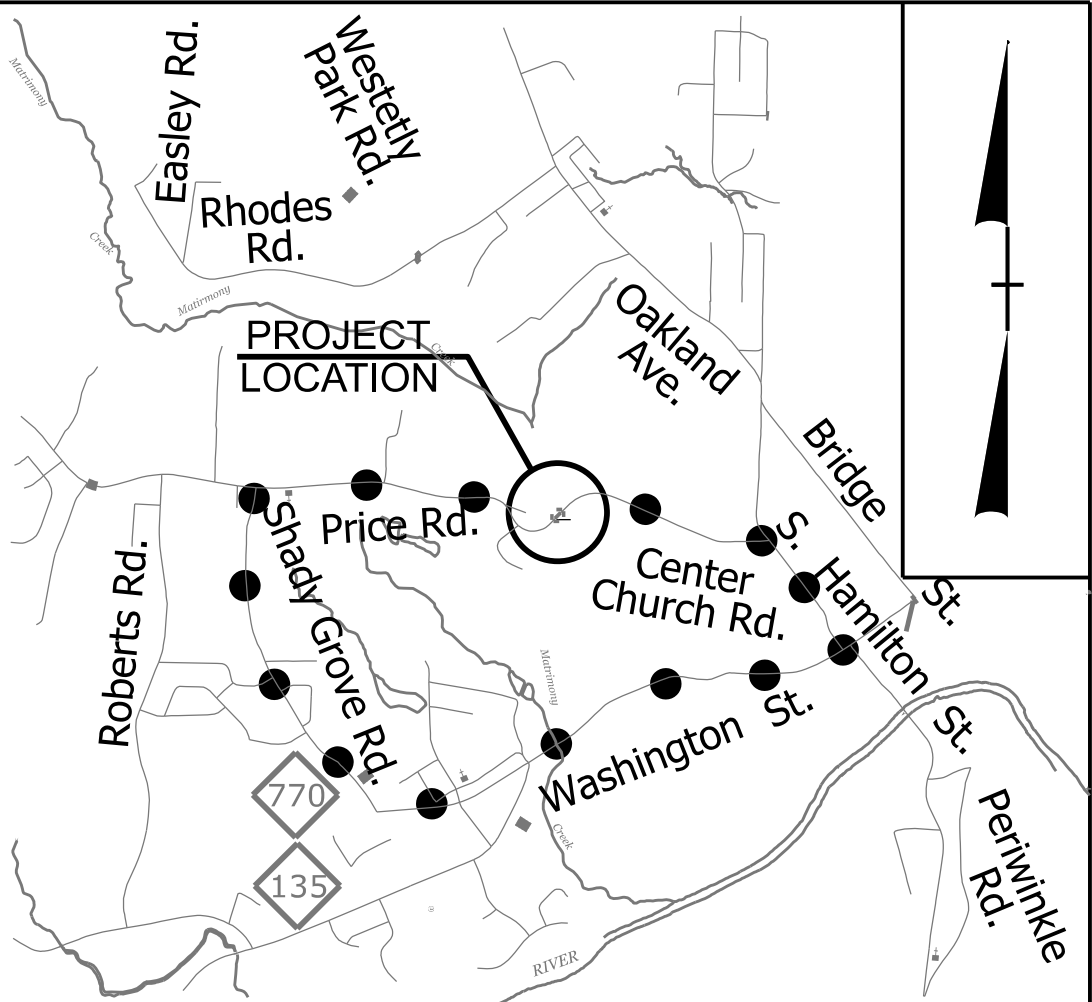


09/08/99

TIP PROJECT: HB-0035

CONTRACT: C205194



VICINITY MAP (NTS)

● OFFSITE DETOUR ROUTE

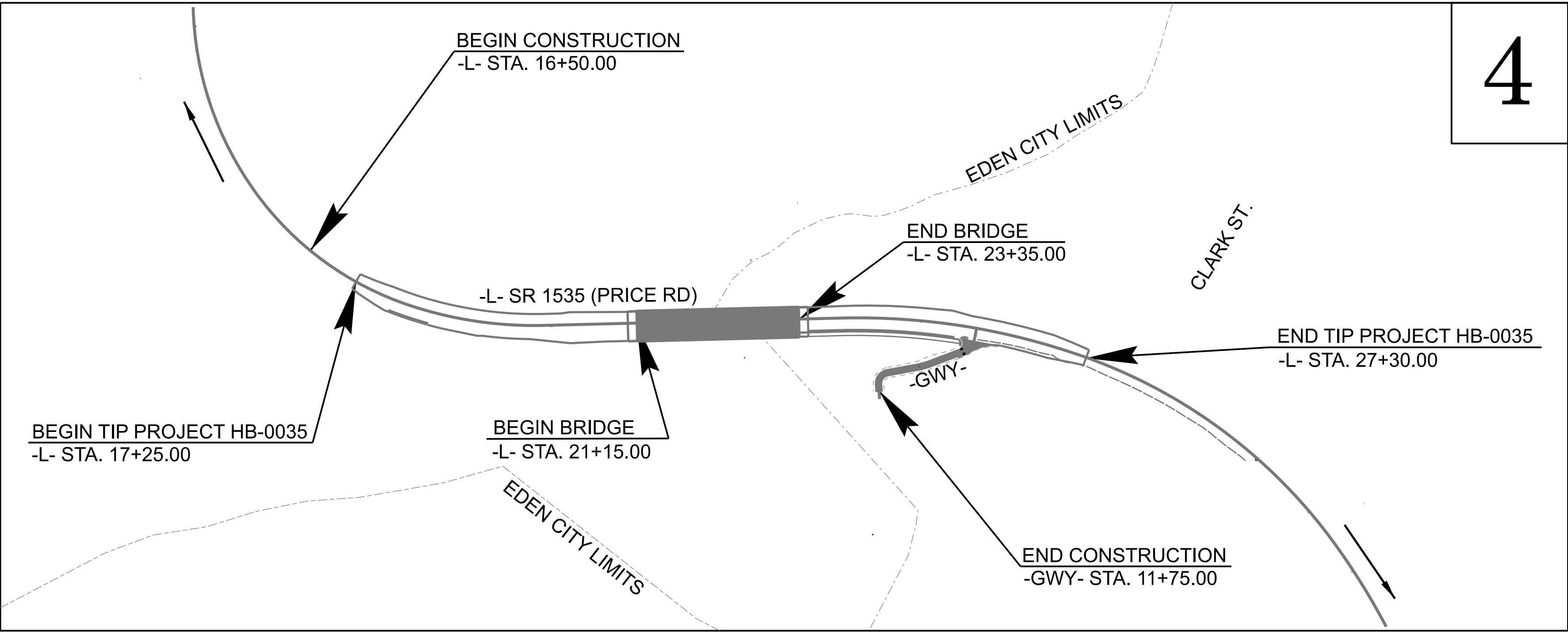
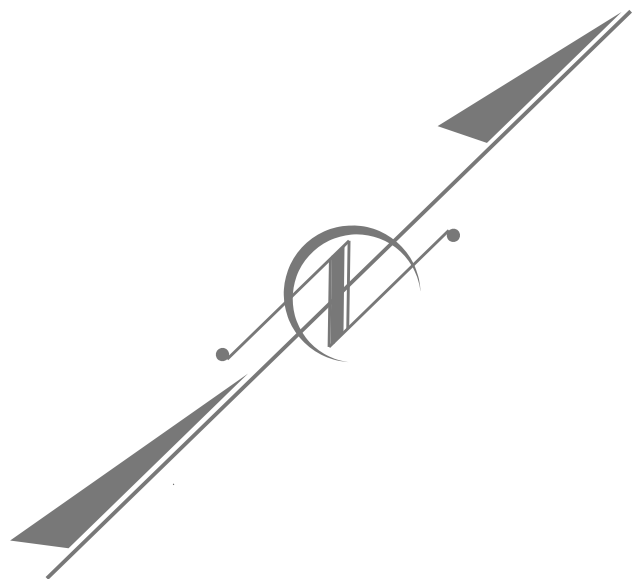
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

LOCATION: *REPLACE BRIDGE #780177 ON SR 1535 (PRICE ROAD) OVER MATRIMONY CREEK IN EDEN*

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

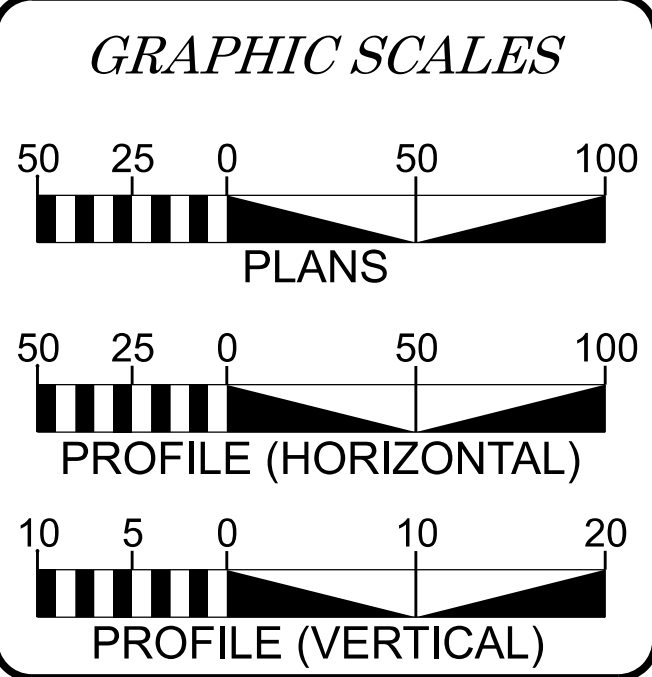
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0035	11	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
50639.1.1	N/A	PE	
50639.2.1	5063901	R/W	
50639.2.2	5063901	UTIL.	
50639.3.1	5063901	CON.	



STRUCTURES

THIS IS NOT A CONTROLLED ACCESS PROJECT.
THIS PROJECT IS WITHIN THE JURISDICTIONAL LIMITS OF THE CITY OF EDEN.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



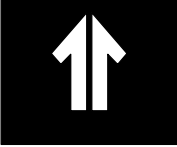
DESIGN DATA
ADT 2026 = 2440
ADT 2046 = 2820
V = 40 MPH
FUNC CLASS =
MINOR COLLECTOR

SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HB-0035 = 0.148 MILES
LENGTH STRUCTURE TIP PROJECT HB-0035 = 0.042 MILES
TOTAL LENGTH TIP PROJECT HB-0035 = 0.190 MILES

NCDOT CONTACT: EMILY FERREIRA, PE
PROJECT MANAGER - NCDOT PMU

PREPARED IN THE OFFICE OF:
**SUMMIT**
DESIGN AND ENGINEERING SERVICES
FIRM NO. C-3176

2024 STANDARD SPECIFICATIONS

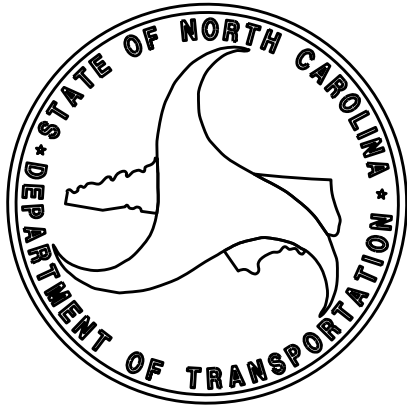
LETTING DATE:
JULY 21, 2026

JENNIFER R. McROY, PE
PROJECT ENGINEER

GREGORY W. DICKEY, PE
PROJECT DESIGNER


4/2/2026

Signed by:
Jennifer R. McRoy
F21A12FB8CD840B...



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")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1, Piles 1-9	9	230	563.70	15								550.5	6	5
End Bent 2, Piles 1-9	9	185	561.86	25			310							
TOTAL QUANTITY:													54	45

**RDR = (Factored Resistance + Factored Drag Load + Factored Dead Load) / Dynamic Resistance Factor + Nominal Drag Load Resistance + Nominal Resistance from Scourable Material*

** 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.

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 KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-9	228.7					
End Bent 2, Piles 1-9	185			0.6		

* 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")	Number of Piers per Line	Factored Resistance per Pier KIPS	Required Drilled Pier Tip Elevation FT	Required Tip Resistance per Pier KSF	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	Permanent Steel Casing Tip Elevation (Elevation Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier LIN FT
Bent 1, Piers 1-3	3	1180	522	200	529			11	4		532	5
TOTAL QUANTITY:								33	12			15

* Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "48" Dia. Drilled Piers" or "48" Dia. Drilled Piers Not in Soil" and "48" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications. For bents with a not in soil pay item, drilled piers through air or water will be paid at the contract unit price for "48" Dia. Drilled Piers in Soil."

** Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casing for 48" Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

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) EACH	Crosshole Sonic Logging (CSL) EACH	Thermal Integrity Profiler (TIP) EACH	Shaft Inspection Device (SID) EACH	Pile Integrity Test (PIT) EACH
Bent 1, Piers 1-3		1		1	
TOTAL QUANTITY:		1		1	

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 3 OF 4

NOTES:

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thein Tun Zan, #030943) on 07-10-2025.
- 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 may adjust the quantity for DPT Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, TIPs, CSL Testing, SID Inspections and PITs when necessary.

FOUNDATION NOTES ON PLANS:

- For piles, see Section 450 of the Standard Specifications.
- For drilled piers, see section 411of the Standard Specifications.
- It has been estimated that a hammer with an equivalent rated energy in the range of 30,000 ft-lbs per blow will be required to drive piles at Bent No. 2. This estimated energy range does not release the contractor from providing driving equipment in accordance with subarticle 450-3(D)(2) of the standard specifications.
- Fill the bottom 3 ft. of holes for pile excavation at End Bent No. 1 with concrete or grout and the rest of the holes with class II or III select material that meets Section 1016 of the standard specifications.

DRAWN BY:	B. M. WILSON	DATE:	12/2025
CHECKED BY:	J. R. MCROY	DATE:	12/2025
DESIGN ENGINEER OF RECORD:	J. R. MCROY	DATE:	12/2025

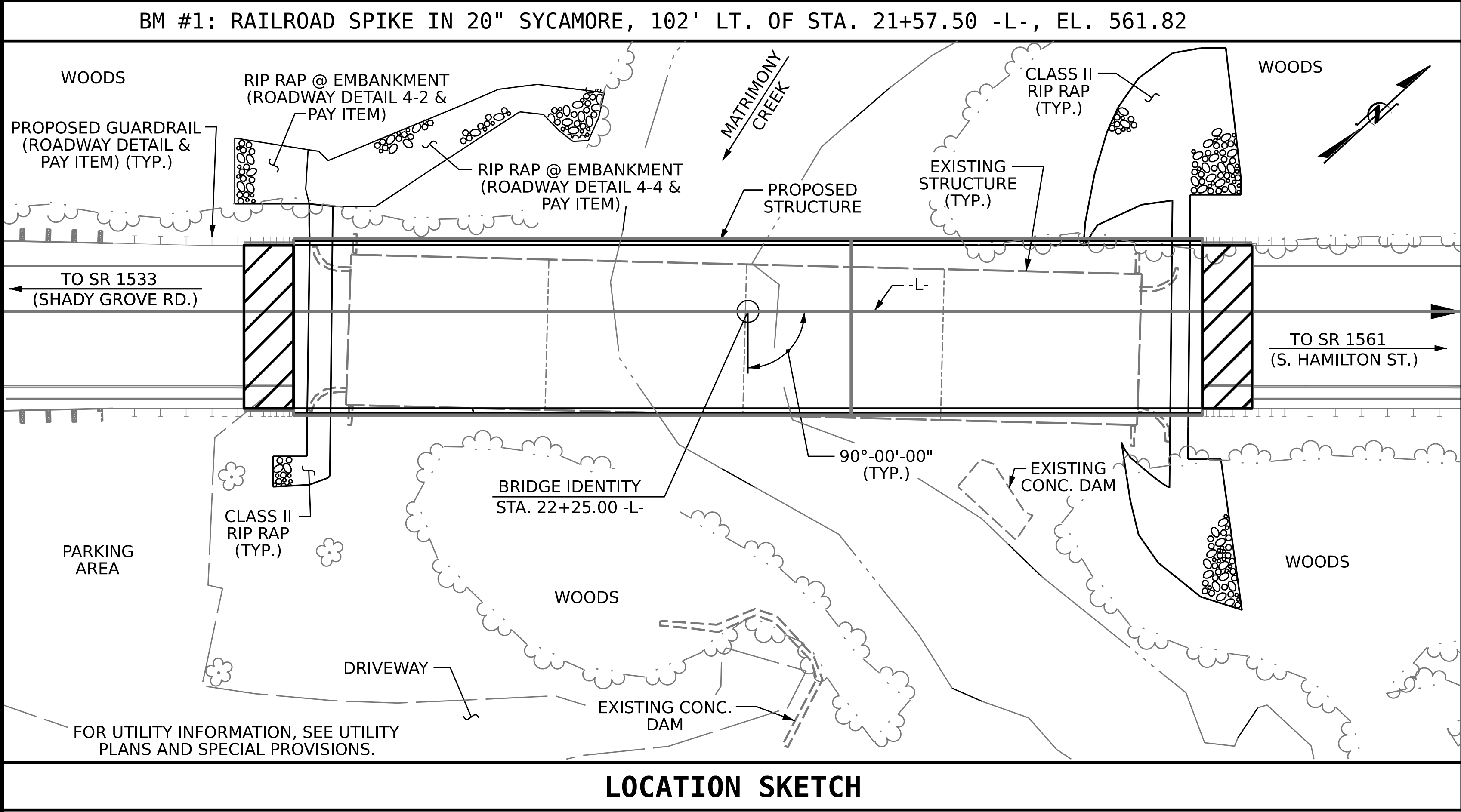


Signed by:
Jennifer R. McRoy
DATE: 12/25/2025
SIGNATURE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER
FOUNDATION
TABLES

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



NOTES

ASSUMED LIVE LOAD HL=93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 4 SHALL BE EXCAVATED FOR A DISTANCE OF 26' LEFT AND 44' RIGHT OF CENTERLINE ROADWAY AT END BENT 1 AND 2, OR 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS EL. 529.0. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS, 1 @ 47'-10", 2 @ 47'-6" AND 1 @ 47'-10", WITH A CLEAR ROADWAY WIDTH OF 28'-0", REINFORCED CONCRETE DECK ON PRESTRESSED GIRDERS WITH REINFORCED CONCRETE SPILL-THRU ABUTMENTS ON PILES AND REINFORCED CONCRETE CAP AND COLUMNS AT BENT, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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 CONDITION AT THE PROJECT SITE.

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

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 22+25.00 -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 ARTICLE 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.

HYDRAULIC DATA

DESIGN DISCHARGE	= 4400 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 545.4 FT.
DRAINAGE AREA	= 23.7 SQ. MI.
BASIC DISCHARGE (Q100)	= 5700 C.F.S.
BASIS HIGH WATER ELEVATION	= 546.7 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 67000 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 571.1 FT.

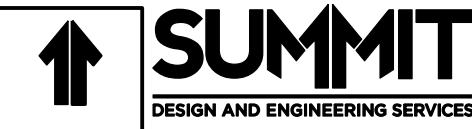
WS EL. TAKEN @ RIVER STATION 10840

TOTAL BILL OF MATERIAL													
	CONSTRUCTION, MAINT. & REMOVAL OF TEMPORARY ACCESS @ STA. 22+25.00 -L-	REMOVAL OF EXISTING STRUCTURE @ STA. 22+25.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 22+25.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LUMP SUM								LUMP SUM	9,188	7,450
END BENT 1				45	54								
BENT 1						12	33	15	1	1			
END BENT 2													
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	45	54	12	33	15	1	1	LUMP SUM	9,188	7,450

TOTAL BILL OF MATERIAL															
	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	FIB 63" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	1'-2" X 3'-3" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EACH	NO.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		LUMP SUM			8	871.33				421.67	218.33	218.33			LUMP SUM
END BENT 1	31.5		5,119					9	135				125	140	
BENT 1	54.6		12,344	2,986											
END BENT 2	31.5		5,120				9	9	225				230	256	
TOTAL	117.6	LUMP SUM	22,583	2,986	8	871.33	9	18	360	421.67	218.33	218.33	355	396	LUMP SUM

DRAWN BY : M.K. BEARD DATE : 03/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

Prepared in the Office of:



NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by:
Jennifer R. McRoy
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PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

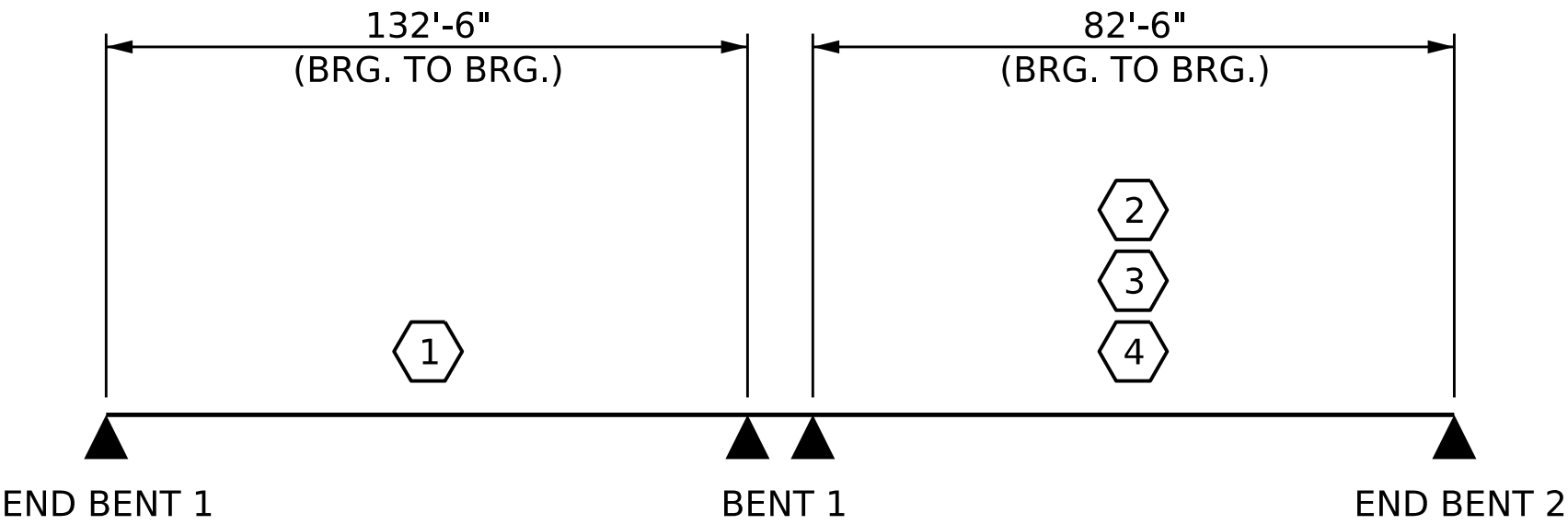
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER MATRIMONY
CREEK ON SR 1535 (PRICE RD.)
BETWEEN SR 1533 & SR 1561

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-4
2			4			TOTAL SHEETS 36

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING Ⓢ	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER	
							LIVE-LOAD FACTORS (γ LL)	MOMENT			SHEAR				LIVE-LOAD FACTORS (γ LL)	MOMENT								
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR		SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)
DESIGN LOAD		HL-93 (INVENTORY)	N/A	Ⓢ1	1.10	--	1.75	1.04	1.16	B	EL	41.25	1.03	1.38	A	I	106.43	0.80	0.99	1.10	A	EL	66.25	
		HL-93 (OPERATING)	N/A		1.50	--	1.35	1.04	1.50	B	EL	41.25	1.03	1.84	A	I	12.68	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	Ⓢ2	1.55	55.80	1.75	1.04	1.55	B	EL	41.25	1.03	1.98	A	I	106.43	0.80	1.04	1.59	B	EL	41.25	
		HS-20 (OPERATING)	36.000		2.01	72.33	1.35	1.04	2.01	B	EL	41.25	1.03	2.62	A	I	106.43	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.68	49.70	1.40	1.04	4.47	B	EL	41.25	1.03	6.59	A	I	26.07	0.80	1.04	3.68	B	EL	41.25	
		SNGARBS2	20.000		2.71	54.16	1.40	1.04	3.29	B	EL	41.25	1.03	4.53	A	I	106.43	0.80	1.04	2.71	B	EL	41.25	
		SNAGRIS2	22.000		2.55	56.10	1.40	1.04	3.10	B	EL	41.25	1.03	4.15	A	I	26.07	0.80	1.04	2.55	B	EL	41.25	
		SNCOTTS3	27.250		1.83	49.89	1.40	1.04	2.22	B	EL	41.25	1.03	3.18	A	I	26.07	0.80	1.04	1.83	B	EL	41.25	
		SNAGGRS4	34.925		1.52	52.96	1.40	1.04	1.84	B	EL	41.25	1.03	2.54	A	I	26.07	0.80	1.04	1.52	B	EL	41.25	
		SNS5A	35.550		1.48	52.75	1.40	1.04	1.80	B	EL	41.25	1.03	2.54	A	I	26.07	0.80	1.04	1.48	B	EL	41.25	
		SNS6A	39.950		1.36	54.16	1.40	1.04	1.65	B	EL	41.25	1.03	2.27	A	I	106.43	0.80	1.04	1.36	B	EL	41.25	
		SNS7B	42.000		1.29	54.22	1.40	1.04	1.57	B	EL	41.25	1.03	2.20	A	I	26.07	0.80	1.04	1.29	B	EL	41.25	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.65	54.50	1.40	1.04	2.01	B	EL	41.25	1.03	2.76	A	I	26.07	0.80	1.04	1.65	B	EL	41.25	
		TNT4A	33.075		1.66	54.82	1.40	1.04	2.01	B	EL	41.25	1.03	2.71	A	I	106.43	0.80	1.04	1.66	B	EL	41.25	
		TNT6A	41.600		1.35	56.15	1.40	1.04	1.64	B	EL	41.25	1.03	2.29	A	I	26.07	0.80	1.04	1.35	B	EL	41.25	
		TNT7A	42.000		1.35	56.85	1.40	1.04	1.64	B	EL	41.25	1.03	2.25	A	I	26.07	0.80	1.04	1.35	B	EL	41.25	
		TNT7B	42.000		1.39	58.52	1.40	1.04	1.69	B	EL	41.25	1.03	2.16	A	I	26.07	0.80	1.04	1.39	B	EL	41.25	
		TNAGRIT4	43.000		1.33	57.22	1.40	1.04	1.62	B	EL	41.25	1.03	2.10	A	I	26.07	0.80	1.04	1.33	B	EL	41.25	
		TNAGT5A	45.000		1.26	56.57	1.40	1.04	1.53	B	EL	41.25	1.03	2.04	A	I	106.43	0.80	1.04	1.26	B	EL	41.25	
		TNAGT5B	45.000	Ⓢ3	1.24	55.99	1.40	1.04	1.51	B	EL	41.25	1.03	1.99	A	I	26.07	0.80	1.04	1.24	B	EL	41.25	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.91	54.91	1.30	1.04	2.50	B	EL	41.25	1.03	3.36	A	I	26.07	0.80	1.04	1.91	B	EL	41.25	
		EV3	43.000	Ⓢ4	1.25	53.93	1.30	1.04	1.64	B	EL	41.25	1.03	2.19	A	I	106.43	0.80	1.04	1.25	B	EL	41.25	



LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	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 * *
④	EMERGENCY VEHICLE LOAD RATING **
* * SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	

ASSEMBLED BY: M.K. BEARD		DATE : 2/11/2025	
CHECKED BY : J.R. MCROY		DATE : 12/2025	
DRAWN BY : MAA	1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI	2/08	REV. 10/1/11	MAA/GM
		REV. 04/23	BNB/AAI

Prepared in the Office of:
SUMMIT
DESIGN AND ENGINEERING SERVICES

PROJECT NO. HB-0035
ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com


Signed by: *Jennifer R. McRoy* 3/4/2026
F21A12FB8CDBA0B...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			36
2			4			

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NOTES

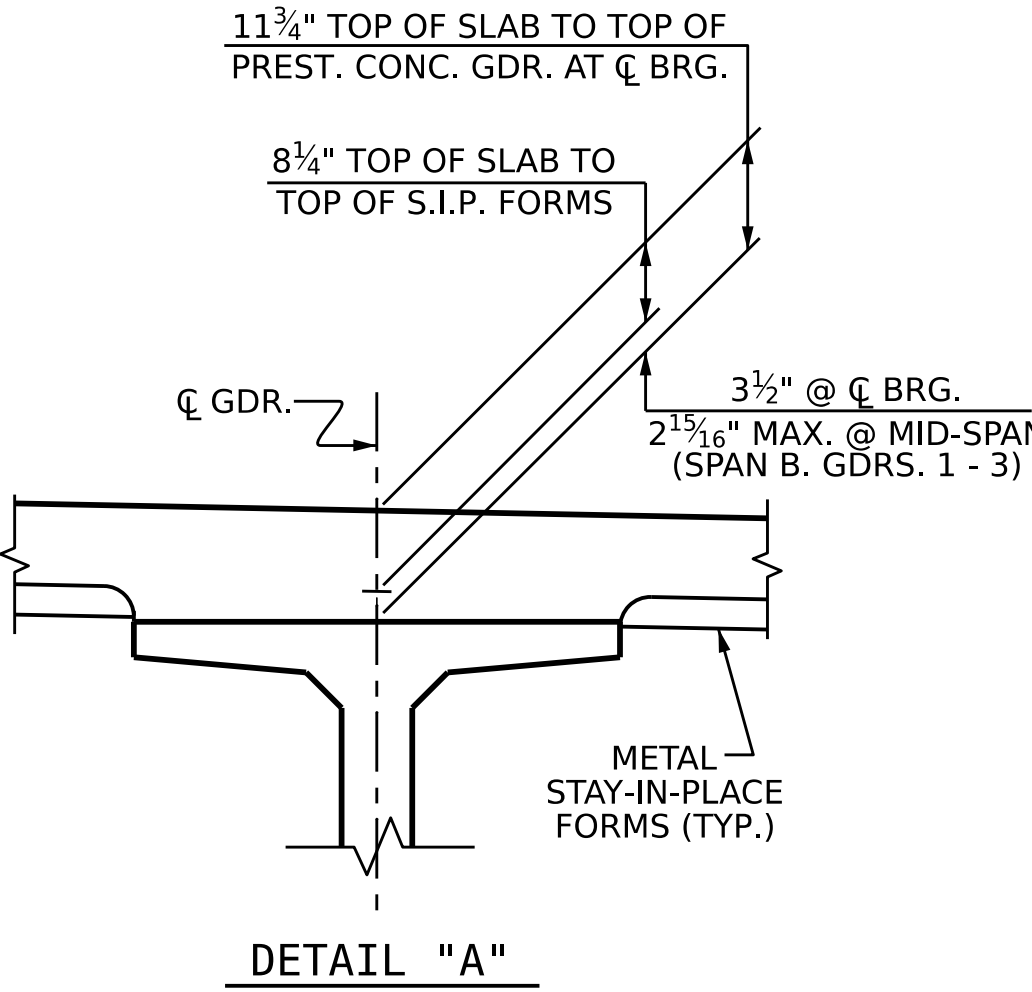
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

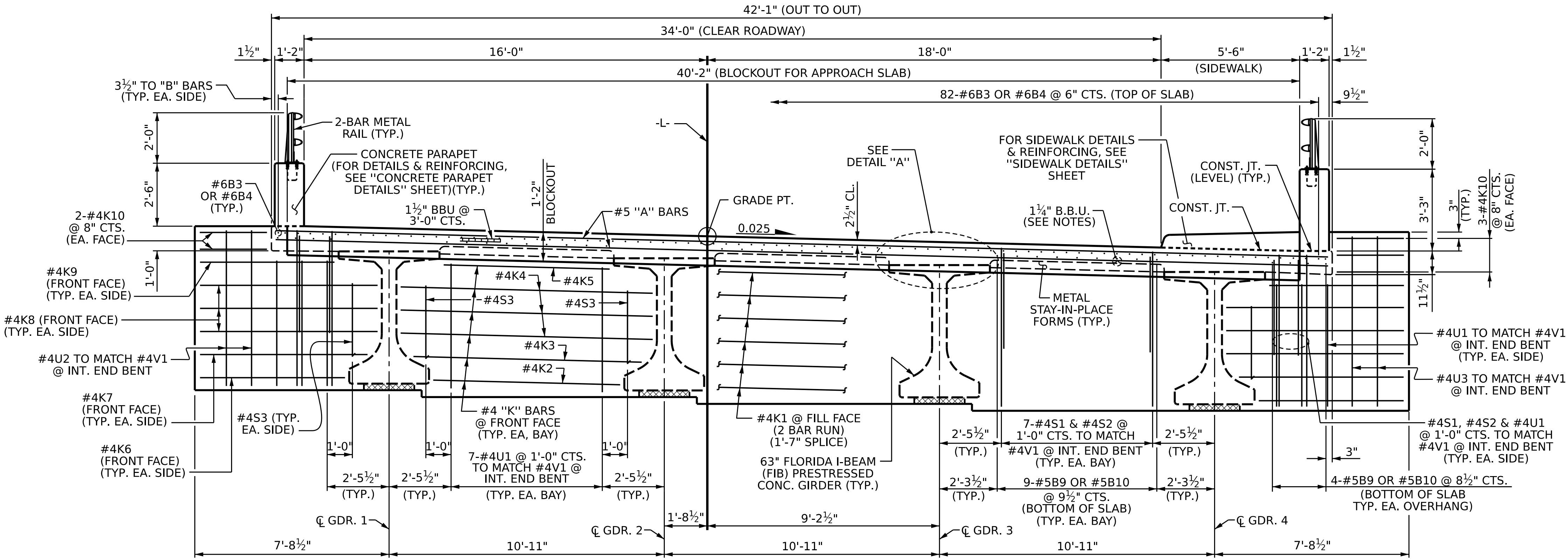
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR ADDITIONAL INFORMATION ON DECK SLAB, SEE "PLAN OF SPAN" SHEETS.



TYPICAL SECTION AT INTEGRAL END BENT

SHOWING ABUTMENT WALL @ FILL FACE OF INTEGRAL END BENTS.

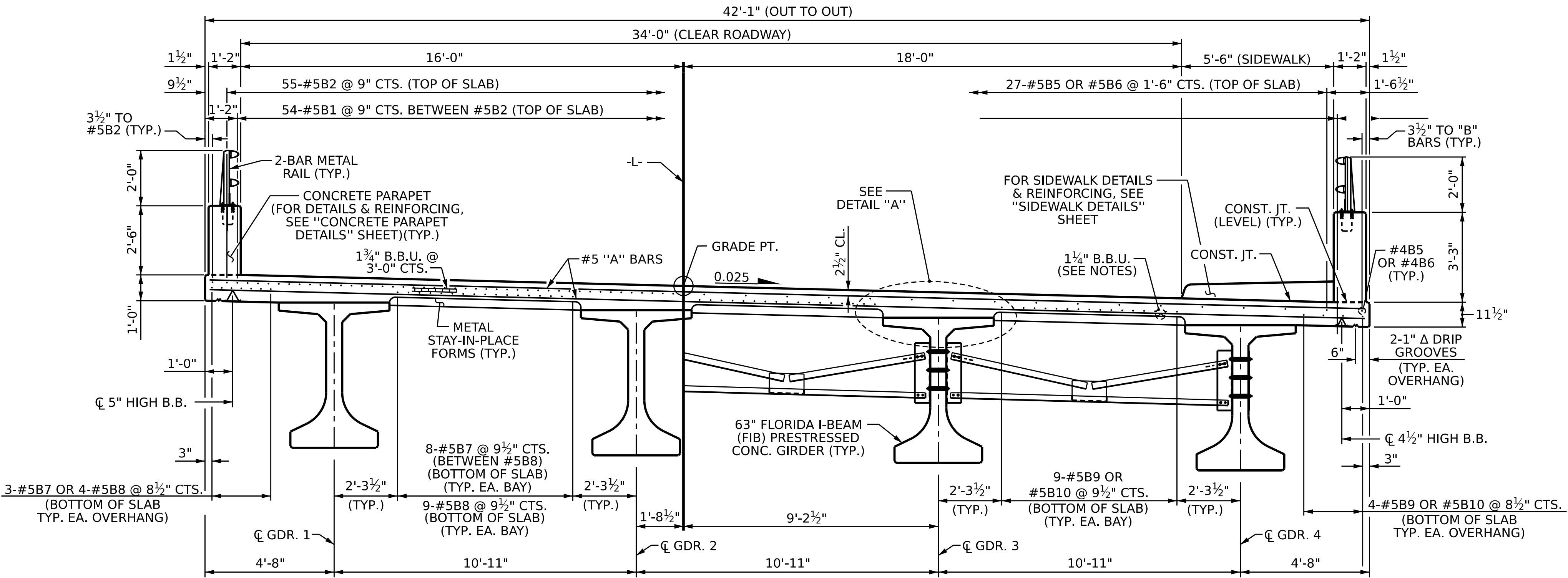


HALF SECTION OF LINK SLAB AT BENTS

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

HALF SECTION AT INTERMEDIATE DIAPHRAGM

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



Prepared in the Office of:



NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by:
Jennifer R. McRoy
F21A12F8BC0B40B...

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 1 OF 2

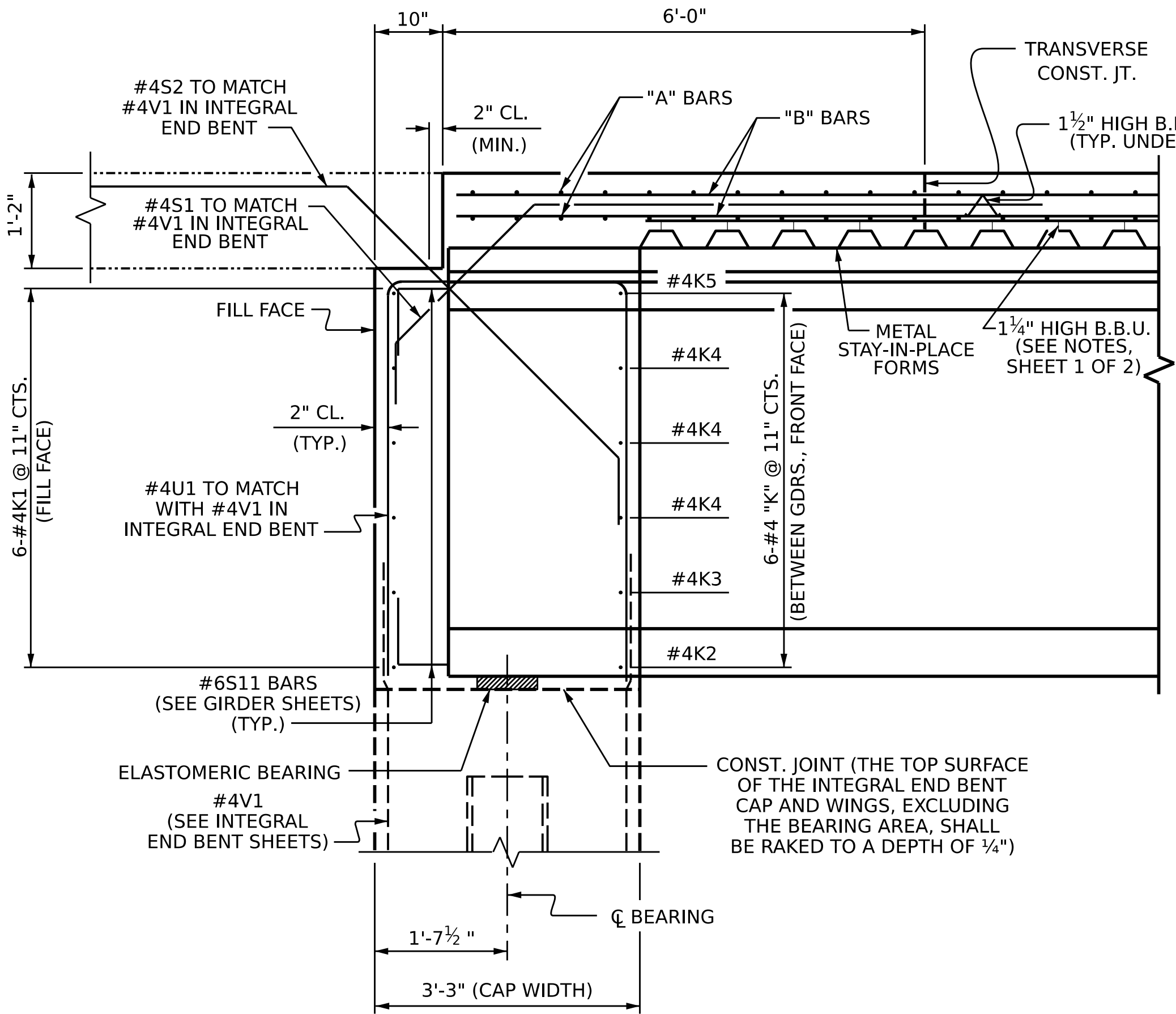
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

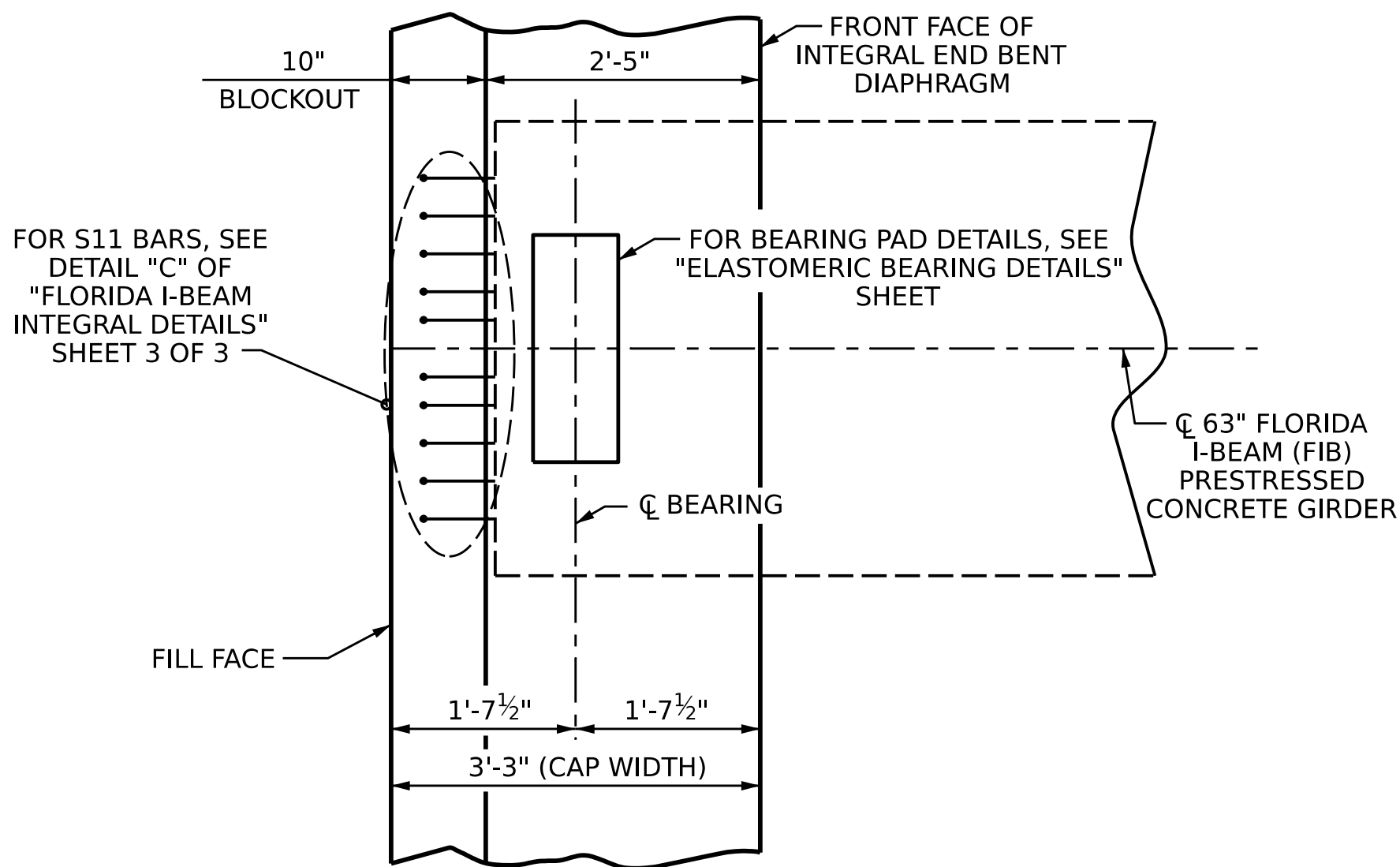
DRAWN BY : M.K. BEARD DATE : 01/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

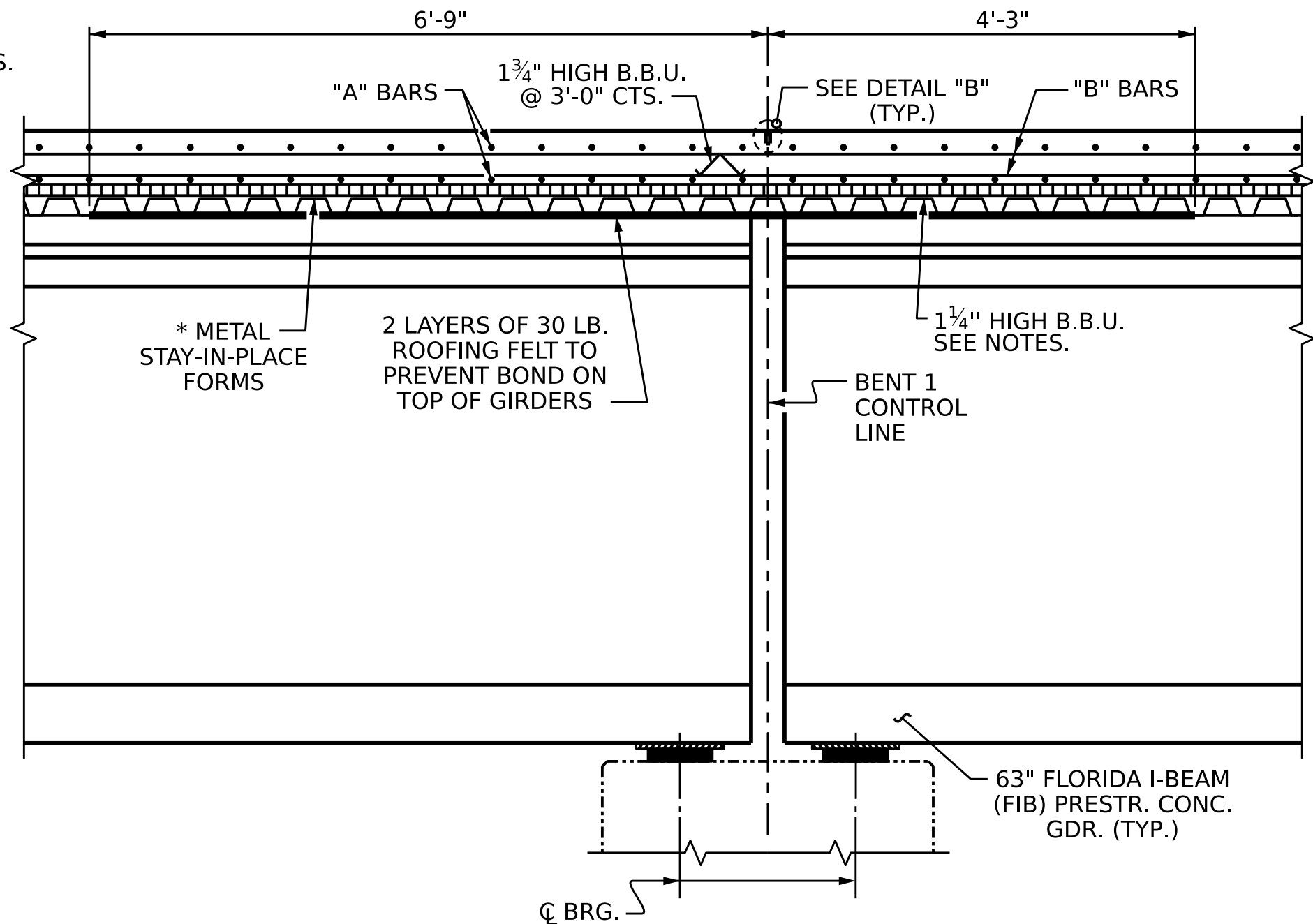
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	S-6
1			3				
2			4			36	



SECTION THRU INTEGRAL END BENT

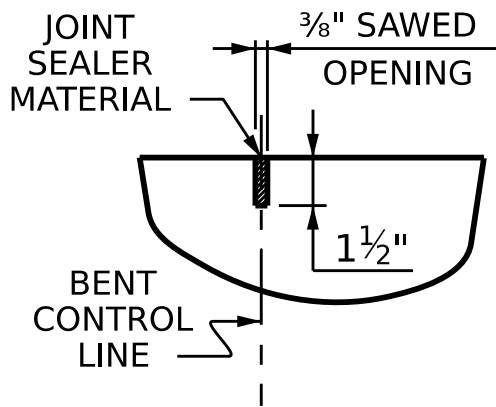


PLAN AT INTEGRAL END BENT



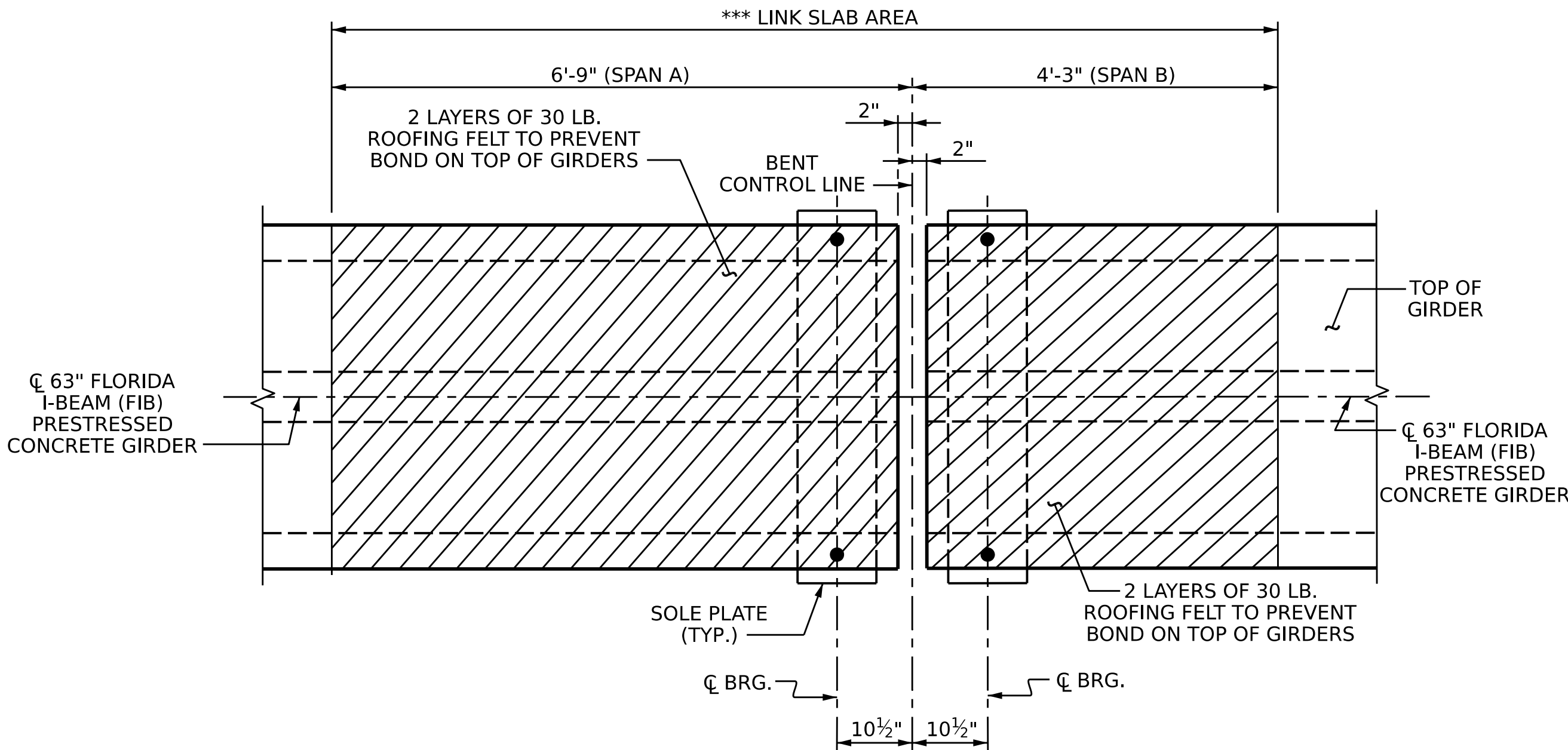
SECTION AT LINK SLAB

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



DETAIL "B"

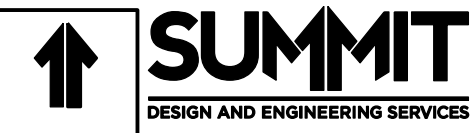
A 1 1/2" DEEP 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



PLAN AT BENT

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

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Raleigh, NC 27609
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www.summitde.com



Signed by:
Jennifer R. McRoy
F21A12FB8CD840B

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 2 OF 2

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-7
TOTAL
SHEETS
36

DRAWN BY : K. D. LAYNE DATE : 01/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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SIGNATURES COMPLETED



FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE
SHEET 2 OF 4.

