

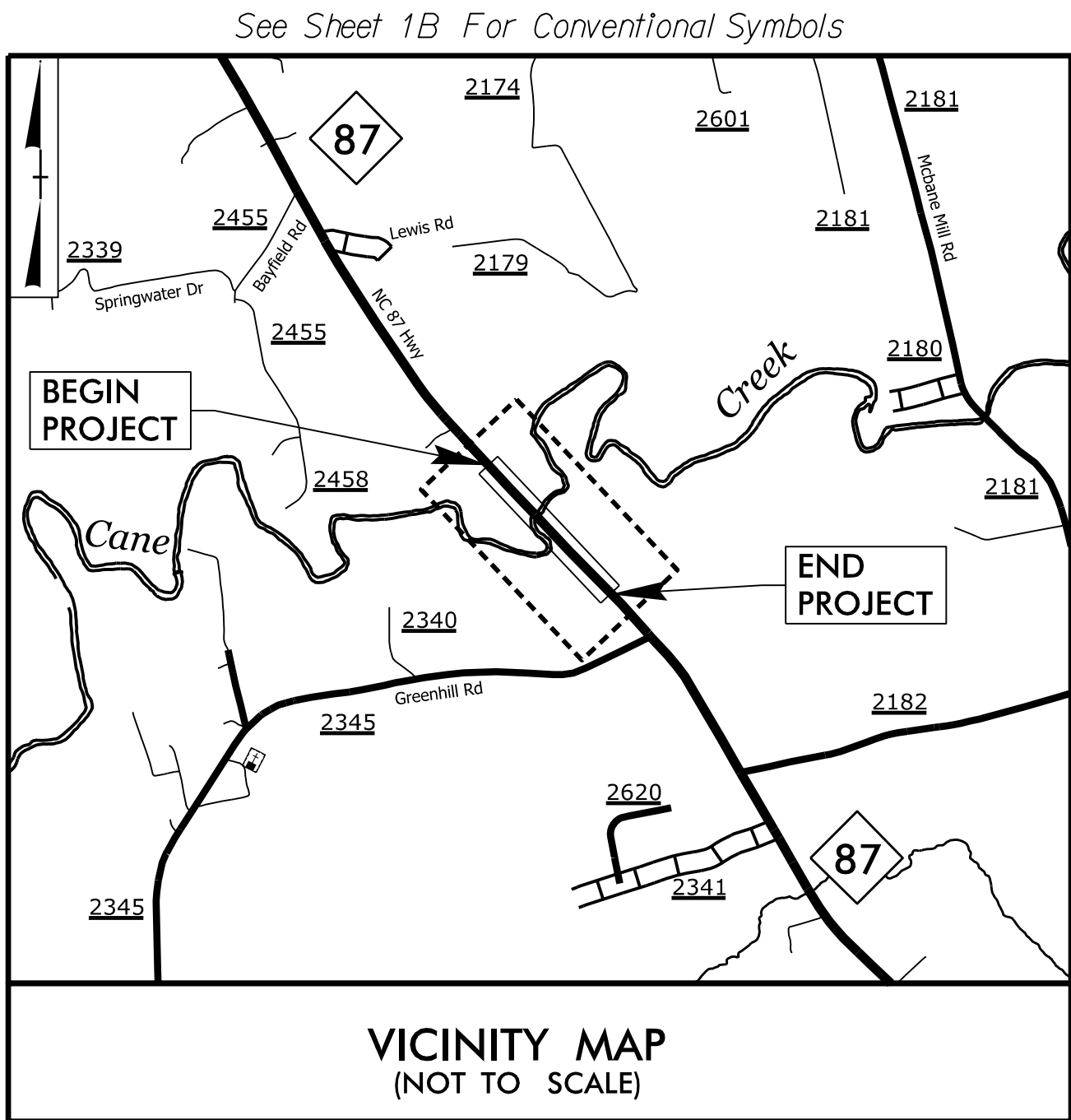
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0060	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
67060.1.1	N/A	PE	
67060.2.1	N/A	ROWUTIL	
67060.3.1	N/A	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

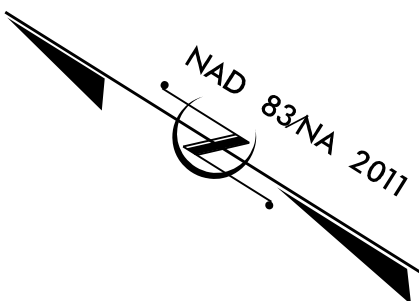
ALAMANCE COUNTY

LOCATION: REPLACE BRIDGE 000014 ON NC 87 OVER CANE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, GUARDRAIL,
AND STRUCTURES



VICINITY MAP
(NOT TO SCALE)



BEGIN STATE TIP PROJECT BR-0060
-L- STA 12+16.55

BEGIN CONSTRUCTION
-L- STA 11+45.84

TO LEWIS RD

BEGIN BRIDGE
-L- STA 20+04.00

END BRIDGE
-L- STA 22+34.00

NC 87

-DETDR1-

-DR1- -L DETOUR-

END CONSTRUCTION
-L- STA 35+16.10

TO GREENHILL RD

END STATE TIP PROJECT BR-0060
-L- STA 34+64.00

STRUCTURE

TIP PROJECT: BR-0060

CONTRACT: C204936

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2026 = 3,000
ADT 2046 = 3,300
K = 10 %
D = 60 %
T = 7 % *
V = 60 MPH
* TTST = 3% DUAL 4%
FUNC CLASS =
MINOR ARTERIAL-
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0060 = 0.383 MILES
LENGTH STRUCTURE TIP PROJECT BR-0060 = 0.043 MILES
TOTAL LENGTH TIP PROJECT BR-0060 = 0.426 MILES

Prepared for NCDOT In the Office of:

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4625 VOICE (919) 781-4865 FAX
NC License NO.: F-0105

2024 STANDARD SPECIFICATIONS

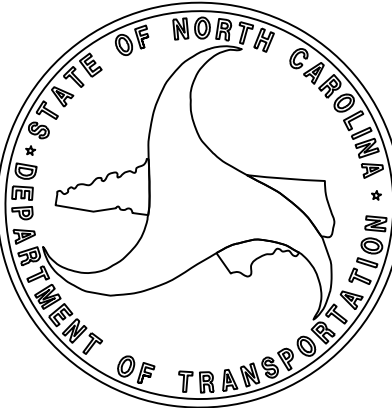
RIGHT OF WAY DATE:
MARCH 27, 2023

LETTING DATE:
FEBRUARY 17, 2026

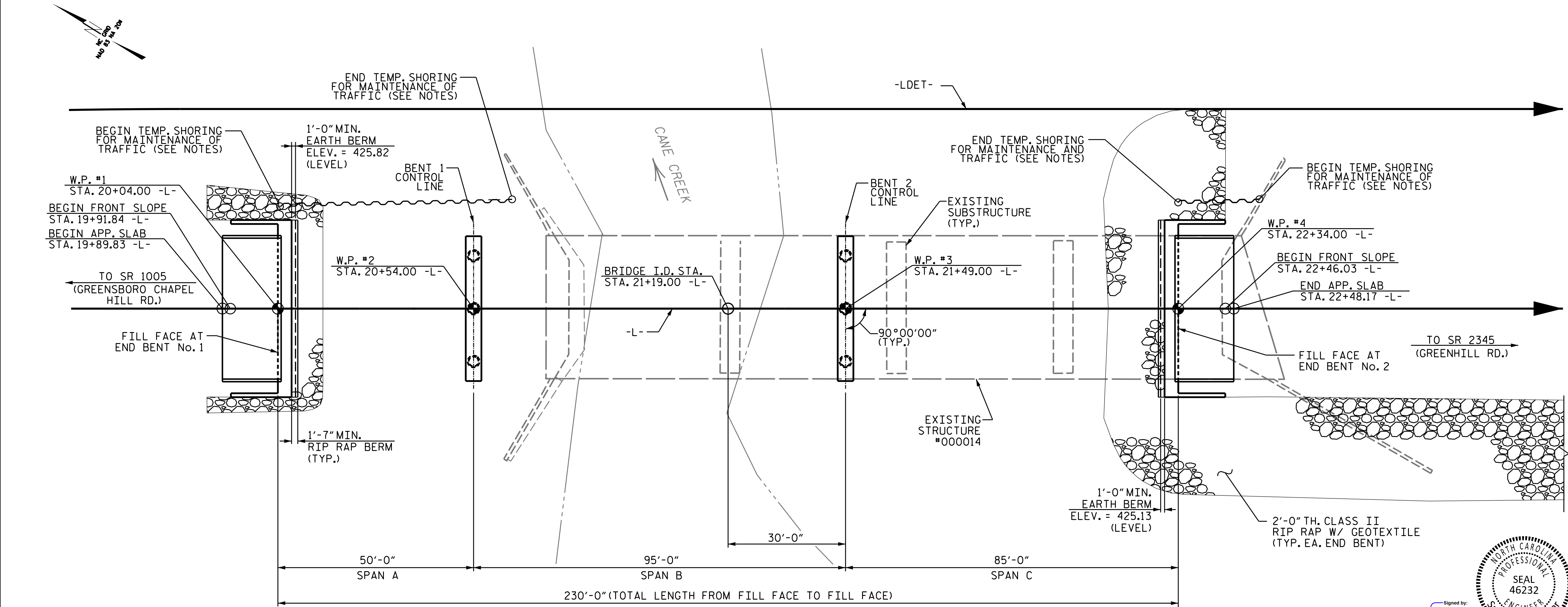
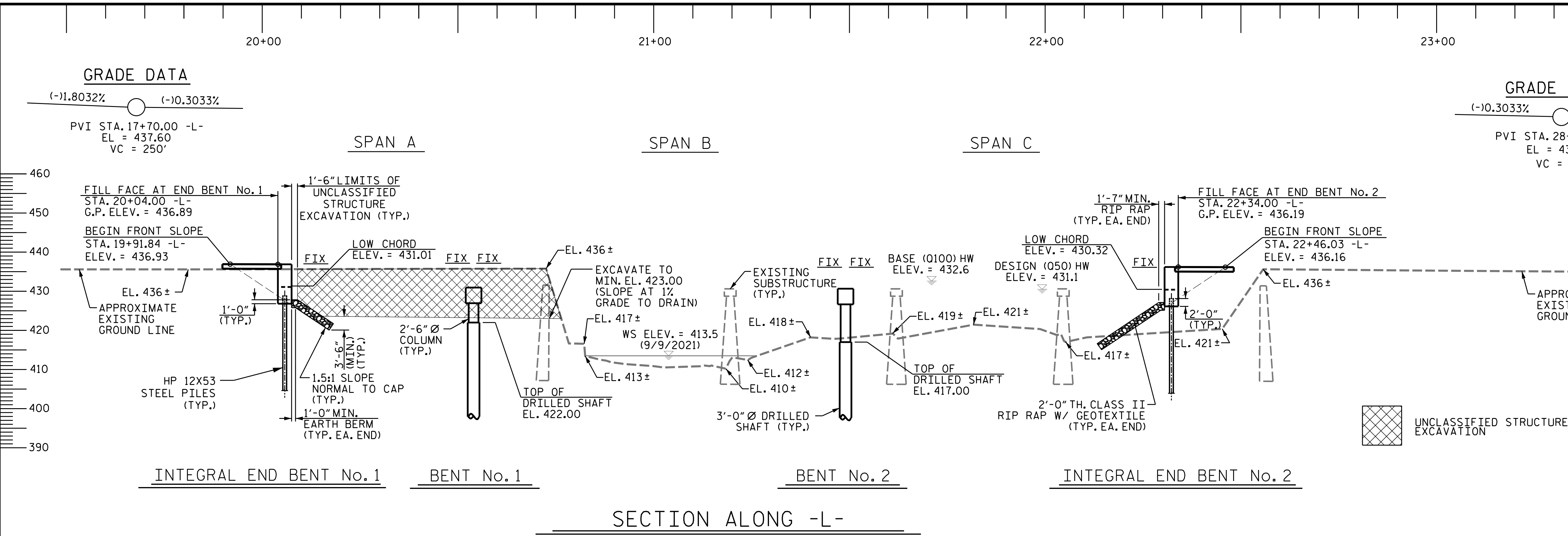
TRENT HUFFMAN, P.E.
PROJECT ENGINEER

SANTIAGO AGUILAR, P.E.
PROJECT STRUCTURES ENGINEER

DAVID STUTTS, P.E.
NCDOT CONTACT



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T.Kirschbaum



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-
SHEET 1 OF 4 REPLACES BRIDGE No. 000014

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE OVER CANE CREEK
ON NC 87 BETWEEN
SR 1005 AND SR 2345

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

PLAN
PILES ARE NOT SHOWN FOR CLARITY
END BENTS & BENTS ARE PARALLEL

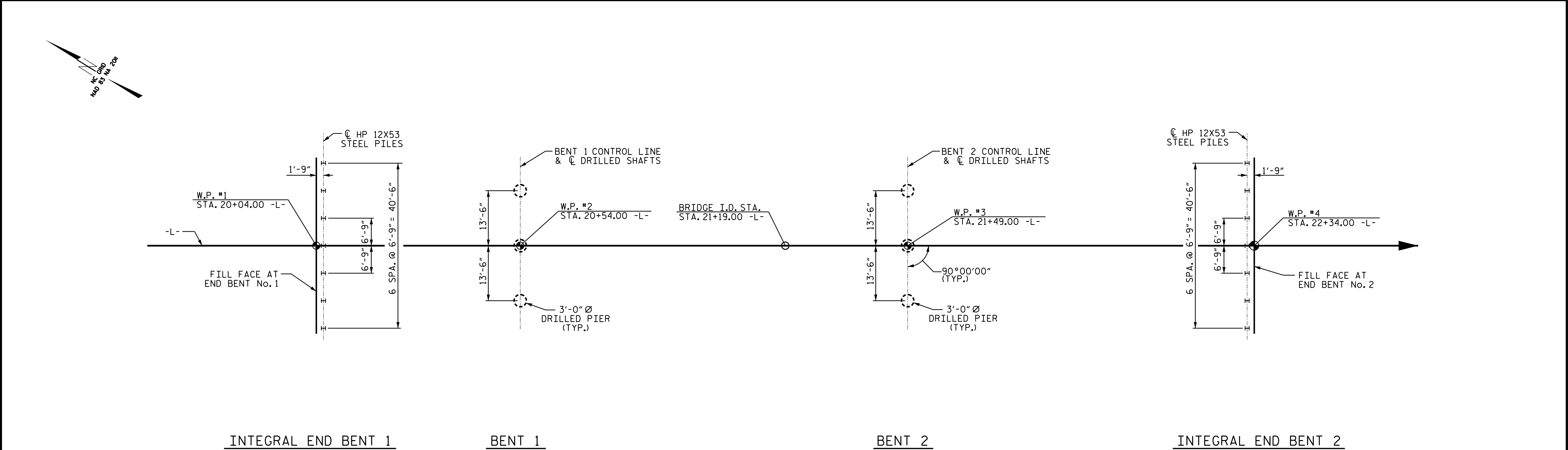
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

Signed by:
Santiago E. Aguilar
Professional Engineer
Seal 46232
09/02/2025

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

12/2/2025 02:16:10 PM 1001-108-BR-0060-Structures\01_CADD\02_Final Drawings\401_003_BR0060_SMU_FL02_002_000014.dgn
+kirschbaum



FOUNDATION LAYOUT

ALL BENTS ARE PARALLEL
(DIMENSION LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES AT BOTTOM OF CAP OR FOOTING)

FOUNDATION NOTES:

1. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
2. FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
3. INSTALL PERMANENT STEEL CASINGS AT BENT NO. 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 403.9 FT (PIER 1) AND ELEVATION 408.6 FT (PIERS 2-3).
4. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
5. BEFORE FILLING HOLES FOR PILE EXCAVATION AT END BENT NO. 1, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE.
6. FILL THE BOTTOM 3 FT OF HOLES FOR PILE EXCAVATION AT END BENT NO. 1 WITH CONCRETE AND THE REST OF HOLES WITH CLASS II OR III SELECT MATERIAL THAT MEETS SECTION 1016 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

SHEET 2 OF 4

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

moffatt & nichol
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NC License NO.: F-0105

Signed by: *Santiago E. Aguilar*
12/2/2025
NORTH CAROLINA
PROFESSIONAL
SEAL
46232
ENGINEER
SANTIAGO E. AGUILAR

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

[illegible]

$$* \text{RDR} = \frac{\text{Factored Resistance} + \text{Factored Drag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \text{Nominal Drag Load Resistance} + \text{Nominal Resistance from Scourable Material}$$

**** 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 1-7	190			0.6		
End Bent 2, Piles 1-7	240			0.6		

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

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
End Bent 1, Piles 1-7				7
End Bent 2, Piles 1-7				7
TOTAL QUANTITY:				14

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)			Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH	End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT
End Bent 2	30	1		
TOTAL QUANTITY:		1		

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

[illegible]

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 "36-inch Dia. Drilled Piers" or "36-inch Dia. Drilled Piers Not in Soil" and "36-inch 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 "36-inch 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 36-inch 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			
Bent 2, Piers 1-3		1			
TOTAL QUANTITY:		2			

PROJECT NO. BR-0060

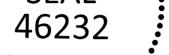
ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 3 OF 4

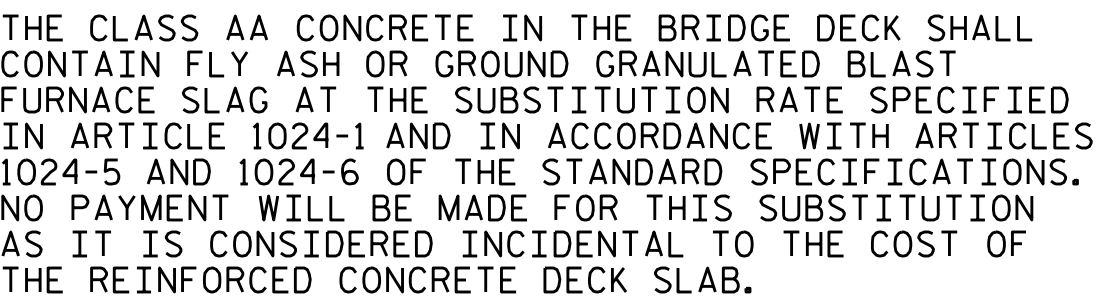
NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Joshua D. Fregosi, #038602) on 08-22-2025.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. 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.

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH
Signed by:  12/2/2025	PILE AND DRILLED PIER FOUNDATION TABLES
SIGNATURE	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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

NOTES



THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THE INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

THE SCOUR CRITICAL ELEVATION FOR BENT #1 IS ELEVATION 415.0 (PIERS 1 AND 2) AND ELEVATION 417.0 (PIER 3). THE SCOUR CRITICAL ELEVATION FOR BENT #2 IS ELEVATION 412.0. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

FOR EROSION CONTROL MEASURES, SEE EROSION
CONTROL PLANS.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

TOTAL BILL OF MATERIAL

HYDRAULIC DATA

DESIGN DISCHARGE	10100 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS.
DESIGN HIGHWATER ELEV.	431.1 FT.
DRAINAGE AREA	64.5 SQ. MI.
BASE DRAINAGE (Q100)	12700 CFS
BASE HIGHWATER ELEV.	432.6 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	17400 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=> 100 YRS.
*OVERTOPPING FLOOD ELEV.	435.6 FT.

* OCCURS AT STA. 24+42.60 -L-

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
 CHECKED BY : P. SHAW DATE : 09-2025
 DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

Signed by: Santiago E. Aguilar
43B96678EF64A02...
12/2/2025

ENGINEER
Santiago E. Aguilar

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
BRIDGE OVER CANE CREEK
ON NC 87 BETWEEN
SR 1005 AND SR 2345

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+kirschbaum

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	#	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER	
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT				SHEAR				LIVE-LOAD FACTORS (γ _{LL})	MOMENT								
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.33	--	1.75	0.90	1.73	B	ER	46.63	1.01	1.33	B	I	84.49	0.80	0.80	1.44	B	ER	46.63		
	HL-93 (OPERATING)	N/A		1.76	--	1.35	0.90	2.24	B	ER	46.63	1.01	1.76	B	I	8.76	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36,000	2	1.80	64,800	1.75	0.90	2.39	B	ER	46.63	1.01	1.80	B	I	84.49	0.80	0.80	1.99	B	ER	46.63		
	HS-20 (OPERATING)	36,000		2.36	84,960	1.35	0.90	3.10	B	ER	46.63	1.01	2.36	B	I	8.76	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		4.70	63,450	1.40	0.90	6.97	C	EL	41.19	1.01	6.05	B	I	8.76	0.80	0.80	4.70	B	ER	46.63	
		SNGARBS2	20,000		3.41	68,200	1.40	0.90	5.10	C	EL	41.19	1.01	4.22	B	I	8.76	0.80	0.80	3.41	B	ER	46.63	
		SNAGRIS2	22,000		3.20	70,400	1.40	0.90	4.78	C	EL	41.19	1.01	3.90	B	I	8.76	0.80	0.80	3.20	B	ER	46.63	
		SNCOTTS3	27,250		2.33	63,493	1.40	0.90	3.44	C	EL	41.19	1.01	2.92	B	I	8.76	0.80	0.80	2.33	B	ER	46.63	
		SNAGGRS4	34,925		1.92	67,056	1.40	0.90	2.85	C	EL	41.19	1.01	2.29	B	I	84.49	0.80	0.80	1.92	B	ER	46.63	
		SNS5A	35,550		1.88	66,834	1.40	0.90	2.79	C	EL	41.19	1.01	2.31	B	I	8.76	0.80	0.80	1.88	B	ER	46.63	
		SNS6A	39,950		1.71	68,315	1.40	0.90	2.55	C	EL	41.19	1.01	2.08	B	I	8.76	0.80	0.80	1.71	B	ER	46.63	
		SNS7B	42,000		1.63	68,460	1.40	0.90	2.42	C	EL	41.19	1.01	2.03	B	I	8.76	0.80	0.80	1.63	B	ER	46.63	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		2.08	68,640	1.40	0.90	3.11	C	EL	41.19	1.01	2.47	B	I	84.49	0.80	0.80	2.08	B	ER	46.63	
		TNT4A	33,075		2.08	68,796	1.40	0.90	3.11	C	EL	41.19	1.01	2.60	B	I	8.76	0.80	0.80	2.08	B	ER	46.63	
		TNT6A	41,600		1.69	70,304	1.40	0.90	2.53	C	EL	41.19	1.01	2.13	B	I	8.76	0.80	0.80	1.69	B	ER	46.63	
		TNT7A	42,000		1.69	70,980	1.40	0.90	2.54	B	ER	46.63	1.01	2.09	B	I	8.76	0.80	0.80	1.69	B	ER	46.63	
		TNT7B	42,000		1.73	72,660	1.40	0.90	2.60	B	ER	46.63	1.01	1.99	B	I	84.49	0.80	0.80	1.73	B	ER	46.63	
		TNAGRIT4	43,000		1.66	71,380	1.40	0.90	2.49	B	ER	46.63	1.01	1.96	B	I	8.76	0.80	0.80	1.66	B	ER	46.63	
		TNAGT5A	45,000		1.57	70,650	1.40	0.90	2.36	B	ER	46.63	1.01	1.87	B	I	8.76	0.80	0.80	1.57	B	ER	46.63	
		TNAGT5B	45,000	3	1.56	70,200	1.40	0.90	2.33	C	EL	41.19	1.01	1.84	B	I	84.49	0.80	0.80	1.56	B	ER	46.63	
EMERGENCY VEHICLE (EV)	EV2	28,750		2.40	69,000	1.30	0.90	3.88	C	EL	41.19	1.01	3.12	B	I	8.76	0.80	0.80	2.40	B	ER	46.63		
	EV3	43,000	4	1.58	67,940	1.30	0.90	2.54	C	EL	41.19	1.01	2.11	B	I	8.76	0.80	0.80	1.58	B	ER	46.63		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{OW}
	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.

⬡ CONTROLLING LOAD RATING

⬡1 DESIGN LOAD RATING (HL-93)

⬡2 DESIGN LOAD RATING (HS-20)

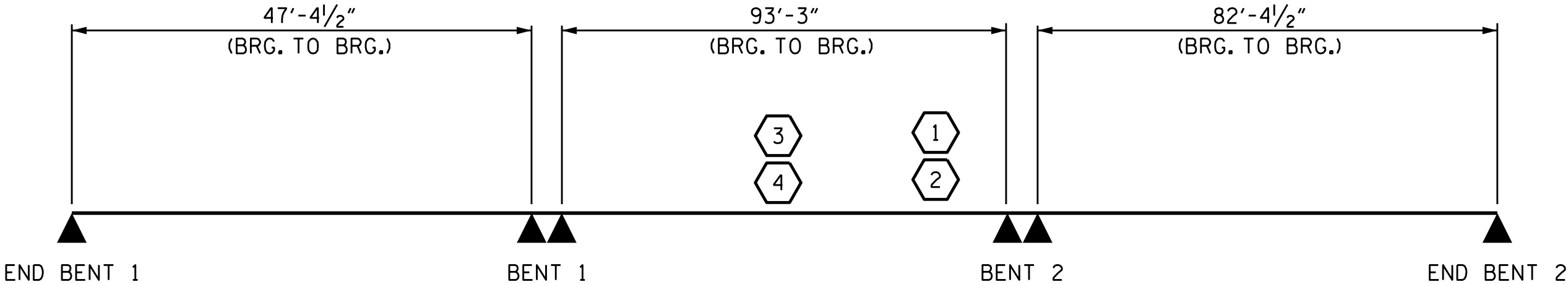
⬡3 LEGAL LOAD RATING **

⬡4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

ASSEMBLED BY : T. KIRSCHBAUM	DATE : 05-2025
CHECKED BY : S. AGUILAR	DATE : 05-2025
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

moffatt & nichol

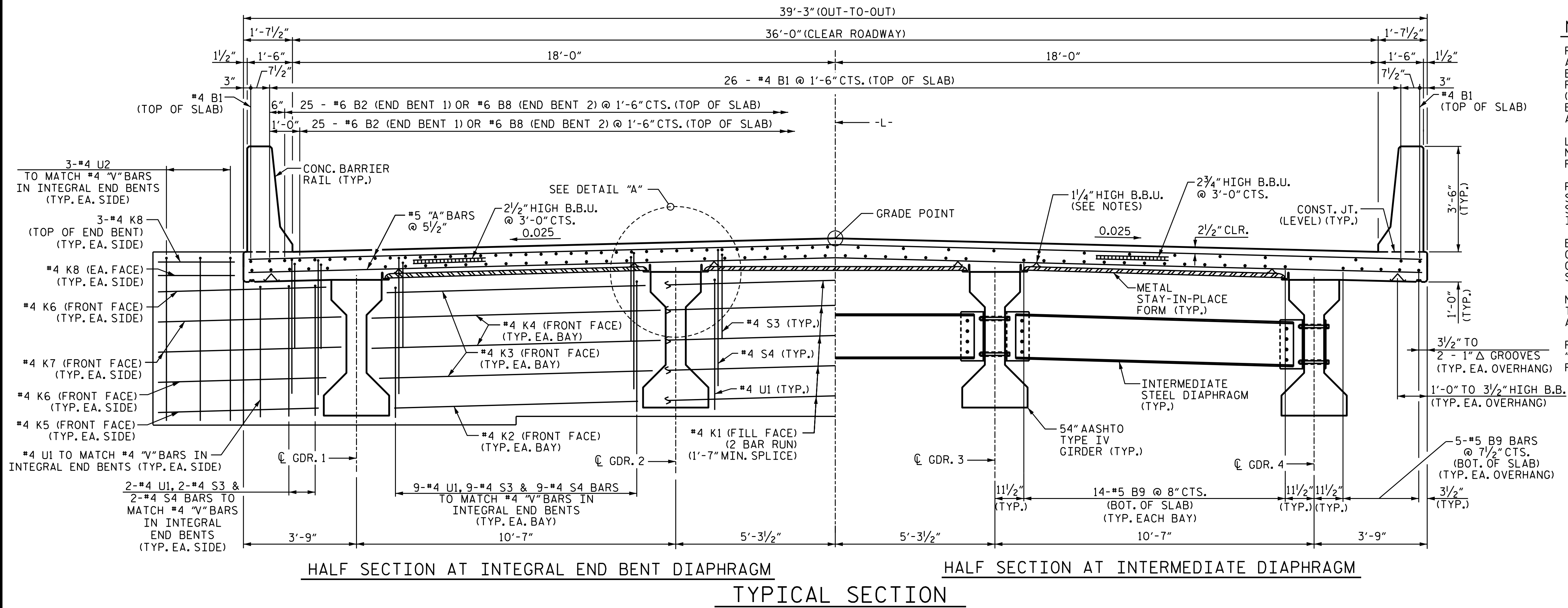
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

Signed by:

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			37



NOTES

PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS WHEN USING REMOVABLE FORMS. PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 3/4" ABOVE THE TOP OF THE REMOVABLE FORM.

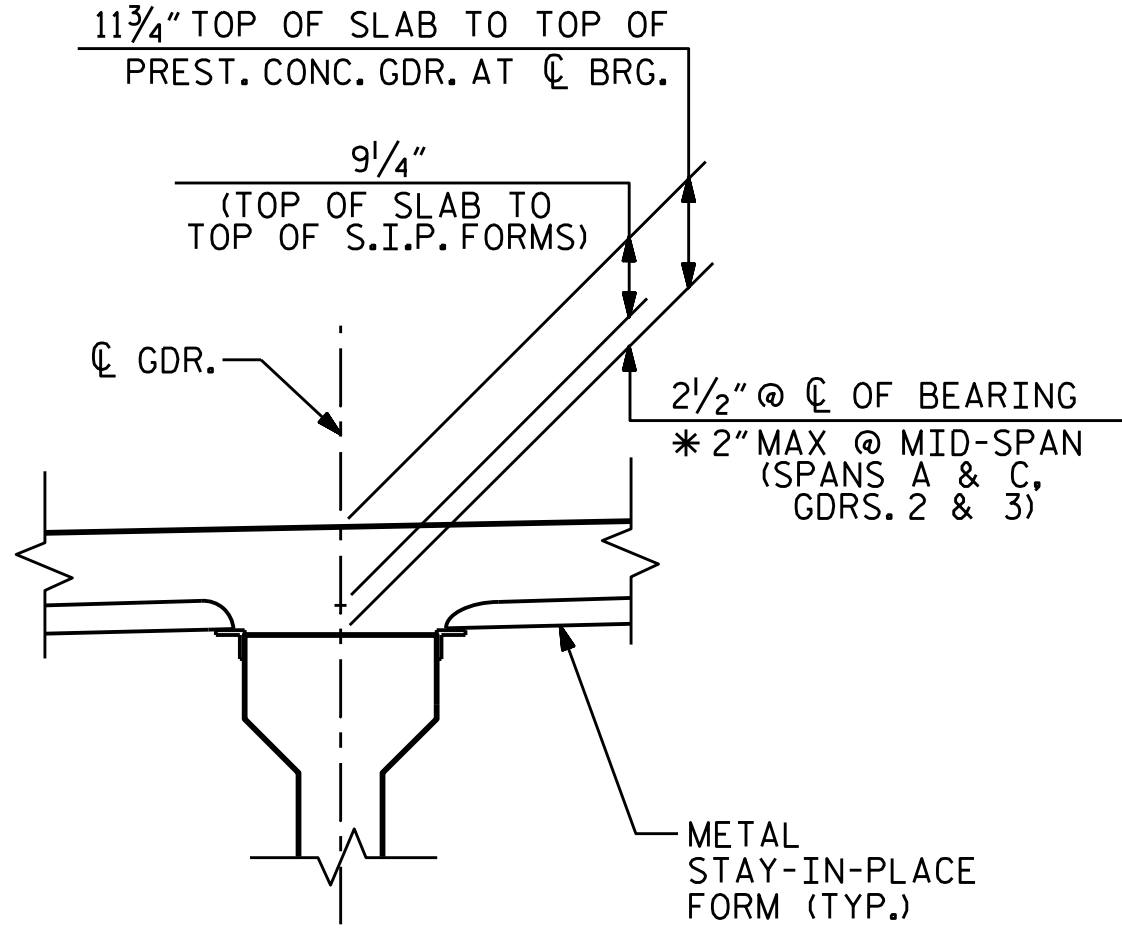
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

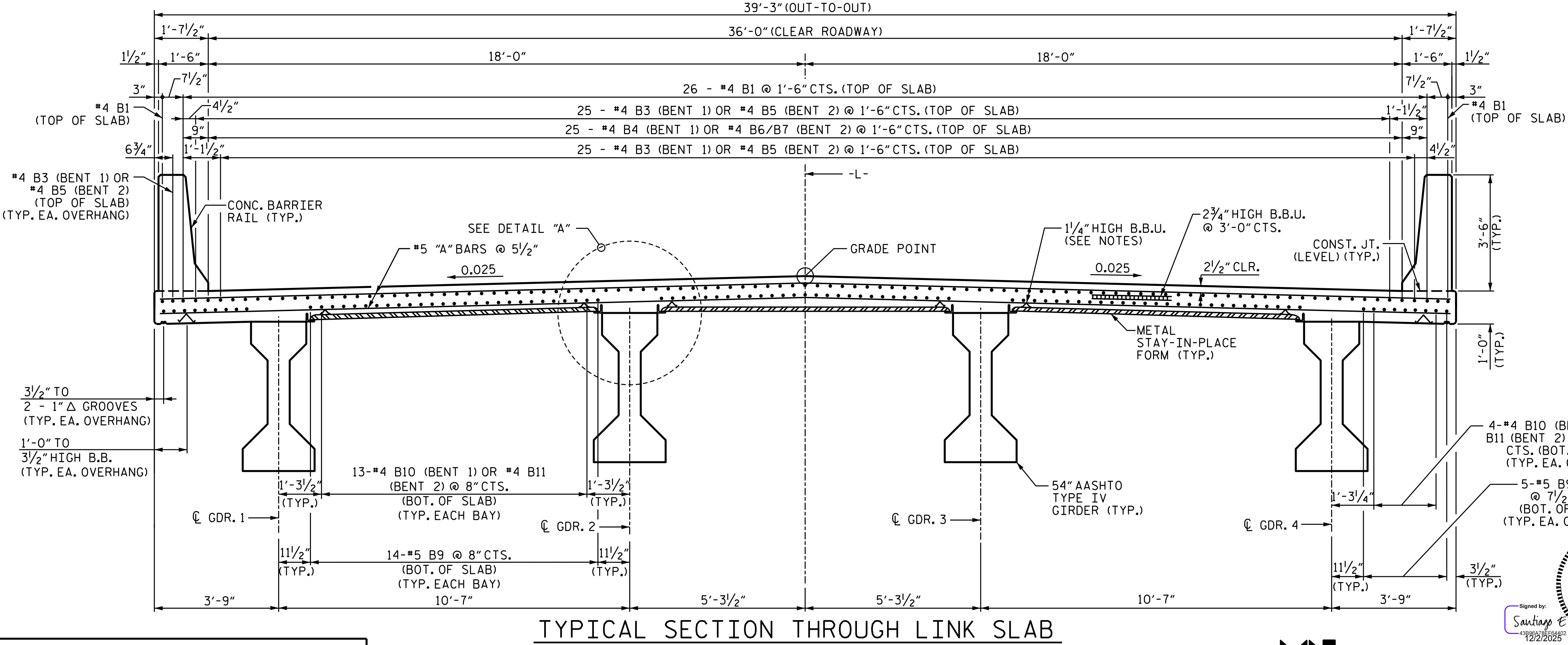
NO WELDING OF FORMS OR FALSEWORK TO THE TOP OF THE GIRDER WILL BE PERMITTED IN THE LINK SLAB AREA. SEE "PLAN OF SPANS" SHEETS FOR LOCATIONS.

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



DETAIL "A"

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



PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 1 OF 2

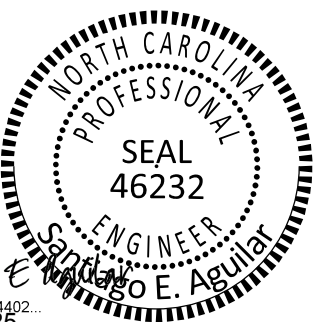
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-6
2			4			

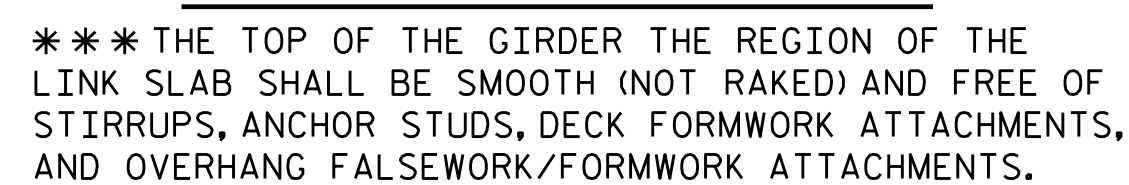
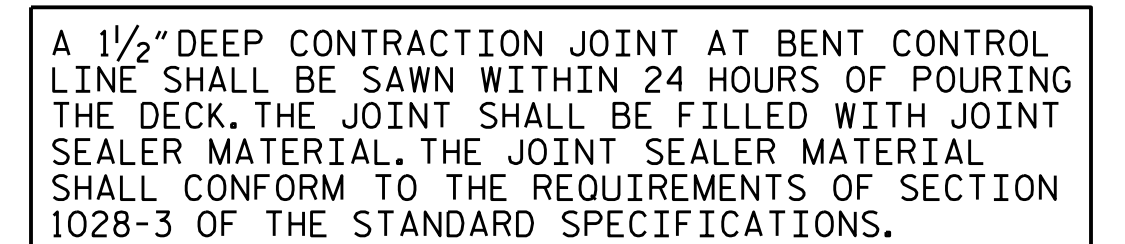
TOTAL SHEETS	
37	

DRAWN BY : T. KIRSCHBAUM DATE : 05-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

moffatt & nichol
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(919) 781-4626 VOICE (919) 781-4869 FAX
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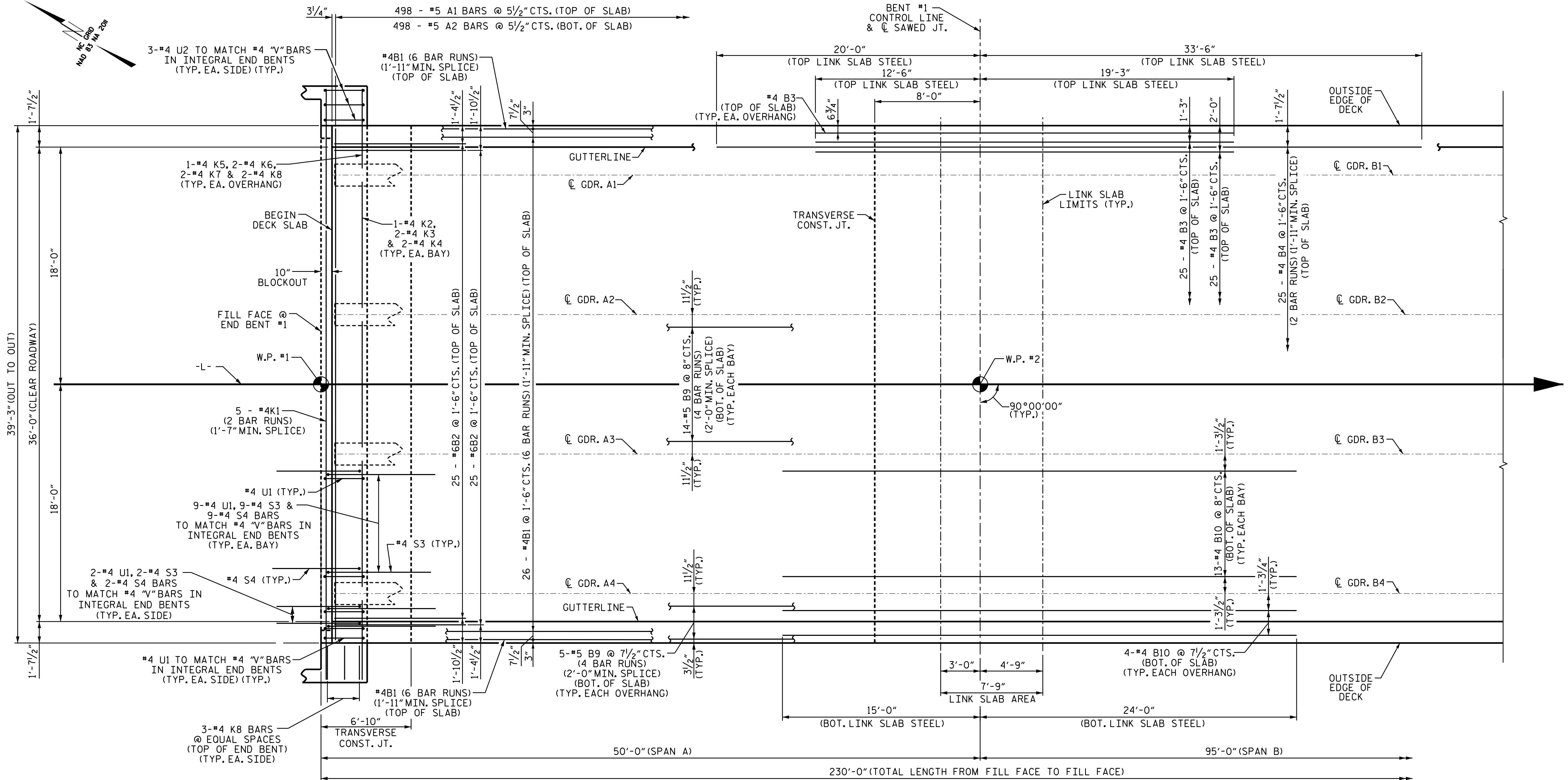
DOCUMENT NOT CONSIDERED
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SHEET 2 OF 2

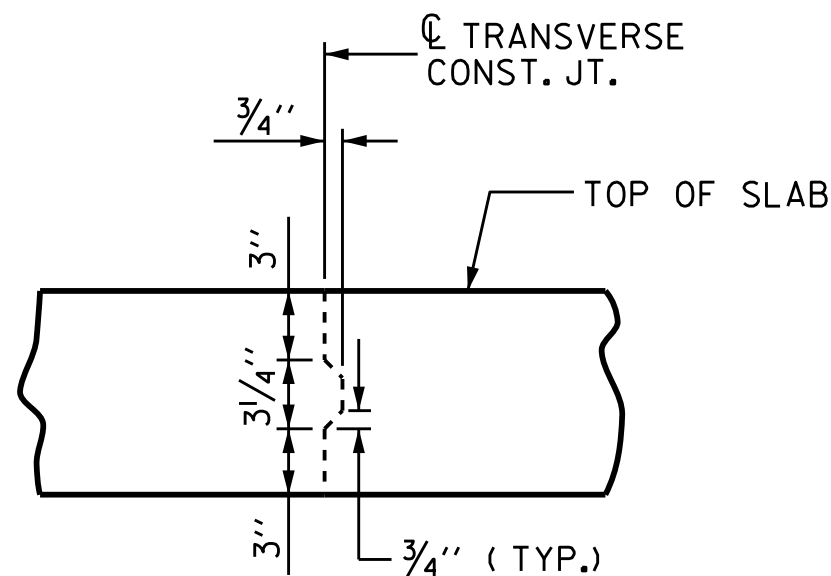
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 37
2			4			

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+kirschbaum



PLAN OF SPAN A



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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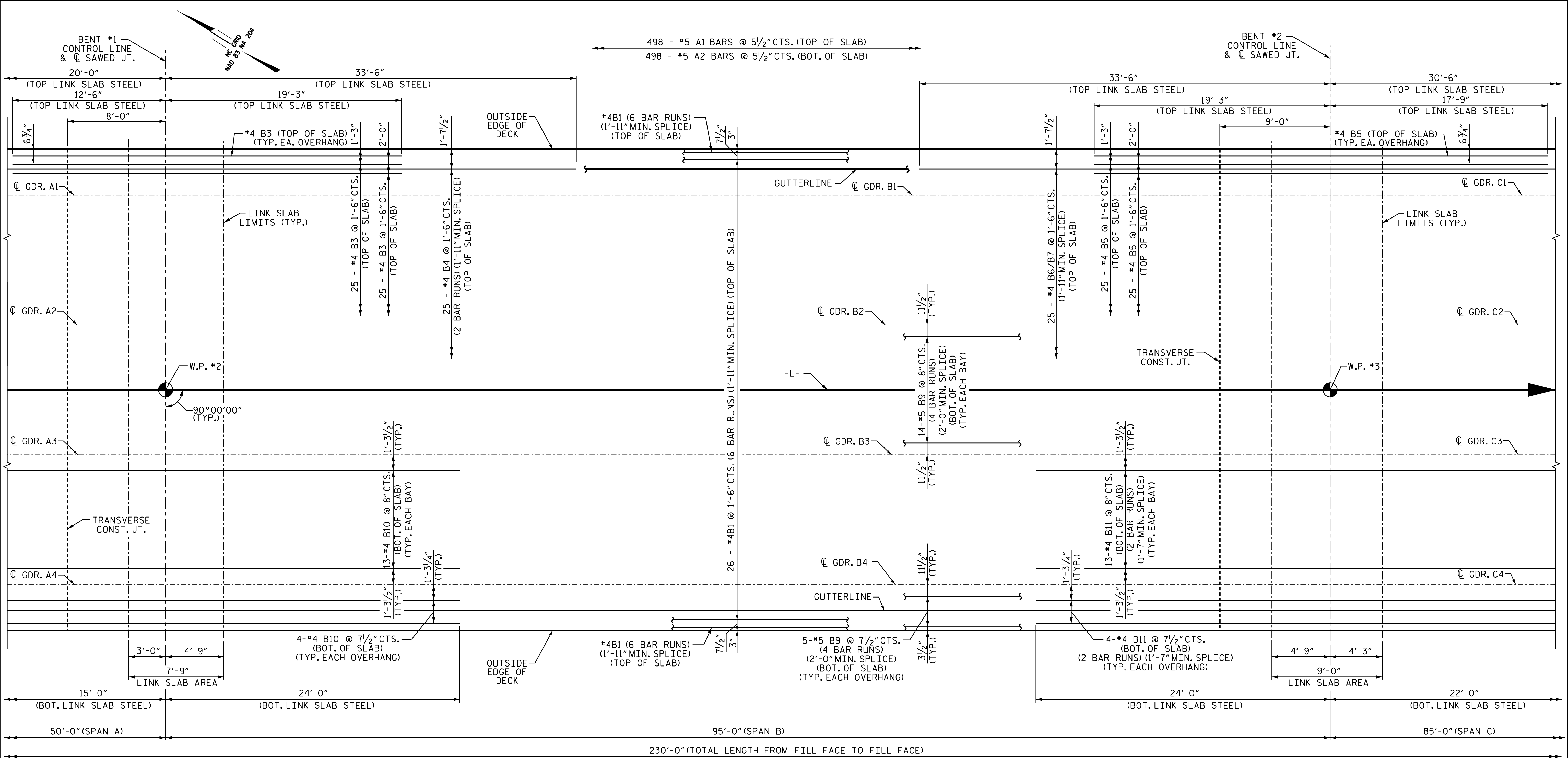


PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

SHEET 1 OF 5

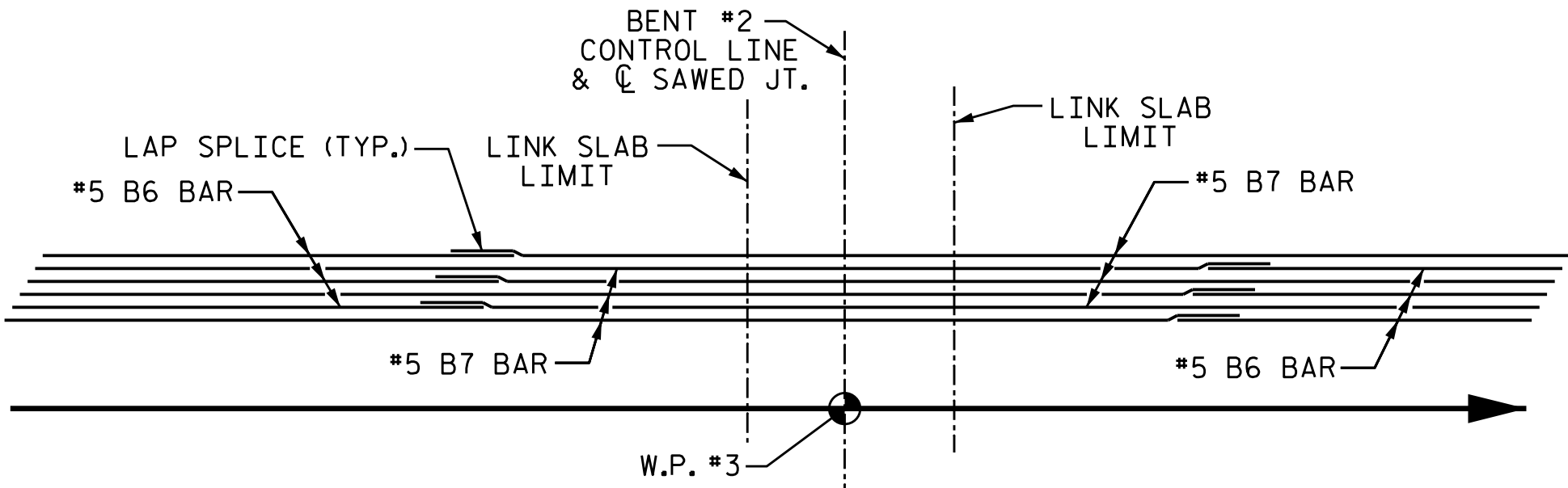
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 37

12/2/2025 05:18:10 PM \\RA10011-108\BR-0060\Structures\01_CADD\02_Final Drawings\401_01_BR0060_SMU_P502_009_000014.dgn
tkirschbaum



PLAN OF SPAN B

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE SHEET S-8



PLACEMENT OF B6/B7 BARS

NOTE: REINFORCEMENT SPLICES SHALL NOT BE PLACED INSIDE THE LINK SLAB LIMITS.
ALTERNATE THE PLACEMENT OF ADJACENT BARS AS SHOWN IN THE ABOVE FIGURE.

