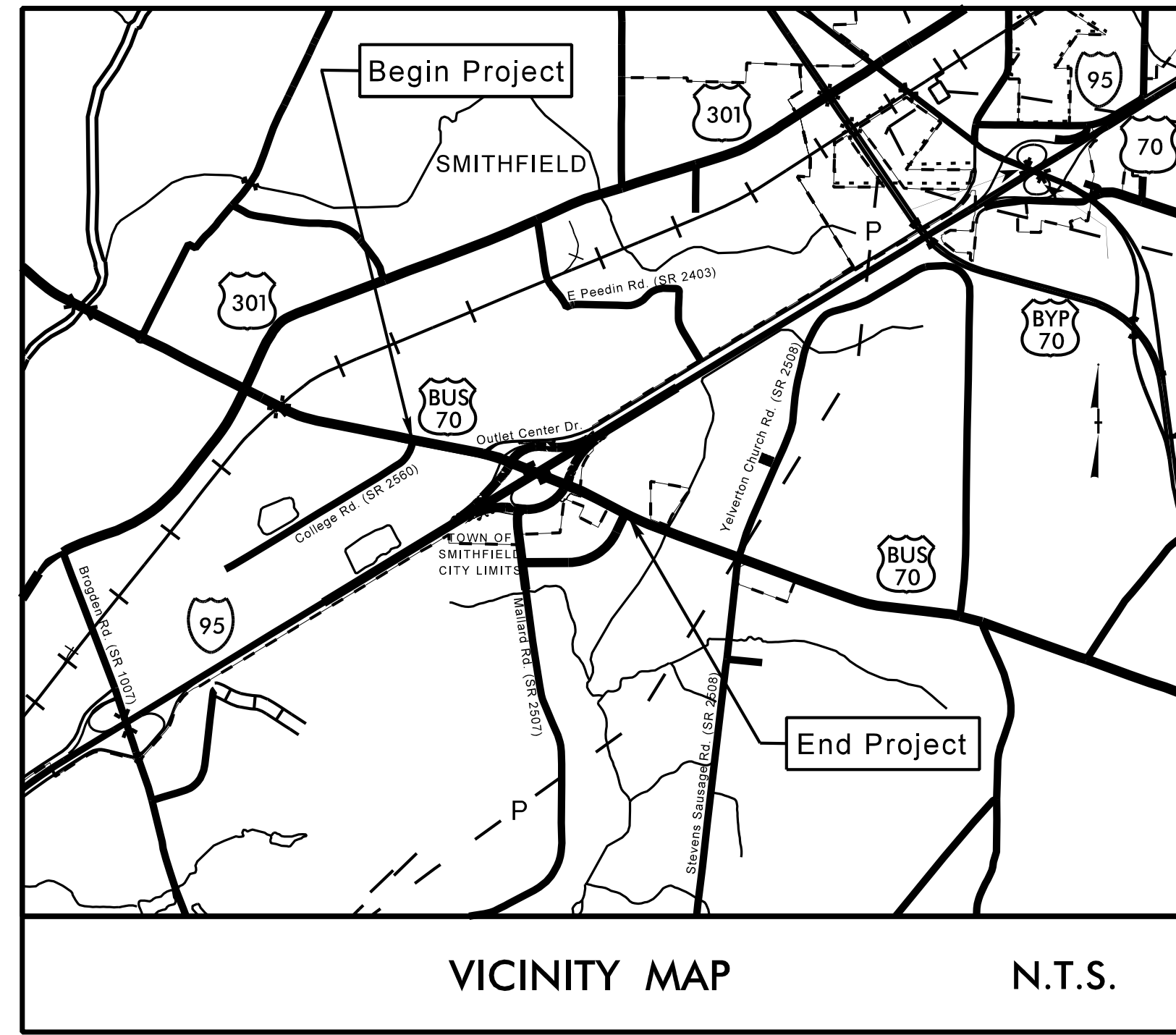


TIP PROJECT: I-5972

CONTRACT: C204873

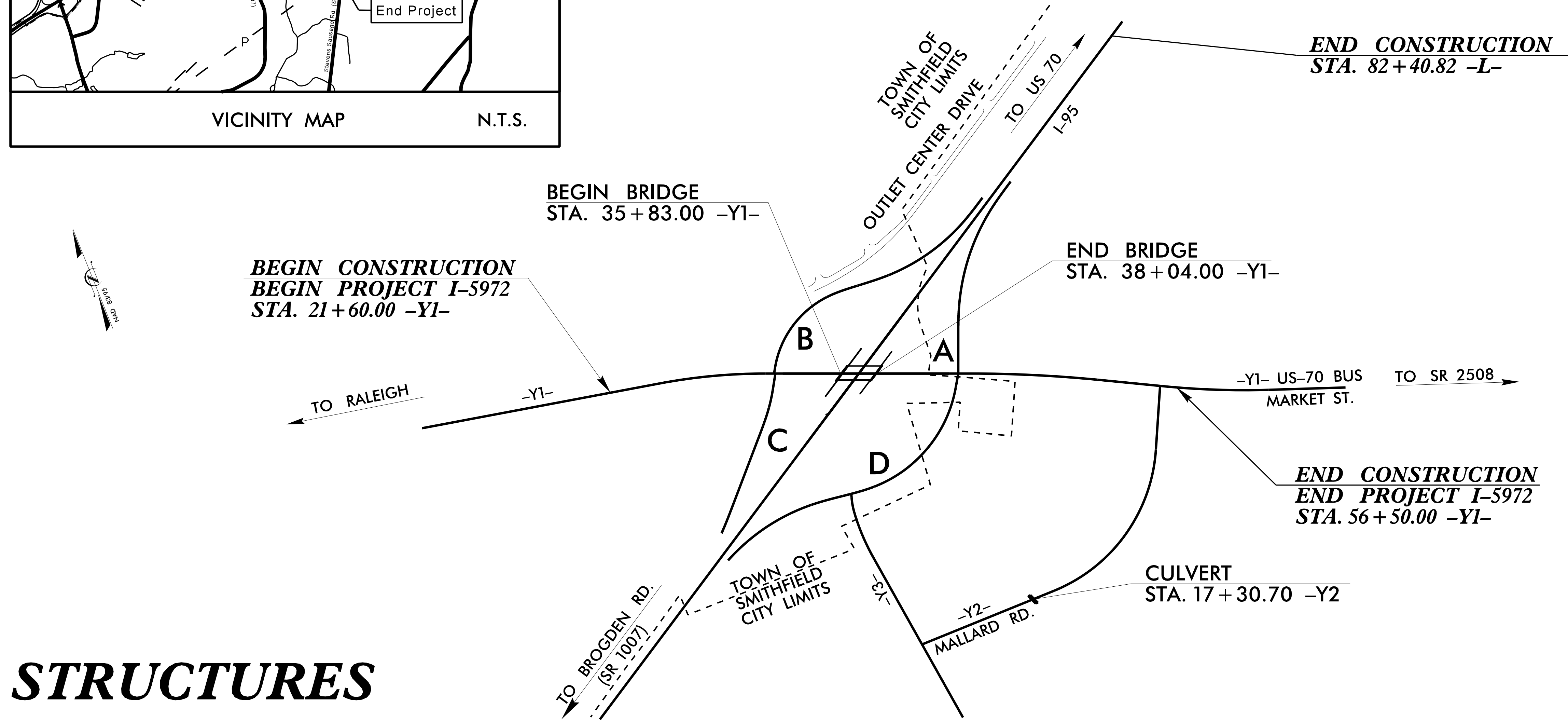
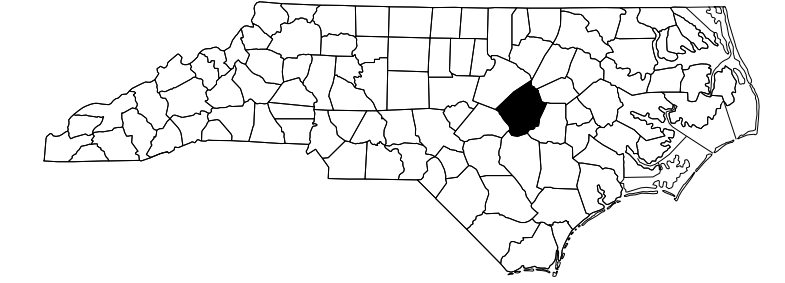


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
JOHNSTON COUNTY

**LOCATION: I-95 AND US-70 BUSINESS, (E. MARKET STREET),
EXIT 95 INTERCHANGE FROM OUTLET CENTER DR.
TO WEST OF YELVERTON GROVE RD.**

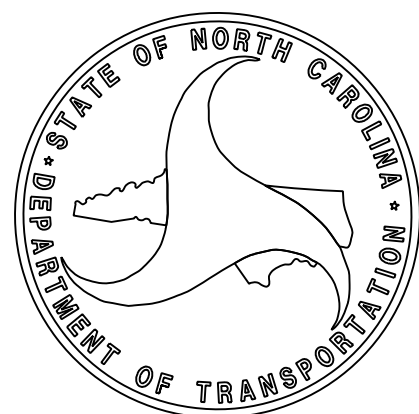
**TYPE OF WORK: GRADING, DRAINAGE, PAVING,
SIGNING, SIGNALS AND STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5972	1	67
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
44989.1.1	NHP-0095(045)	PE	
44989.2.1	NHP-0095(045)	RW, UTILITIES	
44989.3.1	NHP-0095(045)	CONST.	



STRUCTURES

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UNLESS ALL SIGNATURES COMPLETED**



DESIGN DATA

ADT 2017 =	13,600
ADT 2037 =	17,600
K =	8 %
D =	55 %
T =	4 % *
V =	50 MPH
* (TTST 1 % + DUAL 3 %)	
FUNC CLASSIFICATION = MINOR ARTERIAL (BRIDGE)	

PROJECT LENGTH

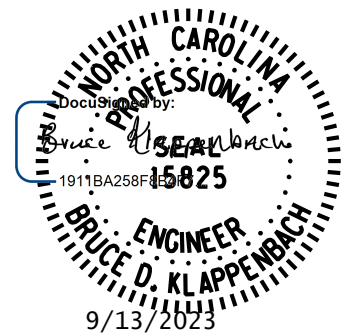
LENGTH ROADWAY TIP PROJECT I-5972 =	1.031 MILES
TOTAL LENGTH TIP PROJECT I-5972 =	1.031 MILES

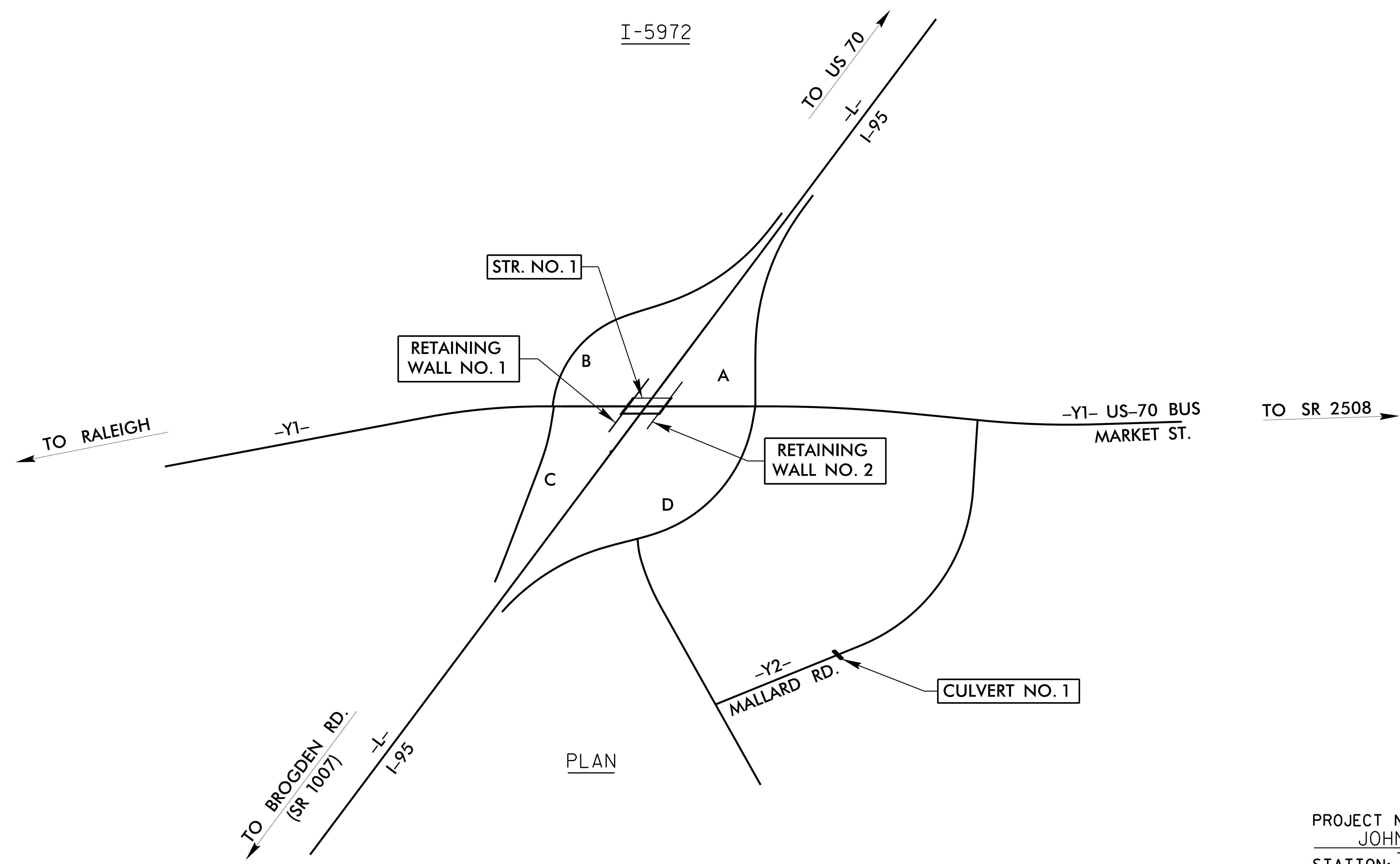
Prepared for the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS	
LETTING DATE : NOVEMBER 21, 2023	MICHAEL T. MERRITT, P.E. PROJECT ENGINEER Bruce D. Klappenbach, P.E. PROJECT STRUCTURE ENGINEER
NCDOT CONTACT:	RUSSELL BROADWELL, P.E. DIVISION 4 PROJECT ENGINEER

PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1 SUITE 700
RALEIGH, NC 27615 (919) 878-9560
NC LICENSE NUMBER: F-0112



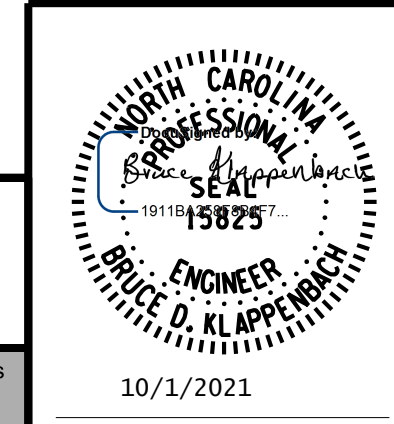


PLAN

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

INDEX			
NO.	STATION	DESCRIPTION	SHEET NUMBERS
STR. NO. 1	STA. 35+93.50 -Y1-	BRIDGE ON US 70 BUS (E. MARKET ST.) OVER I-95 BETWEEN US 301 AND SR 2508	S-1 THRU S-54
CULVERT NO. 1	STA. 17+30.70 -Y2-	DOUBLE 8 FT. X 5 FT. CONCRETE BOX CULVERT	CU-1 THRU CU-5
WALL NO. 1	STA. 35+93.50 -Y1-	MSE RETAINING WALL AT END BENT 1	W-1 THRU W-5
WALL NO. 2	STA. 35+93.50 -Y1-	MSE RETAINING WALL AT END BENT 2	

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 INDEX

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

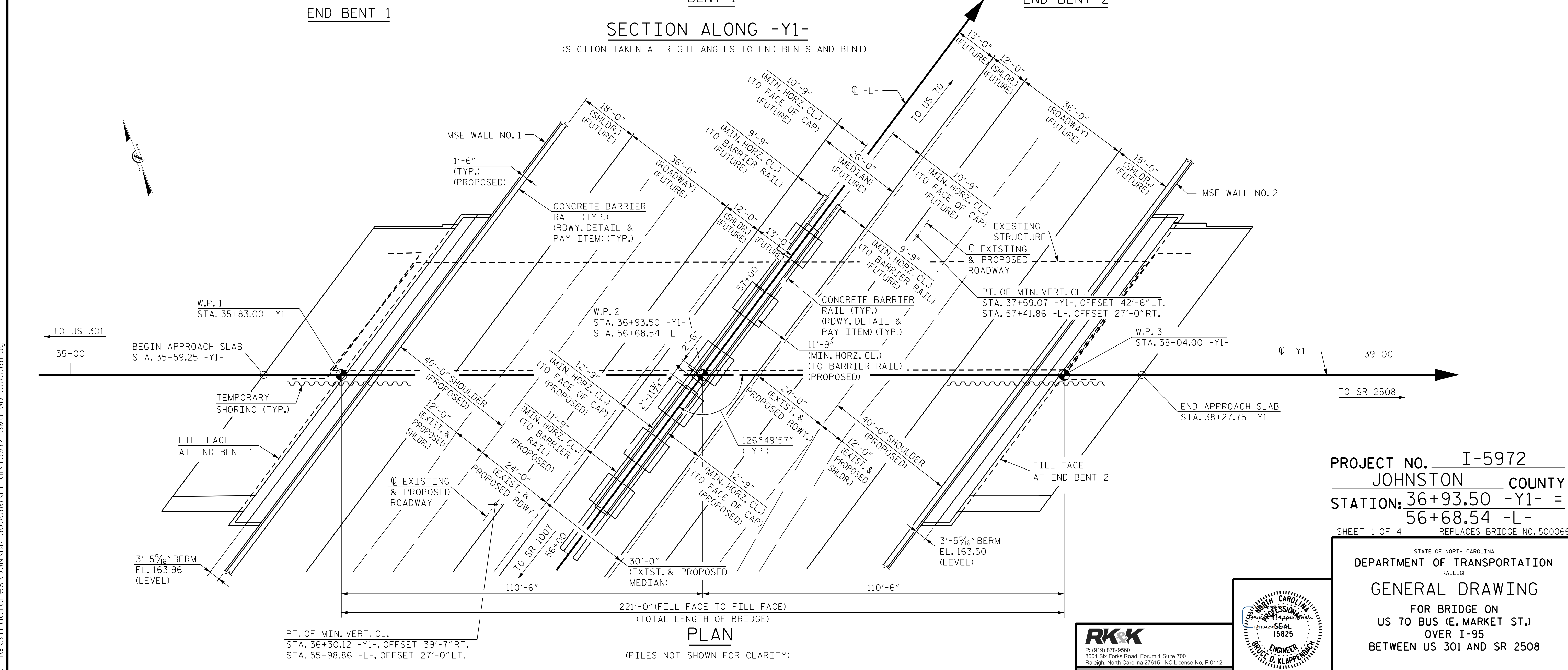
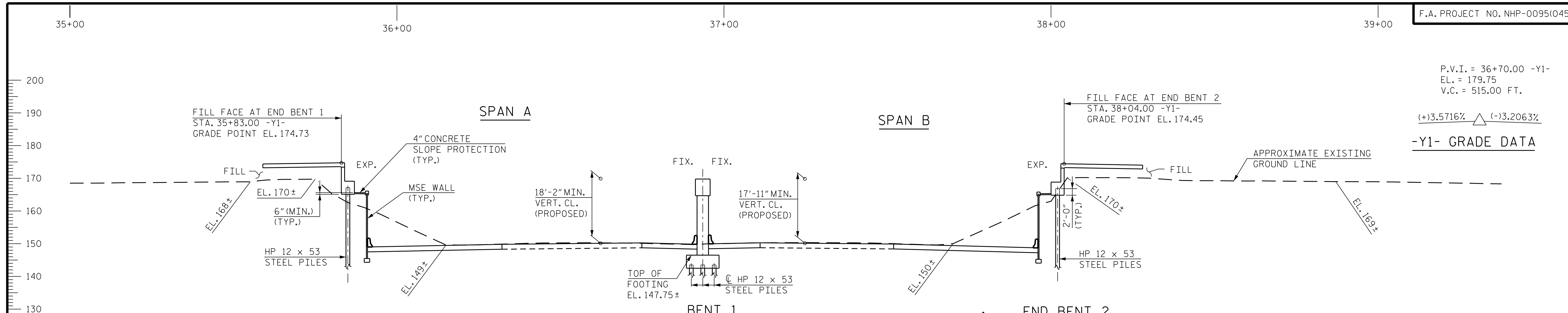
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R:\Structures\DCN\Project Misc_DGNs\I5972_SMU_IS_500066.dgn
 10/1/2021
 bhaag

DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

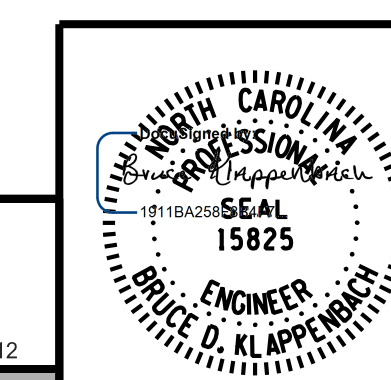
P.V.I. = 36+70.00 -Y1-
 EL. = 179.75
 V.C. = 515.00 FT.

(+3.5716% Δ (-)3.2063%
 -Y1- GRADE DATA



PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1- =
56+68.54 -L-
 SHEET 1 OF 4 REPLACES BRIDGE NO. 500066

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON
 US 70 BUS (E. MARKET ST.)
 OVER I-95
 BETWEEN US 301 AND SR 2508



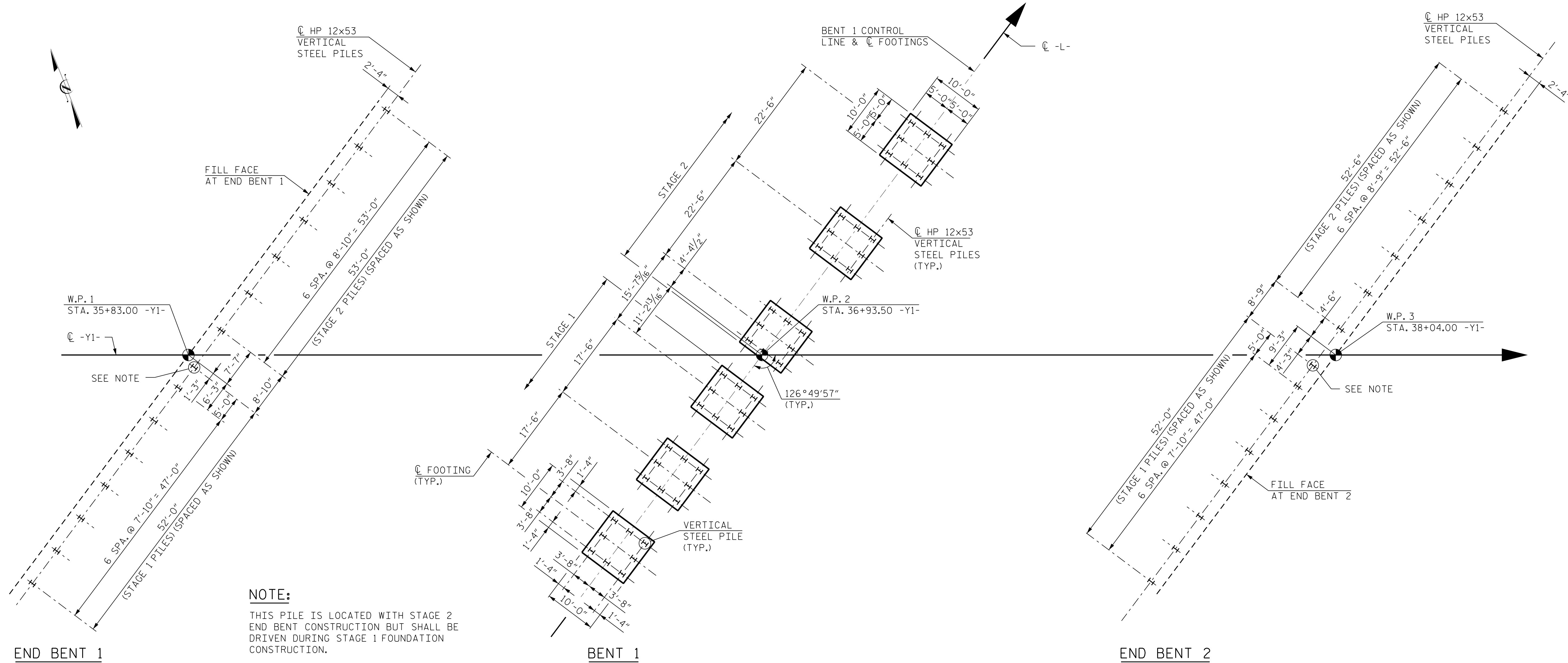
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9/13/2023
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			54
2			4			

DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

bklappenbach
 9/13/2023 R:\Structures\DON\BR_500066\Final\I5972_SMU_GD_500066.dgn



NOTE:
 THIS PILE IS LOCATED WITH STAGE 2 END BENT CONSTRUCTION BUT SHALL BE DRIVEN DURING STAGE 1 FOUNDATION CONSTRUCTION.

FOUNDATION LAYOUT

ALL PILES ARE HP 12x53 VERTICAL STEEL PILES.
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
 DIMENSIONS SHOWN FOR BENT FOOTINGS AND STEEL PILES ARE TYPICAL FOR EACH FOOTING.

FOUNDATION NOTES

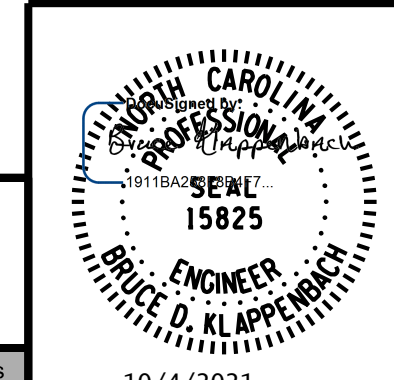
- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW.
- OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON
 US 70 BUS (E. MARKET ST.)
 OVER I-95
 BETWEEN US 301 AND SR 2508

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			54

DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

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10/4/2021 R:\Structures\DON\BR_500066\Final\I5972_SMU_FL_500066.dgn

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLES SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE PRIOR TO BEGINNING BRIDGE CONSTRUCTION. VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 50 FT., 2 @ 63 FT., 1 @ 50 FT.) WITH 5.5 IN. OF ASPHALT OVERLAY ON A REINFORCED CONCRETE DECK ON 4 LINES OF STEEL I-BEAMS AND A CLEAR ROADWAY WIDTH OF 31.25 FT. THE SUBSTRUCTURE CONSISTS OF REINFORCED CONCRETE CAPS ON PRECAST/PRESTRESSED CONCRETE PILES AT EACH INTERIOR BENT AND END BENT LOCATED 18 FT. NORTH OF THE EXISTING STRUCTURE, SHALL BE REMOVED. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE 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.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEMS FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

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

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON
 US 70 BUS (E. MARKET ST.)
 OVER I-95
 BETWEEN US 301 AND SR 2508

REVISIONS

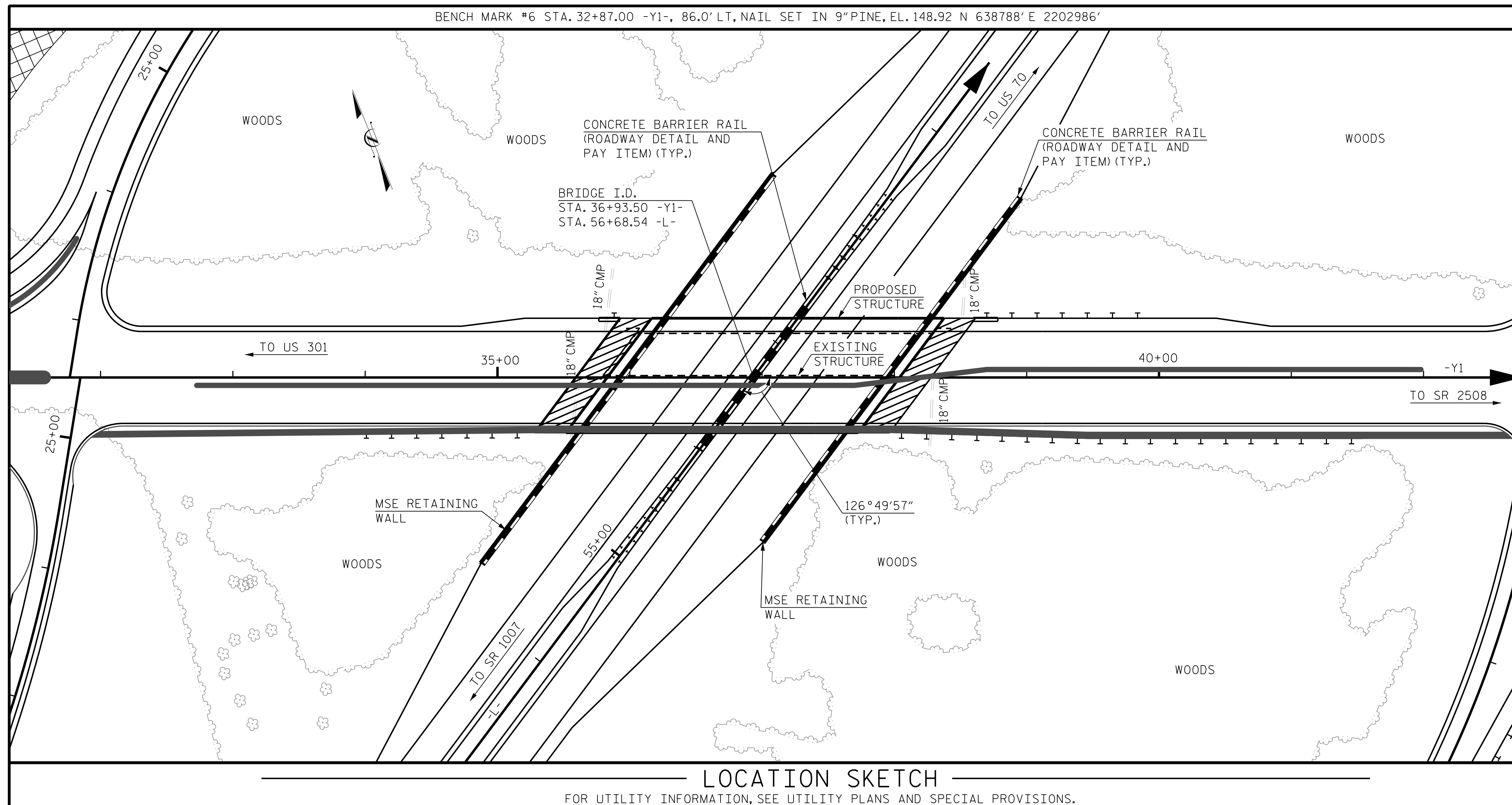
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.

S-3
 TOTAL SHEETS
 54

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPTRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SET UP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2"x2'-6" CONCRETE PARAPET	1'-2"x3'-2 3/4" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS		
	LUMP SUM	LUMP SUM	LUMP SUM	EA.	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	SY	LUMP SUM	LUMP SUM		
SUPERSTRUCTURE	—	—	—	—	19,441	20,634	—	LUMP SUM	—	—	22	2,366.38	—	—	—	420.89	225.74	218.24	—	LUMP SUM	LUMP SUM	
END BENT 1	—	—	—	—	—	—	112.0	—	14,571	—	—	—	15	15	900	—	—	—	—	—	—	
BENT 1	—	—	LUMP SUM	—	—	—	227.2	—	35,946	2,613	—	—	48	48	1,920	—	—	—	—	—	—	
END BENT 2	—	—	—	—	—	—	113.3	—	14,665	—	—	—	15	15	825	—	—	—	—	—	—	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	1	19,441	20,634	452.5	LUMP SUM	65,182	2,613	22	2,366.38	78	78	3,645	15	420.89	225.74	218.24	89.0	LUMP SUM	LUMP SUM



SAMPLE BAR REPLACEMENT			
SIZE	LENGTH	SIZE	LENGTH
#3	6'-2"	#8	12'-0"
#4	1'-4"	#9	13'-2"
#5	8'-6"	#10	14'-6"
#6	9'-8"	#11	15'-10"
#7	10'-10"		

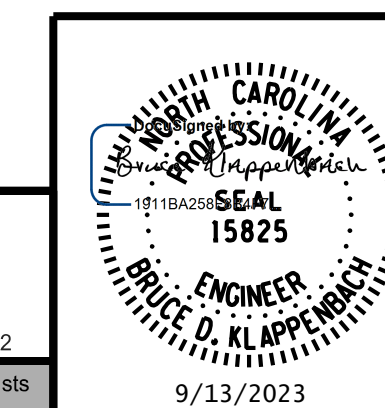
NOTE:

SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND $f_y = 60$ ksi.

NOTES (CONTINUED):

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 36+93.50 -Y1-."

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DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

bklappenbach 8/10/2023 \\ad.rkk.com\fs\Cloud\Projects\2015\15213_NCEas+LSA\M01_I5972_I95-US70Bus-Inter-chn\Design\Structures\DG\BR_500066\Final\I5972_SMU_SUM_500066.dgn

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 _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ _L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.23	-	1.75	0.747	1.73	A & B	E	53.1	0.949	1.36	A & B	I	10.0	0.8	0.747	1.23	A & B	E	53.1	-	
	HL-93 (OPERATING)	N/A		1.80	-	1.35	0.747	2.24	A & B	E	53.1	0.949	1.80	A & B	I	10.0	N/A	-	-	-	-	-	-	-
	HS-20 (INVENTORY)	36,000	2	1.74	62,640	1.75	0.747	2.44	A & B	E	53.1	0.949	1.89	A & B	I	10.0	0.80	0.747	1.74	A & B	E	53.1	-	
	HS-20 (OPERATING)	36,000		2.48	89,280	1.35	0.747	3.17	A & B	E	53.1	0.949	2.48	A & B	I	10.0	N/A	-	-	-	-	-	-	-
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		4.16	56,160	1.40	0.747	7.31	A & B	E	53.1	0.949	6.10	A & B	I	10.0	0.80	0.747	4.16	A & B	E	53.1	-
		SNGARBS2	20,000		3.00	60,000	1.40	0.747	5.27	A & B	E	53.1	0.949	4.23	A & B	I	10.0	0.80	0.747	3.00	A & B	E	53.1	-
		SNAGRIS2	22,000		2.80	61,600	1.40	0.747	4.92	A & B	E	53.1	0.949	3.88	A & B	I	10.0	0.80	0.747	2.80	A & B	E	53.1	-
		SNCOTTS3	27,250		2.07	56,408	1.40	0.747	3.63	A & B	E	53.1	0.949	2.97	A & B	I	10.0	0.80	0.747	2.07	A & B	E	53.1	-
		SNAGGRS4	34,925		1.69	59,023	1.40	0.747	2.97	A & B	E	53.1	0.949	2.39	A & B	I	10.0	0.80	0.747	1.69	A & B	E	53.1	-
		SNS5A	35,550		1.65	58,658	1.40	0.747	2.91	A & B	E	53.1	0.949	2.40	A & B	I	10.0	0.80	0.747	1.65	A & B	E	53.1	-
		SNS6A	39,950		1.50	59,925	1.40	0.747	2.64	A & B	E	53.1	0.949	2.16	A & B	I	10.0	0.80	0.747	1.50	A & B	E	53.1	-
		SNS7B	42,000		1.43	60,060	1.40	0.747	2.51	A & B	E	53.1	0.949	2.09	A & B	I	10.0	0.80	0.747	1.43	A & B	E	53.1	-
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		1.82	60,060	1.40	0.747	3.21	A & B	E	53.1	0.949	2.61	A & B	I	10.0	0.80	0.747	1.82	A & B	E	53.1	-
		TNT4A	33,075		1.83	60,527	1.40	0.747	3.21	A & B	E	53.1	0.949	2.56	A & B	I	10.0	0.80	0.747	1.83	A & B	E	53.1	-
		TNT6A	41,600		1.48	61,568	1.40	0.747	2.60	A & B	E	53.1	0.949	2.19	A & B	I	10.0	0.80	0.747	1.48	A & B	E	53.1	-
		TNT7A	42,000		1.48	62,160	1.40	0.747	2.60	A & B	E	53.1	0.949	2.15	A & B	I	10.0	0.80	0.747	1.48	A & B	E	53.1	-
		TNT7B	42,000		1.51	63,420	1.40	0.747	2.66	A & B	E	53.1	0.949	2.06	A & B	I	10.0	0.80	0.747	1.51	A & B	E	53.1	-
		TNAGRIT4	43,000		1.45	62,350	1.40	0.747	2.55	A & B	E	53.1	0.949	2.00	A & B	I	10.0	0.80	0.747	1.45	A & B	E	53.1	-
EMERGENCY VEHICLE (EV)	EV2	28,750		2.11	60,663	1.30	0.747	3.70	A & B	E	53.1	0.949	2.92	A & B	I	10.0	0.80	0.747	2.11	A & B	E	53.1	-	
	EV3	43,000	4	1.39	59,770	1.30	0.747	2.44	A & B	E	53.1	0.949	1.92	A & B	I	10.0	0.80	0.747	1.39	A & B	E	53.1	-	

LOAD FACTORS:

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

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- PRESTRESSED GIRDERS WERE DESIGNED USING SIMPLE SPAN ANALYSIS.
- EXTERIOR GIRDER NO. 11 CONTROLS THE RATING.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

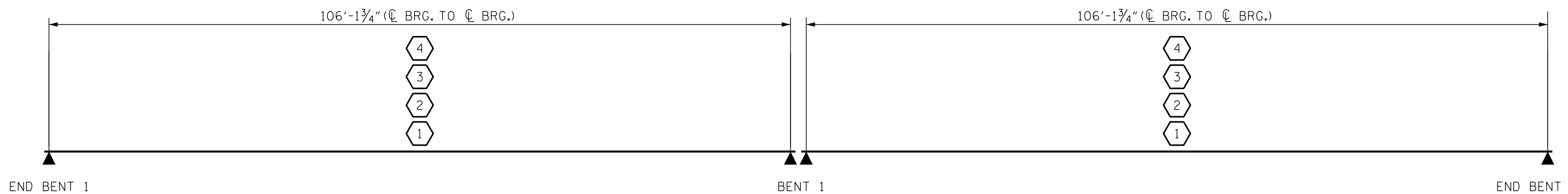
3 LEGAL LOAD RATING **

4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER

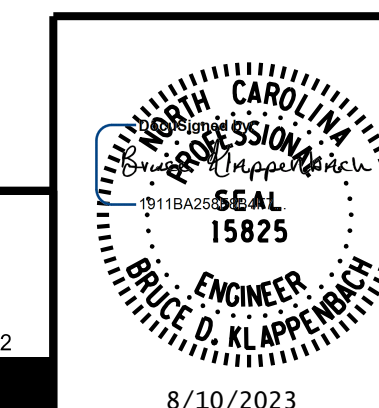


LRFR SUMMARY

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 4 OF 4

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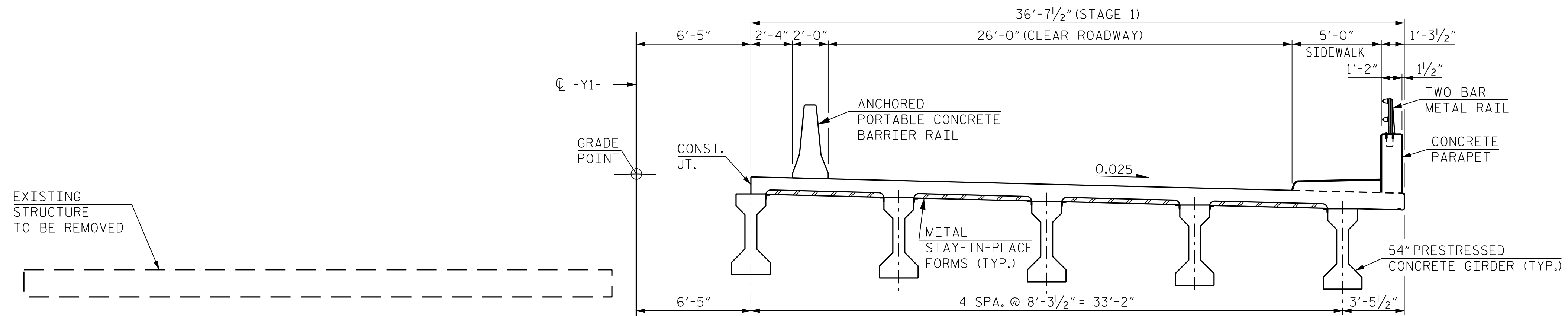


STATE OF NORTH CAROLINA
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 RALEIGH
 GENERAL DRAWING
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

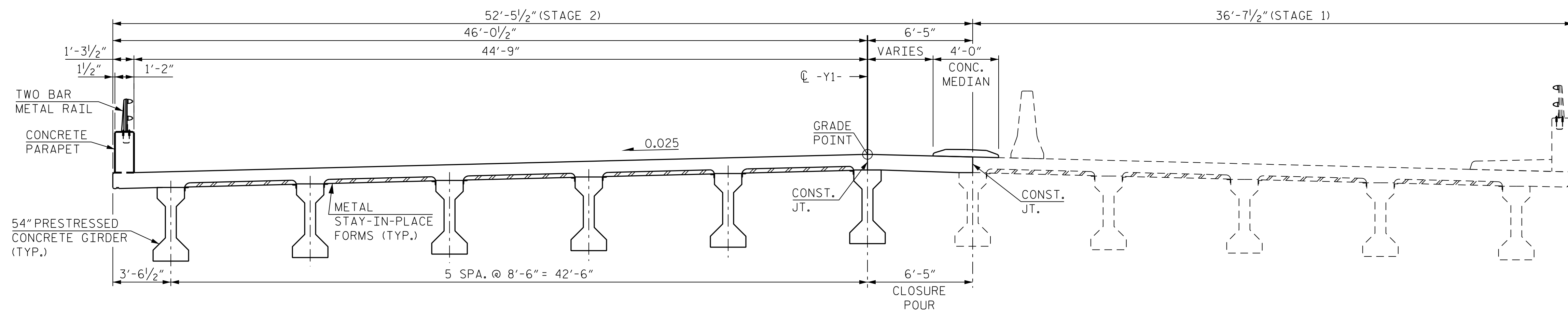
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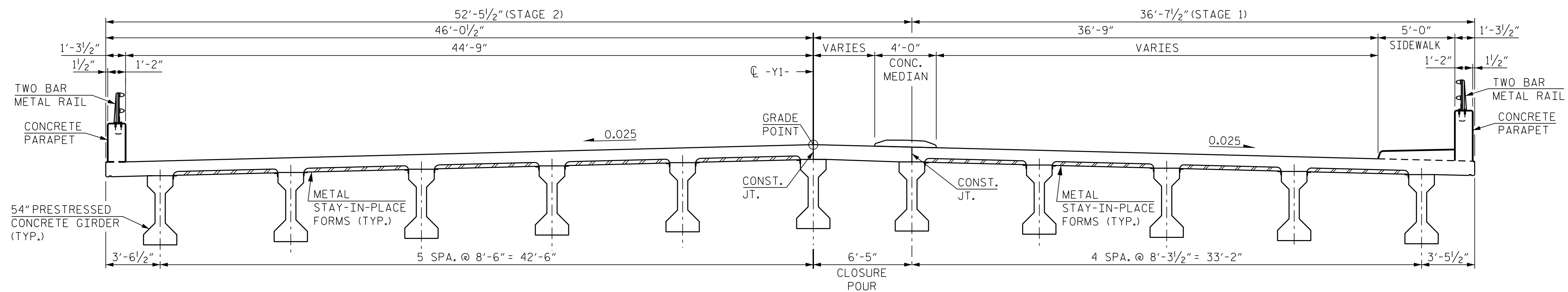
NOTE:
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER RAIL.



TYPICAL SECTION - STAGE 1 CONSTRUCTION



TYPICAL SECTION - STAGE 2 CONSTRUCTION



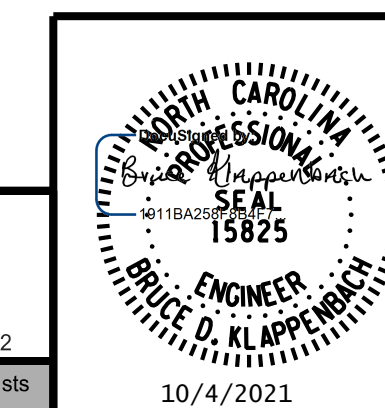
TYPICAL SECTION

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONSTRUCTION SEQUENCE

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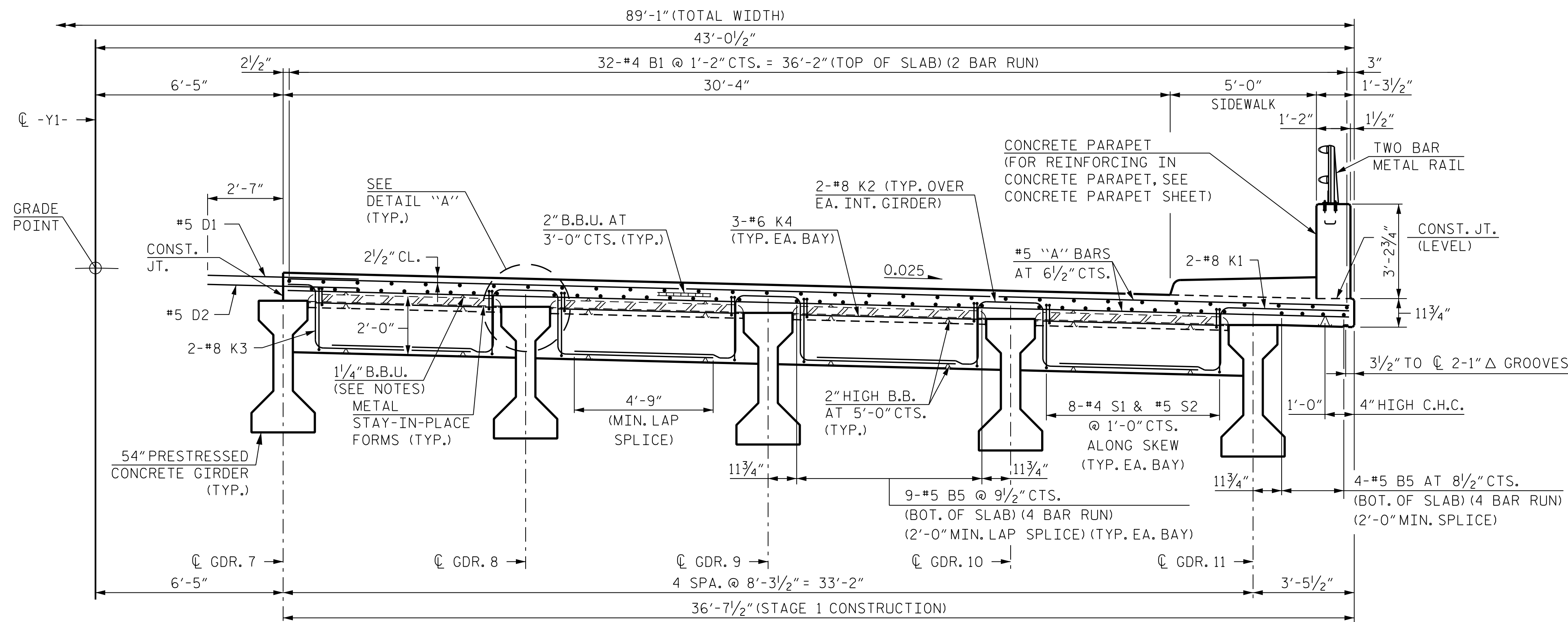


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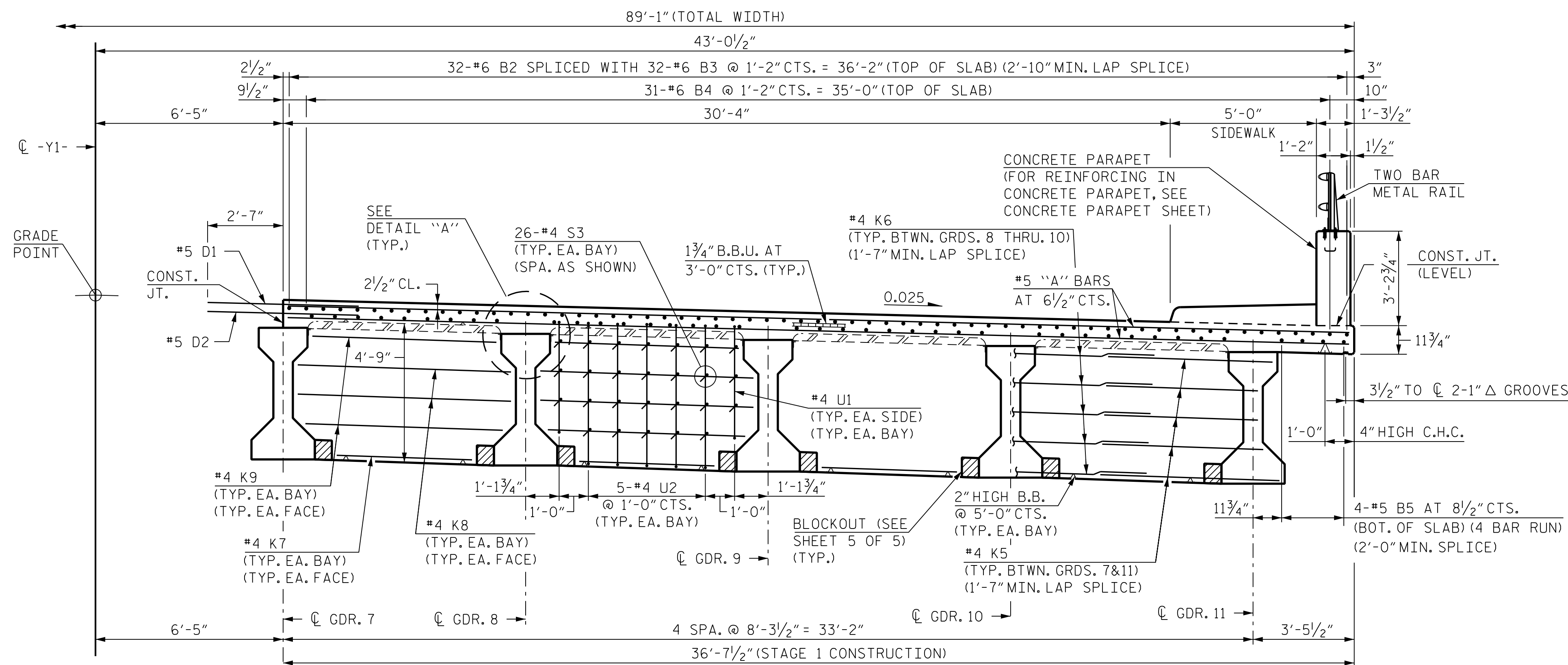
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TYPICAL SECTION AT END BENTS - STAGE 1



TYPICAL SECTION AT BENT - STAGE 1

NOTES:

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

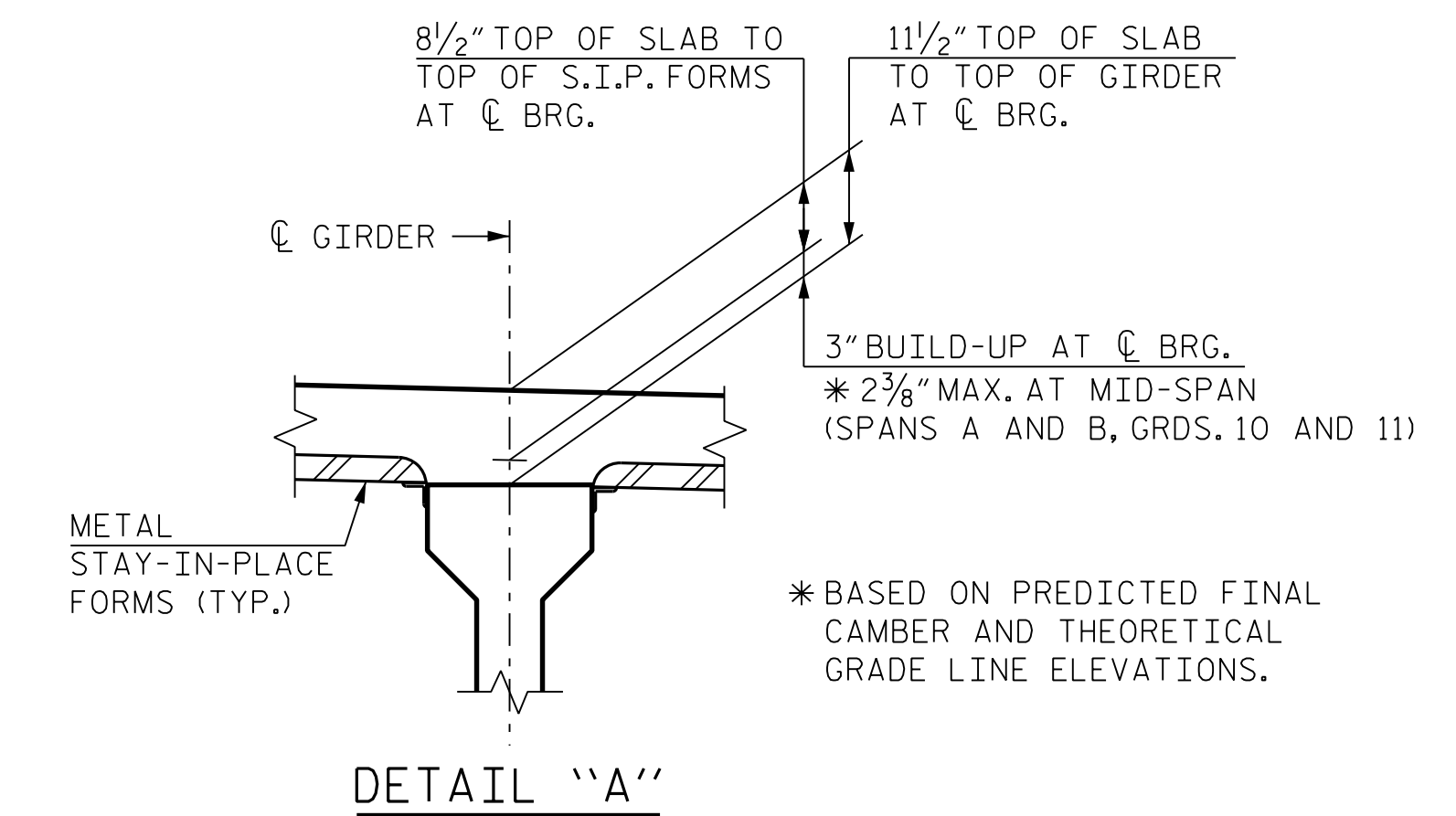
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

DOWELS (#5 D1 AND #5 D2) SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING.

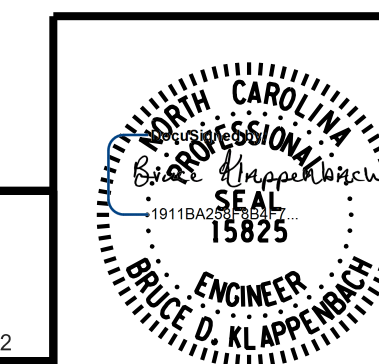
FOR REINFORCING DETAILS IN THE SIDEWALK, SEE "SECTION THROUGH SIDEWALK" ON SHEET 5 OF 5 AND "PLAN OF SPANS, SPANS A & B, STAGE 1" SHEET.



PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
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 TYPICAL SECTIONS
 STAGE 1



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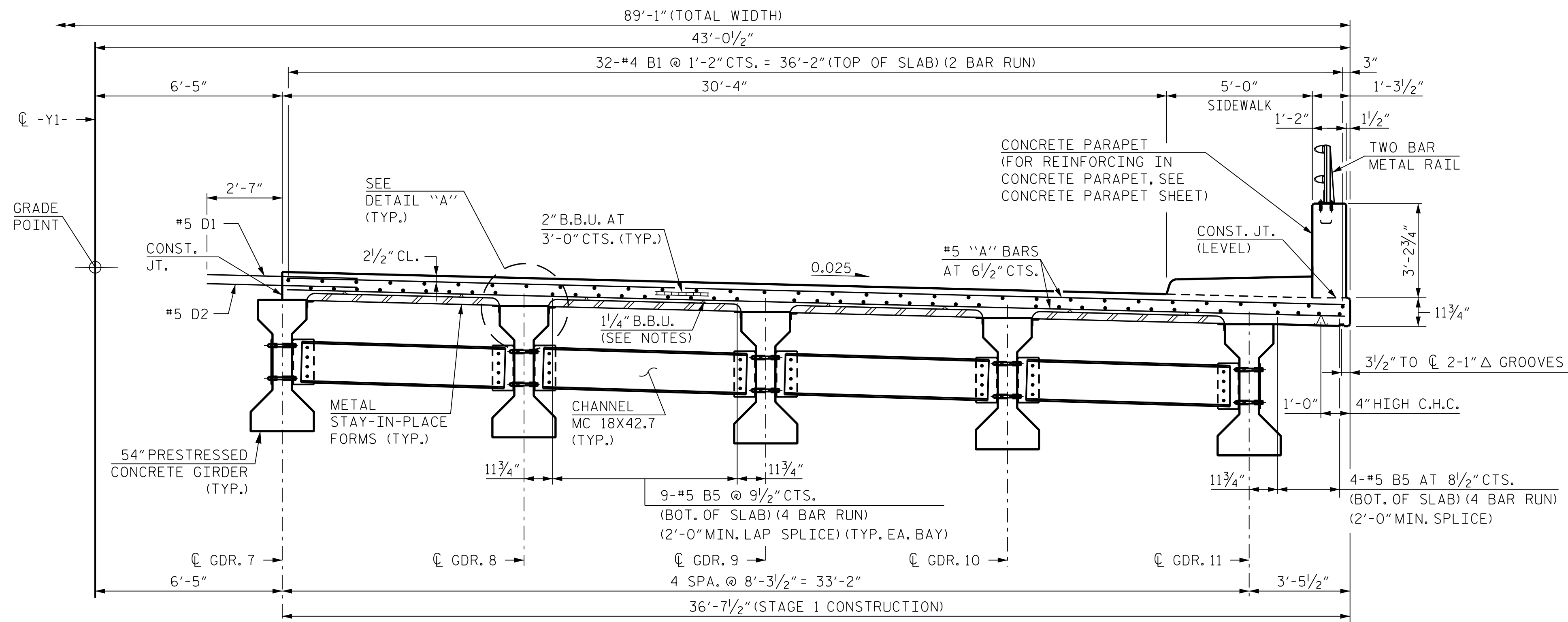
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S-6
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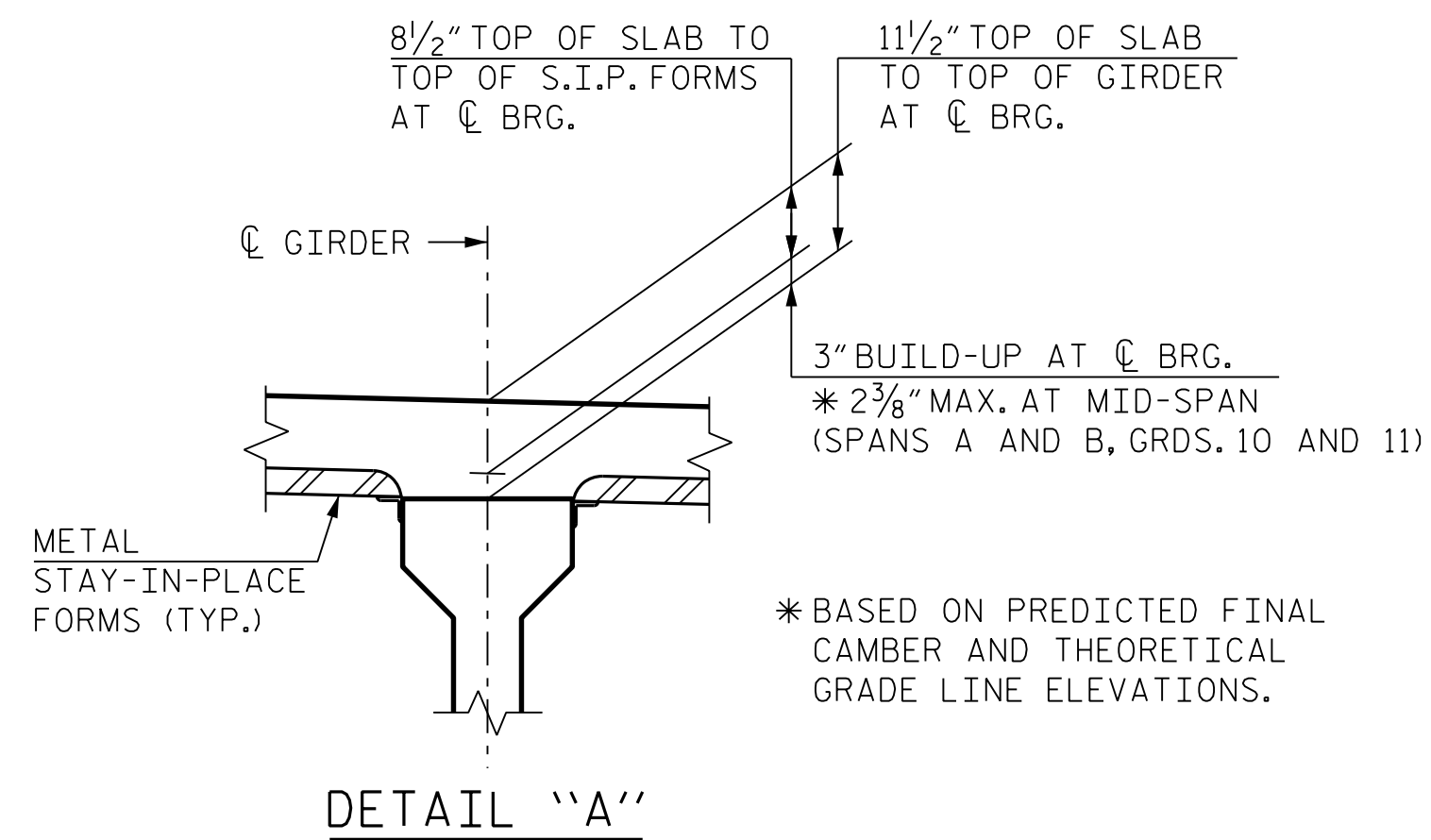
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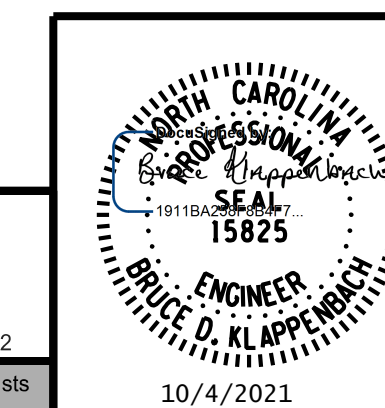
TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM - STAGE 1



PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 5

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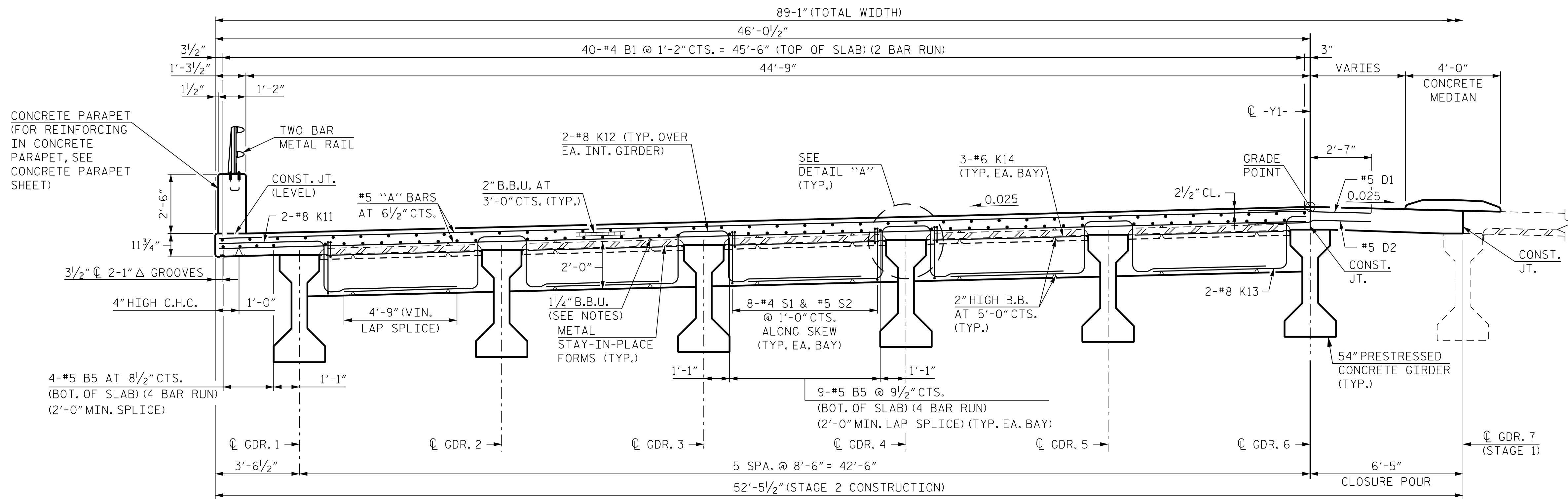
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2/2"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

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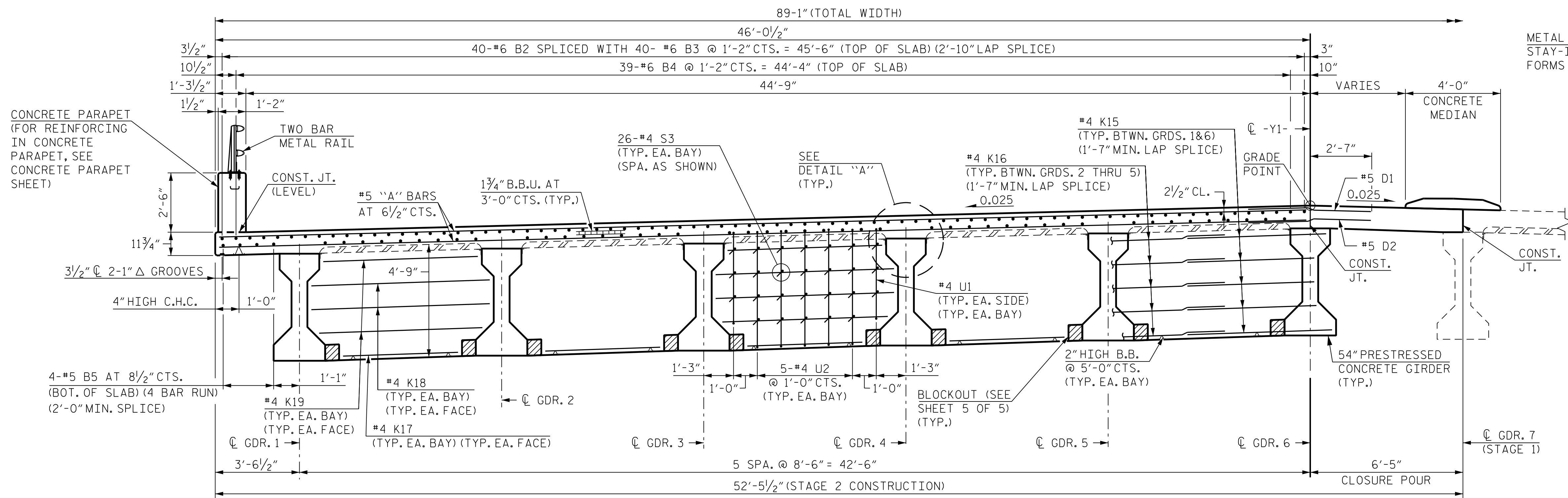
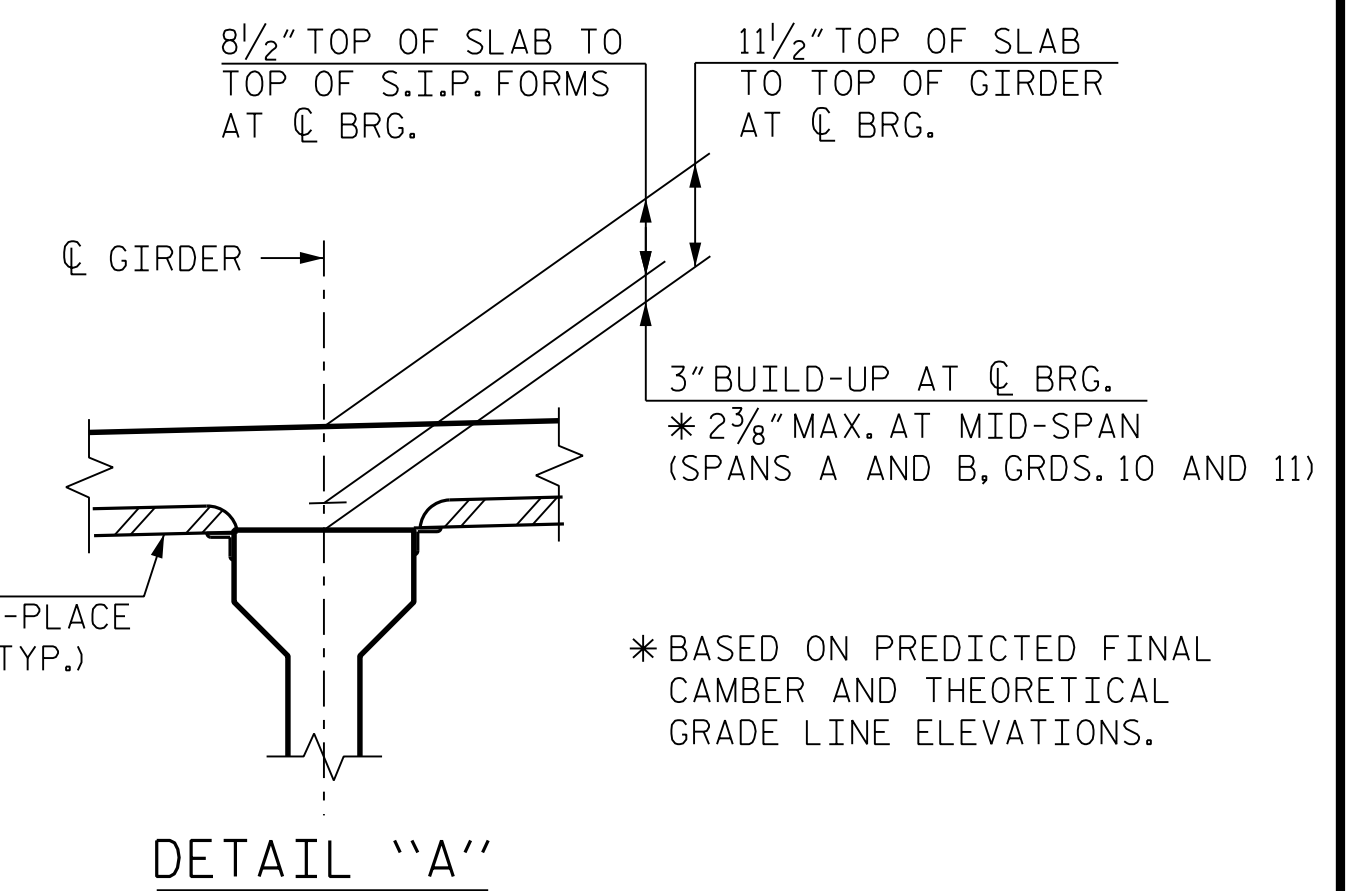
CONCRETE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

DOWELS (#5 D1 AND #5 D2) SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING.



TYPICAL SECTION AT END BENTS - STAGE 2

(FOR REINFORCING IN CLOSURE POUR, SEE CLOSURE POUR DETAIL ON SHEET 4 OF 5)



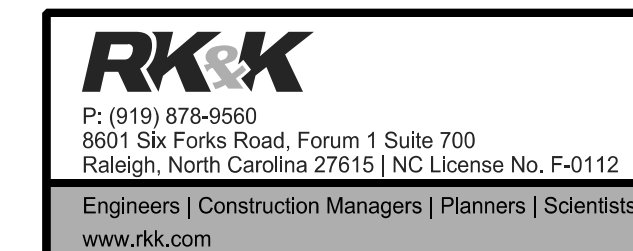
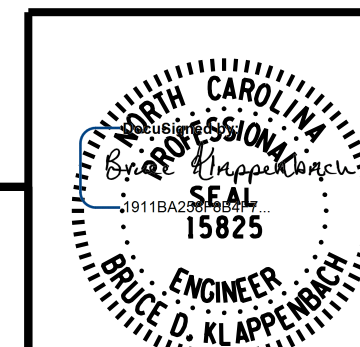
TYPICAL SECTION AT BENT - STAGE 2

(FOR REINFORCING IN CLOSURE POUR, SEE CLOSURE POUR DETAIL ON SHEET 4 OF 5)

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 3 OF 5

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 TYPICAL SECTIONS
 STAGE 2

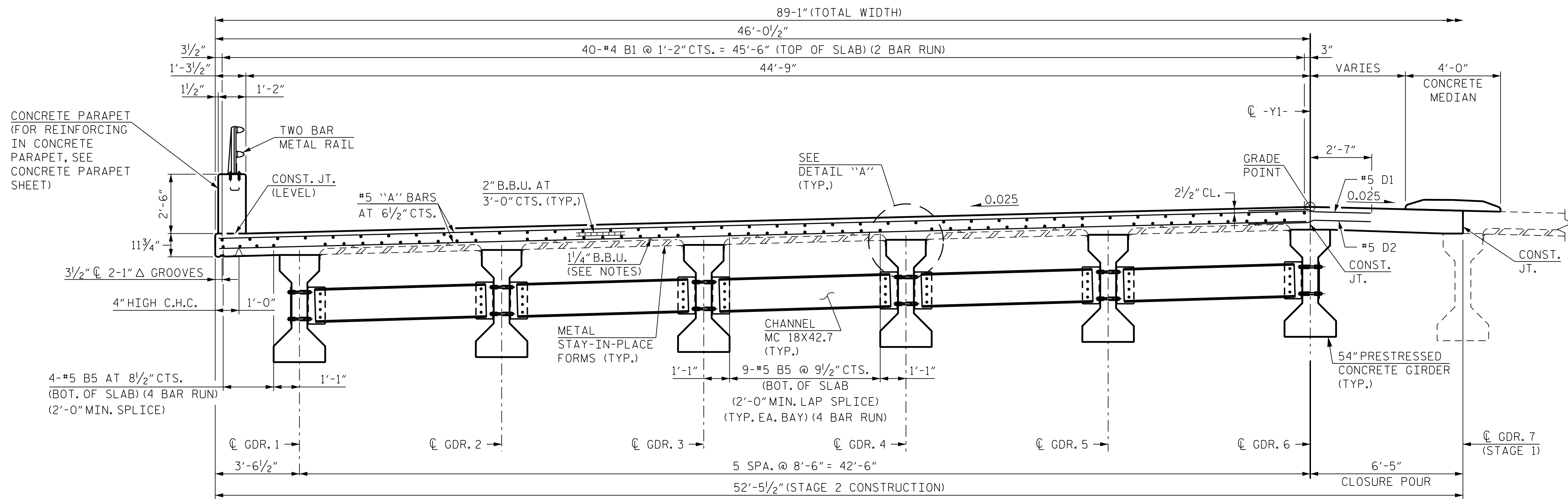


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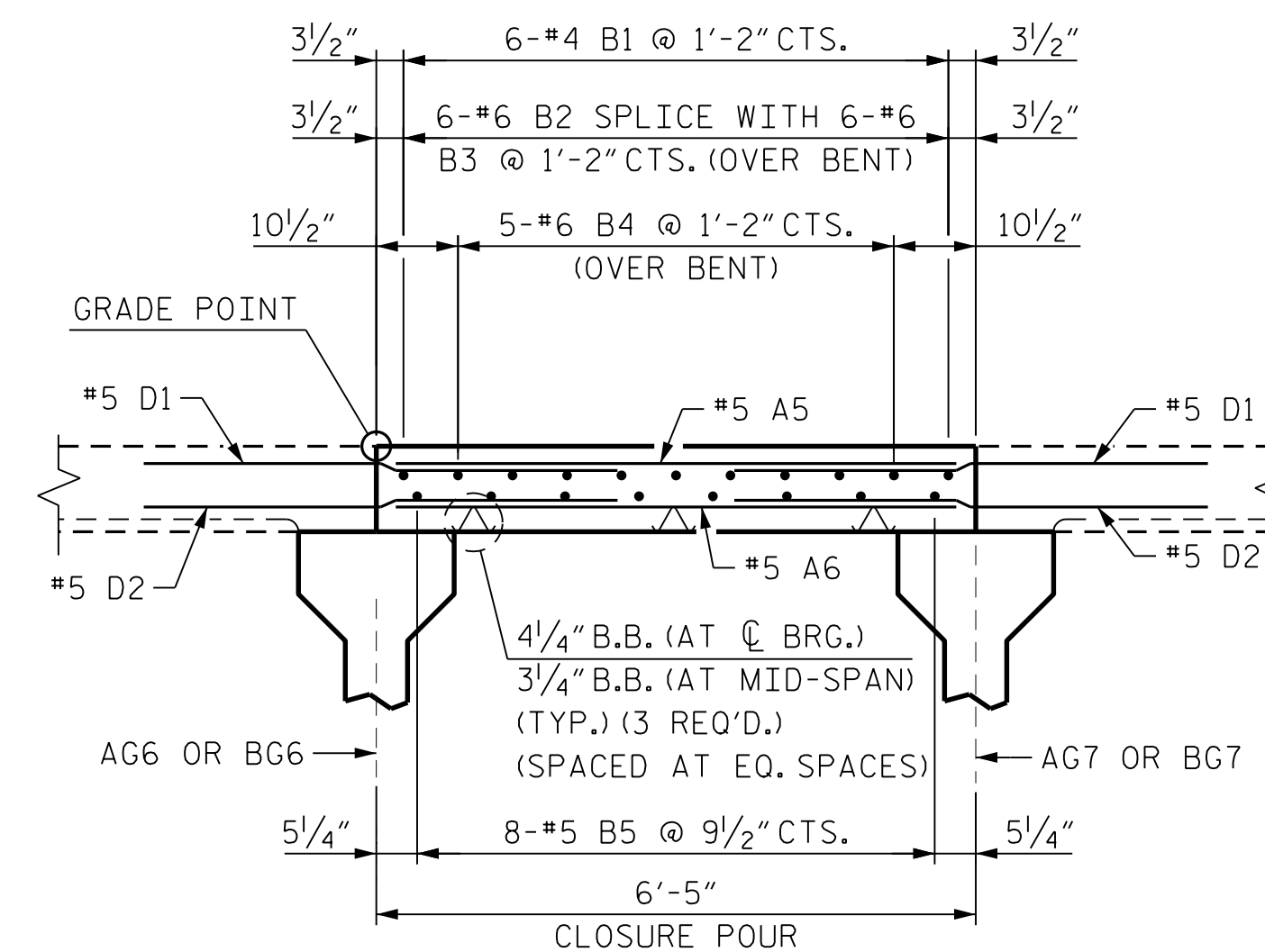
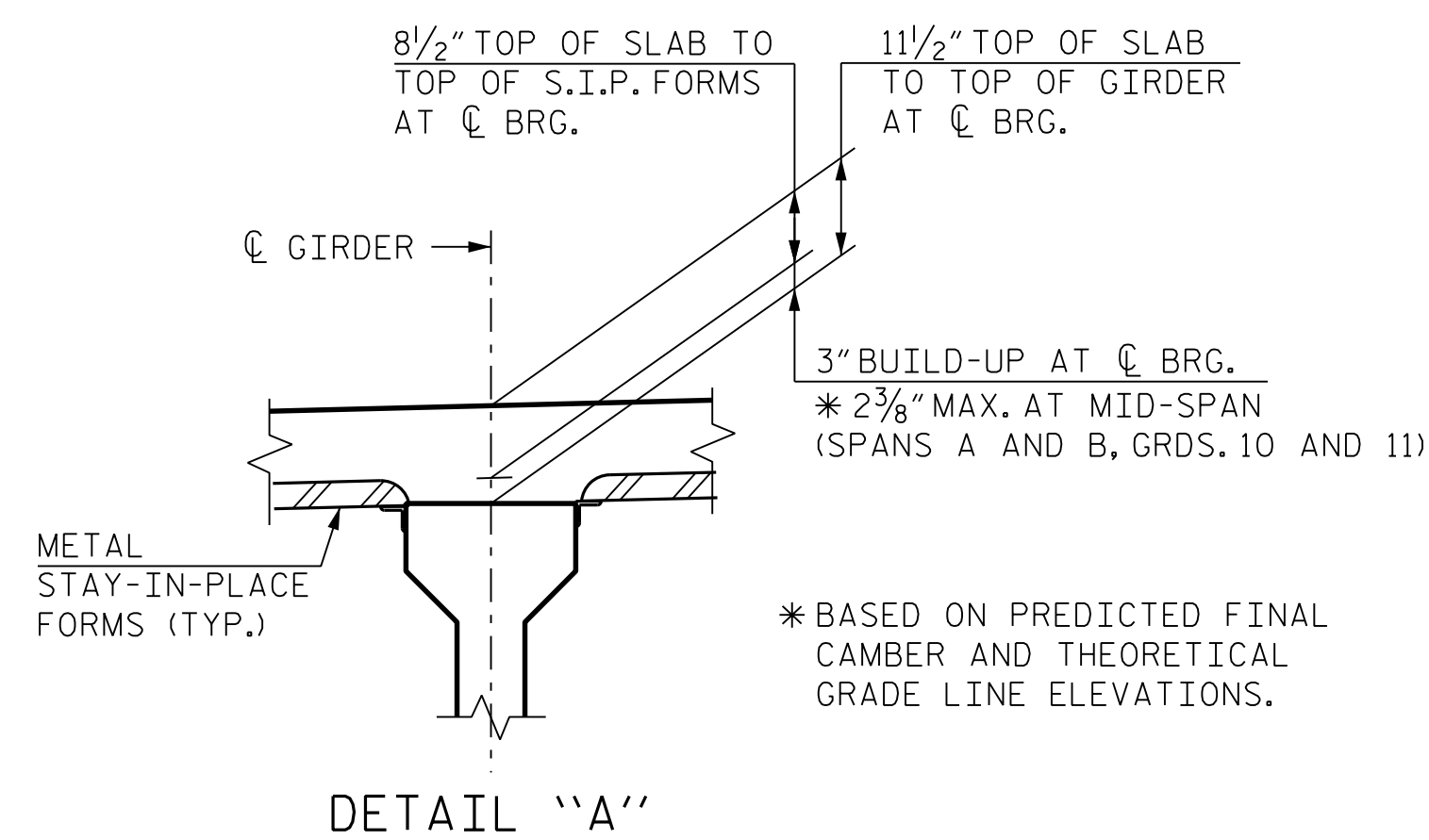
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TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM - STAGE 2

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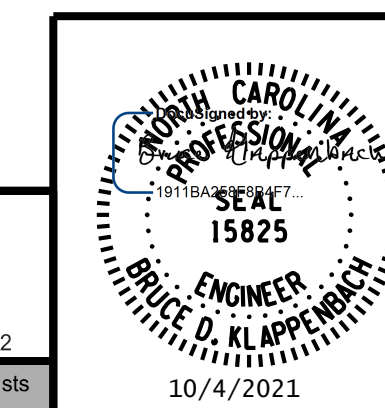
CLOSURE POUR DETAIL