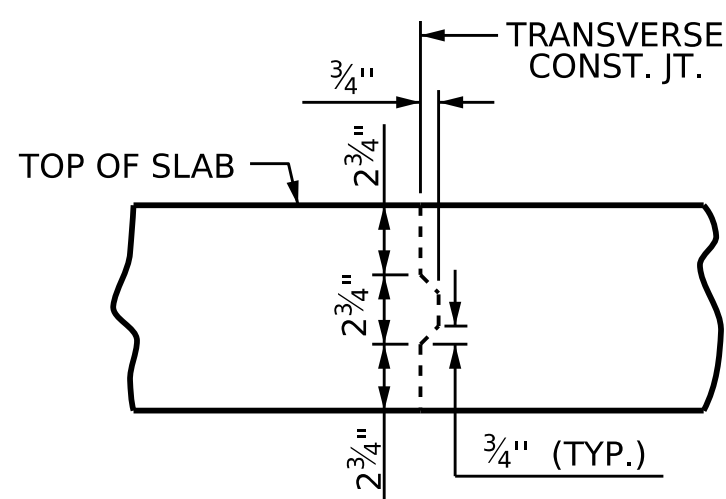
"A" BARS AND TOP "B" LONGITUDINAL BARS ONLY.



FOR "B" BARS IN BOTTOM OF SLAB, SEE SHEET S-9

3/4/2026

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



DRAWN BY : K. D. LAYNE DATE : 12/2024
 CHECKED BY : J. R. MCROY DATE : 12/2025
 DESIGN ENGINEER OF RECORD: J. R. MCROY DATE : 12/2025

PLAN OF WING - W1

PLAN OF WING - W2

ELEVATION OF WING - W1

ELEVATION OF WING - W2

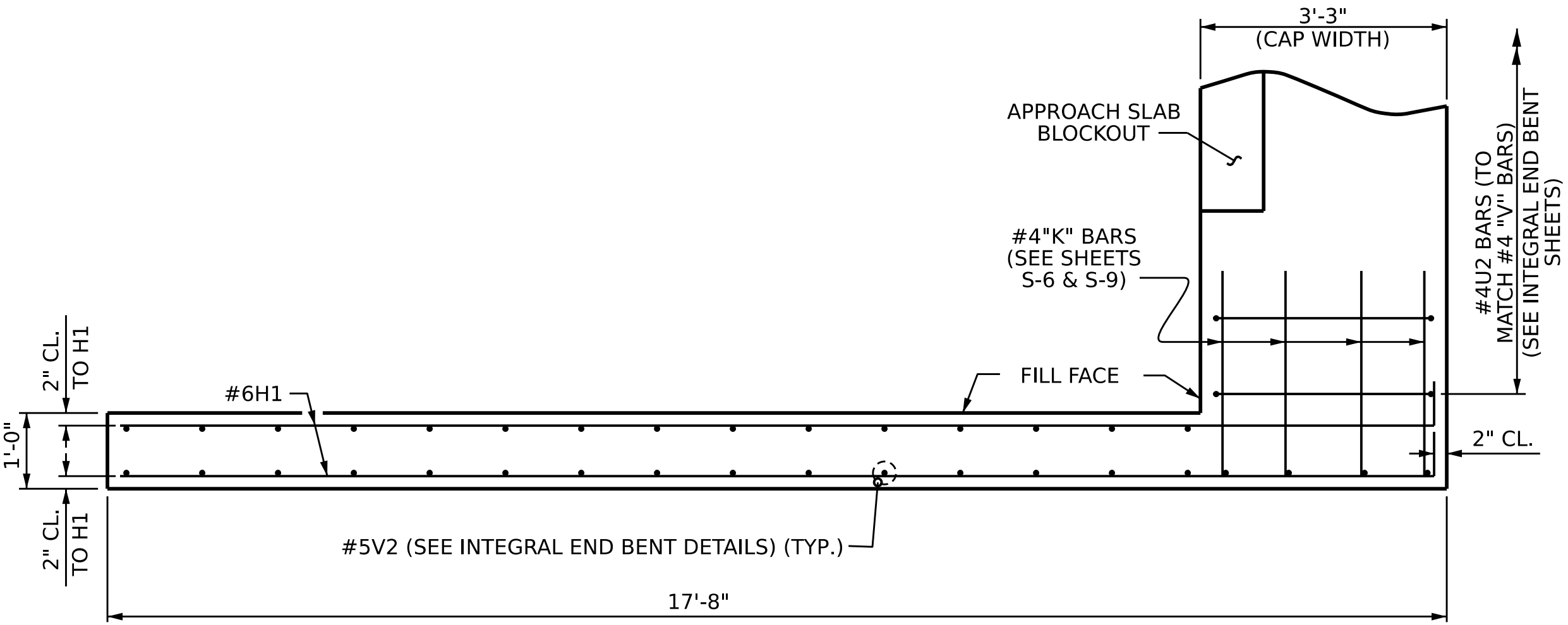
FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT SHEETS.

SECTION Y-Y

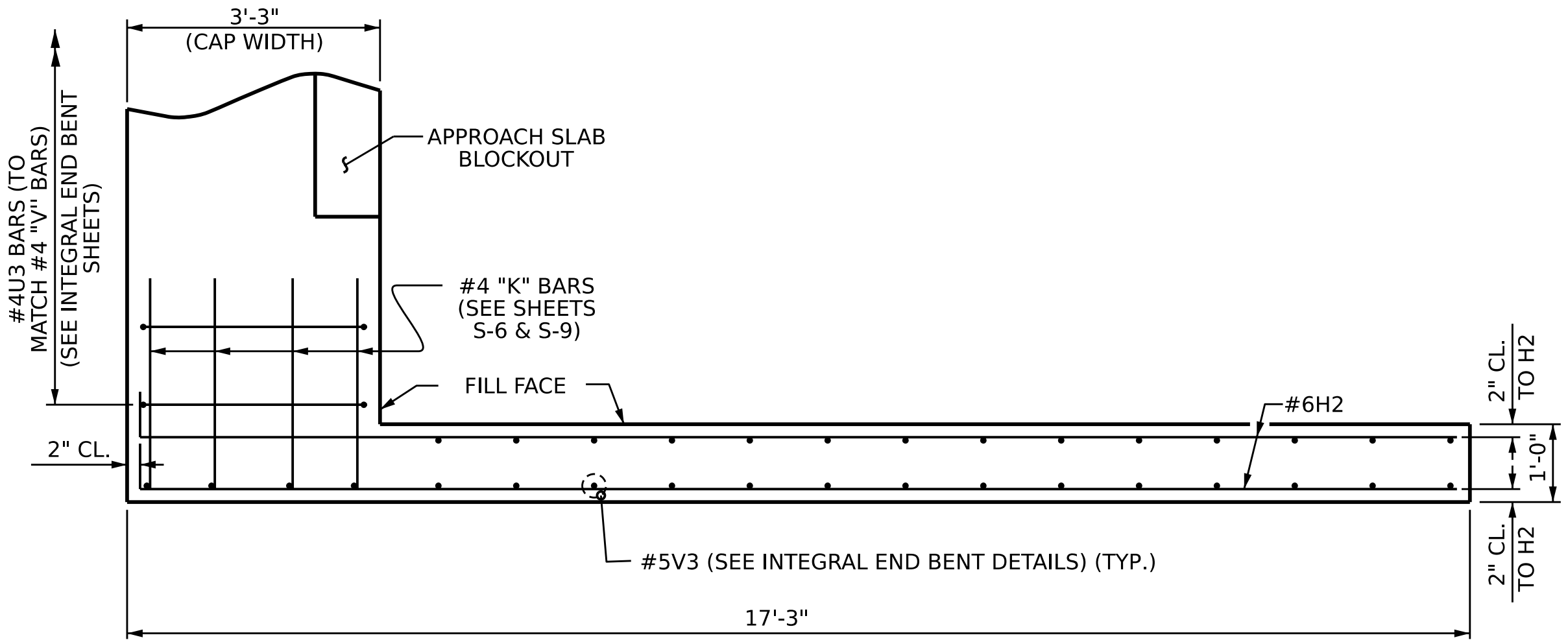
SECTION X-X

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

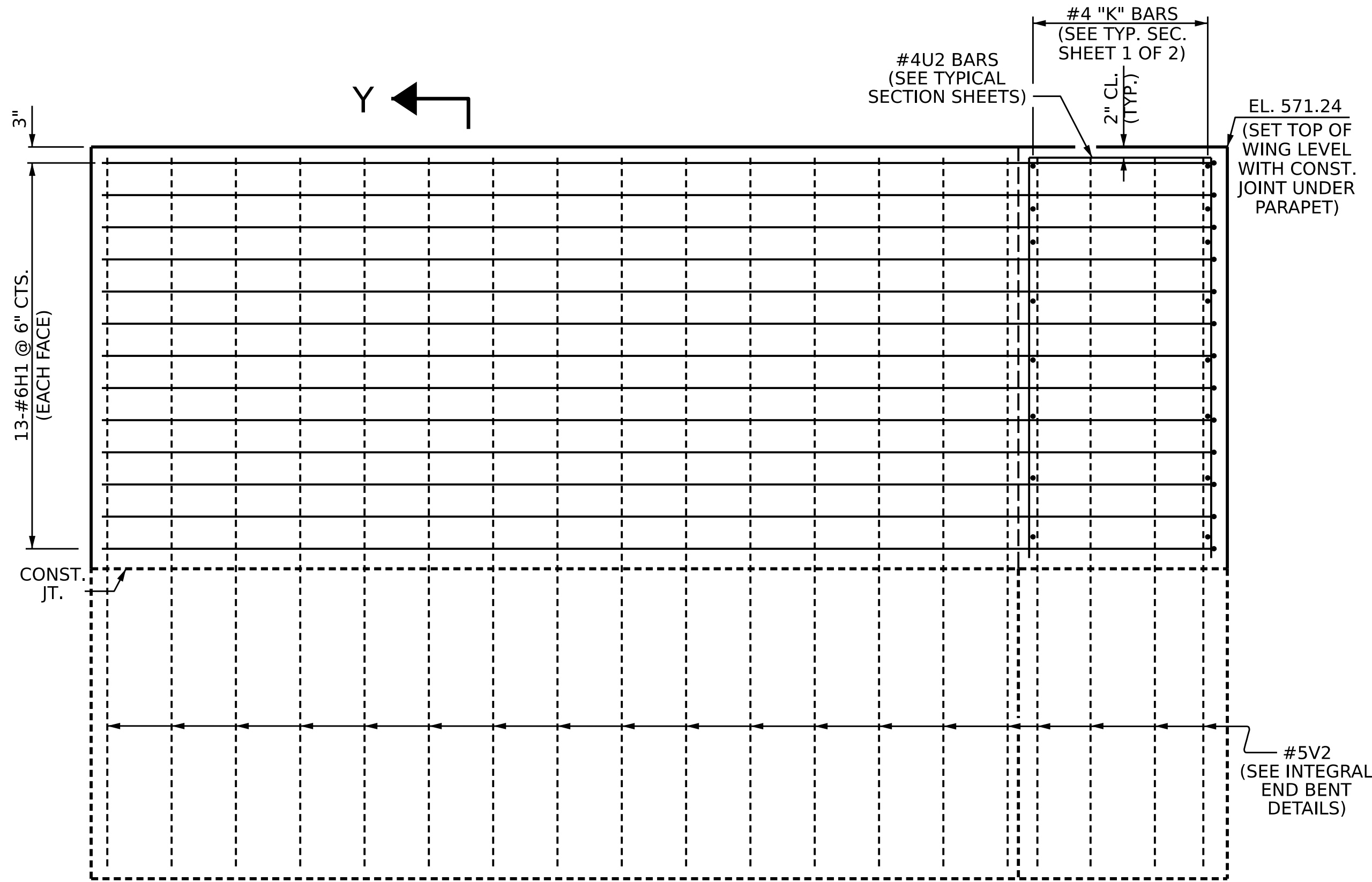
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS



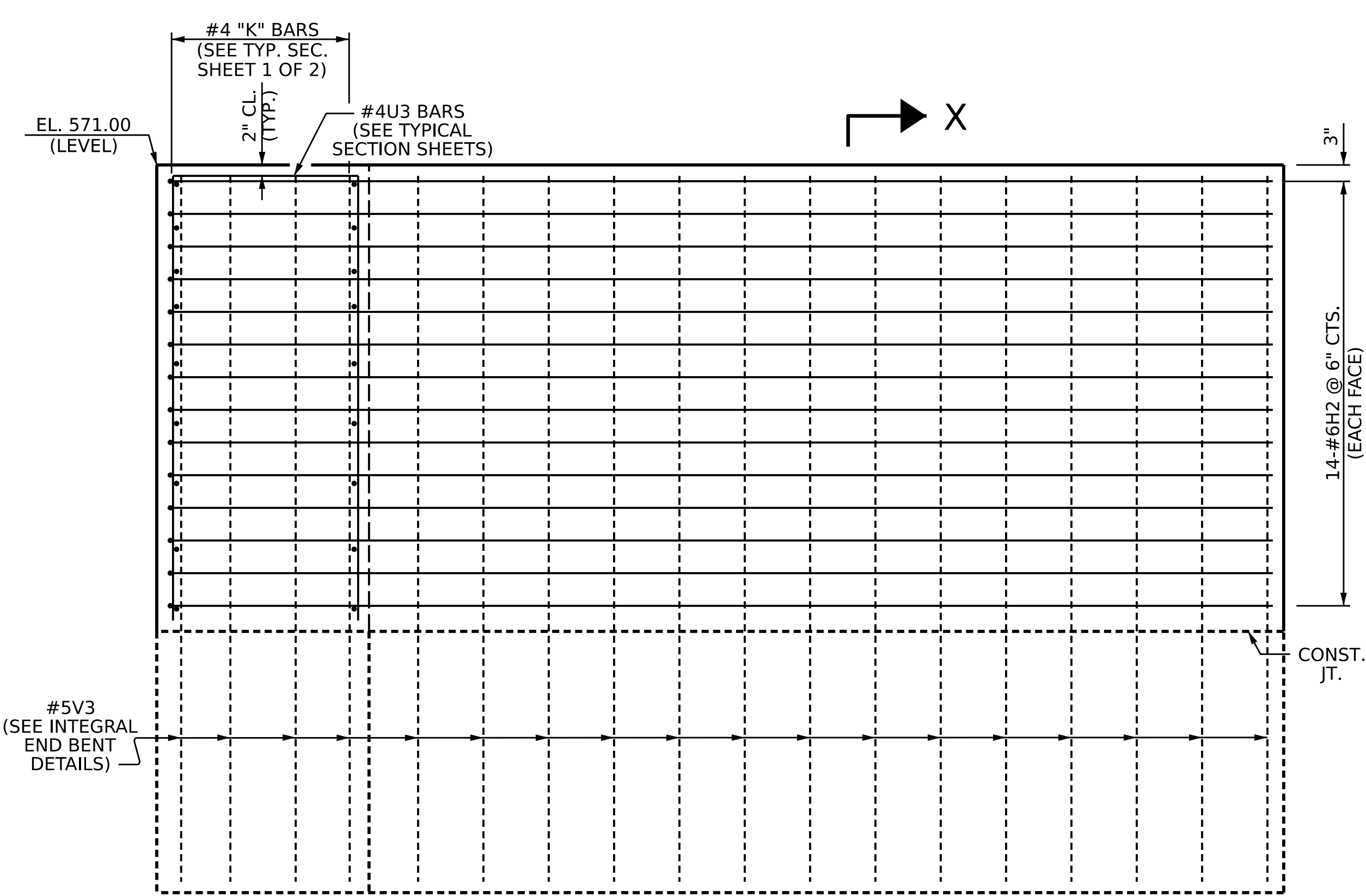
PLAN OF WING - W3



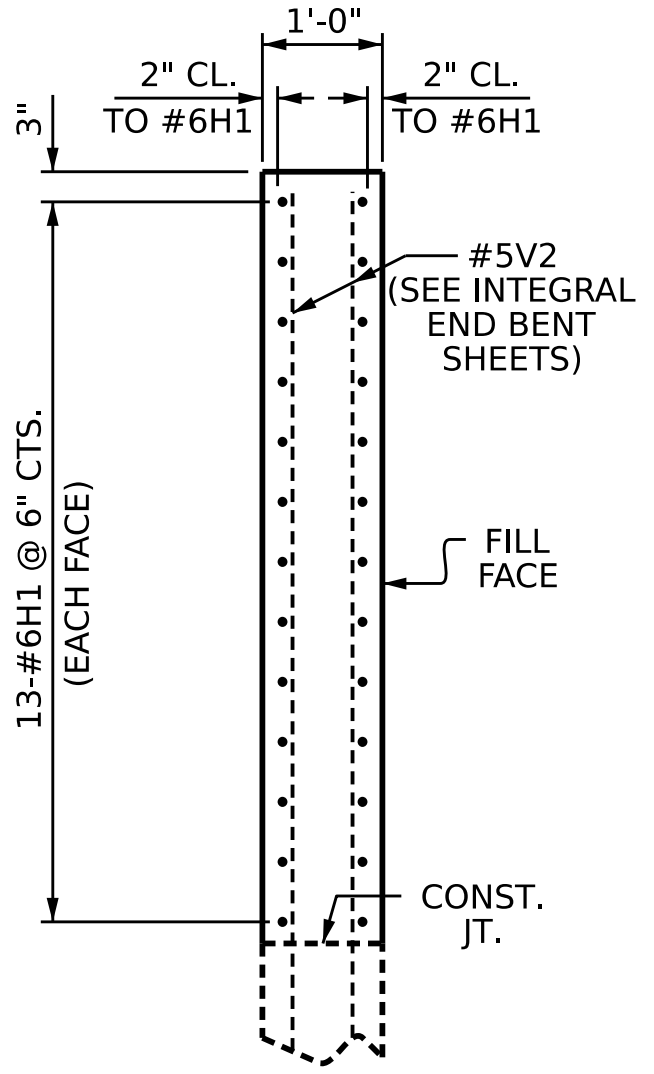
PLAN OF WING - W4



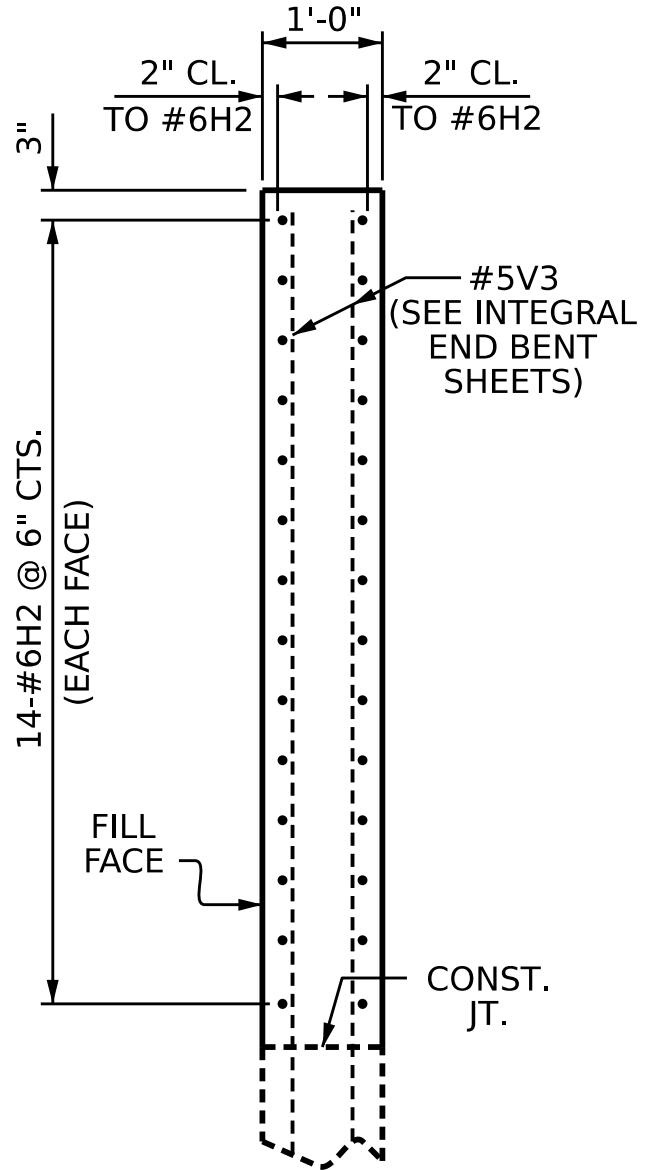
ELEVATION OF WING - W3



ELEVATION OF WING - W4



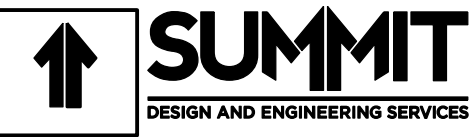
SECTION Y-Y



SECTION X-X

UPPER WINGS AT INTEGRAL END BENT 2
FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT SHEETS.

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Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by: Jennifer R. McRoy
3/4/2026

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

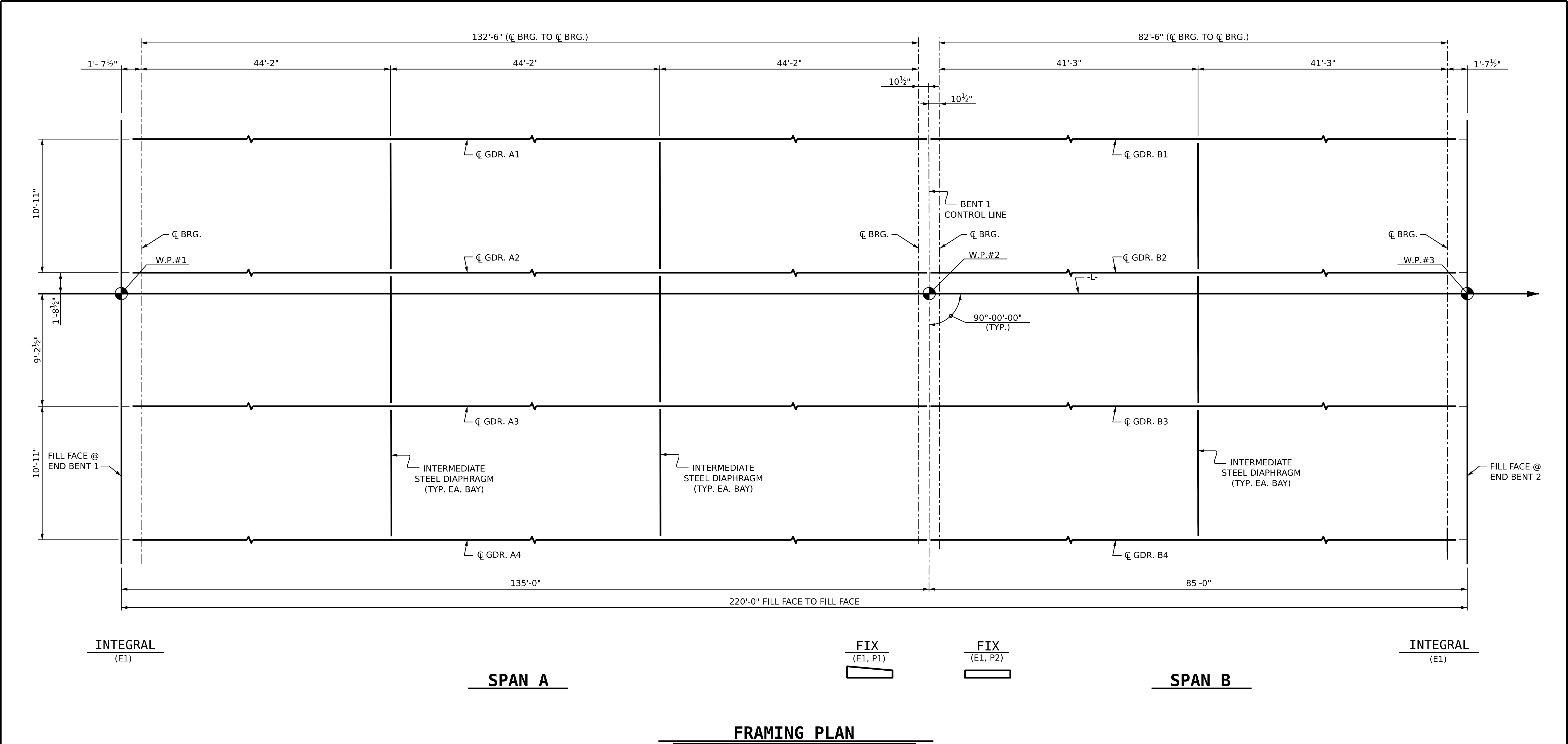
SUPERSTRUCTURE

PLAN OF SPANS

DRAWN BY : K. D. LAYNE DATE : 01/2025
CHECKED BY : J. R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J. R. MCROY DATE : 12/2025

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-11
2			4			
TOTAL SHEETS						36

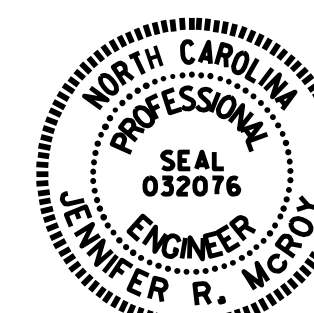


FRAMING PLAN

Prepared in the Office of:



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Signed by:

Jennifer R. McRo
E21A12EB8CDB40B

3/4/2026

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

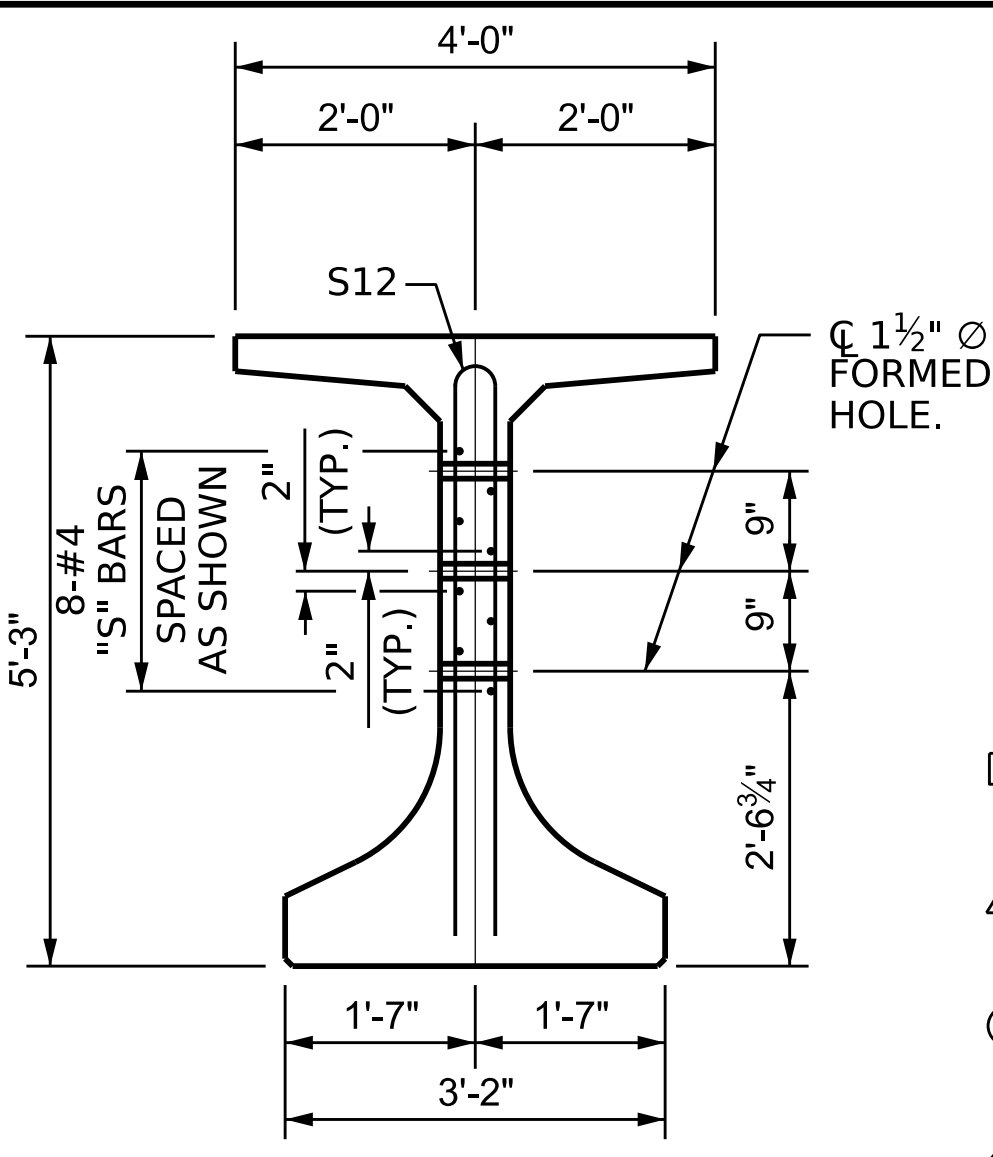
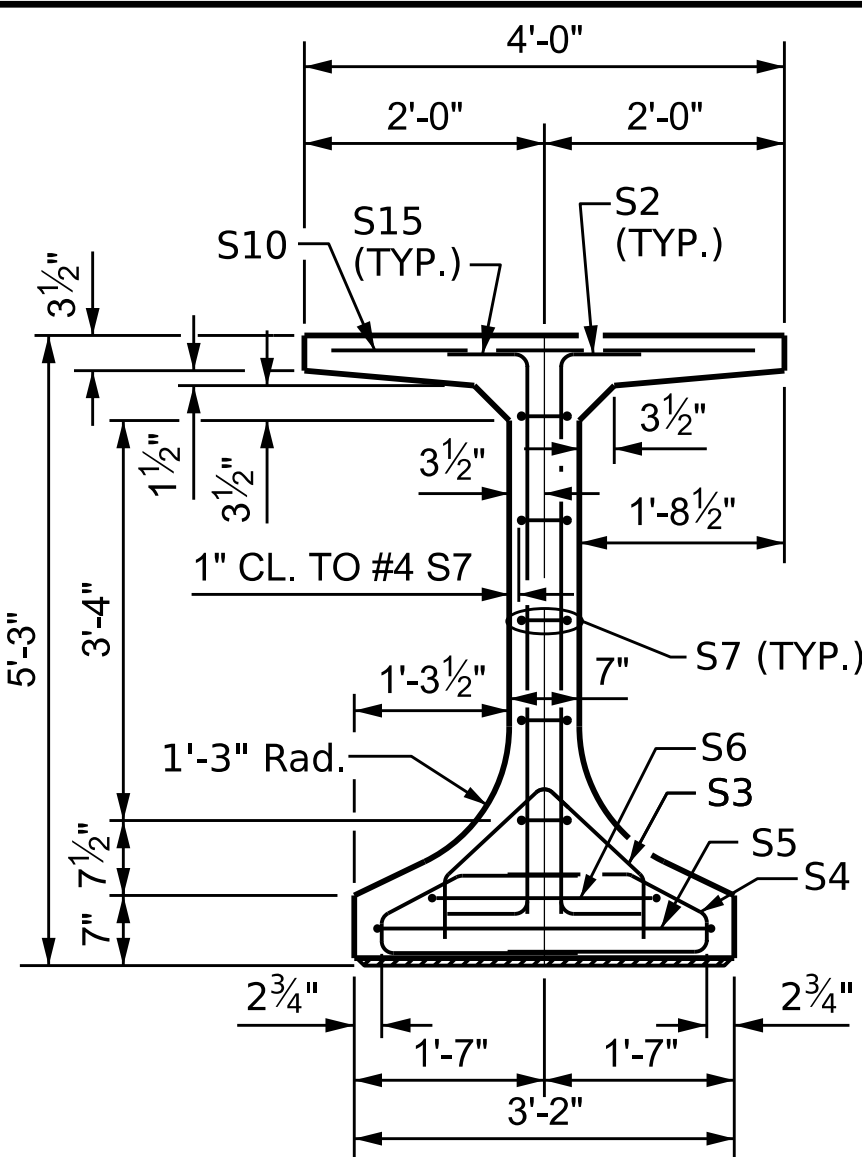
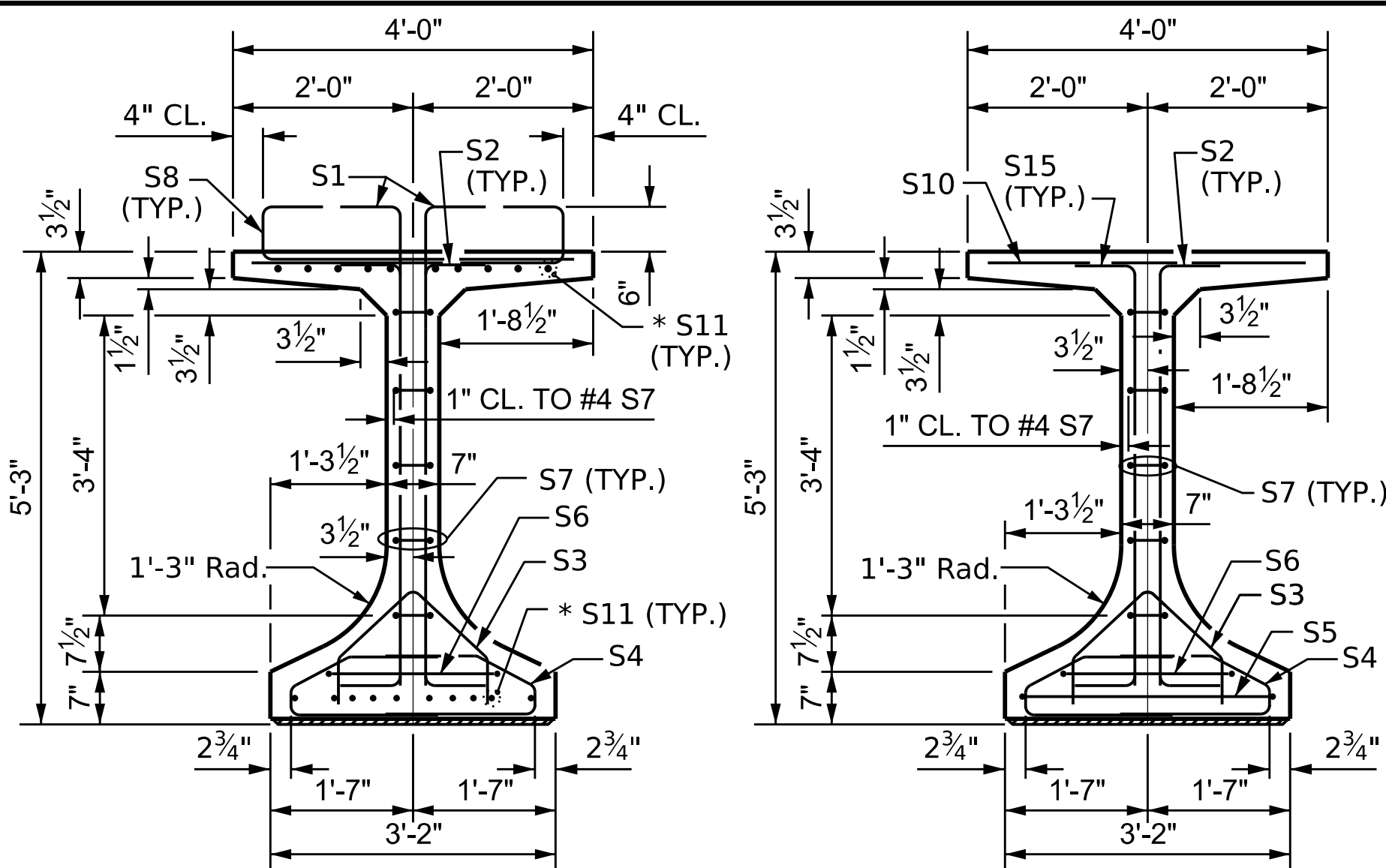
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN

DRAWN BY : K. D. LAYNE DATE : 02/2025
 CHECKED BY : J.R. MCROY DATE : 12/2025
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

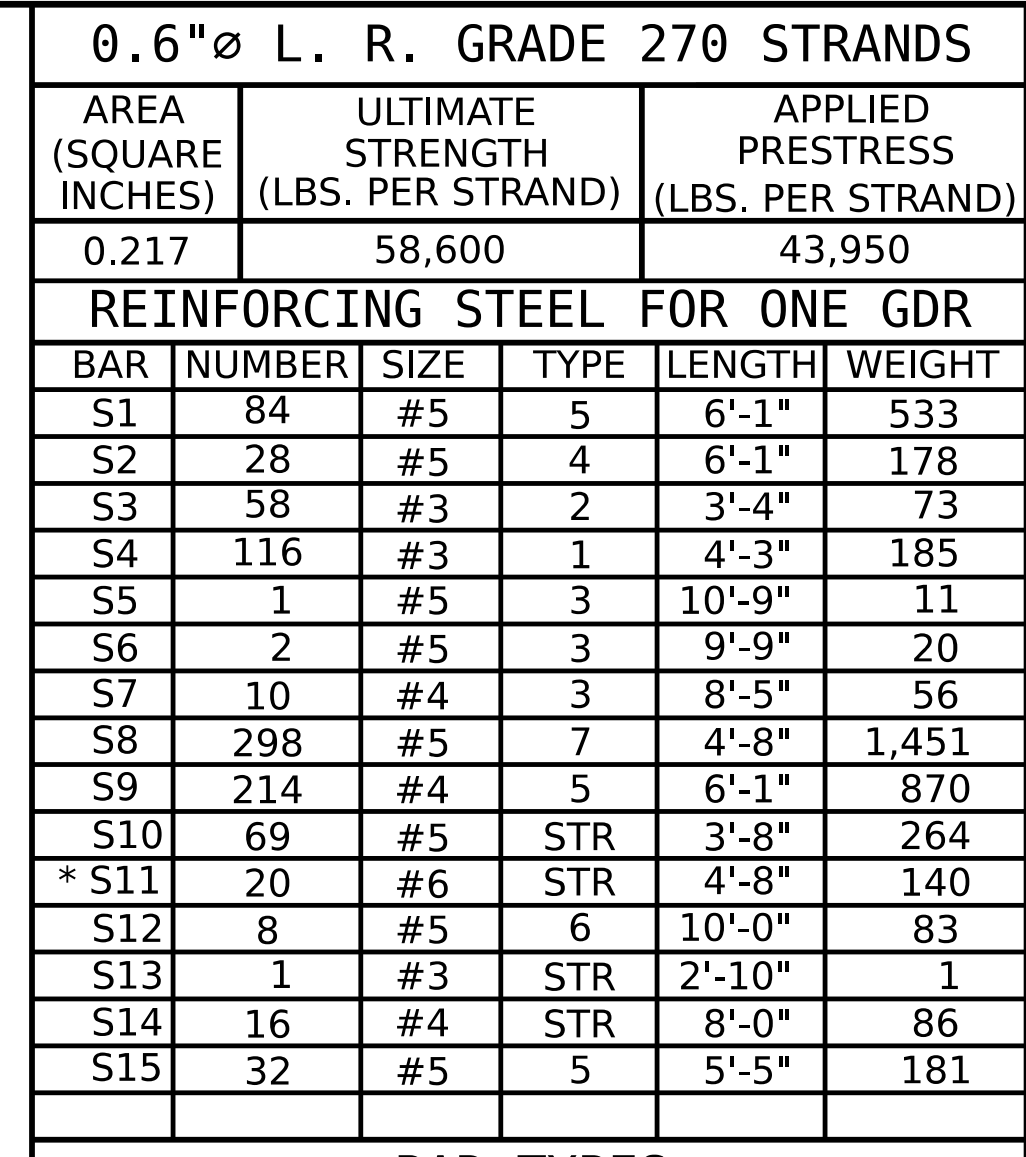
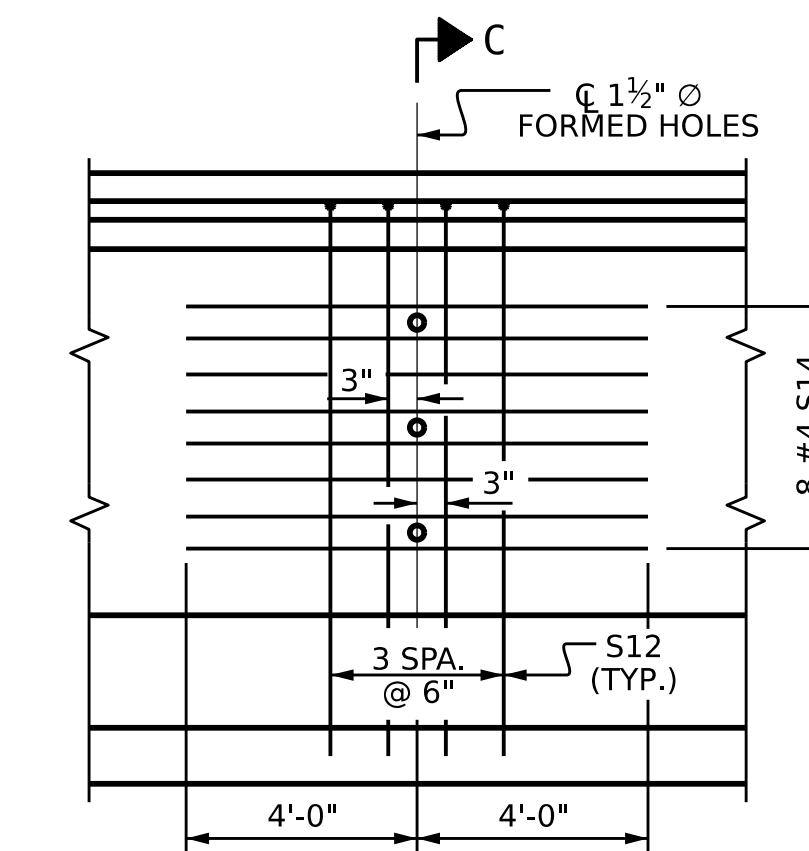
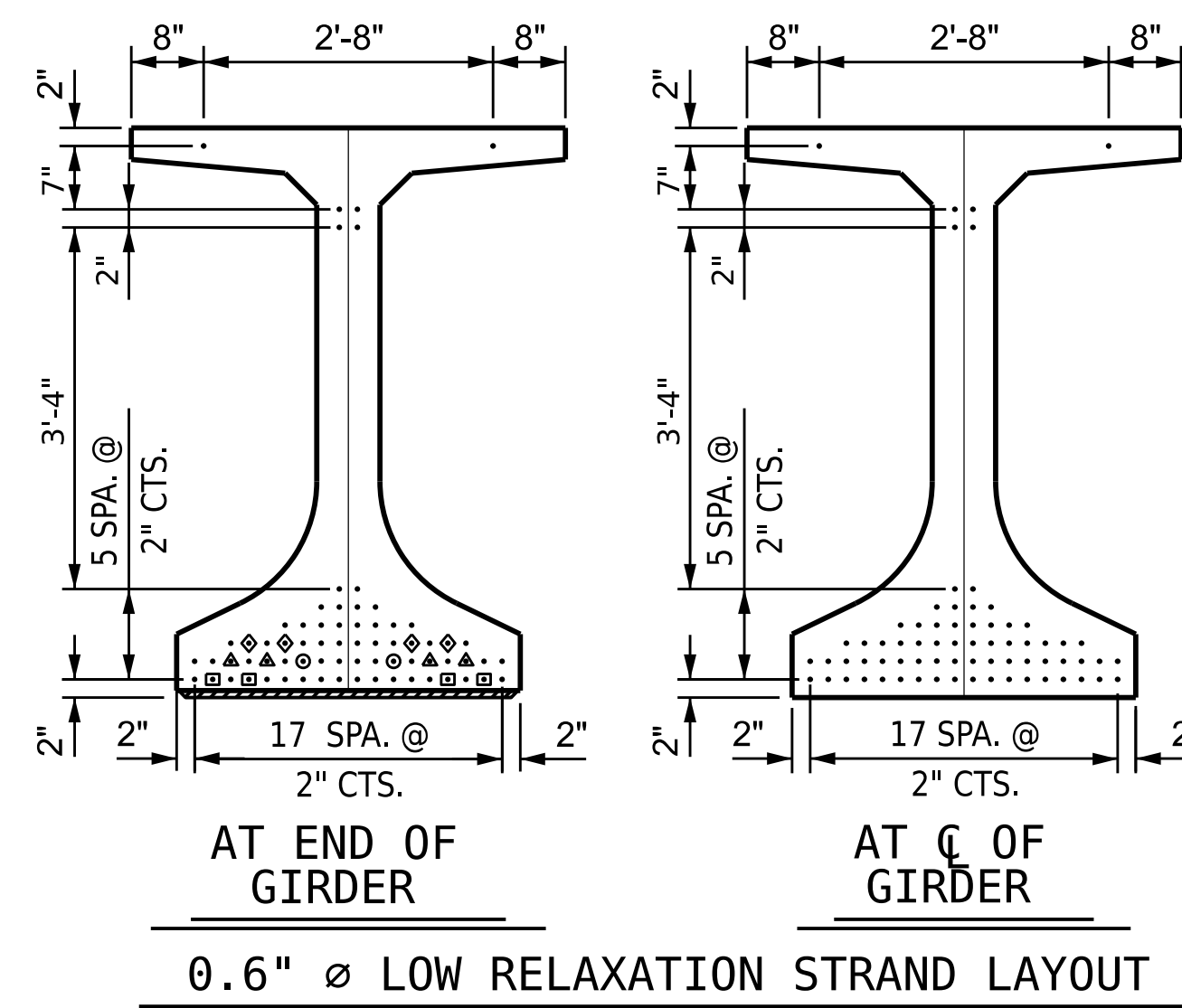
DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
D	1		3			S-12
	2		4			TOTAL SHEETS 36

