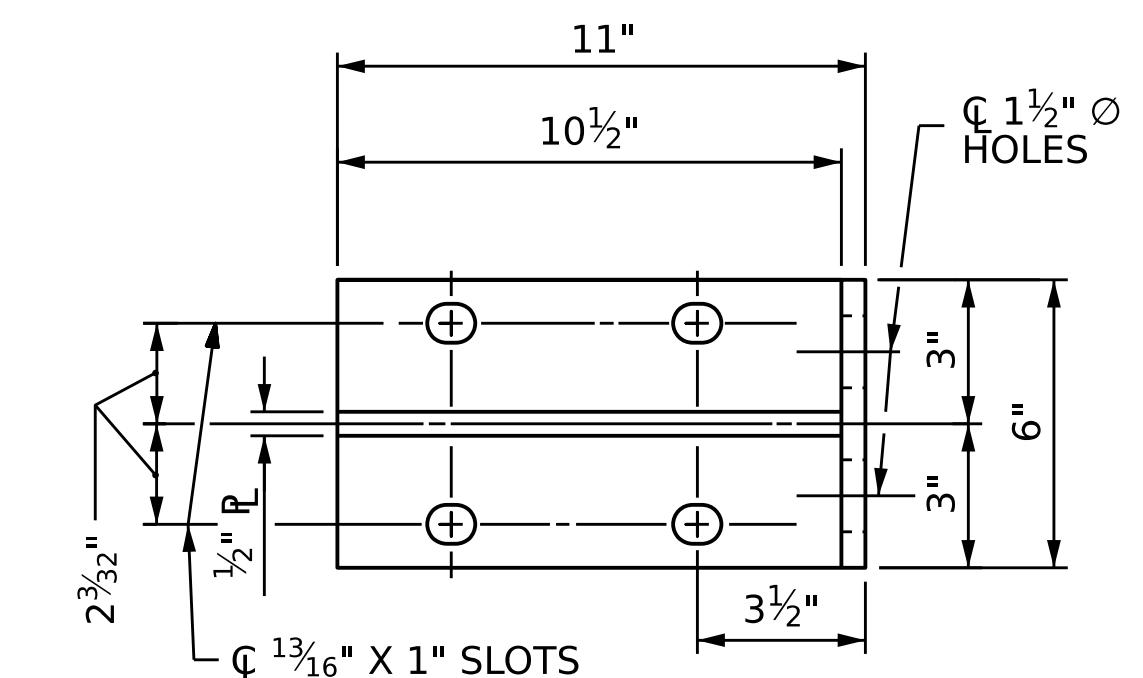


END VIEW

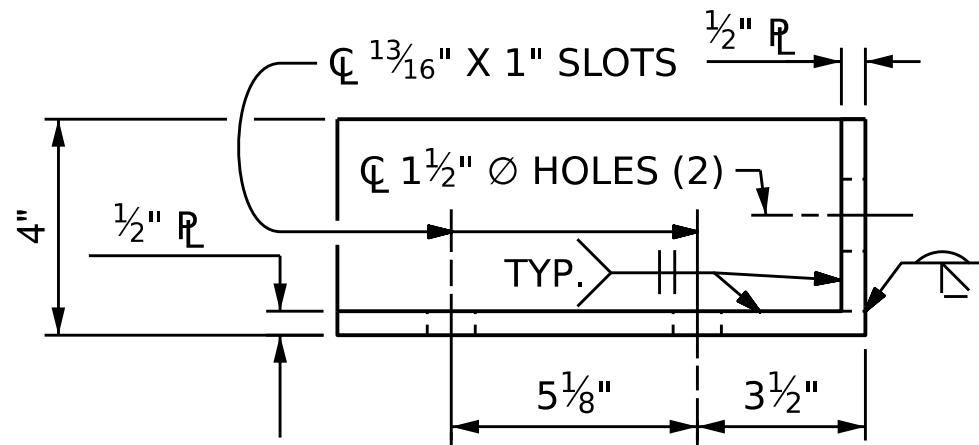
(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



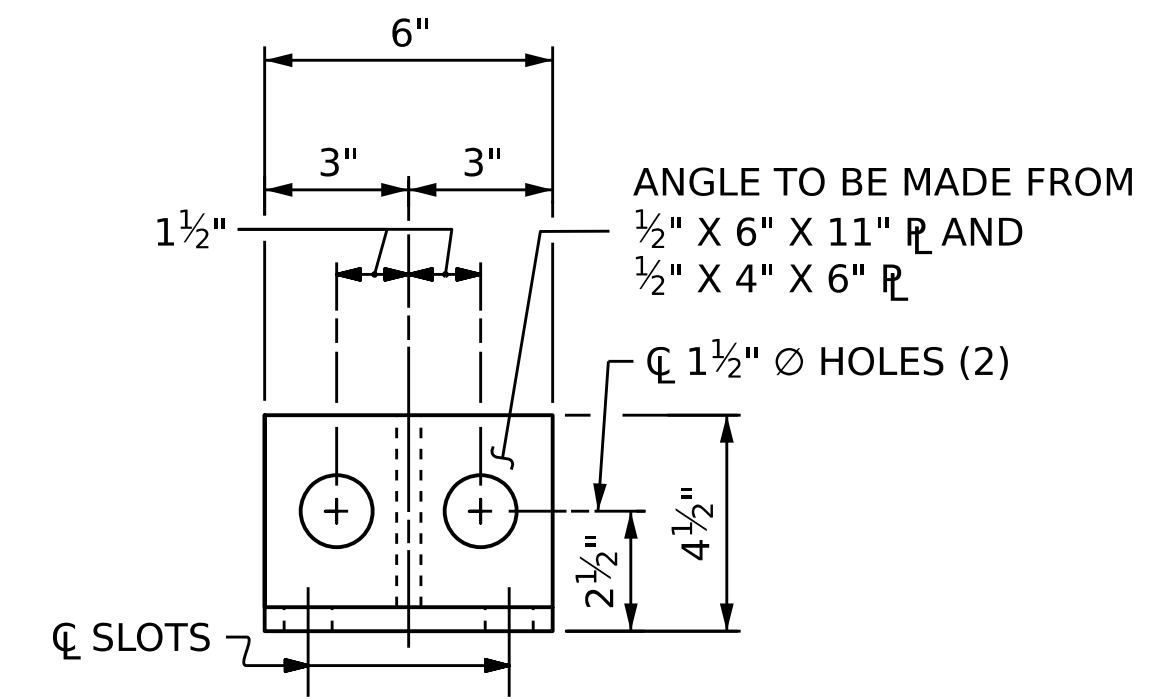
ELEVATION



PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW

NOTES

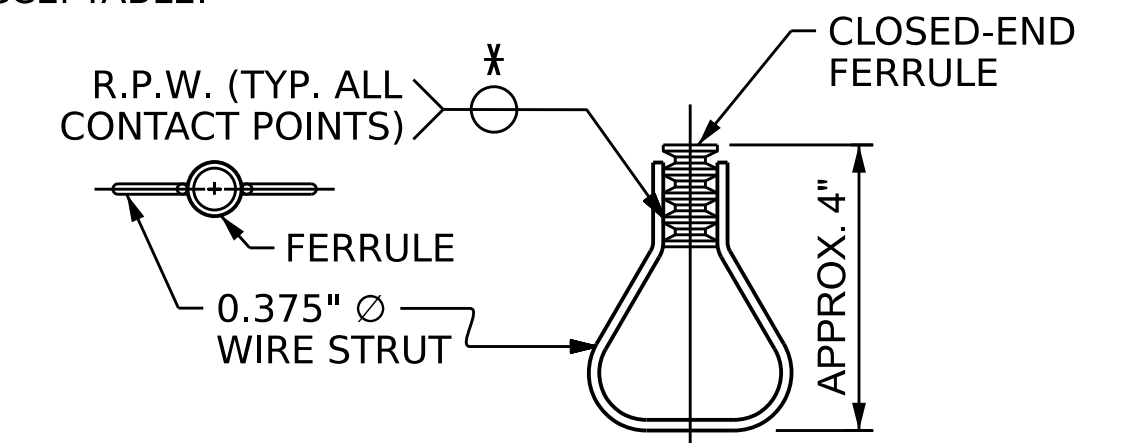
METAL RAIL TO END POST CONNECTION

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
 - A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
 - D. STANDARD CLAMP BARS (STD. No. BMR6).
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" X 1 5/8" BOLT SHALL APPLY TO THE 3/4" X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

STRUCTURAL CONCRETE INSERT

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



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

⊗ EACH WELD ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. BR-0041

ROCKINGHAM COUNTY

STATION: POT 34+73.00 -L-

SHEET 3 OF 3

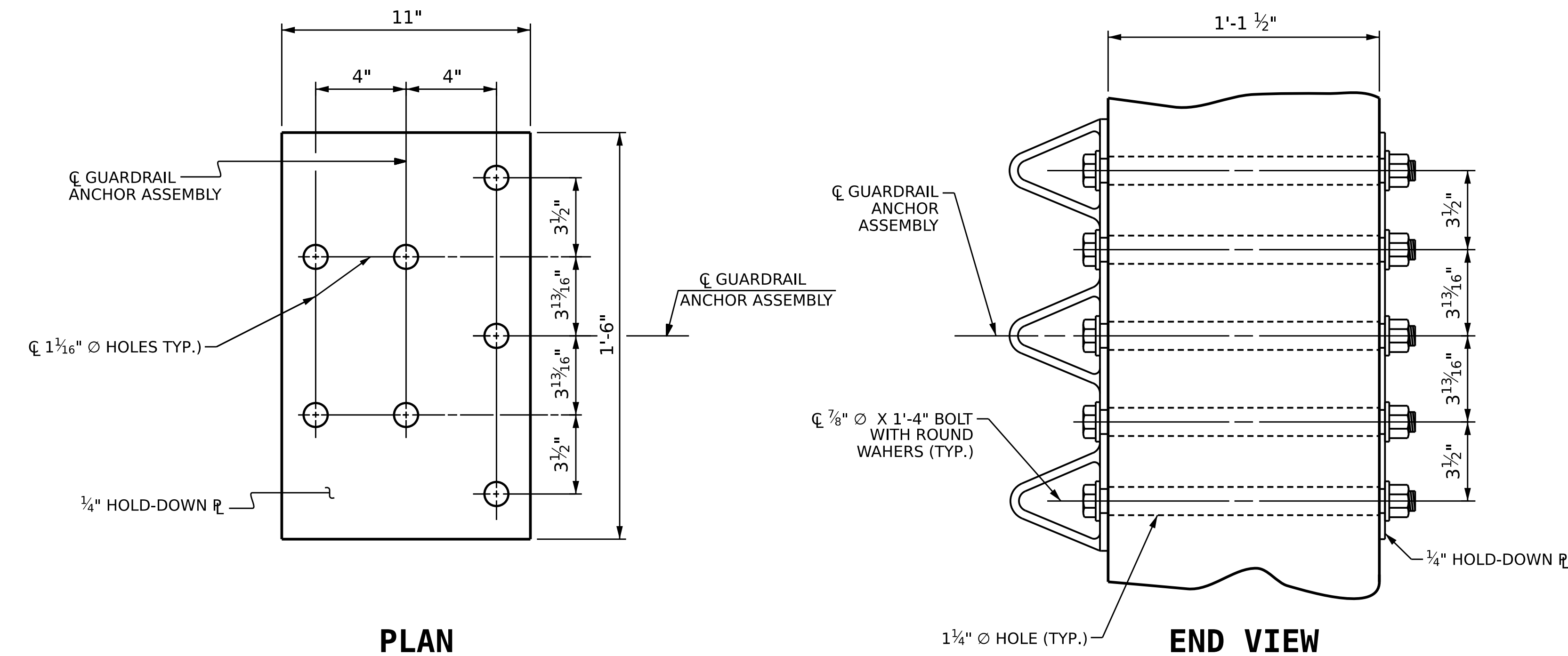
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

PROFESSIONAL SEAL
 NORTH CAROLINA
 ENGINEER
 CARY R. COLE
 2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-27
STANDARD						TOTAL SHEETS 48
3 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : JMB 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : GCH 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



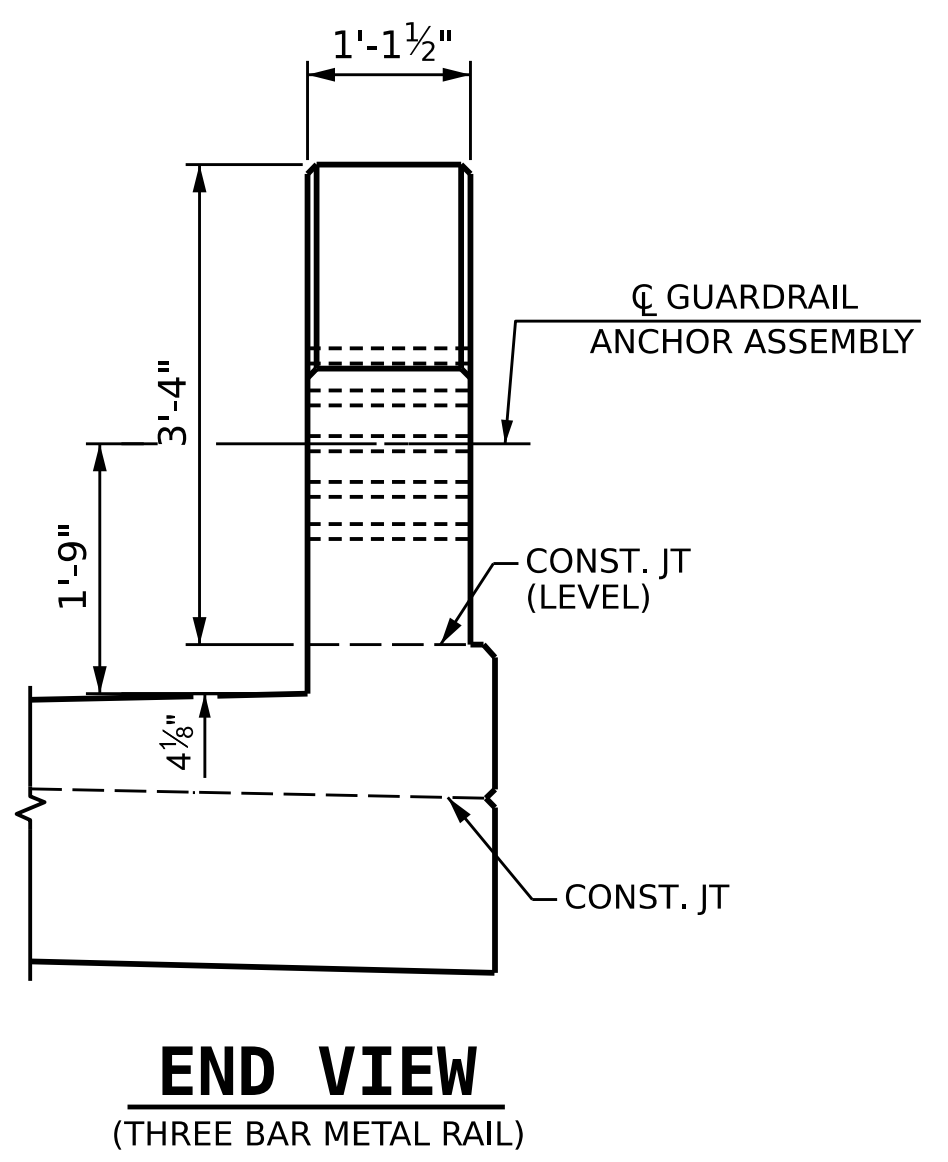
PLAN

END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

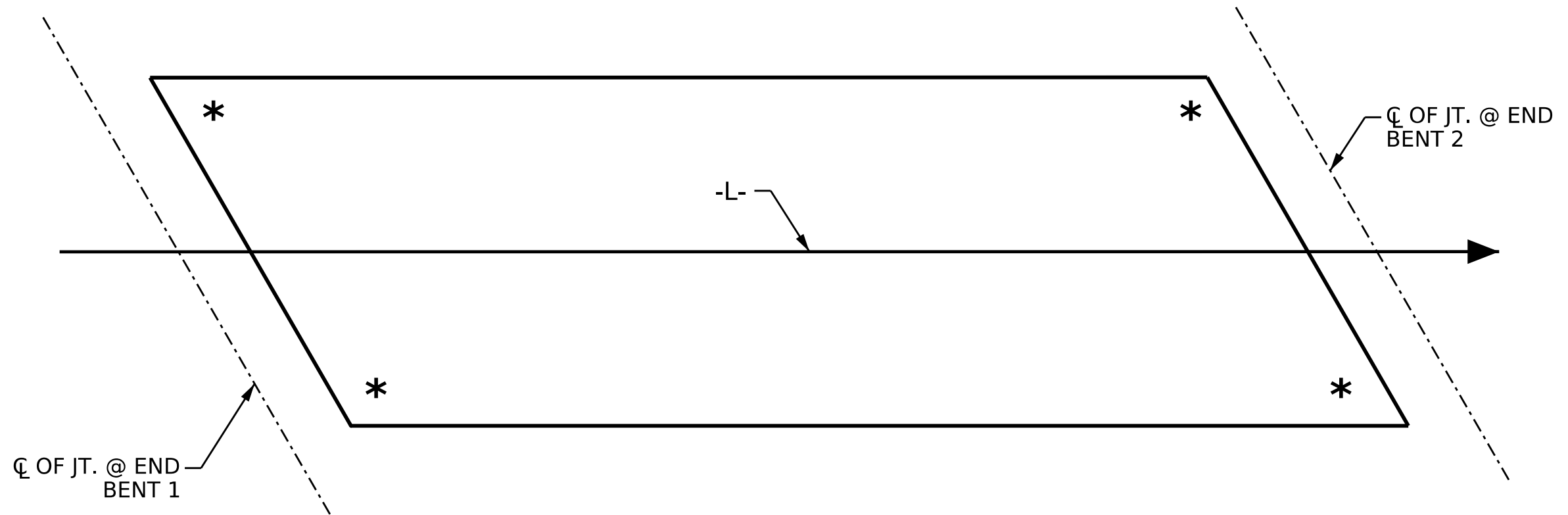
NOTES (FOR METAL RAILS)

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL BE GALVANIZED AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS, AND WASHERS, MAY BE USED AS AN ALTERNATE FOR 7/8" Ø GALVANIZED BOLTS. NUTS AND WASHERS, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OR THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS, AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.
- THE 1 1/16" 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.



END VIEW

(THREE BAR METAL RAIL)



SKETCH SHOWING POINT OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

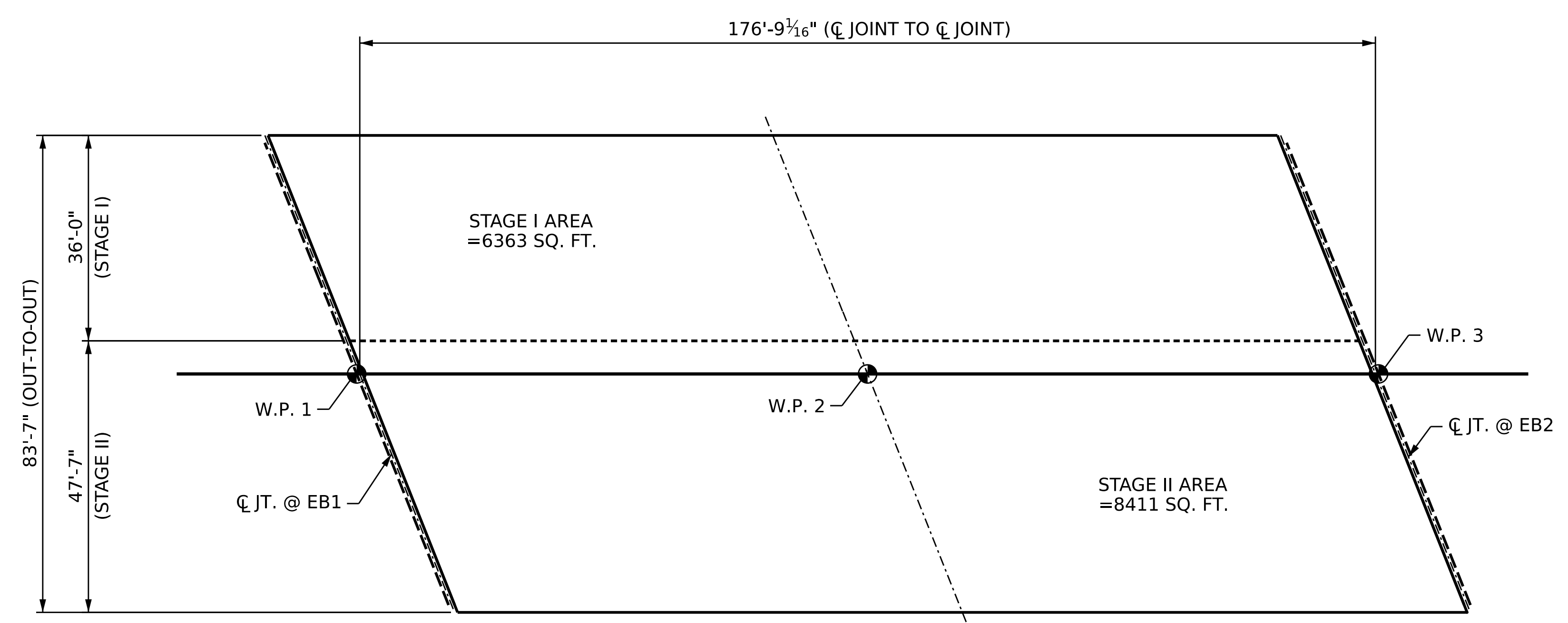
LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

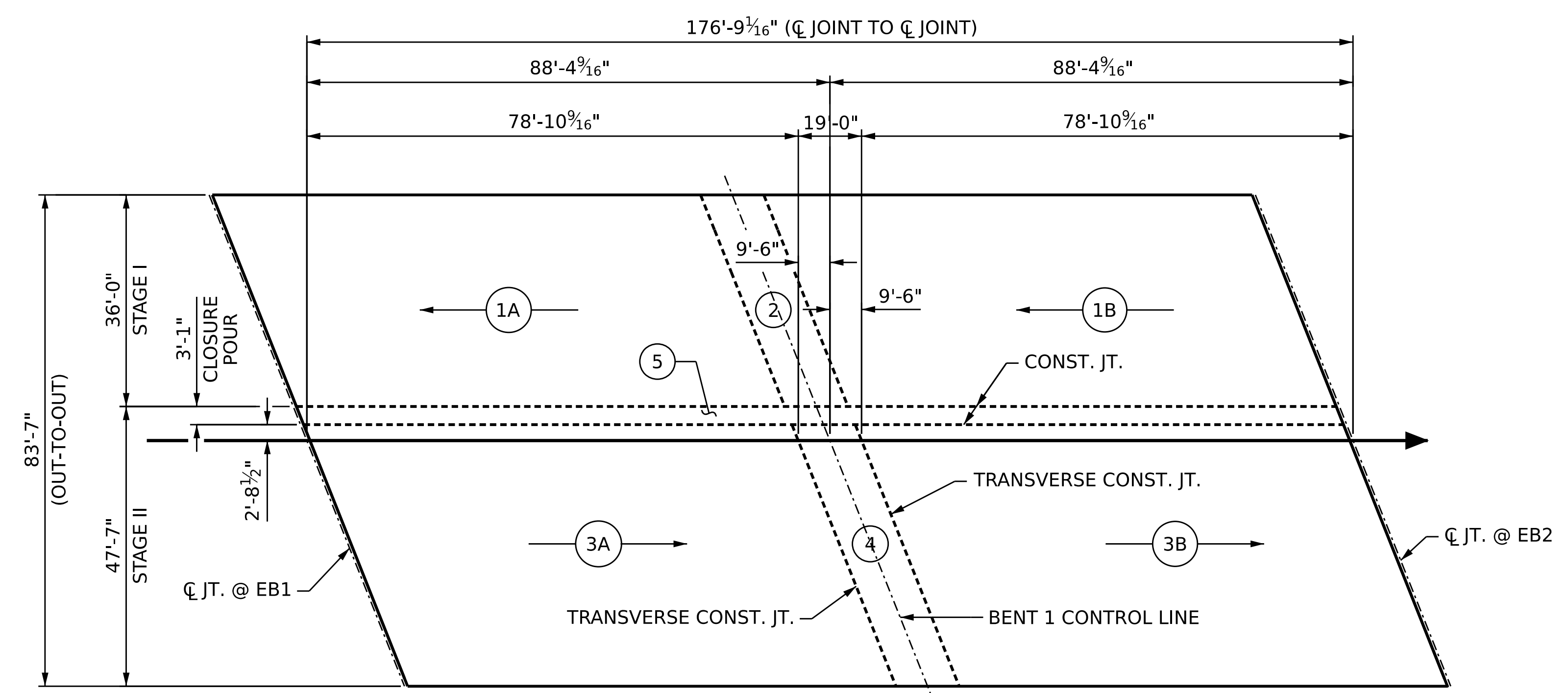
ASSEMBLED BY : L.A. SHIELDS	DATE : 10/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
S-28					48



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 14,774)



POURING SEQUENCE - PLAN

(POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS LABELED POUR #1 REACH A MINIMUM OF 3000 PSI.)

① → INDICATES POUR NUMBER AND DIRECTION

NOTE: SIDEWALKS AND CONCRETE MEDIAN SHALL NOT BE POURED PRIOR TO COMPLETION OF ENTIRE DECK POUR FOR EACH STAGE.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 1 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F02442

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 04343
 CREGORY R. COLS
 2/19/2023

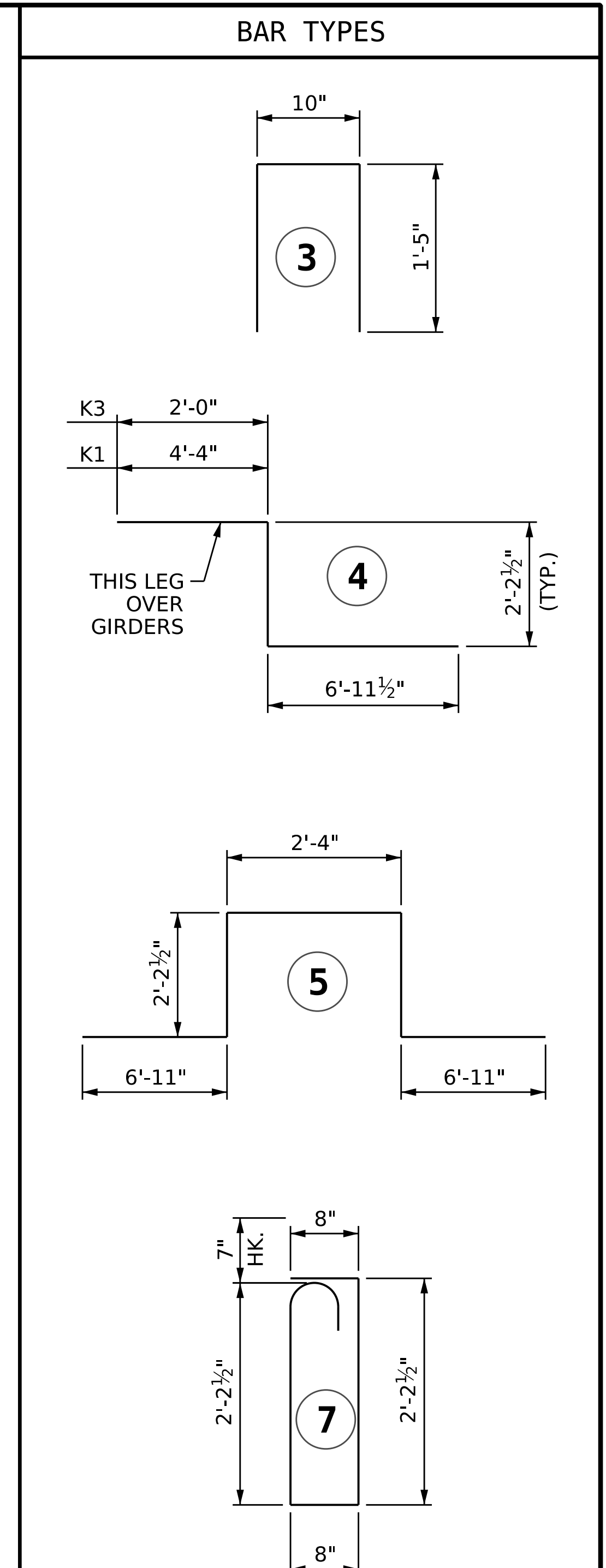
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
BILL OF MATERIALS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
S1-29					48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: B.T. LEROY DATE: 11/2022
 CHECKED BY: S. NATARAJAN DATE: 11/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

REINFORCING BAR SCHEDULE

STAGE I												STAGE II										STAGE II CLOSURE POUR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
* A1	352	5	STR	35'-8"	13095	A215	2	5	STR	19'-11"	42	* A3	345	5	STR	44'-2"	15893	A408	2	5	STR	36'-3"	76	* B1	12	4	STR	30'-6"	244	A2	352	5	STR	35'-8"	13095	A216	2	5	STR	18'-9"	39	A4	345	5	STR	44'-2"	15893	A409	2	5	STR	35'-1"	73	* B2	9	6	STR	23'-2"	313	A217	2	5	STR	17'-7"	37	A410	2	5	STR	34'-0"	71	* B3	4	6	STR	39'-10"	239	* A101	2	5	STR	34'-10"	73	A218	2	5	STR	16'-5"	34	* A301	2	5	STR	43'-1"	90	A411	2	5	STR	32'-10"	68	B4	20	5	STR	45'-6"	949	* A102	2	5	STR	33'-8"	70	A219	2	5	STR	15'-4"	32	* A302	2	5	STR	41'-11"	87	A412	2	5	STR	31'-8"	66	B5	8	4	STR	23'-8"	126	* A103	2	5	STR	32'-6"	68	A220	2	5	STR	14'-2"	30	* A303	2	5	STR	40'-10"	85	A413	2	5	STR	30'-6"	64	* A104	2	5	STR	31'-4"	65	A221	2	5	STR	13'-0"	27	* A304	2	5	STR	39'-8"	83	A414	2	5	STR	29'-4"	61	* G3	2	5	STR	5'-1"	11	* A105	2	5	STR	30'-2"	63	A222	2	5	STR	11'-10"	25	* A305	2	5	STR	38'-6"	80	A415	2	5	STR	28'-2"	59	* A106	2	5	STR	29'-1"	61	A223	2	5	STR	10'-8"	22	* A306	2	5	STR	37'-4"	78	A416	2	5	STR	27'-1"	56	K6	4	8	STR	4'-5"	47	* A107	2	5	STR	27'-11"	58	A224	2	5	STR	9'-6"	20	* A307	2	5	STR	36'-2"	75	A417	2	5	STR	25'-11"	54	K7	6	6	STR	3'-3"	29	* A108	2	5	STR	26'-9"	56	A225	2	5	STR	8'-5"	18	* A308	2	5	STR	35'-10"	73	A418	2	5	STR	24'-9"	52	* A109	2	5	STR	25'-7"	53	A226	2	5	STR	7'-3"	15	* A309	2	5	STR	33'-11"	71	A419	2	5	STR	23'-7"	49	* S1	6	5	7	6'-4"	40	* A110	2	5	STR	24'-5"	51	A227	2	5	STR	6'-1"	13	* A310	2	5	STR	32'-9"	68	A420	2	5	STR	22'-5"	47	* S2	6	4	3	3'-8"	15	* A111	2	5	STR	23'-3"	48	A228	2	5	STR	4'-11"	10	* A311	2	5	STR	31'-7"	66	A421	2	5	STR	21'-3"	44	* A112	2	5	STR	22'-2"	46	A229	2	5	STR	3'-9"	8	* A312	2	5	STR	30'-5"	63	A422	2	5	STR	20'-2"	42	* A113	2	5	STR	21'-0"	44	* A313	2	5	STR	29'-3"	61	A423	2	5	STR	19'-0"	40	* A114	2	5	STR	19'-10"	41	* B1	100	4	STR	30'-6"	2037	* A314	2	5	STR	28'-1"	59	A424	2	5	STR	17'-10"	37	* A115	2	5	STR	18'-8"	39	* B2	75	6	STR	23'-2"	2610	* A315	2	5	STR	26'-11"	56	A425	2	5	STR	16'-8"	35	* A116	2	5	STR	17'-6"	37	* B3	47	6	STR	39'-10"	2812	* A316	2	5	STR	25'-10"	54	A426	2	5	STR	15'-6"	32	* A117	2	5	STR	16'-4"	34	B4	184	5	STR	45'-6"	8732	* A317	2	5	STR	24'-8"	51	A427	2	5	STR	14'-4"	30	* A118	2	5	STR	15'-3"	32	B5	84	4	STR	23'-8"	1328	* A318	2	5	STR	23'-6"	49	A428	2	5	STR	13'-2"	27	* A119	2	5	STR	14'-1"	29	* A319	2	5	STR	22'-4"	47	A429	2	5	STR	12'-1"	25	* A120	2	5	STR	12'-11"	27	* D1	382	5	STR	5'-4"	2125	* A320	2	5	STR	21'-2"	44	A430	2	5	STR	10'-11"	23	* A121	2	5	STR	11'-9"	25	D2	382	5	STR	4'-9"	1893	* A321	2	5	STR	20'-0"	42	A431	2	5	STR	9'-9"	20	* A122	2	5	STR	10'-7"	22	* A322	2	5	STR	18'-11"	39	A432	2	5	STR	8'-7"	18	* A123	2	5	STR	9'-5"	20	* G1	2	5	STR	38'-5"	80	* A323	2	5	STR	17'-9"	37	A433	2	5	STR	7'-5"	15	* A124	2	5	STR	8'-4"	17	* A324	2	5	STR	16'-7"	35	A434	2	5	STR	6'-3"	13	* A125	2	5	STR	7'-2"	15	* K1	4	8	4	13'-6"	144	* A325	2	5	STR	15'-5"	32	A435	2	5	STR	5'-2"	11	* A126	2	5	STR	6'-0"	13	* K2	8	8	5	20'-7"	440	* A326	2	5	STR	14'-3"	30	A436	2	5	STR	4'-0"	8	* A127	2	5	STR	4'-10"	10	* K3	4	8	4	11'-2"	119	* A327	2	5	STR	13'-1"	27	* A128	2	5	STR	3'-8"	8	* K4	18	6	STR	9'-1"	246	* A328	2	5	STR	12'-0"	25	* B1	124	4	STR	30'-6"	2526	* A129	2	5	STR	2'-6"	5	* A329	2	5	STR	10'-10"	23	* B2	93	6	STR	23'-2"	3236	* A201	2	5	STR	35'-8"	74	* S1	54	5	7	6'-4"	357	* A330	2	5	STR	9'-8"	20	* B3	58	6	STR	39'-10"	3470	* A202	2	5	STR	34'-11"	73	* S2	54	4	3	3'-8"	132	* A331	2	5	STR	8'-6"	18	B4	224	5	STR	45'-6"	10630	* A203	2	5	STR	33'-9"	70	* A332	2	5	STR	7'-4"	15	B5	102	4	STR	23'-8"	1613	* A204	2	5	STR	32'-7"	68	* A333	2	5	STR	6'-2"	13	* A205	2	5	STR	31'-5"	66	* A334	2	5	STR	5'-1"	11	* D1	382	5	STR	5'-4"	2125	* A206	2	5	STR	30'-3"	63	* A335	2	5	STR	3'-11"	8	D2	382	5	STR	4'-9"	1893	* A207	2	5	STR	29'-2"	61	* A336	2	5	STR	2'-9"	6	* G2	2	5	STR	47'-6"	99	* A208	2	5	STR	28'-0"	58	A401	2	5	STR	44'-1"	92	* K1	4	8	4	13'-6"	144	* A209	2	5	STR	26'-10"	56	A402	2	5	STR	43'-2"	90	* K2	12	8	5	20'-7"	659	* A210	2	5	STR	25'-8"	54	A403	2	5	STR	42'-0"	88	* K3	4	8	4	11'-2"	119	* A211	2	5	STR	24'-6"	51	A404	2	5	STR	40'-11"	85	* K5	24	6	STR	8'-7"	309	* A212	2	5	STR	23'-4"	49	A405	2	5	STR	39'-9"	83	* A213	2	5	STR	22'-3"	46	A406	2	5	STR	38'-7"	80	* S1	72	5	7	6'-4"	476	* A214	2	5	STR	21'-1"	44	A407	2	5	STR	37'-5"	78	* S2	72	4	3	3'-8"	176
TOTAL REINFORCING STEEL												LBS.	26253	TOTAL REINFORCING STEEL										LBS.	31841	TOTAL REINFORCING STEEL						LBS.	1151																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
* TOTAL EPOXY COATED REINFORCING STEEL												LBS.	25327	* TOTAL EPOXY COATED REINFORCING STEEL										LBS.	30953	* TOTAL EPOXY COATED REINFORCING STEEL						LBS.	862																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						



GROOVING BRIDGE FLOORS

APPROACH SLABS	3170	SQ. FT.
BRIDGE DECK	11753	SQ. FT.
TOTAL	14923	SQ. FT.

