

09.08/99
TIP PROJECT: U-5798A
CONTRACT: C204507

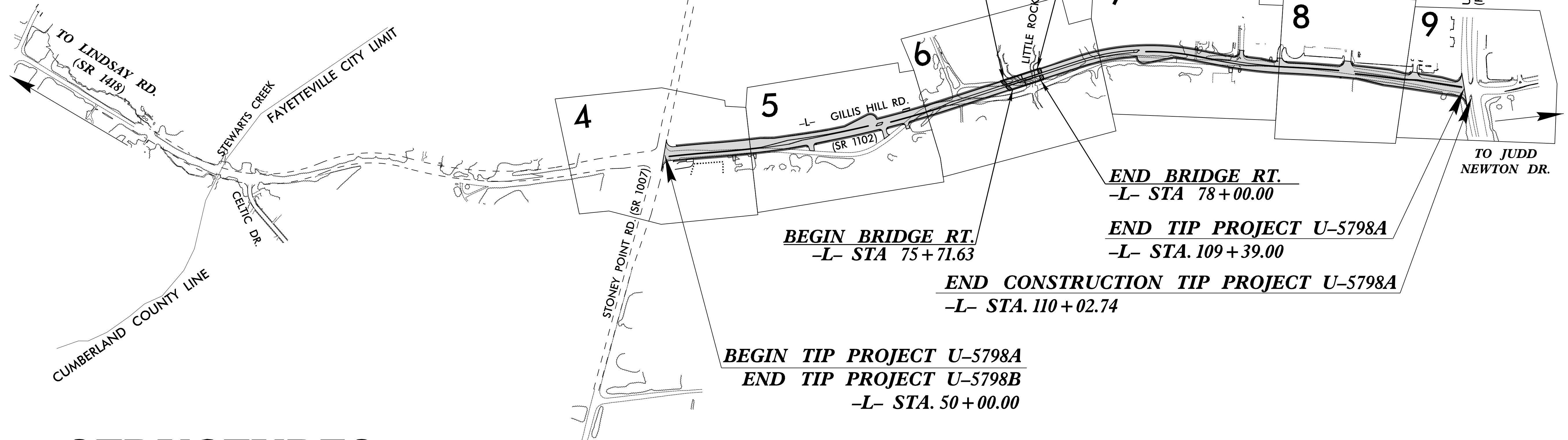
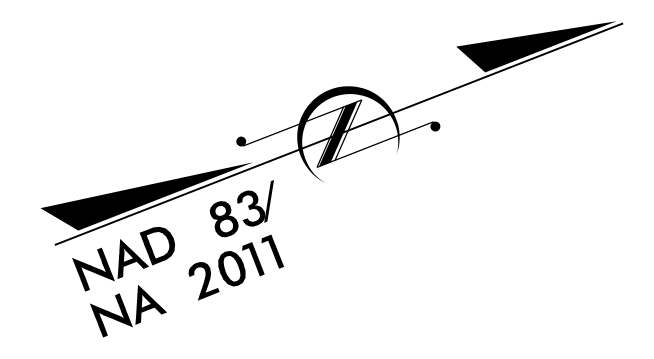
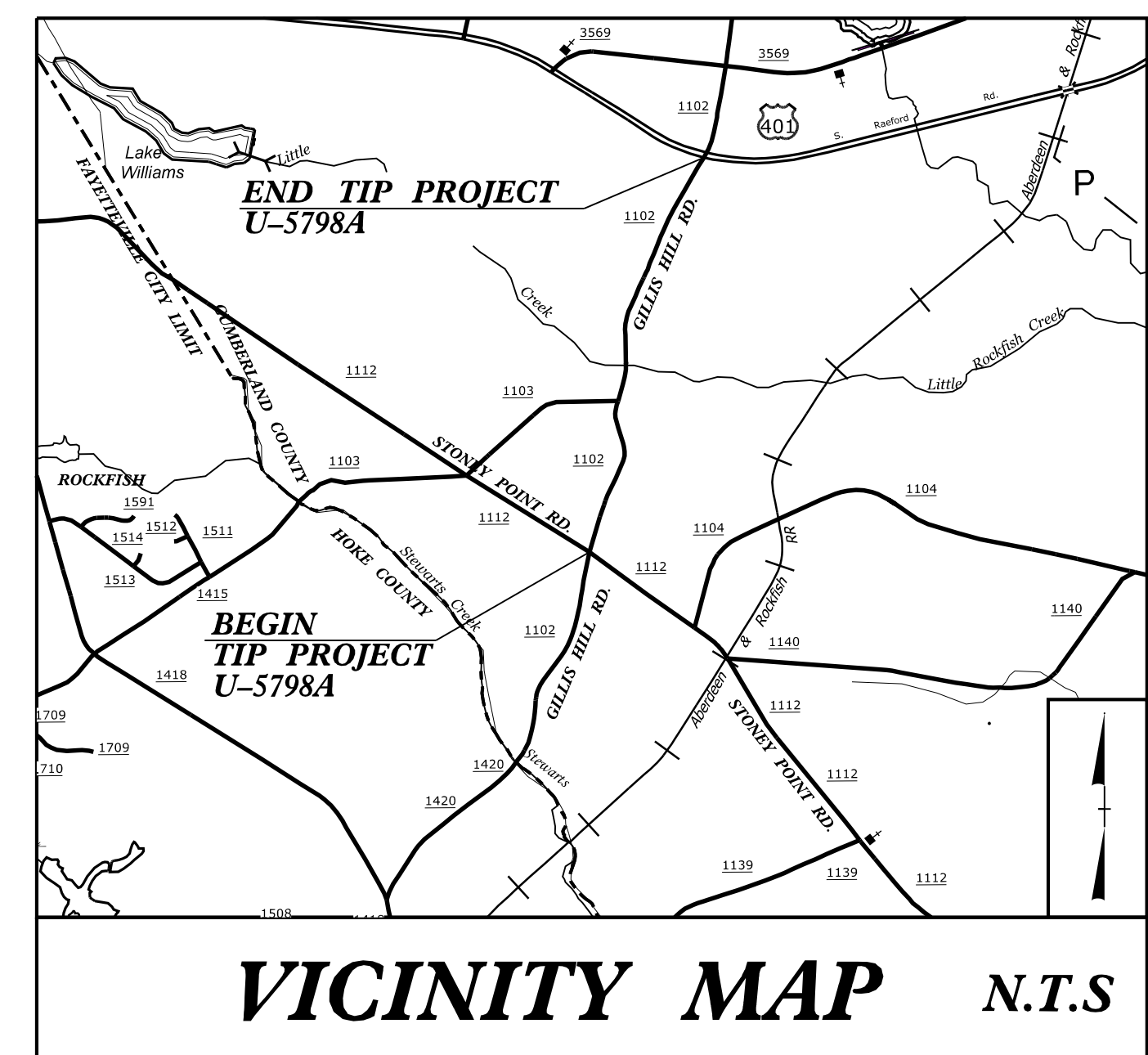
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

LOCATION: SR 1102 (GILLIS HILL ROAD) FROM NORTH OF SR 1112 (STONEY POINT ROAD) TO US 401 (RAEFORD ROAD), WIDEN TO MULTI-LANES AND REPLACE BRIDGE 250075 OVER LITTLE ROCKFISH CREEK.

TYPE OF WORK: PAVING, GRADING, DRAINAGE, STRUCTURES, AND SIGNALS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5798A	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44369.1.2	N/A	PE	
44369.2.2	N/A	ROW	
44369.2.5	N/A	UTL.	
44369.3.2	N/A	CONST.	



STRUCTURES

DESIGN DATA

ADT 2022 =	25,000
ADT 2042 =	30,700
K =	8 %
D =	60 %
T =	3 % *
V =	50 MPH

*(TTST=1 + DUAL=2)

FUNC CLASS =
 MINOR COLLECTOR
 REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5798A =	1.082 MILES
LENGTH STRUCTURE TIP PROJECT U-5798A =	0.043 MILES
TOTAL LENGTH TIP PROJECT U-5798A =	1.125 MILES

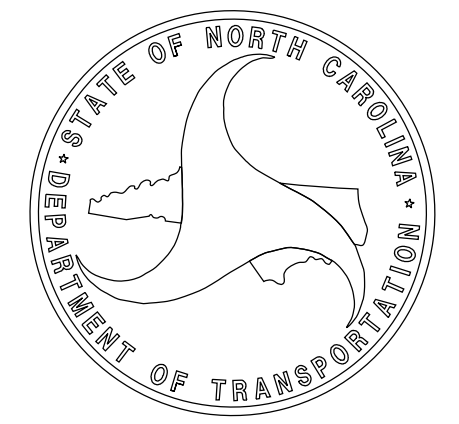
PREPARED IN THE OFFICE OF:

RS&H
 8521 SIX FORKS ROAD, SUITE 400
 RALEIGH, NC 27615
 NC FIRM LICENSE No: F-0493

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2018 STANDARD SPECIFICATIONS

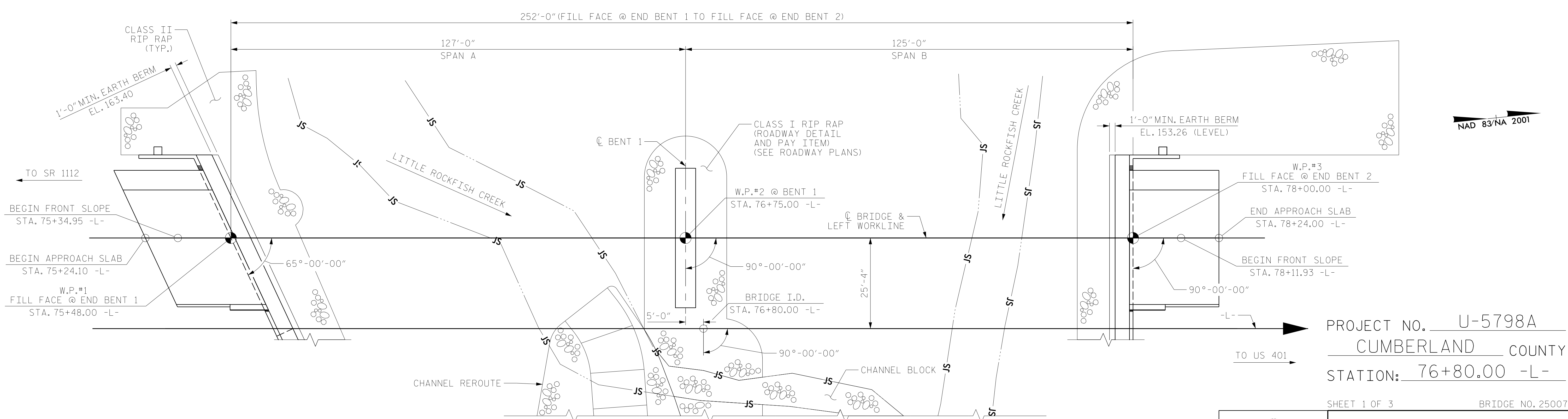
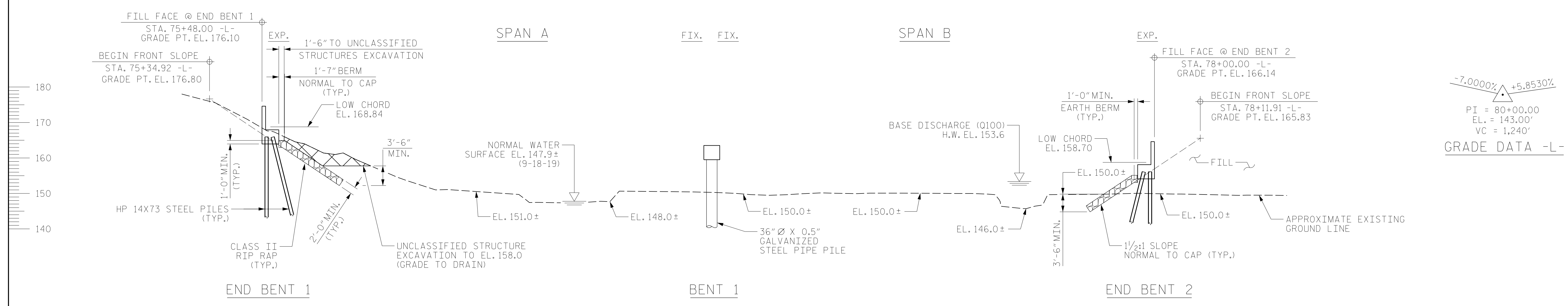
RIGHT OF WAY DATE:
 MARCH 27, 2020

LETTING DATE:
 MARCH 15, 2022



28-JAN-2022 12:53
 R:\Roadway\Proj\U-5798A\U-5798A_Rdy_tsh_structures.dgn
 \$\$\$SERVNAME\$\$\$

75+00 76+00 77+00 78+00 79+00



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

DRAWN BY : NSC DATE : 03/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

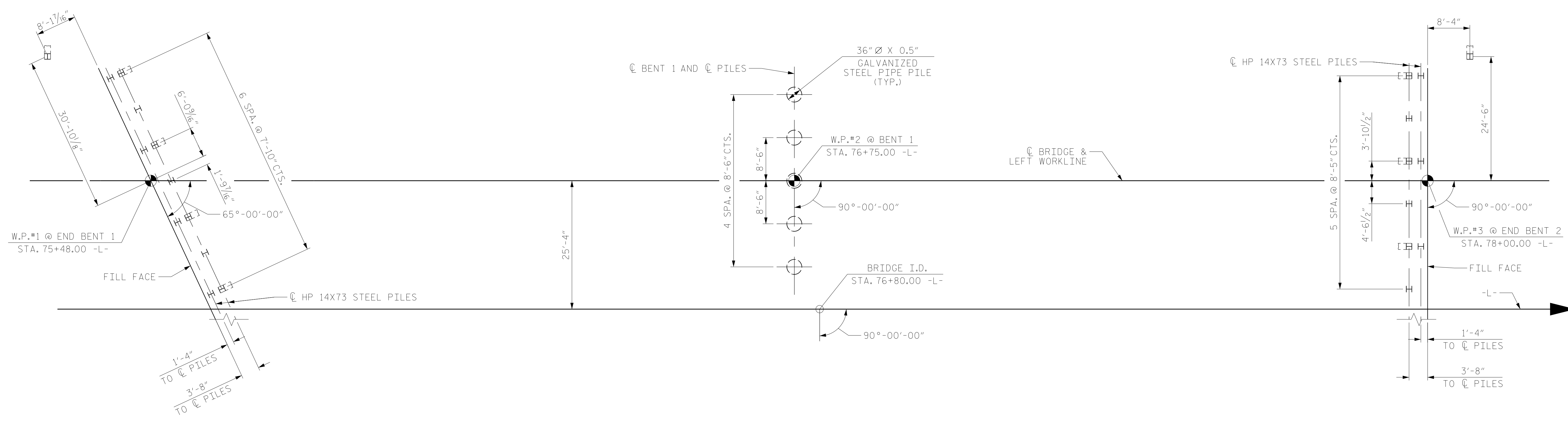
RS&H Architects-Engineers-Planners, Inc.
 8521 Six Forks Road, Suite 400
 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 50737-50463-C-28

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3 BRIDGE NO. 250075

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 LEFT LANE BRIDGE ON SR 1102
 OVER LITTLE ROCKFISH CREEK
 BETWEEN SR 1112 AND US 401
 LEFT LANE

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-1	TOTAL SHEETS
1			3				43
2			4				



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP ELEVATION. BRACED PILES (H) ARE BATTERED AT 3:12.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.

PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 390 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 117.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 141.0 FT, SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 90,000 FT-LBS TO 240,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO.1. THIS ESTIMATED ENERGY DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO.1 OR END BENT NO.2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO.1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



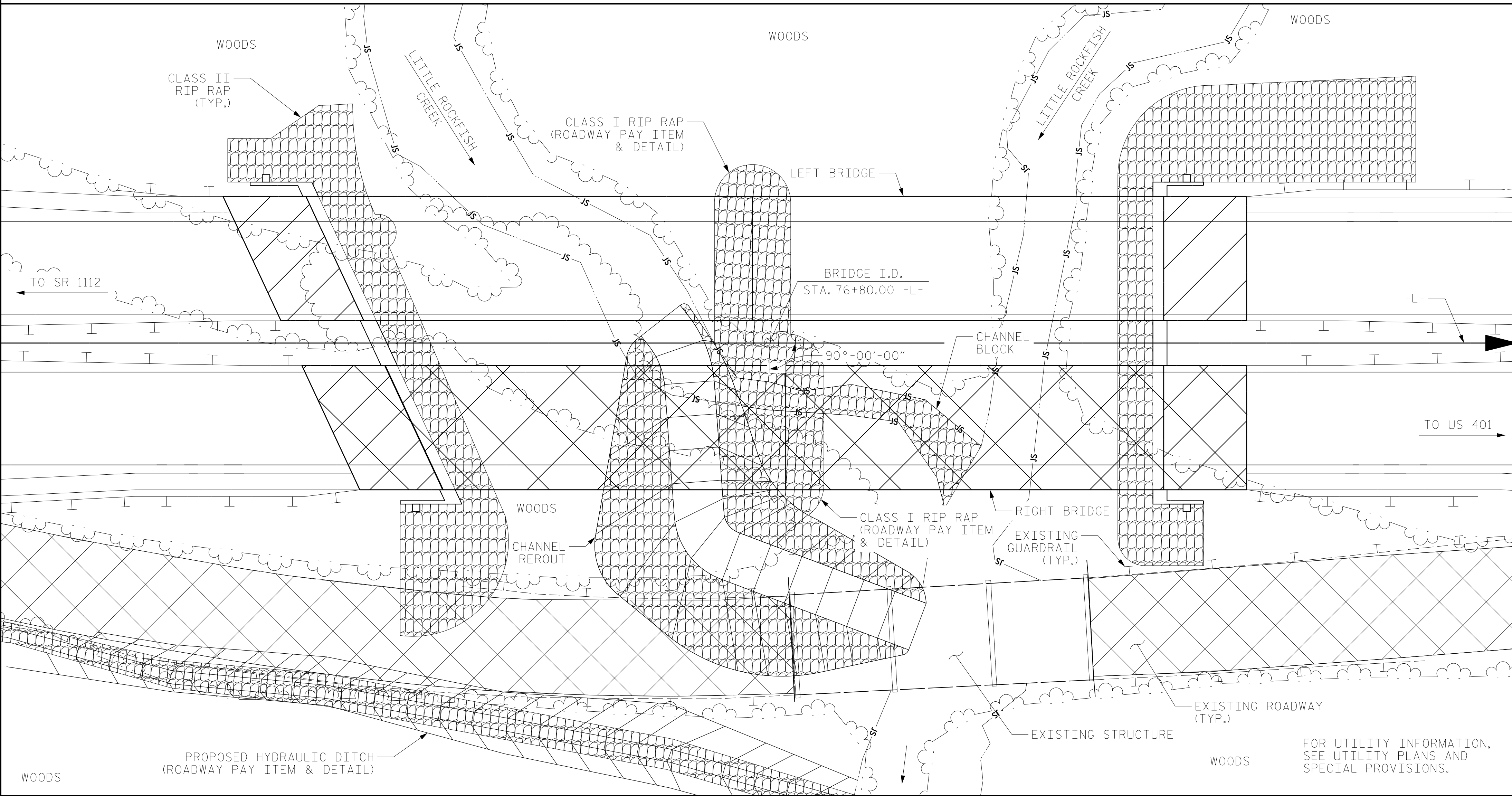
STATE OF NORTH CAROLINA
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GENERAL DRAWING
 LEFT LANE BRIDGE ON SR 1102
 OVER LITTLE ROCKFISH CREEK
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			43

BENCH MARK #9: 239.95' RT. OF -L- STA. 75+65.88, EL. 163.00'



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR INTERIOR BENT NO. 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZING LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S1-1 SHALL BE EXCAVATED FOR A DISTANCE OF 47 FT LEFT AND 26 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF THREE SPANS, ONE SPAN AT 30'-2", ONE SPAN AT 30'-1" AND ONE SPAN AT 30'-2" ON PRESTRESSED CONCRETE CORED SLABS, 32'-0" CLEAR ROADWAY WIDTH ON STEEL PILES AND LOCATED APPROXIMATELY 100' DOWNSTREAM FROM THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

TOTAL BILL OF MATERIALS

	REMOVAL OF EXISTING STRUCTURE @ STA. 76+80.00 -L-	ASBESTOS ASSESMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	63" F.I.B. PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH
SUPERSTRUCTURE					10,090	8,635				8	988.2	12
END BENT NO. 1							68.7		9,183			
BENT NO. 1							45.3		5,056			
END BENT NO. 2							56.4		7,552			10
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	10,090	8,635	170.4	LUMP SUM	21,791	8	988.2	22

	PILE DRIVING EQUIPMENT SETUP FOR PP 36" Ø X 0.5" GALVANIZED STEEL PILES	HP 14X73 STEEL PILES	PP 36" Ø X 0.5" GALVANIZED STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 3'-3" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEAL
	EACH	NO.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE											
END BENT NO. 1		12	720.0					167	185		
BENT NO. 1	5			3	650.0						
END BENT NO. 2		10	700.0	5				365	405		
TOTAL	5	22	1,420.0	14	650.0	251.0	260.8	259.0	532	590	LUMP SUM

HYDRAULIC DATA

DESIGN DISCHARGE	= 710 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 152.1'
DRAINAGE AREA	= 16.1 SQ. MI.
BASE DISCHARGE (Q100)	= 970 CFS
BASE HIGH WATER ELEVATION	= 153.6'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1,300+ CFS
FREQUENCY OF OVERTOPPING	= 500+ YRS
* OVERTOPPING ELEVATION	= 163.44'
	* SAG @ STA. 80+55.33 -L-

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 LEFT LANE BRIDGE ON SR 1102
 OVER LITTLE ROCKFISH CREEK
 BETWEEN SR 1112 AND US 401
LEFT LANE

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-3
1	NSC	03/2022	3			TOTAL SHEETS 43
2			4			

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.11	--	1.75	0.91	1.26	A	EL	65.29	0.97	1.36	A	EL	25.69	0.80	0.91	1.11	A	EL	65.29		
	HL-93 (OPERATING)	N/A		1.64	--	1.35	0.91	1.64	A	EL	65.29	1.11	1.81	A	I	24.66	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.64	59.040	1.75	0.91	1.85	A	EL	65.29	1.11	1.9	A	I	24.66	0.80	0.91	1.64	A	EL	65.29		
	HS-20 (OPERATING)	36.000		2.42	87.120	1.35	0.91	2.42	A	EL	65.29	1.11	2.52	A	I	24.66	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		4.01	54.135	1.40	0.91	5.66	A	EL	65.29	1.11	6.18	A	I	24.66	0.80	0.91	4.01	A	EL	65.29	
		SNGARBS2	20,000		2.85	57.000	1.40	0.91	4.03	A	EL	65.29	1.11	4.27	A	I	24.66	0.80	0.91	2.85	A	EL	65.29	
		SNAGRIS2	22,000		2.64	58.080	1.40	0.91	3.74	A	EL	65.29	1.11	3.93	A	I	24.66	0.80	0.91	2.64	A	EL	65.29	
		SNCOTTS3	27,250		1.98	53.955	1.40	0.91	2.8	A	EL	65.29	1.11	3.01	A	I	24.66	0.80	0.91	1.98	A	EL	65.29	
		SNAGGRS4	34,925		1.61	56.229	1.40	0.91	2.27	A	EL	65.29	1.11	2.42	A	I	24.66	0.80	0.91	1.61	A	EL	65.29	
		SNS5A	35,550		1.58	56.169	1.40	0.91	2.23	A	EL	65.29	1.11	2.42	A	I	24.66	0.80	0.91	1.58	A	EL	65.29	
		SNS6A	39,950		1.43	57.129	1.40	0.91	2.02	A	EL	65.29	1.11	2.17	A	I	24.66	0.80	0.91	1.43	A	EL	65.29	
	SNS7B	42,000		1.36	57.120	1.40	0.91	1.92	A	EL	65.29	1.11	2.11	A	I	24.66	0.80	0.91	1.36	A	EL	65.29		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.73	57.090	1.40	0.91	2.45	A	EL	65.29	1.11	2.63	A	I	24.66	0.80	0.91	1.73	A	EL	65.29	
		TNT4A	33,075		1.74	57.551	1.40	0.91	2.46	A	EL	65.29	1.11	2.59	A	I	24.66	0.80	0.91	1.74	A	EL	65.29	
		TNT6A	41,600		1.40	58.240	1.40	0.91	1.98	A	EL	65.29	1.11	2.2	A	I	24.66	0.80	0.91	1.4	A	EL	65.29	
		TNT7A	42,000		1.40	58.800	1.40	0.91	1.98	A	EL	65.29	1.11	2.16	A	I	24.66	0.80	0.91	1.4	A	EL	65.29	
		TNT7B	42,000		1.42	59.640	1.40	0.91	2.01	A	EL	65.29	1.11	2.07	A	I	24.66	0.80	0.91	1.42	A	EL	65.29	
		TNAGRIT4	43,000		1.37	58.910	1.40	0.91	1.94	A	EL	65.29	1.11	2.01	A	I	24.66	0.80	0.91	1.37	A	EL	65.29	
TNAGT5A		45,000		1.30	58,500	1.40	0.91	1.84	A	EL	65.29	1.11	1.97	A	I	24.66	0.80	0.91	1.3	A	EL	65.29		
TNAGT5B	45,000	③	1.29	58.050	1.40	0.91	1.83	A	EL	65.29	1.11	1.91	A	I	24.66	0.80	0.91	1.29	A	EL	65.29			

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

COMMENTS:
 1. TRANSFORMING ALL PRESTRESSING TENDONS.
 2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.
 3. GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.
 4. GIRDERS LOAD RATED AS SIMPLE SPAN.
 5. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE. SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

		CL BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG.
EXTERIOR GIRDER (EL) SPAN A	ϕV_n (KIPS)	548	512	378	326	277	282	277	326	378	512	548
	ϕM_n (KIP-FT)	----	15289	16437	16941	17126	17126	17126	16941	16437	15289	----
INTERIOR GIRDER (I) SPAN A	ϕV_n (KIPS)	549	517	389	378	321	330	321	378	389	517	549
	ϕM_n (KIP-FT)	----	15454	16723	17392	17680	17680	17680	17392	16723	15454	----

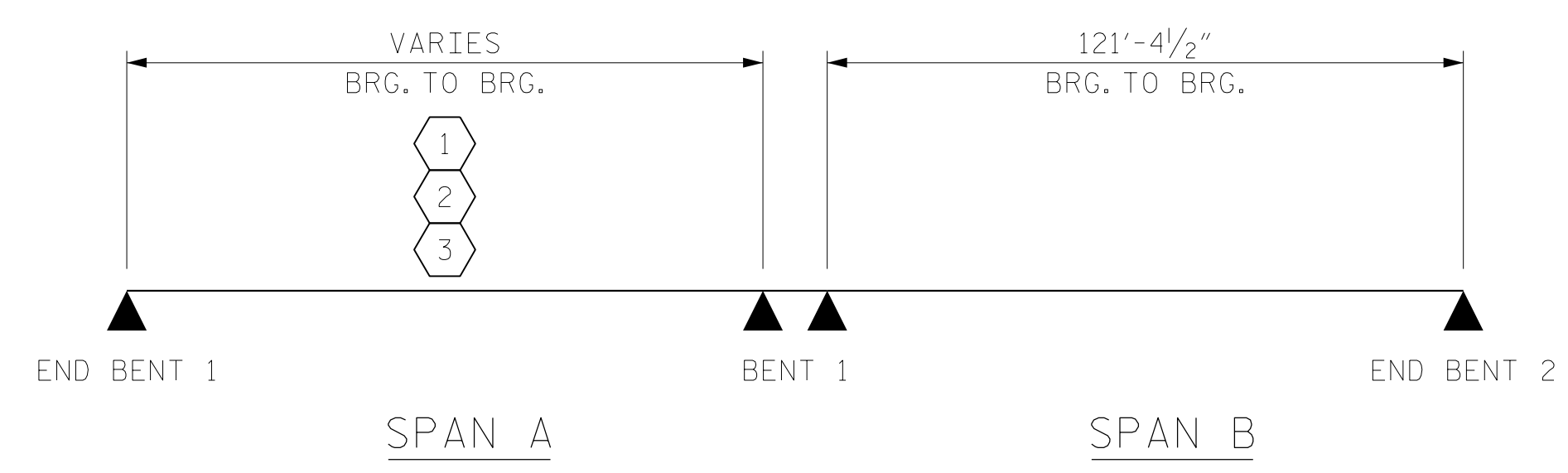
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	63.00	71.50
AREA	IN ²	955.60	1748.40
I _{xx}	IN ⁴	530,313	1,235,785
Y _{cg}	IN	27.96	42.86
SELF WT.	PLF	1037.10	2006.60
EFF. WIDTH	IN	---	109.50

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	63.00	71.50
AREA	IN ²	995.60	1896.90
I _{xx}	IN ⁴	530,313	1,318,108
Y _{cg}	IN	27.96	44.77
SELF WT.	PLF	1037.10	2214.70
EFF. WIDTH	IN	---	133.00

SECTION PROPERTIES PROVIDED AT MIDSPAN



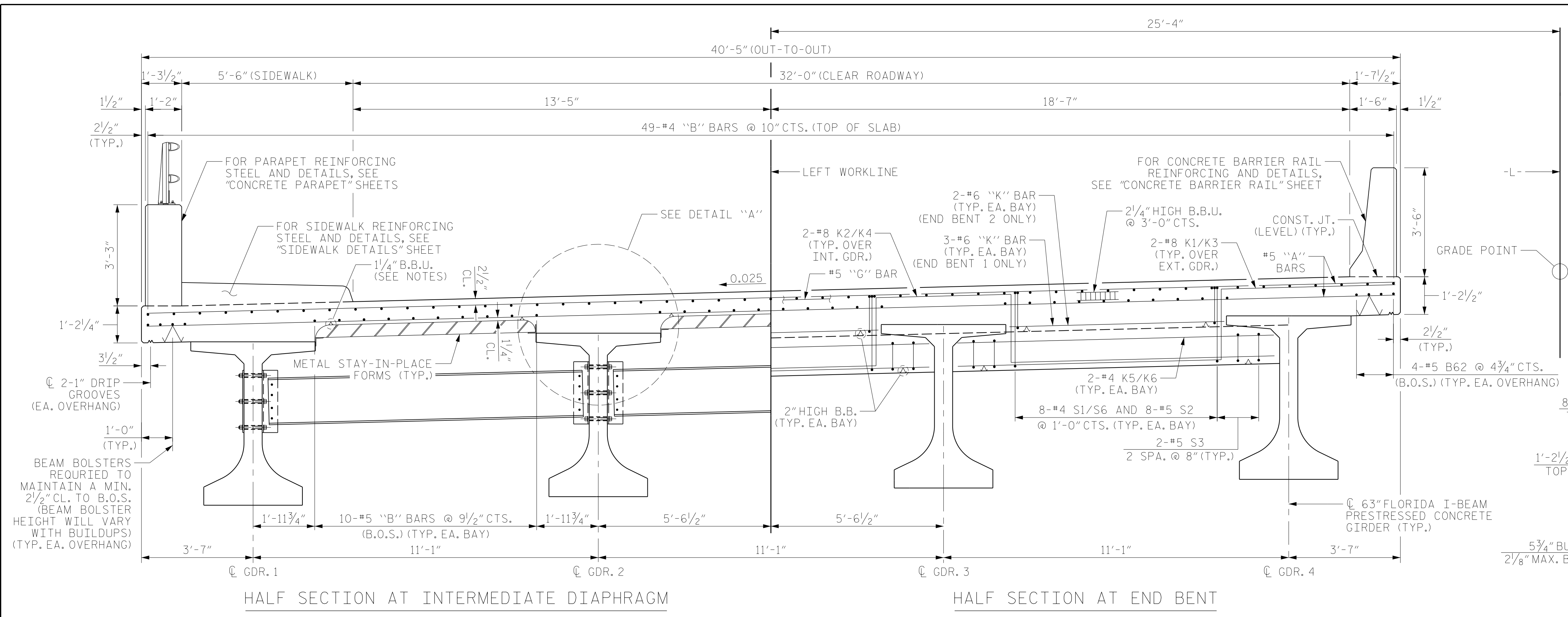
LRFR SUMMARY

DRAWN BY : MRA DATE : 04/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

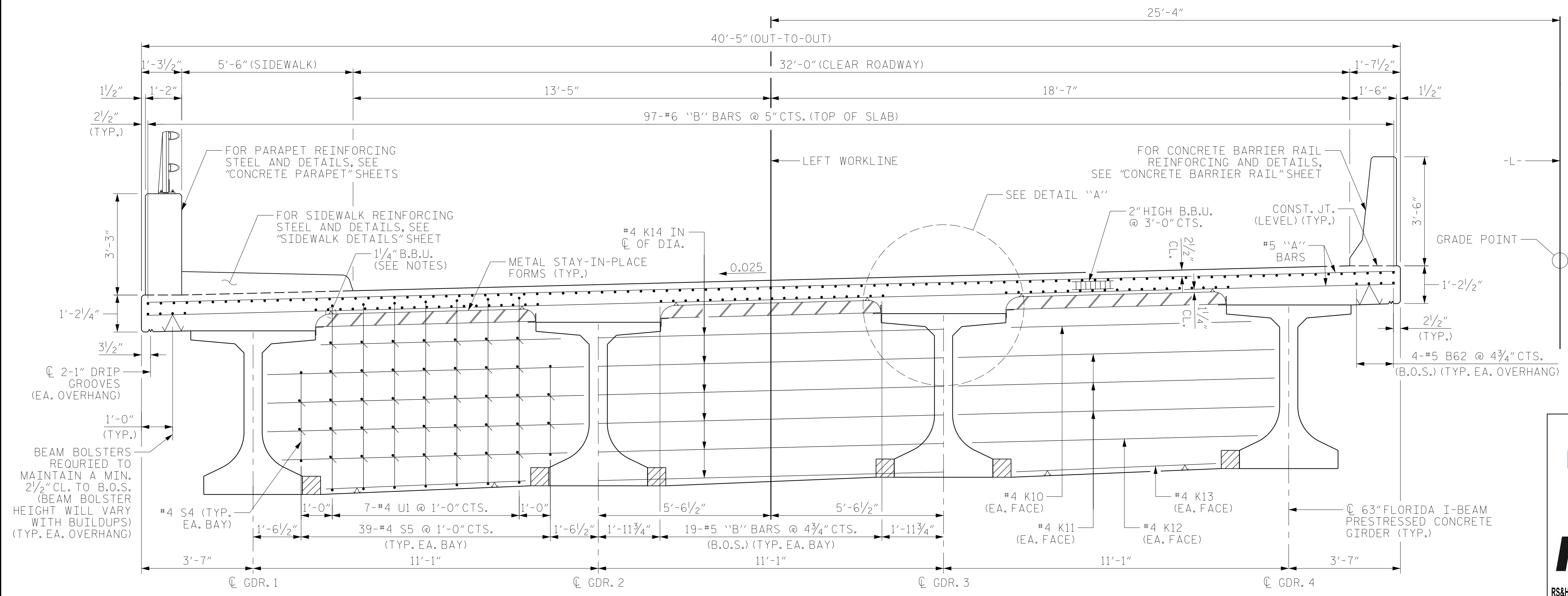
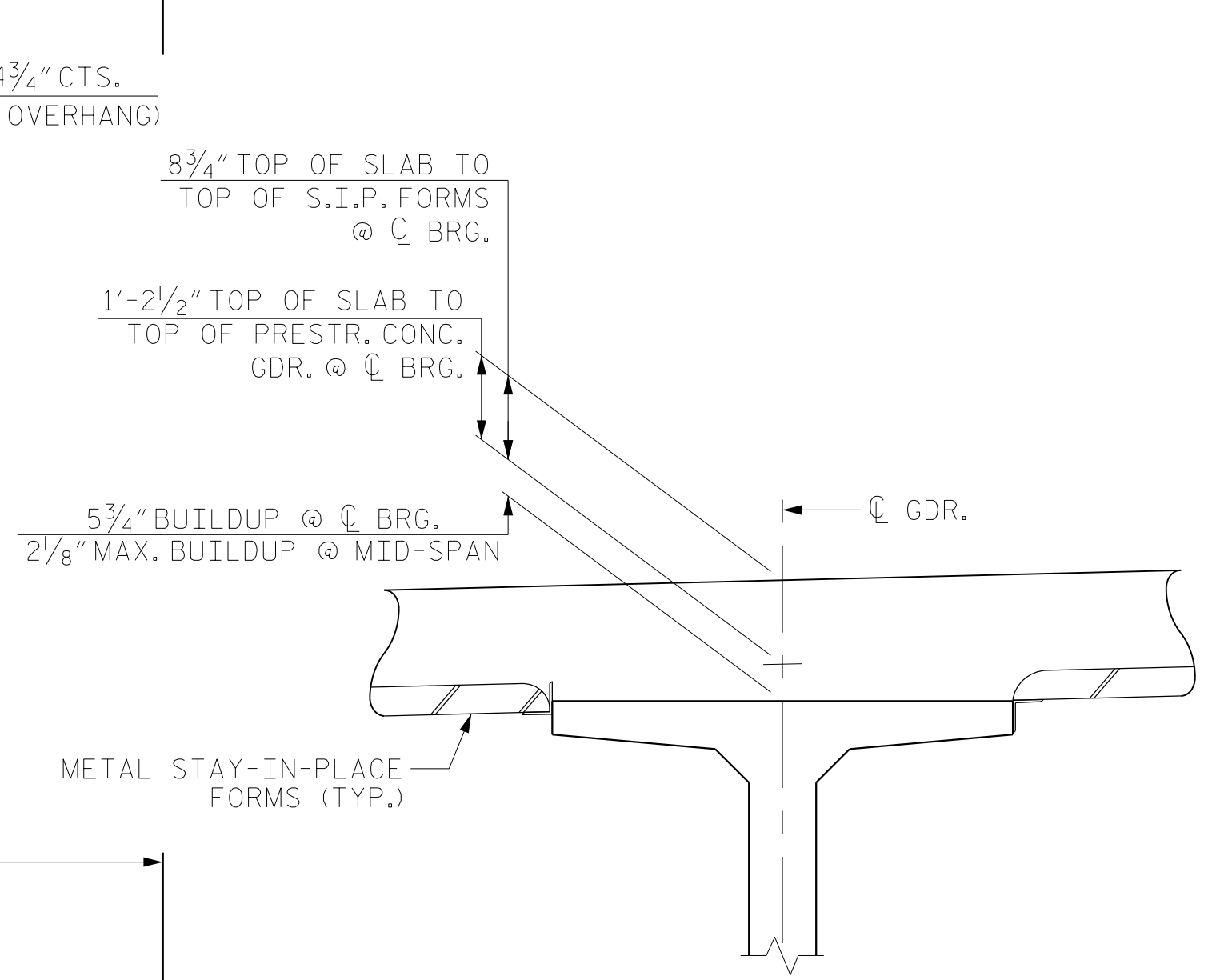
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 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 5073-F5403-C28

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-4
2			4			TOTAL SHEETS 43



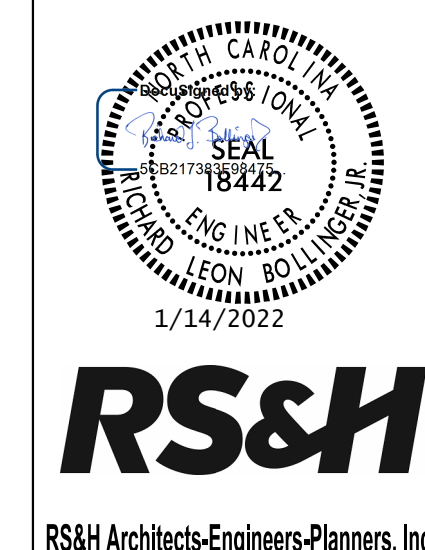
NOTES:
 PROVIDE 1/4" HIGH BEAM BOLSTERS UPPERS AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL DECK SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 B.O.S. = BOTTOM OF SLAB



DETAIL "A"
 REINFORCING NOT SHOWN FOR CLARITY

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
TYPICAL SECTION
 LEFT LANE

DRAWN BY: MRA DATE: 04/2020
 CHECKED BY: NSC DATE: 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE: 09/2021

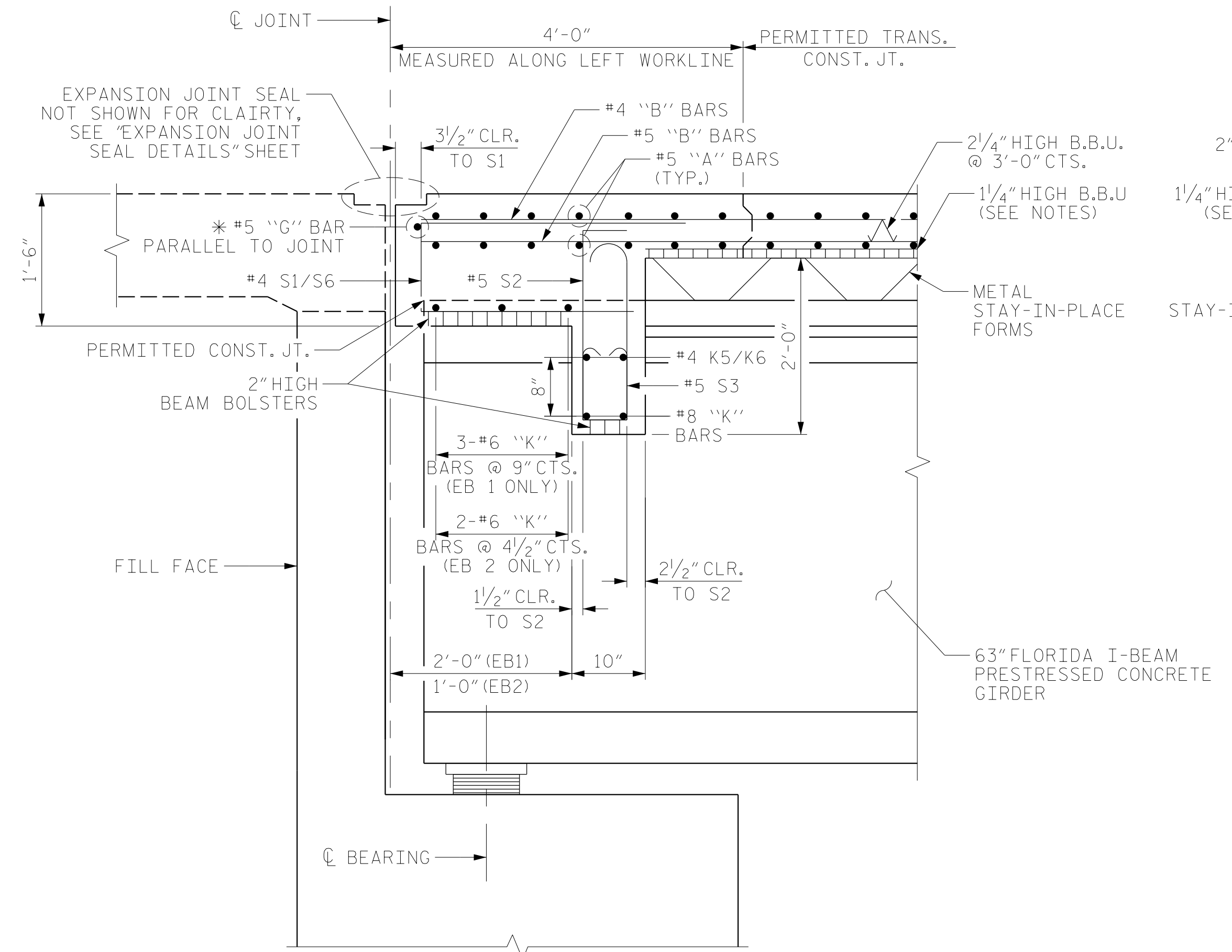
TYPICAL SECTION AT BENT DIAPHRAGM

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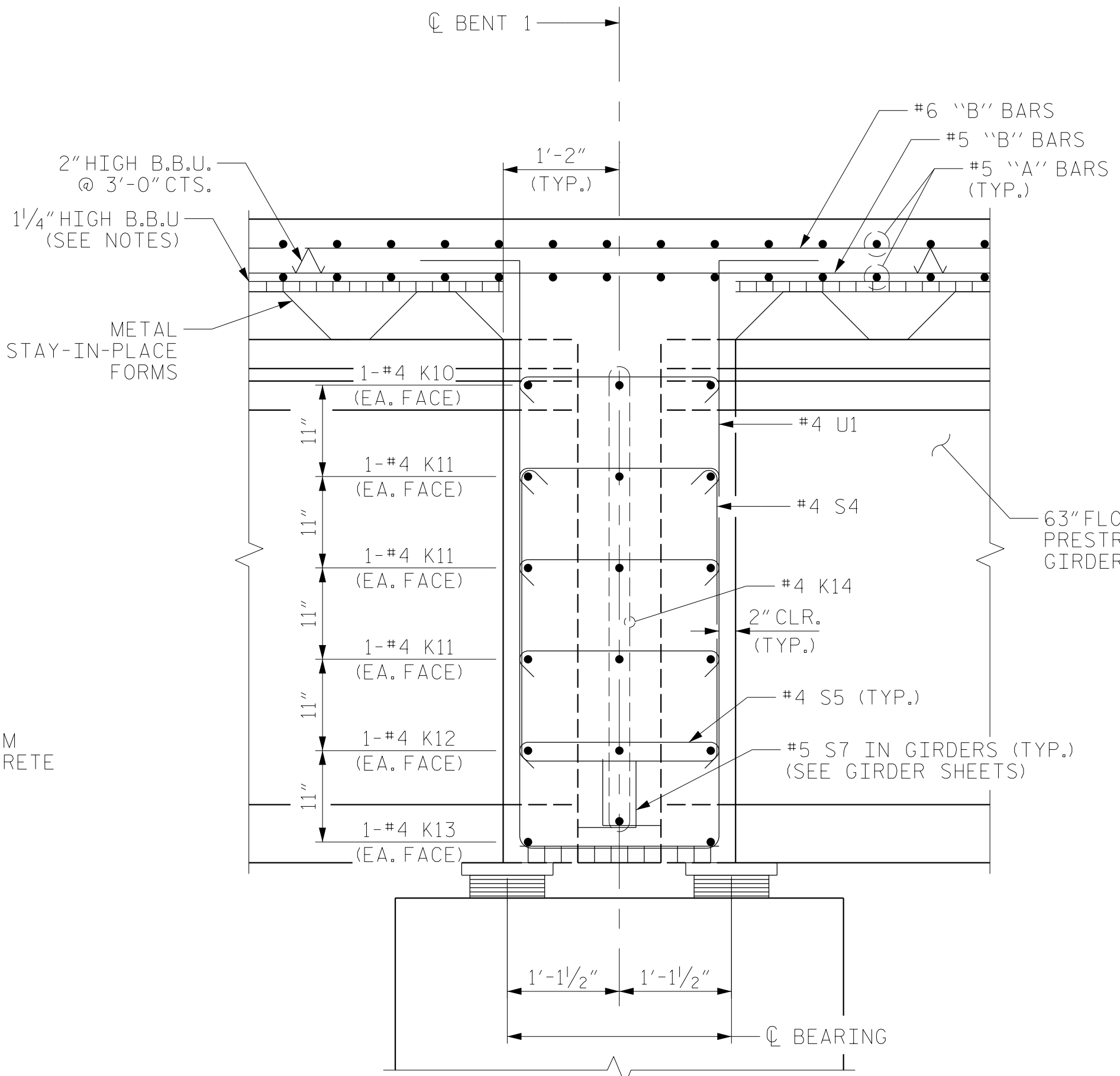
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5	
1			3			TOTAL SHEETS	
2			4			43	

NOTES:
 FOR NOTES, SEE SHEET 1 OF 2.
 FOR EXPANSION JOINT SEAL OPENING, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

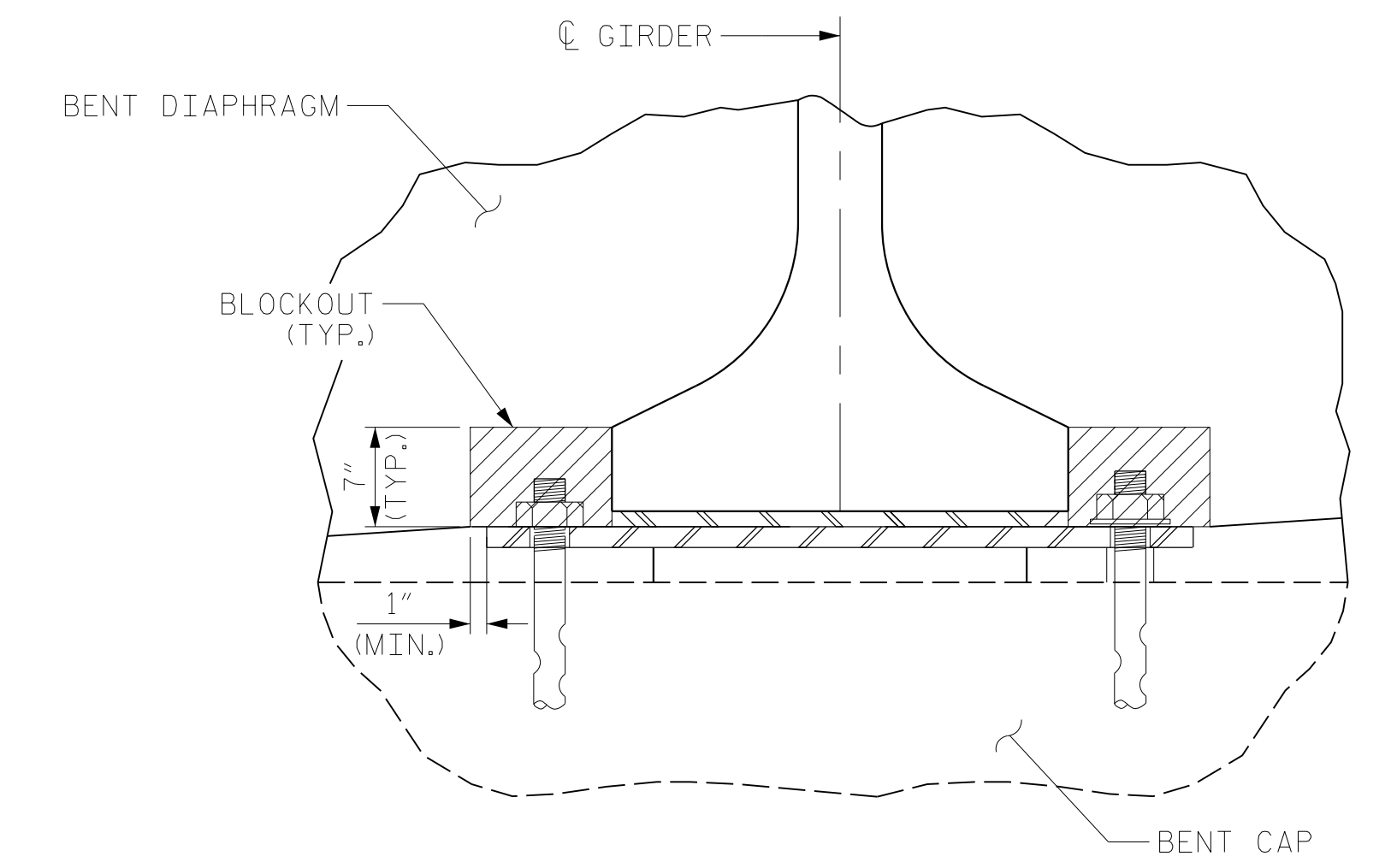


SECTION THROUGH END BENT DIAPHRAGM

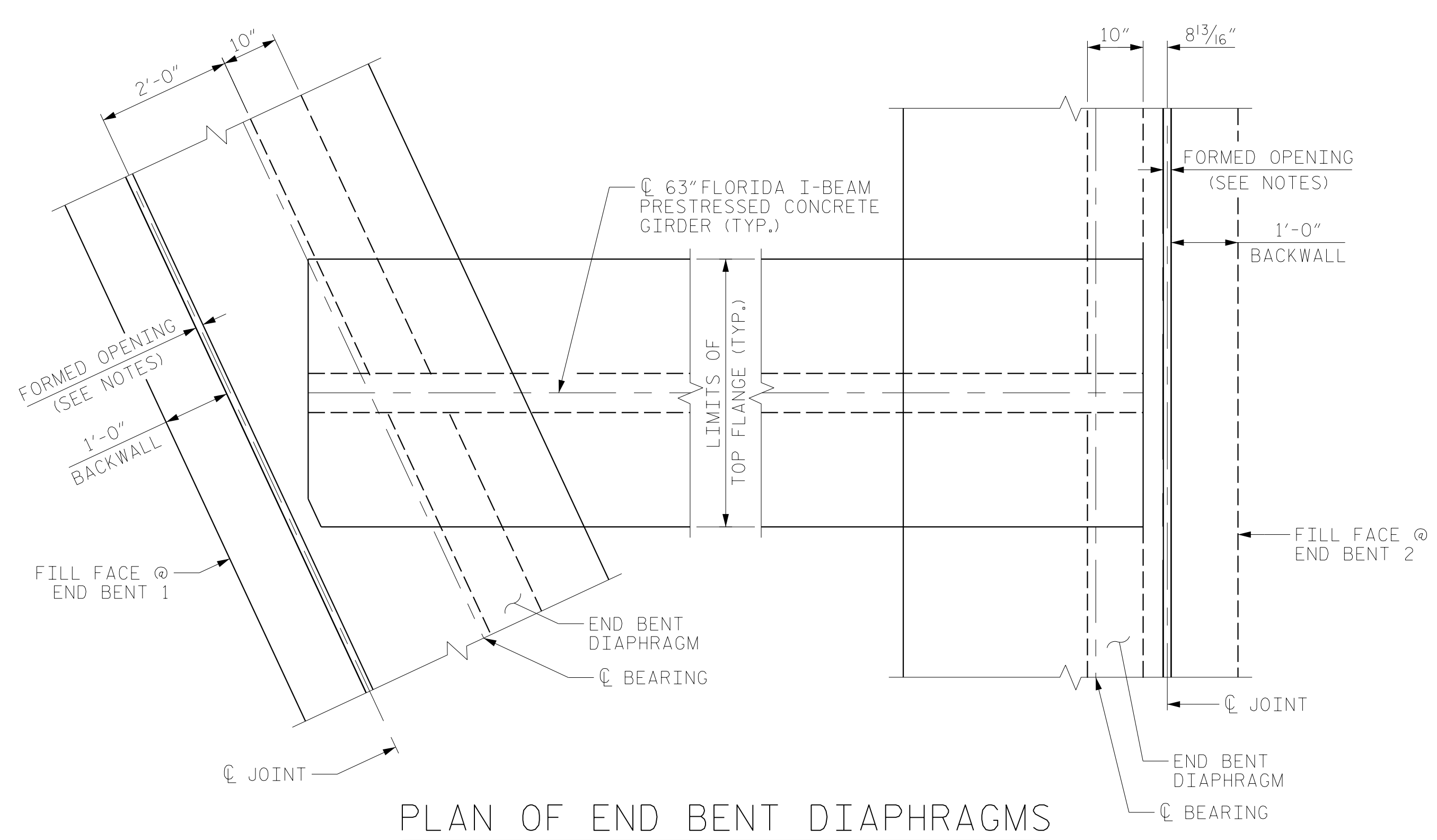
* "G" BAR MAY BE SHIFTED SLIGHTLY, AS NEEDED, TO CLEAR REINFORCING STEEL AND STIRRUPS
 END BENT 1 SHOWN, END BENT 2 SIMILAR



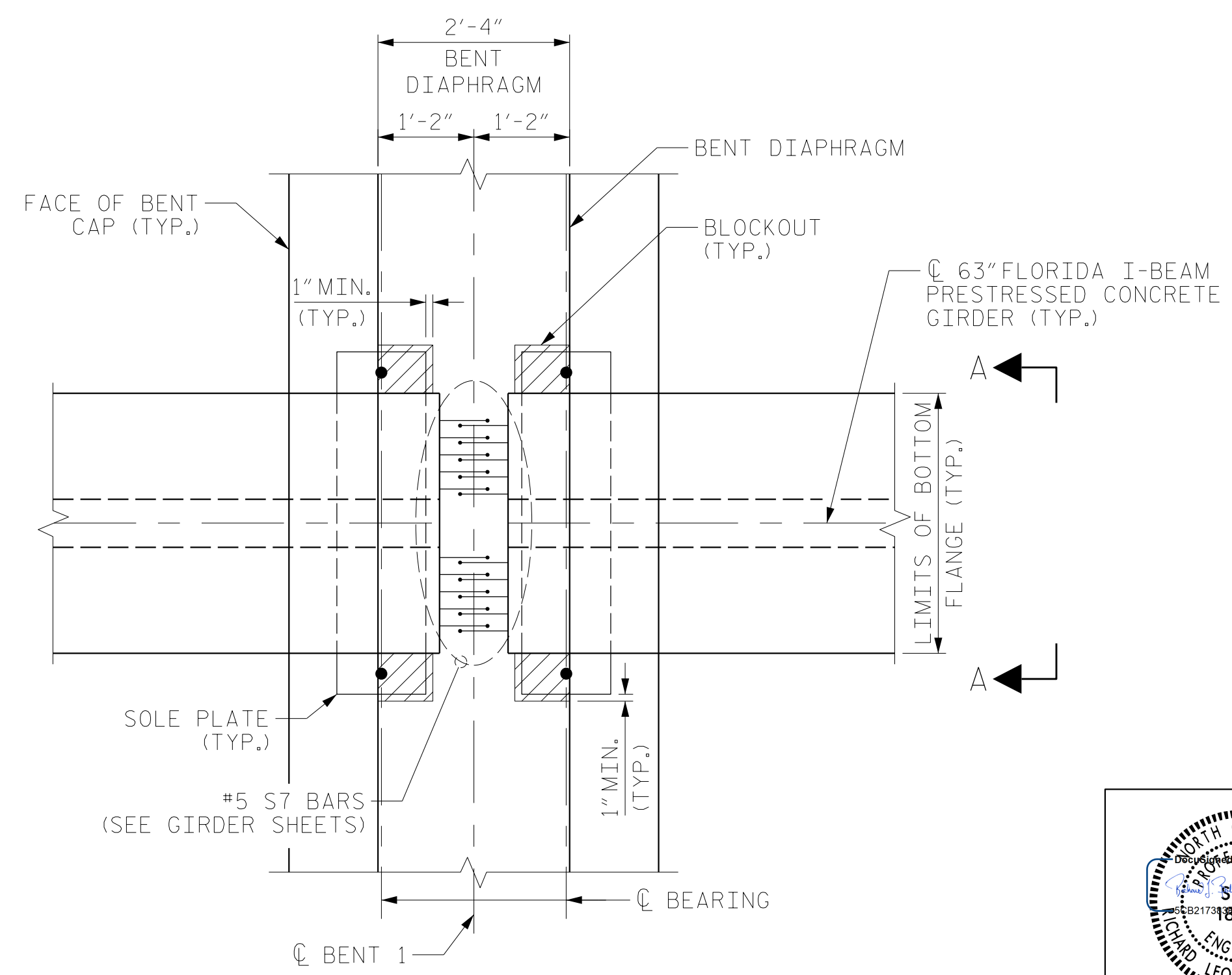
SECTION THROUGH BENT DIAPHRAGM



VIEW A-A



PLAN OF END BENT DIAPHRAGMS



BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 2



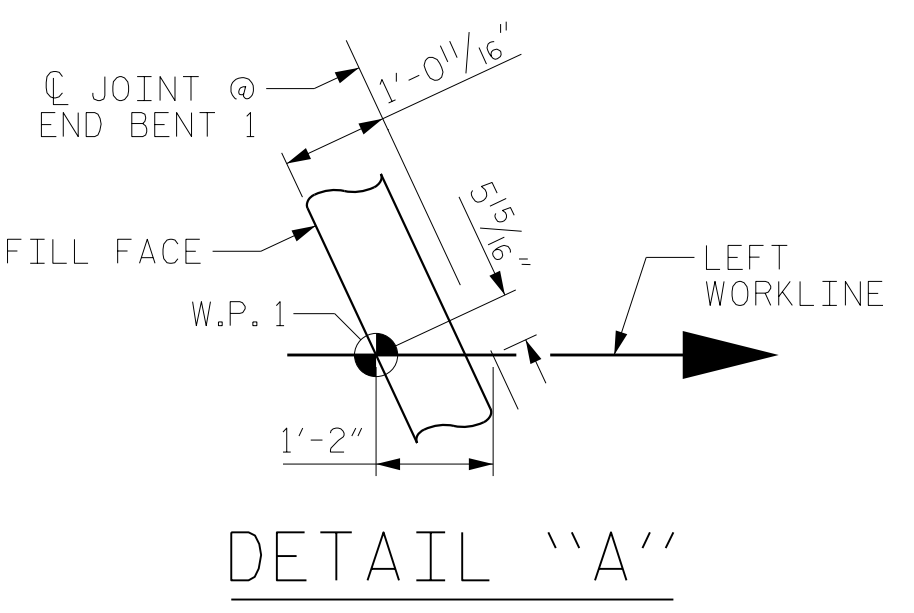
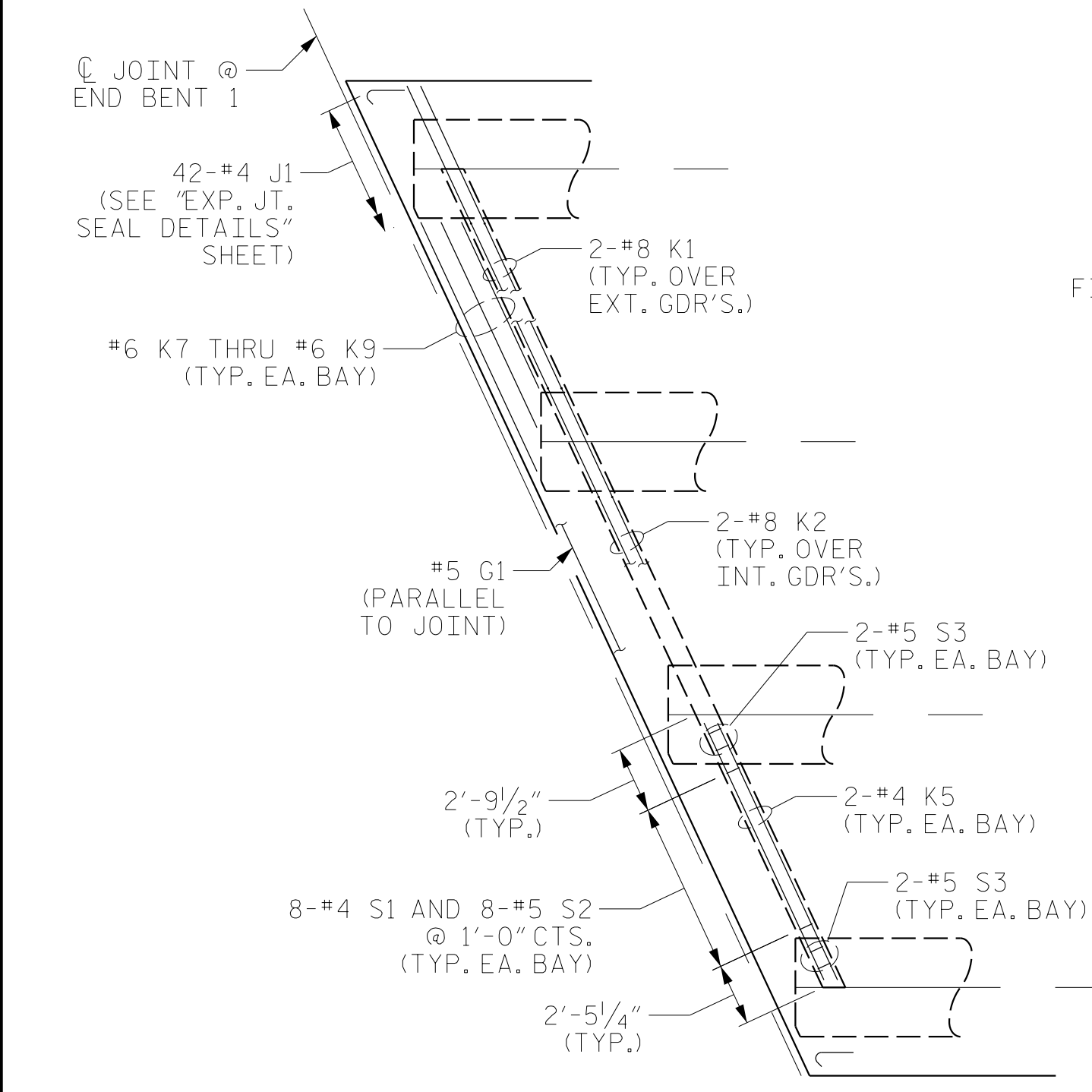
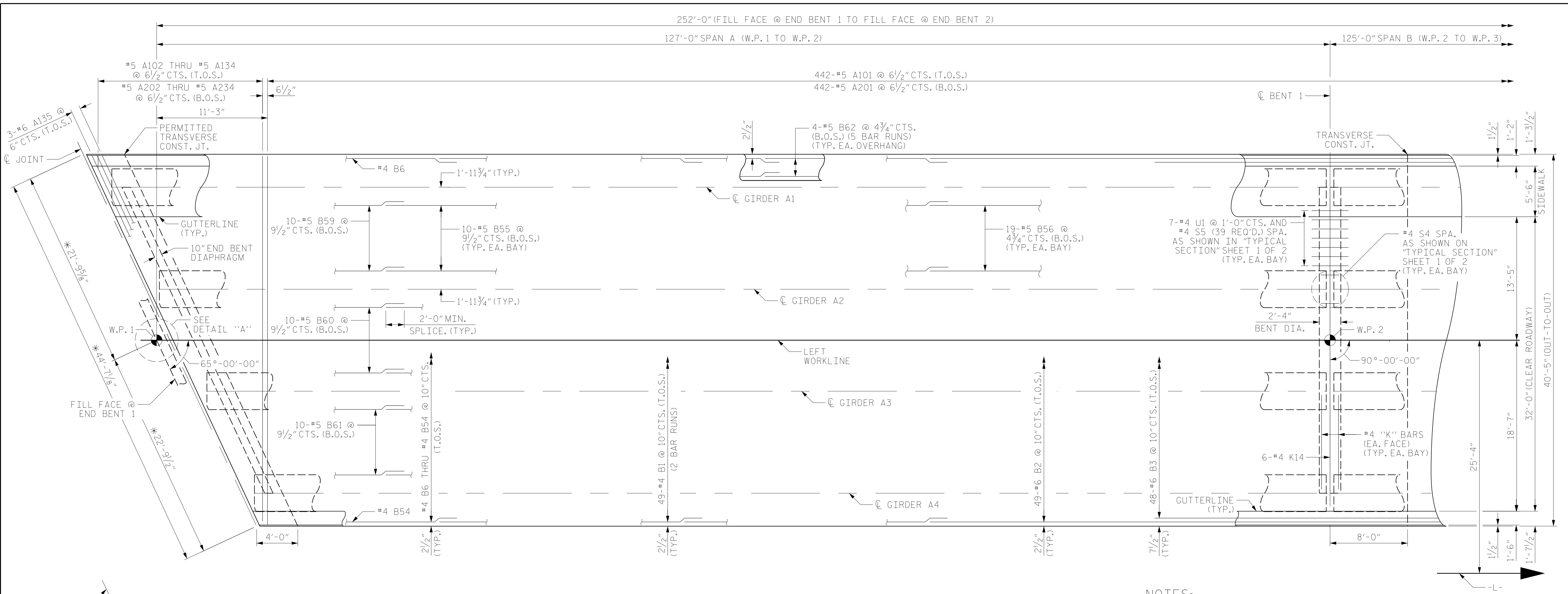
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STATE OF NORTH CAROLINA
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 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			43

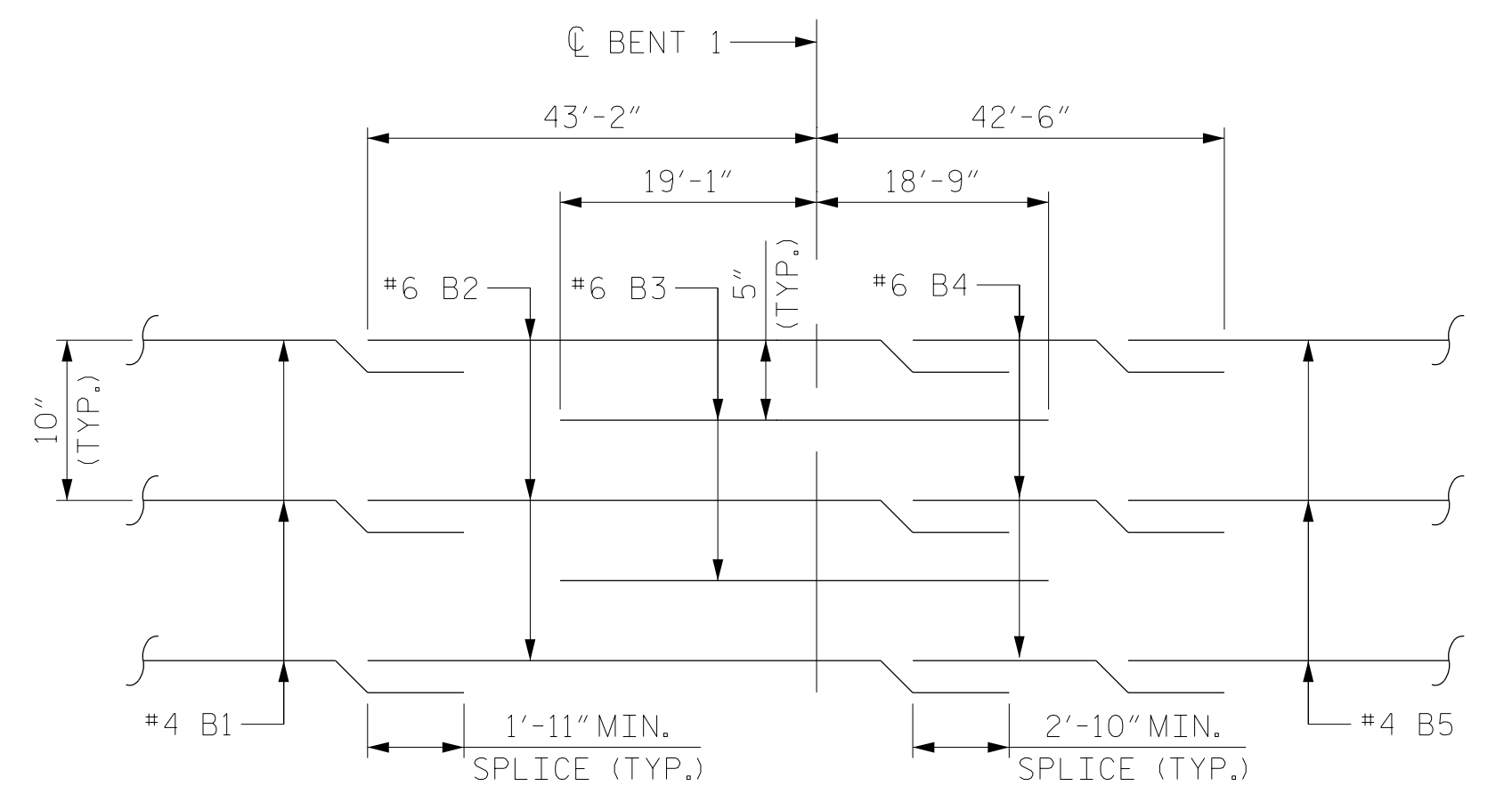
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PLAN OF SPAN A

* DIMENSIONS MEASURED ALONG \varnothing JOINT



NOTES:

- FOR SPLICE LENGTHS NOT SHOWN, REFER TO THE MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
- FOR END BENT AND BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.
- STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY, FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.
- FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET" SHEETS.
- FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET.
- FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
- T.O.S. = TOP OF SLAB
- B.O.S. = BOTTOM OF SLAB

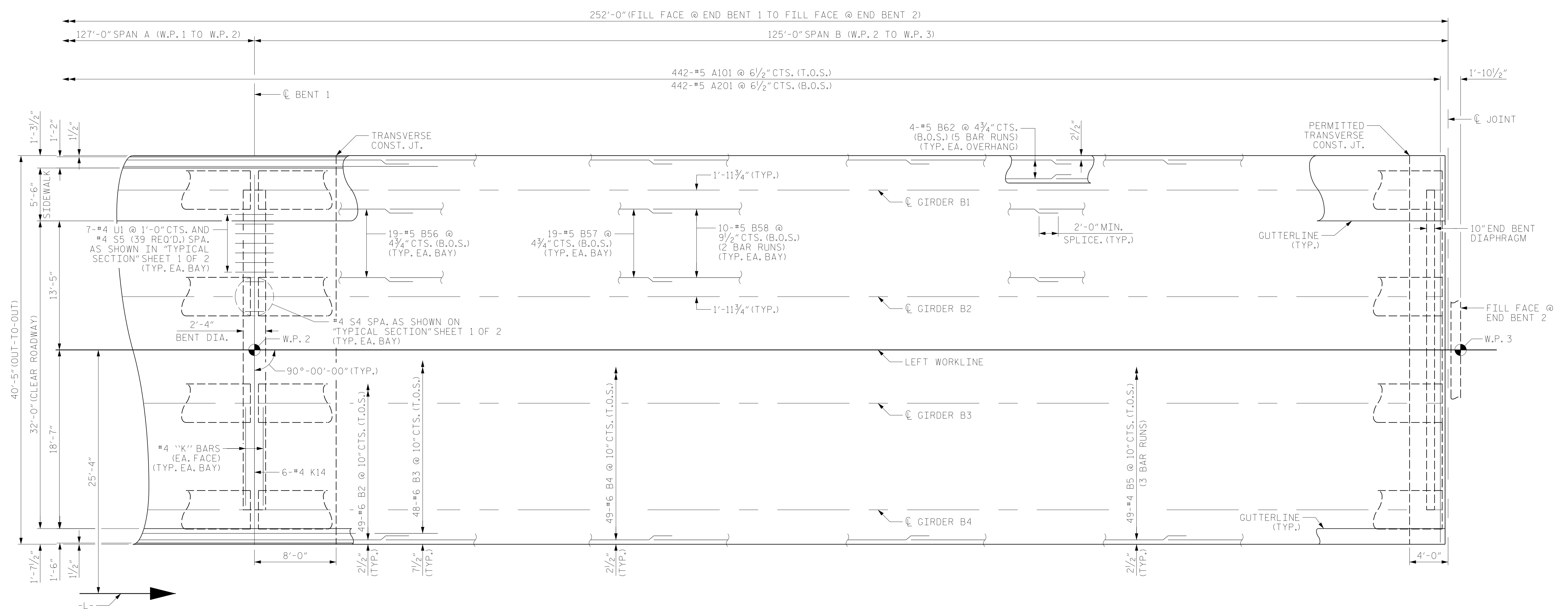
PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
PLAN OF SPAN A LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-7
TOTAL SHEETS					43

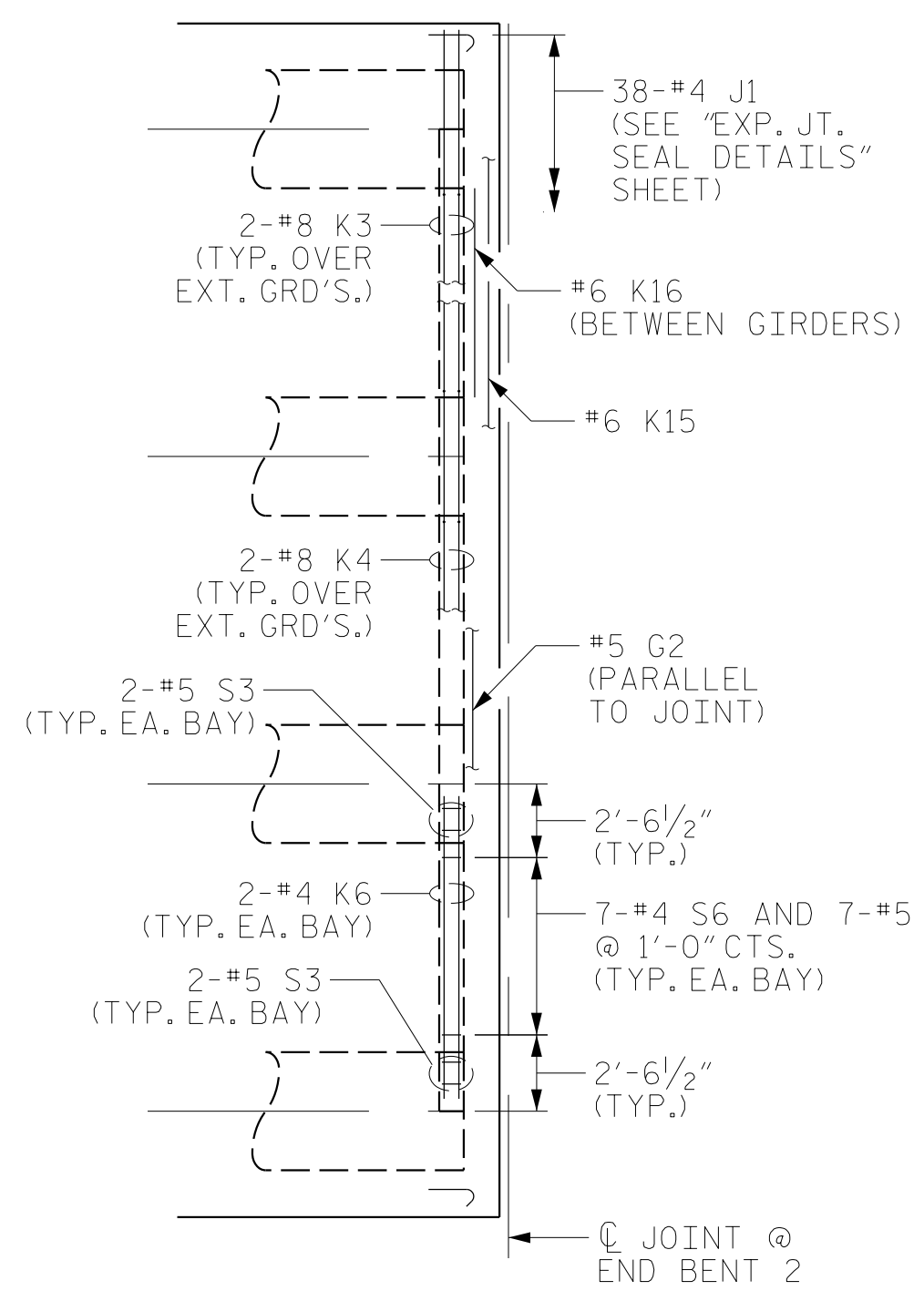
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PLAN OF SPAN B

NOTE:
FOR NOTES, SEE SHEET 1 OF 2.



END BENT 2 DIAPHRAGM REINFORCING DETAILS

#5 G2 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

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DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 2 OF 2

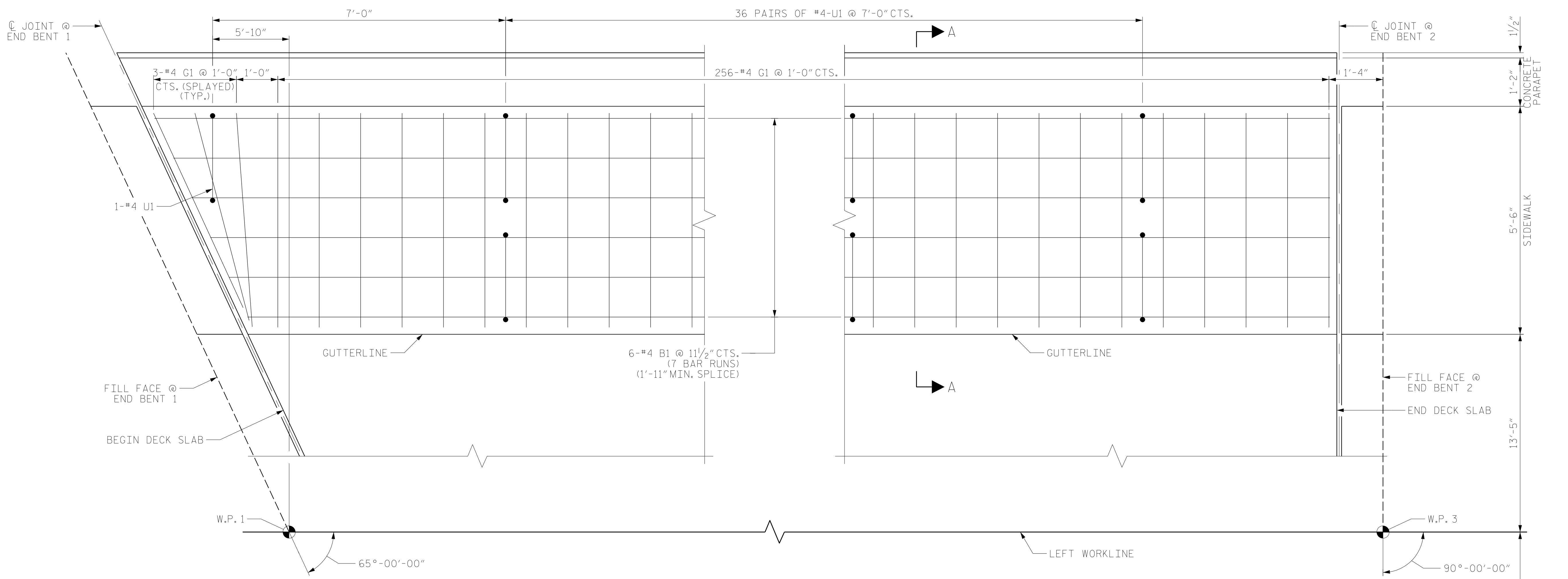


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN B
LEFT LANE

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-8	
1			3			TOTAL SHEETS	43
2			4				

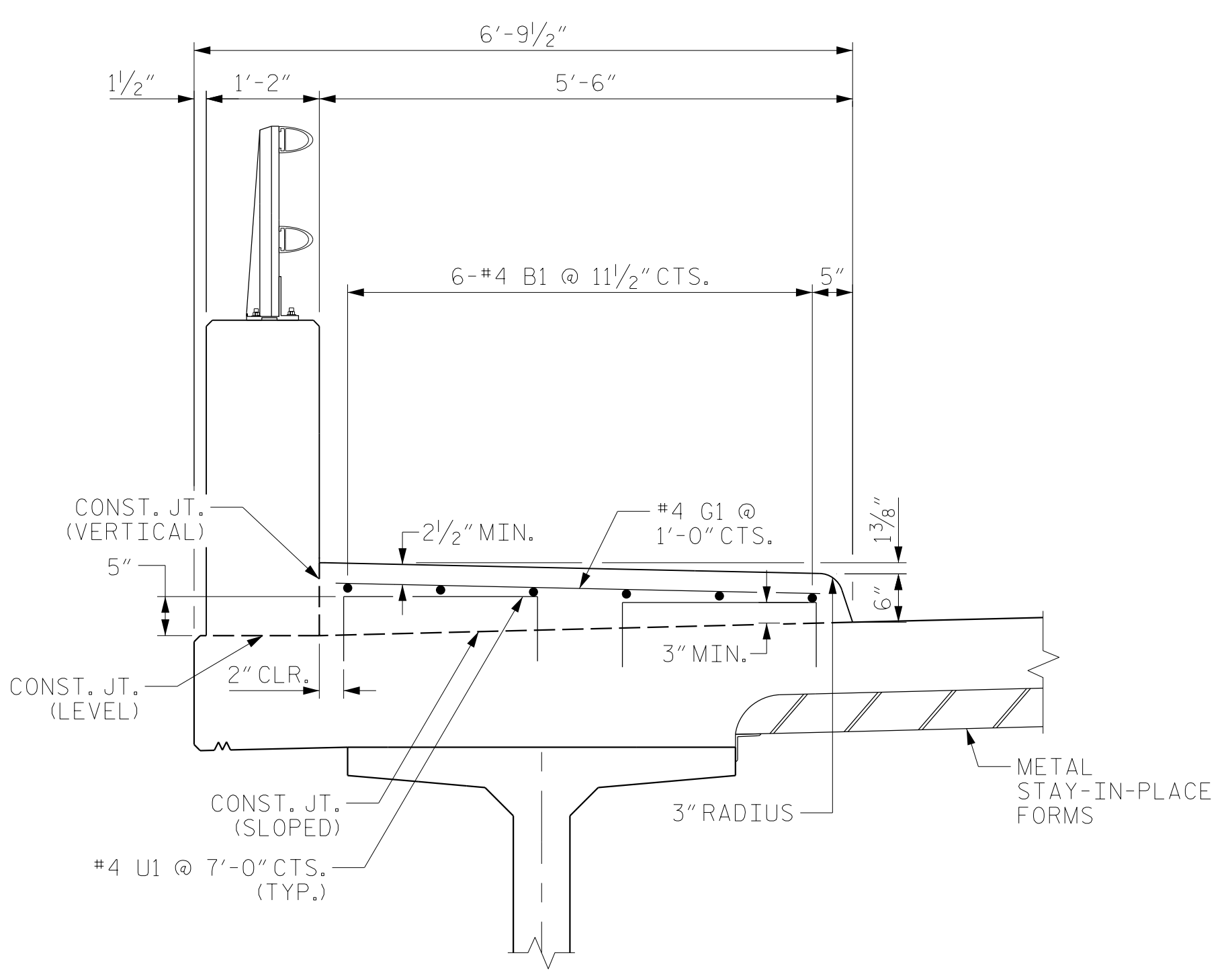
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PLAN OF SIDEWALK

NOTES

- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- CONTRACTION JOINTS SHALL BE NORMAL TO BARRIER.
- ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.
- FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DRAWINGS.
- PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".
- U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET" SHEETS.
- FOR SIDEWALK COVER PLATE DETAILS AT END BENTS, SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS.



SECTION A-A

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

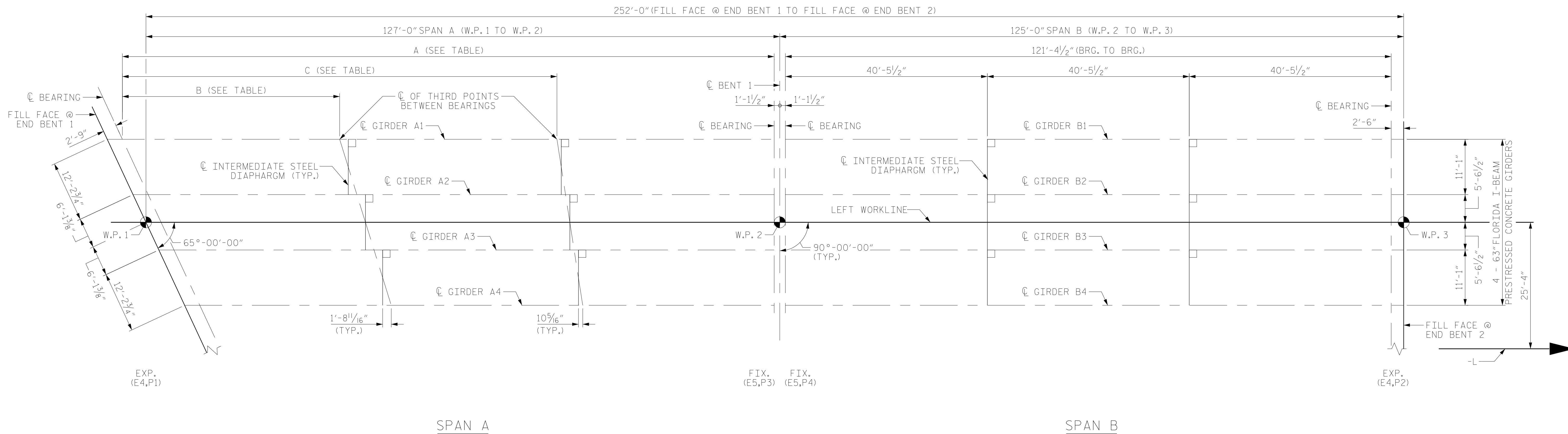
BILL OF MATERIAL						BAR TYPES	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*B1	42	#4	STR	38'-6"	1080	<p>ALL BAR DIMENSIONS ARE OUT TO OUT</p>	
*G1	259	#4	STR	5'-2"	894		
*U1	73	#4	1	3'-4"	163		
* EPOXY COATED REINFORCING STEEL					2,137 LBS.		
CLASS AA CONCRETE					32.3 C.Y.		

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE						SHEET NO.	
SIDEWALK DETAILS LEFT LANE						S1-9	
REVISIONS						TOTAL SHEETS	
NO.	BY:	DATE:	NO.	BY:	DATE:	43	
1			3				
2			4				



FRAMING PLAN

NOTE:

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" F.I.B. PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDER	A	B	C
A1	130'-7 ⁷ / ₈ "	43'-6 ³ / ₈ "	87'-0 ³ / ₄ "
A2	125'-5 ¹ / ₁₆ "	41'-9 ¹¹ / ₁₆ "	83'-7 ⁷ / ₁₆ "
A3	120'-3 ¹ / ₁₆ "	40'-1 ¹ / ₁₆ "	80'-2 ¹ / ₁₆ "
A4	115'-1 ¹ / ₁₆ "	38'-4 ³ / ₈ "	76'-8 ³ / ₄ "

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

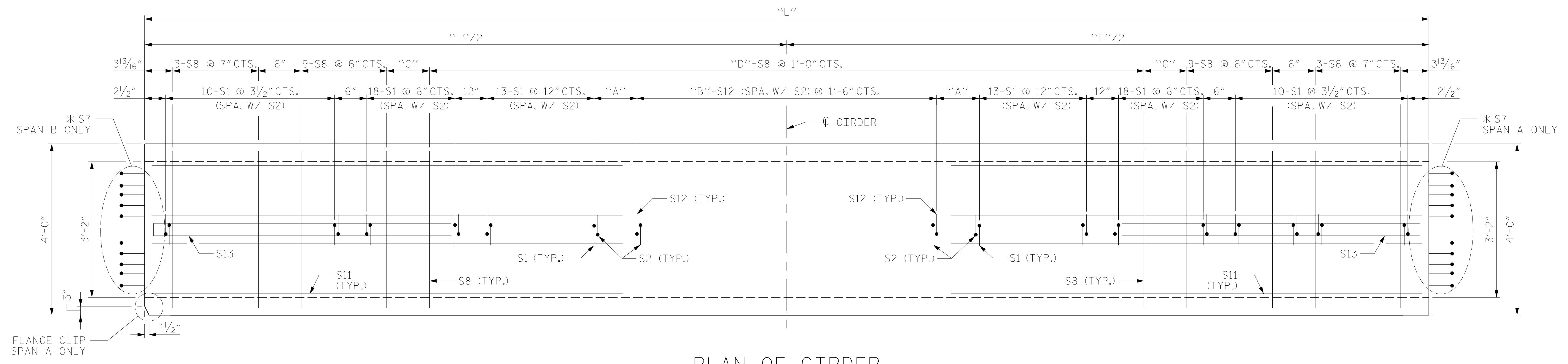


STATE OF NORTH CAROLINA
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 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 LEFT LANE

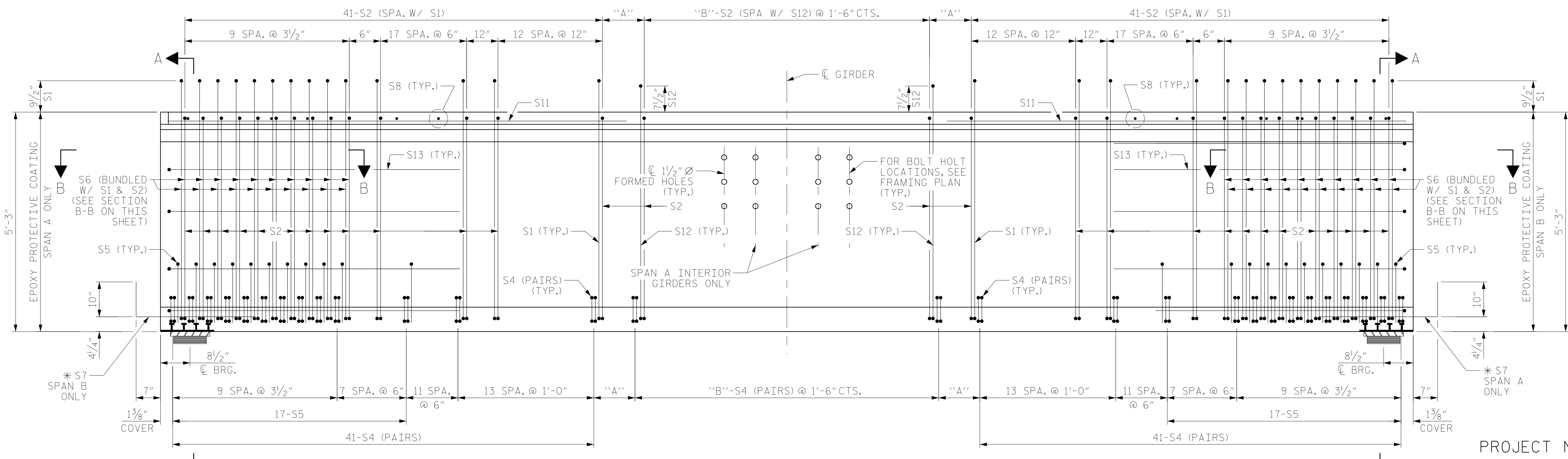
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-10
2			4			TOTAL SHEETS 43



PLAN OF GIRDER



ELEVATION OF GIRDER

EXP. - SPAN A
FIX. - SPAN B

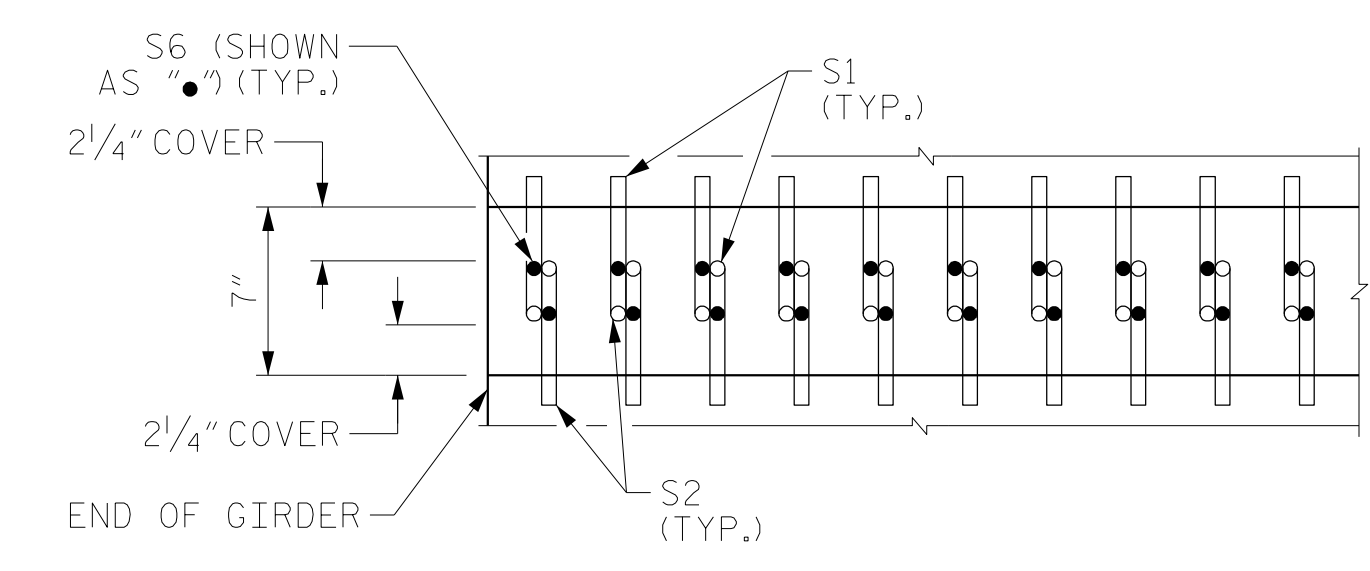
FIX. - SPAN A
EXP. - SPAN B

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 3

NOTES

- FOR GIRDER DIMENSIONS AND VARIABLES, SEE SHEET 2 OF 3.
- FOR ADDITIONAL "S" BARS, SEE PARTIAL ELEVATION ON "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- FOR VERTICAL DIMENSIONS TO FORMED HOLE LOCATIONS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- ALTERNATE DIRECTION OF #5 S1 AND #5 S2 BARS.
- FOR SECTION A-A, SEE SHEET 2 OF 3.
- * FOR S7 BAR SPACING, SEE DETAIL "A" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- BARS MAY BE SHIFTED AS NECESSARY TO AVOID CONFLICT.



SECTION B-B

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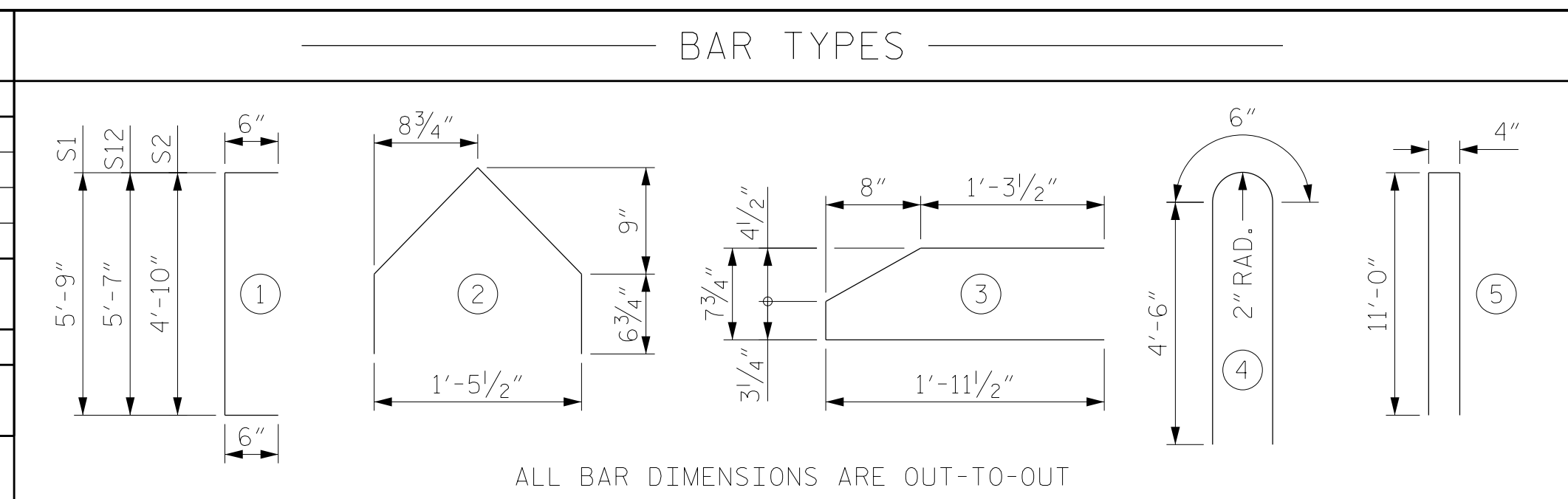
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S1-11	
SUPERSTRUCTURE F.I.B. 63" PRESTRESSED CONCRETE GIRDERS LEFT LANE						TOTAL SHEETS 43	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

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SPAN A GIRDER DIMENSIONS					
GIRDER	L	A	B	C	D
GIRDER A1	132'-0 ¹ / ₈ "	1'-5 ¹ / ₁₆ "	54	6 ¹ / ₄ "	120
GIRDER A2	126'-10 ¹ / ₁₆ "	1'-1 ¹ / ₁₆ "	51	11 ¹ / ₄ "	114
GIRDER A3	121'-8 ¹ / ₁₆ "	9 ¹ / ₁₆ "	48	10 ¹ / ₄ "	109
GIRDER A4	116'-6 ¹ / ₁₆ "	1'-2 ¹ / ₁₆ "	44	9 ¹ / ₄ "	104

SPAN B GIRDER DIMENSIONS					
GIRDER	L	A	B	C	D
GIRDERS B1, B2, B3, & B4	122'-9 ¹ / ₂ "	1'-3 ³ / ₄ "	48	10 ⁵ / ₁₆ "	110



ALL BAR DIMENSIONS ARE OUT-TO-OUT

SPAN A			SPAN B		
0.6" Ø L. R. GRADE 270 STRANDS			0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. IN.)	ULTIMATE STRENGTH (LBS/STRAND)	APPLIED PRESTRESS (LBS/STRAND)	AREA (SQ. IN.)	ULTIMATE STRENGTH (LBS/STRAND)	APPLIED PRESTRESS (LBS/STRAND)
0.217	58,600	43,950	0.217	58,600	43,950

REINF. STEEL FOR ONE GIRDER						REINF. STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#5	1	6'-9"	577	S1	82	#5	1	6'-9"	577
S2	136	#5	1	5'-10"	827	S2	130	#5	1	5'-10"	791
S2	133	#5	1	5'-10"	809	S4	260	#3	3	4'-4"	424
S2	130	#5	1	5'-10"	791	S5	34	#3	2	3'-3"	42
S2	126	#5	1	5'-10"	767	S6	40	#5	STR	4'-9"	198
S3	16	#4	STR	11'-6"	123	*S7	10	#5	STR	3'-8"	38
S4	272	#3	3	4'-4"	443	S8	134	#4	STR	3'-8"	328
S4	266	#3	3	4'-4"	433	S9	16	#4	STR	8'-0"	86
S4	260	#3	3	4'-4"	424	S10	8	#4	4	9'-6"	51
S4	252	#3	3	4'-4"	411	S11	8	#6	STR	24'-0"	288
S5	34	#3	2	3'-3"	42	S12	48	#5	1	6'-7"	330
S6	40	#5	STR	4'-9"	198	S13	10	#4	5	22'-4"	149
*S7	10	#5	STR	3'-8"	38						

GIRDER	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	GIRDER	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
GIRDER 1	S2	136	#5	1	5'-10"	827	GIRDER 2	S2	130	#5	1	5'-10"	791
GIRDER 2	S2	133	#5	1	5'-10"	809	GIRDER 3	S4	260	#3	3	4'-4"	424
GIRDER 3	S2	130	#5	1	5'-10"	791	GIRDER 4	S5	34	#3	2	3'-3"	42
GIRDER 4	S2	126	#5	1	5'-10"	767	INTERIOR	S6	40	#5	STR	4'-9"	198
INTERIOR	S3	16	#4	STR	11'-6"	123	GIRDER 1	*S7	10	#5	STR	3'-8"	38
GIRDER 1	S4	272	#3	3	4'-4"	443	GIRDER 2	S8	134	#4	STR	3'-8"	328
GIRDER 2	S4	266	#3	3	4'-4"	433	GIRDER 3	S9	16	#4	STR	8'-0"	86
GIRDER 3	S4	260	#3	3	4'-4"	424	GIRDER 4	S10	8	#4	4	9'-6"	51
GIRDER 4	S4	252	#3	3	4'-4"	411	EXTERIOR	S11	8	#6	STR	24'-0"	288
	S5	34	#3	2	3'-3"	42	INTERIOR	S12	48	#5	1	6'-7"	330
	S6	40	#5	STR	4'-9"	198	GIRDER 1	S13	10	#4	5	22'-4"	149
	*S7	10	#5	STR	3'-8"	38							

QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. GRADE NO.
3302	31.4	65

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	122'-9 ¹ / ₂ "	491'-2"

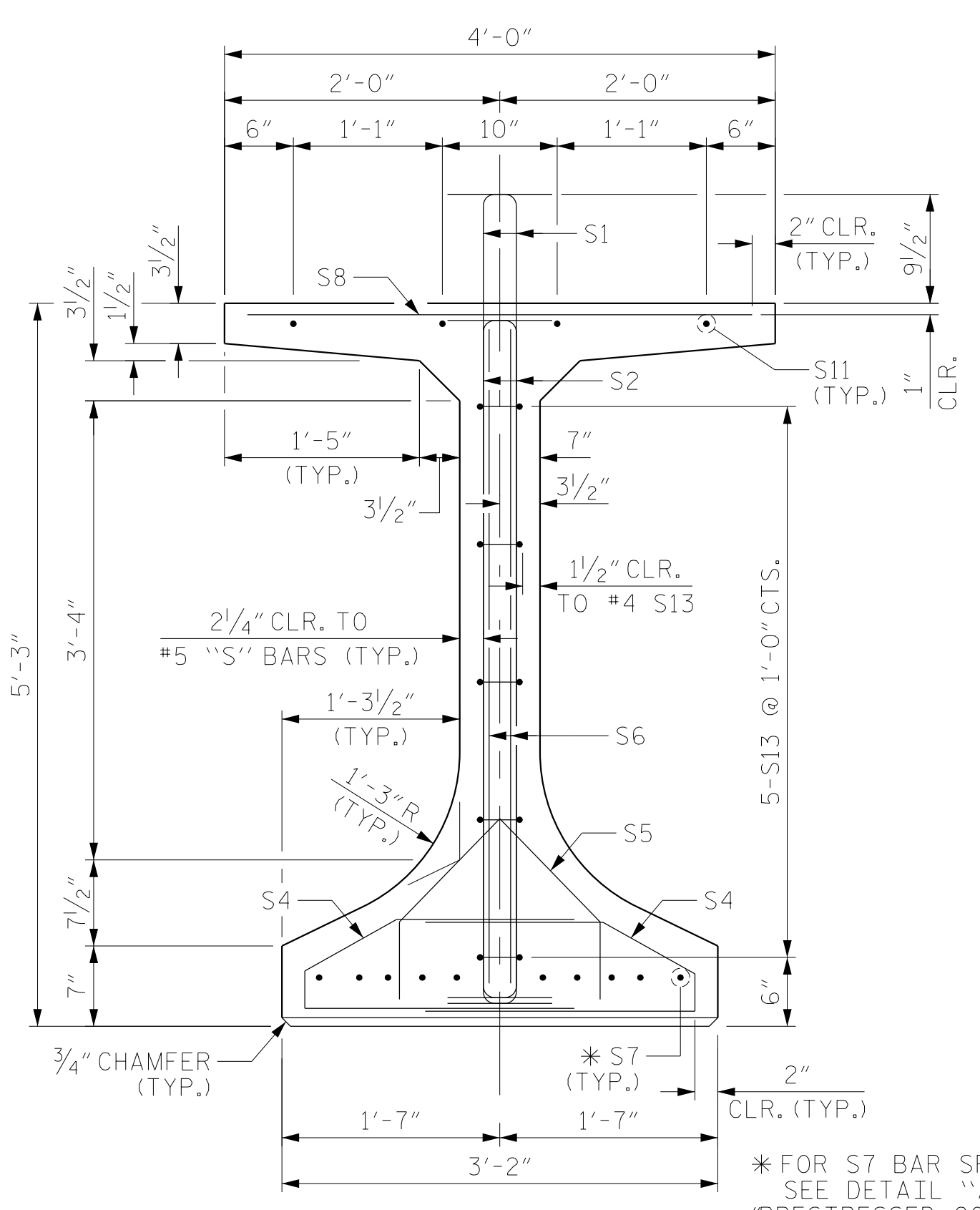
QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. GRADE NO.
GIRDER 1	3423	33.8
GIRDER 2	3447	32.5
GIRDER 3	3388	31.2
GIRDER 4	3223	29.8

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	497'-0 ⁵ / ₁₆ "

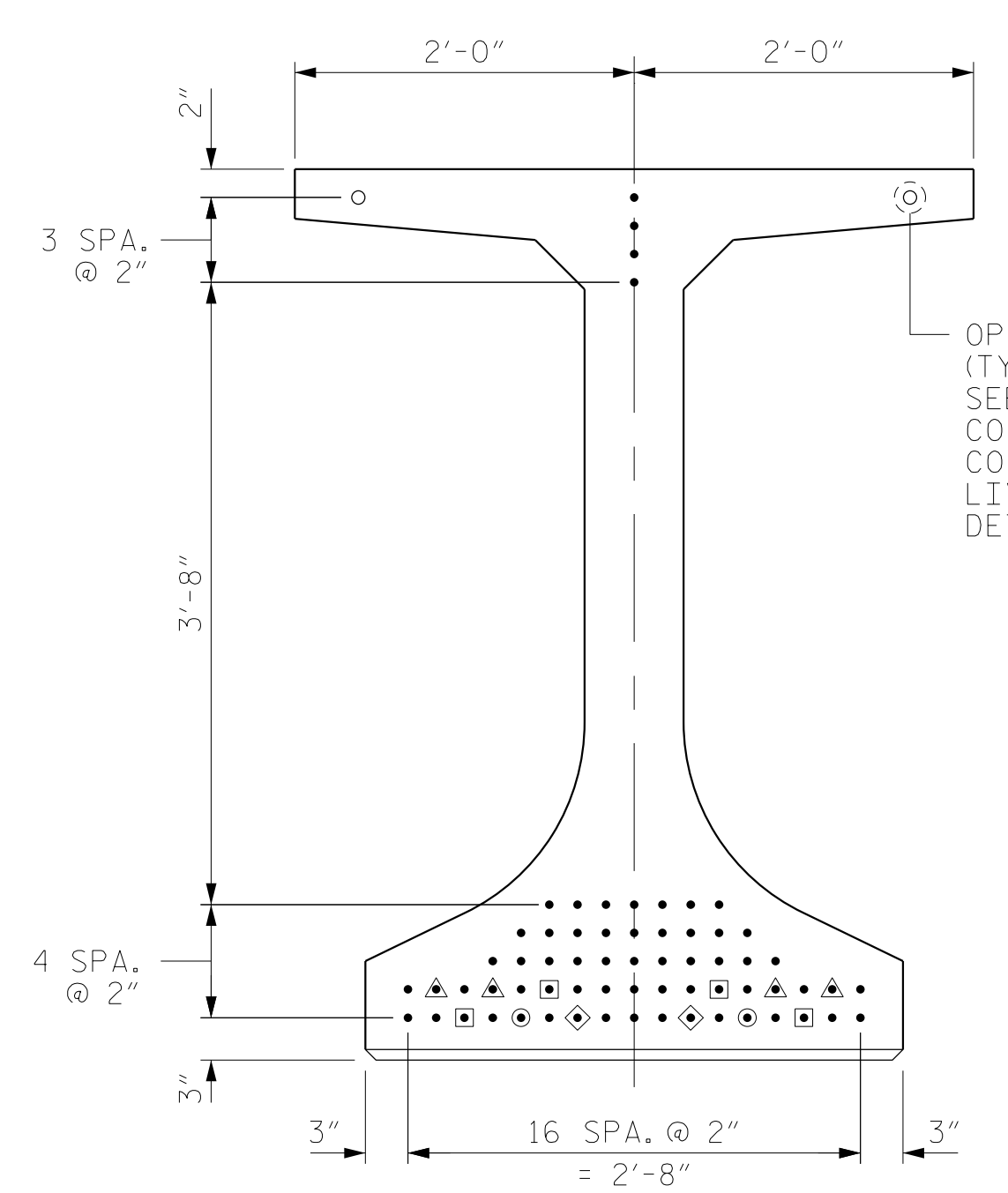
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

DEBONDING LEGEND

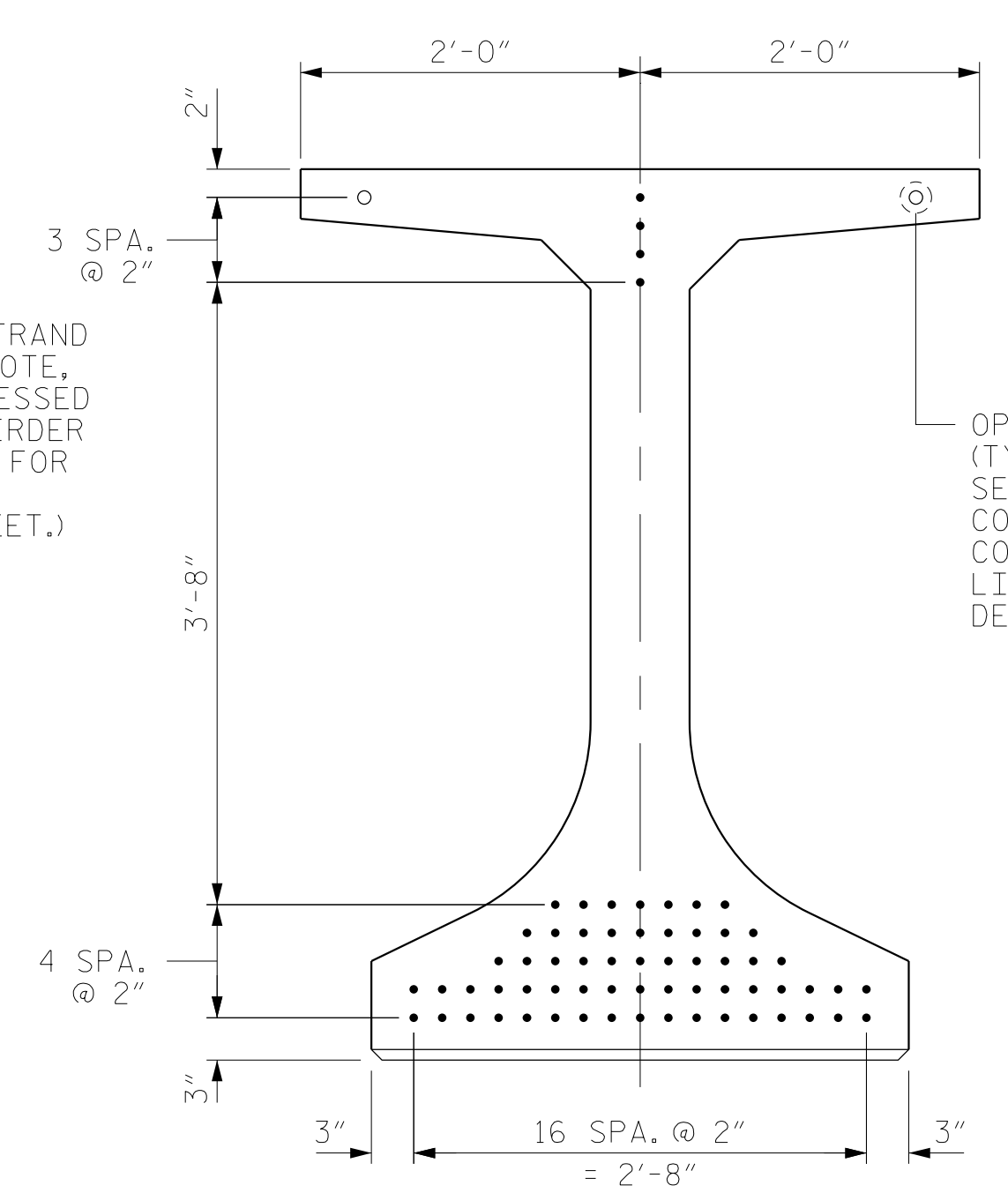
- FULLY BONDED STRANDS
- ◊ DEBONDED FOR 36'-0" FROM END OF GIRDER
- ◻ DEBONDED FOR 24'-0" FROM END OF GIRDER
- ◼ DEBONDED FOR 12'-0" FROM END OF GIRDER
- ▲ DEBONDED FOR 4'-0" FROM END OF GIRDER



SECTION A-A



AT END OF GIRDER



AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

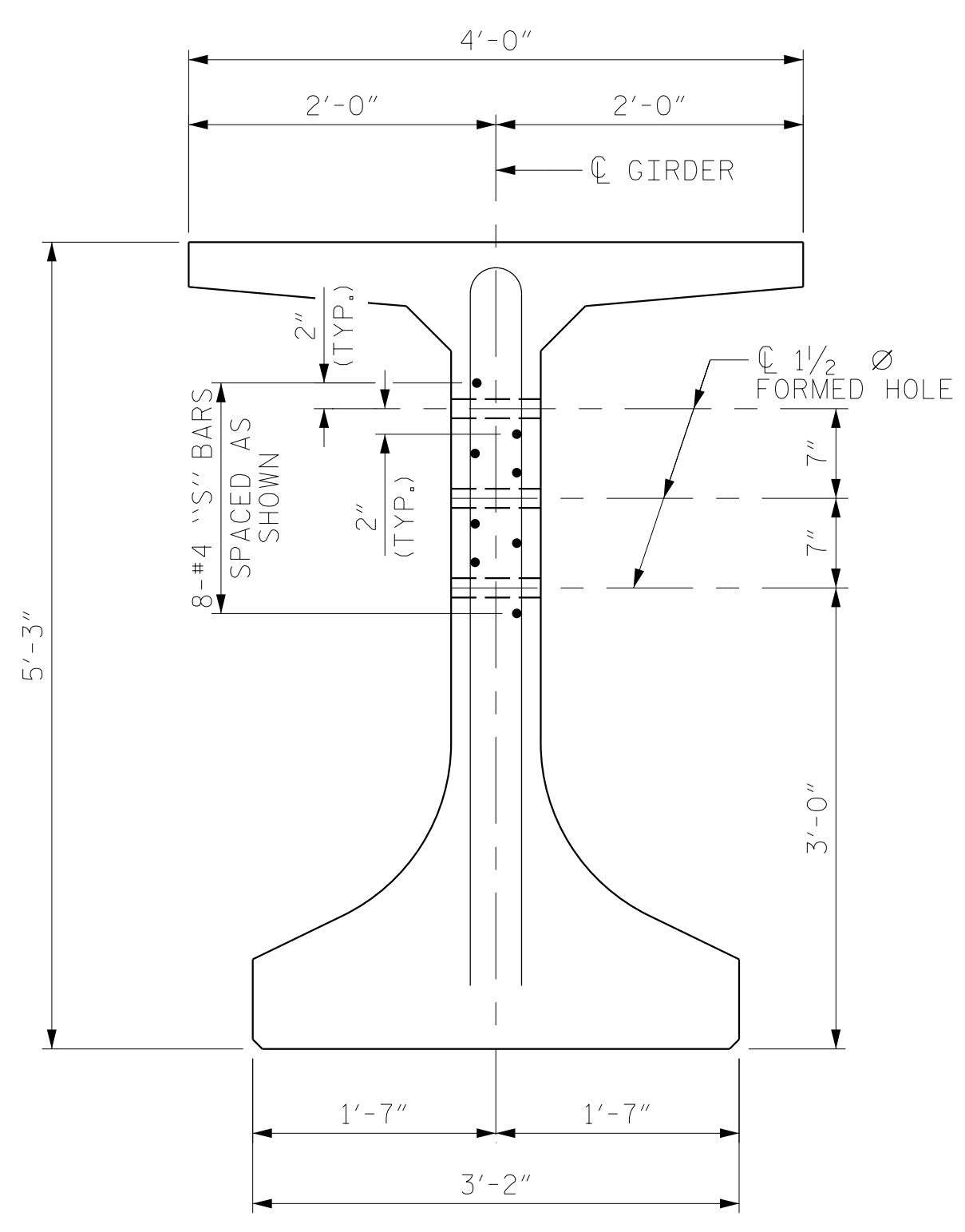
(65 STRAND REQUIRED)

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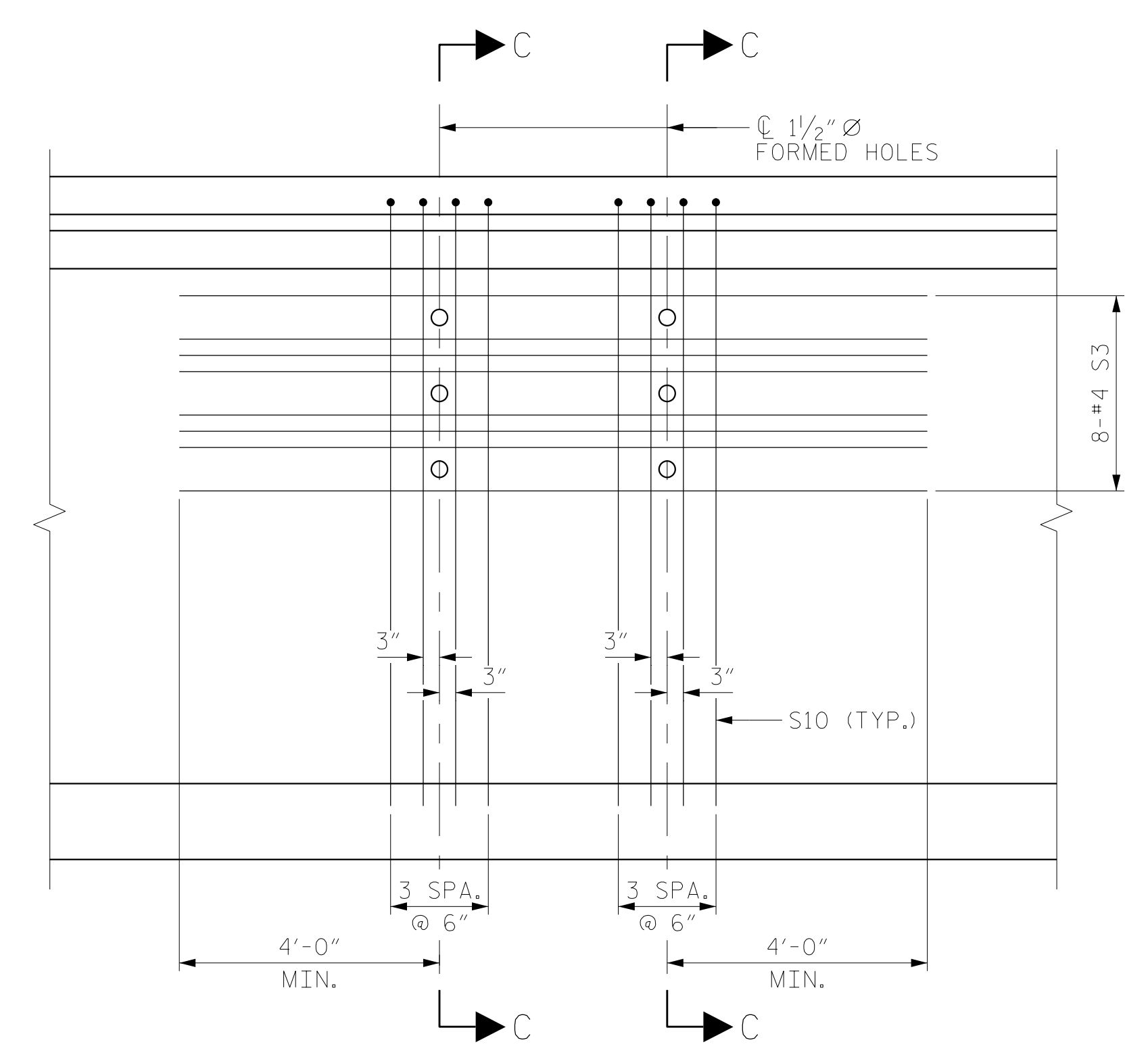
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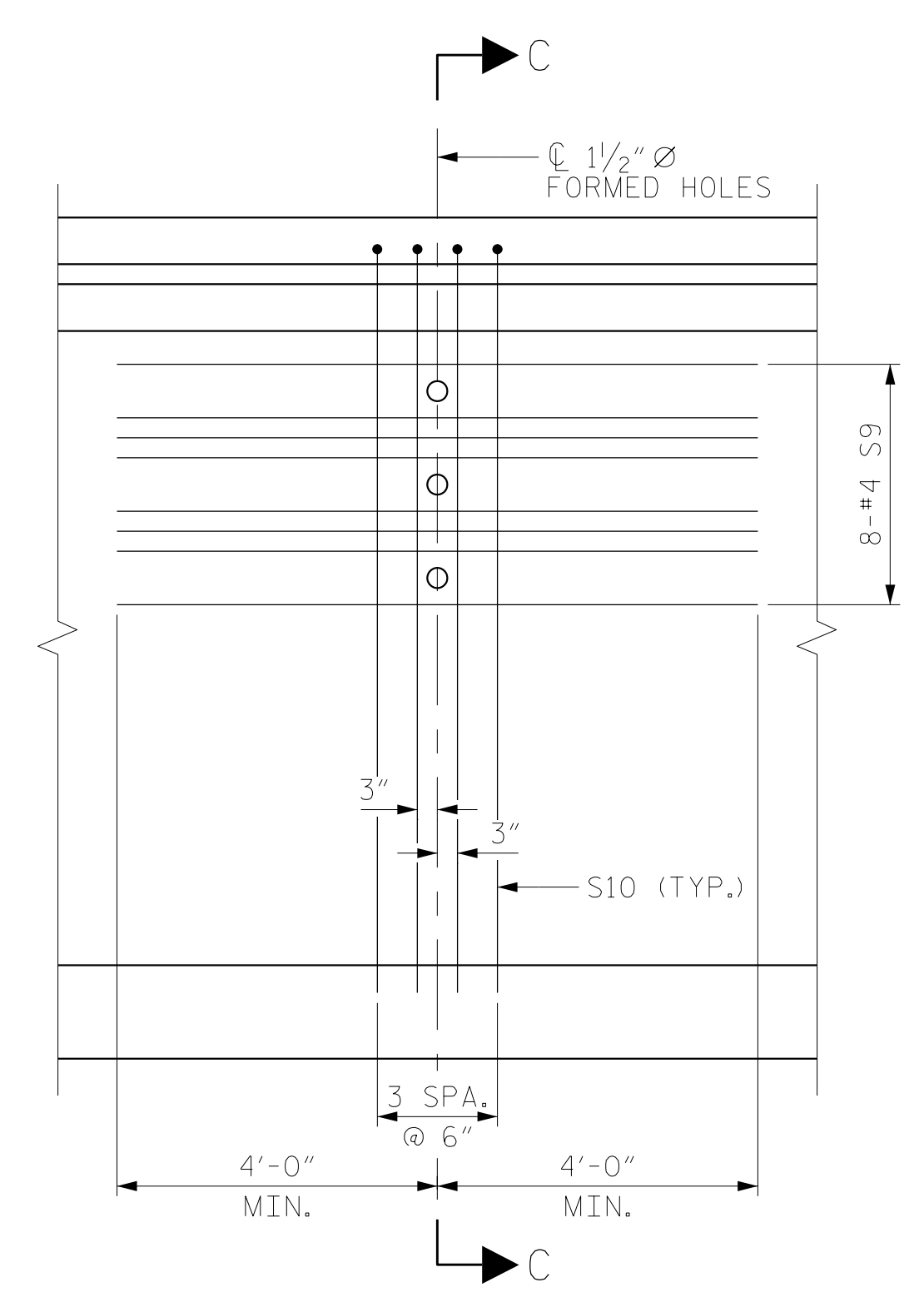
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
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SECTION C-C

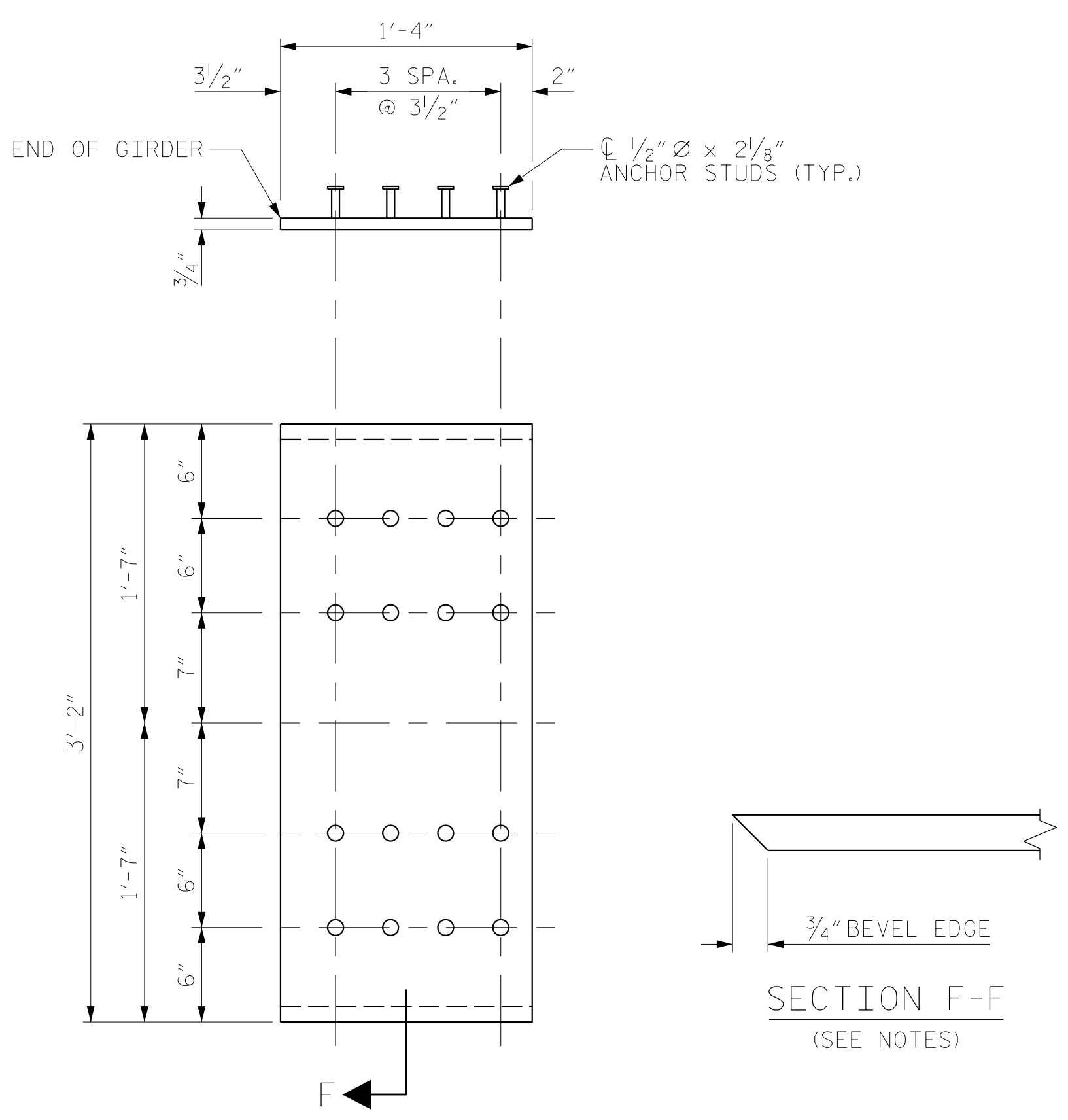


INTERIOR GIRDER

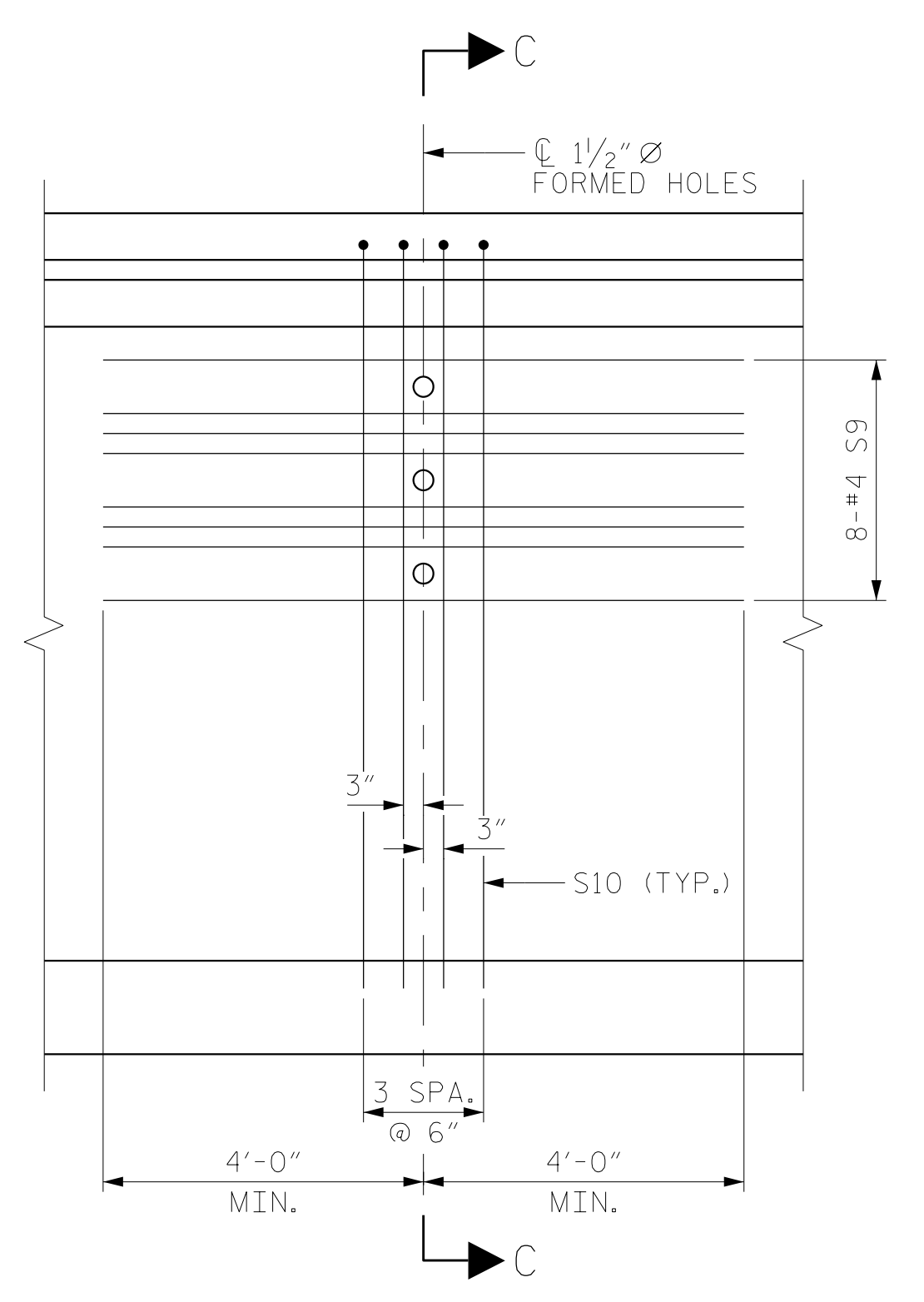


EXTERIOR GIRDER

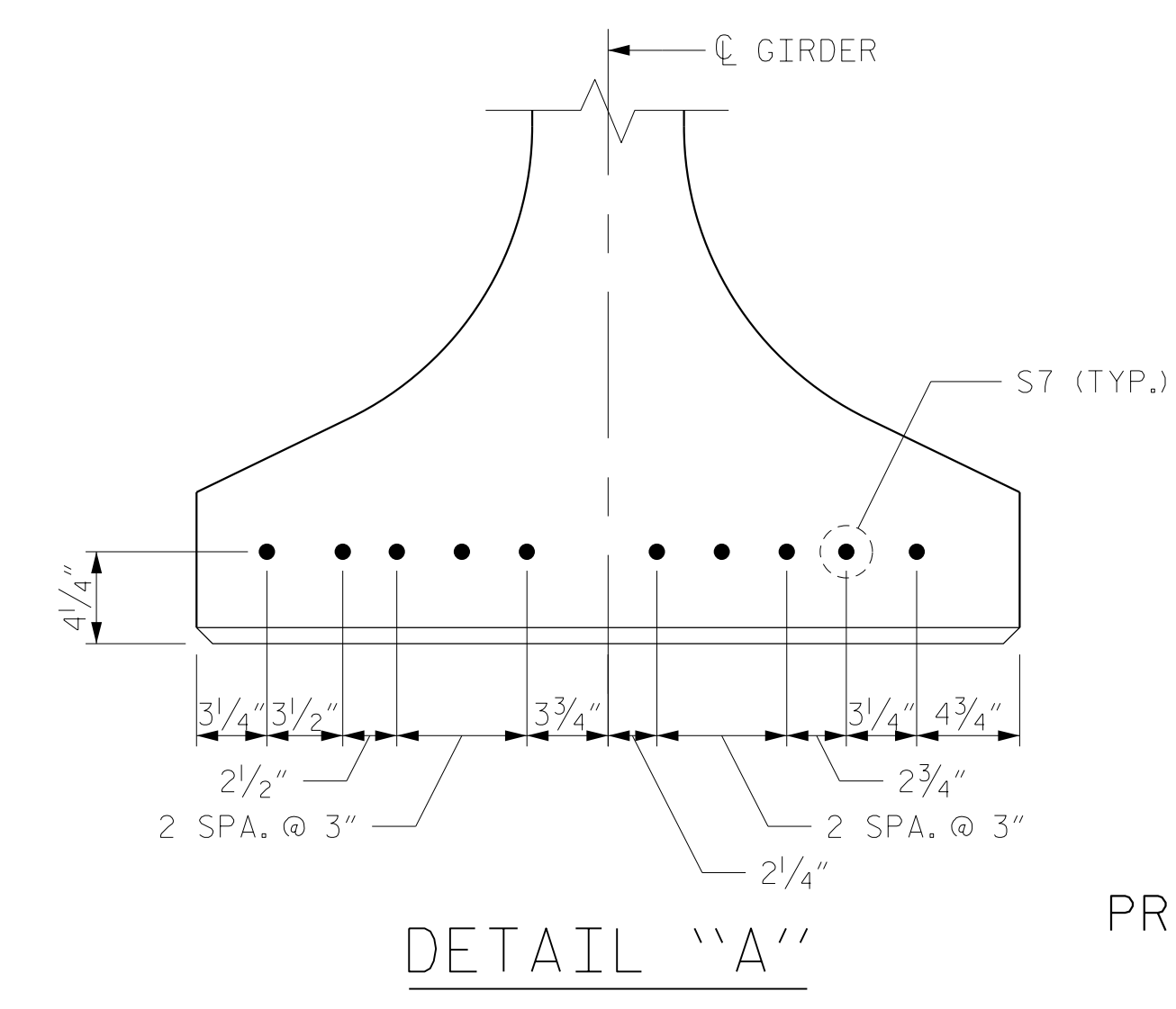
SPAN A PARTIAL ELEVATION



EMBEDDED PLATE "B-1" DETAILS
(2 REQ'D PER GIRDER)



SPAN B PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING FOR ALL GIRDERS



DETAIL "A"

NOTES:

- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL SHALL BE GRADE 60.
- APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.
- EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.
- 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 THE END 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 6,500 P.S.I.
- 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", SHALL BE RAKED TO A DEPTH OF 1/4".
- THE COST OF ALL CONCRETE, REINFORCING STEEL, PRESTRESSED STRANDS, INSERTS EMBEDDED IN THE CONCRETE, EMBEDDED PLATES, TEMPORARY BRACING AND INCIDENTAL ITEMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR PRESTRESSED CONCRETE GIRDERS.
- PRIOR TO CASTING THE GIRDERS, THE CONTRACTOR SHALL SUBMIT COMPLETE WORKING DRAWINGS WITH EXACT LOCATION AND COMPLETE DESCRIPTION OF ALL INSERTS CAST IN THE GIRDERS TO THE DEPARTMENT FOR APPROVAL. SUCH INSERTS INCLUDE BUT ARE NOT LIMITED TO: INSERTS FOR SUPPORTING FALSEWORK AND FORMWORK, INSERTS FOR ATTACHING DIAPHRAGMS, INSERTS FOR CONNECTING TEMPORARY BRACING AND LIFTING INSERTS.
- THE CONTRACTOR HAS THE OPTION TO PROVIDE 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. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

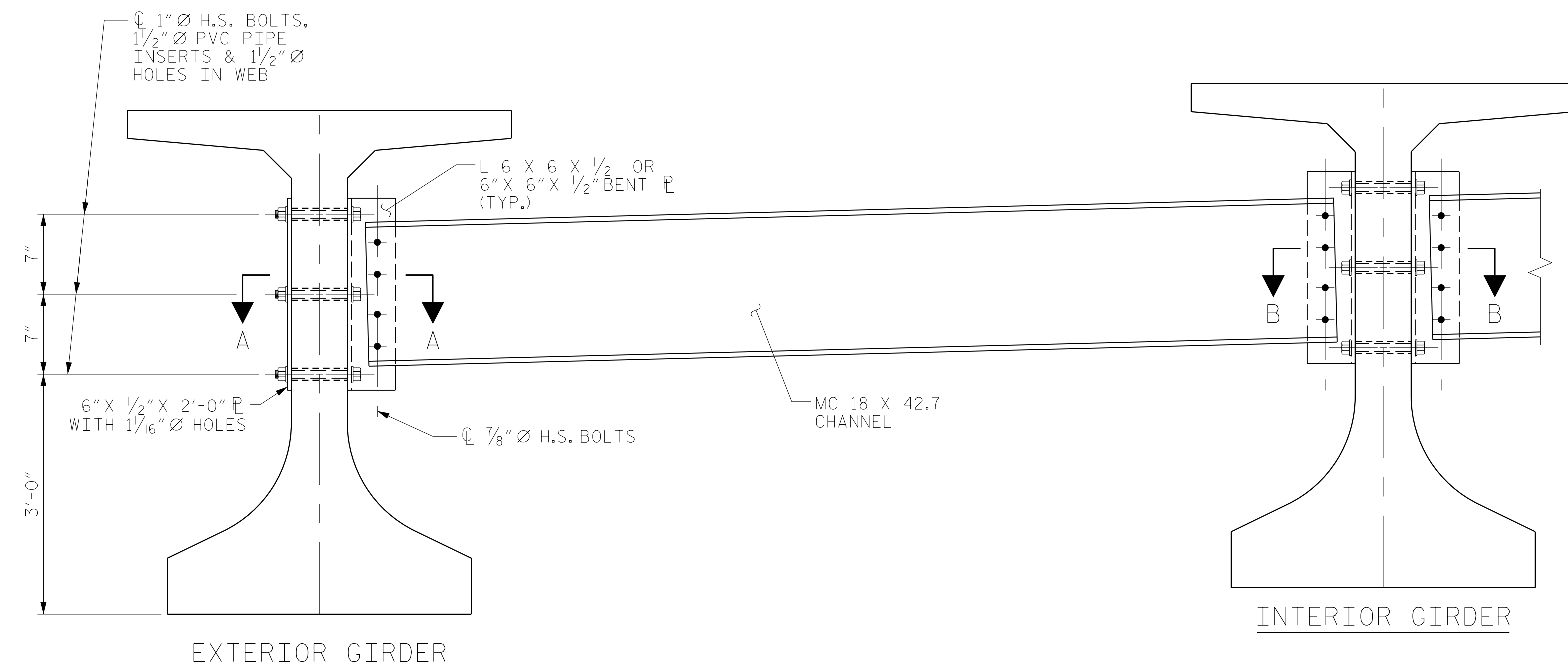
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PRESTRESSED CONCRETE
 GIRDER CONTINUOUS
 FOR LIVE LOAD DETAILS
 LEFT LANE

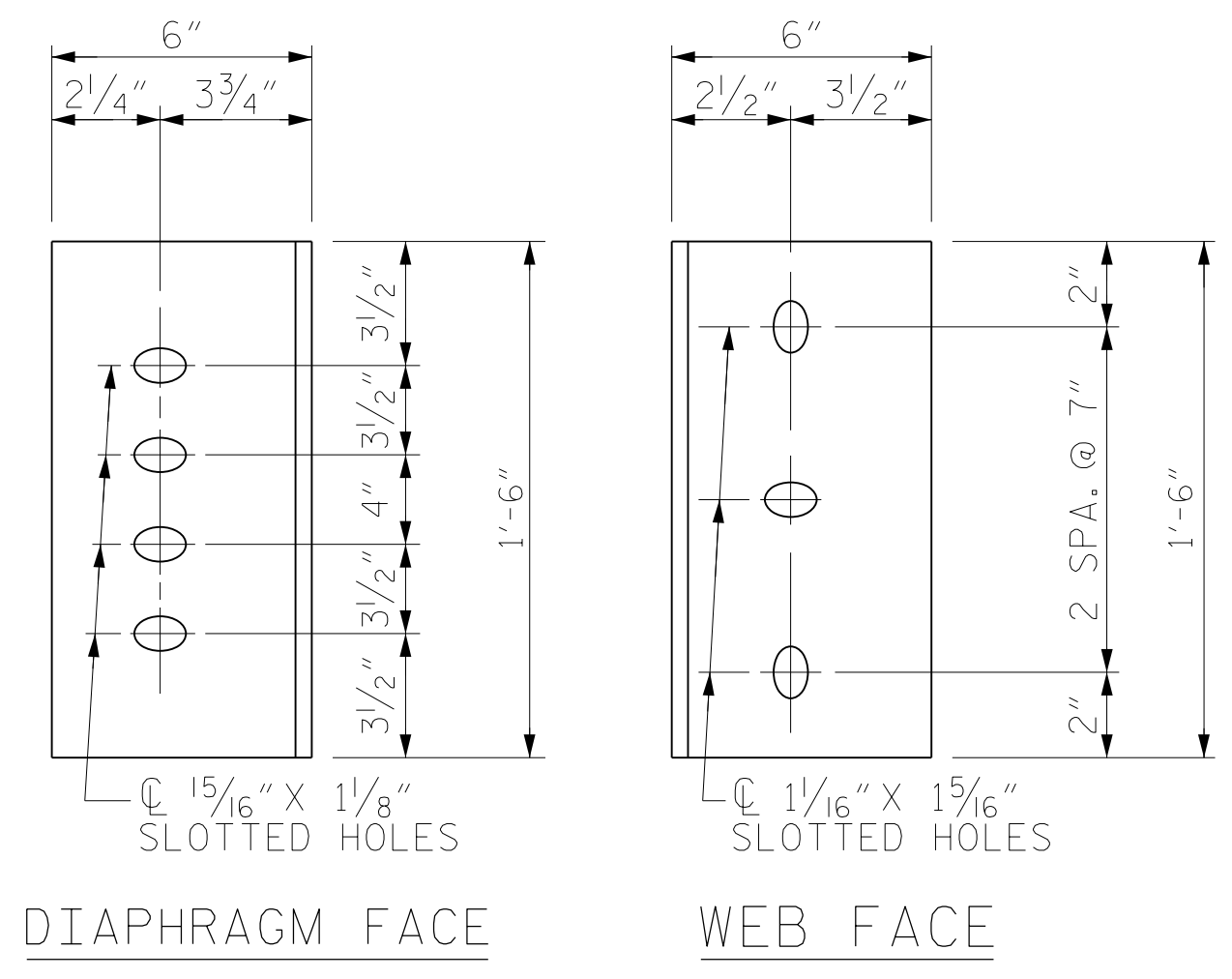
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			43

DRAWN BY :	MRA	DATE :	04/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

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 SIGNATURES COMPLETED



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM F3125 GR. A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM F3125 GR. A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL $\frac{1}{4}$ 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.

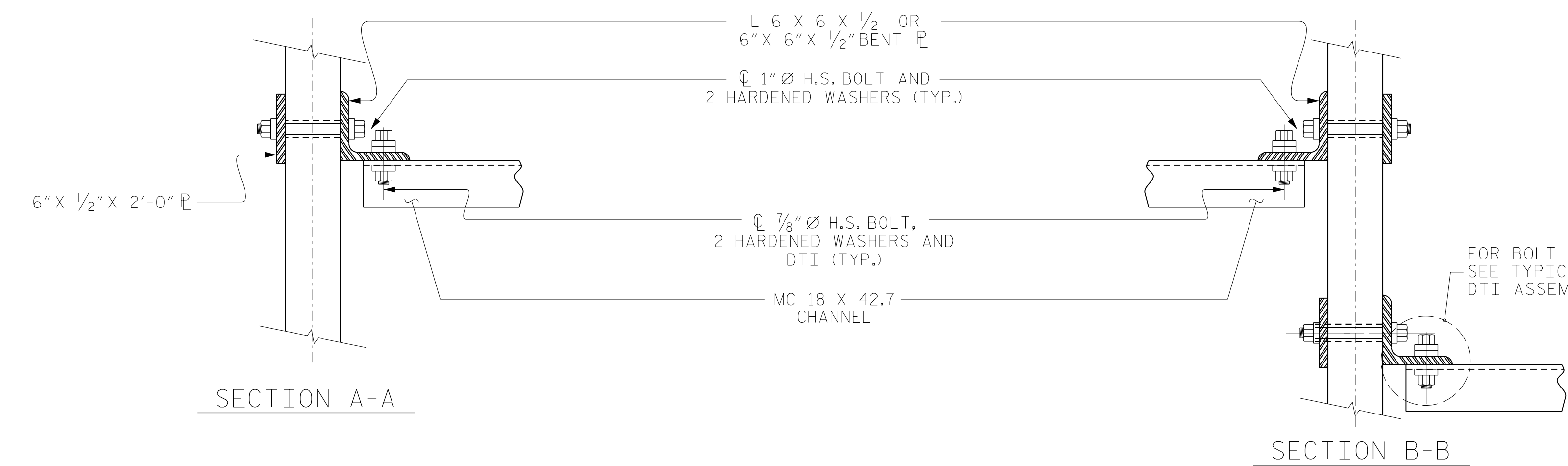
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST $\frac{1}{4}$ " PROJECTION BEYOND THE NUT.