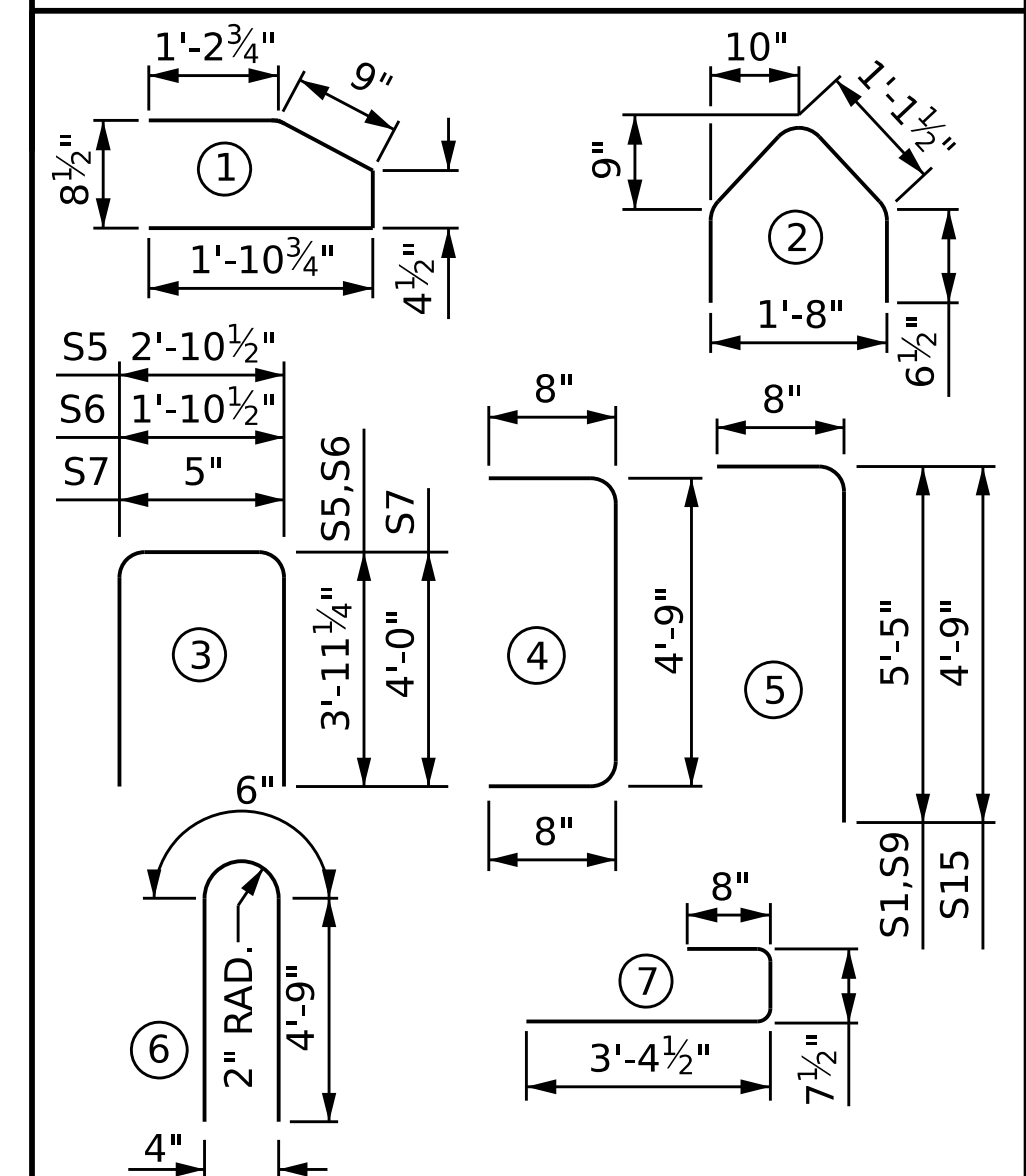


DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 3'-0" FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◎ STRANDS DEBONDED FOR 9'-0" FROM END OF GIRDER
- ◆ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



BAR TYPES

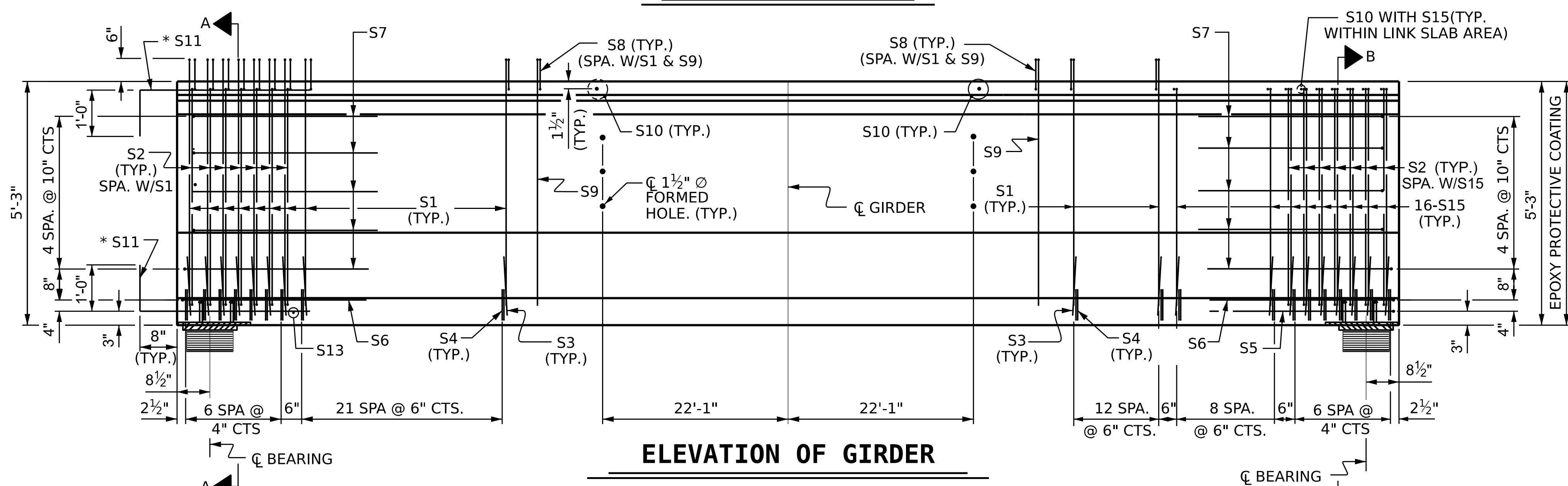
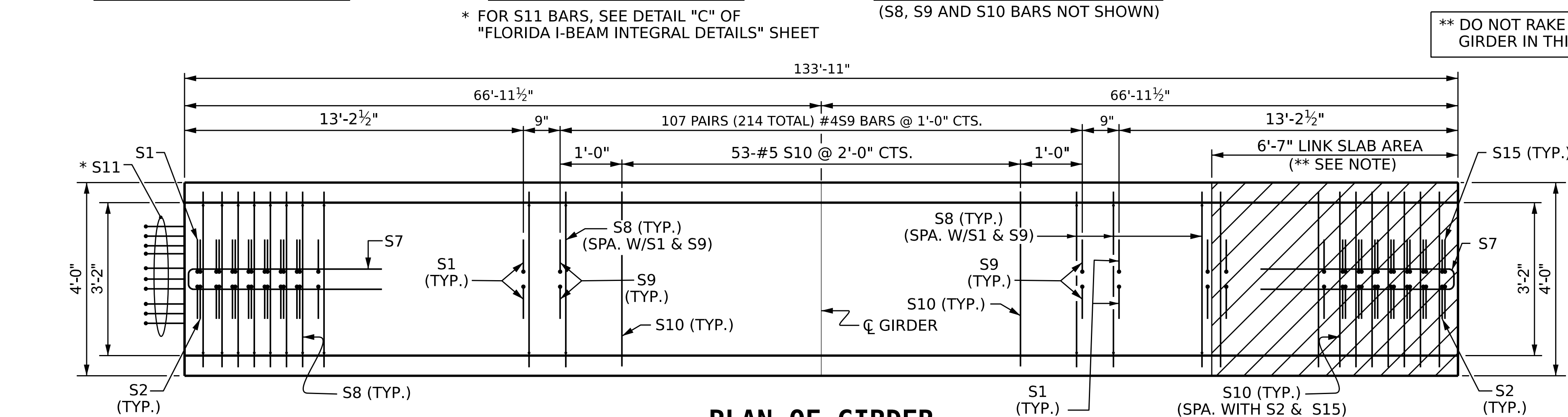


QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	9,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
4 132	34.3	70

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	133'-11"	535'-8"



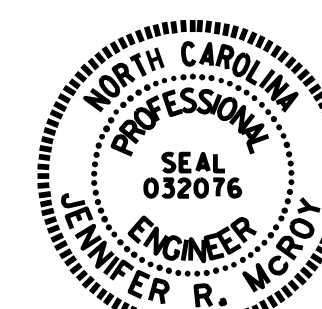
*** NOTE:**

S11 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

Prepared in the Office of:



NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by: Jennifer R. McRoy 3/4/202
E21412EB8CDB40B

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PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

76 SHEET 1 OF 3

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

63" FIB PRESTRESSED
CONCRETE GIRDER
FOR INTEGRAL END BENTS
AND LINK SLAB

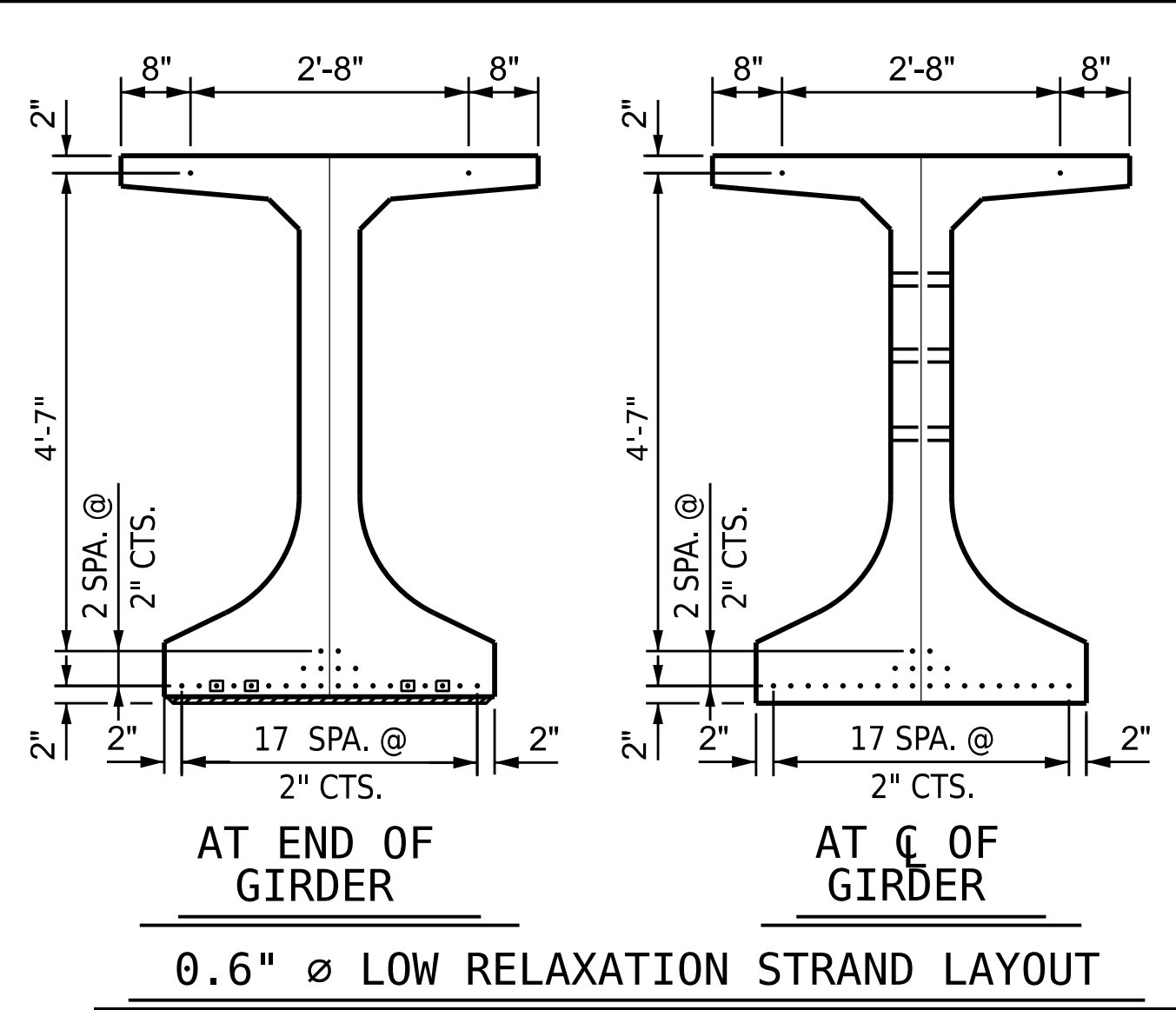
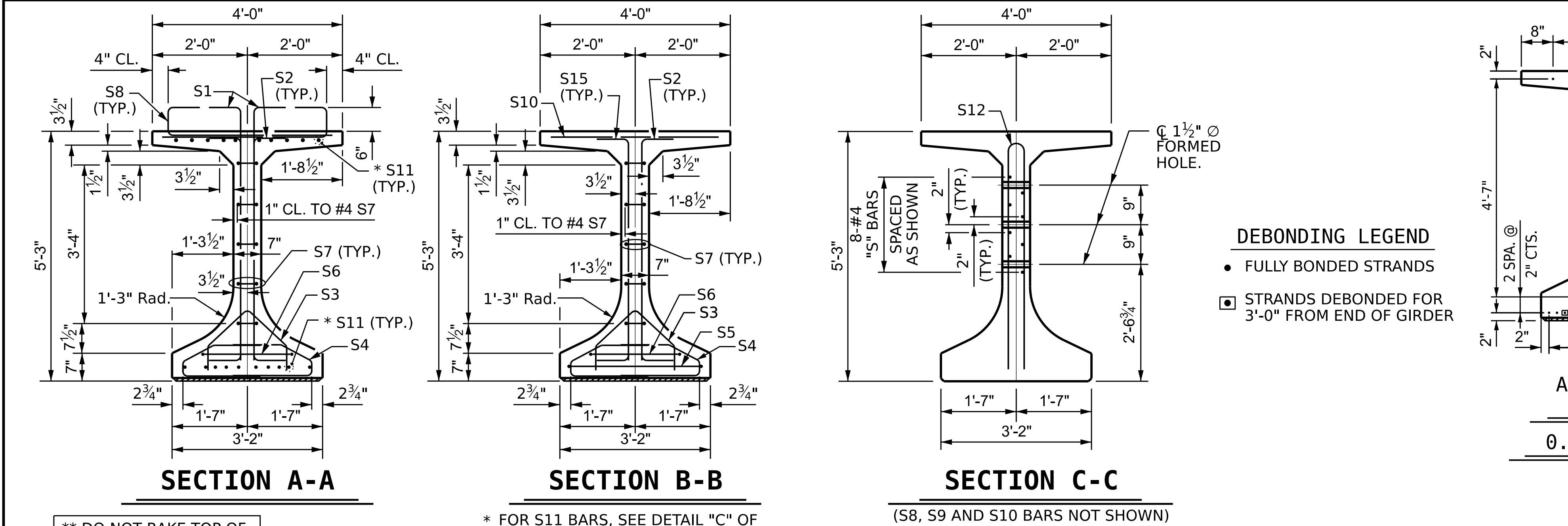
(SPAN A)

REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

CHECKED BY : J.R. MCROY DATE : 12/2025

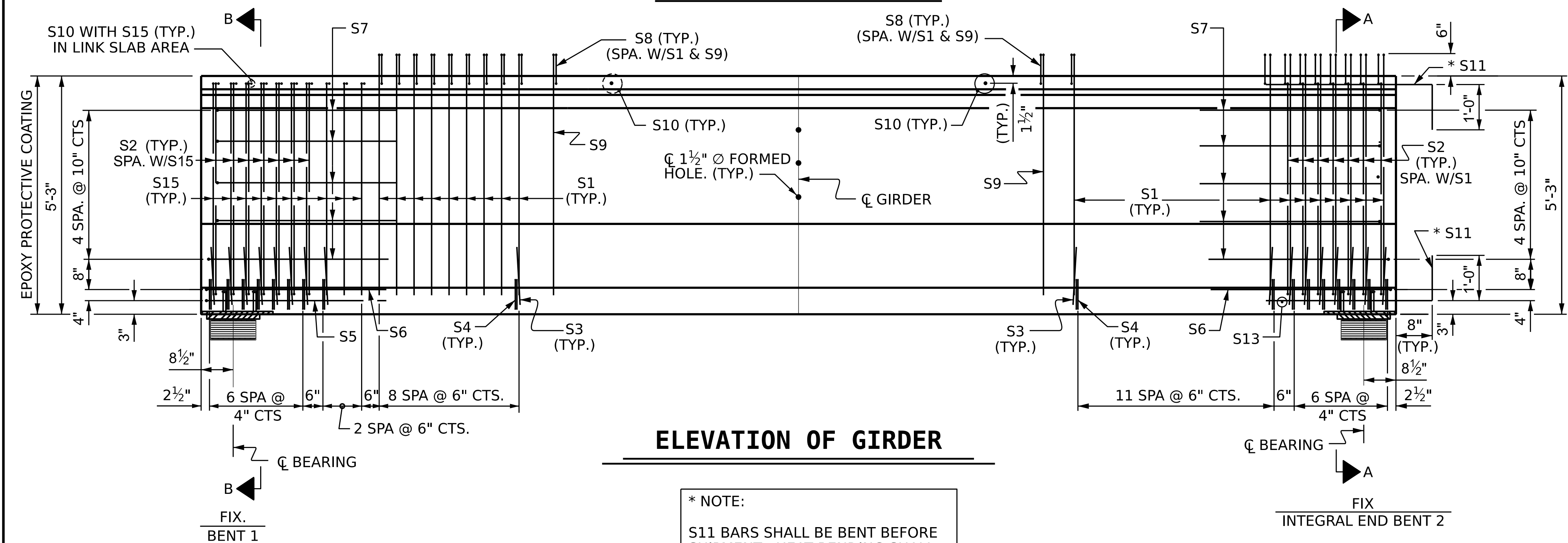
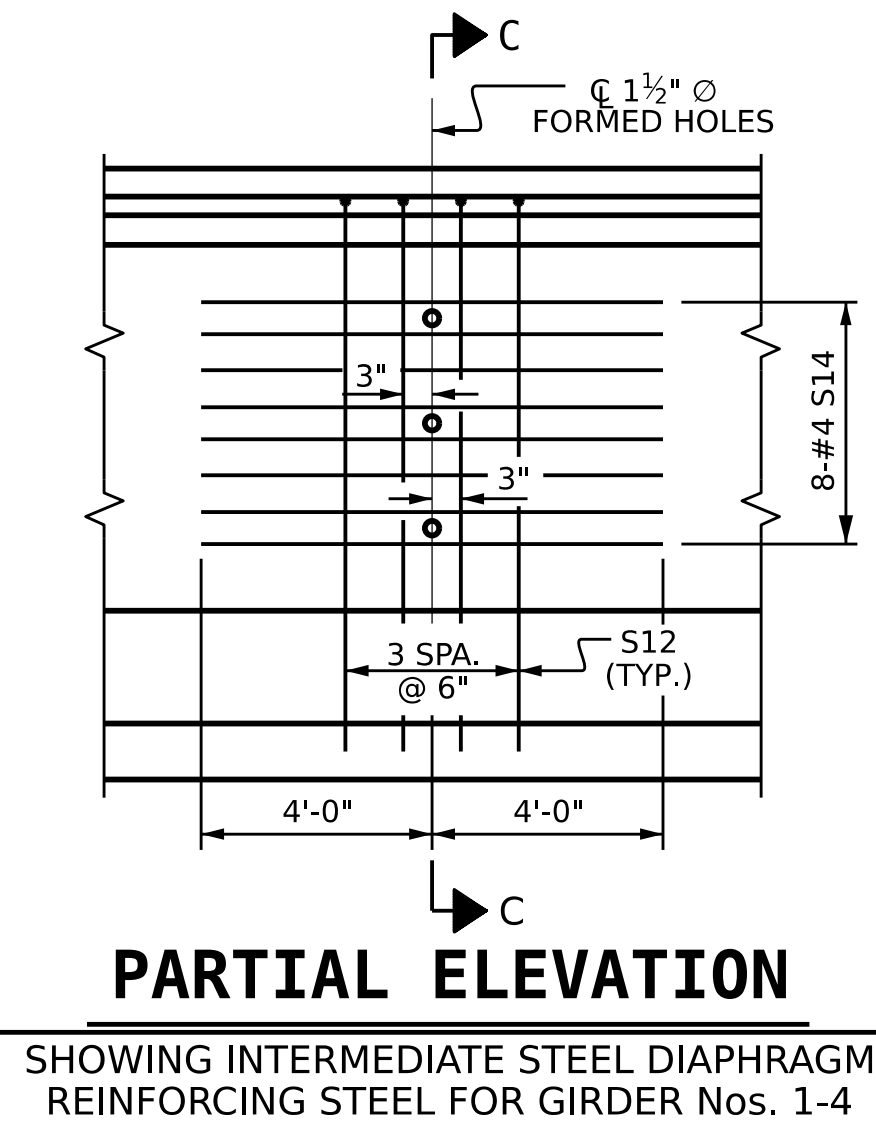
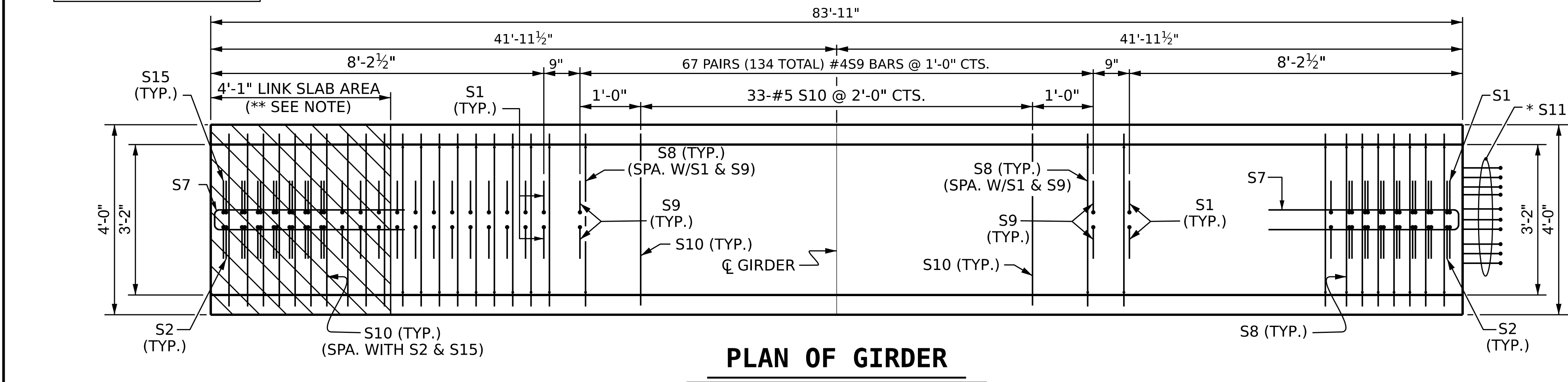
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025



** DO NOT RAKE TOP OF GIRDER IN THIS AREA

* FOR S11 BARS, SEE DETAIL "C" OF "FLORIDA I-BEAM INTEGRAL DETAILS" SHEET

(S8, S9 AND S10 BARS NOT SHOWN)



* NOTE:
S11 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

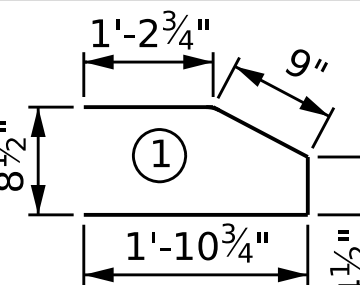
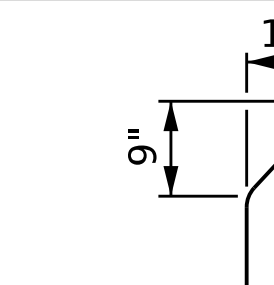
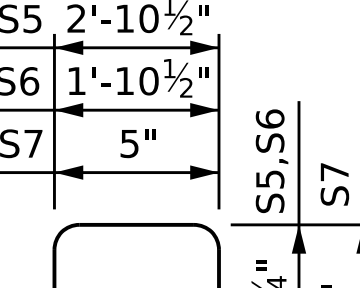
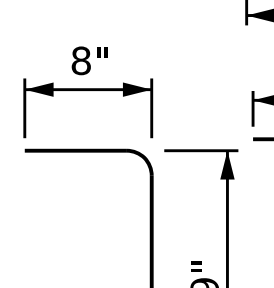
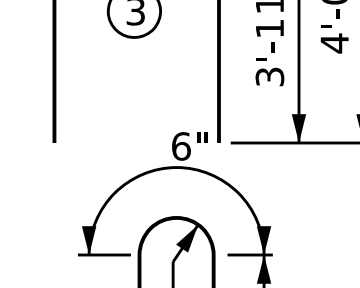
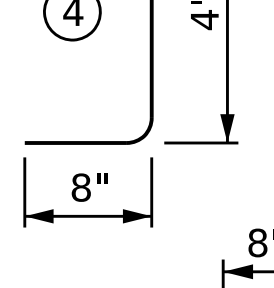
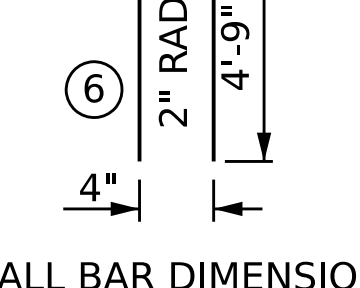
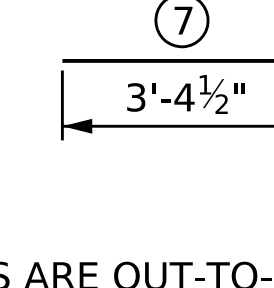
DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com

NORTH CAROLINA
PROFESSIONAL
SEAL
032076
ENGINEER
JENNIFER R. MCROY
Signed by: Jennifer R. McRoy 3/4/2026
F21A12PB8CB040B...

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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 GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	56	#5	5	6'-1"	355
S2	28	#5	4	6'-1"	178
S3	38	#3	2	3'-4"	48
S4	76	#3	1	4'-3"	121
S5	1	#5	3	10'-9"	11
S6	2	#5	3	9'-9"	20
S7	10	#4	3	8'-5"	56
S8	190	#5	7	4'-8"	925
S9	134	#4	5	6'-1"	850
S10	43	#5	STR	3'-8"	165
* S11	20	#6	STR	4'-8"	140
S12	4	#5	6	10'-0"	42
S13	1	#3	STR	2'-10"	1
S14	8	#4	STR	8'-0"	43
S15	20	#5	5	5'-5"	113

BAR TYPES	
	
	
	
	

ALL BAR DIMENSIONS ARE OUT-TO-OUT

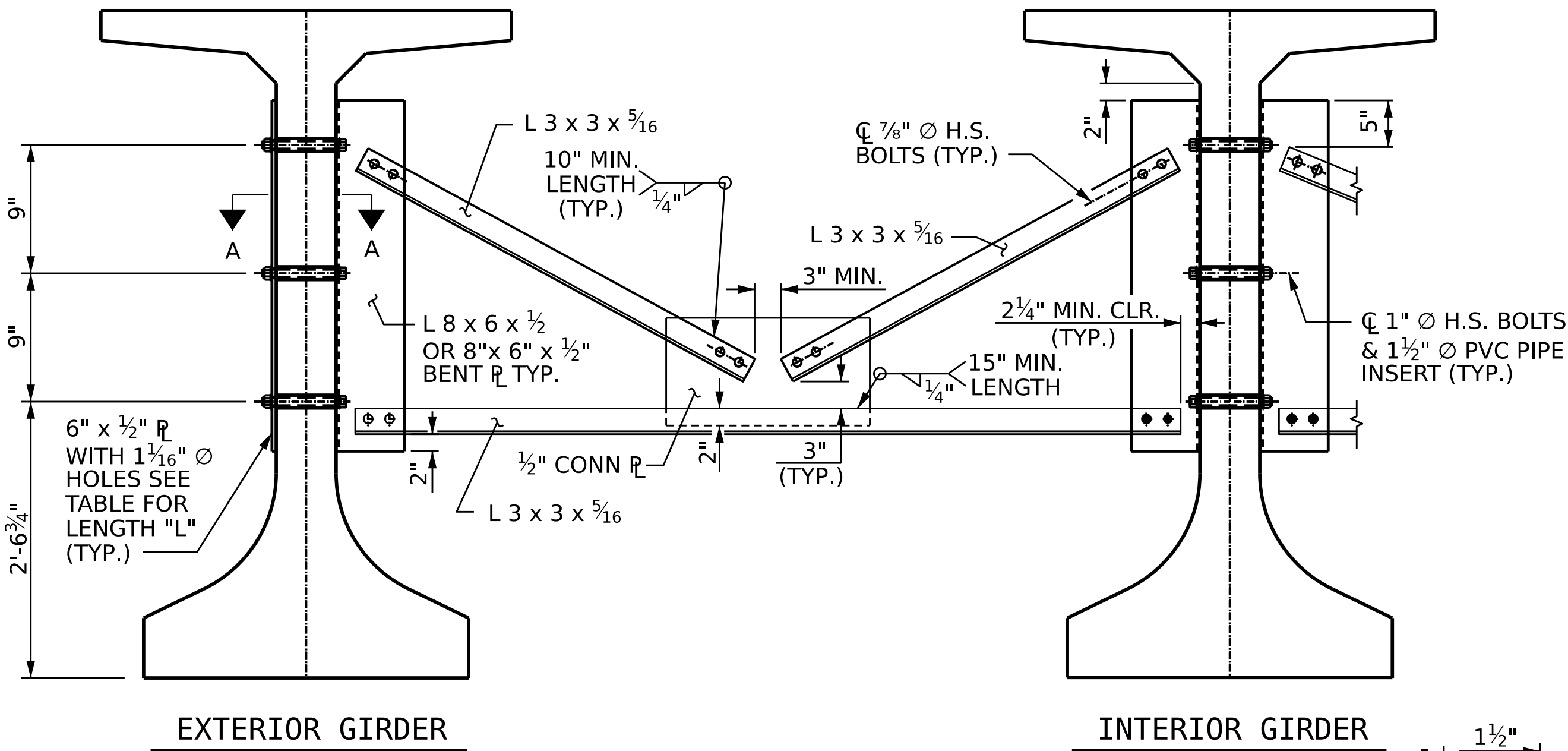
QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL	5,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
3,068	21.5	26

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	83'-11"	335'-8"

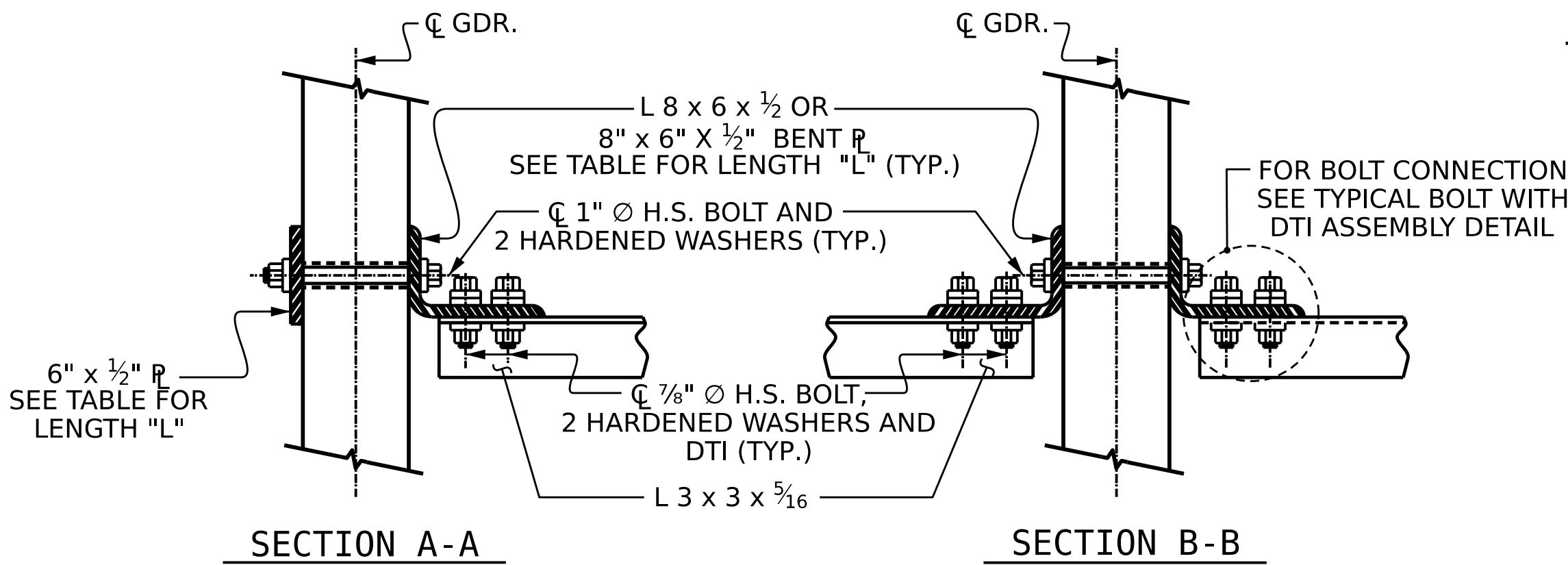
PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

SHEET 2 OF 3

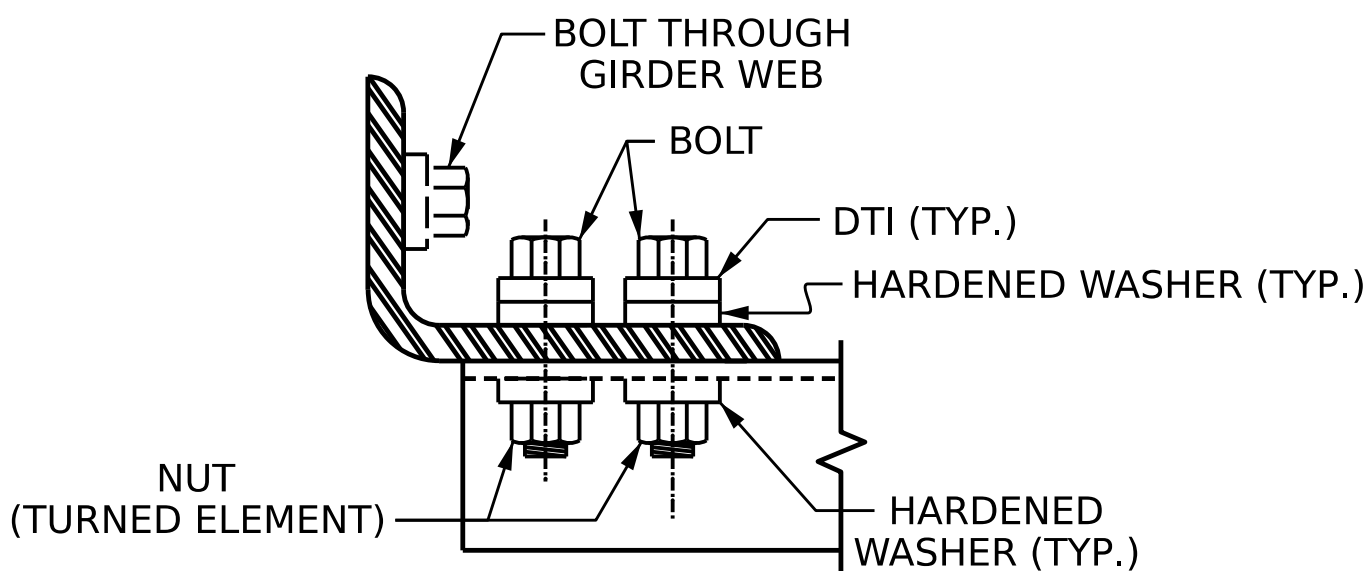
STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
63" FIB PRESTRESSED CONCRETE GIRDER FOR INTEGRAL END BENTS AND LINK SLAB					
(SPAN B)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					36



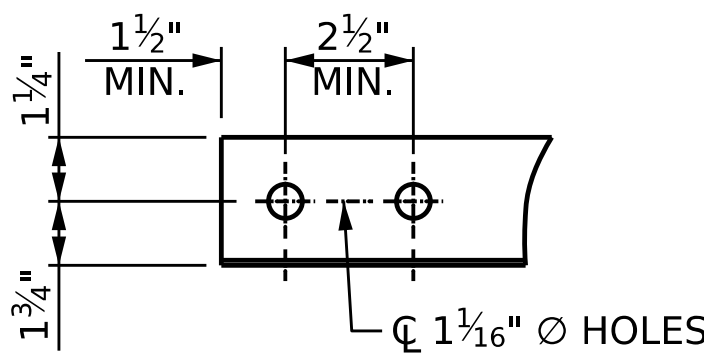
PART SECTION AT INTERMEDIATE DIAPHRAGM



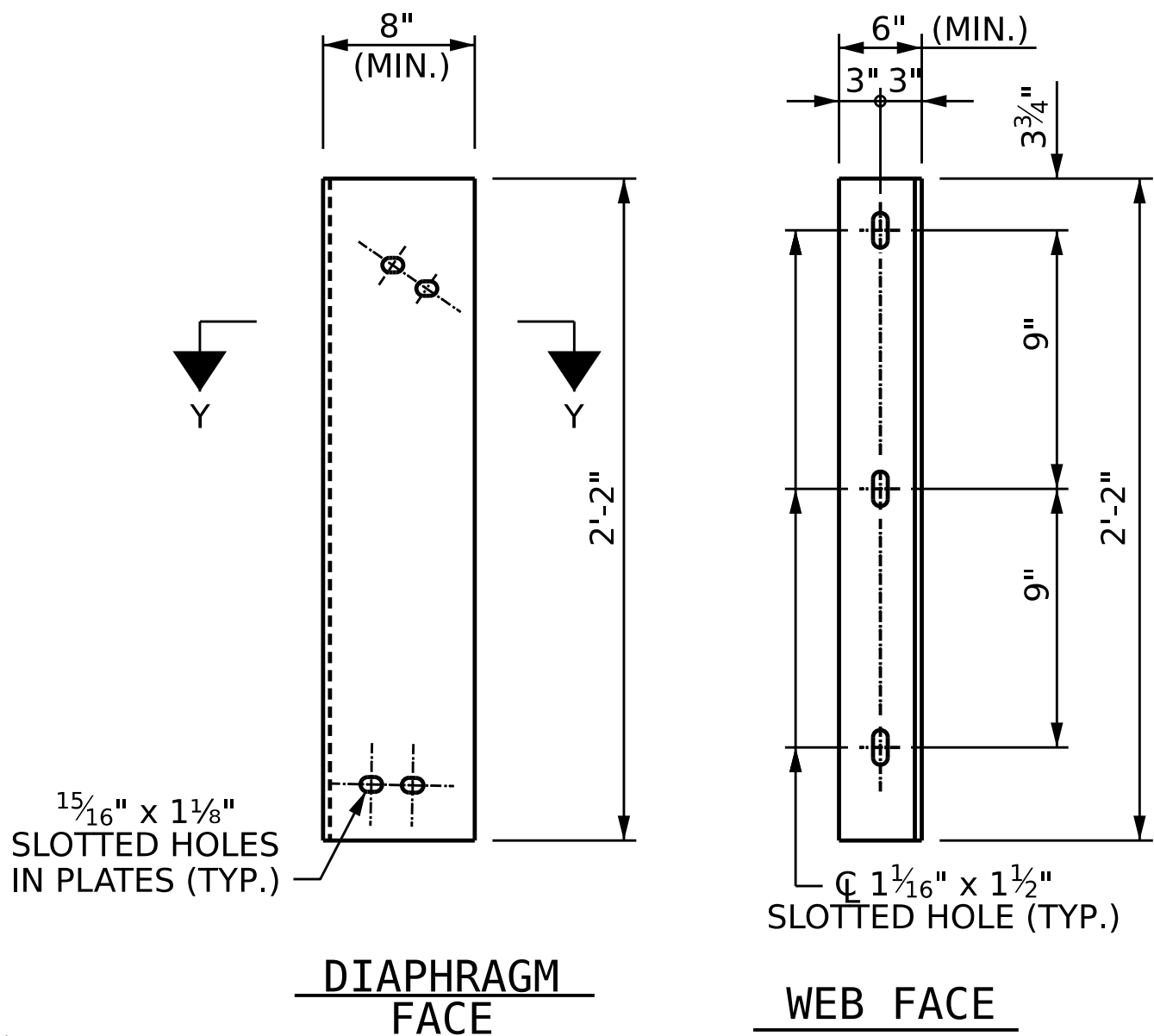
CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL



ANGLE END



CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

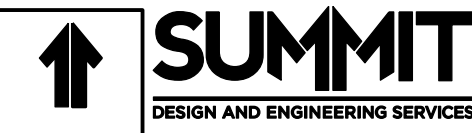
INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

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

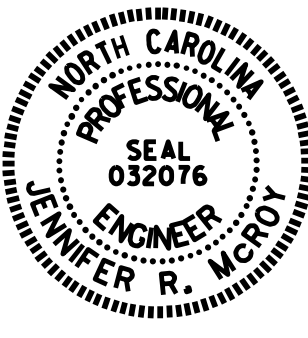
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

Prepared in the Office of:



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Signed by: Jennifer R. McRoy 3/4/2026
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PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

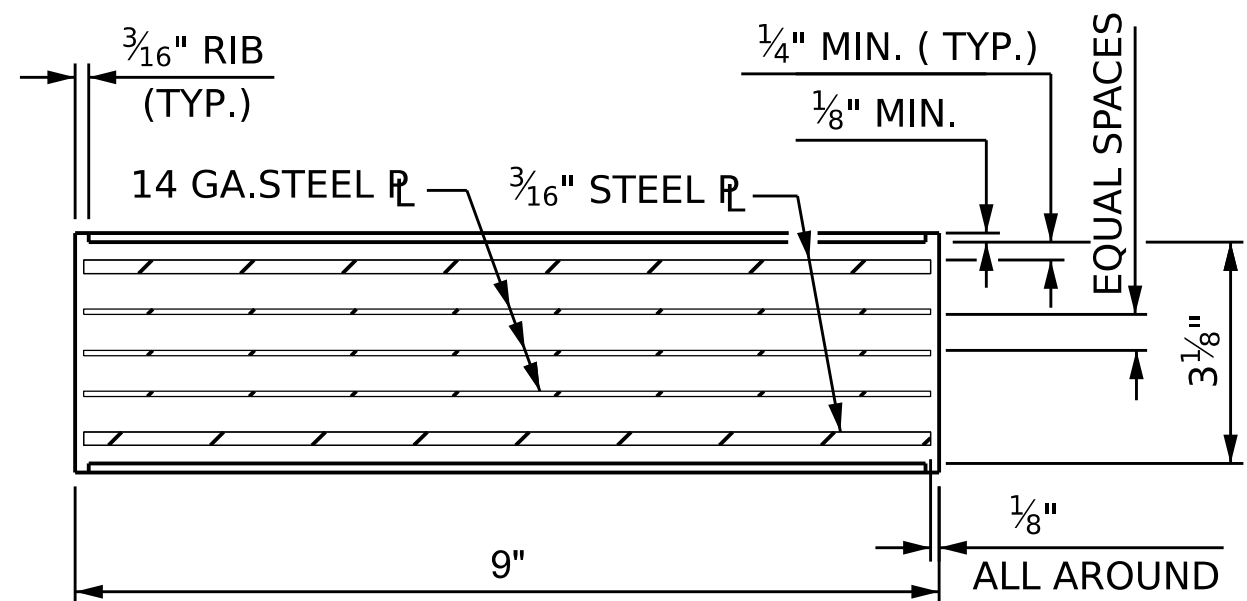
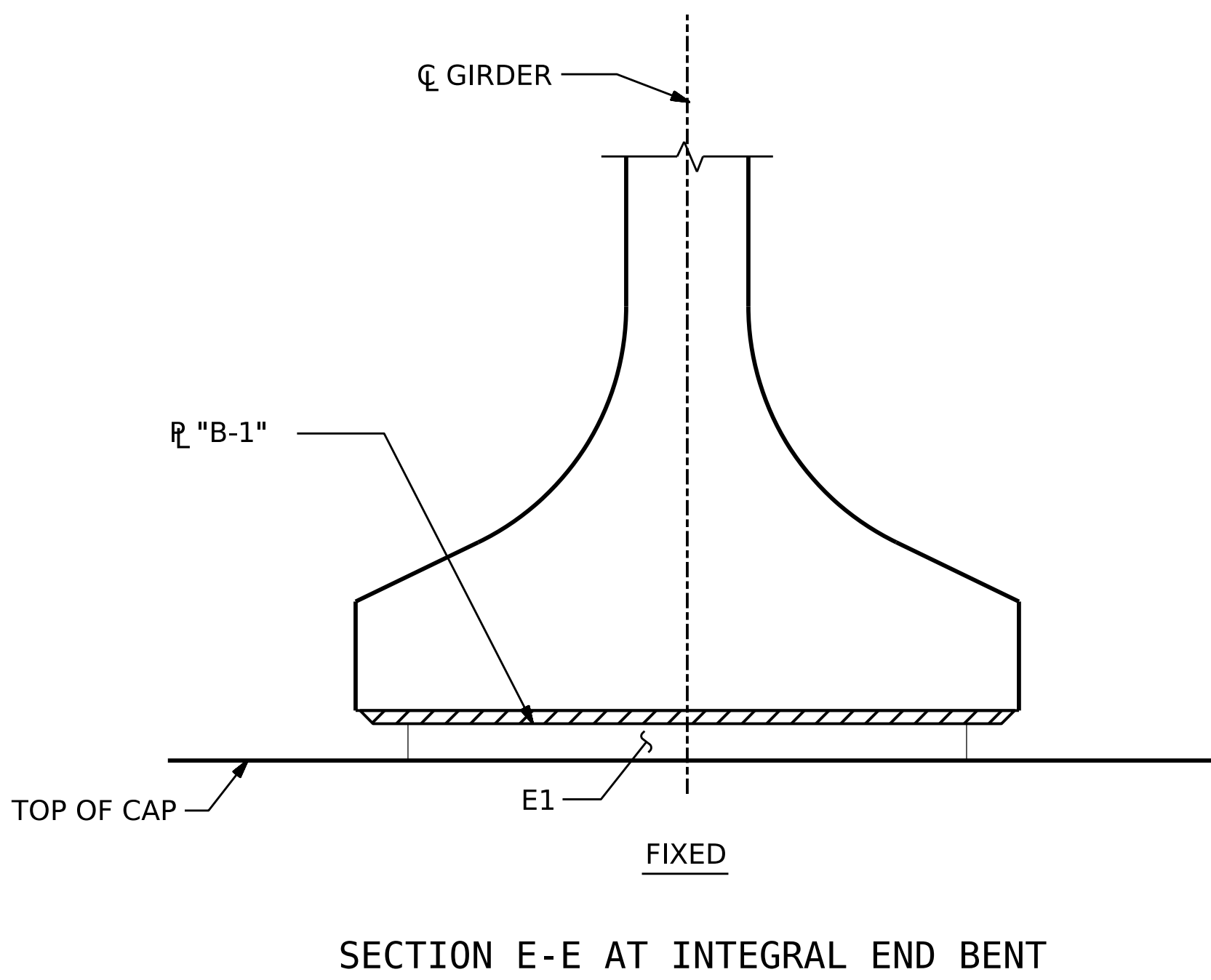
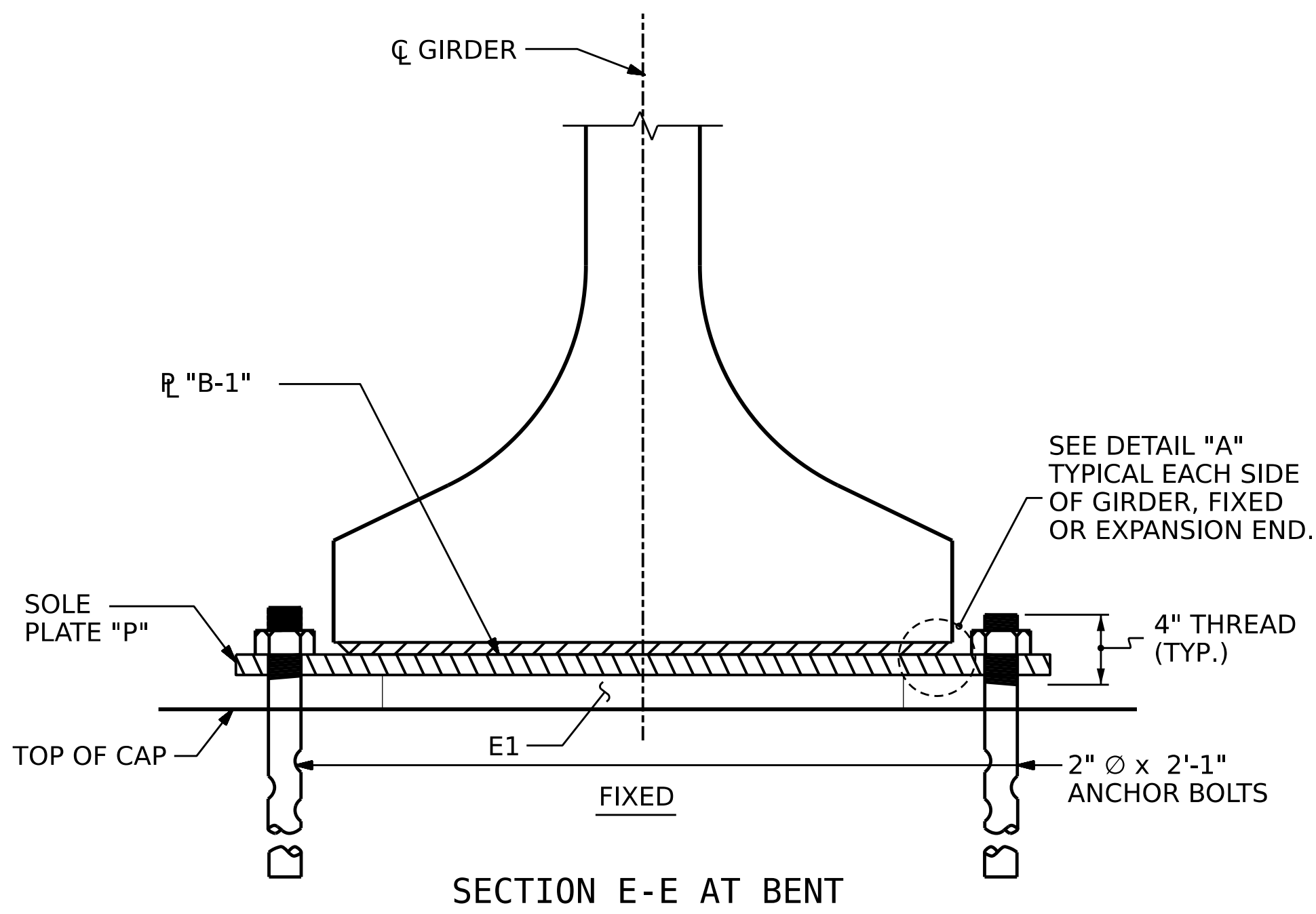
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 63" FIB

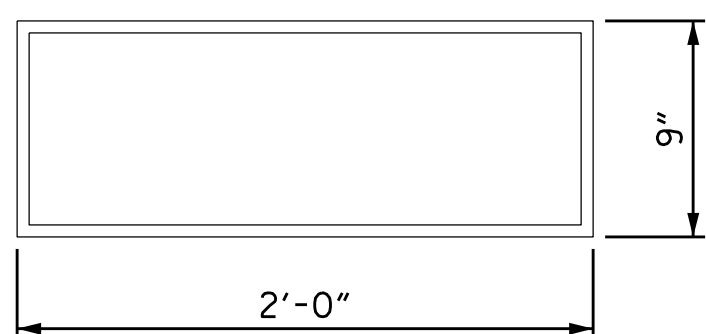
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			36