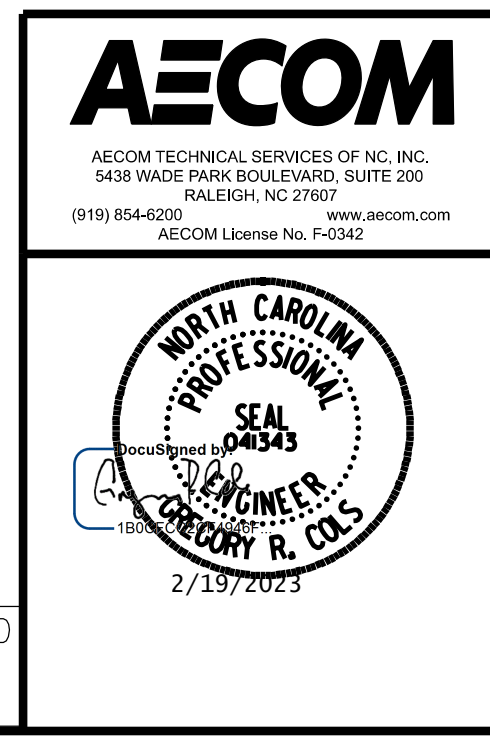
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

SUPERSTRUCTURE BILL OF MATERIAL

STAGE I	POUR #	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
		(CU. YDS)	(LBS.)	(LBS.)
STAGE I	POUR #1	191.9		
	POUR #2	22.4		
	TOTAL		26,253	25,327
STAGE II & CLOSURE POUR	POUR #3	237.1		
	POUR #4	27.7		
	POUR #5	20.64		
	TOTAL		32,992	31,815
	TOTALS *	499.74	59,245	57,142

PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-



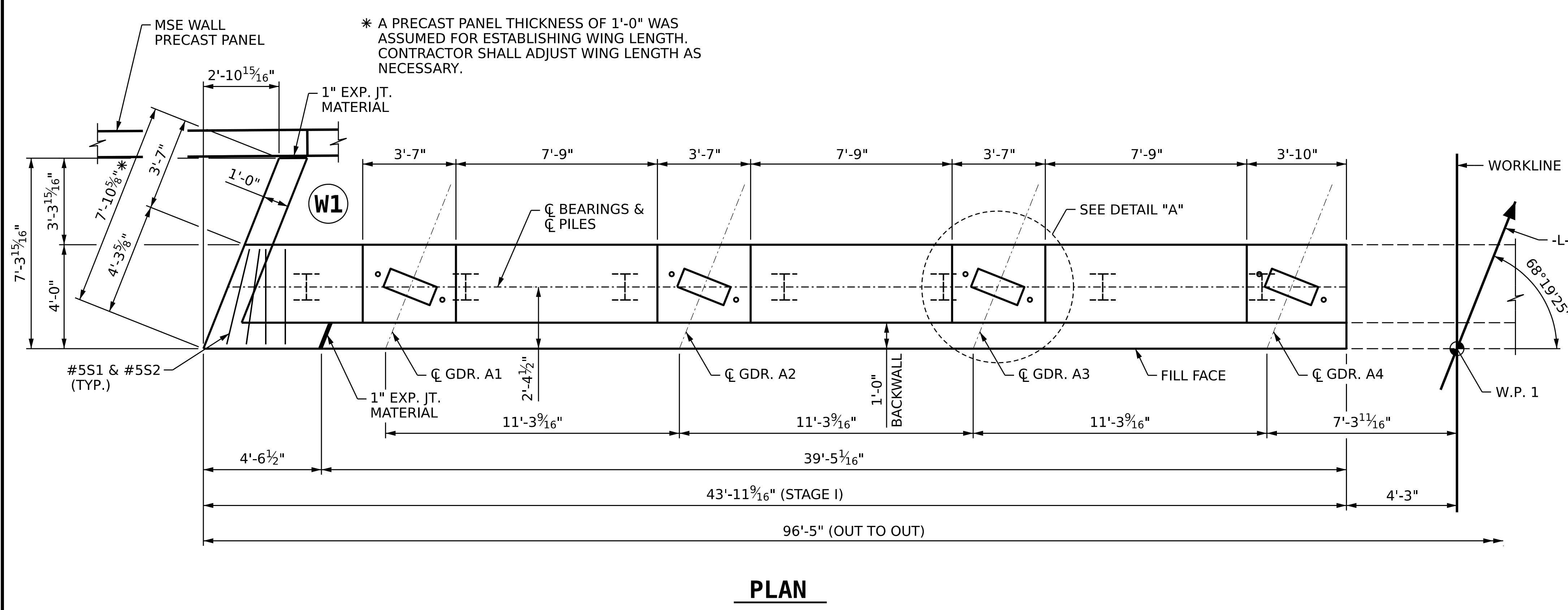
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
BILL OF MATERIALS

REVISIONS						SHEET NO. S1-30
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 48
2			4			

DRAWN BY: B.T. LEROY DATE: 11/2022
 CHECKED BY: S. NATARAJAN DATE: 11/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

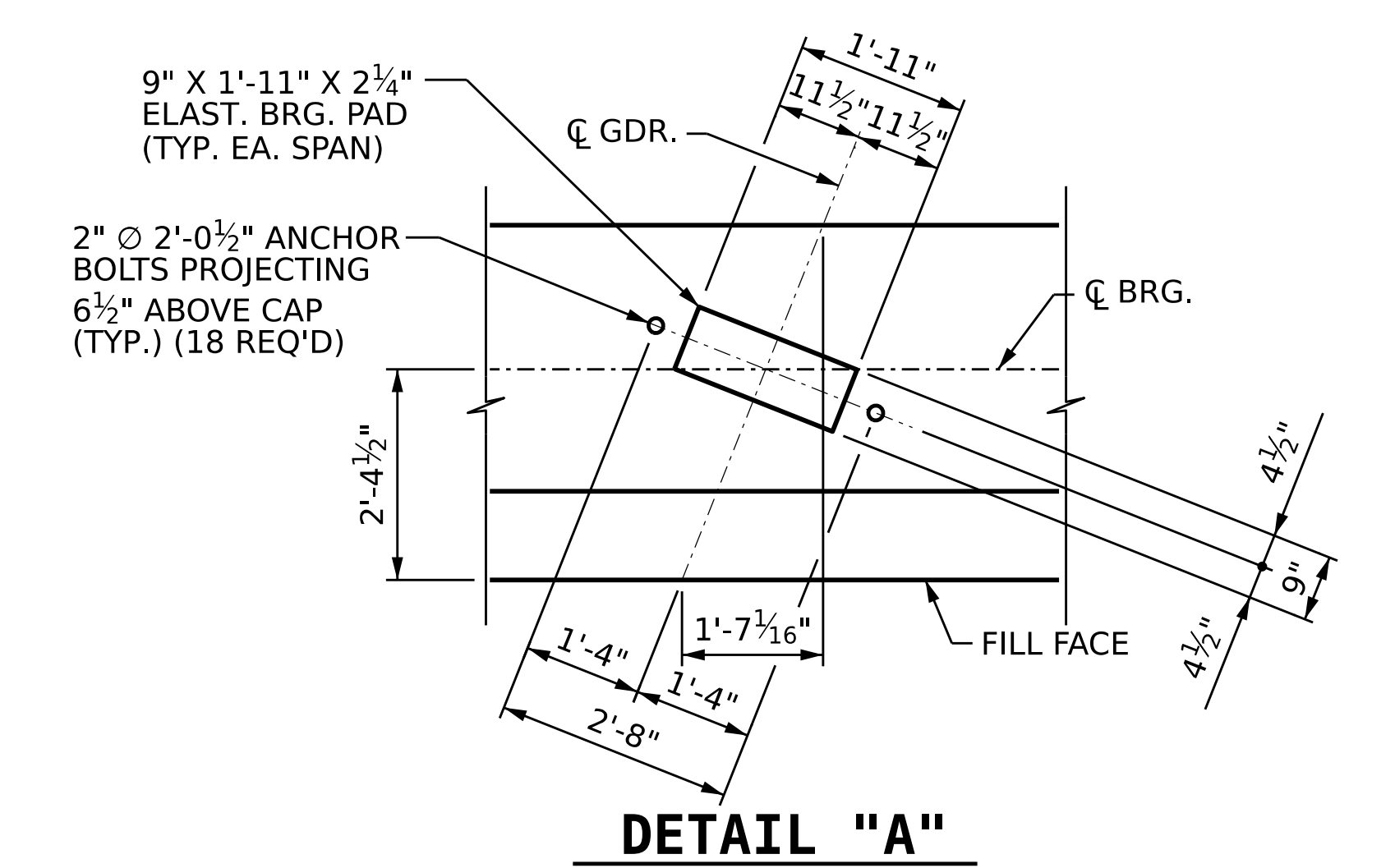
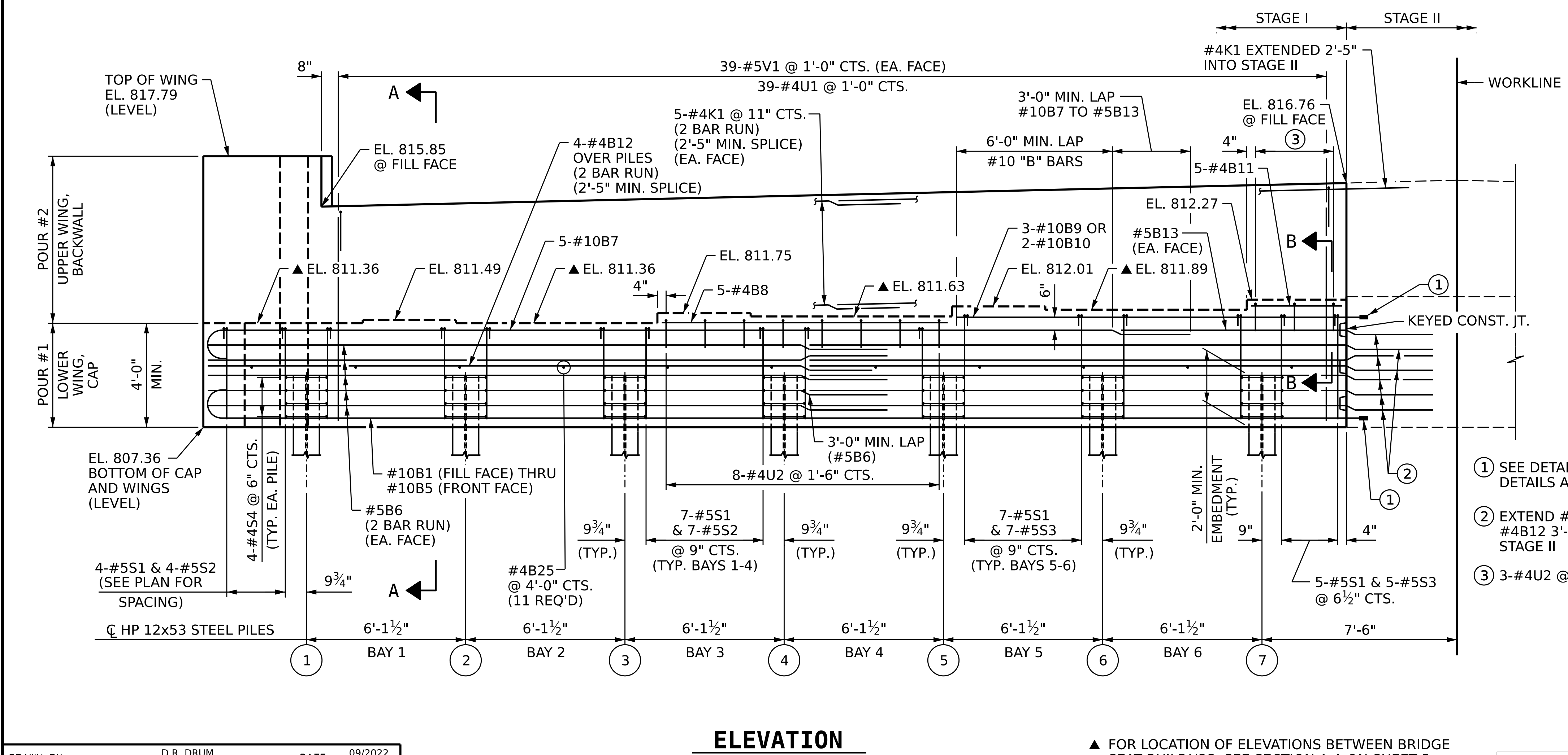
* SIDEWALK AND MEDIAN QUANTITIES ARE NOT INCLUDED.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



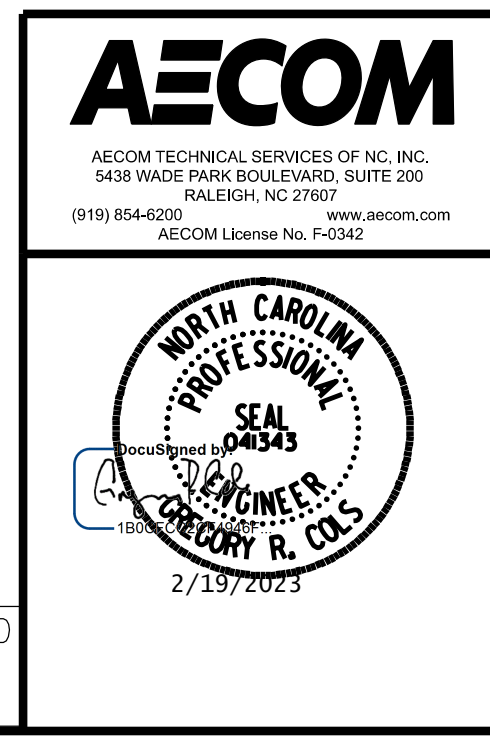
NOTES:

- MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #10 BARS IN STAGE I WITH THE #10 "B" BARS 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 #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.
- 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.



PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -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.

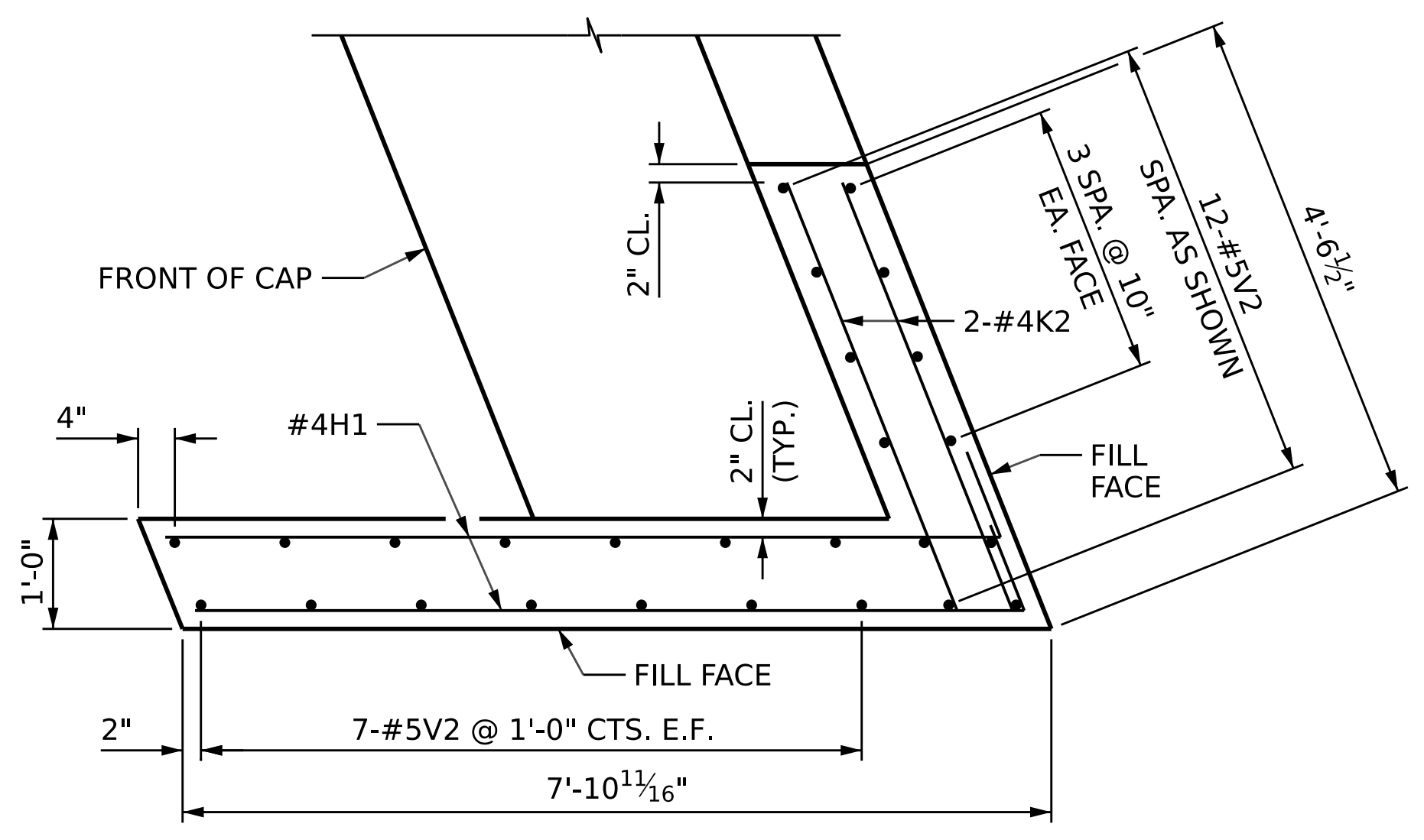


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 1 STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-31
					TOTAL SHEETS 48

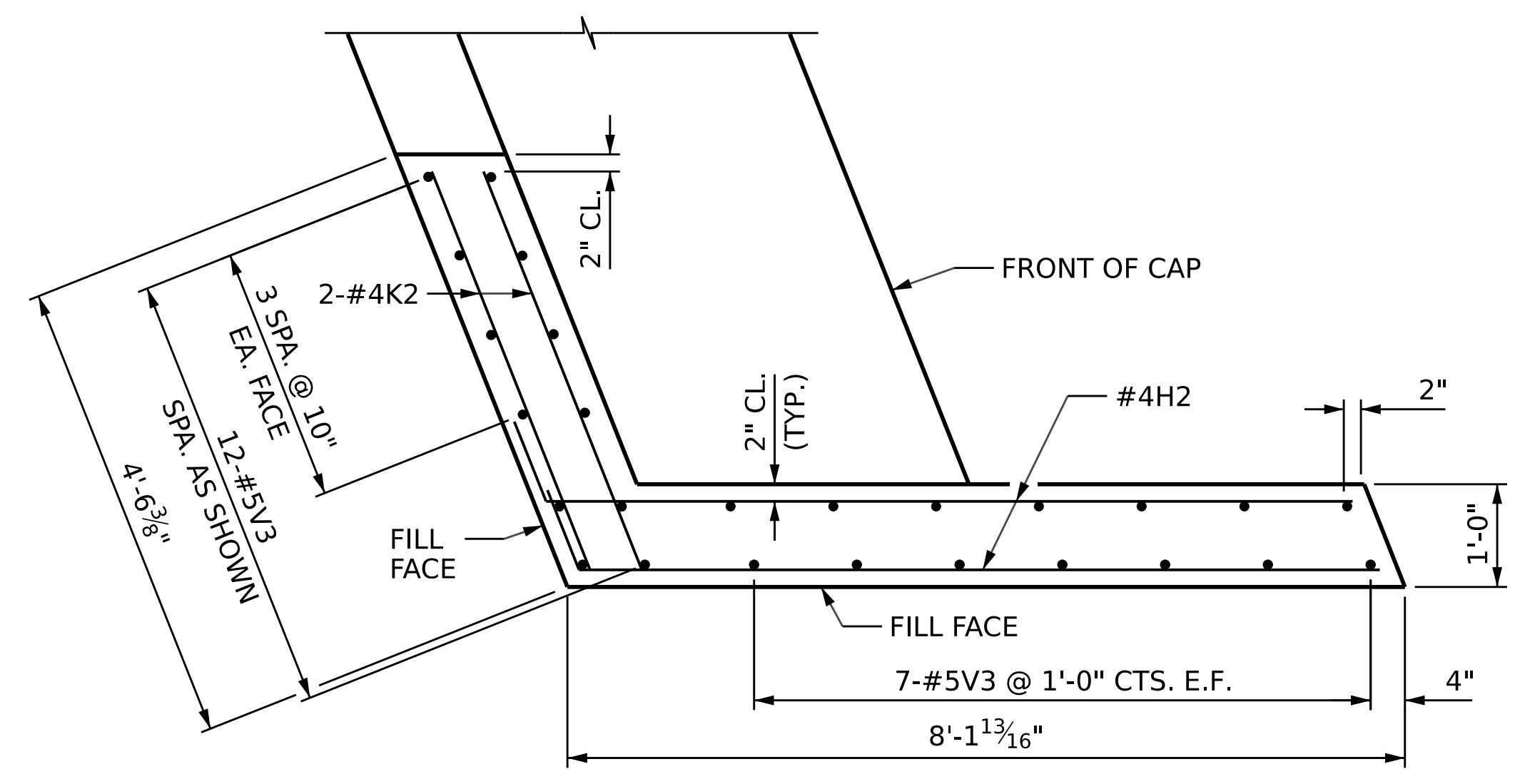
DRAWN BY: D.R. DRUM DATE: 09/2022
 CHECKED BY: S. NATARAJAN DATE: 10/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

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

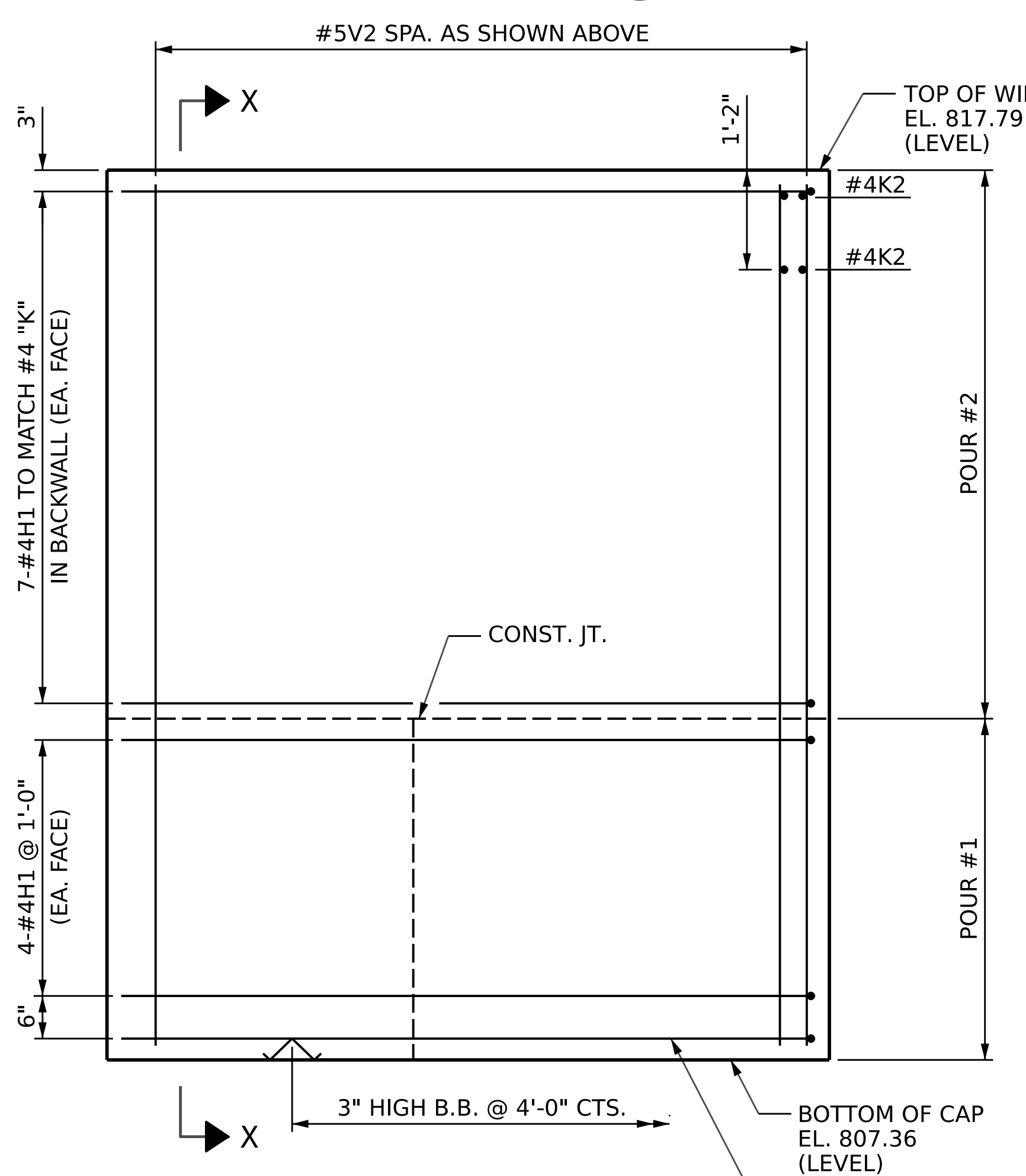
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



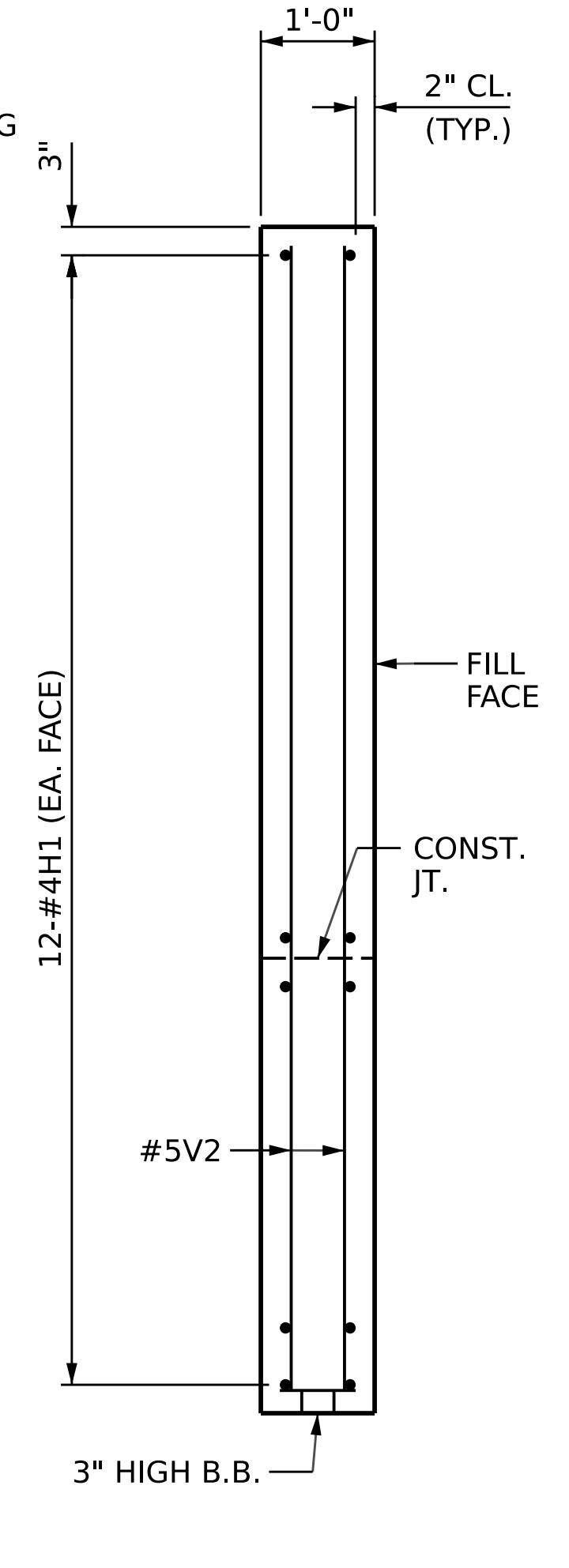
PLAN OF WING (W1)



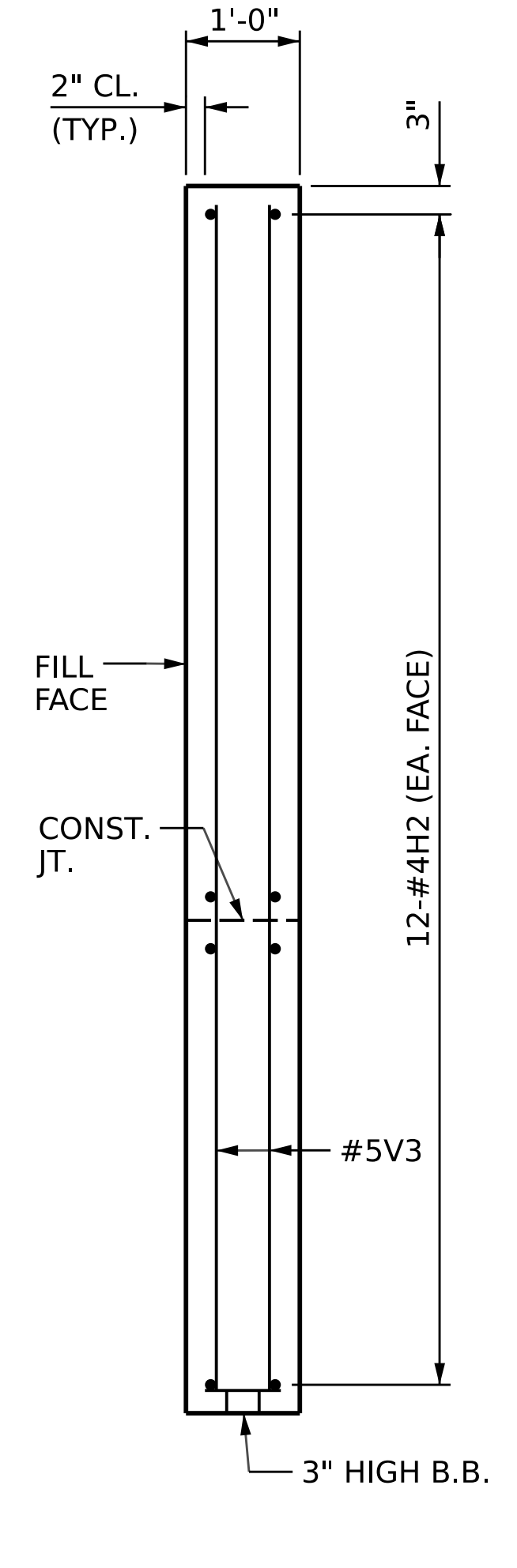
PLAN OF WING (W2)



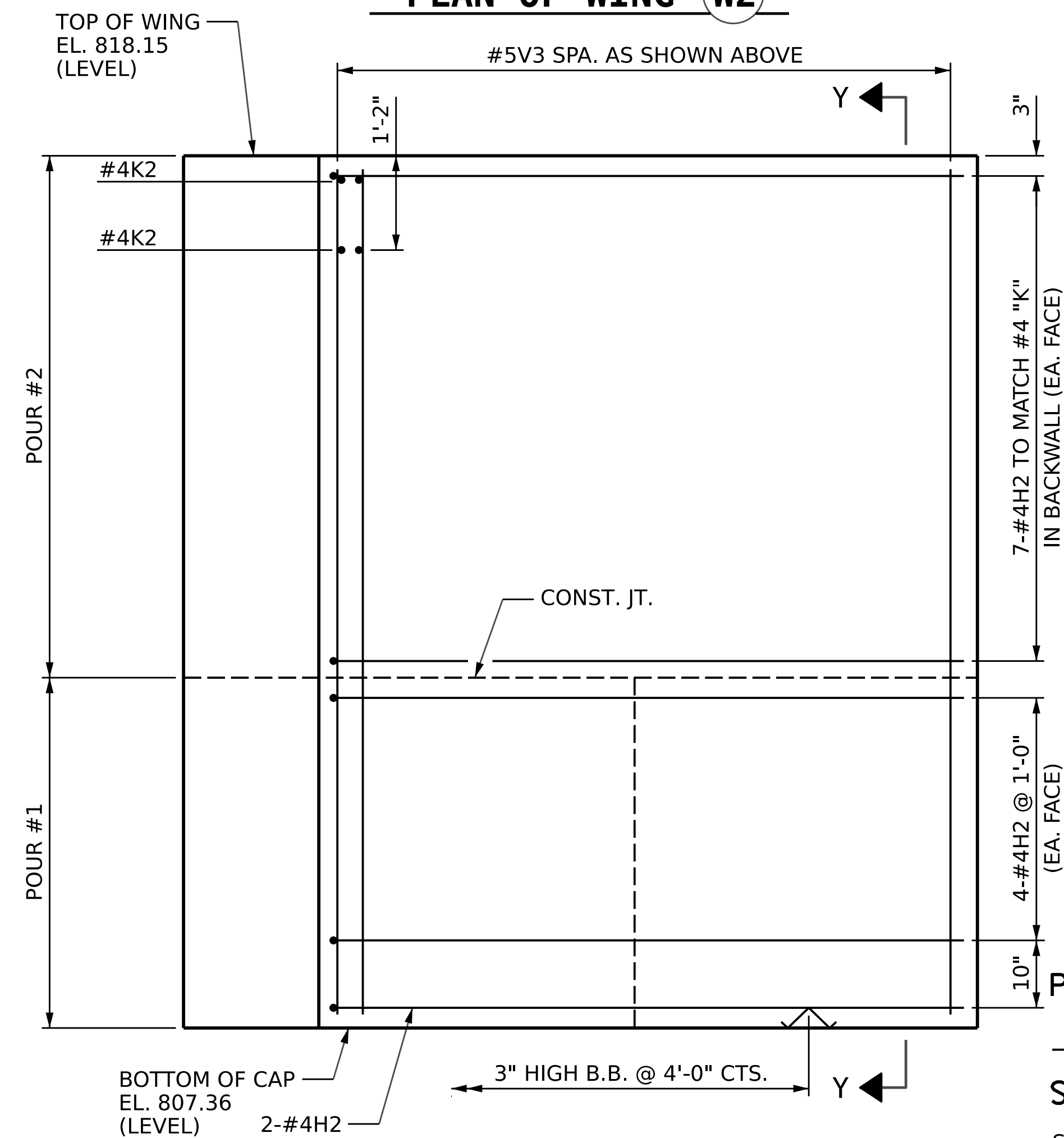
ELEVATION OF WING (W1)



SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W2)

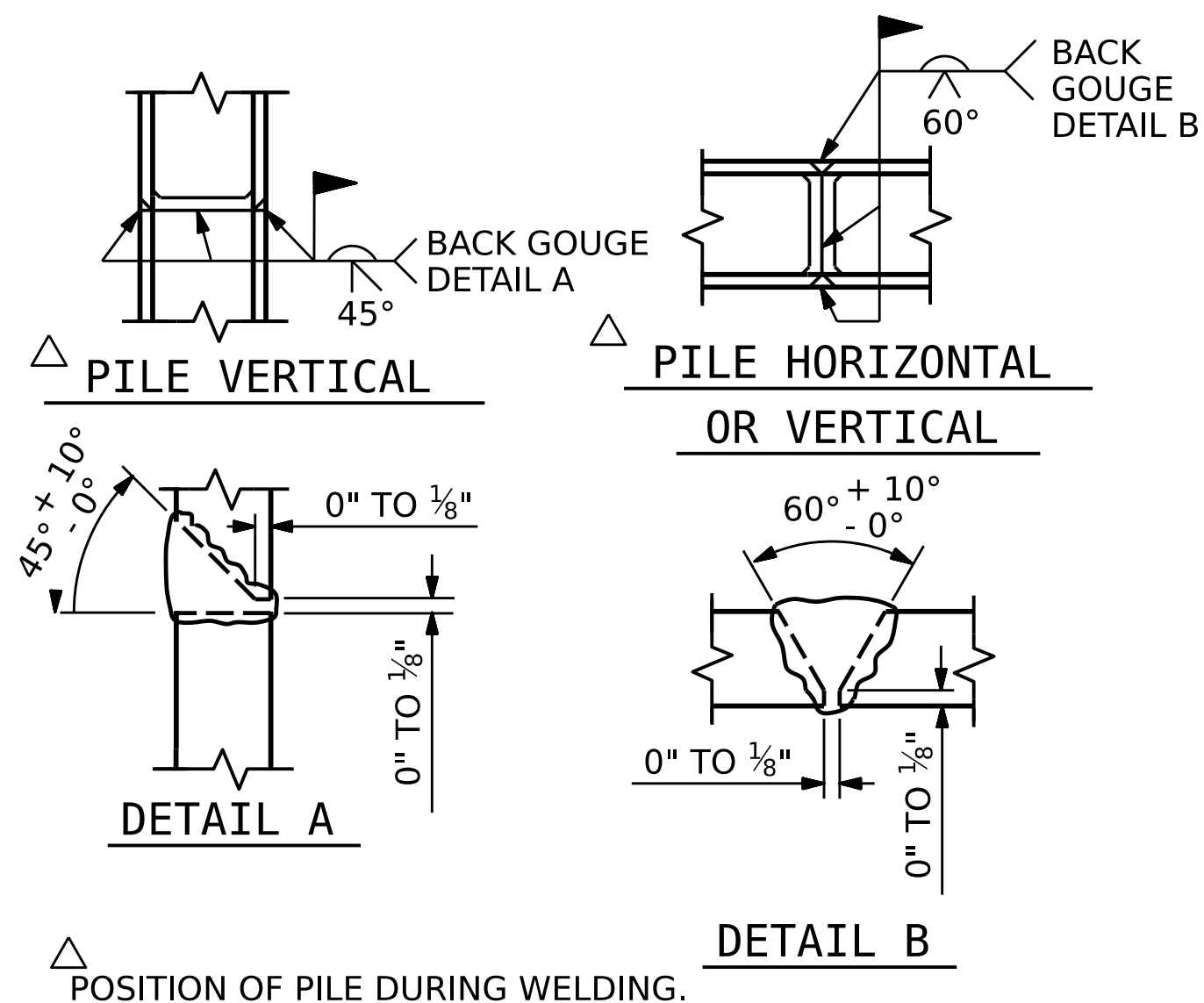
PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 3 OF 5