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 4 OF 5

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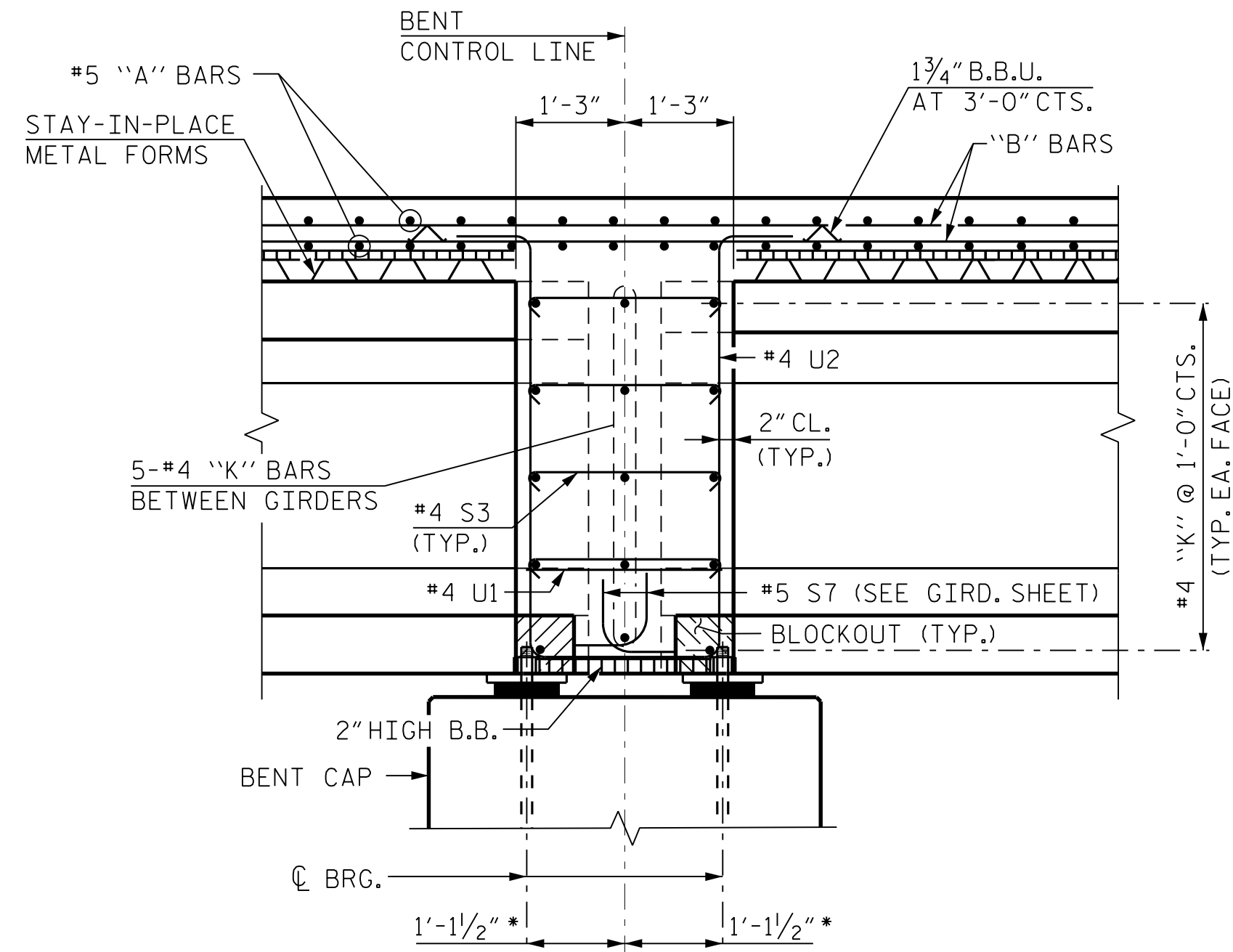
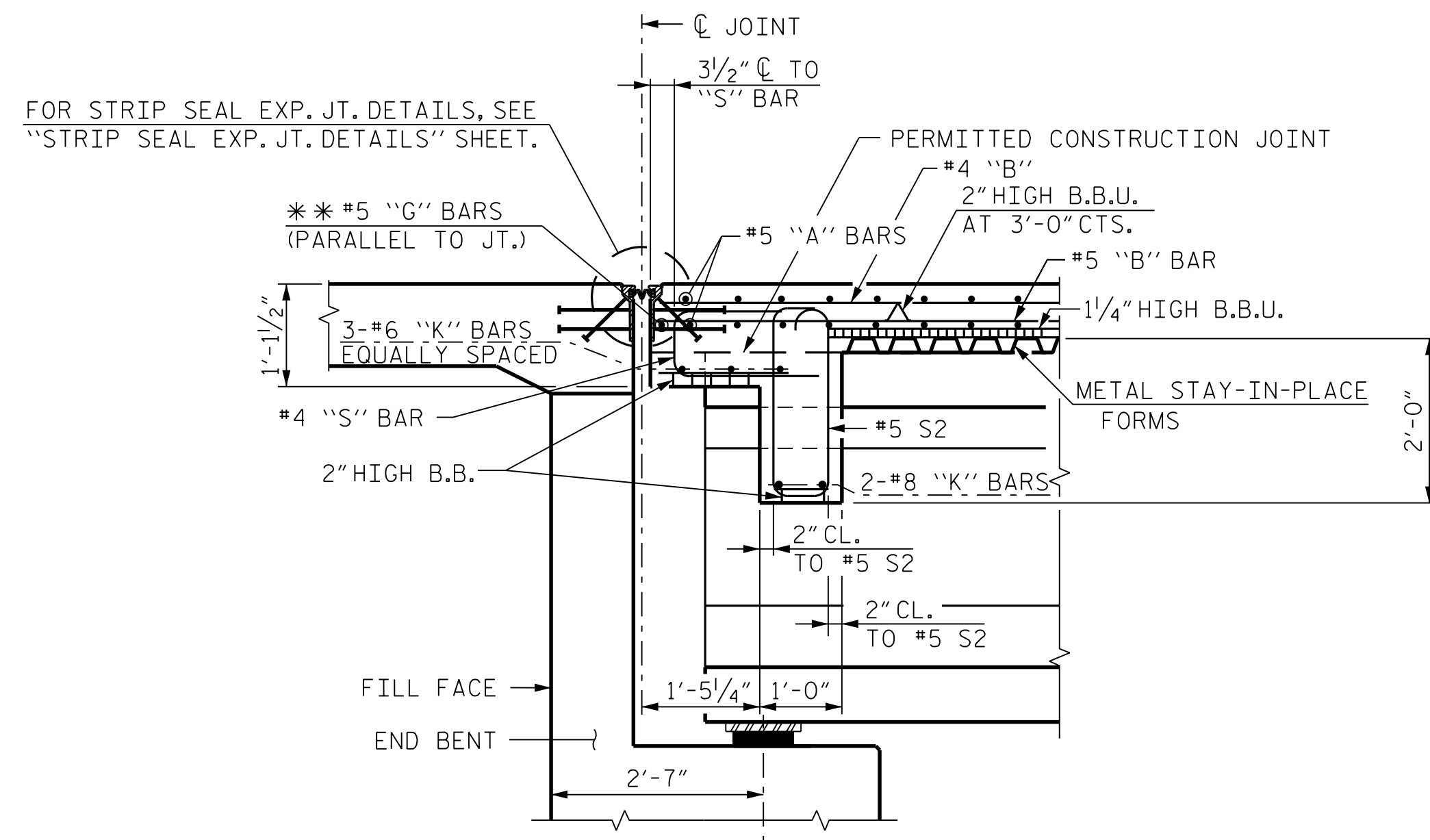
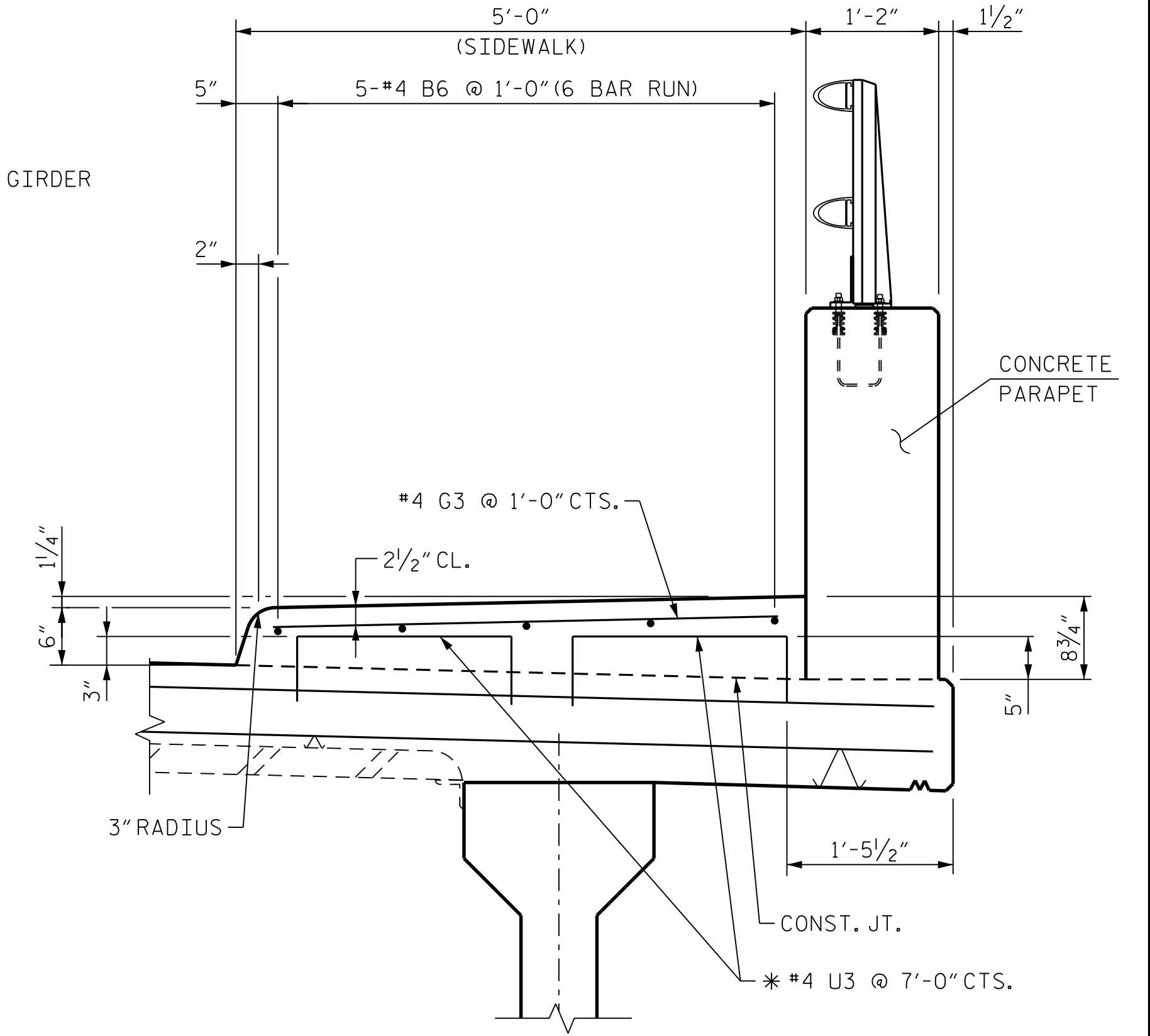
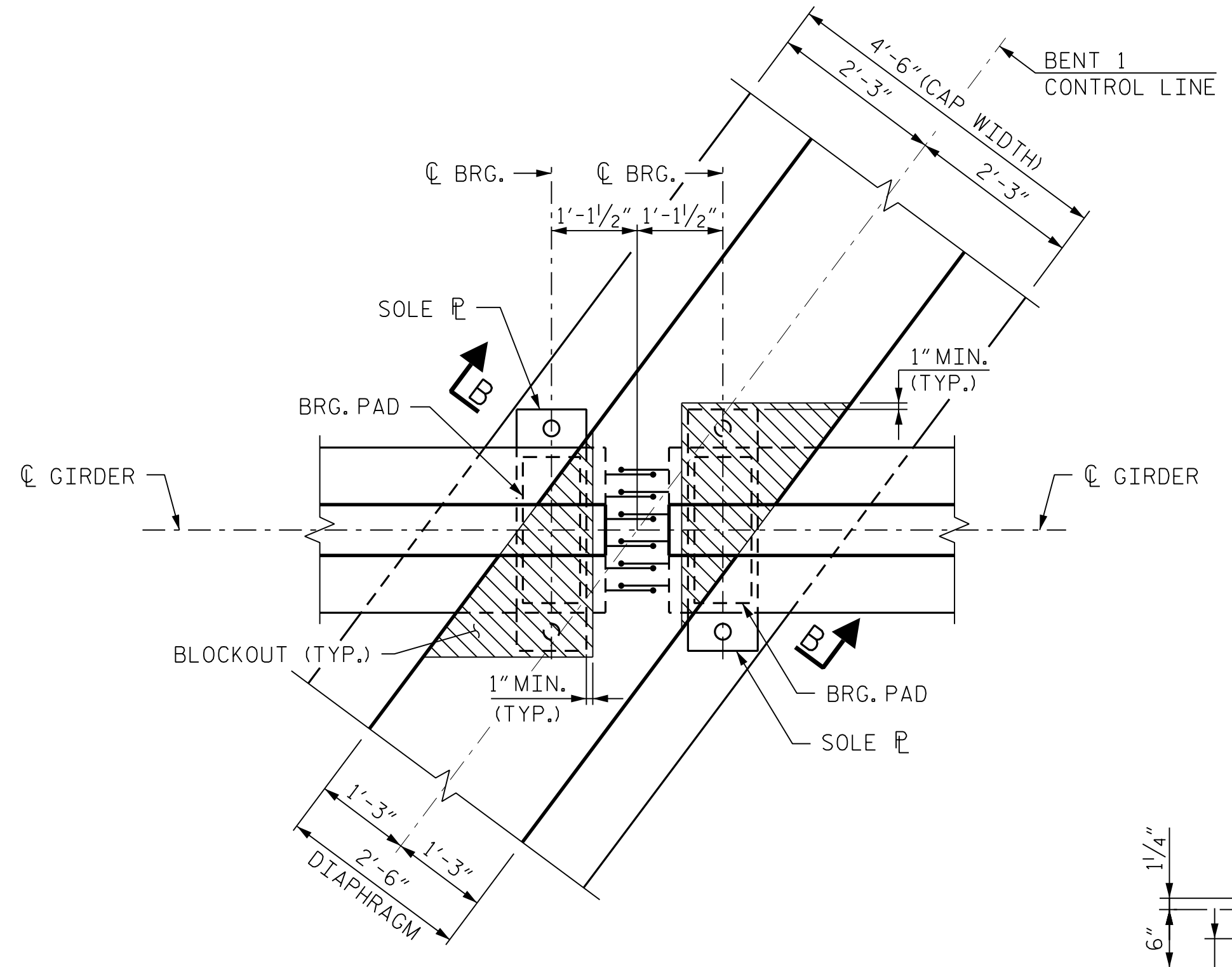
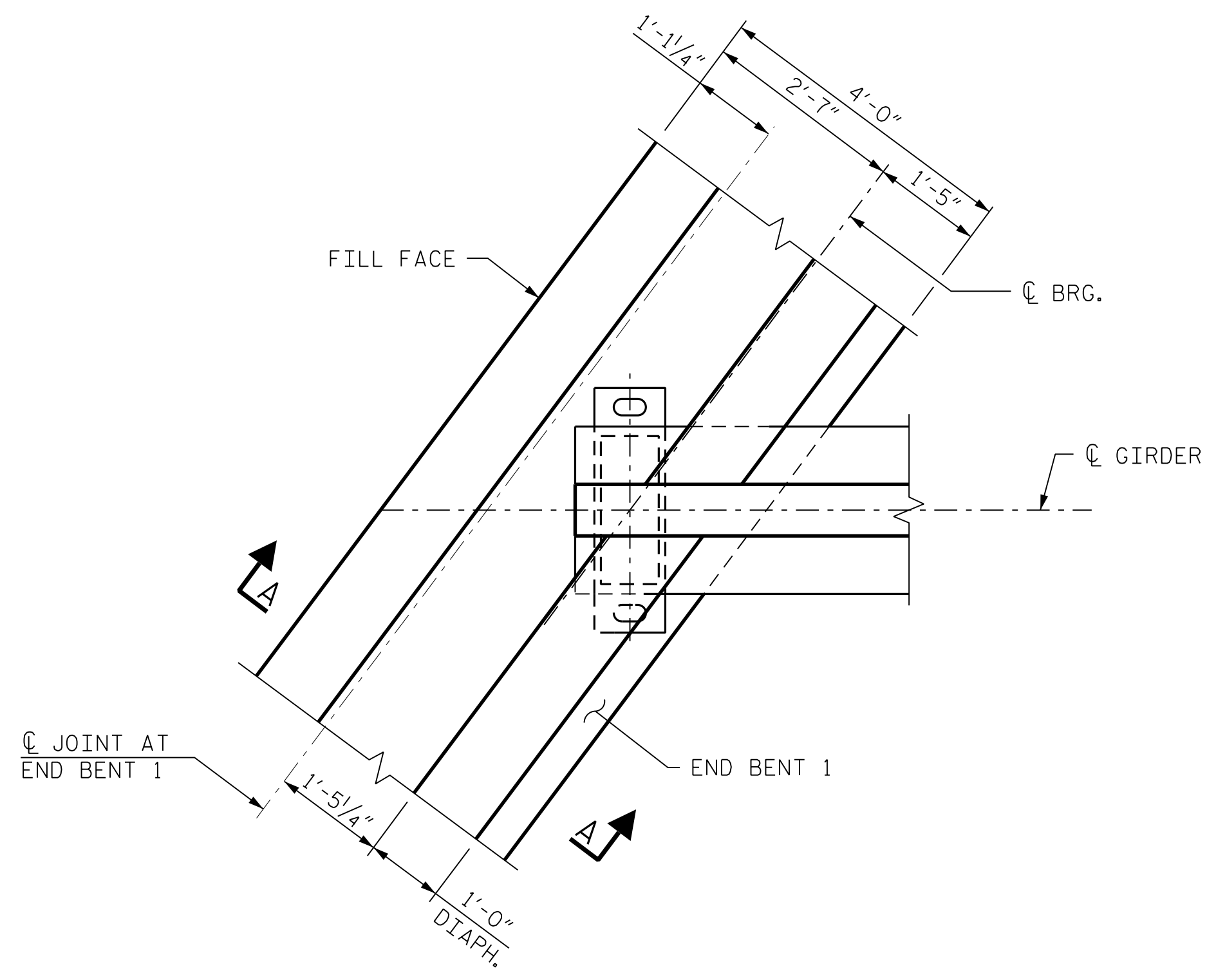


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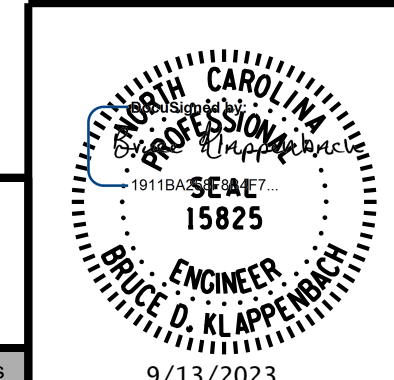
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PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
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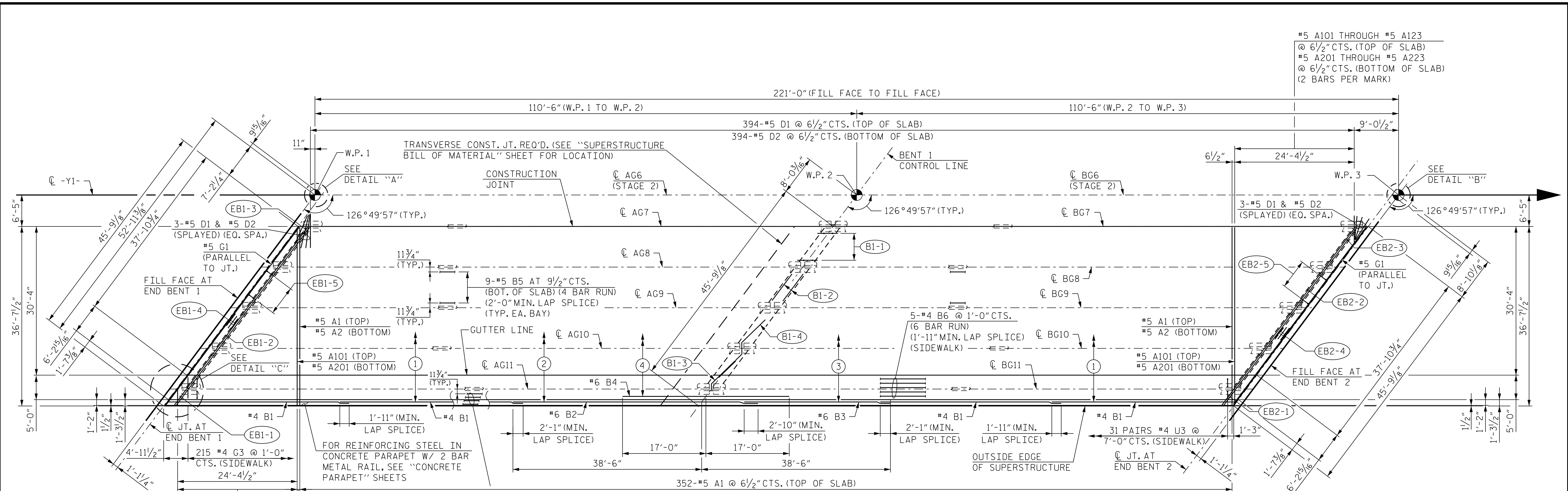
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#5 A101 THROUGH #5 A123 @ 6 1/2" CTS. (TOP OF SLAB)
#5 A201 THROUGH #5 A223 @ 6 1/2" CTS. (BOTTOM OF SLAB)
(2 BARS PER MARK)

PLAN OF SPANS (STAGE 1)

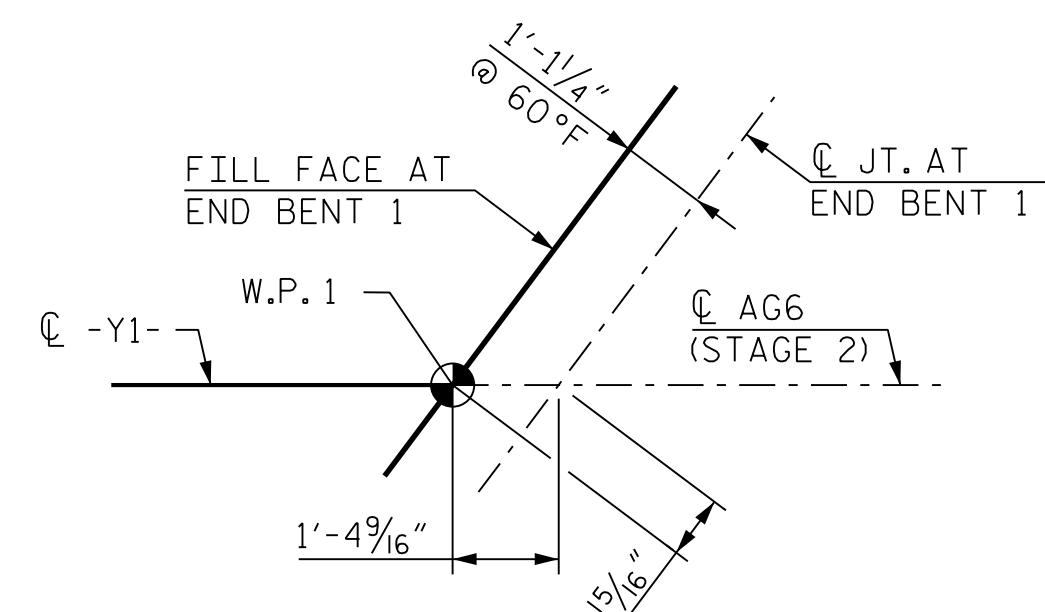
END BENT 1 DIAPHRAGM DETAILS	
EB1-1	2-#8 K1 (OVER EXT. GDR.) (4'-9" MIN. SPLICE)
EB1-2	2-#8 K2 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB1-3	2-#8 K3 (OVER GDR. 7) (4'-9" MIN. SPLICE)
EB1-4	3-#6 K4 (TYP. EA. BAY)
EB1-5	8-#4 S1 AND 8-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)

BENT 1 DIAPHRAGM DETAILS	
B1-1	2-#4 U1, 5-#4 U2 AT 1'-0" CTS. (TYP. EA. BAY)
B1-2	1-#4 K7, 2-#4 K8 & 2-#4 K9 (TYP. EA. FACE) (TYP. EA. BAY)
B1-3	5-#4 K5 BETWEEN GDRS. (TYP. EXT. GDRS.)
B1-4	5-#4 K6 BETWEEN GDRS. (TYP. INT. GDRS.)

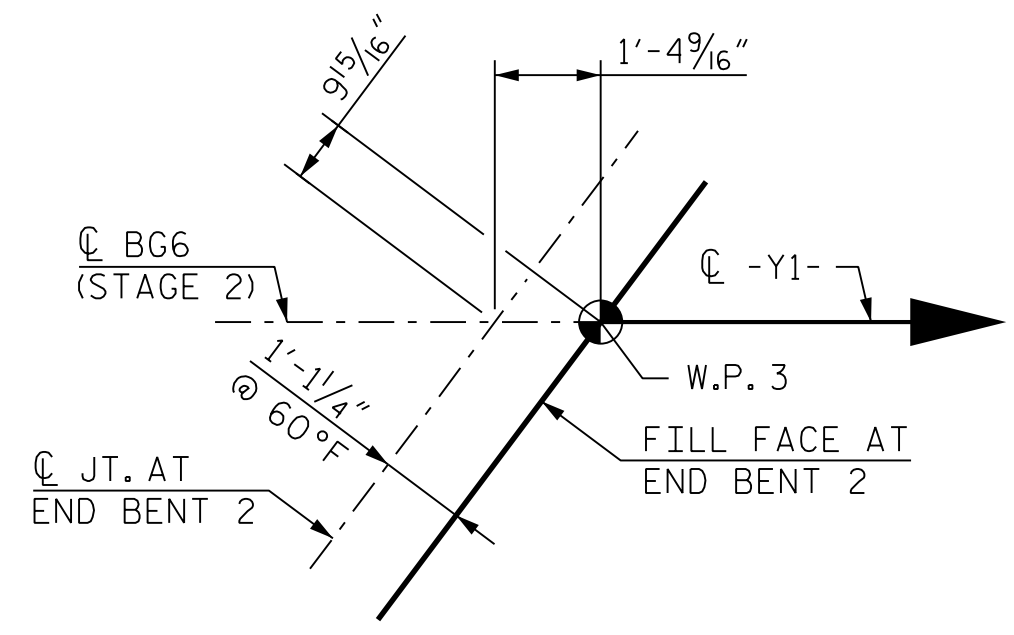
SLAB REINFORCING	
1	32-#4 B1 @ 1'-2" CTS. (TOP OF SLAB) (2 BAR RUN) (1'-11" MIN. LAP SPLICE)
2	32-#6 B2 @ 1'-2" CTS. (TOP OF SLAB) **
3	32-#6 B3 @ 1'-2" CTS. (TOP OF SLAB) **
4	31-#6 B4 @ 1'-2" CTS. (TOP OF SLAB)

** ALTERNATE #6 B2 AND #6 B3 ALONG BENT CENTERLINE, 2'-10" MIN. SPLICE

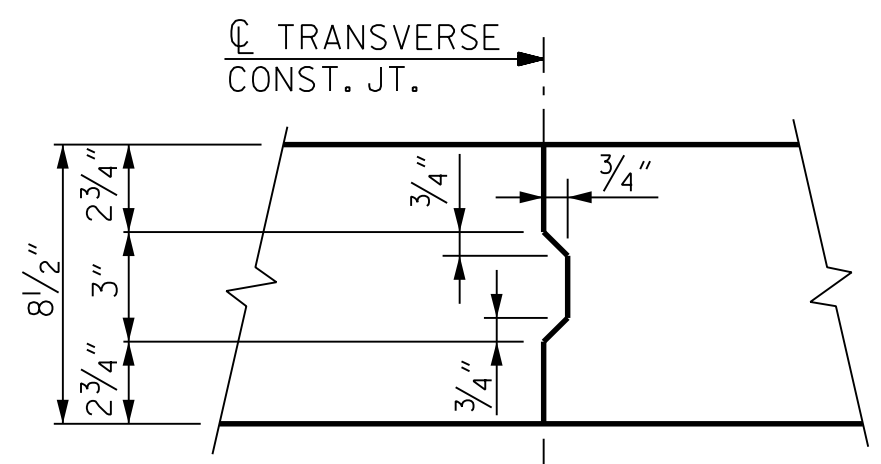
END BENT 2 DIAPHRAGM DETAILS	
EB2-1	2-#8 K1 (OVER EXT. GDR.) (4'-9" MIN. SPLICE)
EB2-2	2-#8 K2 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
EB2-3	2-#8 K3 (OVER GDR. 7) (4'-9" MIN. SPLICE)
EB2-4	3-#6 K4 (TYP. EA. BAY)
EB2-5	8-#4 S1 AND 8-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)



DETAIL "A"

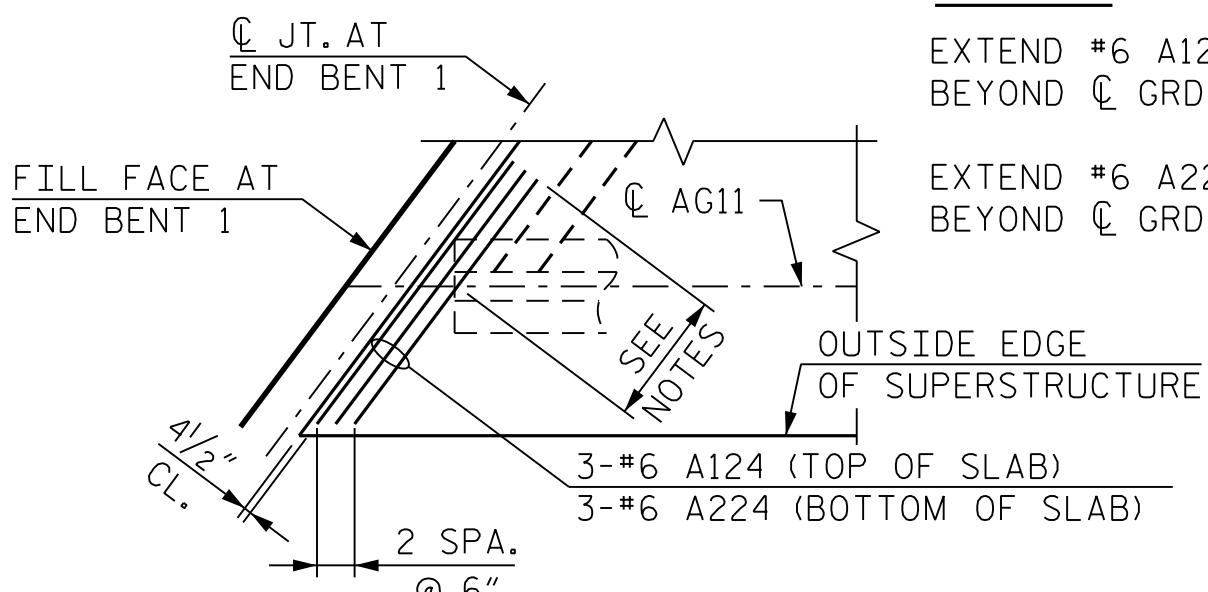


DETAIL "B"



NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL AND TRANSVERSE REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB



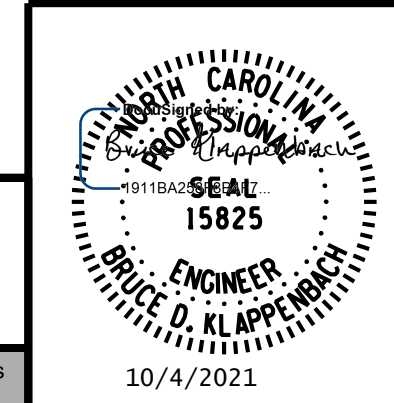
DETAIL "C"
(END BENT 1 SHOWN, END BENT 2 SIMILAR FOR STAGE 2 CONSTRUCTION)

NOTES:
EXTEND #6 A124 2'-10" (MIN.) BEYOND CL GRD.
EXTEND #6 A224 2'-5" (MIN.) BEYOND CL GRD.

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE
PLAN OF SPANS
SPANS A AND B
STAGE 1



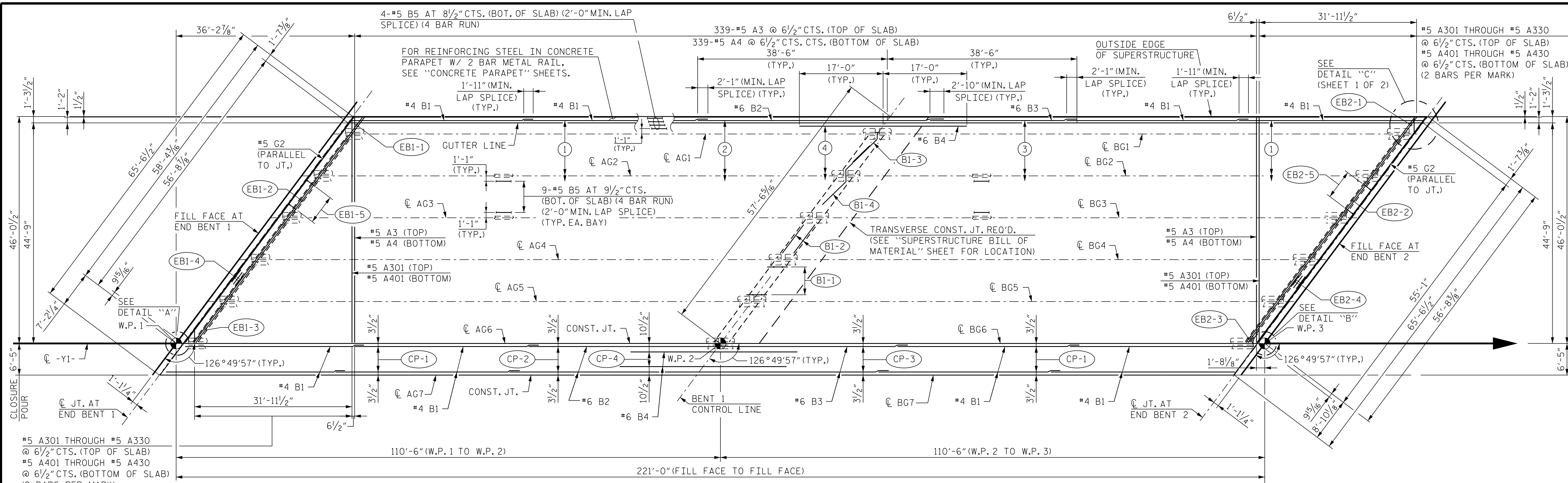
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TOP "B" BARS SHOWN IN CLOSURE POUR. FOR OTHER REINFORCING IN THE CLOSURE POUR, SEE CLOSURE POUR DETAIL. (STAGE 2)

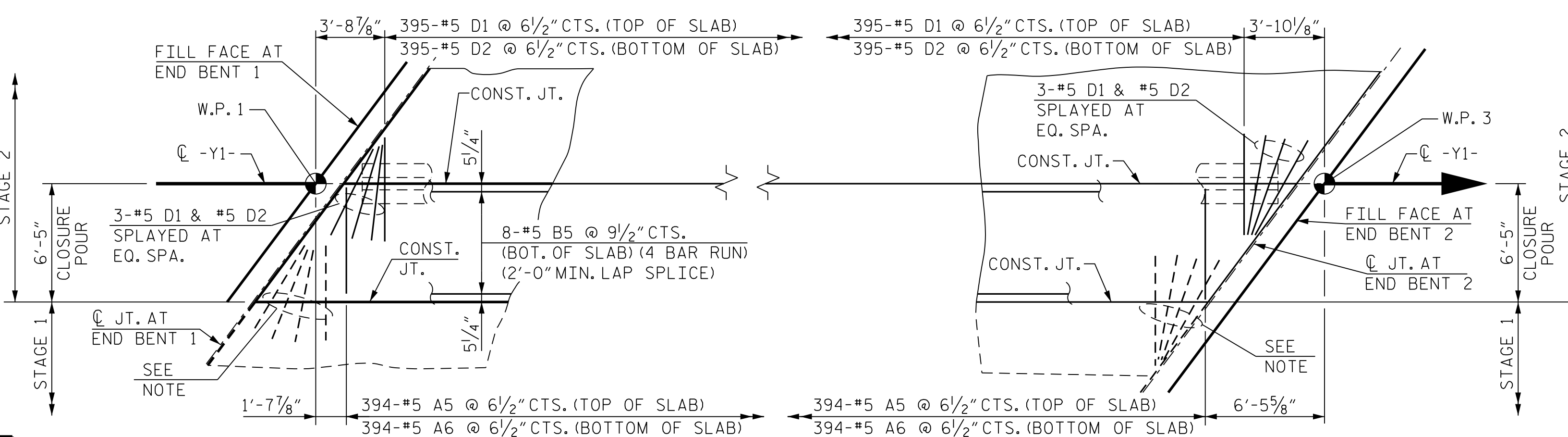
END BENT 1 DIAPHRAGM DETAILS

(EB1-1)	2-#8 K11 (OVER EXT. GDR.) (4'-9" MIN. SPLICE)
(EB1-2)	2-#8 K12 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
(EB1-3)	2-#8 K13 (OVER GDR. 6) (4'-9" MIN. SPLICE)
(EB1-4)	3-#6 K14 (TYP. EA. BAY)
(EB1-5)	8-#4 S1 AND 8-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)

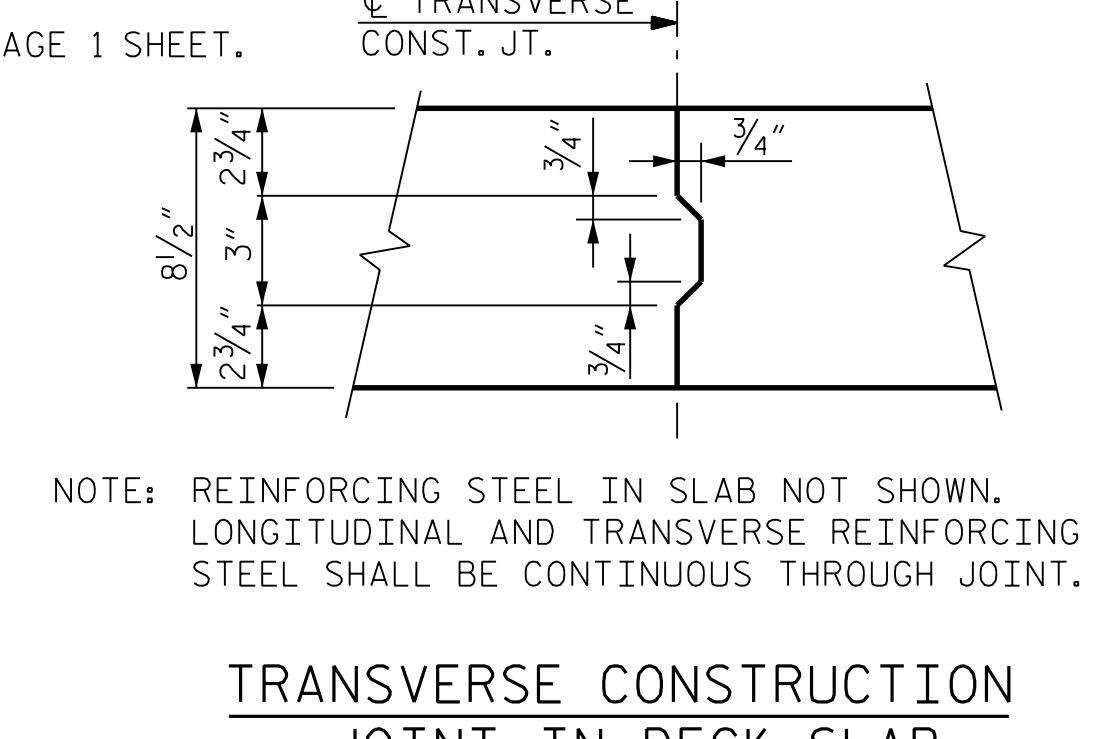
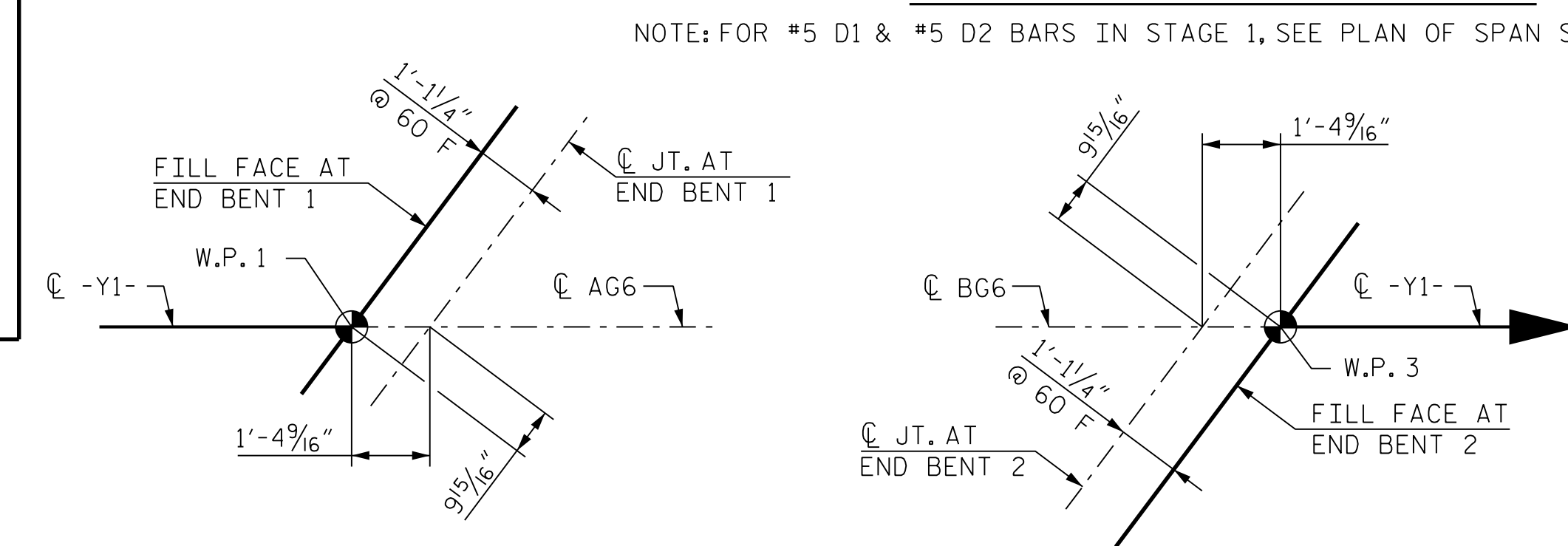
SLAB REINFORCING

1	40-#4 B1 @ 1'-2" CTS. (TOP OF SLAB) (2 BAR RUN)
2	40-#6 B2 @ 1'-2" CTS. (TOP OF SLAB) **
3	40-#6 B3 @ 1'-2" CTS. (TOP OF SLAB) **
4	39-#6 B4 @ 1'-2" CTS. (TOP OF SLAB)

** ALTERNATE #6 B2 AND #6 B3 ALONG BENT CENTERLINE, 2'-10" MIN. SPLICE



CLOSURE POUR DETAIL



BENT 1 DIAPHRAGM DETAILS

(B1-1)	2-#4 U1, 2-#4 U2 AT 1'-0" CTS. (TYP. EA. BAY)
(B1-2)	1-#4 K17, 2-#4 K18 & 2-#4 K19 (TYP. EA. FACE) (TYP. EA. BAY)
(B1-3)	5-#4 K15 BETWEEN GDRS. (TYP. EXT. GDRS.)
(B1-4)	5-#4 K16 BETWEEN GDRS. (TYP. INT. GDRS.)

CLOSURE POUR REINFORCING

(CP-1)	6-#4 B1 @ 1'-2" CTS. (TOP OF SLAB) (2 BAR RUN)
(CP-2)	6-#6 B2 @ 1'-2" CTS. (TOP OF SLAB) **
(CP-3)	6-#6 B3 @ 1'-2" CTS. (TOP OF SLAB) **
(CP-4)	5-#6 B4 @ 1'-2" CTS. (TOP OF SLAB)

** ALTERNATE #6 B2 AND #6 B3 ALONG BENT CENTERLINE, 2'-10" MIN. SPLICE

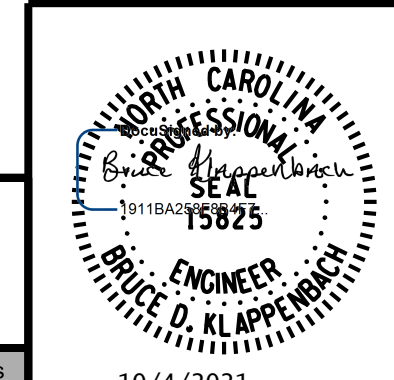
END BENT 2 DIAPHRAGM DETAILS

(EB2-1)	2-#8 K11 (OVER EXT. GDR.) (4'-9" MIN. SPLICE)
(EB2-2)	2-#8 K12 (OVER EA. INT. GDR.) (4'-9" MIN. SPLICE)
(EB2-3)	2-#8 K13 (OVER GDR. 6) (4'-9" MIN. SPLICE)
(EB2-4)	3-#6 K14 (TYP. EA. BAY)
(EB2-5)	8-#4 S1 AND 8-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 2 OF 2

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SUPERSTRUCTURE
PLANS OF SPANS
SPANS A AND B
STAGE 2



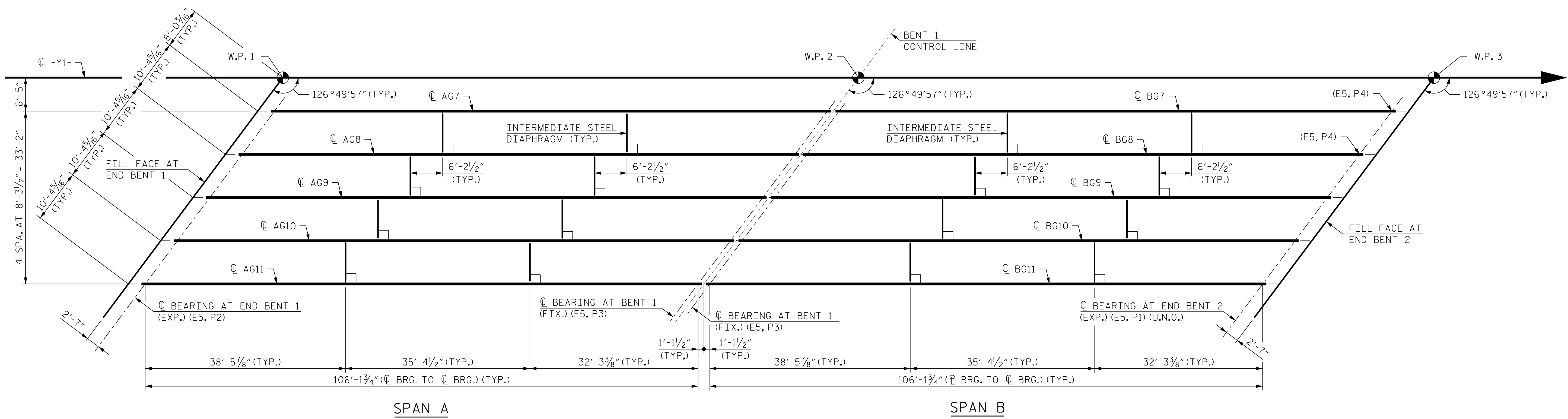
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2			4			TOTAL SHEETS 54

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FRAMING PLAN
(STAGE 1)

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
FRAMING PLAN
SPAN A & B
STAGE 1

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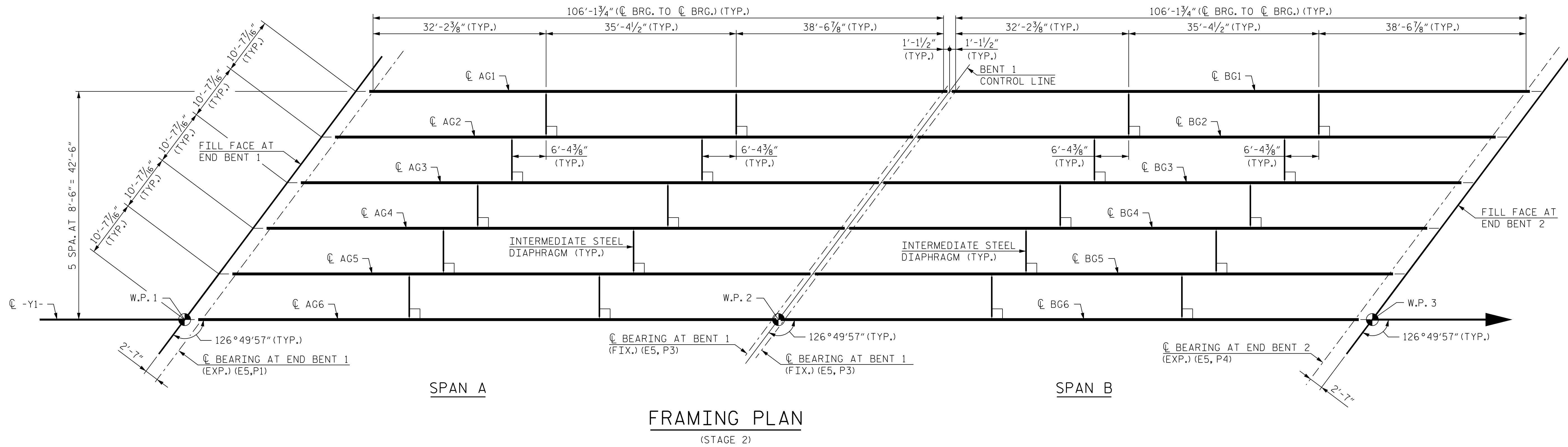
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 PROFESSIONAL SEAL
 15825
 ENGINEER
 BRUCE D. KLAPPENBACH
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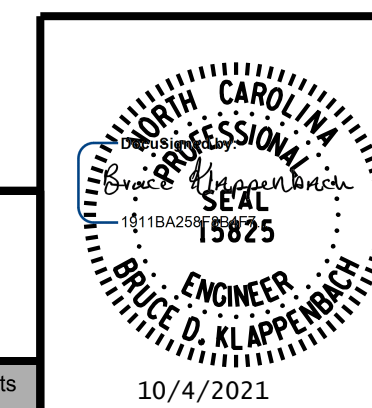
FRAMING PLAN
(STAGE 2)

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
 FRAMING PLAN
 SPAN A & B
 STAGE 2



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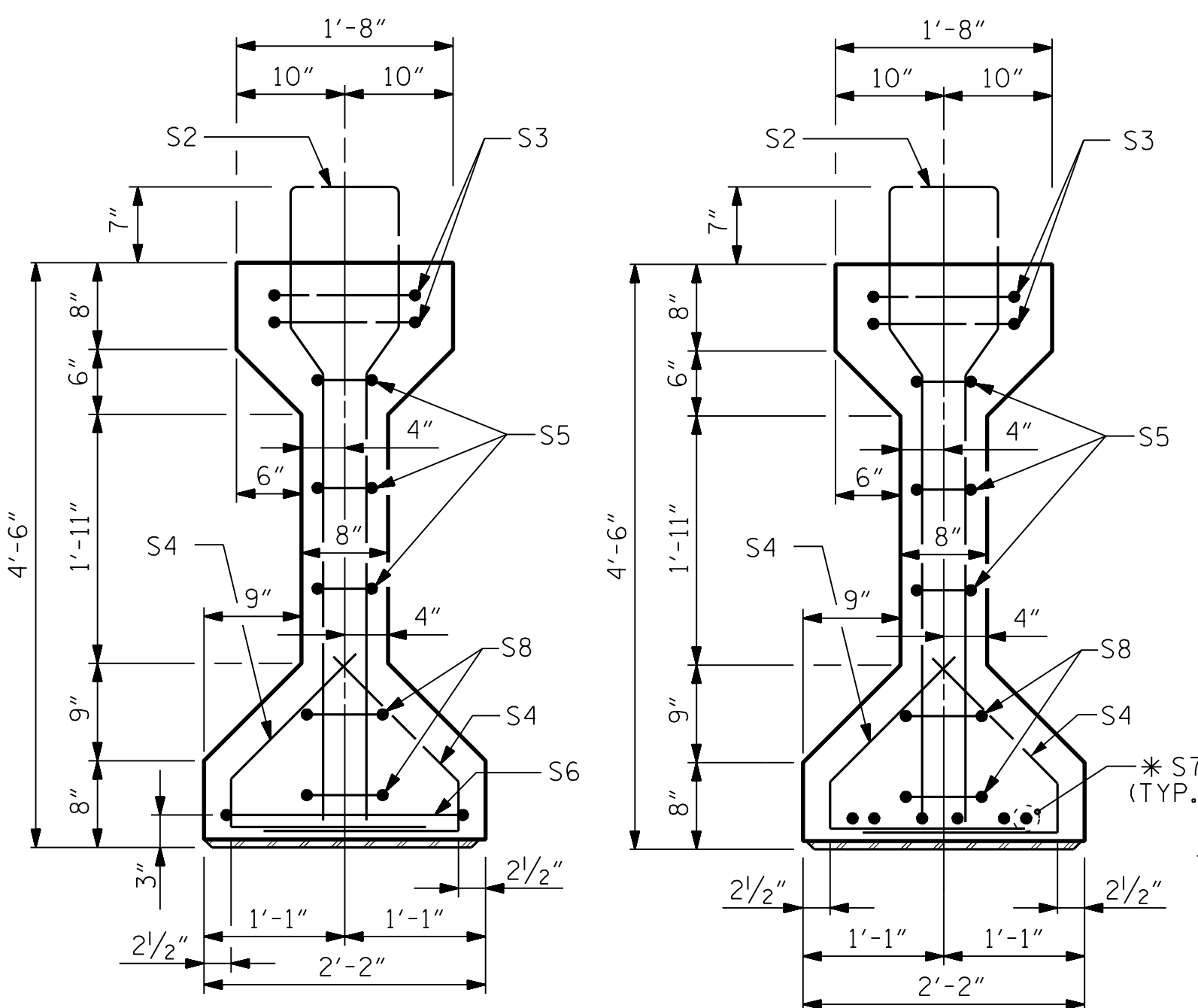
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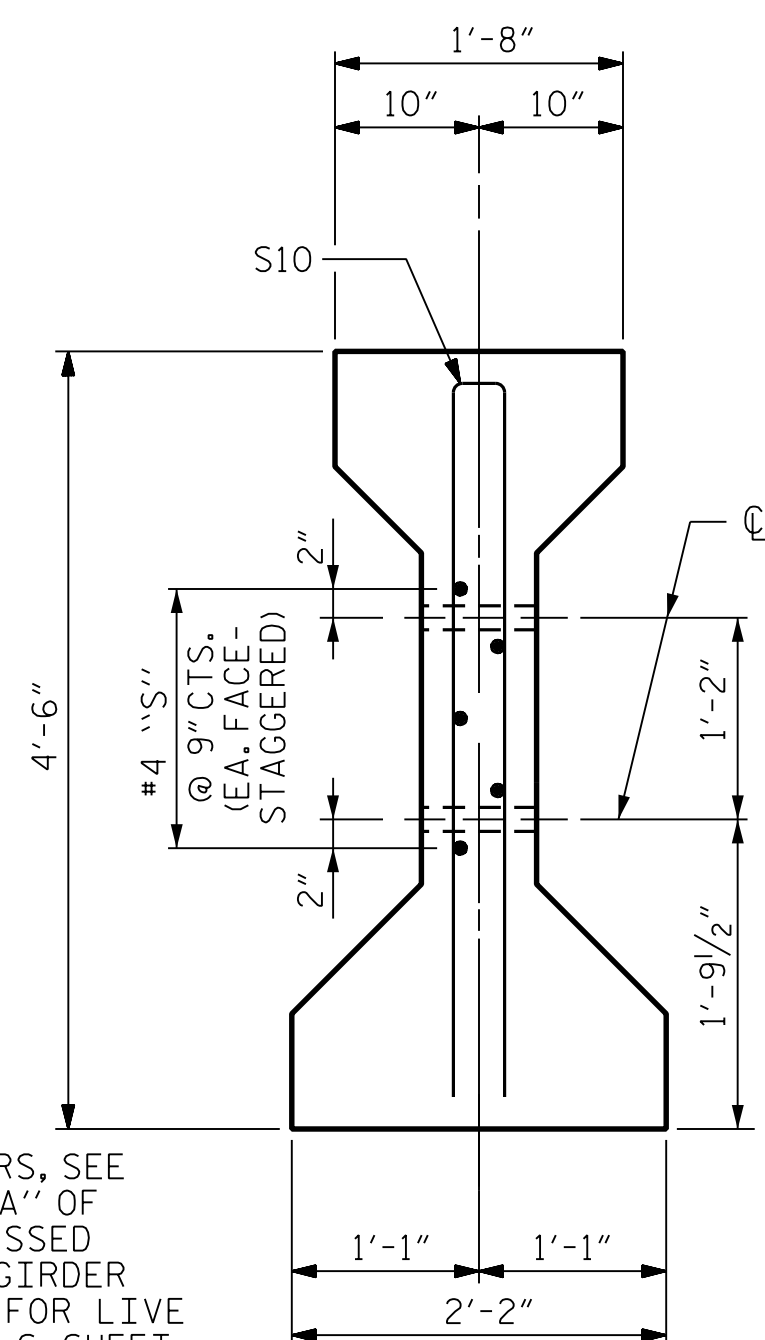
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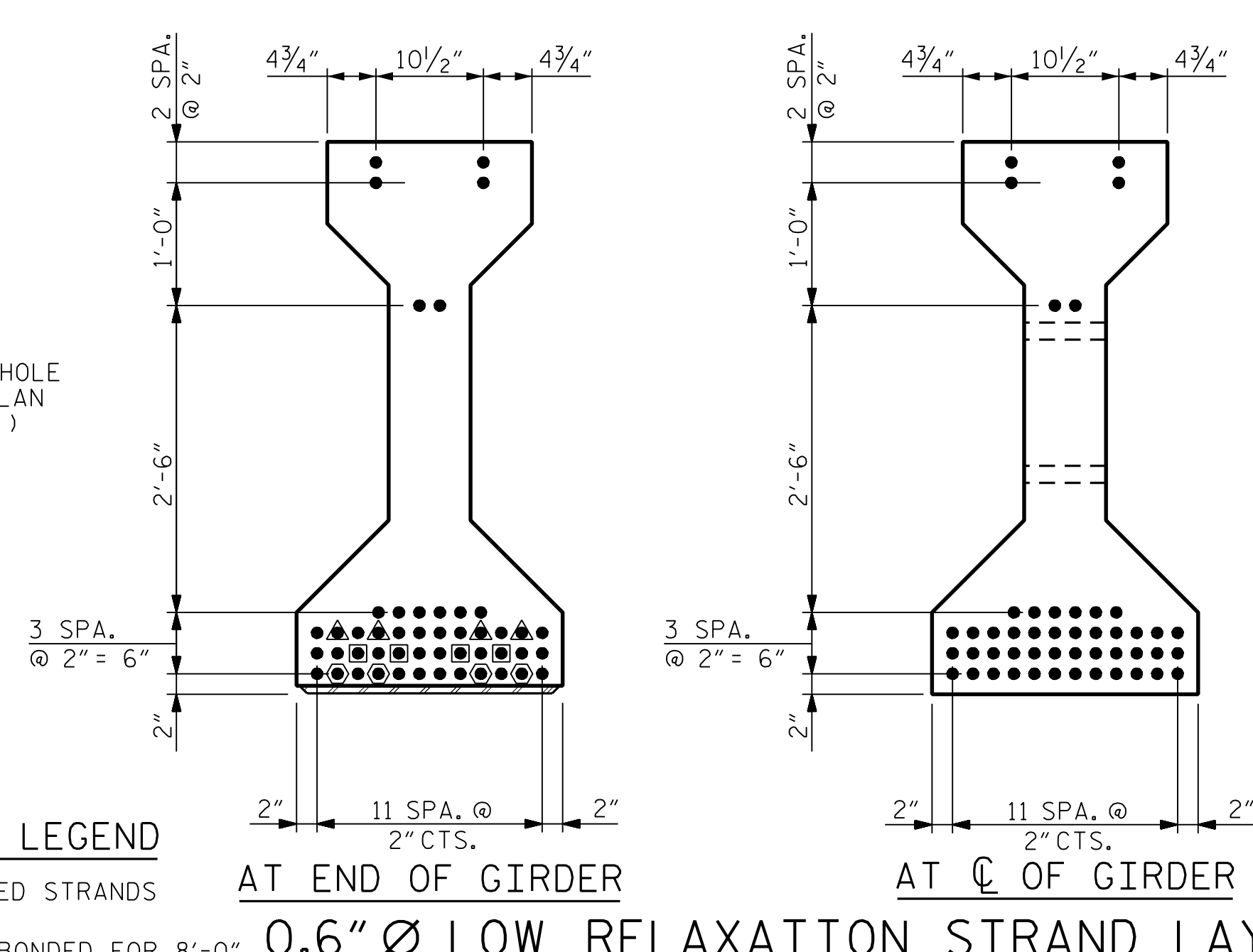
SECTION A-A

SECTION B-B

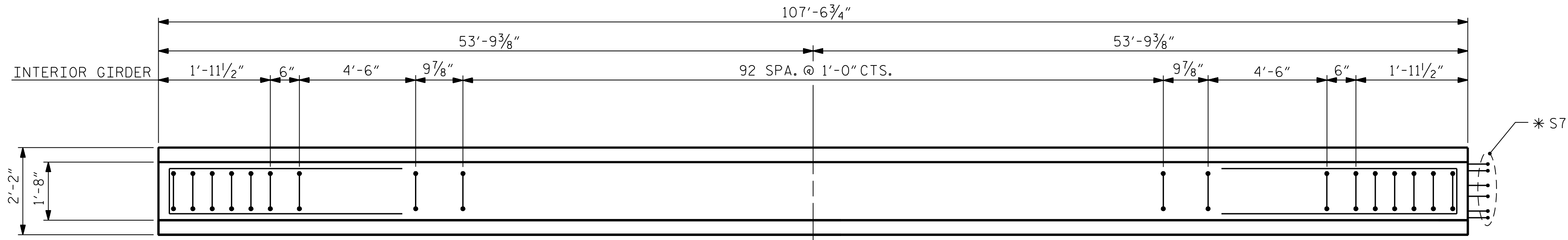


SECTION C-C
(S1 BARS NOT SHOWN)

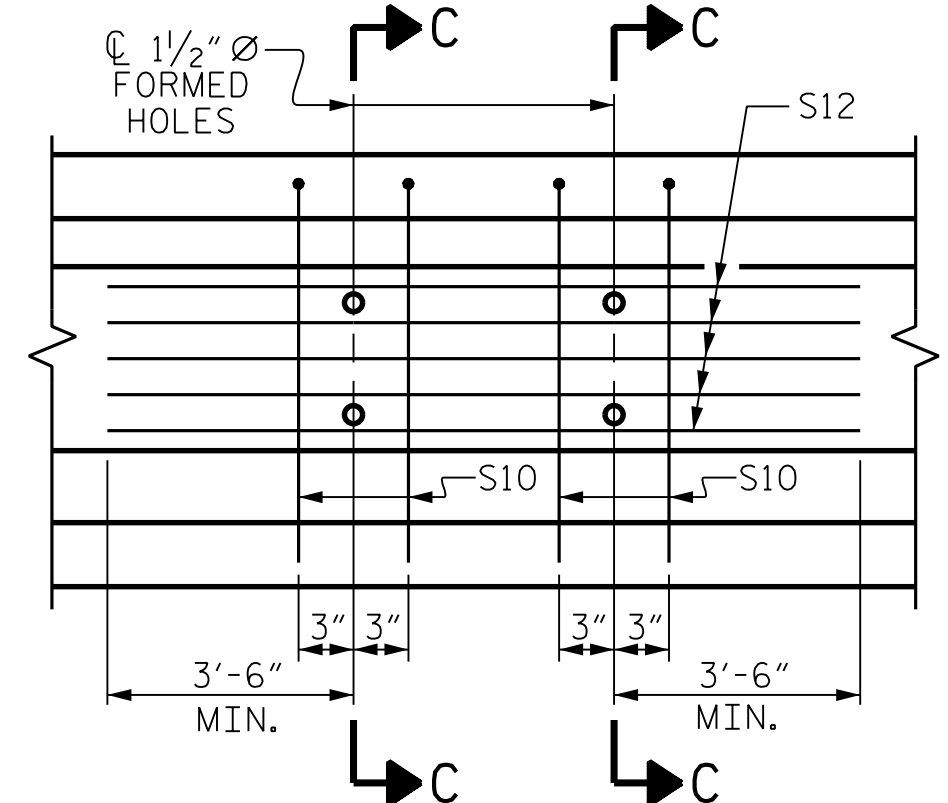
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ▲ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER



0.6" Ø LOW RELAXATION STRAND LAYOUT

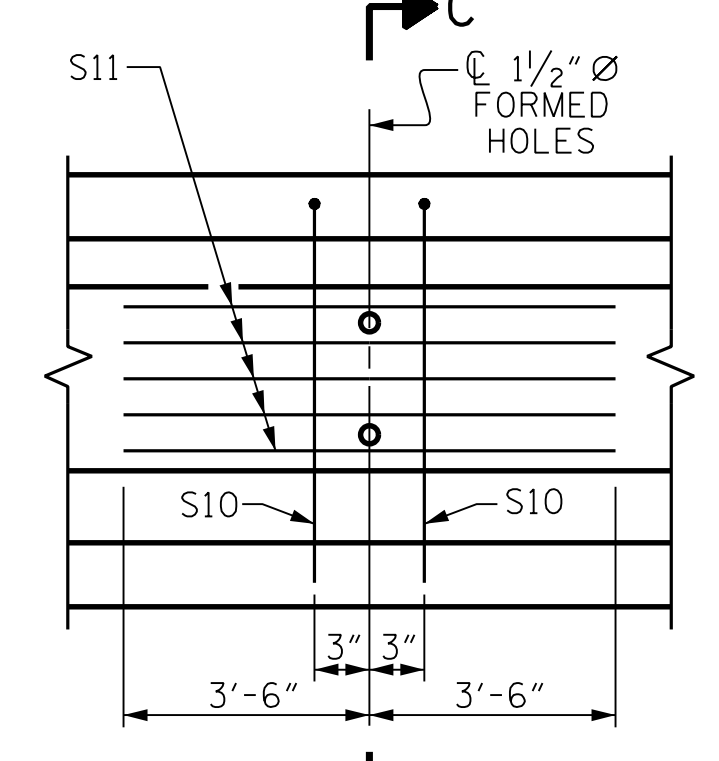


PLAN OF GIRDER



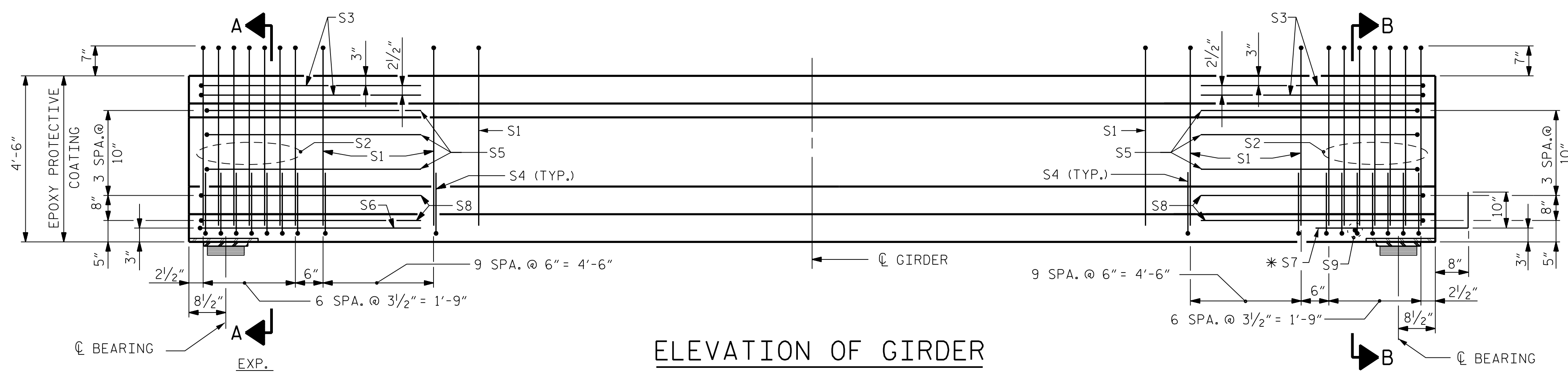
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS.



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS.



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)
(SPAN A SHOWN, SPAN B SIMILAR BY ROTATION)

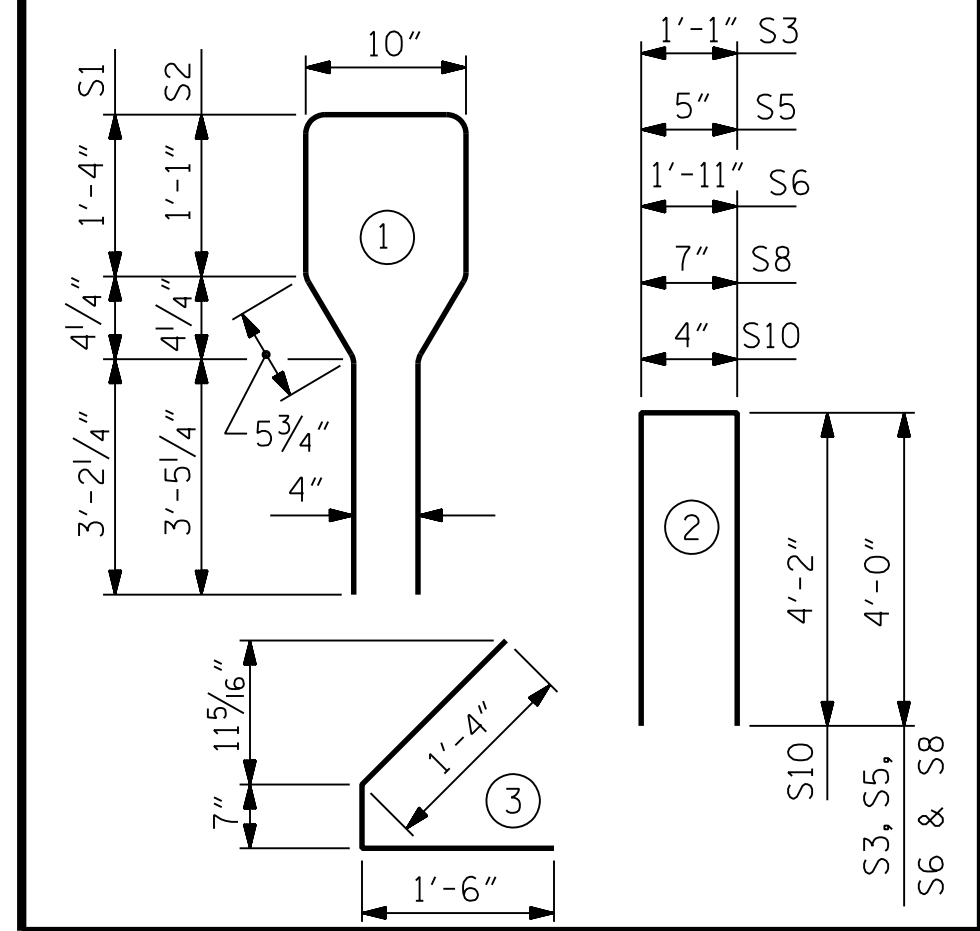
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	113	#4	1	10'-10"	818
S2	14	#6	1	10'-10"	228
S3	4	#4	2	9'-1"	24
S4	68	#4	3	3'-5"	155
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR.	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR.	1'-10"	1
S10	4	#5	2	8'-8"	36
S10	8	#5	2	8'-8"	72
S11	10	#4	STR.	7'-0"	47
S12	10	#4	STR.	13'-6"	90

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	7,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GRD'S 1 & 11	1,396	21.8	48
GRD'S 2-5 & 8-10	1,475	21.8	48

GIRDERS REQUIRED

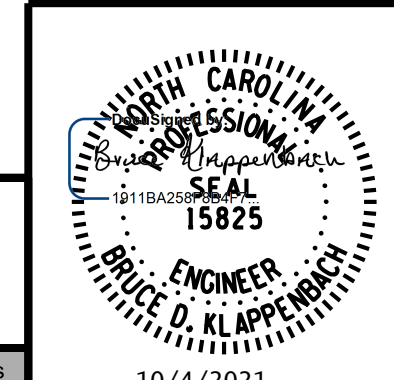
NUMBER	LENGTH	TOTAL LENGTH
18	107'-6 3/4"	1,936'-1 1/2"

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 GIRDERS 1-5 AND 8-11



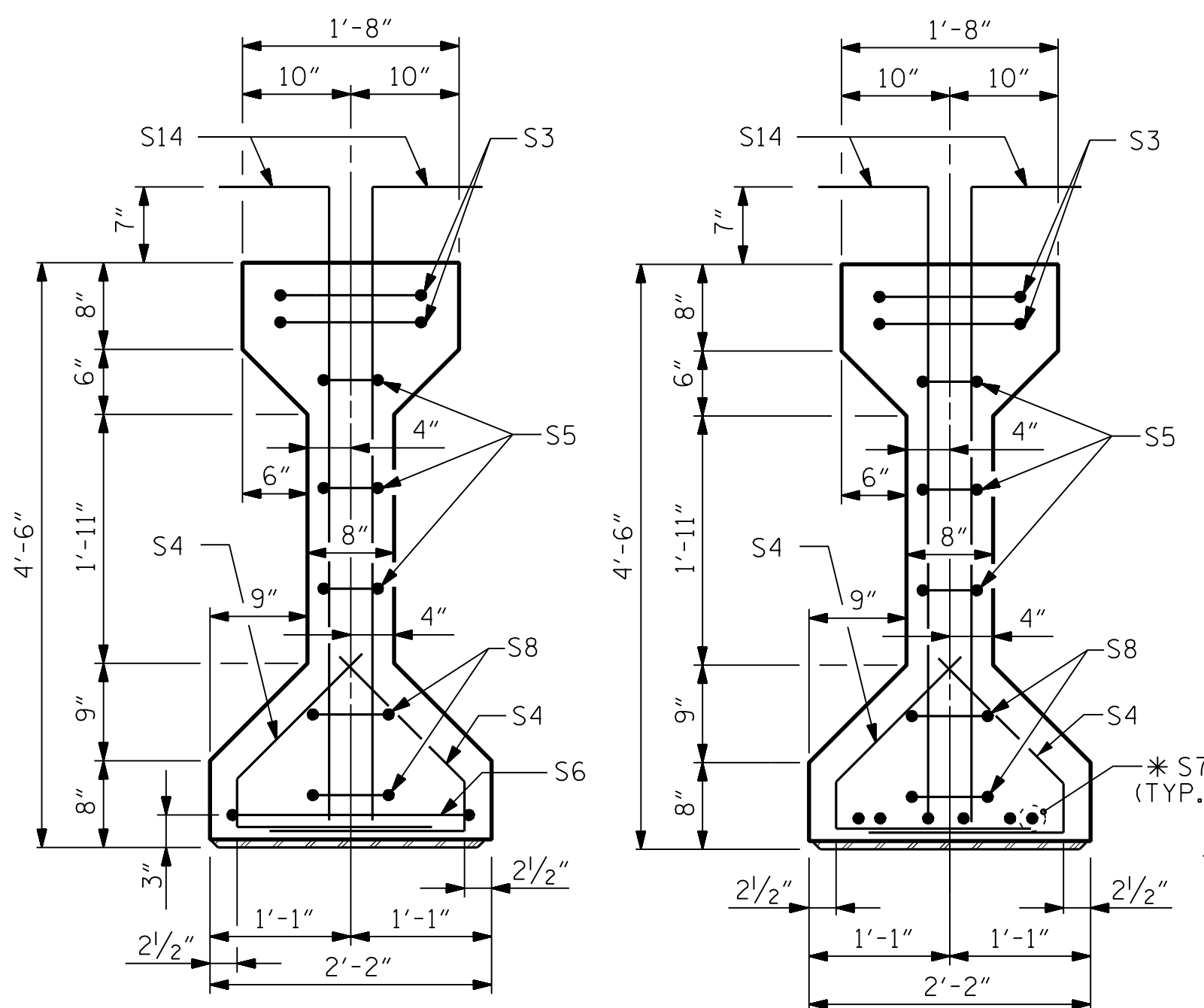
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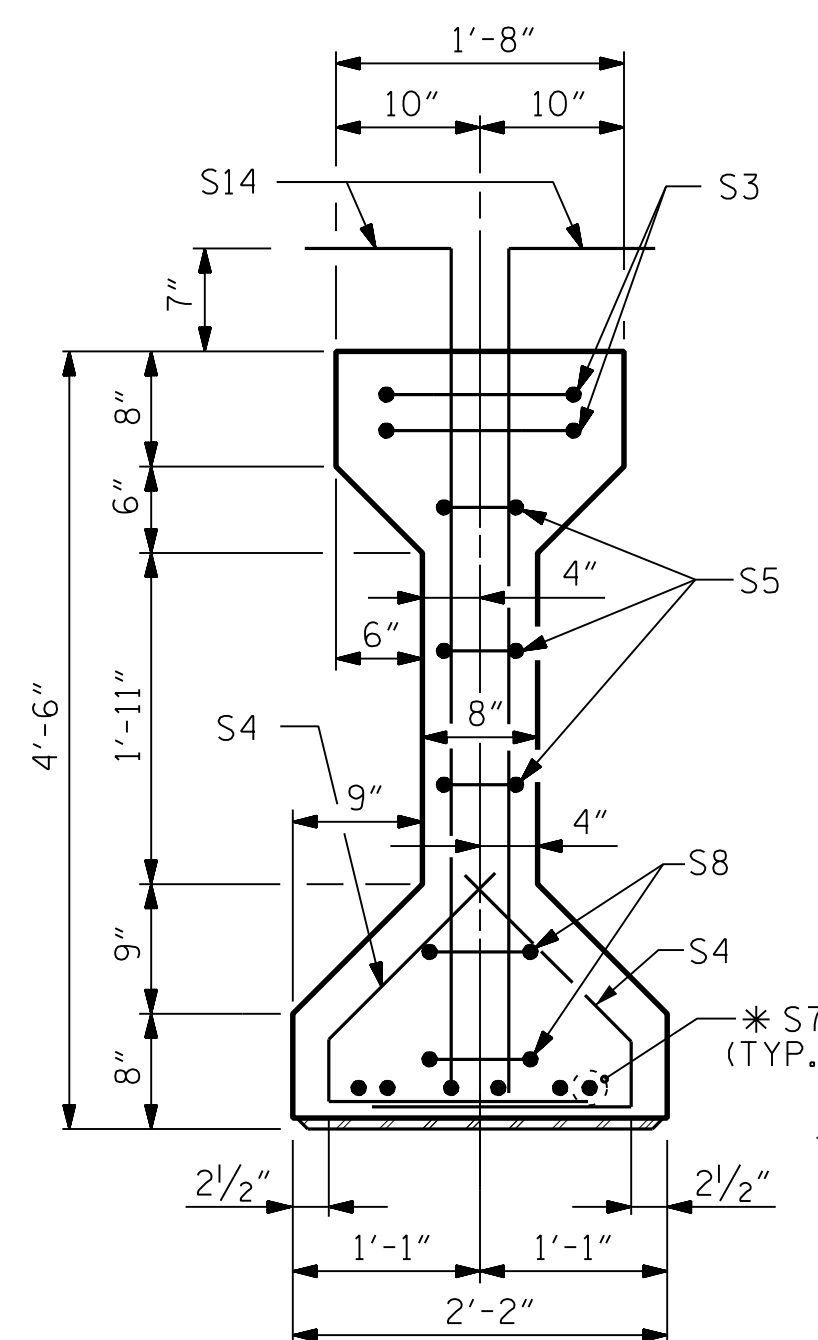
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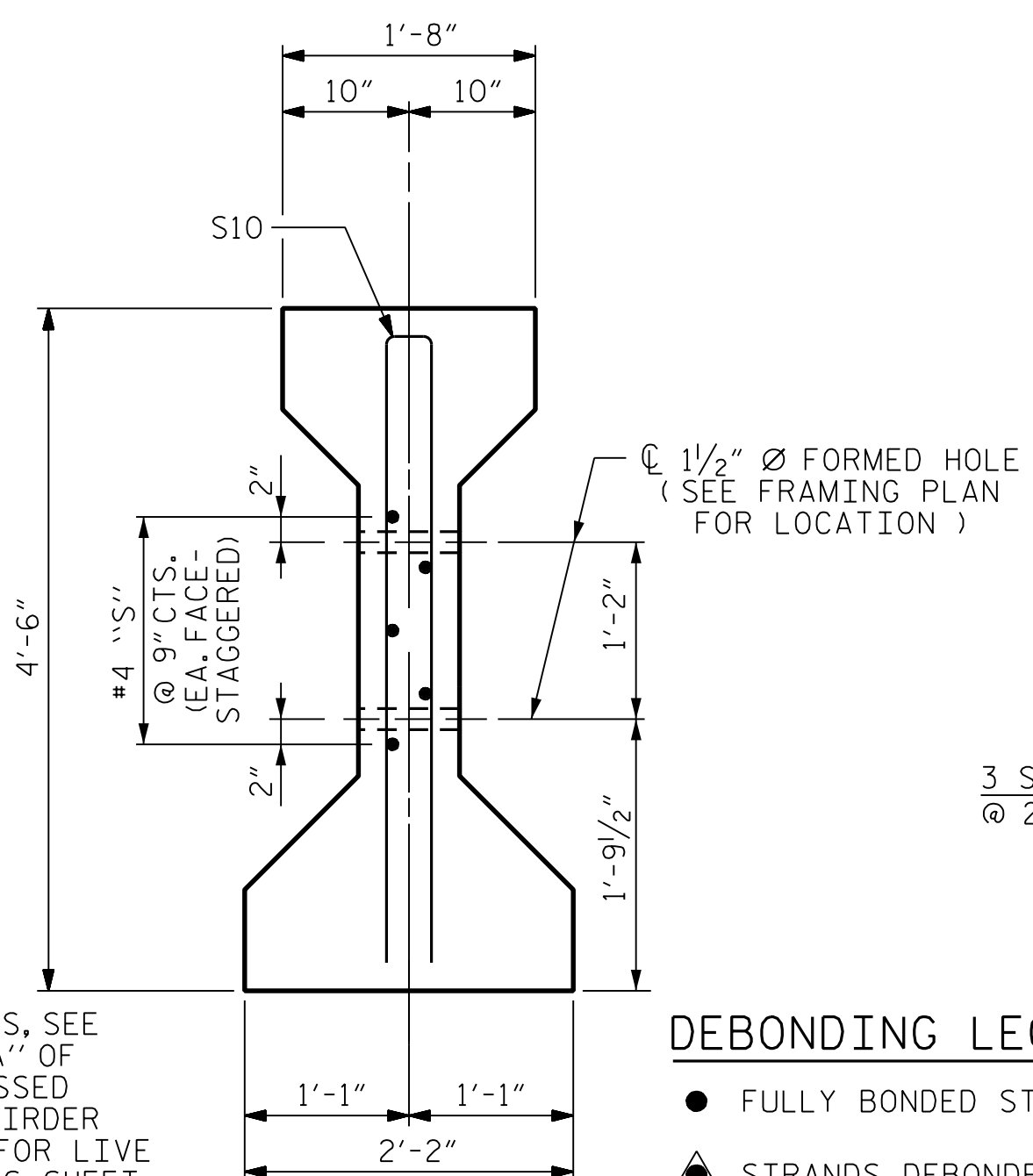
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SECTION A-A



SECTION B-B



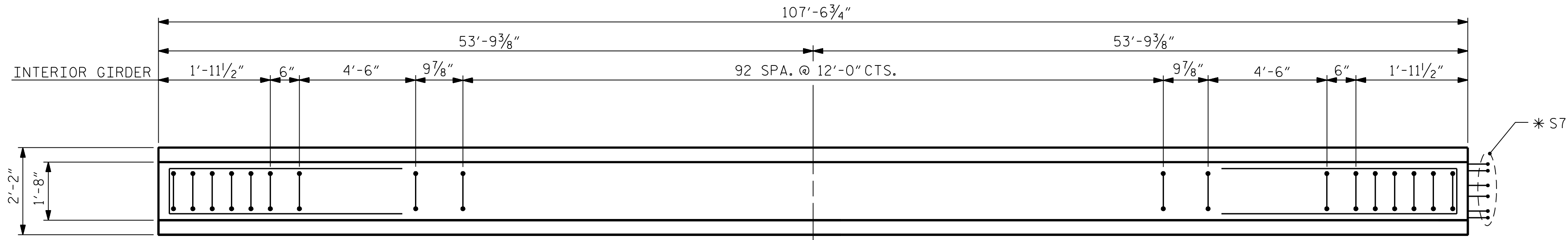
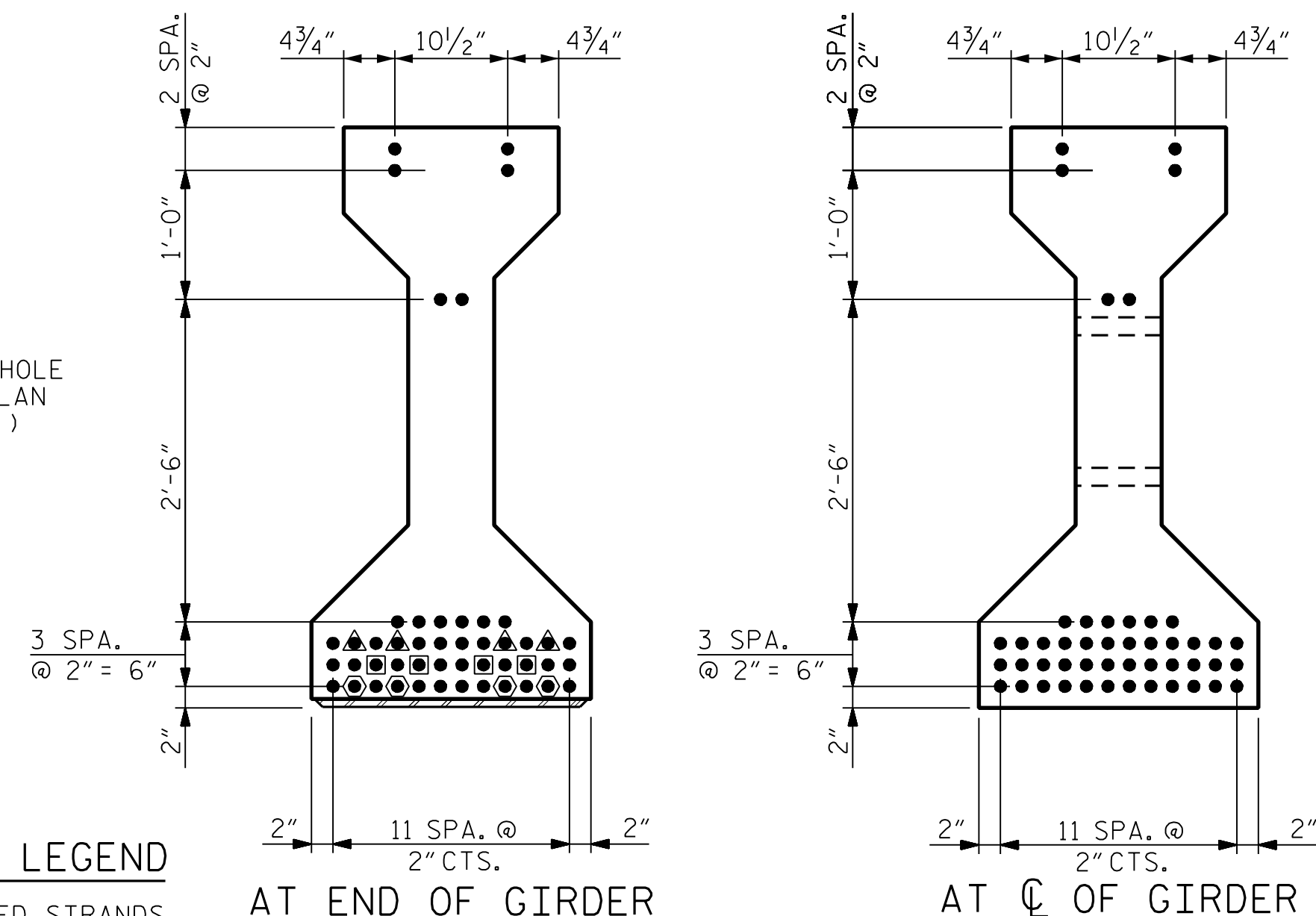
SECTION C-C
(S1 BARS NOT SHOWN)

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

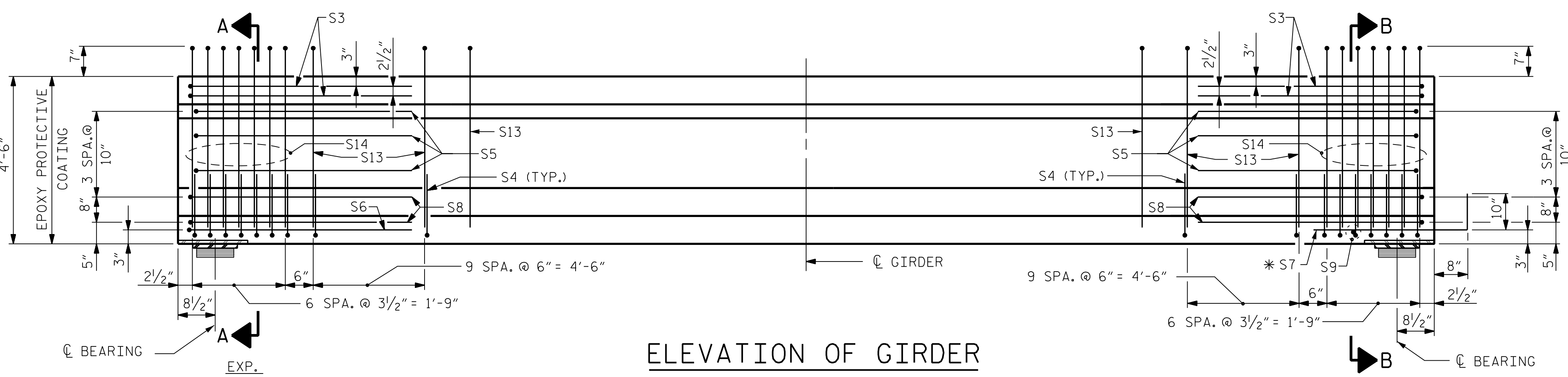
DEBONDING LEGEND

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

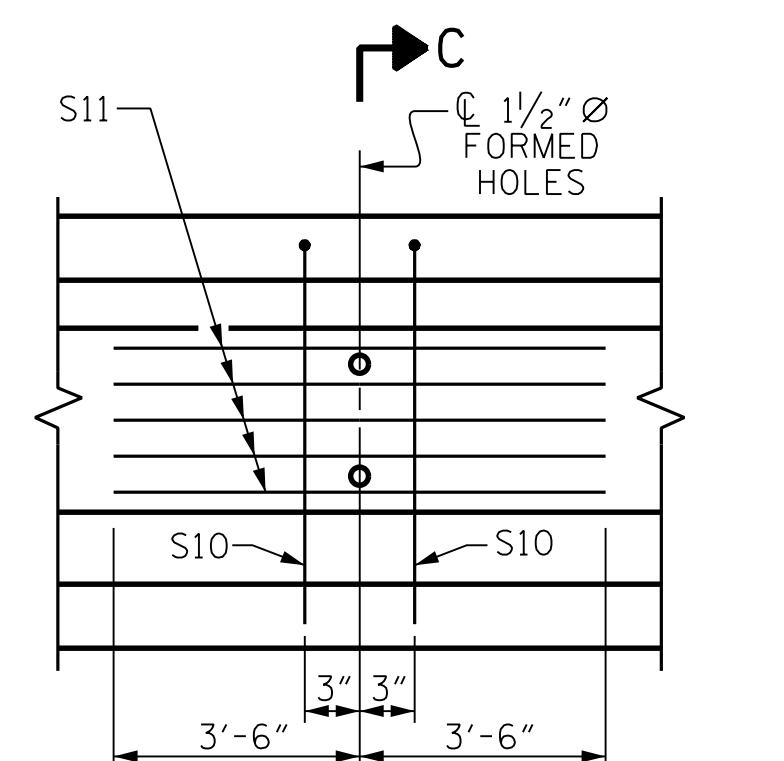


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)
(SPAN A SHOWN, SPAN B SIMILAR BY ROTATION)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS 6 & 7

0.6" Ø L. R. GRADE 270 STRANDS

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

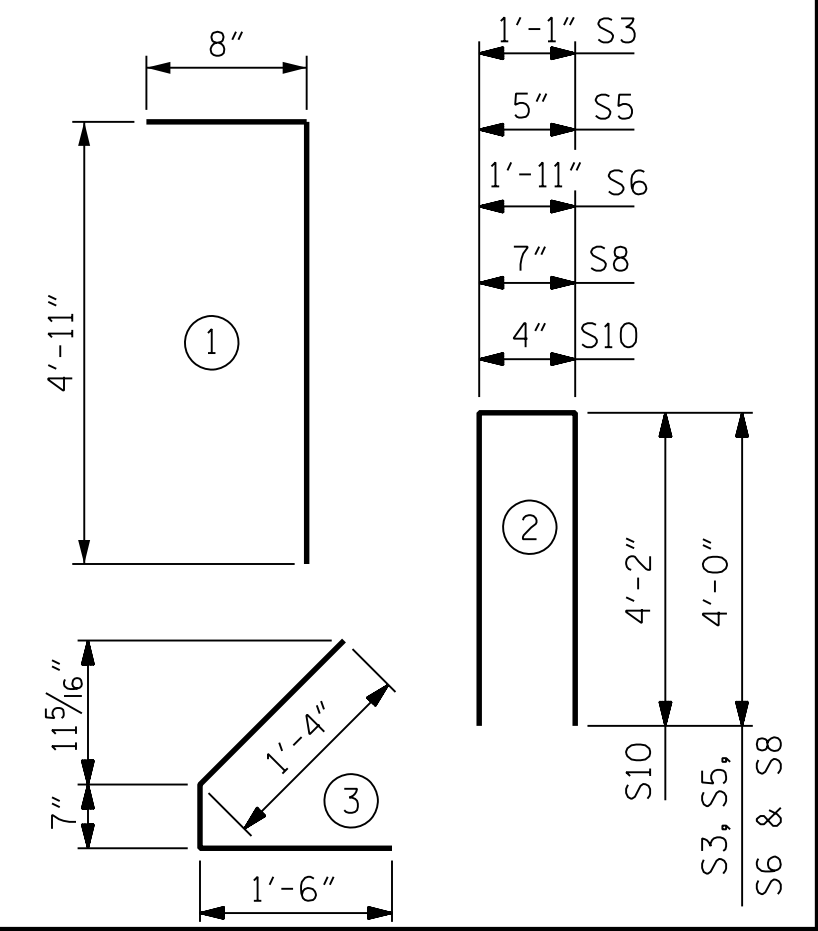
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S3	4	#4	2	9'-1"	24
S4	68	#4	3	3'-5"	155
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR.	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR.	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR.	7'-0"	47
S13	226	#4	1	5'-7"	843
S14	28	#6	1	5'-7"	235

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7,500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDERS 6 & 7	1,428	21.8	48

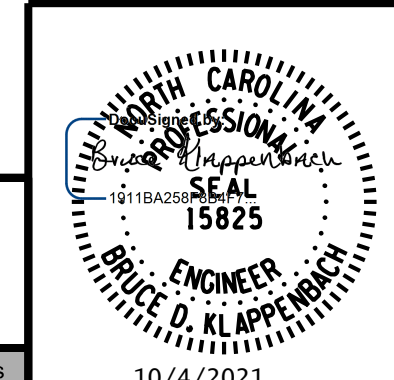
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	107'-6 3/4"	430'-3"

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
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 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 GIRDERS 6 & 7



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NOTES:

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

AT 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.