ASSEMBLED BY : K. D. LAYNE	DATE : 02/2025
CHECKED BY : J.R. MCROY	DATE : 12/2025
DRAWN BY : BNB 08/21	REV. --/--
CHECKED BY : AAI 08/21	REV. --/--

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

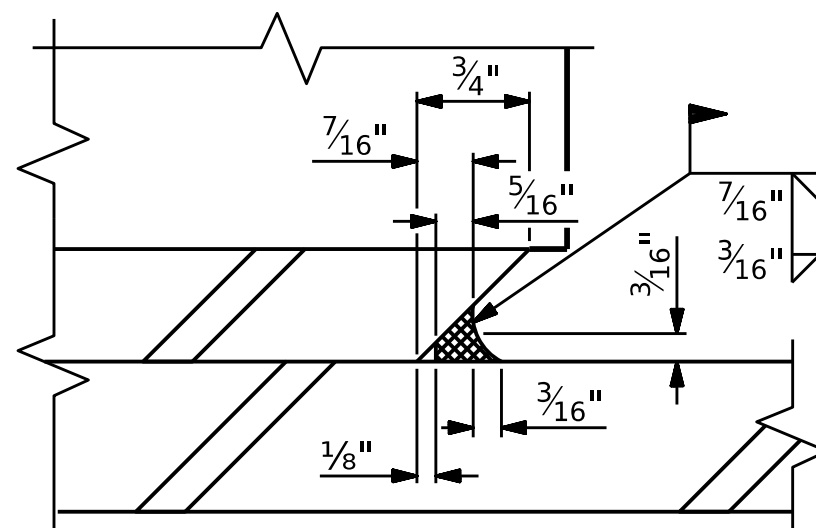


TYPICAL SECTION OF ELASTOMERIC BEARINGS



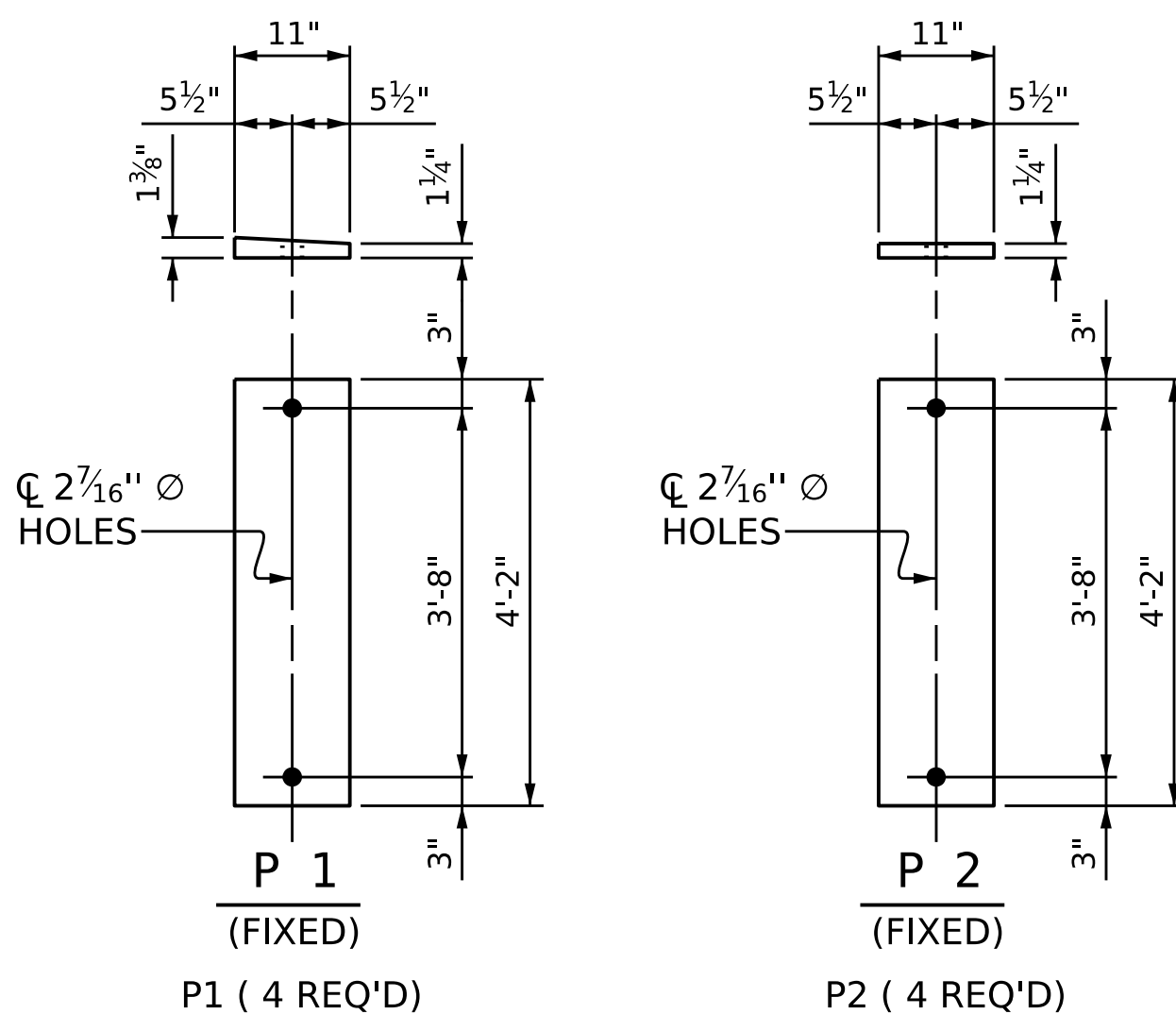
E1 (16 REQ'D)
PLAN VIEW OF
ELASTOMERIC BEARING

TYPE VIII



DETAIL "A"

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE VIII	390 K



SOLE PLATE DETAILS

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

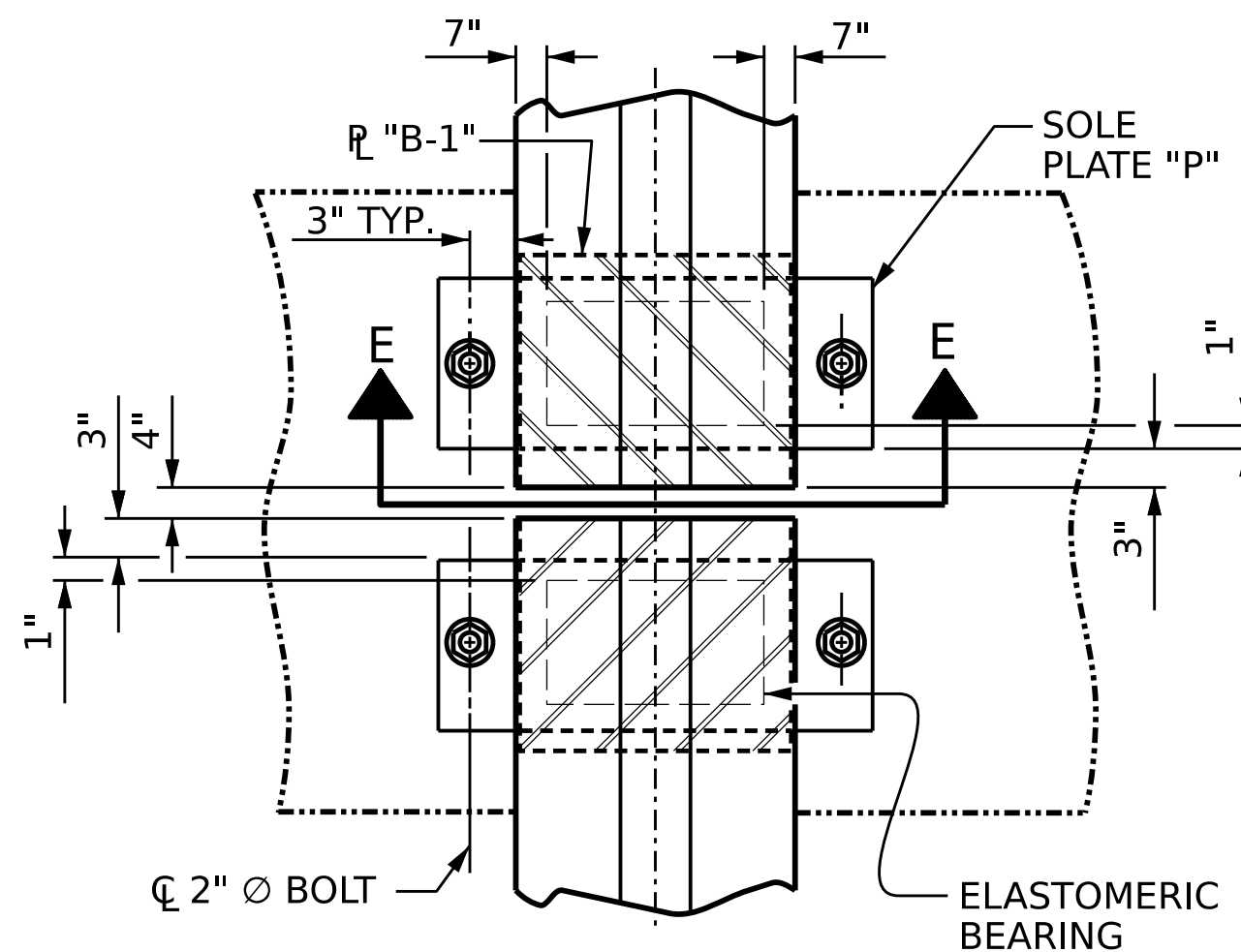
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL PLAN
(SHOWING CONTINUOUS BENT)

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Raleigh, NC 27609
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www.summitde.com



Signed by:
Jennifer R. McRo
E21A12FB8CDB40B...

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS FIB SUPERSTRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			REVISIONS						SHEET NO. S-17	
			NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
			1			3			36	
			2			4				

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025



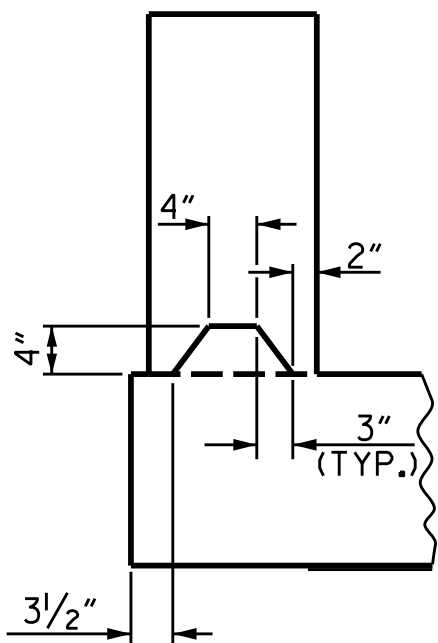
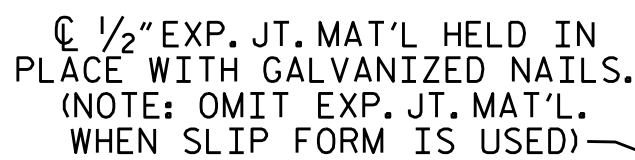
THE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

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

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

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

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES. SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAIL" SHEET



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

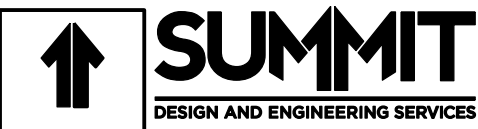
PARAPET DETAIL



PARAPET AND END POST FOR TWO BAR RAIL



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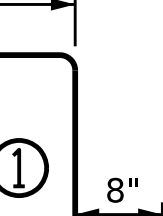
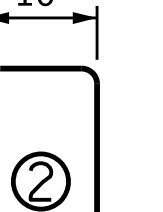


— Signed by:

Jennifer R. McKay
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3/6/2026

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FINAL UNLESS ALL
SIGNATURES COMPLETED

BAR TYPES		BILL OF MATERIAL					
		1 PARAPET AND 2 END POSTS					
		BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
		* B1	48	#5	STR	28'-7"	1,431
		* B2	8	#5	STR	17'-9"	148
		* B3	8	#5	STR	25'-9"	215
		* E1	4	#7	STR	2'-6"	20
		* E2	4	#7	STR	3'-0"	25
		* E3	4	#7	STR	3'-6"	29
		* E4	4	#7	STR	4'-0"	33
		* E5	4	#7	STR	4'-4"	35
		* F1	4	#6	STR	1'-10"	11
		* F2	4	#6	STR	3'-0"	18
		* F3	4	#6	STR	3'-7"	22
		* S1	219	#5	1	5'-5"	1,237
		* S2	219	#5	2	5'-6"	1,256
		* EPOXY COATED REINFORCING STEEL =					4,480 LBS.
BAR DIMENSIONS ARE OUT TO OUT		CLASS "AA" CONCRETE =					24.0 CU. YDS.
		1'-2" x 2'-6" CONC. PARAPET =					218.3 LIN. FT.

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 1 OF 5

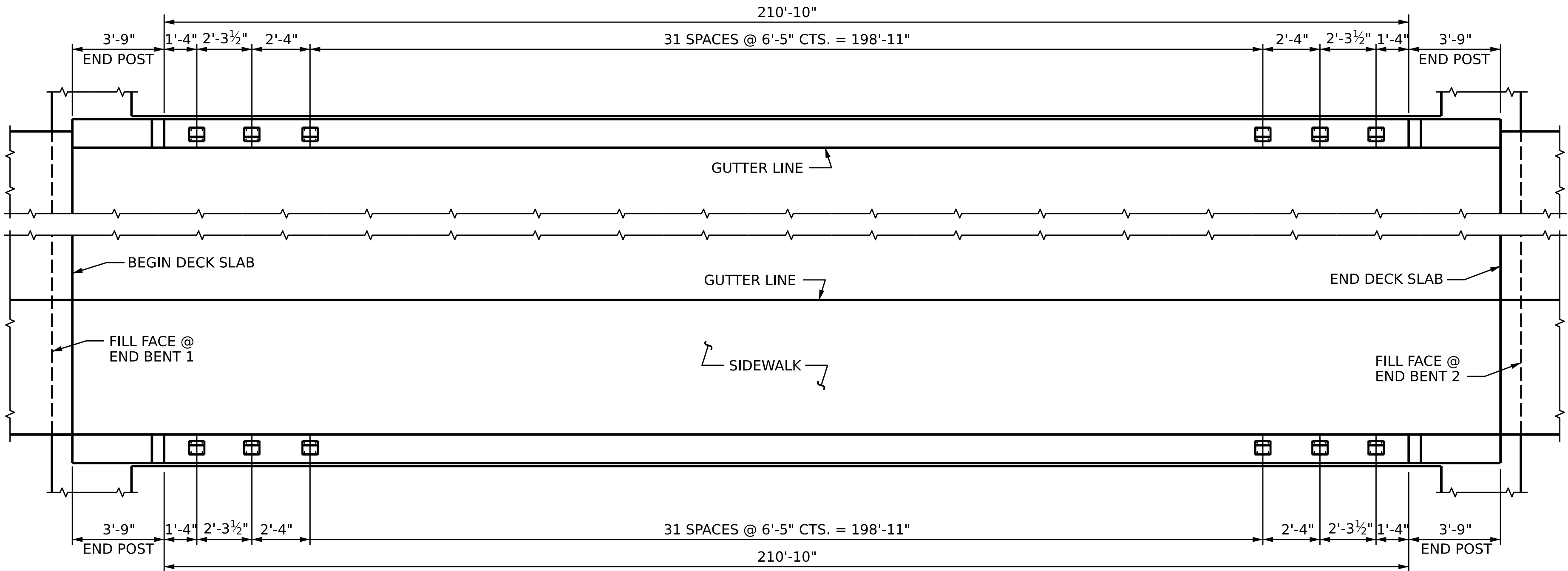
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET DETAILS

(LEFT PARAPET)

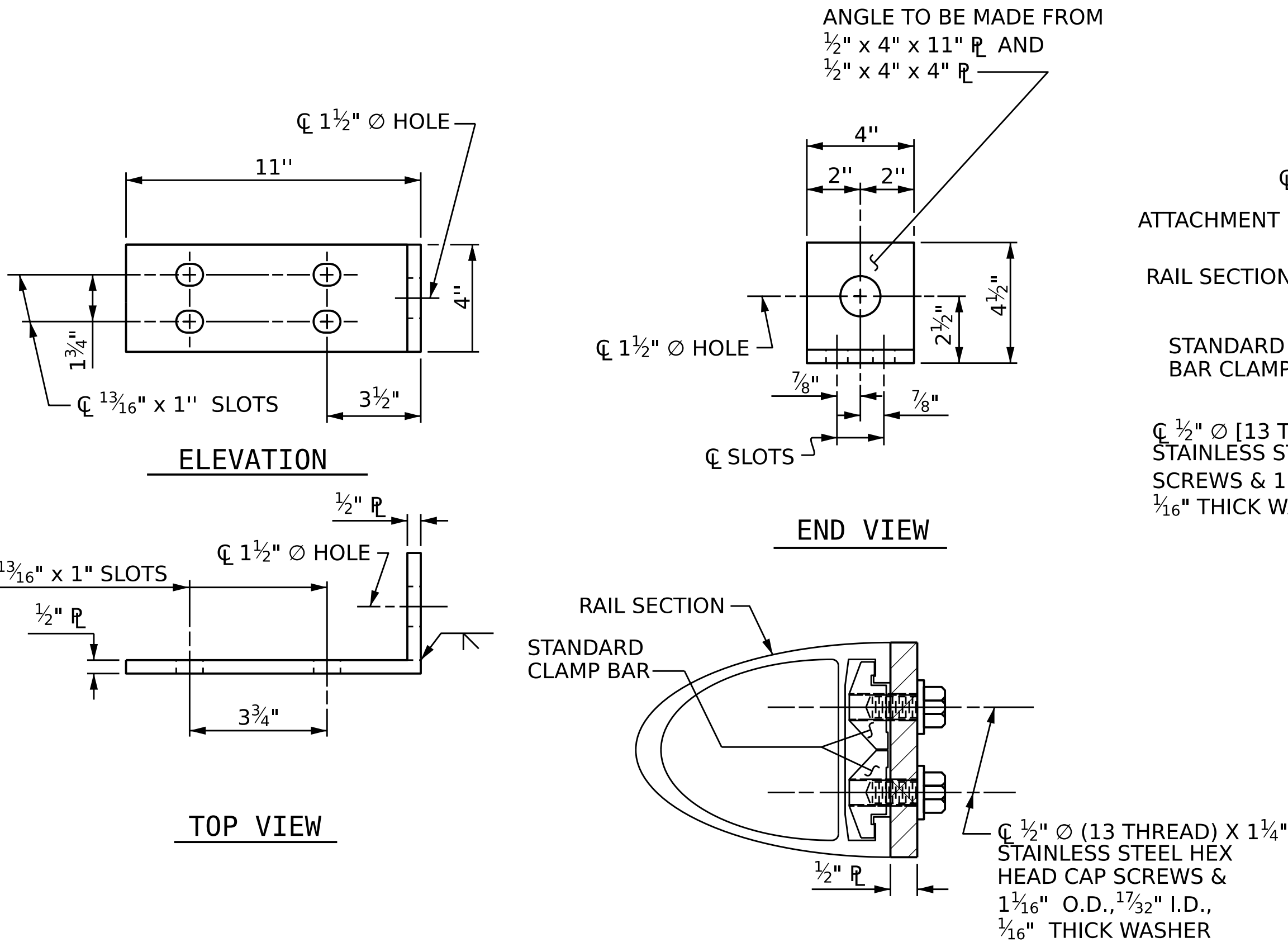
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			36



SPANS A & B

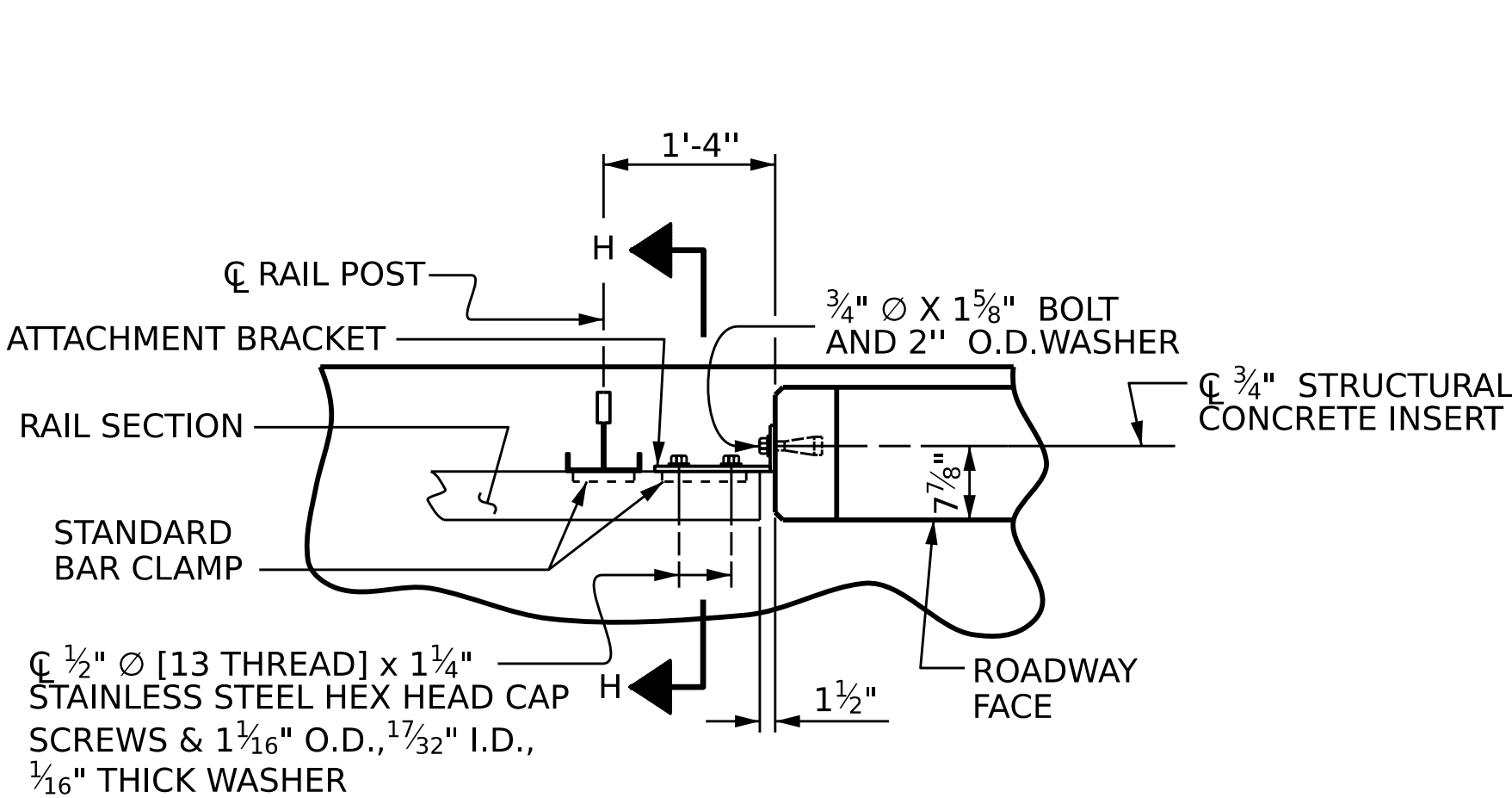
PLAN OF RAIL POST SPACING

DIMENSIONS ARE MEASURED ALONG BACKFACE OF PARAPET

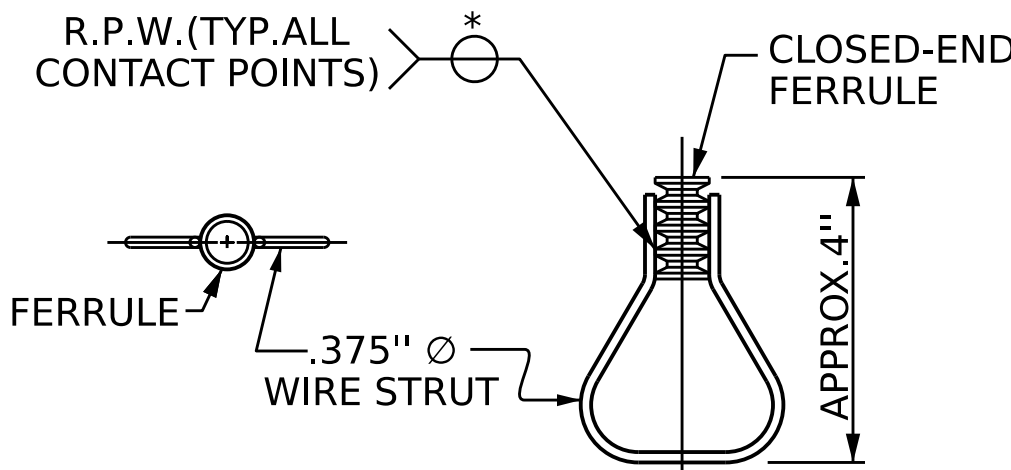


DETAILS FOR ATTACHING METAL RAIL TO END POST

ASSEMBLED BY : K. D. LAYNE	DATE : 01/2025
CHECKED BY : J.R. MCROY	DATE : 12/2025
DRAWN BY : FCJ 1/88	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 3/89	REV. 12/17 MAA/THC
	REV. 10/23 BNB/SNM



PLAN - RAIL AND END POST



STRUCTURAL CONCRETE INSERT

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

NOTES

STRUCTURAL CONCRETE INSERT

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

- 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".
- 1 - 3/4" $\varnothing$ x 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" $\varnothing$ 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.)
- 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" $\varnothing$ WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 1/2" PLATES SHALL CONFORM TO ASTM A36 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" $\varnothing$ x 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" $\varnothing$ x 1 5/8" BOLT SHALL HAVE N. C. THREADS.
- 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.
- STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- 1/2" $\varnothing$ PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

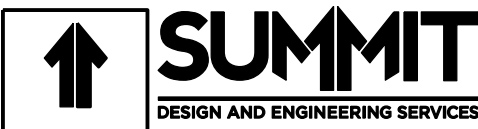
THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

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

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

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

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Signed by: Jennifer R. McRoy
3/4/2026

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PROJECT NO. HB-0035

ROCKINGHAM COUNTY

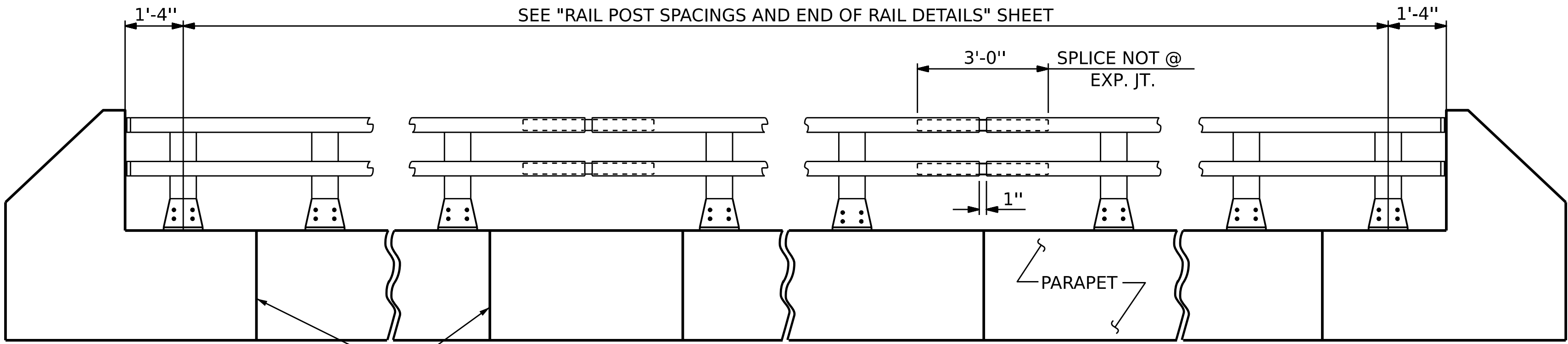
STATION: 22+25.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR TWO BAR METAL RAILS

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

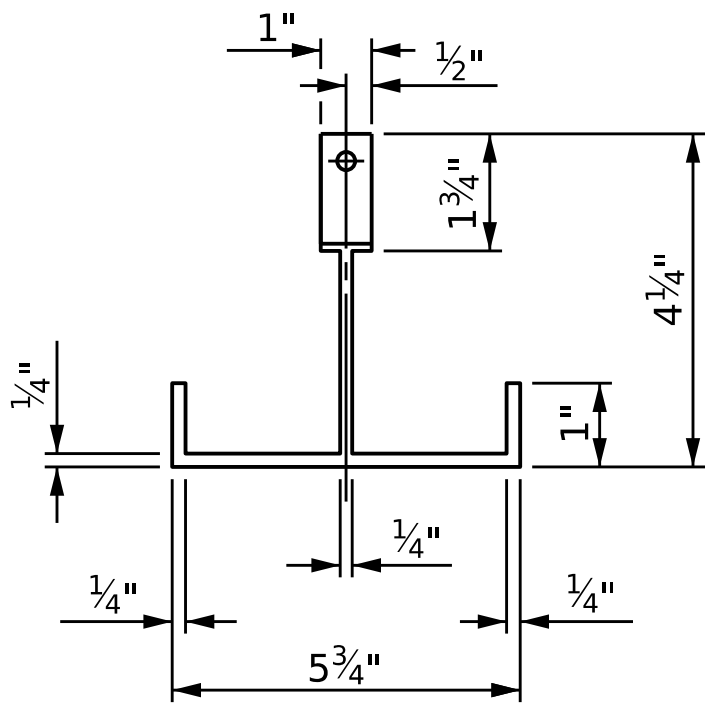
STD. NO. BMR2



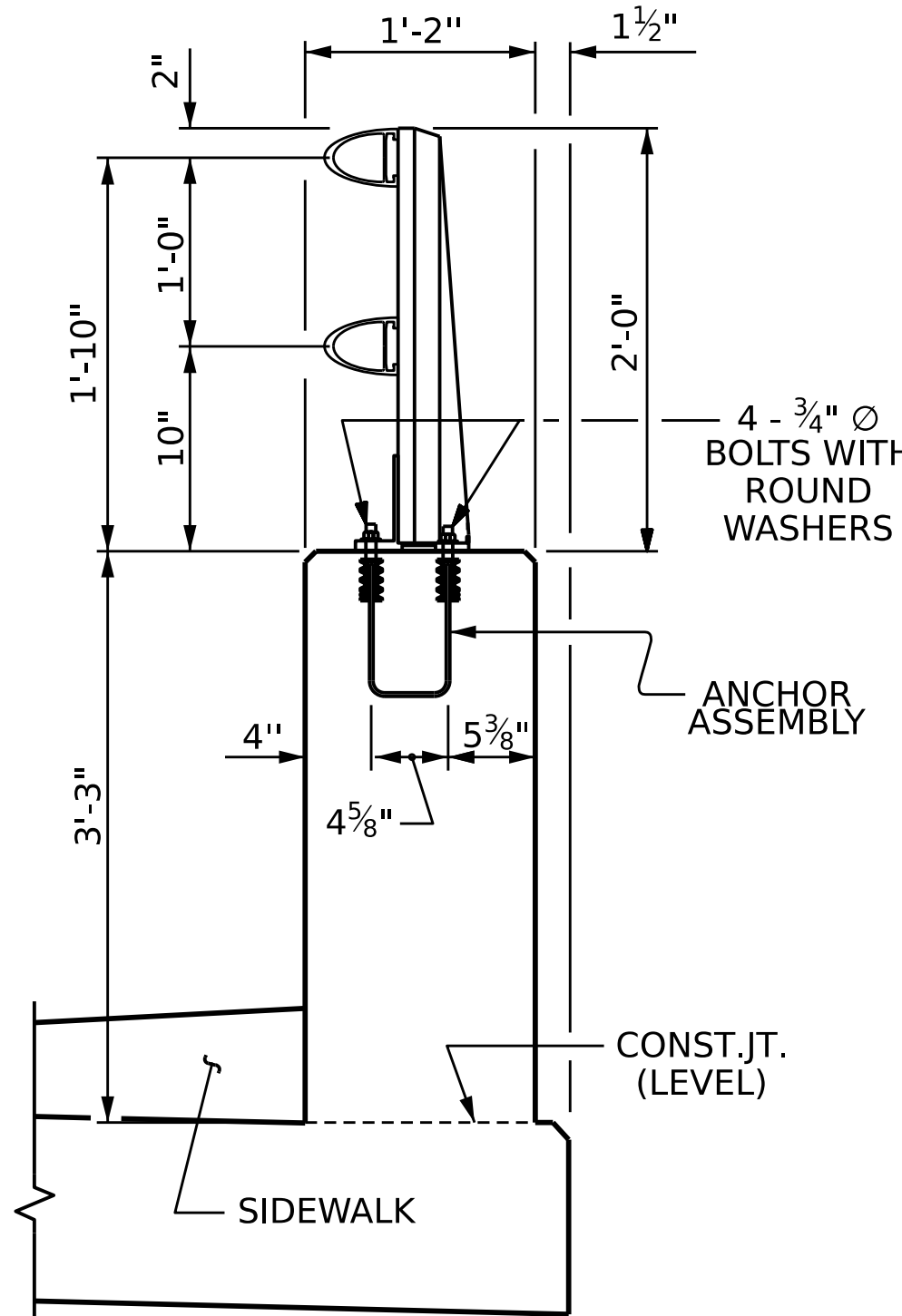
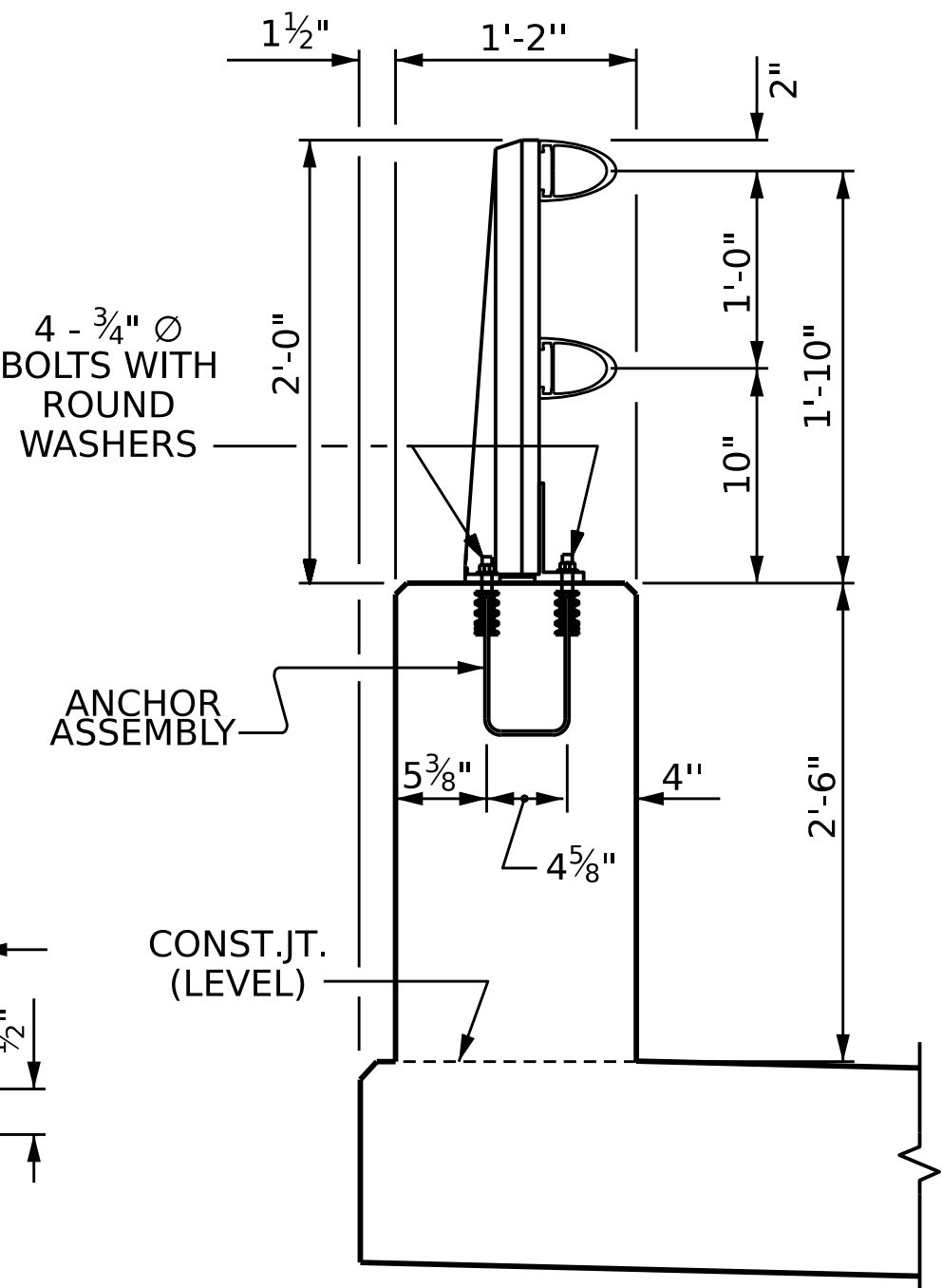
TOOLED CONTRACTION JT.
(SEE NOTES)

ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



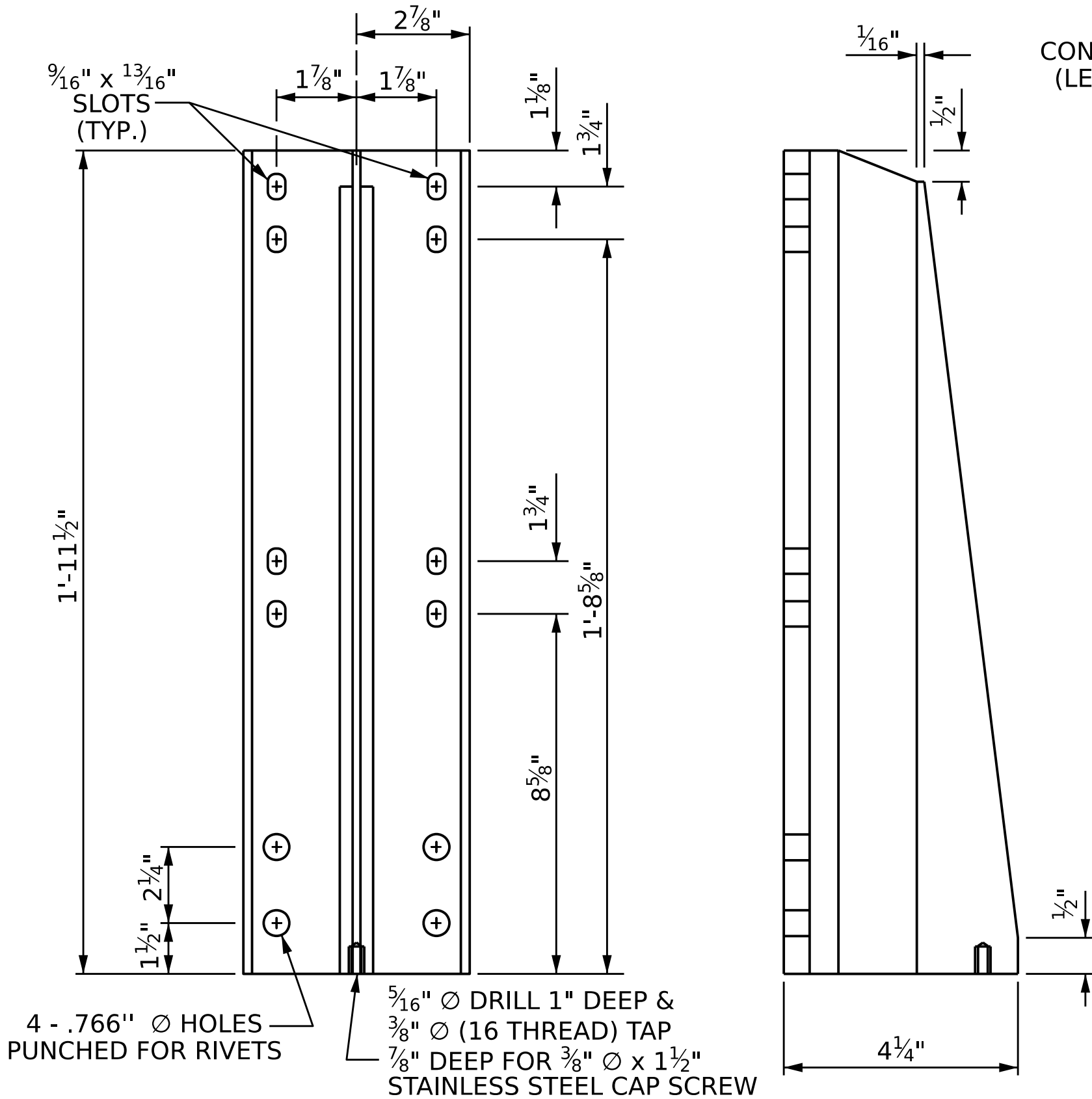
PLAN



LEFT PARAPET

RIGHT PARAPET

SECTION THRU PARAPET AND RAIL

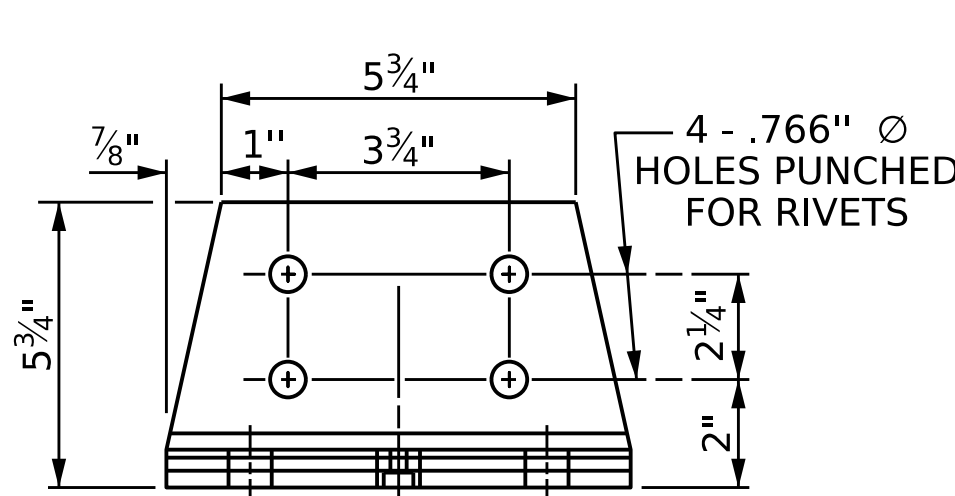


FRONT ELEVATION

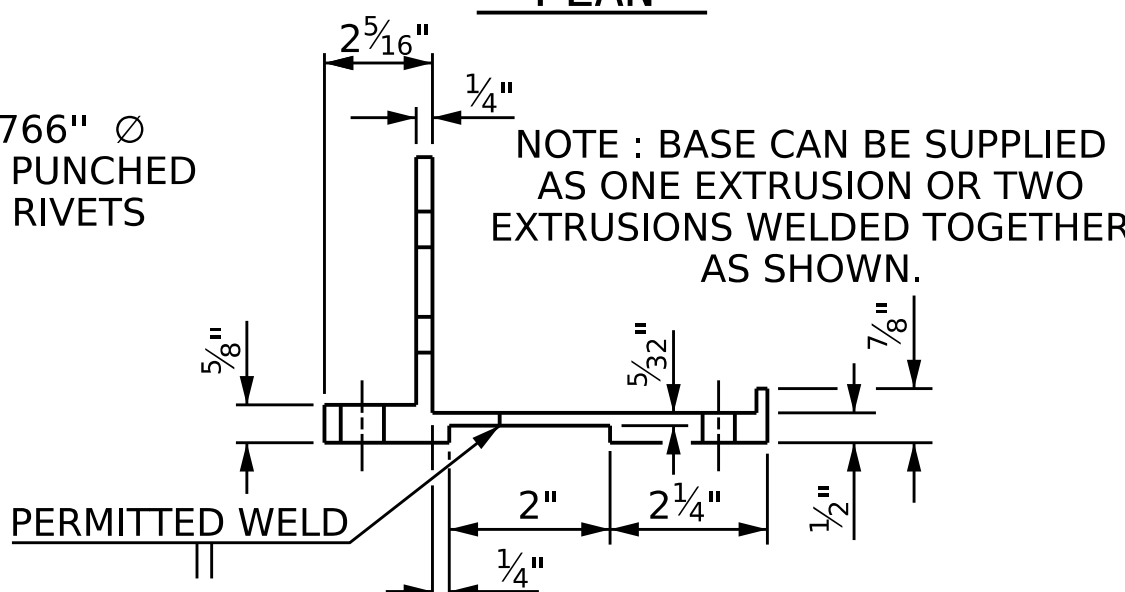
SIDE ELEVATION

DETAILS OF POST

DRAWN BY : K. D. LAYNE DATE : 01/2025
CHECKED BY : J. R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J. R. MCROY DATE : 12/2025

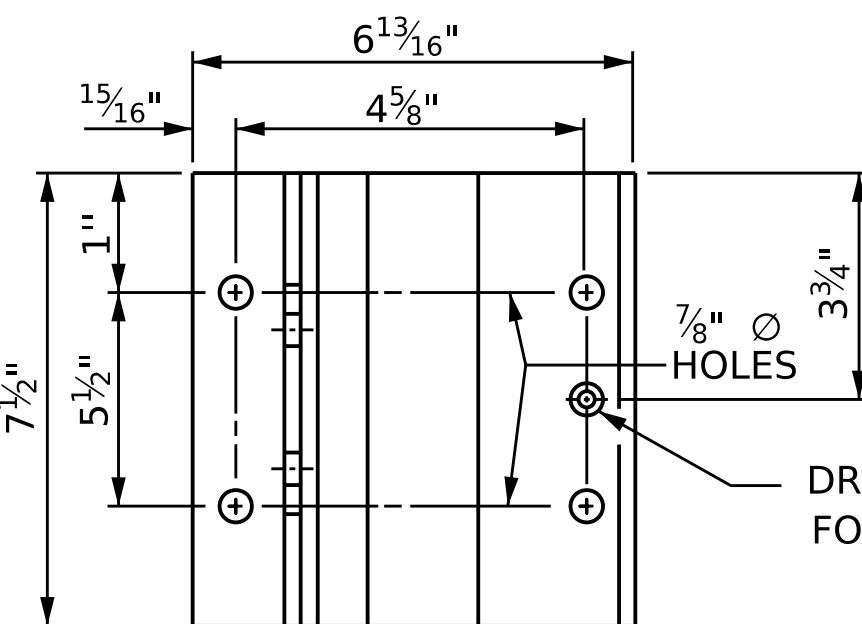


FRONT ELEVATION

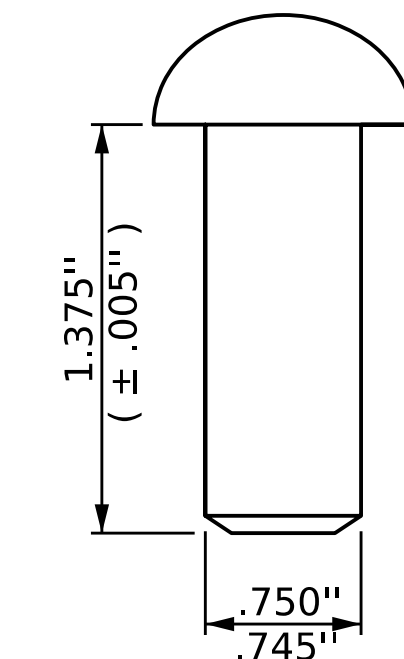


SIDE ELEVATION

POST BASE DETAILS



PLAN



RIVET DETAIL

NOTES

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

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

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

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

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

GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: ASTM A36 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO ASTM A123.

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 A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 421.67 LIN.FT.