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

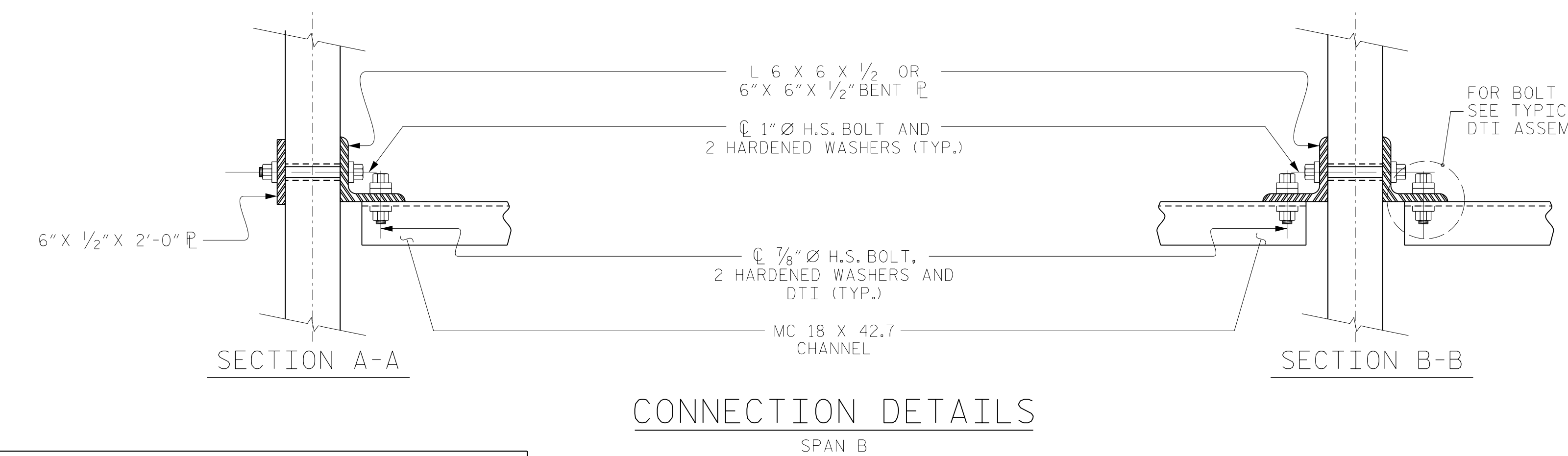
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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



CONNECTION DETAILS SPAN A



CONNECTION DETAILS SPAN B

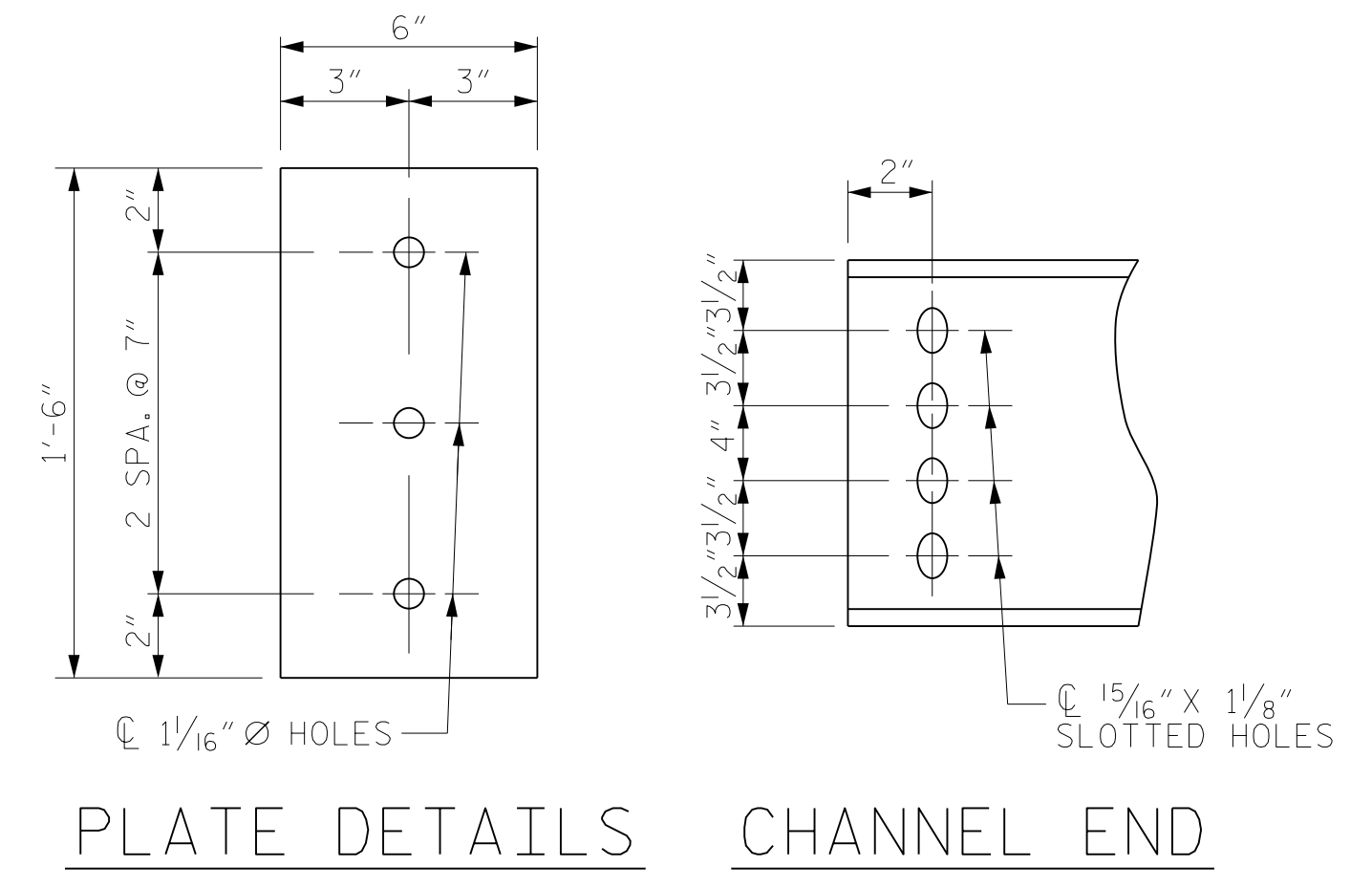
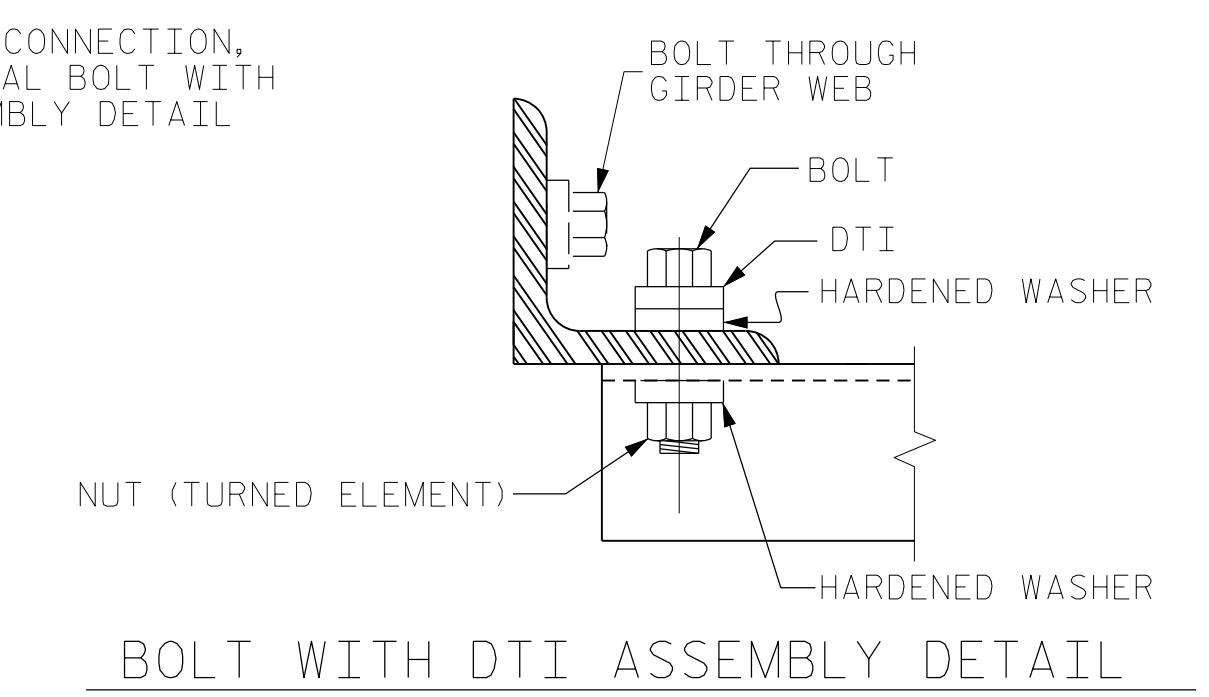


PLATE DETAILS CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

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STATE OF NORTH CAROLINA						SHEET NO.	
DEPARTMENT OF TRANSPORTATION						S1-14	
RALEIGH						TOTAL SHEETS	
SUPERSTRUCTURE						43	
INTERMEDIATE STEEL DIAPHRAGMS FOR 63" F.I.B. PRESTRESSED CONCRETE GIRDERS LEFT LANE							
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DRAWN BY :	MRA	DATE :	04/2020
CHECKED BY :	MKO	DATE :	04/2021
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NOTES

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

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

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

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

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

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

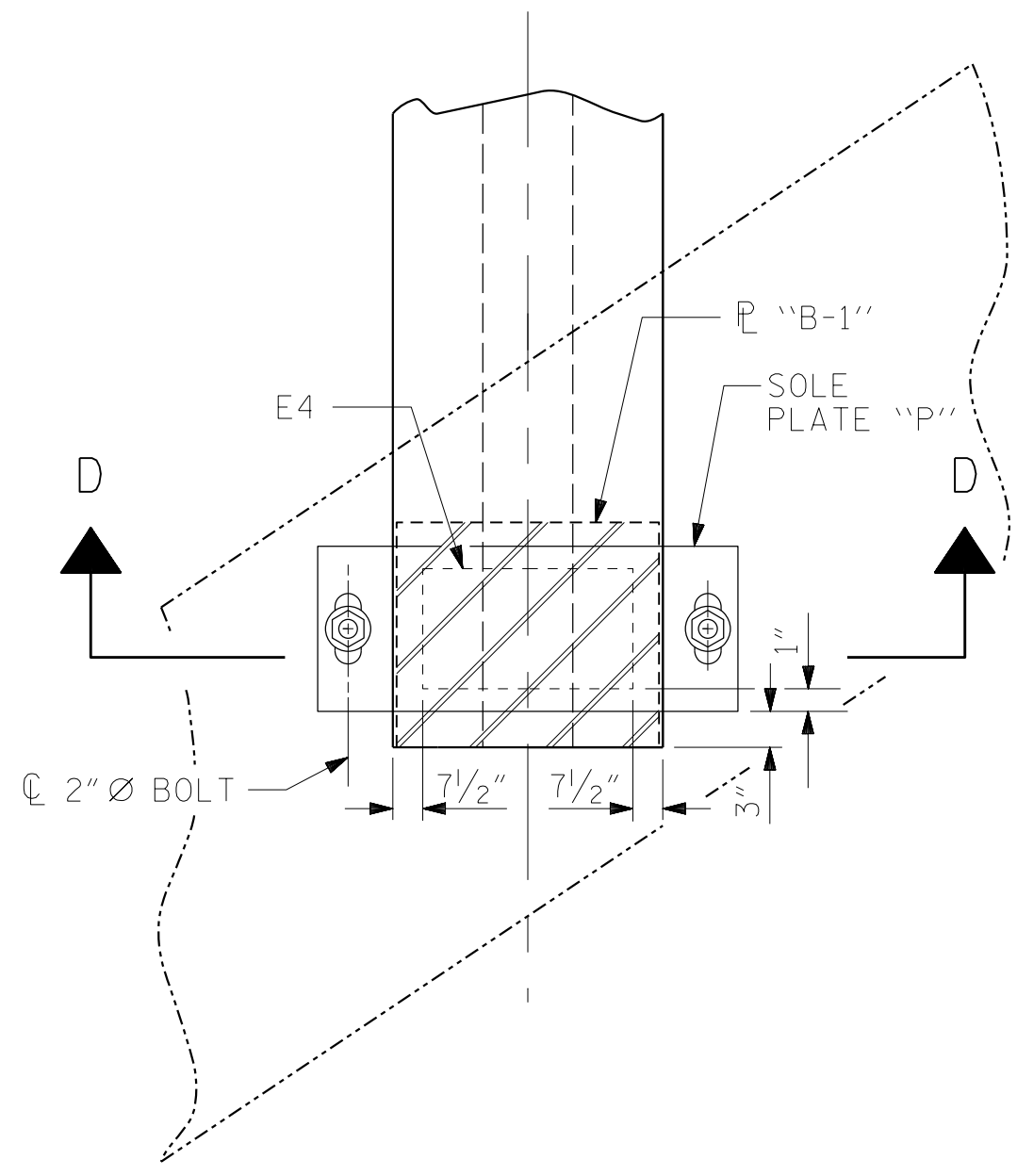
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F3125 GRADE A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

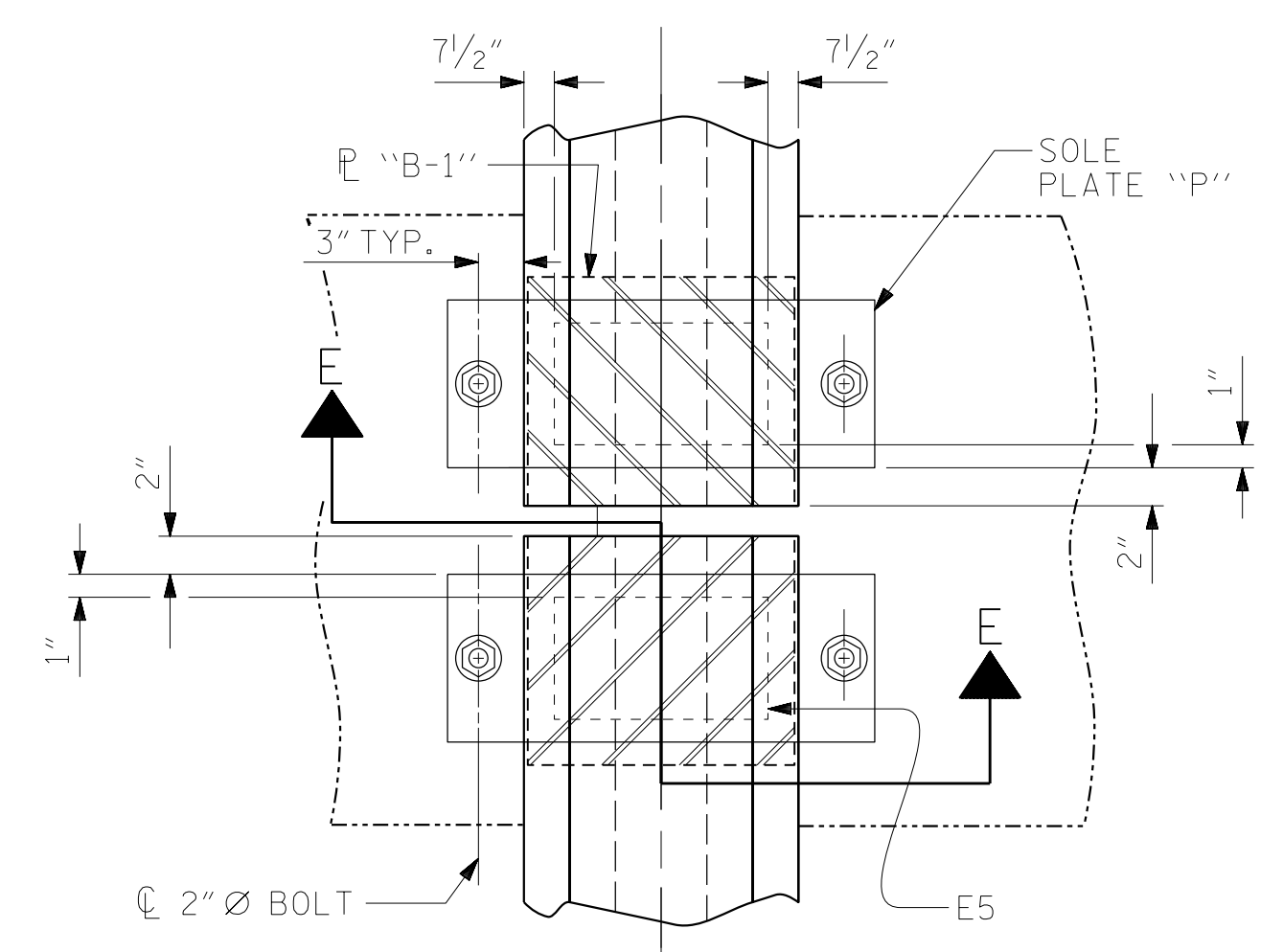
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



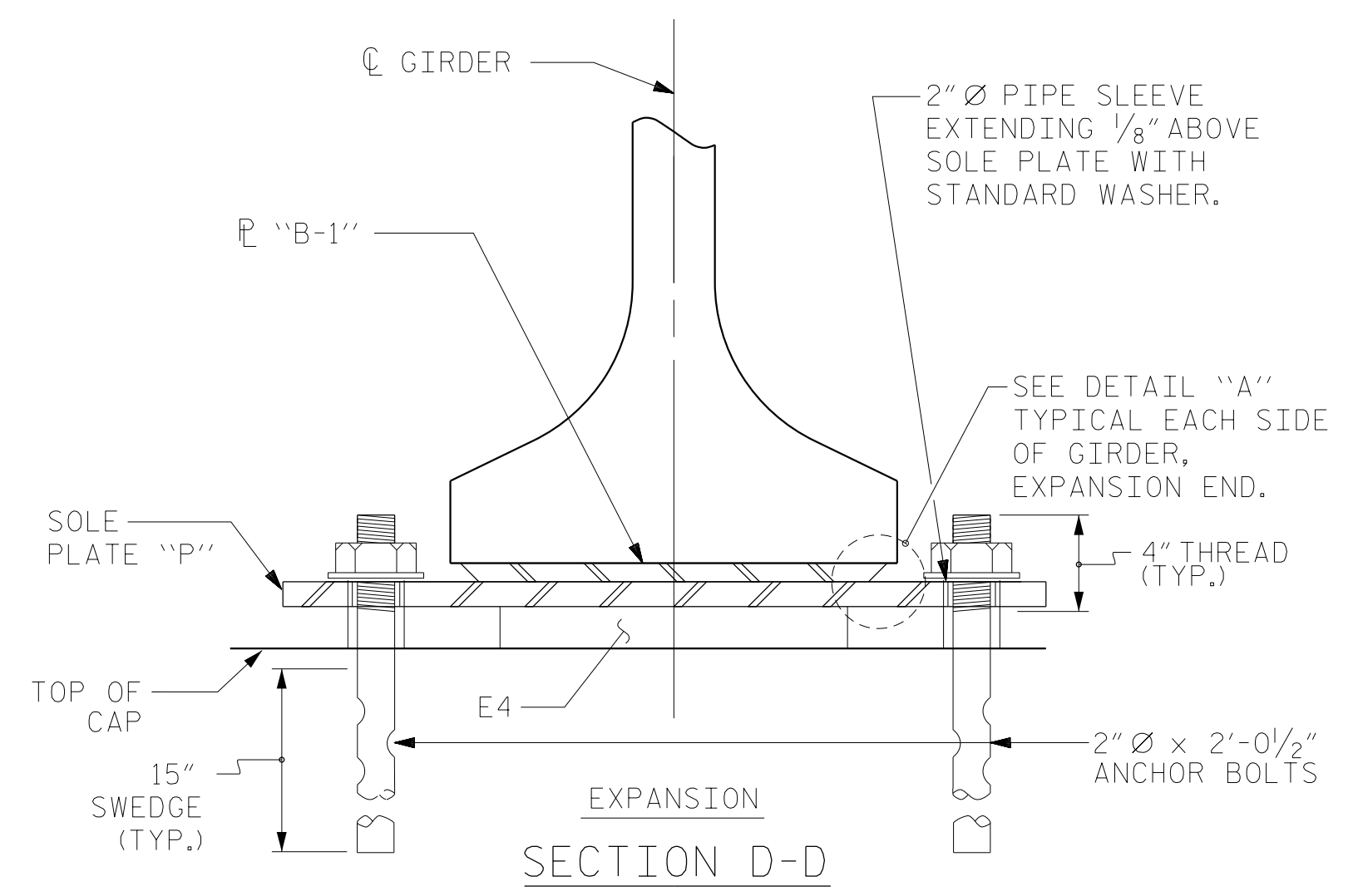
TYPICAL PLAN AT END BENTS

NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY
END BENT 1 SHOWN, END BENT 2 SIMILAR

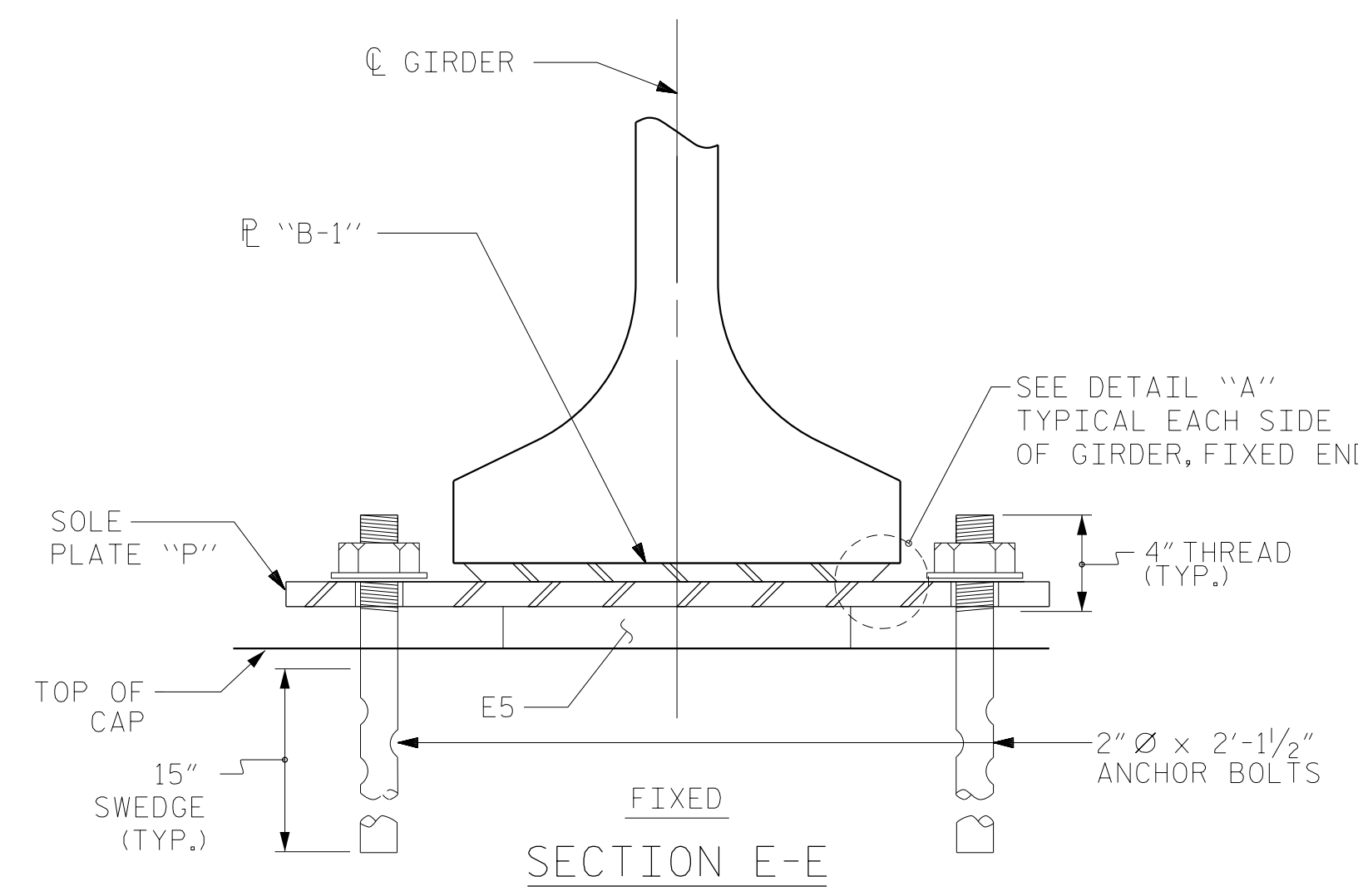


TYPICAL PLAN AT BENT

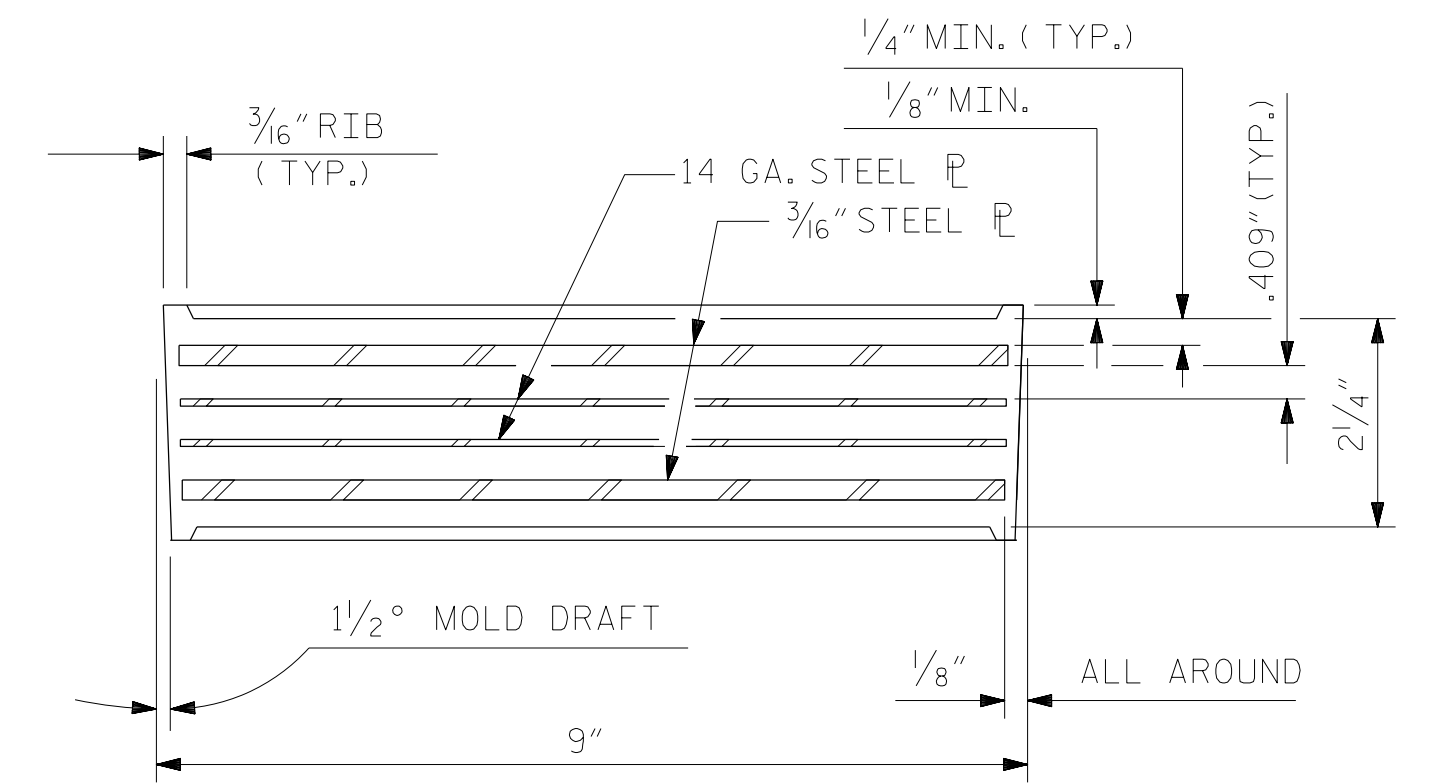
NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY



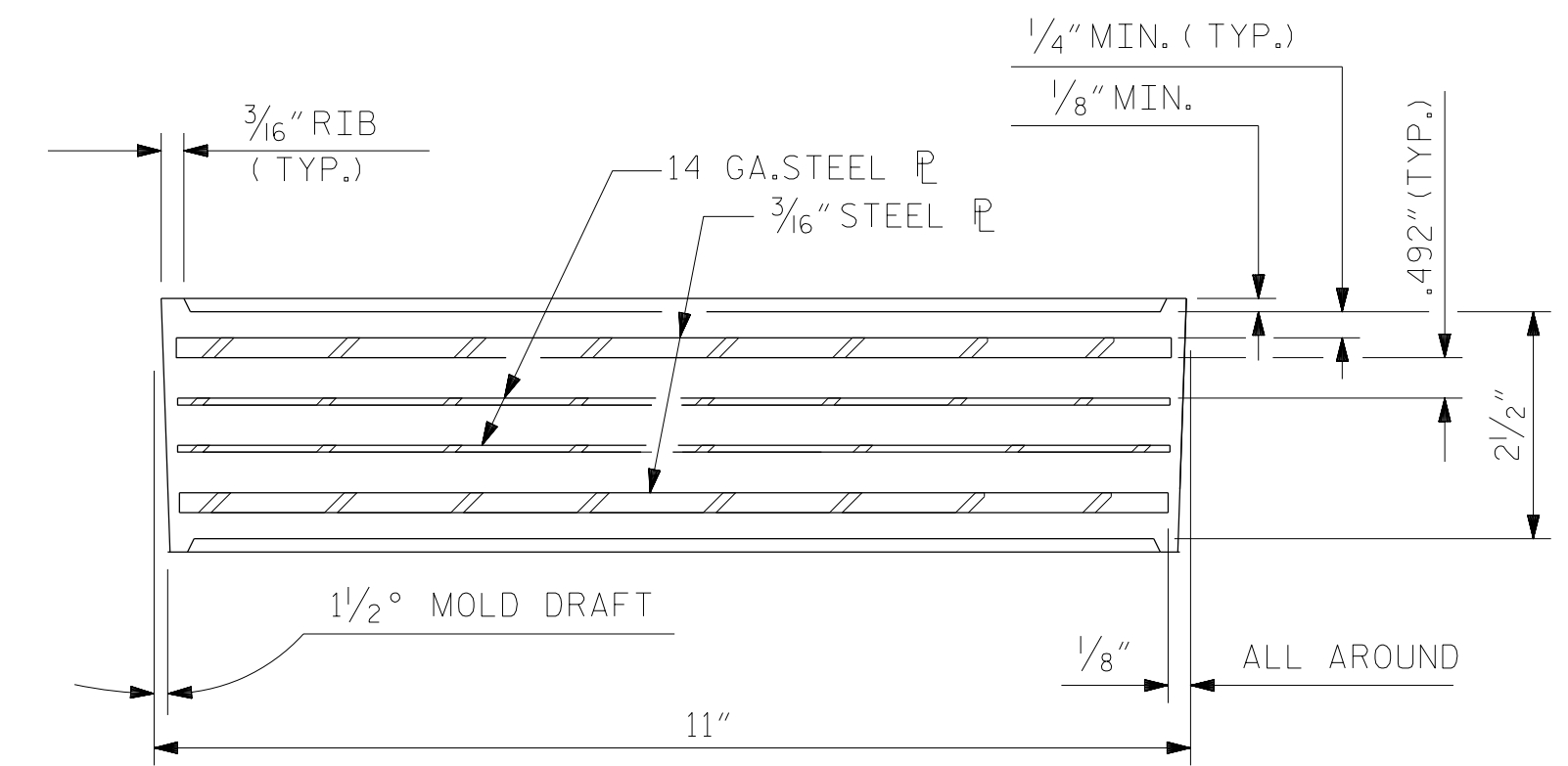
SECTION D-D



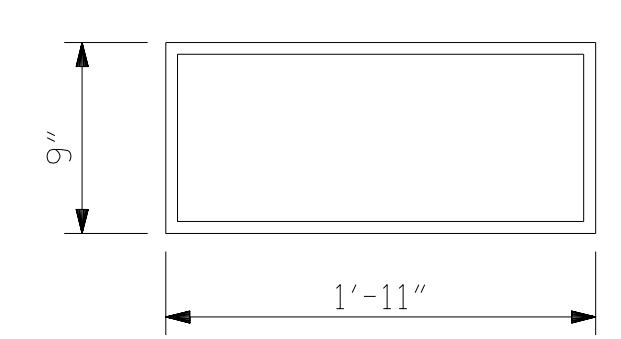
SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS

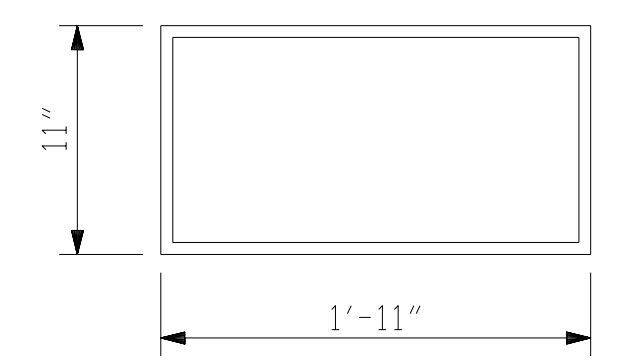


TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

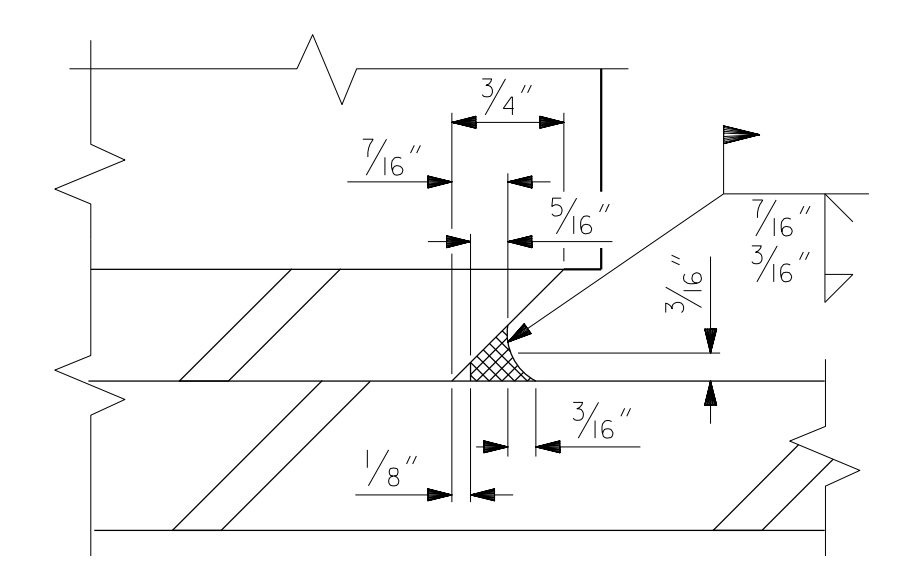
TYPE V



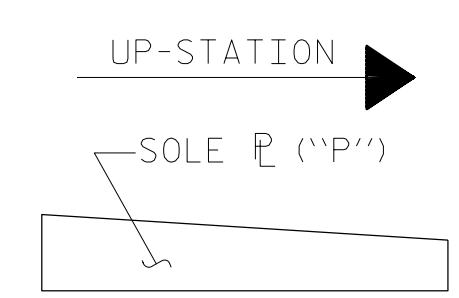
E5 (8 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

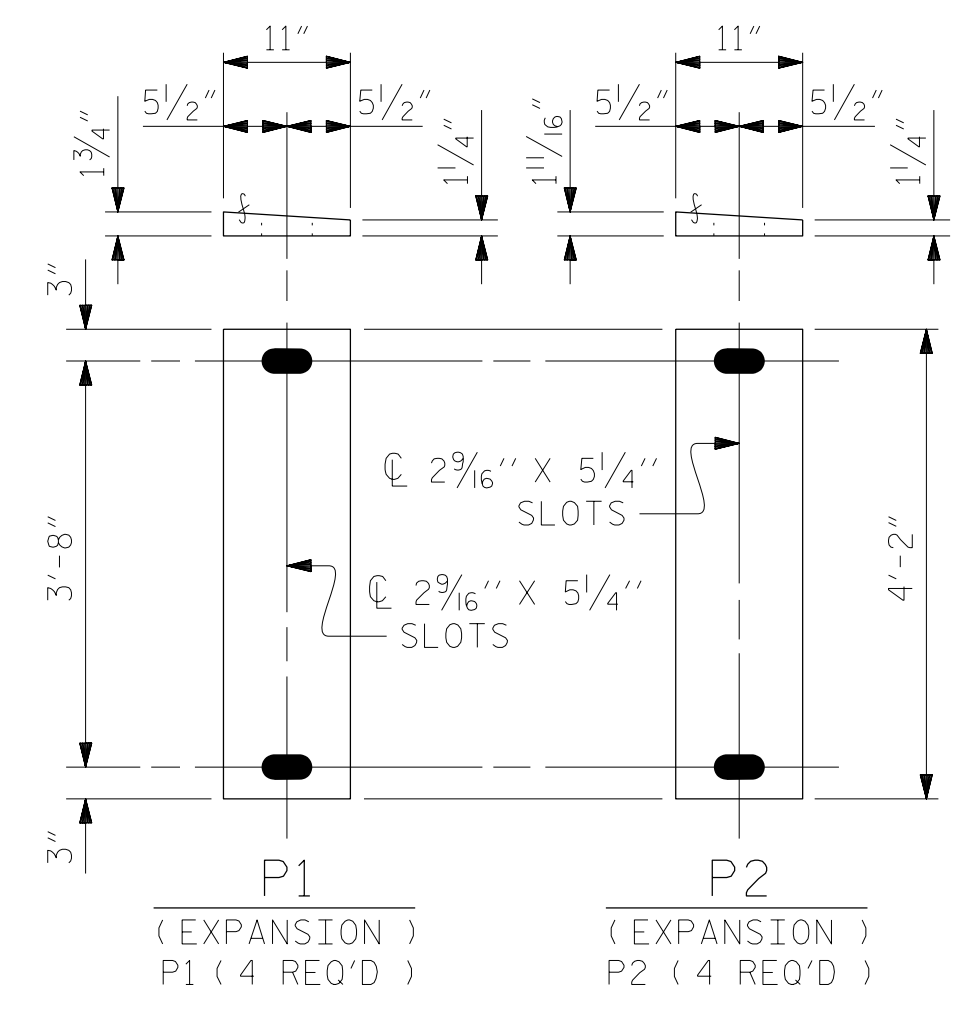
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k
TYPE VI	385 k



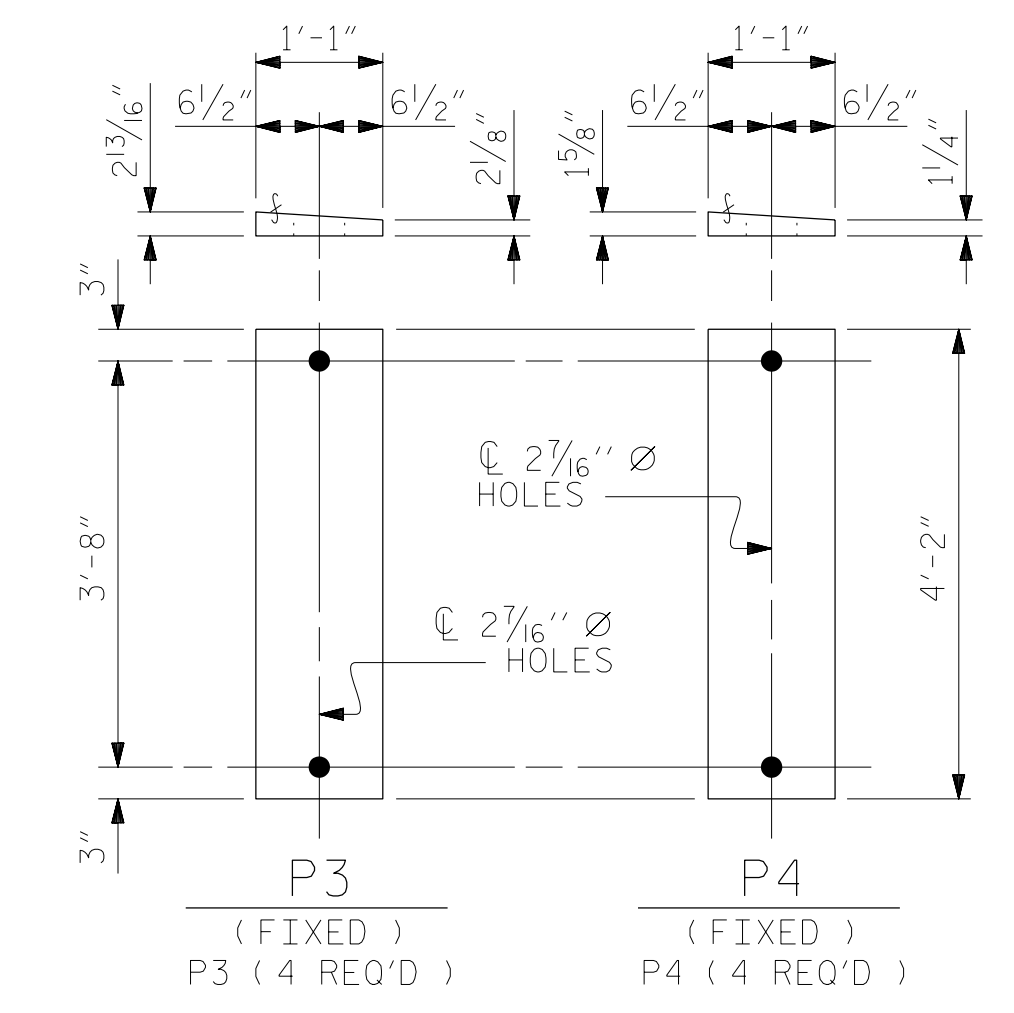
DETAIL "A"



SOLE P PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")



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PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.	
ELASTOMERIC BEARING DETAILS						S1-15	
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE LEFT LANE						TOTAL SHEETS	
REVISIONS						43	
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DRAWN BY : MRA	DATE : 04/2020
CHECKED BY : MKO	DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB	DATE : 09/2021

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with columns for GIRDERS 1 (EXTERIOR) and 2 (INTERIOR), and 3 (INTERIOR) and 4 (EXTERIOR). Rows include FOURTIETH POINTS, CAMBER (GIRDER ALONE IN PLACE), * DEFLECTION DUE TO SUPERIMPOSED D.L., and FINAL CAMBER. Values range from 0 to 0.5 inches.

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

DRAWN BY : MRA DATE : 04/2020
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DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

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PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
LEFT LANE

Table with columns for REVISIONS (NO., BY, DATE) and SHEET NO. (S1-16, TOTAL SHEETS 43).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with columns for span B (0 to 0.5) and rows for four girders (1 Exterior, 1 Interior, 2 Interior, 2 Exterior, 3 Interior, 3 Interior, 4 Exterior, 4 Exterior). Rows include FORTIETH POINTS, CAMBER (GIRDER ALONE IN PLACE), * DEFLECTION DUE TO SUPERIMPOSED D.L., and FINAL CAMBER.

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

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 2 OF 2

DRAWN BY : MRA DATE : 04/2020
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DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

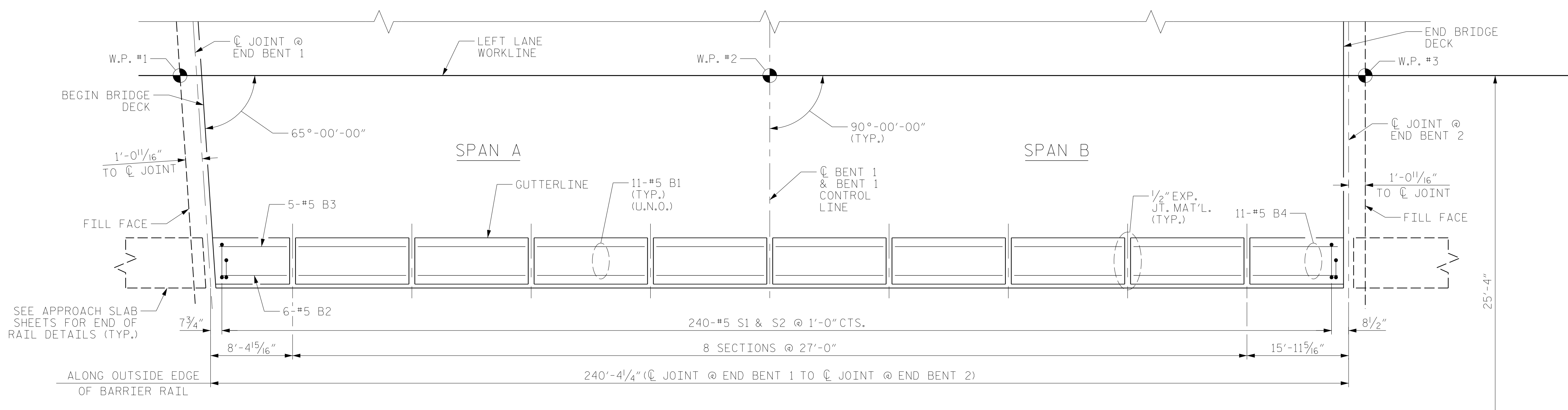
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
LEFT LANE

Table with columns for NO., BY, DATE, and SHEET NO. showing revision history and total sheets.



PLAN OF BARRIER RAIL
PARAPET NOT SHOWN FOR CLARITY

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

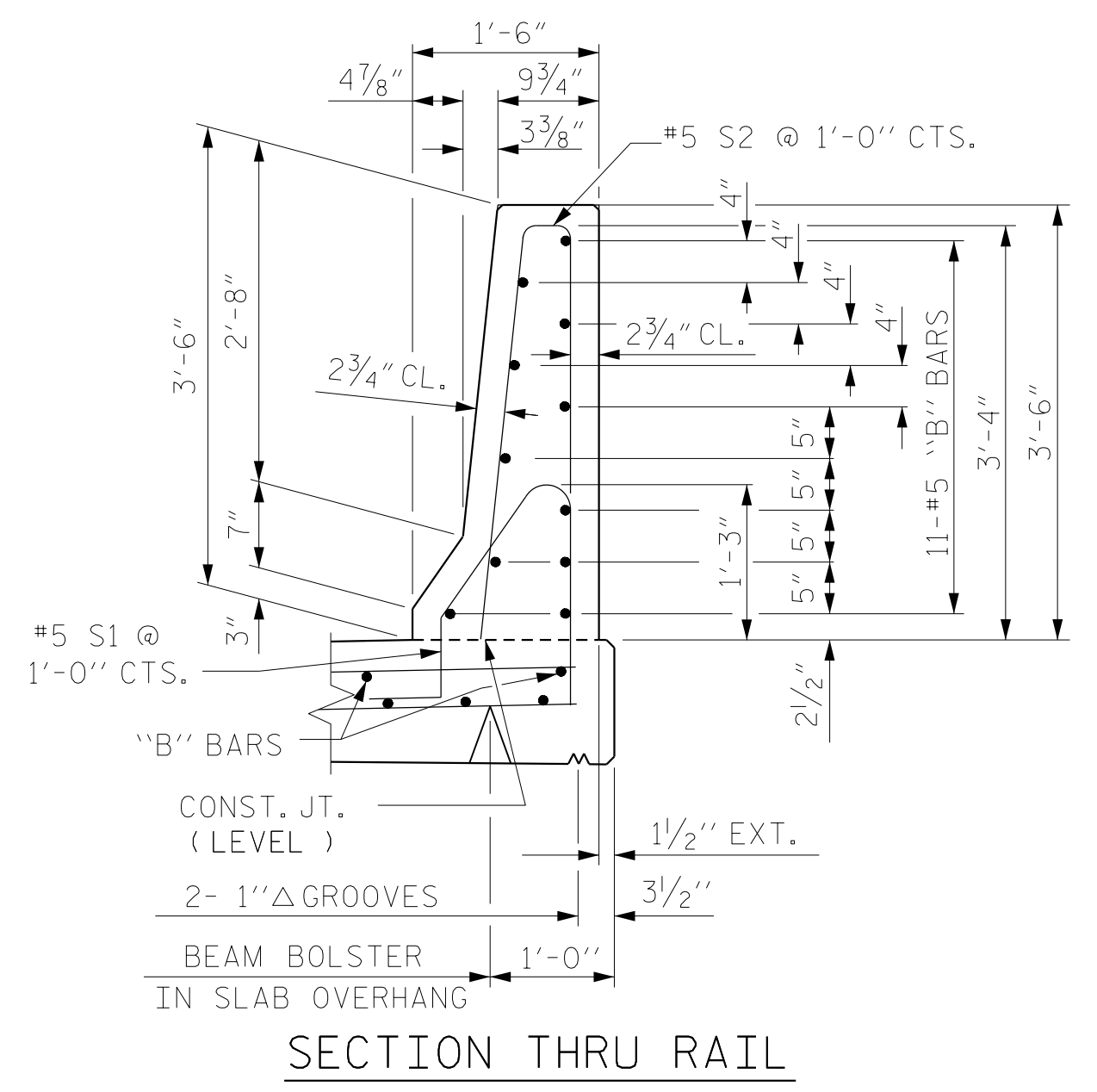
BILL OF MATERIAL FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR.	26'-7"	2440
* B2	6	#5	STR.	8'-2"	51
* B3	5	#5	STR.	8'-4"	43
* B4	11	#5	STR.	15'-6"	178
* S1	240	#5	1	4'-7"	1147
* S2	240	#5	2	7'-0"	1752
* EPOXY COATED REINFORCING STEEL					5,611 LBS.
CLASS AA CONCRETE					32.7 CU. YDS.
CONCRETE BARRIER RAIL					240.4 LIN. FT.

NOTES

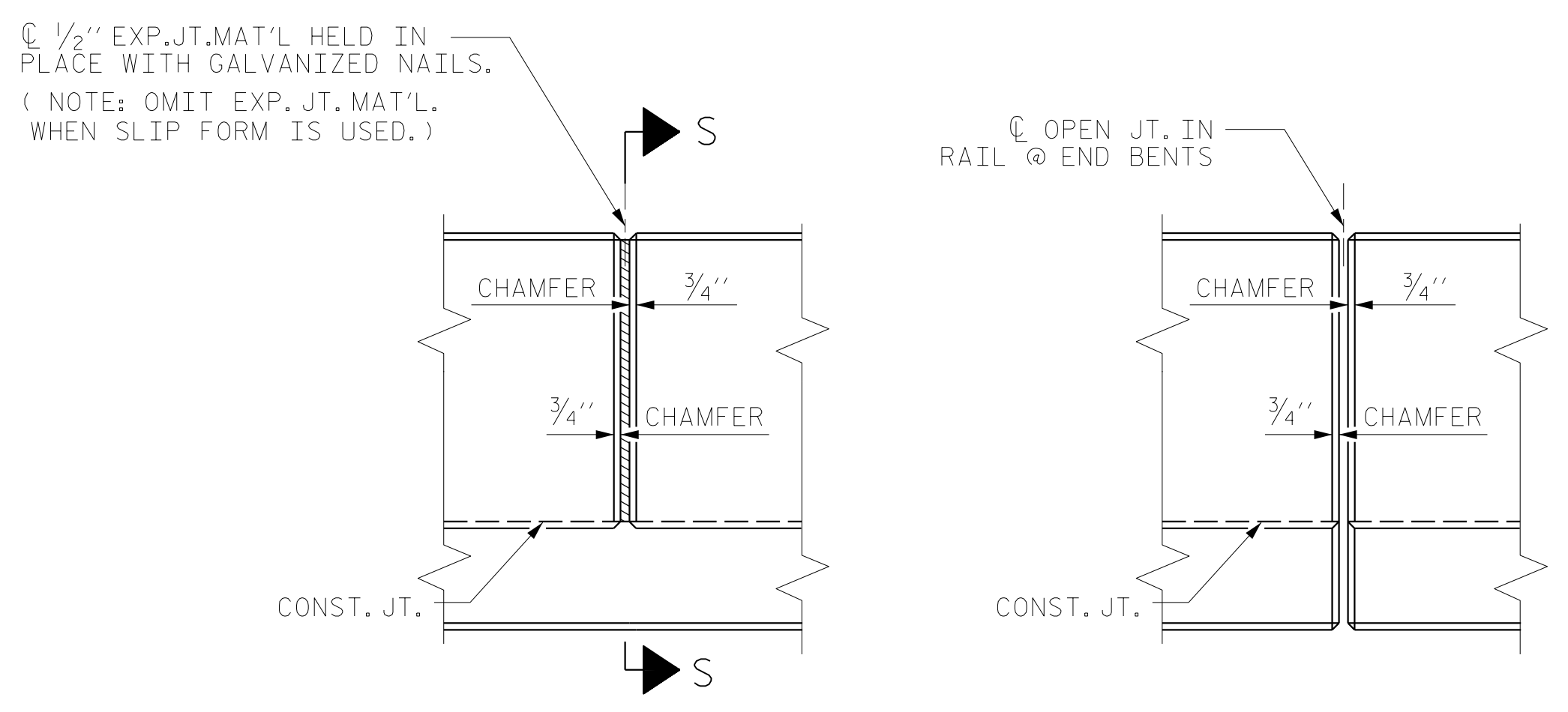
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

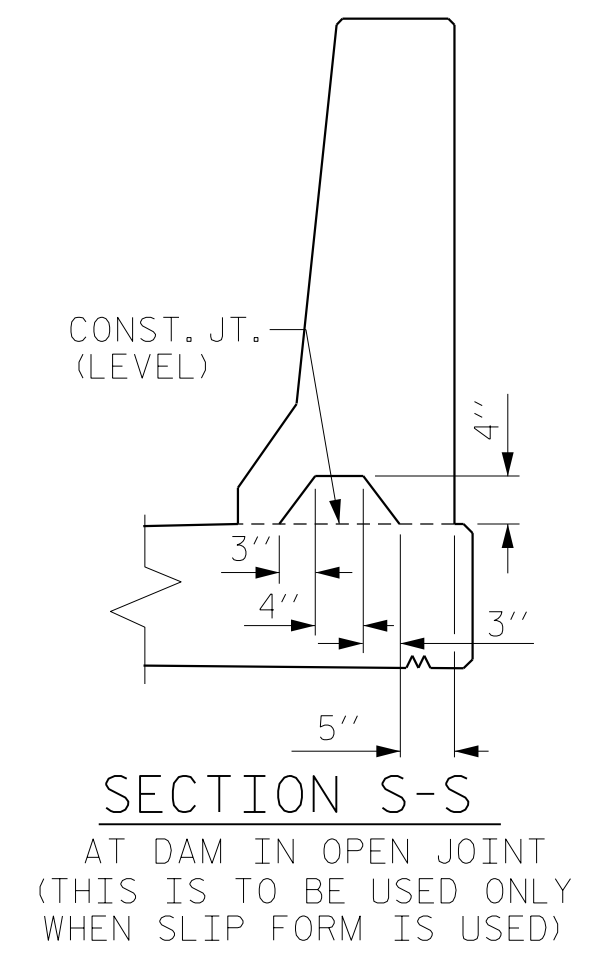
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS



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

BARRIER RAIL DETAILS

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE BARRIER RAIL
LEFT LANE

DRAWN BY :	TWL	DATE :	.05/2020
CHECKED BY :	MRA	DATE :	.05/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	.09/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			43

NOTES

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

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

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

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

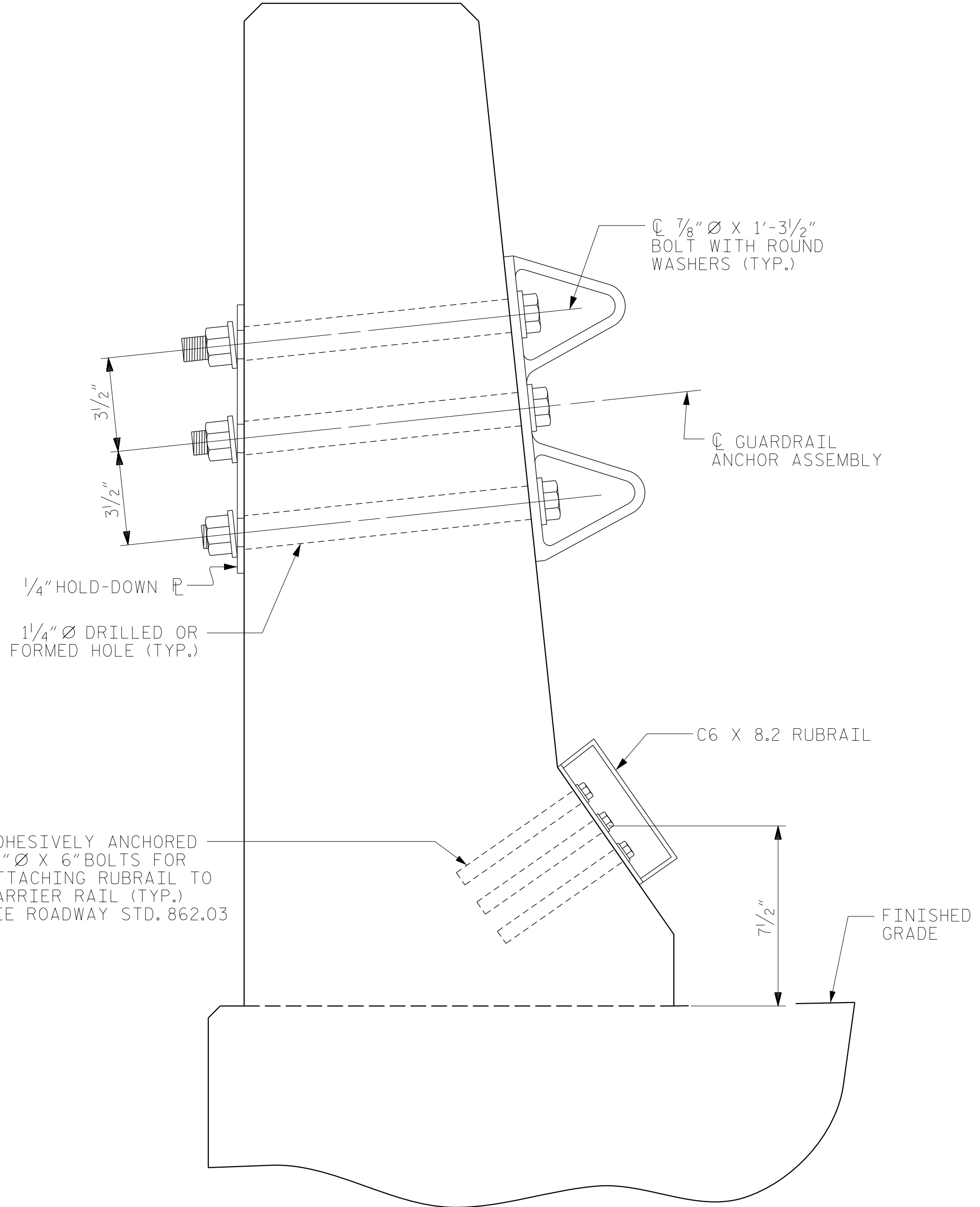
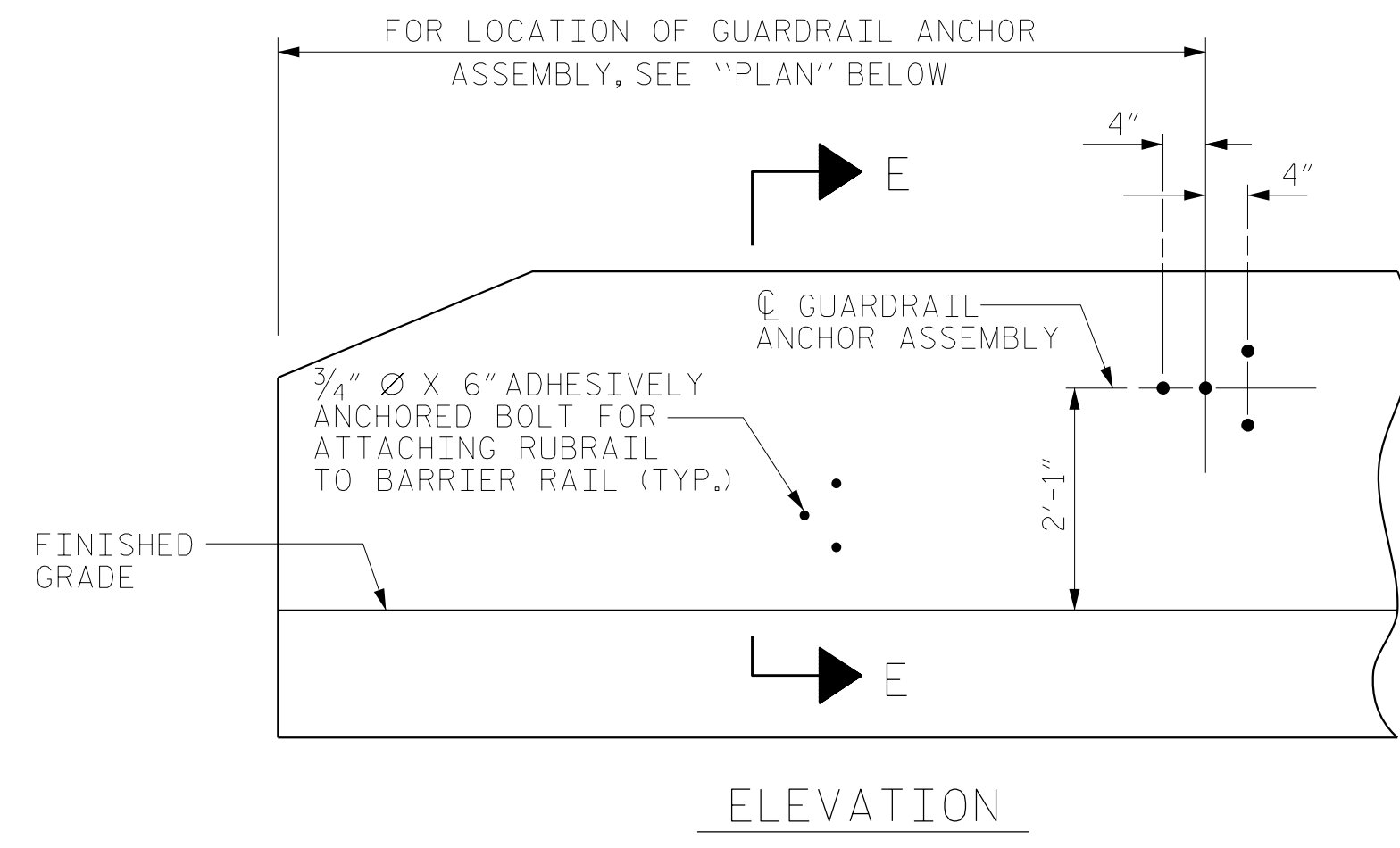
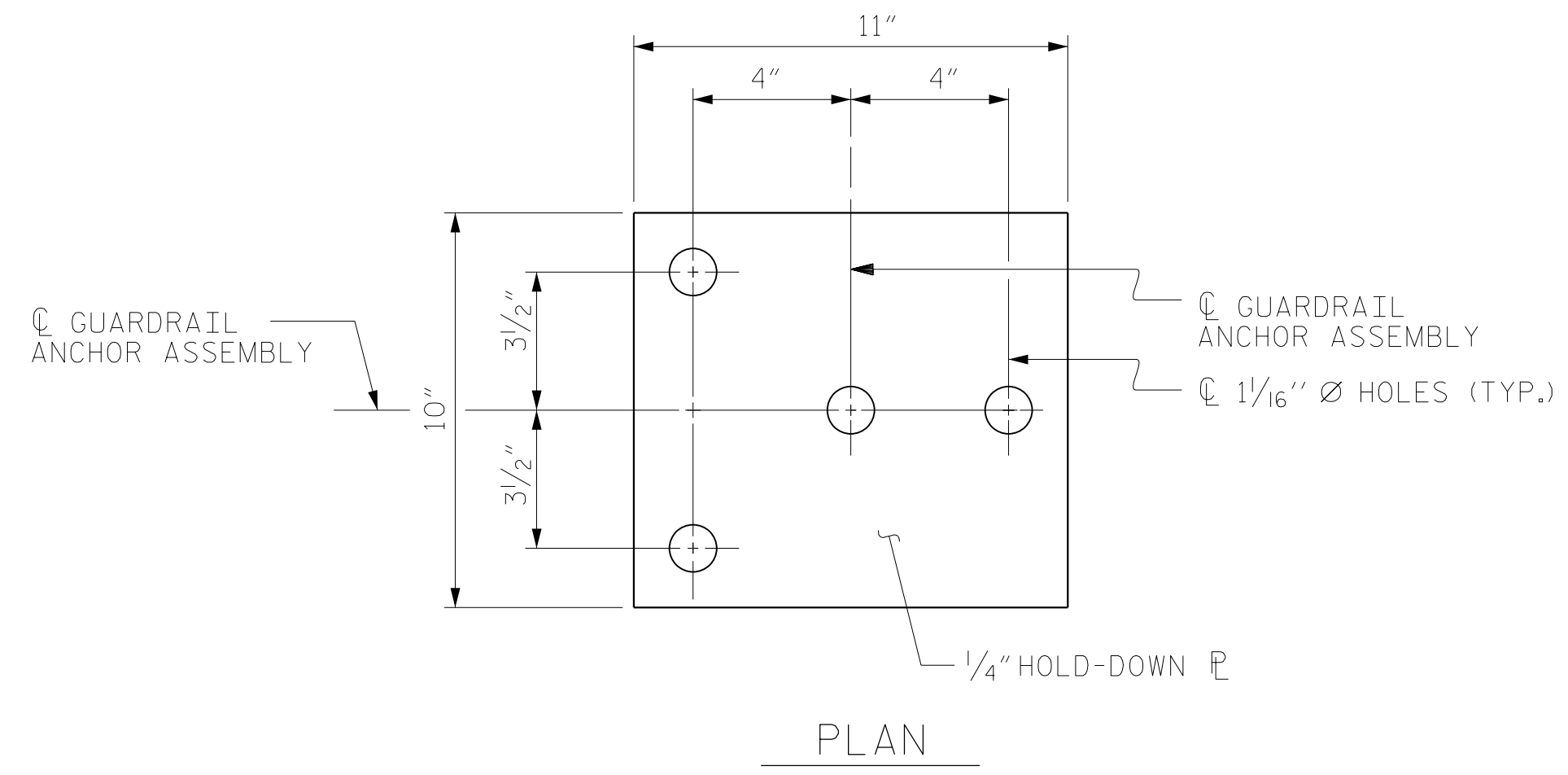
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

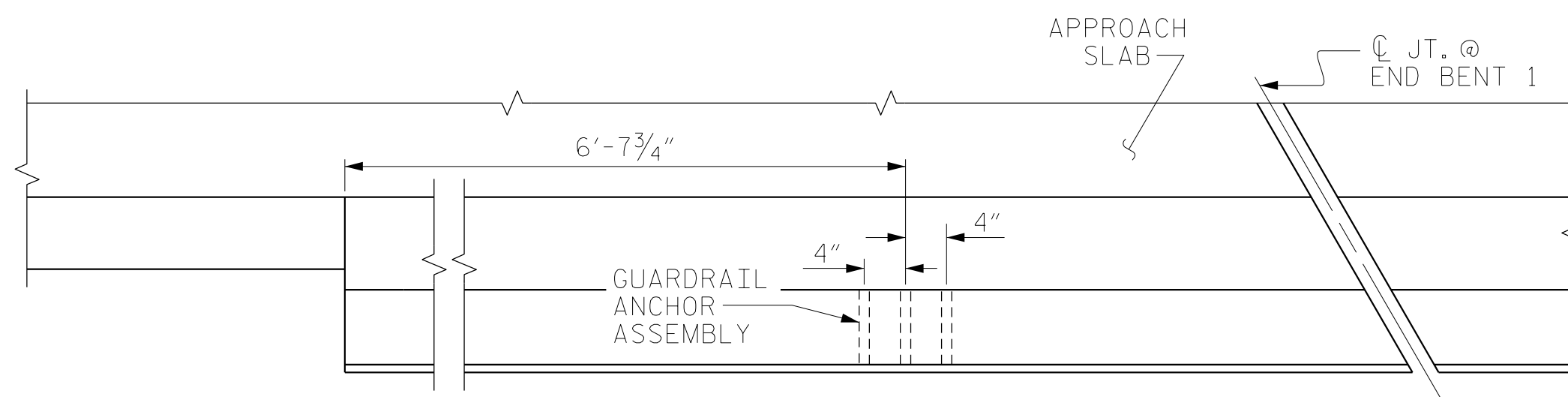
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

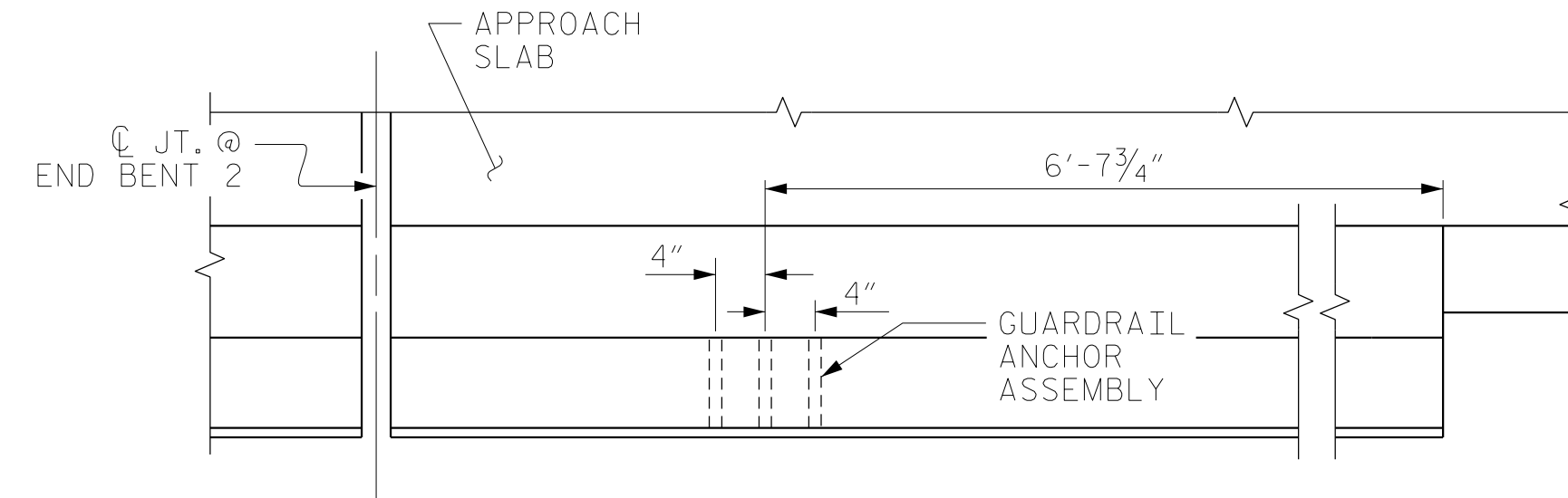
SEE, "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" FOR LEFT SIDE OF BRIDGE.



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

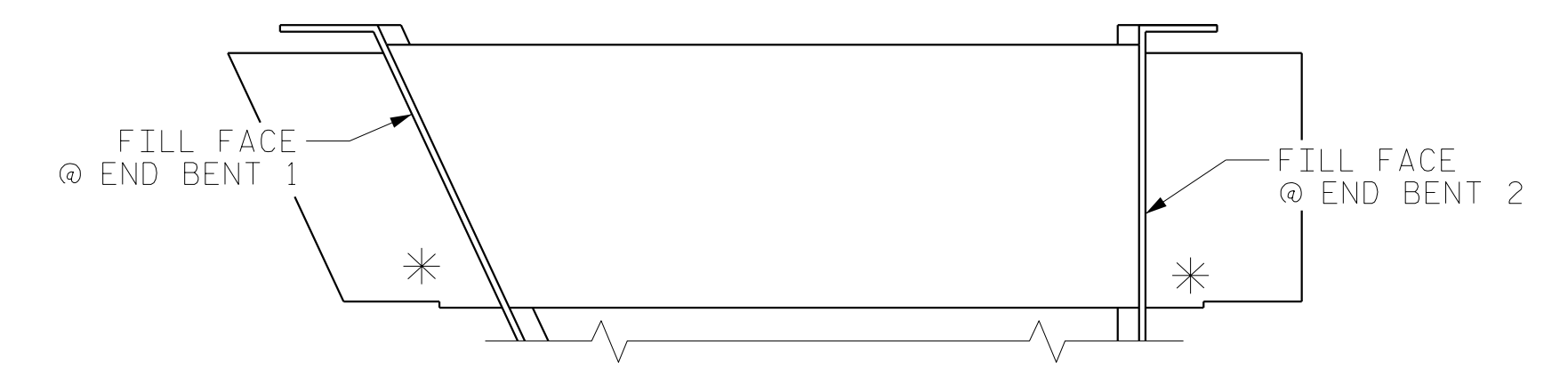


PLAN @ END BENT 1



PLAN @ END BENT 2

LOCATION OF ANCHORS FOR GUARDRAIL



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-



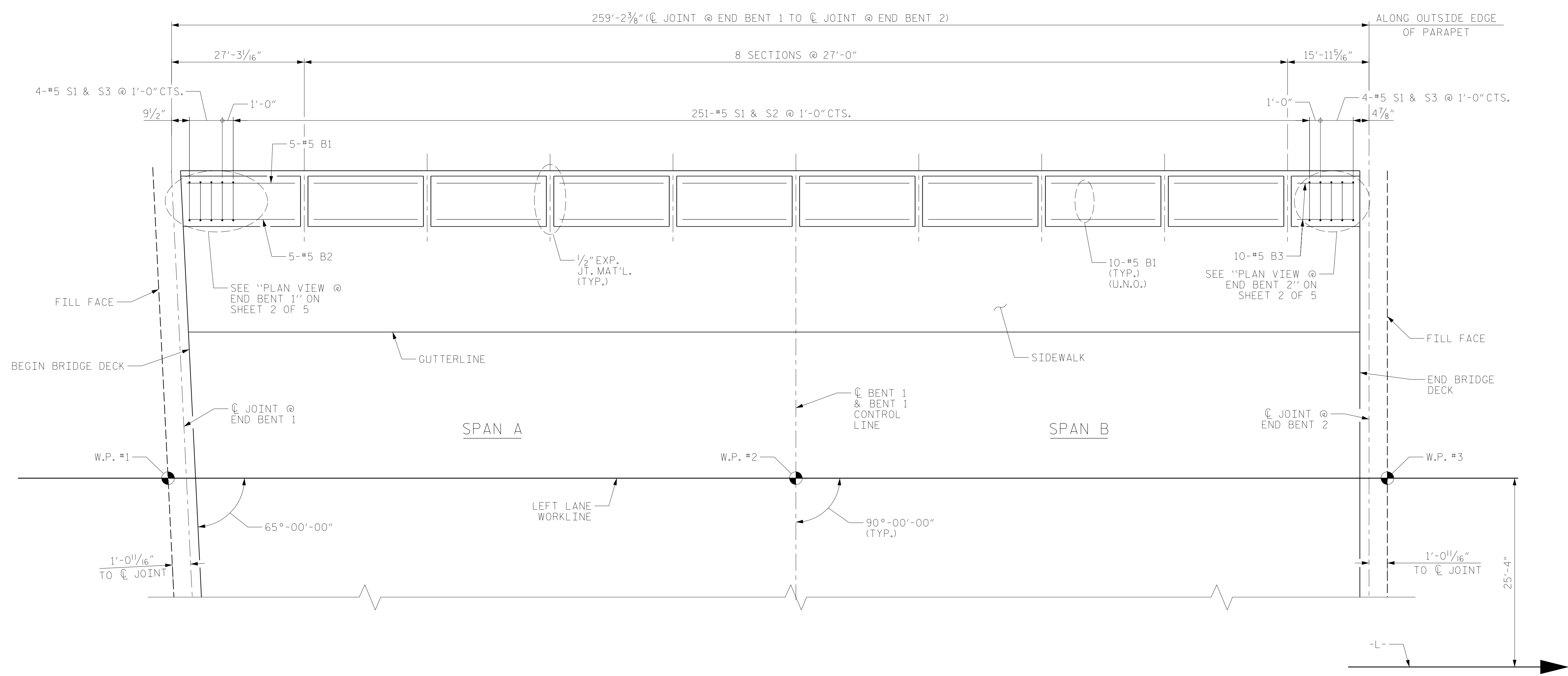
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North Carolina License No. 50737-0403-C&E

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			43

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : TWL	DATE : 01/2020
CHECKED BY : MRA	DATE : 05/2020
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



PLAN OF CONCRETE PARAPET
BARRIER RAIL NOT SHOWN FOR CLARITY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 5

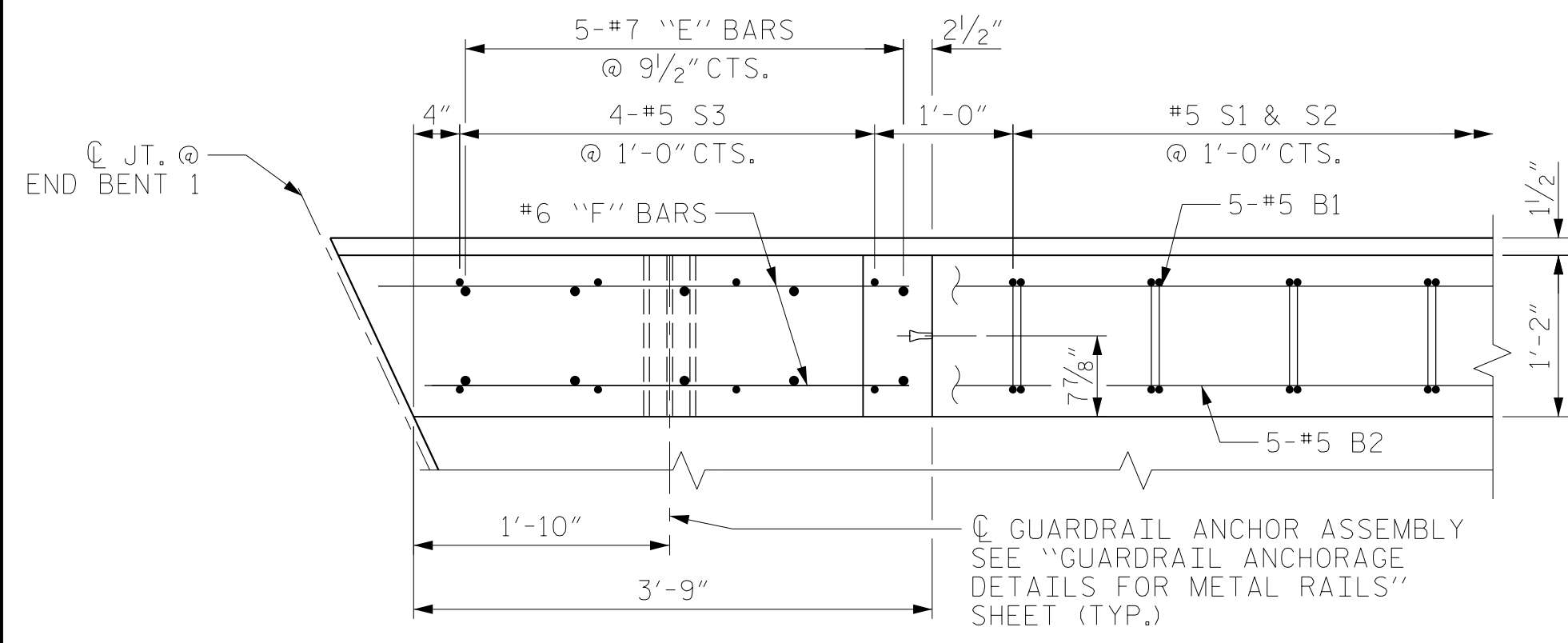
NOTE:
FOR NOTES, SEE SHEET 2 OF 5.

DRAWN BY :	TWL	DATE :	.01/2020
CHECKED BY :	MRA	DATE :	.05/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	.09/2021

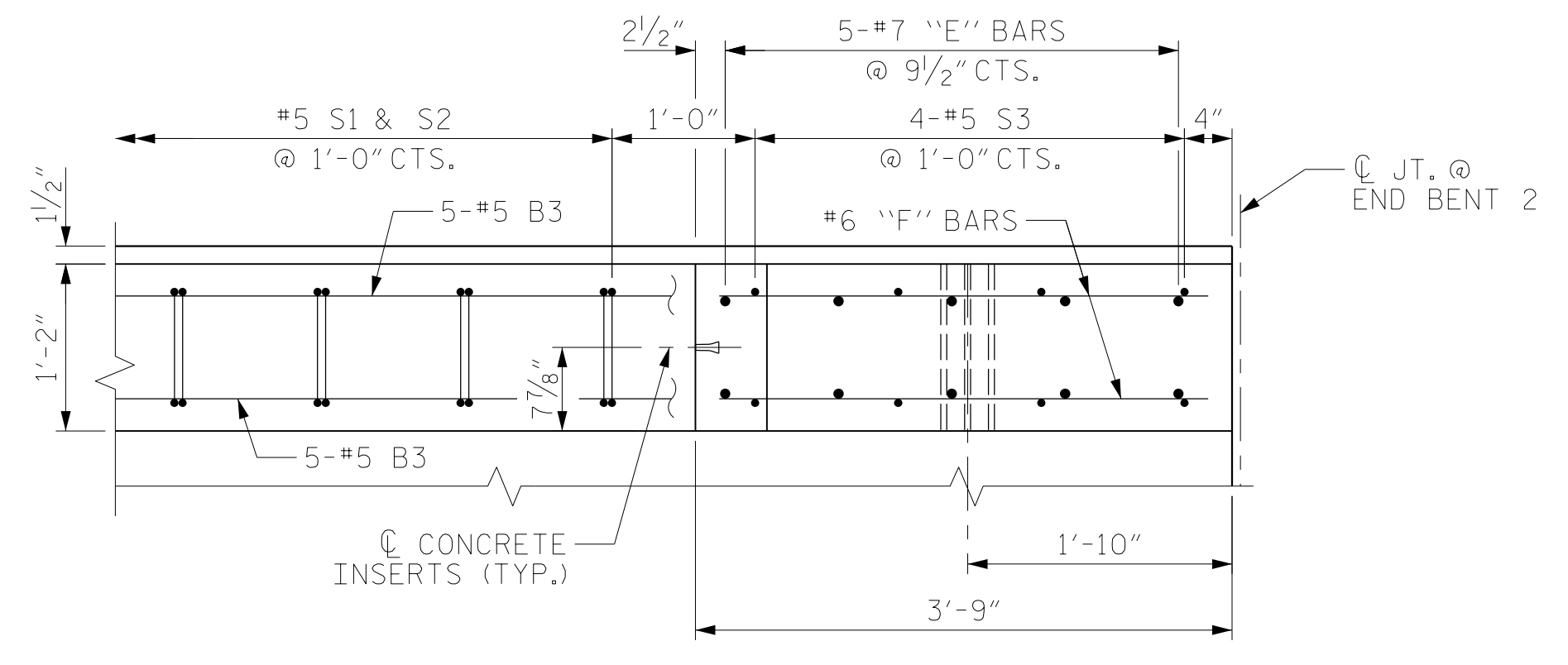
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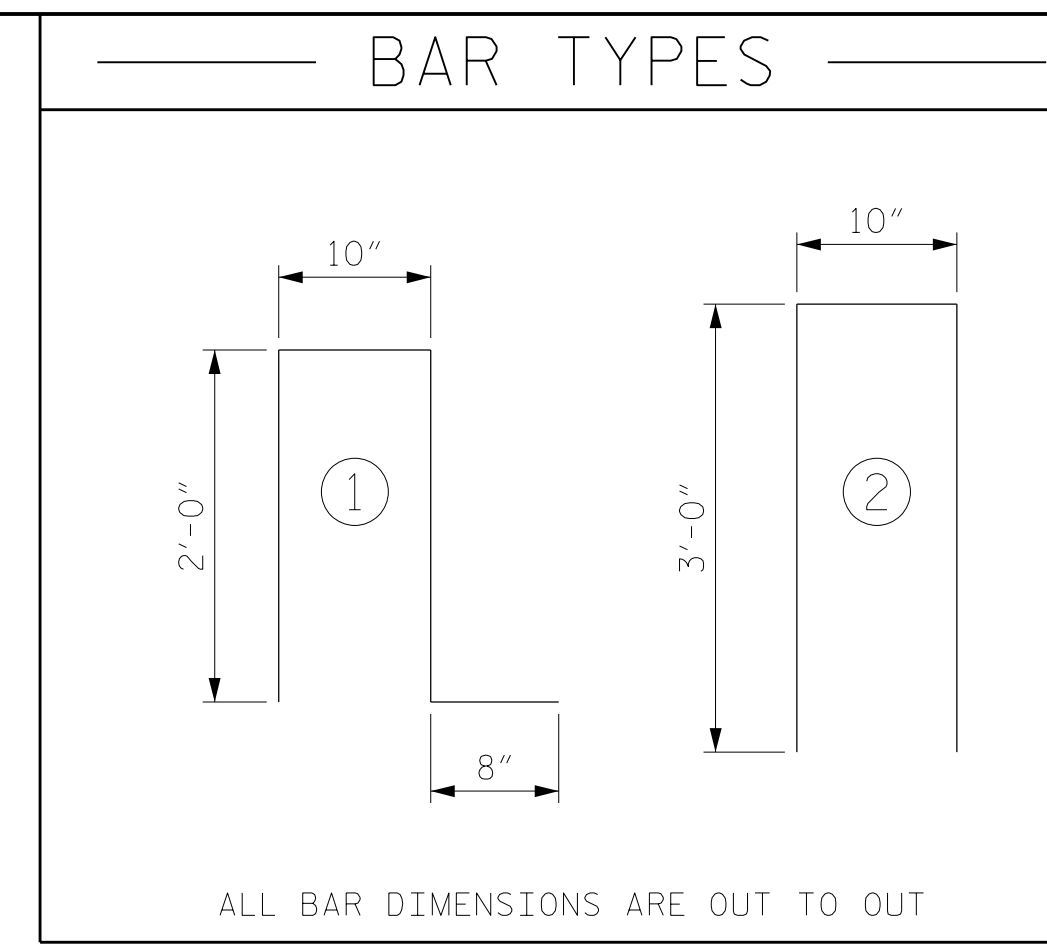
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
CONCRETE PARAPET					
LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-20
TOTAL SHEETS					43



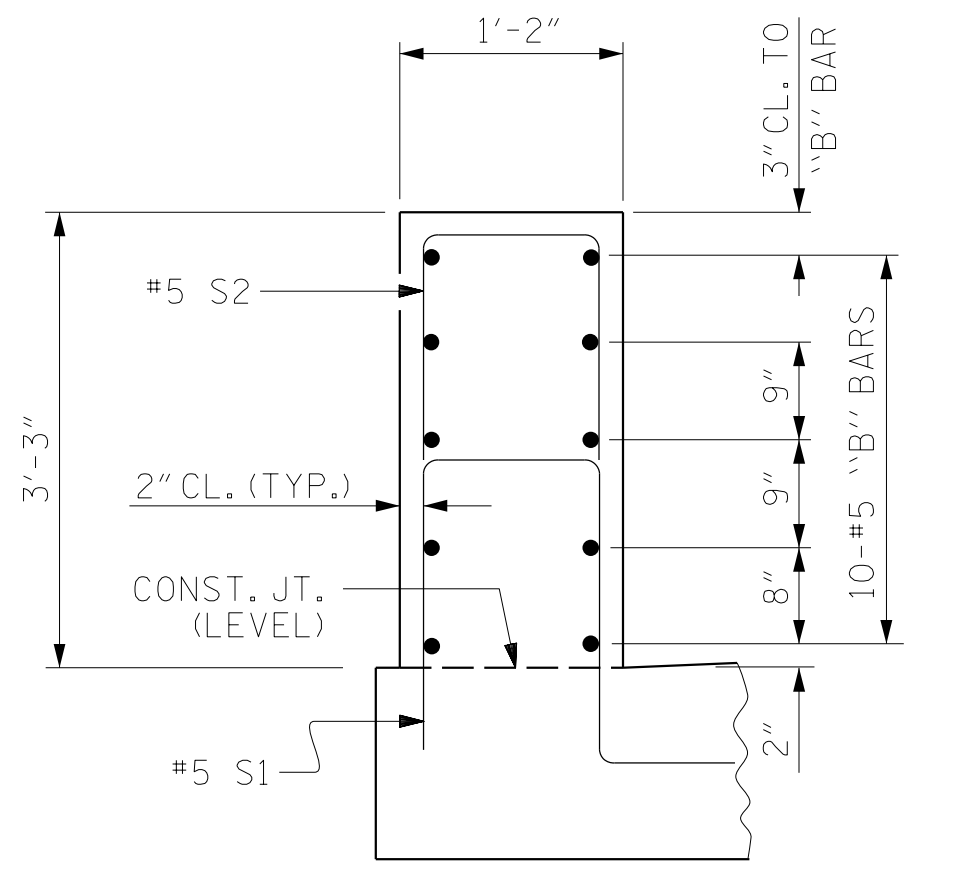
PLAN VIEW @ END BENT 1



PLAN VIEW @ END BENT 2

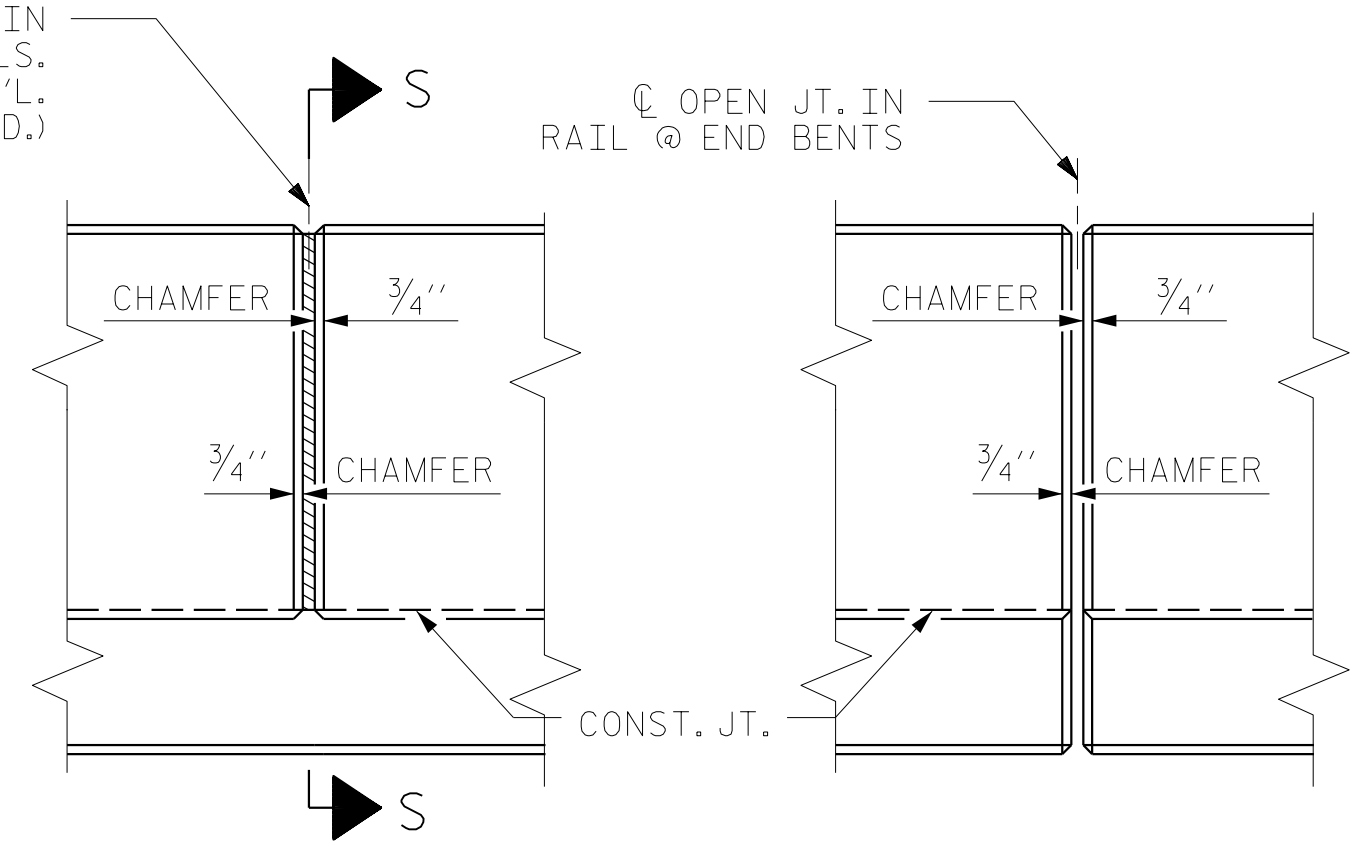


BILL OF MATERIAL FOR CONCRETE PARAPET						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	85	#5	STR.	26'-7"	2357	
*B2	5	#5	STR.	26'-3"	137	
*B3	10	#5	STR.	15'-6"	162	
*E1	4	#7	STR.	3'-6"	29	
*E2	4	#7	STR.	3'-11"	32	
*E3	4	#7	STR.	4'-4"	35	
*E4	4	#7	STR.	4'-9"	39	
*E5	4	#7	STR.	5'-1"	42	
*F1	2	#6	STR.	2'-1"	6	
*F2	2	#6	STR.	1'-10"	6	
*F3	2	#6	STR.	3'-6"	11	
*F4	1	#6	STR.	3'-5"	5	
*F5	2	#6	STR.	3'-0"	9	
*F6	1	#6	STR.	3'-8"	6	
*F7	2	#6	STR.	3'-3"	10	
*S1	259	#5		5'-6"	1486	
*S2	251	#5		6'-10"	1789	
*S3	16	#5	STR.	3'-10"	64	
*EPOXY COATED REINFORCING STEEL					6,225	LBS.
CLASS AA CONCRETE					37.1	C.Y.
CONCRETE PARAPET					259.0	L.F.

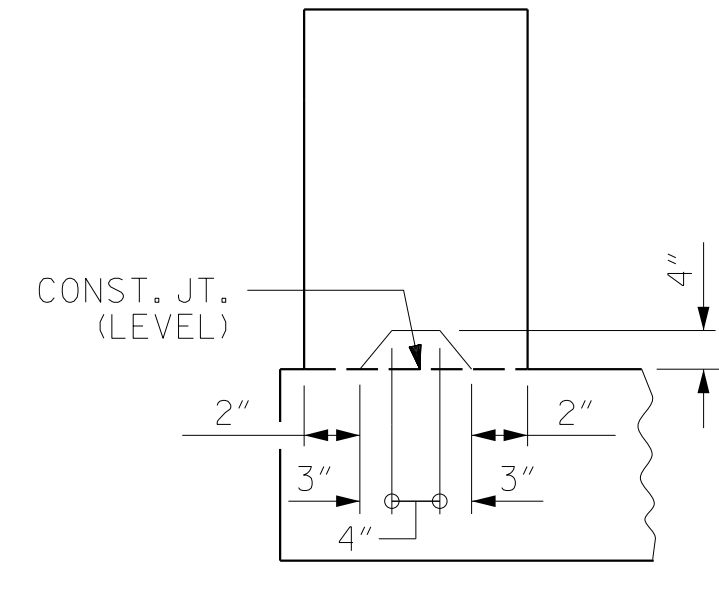


SECTION THROUGH LEFT PARAPET

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



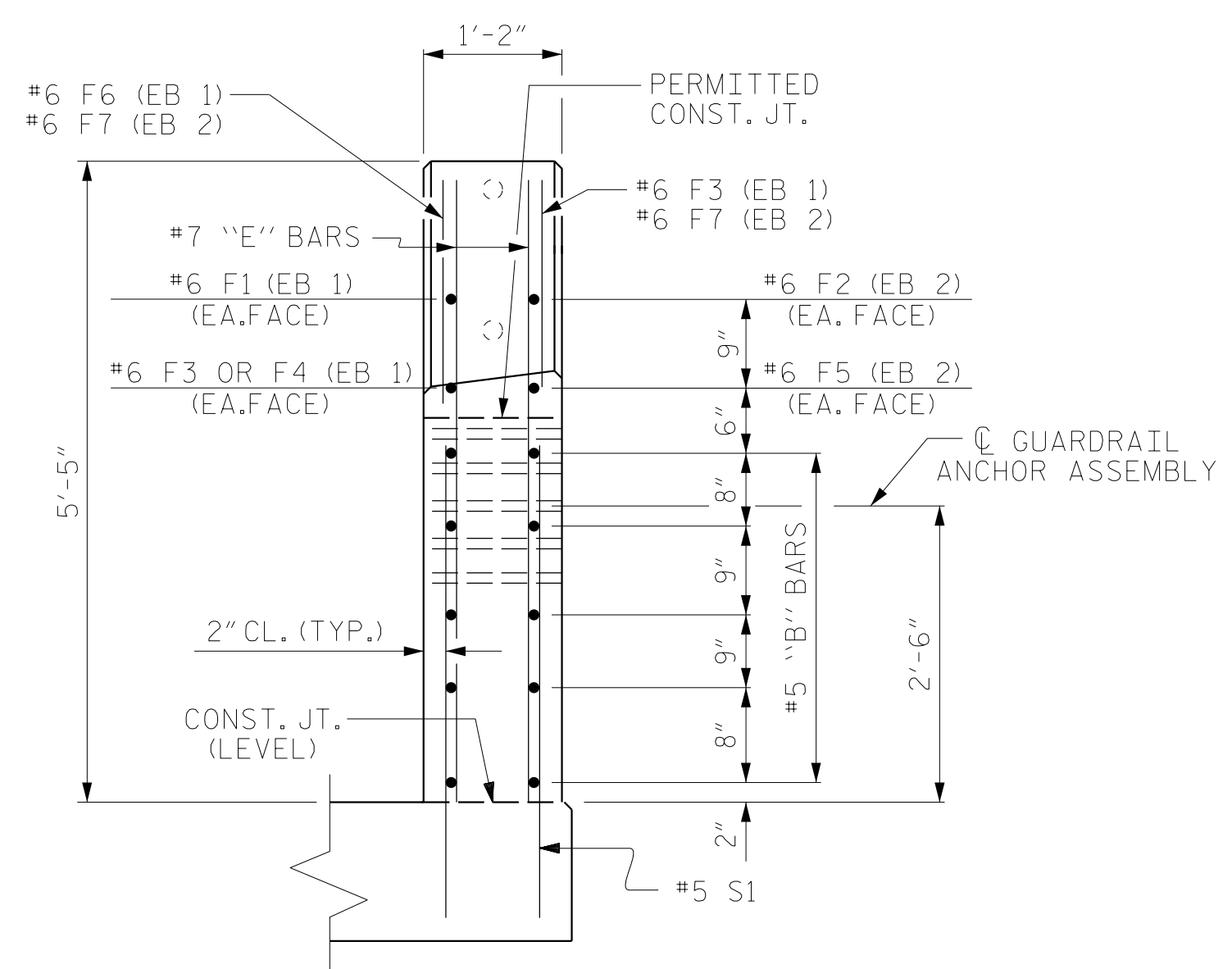
ELEVATION AT EXPANSION JOINTS



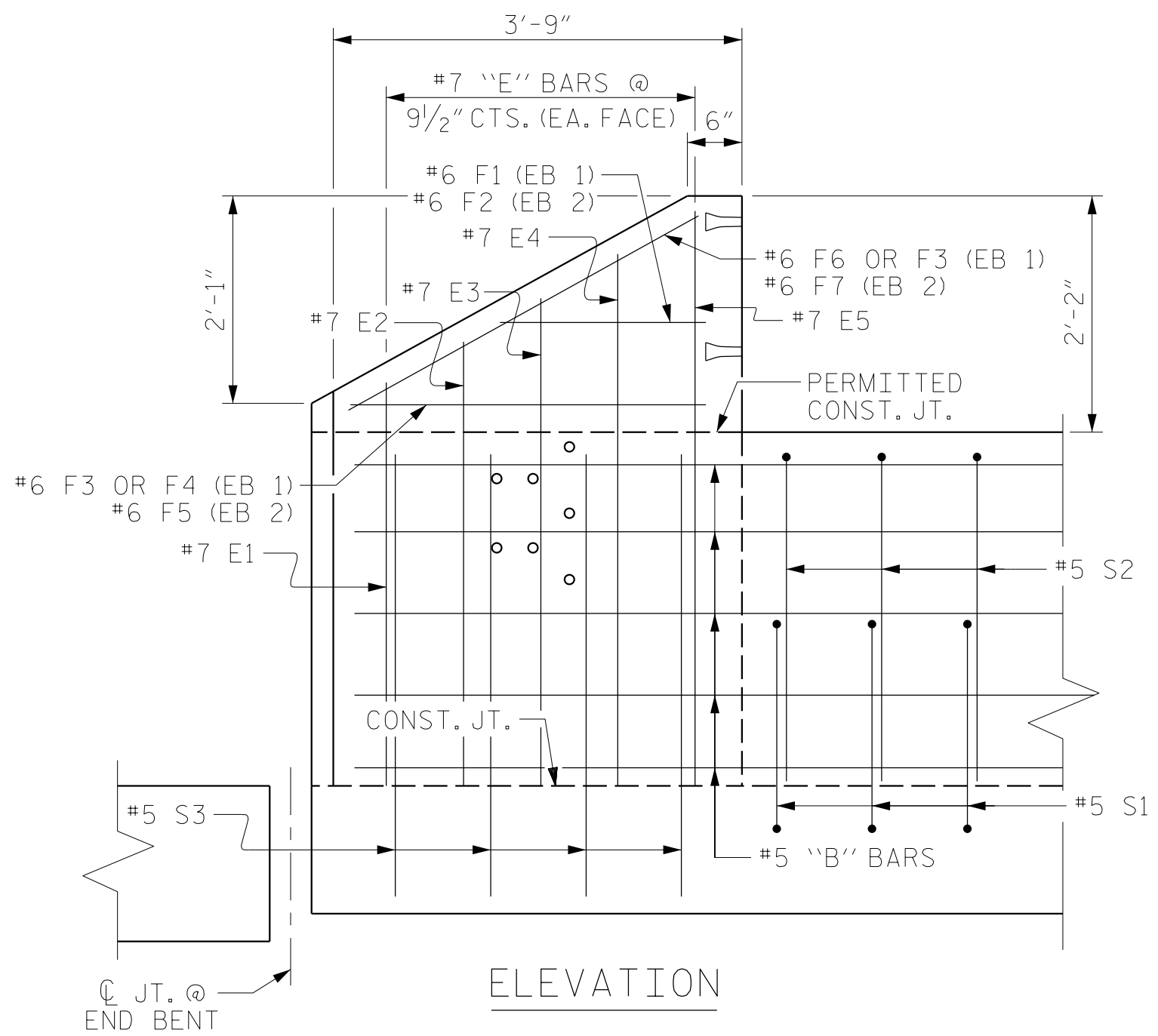
SECTION S-S AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

PARAPET DETAILS

NOTES:
 THE CONCRETE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSION STRENGTH OF 3,000 PSI.
 ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.
 SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET FOR CONCRETE INSERT DETAILS.
 SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR GUARDRAIL ANCHOR ASSEMBLY.
 GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
 #5 "S" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN PARAPET.



END VIEW



ELEVATION

END POST FOR TWO BAR RAIL

BAR CALLOUTS FOR TYPICAL FOR EACH END BENT UNLESS NOTED OTHERWISE

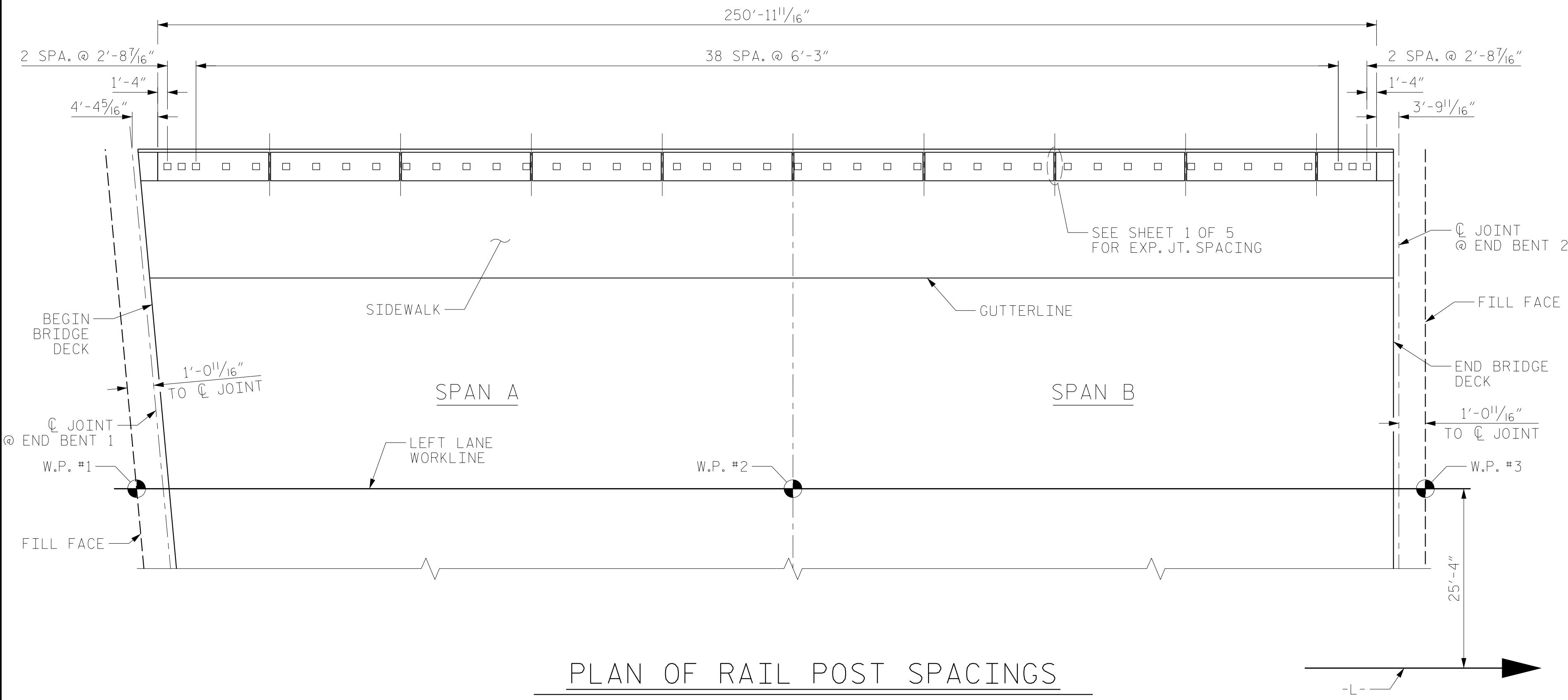
DRAWN BY :	TWL	DATE :	05/2020
CHECKED BY :	MRA	DATE :	05/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			43



PLAN OF RAIL POST SPACINGS

NOTES
STRUCTURAL CONCRETE INSERT

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

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

NOTES
METAL RAIL TO END POST CONNECTION

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

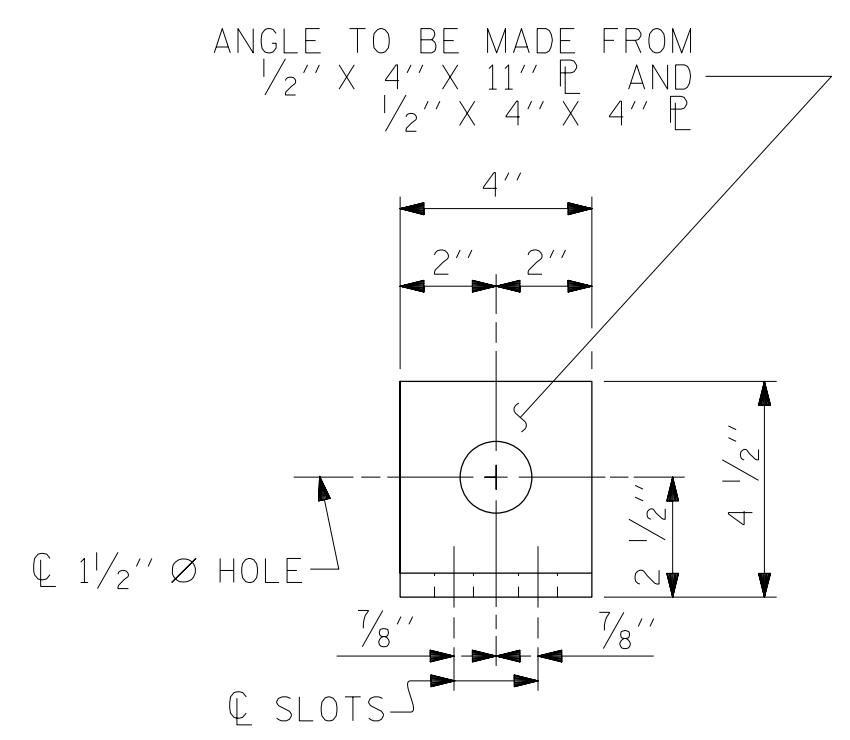
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.
- STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

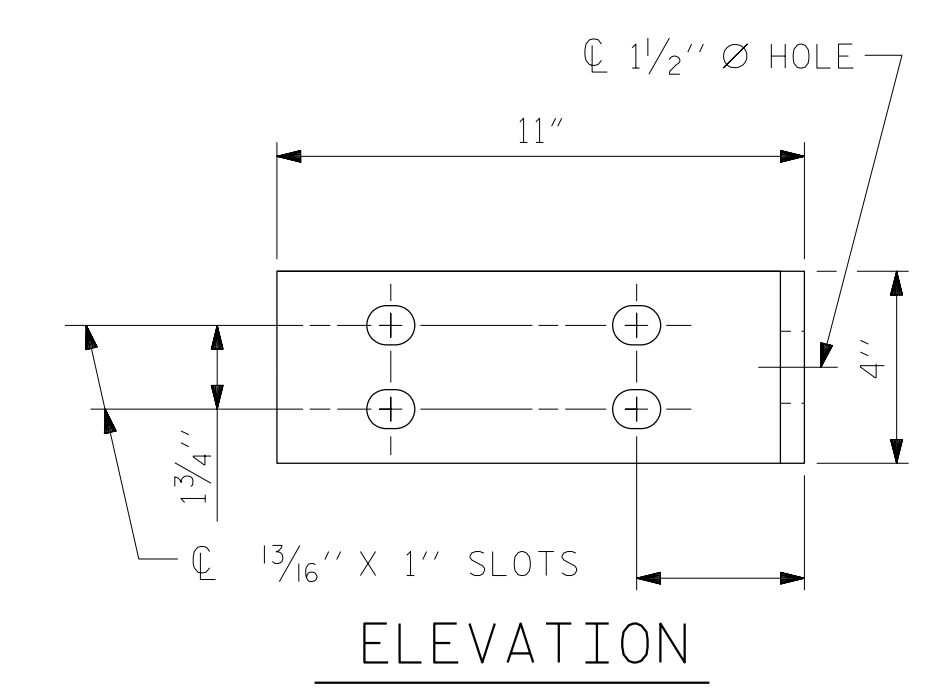
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

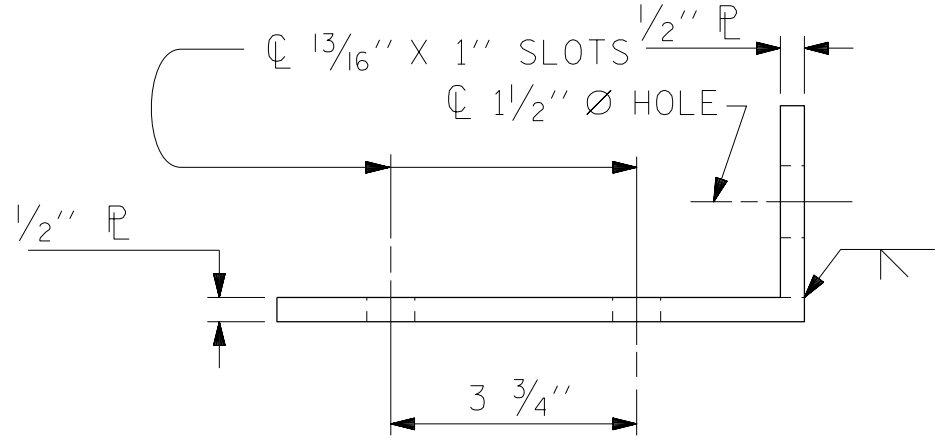
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



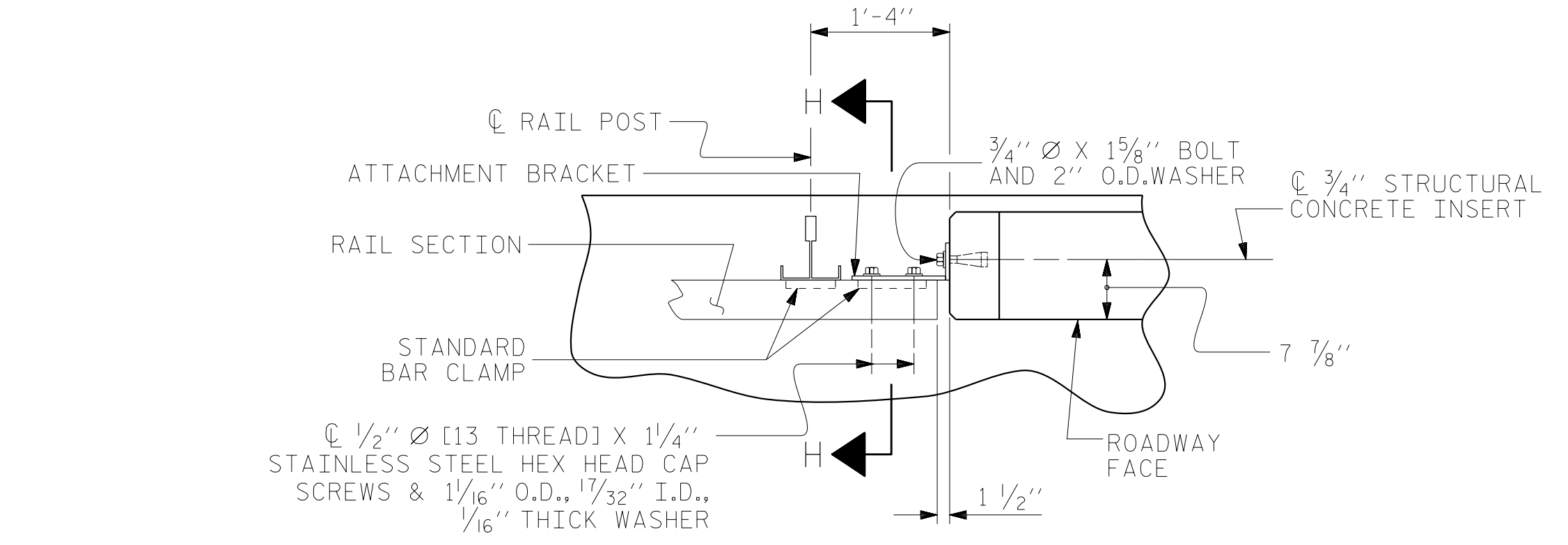
END VIEW (FIX AND EXP.)



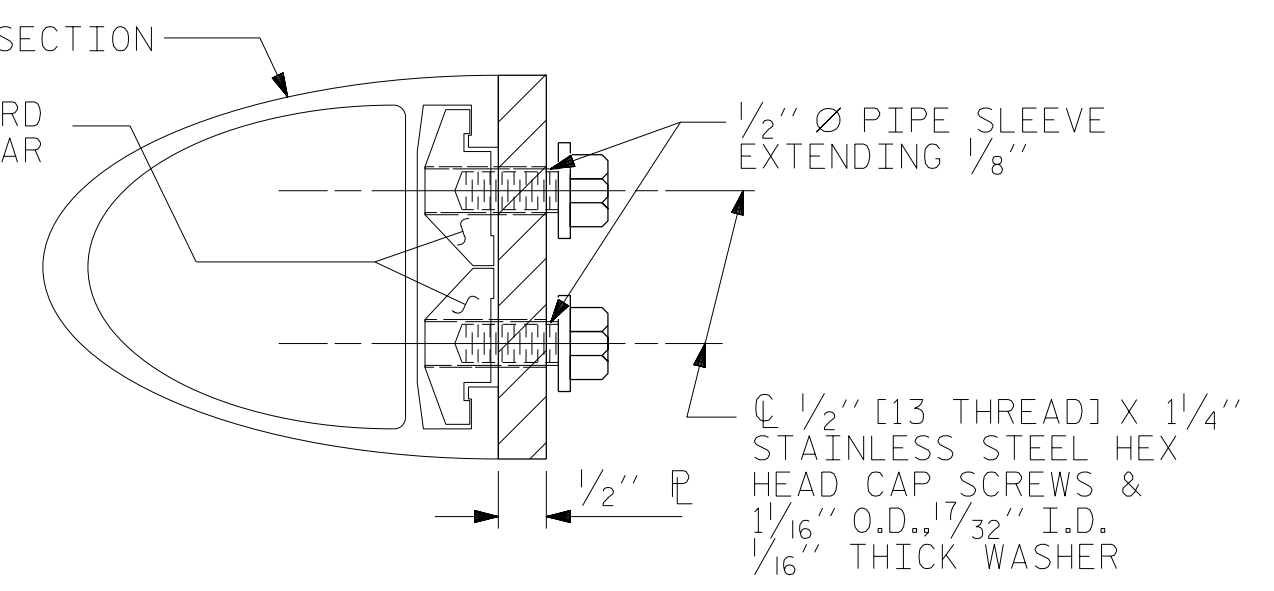
ELEVATION



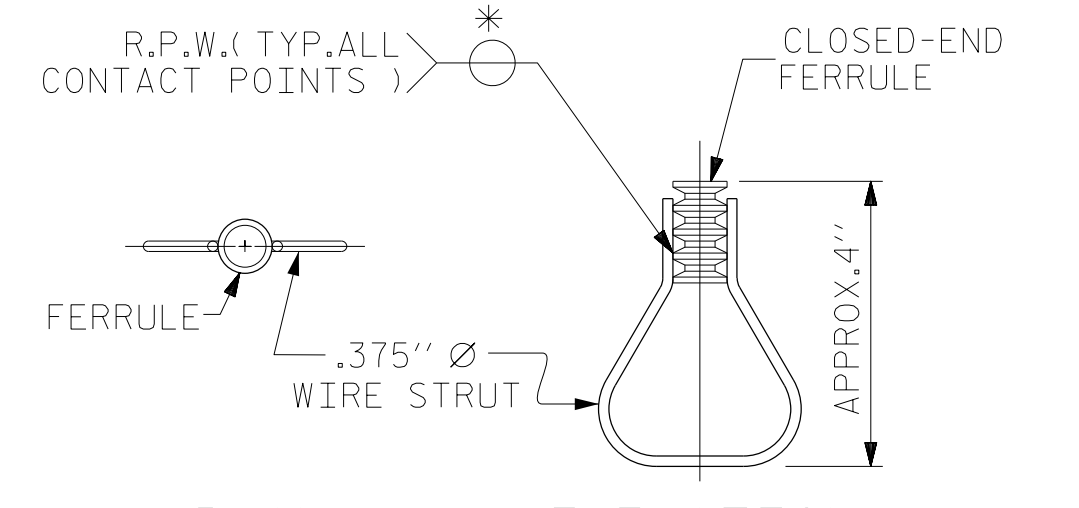
TOP VIEW



PLAN - RAIL AND END POST



SECTION H-H (EXP.)



PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 5

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			43

ASSEMBLED BY : TWL	DATE : 01/2020
CHECKED BY : MRA	DATE : 04/2020
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NOTES

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

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 251.0 LIN. FT.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

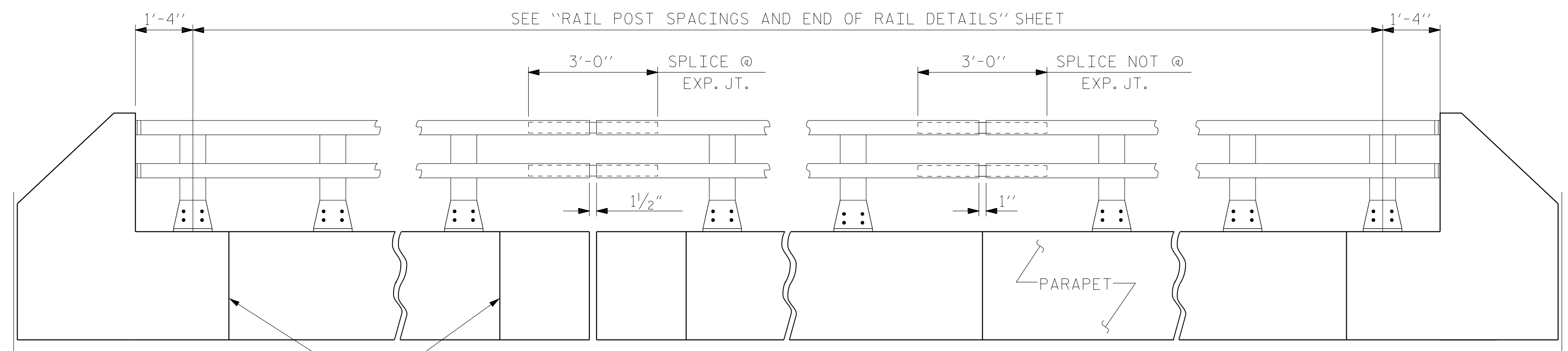
SHEET 4 OF 5

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

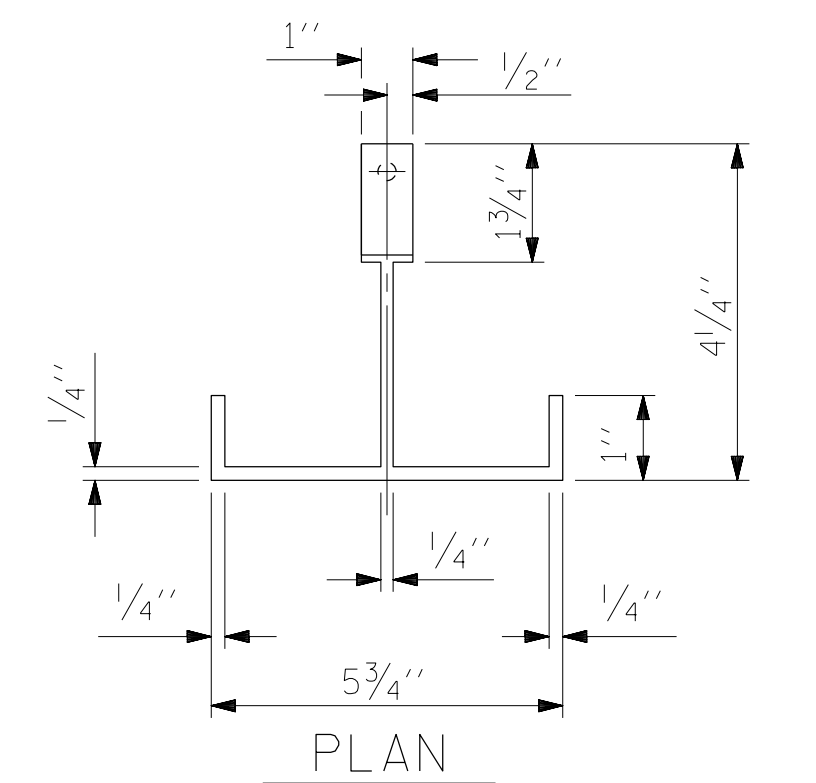
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-23
1			3			TOTAL SHEETS
2			4			43

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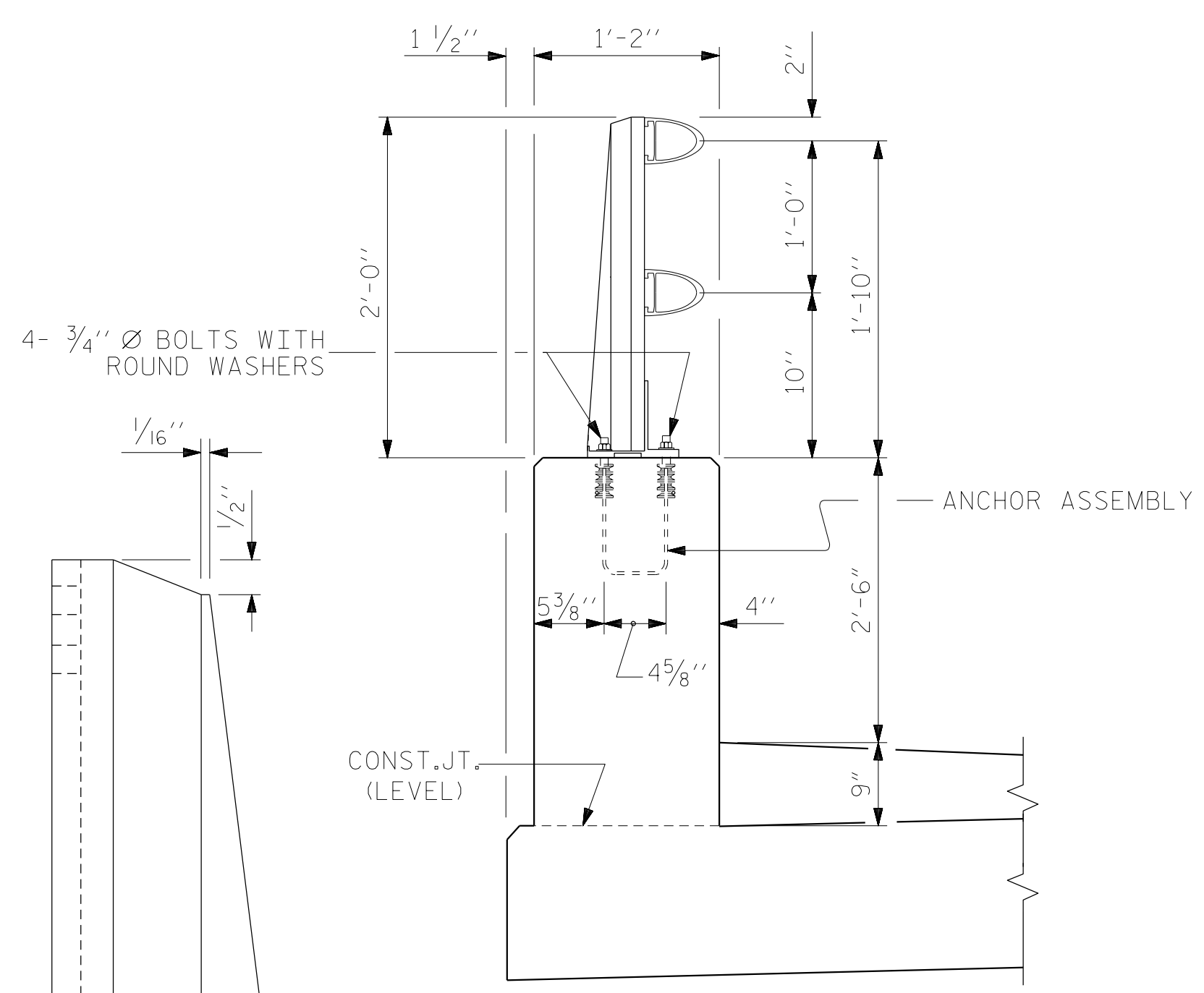


ELEVATION

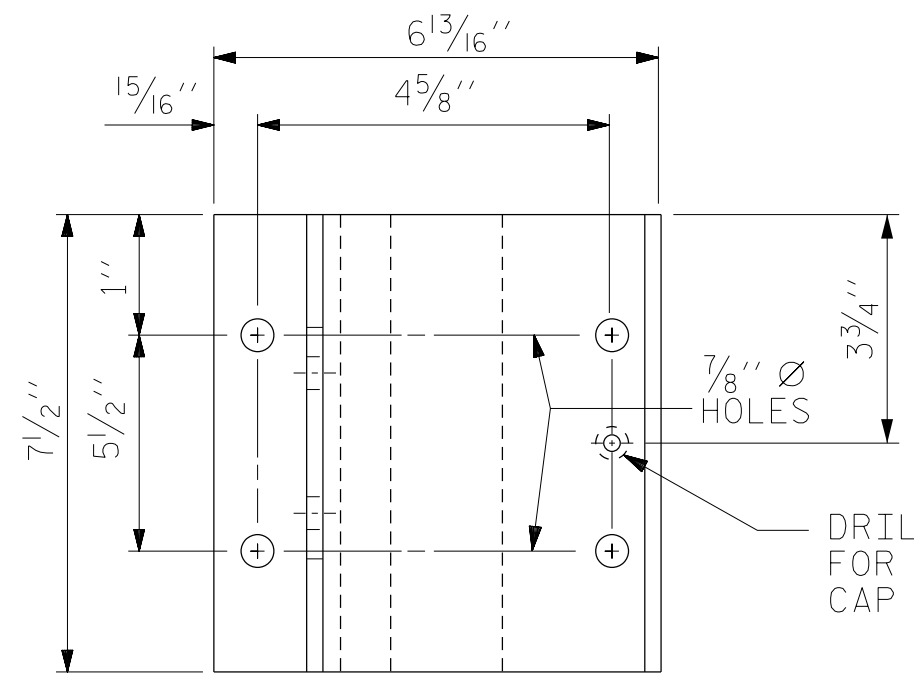
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



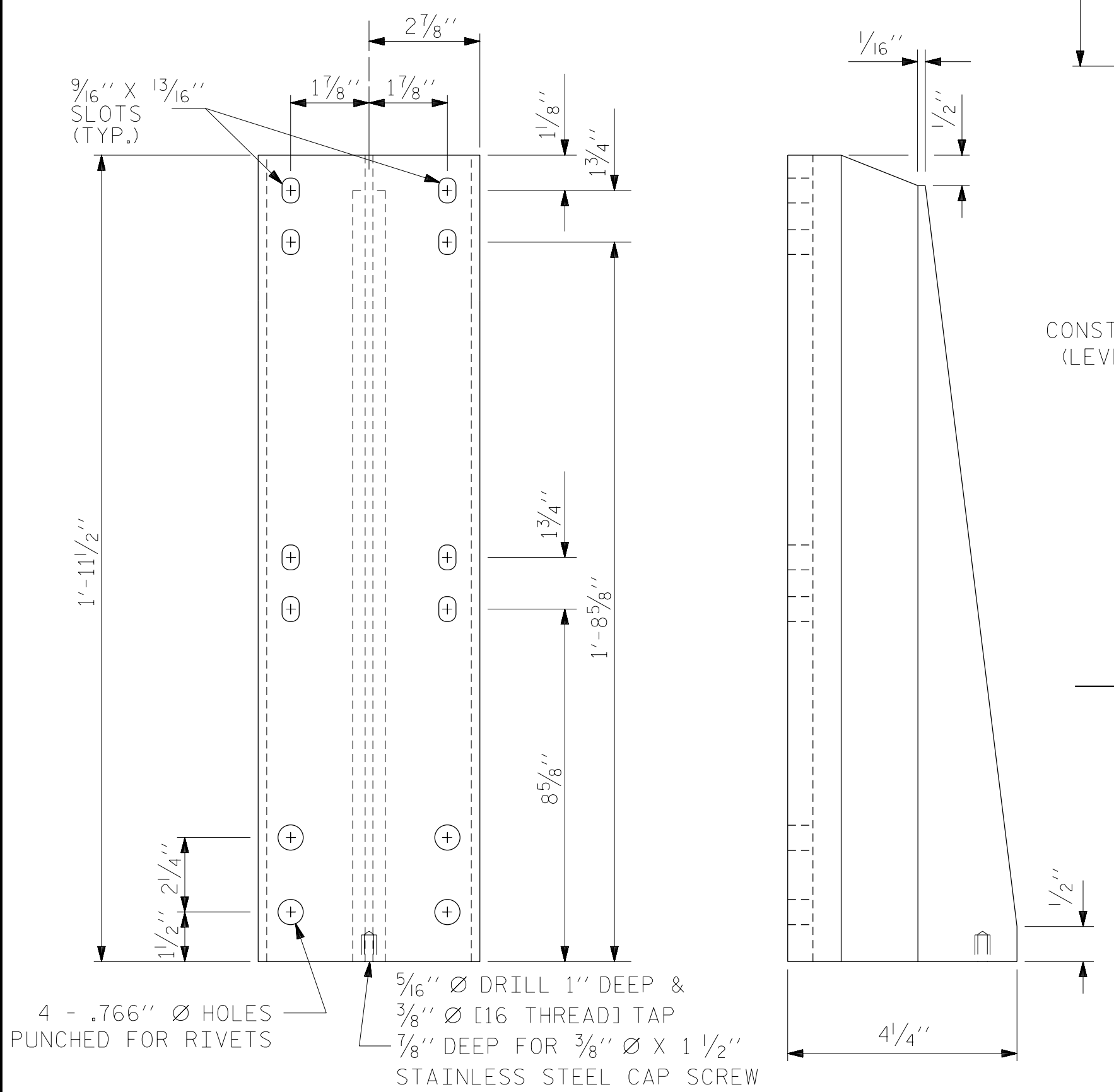
PLAN



SECTION THRU PARAPET AND RAIL



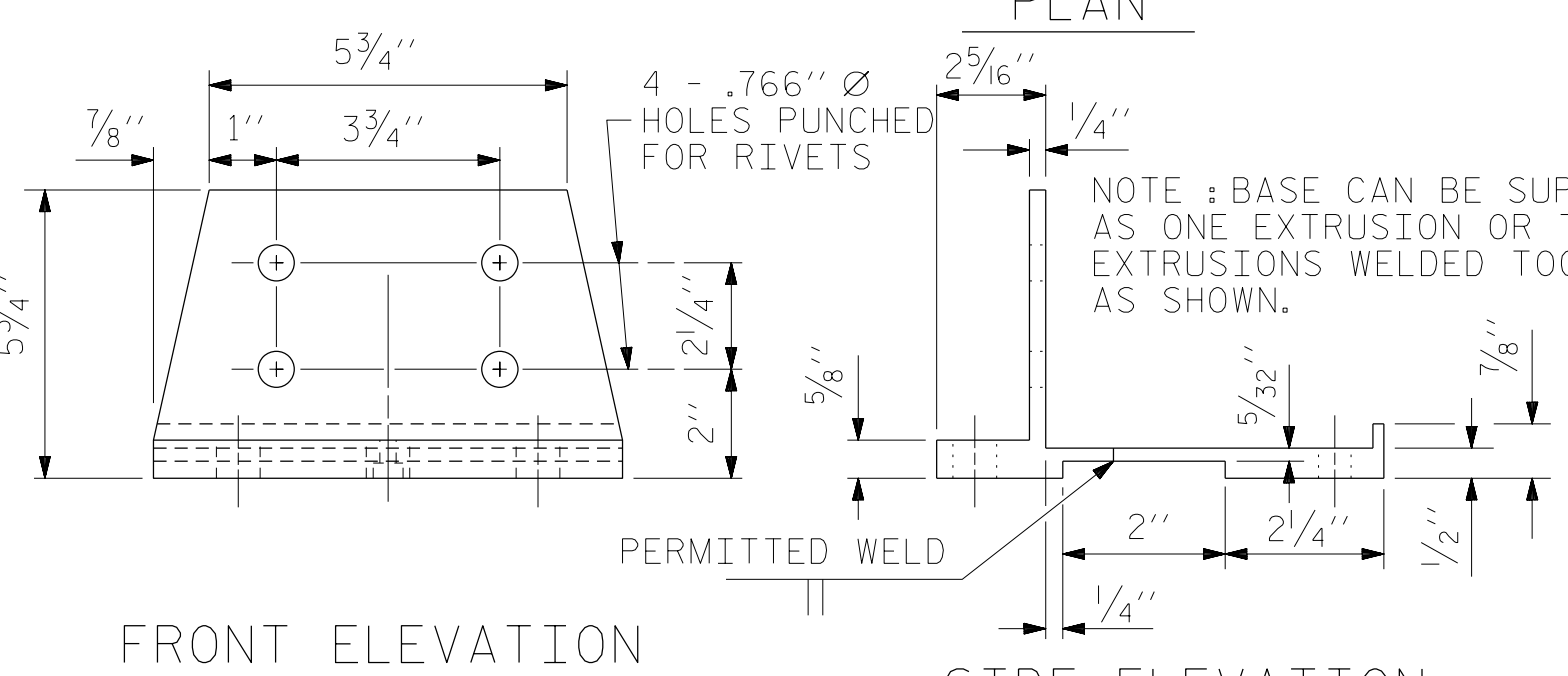
PLAN



FRONT ELEVATION

SIDE ELEVATION

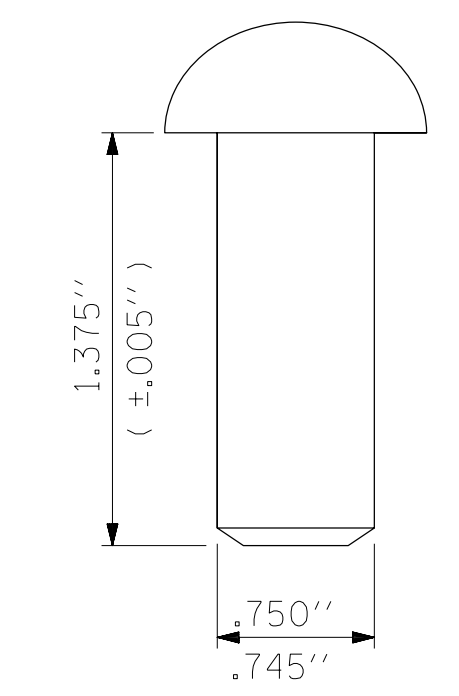
DETAILS OF POST



FRONT ELEVATION

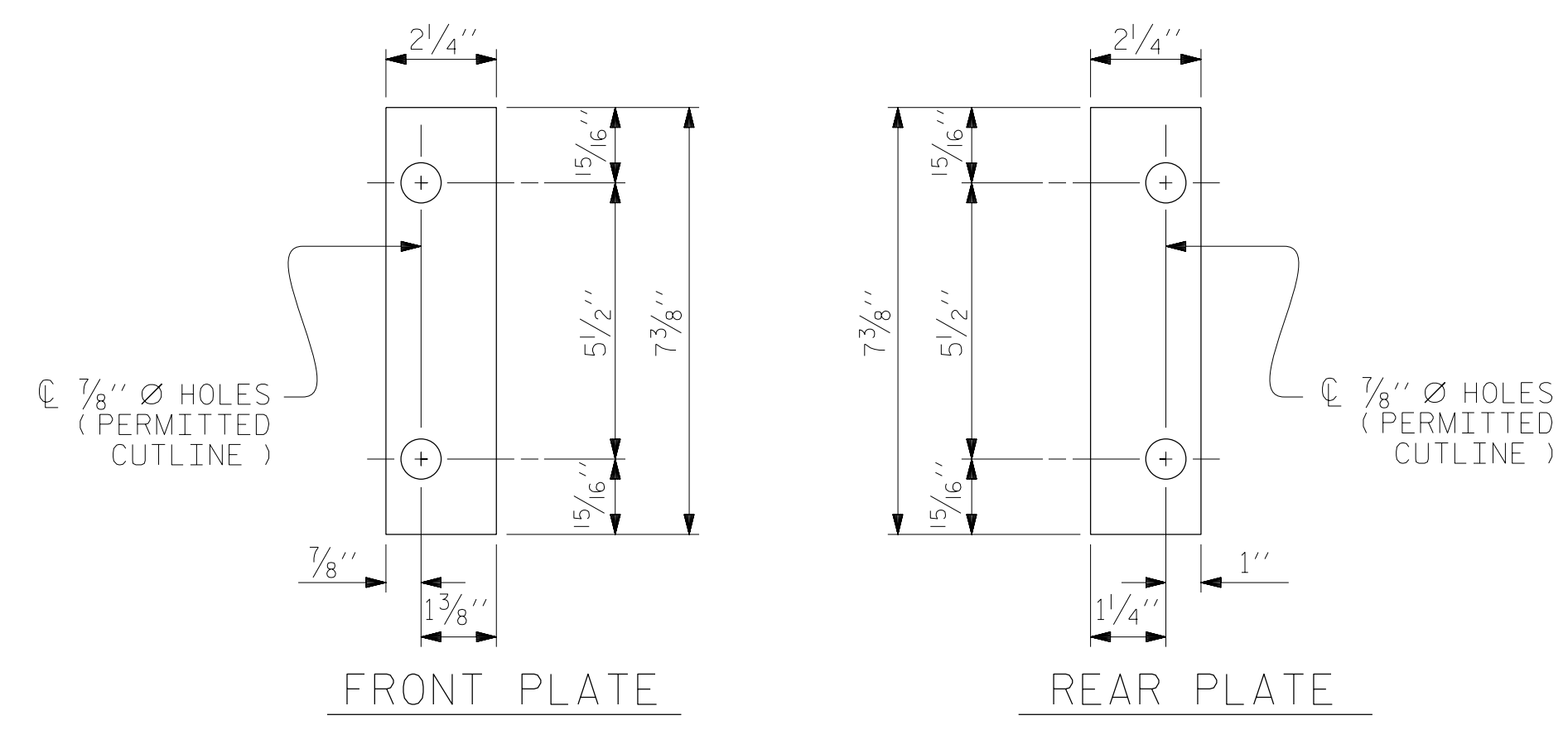
SIDE ELEVATION

POST BASE DETAILS



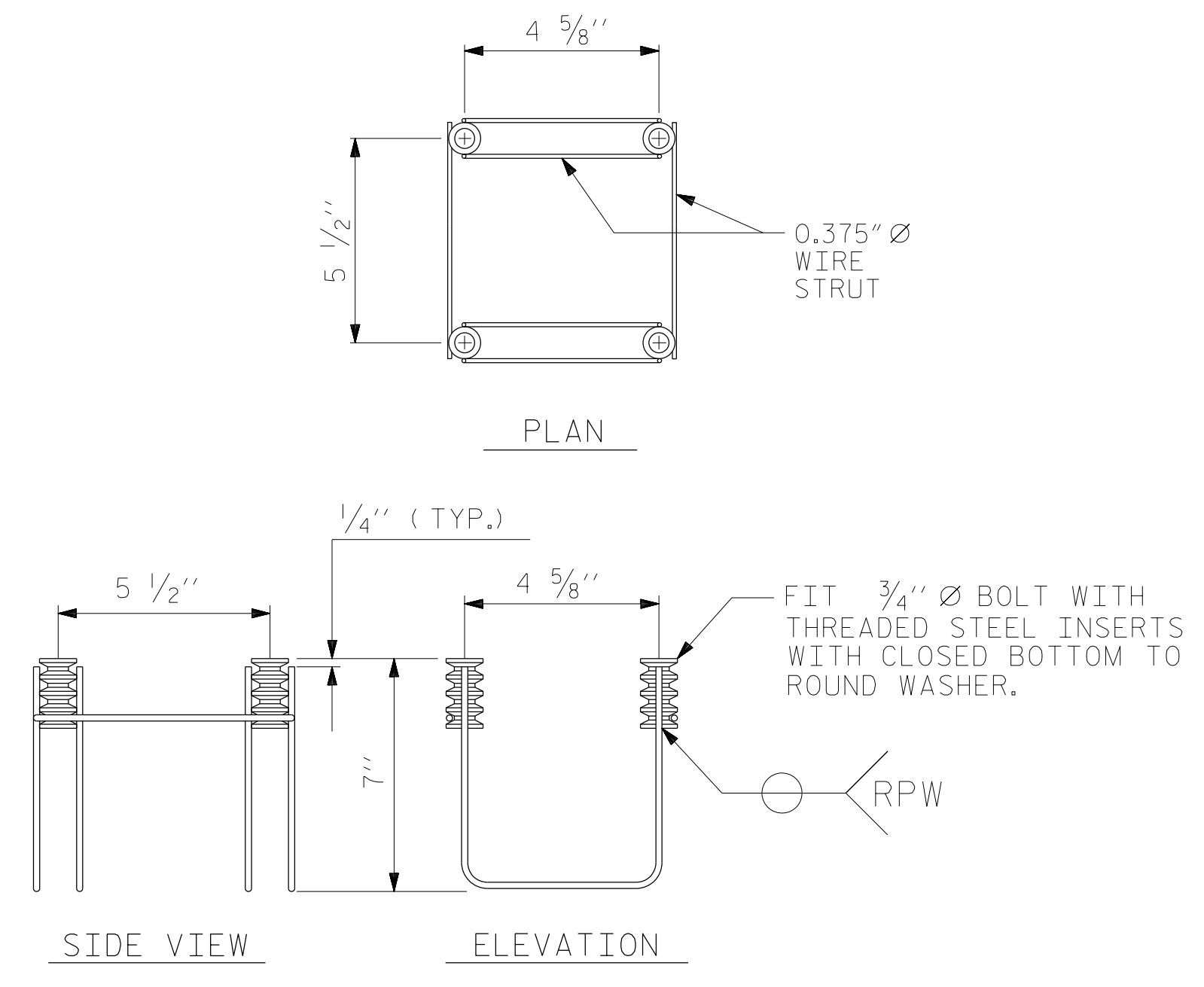
RIVET DETAIL

ASSEMBLED BY: TWL	DATE: 01/2020
CHECKED BY: MRA	DATE: 05/2020
DRAWN BY: EEM 6/94	REV. 10/1/11 MAA/GM
CHECKED BY: RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



SHIM DETAILS

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



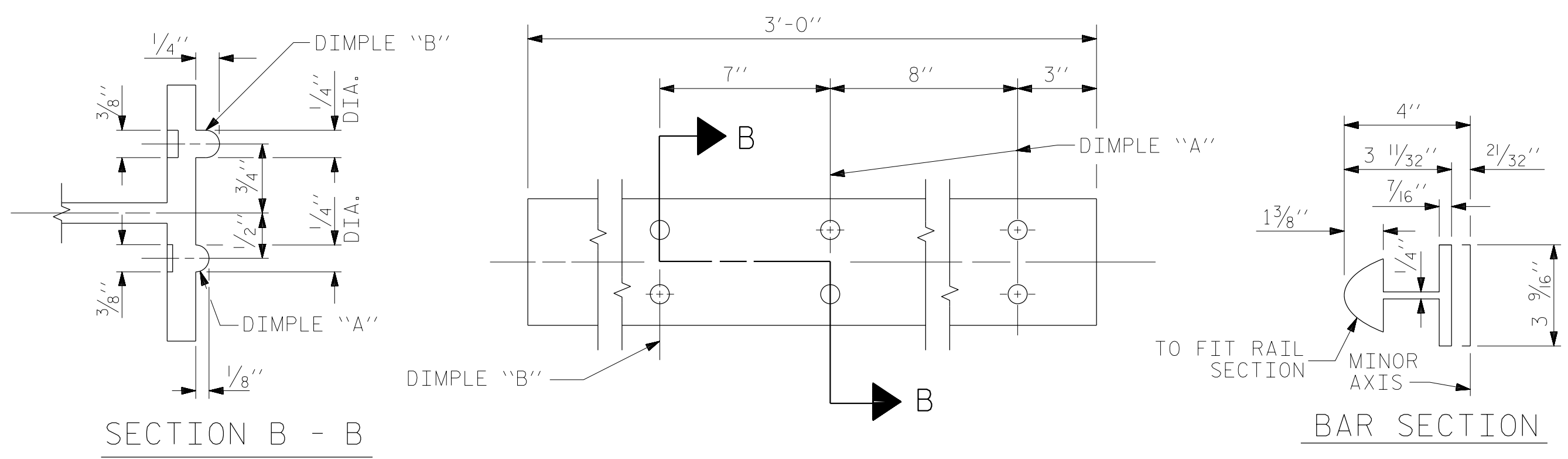
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(43 ASSEMBLIES REQUIRED)

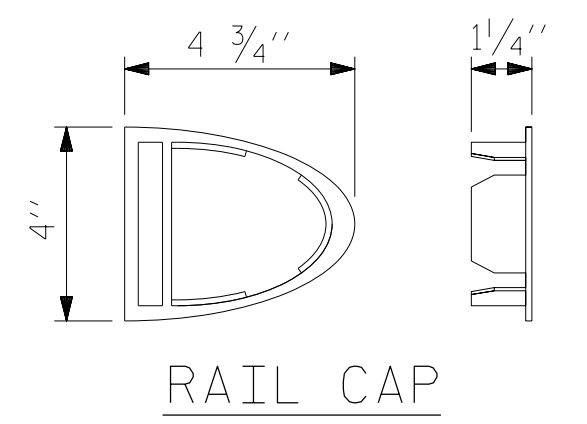
- NOTES**
- STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
 - 4 - 3/4"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

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

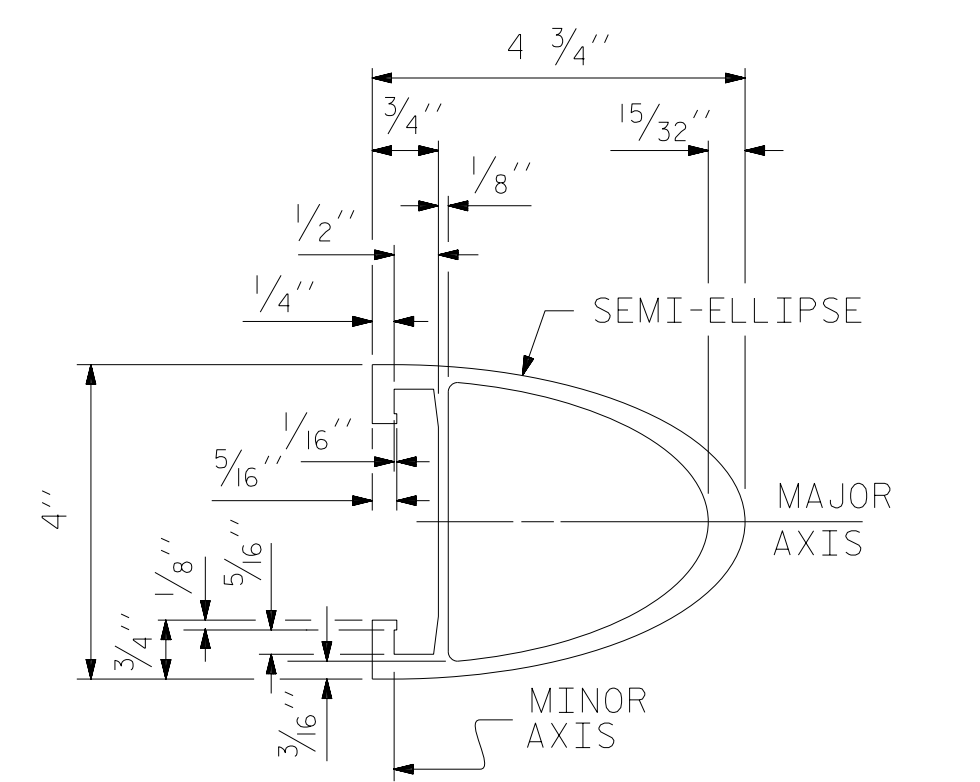
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



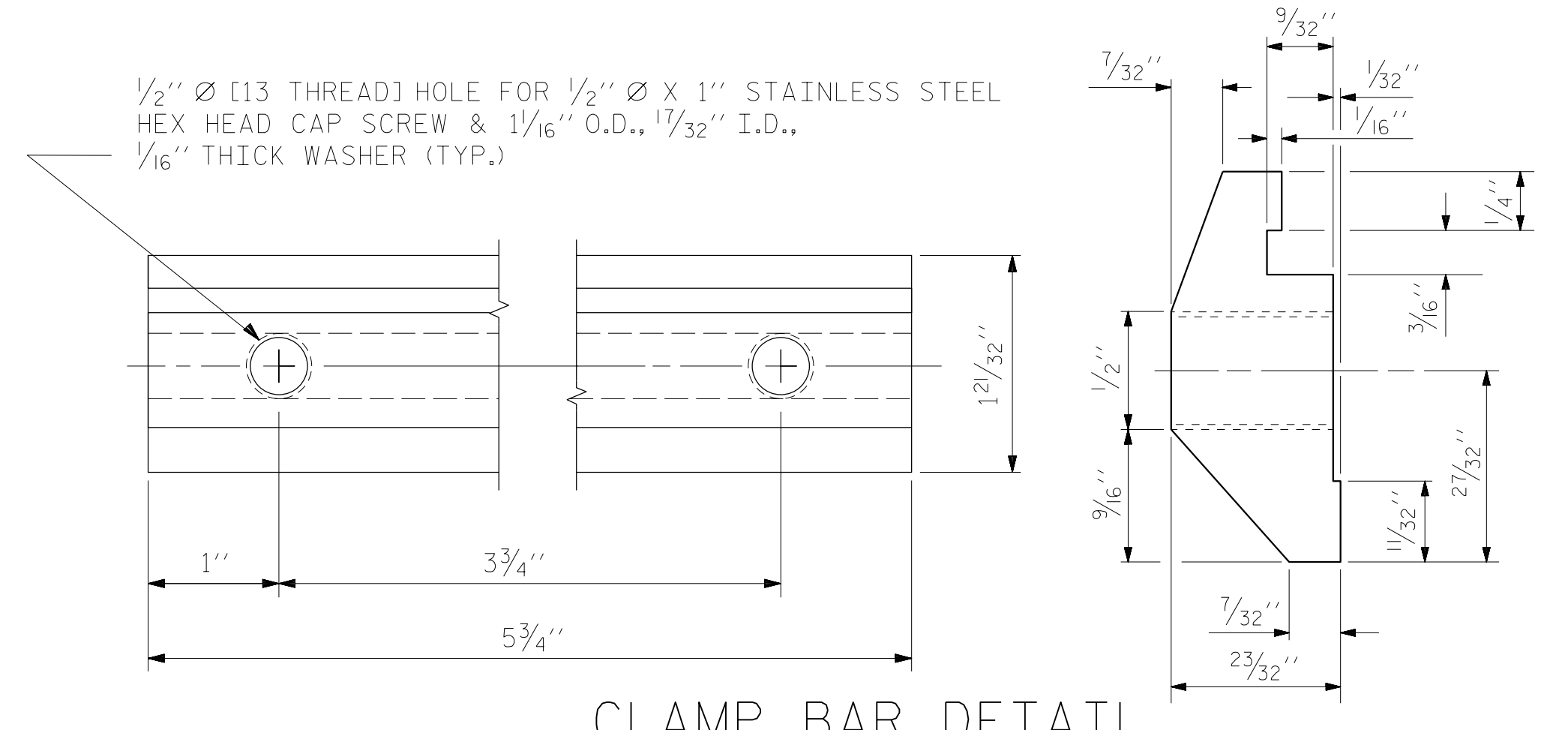
EXPANSION BAR DETAILS



RAIL CAP

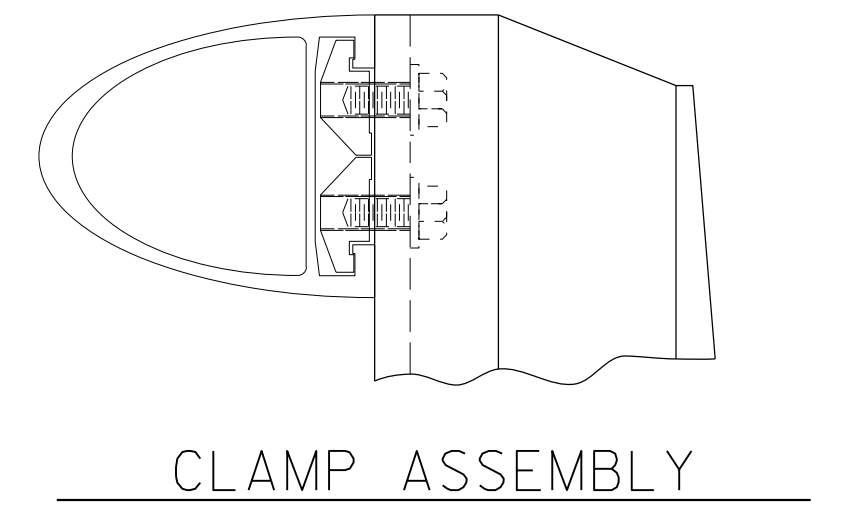


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 5 OF 5

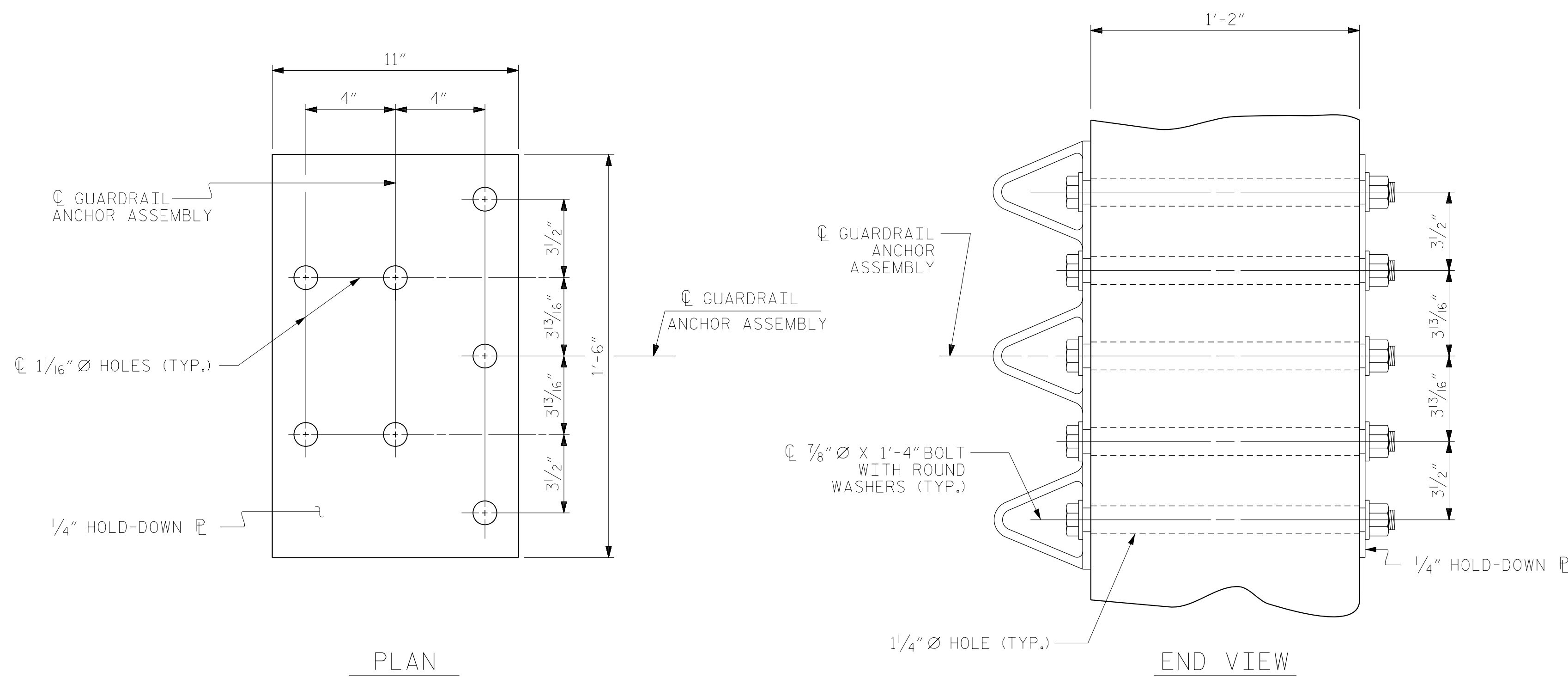
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
2 BAR METAL RAIL
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-24
1			3			TOTAL SHEETS
2			4			43

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY :	TWL	DATE :	01/2020
CHECKED BY :	MRA	DATE :	05/2020
DRAWN BY :	EEM 6/94	REV. 5/1/06R	KMM/GM
CHECKED BY :	RGW 6/94	REV. 10/17/11	MAA/GM
		REV. 12/17	MAA/THC



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

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

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

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

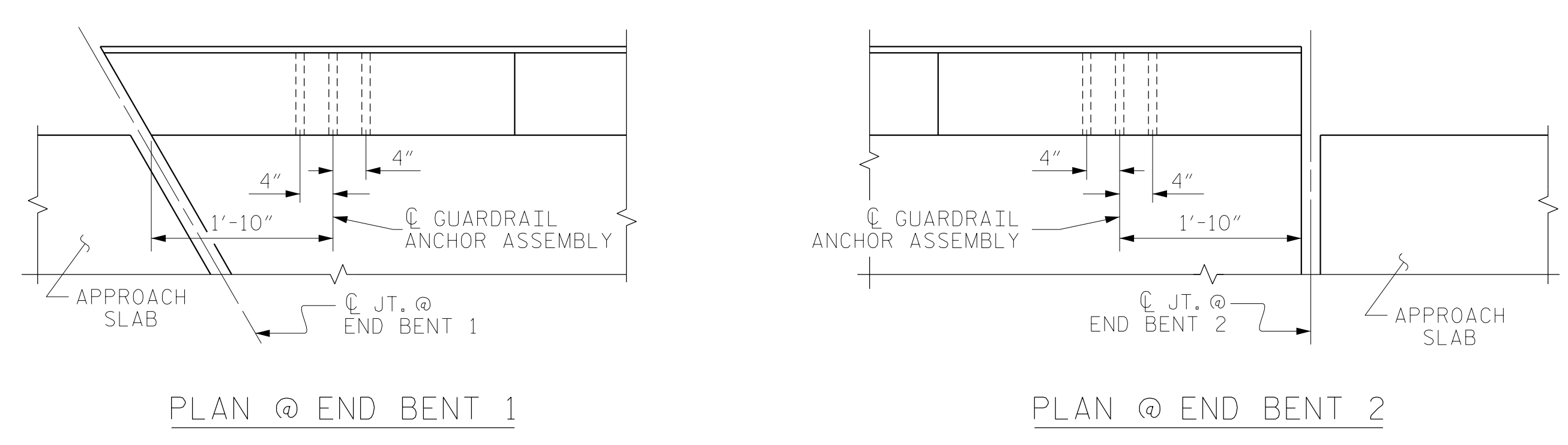
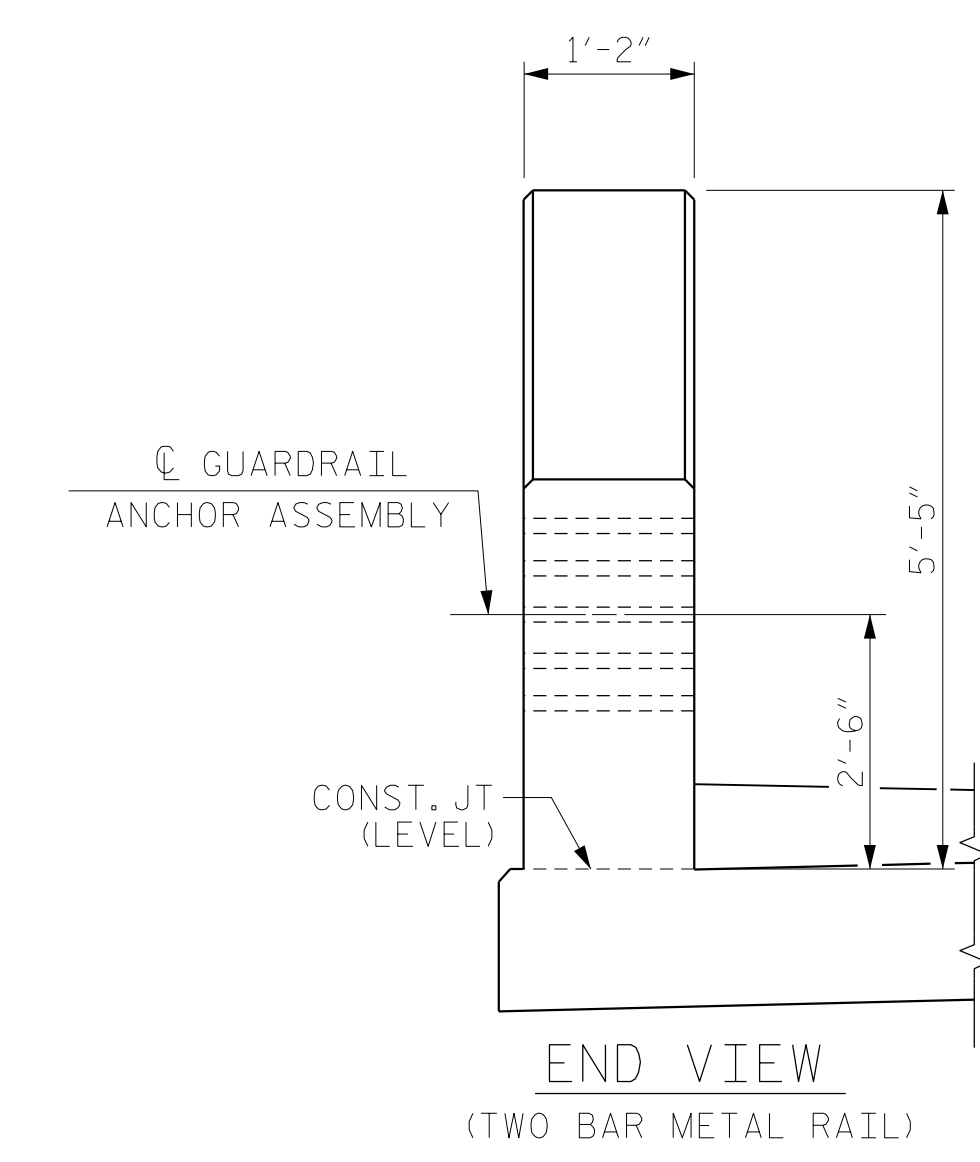
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

SEE, "GUARDRAIL ANCHORAGE FOR BARRIER RAIL" FOR RIGHT SIDE OF BRIDGE.