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD :	G. COLS	DATE :	12/2022

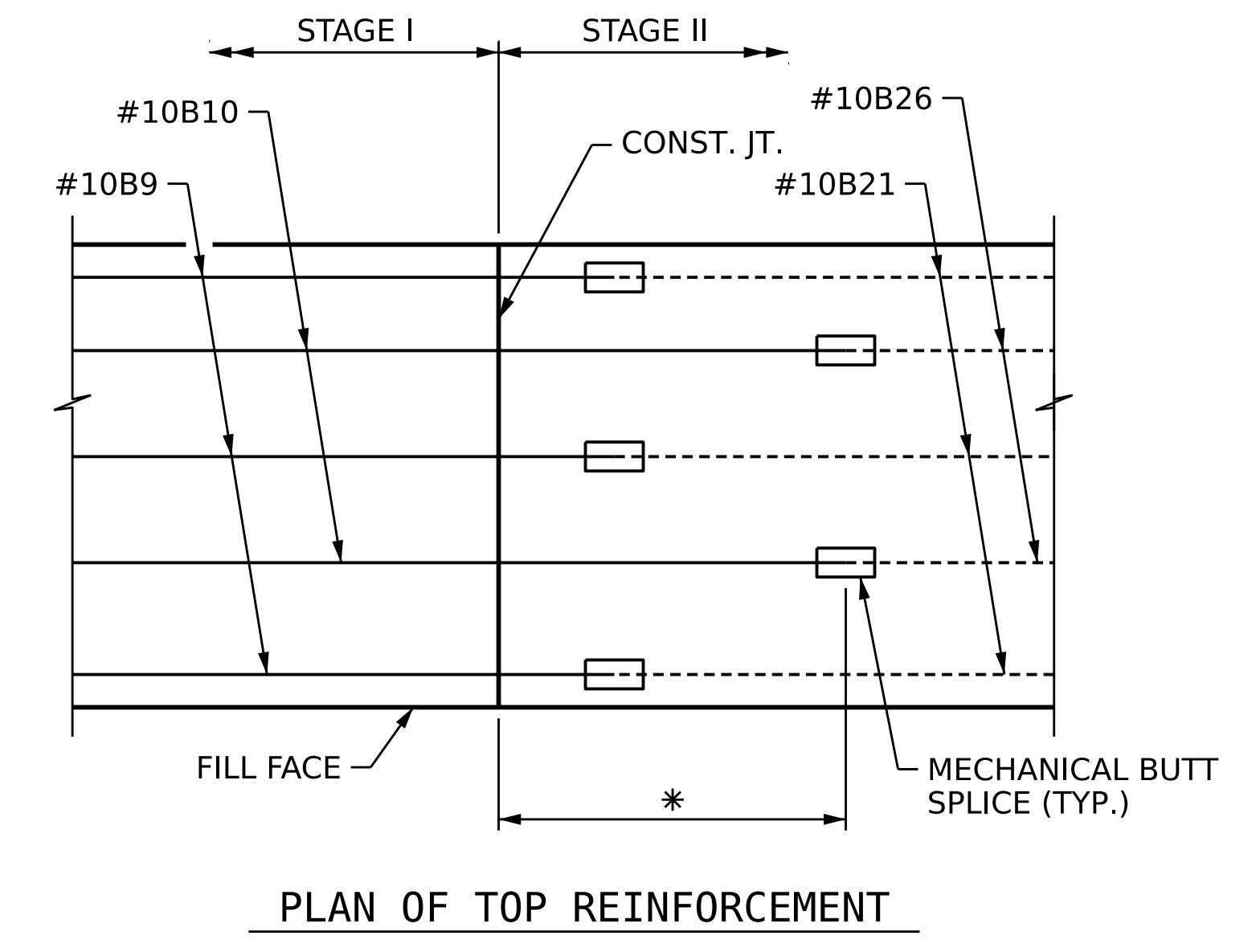
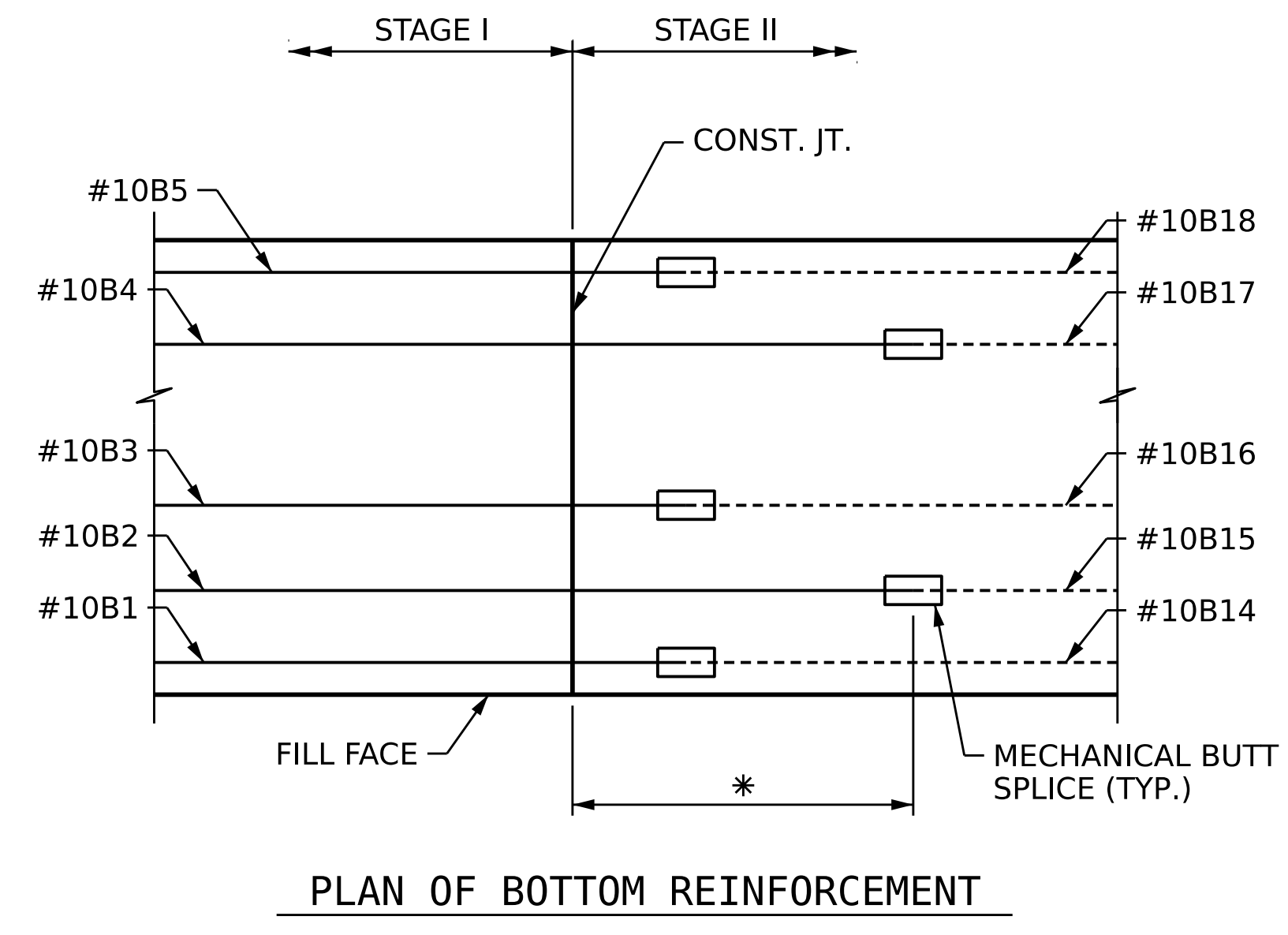
2/6/2023
 C:\pwworking\aecom.ds21.no.2020\d0125629\401.065.BR-0041.SMU.E103.S1-33.780001.dgn
 daniel.drums

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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-33
TOTAL SHEETS					48

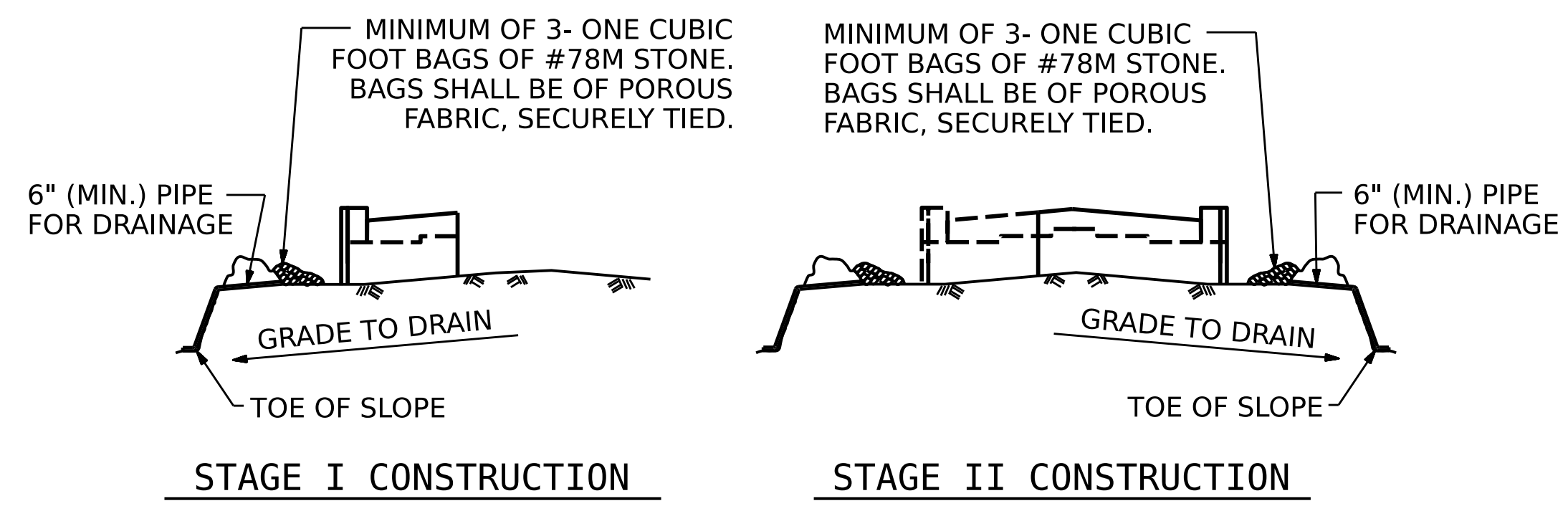


PILE SPLICE DETAILS



DETAIL "B"

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

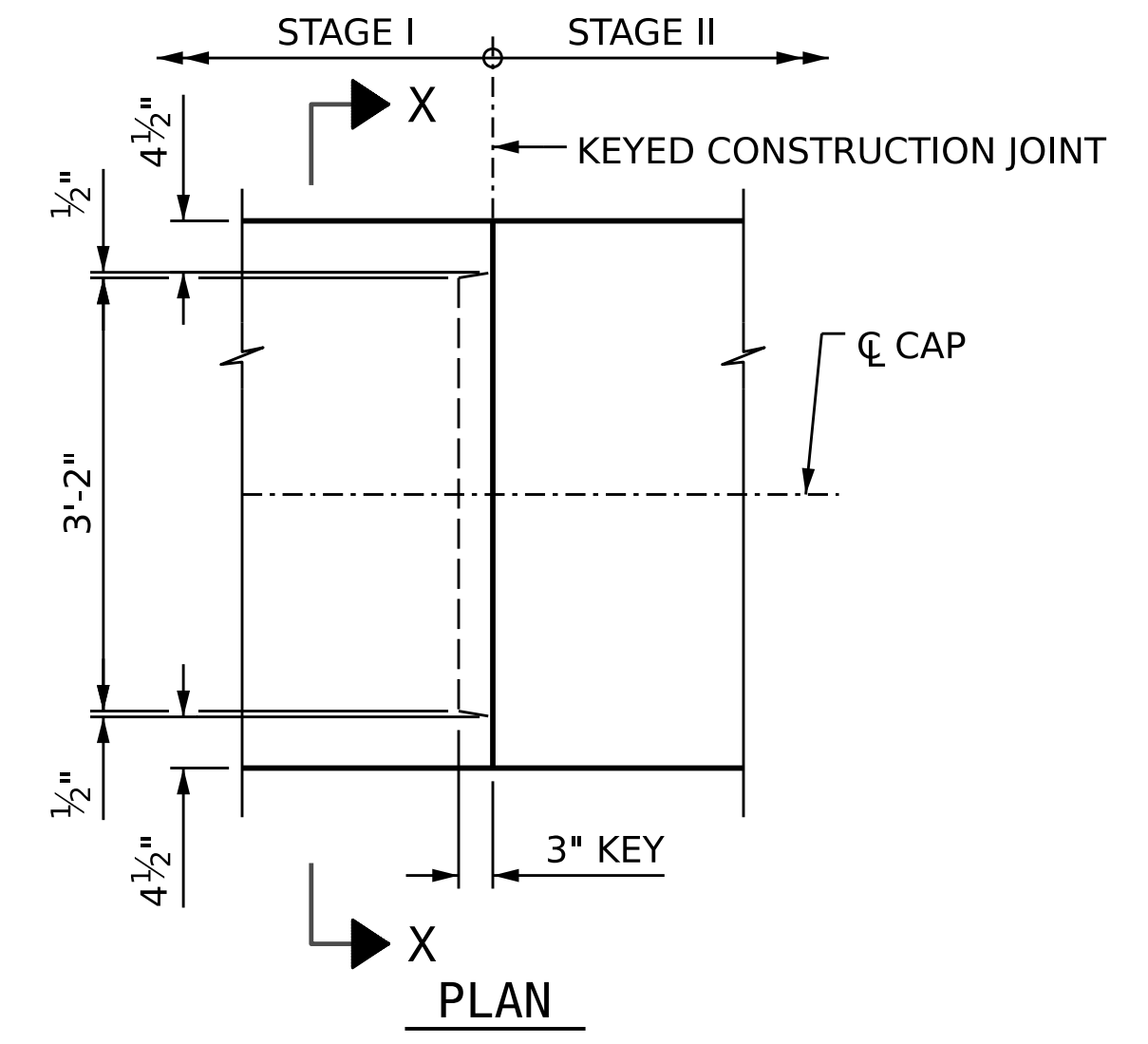
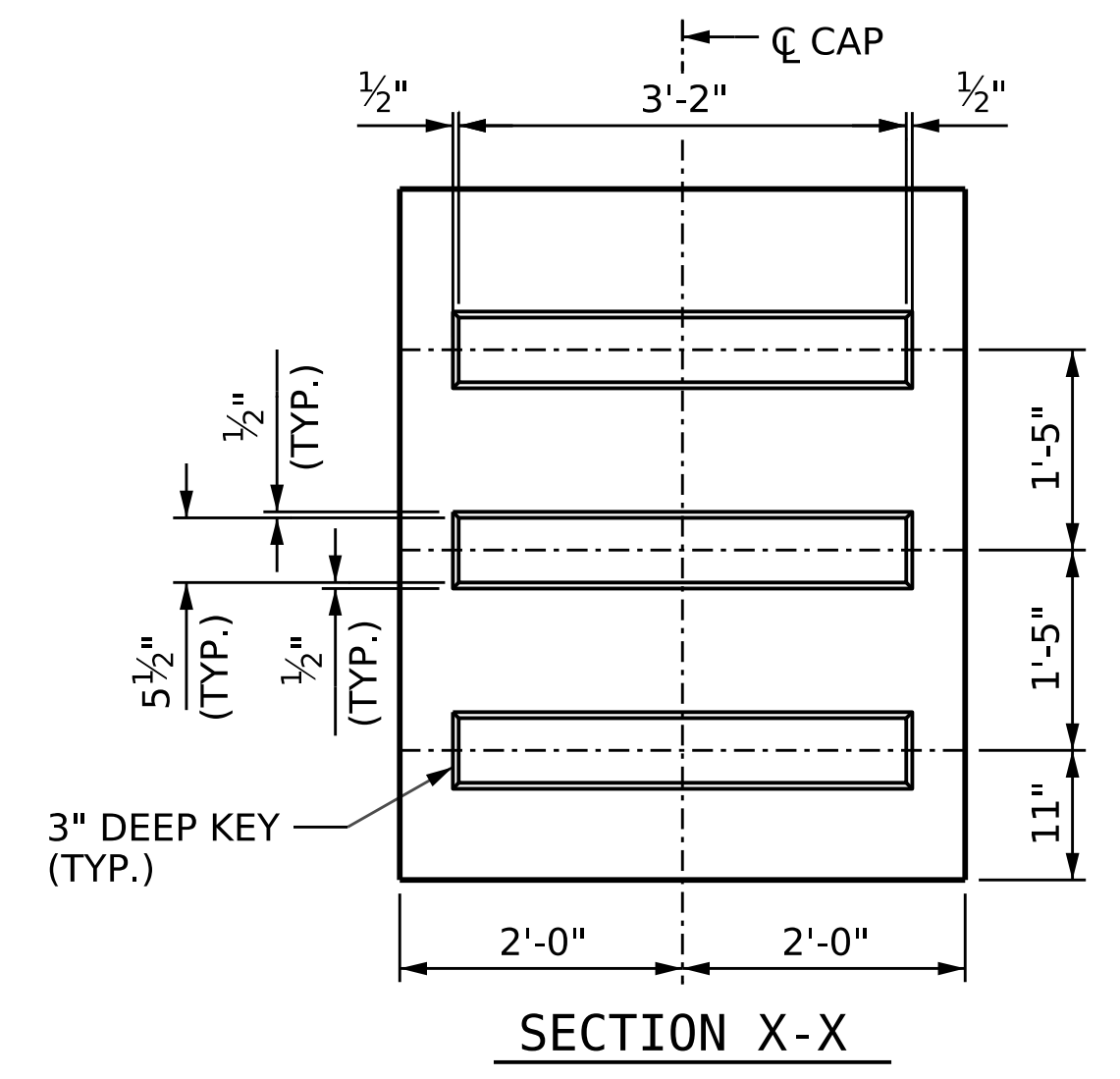


TEMPORARY DRAINAGE AT END BENT

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.



KEYED CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-
SHEET 4 OF 5

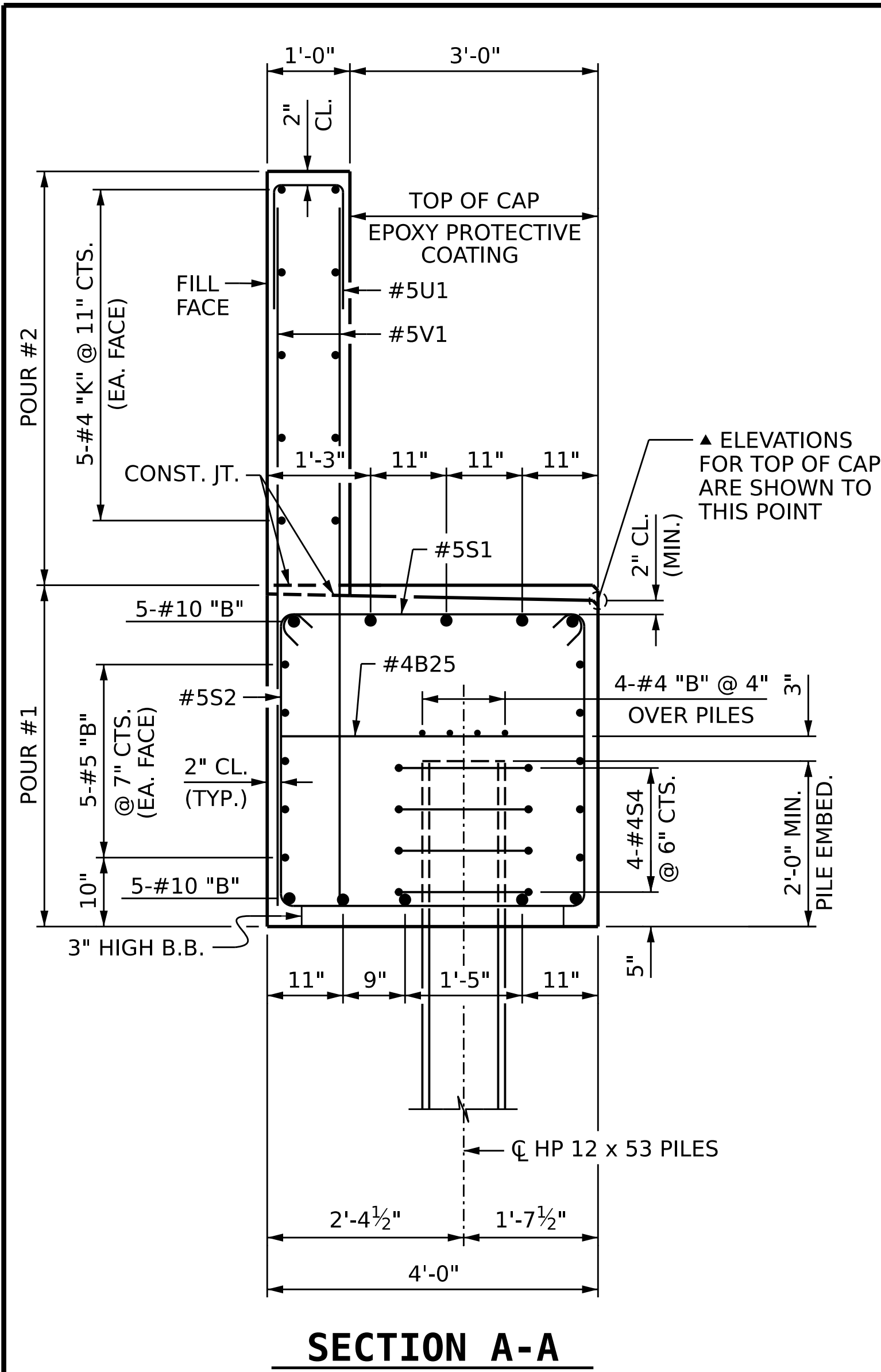
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5430 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F02642

NORTH CAROLINA PROFESSIONAL SEAL
REGISTERED PROFESSIONAL ENGINEER
GREGORY R. COLS
2/19/2023

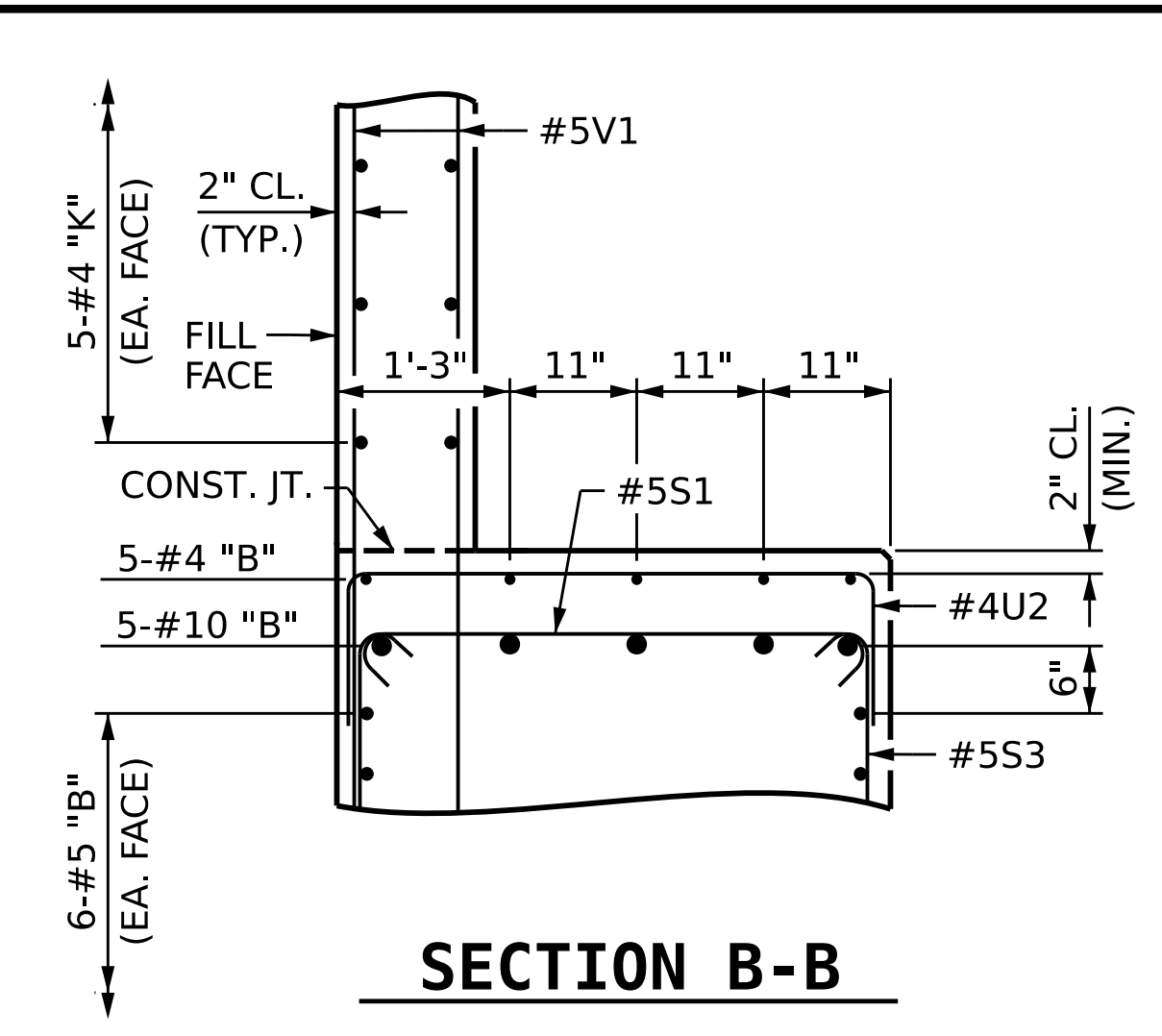
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUBSTRUCTURE END BENT 1 DETAILS						S-34
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	48
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

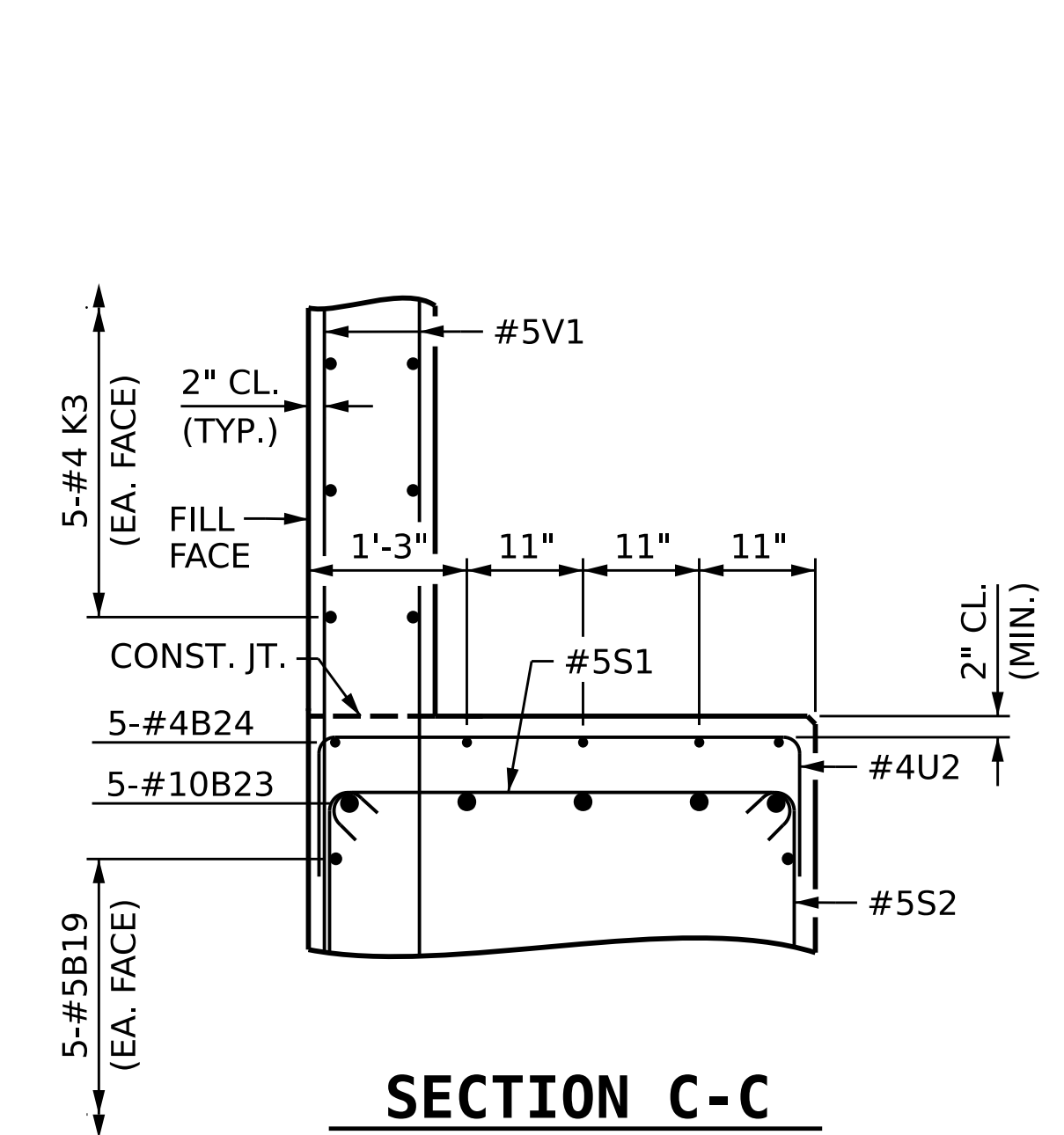
DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022



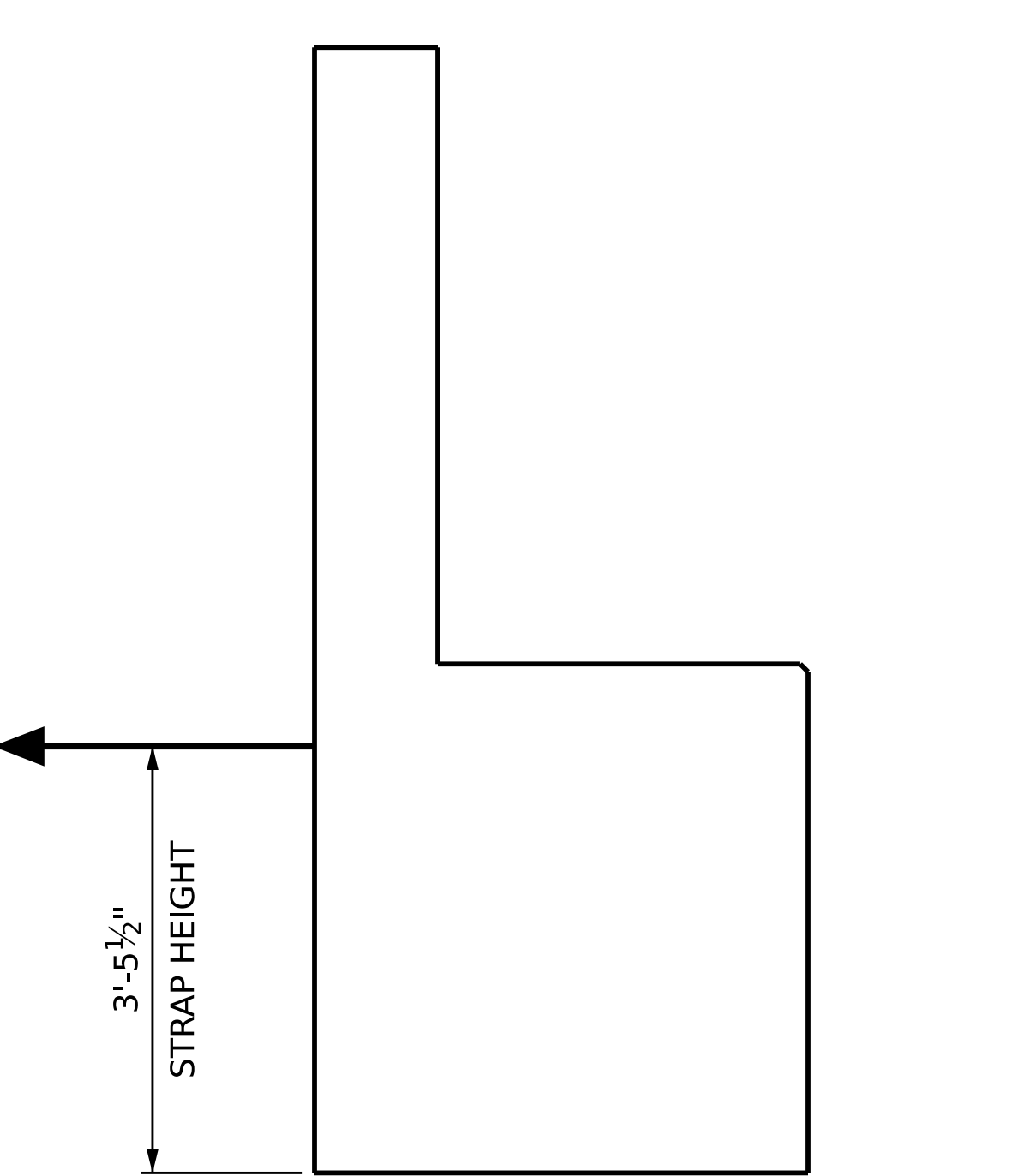
SECTION A-A



SECTION B-B



SECTION C-C



STRAP FORCE

SEE WALL PLANS AND SPECIAL PROVISIONS

BAR TYPES

BAR	DIM. "X"
B1	44'-9"
B2	46'-6"
B3	44'-2"
B4	45'-7"
B5	43'-4"
B7	37'-9"
B14	51'-4"
B15	49'-7"
B16	51'-11"
B17	50'-5"
B18	52'-8"
B23	25'-7"

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	46'-2"	199	B14	1	10	1	52'-9"	227
B2	1	10	1	47'-11"	206	B15	1	10	1	51'-0"	219
B3	1	10	1	45'-7"	196	B16	1	10	1	53'-4"	229
B4	1	10	1	47'-0"	202	B17	1	10	1	51'-10"	223
B5	1	10	1	44'-9"	193	B18	1	10	1	54'-1"	233
B6	20	5	STR	25'-1"	523	B19	20	5	STR	28'-5"	593
B7	5	10	1	39'-2"	843	B20	2	5	STR	31'-3"	65
B8	5	4	STR	11'-0"	37	B21	3	10	STR	37'-3"	481
B9	3	10	STR	16'-0"	207	B22	5	4	STR	15'-7"	52
B10	2	10	STR	18'-0"	155	B23	5	10	1	27'-0"	581
B11	5	4	STR	3'-6"	12	B24	5	4	STR	16'-0"	53
B12	8	4	STR	24'-8"	132	B25	13	4	STR	3'-8"	32
B13	2	5	STR	12'-2"	25	B26	2	10	STR	35'-3"	303
B25	11	4	STR	3'-8"	27	B27	8	4	STR	28'-1"	150
						B28	5	4	STR	3'-3"	11
H1	24	4	2	8'-5"	135	H2	24	4	3	8'-8"	139
K1	20	4	STR	24'-4"	325	K2	4	4	STR	4'-2"	11
K2	4	4	STR	4'-2"	11	K3	20	4	STR	28'-1"	375
S1	51	5	4	4'-7"	244	S1	64	5	4	4'-7"	306
S2	32	5	5	11'-9"	392	S2	19	5	5	11'-9"	233
S3	19	5	5	12'-9"	253	S3	45	5	5	12'-9"	598
S4	28	4	6	6'-6"	122	S4	32	4	6	6'-6"	139
U1	39	4	7	4'-8"	122	U1	48	4	7	4'-8"	150
U2	11	4	7	6'-2"	45	U2	26	4	7	6'-2"	107
V1	78	5	STR	8'-1"	658	V1	96	5	STR	8'-1"	809
V2	26	5	STR	10'-1"	273	V3	26	5	STR	10'-5"	282
REINFORCING STEEL					5,537 LBS.	REINFORCING STEEL					6,601 LBS.
CLASS A CONCRETE						CLASS A CONCRETE					
POUR #1 (CAP & LOWER WINGWALL)					28.2 C.Y.	POUR #1 (CAP & LOWER WINGWALL)					37.1 C.Y.
POUR #2 (BACKWALL & UPPER WINGWALL)					9.4 C.Y.	POUR #2 (BACKWALL & UPPER WINGWALL)					10.8 C.Y.
TOTAL = 37.6 C.Y.						TOTAL = 47.9 C.Y.					