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PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

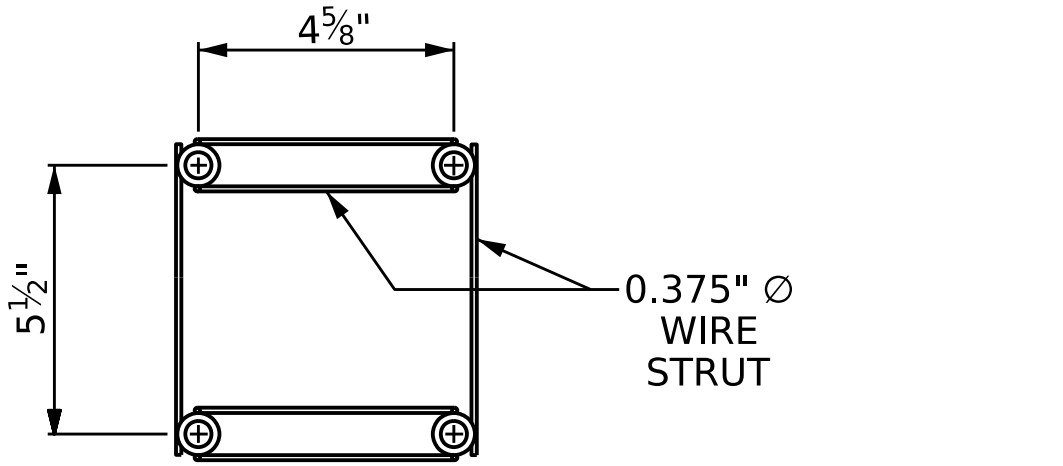
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

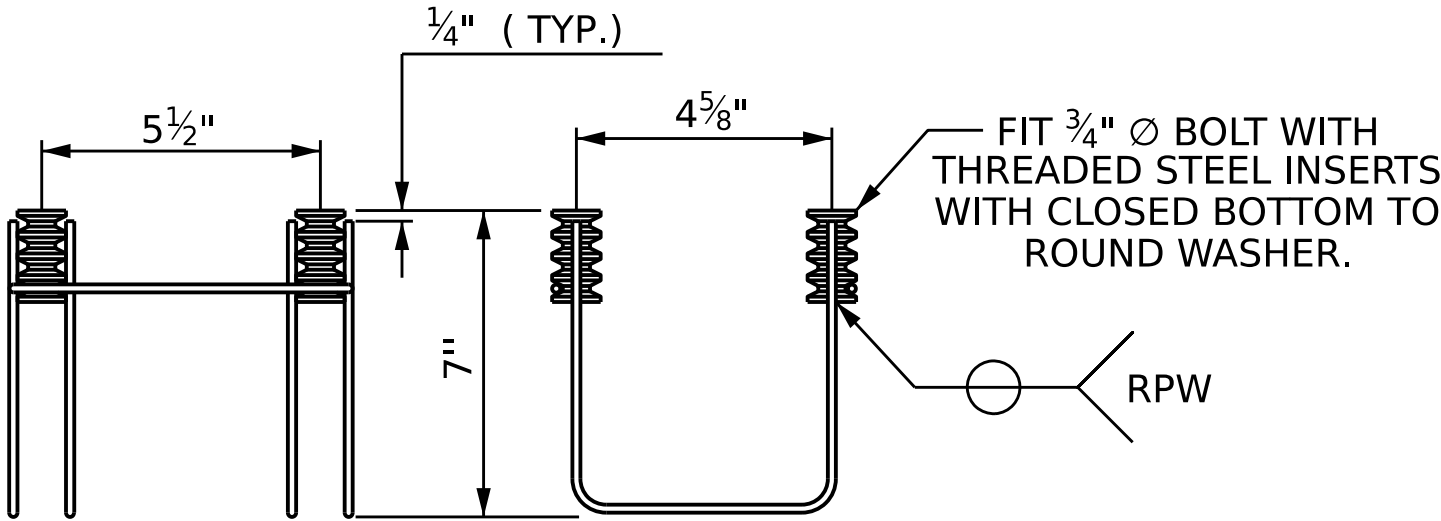
2 BAR METAL RAIL

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-22
2			4			TOTAL SHEETS 36



PLAN

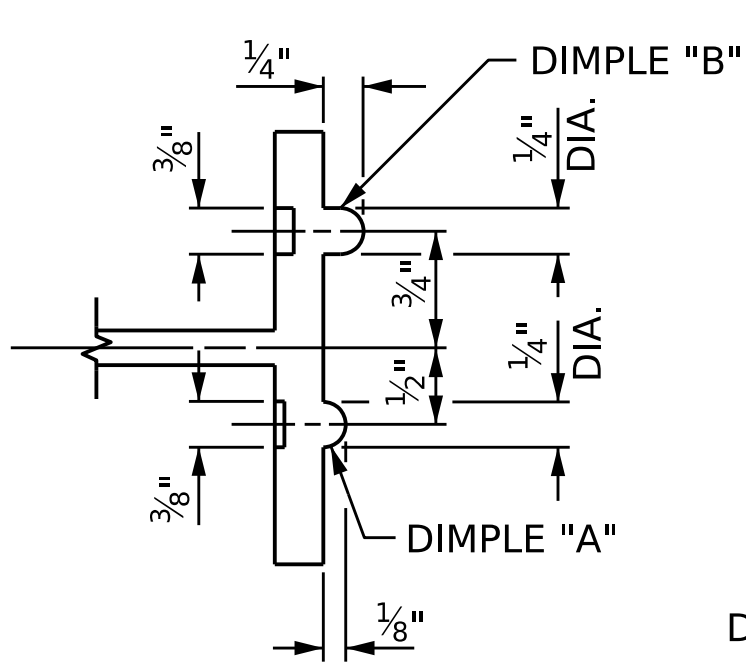


SIDE VIEW

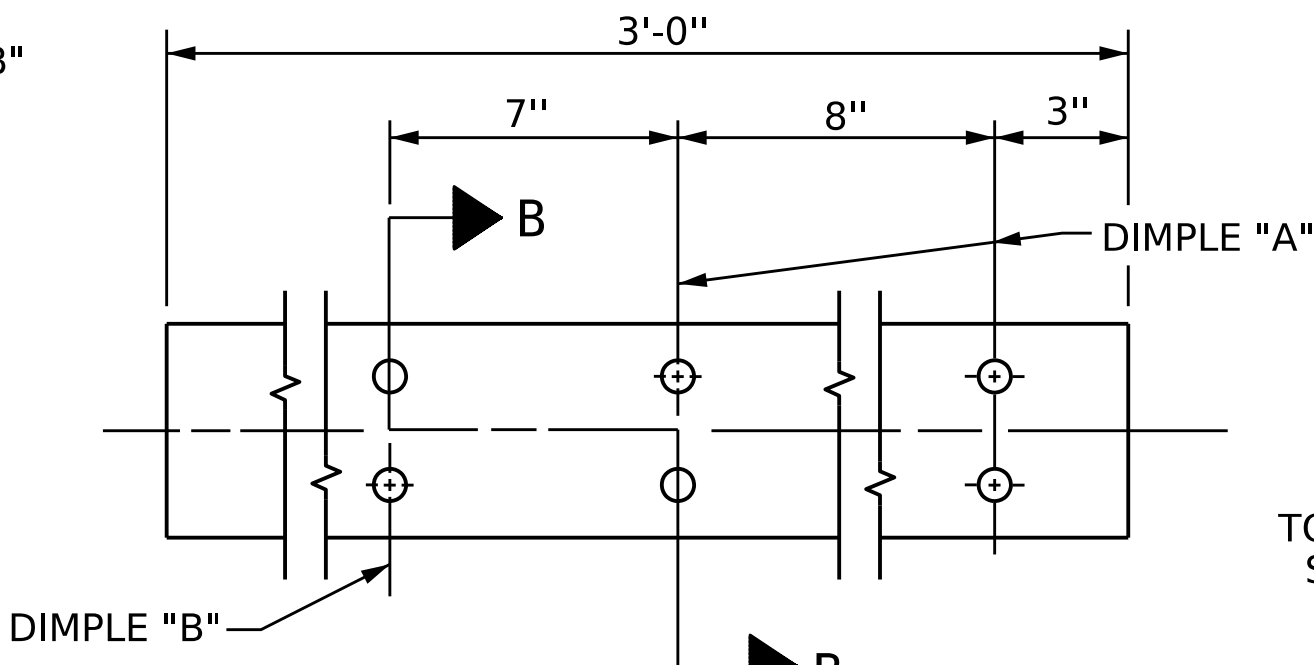
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

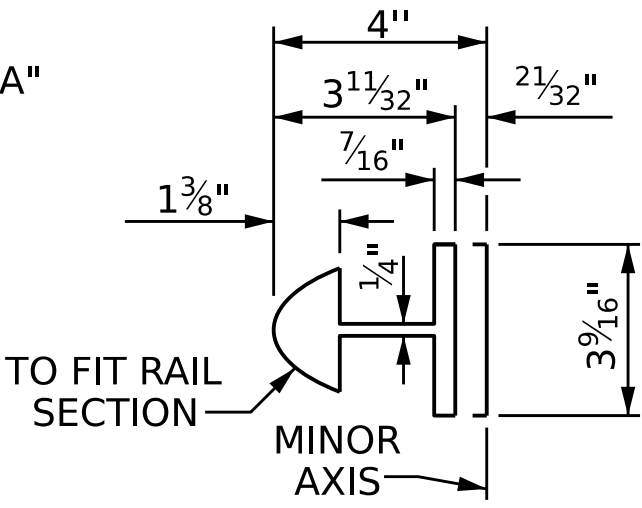
(72 ASSEMBLIES REQUIRED)



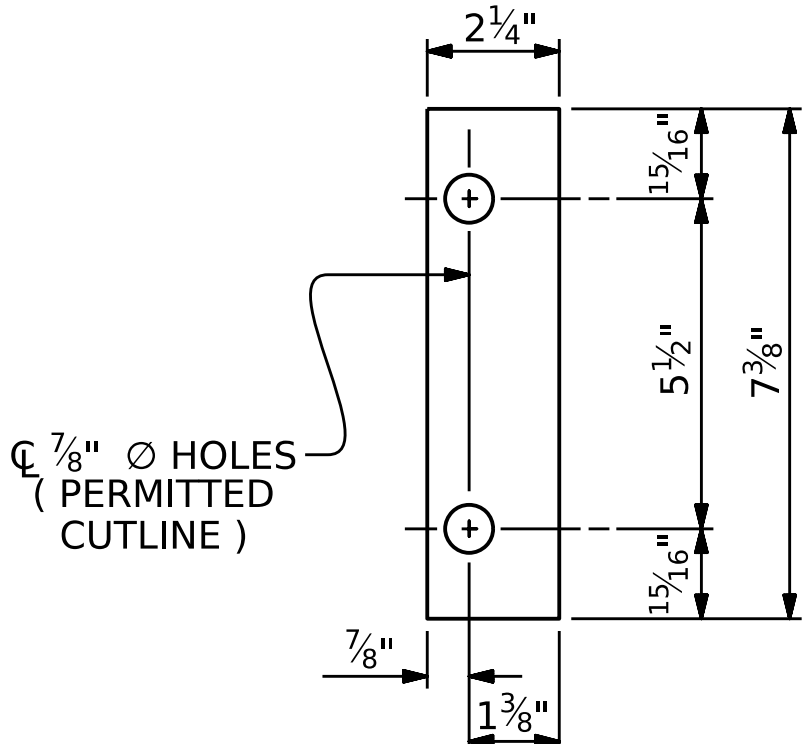
SECTION B-B



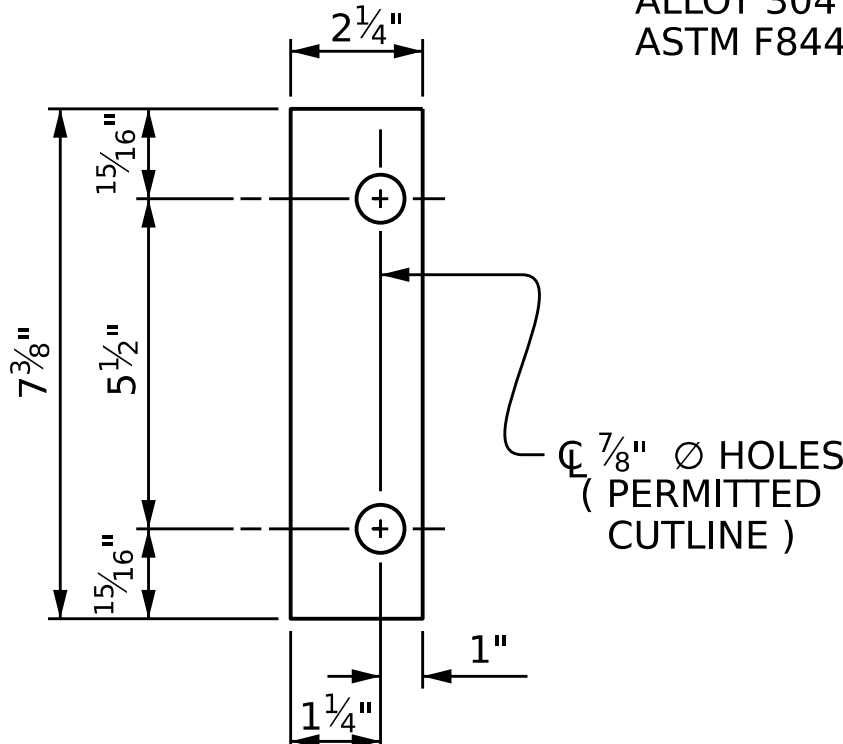
EXPANSION BAR DETAILS



BAR SECTION



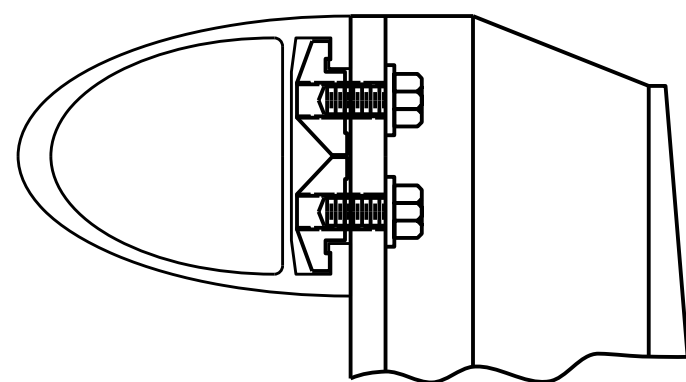
FRONT PLATE



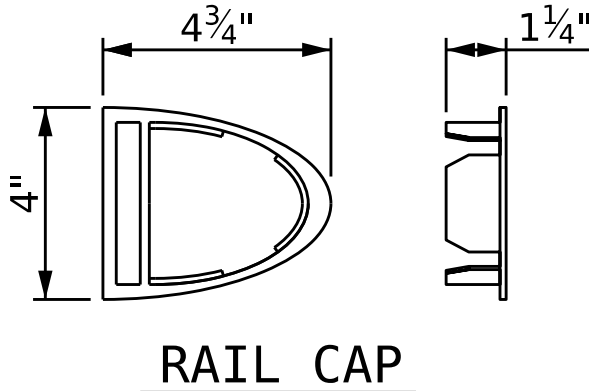
REAR PLATE

SHIM DETAILS

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



CLAMP ASSEMBLY



RAIL CAP

NOTES

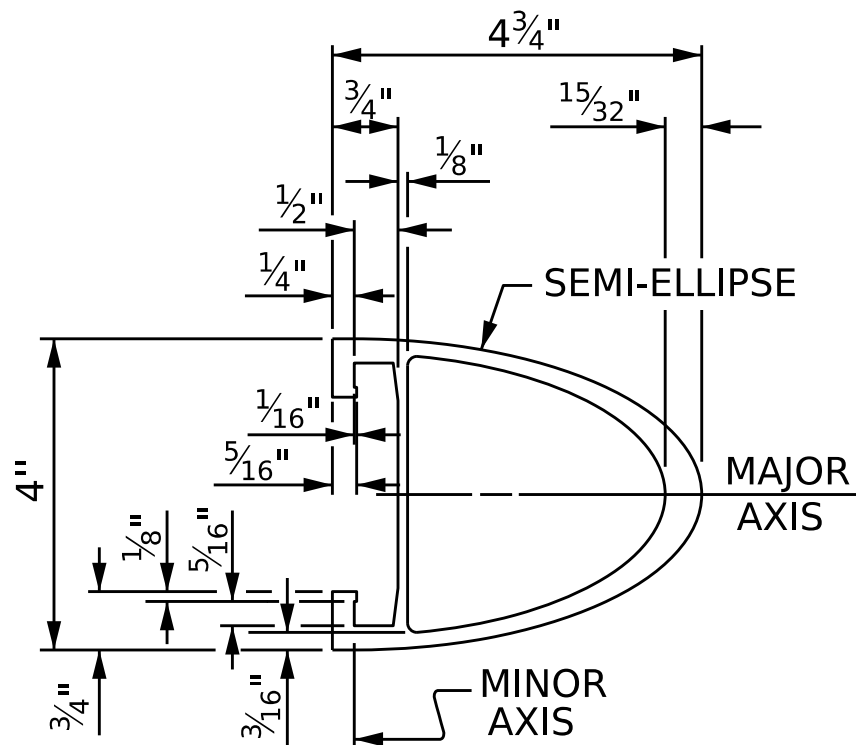
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- 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.
- 4 - 3/4" $\varnothing$ 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" $\varnothing$ 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.
- 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" $\varnothing$ WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF ASTM A123.
- 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.
- BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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



RAIL SECTION



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3/4/2026
F21A12P8BCD40B.

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

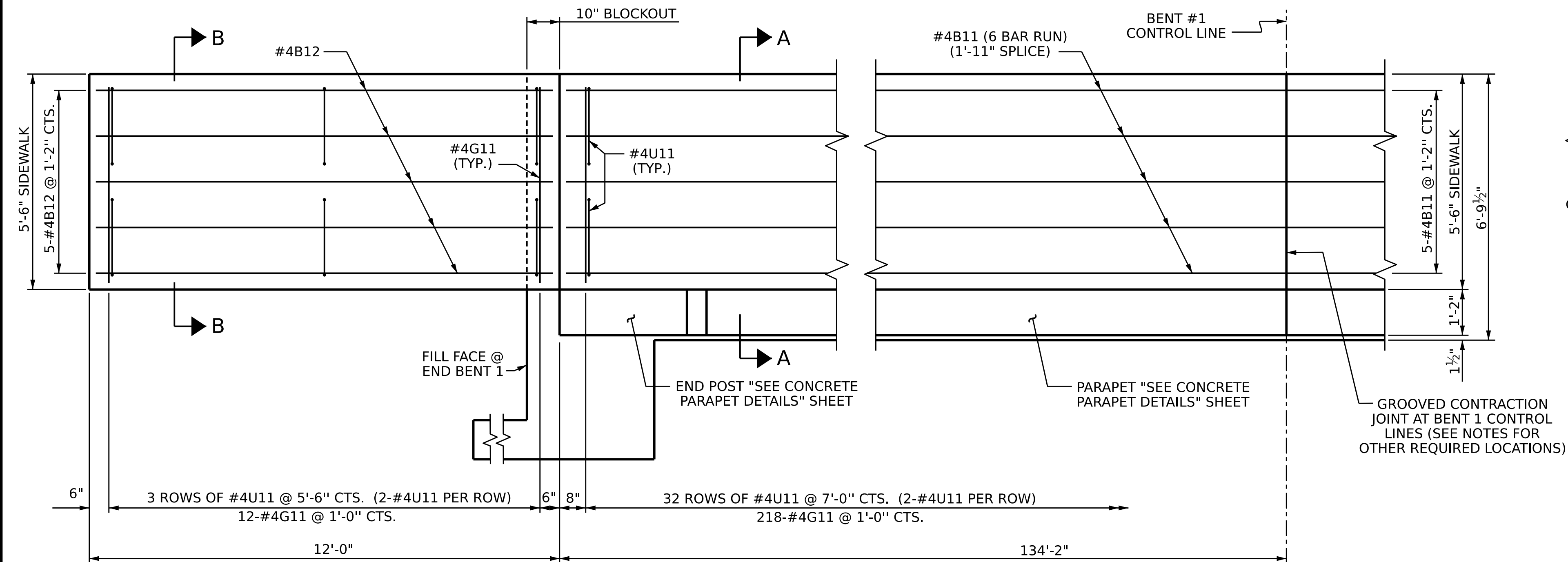
2 BAR METAL RAIL

REVISIONS

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

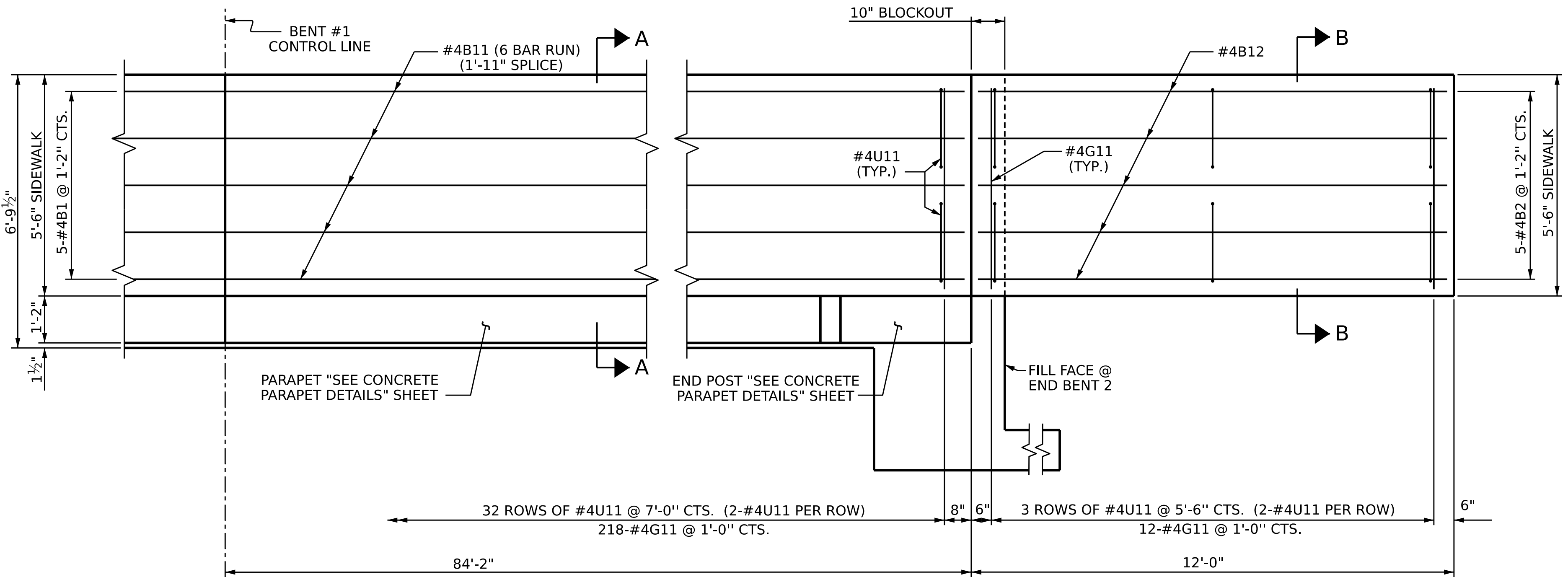
ASSEMBLED BY : K.D.LAYNE	DATE : 01/2025
CHECKED BY : J.R.MCROY	DATE : 12/2025
DRAWN BY : EEM 6/94	REV. 10/11
CHECKED BY : RGW 6/94	REV. 12/17
	REV. 10/23
	MAA/GM
	MAA/THC
	BNB/SNM

STD. NO. BMR4



APPROACH SLAB AT END BENT 1

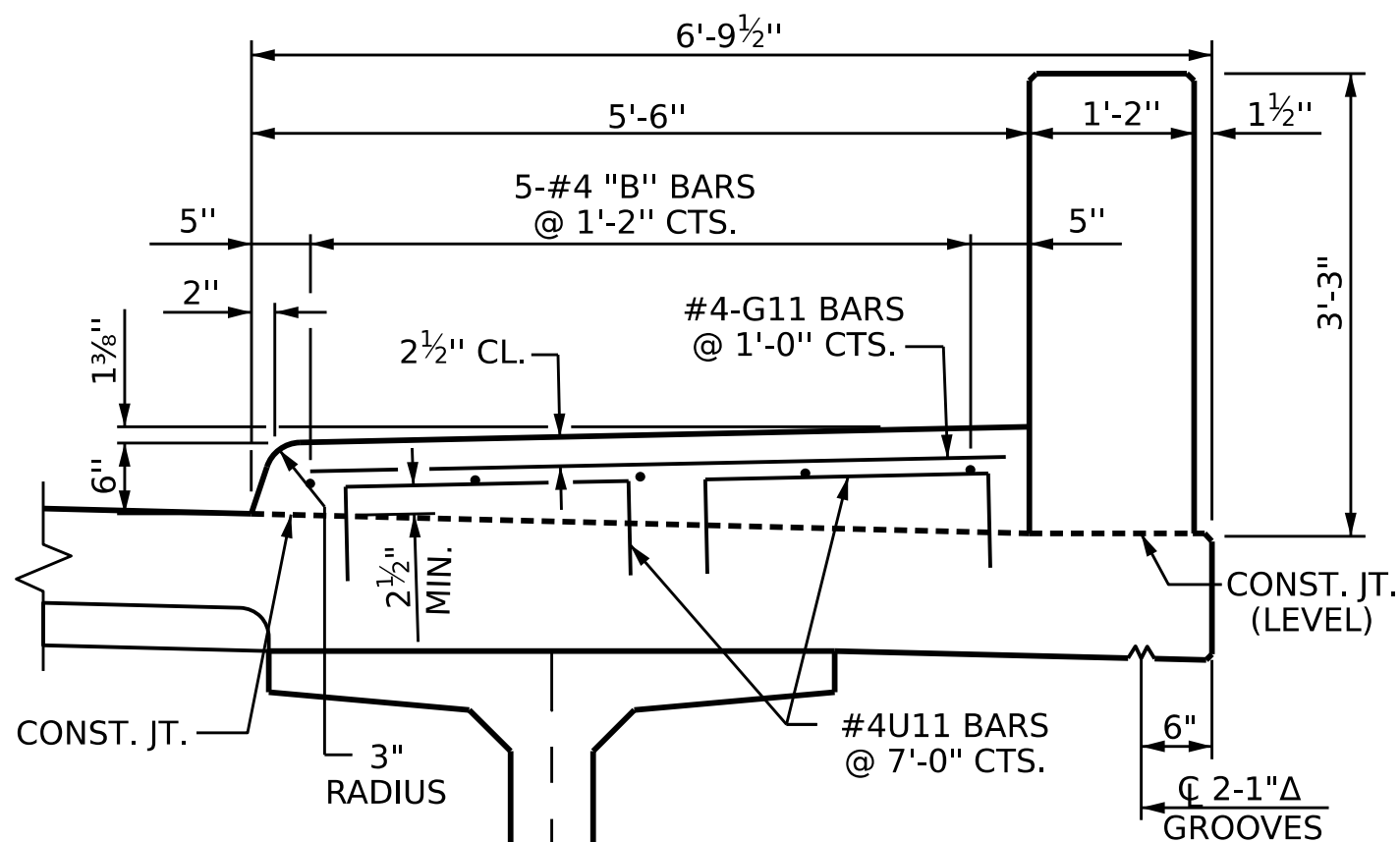
SPAN A



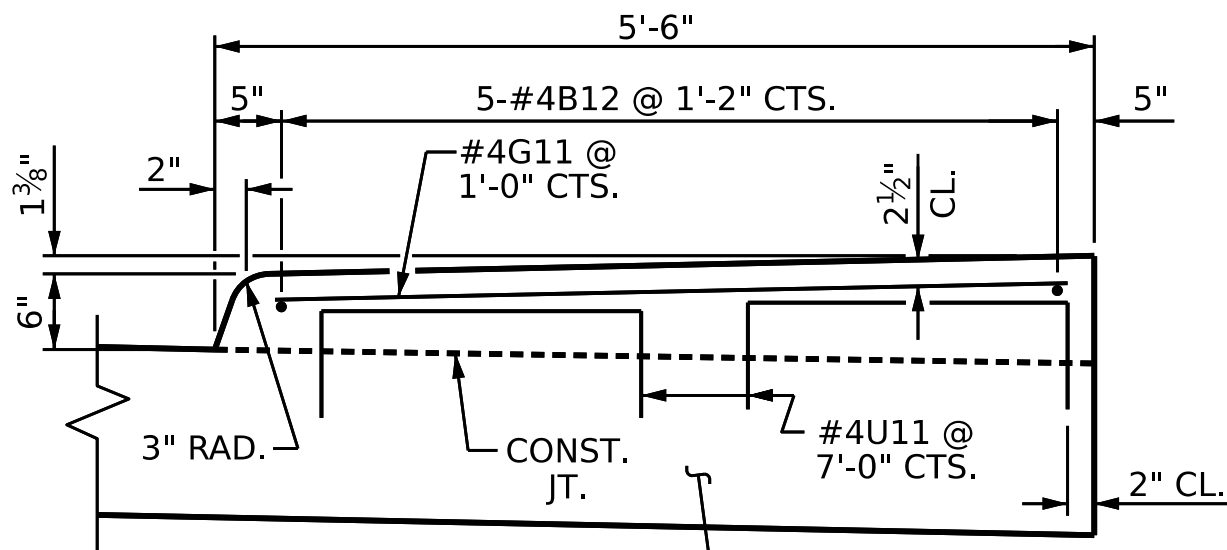
SPAN B

APPROACH SLAB AT END BENT 2

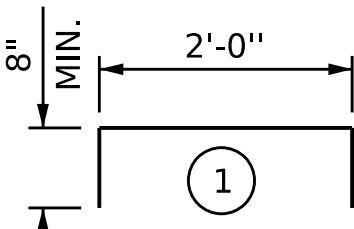
PLAN OF SIDEWALK



SECTION A-A



SECTION B-B

BAR TYPE					
					
BILL OF MATERIALS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B11	30	#4	STR	38'-0"	762
* B12	10	#4	STR	11'-8"	78
* U11	76	#4	1	3'-4"	169
* G11	242	#4	STR	5'-0"	808
* EPOXY COATED REINF. STEEL =					1,817 LBS
CLASS AA CONCRETE =					30.9 C.Y.

NOTES

THE #4U11 & #4G11 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" CLEARANCE TO THE 1" EXPANSION JOINT MATERIAL IN SIDEWALK.

THE 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.

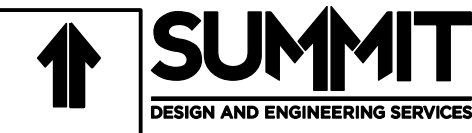
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED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

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

#4U11 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

CONCRETE AND REINFORCING STEEL FOR THE SIDEWALKS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB"

Prepared in the Office of:



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Signed by:
Jennifer R. McRoy
F21A12FB8CDBA0B

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

SIDEWALK DETAILS

DRAWN BY : K. D. LAYNE DATE : 01/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 7 - ⅝" Ø BOLTS WITH NUTS AND WASHERS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅝" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

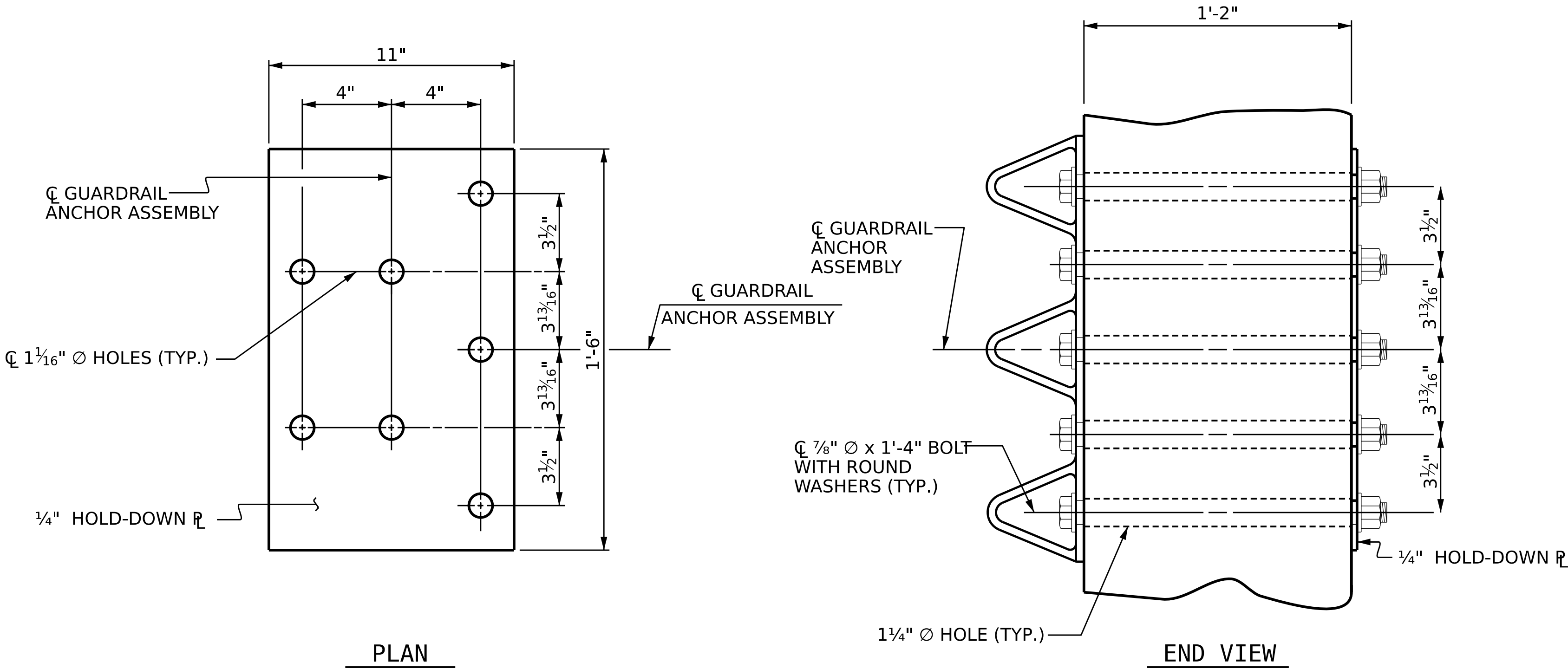
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

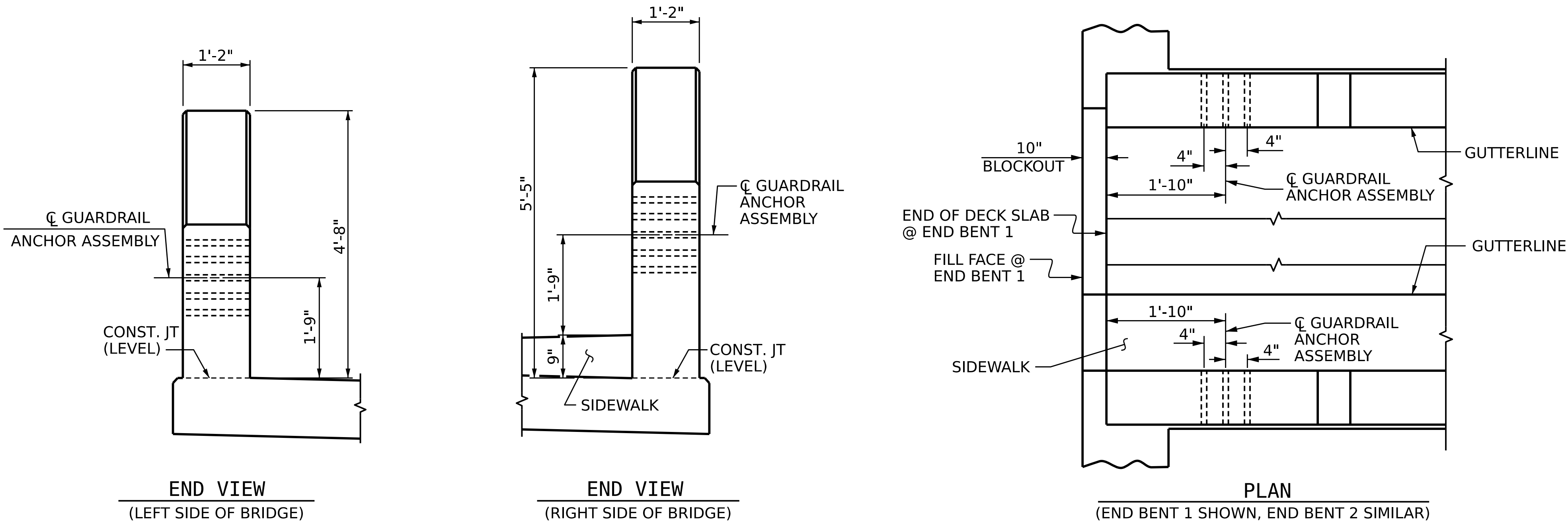
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

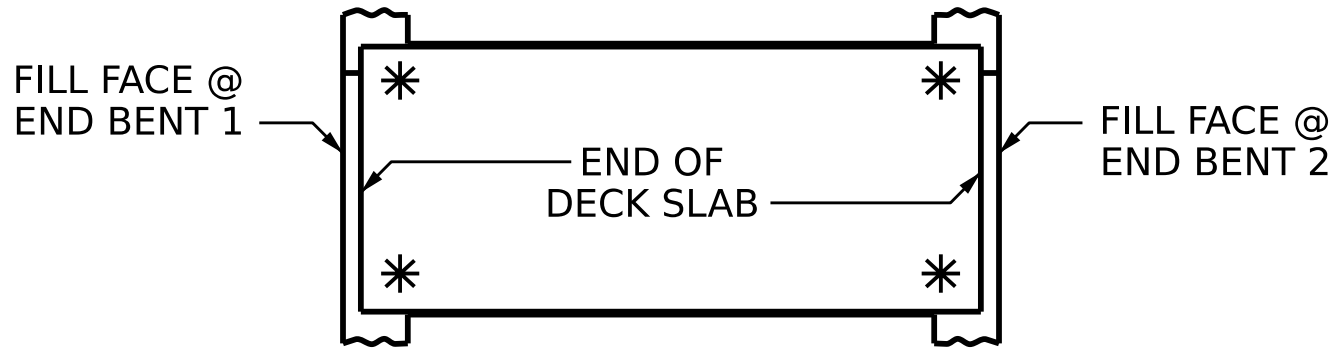
THE 1 ¼" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



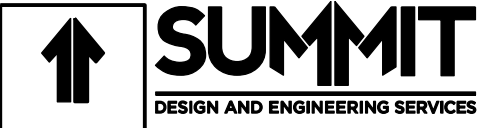
LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

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STATION: 22+25.00 -L-

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DEPARTMENT OF TRANSPORTATION
RALEIGH

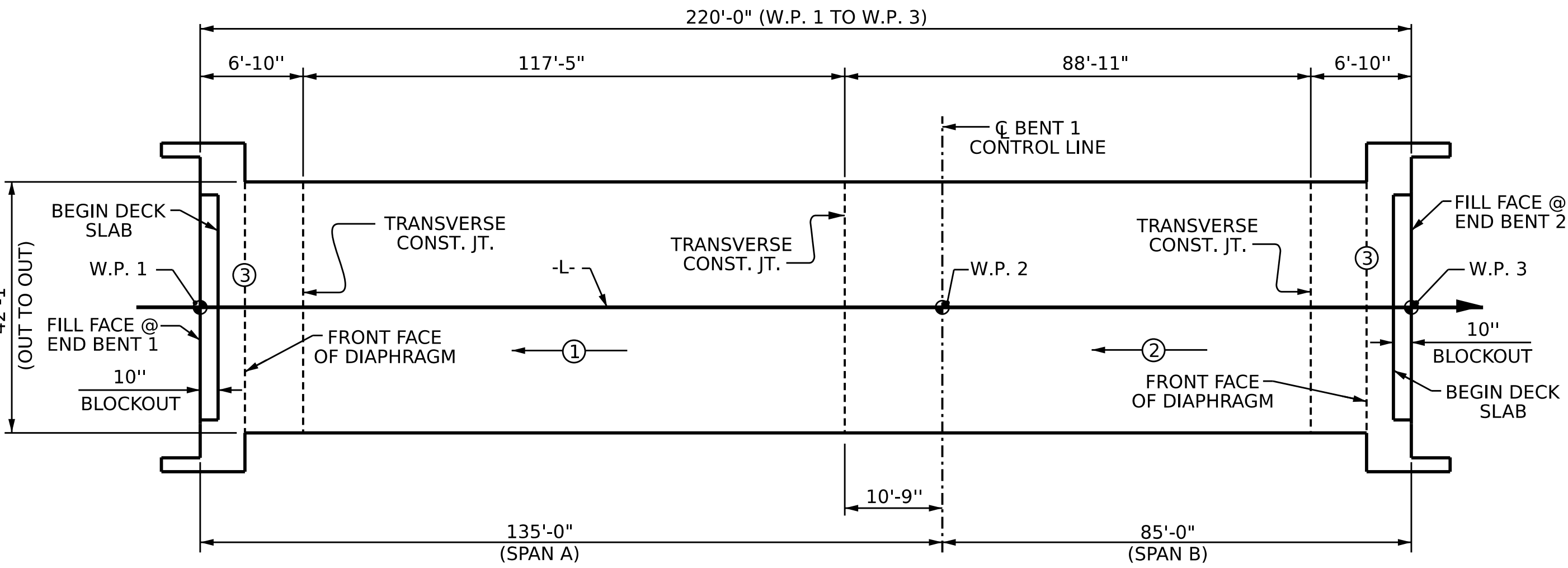
GUARDRAIL ANCHORAGE
DETAILS
FOR METAL RAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-25
2			4			TOTAL SHEETS 36

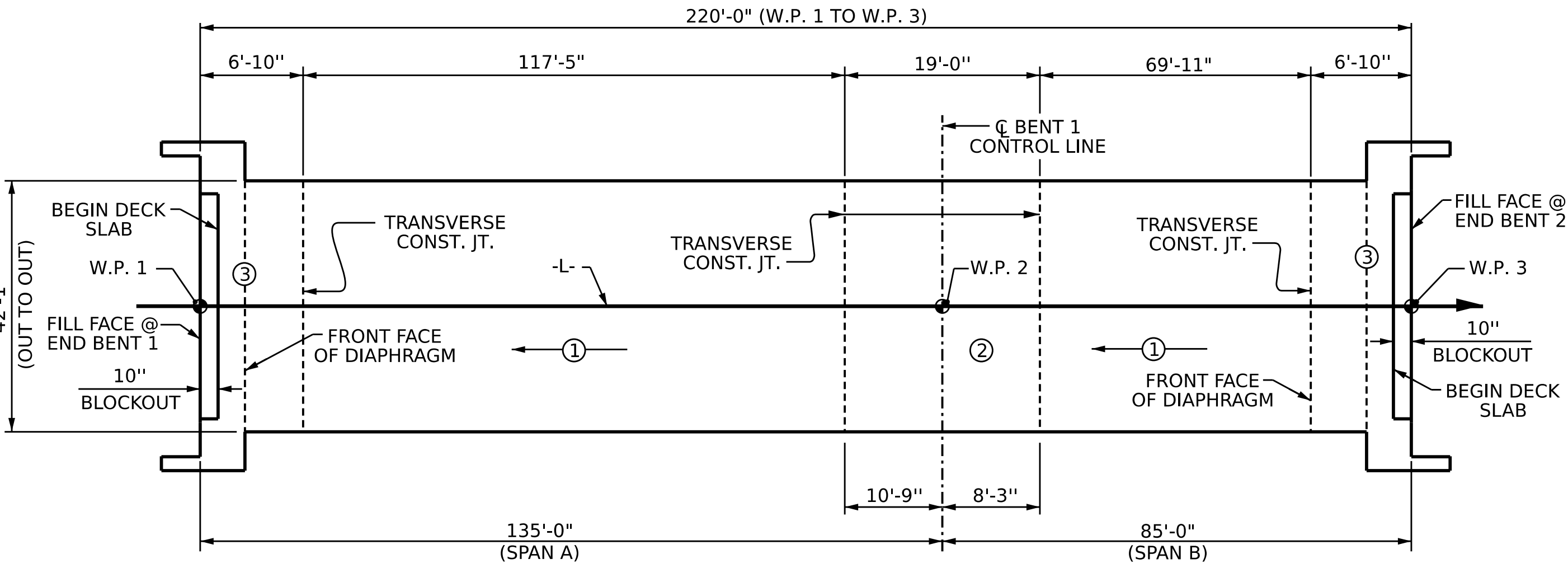
DRAWN BY : K.D. LAYNE DATE : 01/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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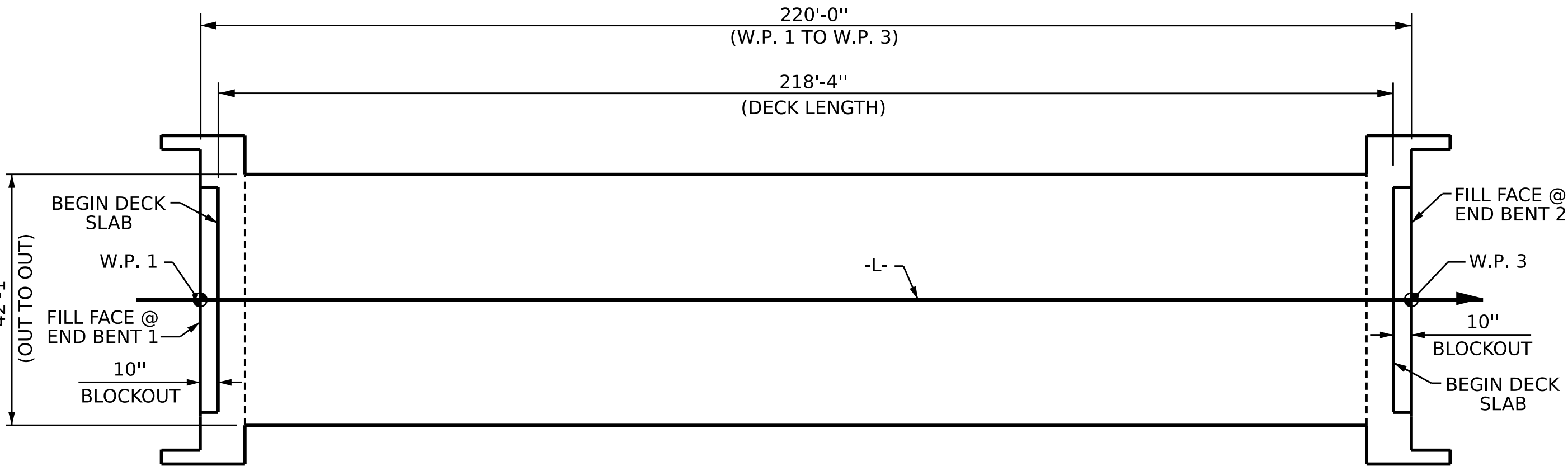
POURING SEQUENCE

① = INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

① = INDICATES POUR NUMBER AND DIRECTION OF POUR



LAYOUT FOR COMPUTING AREA OF
REINFORCED CONCRETE DECK SLAB
(9,188.2 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"			

CLASS AA CONCRETE BREAKDOWN

POUR #1	161.8 CU. YDS.
POUR #2	122.5 CU. YDS.
POUR #3	86.2 CU. YDS.
CLASS AA CONCRETE	370.5 CU. YDS.

GROOVING BRIDGE FLOORS

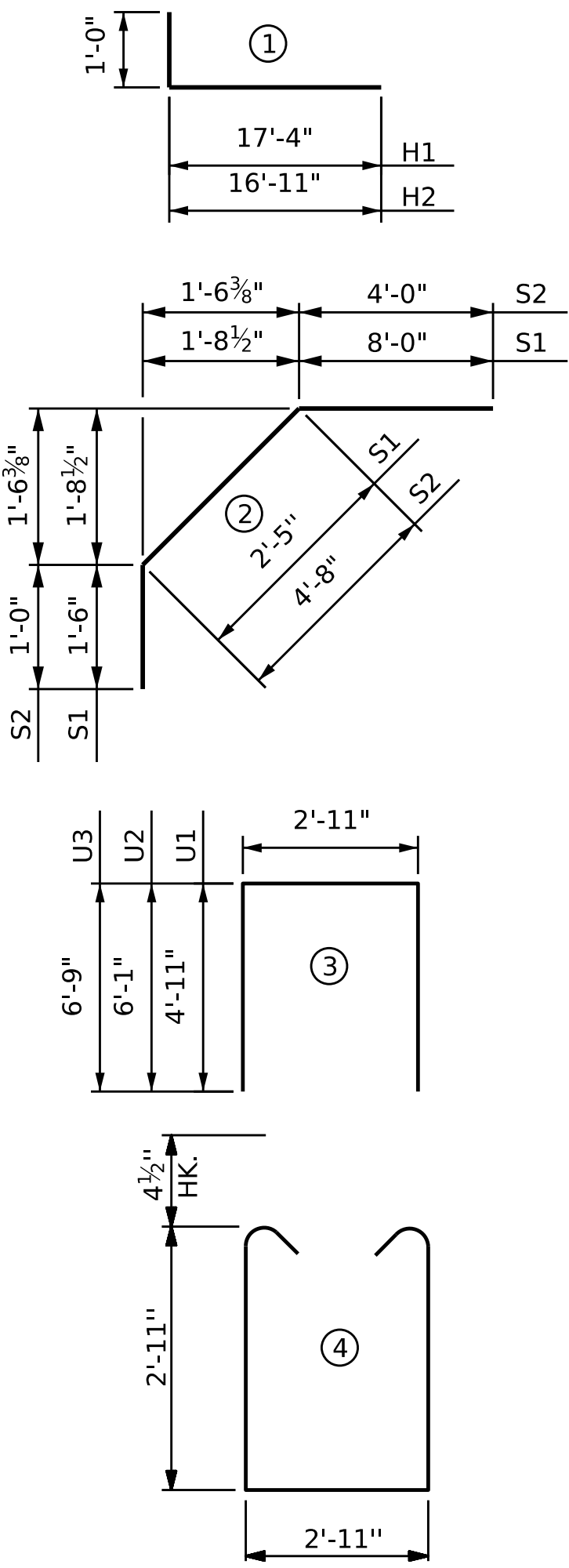
APPROACH SLABS	692 SQ.FT.
BRIDGE DECK	6,758 SQ.FT.
TOTAL	7,450 SQ.FT.