SKETCH SHOWING POINTS OF ATTACHMENT
* DENOTES LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS LEFT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 43

ASSEMBLED BY : TWL	DATE : 01/2020
CHECKED BY : MRA	DATE : 05/2020
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

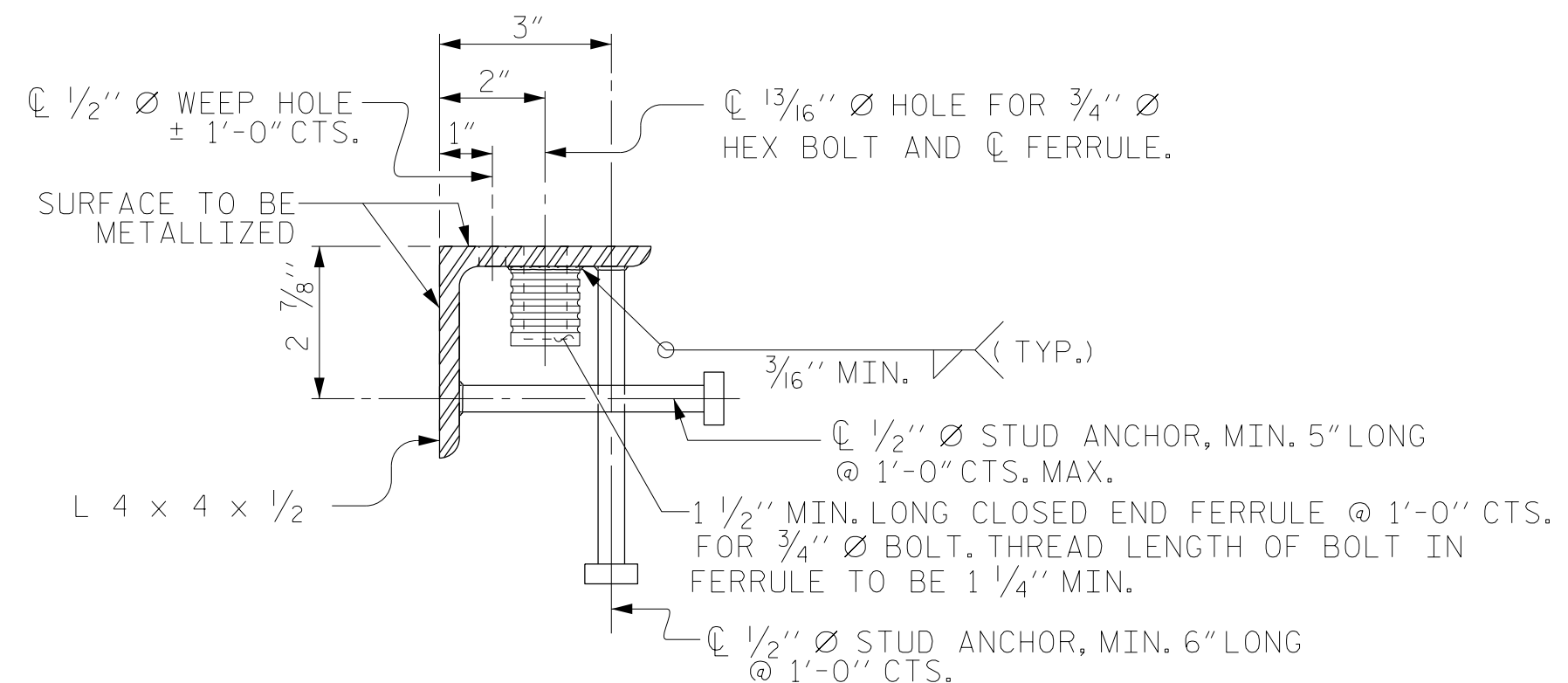
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE, THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

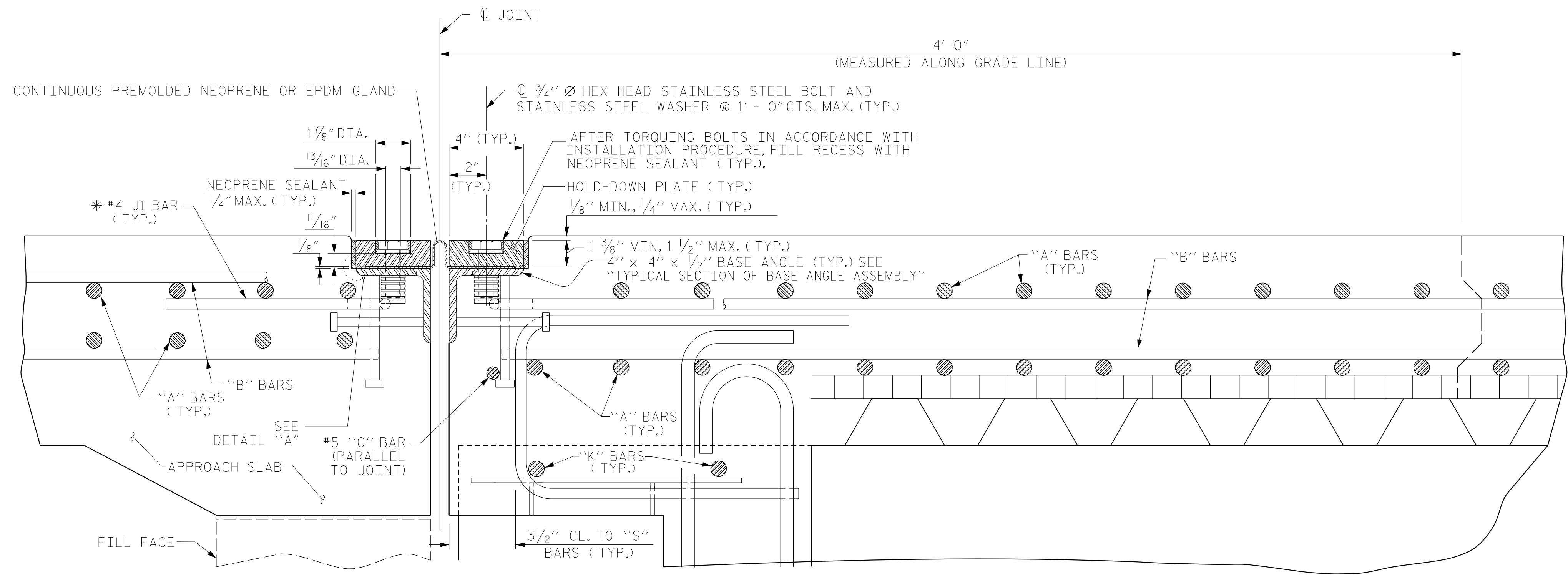
GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

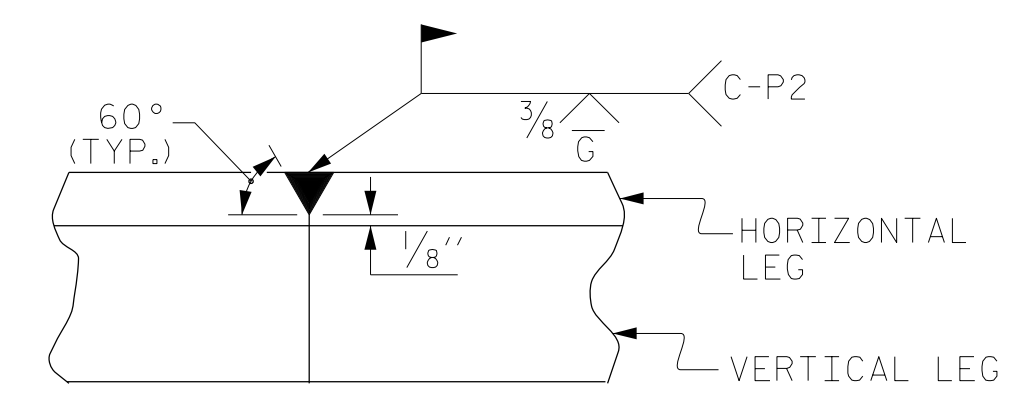
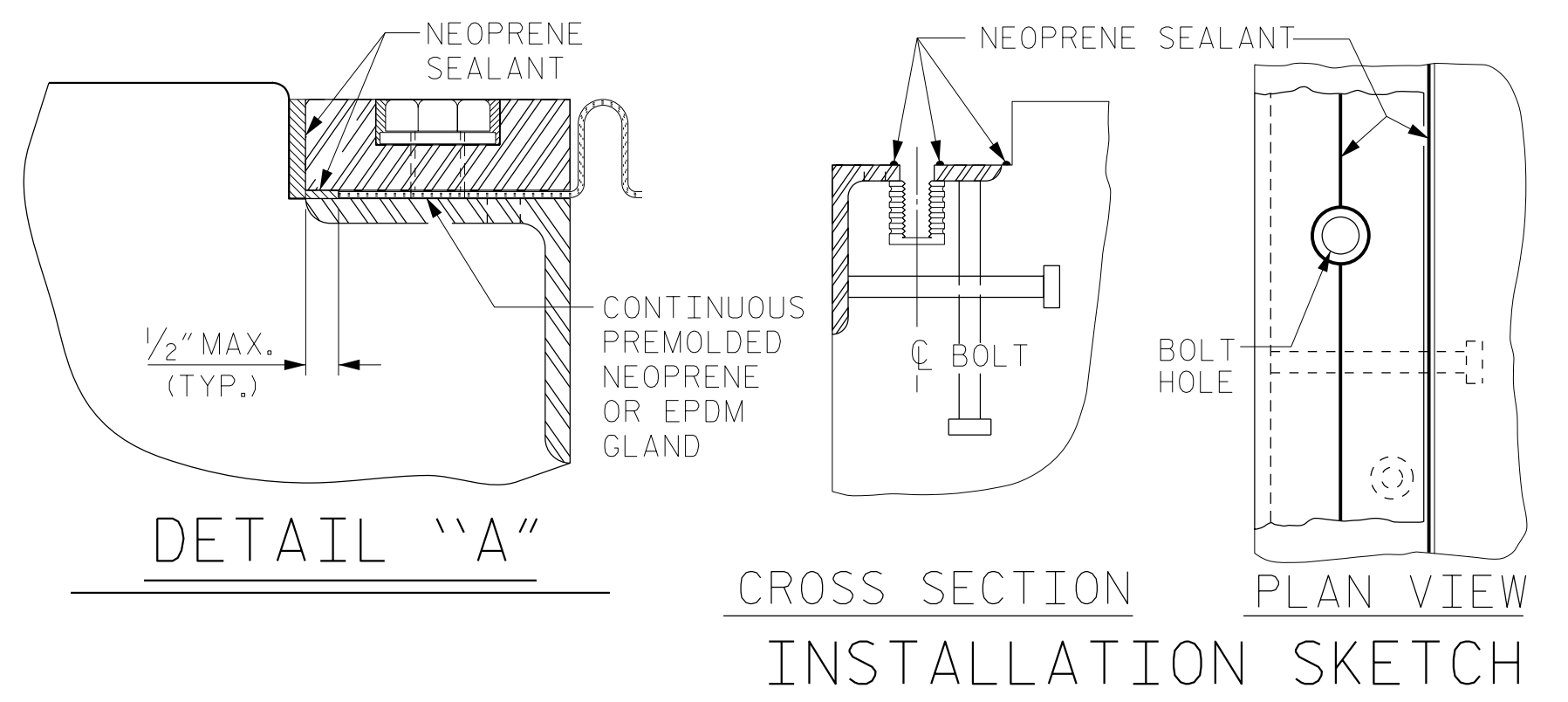
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	65°-00'-00"	3/4"	1 1/2"	1 3/8"	1 1/8"
2	90°-00'-00"	3/4"	1 1/6"	1 3/8"	1 1/8"



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



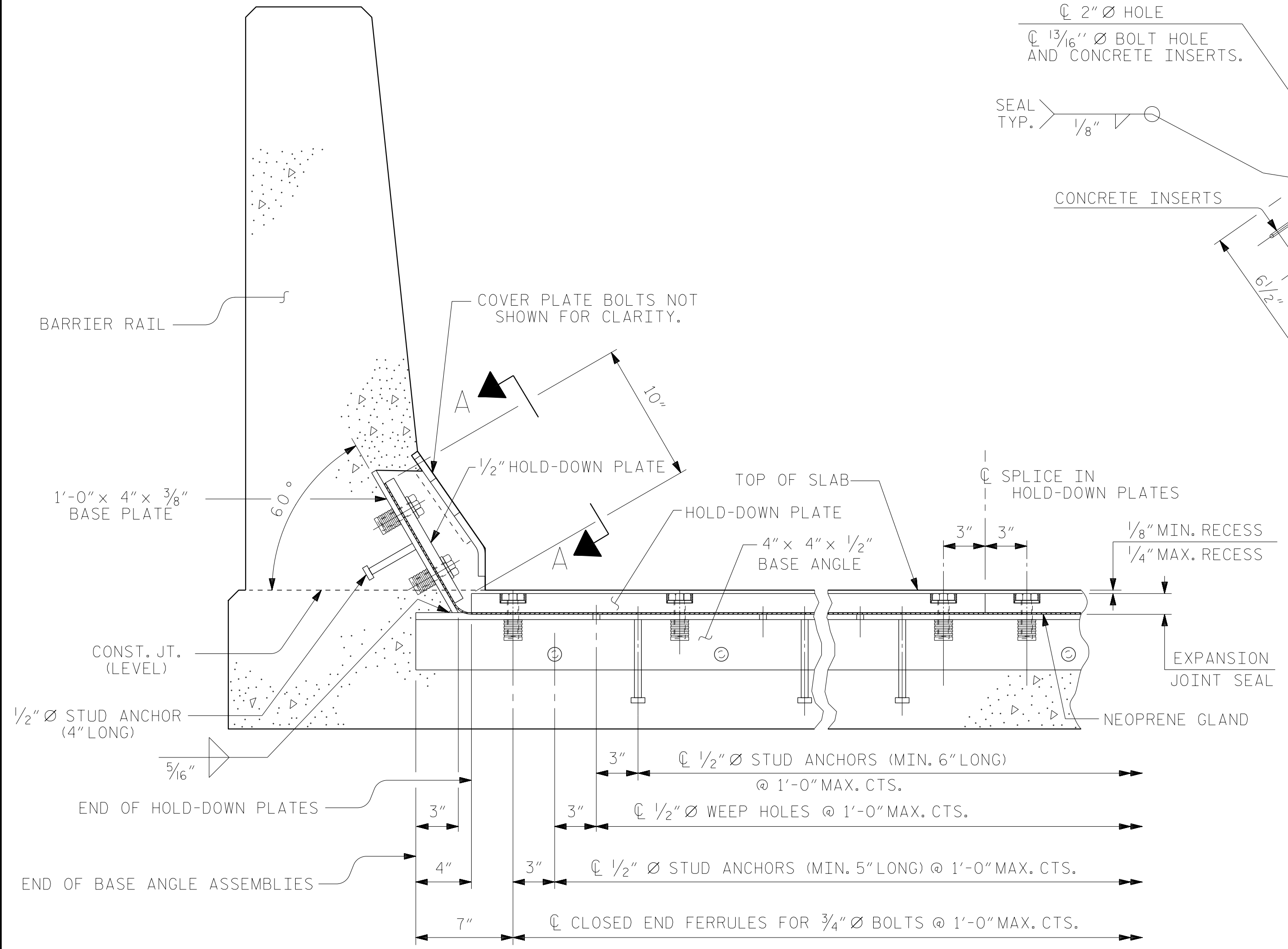
DETAIL- FIELD WELD SPLICE OF BASE ANGLE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

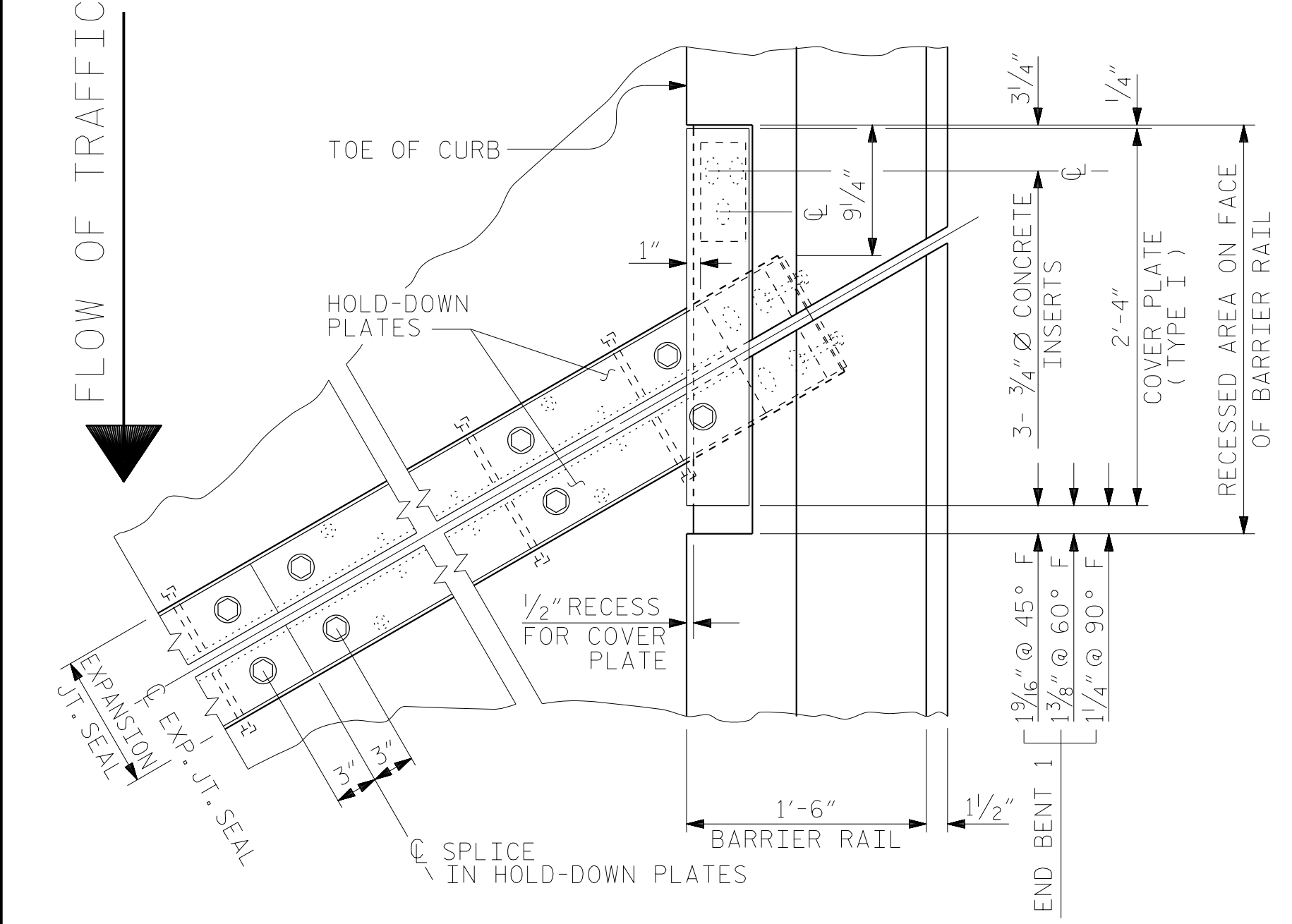
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT SEAL DETAILS
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-26
2			4			TOTAL SHEETS 43

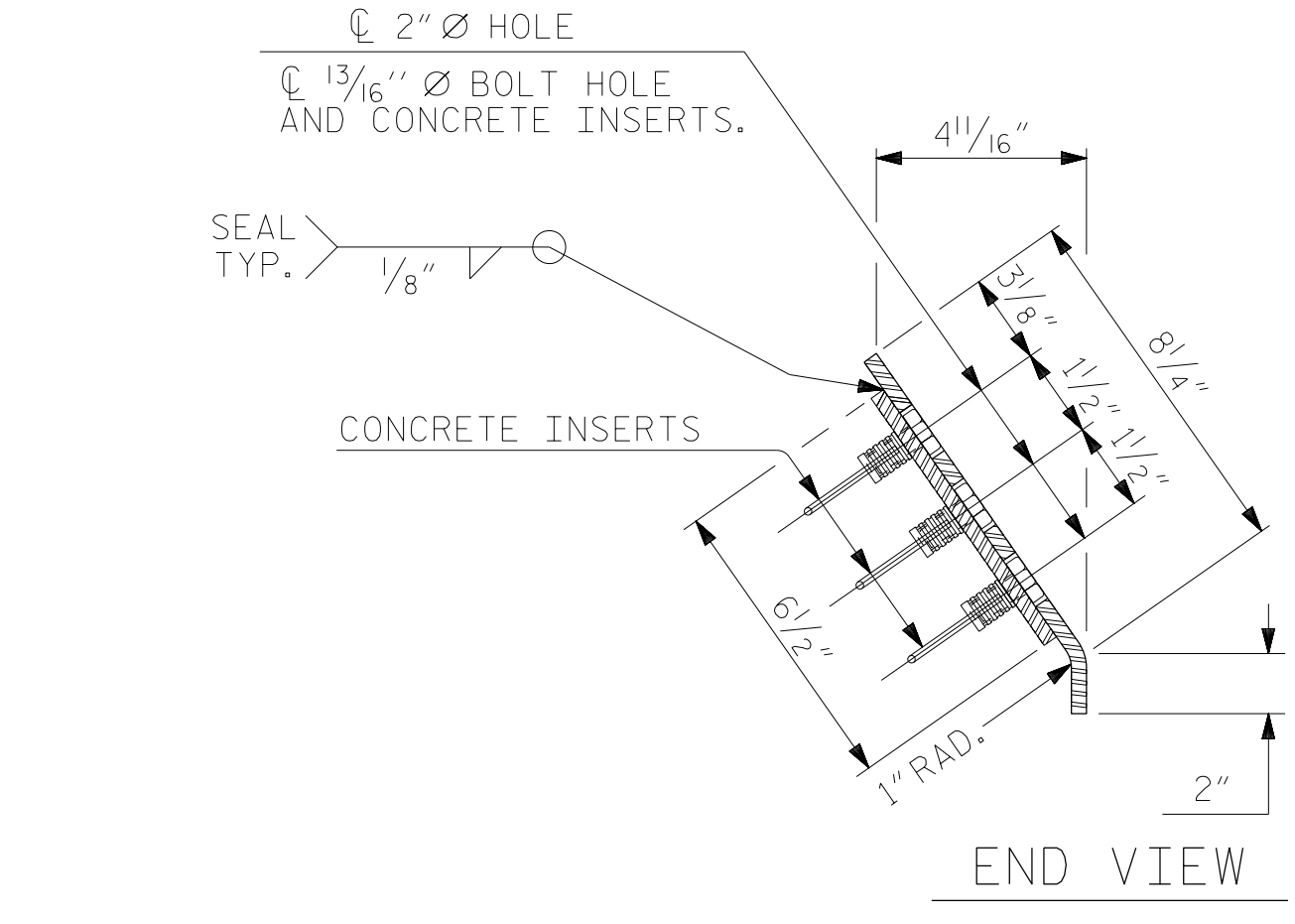
ASSEMBLED BY : NSC	DATE : 02/2020
CHECKED BY : MRA	DATE : 04/2020
DRAWN BY : REK 9/87	REV. 10/17 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/18 MAA/GM



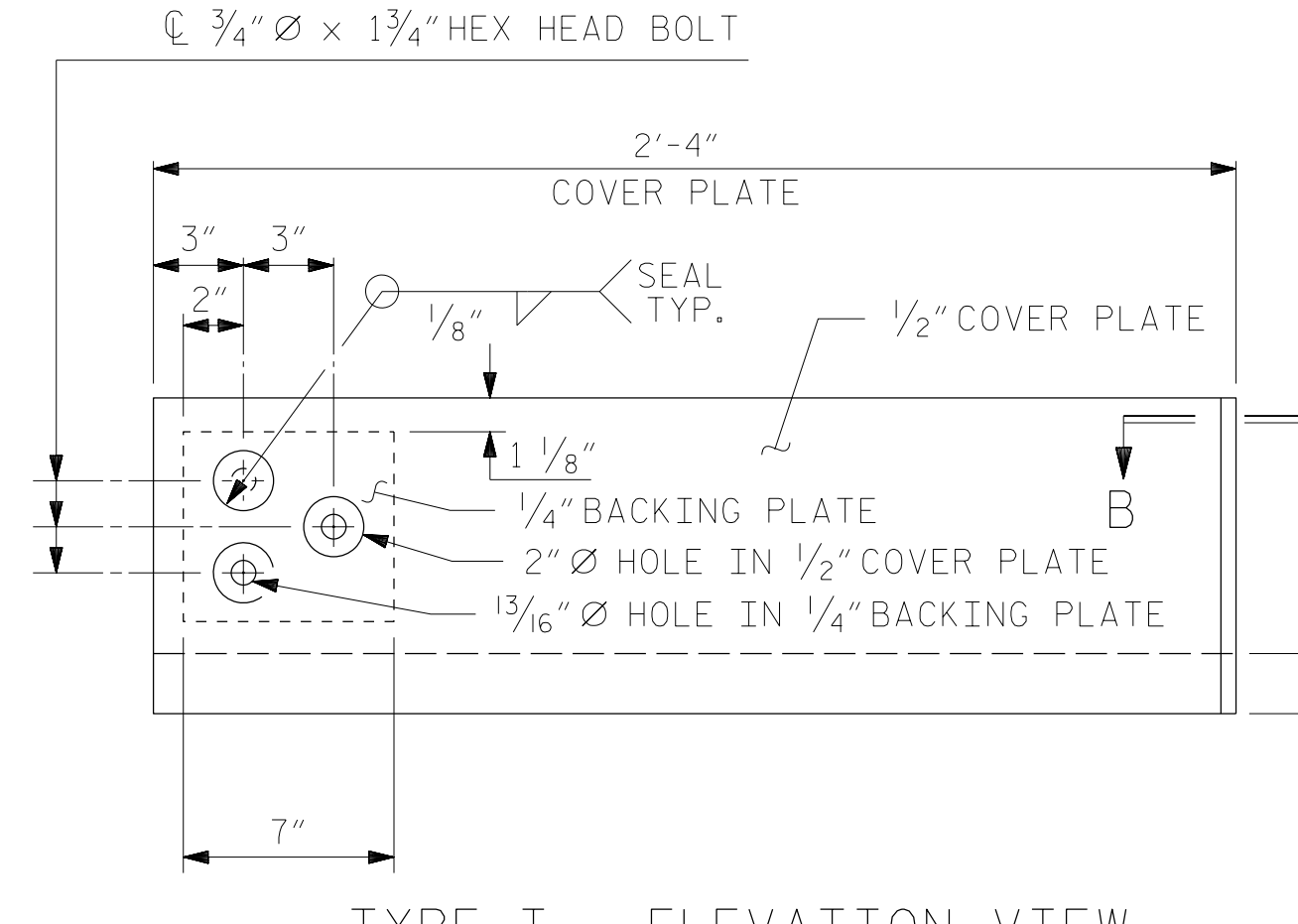
SECTION THRU RAIL NORMAL TO JOINT



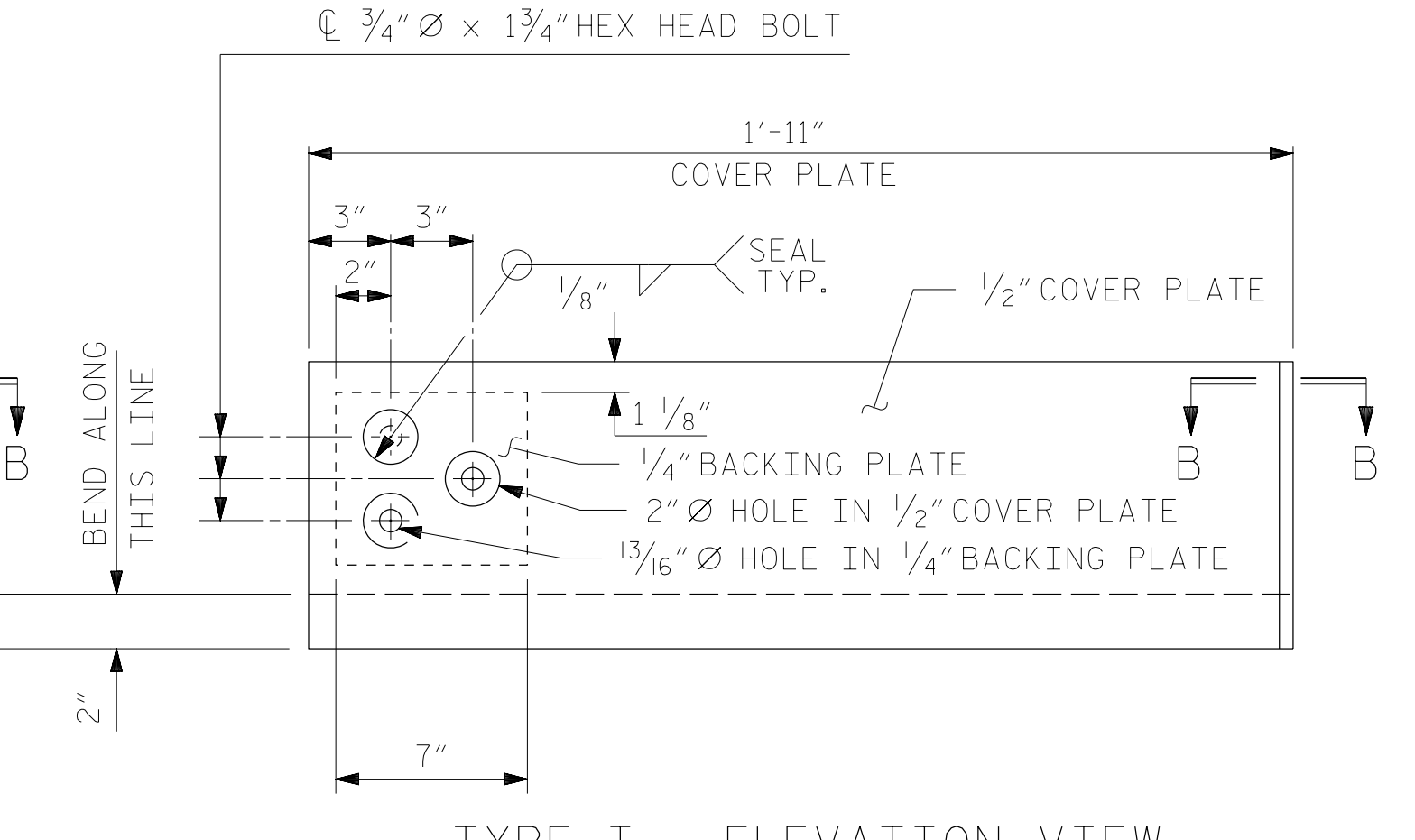
PLAN OF EXPANSION JOINT SEAL - END BENT 1



END VIEW

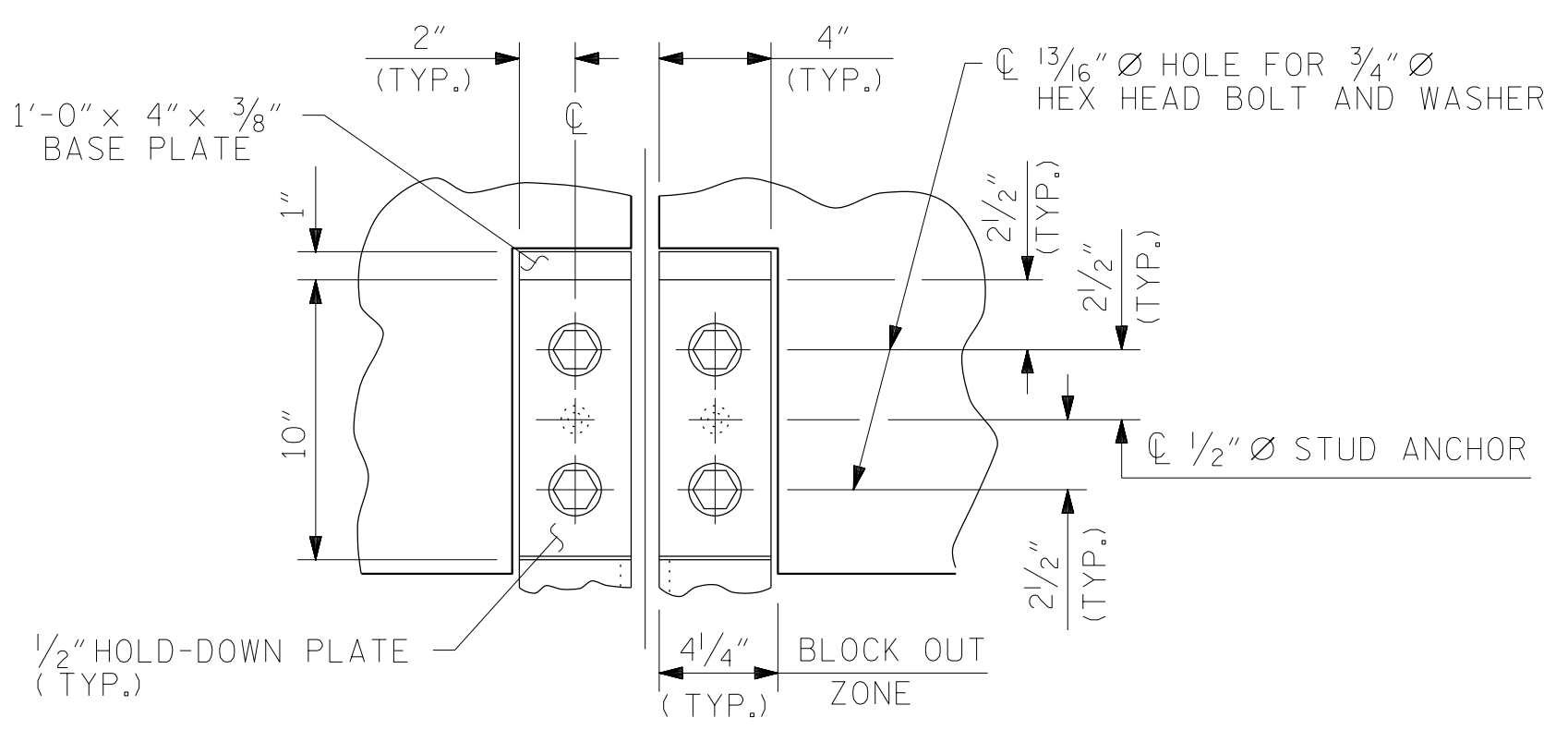


TYPE I - ELEVATION VIEW @ END BENT 1

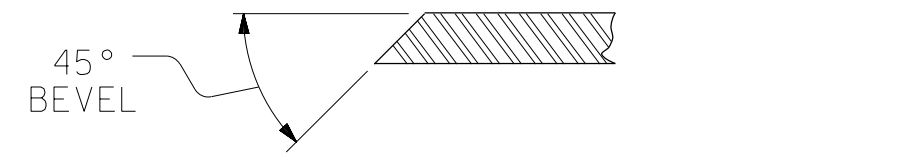


TYPE I - ELEVATION VIEW @ END BENT 2

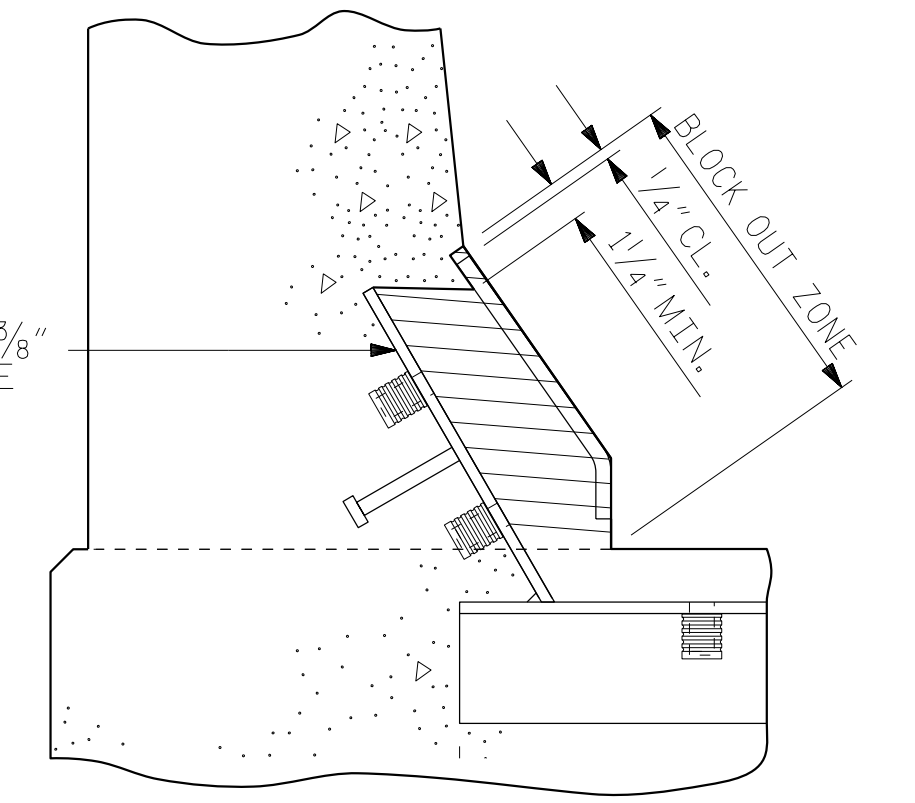
COVER PLATE DETAILS



SECTION A - A

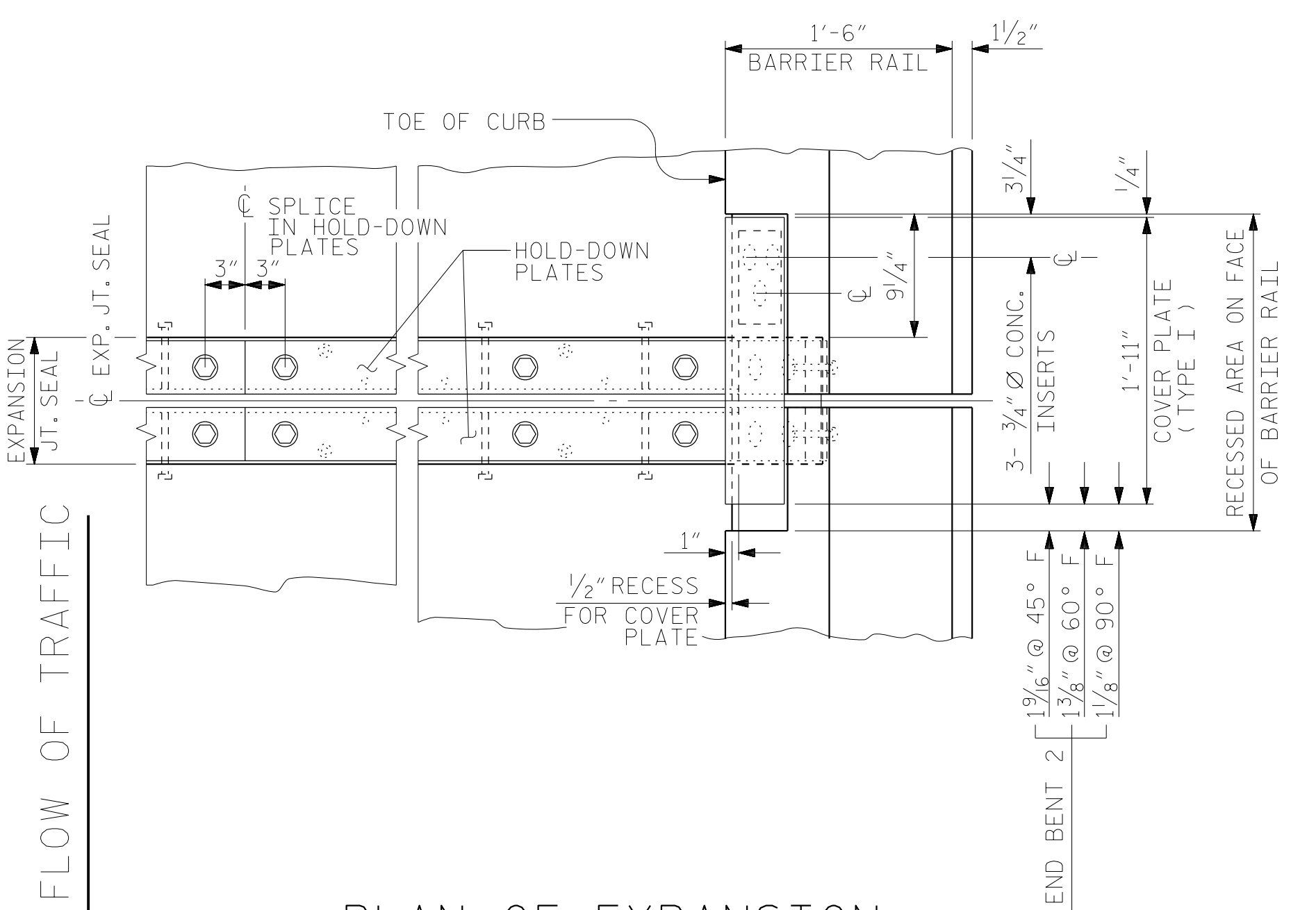


SECTION B - B

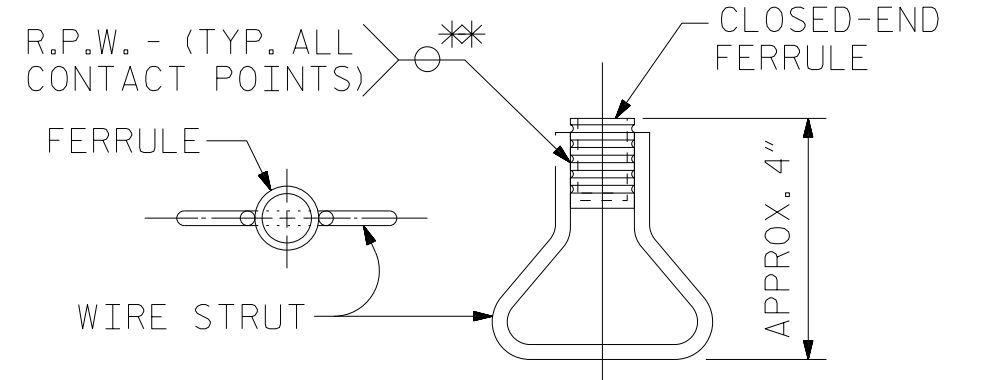


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL - END BENT 2



CONCRETE INSERT PLAN ELEVATION

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

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 4



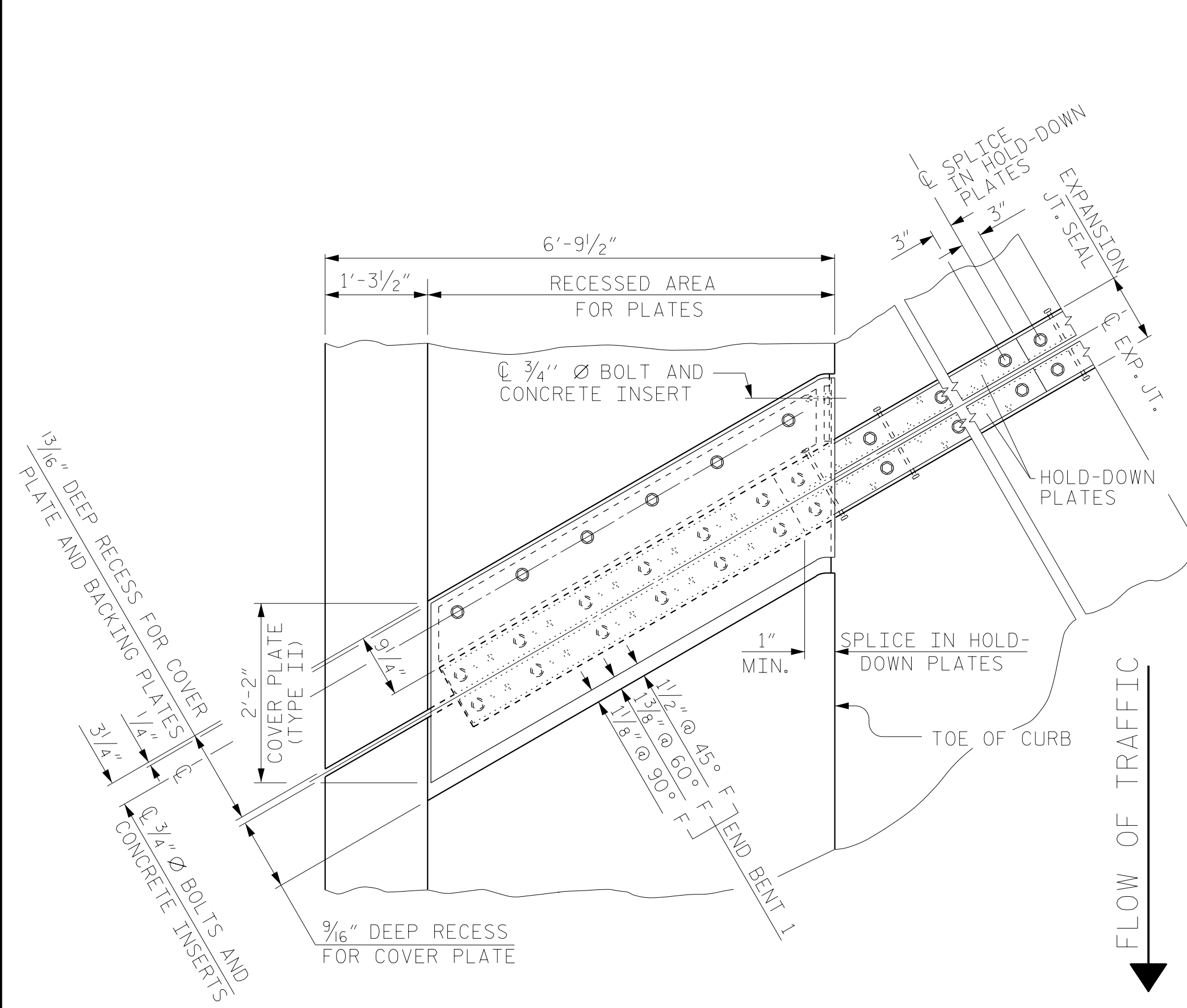
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 EXPANSION JOINT SEAL DETAILS
 FOR BARRIER RAIL
 LEFT LANE

DRAWN BY :	NSC	DATE :	02/2020
CHECKED BY :	MRA	DATE :	04/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

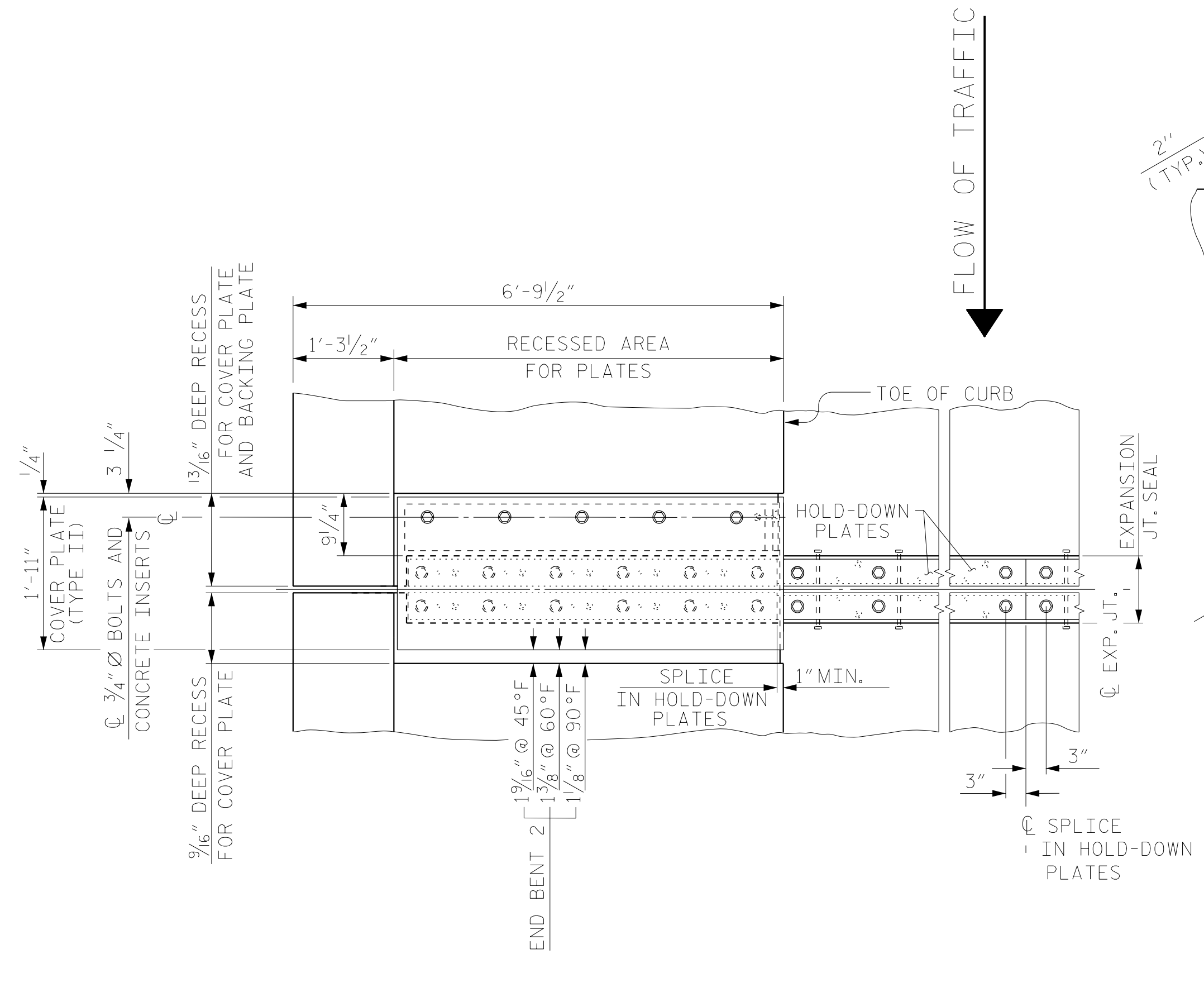
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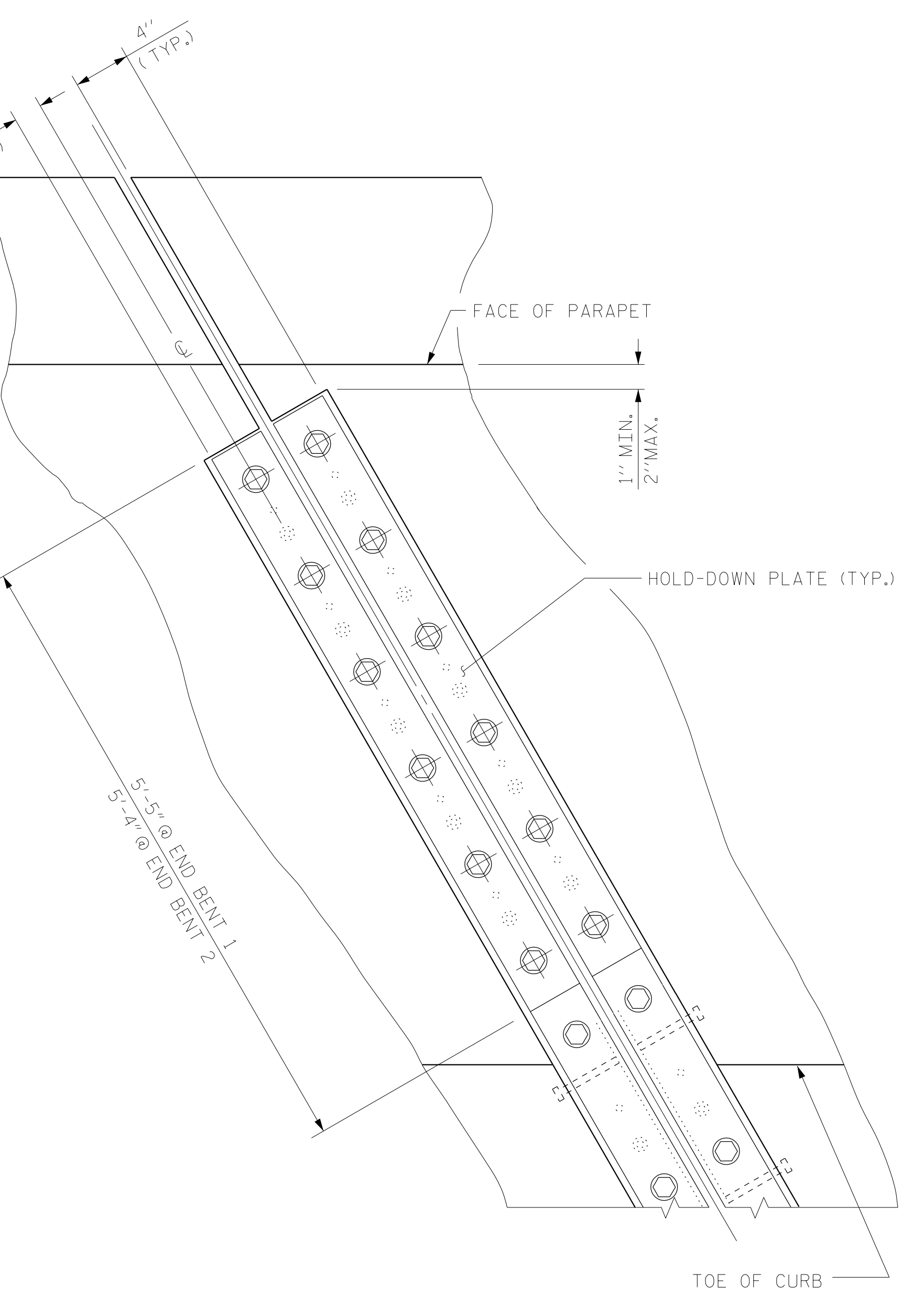
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			43



PLAN OF EXPANSION JOINT SEAL - END BENT 1



PLAN OF EXPANSION JOINT SEAL - END BENT 2

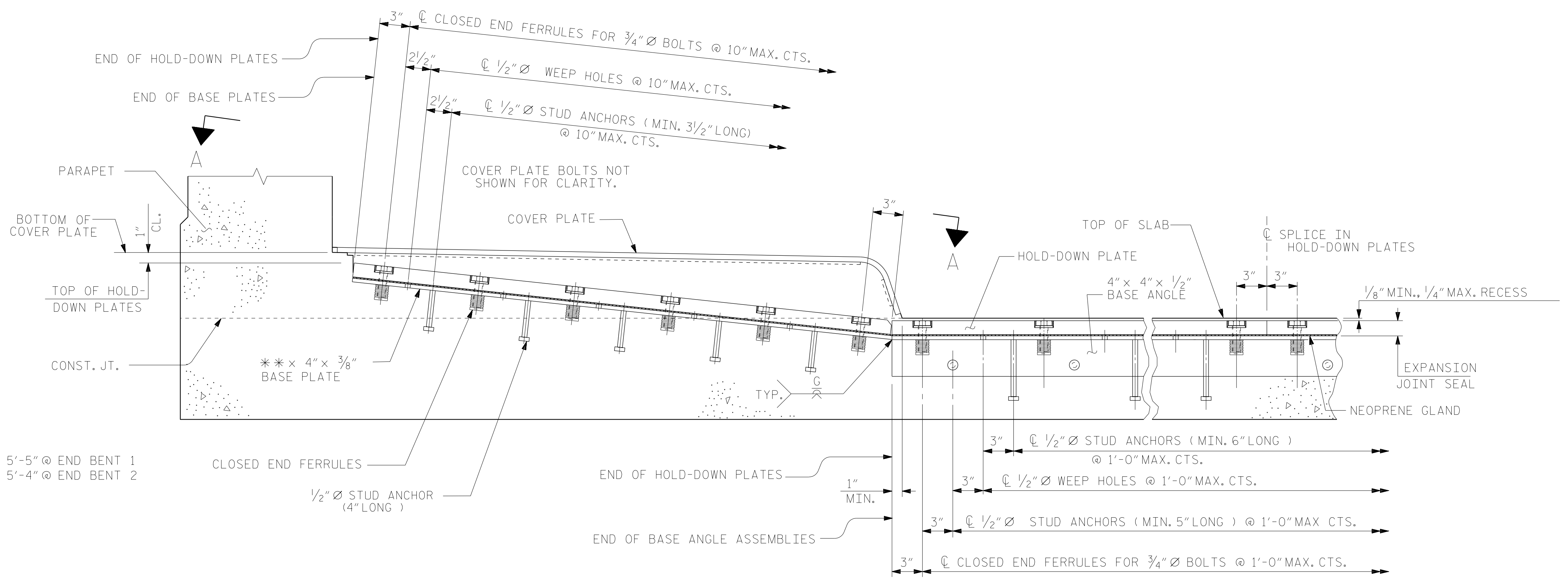


SECTION A - A

END BENT 1 SHOWN
END BENT 2 NORMAL TO ALIGNMENT

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 4



SECTION THRU SIDEWALK NORMAL TO JOINT

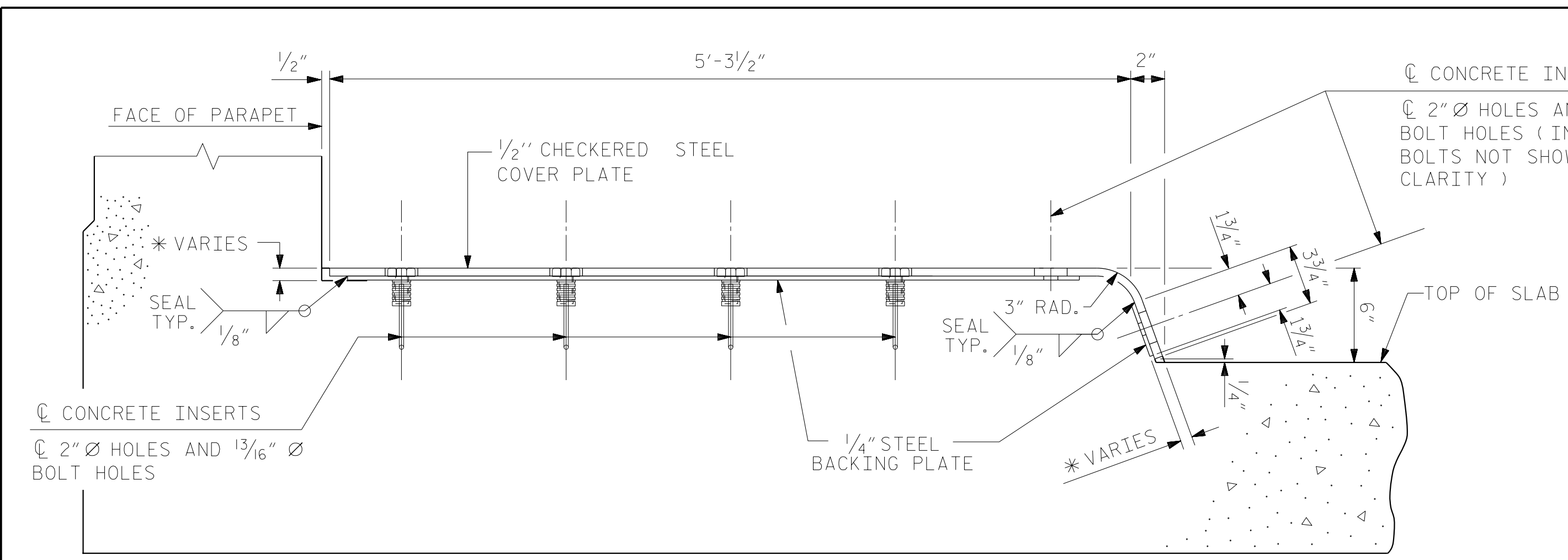
ASSEMBLED BY : NSC	DATE : 02/2020
CHECKED BY : MRA	DATE : 04/2020
DRAWN BY : REK 10/87	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THG

11/24/2021
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FINAL UNLESS ALL
SIGNATURES COMPLETED

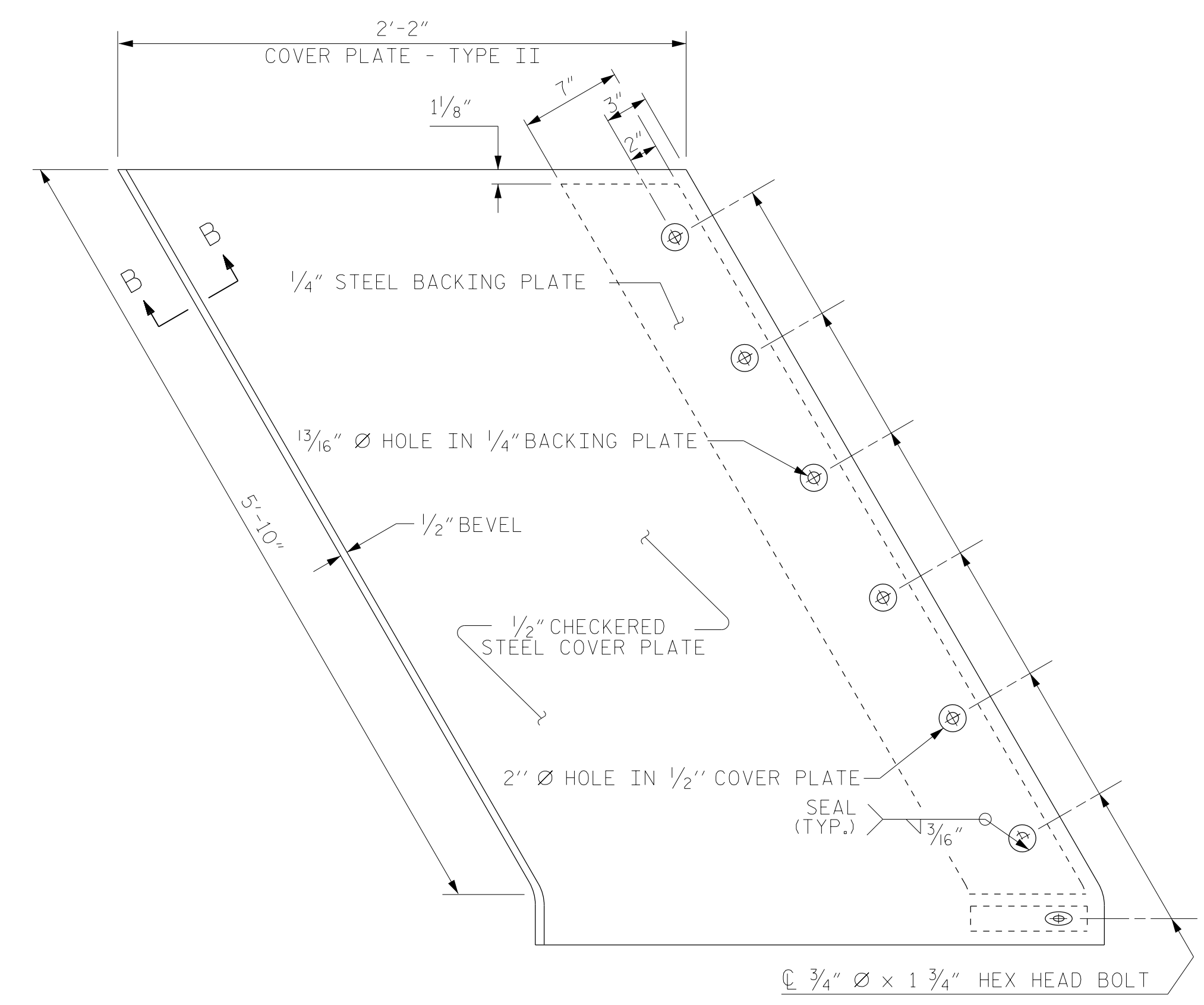
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S1-28
STANDARD EXPANSION JOINT SEAL DETAILS FOR SIDEWALK LEFT LANE						TOTAL SHEETS 43
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

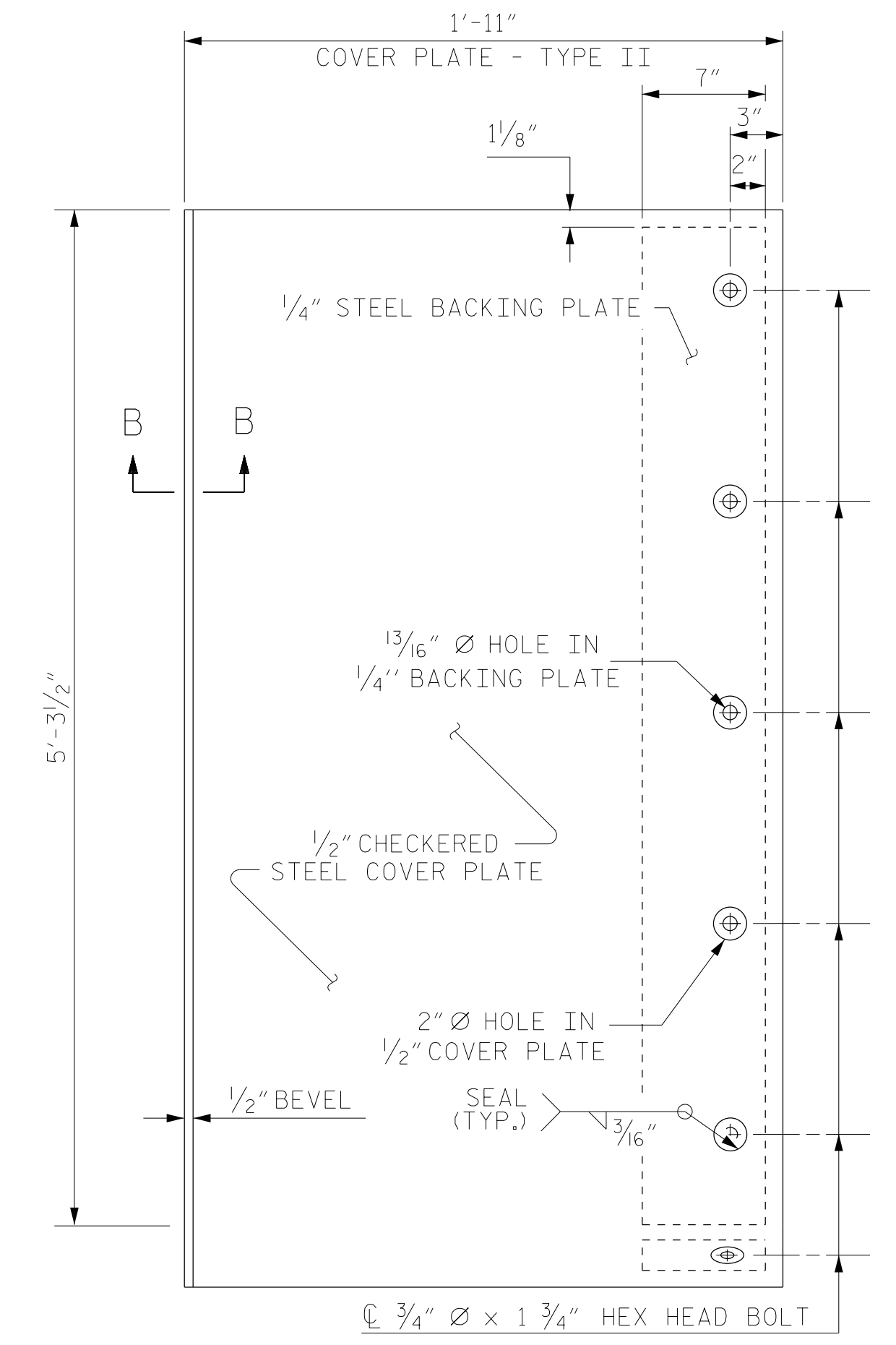


END VIEW
(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:
 1 3/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

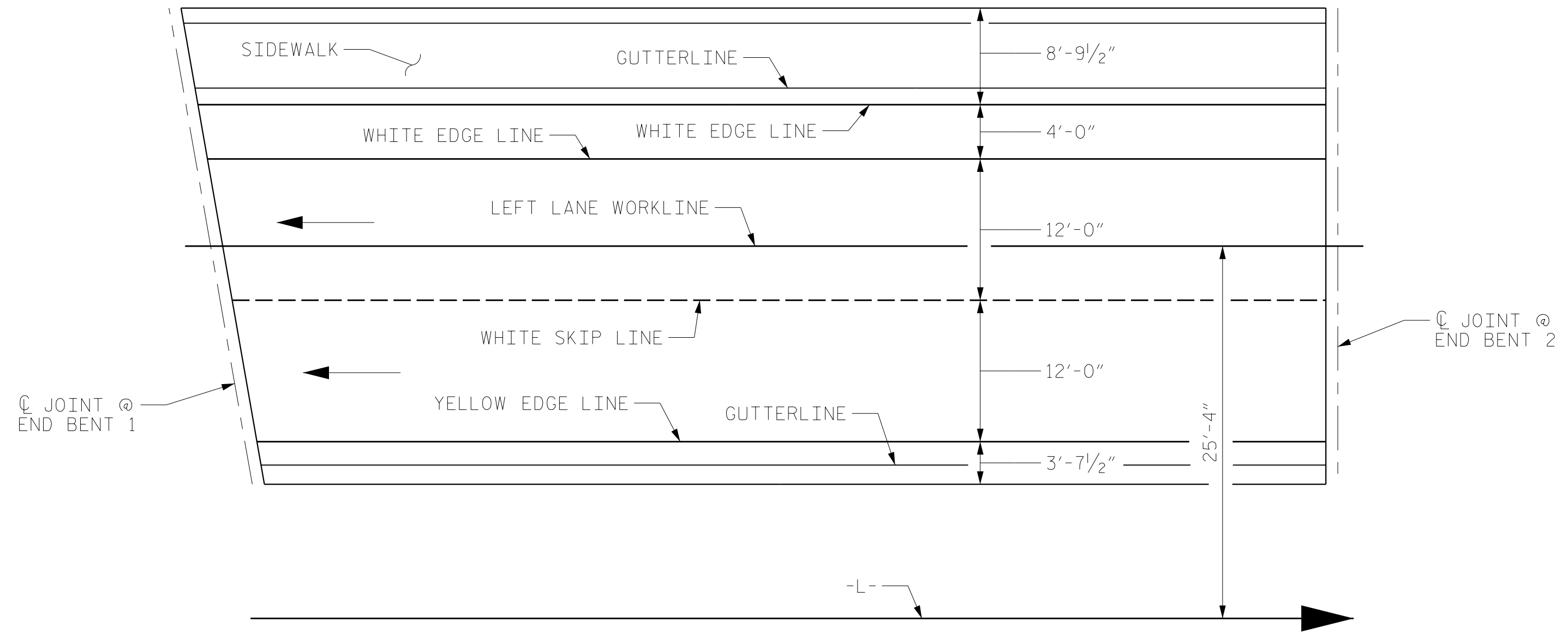


TYPE II - PLAN VIEW
END BENT 1

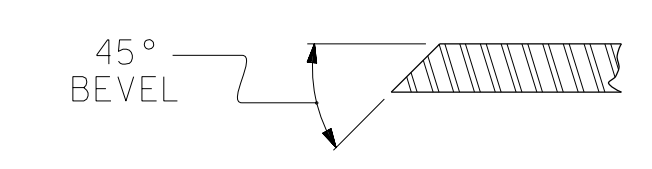


TYPE II - PLAN VIEW
END BENT 2

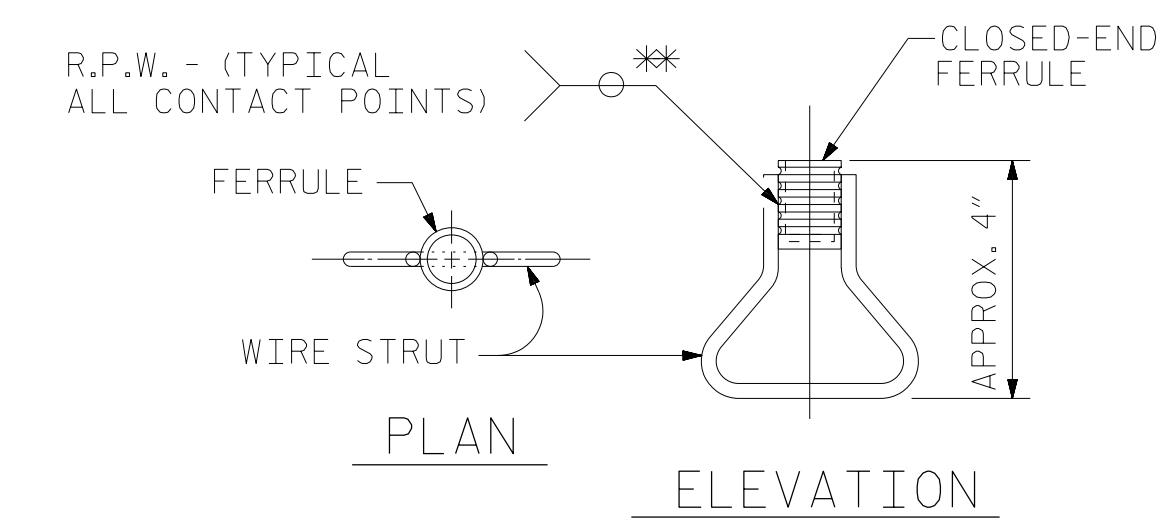
COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

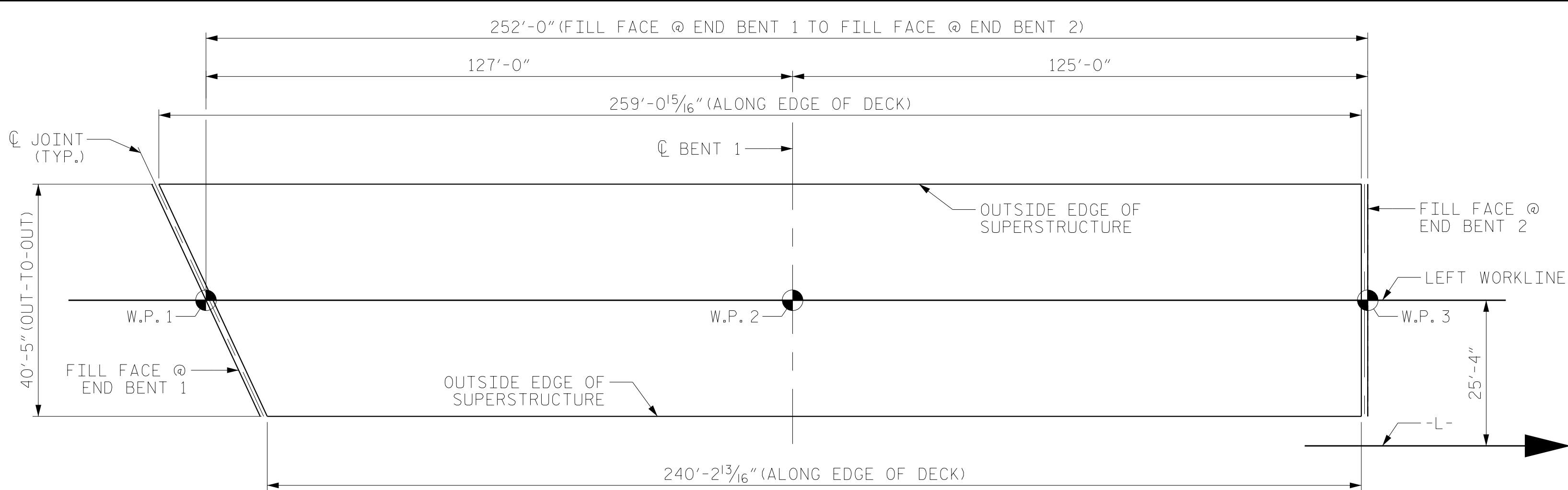
SHEET 4 OF 4

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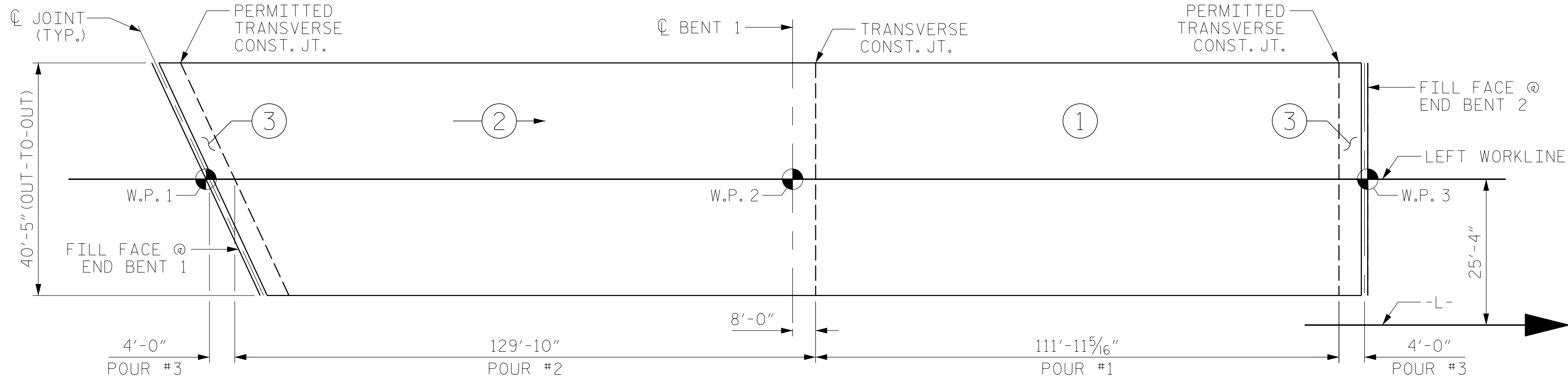
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29
1			3			TOTAL SHEETS 43
2			4			

ASSEMBLED BY : NSC	DATE : 02/2020
CHECKED BY : MRA	DATE : 04/2020
DRAWN BY : REK 10/87	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

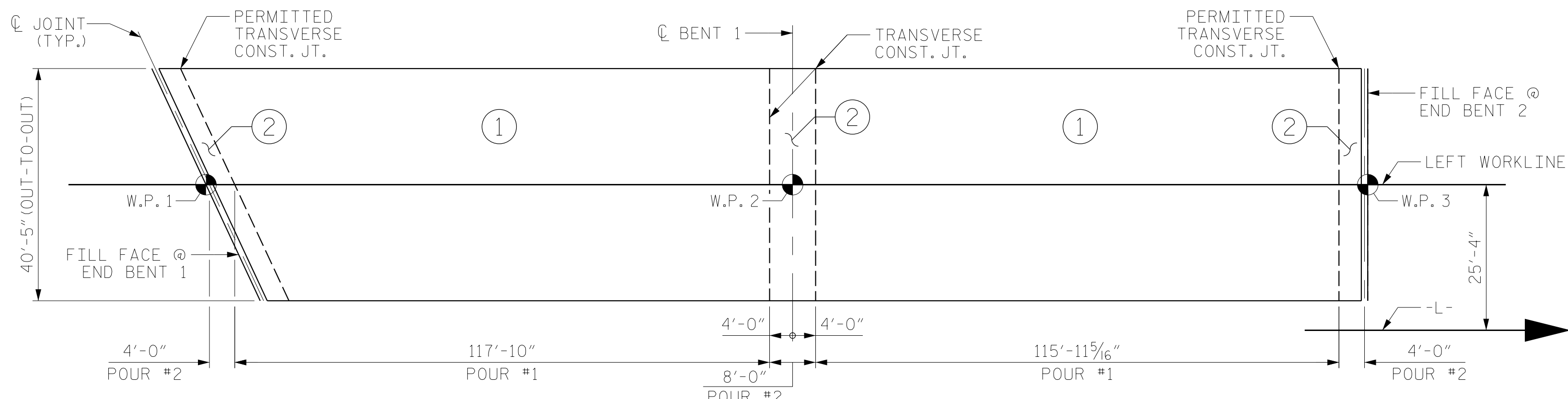
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LAYOUT FOR COMPUTING AREA OF REINFORCING CONCRETE DECK SLAB
(SQ. FT. = 10,090)

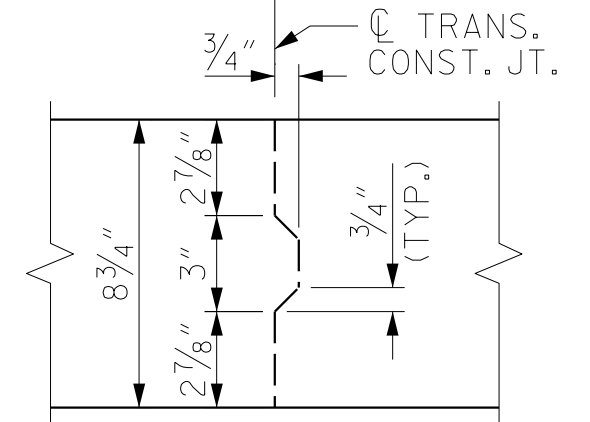


POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR ② CANNOT BE STARTED UNTIL ADJACENT POUR ① REACHES A MINIMUM STRENGTH OF 3,000 PSI.



TRANSVERSE CONSTRUCTION JOINT DETAIL

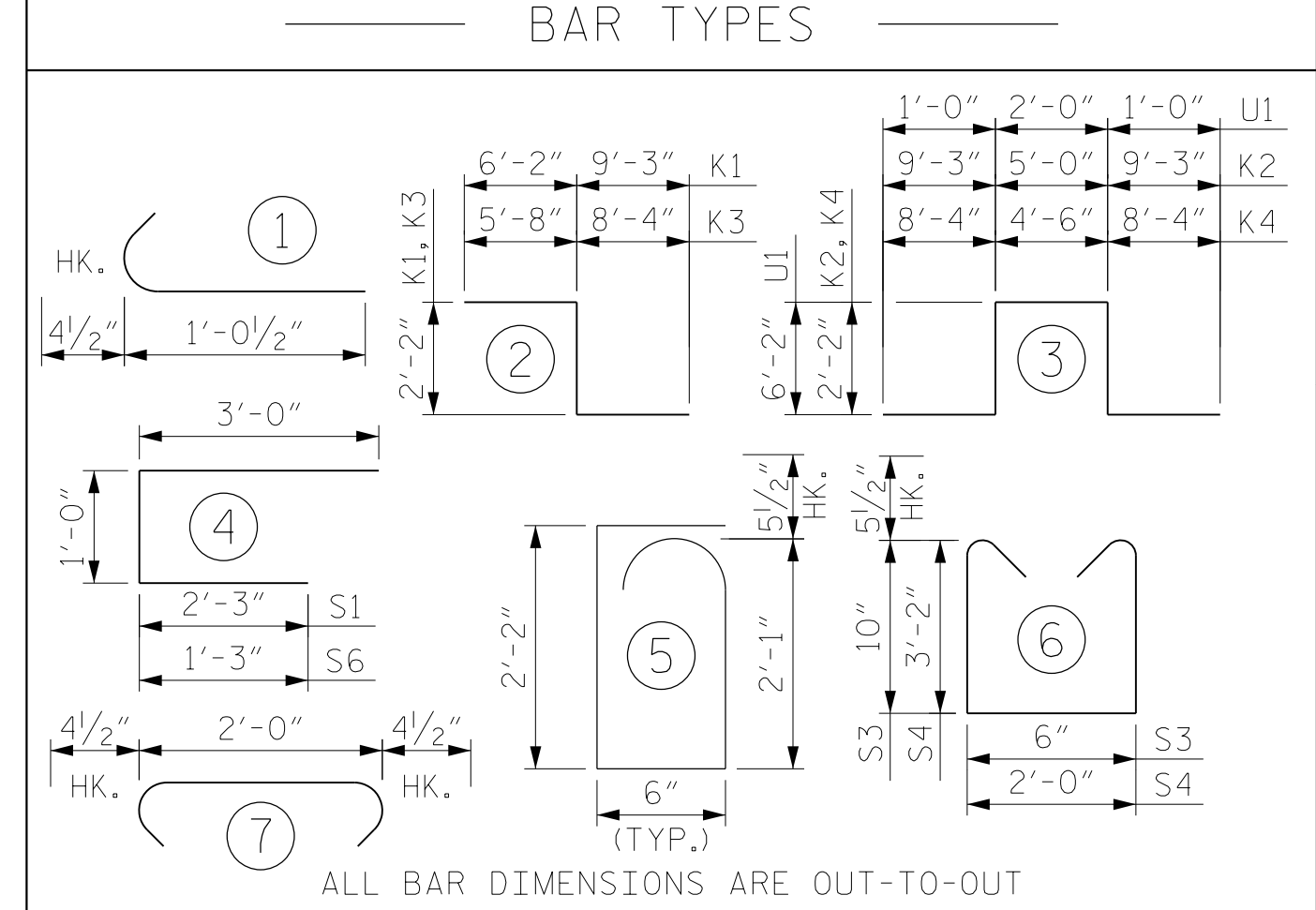
REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCEMENT SHALL BE CONTINUOUS THROUGH JOINT.

Table with 5 columns: BAR SIZE, SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL, APPROACH SLABS, and PARAPETS AND BARRIER RAILS. It provides minimum splice lengths for epoxy coated and uncoated bars.

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

REINFORCING BAR SCHEDULE

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
A101	442	#5	STR	40'-1"	18479	A230	1	#5	STR	34'-6"
A102	1	#5	STR	2'-0"	2	A231	1	#5	STR	35'-8"
A103	1	#5	STR	3'-2"	3	A232	1	#5	STR	36'-10"
A104	1	#5	STR	4'-4"	5	A233	1	#5	STR	38'-0"
A105	1	#5	STR	5'-6"	6	A234	1	#5	STR	39'-2"
A106	1	#5	STR	6'-8"	7					
A107	1	#5	STR	7'-10"	8	*B1	98	#4	STR	28'-9"
A108	1	#5	STR	9'-0"	9	*B2	49	#6	STR	60'-0"
A109	1	#5	STR	10'-2"	11	*B3	48	#6	STR	37'-10"
A110	1	#5	STR	11'-4"	12	*B4	49	#6	STR	28'-6"
A111	1	#5	STR	12'-6"	13	*B5	147	#4	STR	29'-0"
A112	1	#5	STR	13'-8"	14	*B6	1	#4	STR	40'-0"
A113	1	#5	STR	14'-10"	15	*B7	1	#4	STR	39'-8"
A114	1	#5	STR	15'-11"	17	*B8	1	#4	STR	39'-3"
A115	1	#5	STR	17'-1"	18	*B9	1	#4	STR	38'-10"
A116	1	#5	STR	18'-3"	19	*B10	1	#4	STR	38'-6"
A117	1	#5	STR	19'-5"	20	*B11	1	#4	STR	38'-1"
A118	1	#5	STR	20'-7"	21	*B12	1	#4	STR	37'-8"
A119	1	#5	STR	21'-9"	23	*B13	1	#4	STR	37'-4"
A120	1	#5	STR	22'-11"	24	*B14	1	#4	STR	36'-11"
A121	1	#5	STR	24'-1"	25	*B15	1	#4	STR	36'-6"
A122	1	#5	STR	25'-3"	26	*B16	1	#4	STR	36'-2"
A123	1	#5	STR	26'-5"	28	*B17	1	#4	STR	35'-9"
A124	1	#5	STR	27'-7"	29	*B18	1	#4	STR	35'-4"
A125	1	#5	STR	28'-9"	30	*B19	1	#4	STR	35'-0"
A126	1	#5	STR	29'-11"	31	*B20	1	#4	STR	34'-7"
A127	1	#5	STR	31'-1"	32	*B21	1	#4	STR	34'-2"
A128	1	#5	STR	32'-3"	34	*B22	1	#4	STR	33'-10"
A129	1	#5	STR	33'-5"	35	*B23	1	#4	STR	33'-5"
A130	1	#5	STR	34'-6"	36	*B24	1	#4	STR	33'-0"
A131	1	#5	STR	35'-8"	37	*B25	1	#4	STR	32'-7"
A132	1	#5	STR	36'-10"	38	*B26	1	#4	STR	32'-3"
A133	1	#5	STR	38'-0"	40	*B27	1	#4	STR	31'-10"
A134	1	#5	STR	39'-2"	41	*B28	1	#4	STR	31'-6"
A135	3	#6	STR	19'-3"	87	*B29	1	#4	STR	31'-1"
						*B30	1	#4	STR	30'-8"
						*B31	1	#4	STR	30'-4"
						*B32	1	#4	STR	29'-11"
						*B33	1	#4	STR	29'-6"
						*B34	1	#4	STR	29'-2"
						*B35	1	#4	STR	28'-9"
						*B36	1	#4	STR	28'-4"
						*B37	1	#4	STR	28'-0"
						*B38	1	#4	STR	27'-7"
						*B39	1	#4	STR	27'-2"
						*B40	1	#4	STR	26'-10"
						*B41	1	#4	STR	26'-5"
						*B42	1	#4	STR	26'-0"
						*B43	1	#4	STR	25'-8"
						*B44	1	#4	STR	25'-3"
						*B45	1	#4	STR	24'-10"
						*B46	1	#4	STR	24'-6"
						*B47	1	#4	STR	24'-1"
						*B48	1	#4	STR	23'-8"
						*B49	1	#4	STR	23'-4"
						*B50	1	#4	STR	22'-11"
						*B51	1	#4	STR	22'-6"
						*B52	1	#4	STR	22'-2"
						*B53	1	#4	STR	21'-9"
						*B54	1	#4	STR	21'-4"
						B55	30	#5	STR	60'-0"
						B56	57	#5	STR	60'-0"
						B57	57	#5	STR	27'-8"
						B58	60	#5	STR	42'-7"
						B59	10	#5	STR	33'-3"



ALL BAR DIMENSIONS ARE OUT-TO-OUT
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

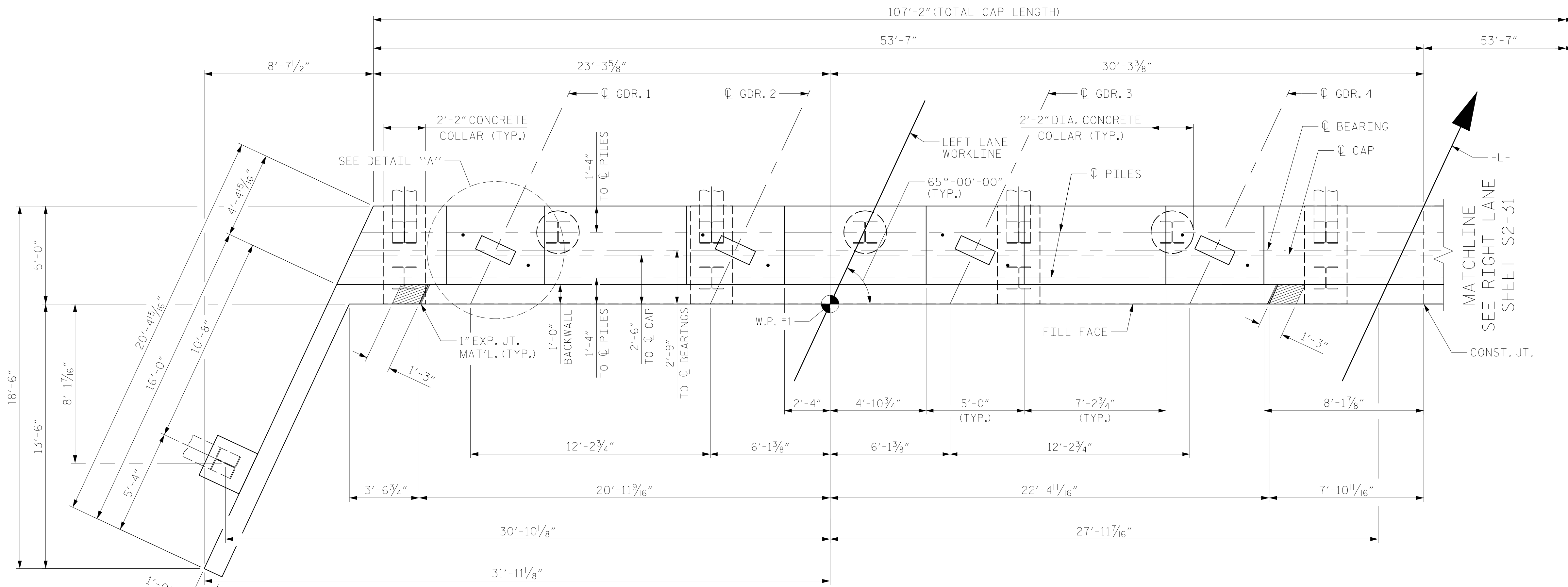
PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

Professional Engineer Seal for Leon Bollinger, License No. 48277, State of North Carolina. Date: 1/14/2022. RS&H logo and address: RS&H Architects-Engineers-Planners, Inc. 8521 Six Forks Road, Suite 400, 919-926-4100 FAX 919-846-9080.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
BILL OF MATERIAL					
LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

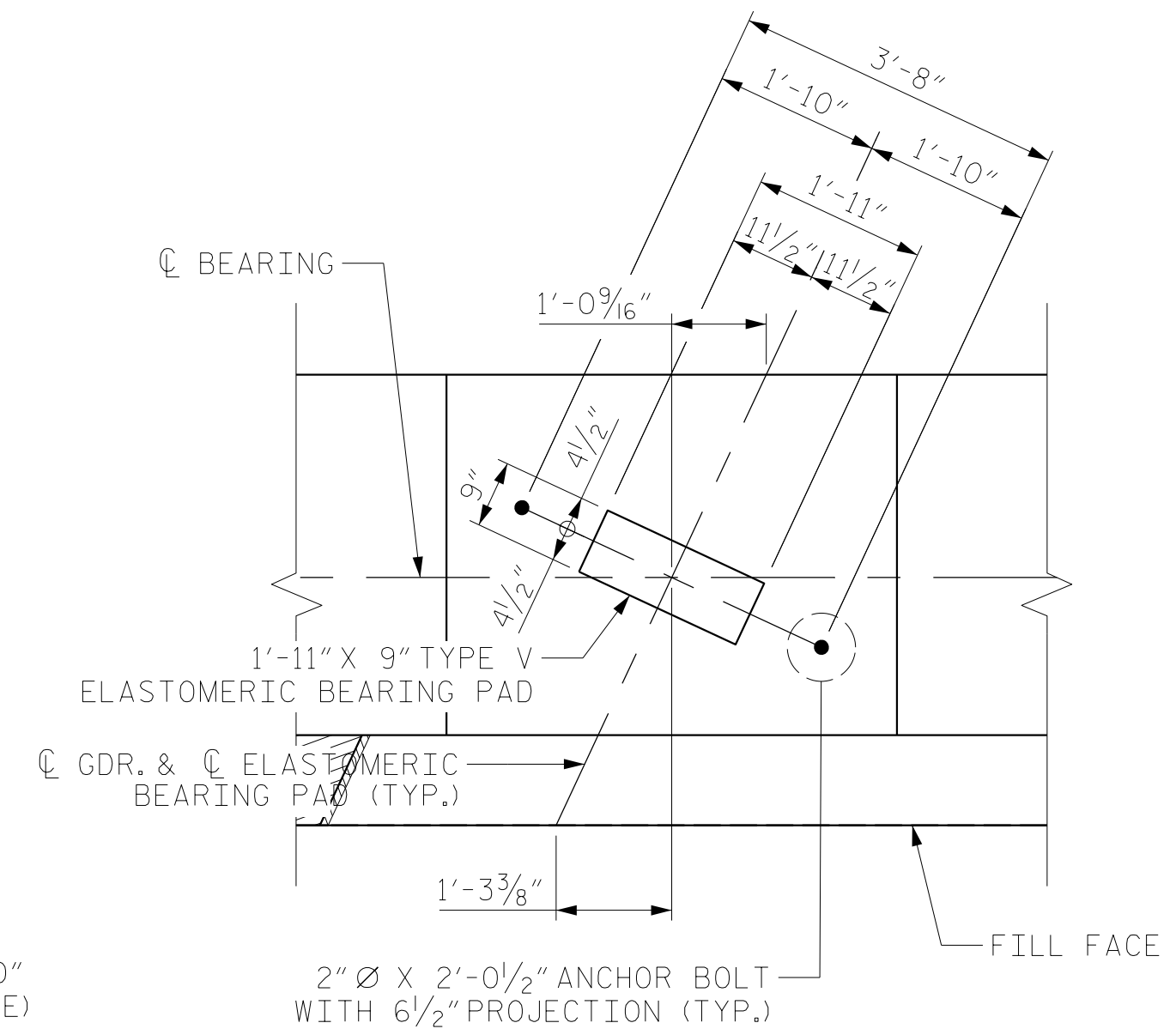
SHEET NO. S1-30
TOTAL SHEETS 43

DRAWN BY :	MRA	DATE :	03/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021



PARTIAL PLAN

NOTES:
 FOR SECTION A-A, PARTIAL SECTION B-B, AND PARTIAL SECTION C-C, SEE SHEET 3 OF 3.
 STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATION, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 THE TOP SURFACE AREA OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.

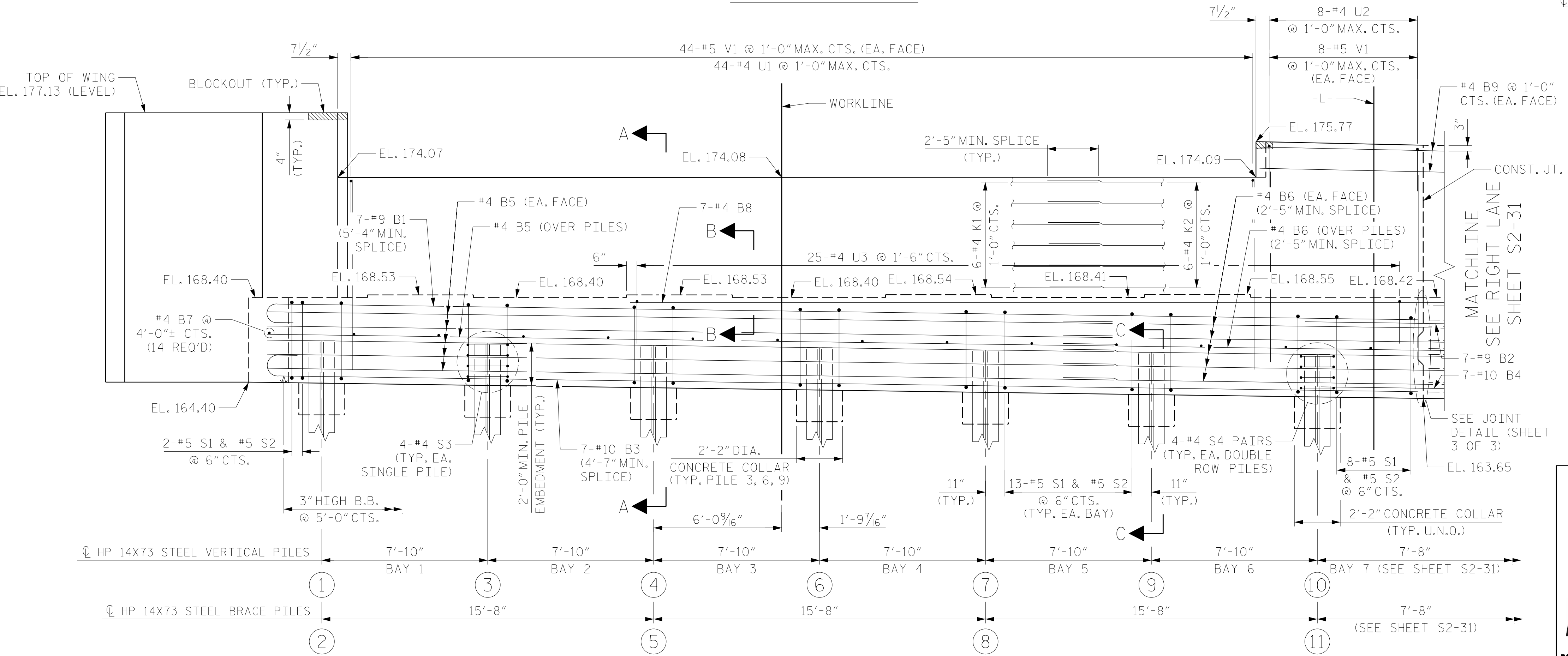


DETAIL "A"
 PILE NOT SHOWN FOR CLARITY

TOP OF PILE ELEVATIONS						
PILE 1	PILE 3	PILE 4	PILE 6	PILE 7	PILE 9	PILE 10
166.36	166.25	166.14	166.03	165.93	165.82	165.71
PILE 2	PILE 5	PILE 8	PILE 11			
166.36	166.14	165.93	165.71			

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



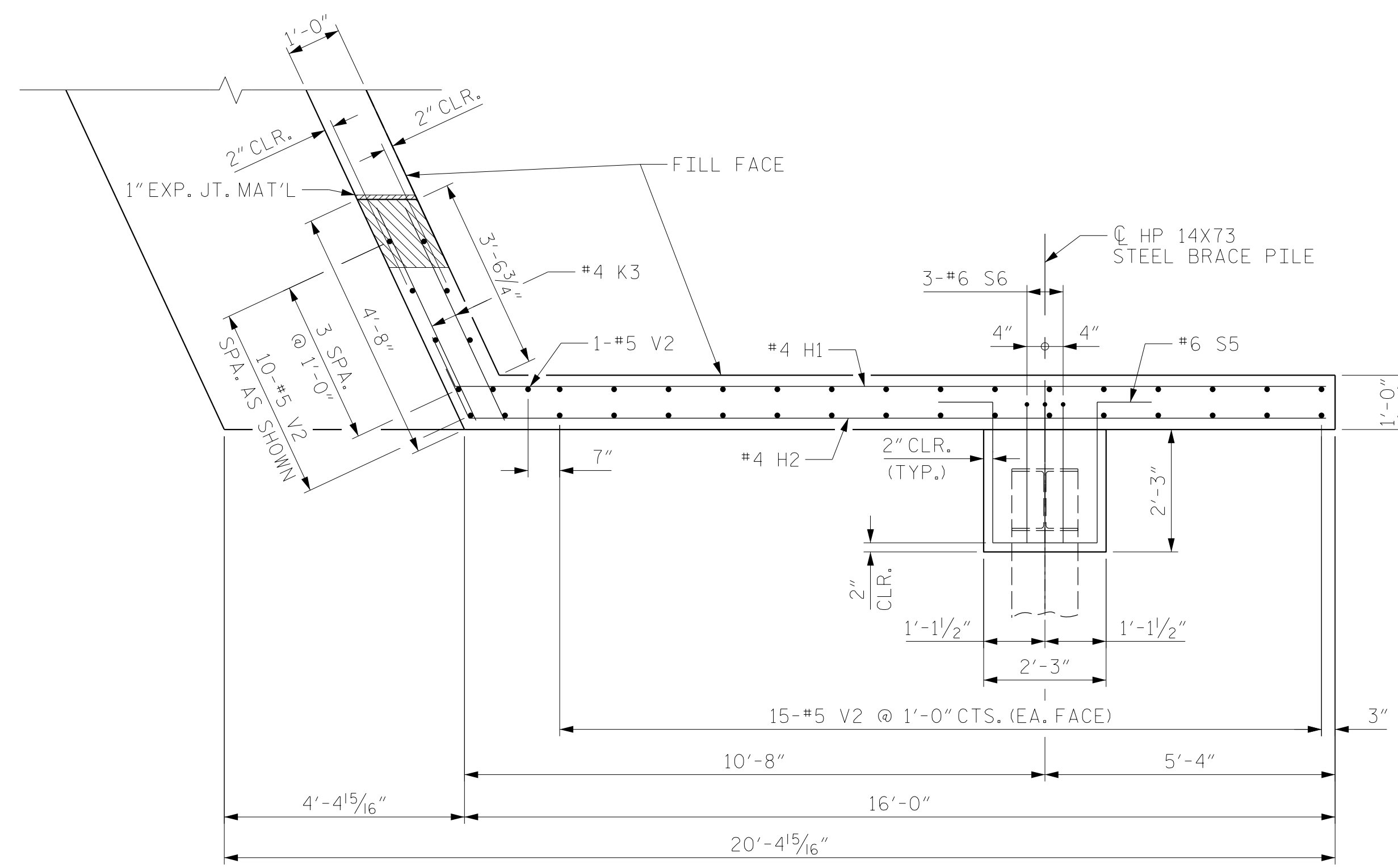
PARTIAL ELEVATION
 BRACE PILE IN WING NOT SHOWN FOR CLARITY

DRAWN BY : NSC DATE : 03/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

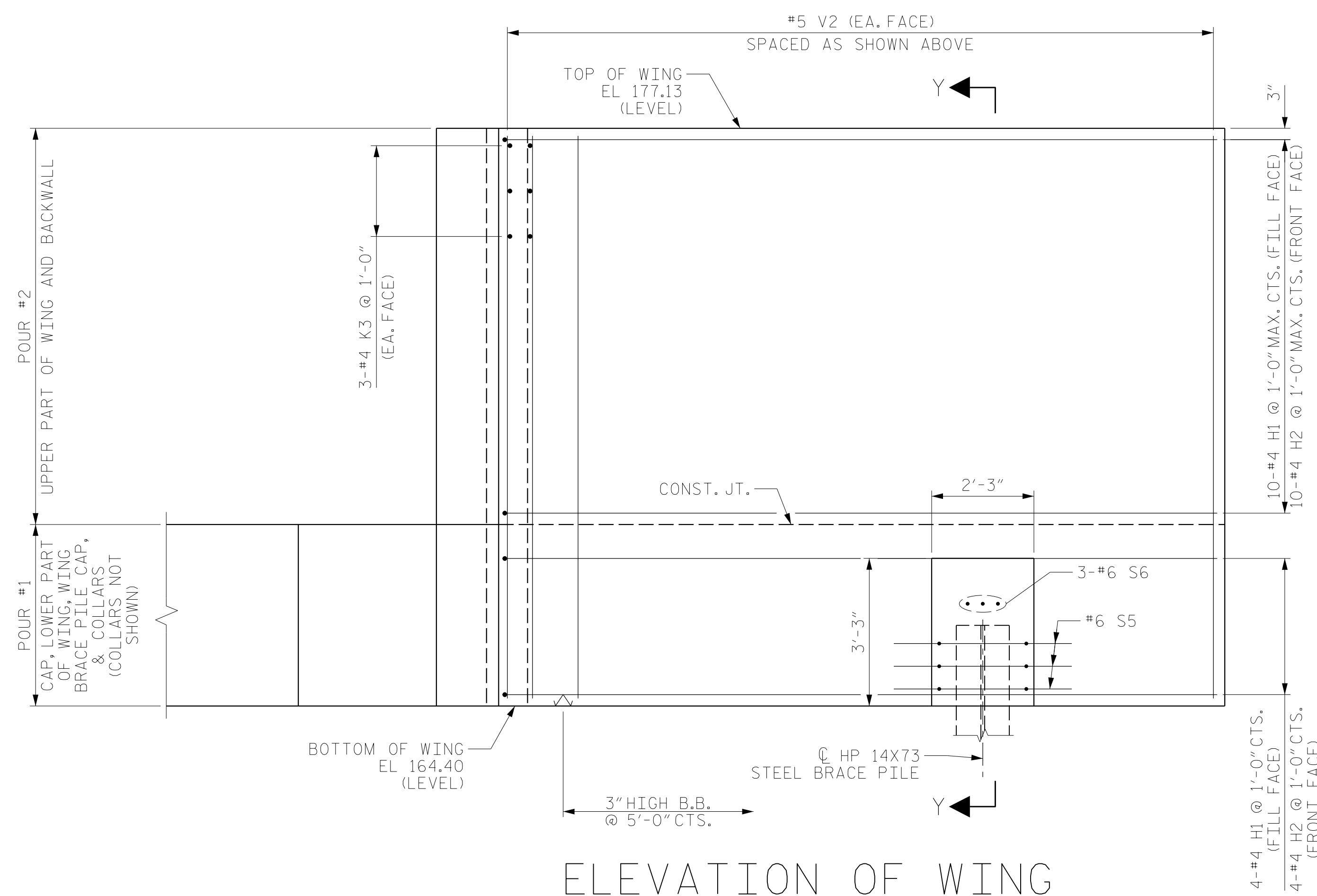
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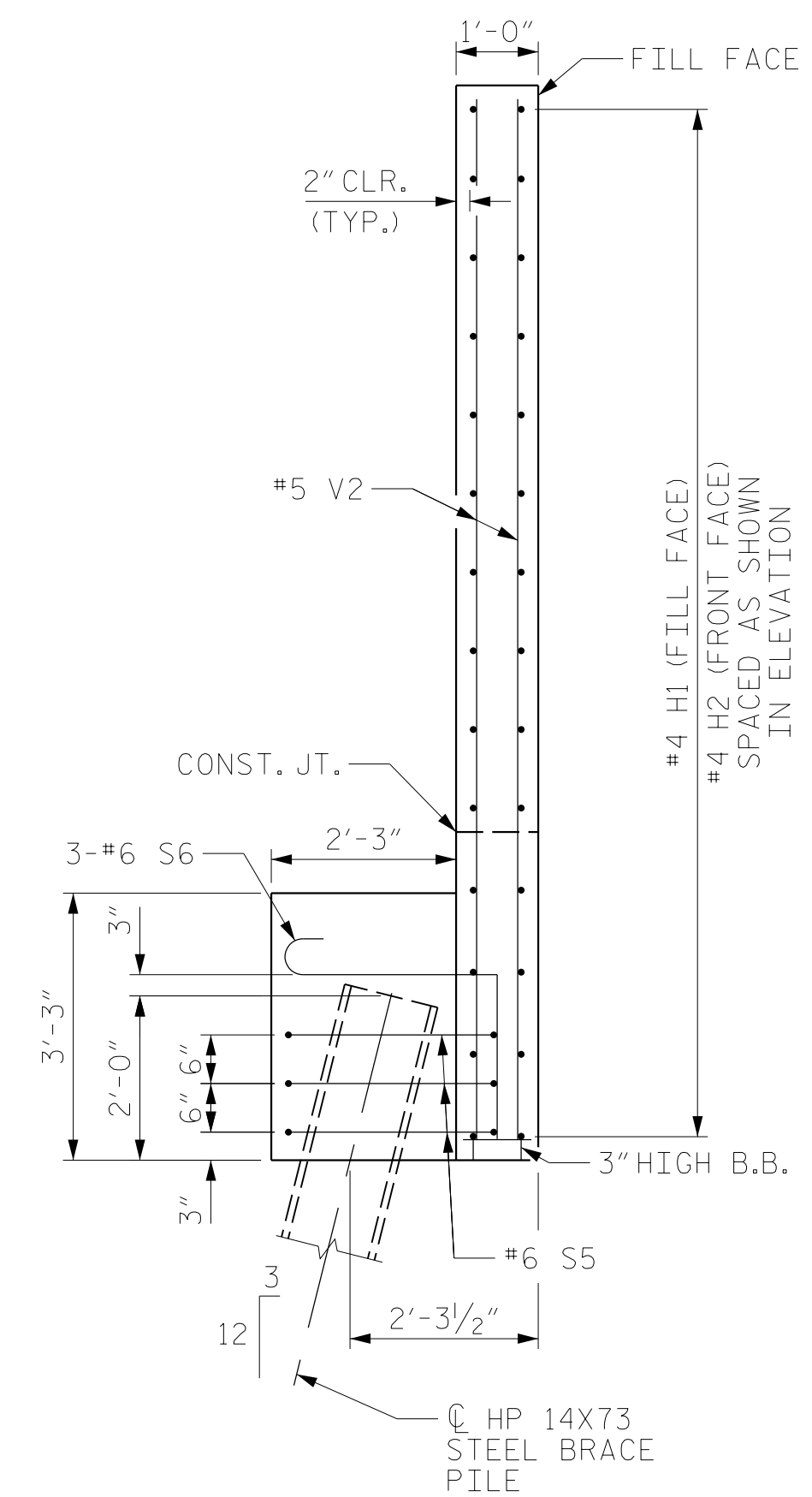
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-31
1			3			TOTAL SHEETS 43
2			4			



PLAN OF WING



ELEVATION OF WING



SECTION Y-Y

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



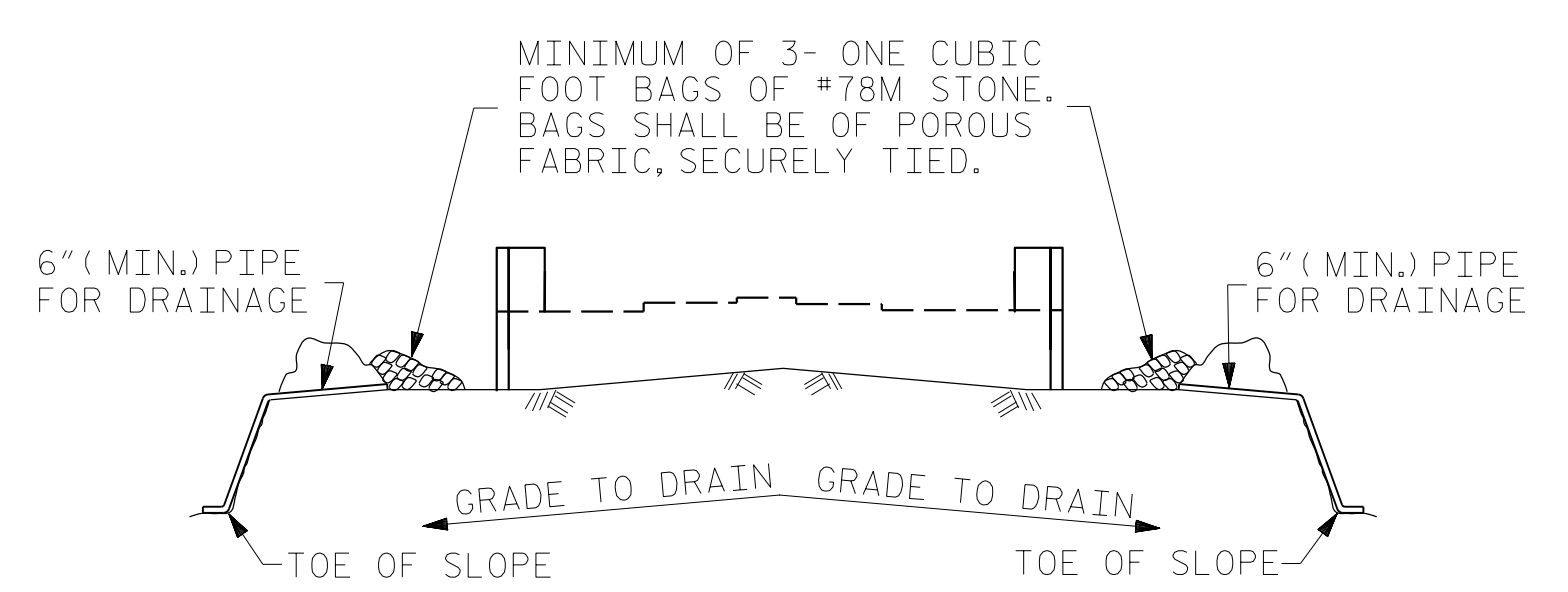
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 WING WALL DETAILS
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-32
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : NSC DATE : 03/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

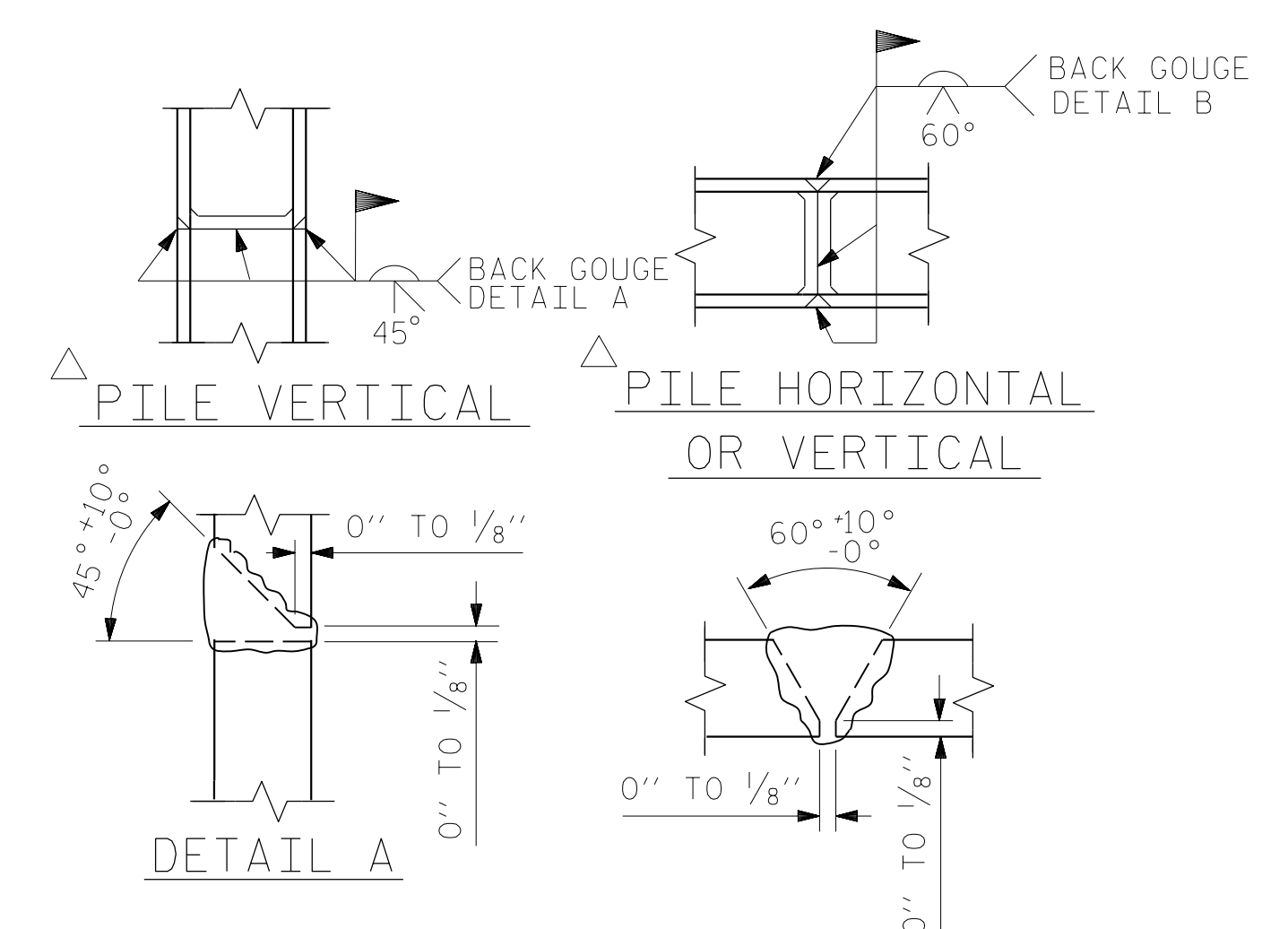


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

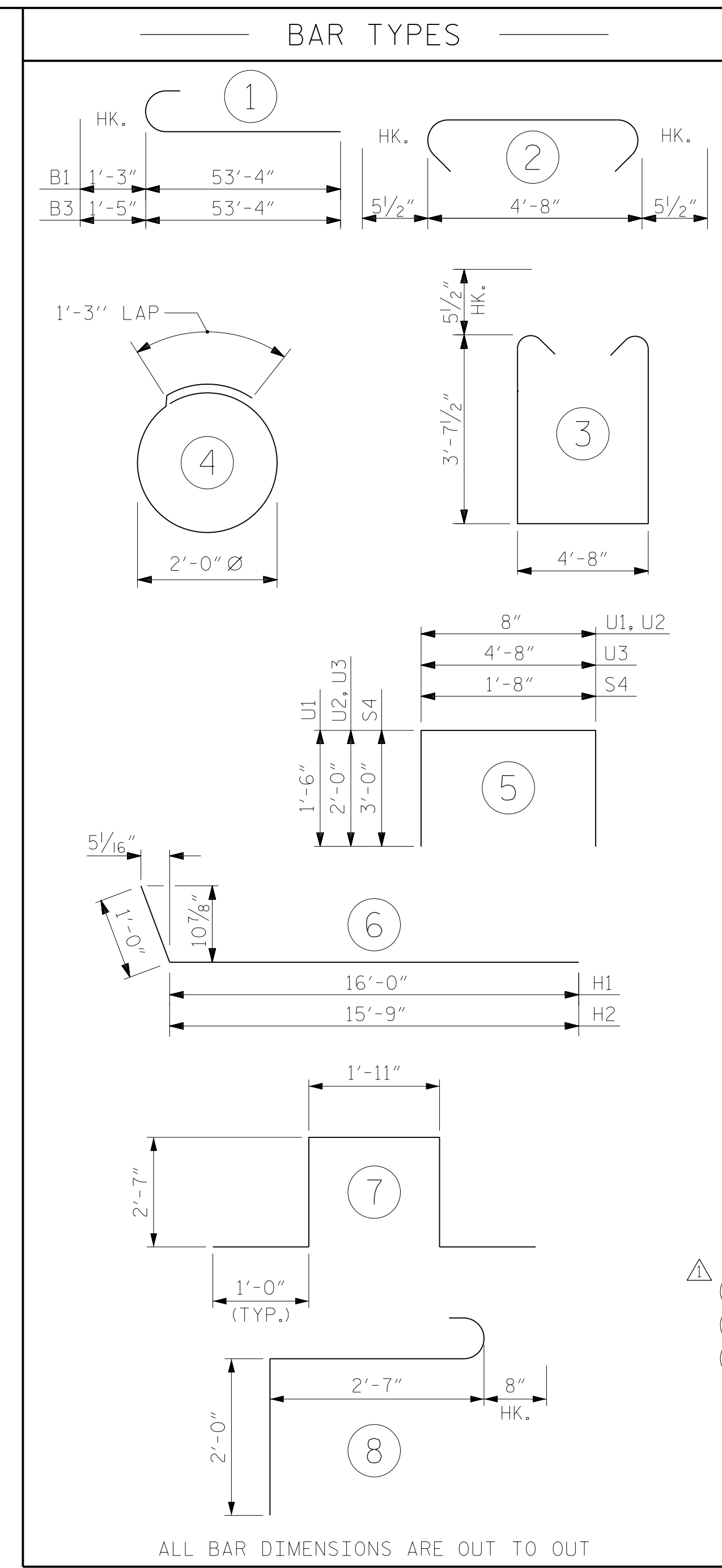
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT NO. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#9	1	54'-7"	1299
B2	7	#9	STR	13'-1"	311
B3	7	#10	1	54'-9"	1649
B4	7	#10	STR	11'-7"	349
B5	18	#4	STR	40'-0"	481
B6	18	#4	STR	20'-8"	248
B7	14	#4	STR	4'-8"	44
B8	7	#4	STR	40'-0"	187
B9	4	#4	STR	11'-3"	30
H1	14	#4	6	17'-0"	159
H2	14	#4	6	16'-9"	157
K1	12	#4	STR	40'-0"	321
K2	12	#4	STR	20'-9"	166
K3	6	#4	STR	4'-3"	17
S1	88	#5	3	12'-10"	1178
S2	88	#5	2	5'-7"	512
S3	12	#4	4	7'-7"	61
S4	32	#4	5	7'-8"	164
S5	3	#6	7	9'-1"	41
S6	3	#6	8	5'-3"	24
U1	44	#4	5	3'-8"	108
U2	8	#4	5	4'-8"	25
U3	25	#4	5	8'-8"	145
V1	104	#5	STR	9'-0"	976
V2	41	#5	STR	12'-5"	531

REINFORCING STEEL 9,183 LBS.
CLASS A CONCRETE

POUR #1
CAP, COLLARS AND LOWER PART OF WINGS 50.9 C.Y.

POUR #2
UPPER PART OF WINGS AND BACKWALL 17.8 C.Y.

TOTAL CLASS A CONCRETE 68.7 C.Y.