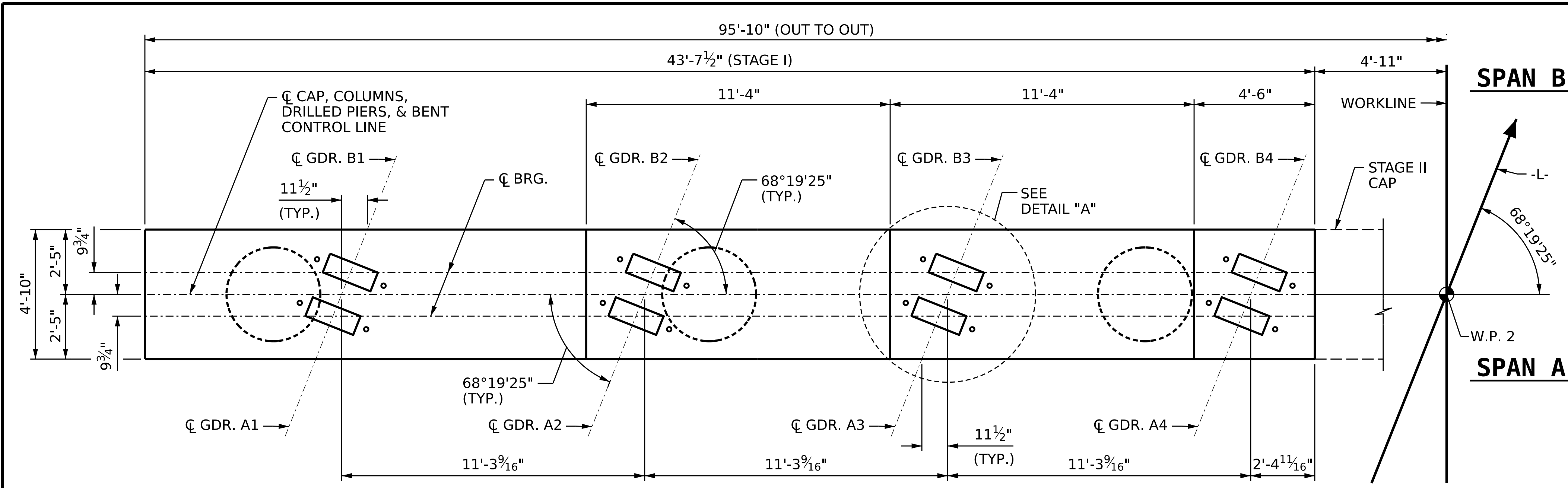
DRAWN BY: D.R. DRUM DATE: 09/2022
 CHECKED BY: S. NATARAJAN DATE: 10/2022
 DESIGN ENGINEER OF RECORD: G. COLS DATE: 12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 5 OF 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTALS
2			4			48

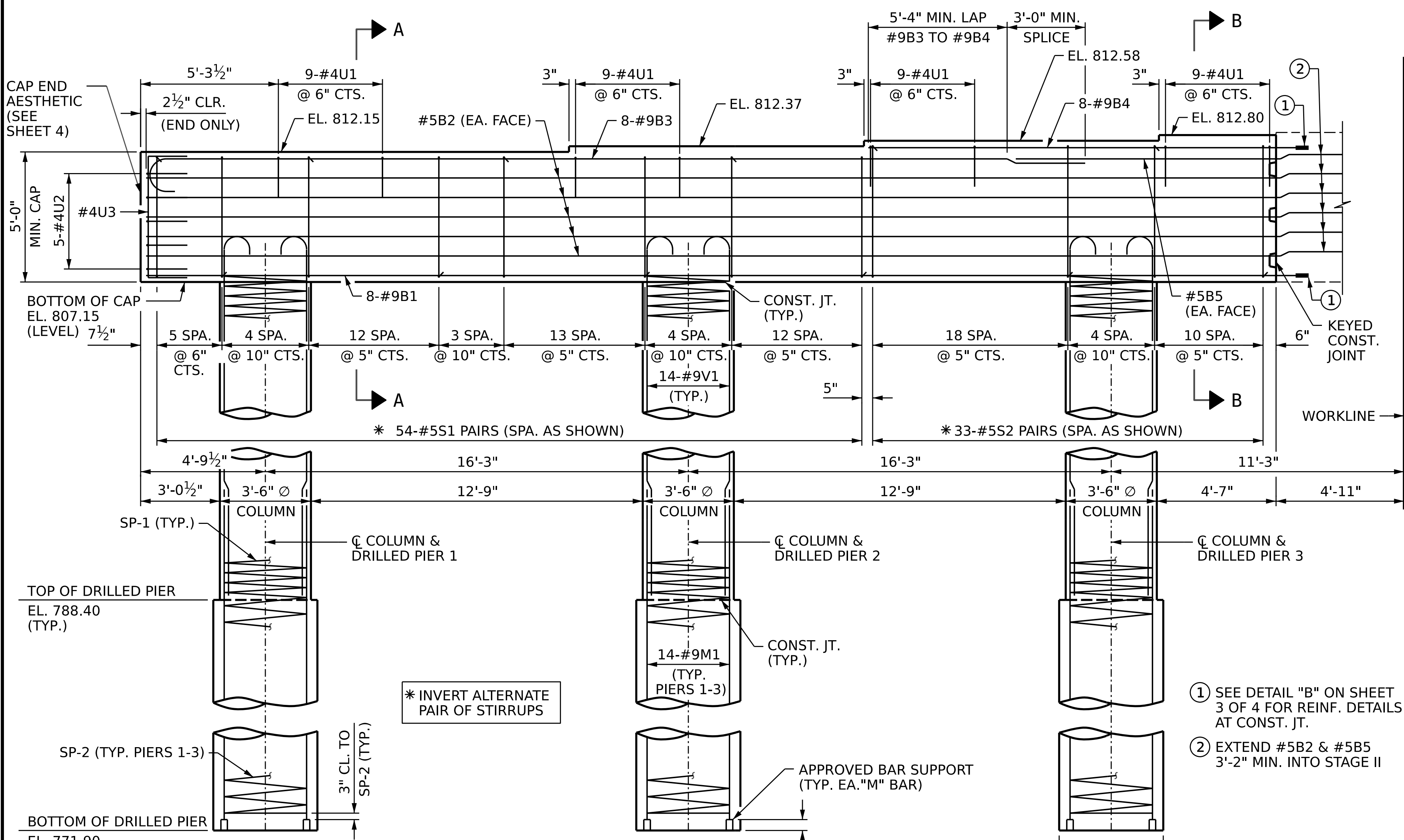
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
END BENT 1
 SECTIONS



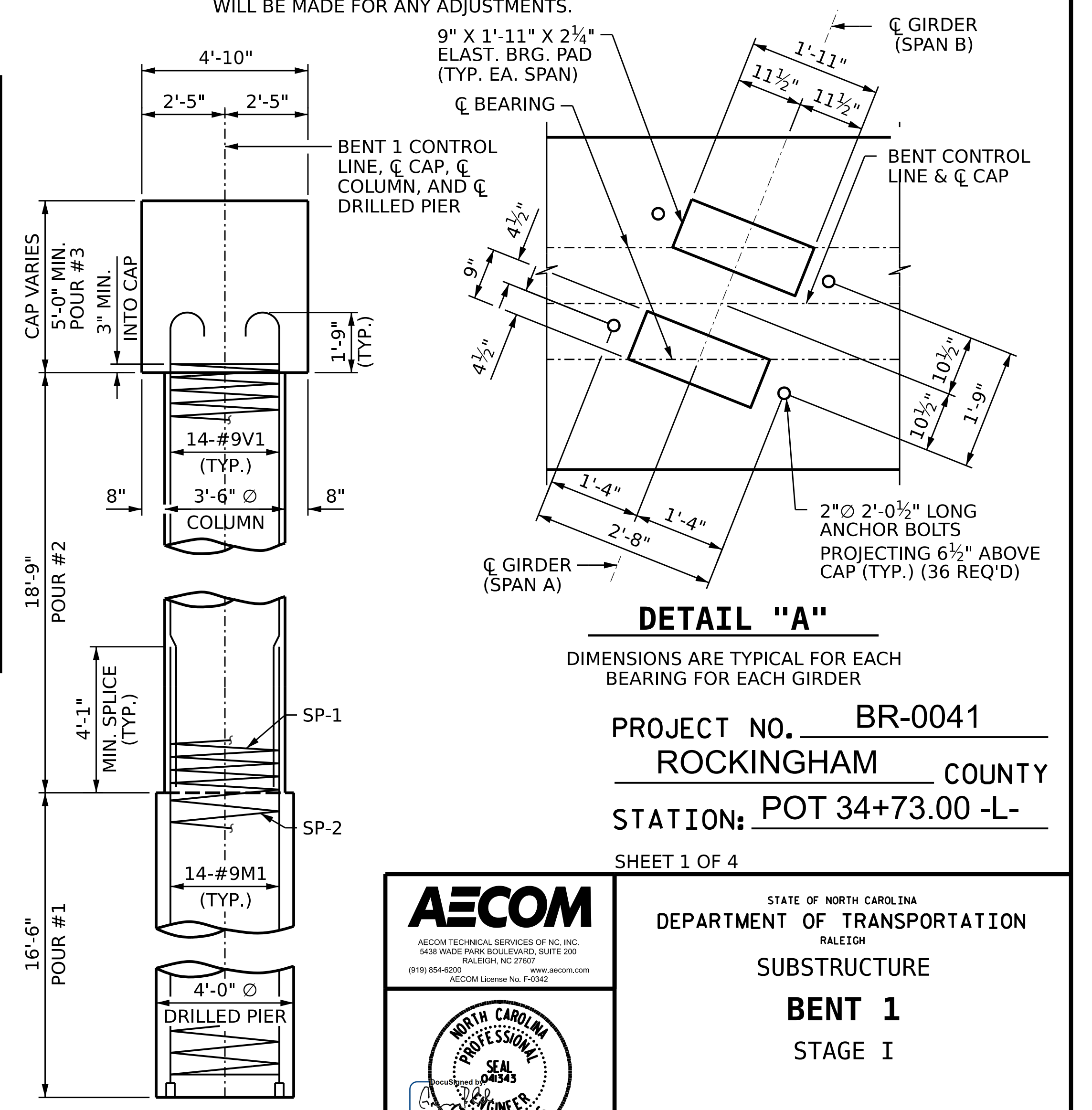
PLAN

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 #9 BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II.
- 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 "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.



ELEVATION



STAGE I END ELEVATION

DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH BEARING FOR EACH GIRDER

PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
BENT 1
 STAGE I

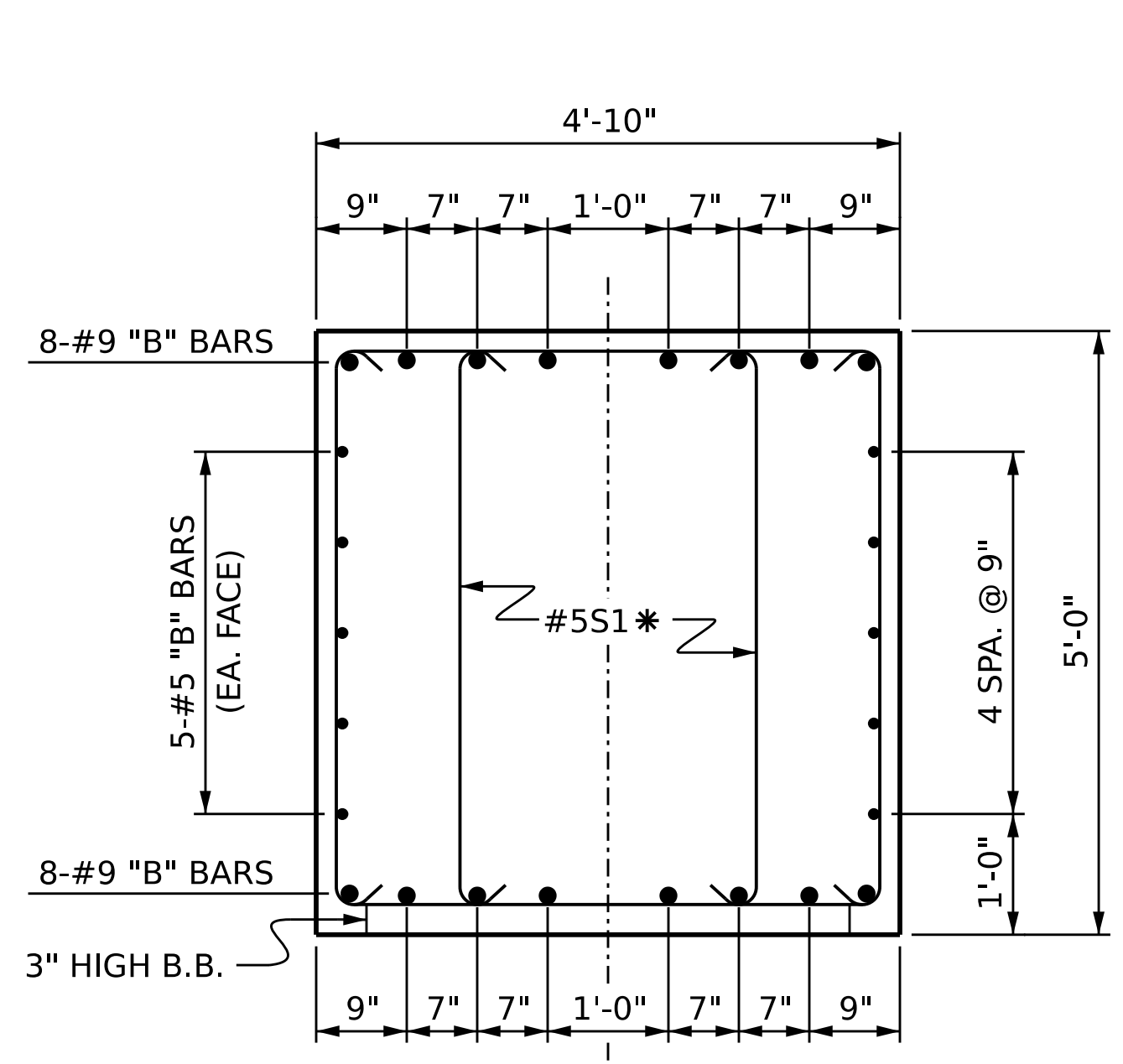
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

NORTH CAROLINA PROFESSIONAL SEAL
 GREGORY R. COLS
 2/19/2023

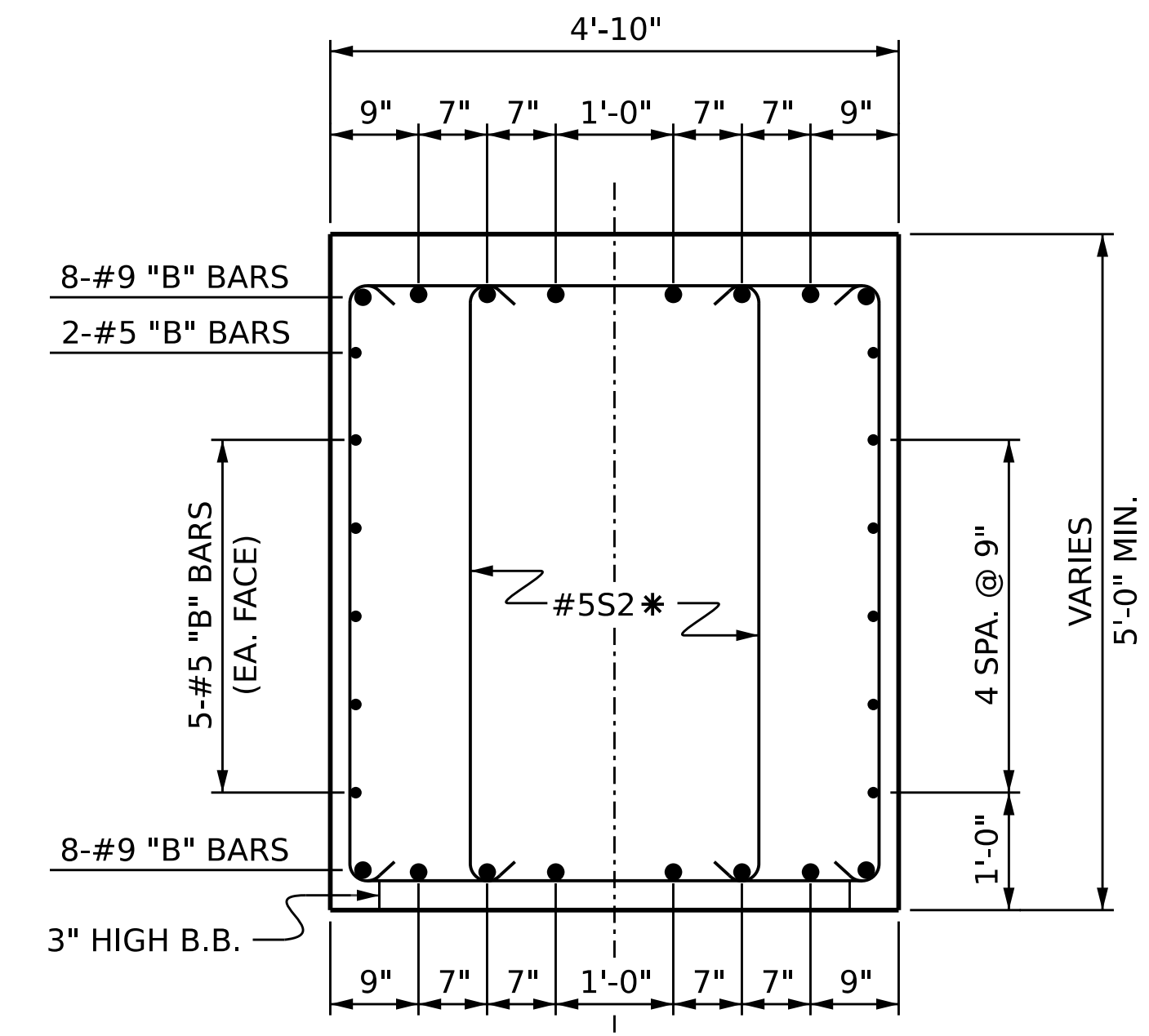
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS 48
2			4			

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

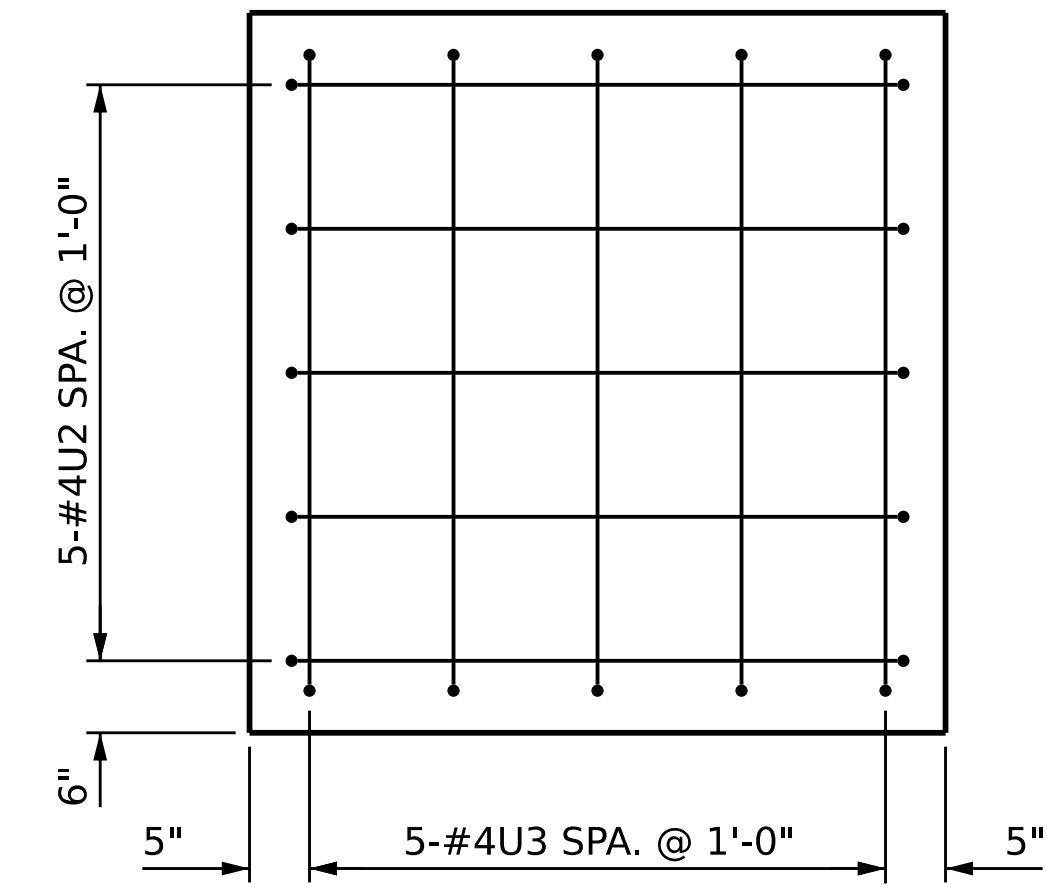


SECTION A-A

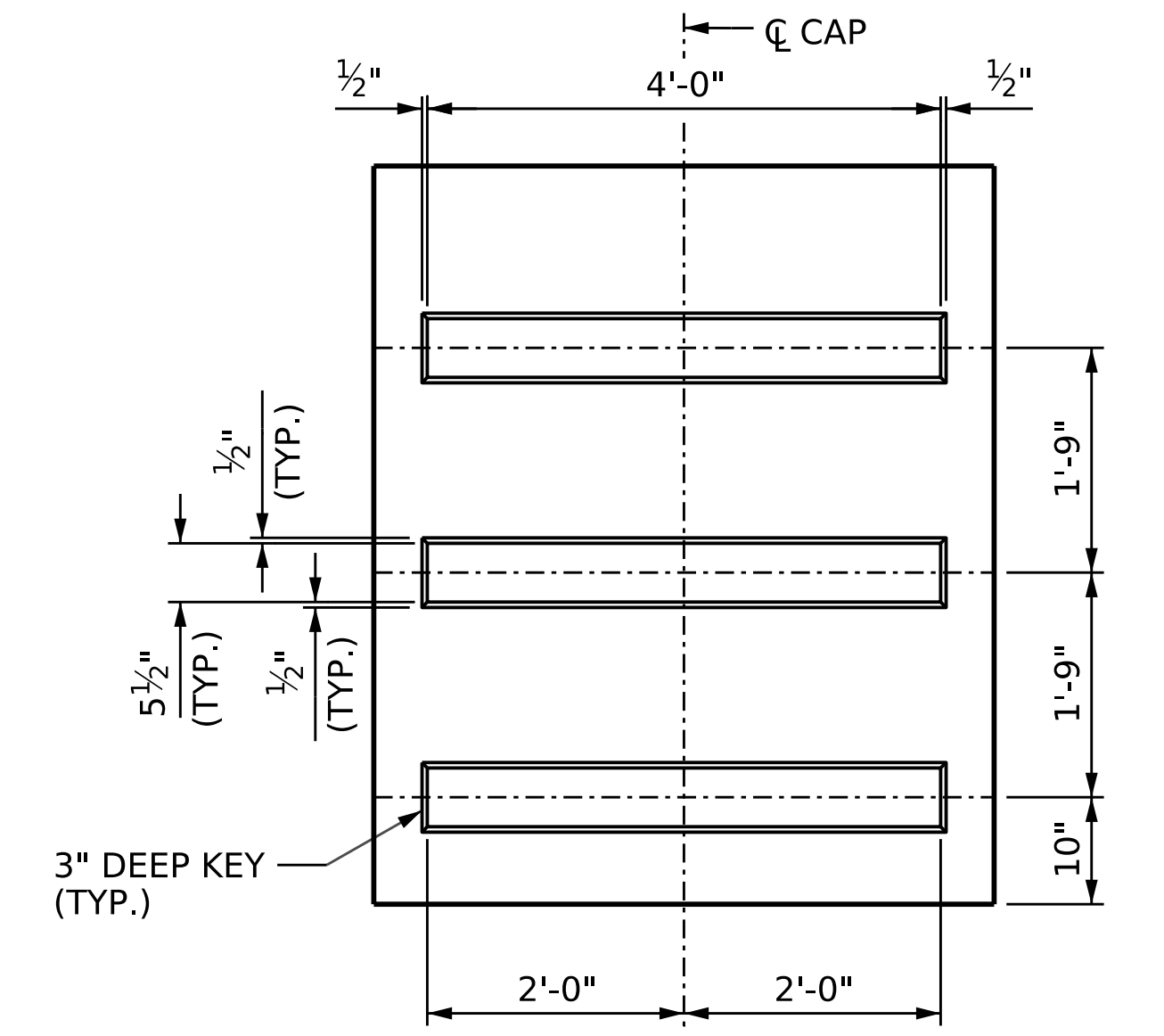


SECTION B-B

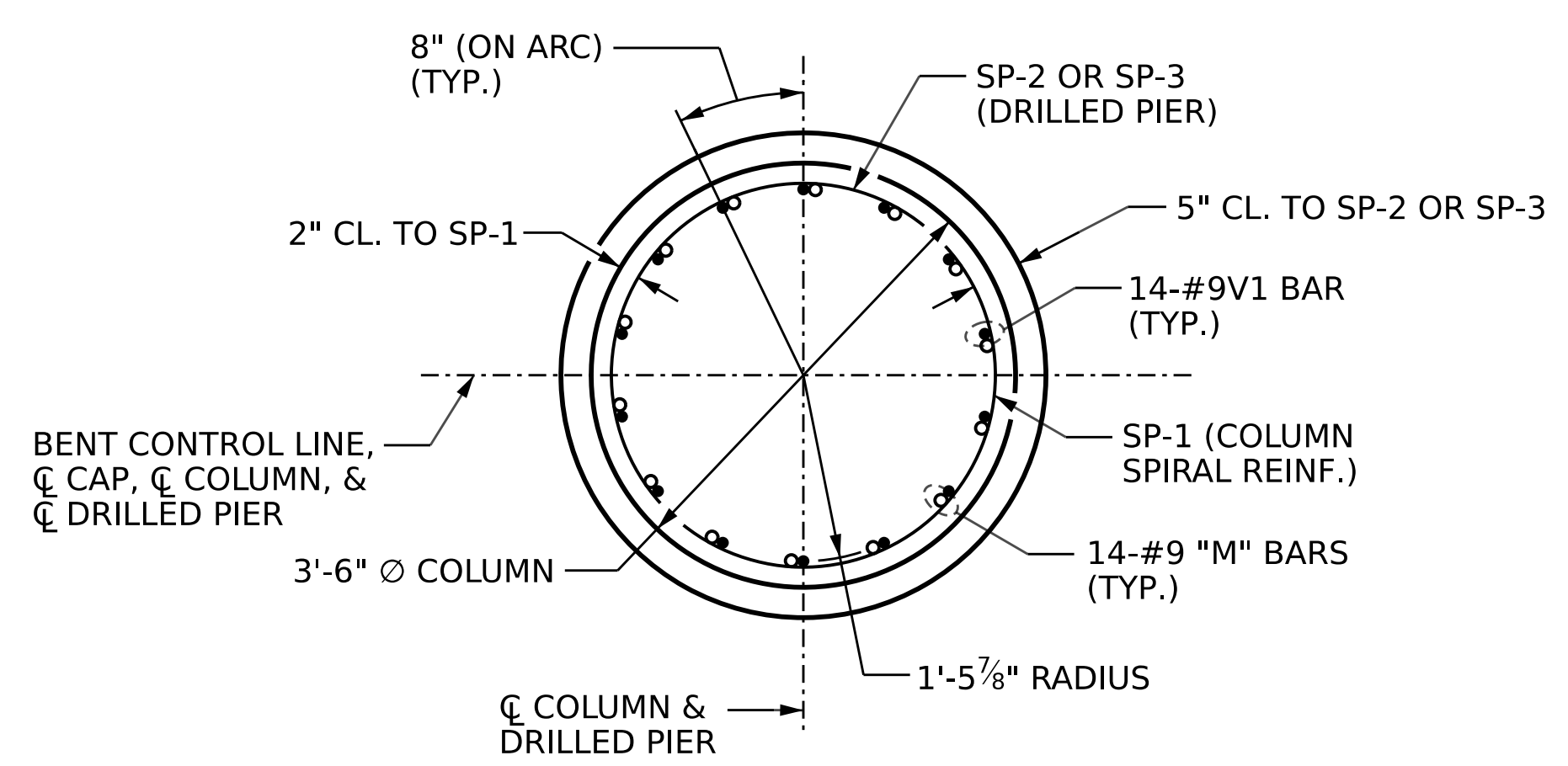
*INVERT ALTERNATE PAIR OF STIRRUPS



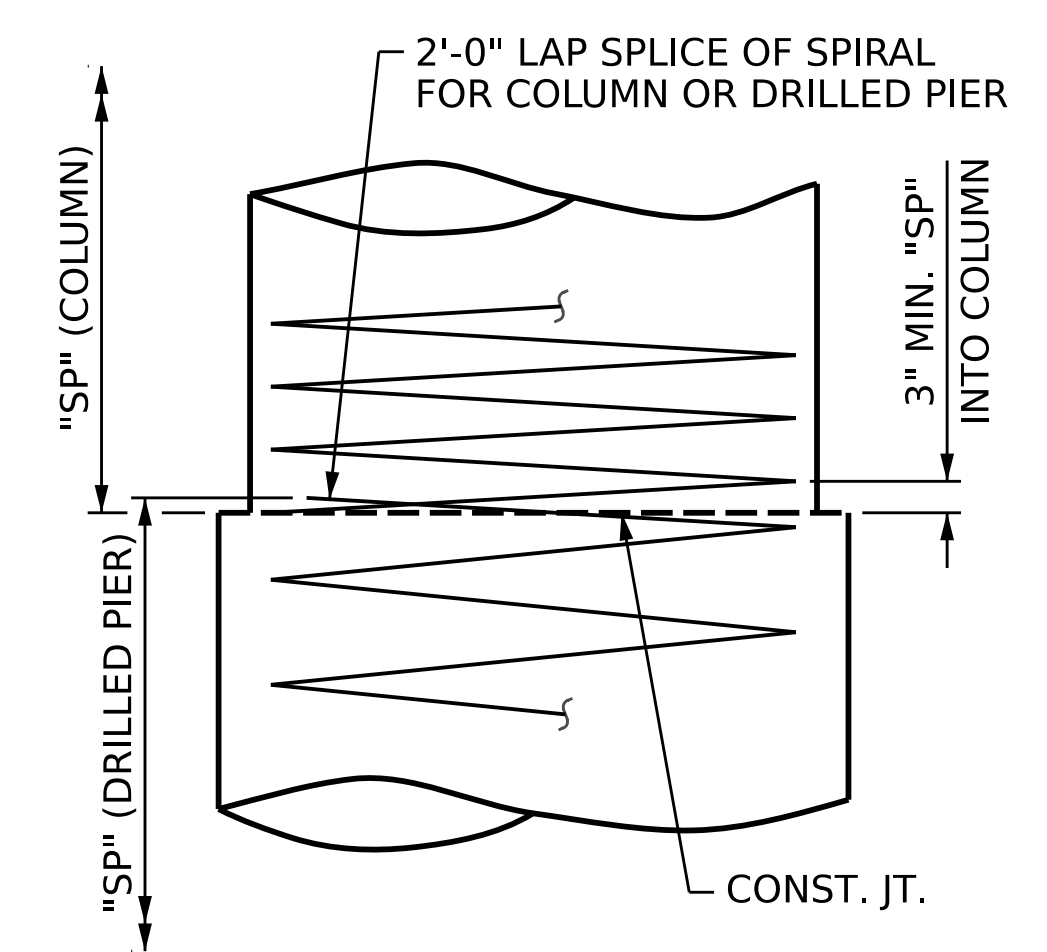
CAP END VIEW



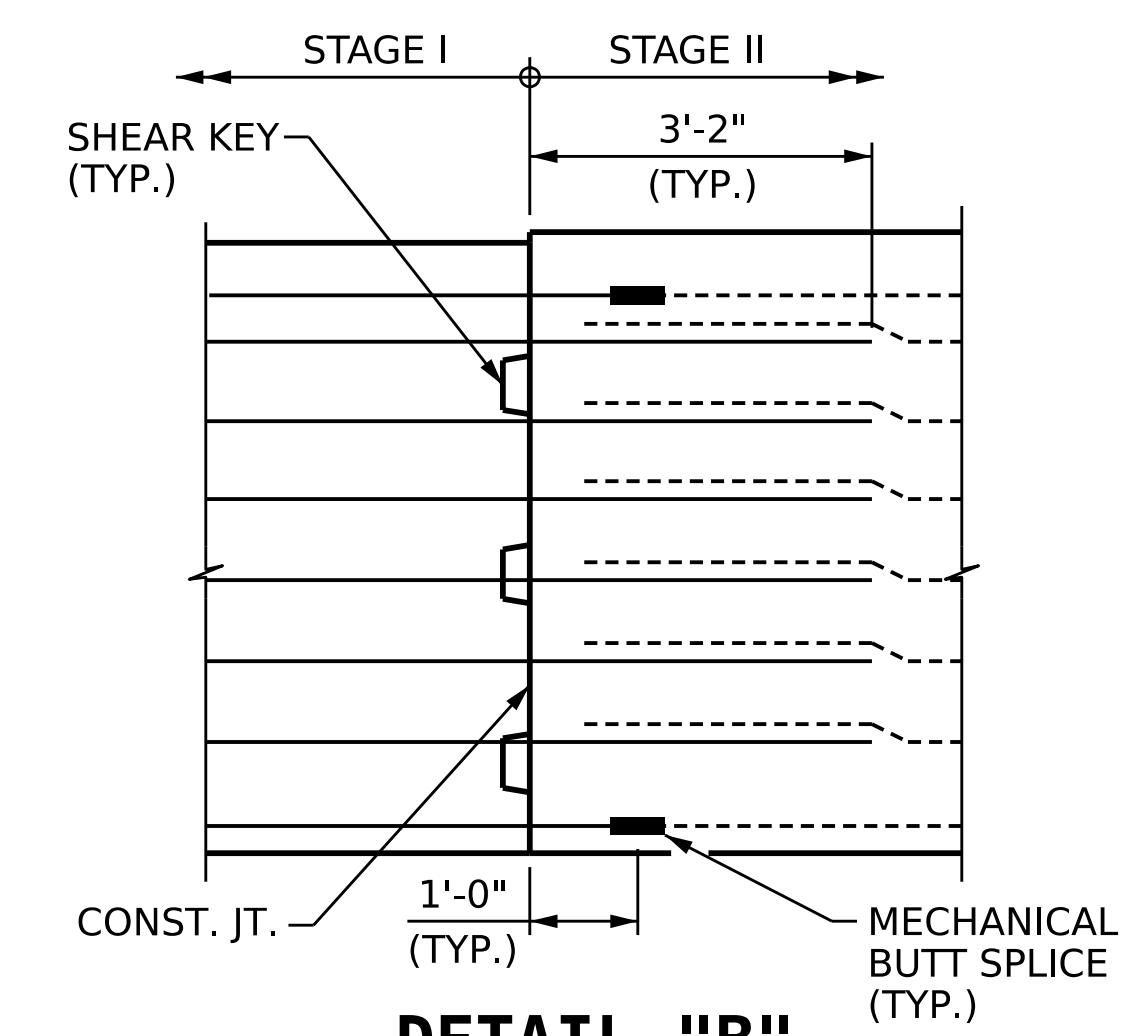
SECTION X-X



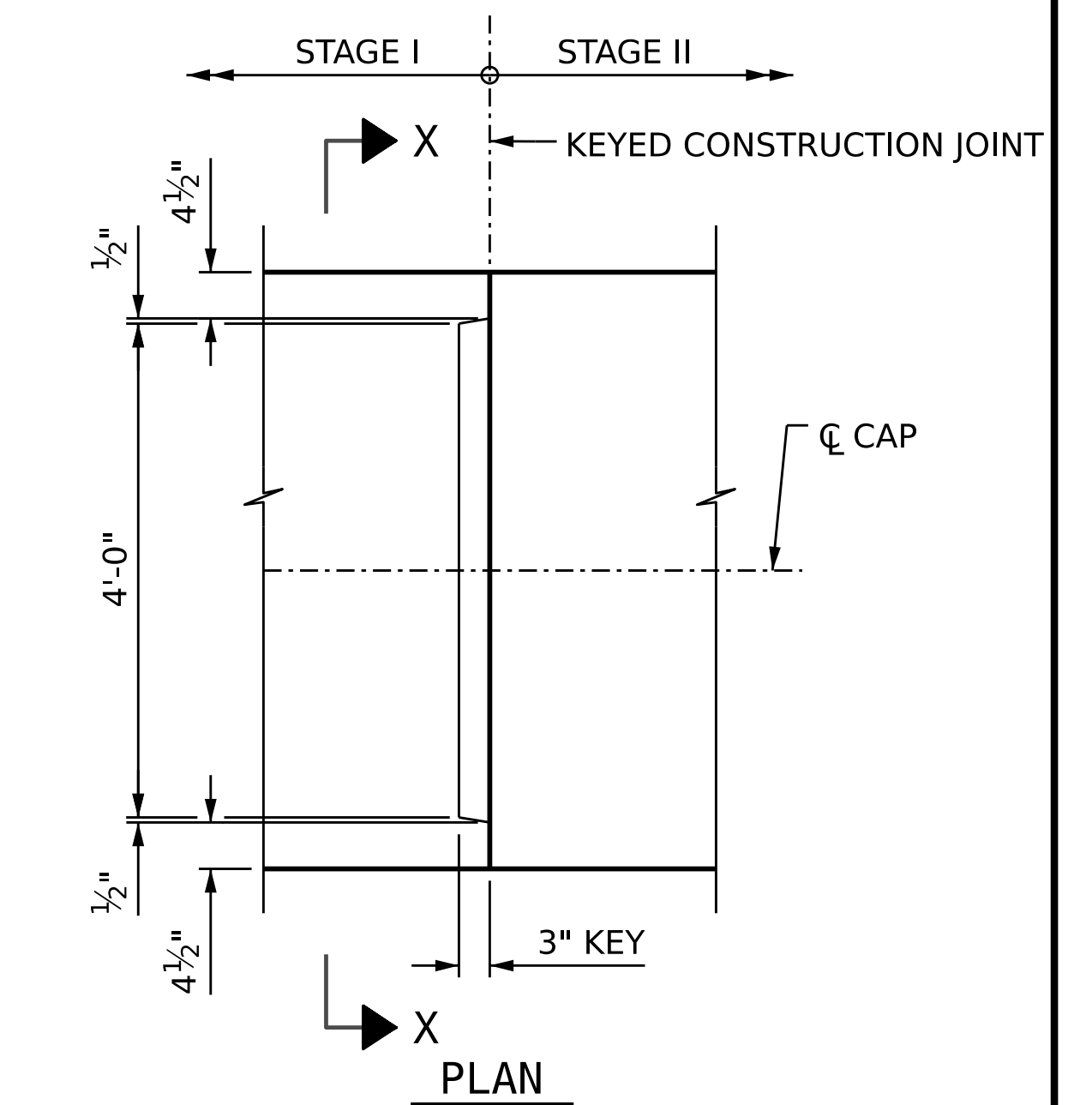
SECTION THRU COLUMN & DRILLED PIER



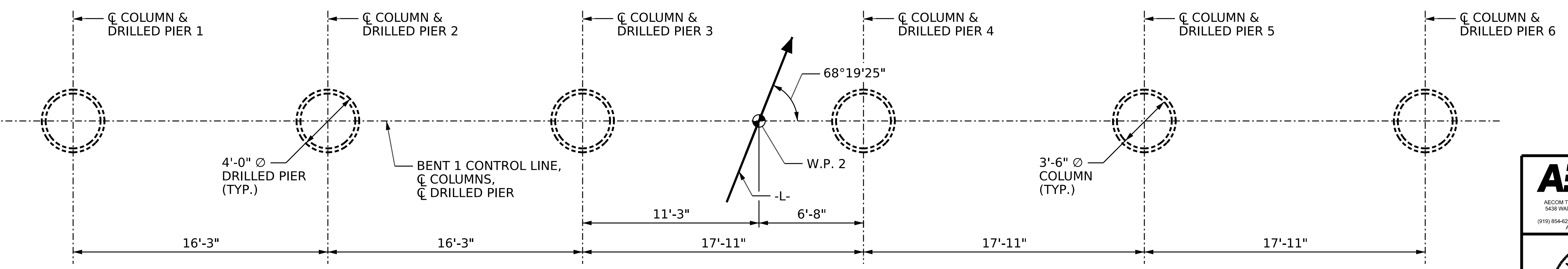
CONSTRUCTION JOINT DETAIL



DETAIL "B"