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DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

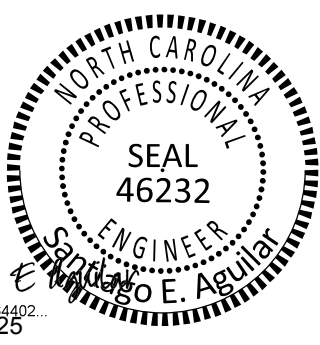
PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 5

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

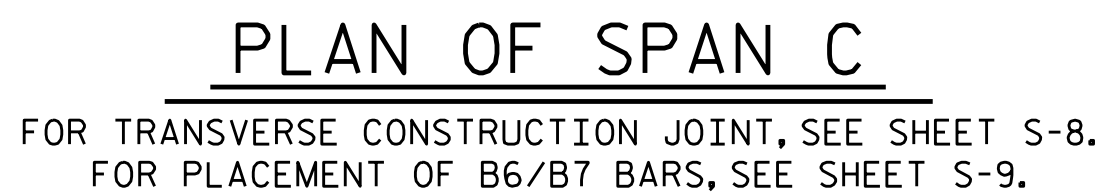


Signed by:
Santiago E. Aguilar
09/02/2025

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9	TOTAL SHEETS
1			3				37
2			4				



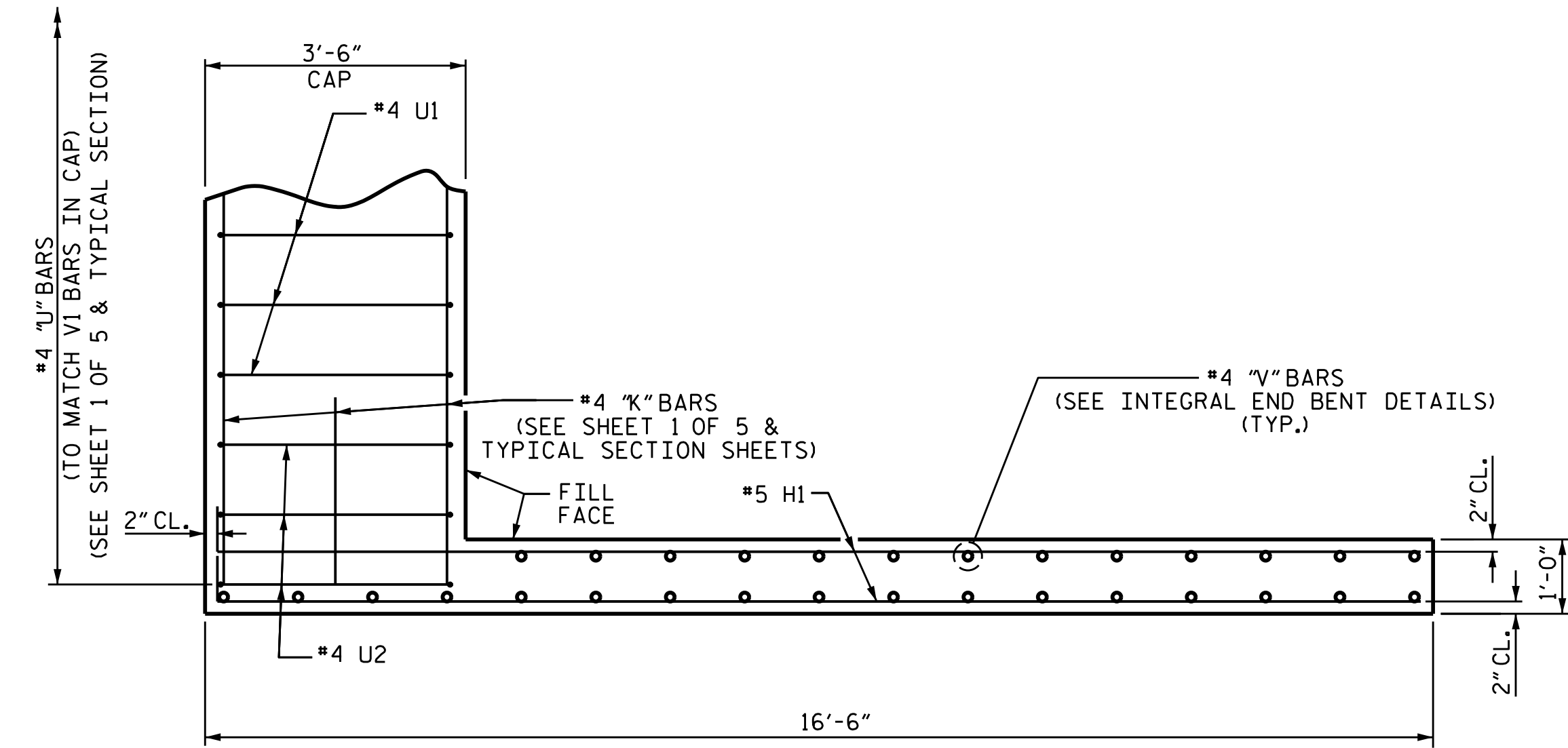
SHEET 3 OF 5

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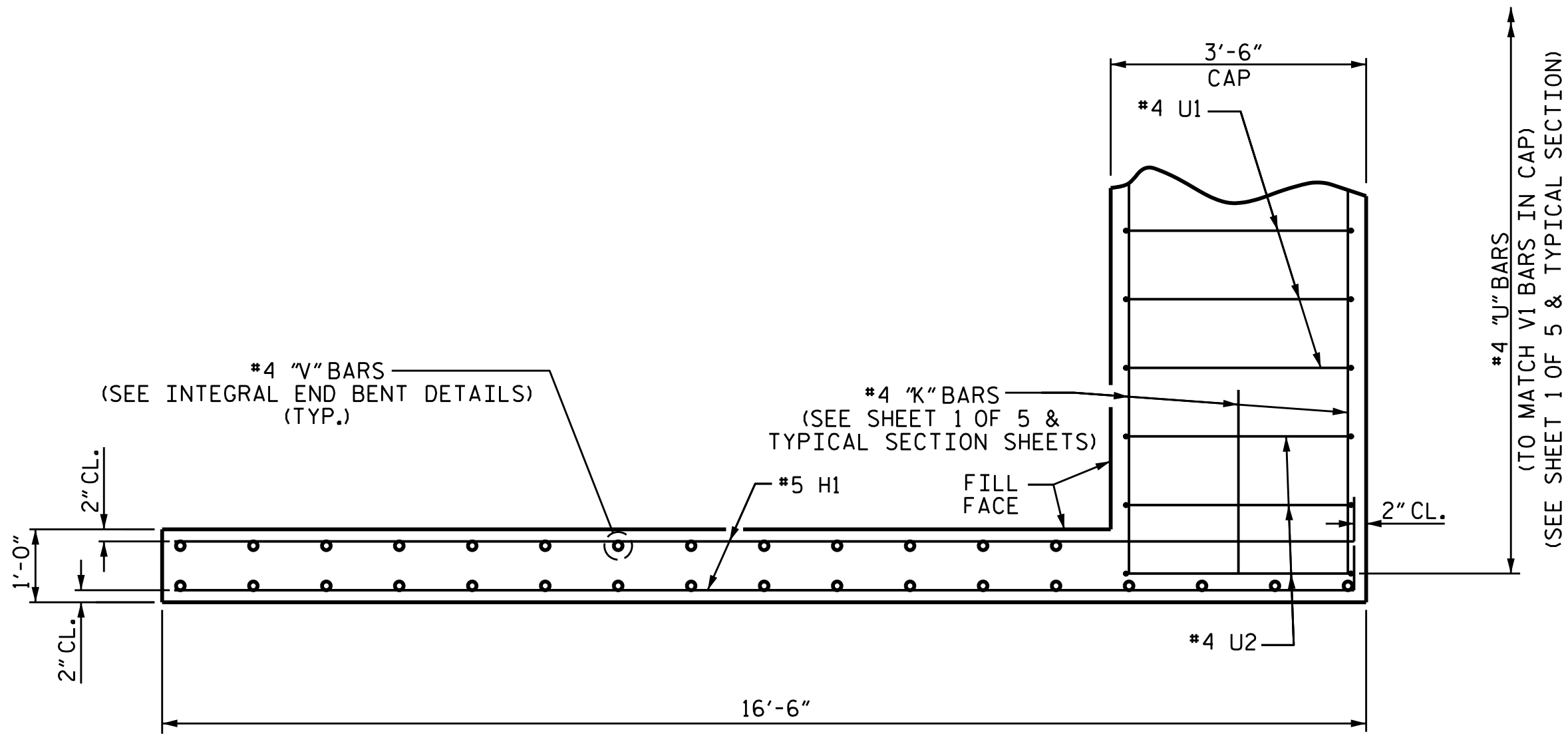
A circular professional engineer seal for the State of North Carolina. The outer ring contains the text "NORTH CAROLINA" at the top and "ENGINEER" at the bottom. Inside this ring, the word "PROFESSIONAL" is written in an arc. In the center, the word "SEAL" is above the number "46232". Below the number, the name "Sergio E. Aguilar" is written in a cursive script. A small "EIT" logo is visible in the bottom left corner of the seal.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE

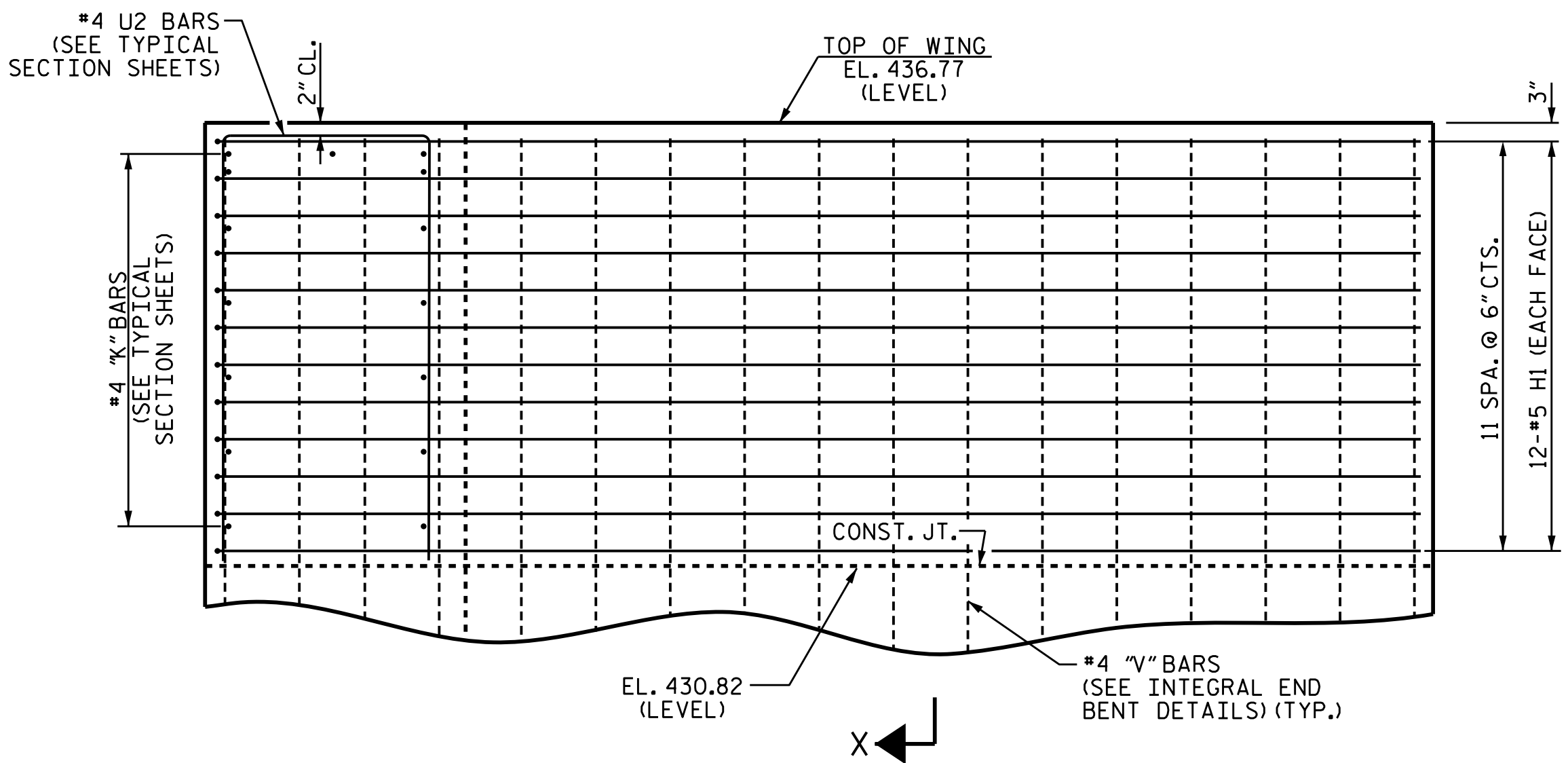
PLAN OF SPAN C



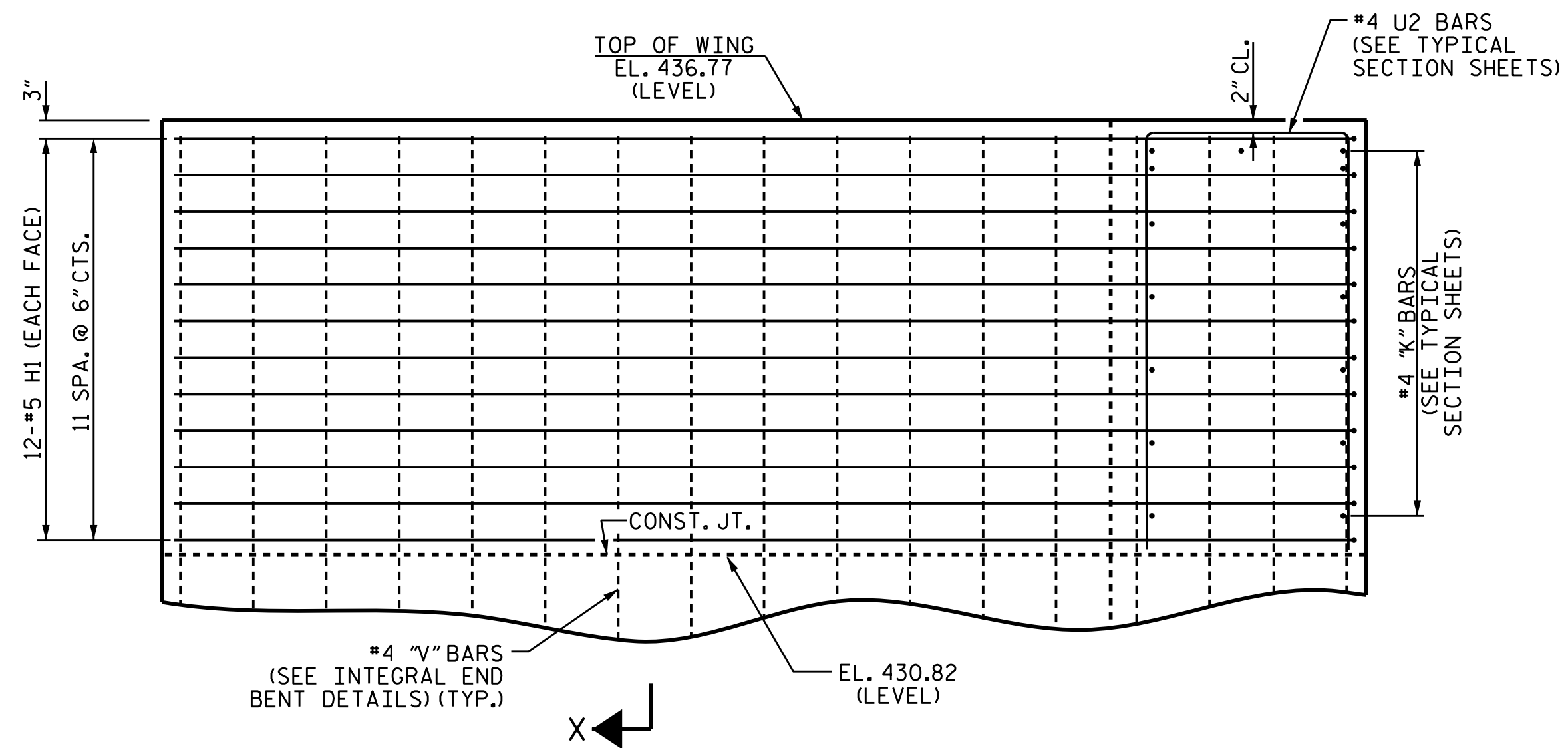
PLAN OF WING (W1)



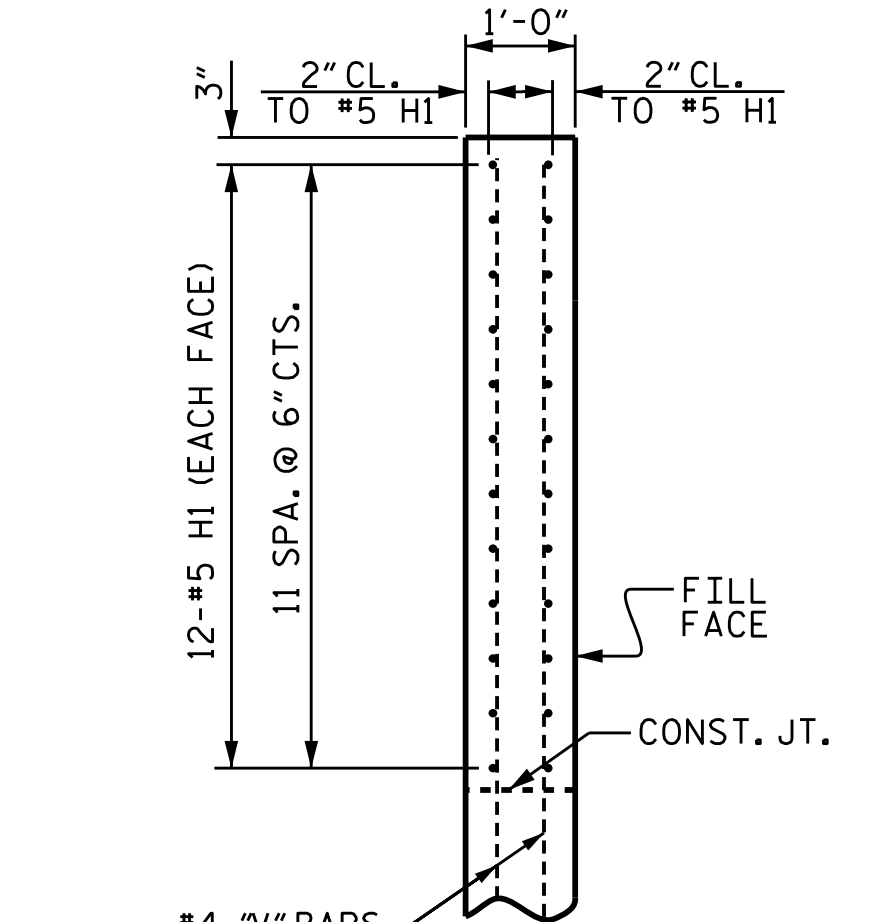
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

WING DETAILS

FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT 1" SHEETS

PROJECT NO. BR-0060

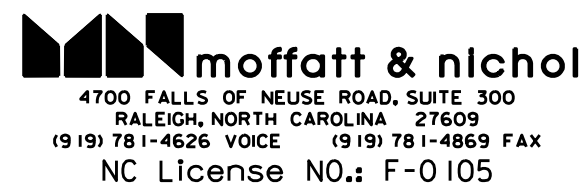
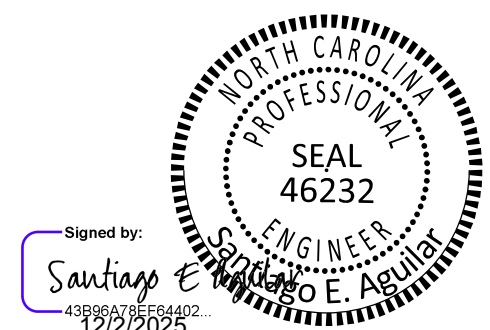
ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
UPPER WING DETAILS
AT INTEGRAL END BENT 1

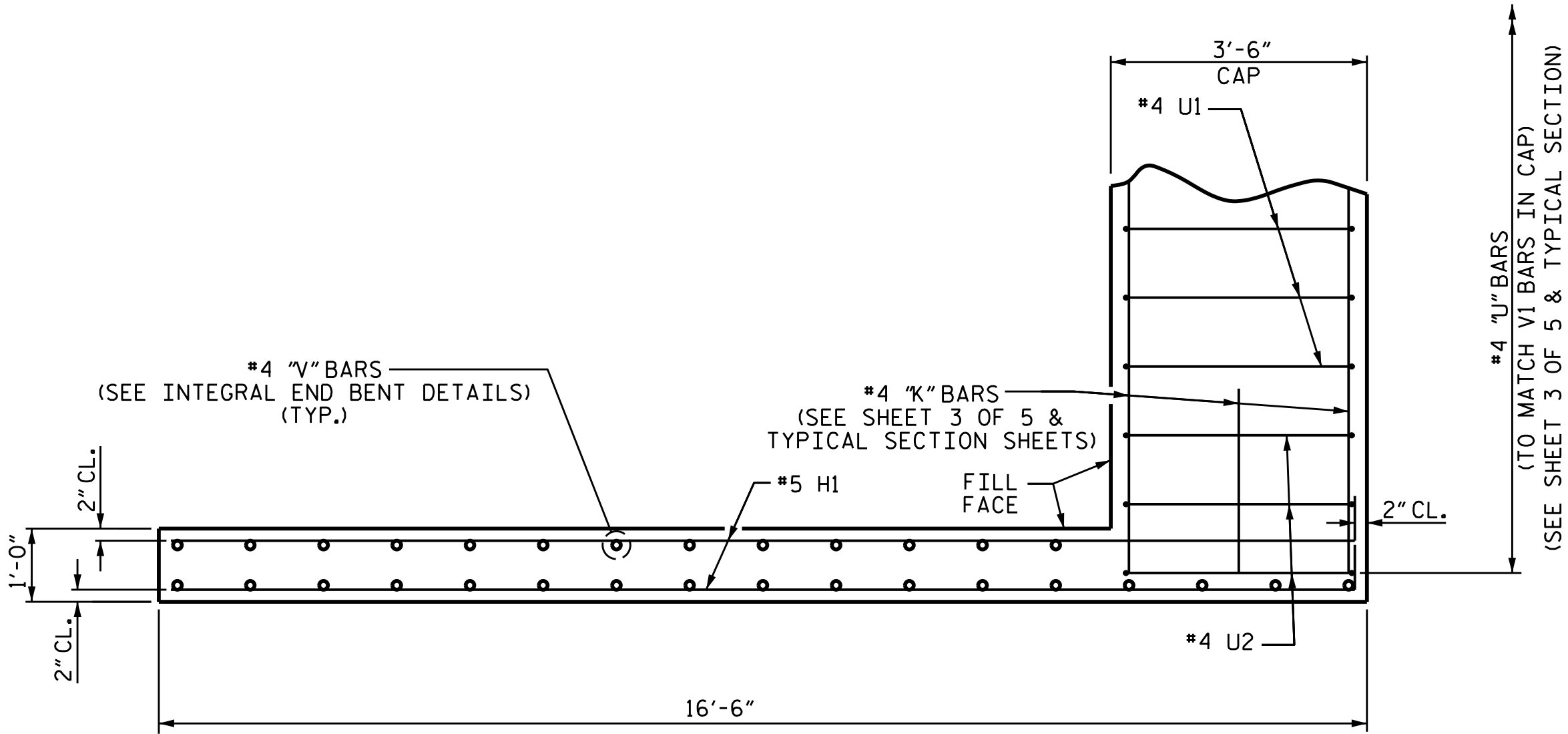
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 37



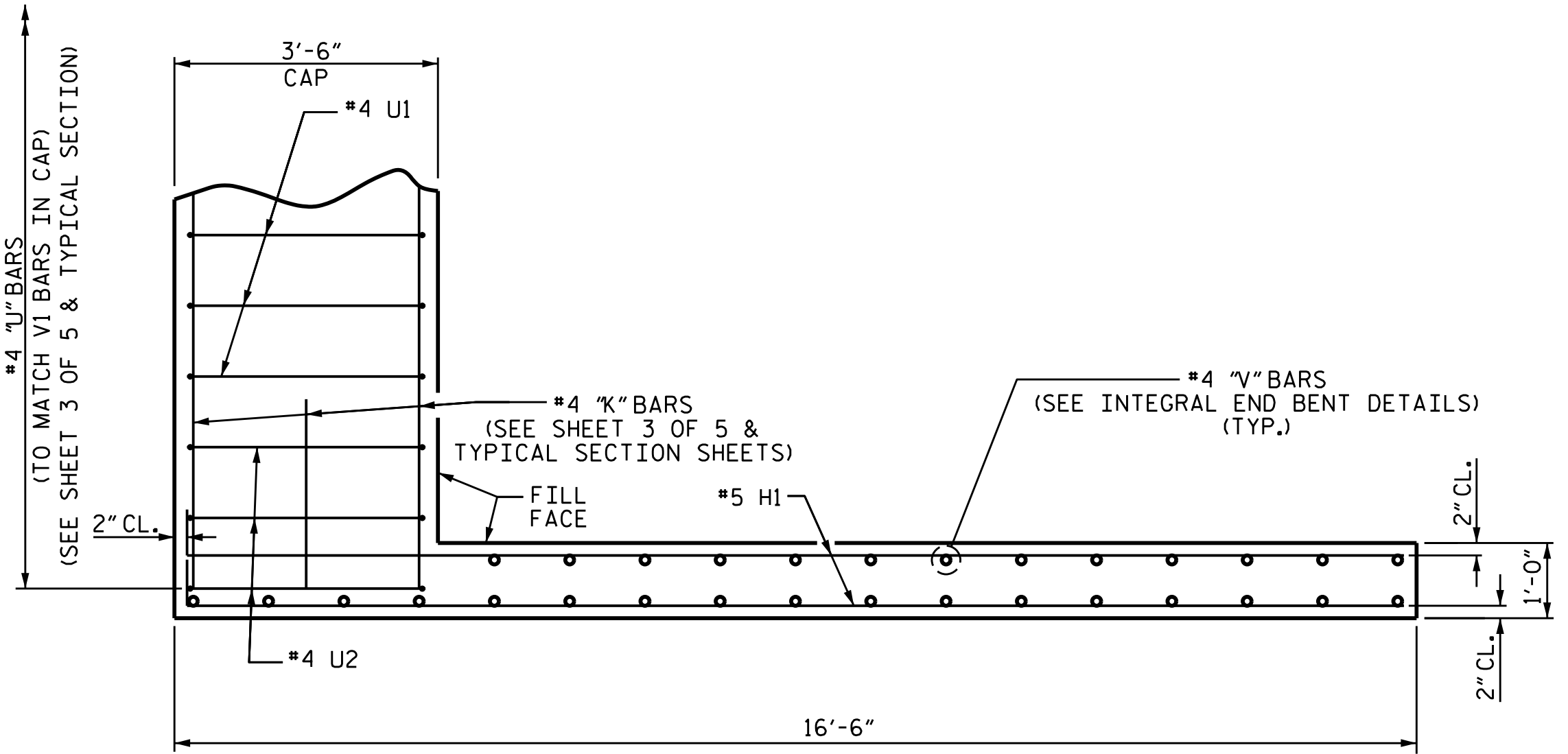
DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

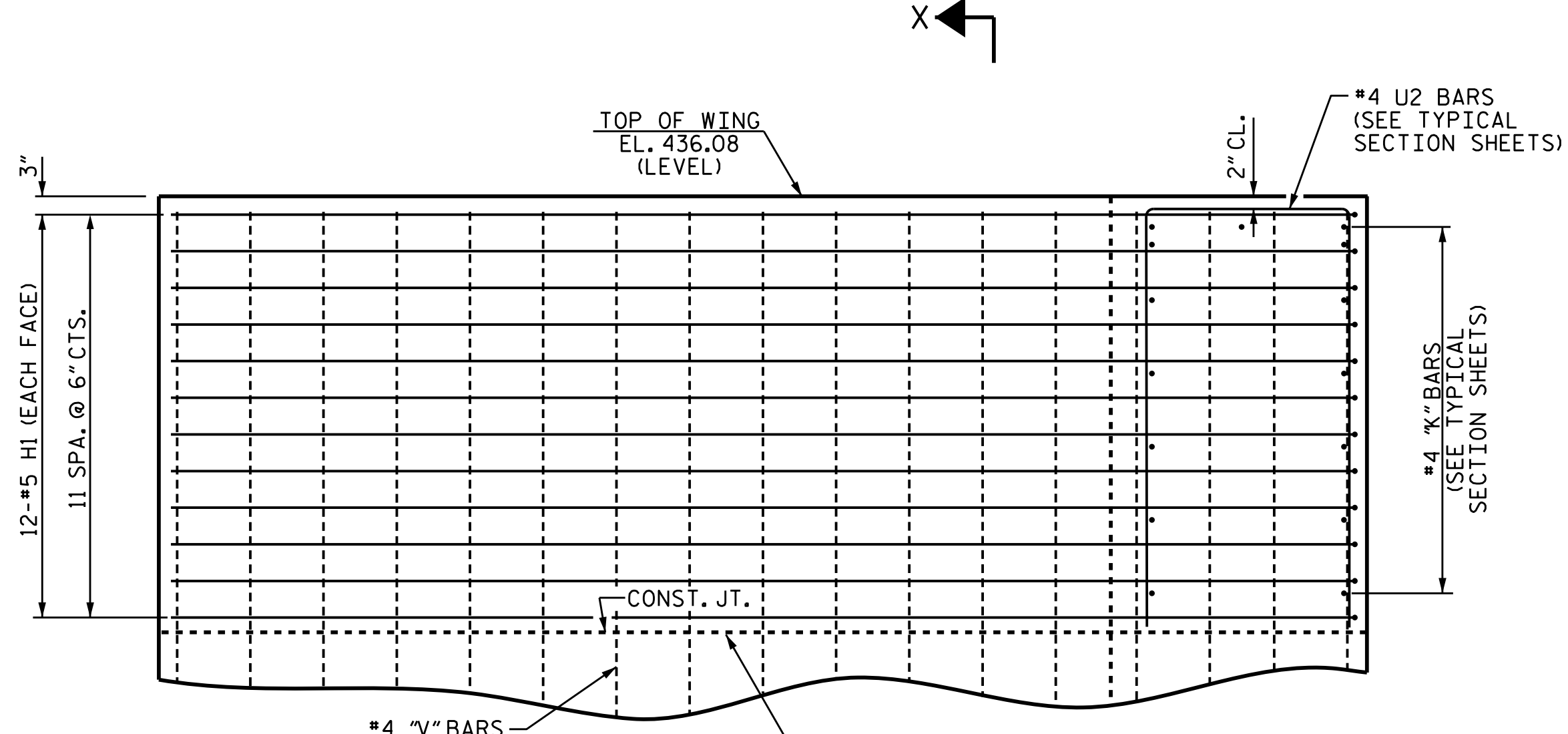
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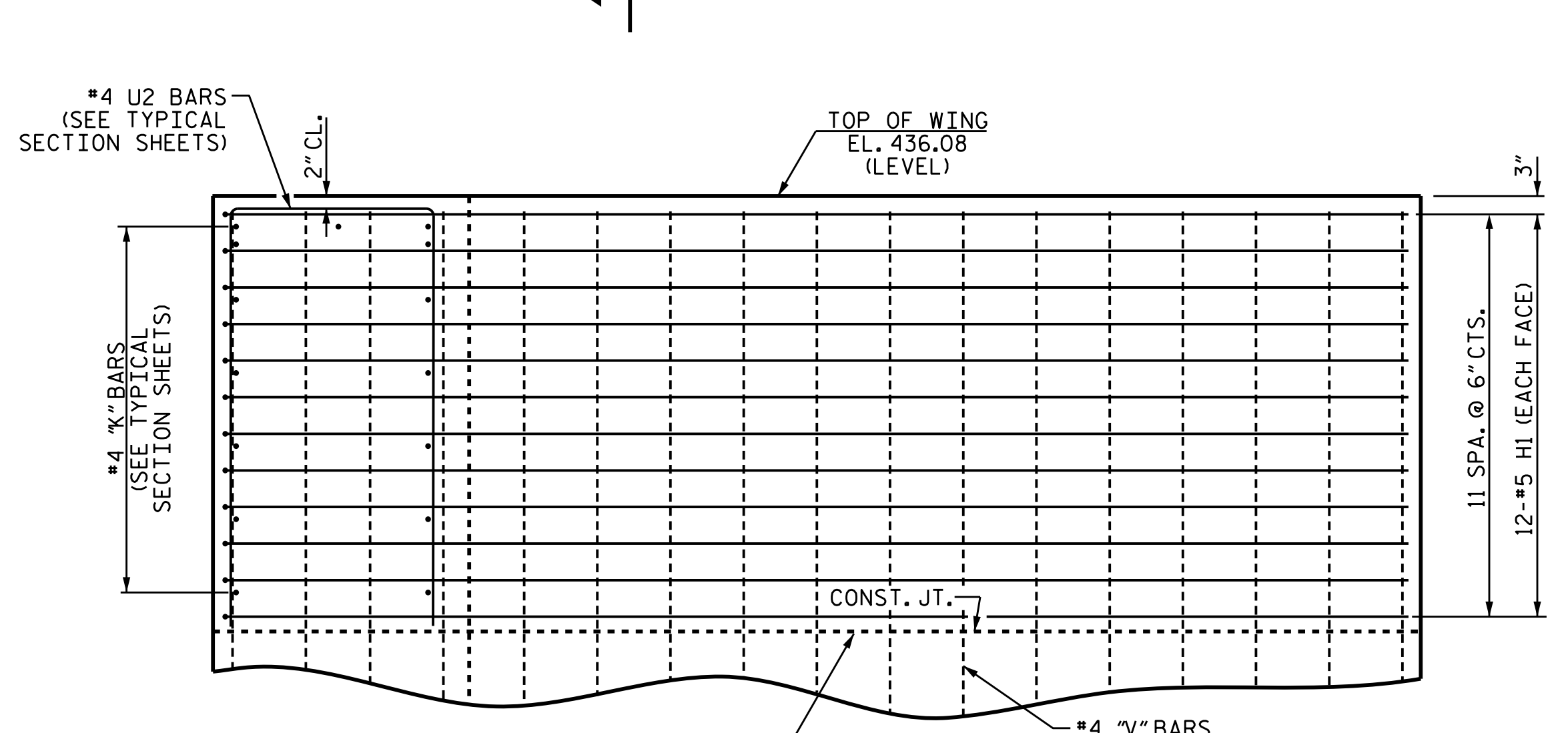
PLAN OF WING (W3)



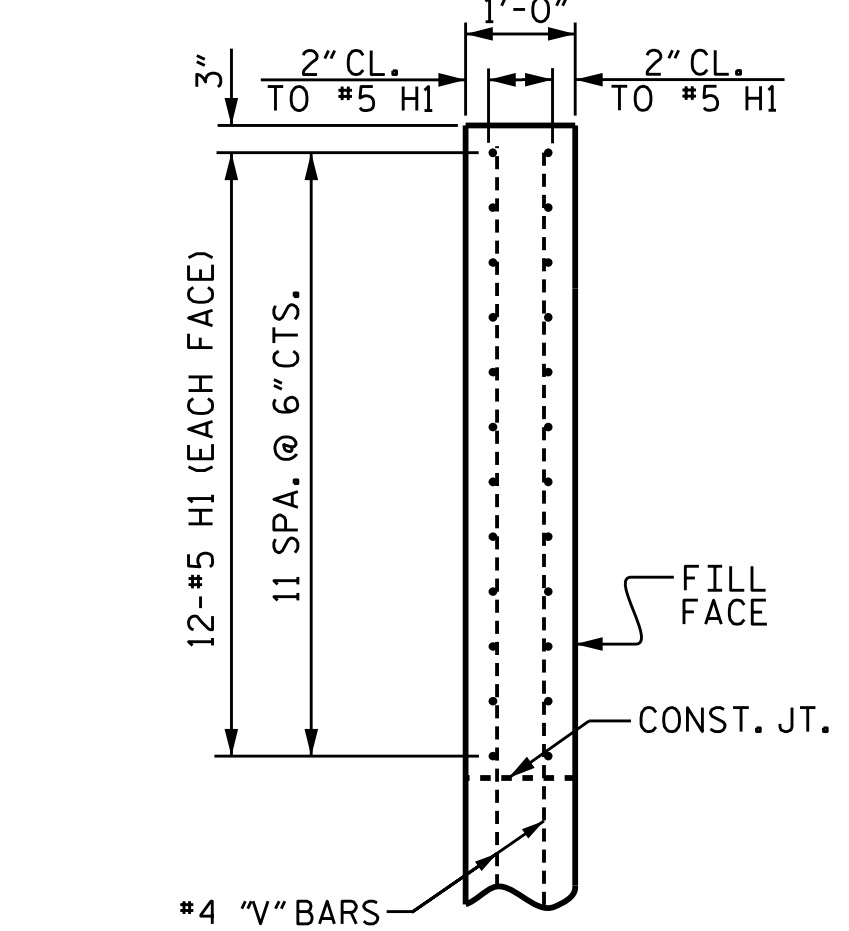
PLAN OF WING (W4)



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION X-X

WING DETAILS

FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT 2" SHEETS

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 5 OF 5

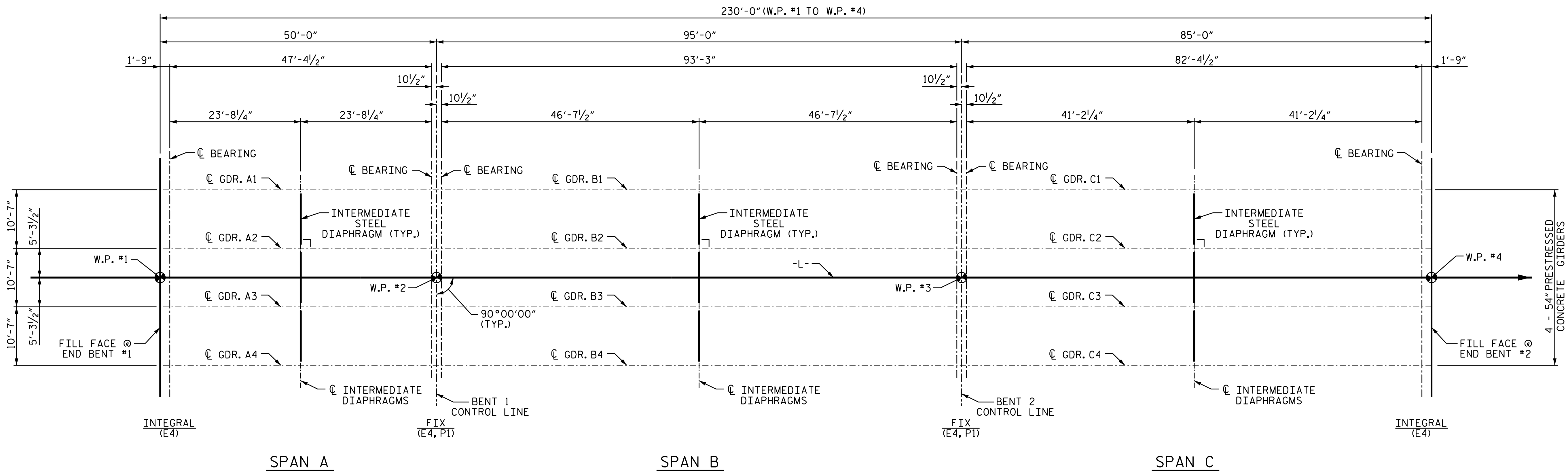
DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

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(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

Signed by: *Santiago E. Aguilar*
12/2/2025
NORTH CAROLINA
PROFESSIONAL
SEAL
46232
ENGINEER
SANTIAGO E. AGUILAR

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-12
2			4			
TOTAL SHEETS						37



FRAMING PLAN

NOTES:

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

FOR ELASTOMERIC BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

END BENTS AND INTERMEDIATE BENTS ARE PARALLEL.

ALL GIRDERS ARE PARALLEL TO -L-.

CONTRACTOR IS RESPONSIBLE FOR FURNISHING ANY NECESSARY TEMPORARY BRACING FOR GIRDERS DURING ERECTION PRIOR TO PLACING DIAPHRAGMS AND DECK.

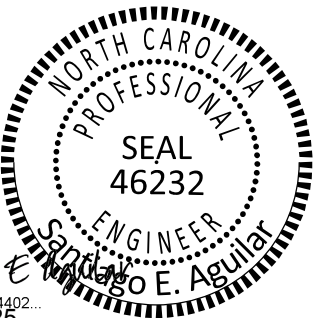
ALL DIMENSIONS SHOWN ARE HORIZONTAL.

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN



Signed by:
S. Aguilera
12/2/2025

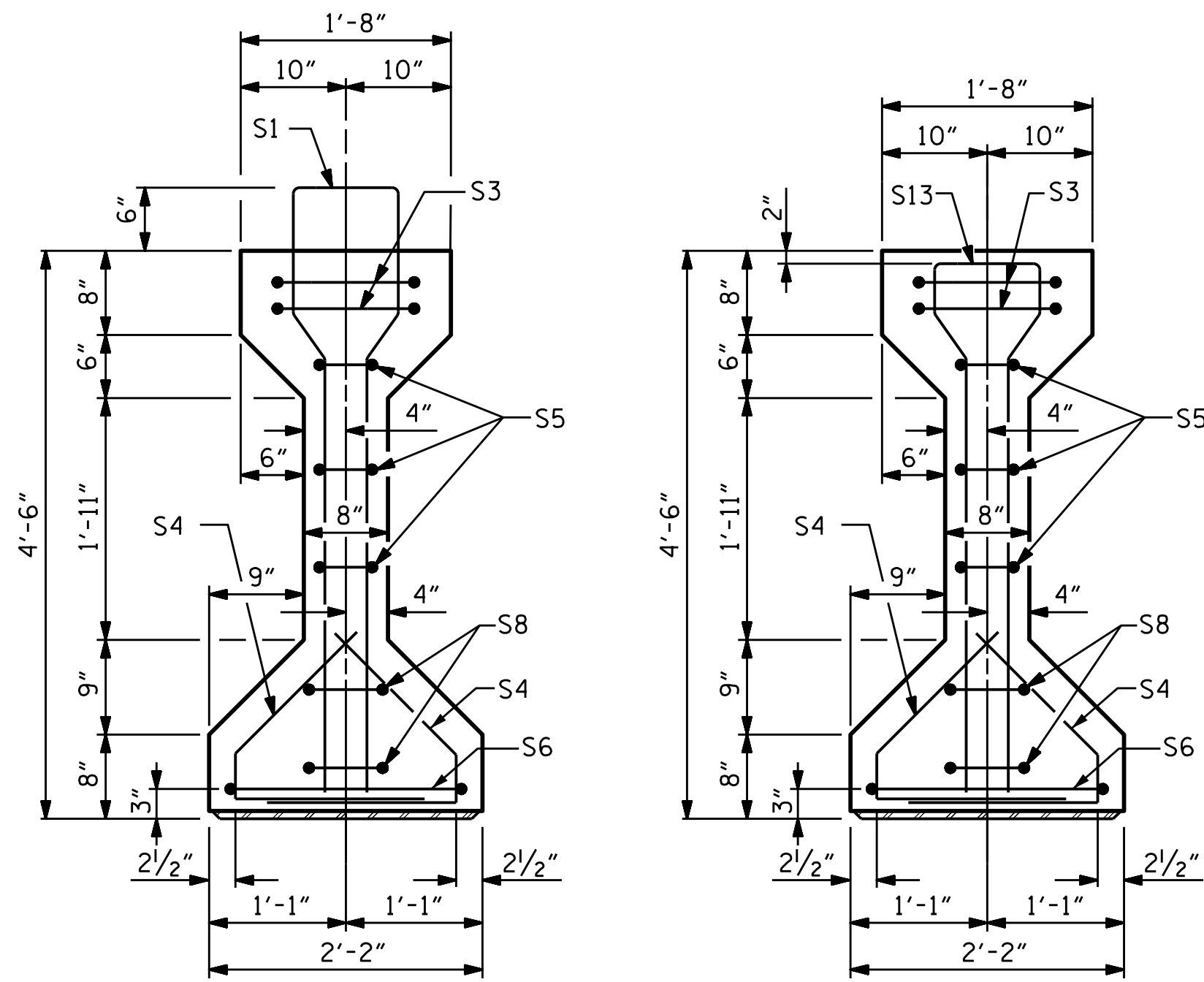
mo **hoffatt & nichol**
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	TOTAL SHEETS
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2			4				

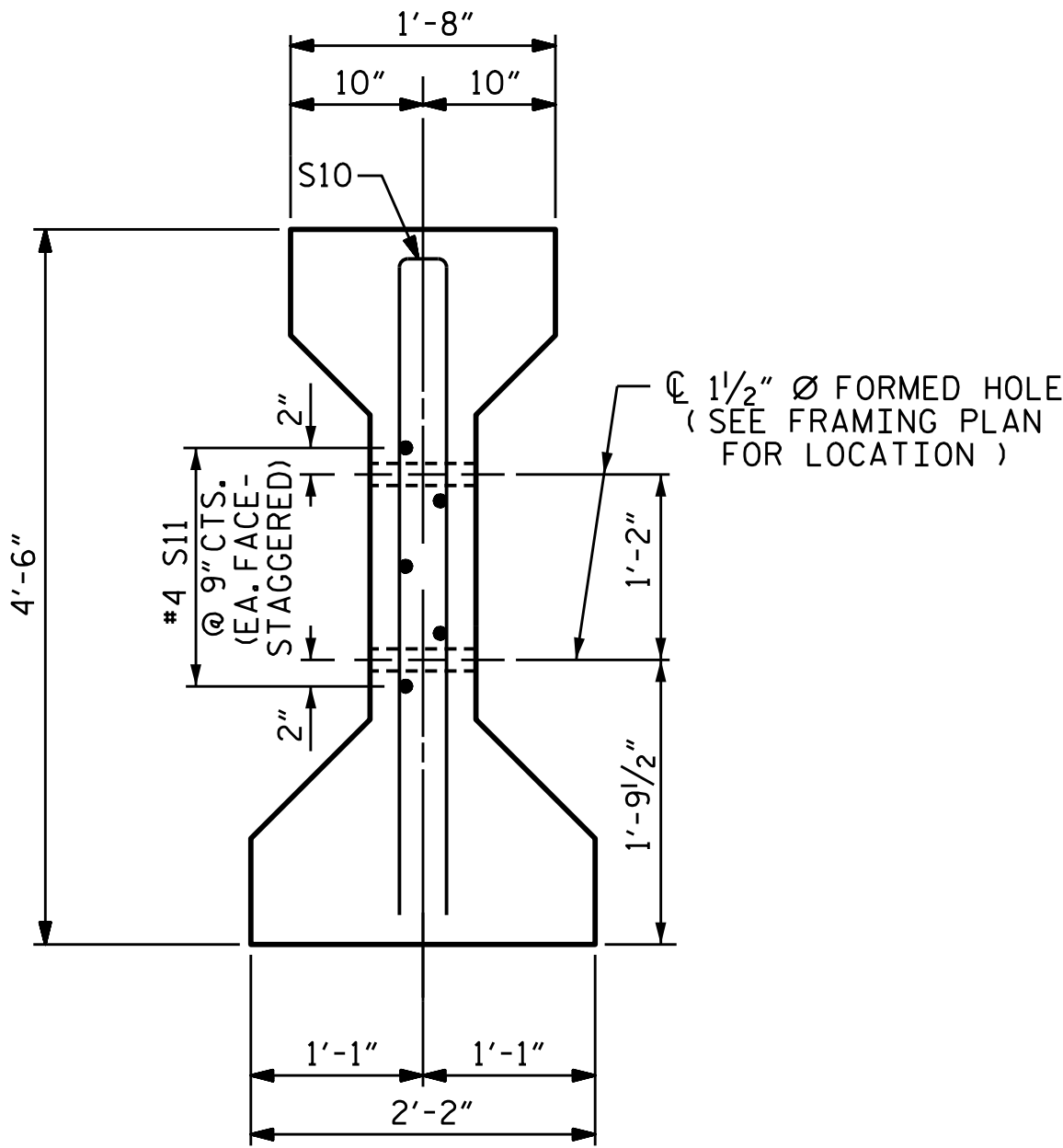
DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILERA DATE : 09-2025





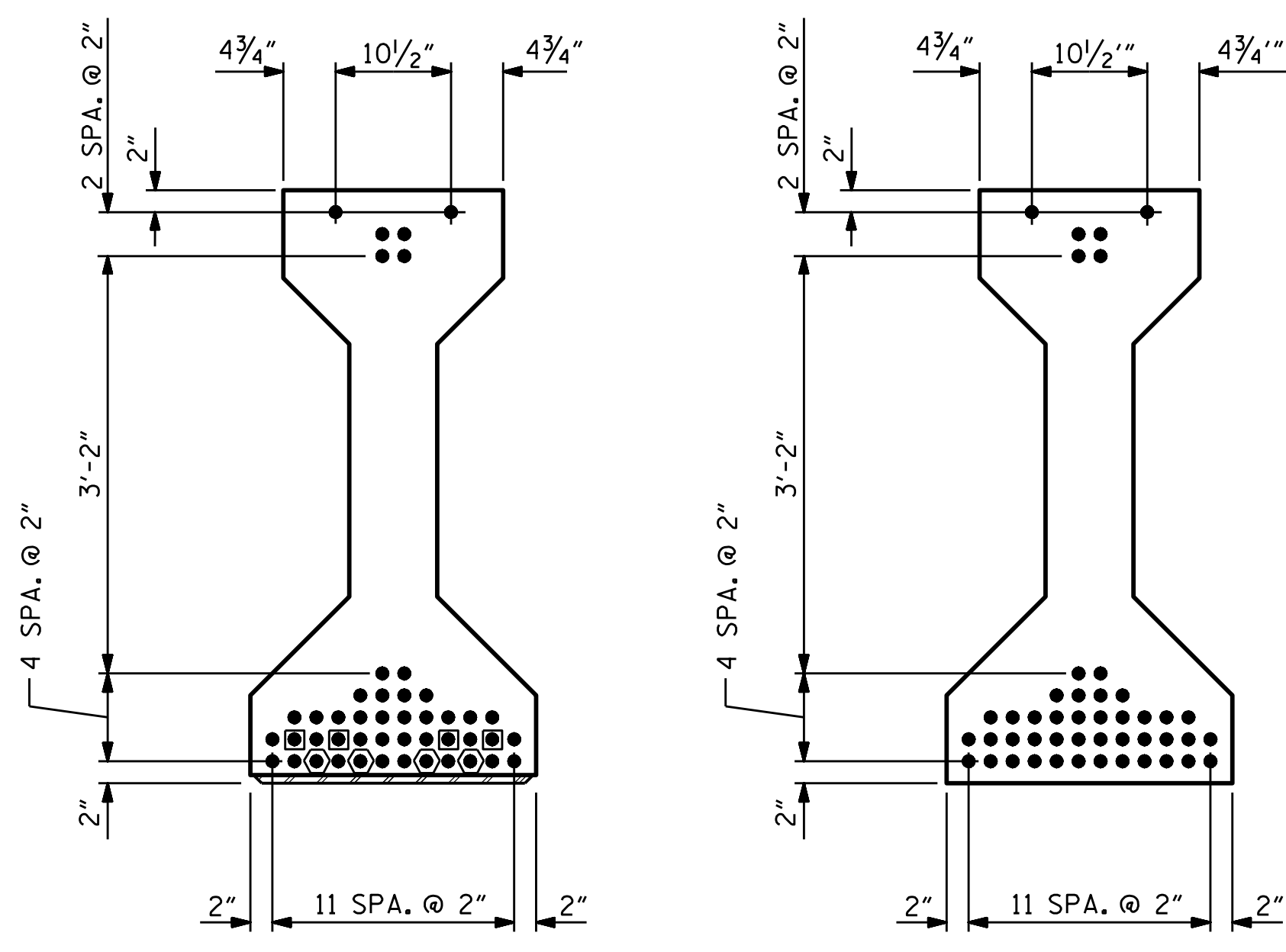
SECTION A-A

SECTION B-B



SECTION C-C

(S1 BARS NOT SHOWN)