HP 14 X 73 STEEL PILES NO. 12 720.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP NO. 12 FOR HP 14X73 STEEL PILES

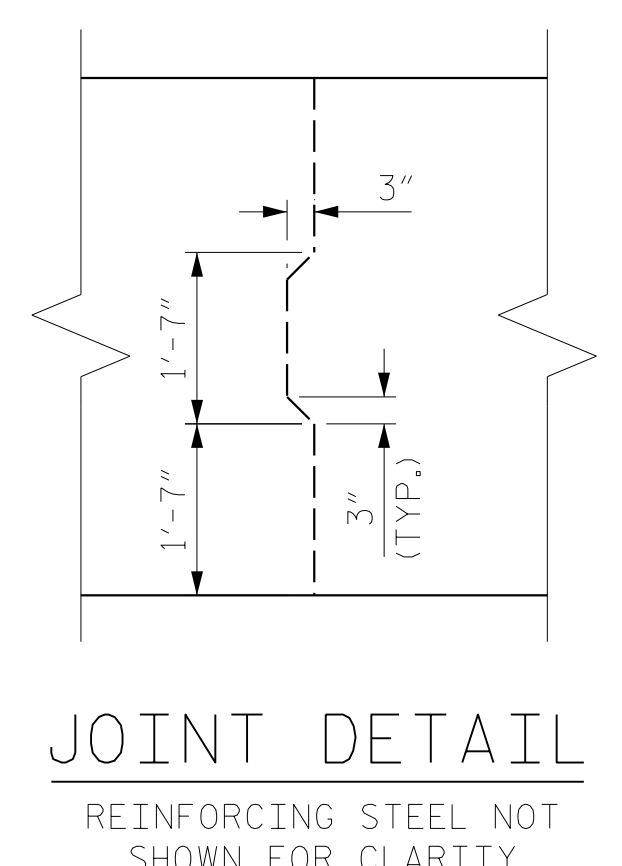
PILE REDRIVES (FOR ONE END BENT) NO. 6

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

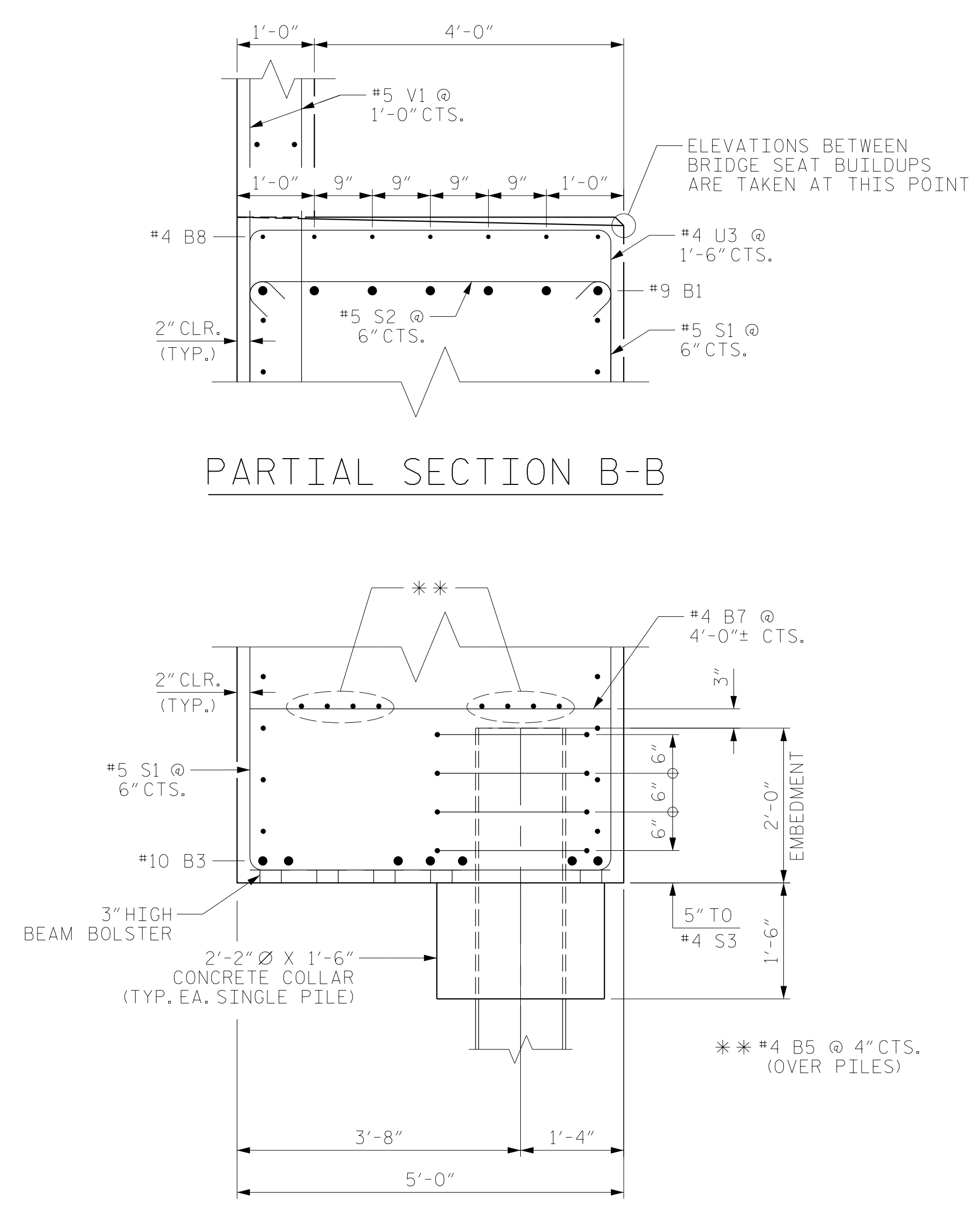
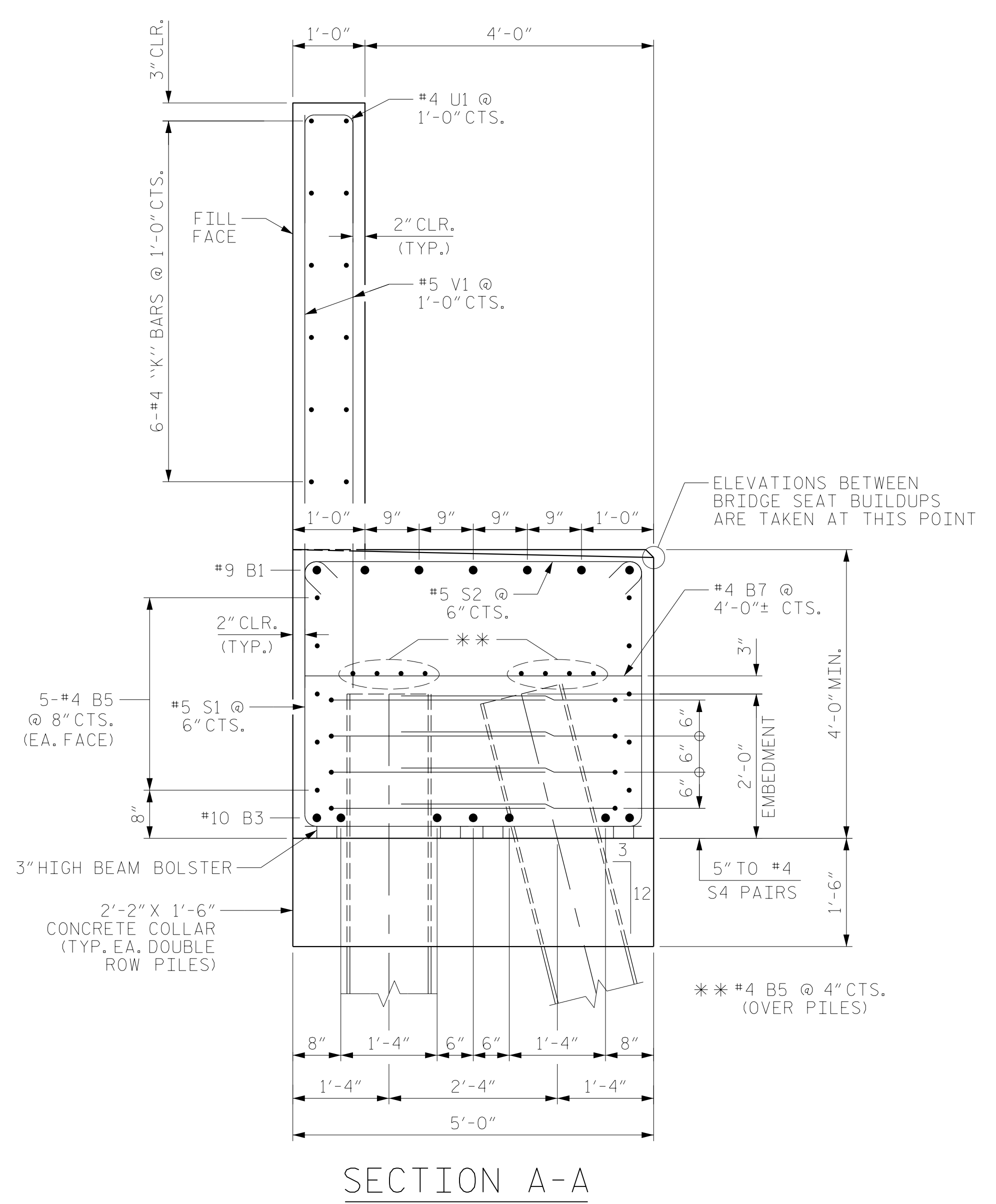
SHEET 3 OF 3

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

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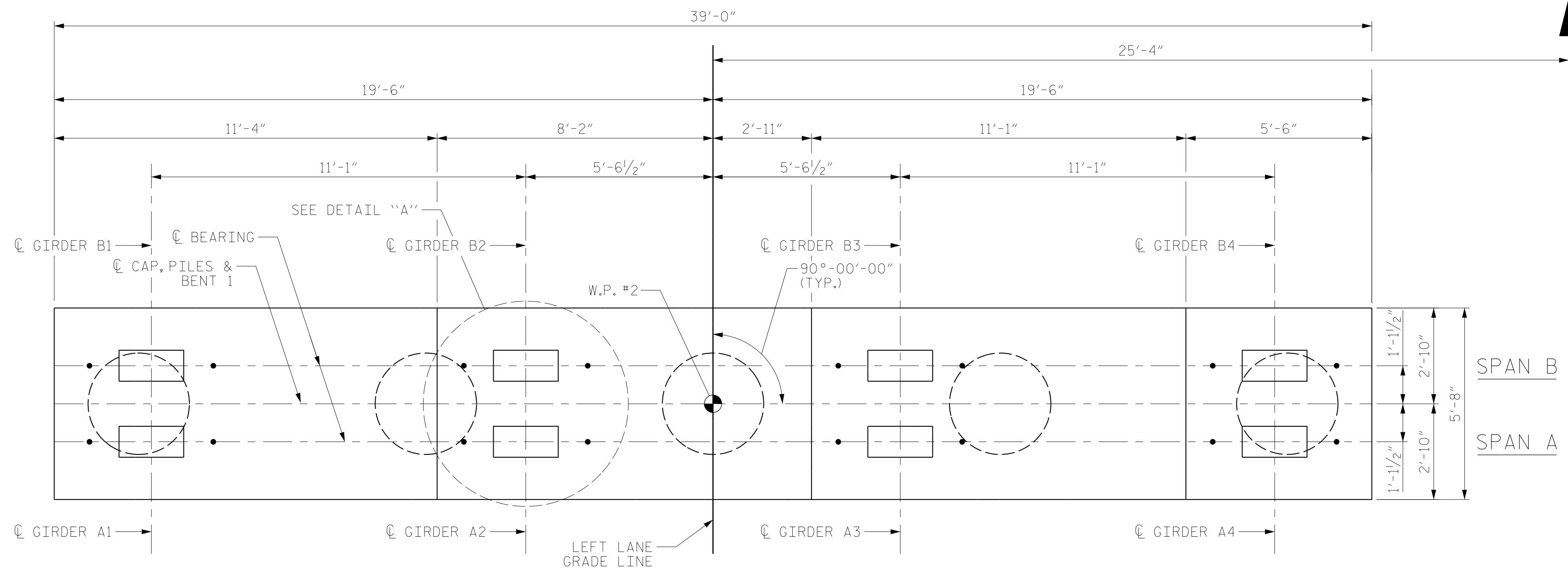


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DRAWN BY : NSC	DATE : 03/2020
CHECKED BY : MKO	DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB	DATE : 09/2021

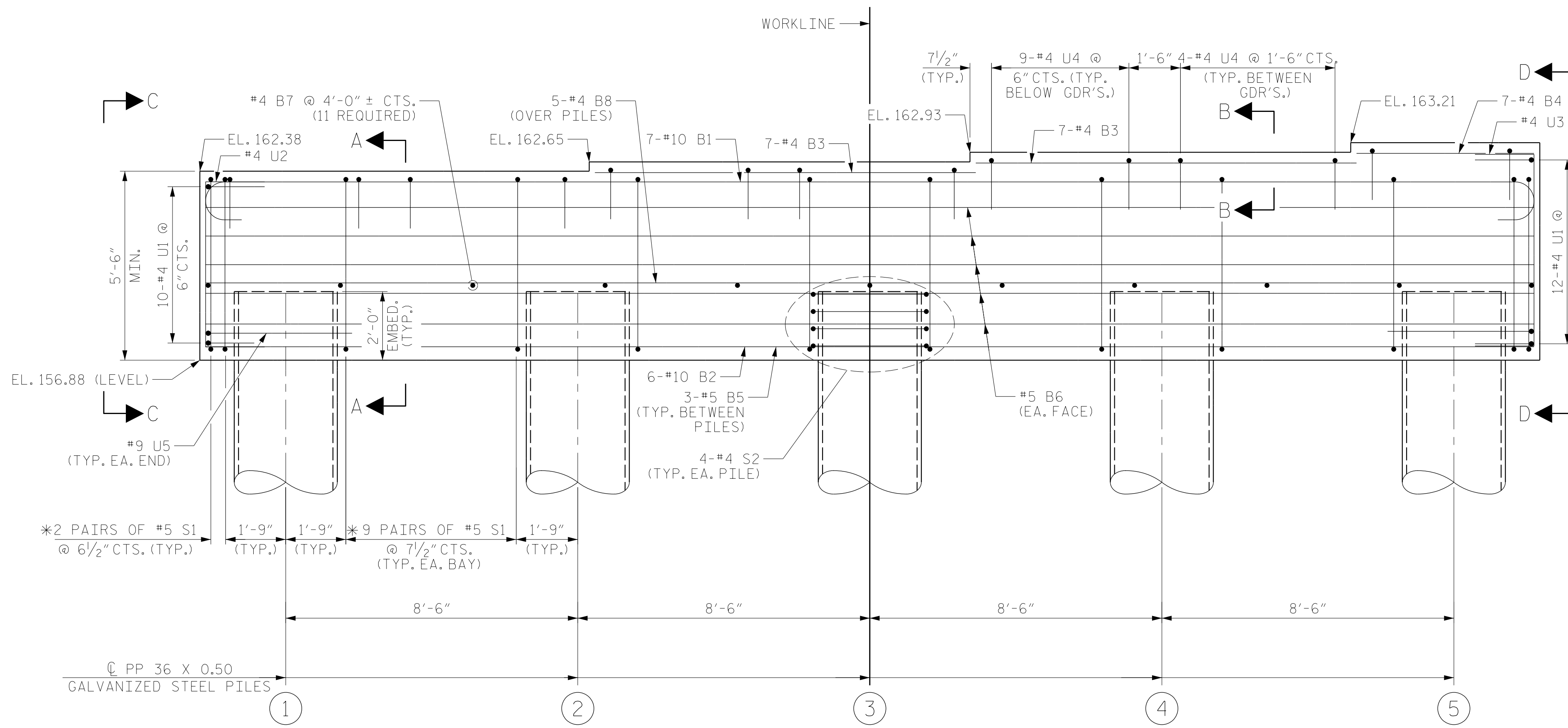
REVISD HP 14X73 STEEL PILE COUNT AND LENGTH



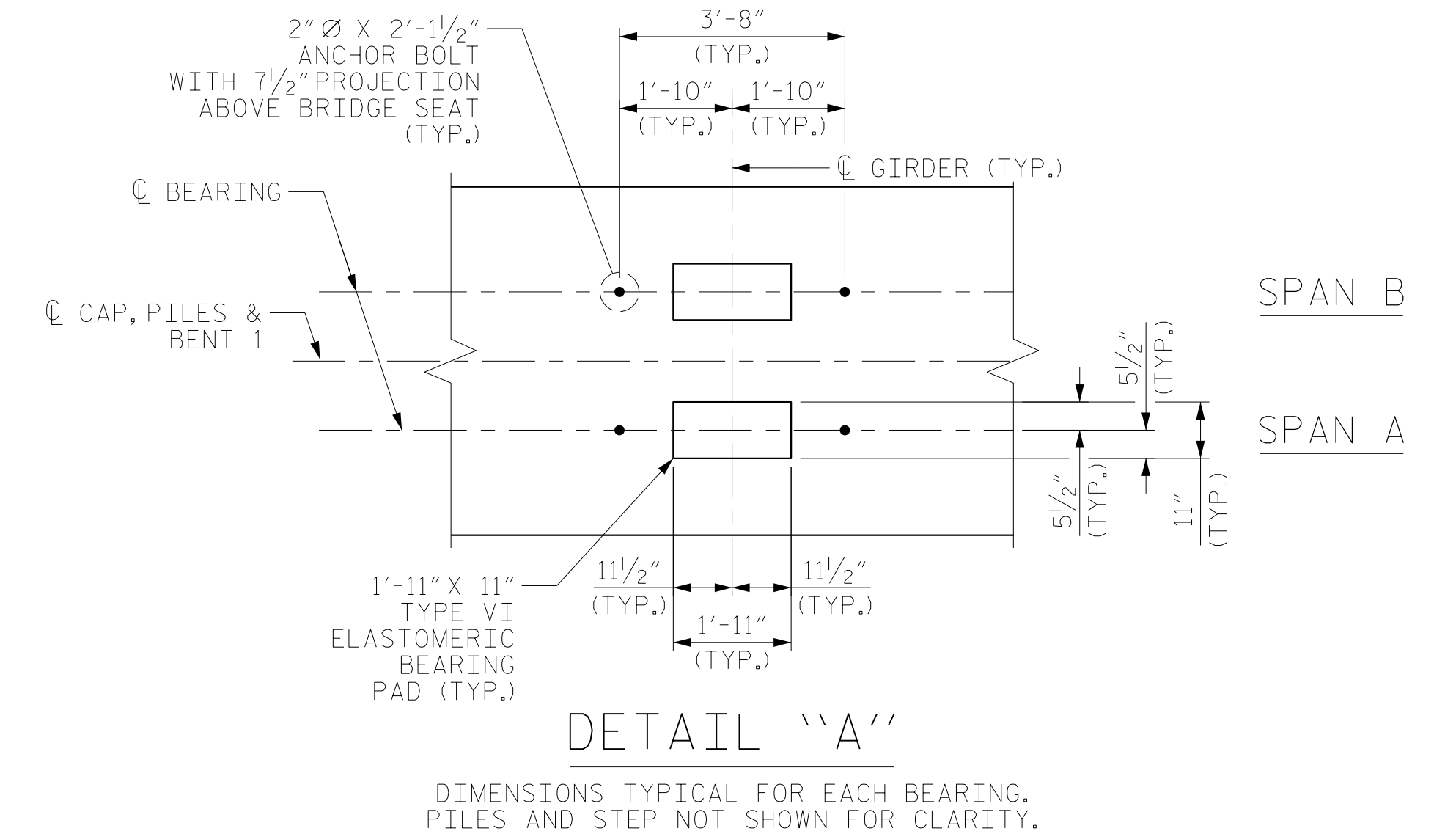
PLAN

NOTES:

- FOR SECTION A-A, PARTIAL SECTION B-B, VIEW C-C AND VIEW D-D SEE SHEET 2 OF 3.
- FOR REINFORCING STEEL BILL OF MATERIAL, SEE SHEET 2 OF 3.
- FOR ADDITIONAL REINFORCING STEEL AND CONCRETE IN PP 36 X 0.50 GALVANIZED STEEL PILES, SEE SHEET 3 OF 3.
- HOOKS ON V1 BARS IN CONCRETE PLUGS MAY BE TURNED AS NECESSARY TO AVOID EMBEDDED ANCHOR BOLTS.
- S1 AND U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- U1, U2 AND U3 BARS MAY BE ROTATED AS NECESSARY SO THAT LEGS OF BARS CLEAR PIPE PILES.
- *INVERT ALTERNATE #5 S1 STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 30 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



ELEVATION



DETAIL "A"

DIMENSIONS TYPICAL FOR EACH BEARING. PILES AND STEP NOT SHOWN FOR CLARITY.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



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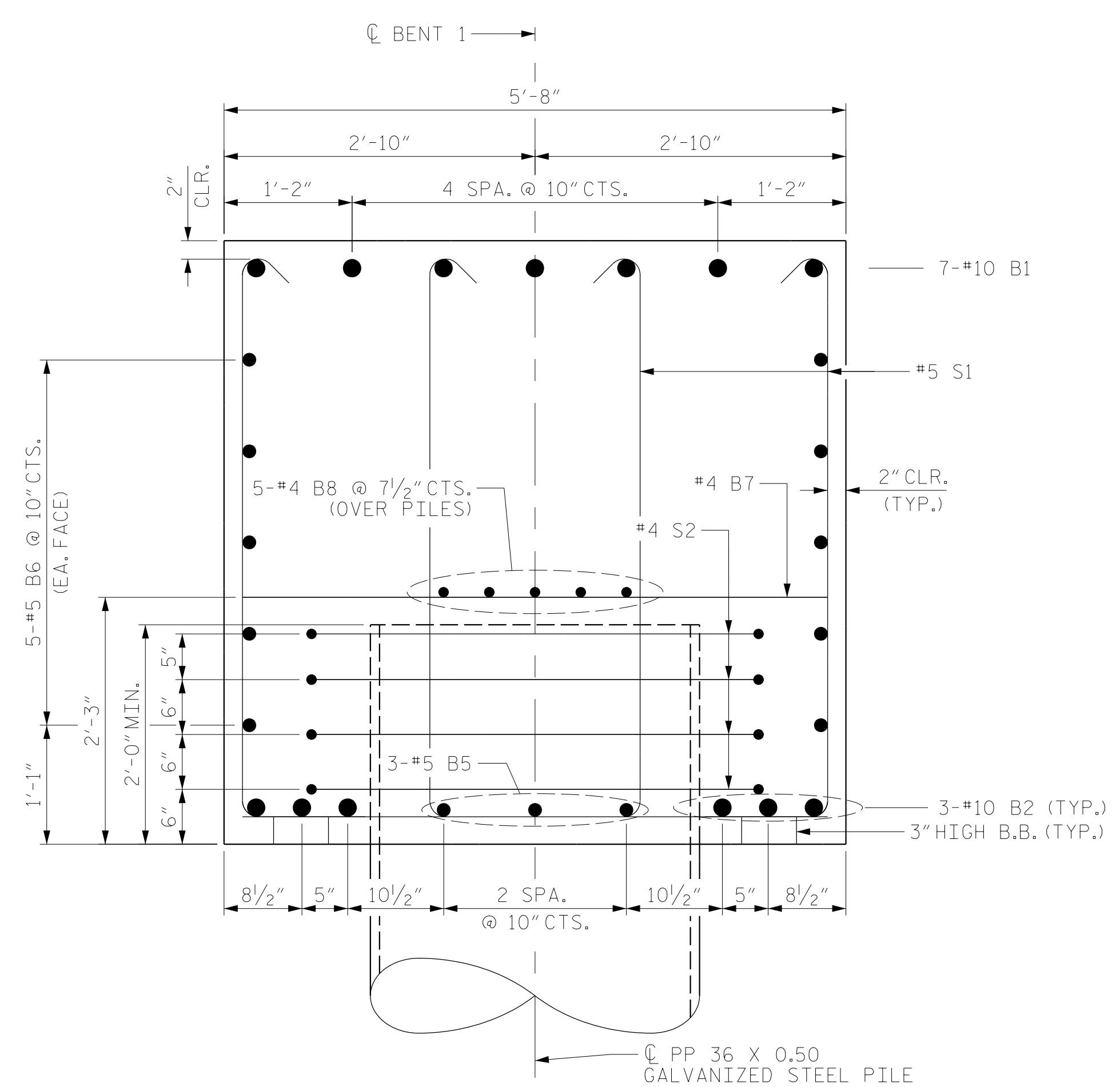
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

 BENT 1
 LEFT LANE

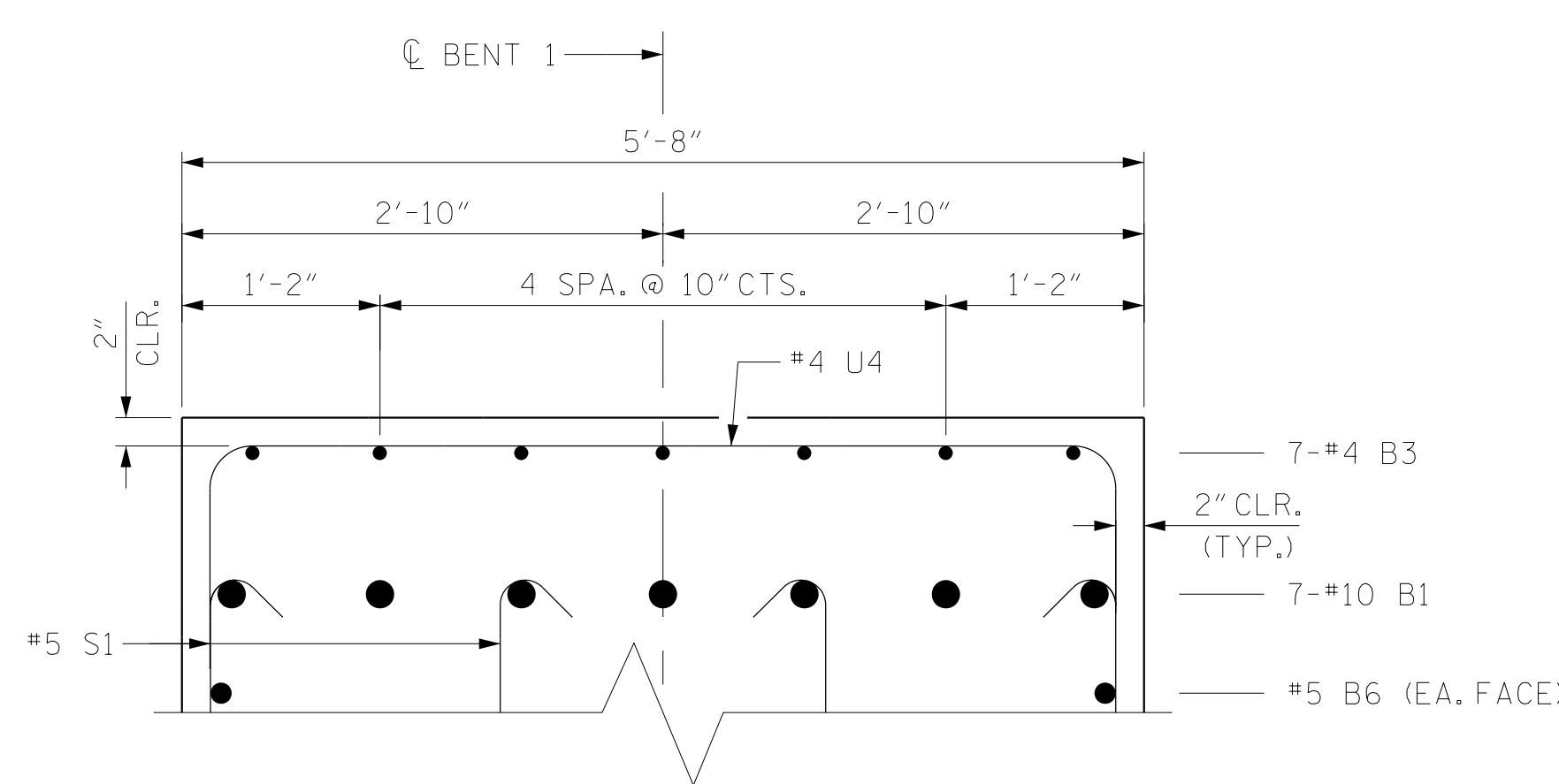
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-34
1			3			TOTAL SHEETS
2			4			43

DRAWN BY :	TWL	DATE :	01/2021
CHECKED BY :	MRA	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

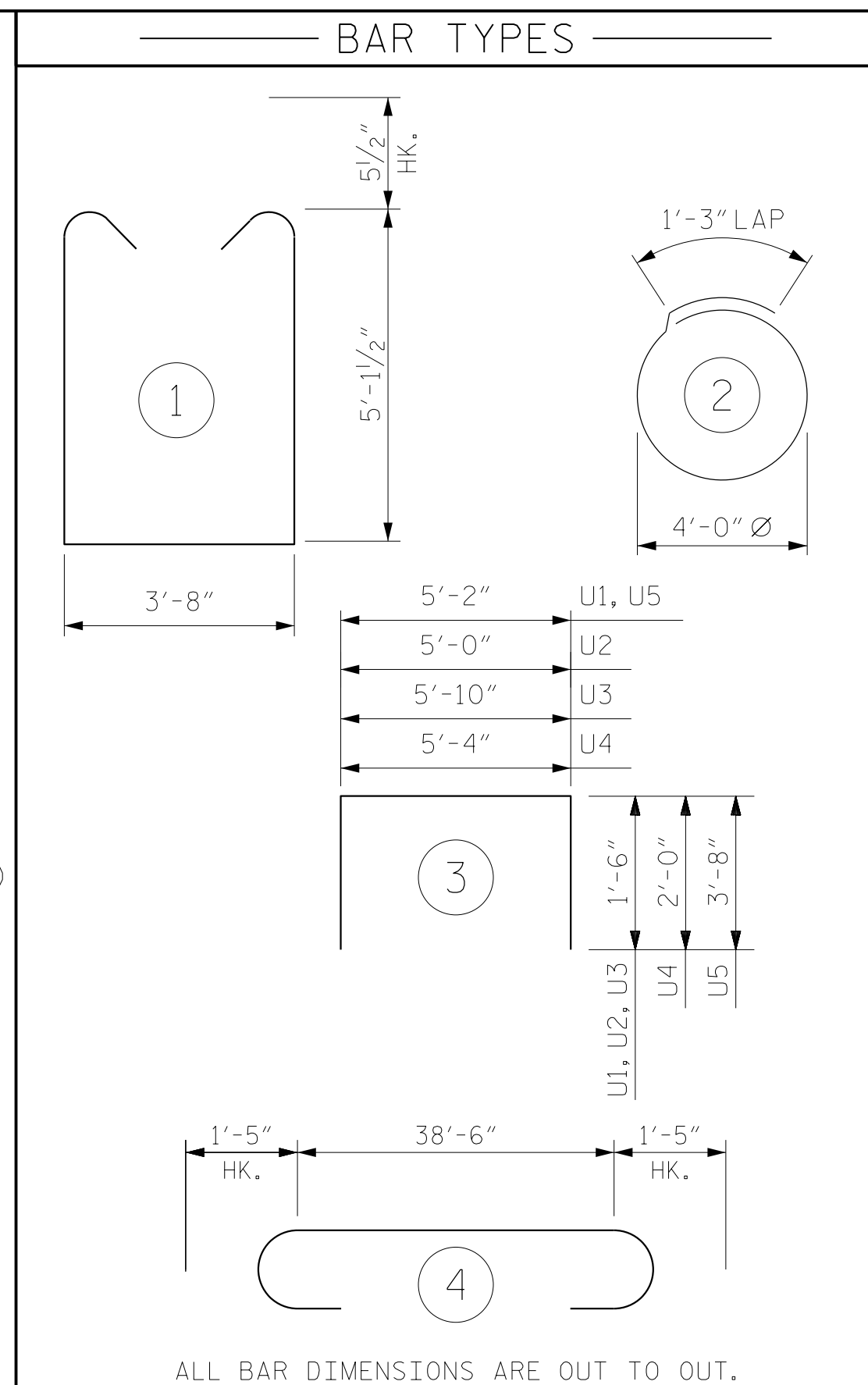
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SECTION A-A

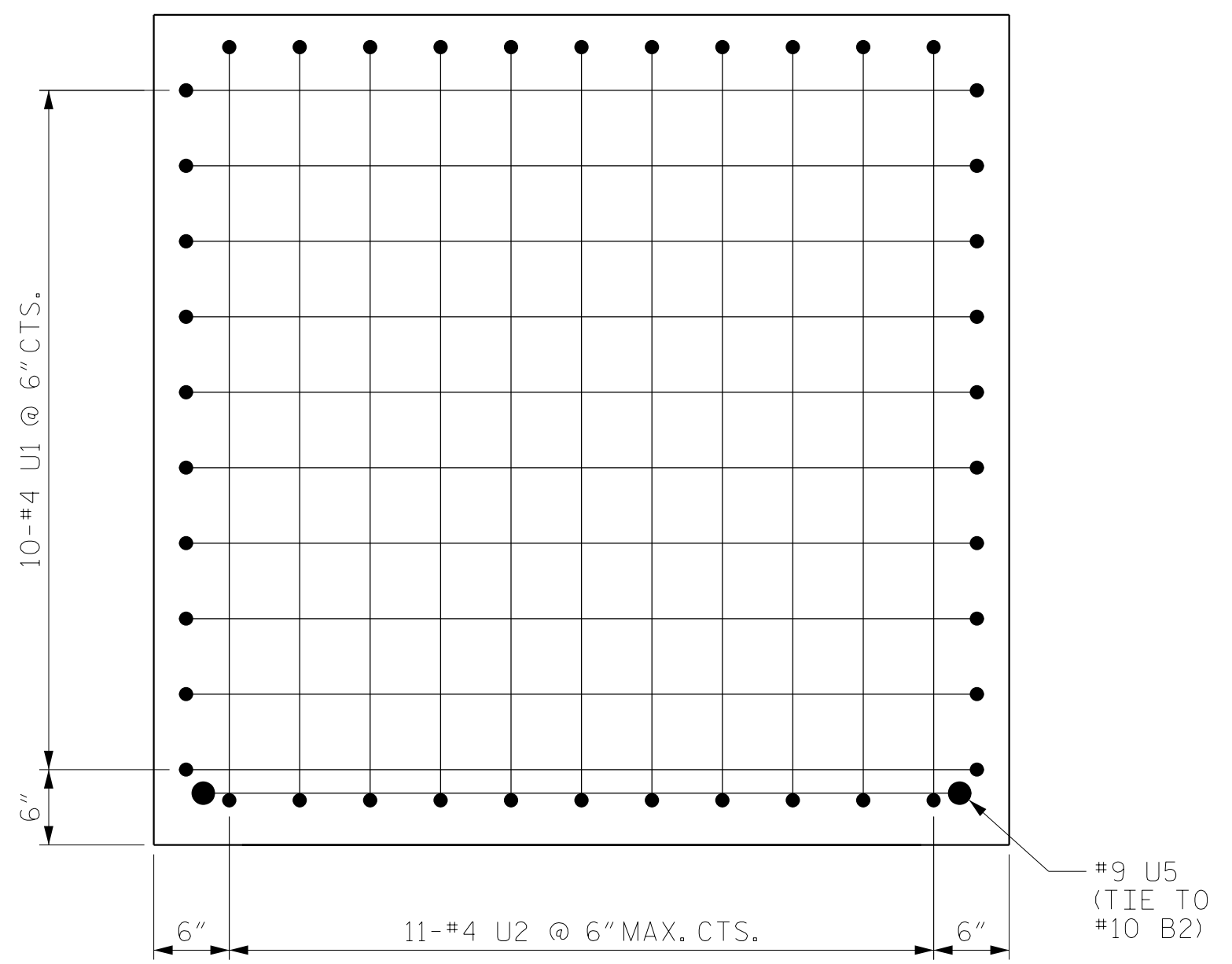


PARTIAL SECTION B-B

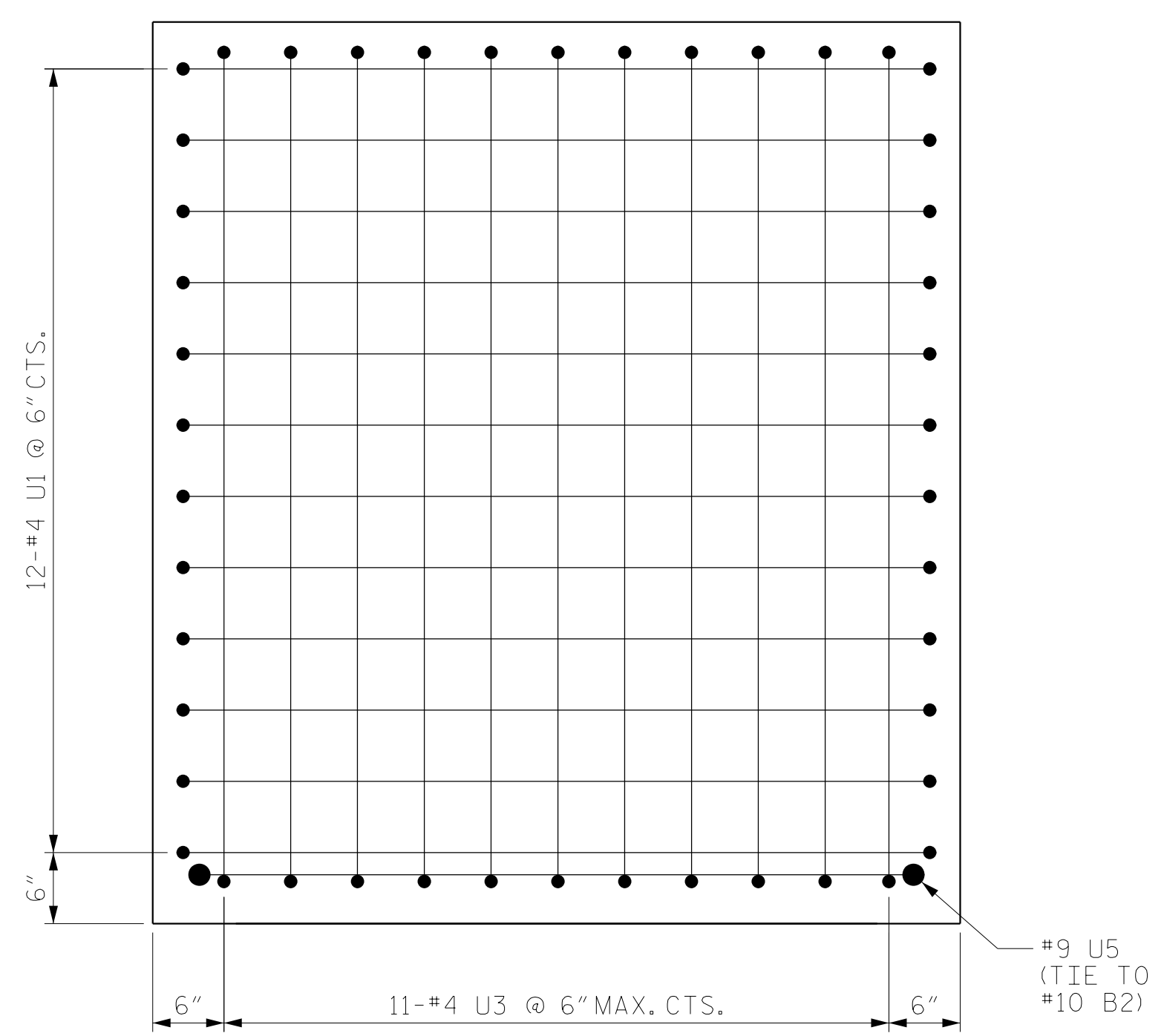


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	4	41'-4"	1245
B2	6	#10	STR.	38'-8"	998
B3	14	#4	STR.	11'-1"	104
B4	7	#4	STR.	5'-2"	24
B5	12	#5	STR.	5'-0"	63
B6	10	#5	STR.	38'-8"	403
B7	11	#4	STR.	5'-4"	39
B8	5	#4	STR.	38'-8"	129
S1	80	#5	1	14'-10"	1238
S2	20	#4	2	13'-10"	185
U1	22	#4	3	8'-2"	120
U2	11	#4	3	8'-0"	59
U3	11	#4	3	8'-10"	65
U4	48	#4	3	9'-4"	299
U5	2	#9	3	12'-6"	85
REINFORCING STEEL					5,056 LBS.
▲ CLASS A CONCRETE					45.3 C.Y.
PP 36 X 0.50 GALVANIZED STEEL PILES					
BENT NO. 1 NO. 5					650.0 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR PP 36 X 0.50 GALVANIZED STEEL PILES					NO. 5
PILE REDRIVES					NO. 3
▲ CONCRETE DISPLACED BY THE PP 36 X 0.50 GALVANIZED STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.					



VIEW C-C



VIEW D-D

DRAWN BY : TWL DATE : 01/2021
 CHECKED BY : MRA DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

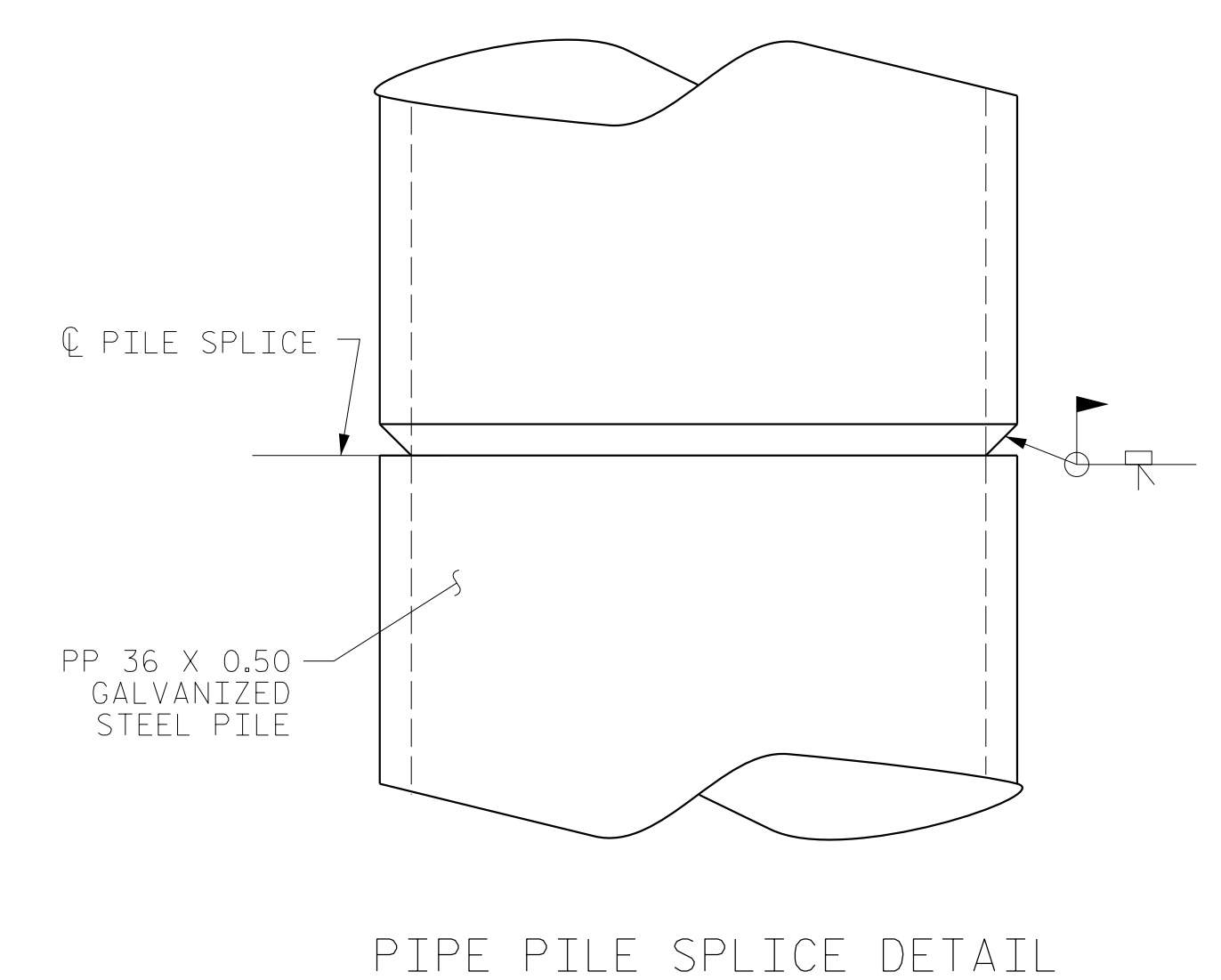
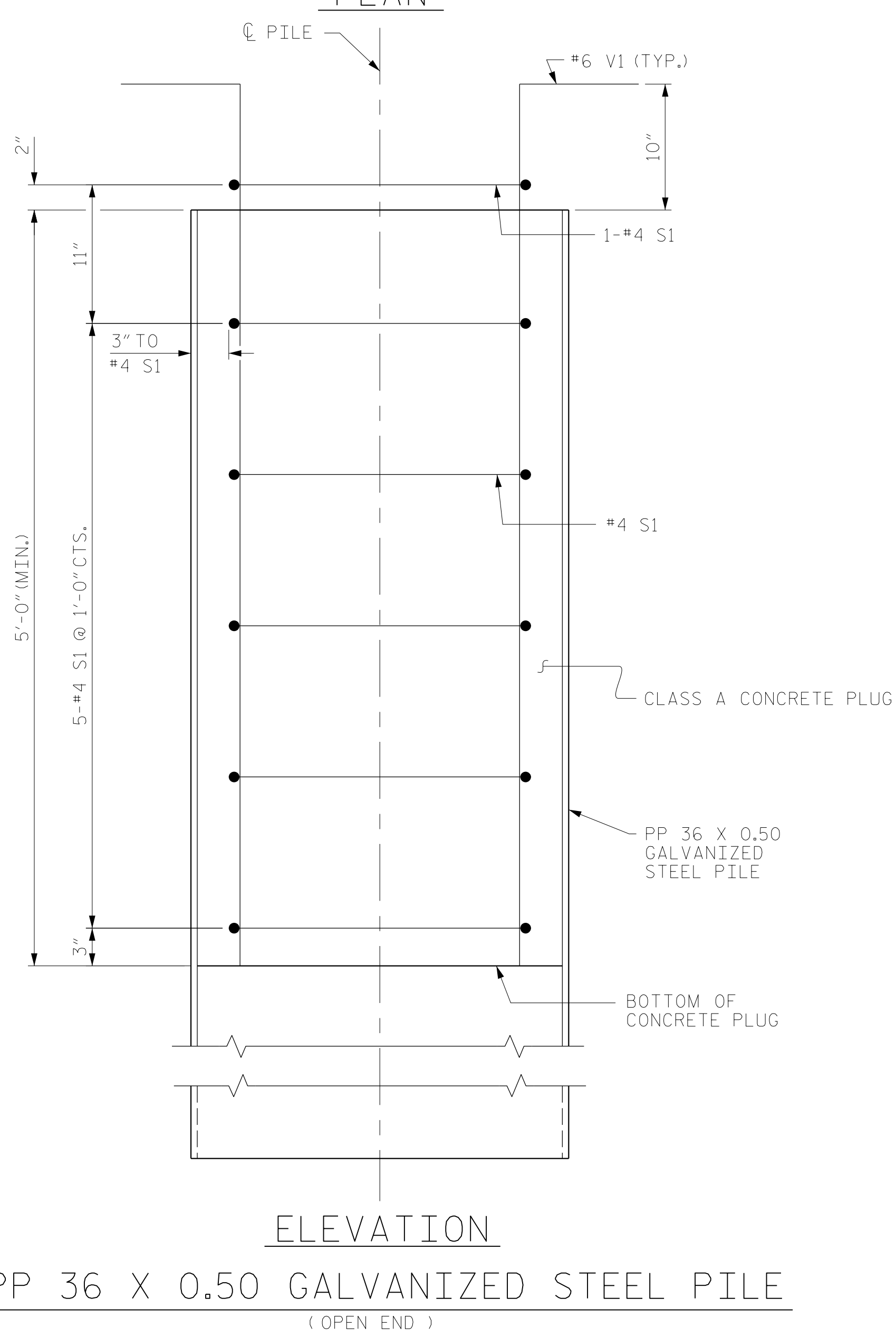
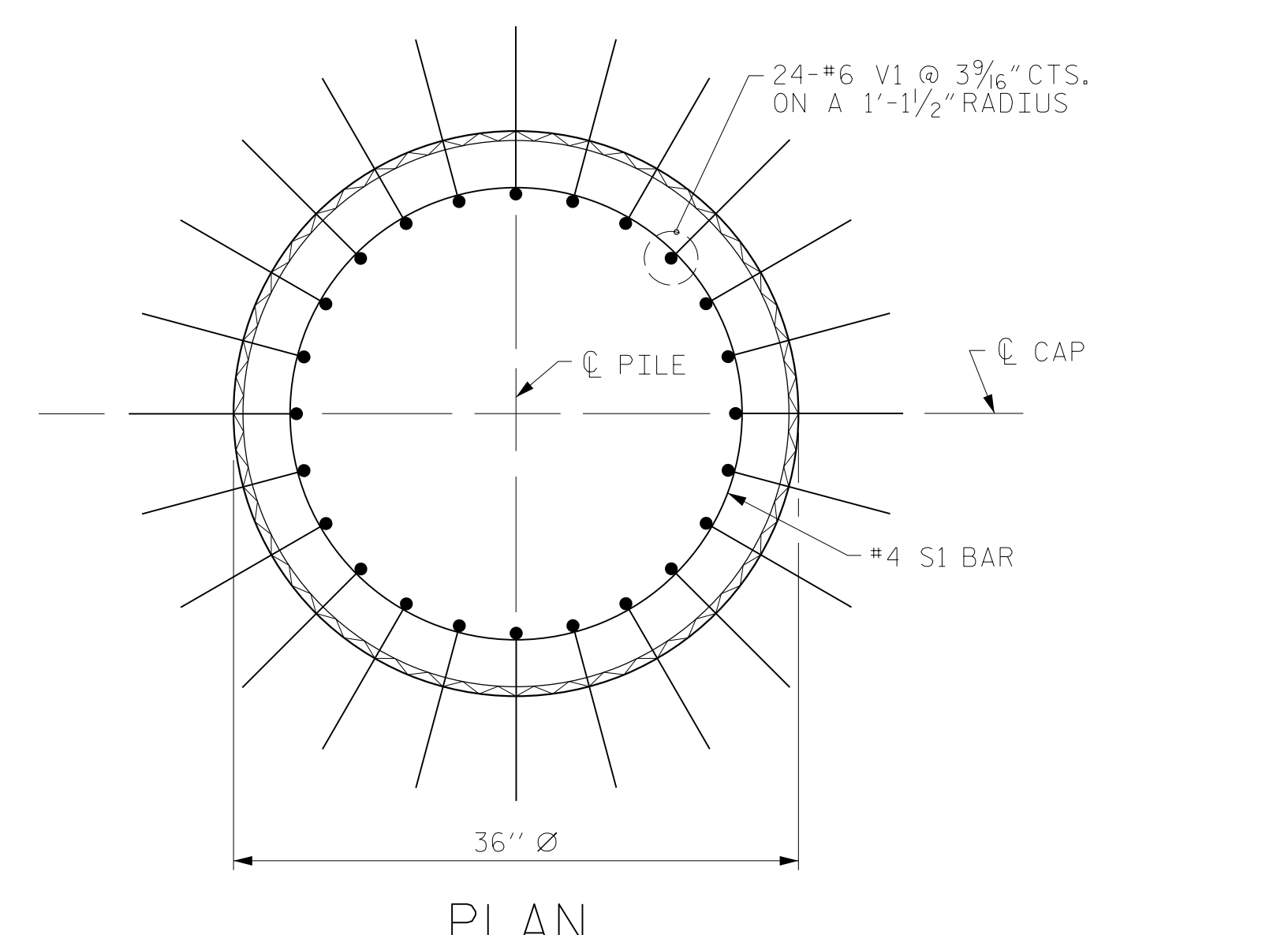
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PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1 DETAILS					
LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-35
TOTAL SHEETS					43



NOTES:

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE TOP 30 FEET OF EACH INTERIOR BENT STEEL PIPE PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 36 X 0.50 GALVANIZED STEEL PILES.

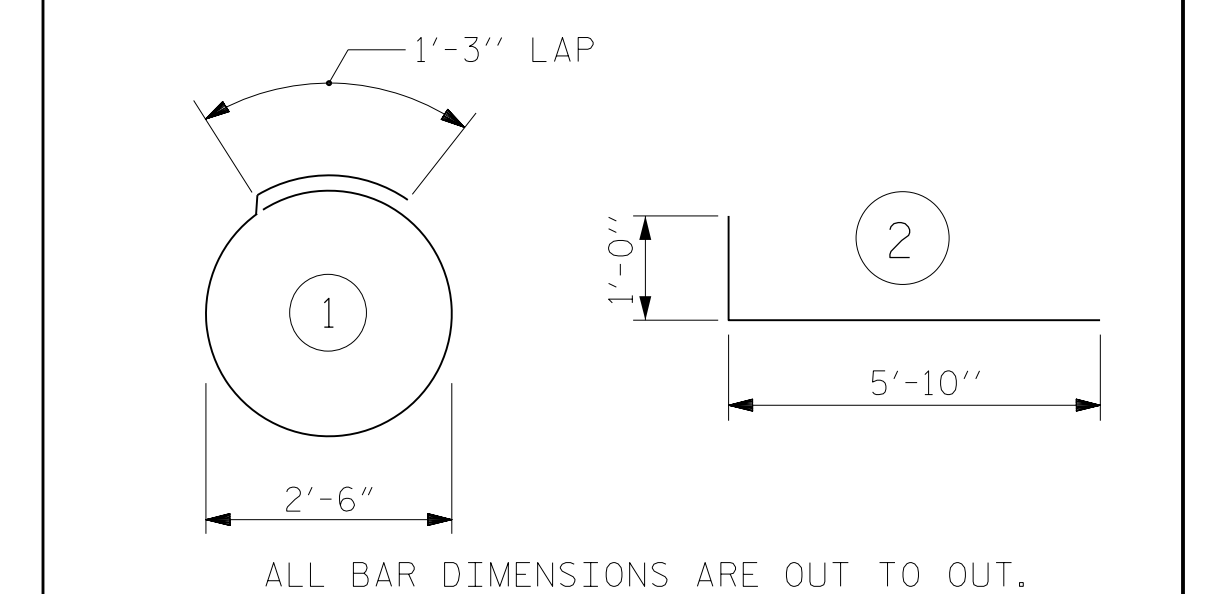
BILL OF MATERIAL FOR ONE PP 36 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	9'-1"	36
V1	24	#6	2	6'-10"	246

REINFORCING STEEL 282 LBS.

CLASS A CONCRETE
5'-0" MINIMUM PLUG 1.2 C.Y.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 3

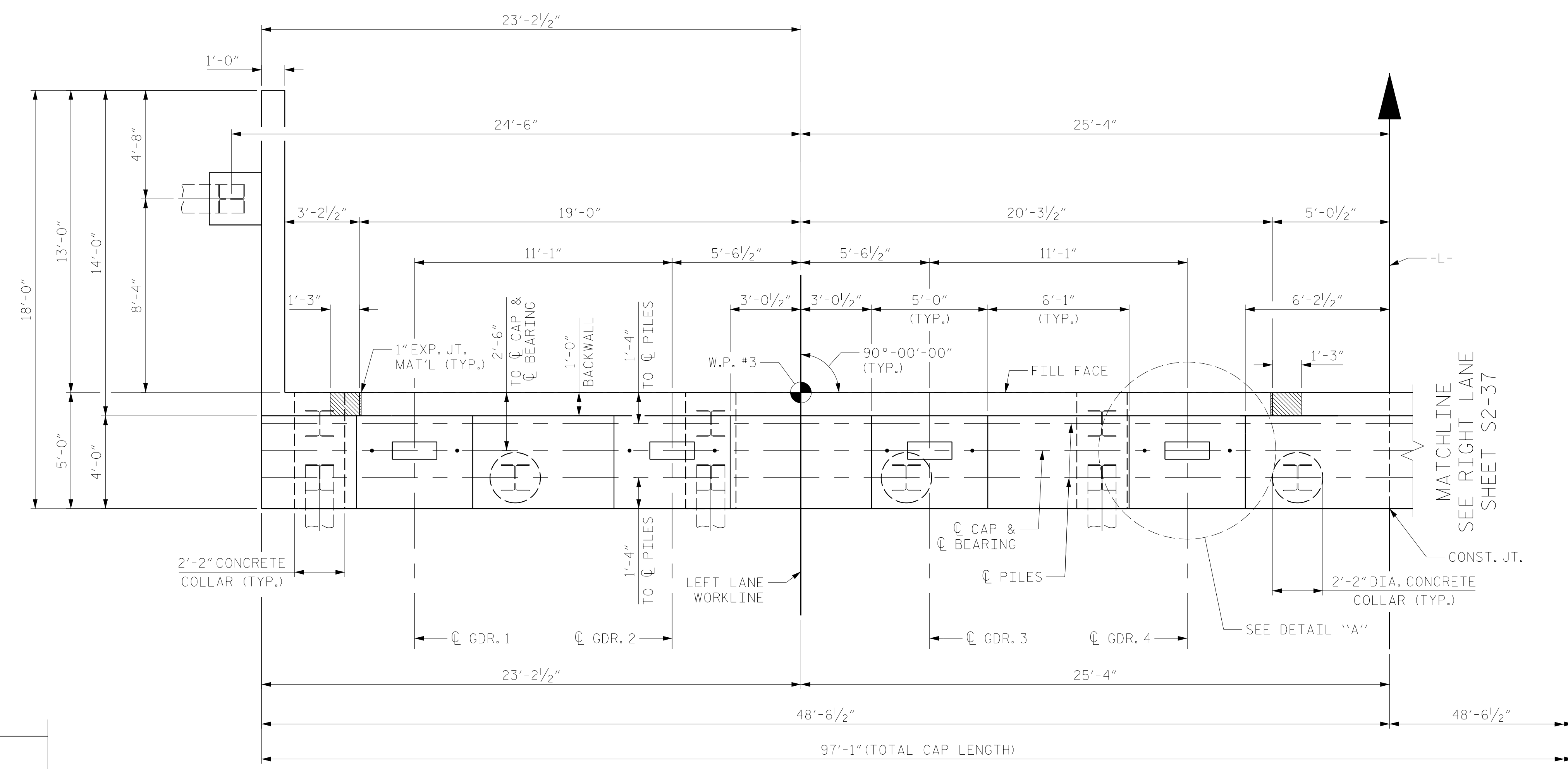


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
36" STEEL PIPE PILE
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-36
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : TWL DATE : 01/2021
CHECKED BY : MRA DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

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PARTAIL PLAN

NOTES:

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

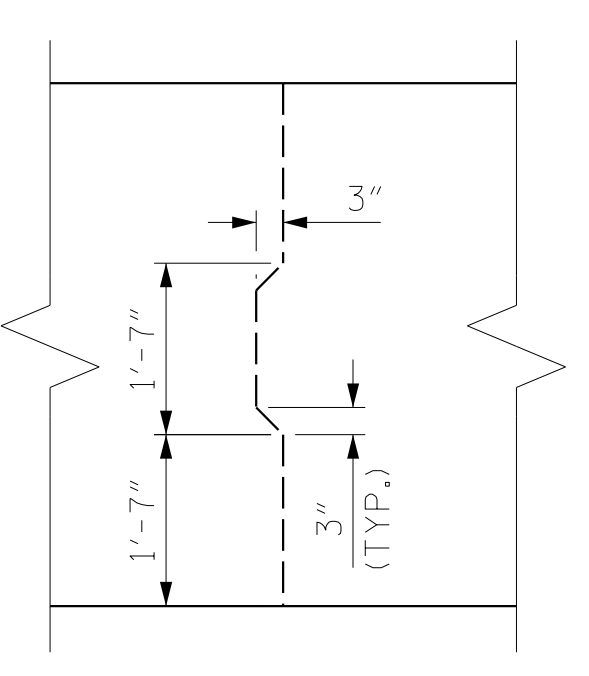
STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

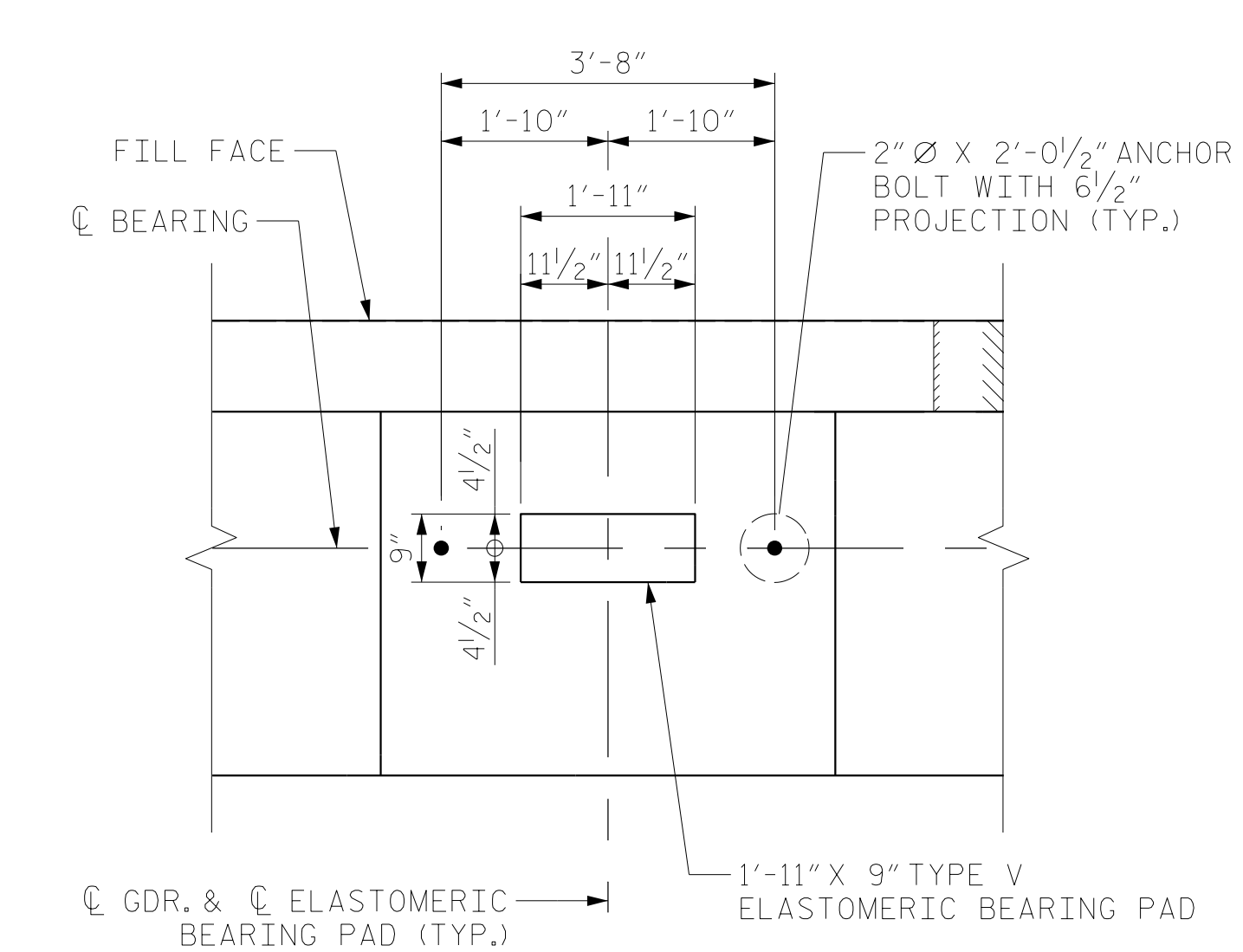
THE TOP SURFACE OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATION, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

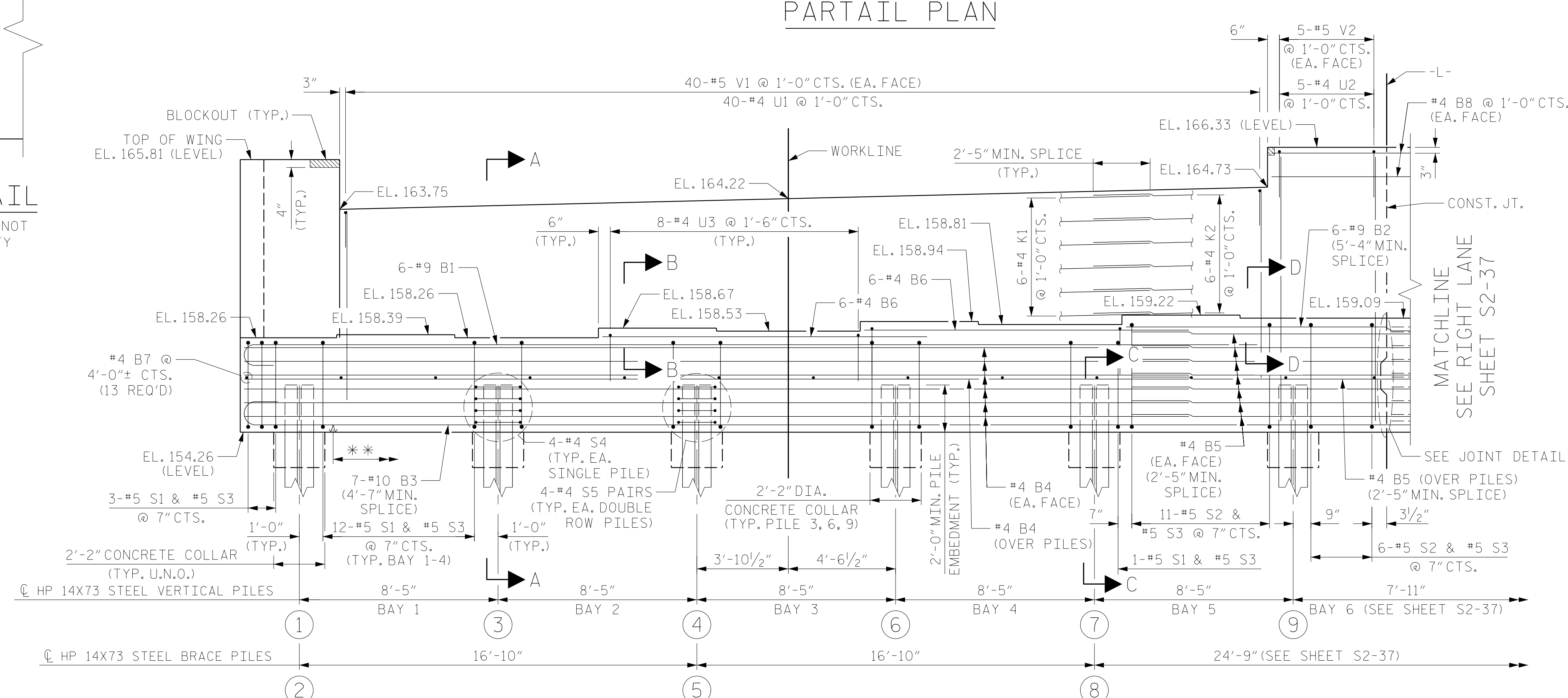
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.



JOINT DETAIL
REINFORCING STEEL NOT SHOWN FOR CLARITY



DETAIL "A"
PILE NOT SHOWN FOR CLARITY



PARTAIL ELEVATION

BRACE PILE IN WING NOT SHOWN FOR CLARITY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



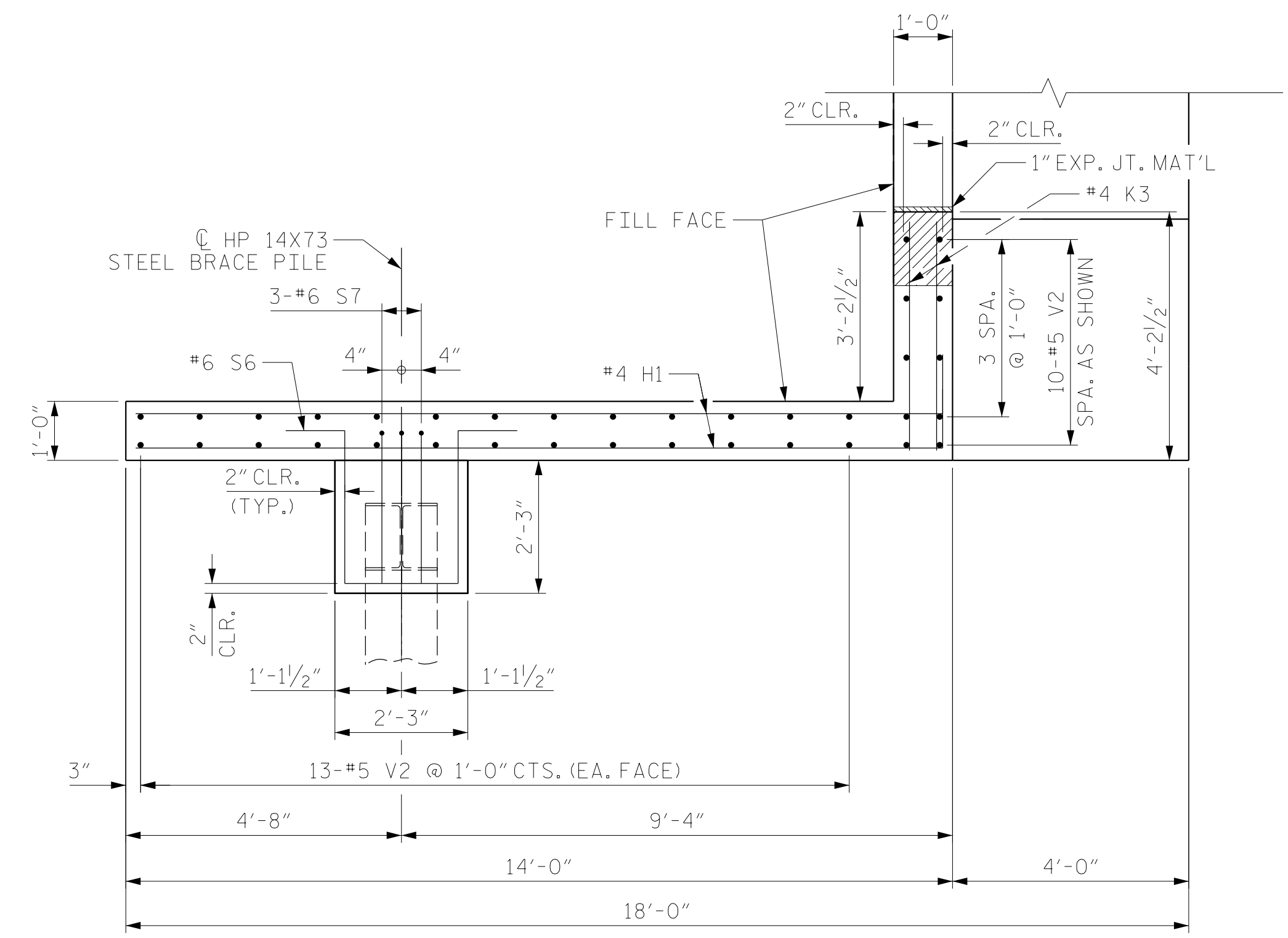
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
END BENT 2 PARTIAL PLAN AND ELEVATION LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

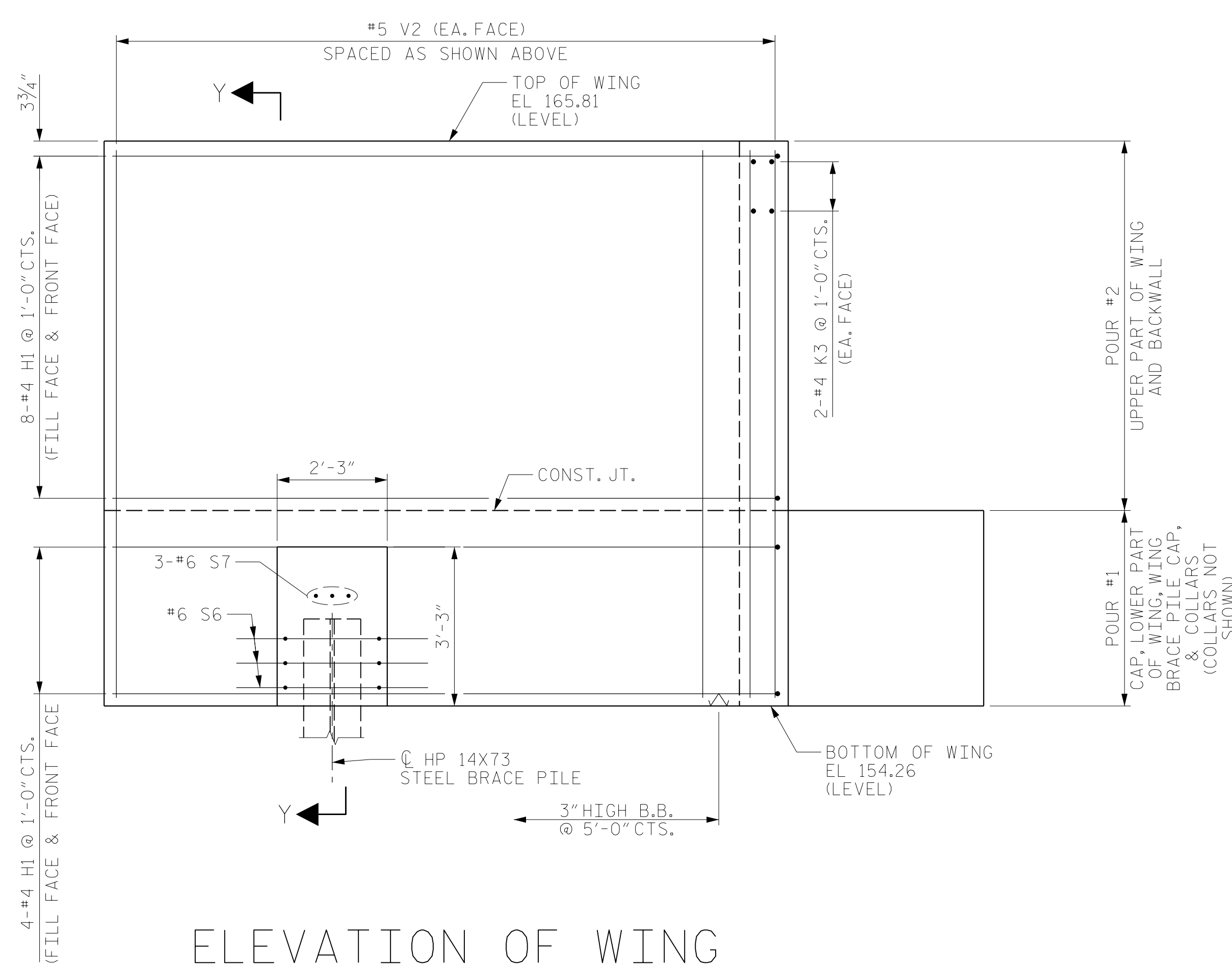
SHEET NO.	S1-37
TOTAL SHEETS	43

DRAWN BY : NSC DATE : 03/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

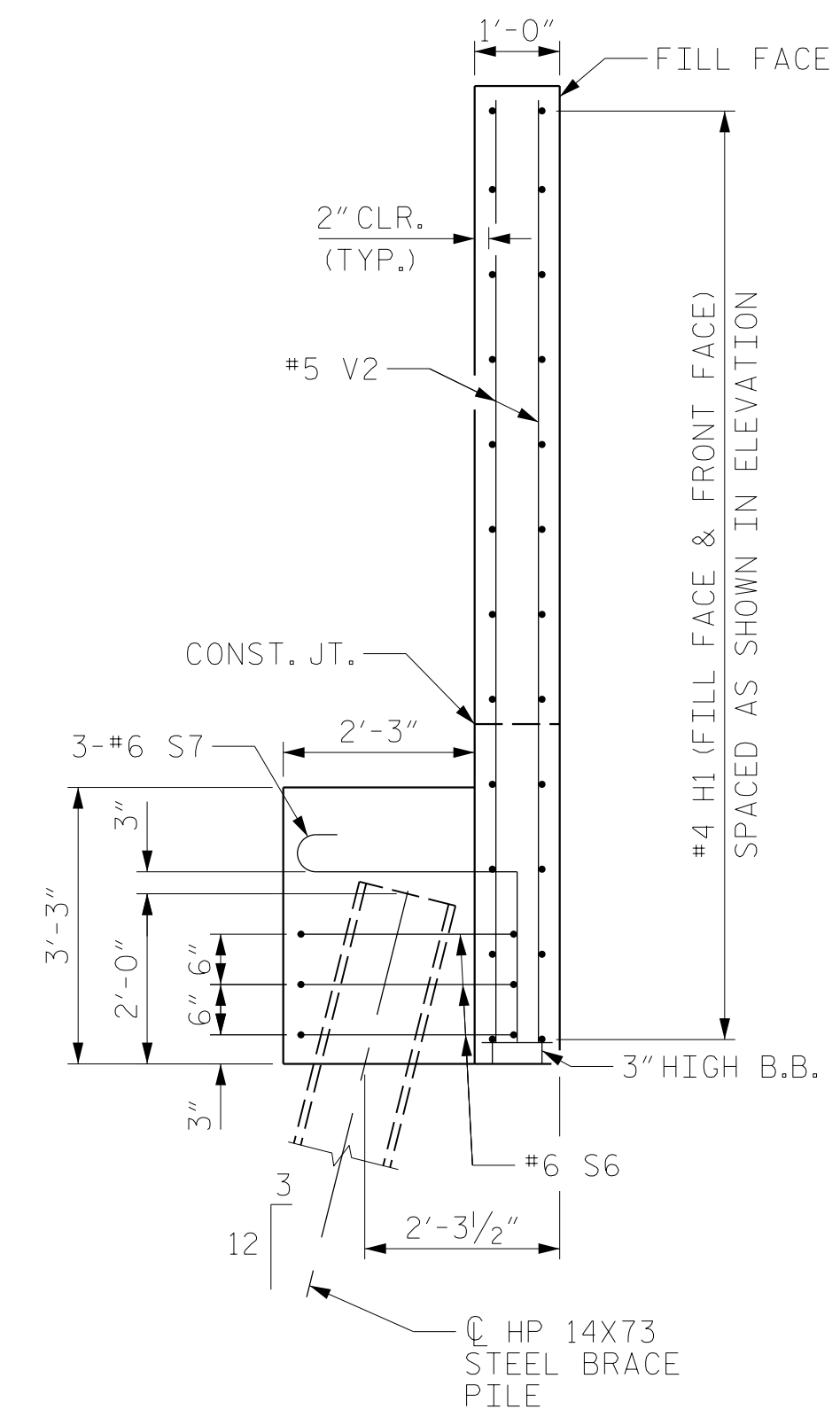
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PLAN OF WING



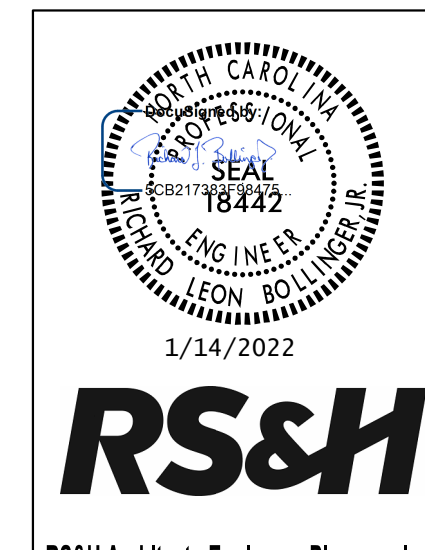
ELEVATION OF WING



SECTION Y-Y

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



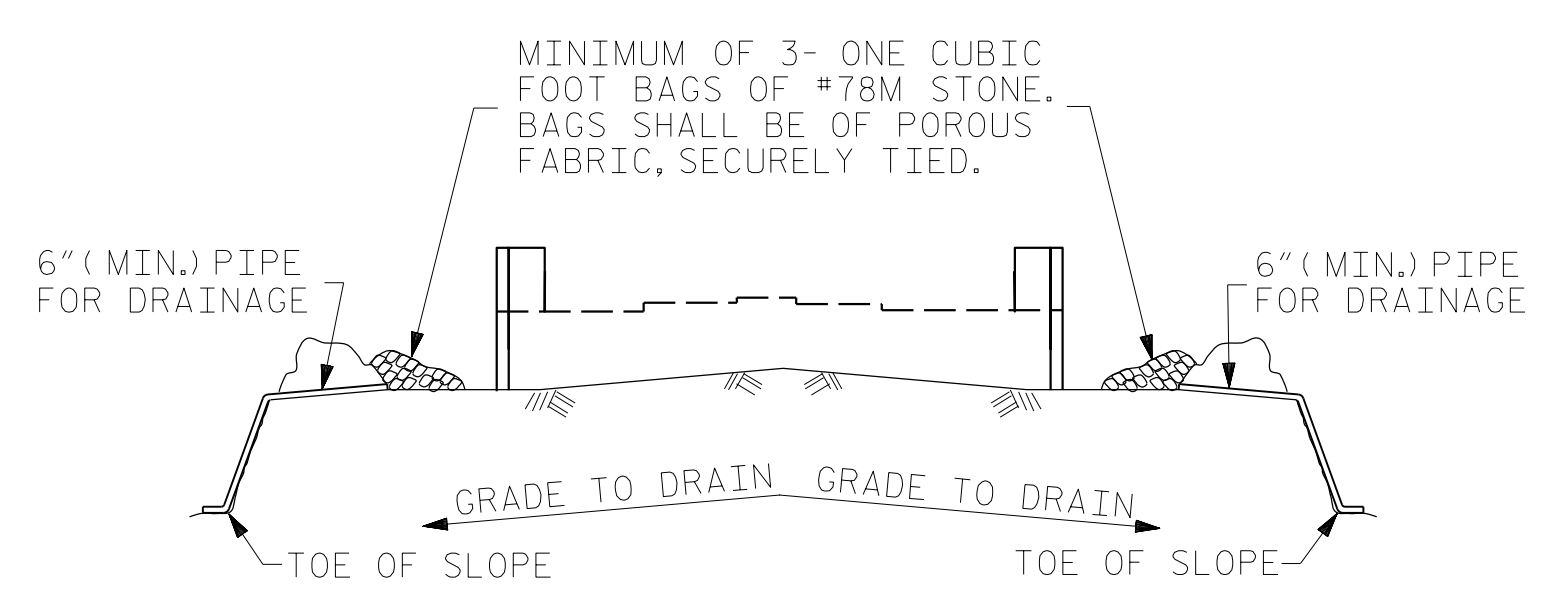
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 WING WALL DETAILS
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-38
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : NSC DATE : 03/2020
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

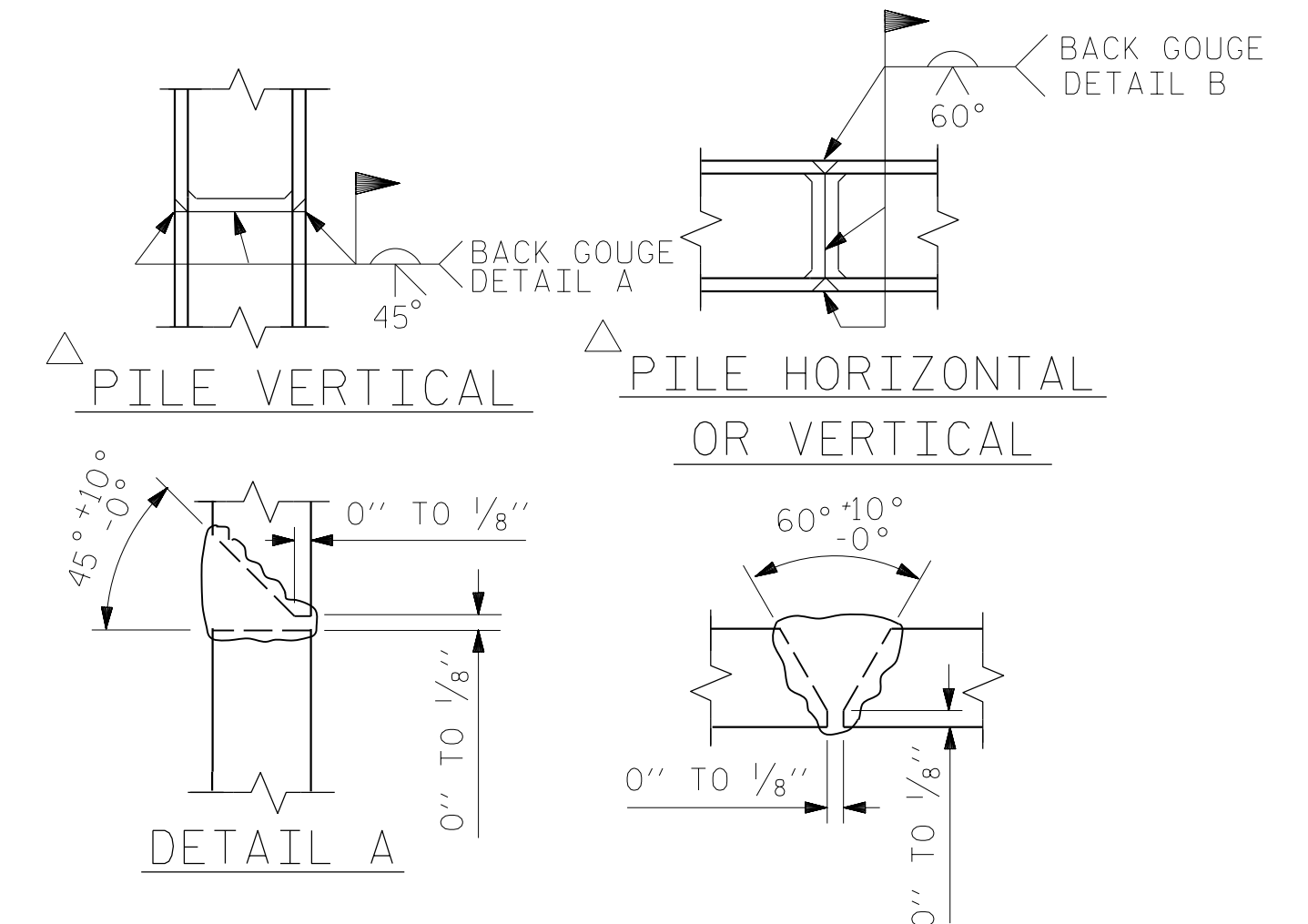


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

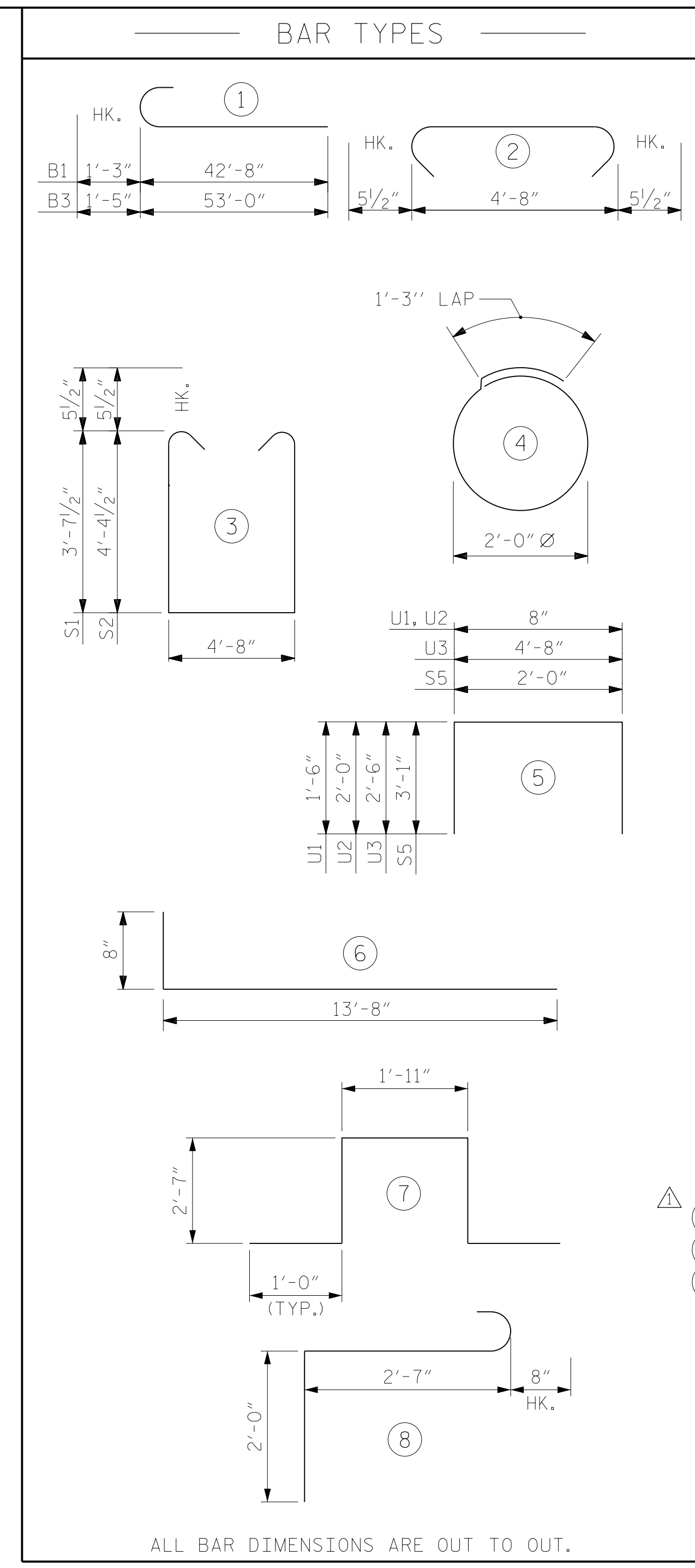
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



BILL OF MATERIAL					
END BENT NO. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	43'-11"	896
B2	6	#9	STR	16'-5"	335
B3	7	#10	1	54'-5"	1639
B4	20	#4	STR	40'-0"	534
B5	22	#4	STR	13'-3"	195
B6	12	#4	STR	13'-6"	108
B7	13	#4	STR	4'-8"	41
B8	4	#4	STR	9'-9"	26
H1	24	#4	6	14'-4"	230
K1	12	#4	STR	40'-0"	321
K2	12	#4	STR	13'-5"	108
K3	4	#4	STR	3'-10"	10
S1	52	#5	3	12'-10"	696
S2	17	#5	3	14'-4"	254
S3	69	#5	2	5'-7"	402
S4	12	#4	4	7'-7"	61
S5	24	#4	5	8'-2"	131
S6	3	#6	7	9'-1"	41
S7	3	#6	8	5'-3"	24
U1	40	#4	5	3'-8"	98
U2	5	#4	5	4'-8"	16
U3	16	#4	5	9'-8"	103
V1	80	#5	STR	9'-0"	751
V2	46	#5	STR	11'-1"	532

REINFORCING STEEL 7,552 LBS.
CLASS A CONCRETE

POUR #1
CAP AND LOWER PART OF WINGS 42.0 C.Y.

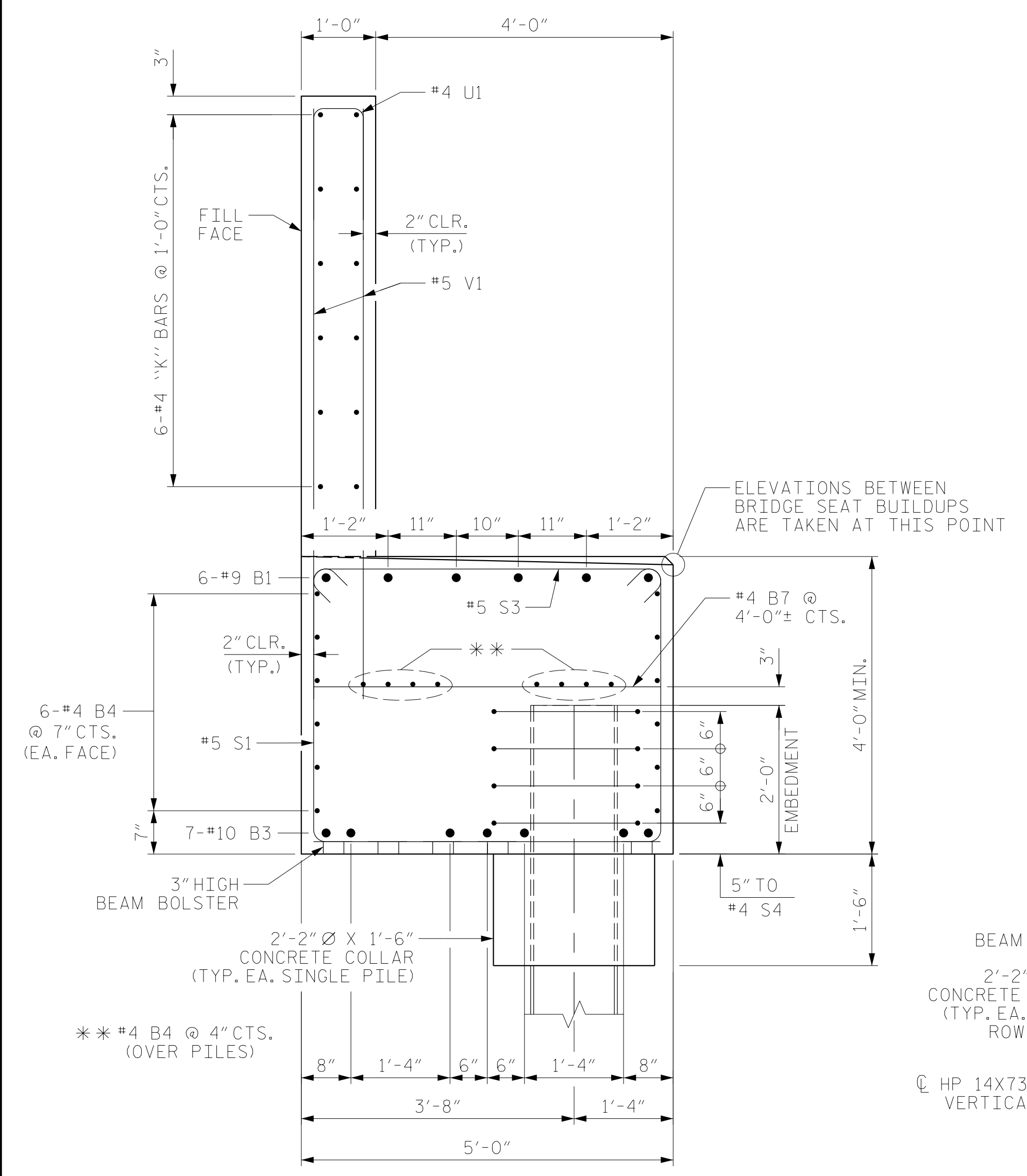
POUR #2
UPPER PART OF WINGS AND BACKWALL 14.4 C.Y.

TOTAL CLASS A CONCRETE 56.4 C.Y.

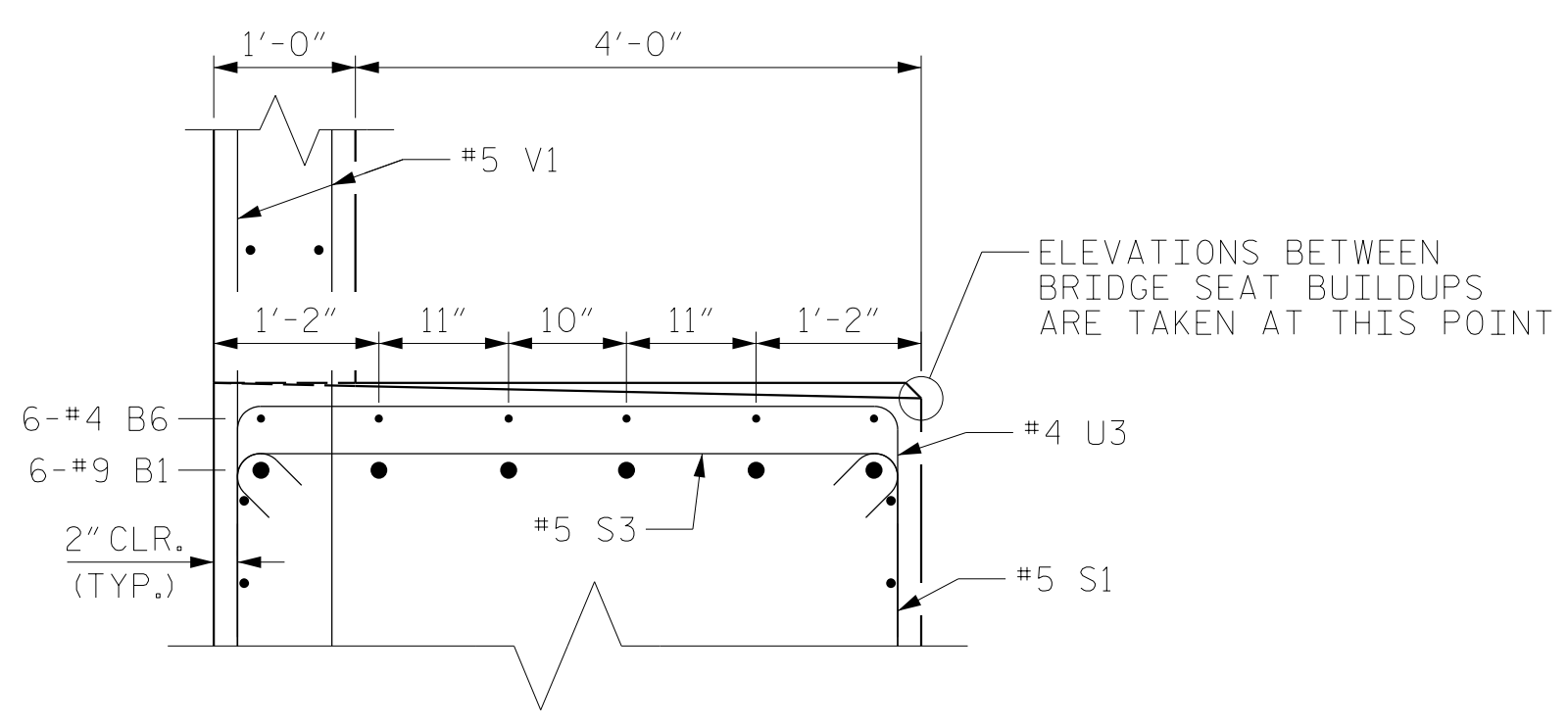
HP 14 X 73 STEEL PILES NO. 10 700.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES NO. 10

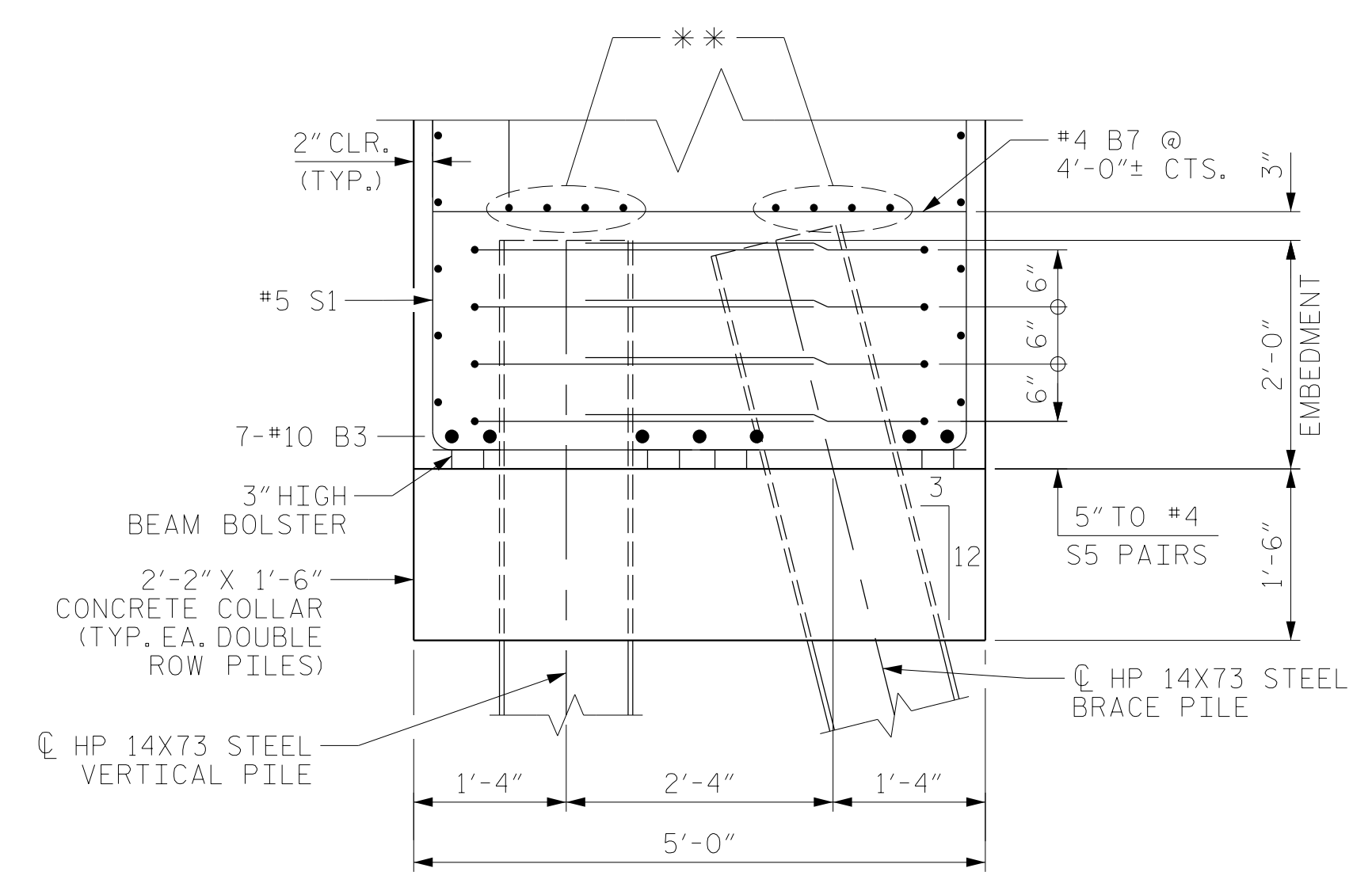
PILE REDRIVES (FOR ONE END BENT) NO. 5



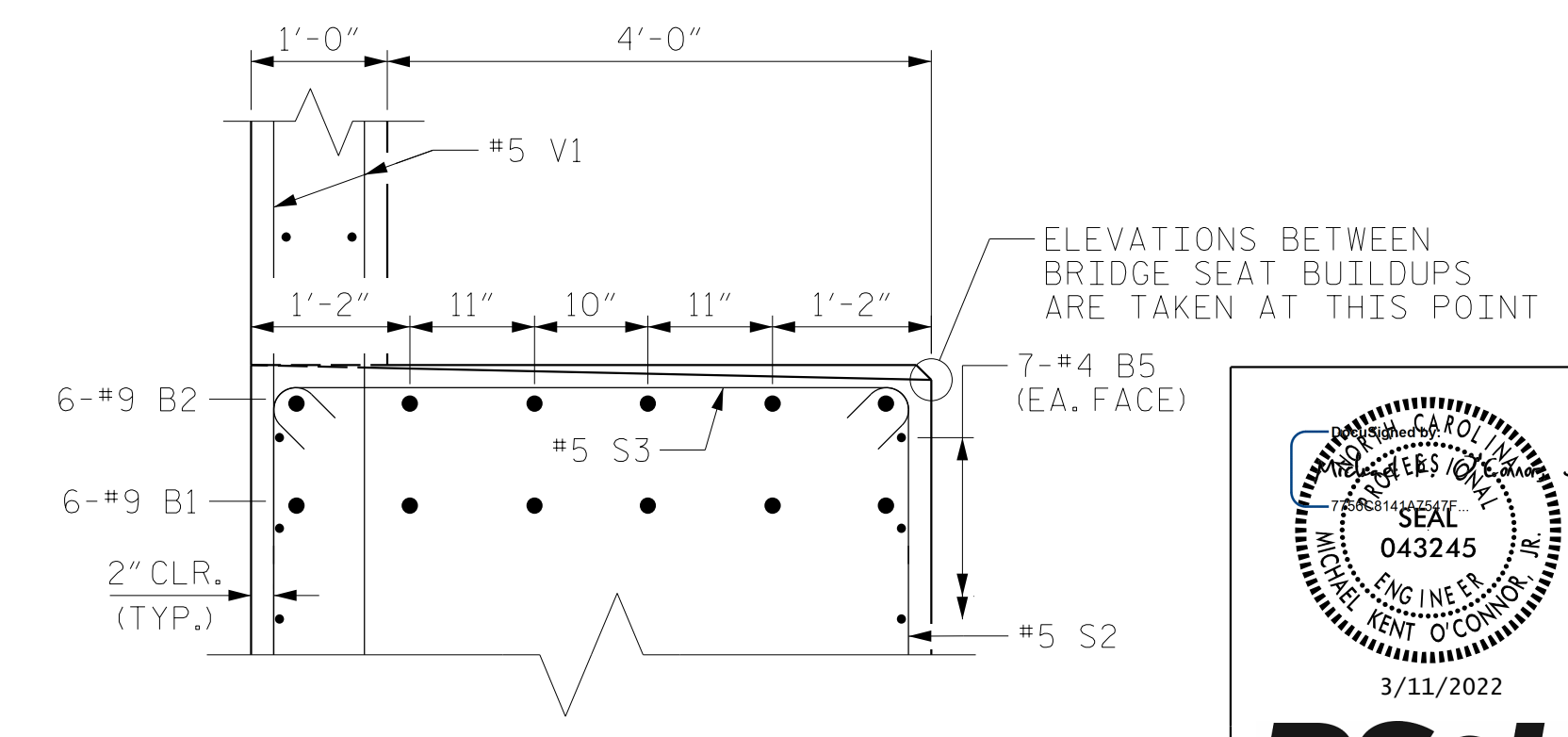
SECTION A-A



PARTIAL SECTION B-B



PARTIAL SECTION C-C



PARTIAL SECTION D-D

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 3

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
DETAILS
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-39
1	NSC	03/2022	3			TOTAL SHEETS 43
2			4			

DRAWN BY : NSC DATE : 03/2020
CHECKED BY : MKO DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

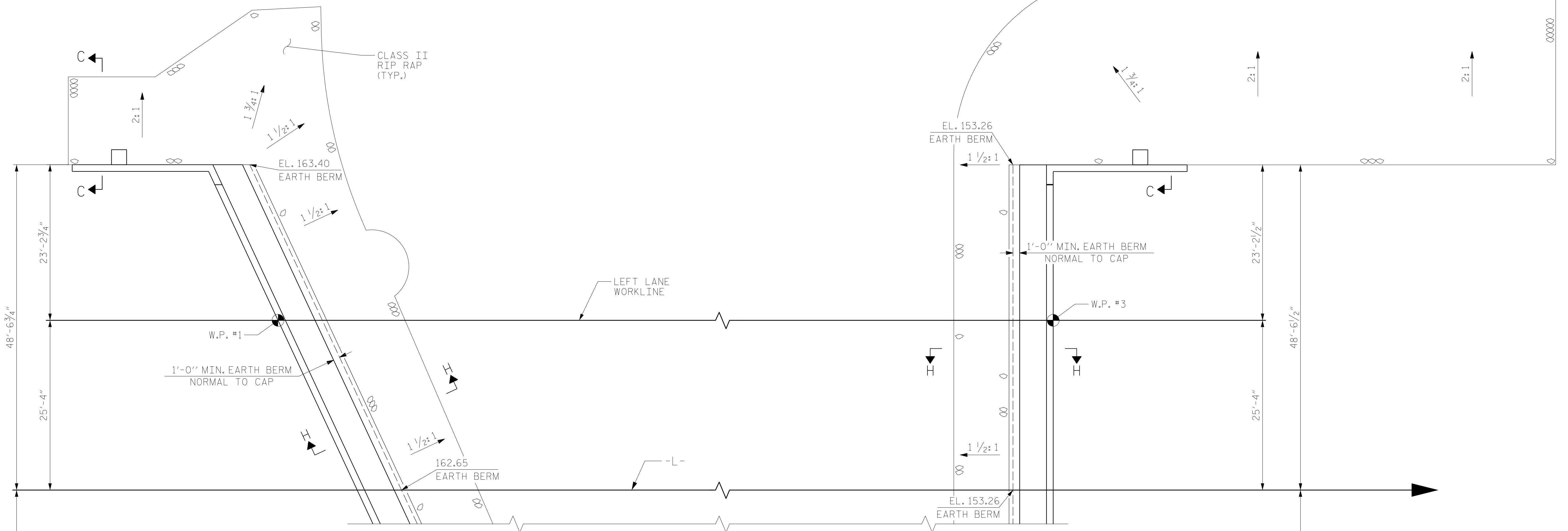
** #4 B4 @ 4" CTS. (OVER PILES)

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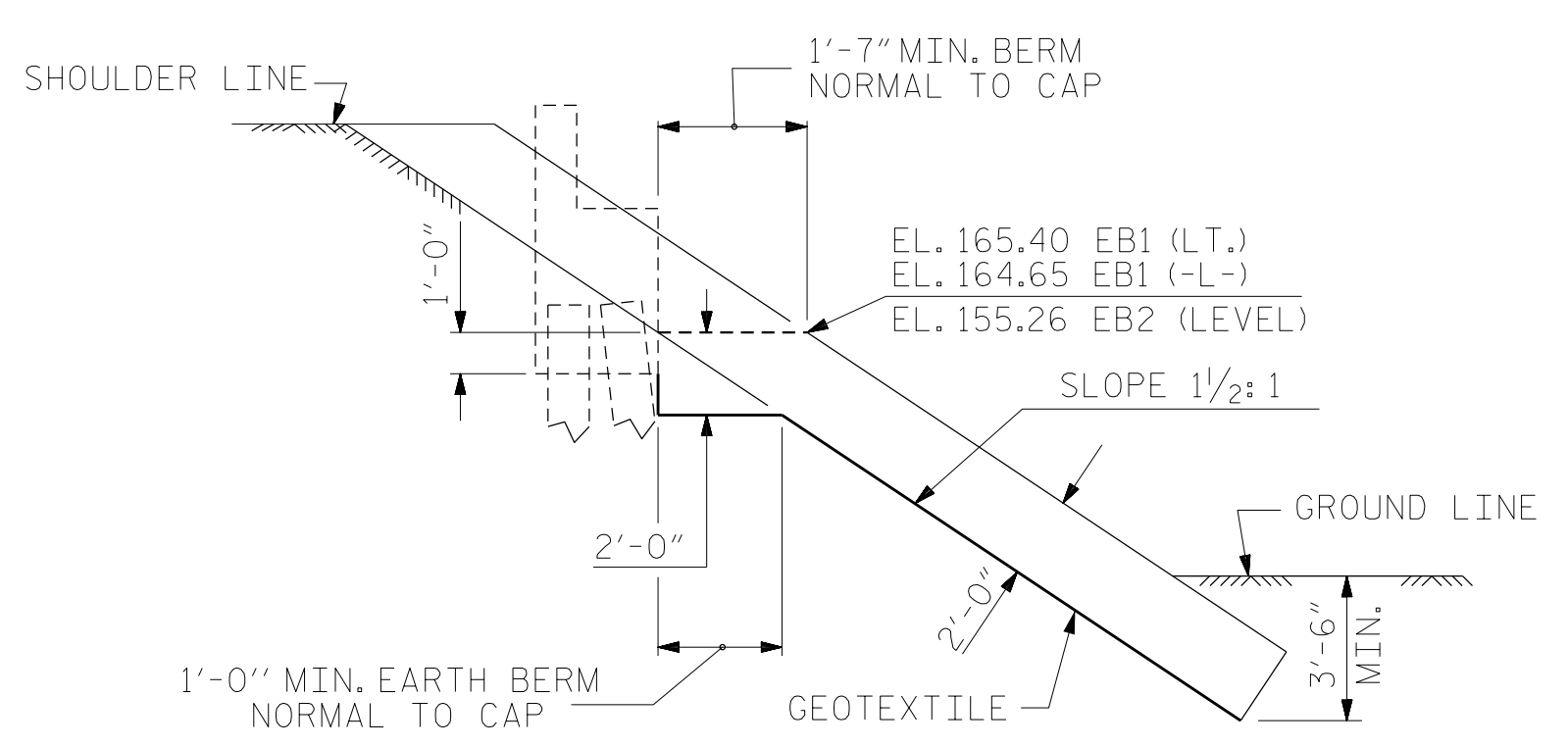
REVISD HP 14X73 STEEL PILE COUNT AND LENGTH

ESTIMATED QUANTITIES		
BRIDGE @ STA. 76+80.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	167	185
END BENT 2	365	405

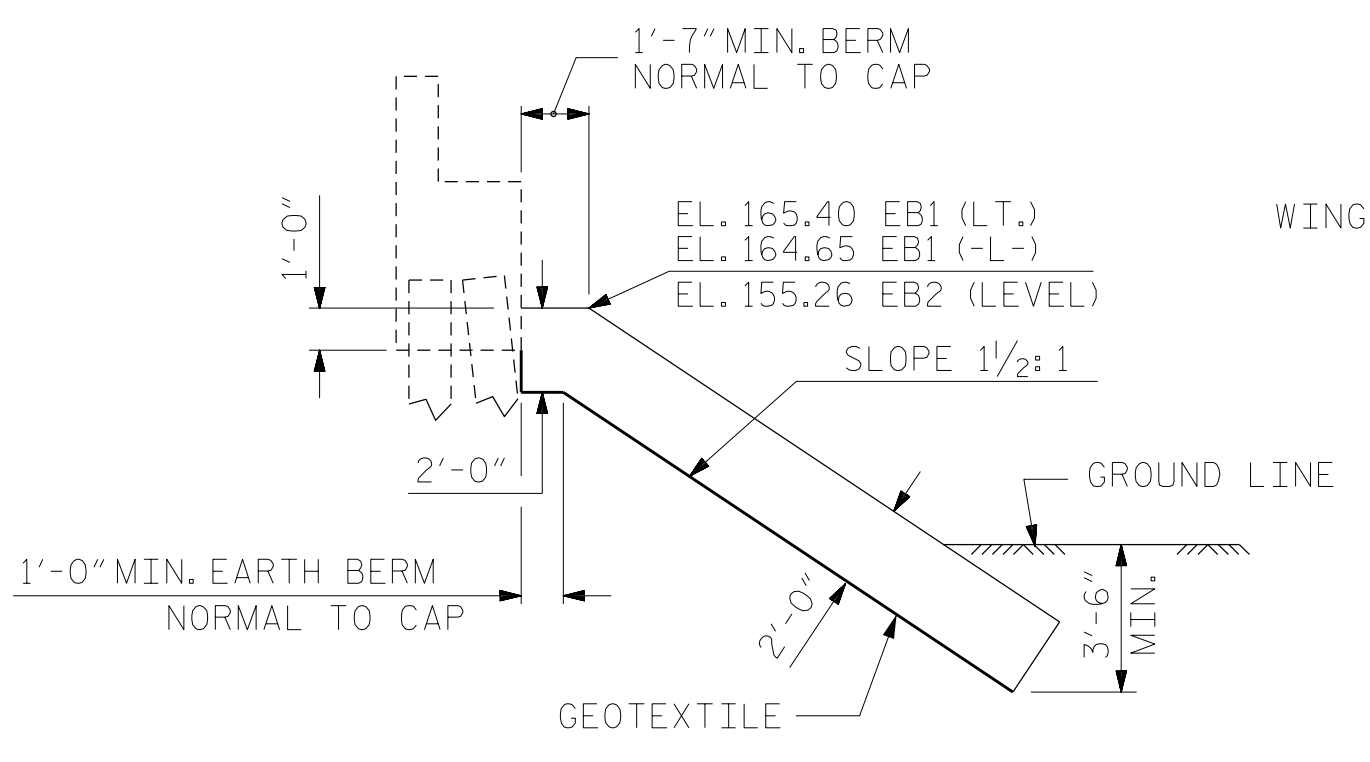
NOTES :
 FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.
 RIP RAP AND GEOTEXTILE QUANTITIES ARE FROM LEFT OF -L-.



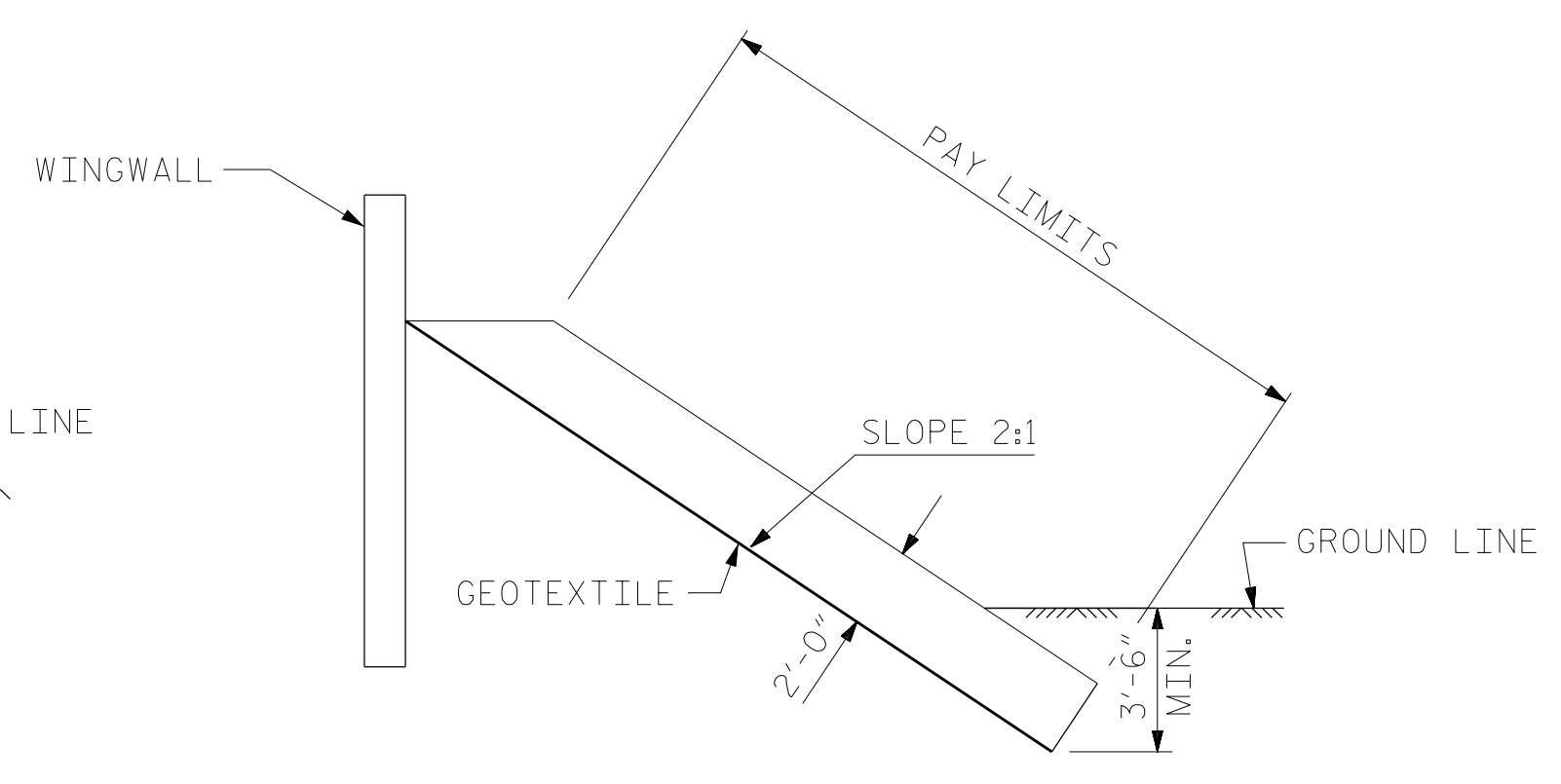
PLAN



SECTION H-H



LEFT LANE WORK LINE SECTION
 BERM RIP RAPPED



SECTION C-C

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-



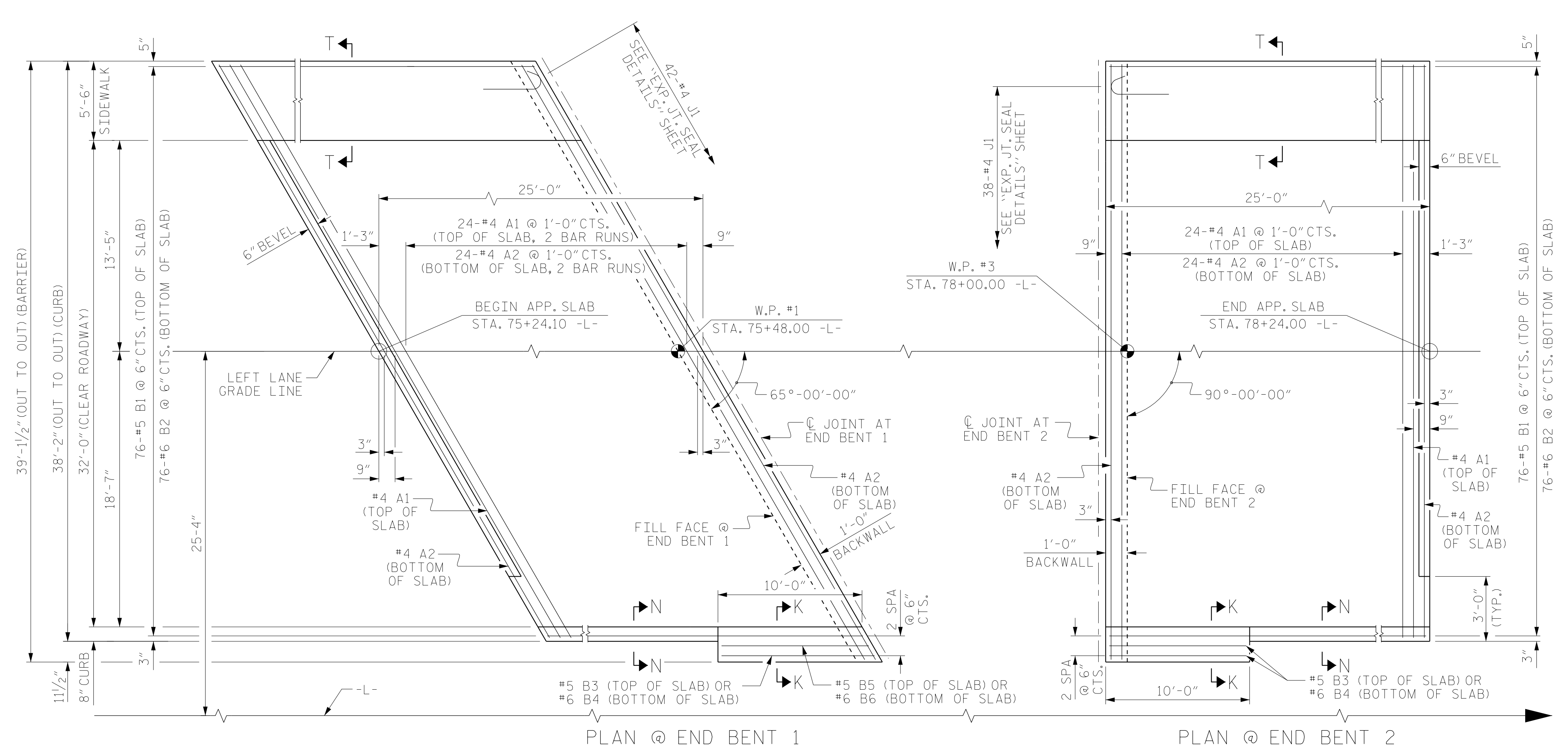
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 RIP RAP DETAILS
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-40
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : TWL DATE : 05/2020
 CHECKED BY : MRA DATE : 05/2020
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

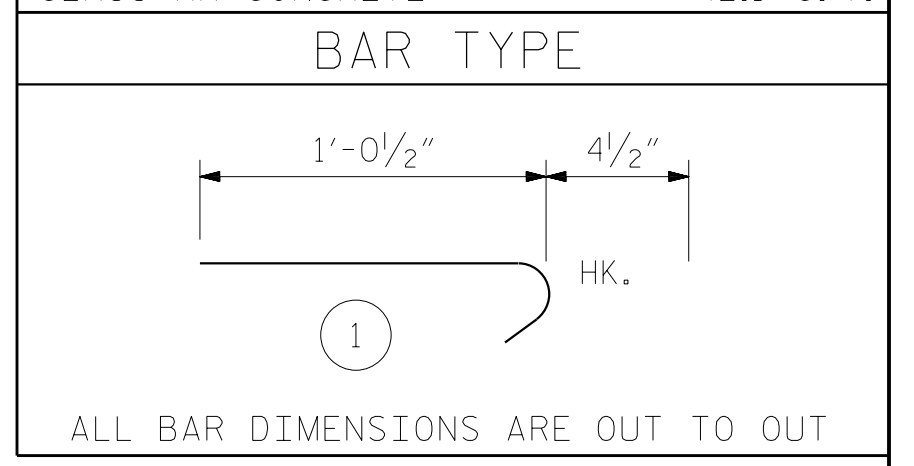
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SPLICE LENGTHS			
BAR SIZE	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	
#5	2'-5"	2'-0"	
#6	3'-7"	2'-5"	

BILL OF MATERIAL						
APPROACH SLAB AT END BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	50	#4	STR.	23'-1"	771	
A2	52	#4	STR.	22'-11"	796	
* B1	76	#5	STR.	23'-8"	1876	
B2	76	#6	STR.	24'-7"	2806	
* B3	1	#5	STR.	9'-11"	10	
B4	1	#6	STR.	10'-3"	15	
* B5	1	#5	STR.	9'-8"	10	
B6	1	#6	STR.	10'-0"	15	
* J1	42	#4	1	1'-5"	40	
REINFORCING STEEL					3,632	LBS.
* EPOXY COATED REINFORCING STEEL					2,707	LBS.
CLASS AA CONCRETE					42.1	C. Y.

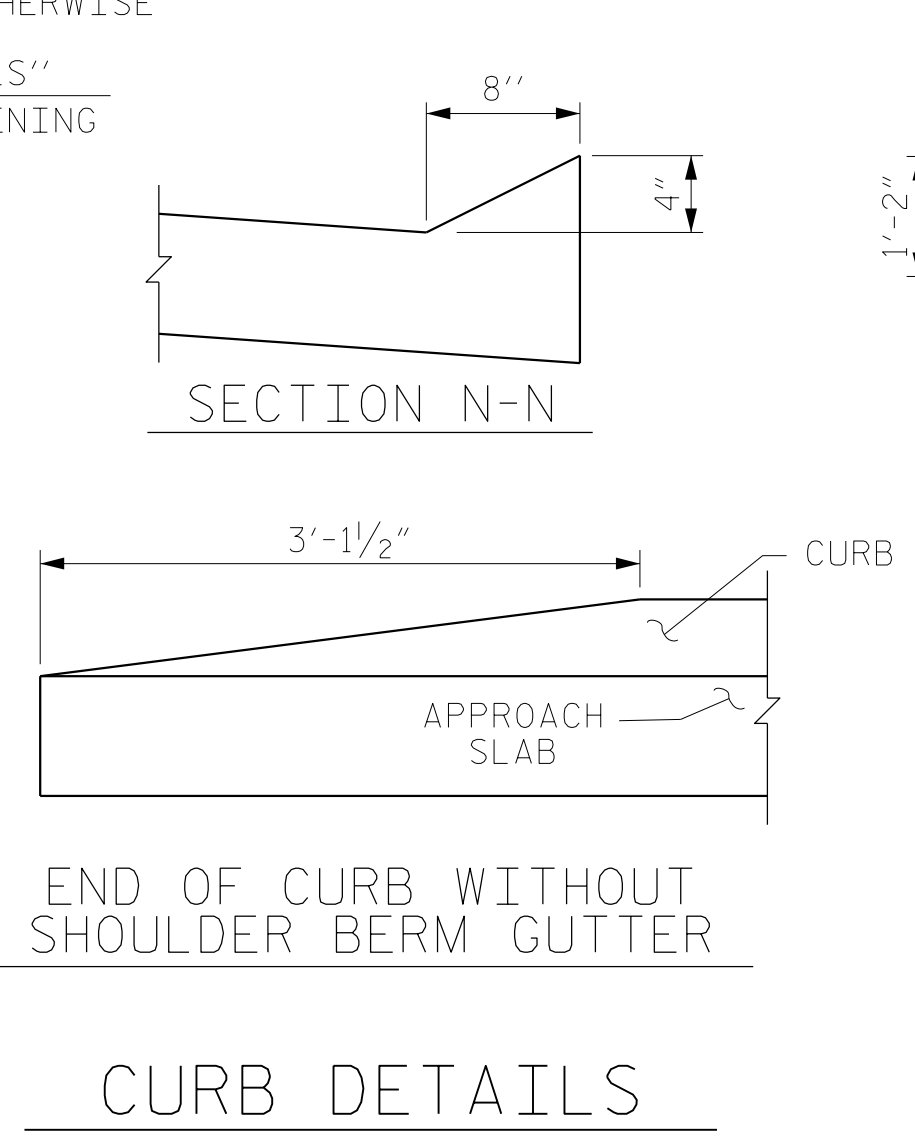
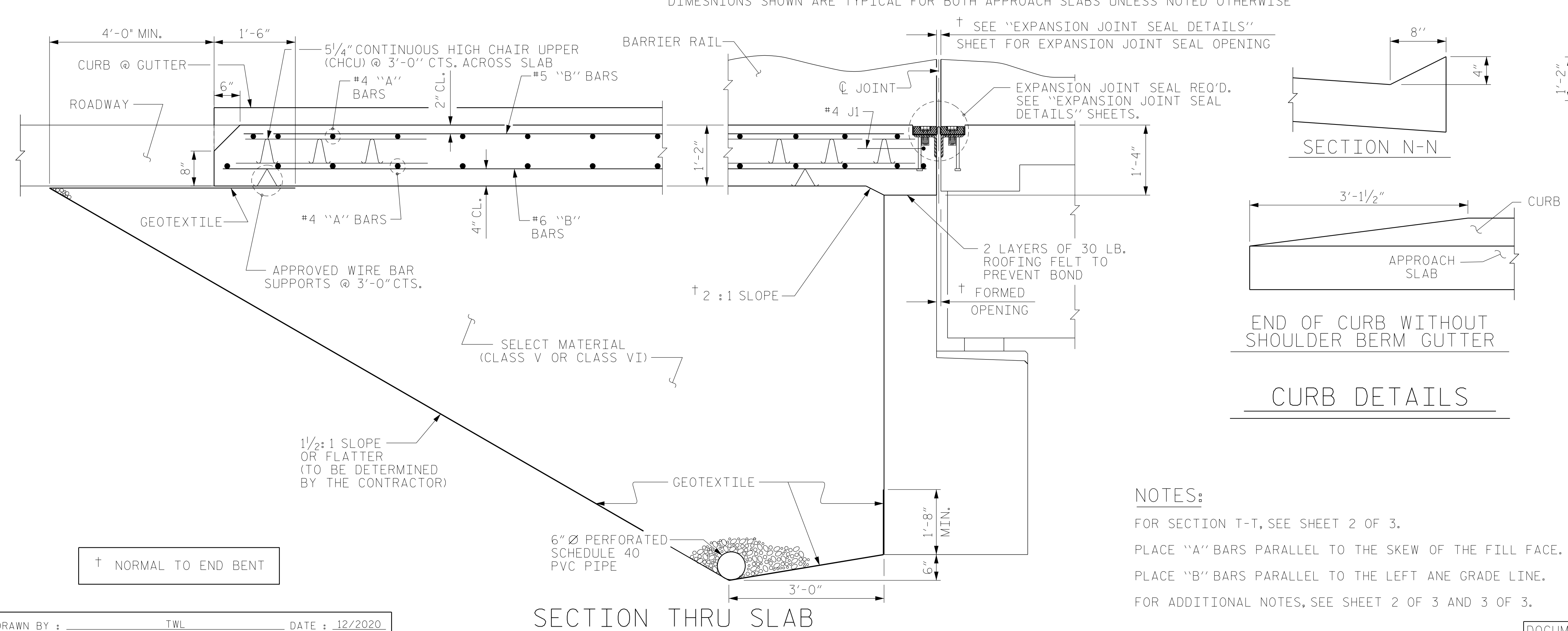
APPROACH SLAB AT END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	50	#4	STR.	21'-0"	701	
A2	52	#4	STR.	20'-10"	724	
* B1	76	#5	STR.	23'-10"	1889	
B2	76	#6	STR.	24'-8"	2816	
* B3	2	#5	STR.	9'-4"	19	
B4	2	#6	STR.	9'-8"	29	
* J1	38	#4	1	1'-5"	36	
REINFORCING STEEL					3,569	LBS.
* EPOXY COATED REINFORCING STEEL					2,645	LBS.
CLASS AA CONCRETE					42.1	C. Y.



ALL BAR DIMENSIONS ARE OUT TO OUT
 ** QUANTITIES FOR SIDEWALK AND END POST ARE NOT INCLUDED. SEE SHEET 2 OF 2.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



NOTES:
 FOR SECTION T-T, SEE SHEET 2 OF 3.
 PLACE "A" BARS PARALLEL TO THE SKEW OF THE FILL FACE.
 PLACE "B" BARS PARALLEL TO THE LEFT ANE GRADE LINE.
 FOR ADDITIONAL NOTES, SEE SHEET 2 OF 3 AND 3 OF 3.

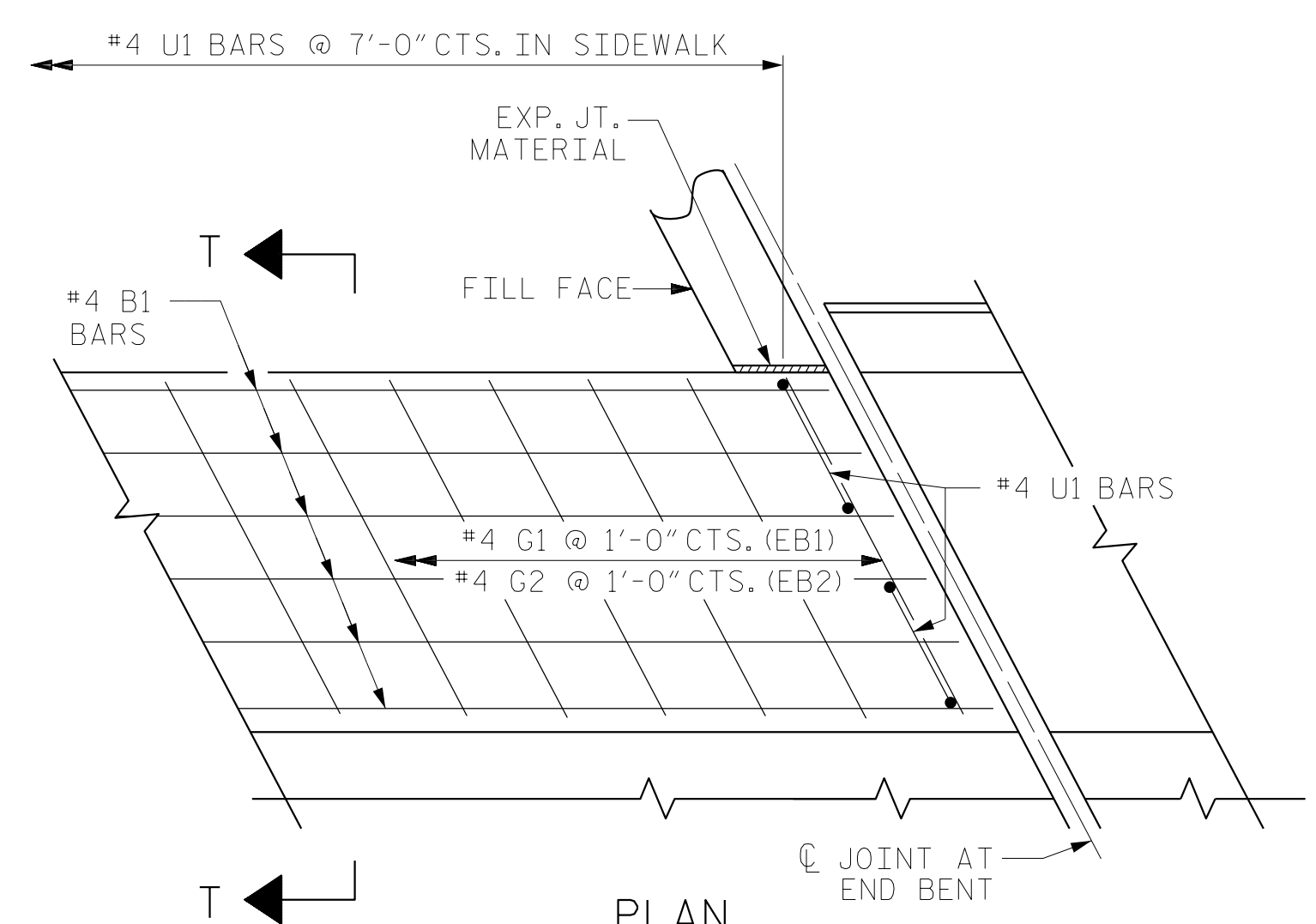
DRAWN BY : TWL DATE : 12/2020
 CHECKED BY : MRA DATE : 12/2020
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

SECTION THRU SLAB
 (TYPE I - STANDARD APPROACH FILL)

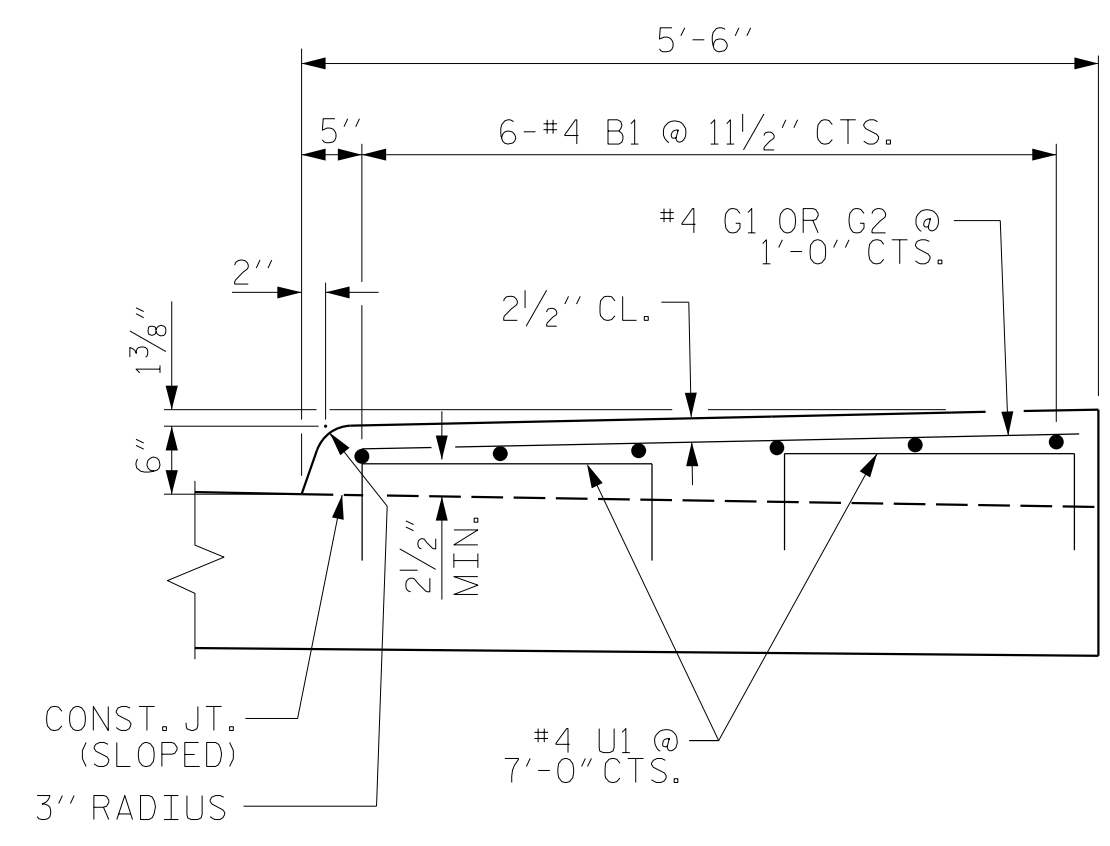
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT					
LEFT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S1-41
					TOTAL SHEETS 43



PLAN
END BENT 1 SHOWN, END BENT 2 SIMILAR
(END BENT 2 AT 90 DEGREE SKEW)



SECTION T-T
U1 BARS MAY BE PUSHED INTO GREEN
CONCRETE AFTER SLAB HAS BEEN SCREEDED OFF

DETAILS OF SIDEWALK ON APPROACH SLAB

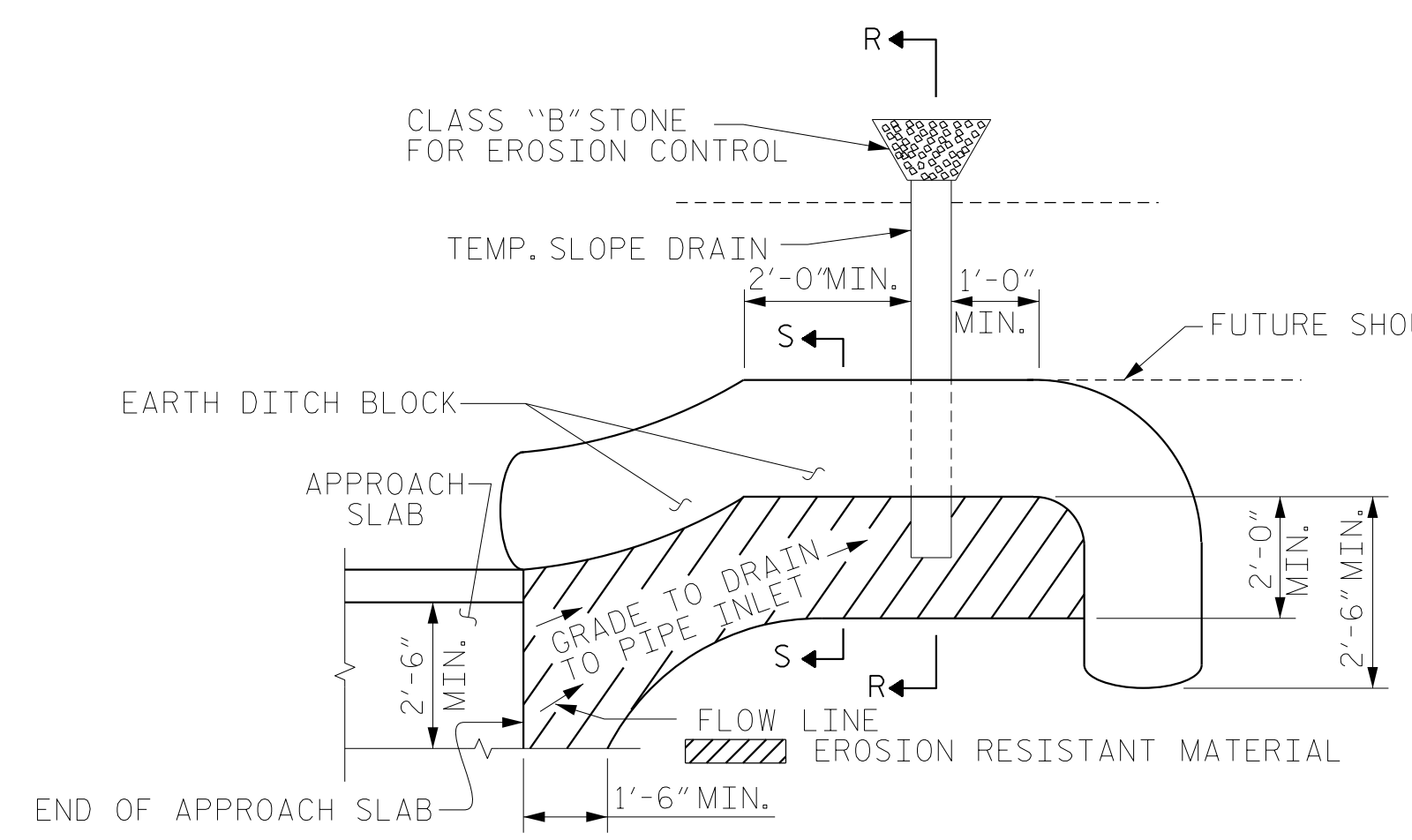
NOTES:

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

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

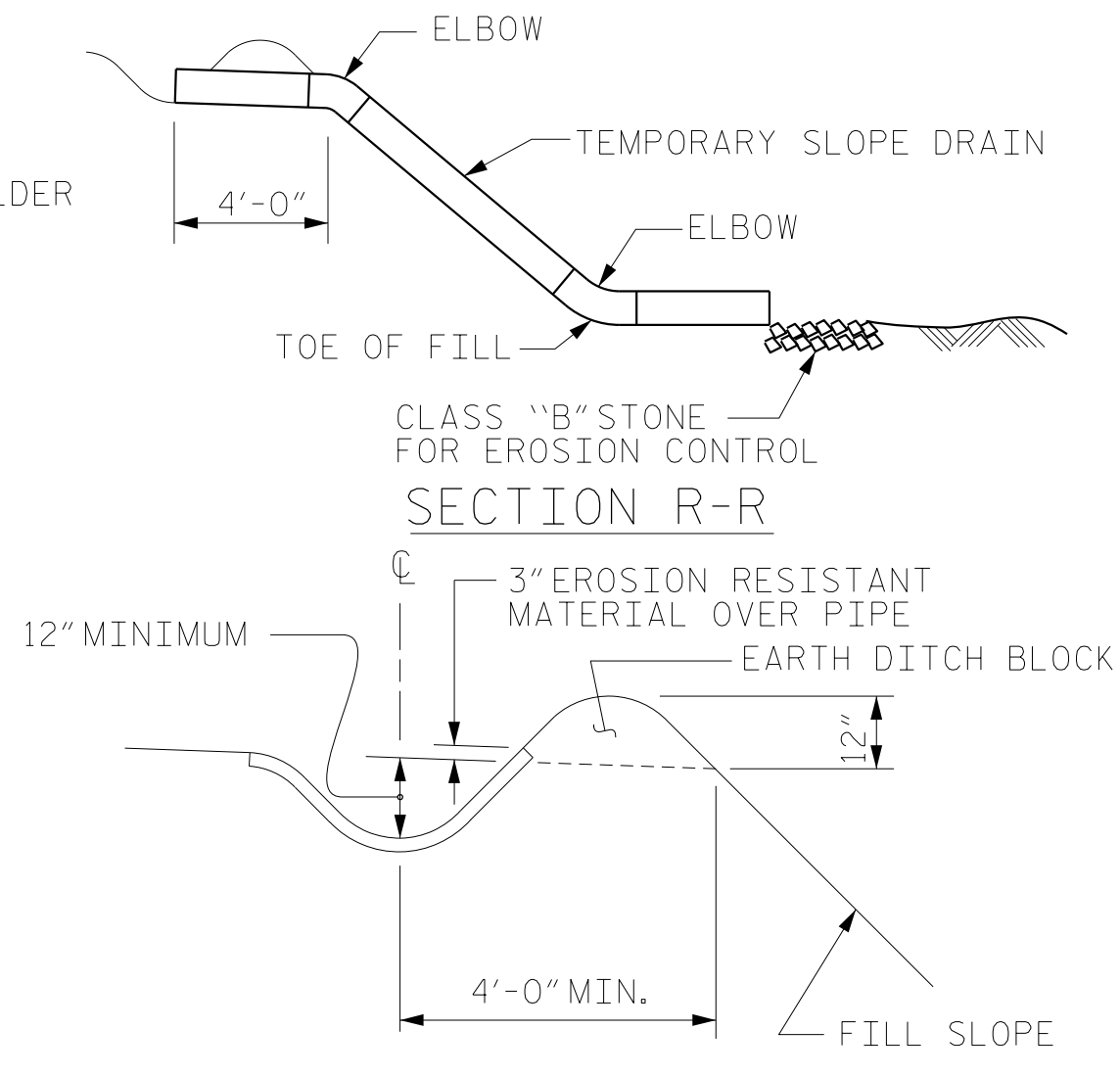
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

BILL OF MATERIAL					
SIDEWALK AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	6	#4	STR.	24'-7"	99
*G1	25	#4	STR.	5'-5"	90
*U1	8	#4	2	4'-0"	21
* EPOXY COATED REINFORCING STEEL					210 LBS.
CLASS AA CONCRETE					3.1 C.Y.
SIDEWALK AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	6	#4	STR.	24'-8"	99
*G2	25	#4	STR.	4'-11"	82
*U2	8	#4	2	3'-9"	20
* EPOXY COATED REINFORCING STEEL					201 LBS.
CLASS AA CONCRETE					3.1 C.Y.
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					



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

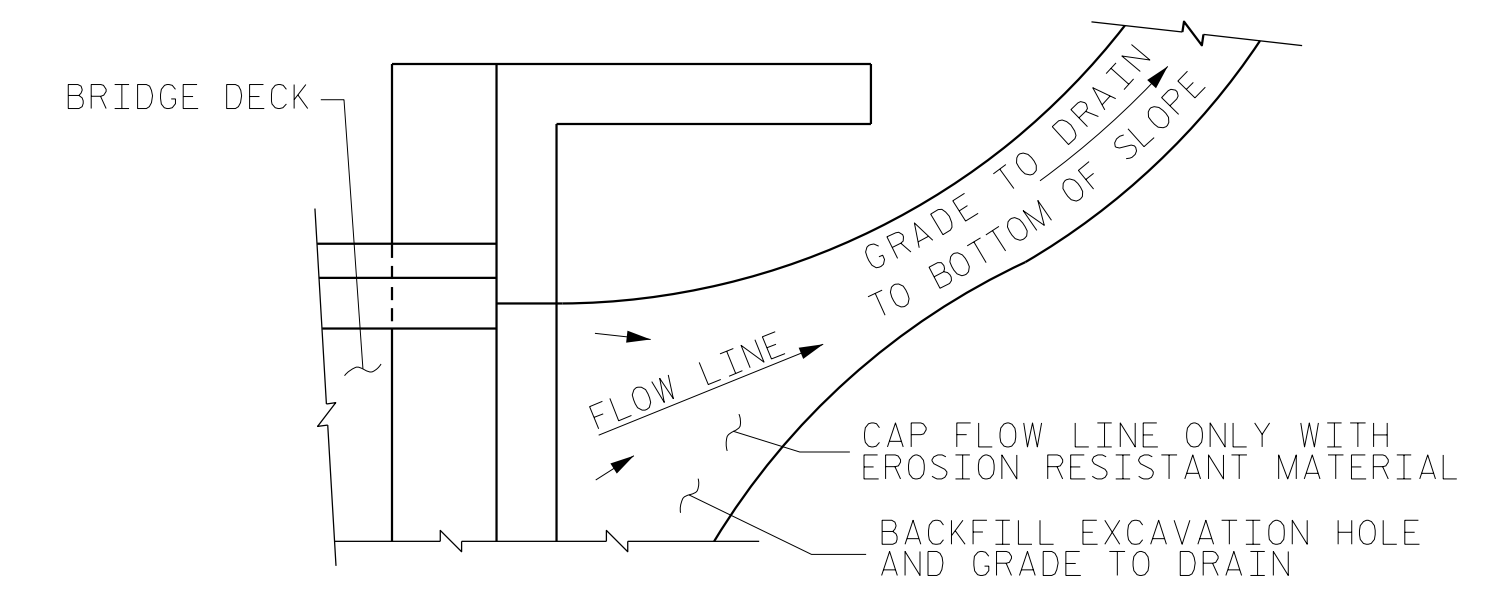
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

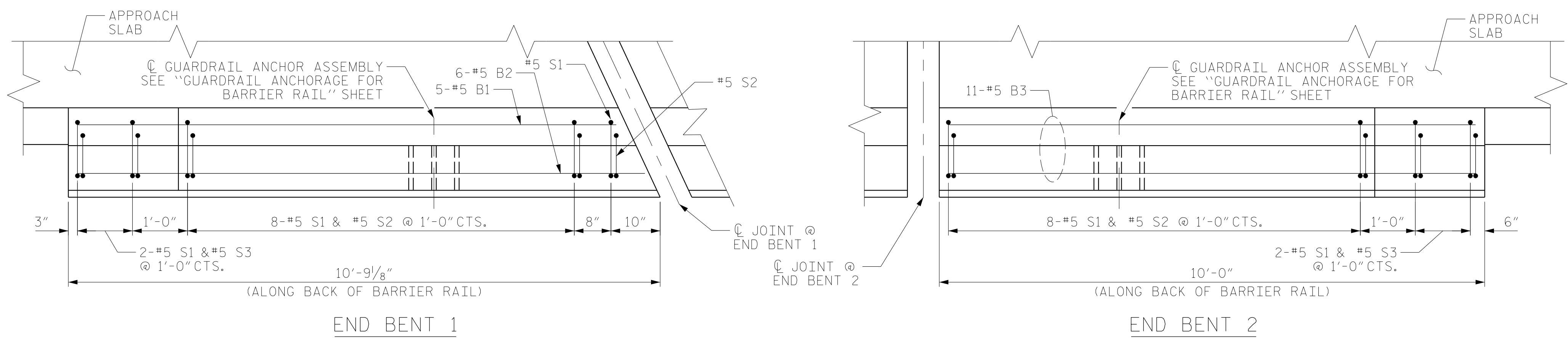
SHEET 2 OF 3

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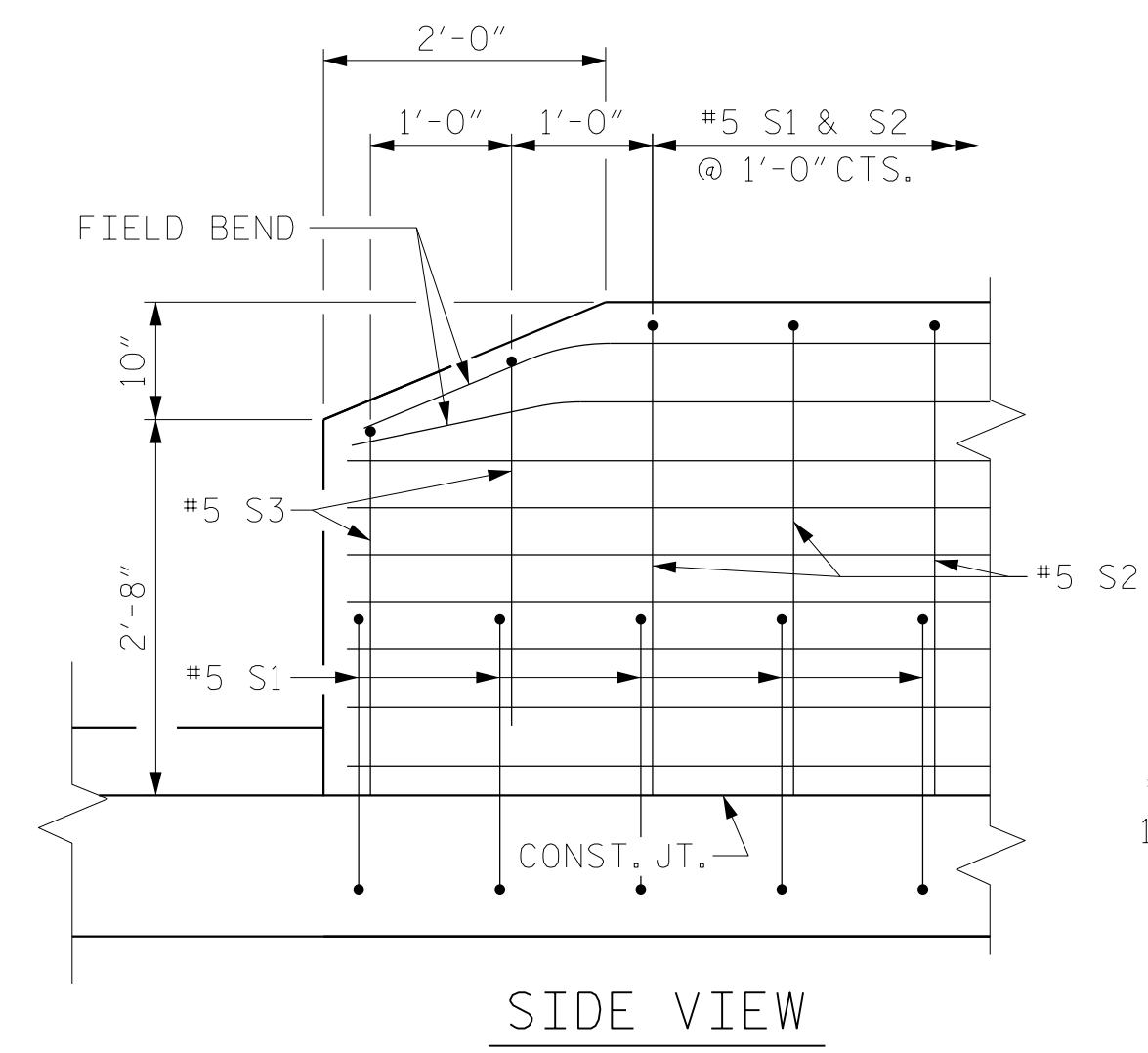
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
LEFT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S1-42
					TOTAL SHEETS 43

DRAWN BY :	TWL	DATE :	12/2020
CHECKED BY :	MRA	DATE :	12/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

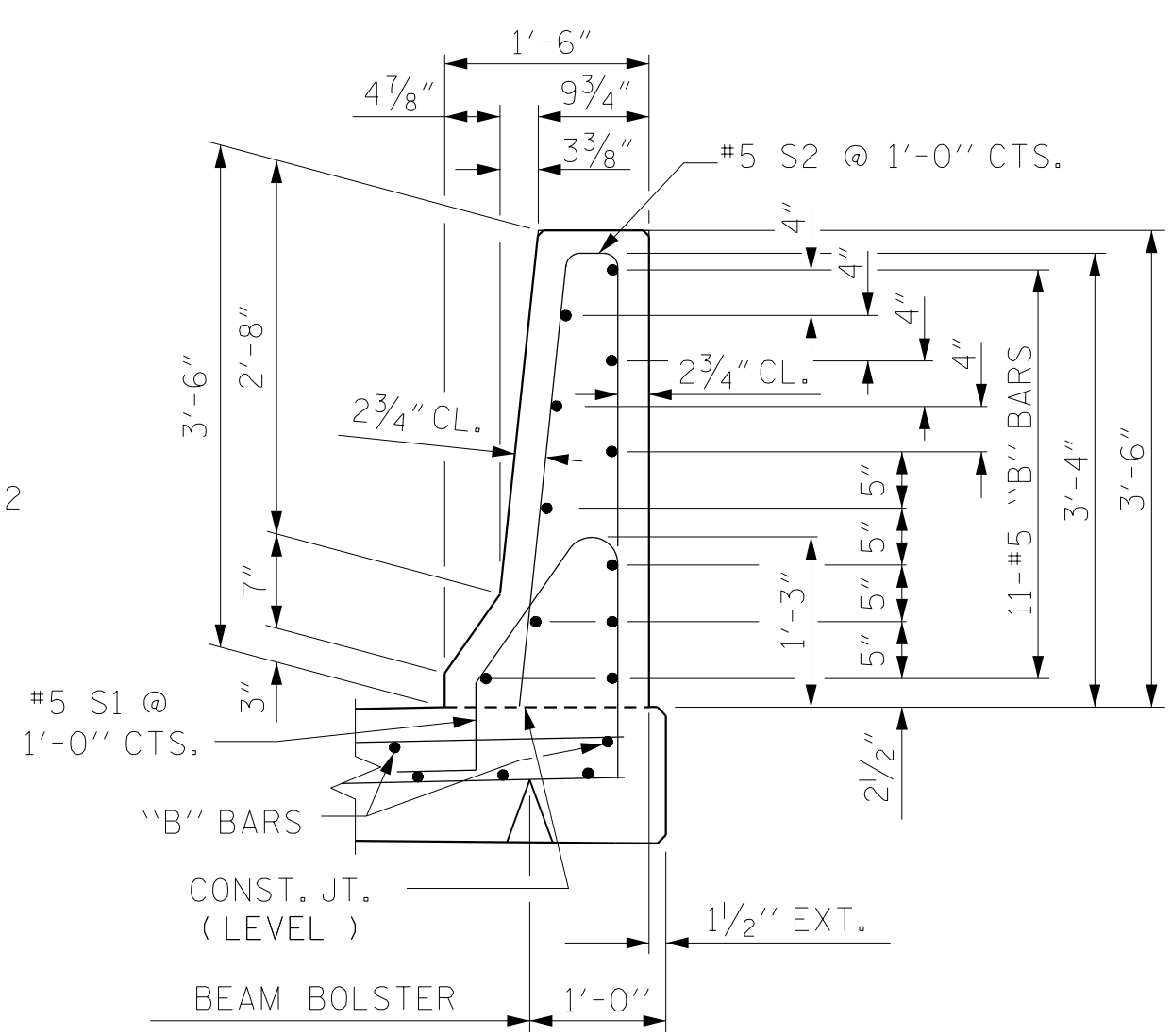
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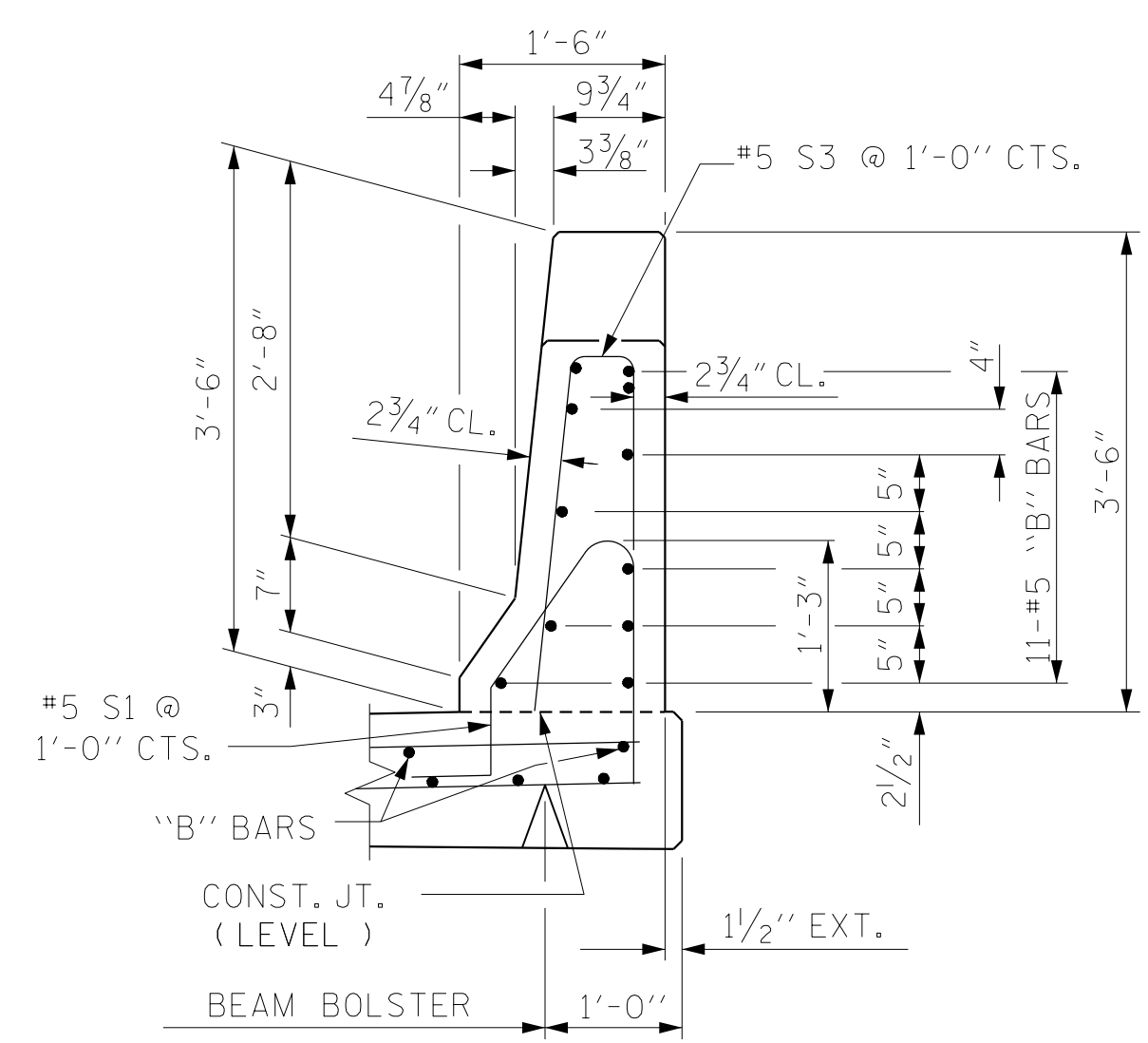
PLAN OF BARRIER RAIL



SIDE VIEW



SECTION THRU RAIL



END VIEW

END OF RAIL DETAILS

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	5	#5	STR.	9'-9"	51
* B2	6	#5	STR.	10'-2"	64
* B3	11	#5	STR.	9'-8"	111
* S1	21	#5	1	5'-1"	111
* S2	17	#5	2	7'-0"	124
* S3	4	#5	2	5'-6"	23

* EPOXY COATED REINFORCING STEEL 484 LBS.
CLASS AA CONCRETE 2.8 CU. YDS.
CONCRETE BARRIER RAIL 20.4 LIN. FT.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 3

NOTES:
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

DRAWN BY :	TWL	DATE :	12/2020
CHECKED BY :	MRA	DATE :	12/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BRIDGE APPROACH SLAB DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-43
1			3			TOTAL SHEETS
2			4			43

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.
	- -	27,000 LBS. PER SQ. IN.
	- -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	- - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	- - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	- - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	- - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	- - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	- - - - -	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

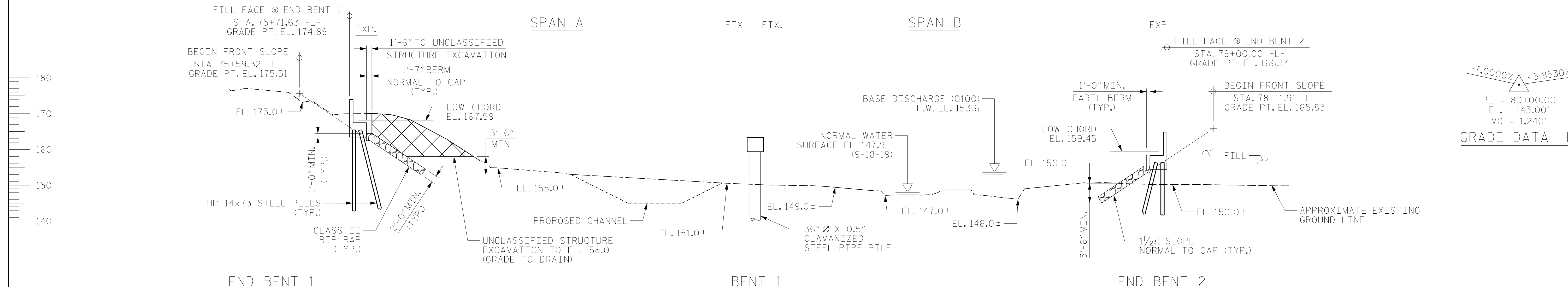
GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN

75+00 76+00 77+00 78+00 79+00

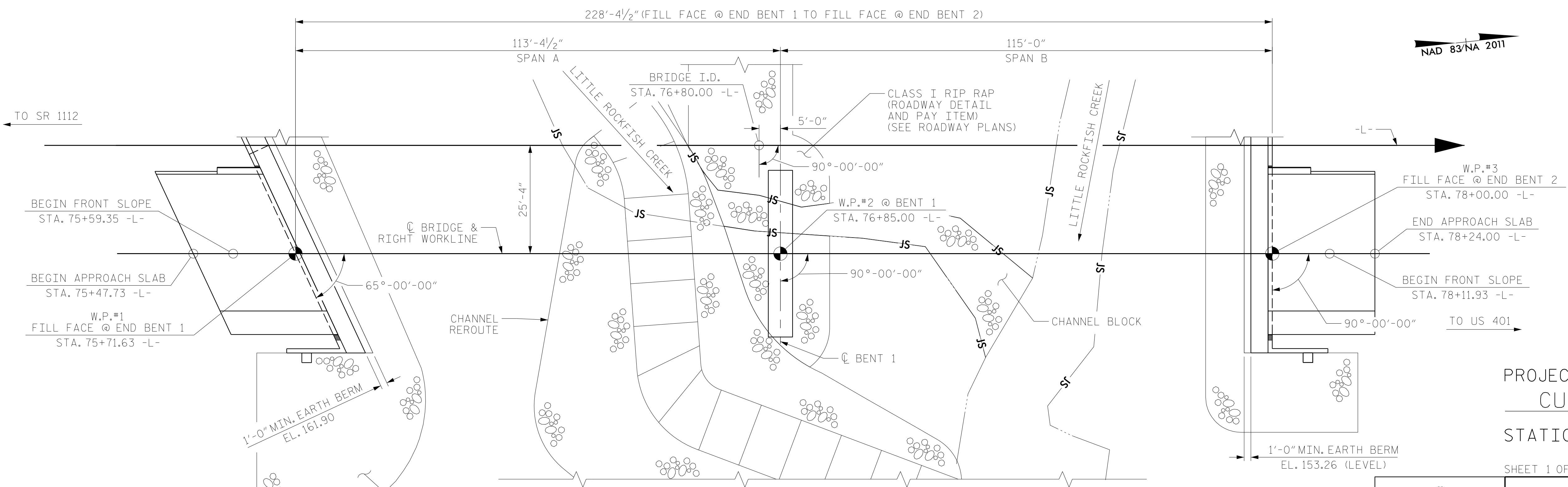


-7.0000% +5.8530%

PI = 80+00.00
EL. = 143.00'
VC = 1,240'

GRADE DATA -L-

SECTION ALONG RIGHT WORKLINE
(SECTION AT END BENT 1 TAKEN AT RIGHT ANGLE)



PLAN ALONG RIGHT WORKLINE
(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

DRAWN BY : NSC DATE : 03/2020
CHECKED BY : MKO DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

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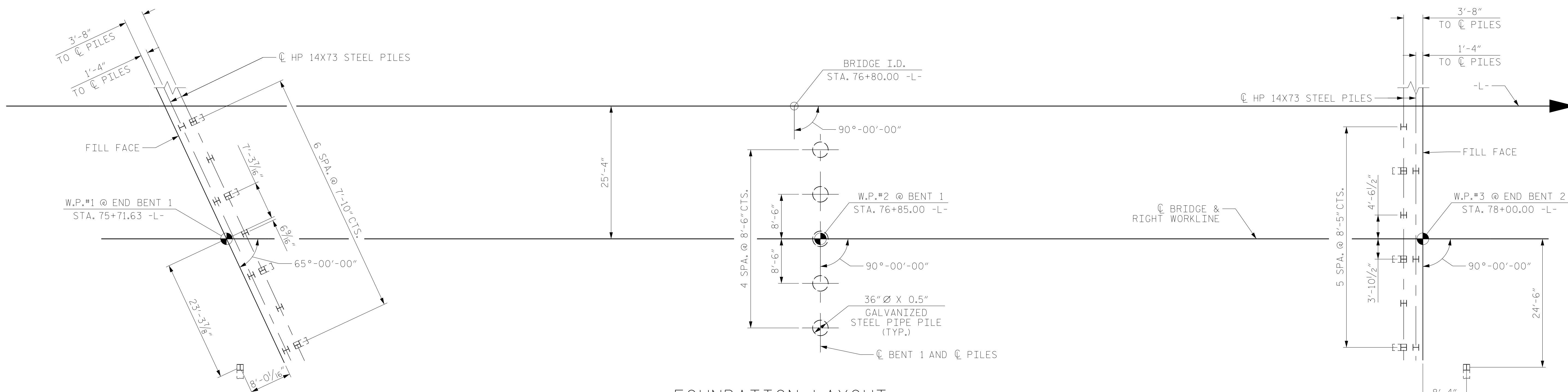
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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North Carolina License No. 50737-F-0403-C-28

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 3 BRIDGE NO. 250501

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			43



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP ELEVATION. BRACED PILES (H) ARE BATTERED AT 3:12.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
 PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.
 PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 365 TONS PER PILE.
 DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
 DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
 DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 490 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.
 INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 117.0 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 90,000 FT-LBS TO 240,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO.1. THIS ESTIMATED ENERGY DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO.1 OR END BENT NO.2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO.1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 141.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