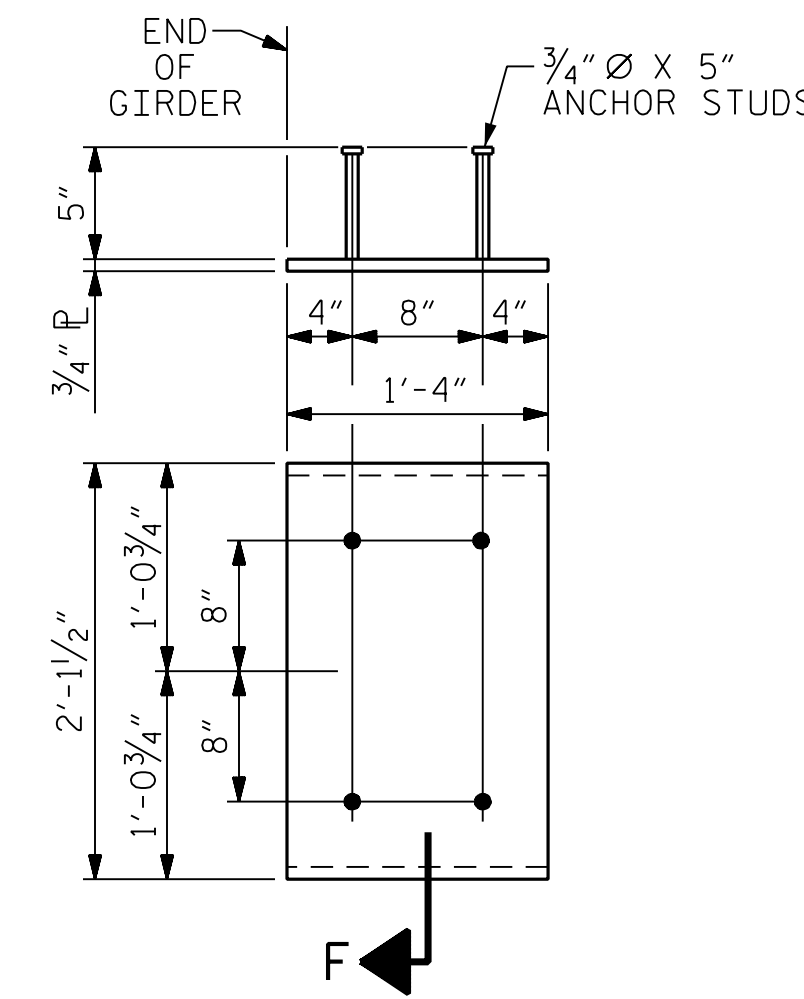
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

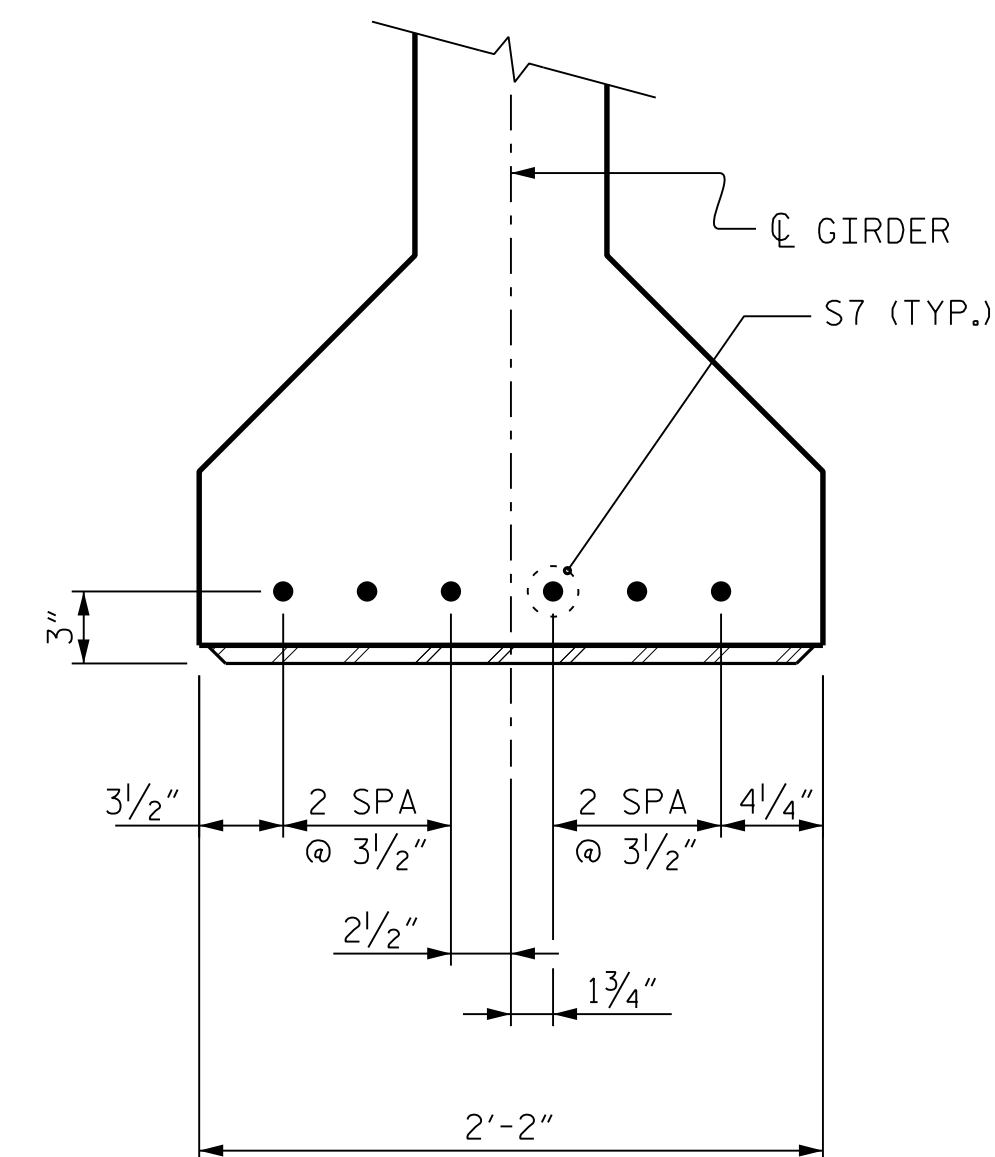
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD 4,500 LBS.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.



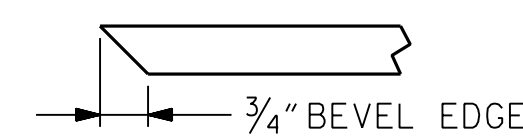
**EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE IV GIRDER**

(2 REQ'D PER GIRDER)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)



SECTION "F"

(SEE NOTES)

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 3 OF 4

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

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STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

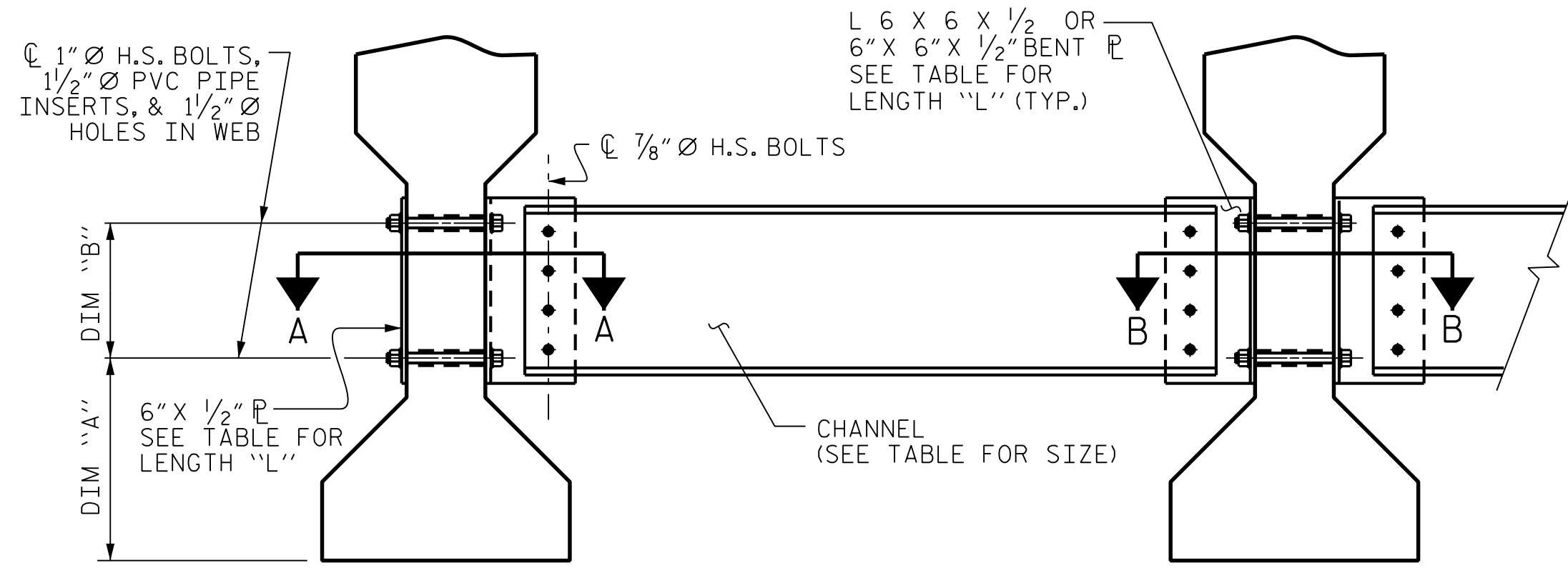
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

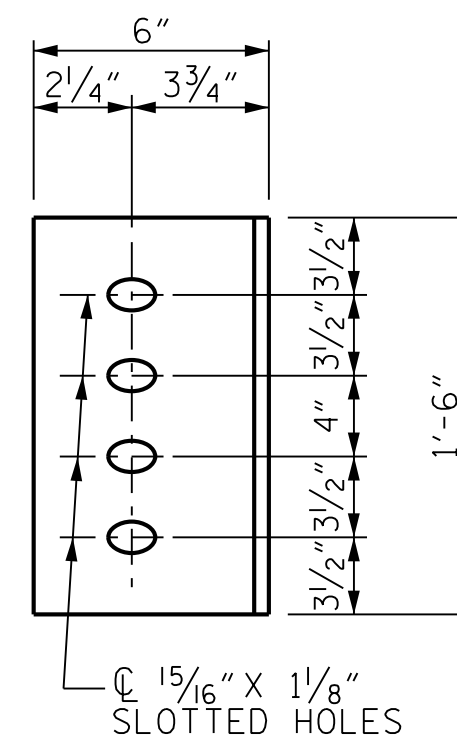
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

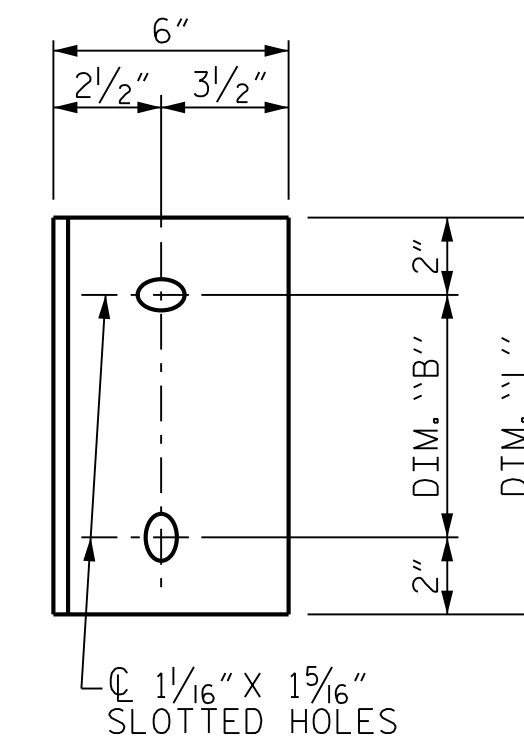
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



EXTERIOR GIRDER **INTERIOR GIRDER**
PART SECTION AT INTERMEDIATE DIAPHRAGM
 (TYPE IV GIRDER SHOWN)

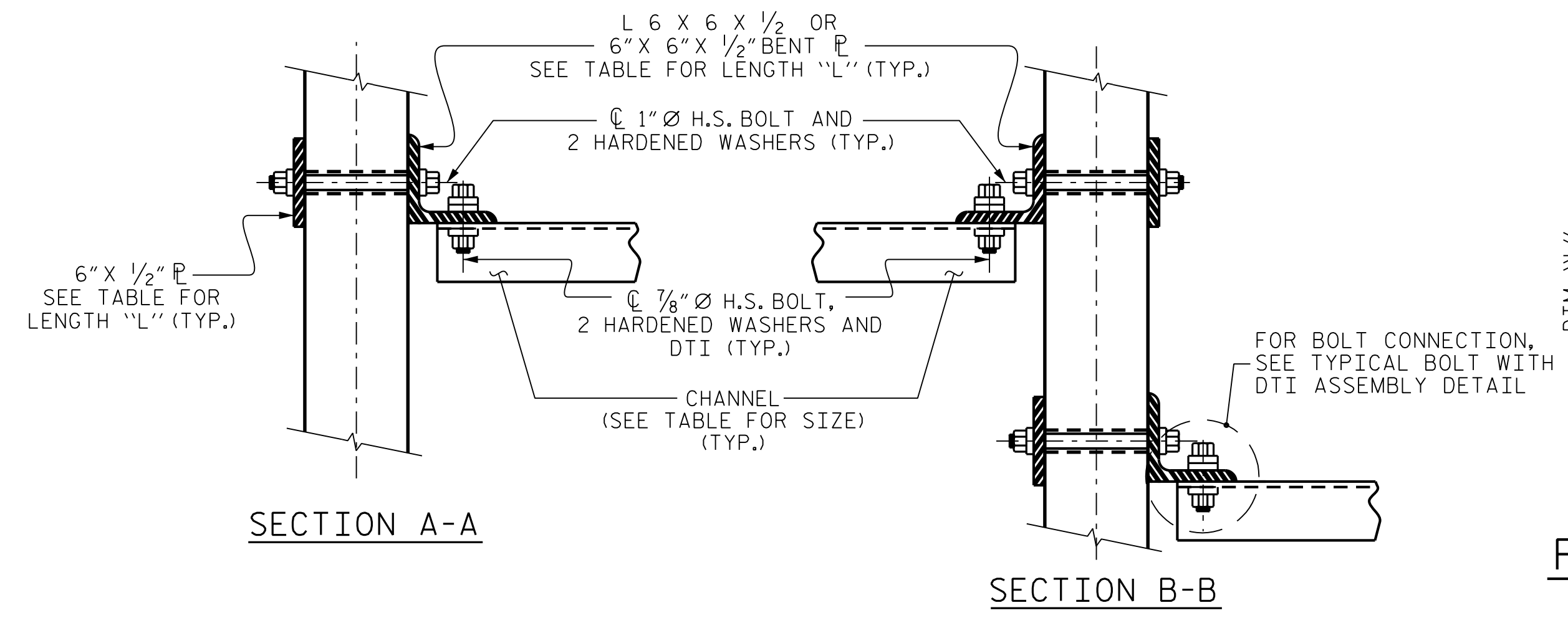


DIAPHRAGM FACE
 (TYPE IV GDR.)



WEB FACE

CONNECTOR PLATE DETAILS



CONNECTION DETAILS

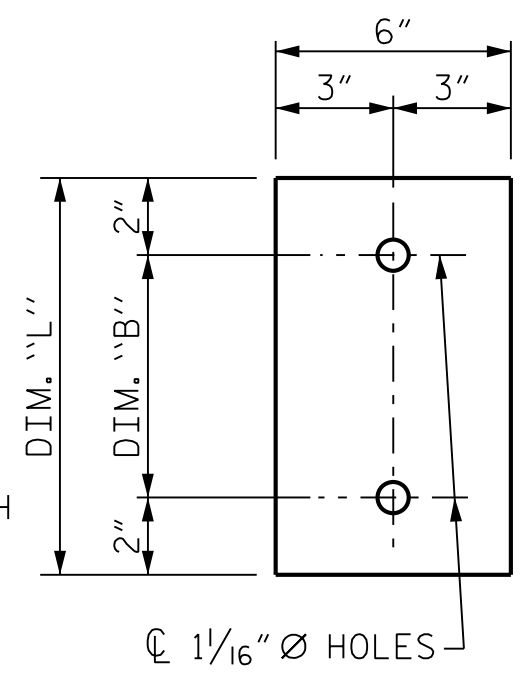
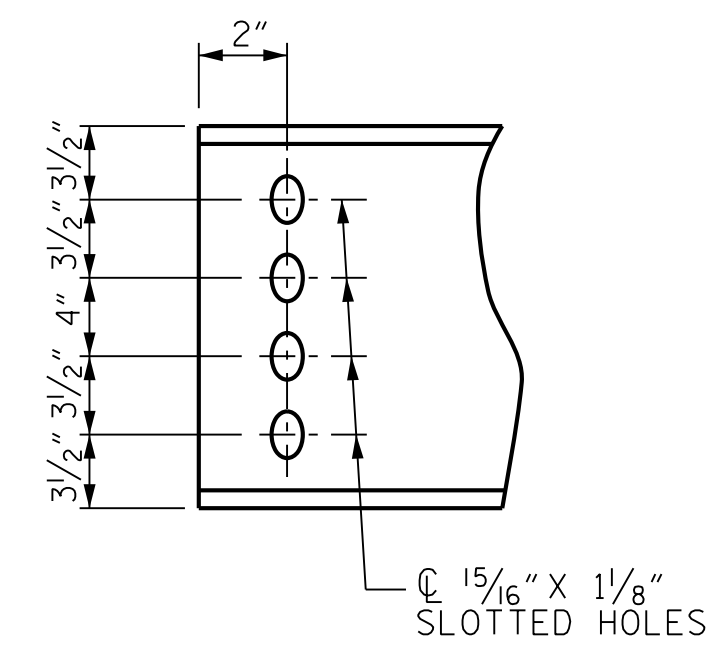
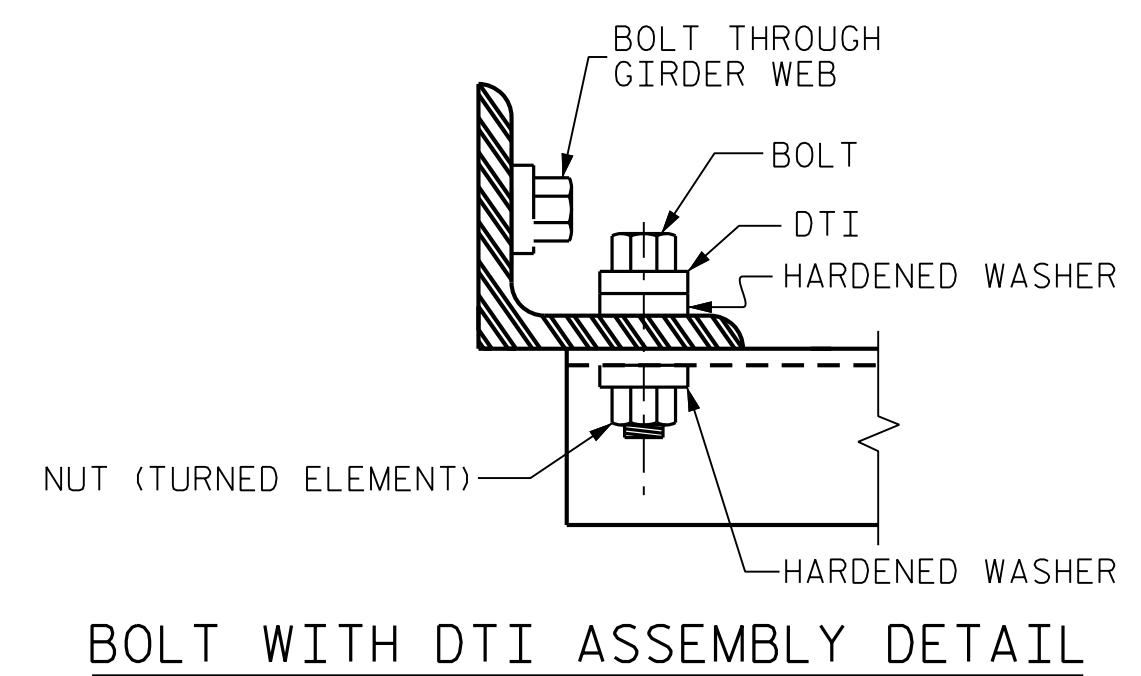


PLATE DETAILS



CHANNEL END
 (TYPE IV GDR.)



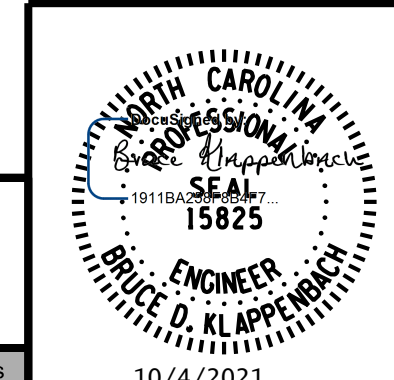
BOLT WITH DTI ASSEMBLY DETAIL

TABLE

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

PROJECT NO. I-5972
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SHEET 4 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 INTERMEDIATE STEEL
 DIAPHRAGMS FOR
 TYPE IV PRESTRESSED
 CONCRETE GIRDERS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			54

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DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

NOTES:

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

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

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

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

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

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

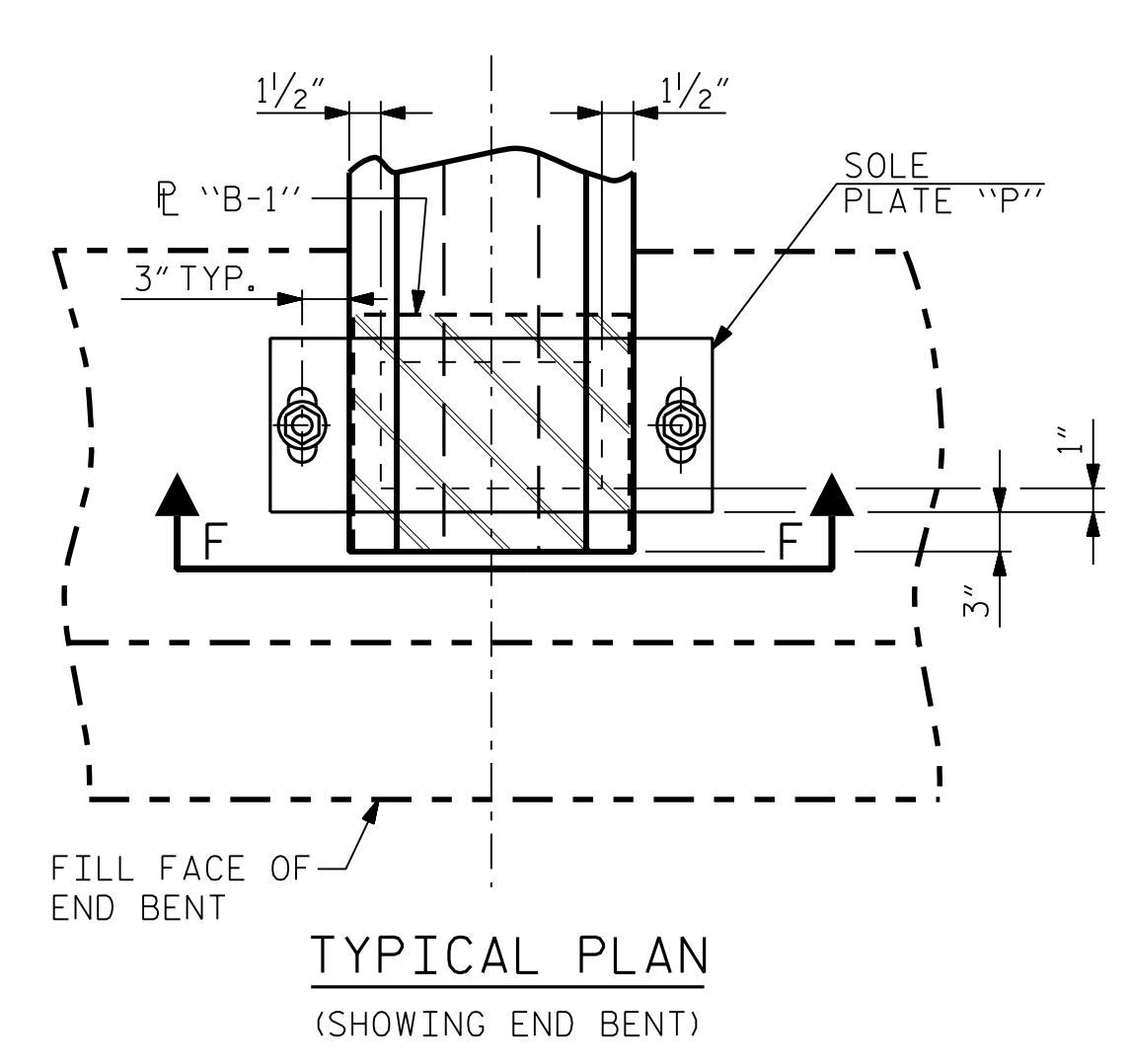
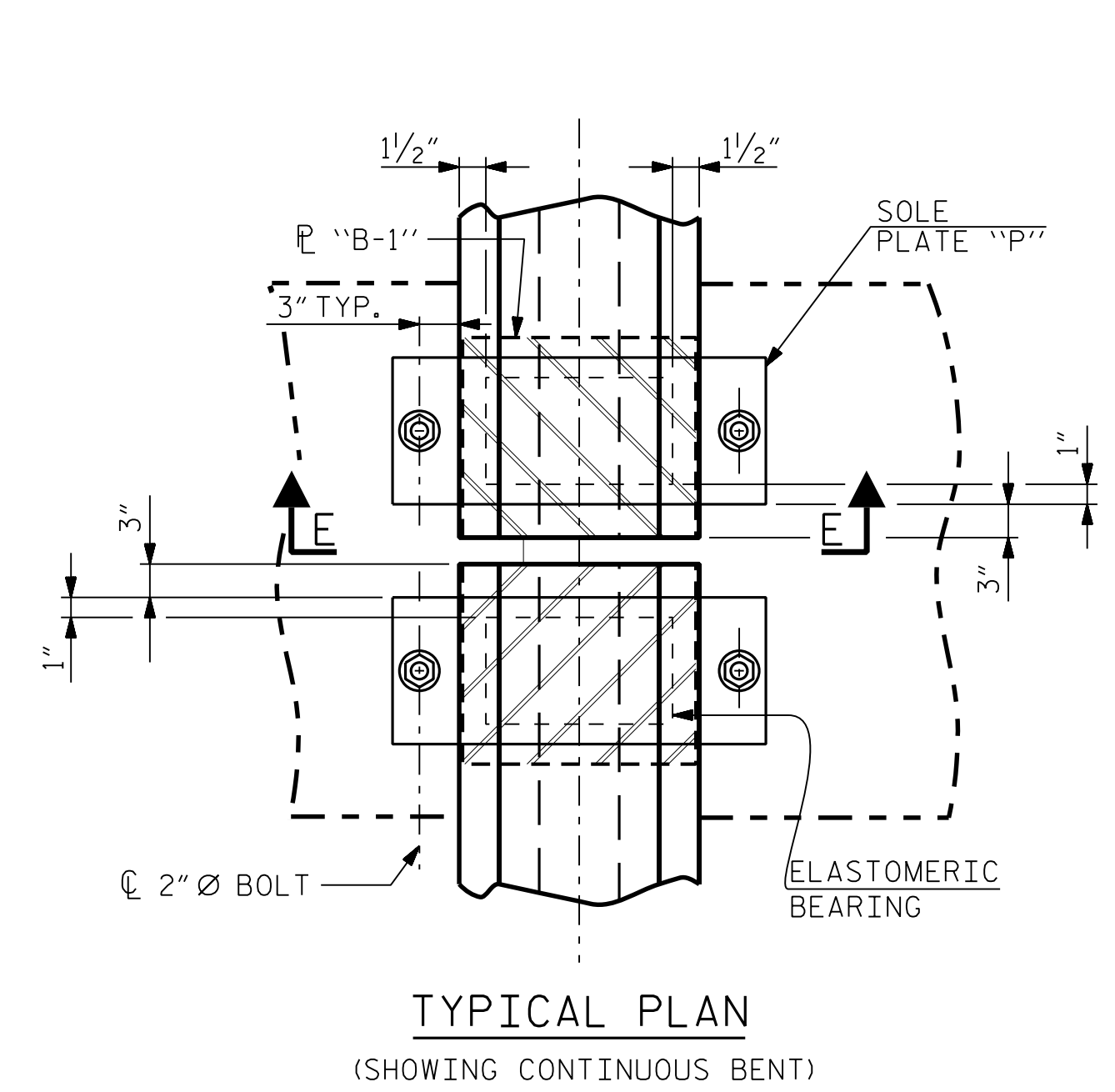
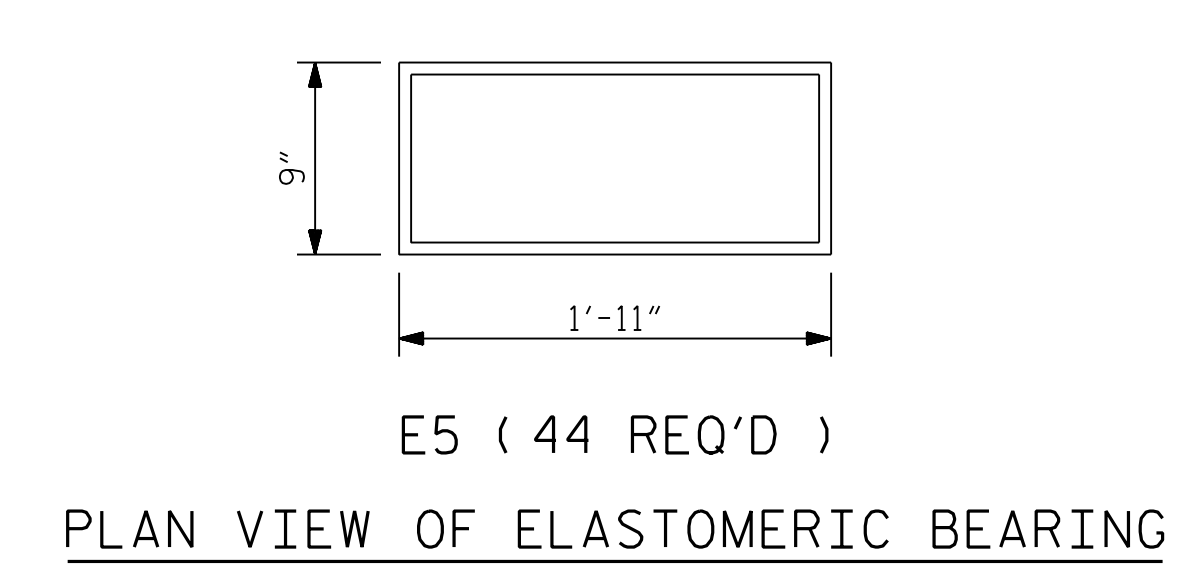
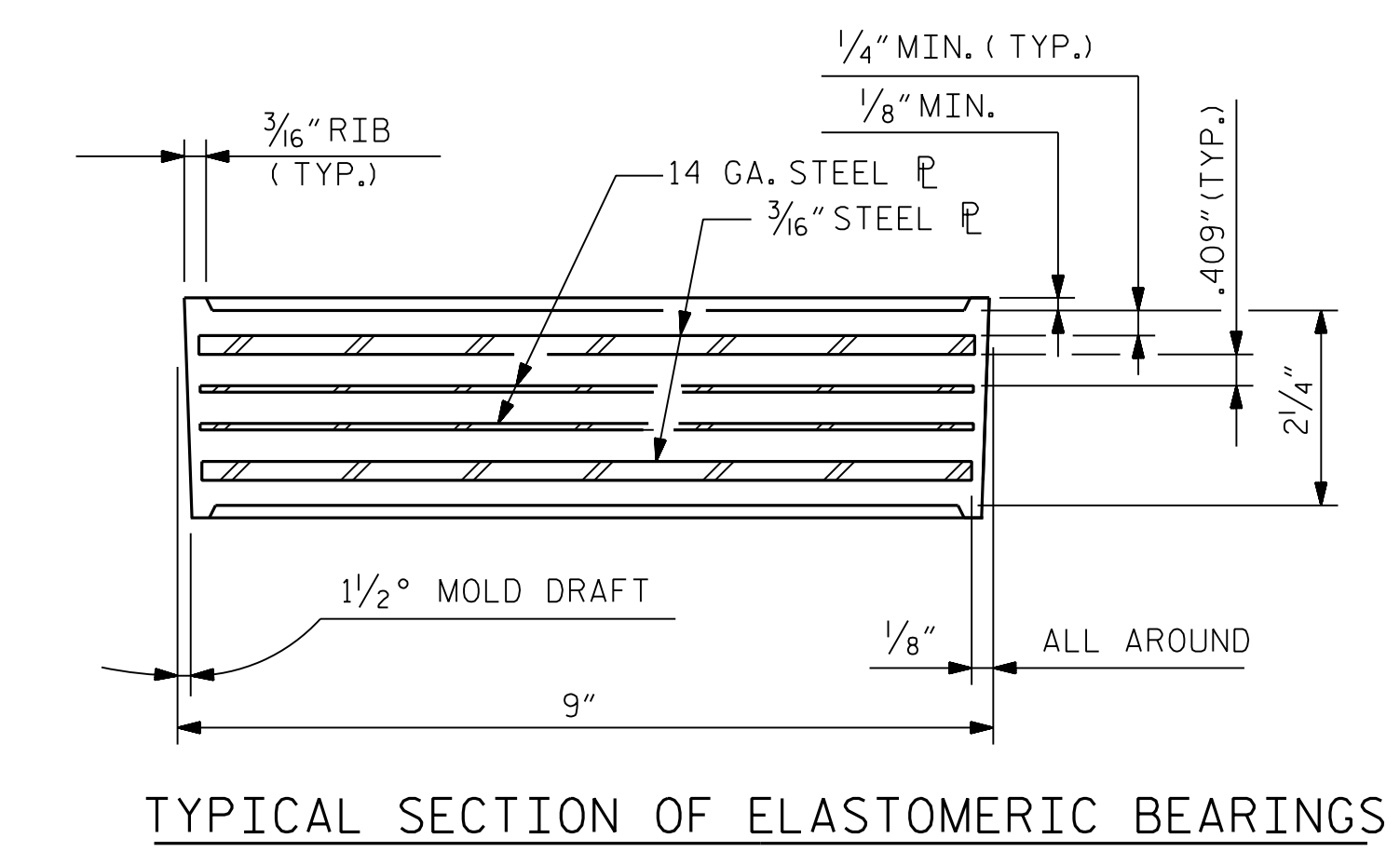
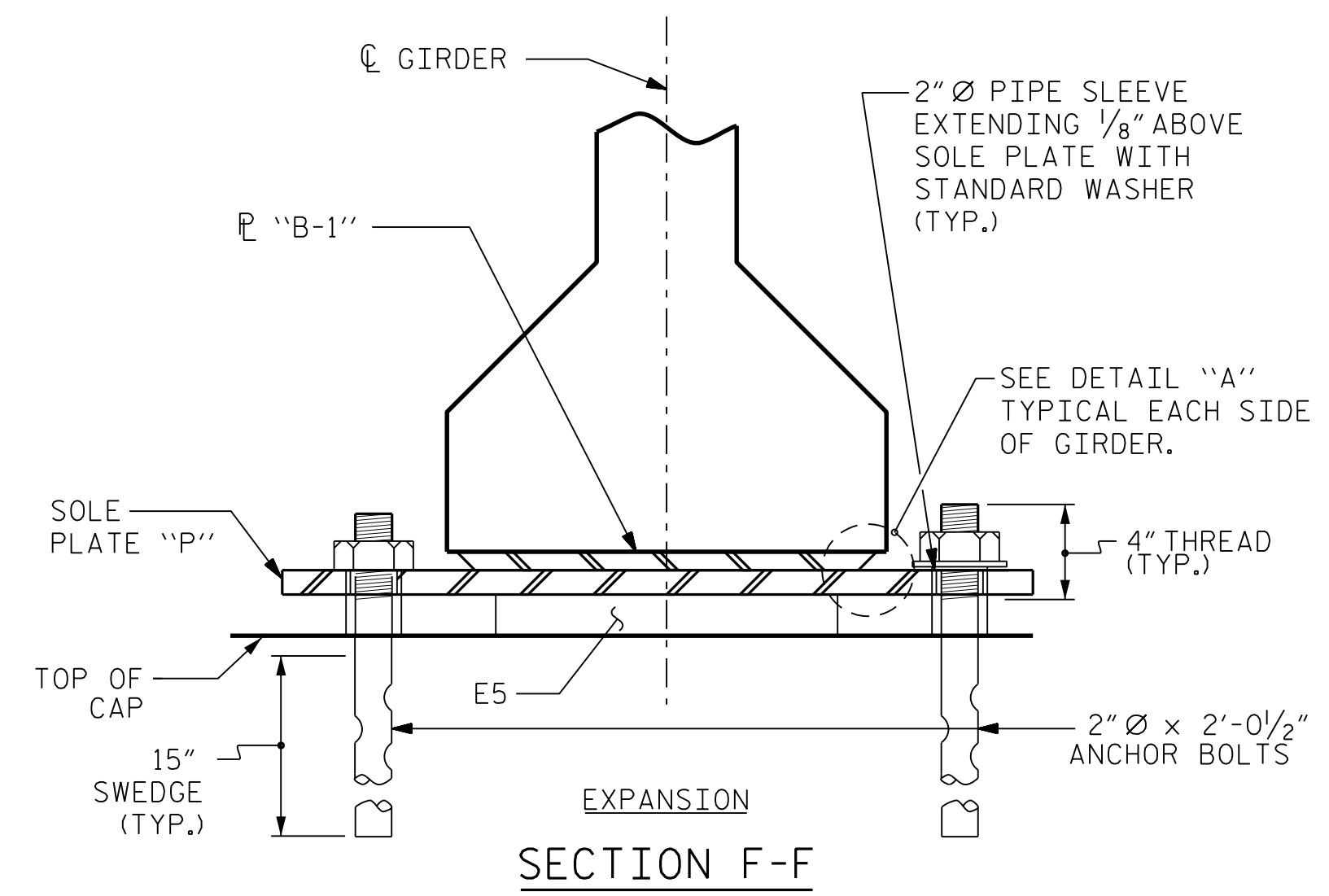
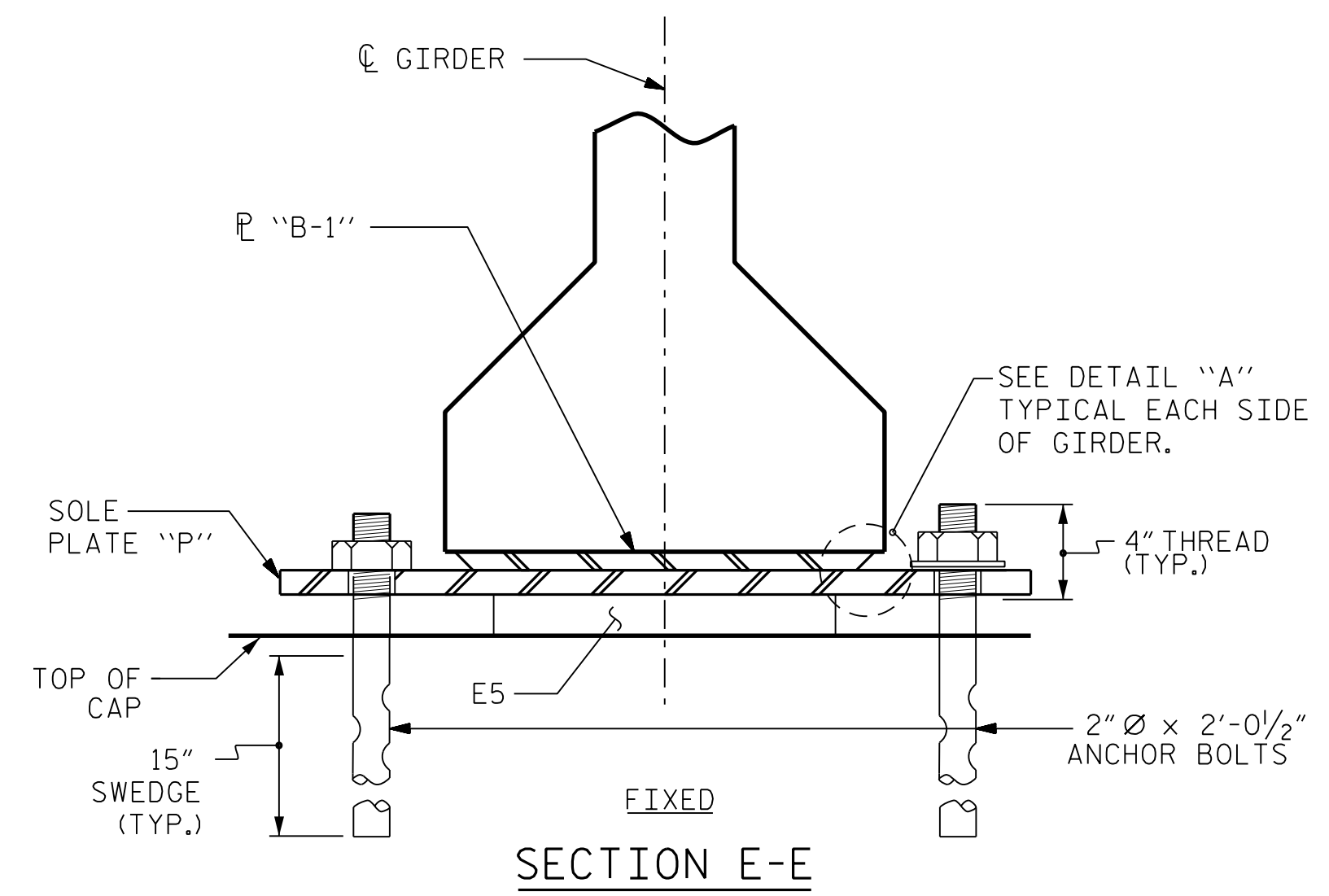
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

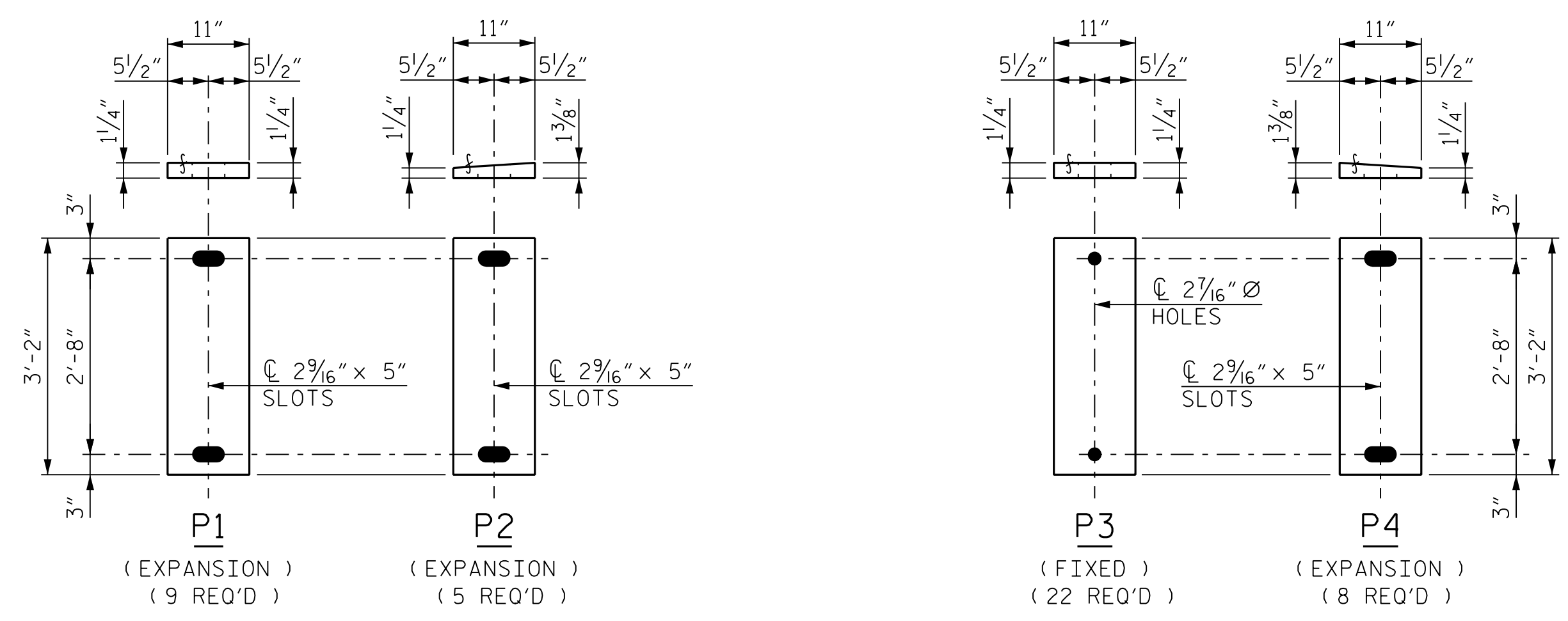
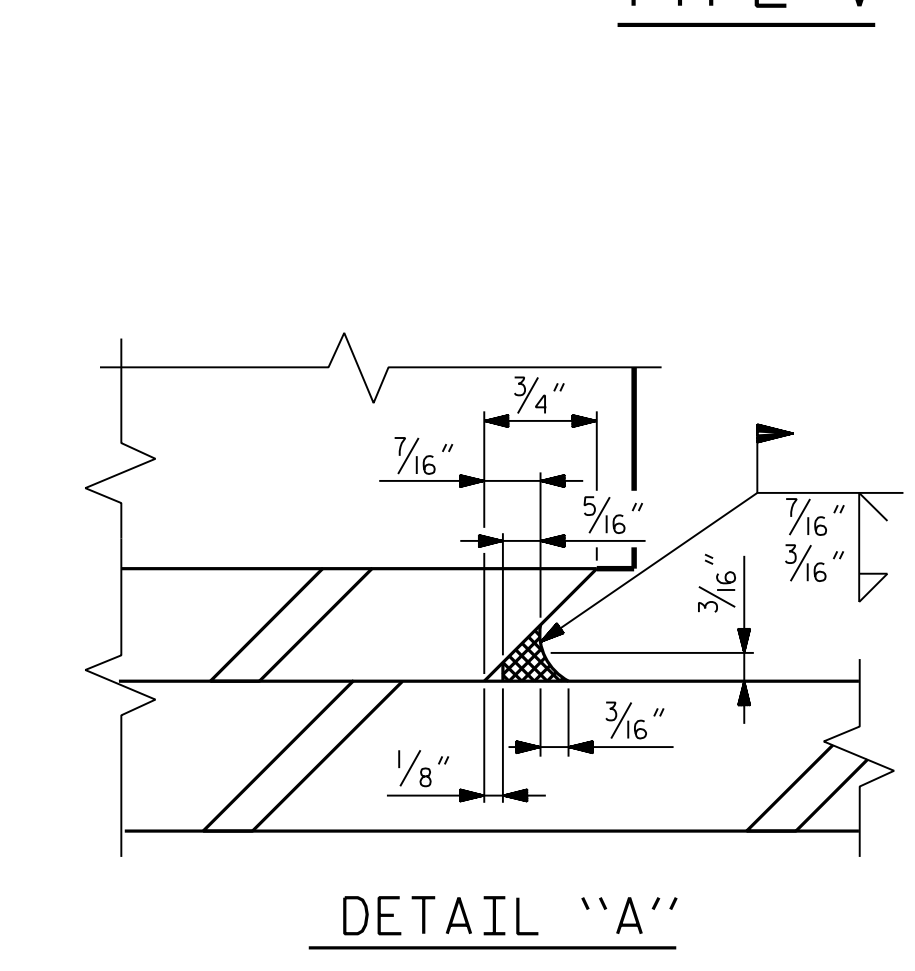
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

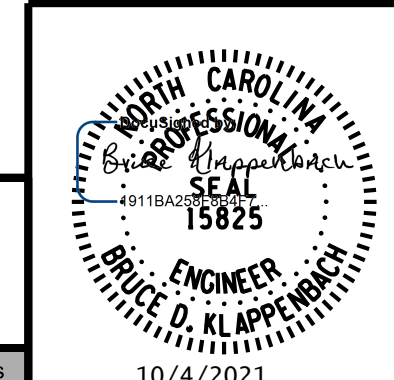


MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k



PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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**SUPERSTRUCTURE
 ELASTOMERIC
 BEARING DETAILS**



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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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					TOTAL SHEETS
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 bhag

DRAWN BY : B. A. HAAG DATE : JUN 2021
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 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPANS A & B

GIRDER		FORTIETH POINTS																				
		0	0.025	0.05	0.075	0.1	0.125	0.15	0.175	0.2	0.225	0.25	0.275	0.3	0.325	0.35	0.375	0.4	0.425	0.45	0.475	0.5
AG1-AG3, BG1-BG3	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.015	-0.031	-0.046	-0.061	-0.076	-0.091	-0.106	-0.120	-0.132	-0.143	-0.155	-0.167	-0.174	-0.181	-0.189	-0.196	-0.199	-0.201	-0.204	-0.206
	FINAL CAMBER	0	1/16	1/8	3/16	5/16	5/16	3/8	7/16	1/2	9/16	9/16	5/8	5/8	11/16	3/4	3/4	3/4	3/4	13/16	13/16	3/4
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.231	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.204	-0.201	-0.199	-0.196	-0.189	-0.181	-0.174	-0.167	-0.155	-0.143	-0.132	-0.120	-0.106	-0.091	-0.076	-0.061	-0.046	-0.031	-0.015	0.000	
AG4 & AG5, BG4 & BG5	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.015	-0.029	-0.044	-0.058	-0.072	-0.086	-0.100	-0.114	-0.125	-0.136	-0.147	-0.158	-0.165	-0.172	-0.179	-0.186	-0.188	-0.191	-0.193	-0.196
	FINAL CAMBER	0	1/16	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	11/16	3/4	13/16	13/16	7/8	7/8	7/8	15/16	15/16	7/8
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.231	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.193	-0.191	-0.188	-0.186	-0.179	-0.172	-0.165	-0.158	-0.147	-0.136	-0.125	-0.114	-0.100	-0.086	-0.072	-0.058	-0.044	-0.029	-0.015	0.000	
AG6 & AG7, BG6 & BG7	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.014	-0.027	-0.041	-0.054	-0.067	-0.080	-0.093	-0.106	-0.116	-0.127	-0.137	-0.147	-0.153	-0.160	-0.166	-0.173	-0.175	-0.177	-0.180	-0.182
	FINAL CAMBER	0	1/8	3/16	1/4	3/8	7/16	9/16	9/16	5/8	3/4	13/16	13/16	7/8	15/16	1	1	1	11/16	11/16	11/16	11/16
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.231	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.180	-0.177	-0.175	-0.173	-0.166	-0.160	-0.153	-0.147	-0.137	-0.127	-0.116	-0.106	-0.093	-0.080	-0.067	-0.054	-0.041	-0.027	-0.014	0.000	
AG8, BG8	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.015	-0.029	-0.044	-0.059	-0.073	-0.087	-0.101	-0.115	-0.126	-0.137	-0.149	-0.160	-0.167	-0.174	-0.181	-0.188	-0.190	-0.193	-0.195	-0.197
	FINAL CAMBER	0	1/16	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	11/16	3/4	3/4	13/16	13/16	13/16	7/8	7/8	7/8	7/8
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.231	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.195	-0.193	-0.190	-0.188	-0.181	-0.174	-0.167	-0.160	-0.149	-0.137	-0.126	-0.115	-0.101	-0.087	-0.073	-0.059	-0.044	-0.029	-0.015	0.000	
AG9, BG9	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.016	-0.031	-0.047	-0.062	-0.077	-0.092	-0.107	-0.122	-0.134	-0.145	-0.157	-0.169	-0.176	-0.176	-0.191	-0.199	-0.201	-0.204	-0.206	-0.209
	FINAL CAMBER	0	1/16	1/8	3/16	1/4	5/16	3/8	7/16	7/16	1/2	9/16	9/16	5/8	5/8	5/8	11/16	11/16	3/4	3/4	3/4	3/4
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.242	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.206	-0.204	-0.201	-0.199	-0.191	-0.184	-0.184	-0.169	-0.157	-0.137	-0.134	-0.122	-0.107	-0.092	-0.077	-0.062	-0.047	-0.031	-0.016	0.000	
AG10-AG11, BG10-BG11	CAMBER (GIRDER ALONE IN PLACE)	0.000	0.022	0.043	0.064	0.085	0.105	0.124	0.143	0.161	0.177	0.193	0.206	0.220	0.231	0.242	0.250	0.258	0.262	0.267	0.269	0.271
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	0.000	-0.016	-0.032	-0.048	-0.065	-0.080	-0.096	-0.111	-0.127	-0.139	-0.151	-0.163	-0.175	-0.183	-0.191	-0.199	-0.206	-0.209	-0.212	-0.214	-0.217
	FINAL CAMBER	0	1/16	1/8	3/16	1/4	5/16	3/8	3/8	7/16	7/16	1/2	1/2	9/16	9/16	5/8	5/8	5/8	5/8	11/16	11/16	5/8
		0.525	0.55	0.575	0.6	0.625	0.65	0.675	0.7	0.725	0.75	0.775	0.8	0.825	0.85	0.875	0.9	0.925	0.95	0.975	1.0	
	CAMBER (GIRDER ALONE IN PLACE)	0.269	0.267	0.262	0.258	0.250	0.242	0.231	0.220	0.206	0.193	0.177	0.161	0.143	0.124	0.105	0.085	0.064	0.043	0.022	0.000	
	DEFLECTION DUE TO SUPERIMPOSED D.L.*	-0.214	-0.212	-0.209	-0.206	-0.199	-0.191	-0.183	-0.175	-0.163	-0.151	-0.139	-0.127	-0.111	-0.096	-0.080	-0.065	-0.048	-0.032	-0.016	0.000	

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT THE FORTIETH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

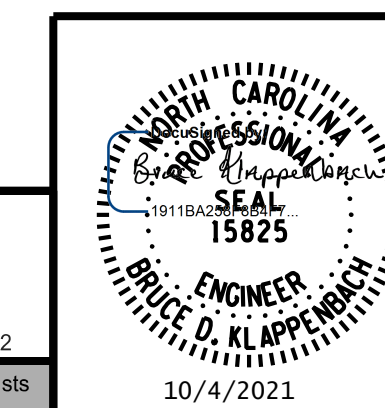
* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 GIRDER CAMBER DETAILS
 SPANS A AND B

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

TOTAL SHEETS: 54

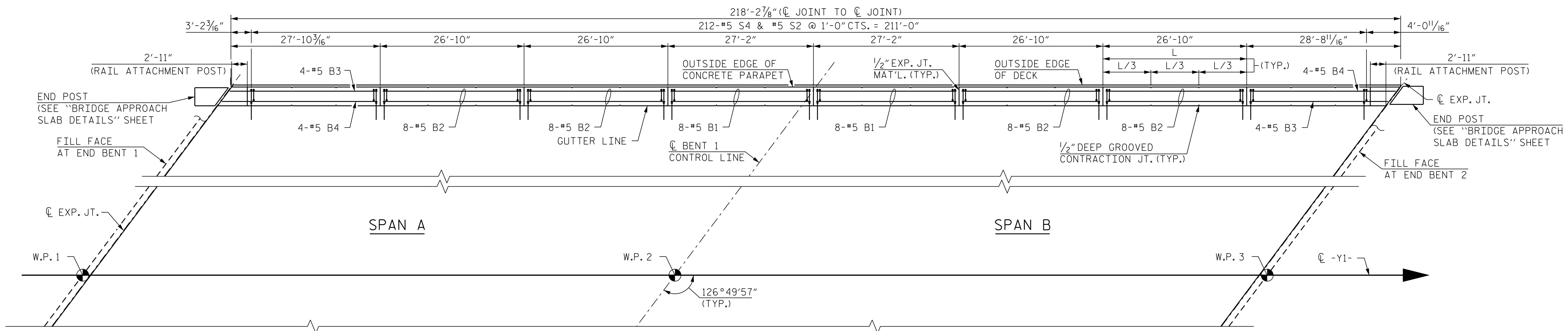


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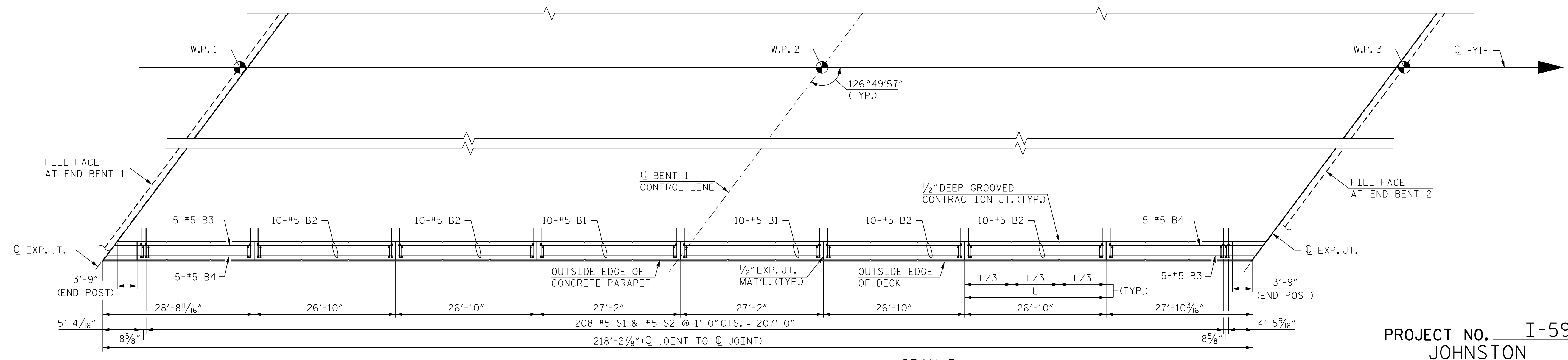
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DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021



PLAN OF PARAPET - LEFT SIDE
 (STAGE 2)

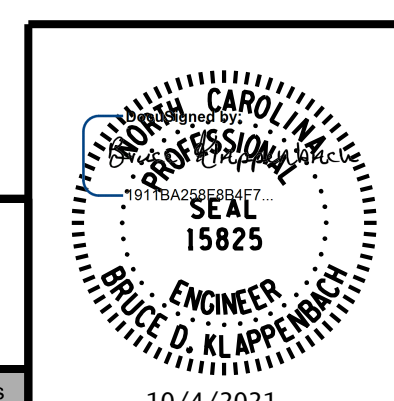


PLAN OF PARAPET - RIGHT SIDE
 (STAGE 1)

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 PLAN



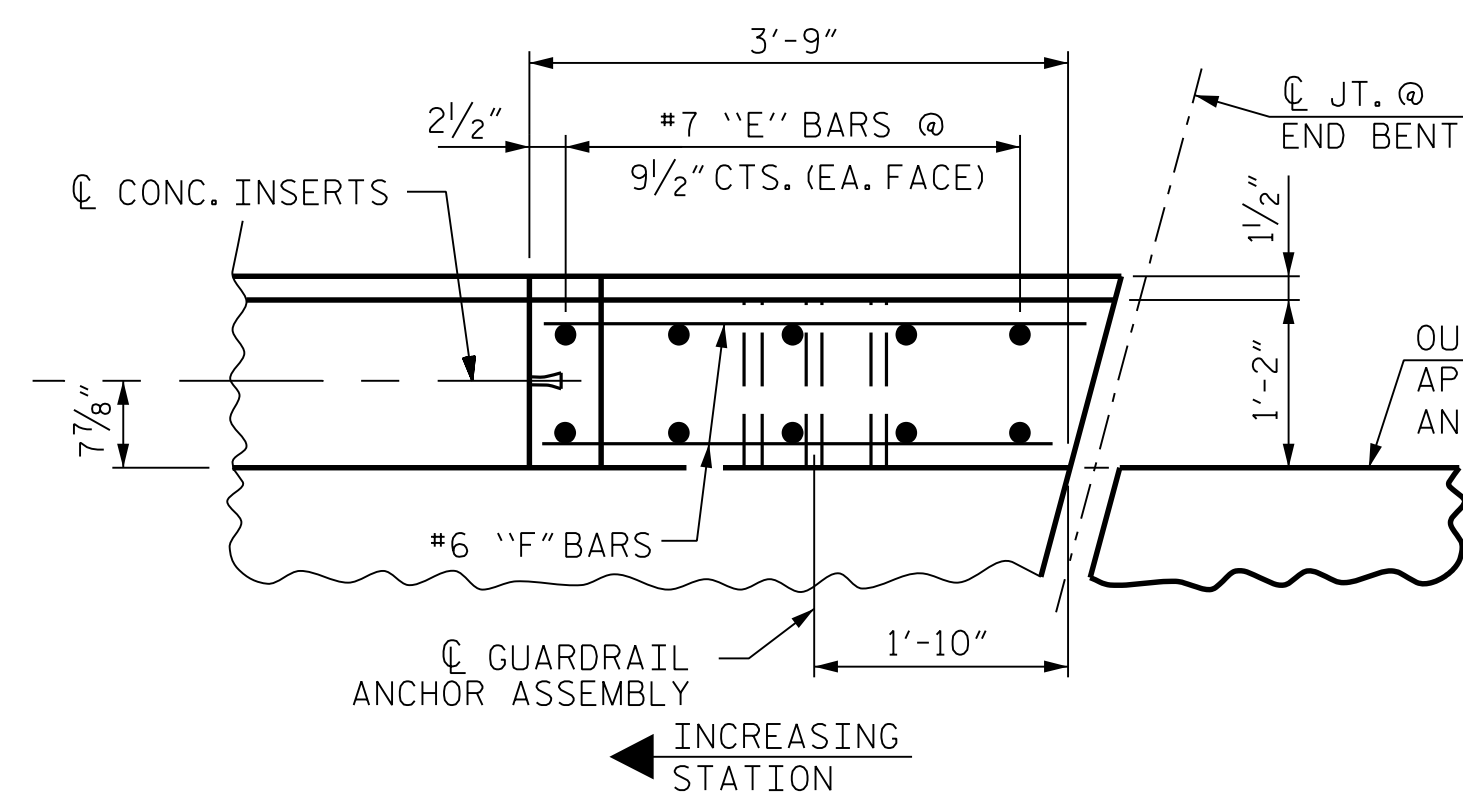
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1			3			TOTAL SHEETS
2			4			54

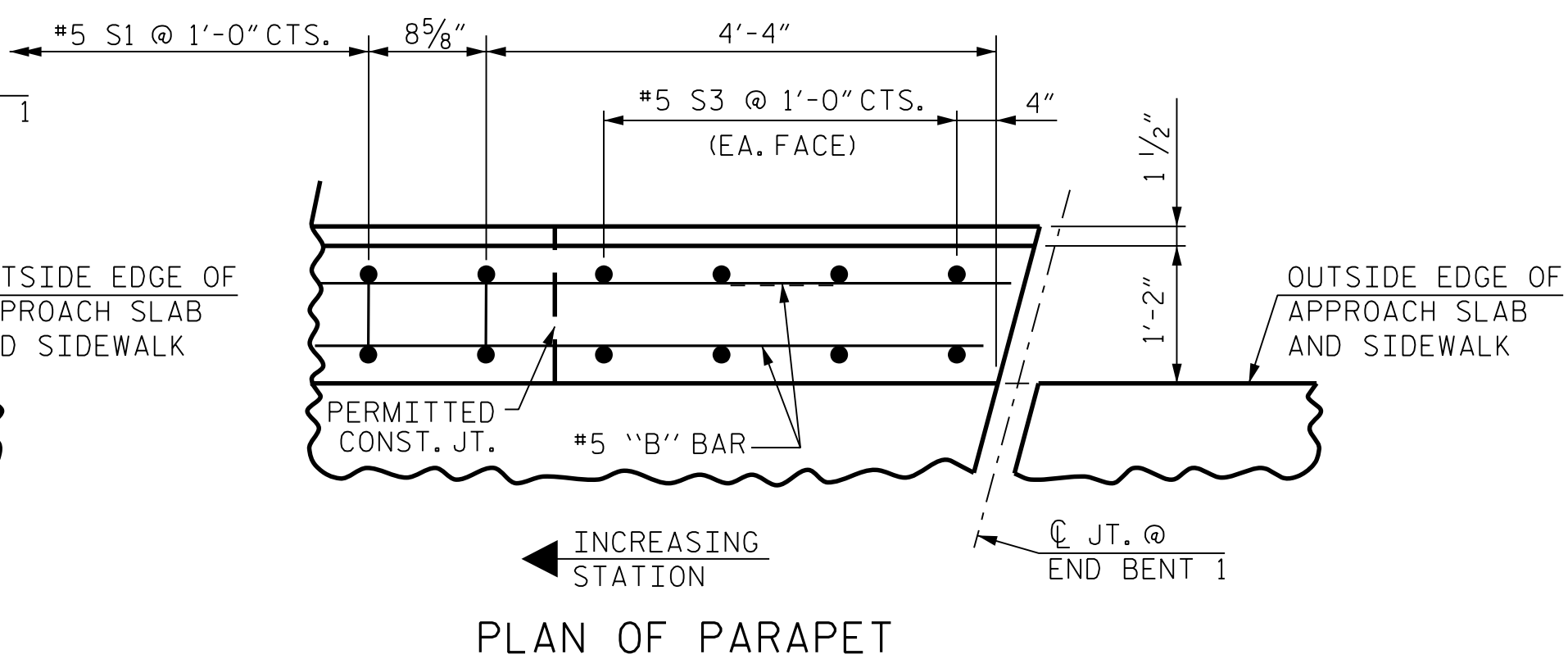
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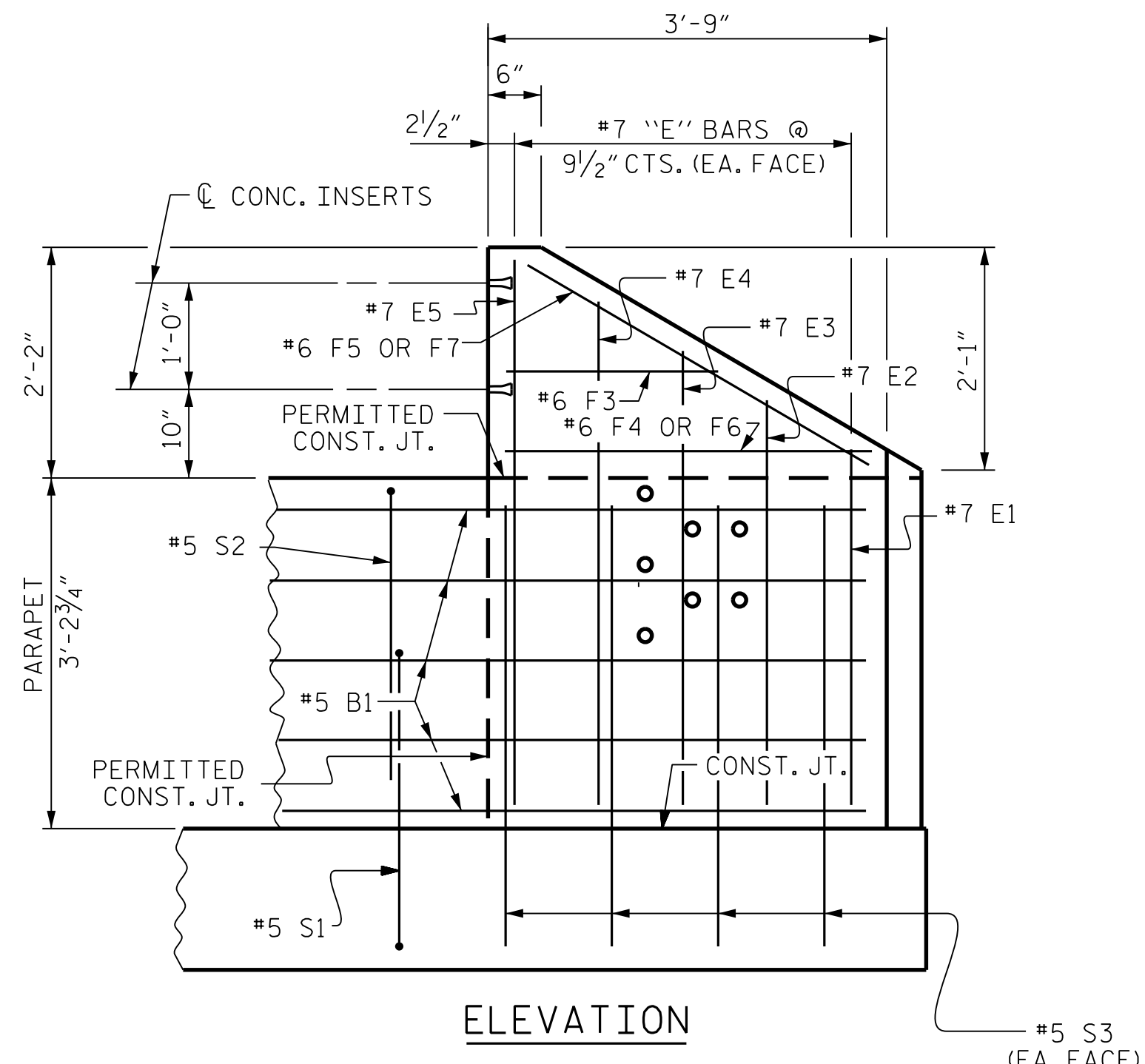
DRAWN BY : B. A. HAAG DATE : JUN 2021
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 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021



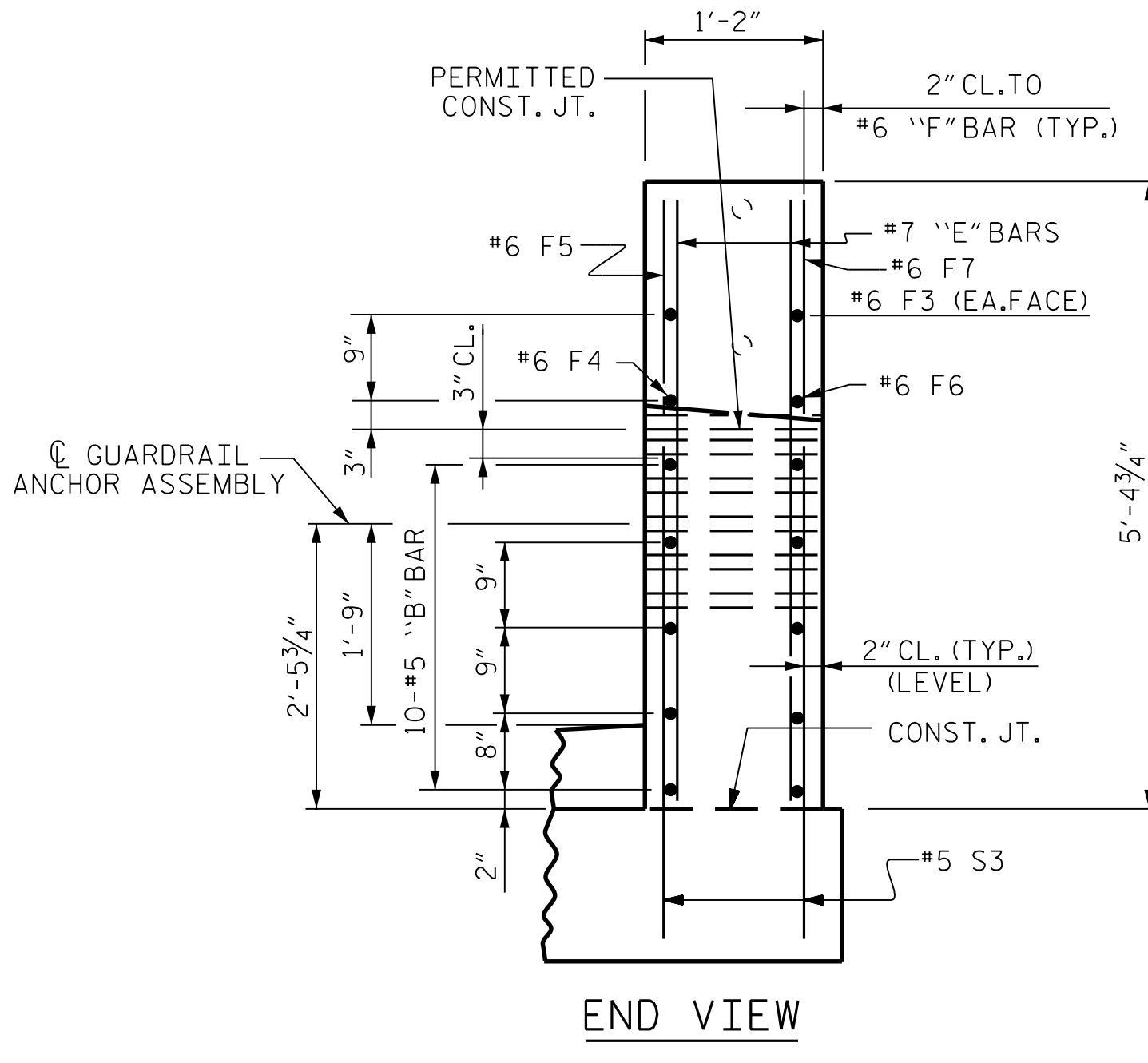
PLAN OF END POST



PLAN OF PARAPET

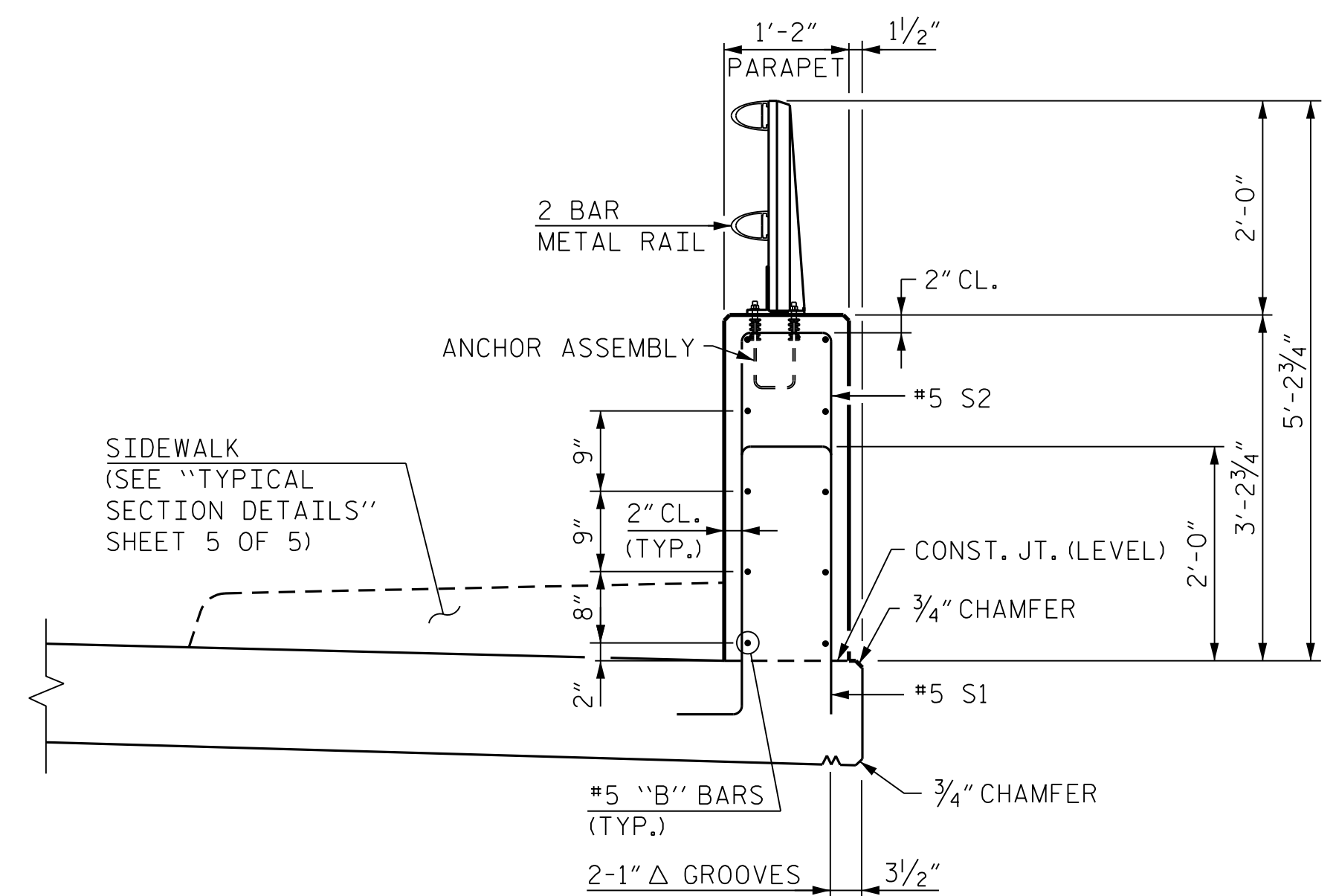


ELEVATION



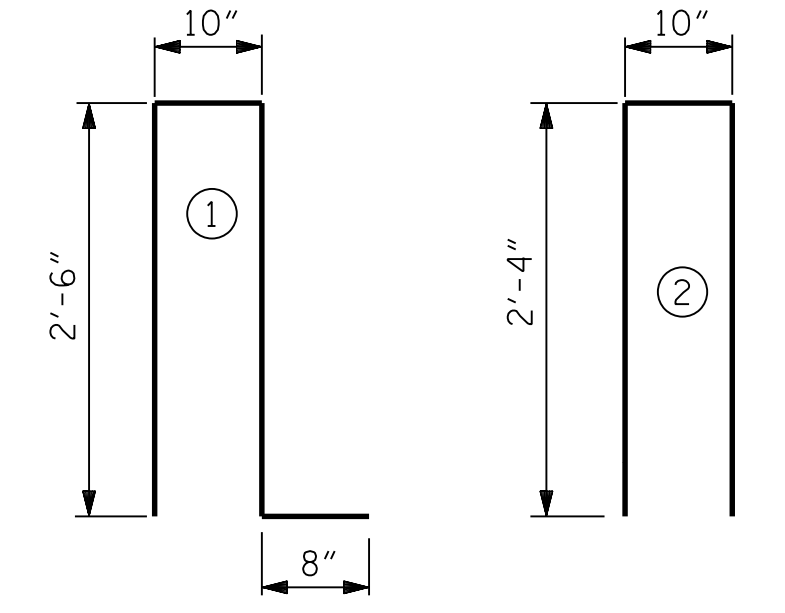
END VIEW

PARAPET AND END POST FOR TWO BAR RAIL
(RIGHT SIDE STAGE 1)



SECTION THROUGH PARAPET
(RIGHT SIDE STAGE 1)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL STAGE 1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	20	5	STR.	26'-9"	558
*B2	40	5	STR.	26'-5"	1102
*B3	10	5	STR.	27'-4"	285
*B4	10	5	STR.	27'-11"	291
*E1	4	7	STR.	3'-0"	25
*E2	4	7	STR.	3'-6"	29
*E3	4	7	STR.	4'-0"	33
*E4	4	7	STR.	4'-6"	37
*E5	4	7	STR.	5'-0"	41
*F3	4	6	STR.	1'-9"	11
*F4	2	6	STR.	2'-11"	9
*F5	2	6	STR.	3'-3"	10
*F6	2	6	STR.	3'-5"	10
*F7	2	6	STR.	3'-9"	11
*S1	210	5	1	6'-6"	1,424
*S2	210	5	2	5'-6"	1,205
*S3	16	5	STR.	3'-6"	58

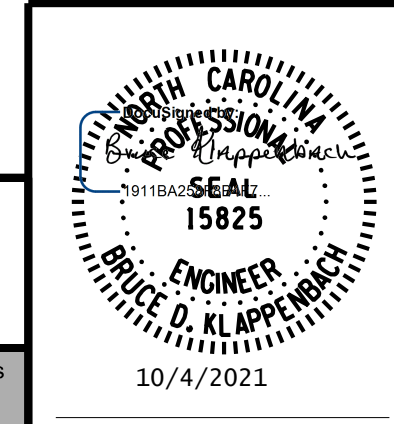
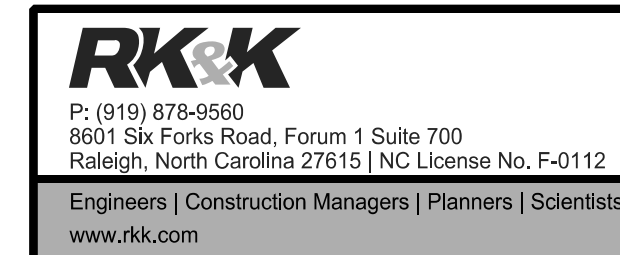
*EPOXY COATED REINFORCING STEEL	5,139 LBS.
CLASS "AA" CONCRETE (PARAPET)	30.5 CY
1'-2" x 3'-2 3/4" CONCRETE PARAPET	218.24 LIN. FT.