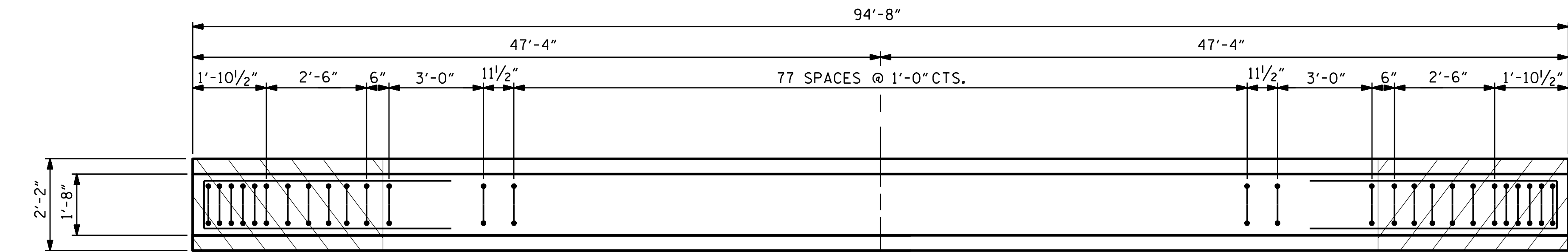
AT END OF GIRDER

AT C OF GIRDER

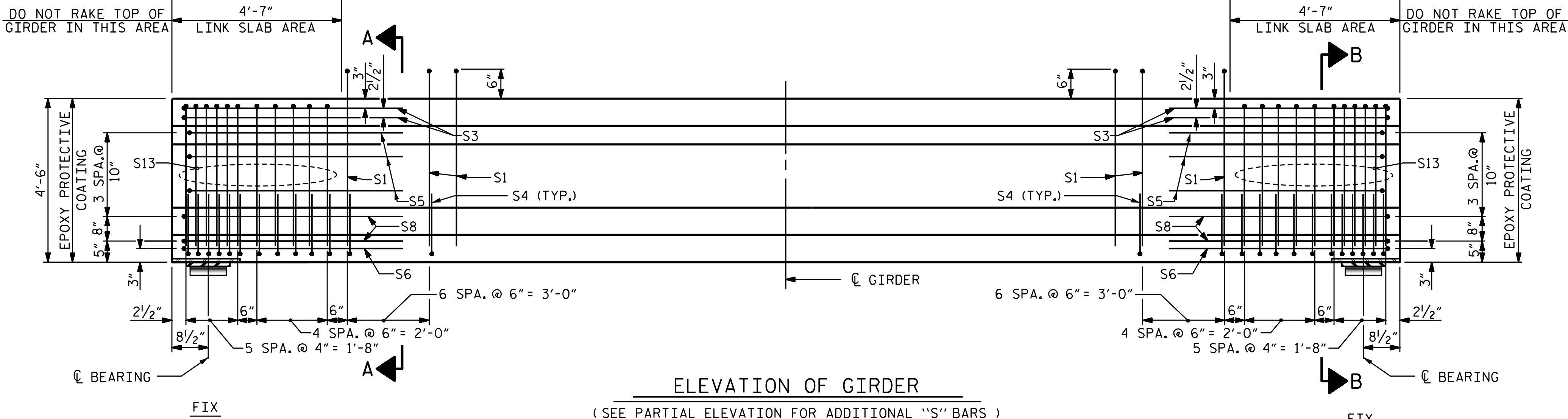
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

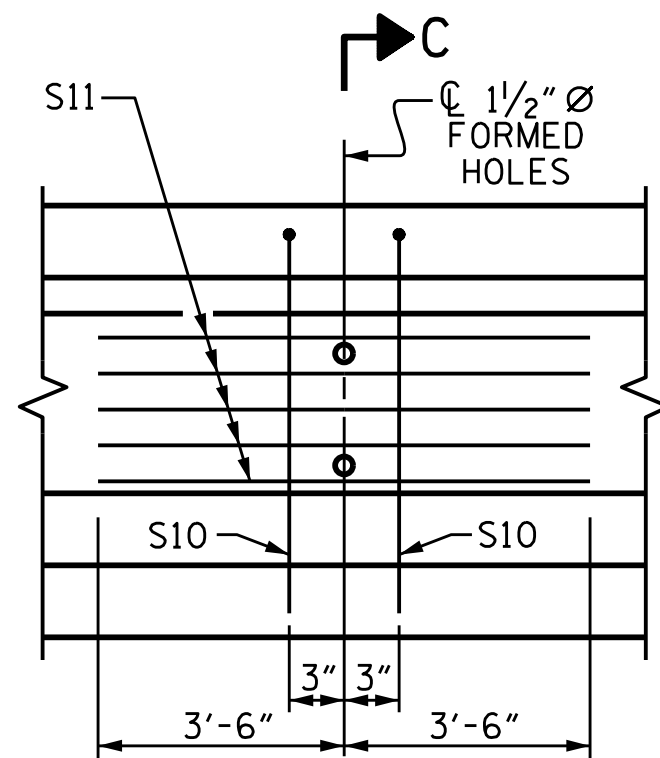


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

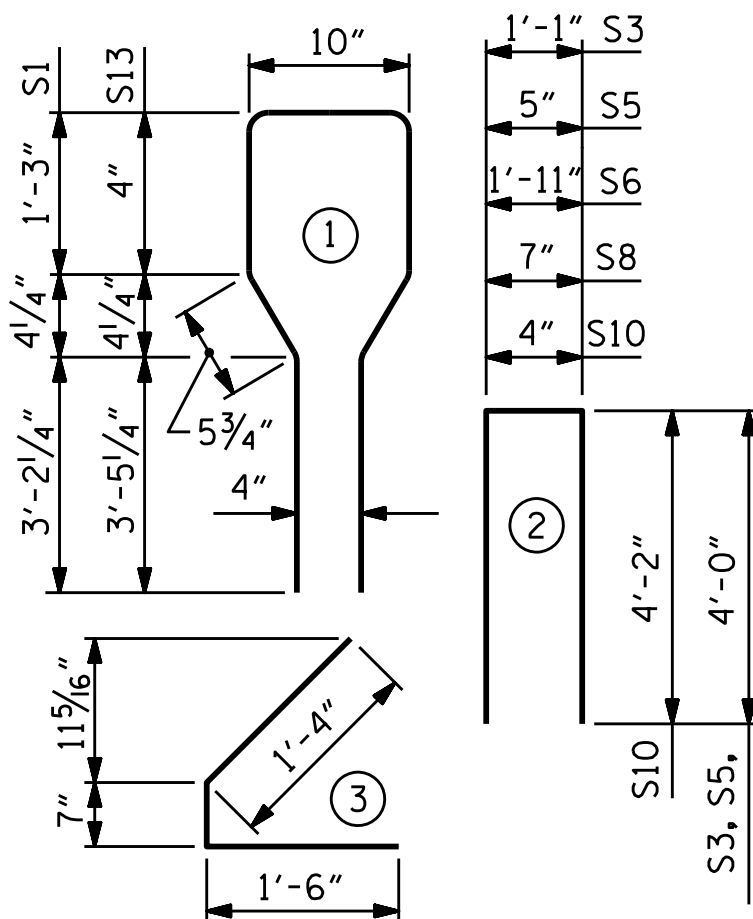
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	92	#4	1	10'-8"	656
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	22	#6	1	9'-4"	308

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1,263	19.3	46
INTERIOR GIRDER	1,263	19.3	46

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	94'-8"	378'-8"

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 5

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	
2			4			37	

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
LINK SLAB SPAN B

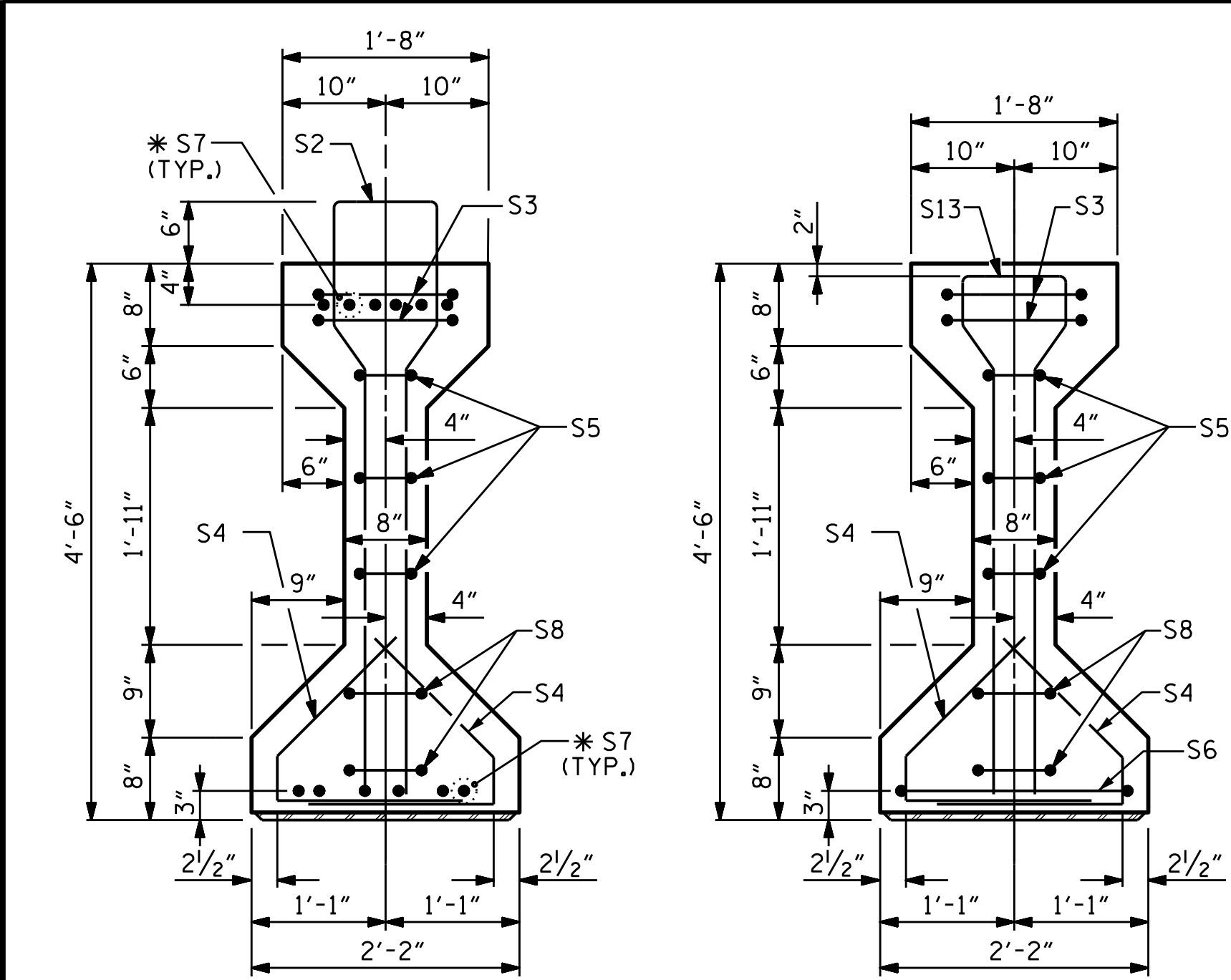
ASSEMBLED BY : T. KIRSCHBAUM	DATE : 09-2025
CHECKED BY : P. SHAW	DATE : 09-2025
DRAWN BY : JMB 12/87	REV. 1/15 MAA/TMG
CHECKED BY : ARB 12/87	REV. 12/17 MAA/THC
	REV. 10/23 BNB/AKP

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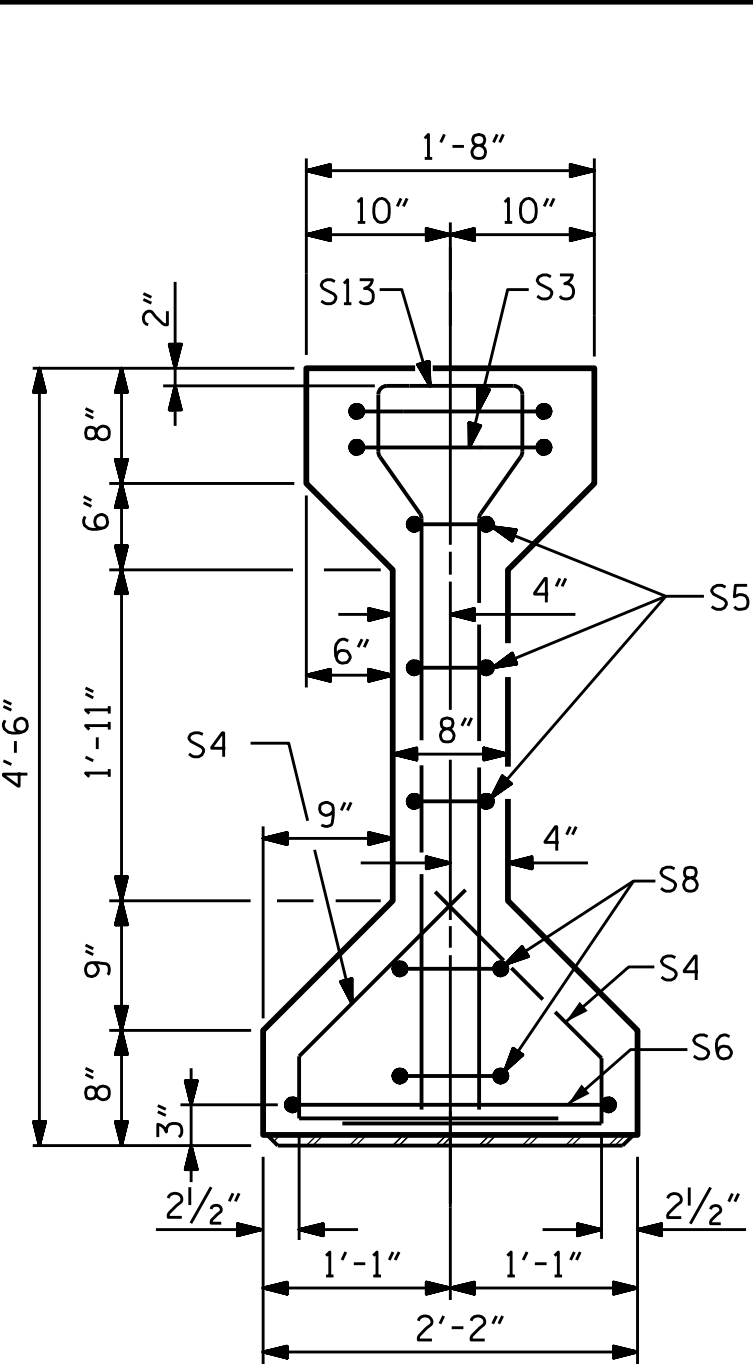
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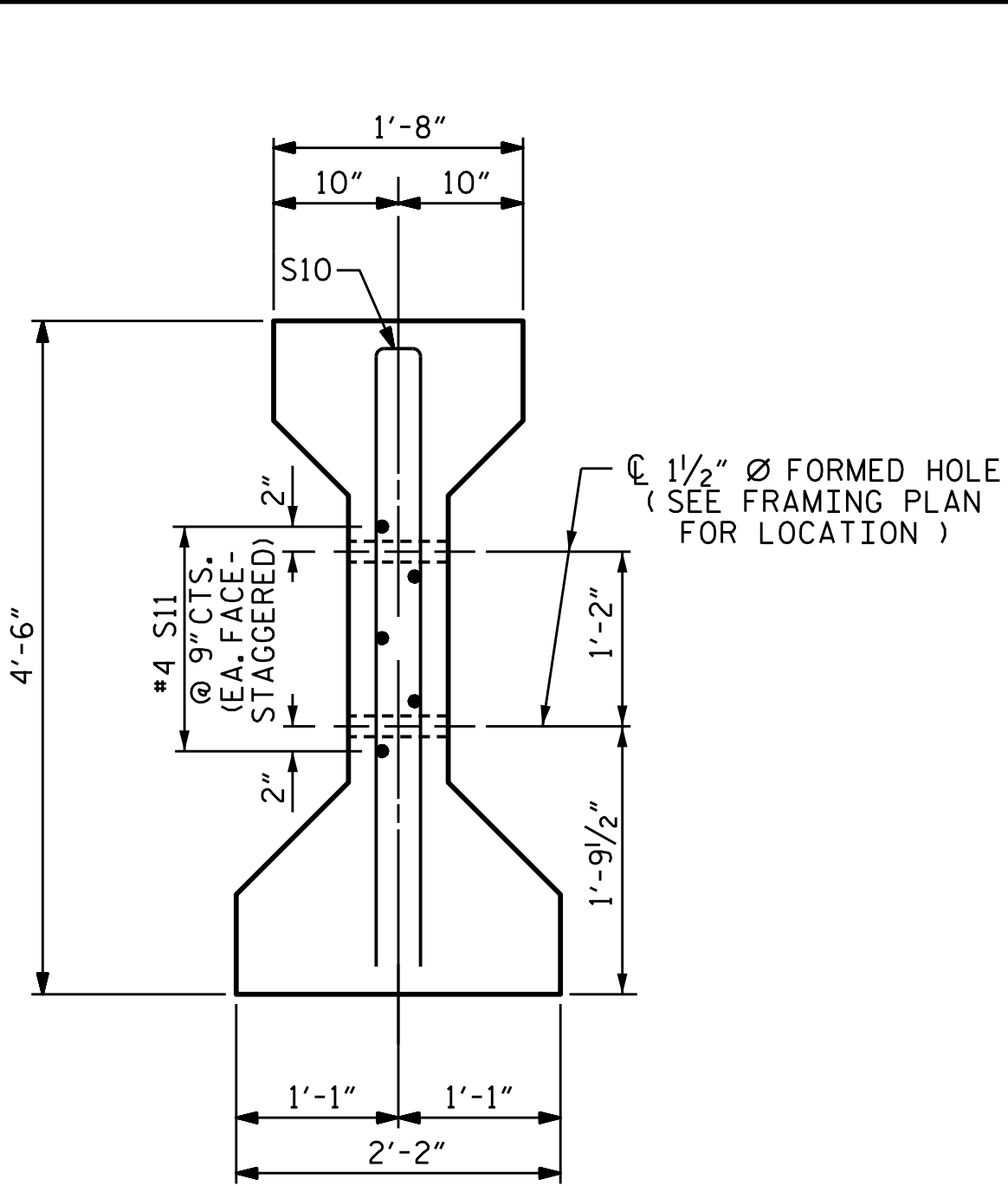
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+Kirschbaum



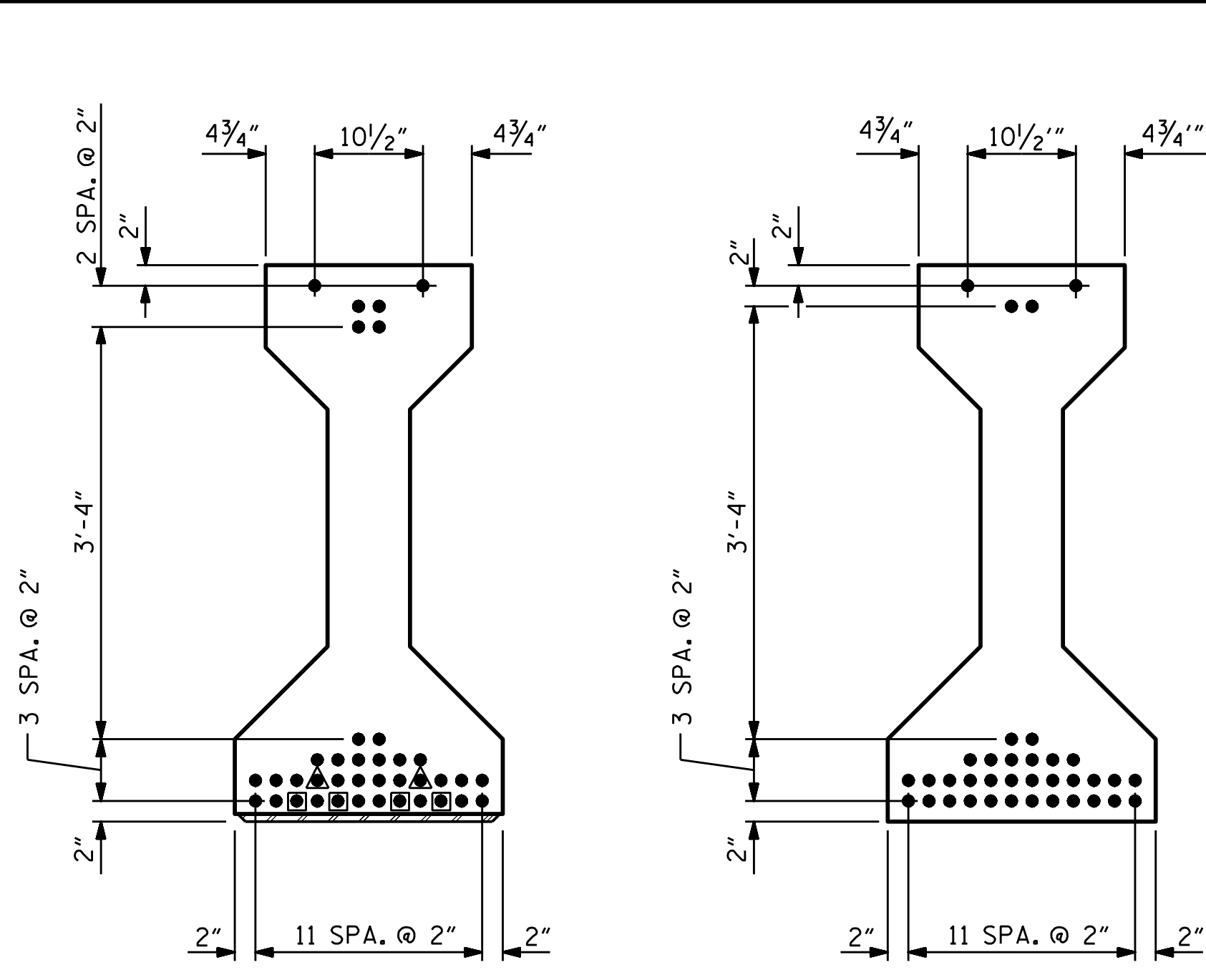
SECTION A-A
*FOR S7 BARS, SEE DETAIL "C"
OF PRESTRESSED CONCRETE
GIRDER CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



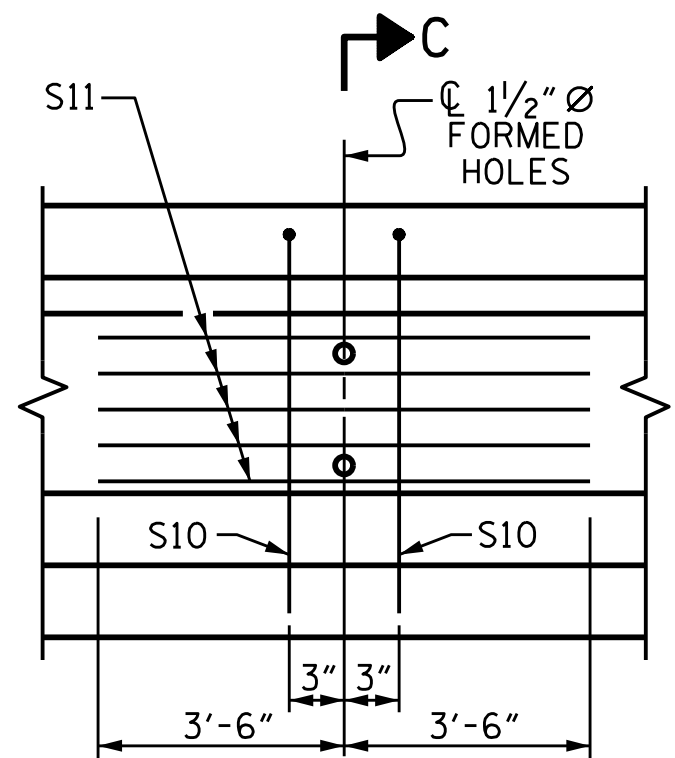
AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

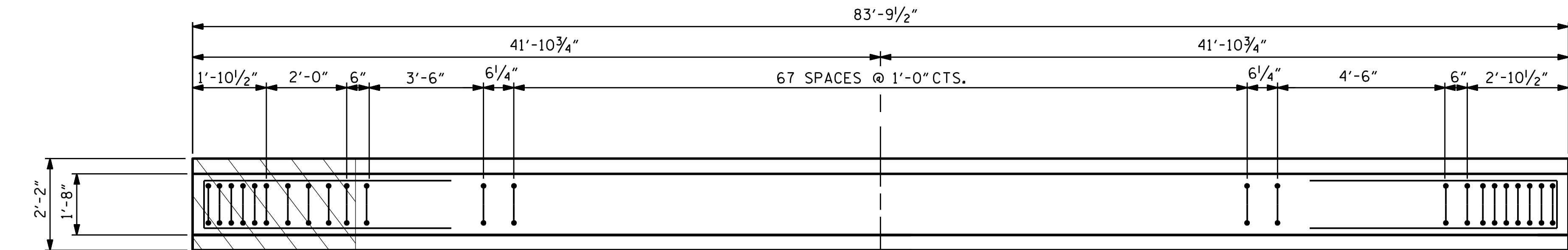
DEBONDING LEGEND

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

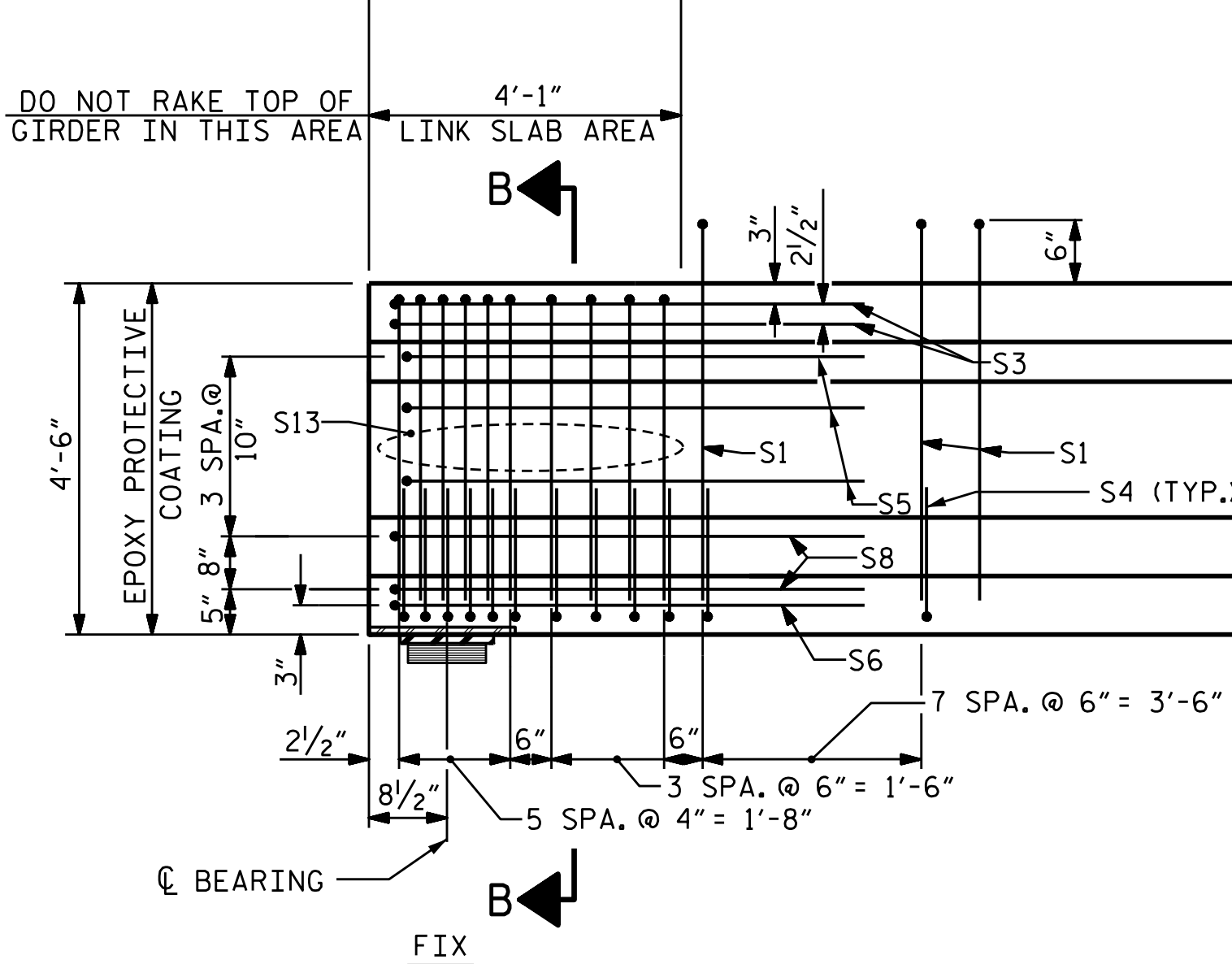


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS



PLAN OF GIRDER



ELEVATION OF GIRDER

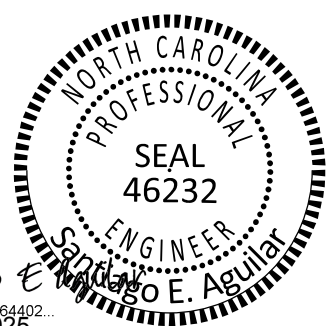
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

INTEGRAL END BENT

ASSEMBLED BY : T. KIRSCHBAUM	DATE : 05-2025
CHECKED BY : S. AGUILAR	DATE : 05-2025
DRAWN BY : JMB 12/87	REV. 1/15 MAA/TMG
CHECKED BY : ARB 12/87	REV. 12/17 MAA/THC
	REV. 10/23 BNB/AKP

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

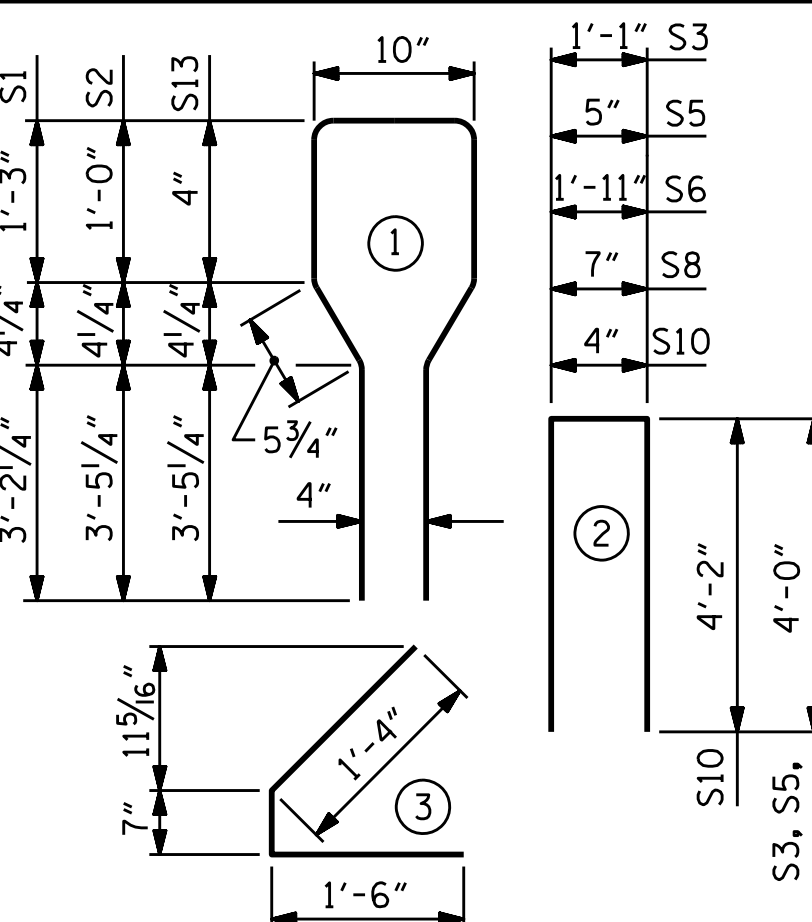
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	86	#4	1	10'-8"	613
S2	9	#6	1	10'-8"	144
S3	4	#4	2	9'-1"	24
S4	74	#4	3	3'-5"	169
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	10	#6	1	9'-4"	140
S14	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1,243	17.0	38
INTERIOR GIRDER	1,243	17.0	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	83'-9 1/2"	335'-2"

PROJECT NO. BR-0060

ALAMANCE COUNTY

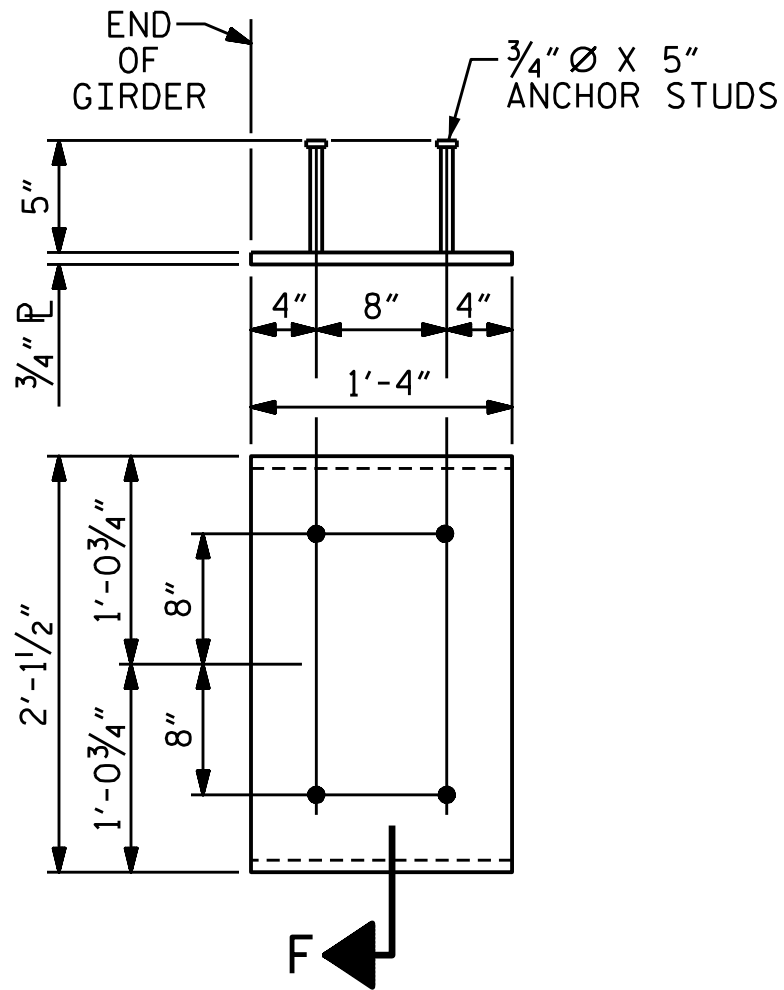
STATION: 21+19.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER LINK B SPAN C					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-16
TOTAL SHEETS					37

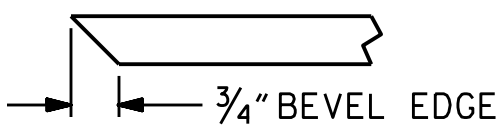
STD. NO. PCG3

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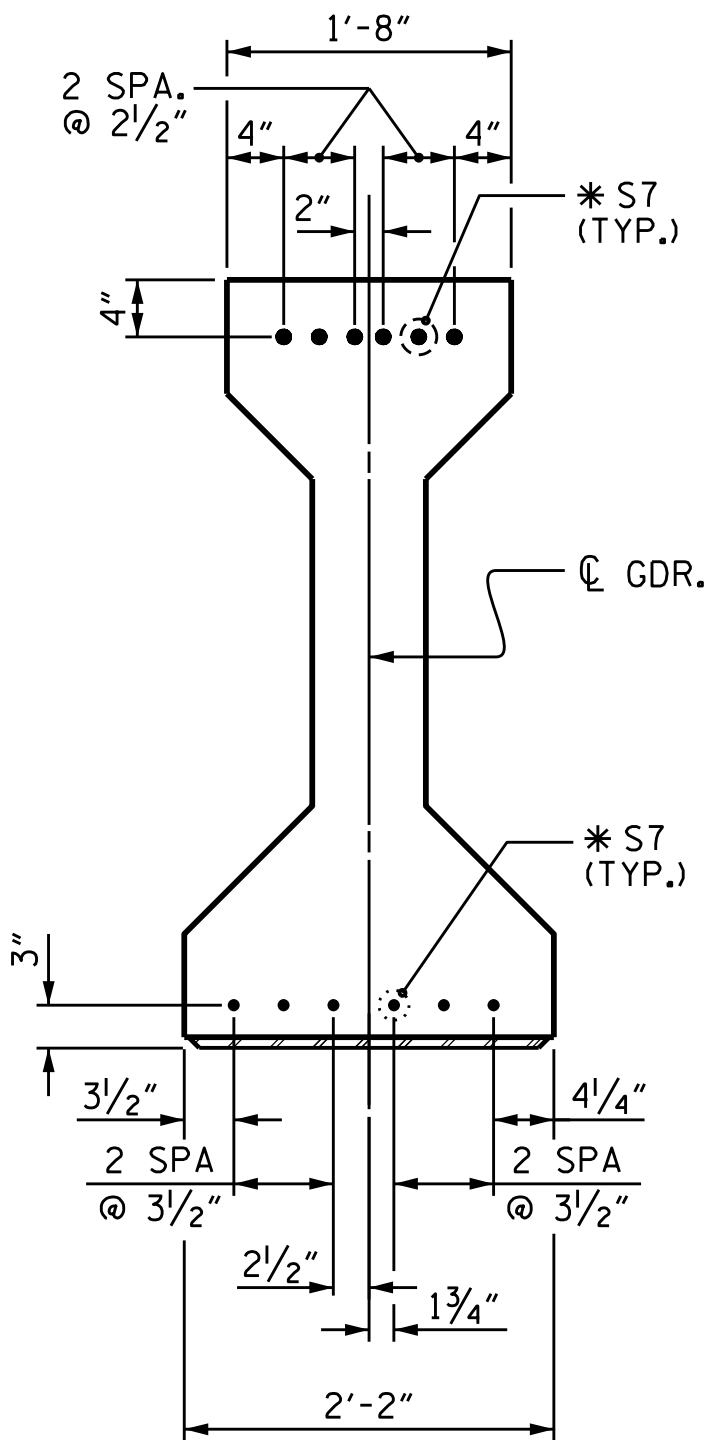
EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "C"

(FOR AASHTO TYPE IV GIRDERS)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO BOTH SIDES AND BOTTOM OF END 2 FEET OF GIRDER AND END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4" AND THE PORTION WITHIN THE LINK SLAB AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

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

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

PROJECT NO. BR-0060

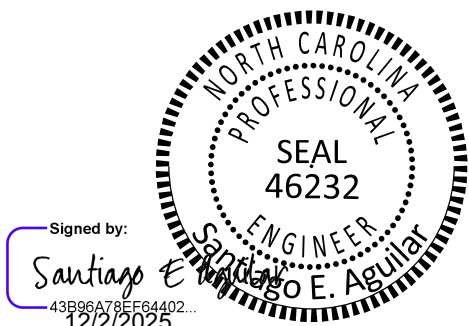
ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 4 OF 5

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			37

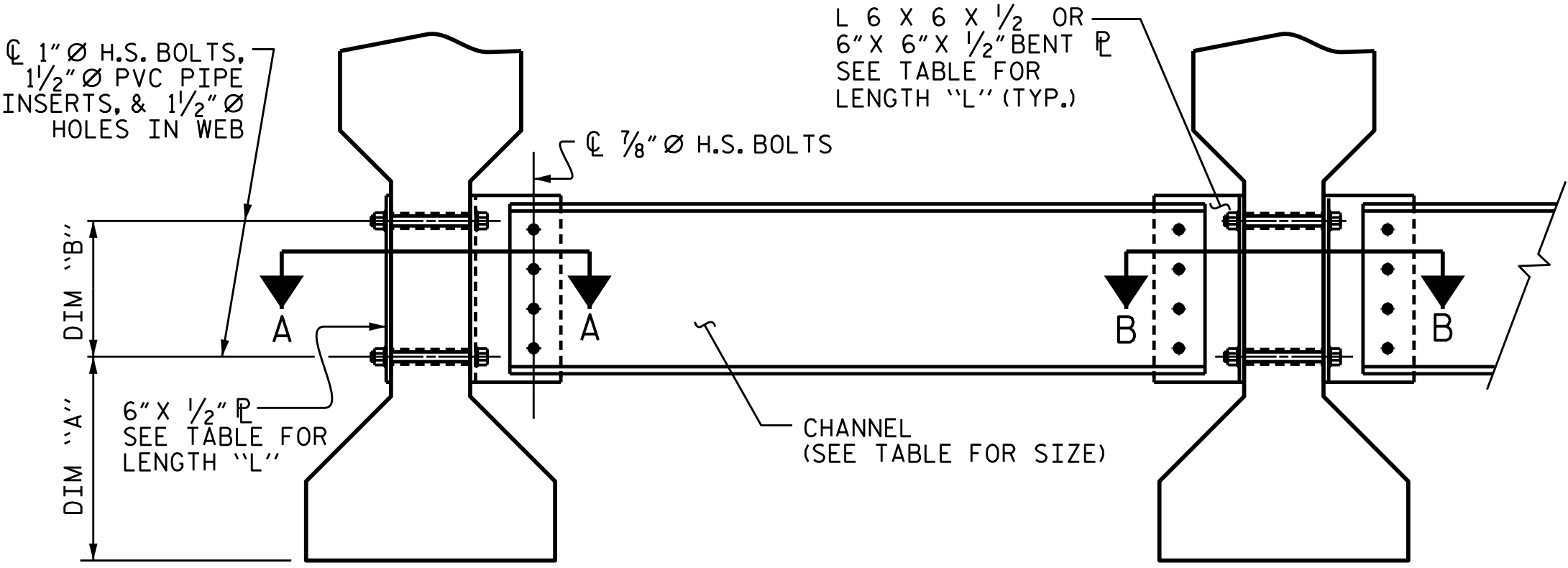


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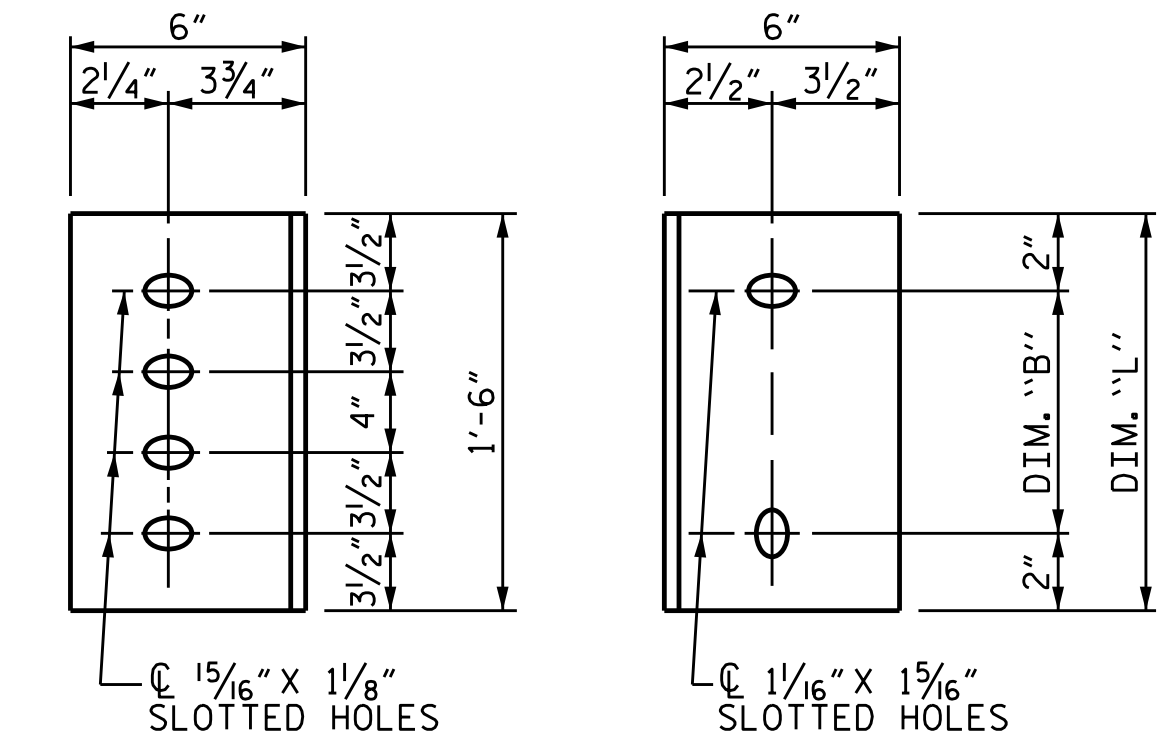
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EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

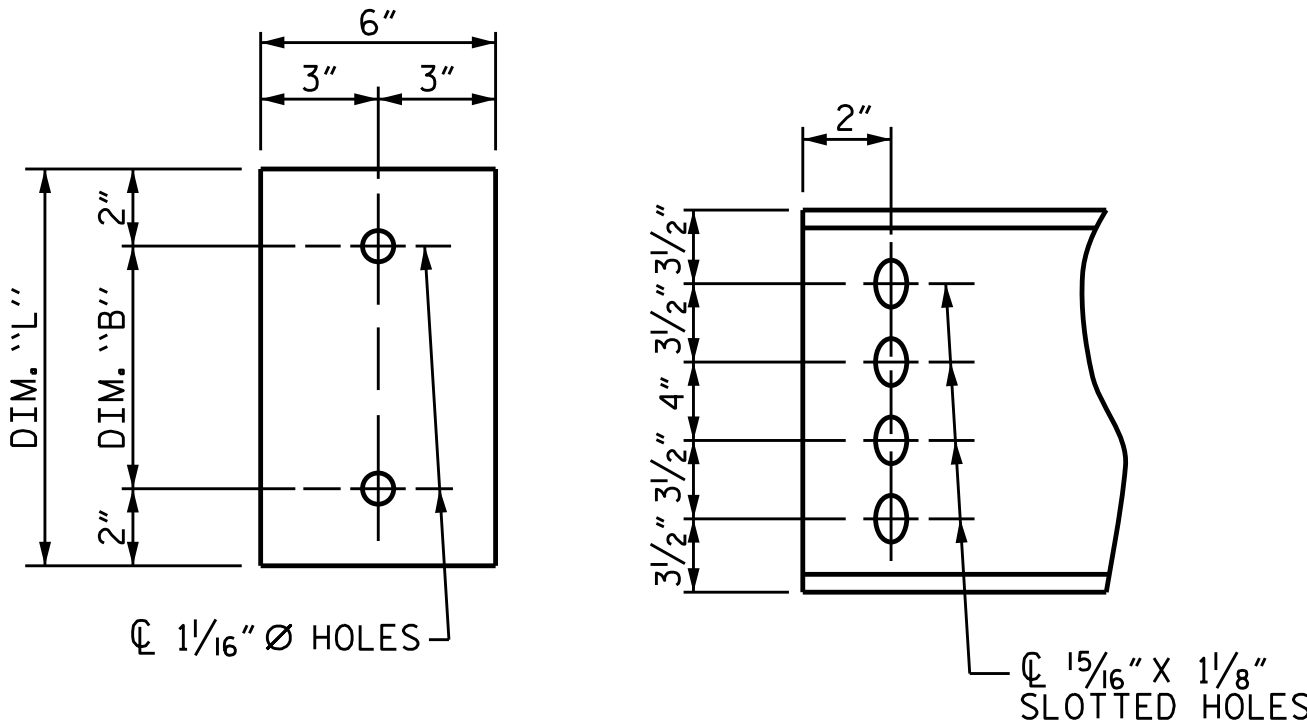


PLATE DETAILS

CHANNEL END

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

TABLE

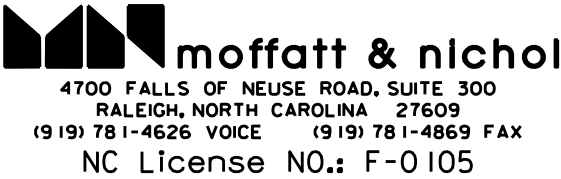
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