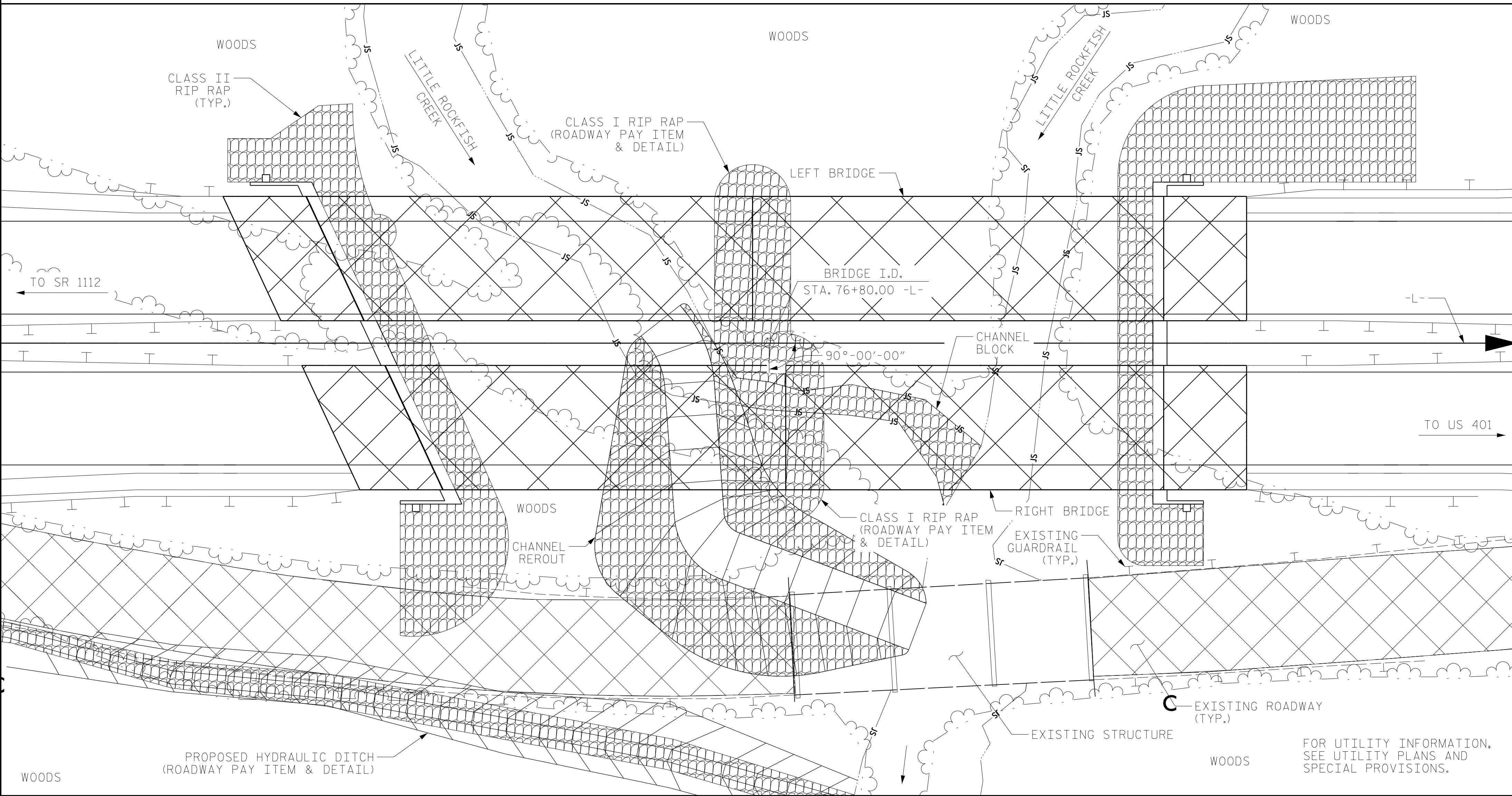
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 RIGHT LANE BRIDGE ON SR 1102
 OVER LITTLE ROCKFISH CREEK
 BETWEEN SR 1112 AND US 401
 RIGHT LANE

DRAWN BY :	NSC	DATE :	03/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			43

BENCH MARK #9: 239.95' RT. OF -L- STA. 75+65.88, EL. 163.00'



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR INTERIOR BENT NO. 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZING LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S2-1 SHALL BE EXCAVATED FOR A DISTANCE OF 26 FT LEFT AND 52 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF THREE SPANS, ONE SPAN AT 30'-2", ONE SPAN AT 30'-1" AND ONE SPAN AT 30'-2" ON PRESTRESSED CONCRETE CORED SLABS, 32'-0" CLEAR ROADWAY WIDTH ON STEEL PILES AND LOCATED APPROXIMATELY 60' DOWNSTREAM FROM THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR REMOVAL OF EXISTING STRUCTURE AND ASBESTOS ASSESSMENT, SEE LEFT LANE BRIDGE.
- FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIALS

	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" F.I.B. PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 36" Ø X 0.5" GALVANIZED STEEL PILES
	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	EACH
SUPERSTRUCTURE			9,135	8,020				8	893.7	12	
END BENT NO. 1					67.3		7,856				
BENT NO. 1					45.3		5,056				5
END BENT NO. 2					61.0		7,205			10	
TOTAL	2	LUMP SUM	9,135	8,020	173.6	LUMP SUM	20,117	8	893.7	22	5

	HP 14X73 STEEL PILES	PP 36" Ø X 0.5" GALVANIZED STEEL PILES	PILE REDRIVES	TWO BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 3'-3" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEAL
	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	12	720.0			209.2	256.0	216.8			
END BENT NO. 1							214	238		
BENT NO. 1	5	600.0	3							
END BENT NO. 2	10	700.0	5				116	129		
TOTAL	22	1,420.0	5	600.0	14	209.2	256.0	216.8	LUMP SUM	LUMP SUM

HYDRAULIC DATA

DESIGN DISCHARGE	= 710 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 152.1'
DRAINAGE AREA	= 16.1 SQ. MI.
BASE DISCHARGE (Q100)	= 970 CFS
BASE HIGH WATER ELEVATION	= 153.6'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1,300+ CFS
FREQUENCY OF OVERTOPPING	= 500+ YRS
* OVERTOPPING ELEVATION	= 163.44'
	* SAG @ STA. 80+55.33 -L-

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 RIGHT LANE BRIDGE ON SR 1102
 OVER LITTLE ROCKFISH CREEK
 BETWEEN SR 1112 AND US 401
 RIGHT LANE

DRAWN BY : NSC DATE : 03/2022
 CHECKED BY : MKO DATE : 04/2021
 DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1	NSC	03/2022	3			TOTAL SHEETS 43
2			4			

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FF)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	0.87	1.25	A	EL	58.48	1.11	1.27	A	I	33.25	0.80	0.87	1.09	A	EL	58.48		
	HL-93 (OPERATING)	N/A		1.62	--	1.35	0.87	1.62	A	EL	58.48	1.11	1.68	A	I	33.25	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.57	56.520	1.75	0.87	1.79	A	EL	58.48	1.11	1.68	A	I	33.25	0.80	0.87	1.57	A	EL	58.48		
	HS-20 (OPERATING)	36.000		2.22	79.920	1.35	0.87	2.31	A	EL	58.48	1.11	2.22	A	I	33.25	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SN5H	13.500		3.78	51.030	1.40	0.87	5.4	A	EL	58.48	1.11	5.41	A	I	33.25	0.80	0.87	3.78	A	EL	58.48	
		SNGARBS2	20.000		2.71	54.200	1.40	0.87	3.87	A	EL	58.48	1.11	3.77	A	I	33.25	0.80	0.87	2.71	A	EL	58.48	
		SNAGRIS2	22.000		2.52	55.440	1.40	0.87	3.6	A	EL	58.48	1.11	3.47	A	I	33.25	0.80	0.87	2.52	A	EL	58.48	
		SNCOTTS3	27.250		1.87	50.958	1.40	0.87	2.67	A	EL	58.48	1.11	2.62	A	I	33.25	0.80	0.87	1.87	A	EL	58.48	
		SNAGGRS4	34.925		1.52	53.086	1.40	0.87	2.18	A	EL	58.48	1.11	2.13	A	I	33.25	0.80	0.87	1.52	A	EL	58.48	
		SNS5A	35.550		1.49	52.970	1.40	0.87	2.13	A	EL	58.48	1.11	2.14	A	I	33.25	0.80	0.87	1.49	A	EL	58.48	
		SNS6A	39.950		1.35	53.933	1.40	0.87	1.94	A	EL	58.48	1.11	1.93	A	I	33.25	0.80	0.87	1.35	A	EL	58.48	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.65	54.450	1.40	0.87	2.36	A	EL	58.48	1.11	2.34	A	I	33.25	0.80	0.87	1.65	A	EL	58.48	
		TNT4A	33.075		1.65	54.574	1.40	0.87	2.36	A	EL	58.48	1.11	2.28	A	I	33.25	0.80	0.87	1.65	A	EL	58.48	
		TNT6A	41.600		1.33	55.328	1.40	0.87	1.91	A	EL	58.48	1.11	1.99	A	I	33.25	0.80	0.87	1.33	A	EL	58.48	
		TNT7A	42.000		1.33	55.860	1.40	0.87	1.91	A	EL	58.48	1.11	1.96	A	I	33.25	0.80	0.87	1.33	A	EL	58.48	
		TNT7B	42.000		1.36	57.120	1.40	0.87	1.94	A	EL	58.48	1.11	1.85	A	I	33.25	0.80	0.87	1.36	A	EL	58.48	
		TNAGRIT4	43.000		1.31	56.330	1.40	0.87	1.87	A	EL	58.48	1.11	1.78	A	I	33.25	0.80	0.87	1.31	A	EL	58.48	
		TNAGT5A	45.000		1.24	55.800	1.40	0.87	1.77	A	EL	58.48	1.11	1.76	A	I	33.25	0.80	0.87	1.24	A	EL	58.48	
TNAGT5B	45.000	③	1.23	55.350	1.40	0.87	1.76	A	EL	58.48	1.11	1.69	A	I	33.25	0.80	0.87	1.23	A	EL	58.48			

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

COMMENTS:
 1. TRANSFORMING ALL PRESTRESSING TENDONS.
 2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE.
 3. GIRDERS DESIGNED AS SIMPLE-MADE-CONTINUOUS (FOR LIVE AND SUPERIMPOSED DEAD LOAD) FOR SHEAR.
 4. GIRDERS LOAD RATED AS SIMPLE SPAN.
 5. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE, SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

		CL BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	CL BRG.
EXTERIOR GIRDER (EL) SPAN A	ΦV_n (KIPS)	476	438	419	289	244	249	244	289	419	438	476
	ΦM_n (KIP-FT)	----	12118	13139	13687	13852	13852	13852	13687	13139	12118	----
INTERIOR GIRDER (I) SPAN A	ΦV_n (KIPS)	477	712	426	327	274	282	274	327	426	712	477
	ΦM_n (KIP-FT)	----	12303	13308	13949	14223	14240	14223	13949	13308	12303	----

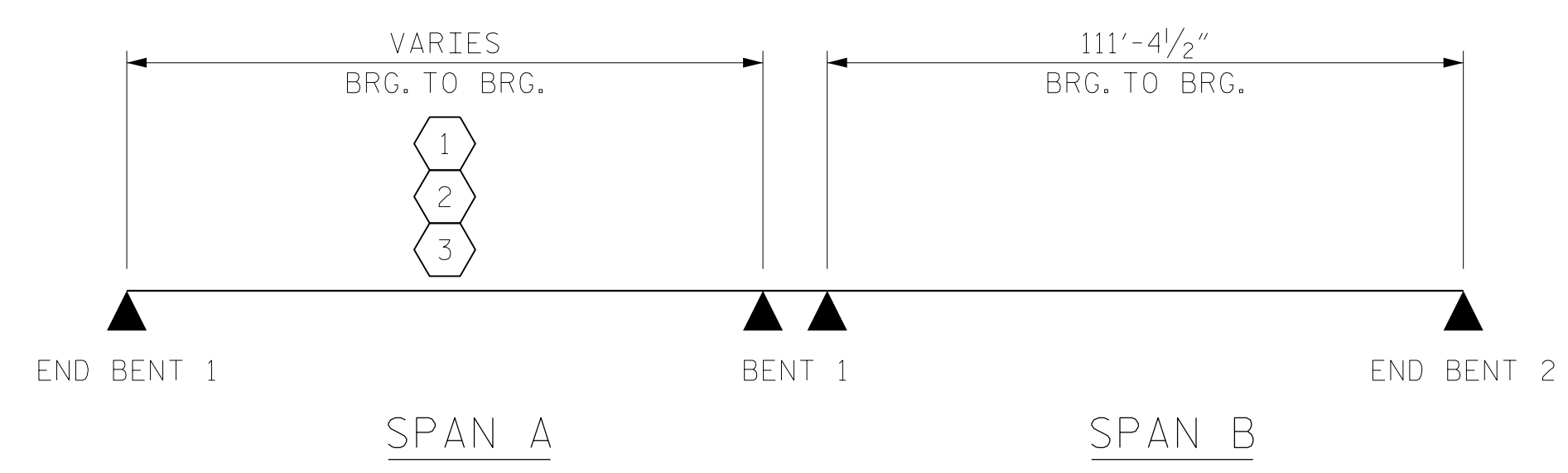
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	54.00	62.50
AREA	IN ²	932.60	1680.70
I _{xx}	IN ⁴	359,929	880,201
Y _{cg}	IN	24.05	37.59
SELF WT.	PLF	971.40	1941.00
EFF. WIDTH	IN	---	109.50

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	54.00	62.50
AREA	IN ²	932.60	1829.20
I _{xx}	IN ⁴	359,929	939,364
Y _{cg}	IN	24.05	39.26
SELF WT.	PLF	971.40	2149.00
EFF. WIDTH	IN	---	133.00

SECTION PROPERTIES PROVIDED AT MIDSPAN



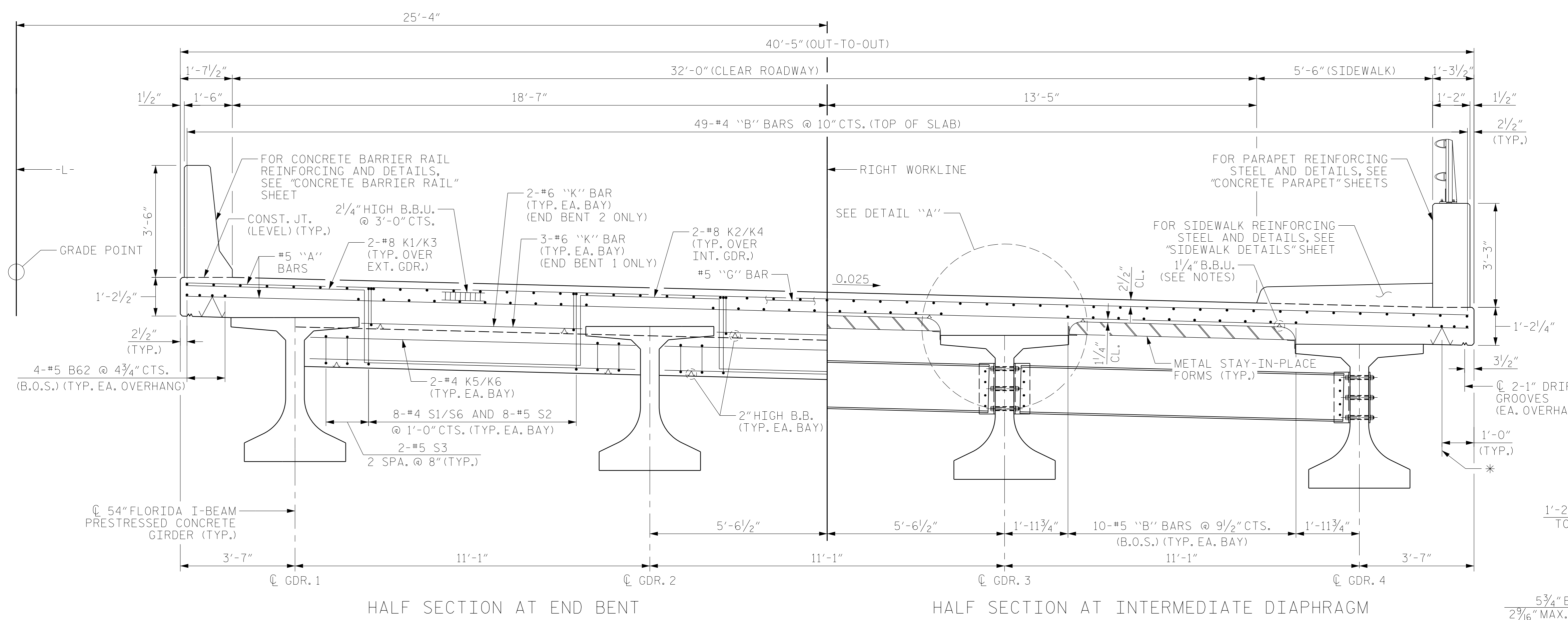
LRFR SUMMARY

DRAWN BY : MRA DATE : 03/2020
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			43



HALF SECTION AT END BENT

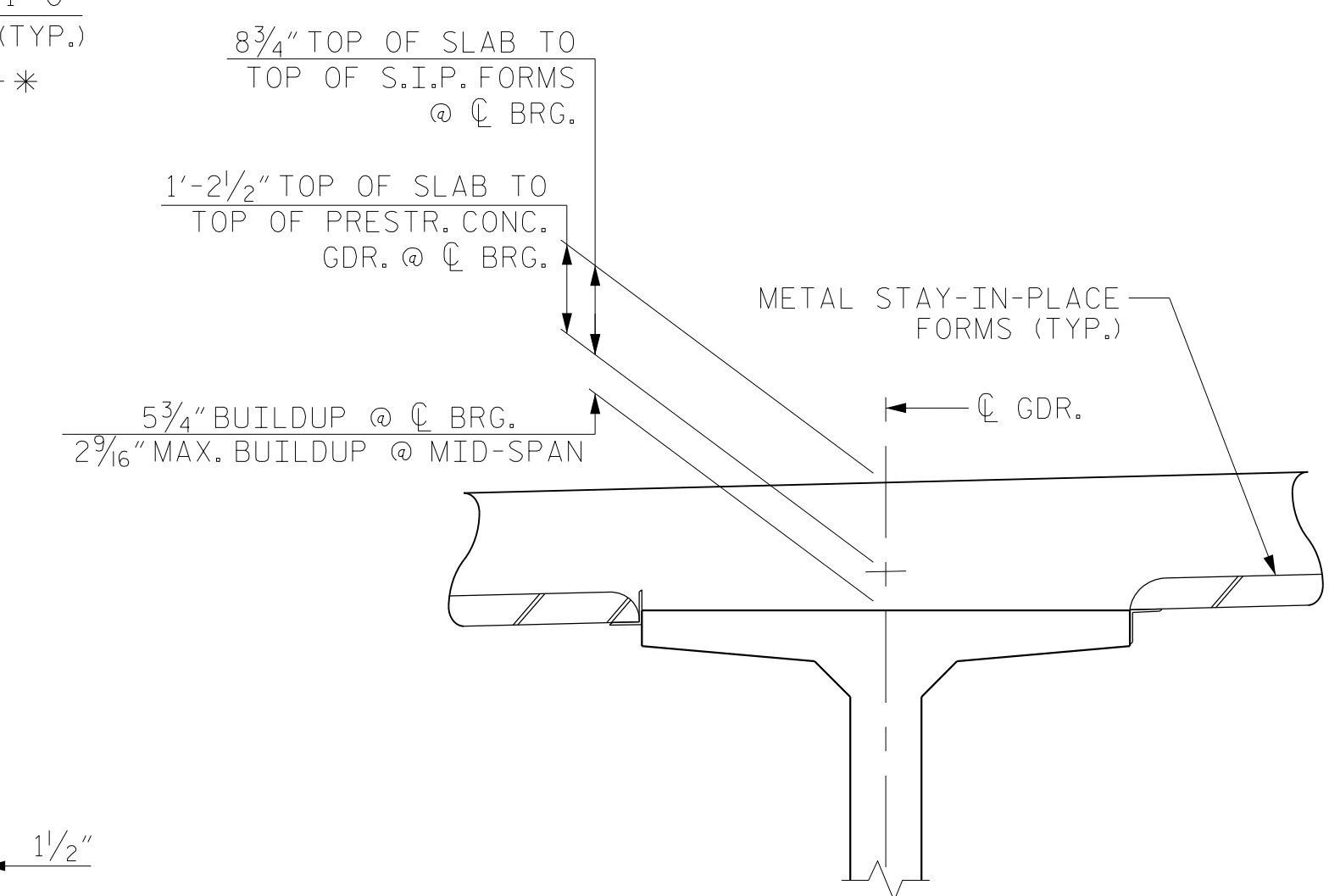
HALF SECTION AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

NOTES:
 PROVIDE 1/4" HIGH BEAM BOLSTERS UPPERS AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL DECK SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

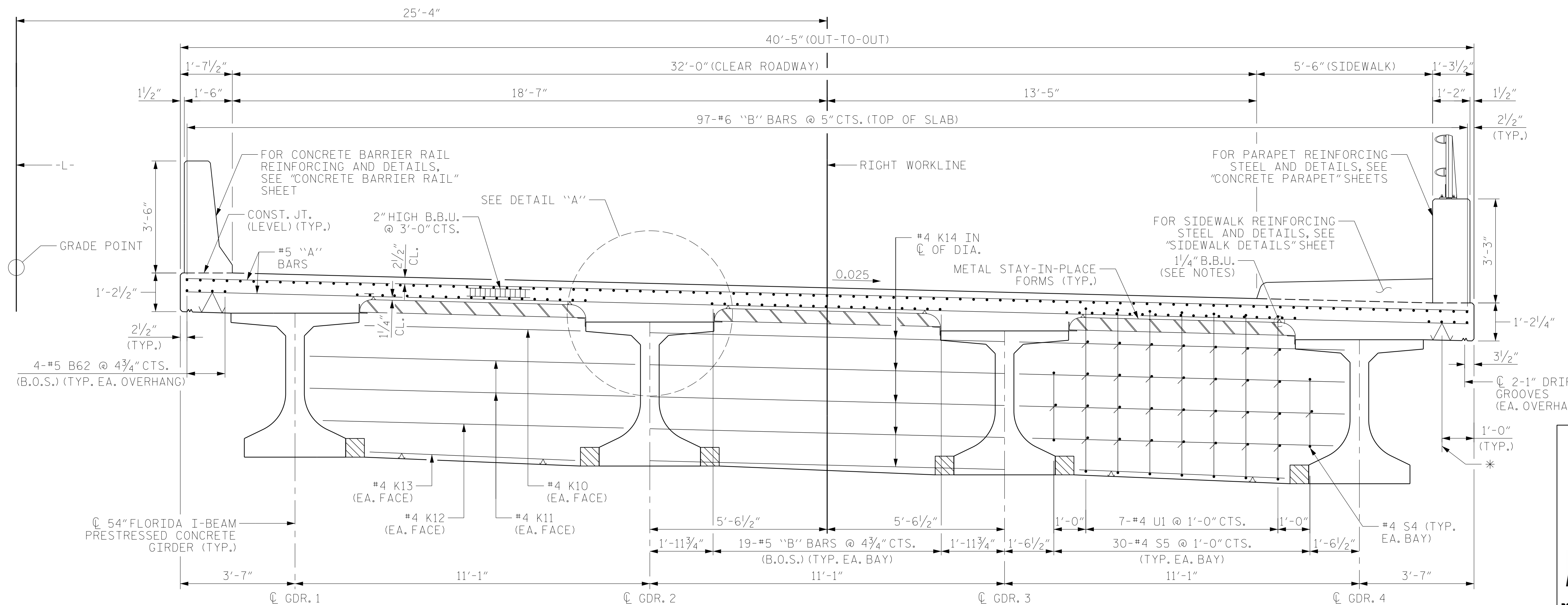
* BEAM BOLSTERS REQUIRED TO MAINTAIN A MIN. 2 1/2" CL. TO B.O.S. (BEAM BOLSTER HEIGHT WILL VARY WITH BUILDUPS) (TYP. EA. OVERHANG)

B.O.S. = BOTTOM OF SLAB



DETAIL "A"

REINFORCING NOT SHOWN FOR CLARITY



TYPICAL SECTION AT BENT DIAPHRAGM

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 2

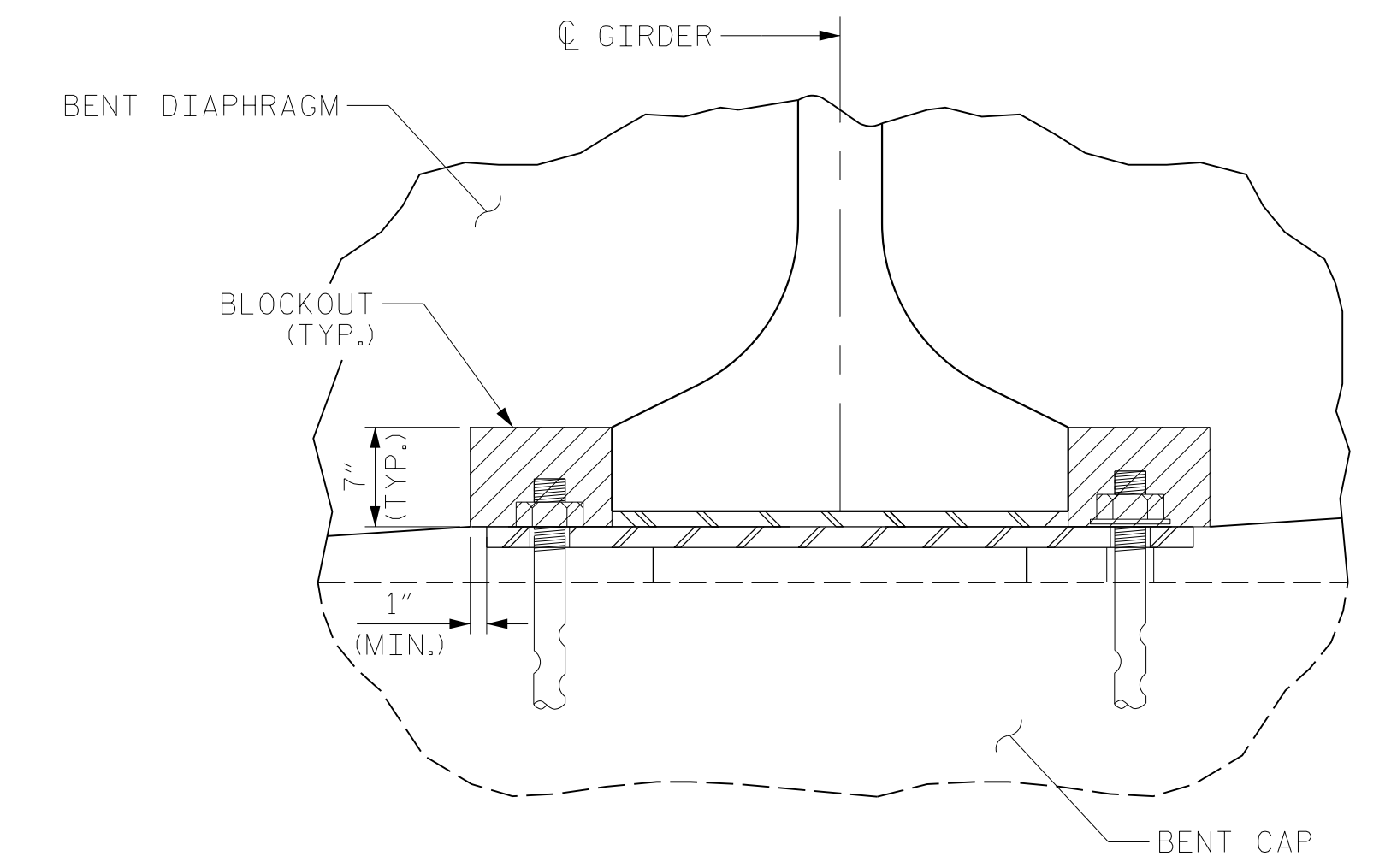
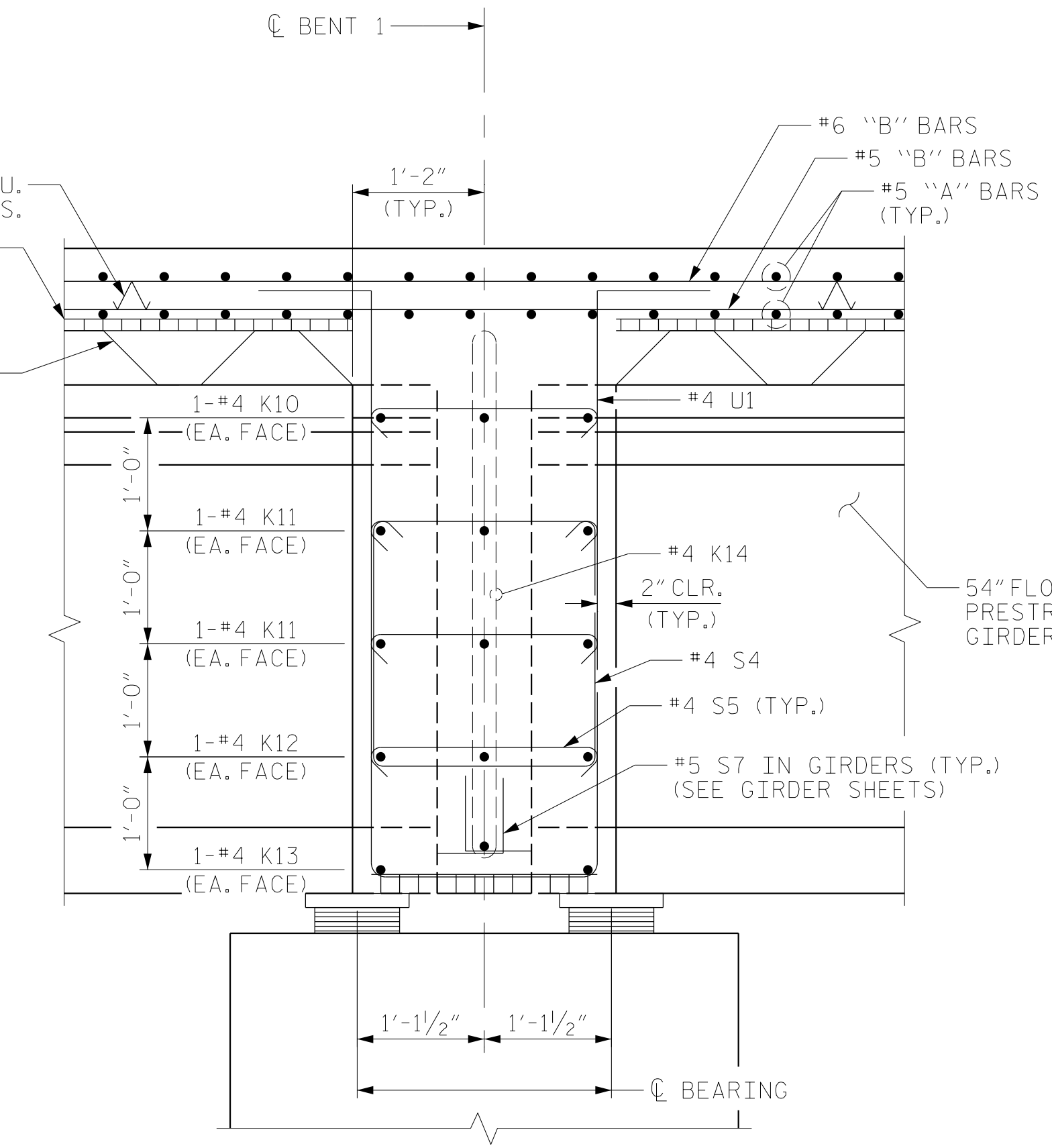
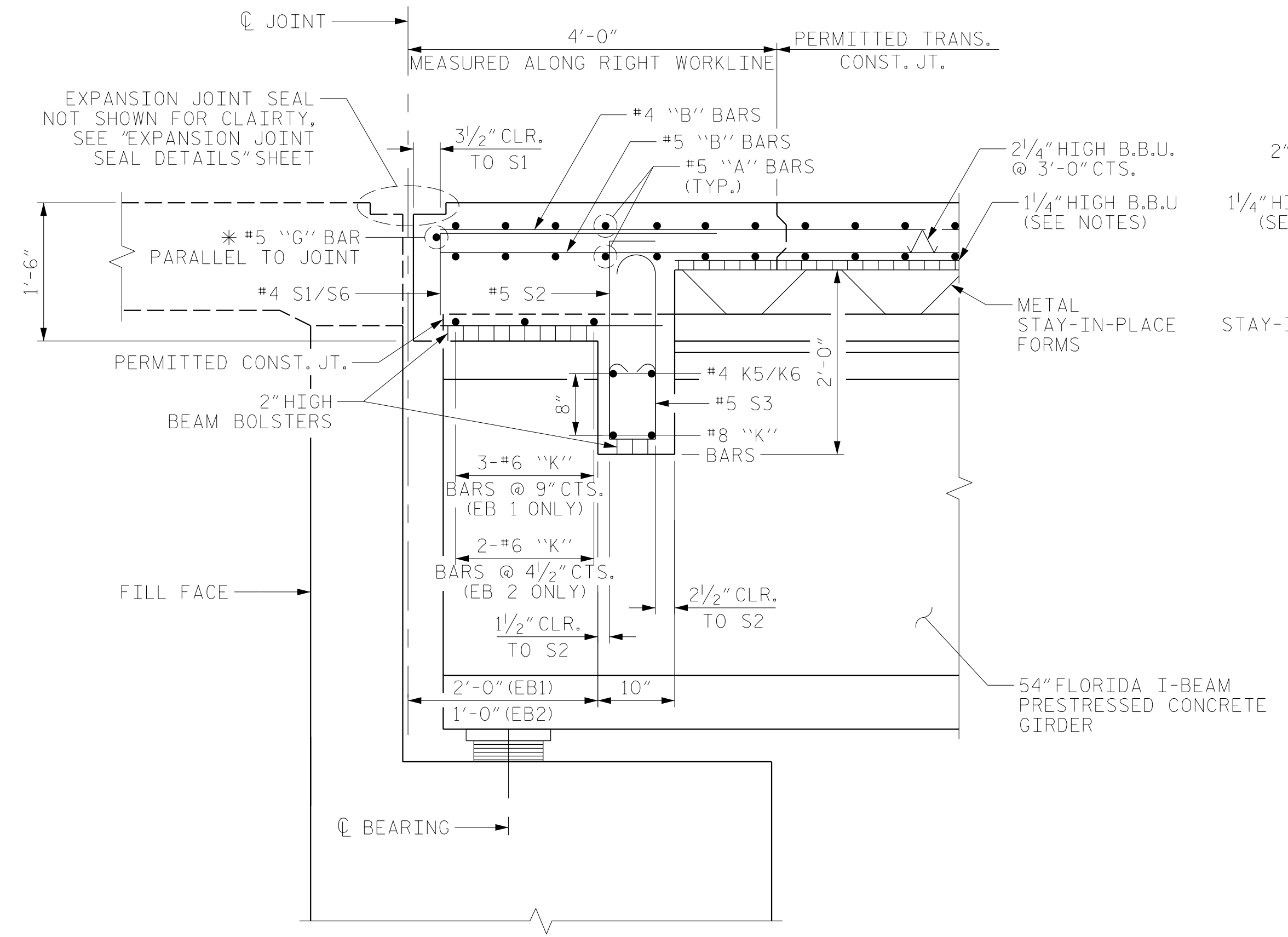


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TYPICAL SECTION RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-5					TOTAL SHEETS 43

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NOTES:
 FOR NOTES, SEE SHEET 1 OF 2.
 FOR EXPANSION JOINT SEAL OPENING, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

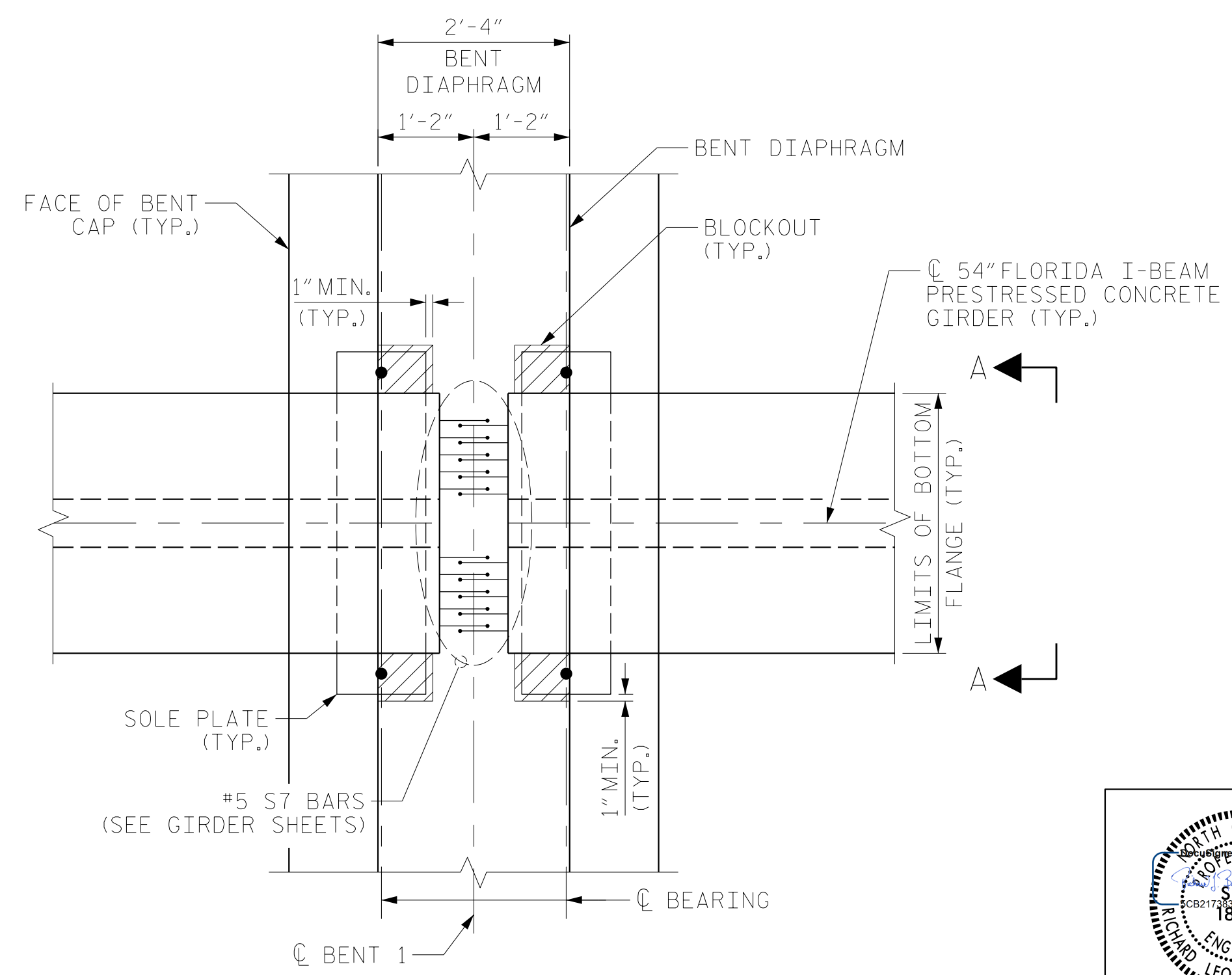
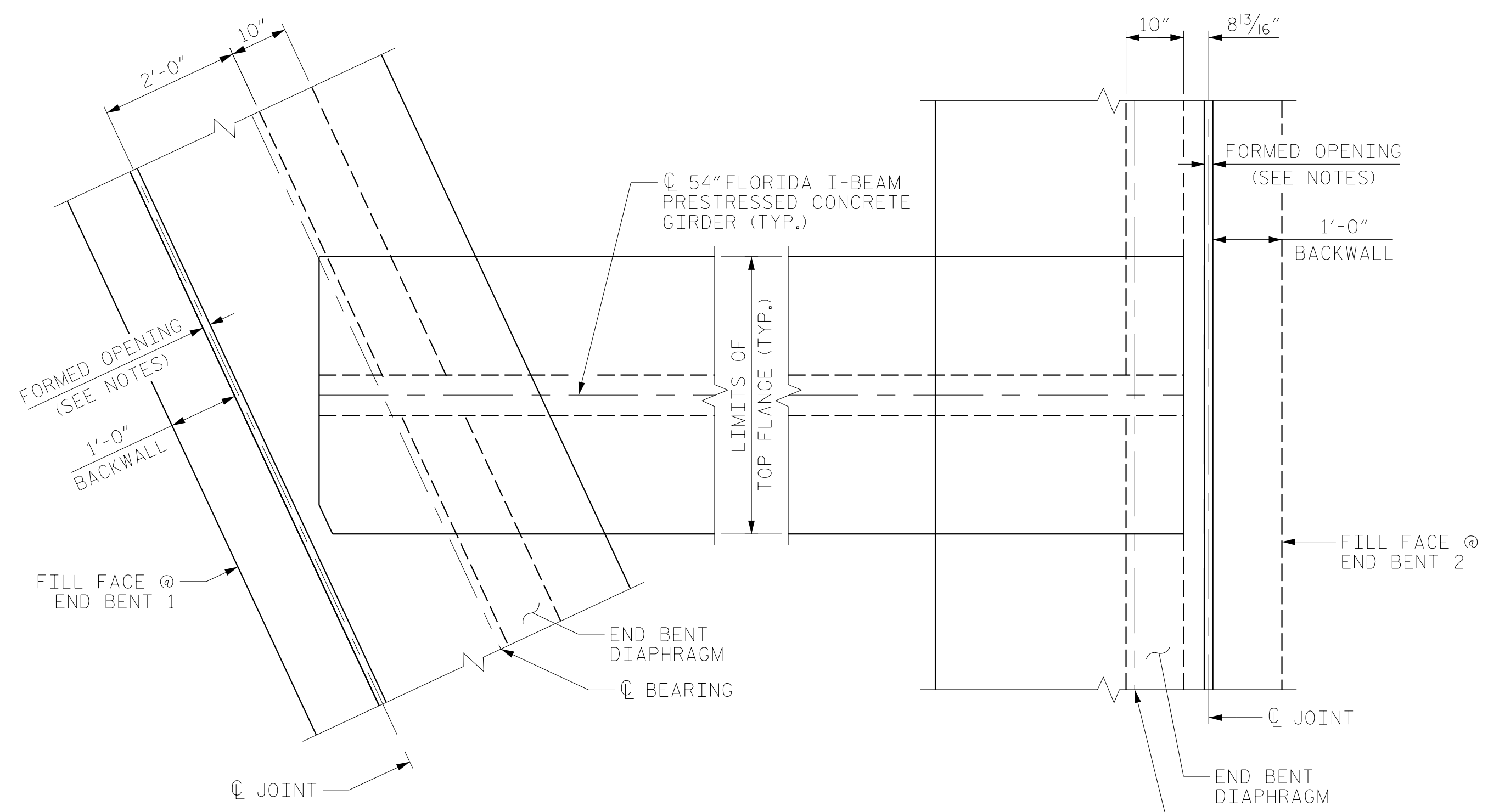


SECTION THROUGH END BENT DIAPHRAGM

SECTION THROUGH BENT DIAPHRAGM

VIEW A-A

* "G" BAR MAY BE SHIFTED SLIGHTLY, AS NEEDED, TO CLEAR REINFORCING STEEL AND STIRRUPS
 END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN OF END BENT DIAPHRAGMS

BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 2



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 RALEIGH
 SUPERSTRUCTURE
**TYPICAL SECTION
 DETAILS**
 RIGHT LANE

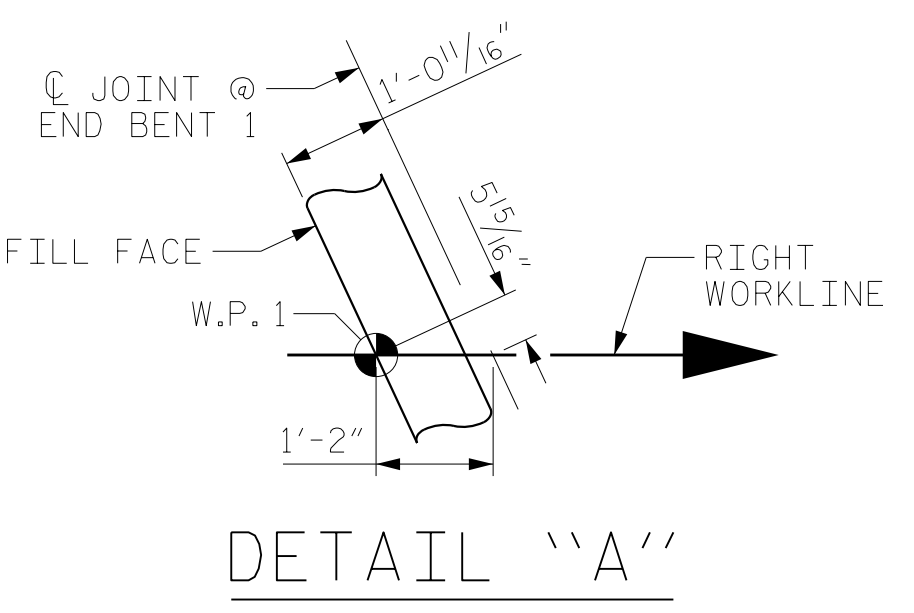
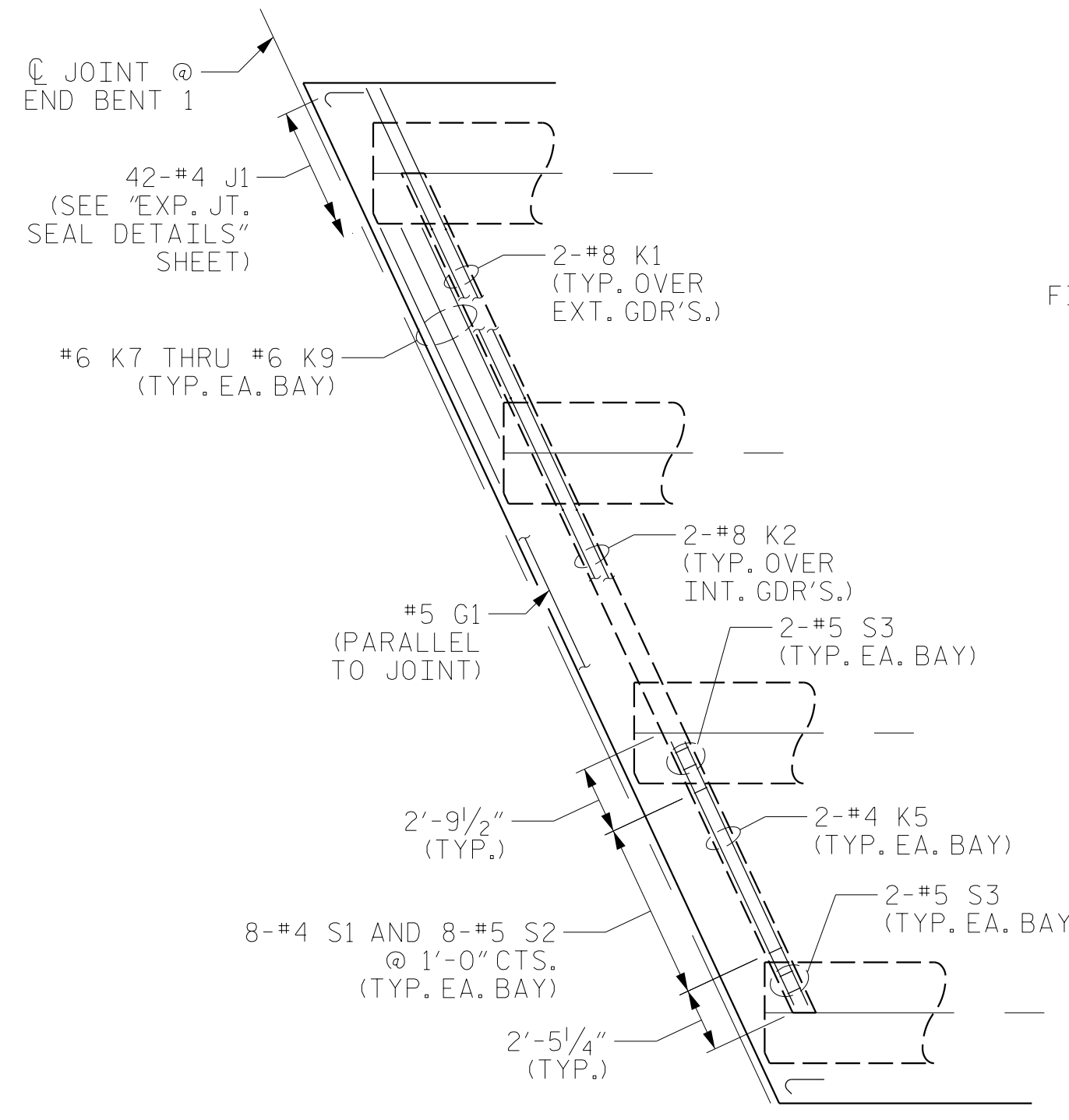
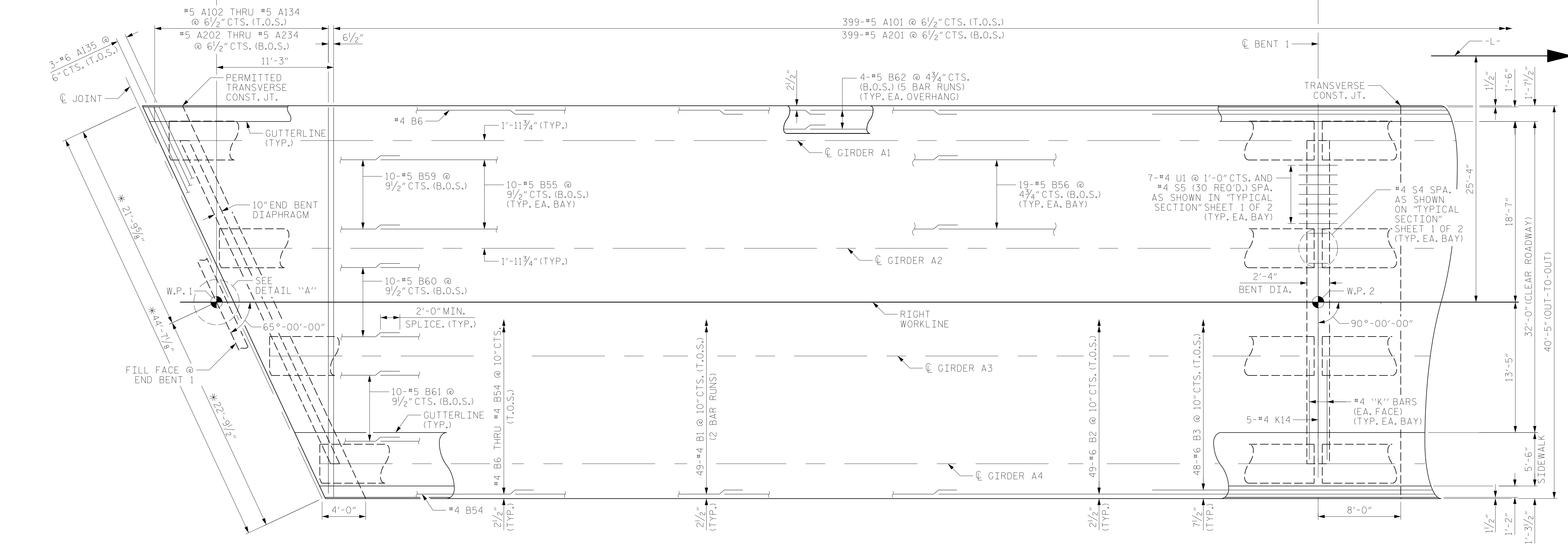
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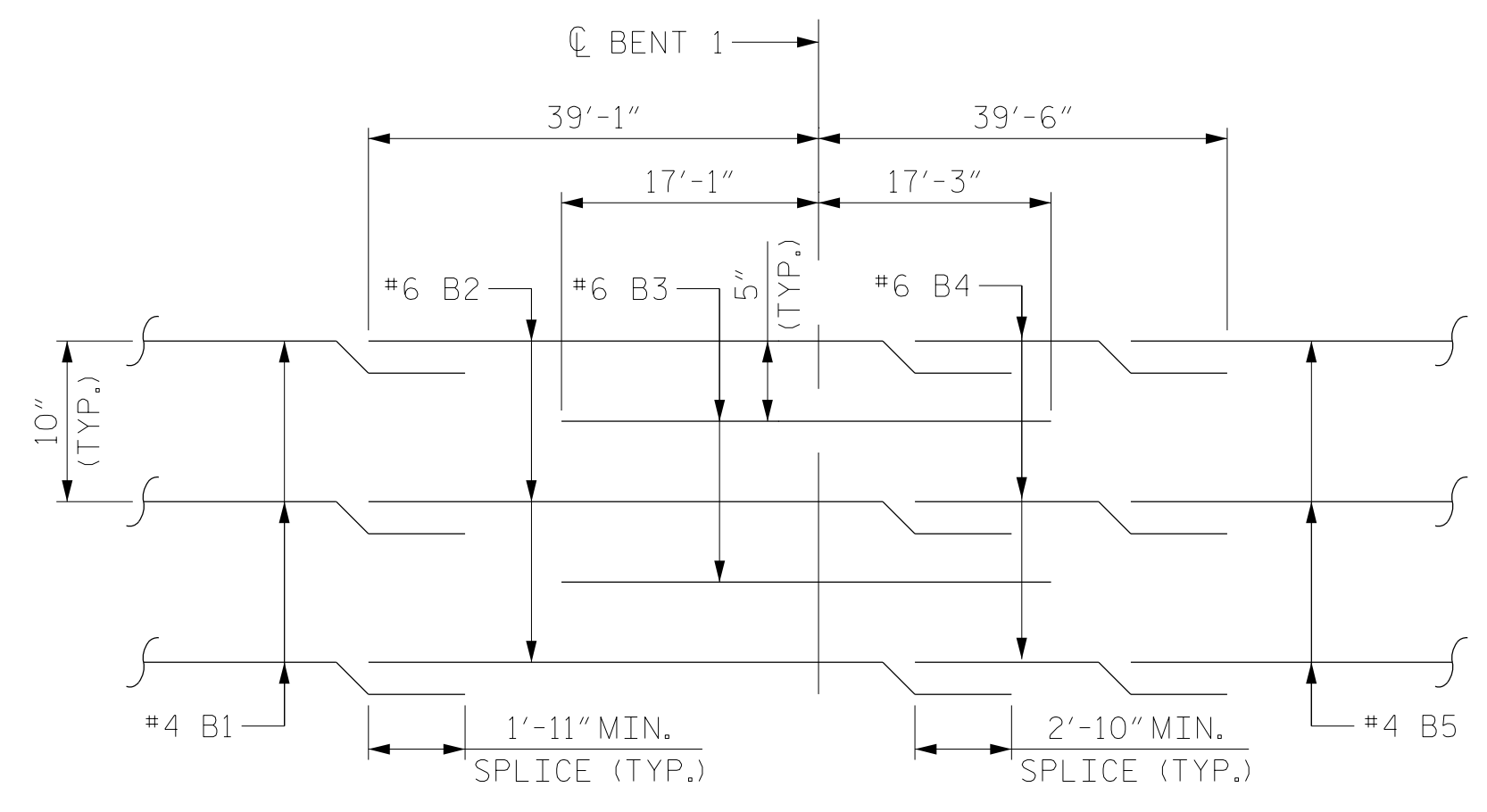
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
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228'-4 1/2" (FILL FACE @ END BENT 1 TO FILL FACE @ END BENT 2)
 113'-4 1/2" SPAN A (W.P. 1 TO W.P. 2) 115'-0" SPAN B (W.P. 2 TO W.P. 3)



PLAN OF SPAN A

* DIMENSIONS MEASURED ALONG C JOINT



NOTES:

- FOR SPLICE LENGTHS NOT SHOWN, REFER TO THE MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
- FOR END BENT AND BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.
- STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY, FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.
- FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET" SHEETS.
- FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET.
- FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
- T.O.S. = TOP OF SLAB
- B.O.S. = BOTTOM OF SLAB

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 2



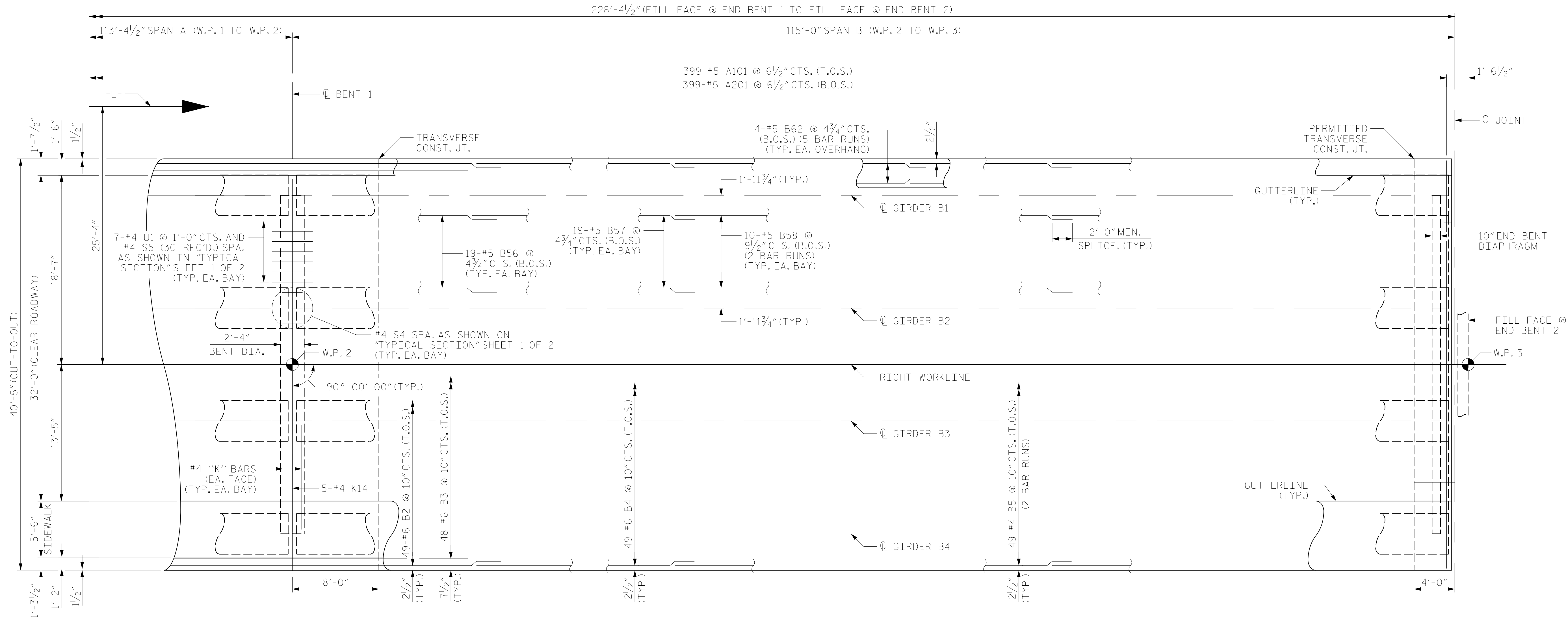
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STATE OF NORTH CAROLINA
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 SUPERSTRUCTURE
 PLAN OF SPAN A
 RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			43

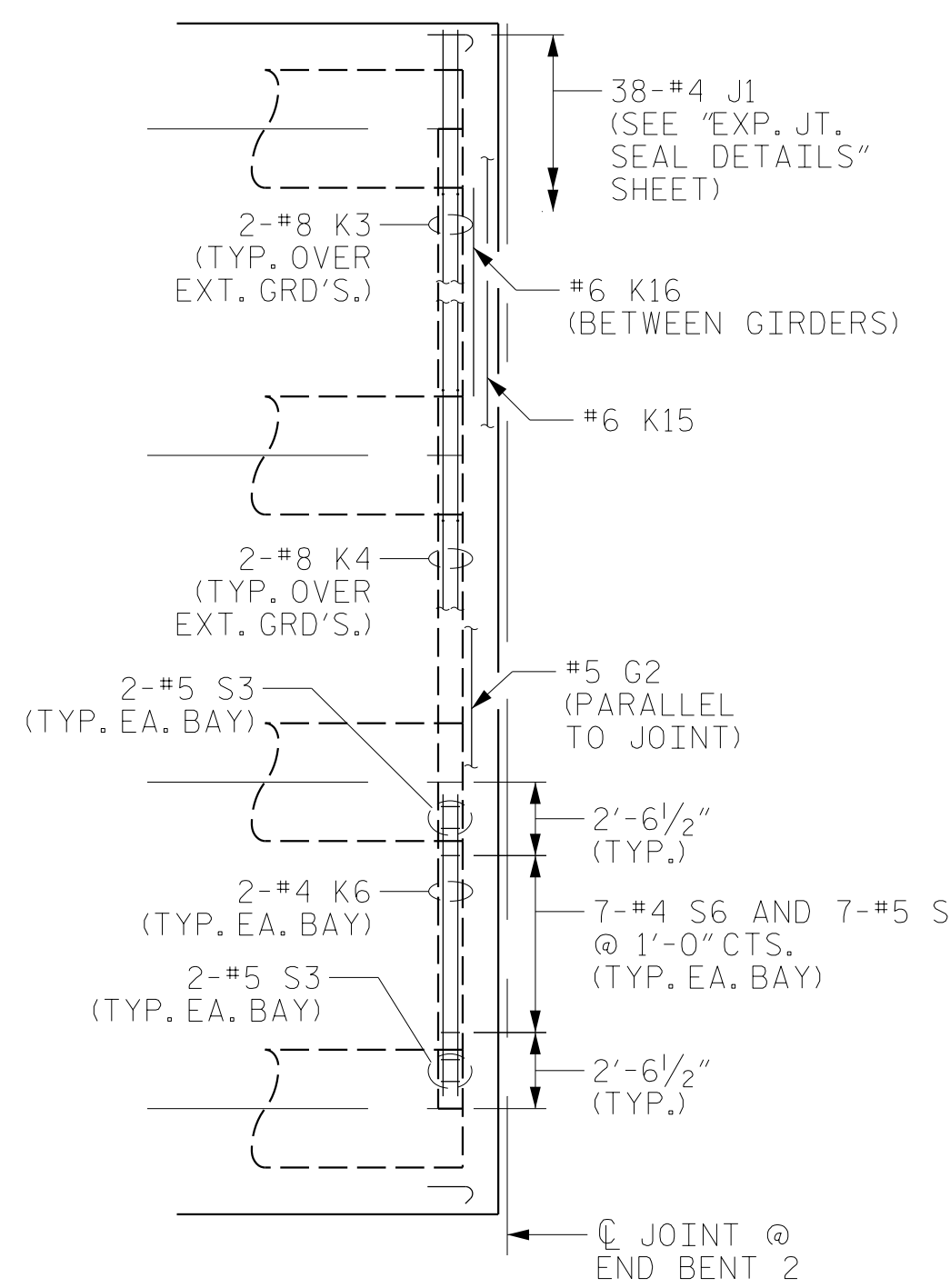
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PLAN OF SPAN B

NOTE:
FOR NOTES, SEE SHEET 1 OF 2.



END BENT 2 DIAPHRAGM REINFORCING DETAILS

#5 G2 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

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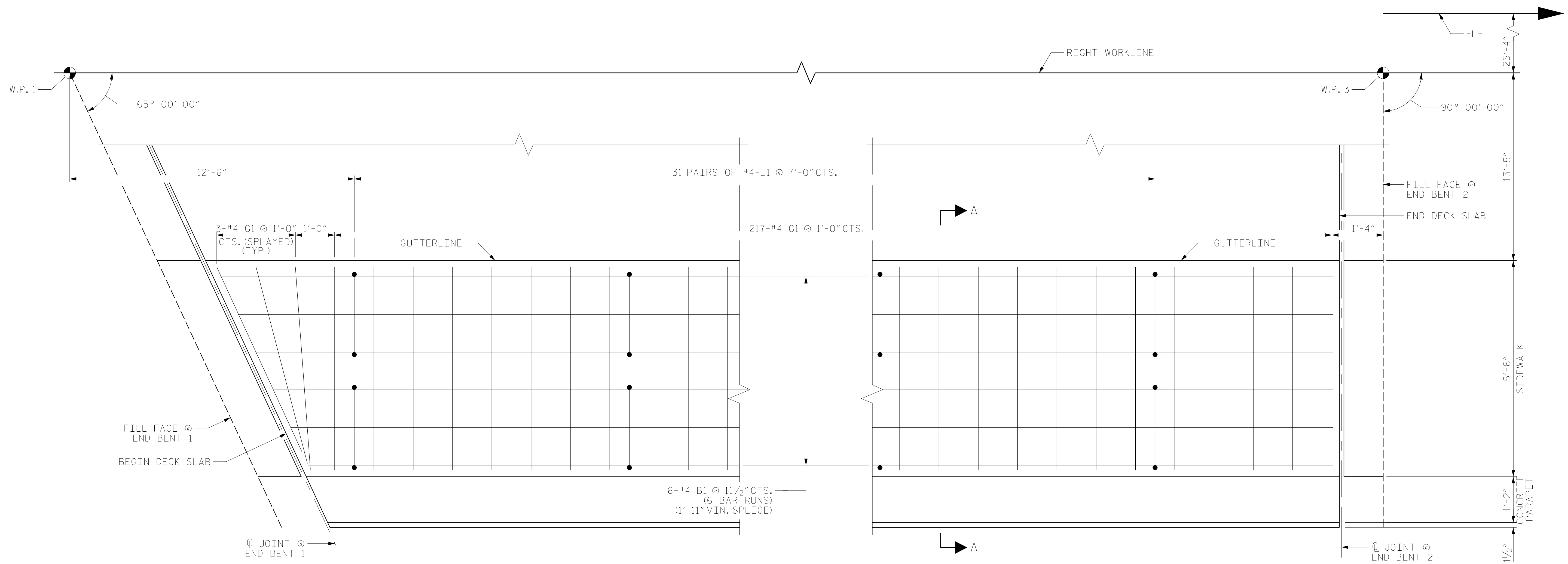
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SHEET 2 OF 2

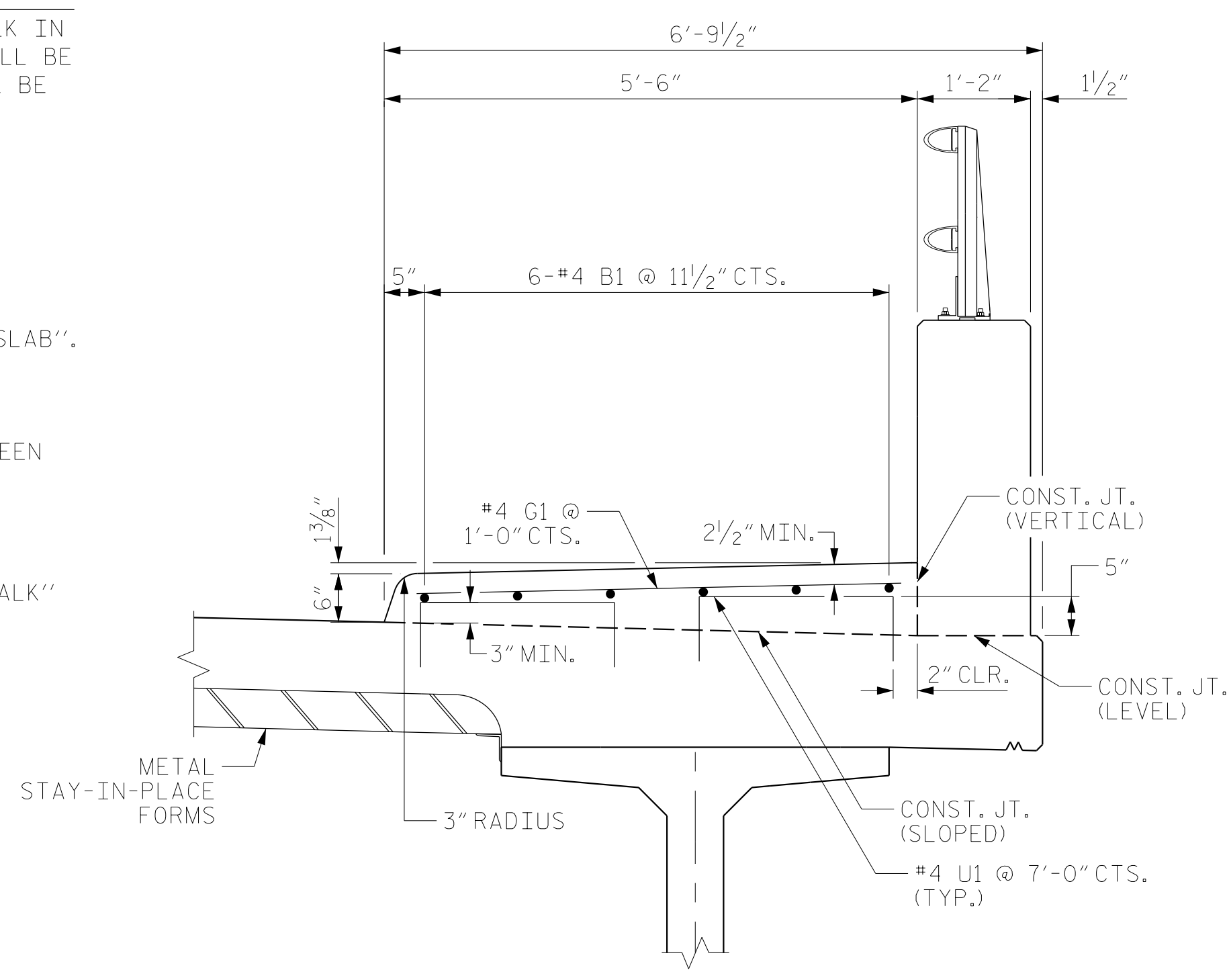
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PLAN OF SPAN B RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-8					TOTAL SHEETS 43



PLAN OF SIDEWALK

NOTES

- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- CONTRACTION JOINTS SHALL BE NORMAL TO BARRIER.
- ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.
- FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DRAWINGS.
- PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".
- U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET" SHEETS.
- FOR SIDEWALK COVER PLATE DETAILS AT END BENTS, SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS.



SECTION A-A

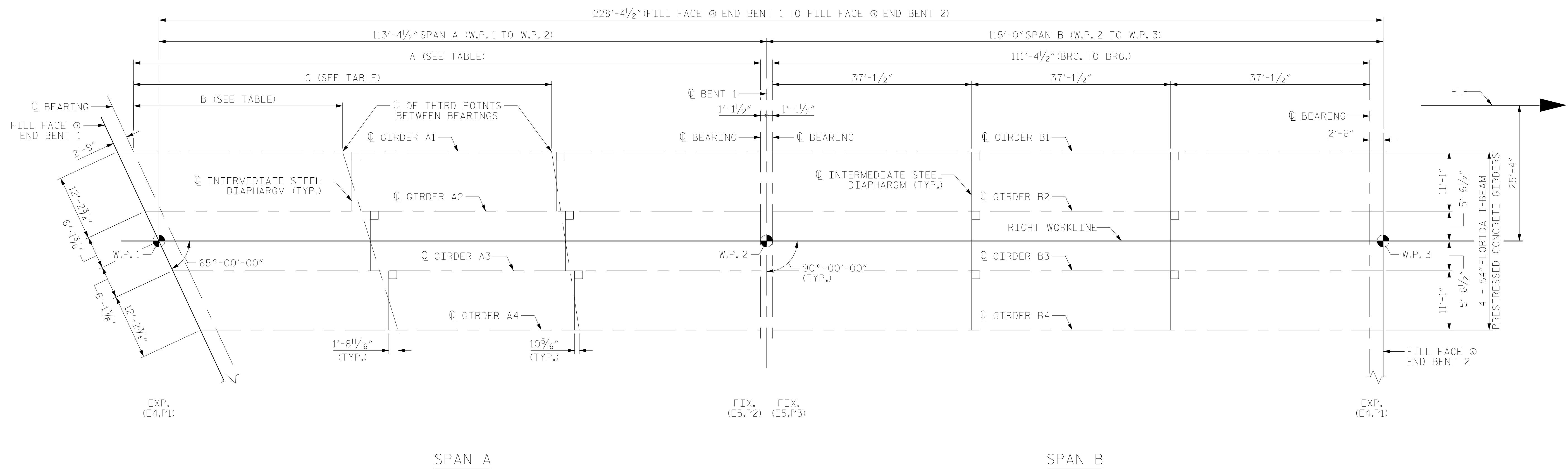
PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

BILL OF MATERIAL					BAR TYPES	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	36	#4	STR	38'-2"	918	<p>ALL BAR DIMENSIONS ARE OUT TO OUT</p>
*G1	220	#4	STR	5'-2"	759	
*U1	62	#4	1	3'-4"	138	
* EPOXY COATED REINFORCING STEEL					1,815 LBS.	
CLASS AA CONCRETE					27.4 C.Y.	

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SIDEWALK DETAILS RIGHT LANE						TOTAL SHEETS 43
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



SPAN A

SPAN B

FRAMING PLAN

NOTE:

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 54" F.I.B. PRESTRESSED CONCRETE GIRDERS" SHEET.

GIRDER	A	B	C
A1	116'-11 5/8"	38'-11 1/8"	77'-11 3/4"
A2	111'-9 3/16"	37'-3 3/16"	74'-6 3/8"
A3	106'-7 9/16"	35'-6 1/2"	71'-1"
A4	101'-5 9/16"	33'-9 13/16"	67'-7 5/8"

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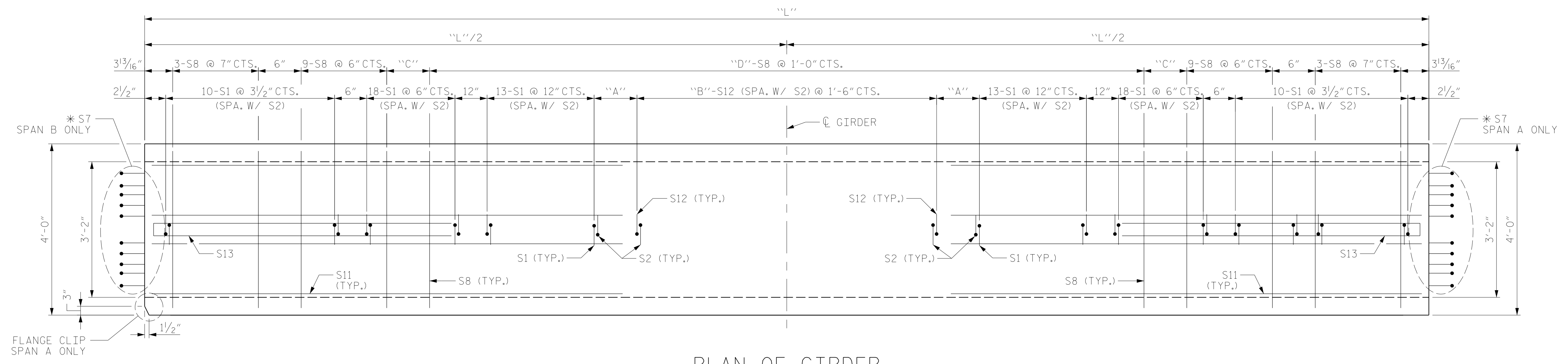
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 FRAMING PLAN
 RIGHT LANE

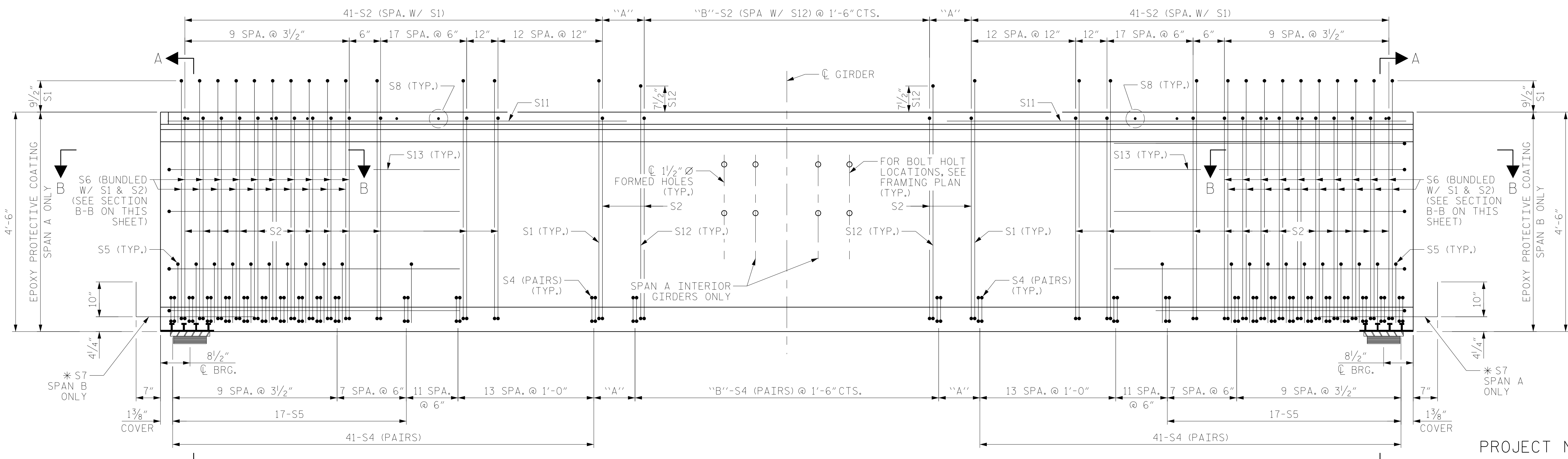
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2			4			43



PLAN OF GIRDER



ELEVATION OF GIRDER

EXP. - SPAN A
FIX. - SPAN B

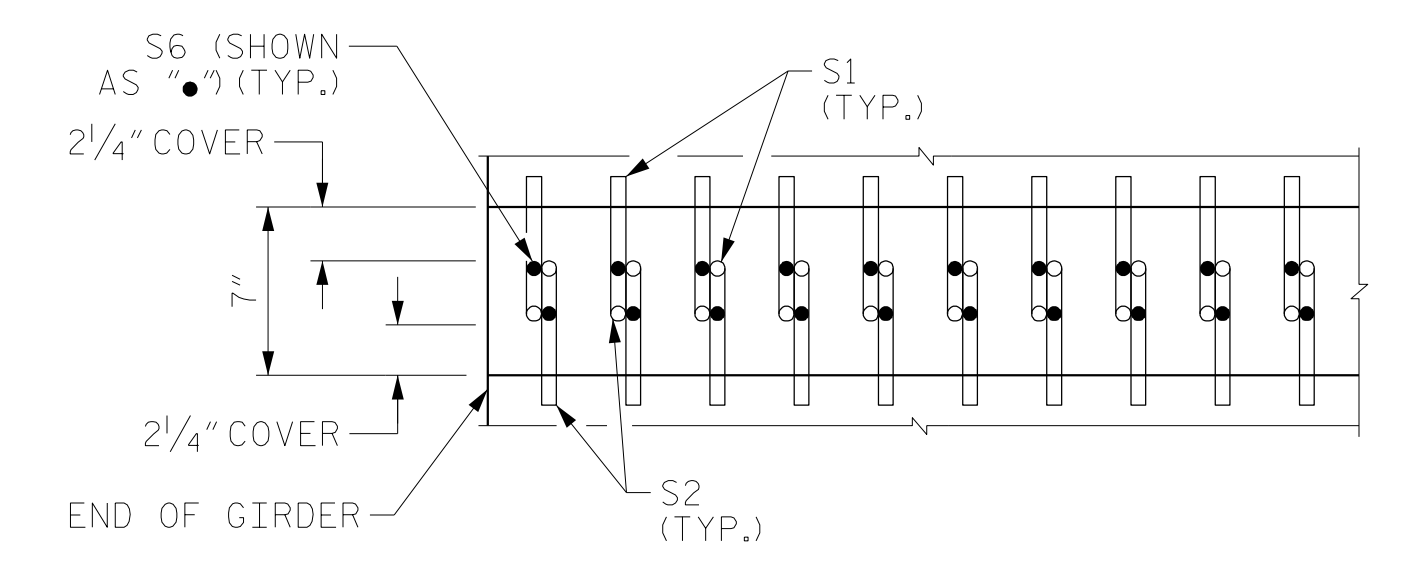
FIX. - SPAN A
EXP. - SPAN B

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 3

NOTES

- FOR GIRDER DIMENSIONS AND VARIABLES, SEE SHEET 2 OF 3.
- FOR ADDITIONAL "S" BARS, SEE PARTIAL ELEVATION ON "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- FOR VERTICAL DIMENSIONS TO FORMED HOLE LOCATIONS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- ALTERNATE DIRECTION OF #5 S1 AND #5 S2 BARS.
- FOR SECTION A-A, SEE SHEET 2 OF 3.
- * FOR S7 BAR SPACING, SEE DETAIL "A" OF "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET.
- BARS MAY BE SHIFTED AS NECESSARY TO AVOID CONFLICT.



SECTION B-B

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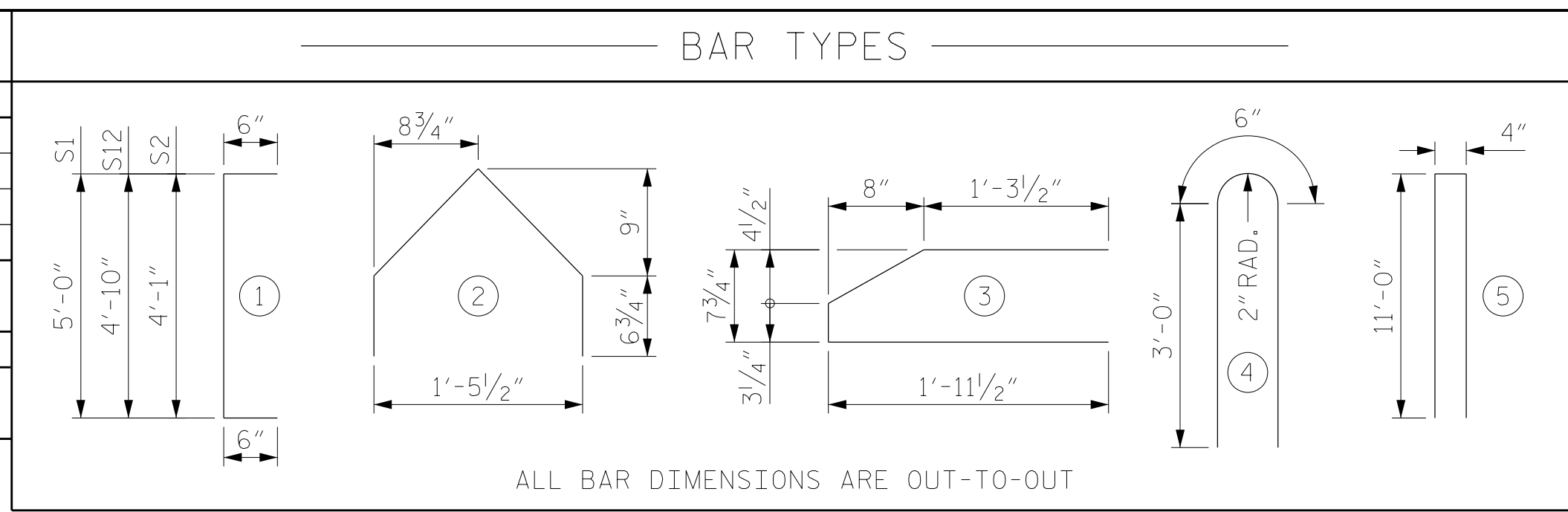
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE F.I.B. 54" PRESTRESSED CONCRETE GIRDERS RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S2-11
TOTAL SHEETS					43

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SPAN A GIRDER DIMENSIONS					
GIRDER	L	A	B	C	D
GIRDER A1	118'-4 ⁵ / ₈ "	1'-4 ⁵ / ₁₆ "	45	8 ¹ / ₂ "	106
GIRDER A2	113'-2 ³ / ₁₆ "	1'-0 ³ / ₁₆ "	42	7 ¹ / ₂ "	101
GIRDER A3	108'-0 ⁹ / ₁₆ "	1'-5 ¹ / ₄ "	38	6 ¹ / ₂ "	96
GIRDER A4	102'-10 ³ / ₁₆ "	1'-1 ¹ / ₄ "	35	11 ¹ / ₂ "	90

SPAN B GIRDER DIMENSIONS					
GIRDER	L	A	B	C	D
GIRDERS B1, B2, B3, & B4	112'-9 ¹ / ₂ "	9 ³ / ₄ "	42	10 ⁵ / ₁₆ "	100



SPAN A			SPAN B		
0.6" Ø L. R. GRADE 270 STRANDS			0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. IN.)	ULTIMATE STRENGTH (LBS/STRAND)	APPLIED PRESTRESS (LBS/STRAND)	AREA (SQ. IN.)	ULTIMATE STRENGTH (LBS/STRAND)	APPLIED PRESTRESS (LBS/STRAND)
0.217	58,600	43,950	0.217	58,600	43,950

REINF. STEEL FOR ONE GIRDER						REINF. STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT

GIRDER 1	S2	127	#5	1	6'-0"	513	S1	82	#5	1	6'-0"	513
GIRDER 2	S2	124	#5	1	5'-1"	673	S2	124	#5	1	5'-1"	657
GIRDER 3	S2	120	#5	1	5'-1"	657	S4	248	#3	3	4'-4"	404
GIRDER 4	S2	117	#5	1	5'-1"	620	S5	34	#3	2	3'-3"	42
INTERIOR	S3	16	#4	STR	11'-6"	123	*S7	10	#5	STR	3'-8"	38
GIRDER 1	S4	254	#3	3	4'-4"	414	S8	124	#4	STR	3'-8"	306
GIRDER 2	S4	248	#3	3	4'-4"	404	S9	16	#4	STR	8'-0"	86
GIRDER 3	S4	240	#3	3	4'-4"	391	S10	8	#4	4	6'-6"	35
GIRDER 4	S4	234	#3	3	4'-4"	381	S11	8	#6	STR	24'-0"	288
	S5	34	#3	2	3'-3"	42	S12	42	#5	1	5'-10"	256
	S6	40	#5	STR	4'-0"	167	S13	8	#4	5	22'-4"	119
	*S7	10	#5	STR	3'-8"	38						

QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. GRADE NO.
2909	27.1	60

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	112'-9 ¹ / ₂ "	451'-2"

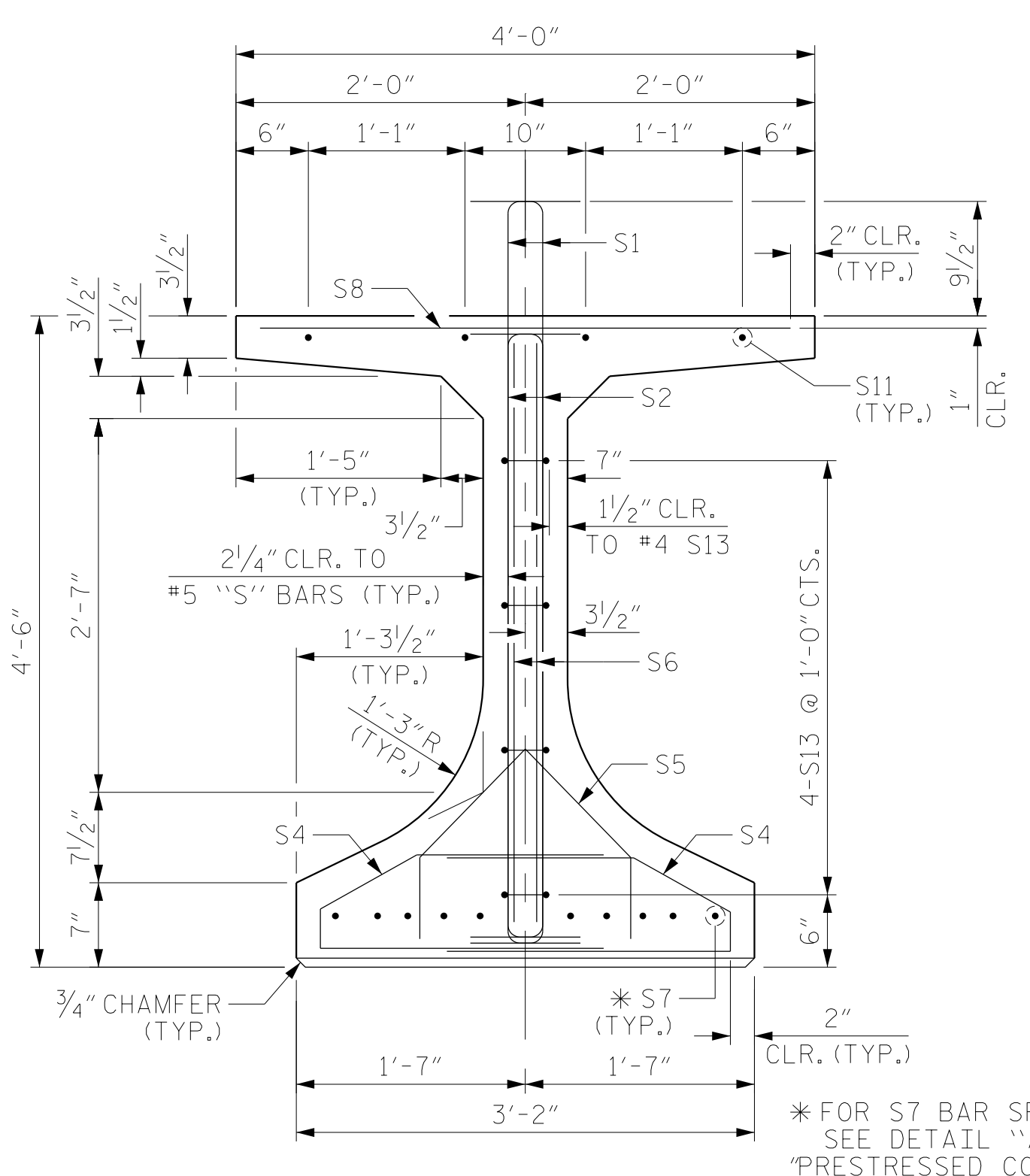
QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. GRADE NO.	
GIRDER 1	2967	28.4	60
GIRDER 2	2982	27.2	60
GIRDER 3	2911	25.9	60
GIRDER 4	2781	24.7	60

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	442'-6 ⁵ / ₁₆ "

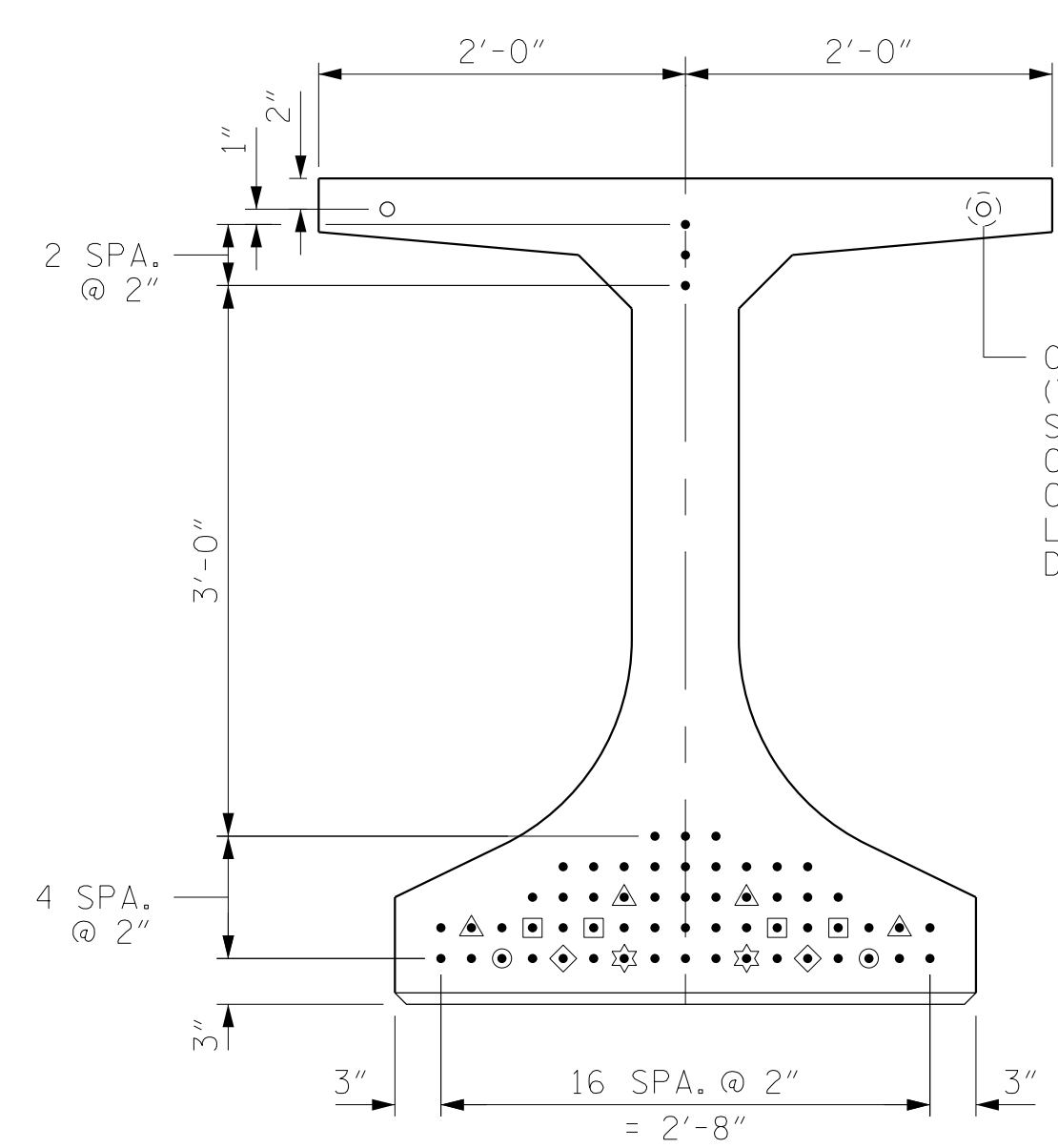
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

DEBONDING LEGEND

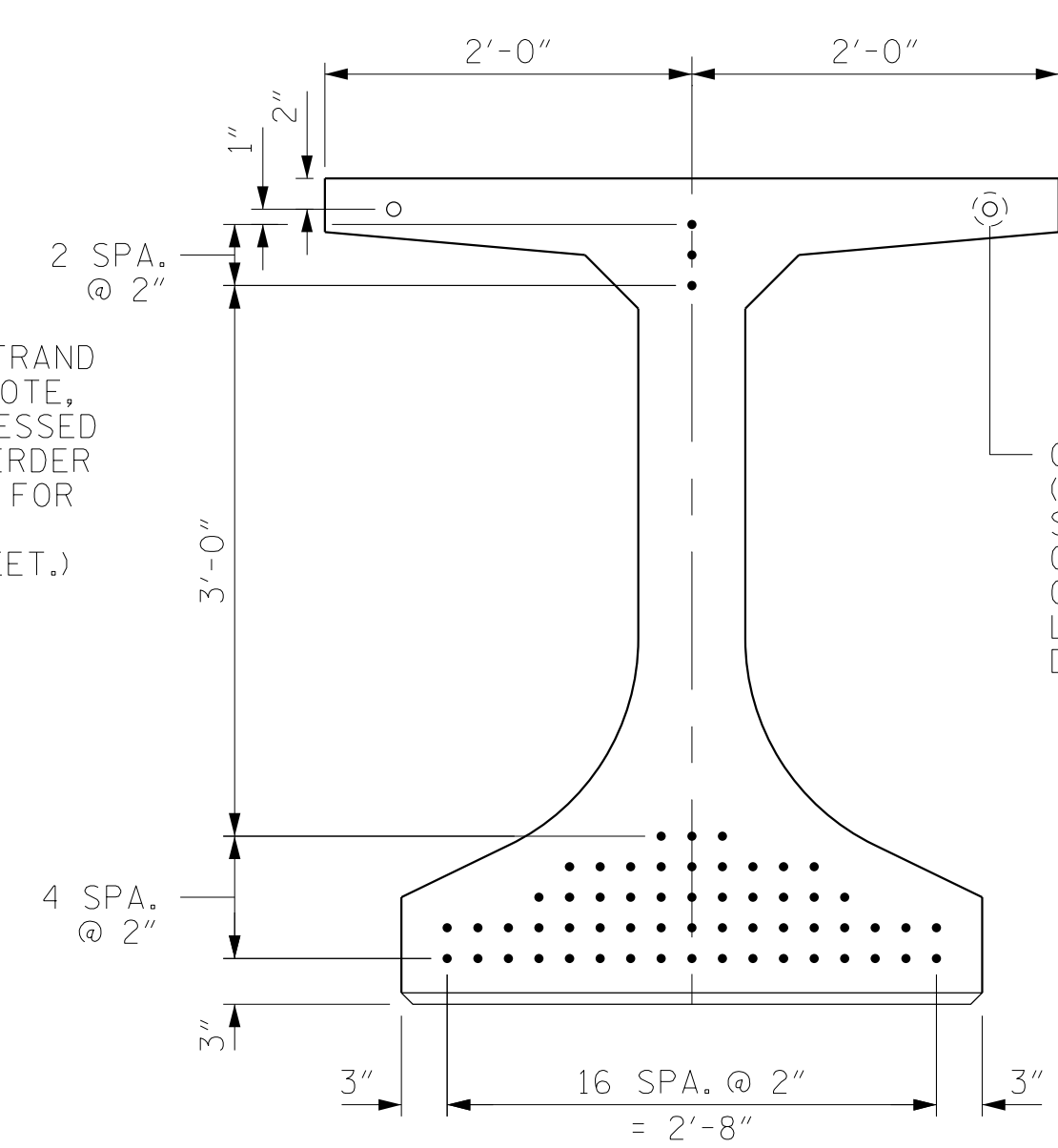
- FULLY BONDED STRANDS
- ◊ DEBONDED FOR 32'-0" FROM END OF GIRDER
- ◈ DEBONDED FOR 22'-0" FROM END OF GIRDER
- ◉ DEBONDED FOR 12'-0" FROM END OF GIRDER
- ◐ DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◑ DEBONDED FOR 4'-0" FROM END OF GIRDER



SECTION A-A



AT END OF GIRDER



AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(60 STRANDS REQUIRED)

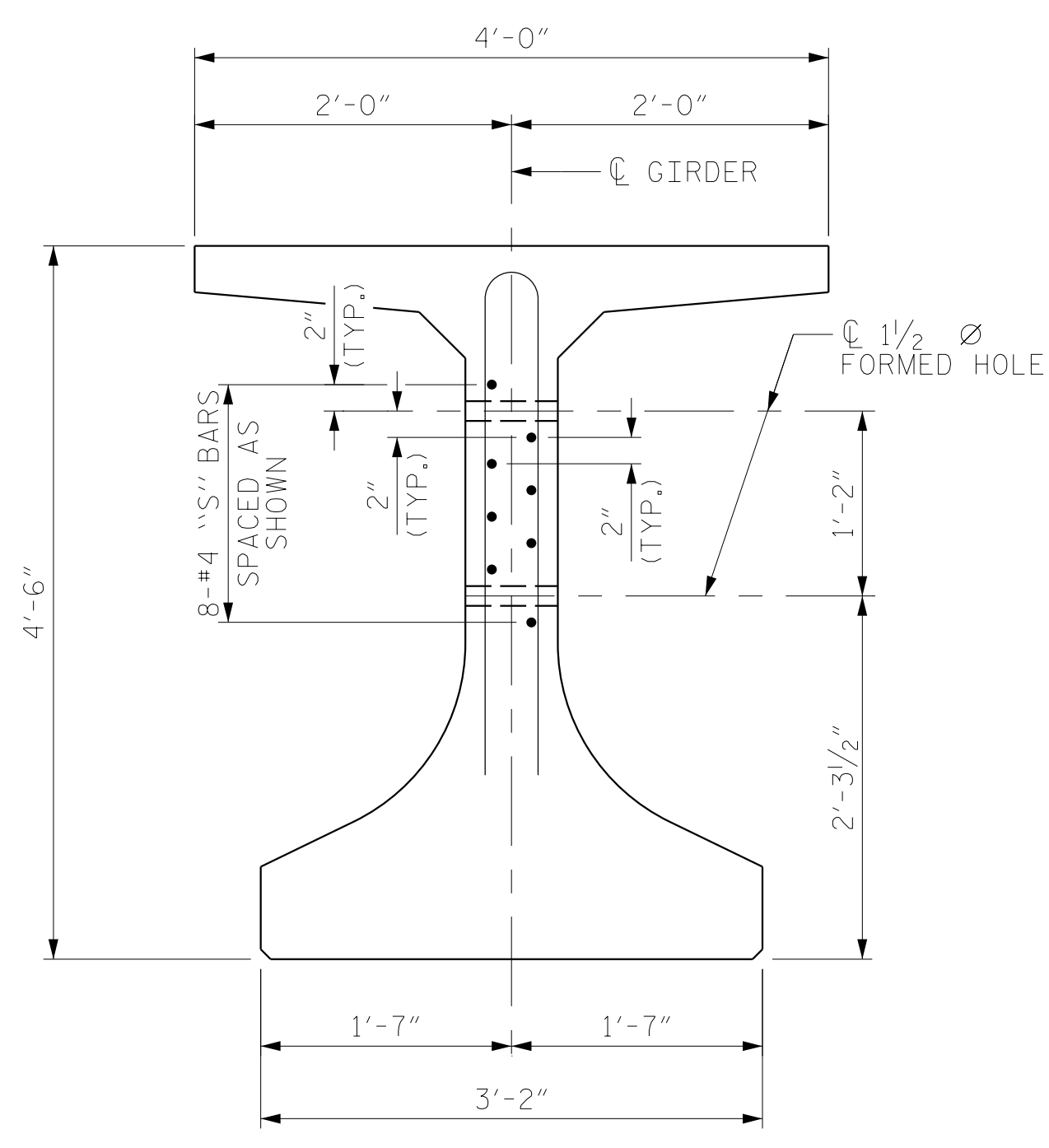
DRAWN BY :	MRA	DATE :	04/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

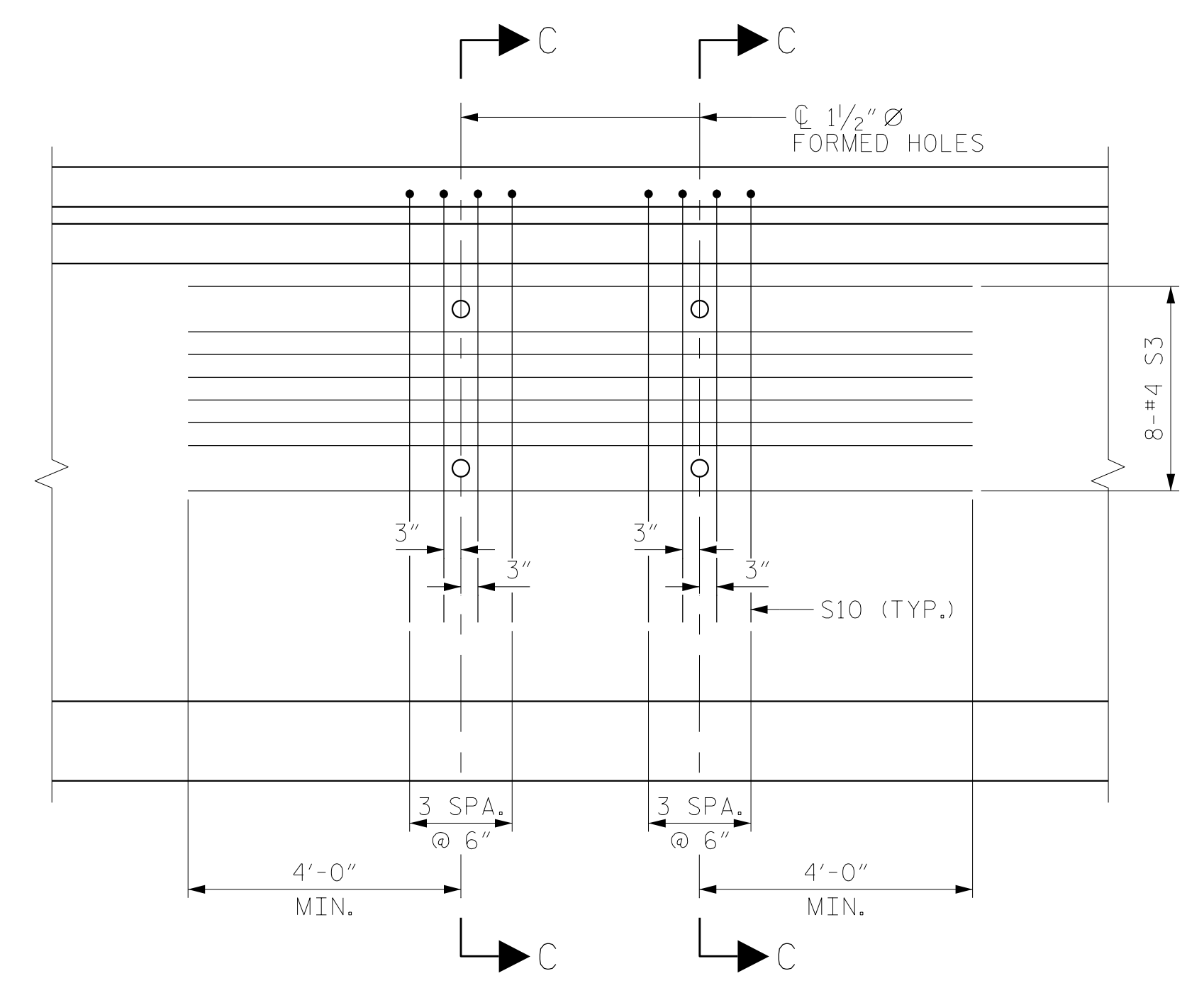


PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

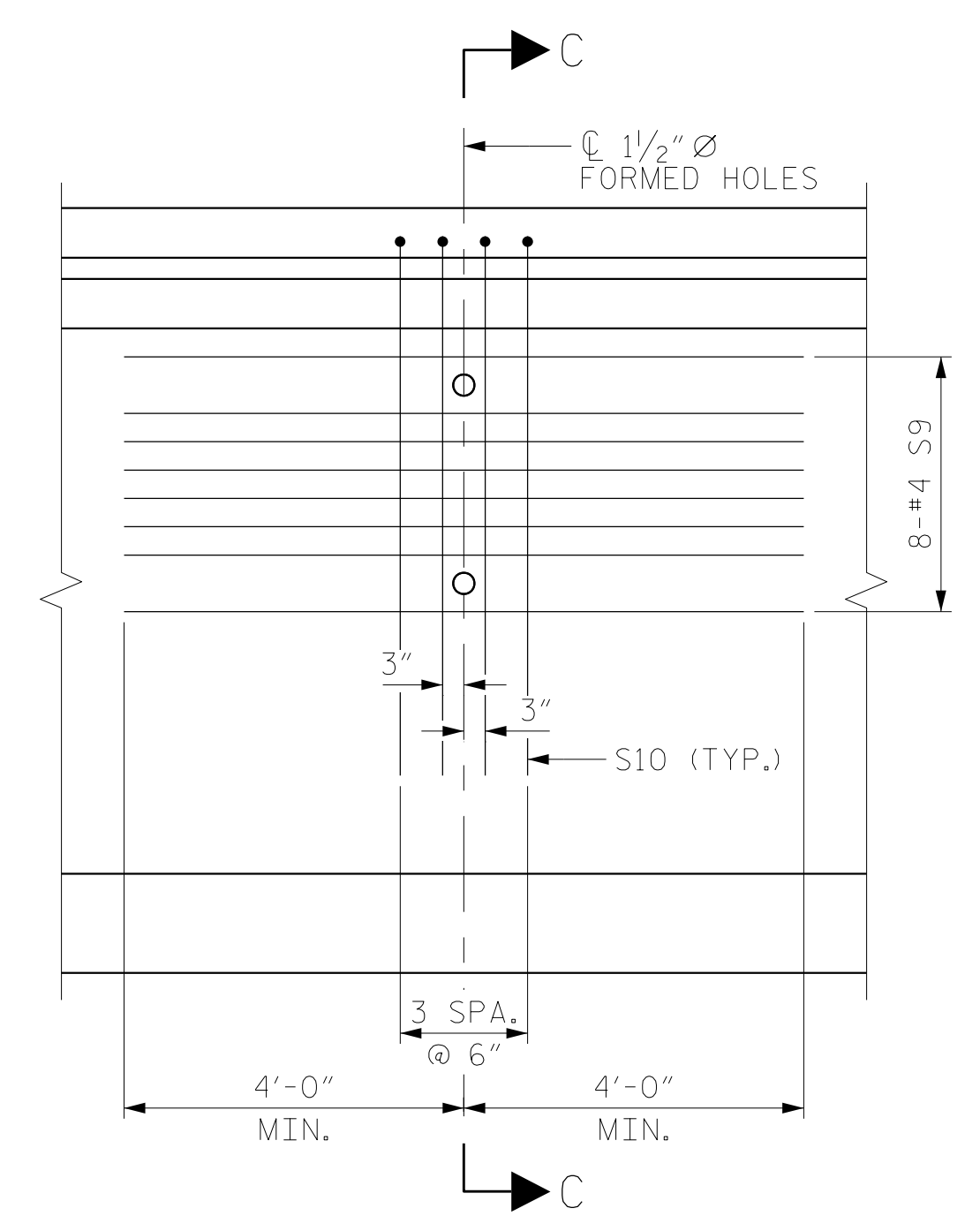
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			43



SECTION C-C

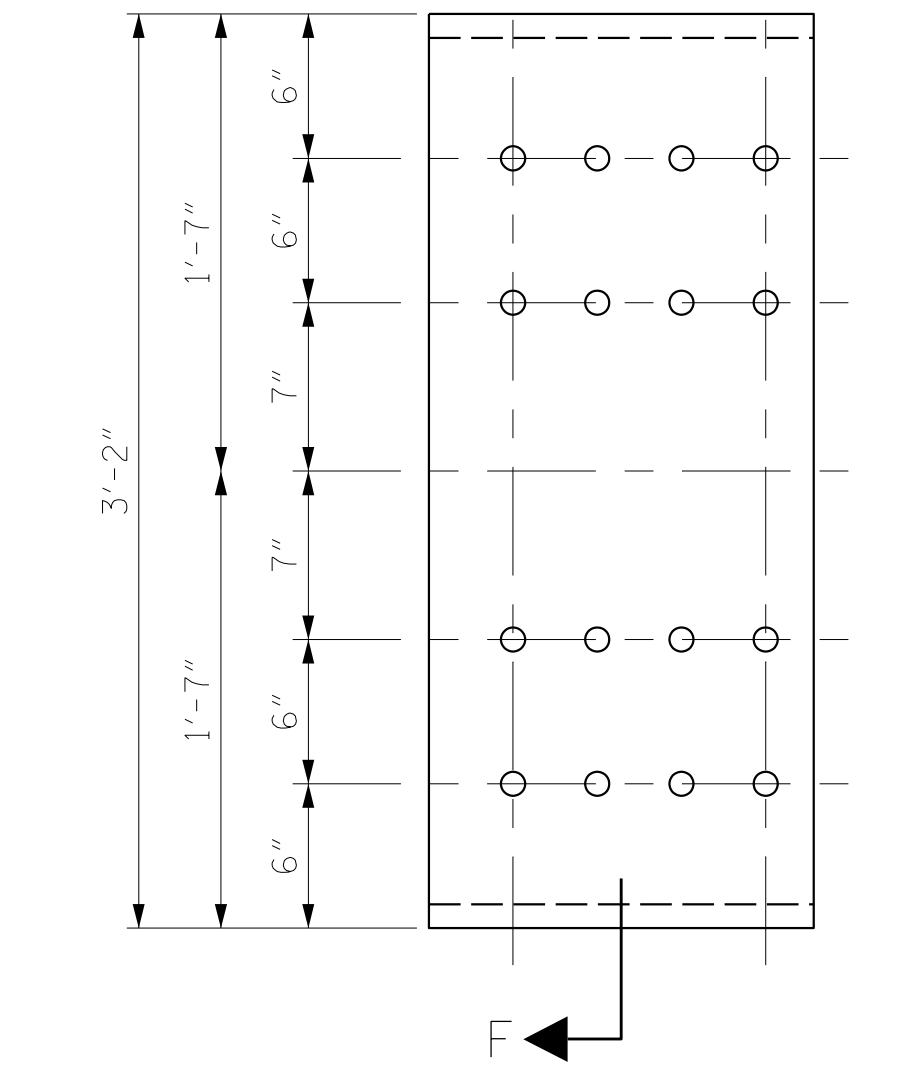
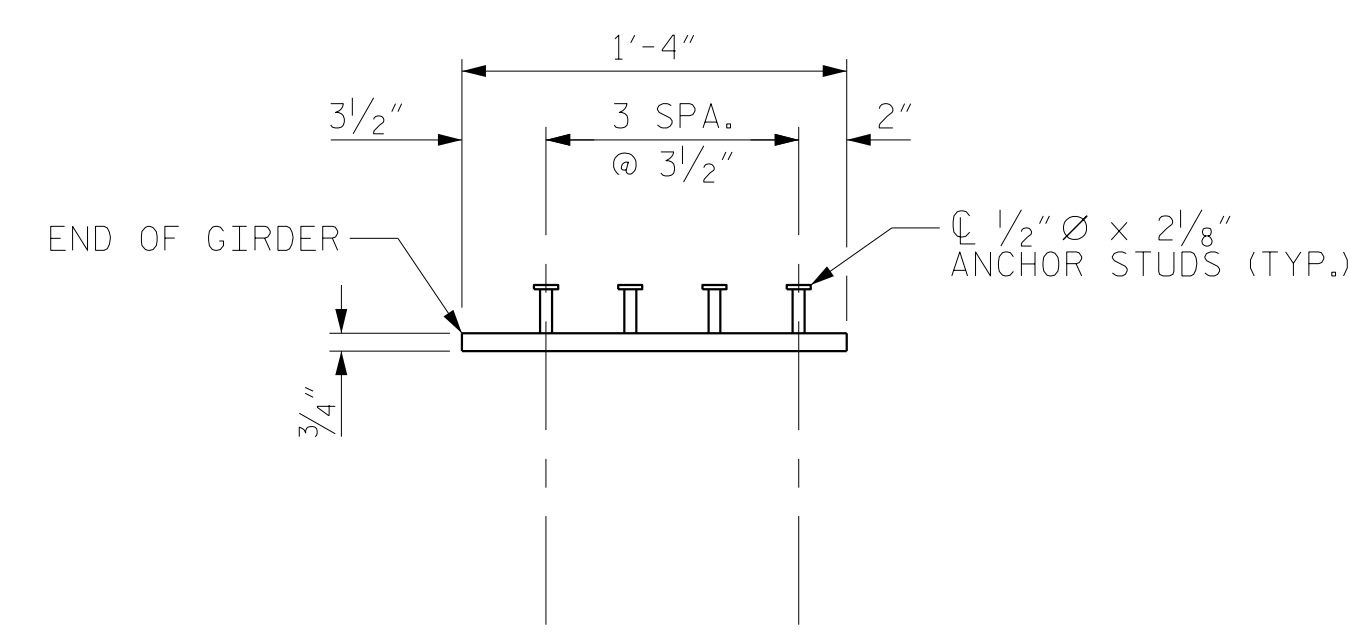


INTERIOR GIRDER

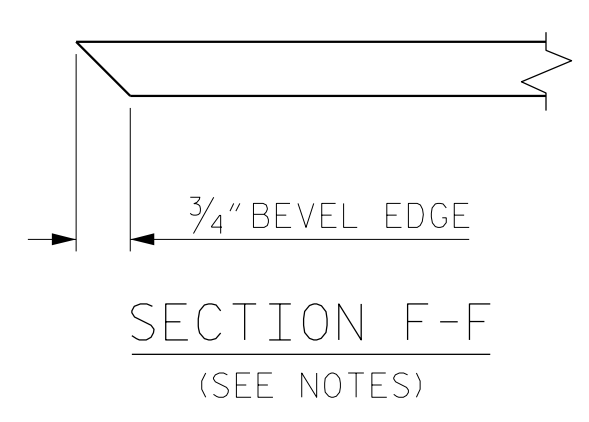


EXTERIOR GIRDER

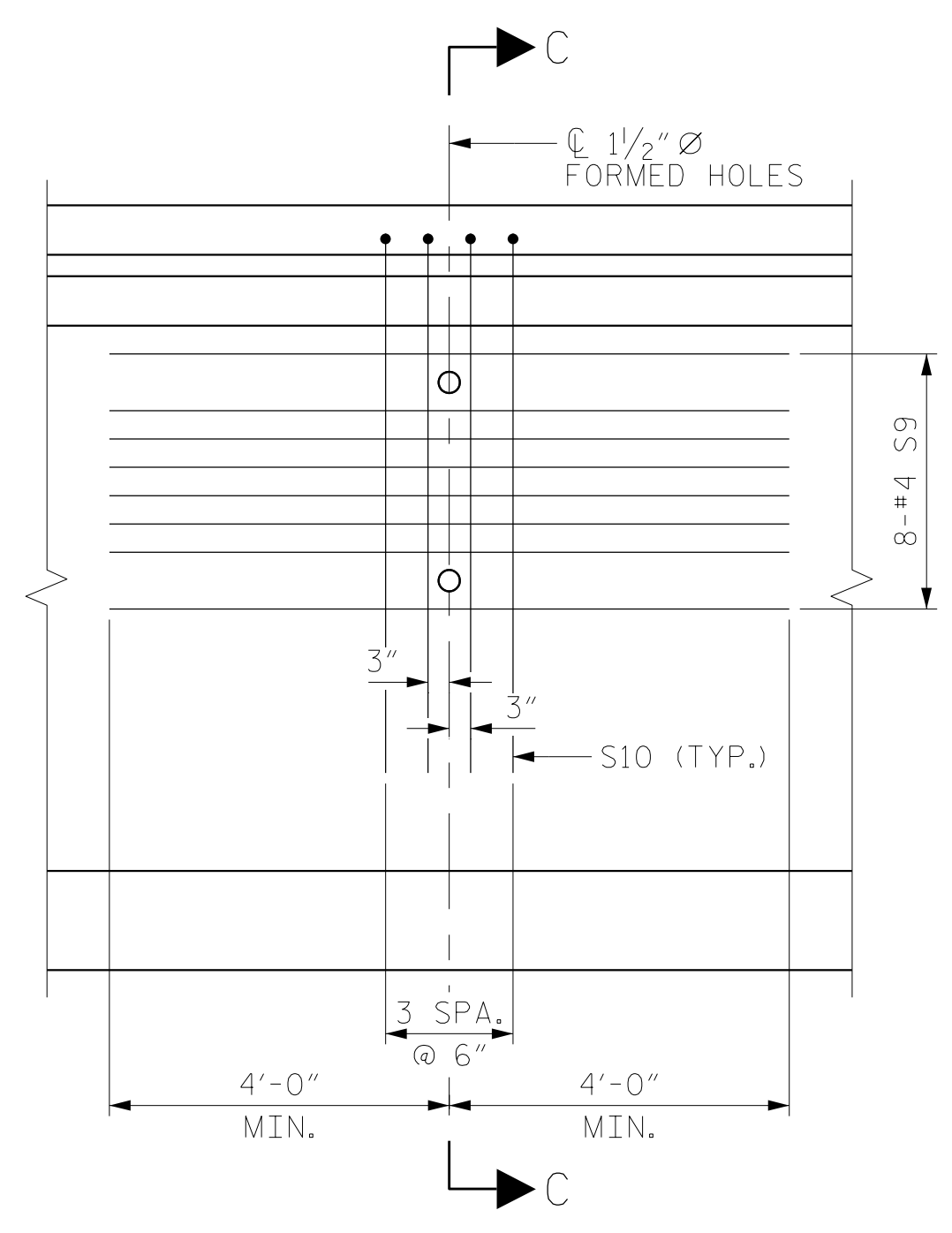
SPAN A PARTIAL ELEVATION



EMBEDDED PLATE "B-1" DETAILS
(2 REQ'D PER GIRDER)

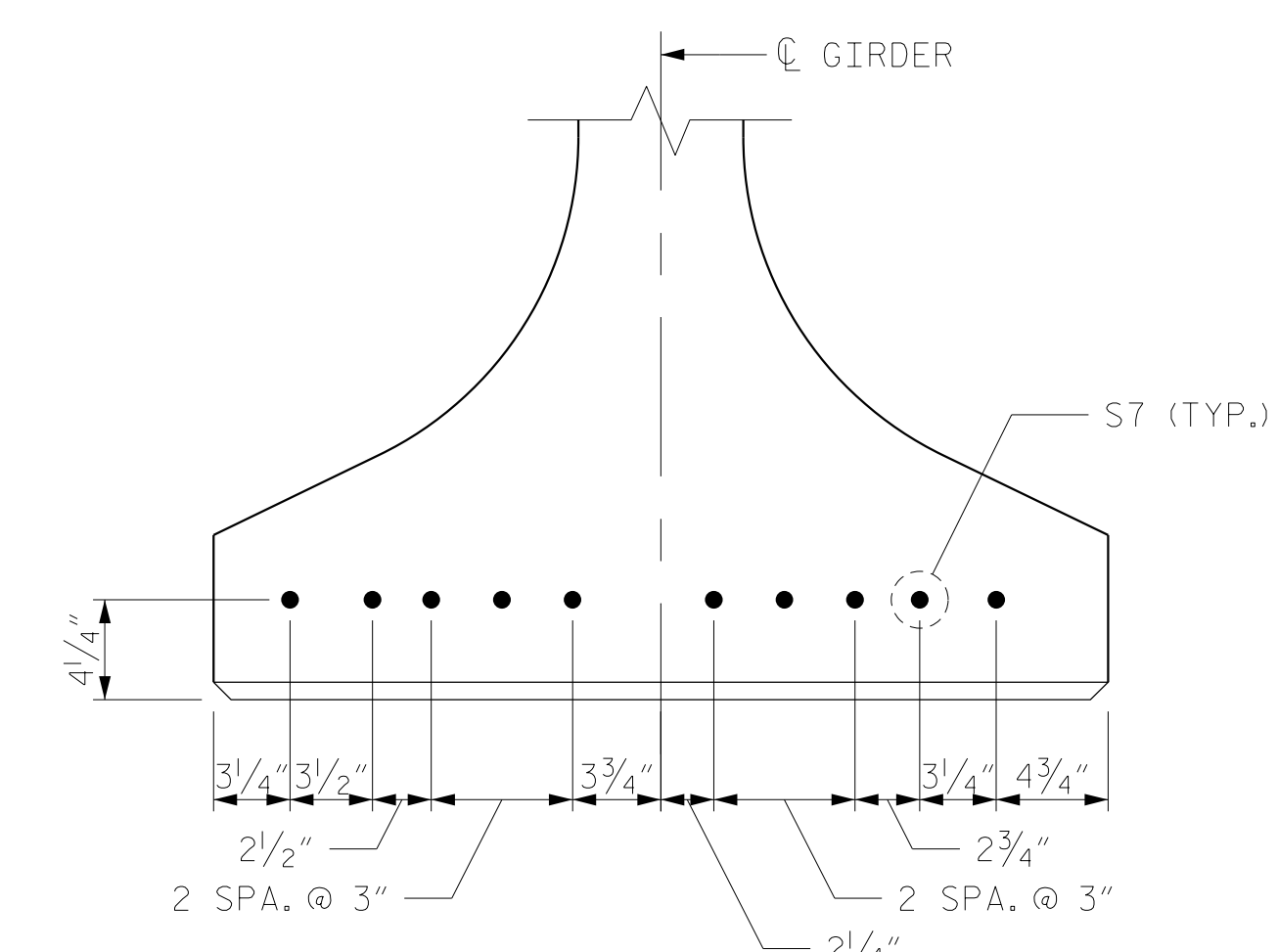


SECTION F-F
(SEE NOTES)



SPAN B PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING FOR ALL GIRDERS



DETAIL "A"

NOTES:

- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL SHALL BE GRADE 60.
- APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.
- EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.
- 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 THE END 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 6,500 P.S.I.
- 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", SHALL BE RAKED TO A DEPTH OF 1/4".
- THE COST OF ALL CONCRETE, REINFORCING STEEL, PRESTRESSED STRANDS, INSERTS EMBEDDED IN THE CONCRETE, EMBEDDED PLATES, TEMPORARY BRACING AND INCIDENTAL ITEMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR PRESTRESSED CONCRETE GIRDERS.
- PRIOR TO CASTING THE GIRDERS, THE CONTRACTOR SHALL SUBMIT COMPLETE WORKING DRAWINGS WITH EXACT LOCATION AND COMPLETE DESCRIPTION OF ALL INSERTS CAST IN THE GIRDERS TO THE DEPARTMENT FOR APPROVAL. SUCH INSERTS INCLUDE BUT ARE NOT LIMITED TO: INSERTS FOR SUPPORTING FALSEWORK AND FORMWORK, INSERTS FOR ATTACHING DIAPHRAGMS, INSERTS FOR CONNECTING TEMPORARY BRACING AND LIFTING INSERTS.
- THE CONTRACTOR HAS THE OPTION TO PROVIDE 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. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 3 OF 3

RS&H Architects-Engineers-Planners, Inc.
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 919-926-4100 FAX 919-846-9080
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S2-13	
SUPERSTRUCTURE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS RIGHT LANE						TOTAL SHEETS 43	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : MRA	DATE : 04/2020
CHECKED BY : MKO	DATE : 04/2021
DESIGN ENGINEER OF RECORD: RLB	DATE : 09/2021

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM F3125 GR. A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM F3125 GR. 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.

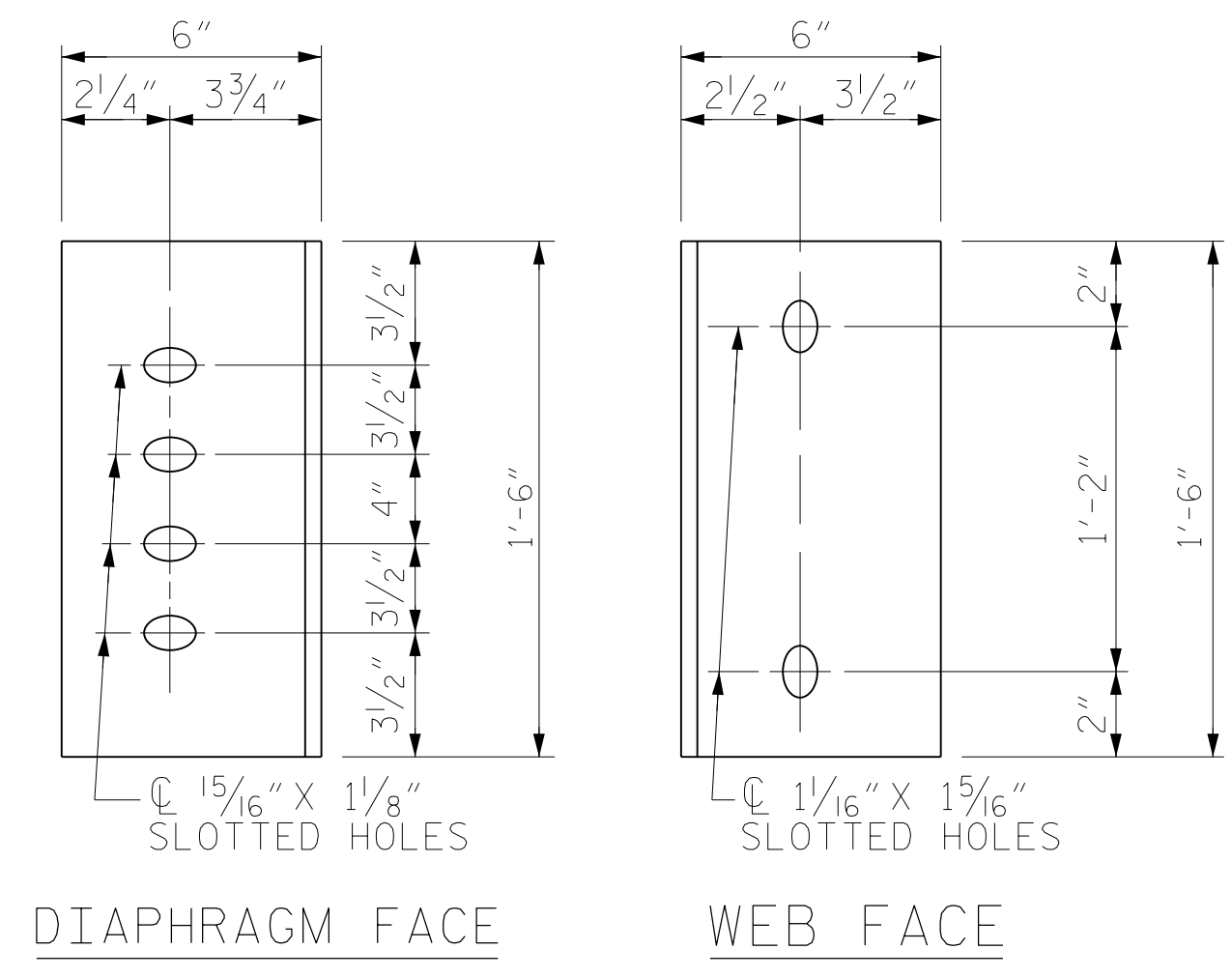
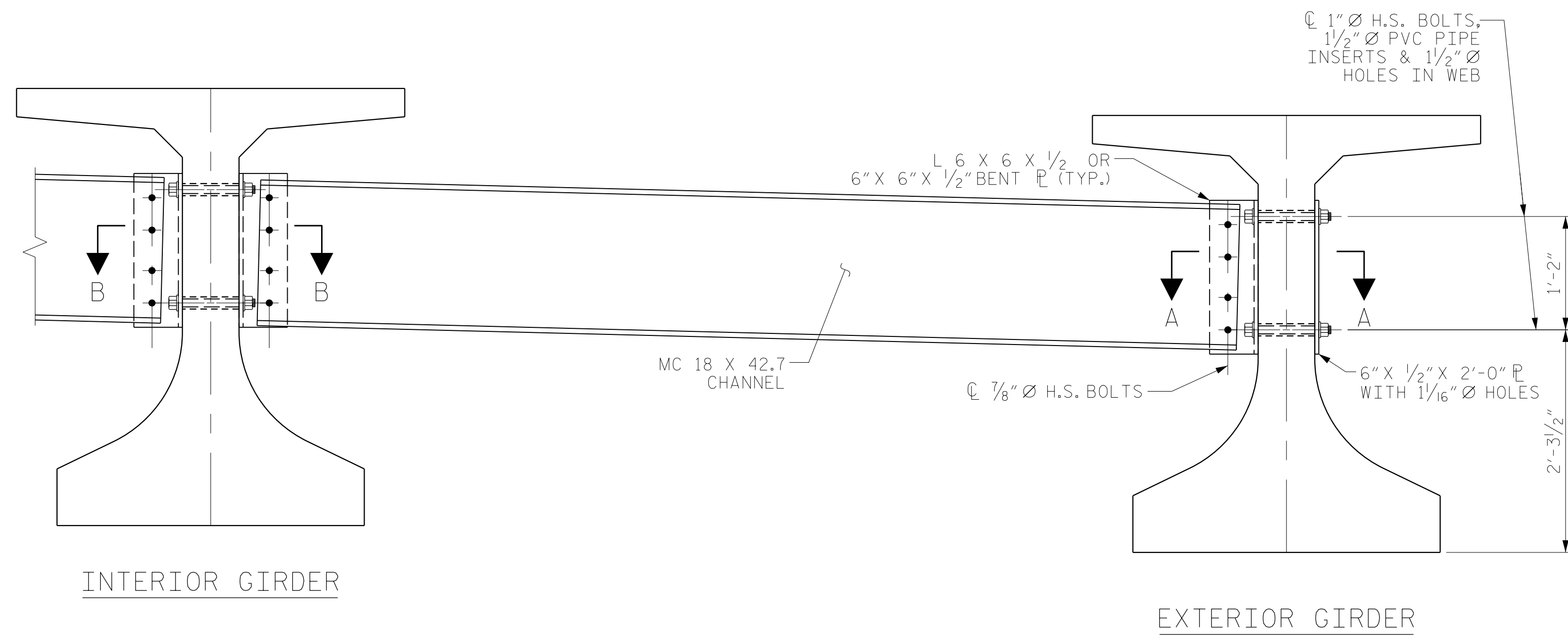
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

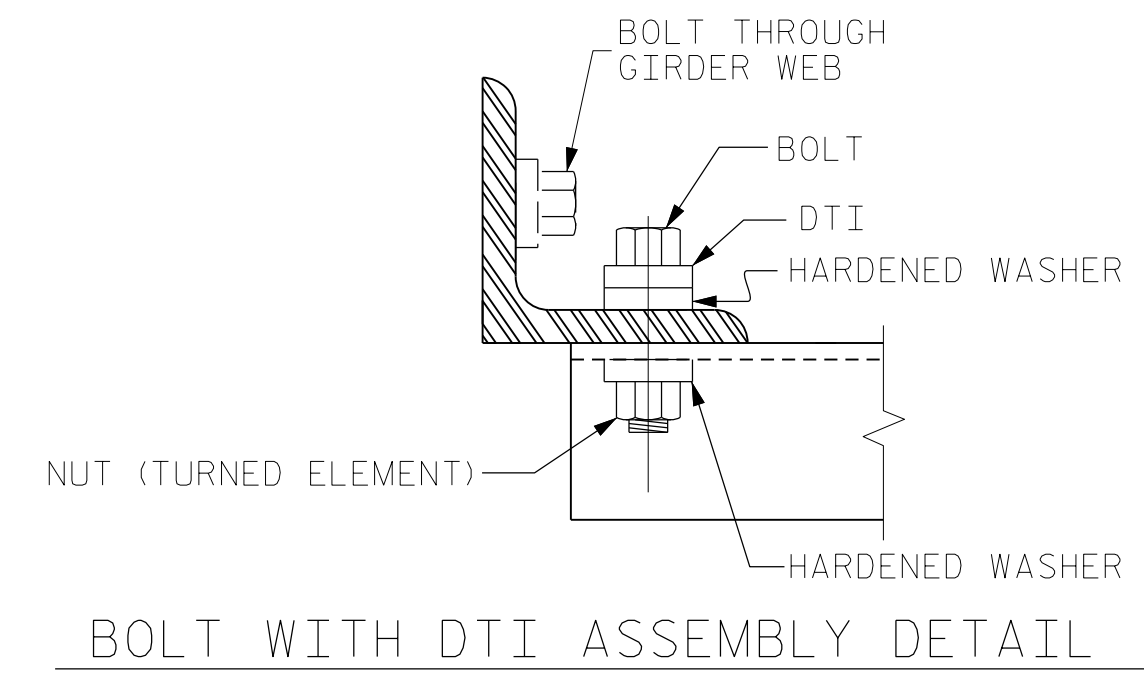
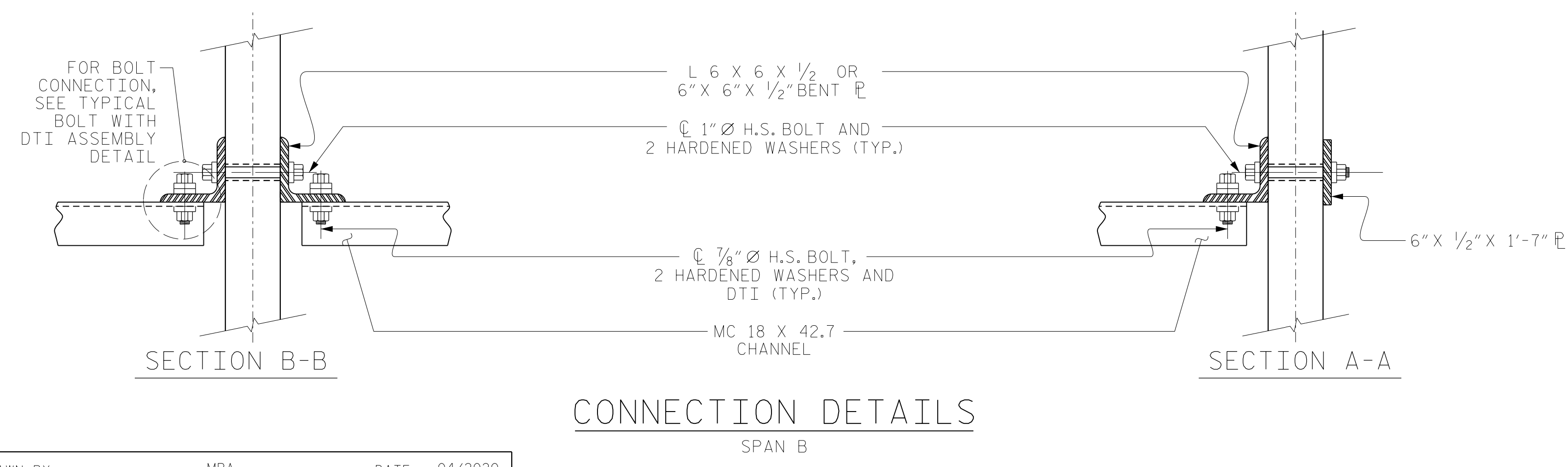
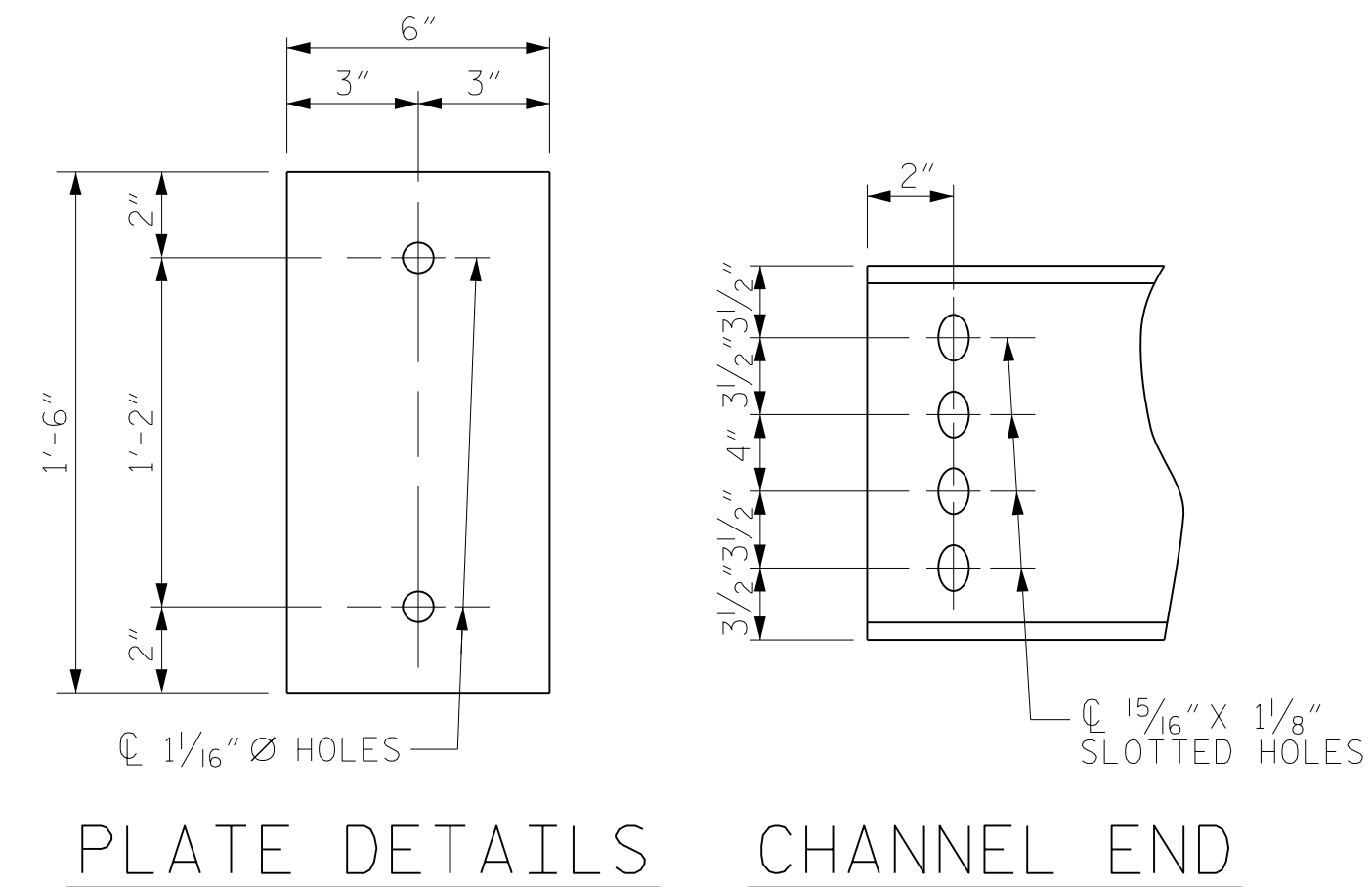
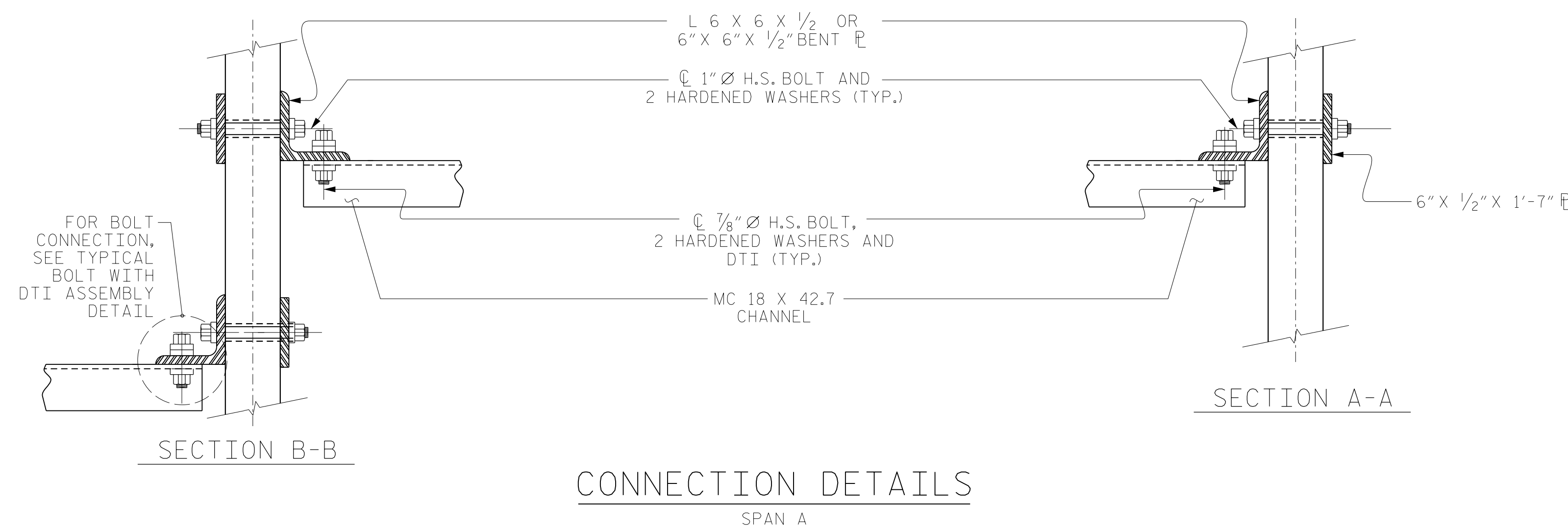
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



PART SECTION AT INTERMEDIATE DIAPHRAGM

CONNECTOR PLATE DETAILS



PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

RS&H
 RS&H Architects-Engineers-Planners, Inc.
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 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 50737-F-0403-C-02

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S2-14
INTERMEDIATE STEEL DIAPHRAGMS FOR 54" F.I.B. PRESTRESSED CONCRETE GIRDERS						TOTAL SHEETS
RIGHT LANE						43
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY :	MRA	DATE :	04/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

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NOTES

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

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

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

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

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

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

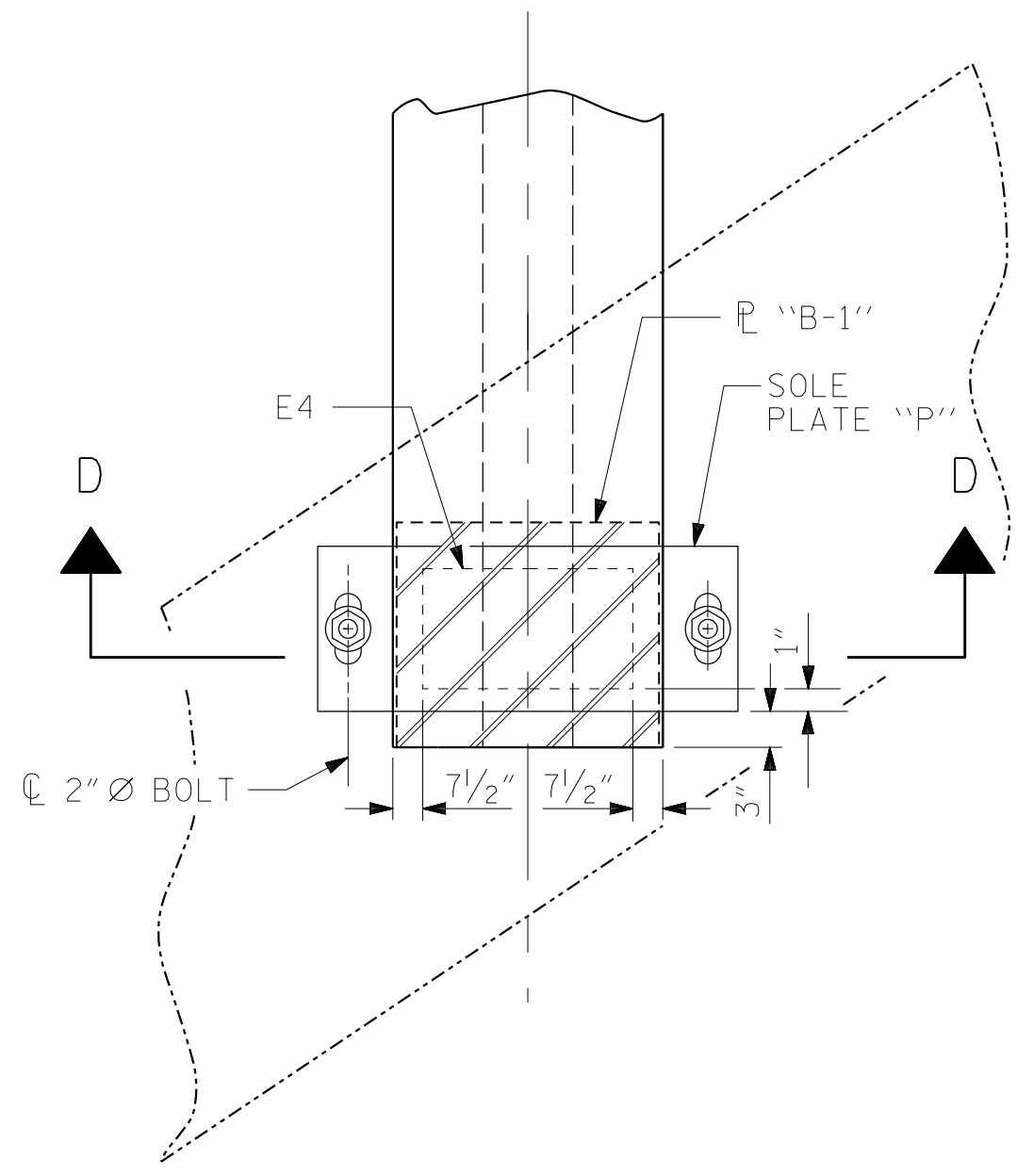
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F3125 GRADE A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

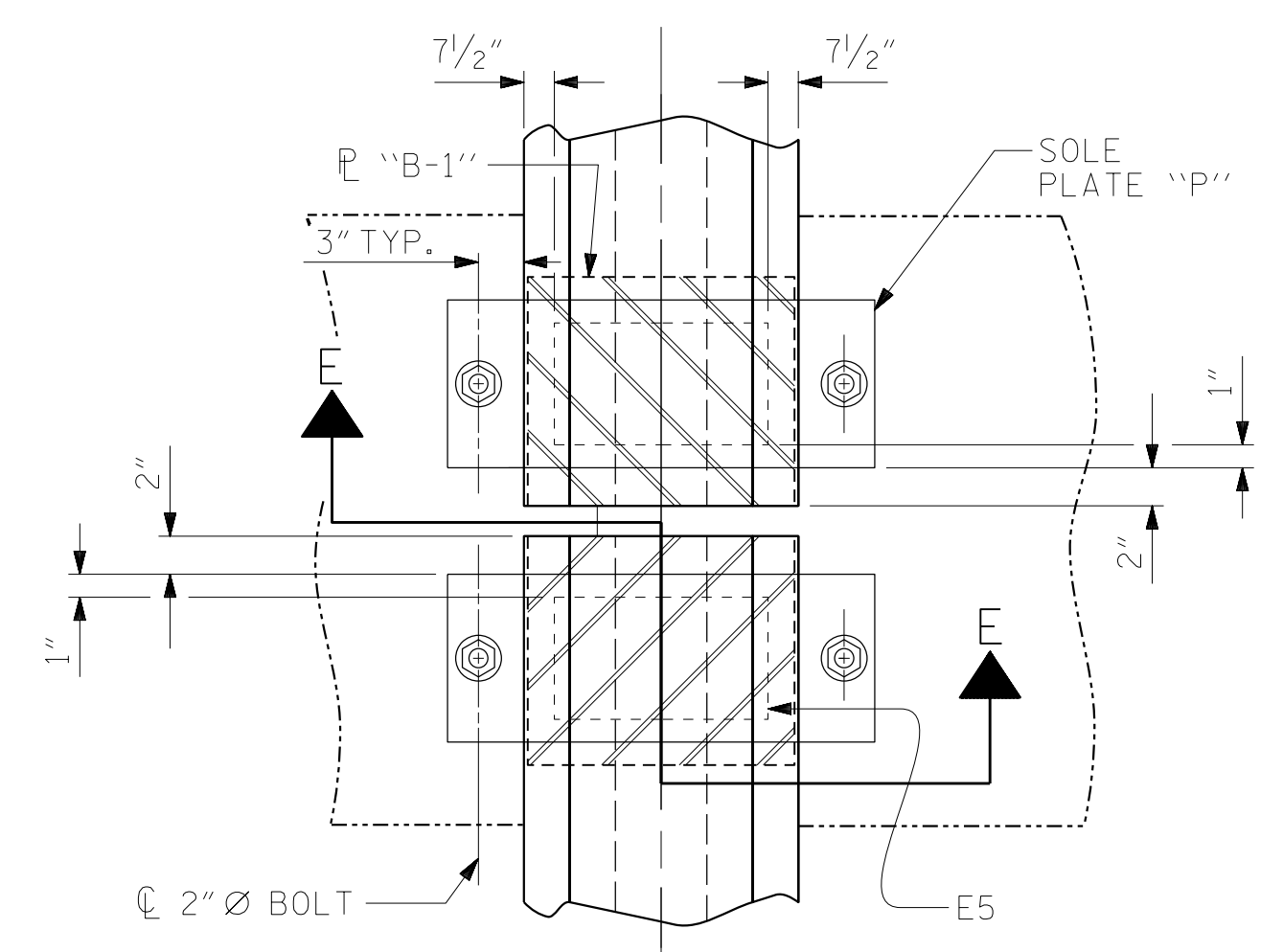
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