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE	REINFORCING STEEL	* EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS * *	370.5	31,836	33,000

* * QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

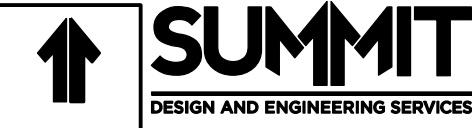
SPANS A & B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	403	#5	STR	41'-9"	17,549
A2	403	#5	STR	41'-9"	17,549
* B1	54	#5	STR	43'-0"	2,422
* B2	114	#5	STR	39'-3"	4,667
* B3	84	#6	STR	26'-10"	3,386
* B4	84	#6	STR	16'-10"	2,124
* B5	58	#4	STR	33'-9"	1,308
* B6	58	#4	STR	21'-3"	823
B7	30	#5	STR	54'-0"	1,690
B8	70	#5	STR	33'-6"	2,446
B9	70	#5	STR	49'-8"	3,626
B10	35	#5	STR	59'-9"	2,181
H1	52	#6	1	18'-4"	1,432
H2	56	#6	1	17'-11"	1,507
K1	24	#4	STR	24'-8"	395
K2	6	#4	STR	7'-5"	30
K3	6	#4	STR	9'-0"	36
K4	18	#4	STR	10'-0"	120
K5	6	#4	STR	6'-7"	26
K6	4	#4	STR	5'-9"	15
K7	4	#4	STR	6'-6"	17
K8	12	#4	STR	7'-0"	56
K9	4	#4	STR	5'-4"	14
K10	28	#4	STR	2'-8"	50
* S1	50	#4	2	11'-11"	398
* S2	50	#4	2	9'-8"	323
S3	16	#4	4	9'-6"	102
U1	54	#4	3	12'-9"	460
U2	4	#4	3	15'-1"	40
U3	4	#4	3	16'-5"	44

REINFORCING STEEL 31,836 LBS

* EPOXY COATED
REINFORCING STEEL 33,000 LBS

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Signed by:
Jennifer R. McRoy
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ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

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

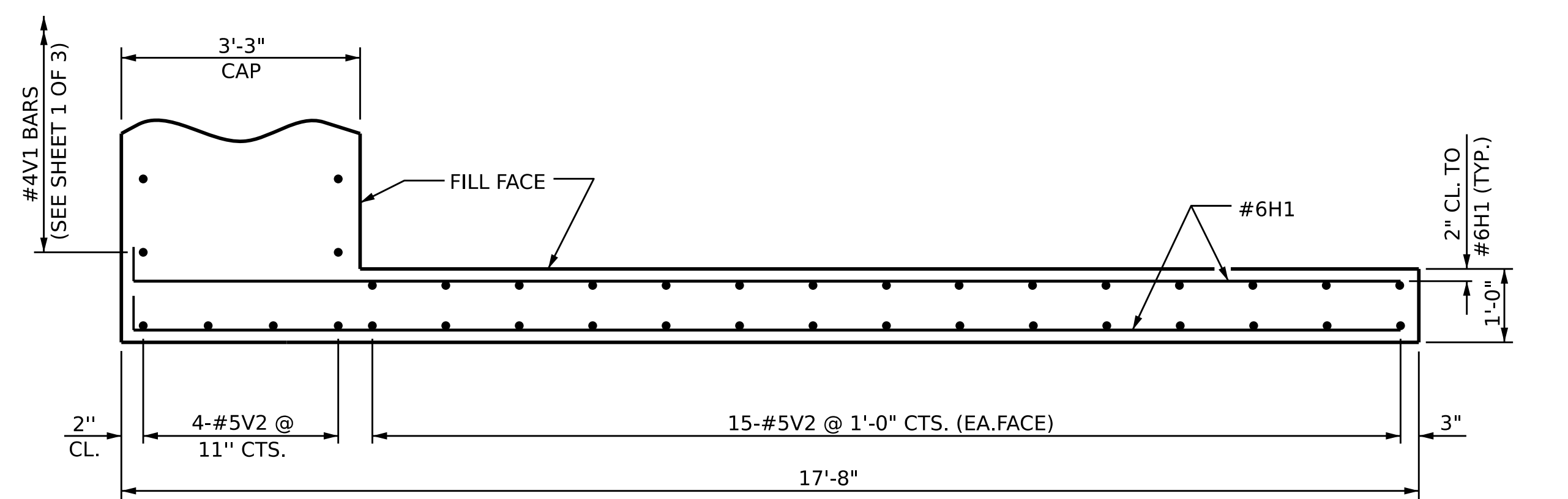
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
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2			4			TOTAL SHEETS 36

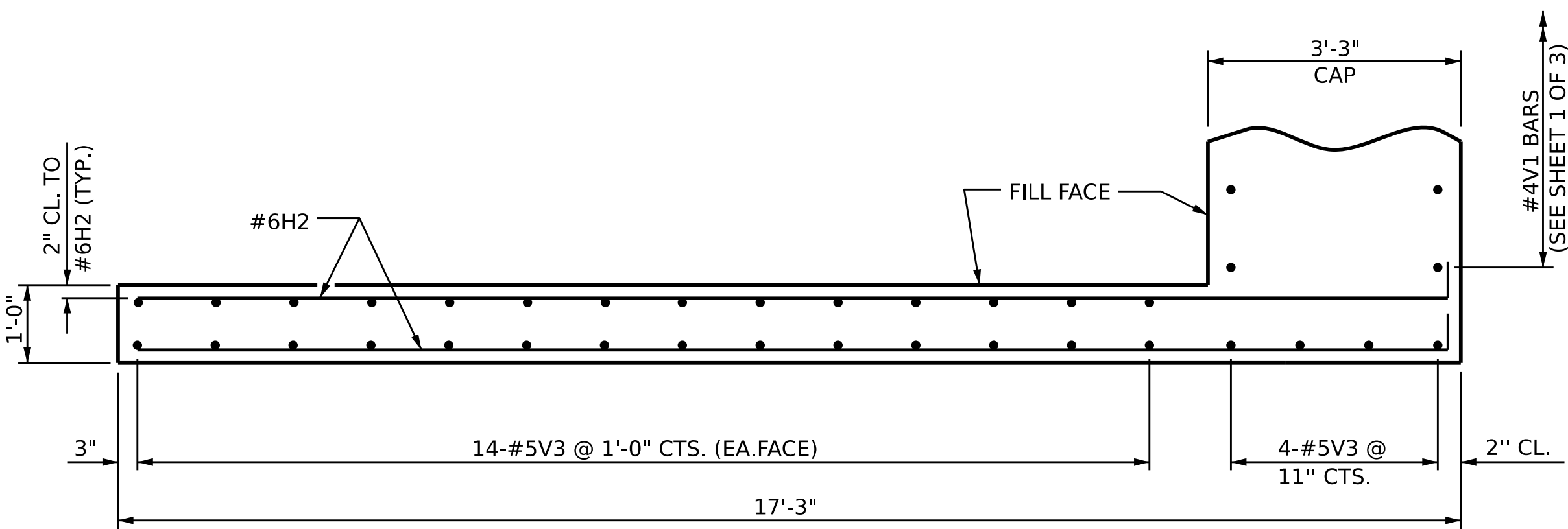
PLAN

ELEVATION

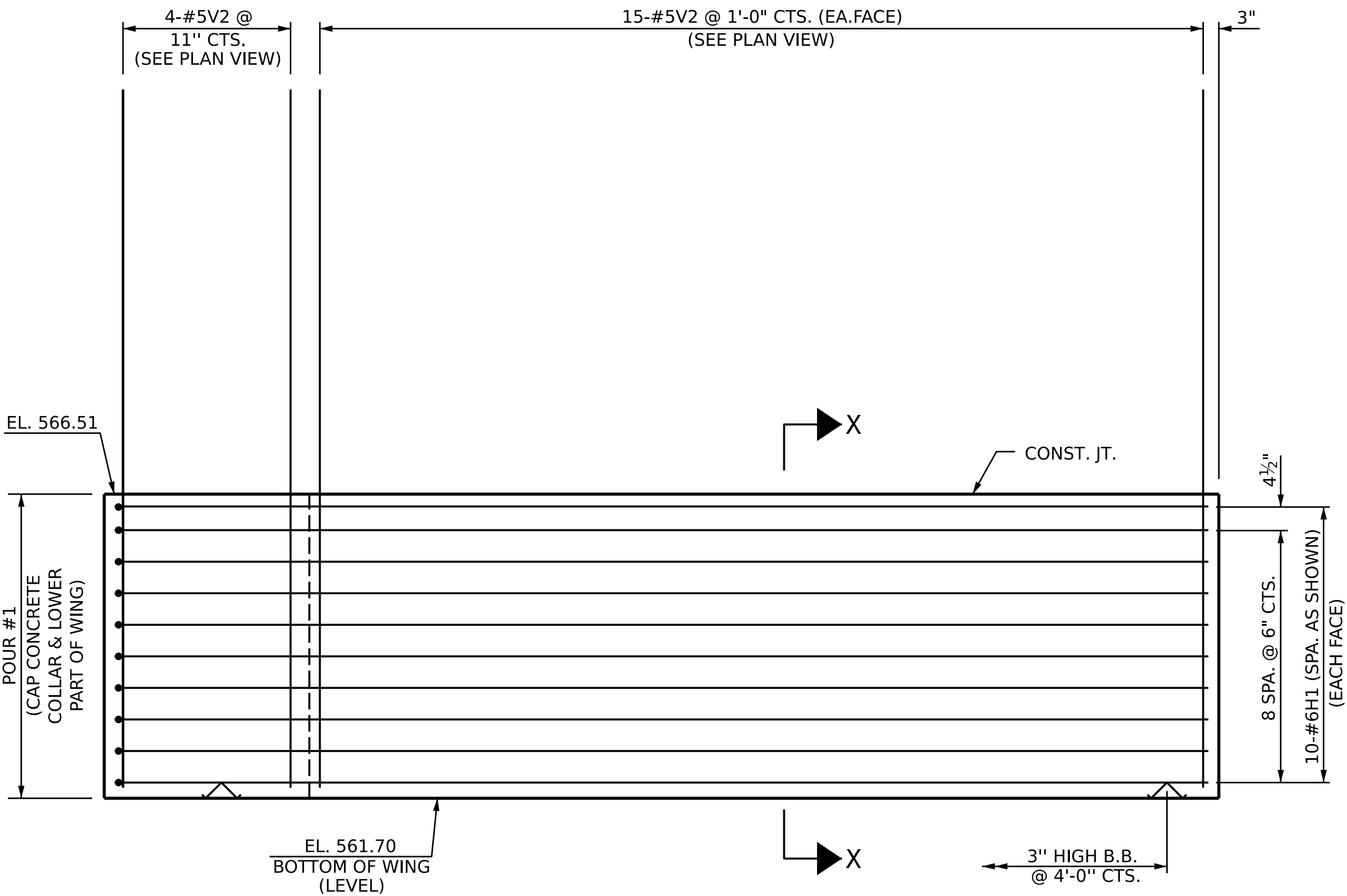
REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			



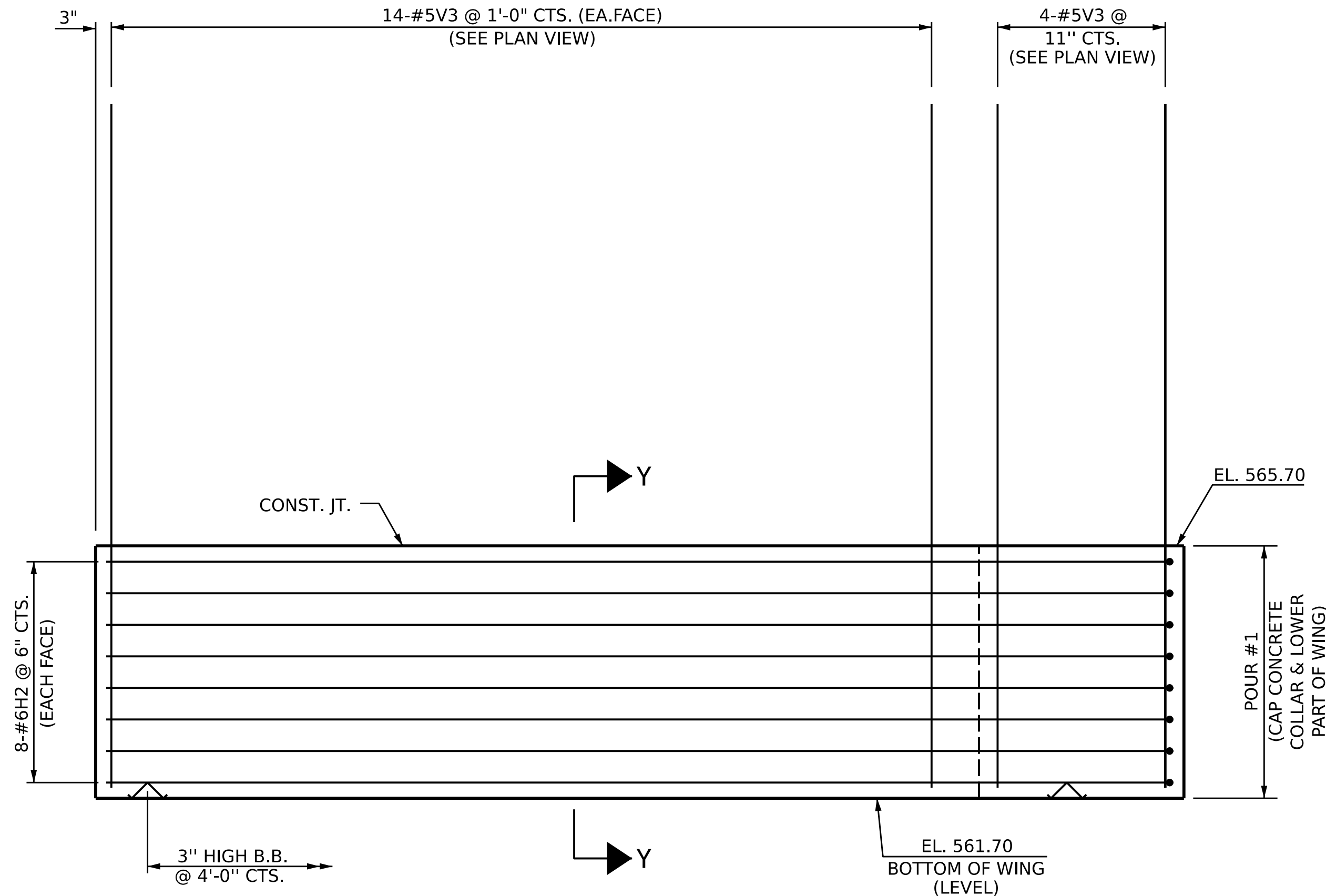
PLAN OF LEFT WING (W1)



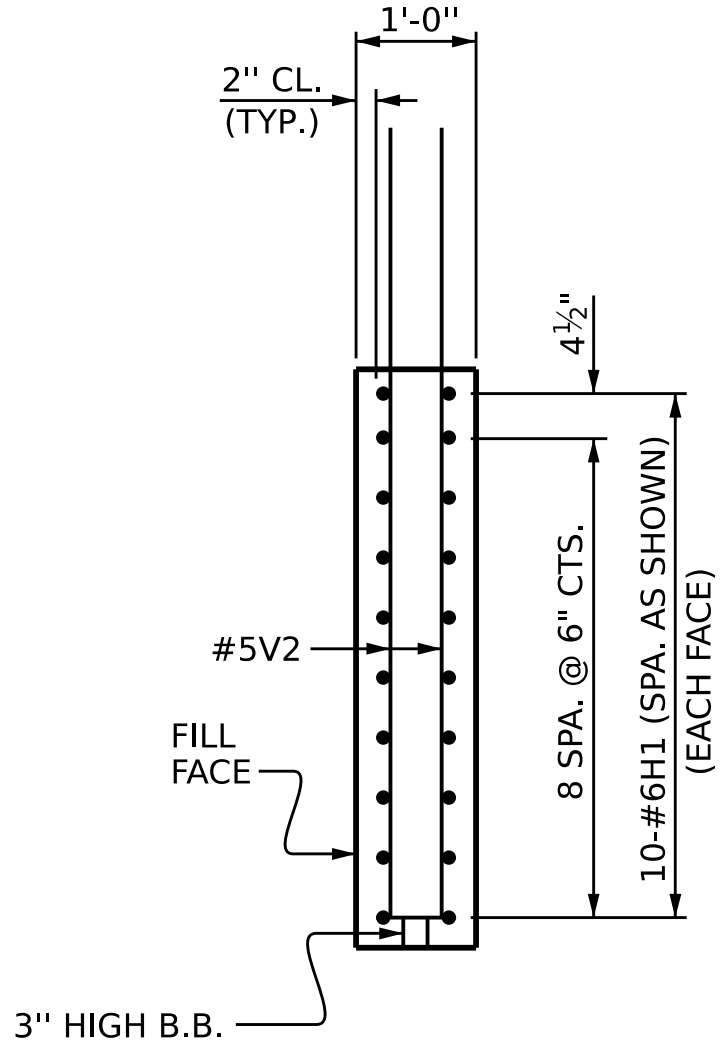
PLAN OF RIGHT WING (W2)



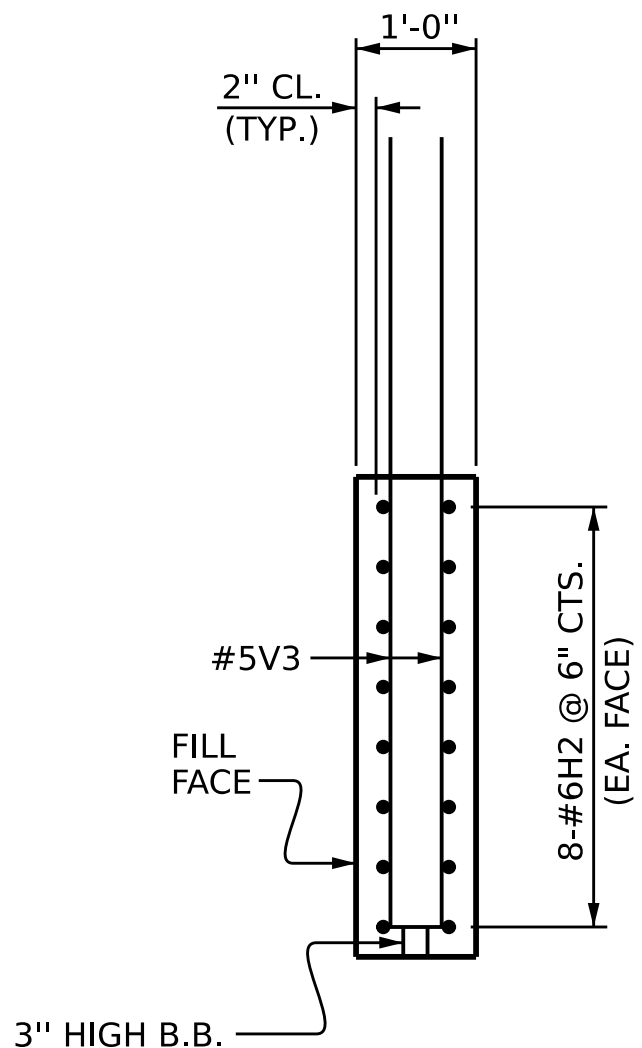
ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



SECTION X-X



SECTION Y-Y

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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NC FIRM LICENSE No: C-5176
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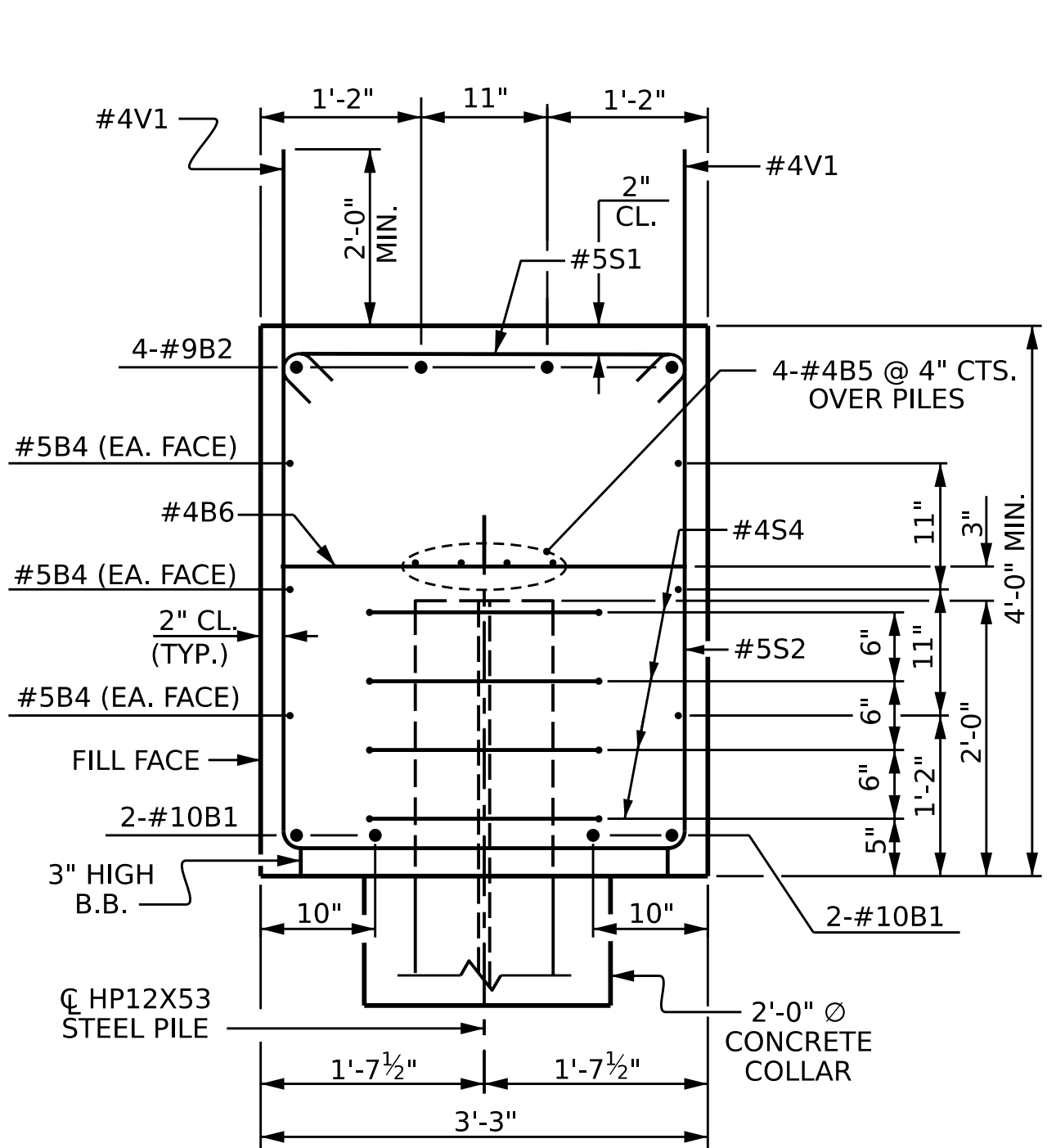
Signed by: Jennifer R. McRoy 3/4/2026
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FINAL UNLESS ALL
SIGNATURES COMPLETED

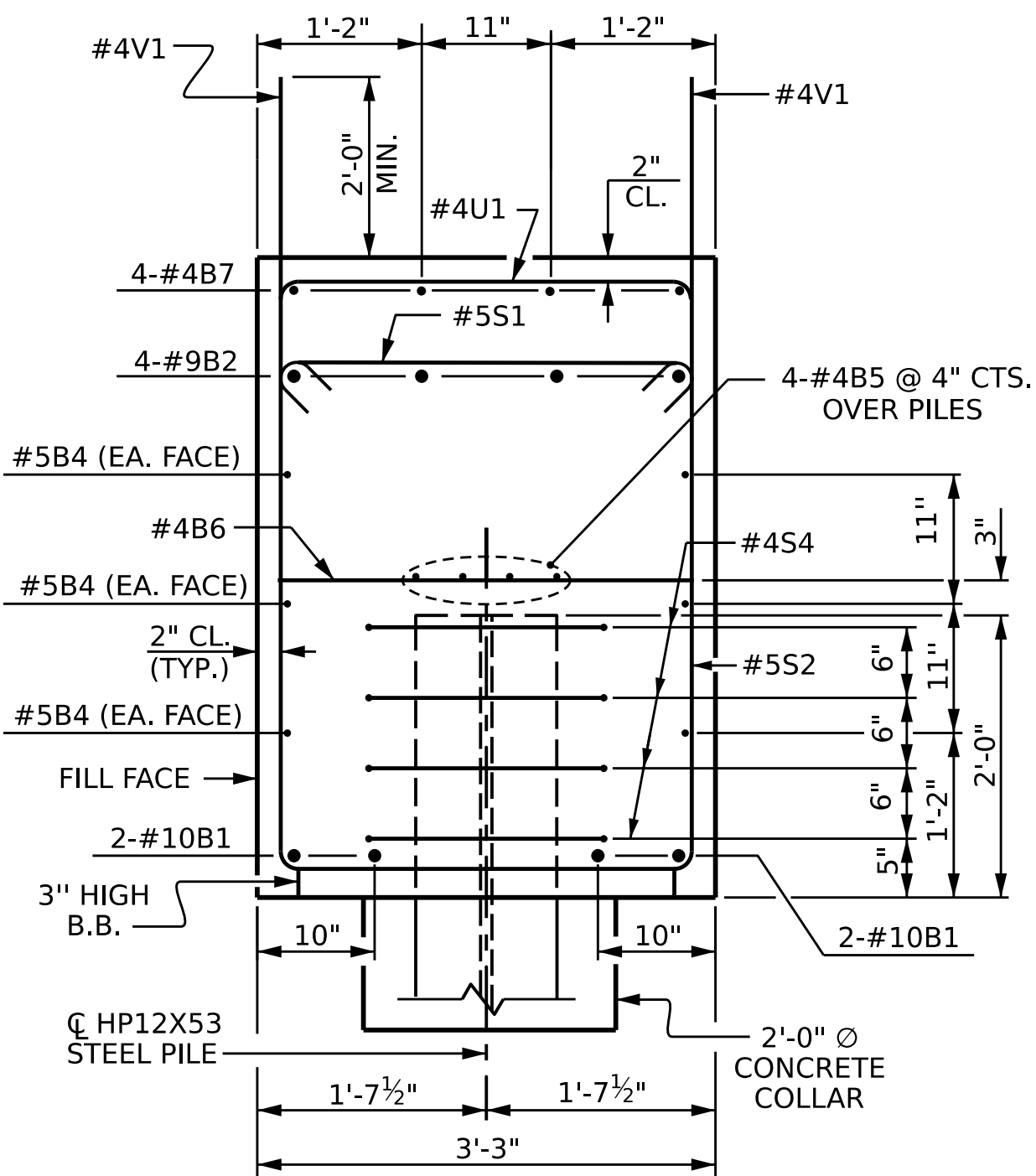
PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

SHEET 2 OF 3

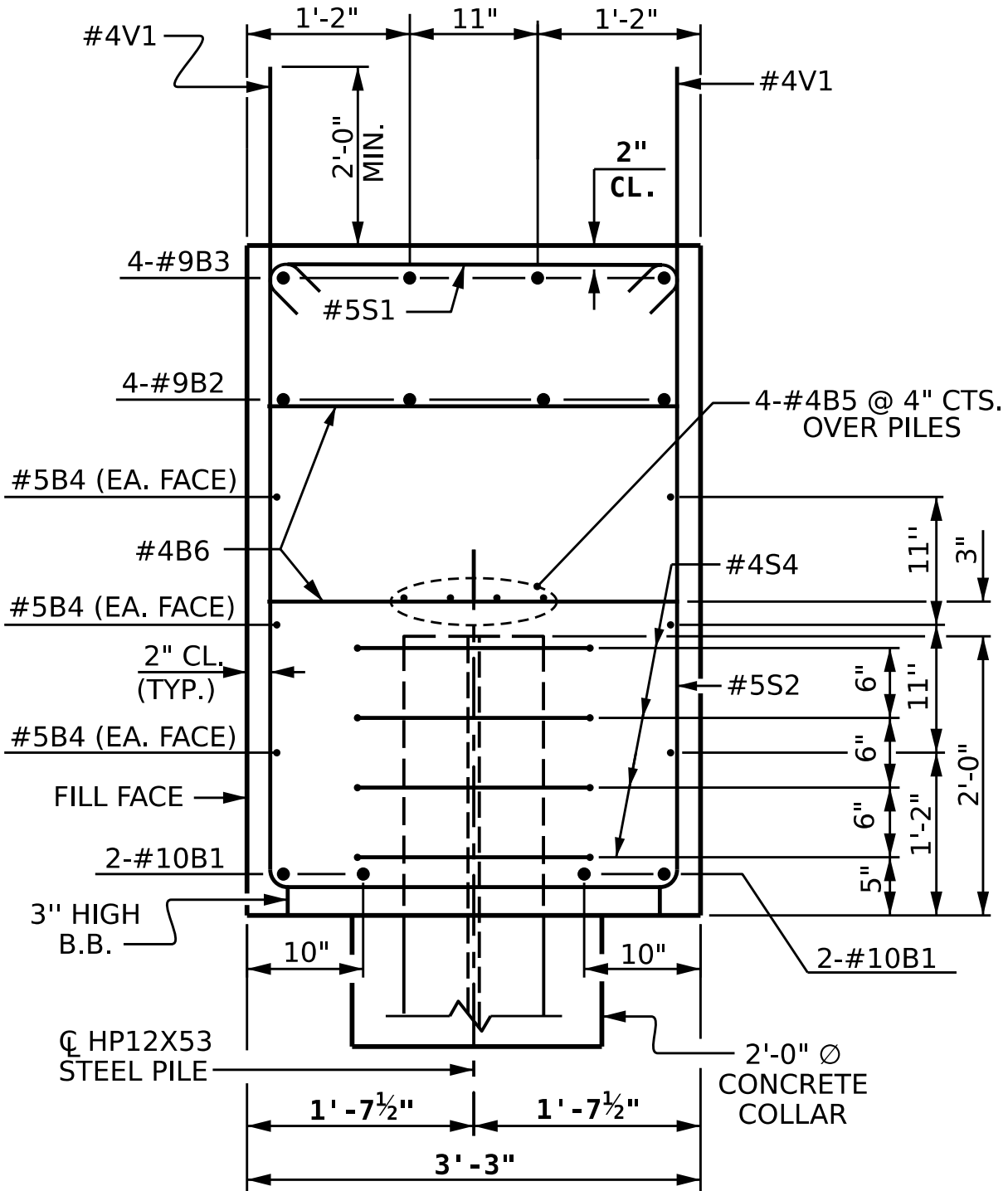
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			36



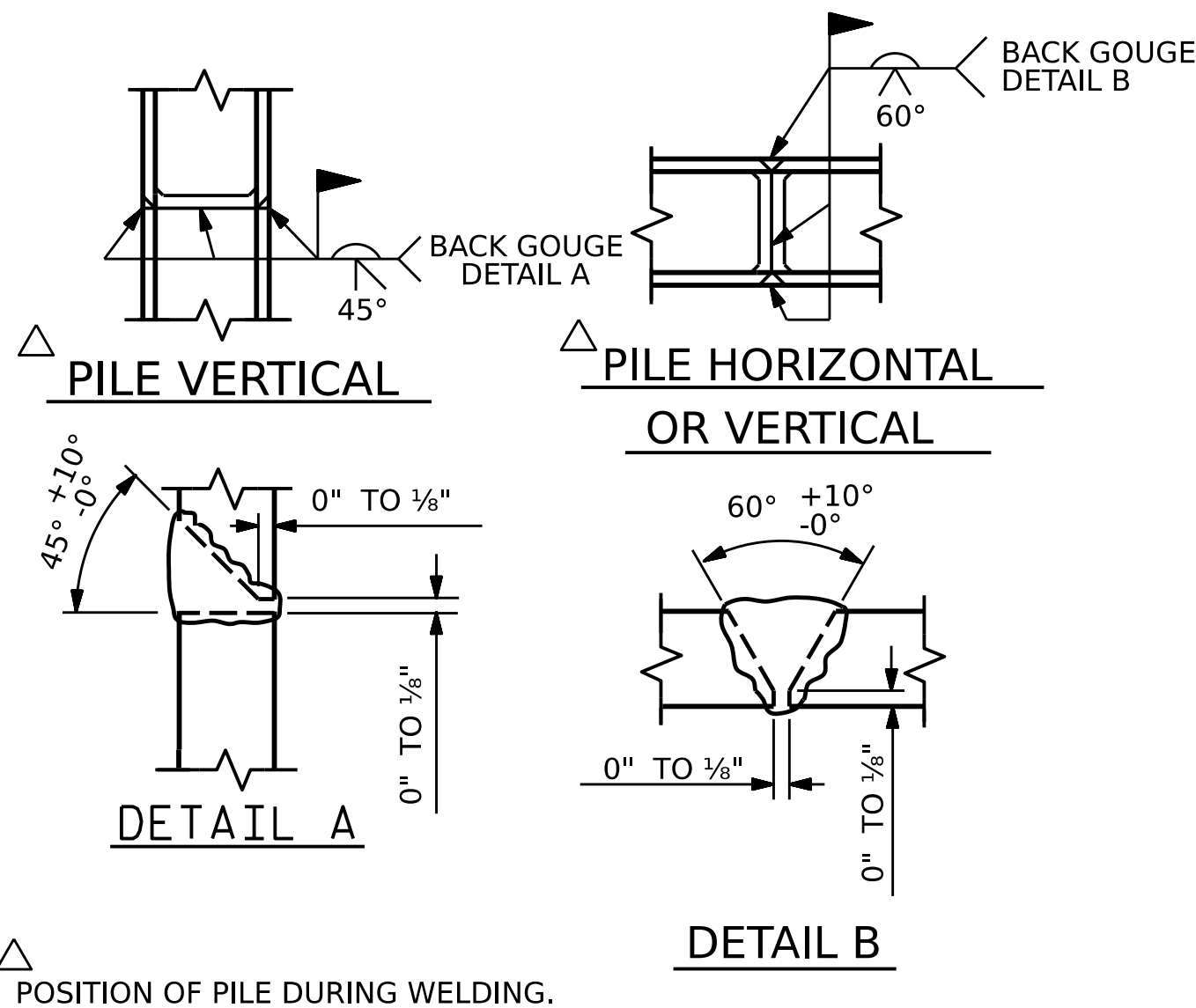
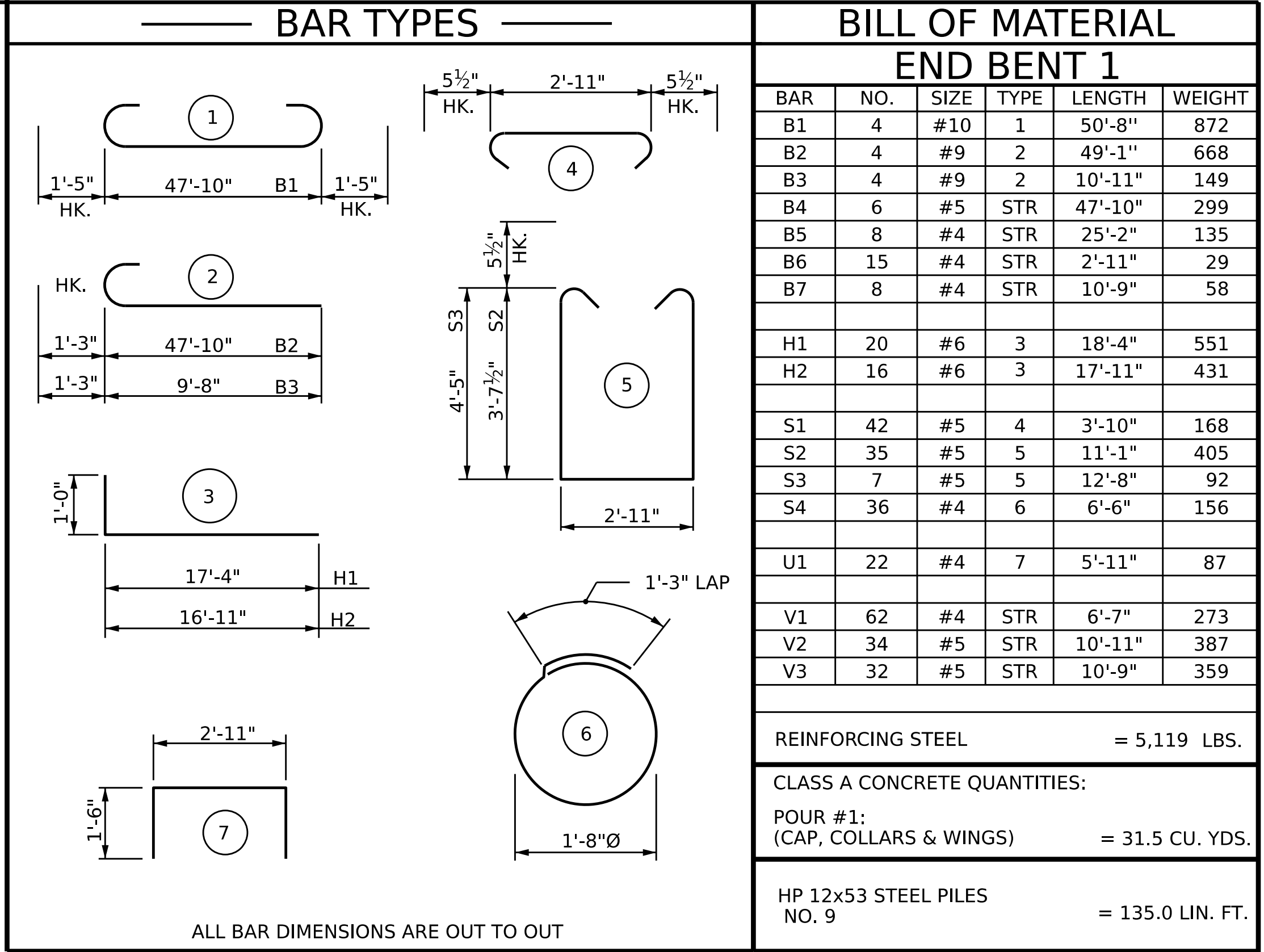
SECTION A-A



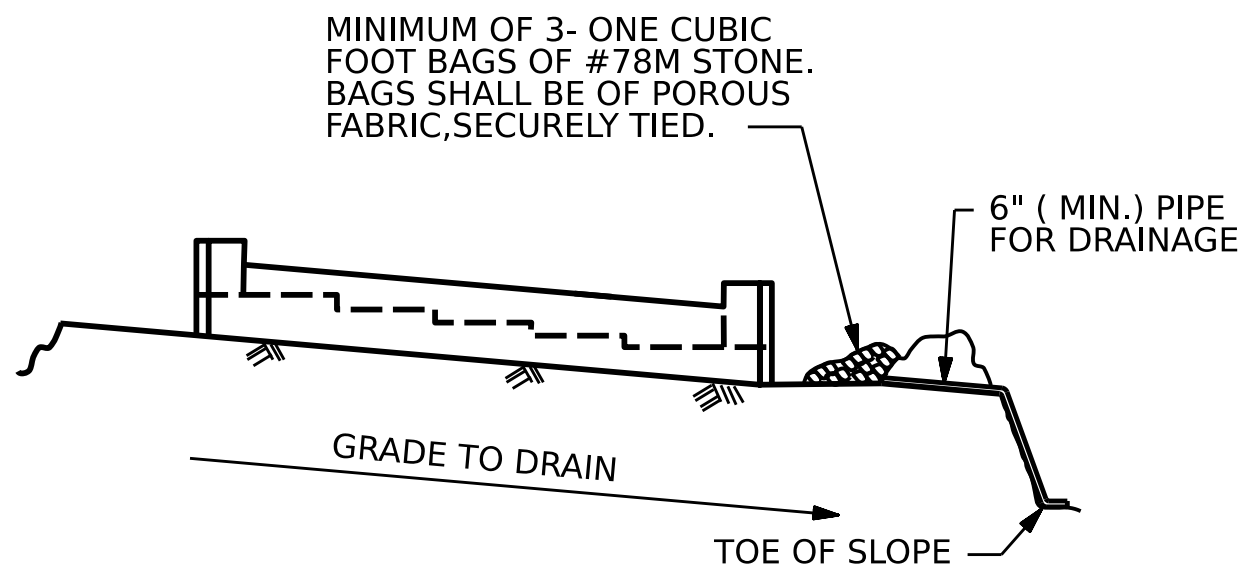
SECTION B-B



SECTION C-C



PILE SPLICE DETAILS



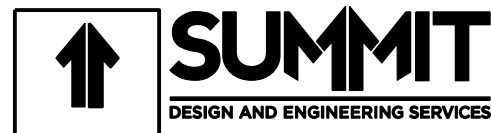
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

Prepared in the Office of:



NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by:
Jennifer R. McRoy
3/4/2026

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

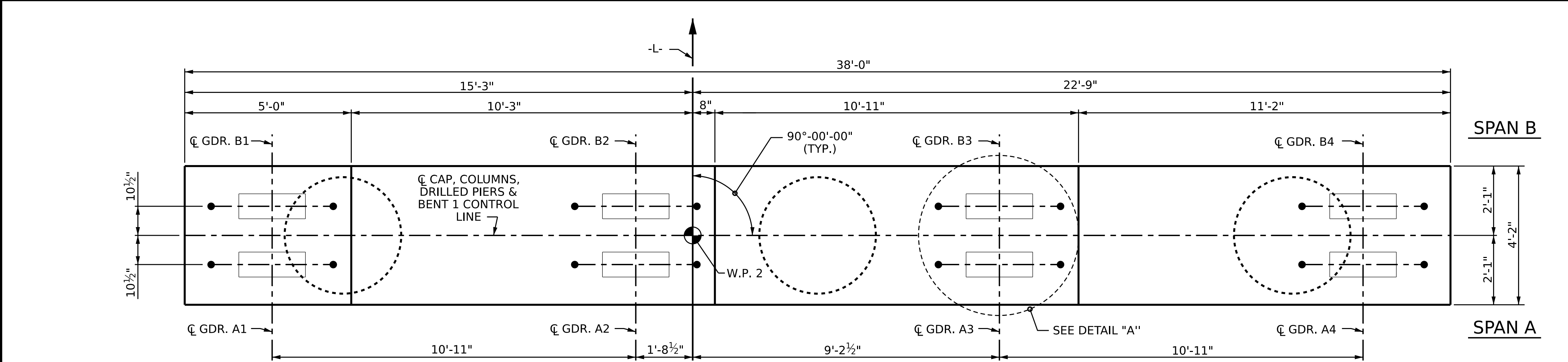
INTEGRAL
END BENT 1
DETAILS

REVISIONS

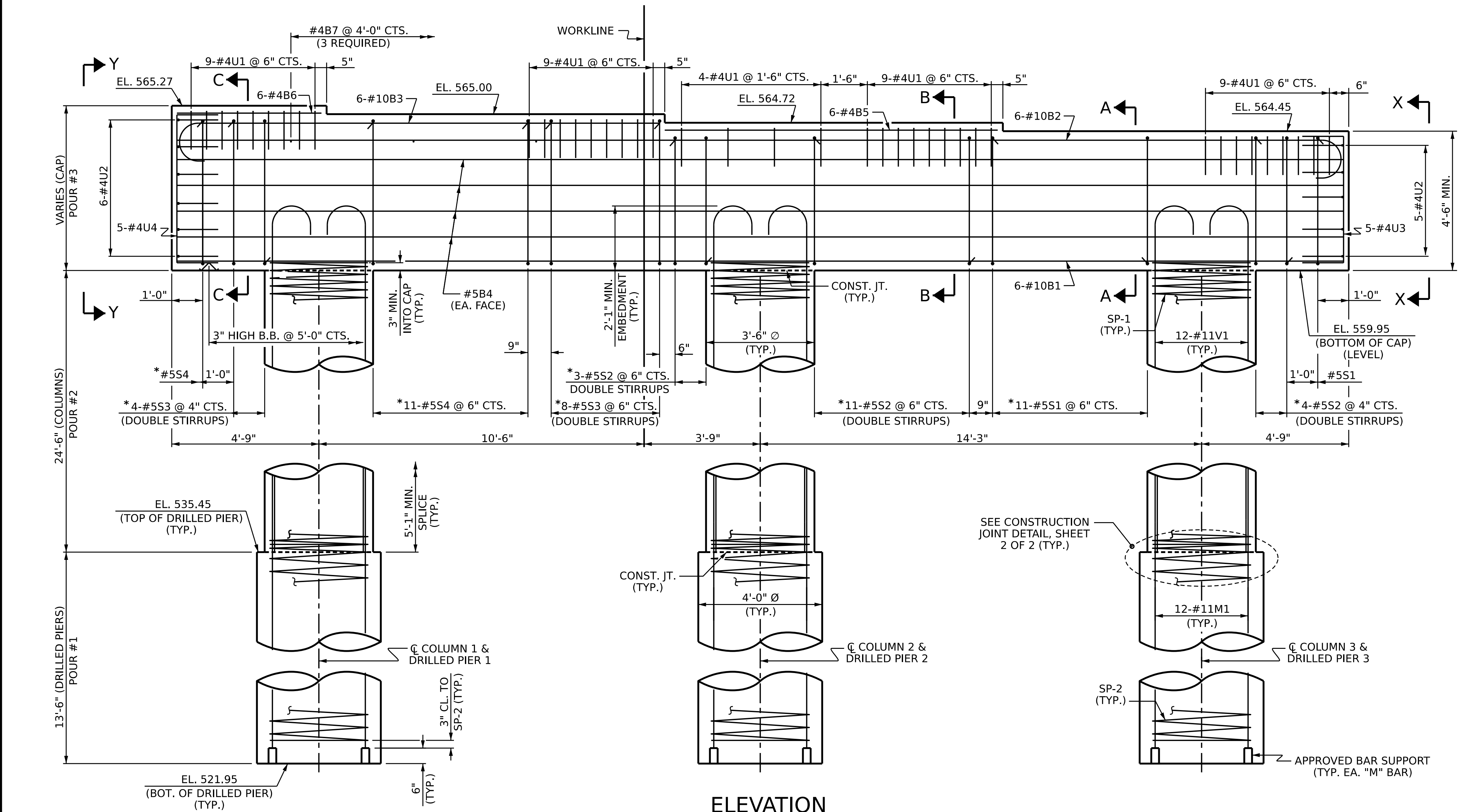
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-29
2			4			TOTAL SHEETS 36

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025



PLAN



ELEVATION

NOTES

FOR CONSTRUCTION JOINT DETAIL, SECTIONS A-A, B-B, C-C AND VIEWS X-X AND Y-Y, SEE SHEET 2 OF 2.

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

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

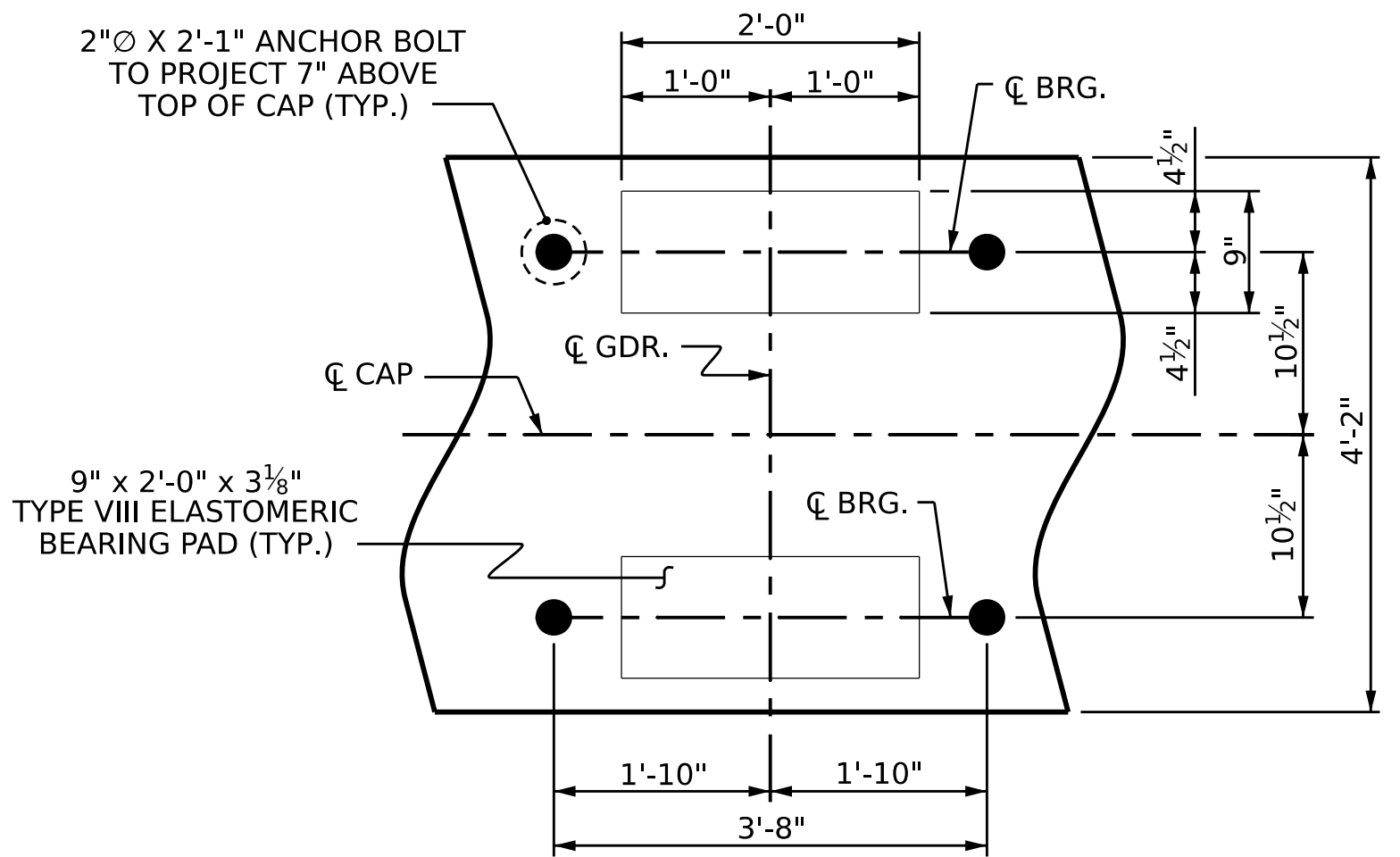
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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 IN THE DRILLED PIER 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.

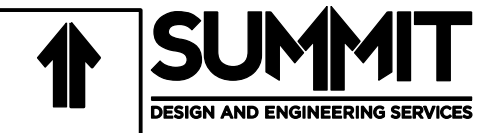
SEE FOUNDATION TABLE, SHEET S-3, FOR DRILLED PIER FOUNDATION DATA.

* INVERT ALTERNATE STIRRUPS.

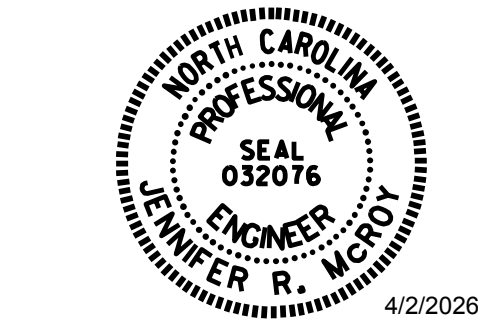


DETAIL "A"
(TYP. EA. BRG. FOR EA. GDR.)

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Signed by:
Jennifer R. McRoy
F21A12FB8CDB40B...