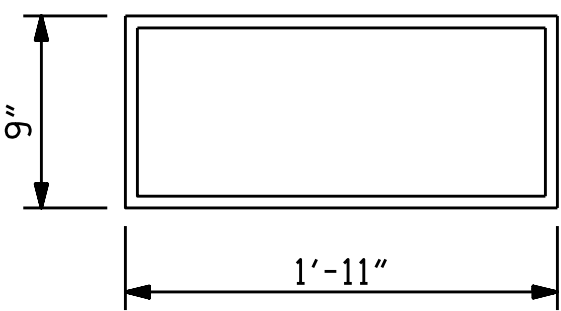
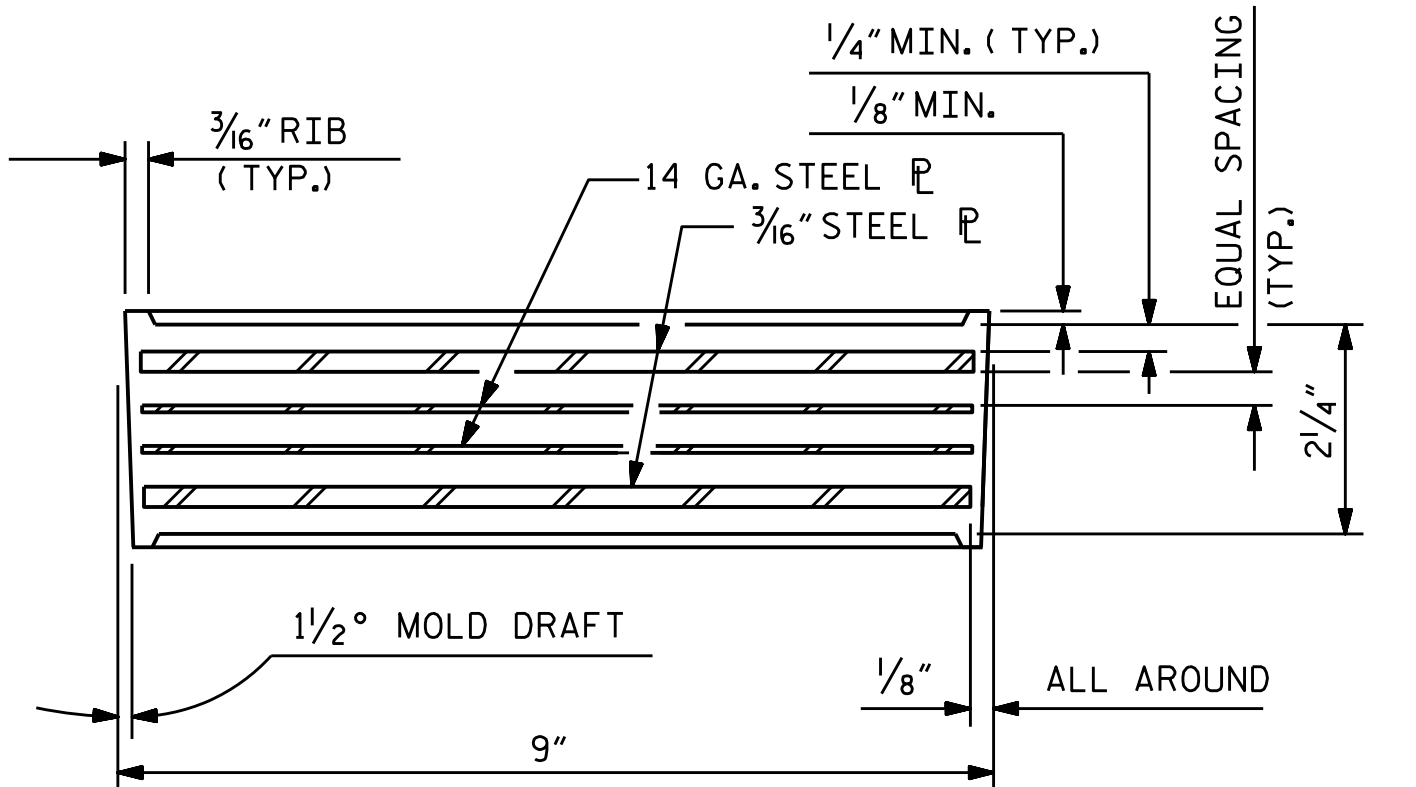
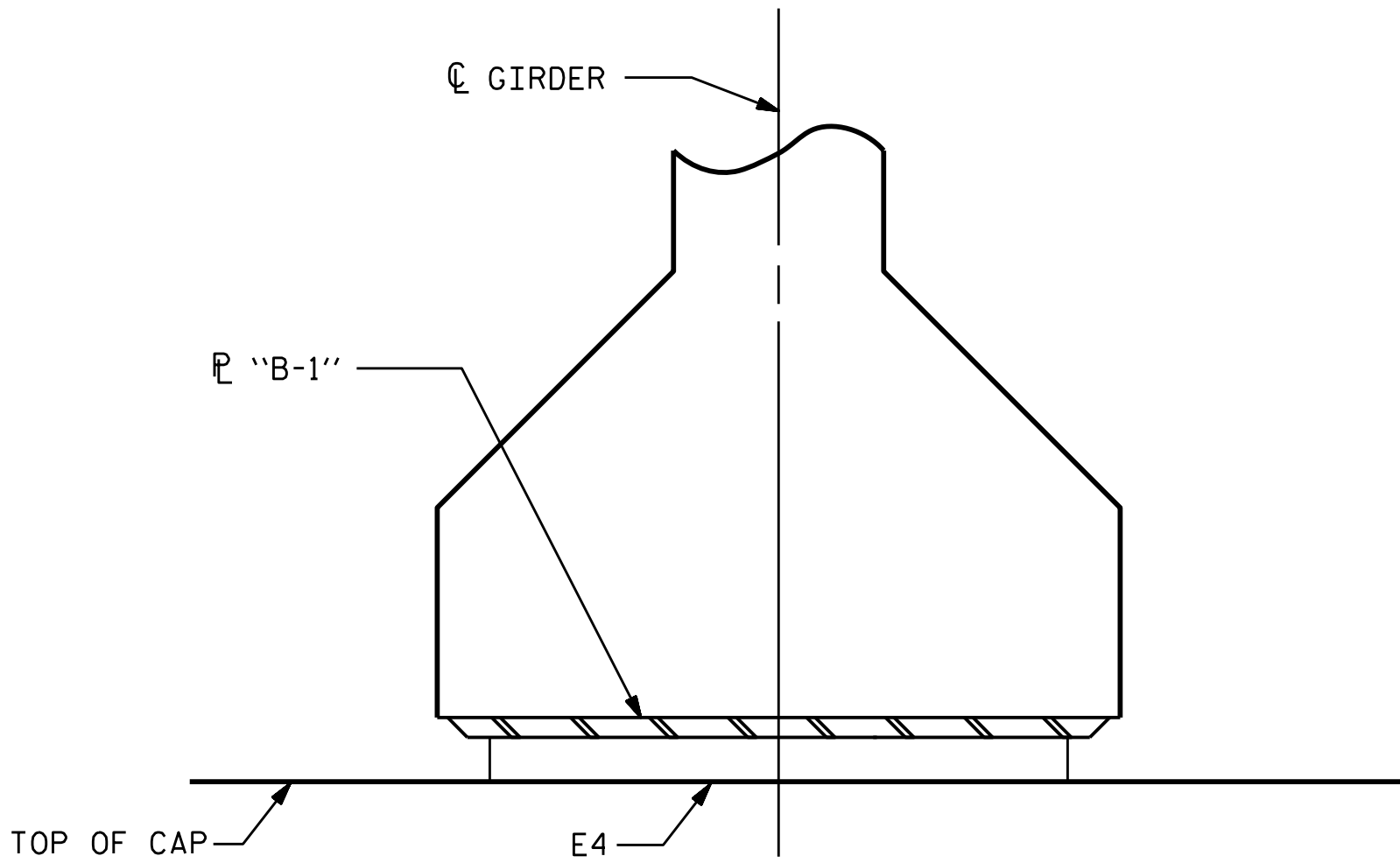
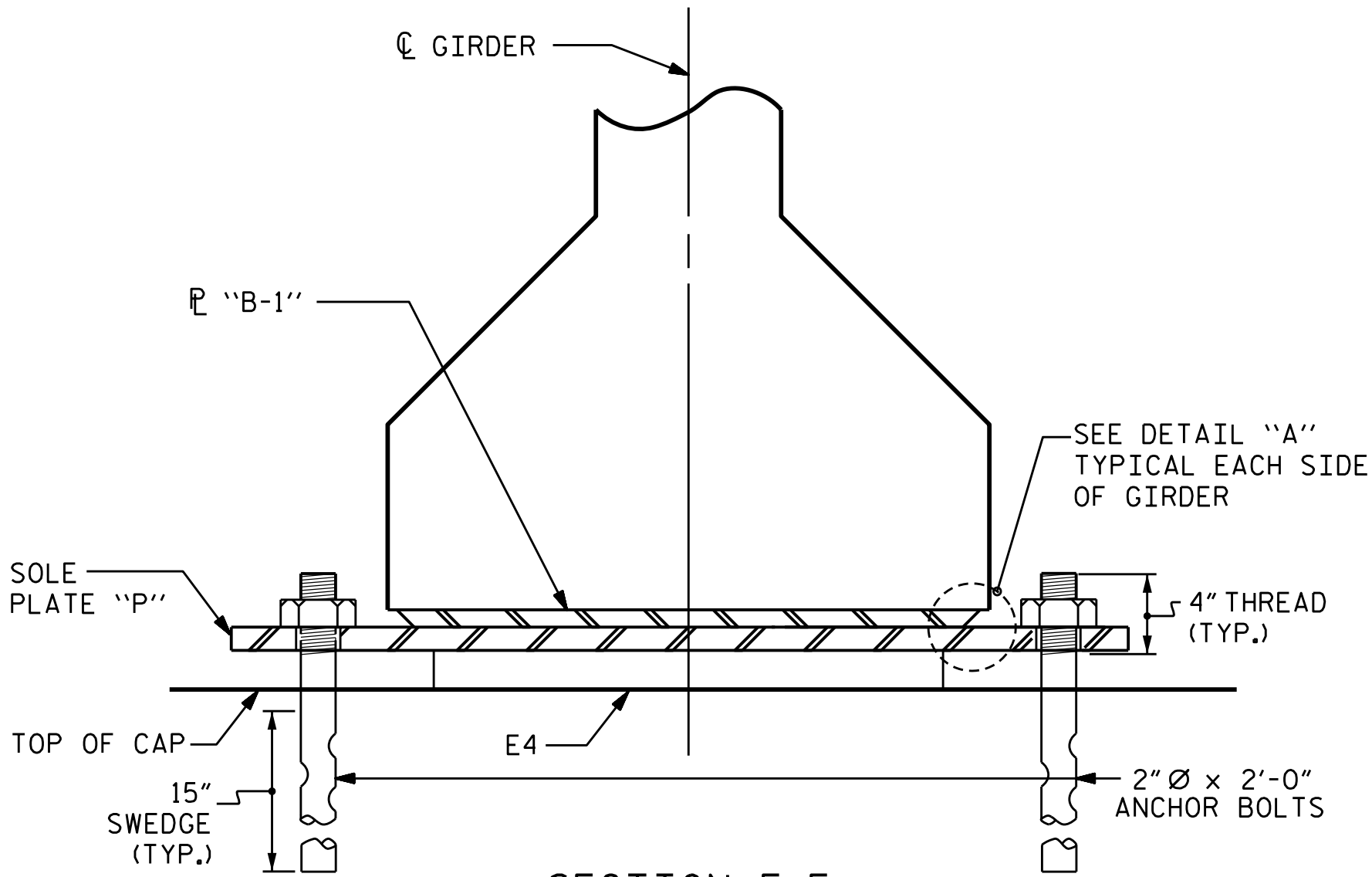
SHEET 5 OF 5



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			
TOTAL SHEETS						37

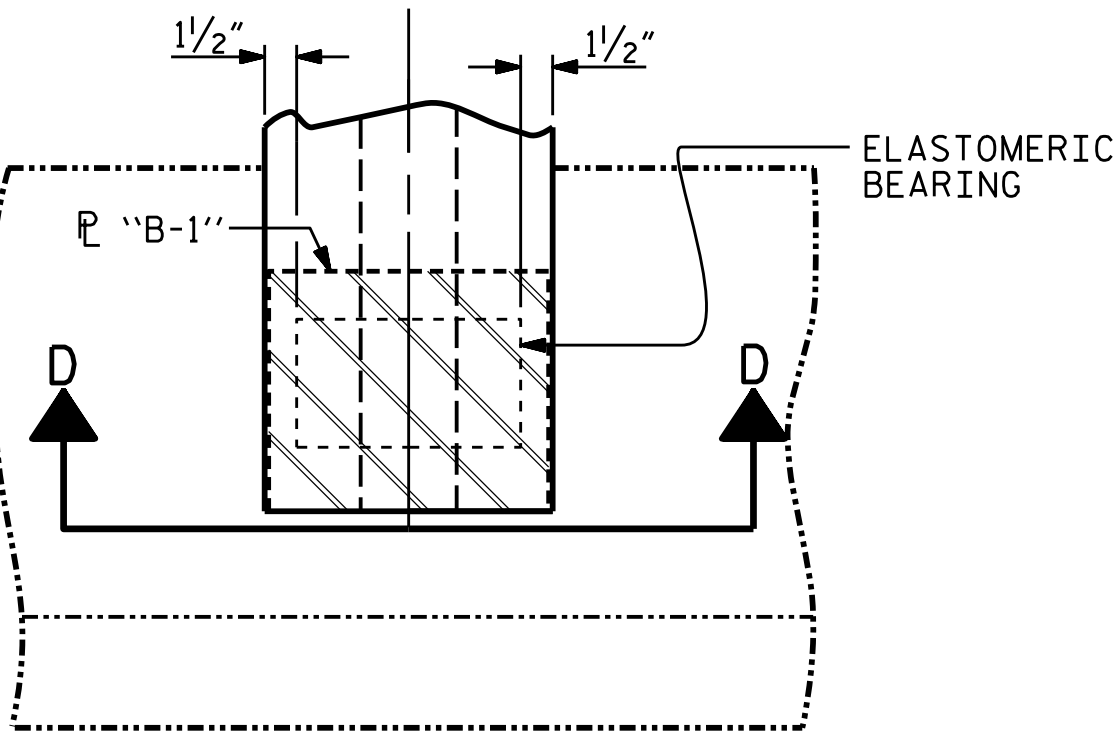
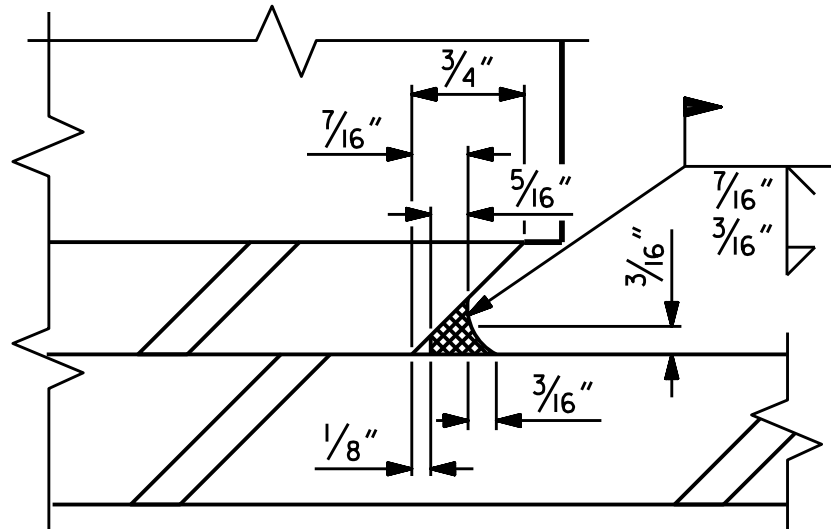
ASSEMBLED BY : T. KIRSCHBAUM	DATE : 09-2025
CHECKED BY : P. SHAW	DATE : 09-2025
DRAWN BY : TLA 6/05	REV. 5/1/06 KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



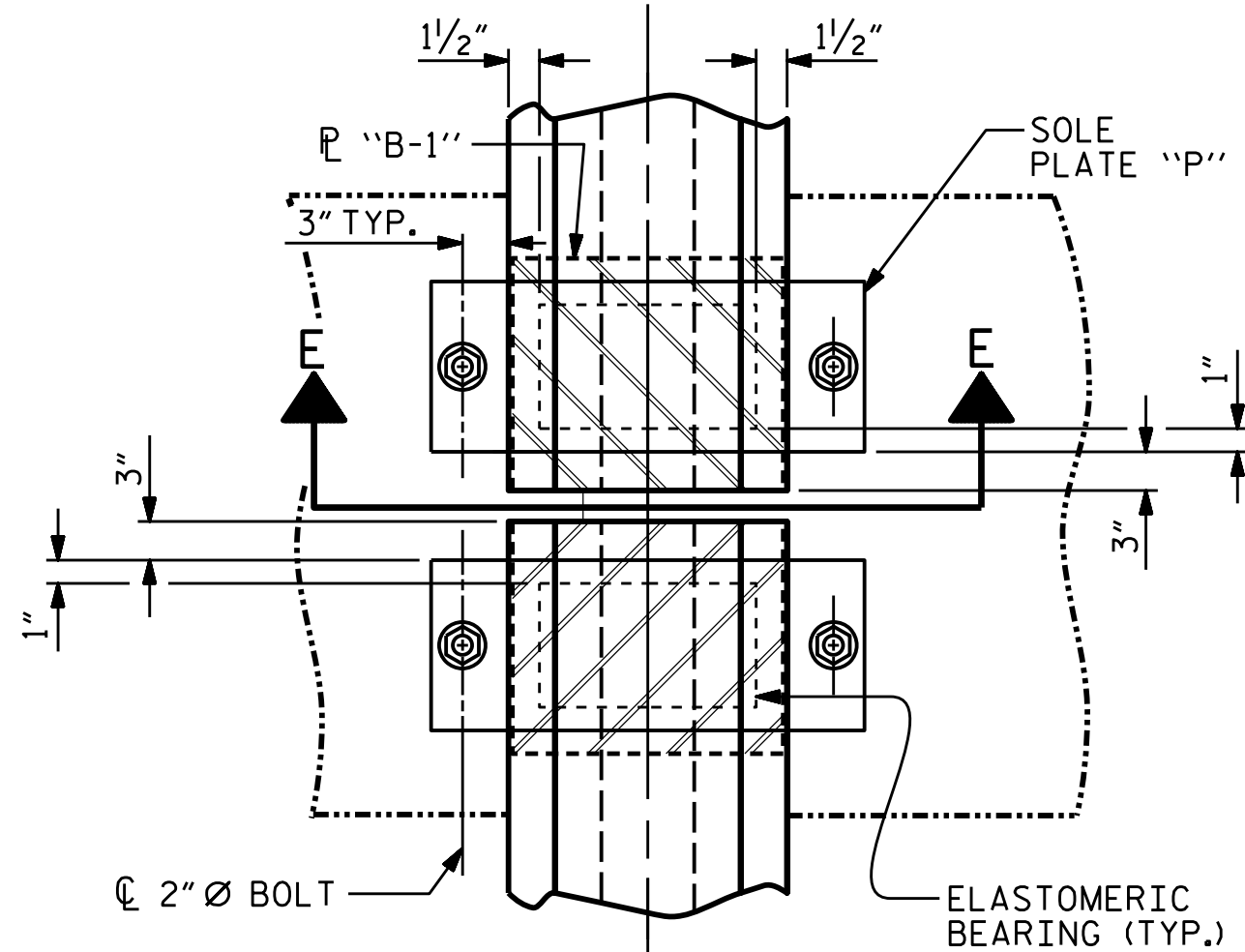
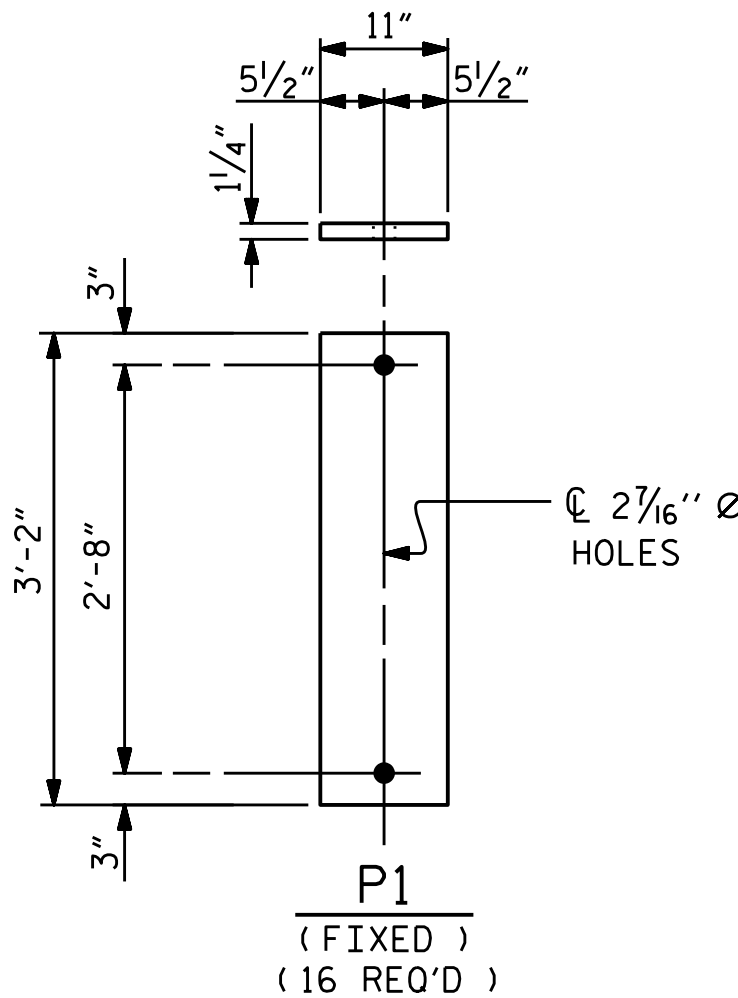
E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



TYPICAL PLAN (SHOWING INTEGRAL END BENT)



TYPICAL PLAN (SHOWING CONTINUOUS BENT)

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

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

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

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



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

STD. NO. EB4 (SHT 1)

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NOTES

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN A																				
	GIRDERS 1 & 4																				
	TWENTIETH POINTS																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.009	0.017	0.025	0.032	0.039	0.044	0.049	0.052	0.054	0.055	0.054	0.052	0.049	0.044	0.039	0.032	0.025	0.017	0.009	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.001	0.003	0.004	0.006	0.007	0.008	0.009	0.010	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.004	0.003	0.001	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	1/2"	3/16"	1/2"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN A																				
	GIRDERS 2 & 3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.009	0.017	0.025	0.032	0.039	0.044	0.049	0.052	0.054	0.055	0.054	0.052	0.049	0.044	0.039	0.032	0.025	0.017	0.009	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.001	0.003	0.005	0.006	0.008	0.009	0.010	0.011	0.011	0.011	0.011	0.011	0.010	0.009	0.008	0.006	0.005	0.003	0.001	0.000
FINAL CAMBER ↑	0	1⁄16"	3⁄16"	1⁄4"	5⁄16"	3⁄8"	7⁄16"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	7⁄16"	3⁄8"	5⁄16"	1⁄4"	3⁄16"	1⁄16"	0

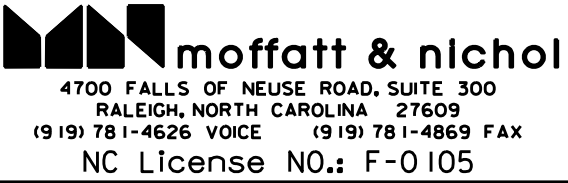
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN B																				
	GIRDERS 1 & 4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.035	0.070	0.102	0.132	0.158	0.181	0.199	0.211	0.219	0.222	0.219	0.211	0.199	0.181	0.158	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.022	0.045	0.067	0.088	0.106	0.122	0.134	0.143	0.148	0.150	0.148	0.143	0.134	0.122	0.106	0.088	0.067	0.045	0.022	0.000
FINAL CAMBER ↑	0	3⁄16"	5⁄16"	7⁄16"	1⁄2"	5⁄8"	11⁄16"	3⁄4"	13⁄16"	7⁄8"	7⁄8"	7⁄8"	13⁄16"	3⁄4"	11⁄16"	5⁄8"	1⁄2"	7⁄16"	5⁄16"	3⁄16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN B																				
	GIRDERS 2 & 3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.035	0.070	0.102	0.132	0.158	0.181	0.199	0.211	0.219	0.222	0.219	0.211	0.199	0.181	0.158	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.025	0.050	0.074	0.097	0.118	0.135	0.149	0.158	0.164	0.181	0.164	0.158	0.149	0.135	0.118	0.097	0.074	0.050	0.025	0.000
FINAL CAMBER ↑	0	1⁄8"	1⁄4"	5⁄16"	7⁄16"	1⁄2"	9⁄16"	5⁄8"	5⁄8"	11⁄16"	11⁄16"	11⁄16"	5⁄8"	5⁄8"	9⁄16"	1⁄2"	7⁄16"	5⁄16"	1⁄4"	1⁄8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN C																				
	GIRDERS 1 & 4																				
	TWENTIETH POINTS																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.023	0.045	0.066	0.086	0.103	0.117	0.129	0.137	0.143	0.144	0.143	0.137	0.129	0.117	0.103	0.086	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.013	0.027	0.041	0.053	0.064	0.074	0.081	0.087	0.090	0.091	0.090	0.087	0.081	0.074	0.064	0.053	0.041	0.027	0.015	0.000
FINAL CAMBER ↑	0	1⁄8"	1⁄4"	5⁄16"	3⁄8"	7⁄16"	1⁄2"	9⁄16"	5⁄8"	5⁄8"	5⁄8"	5⁄8"	5⁄8"	9⁄16"	1⁄2"	7⁄16"	3⁄8"	5⁄16"	1⁄4"	1⁄8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN C																				
	GIRDERS 2 & 3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.023	0.045	0.066	0.086	0.103	0.117	0.129	0.137	0.143	0.144	0.143	0.137	0.129	0.117	0.103	0.086	0.066	0.045	0.023	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.015	0.030	0.045	0.059	0.071	0.082	0.090	0.096	0.100	0.101	0.100	0.096	0.090	0.082	0.071	0.059	0.045	0.030	0.015	0.000
FINAL CAMBER ↑	0	1⁄8"	3⁄16"	1⁄4"	5⁄16"	3⁄8"	7⁄16"	7⁄16"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	1⁄2"	7⁄16"	7⁄16"	3⁄8"	5⁄16"	1⁄4"	3⁄16"	1⁄8"	0

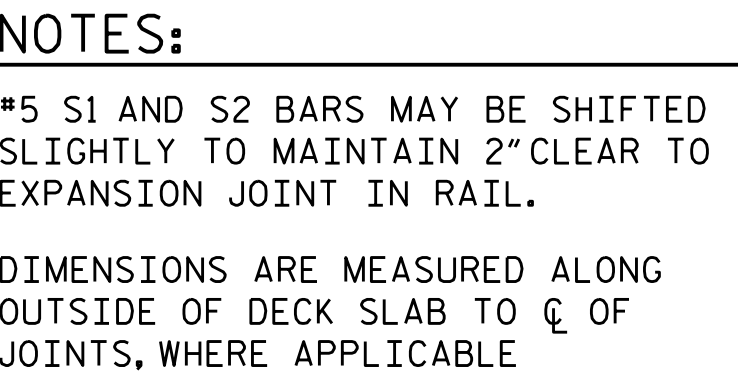
PROJECT NO. _____ BR-0060 _____
_____ ALAMANCE _____ COUNTY
STATION: _____ 21+19.00 -L- _____



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-20
2			4			TOTAL SHEETS 37

DRAWN BY : _____ T. KIRSCHBAUM _____ DATE : 09-2025
CHECKED BY : _____ P. SHAW _____ DATE : 09-2025
DESIGN ENGINEER OF RECORD: _____ S. AGUILAR _____ DATE : 09-2025



PROJECT NO. BR-0060
ALAMANCE COUNTY
 STATION: 21+19.00 -L-

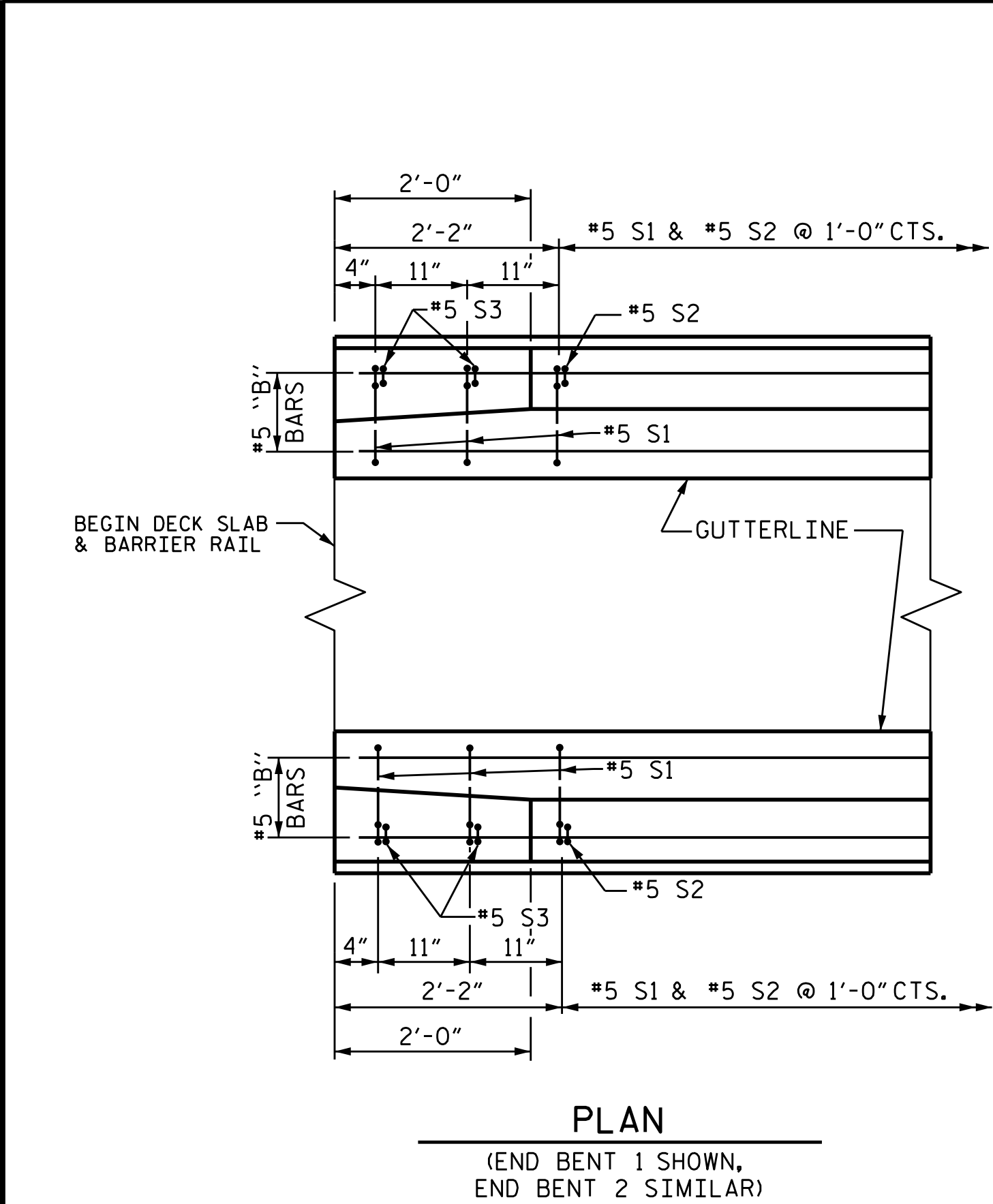
CONCRETE BARRIER RAIL PLAN

REVISIONS						SHEET NO. S-21 TOTAL SHEETS 37
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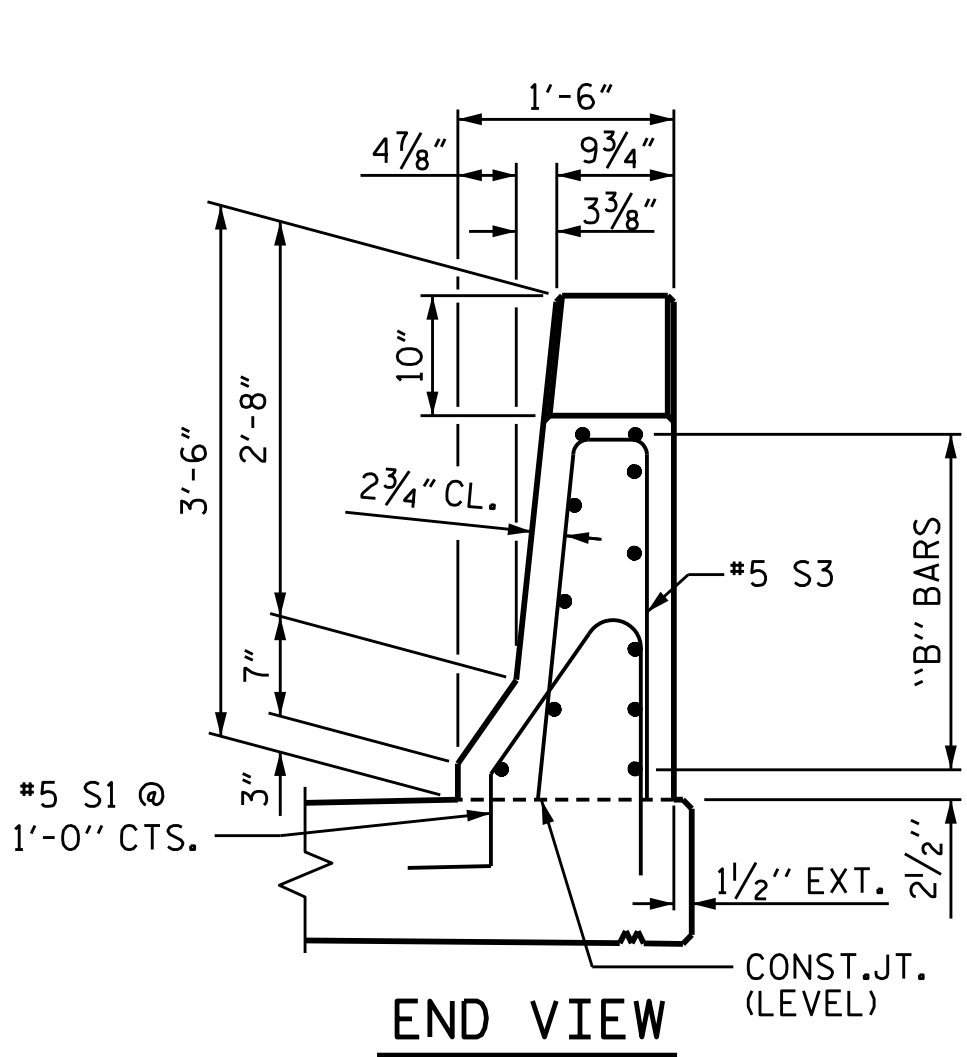
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SIGNATURES COMPLETED

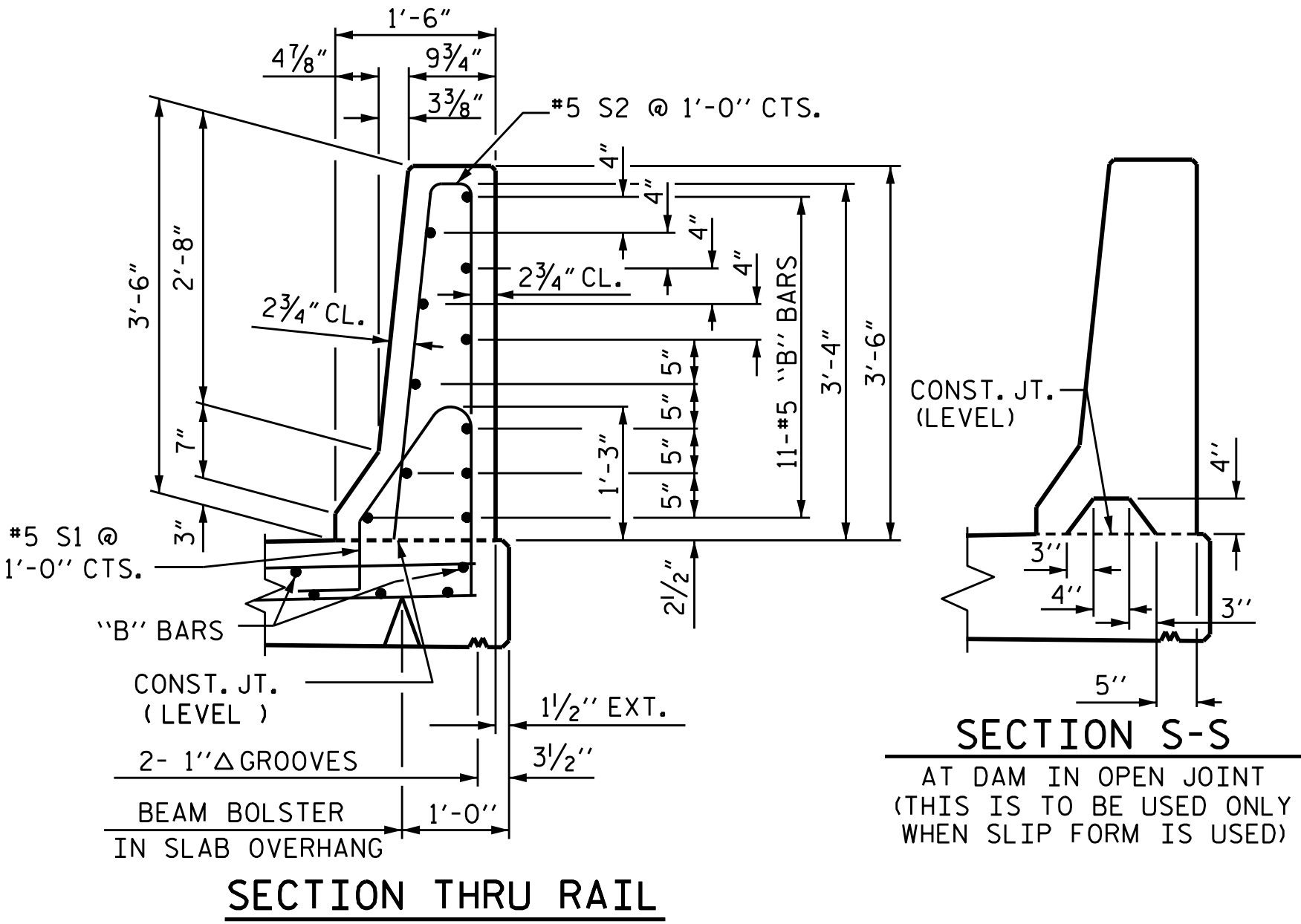




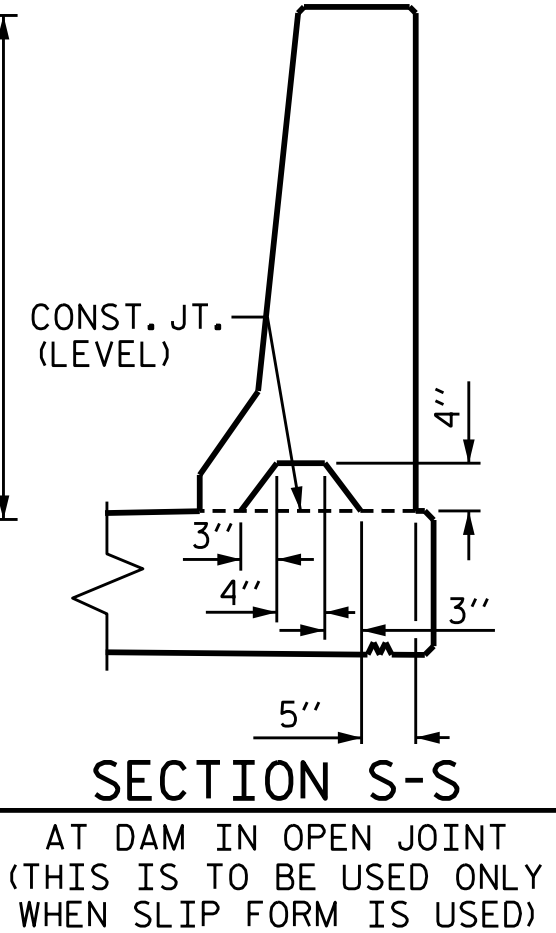
PLAN
(END BENT 1 SHOWN,
END BENT 2 SIMILAR)



END VIEW



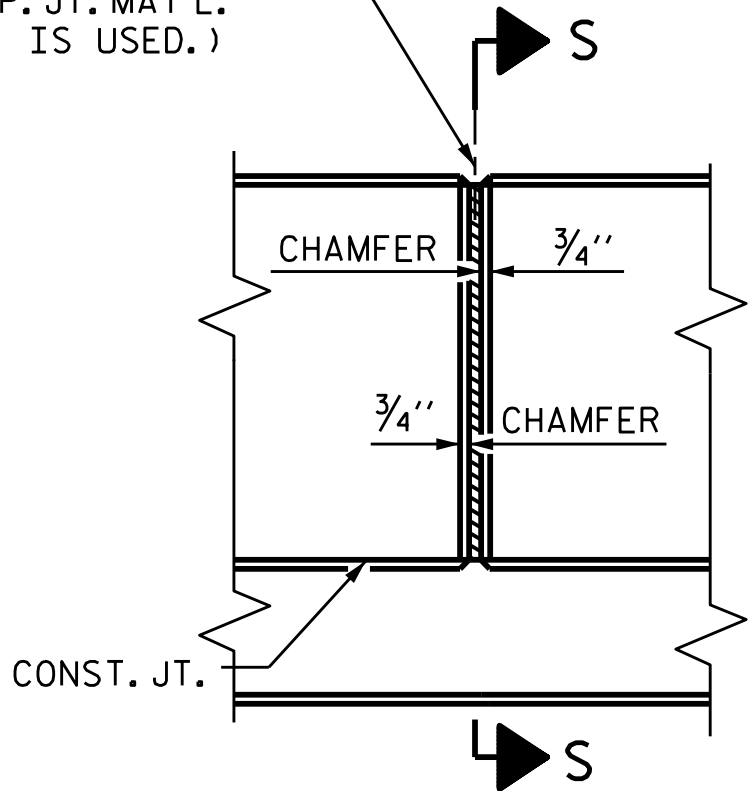
SECTION THRU RAIL



SECTION S-S

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

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



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

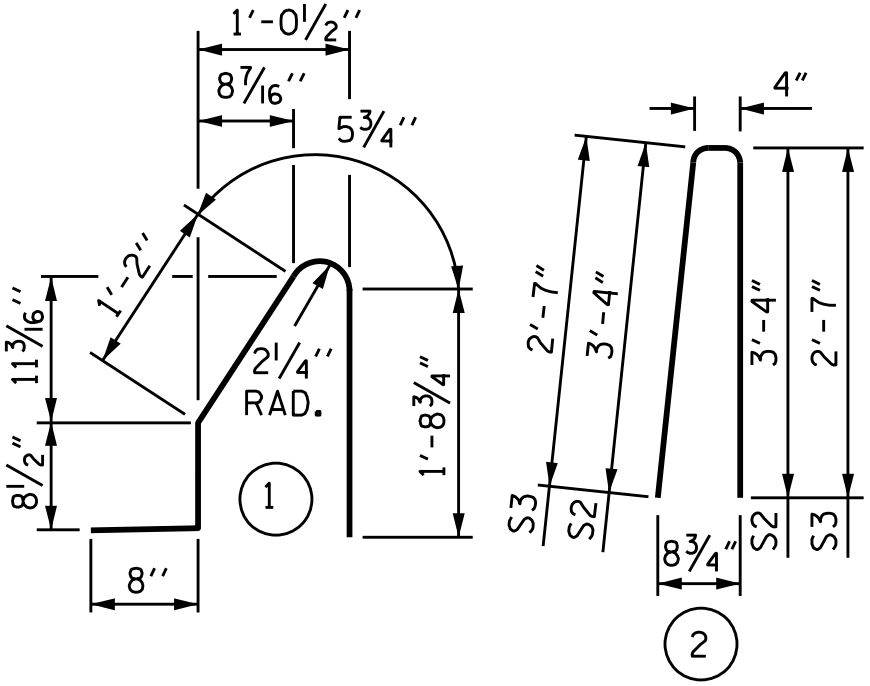
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	22	#5	STR	25'-0"	574
* B2	176	#5	STR	23'-4"	4,283
* B3	22	#5	STR	12'-6"	287
* S1	458	#5	1	4'-9"	2,269
* S2	450	#5	2	7'-0"	3,285
* S3	8	#5	2	5'-6"	46

* EPOXY COATED REINFORCING STEEL	10,744 LBS.
CLASS AA CONCRETE	62.1 CU. YDS.
CONCRETE BARRIER RAIL	456.67 LIN. FT.

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE
BARRIER RAIL



Signed by:
Santiago E. Aguila
12/2/2025

moffatt & nichol
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(919) 781-4626 VOICE (919) 781-4869 FAX
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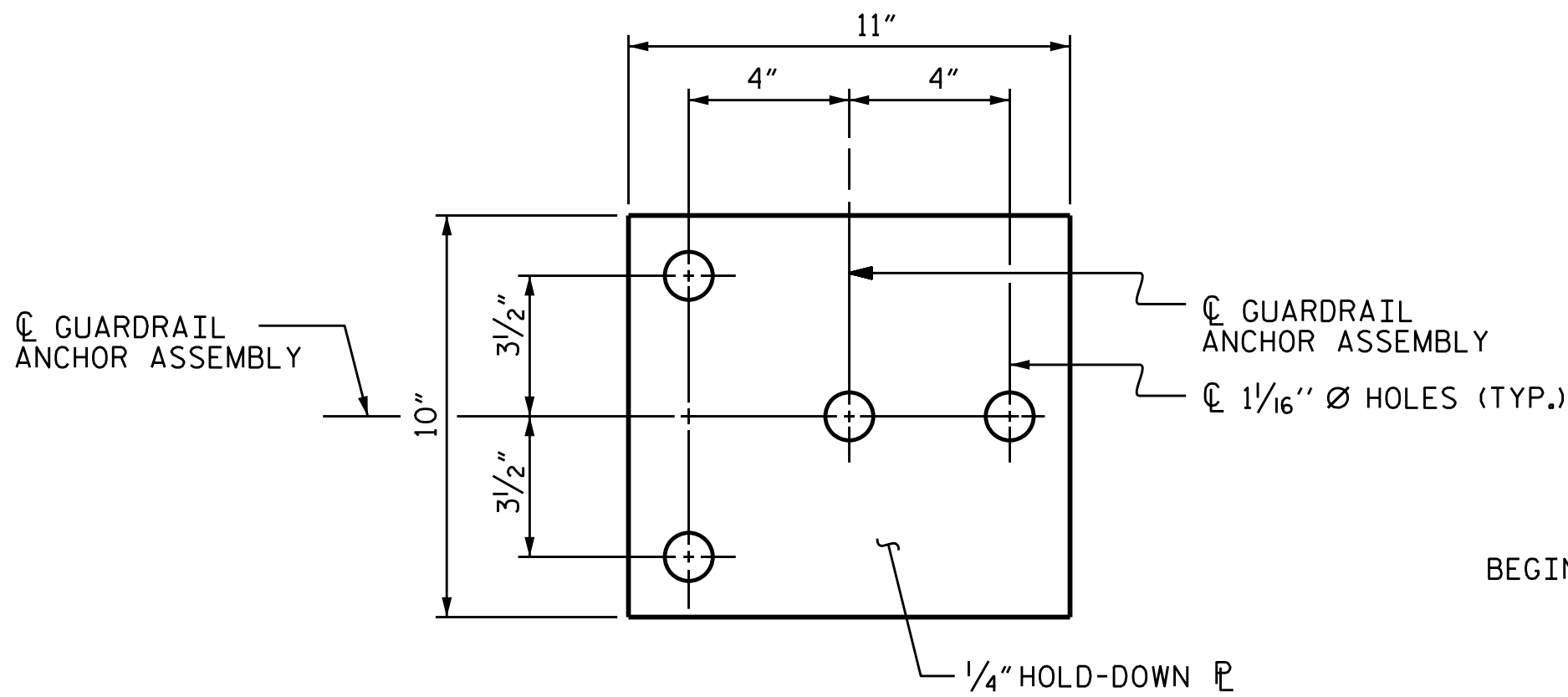
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FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS

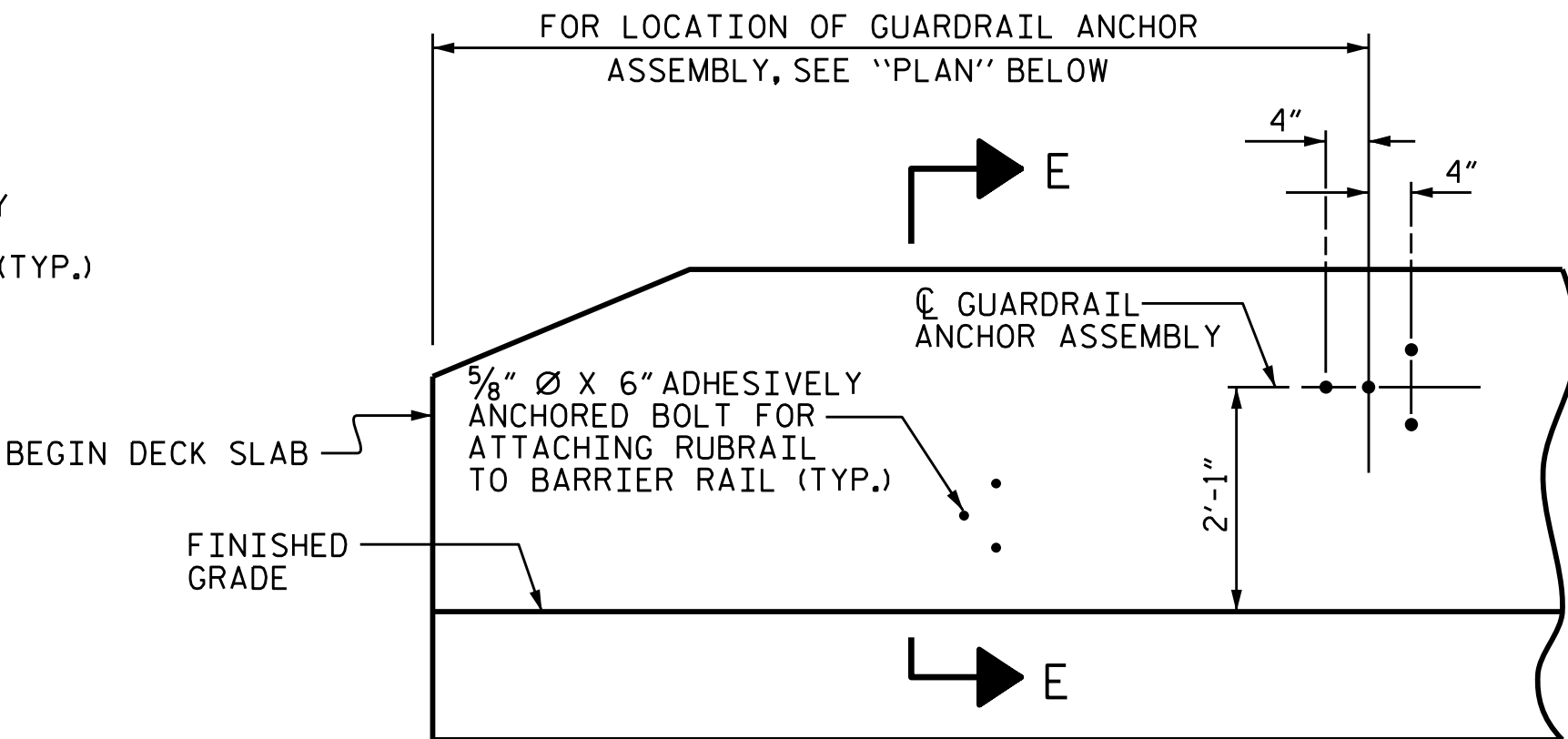
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-22
2			4			TOTAL SHEETS 37

ASSEMBLED BY : T. KIRSCHBAUM	DATE : 09-2025
CHECKED BY : P. SHAW	DATE : 09-2025
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