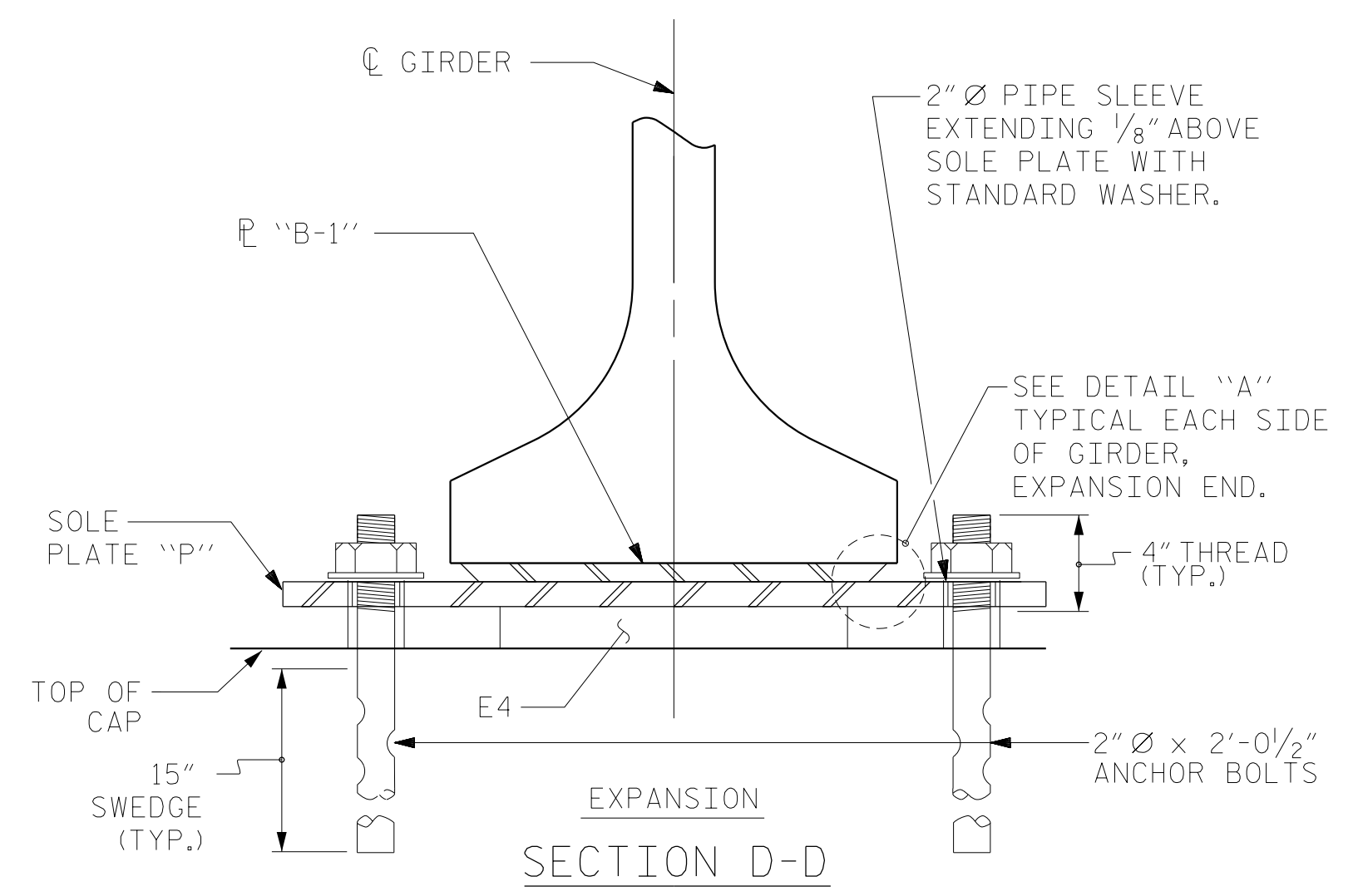
TYPICAL PLAN AT END BENTS

NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY
END BENT 1 SHOWN, END BENT 2 SIMILAR

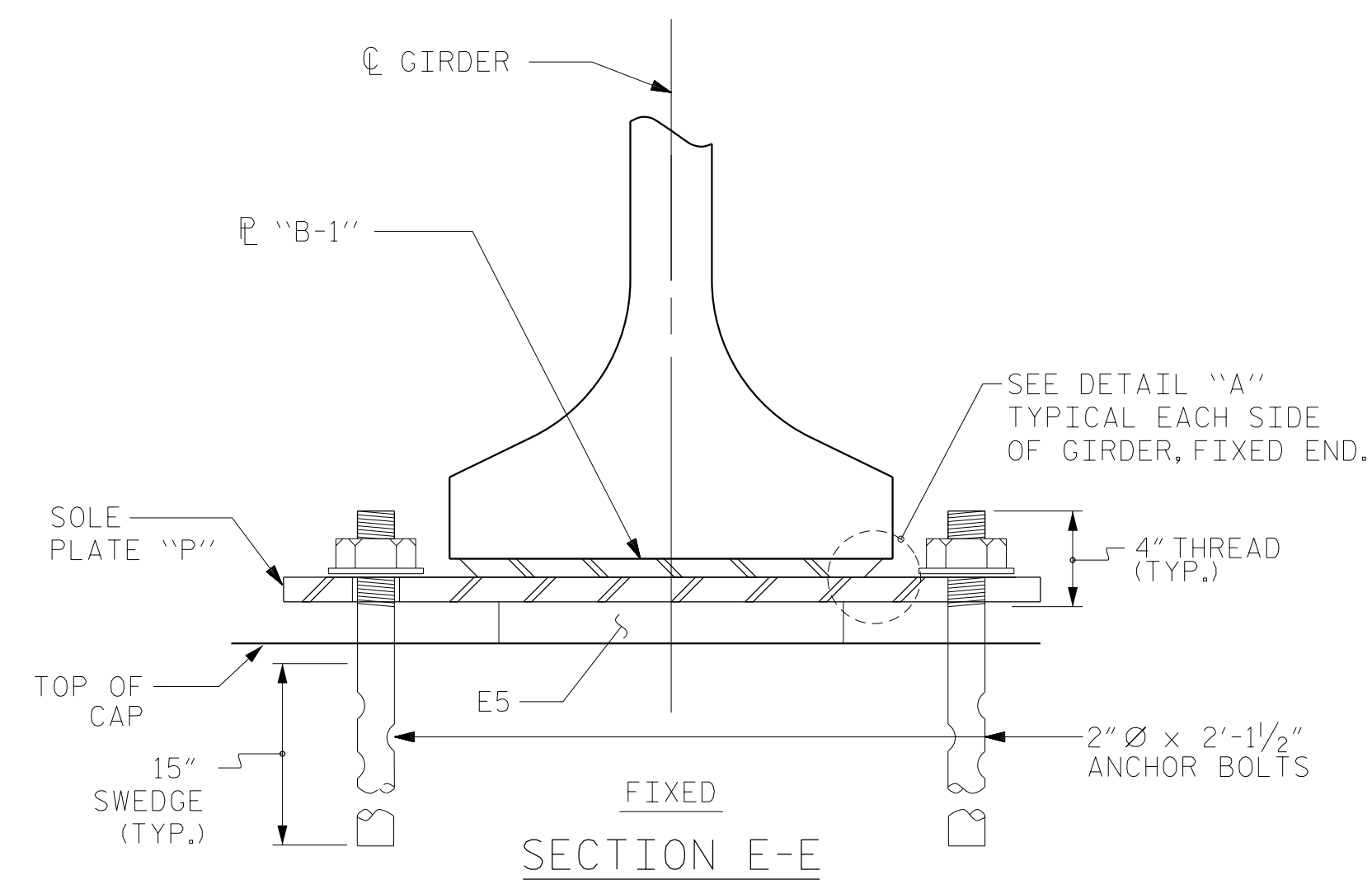


TYPICAL PLAN AT BENT

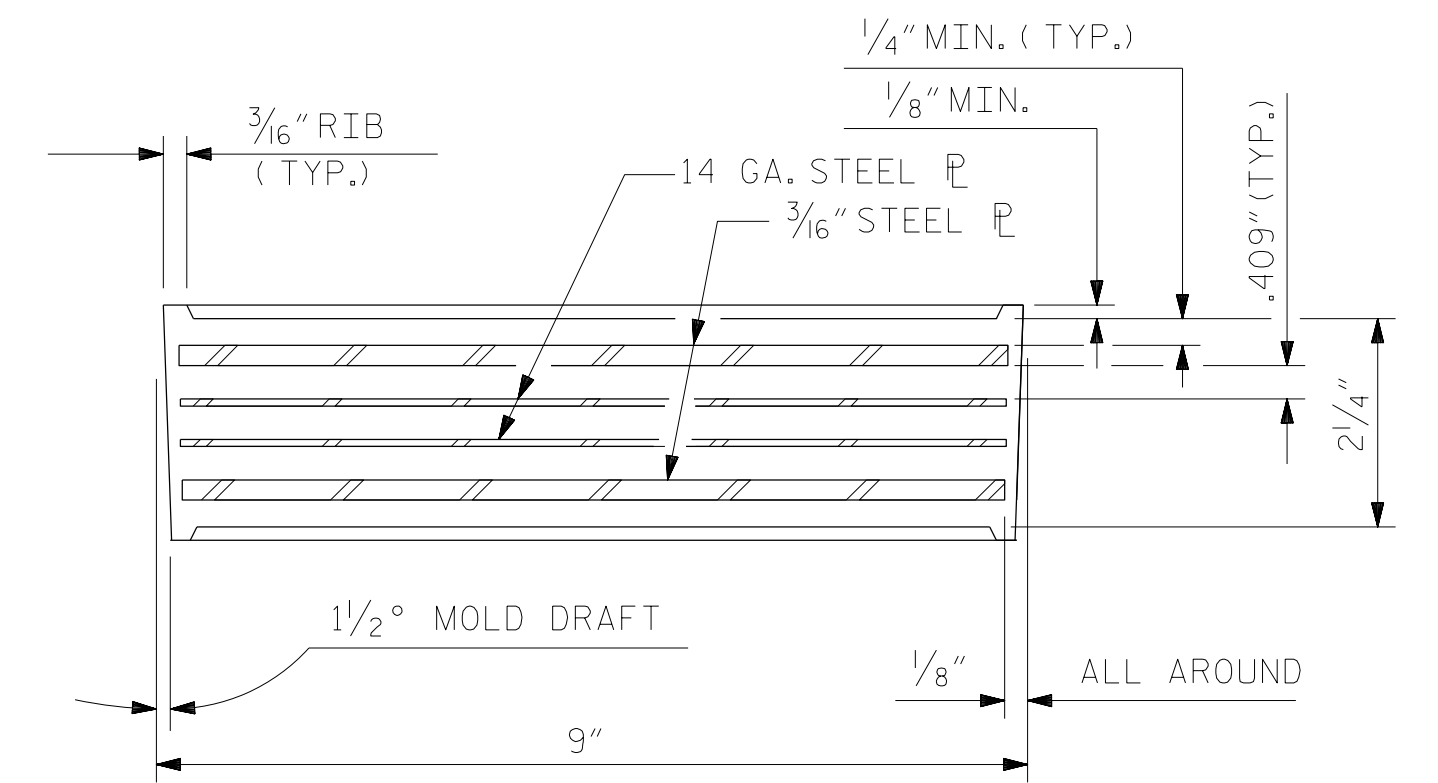
NOTE: BOTTOM FLANGE SHOWN, TOP FLANGE NOT SHOWN FOR CLARITY



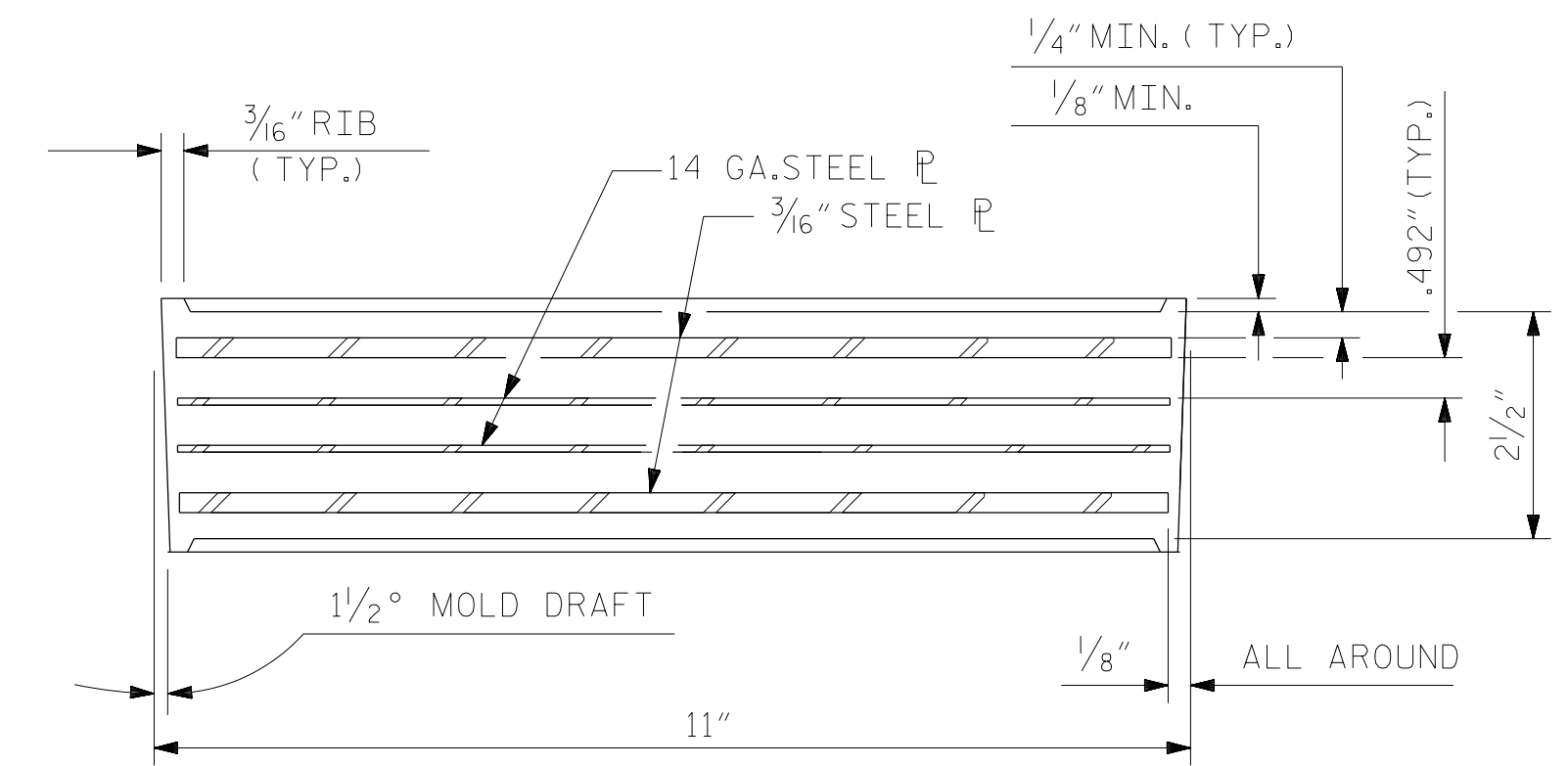
SECTION D-D



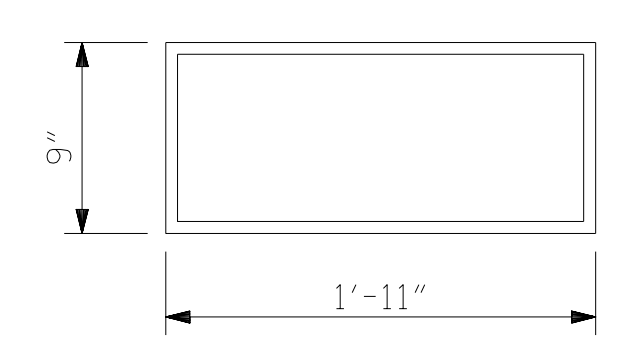
SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS



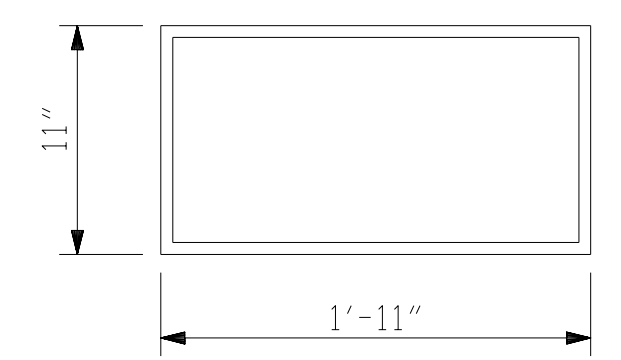
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

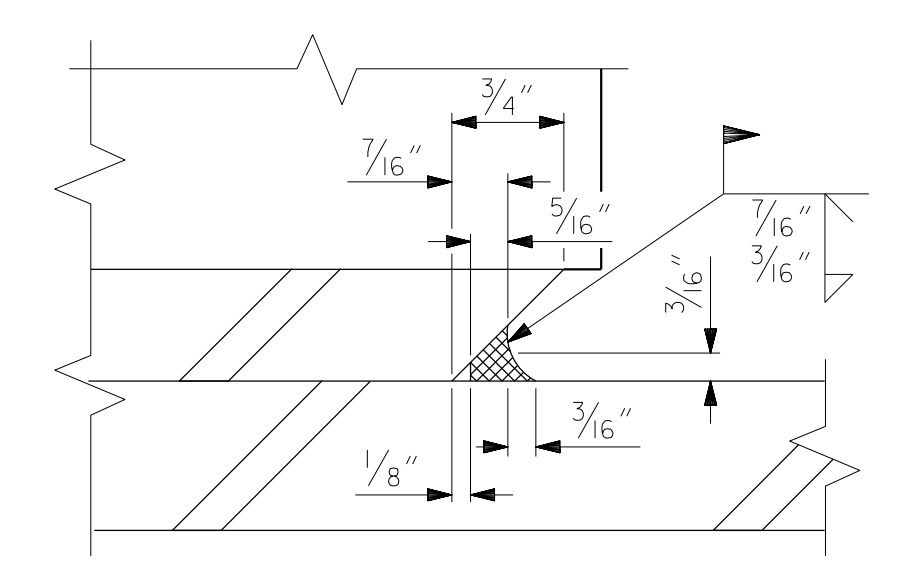


E5 (8 REQ'D)

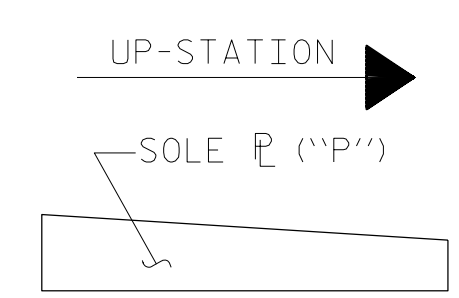
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

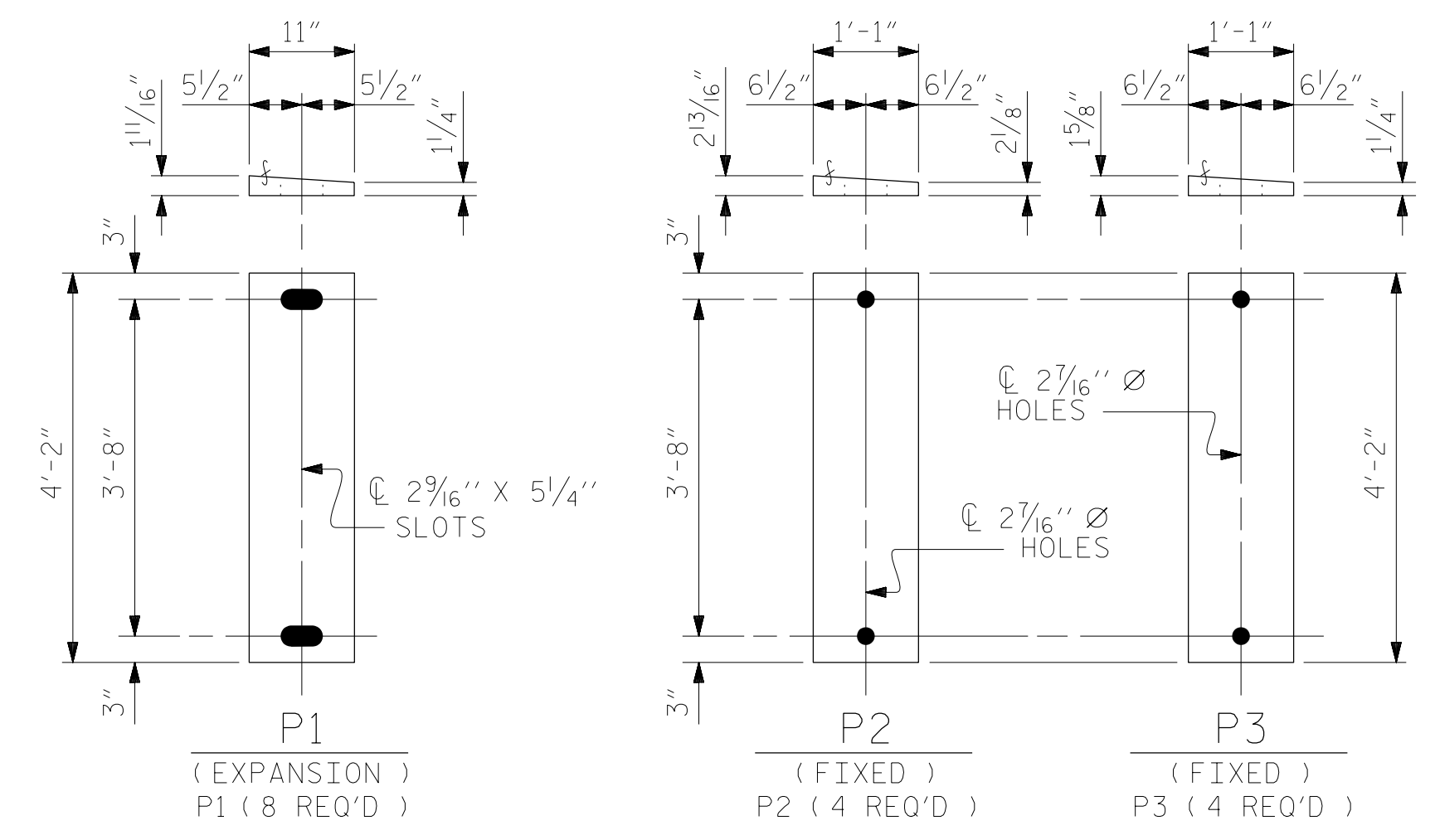
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k
TYPE VI	385 k



DETAIL "A"



SOLE PLATE PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

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PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
ELASTOMERIC BEARING DETAILS					
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

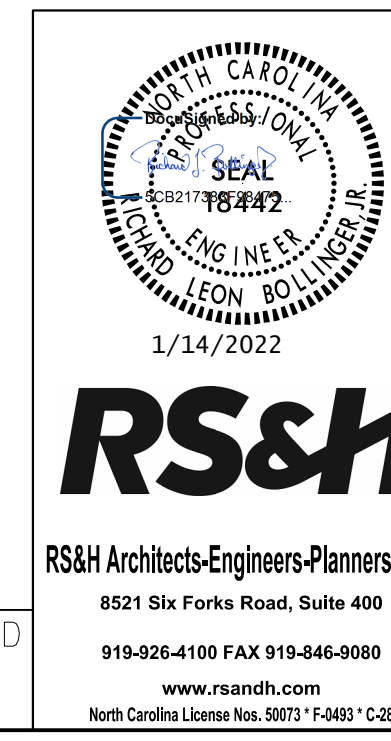
DRAWN BY :	MRA	DATE :	04/2020
CHECKED BY :	MKO	DATE :	04/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with columns for span points (0 to 0.5) and rows for camber, deflection, and final camber for Girders 1 (Exterior), 2 (Interior), 3 (Interior), and 4 (Exterior). Includes a note: '* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD. ALL VALUES ARE SHOWN IN FEEL (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 2

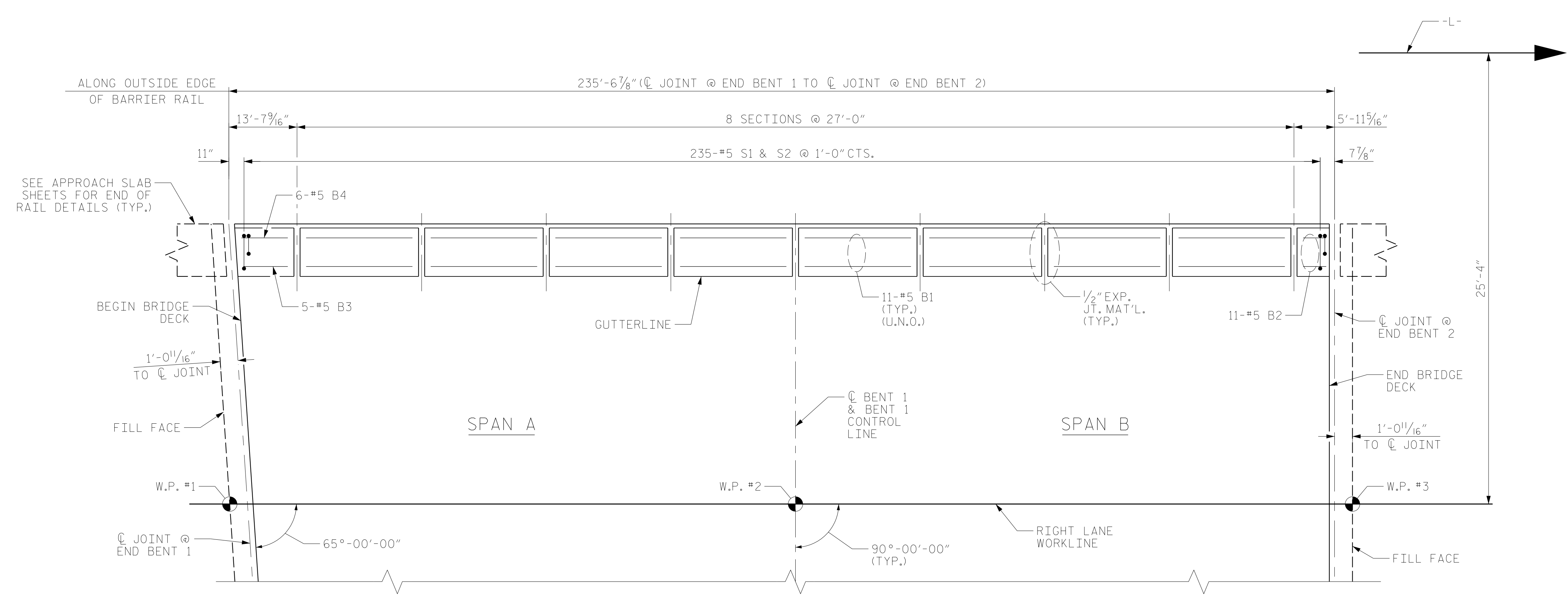


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS
RIGHT LANE

DRAWN BY: MRA DATE: 04/2020
CHECKED BY: MKO DATE: 04/2021
DESIGN ENGINEER OF RECORD: RLB DATE: 09/2021

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Table with columns for REVISIONS (NO., BY, DATE) and SHEET NO. (S2-16, TOTAL SHEETS 43).



PLAN OF BARRIER RAIL
PARAPET NOT SHOWN FOR CLARITY

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

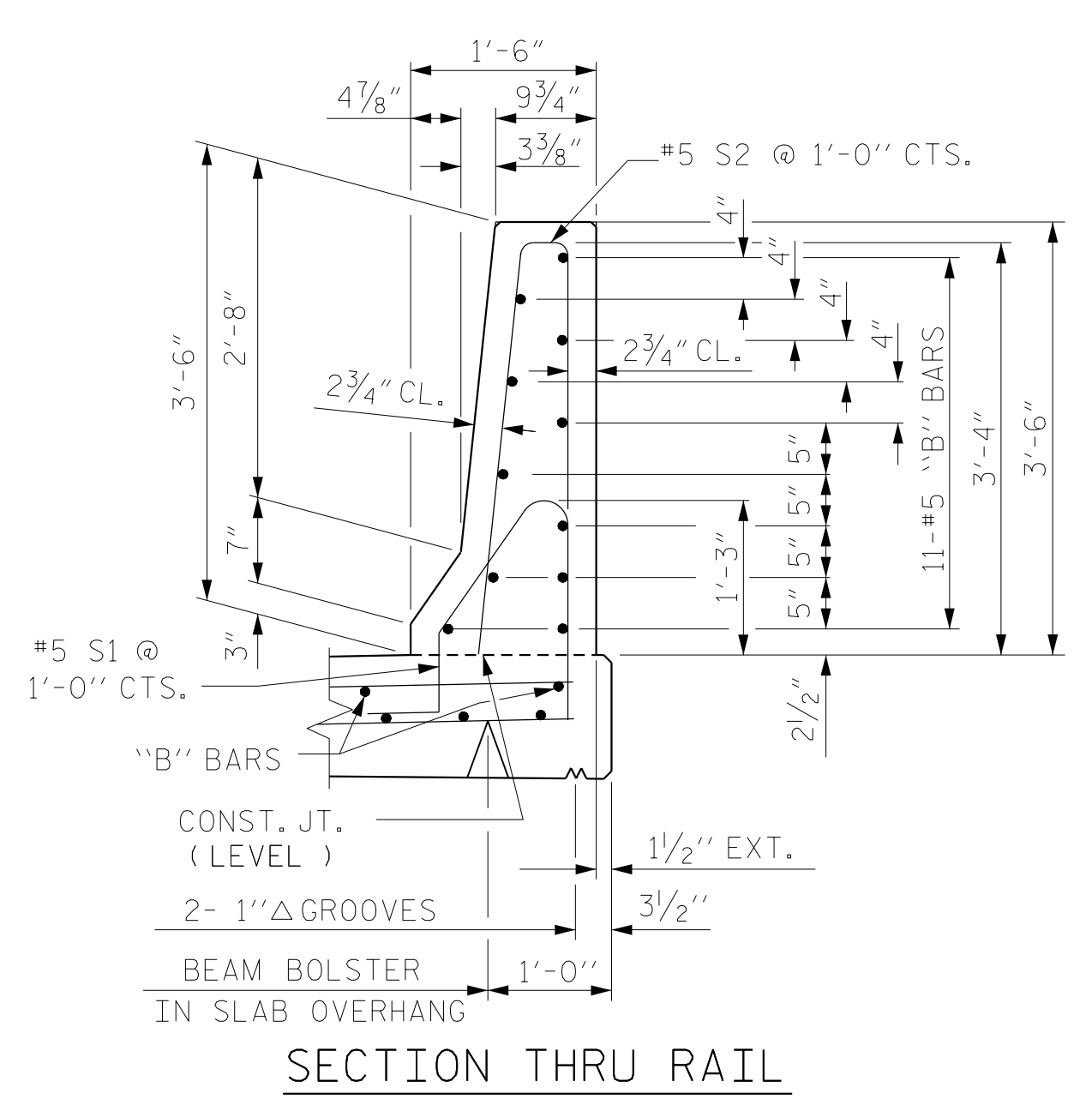
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR.	26'-7"	2440
* B2	11	#5	STR.	5'-6"	63
* B3	5	#5	STR.	12'-7"	66
* B4	6	#5	STR.	12'-11"	81
* S1	235	#5	1	4'-7"	1123
* S2	235	#5	2	7'-0"	1716
* EPOXY COATED REINFORCING STEEL					5,489 LBS.
CLASS AA CONCRETE					32.1 CU. YDS.
CONCRETE BARRIER RAIL					235.6 LIN. FT.

NOTES

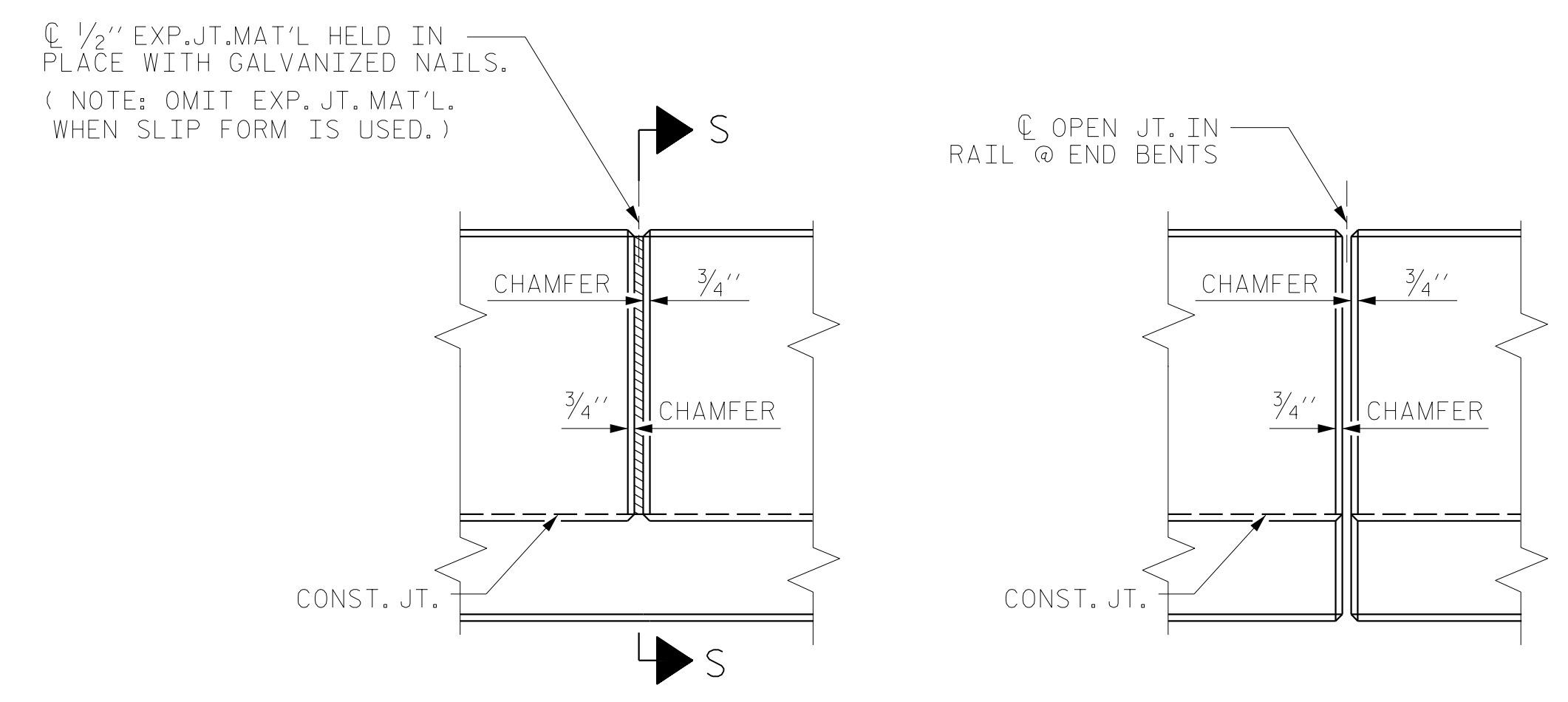
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

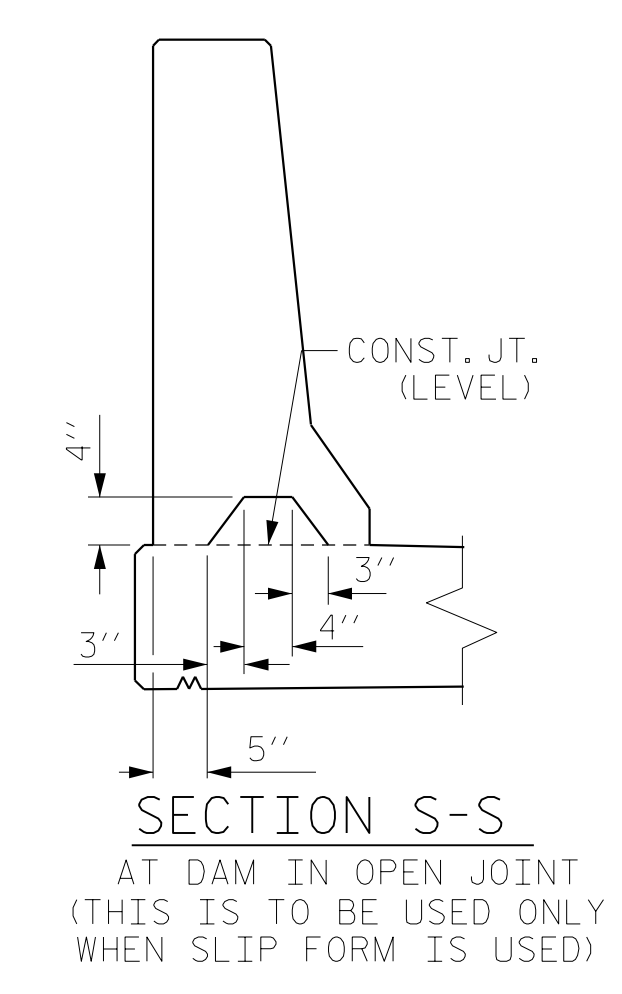
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS



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

BARRIER RAIL DETAILS

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE
BARRIER RAIL
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-18
2			4			TOTAL SHEETS 43

DRAWN BY : TWL DATE : 12/2020
CHECKED BY : MRA DATE : 12/2020
DESIGN ENGINEER OF RECORD: RLB DATE : 09/2021

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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.

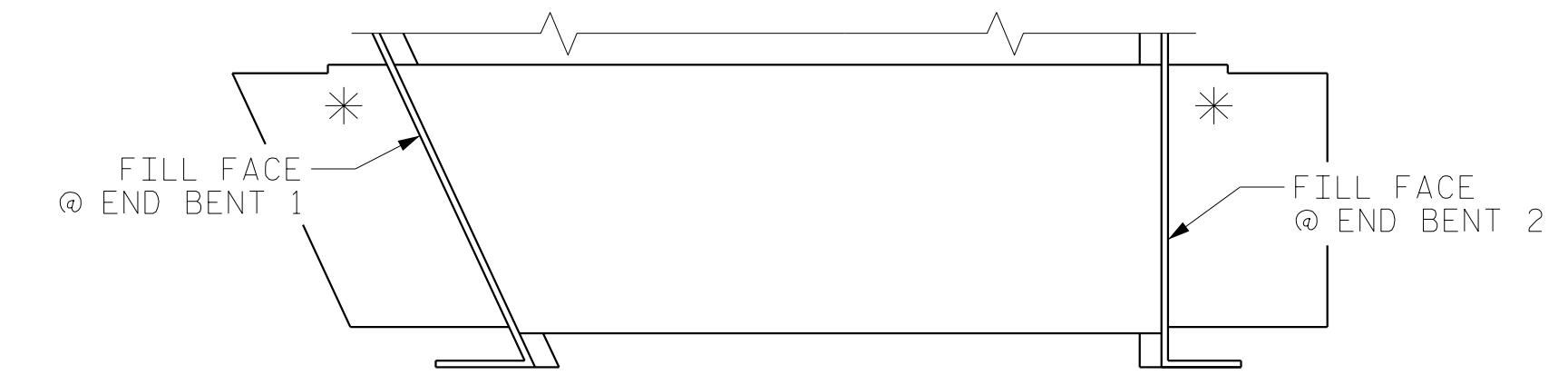
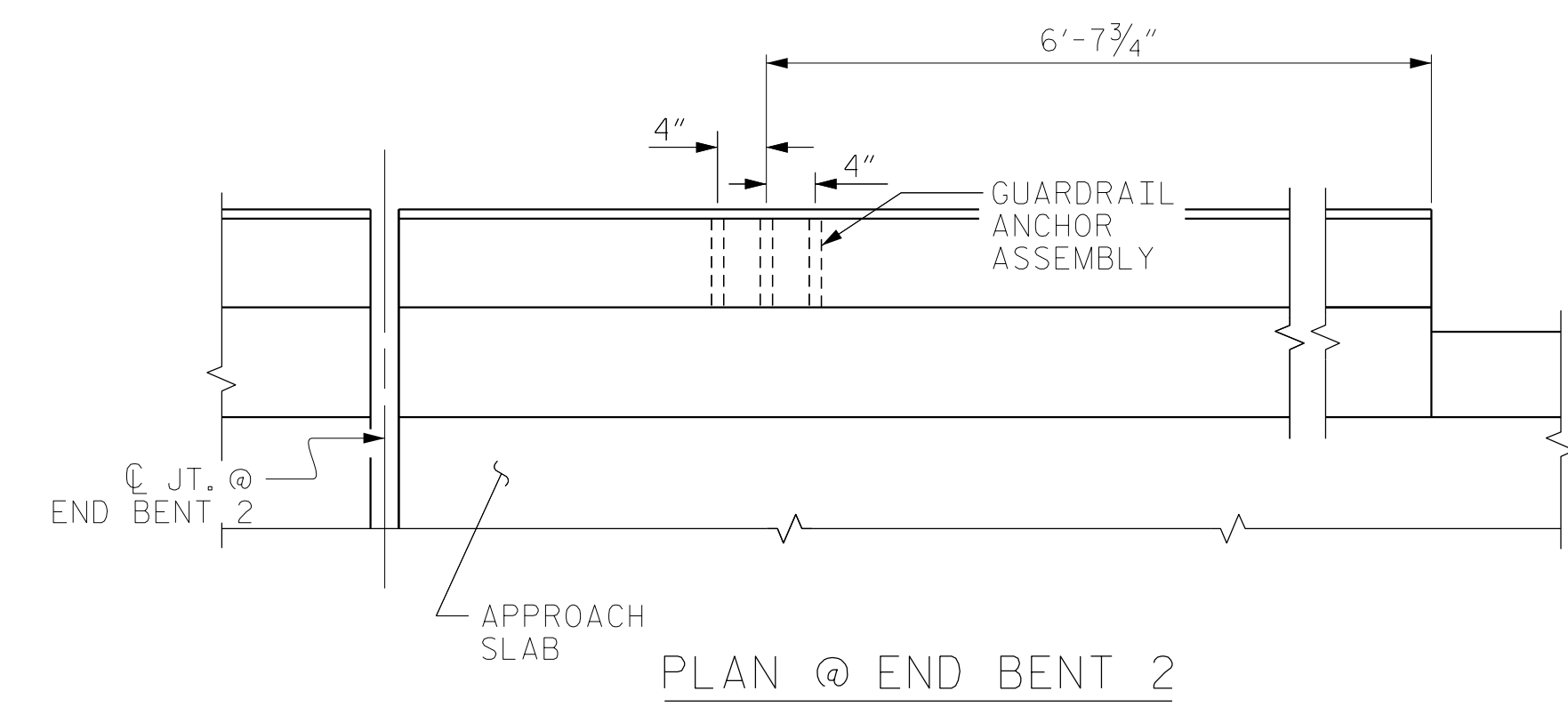
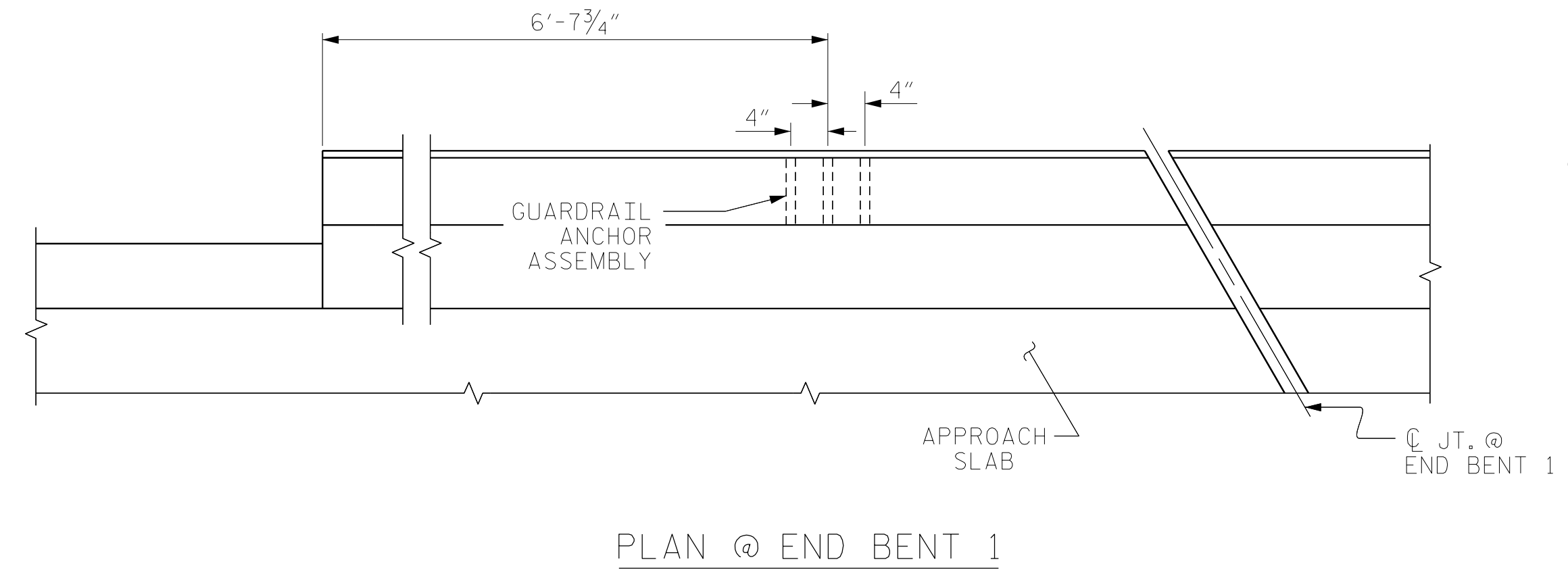
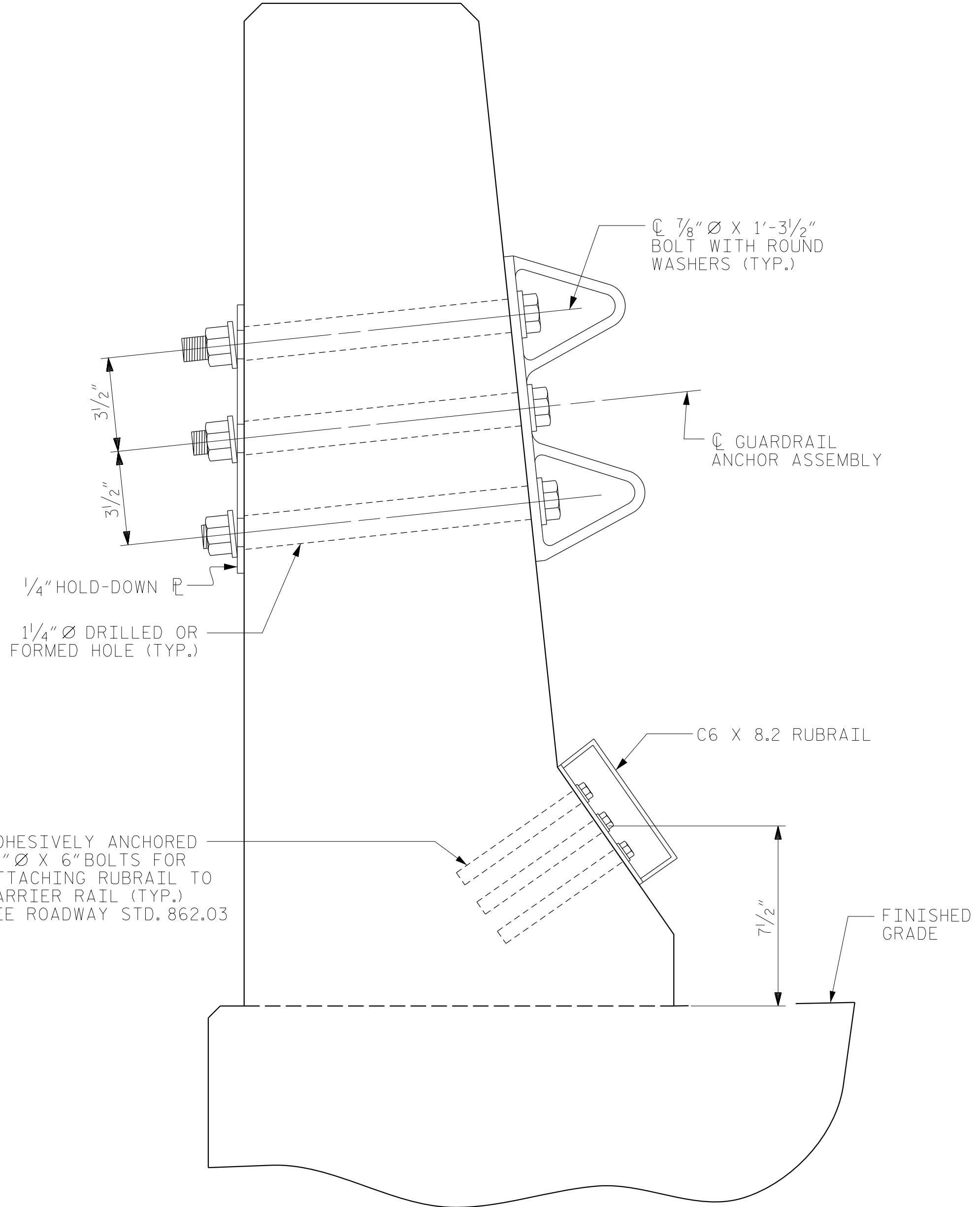
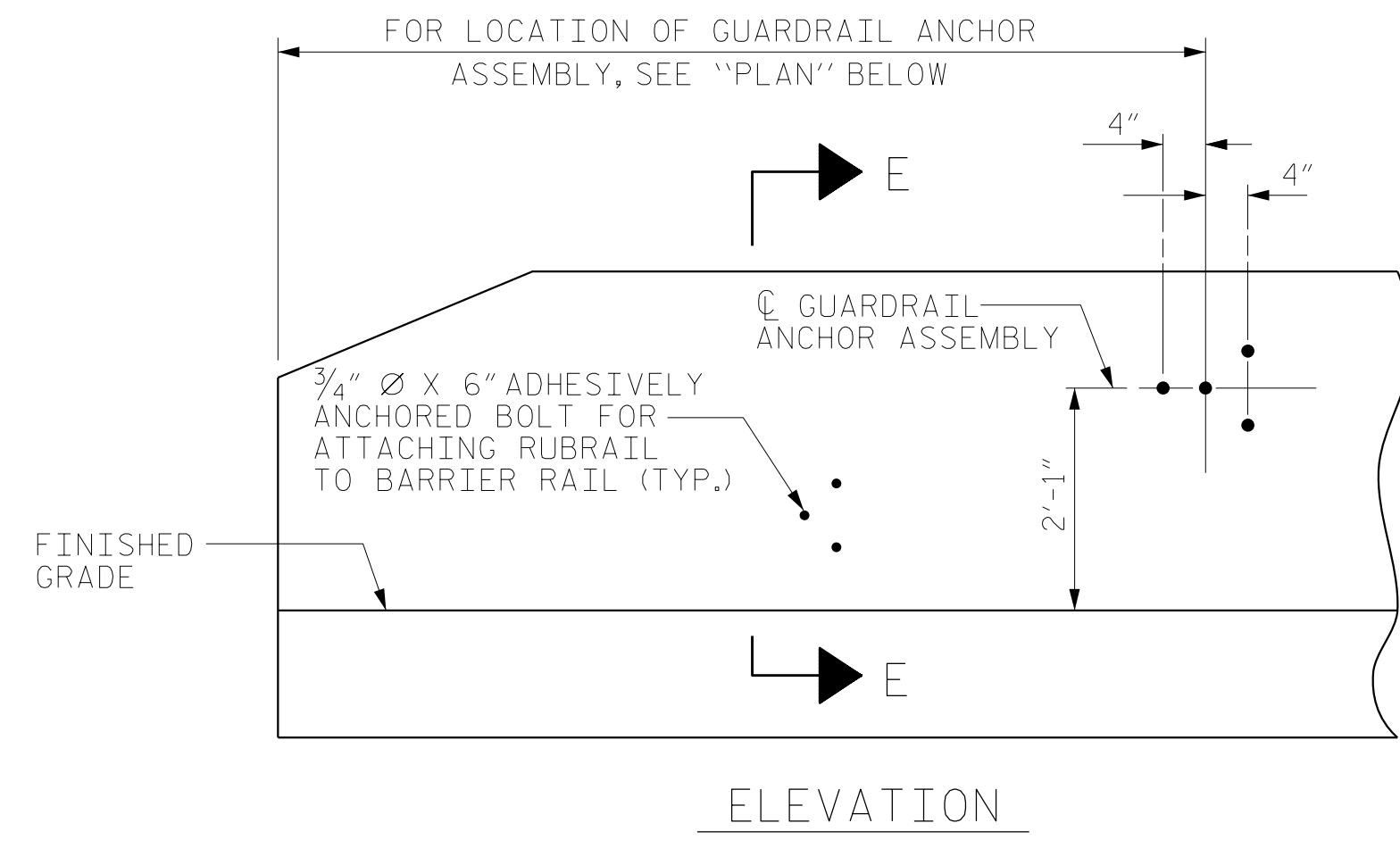
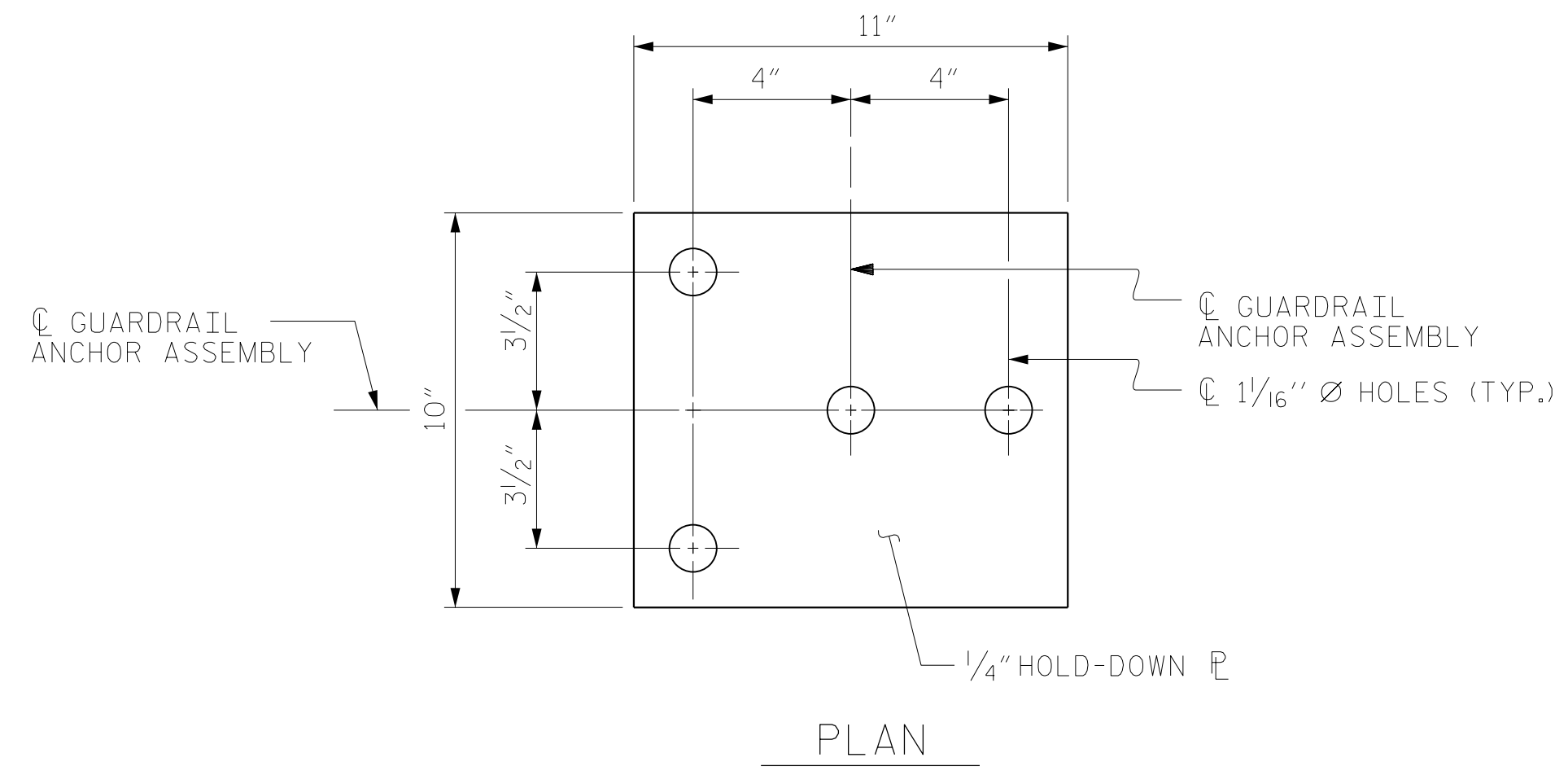
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

SEE, "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" FOR RIGHT SIDE OF BRIDGE.

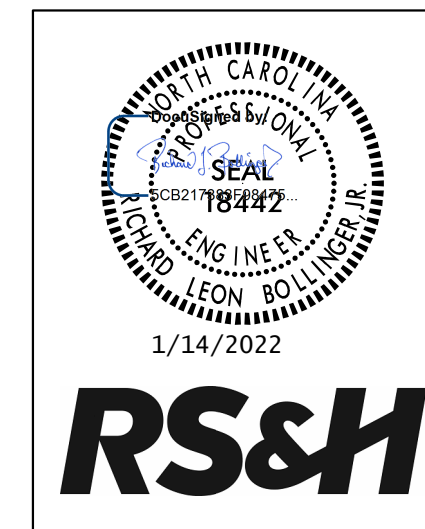


SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-



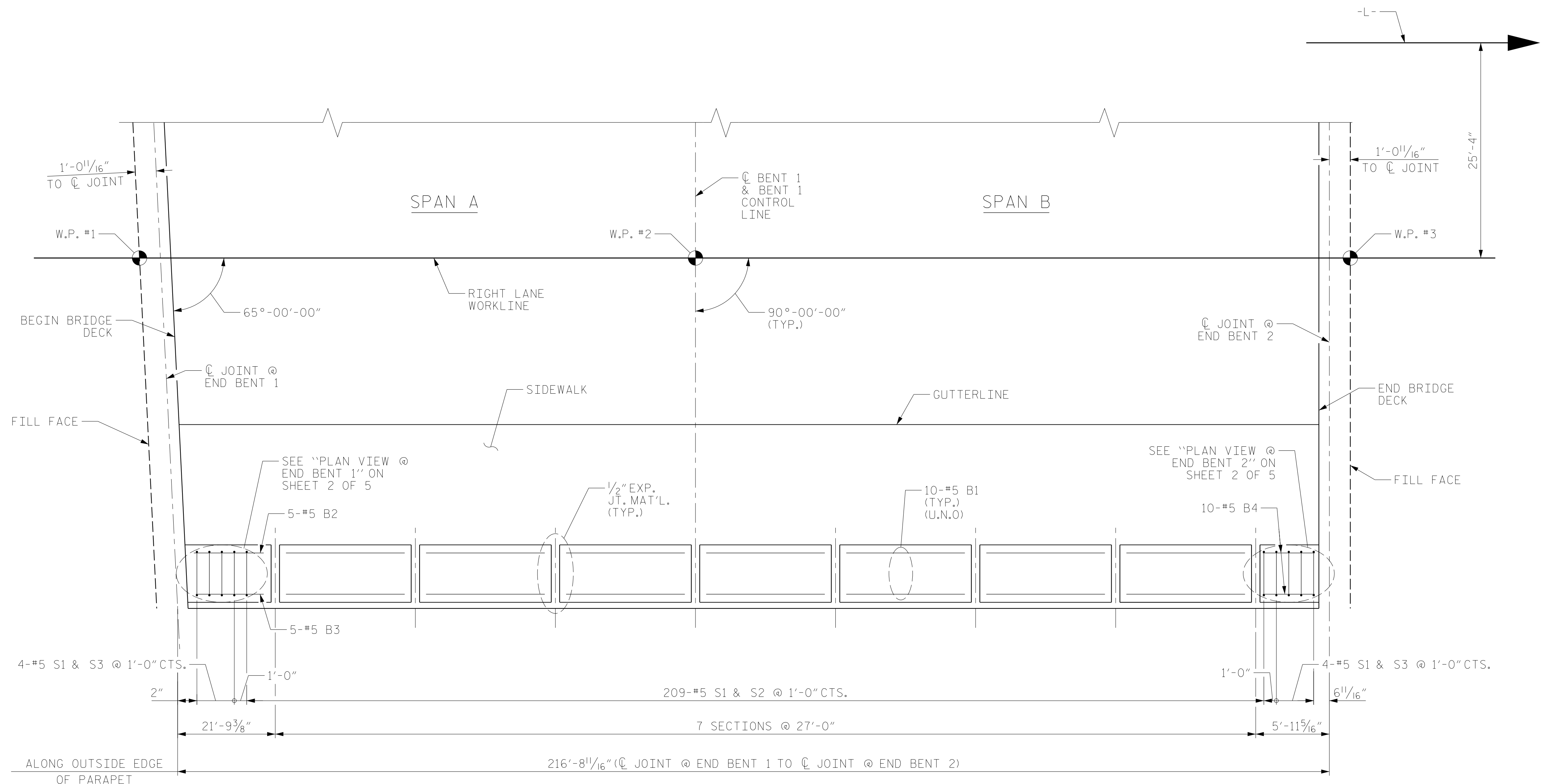
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL
RIGHT LANE

ASSEMBLED BY : TWL	DATE : 12/2020
CHECKED BY : MRA	DATE : 12/2020
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			43
2			4			



PLAN OF CONCRETE PARAPET
BARRIER RAIL NOT SHOWN FOR CLARITY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 1 OF 5

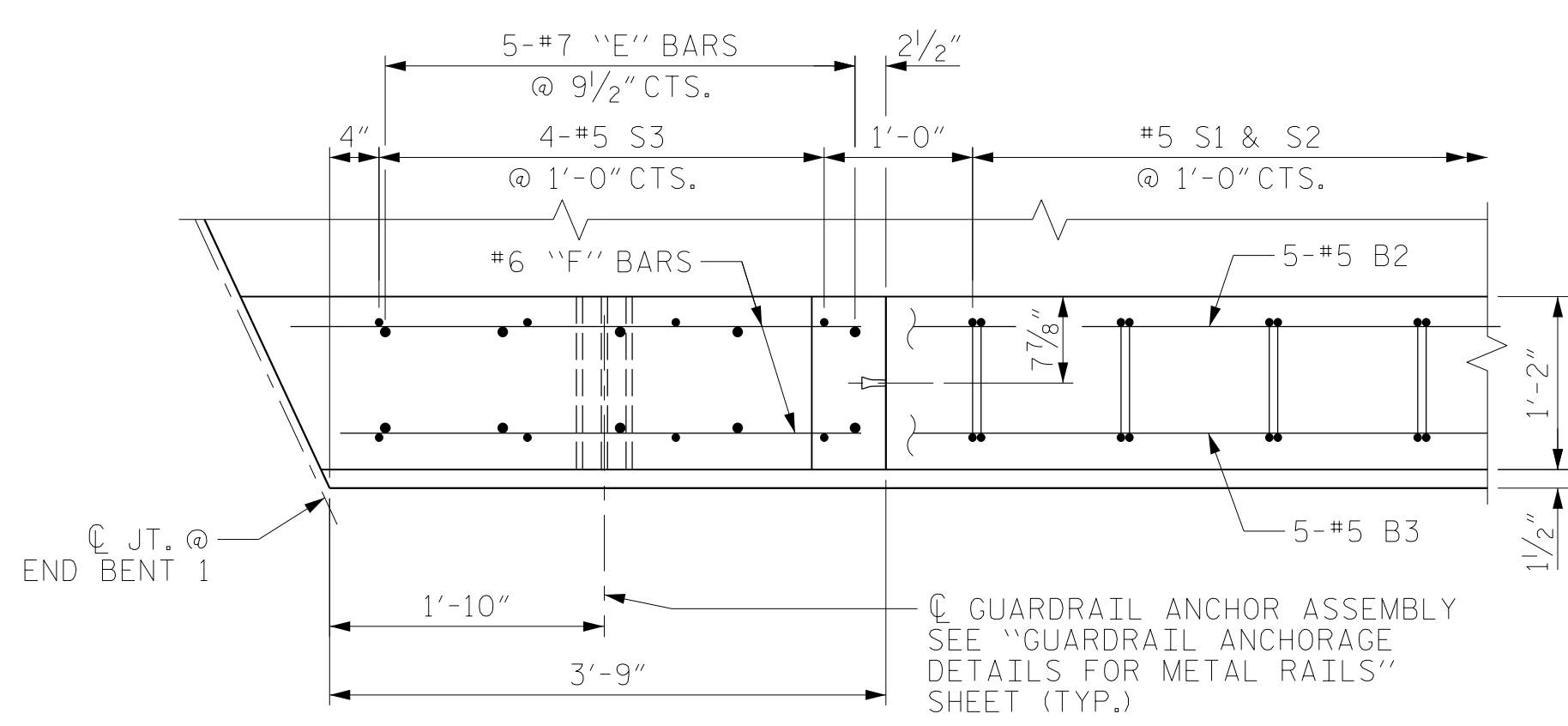
NOTE:
FOR NOTES, SEE SHEET 2 OF 5.

DRAWN BY :	TWL	DATE :	12/2020
CHECKED BY :	MRA	DATE :	12/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

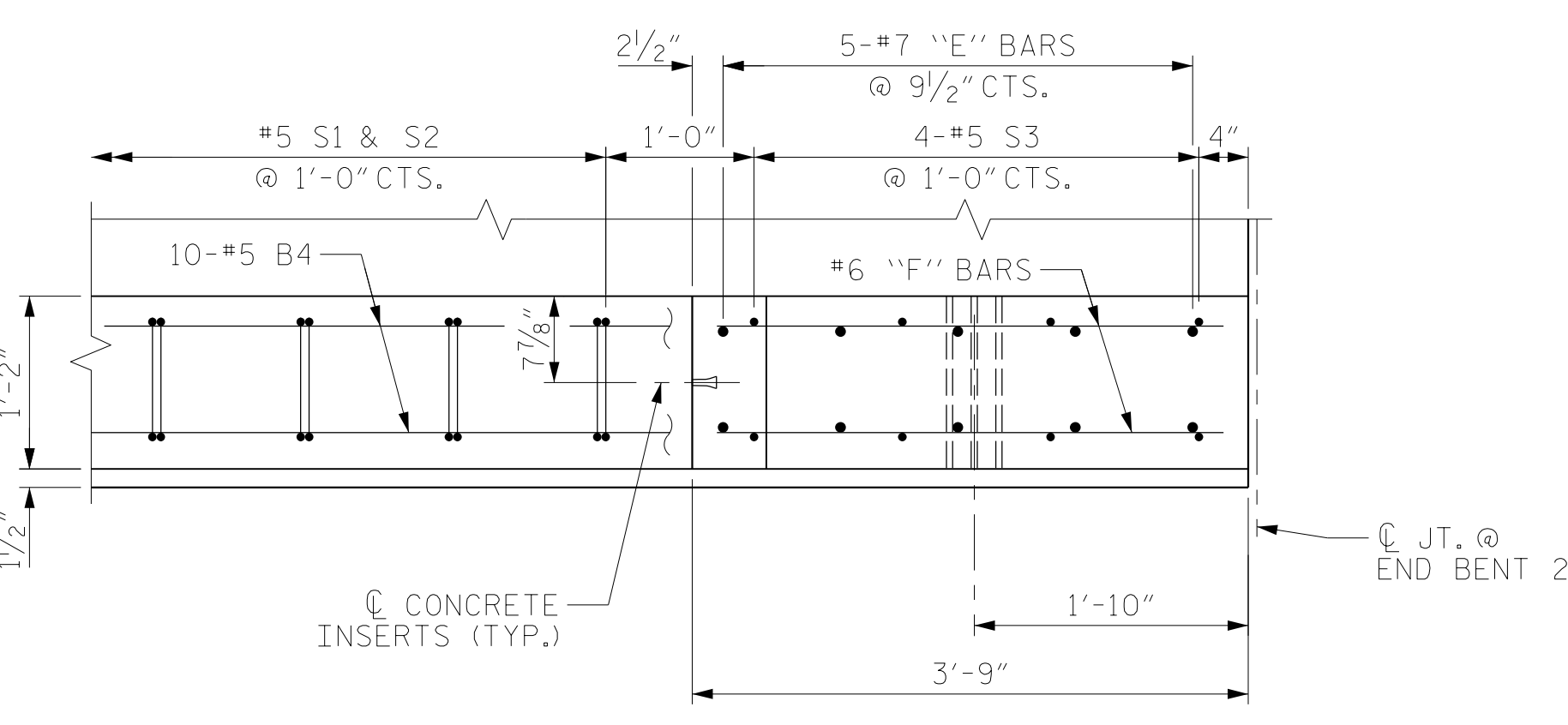
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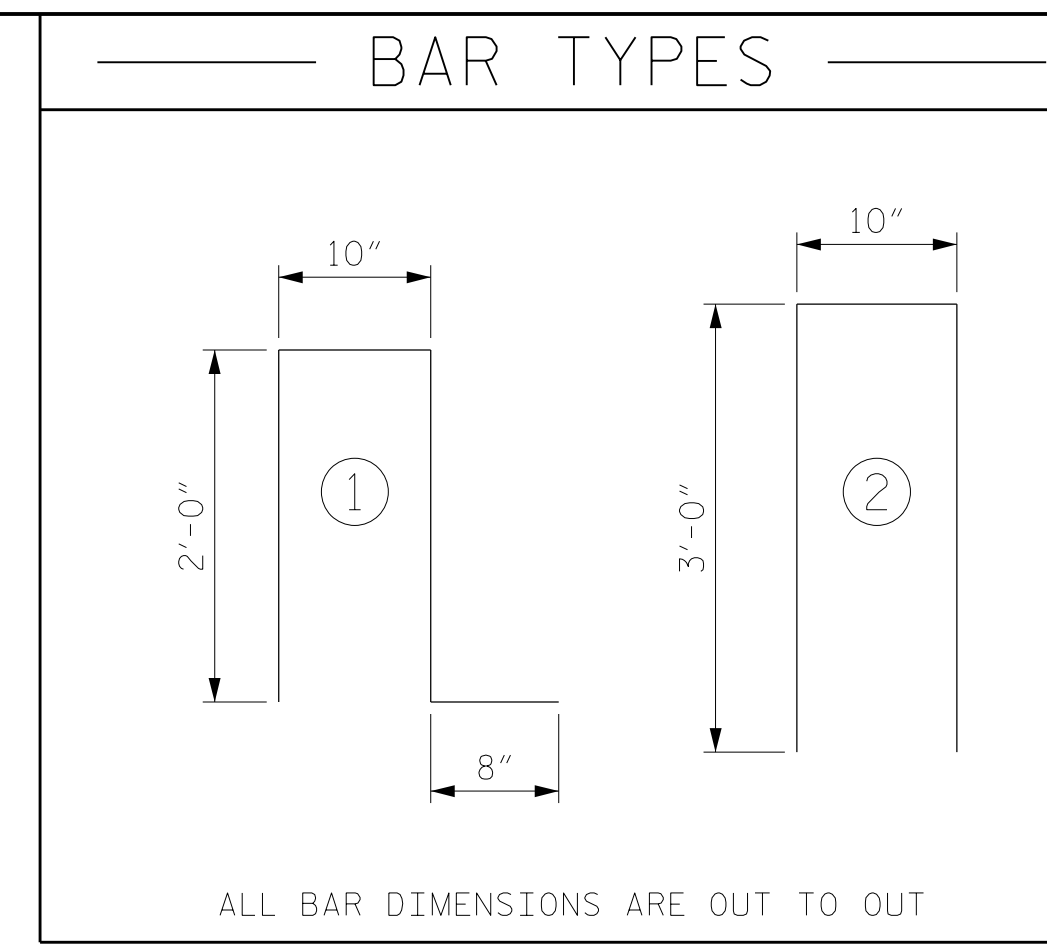
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
CONCRETE PARAPET					
RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S2-20
TOTAL SHEETS					43



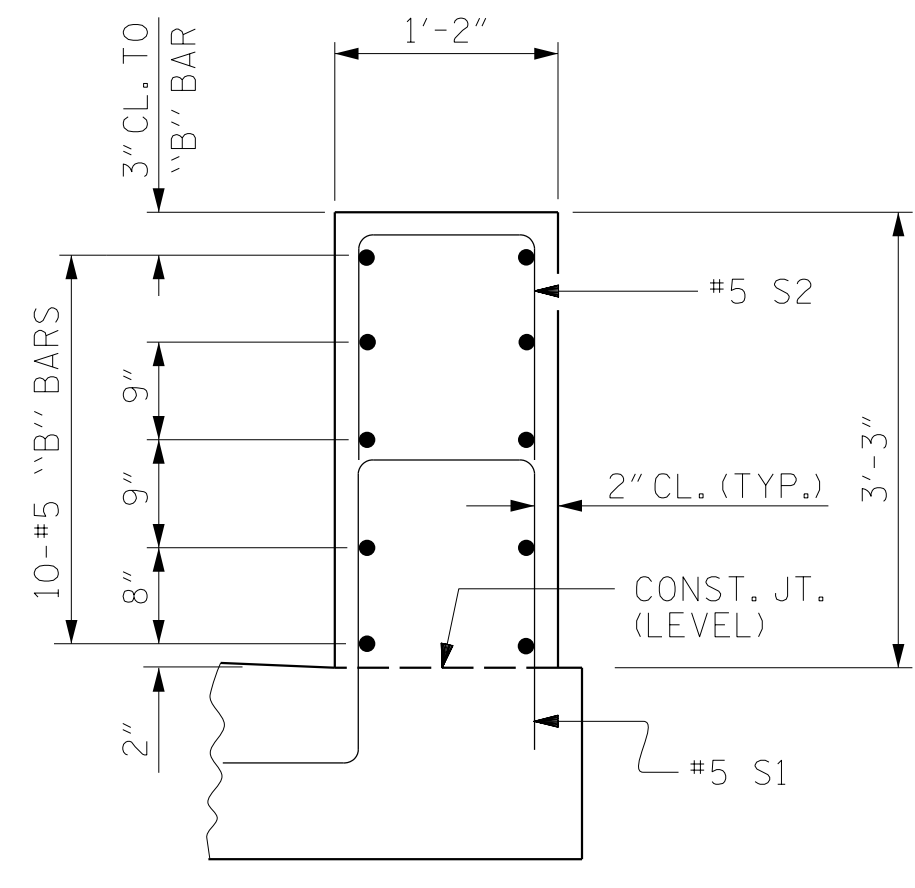
PLAN VIEW @ END BENT 1



PLAN VIEW @ END BENT 2

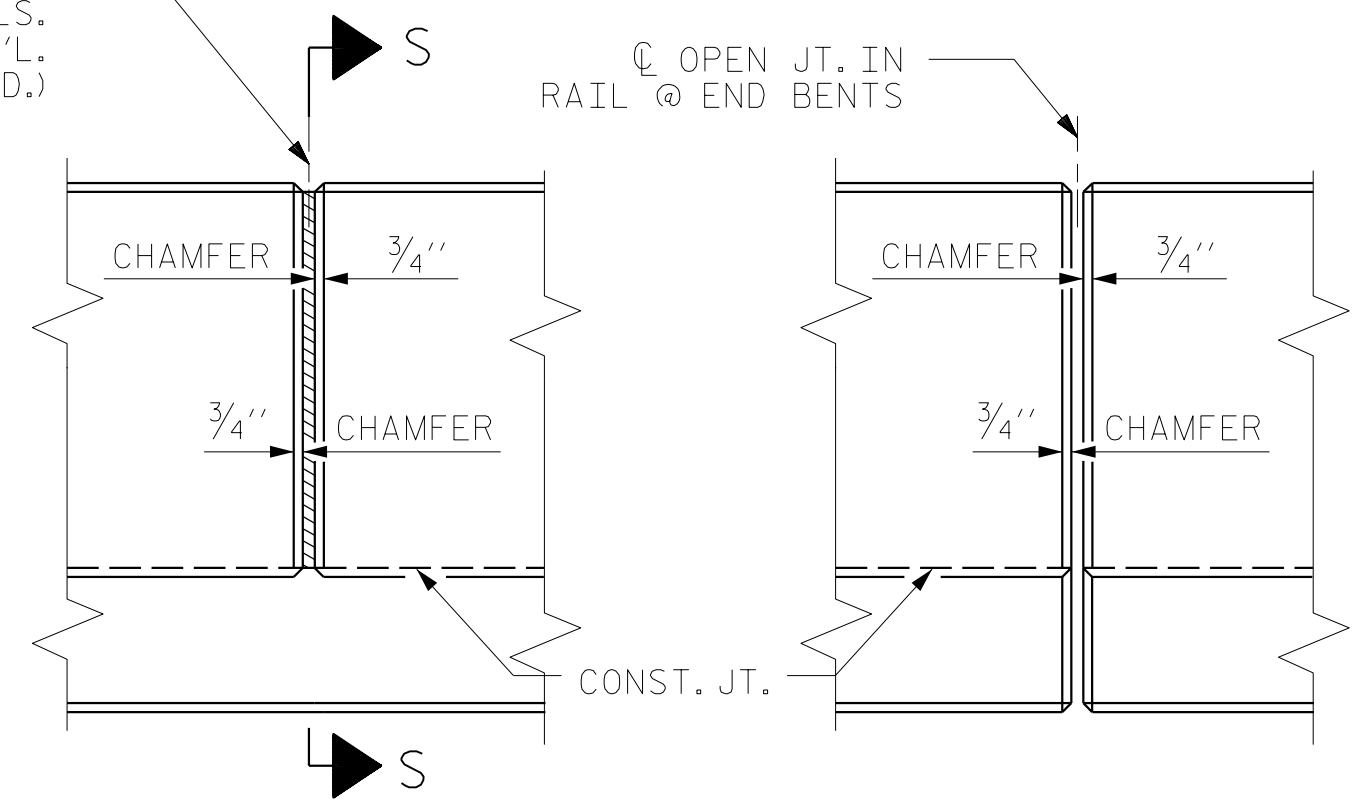


BILL OF MATERIAL FOR CONCRETE PARAPET					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	70	#5	STR.	26'-7"	1941
*B2	5	#5	STR.	21'-10"	114
*B3	5	#5	STR.	21'-6"	112
*B4	10	#5	STR.	5'-6"	57
*E1	4	#7	STR.	3'-6"	29
*E2	4	#7	STR.	3'-11"	32
*E3	4	#7	STR.	4'-4"	35
*E4	4	#7	STR.	4'-9"	39
*E5	4	#7	STR.	5'-1"	42
*F1	2	#6	STR.	2'-1"	6
*F2	2	#6	STR.	1'-10"	6
*F3	2	#6	STR.	3'-6"	11
*F4	1	#6	STR.	3'-5"	5
*F5	2	#6	STR.	3'-0"	9
*F6	1	#6	STR.	3'-8"	6
*F7	2	#6	STR.	3'-3"	10
*S1	217	#5	1	5'-6"	1245
*S2	209	#5	2	6'-10"	1490
*S3	8	#5	2	11'-2"	93
*EPOXY COATED REINFORCING STEEL					5,096 LBS.
CLASS AA CONCRETE					31.1 C.Y.
CONCRETE PARAPET					216.8 L.F.

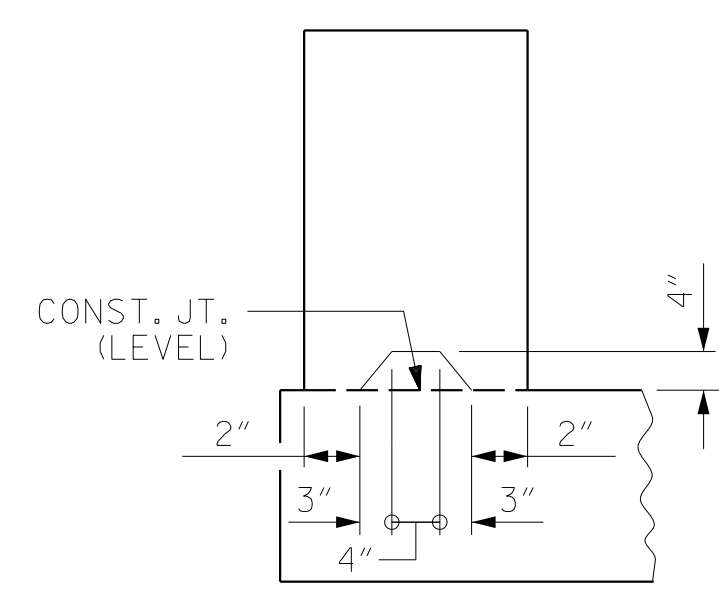


SECTION THROUGH LEFT PARAPET

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



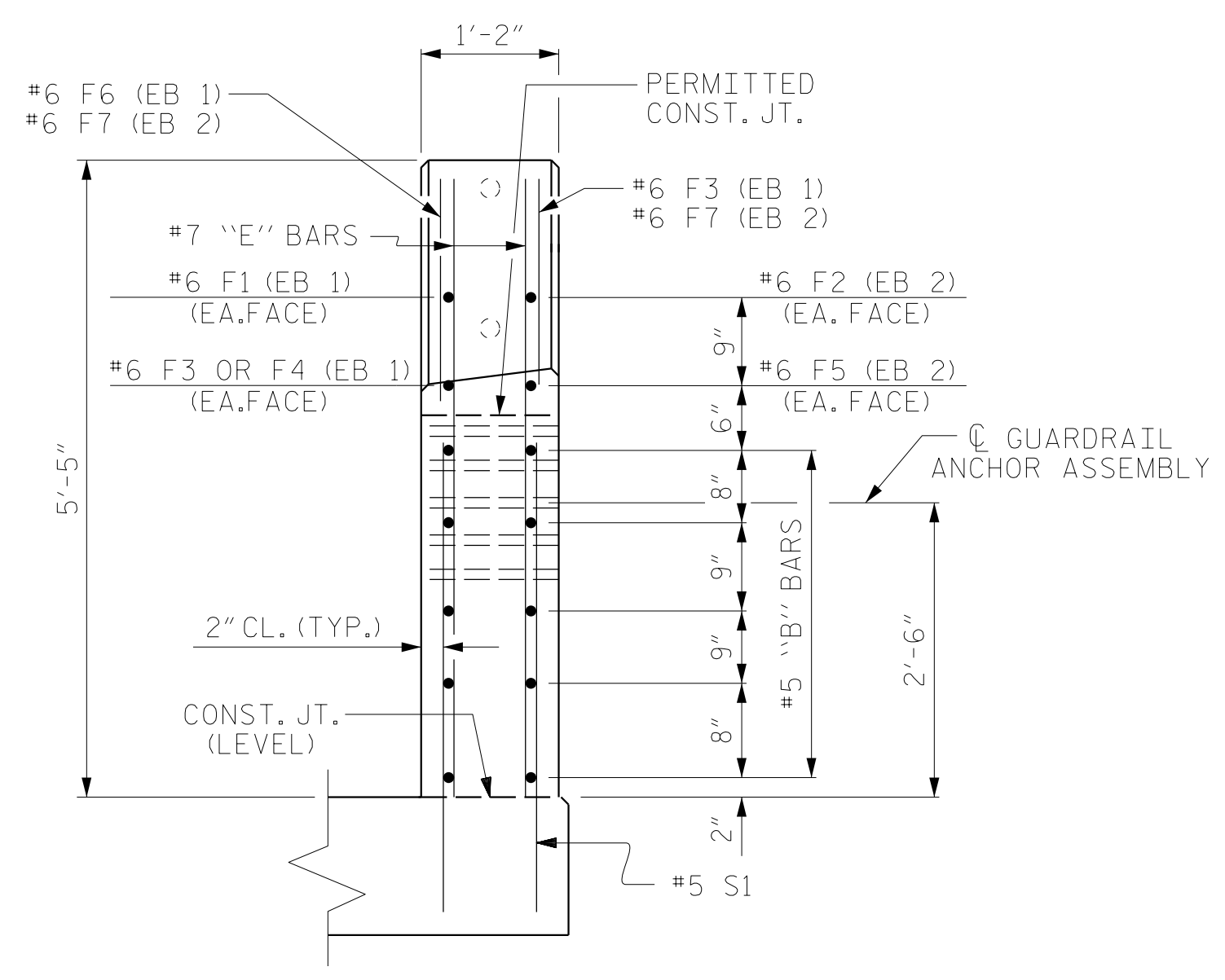
ELEVATION AT EXPANSION JOINTS



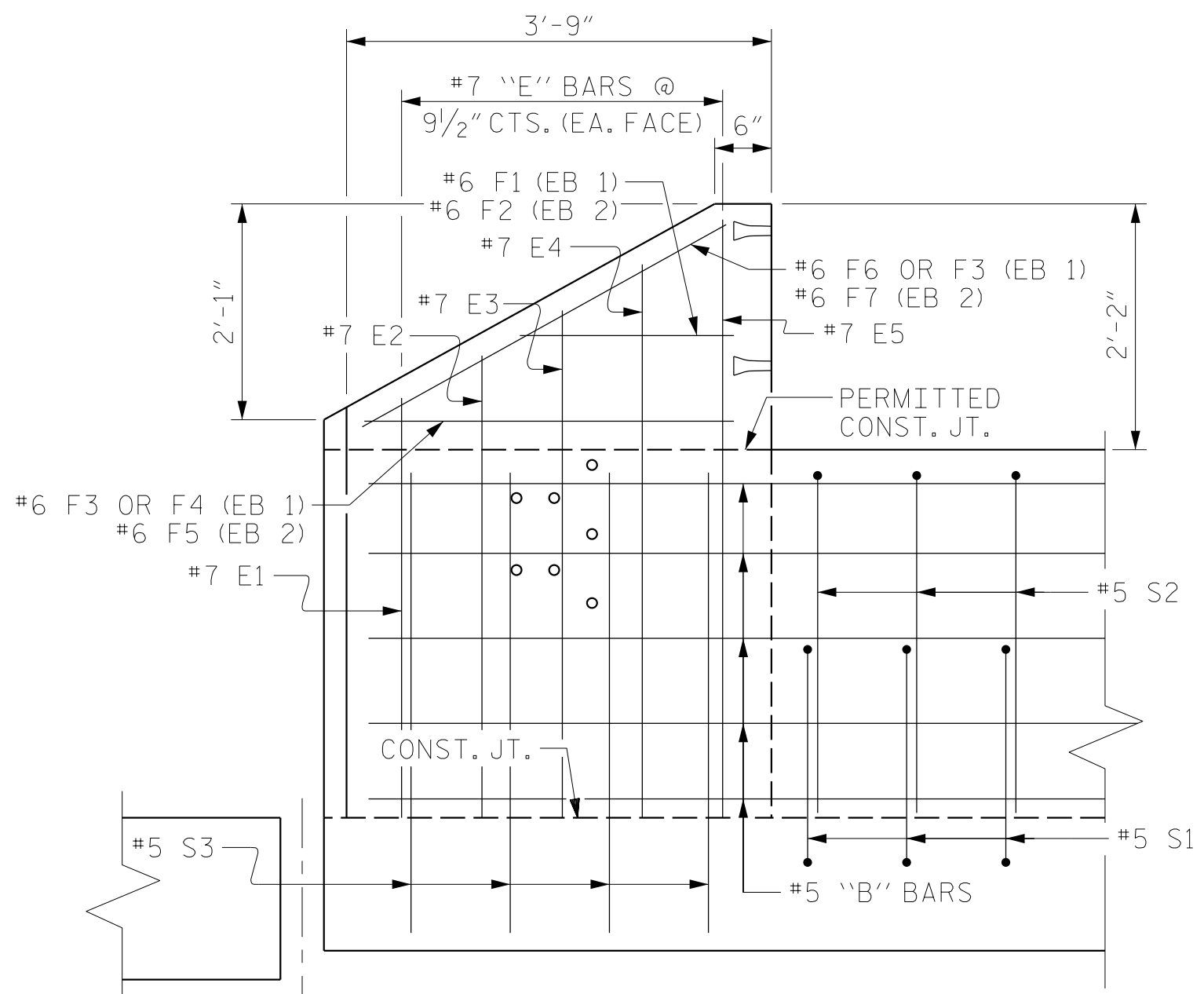
SECTION S-S AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

PARAPET DETAILS

NOTES:
 THE CONCRETE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSION STRENGTH OF 3,000 PSI.
 ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.
 SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET FOR CONCRETE INSERT DETAILS.
 SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR GUARDRAIL ANCHOR ASSEMBLY.



END VIEW



ELEVATION

END POST FOR TWO BAR RAIL

BAR CALLOUTS FOR TYPICAL FOR EACH END BENT UNLESS NOTED OTHERWISE

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CHECKED BY :	MRA	DATE :	12/2020
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

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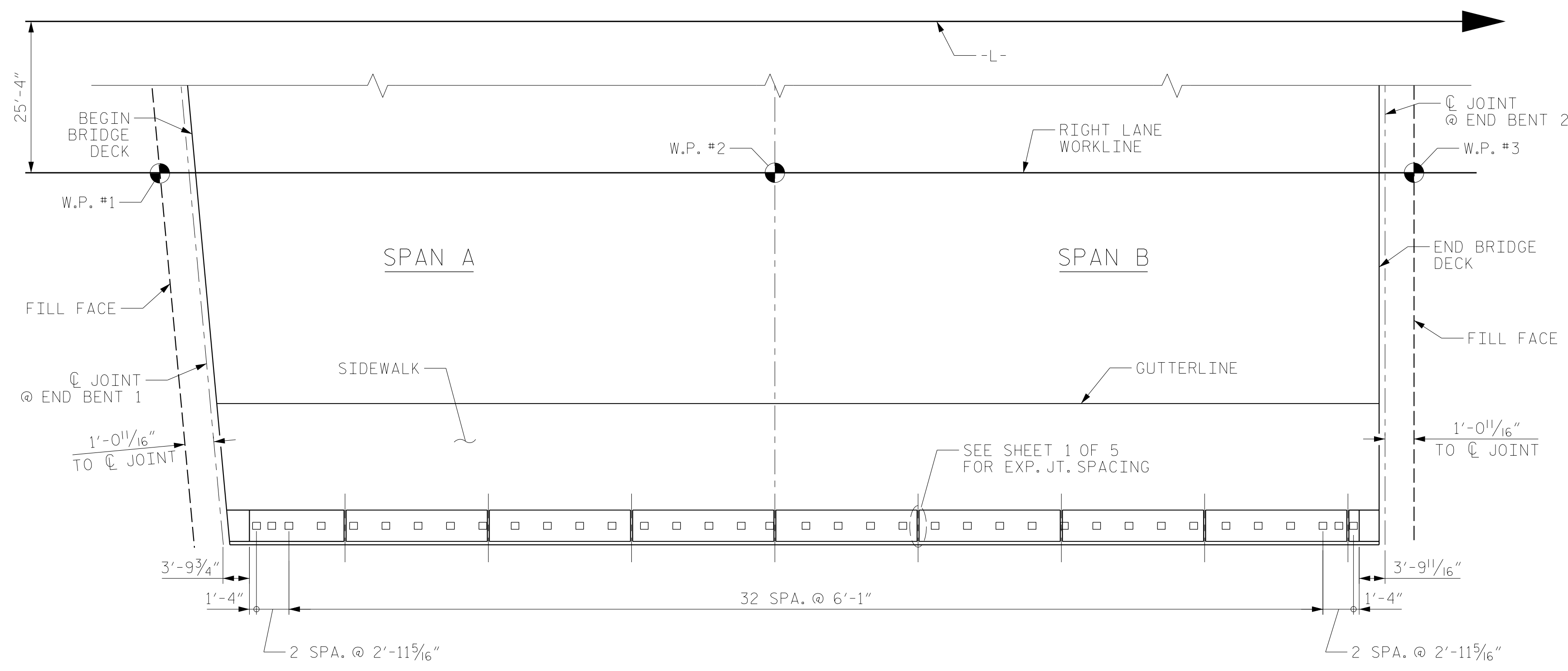
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 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE CONCRETE PARAPET DETAILS RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S2-21
TOTAL SHEETS	43



PLAN OF RAIL POST SPACINGS

NOTES
STRUCTURAL CONCRETE INSERT

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

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

NOTES
METAL RAIL TO END POST CONNECTION

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

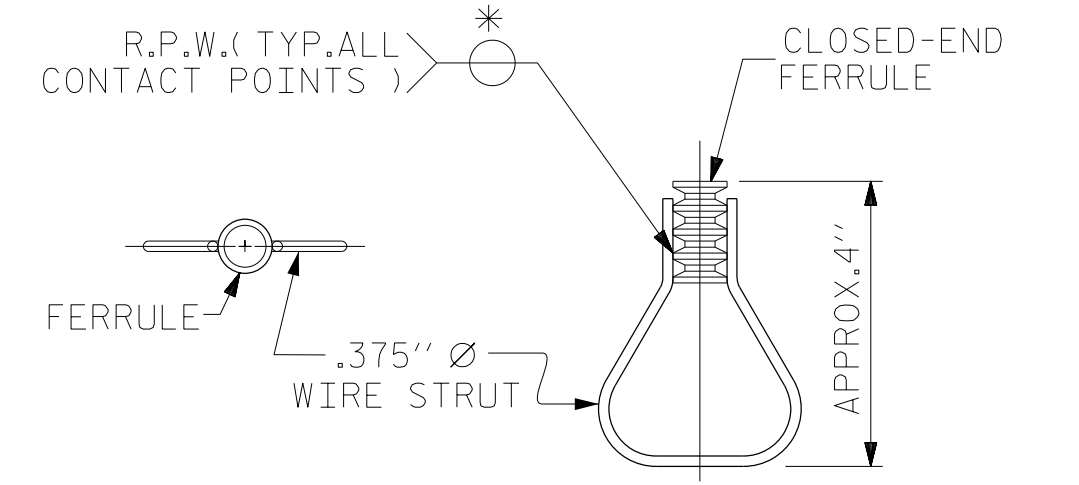
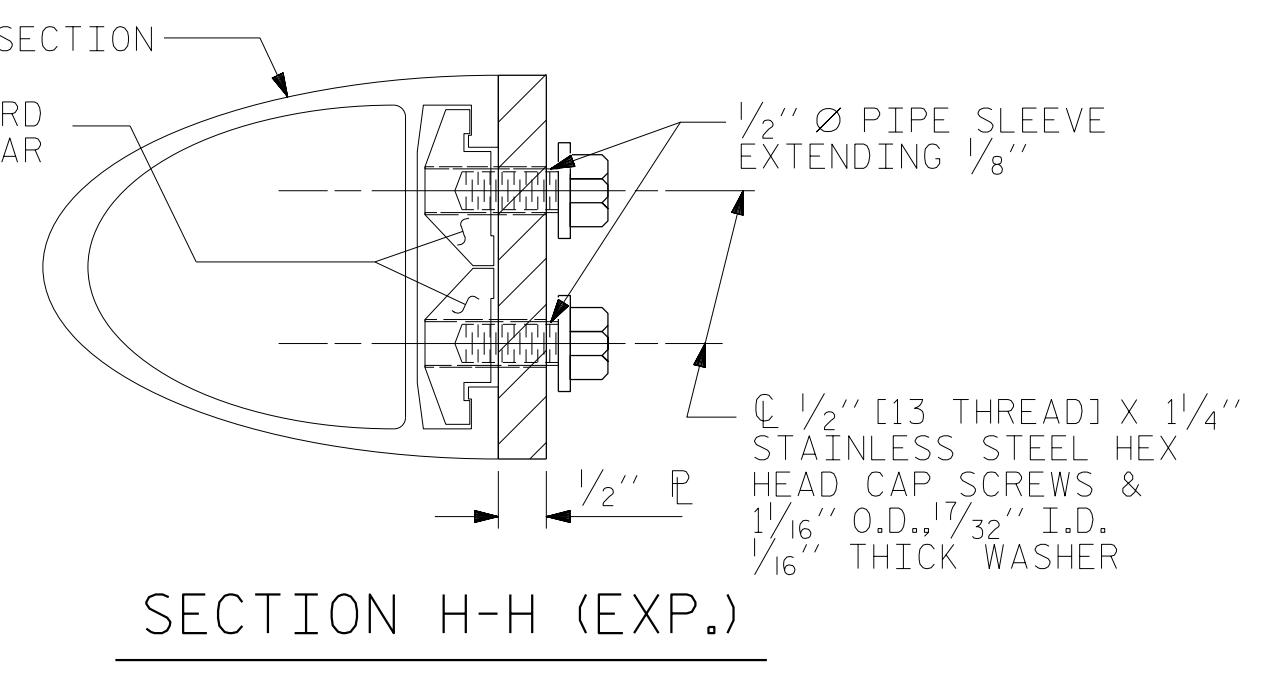
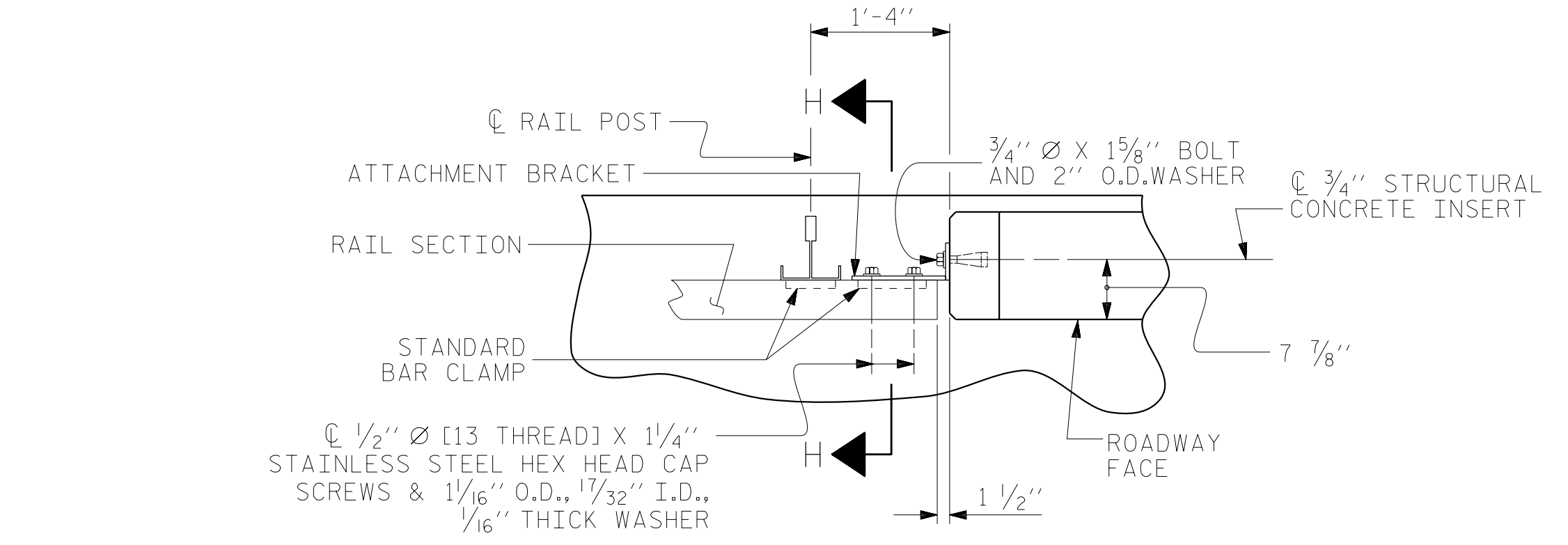
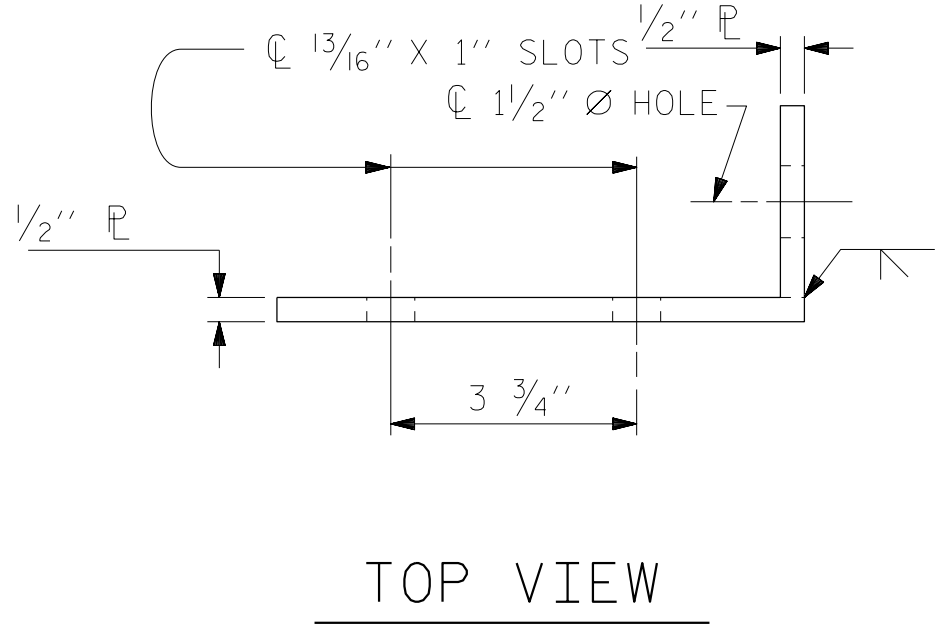
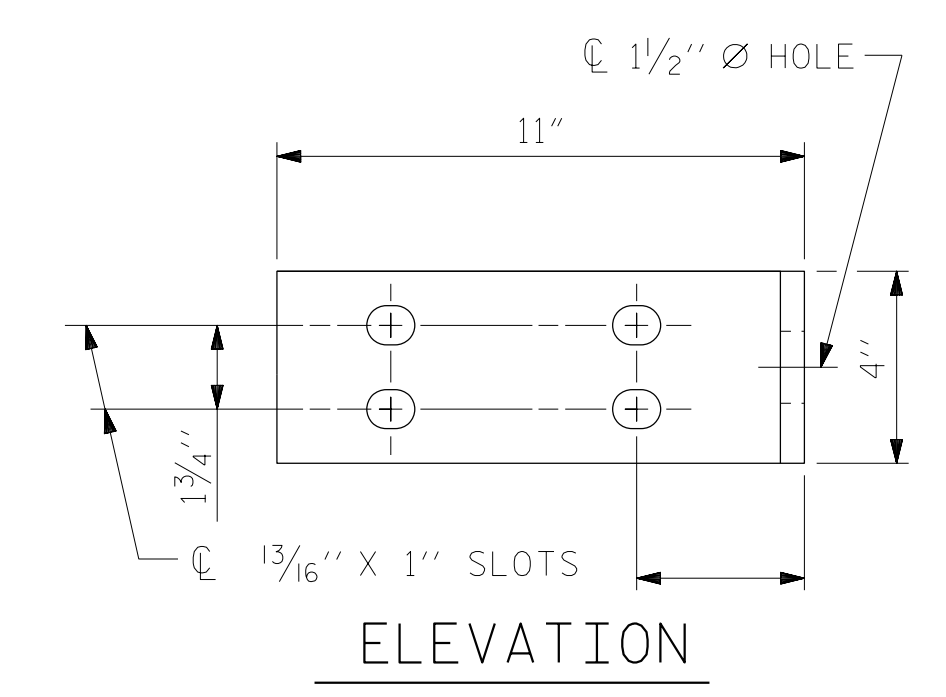
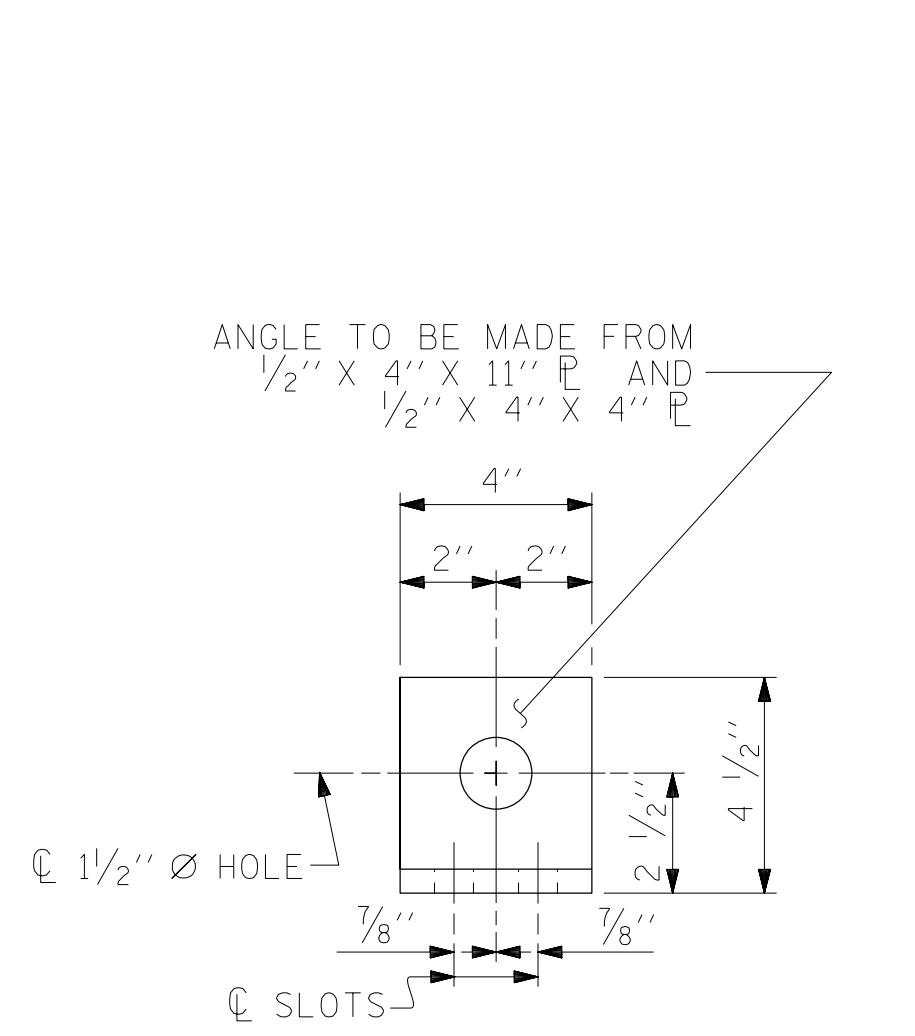
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.
- STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 5



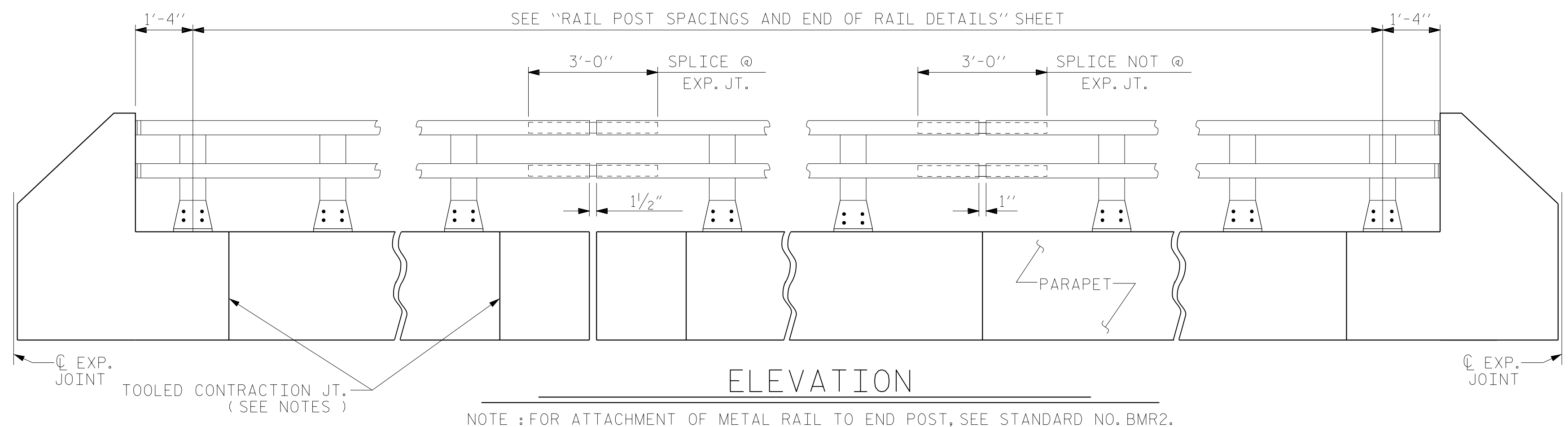
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS
RIGHT LANE

ASSEMBLED BY : TWL	DATE : 12/2020
CHECKED BY : MRA	DATE : 12/2020
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

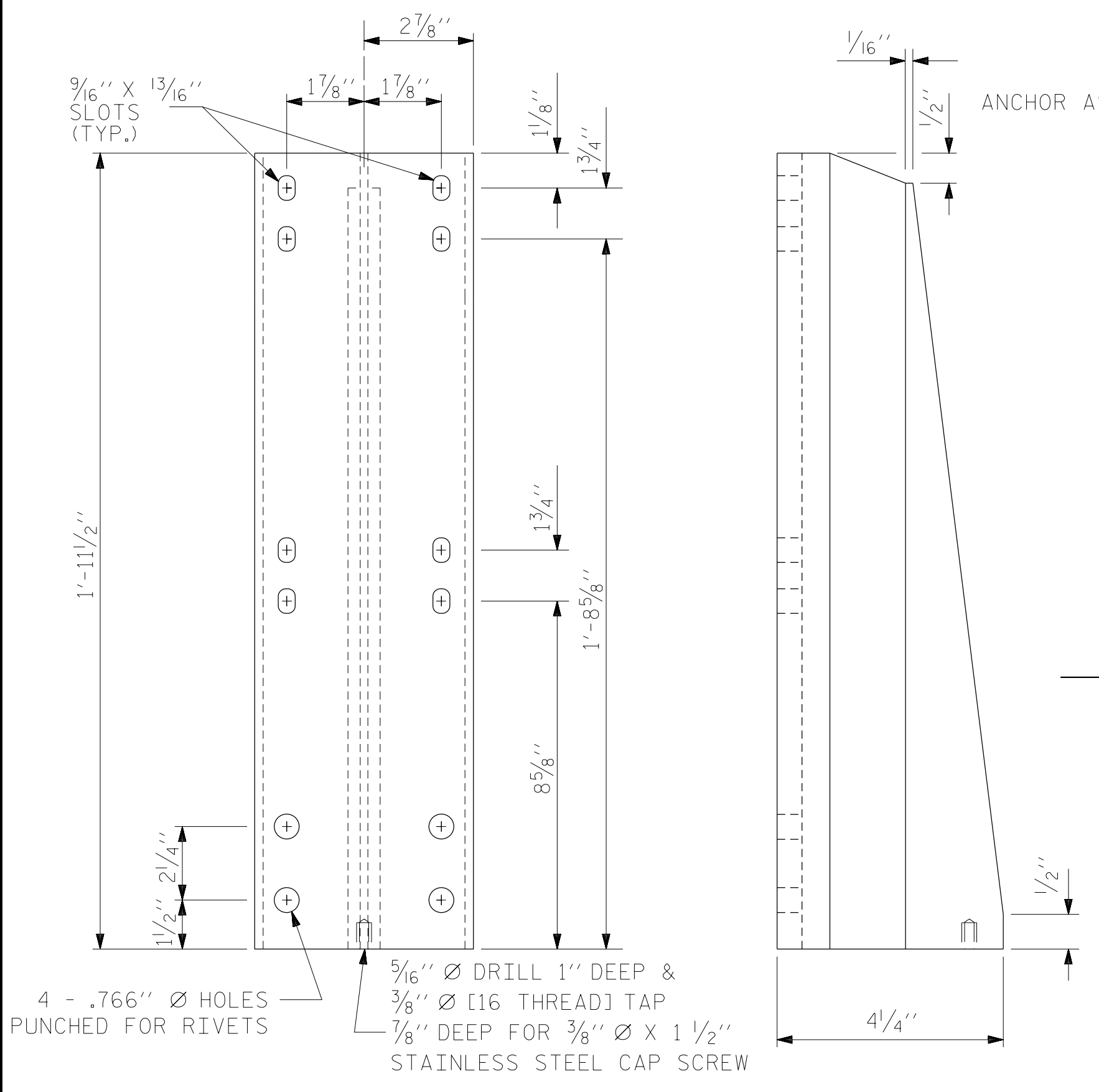
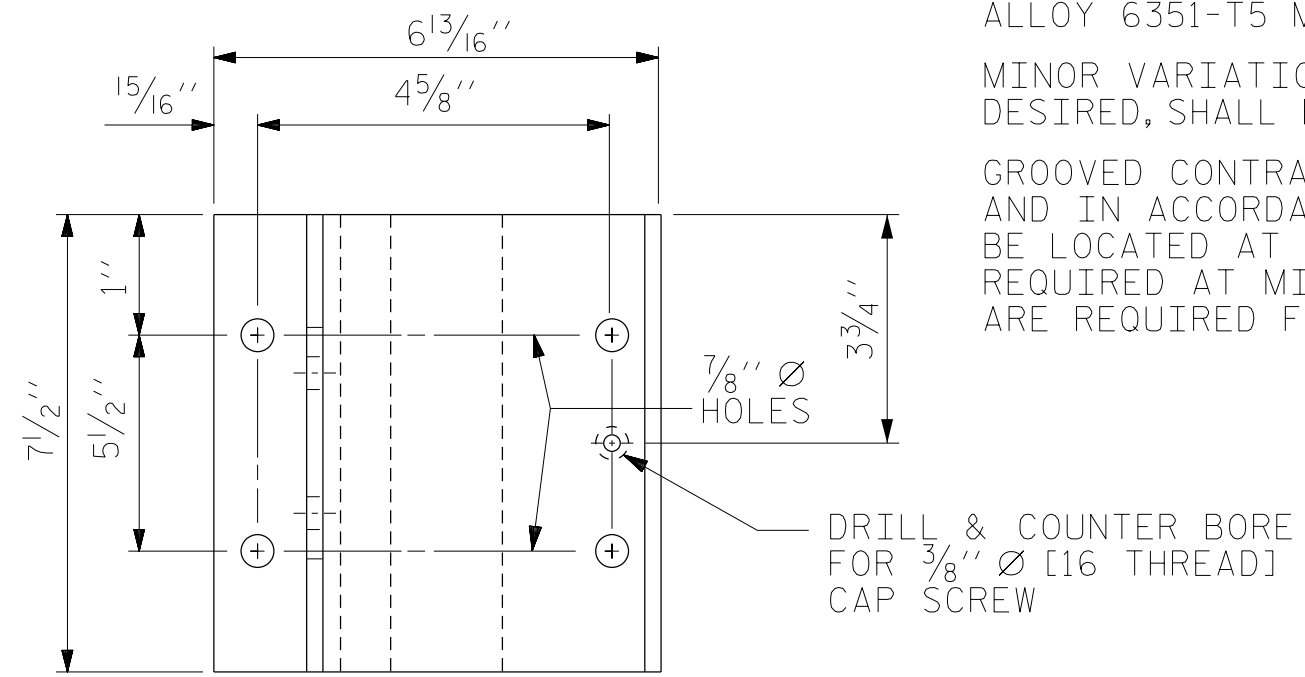
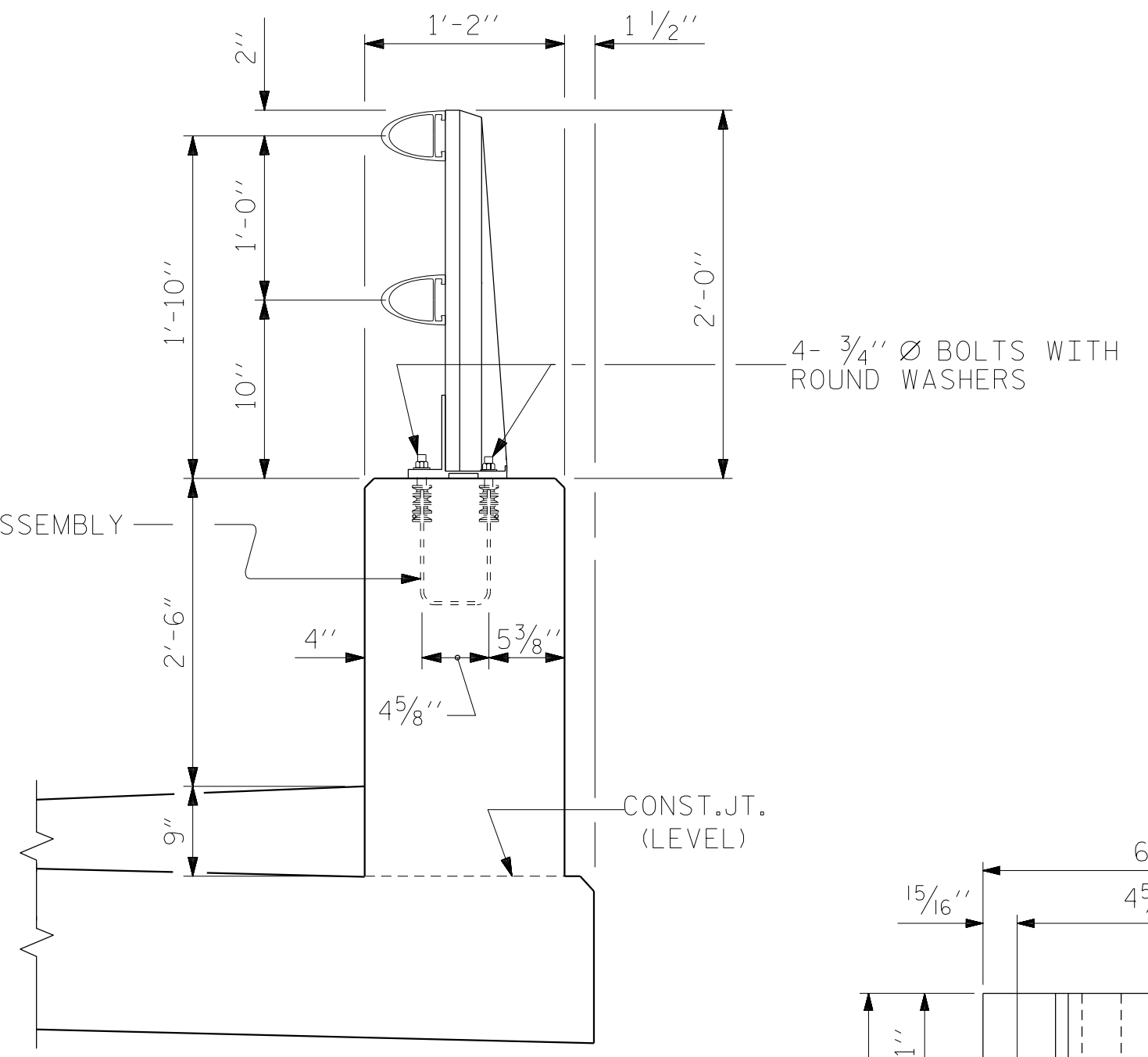
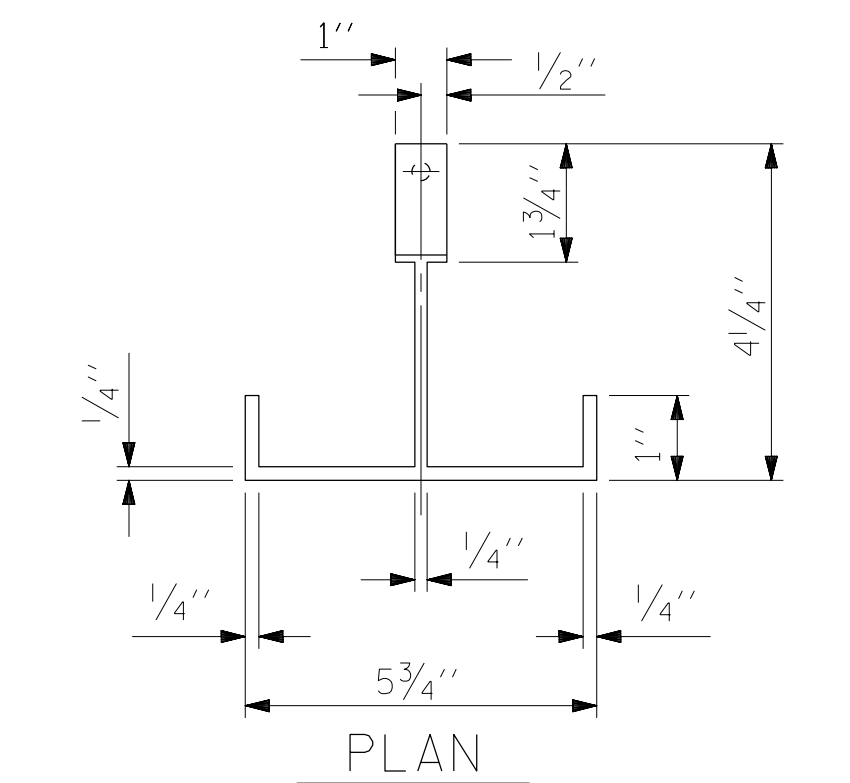
DETAILS FOR ATTACHING METAL RAIL TO END POST

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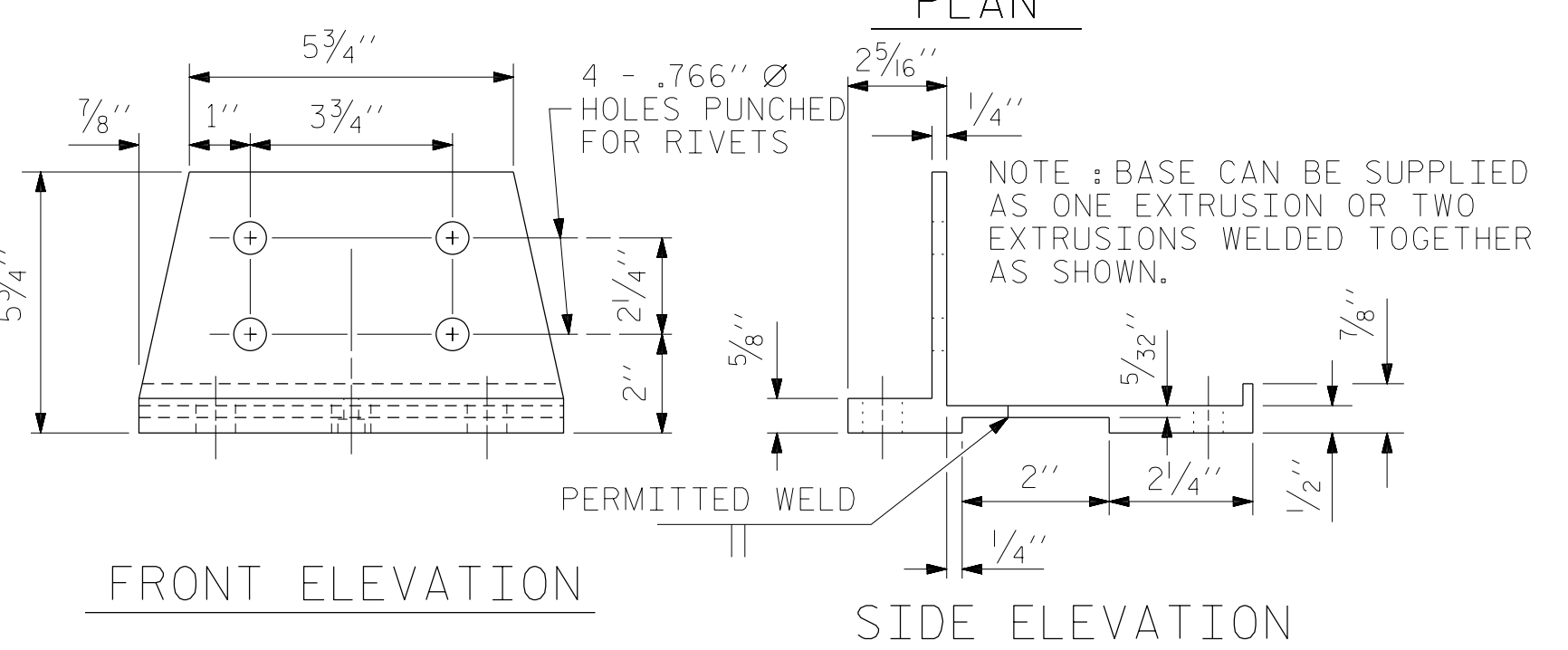
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 43
2			4			



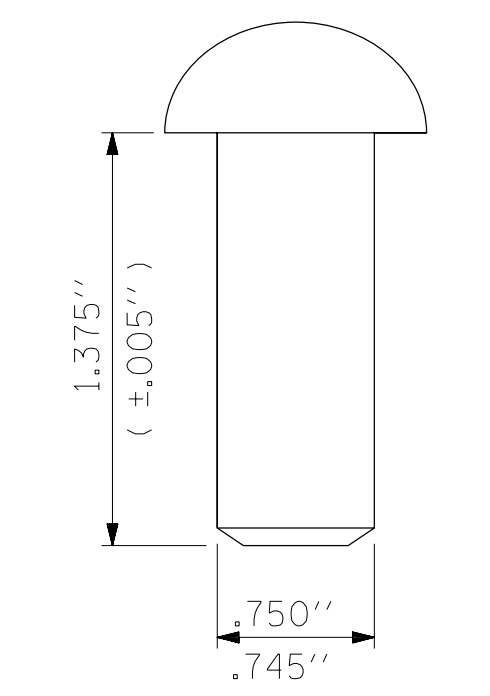
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



DETAILS OF POST



POST BASE DETAILS



PAY LENGTH = 209.2 LIN. FT.

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 4 OF 5

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S2-23 TOTAL SHEETS 43

NOTES

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

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

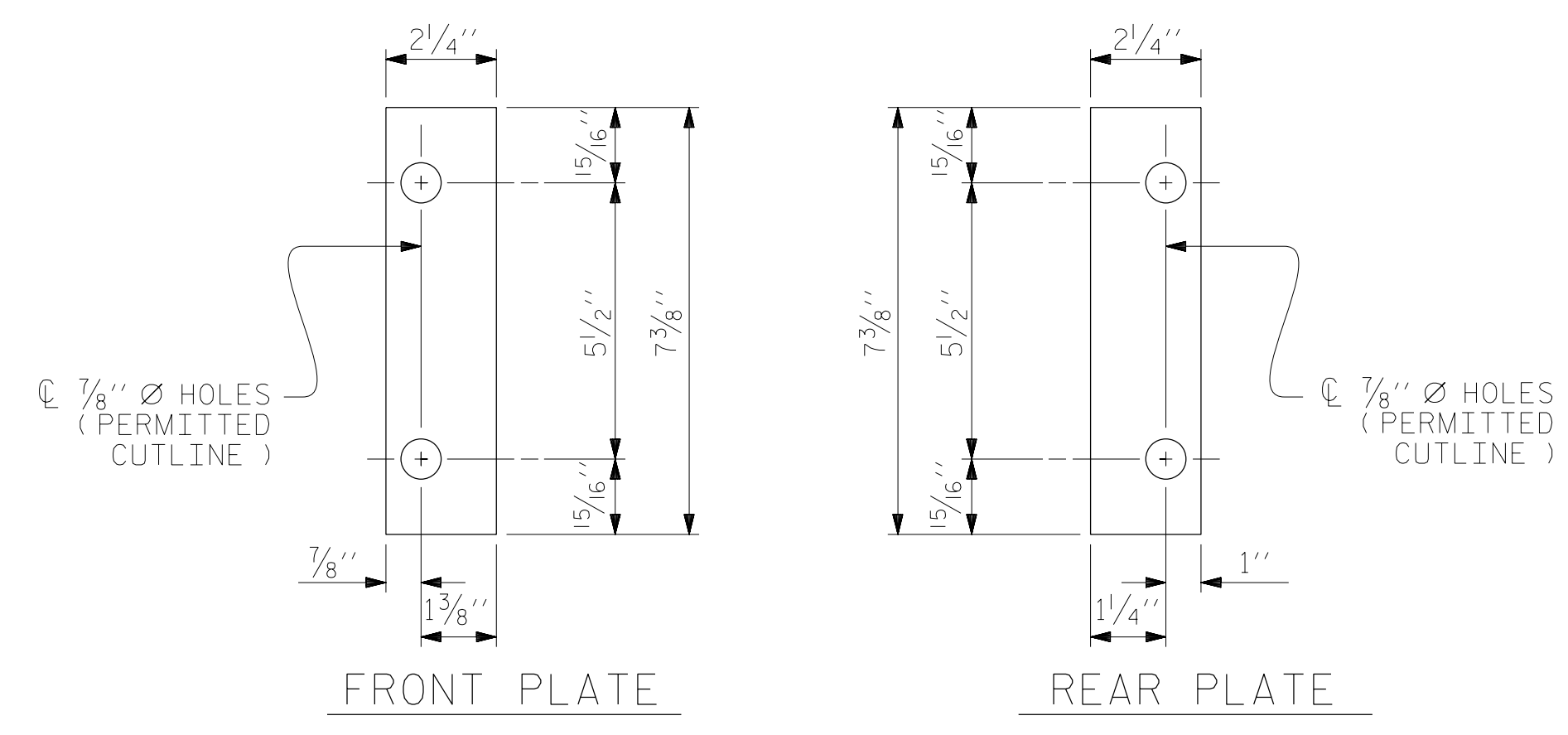
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

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

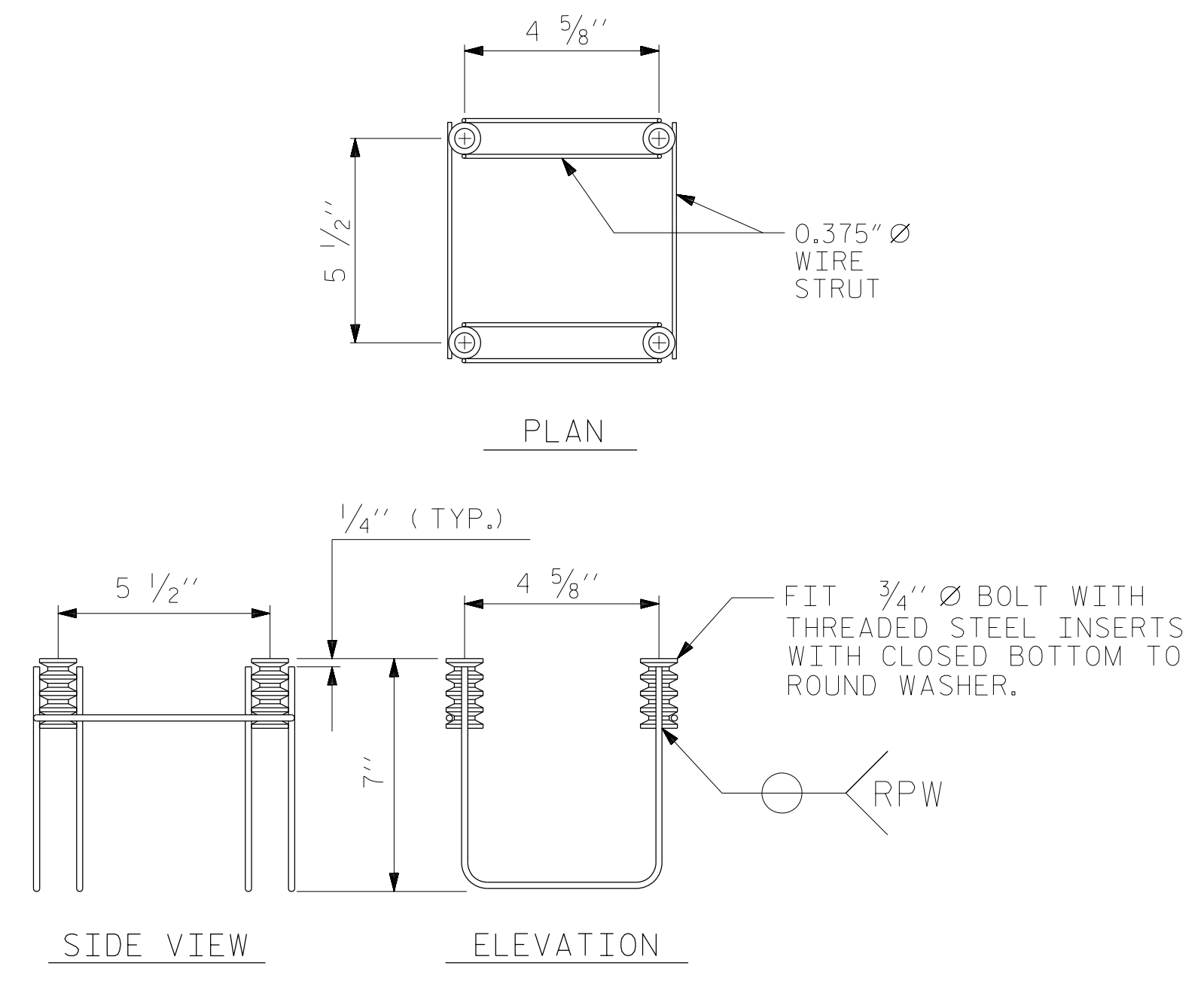
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CHECKED BY : RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



SHIM DETAILS

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



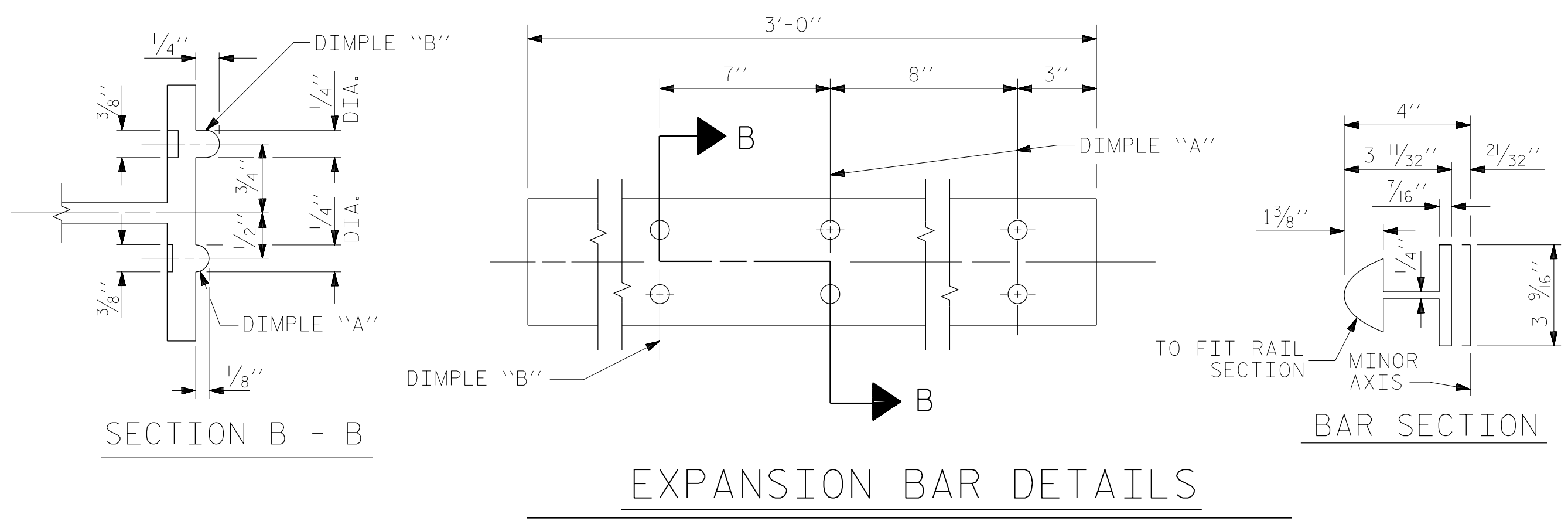
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(37 ASSEMBLIES REQUIRED)

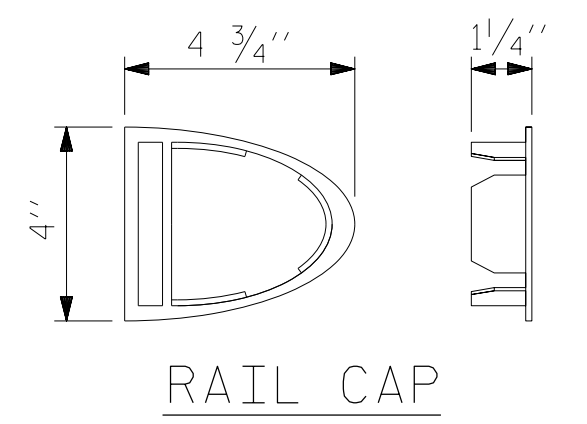
- NOTES**
- STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
 - 4 - 3/4"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

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

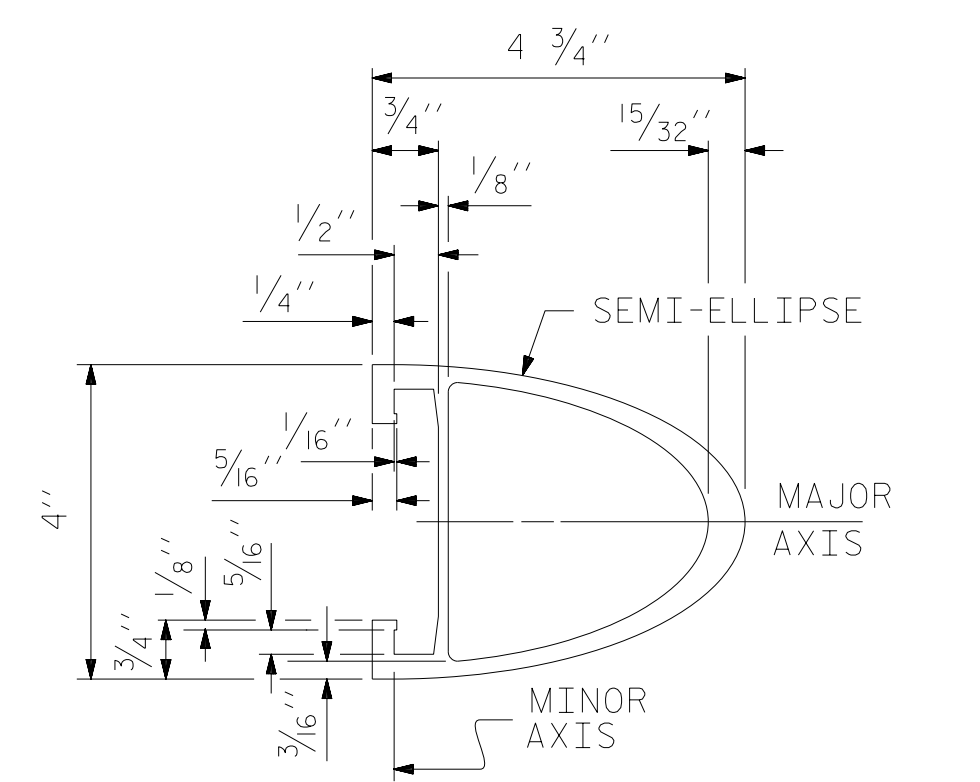
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



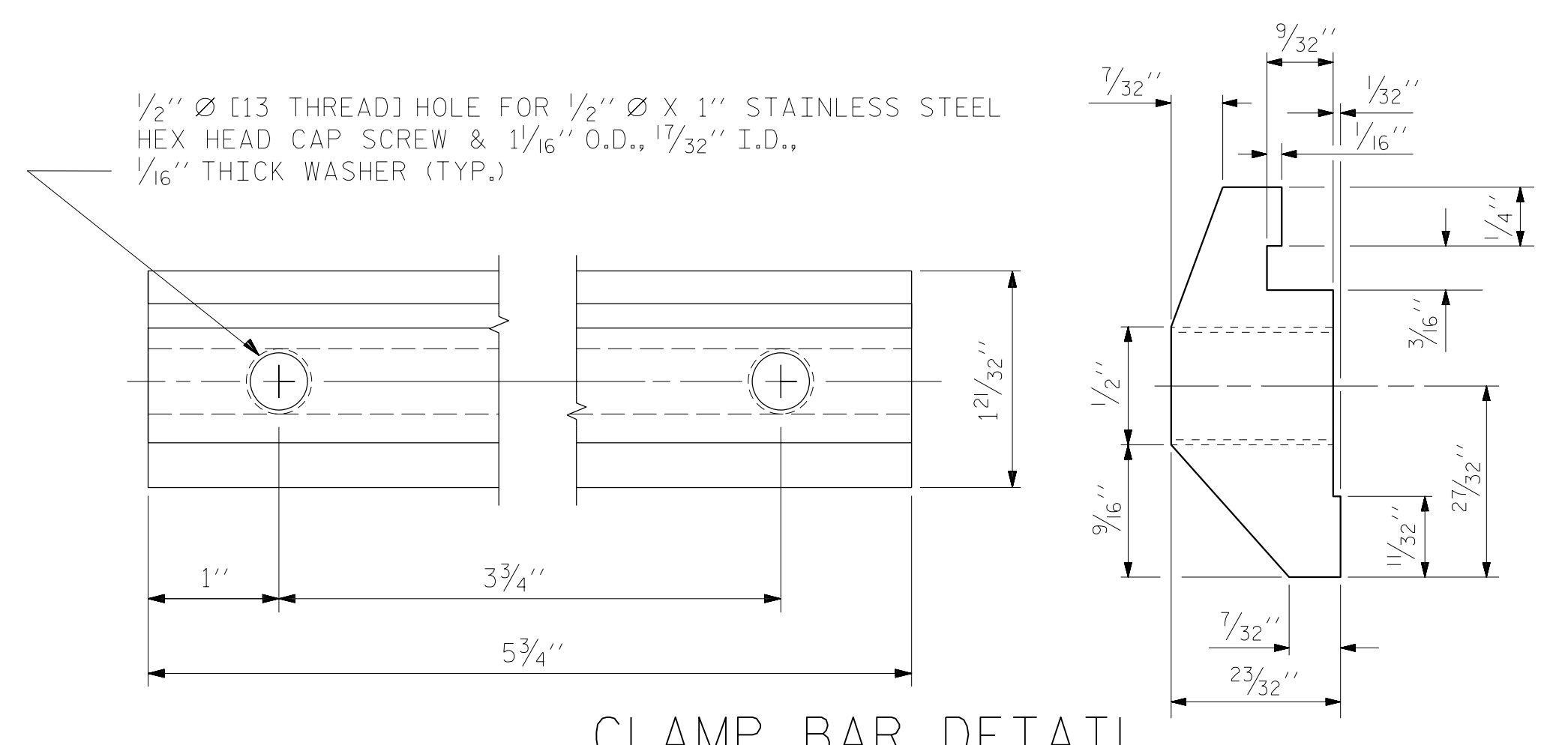
EXPANSION BAR DETAILS



RAIL CAP

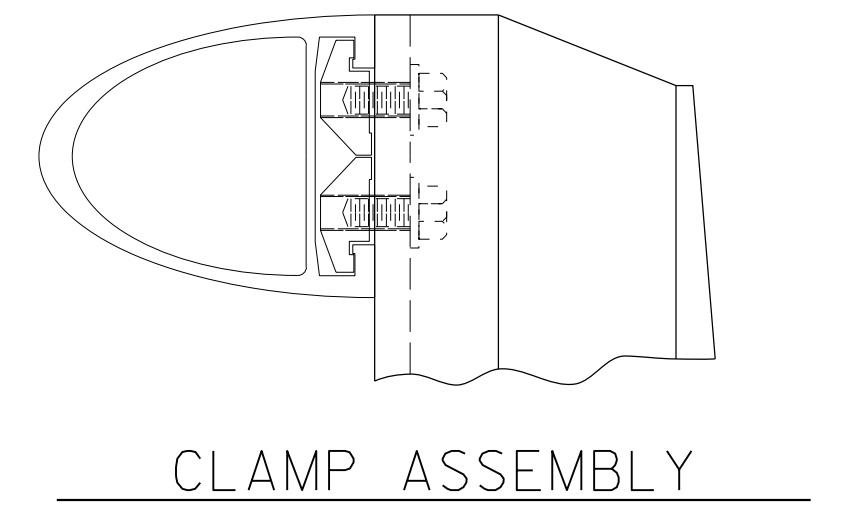


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

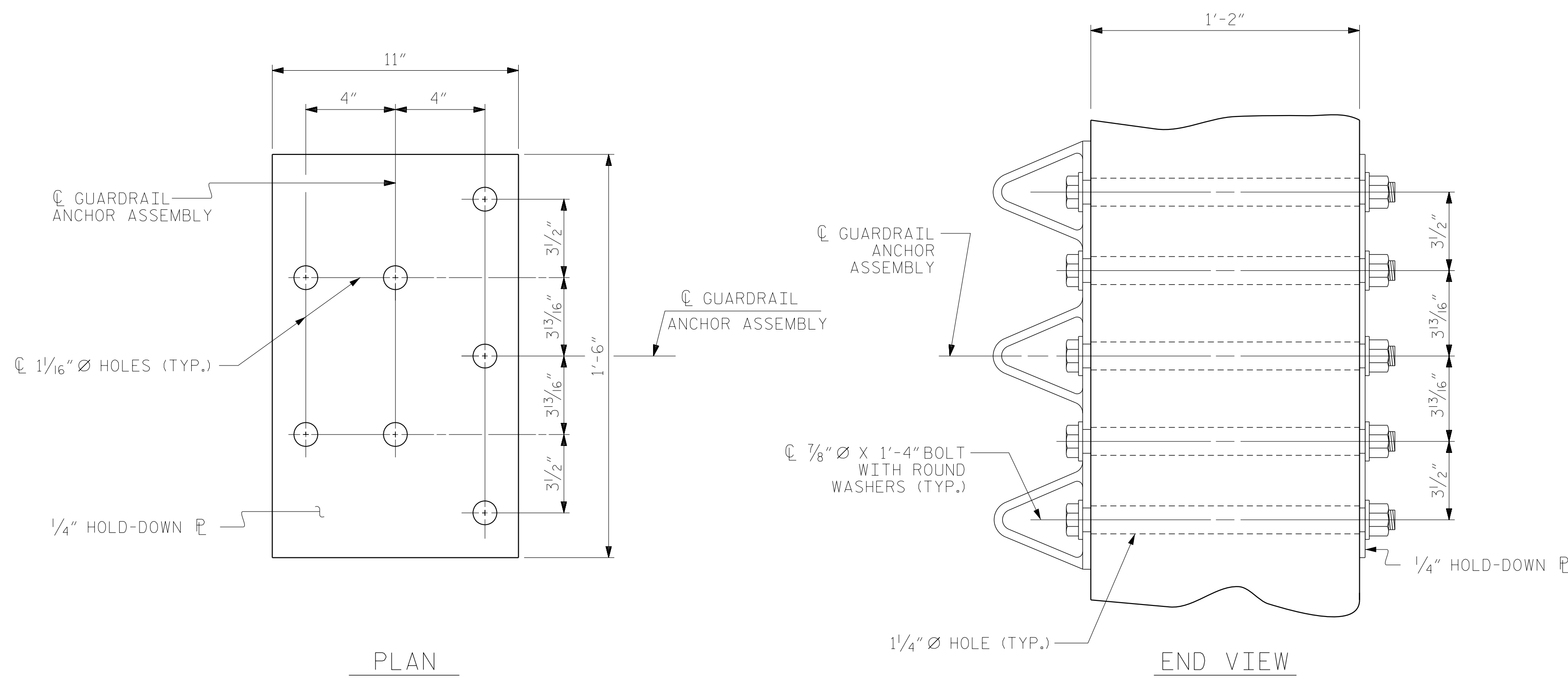
SHEET 5 OF 5

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			24
2			4			43

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY :	TWL	DATE :	12/2020
CHECKED BY :	MRA	DATE :	12/2020
DRAWN BY :	EEM 6/94	REV. 5/1/06R	KMM/GM
CHECKED BY :	RGW 6/94	REV. 10/17/11	MAA/GM
		REV. 12/17	MAA/THC



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

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

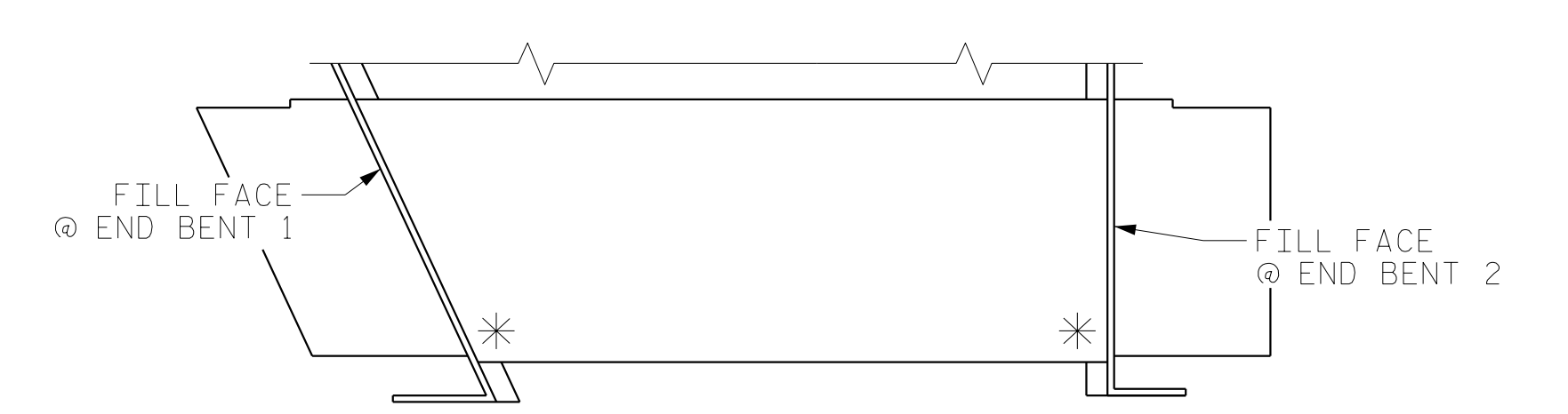
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

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

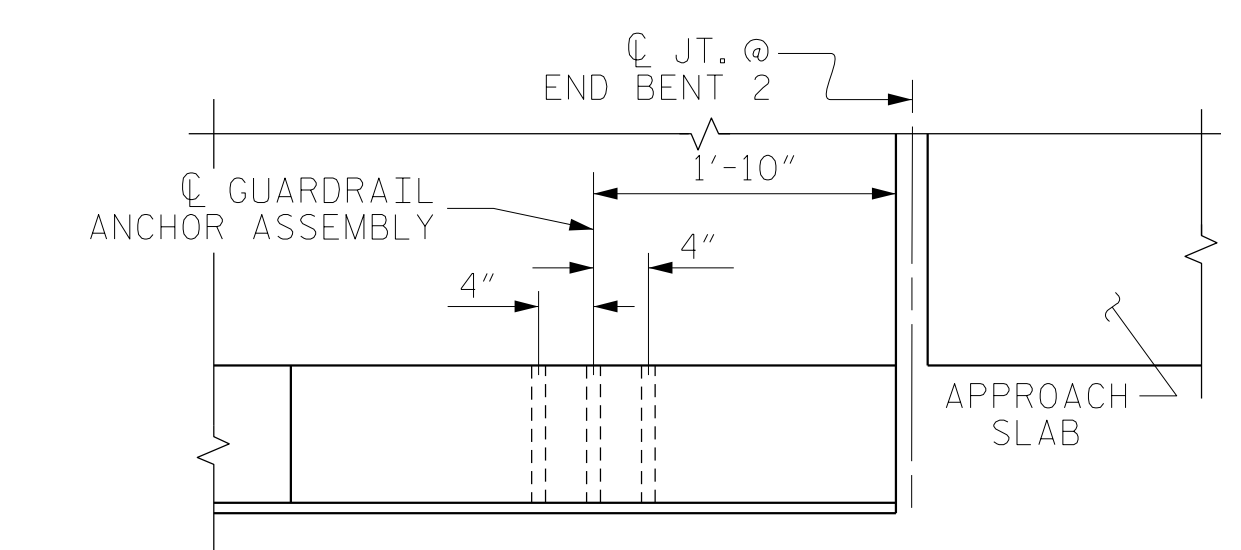
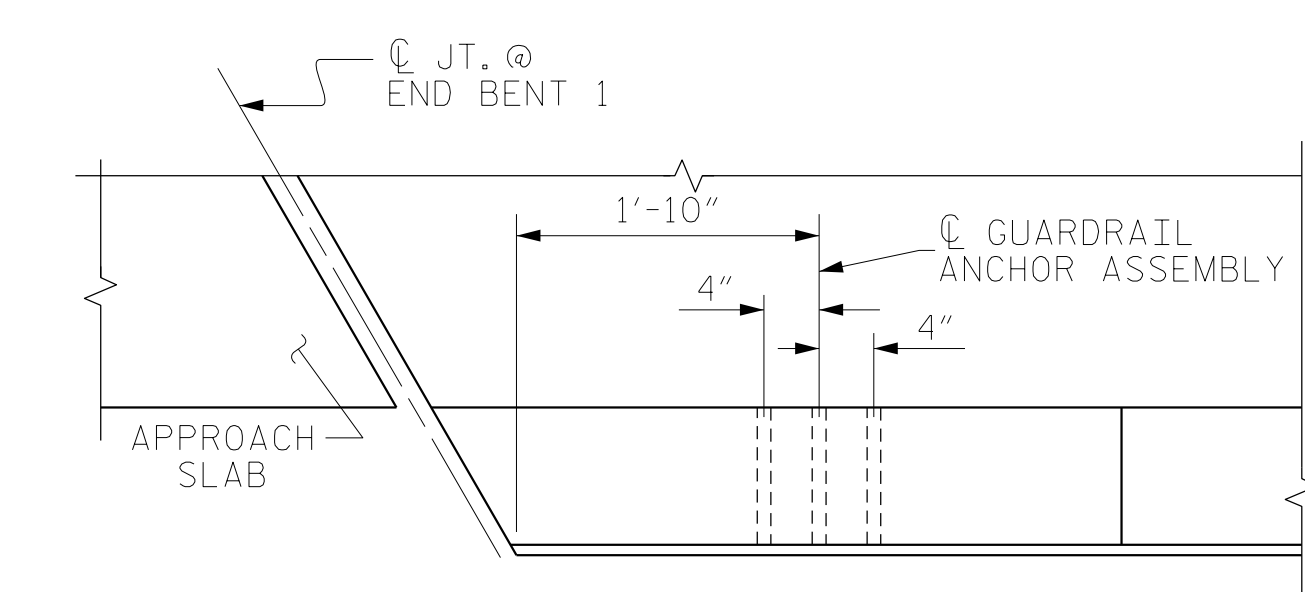
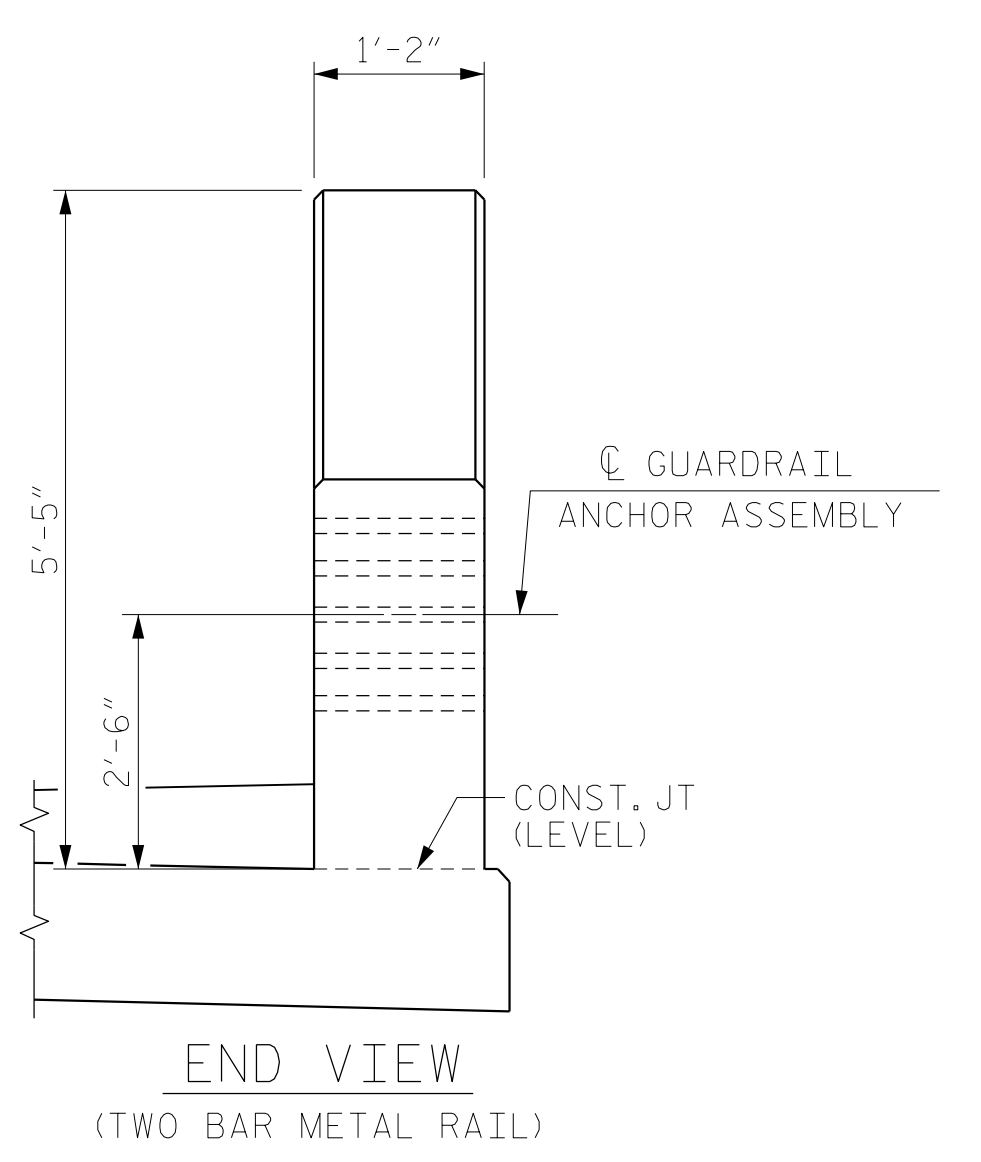
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

SEE, "GUARDRAIL ANCHORAGE FOR BARRIER RAIL" FOR LEFT SIDE OF BRIDGE.