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET
AND END POST
DETAILS AND
BILL OF MATERIAL
RIGHT SIDE - STAGE 1

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2			4			54

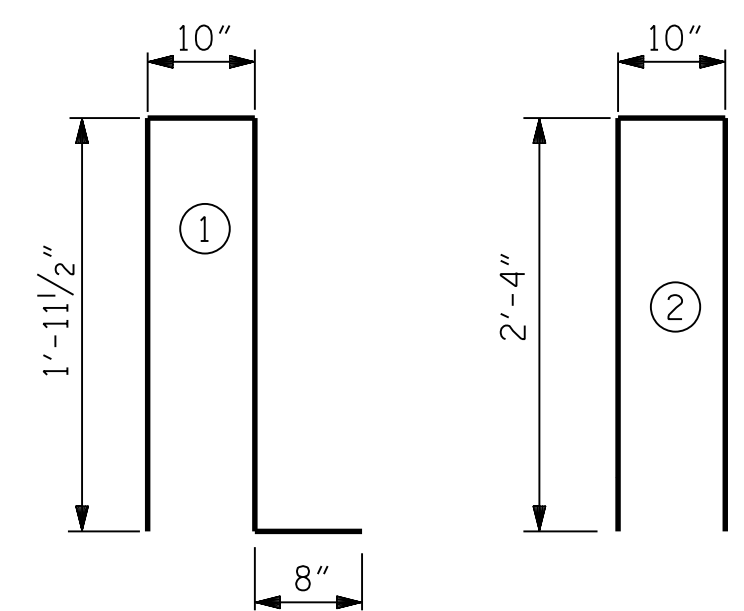


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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL - STAGE 2

FOR CONCRETE PARAPET & 2 METAL RAIL ATTACHMENT POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	16	5	STR.	26'-9"	446
*B2	32	5	STR.	26'-5"	882
*B3	8	5	STR.	27'-4"	228
*B4	8	5	STR.	27'-11"	233
*E6	12	5	STR.	4'-4"	54
*F1	6	5	STR.	2'-6"	16
*F2	6	5	STR.	3'-1"	19
*S2	212	5	2	5'-6"	1,216
*S4	218	5	1	5'-5"	1,232

* EPOXY COATED REINFORCING STEEL	4,326 LBS.
CLASS "AA" CONCRETE (PARAPET)	24.4 CY
1'-2" x 2'-6" CONCRETE PARAPET	218.24 LIN. FT.

NOTES:

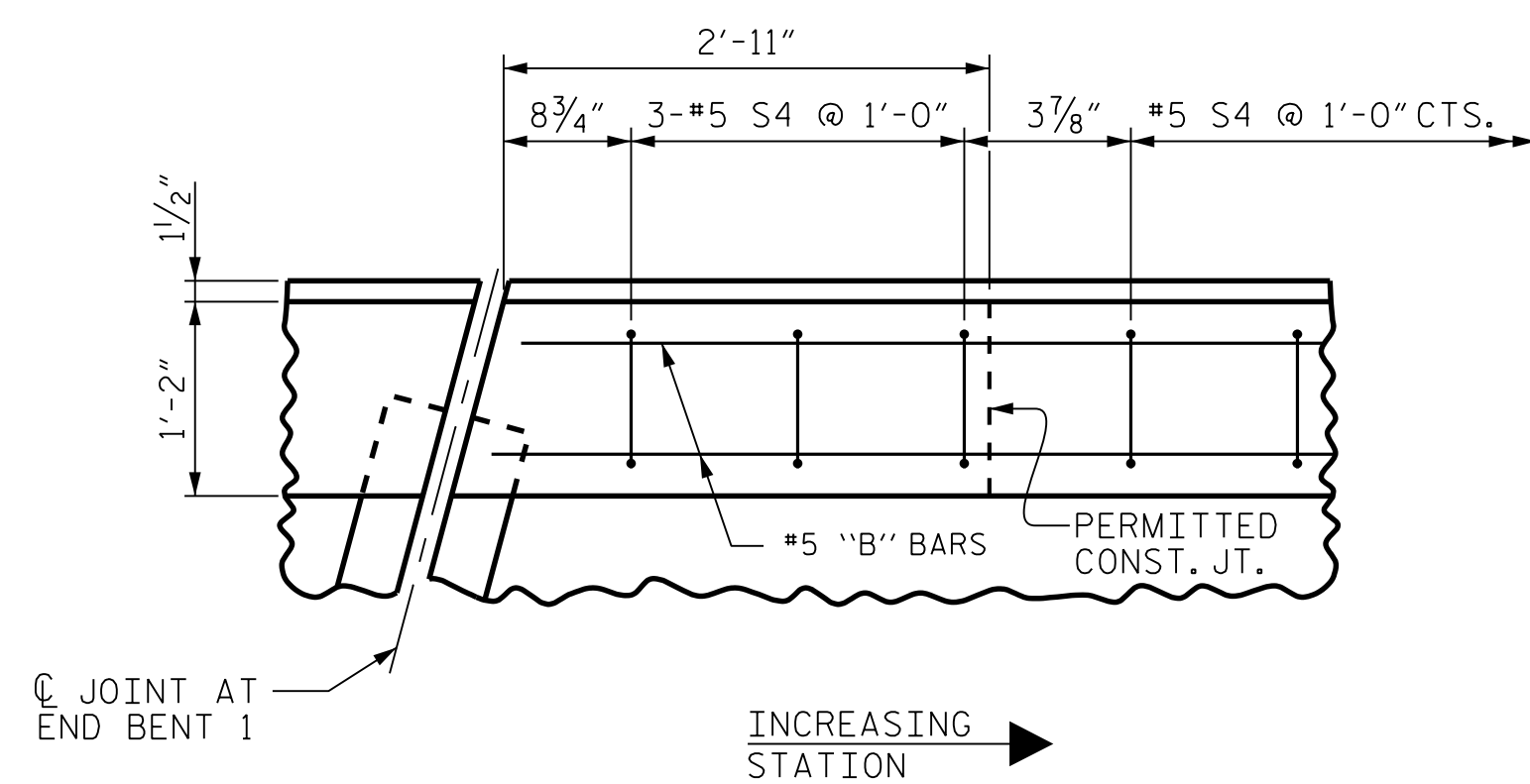
THE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

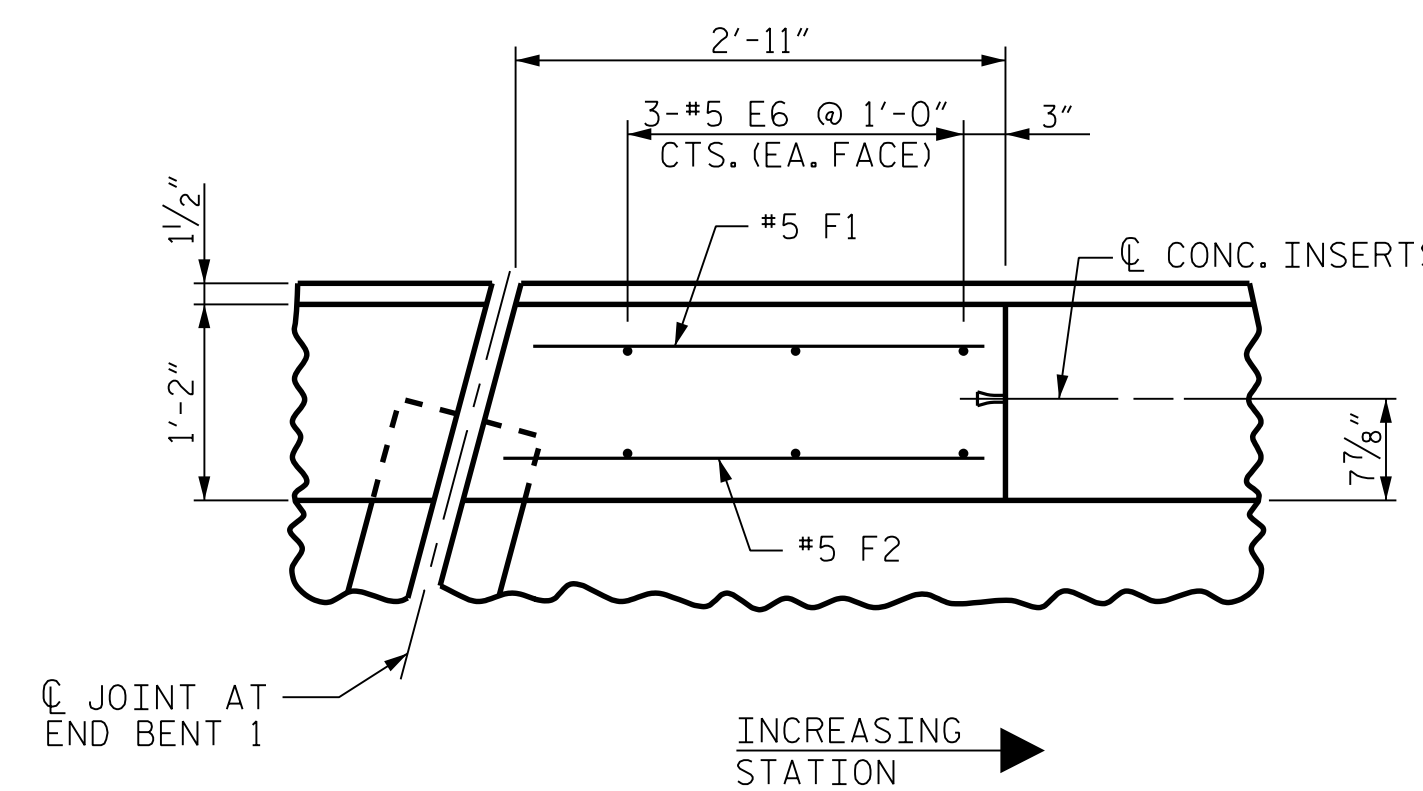
VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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

FOR DETAILS OF CONCRETE INSERTS AND ANCHOR ASSEMBLIES, SEE "2 BAR METAL RAIL" AND "RAIL POST SPACINGS AND END OF RAIL" SHEETS.
FOR GUARDRAIL ANCHOR ASSEMBLY DETAILS, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.

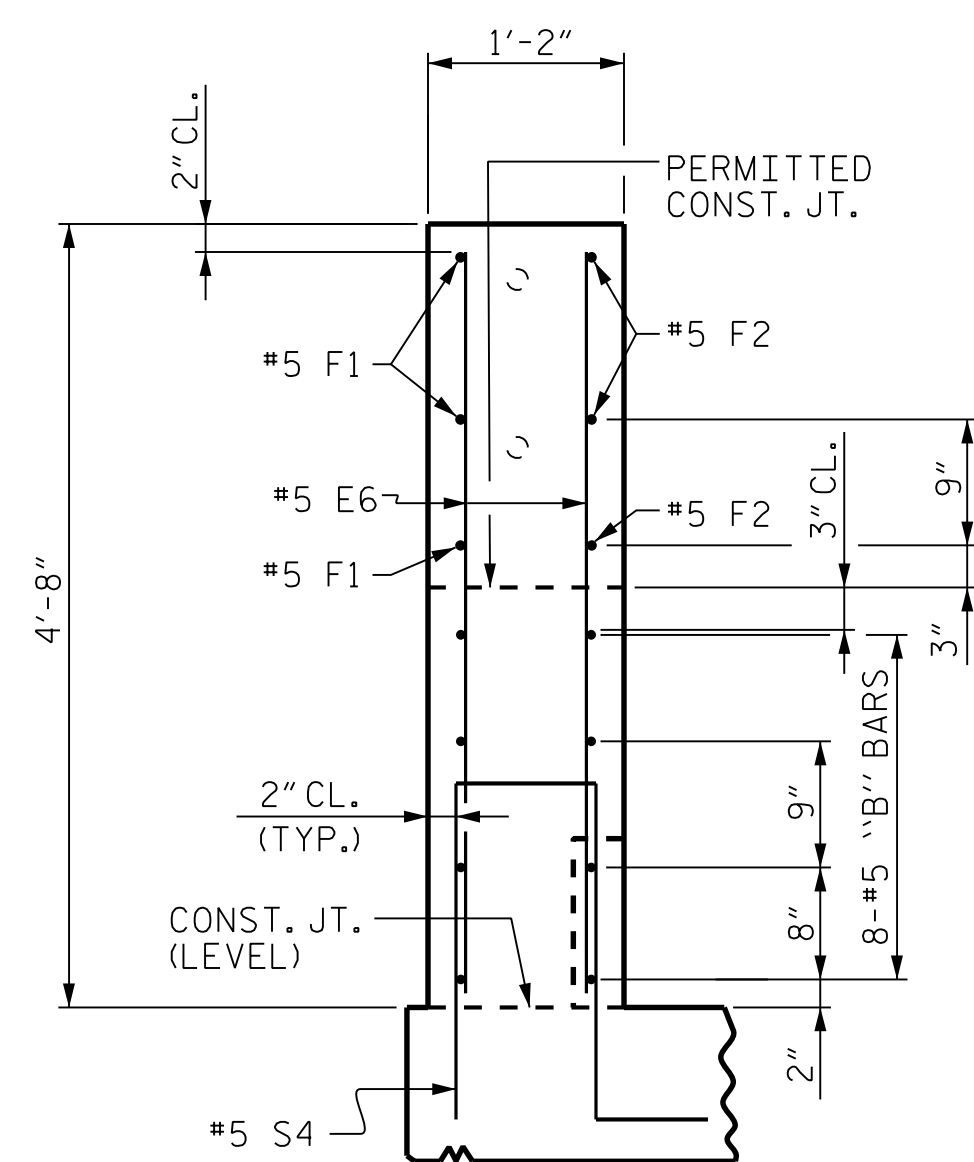
FOR END POST BILL OF MATERIAL ON APPROACH SLABS, SEE SHEET S-53.



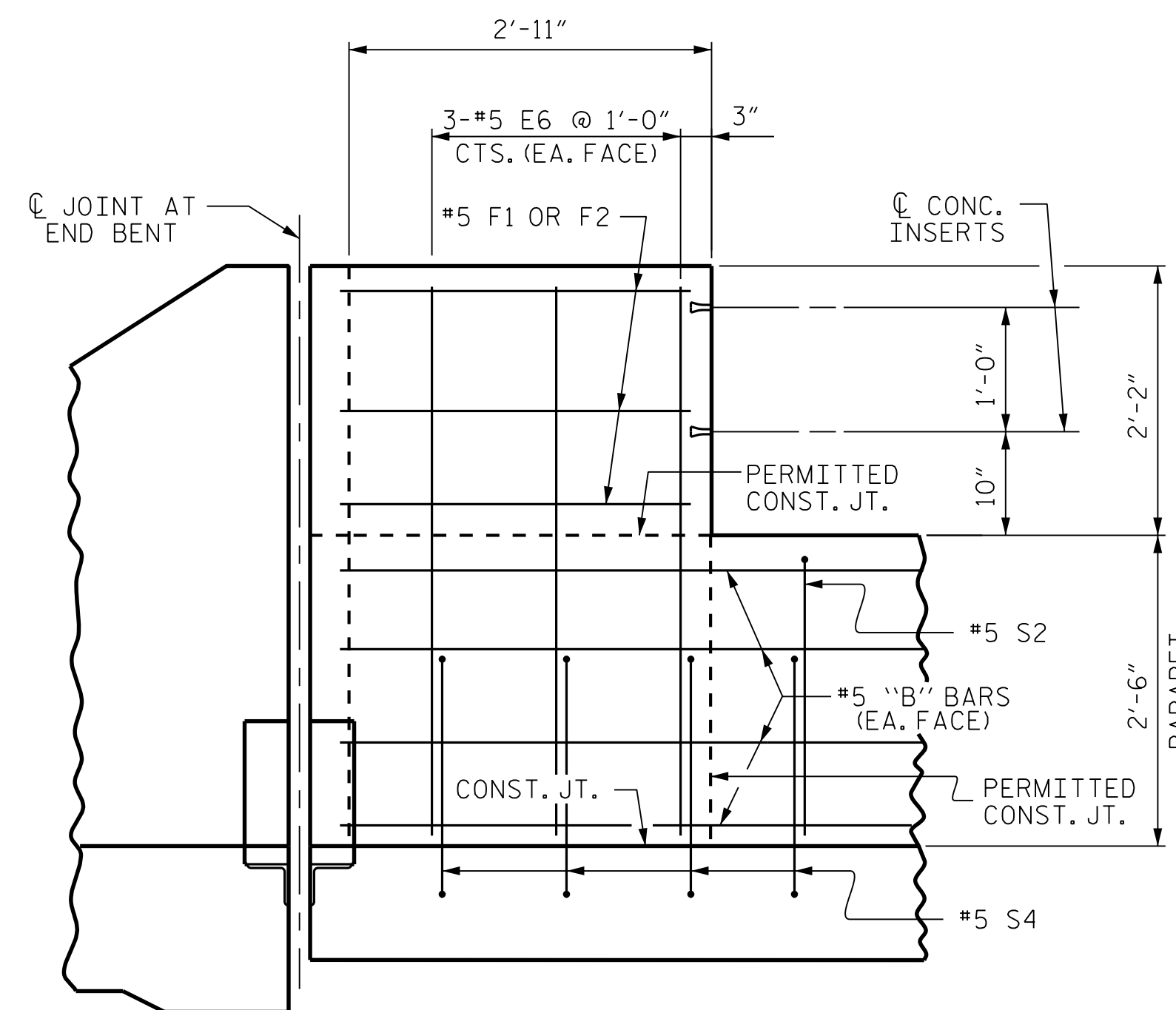
PLAN OF PARAPET



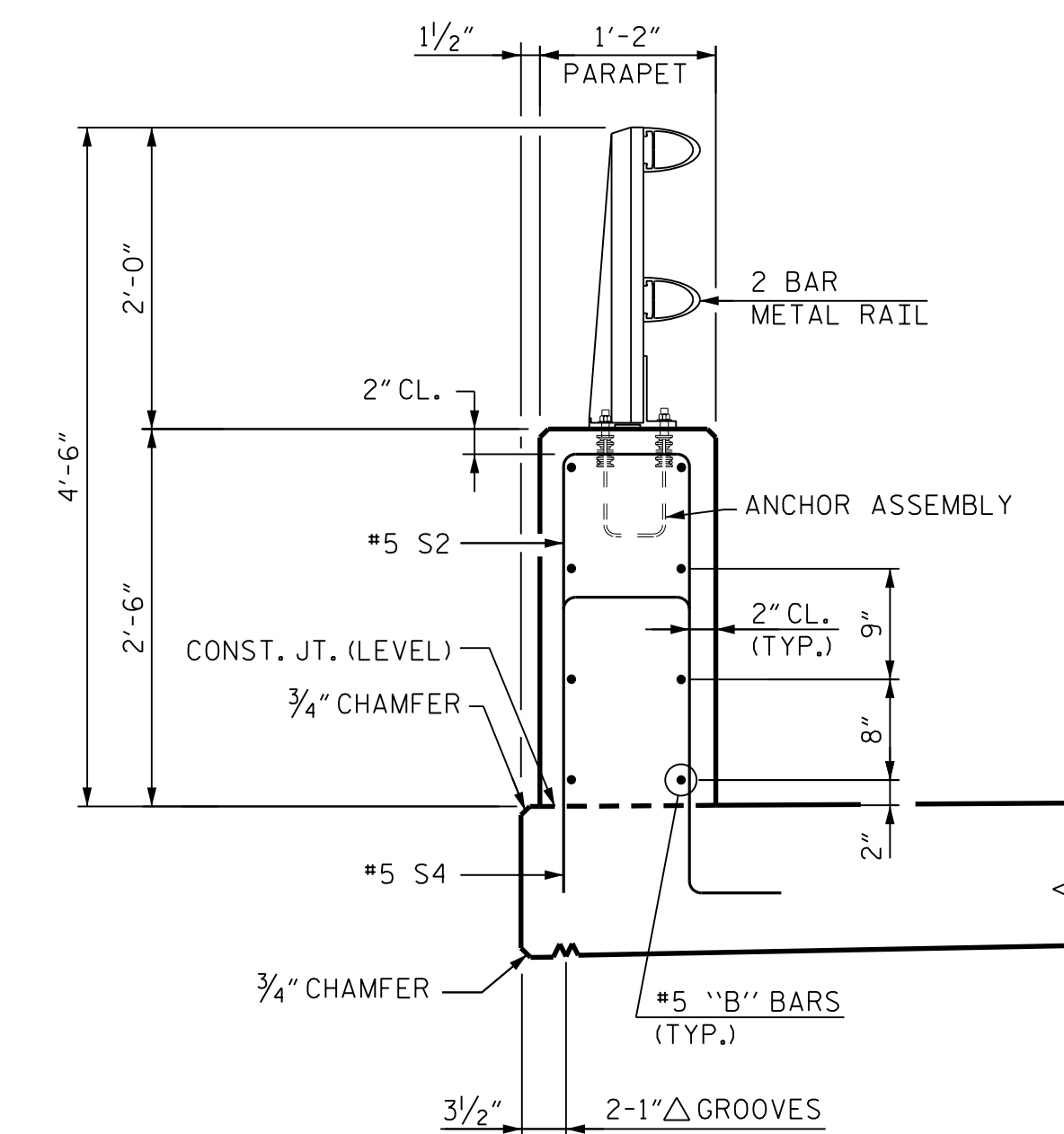
PLAN OF METAL RAIL ATTACHMENT POST



END VIEW



ELEVATION



SECTION THROUGH PARAPET

(LEFT SIDE - STAGE 2)

PARAPET AND METAL RAIL ATTACHMENT POST FOR TWO BAR METAL RAIL

(LEFT SIDE - STAGE 2)

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET
AND RAIL ATTACHMENT
POST DETAILS AND
BILL OF MATERIAL
LEFT SIDE - STAGE 2

REVISIONS

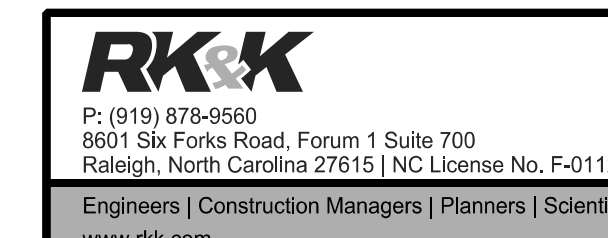
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1			3		
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SHEET NO.

S-23

TOTAL SHEETS

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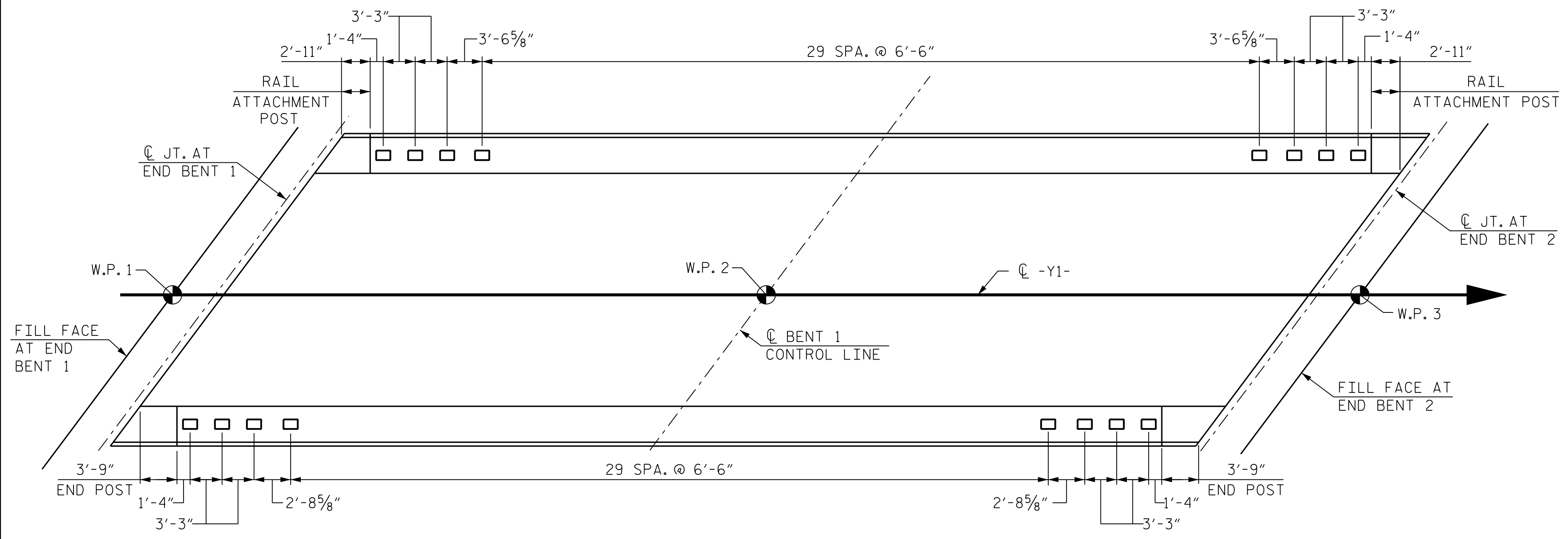
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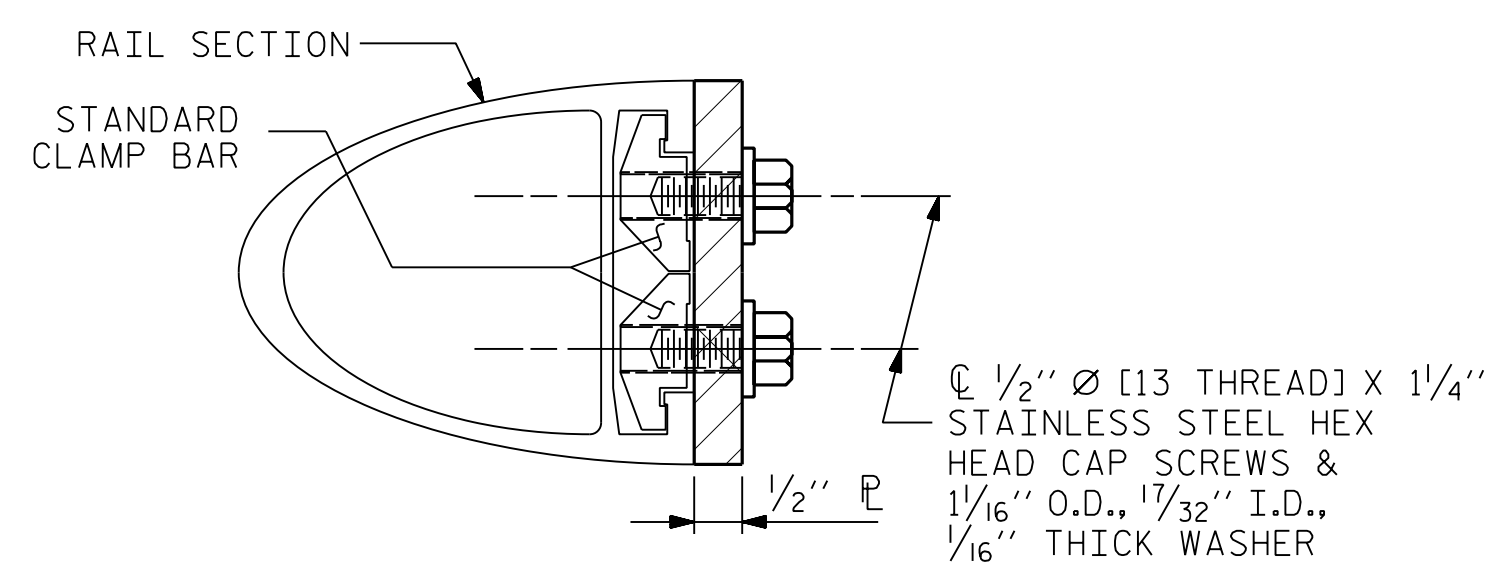
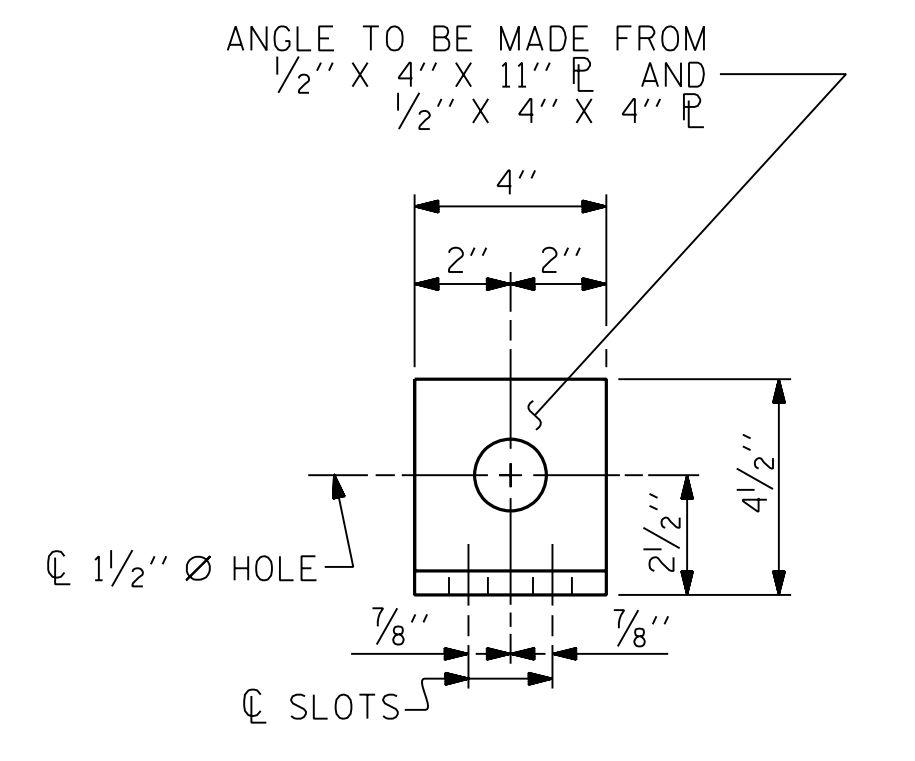
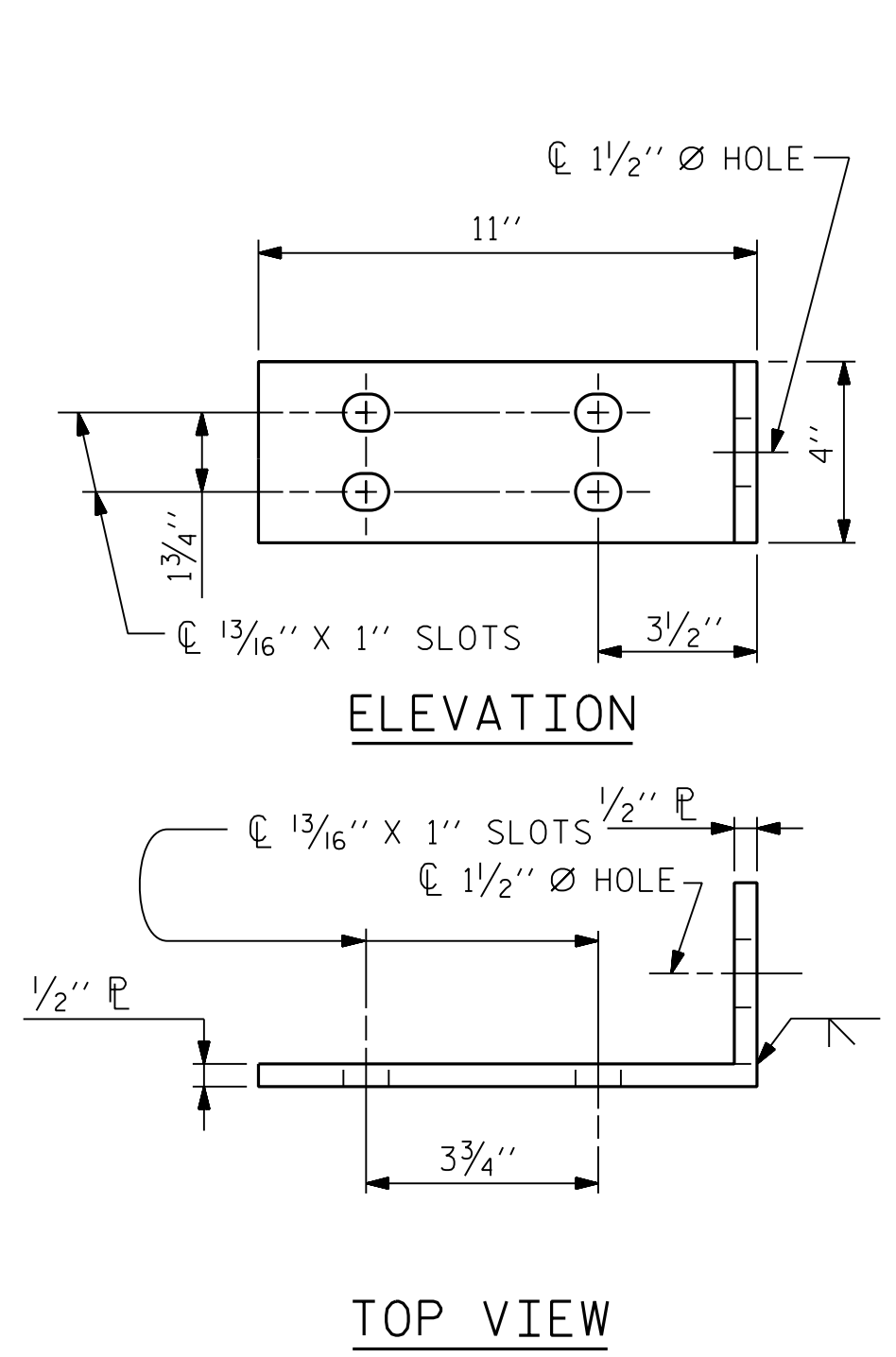
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PLAN OF RAIL POST SPACING



FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
 - B. 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.)
 - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

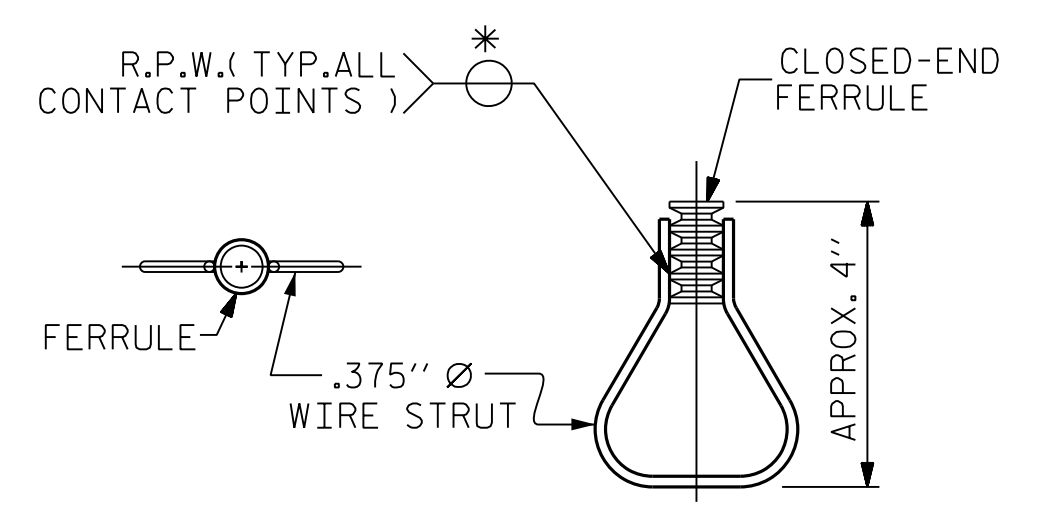
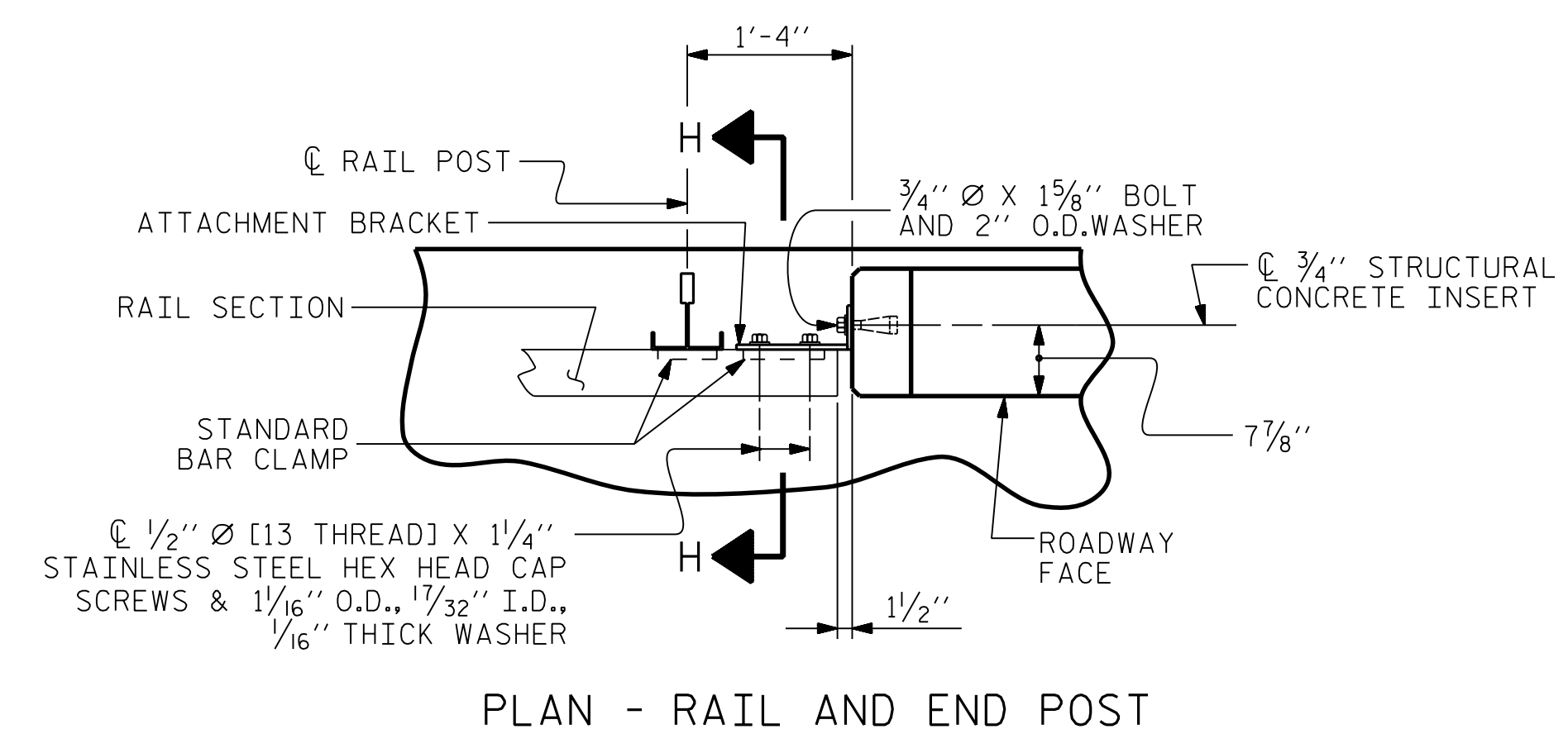
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" 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.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 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 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.



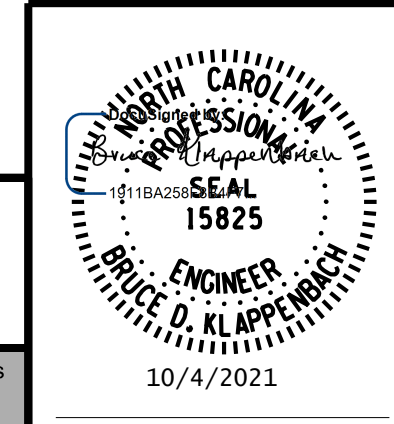
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 3

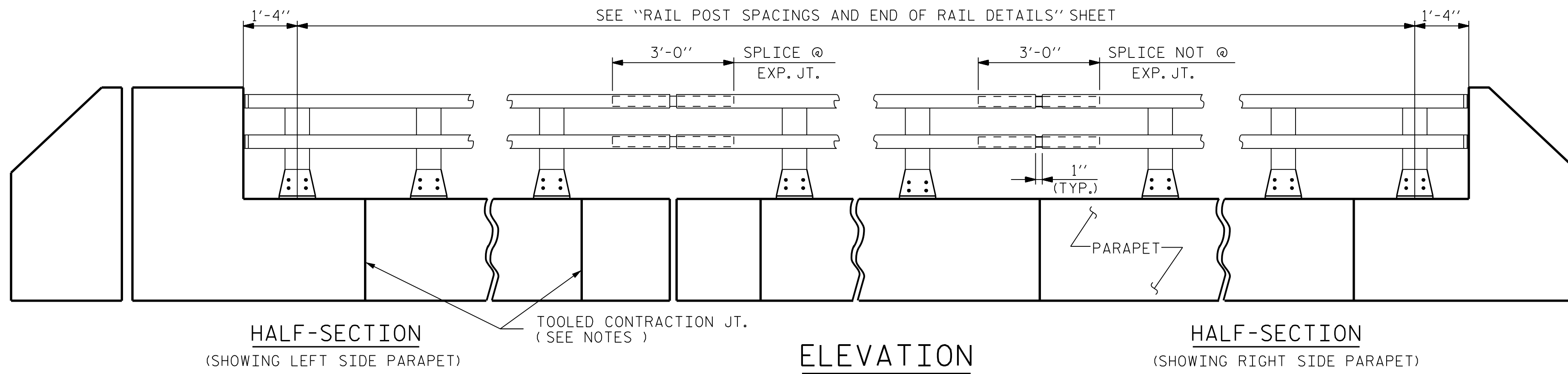
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR TWO BAR METAL RAILS

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NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET S1-23.

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.

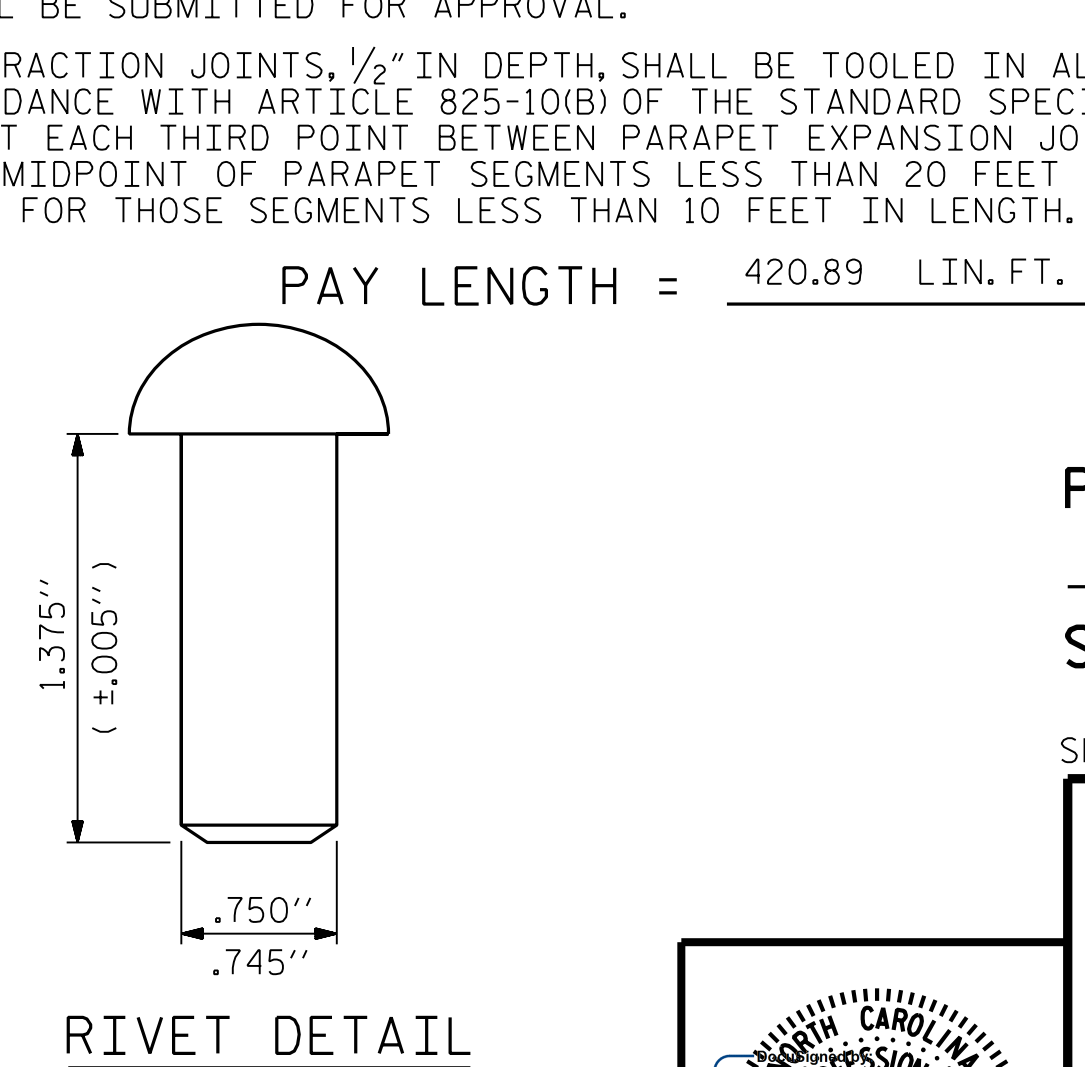
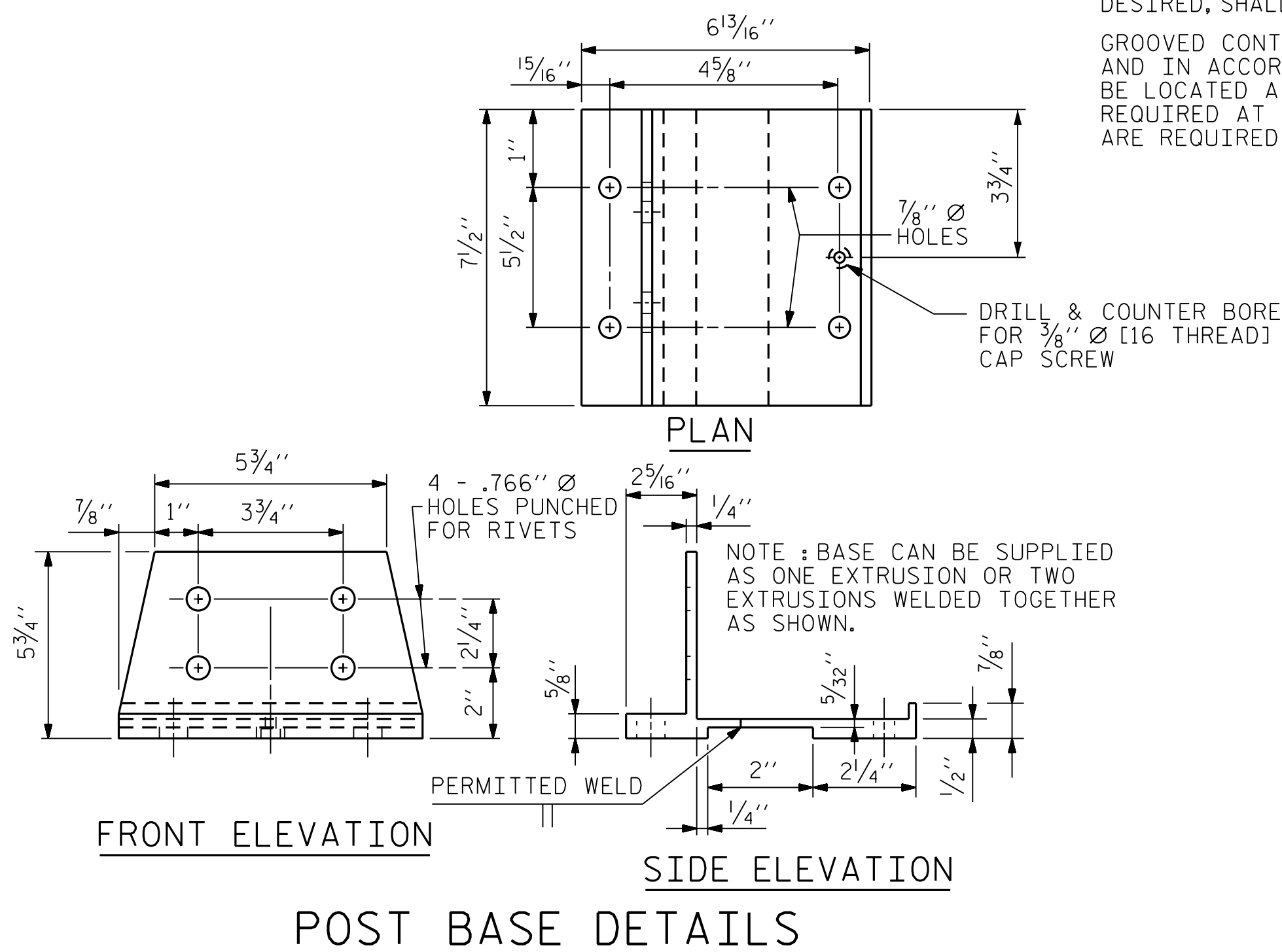
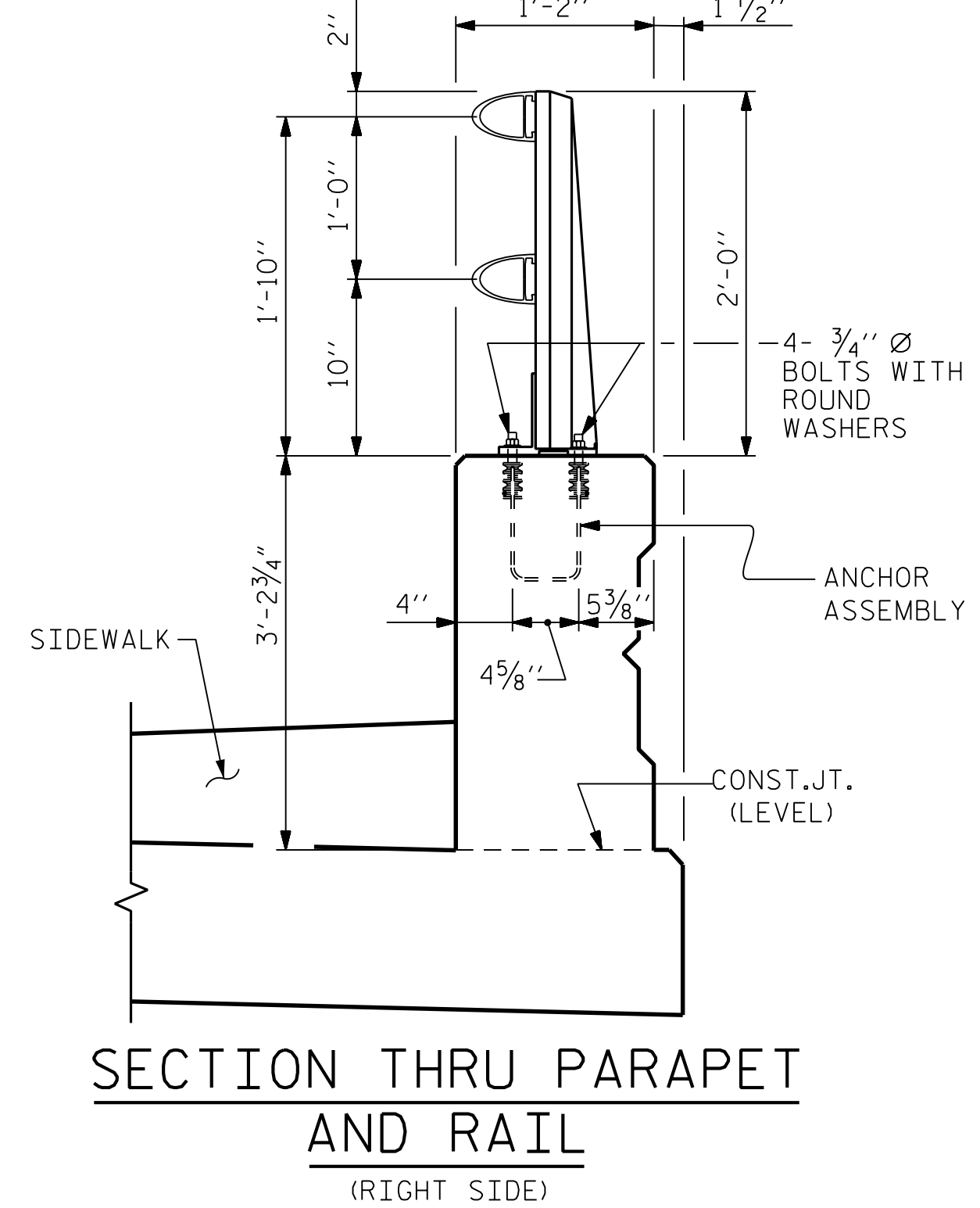
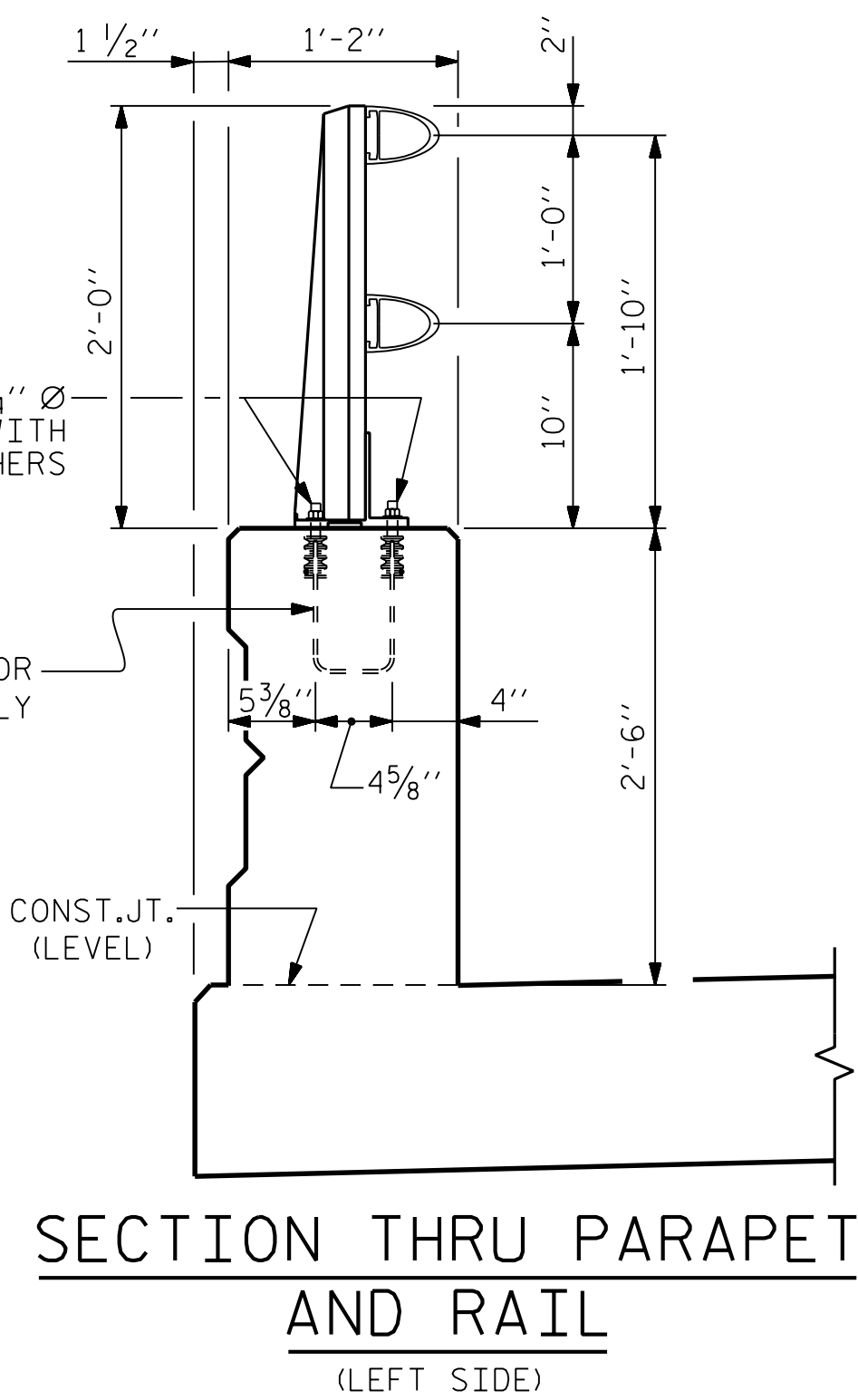
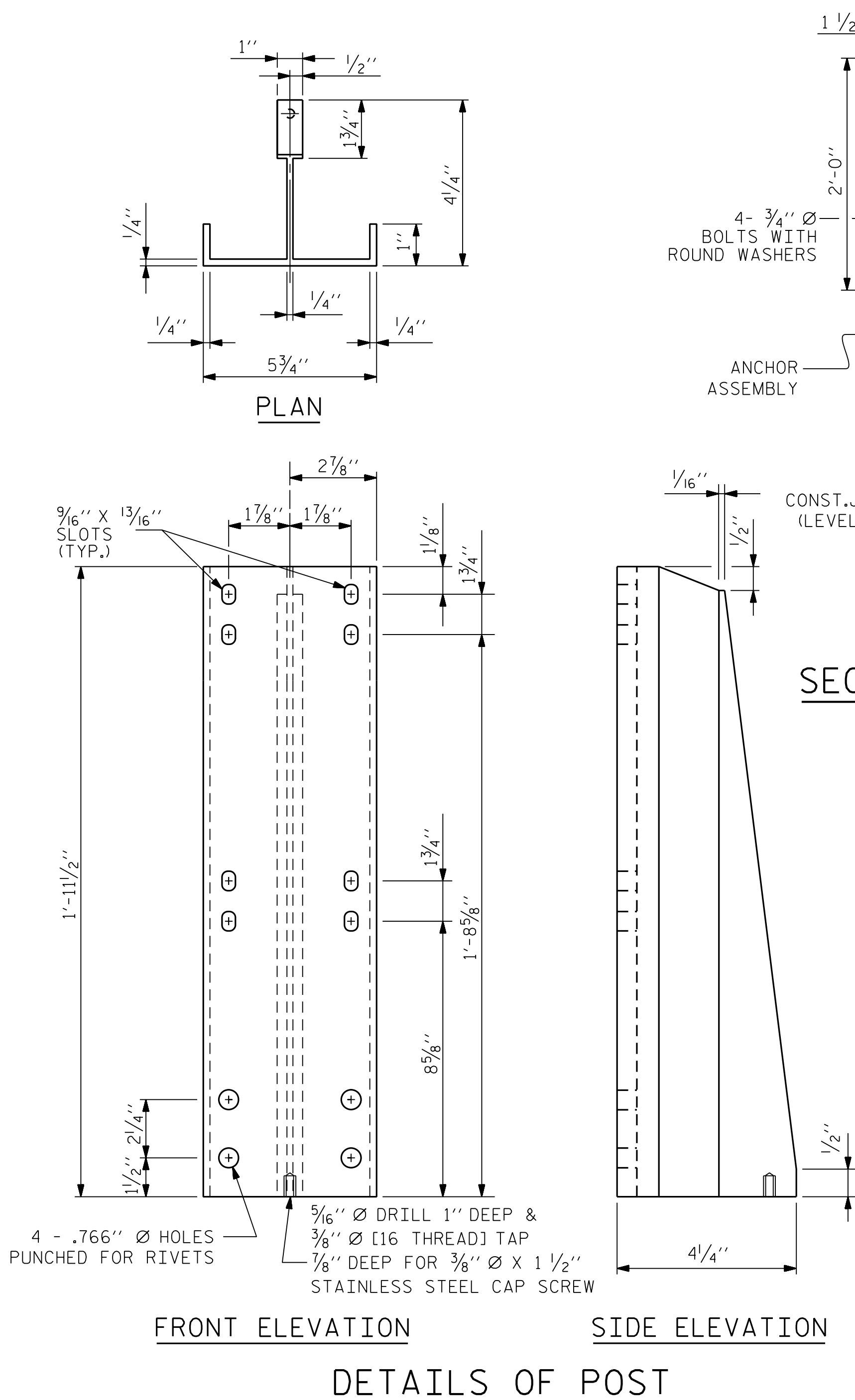
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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 = 420.89 LIN. FT.



PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

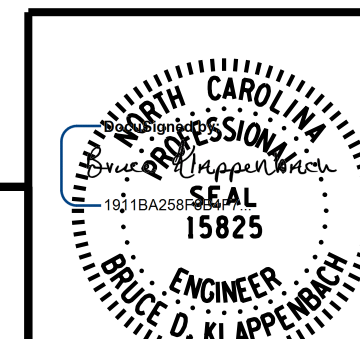
SHEET 2 OF 3

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

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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NOTES

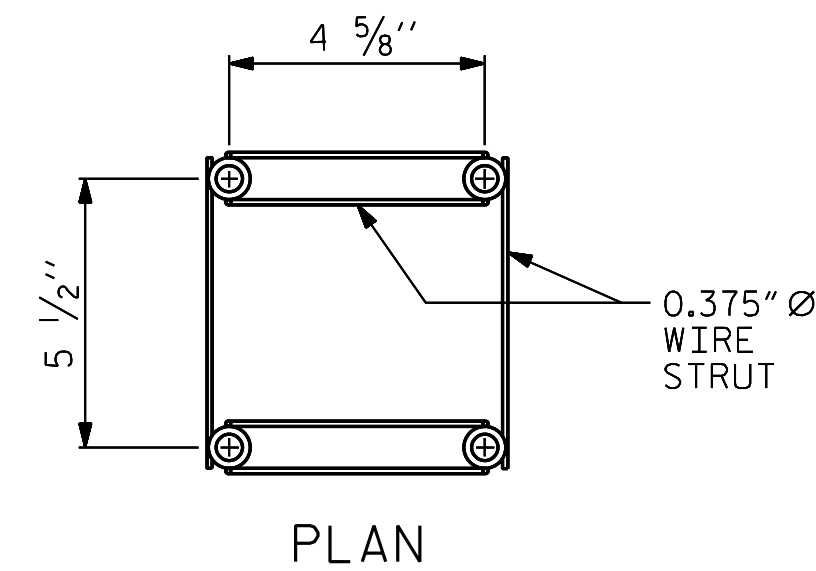
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

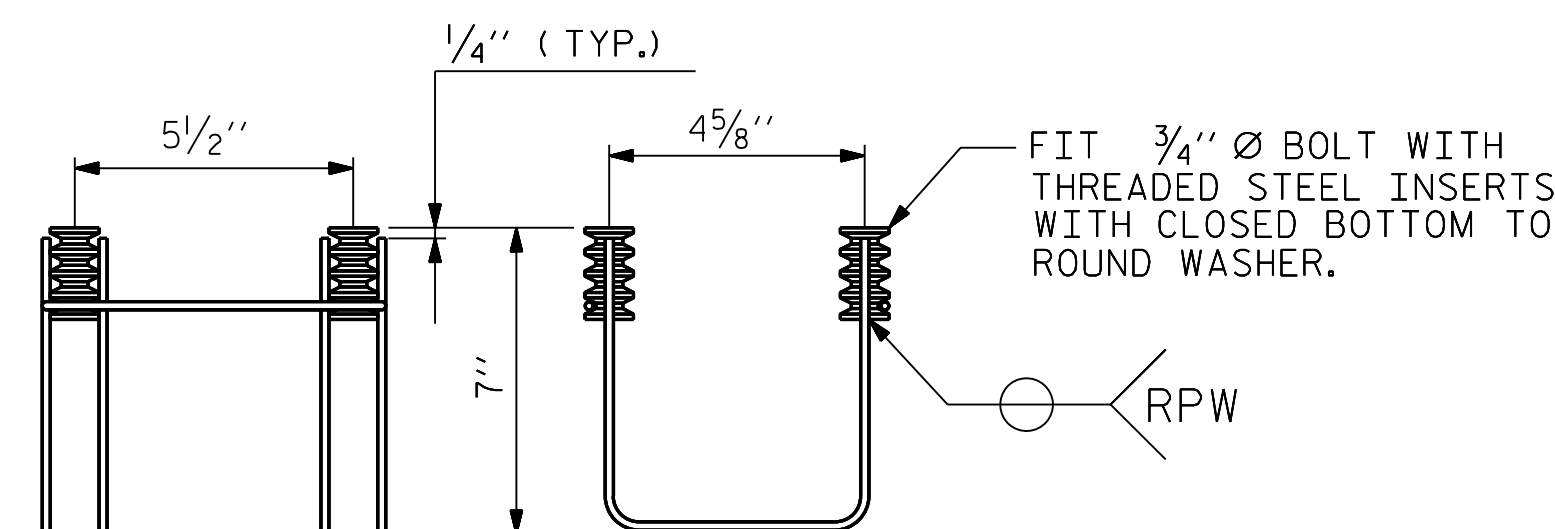
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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.
- C. 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.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. 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.
- F. 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.



PLAN

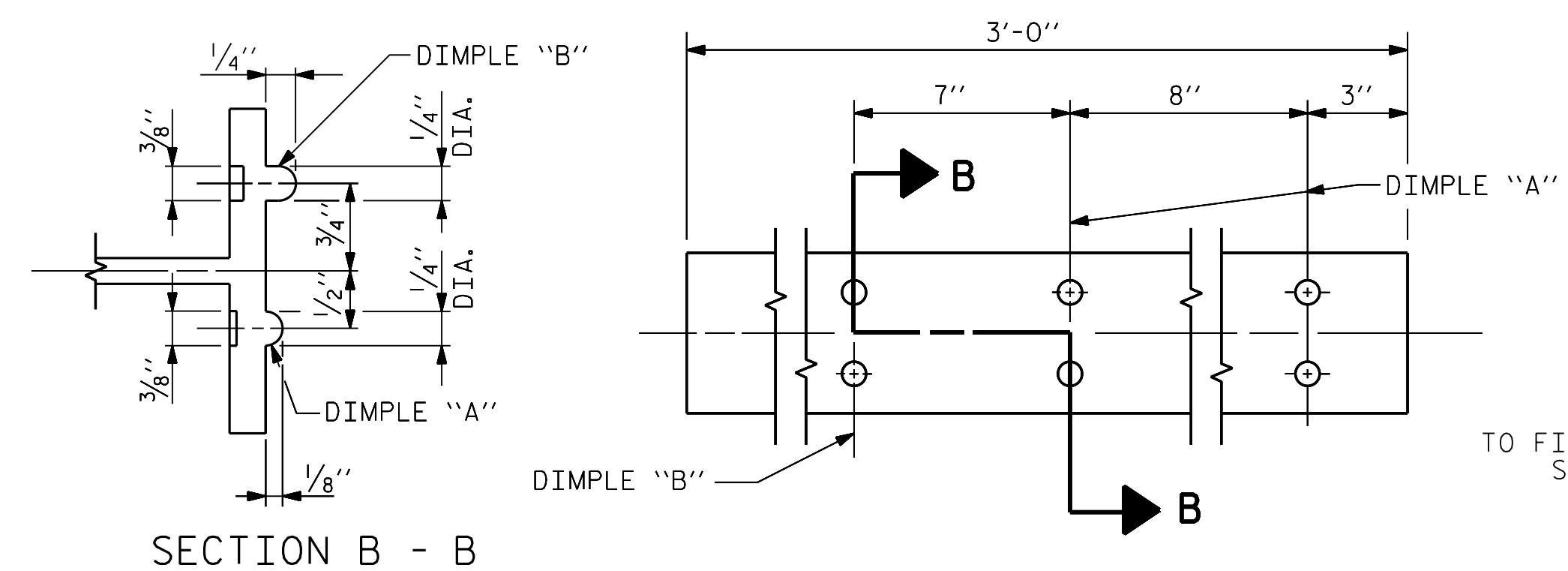


SIDE VIEW

ELEVATION

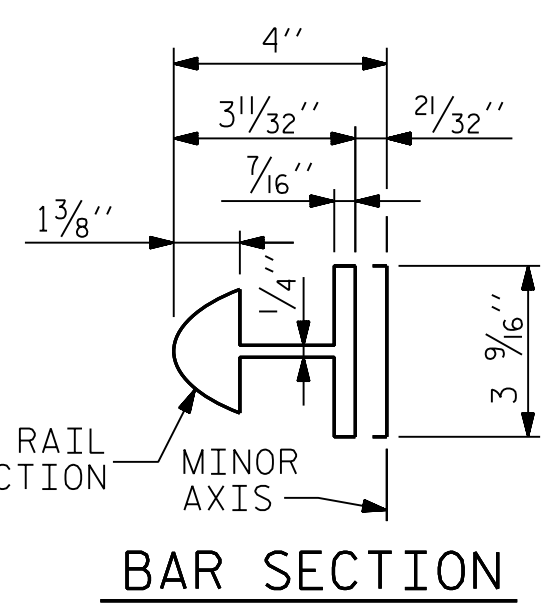
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(72 ASSEMBLIES REQUIRED)

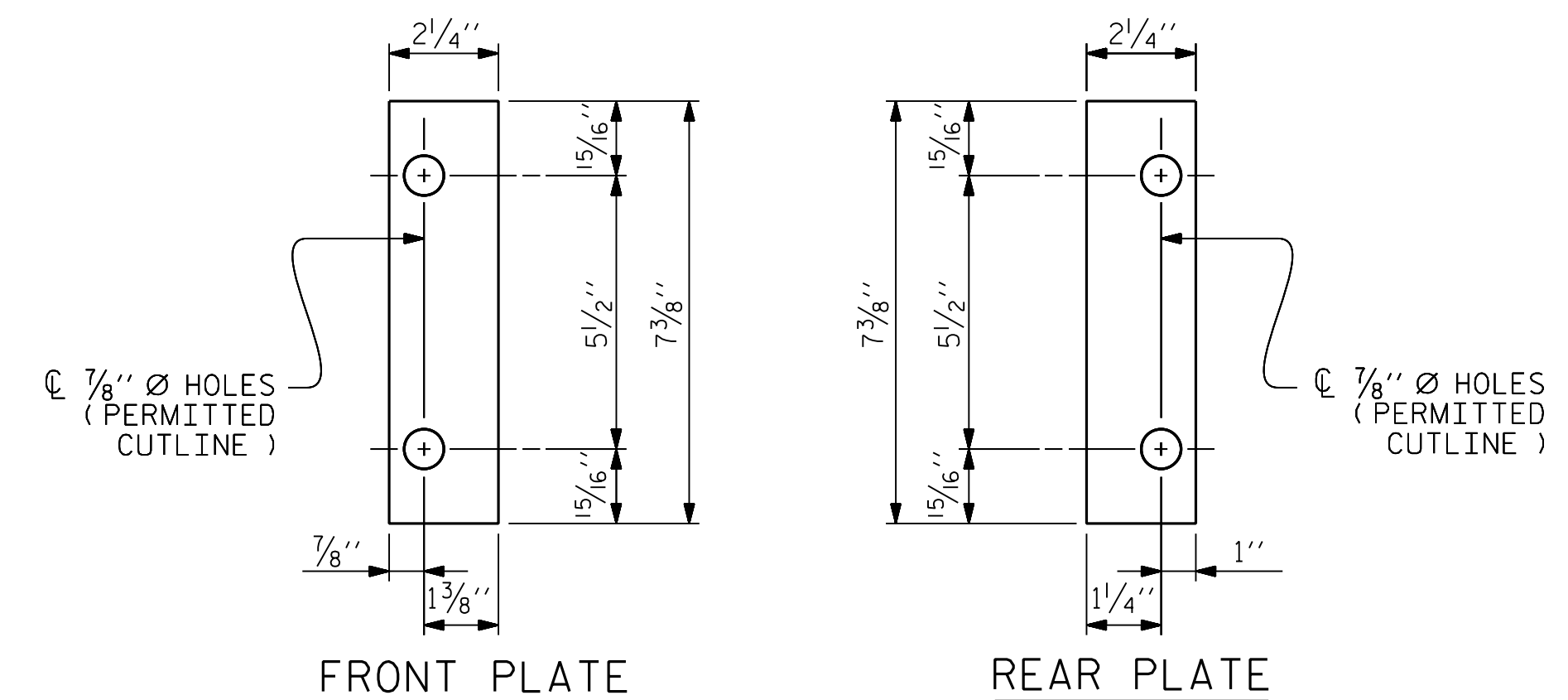


SECTION B - B

EXPANSION BAR DETAILS



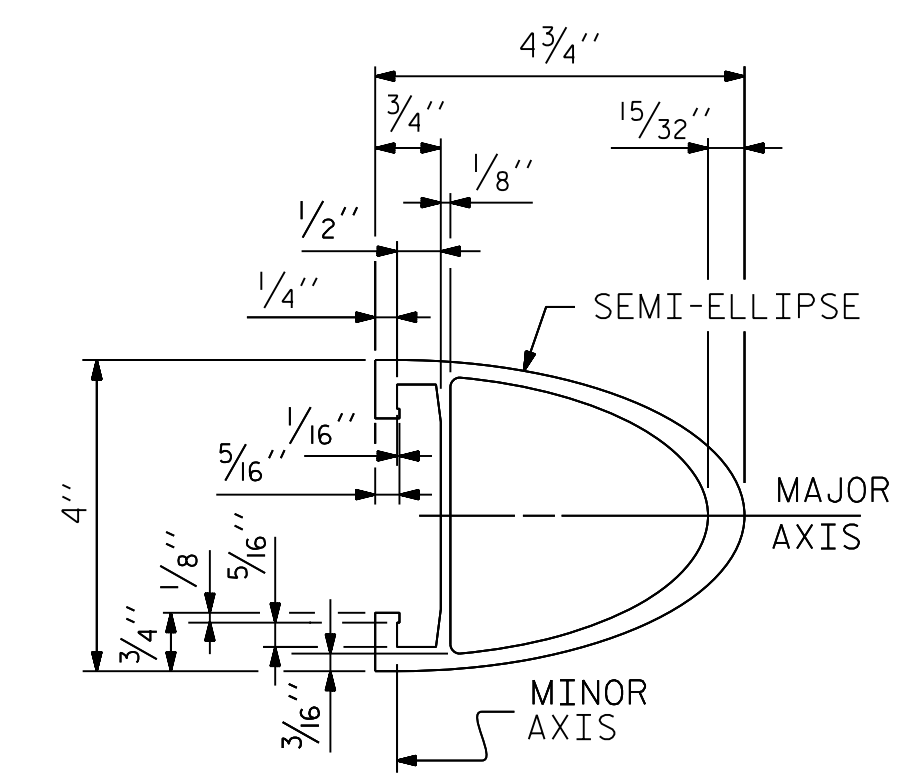
BAR SECTION



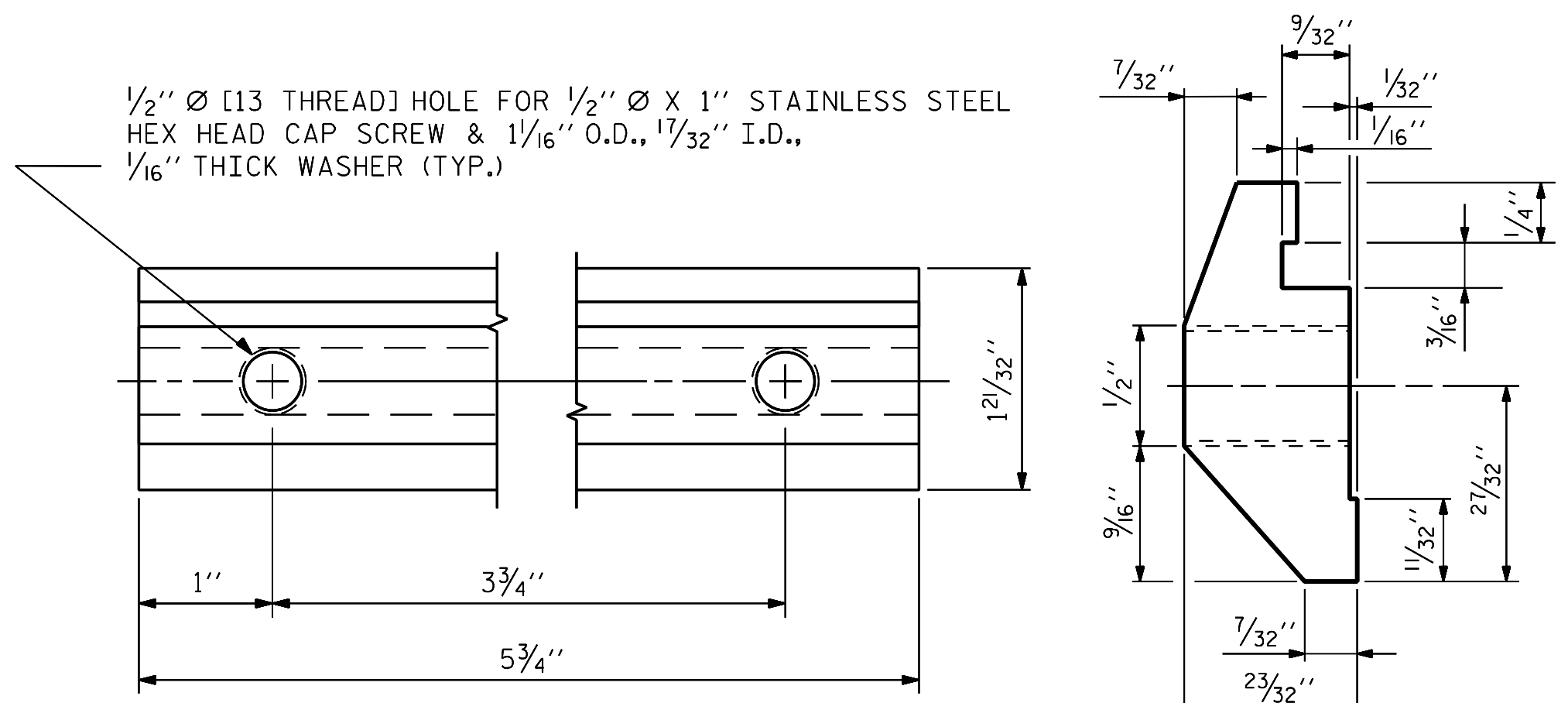
FRONT PLATE

REAR PLATE

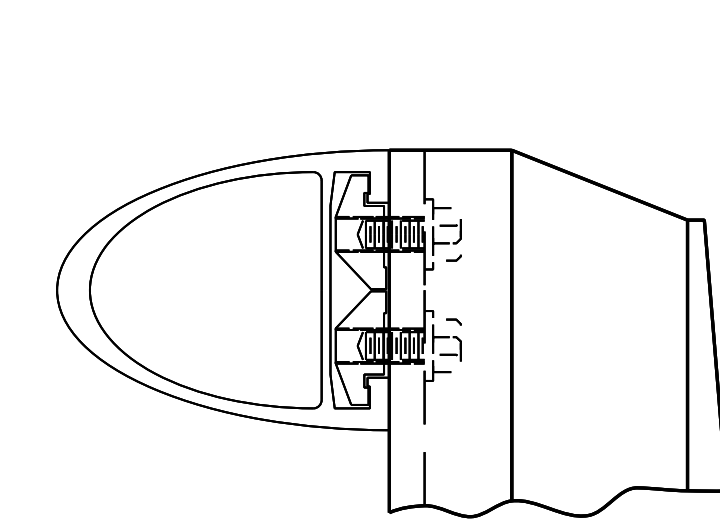
SHIM DETAILS



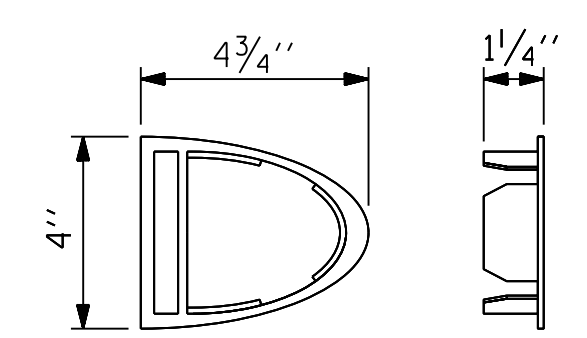
RAIL SECTION



CLAMP BAR DETAIL
(4 REQUIRED PER POST)