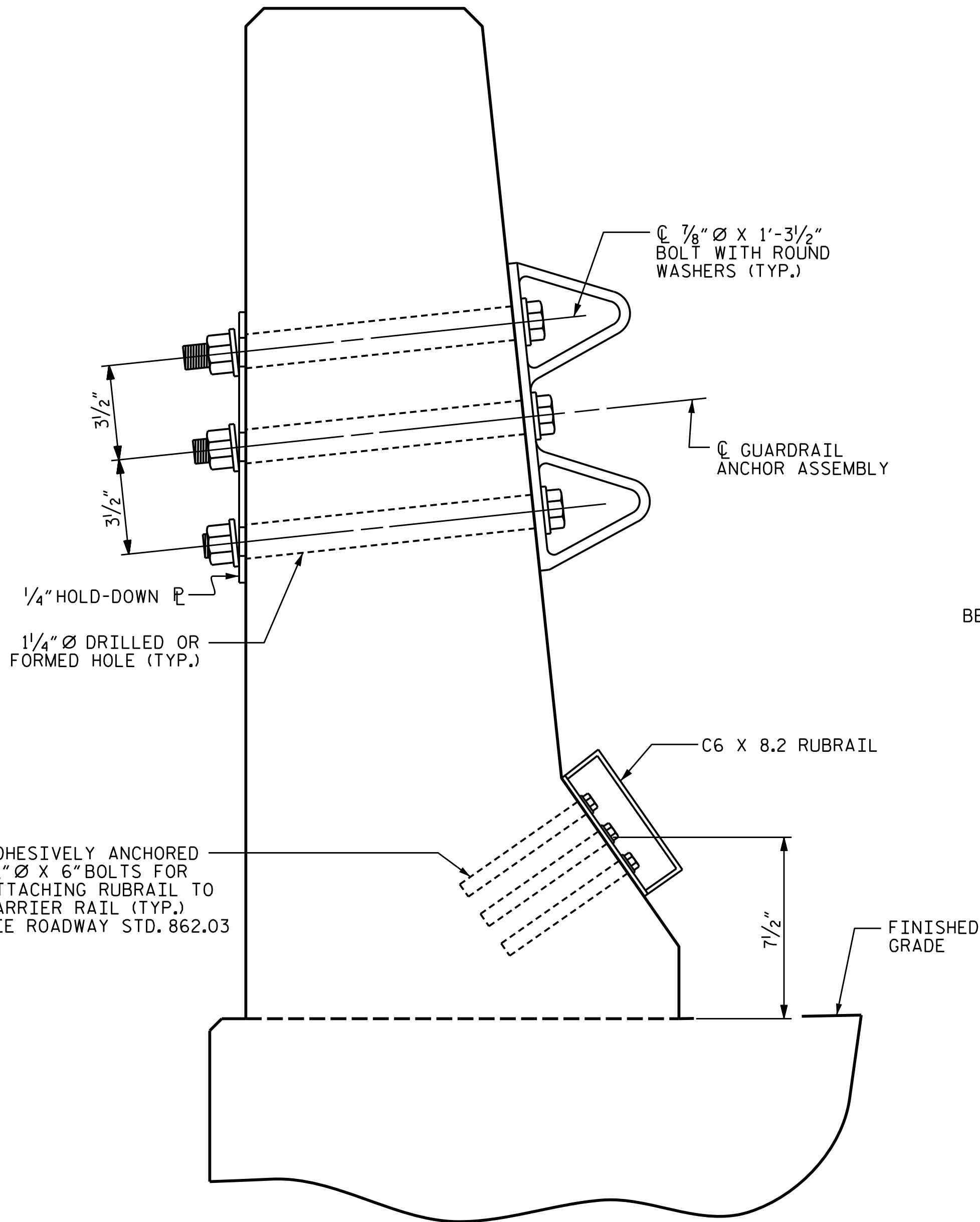
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+kirschbaum



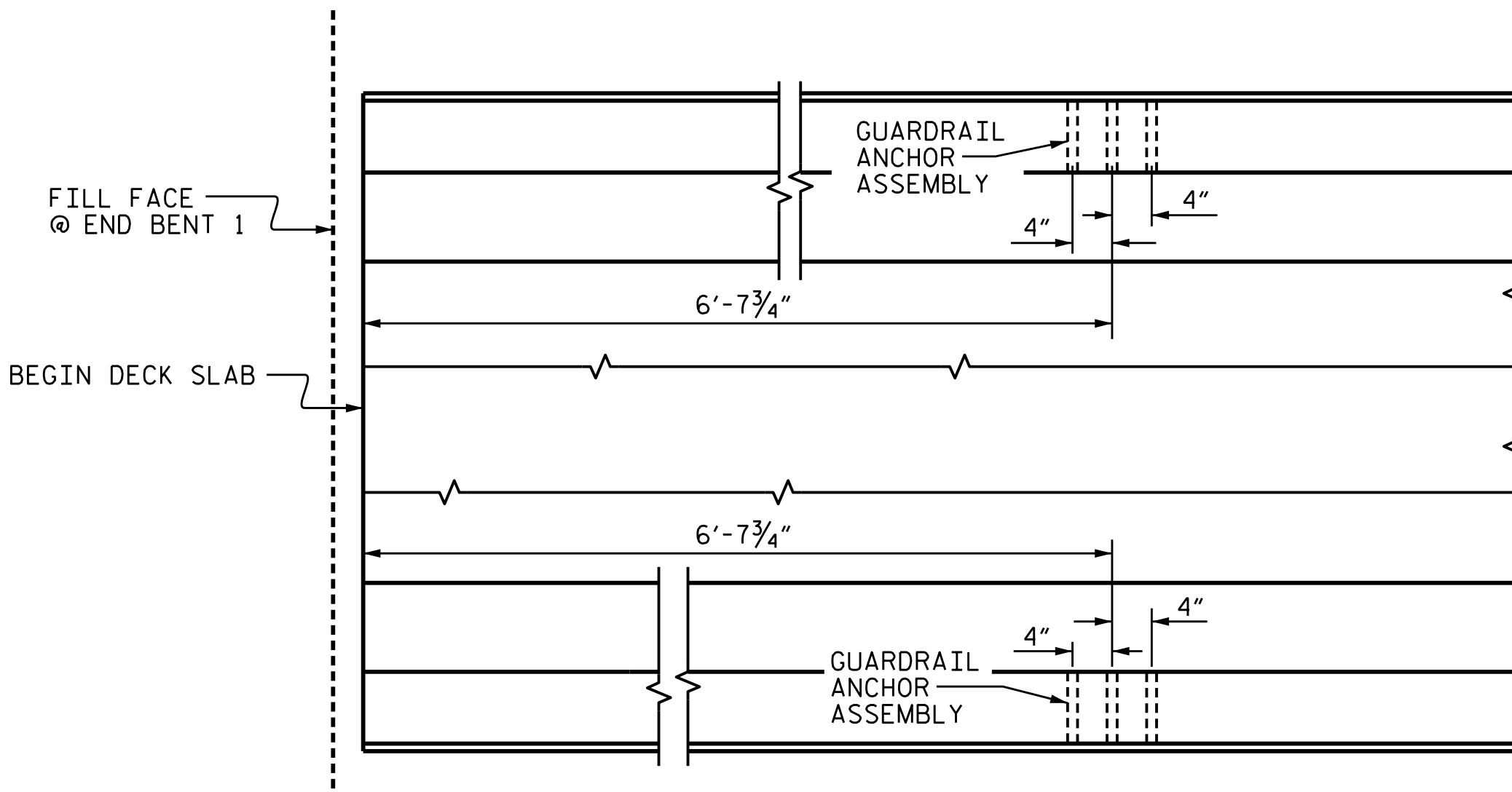
PLAN



ELEVATION



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

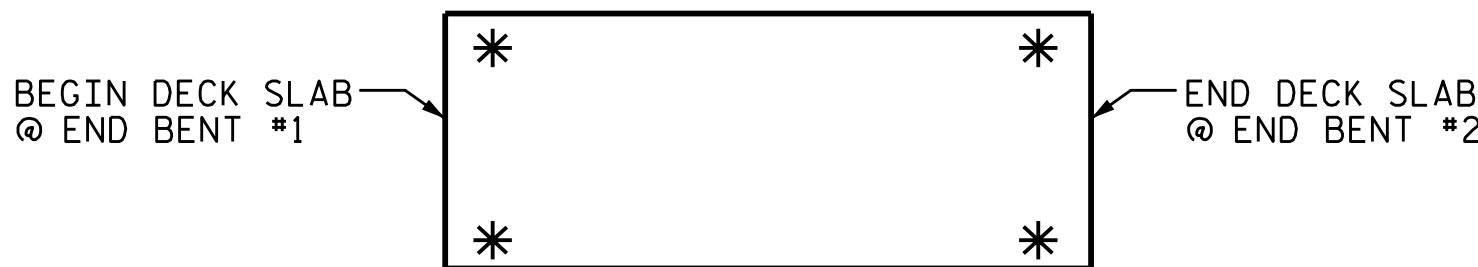
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 5/8" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 3 OF 3

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

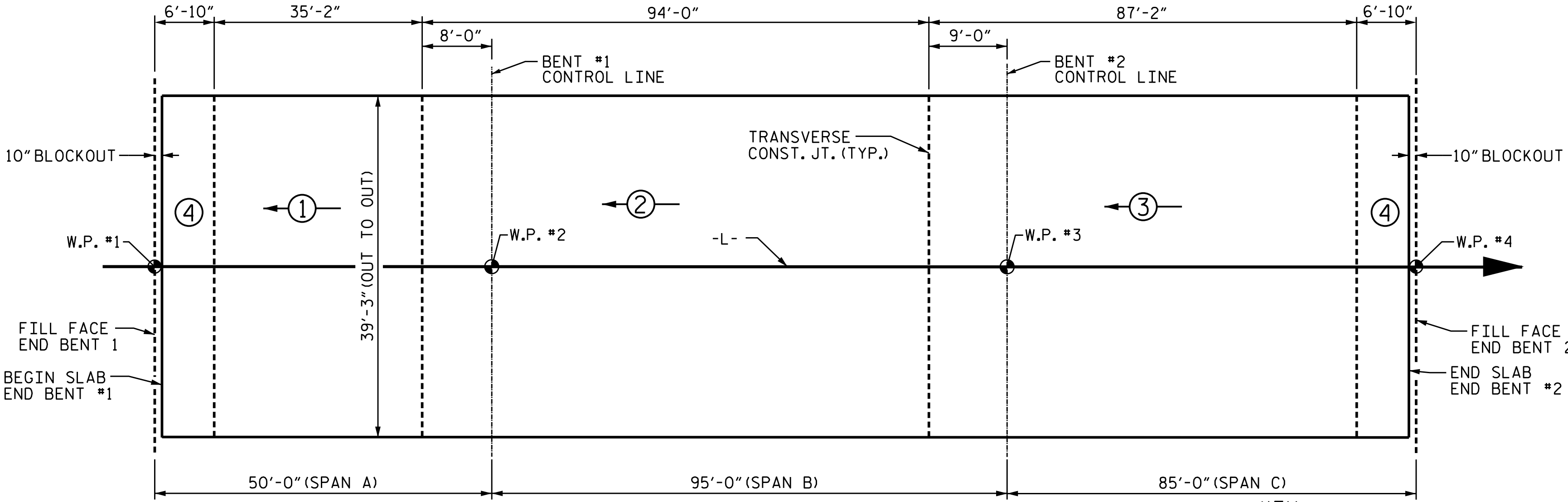


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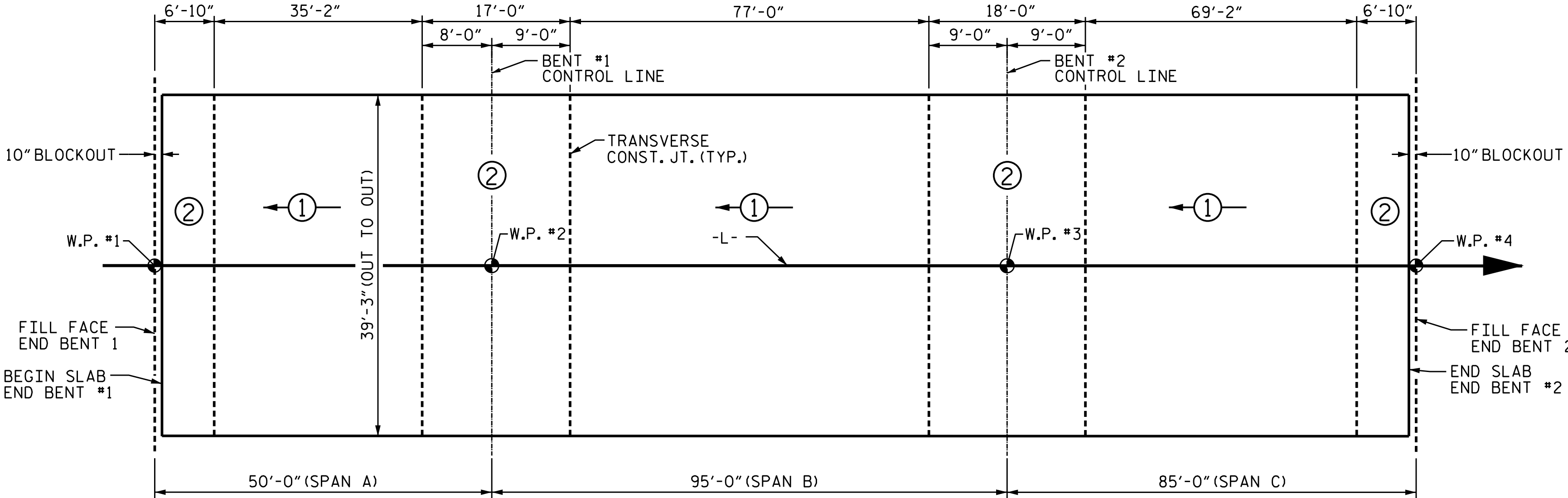
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS	
2			4			37	

(SHT 1b) STD. NO. GRA2



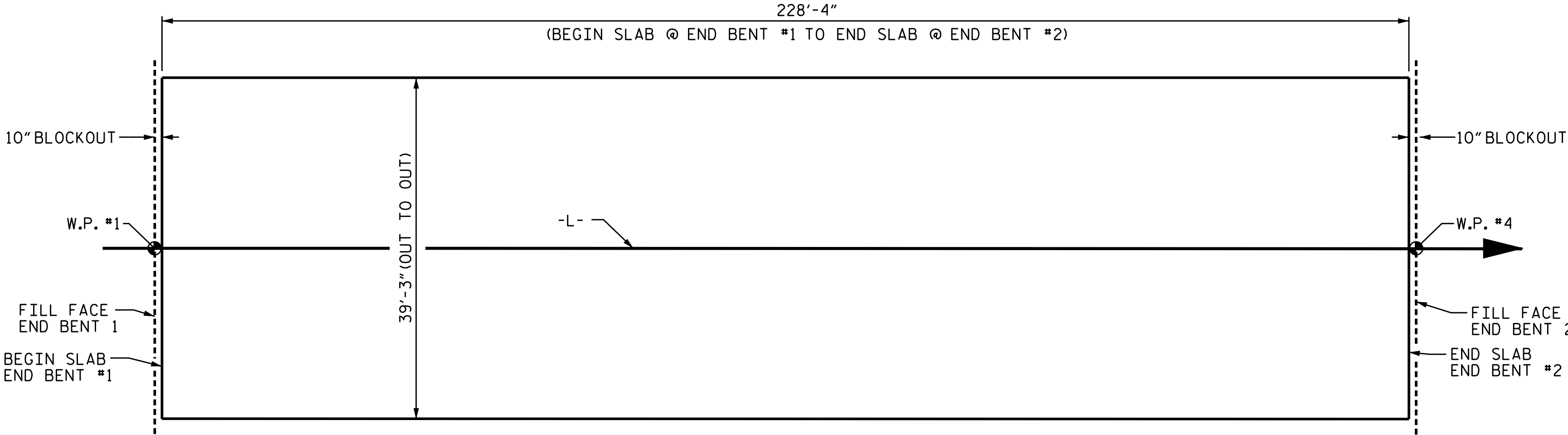
POURING SEQUENCE

POURS CAN NOT BE STARTED UNTIL ADJACENT POURS REACH A MINIMUM OF 3000 PSI.



OPTIONAL POURING SEQUENCE

* POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 8,962)

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	498	#5	STR	38'-10"	20,171
A2	498	#5	STR	38'-10"	20,171
* B1	168	#4	STR	39'-7"	4,442
* B2	50	#6	STR	10'-0"	751
* B3	52	#4	STR	31'-9"	1,103
* B4	50	#4	STR	27'-9"	927
* B5	52	#4	STR	37'-0"	1,285
* B6	25	#4	STR	25'-11"	433
* B7	25	#4	STR	40'-0"	668
* B8	50	#6	STR	17'-0"	1,277
B9	208	#5	STR	58'-6"	12,691
B10	47	#4	STR	39'-0"	1,224
B11	94	#4	STR	23'-10"	1,497
K1	20	#4	STR	23'-3"	311
K2	6	#4	STR	8'-1"	32
K3	12	#4	STR	8'-7"	69
K4	12	#4	STR	9'-7"	77
K5	4	#4	STR	5'-3"	14
K6	8	#4	STR	5'-6"	29
K7	8	#4	STR	6'-0"	32
K8	20	#4	STR	2'-6"	33
H1	96	#5	1	16'-10"	1,685
* S3	62	#4	2	11'-11"	494
* S4	62	#4	2	10'-1"	418
U1	66	#4	3	11'-6"	507
U2	12	#4	3	13'-10"	111

*EPOXY COATED

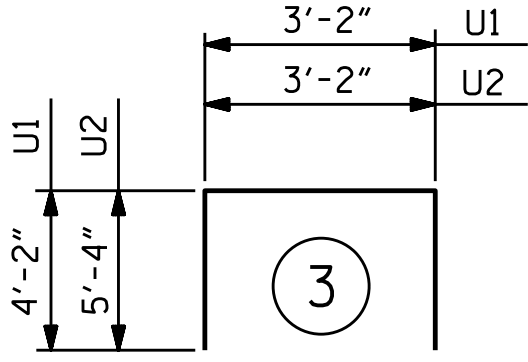
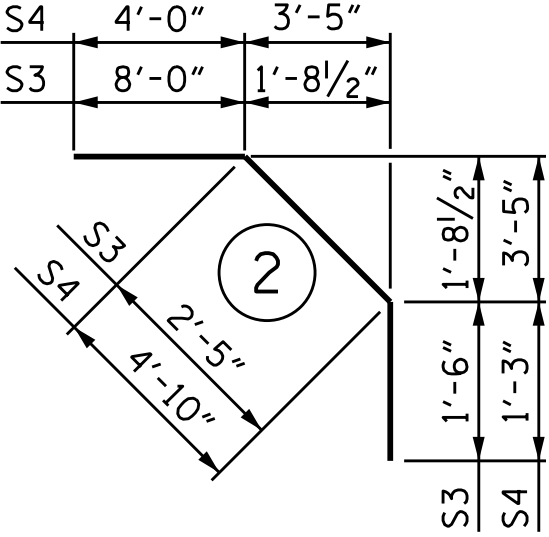
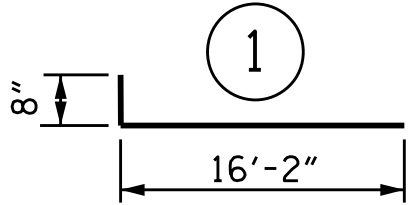
GROOVING BRIDGE FLOORS

APPROACH SLABS	957	SQ.FT.
BRIDGE DECK	7,535	SQ.FT.
TOTAL	8,492	SQ.FT.

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

—SUPERSTRUCTURE BILL OF MATERIAL—

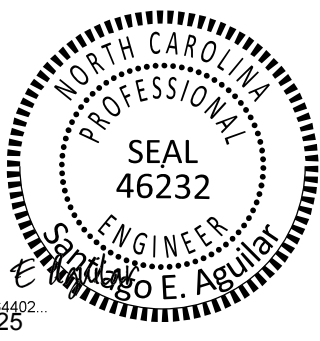
	CLASS AA CONCRETE	REINFORCING STEEL	*EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	46.9		
POUR 2	125.2		
POUR 3	114.7		
POUR 4	80.7		
TOTALS **	367.5	38,483	31,969

** QUANTITIES FOR CONCRETE BARRIER RAIL NOT INCLUDED

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
BILL OF MATERIAL**

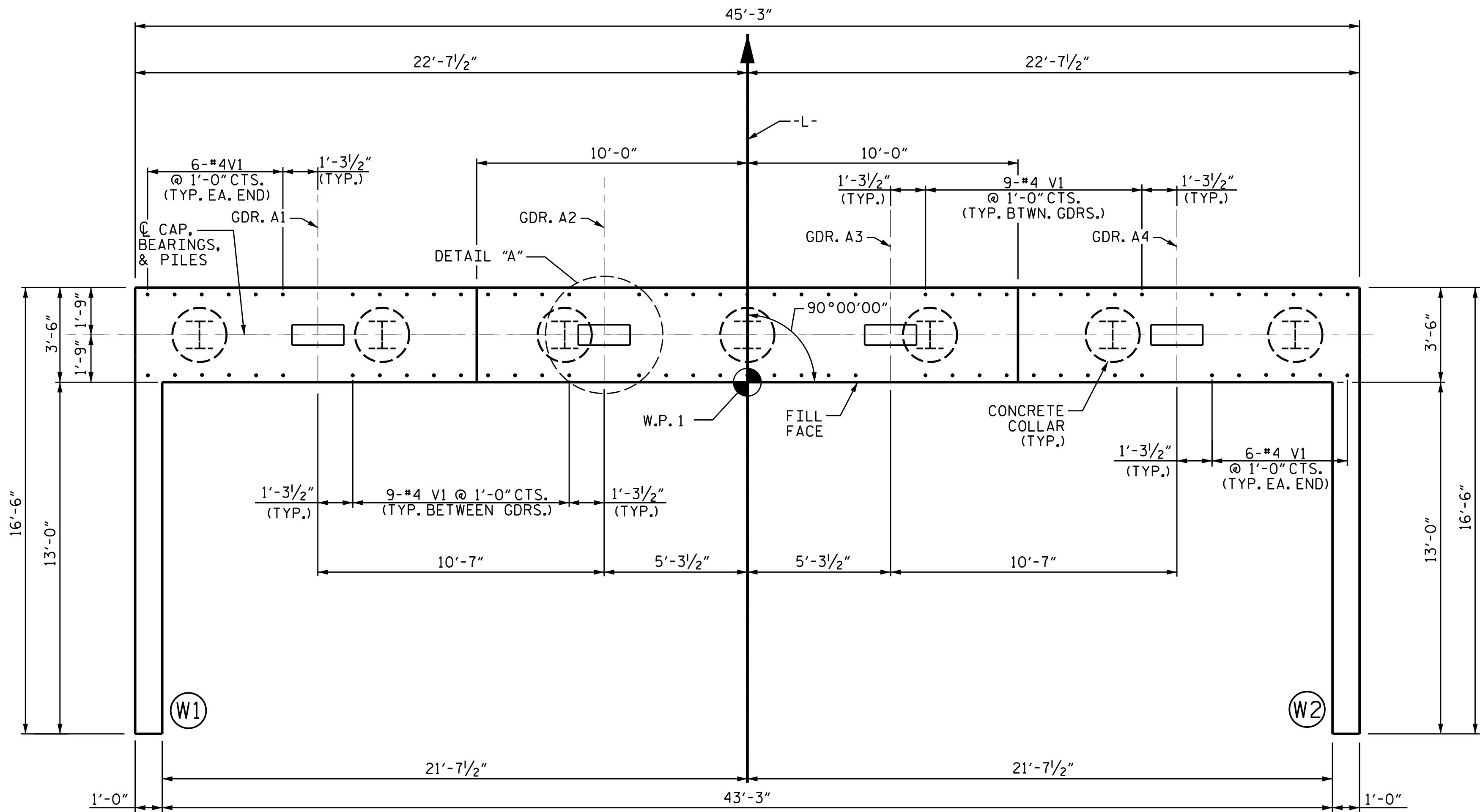


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moffatt & nichol
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NC License NO.: F-0105

REVISIONS						SHEET NO. S-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			37

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T.Kirschbaum



PLAN OF CAP

NOTES:

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

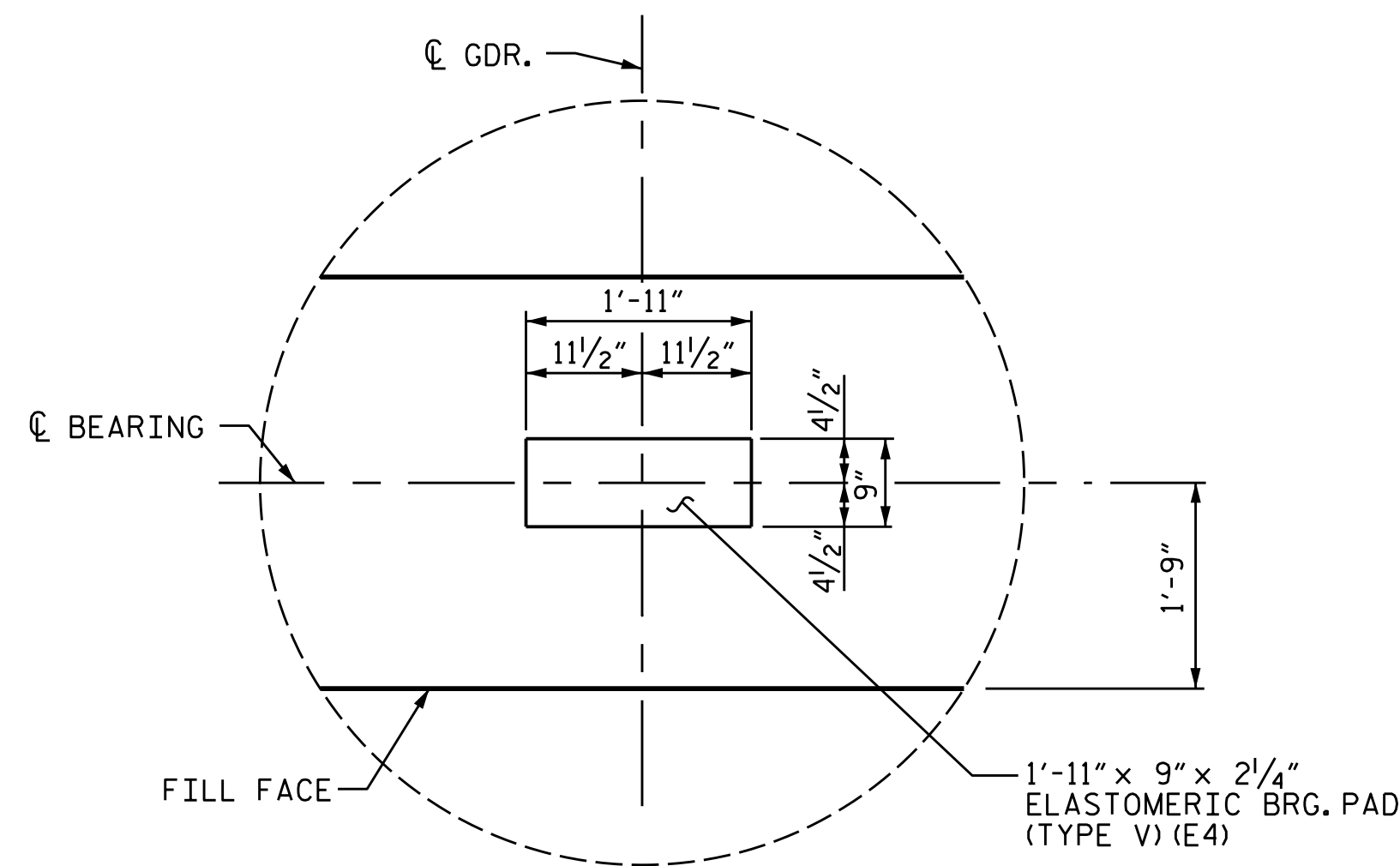
SEE THE SUPERSTRUCTURE SHEETS FOR UPPER PART OF THE INTEGRAL END BENT DETAIL.

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

FOR SECTIONS A-A & B-B, SEE SHEET 3 OF 3.

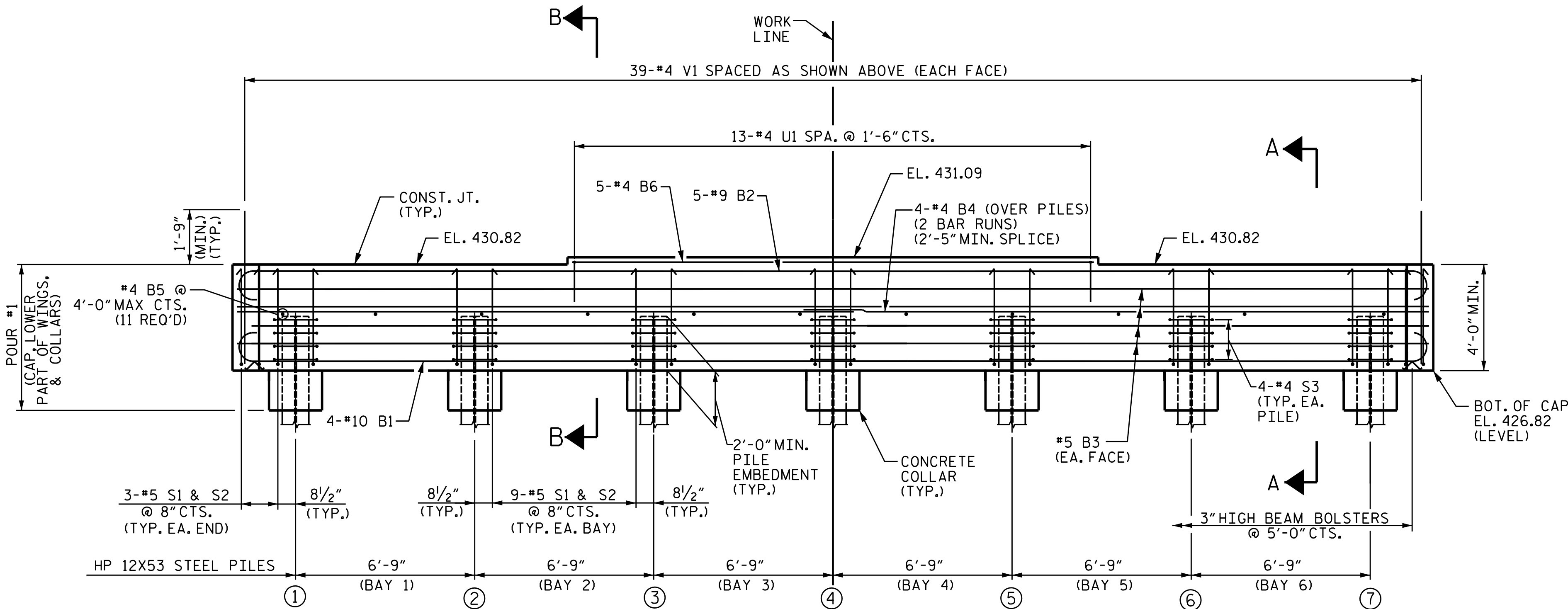
FOR "CORROSION PROTECTION FOR STEEL PILES DETAIL", SEE SHEET 3 OF 3.

THE UPPER PART OF INTEGRAL PORTION AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLAN OF SPANS.



DETAIL "A"

(TYP. EACH GIRDER)



ELEVATION

(REINFORCING IN WING NOT SHOWN FOR CLARITY)

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

INTEGRAL END BENT 1



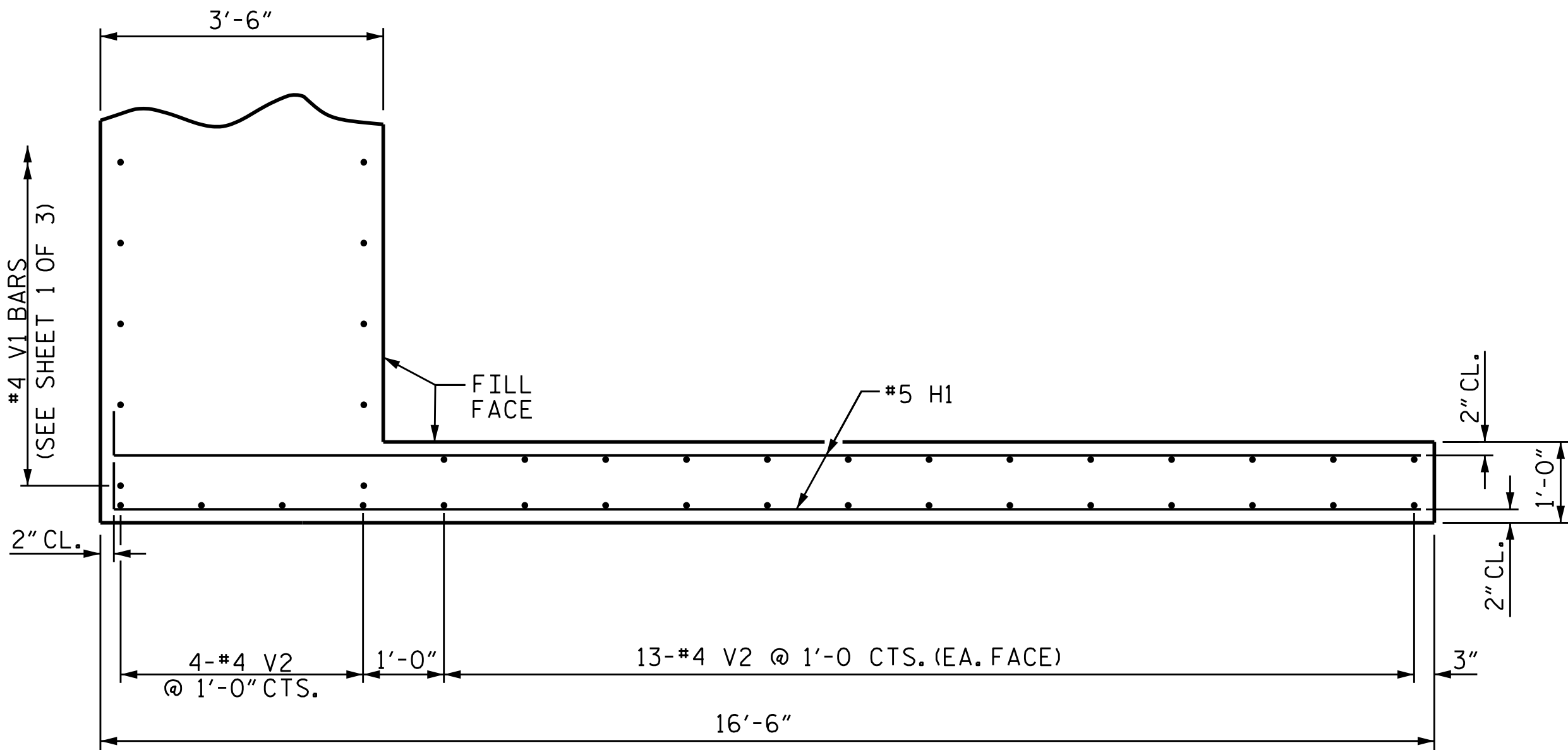
Signed by:
Santiago E. Aguilar
12/2/2025

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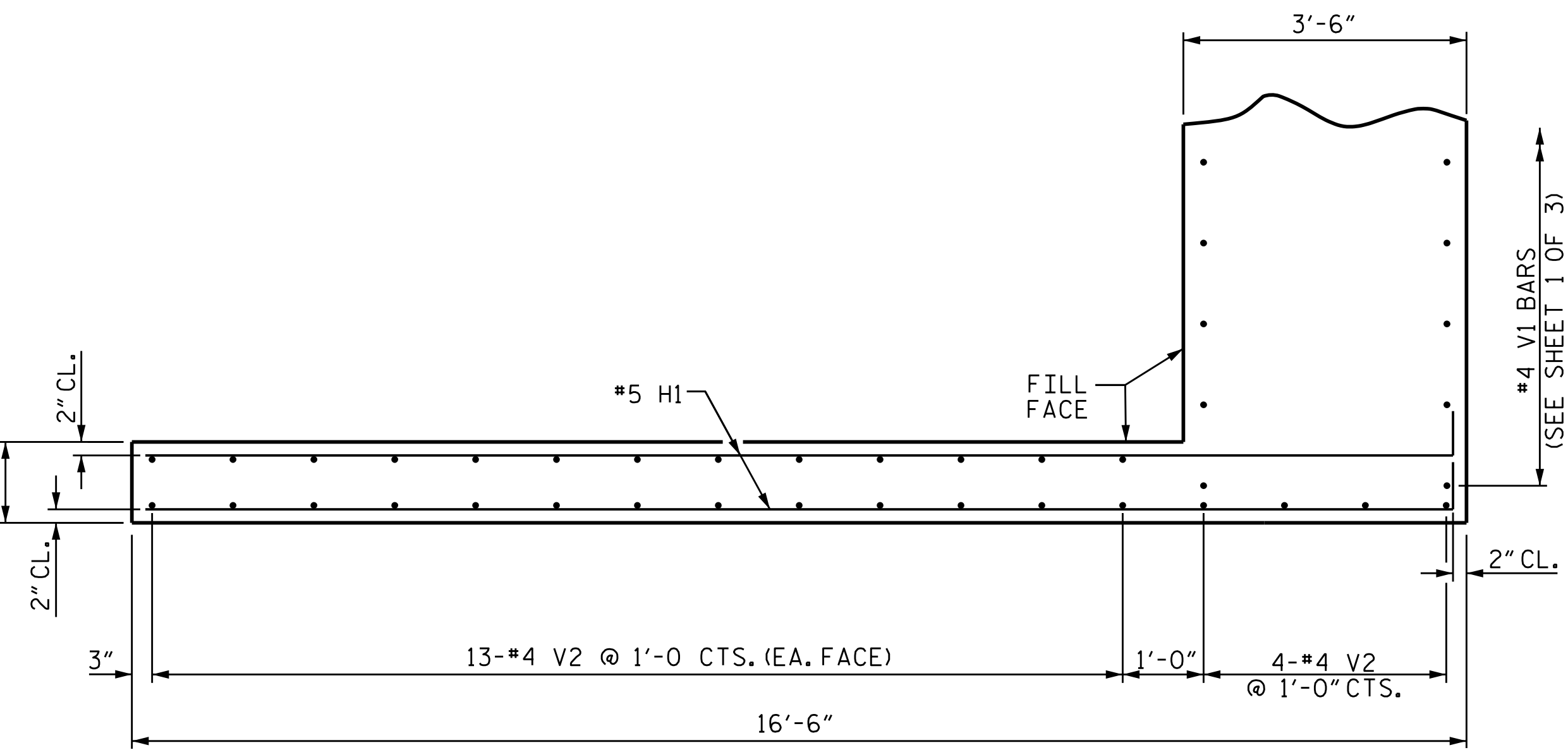
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CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

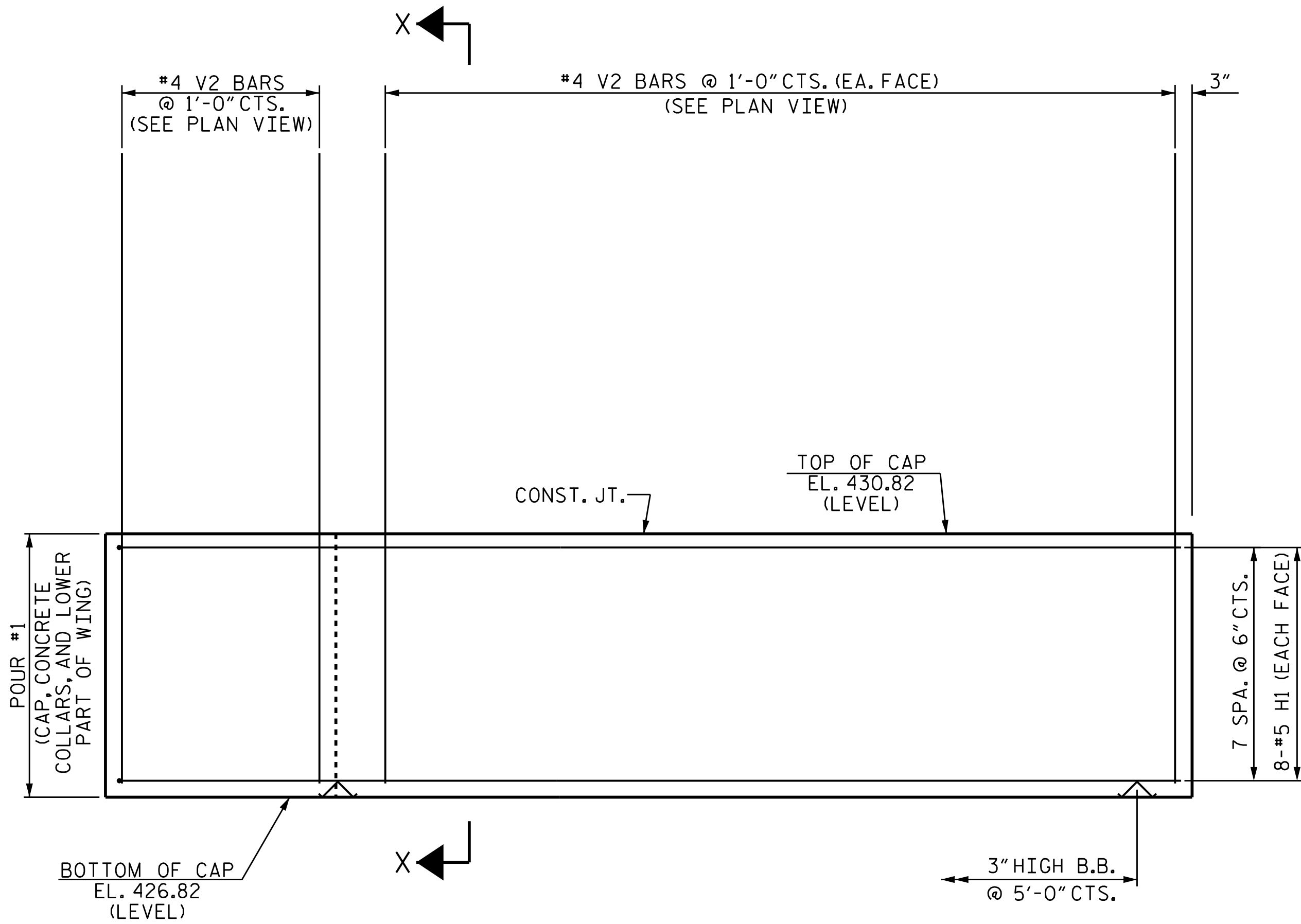
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 37



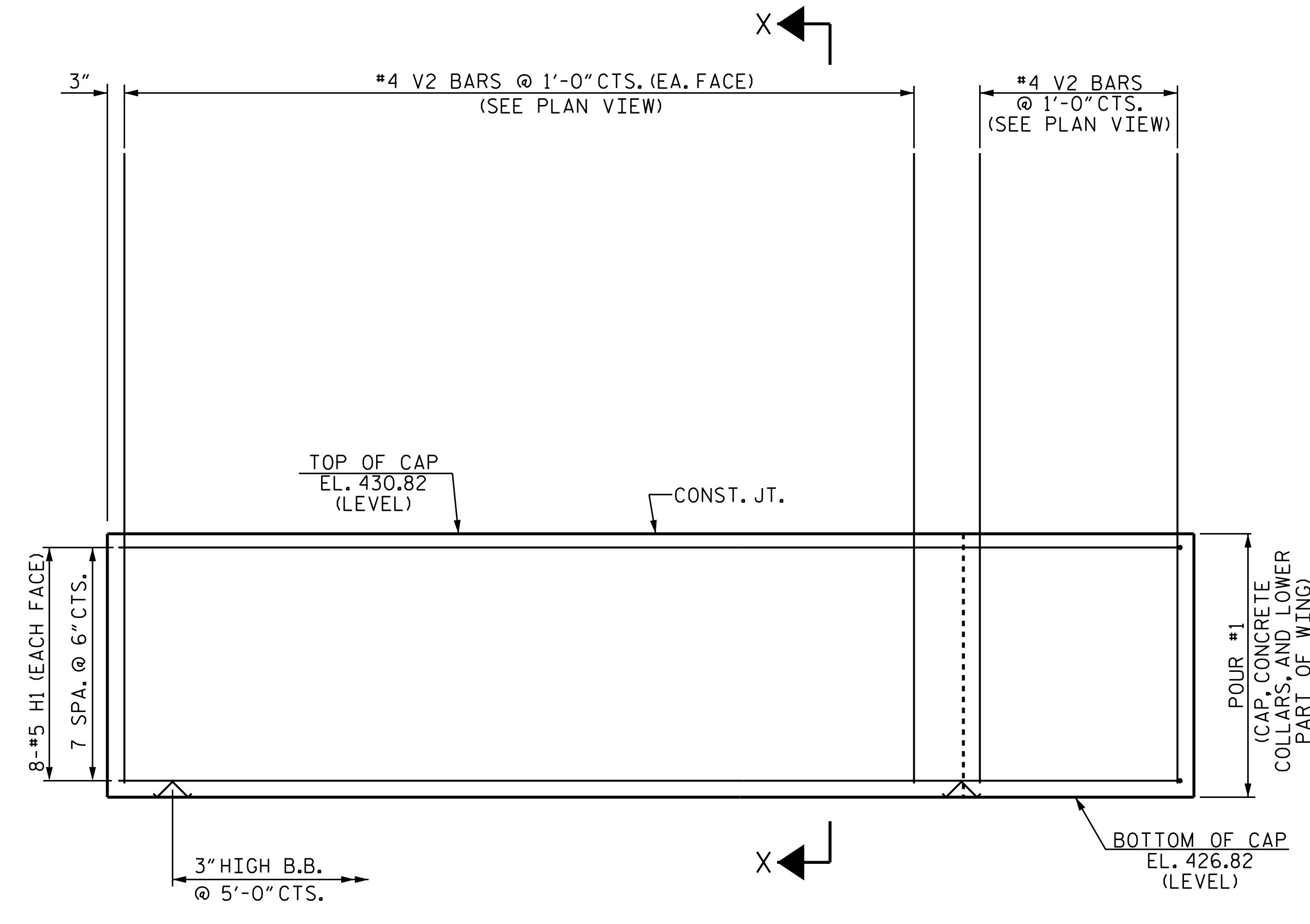
PLAN OF WING (W1)



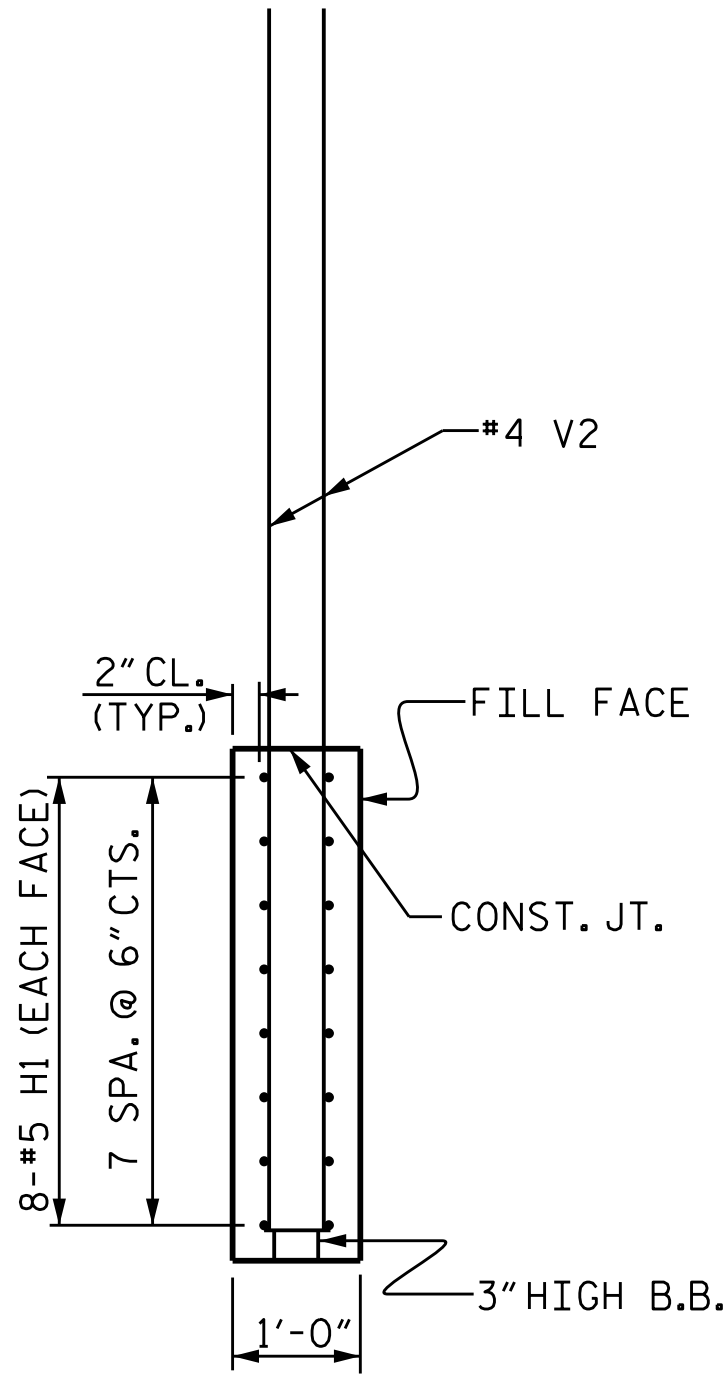
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

WING DETAILS

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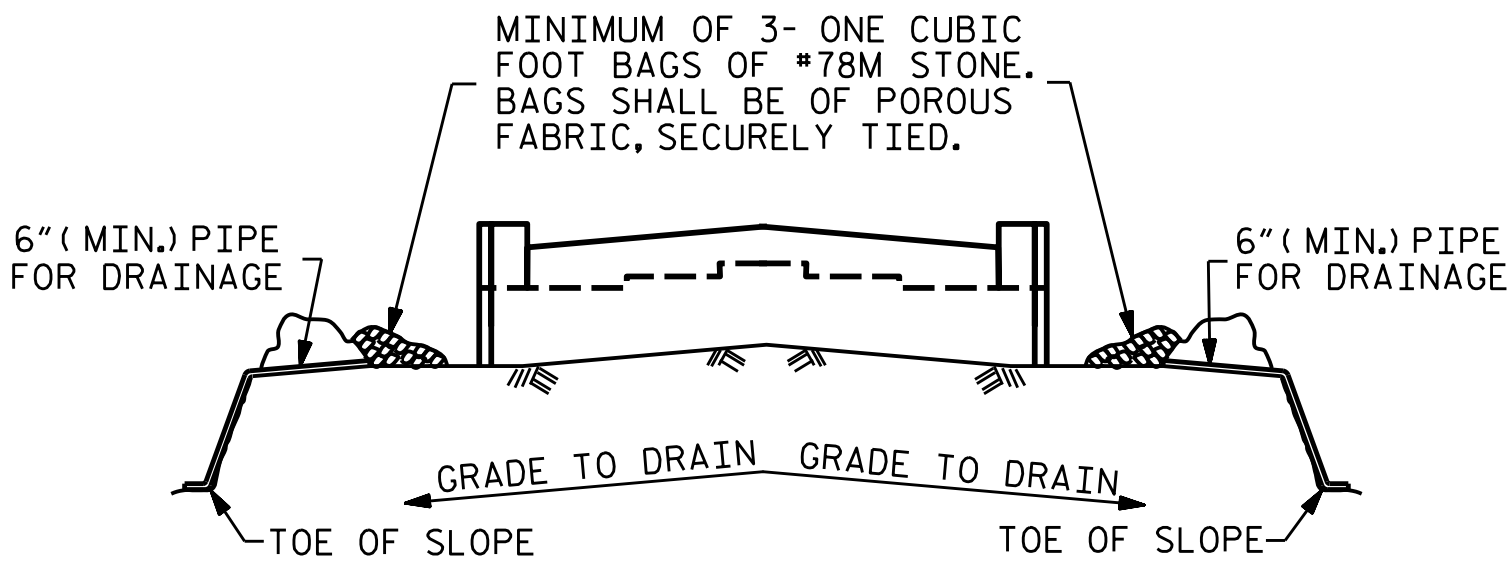
PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