4/2/2026

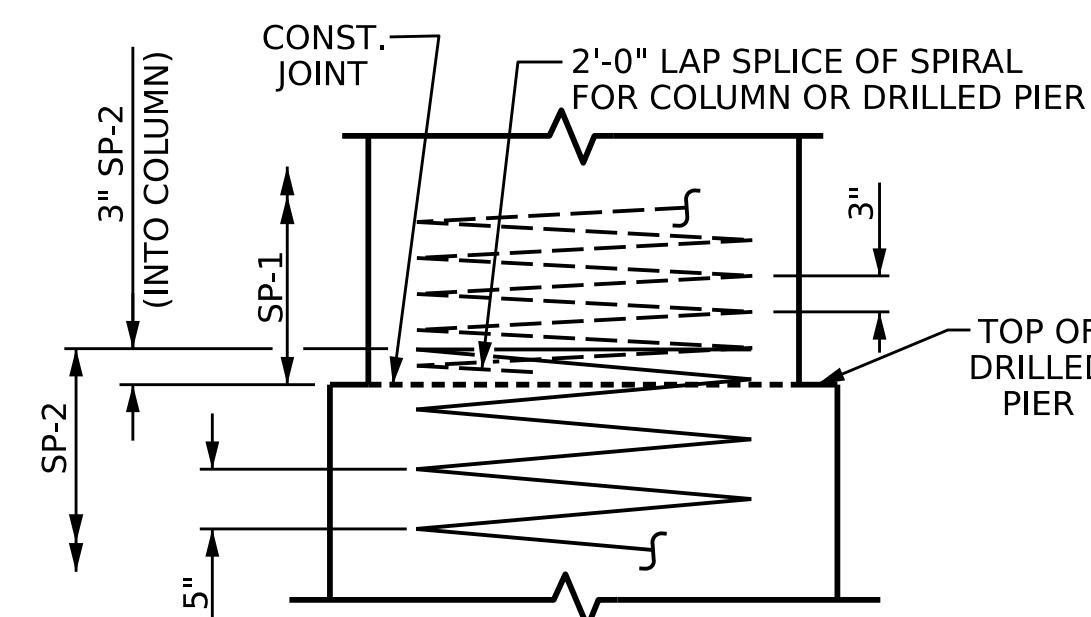
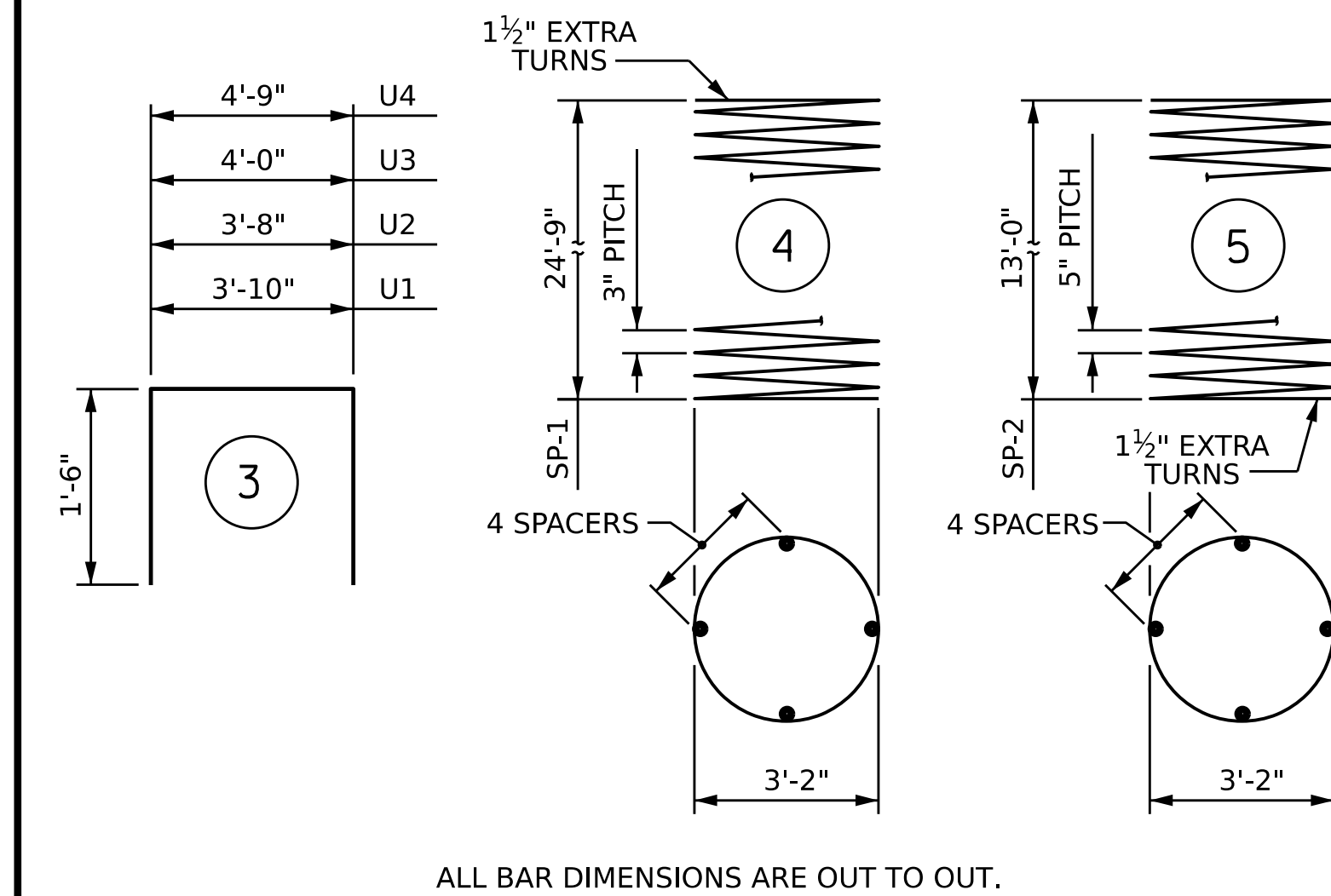
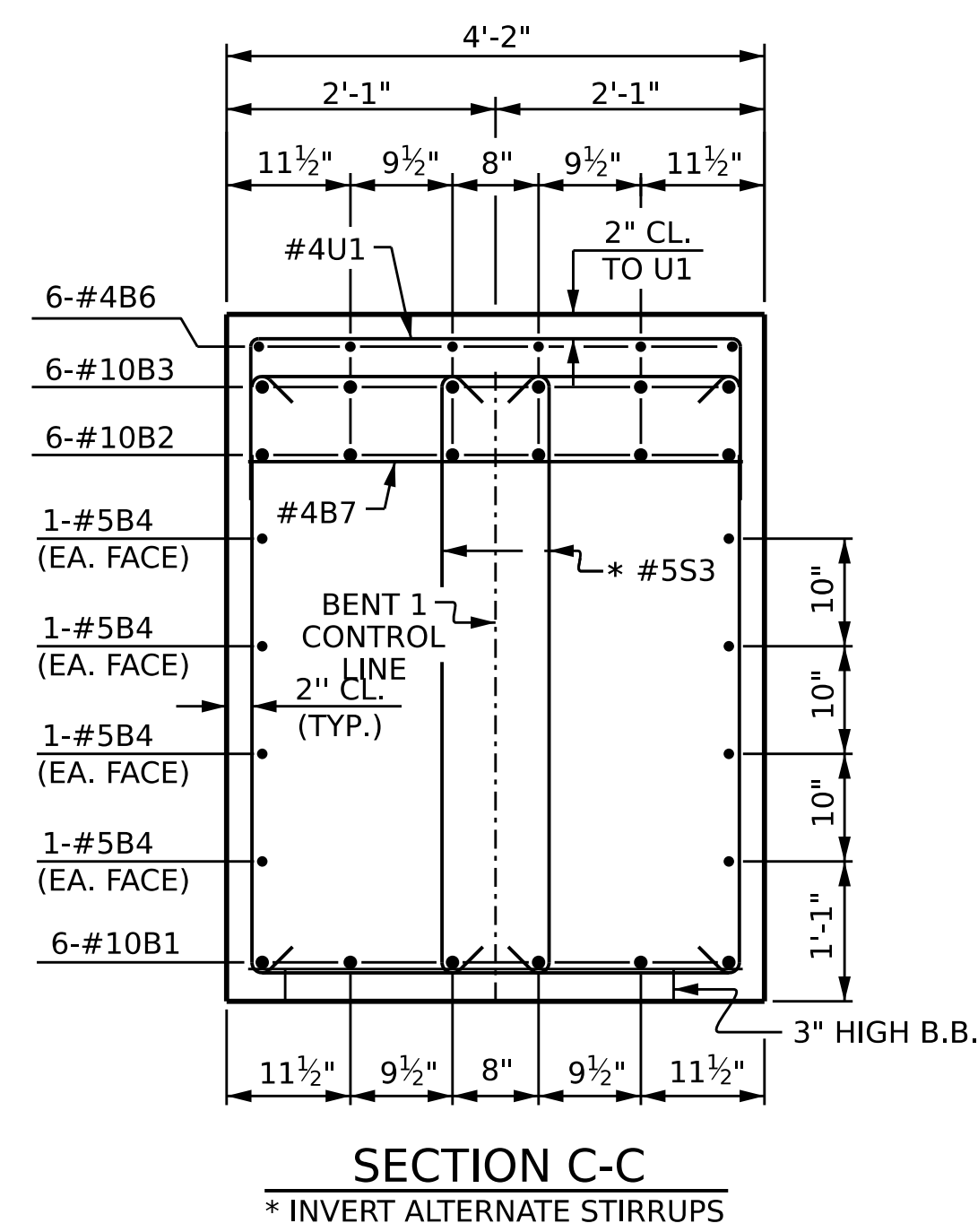
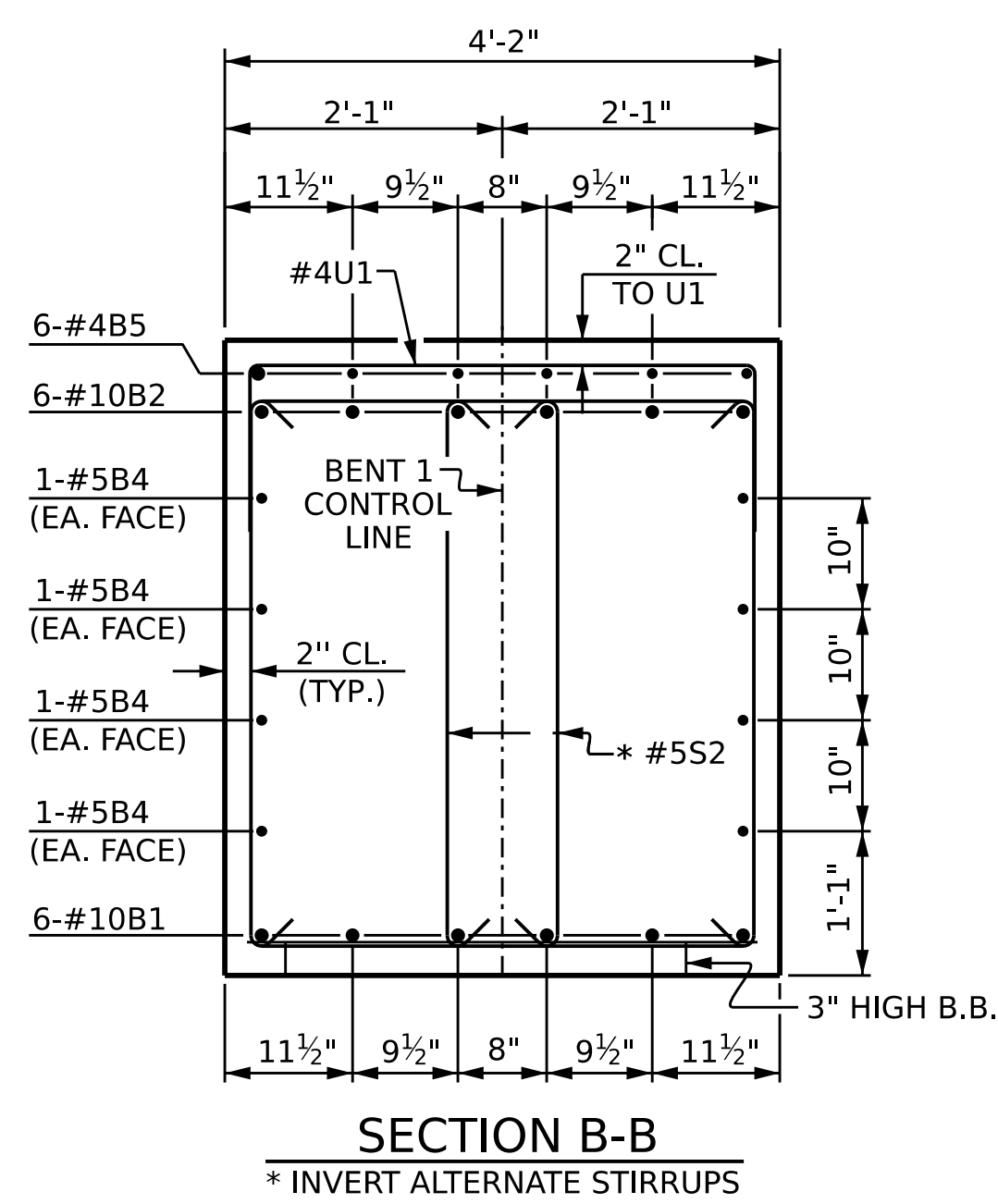
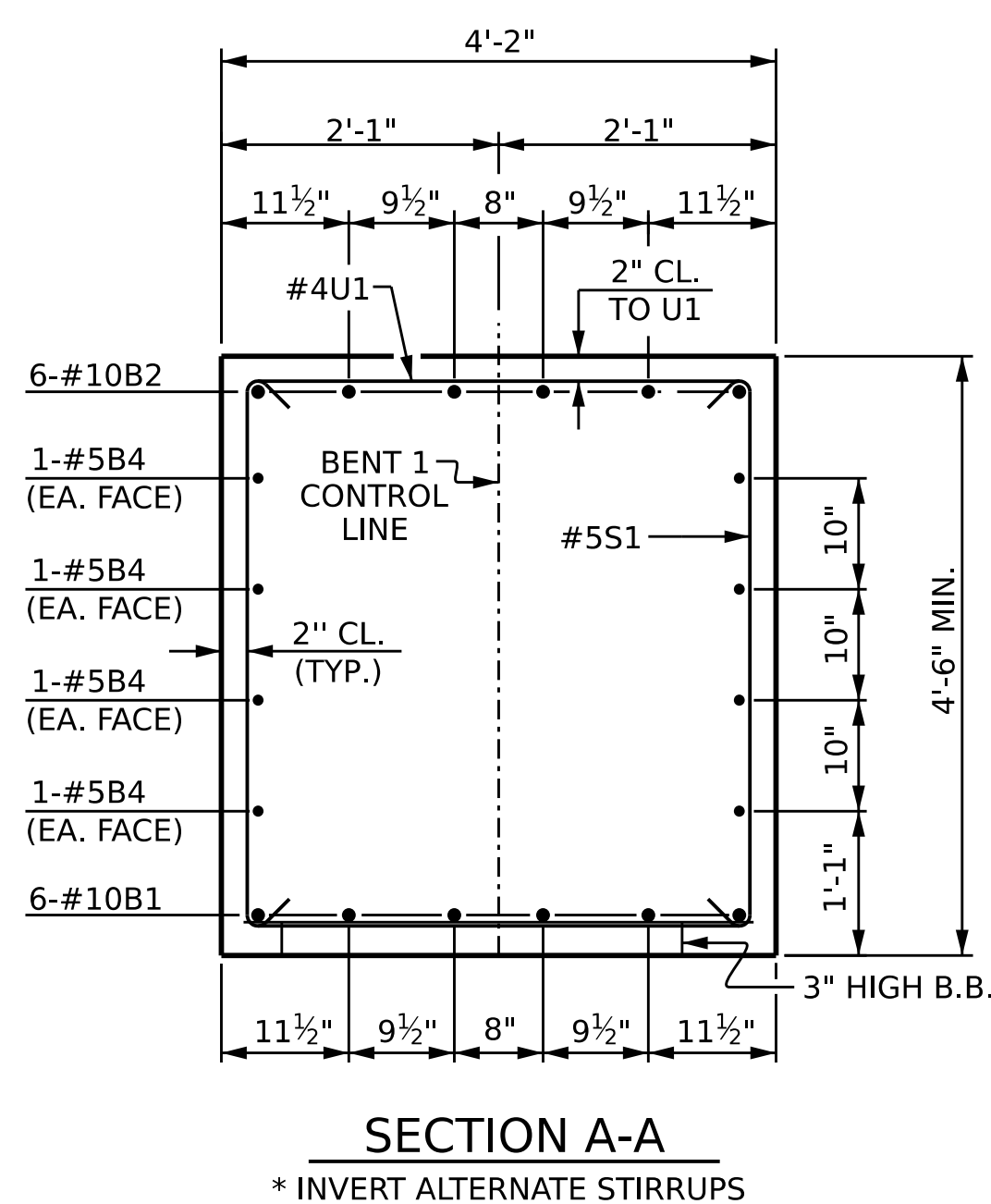
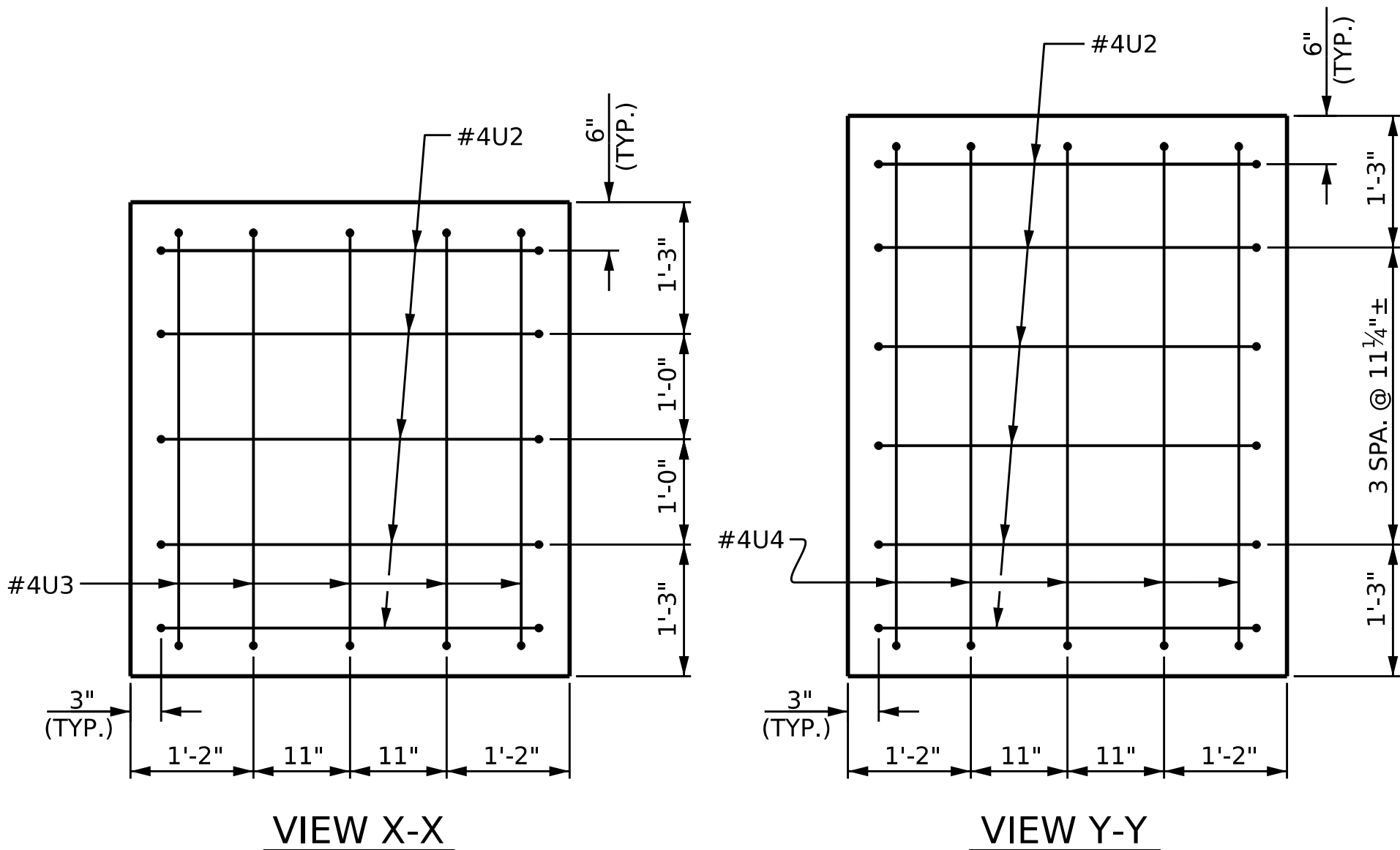
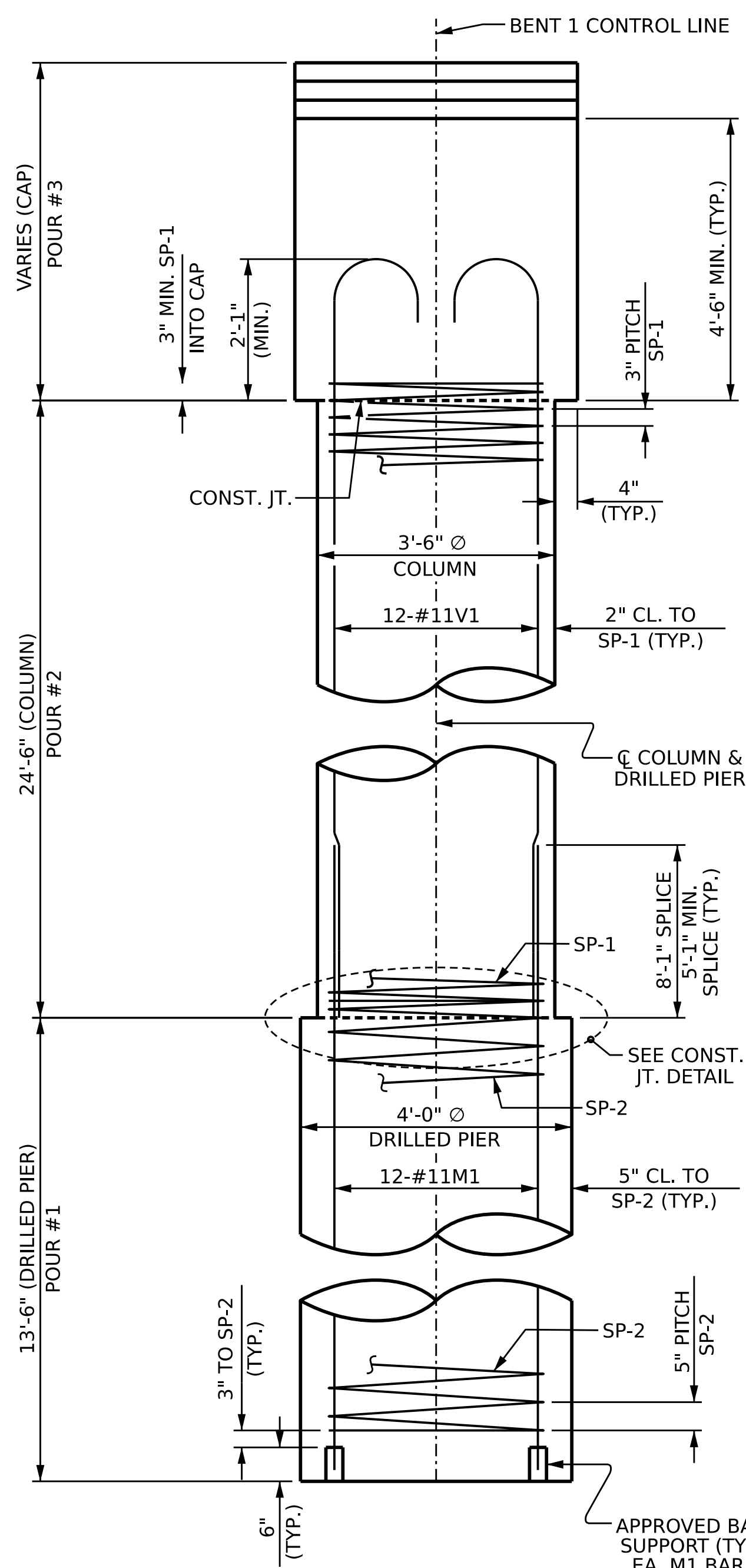
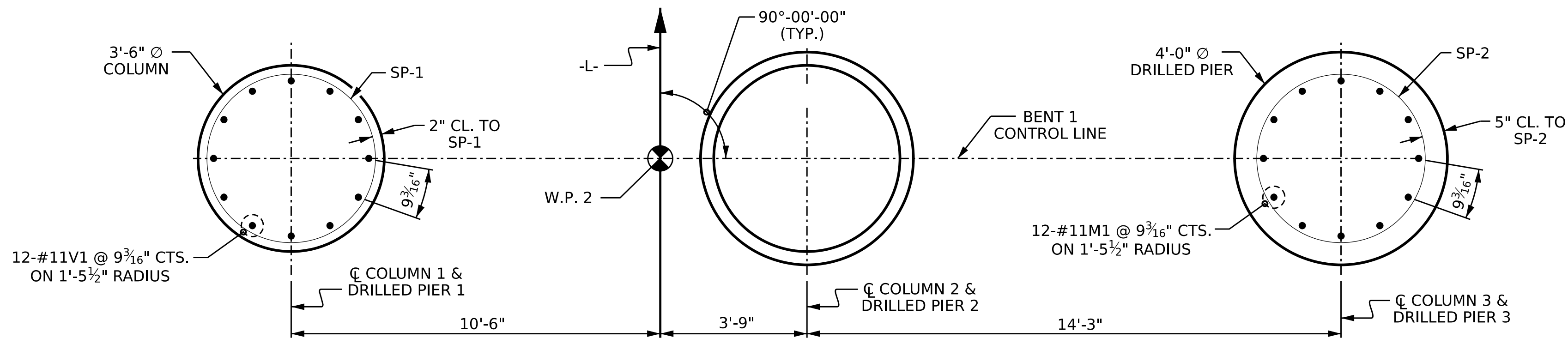
PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

SHEET 1 OF 2

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-30
TOTAL SHEETS					36

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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FINAL UNLESS ALL
SIGNATURES COMPLETED



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR.	37'-8"	972
B2	6	#10	1	39'-1"	1,009
B3	6	#10	1	17'-0"	439
B4	8	#5	STR	37'-8"	314
B5	6	#4	STR	10'-7"	42
B6	6	#4	STR	4'-8"	19
B7	3	#4	STR	3'-10"	8
M1	36	#11	STR	21'-4"	4,080
S1	12	#5	2	13'-0"	163
S2	36	#5	2	11'-9"	441
S3	24	#5	2	12'-10"	321
S4	12	#5	2	14'-1"	176
U1	40	#4	3	6'-10"	183
U2	11	#4	3	6'-8"	49
U3	5	#4	3	7'-0"	23
U4	5	#4	3	7'-9"	26
V1	36	#10	1	26'-4"	4,079
TOTAL REINFORCING STEEL				12,344 LBS.	
SP-1	3	**	4	989'-0"	1,982
SP-2	3	***	5	320'-9"	1,004
SPIRAL COLUMN REINFORCING STEEL				2,986 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				26.2 C.Y.	
POUR #3 (CAP)				28.4 C.Y.	
TOTAL				54.6 C.Y.	
DRILLED PIER CONCRETE					
POUR #3 (DRILLED PIERS)				18.8 C.Y.	

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www.summitde.com



Signed by:
Jennifer R. McKou
E21A12EB8CDB40B

4/2/2026

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

SHEET 2 OF 2

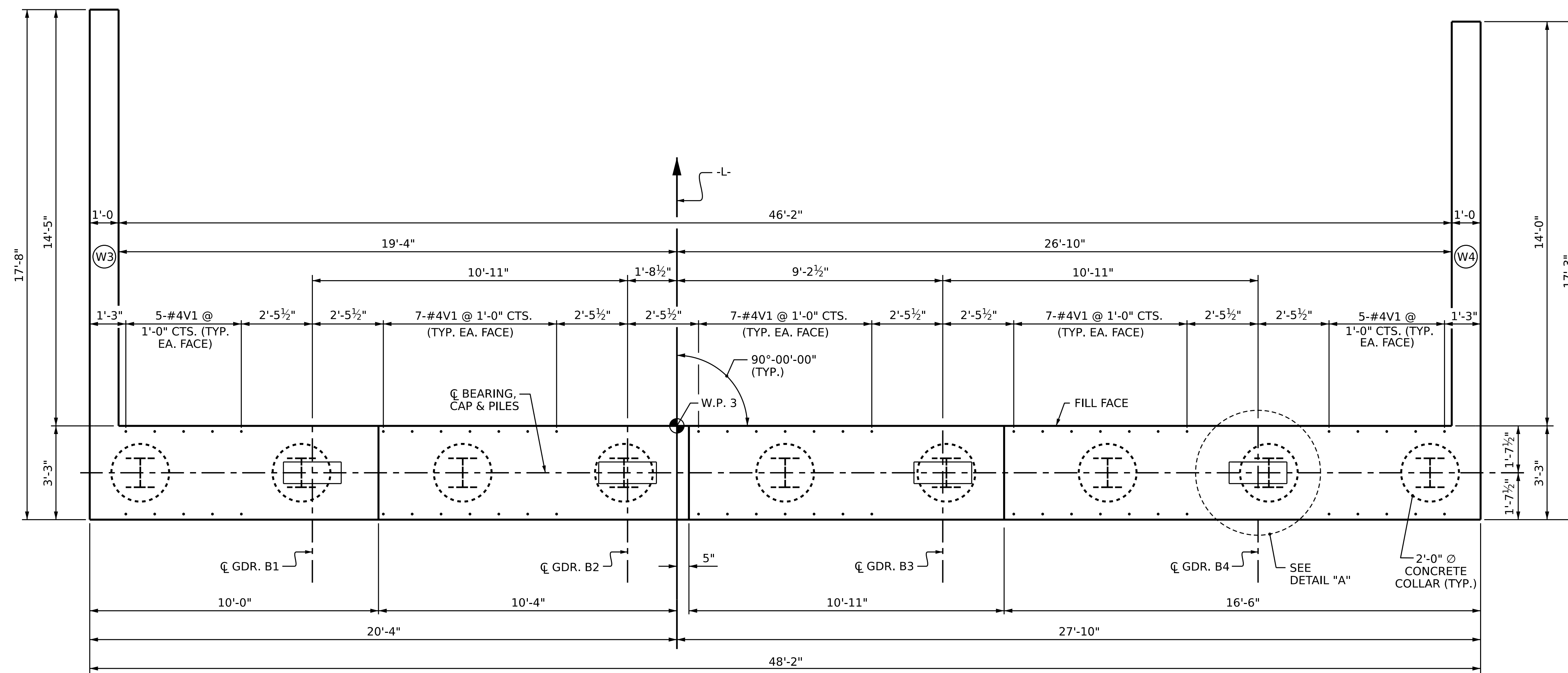
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

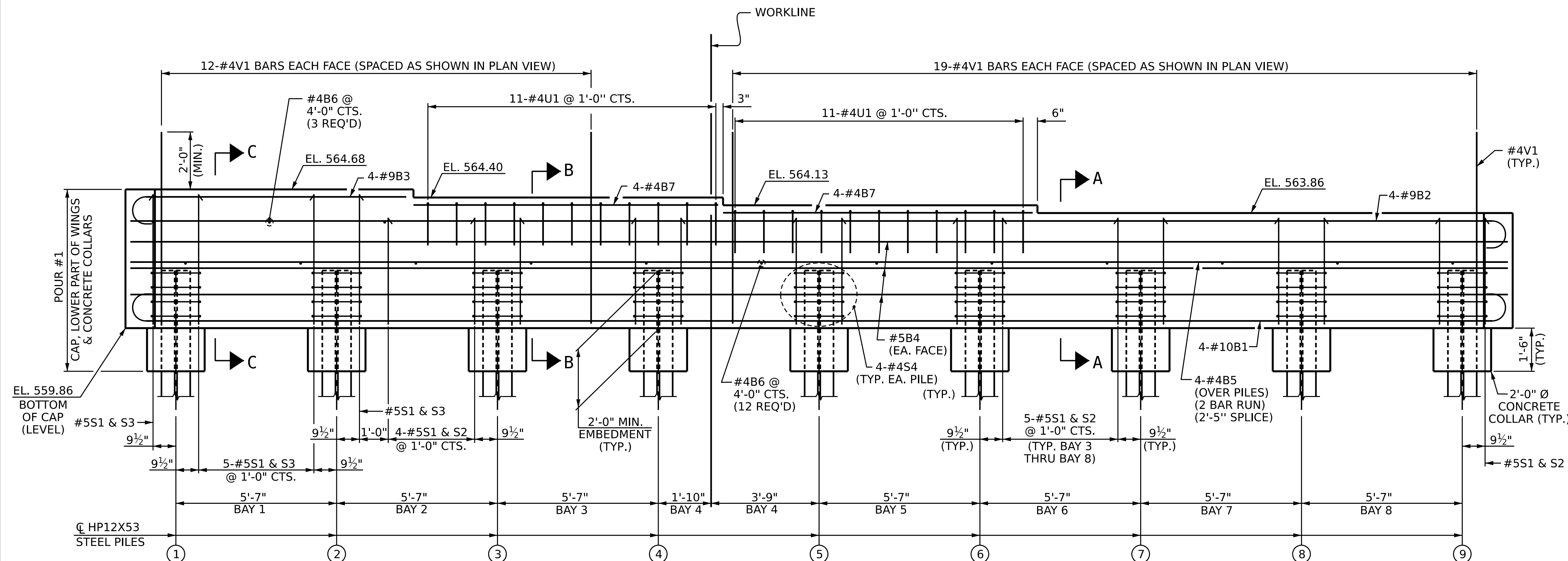
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : K. D. LAYNE DATE : 03/2025
 CHECKED BY : J.R. MCROY DATE : 12/2025
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

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FINAL UNLESS ALL
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PLAN



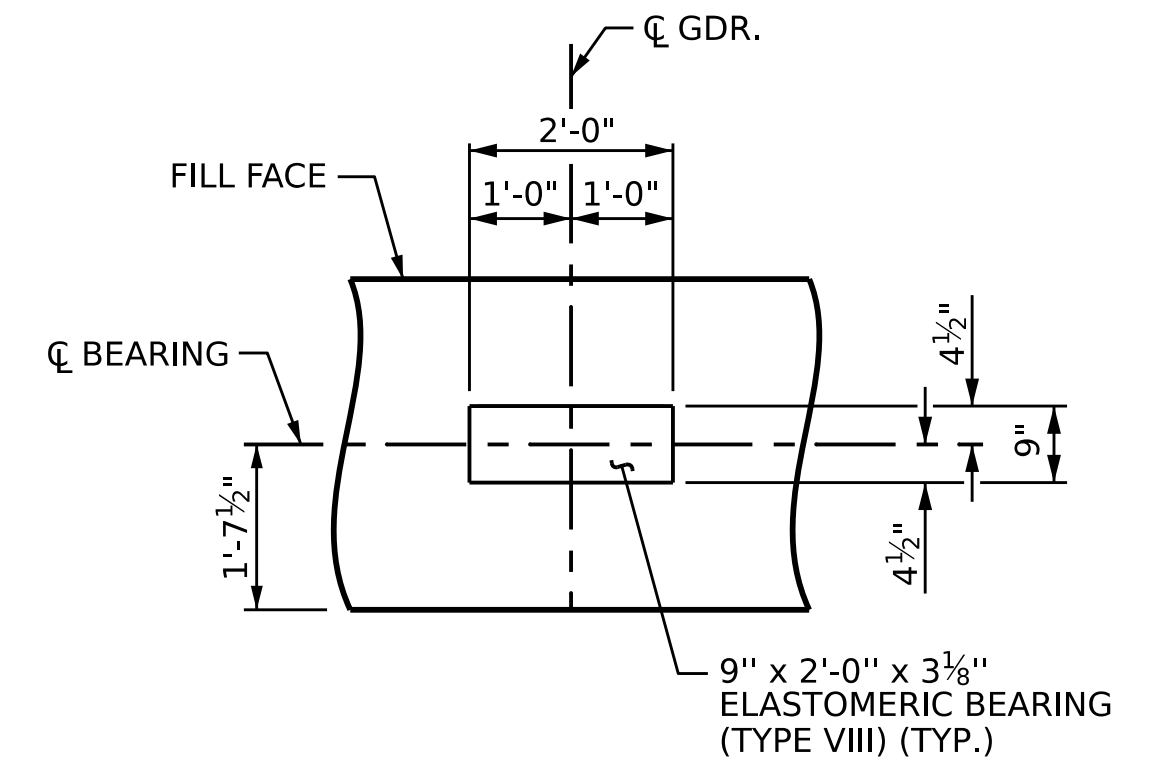
ELEVATION

NOTES

THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE.
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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

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

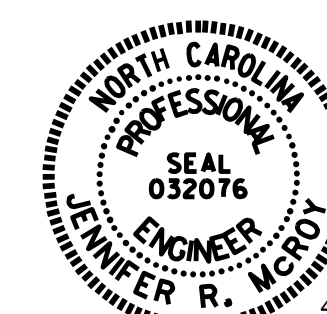


DETAIL "A"
(TYPICAL AT EACH BEARING)

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Signed by: Jennifer R. McKee

4/2/2026

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL
END BENT 2

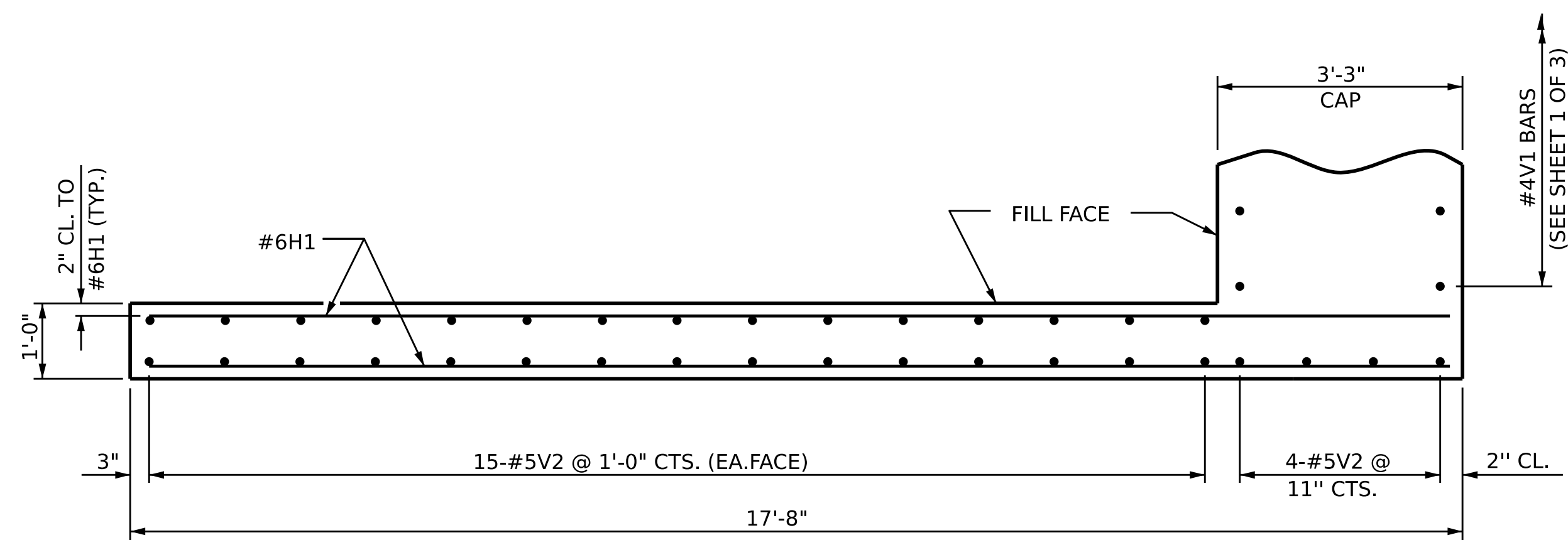
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : K. D. LAYNE DATE : 02/2025
 CHECKED BY : J.R. MCROY DATE : 12/2025
 DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

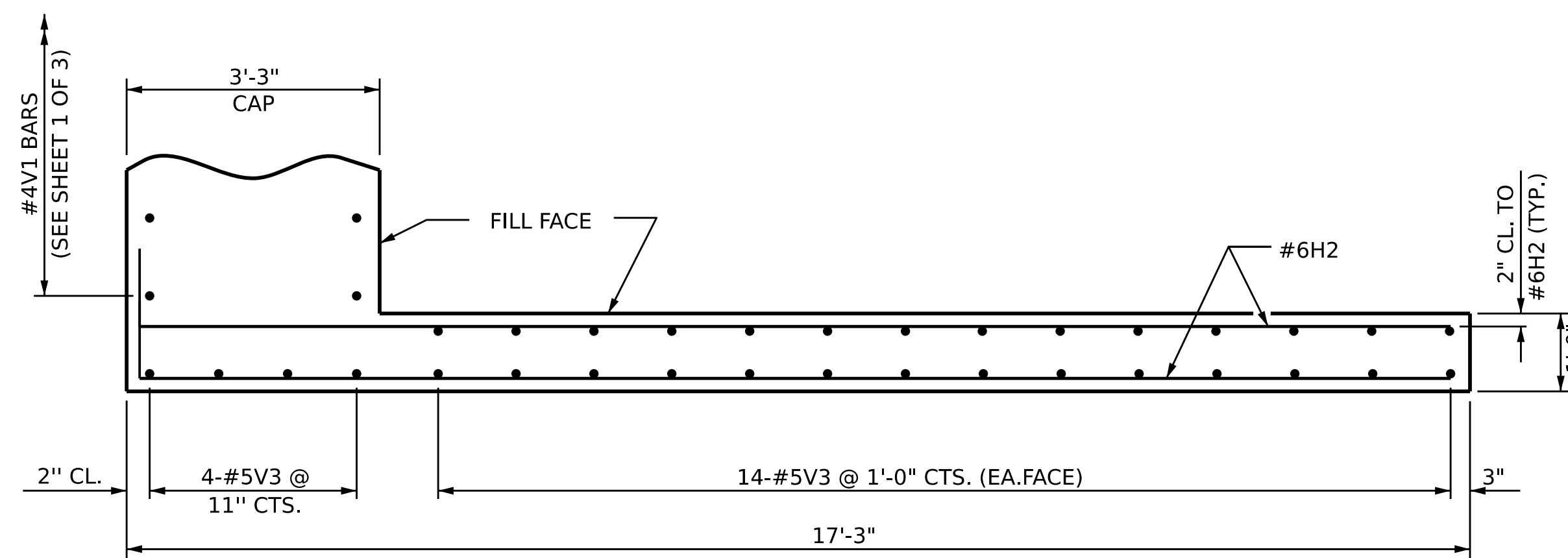
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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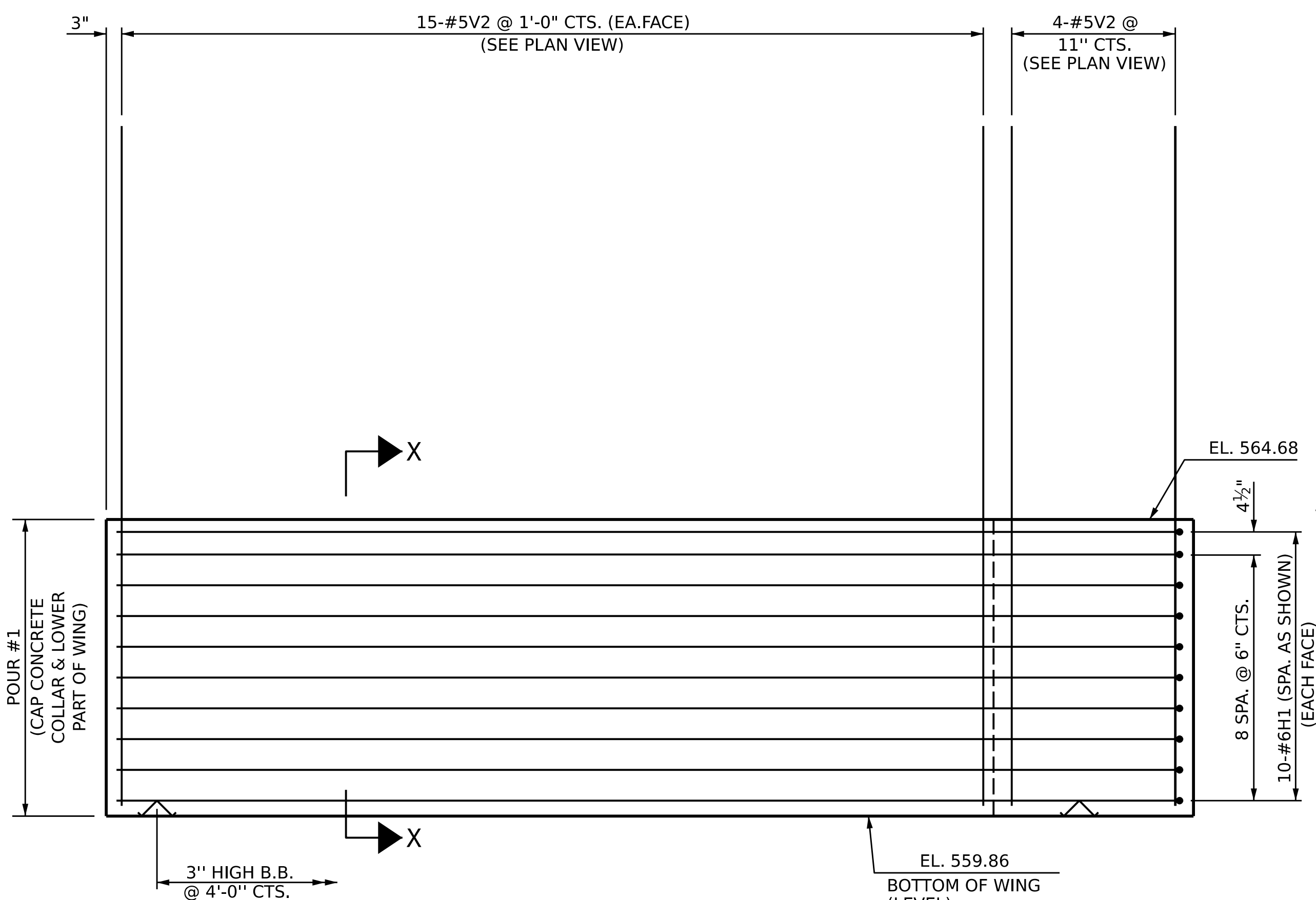
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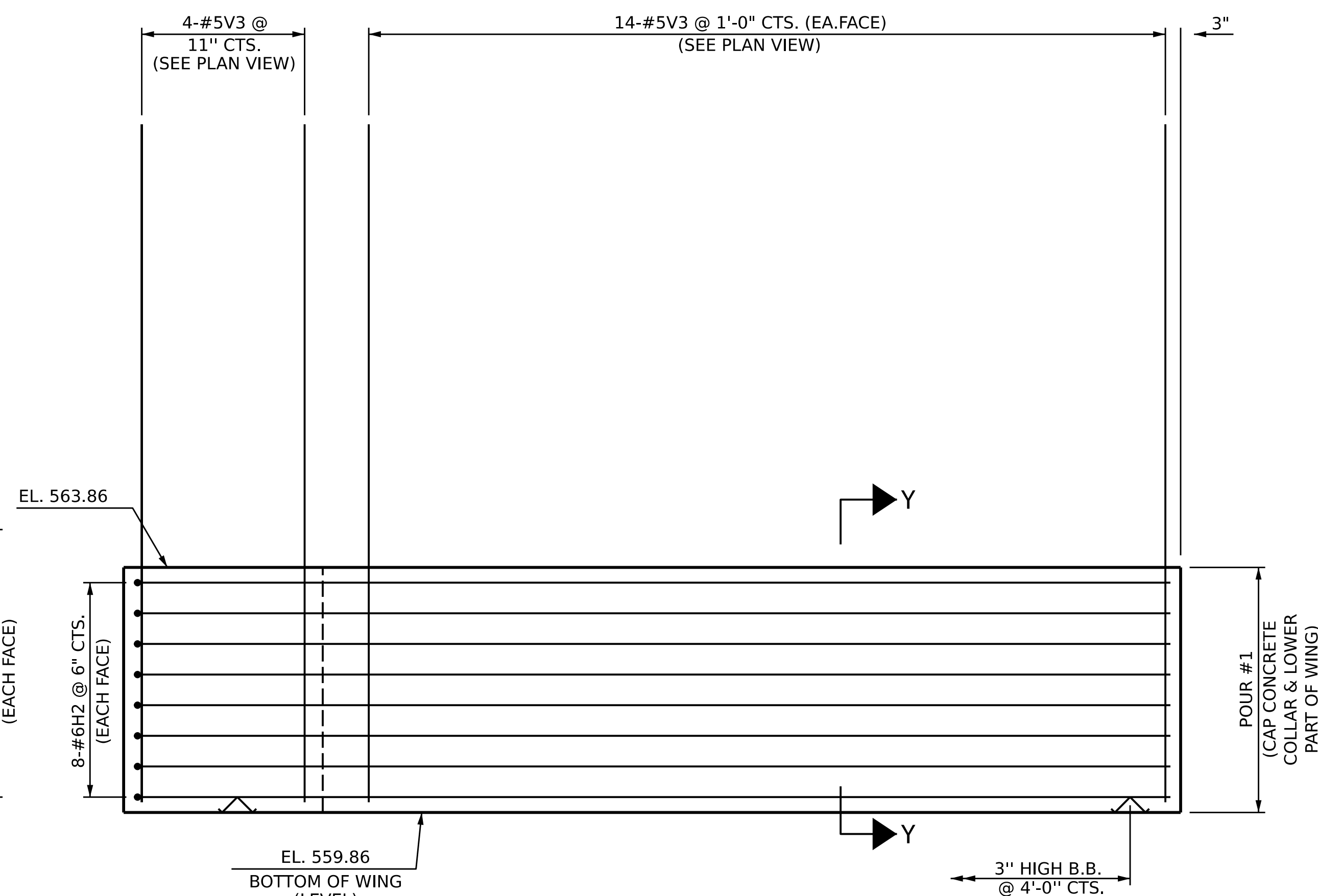
PLAN OF LEFT WING (W3)



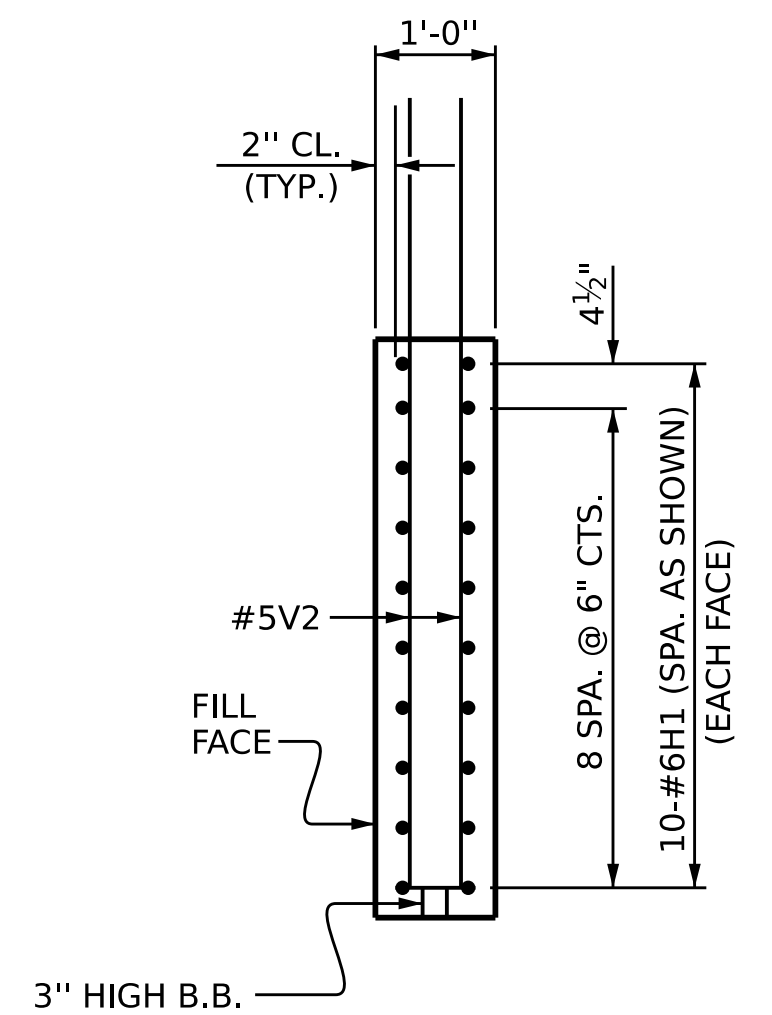
PLAN OF RIGHT WING (W4)