KEYED CONSTRUCTION JOINT DETAIL



PLAN OF DRILLED PIERS AND COLUMNS

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 3 OF 4

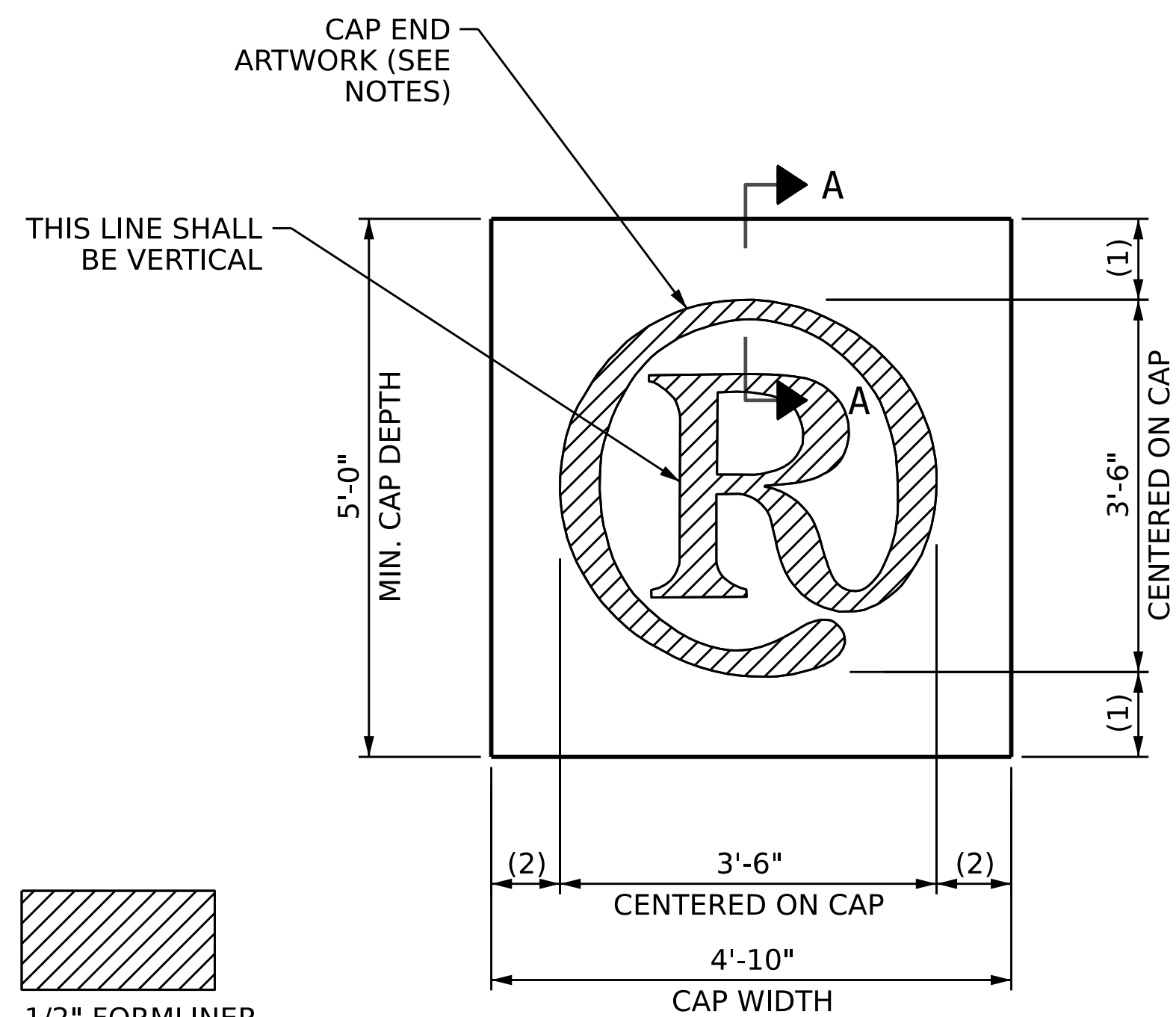
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 DANIEL DRUM
 2/19/2023

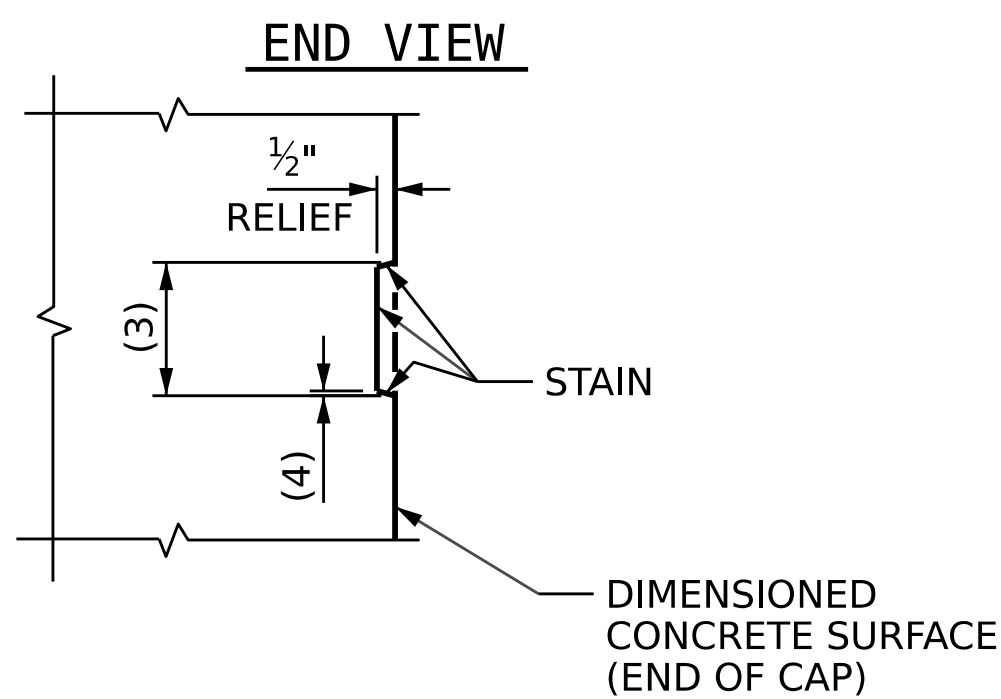
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-38
					TOTAL SHEETS 48

DRAWN BY : D.R. DRUM	DATE : 09/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DESIGN ENGINEER OF RECORD : G. COLS	DATE : 12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



(1), (2): PROVIDE EQUAL DISTANCE



SECTION A-A THRU FORMLINER RELIEF

NOTES

THE CONTRACTOR SHALL PROVIDE A FORMLINER TO ACHIEVE THE CAP END AESTHETIC AS SHOWN IN THE DETAILS AS A RELIEF AREA ON THE END OF THE CAP. THE ENTIRE AREA THAT IS RECESSED SHALL BE STAINED.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE METHOD FOR ACHIEVING THE FORMLINER RELIEF, INCLUDING DIMENSIONS, AND PAINT SYSTEM AND COLOR TO BE USED, FOR APPROVAL PRIOR TO CONSTRUCTING THE CAP.

AT THE CONTRACTOR'S REQUEST, THE ENGINEER MAY PROVIDE A DIGITAL FILE OF THE ARTWORK SHAPE.

SEE SPECIAL PROVISIONS.

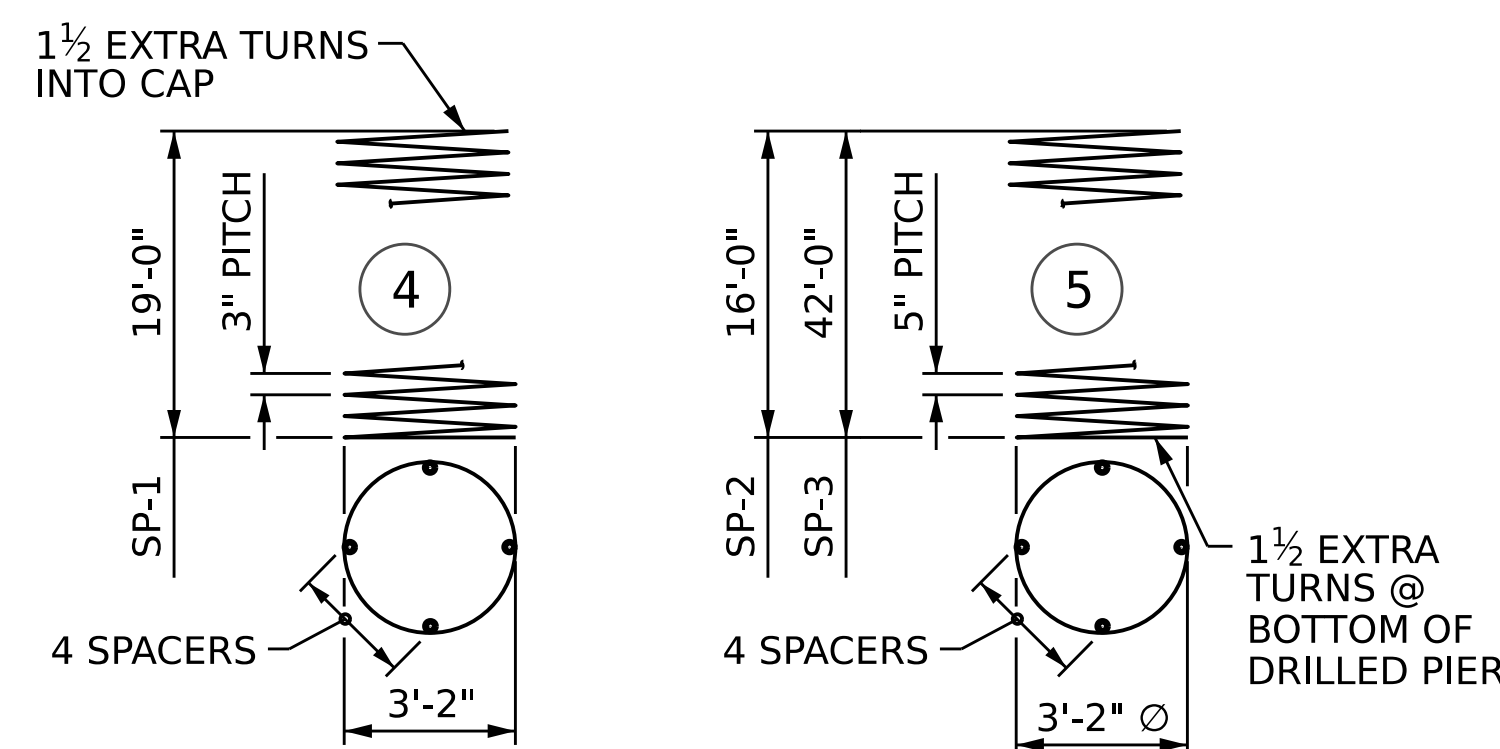
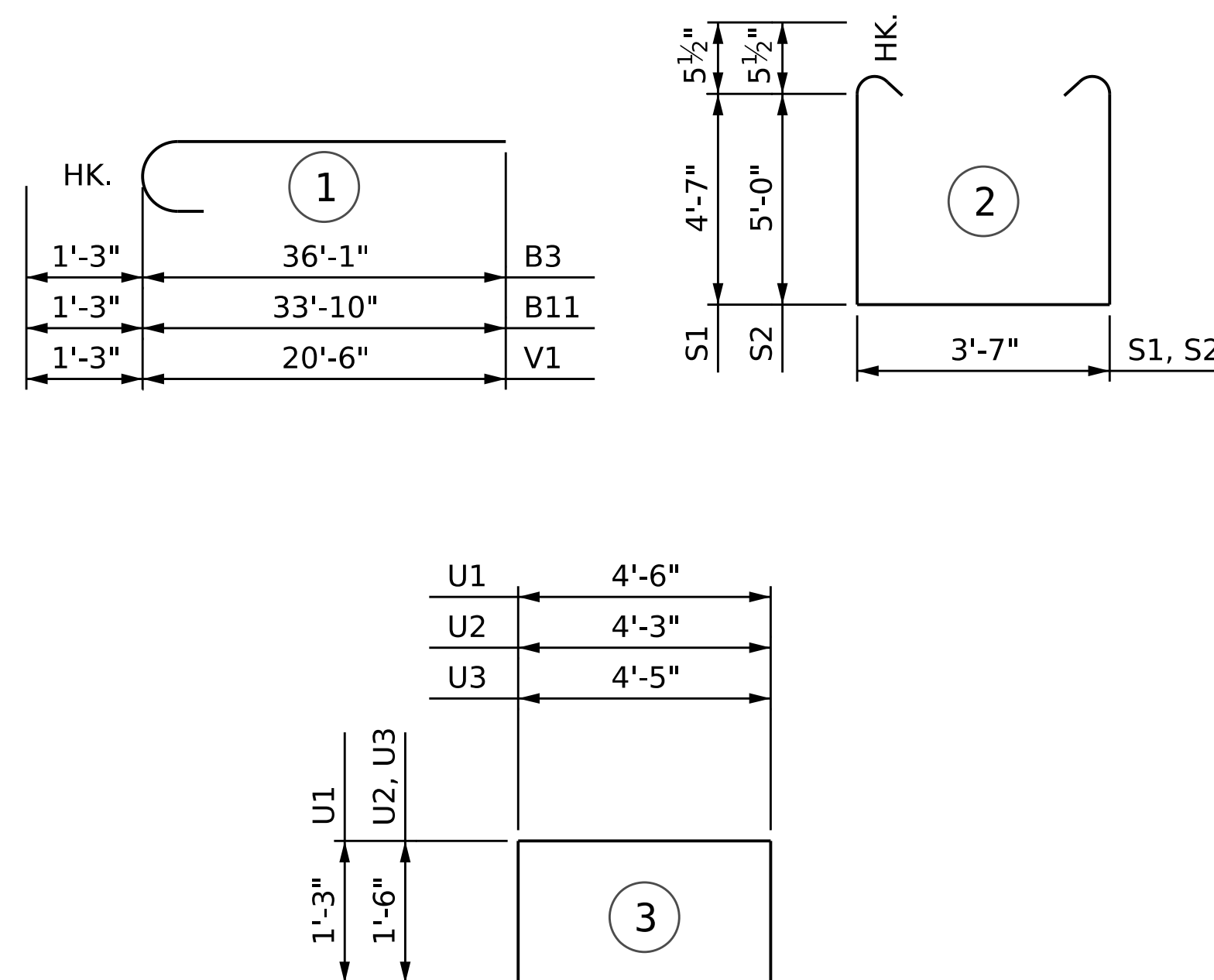
CAP END AESTHETICS

PROVIDE ON EACH END OF BENT 1 CAP

QTY. "CAP END AESTHETIC" = 2 EA.

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022

BAR TYPES



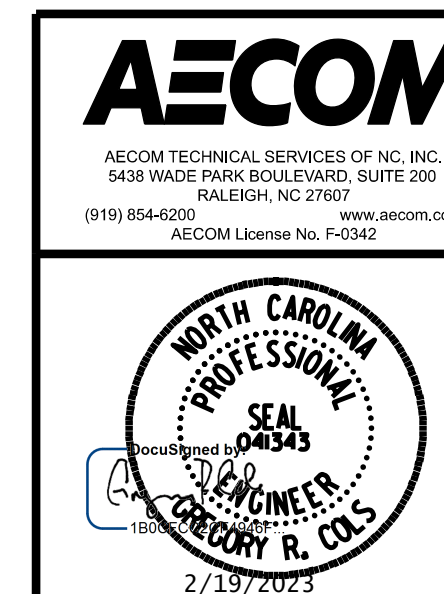
BILL OF MATERIAL

BENT 1

STAGE I					STAGE II						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	44'-5"	1208	B6	8	9	STR	51'-0"	1387
B2	10	5	STR	46'-7"	486	B7	10	5	STR	52'-0"	542
B3	8	9	1	37'-4"	1015	B8	2	5	STR	21'-2"	44
B4	8	9	STR	16'-8"	453	B9	8	9	STR	25'-6"	694
B5	2	5	STR	13'-6"	28	B10	8	4	STR	4'-10"	26
						B11	8	9	1	35'-1"	954
M1	42	9	STR	23'-1"	3296	M2	42	9	STR	49'-1"	7009
S1	108	5	2	13'-8"	1539	S1	92	5	2	13'-8"	1311
S2	66	5	2	14'-6"	998	S2	98	5	2	14'-6"	1482
U1	36	4	3	7'-0"	168	U1	46	4	3	7'-0"	215
U2	5	4	3	7'-3"	24	U2	5	4	3	7'-3"	24
U3	5	4	3	7'-5"	25	U3	5	4	3	7'-5"	25
V1	42	9	1	21'-9"	3106	V1	42	9	1	21'-9"	3106
REINFORCING STEEL					12,346 LBS.	REINFORCING STEEL					16,819 LBS.
SP-1	3	*	4	759'-10"	1523	SP-1	3	*	4	759'-10"	1523
SP-2	3	**	5	390'-1"	1221	SP-3	3	**	5	1000'-2"	3130
SPIRAL COLUMN REINFORCING STEEL					2,744 LBS.	SPIRAL COLUMN REINFORCING STEEL					4,653 LBS.
* THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 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						** 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)					20.0 C.Y.	POUR #2 (COLUMNS)					20.0 C.Y.
POUR #3 (CAP)					40.8 C.Y.	POUR #3 (CAP)					49.8 C.Y.
TOTAL CLASS A CONCRETE					60.8 C.Y.	TOTAL CLASS A CONCRETE					69.8 C.Y.
DRILLED PIERS:						DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					23.0 C.Y.	DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					59.3 C.Y.

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

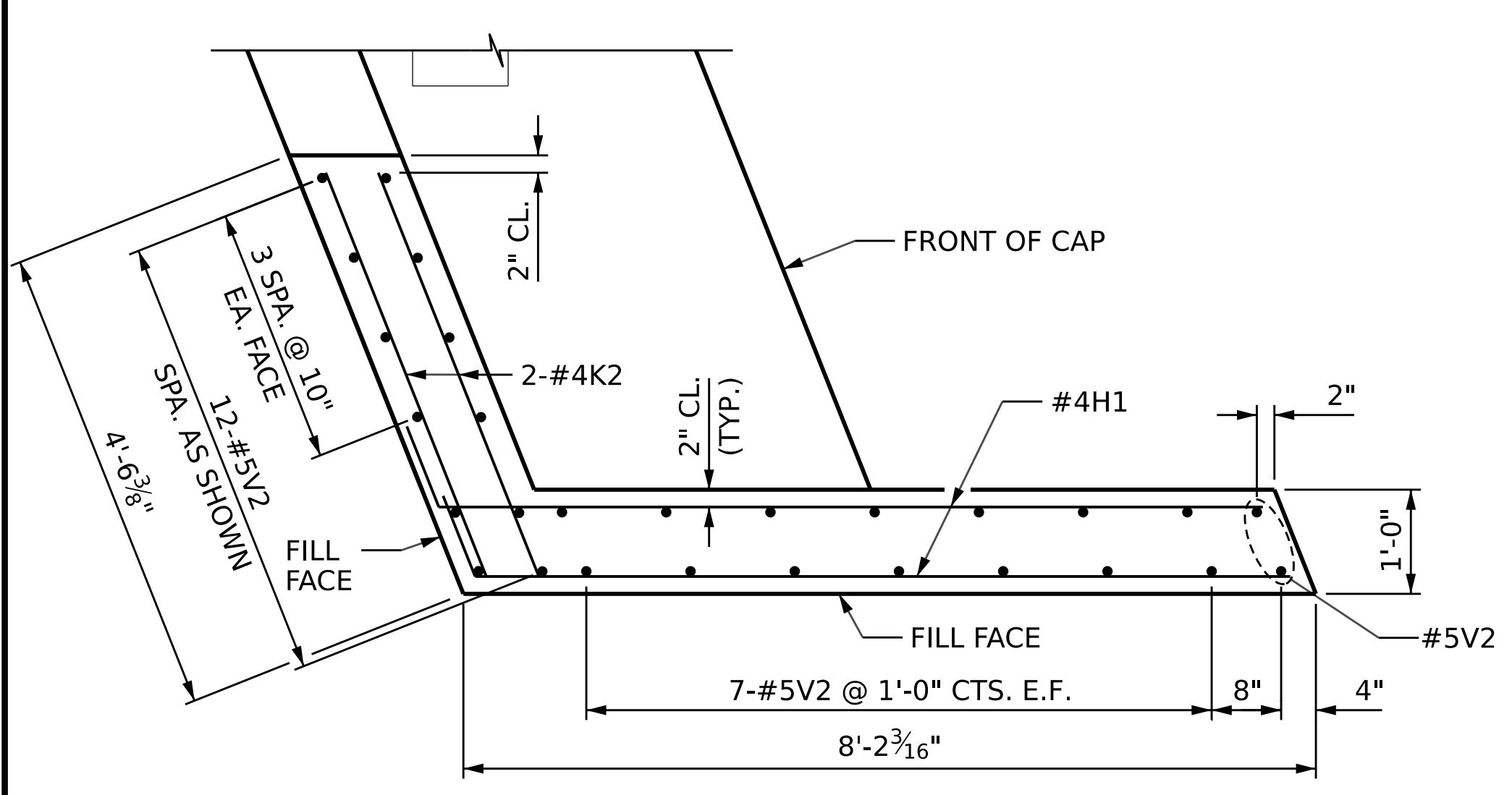
SHEET 4 OF 4



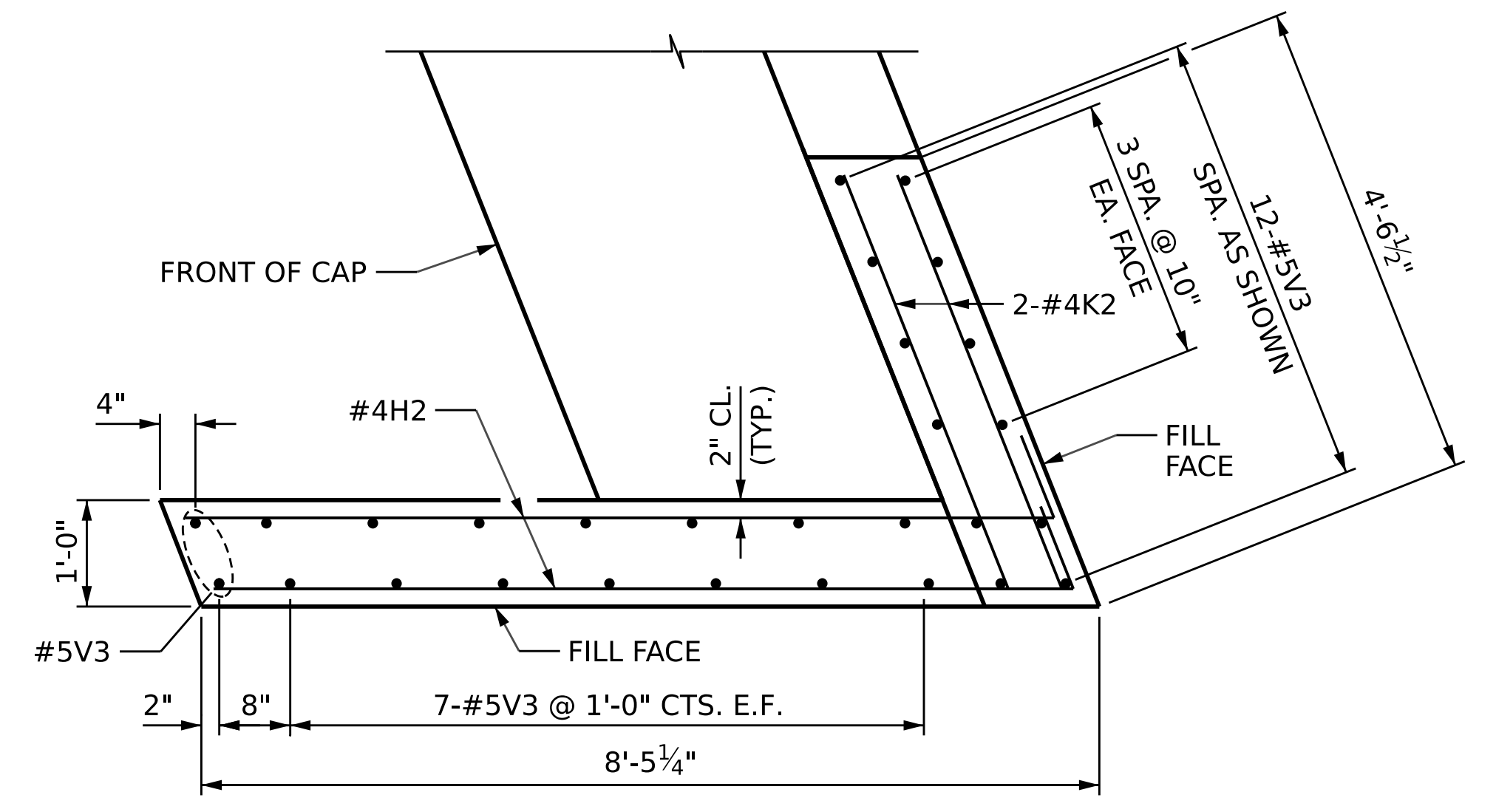
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			48

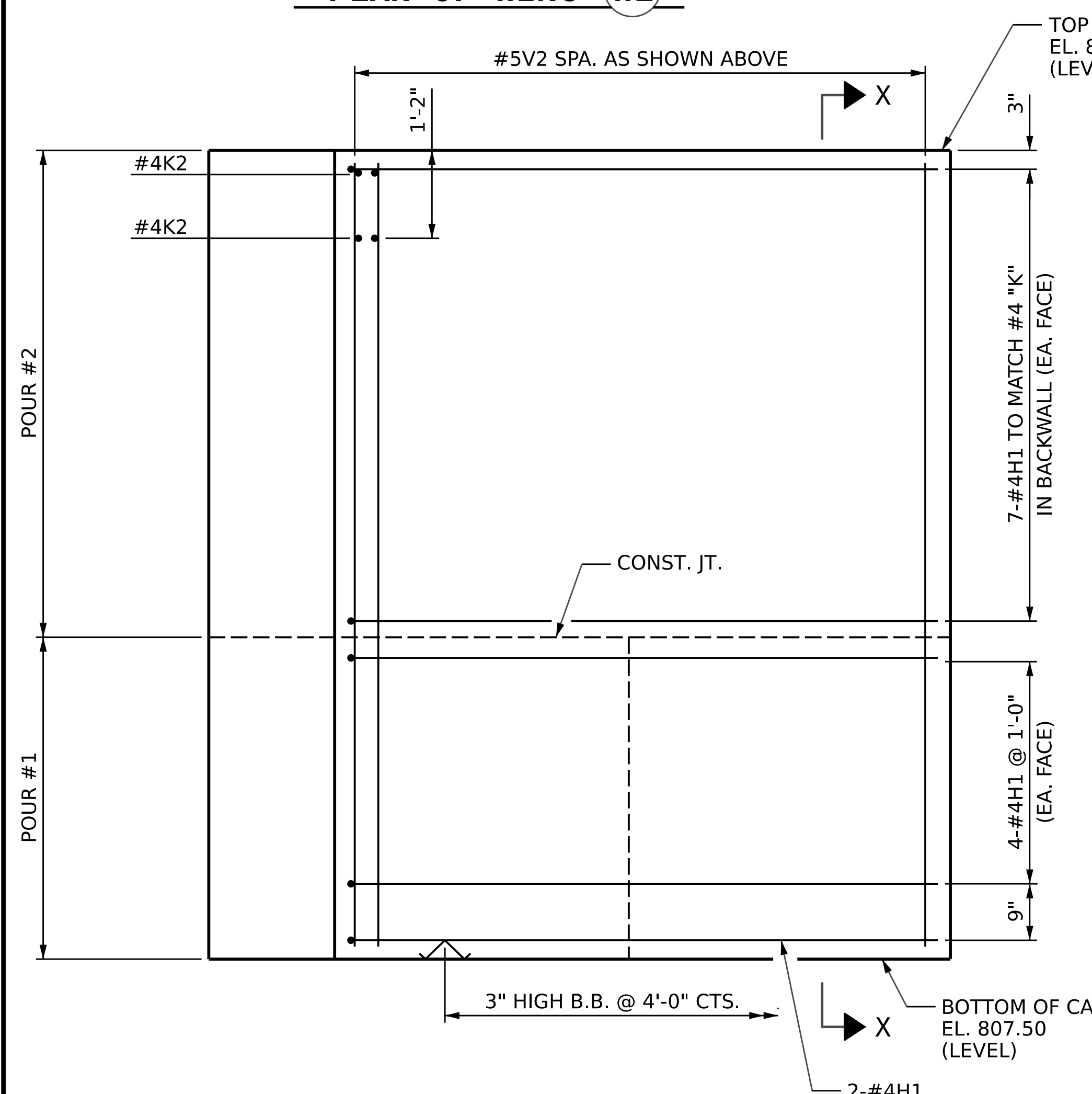
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



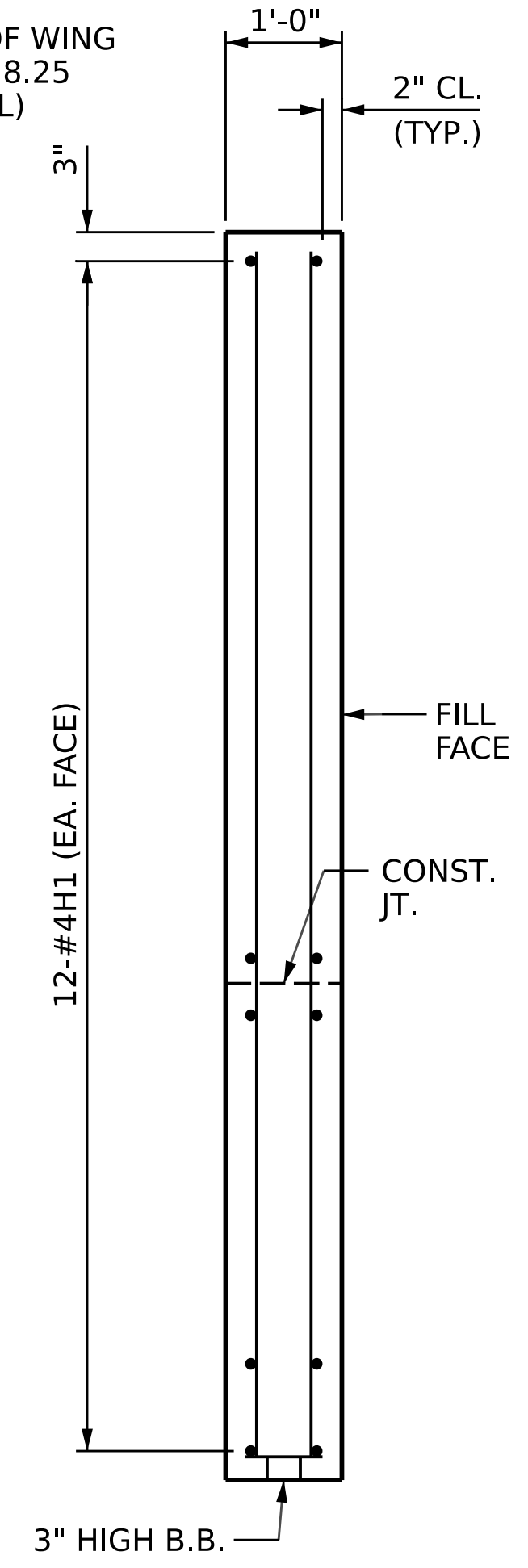
PLAN OF WING (W1)