SHEET 2 OF 3

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26	
1			3			TOTAL SHEETS	
2			4			37	

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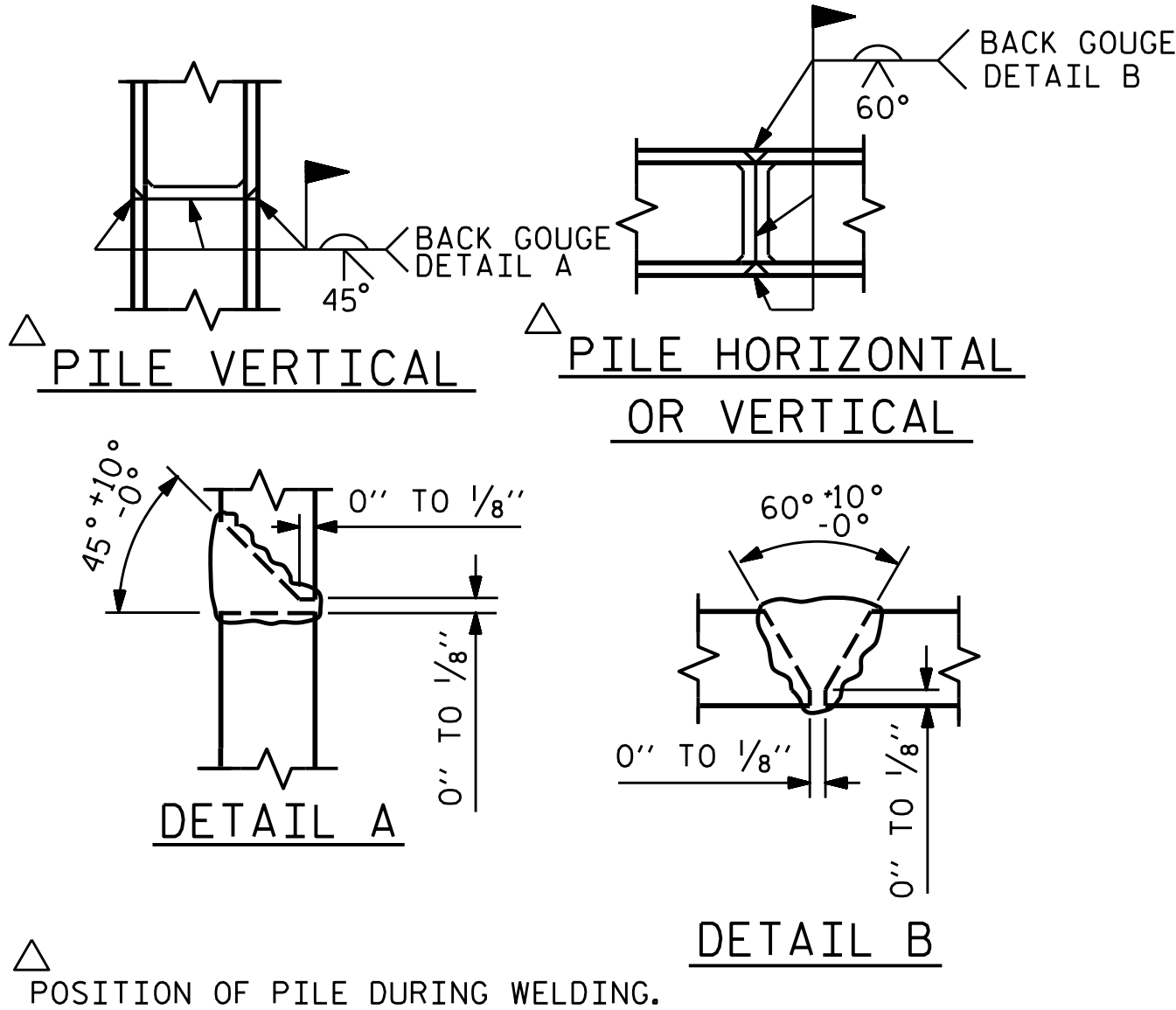


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

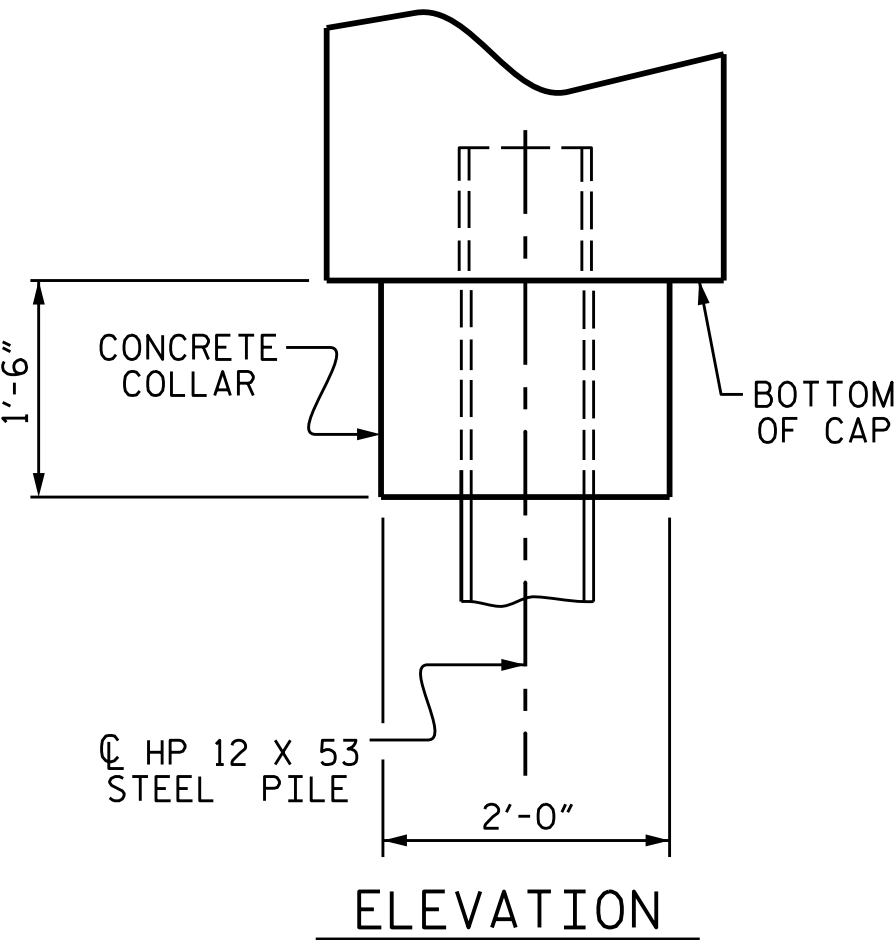
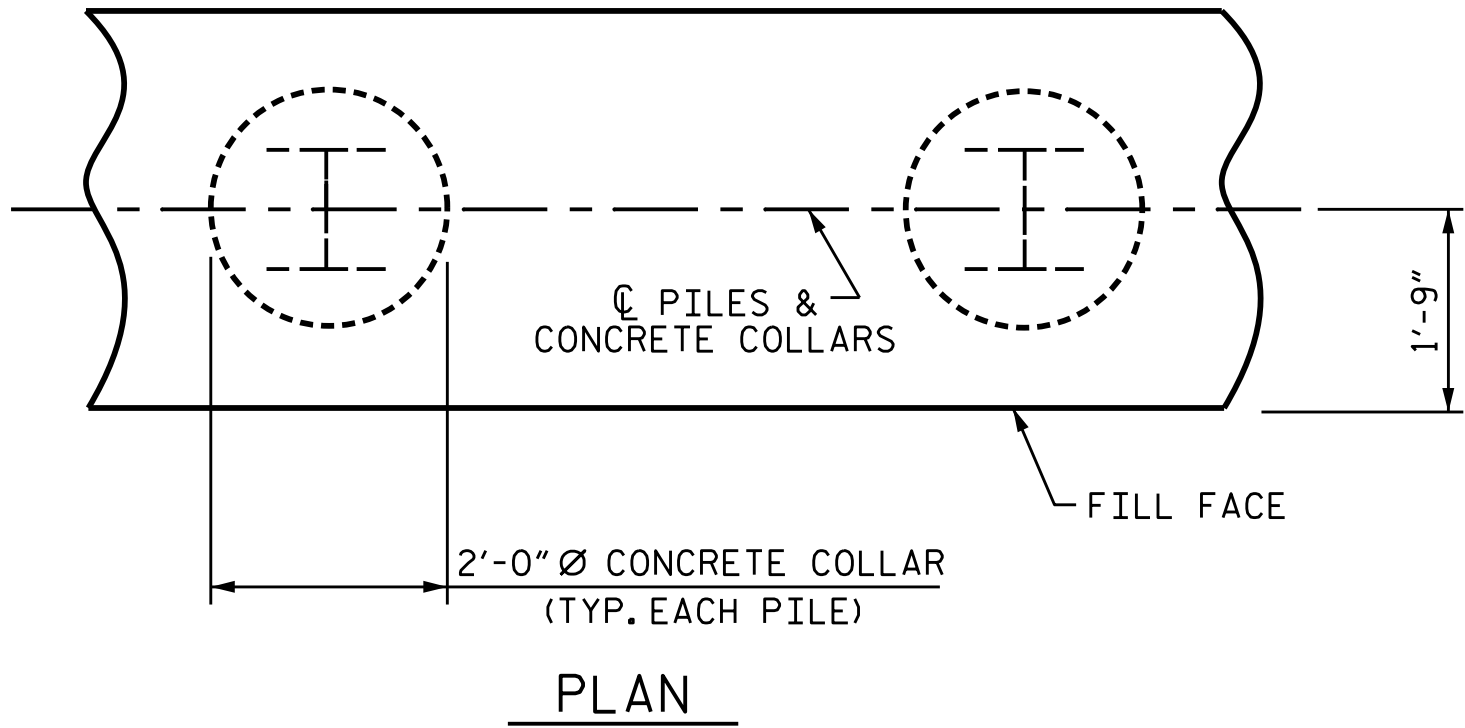
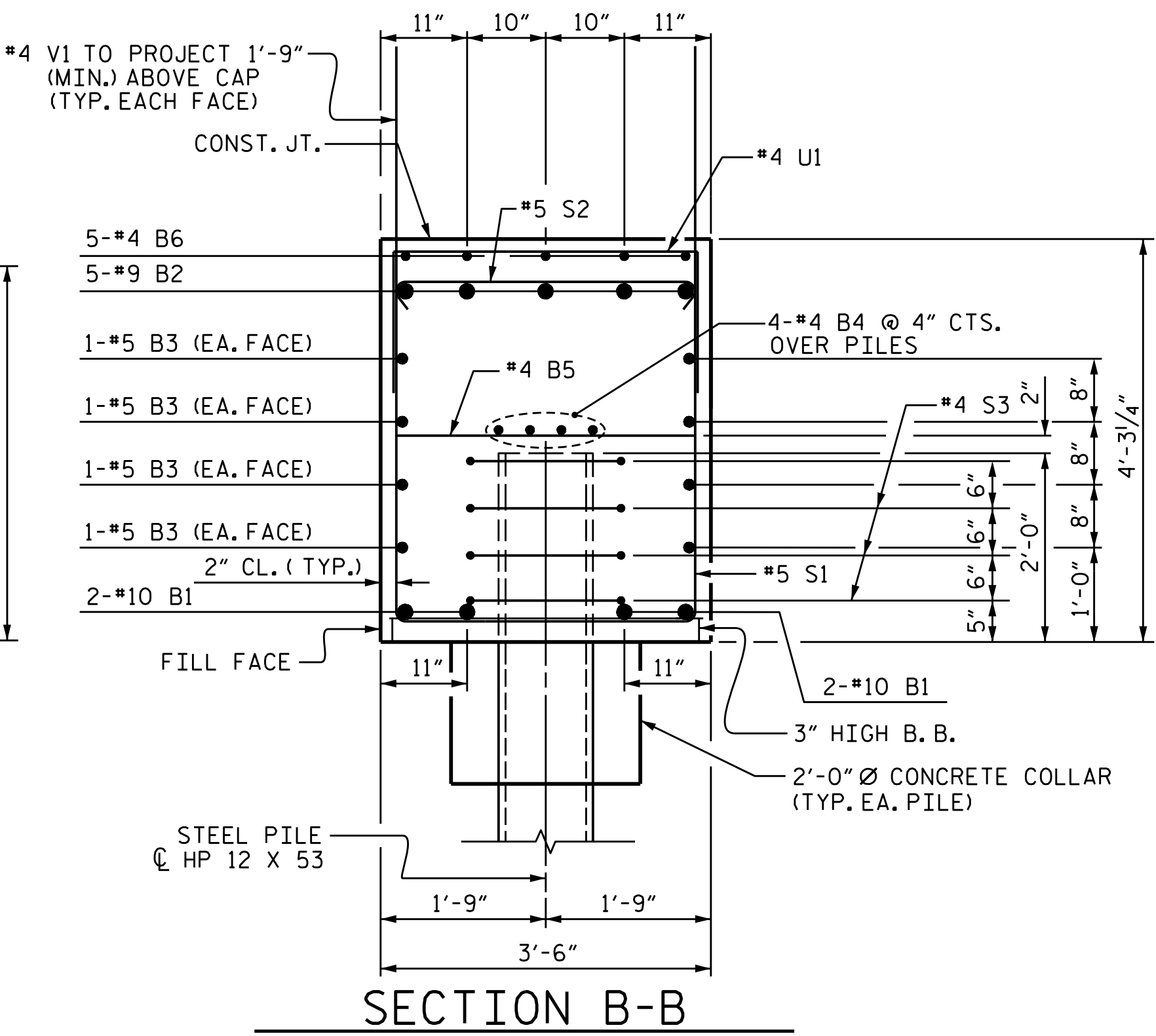
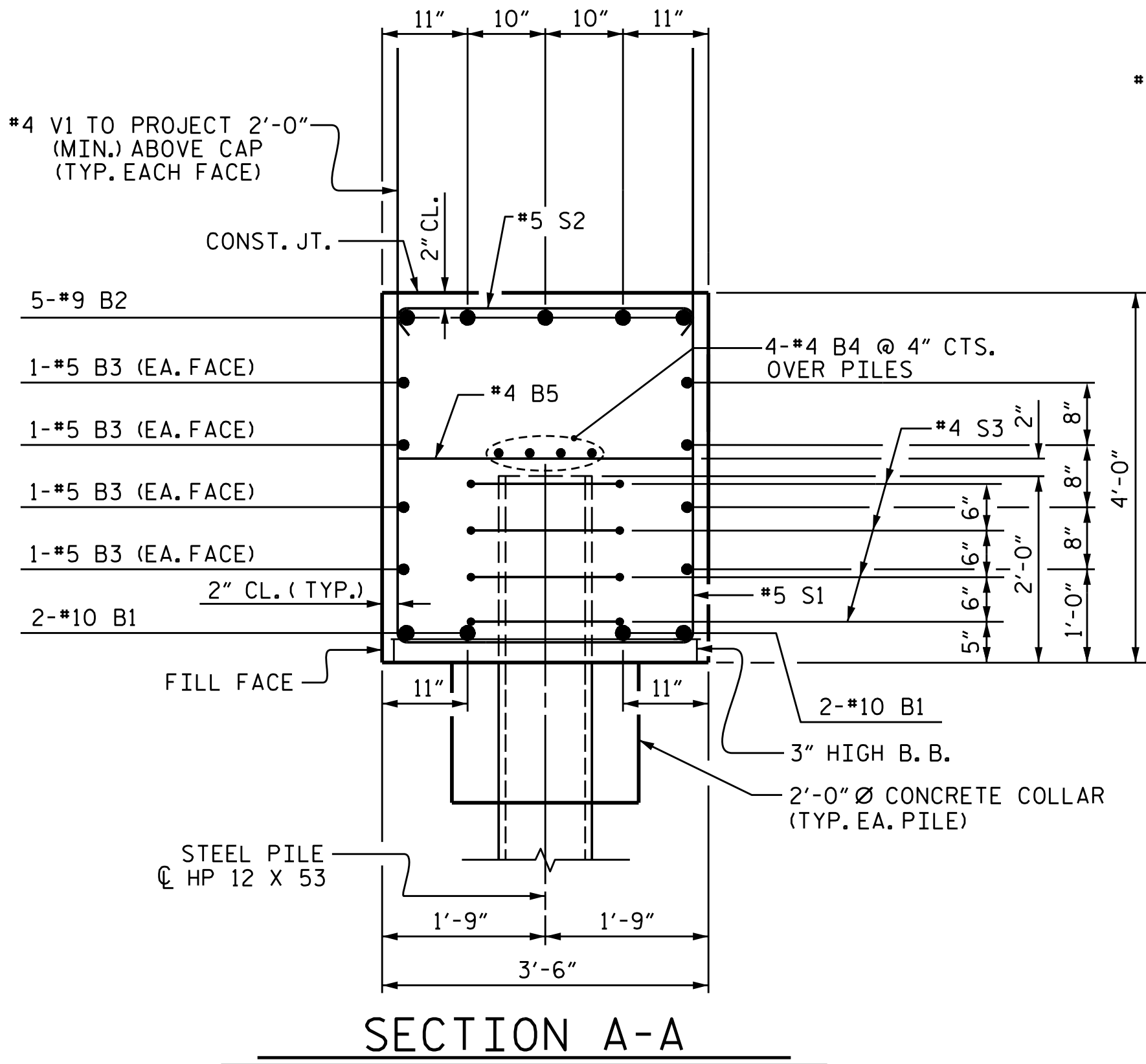
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPES					
BILL OF MATERIAL FOR END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	47'-7"	819
B2	5	#9	1	47'-3"	803
B3	8	#5	STR	44'-11"	375
B4	8	#4	STR	23'-8"	126
B5	11	#4	STR	3'-2"	23
B6	5	#4	STR	19'-8"	66
H1	32	#5	2	16'-10"	562
S1	60	#5	3	11'-4"	709
S2	60	#5	4	4'-1"	256
S3	28	#4	5	6'-6"	122
U1	13	#4	6	6'-2"	54
V1	78	#4	STR	5'-10"	304
V2	60	#4	STR	9'-6"	381
REINFORCING STEEL (FOR END BENT #1) 4,600 LBS.					
CLASS A CONCRETE BREAKDOWN (FOR END BENT #1)					
POUR #1 CAP, COLLARS & LOWER PART OF WINGS				29.3 C.Y.	
TOTAL CLASS A CONCRETE				29.3 C.Y.	



CORROSION PROTECTION FOR STEEL PILES DETAIL

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 3 OF 3

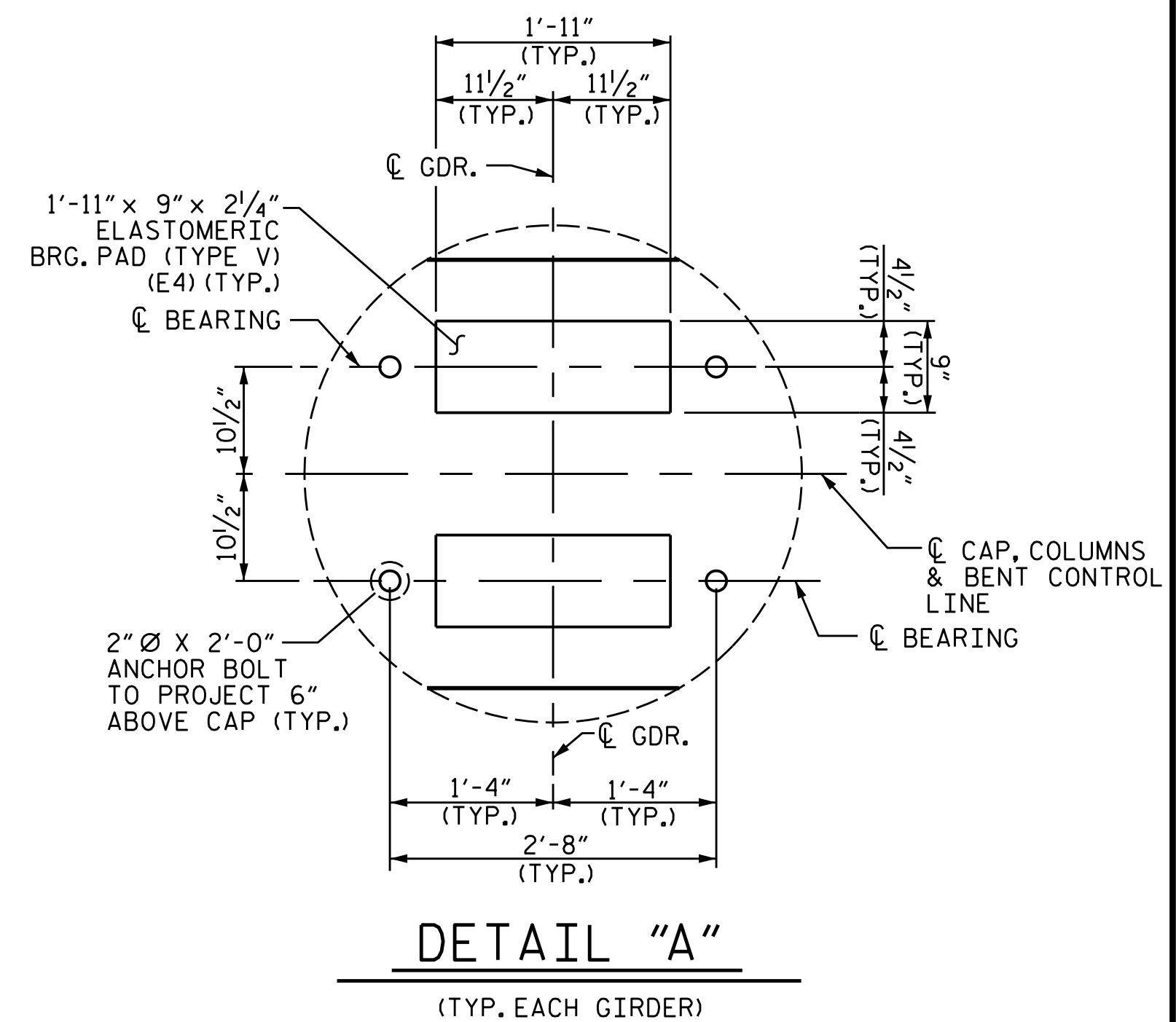
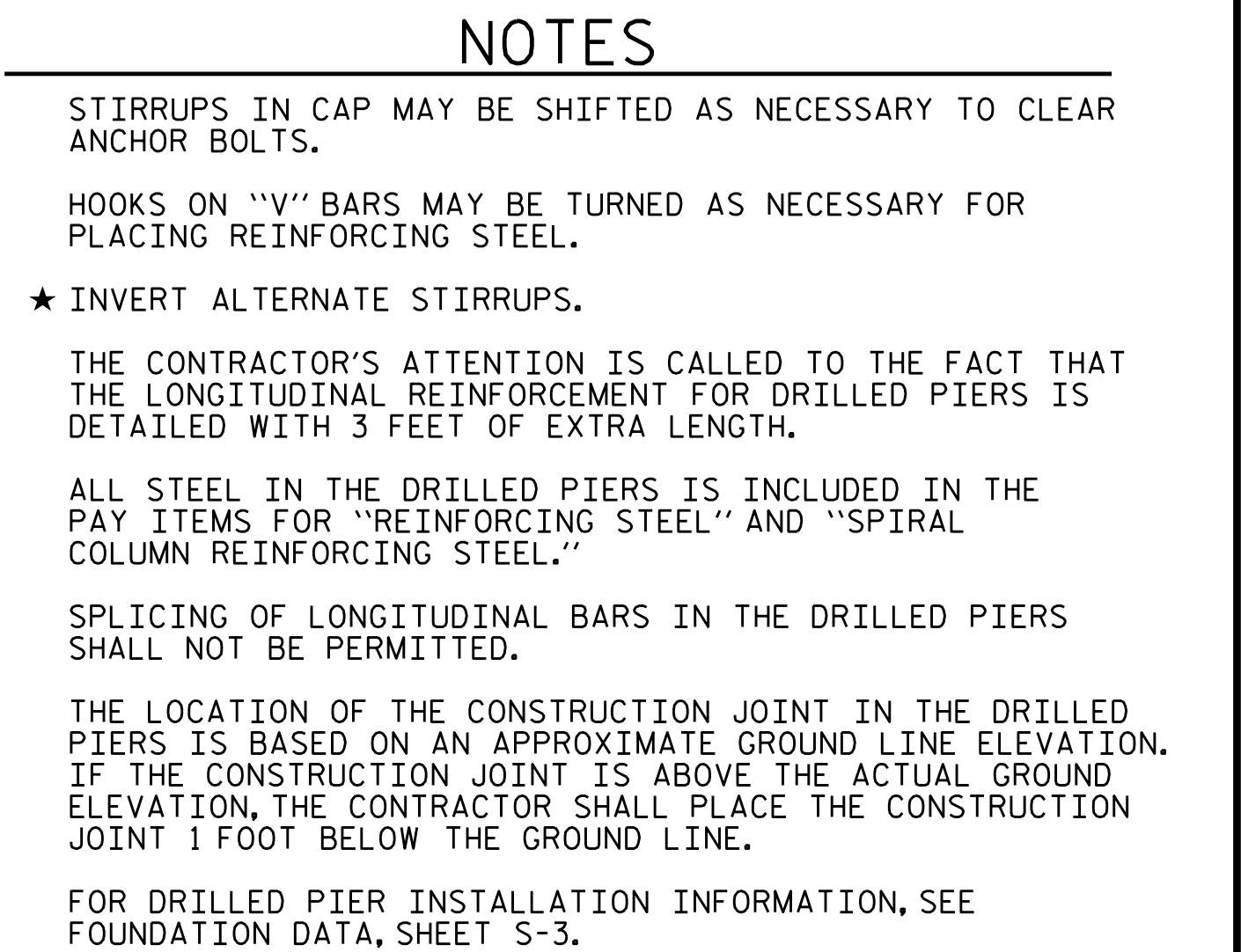


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SHEET NO. S-27	
TOTAL SHEETS 37	



SHEET 1 OF 2

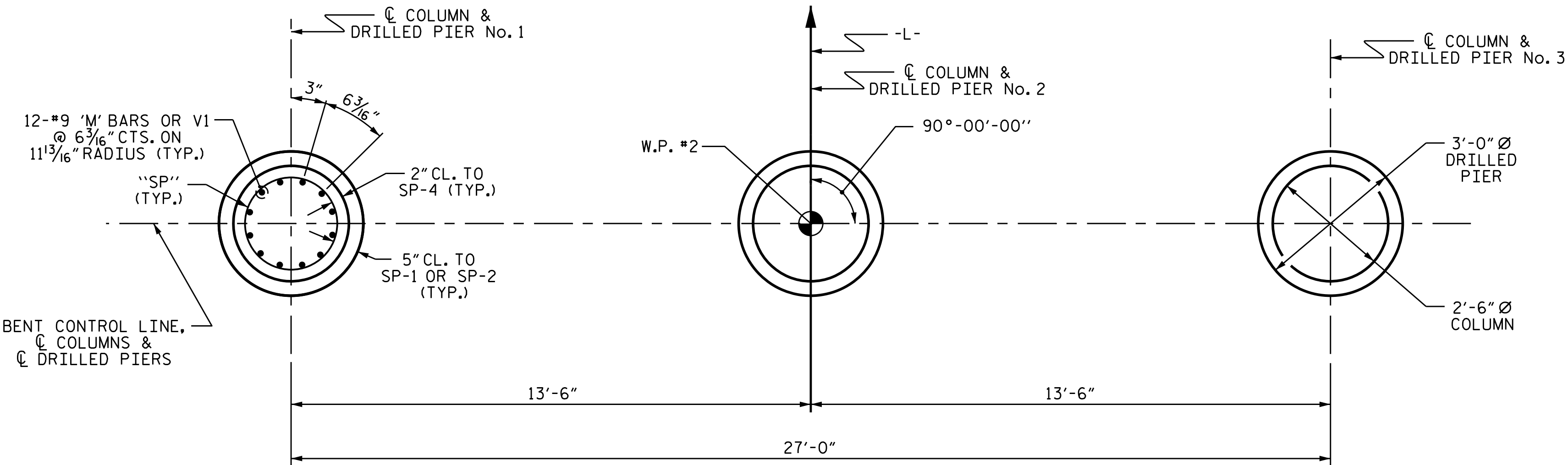
BENT 1

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

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(919) 781-4626 VOICE (919) 781-4869 FAX
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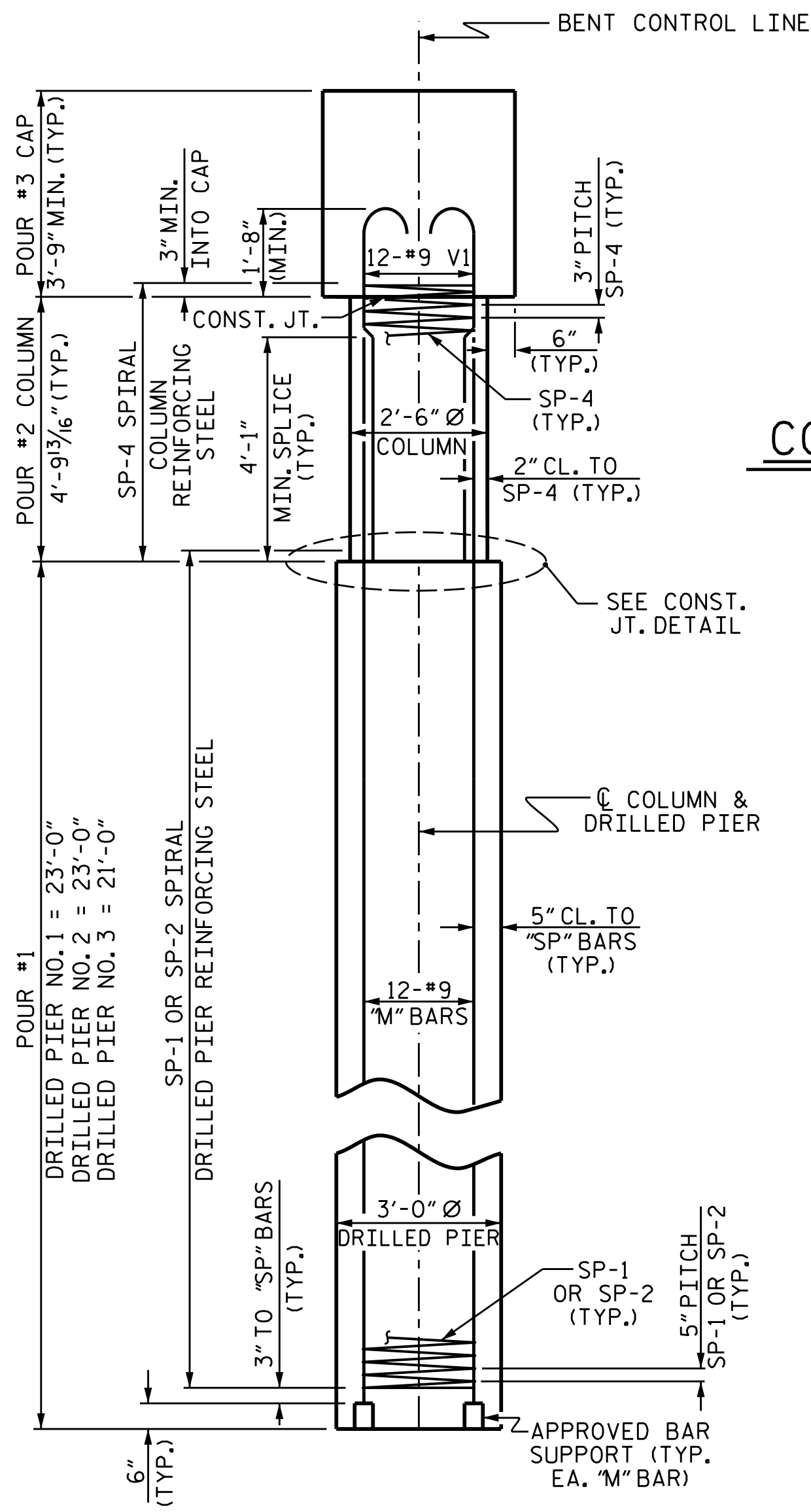
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FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			37

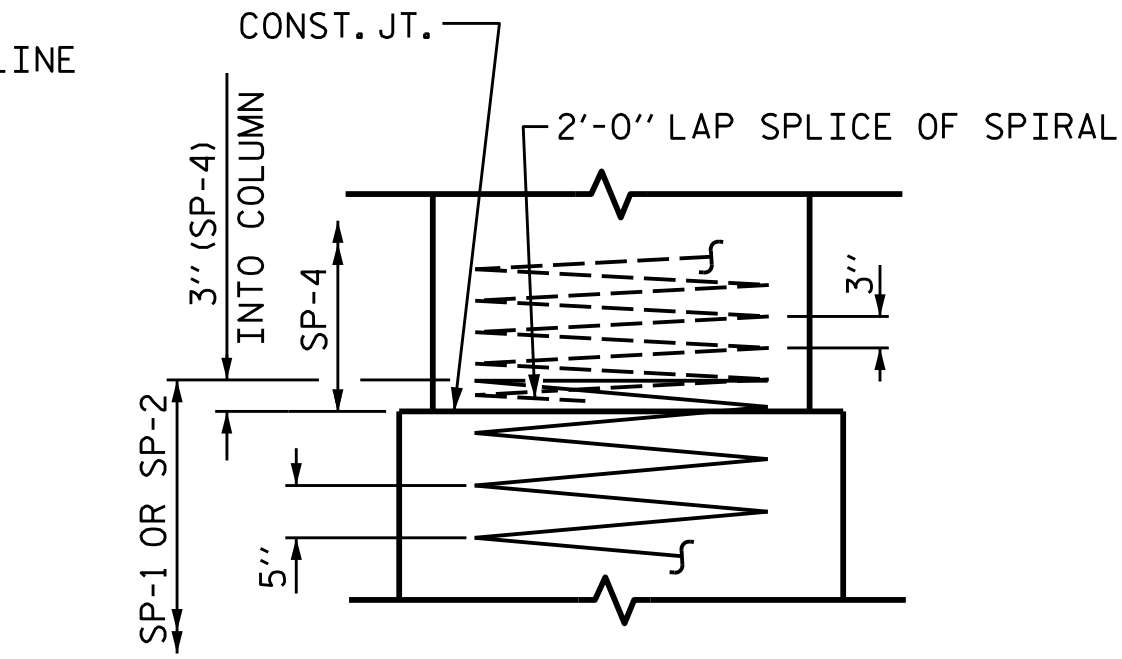


PLAN OF DRILLED PIERS & COLUMNS

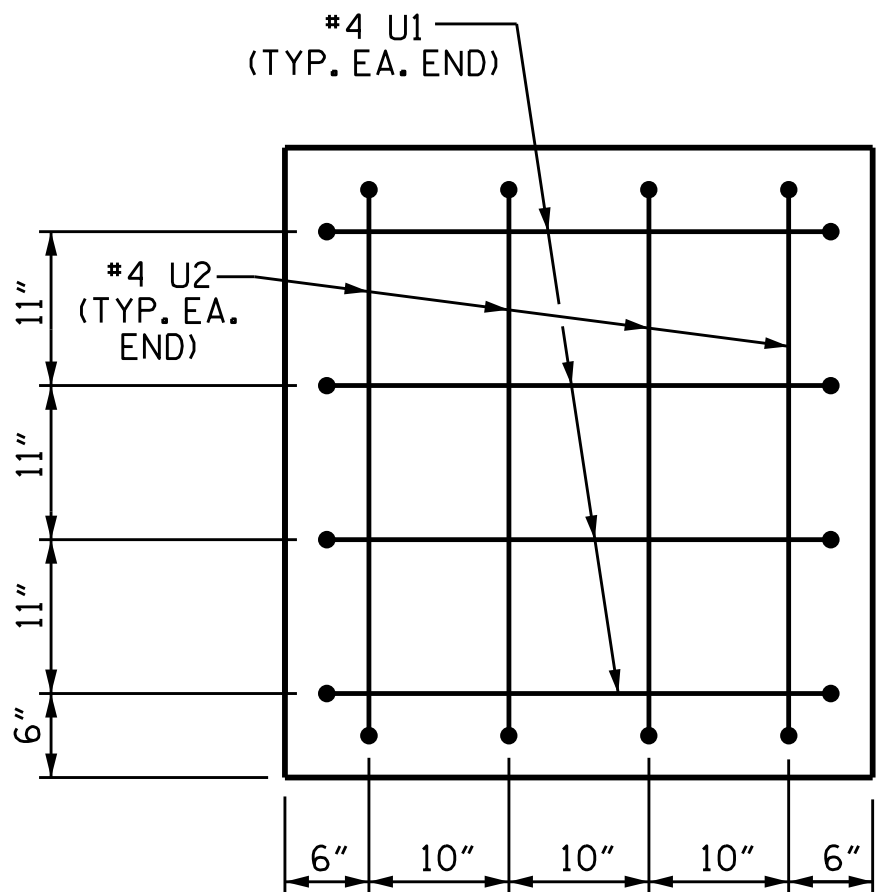
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



END ELEVATION

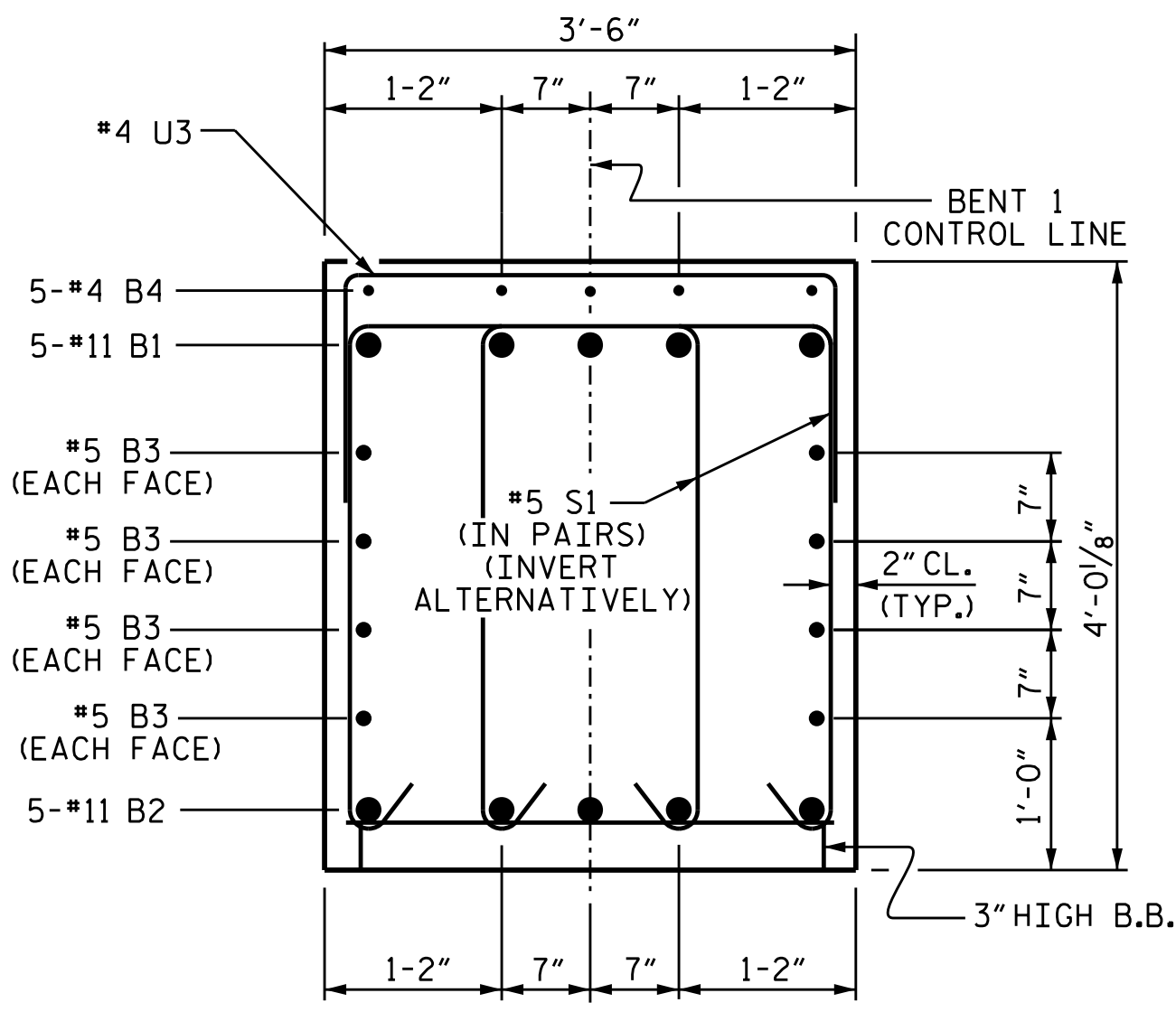


CONSTRUCTION JOINT DETAIL

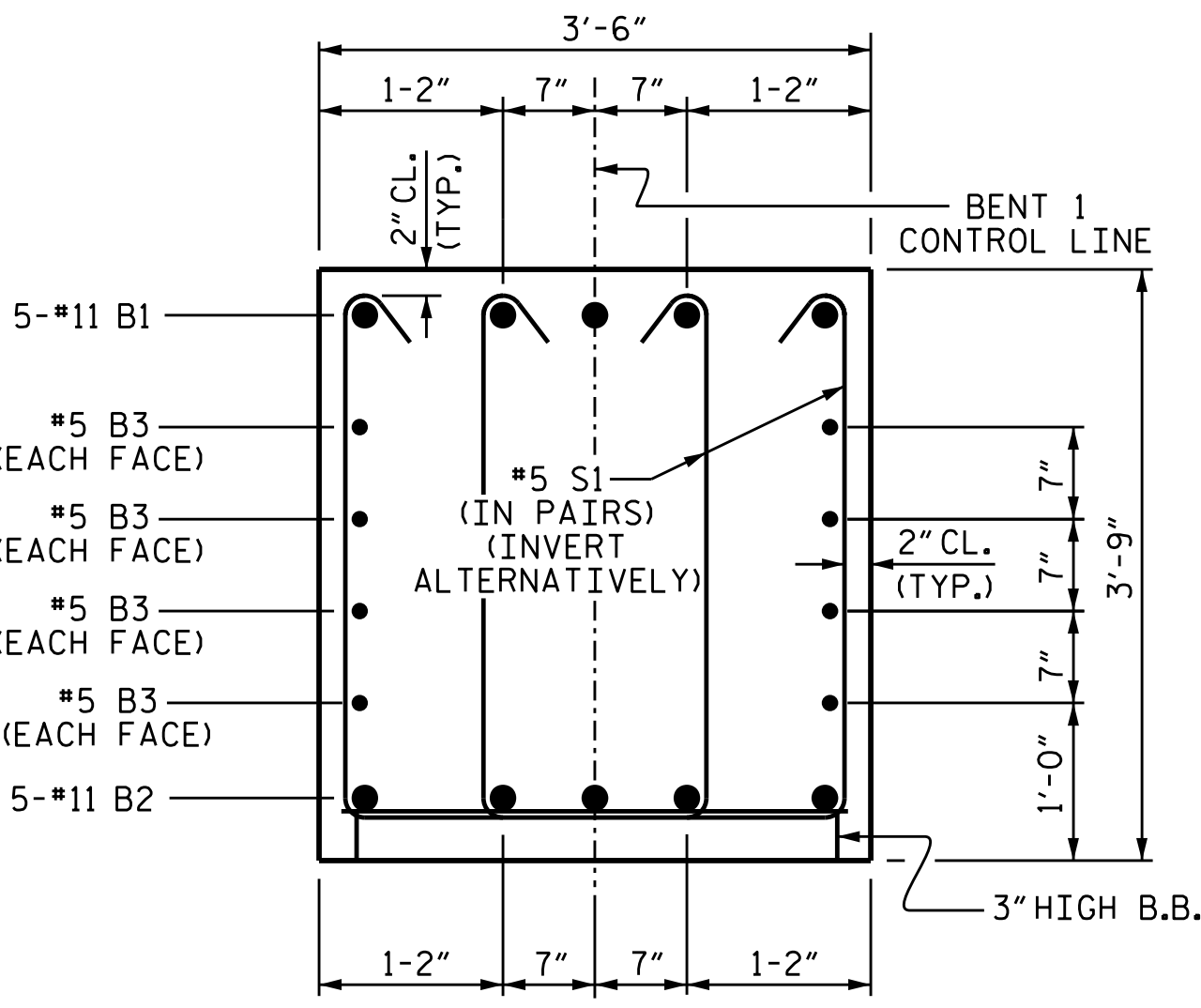


END OF CAP VIEW

(TYPICAL BOTH ENDS)

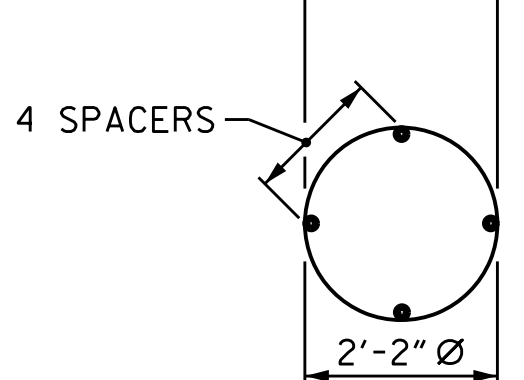
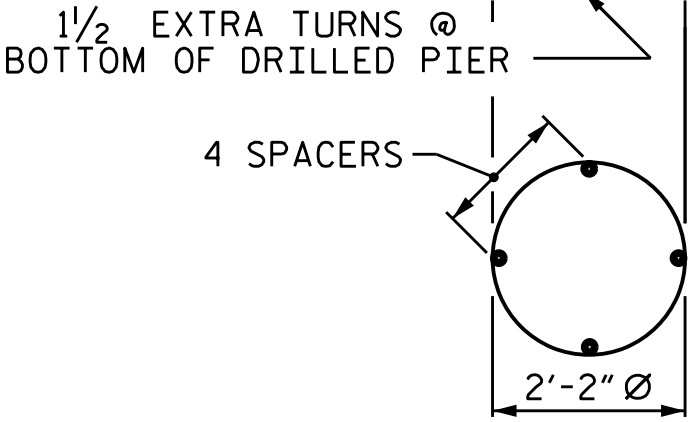
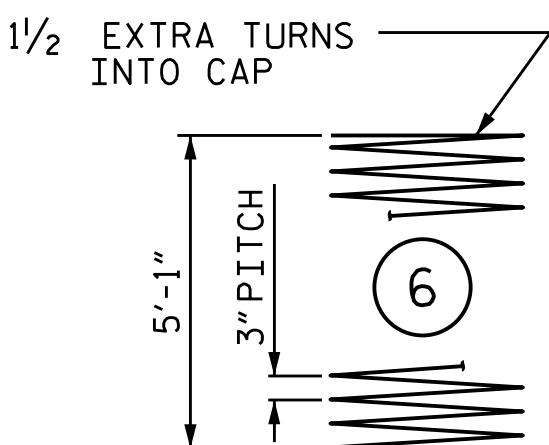
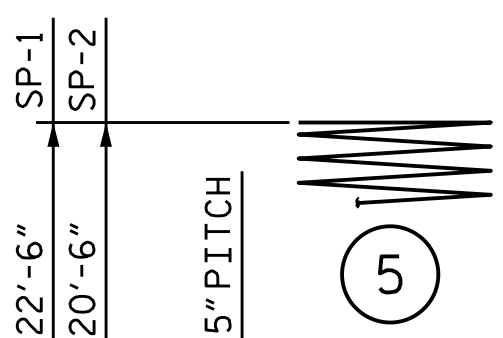
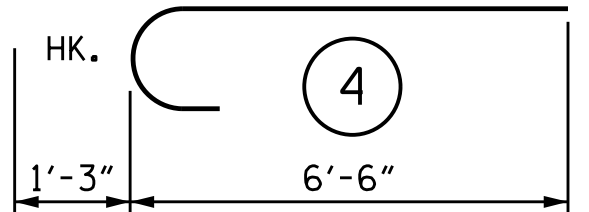
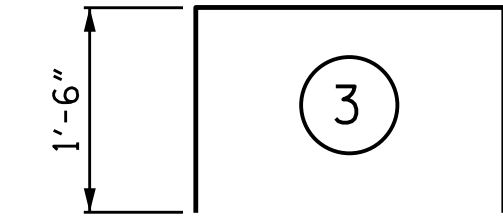
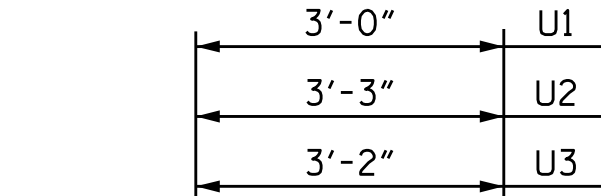
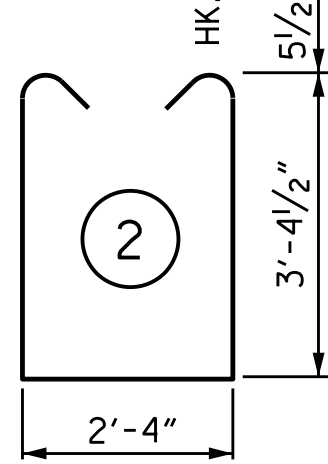
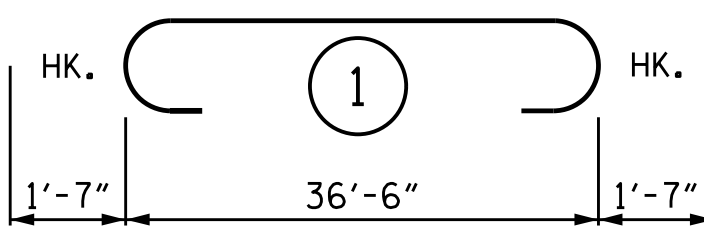


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#11	1	39'-8"	1,054
B2	5	#11	STR	36'-8"	974
B3	8	#5	STR	36'-8"	306
B4	5	#4	STR	15'-8"	52

M1	24	#9	STR	29'-7"	2,414
M2	12	#9	STR	27'-7"	1,125

S1	144	#5	2	10'-0"	1,502
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U1	8	#4	3	6'-0"	32
U2	8	#4	3	6'-3"	33
U3	40	#4	3	6'-2"	165

V1	36	#9	4	7'-9"	949
----	----	----	---	-------	-----

REINFORCING STEEL					8,606 LBS.
-------------------	--	--	--	--	------------

SP-1	2	*	5	372'-9"	778
SP-2	1	*	5	339'-6"	354

SP-4	3	**	6	147'-0"	295
------	---	----	---	---------	-----

SPIRAL COLUMN REINFORCING STEEL					1,427 LBS.
---------------------------------	--	--	--	--	------------

* THE SP-1 & SP-2 SPIRAL REINFORC. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

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

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	2.7 C.Y.
POUR #3 (CAP)	18.6 C.Y.