CLAMP ASSEMBLY

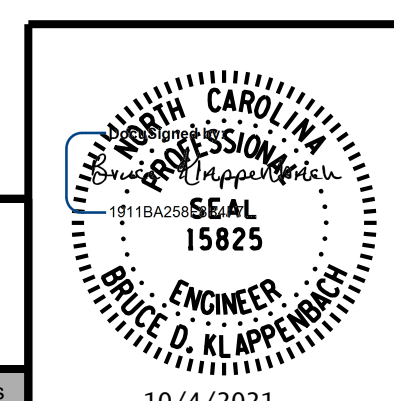


RAIL CAP

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SHEET 3 OF 3

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STANDARD
2 BAR METAL RAIL



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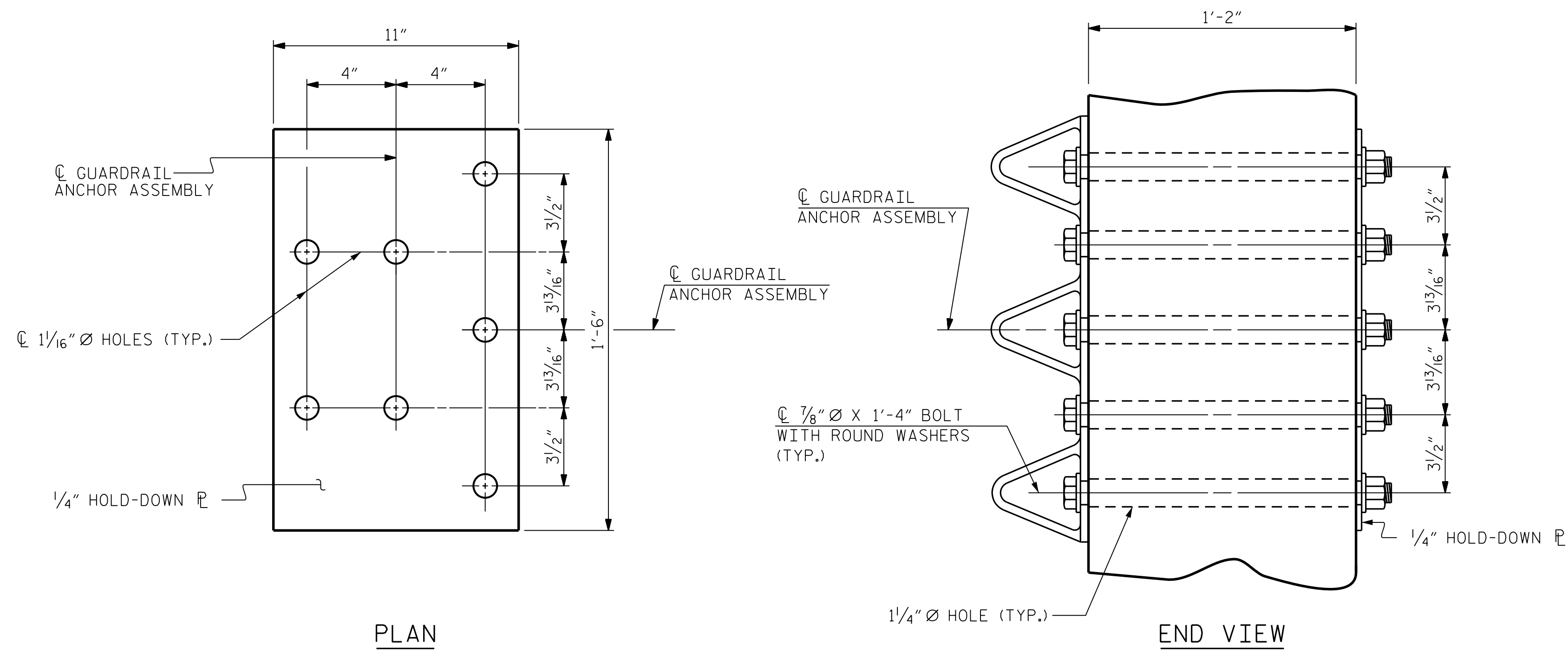
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GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

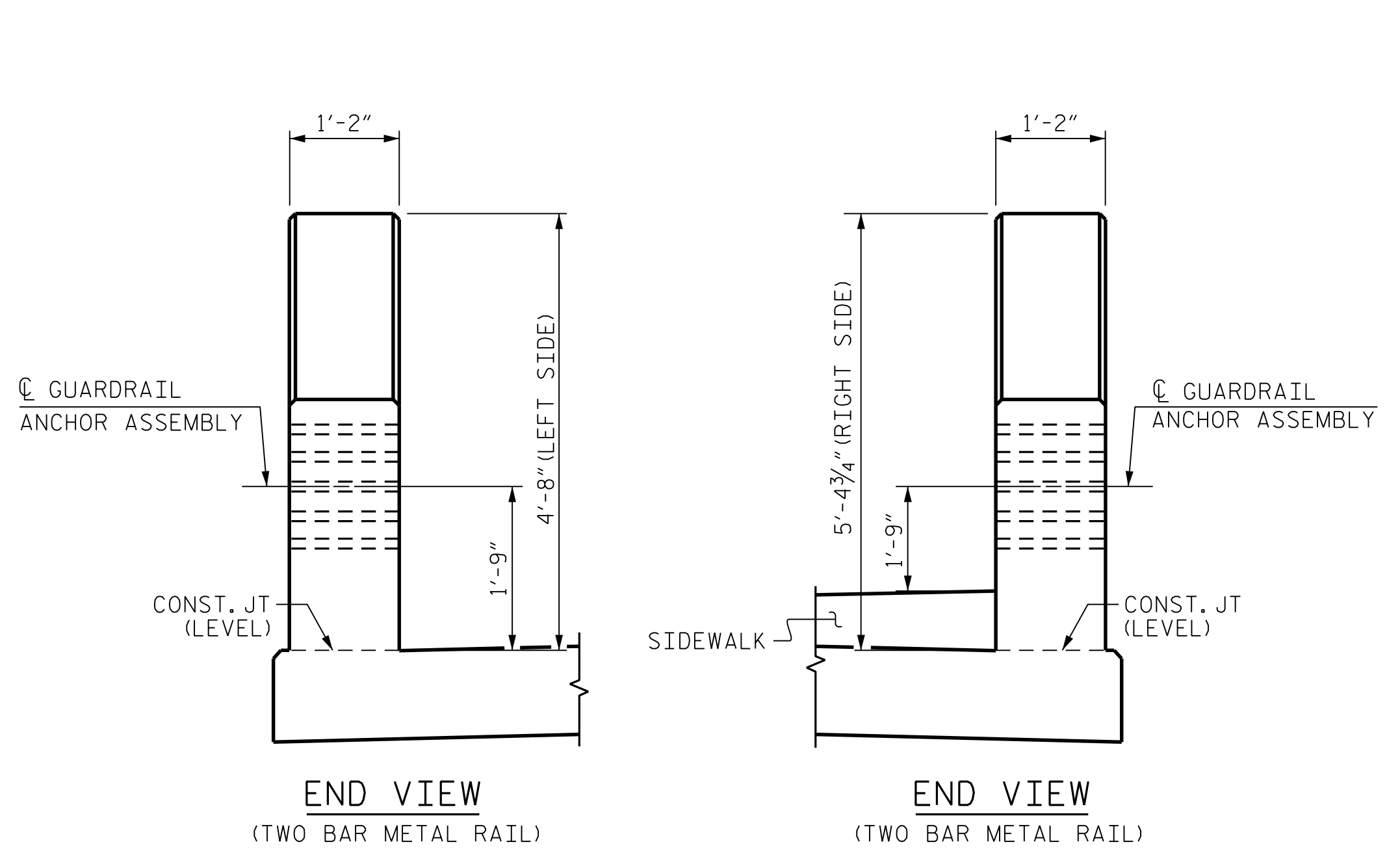
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

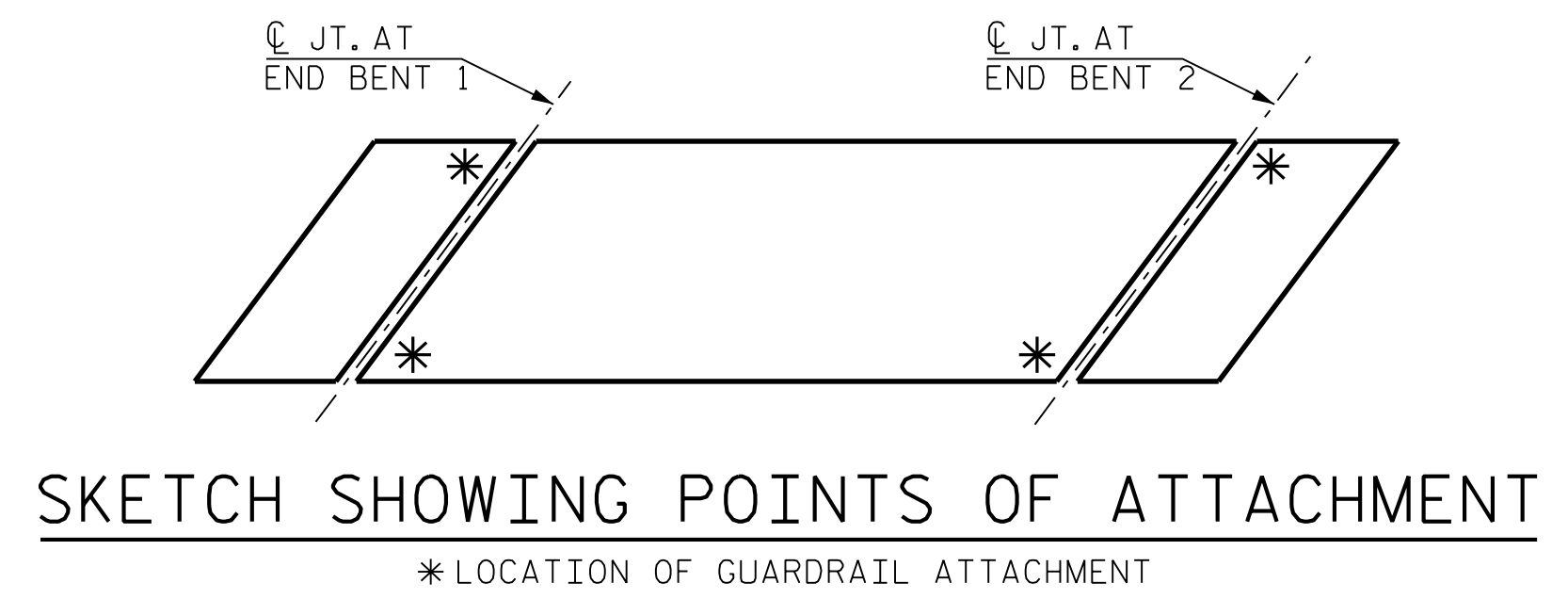
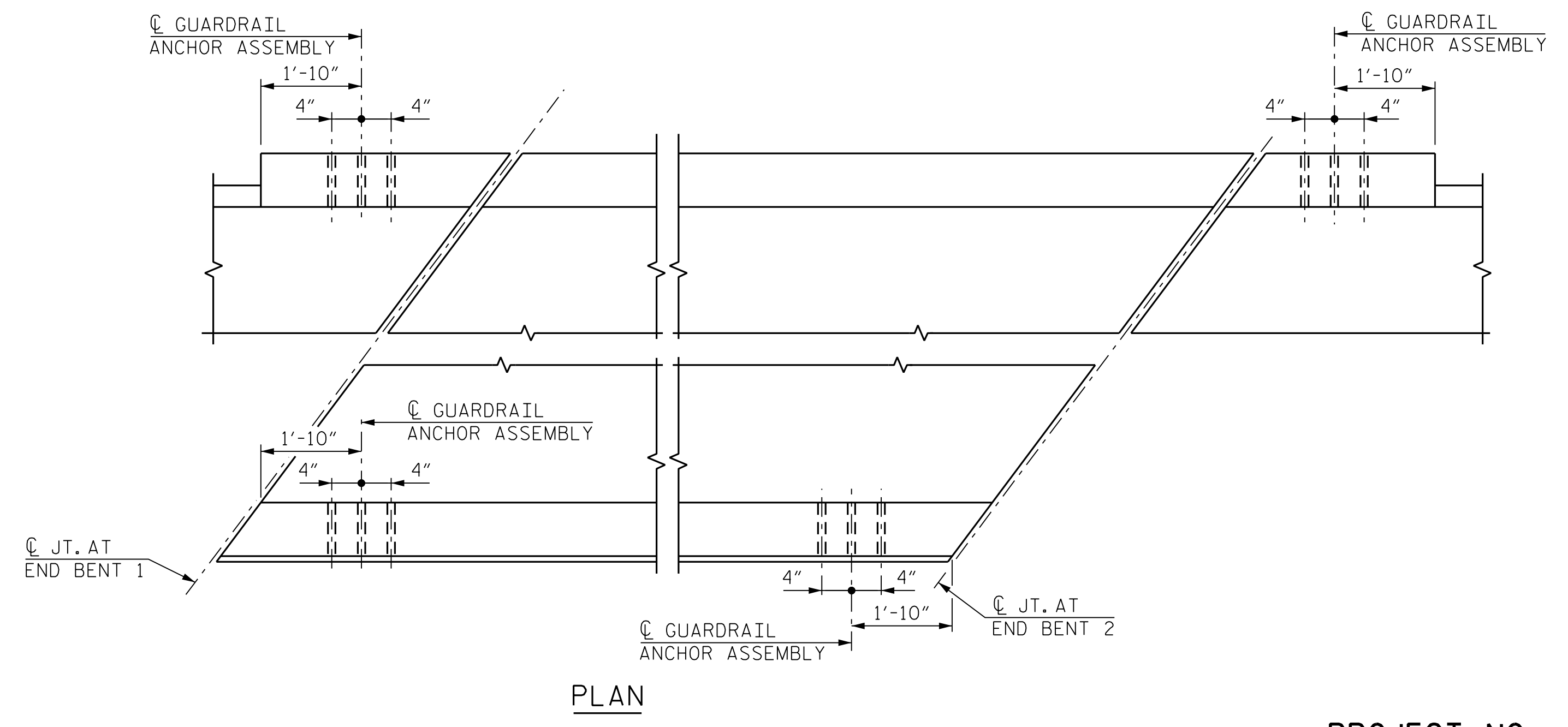
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.



LOCATION OF GUARDRAIL ANCHOR AT END POST

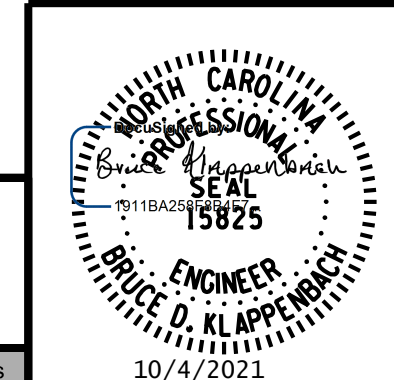


SKETCH SHOWING POINTS OF ATTACHMENT
* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

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**GUARDRAIL ANCHORAGE
 DETAILS FOR
 METAL RAILS**



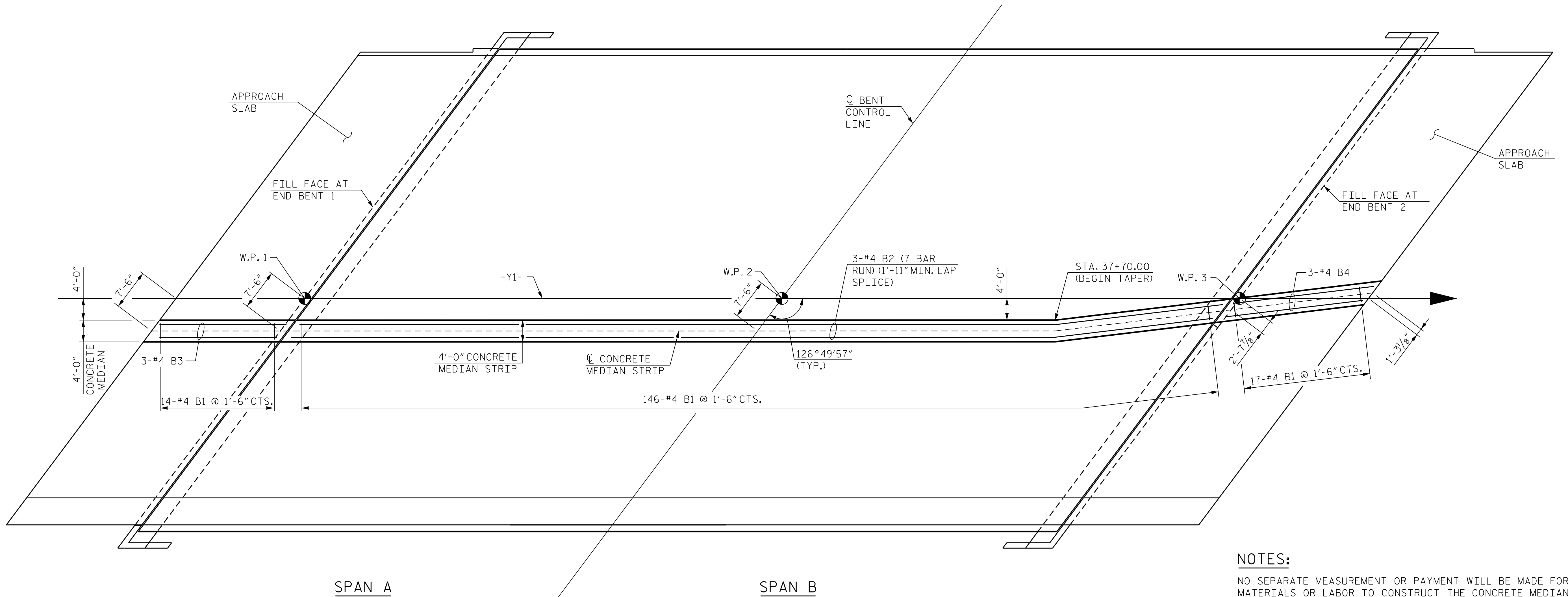
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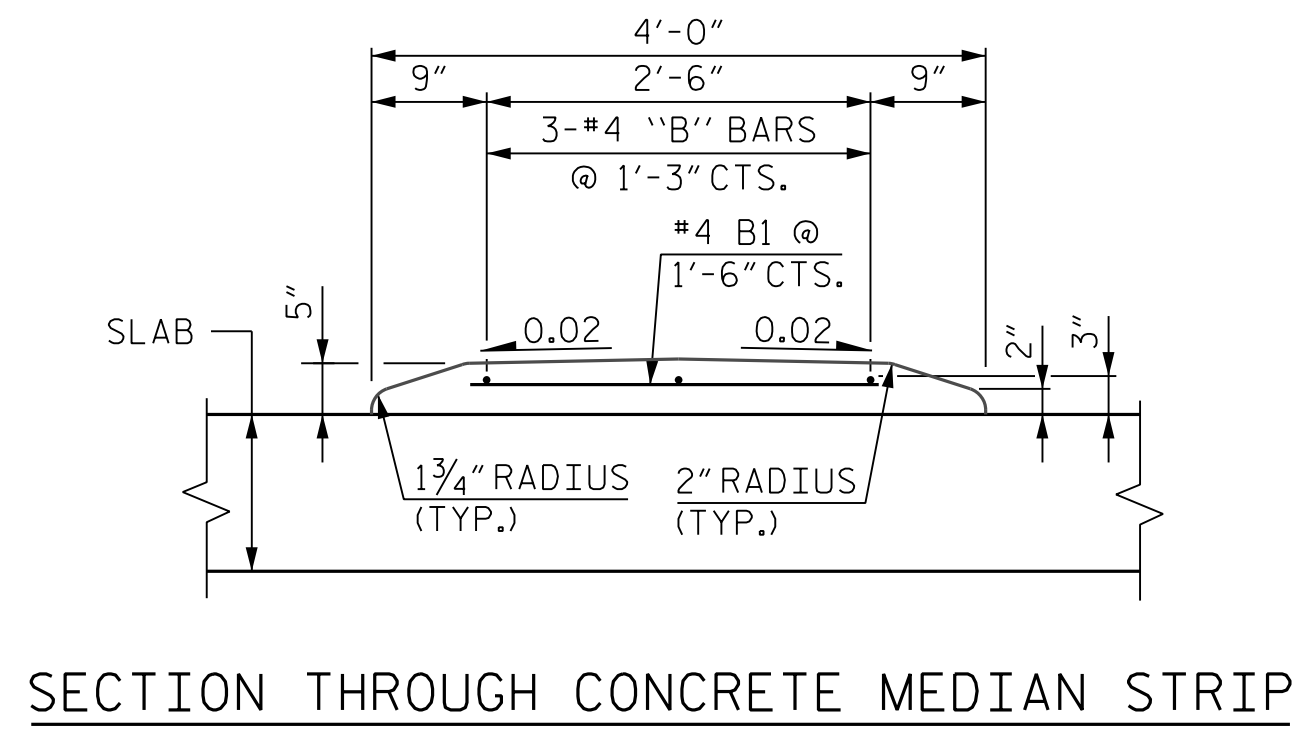
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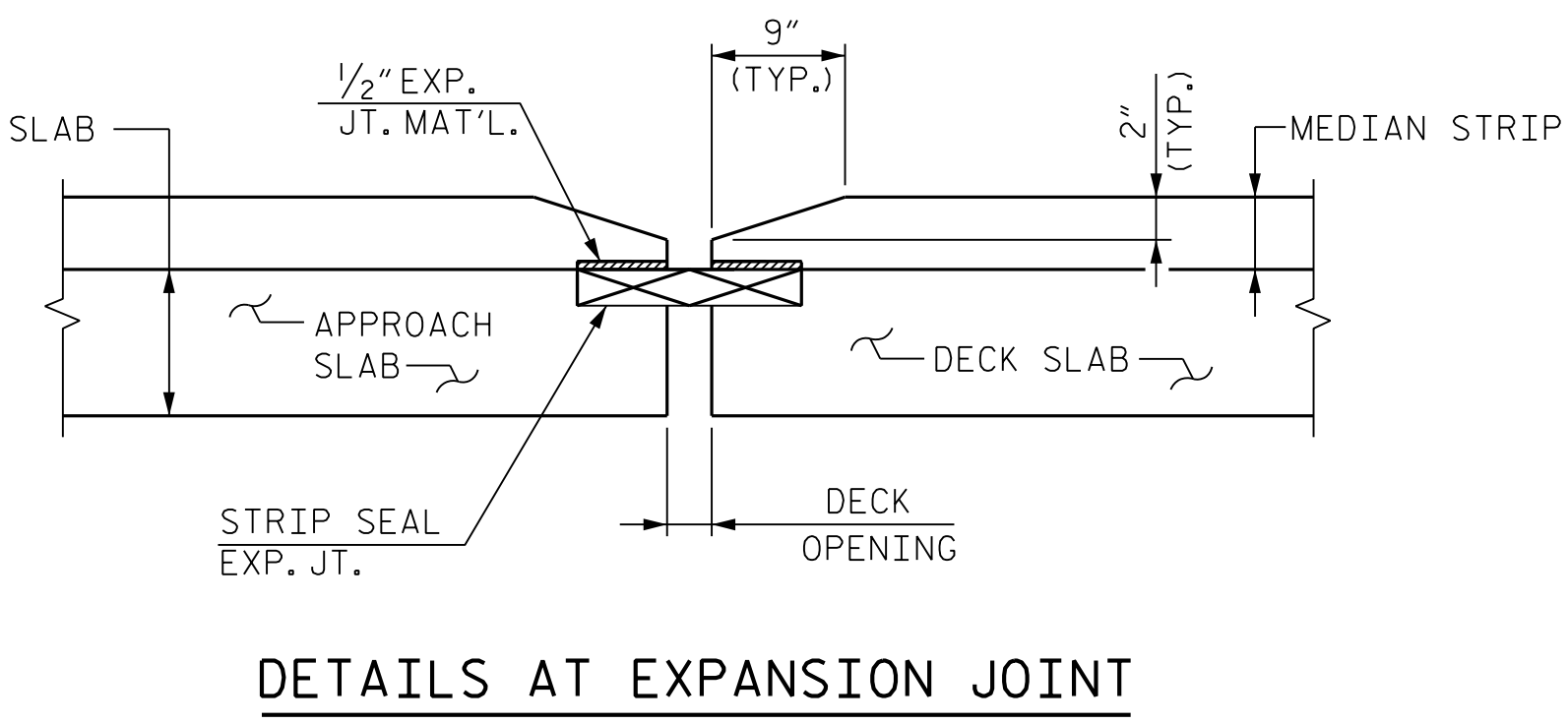
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PLAN



SECTION THROUGH CONCRETE MEDIAN STRIP



DETAILS AT EXPANSION JOINT

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

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

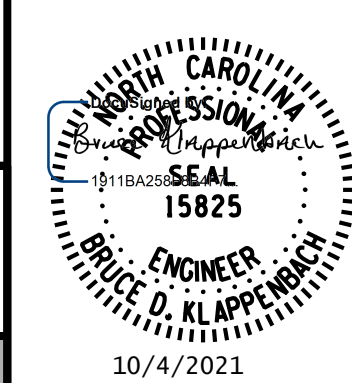
FOR LOCATION OF CONCRETE MEDIAN, SEE ROADWAY PLANS.
 ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

THE MEDIAN 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.

BILL OF MATERIAL					
CONCRETE MEDIAN					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	177	#4	STR.	2'-9"	325
*B2	21	#4	STR.	33'-4"	468
*B3	3	#4	STR.	24'-6"	49
*B4	3	#4	STR.	26'-7"	53
* EPOXY COATED REINFORCING STEEL					895 LBS.
CLASS AA CONCRETE					15.3 C. Y.

PROJECT NO. I-5972
JOHNSTON COUNTY
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STATE OF NORTH CAROLINA
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MEDIAN STRIP
DETAILS



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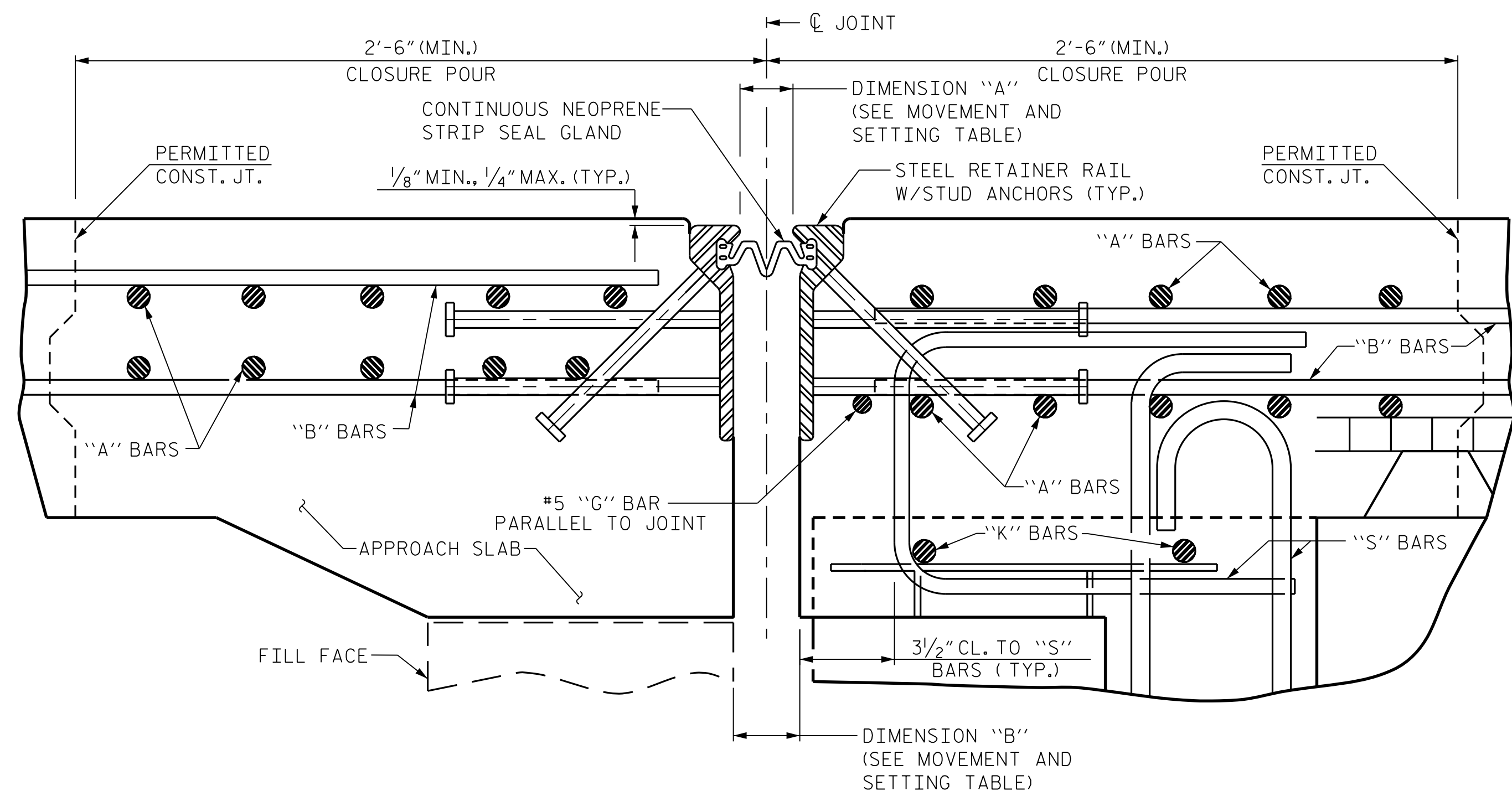
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STRIP SEAL EXPANSION JOINT DETAILS
SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH/DECK SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

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

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

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

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

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

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

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

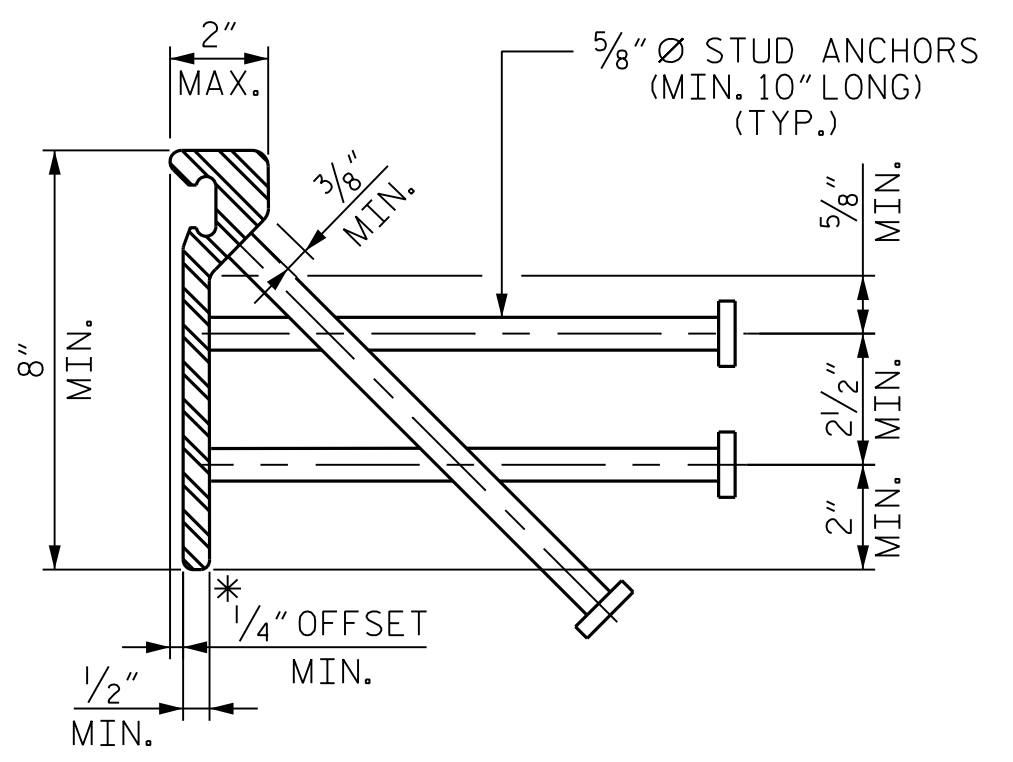
NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

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

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

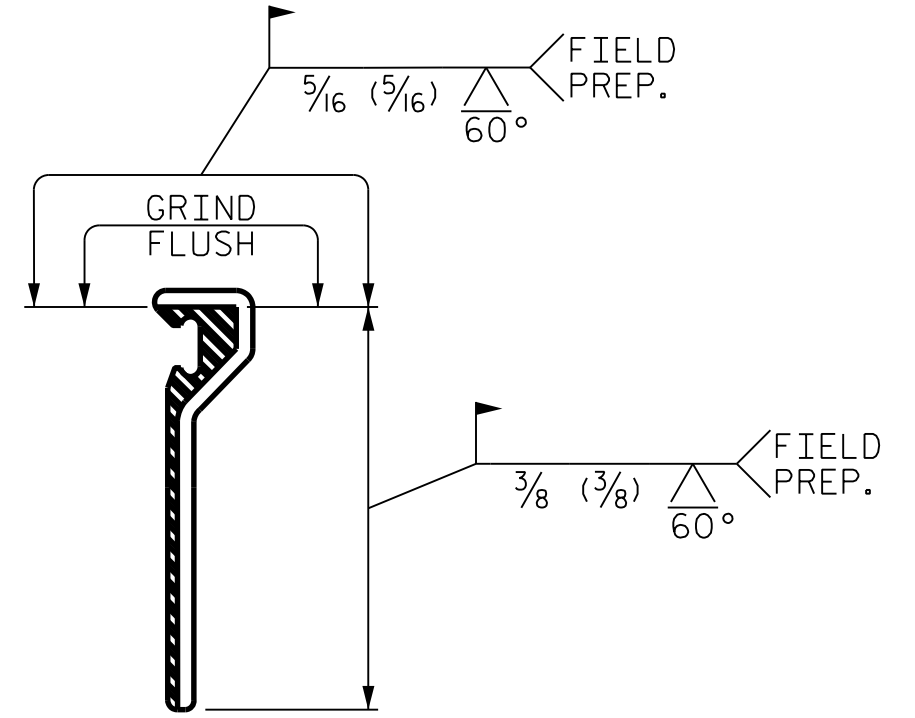
THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

A TEMPORARY GLAND IS REQUIRED FOR STAGE 1. NO SEPARATE PAYMENT WILL BE MADE FOR THE TEMPORARY GLAND.

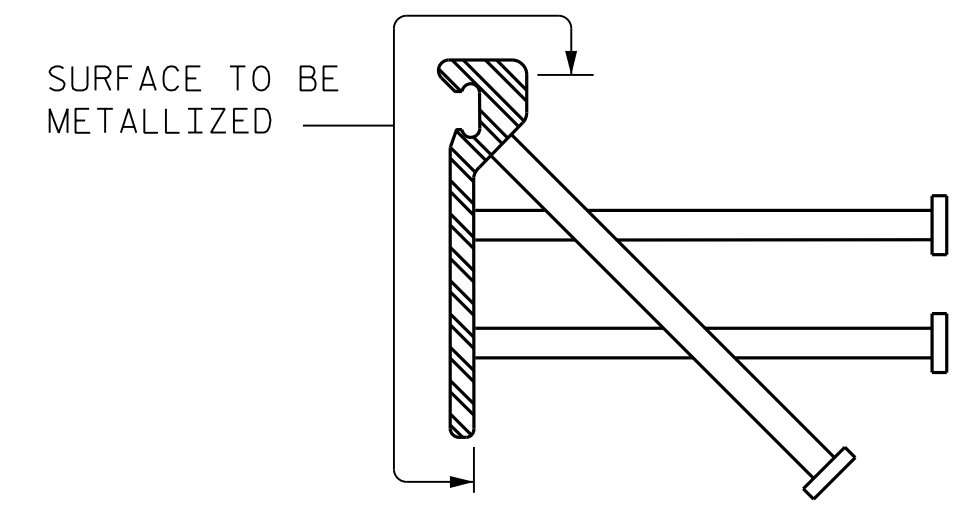


TYPICAL SECTION STEEL RETAINER RAIL

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



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL

LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	DIMENSION "A"				DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	
			END BENT 1	126° 49' 57"	1/16"	2 1/16"	2"	1 13/16"	2 9/16"
END BENT 2	126° 49' 57"	1/16"	2 1/16"	2"	1 13/16"	2 9/16"	2 1/2"	2 5/16"	

PROJECT NO. I-5972
JOHNSTON COUNTY
STATION: 36+93.50 -Y1-

SHEET 1 OF 4

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STRIP SEAL EXPANSION JOINT DETAILS

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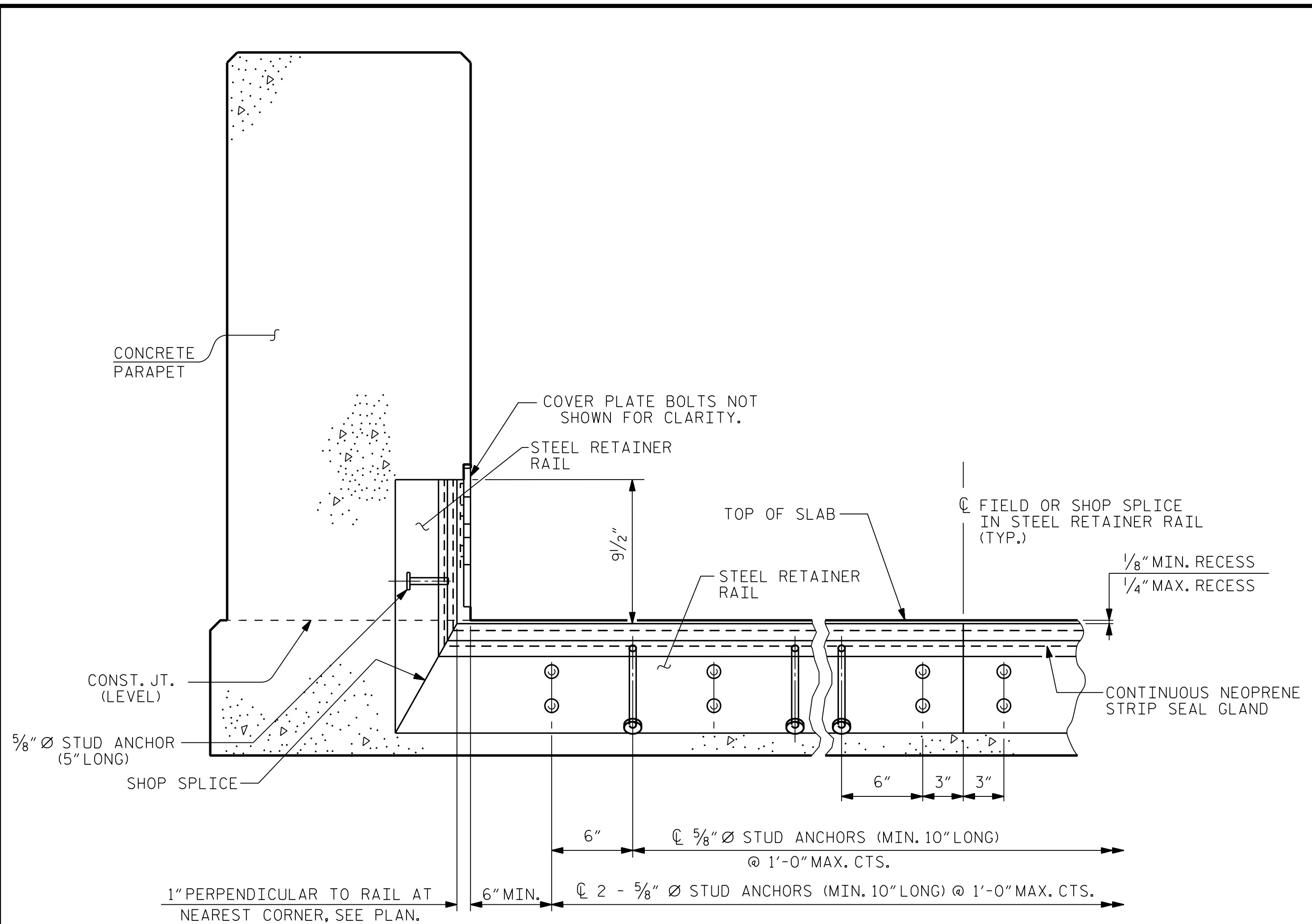
PROFESSIONAL SEAL
15825
ENGINEER
BRIAN D. KLAPPENBACH

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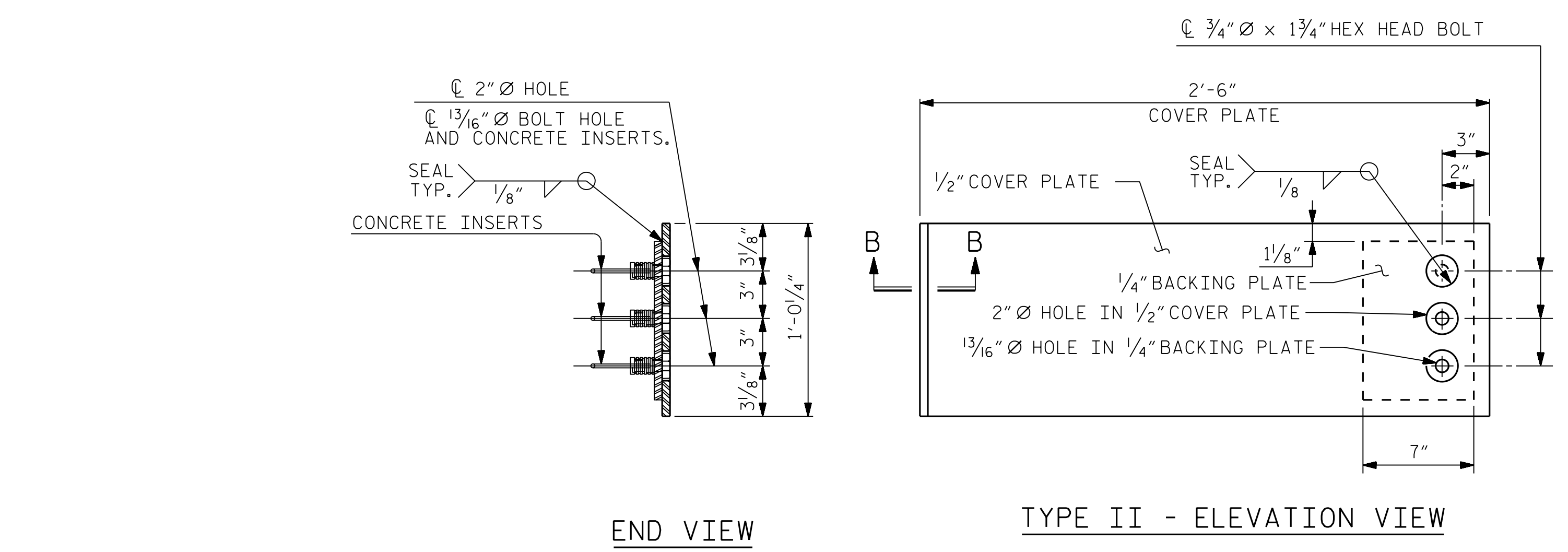
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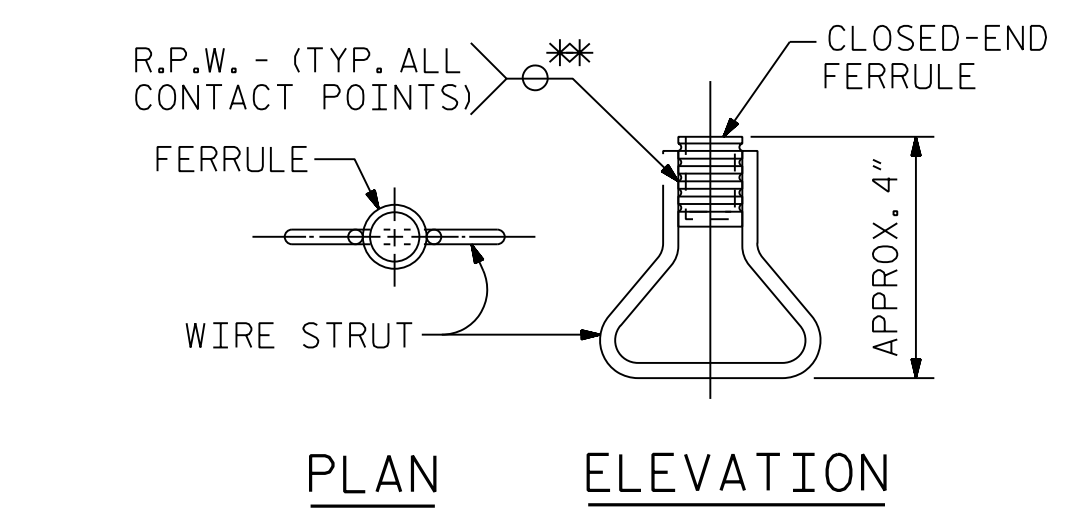
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SECTION THRU RAIL NORMAL TO JOINT

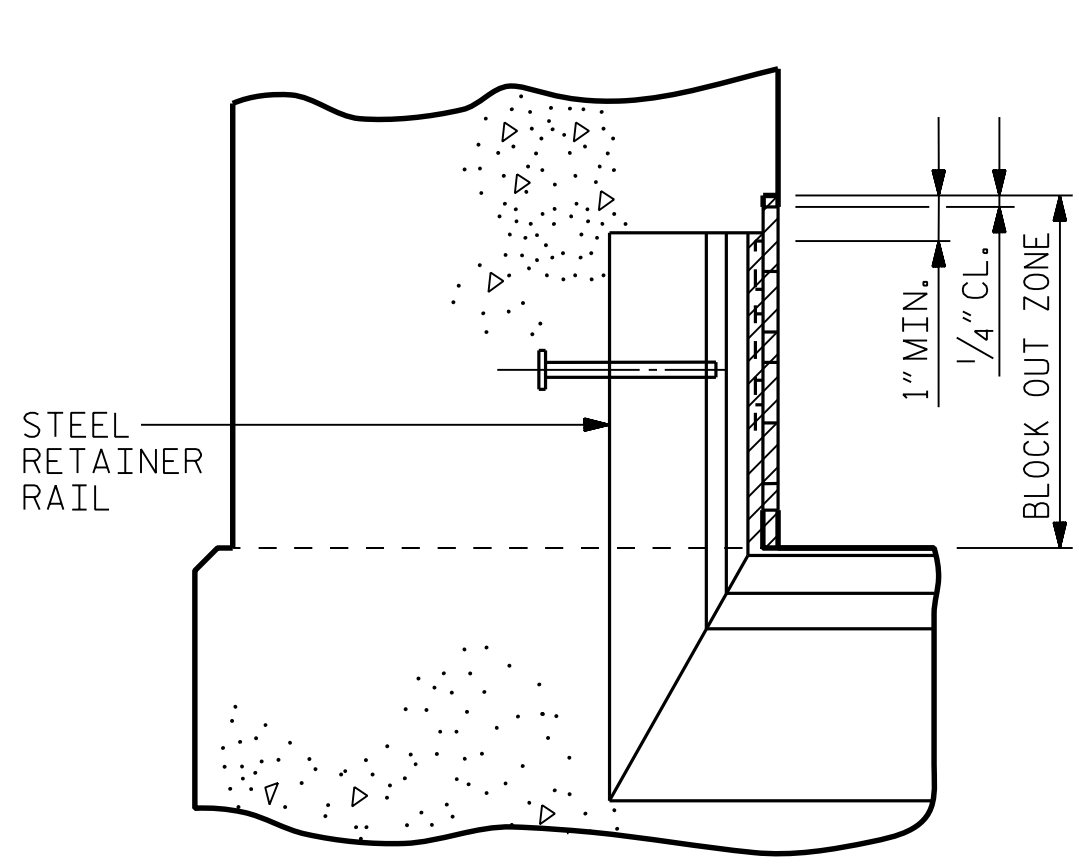


COVER PLATE DETAILS

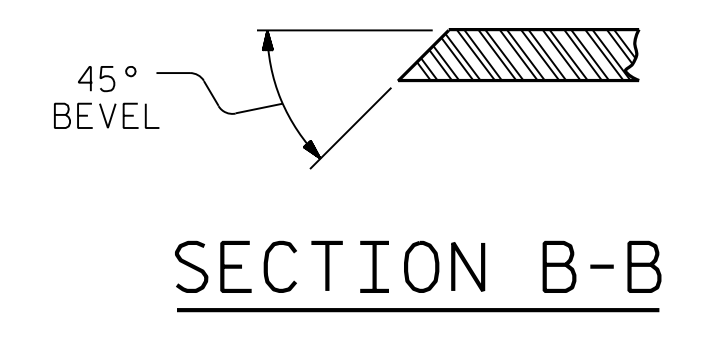


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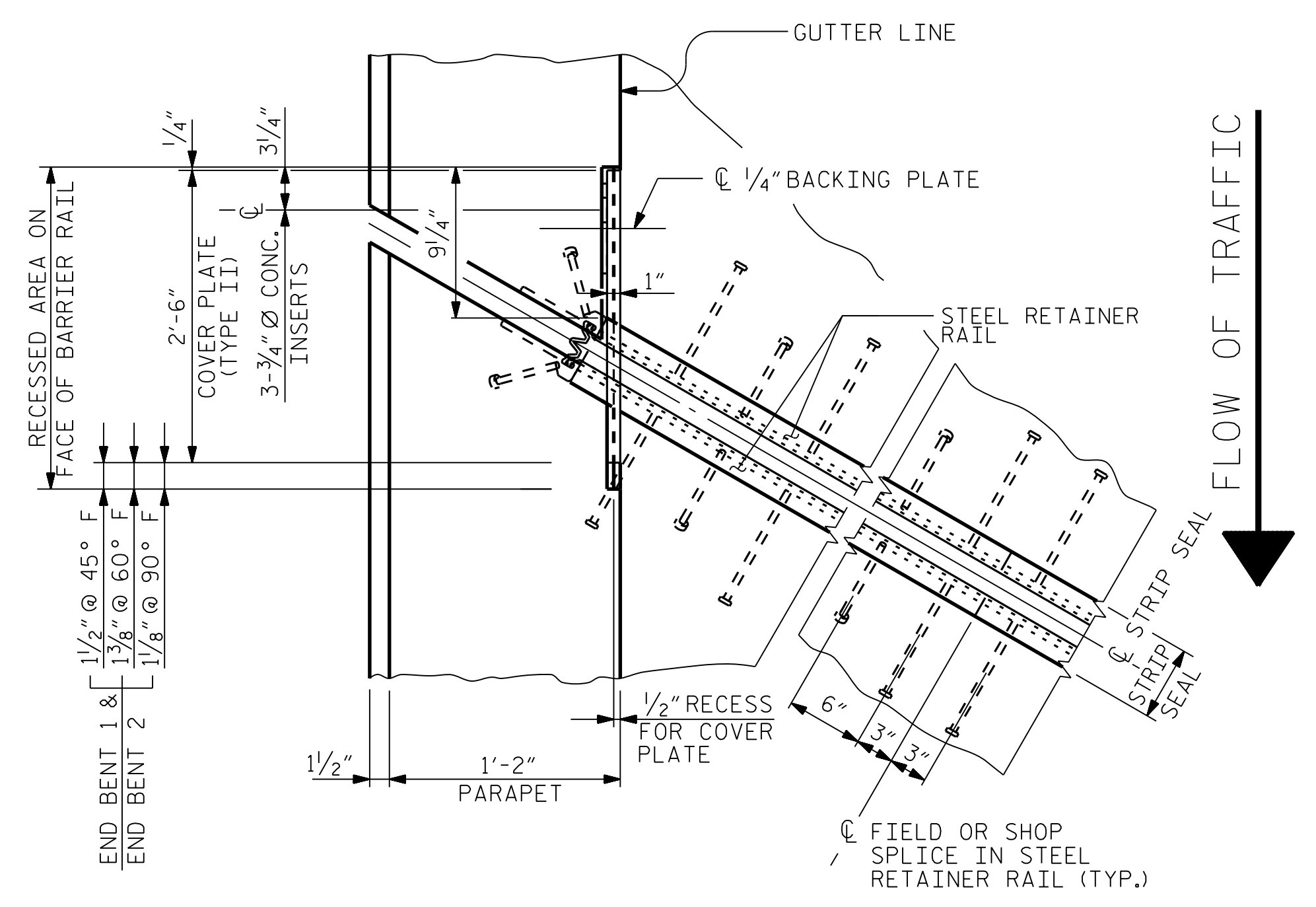
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FOR PAVEMENT MARKING ALIGNMENT,
SEE SHEET 4 OF 4.



BLOCK OUT DETAIL



SECTION B-B



PLAN OF STRIP SEAL EXPANSION JOINT

PROJECT NO. I-5972
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STATION: 36+93.50 -Y1-

SHEET 2 OF 4

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STRIP SEAL
EXPANSION JOINT DETAILS
LEFT SIDE - STAGE 2

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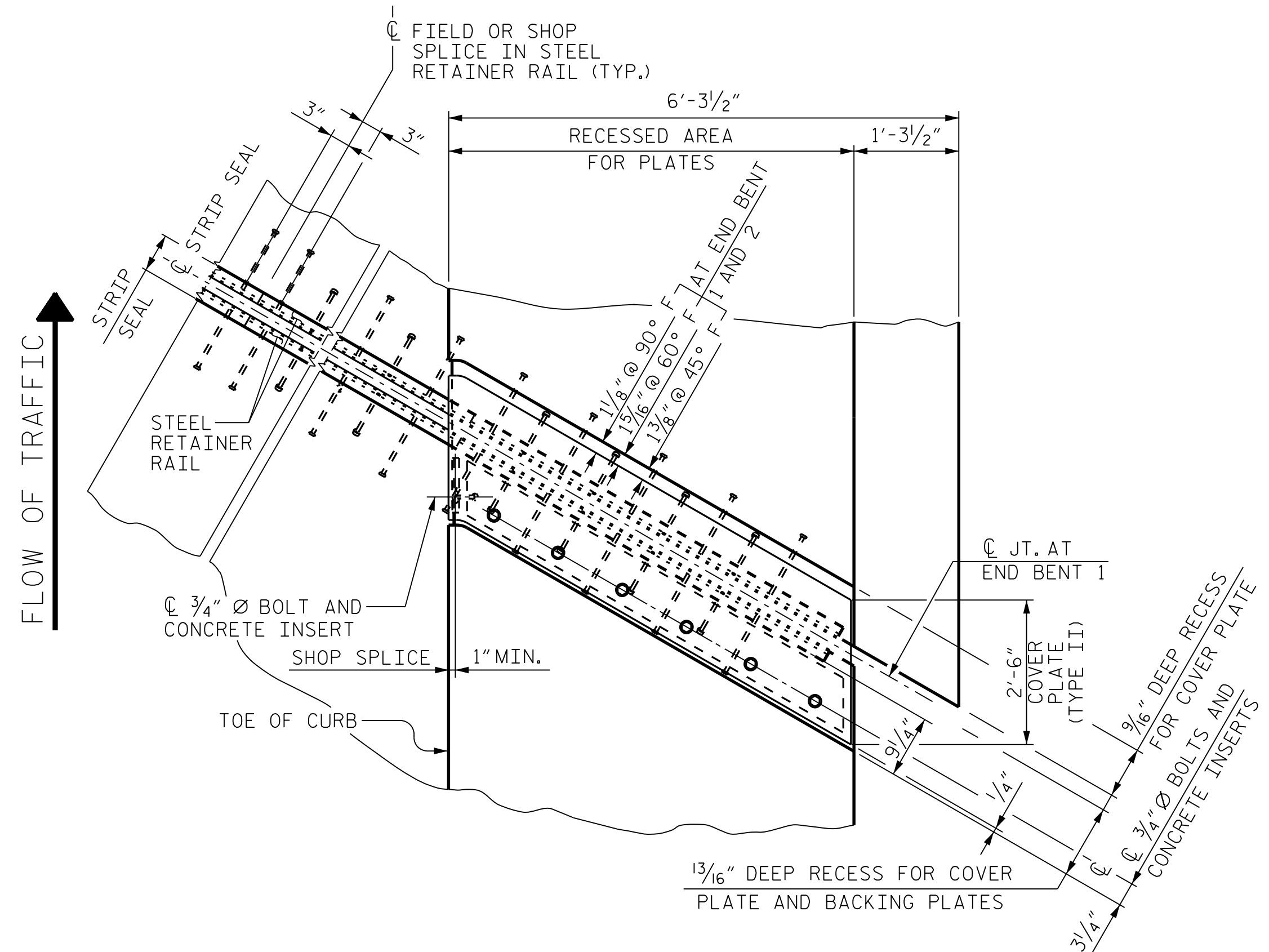
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ENGINEER
BRUCE D. KLAPPENBACH
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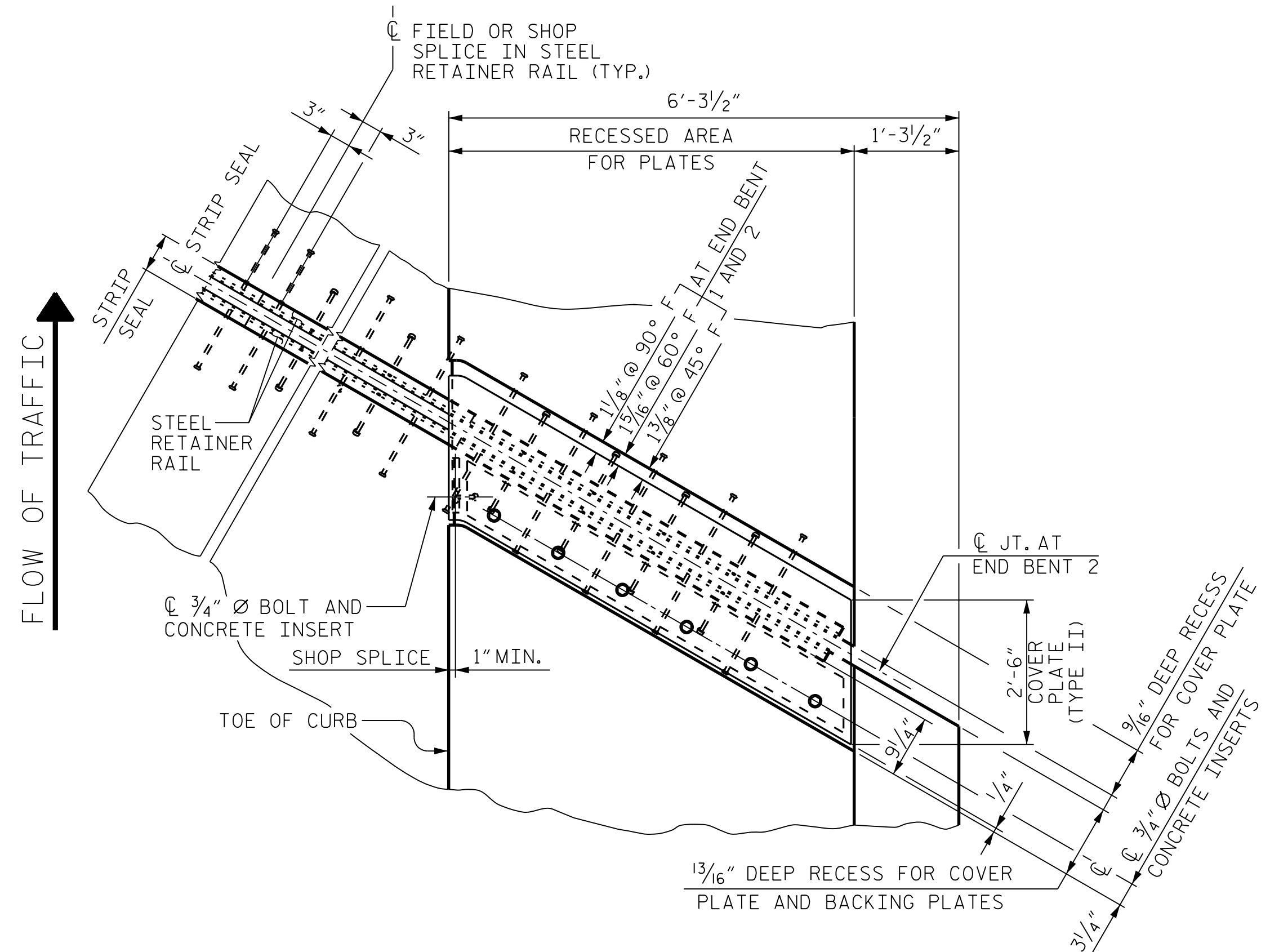
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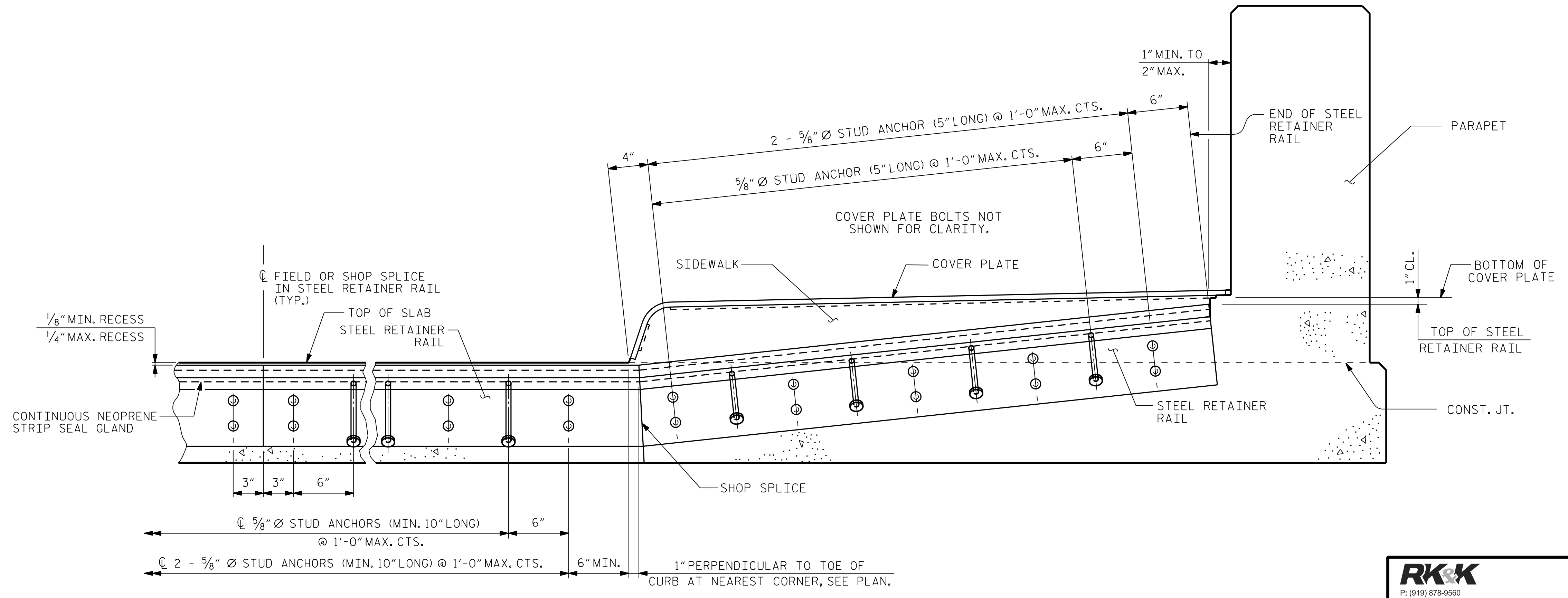
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PLAN OF STRIP SEAL EXPANSION JOINT
(DETAIL AT END BENT 1)



PLAN OF STRIP SEAL EXPANSION JOINT
(DETAIL AT END BENT 2)



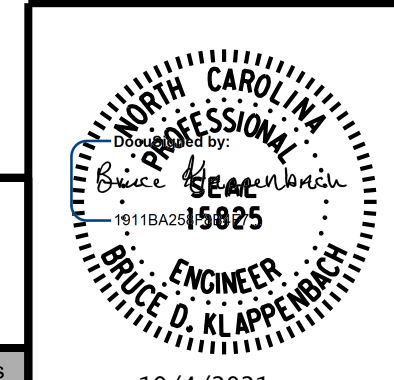
SECTION THRU SIDEWALK NORMAL TO JOINT

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SHEET 3 OF 4

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SUPERSTRUCTURE STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK RIGHT SIDE - STAGE 1



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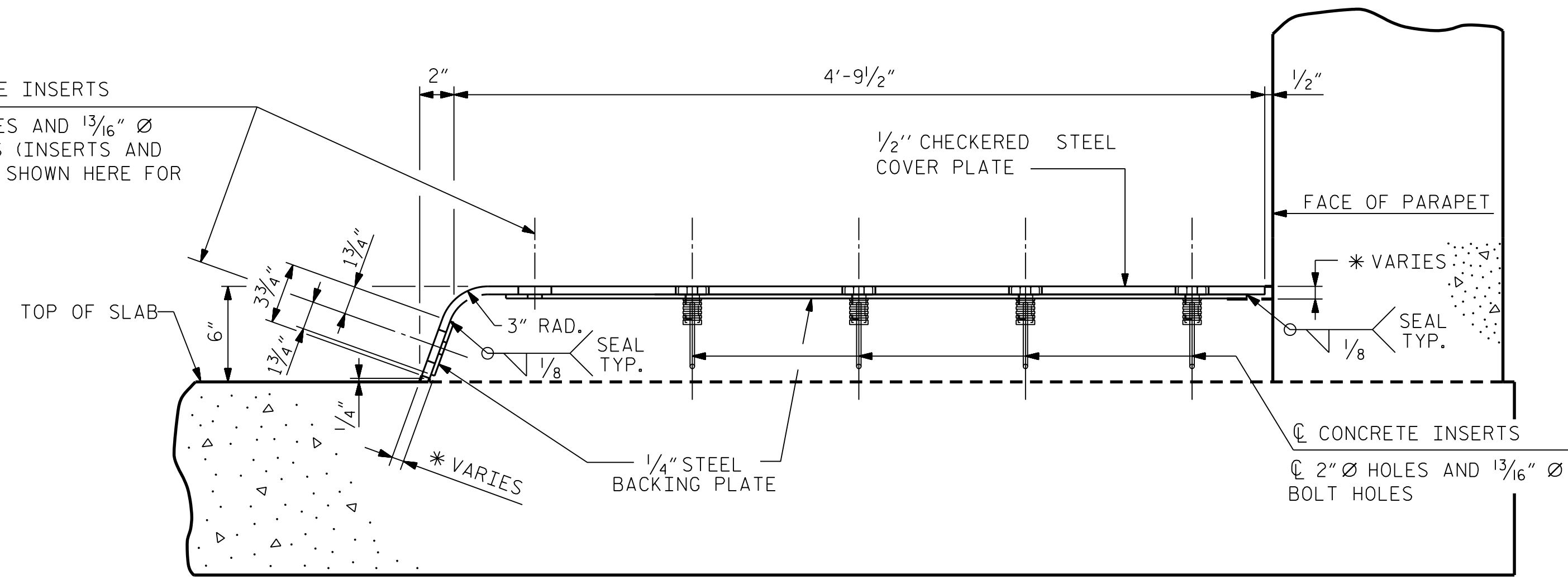
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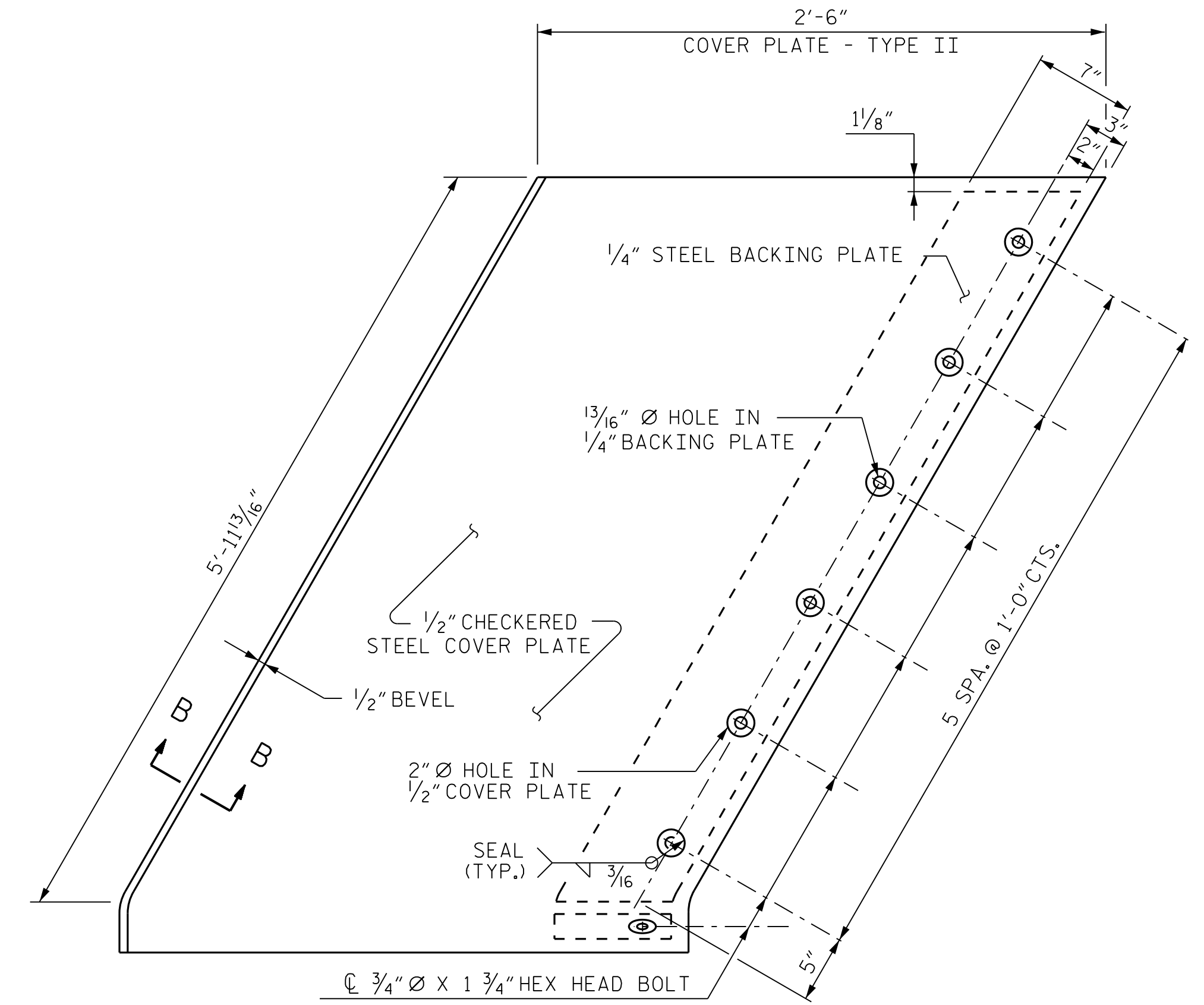
☐ CONCRETE INSERTS
 ☐ 2" Ø HOLES AND 13/16" Ø BOLT HOLES (INSERTS AND BOLTS NOT SHOWN HERE FOR CLARITY)



END VIEW

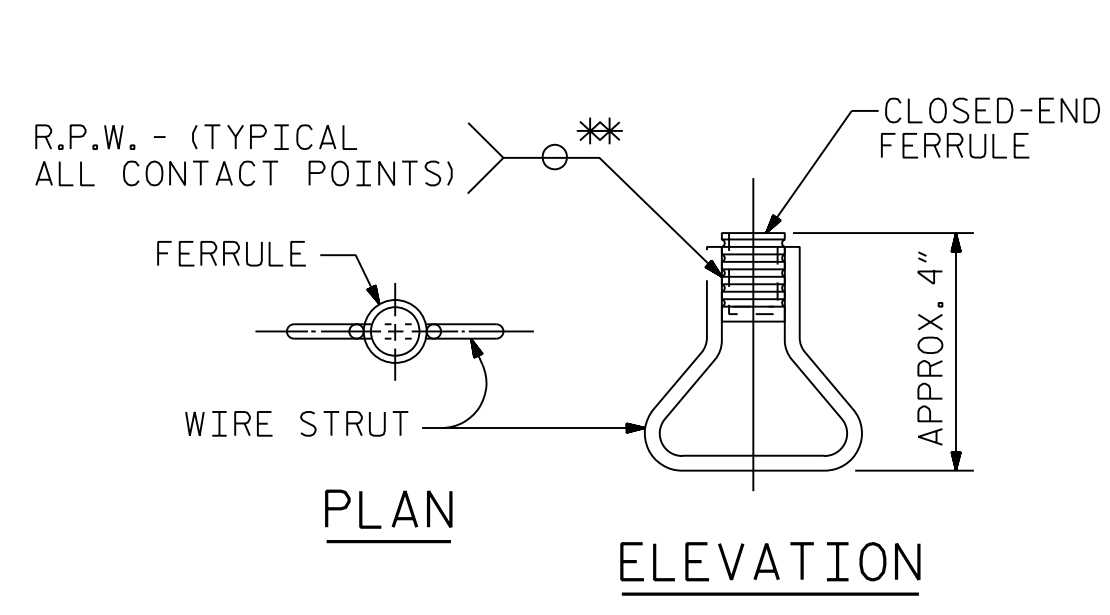
(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:
 13/16" 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.



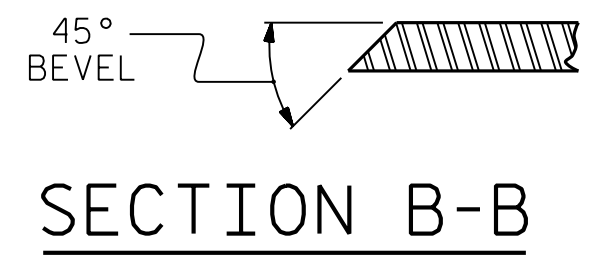
TYPE II - PLAN VIEW

COVER PLATE DETAILS

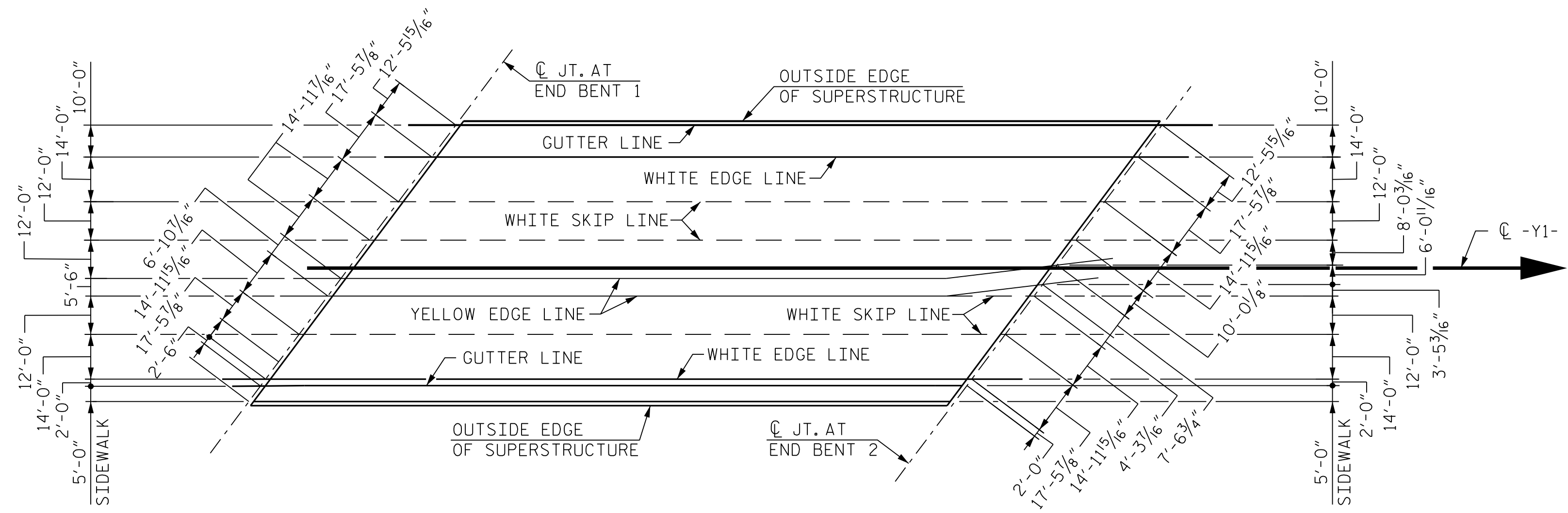


CONCRETE INSERT

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



SECTION B-B

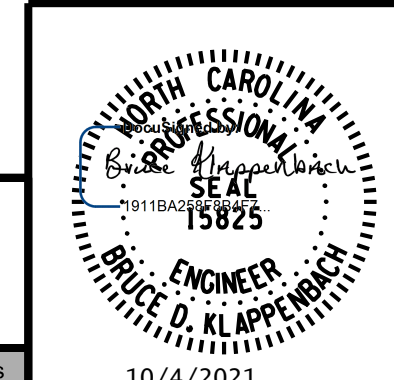


PAVEMENT MARKING ALIGNMENT

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STRIP SEAL EXPANSION JOINT
 DETAILS FOR SIDEWALK



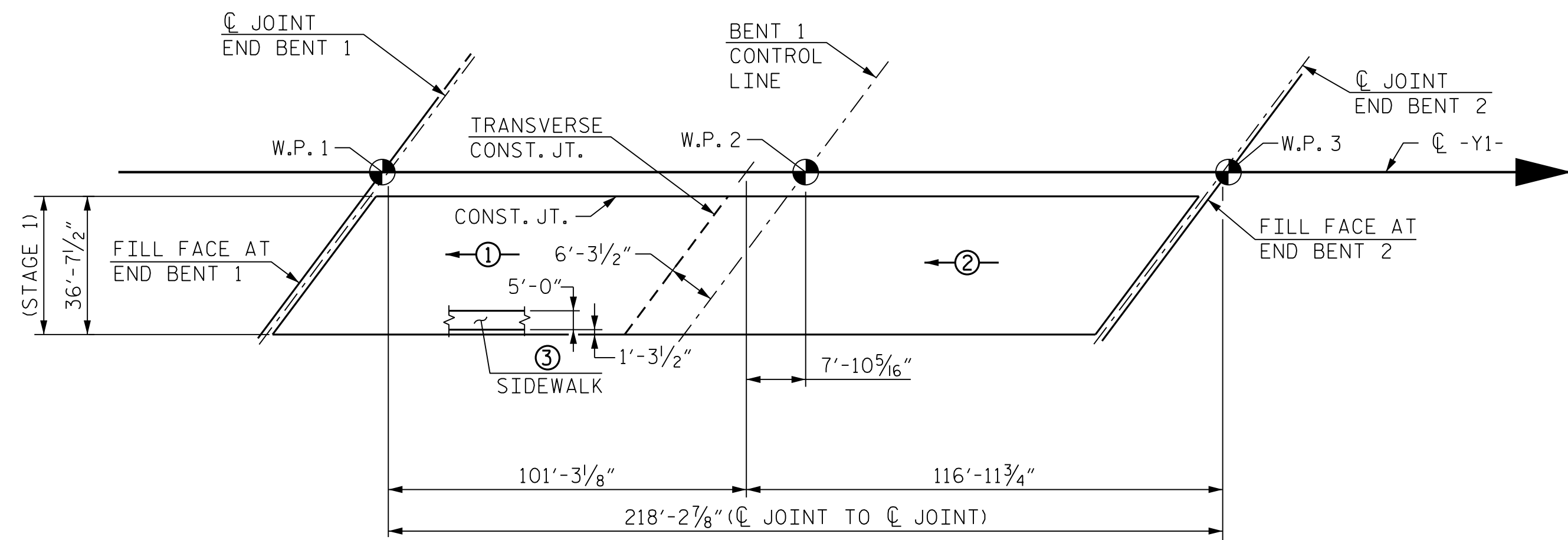
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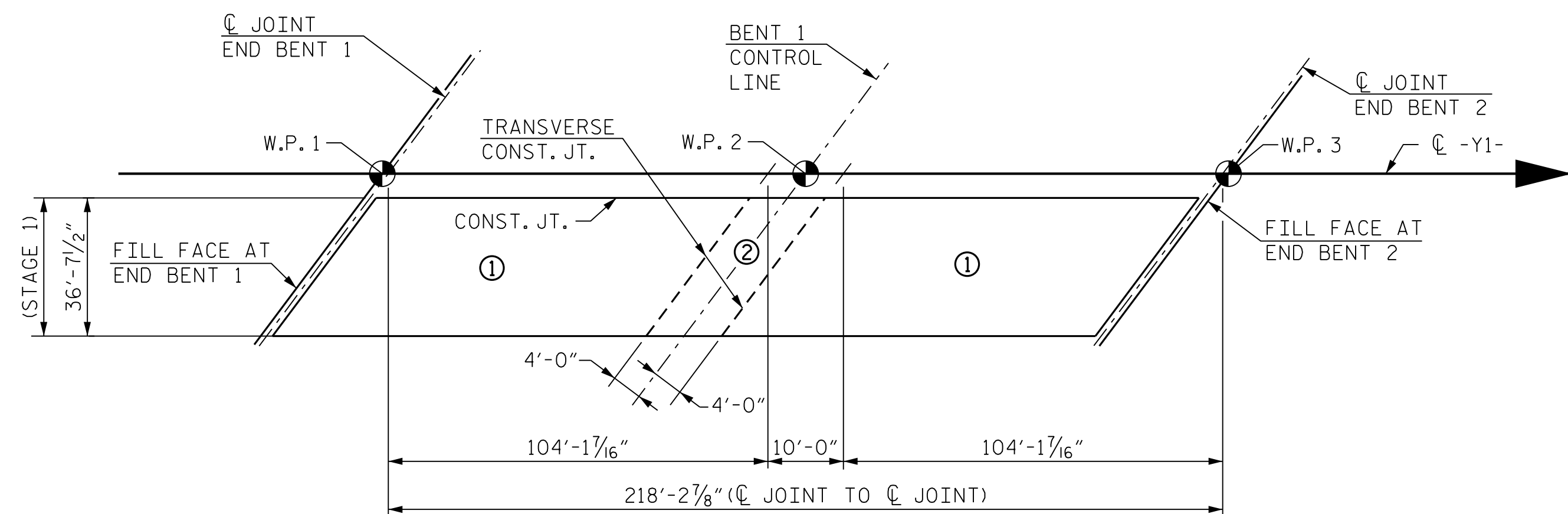
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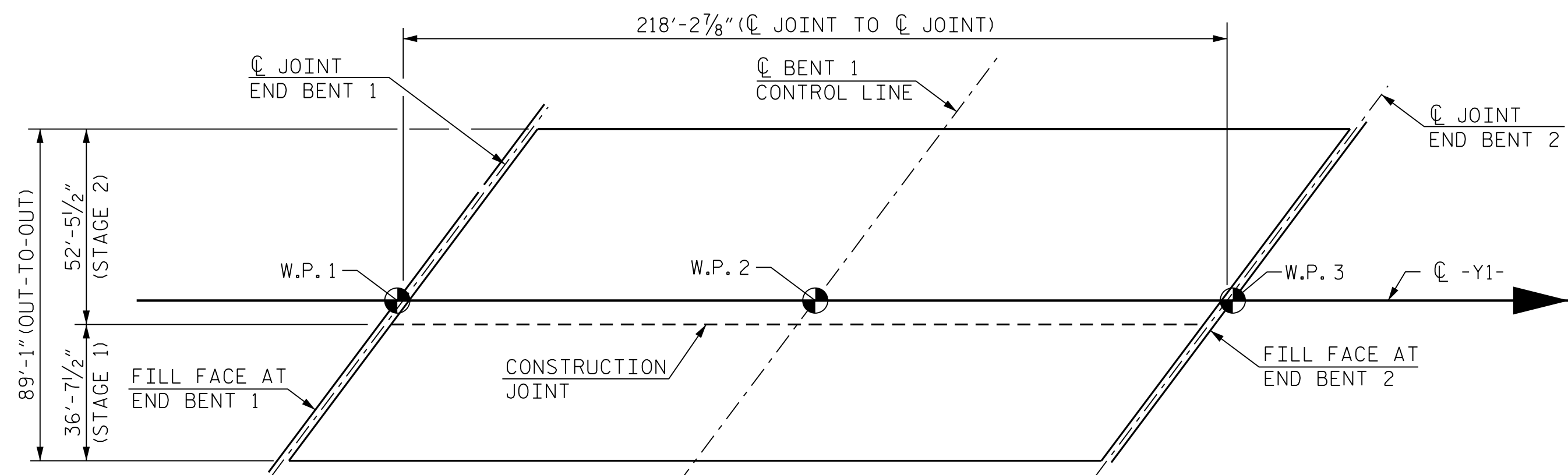
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POURING SEQUENCE



OPTIONAL POURING SEQUENCE



LAYOUT FOR COMPUTING AREA
 REINFORCED CONCRETE DECK SLAB
 STAGE 1 = 7,993 SQ. FT.
 STAGE 2 = 11,448 SQ. FT.
 TOTAL = 19,441 SQ. FT.