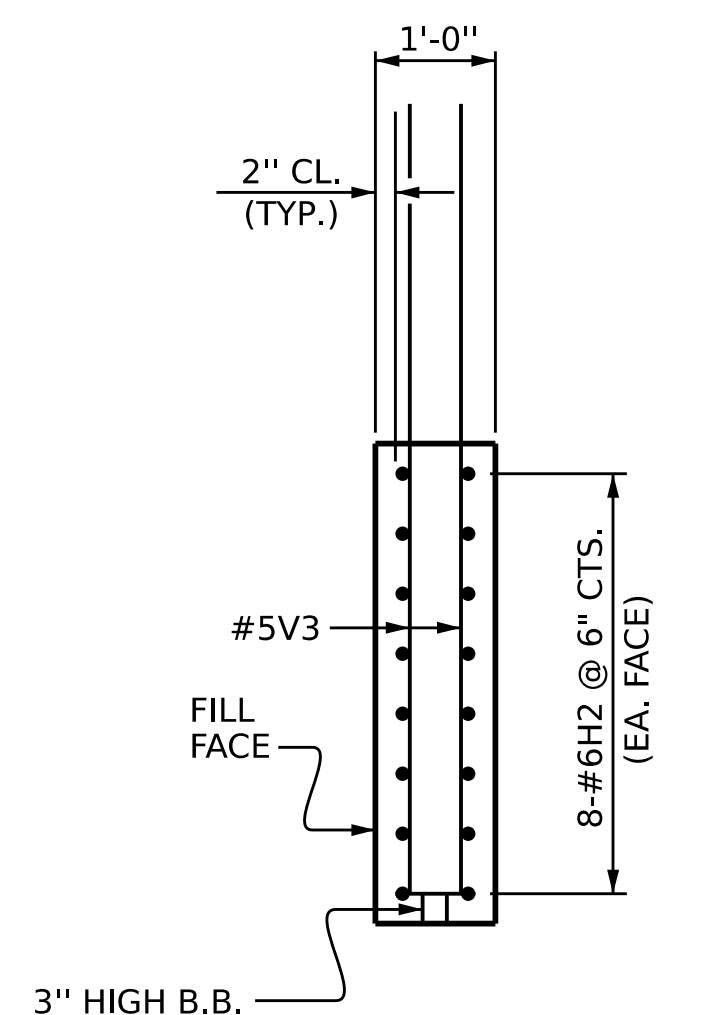
ELEVATION OF LEFT WING (W3)



ELEVATION OF RIGHT WING (W4)



SECTION X-X



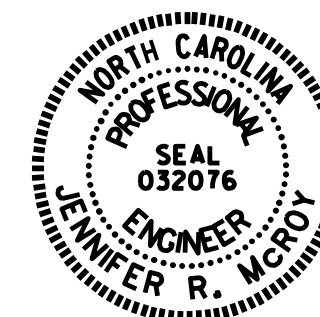
SECTION Y-Y

DRAWN BY :	K. D. LAYNE	DATE :	02/2025
CHECKED BY :	J.R. MCROY	DATE :	12/2025
DESIGN ENGINEER OF RECORD:	J.R. MCROY	DATE :	12/2025

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Signed by: Jennifer R. McKay 3/4/2026
F01A12FB8CDB409

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PROJECT NO. HB-0035
ROCKINGHAM COUNTY
 STATION: 22+25.00 -L-

SHEET 2 OF 3

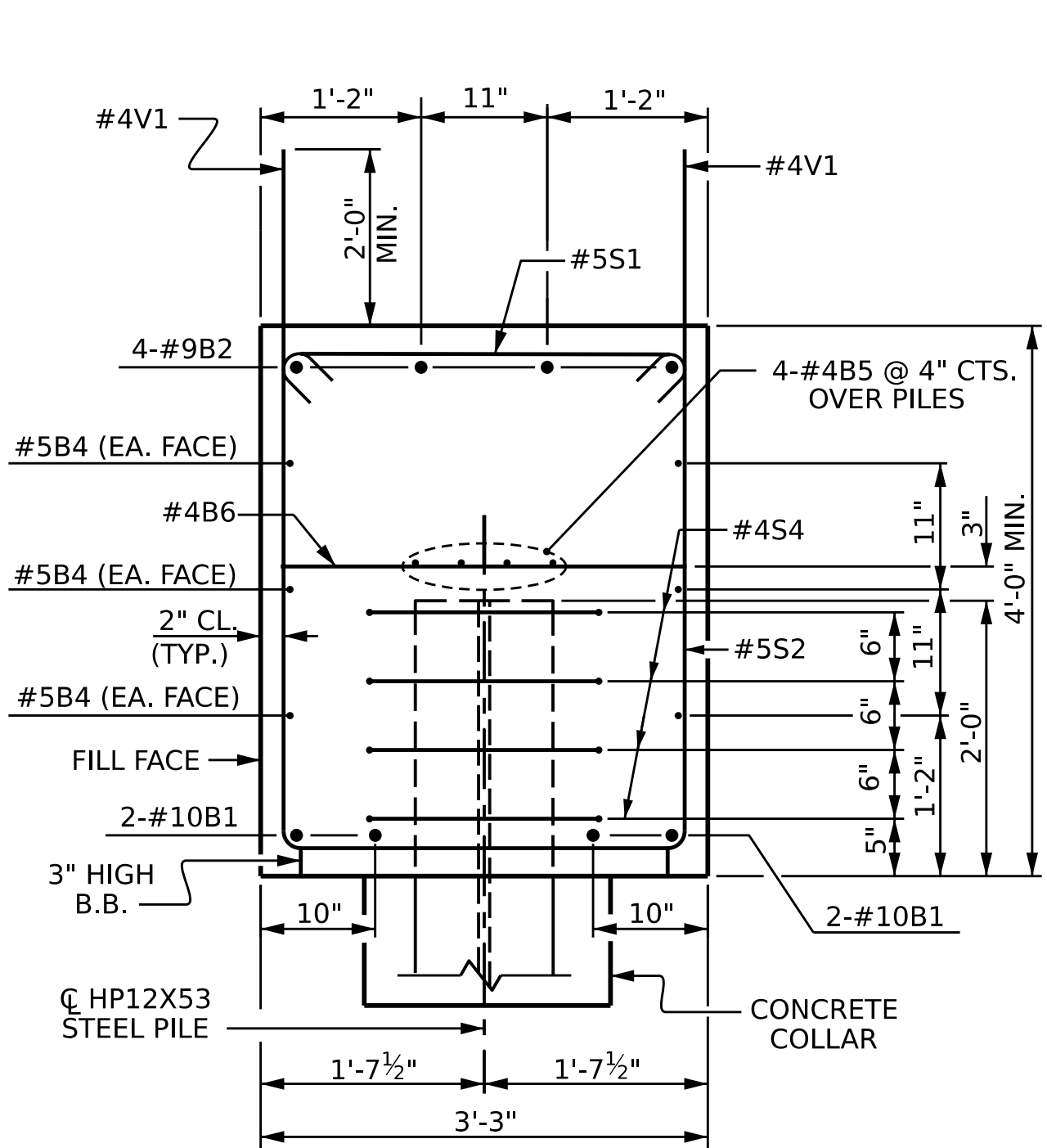
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

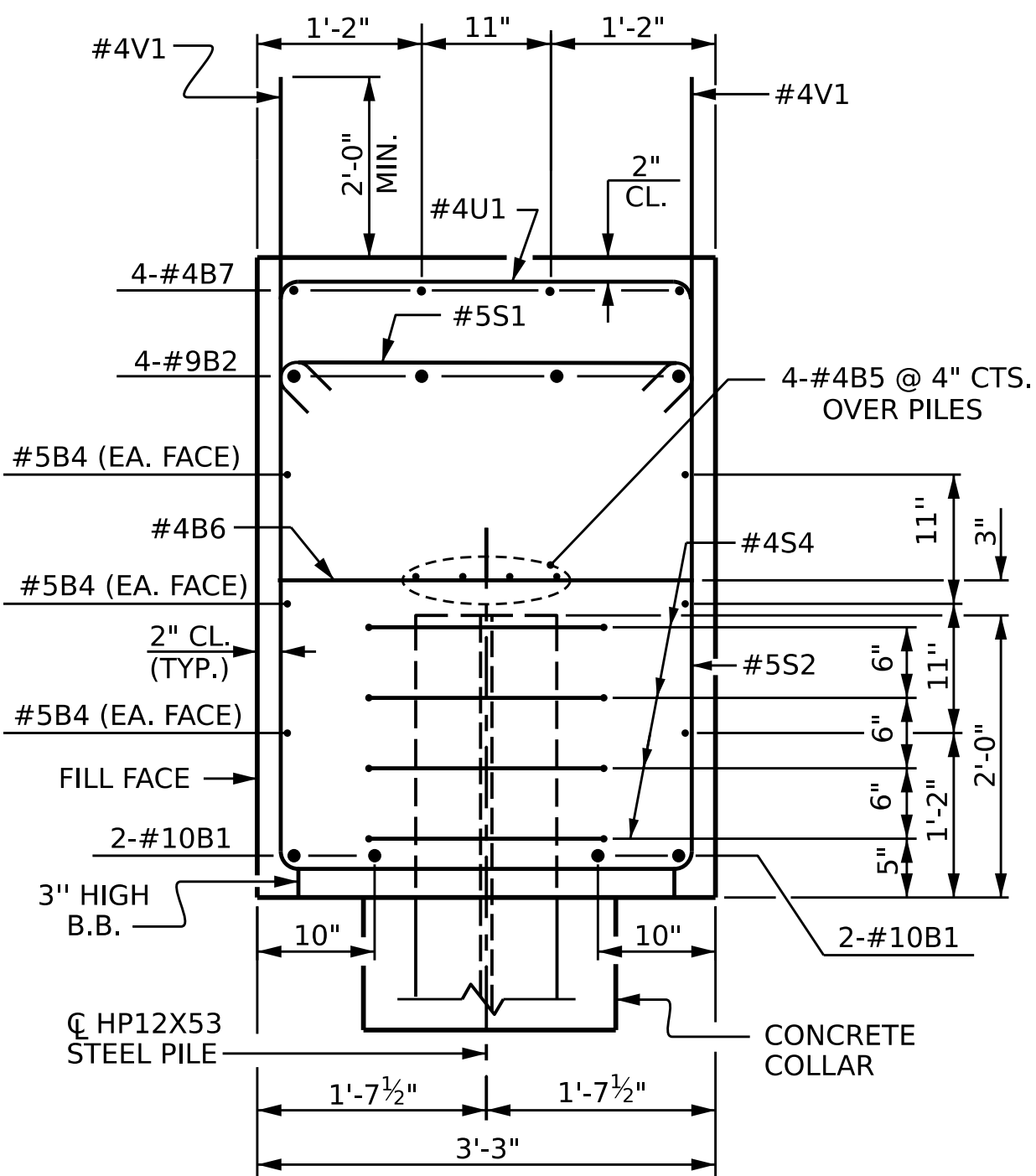
INTEGRAL END BENT 2 WINGS

REVISIONS						SHEET NO. S-33
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			

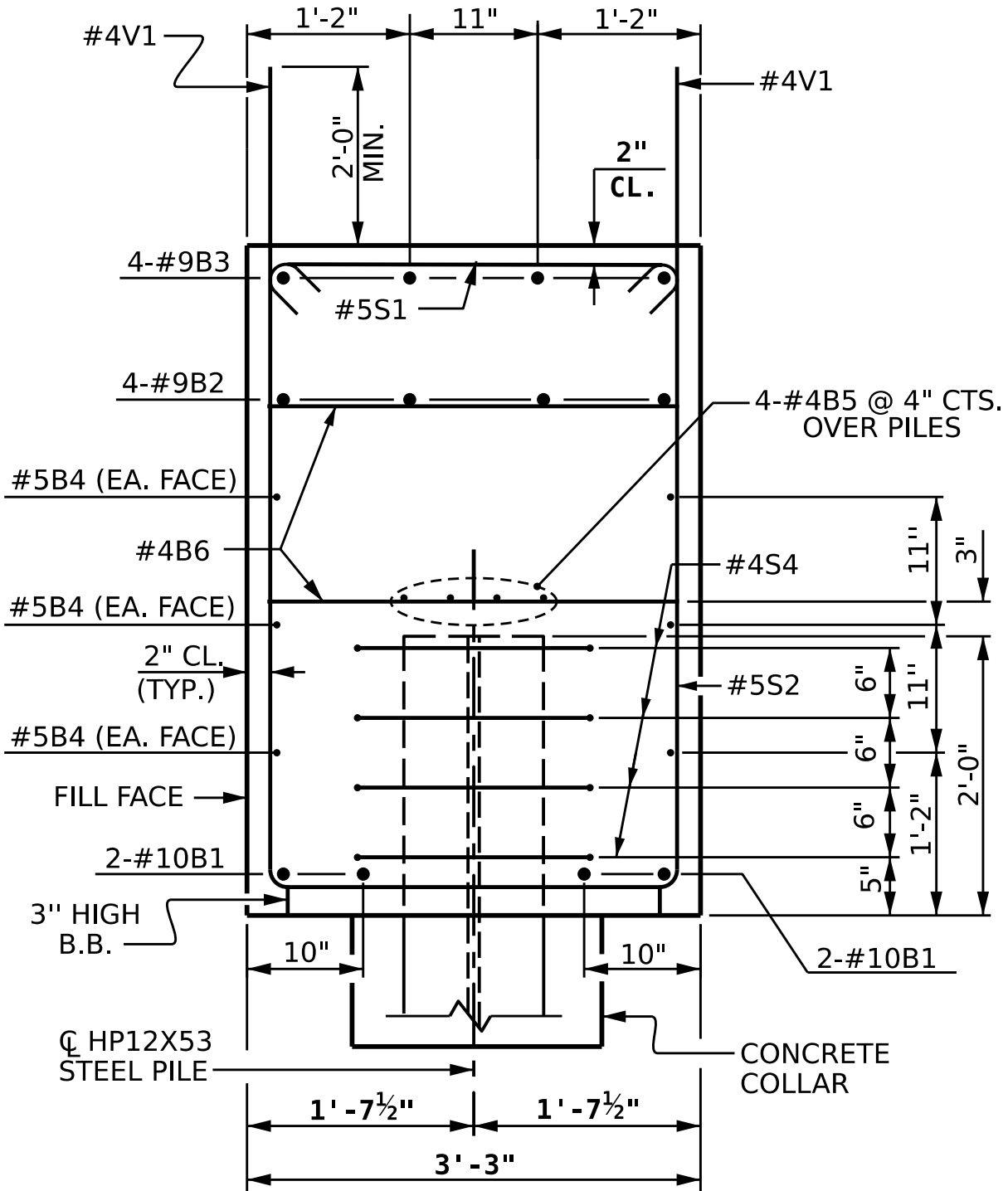
ET NO.



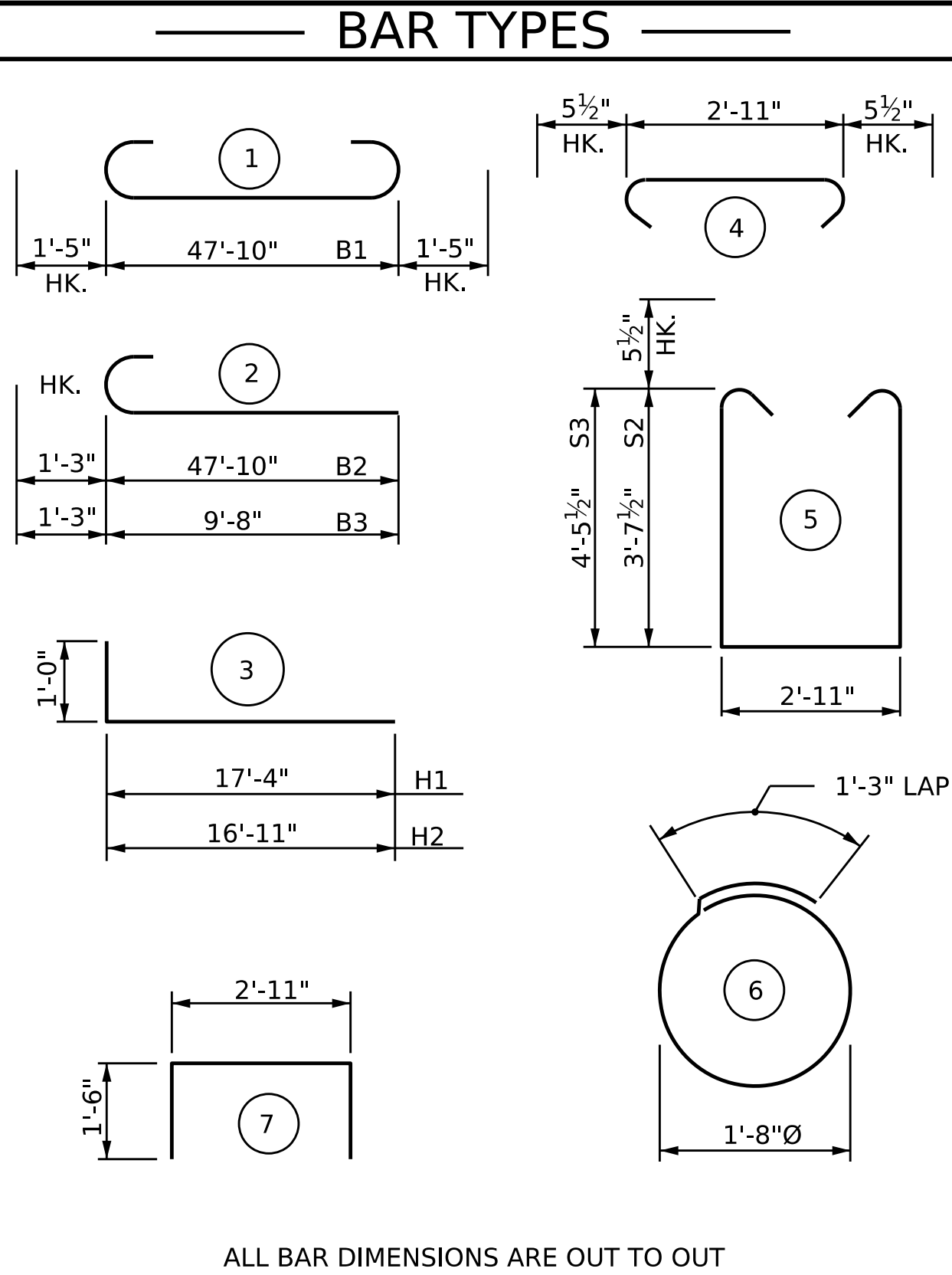
SECTION A-A



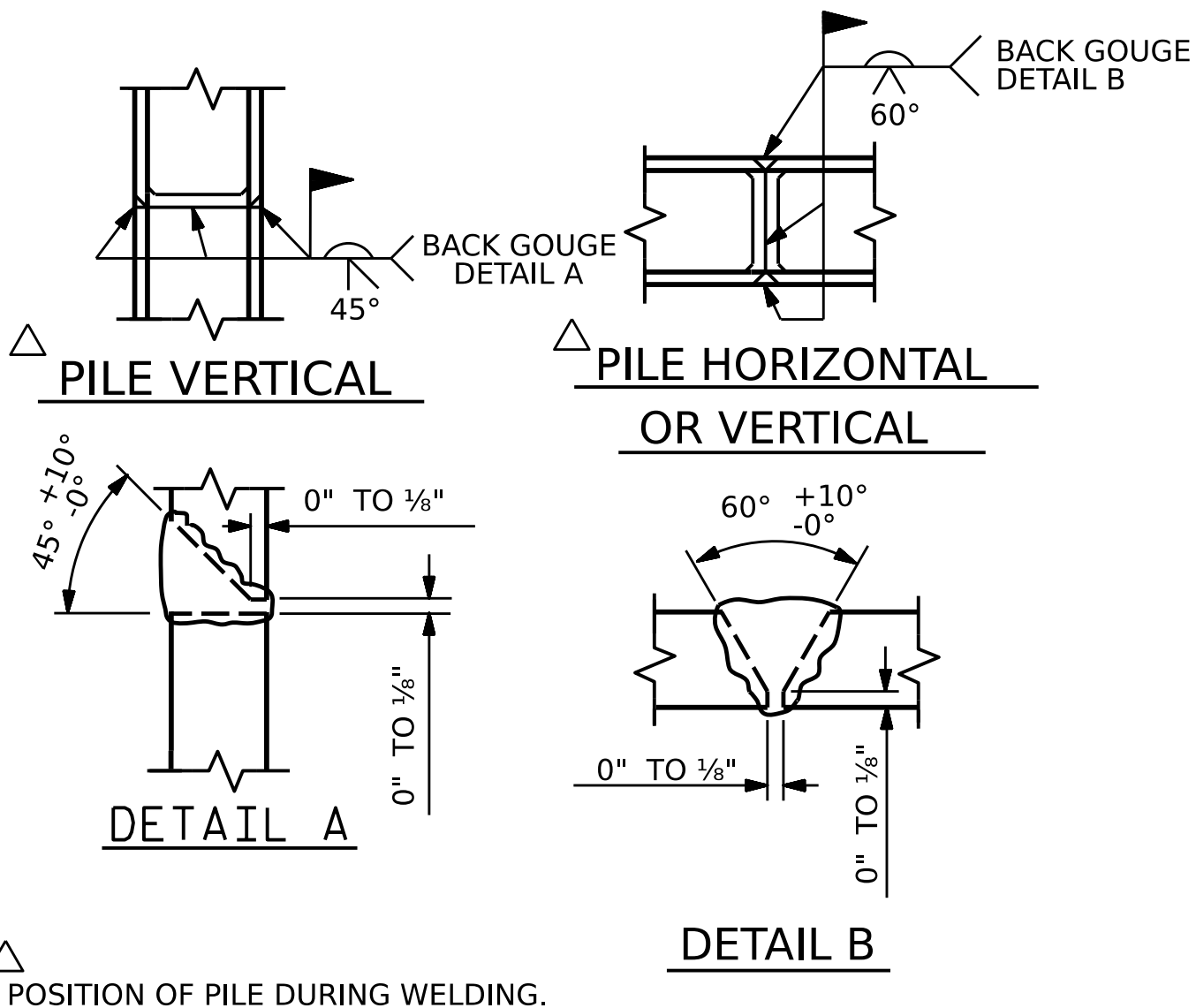
SECTION B-B



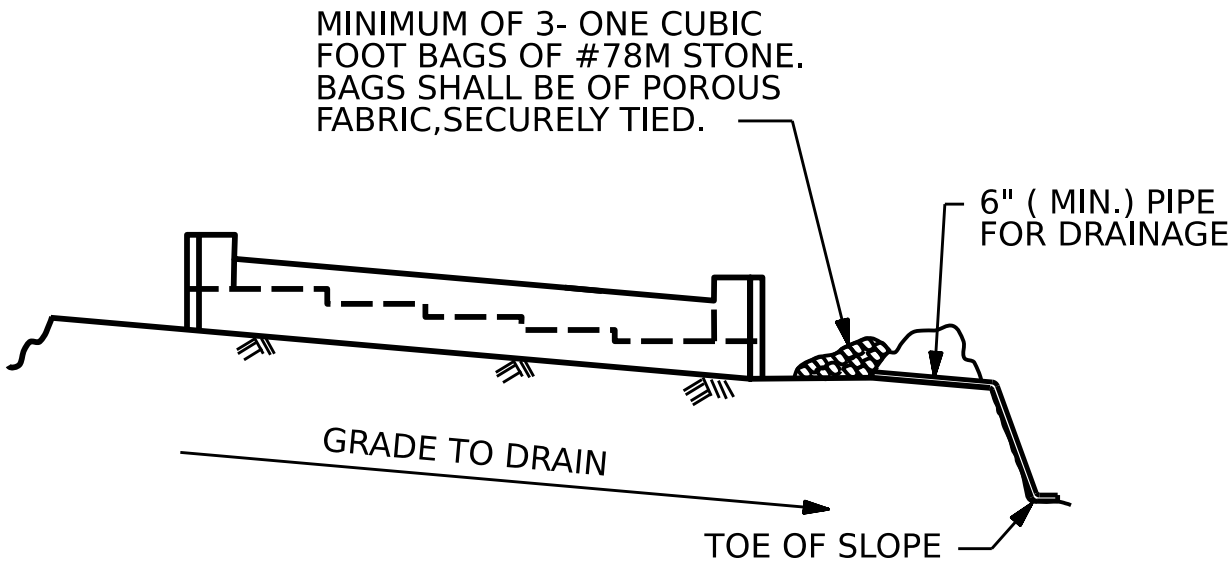
SECTION C-C



BILL OF MATERIAL						
END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	#10	1	50'-8"	872	
B2	4	#9	2	49'-1"	668	
B3	4	#9	2	10'-11"	149	
B4	6	#5	STR	47'-10"	299	
B5	8	#4	STR	25'-2"	135	
B6	15	#4	STR	2'-11"	29	
B7	8	#4	STR	10'-9"	58	
H1	20	#6	3	18'-4"	551	
H2	16	#6	3	17'-11"	431	
S1	42	#5	4	3'-10"	168	
S2	35	#5	5	11'-1"	405	
S3	7	#5	5	12'-9"	93	
S4	36	#4	6	6'-6"	156	
U1	22	#4	7	5'-11"	87	
V1	62	#4	STR	6'-7"	273	
V2	34	#5	STR	10'-11"	387	
V3	32	#5	STR	10'-9"	359	
REINFORCING STEEL				= 5,120 LBS.		
CLASS A CONCRETE QUANTITIES:						
POUR #1: (CAP, COLLARS & WINGS)				= 31.5 CU. YDS.		
HP 12x53 STEEL PILES NO. 9				= 225.0 LIN. FT.		



PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

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SUMMIT
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(919)322-0115
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Signed by: *Jennifer R. McCoy* 3/4/2026
F21A12FB8CDB40B

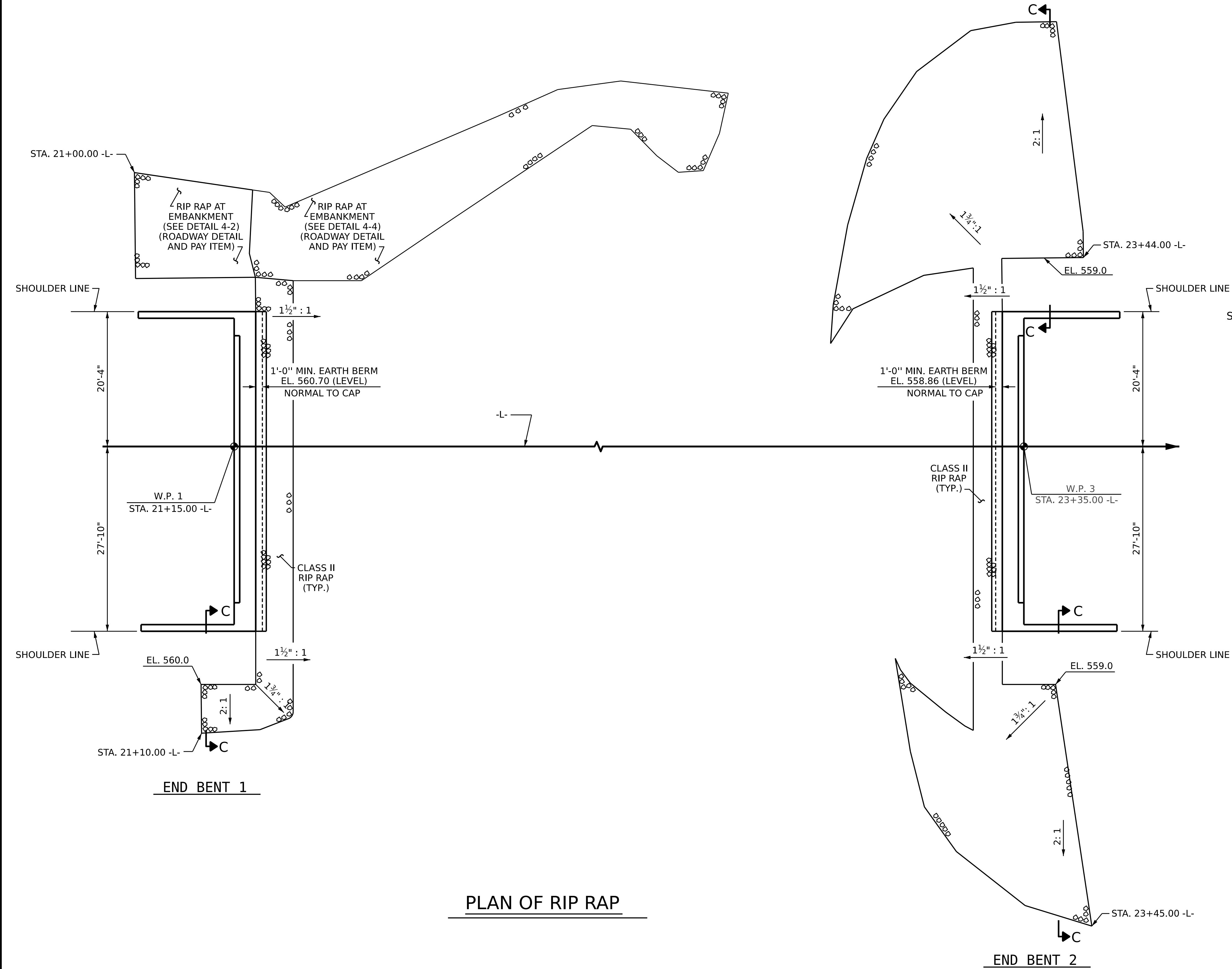
NORTH CAROLINA
PROFESSIONAL
SEAL
032076
ENGINEER
JENNIFER R. MCCOY

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

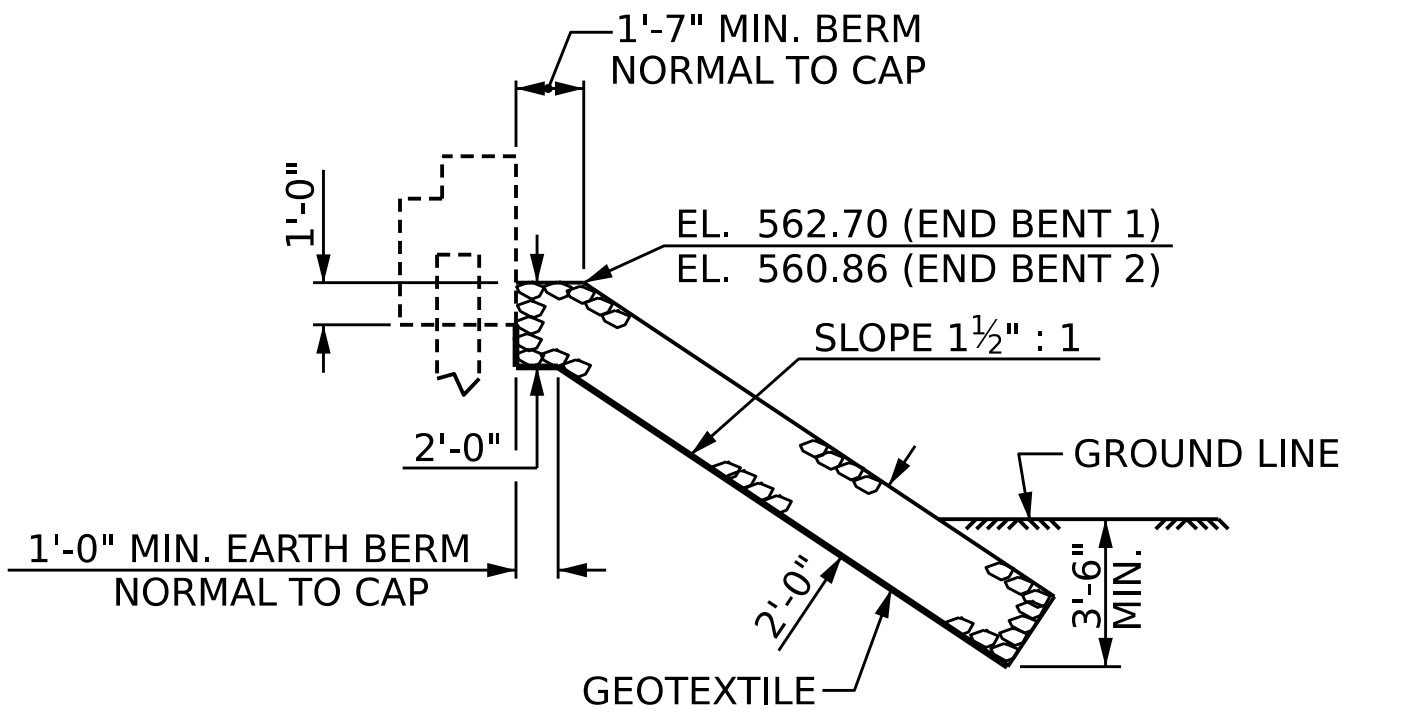
PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

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

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

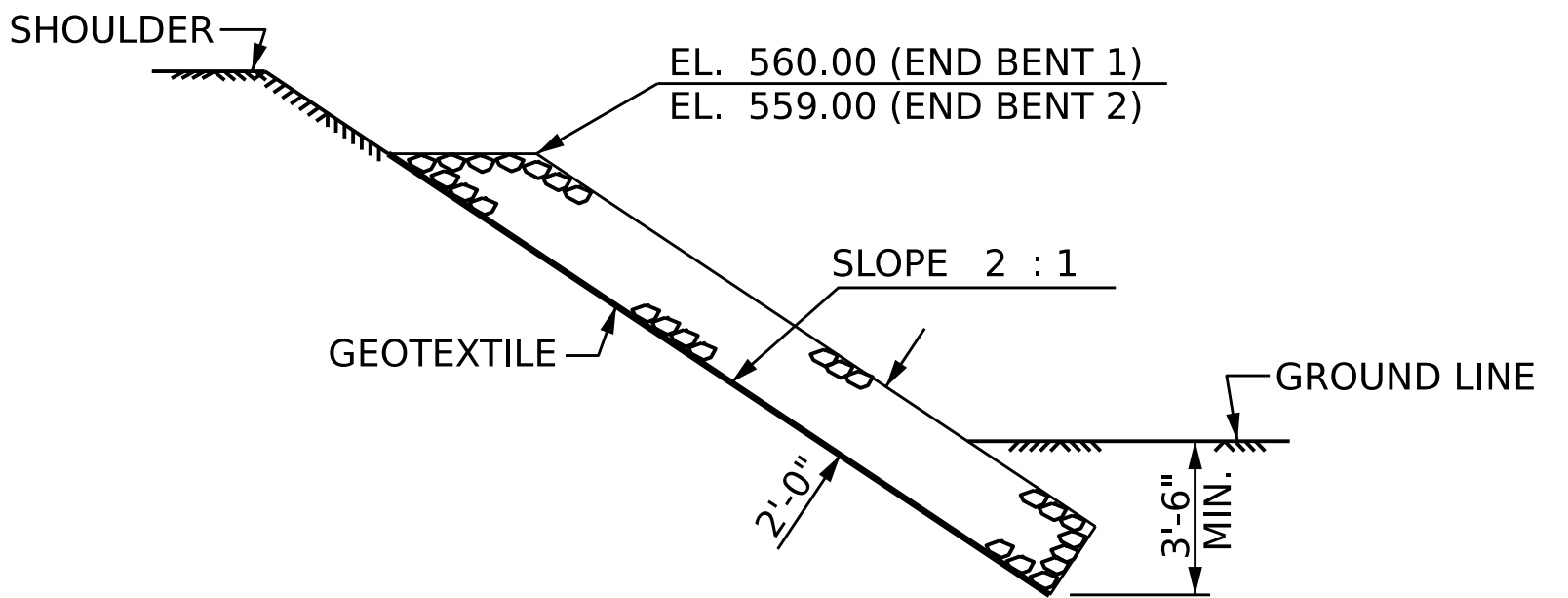


PLAN OF RIP RAP



C SECTION

BERM RIP RAPPED

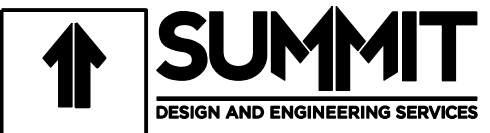


SECTION C-C

ESTIMATED QUANTITIES

BRIDGE @ STA. 22+25.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	125	140
END BENT 2	230	256

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Signed by: Jennifer R. McRoy
P21A12FB8CDB40B...

3/4/2026

PROJECT NO. HB-0035
ROCKINGHAM COUNTY
STATION: 22+25.00 -L-

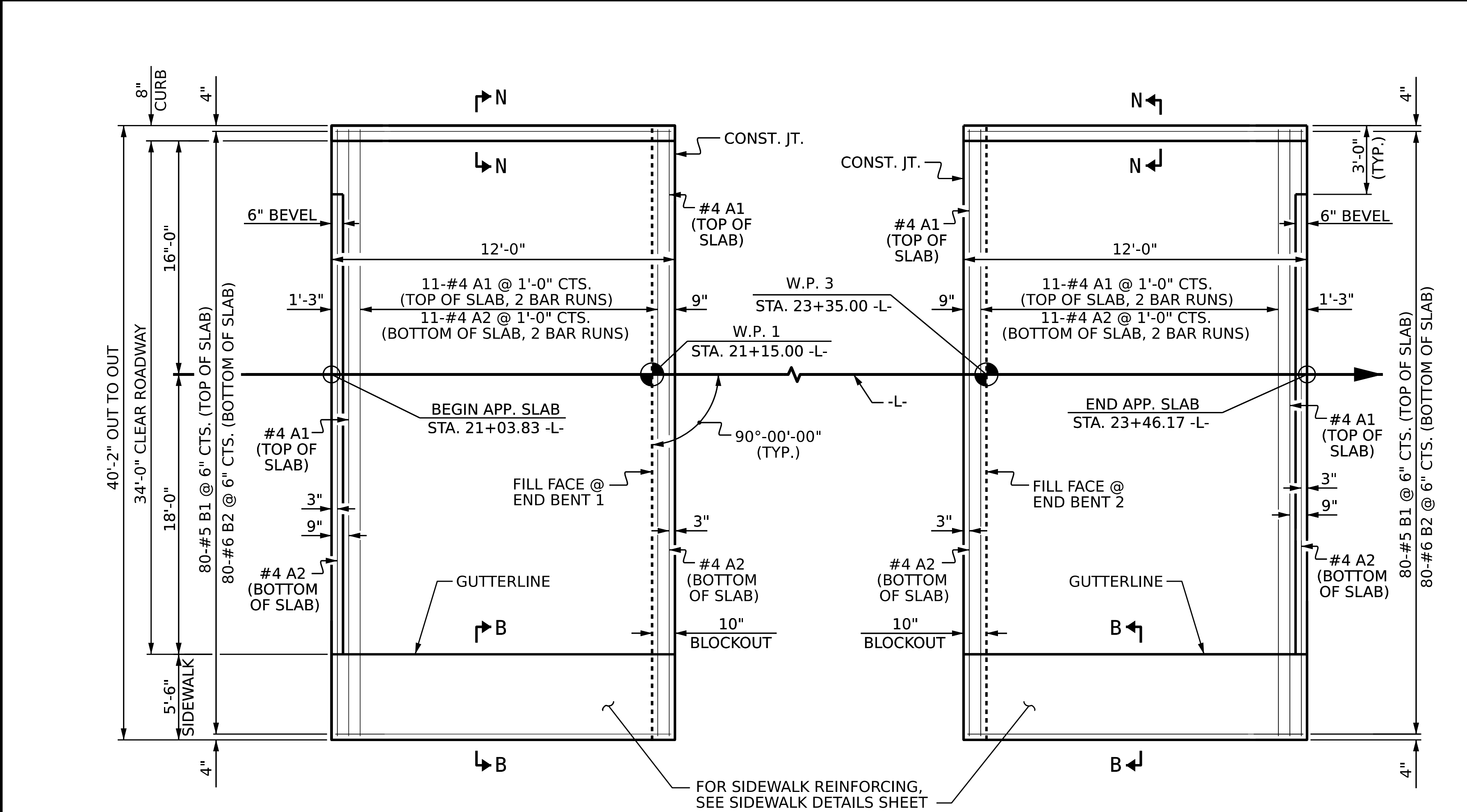
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

DRAWN BY : K. D. LAYNE DATE : 02/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

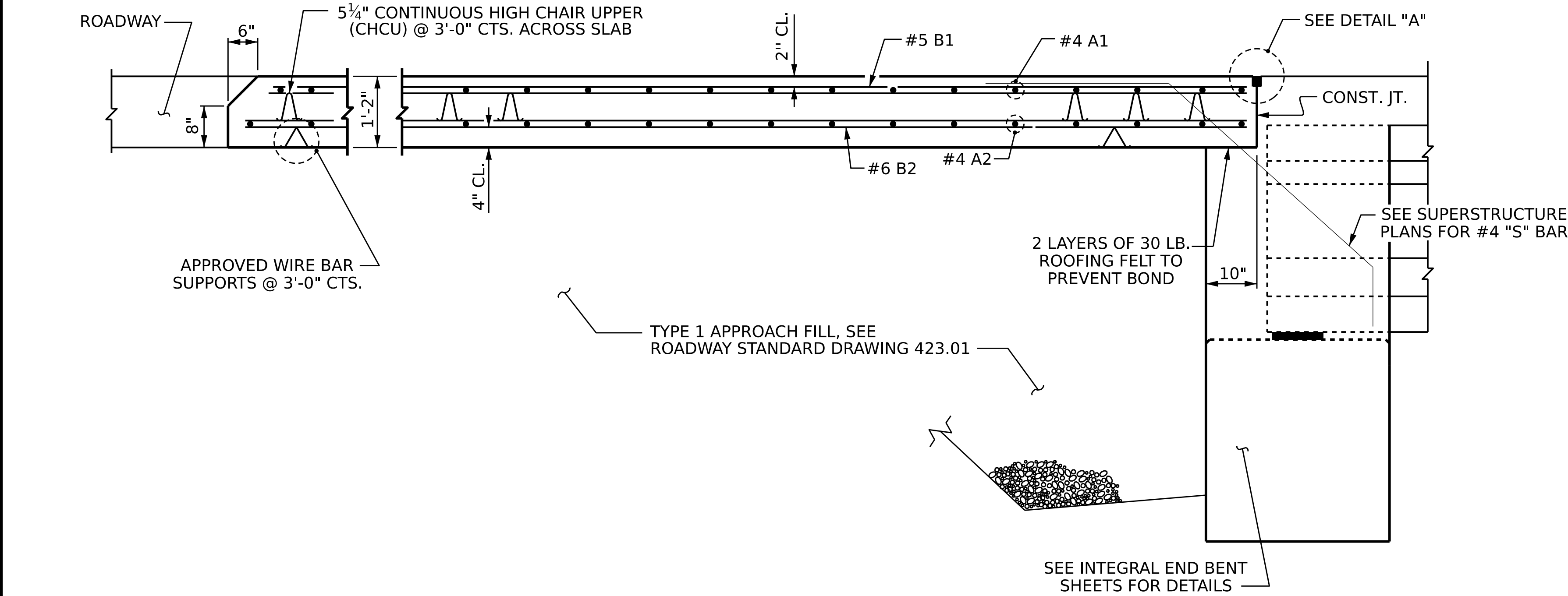
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			36



PLAN @ INTEGRAL END BENT 1

PLAN @ INTEGRAL END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

DRAWN BY : M.K. BEARD DATE : 01/2025
CHECKED BY : J.R. MCROY DATE : 12/2025
DESIGN ENGINEER OF RECORD: J.R. MCROY DATE : 12/2025

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

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

AT THE CONTRACTORS OPTION "TYPE 1A - ALTERNATE APPROACH FILL" (ROADWAY STD. 423.02) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

FOR SECTION B-B SHOWING SIDEWALK REINFORCING BARS AND QUANTITIES, SEE "SIDEWALK DETAILS" SHEET.

BILL OF MATERIAL

FOR ONE APPROACH SLAB
(2 REQ'D)

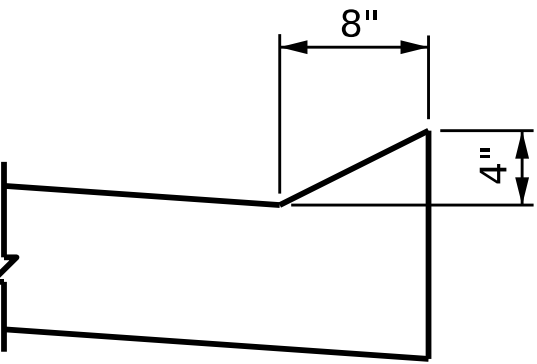
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	20'-11"	363
A2	26	#4	STR	20'-8"	360
* B1	80	#5	STR	11'-2"	932
B2	80	#6	STR	11'-8"	1,402

REINFORCING STEEL	LBS.	1,762
* EPOXY COATED REINFORCING STEEL	LBS.	1,295

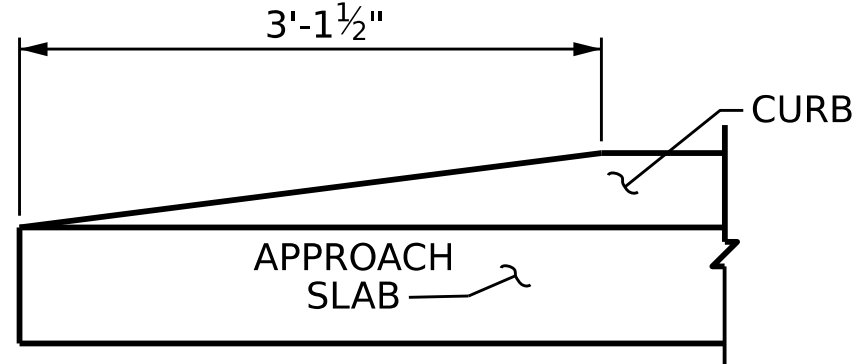
CLASS AA CONCRETE	C. Y.	21.7
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SPLICE LENGTHS

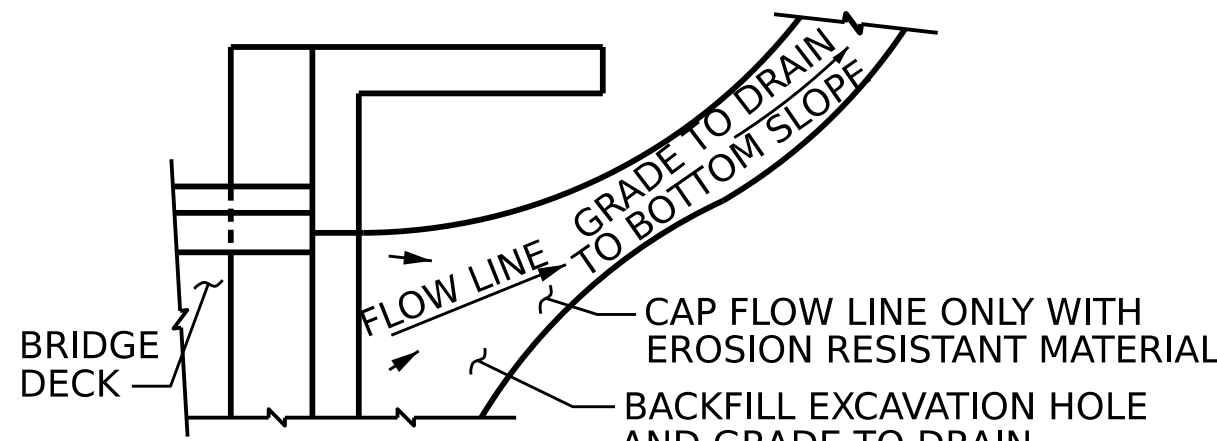
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



SECTION N-N

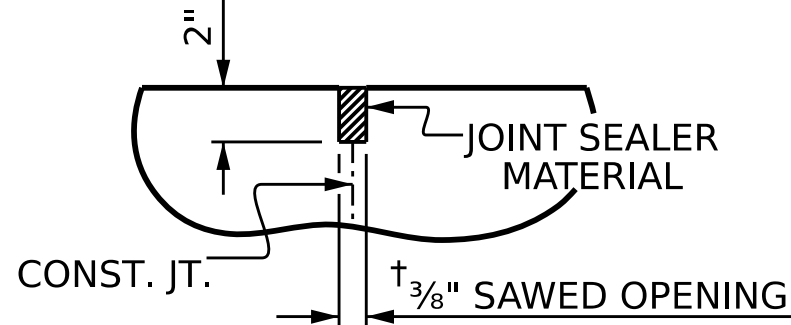


END OF CURB WITHOUT
SHOULDER BERM GUTTER



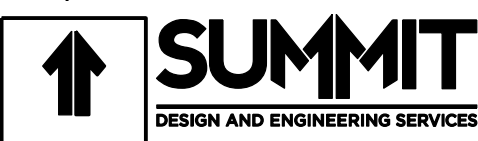
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



DETAIL "A"

Prepared in the Office of:



NC FIRM LICENSE No: C-5176
1000 Social St., Suite 800
Raleigh, NC 27609
(919)322-0115
www.summitde.com



Signed by:
Jennifer R. McRoy
F21A12FB8CDB40B...

3/6/2026

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

PROJECT NO. HB-0035

ROCKINGHAM COUNTY

STATION: 22+25.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT
WITH FLEXIBLE PAVEMENT

REVISIONS

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

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" 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 ⅝" 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 ⅛" 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.