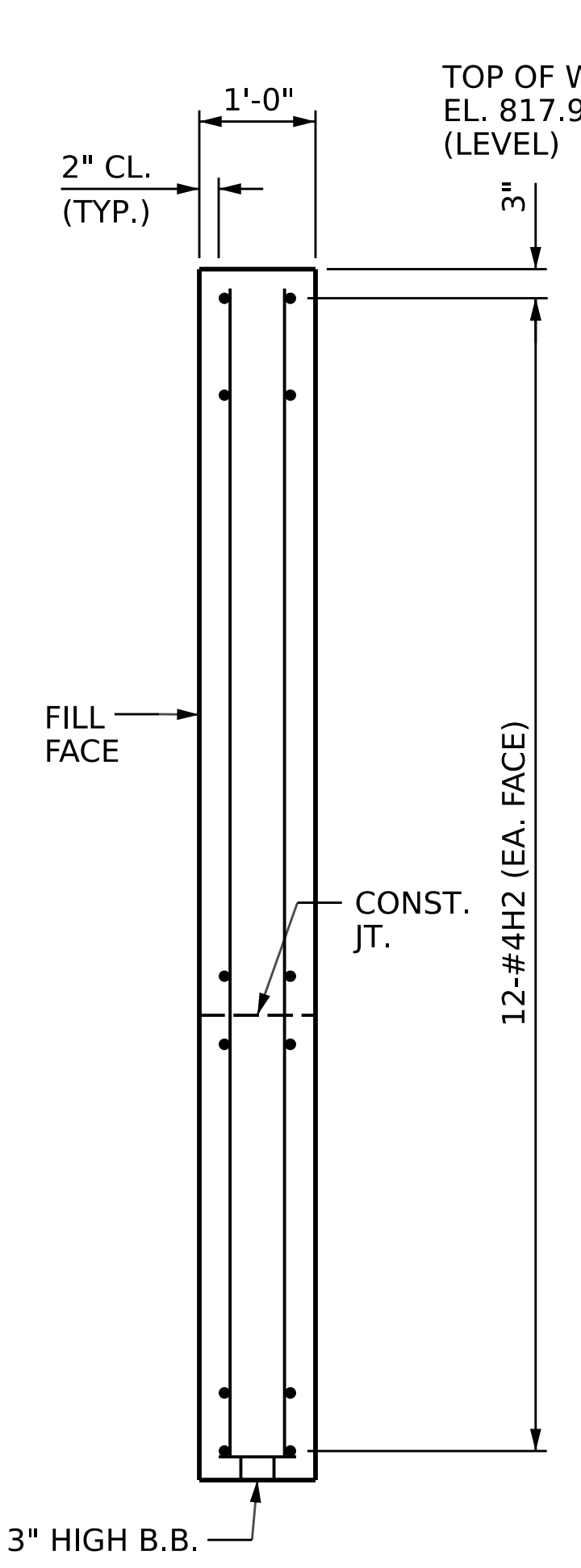
PLAN OF WING (W2)



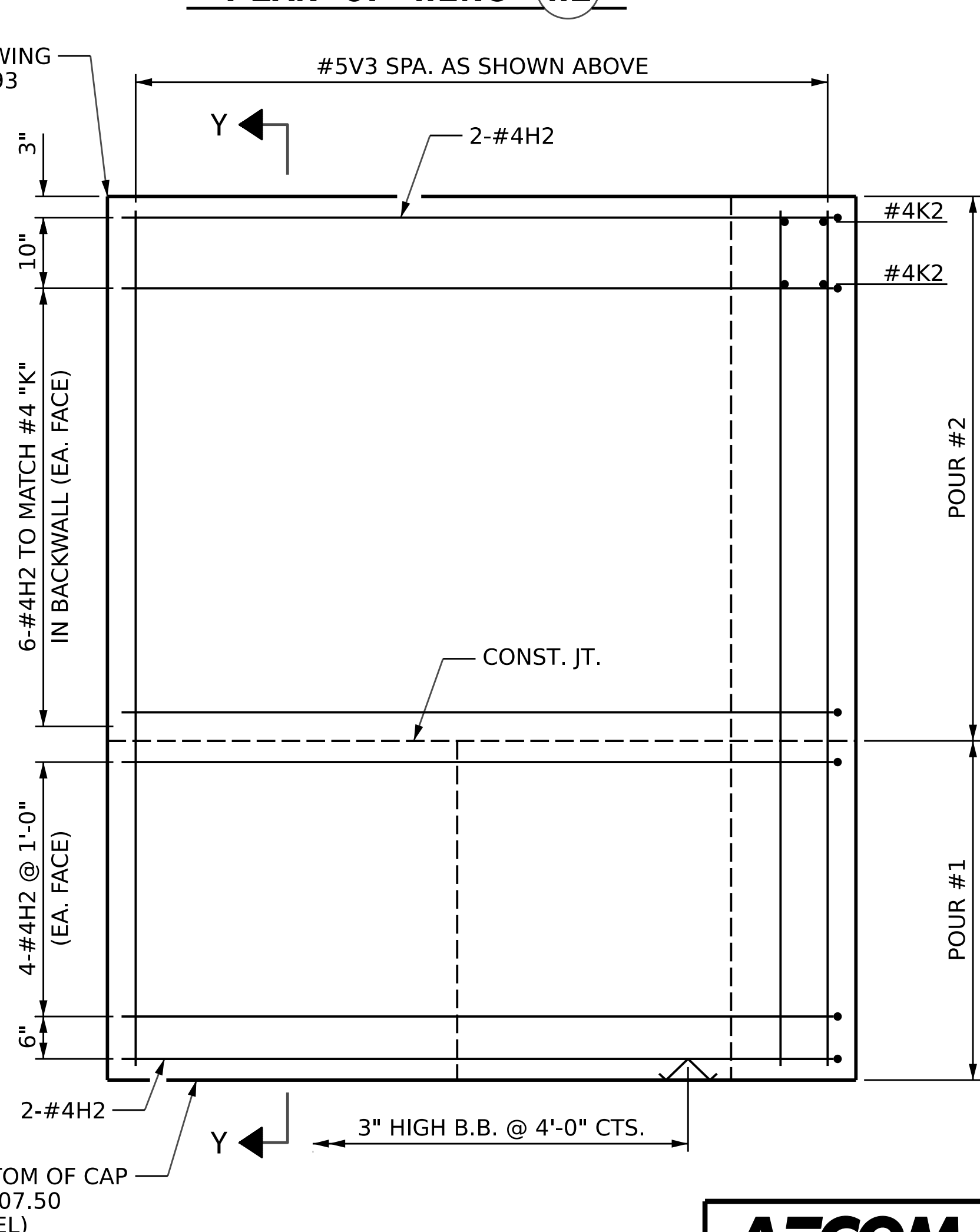
ELEVATION OF WING (W1)



SECTION X-X



SECTION Y-Y



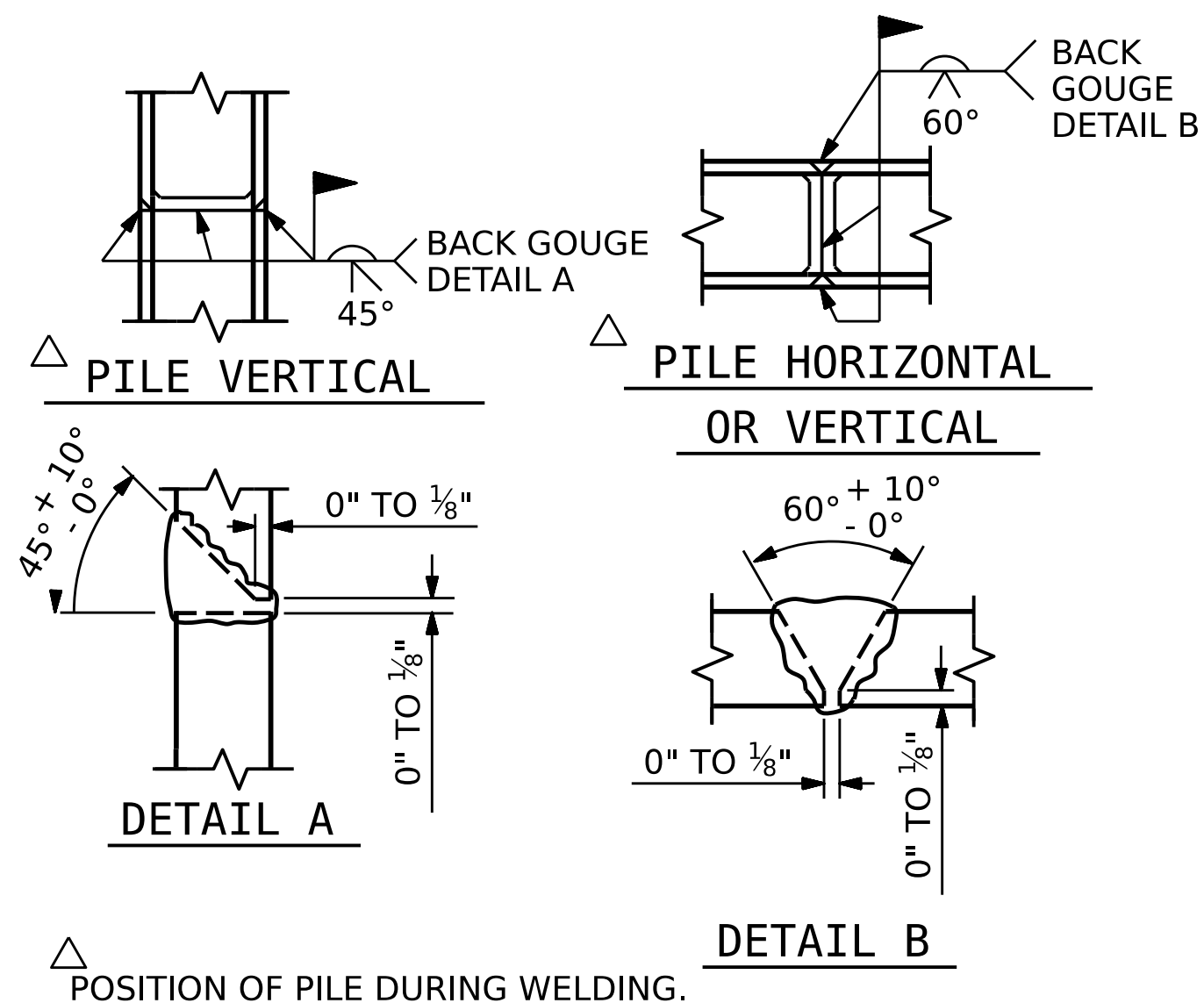
ELEVATION OF WING (W2)

PROJECT NO. BR-0041
 ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 3 OF 5

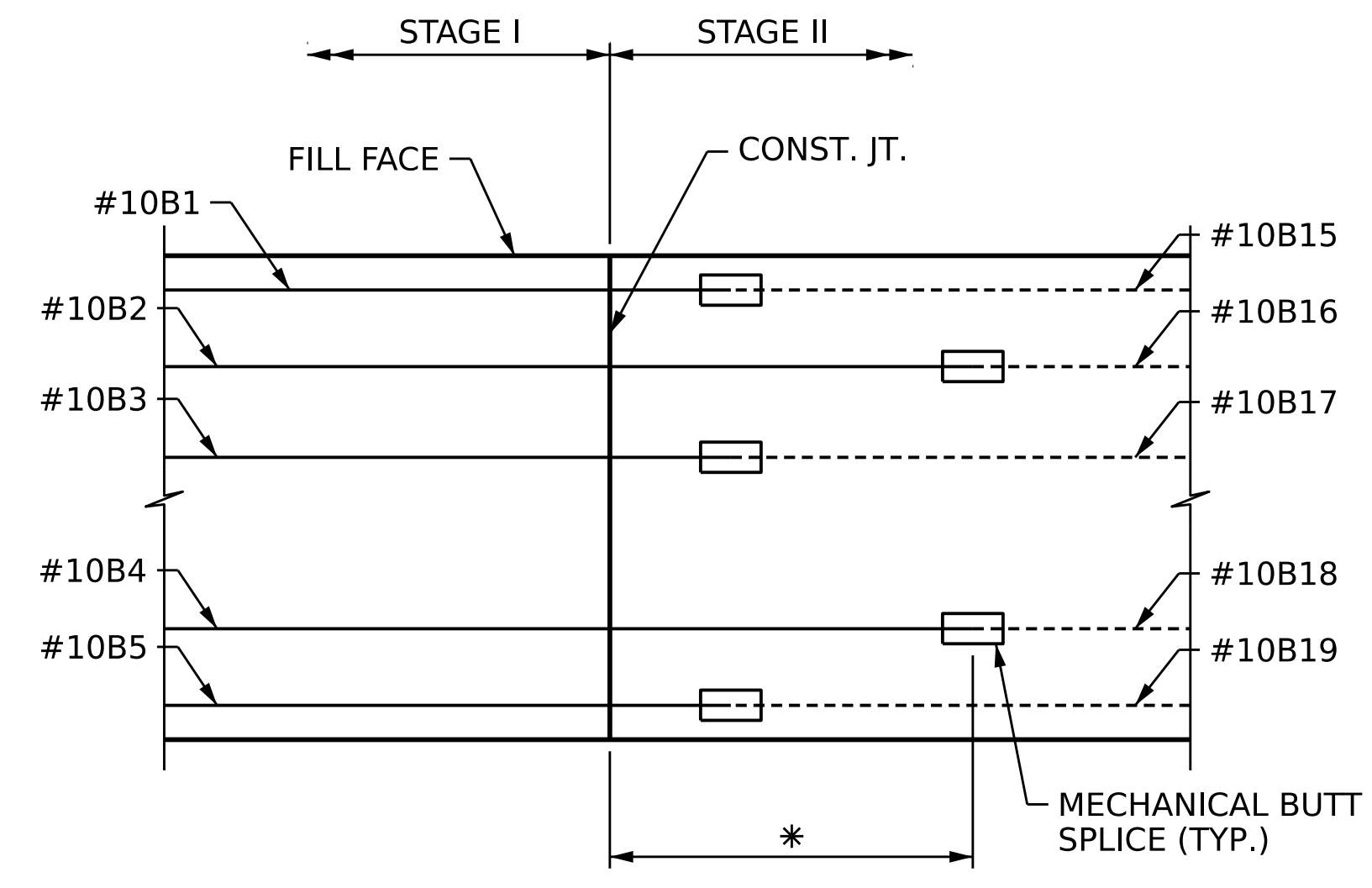
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 WINGWALLS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-42 TOTAL SHEETS 48

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD :	G. COLS	DATE :	12/2022

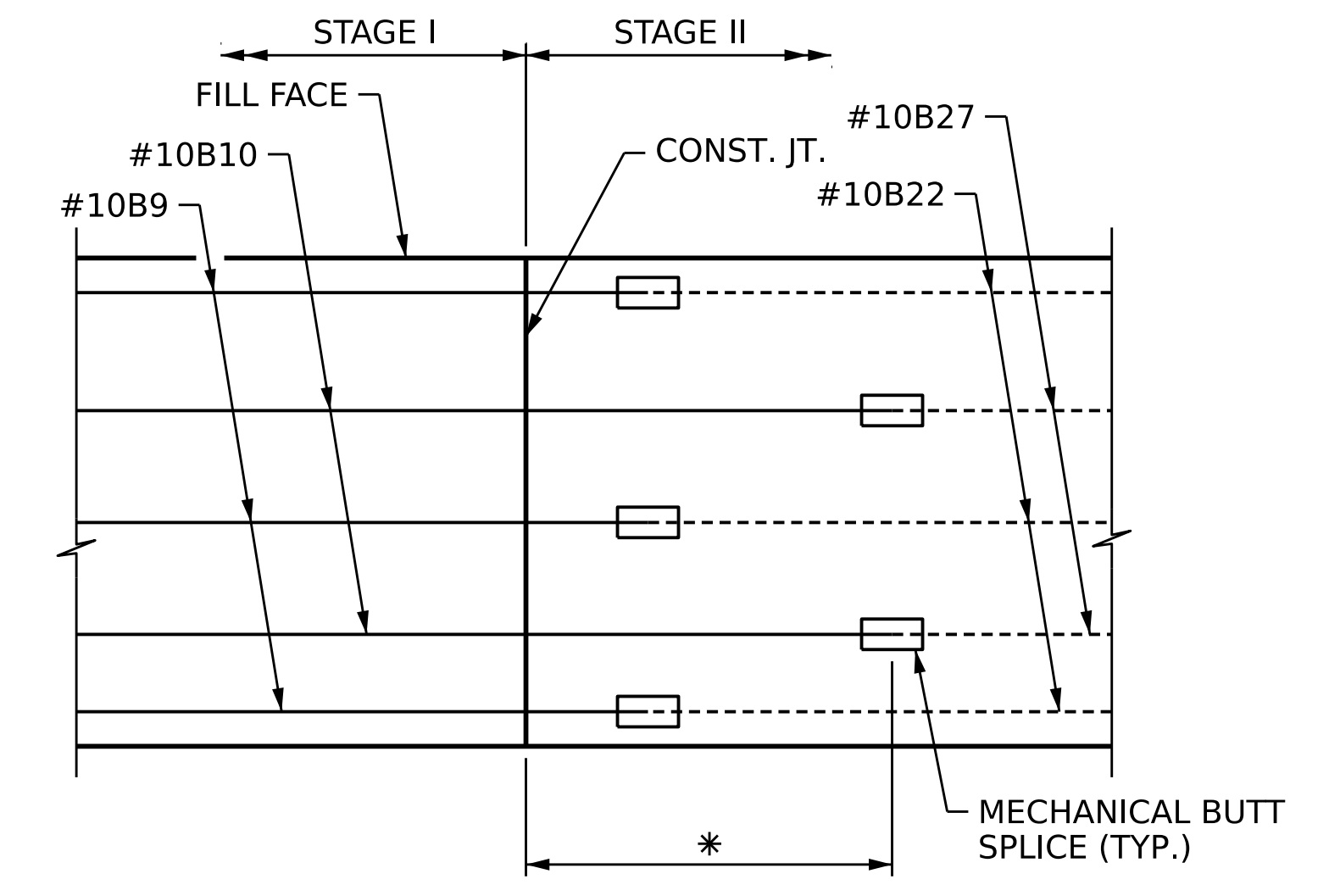
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED



PILE SPLICE DETAILS



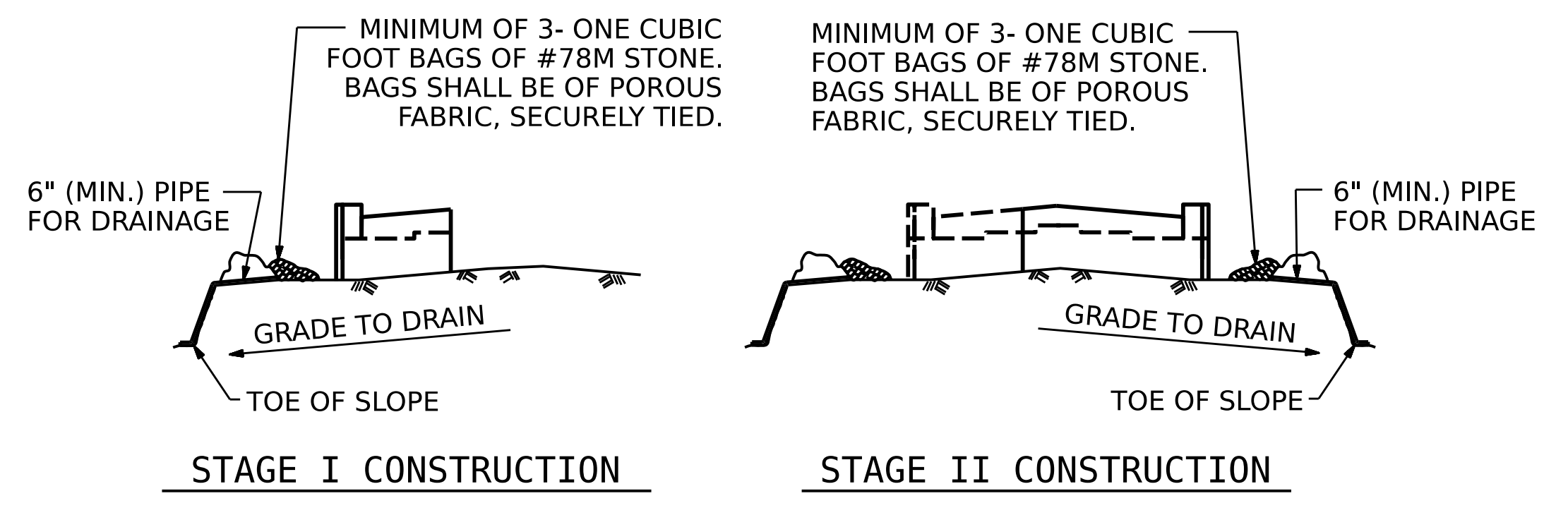
PLAN OF BOTTOM REINFORCEMENT



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

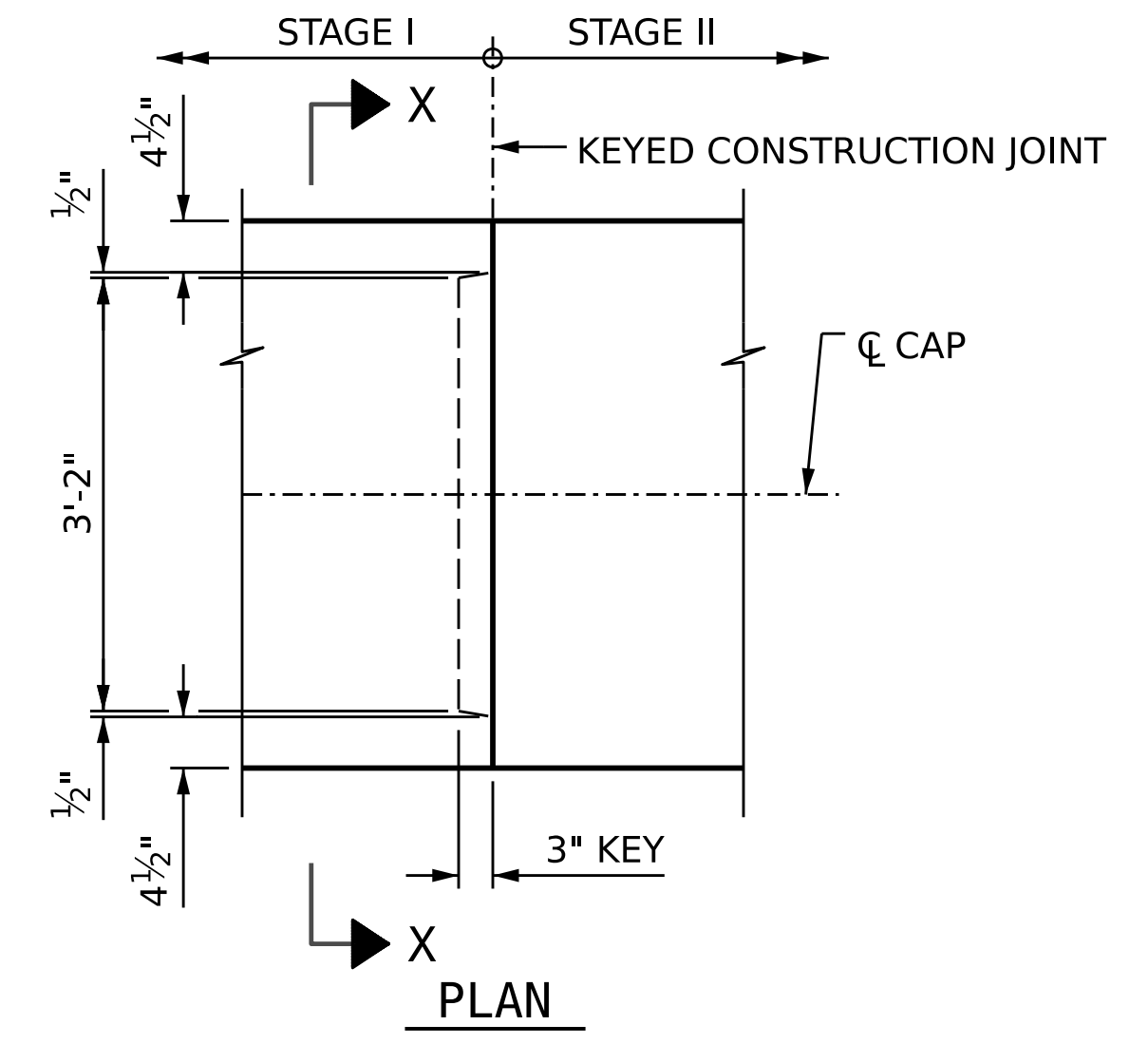
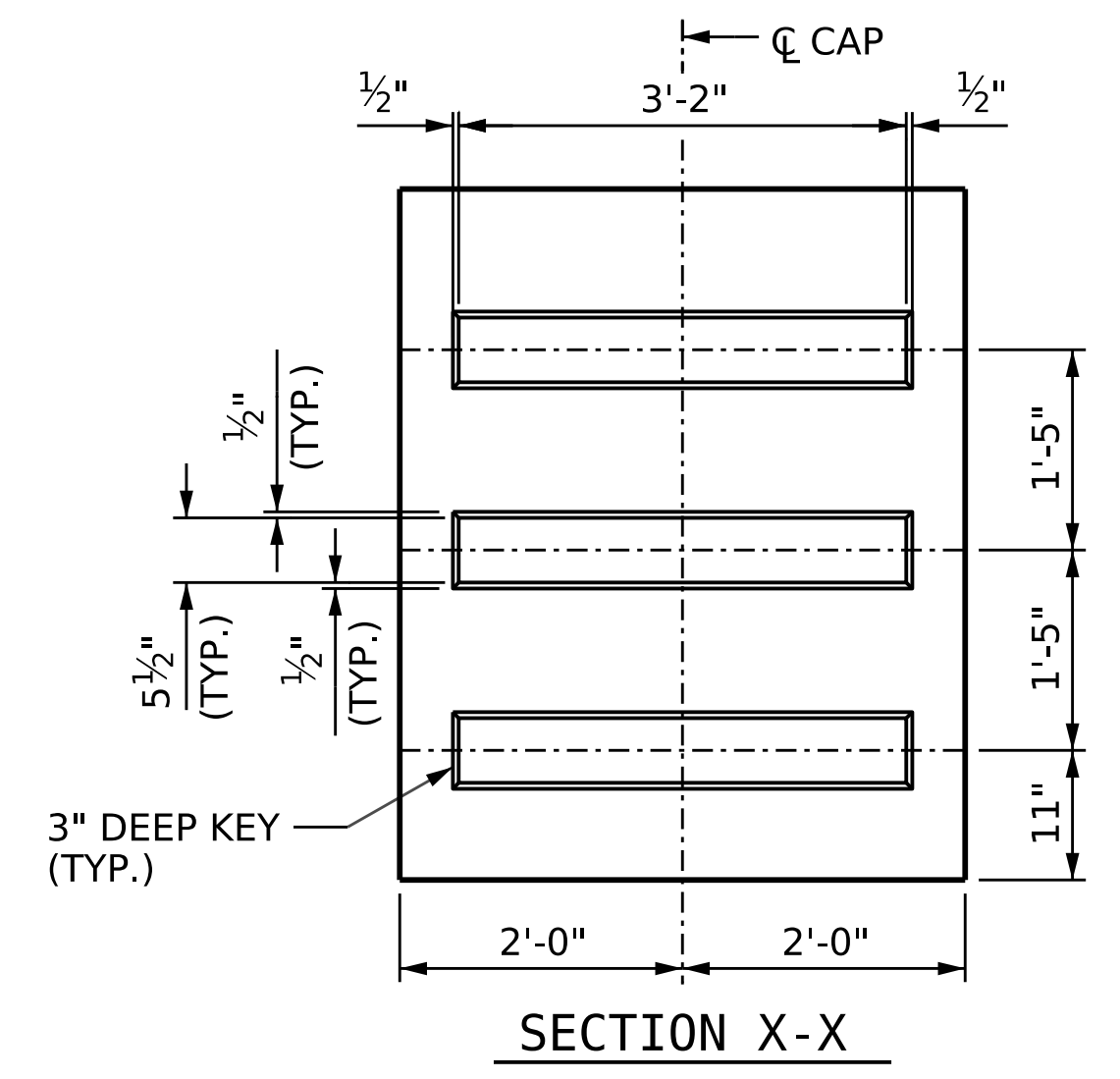


TEMPORARY DRAINAGE AT END BENT

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.



KEYED CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 4 OF 5

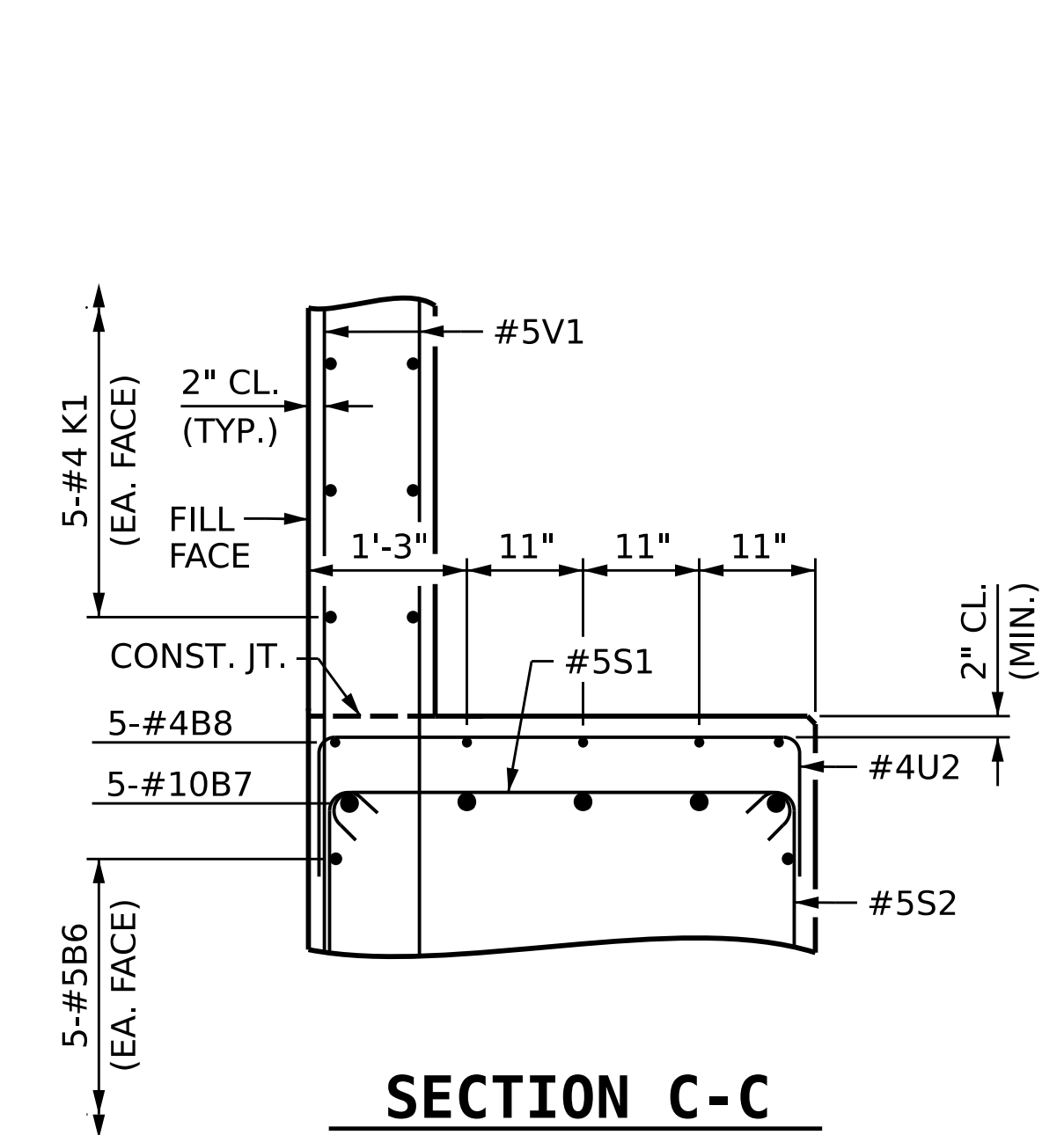
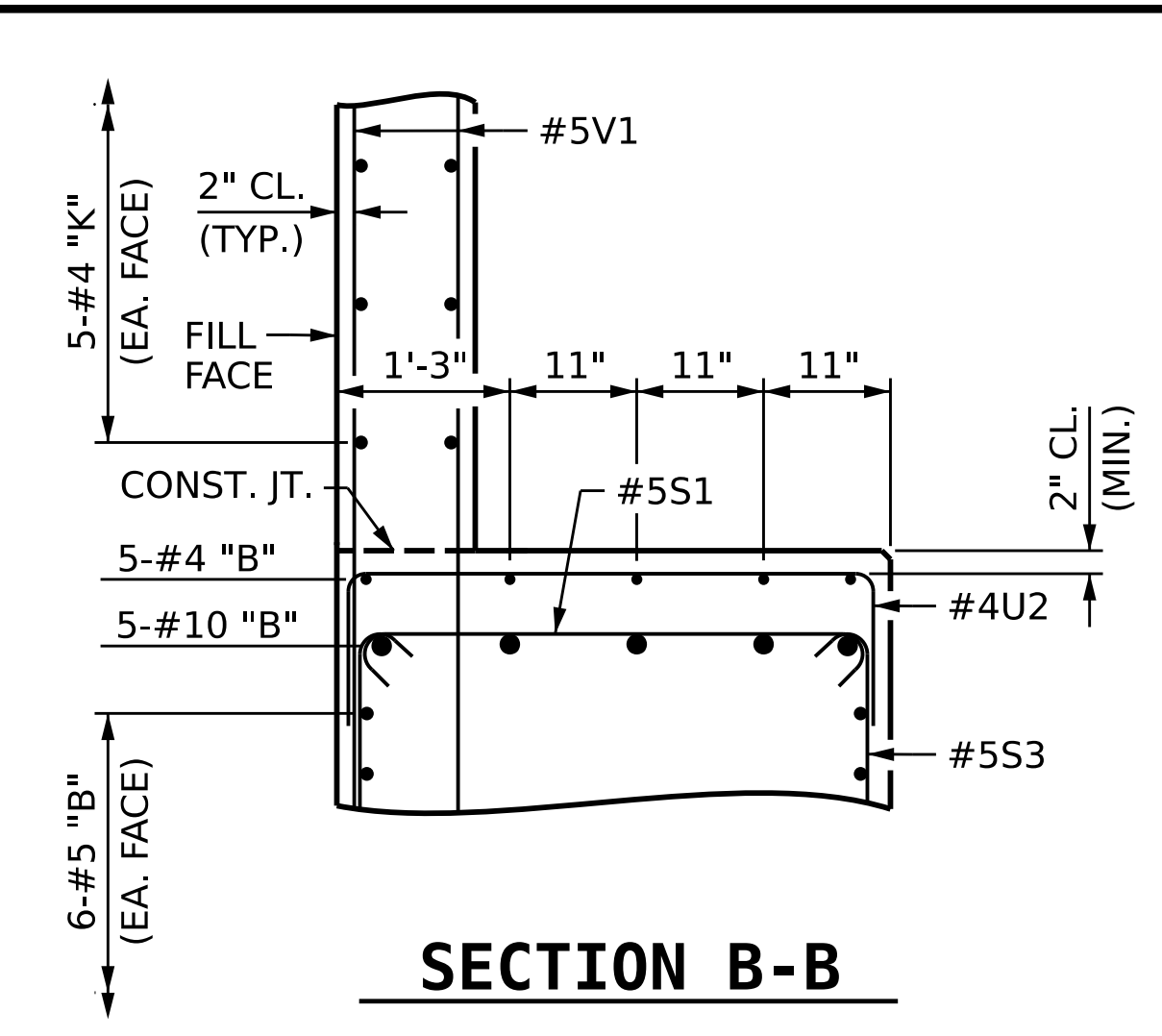
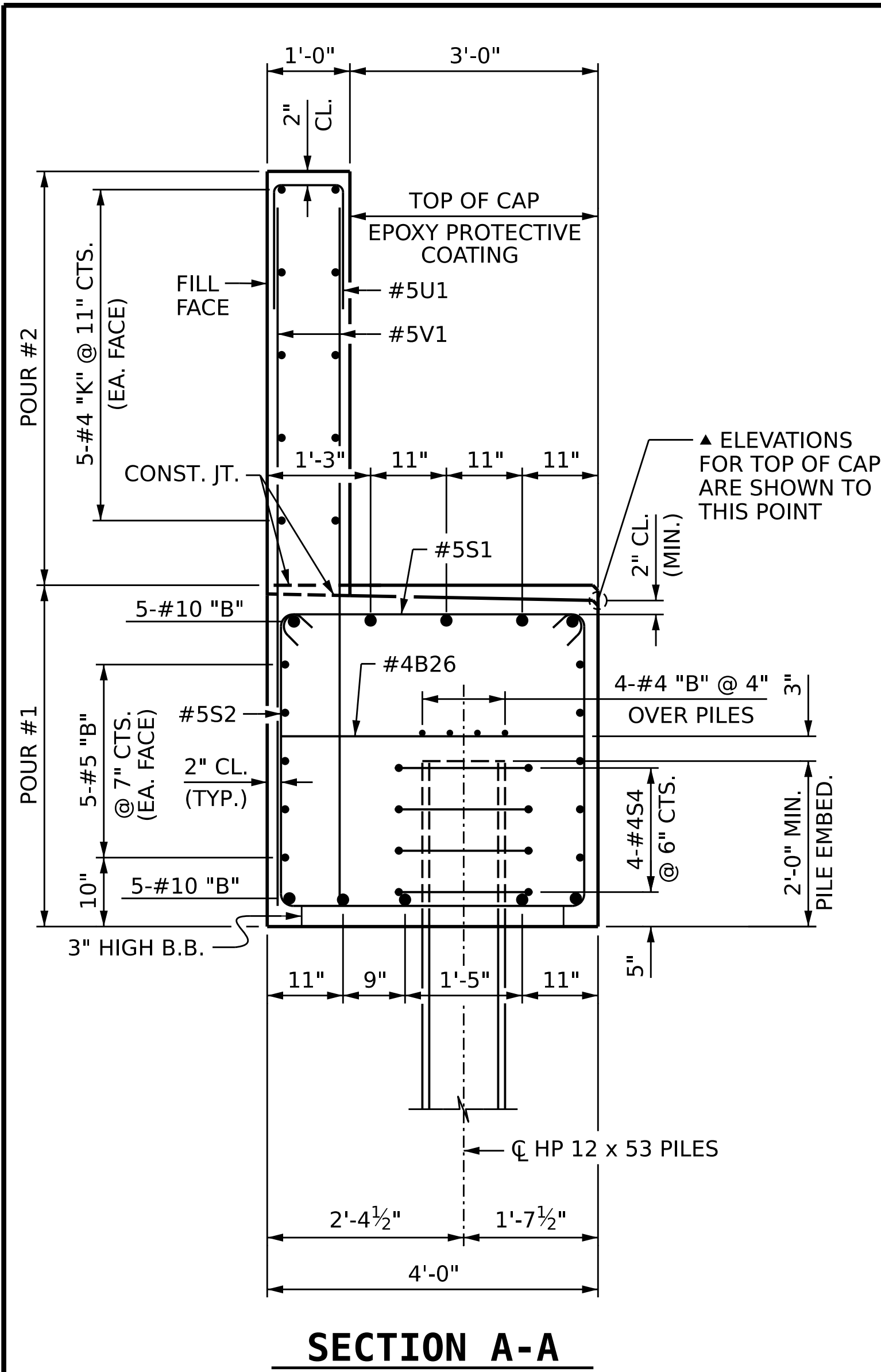
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