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

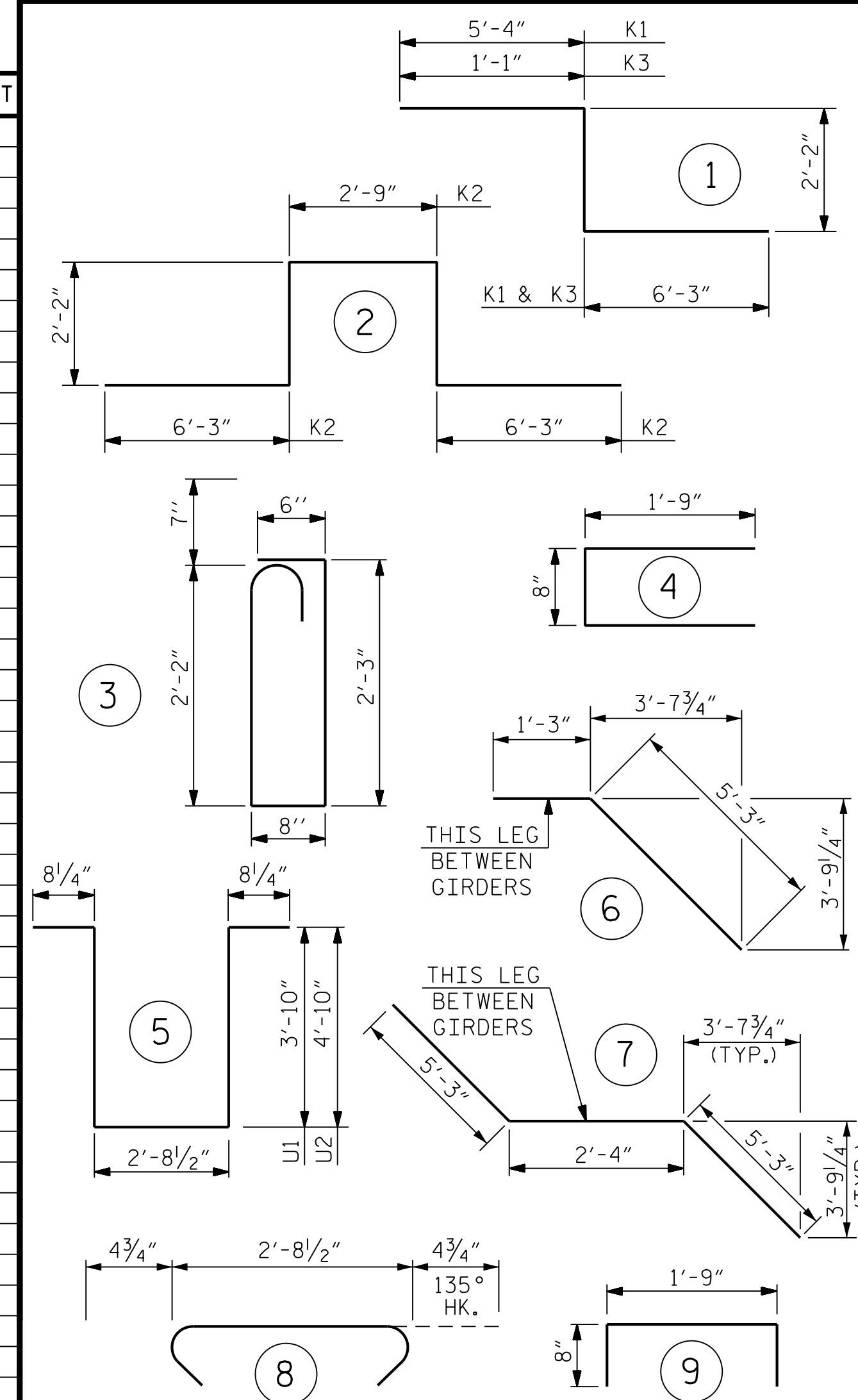
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"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

REINFORCING BAR SCHEDULE - STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	352	5	STR.	36'-3"	13,309	*B1	128	4	STR.	37'-3"	3,185
A2	352	5	STR.	36'-3"	13,309	*B2	32	6	STR.	50'-0"	2,403
*A101	4	5	STR.	35'-0"	146	*B3	32	6	STR.	29'-10"	1,434
*A102	4	5	STR.	33'-6"	140	*B4	31	6	STR.	34'-0"	1,583
*A103	4	5	STR.	32'-1"	134	*B5	160	5	STR.	55'-11"	9,331
*A104	4	5	STR.	30'-8"	128	*B6	30	4	STR.	37'-11"	760
*A105	4	5	STR.	29'-2"	122	*D1	400	5	STR.	5'-3"	2,190
*A106	4	5	STR.	27'-9"	116	D2	400	5	STR.	5'-3"	2,190
*A107	4	5	STR.	26'-4"	110	*G1	2	5	STR.	45'-4"	95
*A108	4	5	STR.	24'-10"	104	*G3	215	4	STR.	4'-6"	646
*A109	4	5	STR.	23'-5"	98						
*A110	4	5	STR.	22'-0"	92						
*A111	4	5	STR.	20'-6"	86	*K1	4	8	1	13'-9"	147
*A112	4	5	STR.	19'-1"	80	*K2	12	8	2	19'-7"	627
*A113	4	5	STR.	17'-7"	73	*K3	4	8	1	9'-6"	101
*A114	4	5	STR.	16'-2"	67	*K4	24	6	STR.	7'-10"	282
*A115	4	5	STR.	14'-9"	62	K5	10	4	6	6'-6"	43
*A116	4	5	STR.	13'-3"	55	K6	15	4	7	12'-10"	129
*A117	4	5	STR.	11'-10"	49	K7	8	4	STR.	6'-6"	35
*A118	4	5	STR.	10'-5"	43	K8	16	4	STR.	9'-1"	97
*A119	4	5	STR.	8'-11"	37	K9	16	4	STR.	7'-10"	84
*A120	4	5	STR.	7'-6"	31						
*A121	4	5	STR.	6'-1"	25	*S1	64	4	4	4'-2"	178
*A122	4	5	STR.	4'-7"	19	*S2	64	5	3	6'-2"	412
*A123	4	5	STR.	3'-2"	13	S3	104	4	8	3'-6"	243
*A124	3	6	STR.	7'-1"	32						
A201	4	5	STR.	35'-0"	146	U1	8	4	5	11'-9"	63
A202	4	5	STR.	33'-6"	140	U2	20	4	5	13'-9"	184
A203	4	5	STR.	32'-1"	134	*U3	62	4	9	3'-1"	128
A204	4	5	STR.	30'-8"	128						
A205	4	5	STR.	29'-2"	122						
A206	4	5	STR.	27'-9"	116						
A207	4	5	STR.	26'-4"	110						
A208	4	5	STR.	24'-10"	104						
A209	4	5	STR.	23'-5"	98						
A210	4	5	STR.	22'-0"	92						
A211	4	5	STR.	20'-6"	86						
A212	4	5	STR.	19'-1"	80						
A213	4	5	STR.	17'-7"	73						
A214	4	5	STR.	16'-2"	67						
A215	4	5	STR.	14'-9"	62						
A216	4	5	STR.	13'-3"	55						
A217	4	5	STR.	11'-10"	49						
A218	4	5	STR.	10'-5"	43						
A219	4	5	STR.	8'-11"	37						
A220	4	5	STR.	7'-6"	31						
A221	4	5	STR.	6'-1"	25						
A222	4	5	STR.	4'-7"	19						
A223	4	5	STR.	3'-2"	13						
A224	3	6	STR.	6'-8"	30						

REINFORCING STEEL 27,568 LBS.
 *EPOXY COATED REINFORCING STEEL 29,342 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	108.4		
POUR 2	143.3		
POUR 3 (SIDEWALK)	24.4		
TOTALS**	276.1	27,568	29,342

**QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 2

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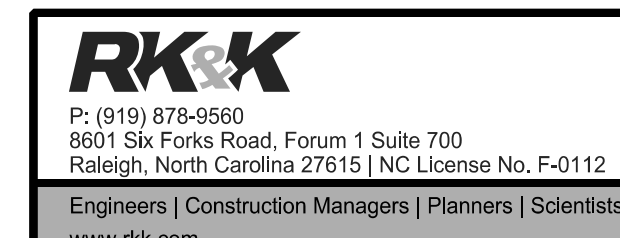
SUPERSTRUCTURE
 BILL OF MATERIAL
 STAGE 1

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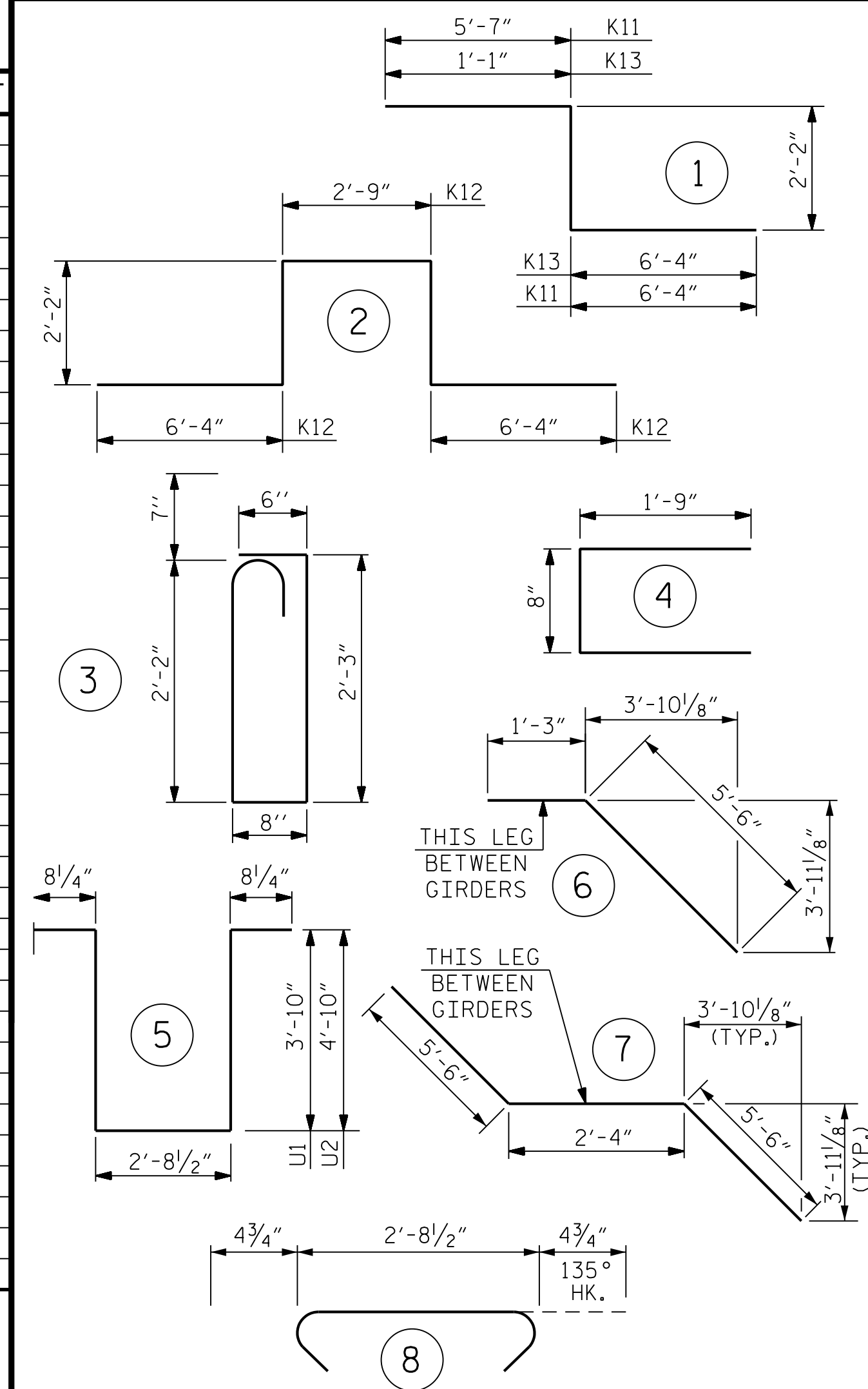
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REINFORCING BAR SCHEDULE - STAGE 2

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A3	339	5	STR.	45'-8"	16,147	A423	4	5	STR.	12'-7"	52
A4	339	5	STR.	45'-8"	16,147	A424	4	5	STR.	11'-2"	47
* A5	394	5	STR.	6'-1"	2,500	A425	4	5	STR.	9'-9"	41
A6	394	5	STR.	6'-1"	2,500	A426	4	5	STR.	8'-3"	34
						A427	4	5	STR.	6'-10"	29
* A301	4	5	STR.	44'-5"	185	A428	4	5	STR.	5'-5"	23
* A302	4	5	STR.	43'-0"	179	A429	4	5	STR.	3'-11"	16
* A303	4	5	STR.	41'-7"	173	A430	4	5	STR.	2'-6"	10
* A304	4	5	STR.	40'-1"	167	A431	3	6	STR.	6'-8"	30
* A305	4	5	STR.	38'-8"	161						
* A306	4	5	STR.	37'-3"	155	* B1	184	4	STR.	37'-3"	4,578
* A307	4	5	STR.	35'-9"	149	* B2	46	6	STR.	50'-0"	3,455
* A308	4	5	STR.	34'-4"	143	* B3	46	6	STR.	29'-10"	2,061
* A309	4	5	STR.	32'-10"	137	* B4	44	6	STR.	34'-0"	2,247
* A310	4	5	STR.	31'-5"	131	B5	228	5	STR.	55'-11"	13,297
* A311	4	5	STR.	30'-0"	125						
* A312	4	5	STR.	28'-6"	119	* D1	405	5	STR.	5'-3"	2,218
* A313	4	5	STR.	27'-1"	113	D2	405	5	STR.	5'-3"	2,218
* A314	4	5	STR.	25'-8"	107						
* A315	4	5	STR.	24'-2"	101	* G2	2	5	STR.	57'-6"	120
* A316	4	5	STR.	22'-9"	95						
* A317	4	5	STR.	21'-4"	89	* K11	4	8	1	14'-1"	150
* A318	4	5	STR.	19'-10"	83	* K12	16	8	2	19'-9"	844
* A319	4	5	STR.	18'-5"	77	* K13	4	8	1	9'-7"	102
* A320	4	5	STR.	17'-0"	71	* K14	30	6	STR.	8'-1"	364
* A321	4	5	STR.	15'-6"	65	K15	10	4	6	6'-9"	45
* A322	4	5	STR.	14'-1"	59	K16	20	4	7	13'-4"	178
* A323	4	5	STR.	12'-7"	52	K17	10	4	STR.	6'-10"	46
* A324	4	5	STR.	11'-2"	47	K18	20	4	STR.	9'-5"	126
* A325	4	5	STR.	9'-9"	41	K19	20	4	STR.	8'-2"	109
* A326	4	5	STR.	8'-3"	34						
* A327	4	5	STR.	6'-10"	29	* S1	80	4	4	4'-2"	223
* A328	4	5	STR.	5'-5"	23	* S2	80	5	3	6'-2"	515
* A329	4	5	STR.	3'-11"	16	S3	130	4	8	3'-6"	304
* A330	4	5	STR.	2'-6"	10						
* A331	3	6	STR.	7'-1"	32	U1	10	4	5	11'-9"	78
						U2	25	4	5	13'-9"	230
A401	4	5	STR.	44'-5"	185						
A402	4	5	STR.	43'-0"	179						
A403	4	5	STR.	41'-7"	173						
A404	4	5	STR.	40'-1"	167						
A405	4	5	STR.	38'-8"	161						
A406	4	5	STR.	37'-3"	155						
A407	4	5	STR.	35'-9"	149						
A408	4	5	STR.	34'-4"	143						
A409	4	5	STR.	32'-10"	137						
A410	4	5	STR.	31'-5"	131						
A411	4	5	STR.	30'-0"	125						
A412	4	5	STR.	28'-6"	119						
A413	4	5	STR.	27'-1"	113						
A414	4	5	STR.	25'-8"	107						
A415	4	5	STR.	24'-2"	101						
A416	4	5	STR.	22'-9"	95						
A417	4	5	STR.	21'-4"	89						
A418	4	5	STR.	19'-10"	83						
A419	4	5	STR.	18'-5"	77						
A420	4	5	STR.	17'-0"	71						
A421	4	5	STR.	15'-6"	65						
A422	4	5	STR.	14'-1"	59						

REINFORCING STEEL 38,244 LBS.
 * EPOXY COATED REINFORCING STEEL 38,492 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 4	133.5		
POUR 5	177.4		
POUR 6 (CLOSURE POUR)	42.0		
TOTALS**	352.9	38,244	38,492

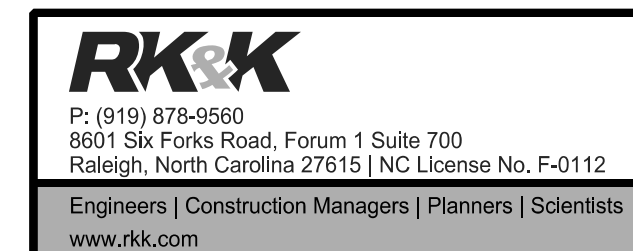
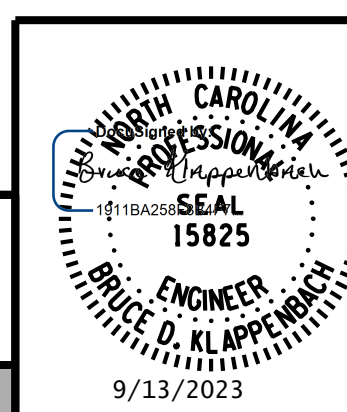
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SHEET 2 OF 2

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SUPERSTRUCTURE
 BILL OF MATERIAL
 STAGE 2

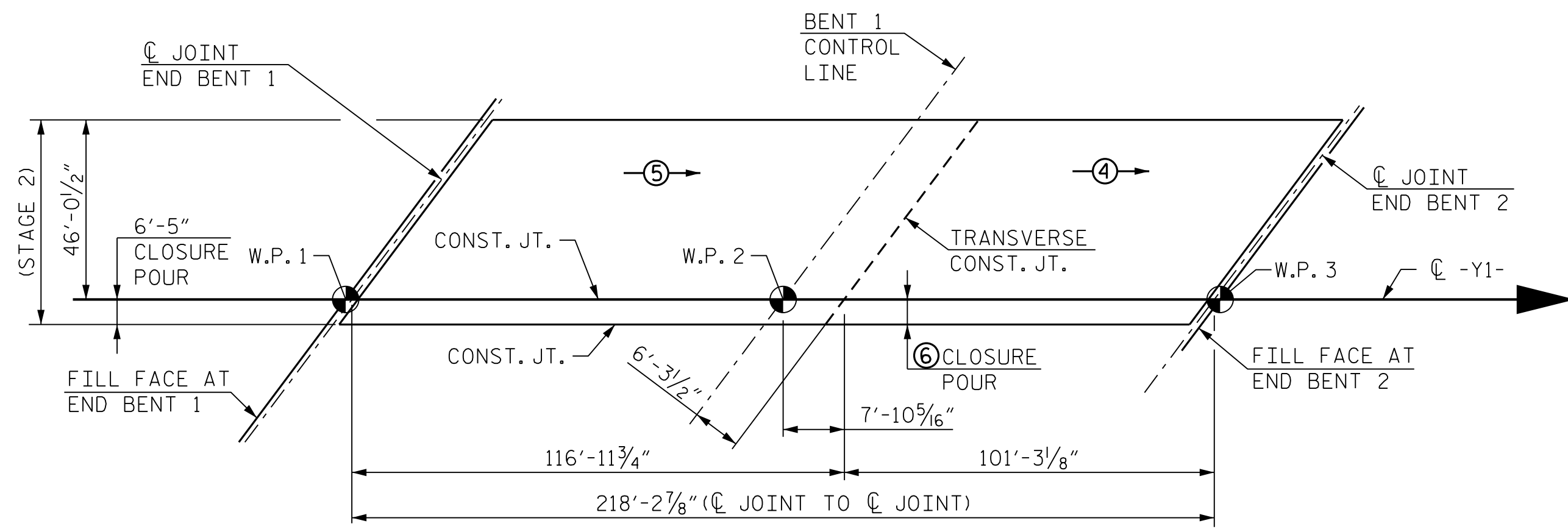


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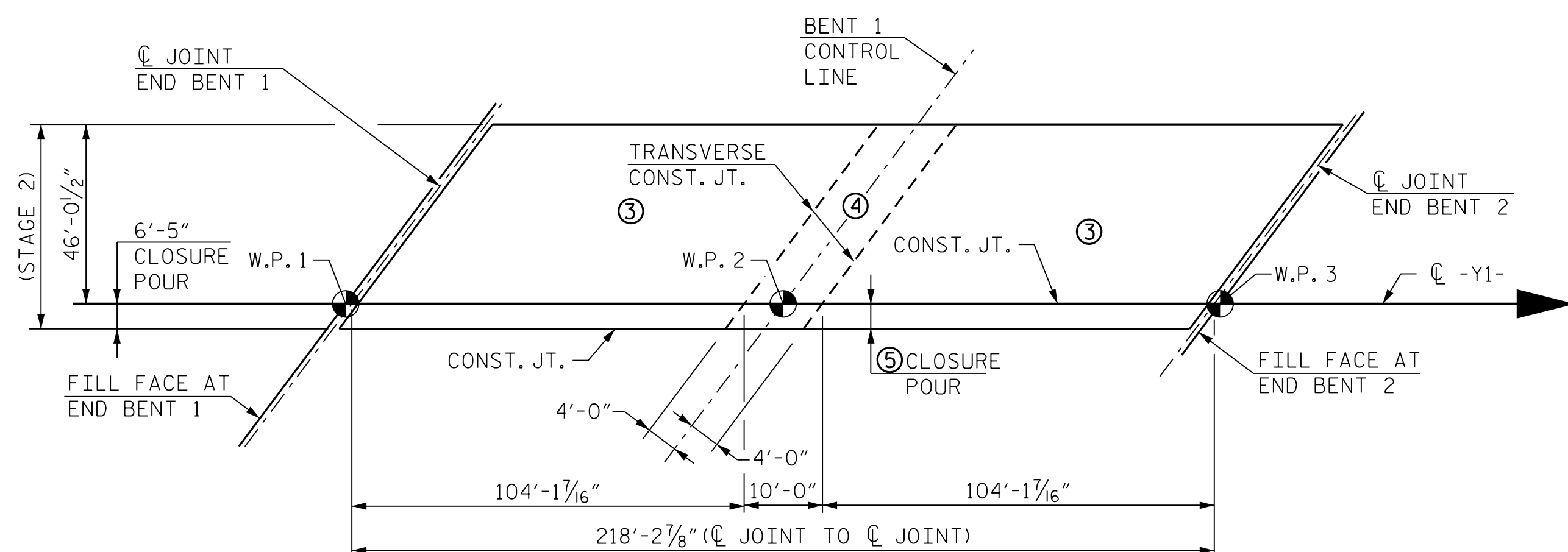
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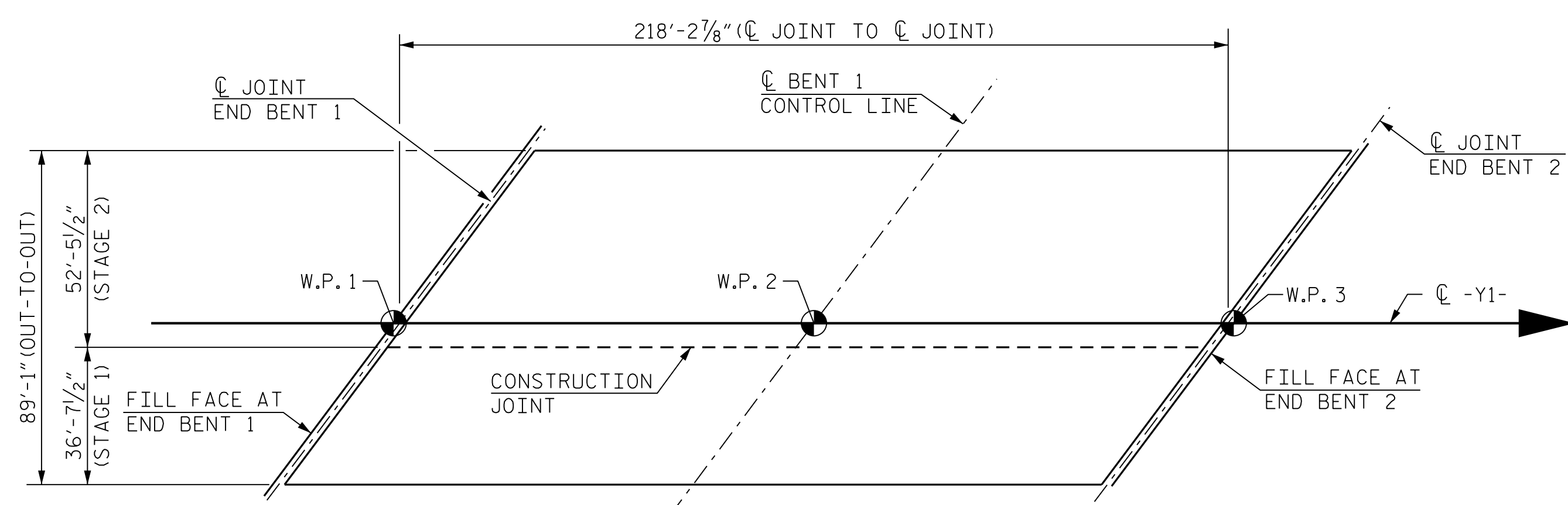
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POURING SEQUENCE



OPTIONAL POURING SEQUENCE



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB

STAGE 1 = 7,993 SQ. FT.
 STAGE 2 = 11,448 SQ. FT.
 TOTAL = 19,441 SQ. FT.

GROOVING BRIDGE FLOORS (STAGE 2)

	APPROACH SLABS	BRIDGE DECK	TOTAL
APPROACH SLABS	2,352 SQ.FT.		
BRIDGE DECK		10,605 SQ.FT.	
TOTAL			12,957 SQ.FT.

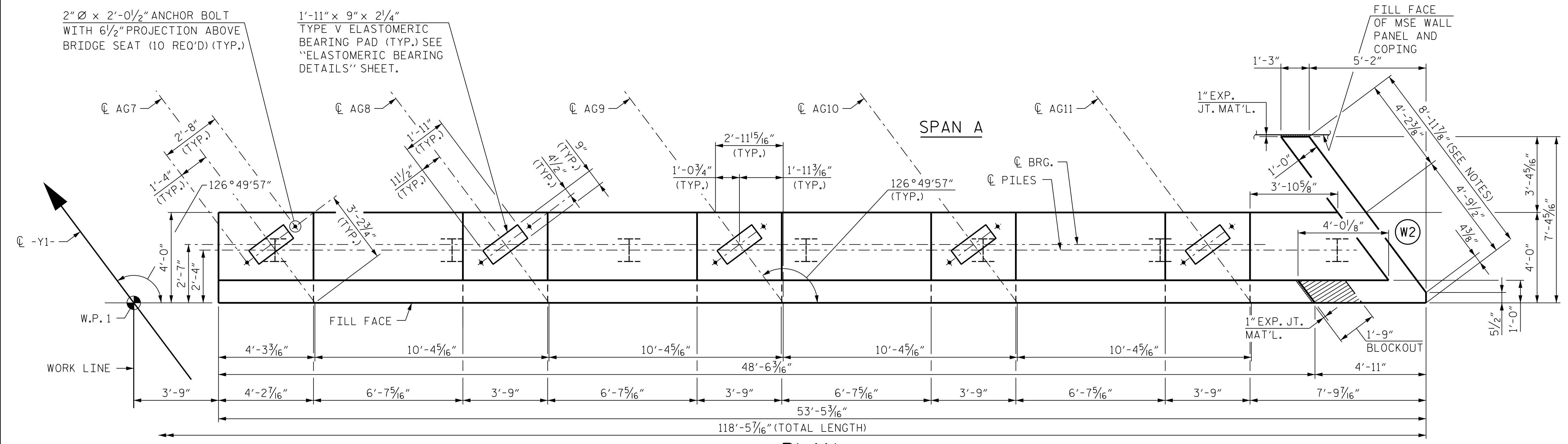
NOTE: INCLUDES CLOSURE POUR

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

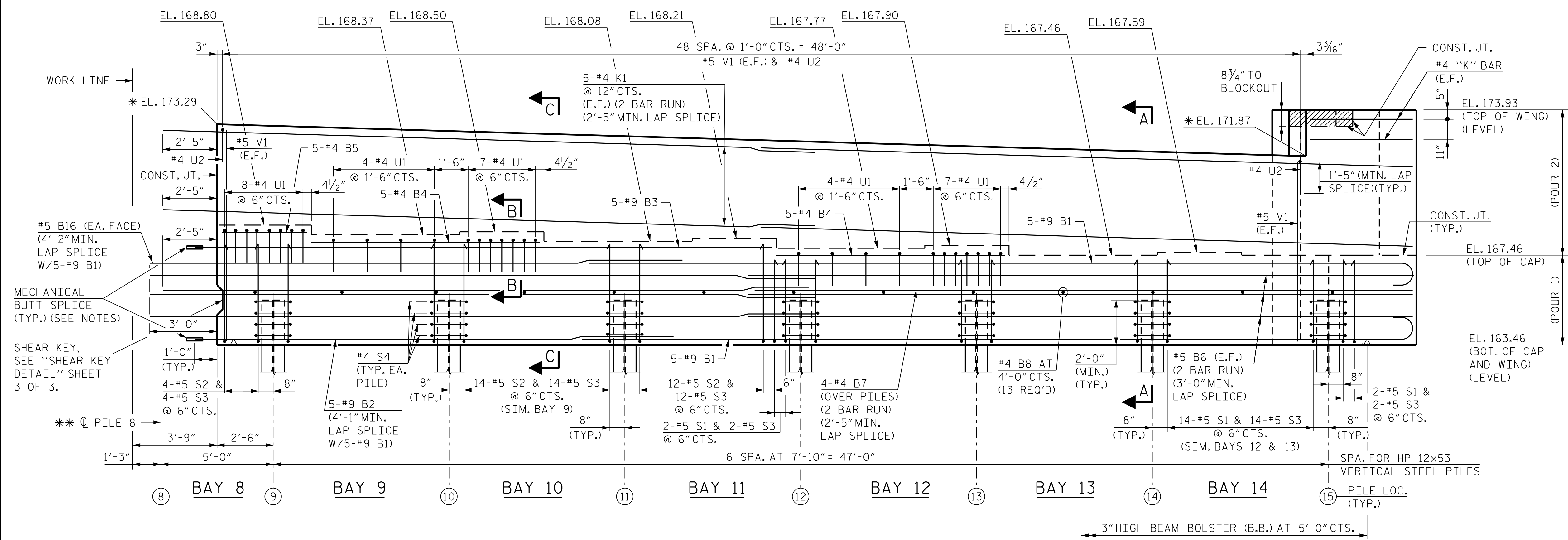
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"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

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PLAN



ELEVATION

* ELEVATION AT FILL FACE

NOTES:

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

FOR PILE SPLICE DETAILS, SEE END BENT 2 STAGE 1, SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE, SEE END BENT 1 STAGE 2, SHEET 3 OF 3.

STIRRUPS IN THE 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, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE PARAPETS ARE CAST IF SLIP FORMING IS USED.

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

WING LENGTH IS BASED ON THE MSE WALL COPING BEING FLUSH WITH THE FILL FACE OF THE MSE WALL PANEL. IF AN ALTERNATE COPING DETAIL IS USED, THE CONTRACTOR SHALL ADJUST THE LENGTH OF THE WING. FOR COPING DETAILS, SEE MSE RETAINING WALL PLANS.

WING IS PARALLEL TO -Y1-.

FOR MECHANICAL BUTT SPLICING OF REINFORCING STEEL, SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 3

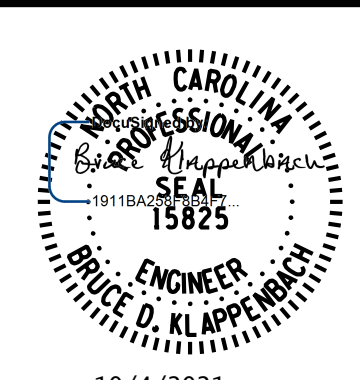
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SUBSTRUCTURE
END BENT 1
PLAN AND ELEVATION
STAGE 1

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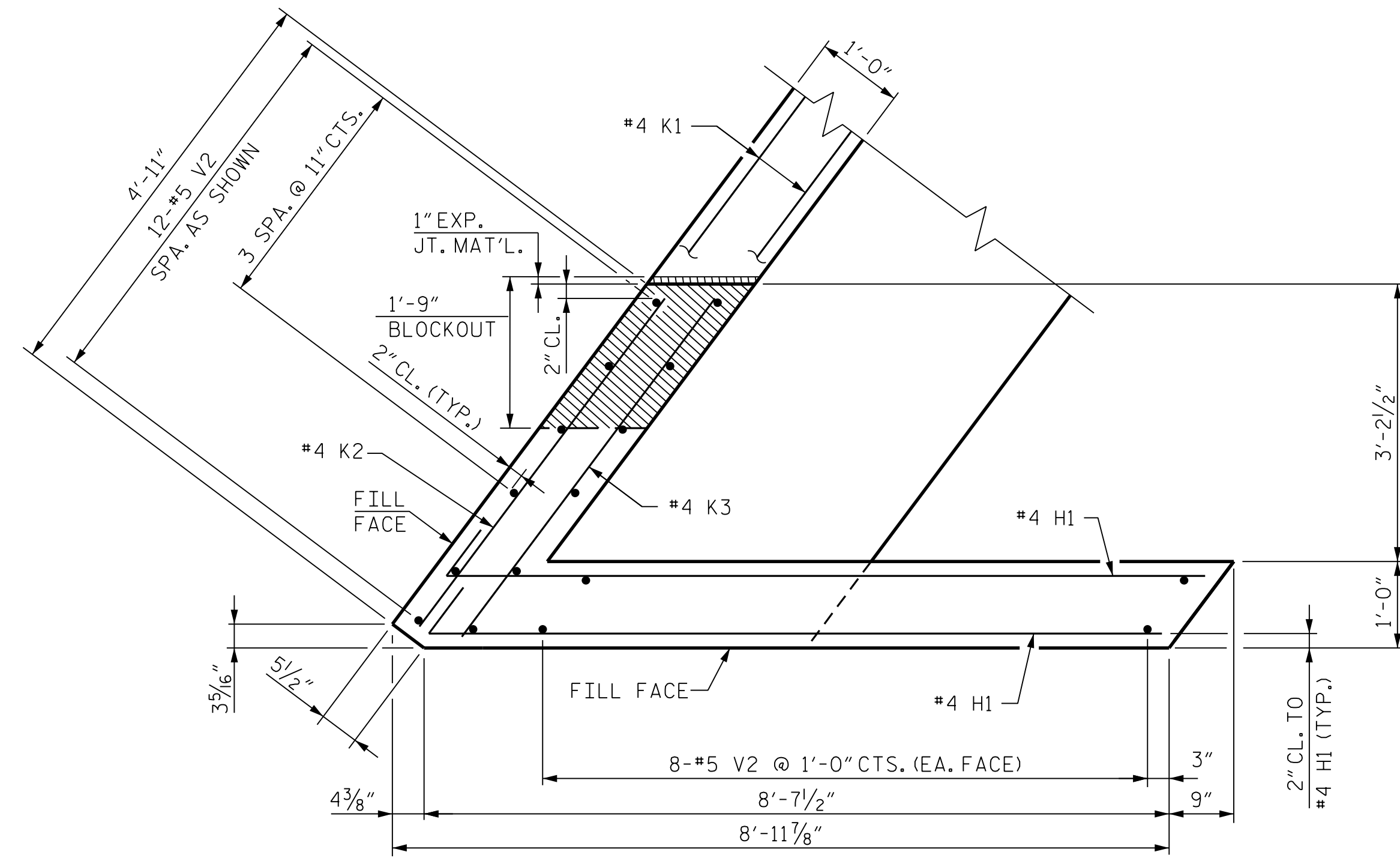
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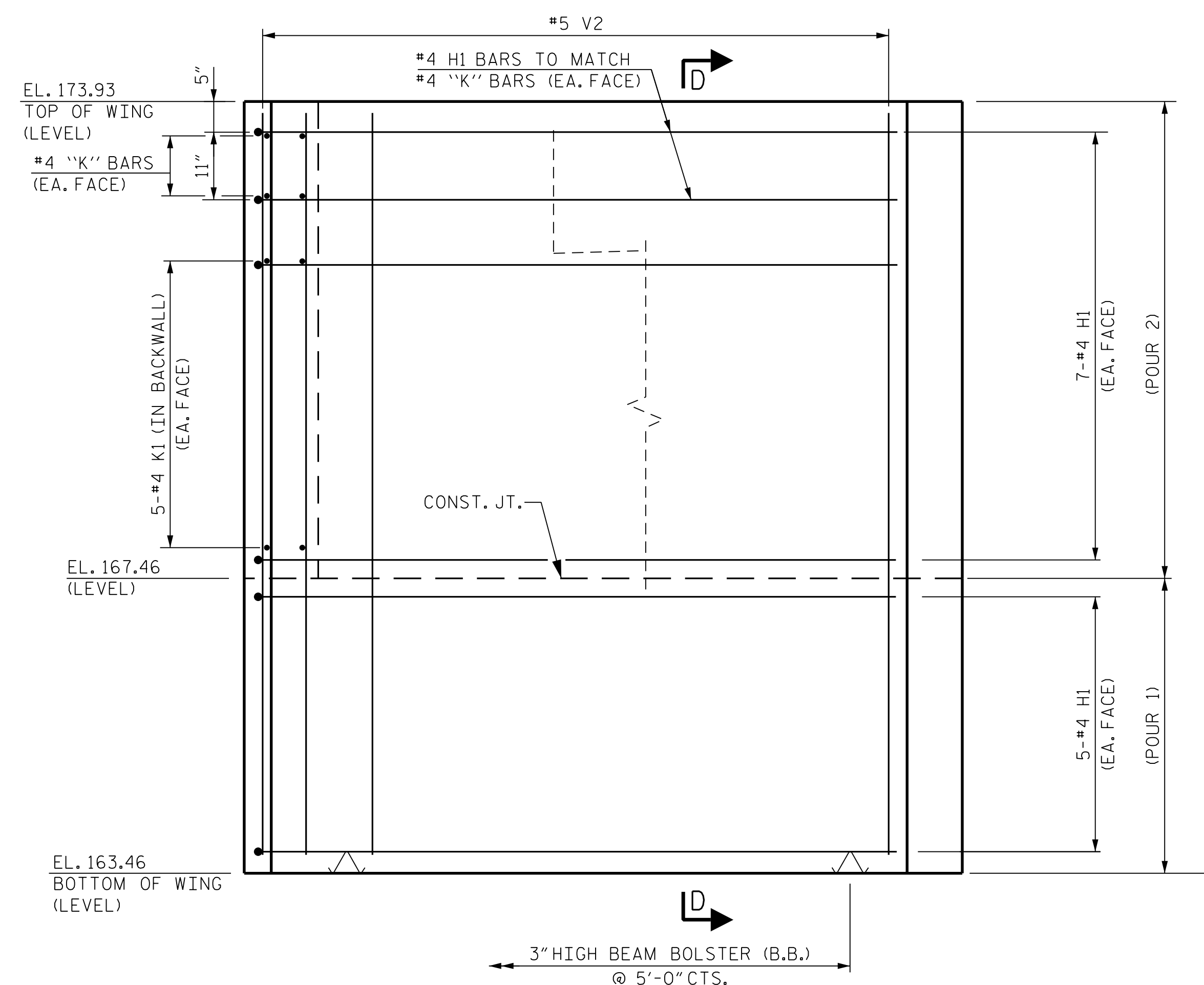
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 DESIGN ENGINEER OF RECORD: B. D. KLAPPENBACH DATE: JUN 2021

bhaag



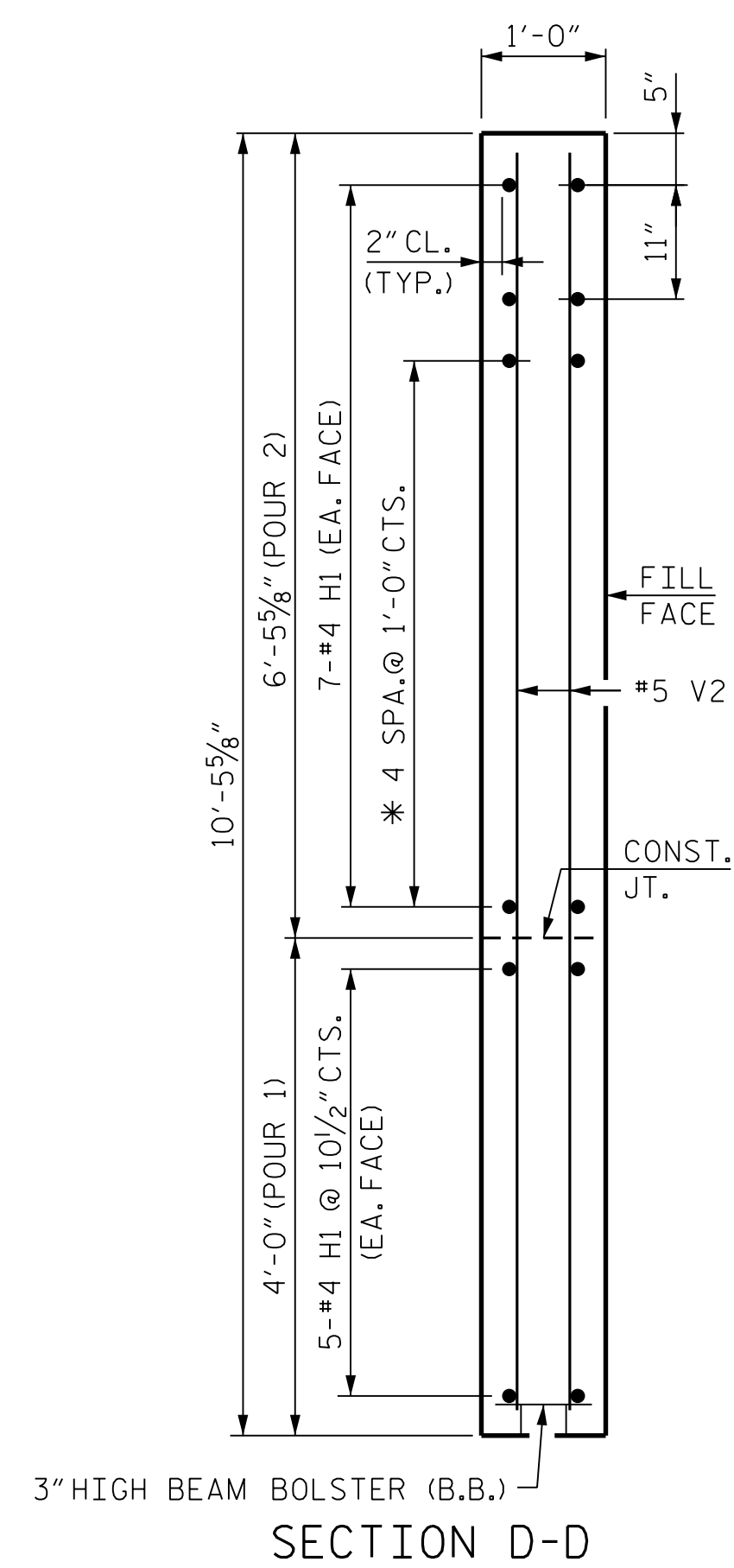
PLAN OF RIGHT WINGWALL



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS

W2



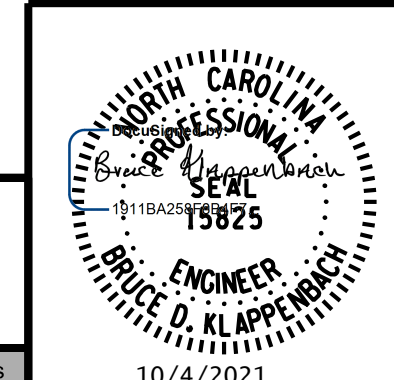
SECTION D-D

* MATCH TO K1 BARS IN BACKWALL

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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 SUBSTRUCTURE
 END BENT 1
 WINGWALL DETAILS
 STAGE 1



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REVISIONS						SHEET NO.
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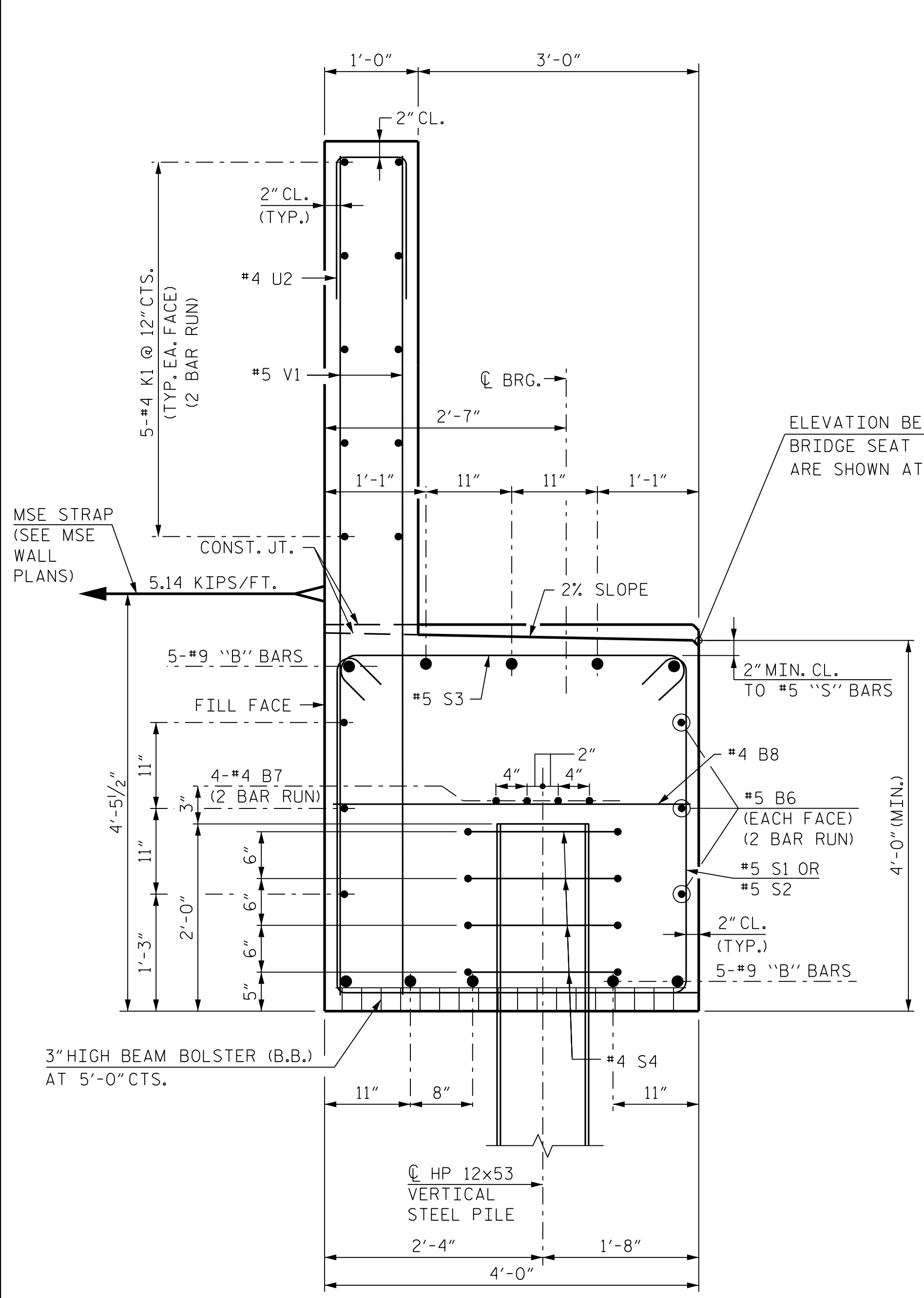
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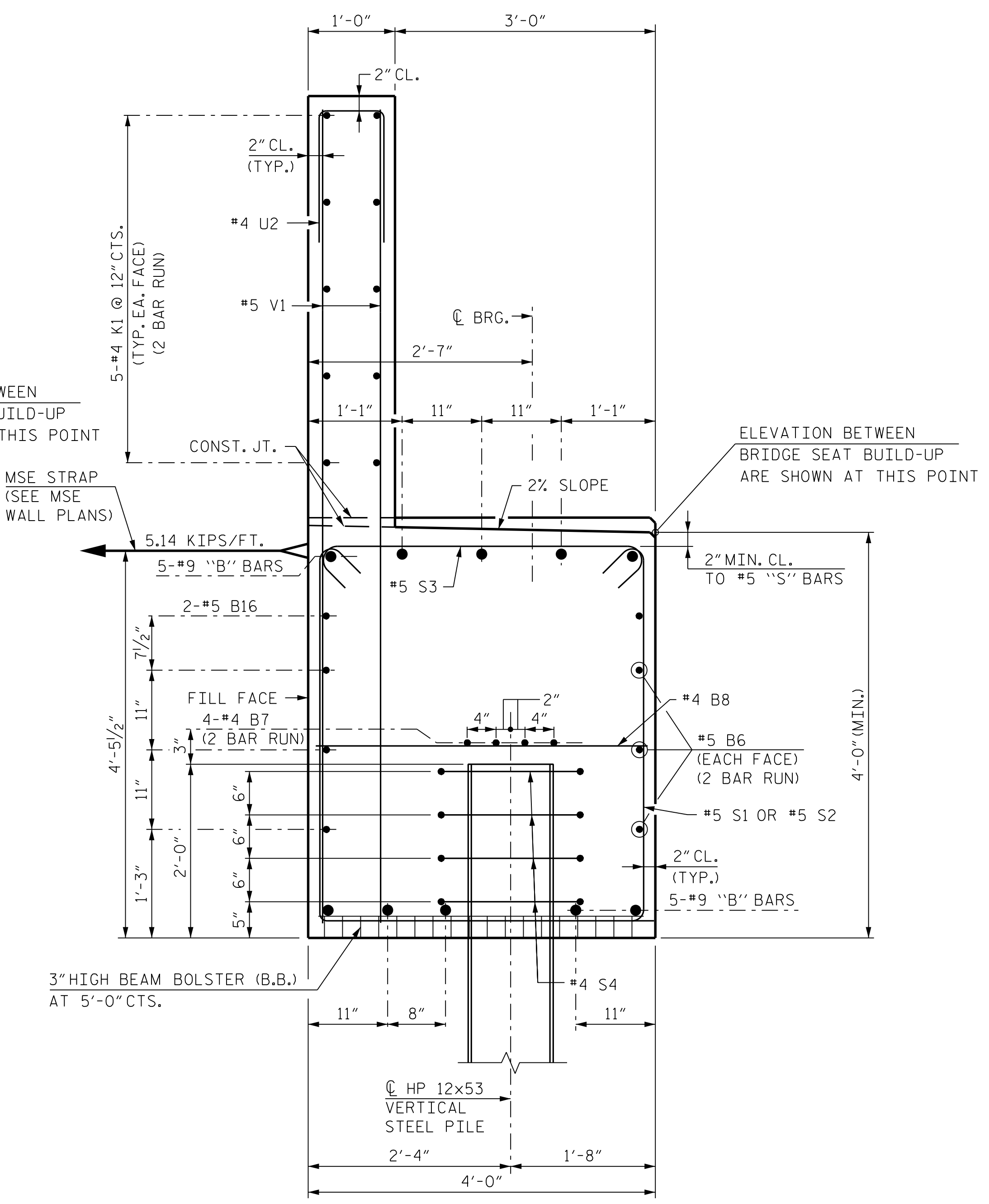
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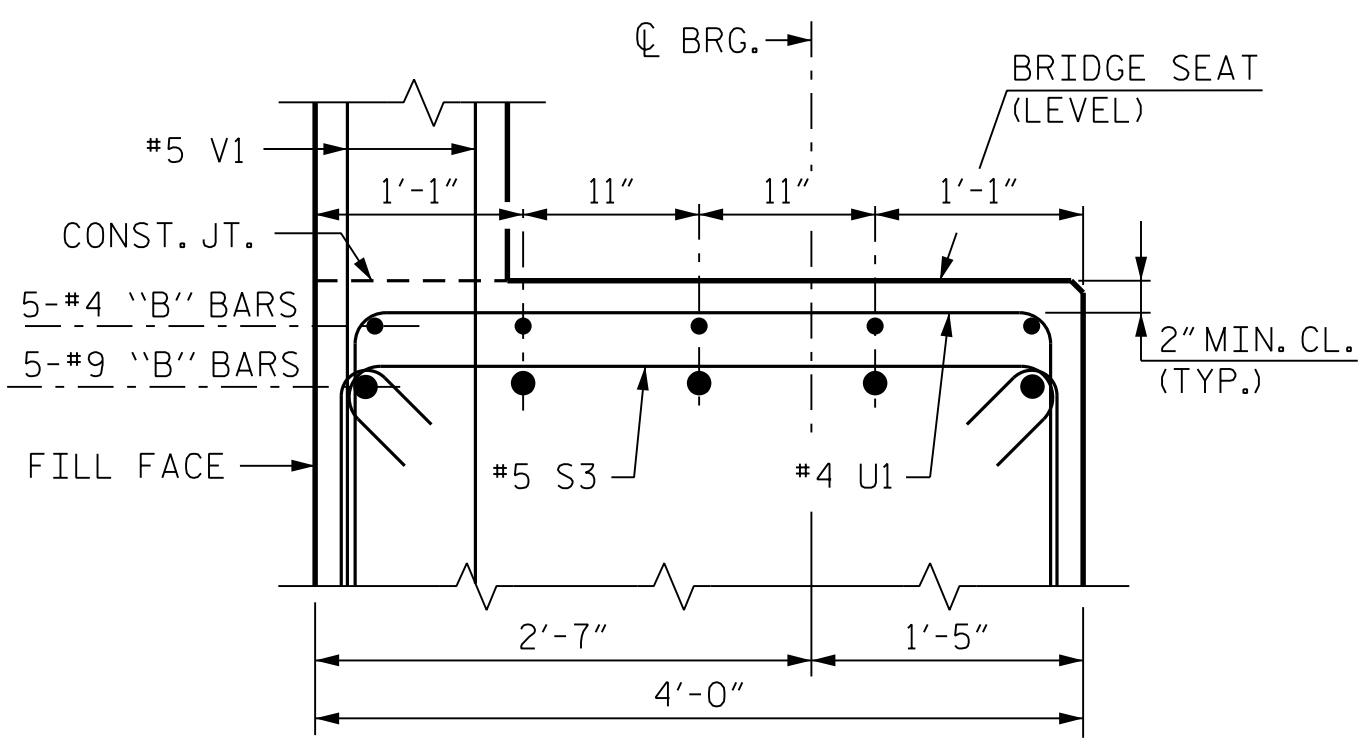
SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)

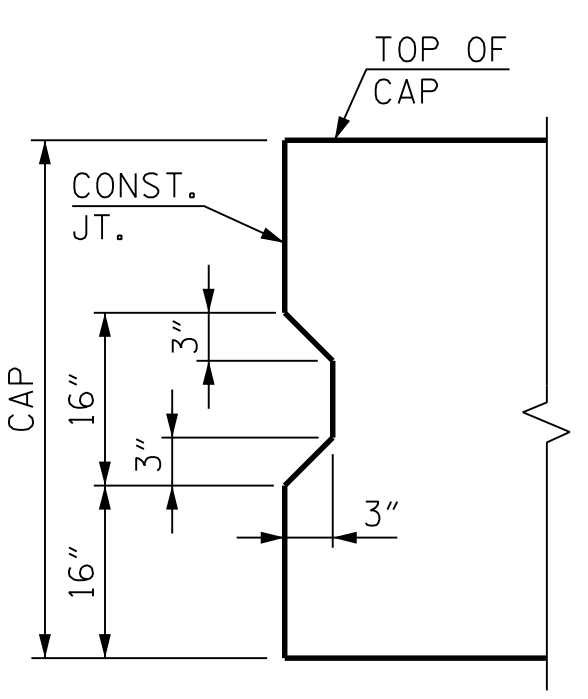


SECTION C-C

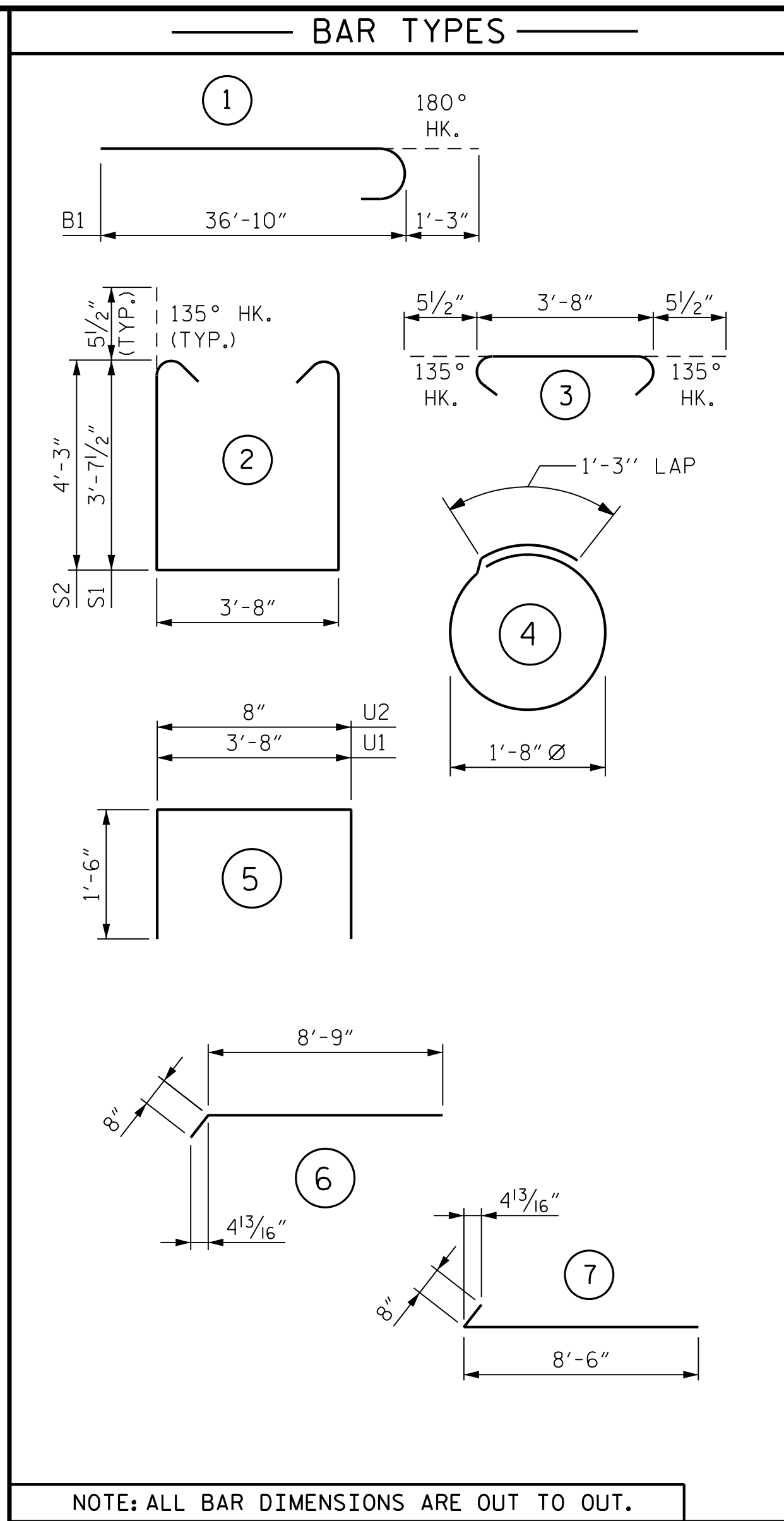
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SECTION B-B



SHEAR KEY DETAIL

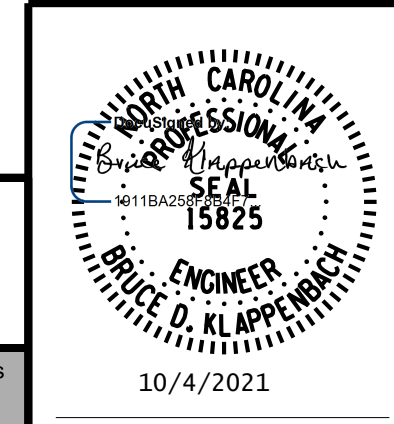


BILL OF MATERIAL					
END BENT 1 - STAGE 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9		38'-1"	1,295
B2	5	#9	STR.	21'-8"	368
B3	5	#9	STR.	25'-9"	438
B4	10	#4	STR.	10'-2"	68
B5	5	#4	STR.	3'-11"	13
B6	12	#5	STR.	28'-7"	358
B7	8	#4	STR.	29'-3"	156
B8	13	#4	STR.	3'-8"	32
B16	2	#5	STR.	23'-7"	49
H1	24	#4		9'-2"	147
K1	20	#4	STR.	29'-3"	391
K2	2	#4	STR.	4'-7"	6
K3	2	#4	STR.	4'-10"	6
S1	46	#5		11'-10"	568
S2	44	#5		13'-1"	600
S3	90	#5		4'-7"	430
S4	28	#4		6'-6"	122
U1	30	#4		6'-8"	134
U2	49	#4		3'-8"	120
V1	98	#5	STR.	8'-0"	818
V2	28	#5	STR.	10'-0"	292
REINFORCING STEEL					6,411 LBS.
CLASS "A" CONCRETE					
POUR 1 (CAP AND LOWER WINGS)					35.7 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)					11.5 C.Y.
TOTAL					47.2 C.Y.
HP 12x53 STEEL PILES					
NO.					8
L.F.					480
STEEL PILE POINTS					8 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES					8 EA.

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 3 OF 3

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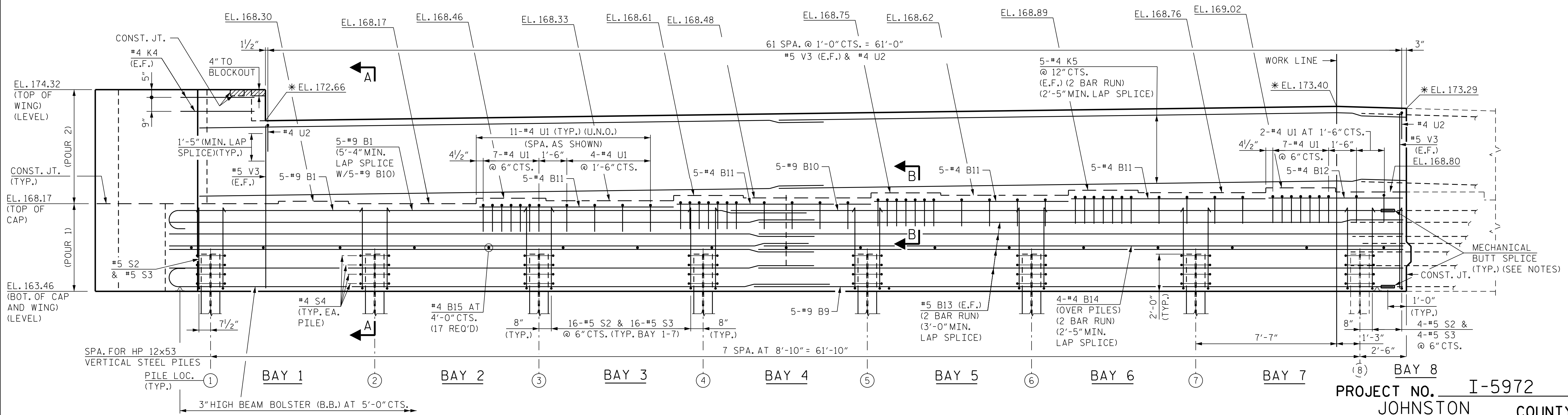
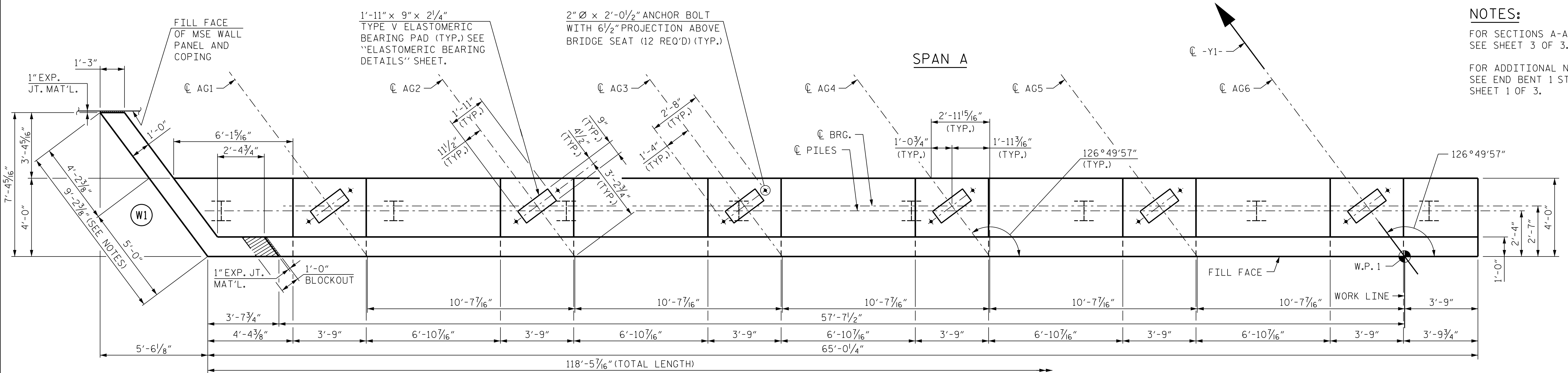
SUBSTRUCTURE
 END BENT 1
 MISCELLANEOUS DETAILS
 AND BILL OF MATERIAL
 STAGE 1

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1			3		
2			4		

SHEET NO. **S-37**
 TOTAL SHEETS 54

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NOTES:
 FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.
 FOR ADDITIONAL NOTES SEE END BENT 1 STAGE 1 SHEET 1 OF 3.



PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 3

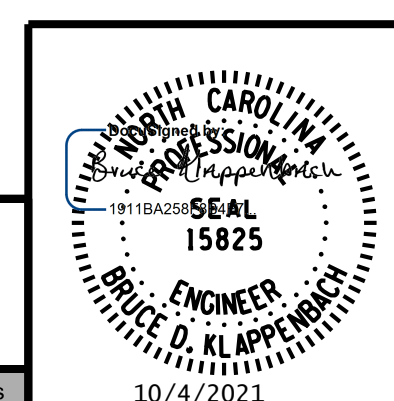
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SUBSTRUCTURE
 END BENT 1
 PLAN AND ELEVATION
 STAGE 2

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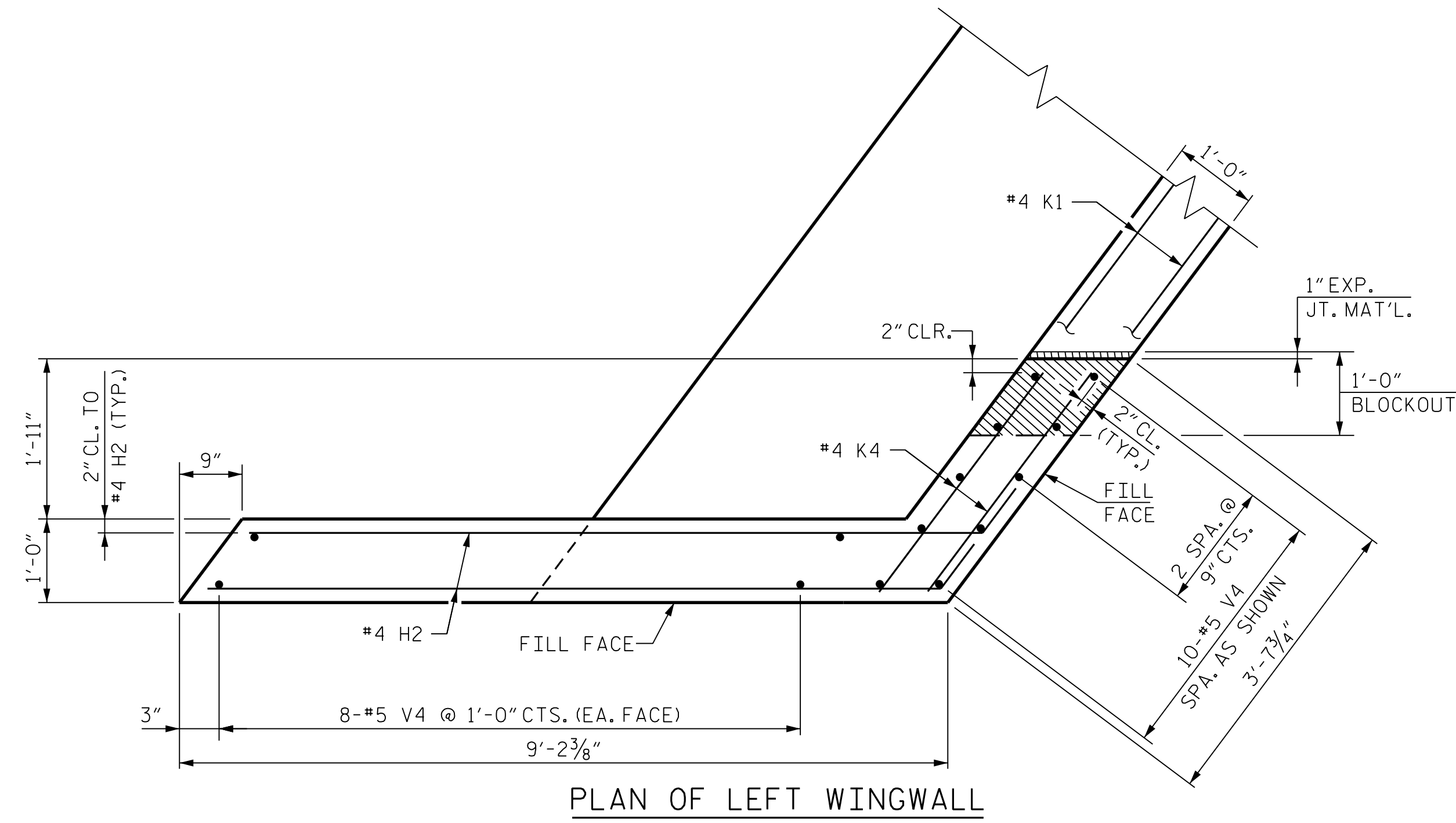
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1			3
2			4

S-38
 TOTAL SHEETS: 54

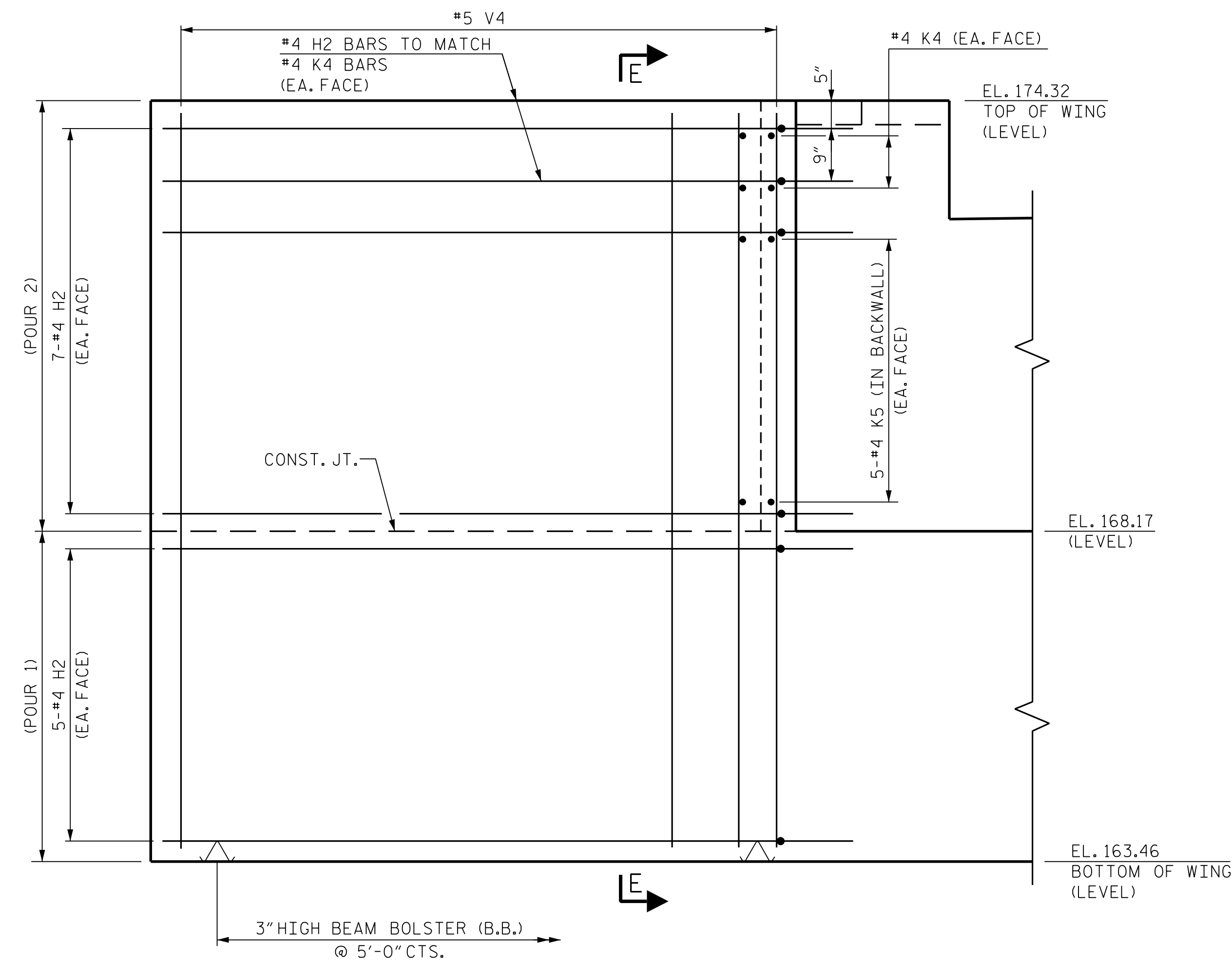
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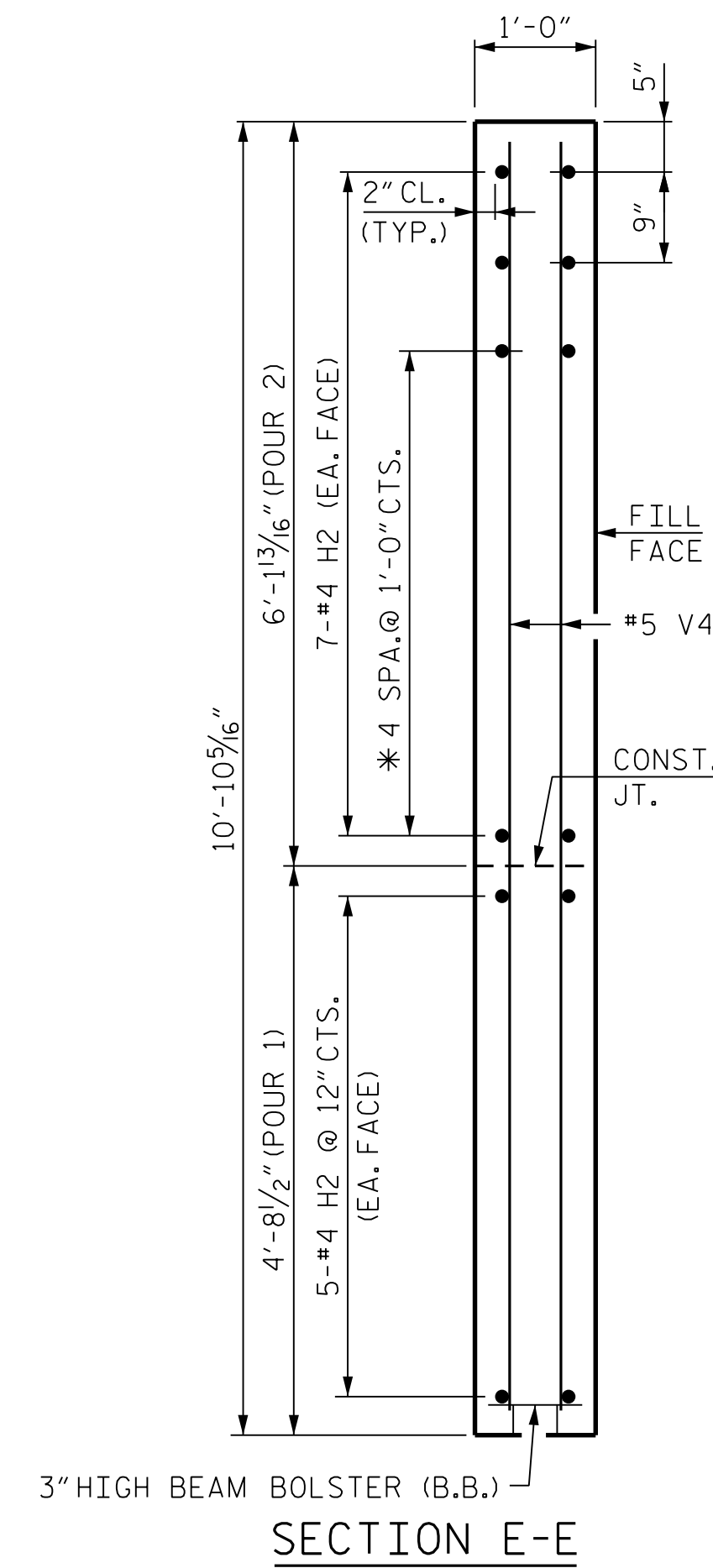
PLAN OF LEFT WINGWALL



ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS

W1



SECTION E-E

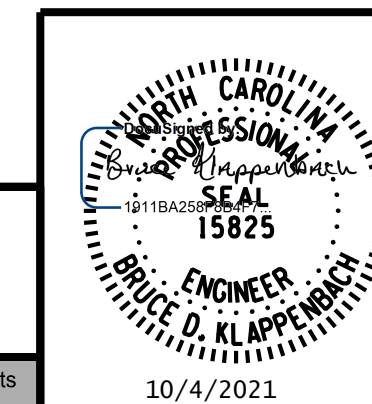
* MATCH TO K5 BARS IN BACKFILL

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE
 END BENT 1
 WINGWALL DETAILS
 STAGE 2



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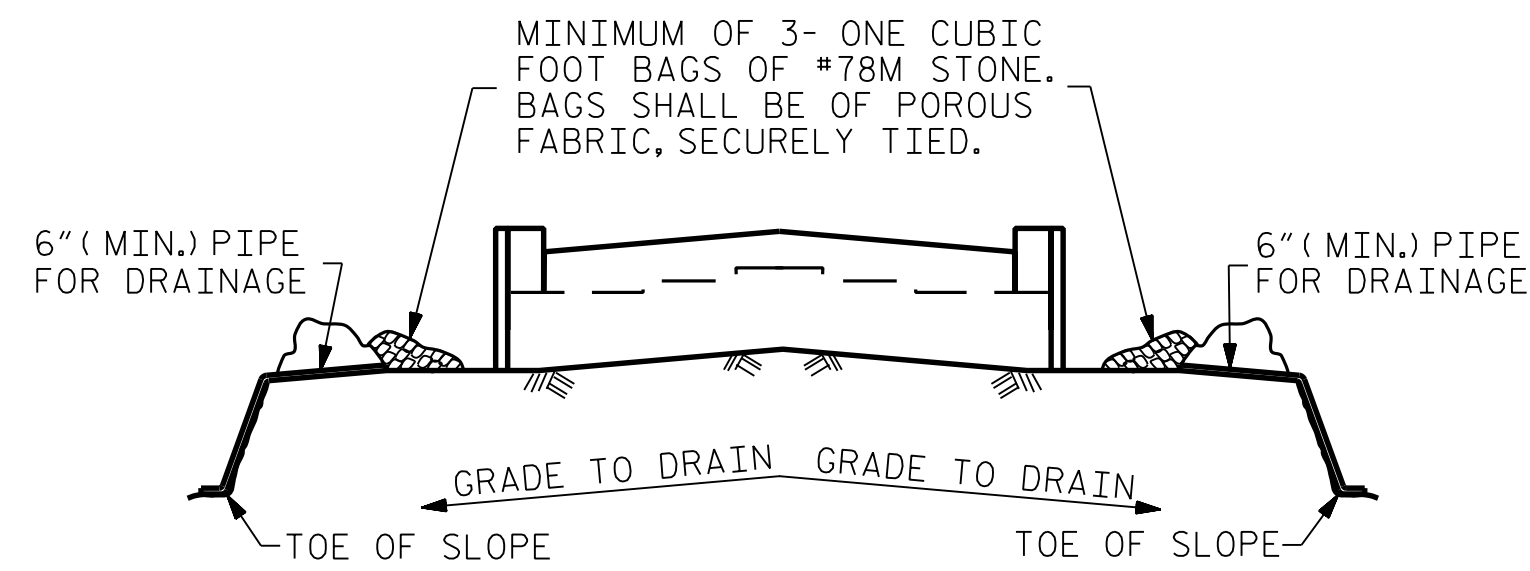
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2			4			TOTAL SHEETS 54

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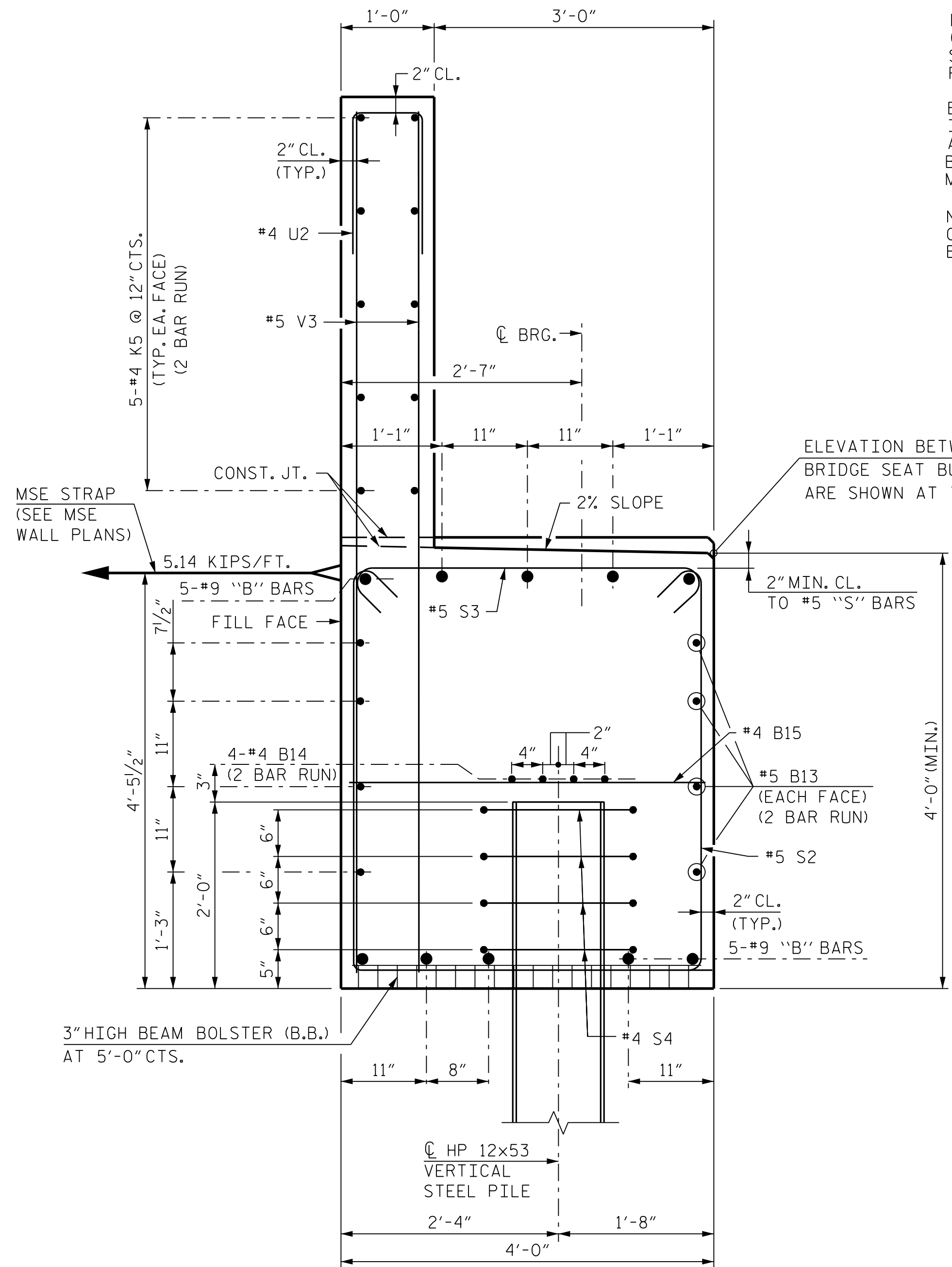


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

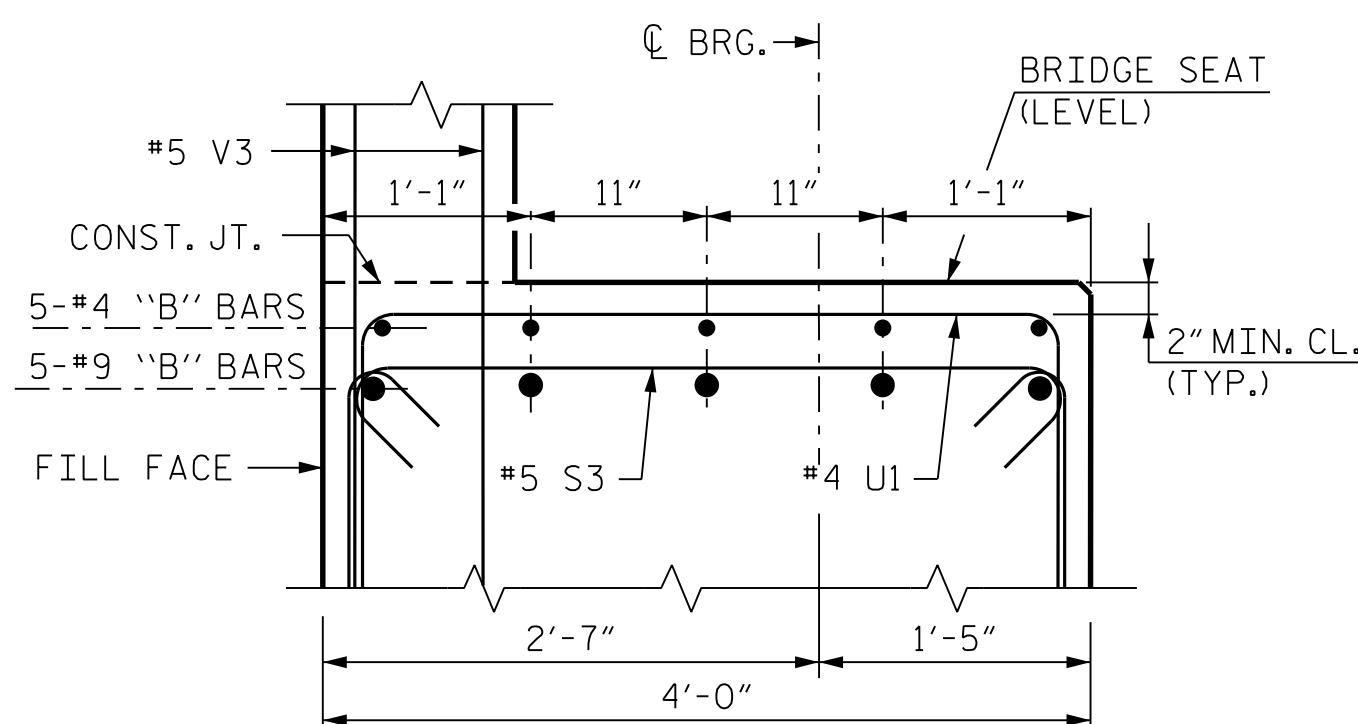
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SECTION B-B

BAR TYPES		BILL OF MATERIAL				
END BENT 1 - STAGE 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9		38'-1"	1,295	
B9	5	#9	STR.	34'-2"	581	
B10	5	#9	STR.	35'-5"	602	
B11	20	#4	STR.	10'-5"	139	
B12	5	#4	STR.	6'-3"	21	
B13	16	#5	STR.	34'-11"	583	
B14	8	#4	STR.	35'-1"	187	
B15	17	#4	STR.	3'-8"	42	
H2	24	#4		9'-5"	151	
K5	20	#4	STR.	34'-0"	454	
K4	4	#4	STR.	3'-2"	8	
S2	117	#5		13'-1"	1,597	
S3	117	#5		4'-7"	559	
S4	32	#4		6'-6"	139	
U1	53	#4		6'-8"	236	
U2	62	#4		3'-8"	152	
V3	124	#5	STR.	8'-9"	1,132	
V4	26	#5	STR.	10'-5"	282	
REINFORCING STEEL					8,160 LBS.	
CLASS "A" CONCRETE						
POUR 1 (CAP AND LOWER WINGS)					51.6 C.Y.	
POUR 2 (BACKWALL & UPPER WINGS)					13.2 C.Y.	
TOTAL					64.8 C.Y.	
HP 12x53 STEEL PILES						
NO.					7	
L.F.					420	
STEEL PILE POINTS					7 EA.	
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES					7 EA.	