TOTAL CLASS A CONCRETE	21.3 C.Y.
------------------------	-----------

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS)	17.6 C.Y.
-------------------------	-----------

PROJECT NO. BR-0060

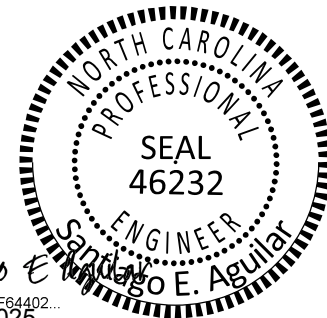
ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1
DETAILS



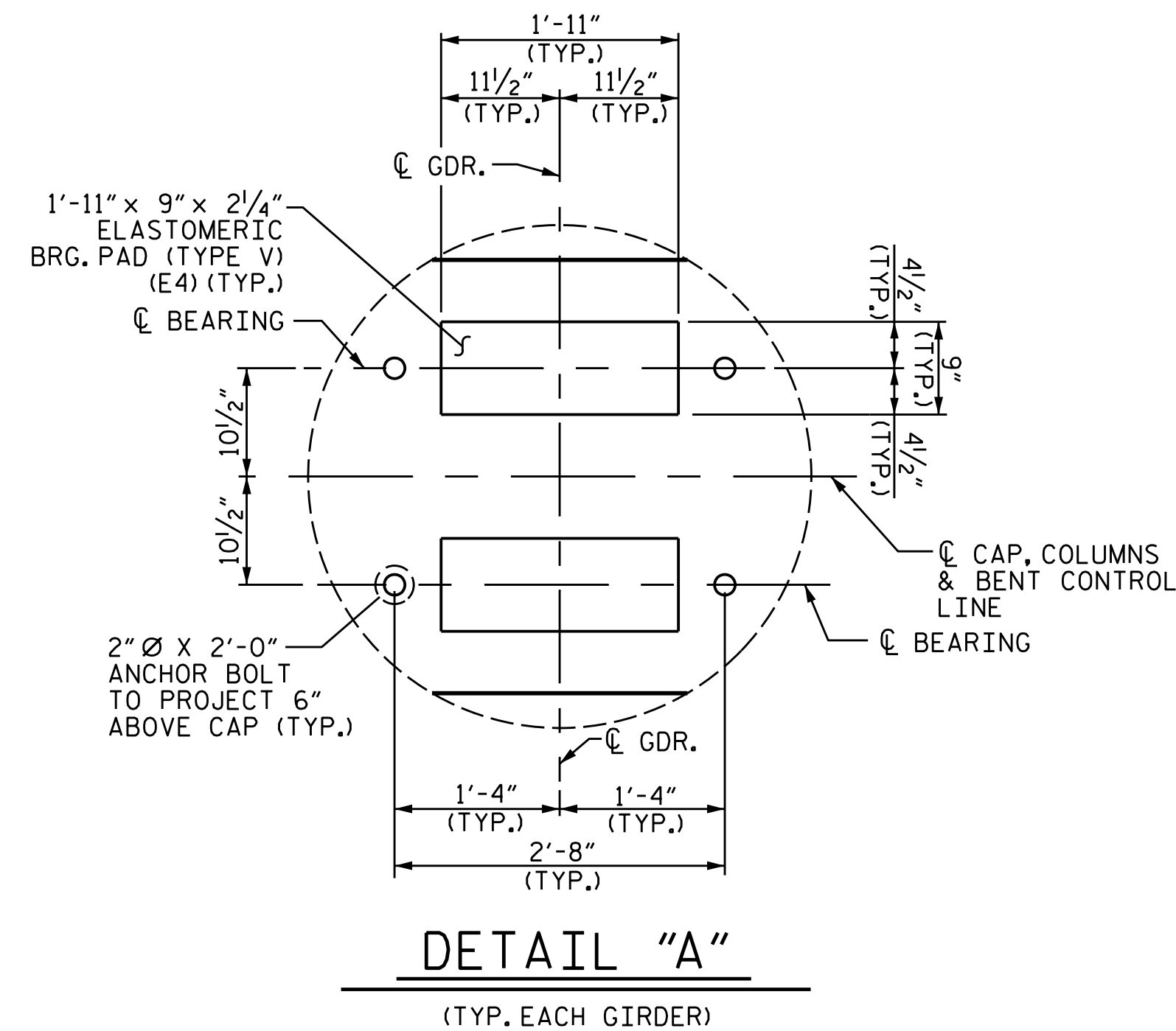
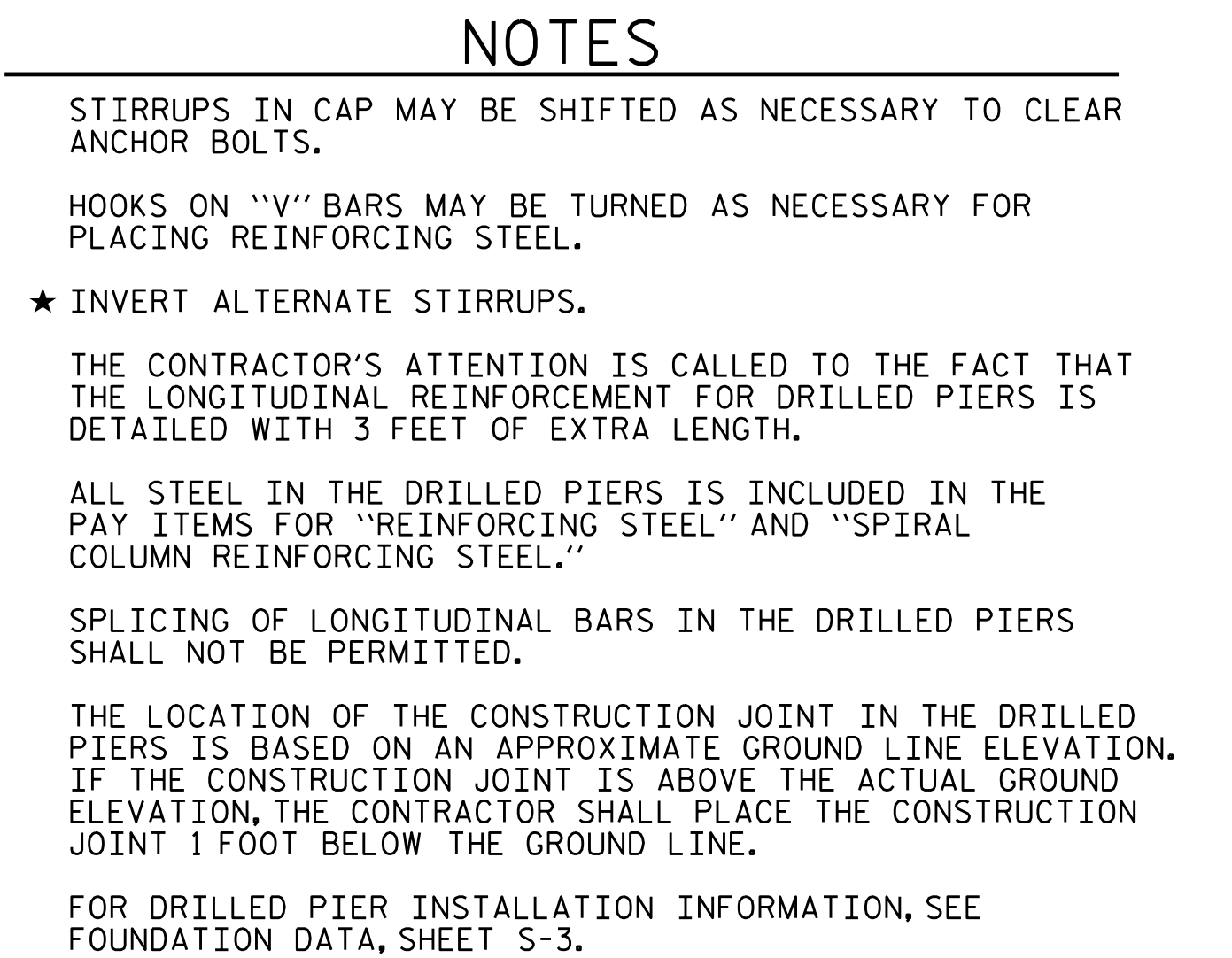
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FINAL UNLESS ALL
SIGNATURES COMPLETED

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

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

TOTAL SHEETS	S-29
37	



SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUBSTRUCTURE

BENT 2

REVISIONS						SHEET NO.
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2			4			

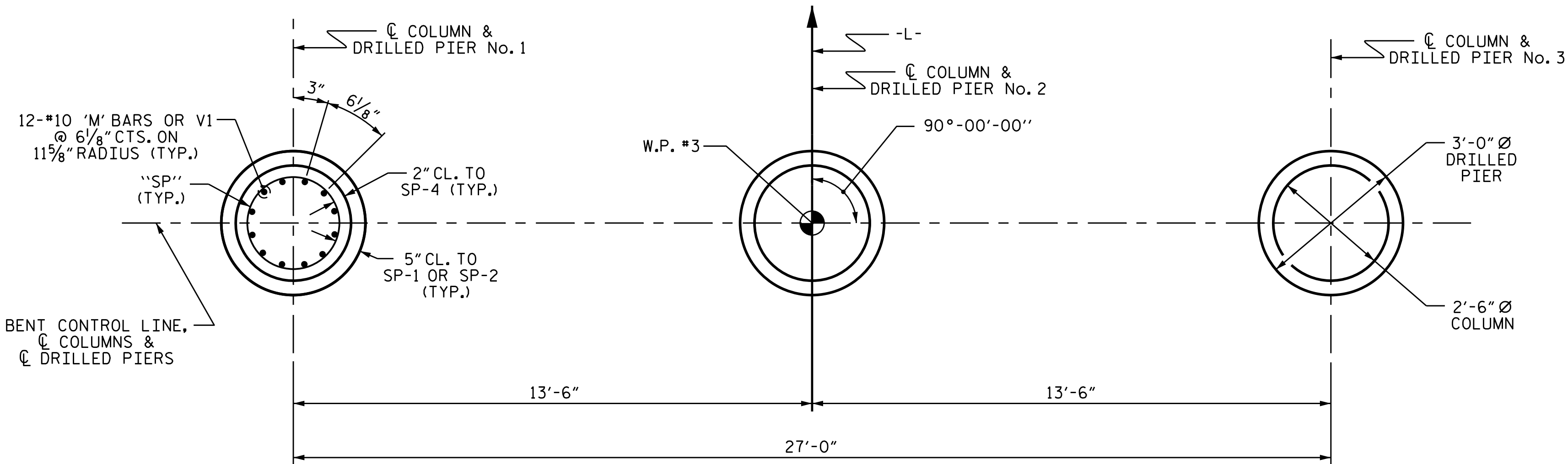
ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

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4700 FALLS OF NEUSE ROAD, SUITE 300
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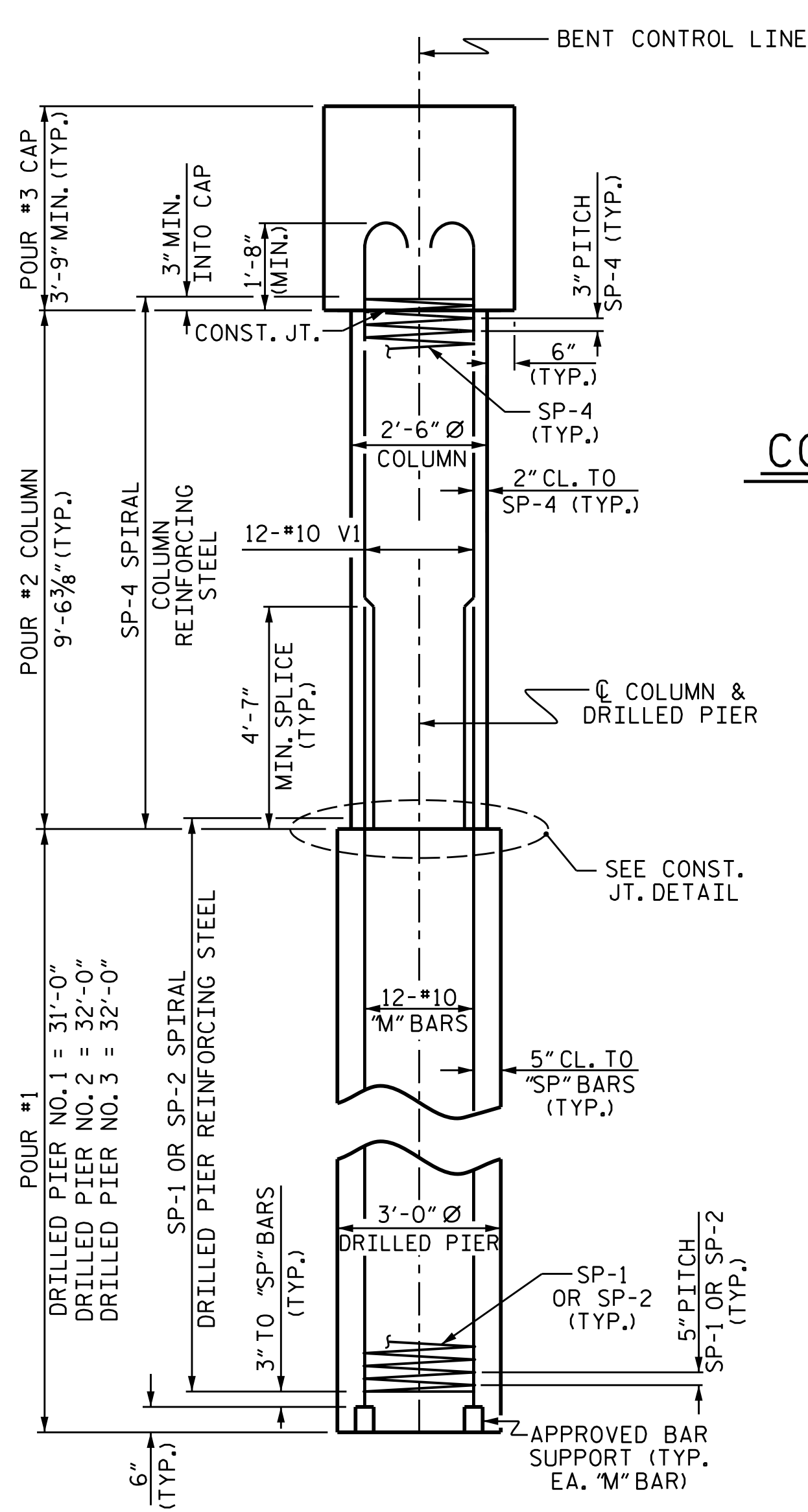
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FINAL UNLESS ALL
SIGNATURES COMPLETED



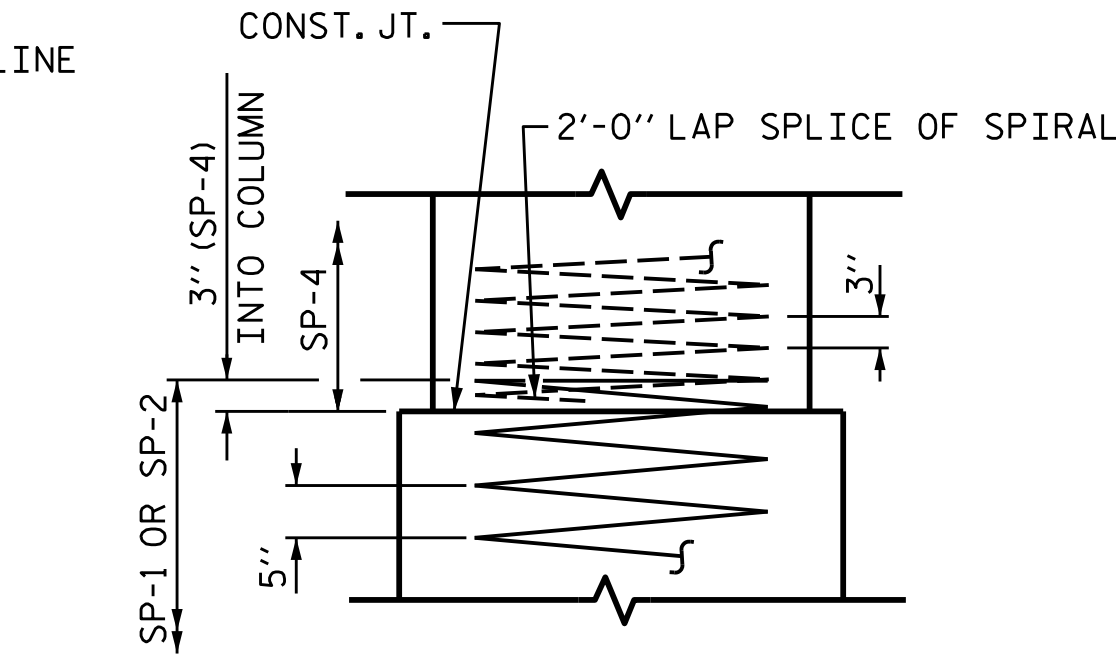


PLAN OF DRILLED PIERS & COLUMNS

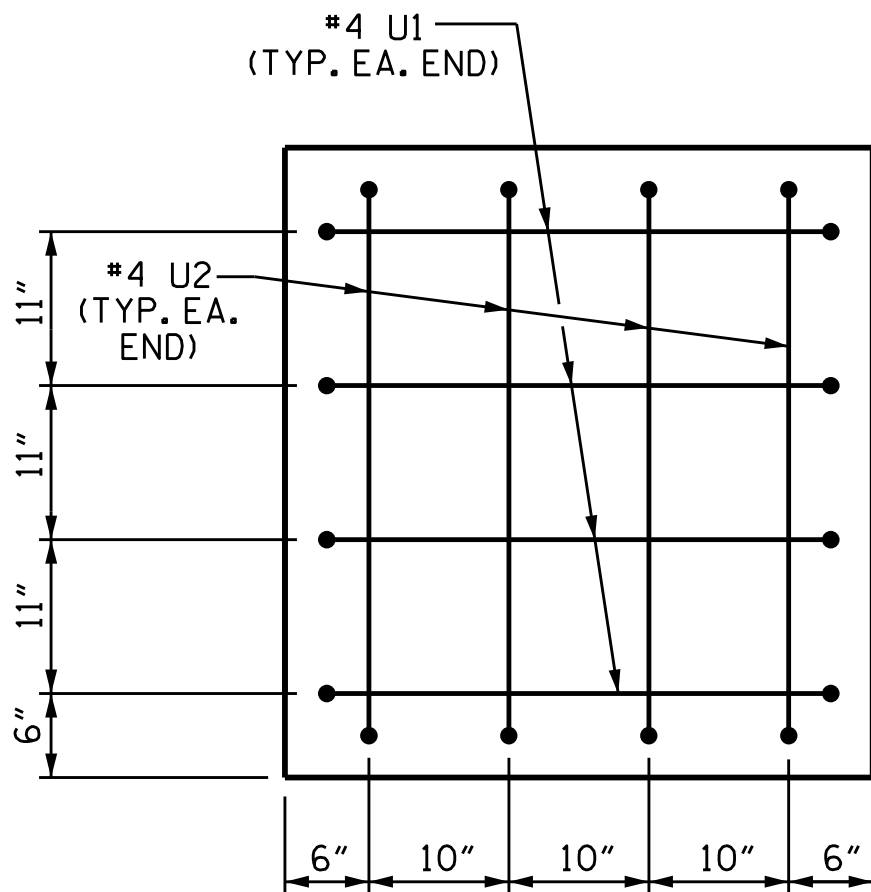
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



END ELEVATION

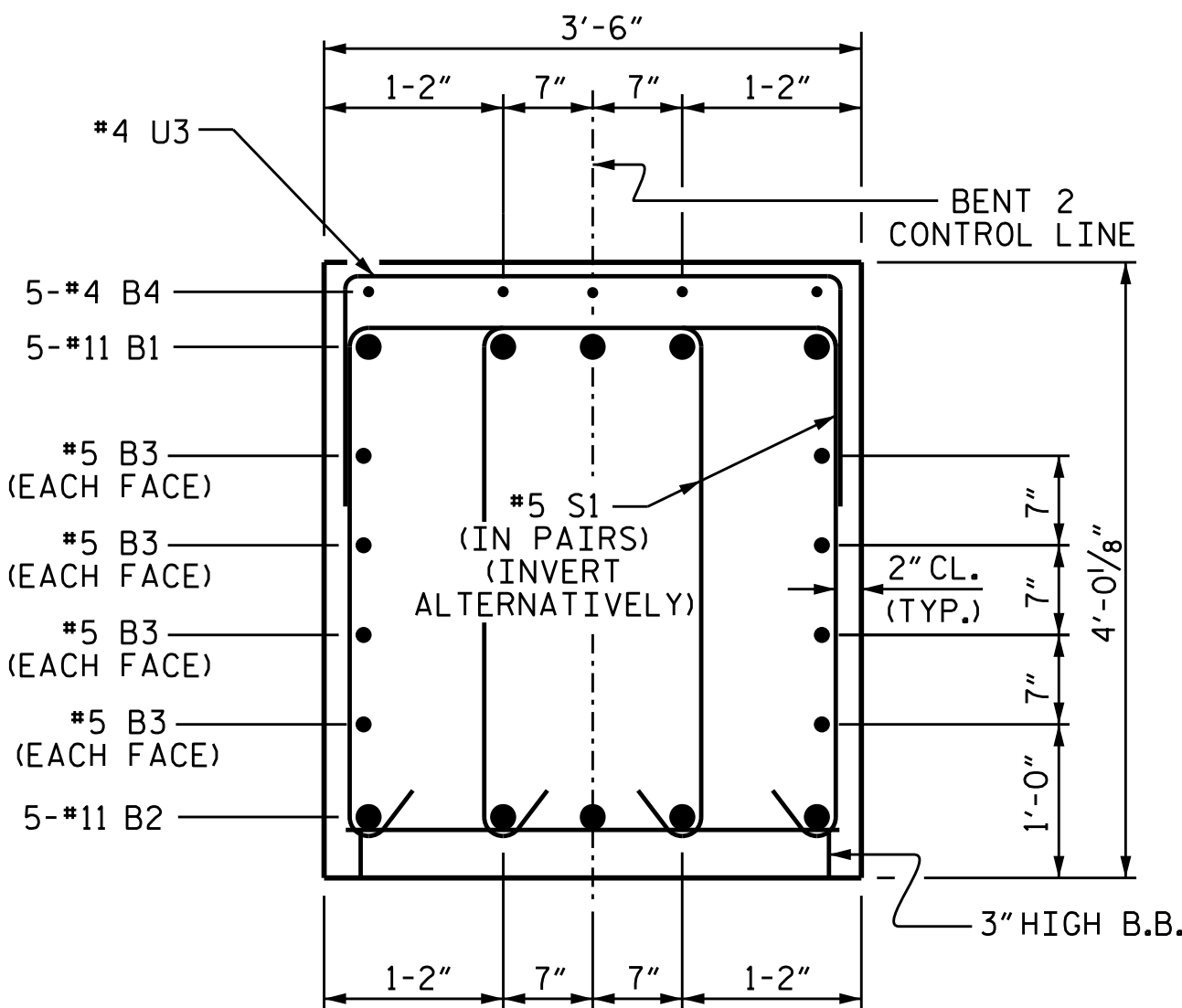


CONSTRUCTION JOINT DETAIL

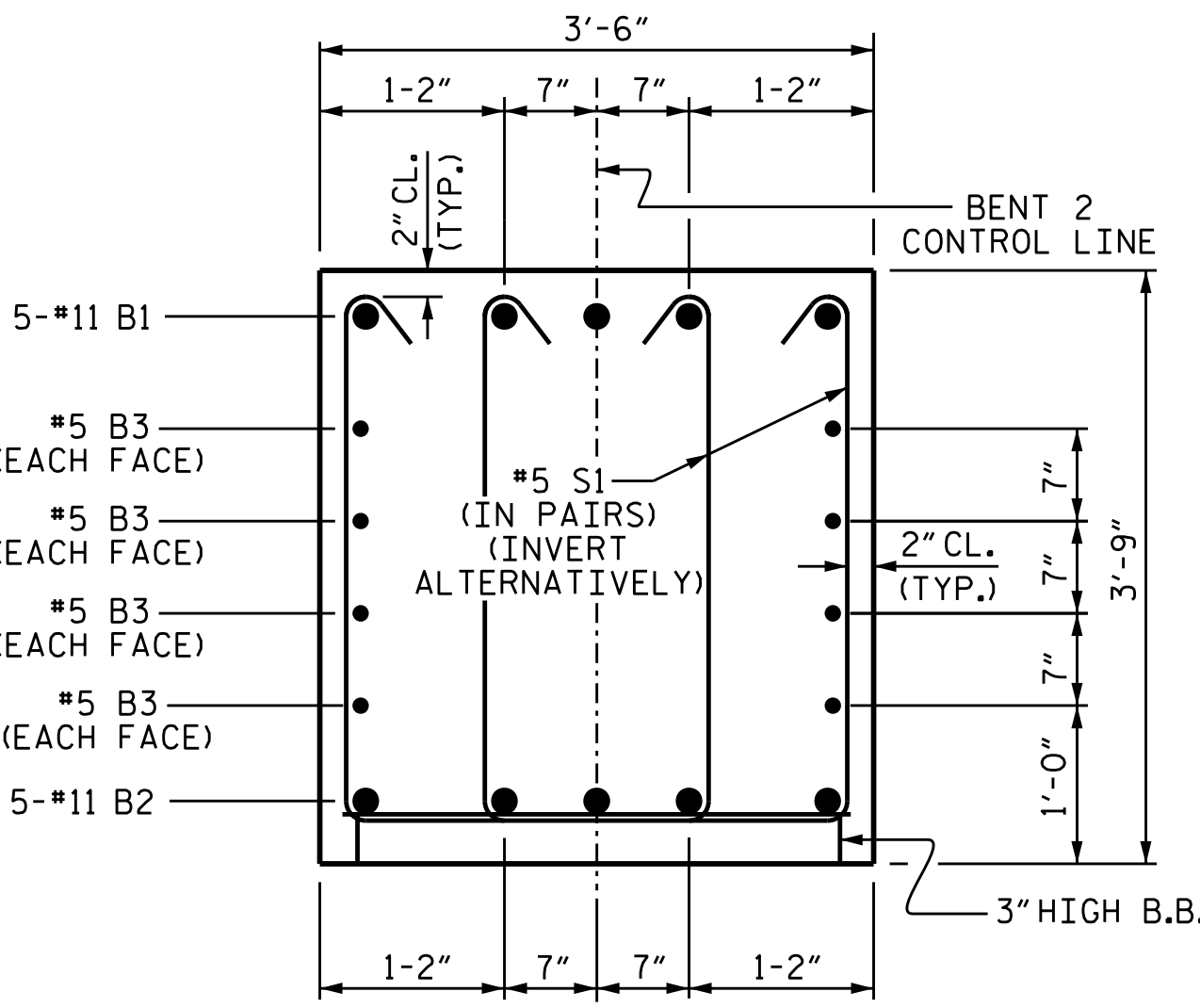


END OF CAP VIEW

(TYPICAL BOTH ENDS)

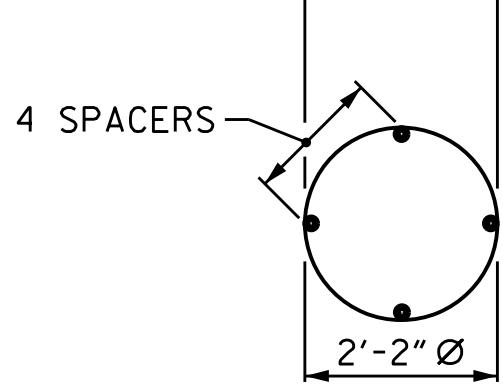
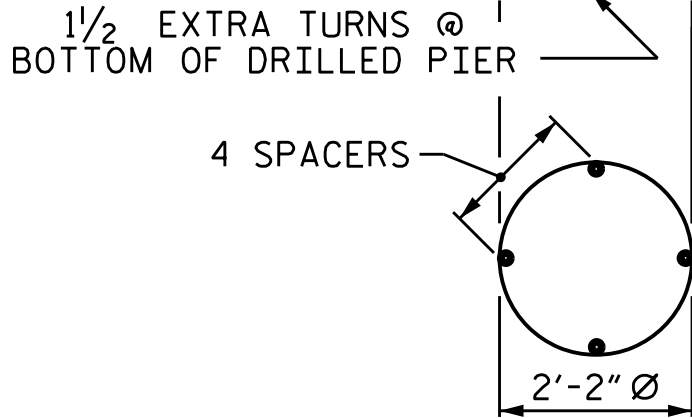
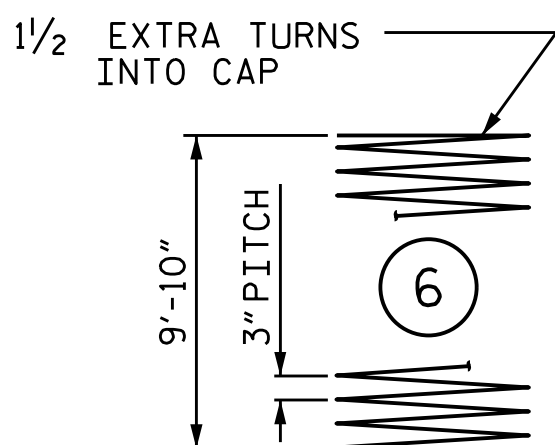
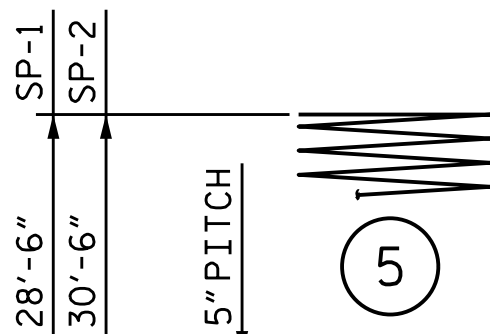
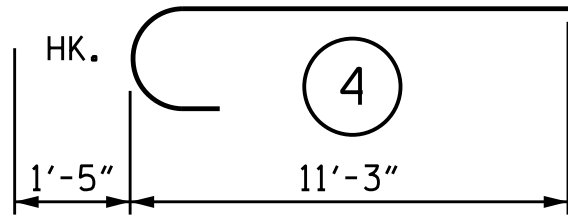
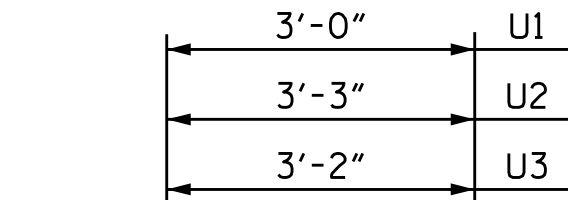
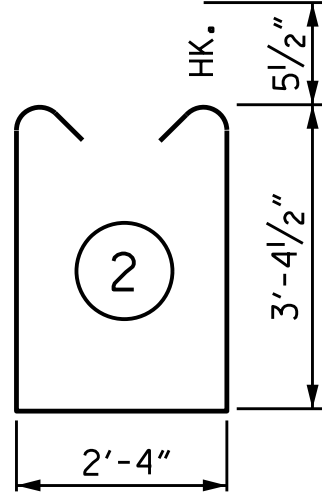
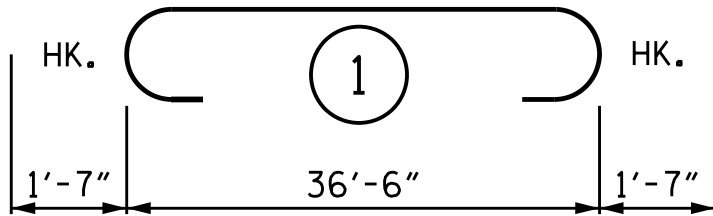


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#11	1	39'-8"	1,054
B2	5	#11	STR	36'-8"	974
B3	8	#5	STR	36'-8"	306
B4	5	#4	STR	15'-8"	52

M1	12	#10	STR	38'-7"	1,966
M2	24	#10	STR	39'-7"	4,036

S1	152	#5	2	10'-0"	1,585
----	-----	----	---	--------	-------

U1	8	#4	3	6'-0"	32
U2	8	#4	3	6'-3"	33
U3	40	#4	3	6'-2"	165

V1	36	#10	4	12'-8"	1,962
----	----	-----	---	--------	-------

REINFORCING STEEL					12,165 LBS.
-------------------	--	--	--	--	-------------

SP-1	1	*	5	499'-3"	521
SP-2	2	*	5	519'-3"	1,084

SP-4	3	**	6	273'-11"	549
------	---	----	---	----------	-----

SPIRAL COLUMN REINFORCING STEEL					2,153 LBS.
---------------------------------	--	--	--	--	------------

* THE SP-1 & SP-2 SPIRAL REINFORC. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

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

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	5.2 C.Y.
POUR #3 (CAP)	18.6 C.Y.

TOTAL CLASS A CONCRETE	23.8 C.Y.
------------------------	-----------

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS)	24.9 C.Y.
-------------------------	-----------

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 2
DETAILS



moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-31
2			4			TOTAL SHEETS 37



(TYP. EACH GIRDER)



(REINFORCING IN WING NOT SHOWN FOR CLARITY)

moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

THE UPPER PART OF INTEGRAL PORTION AND WINGS SHALL BE
POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLAN
OF SPANS.

SHEET 1 OF 3

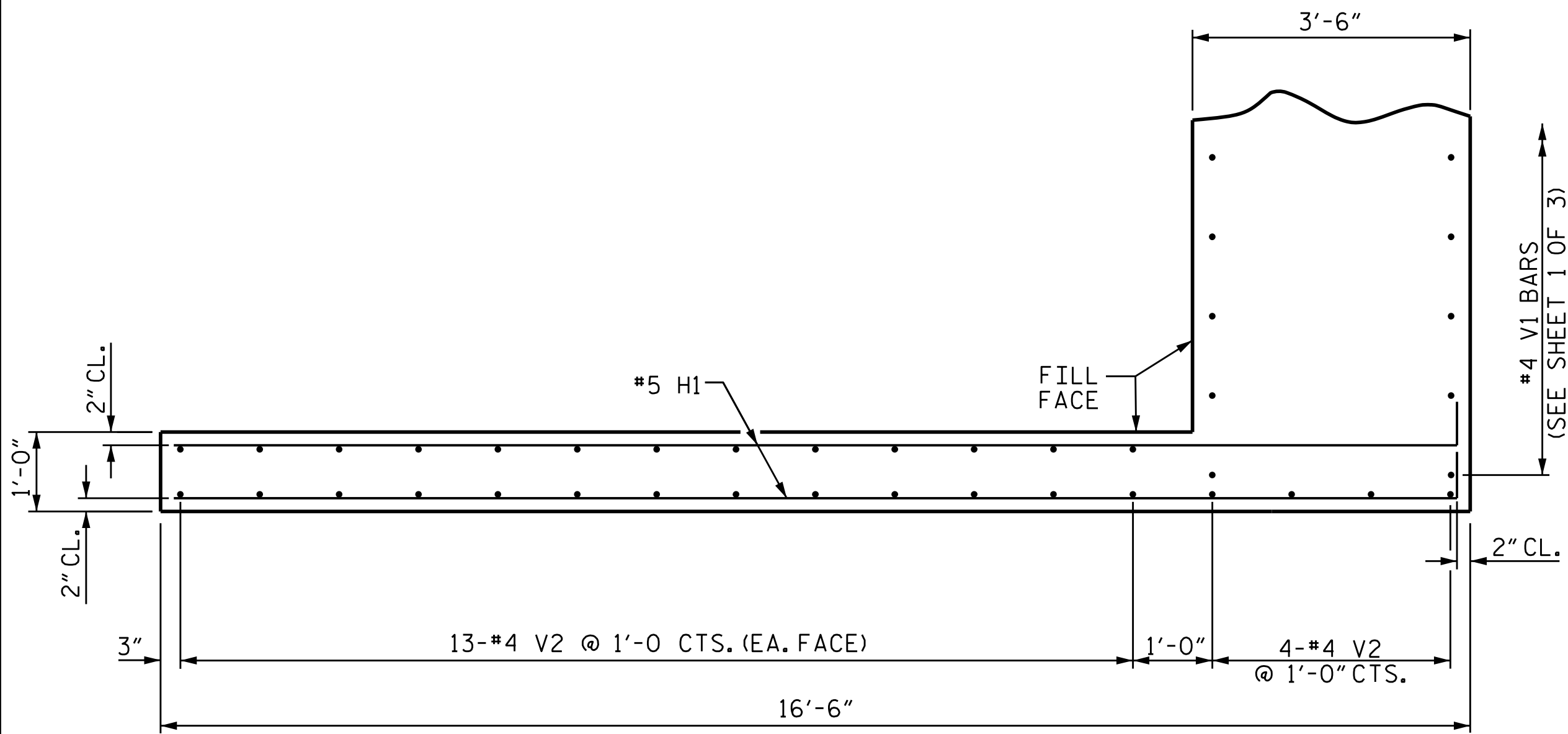
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	1			3			TOTAL SHEETS 37
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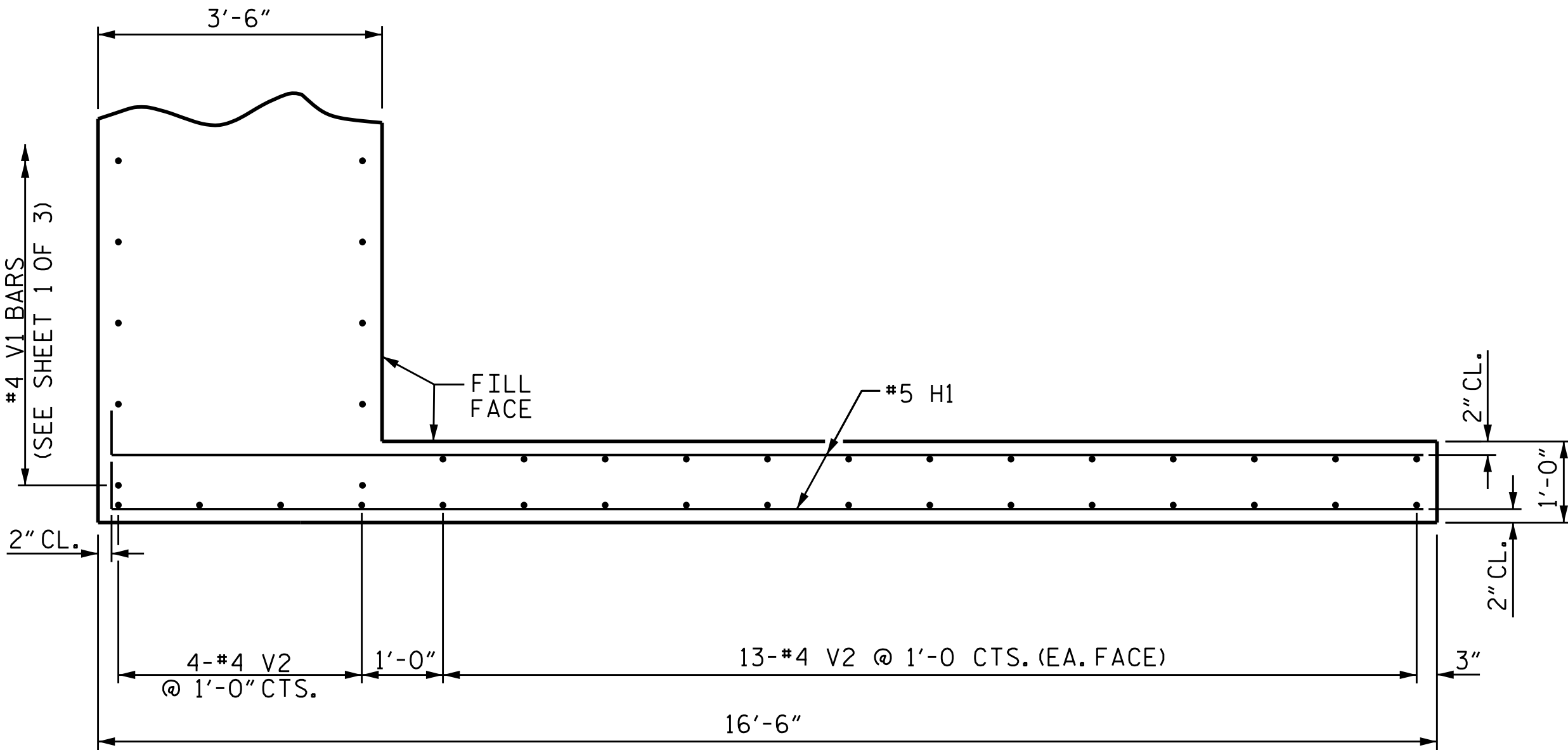
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Santiago
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12/2/2

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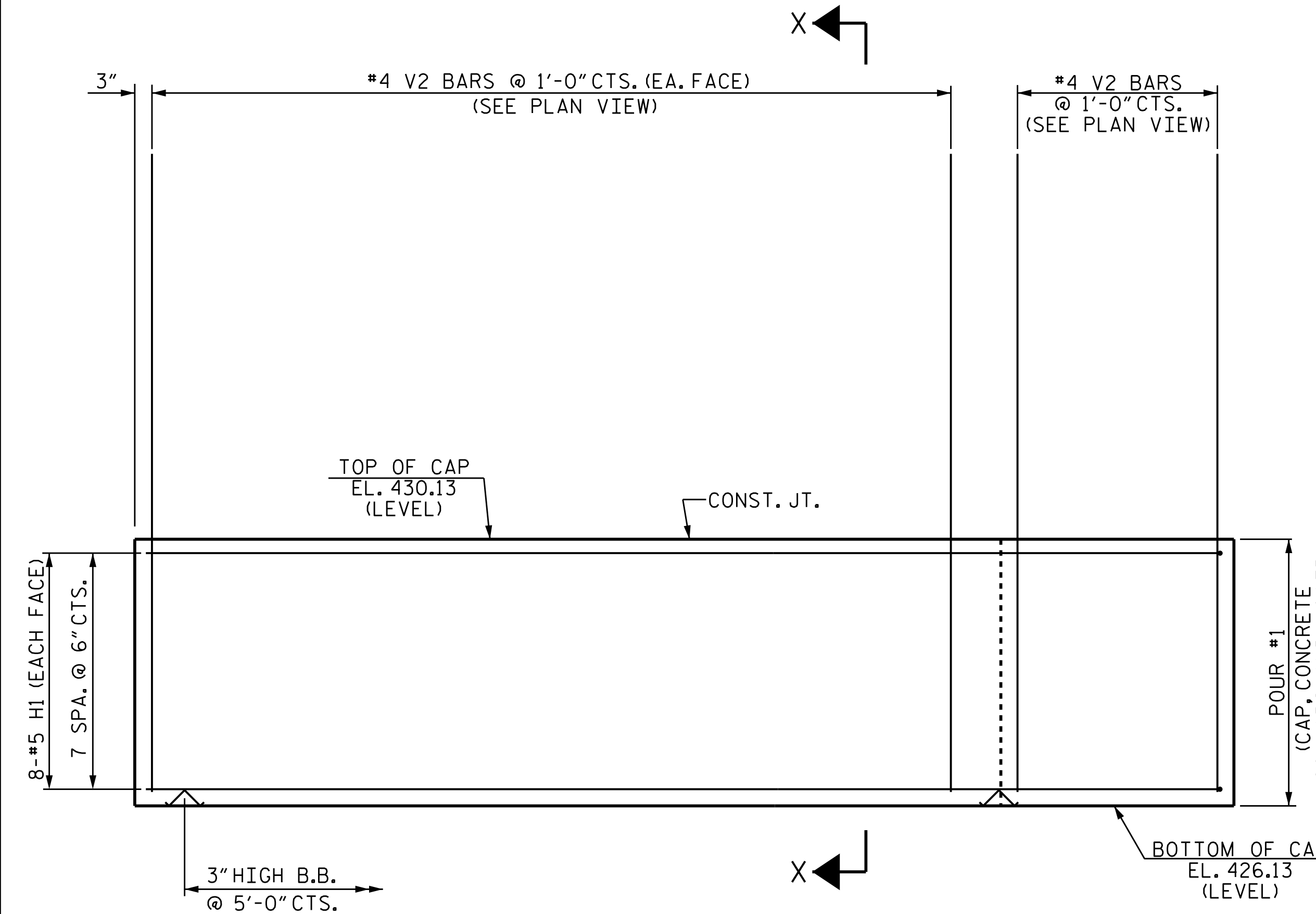
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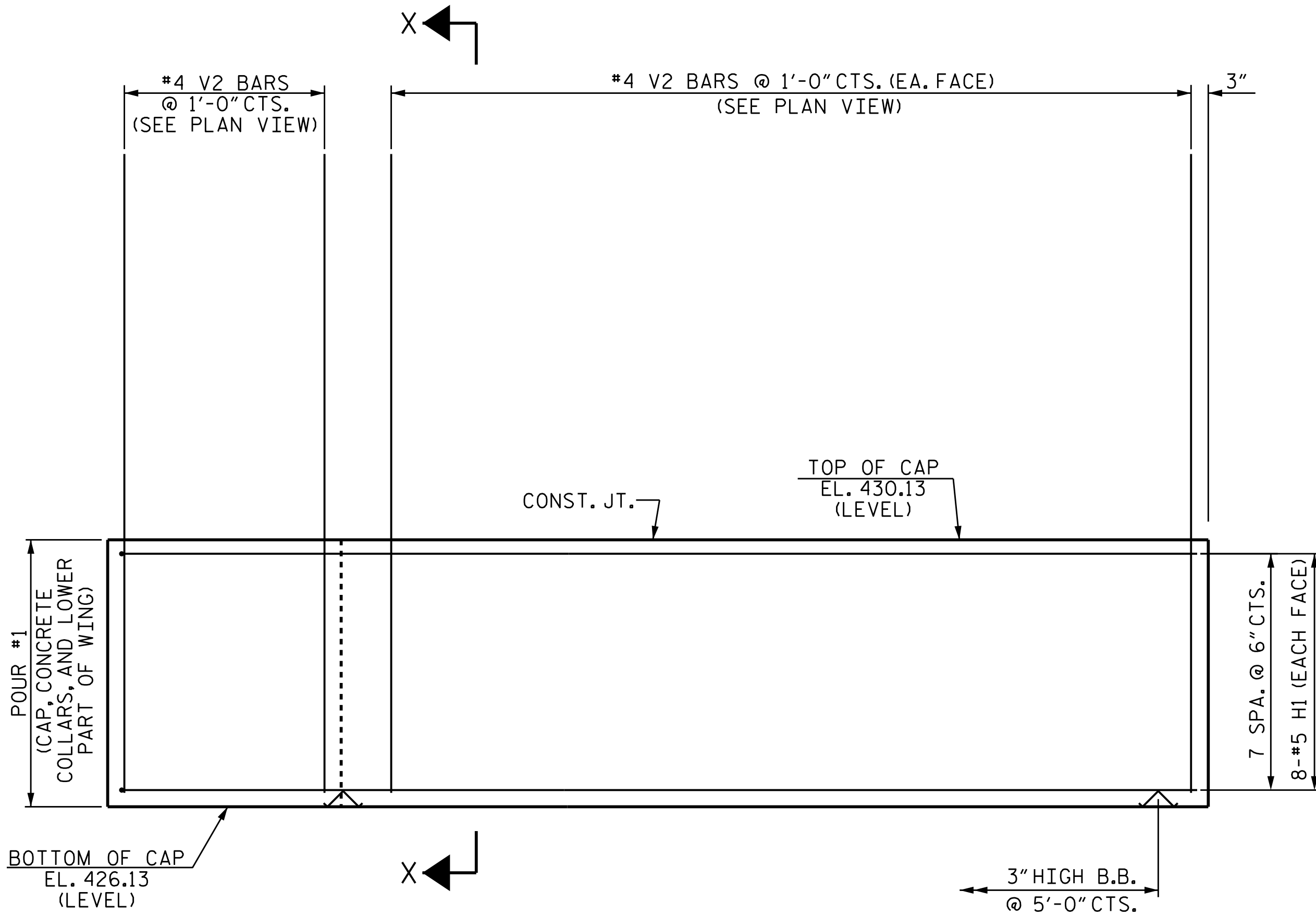
PLAN OF WING (W3)



PLAN OF WING (W4)

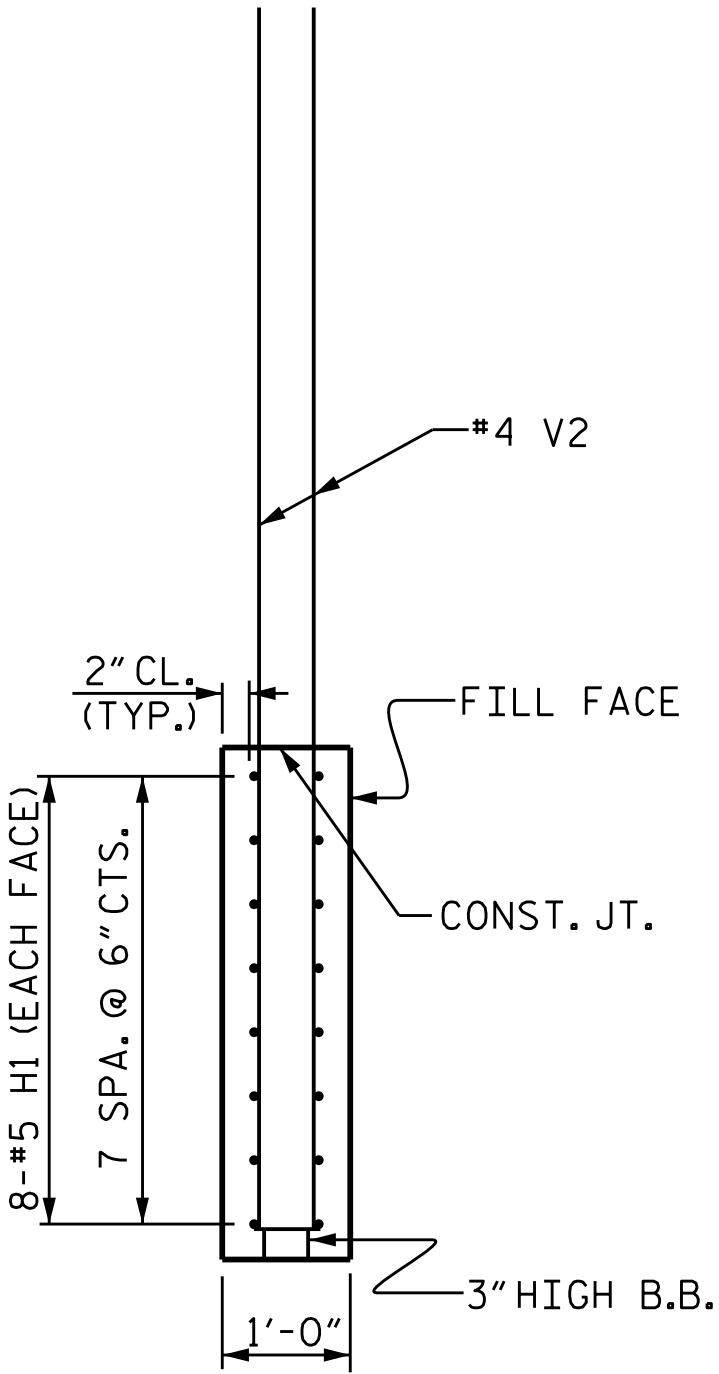


ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

WING DETAILS



SECTION X-X

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 2 OF 3



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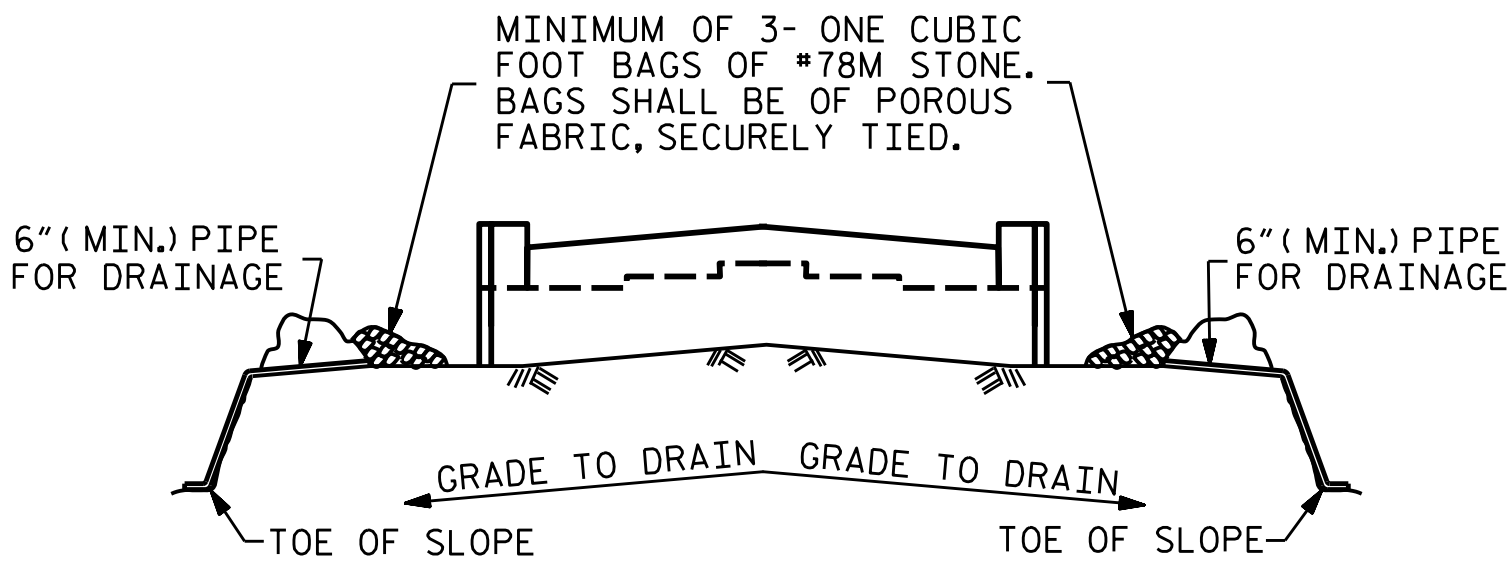
DRAWN BY : T. KIRSCHBAUM DATE : 09-2025
CHECKED BY : P. SHAW DATE : 09-2025
DESIGN ENGINEER OF RECORD: S. AGUILAR DATE : 09-2025

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4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	
2			4			37	

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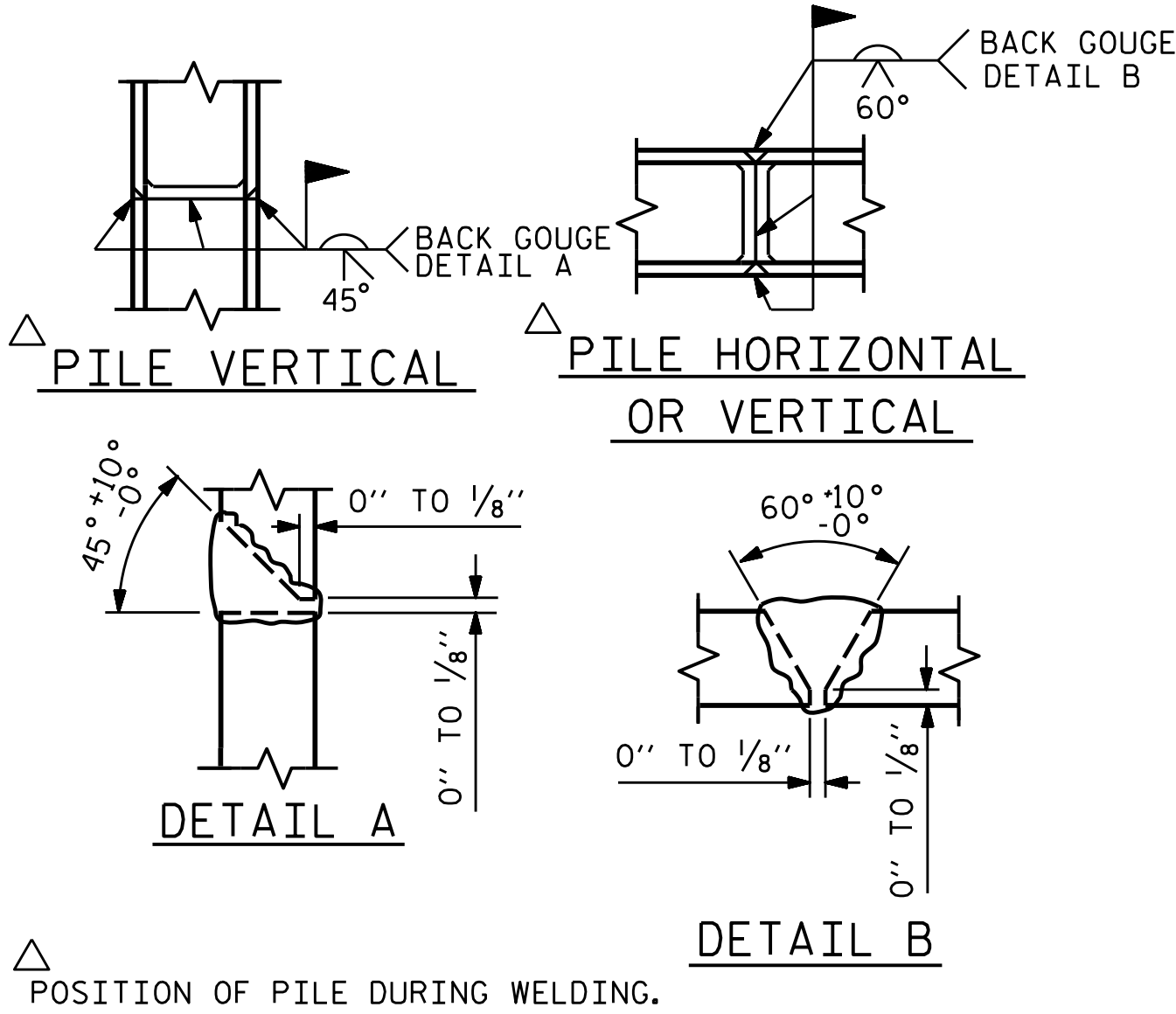


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

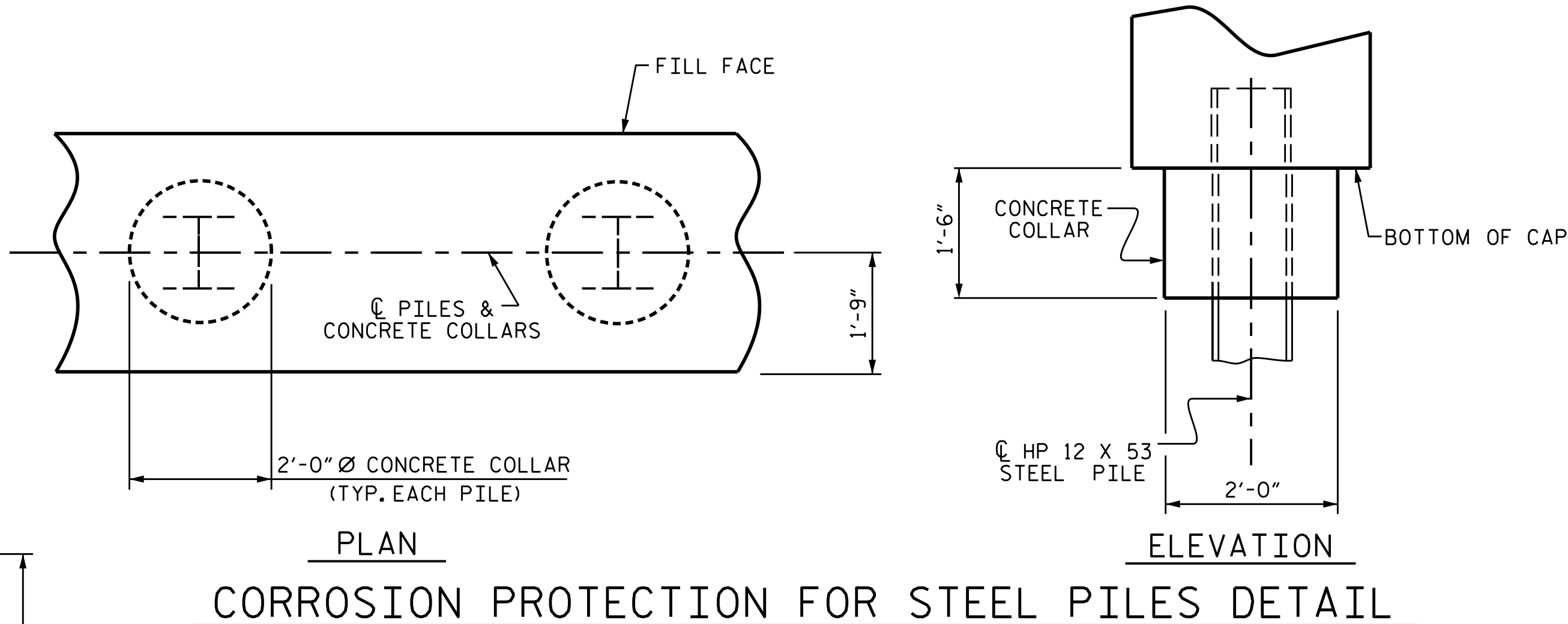
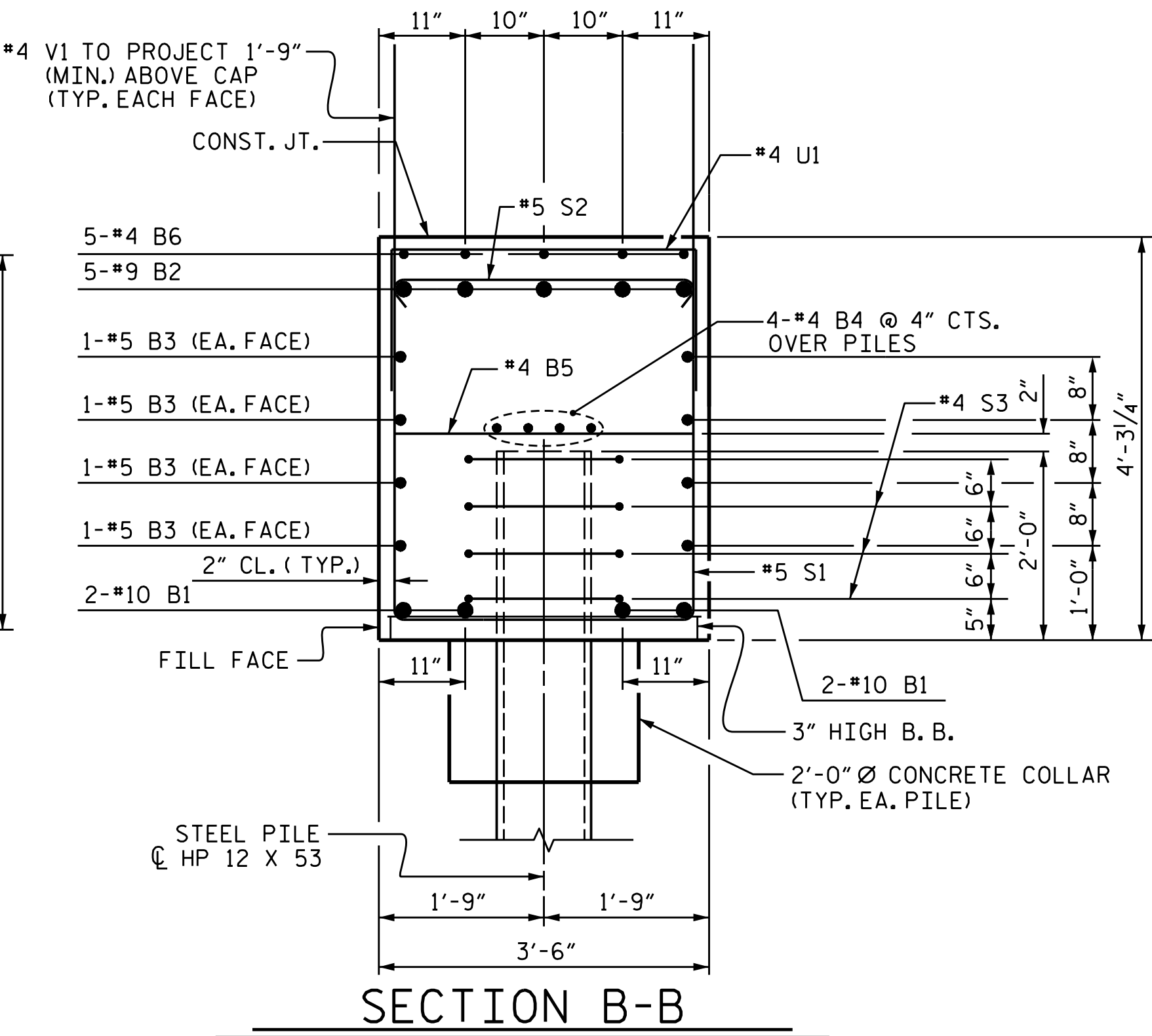
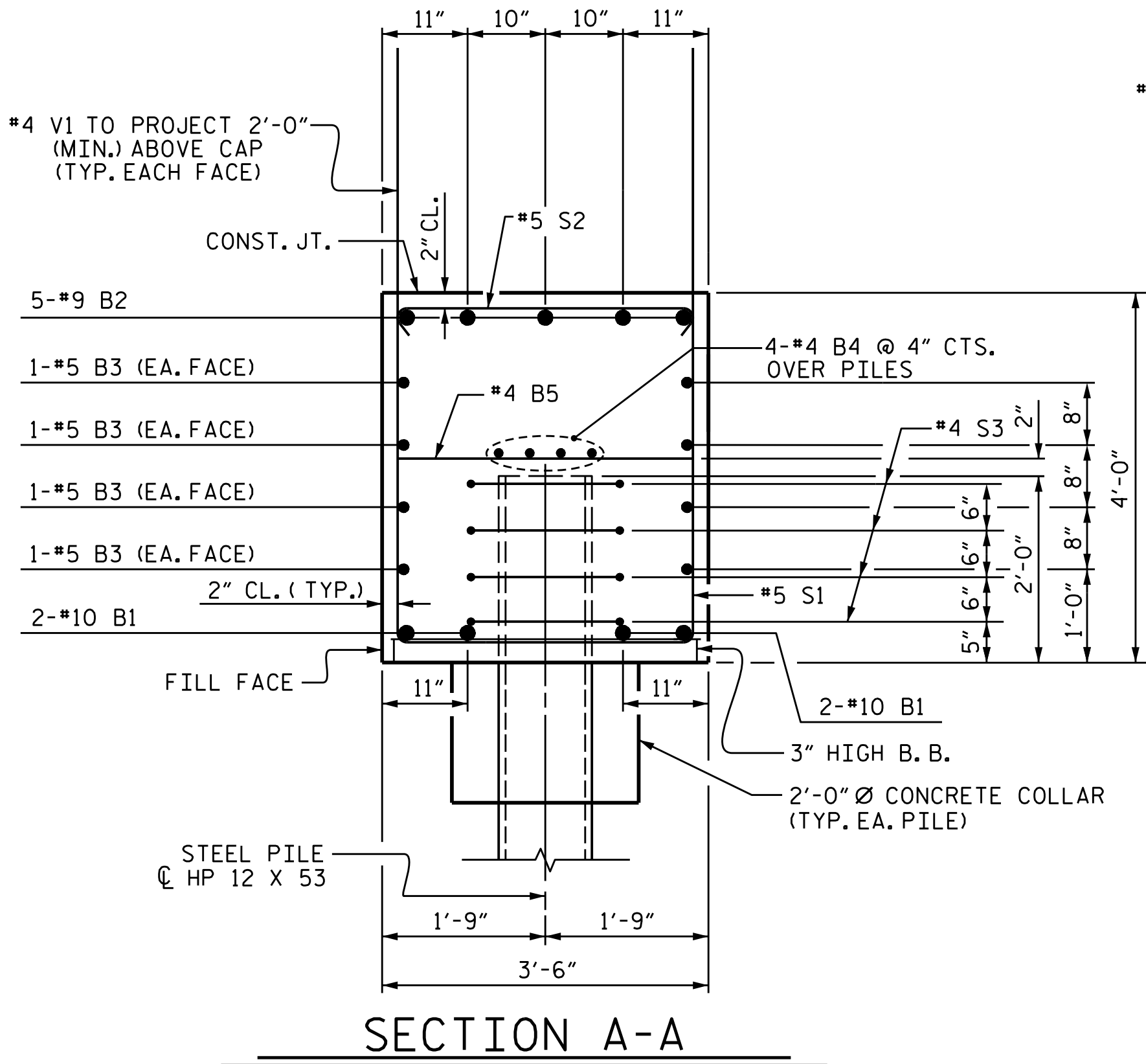
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPES					
BILL OF MATERIAL FOR END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	47'-7"	819
B2	5	#9	1	47'-3"	803
B3	8	#5	STR	44'-11"	375
B4	8	#4	STR	23'-8"	126
B5	11	#4	STR	3'-2"	23
B6	5	#4	STR	19'-8"	66
H1	32	#5	2	16'-10"	562
S1	60	#5	3	11'-4"	709
S2	60	#5	4	4'-1"	256
S3	28	#4	5	6'-6"	122
U1	13	#4	6	6'-2"	54
V1	78	#4	STR	5'-10"	304
V2	60	#4	STR	9'-6"	381
REINFORCING STEEL (FOR END BENT #2) 4,600 LBS.					
CLASS A CONCRETE BREAKDOWN (FOR END BENT #2)					
POUR #1 CAP, COLLARS & LOWER PART OF WINGS				29.3 C.Y.	
TOTAL CLASS A CONCRETE				29.3 C.Y.	



PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 3 OF 3



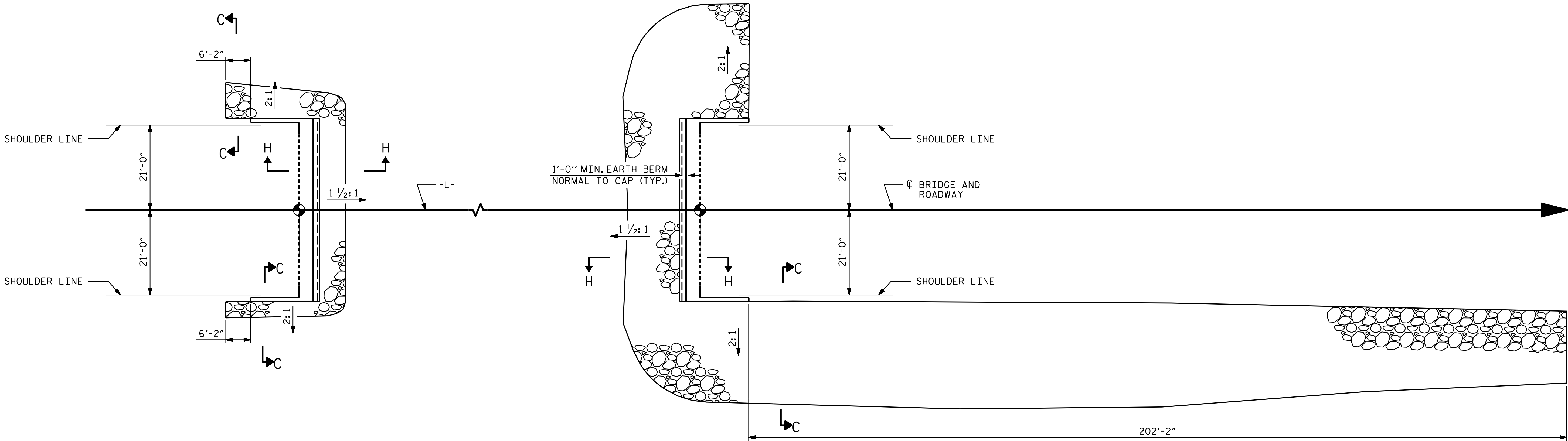
moffatt & nichol

4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-34					TOTAL SHEETS 37

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



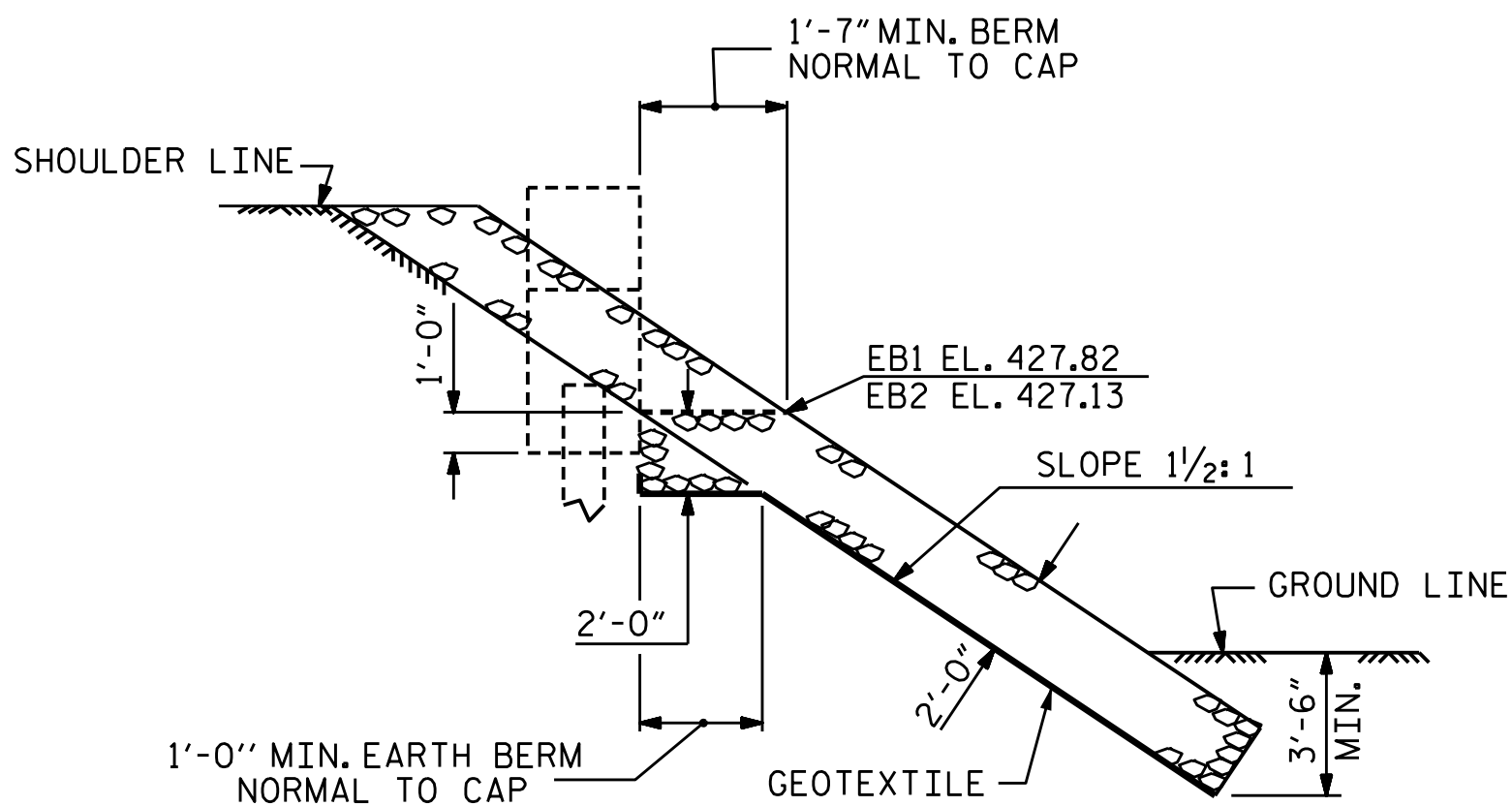
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END BENT No. 1

INTEGRAL
END BENT No. 2

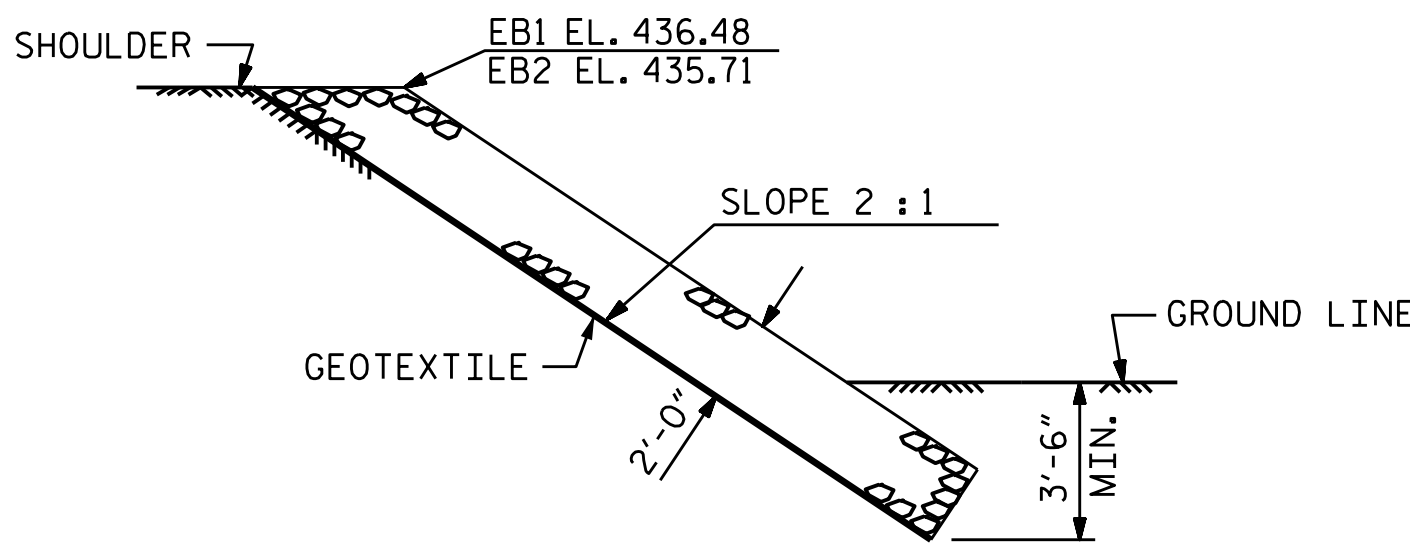
PLAN

ESTIMATED QUANTITIES

BRIDGE @ STA. 21+19.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	115	130
END BENT 2	910	1010



SECTION H-H



SECTION C-C

PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS



DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

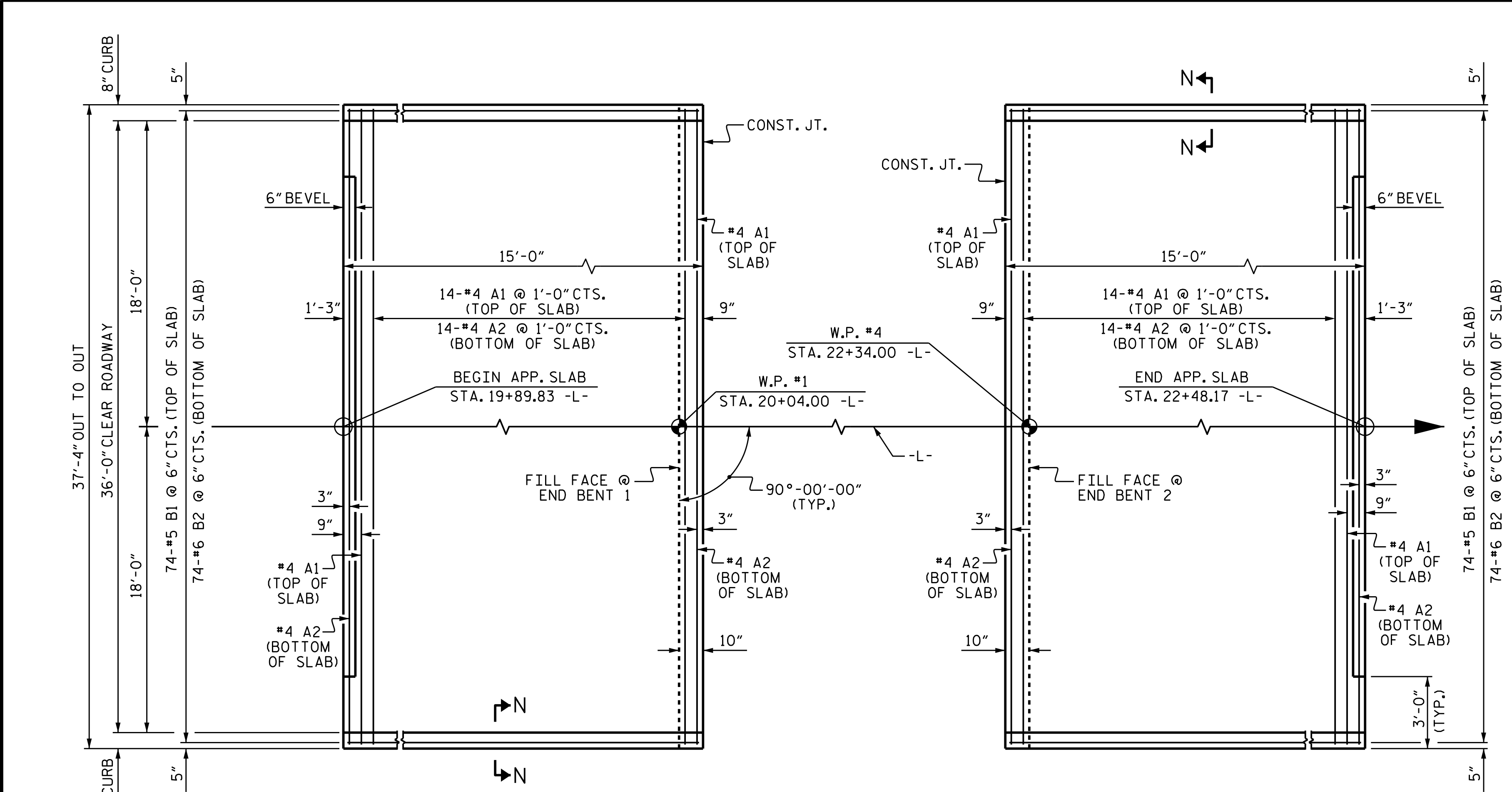
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RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

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

TOTAL
SHEETS
37

STD. NO. RR1

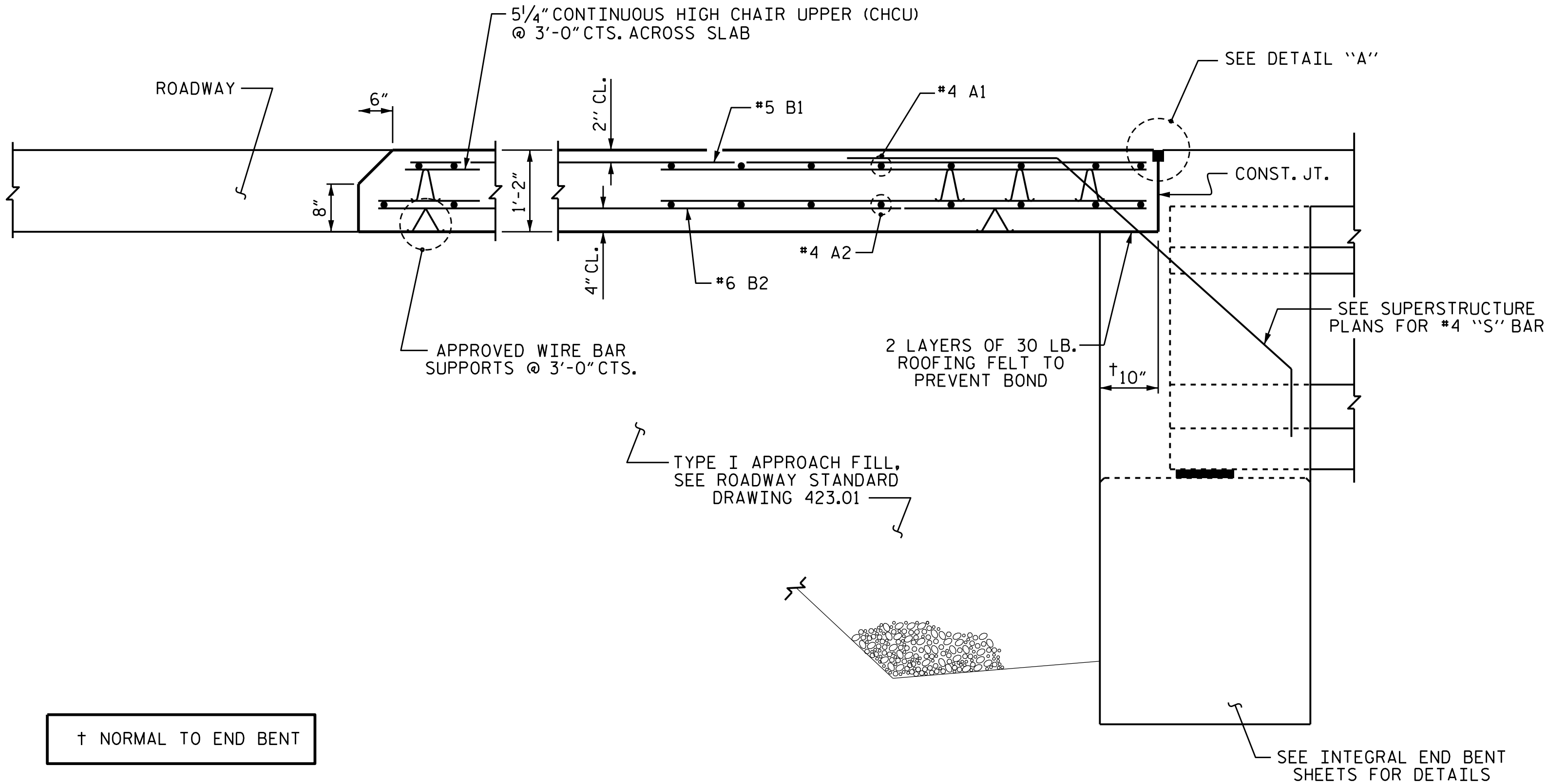
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+tkirschbaum



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

† NORMAL TO END BENT

ASSEMBLED BY : T. KIRSCHBAUM	DATE : 09-2025
CHECKED BY : S. AGUILAR	DATE : 09-2025
DRAWN BY : TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

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".

BILL OF MATERIAL

FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	16	#4	STR	36'-11"	395
A2	16	#4	STR	36'-11"	395
* B1	74	#5	STR	14'-1"	1,087
B2	74	#6	STR	14'-7"	1,621

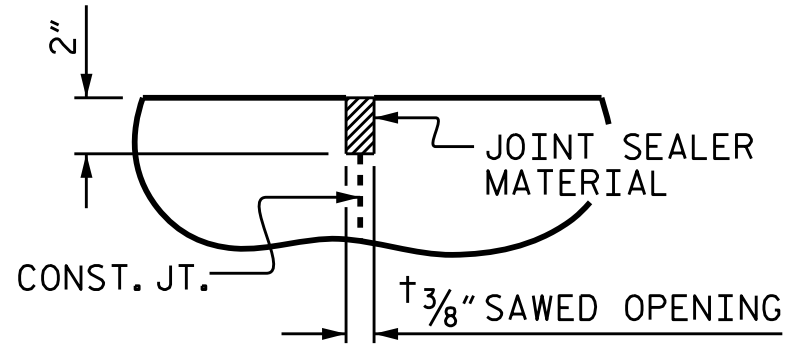
REINFORCING STEEL 2,016 LBS.

* EPOXY COATED REINFORCING STEEL 1,482 LBS.

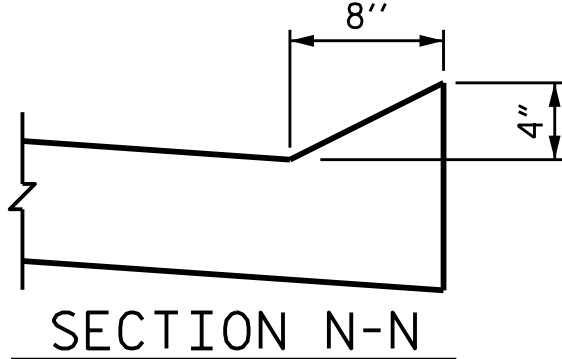
CLASS AA CONCRETE 24.2 C. Y.

SPLICE LENGTHS

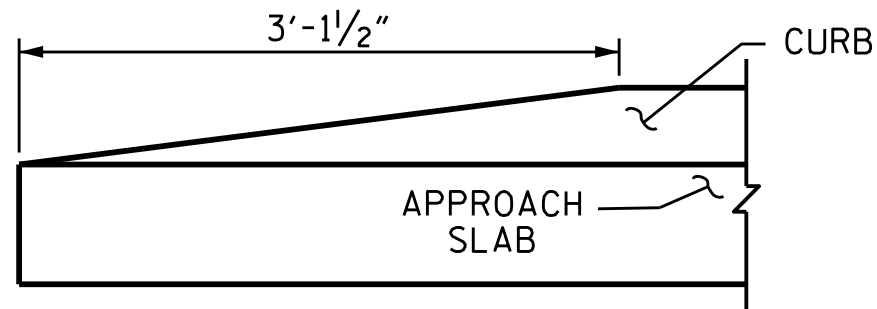
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



DETAIL "A-A"



SECTION N-N



END OF CURB WITHOUT
SHOULDER BERM GUTTER

PROJECT NO. BR-0060

ALAMANCE COUNTY

STATION: 21+19.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT
WITH FLEXIBLE PAVEMENT



Signed by:
Santiago E. Aguilar
12/2/2025

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

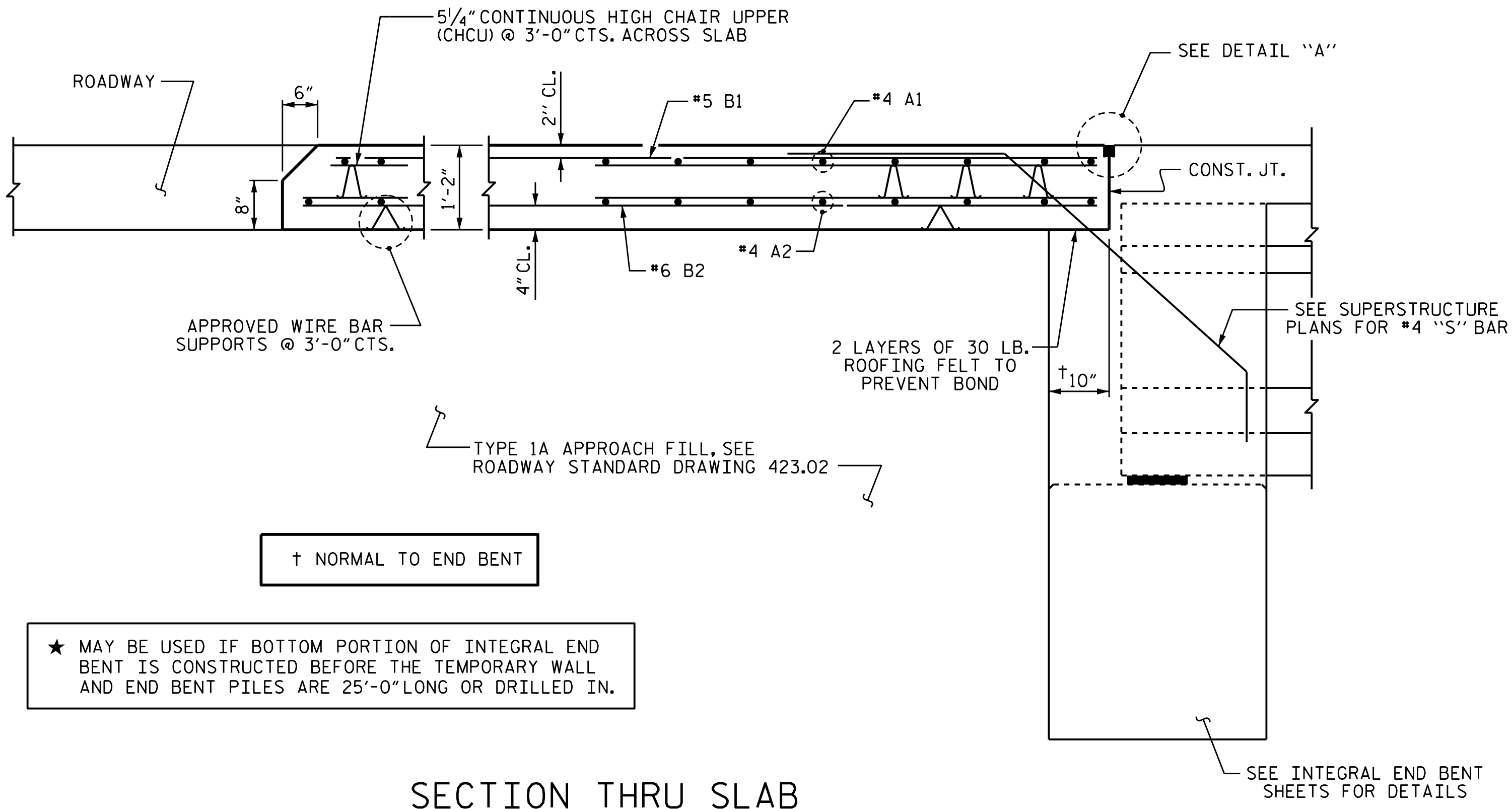
moffatt & nichol
4700 FALLS OF NEUSE ROAD, SUITE 300
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX
NC License NO.: F-0105

REVISIONS

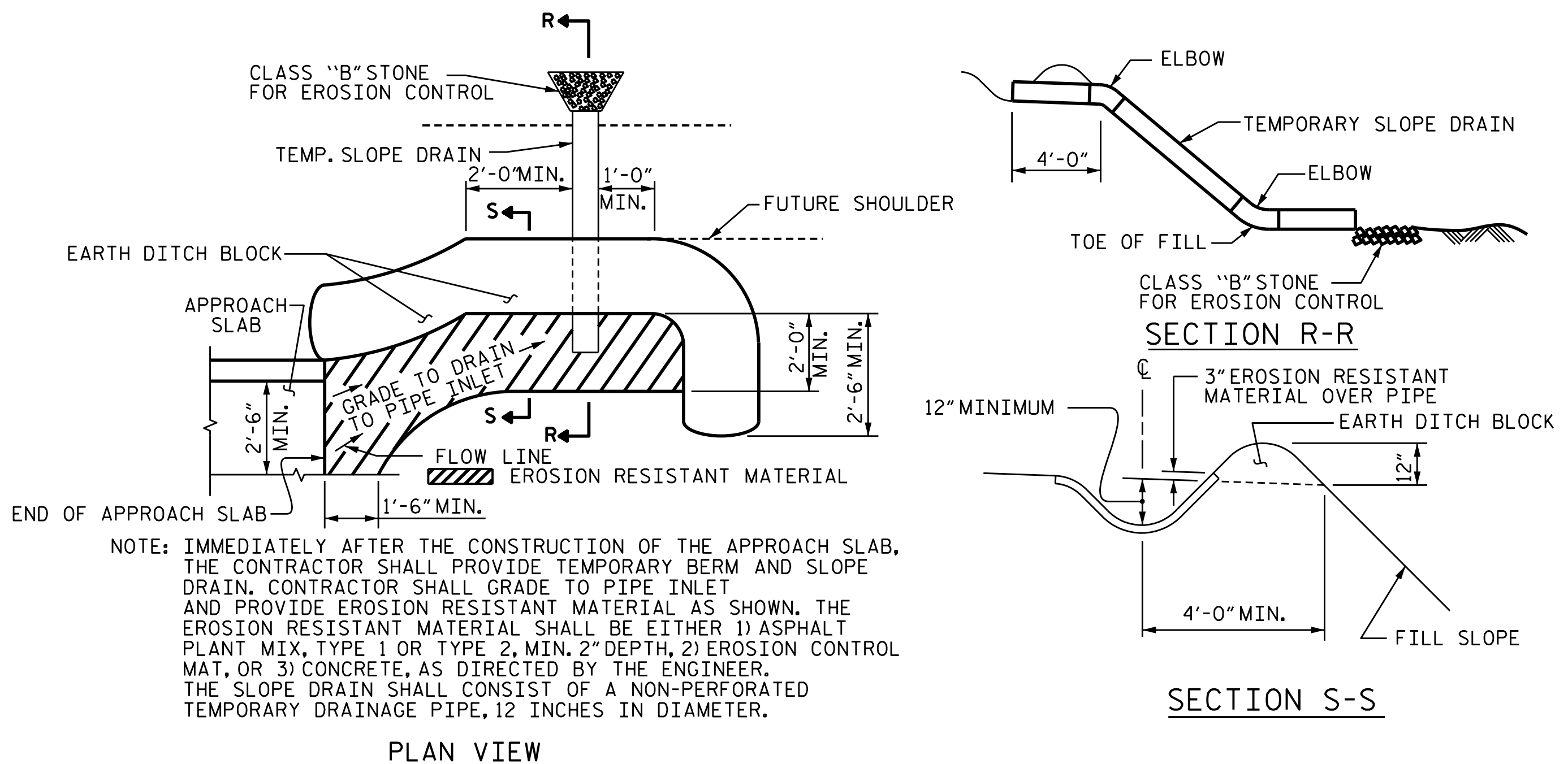
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-36
2			4			TOTAL SHEETS 37

STD. NO. BAS2

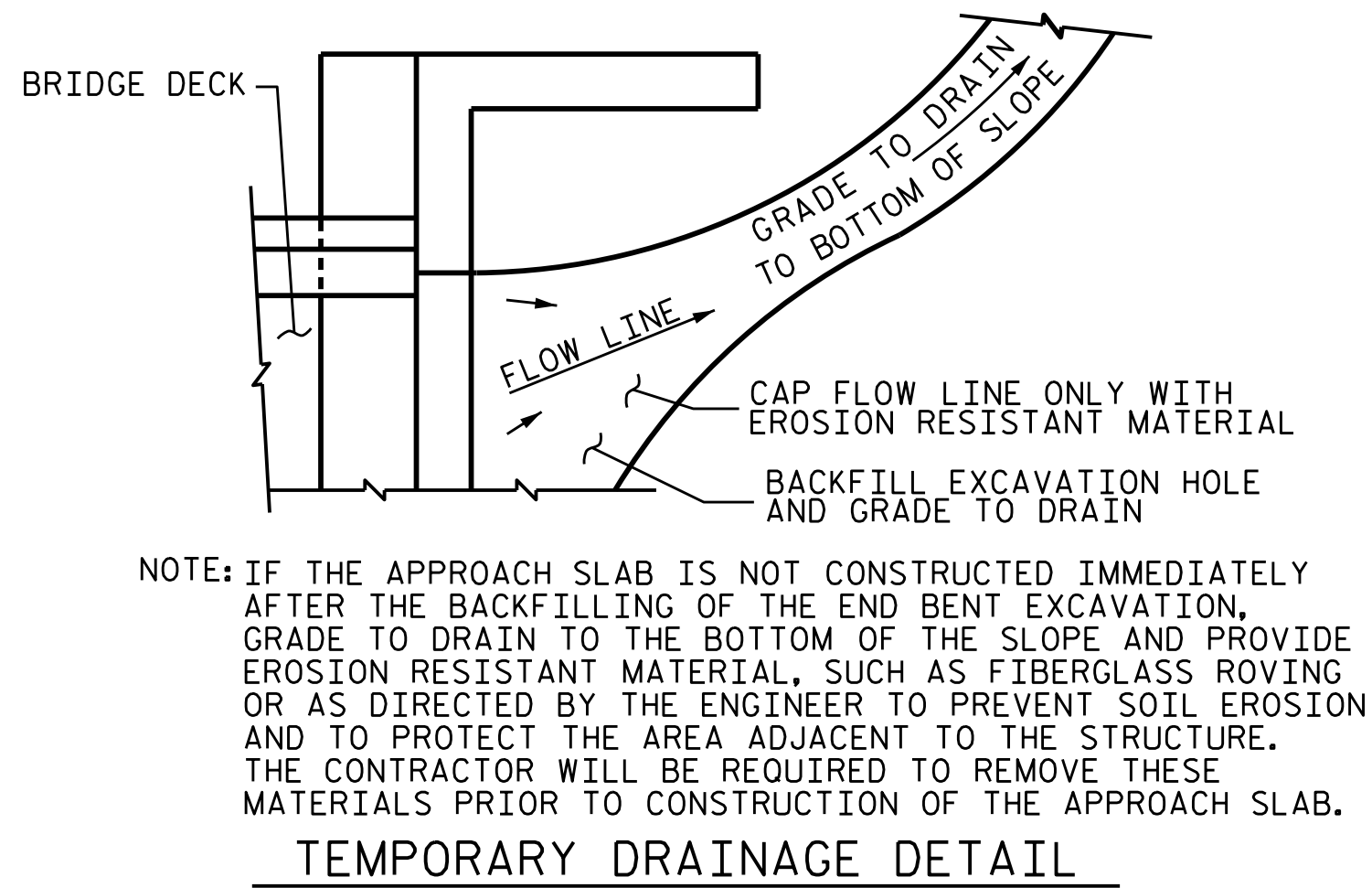
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+tkirschbaum



SECTION THRU SLAB
(TYPE 1A - ALTERNATE APPROACH FILL)



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



PROJECT NO. BR-0060
ALAMANCE COUNTY
STATION: 21+19.00 -L-
SHEET 2 OF 2

ASSEMBLED BY : T. KIRSCHBAUM	DATE : 09-2025
CHECKED BY : S. AGUILAR	DATE : 09-2025
DRAWN BY : TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
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NC License NO.: F-0105

Signed by:
Santiago E. Aguilar
12/2/2025
NORTH CAROLINA
PROFESSIONAL
SEAL
46232
ENGINEER
SANTIAGO E. AGUILAR

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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