SKETCH SHOWING POINTS OF ATTACHMENT
* LOCATION OF GUARDRAIL ATTACHMENT



PLAN @ END BENT 1 PLAN @ END BENT 2

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

ASSEMBLED BY : TWL	DATE : 12/2020
CHECKED BY : MRA	DATE : 12/2020
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-25					TOTAL SHEETS 43

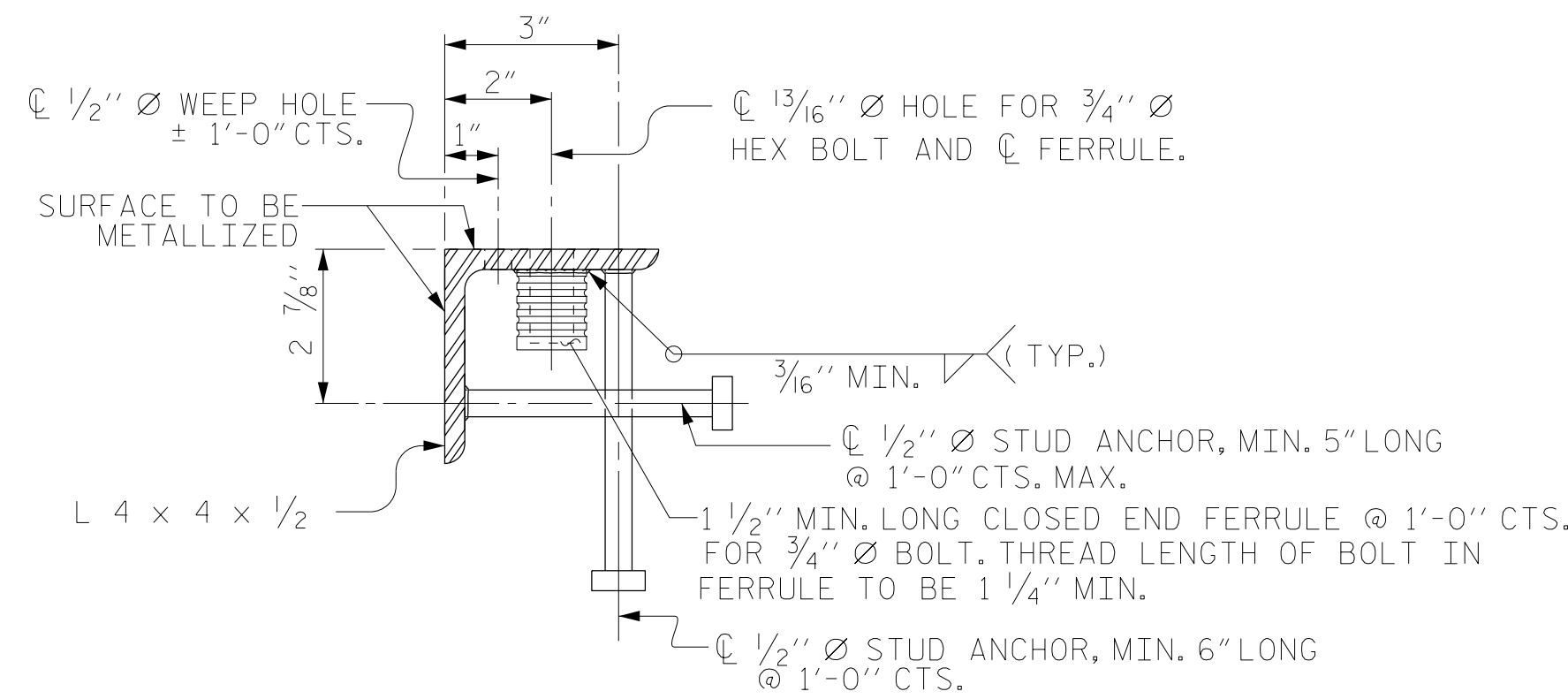
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE, THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

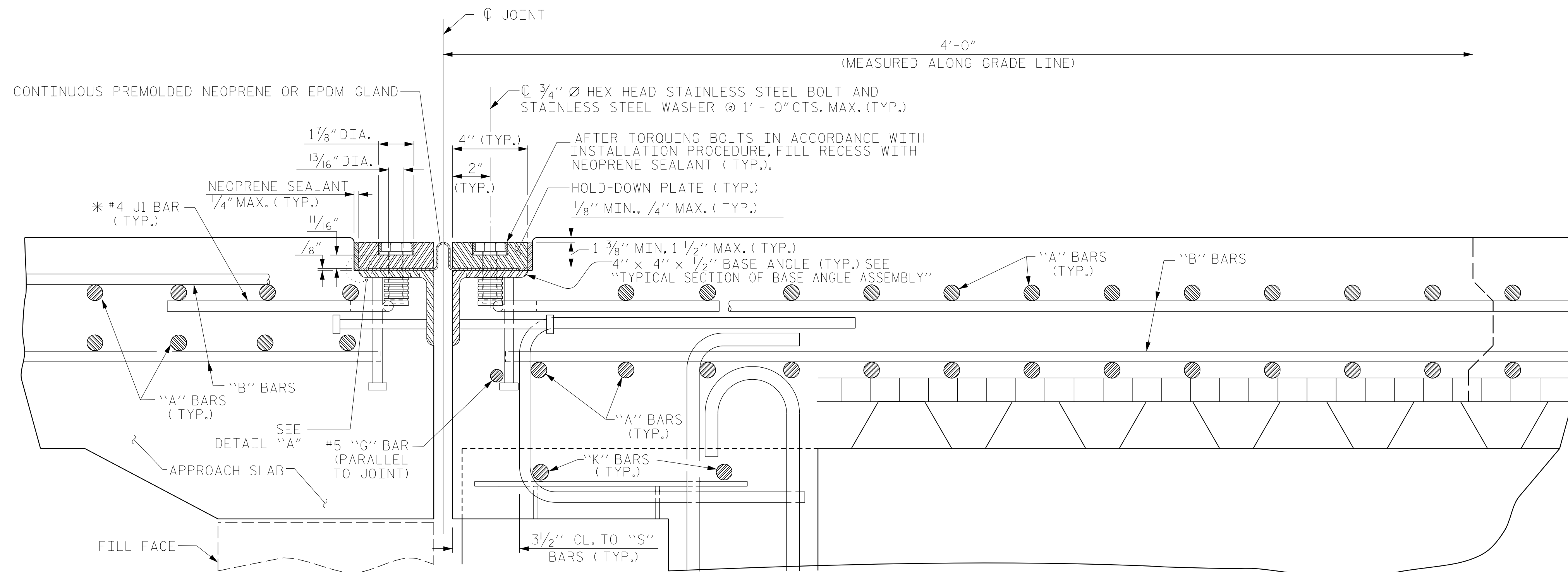
GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

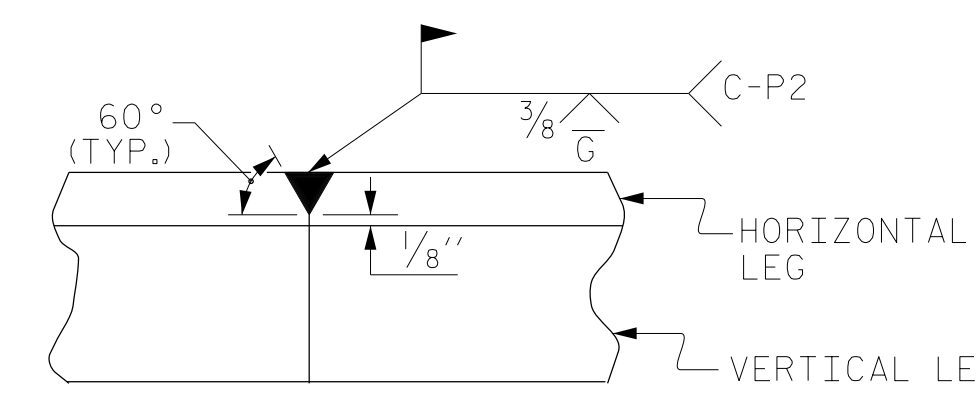
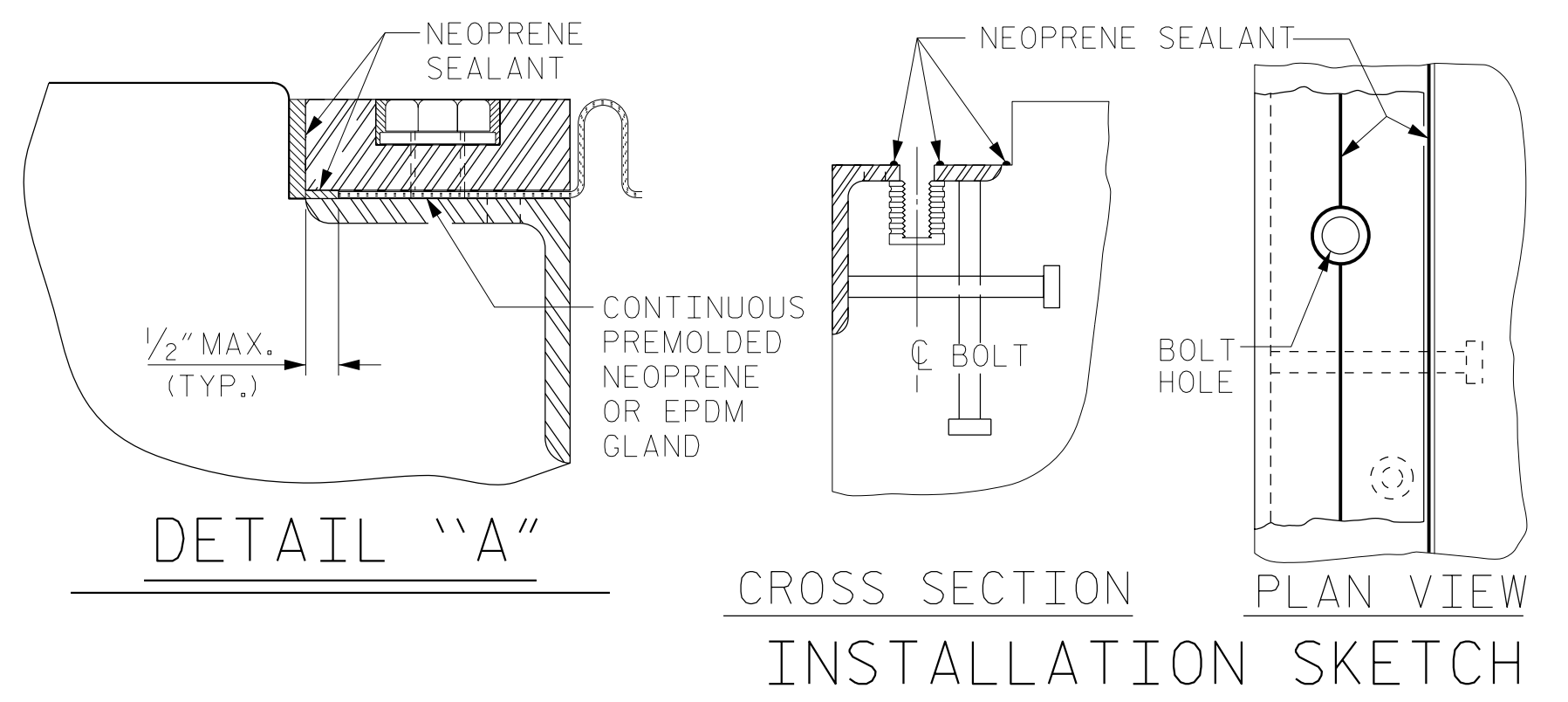
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	65°-00'-00"	1 1/16"	1 1/16"	1 5/16"	1 1/8"
2	90°-00'-00"	1 1/16"	1 1/2"	1 3/8"	1 1/8"



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

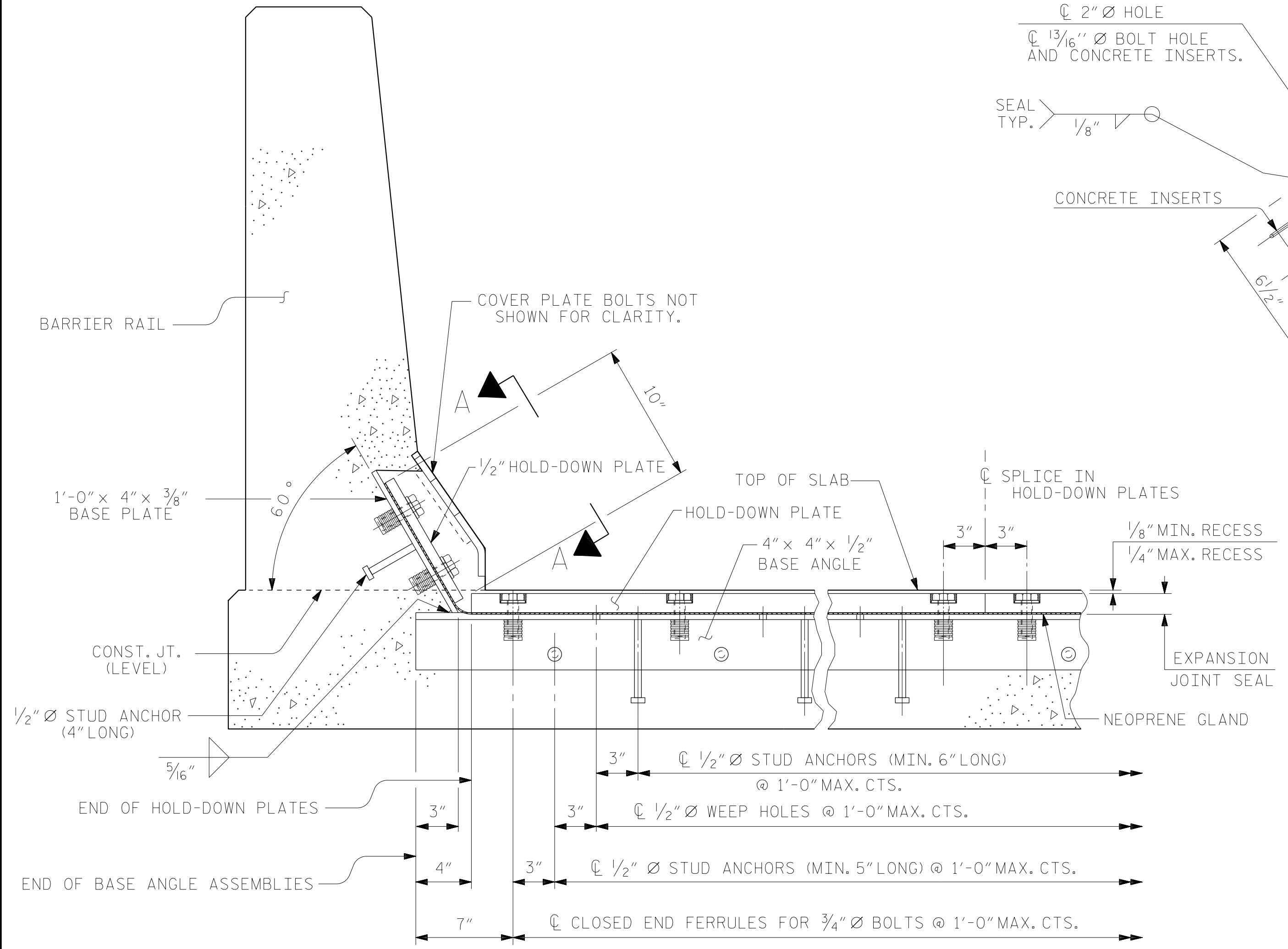


DETAIL- FIELD WELD SPLICE OF BASE ANGLE

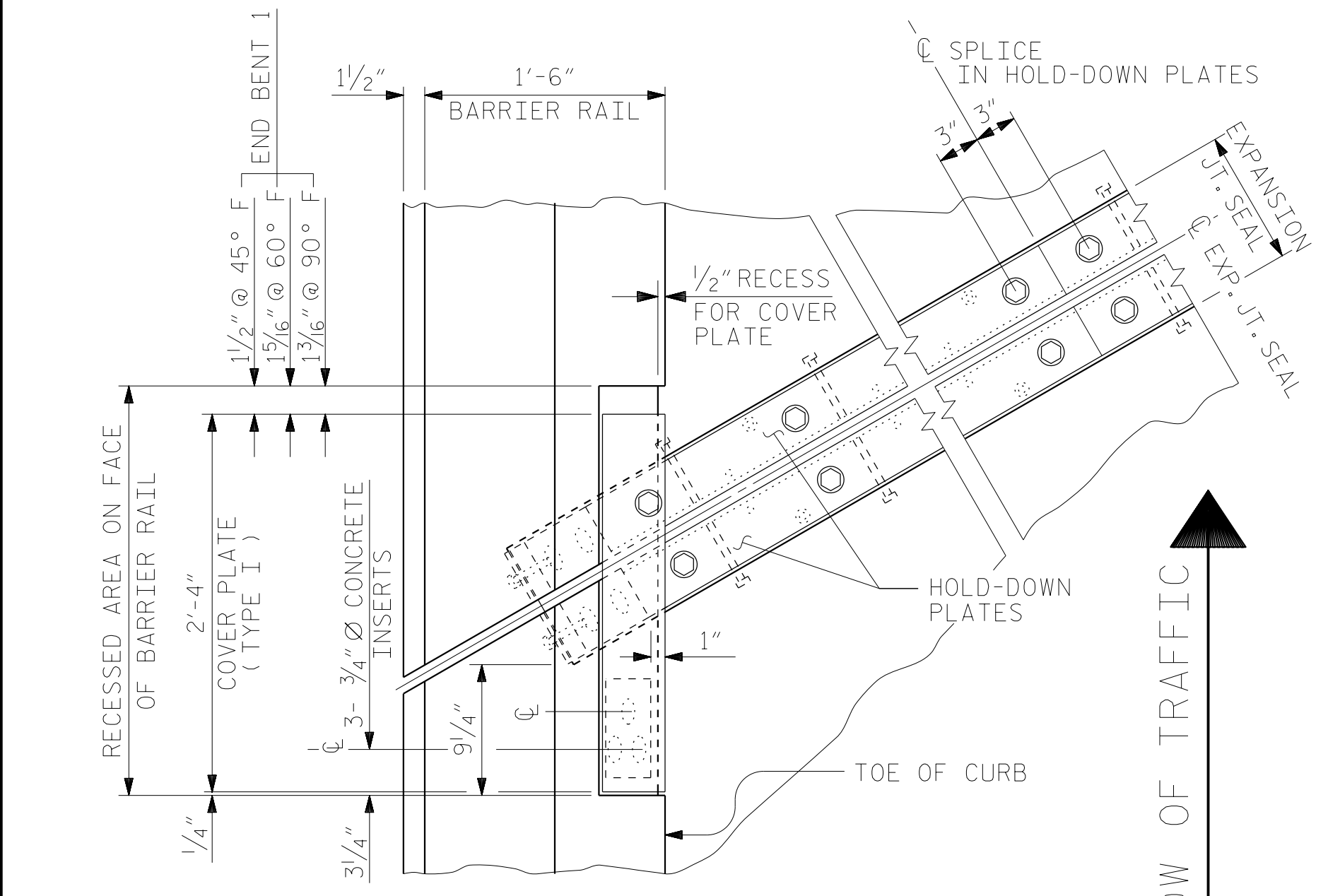
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CHECKED BY : MRA	DATE : 05/2020
DRAWN BY : REK 9/87	REV. 10/17 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/18 MAA/GM

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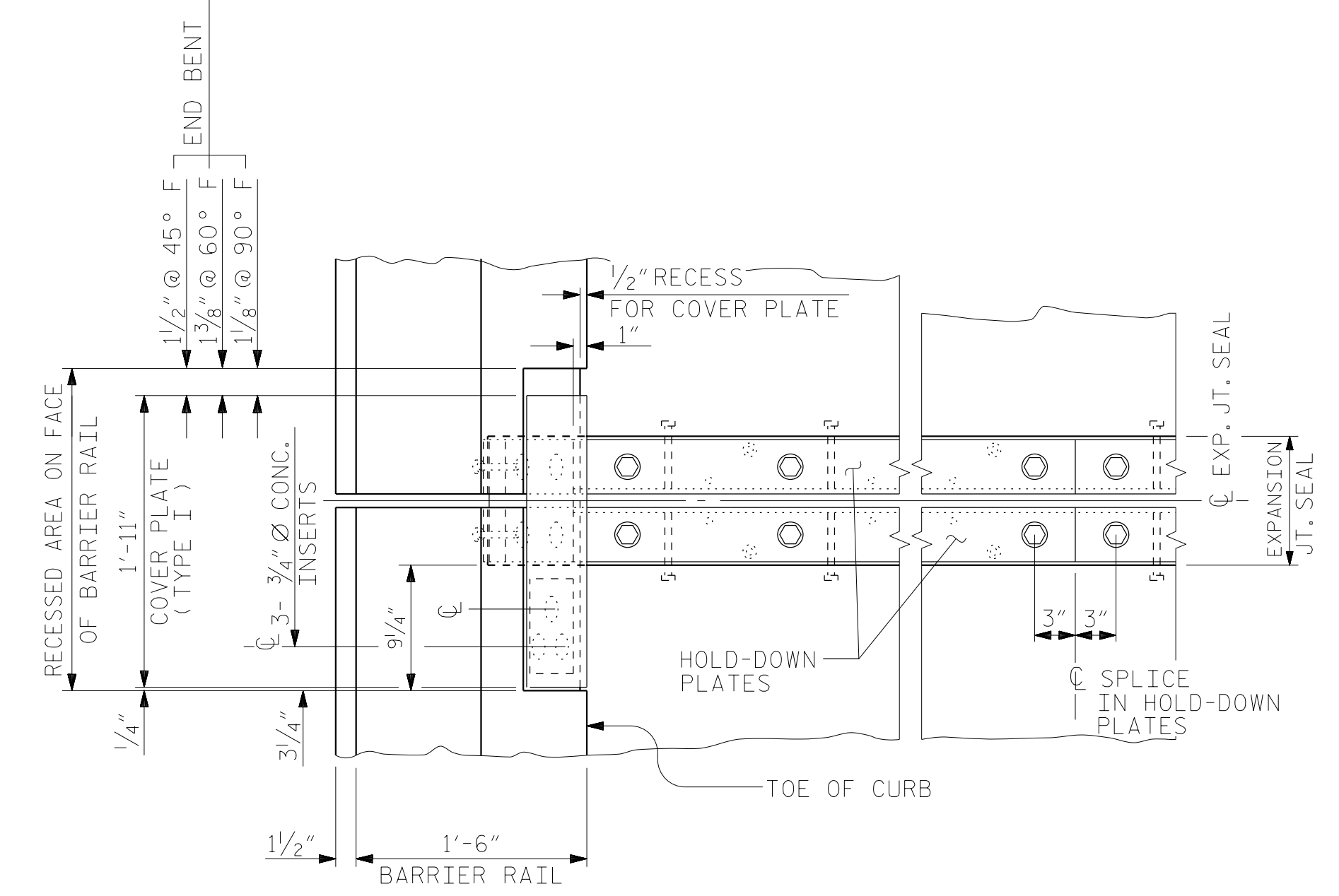
STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION			
RALEIGH		STANDARD			
EXPANSION JOINT SEAL DETAILS					
RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-26			TOTAL SHEETS 43		



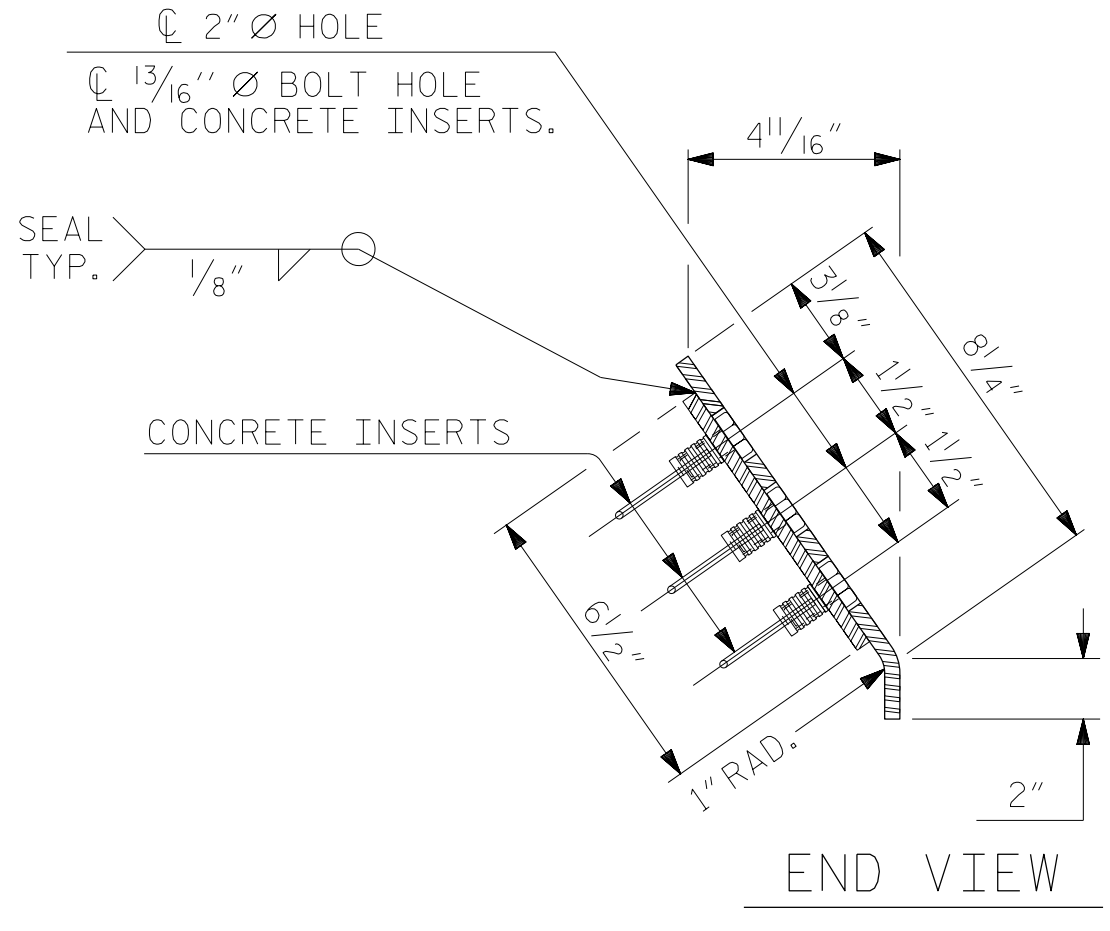
SECTION THRU RAIL NORMAL TO JOINT



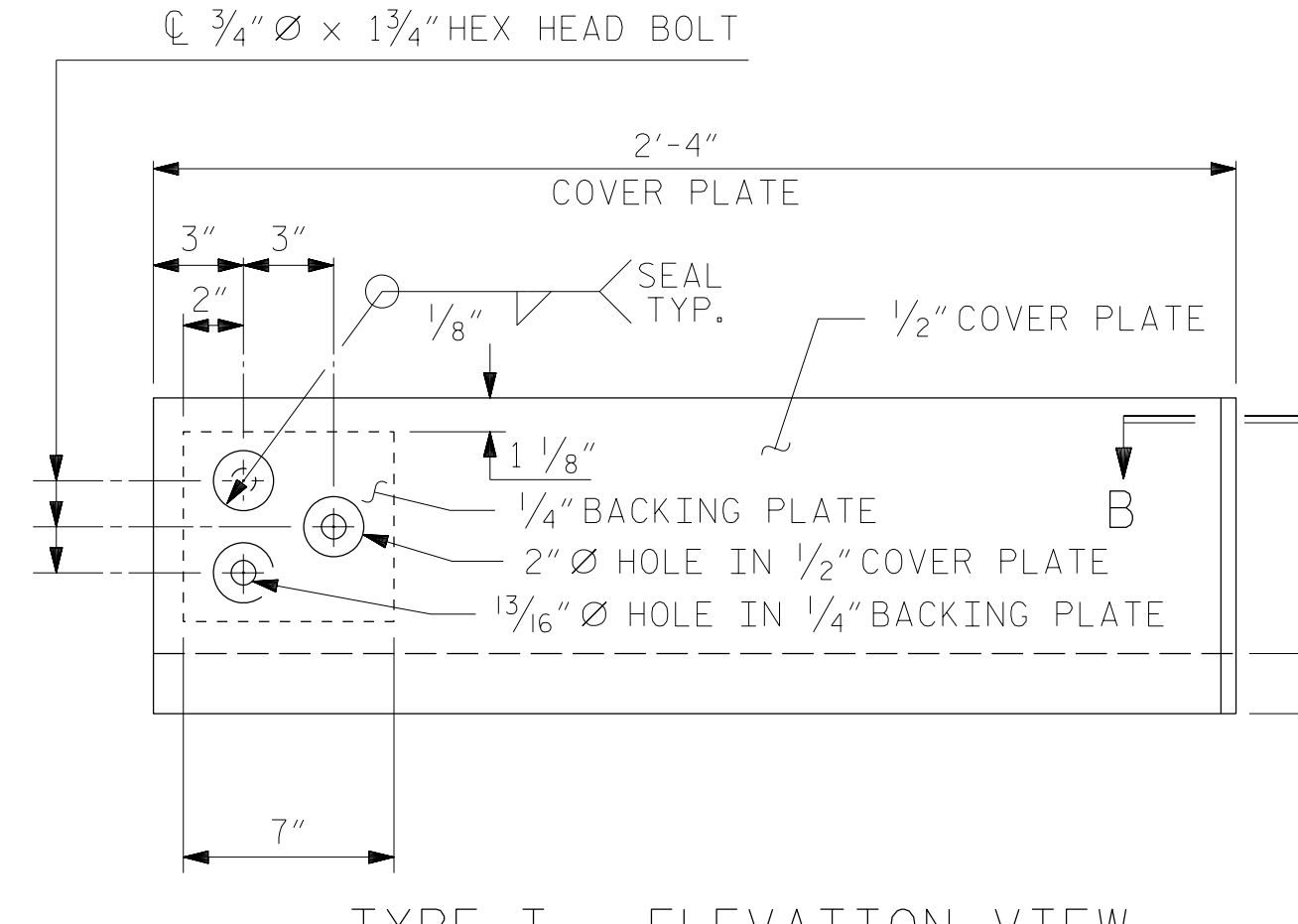
PLAN OF EXPANSION JOINT SEAL - END BENT 1



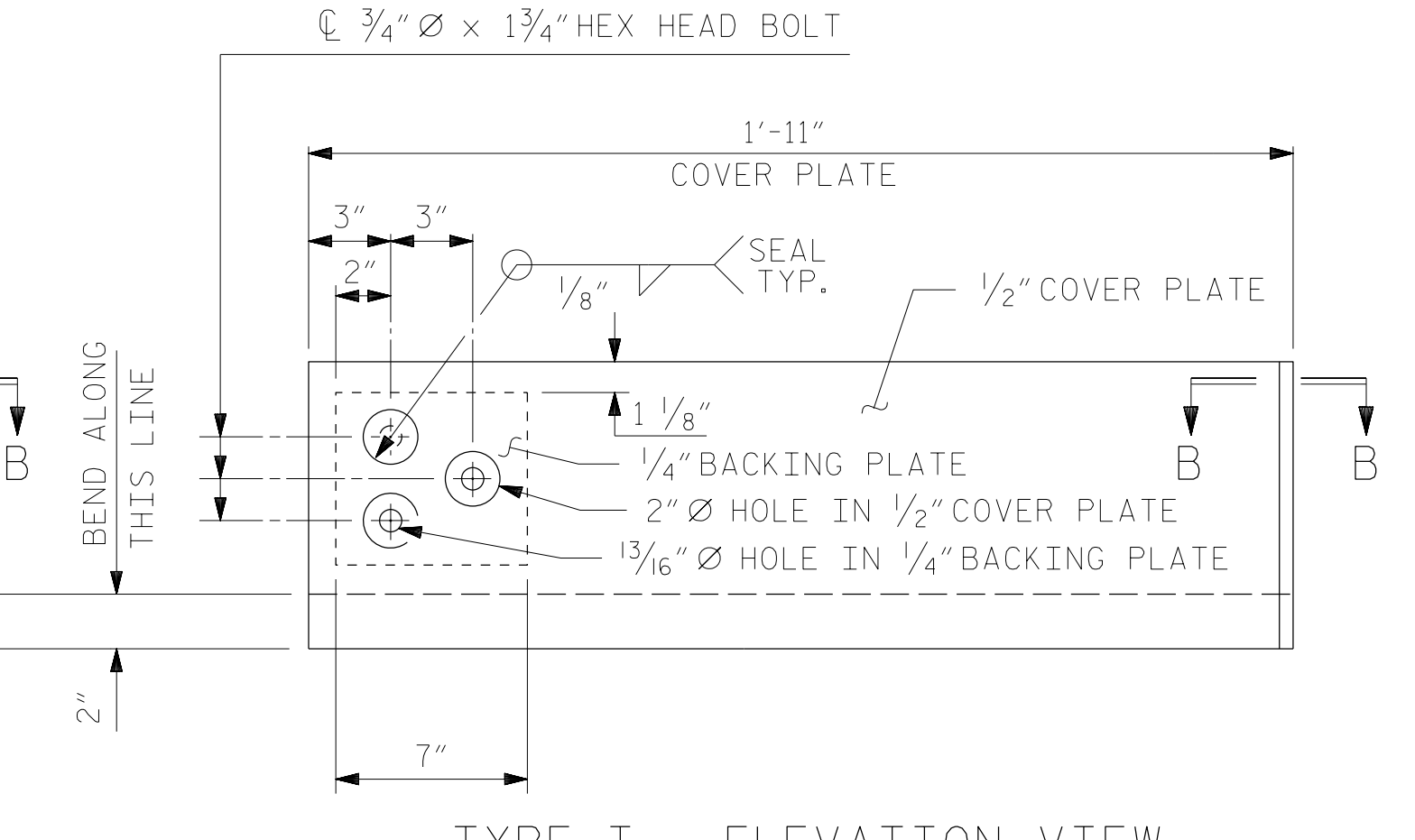
PLAN OF EXPANSION JOINT SEAL - END BENT 2



END VIEW

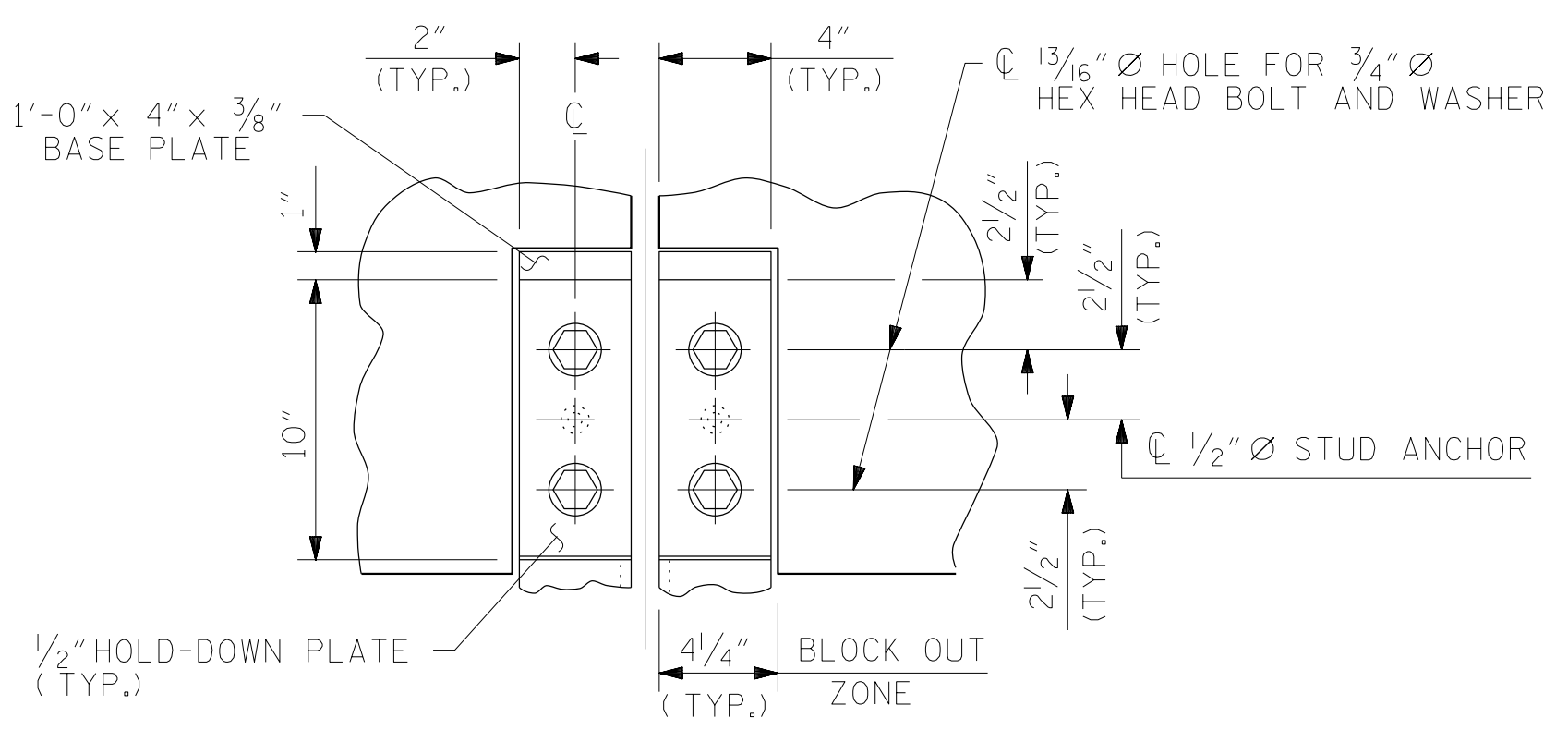


TYPE I - ELEVATION VIEW @ END BENT 1

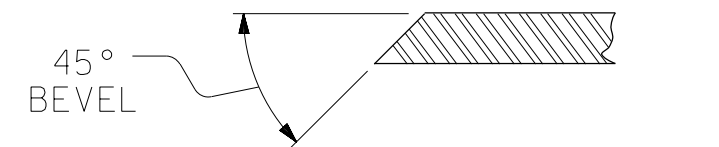


TYPE I - ELEVATION VIEW @ END BENT 2

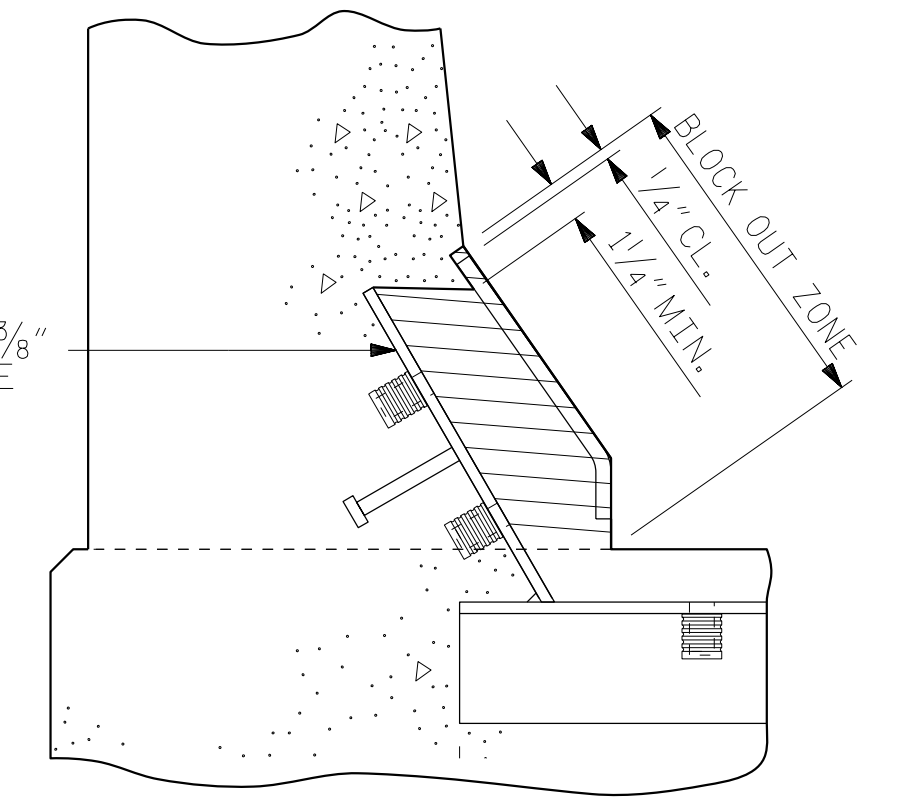
COVER PLATE DETAILS



SECTION A - A

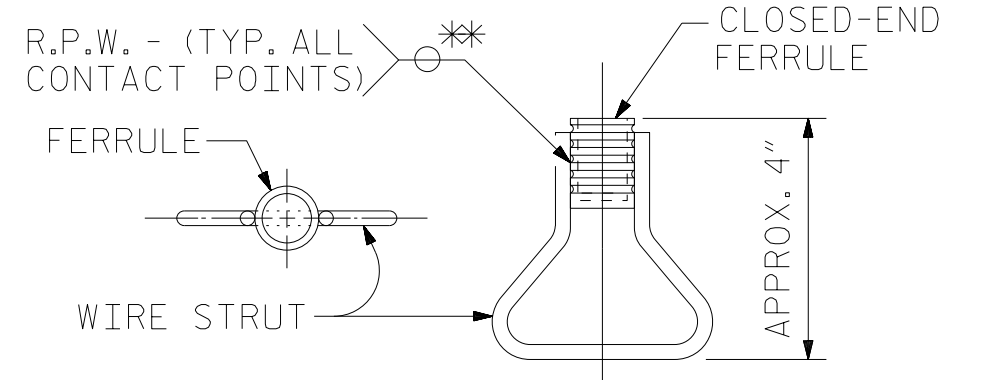


SECTION B - B



BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.

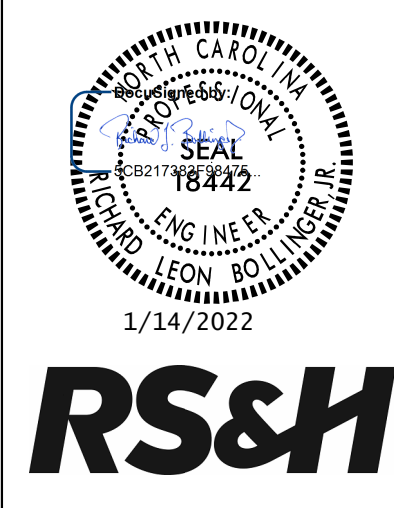


CONCRETE INSERT

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

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 4



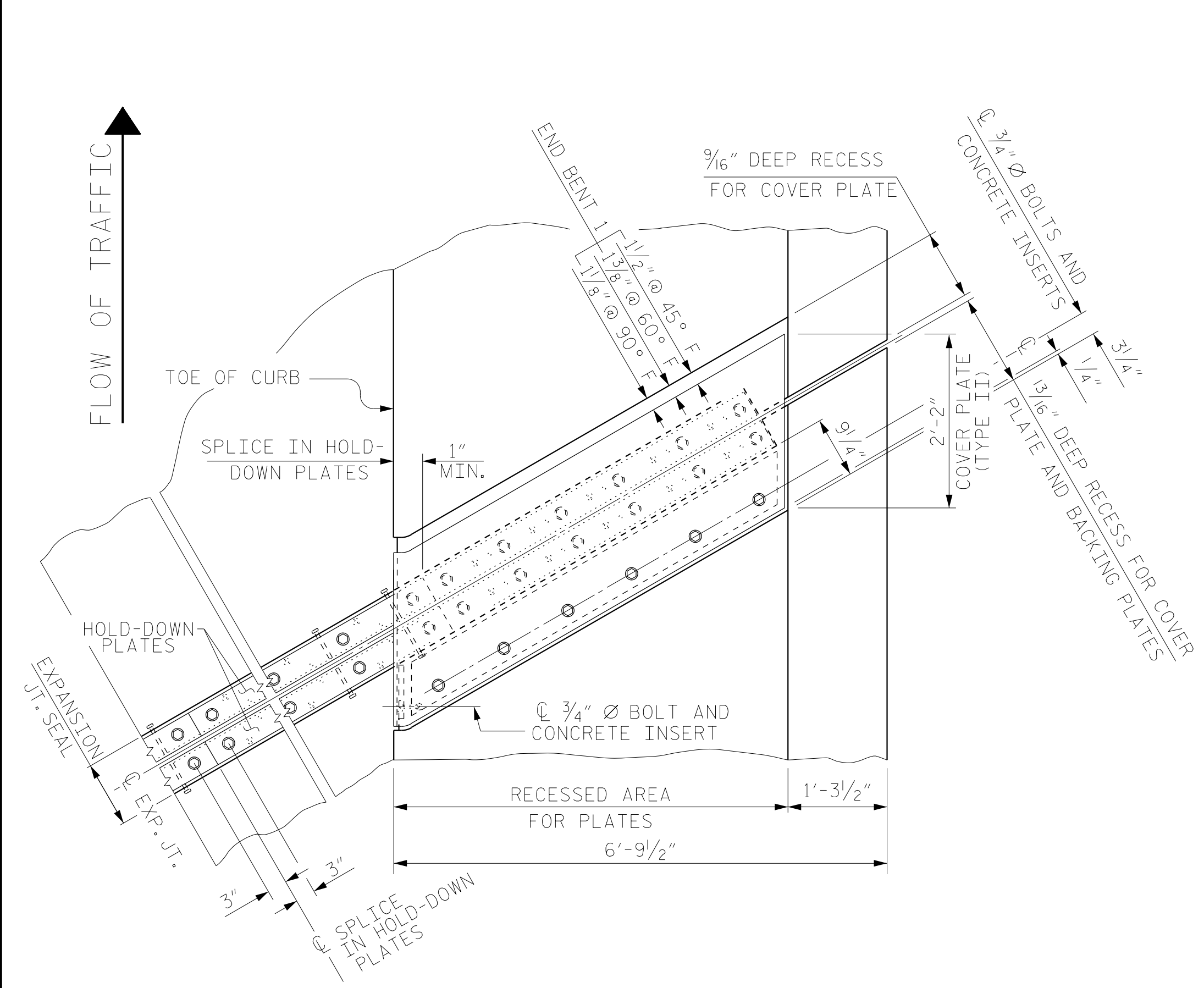
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 EXPANSION JOINT SEAL DETAILS
 FOR BARRIER RAIL
 RIGHT LANE

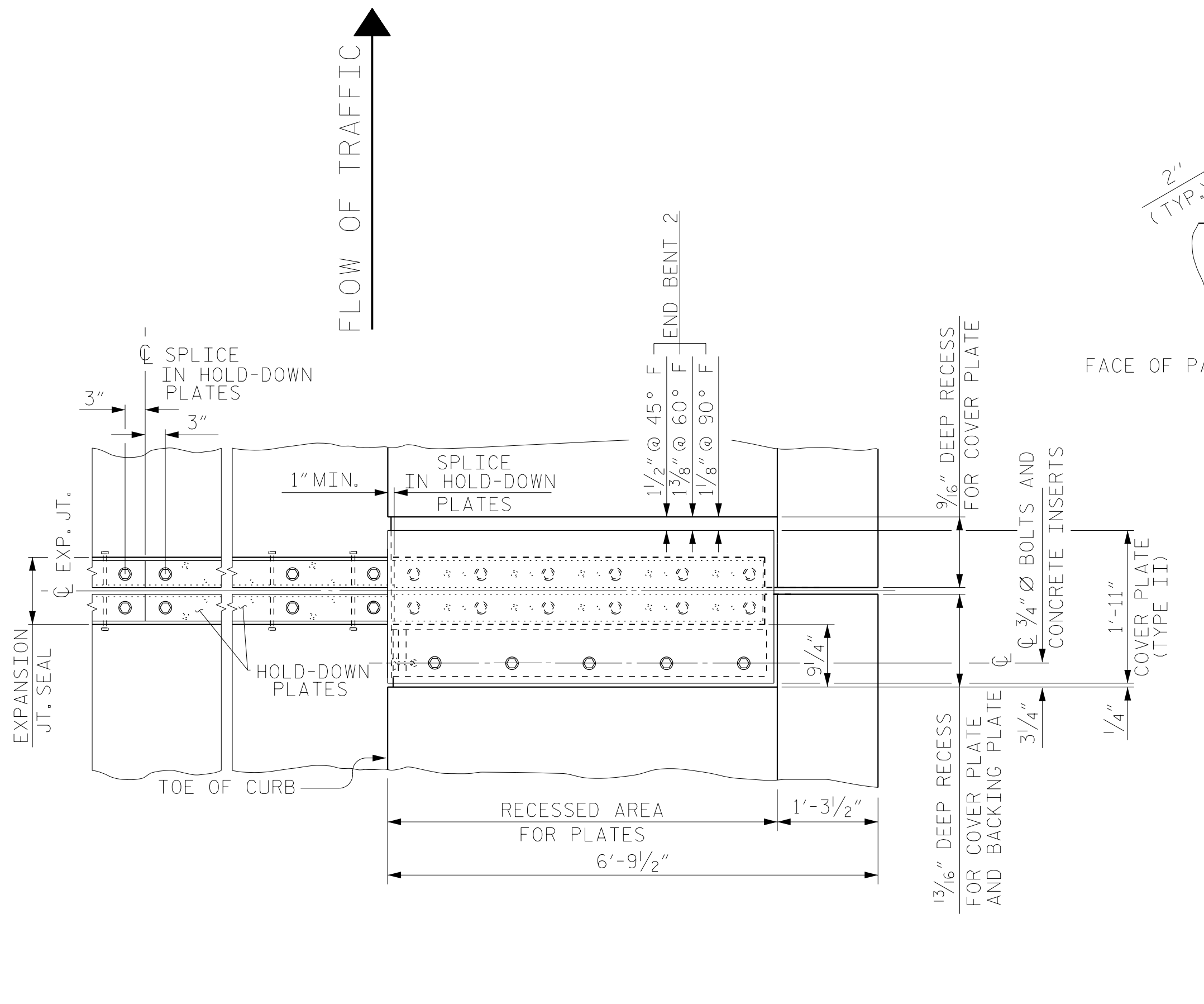
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-27
1			3			TOTAL SHEETS
2			4			43

DRAWN BY : NSC	DATE : 04/2020
CHECKED BY : MRA	DATE : 05/2020
DESIGN ENGINEER OF RECORD: RLB	DATE : 09/2021

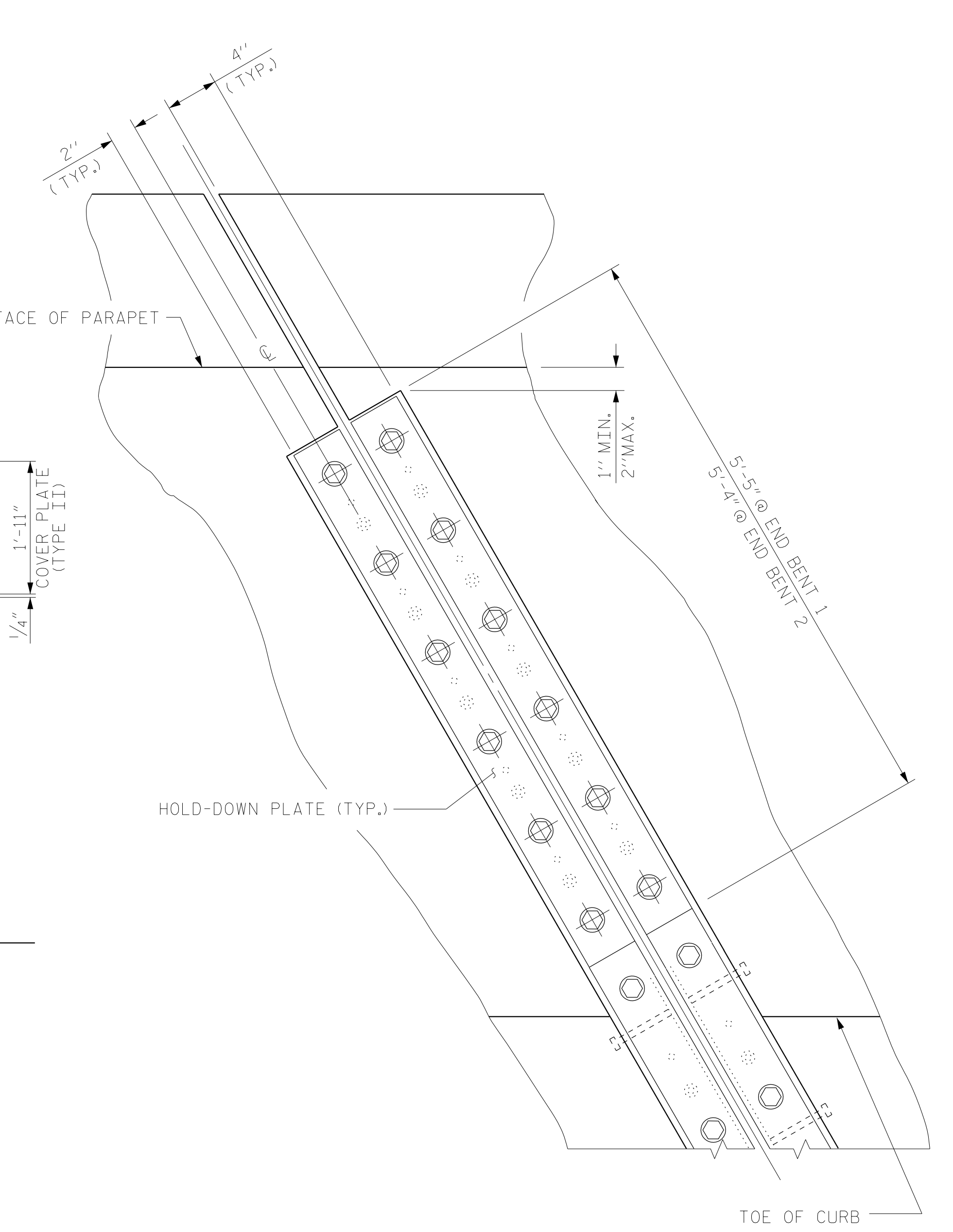
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PLAN OF EXPANSION JOINT SEAL - END BENT 1

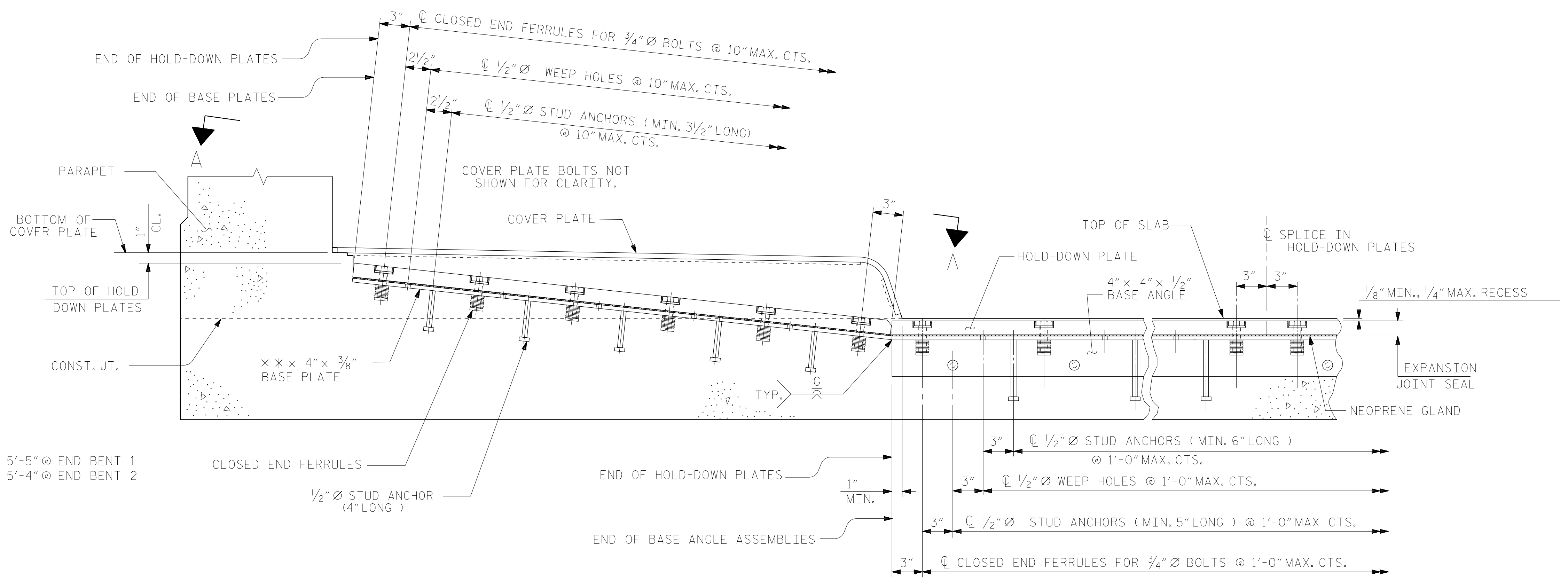


PLAN OF EXPANSION JOINT SEAL - END BENT 2



SECTION A - A

END BENT 1 SHOWN
END BENT 2 NORMAL TO ALIGNMENT



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 4

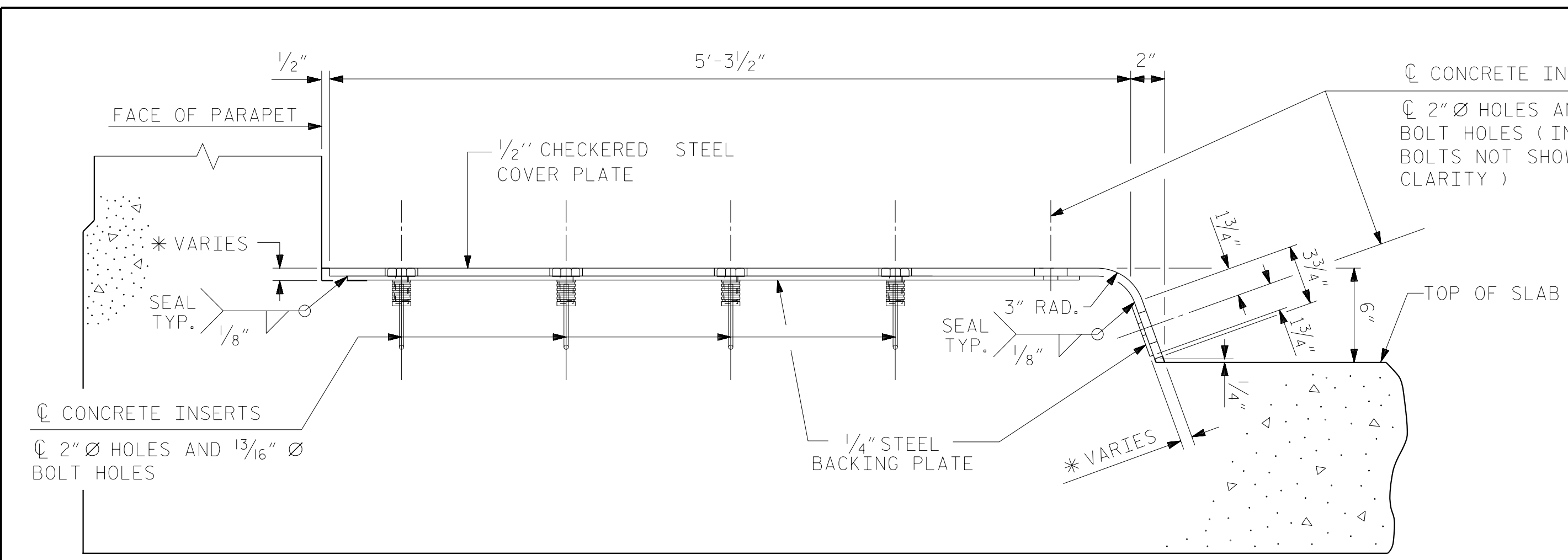
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CHECKED BY : MRA	DATE : 05/2020
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CHECKED BY : CRK 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THG

11/24/2021
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

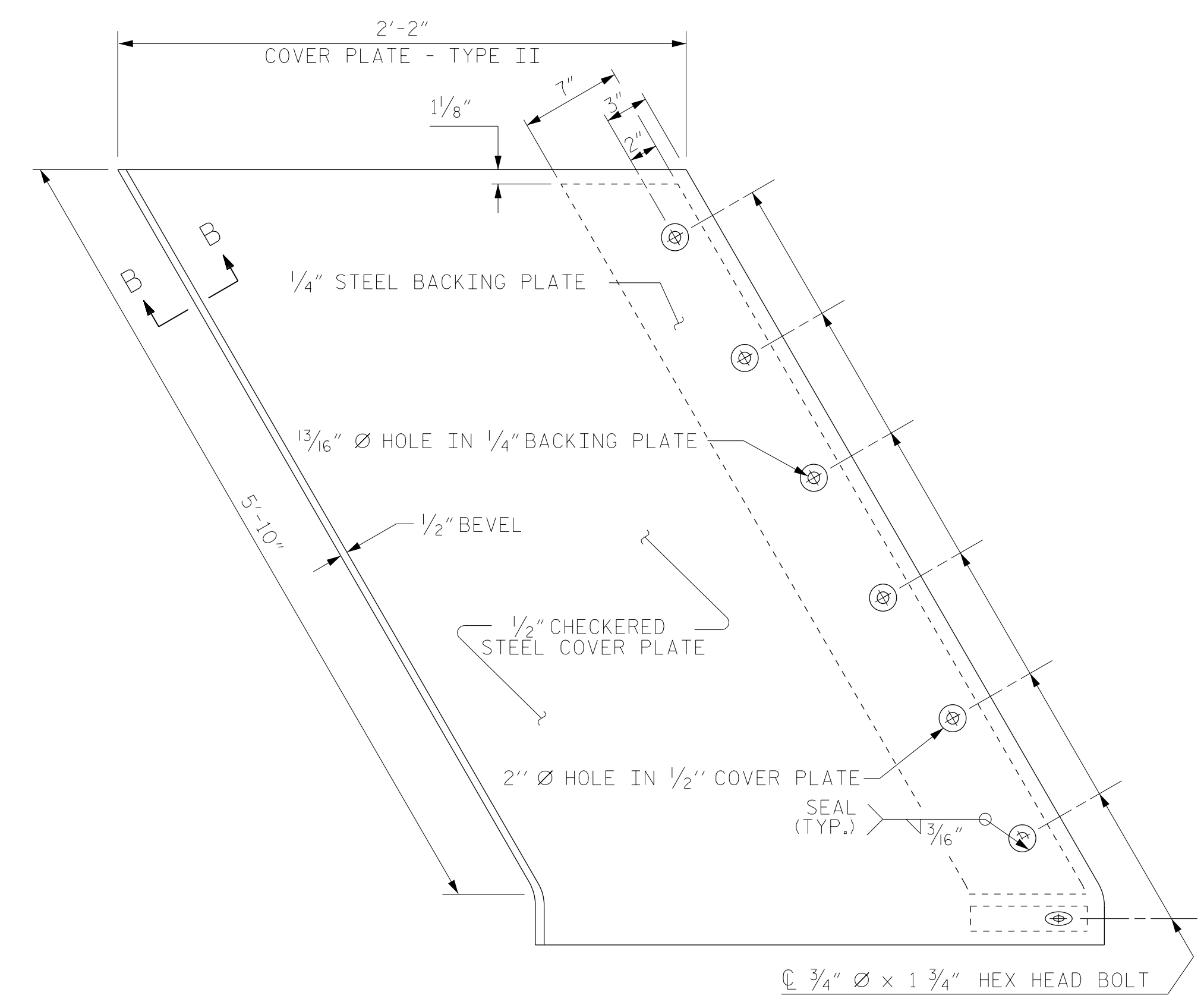
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S2-28
STANDARD EXPANSION JOINT SEAL DETAILS FOR SIDEWALK RIGHT LANE						TOTAL SHEETS 43
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. EJS3 STR. #2

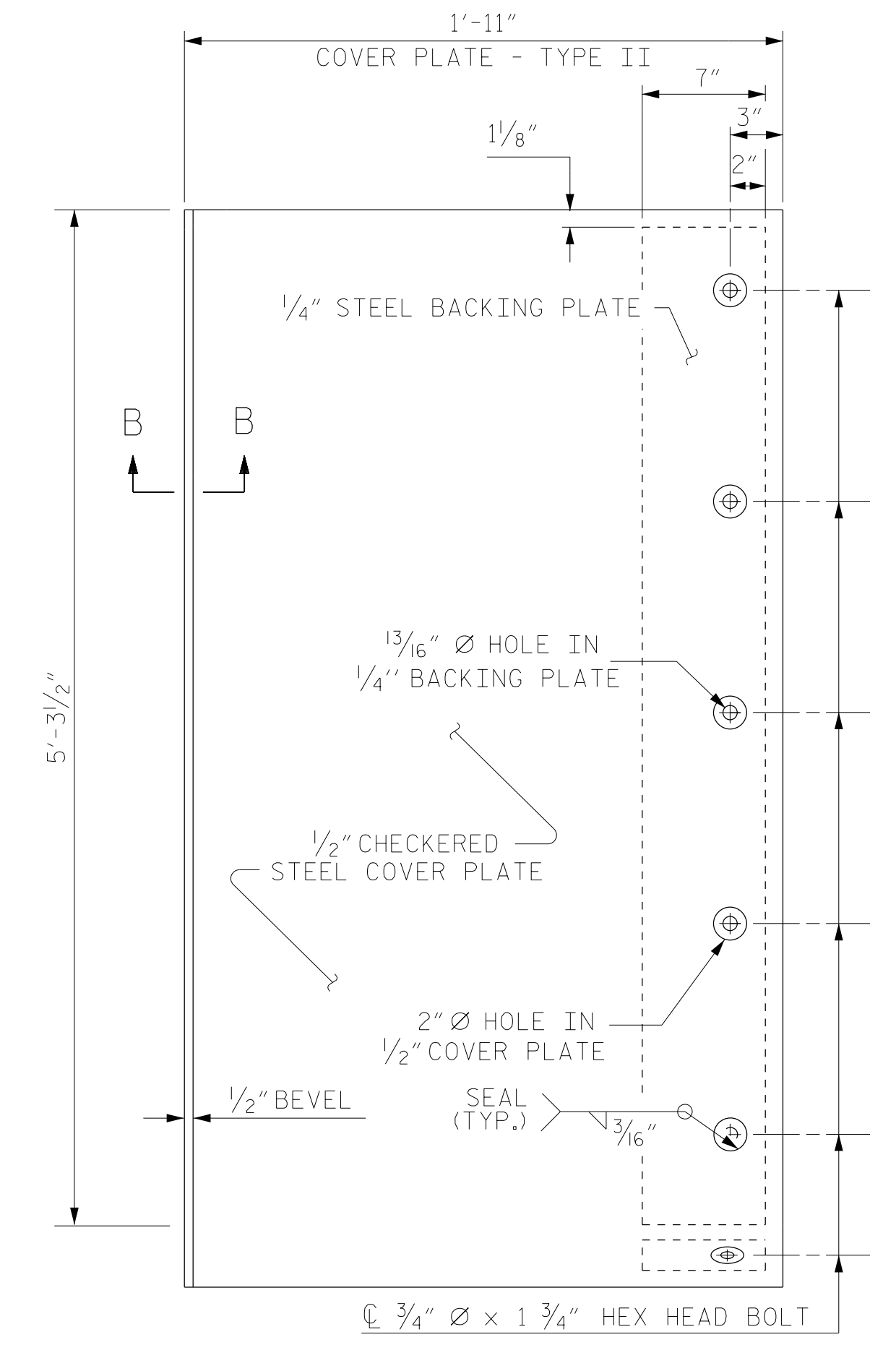


END VIEW
(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:
 1 3/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

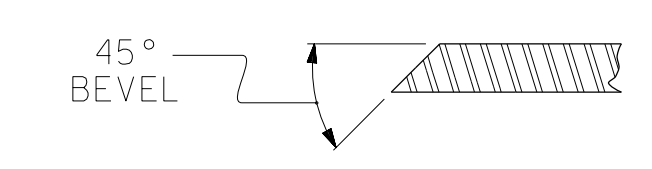


TYPE II - PLAN VIEW
END BENT 1

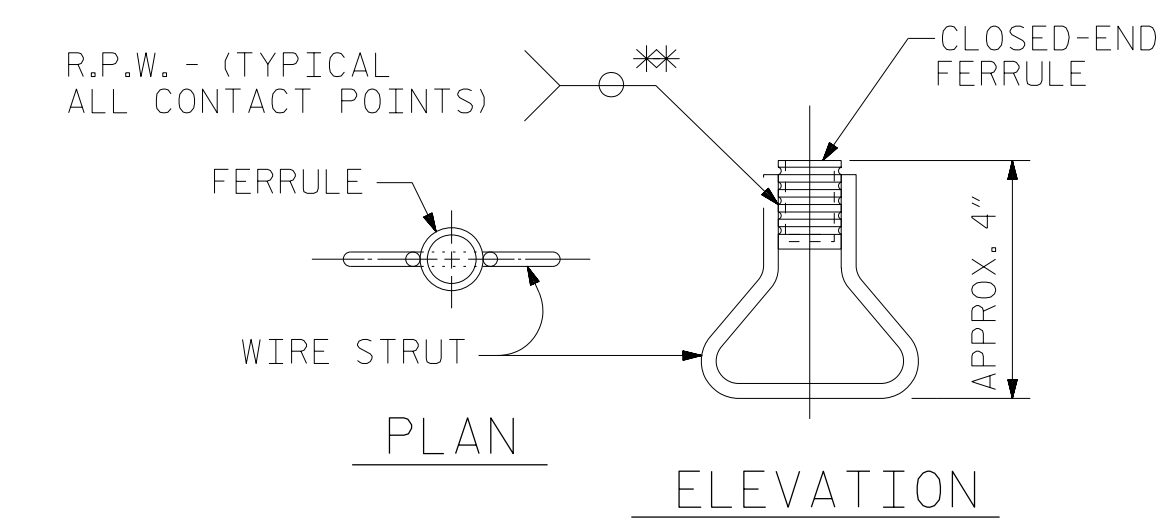


TYPE II - PLAN VIEW
END BENT 2

COVER PLATE DETAILS

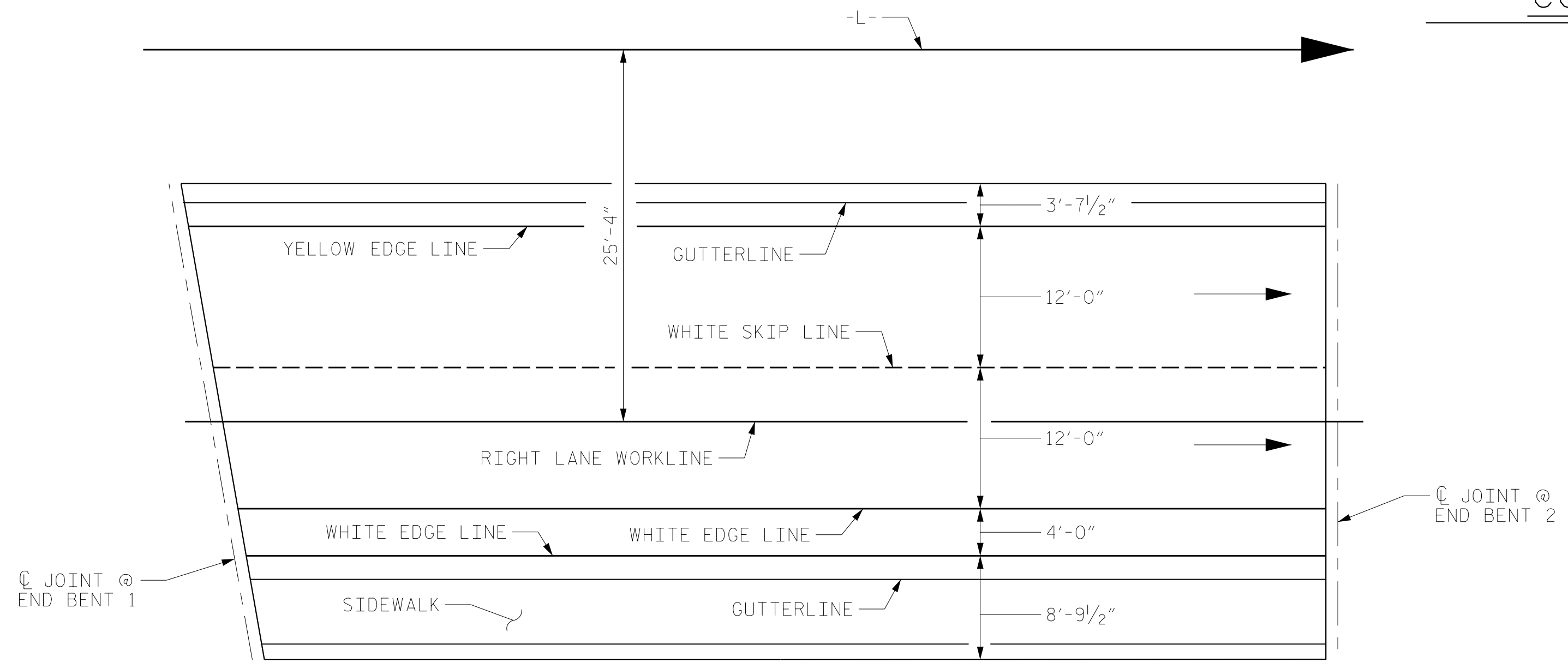


SECTION B - B



CONCRETE INSERT

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



PAVEMENT MARKING ALIGNMENT

PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

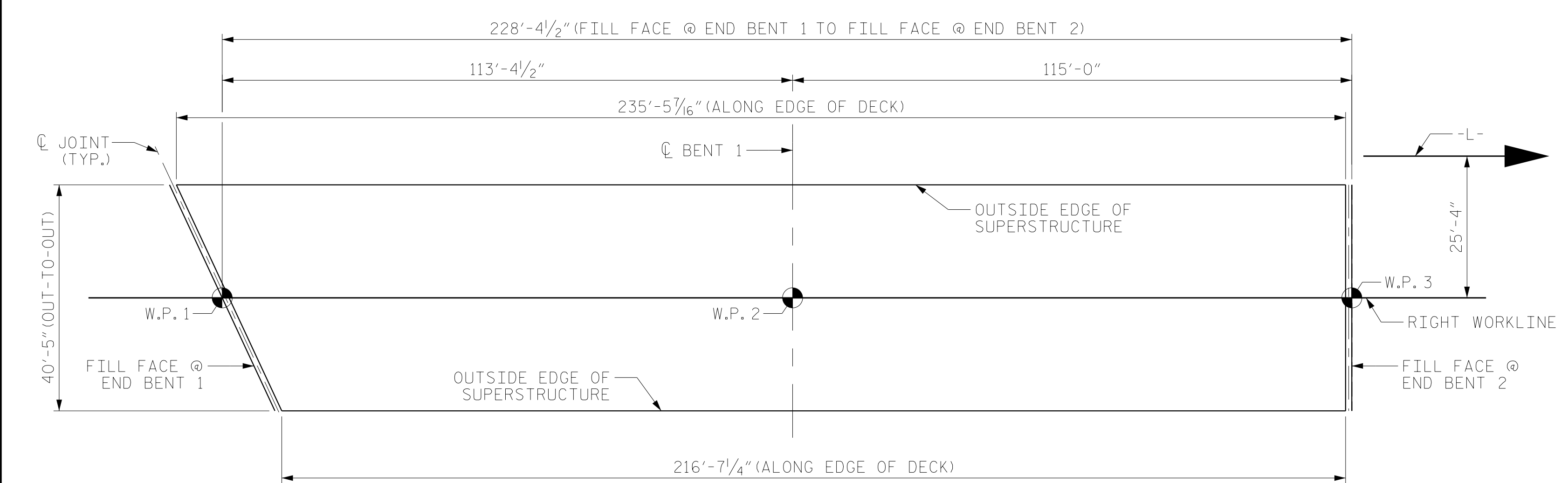
SHEET 4 OF 4

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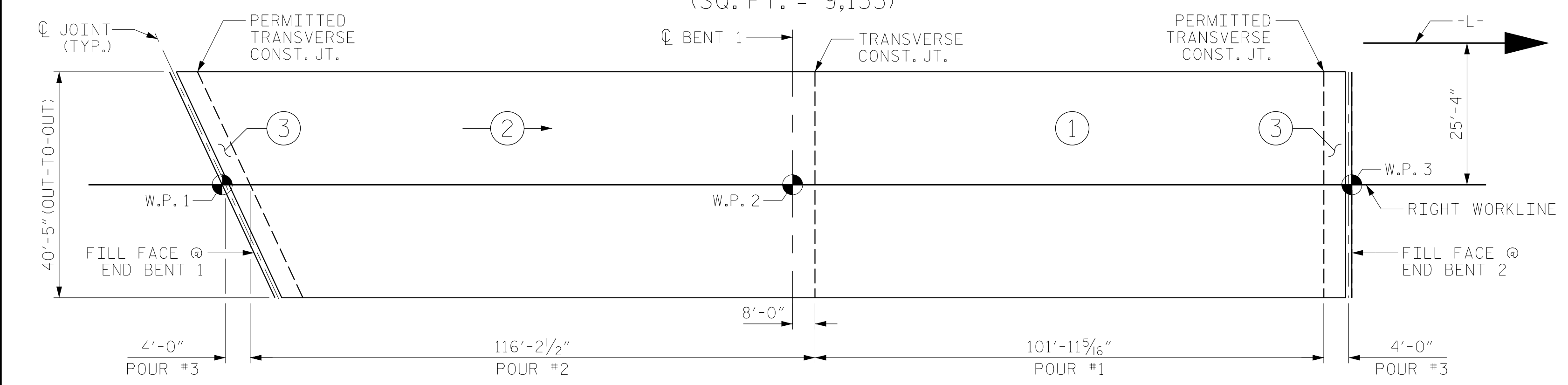
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S2-29
STANDARD EXPANSION JOINT SEAL DETAILS FOR SIDEWALK RIGHT LANE						TOTAL SHEETS 43
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : NSC	DATE : 04/2020
CHECKED BY : MRA	DATE : 05/2020
DRAWN BY : REK 10/87	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 1/88	REV. 10/1/11 MAA/GM
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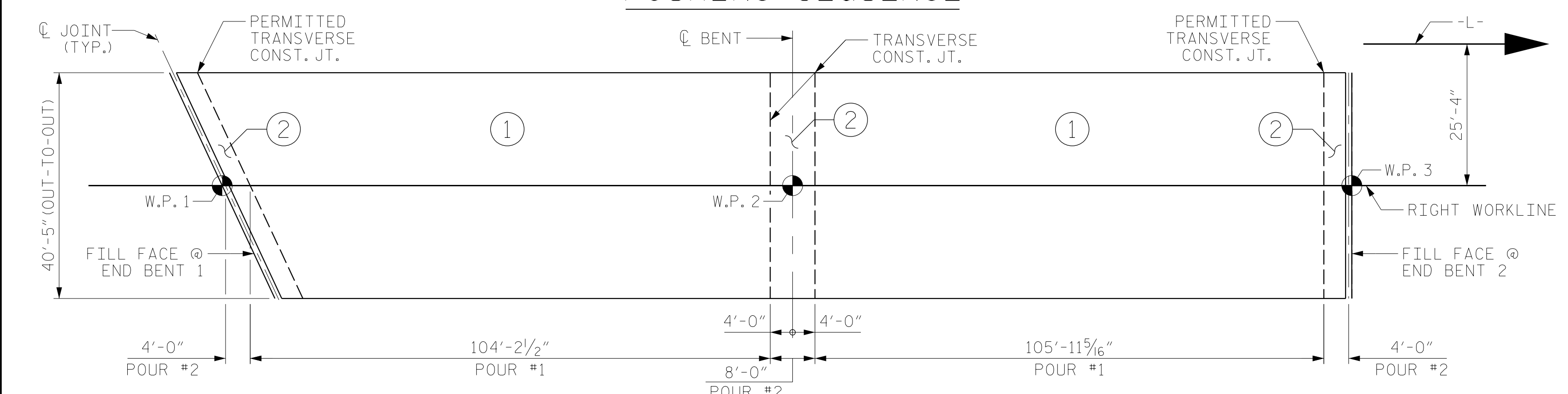
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LAYOUT FOR COMPUTING AREA OF REINFORCING CONCRETE DECK SLAB (SQ. FT. = 9,135)

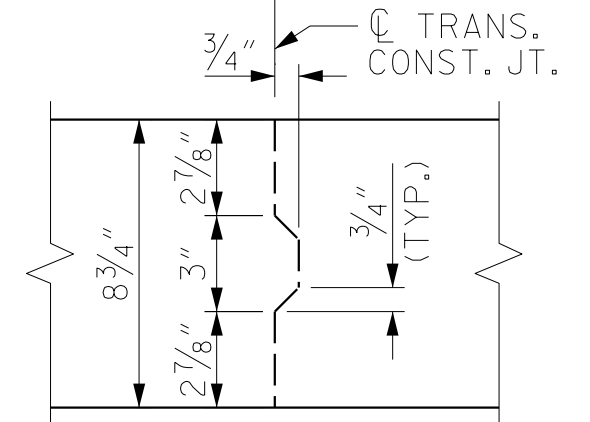


POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR ② CANNOT BE STARTED UNTIL ADJACENT POUR ① REACHES A MINIMUM STRENGTH OF 3,000 PSI.



TRANSVERSE CONSTRUCTION JOINT DETAIL

REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCEMENT SHALL BE CONTINUOUS THROUGH JOINT.

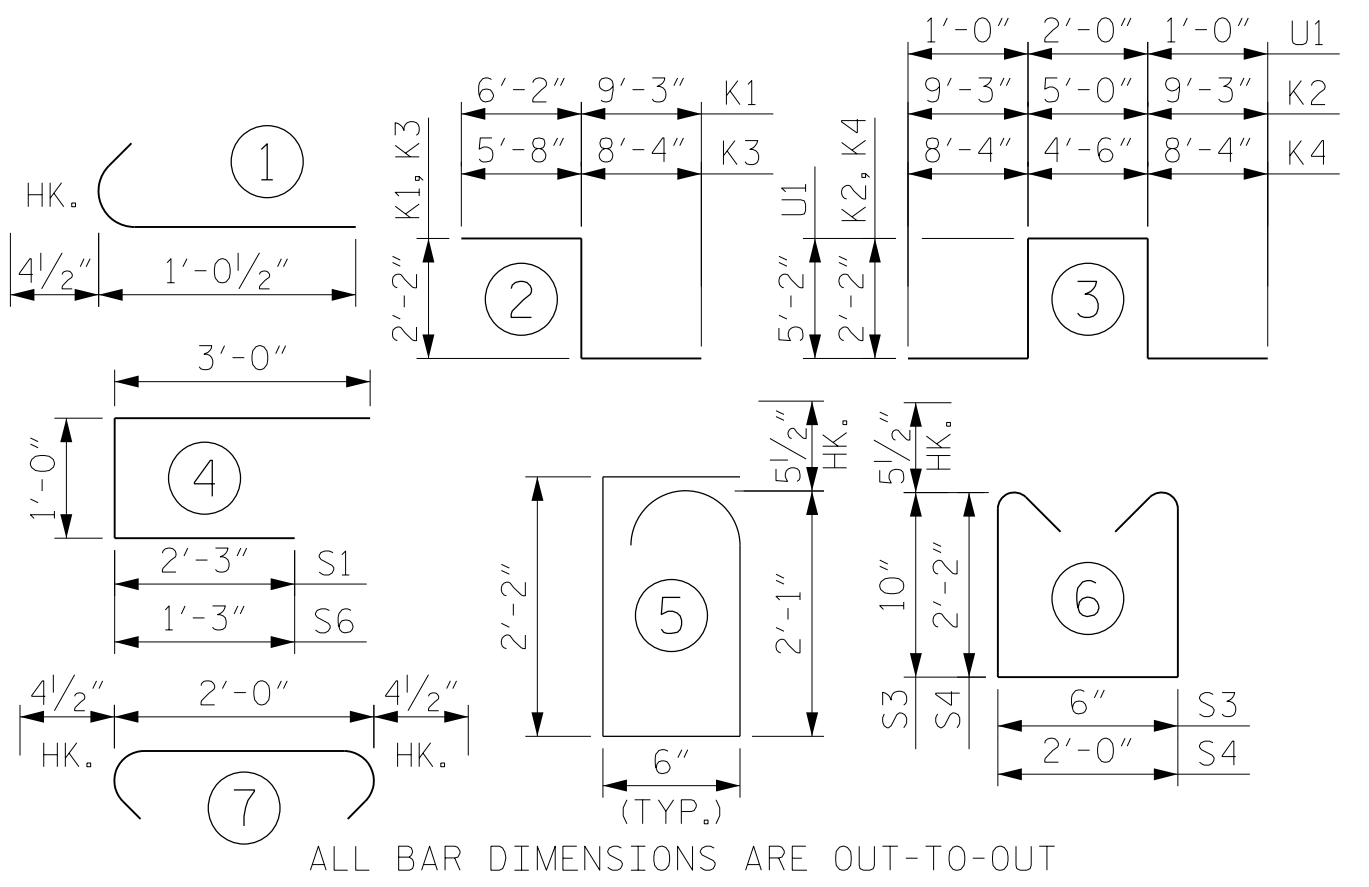
DRAWN BY: MRA DATE: 04/2020
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 DESIGN ENGINEER OF RECORD: RLB DATE: 09/2021

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"	--	--	--
#8	4'-9"	3'-2"	--	--	--

REINFORCING BAR SCHEDULE

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT			
*A101	399	#5	STR	40'-1"	16681	A230	1	#5	STR	34'-6"	36	B60	10	#5	STR	18'-7"	194
*A102	1	#5	STR	2'-0"	2	A231	1	#5	STR	35'-8"	37	B61	10	#5	STR	13'-5"	140
*A103	1	#5	STR	3'-2"	3	A232	1	#5	STR	36'-10"	38	B62	40	#5	STR	48'-8"	2030
*A104	1	#5	STR	4'-4"	5	A233	1	#5	STR	38'-0"	40	*G1	1	#5	STR	44'-2"	46
*A105	1	#5	STR	5'-6"	6	A234	1	#5	STR	39'-2"	41	*G2	1	#5	STR	40'-1"	42
*A106	1	#5	STR	6'-8"	7	*B1	98	#4	STR	24'-0"	1571	*J1	80	#4	1	1'-5"	76
*A107	1	#5	STR	7'-10"	8	*B2	49	#6	STR	60'-0"	4416	*K1	4	#8	2	17'-7"	188
*A108	1	#5	STR	9'-0"	9	*B3	48	#6	STR	34'-4"	2475	*K2	4	#8	3	27'-10"	297
*A109	1	#5	STR	10'-2"	11	*B4	49	#6	STR	21'-5"	1576	*K3	4	#8	2	16'-2"	173
*A110	1	#5	STR	11'-4"	12	*B5	98	#4	STR	39'-1"	2559	*K4	4	#8	3	25'-6"	272
*A111	1	#5	STR	12'-6"	13	*B6	1	#4	STR	40'-0"	27	*K5	6	#4	STR	11'-2"	45
*A112	1	#5	STR	13'-8"	14	*B7	1	#4	STR	39'-8"	26	*K6	6	#4	STR	10'-2"	41
*A113	1	#5	STR	14'-10"	15	*B8	1	#4	STR	37'-8"	25	*K7	3	#6	STR	11'-2"	50
*A114	1	#5	STR	15'-11"	17	*B9	1	#4	STR	38'-6"	26	*K8	3	#6	STR	9'-2"	41
*A115	1	#5	STR	17'-1"	18	*B10	1	#4	STR	38'-1"	25	*K9	3	#6	STR	7'-5"	33
*A116	1	#5	STR	18'-3"	19	*B11	1	#4	STR	37'-8"	25	*K10	6	#4	STR	6'-9"	27
*A117	1	#5	STR	19'-5"	20	*B12	1	#4	STR	37'-4"	25	*K11	12	#4	STR	10'-2"	81
*A118	1	#5	STR	20'-7"	21	*B13	1	#4	STR	36'-11"	25	*K12	6	#4	STR	9'-4"	37
*A119	1	#5	STR	21'-9"	23	*B14	1	#4	STR	36'-6"	24	*K13	6	#4	STR	9'-5"	26
*A120	1	#5	STR	22'-11"	24	*B15	1	#4	STR	36'-2"	24	*K14	5	#4	STR	33'-3"	111
*A121	1	#5	STR	24'-1"	25	*B16	1	#4	STR	35'-9"	24	*K15	1	#6	STR	32'-4"	49
*A122	1	#5	STR	25'-3"	26	*B17	1	#4	STR	35'-4"	24	*K16	3	#6	STR	6'-9"	30
*A123	1	#5	STR	26'-5"	28	*B18	1	#4	STR	34'-7"	23	*S1	24	#4	4	6'-3"	100
*A124	1	#5	STR	27'-7"	29	*B19	1	#4	STR	34'-2"	23	*S2	48	#5	5	5'-9"	288
*A125	1	#5	STR	28'-9"	30	*B20	1	#4	STR	33'-10"	23	S3	24	#5	6	3'-1"	77
*A126	1	#5	STR	29'-11"	31	*B21	1	#4	STR	33'-5"	22	S4	6	#4	6	7'-3"	29
*A127	1	#5	STR	31'-1"	32	*B22	1	#4	STR	33'-0"	22	S5	90	#4	7	2'-9"	165
*A128	1	#5	STR	32'-3"	34	*B23	1	#4	STR	32'-7"	22	*S6	24	#4	4	5'-3"	84
*A129	1	#5	STR	33'-5"	35	*B24	1	#4	STR	32'-3"	22	*U1	21	#4	2	14'-4"	201
*A130	1	#5	STR	34'-6"	36	*B25	1	#4	STR	31'-10"	21	REINFORCING STEEL					29,669 LBS.
*A131	1	#5	STR	35'-8"	37	*B26	1	#4	STR	31'-6"	21	*EPOXY COATED REINFORCING STEEL					33,134 LBS.
*A132	1	#5	STR	36'-10"	38	*B27	1	#4	STR	31'-1"	21	GROOVING BRIDGE FLOORS					
*A133	1	#5	STR	38'-0"	40	*B28	1	#4	STR	30'-8"	20	APPROACH SLABS	1440	SO. FT.			
*A134	1	#5	STR	39'-2"	41	*B29	1	#4	STR	30'-4"	20	BRIDGE DECK	6580	SO. FT.			
*A135	3	#6	STR	19'-3"	87	*B30	1	#4	STR	29'-11"	20	TOTAL	8020	SO. FT.			
A201	399	#5	STR	40'-1"	16681	*B31	1	#4	STR	29'-6"	20	CLASS AA CONCRETE					
A202	1	#5	STR	2'-0"	2	*B32	1	#4	STR	29'-2"	19	POUR 1	142.6	CU. YDS.			
A203	1	#5	STR	3'-2"	3	*B33	1	#4	STR	28'-9"	19	POUR 2	187.5	CU. YDS.			
A204	1	#5	STR	4'-4"	5	*B34	1	#4	STR	28'-4"	19	POUR 3	16.1	CU. YDS.			
A205	1	#5	STR	5'-6"	6	*B35	1	#4	STR	28'-0"	19	* * TOTAL	346.2	CU. YDS.			
A206	1	#5	STR	6'-8"	7	*B36	1	#4	STR	27'-7"	18	* * QUANTITIES FOR PARAPET AND SIDEWALK ARE NOT INCLUDED					
A207	1	#5	STR	7'-10"	8	*B37	1	#4	STR	27'-2"	18						
A208	1	#5	STR	9'-0"	9	*B38	1	#4	STR	26'-10"	18						
A209	1	#5	STR	10'-2"	11	*B39	1	#4	STR	26'-5"	18						
A210	1	#5	STR	11'-4"	12	*B40	1	#4	STR	26'-0"	17						
A211	1	#5	STR	12'-6"	13	*B41	1	#4	STR	25'-8"	17						
A212	1	#5	STR	13'-8"	14	*B42	1	#4	STR	25'-3"	17						
A213	1	#5	STR	14'-10"	15	*B43	1	#4	STR	24'-10"	17						
A214	1	#5	STR	15'-11"	17	*B44	1	#4	STR	24'-6"	16						
A215	1	#5	STR	17'-1"	18	*B45	1	#4	STR	24'-1"	16						
A216	1	#5	STR	18'-3"	19	*B46	1	#4	STR	23'-8"	16						
A217	1	#5	STR	19'-5"	20	*B47	1	#4	STR	23'-4"	16						
A218	1	#5	STR	20'-7"	21	*B48	1	#4	STR	22'-11"	15						
A219	1	#5	STR	21'-9"	23	*B49	1	#4	STR	22'-6"	15						
A220	1	#5	STR	22'-11"	24	*B50	1	#4	STR	22'-2"	15						
A221	1	#5	STR	24'-1"	25	*B51	1	#4	STR	21'-9"	15						
A222	1	#5	STR	25'-3"	26	*B52	1	#4	STR	21'-4"	14						
A223	1	#5	STR	26'-5"	28	*B53	1	#4	STR	21'-6"	15						
A224	1	#5	STR	27'-7"	29	*B54	1	#4	STR	20'-7"	1224						
A225	1	#5	STR	28'-9"	30	B55	30	#5	STR	39'-1"	2446						
A226	1	#5	STR	29'-11"	31	B56	57	#5	STR	23'-9"	248						
A227	1	#5	STR	31'-1"	32	B57	57	#5	STR								
A228	1	#5	STR	32'-3"	34	B58	60	#5	STR								
A229	1	#5	STR	33'-5"	35	B59	10	#5	STR								

BAR TYPES



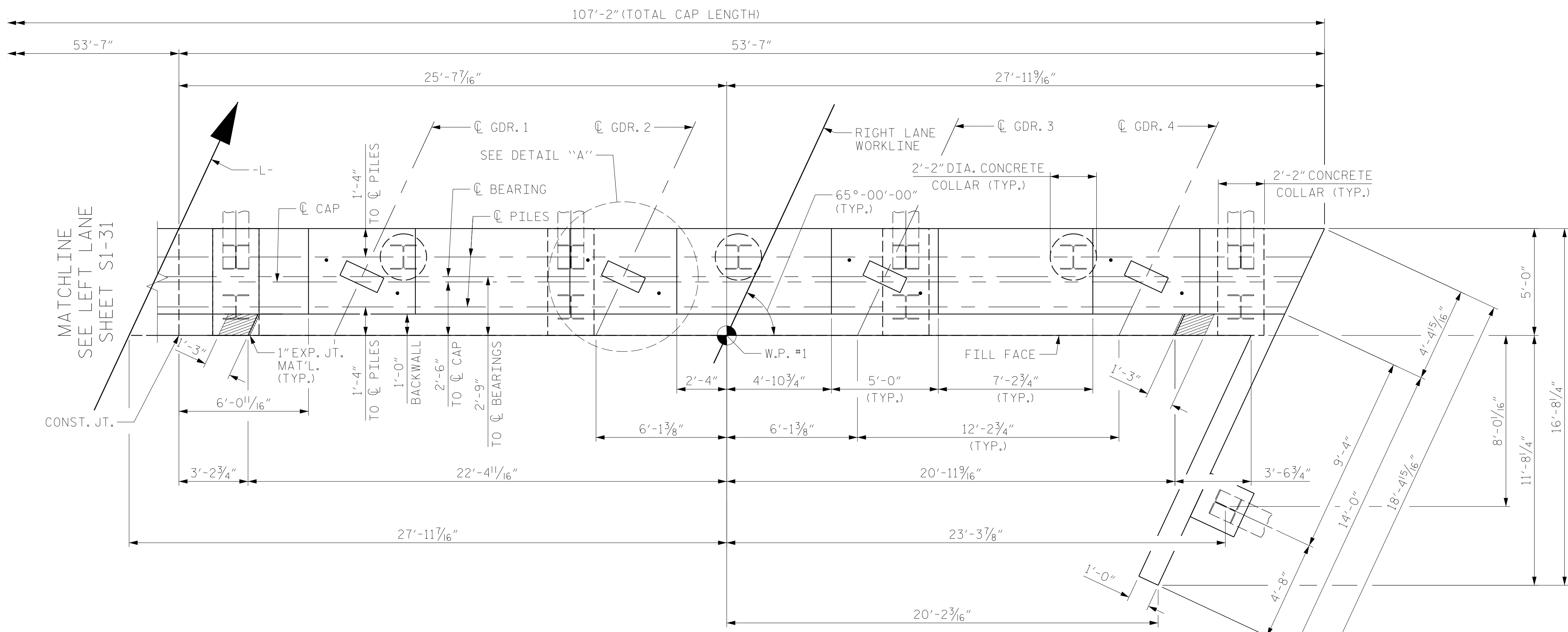
ALL BAR DIMENSIONS ARE OUT-TO-OUT

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 CUMBERLAND COUNTY
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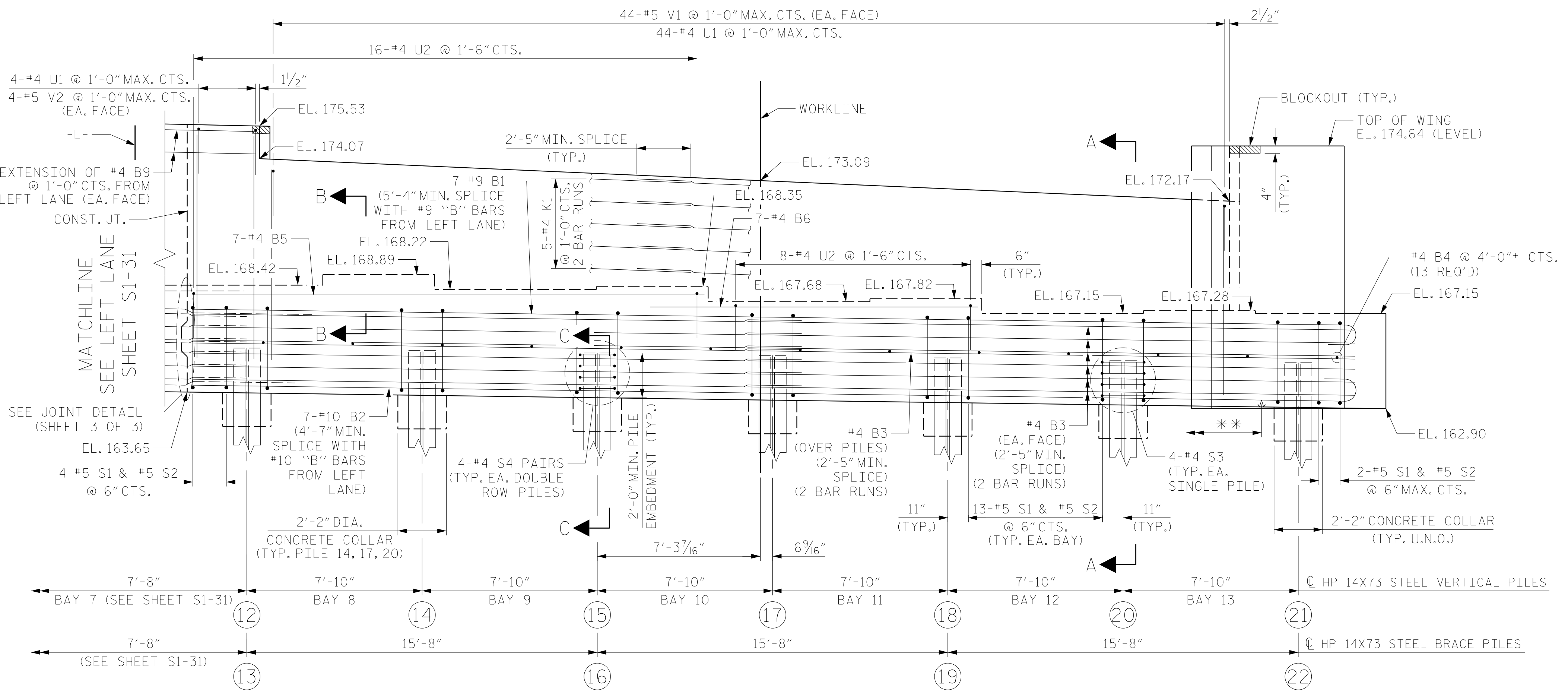


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE BILL OF MATERIAL RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

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PARTIAL PLAN

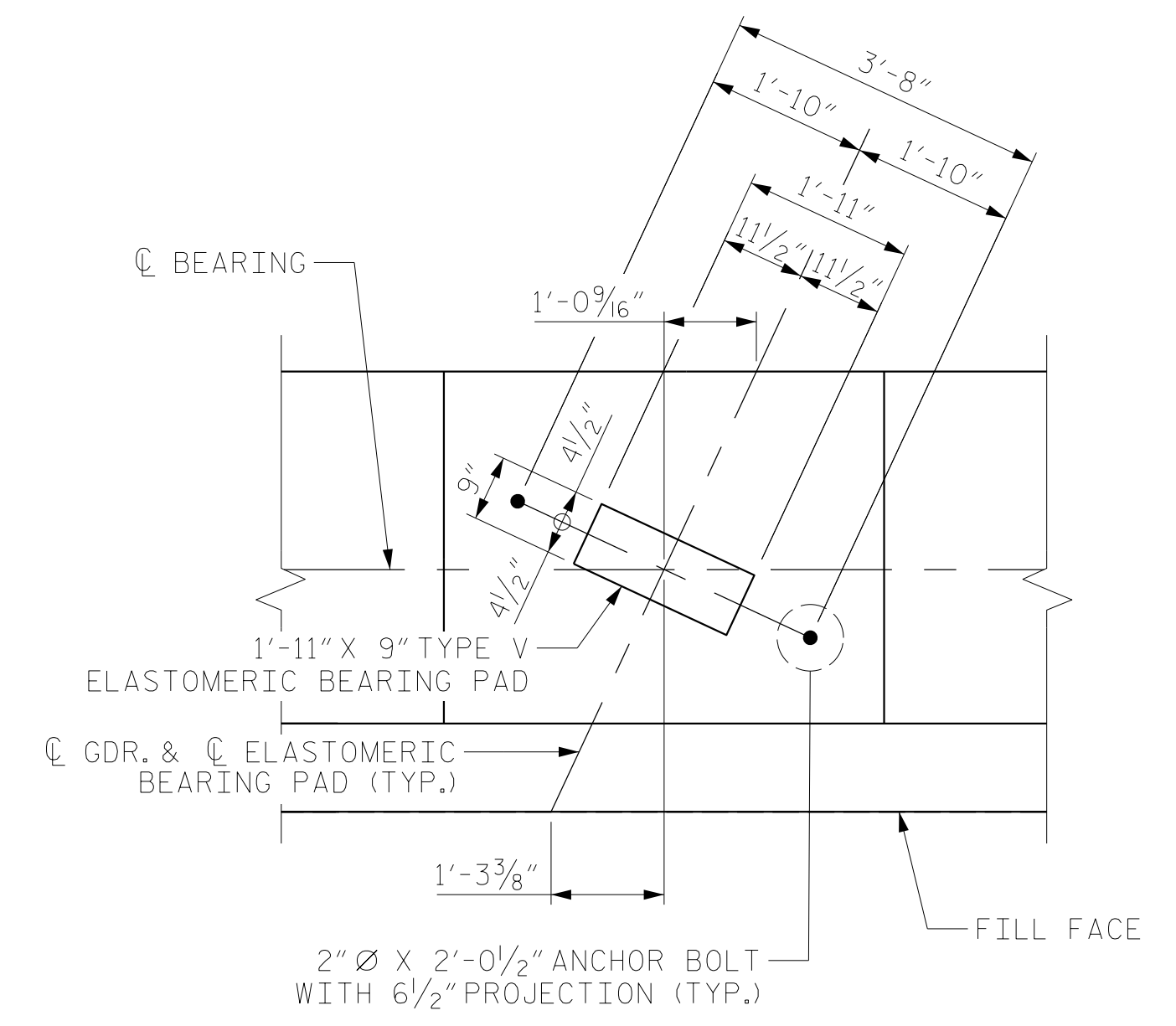


PARTIAL ELEVATION

BRACE PILE IN WING NOT SHOWN FOR CLARITY

NOTES:

- FOR SECTION A-A, PARTIAL SECTION B-B, AND PARTIAL SECTION C-C, SEE SHEET 3 OF 3.
- STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATION, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE AREA OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.



DETAIL "A"

PILES NOT SHOWN FOR CLARITY

TOP OF PILE ELEVATIONS						
PILE 12	PILE 14	PILE 15	PILE 17	PILE 18	PILE 20	PILE 21
165.61	165.50	165.39	165.28	165.18	165.07	164.96
PILE 13	PILE 16		PILE 19	PILE 22		
165.61	165.39		165.18	164.96		

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SHEET 1 OF 3

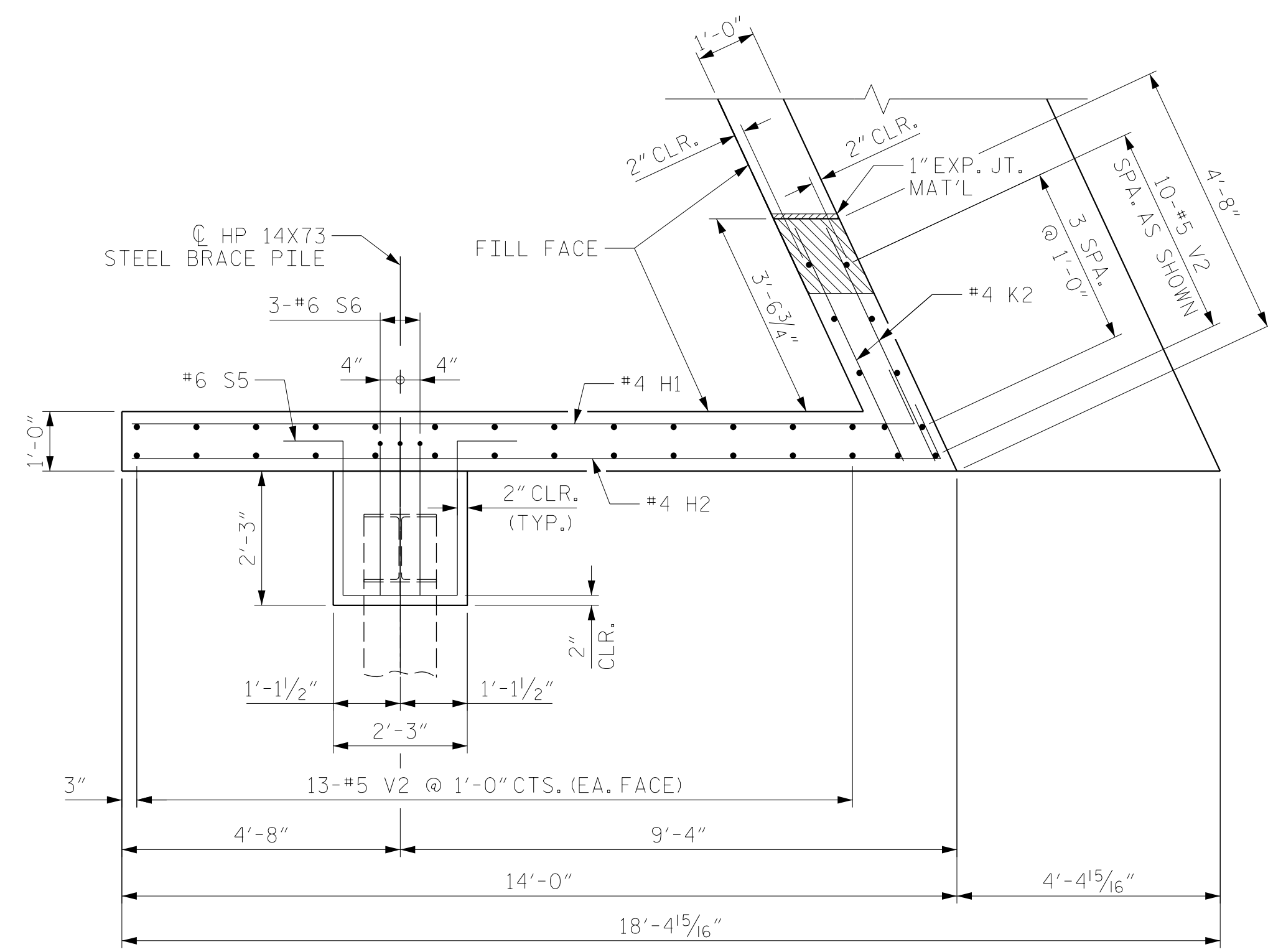
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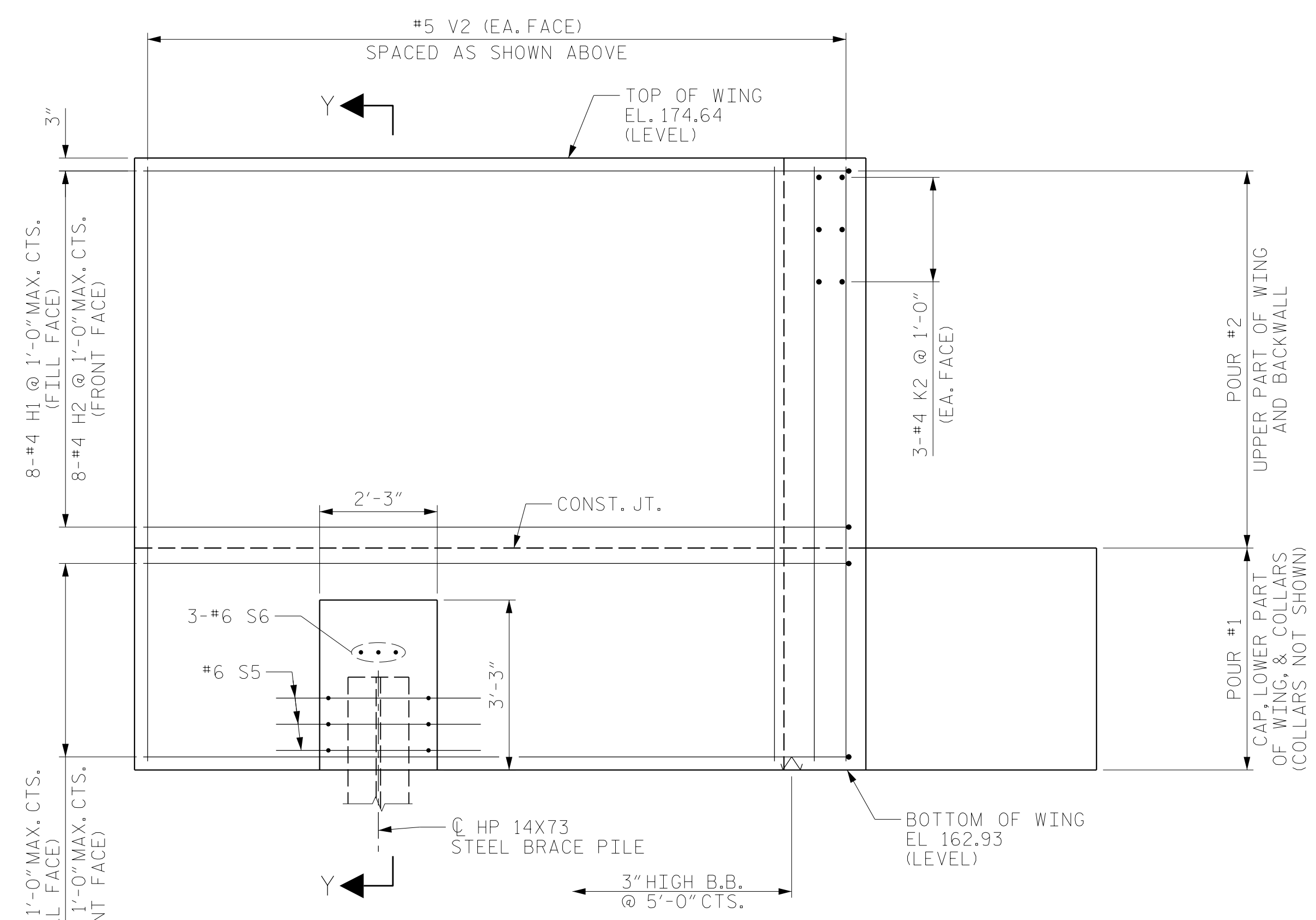
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SUBSTRUCTURE					
END BENT 1 PARTIAL PLAN AND ELEVATION					
RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

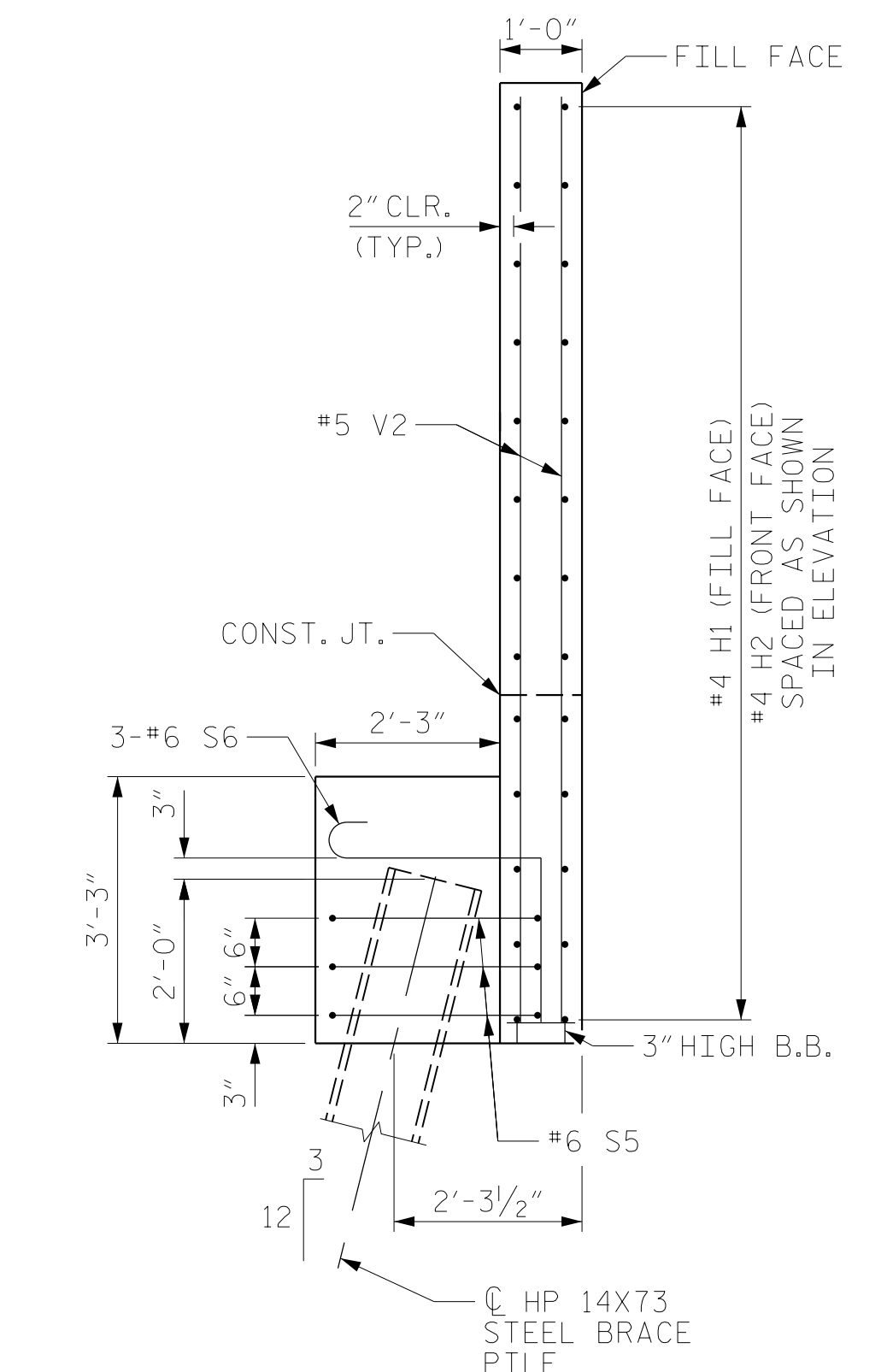
SHEET NO. S2-31	TOTAL SHEETS 43
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PLAN OF WING



ELEVATION OF WING



SECTION Y-Y

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



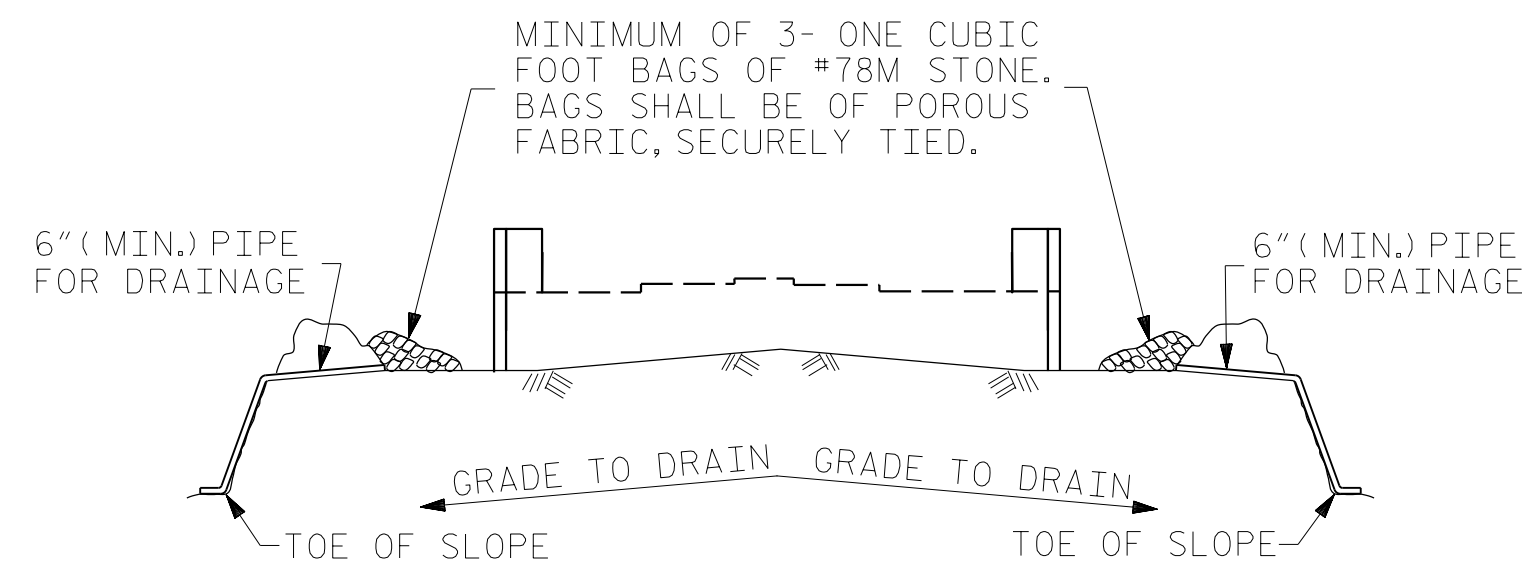
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 WING WALL DETAILS
 RIGHT LANE

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1			3			TOTAL SHEETS
2			4			43

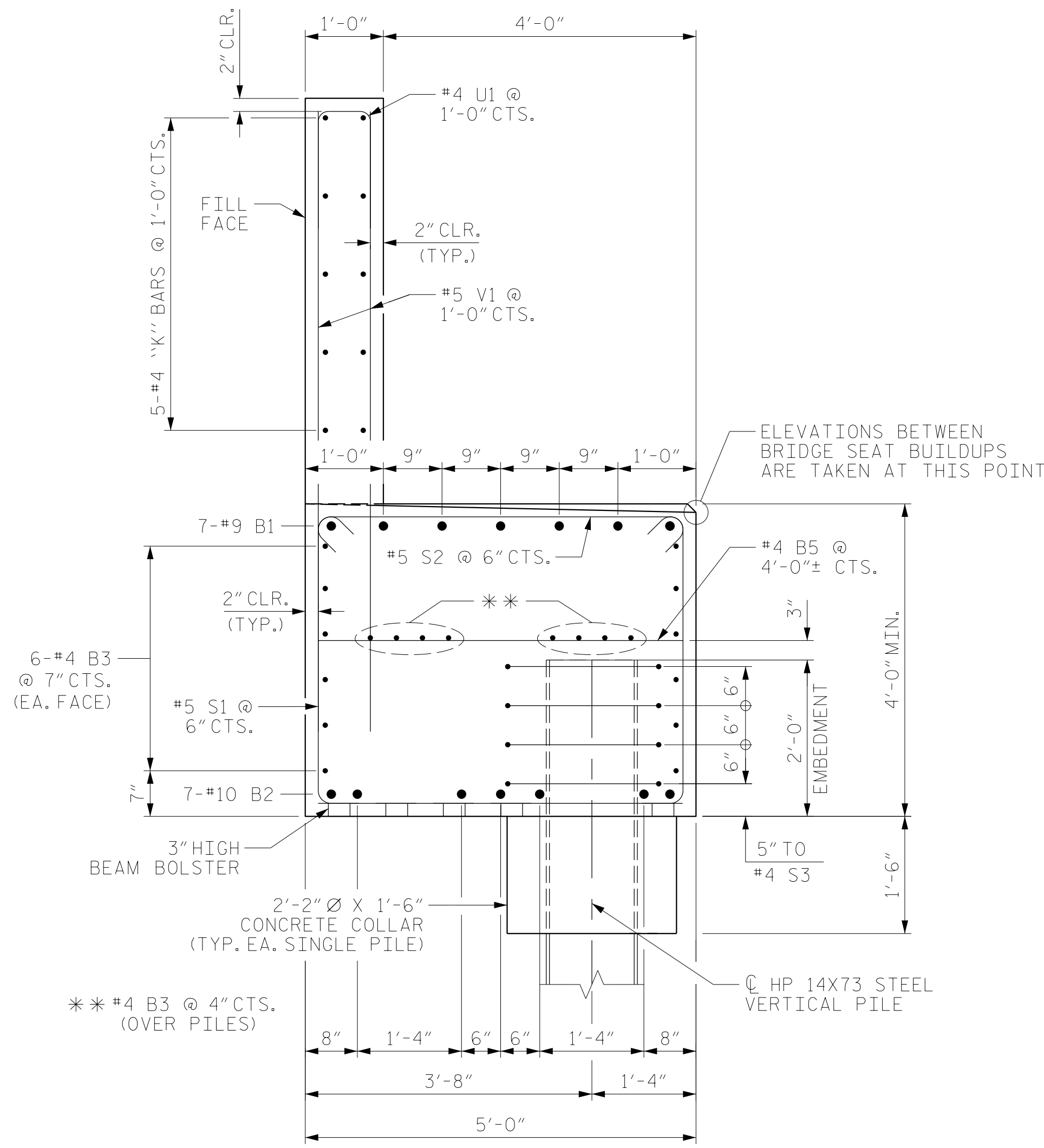


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

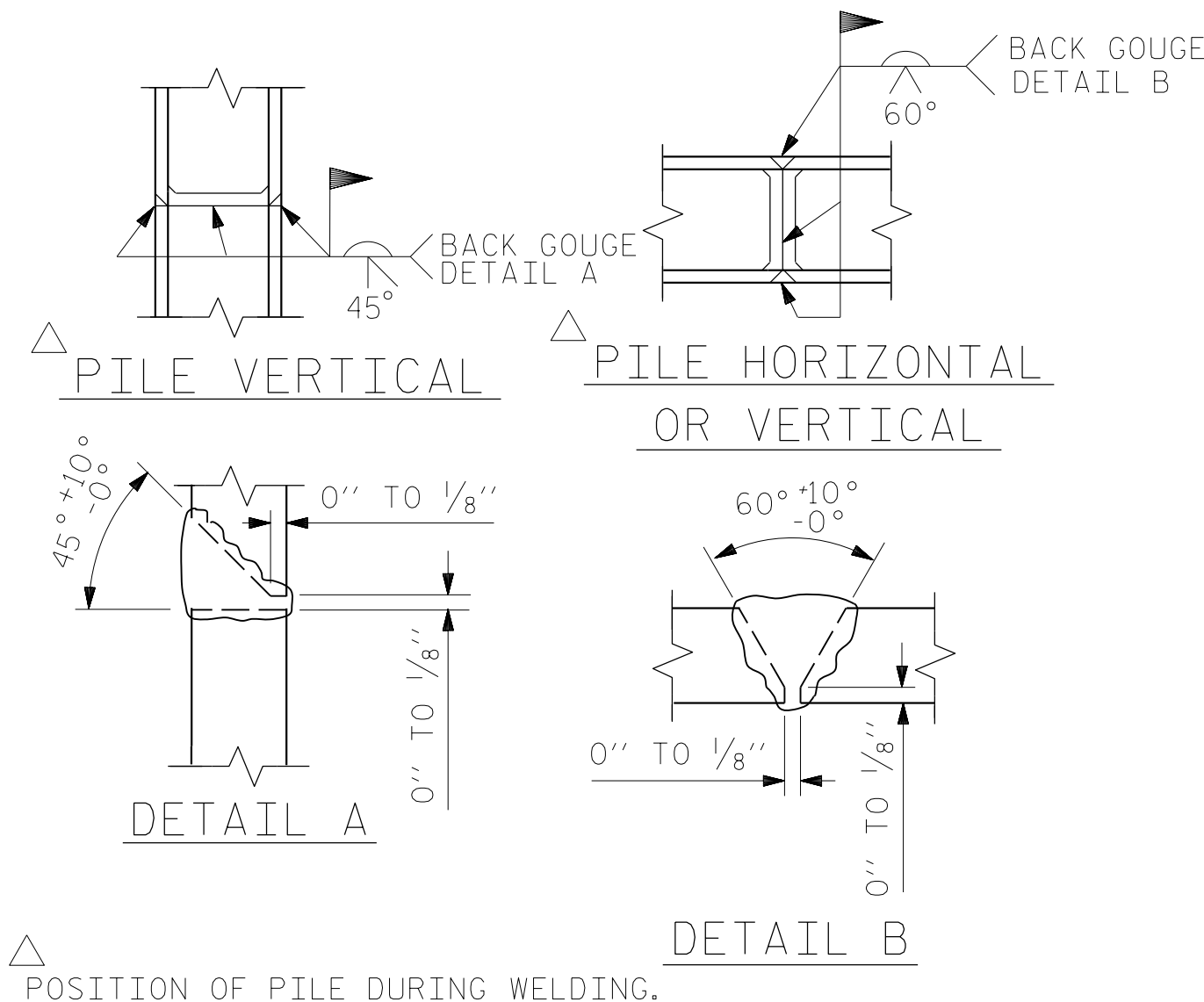
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

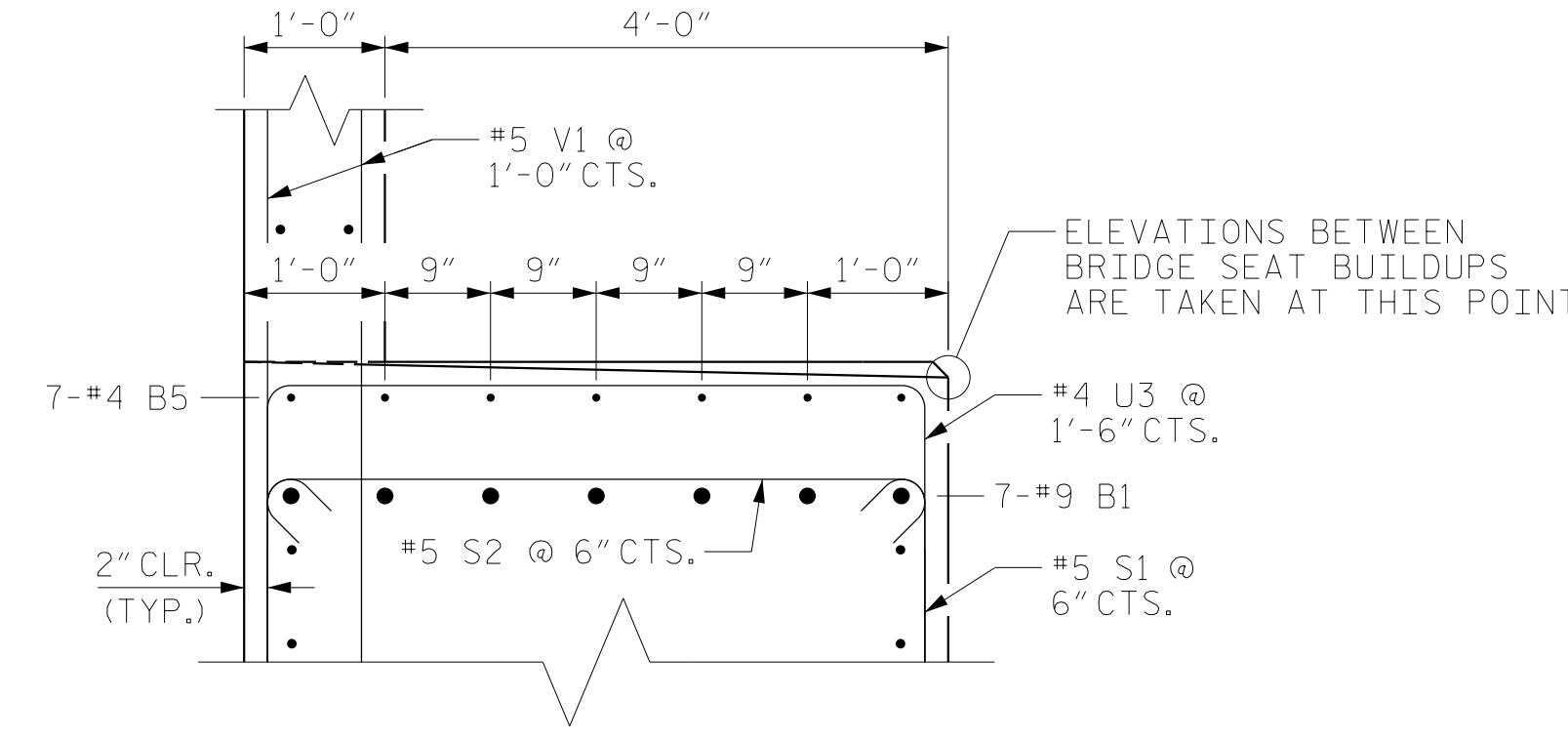
TEMPORARY DRAINAGE AT END BENT



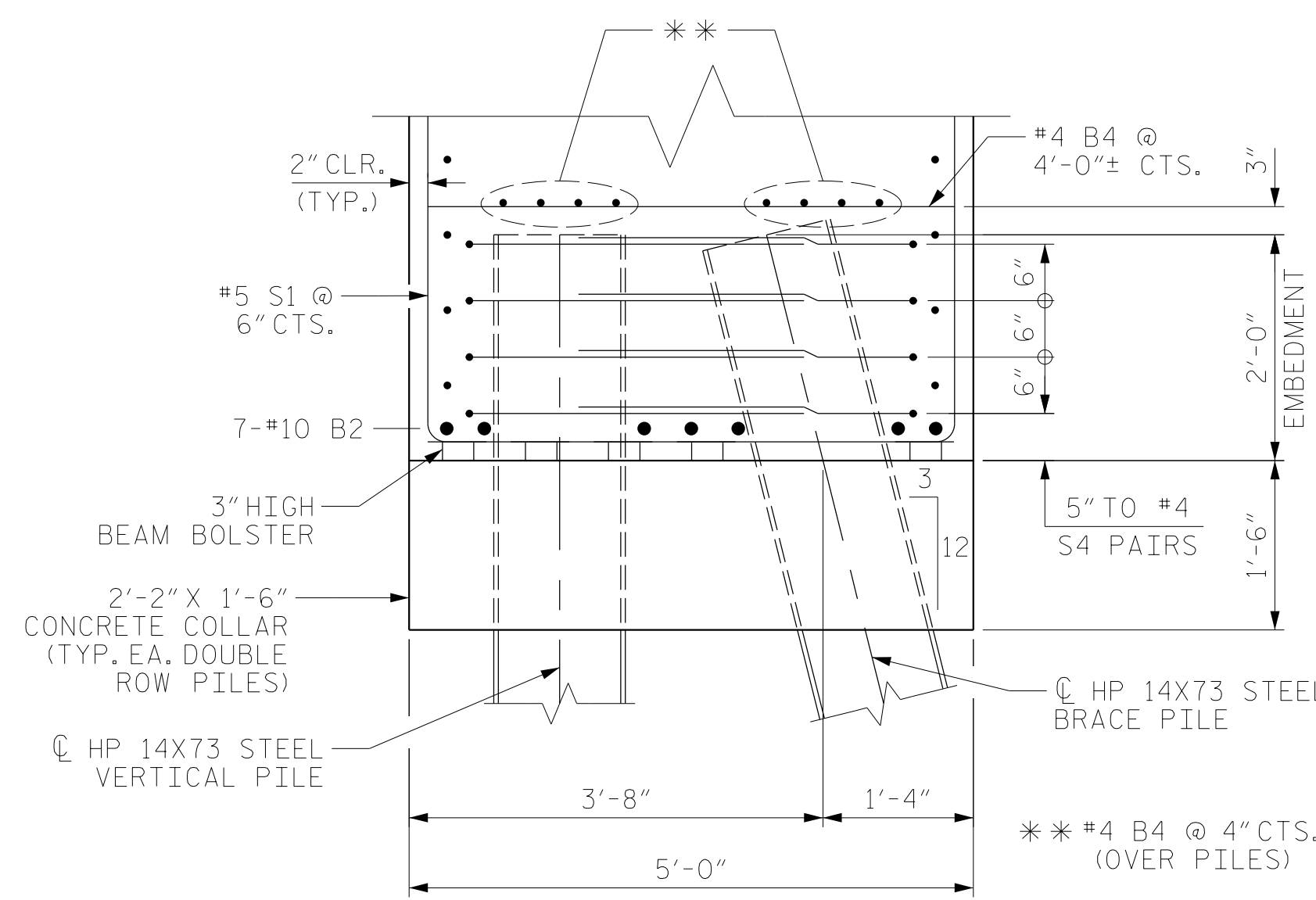
SECTION A-A



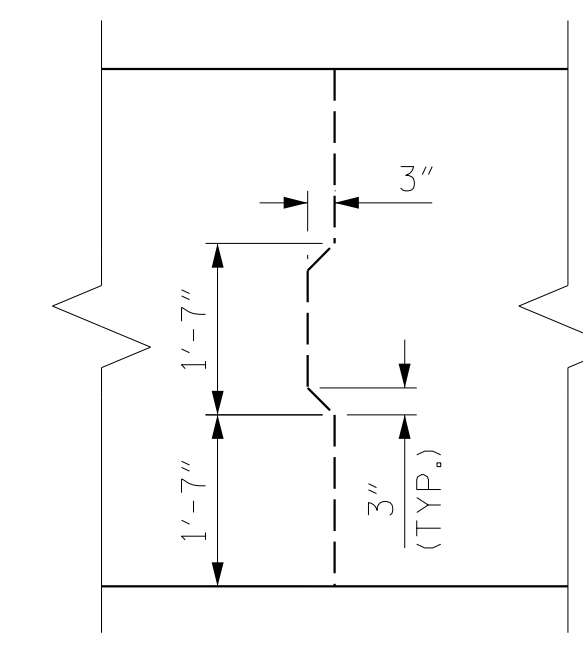
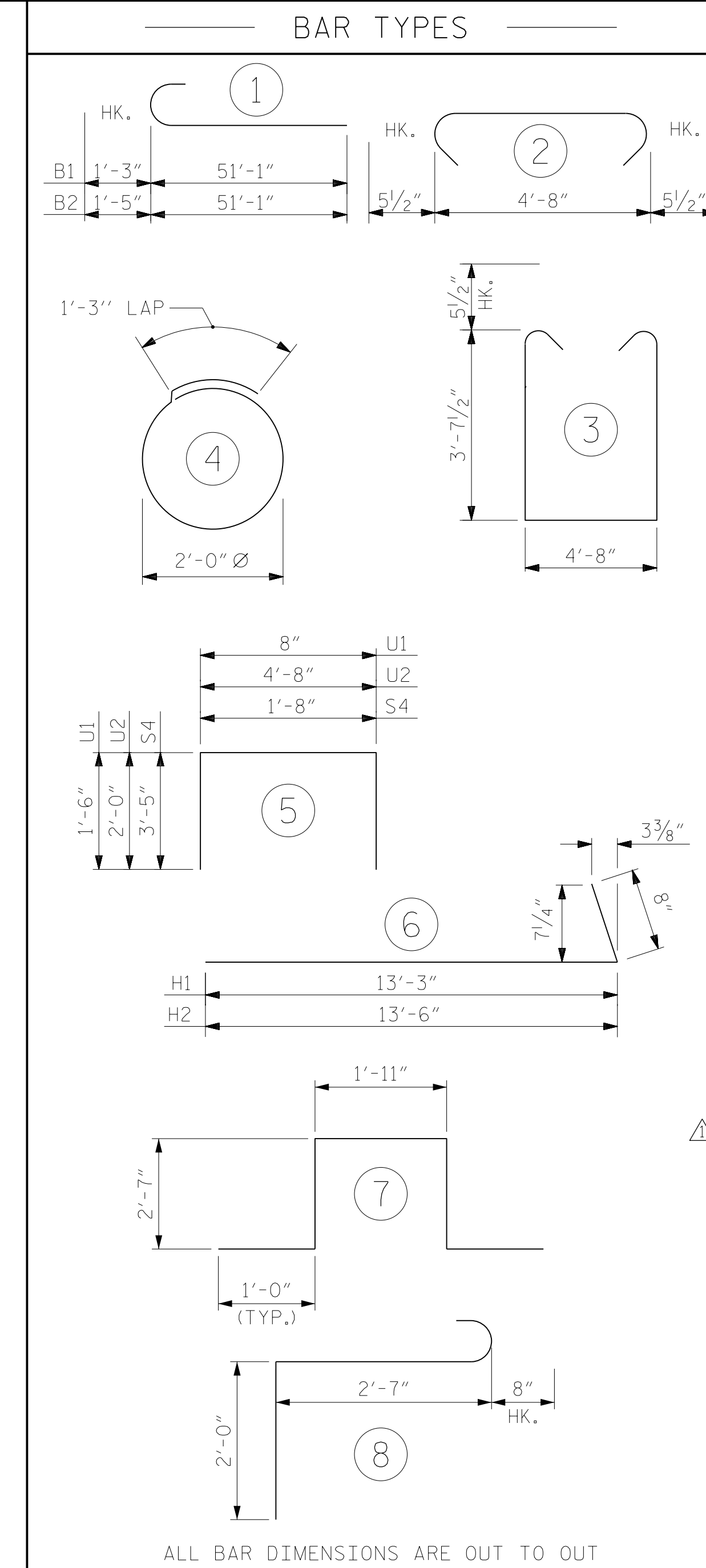
PILE SPLICE DETAILS



PARTIAL SECTION B-B



PARTIAL SECTION C-C



JOINT DETAIL
REINFORCING STEEL NOT SHOWN FOR CLARITY

BILL OF MATERIAL					
END BENT NO. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#9	1	52'-4"	1246	
B2	#10	1	52'-6"	1581	
B3	#4	STR	26'-9"	715	
B4	#4	STR	4'-8"	41	
B5	#4	STR	22'-11"	107	
B6	#4	STR	14'-8"	69	
H1	#4	6	13'-11"	121	
H2	#4	6	14'-2"	123	
K1	#4	STR	26'-10"	358	
K2	#4	STR	4'-3"	17	
S1	#5	3	12'-10"	1124	
S2	#5	2	5'-7"	489	
S3	#4	4	7'-7"	61	
S4	#4	5	8'-6"	182	
S5	#6	7	9'-1"	41	
S6	#6	8	5'-3"	24	
U1	#4	5	3'-8"	118	
U2	#4	5	8'-8"	139	
V1	#5	STR	8'-6"	780	
V2	#5	STR	11'-4"	520	
REINFORCING STEEL				7,856	LBS.
CLASS A CONCRETE					
POUR #1 CAP, COLLARS AND LOWER PART OF WING				52.0	C.Y.
POUR #2 UPPER PART OF WING AND BACKWALL				15.3	C.Y.
TOTAL CLASS A CONCRETE				67.3	C.Y.
HP 14 X 73 STEEL PILES NO. 12				720.0	LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES				NO. 12	
PILE REDRIVES (FOR ONE END BENT)				NO. 6	

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

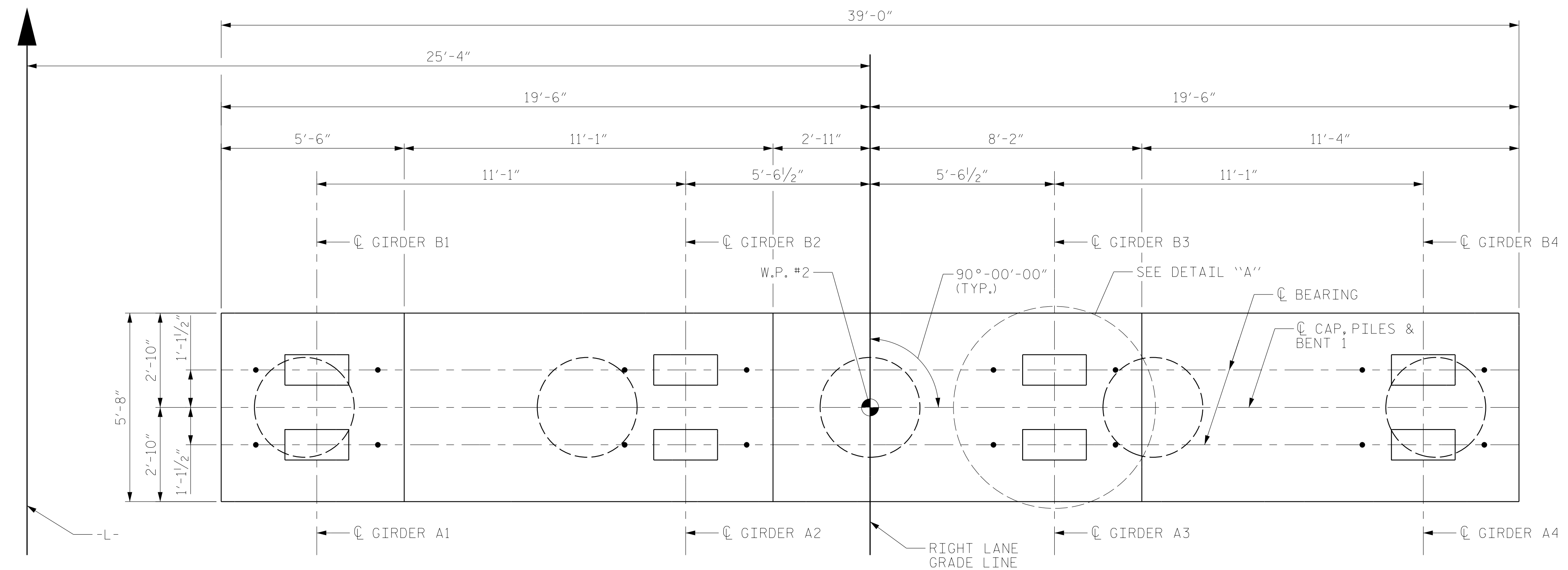
SHEET 3 OF 3



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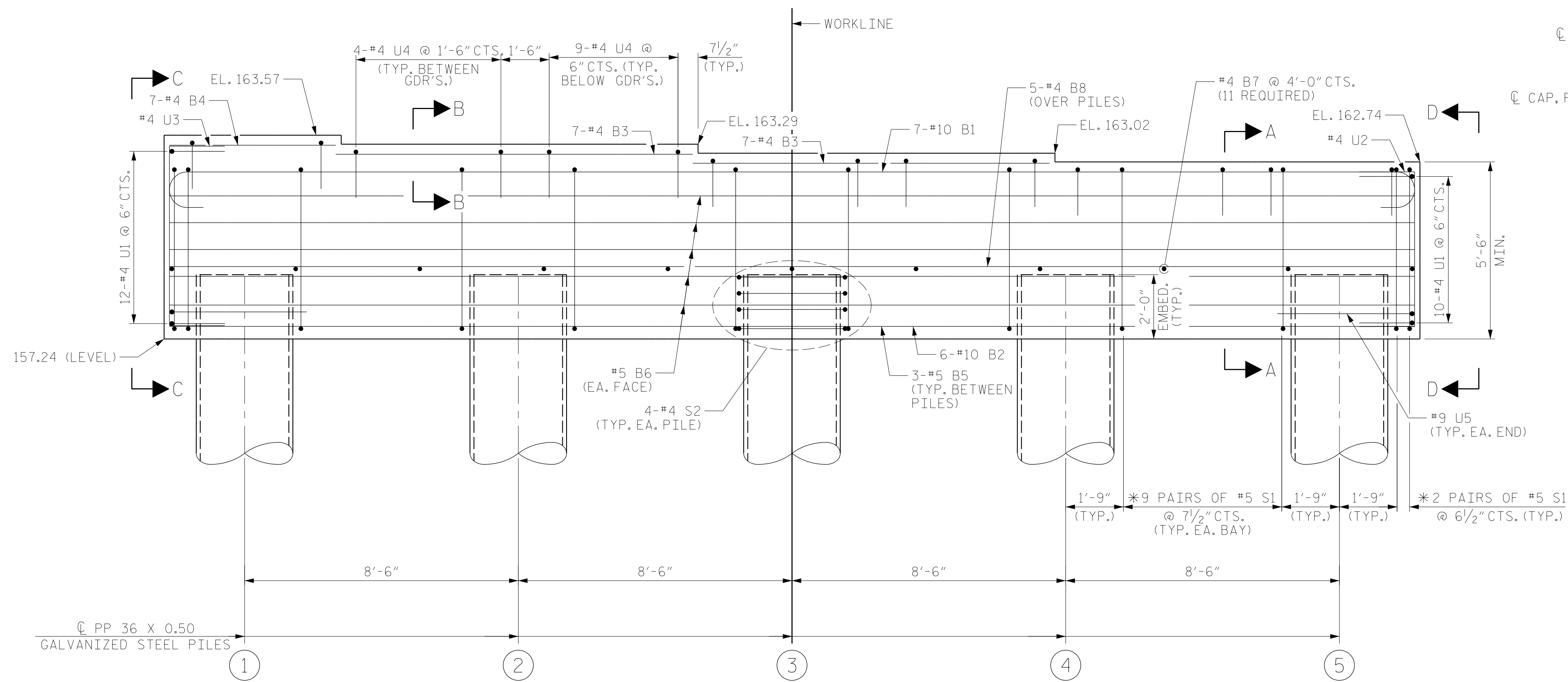
REVISD HP 14X73 STEEL PILE COUNT AND LENGTH



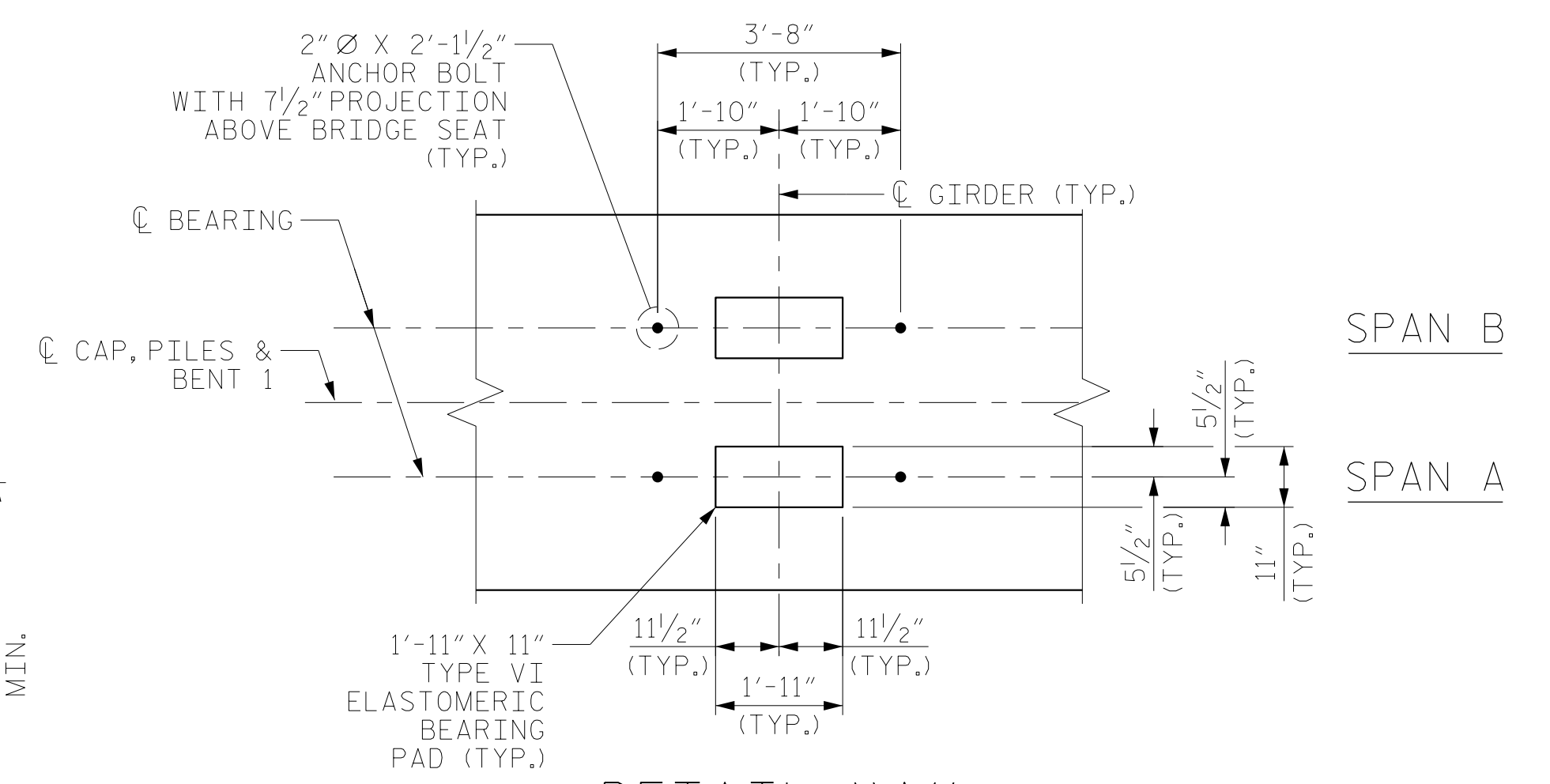
PLAN

SPAN B
SPAN A

NOTES:
 FOR SECTION A-A, PARTIAL SECTION B-B, VIEW C-C AND VIEW D-D, SEE SHEET 2 OF 3.
 FOR REINFORCING STEEL BILL OF MATERIAL, SEE SHEET 2 OF 3.
 FOR ADDITIONAL REINFORCING STEEL AND CONCRETE IN PP 36 X 0.50 GALVANIZED STEEL PILES, SEE SHEET 3 OF 3.
 HOOKS ON V1 BARS IN CONCRETE PLUGS MAY BE TURNED AS NECESSARY TO AVOID EMBEDDED ANCHOR BOLTS.
 S1 AND U4 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 U1, U2 AND U3 BARS MAY BE ROTATED AS NECESSARY SO THAT LEGS OF BARS CLEAR PIPE PILES.
 *INVERT ALTERNATE #5 S1 STIRRUPS.
 GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 30 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



ELEVATION



DETAIL "A"

DIMENSIONS TYPICAL FOR EACH BEARING. PILES AND STEP NOT SHOWN FOR CLARITY.