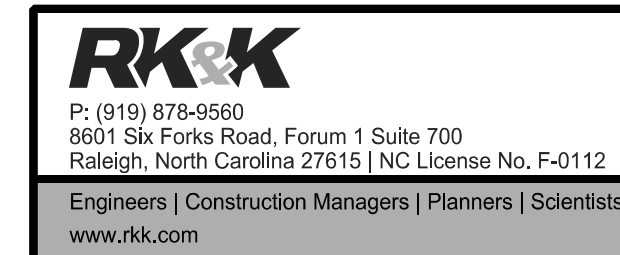
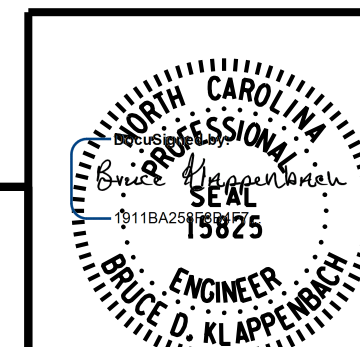
NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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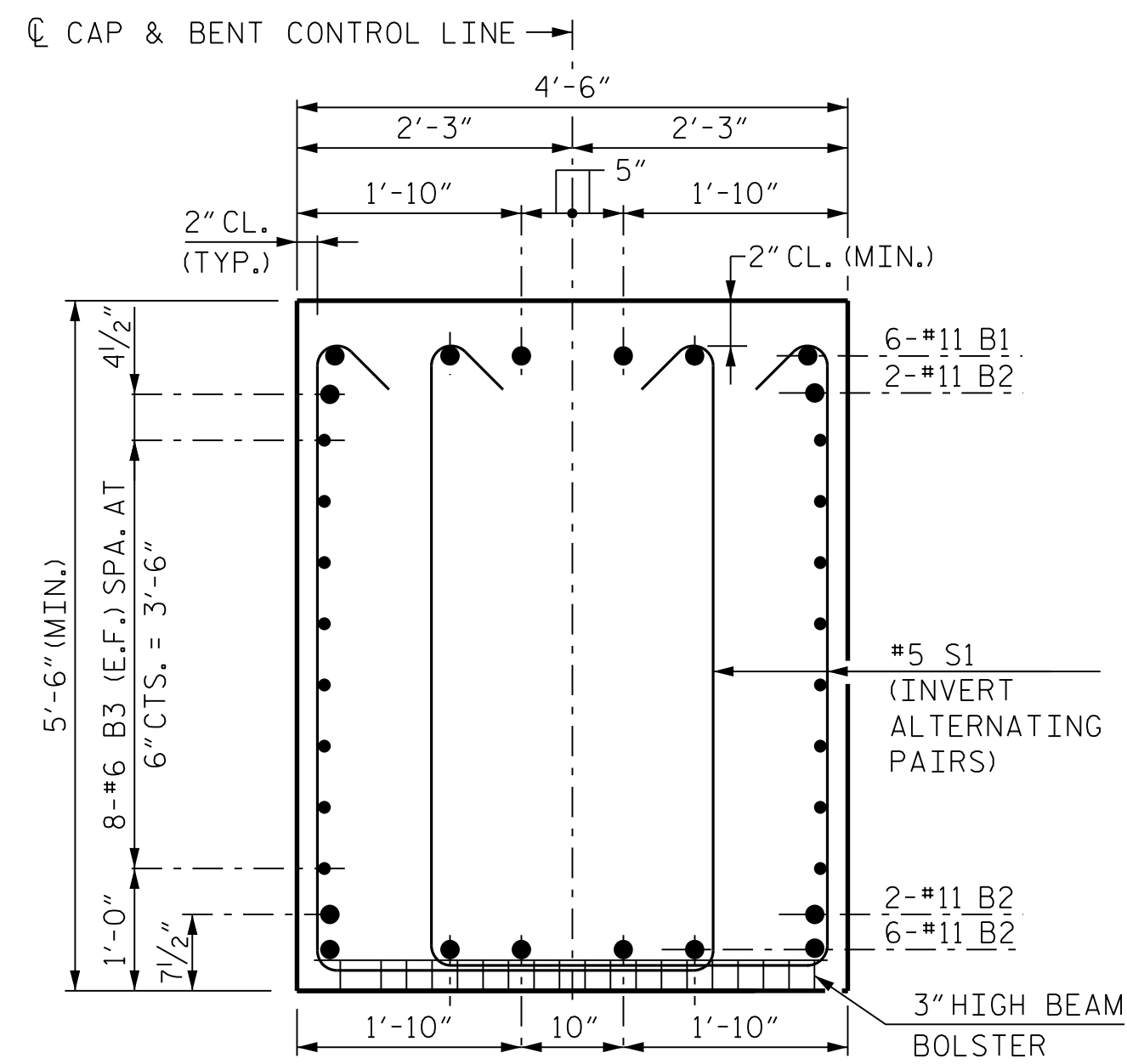
SUBSTRUCTURE
 END BENT 1
 MISCELLANEOUS DETAILS
 AND BILL OF MATERIAL
 STAGE 2



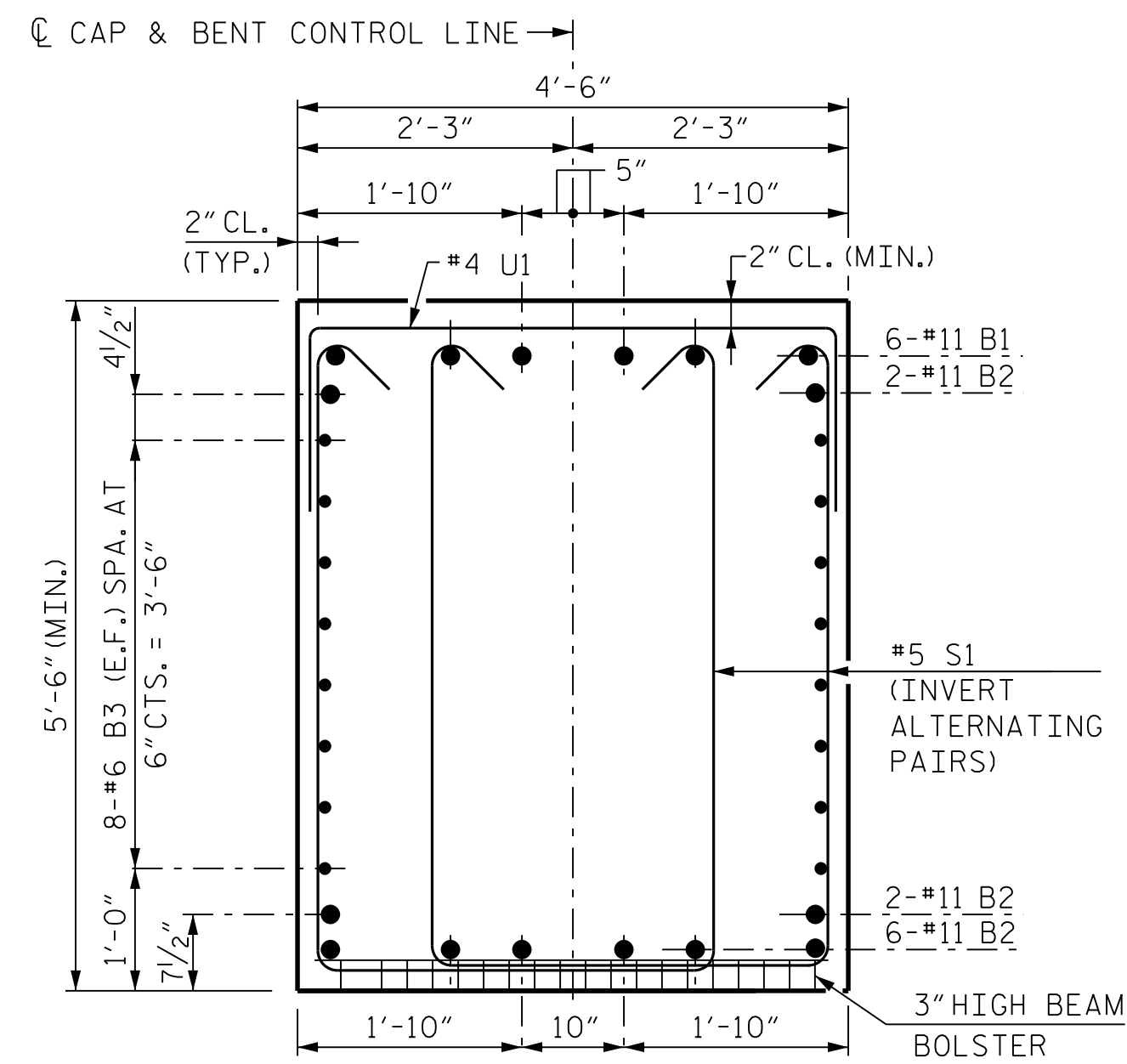
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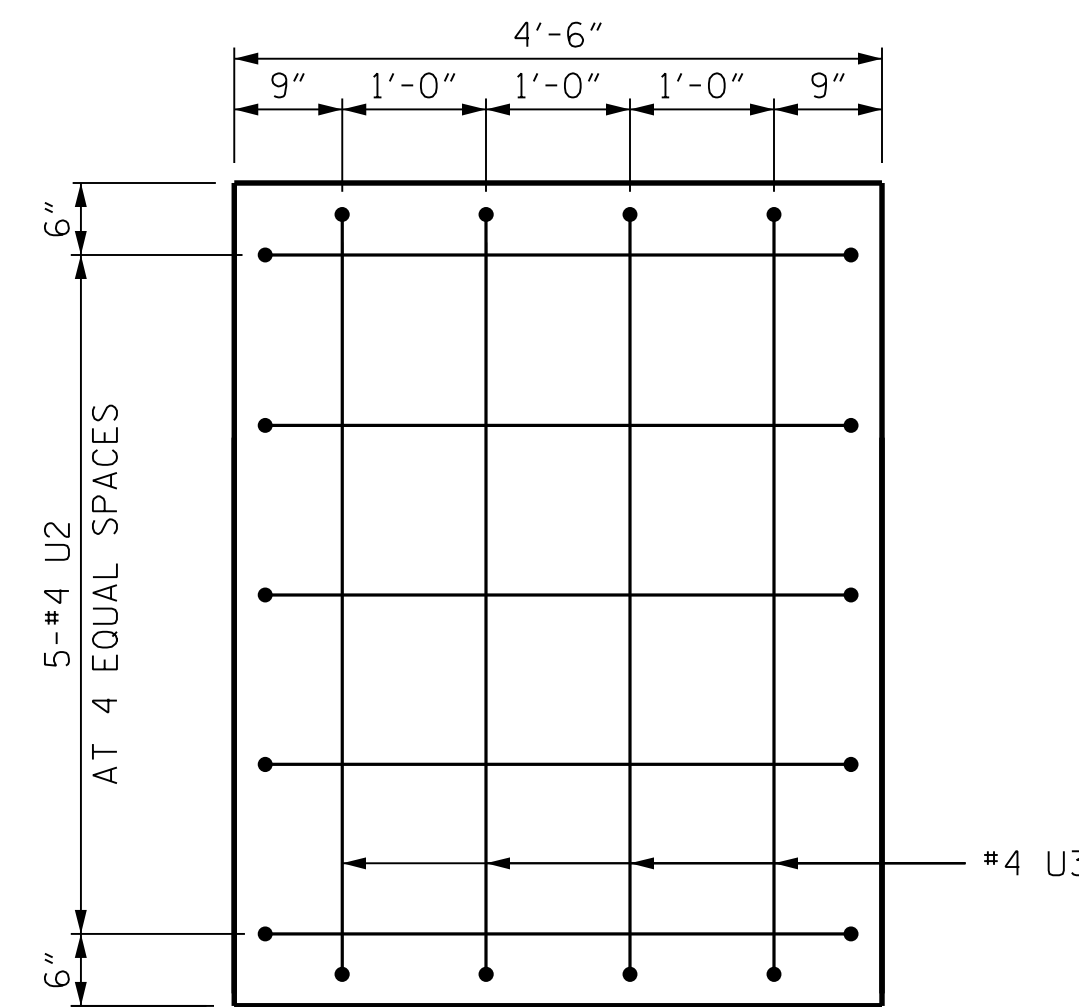
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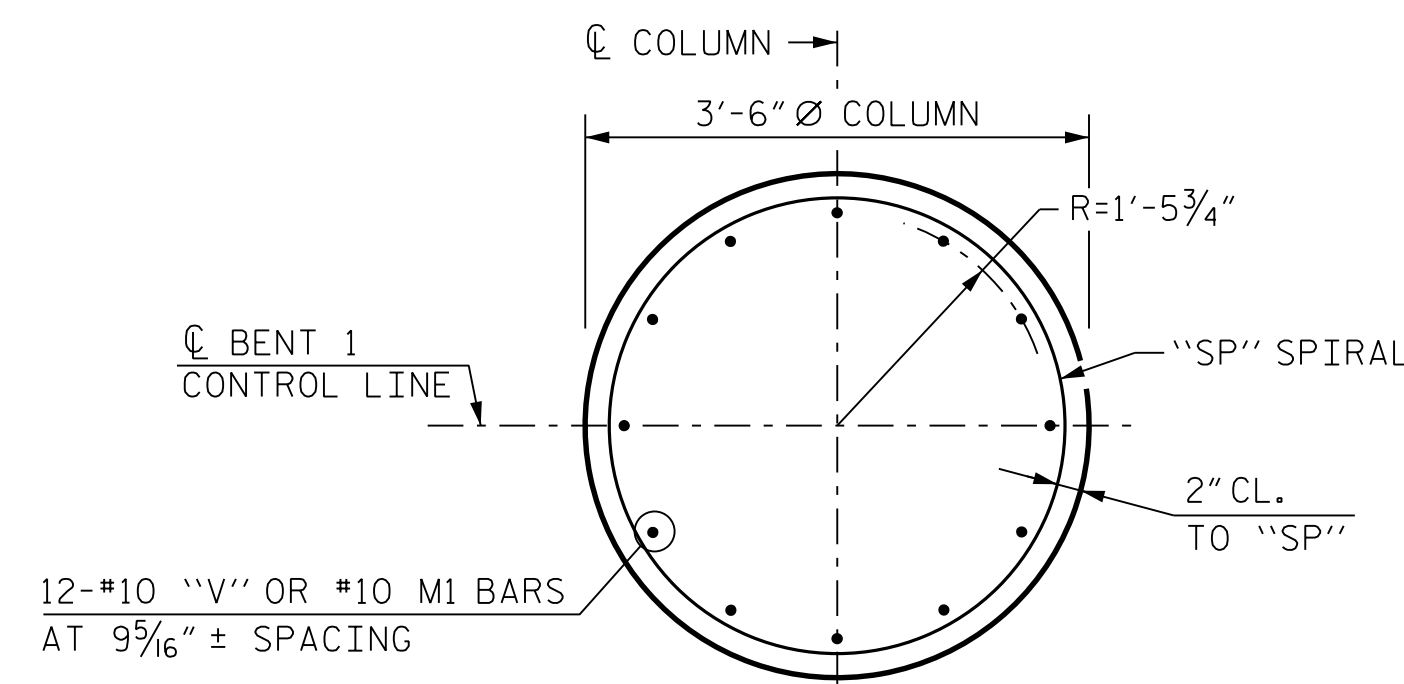
SECTION A-A



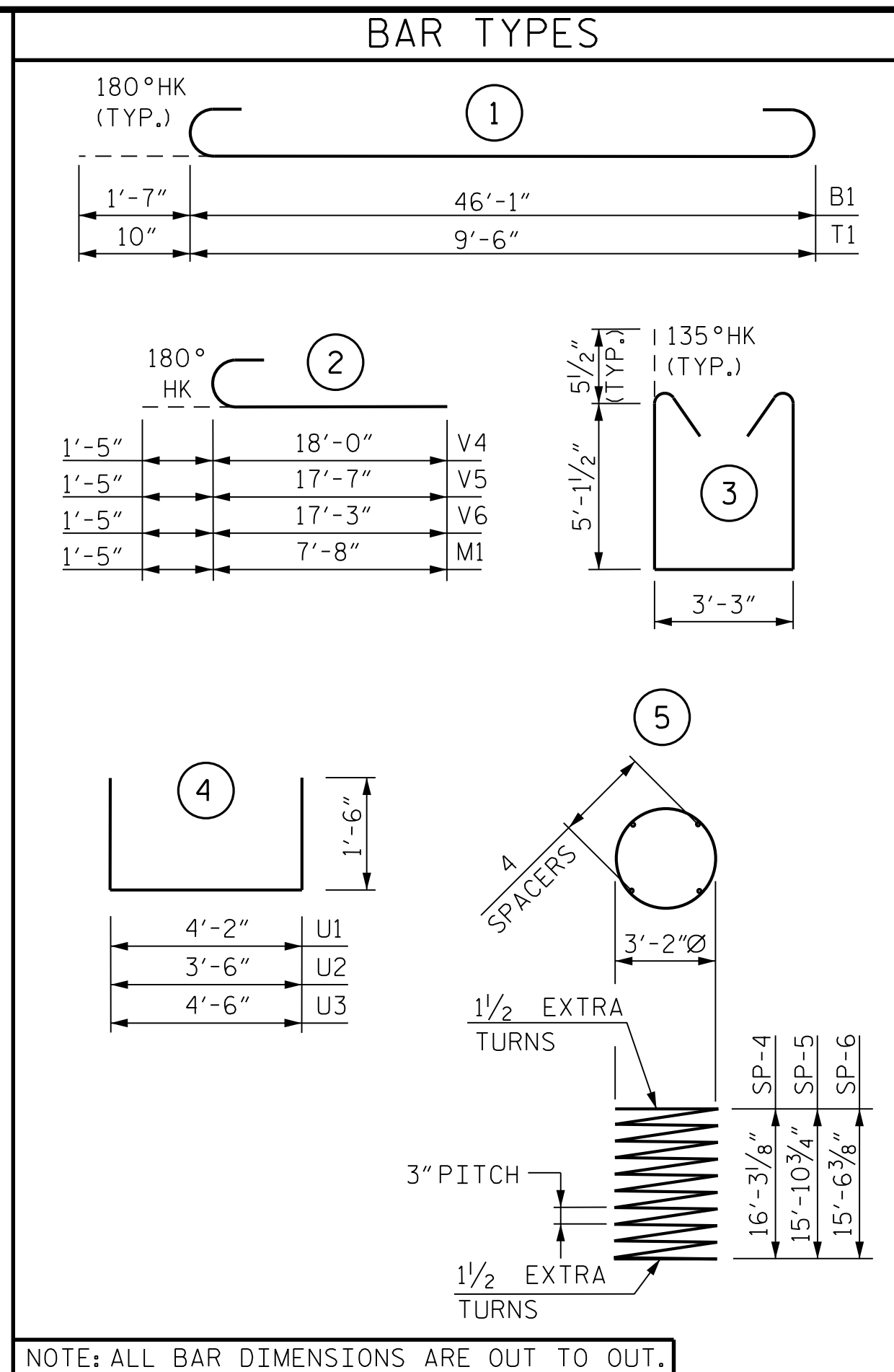
SECTION B-B



END OF CAP DETAIL



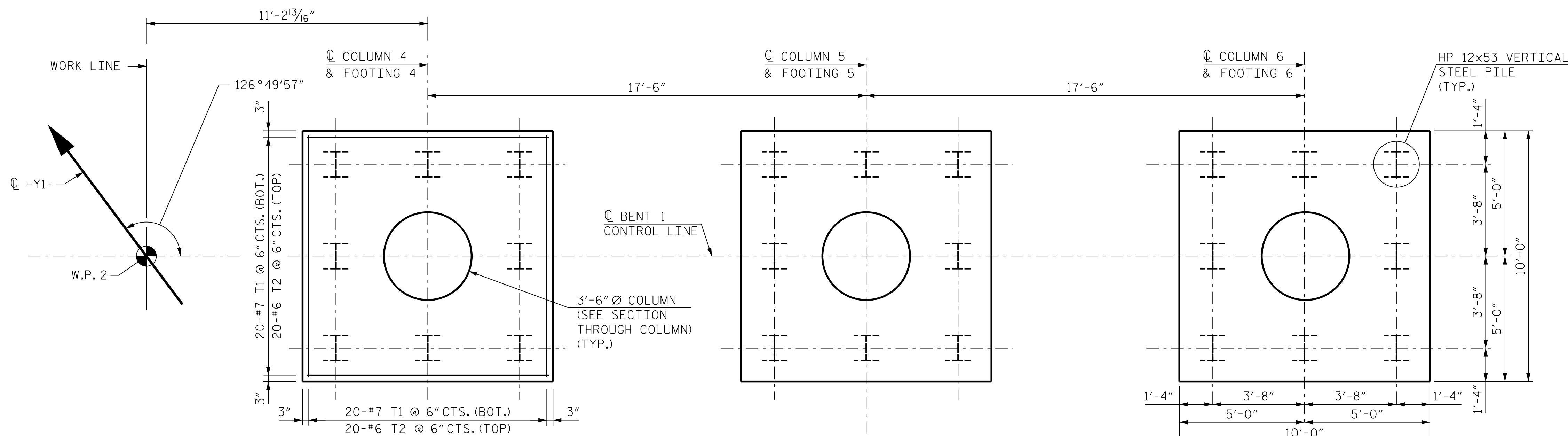
SECTION THROUGH COLUMN



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1 - STAGE 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11		49'-3"	1,570
B2	10	#11	STR.	46'-2"	2,453
B3	16	#6	STR.	46'-2"	1,109
M1	36	#10		9'-1"	1,407
S1	164	#5		14'-5"	2,466
T1	120	#7		11'-2"	2,739
T2	120	#6	STR.	9'-6"	1,712
U1	45	#4		7'-2"	215
U2	10	#4		6'-6"	43
U3	8	#4		7'-6"	40
V4	12	#10		19'-5"	1,003
V5	12	#10		19'-0"	981
V6	12	#10		18'-8"	964
REINFORCING STEEL					16,702 LBS.
SP-4	1	*	5	668'-3"	446
SP-5	1	*	5	654'-1"	437
SP-6	1	*	5	639'-7"	427
SPIRAL COLUMN REINFORCING STEEL					1,310 LBS.
* "SP" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS "A" CONCRETE					
POUR 1 (FOOTINGS)					47.2 C.Y.
POUR 2 (COLUMNS)					16.7 C.Y.
POUR 3 (CAP)					43.6 C.Y.
TOTAL					107.5 C.Y.
HP 12x53 STEEL PILES					
NO.	24				
L.F.	960				
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES					24 EA.



PLAN OF FOOTINGS

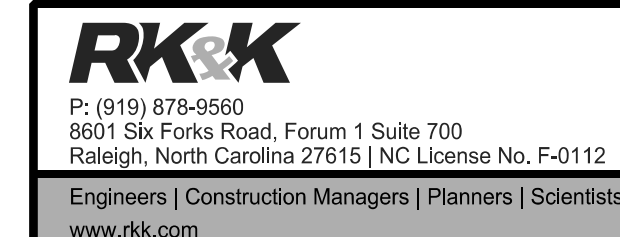
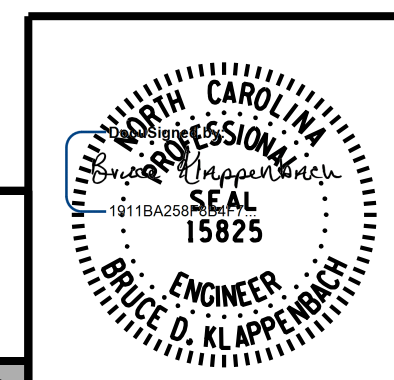
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING)

PROJECT NO. I-5972
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 STATION: 36+93.50 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 BENT 1
 DETAILS AND
 BILL OF MATERIAL
 STAGE 1



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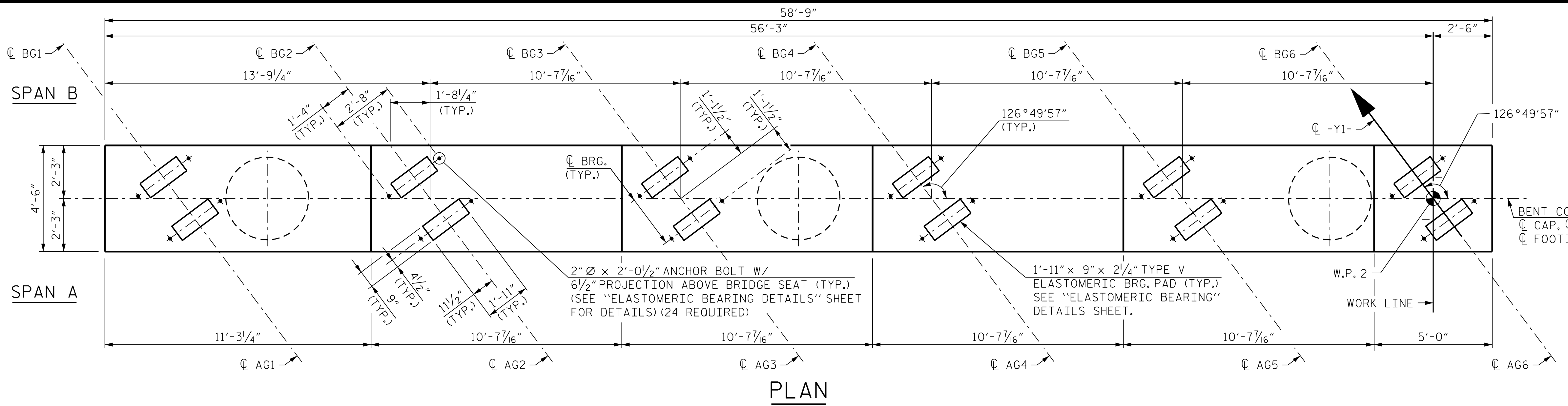
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SHEET NO.	
S-42	TOTAL SHEETS
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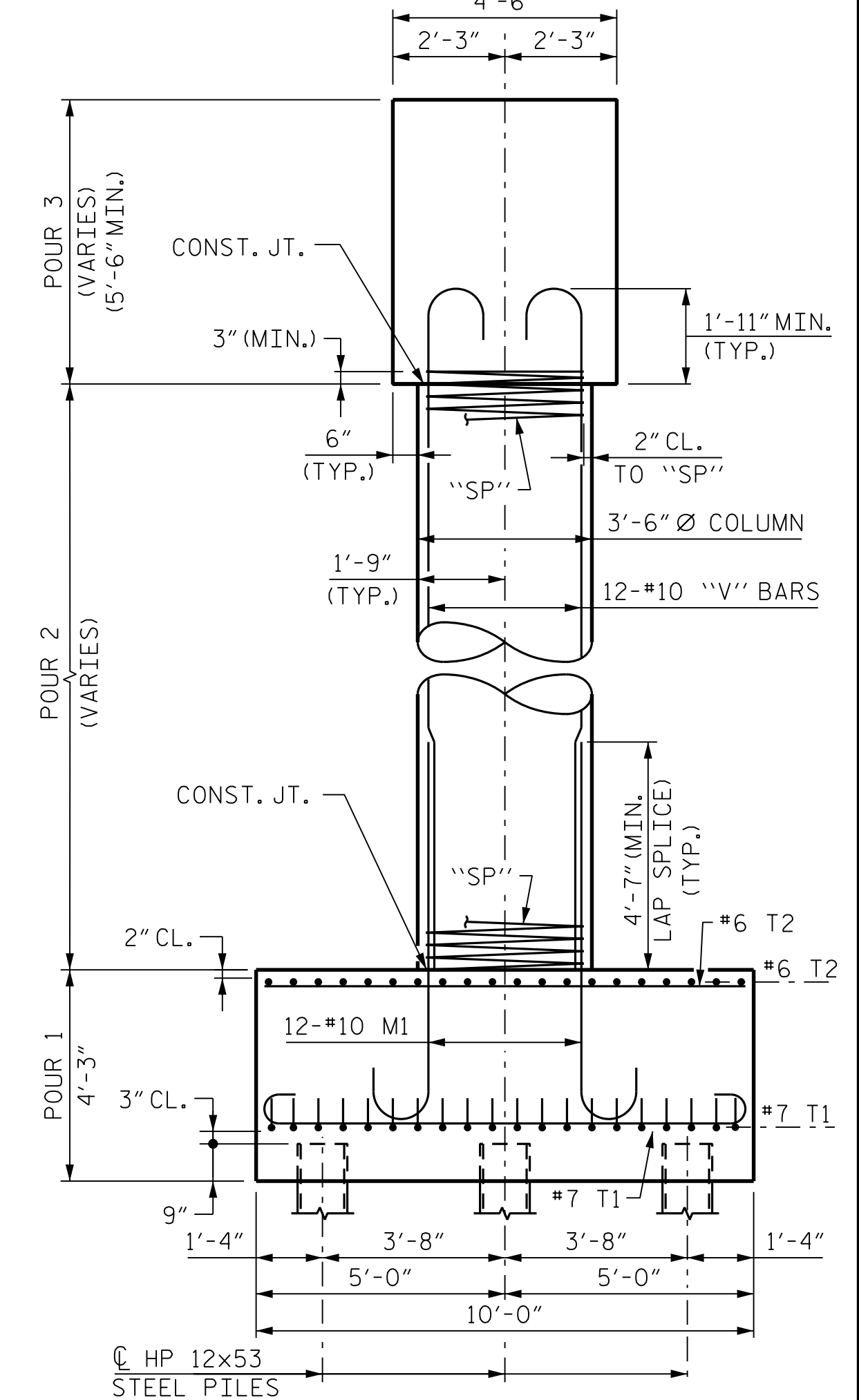
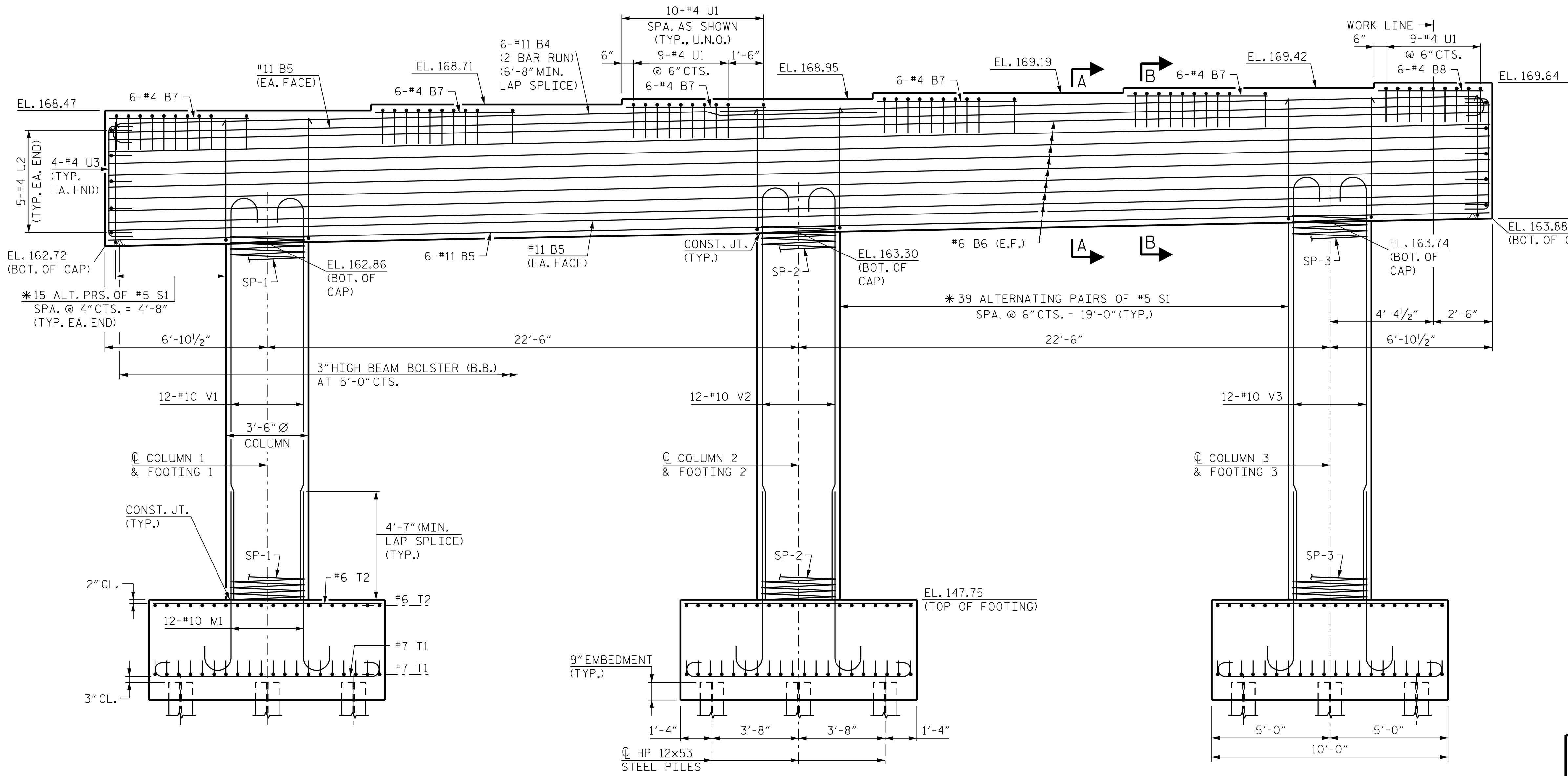
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NOTES:
 FOR SECTIONS A-A AND B-B, SEE SHEET 2 OF 2.
 FOR SECTION THROUGH COLUMN, SEE SHEET 2 OF 2.
 HOOKS ON "V" AND "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE END BENT 2 STAGE 1 SHEET 3 OF 3.



(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING AND COLUMN)

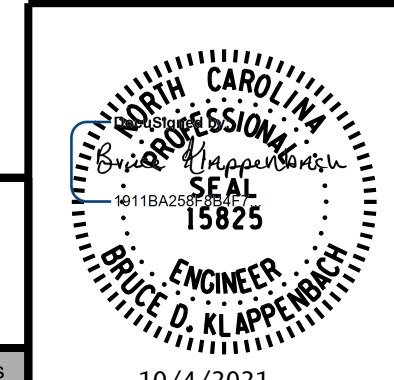
PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING, UNLESS NOTED OTHERWISE)
 * INVERT ALTERNATE PAIRS OF STIRRUPS

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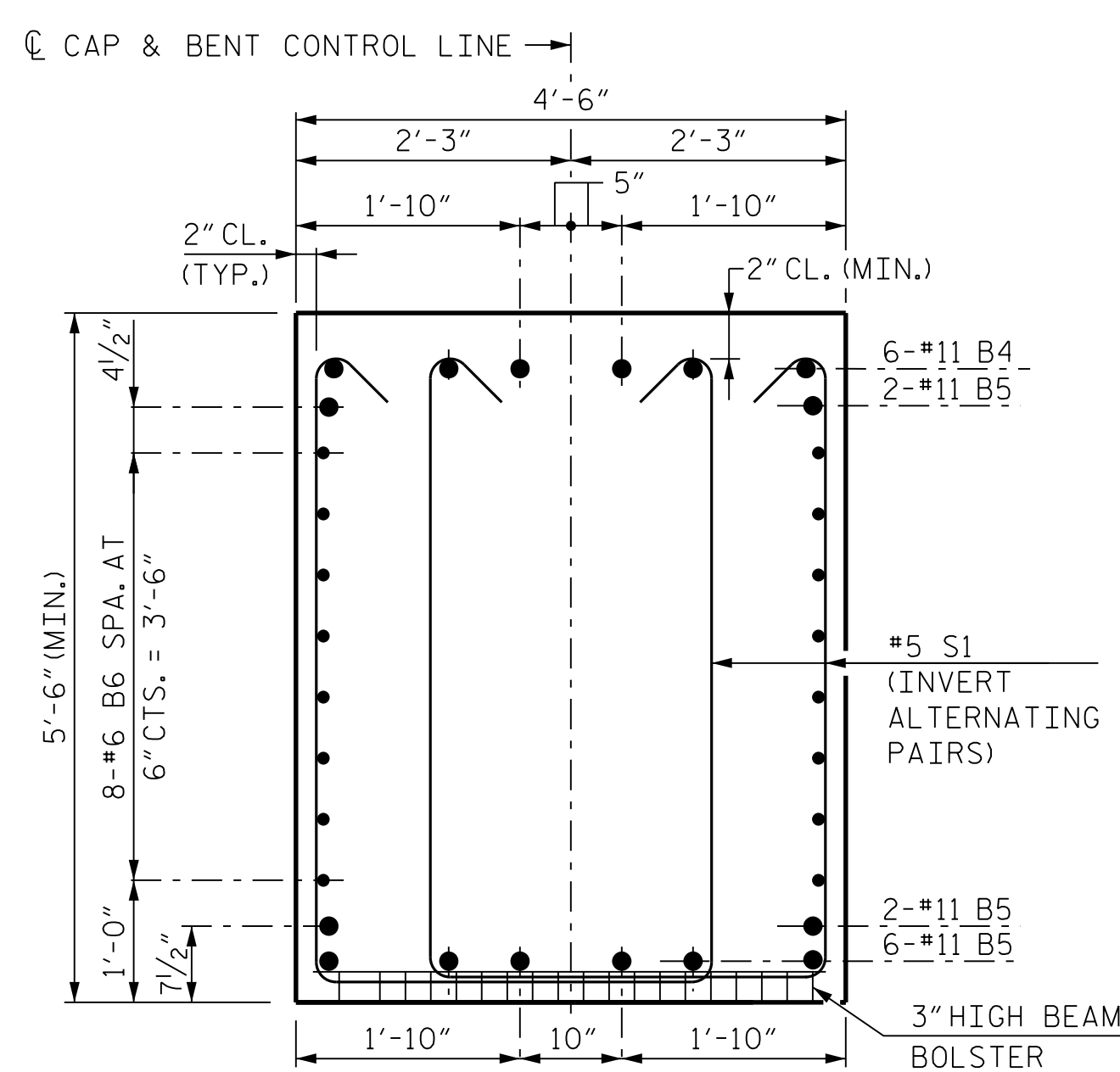
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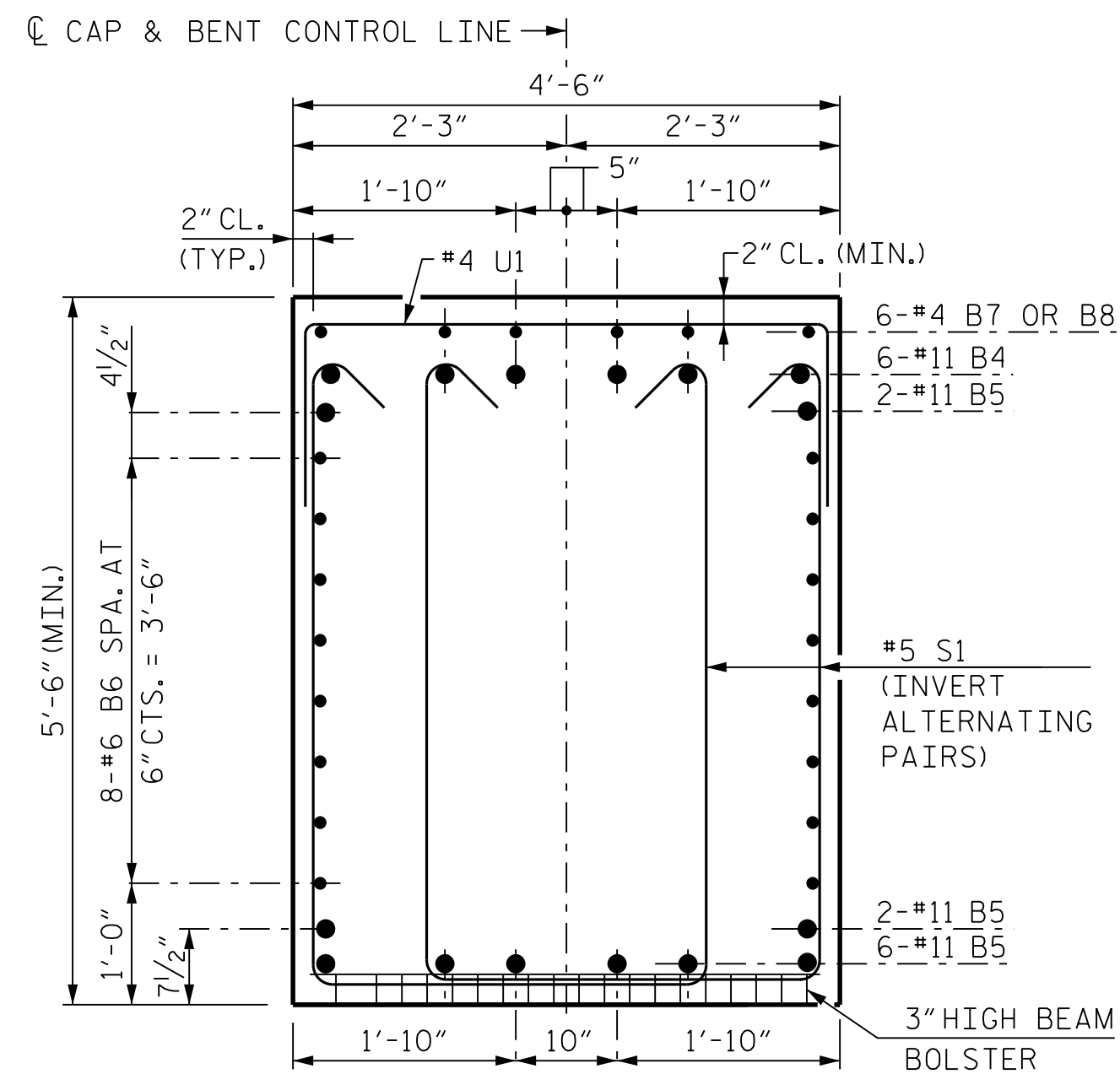


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
PLAN AND ELEVATION					
STAGE 2					
SHEET NO. S-43					
TOTAL SHEETS 54					
REVISIONS					
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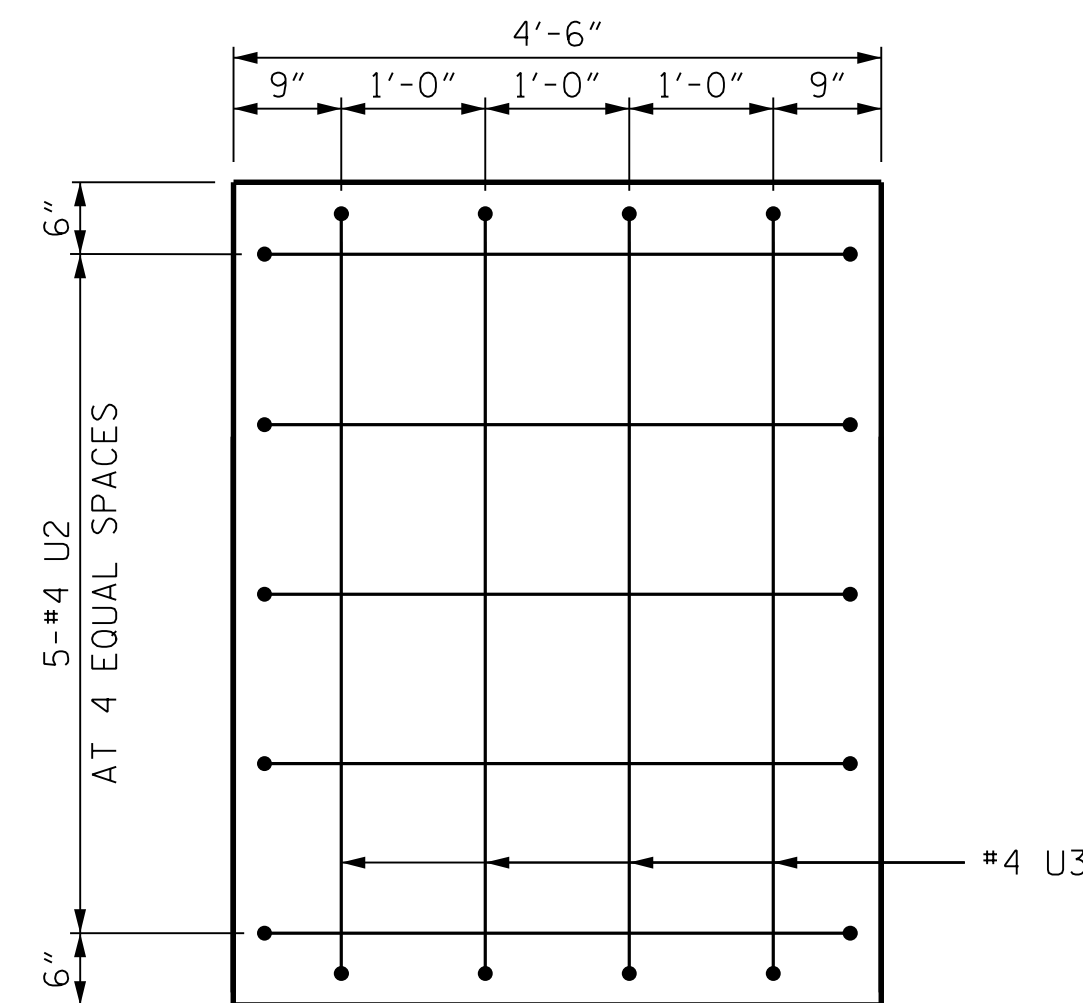
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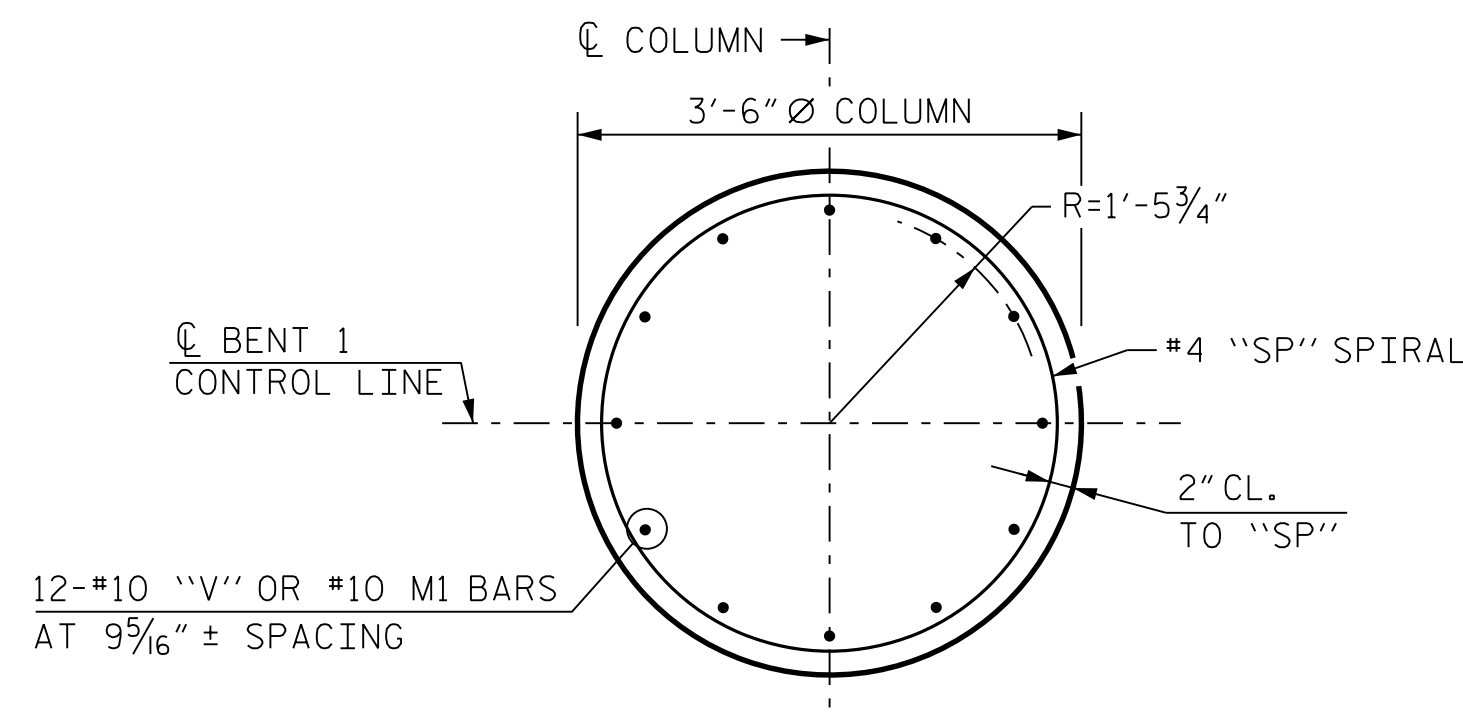
SECTION A-A



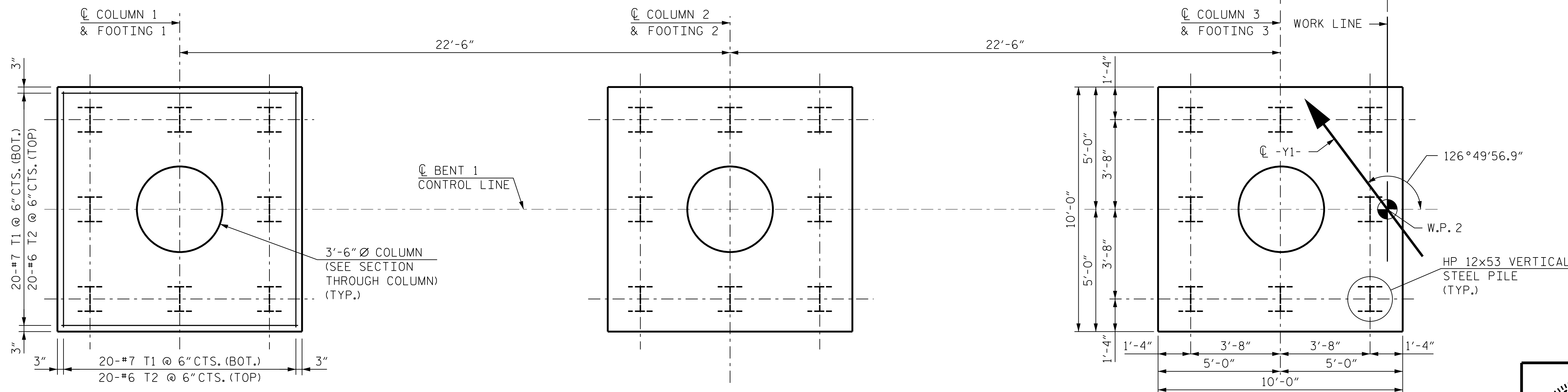
SECTION B-B



END OF CAP DETAIL



SECTION THROUGH COLUMN



PLAN OF FOOTINGS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING)

BAR TYPES

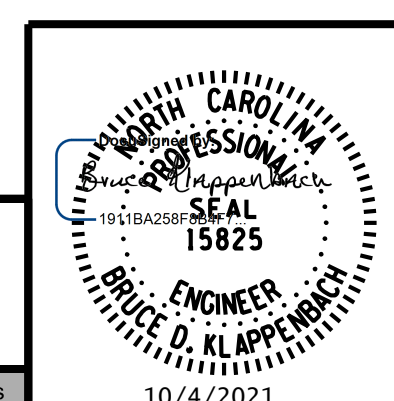
NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 1 - STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	12	#11		34'-1"	2,173
B5	10	#11	STR.	58'-5"	3,104
B6	16	#6	STR.	58'-5"	1,404
B7	30	#4	STR.	6'-0"	120
B8	6	#4	STR.	4'-6"	18
M1	36	#10		9'-1"	1,407
S1	216	#5		14'-6"	3,267
T1	120	#7		11'-2"	2,739
T2	120	#6	STR.	9'-6"	1,712
U1	59	#4		7'-2"	282
U2	10	#4		6'-6"	43
U3	8	#4		7'-6"	40
V1	12	#10		18'-6"	955
V2	12	#10		18'-11"	977
V3	12	#10		19'-5"	1,003
REINFORCING STEEL				19,244	LBS.
SP-1	1	*	5	633'-6"	423
SP-2	1	*	5	650'-3"	434
SP-3	1	*	5	667'-10"	446
SPIRAL COLUMN REINFORCING STEEL				1,303	LBS.
* "SP" SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS "A" CONCRETE					
POUR 1 (FOOTINGS)				47.2	C.Y.
POUR 2 (COLUMNS)				16.6	C.Y.
POUR 3 (CAP)				55.9	C.Y.
TOTAL				119.7	C.Y.
HP 12x53 STEEL PILES					
NO.	24				
L.F.	960				
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES				24	EA.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 BENT 1
 DETAILS AND
 BILL OF MATERIAL
 STAGE 2



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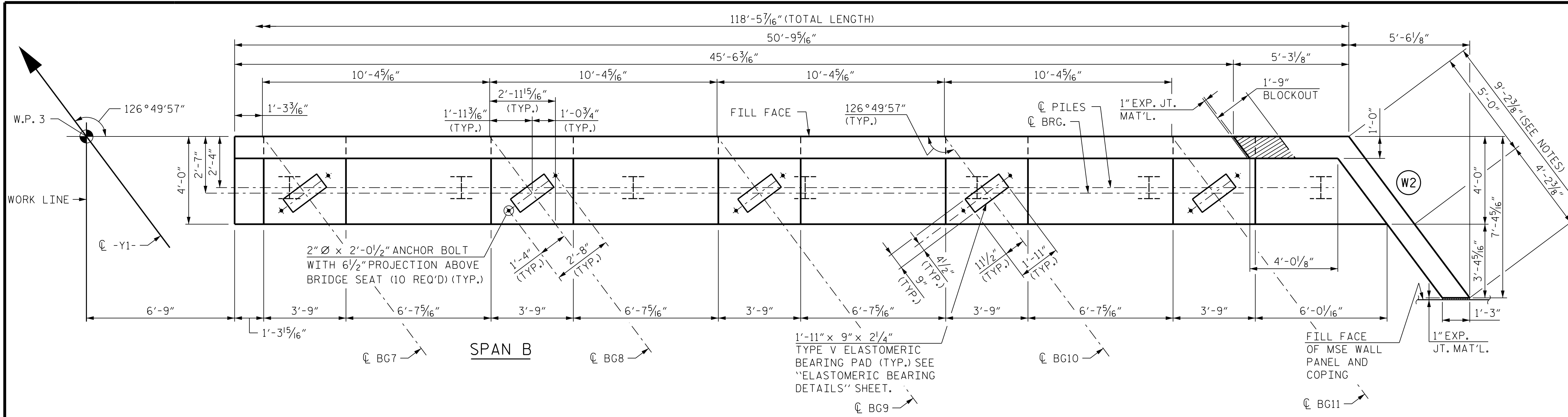
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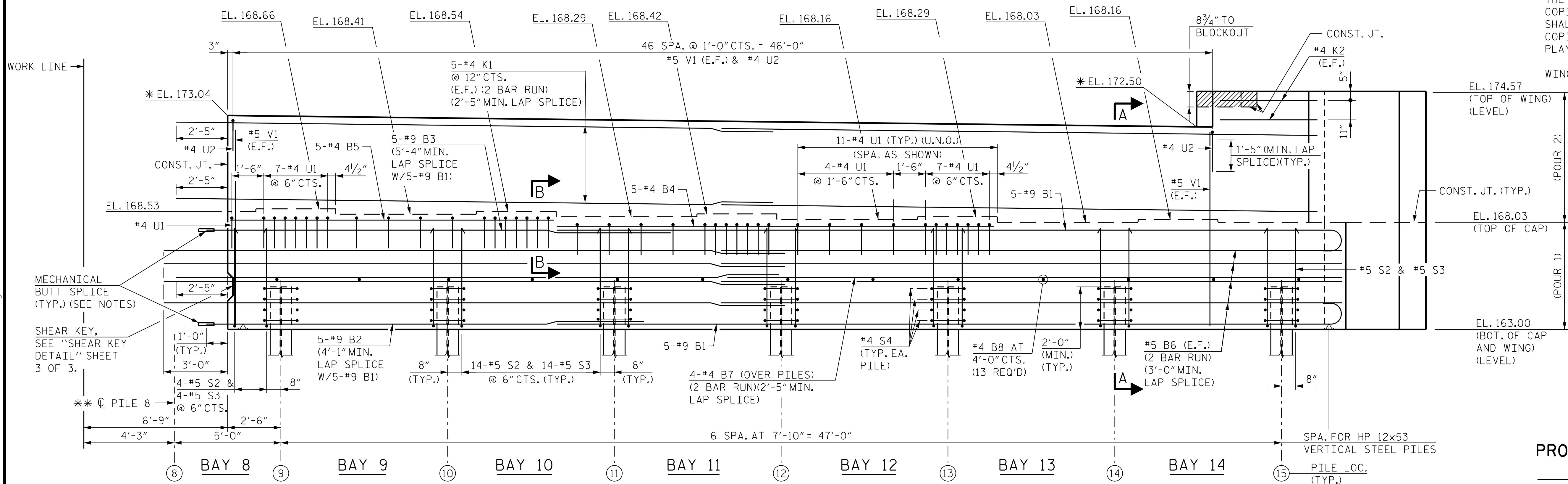
SHEET NO.	
S-44	TOTAL SHEETS 54

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 BHAAG

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PLAN



ELEVATION

* ELEVATION AT FILL FACE

** PILE 8 IS LOCATED WITH STAGE 2 END BENT CONSTRUCTION BUT SHALL BE DRIVEN DURING STAGE 1 FOUNDATION CONSTRUCTION.

NOTES:

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

FOR PILE SPLICE DETAILS, SEE END BENT 2 STAGE 1, SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE, SEE END BENT 1 STAGE 2, SHEET 3 OF 3.

STIRRUPS IN THE 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, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE PARAPETS ARE CAST IF SLIP FORMING IS USED.

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

WING LENGTH IS BASED ON THE MSE WALL COPING BEING FLUSH WITH THE FILL FACE OF THE MSE WALL PANEL. IF AN ALTERNATE COPING DETAIL IS USED, THE CONTRACTOR SHALL ADJUST THE LENGTH OF THE WING FOR COPING DETAILS, SEE MSE RETAINING WALL PLANS.

WING IS PARALLEL TO -Y1-.

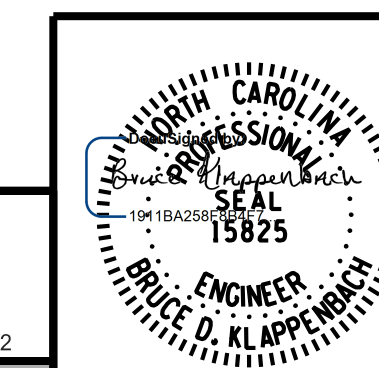
FOR MECHANICAL BUTT SPLICING OF REINFORCING STEEL, SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.

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SHEET 1 OF 3

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SUBSTRUCTURE
END BENT 2
PLAN AND ELEVATION
STAGE 1



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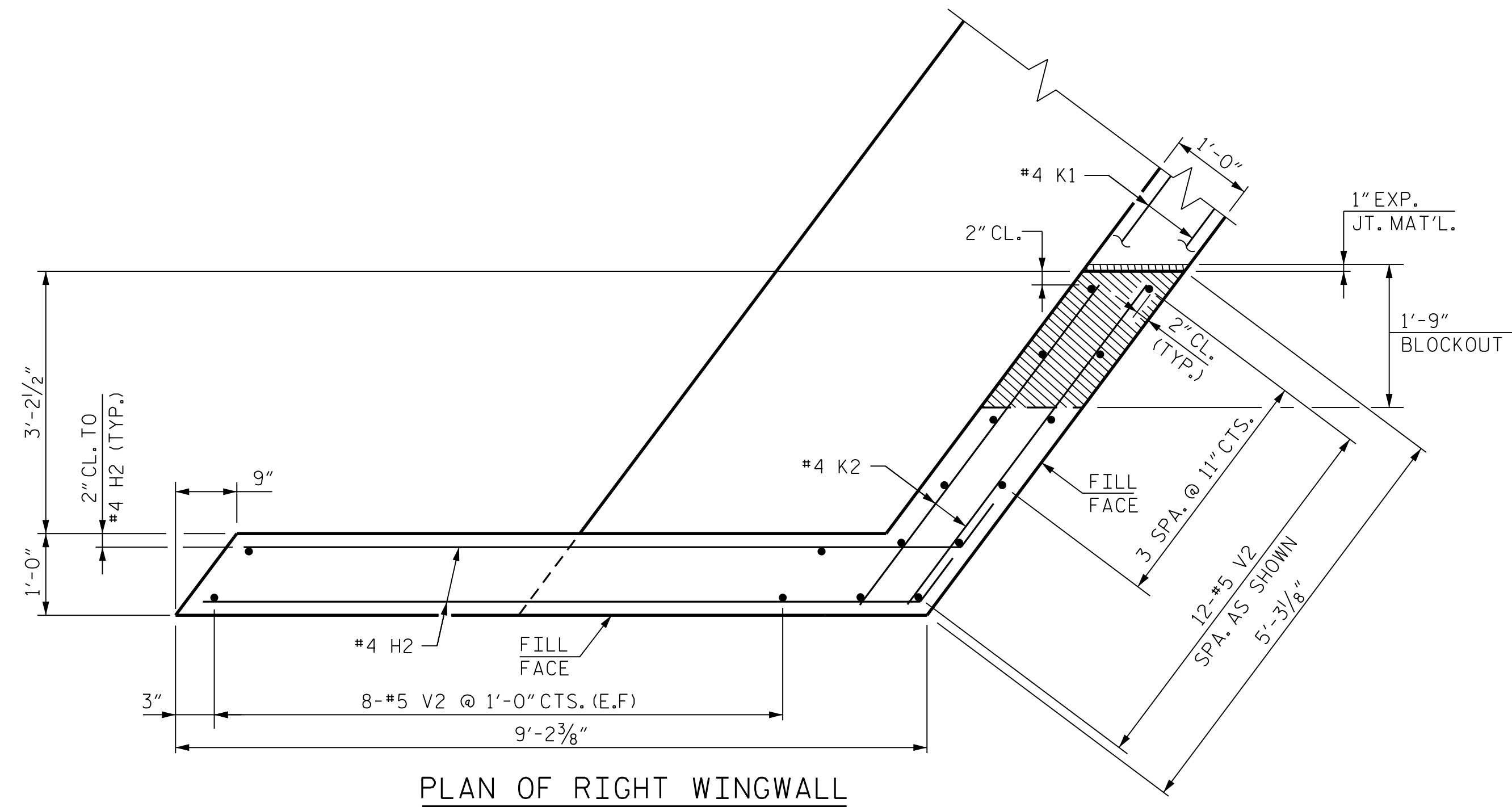
REVISIONS

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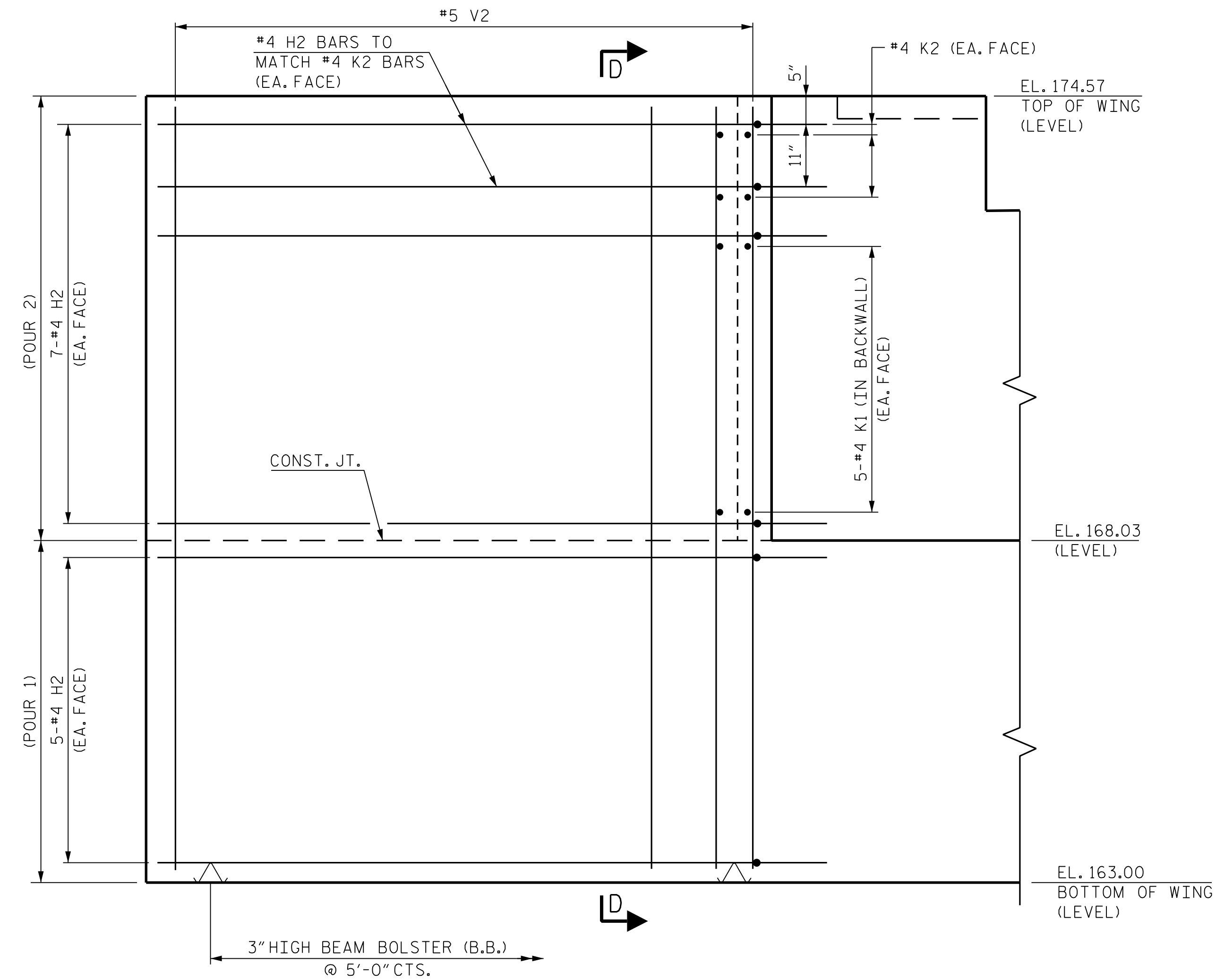
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S-45
TOTAL SHEETS
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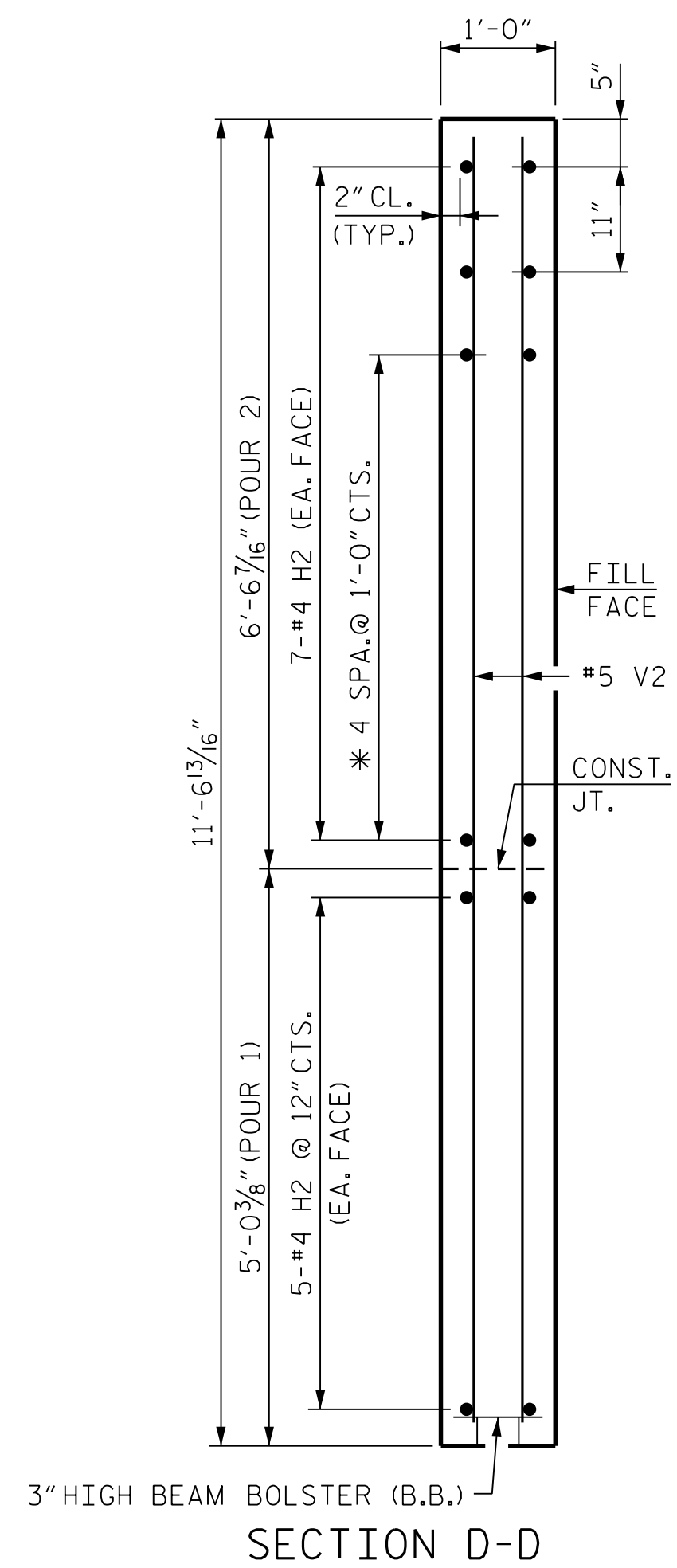


PLAN OF RIGHT WINGWALL



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)



3\"/>

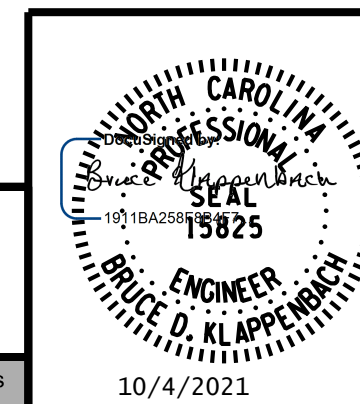
* MATCH TO K1 BARS
IN BACKWALL

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 END BENT 2
 WINGWALL DETAILS
 STAGE 1



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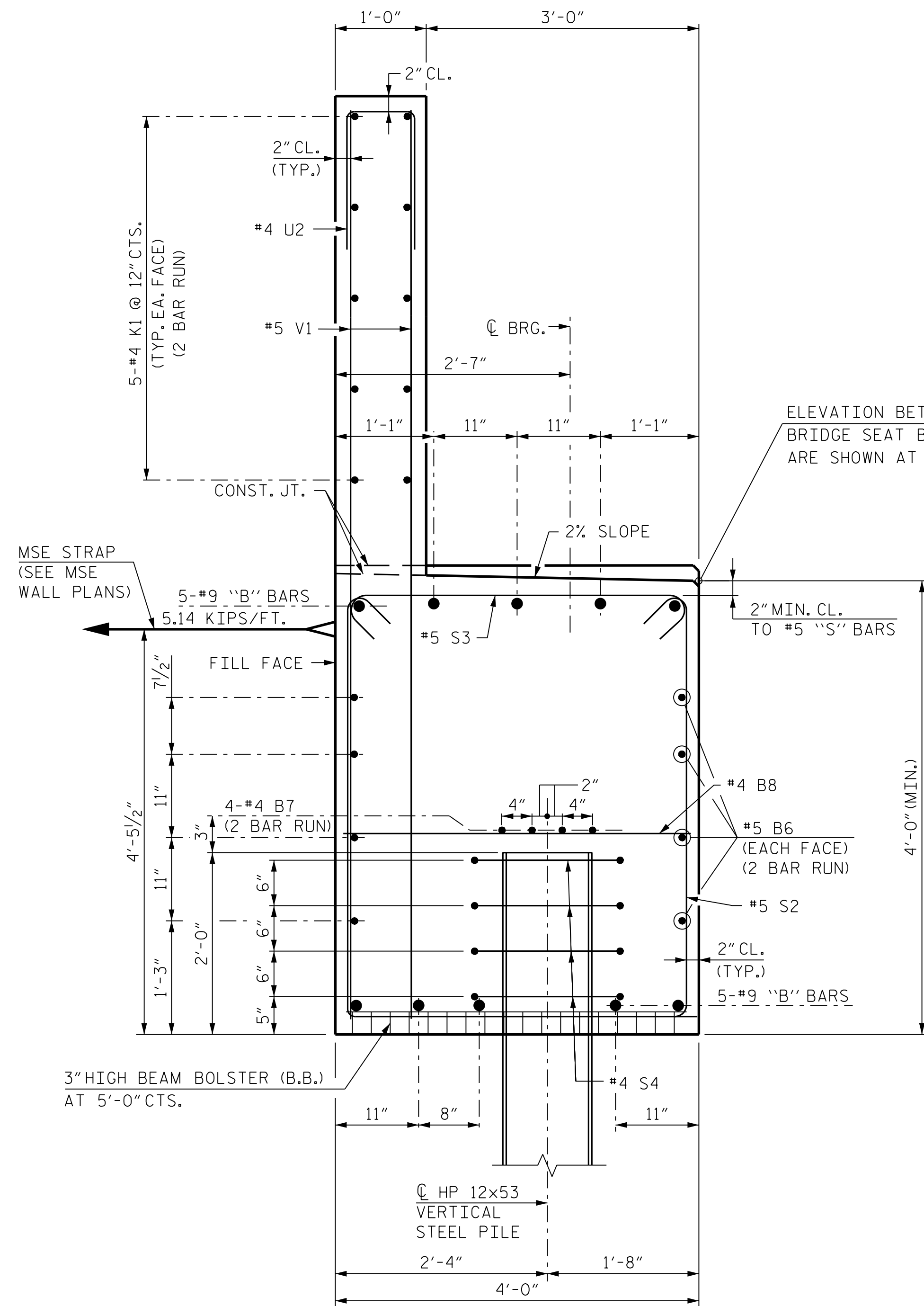
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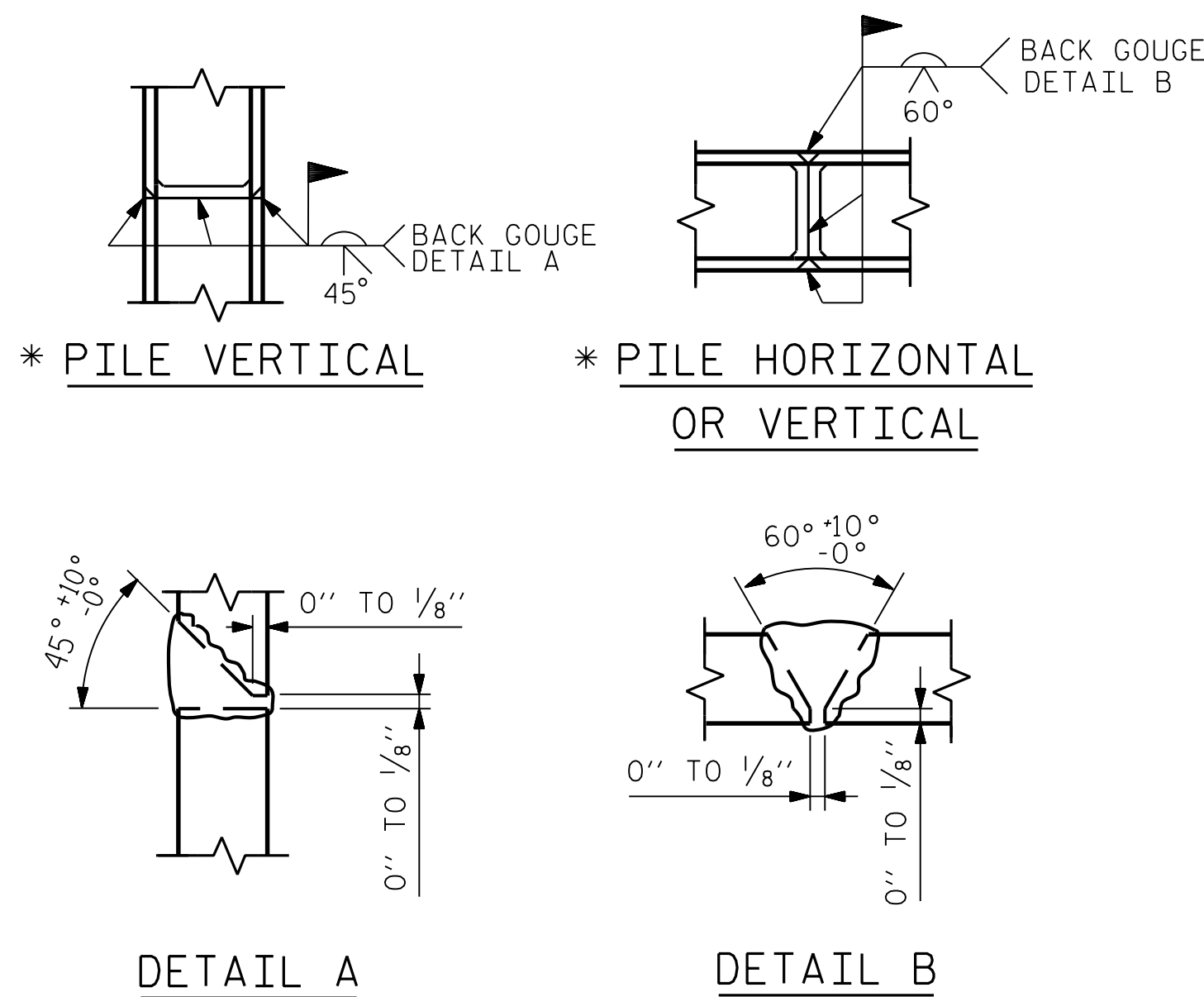
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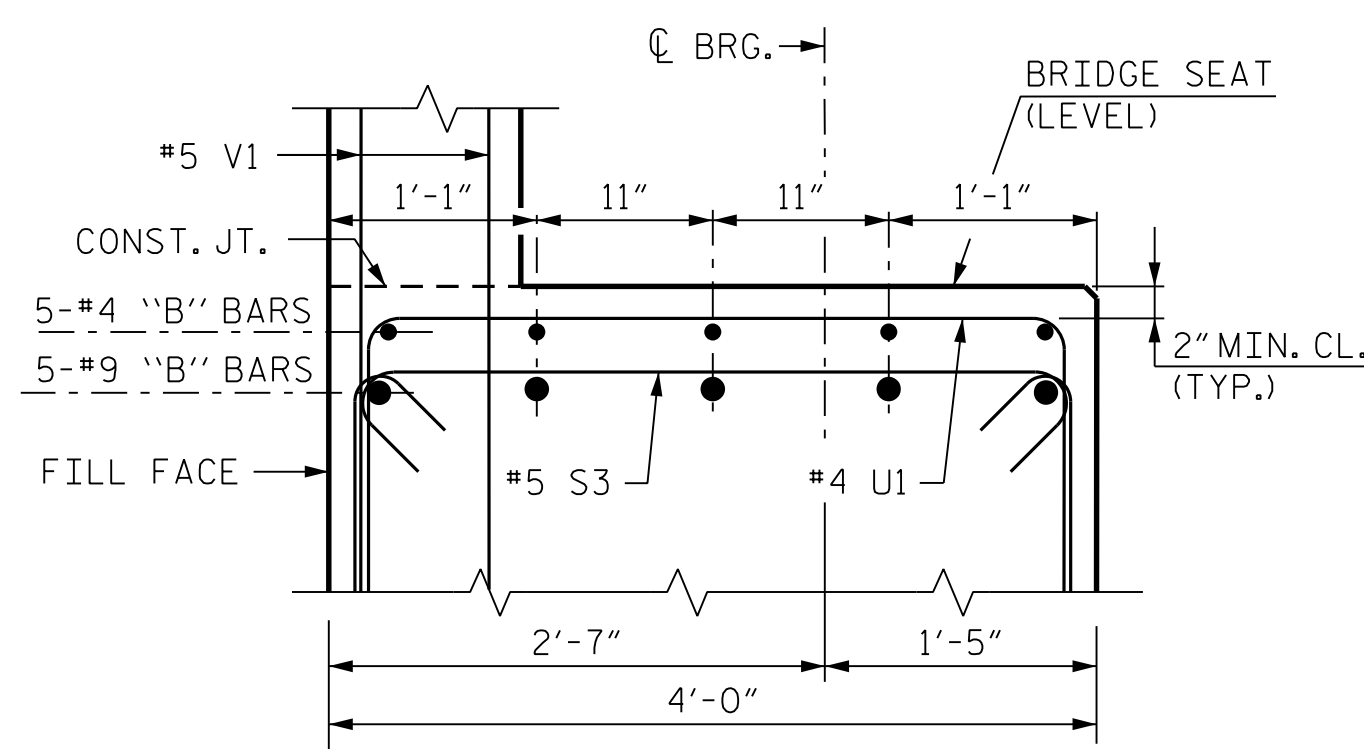
SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)

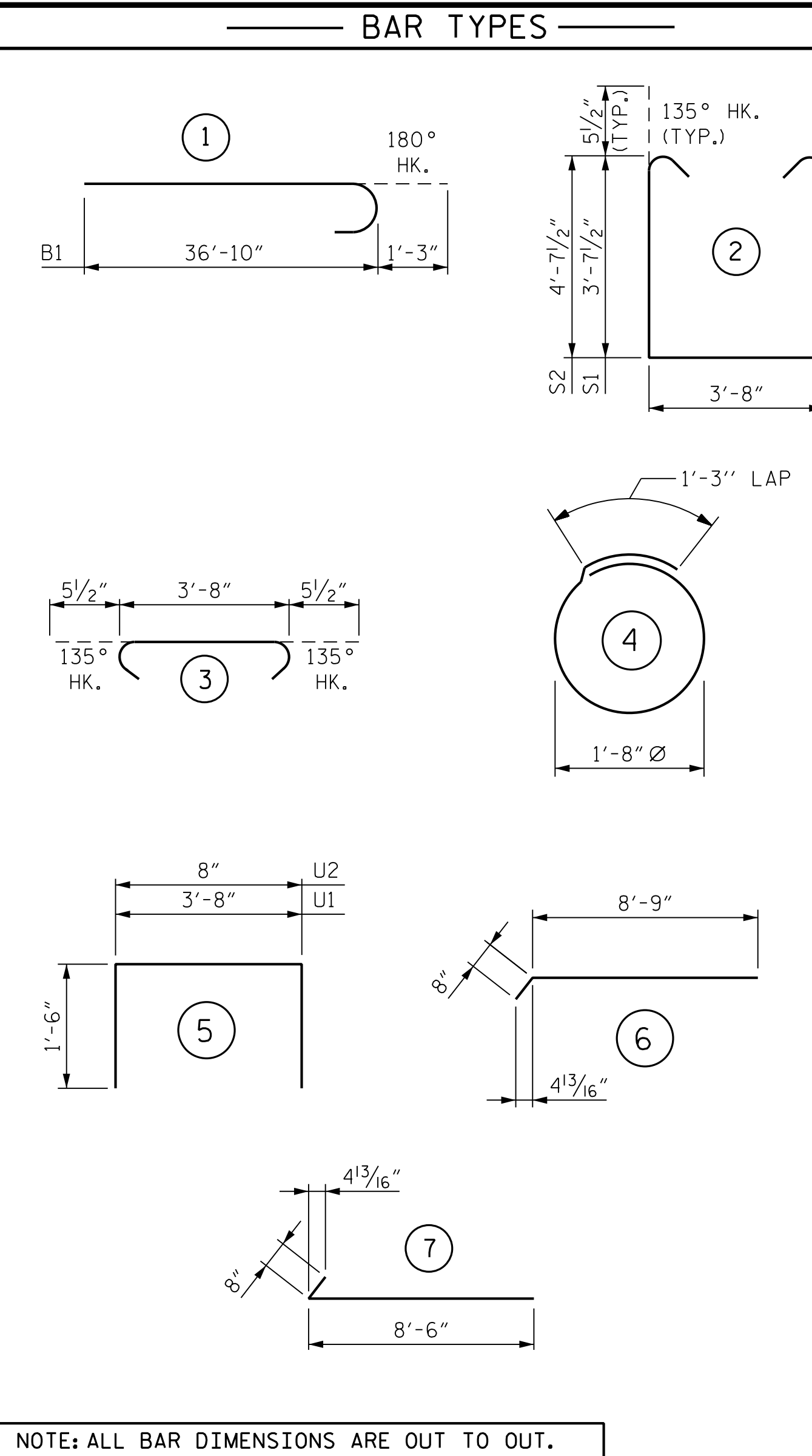


PILE SPLICE DETAILS

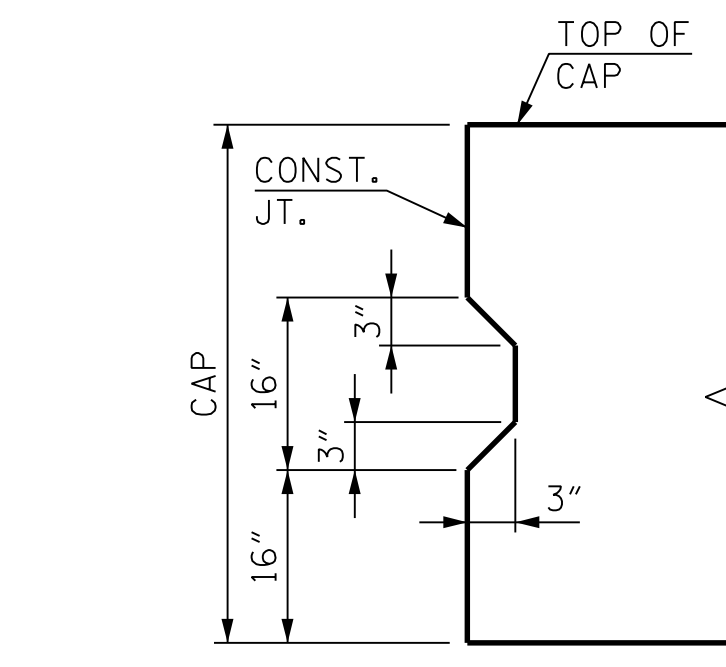
* POSITION OF PILE DURING WELDING.



SECTION B-B



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.



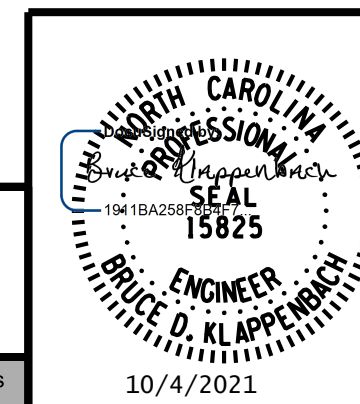
SHEAR KEY DETAIL

BILL OF MATERIAL					
END BENT 2 - STAGE 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9		38'-1"	1,295
B2	5	#9	STR.	22'-1"	375
B3	5	#9	STR.	23'-4"	397
B4	5	#4	STR.	20'-5"	68
B5	5	#4	STR.	15'-1"	50
B6	16	#5	STR.	29'-10"	498
B7	8	#4	STR.	29'-3"	156
B8	13	#4	STR.	3'-8"	32
H2	24	#4		9'-5"	151
K1	20	#4	STR.	28'-1"	375
K2	4	#4	STR.	4'-10"	13
S2	89	#5		13'-10"	1,284
S3	89	#5		4'-7"	425
S4	28	#4		6'-6"	122
U1	41	#4		6'-8"	183
U2	47	#4		3'-8"	115
V1	94	#5	STR.	9'-1"	891
V2	28	#5	STR.	11'-1"	324
REINFORCING STEEL					6,754 LBS.
CLASS "A" CONCRETE					
POUR 1 (CAP AND LOWER WINGS)					42.9 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)					11.1 C.Y.
TOTAL					54.0 C.Y.
HP 12x53 STEEL PILES					
NO.					8
L.F.					440
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES					8 EA.

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 END BENT 2
 MISCELLANEOUS DETAILS
 AND BILL OF MATERIAL
 STAGE 1

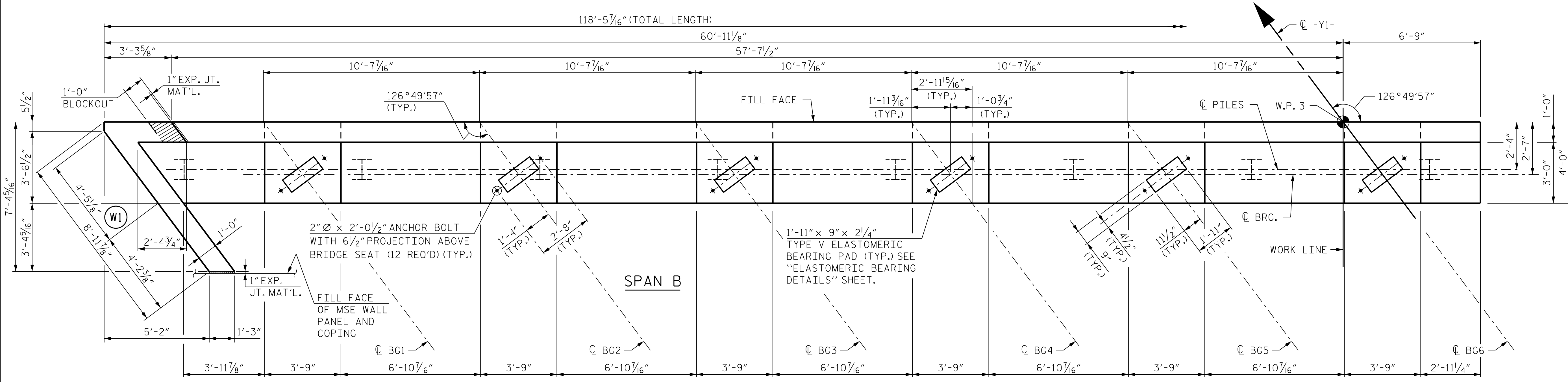


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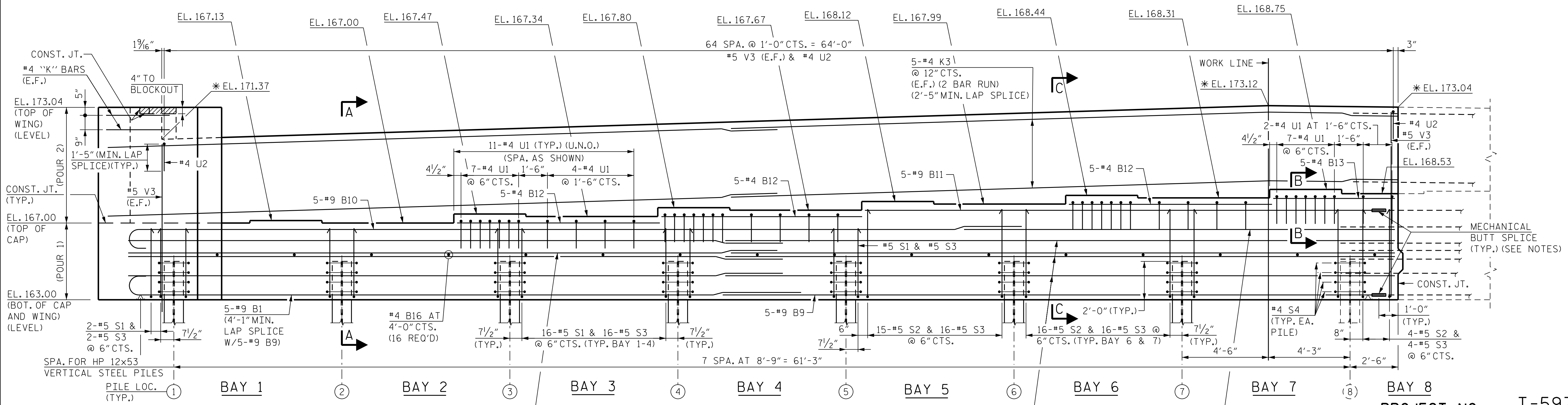
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SHEET NO.
S-47
 TOTAL SHEETS
54



PLAN

NOTES:
 FOR SECTIONS A-A, B-B AND C-C, SEE SHEET 3 OF 3.
 FOR ADDITIONAL NOTES SEE END BENT 2 STAGE 1 SHEET 1 OF 3.

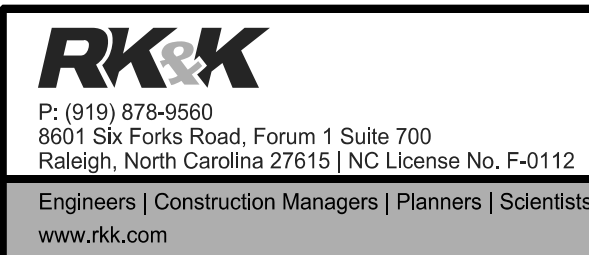
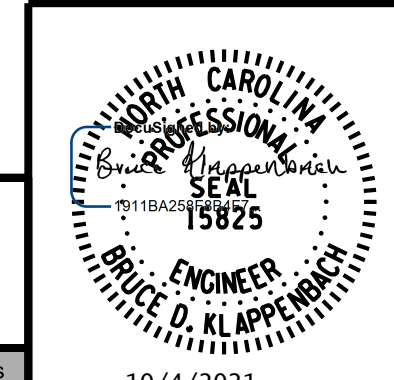


ELEVATION
 * ELEVATION AT FILL FACE

PROJECT NO. I-5972
 JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 PLAN AND ELEVATION
 STAGE 2

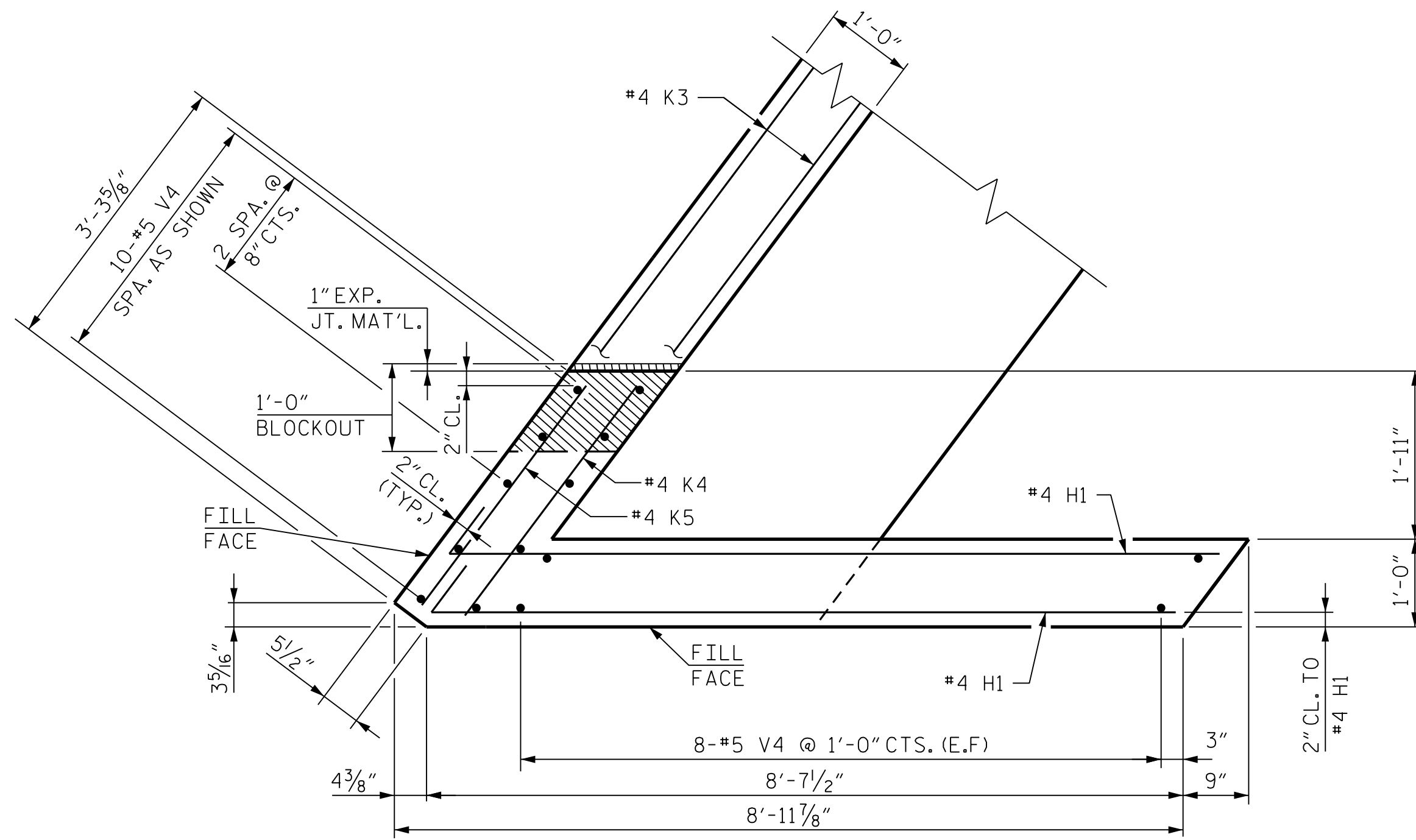


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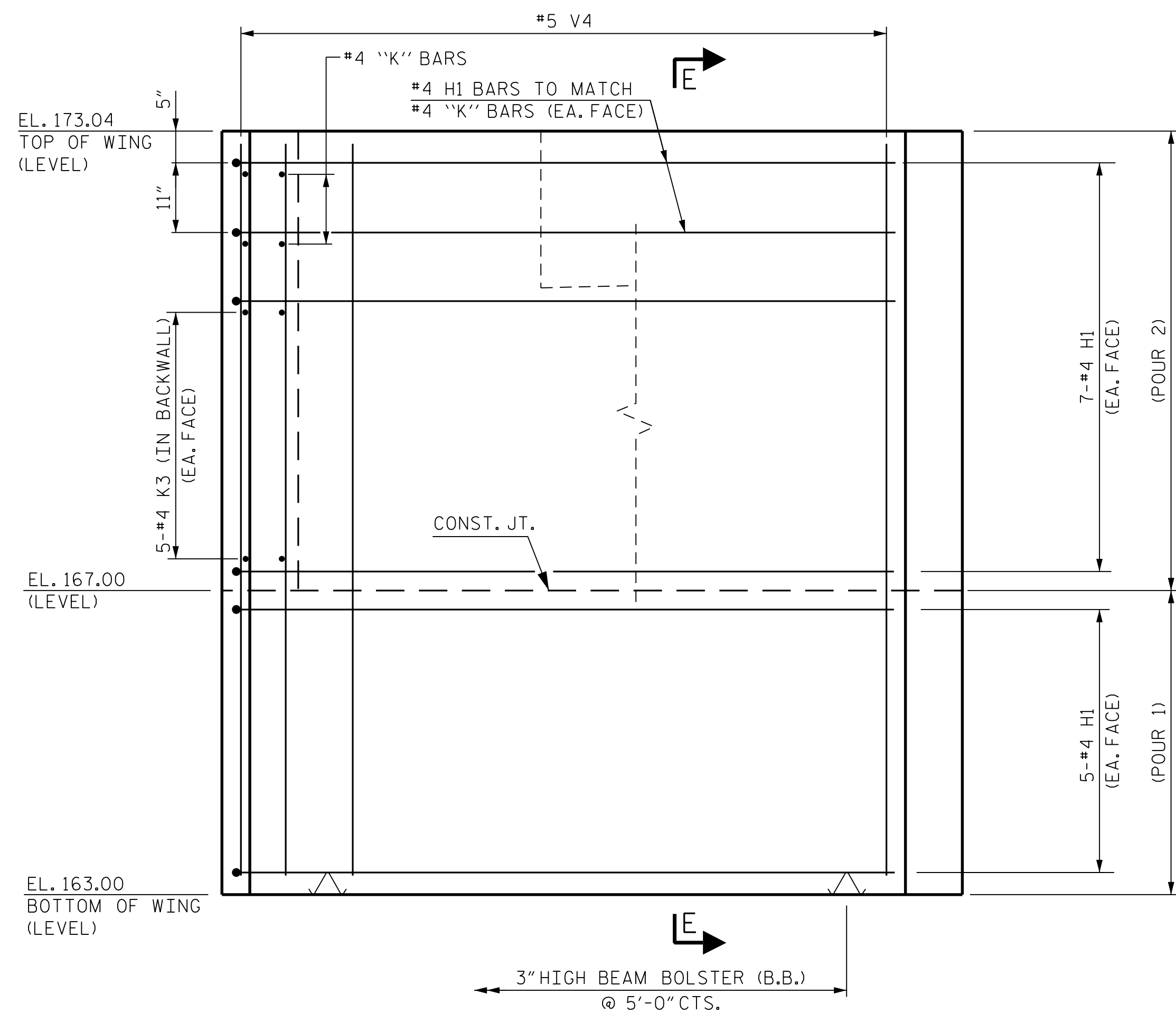
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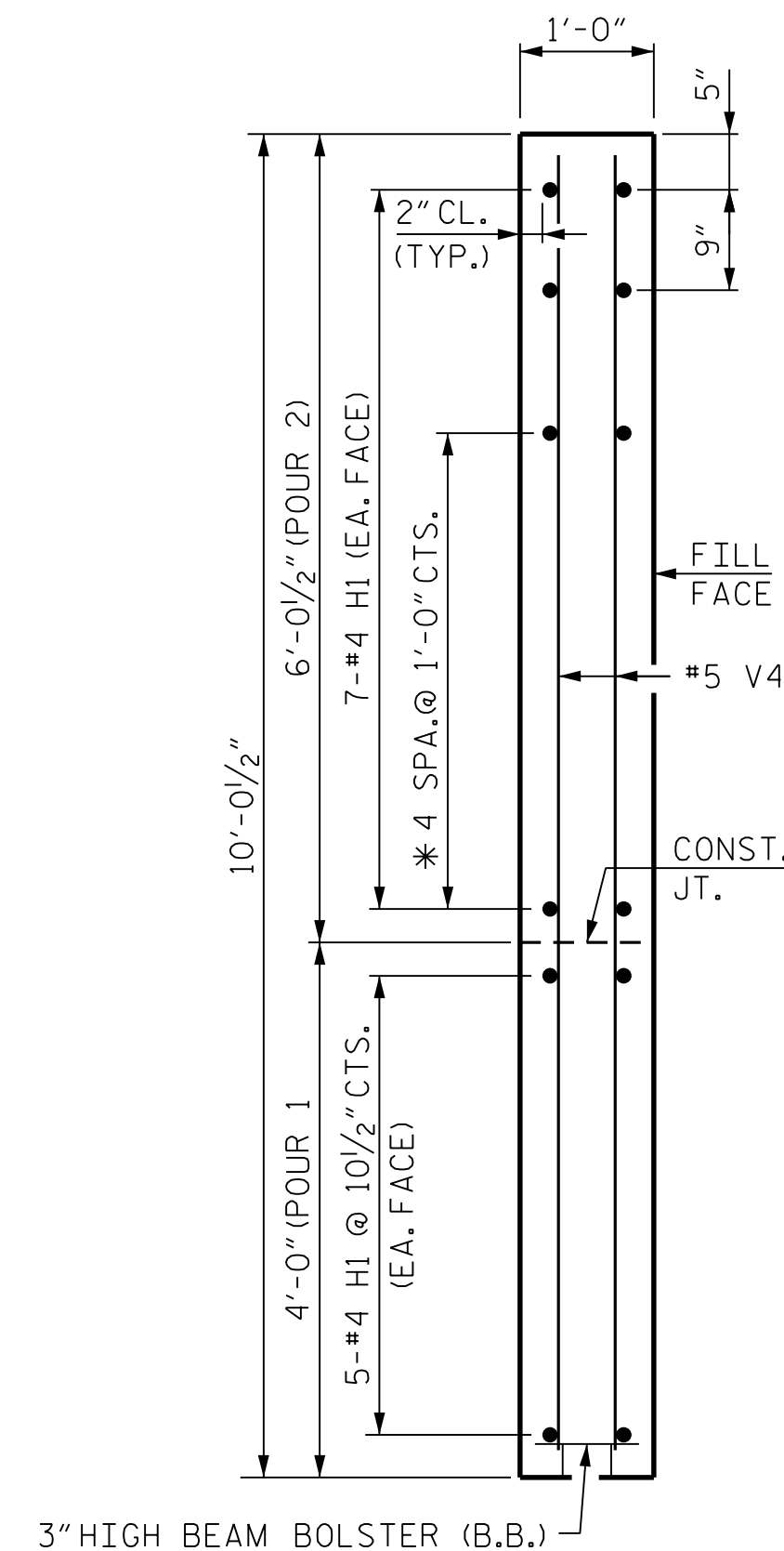


PLAN OF LEFT WINGWALL



ELEVATION OF LEFT WINGWALL
LEFT WINGWALL DETAILS

W1



SECTION E-E

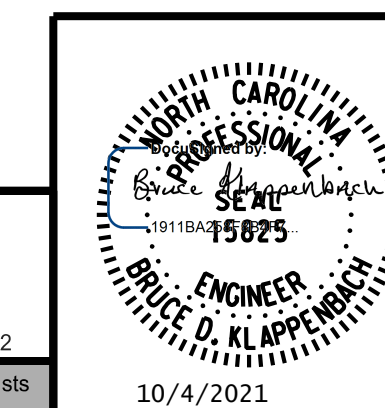
* MATCH TO K3 BARS IN BACKWALL

PROJECT NO. I-5972
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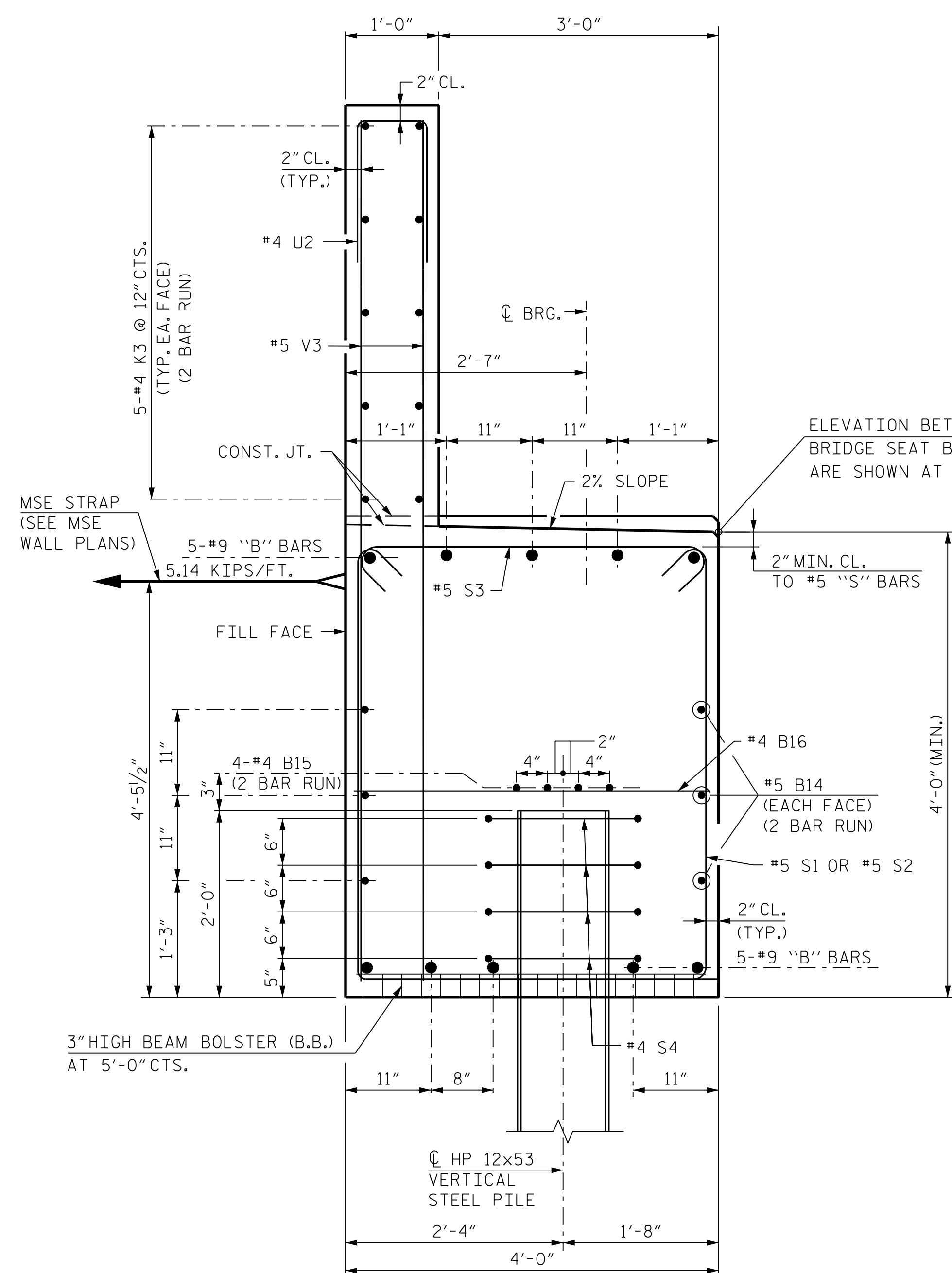
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TOTAL SHEETS
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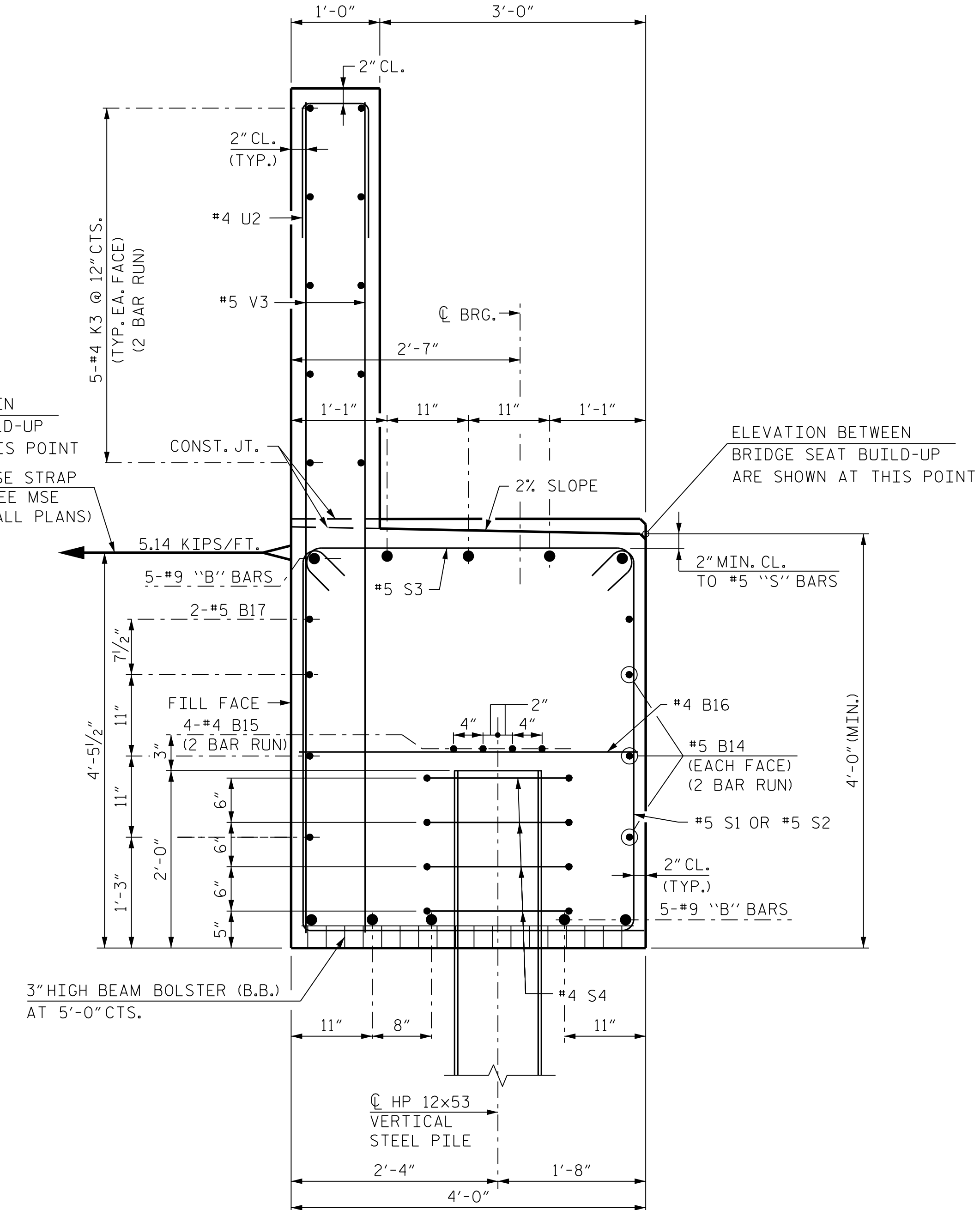
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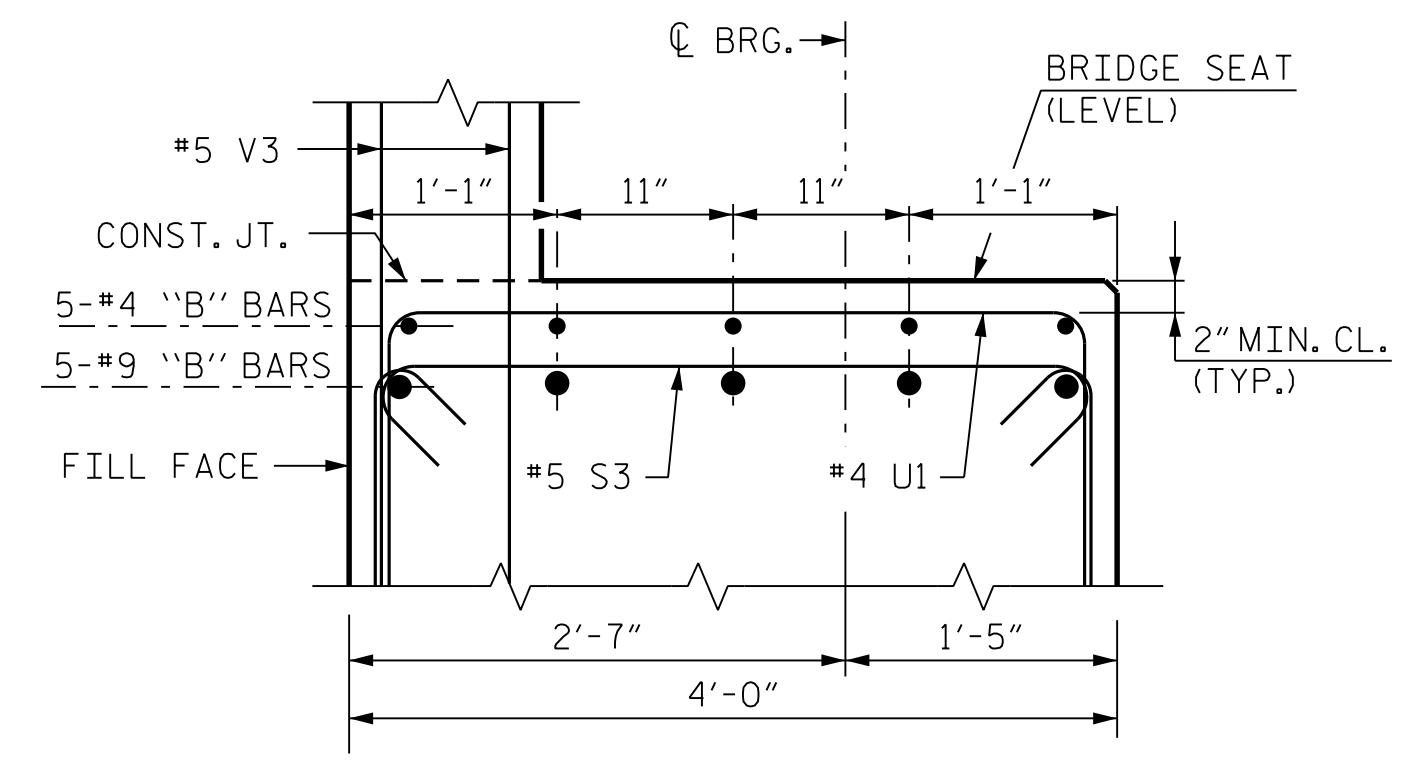
SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)

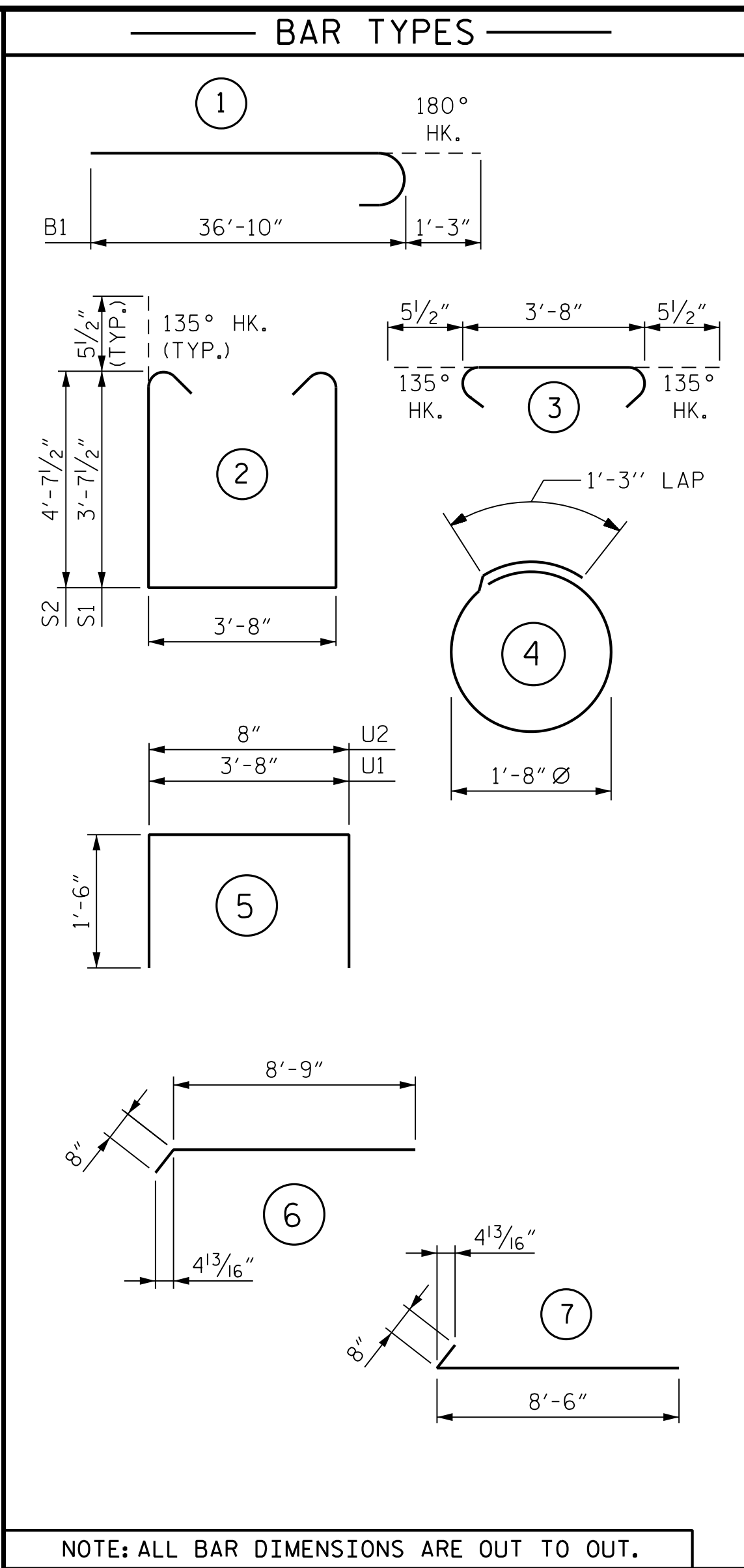


SECTION C-C

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



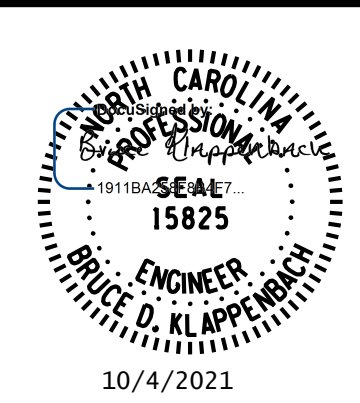
SECTION B-B



BILL OF MATERIAL					
END BENT 2 - STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9		38'-1"	647
B9	5	#9	STR.	34'-2"	581
B10	5	#9		49'-6"	842
B11	5	#9	STR.	26'-9"	455
B12	15	#4	STR.	10'-6"	105
B13	5	#4	STR.	6'-4"	21
B14	12	#5	STR.	35'-2"	440
B15	8	#4	STR.	34'-8"	185
B16	16	#4	STR.	3'-8"	39
B17	2	#5	STR.	23'-6"	49
H1	20	#4		9'-2"	122
K3	20	#4	STR.	35'-4"	472
K4	2	#4	STR.	2'-11"	4
K5	2	#4	STR.	3'-2"	4
S1	67	#5		11'-10"	827
S2	51	#5		13'-10"	736
S3	118	#5		4'-7"	564
S4	32	#4		6'-6"	139
U1	42	#4		6'-8"	187
U2	65	#4		3'-8"	159
V3	130	#5	STR.	7'-11"	1,073
V4	26	#5	STR.	9'-7"	260
REINFORCING STEEL					7,911 LBS.
CLASS "A" CONCRETE					
POUR 1 (CAP AND LOWER WINGS)					45.8 C.Y.
POUR 2 (BACKWALL & UPPER WINGS)					13.5 C.Y.
TOTAL					59.3 C.Y.
HP 12x53 STEEL PILES					
NO.					7
L.F.					385
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES					7 EA.

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 END BENT 2
 MISCELLANEOUS DETAILS
 AND BILL OF MATERIAL
 STAGE 2

REVISIONS						SHEET NO.
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GENERAL NOTES

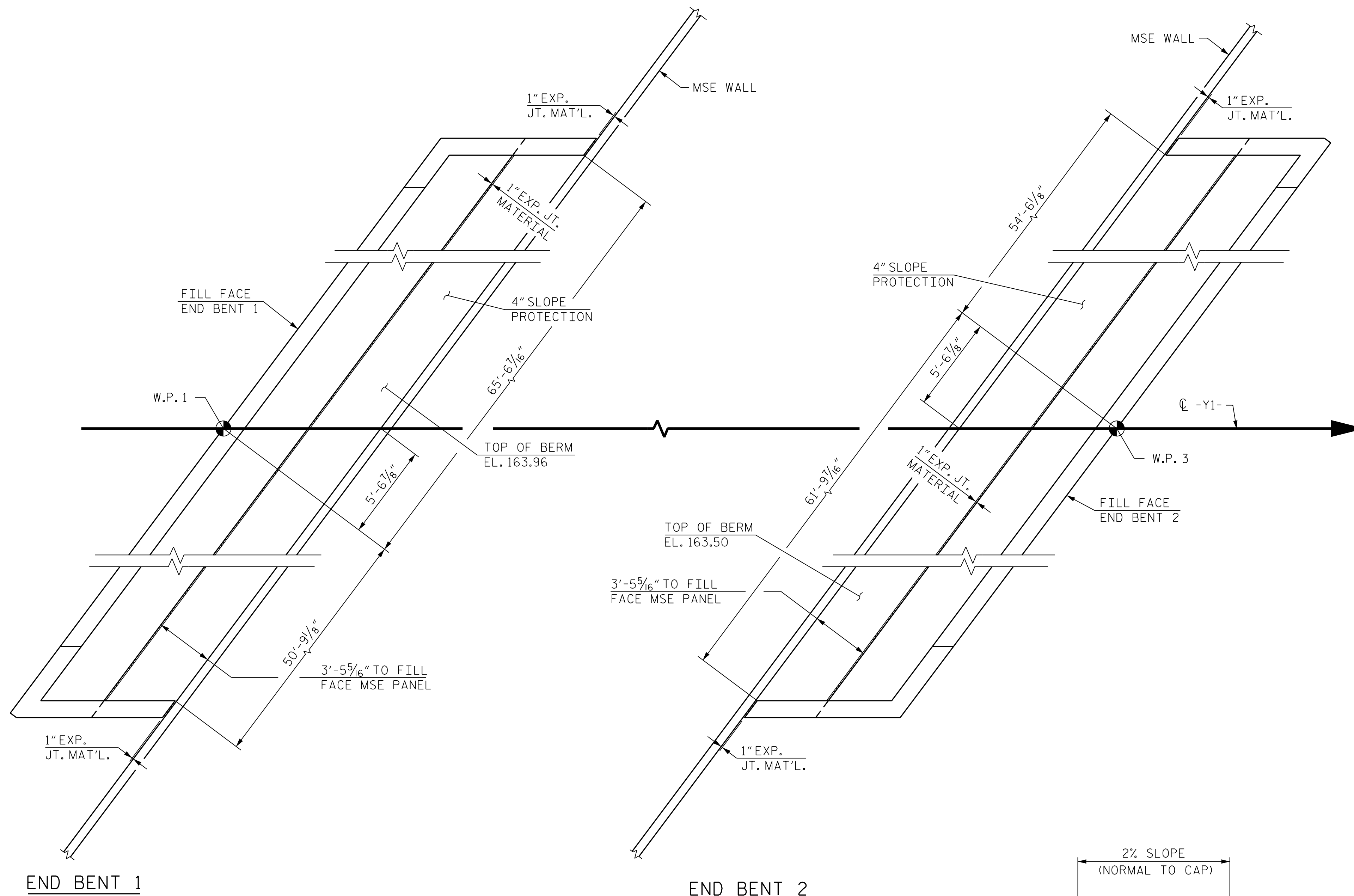
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

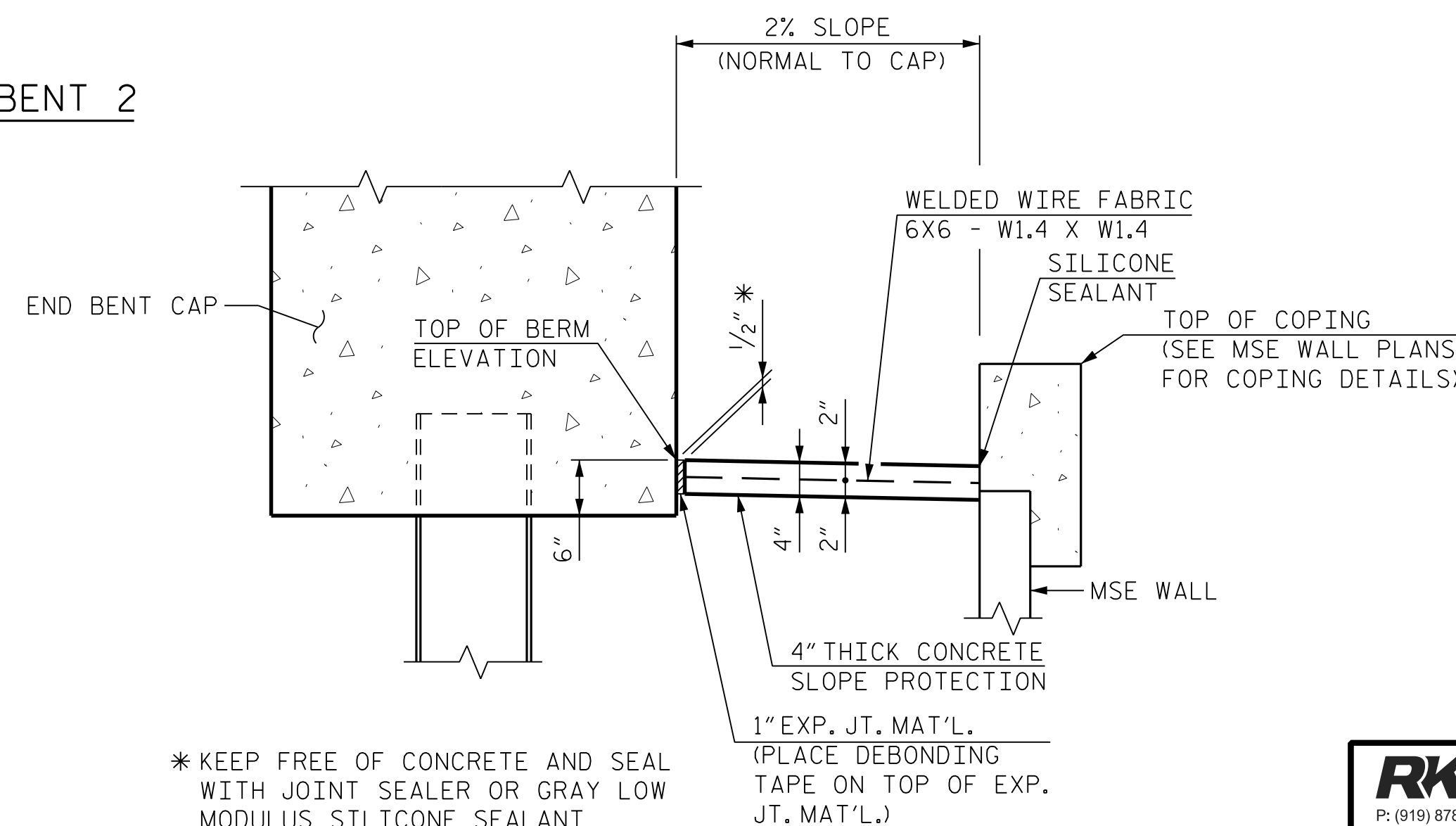
ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE AT STA. 36+93.50 -Y1-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	44.5	85.0
END BENT 2	44.5	85.0

* QUANTITY SHOWN IS BASED ON 5' POURS.



PLAN



SECTION ALONG C ROADWAY

* KEEP FREE OF CONCRETE AND SEAL WITH JOINT SEALER OR GRAY LOW MODULUS SILICONE SEALANT

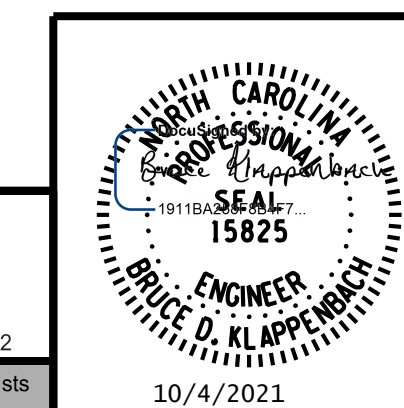
1" EXP. JT. MAT'L. (PLACE DEBONDING TAPE ON TOP OF EXP. JT. MAT'L.)

PROJECT NO. I-5972
JOHNSTON COUNTY
 STATION: 36+93.50 -Y1-

STATE OF NORTH CAROLINA
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**STANDARD
 SLOPE PROTECTION
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
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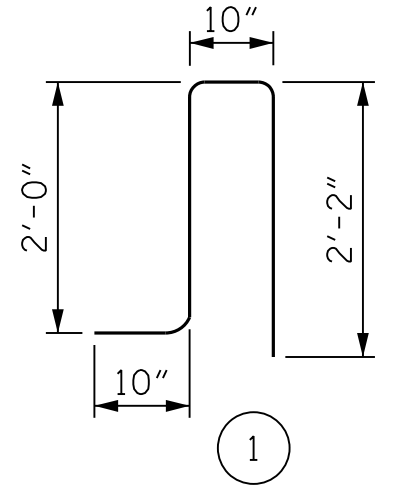
10/4/2021

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DRAWN BY : B. A. HAAG DATE : JUN 2021
 CHECKED BY : B. D. KLAPPENBACH DATE : JUN 2021
 DESIGN ENGINEER OF RECORD : B. D. KLAPPENBACH DATE : JUN 2021

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR 2 END POSTS (STAGE 2)

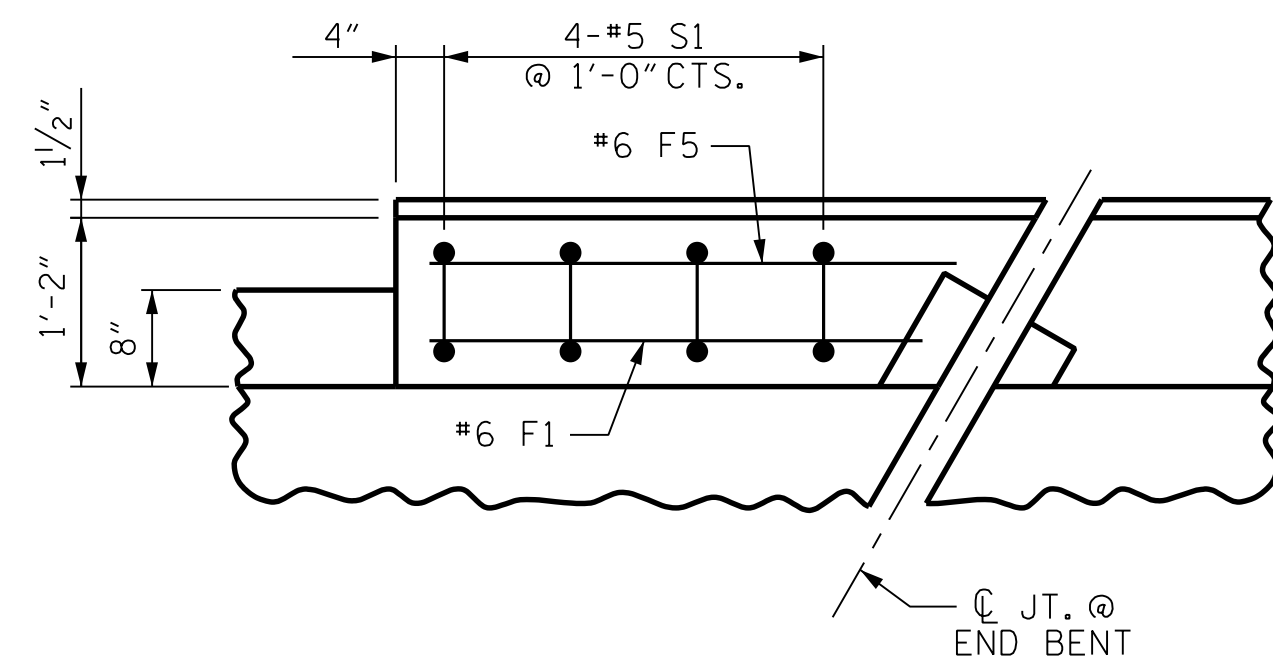
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	4	#7	STR.	2'-6"	20
*E2	4	#7	STR.	2'-11"	24
*E3	4	#7	STR.	3'-5"	28
*E4	4	#7	STR.	3'-10"	31
*E5	4	#7	STR.	4'-4"	35
*F1	4	#6	STR.	3'-5"	21
*F2	2	#6	STR.	2'-11"	4
*F3	2	#6	STR.	1'-9"	3
*F4	2	#6	STR.	3'-3"	5
*F5	4	#6	STR.	3'-11"	24
*F6	2	#6	STR.	3'-5"	10
*F7	2	#6	STR.	2'-4"	7
*F8	2	#6	STR.	3'-9"	11
*S1	8	#5	1	5'-10"	49
* EPOXY COATED REINFORCING STEEL				LBS.	272
CLASS AA CONCRETE				CU.YDS.	1.3
1'-2" x 2'-6" CONCRETE PARAPET				LIN. FT.	7.50

NOTES

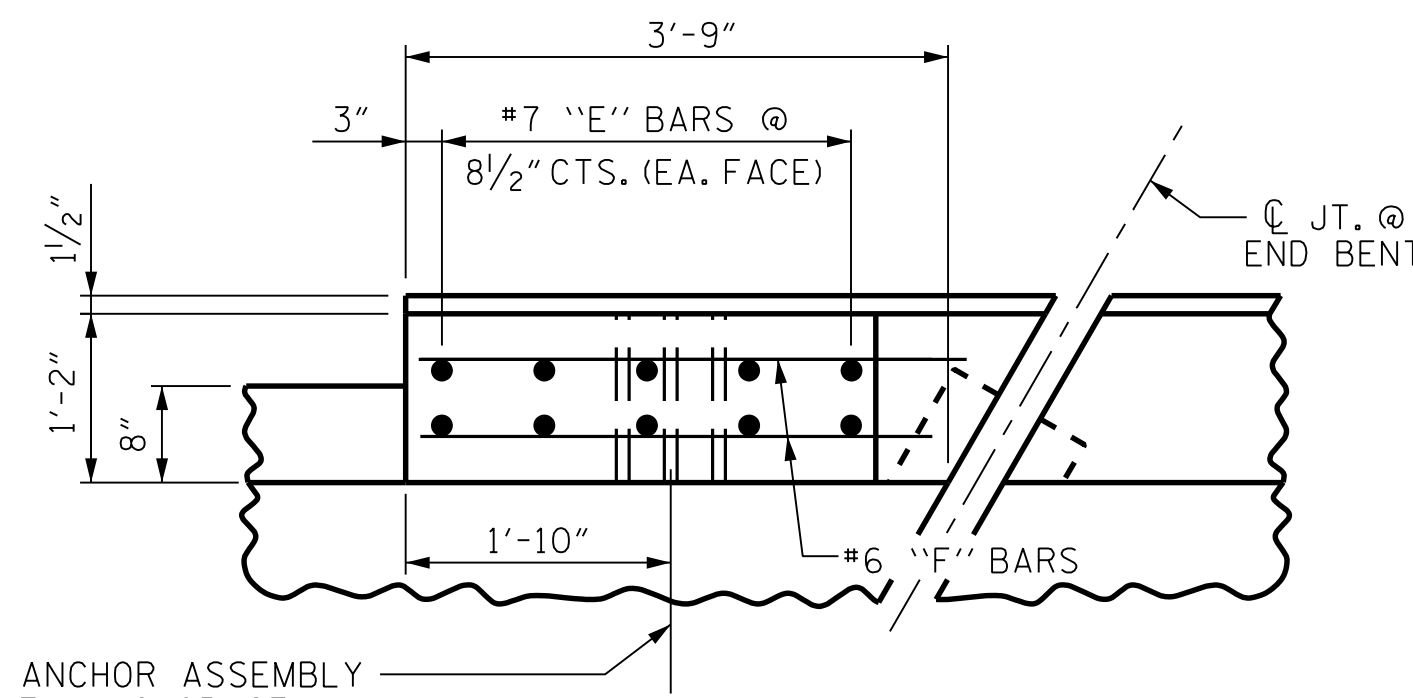
THE COST OF THE END POST ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "1'-2" X 2'-6" CONCRETE PARAPET".

THE 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.

ALL REINFORCING STEEL IN END POSTS SHALL BE EPOXY COATED.

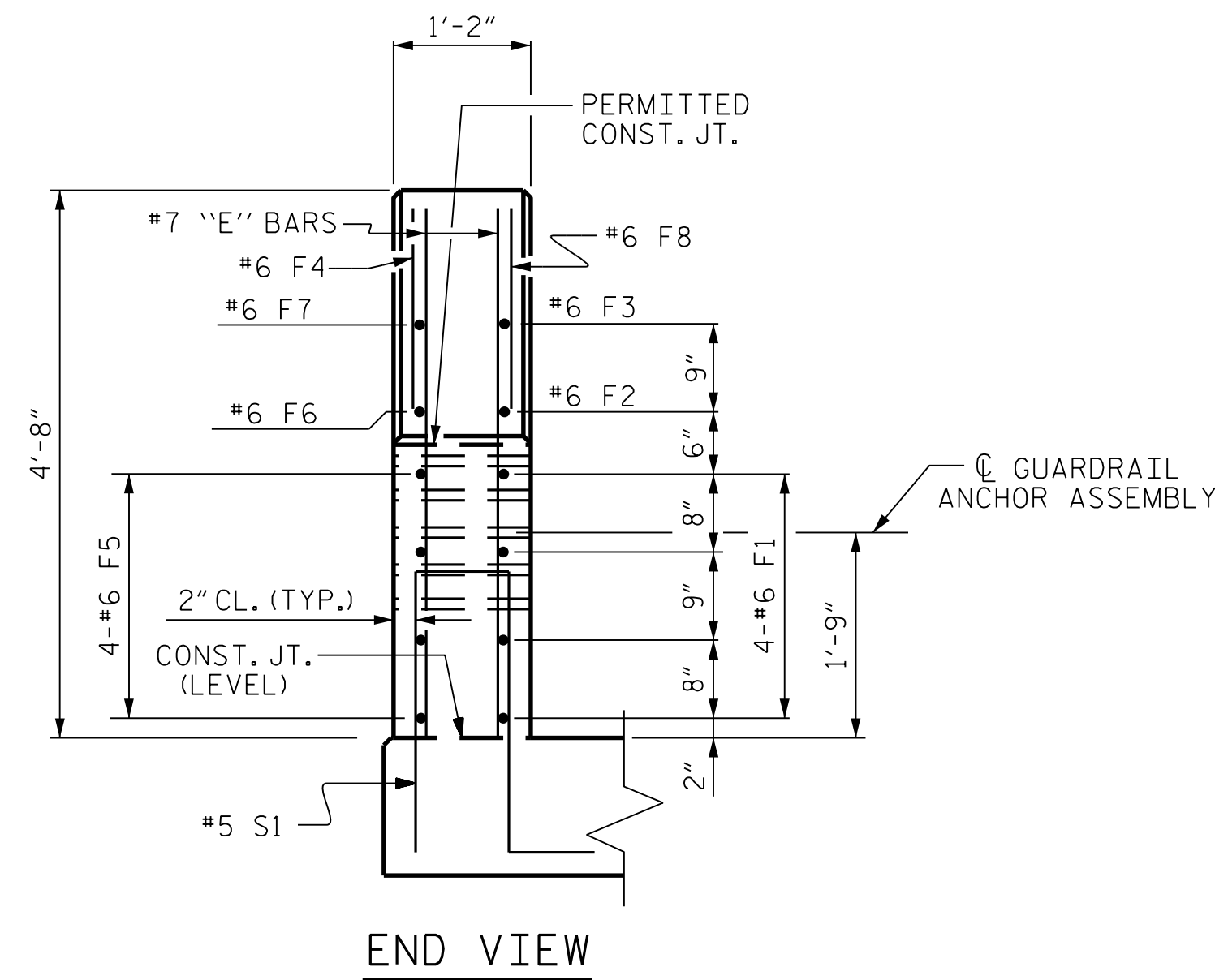


PLAN OF PARAPET

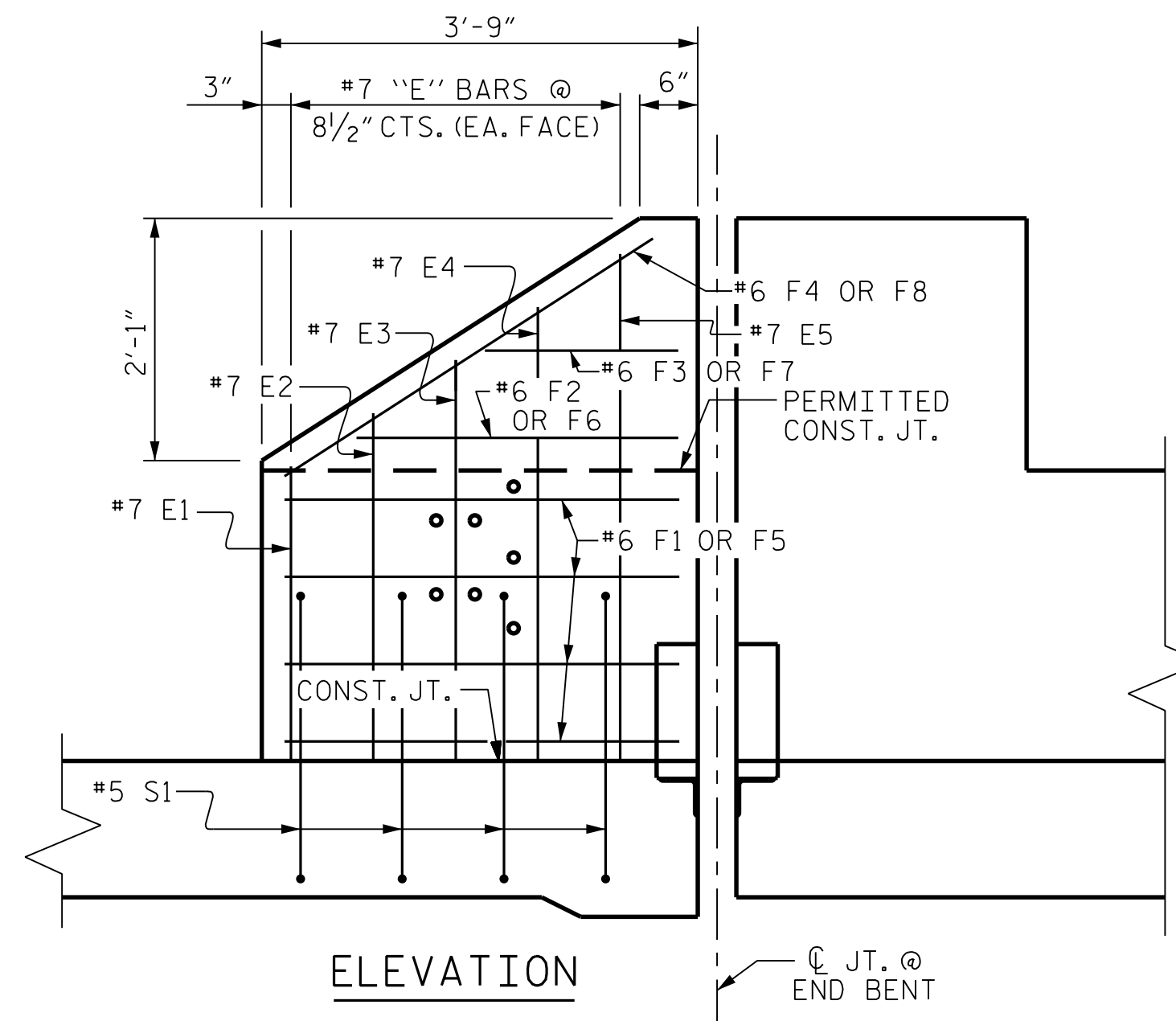


PLAN OF END POST

CL. GUARDRAIL ANCHOR ASSEMBLY SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET (TYP.)



END VIEW



ELEVATION

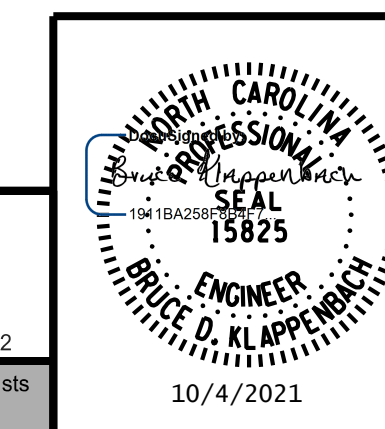
END POST FOR TWO BAR RAIL

LOCATED ON LEFT SIDE (STAGE 2) ONLY.

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
END POST
LEFT SIDE - STAGE 2



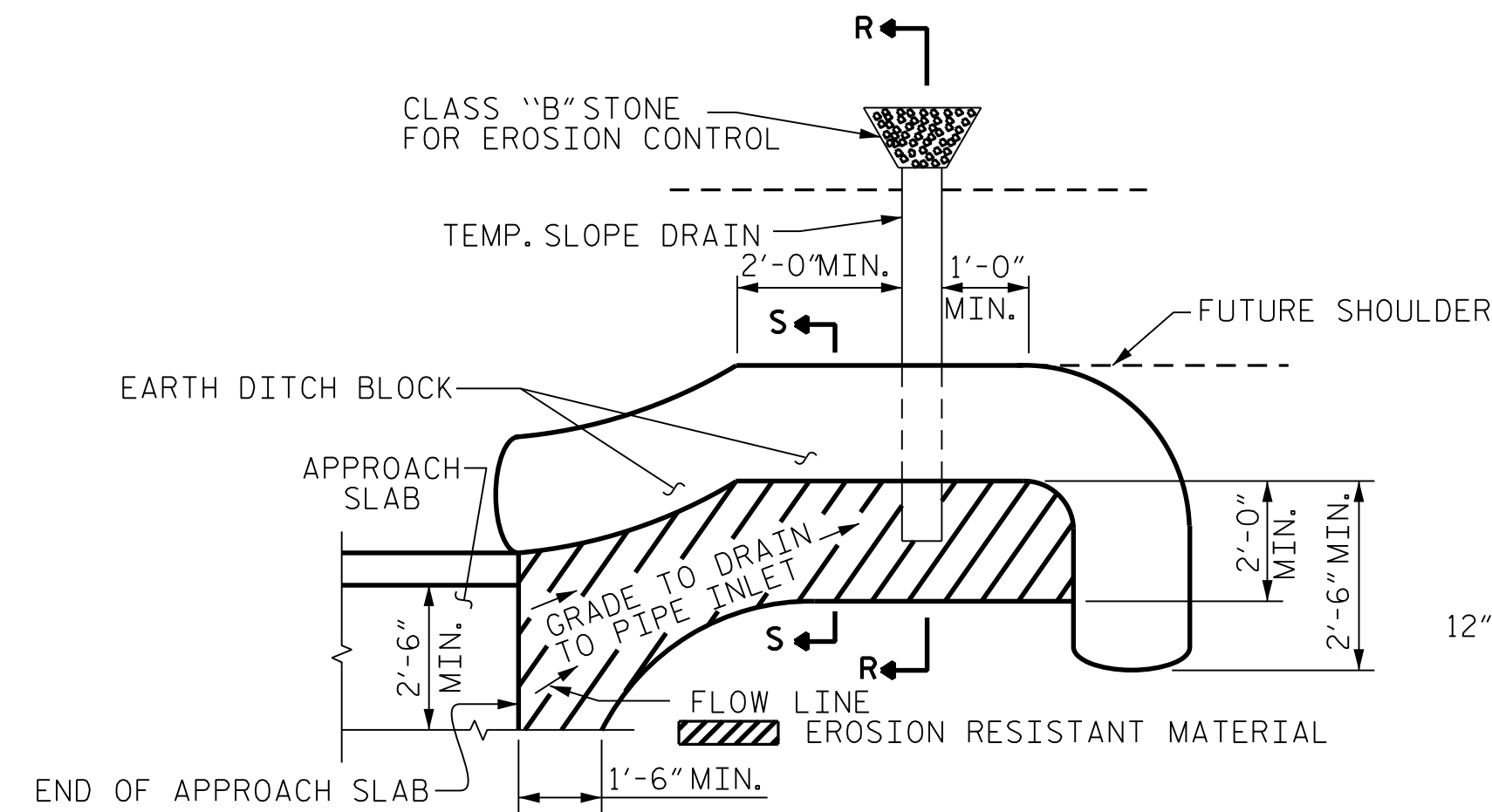
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			54

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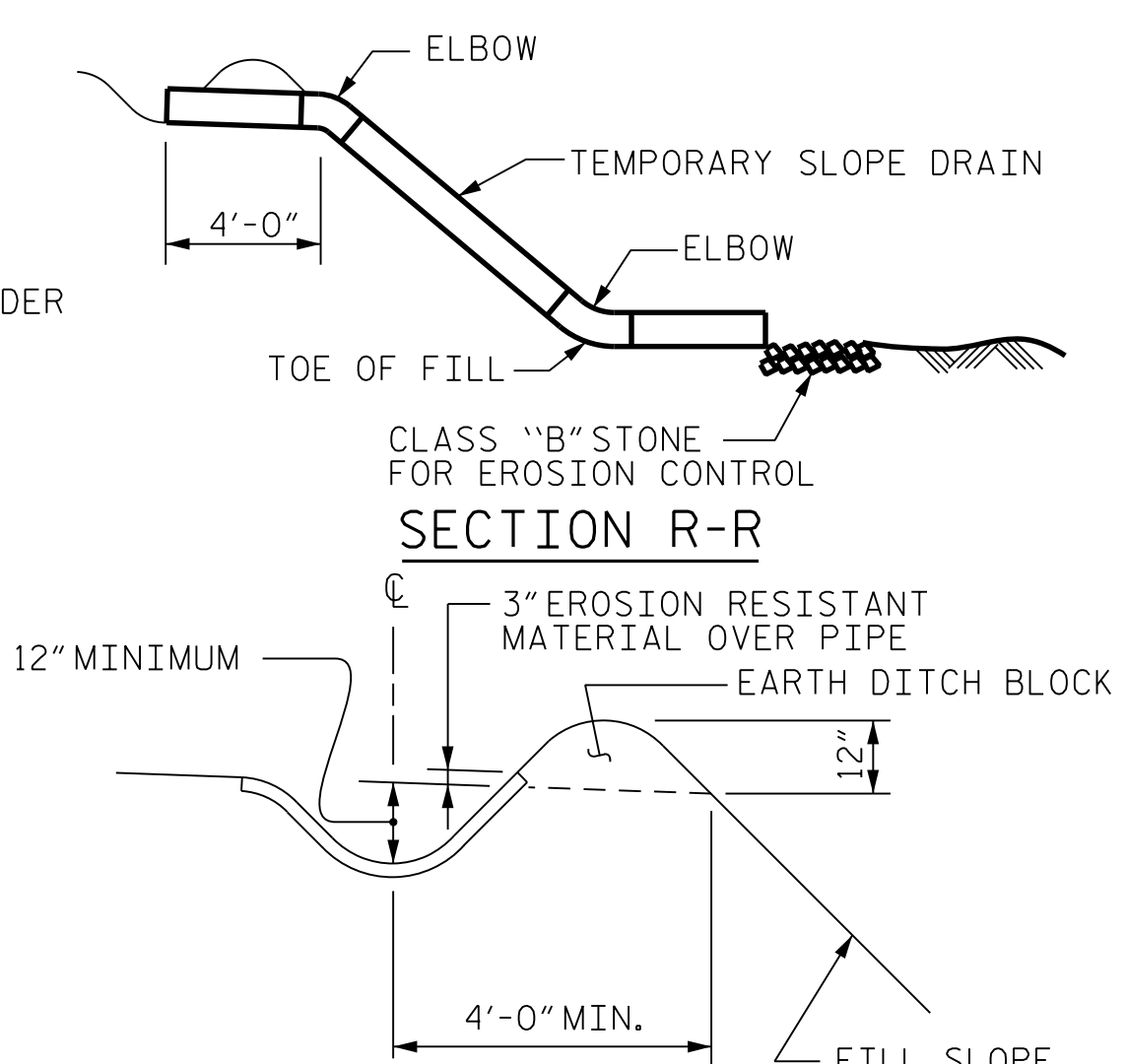
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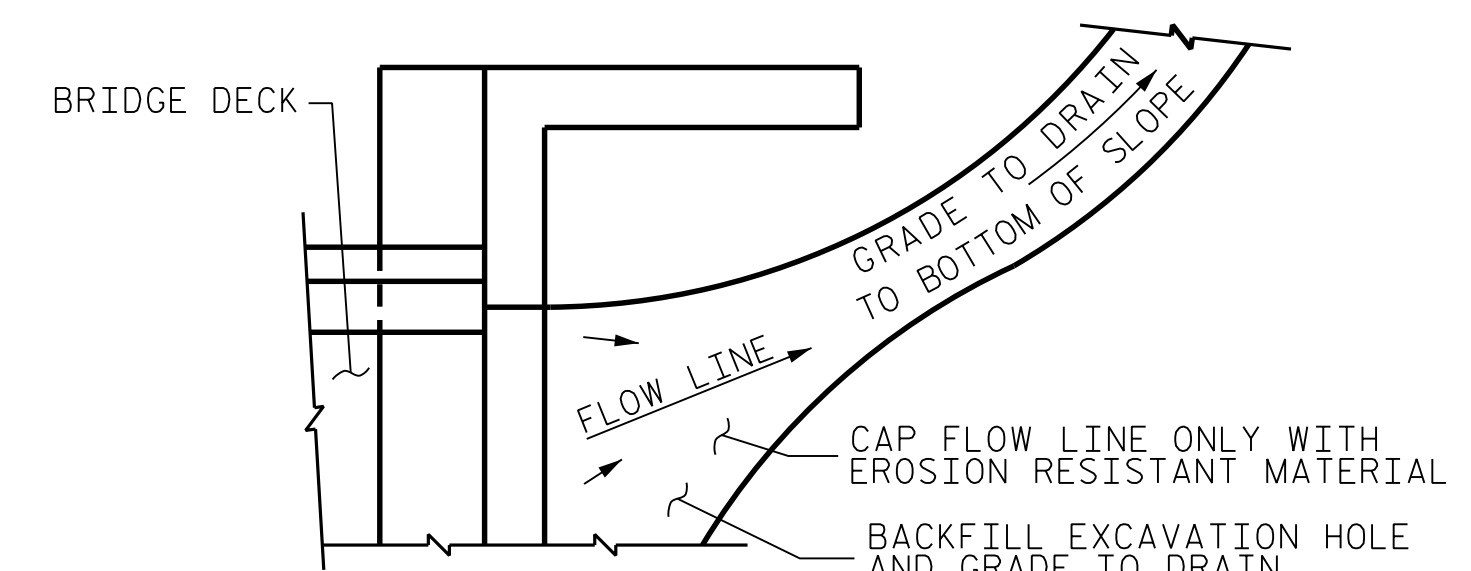


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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

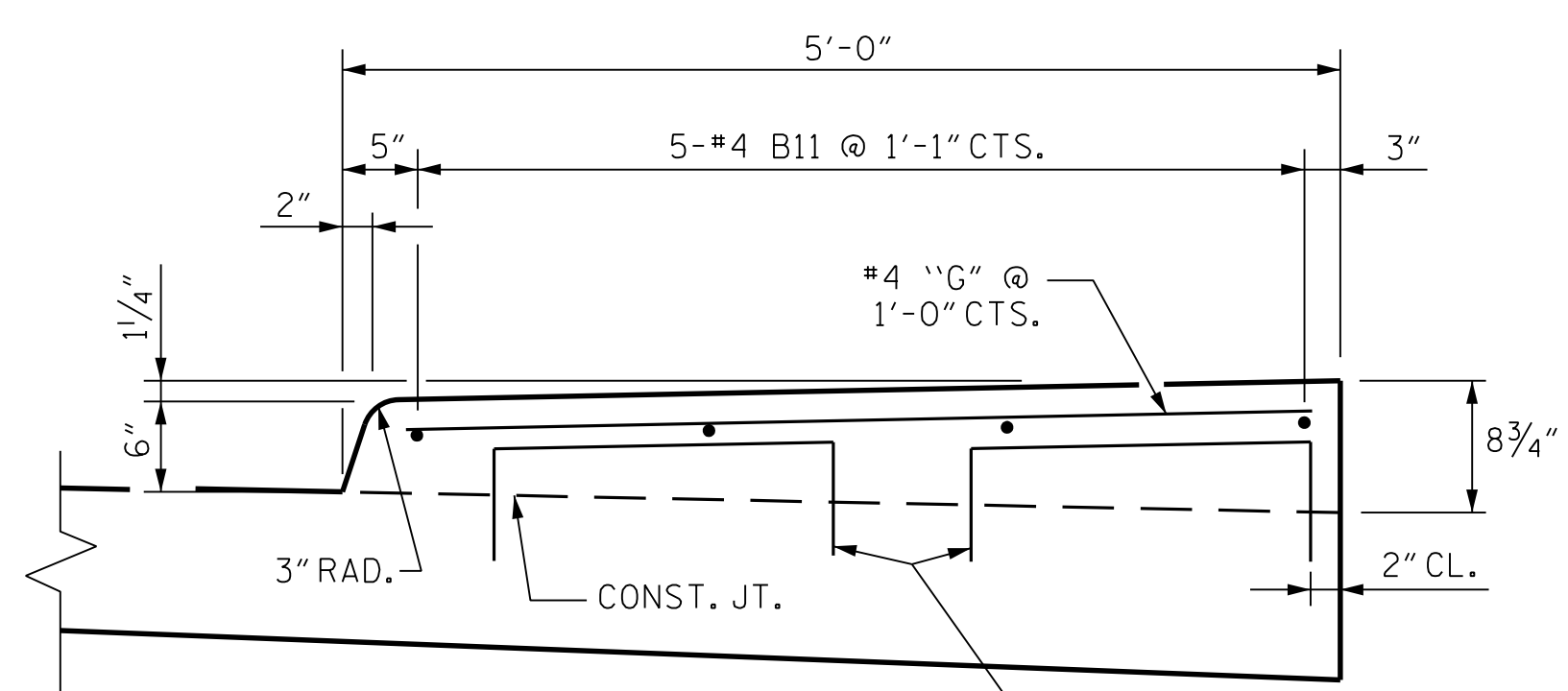


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



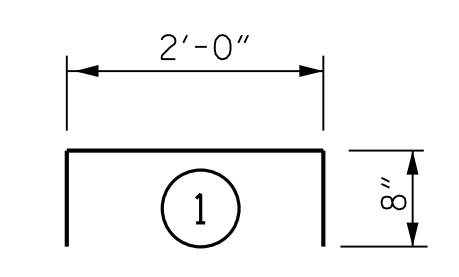
SECTION K-K

SIDEWALK DETAIL RIGHT SIDE - STAGE 1

* U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDED OFF.

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BAR TYPES



ALL DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

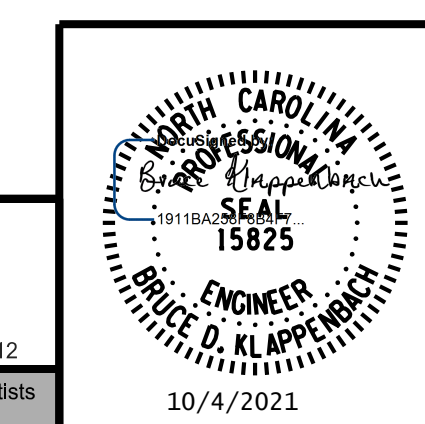
APPROACH SLAB AT END BENT 2 (STAGE 1)						APPROACH SLAB AT END BENT 1 (STAGE 1)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR.	24'-0"	802	* A1	50	#4	STR.	24'-0"	802
A2	52	#4	STR.	23'-8"	822	A2	52	#4	STR.	23'-8"	822
* B1	71	#5	STR.	23'-9"	1,759	* B1	71	#5	STR.	23'-9"	1,759
B2	71	#6	STR.	24'-4"	2,595	B2	71	#6	STR.	24'-4"	2,595
* B11	5	#4	STR.	24'-5"	82	* B11	5	#4	STR.	24'-5"	82
* G1	21	#4	STR.	4'-6"	63	* G1	21	#4	STR.	4'-6"	63
* G2	2	#4	STR.	3'-9"	5	* G2	2	#4	STR.	3'-9"	5
* G3	2	#4	STR.	2'-6"	3	* G3	2	#4	STR.	2'-6"	3
* U1	8	#4	1	3'-4"	18	* U1	8	#4	1	3'-4"	18
REINFORCING STEEL					3,417	REINFORCING STEEL					3,417
* EPOXY COATED REINFORCING STEEL					2,732	* EPOXY COATED REINFORCING STEEL					2,732
** CLASS AA CONCRETE (C.Y.)					41.1	** CLASS AA CONCRETE (C.Y.)					41.1

APPROACH SLAB AT END BENT 2 (STAGE 2)						APPROACH SLAB AT END BENT 1 (STAGE 2)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	50	#4	STR.	33'-7"	1,122	* A3	50	#4	STR.	33'-7"	1,122
A4	52	#4	STR.	33'-5"	1,161	A4	52	#4	STR.	33'-5"	1,161
* B1	104	#5	STR.	23'-9"	2,576	* B1	104	#5	STR.	23'-9"	2,576
B2	104	#6	STR.	24'-5"	3,814	B2	104	#6	STR.	24'-4"	3,801
* B7	1	#5	STR.	3'-6"	4	* B3	1	#5	STR.	3'-9"	4
B8	1	#6	STR.	3'-8"	6	B4	1	#6	STR.	3'-11"	6
* B9	1	#5	STR.	3'-3"	3	* B5	1	#5	STR.	4'-0"	4
B10	1	#6	STR.	3'-6"	5	B6	1	#6	STR.	4'-2"	6
REINFORCING STEEL					4,986	REINFORCING STEEL					4,974
* EPOXY COATED REINFORCING STEEL					3,705	* EPOXY COATED REINFORCING STEEL					3,706
CLASS AA CONCRETE (C.Y.)					56.6	CLASS AA CONCRETE (C.Y.)					56.2

** INCLUDES CONCRETE QUANTITY FOR SIDEWALK.

PROJECT NO. I-5972
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 STATION: 36+93.50 -Y1-

SHEET 3 OF 3



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

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2			4			54

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISHES 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.

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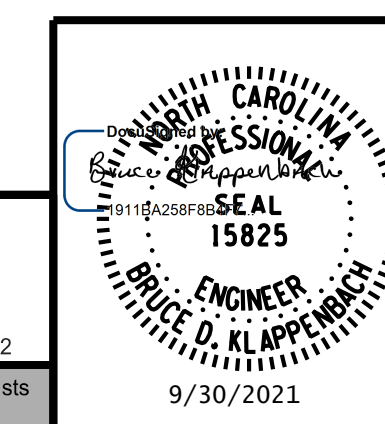
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