NORTH CAROLINA PROFESSIONAL SEAL
 04343
 ENGINEER
 DANIEL R. DRUM
 2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUBSTRUCTURE END BENT 2 DETAILS						S-43
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	48
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	D.R. DRUM	DATE :	09/2022
CHECKED BY :	S. NATARAJAN	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022



BAR TYPES

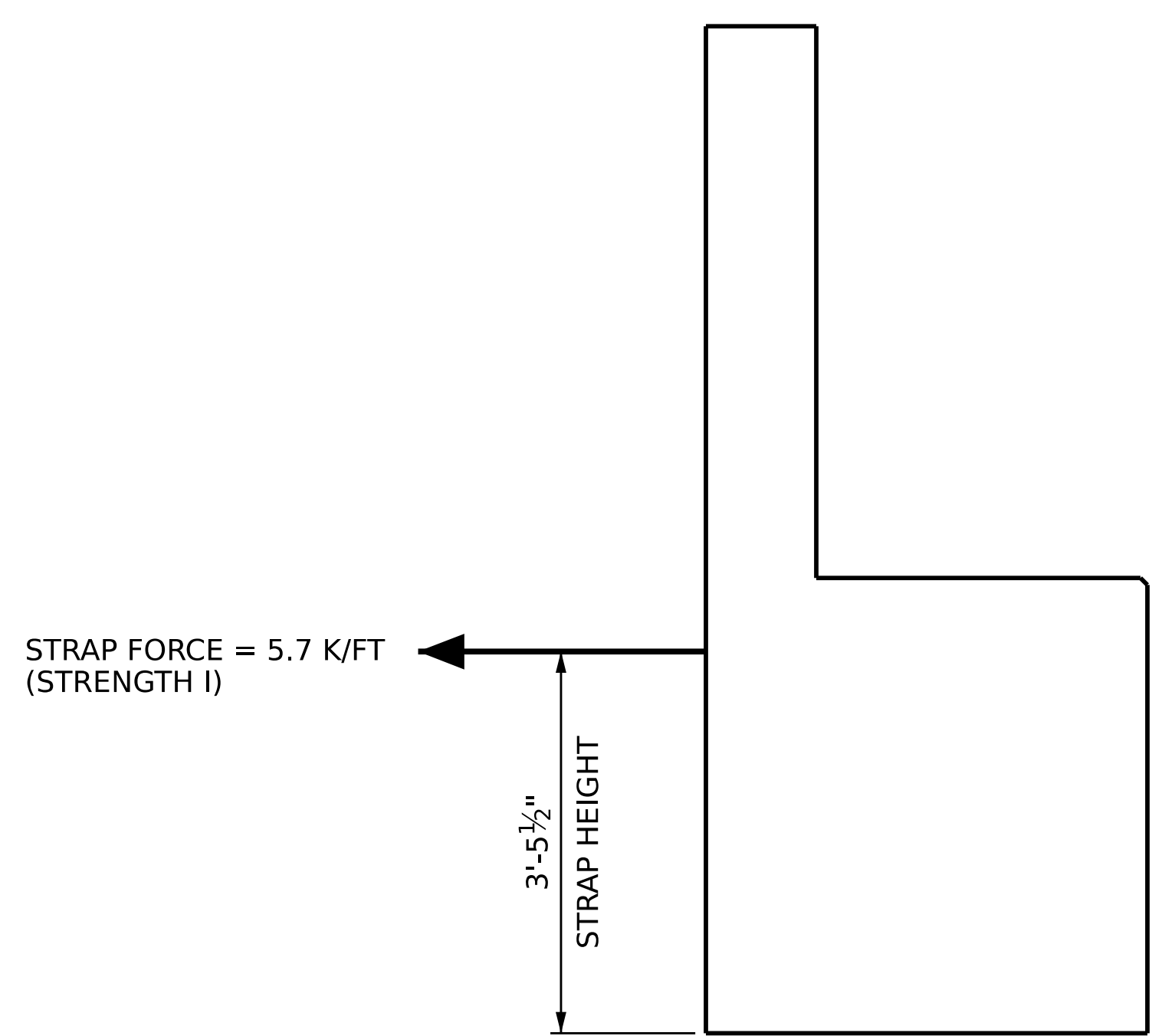
BAR	DIM. "X"
B1	43'-2"
B2	45'-5"
B3	43'-9"
B4	46'-3"
B5	44'-6"
B7	26'-0"
B15	52'-11"
B16	50'-8"
B17	52'-4"
B18	49'-9"
B19	51'-6"
B25	36'-10"

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'-7"	192	B15	1	10	1	54'-4"	234
B2	1	10	1	46'-10"	202	B16	1	10	1	52'-1"	224
B3	1	10	1	45'-2"	194	B17	1	10	1	53'-9"	231
B4	1	10	1	47'-2"	205	B18	1	10	1	51'-2"	220
B5	1	10	1	45'-11"	198	B19	1	10	1	52'-11"	228
B6	20	5	STR	24'-11"	520	B20	20	5	STR	28'-6"	595
B7	5	10	1	27'-5"	590	B21	2	5	STR	20'-4"	42
B8	5	4	STR	16'-8"	56	B22	3	10	STR	26'-4"	340
B9	3	10	STR	27'-6"	355	B23	5	4	STR	4'-8"	16
B10	2	10	STR	29'-6"	254	B24	10	4	STR	10'-5"	70
B11	5	4	STR	3'-3"	11	B25	5	10	1	38'-3"	823
B12	8	4	STR	24'-7"	131	B26	14	4	STR	3'-8"	34
B13	2	5	STR	23'-8"	49	B27	2	10	STR	24'-4"	209
B14	5	4	STR	3'-8"	12	B28	8	4	STR	28'-3"	151
B26	11	4	STR	3'-8"	27						
H1	24	4	2	8'-8"	139	H2	24	4	3	8'-11"	143
K1	20	4	STR	23'-6"	314	K2	4	4	STR	4'-2"	11
K2	4	4	STR	4'-2"	11	K3	20	4	STR	28'-3"	377
S1	51	5	4	4'-7"	244	S1	64	5	4	4'-7"	306
S2	19	5	5	11'-9"	233	S2	32	5	5	11'-9"	392
S3	32	5	5	12'-7"	420	S3	32	5	5	12'-7"	420
S4	28	4	6	6'-6"	122	S4	32	4	6	6'-6"	139
U1	38	4	7	4'-8"	118	U1	49	4	7	4'-8"	153
U2	18	4	7	6'-2"	74	U2	18	4	7	6'-2"	74
V1	76	5	STR	8'-1"	641	V1	98	5	STR	8'-1"	826
V2	26	5	STR	10'-5"	282	V3	26	5	STR	10'-1"	273
REINFORCING STEEL 5,594 LBS.						REINFORCING STEEL 6,531 LBS.					
CLASS A CONCRETE						CLASS A CONCRETE					
POUR #1 (CAP & LOWER WINGWALL) 29.4 C.Y.						POUR #1 (CAP & LOWER WINGWALL) 35.6 C.Y.					
POUR #2 (BACKWALL & UPPER WINGWALL) 9.2 C.Y.						POUR #2 (BACKWALL & UPPER WINGWALL) 11.3 C.Y.					
TOTAL = 38.6 C.Y.						TOTAL = 46.9 C.Y.					



DRAWN BY : D.R. DRUM	DATE : 09/2022
CHECKED BY : S. NATARAJAN	DATE : 10/2022
DESIGN ENGINEER OF RECORD : G. COLS	DATE : 12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

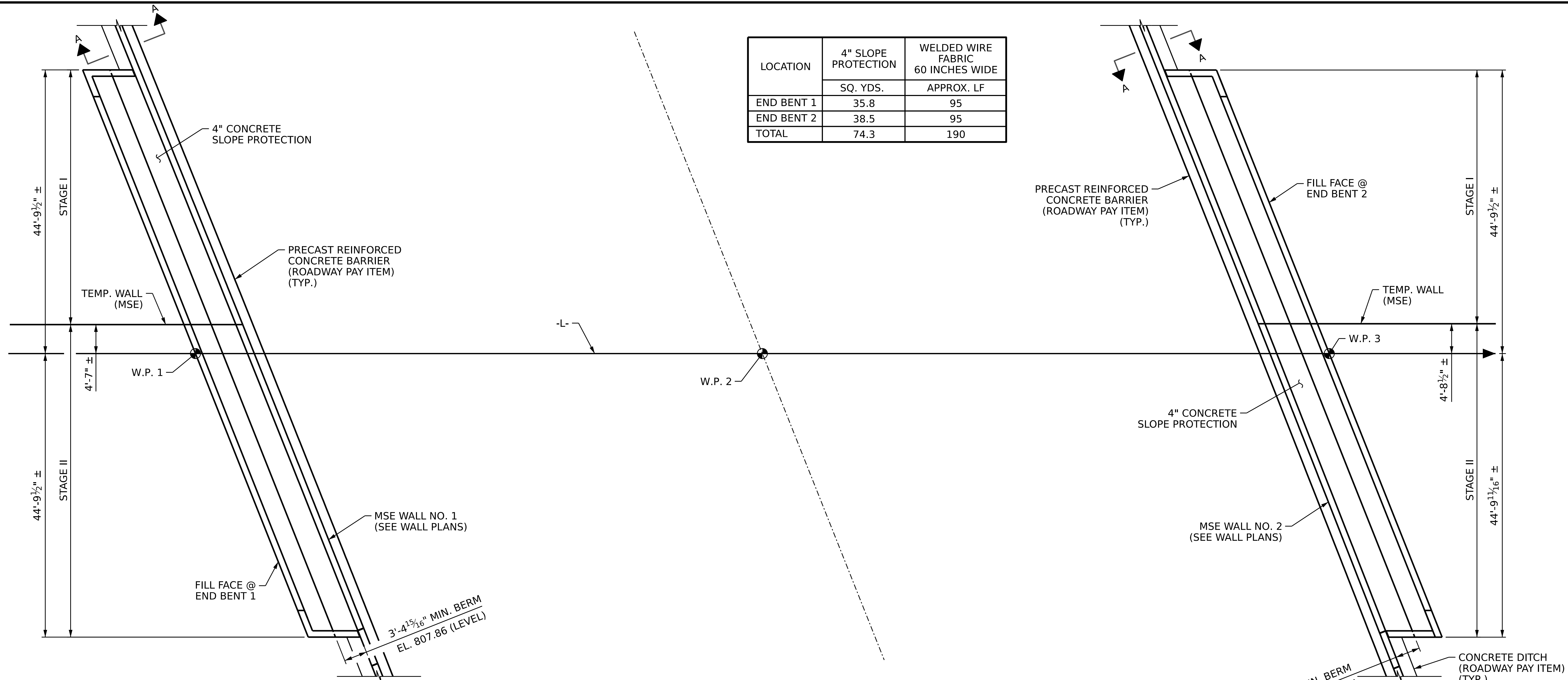
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT 2 SECTIONS

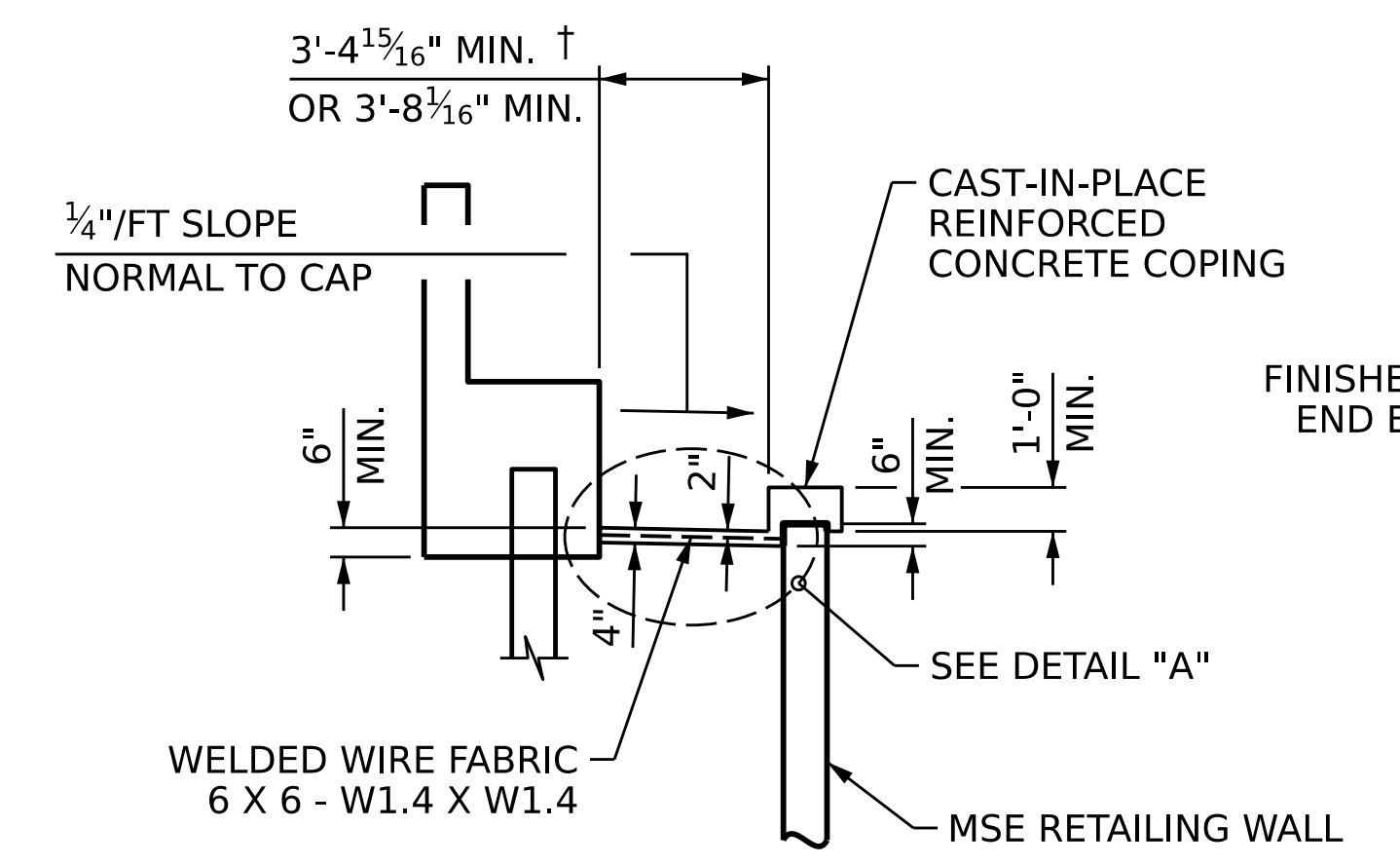
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			5-44
2			4			TOTAL SHEETS 48

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 5 OF 5

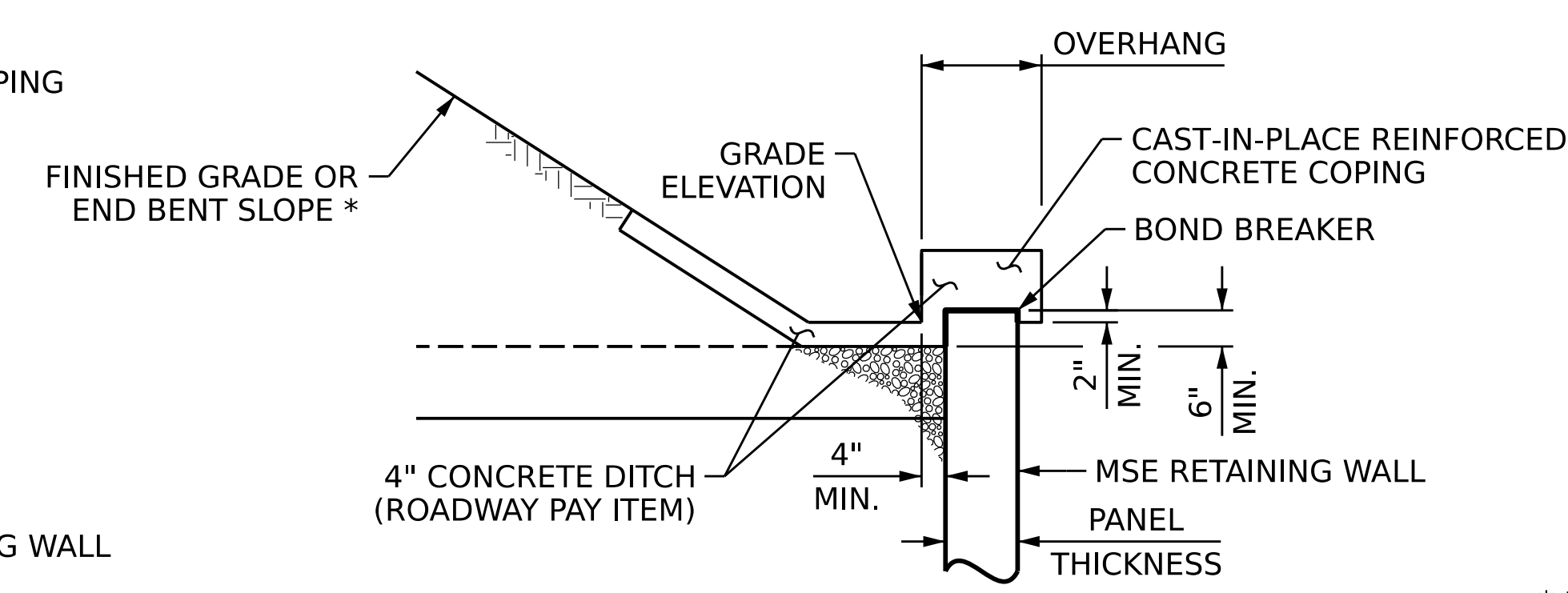
LOCATION	4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQ. YDS.	APPROX. LF
END BENT 1	35.8	95
END BENT 2	38.5	95
TOTAL	74.3	190



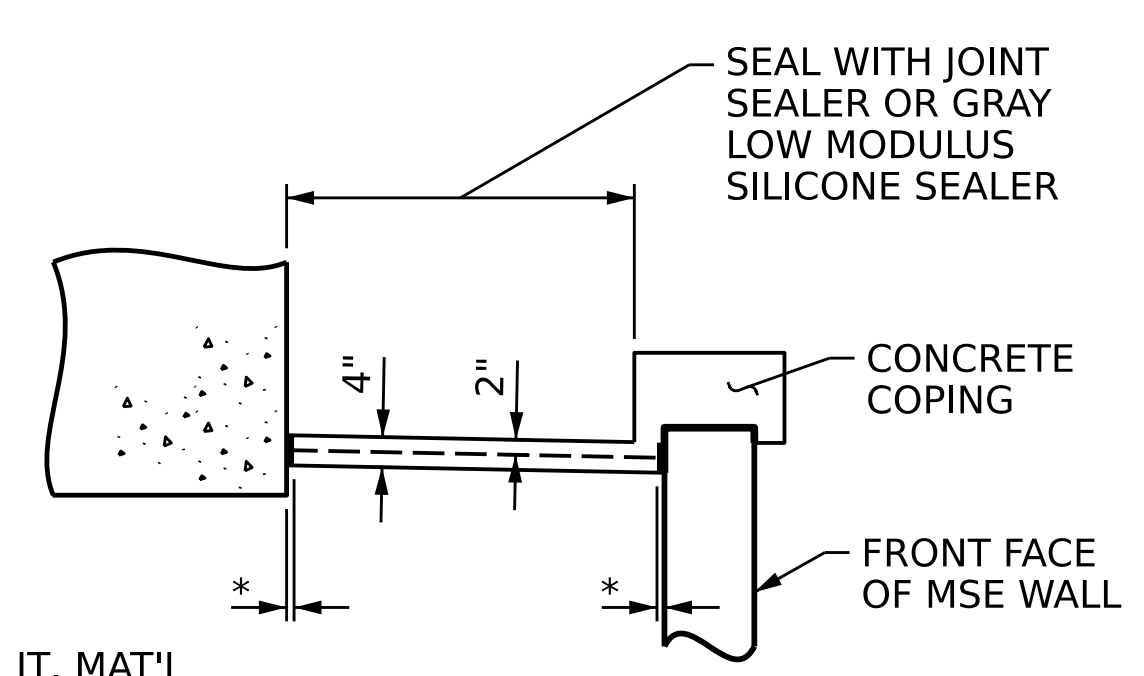
PLAN



SECTION ALONG C - L-



SECTION A-A



DETAIL "A"

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

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-

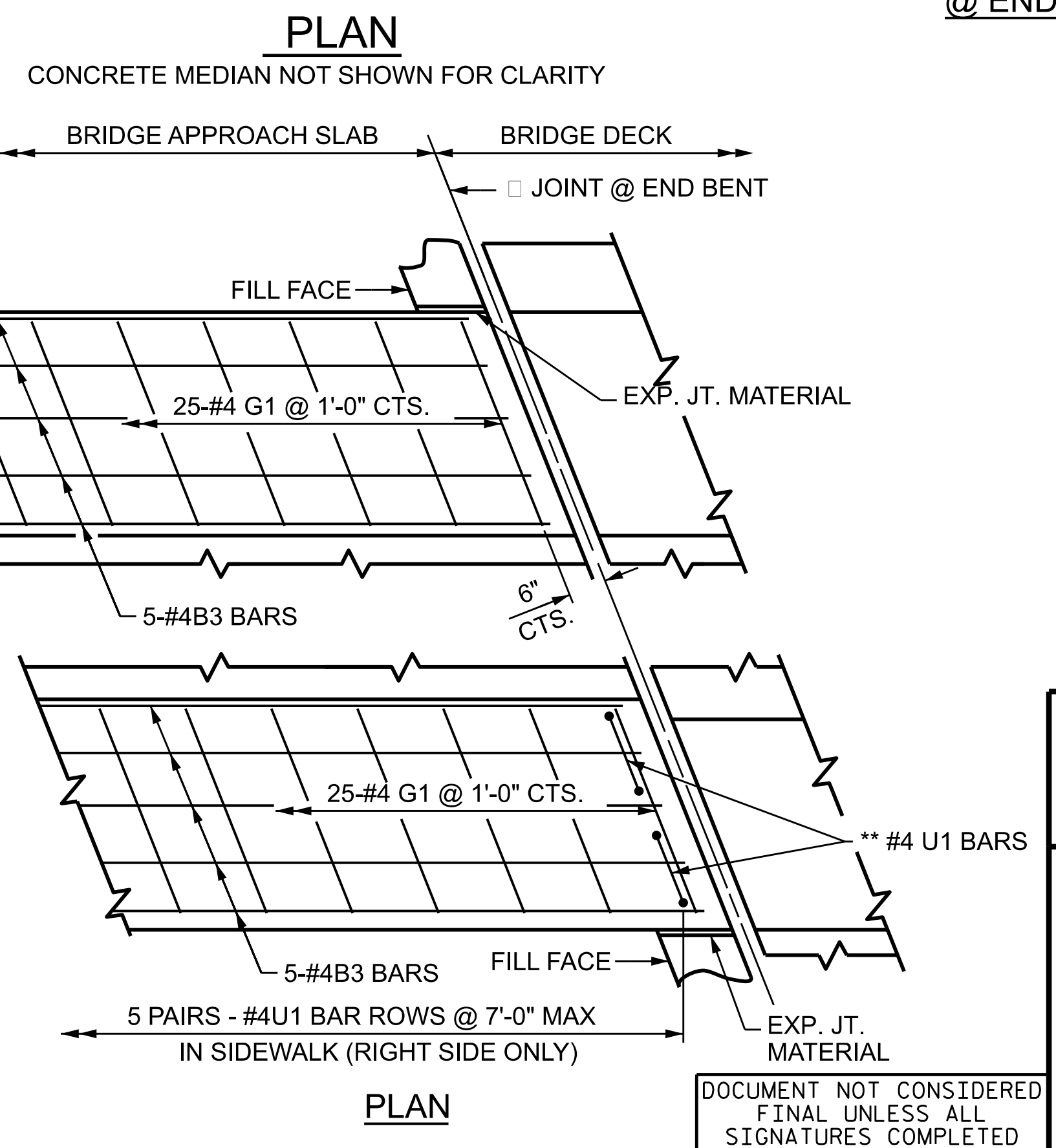
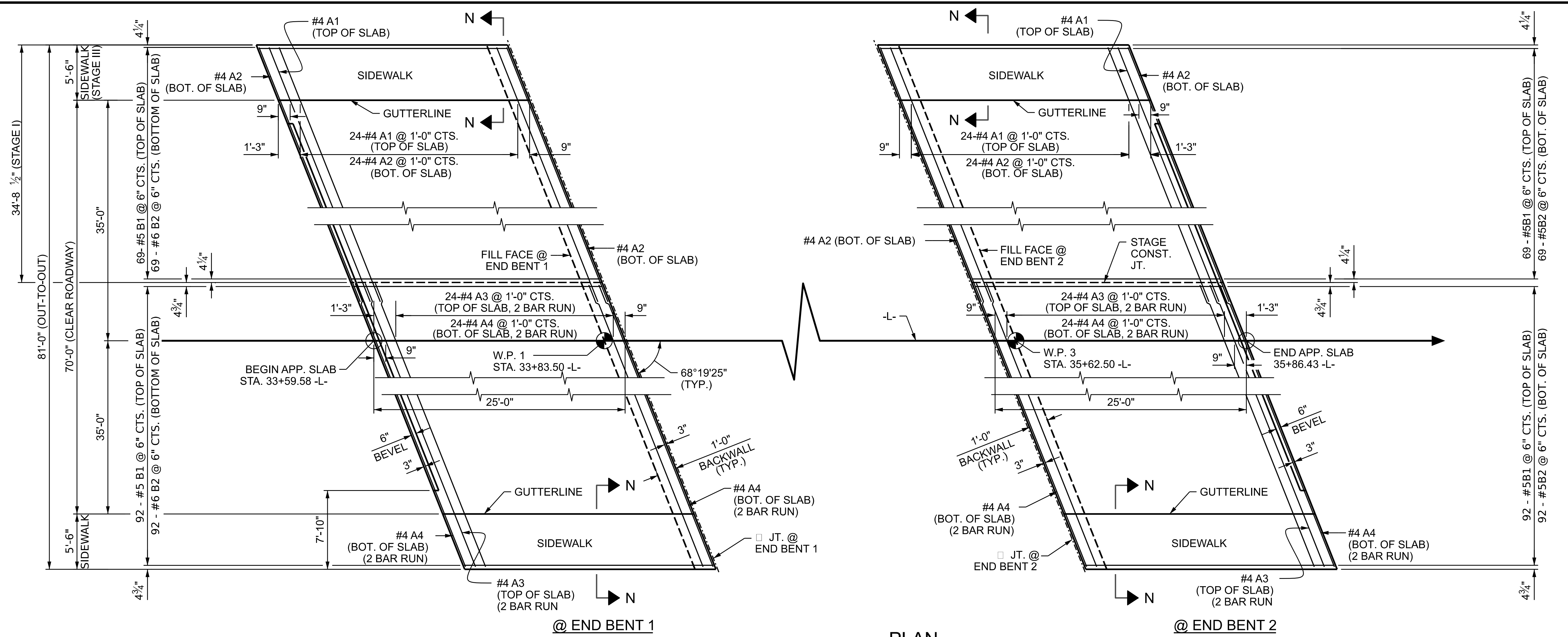
AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5430 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F0242

NORTH CAROLINA PROFESSIONAL SEAL
 04343
 ENGINEER
 DANIEL DRUM
 RALEIGH, N.C.
 2/19/2023

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING					
SLOPE PROTECTION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
					48

DRAWN BY :	B.T. LEROY	DATE :	11/2022
CHECKED BY :	S. NATARAJAN	DATE :	11/2022
DESIGN ENGINEER OF RECORD :	G. COLS	DATE :	12/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NOTES

THE SIDEWALK SHALL NOT BE CAST UNTIL APPROACH SLAB CONCRETE HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN THE SIDEWALKS SHALL BE EPOXY COATED.

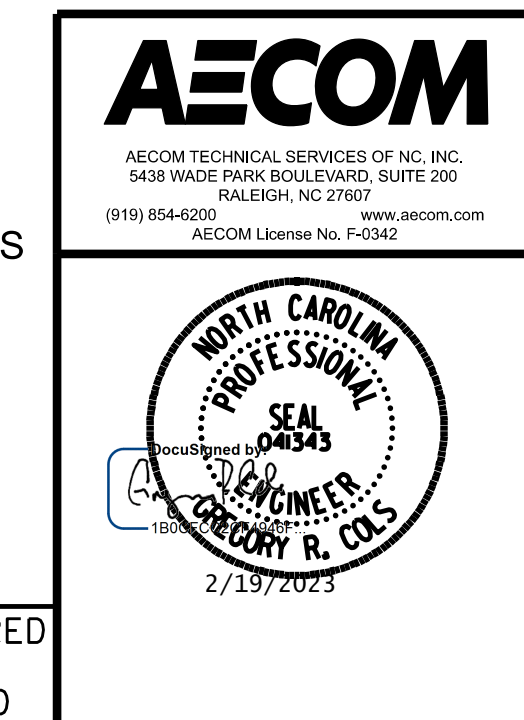
** "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

FOR MEDIAN (STAGE III), SEE "CONCRETE MEDIAN DETAILS" SHEET. QUANTITIES FOR MEDIAN ON APPROACH SLAB ARE INCLUDED WITH MEDIAN DETAILS. THE ENTIRE COST OF MEDIAN ON APPROACH SLAB SHALL BE INCLUDED IN THE LUMP-SUM BID PRICE FOR APPROACH SLABS, NO SPEARATE PAYMENT SHALL BE MADE.

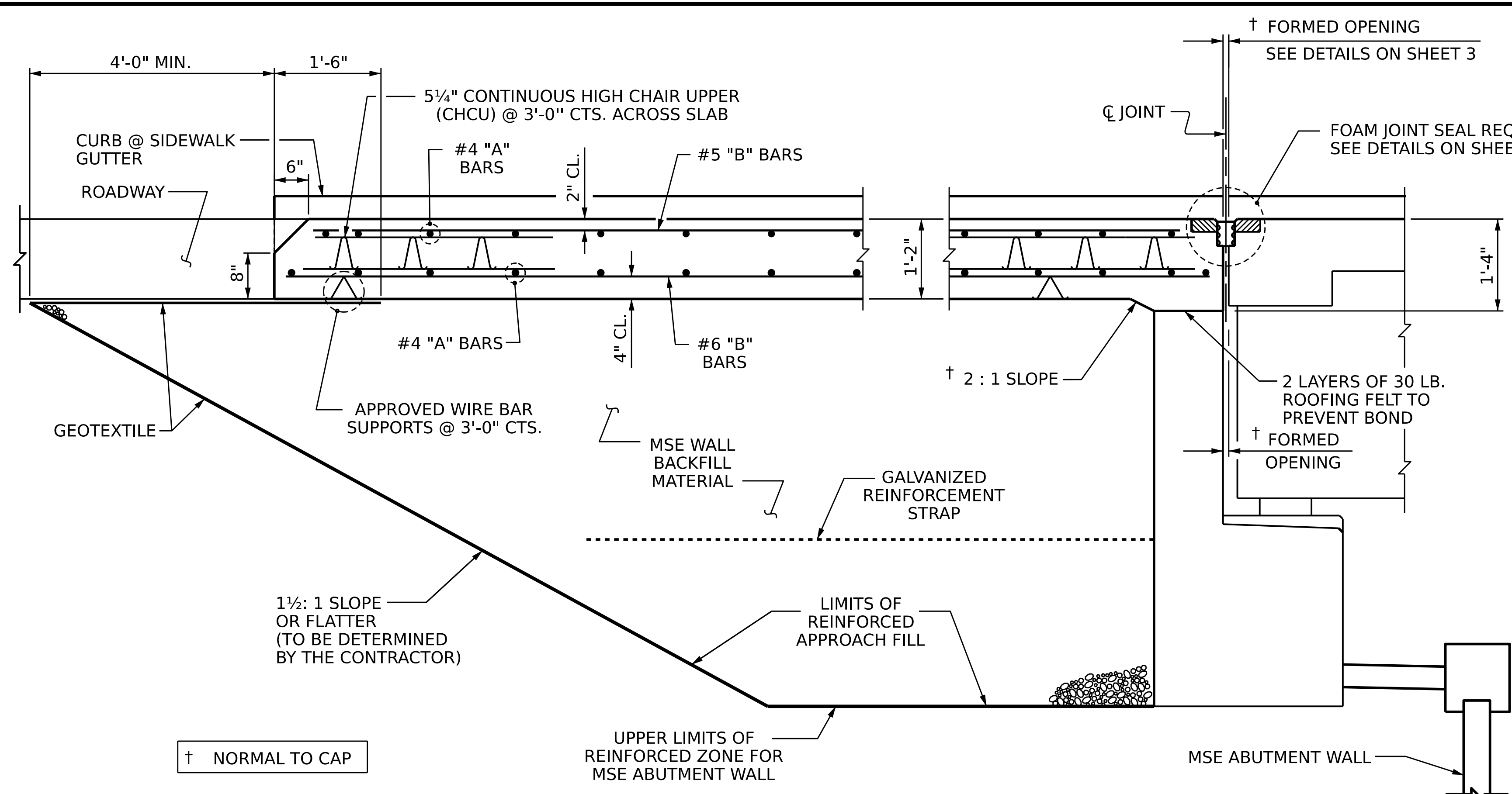
THE ENTIRE COST FOR SIDEWALKS ON APPROACH SLAB SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR APPROACH SLABS, NO SEPARATE PAYMENT SHALL BE MADE.

DRAWN BY :	M.L. CATER	DATE :	10/2022
CHECKED BY :	G.R. COLS	DATE :	10/2022
DESIGN ENGINEER OF RECORD:	G. COLS	DATE :	12/2022

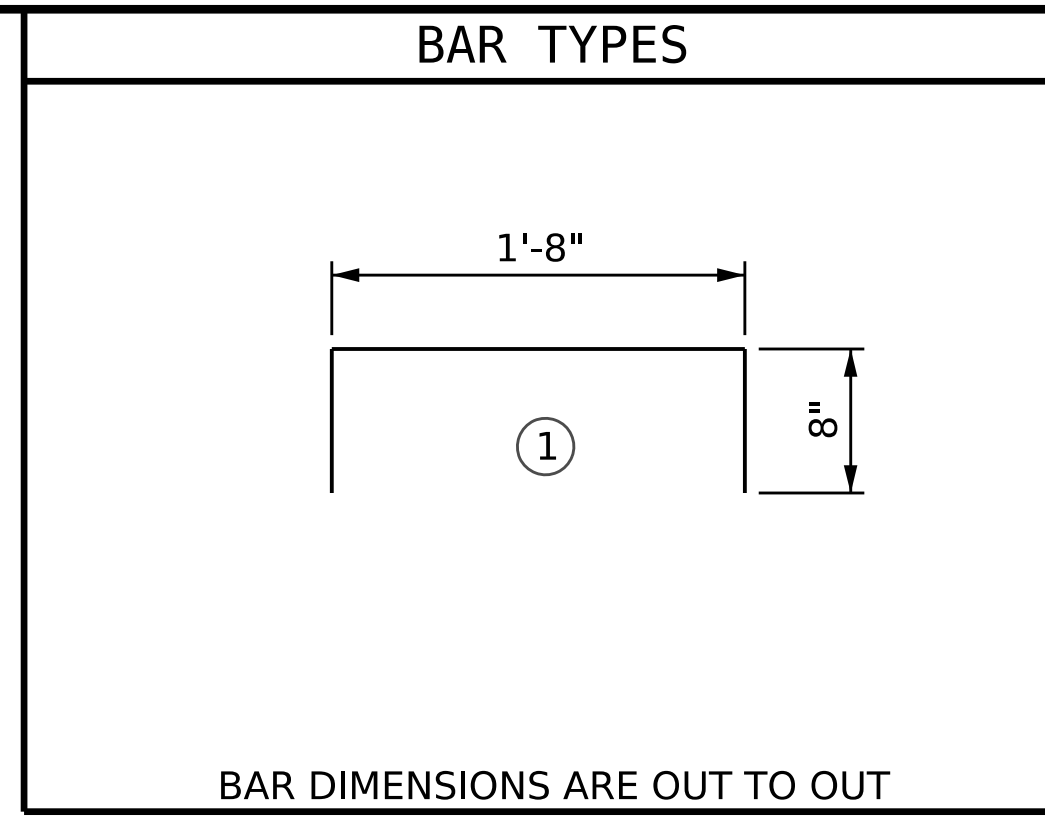
PROJECT NO. BR-0041
ROCKINGHAM COUNTY
 STATION: POT 34+73.00 -L-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-46
					TOTAL 48



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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

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.

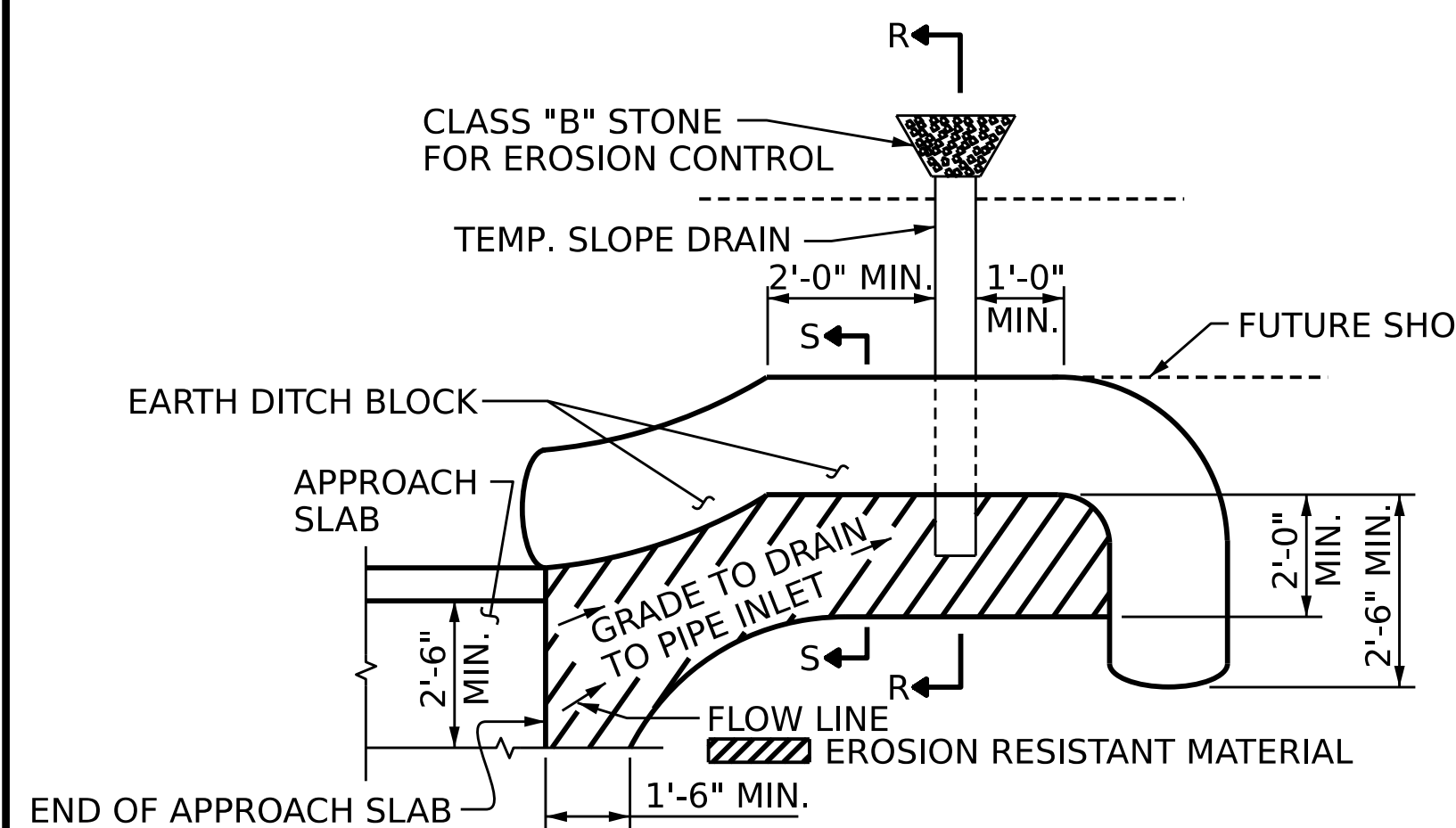
WITH FOAM JOINT SEAL
FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2\"/>

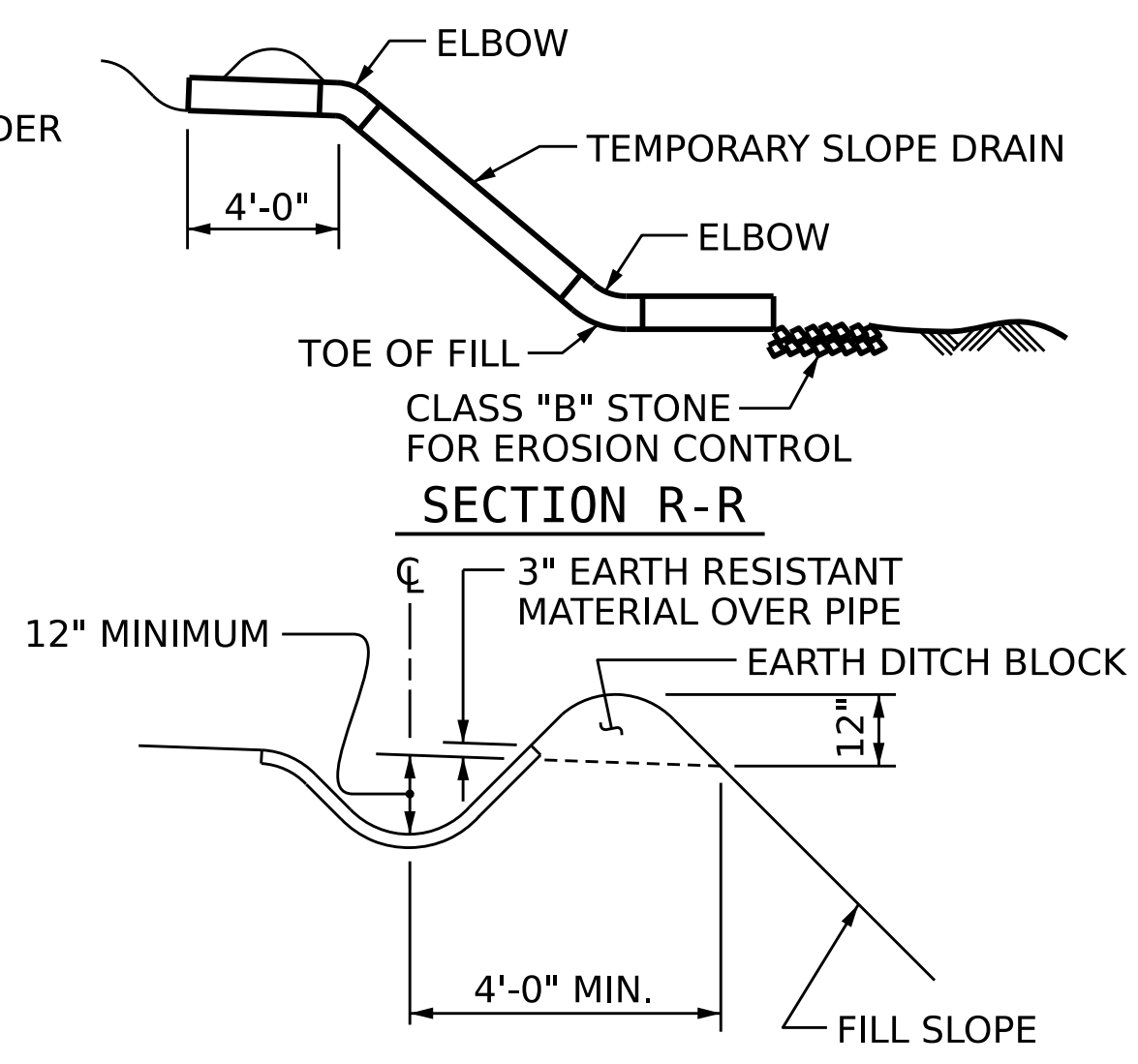
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
STAGE I & III					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	25	#4	STR	39'-4"	657
A2	26	#4	STR	39'-0"	677
* B1	69	#5	STR	23'-7"	1697
B2	69	#6	STR	24'-7"	2548
* B3	5	#4	STR	24'-7"	82
* G1	25	#4	STR	5'-3"	88
REINFORCING STEEL					3,225 LBS.
* EPOXY COATED REINFORCING STEEL					2,524 LBS.
CLASS AA CONCRETE					
POUR #1 (SLAB) (STAGE I)					37.4 C.Y.
POUR #2 (SIDEWALK) (STAGE III)					3.1 C.Y.
CLASS AA CONCRETE					40.5 C.Y.
STAGE II					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	50	#4	STR	26'-7"	888
A4	52	#4	STR	26'-3"	912
* B1	92	#5	STR	23'-7"	2263
B2	92	#6	STR	24'-7"	3397
* B3	5	#4	STR	24'-7"	82
* G1	25	#4	STR	5'-3"	88
* U1	10	#4	1	3'-0"	20
REINFORCING STEEL					4,309 LBS.
* EPOXY COATED REINFORCING STEEL					3,341 LBS.
CLASS AA CONCRETE					
POUR #1 (SLAB)					49.9 C.Y.
POUR #2 (SIDEWALK)					3.1 C.Y.
CLASS AA CONCRETE					53.0 C.Y.

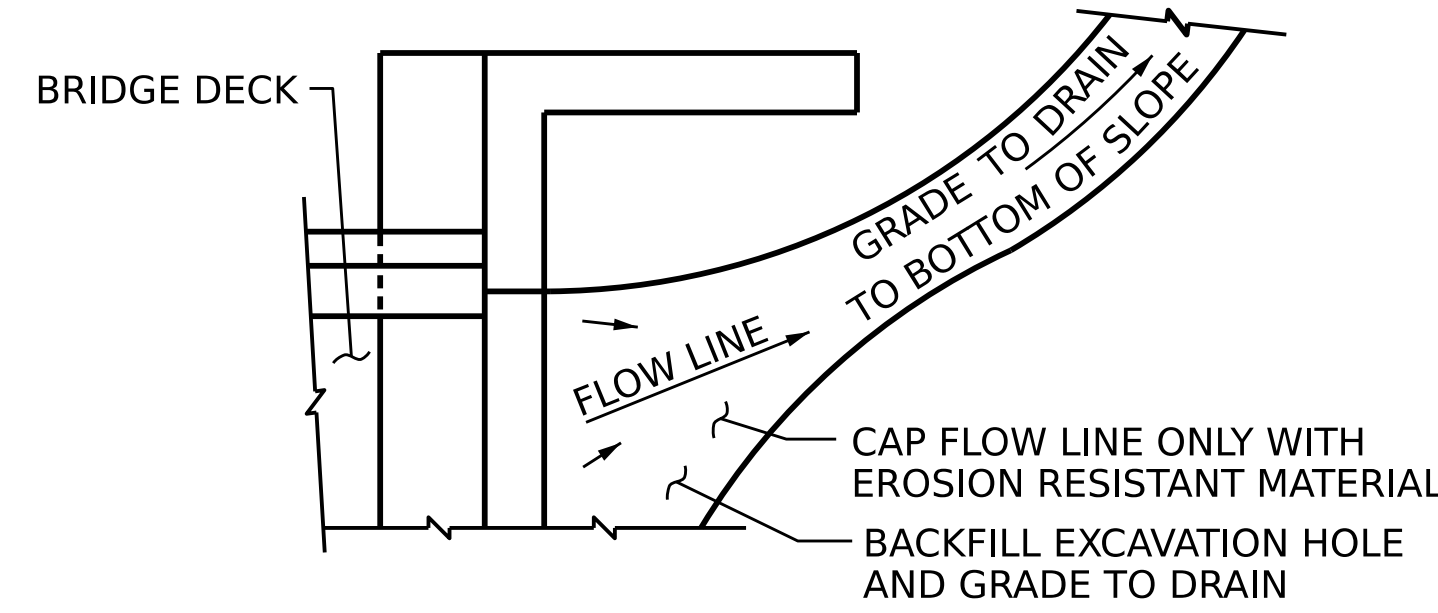
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1' - 11"	1' - 7"
#5	2' - 5"	2' - 0"
#6	3' - 7"	2' - 5"



PLAN VIEW



SECTION S-S



TEMPORARY DRAINAGE DETAIL

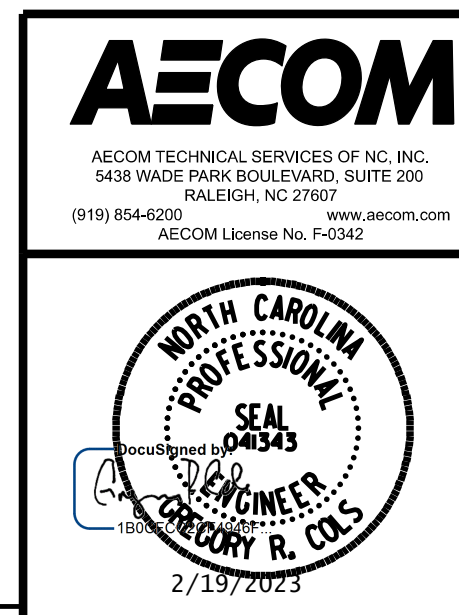
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

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

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

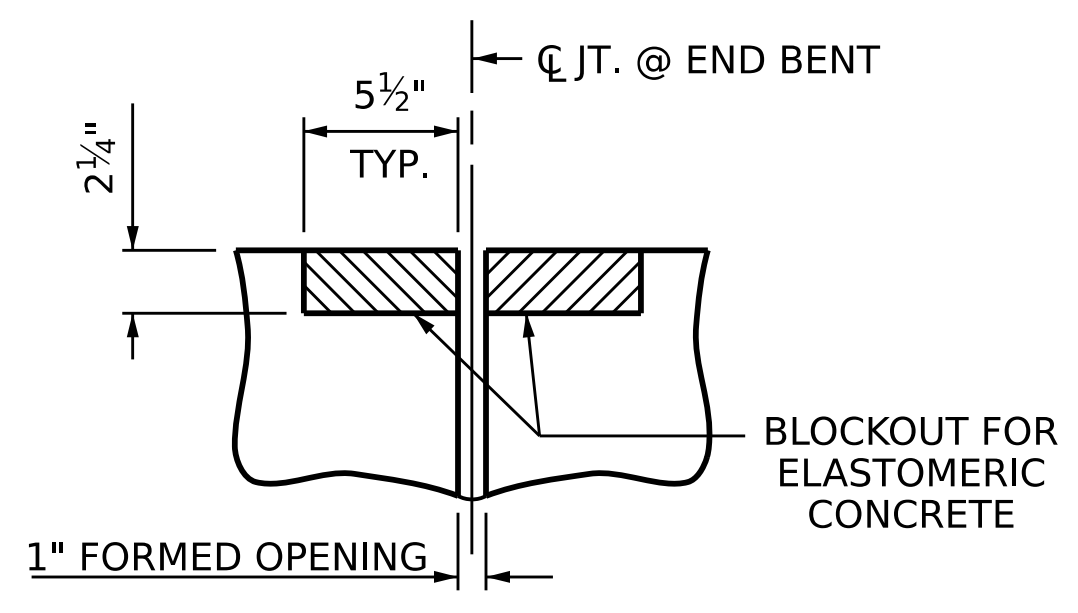
ASSEMBLED BY : M.L. CATER	DATE : 10/2022
CHECKED BY : G. COLS	DATE : 10/2022
DRAWN BY : EEM 3/95	REV. 6/13 MAA/GM
CHECKED BY : VAP 3/95	REV. 12/17 MAA/THC
	REV. 6/19 BNB/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

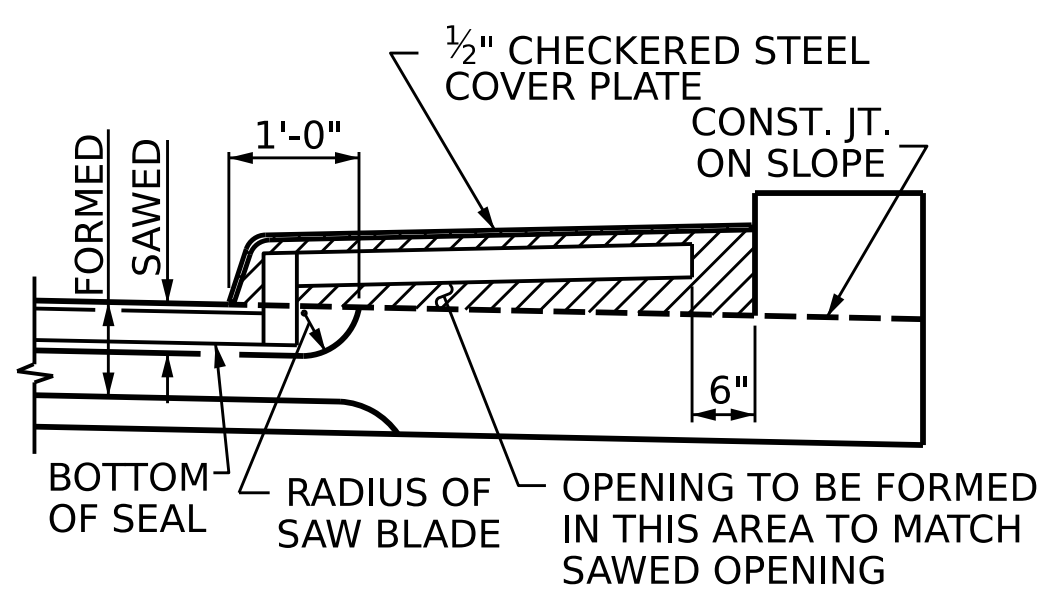


PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-
SHEET 2 OF 2

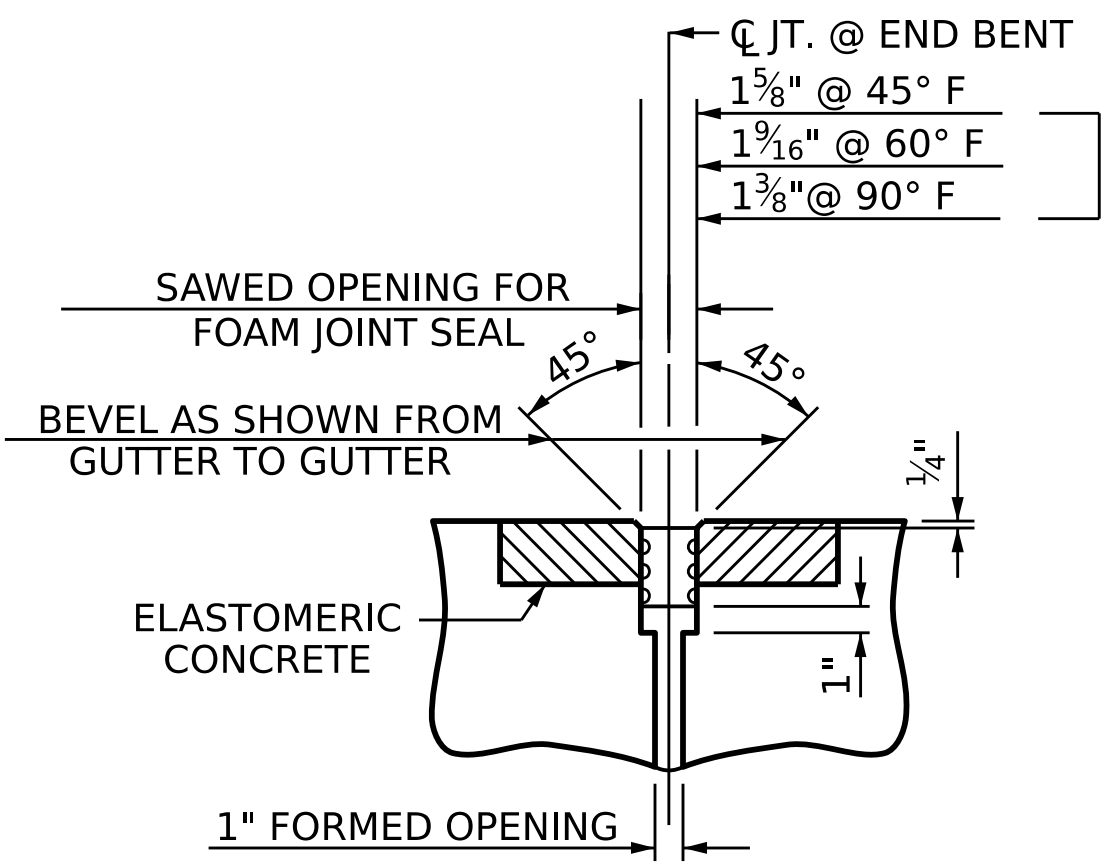
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS 48
2			4			



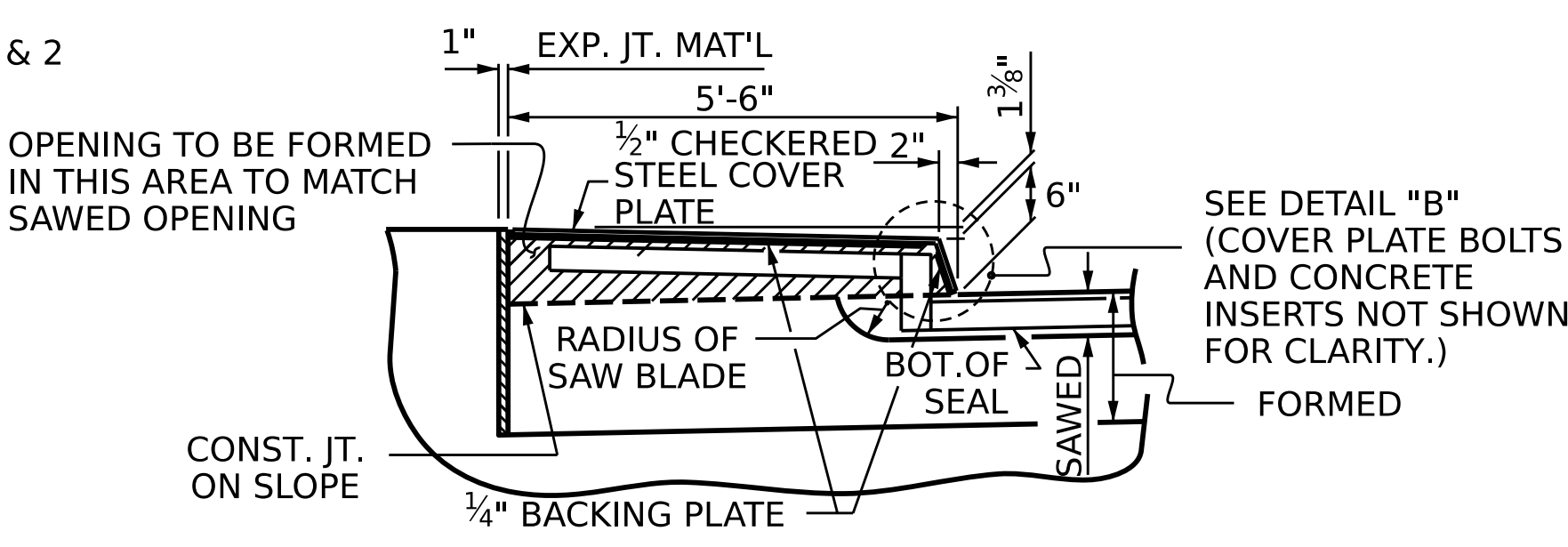
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



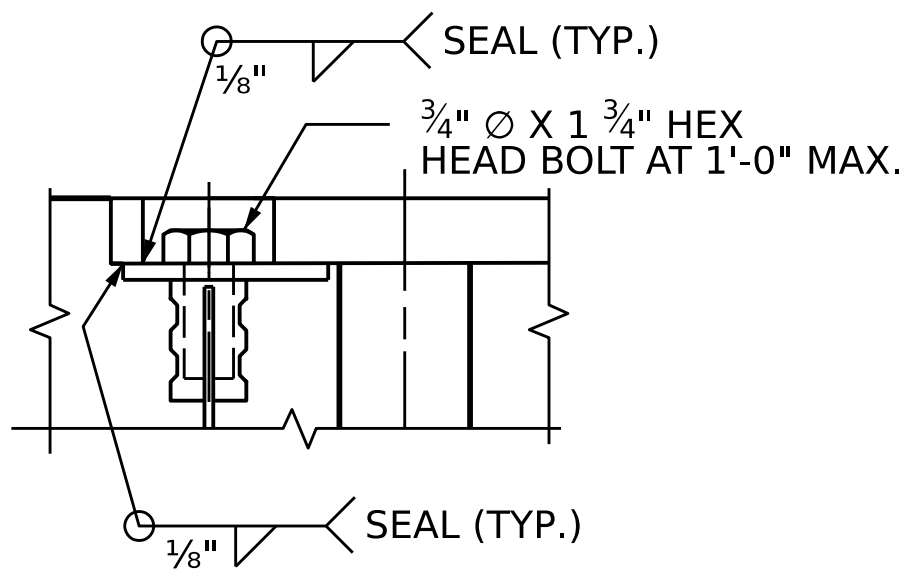
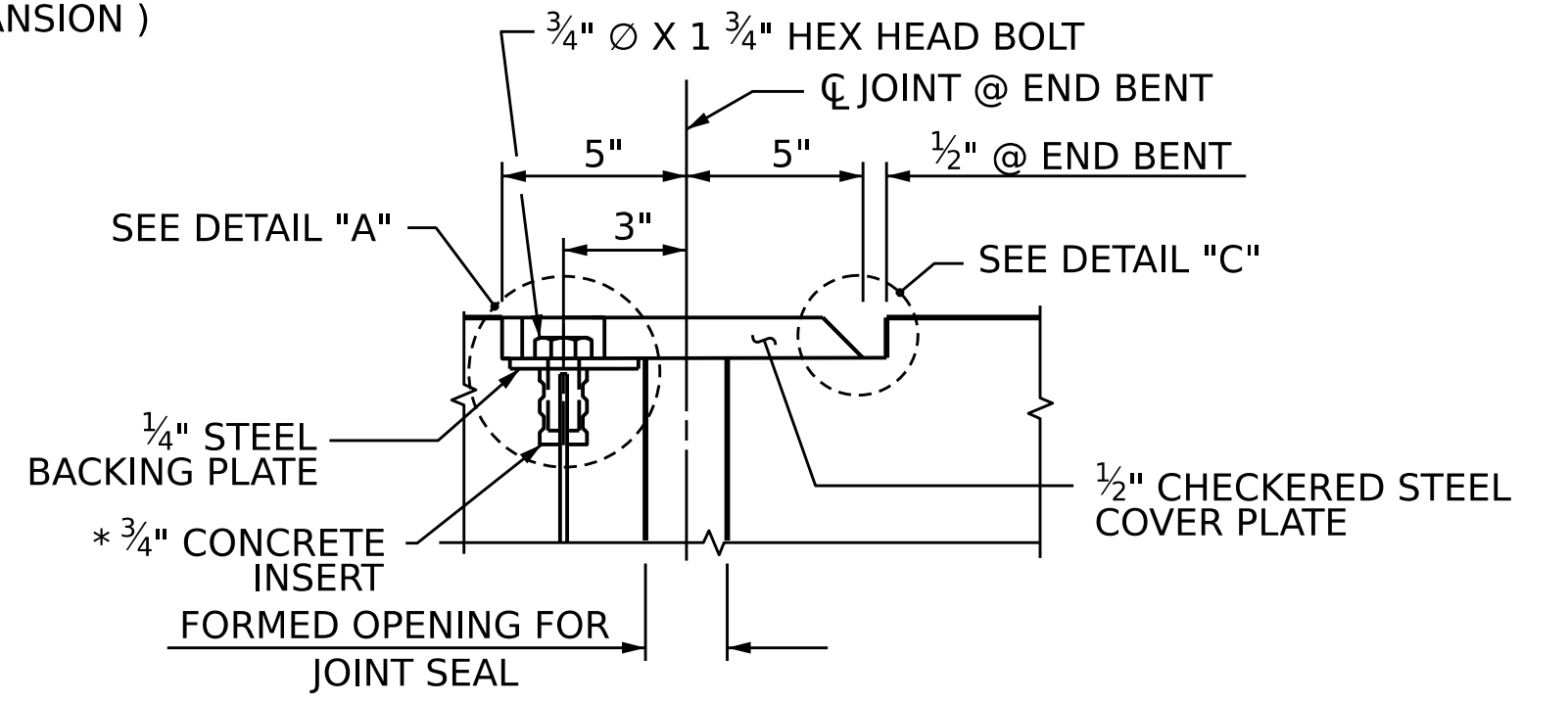
SECTION H-H
(ON BRIDGE DECK)



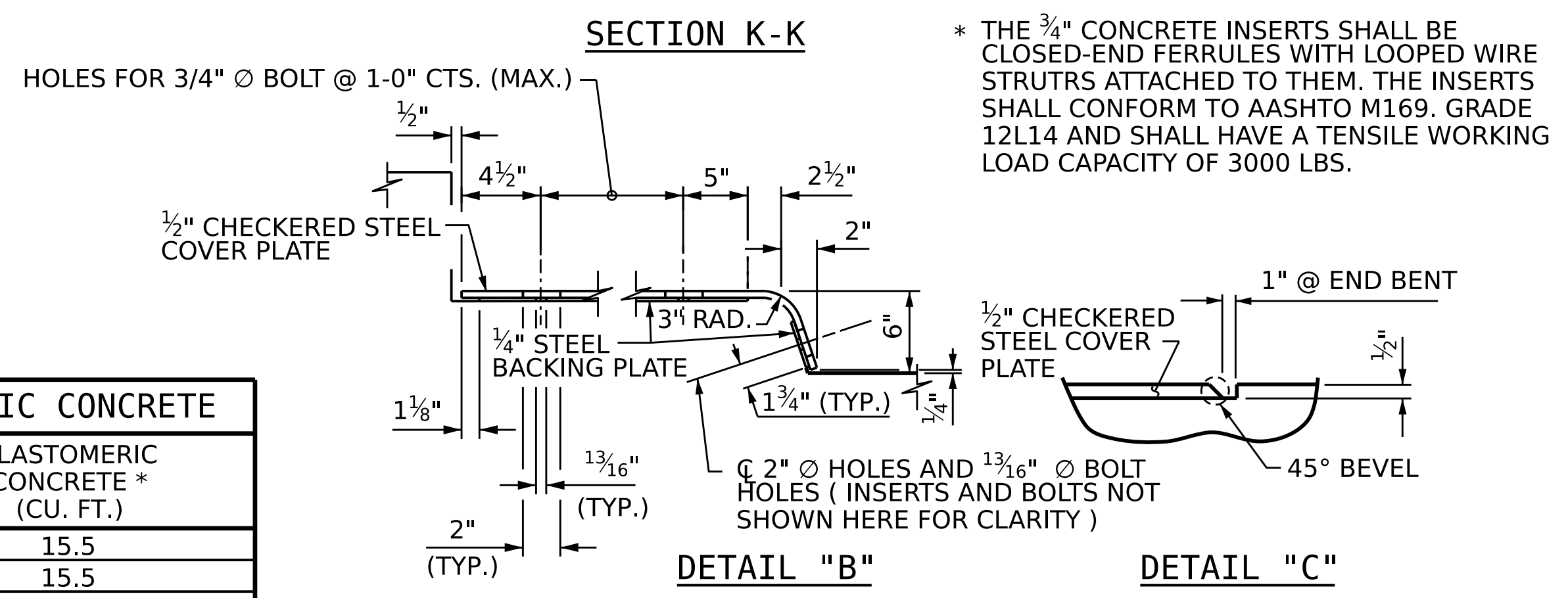
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION I-I
(ON APPROACH SLAB)



DETAIL "A"

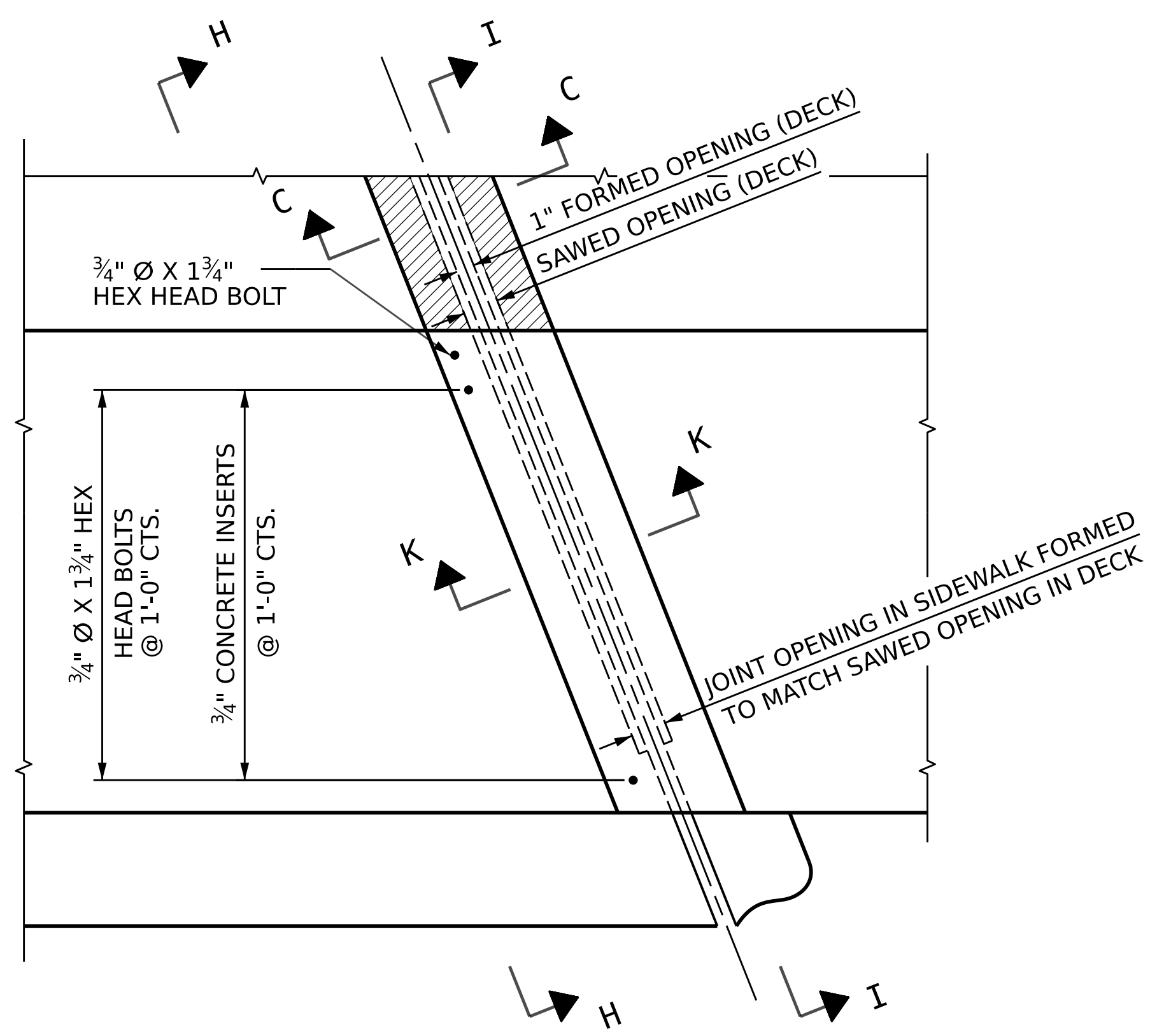


SECTION K-K

DETAIL "B"

DETAIL "C"

JOINT SEAL DETAILS @ END BENT



PLAN

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	15.5
2	15.5
TOTAL	31.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

ASSEMBLED BY : B.T. LEROY	DATE : 11/2022
CHECKED BY : G. COLS	DATE : 11/2022
DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

PROJECT NO. BR-0041
ROCKINGHAM COUNTY
STATION: POT 34+73.00 -L-

SHEET 3 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-48
1			3			TOTAL SHEETS
2			4			48

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

JANUARY, 1990

STD. NO. SN