SPAN B
SPAN A

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3

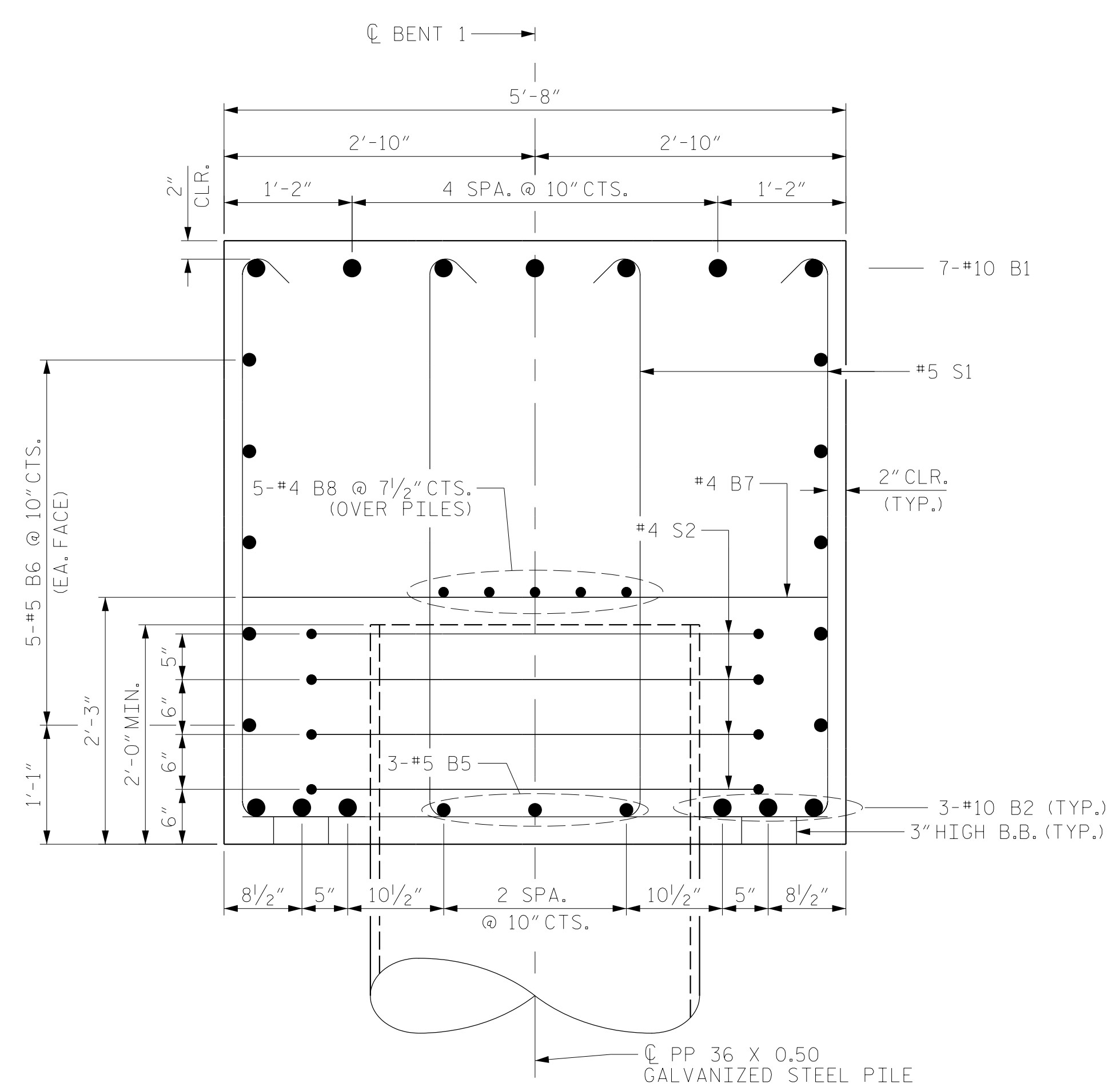


STATE OF NORTH CAROLINA
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 SUBSTRUCTURE
 BENT 1
 RIGHT LANE

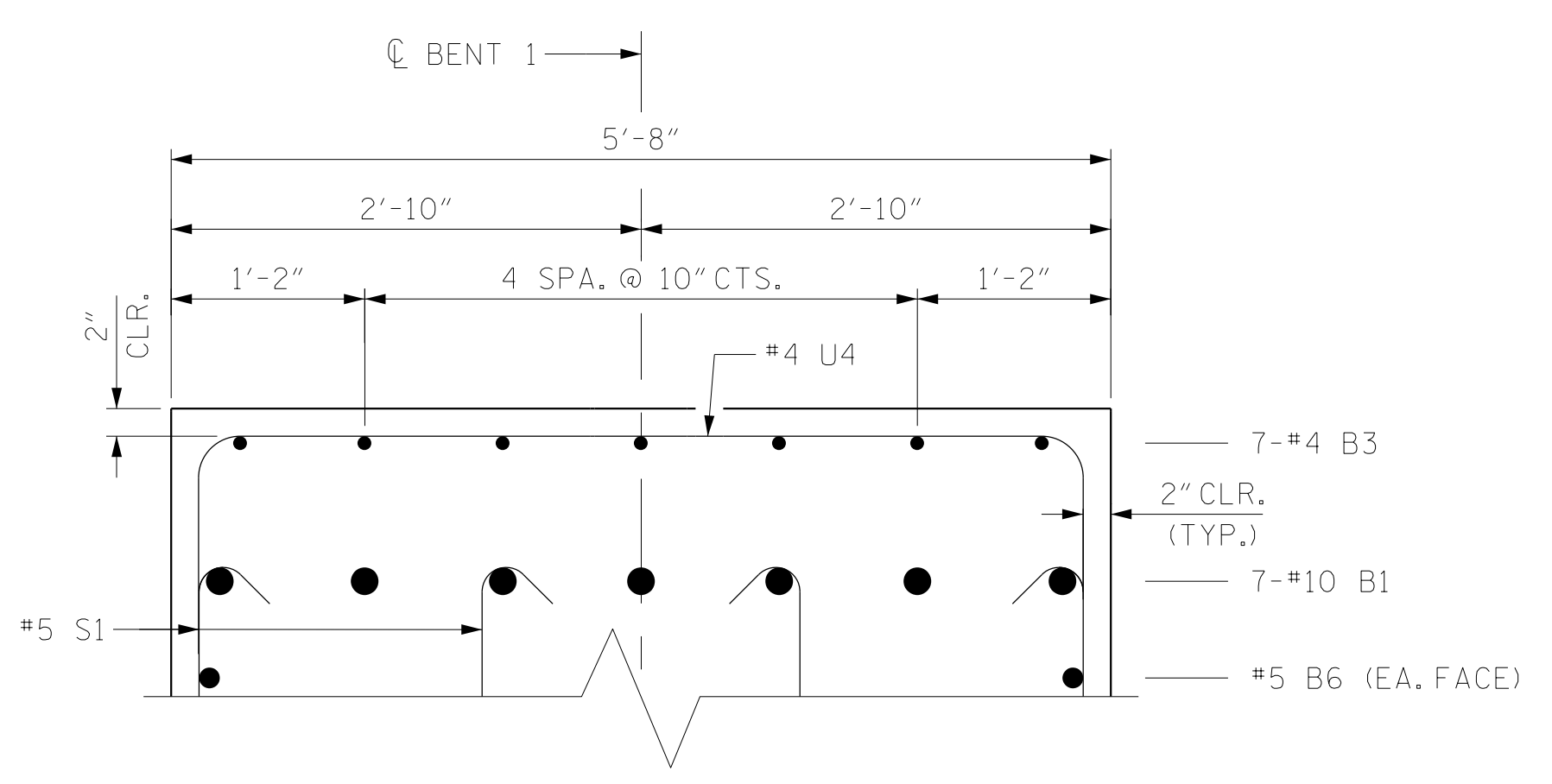
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-34
1			3			TOTAL SHEETS
2			4			43

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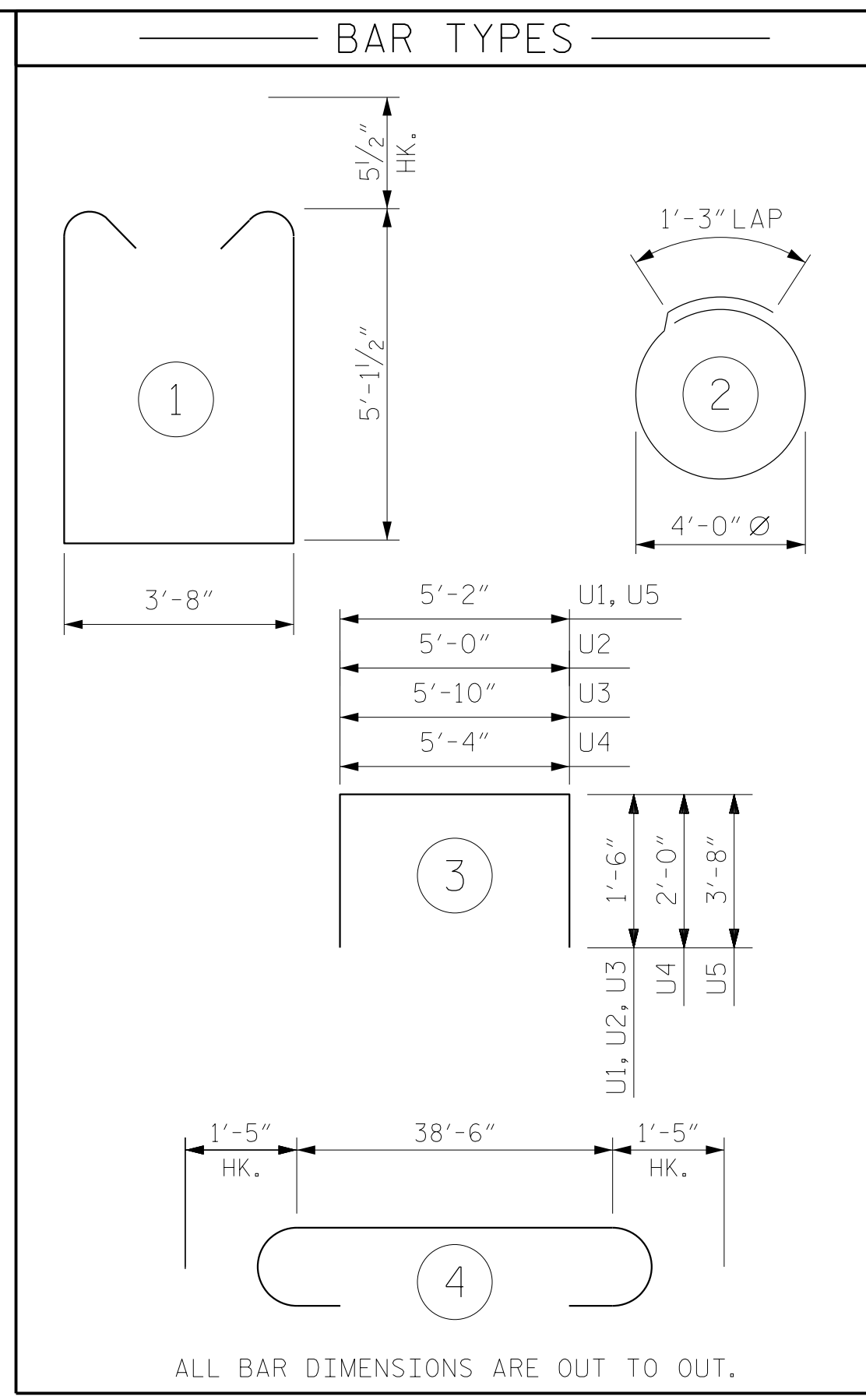
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SECTION A-A

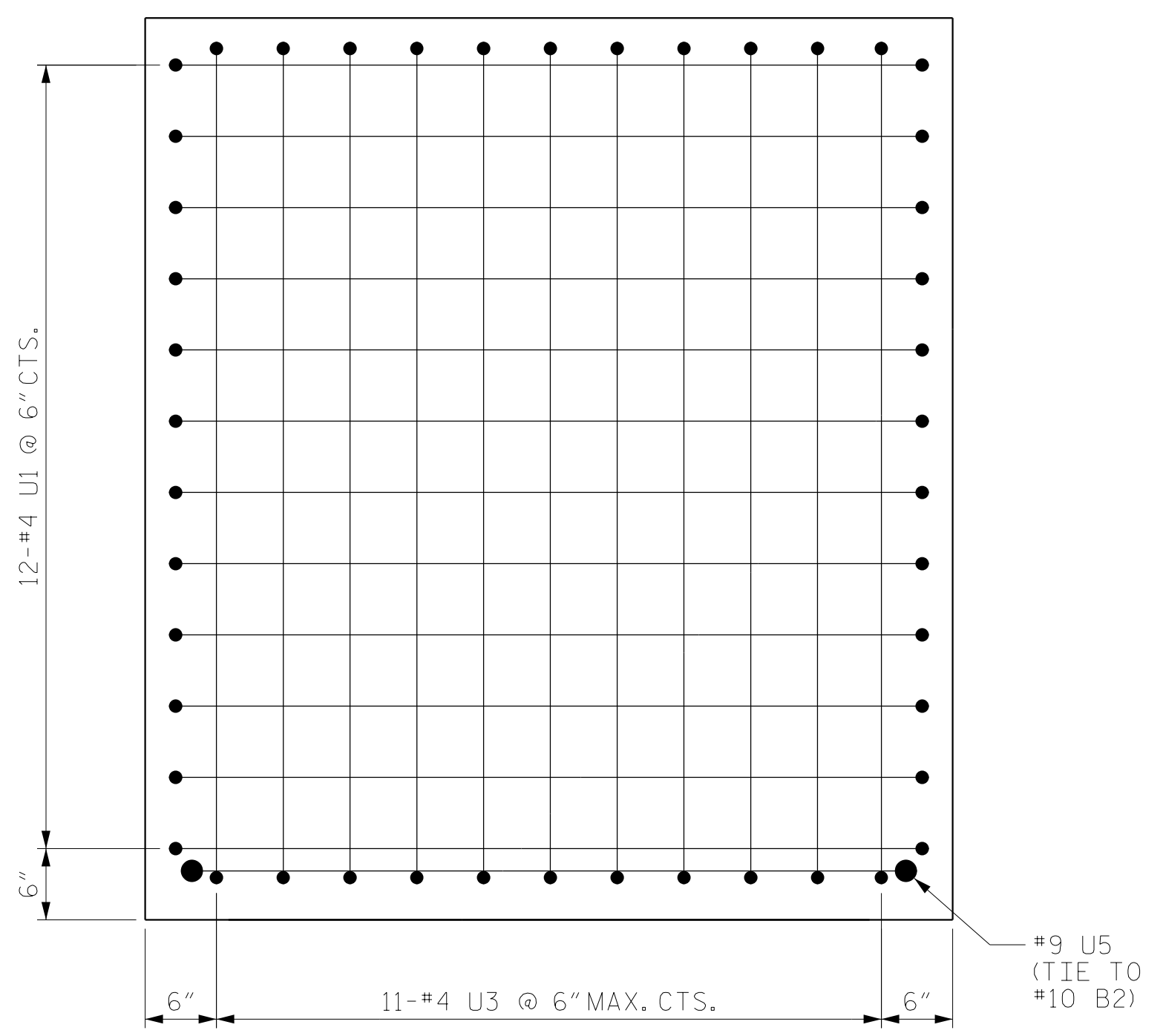


PARTIAL SECTION B-B

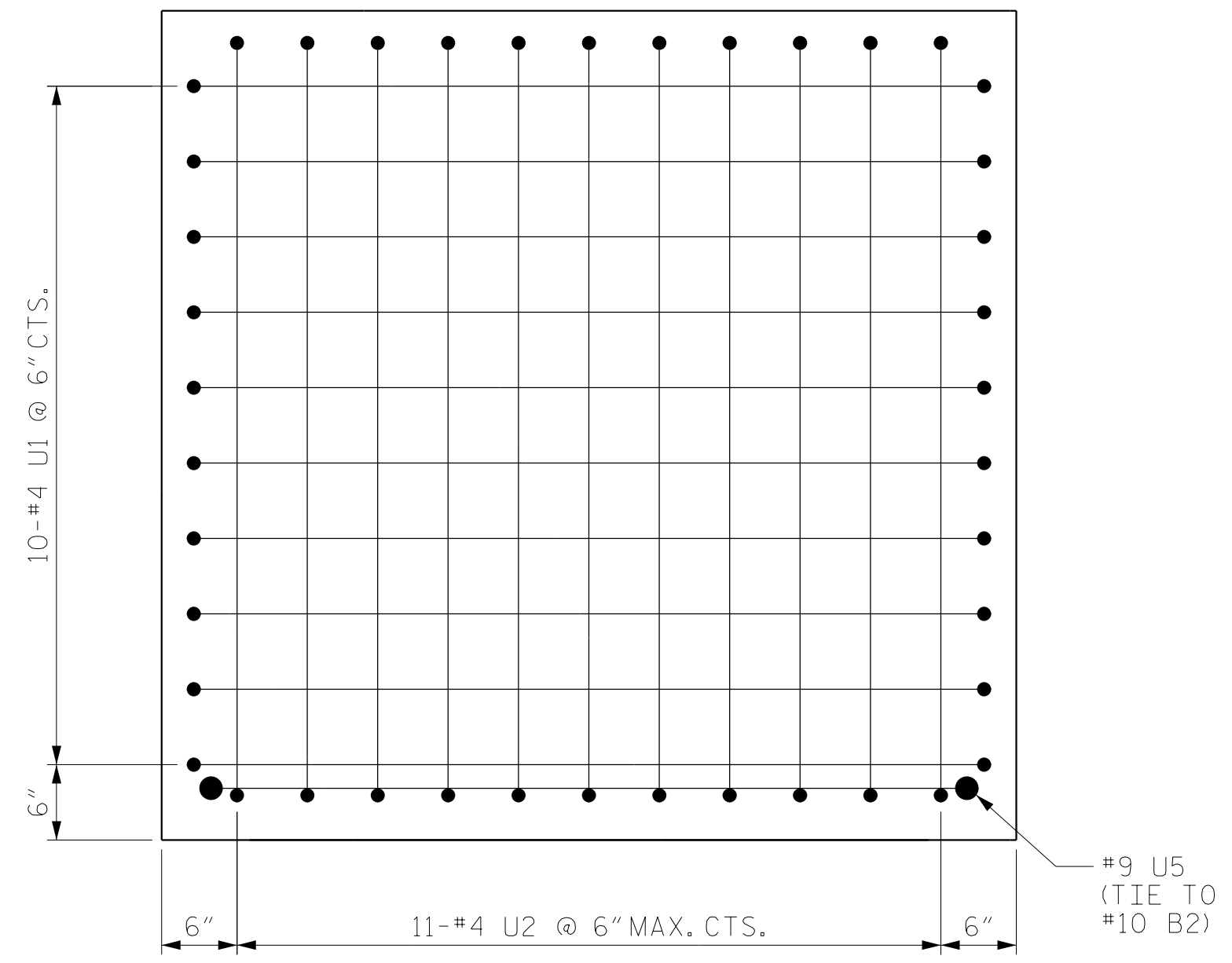


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#10	4	41'-4"	1245	
B2	6	#10	STR.	38'-8"	998	
B3	14	#4	STR.	11'-1"	104	
B4	7	#4	STR.	5'-2"	24	
B5	12	#5	STR.	5'-0"	63	
B6	10	#5	STR.	38'-8"	403	
B7	11	#4	STR.	5'-4"	39	
B8	5	#4	STR.	38'-8"	129	
S1	80	#5	1	14'-10"	1238	
S2	20	#4	2	13'-10"	185	
U1	22	#4	3	8'-2"	120	
U2	11	#4	3	8'-0"	59	
U3	11	#4	3	8'-10"	65	
U4	48	#4	3	9'-4"	299	
U5	2	#9	3	12'-6"	85	
REINFORCING STEEL					5,056 LBS.	
▲ CLASS A CONCRETE					45.3 C.Y.	
PP 36 X 0.50 GALVANIZED STEEL PILES						
BENT NO. 1		NO. 5		600.0 LIN. FT.		
PILE DRIVING EQUIPMENT SETUP FOR PP 36 X 0.50 GALVANIZED STEEL PILES						NO. 5
PILE REDRIVES						NO. 3
▲ CONCRETE DISPLACED BY THE PP 36 X 0.50 GALVANIZED STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.						



VIEW C-C



VIEW D-D

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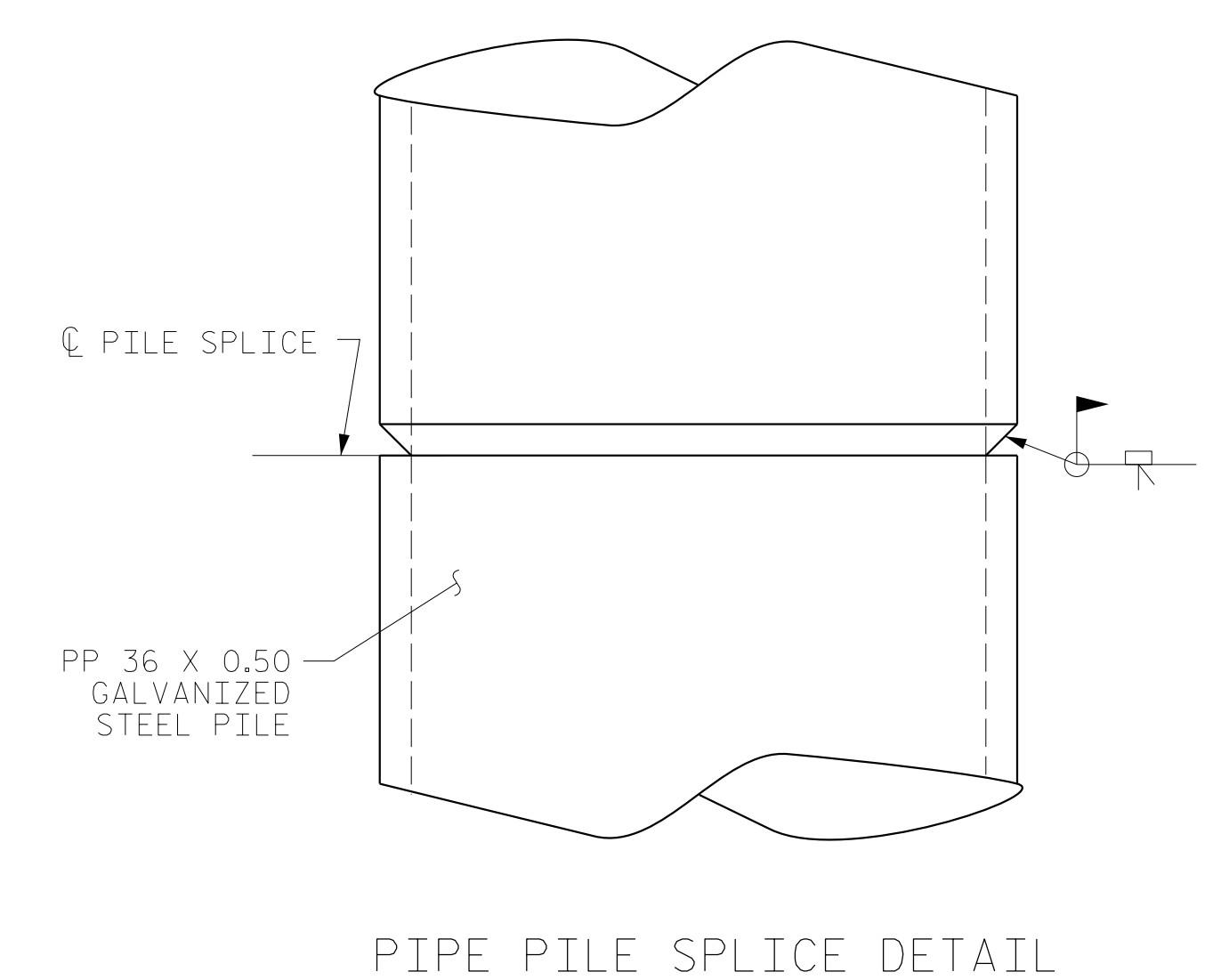
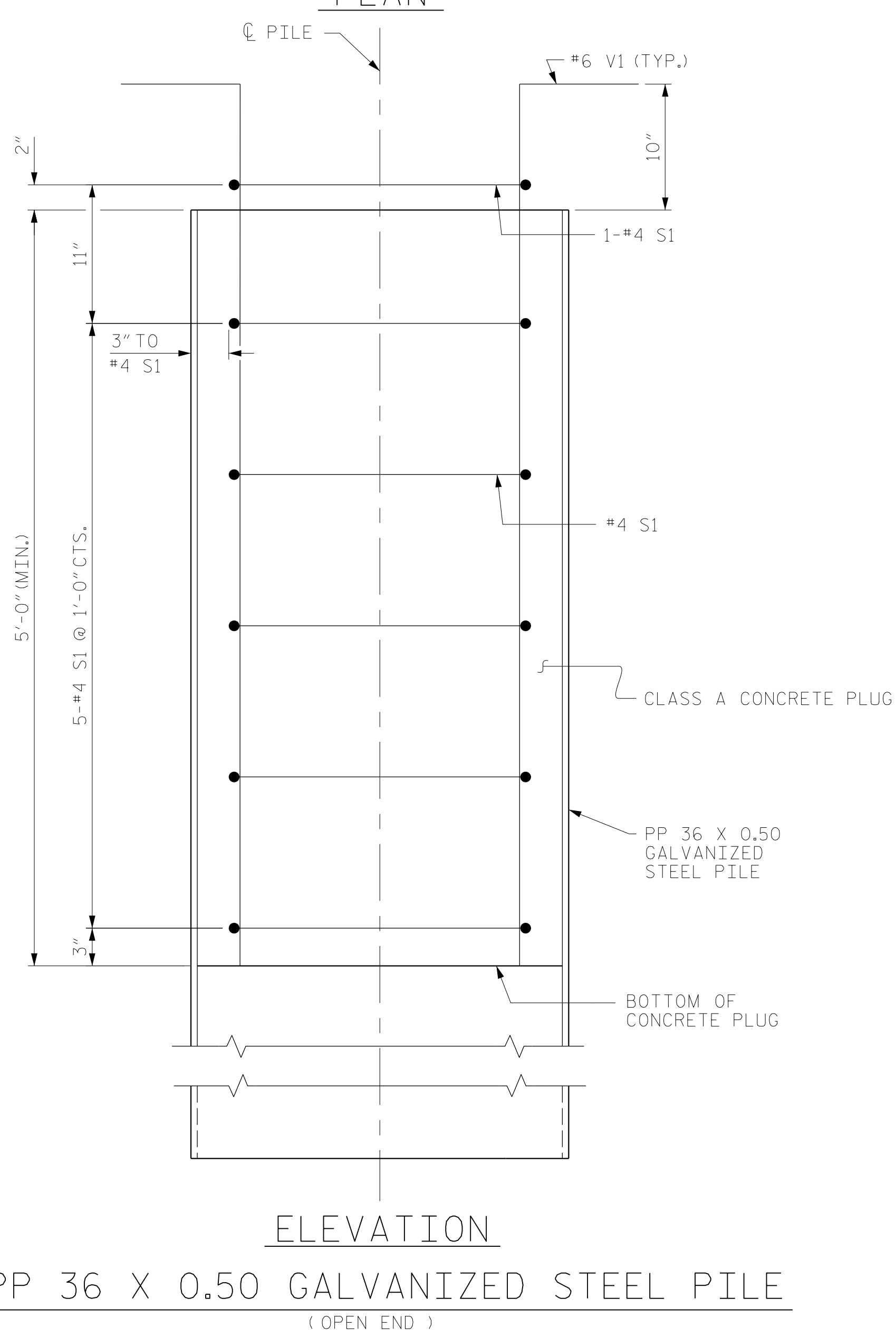
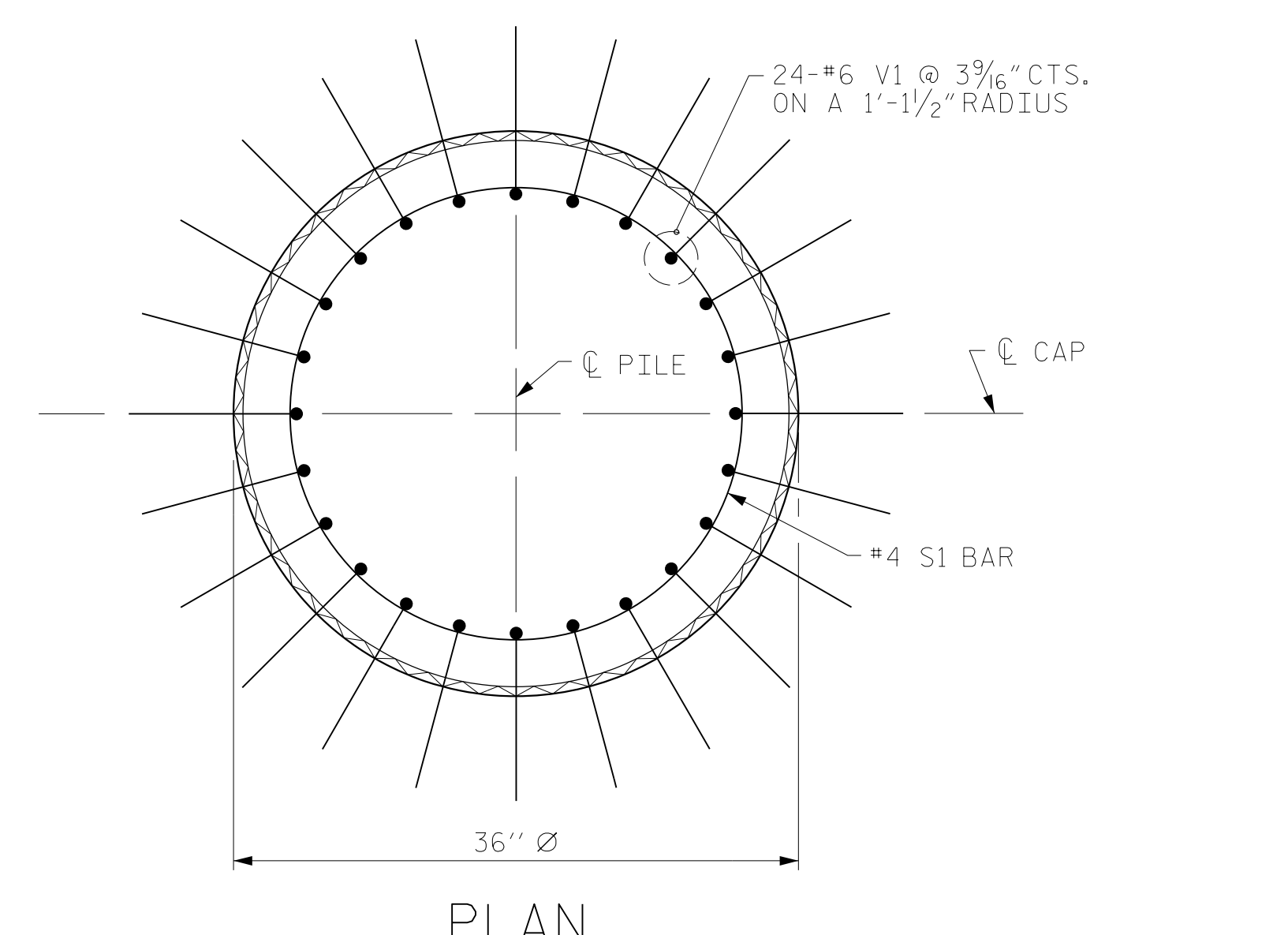
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PROJECT NO. U-5798A
 CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1
 DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-35
1			3			TOTAL SHEETS
2			4			43



NOTES:

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE TOP 30 FEET OF EACH INTERIOR BENT STEEL PIPE PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 36 X 0.50 GALVANIZED STEEL PILES.

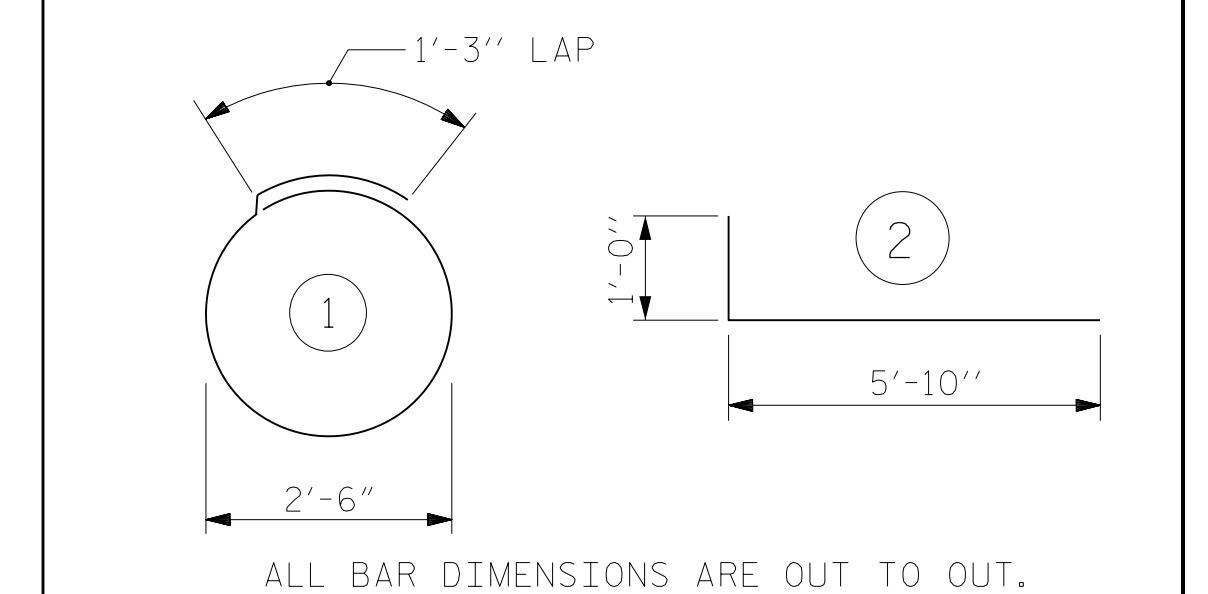
BILL OF MATERIAL FOR ONE PP 36 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	9'-1"	36
V1	24	#6	2	6'-10"	246

REINFORCING STEEL 282 LBS.

CLASS A CONCRETE
5'-0" MINIMUM PLUG 1.2 C.Y.

BAR TYPES



PP 36 X 0.50 GALVANIZED STEEL PILE (OPEN END)

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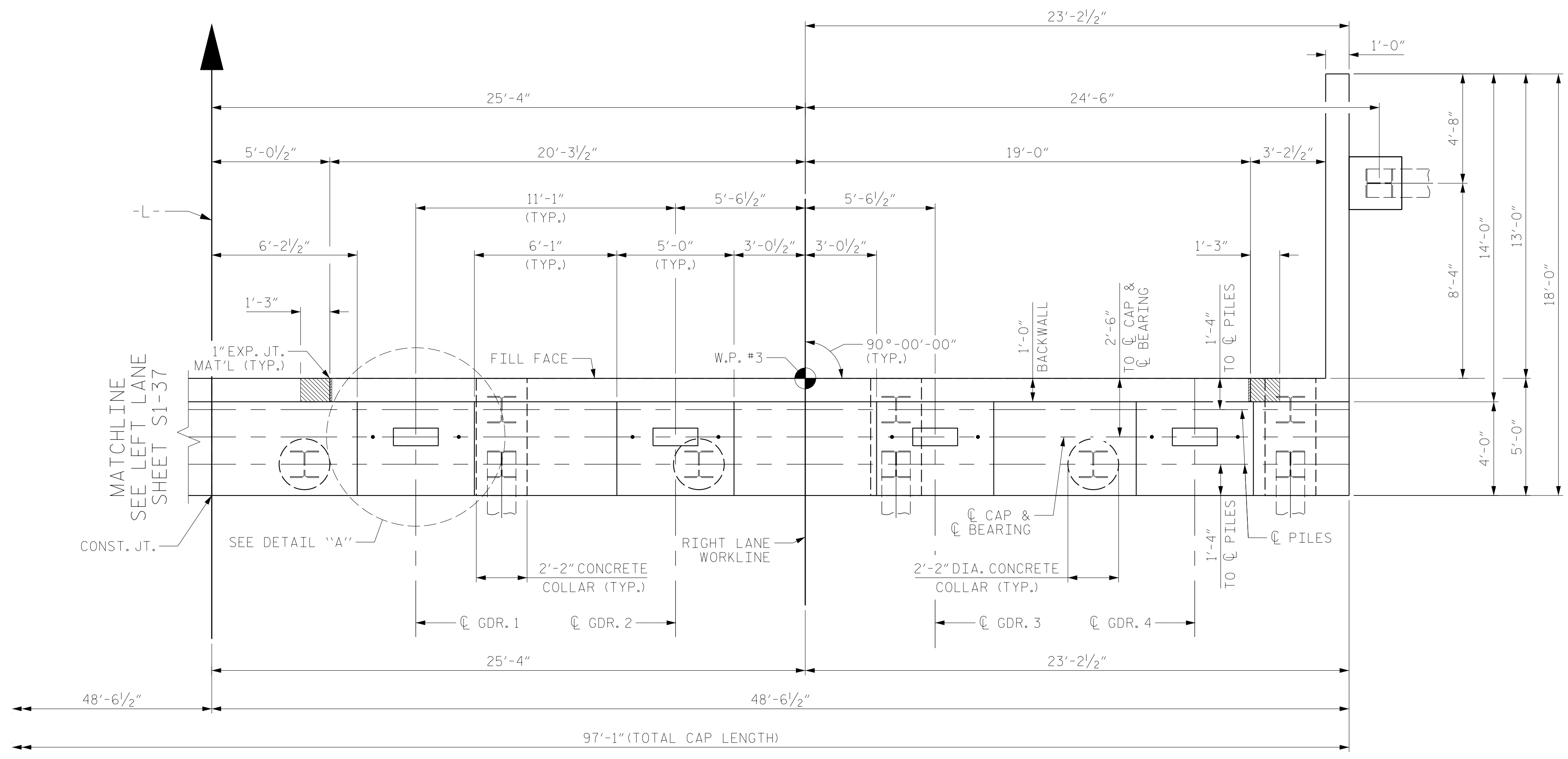
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 STATION: 76+80.00 -L-

SHEET 3 OF 3

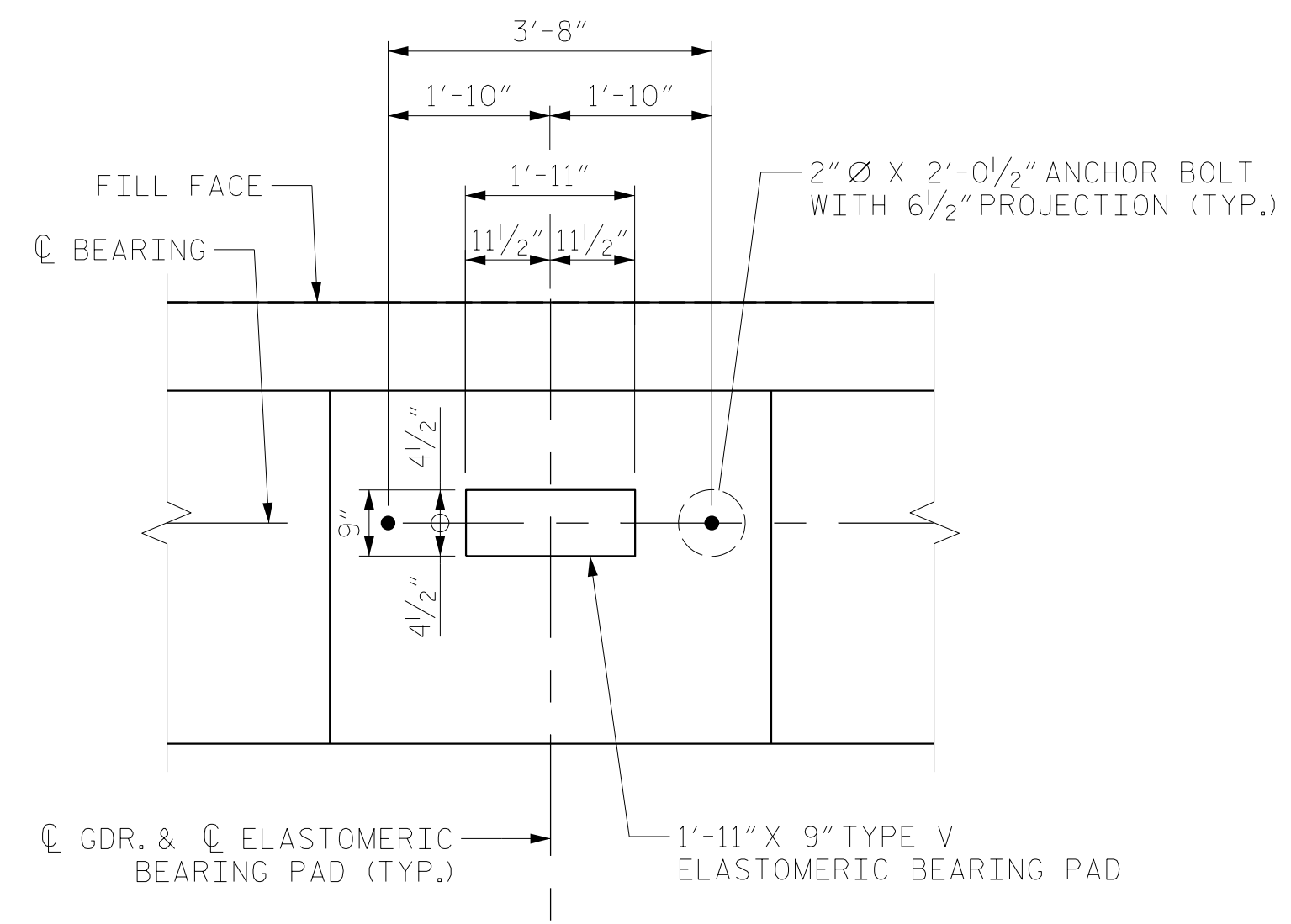
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 36" STEEL PIPE PILE
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-36
1			3			TOTAL SHEETS
2			4			43

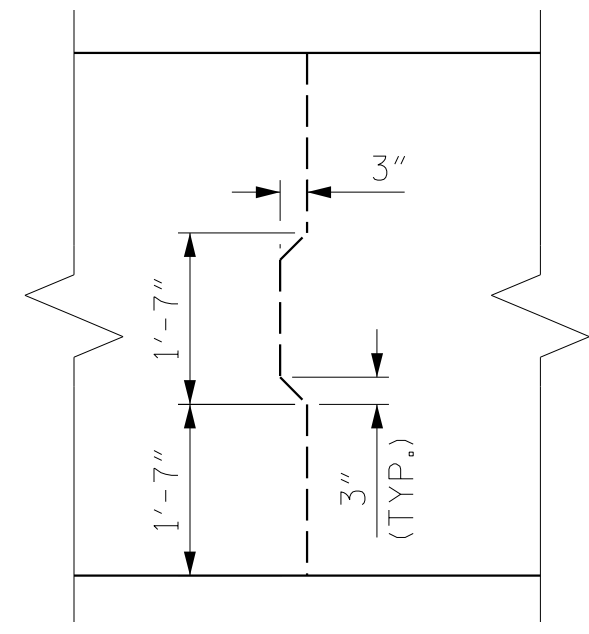


PARTAIL PLAN

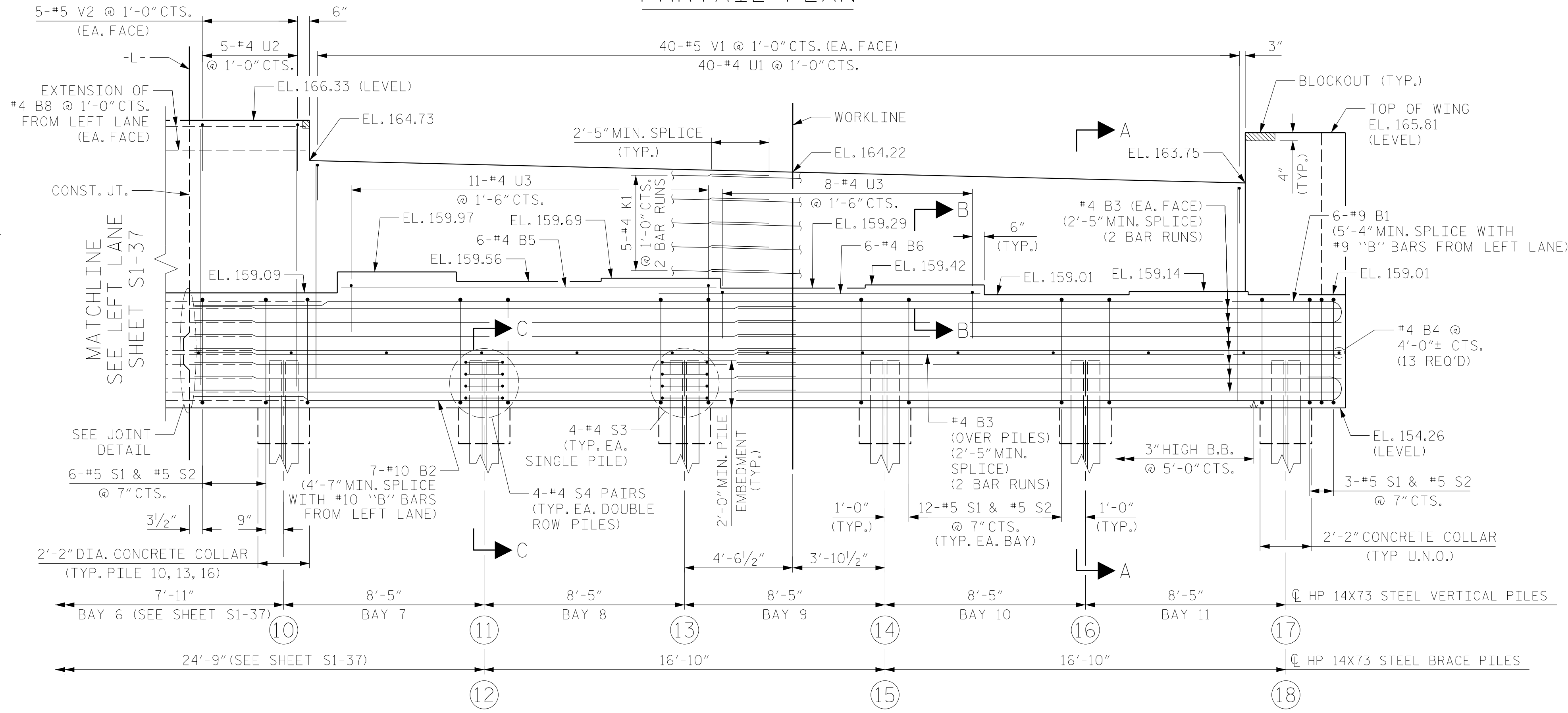
NOTES:
 FOR SECTION A-A, PARTIAL SECTION B-B, AND PARTIAL SECTION C-C, SEE SHEET 3 OF 3.
 STIRRUPS AND U3 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATION, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 THE TOP SURFACE AREA OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.



DETAIL "A"



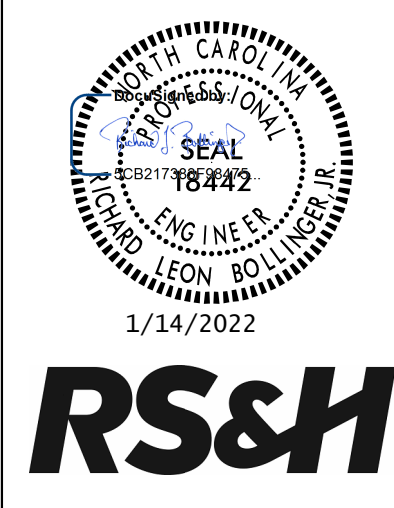
JOINT DETAIL



PARTAIL ELEVATION

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



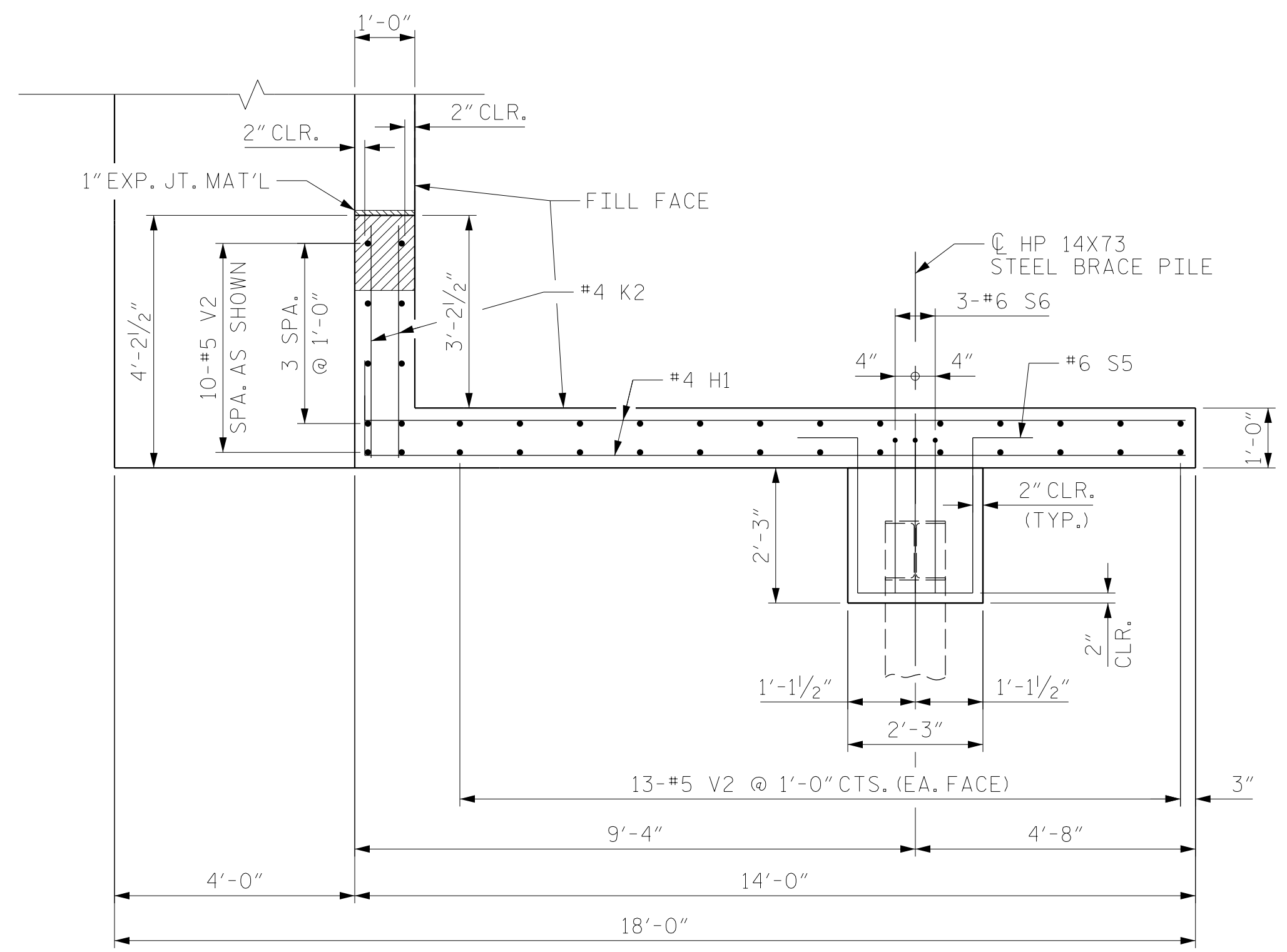
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 RALEIGH
 SUBSTRUCTURE
 END BENT 2 PARTIAL
 PLAN AND ELEVATION
 RIGHT LANE

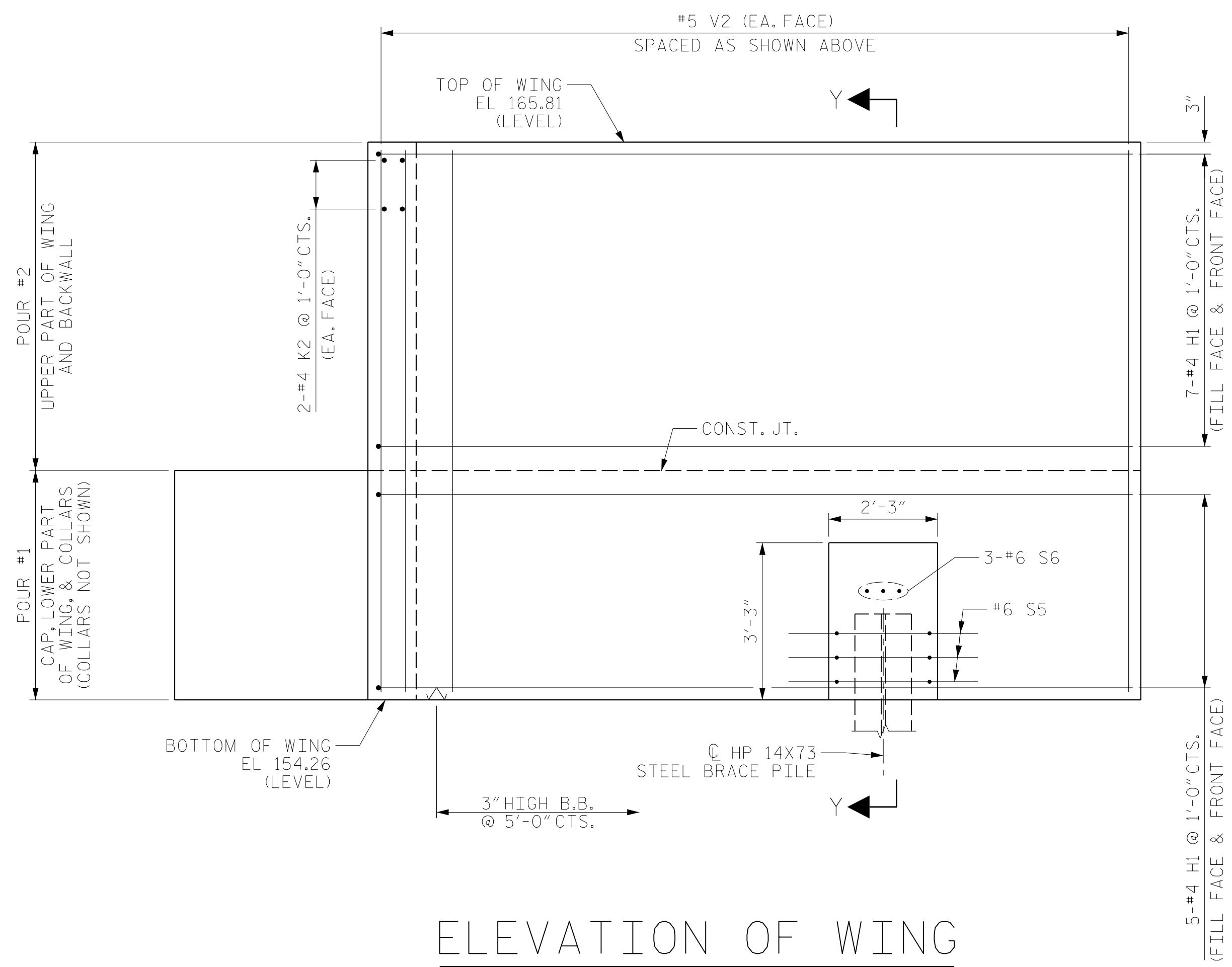
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-37
1			3			TOTAL SHEETS
2			4			43

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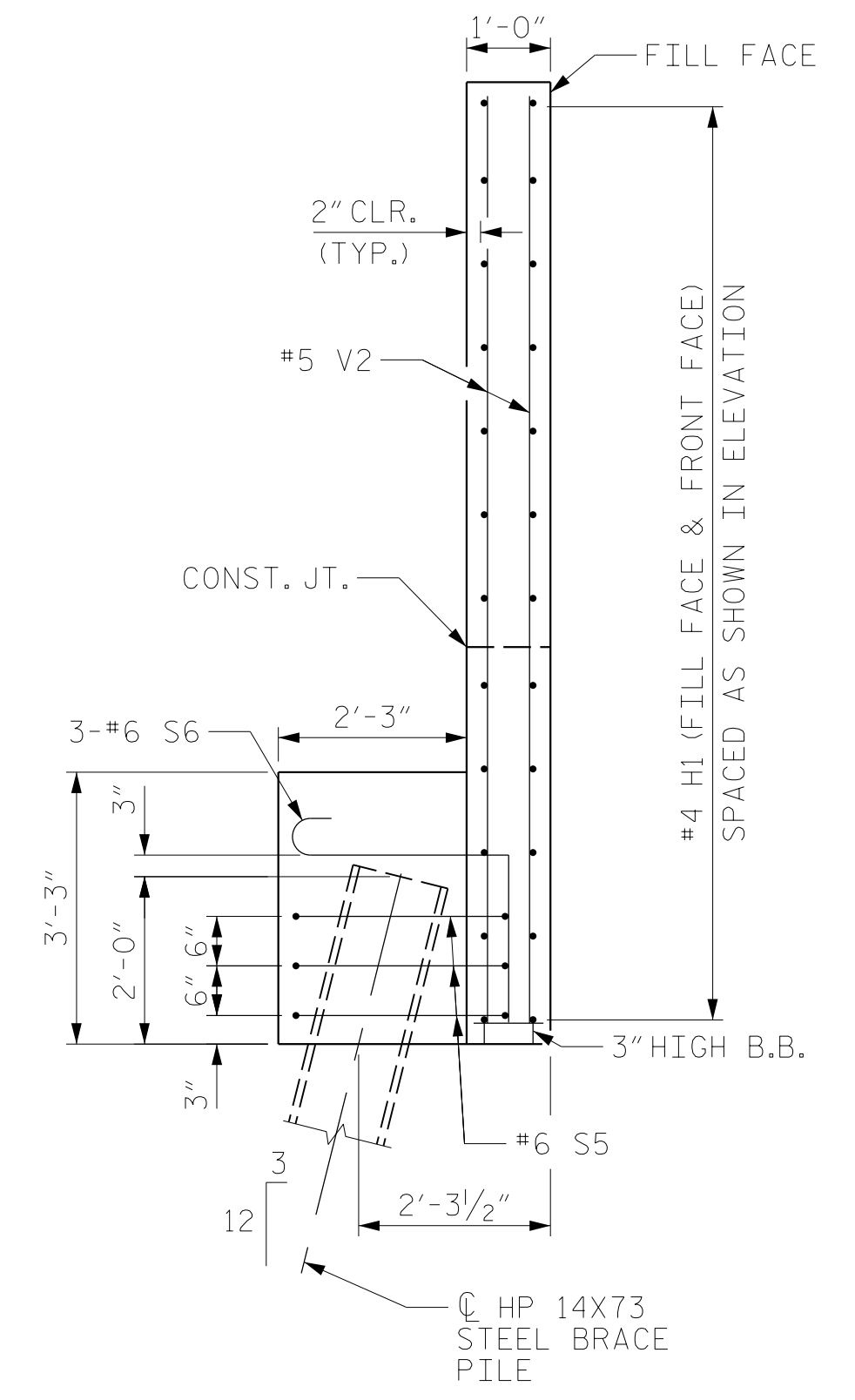
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PLAN OF WING



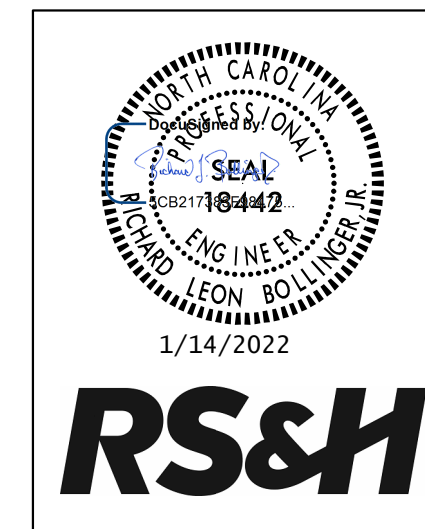
ELEVATION OF WING



SECTION Y-Y

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 2 OF 3



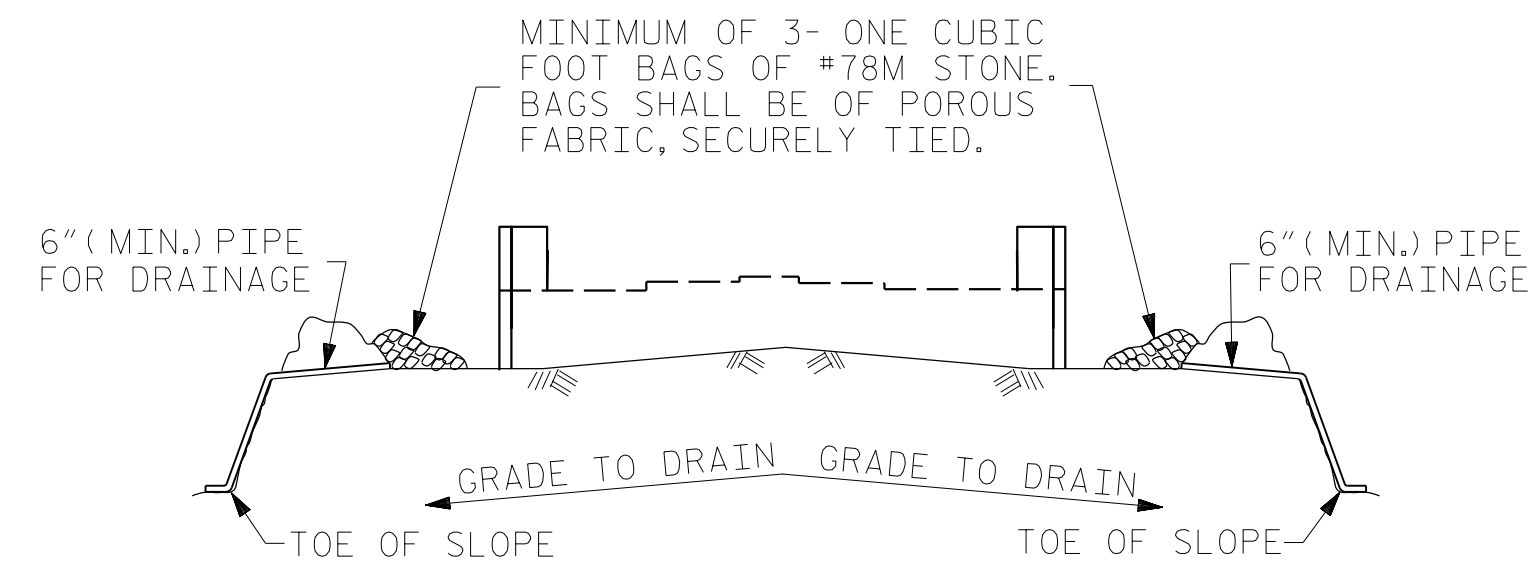
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 WING WALL DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-38
1			3			TOTAL SHEETS
2			4			43

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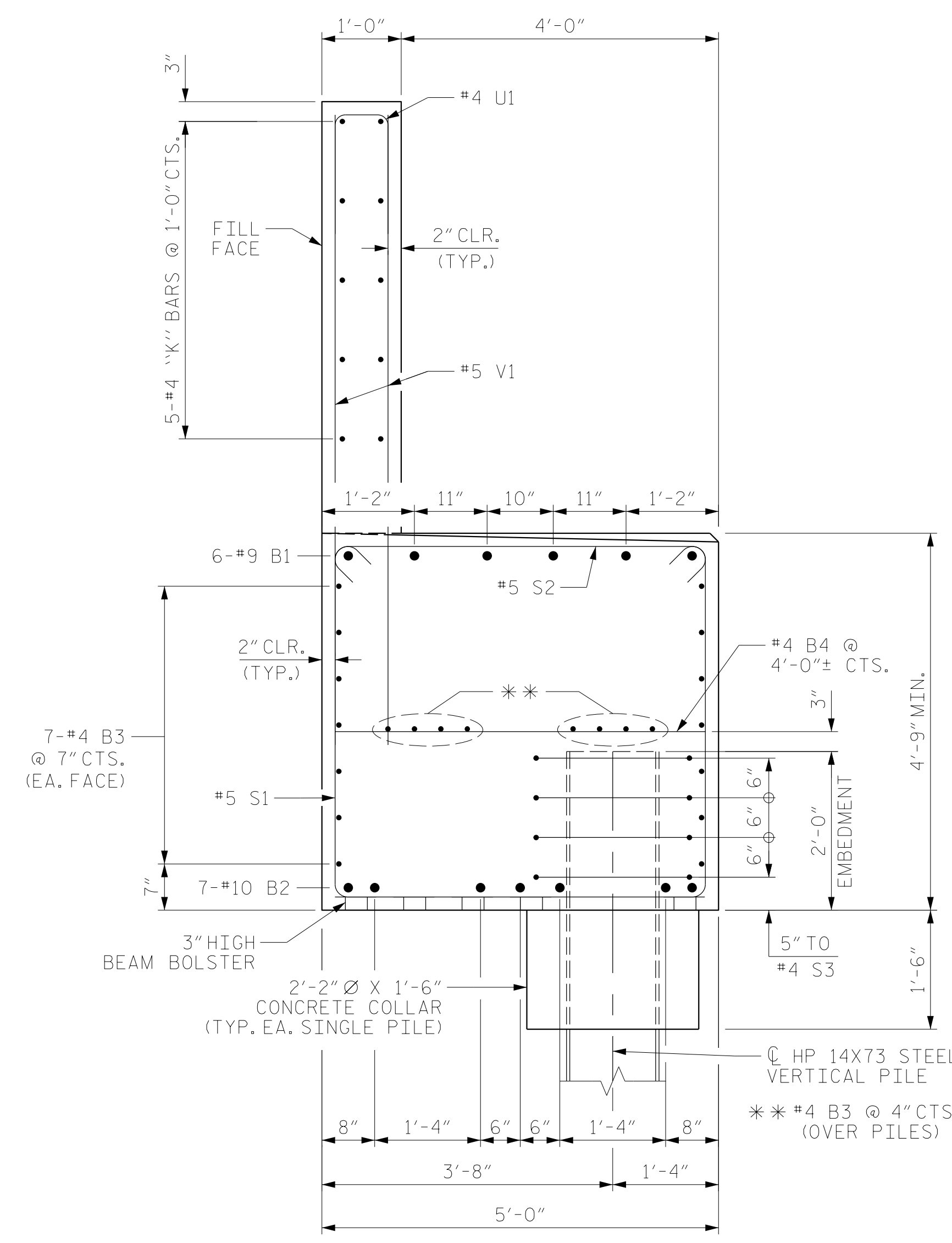


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

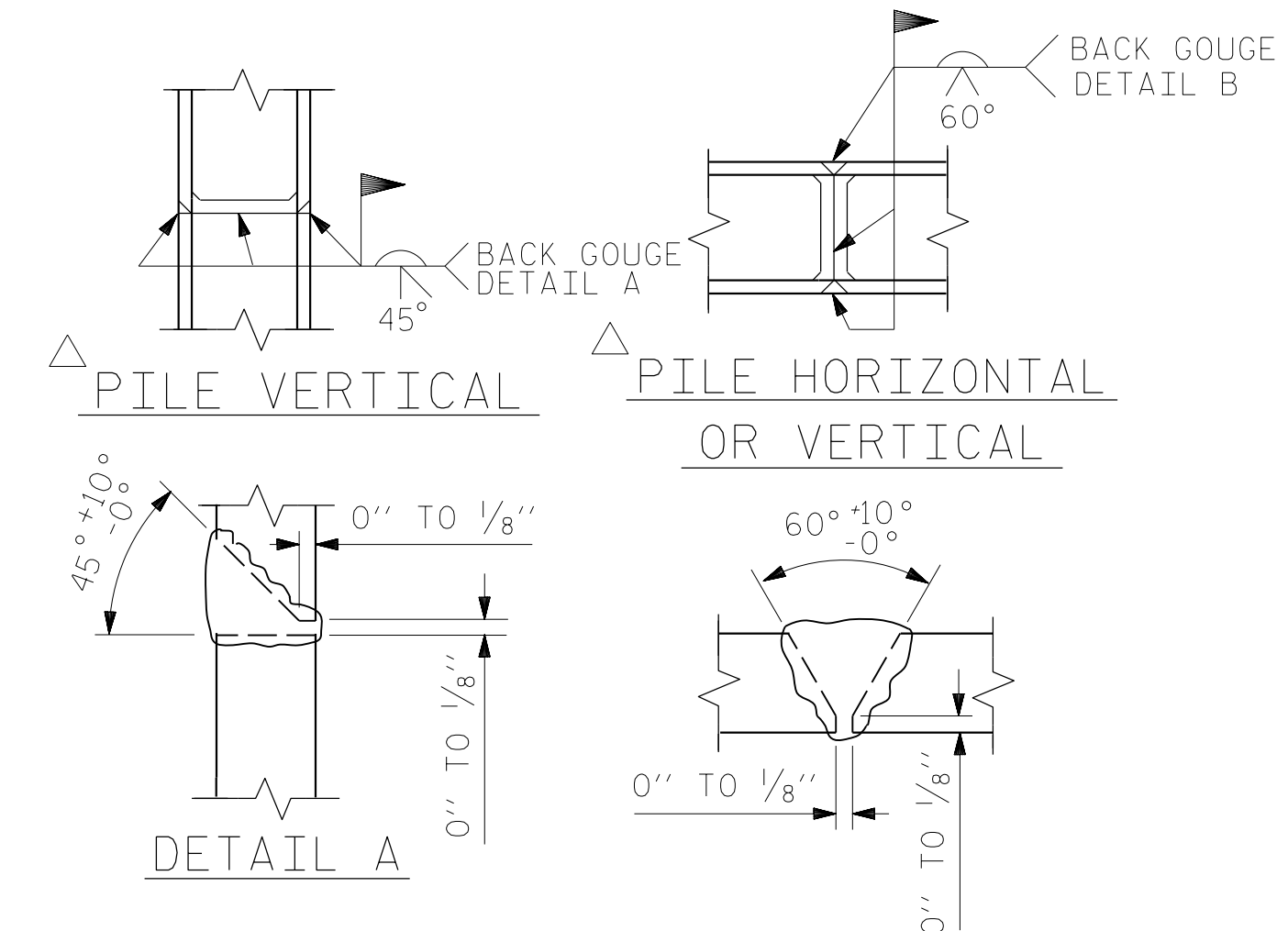
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

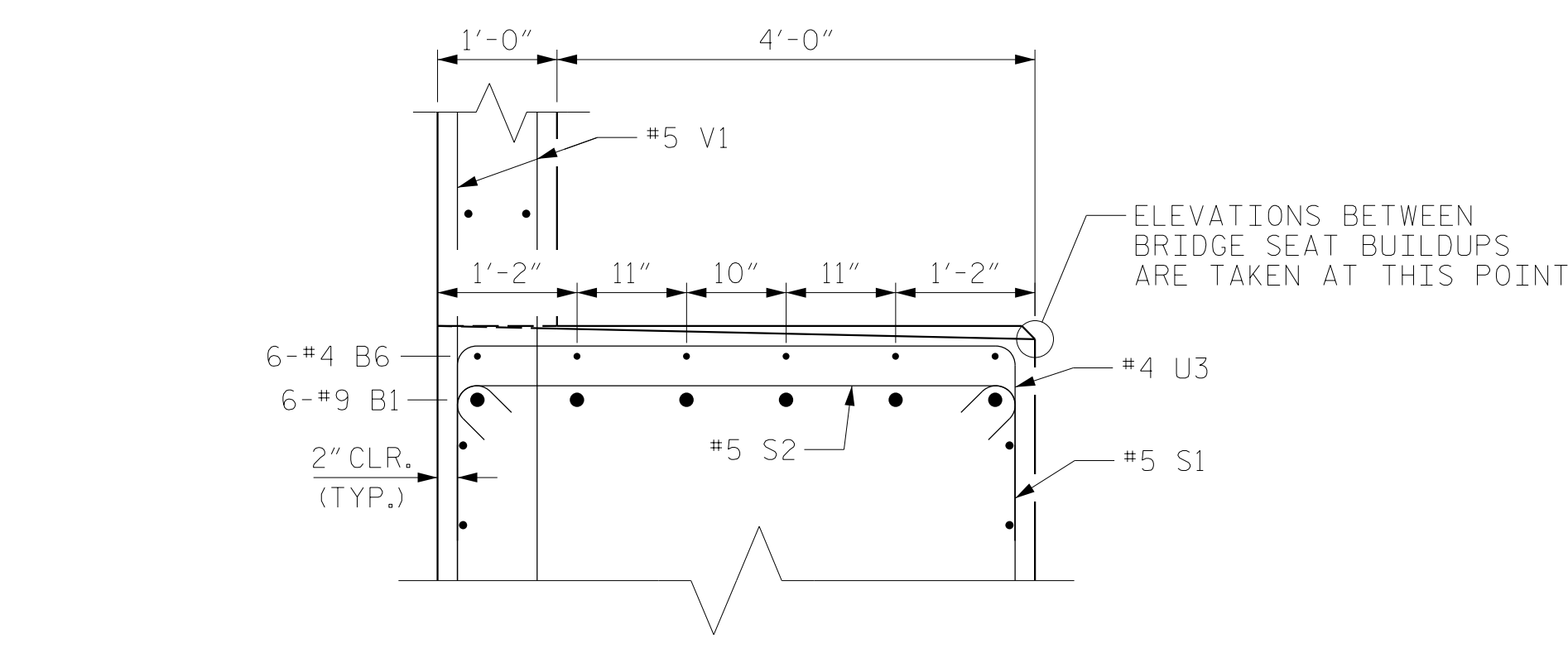


SECTION A-A

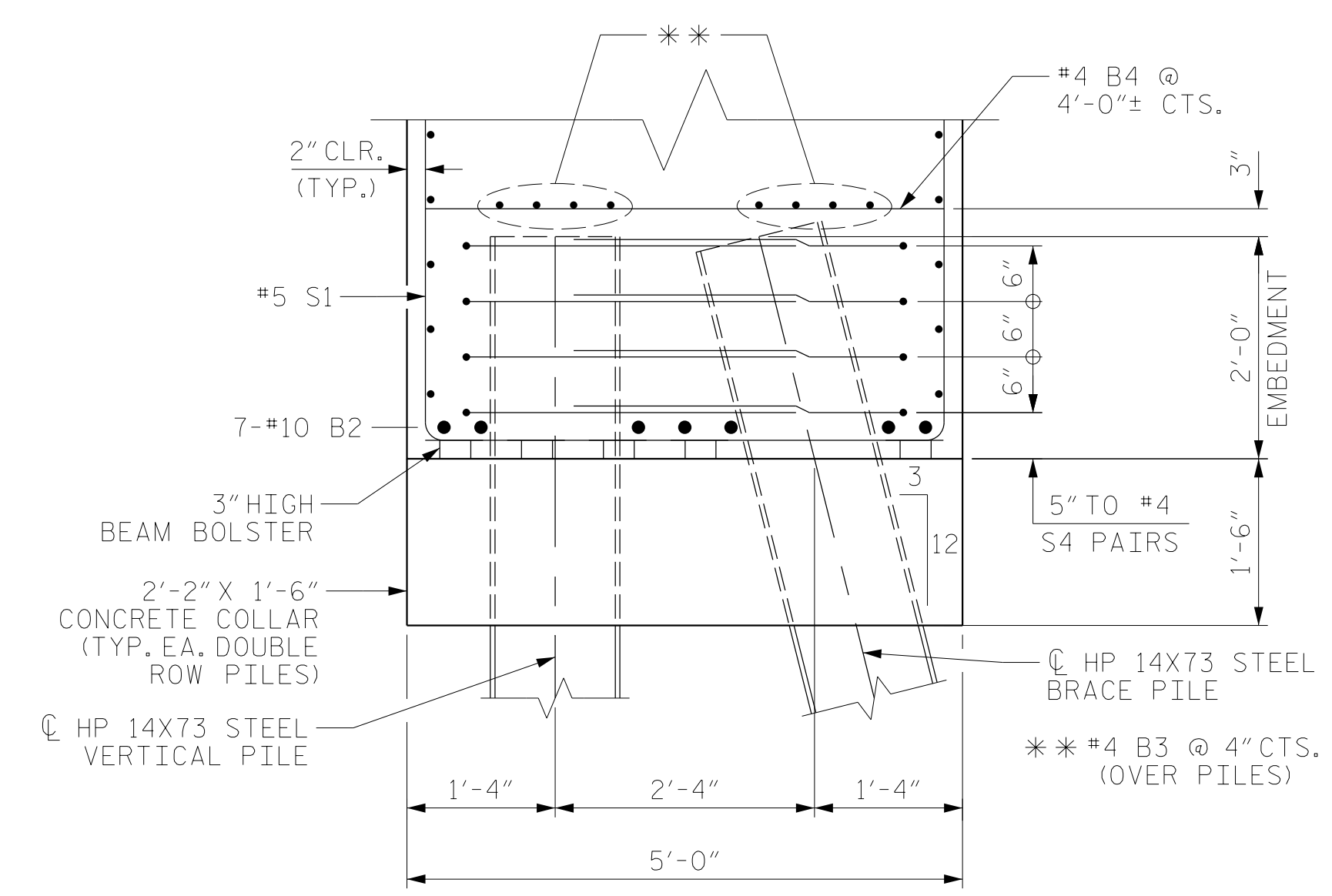


△ POSITION OF PILE DURING WELDING.

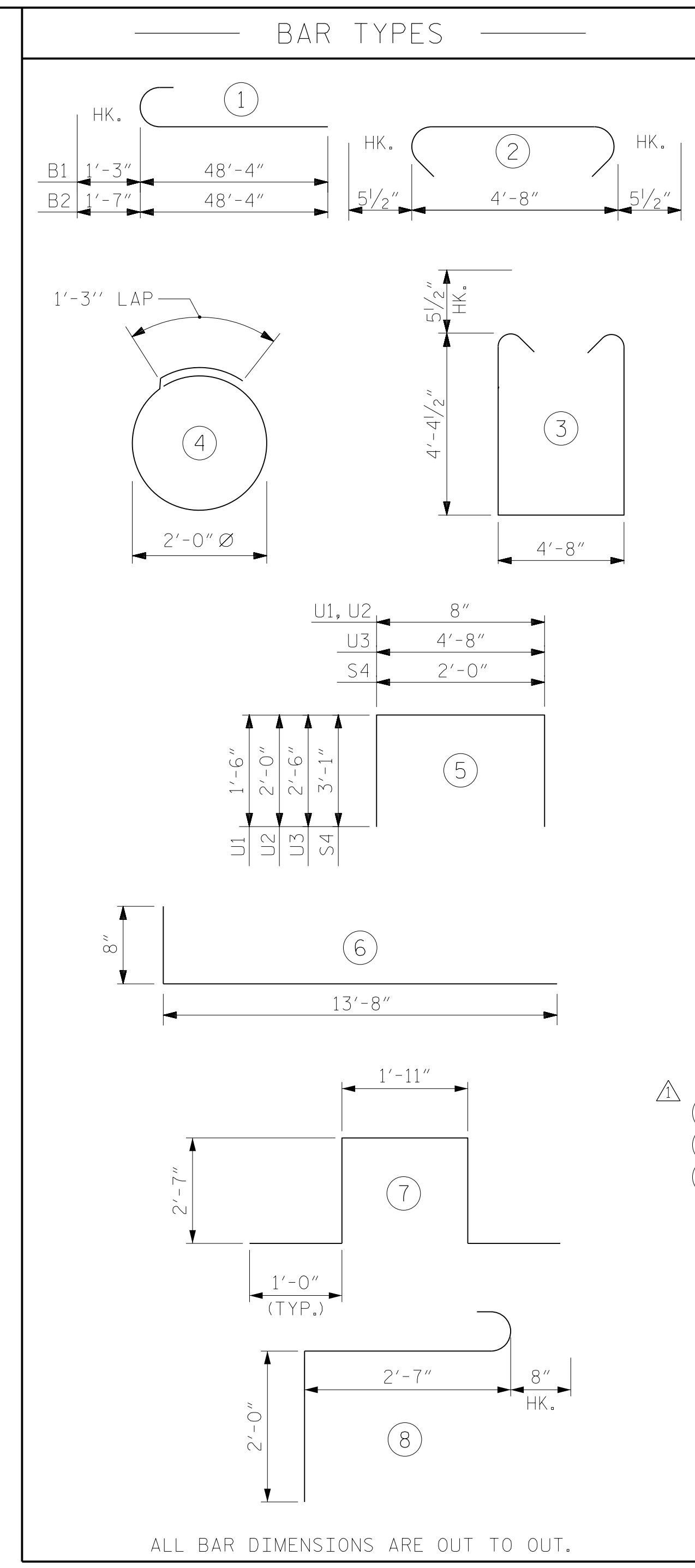
PILE SPLICE DETAILS



PARTIAL SECTION B-B



PARTIAL SECTION C-C



BILL OF MATERIAL					
END BENT NO. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	49'-7"	1012
B2	7	#10	1	49'-9"	1499
B3	44	#4	STR	25'-5"	747
B4	13	#4	STR	4'-8"	41
B5	6	#4	STR	15'-9"	63
B6	6	#4	STR	13'-6"	54
H1	24	#4	6	14'-4"	230
K1	20	#4	STR	25'-4"	338
K2	4	#4	STR	3'-10"	10
S1	69	#5	3	14'-4"	1032
S2	69	#5	2	5'-7"	402
S3	12	#4	4	7'-7"	61
S4	24	#4	5	8'-2"	131
S5	3	#6	7	9'-1"	41
S6	3	#6	8	5'-3"	24
U1	40	#4	5	3'-8"	98
U2	5	#4	5	4'-8"	16
U3	19	#4	5	9'-8"	123
V1	80	#5	STR	9'-0"	751
V2	46	#5	STR	11'-1"	532

REINFORCING STEEL 7,205 LBS.
CLASS A CONCRETE

POUR #1
CAP AND LOWER PART OF WING 48.0 C.Y.

POUR #2
UPPER PART OF WING AND BACKWALL 13.0 C.Y.

TOTAL CLASS A CONCRETE 61.0 C.Y.

HP 14 X 73 STEEL PILES NO. 10 700.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP NO. 10 FOR HP 14X73 STEEL PILES

PILE REDRIVES NO. 5 (FOR ONE END BENT)

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
DETAILS
RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1	NSC	03/2022	3		
2			4		

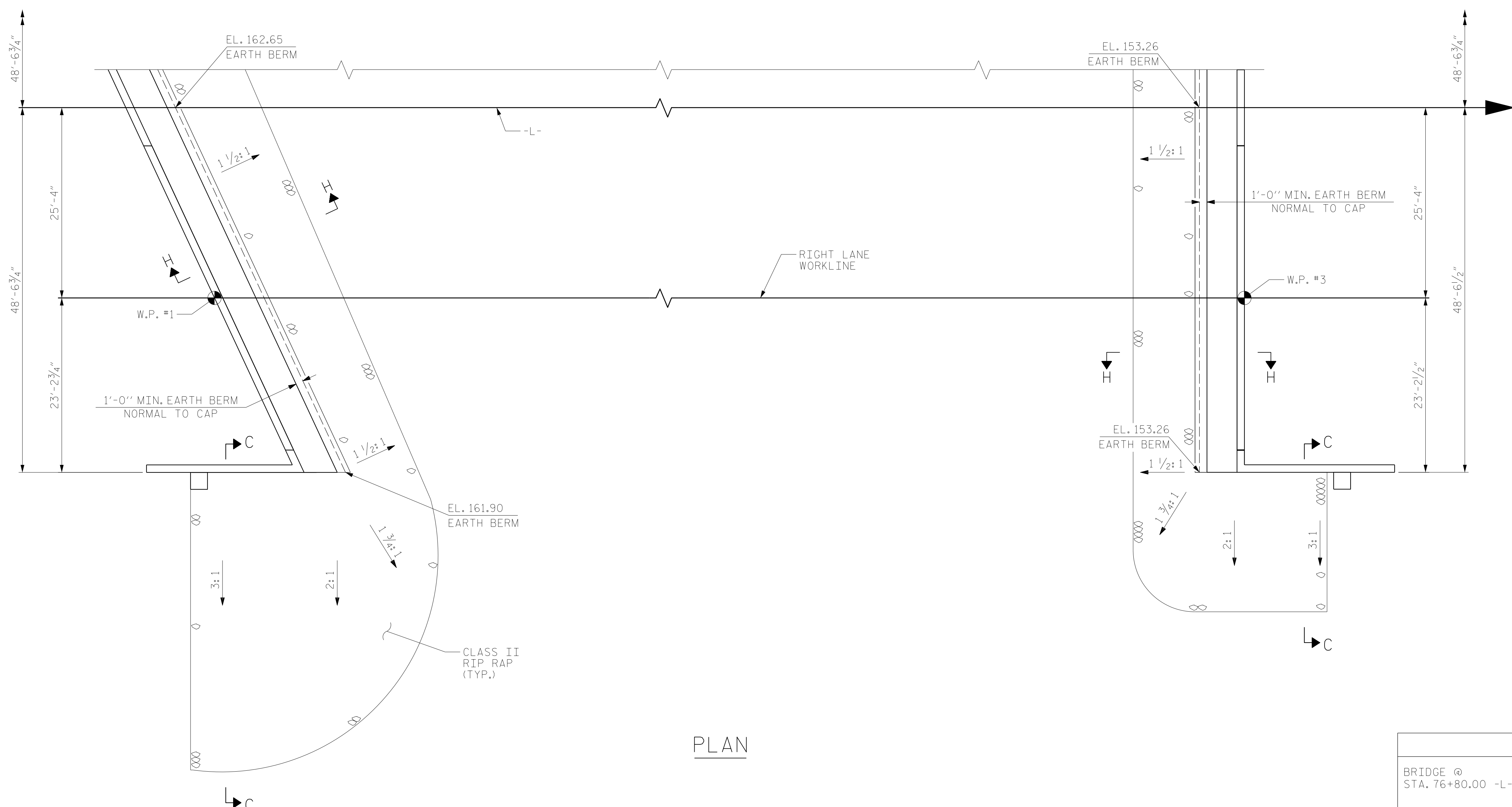
SHEET NO. S2-39
TOTAL SHEETS 43

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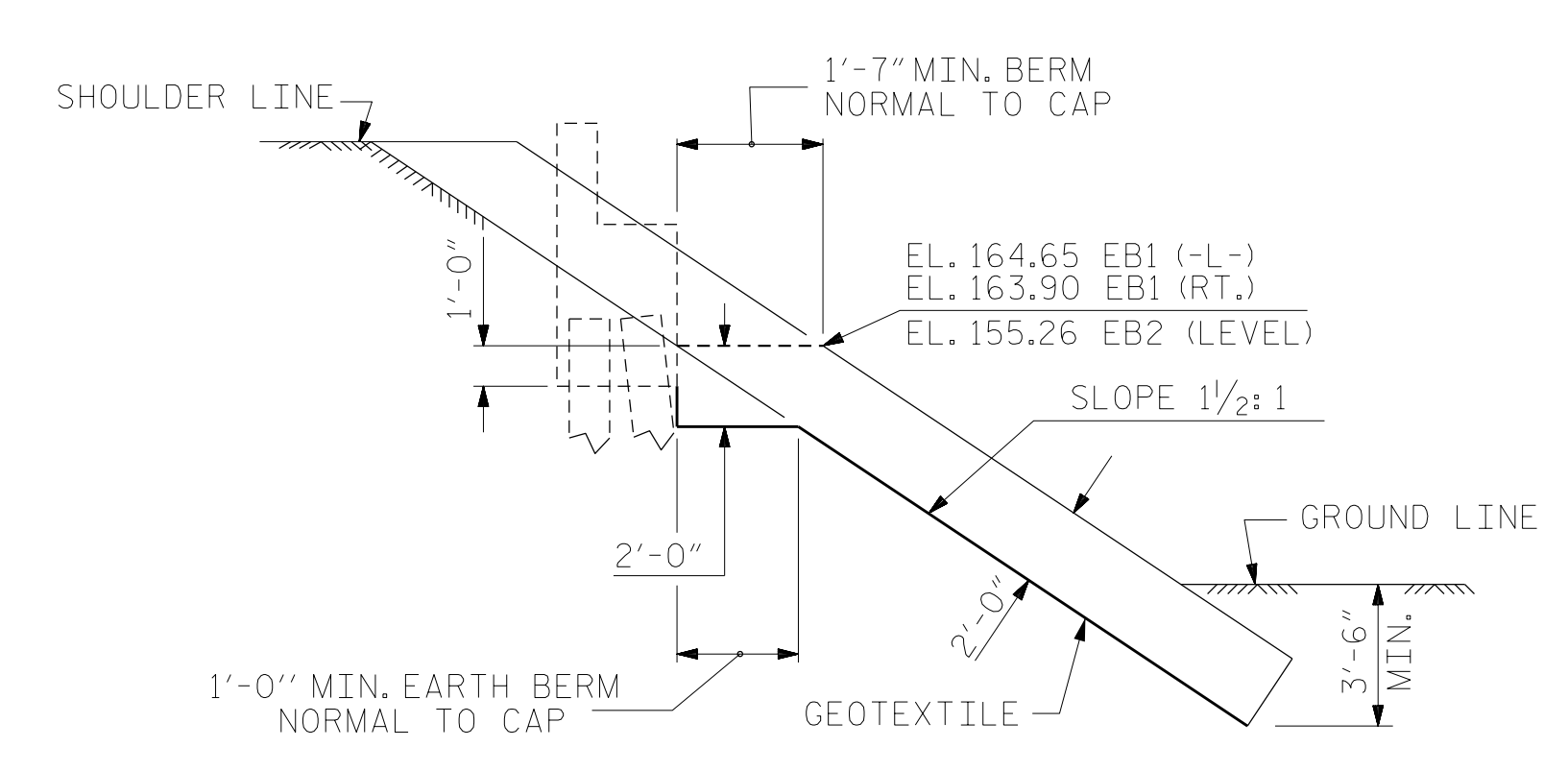
△ REVISED HP 14X73 STEEL PILE COUNT AND LENGTH



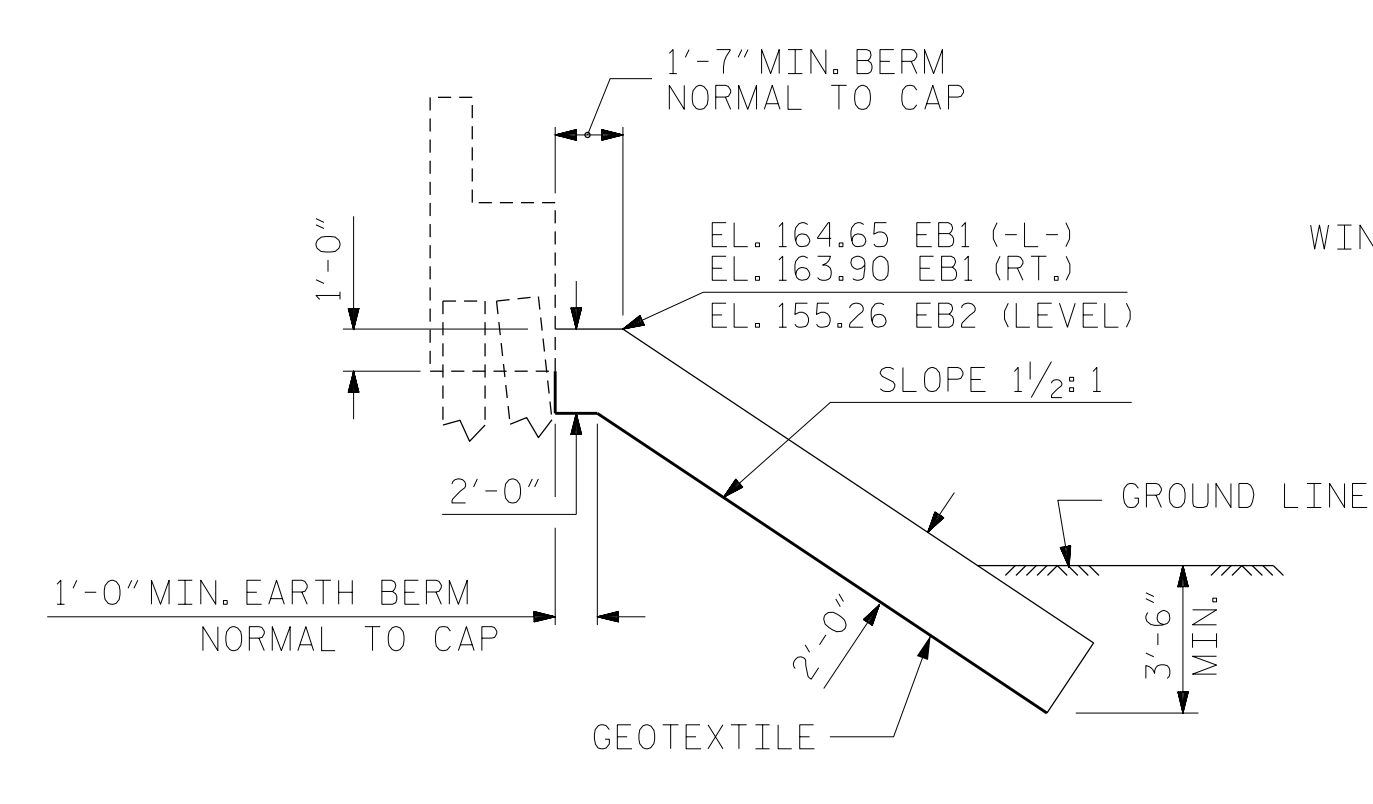
PLAN

NOTES :
 FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.
 RIP RAP AND GEOTEXTILE QUANTITIES ARE FROM RIGHT OF -L-.

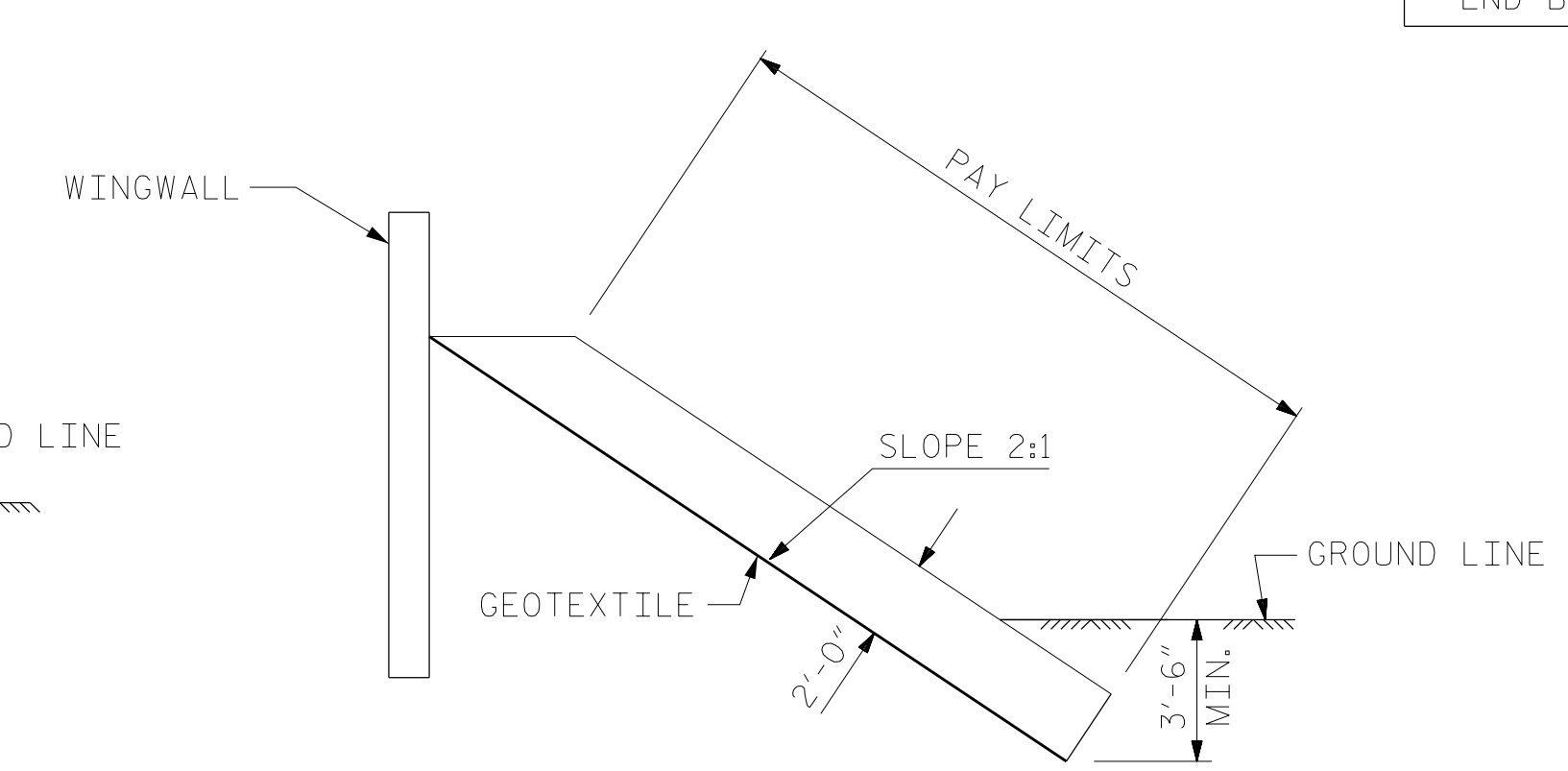
ESTIMATED QUANTITIES		
BRIDGE @ STA. 76+80.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	214	238
END BENT 2	116	129



SECTION H-H



RIGHT LANE WORK LINE SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. U-5798A
CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

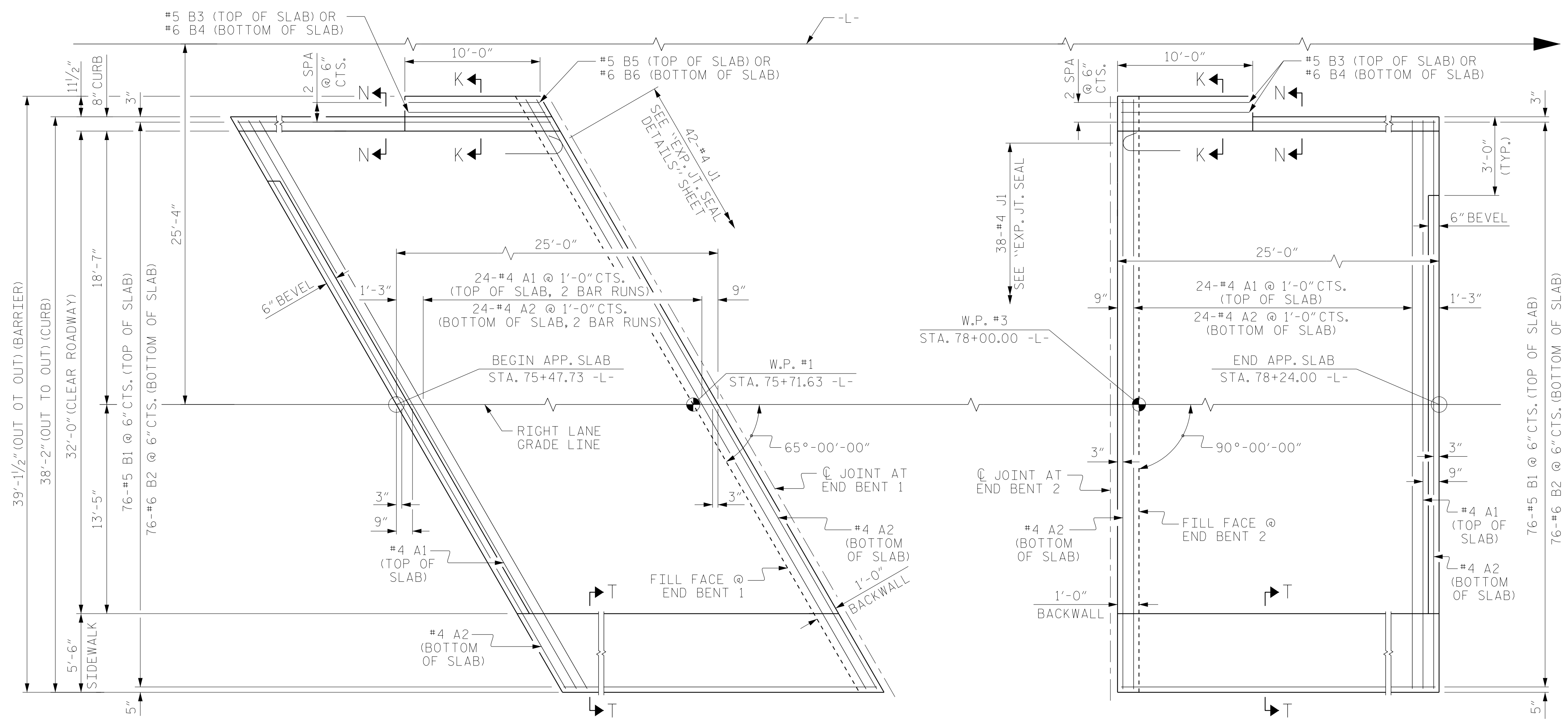


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
RIP RAP DETAILS
 RIGHT LANE

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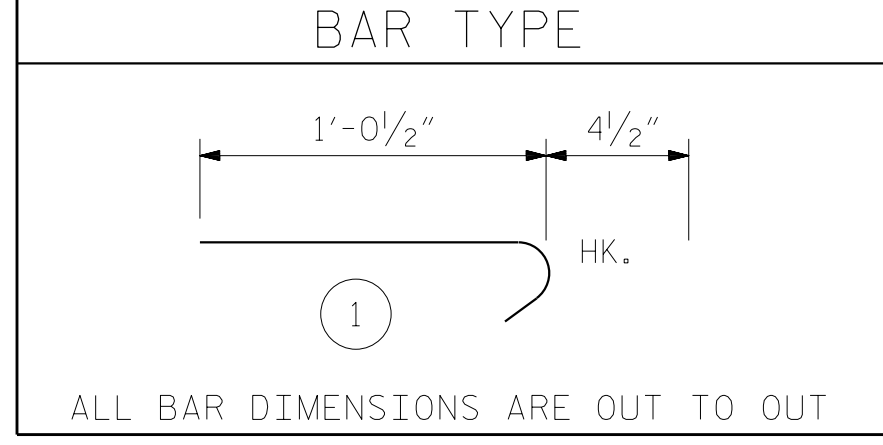
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			43
2			4			43



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

BILL OF MATERIAL						
APPROACH SLAB AT END BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR.	23'-1"	771	
A2	52	#4	STR.	22'-11"	796	
*B1	76	#5	STR.	23'-8"	1876	
B2	76	#6	STR.	24'-7"	2806	
*B3	1	#5	STR.	9'-7"	10	
B4	1	#6	STR.	9'-11"	15	
*B5	1	#5	STR.	9'-4"	10	
B6	1	#6	STR.	9'-8"	15	
*J1	42	#4	1	1'-5"	40	
REINFORCING STEEL				3,632 LBS.		
*EPOXY COATED REINFORCING STEEL				2,707 LBS.		
CLASS AA CONCRETE				42.1 C. Y.		

APPROACH SLAB AT END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR.	21'-0"	701	
A2	52	#4	STR.	20'-10"	724	
*B1	76	#5	STR.	23'-10"	1889	
B2	76	#6	STR.	24'-8"	2816	
*B3	2	#5	STR.	9'-4"	19	
B4	2	#6	STR.	9'-8"	29	
*J1	38	#4	1	1'-5"	36	
REINFORCING STEEL				3,569 LBS.		
*EPOXY COATED REINFORCING STEEL				2,645 LBS.		
CLASS AA CONCRETE				42.1 C. Y.		



ALL BAR DIMENSIONS ARE OUT TO OUT
 ** QUANTITIES FOR SIDEWALK AND END POST ARE NOT INCLUDED. SEE SHEET 2 OF 2.

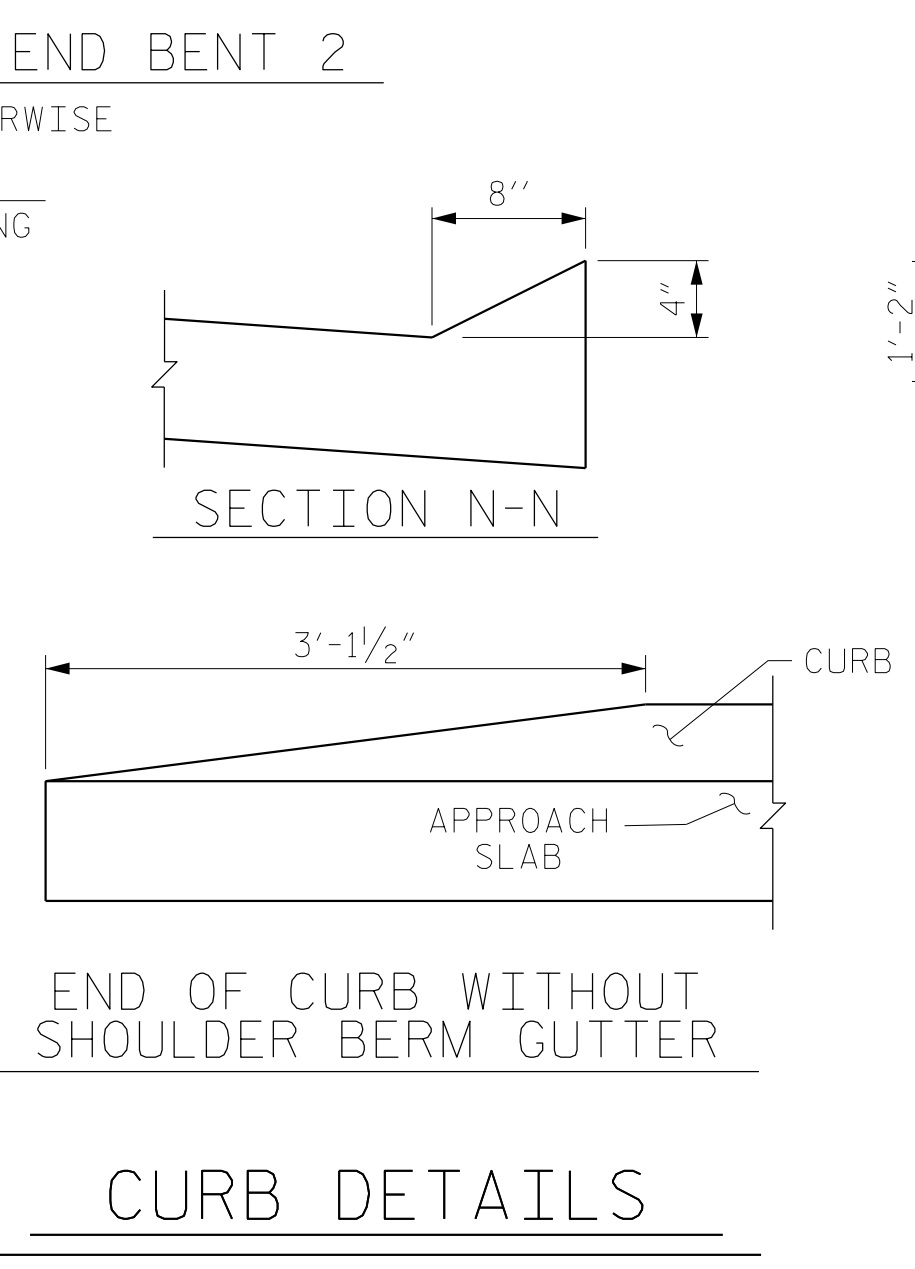
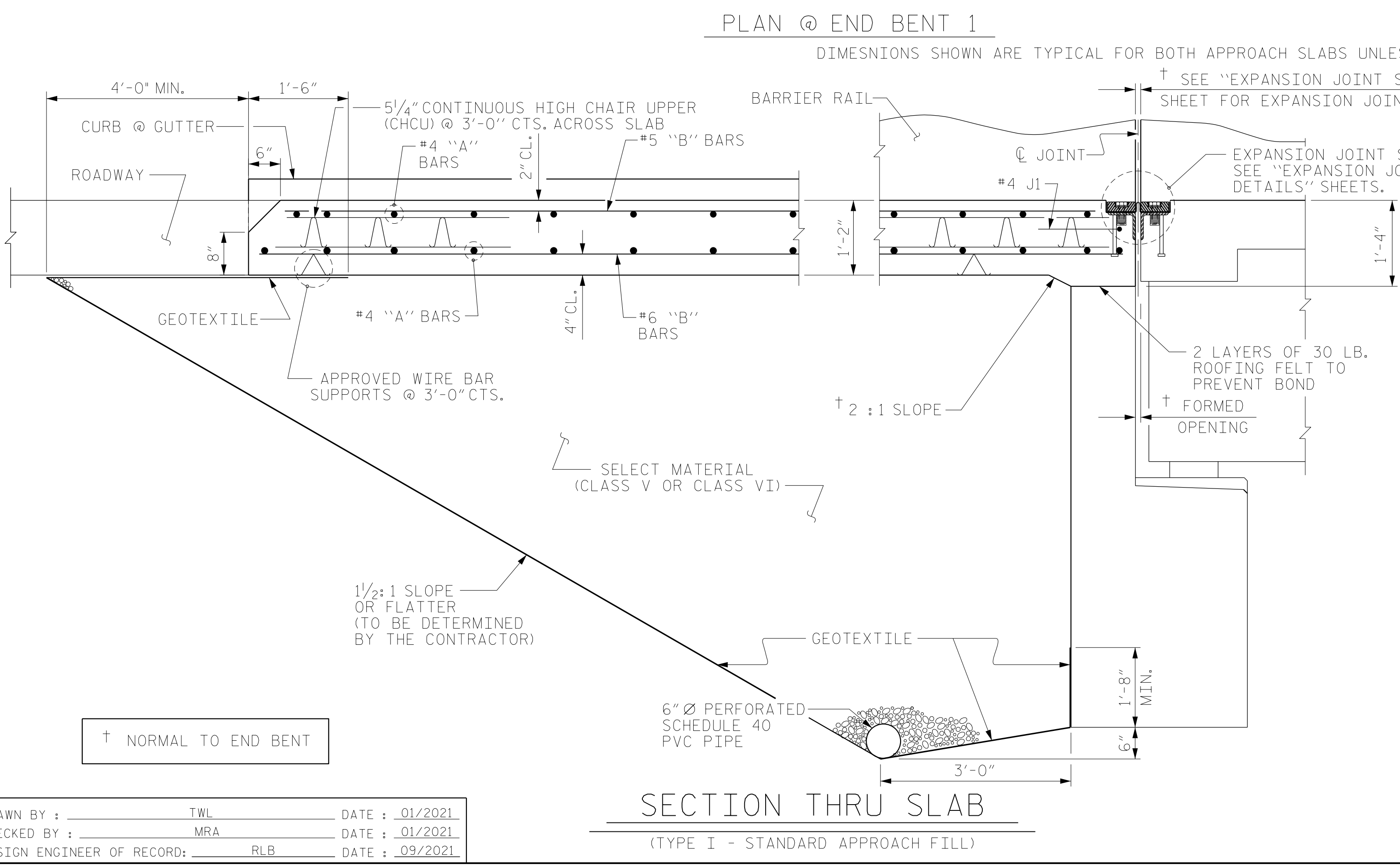
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CUMBERLAND COUNTY
 STATION: 76+80.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT
 RIGHT LANE

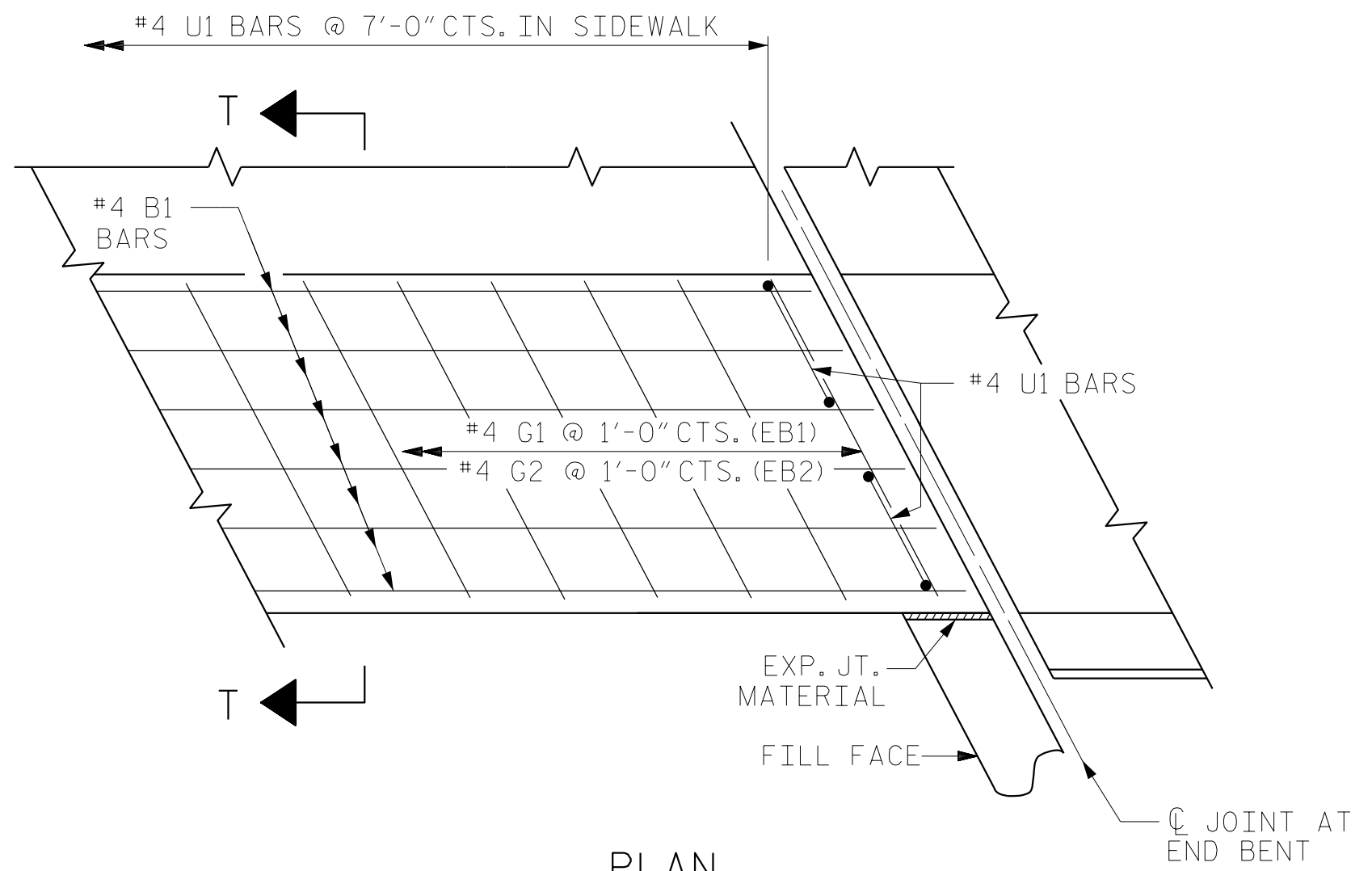
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-41
2			4			TOTAL SHEETS 43



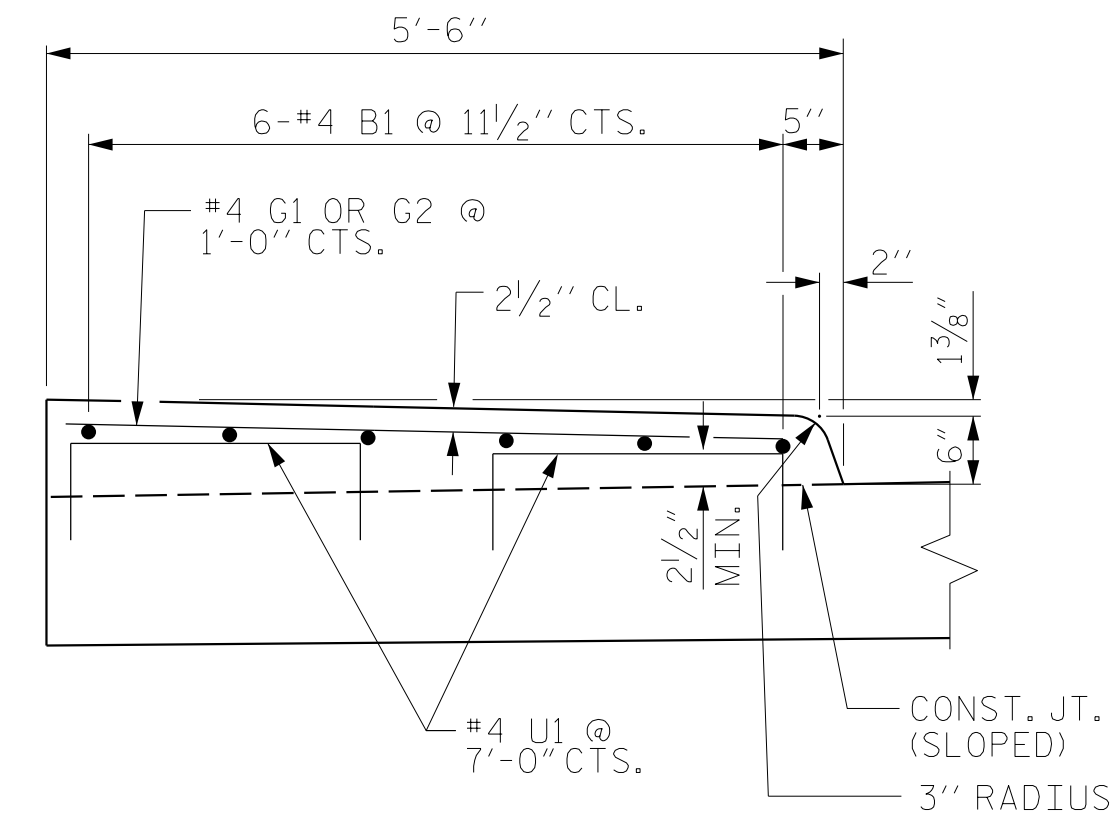
NOTES:
 FOR SECTION T-T, SEE SHEET 2 OF 3.
 PLACE "A" BARS PARALLEL TO THE SKEW OF THE FILL FACE.
 PLACE "B" BARS PARALLEL TO THE LEFT ANE GRADE LINE.
 FOR ADDITIONAL NOTES, SEE SHEET 2 OF 3 AND 3 OF 3.

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PLAN
END BENT 1 SHOWN, END BENT 2 SIMILAR
(END BENT 2 AT 90 DEGREE SKEW)



SECTION T-T
U1 BARS MAY BE PUSHED INTO GREEN
CONCRETE AFTER SLAB HAS BEEN SCREEDED OFF

DETAILS OF SIDEWALK ON APPROACH SLAB

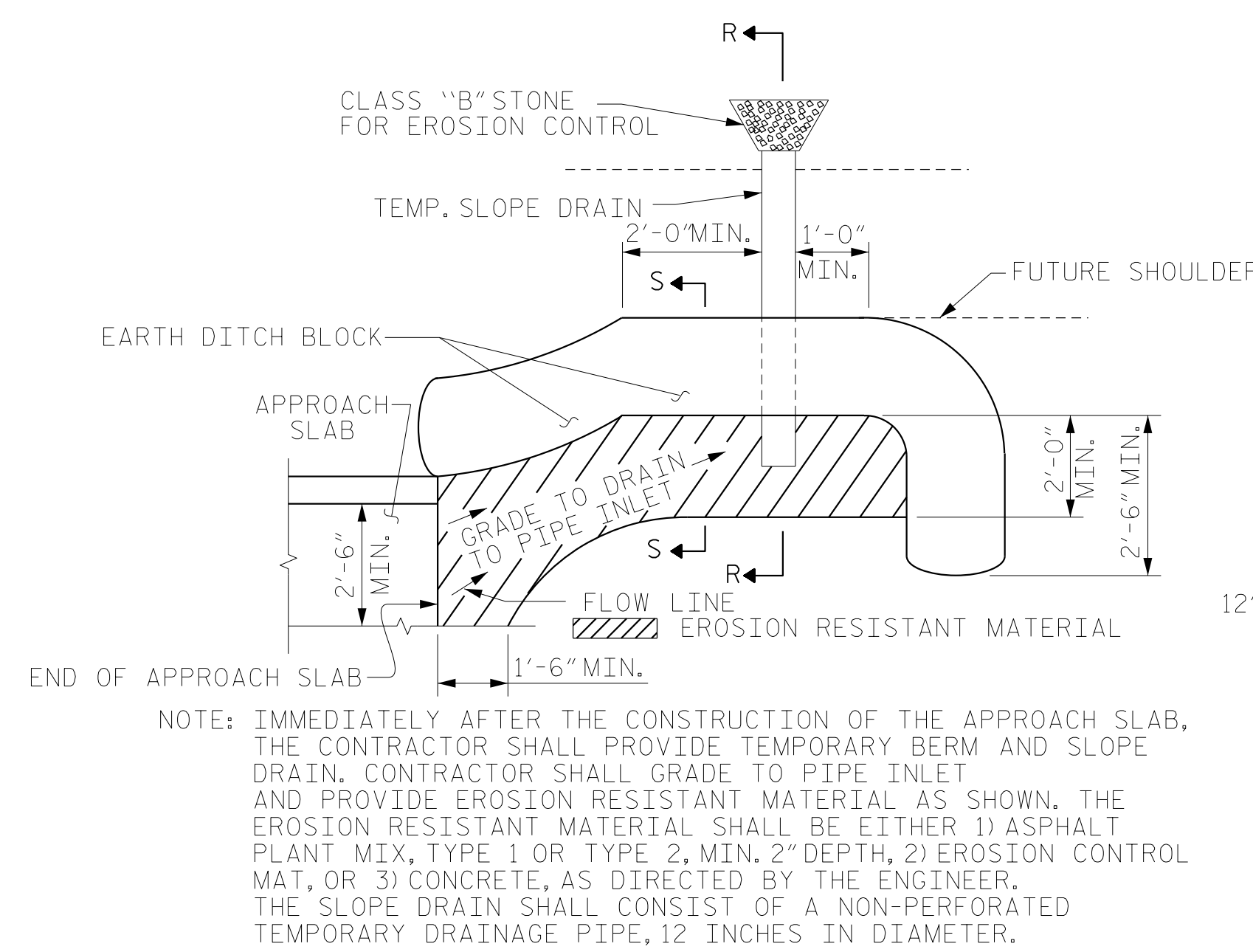
NOTES:

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

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

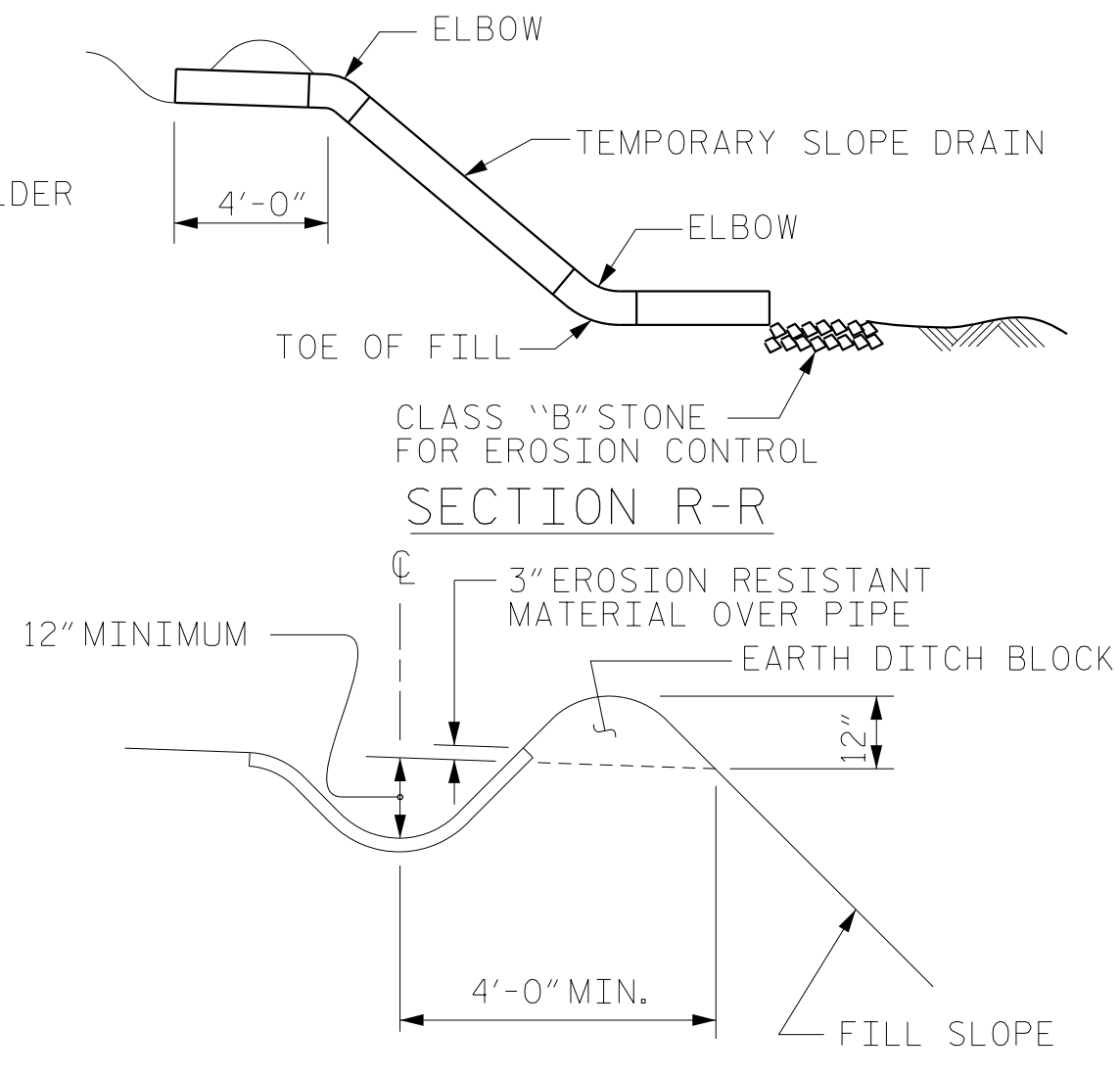
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

BILL OF MATERIAL					
SIDEWALK AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	6	#4	STR.	24'-7"	99
*G1	25	#4	STR.	5'-5"	90
*U1	8	#4	2	4'-0"	21
* EPOXY COATED REINFORCING STEEL					210 LBS.
CLASS AA CONCRETE					3.1 C.Y.
SIDEWALK AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	6	#4	STR.	24'-8"	99
*G2	25	#4	STR.	4'-11"	82
*U2	8	#4	2	3'-9"	20
* EPOXY COATED REINFORCING STEEL					202 LBS.
CLASS AA CONCRETE					3.1 C.Y.
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					



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

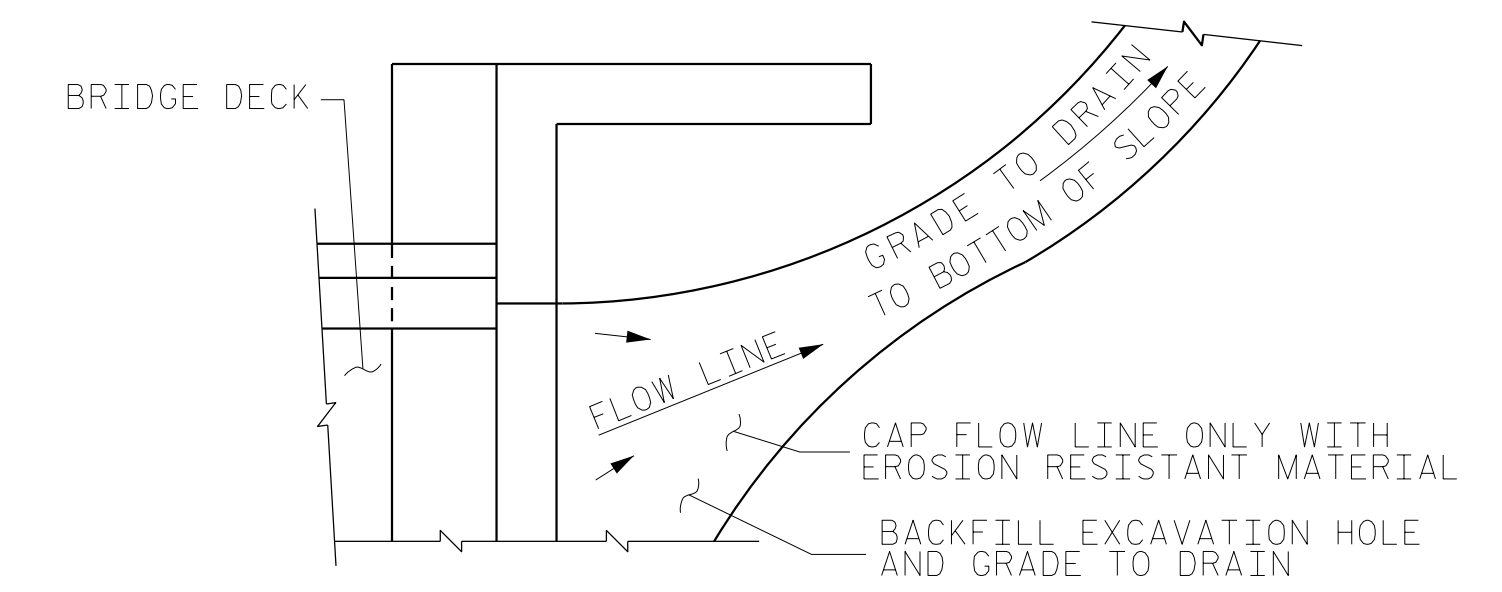
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

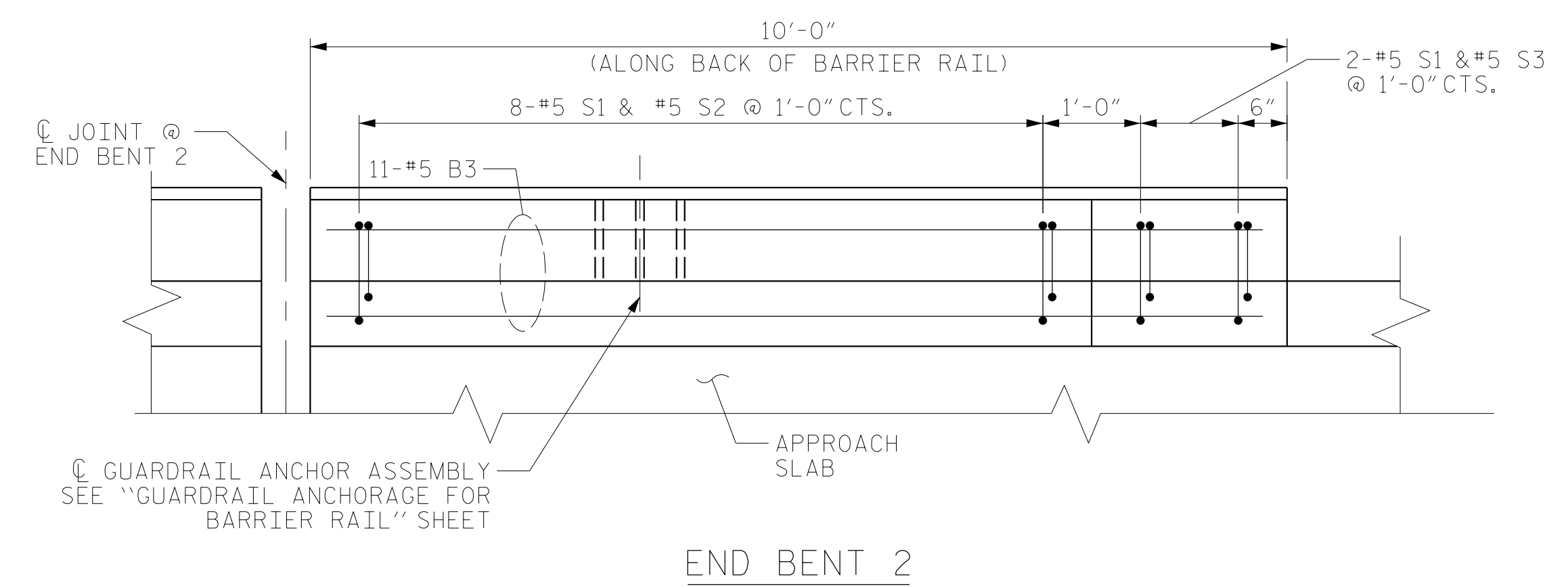
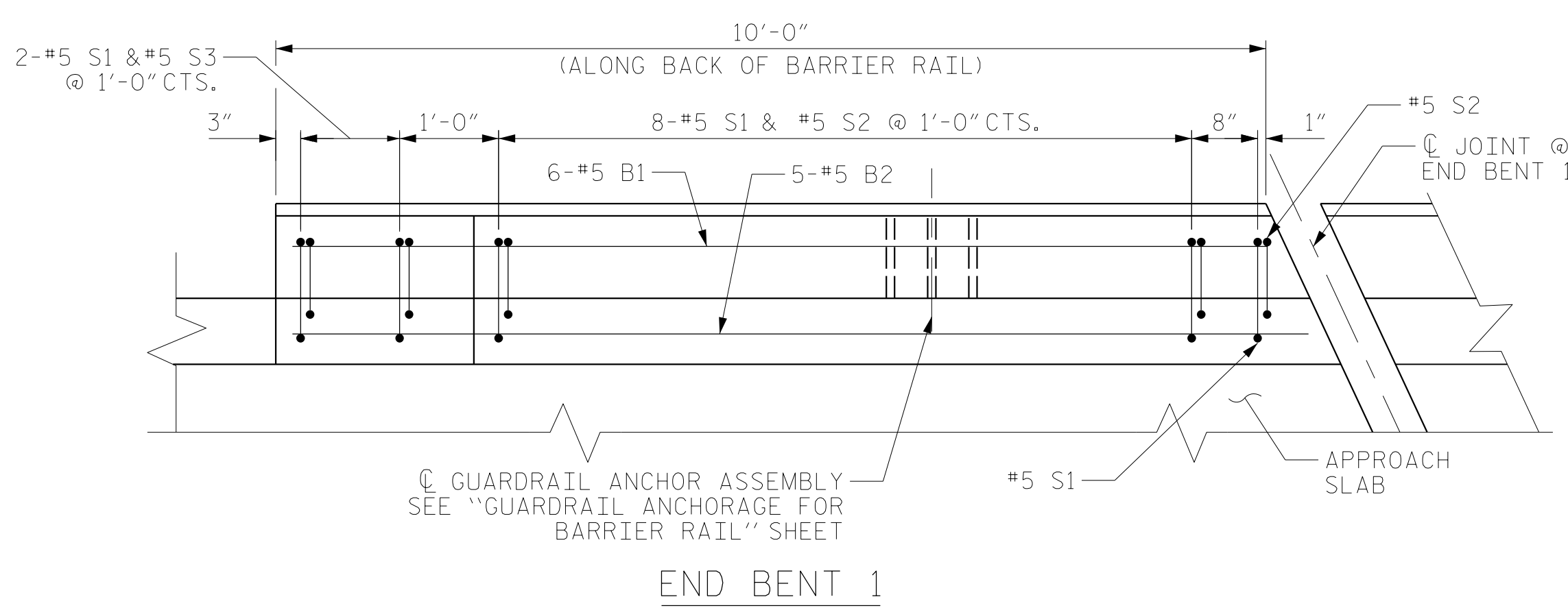
SHEET 2 OF 3

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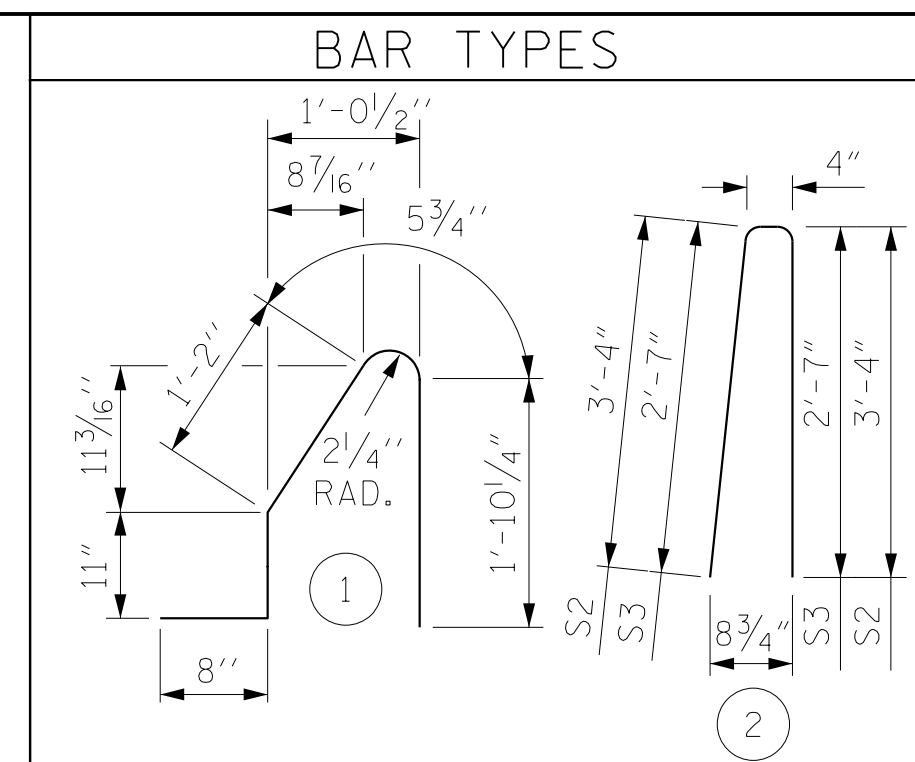
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
RIGHT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S2-42
					TOTAL SHEETS 43

DRAWN BY :	TWL	DATE :	01/2021
CHECKED BY :	MRA	DATE :	01/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

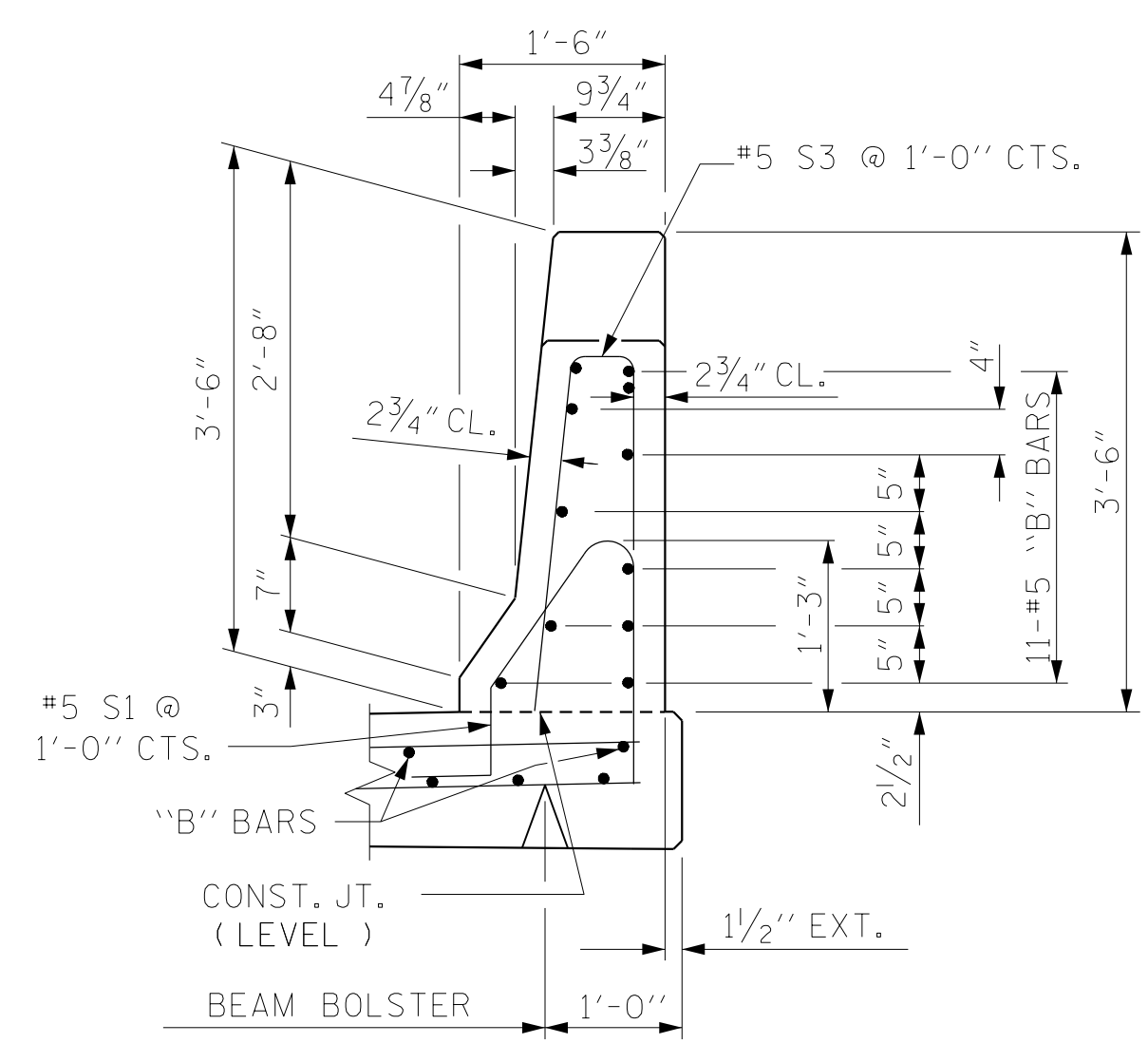
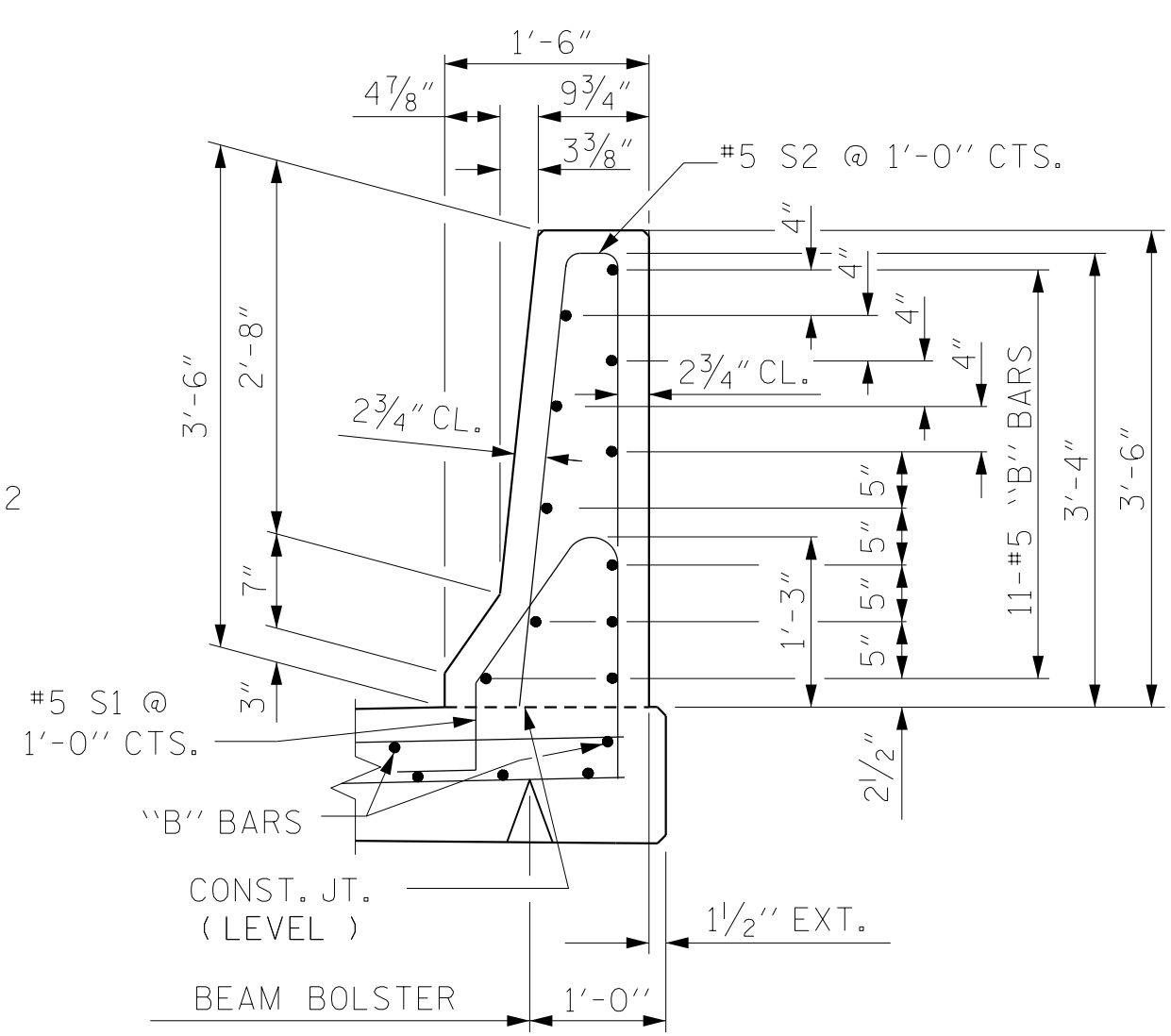
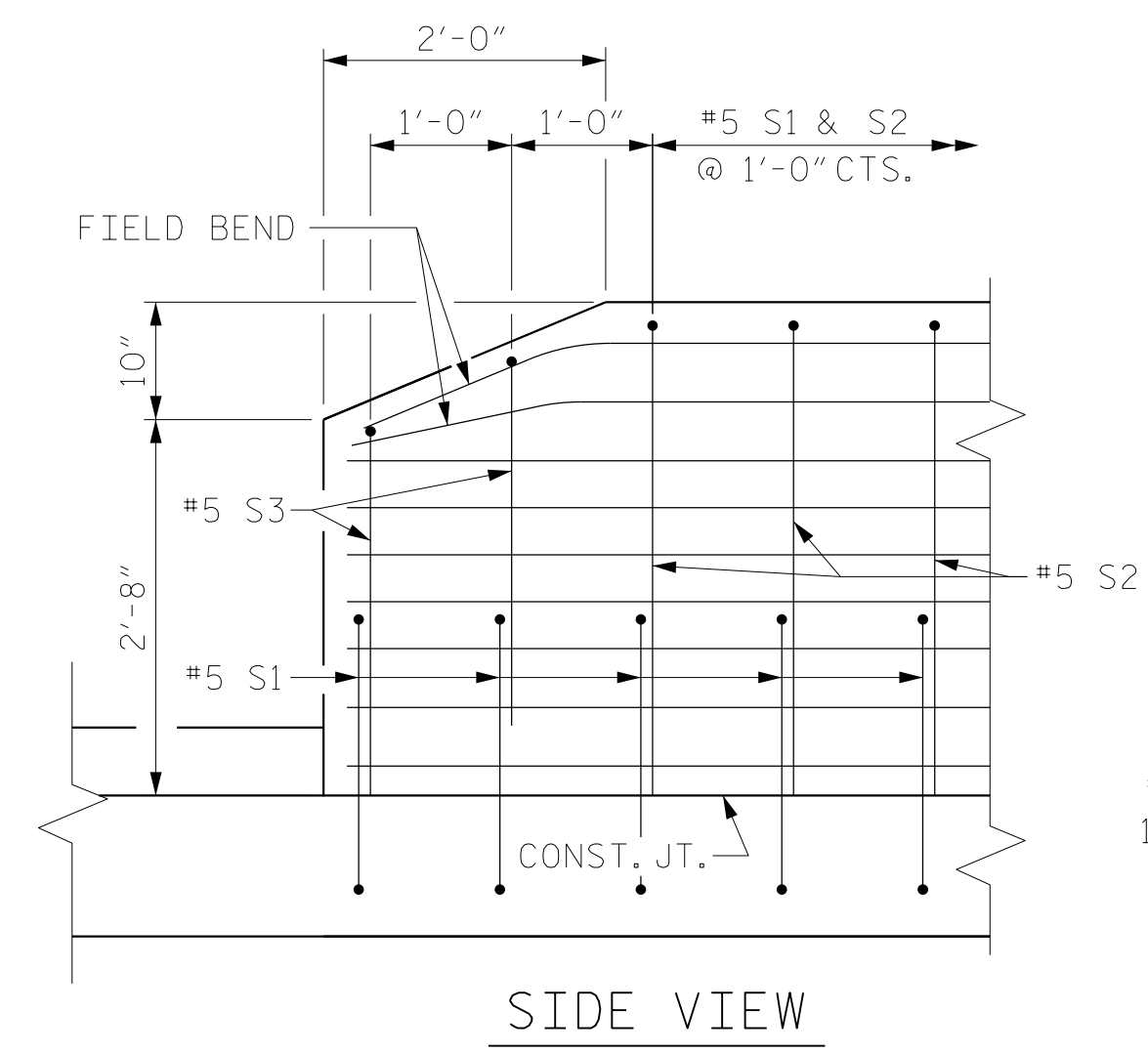


PLAN OF BARRIER RAIL



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	6	#5	STR.	9'-10"	62
* B2	5	#5	STR.	10'-2"	53
* B3	11	#5	STR.	9'-8"	111
* S1	21	#5	1	5'-1"	111
* S2	17	#5	2	7'-0"	124
* S3	4	#5	2	5'-6"	23
* EPOXY COATED REINFORCING STEEL					484 LBS.
CLASS AA CONCRETE					2.8 CU. YDS.
CONCRETE BARRIER RAIL					20.4 LIN. FT.



SECTION THRU RAIL
END OF RAIL DETAILS

PROJECT NO. U-5798A
CUMBERLAND COUNTY
STATION: 76+80.00 -L-

SHEET 3 OF 3

NOTES:
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

DRAWN BY :	TWL	DATE :	01/2021
CHECKED BY :	MRA	DATE :	01/2021
DESIGN ENGINEER OF RECORD:	RLB	DATE :	09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S2-43
TOTAL SHEETS	43

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$ " 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN