

09/28/24

PROJECT: 17BP.14.R.204

CONTRACT: C204828

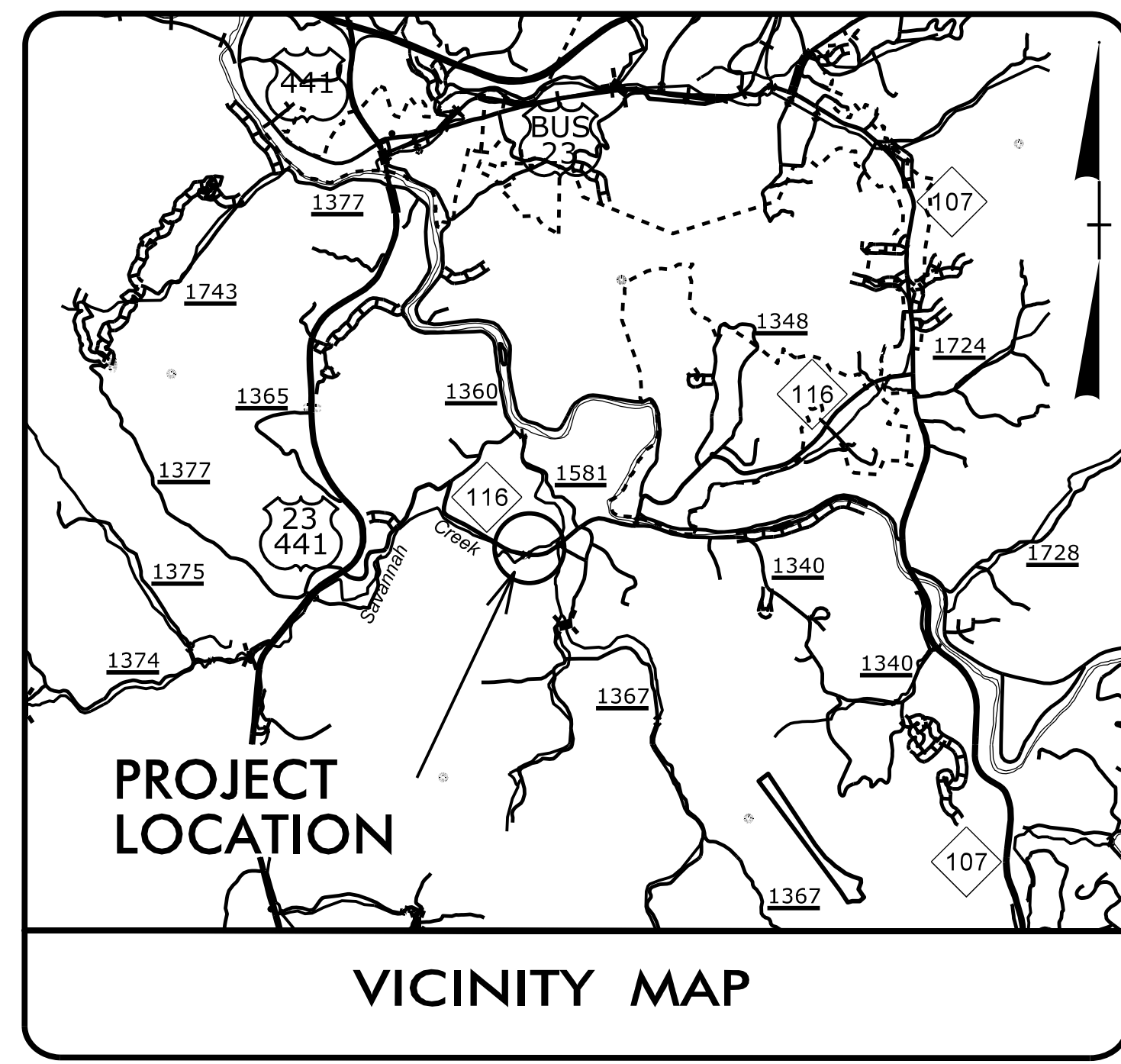
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JACKSON COUNTY

LOCATION: BRIDGE #490032 ON NC 116 (WEBSTER ROAD)
OVER SAVANNAH CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.204		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.14.PE.204	NA	PE	
17BP.14.ROW.204	NA	UTIL & RW	
17BP.14.R.204	NA	CONST.	



BEGIN CONSTRUCTION
-L- 16 + 56.00

BEGIN CONSTRUCTION
-DR2- 10 + 35.00

END BRIDGE
-L- STA. 25 + 45.00

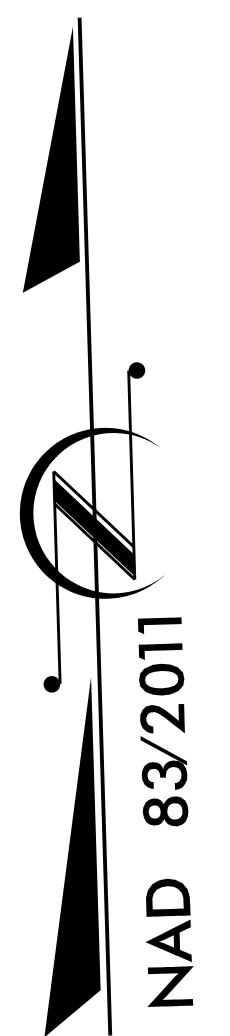
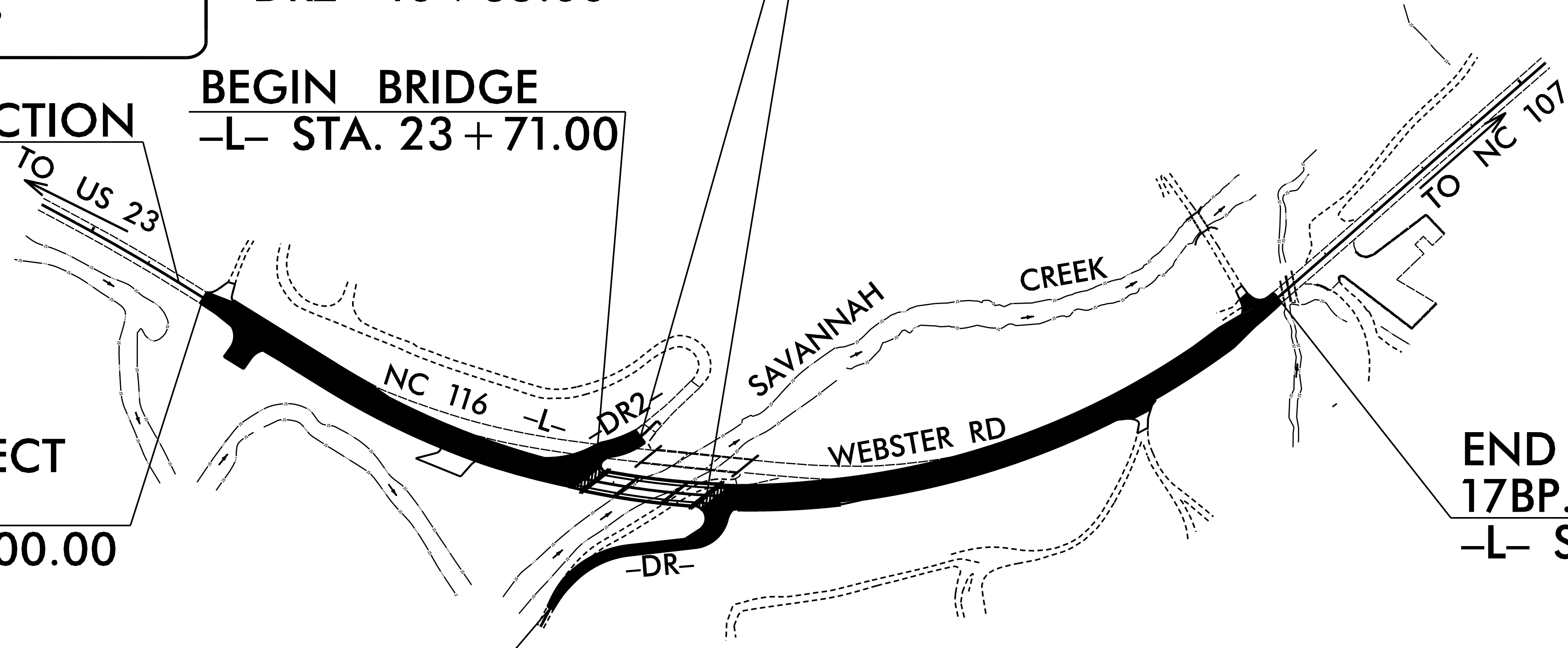
BEGIN BRIDGE
-L- STA. 23 + 71.00

STRUCTURE

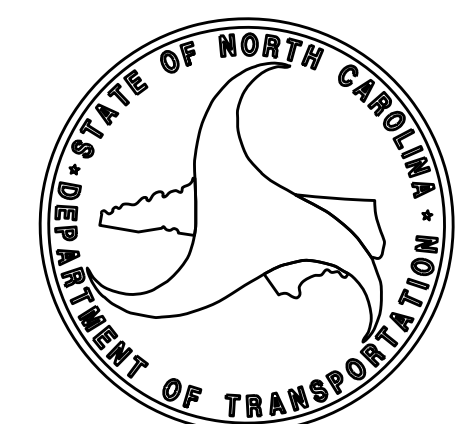
BEGIN PROJECT
17BP.14.R.204
-L- STA. 17 + 00.00

END CONSTRUCTION
-DR- 13 + 55.00

END PROJECT
17BP.14.R.204
-L- STA. 35 + 00.00



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2024 = 5,290
ADT 2044 = 5,840
T = 6 % *
V = 60 MPH
*TTST = 3% DUAL = 3%

FUNC CLASS =
MAJOR COLLECTOR
- RURAL

REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.14.R.204 = 0.308 MILES
LENGTH STRUCTURE PROJECT 17BP.14.R.204 = 0.033 MILES

TOTAL LENGTH PROJECT 17BP.14.R.204 = 0.341 MILES

NCDOT CONTACT: ZACHARY SHULER, PE

PLANS PREPARED BY: TGS ENGINEERS
201 W MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PLANS PREPARED FOR:
NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
1000 Birch Ridge Dr.
Raleigh, NC 27610

LETTING DATE:
JANUARY 16, 2024

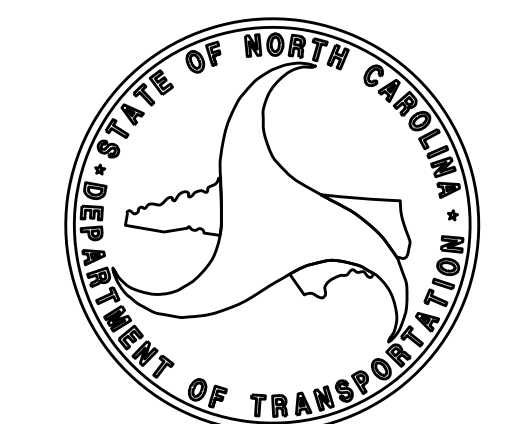
MARC CHEEK, PE
STRUCTURES DESIGN ENGINEER

2024 STANDARD SPECIFICATIONS

STRUCTURES DESIGN ENGINEER

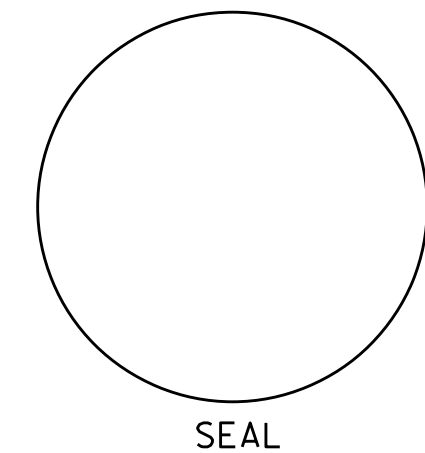
DocuSign
MARSHALL G. CHEEK, JR.
11/15/2023 | 7:42 AM EST

SIGNATURE: P.E.



\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$DON\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

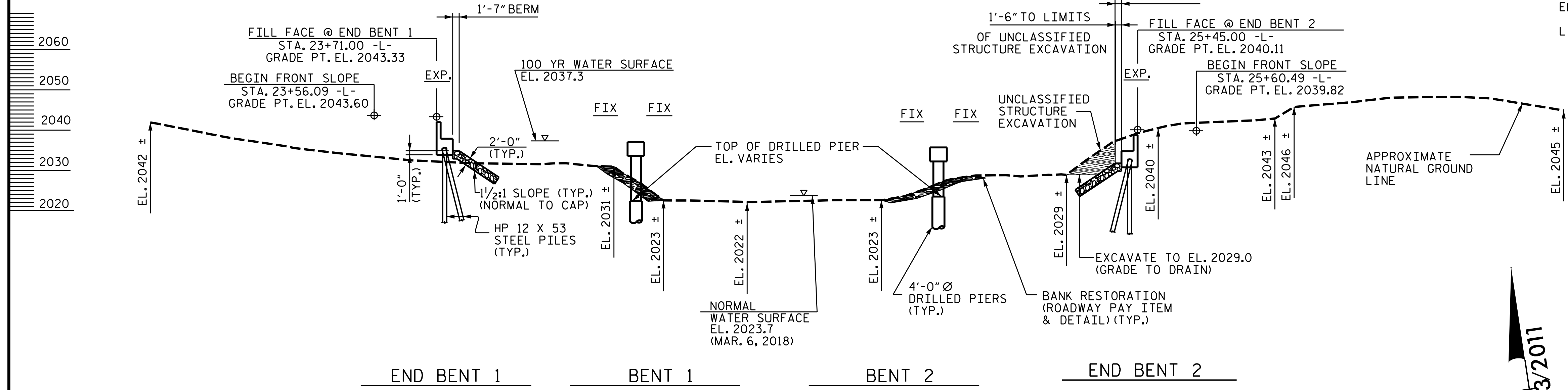


23+00 23+50 24+00 24+50 25+00 25+50 26+00 26+50

SPAN A SPAN B SPAN C

GRADE DATA

(-) 1.8509% (-) 0.6008%
 PI STA. = 27+76.00 -L-
 EL. = 2,035.83
 L = 200'



SECTION ALONG -L-

SECTION THRU END BENTS & BENTS ARE AT RIGHT ANGLES

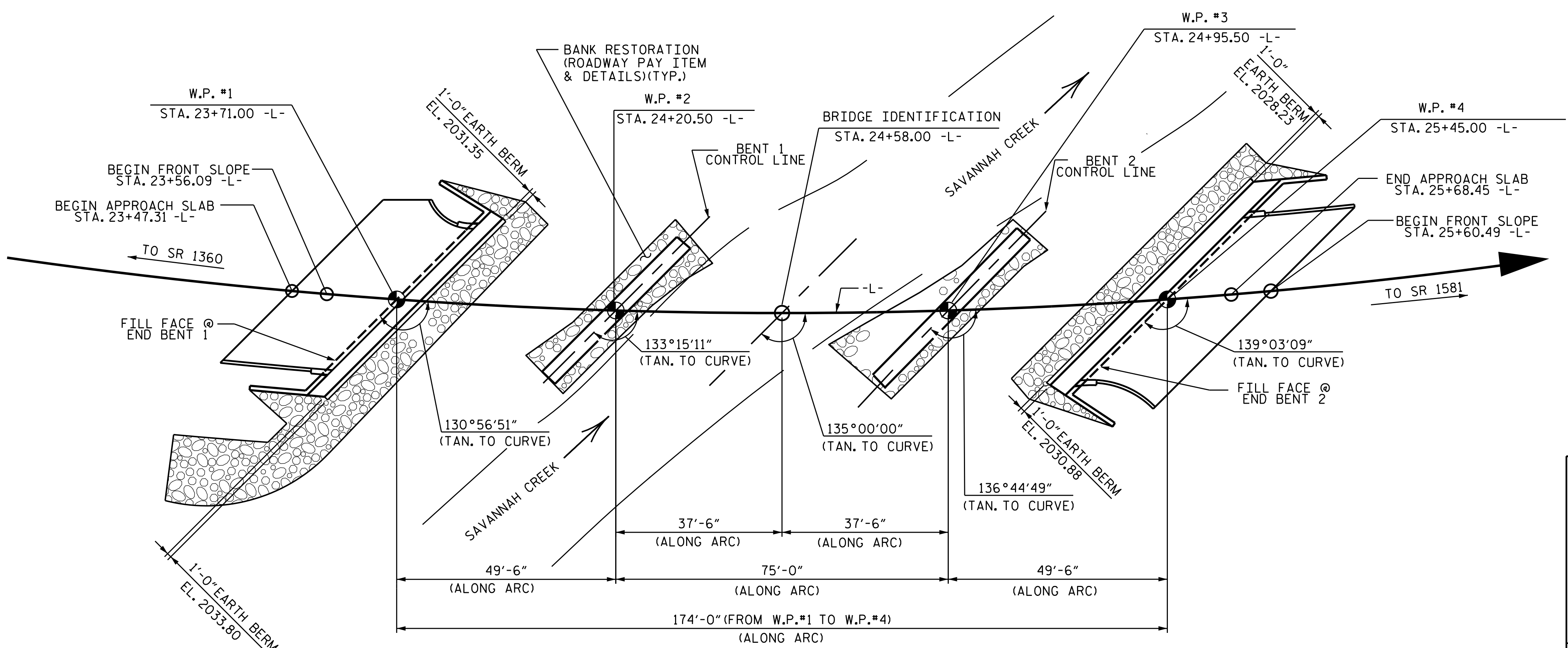
HYDRAULIC DATA:	
DESIGN DISCHARGE	6,400 CFS
FREQUENCY OF DESIGN DISCHARGE	50 YRS.
DESIGN HIGH WATER ELEVATION	2036.2
DRAINAGE AREA	36.6 SQ. MI.
BASE DISCHARGE	7,070 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	2037.3

OVERTOPPING FLOOD DATA:	
OVERTOPPING DISCHARGE	10,000 CFS
FREQUENCY OF OVERTOPPING FLOOD	500 YRS.
OVERTOPPING FLOOD ELEVATION	2041.80

LOW CHORD ELEVATION	
EB1	2037.67
EB2	2034.51

-L- CURVE DATA

PI Sta	28+38.66
Δ	72° 56' 10.9" (LT)
D	4° 39' 29.5"
L	1,565.76'
T	909.10'
R	1,230.00'



PLAN

PILES AND COLUMNS NOT SHOWN IN PLAN VIEW

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 1 OF 5 REPLACES BRIDGE NO. 490032

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 SAVANNAH CREEK
 ON NC 116 BETWEEN
 SR 1360 AND SR 1581

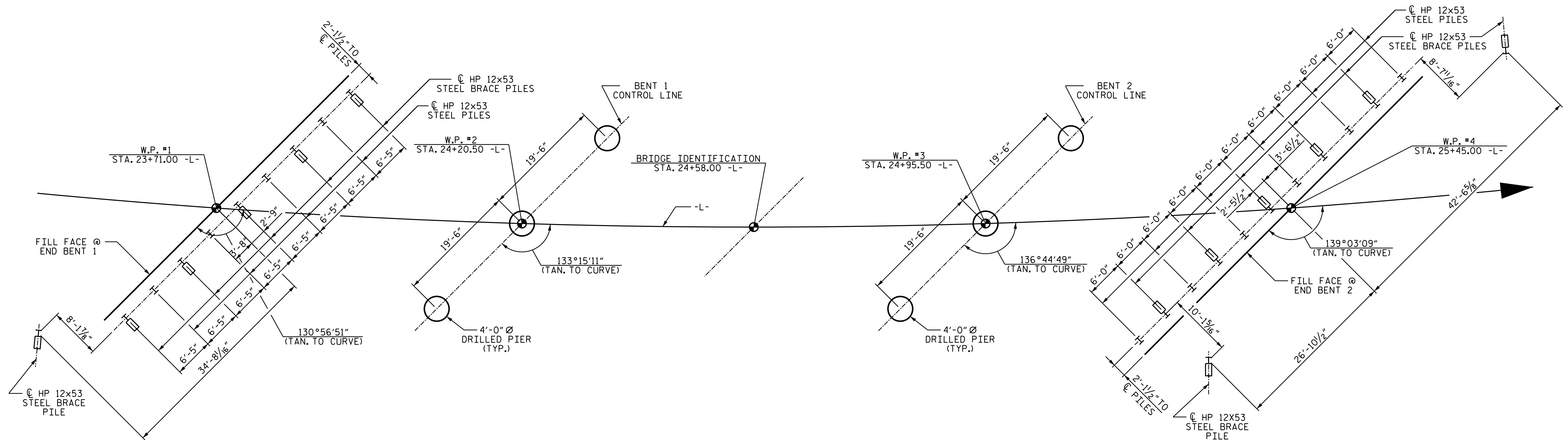
11/15/2023 | 7:42 AM EST

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 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

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

DRAWN BY : LAB/JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22



FOUNDATION LAYOUT PLAN

ALL PILES ARE HP 12x53 STEEL PILES. ALL BRACE PILE ARE BATTERED 3:12.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 2011.0 WITH THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 8 FEET INTO ROCK AS DEFINED BY ARTICLE 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 365 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 2019.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 2018.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 350 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 70 TSF.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 2011.0 WITH THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 8 FEET INTO ROCK AS DEFINED BY ARTICLE 411 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2019.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS ELEVATION 2018.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

DRILLED-IN PILES MAY BE REQUIRED AT END BENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2021.2 OR A MINIMUM OF 1 FOOT INTO ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED-IN PILES MAY BE REQUIRED AT END BENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2020.2 OR A MINIMUM OF 5 FEET INTO ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.14.R.204

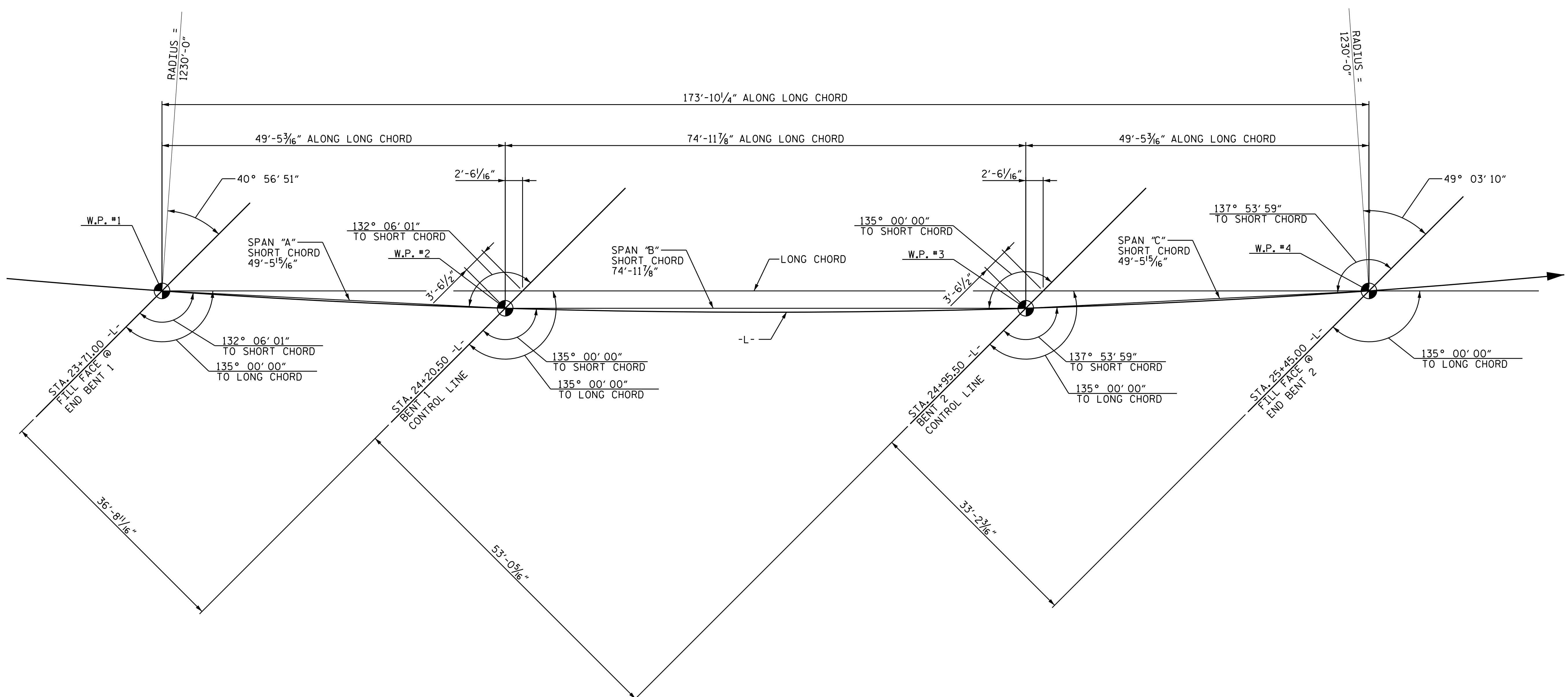
JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 2 OF 5

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
		GENERAL DRAWING FOR BRIDGE OVER SAVANNAH CREEK ON SR 116 BETWEEN SR 1360 AND SR 1581			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.			S-2		
TOTAL SHEETS			47		

DRAWN BY : LAB/JLA DATE : 9/22
CHECKED BY : MGC DATE : 10/22



LONG CHORD LAYOUT
ALL SUBSTRUCTURE UNITS ARE PARALLEL

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 3 OF 5

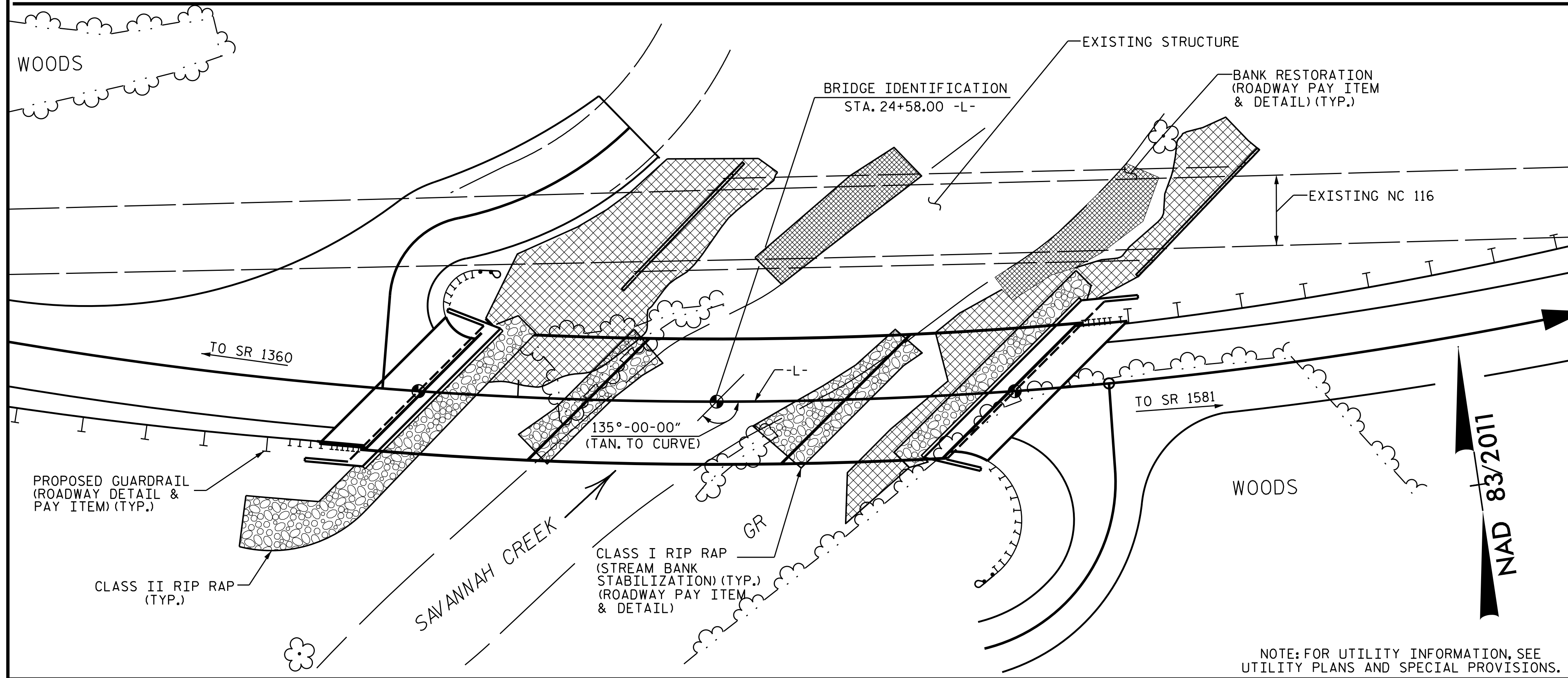
DRAWN BY : NMW DATE : 8/22
 CHECKED BY : MGC DATE : 8/22

DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER
 SAVANNAH CREEK
 ON SR 116 BETWEEN
 SR 1360 AND SR 1581

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

BENCHMARK #2: 8" RAILROAD SPIKE SET IN BASE OF 10" WALNUT TREE; 37' LT OF STA. 17+18.00 -L-; ELEV. 2055.26'



LOCATION SKETCH

TOTAL BILL OF MATERIAL

ITEM	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" DIA. DRILLED PIERS IN SOIL	4'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.
SUPERSTRUCTURE										6250	7652	
END BENT 1			94.00	14.00								63.3
BENT 1					19.63	27.00	22.63					36.2
BENT 2					15.61	25.00	16.61					35.2
END BENT 2			90.00	20.00					LUMP SUM			70.9
TOTALS	LUMP SUM	LUMP SUM	184.00	34.00	35.24	52.00	39.24	1	LUMP SUM	6250	7652	205.6

ITEM	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 x 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINT
	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EA.	NO. LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			12 668.32			325.61	359.30				LUMP SUM
END BENT 1		7761			10	10	150		165	180		
BENT 1		13332	1771									
BENT 2		13011	1672									
END BENT 2		7506			13	13	195		70	80		
TOTALS	LUMP SUM	41610	3443	12 668.32	23	23	345	325.61	359.30	260	LUMP SUM	LUMP SUM

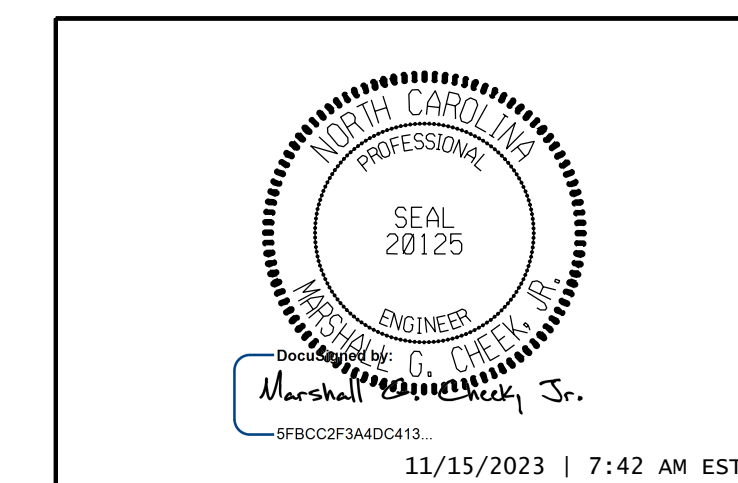
DRAWN BY : LAB DATE : 10/22
 CHECKED BY : MGC DATE : 10/22

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 SAVANNAH CREEK
 ON NC 116 BETWEEN
 SR 1360 AND SR 1581

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TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

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

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.

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.

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 24+58.00 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 85 FT LEFT OF CENTERLINE -L- AT END BENT 1 AND 100 FT LEFT AND 55 FT RIGHT OF CENTERLINE -L- AT END BENT 2, AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING 3 SPAN BRIDGE (1 @ 50'-8", 1 @ 50'-1", 1 @ 50'-8") WITH A SUPERSTRUCTURE CONSISTING OF A REINFORCED CONCRETE DECK ON STEEL I-BEAMS AND WITH A CLEAR ROADWAY WIDTH OF 24 FT AND A 2 1/2" ASPHALT WEARING SURFACE AND A SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE CAPS ON STEEL H-PILES AT THE END BENTS AND REINFORCED CONCRETE POST-AND-BEAM BENTS, AND LOCATED DOWNSTREAM OF THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 5 OF 5



11/30/2023 | 7:00 AM EST

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
SAVANNAH CREEK
ON NC 116 BETWEEN
SR 1360 AND SR 1581

REVISIONS

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

SHEET NO.

S-5
TOTAL SHEETS
47

DRAWN BY : LAB DATE : 5/19
CHECKED BY : MGC DATE : 10/22

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.48	--	1.75	0.774	2.07	B	EL	37.13	1.151	1.48	B	G2	14.3	0.80	0.774	1.93	B	EL	37.13	1	
	HL-93 (OPERATING)	N/A		1.96	--	1.35	0.774	2.68	B	EL	37.13	1.151	1.96	B	G2	14.3	N/A	--	--	--	--	--	1	
	HS-20 (INVENTORY)	36.000	②	1.86	66.9	1.75	0.774	2.72	B	EL	37.13	1.151	1.86	B	G2	14.3	0.80	0.774	2.53	B	EL	37.13	1	
	HS-20 (OPERATING)	36.000		2.44	87.8	1.35	0.774	3.52	B	EL	37.13	1.151	2.44	B	G2	14.3	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.69	76.8	1.40	0.774	7.70	B	EL	37.13	1.151	5.69	B	G2	14.3	0.80	0.774	5.73	B	EL	37.13	1
		SNGARBS2	20.000		4.04	80.8	1.40	0.774	5.72	B	EL	37.13	1.151	4.04	B	G2	14.3	0.80	0.774	4.26	B	EL	37.13	1
		SNAGRIS2	22.000		3.75	82.5	1.40	0.774	5.41	B	EL	37.13	1.151	3.75	B	G2	14.3	0.80	0.774	4.03	B	EL	37.13	1
		SNCOTTS3	27.250		2.77	75.4	1.40	0.774	3.83	B	EL	37.13	1.151	2.77	B	G2	14.3	0.80	0.774	2.85	B	EL	37.13	1
		SNAGGRS4	34.925		2.30	80.3	1.40	0.774	3.20	B	EL	37.13	1.151	2.30	B	G2	14.3	0.80	0.774	2.38	B	EL	37.13	1
		SNS5A	35.550		2.33	82.8	1.40	0.774	3.12	B	EL	37.13	1.151	2.34	B	G2	14.3	0.80	0.774	2.33	B	EL	37.13	1
		SNS6A	39.950		2.13	85.0	1.40	0.774	2.86	B	EL	37.13	1.151	2.14	B	G2	14.3	0.80	0.774	2.13	B	EL	37.13	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.56	84.4	1.40	0.774	3.49	B	EL	37.13	1.151	2.56	B	G2	14.3	0.80	0.774	2.60	B	EL	37.13	1
		TNT4A	33.075		2.48	82.0	1.40	0.774	3.51	B	EL	37.13	1.151	2.48	B	G2	14.3	0.80	0.774	2.61	B	EL	37.13	1
		TNT6A	41.600		2.14	89.0	1.40	0.774	2.87	B	EL	37.13	1.151	2.27	B	G2	14.3	0.80	0.774	2.14	B	EL	37.13	1
		TNT7A	42.000		2.15	90.3	1.40	0.774	2.88	B	EL	37.13	1.151	2.20	B	G2	14.3	0.80	0.774	2.15	B	EL	37.13	1
		TNT7B	42.000		2.05	86.1	1.40	0.774	2.98	B	EL	37.13	1.151	2.05	B	G2	14.3	0.80	0.774	2.22	B	EL	37.13	1
		TNAGRIT4	43.000		1.98	85.1	1.40	0.774	2.83	B	EL	37.13	1.151	1.98	B	G2	14.3	0.80	0.774	2.11	B	EL	37.13	1
		TNAGT5A	45.000		1.97	88.6	1.40	0.774	2.67	B	EL	37.13	1.151	1.97	B	G2	14.3	0.80	0.774	1.99	B	EL	37.13	1
TNAGT5B	45.000	③	1.87	84.1	1.40	0.774	2.64	B	EL	37.13	1.151	1.87	B	G2	14.3	0.80	0.774	1.97	B	EL	37.13	1		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.78	79.9	1.30	0.774	4.04	B	EL	37.13	1.151	2.78	B	G2	14.3	0.80	0.774	3.01	B	EL	37.13	1	
	EV3	43.000	④	1.85	79.6	1.30	0.774	2.65	B	EL	37.13	1.151	1.85	B	G2	14.3	0.80	0.774	1.97	B	EL	37.13	1	

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:

- TYPICAL SECTION IN EACH SPAN HAS VARIABLE GIRDER SPACING AND VARIABLE DECK OVERHANGS. THEREFORE, AVERAGE VALUES FOR BOTH GIRDER SPACING AND DECK OVERHANG USED TO FORMULATE RATING VALUES.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

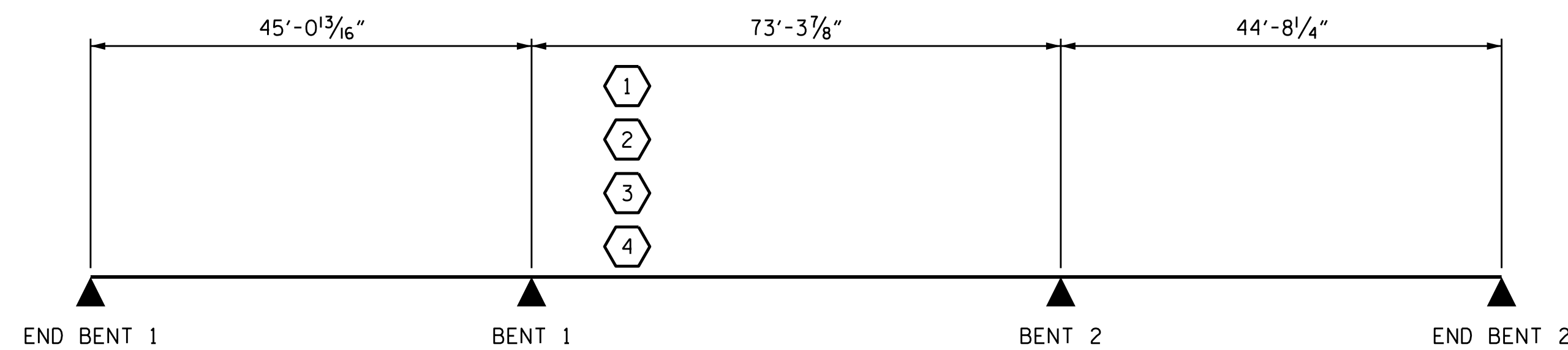
③ LEGAL LOAD RATING **

④ EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

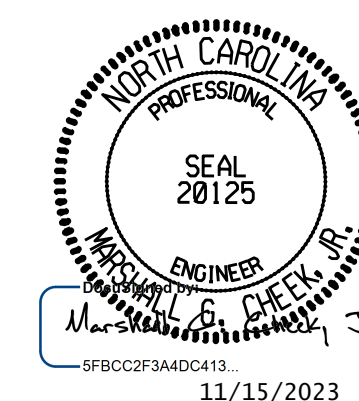


PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

LRFR SUMMARY
 AVERAGE BEARING TO BEARING DIMENSIONS SHOWN.

ASSEMBLED BY : LAB	DATE : 1/23
CHECKED BY : RDE	DATE : 7/23
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 04/23 BNB/AAI

*****SYSTEM*****
 *****DCN*****
 *****USER*****



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 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			47

STD. NO. LRFR1

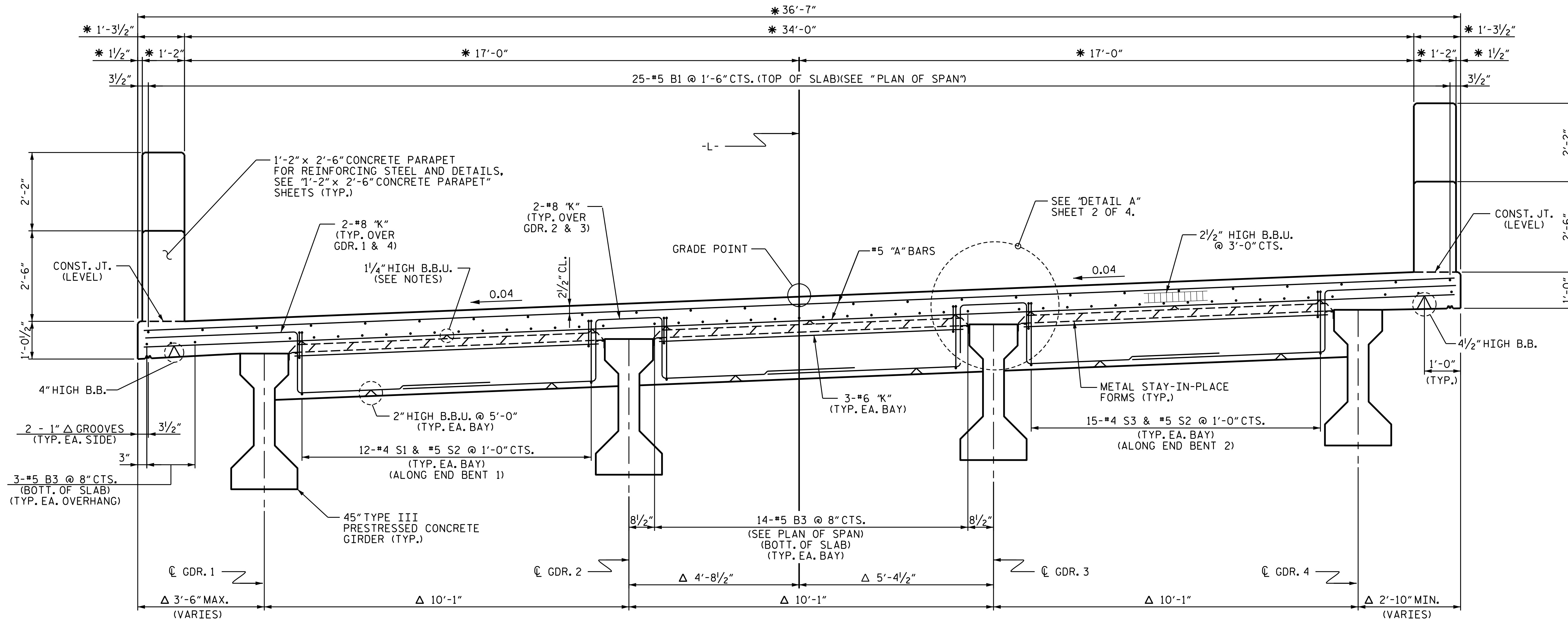
NOTES

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

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.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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



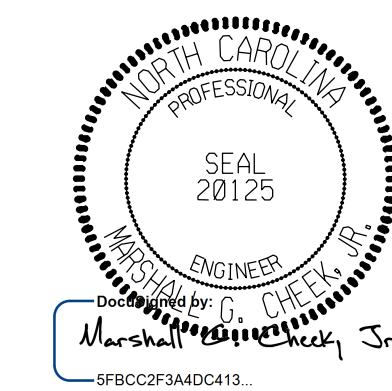
TYPICAL SECTION AT END BENT 1
(END BENT 1 SHOWN; END BENT 2 IS SIMILAR)

* RADIAL DIMENSION

△ THEORETICAL DIMENSIONS SHOWN ARE RADIAL THROUGH WORK POINTS.

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00-L-

SHEET 1 OF 4



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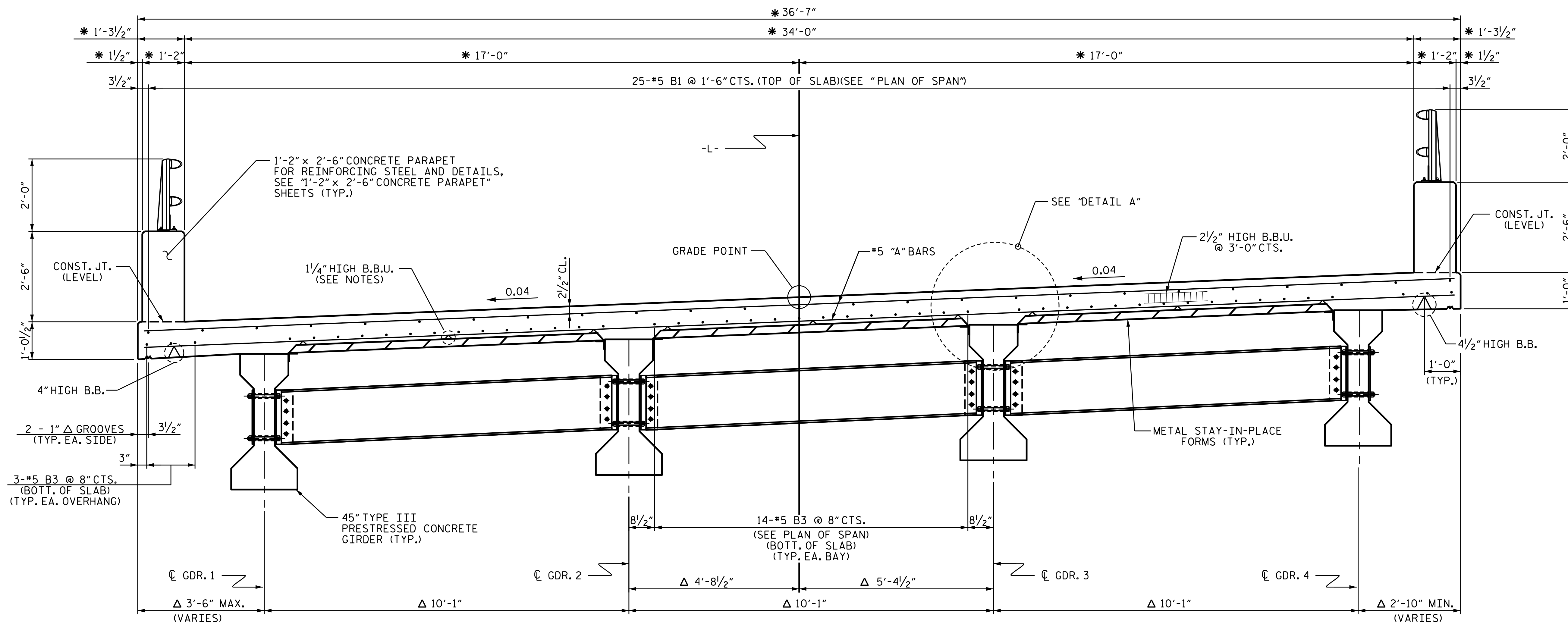
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

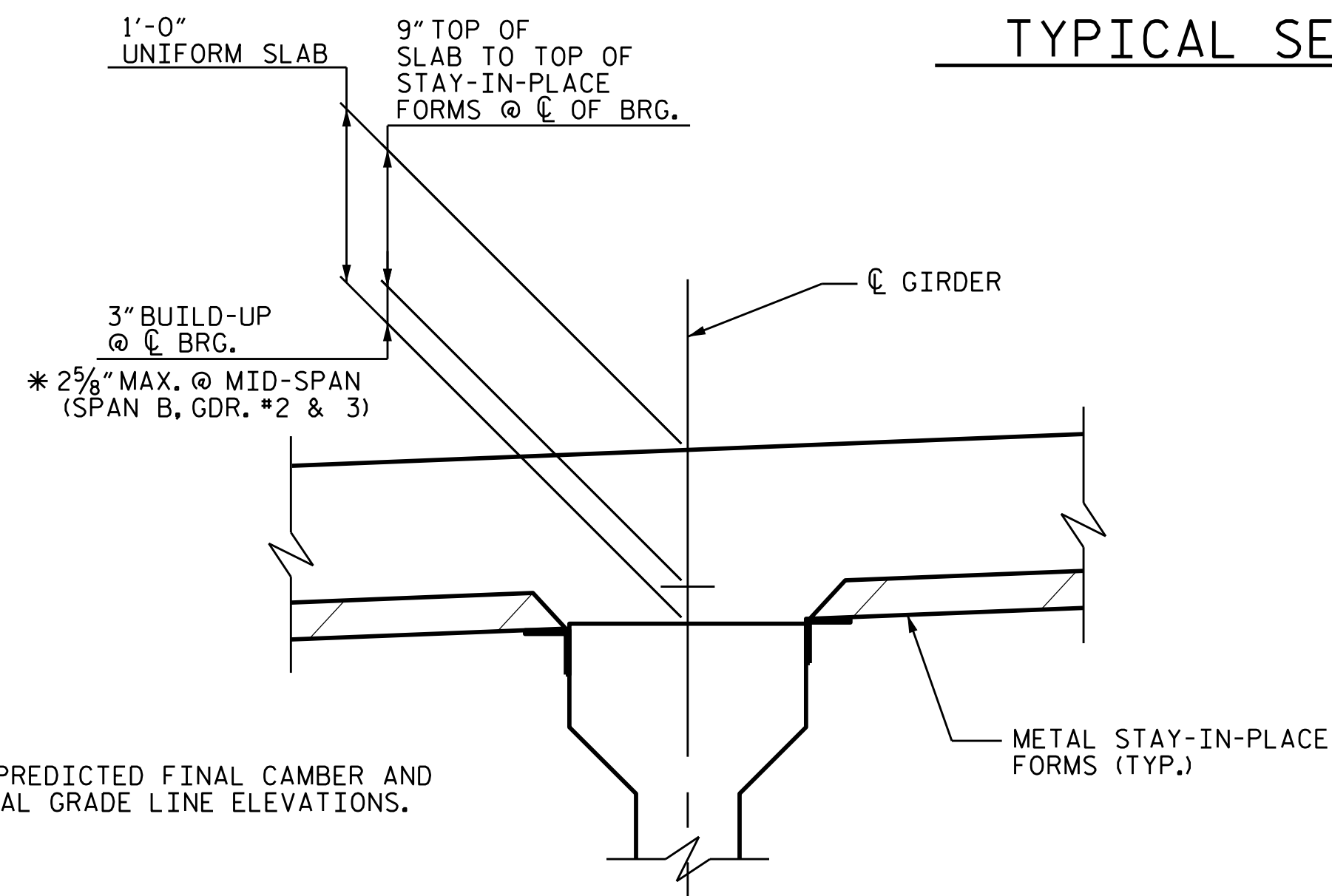
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-7
1			3			TOTAL SHEETS
2			4			47

DRAWN BY: JLA DATE: 9/22
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DESIGN ENGINEER OF RECORD: ZCS DATE: 1/23



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS



DETAIL A

* RADIAL DIMENSION

Δ THEORETICAL DIMENSIONS SHOWN ARE RADIAL THROUGH WORK POINTS.

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

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

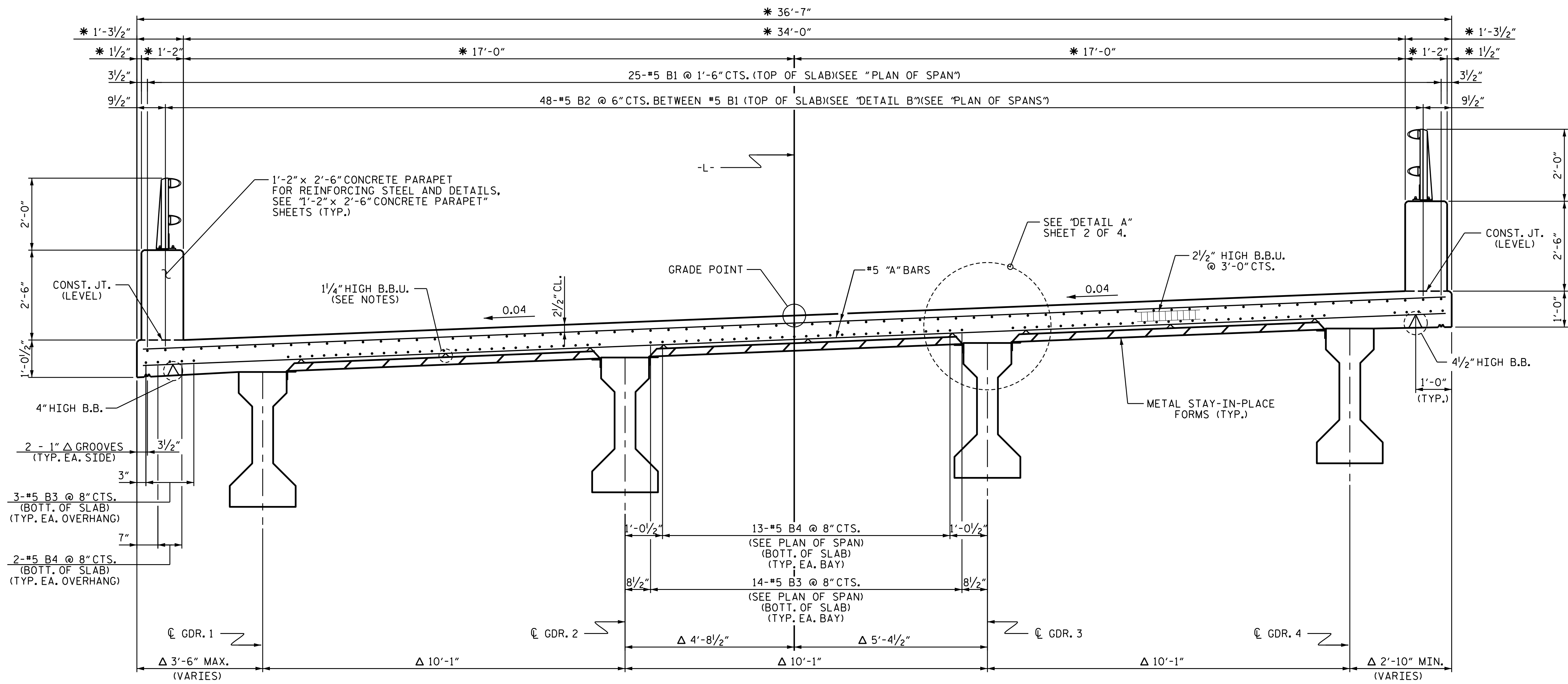
TYPICAL SECTION

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DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23

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CORP. LICENSE NO.: C-0275

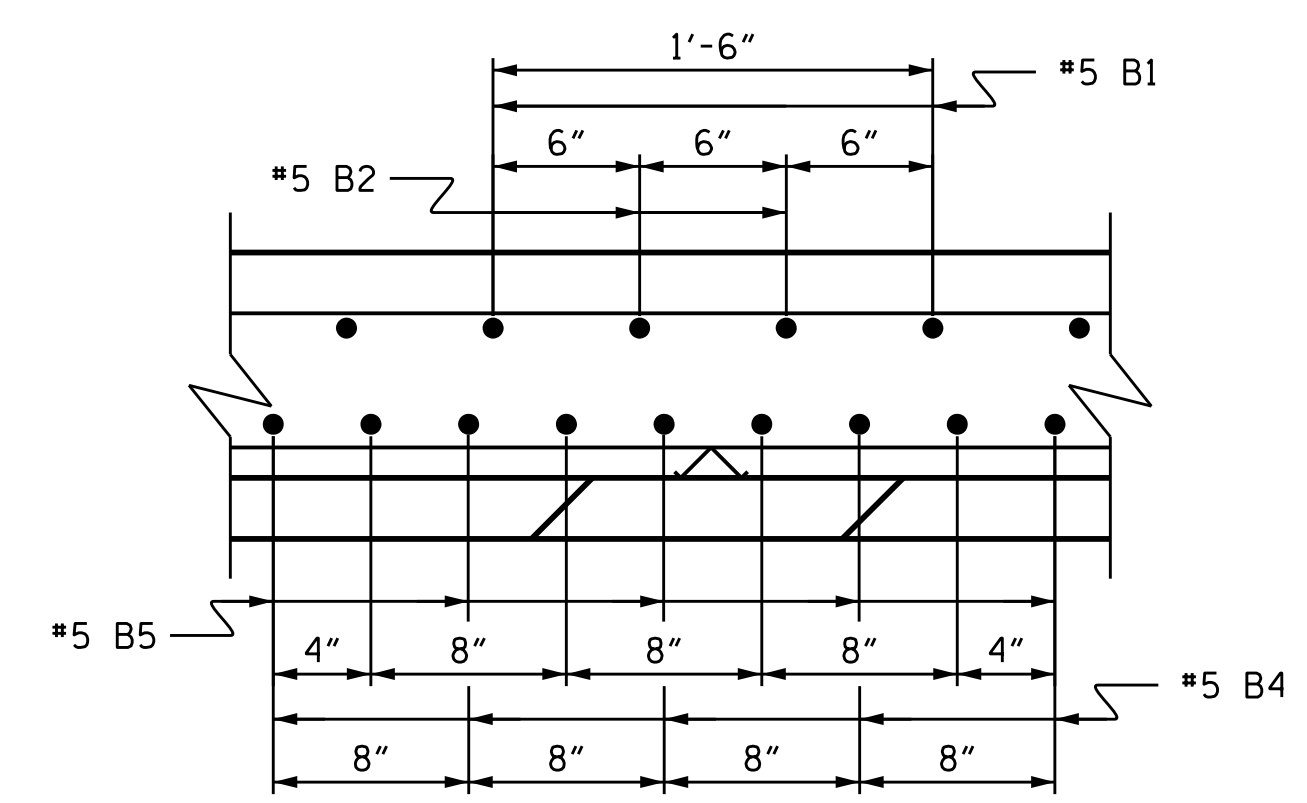
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-8
1			3			TOTAL SHEETS
2			4			47



TYPICAL SECTION AT LINK SLAB

* RADIAL DIMENSION

Δ THEORETICAL DIMENSIONS SHOWN ARE RADIAL THROUGH WORK POINTS.



DETAIL B

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

TYPICAL SECTION

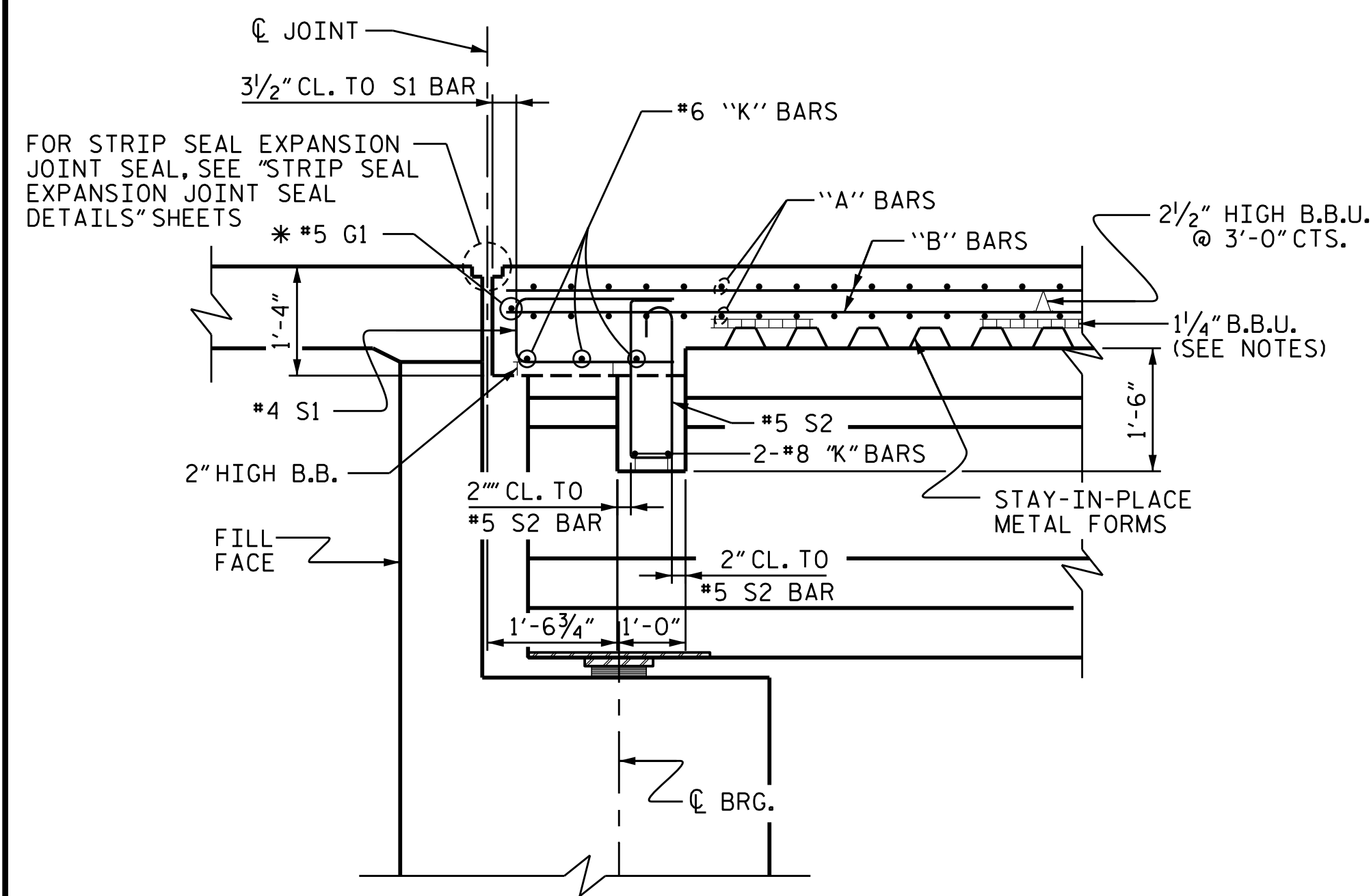
11/15/2023 | 7:42 AM EST

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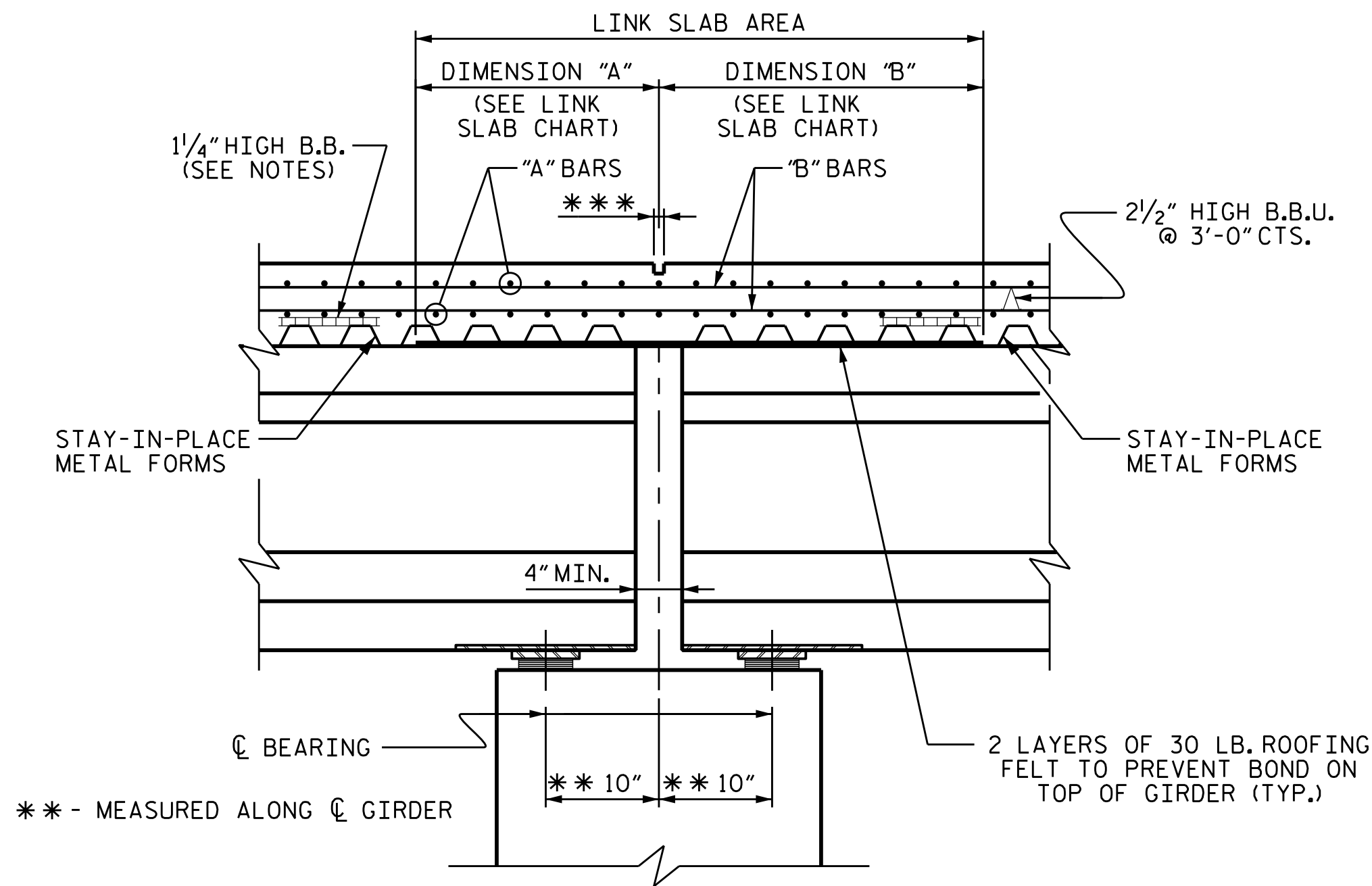
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23

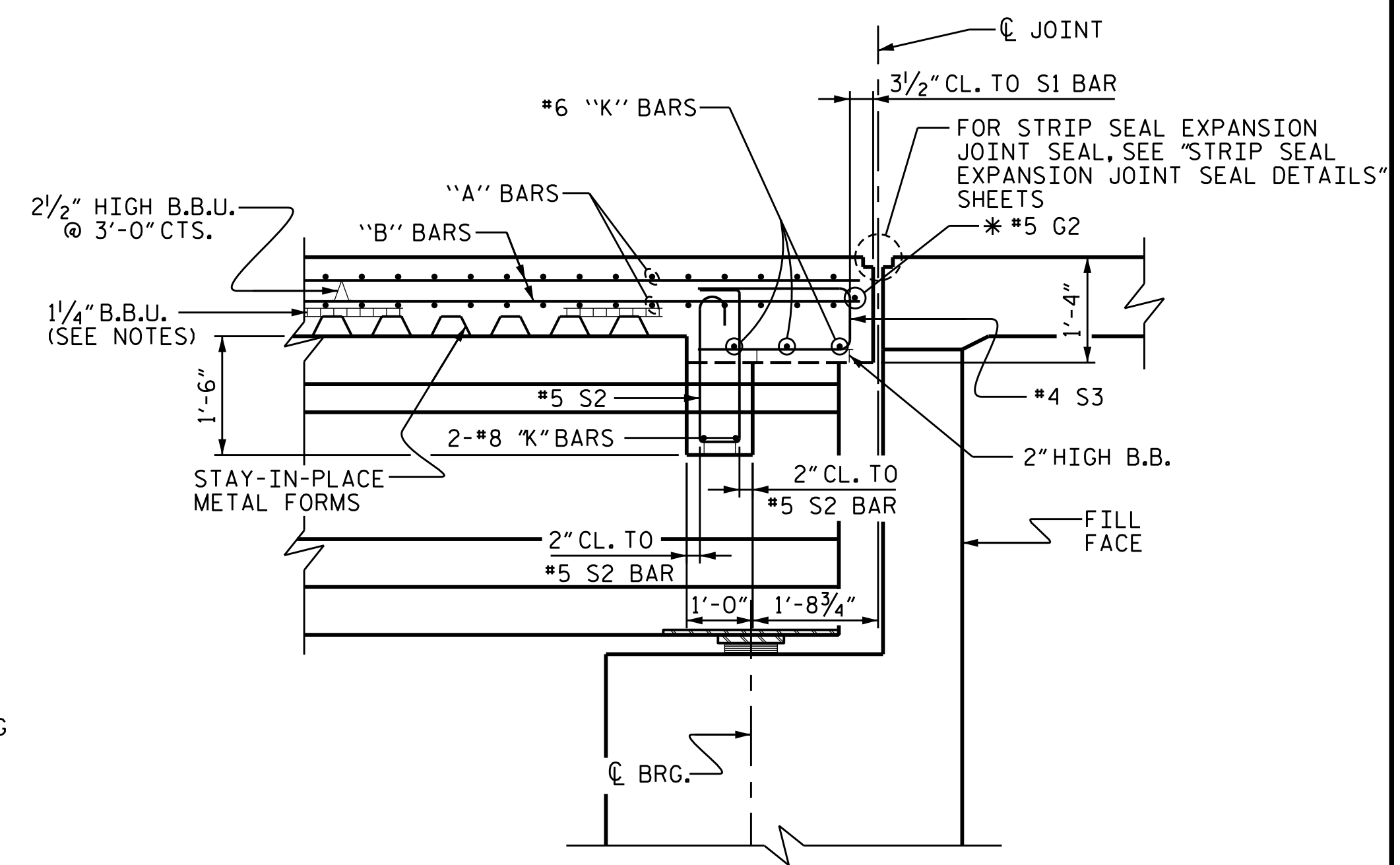


SECTION THRU END BENT 1

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

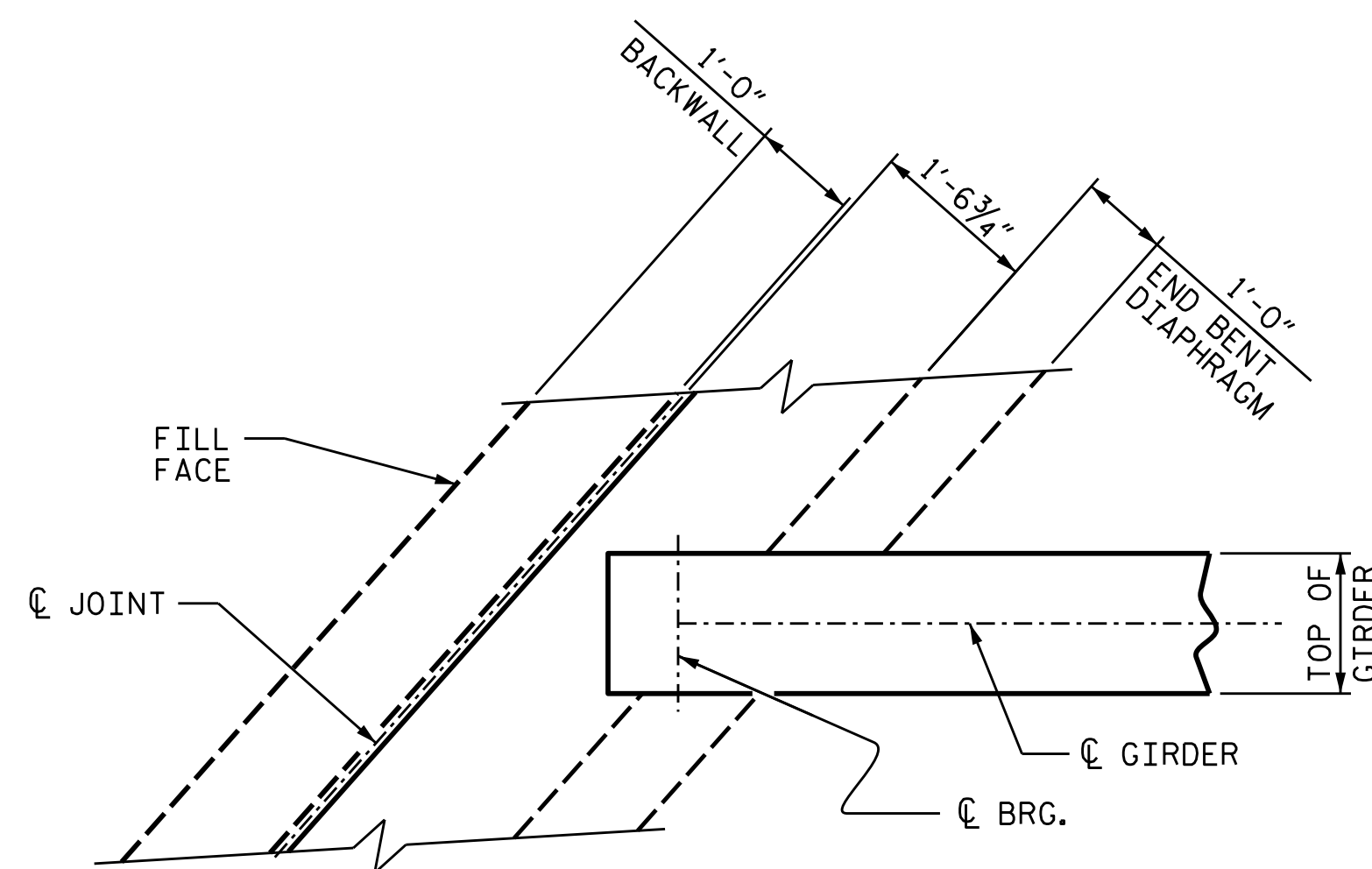


SECTION THRU LINK SLAB

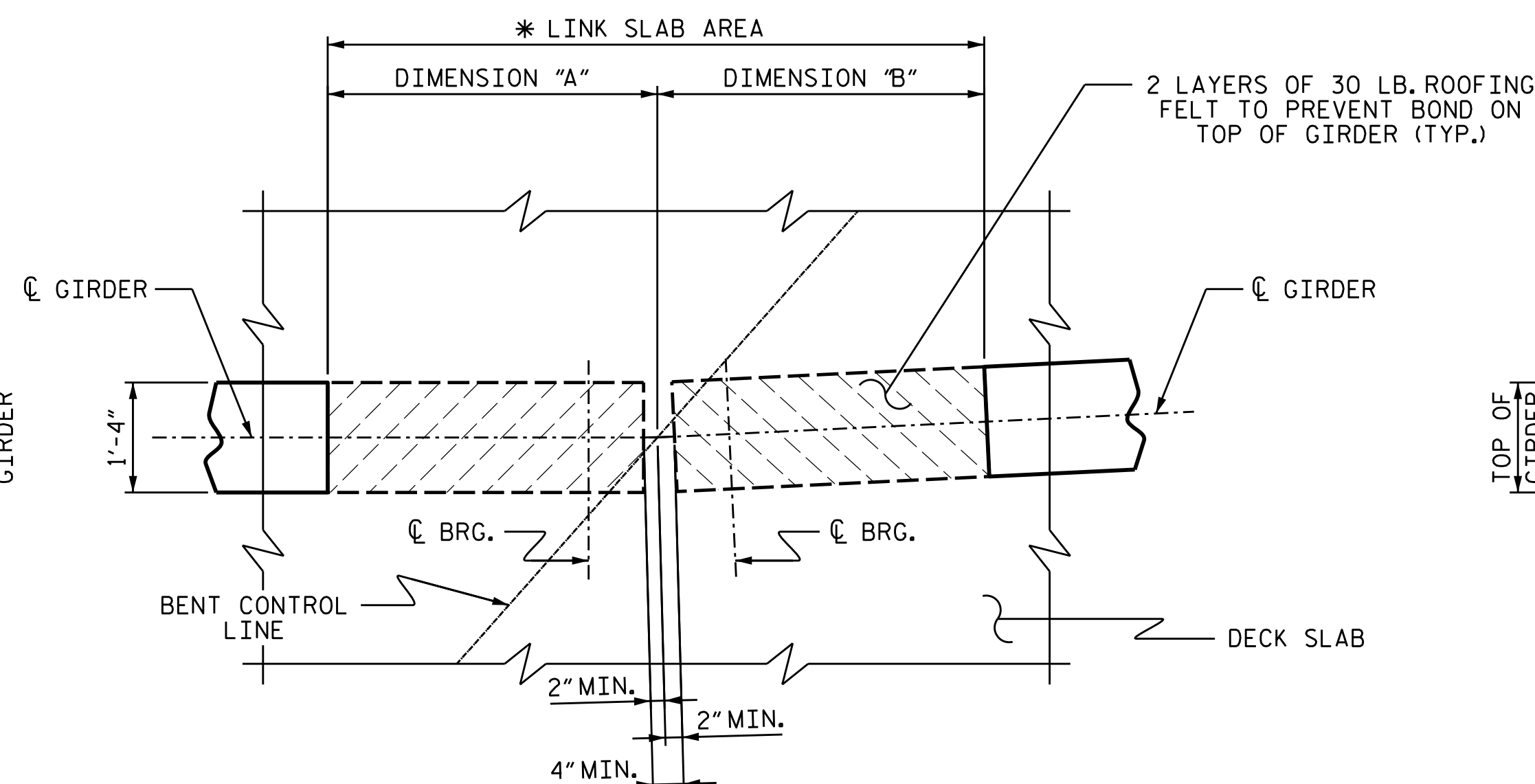


SECTION THRU END BENT 2

* #5 G2 BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STRIRRUPS.

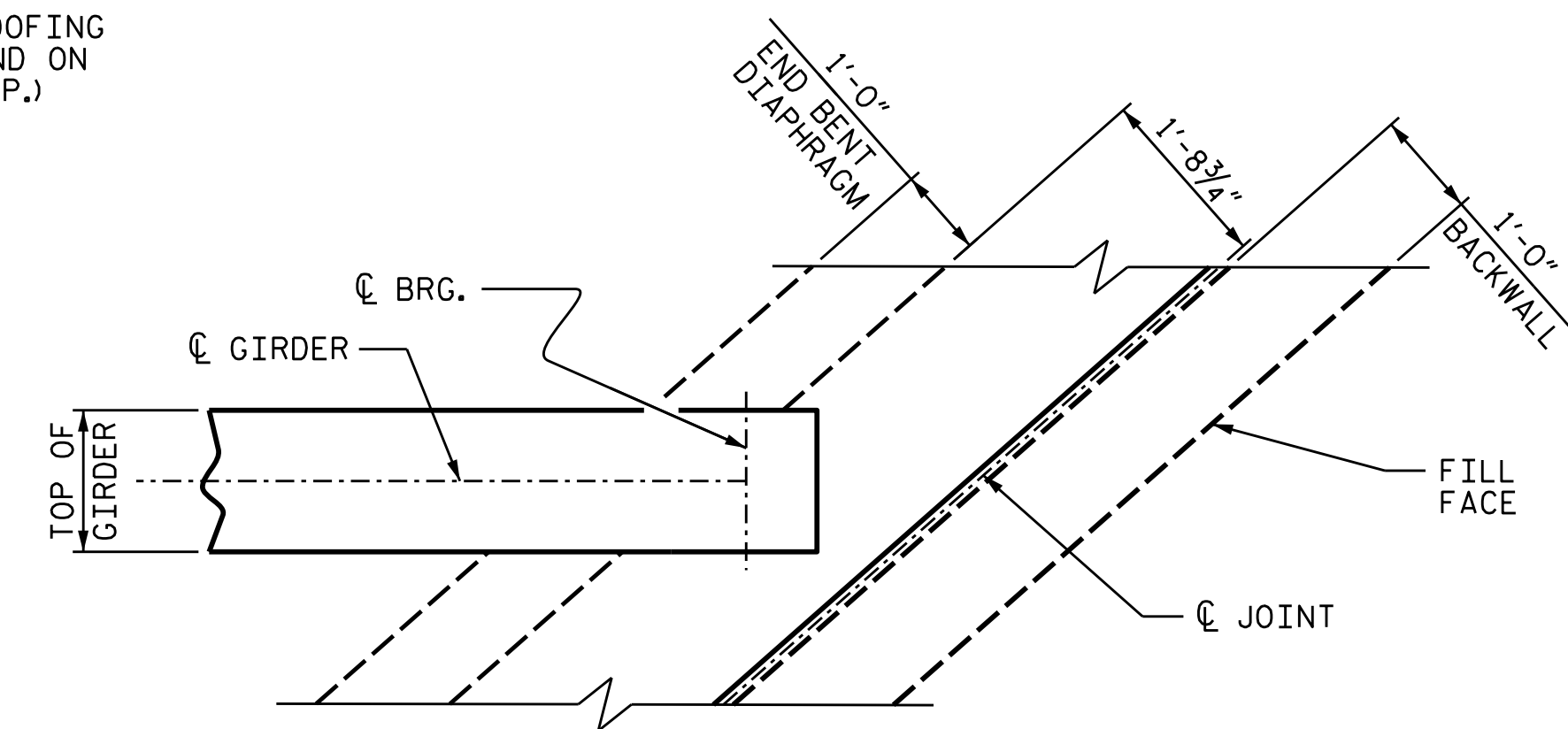


PLAN OF GIRDER AT END BENT 1



PLAN OF GIRDER AT BENT

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



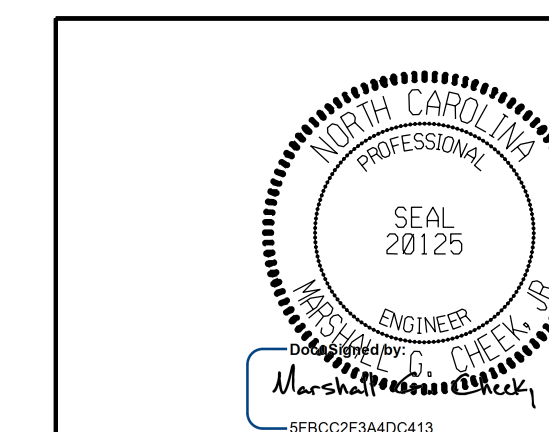
PLAN OF GIRDER AT END BENT 2

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 4 OF 4

LINK SLAB CHART		
BENT No.	DIMENSION "A"	DIMENSION "B"
1	2'-6"	4'-0"
2	4'-0"	2'-6"

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 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23

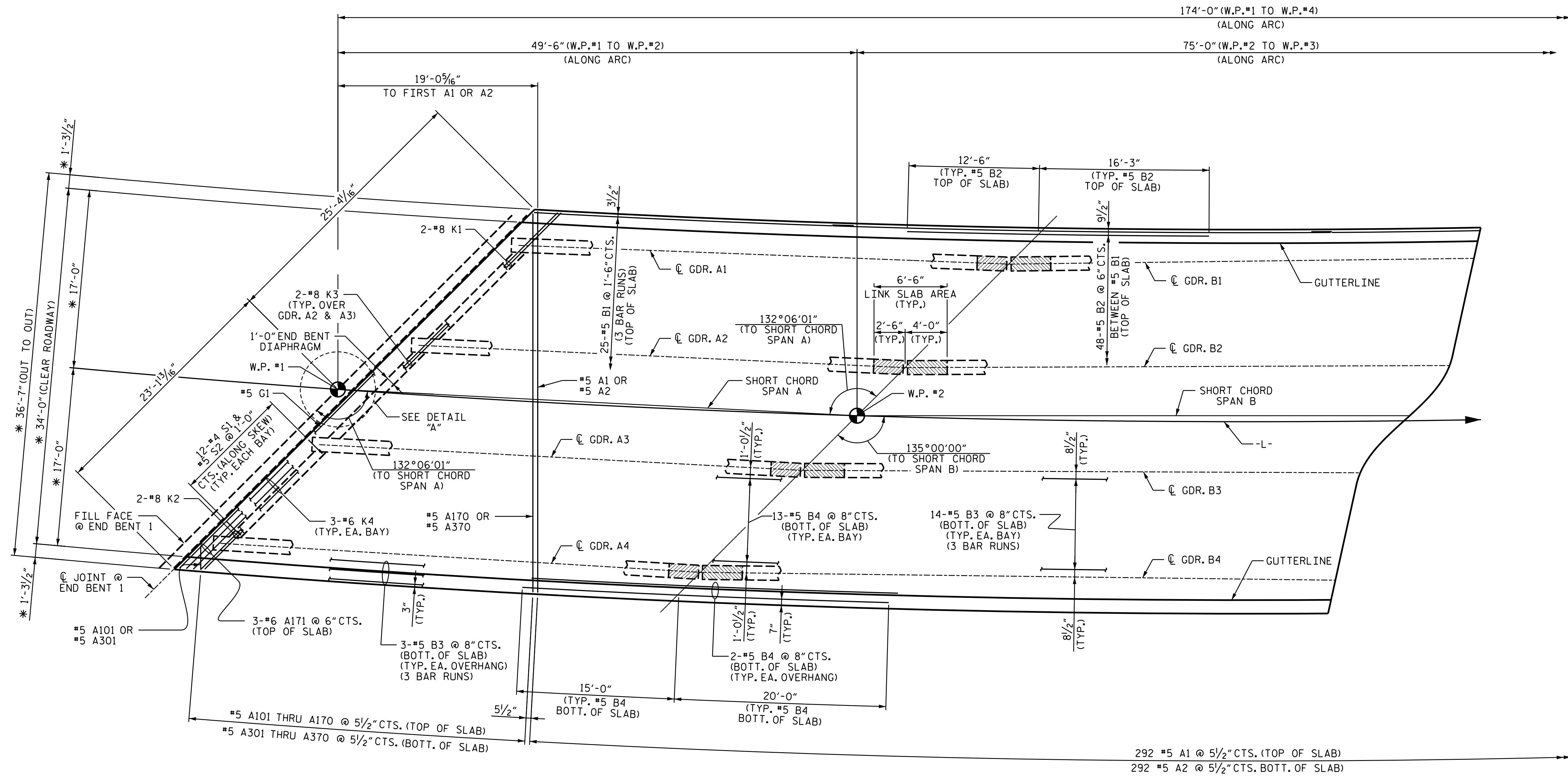


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 SHELBY, NC 28150
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

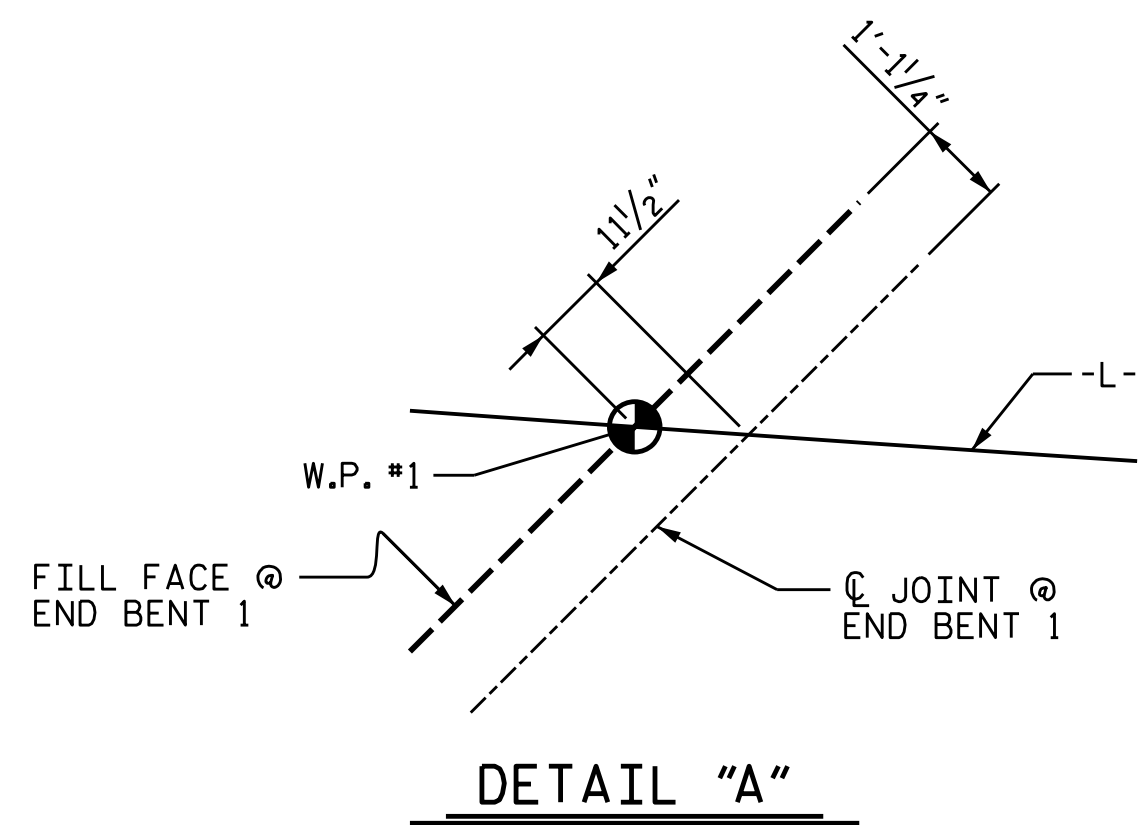
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			47



PLAN OF SPAN A

PLAN OF SPAN B



DETAIL "A"

* RADIAL DIMENSIONS
 ** #5 "A" BARS ARE TO BE PLACED RADially ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 1 OF 3

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

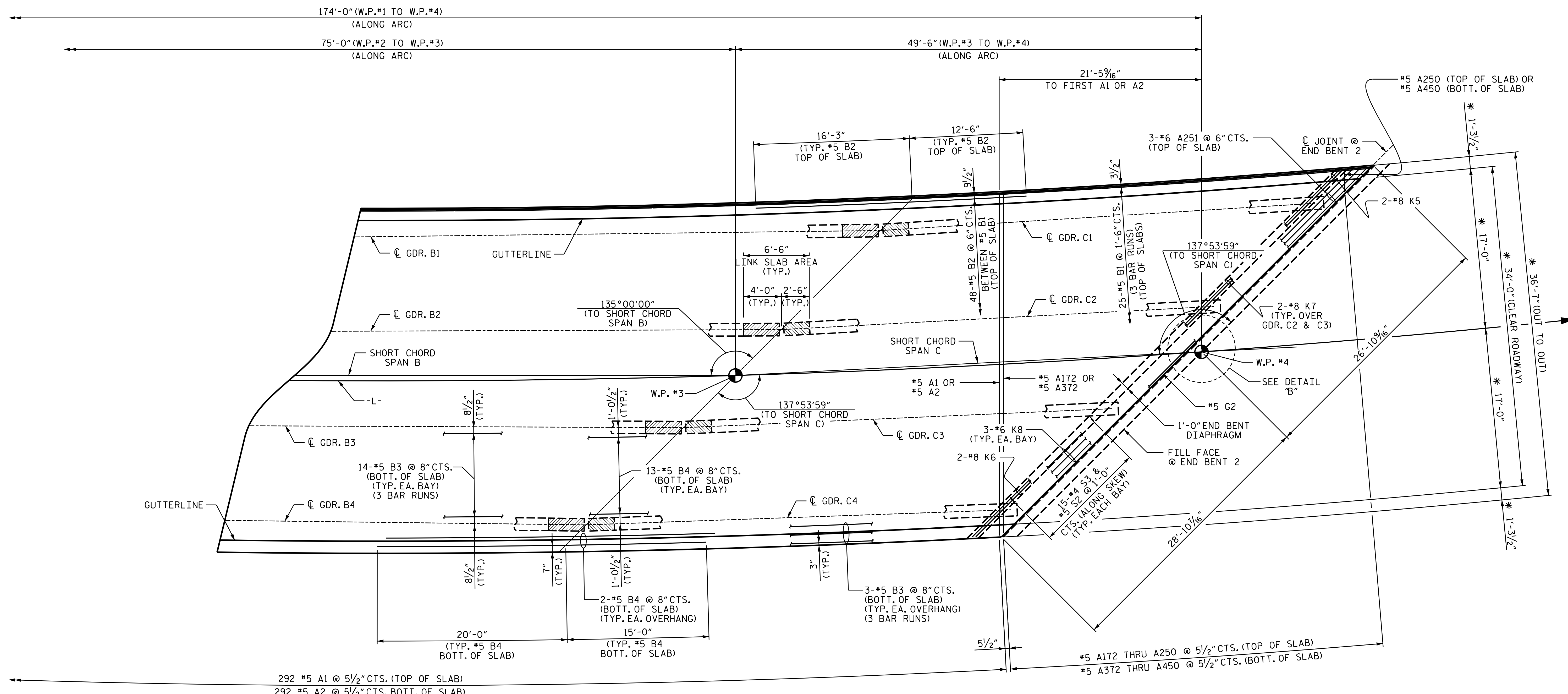
11/15/2023 | 7:42 AM EST

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			47

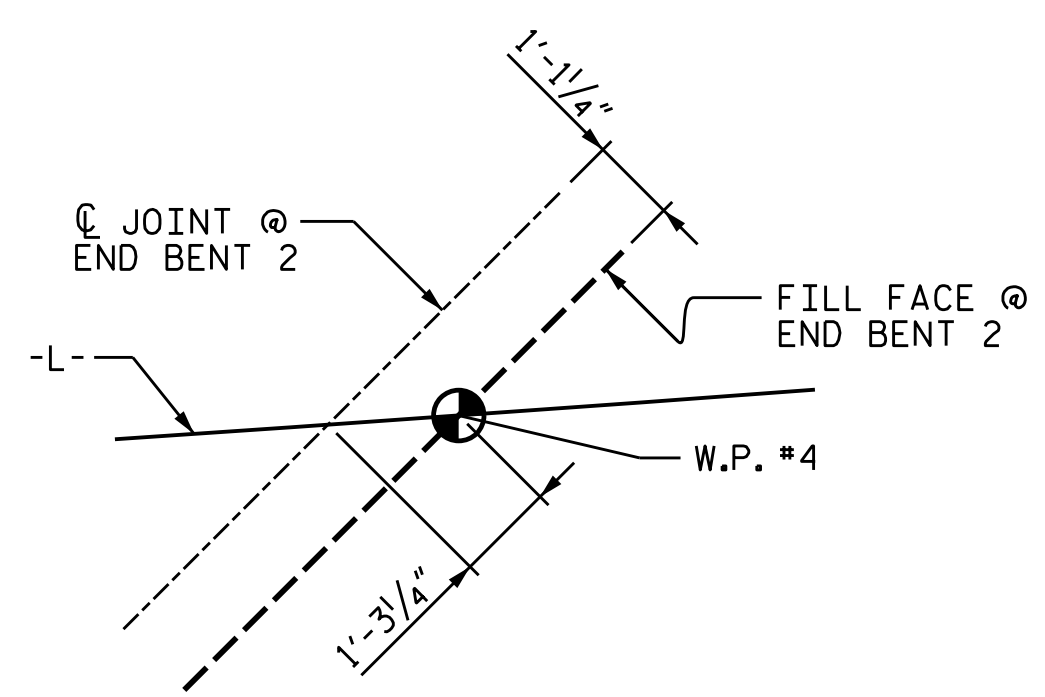
DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : MGC DATE : 1/23



PLAN OF SPAN B

PLAN OF SPAN C

* RADIAL DIMENSIONS
 ** #5 "A" BARS ARE TO BE PLACED RADIALY
 ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.



DETAIL "B"

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 2 OF 3

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

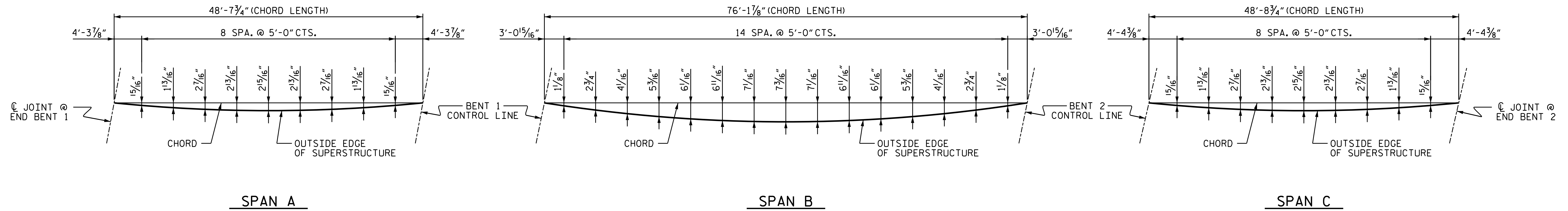
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DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

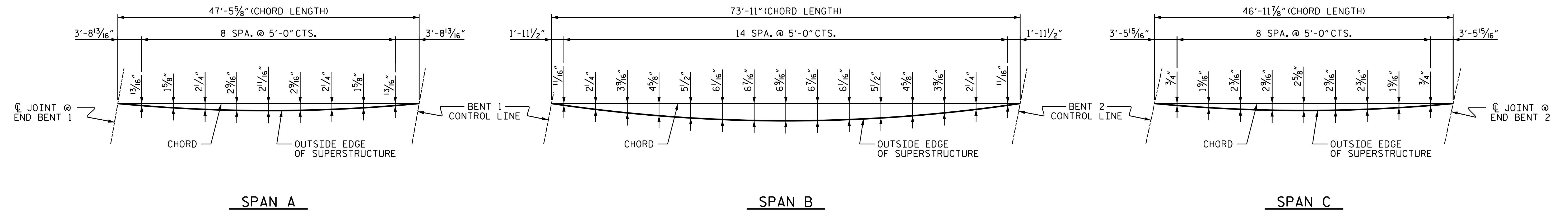
TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-12
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : MGC DATE : 1/23



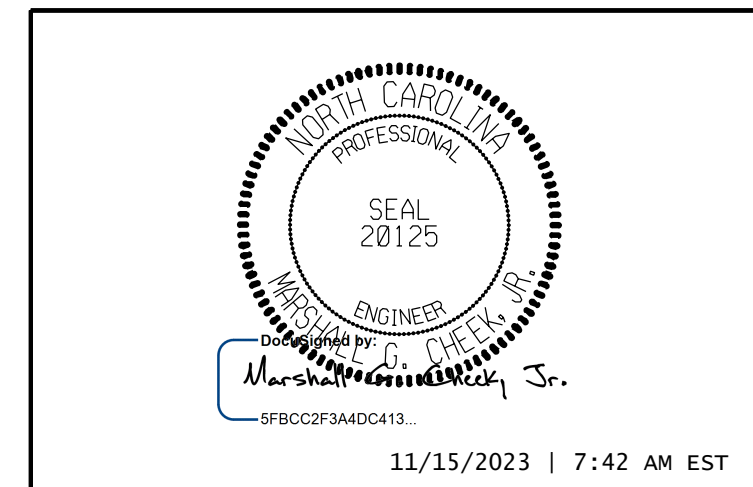
LEFT OUTSIDE EDGE



RIGHT OUTSIDE EDGE

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 3 OF 3



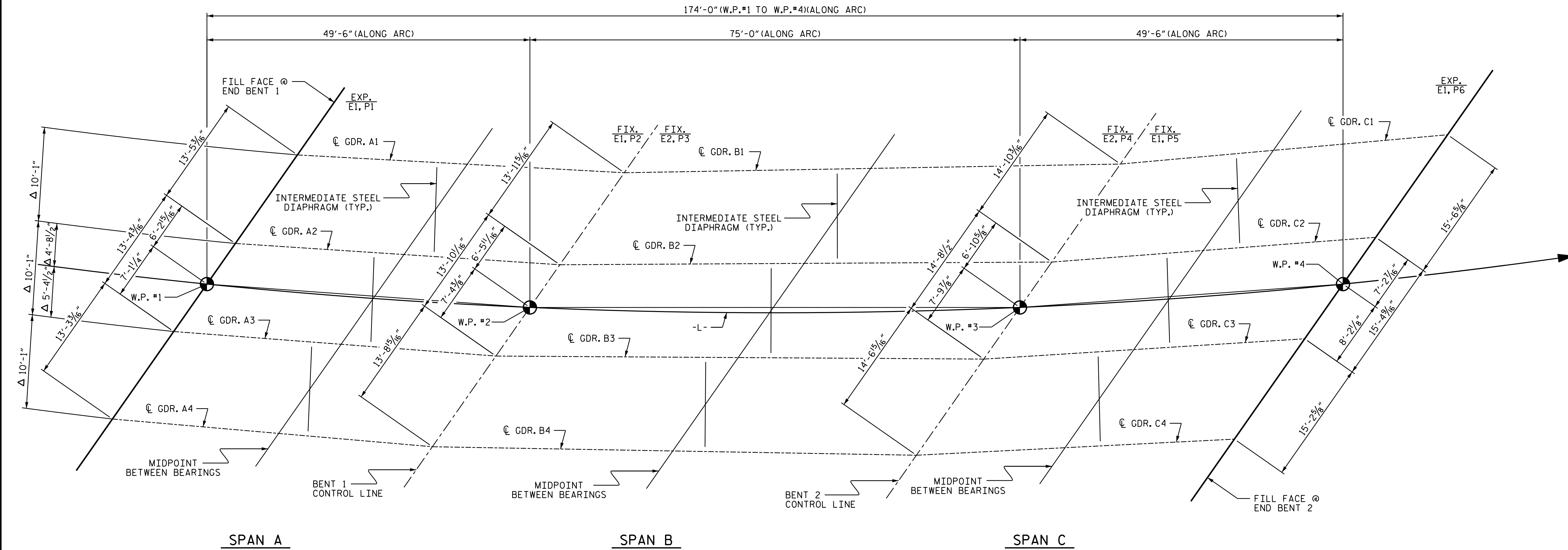
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ARC OFFSETS

DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : MGC DATE : 1/23

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TGS ENGINEERS
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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-13
1			3			TOTAL SHEETS
2			4			47



SPAN A

SPAN B

SPAN C

FRAMING PLAN

FOR ELASTOMERIC BEARINGS AND SOLE PLATES, SEE "ELASTOMERIC BEARINGS" SHEET.

△ THEORETICAL DIMENSIONS SHOWN ARE RADIAL THROUGH WORK POINTS.

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

11/15/2023 | 7:42 AM EST

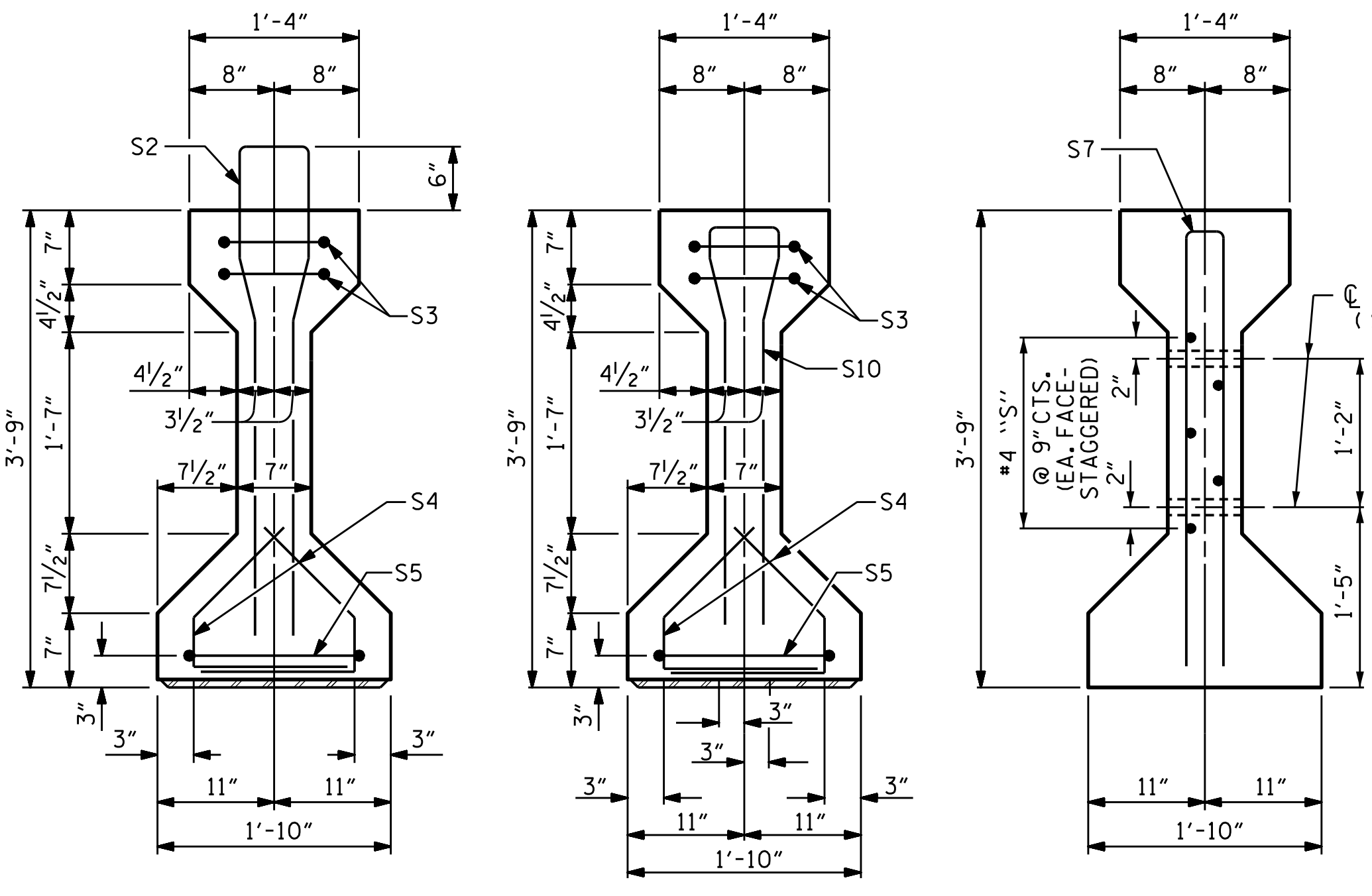
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-14
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 9/22
 DESIGN ENGINEER OF RECORD : MGC DATE : 1/23

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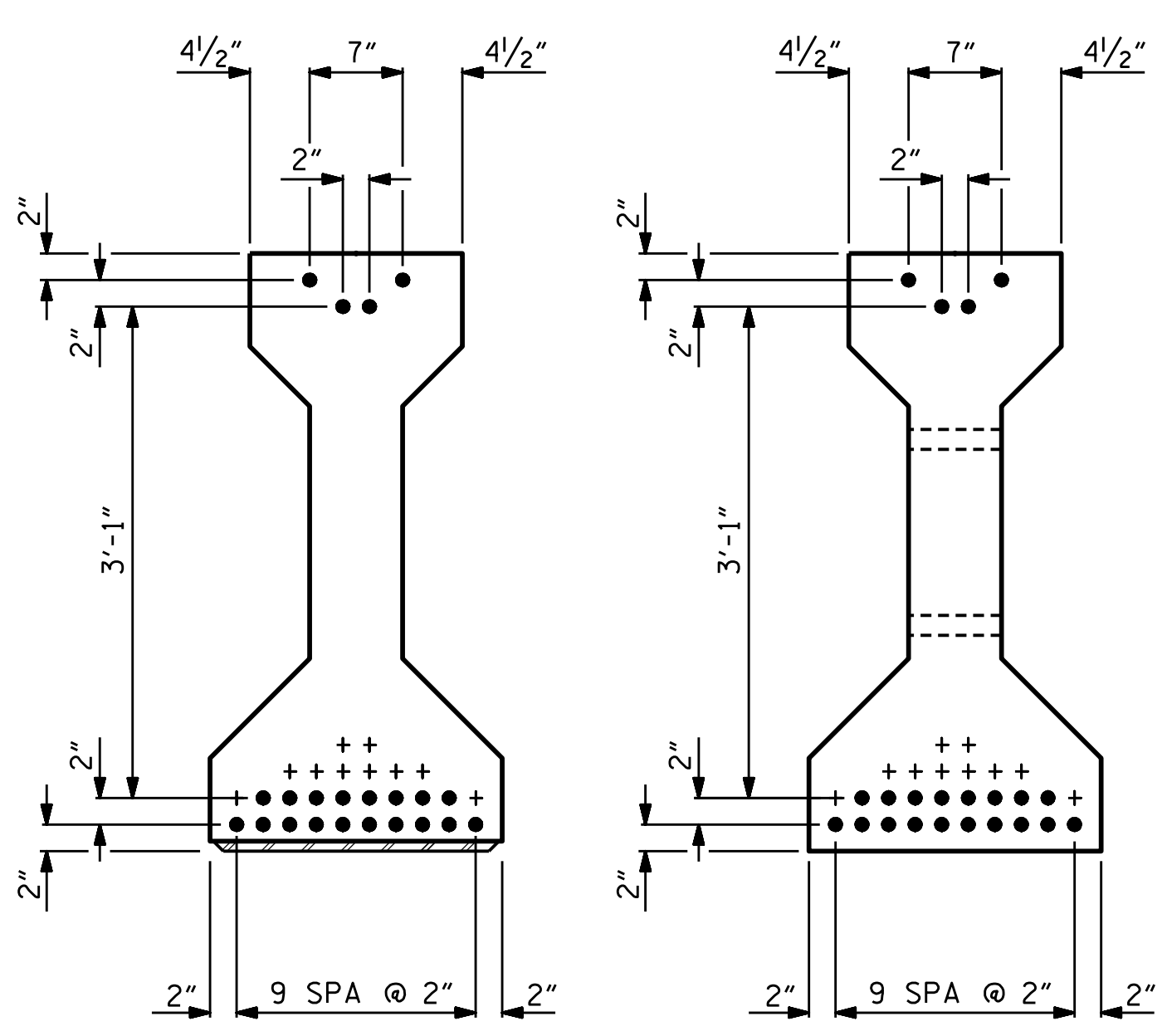


SECTION A-A

SECTION B-B

SECTION C-C

(S1 BARS NOT SHOWN)

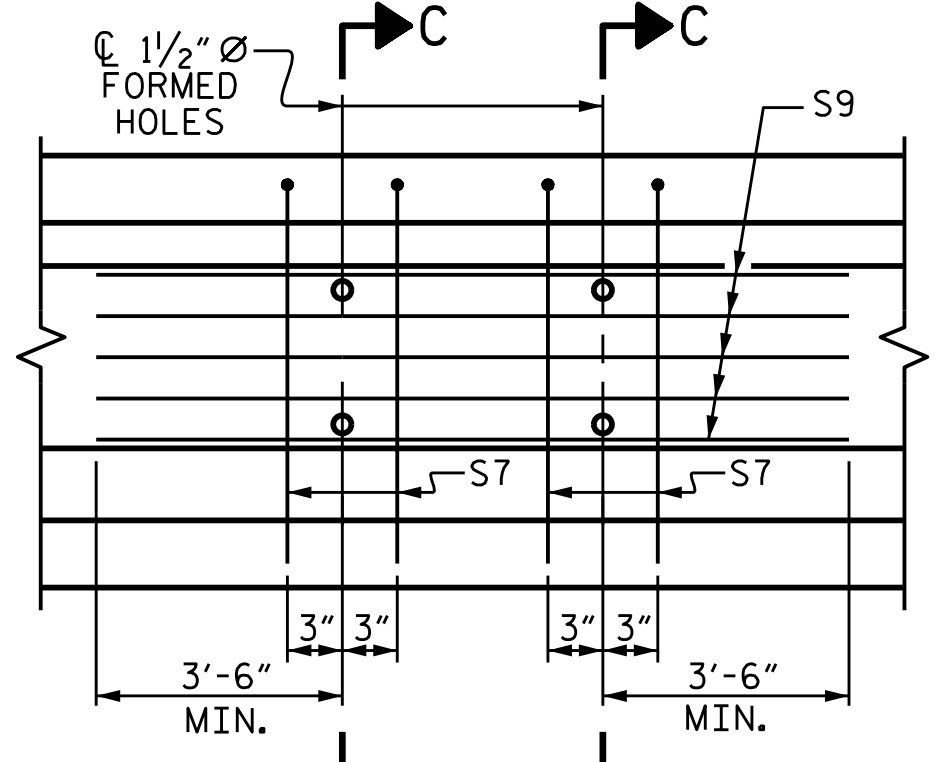


AT END OF GIRDER

AT C OF GIRDER

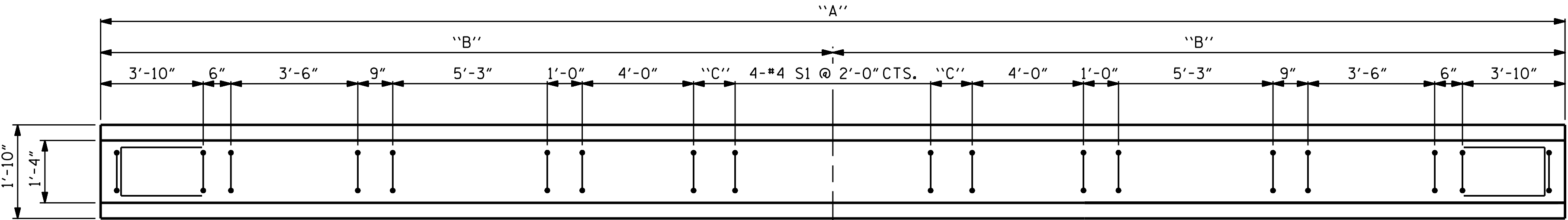
0.6" Ø LOW RELAXATION STRAND LAYOUT

TABLE OF DIMENSIONS			
	"A"	"B"	"C"
GDR A1	46'-10 1/2"	23'-5 1/4"	1'-7 1/4"
GDR A2	46'-6 5/8"	23'-3 5/16"	1'-5 5/16"
GDR A3	46'-2 7/8"	23'-1 1/16"	1'-3 3/16"
GDR A4	45'-11 3/8"	22'-11 1/16"	1'-1 1/16"

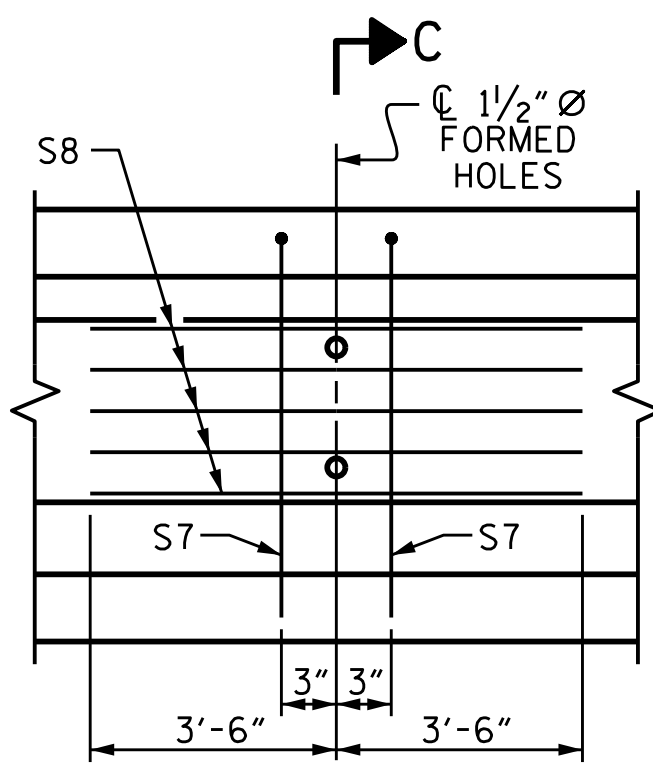


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER A2 & A3

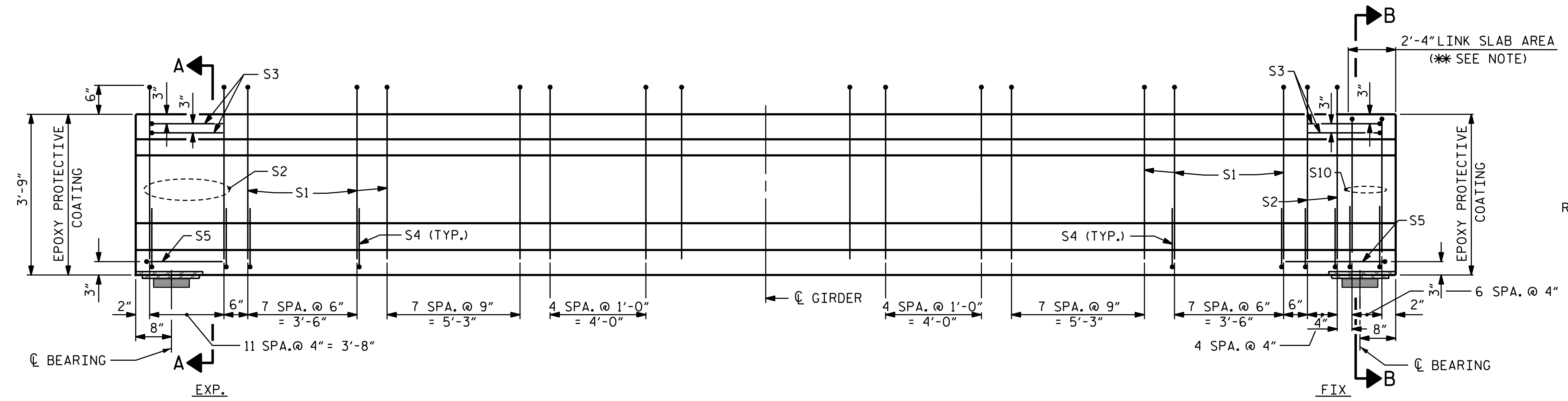


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER A1 & A4



ELEVATION OF GIRDER

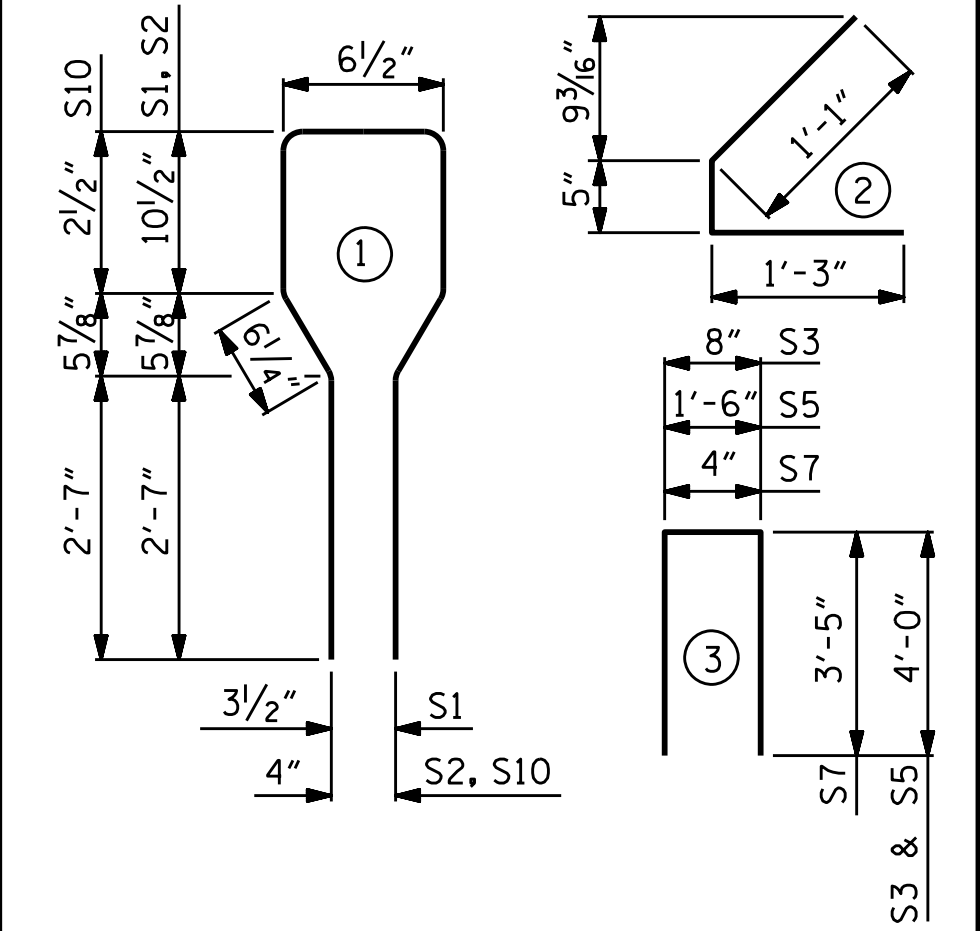
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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	46	#4	1	8'-6"	261
S2	17	#6	1	8'-6"	217
S3	4	#4	3	8'-8"	23
S4	80	#4	2	2'-9"	147
S5	2	#4	3	9'-6"	13
EXT. GDR. S7	2	#5	3	7'-2"	15
INT. GDR. S7	4	#5	3	7'-2"	30
EXT. GDR. S8	5	#4	STR	7'-0"	23
INT. GDR. S9	5	#4	STR	16'-2"	54
S10	7	#6	1	7'-2"	75

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



GIRDER QUANTITIES

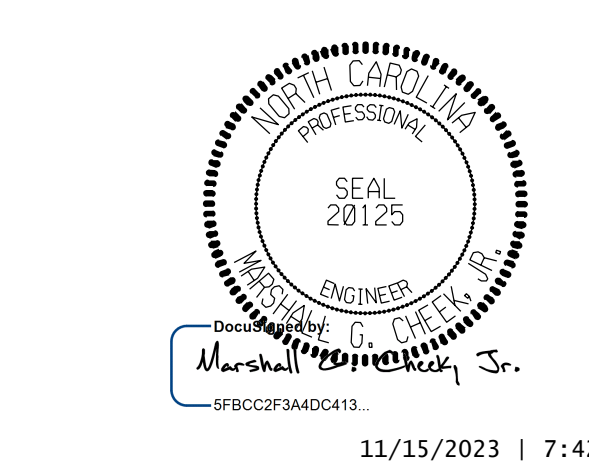
	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDER A1	774	6.7	22
GIRDER A2	820	6.7	22
GIRDER A3	820	6.7	22
GIRDER A4	774	6.6	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	185'-7 3/8"

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 1 OF 5



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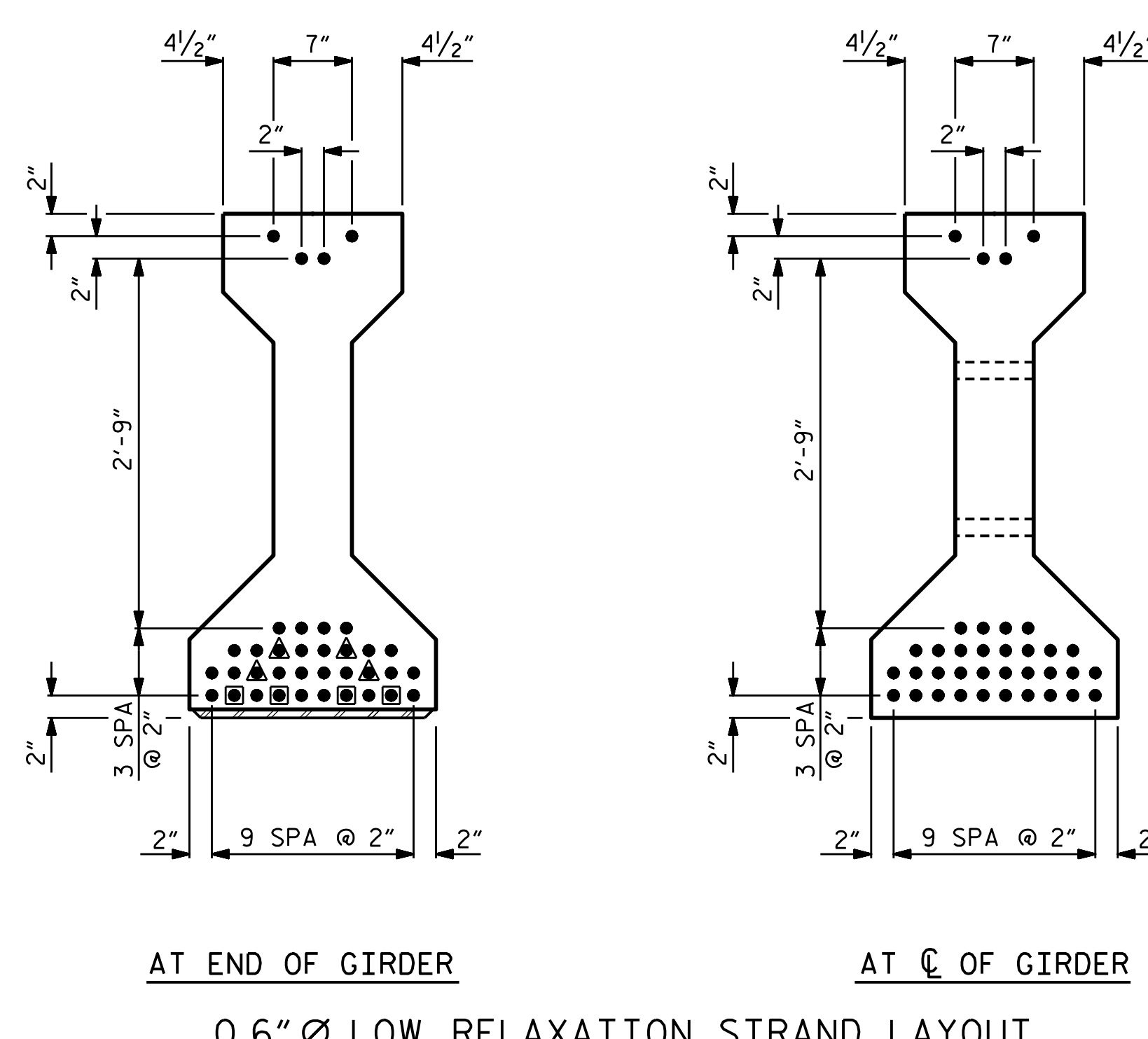
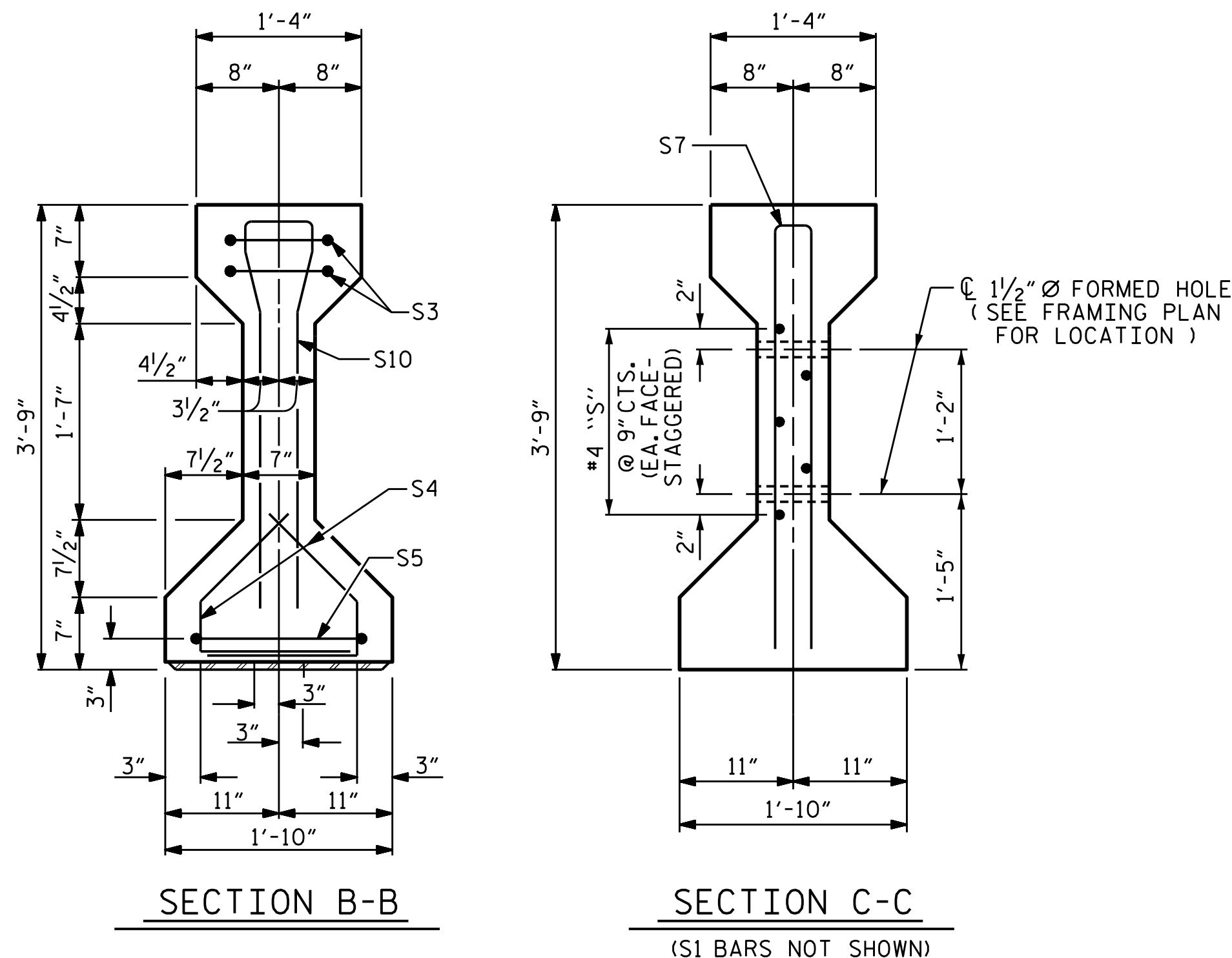
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 PH: (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 AASHTO TYPE III
 PRESTRESSED CONCRETE
 GIRDER
 SPAN A

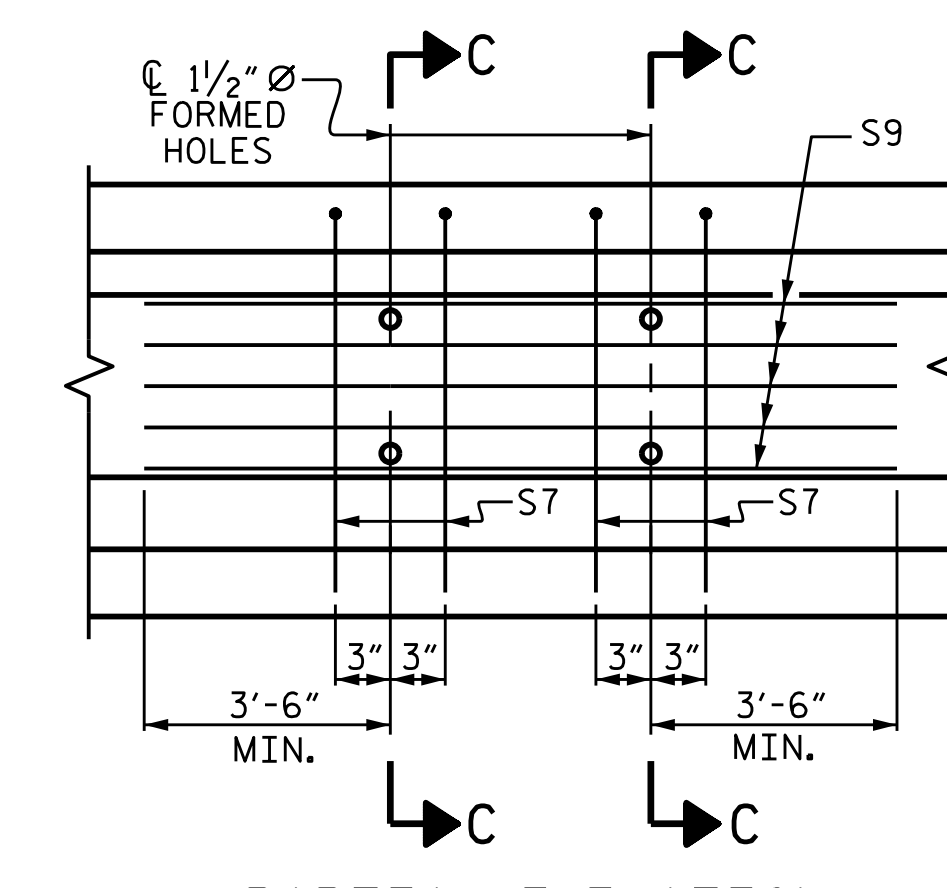
REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

DRAWN BY: ZCS DATE: 1/23
 CHECKED BY: MGC DATE: 1/23
 DESIGN ENGINEER OF RECORD: RDE DATE: 1/23

** DO NOT ROUGHEN TOP OF GIRDER IN THIS AREA



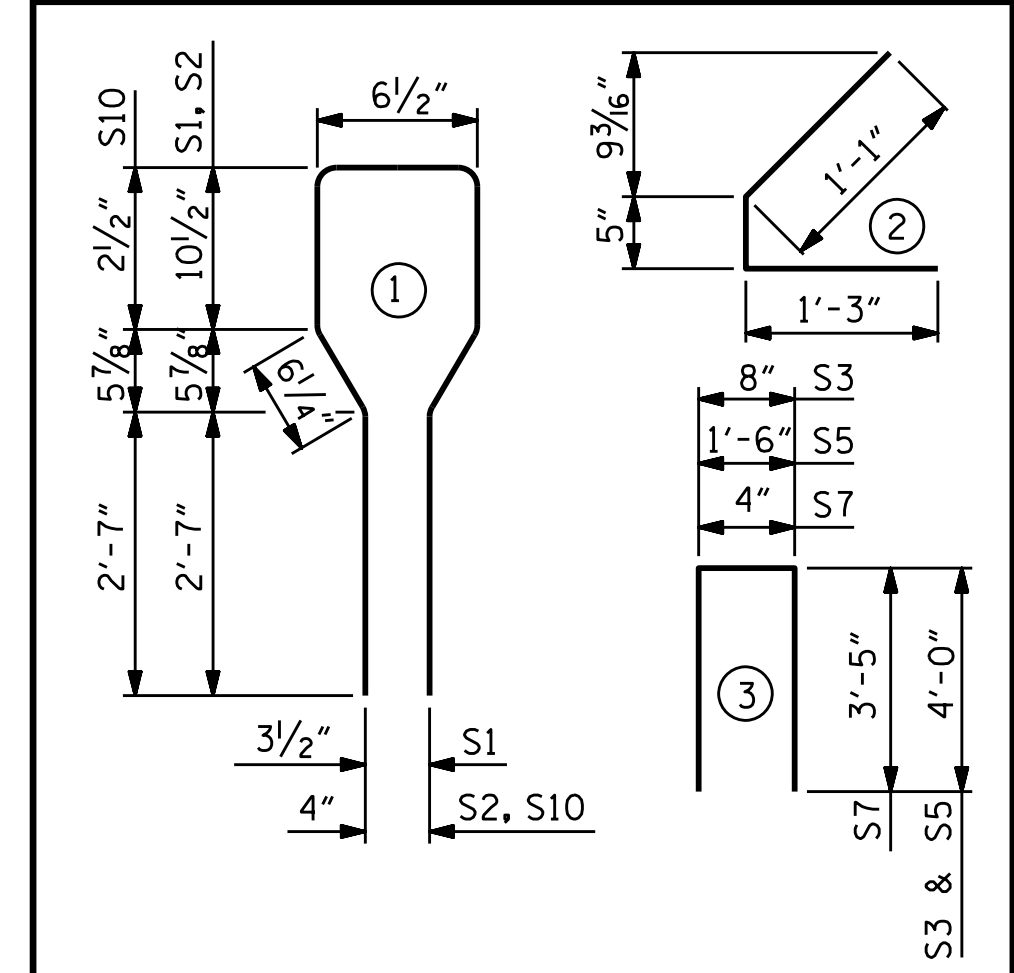
	"A"	"B"	"C"
GDR B1	75'-7 ⁷ / ₈ "	37'-9 ⁹ / ₁₆ "	1'-11 ¹¹ / ₁₆ "
GDR B2	74'-11 ³ / ₈ "	37'-5 ¹¹ / ₁₆ "	1'-7 ¹¹ / ₁₆ "
GDR B3	74'-4"	37'-2"	1'-4"
GDR B4	73'-9"	36'-10 ¹ / ₂ "	1'-0 ¹ / ₂ "



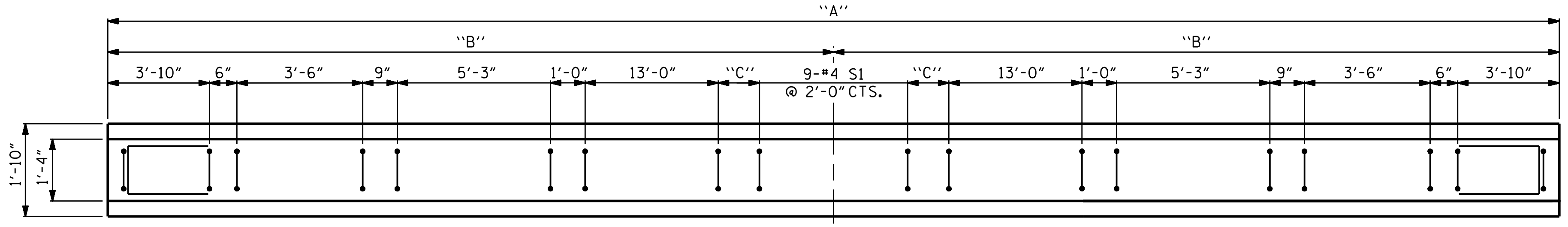
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	69	#4	1	8'-6"	392
S3	4	#4	3	8'-8"	23
S4	80	#4	2	2'-9"	147
S5	2	#4	3	9'-6"	13
EXT. GDR. S7	2	#5	3	7'-2"	15
INT. GDR. S7	4	#5	3	7'-2"	30
EXT. GDR. S8	5	#4	STR	7'-0"	23
INT. GDR. S9	5	#4	STR	17'-2"	57
S10	24	#6	STR	7'-2"	258

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT

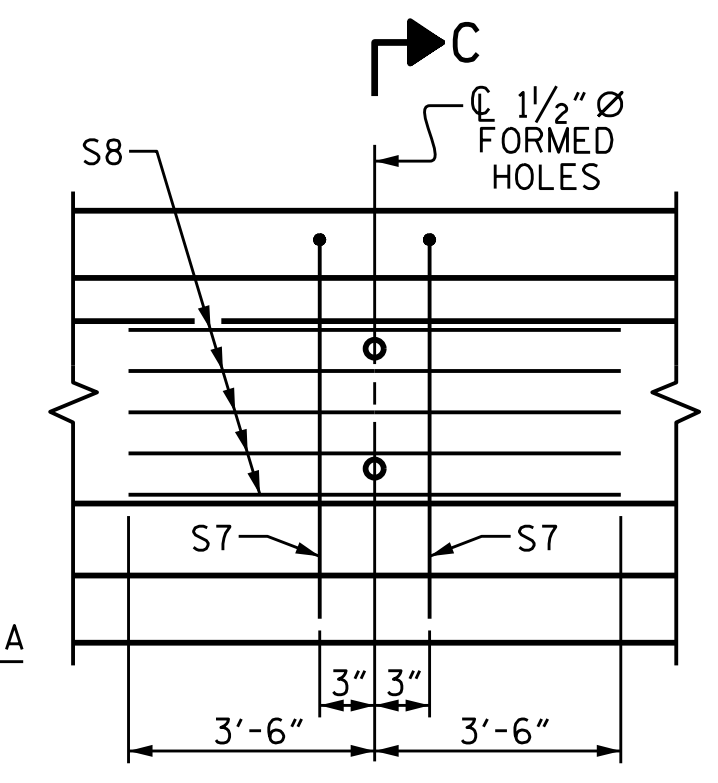


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ▲ STRANDS DEBONDED 8'-0" FROM END OF GIRDER
 - ◼ STRANDS DEBONDED 10'-0" FROM END OF GIRDER

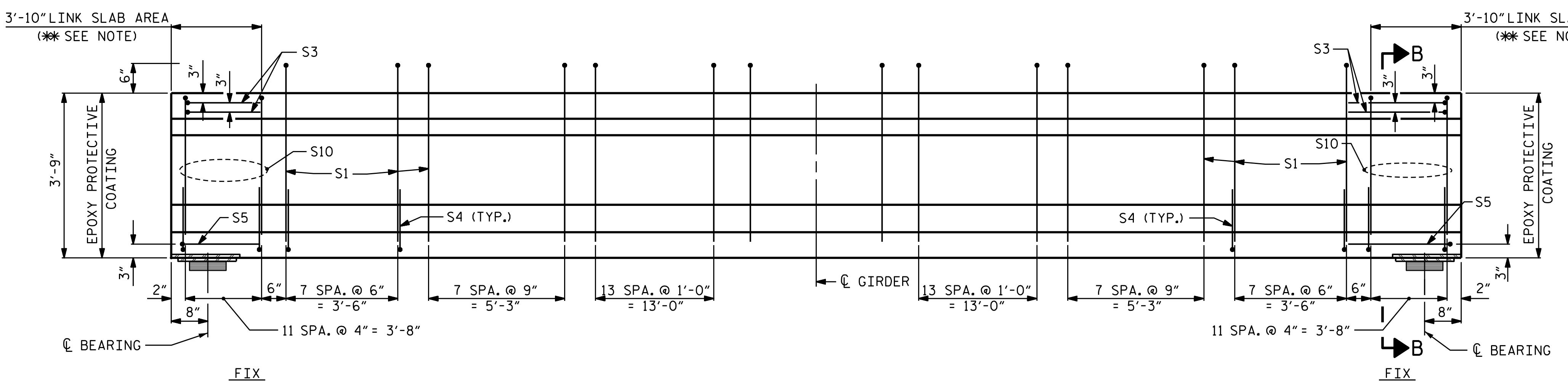


PLAN OF GIRDER

PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER B2 & B3



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER B1 & B4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

DRAWN BY : ZCS DATE : 1/23
CHECKED BY : MGC DATE : 1/23
DESIGN ENGINEER OF RECORD : RDE DATE : 1/23

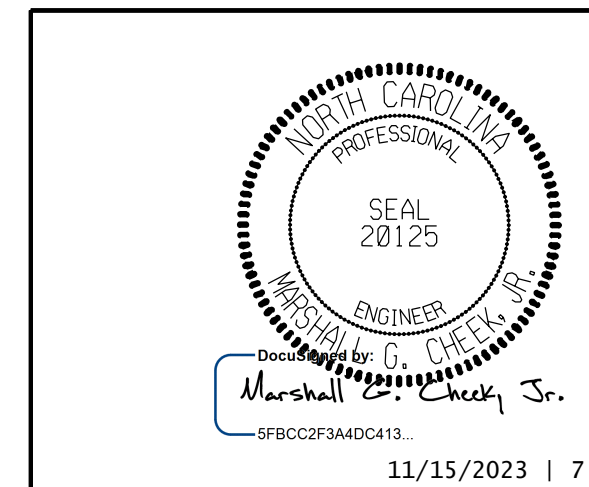
* DO NOT ROUGHEN TOP OF GIRDER IN THIS AREA

GIRDER QUANTITIES			
	REINFORCING STEEL (LB.)	10000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
GIRDER B1	871	10.9	36
GIRDER B2	920	10.8	36
GIRDER B3	920	10.7	36
GIRDER B4	871	10.6	36

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	298'-7 ¹ / ₂ "

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00-L-

SHEET 2 OF 5

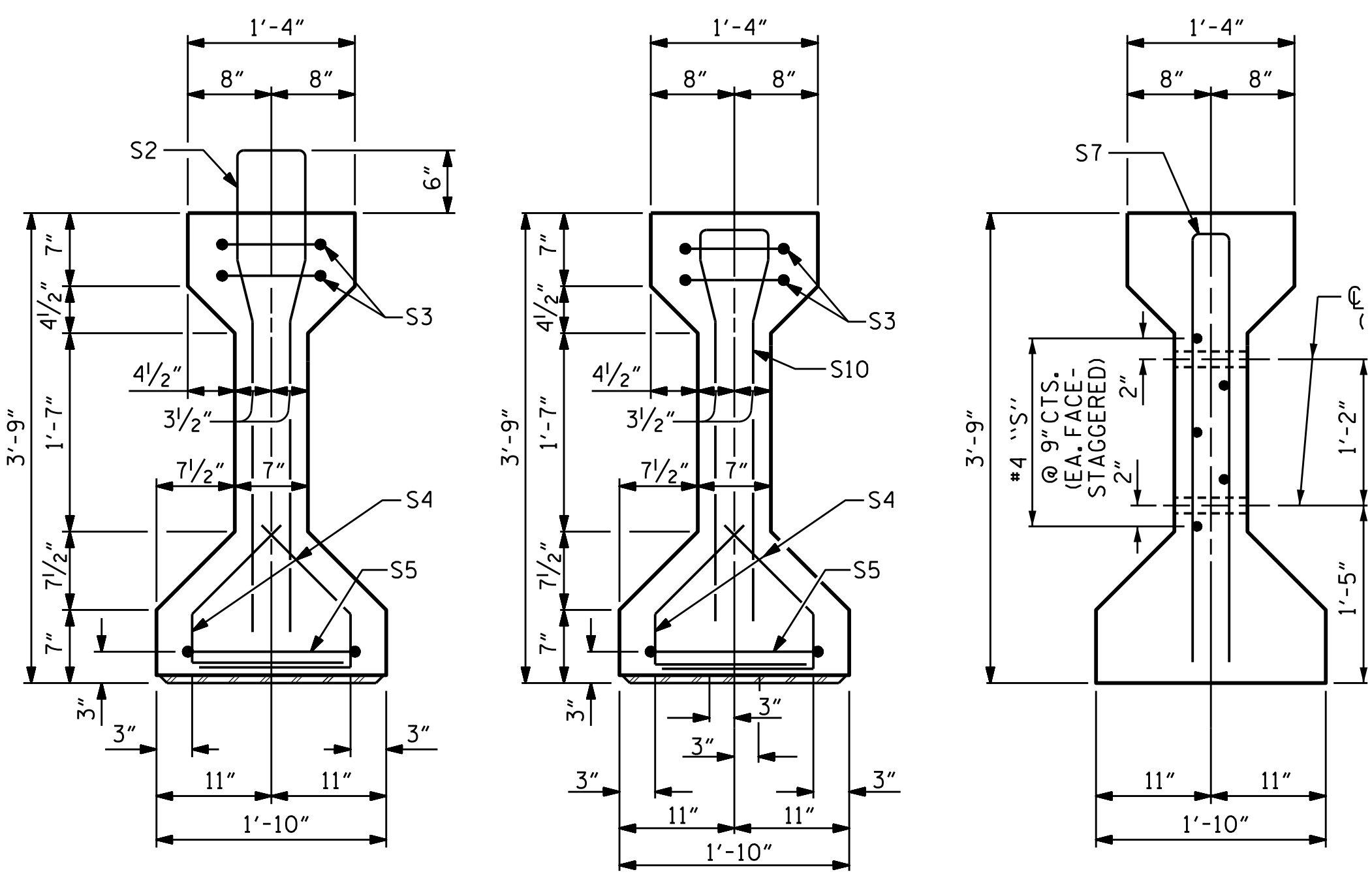


11/15/2023 | 7:42 AM EST
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE
GIRDER
SPAN B

REVISIONS						SHEET NO. S-16 TOTAL SHEETS 47
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

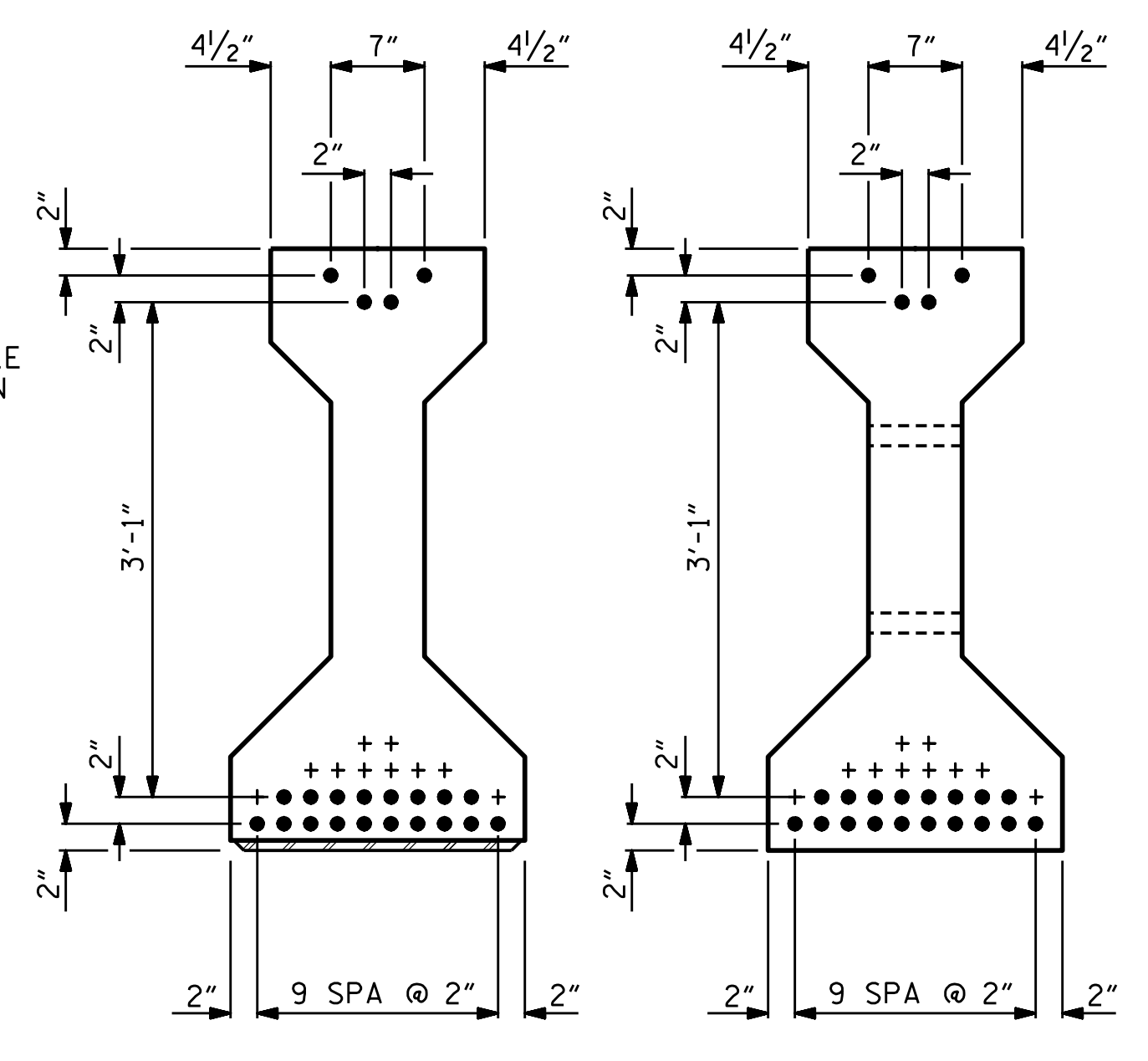
STD. NO. PCG5



SECTION A-A

SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)

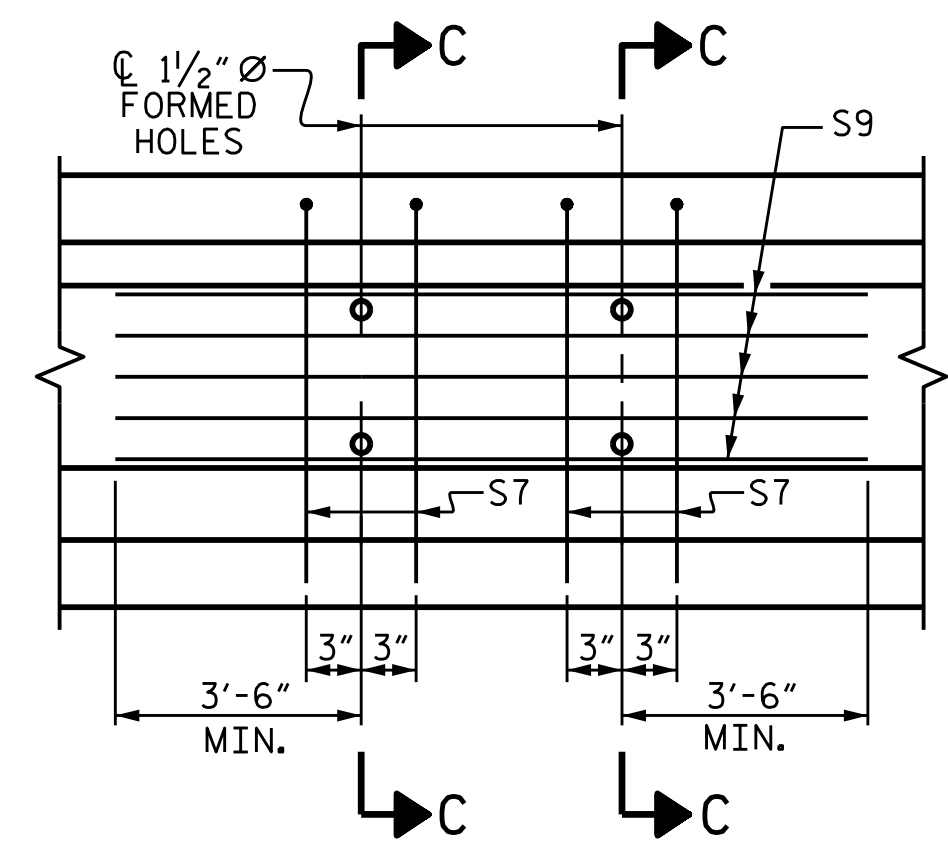


AT END OF GIRDER

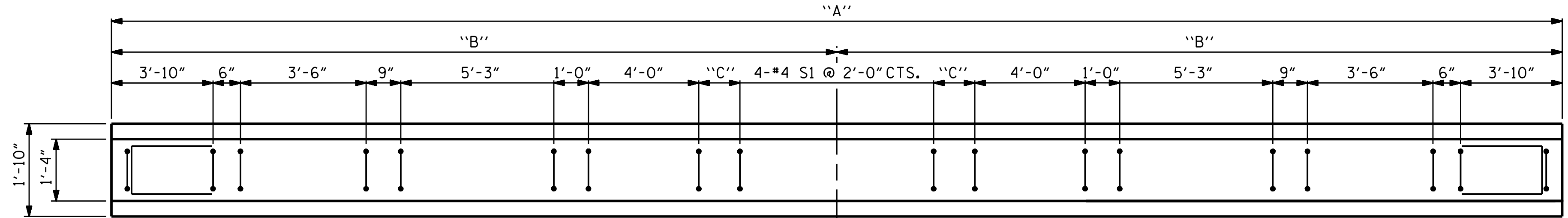
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

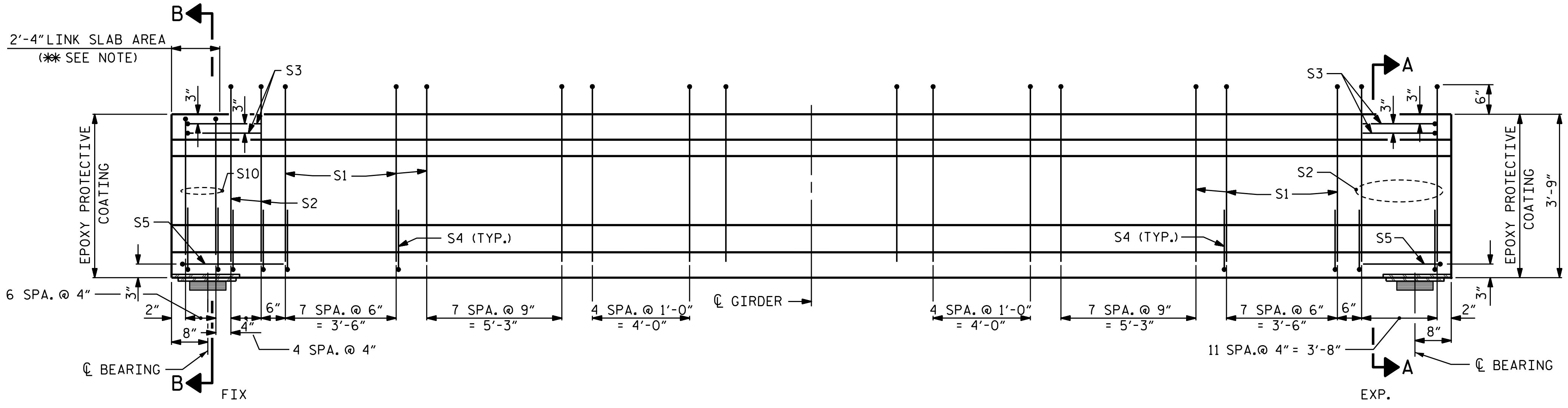
TABLE OF DIMENSIONS			
	"A"	"B"	"C"
GDR C1	46'-8 ⁵ / ₈ "	23'-4 ⁵ / ₁₆ "	1'-6 ⁵ / ₁₆ "
GDR C2	46'-2 ⁷ / ₈ "	23'-1 ⁷ / ₁₆ "	1'-3 ⁷ / ₁₆ "
GDR C3	45'-9 ³ / ₈ "	22'-10 ¹ / ₁₆ "	1'-0 ¹ / ₁₆ "
GDR C4	45'-4 ¹ / ₈ "	22'-8 ¹ / ₁₆ "	10 ¹ / ₁₆ "



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER C2 & C3

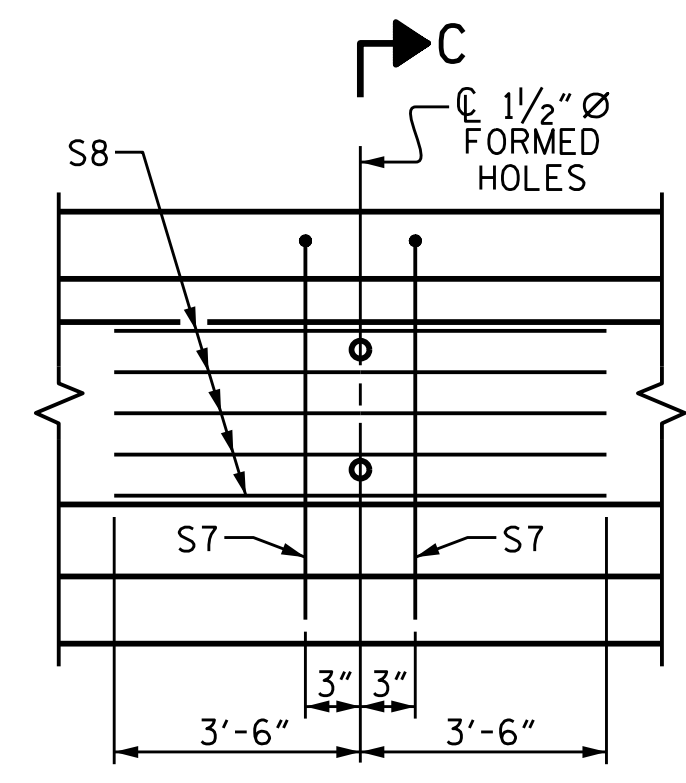


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



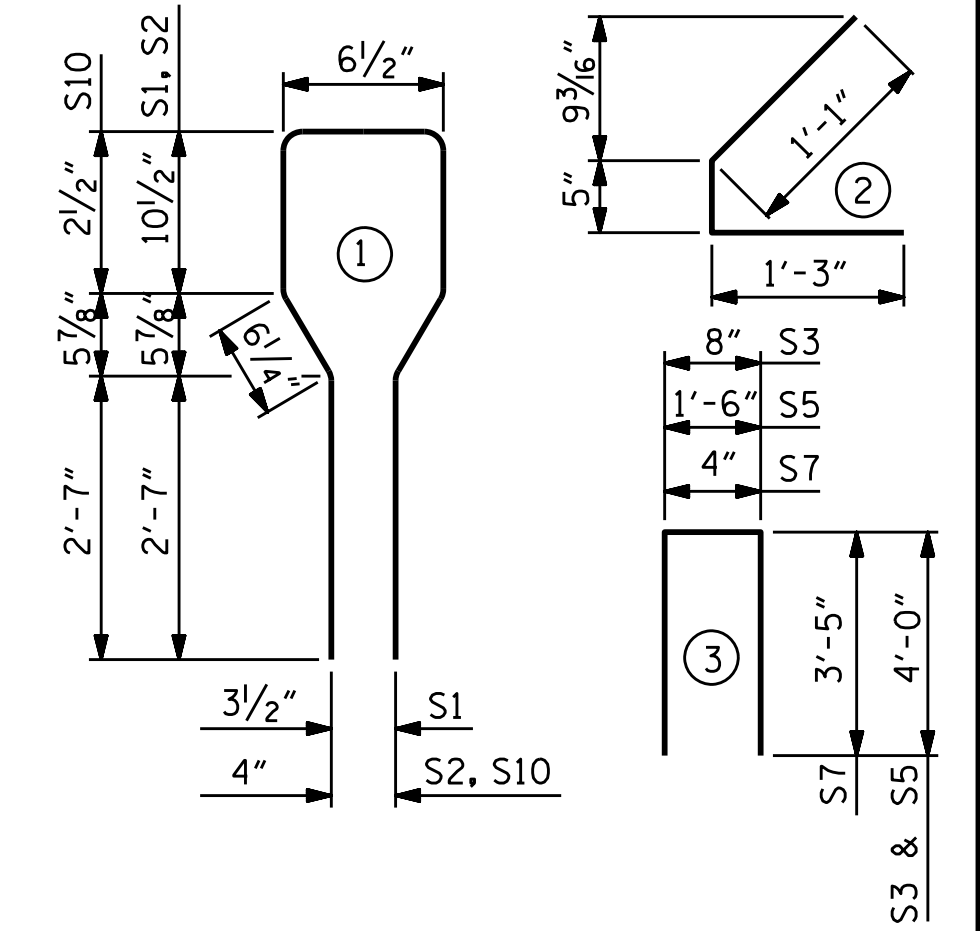
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER C1 & C4

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	46	#4	1	8'-6"	261
S2	17	#6	1	8'-6"	217
S3	4	#4	3	8'-8"	23
S4	80	#4	2	2'-9"	147
S5	2	#4	3	9'-6"	13
EXT GDR. S7	2	#5	3	7'-2"	15
INT GDR. S7	4	#5	3	7'-2"	30
EXT GDR. S8	5	#4	STR	7'-0"	23
INT GDR. S9	5	#4	STR	18'-3"	61
S10	7	#6	1	7'-2"	75

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



GIRDER QUANTITIES

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDER C1	774	6.7	22
GIRDER C2	827	6.7	22
GIRDER C3	827	6.6	22
GIRDER C4	774	6.5	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	184'-1"

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00-L

SHEET 3 OF 5



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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE
GIRDER
SPAN C

REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

DRAWN BY: ZCS DATE: 1/23
CHECKED BY: MGC DATE: 1/23
DESIGN ENGINEER OF RECORD: RDE DATE: 1/23

** DO NOT ROUGHEN TOP OF GIRDER IN THIS AREA

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN A & C GIRDERS 1 & 4																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.011	0.022	0.032	0.041	0.050	0.057	0.062	0.066	0.069	0.070	0.069	0.066	0.062	0.057	0.050	0.041	0.032	0.022	0.011	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.004	0.008	0.012	0.015	0.018	0.021	0.023	0.025	0.026	0.026	0.026	0.025	0.023	0.021	0.018	0.015	0.012	0.008	0.004	0.000
FINAL CAMBER	↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN A & C GIRDERS 2 & 3																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.011	0.022	0.032	0.041	0.049	0.056	0.062	0.066	0.068	0.069	0.068	0.066	0.062	0.056	0.049	0.041	0.032	0.022	0.011	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.004	0.008	0.013	0.017	0.020	0.023	0.025	0.027	0.028	0.029	0.028	0.027	0.025	0.023	0.020	0.017	0.013	0.008	0.004	0.000
FINAL CAMBER	↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN B GIRDER 1																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.032	0.063	0.093	0.120	0.144	0.164	0.181	0.192	0.200	0.202	0.200	0.192	0.181	0.164	0.144	0.120	0.093	0.063	0.032	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.024	0.048	0.071	0.094	0.112	0.130	0.141	0.153	0.157	0.161	0.157	0.153	0.141	0.130	0.112	0.094	0.071	0.048	0.024	0.000
FINAL CAMBER	↑	0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN B GIRDER 2																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.032	0.063	0.092	0.119	0.142	0.162	0.179	0.190	0.197	0.200	0.197	0.190	0.179	0.162	0.142	0.119	0.092	0.063	0.032	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.025	0.051	0.075	0.100	0.119	0.138	0.150	0.162	0.167	0.171	0.167	0.162	0.150	0.138	0.119	0.100	0.075	0.051	0.025	0.000
FINAL CAMBER	↑	0	1/16"	1/8"	3/16"	1/4"	1/4"	5/16"	3/8"	5/16"	3/8"	3/8"	3/8"	5/16"	3/8"	5/16"	1/4"	1/4"	3/16"	1/8"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN B GIRDER 3																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.031	0.062	0.091	0.117	0.141	0.161	0.177	0.188	0.195	0.197	0.195	0.188	0.177	0.161	0.141	0.117	0.091	0.062	0.031	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.025	0.049	0.073	0.096	0.115	0.133	0.145	0.157	0.161	0.165	0.161	0.157	0.145	0.133	0.115	0.096	0.073	0.049	0.025	0.000
FINAL CAMBER	↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	7/16"	3/8"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION STRANDS		SPAN B GIRDER 4																				
	↑	¢ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	¢ BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.031	0.061	0.090	0.116	0.139	0.159	0.175	0.186	0.193	0.195	0.193	0.186	0.175	0.159	0.139	0.116	0.090	0.061	0.031	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.022	0.043	0.064	0.085	0.101	0.117	0.128	0.138	0.142	0.145	0.142	0.138	0.128	0.117	0.101	0.085	0.064	0.043	0.022	0.000
FINAL CAMBER	↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	9/16"	5/8"	5/8"	5/8"	9/16"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET, EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

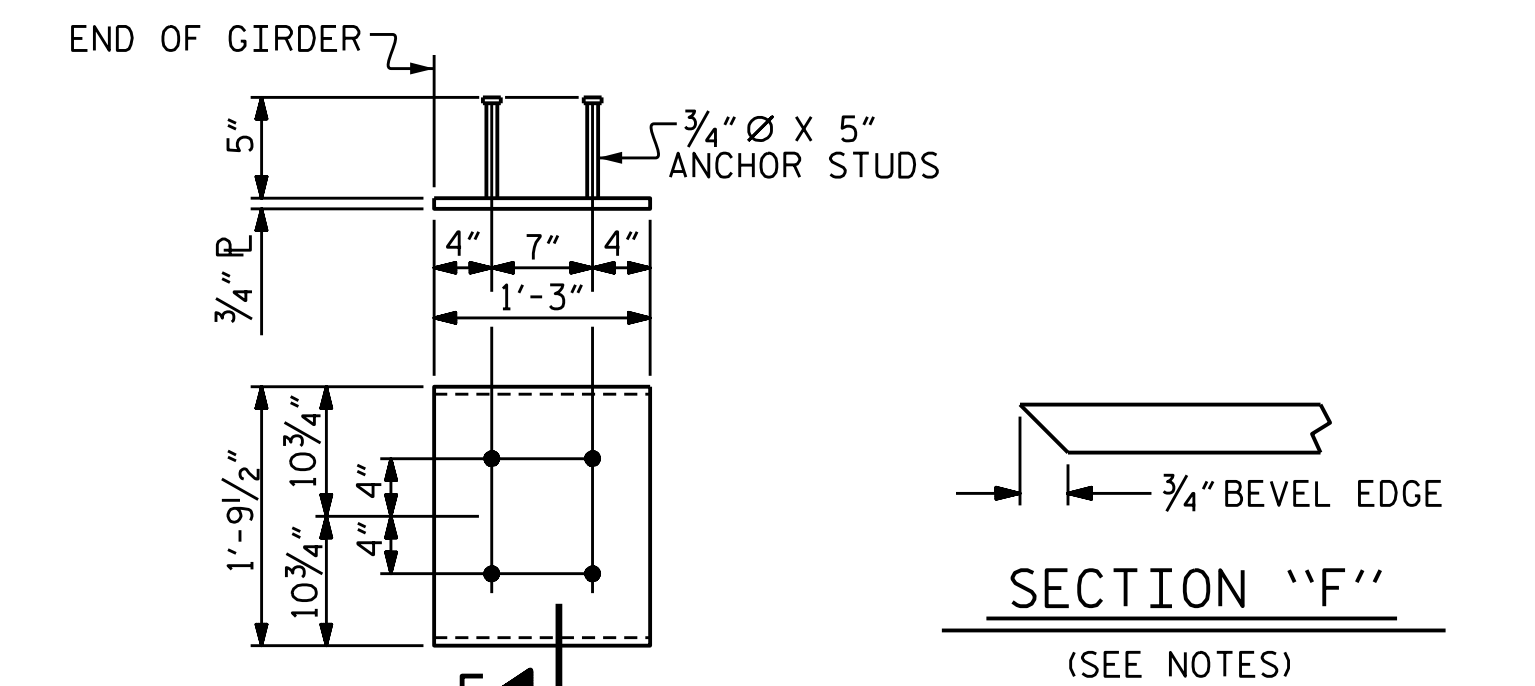
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,000 PSI FOR SPANS "A" AND "C" AND NOT LESS THAN 8,000 PSI FOR SPAN "B".

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", EXCEPT AS NOTED IN THE LINK SLAB AREA.



EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 4 OF 5

Professional Engineer Seal for Marshall G. Cheek, Jr., License No. 34004, State of North Carolina, Seal 20125. Date: 11/15/2023 | 7:42 AM EST.

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-18
2			4			TOTAL SHEETS 47

DRAWN BY : LAB DATE : 1/23
CHECKED BY : RDE DATE : 1/23
DESIGN ENGINEER OF RECORD : RDE DATE : 1/23

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.

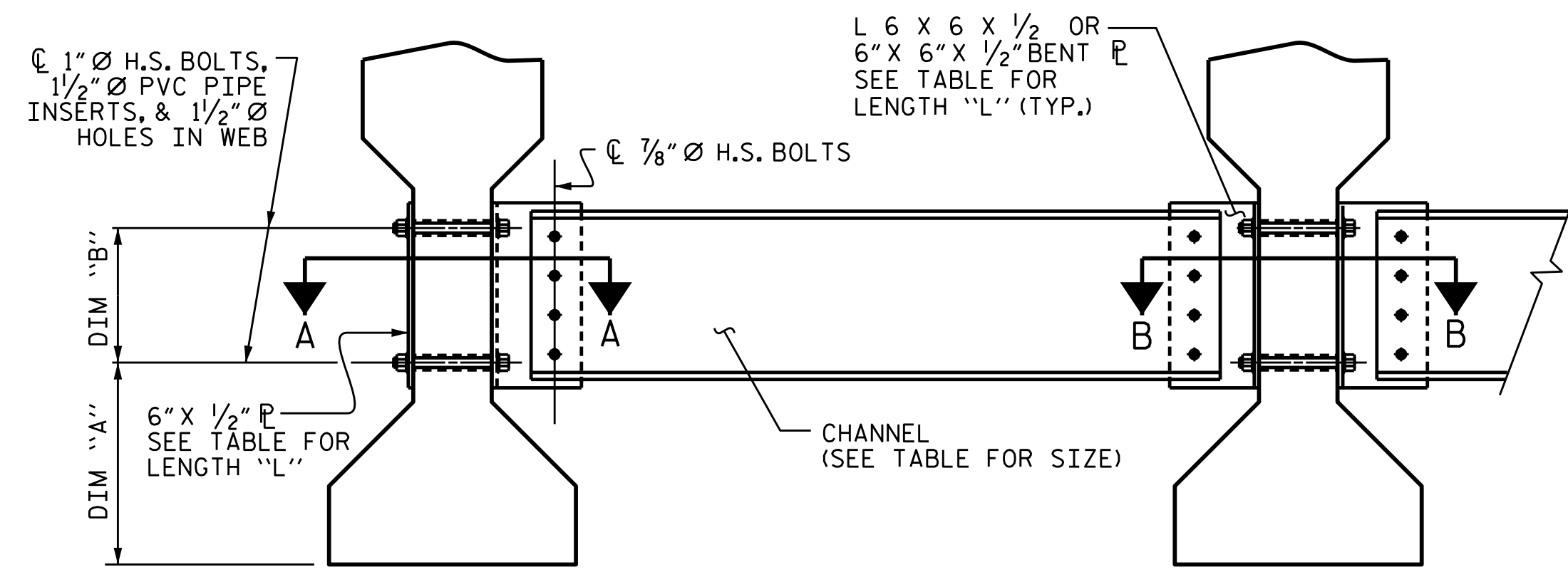
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

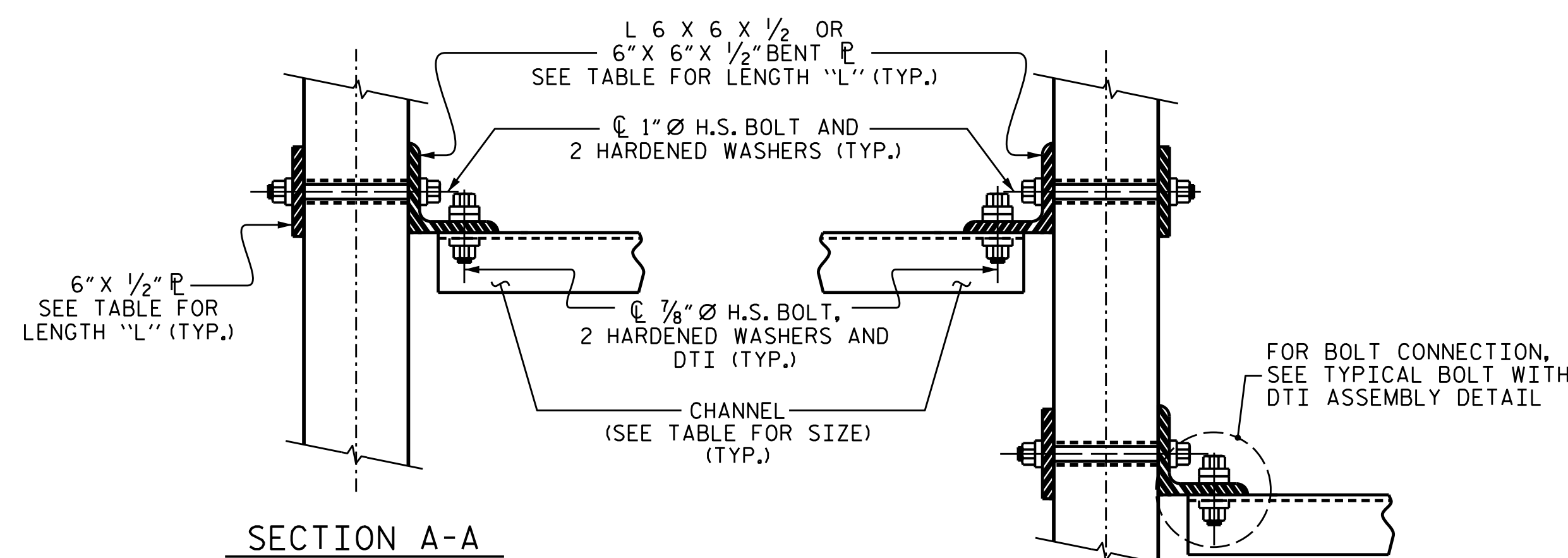


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

(TYPE III OR TYPE IV GIRDER SHOWN)



SECTION A-A

SECTION B-B

CONNECTION DETAILS

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

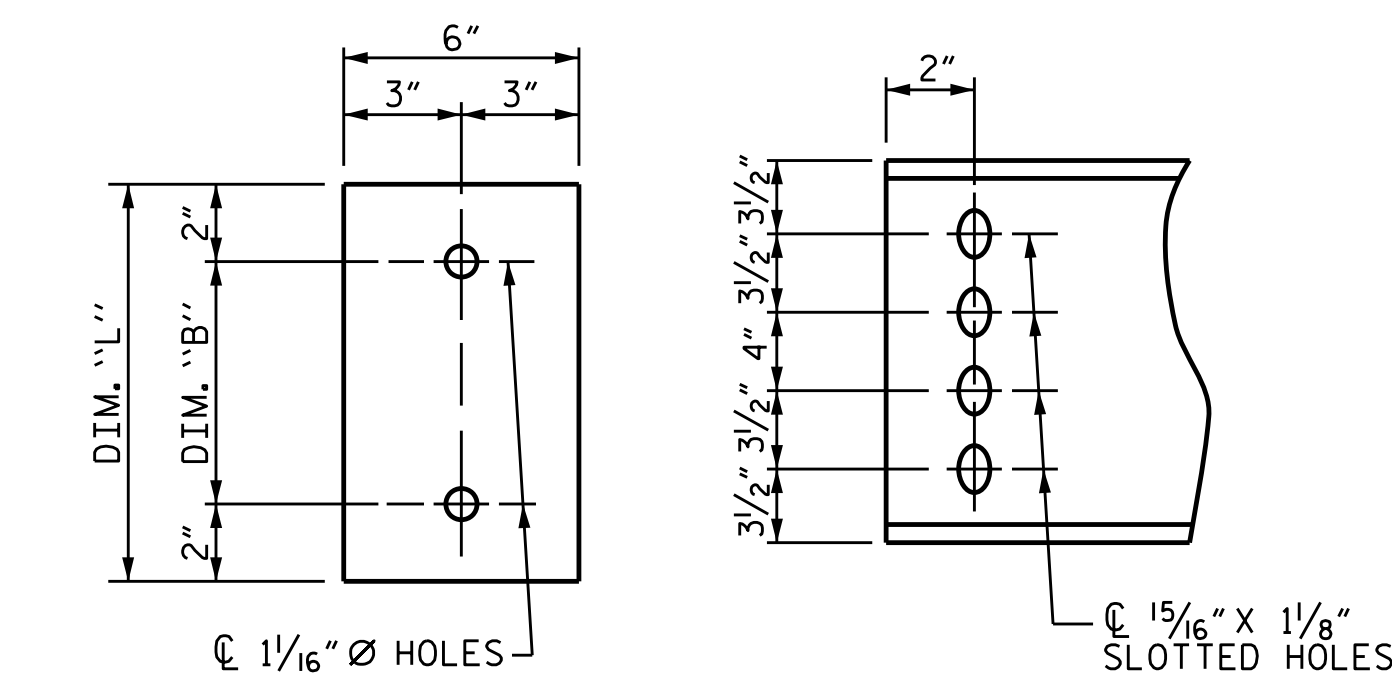
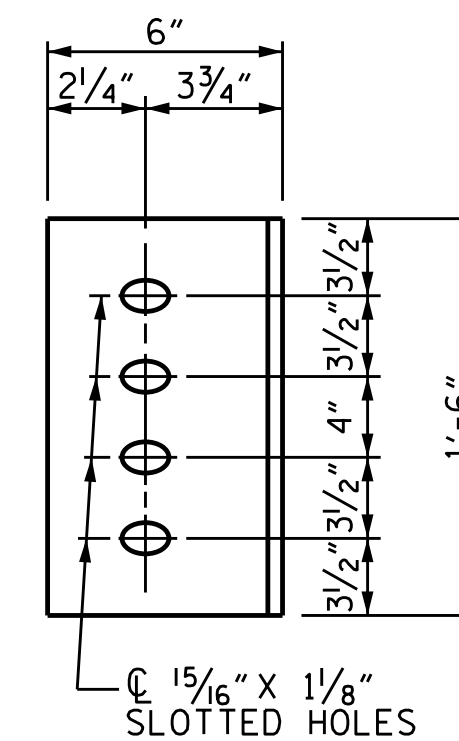


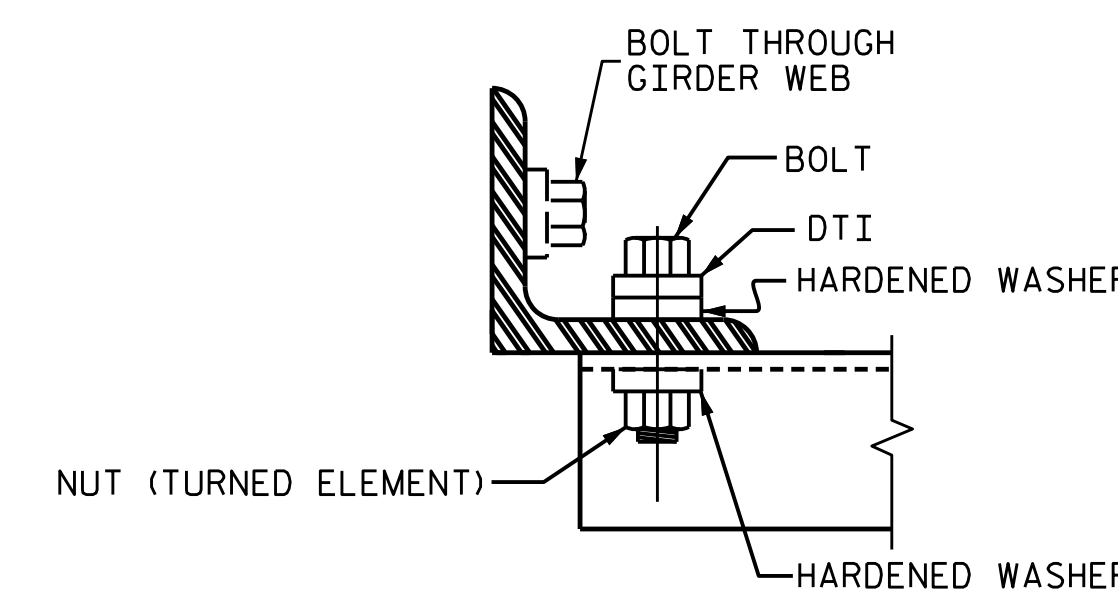
PLATE DETAILS

CHANNEL END



DIAPHRAGM FACE
(TYPE III OR TYPE IV GDR.)

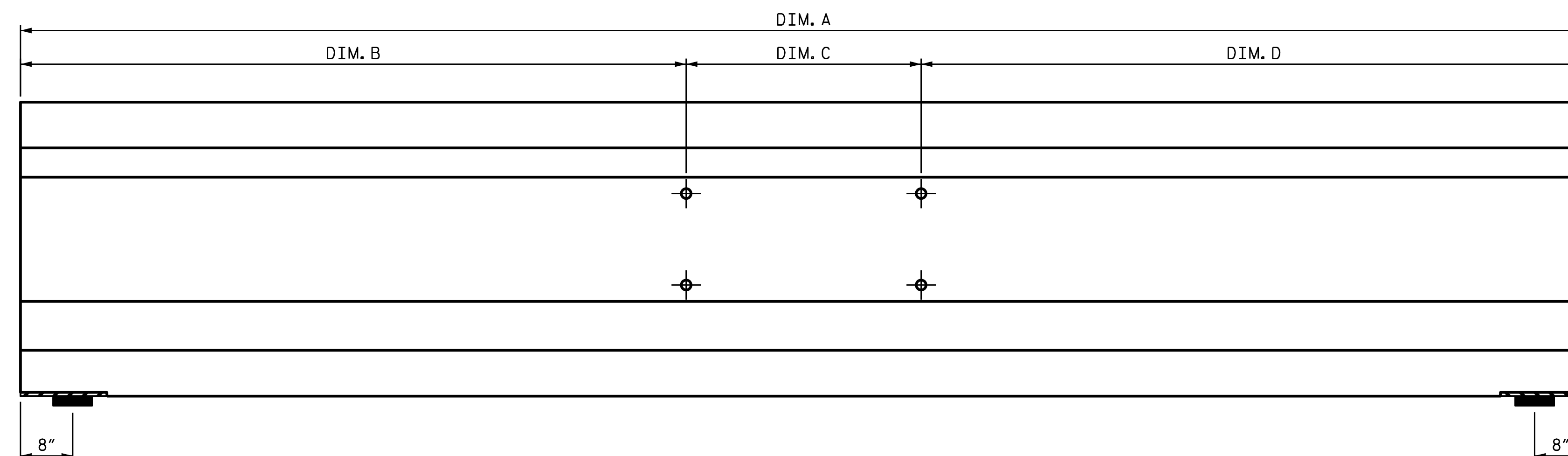
CONNECTOR PLATE DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

CHART A

GIRDER	DIM. A	DIM. B	DIM. C	DIM. D
GDR. A1	46'-10 1/2"	18'-9 3/8"	-	28'-1 1/8"
GDR. A2	46'-6 5/8"	18'-8 1/4"	9'-2 5/16"	18'-7 1/16"
GDR. A3	46'-2 7/8"	18'-7 3/16"	9'-1 3/16"	18'-6 3/8"
GDR. A4	45'-11 3/8"	27'-5 1/8"	-	18'-6 1/4"
GDR. B1	75'-7 1/8"	32'-7 9/16"	-	42'-11 3/16"
GDR. B2	74'-11 3/8"	32'-4 1/16"	10'-3"	32'-3 1/16"
GDR. B3	74'-4"	32'-2"	10'-1"	32'-1"
GDR. B4	73'-9"	41'-9 1/2"	-	31'-11 1/2"
GDR. C1	46'-8 5/8"	17'-7 1/2"	-	29'-1 1/8"
GDR. C2	46'-2 7/8"	17'-5 7/8"	11'-4 3/8"	17'-4 3/8"
GDR. C3	45'-9 3/8"	17'-4 3/8"	11'-1 1/8"	17'-3 1/8"
GDR. C4	45'-4 1/8"	28'-1 3/16"	-	17'-2 5/16"



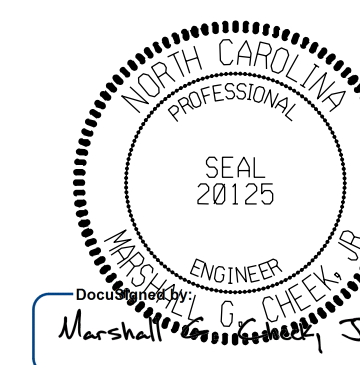
LOCATION OF BOLT HOLES IN GIRDERS - SPANS A, B & C

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 5 OF 5



11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR TYPE II, III, & IV
PRESTRESSED CONCRETE
GIRDERS

REVISIONS

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

SHEET NO.
S-19
TOTAL SHEETS
47

ASSEMBLED BY :	JLA	DATE :	9/22
CHECKED BY :	MGC	DATE :	10/22
DRAWN BY :	TLA	REV. 5/1/06RR	KMM/GM
CHECKED BY :	VC	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

STD. NO. PCG10

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF $5/8$ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

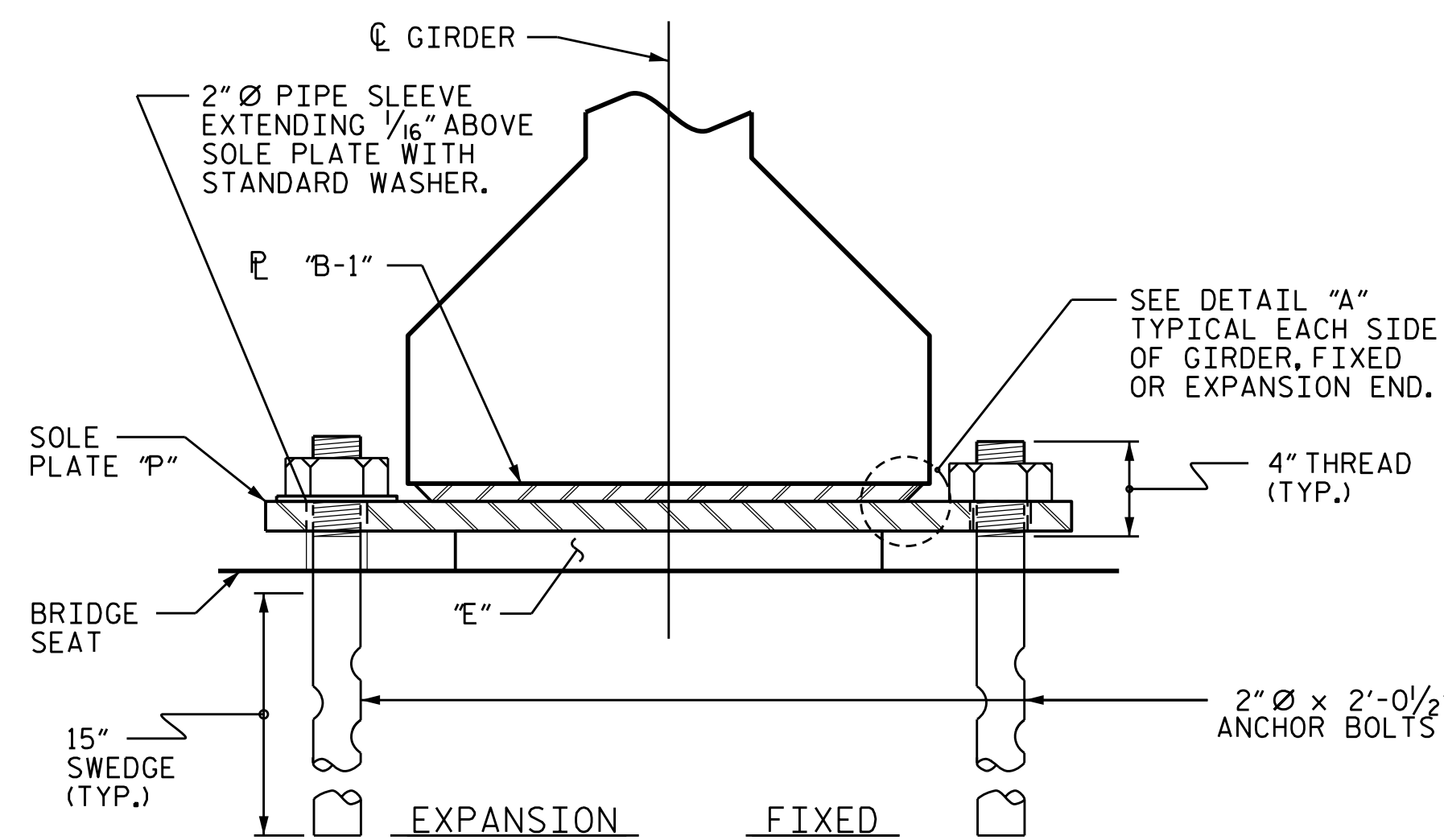
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

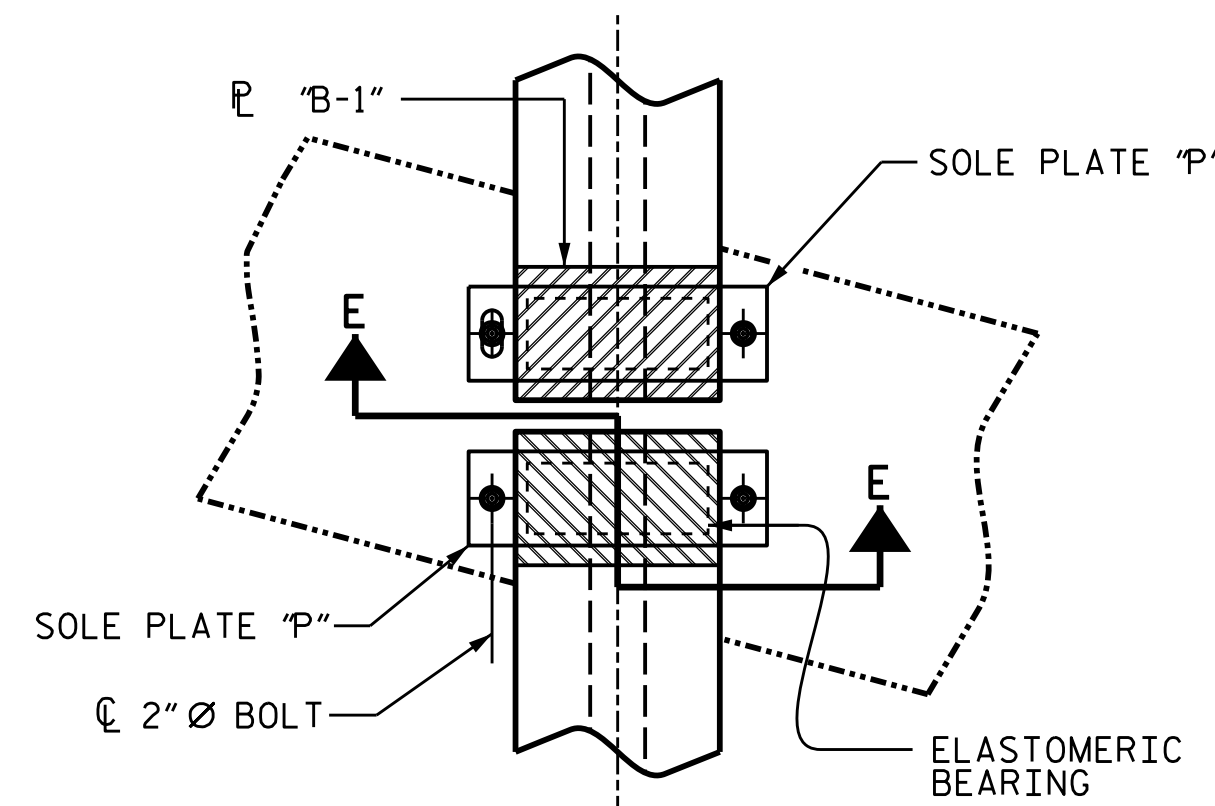
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

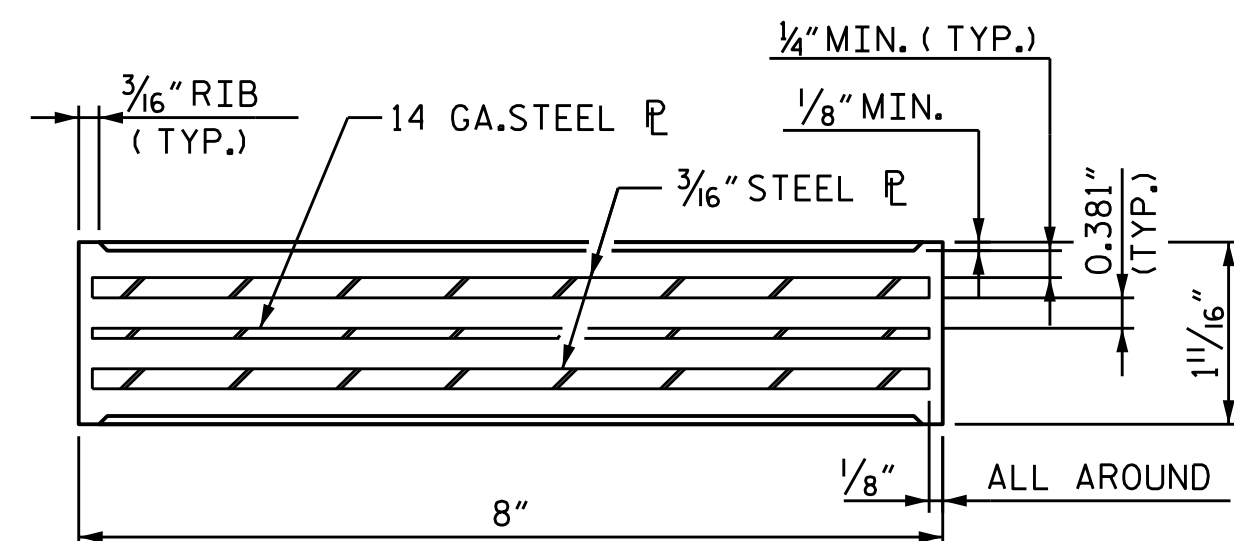
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



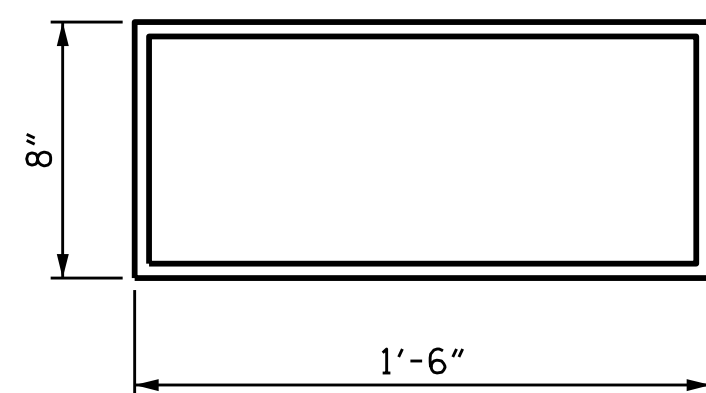
SECTION E-E



TYPICAL BENT PLAN



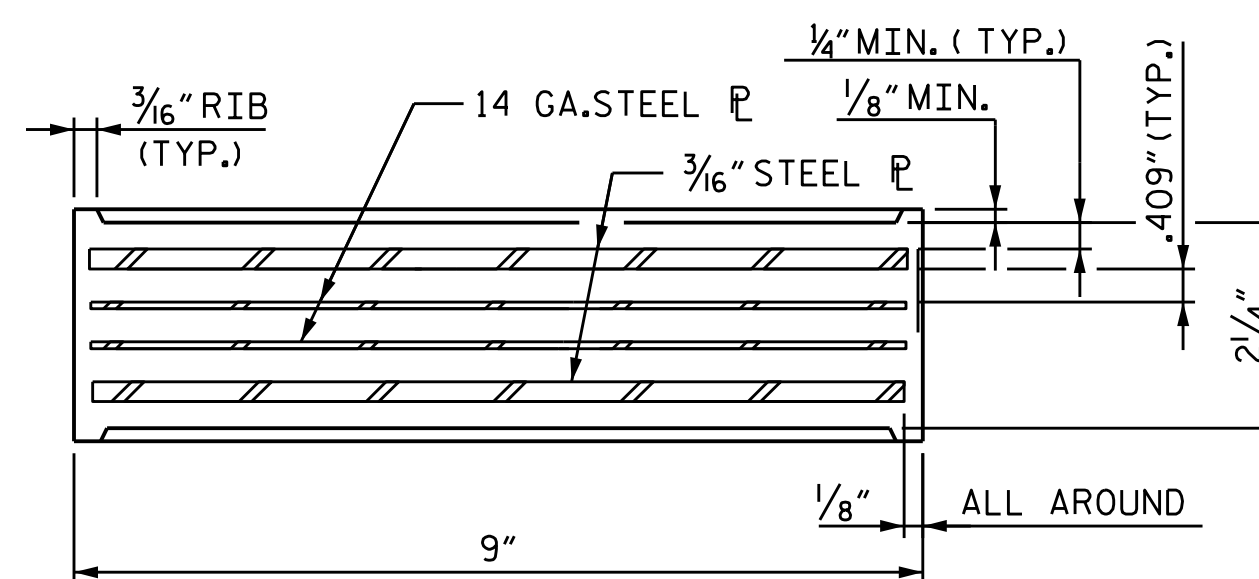
TYPICAL SECTION OF ELASTOMERIC BEARINGS



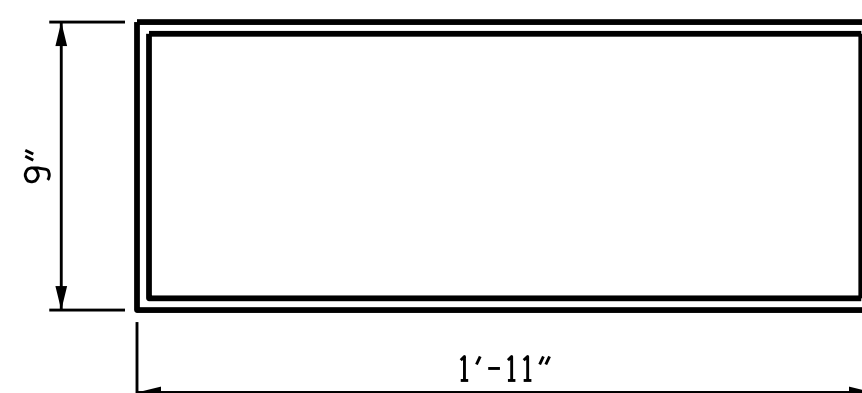
PLAN VIEW OF ELASTOMERIC BEARING

TYPE III

E1 (16 REQ'D)



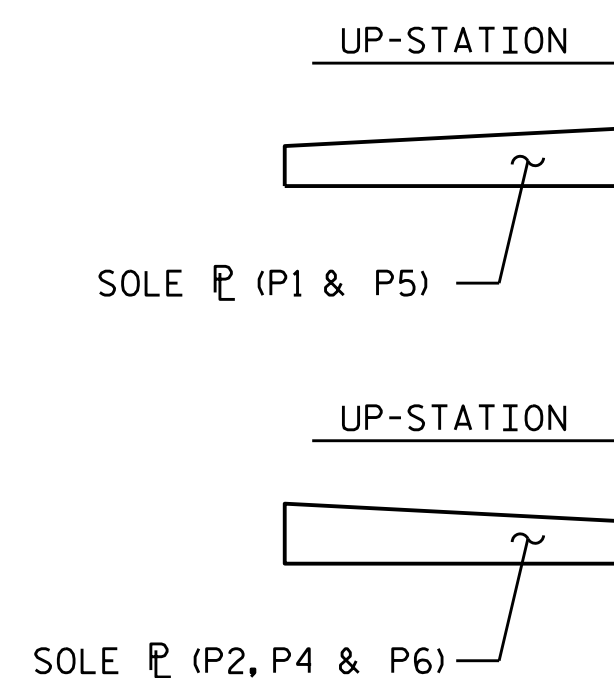
TYPICAL SECTION OF ELASTOMERIC BEARINGS



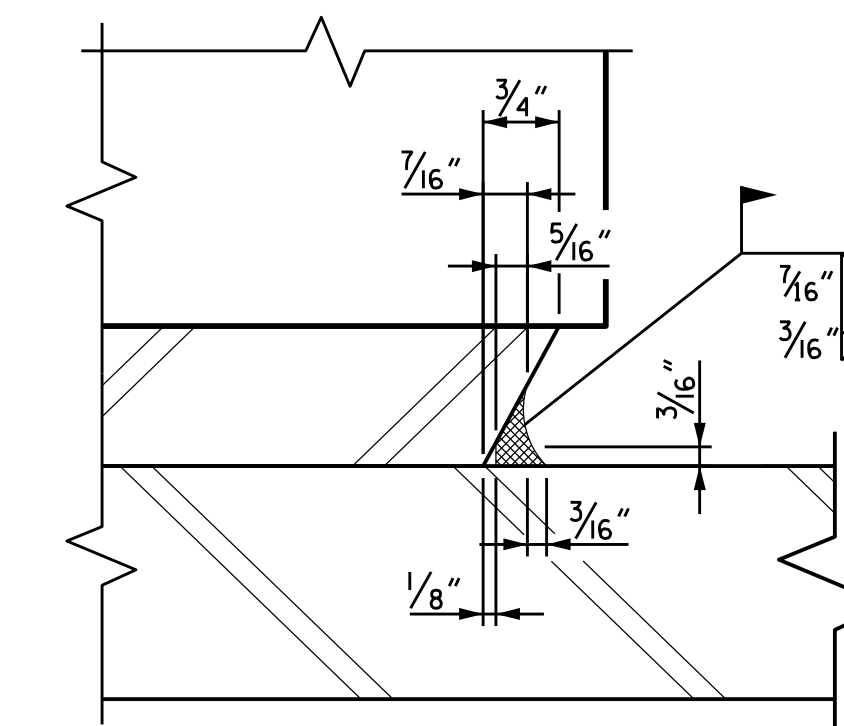
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

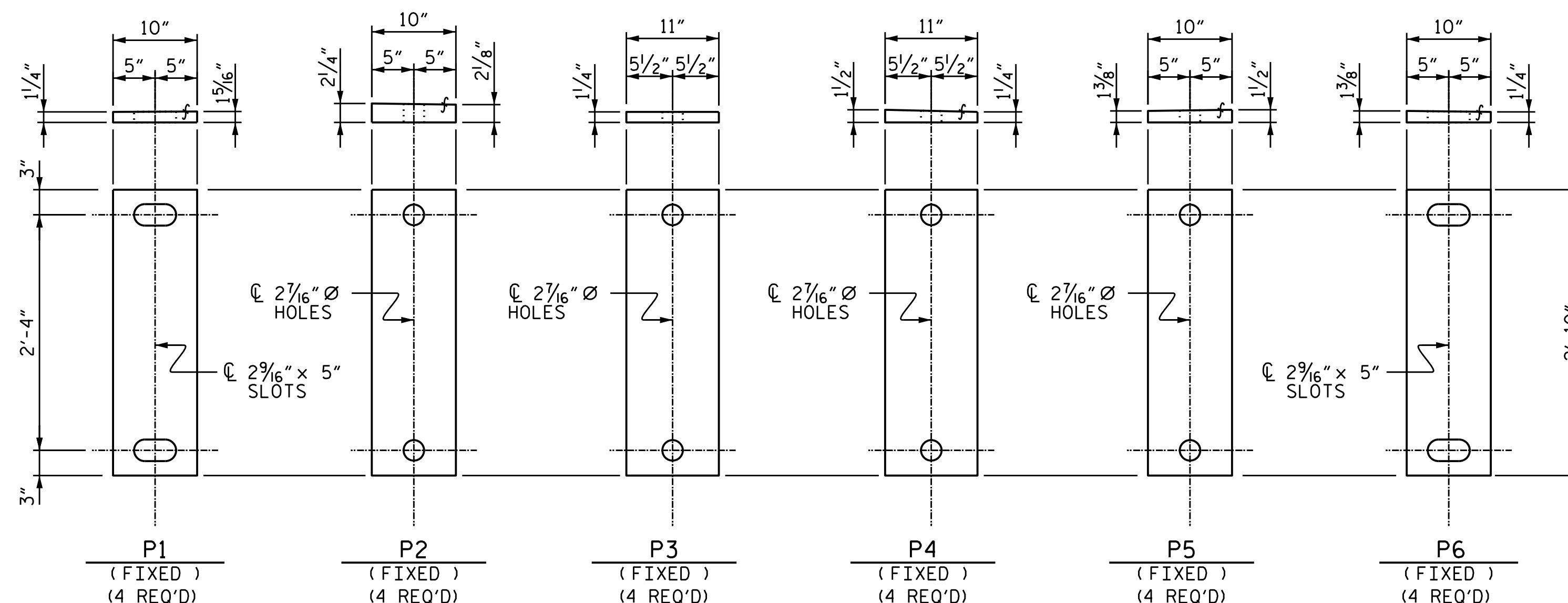
E2 (8 REQ'D)



SOLE PLACEMENT DETAIL



DETAIL "A"



SOLE PLATE DETAILS ("P")

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
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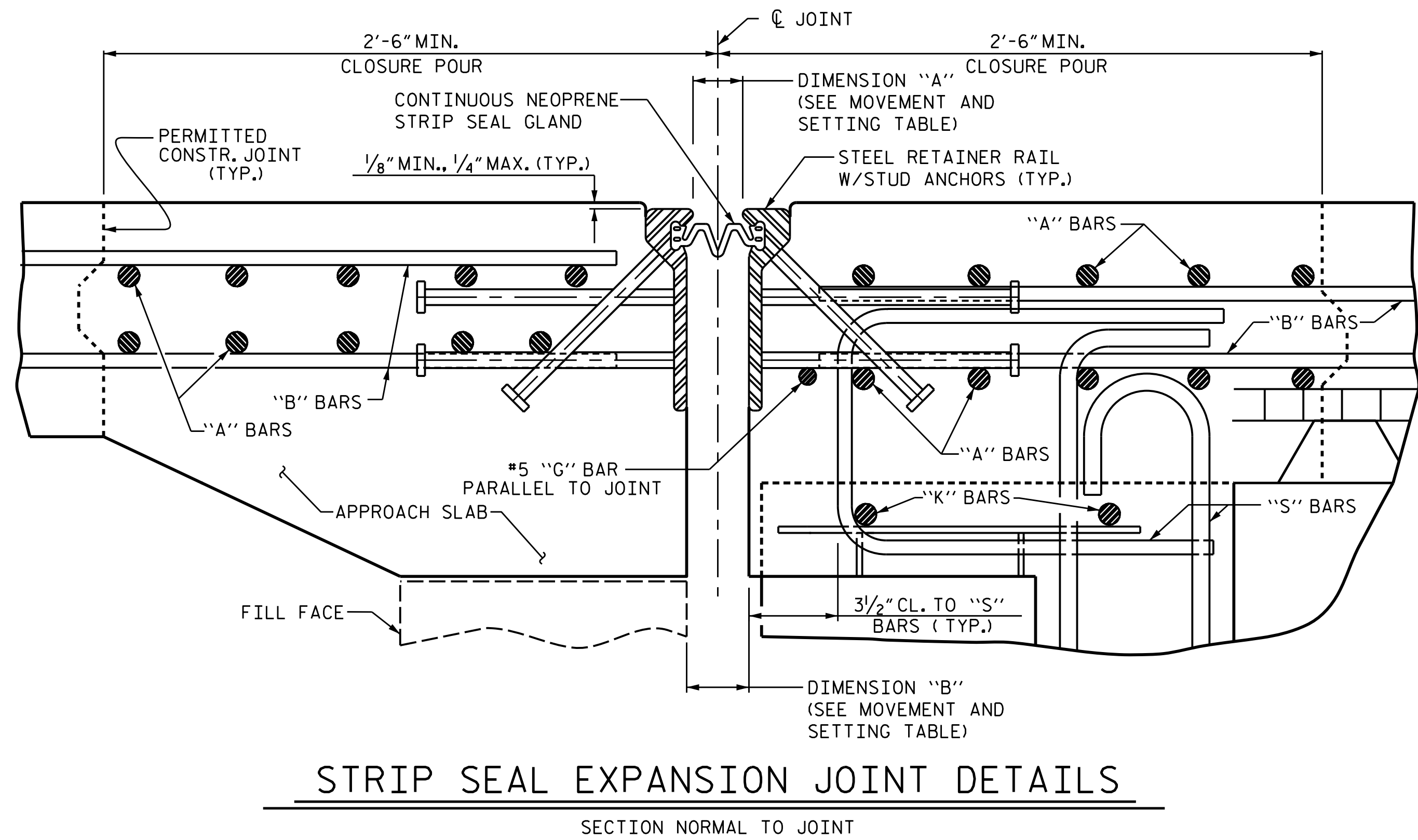
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 CHECKED BY: MGC DATE: 10/22
 DRAWN BY: WJH 8/89 REV. 1/15 MAA/TMG
 CHECKED BY: CRK 8/89 REV. 12/17 MAA/THC
 REV. 10/21 BNB/AAI

Professional Engineer Seal for Marshall W. Cheek, Jr., State of North Carolina, Seal 20125, License No. SFBC029840DC413, dated 11/15/2023 | 7:42 AM EST.

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 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STANDARD					
ELASTOMERIC BEARING DETAILS					
PRESTRESSED CONCRETE GIRDER					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-20
TOTAL SHEETS					47



STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT

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.

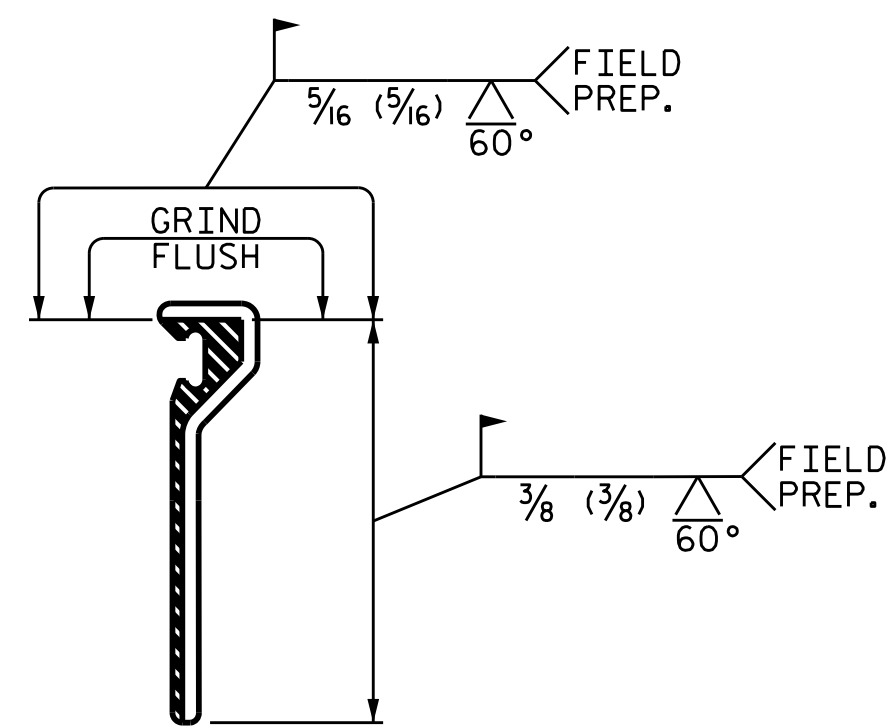
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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.

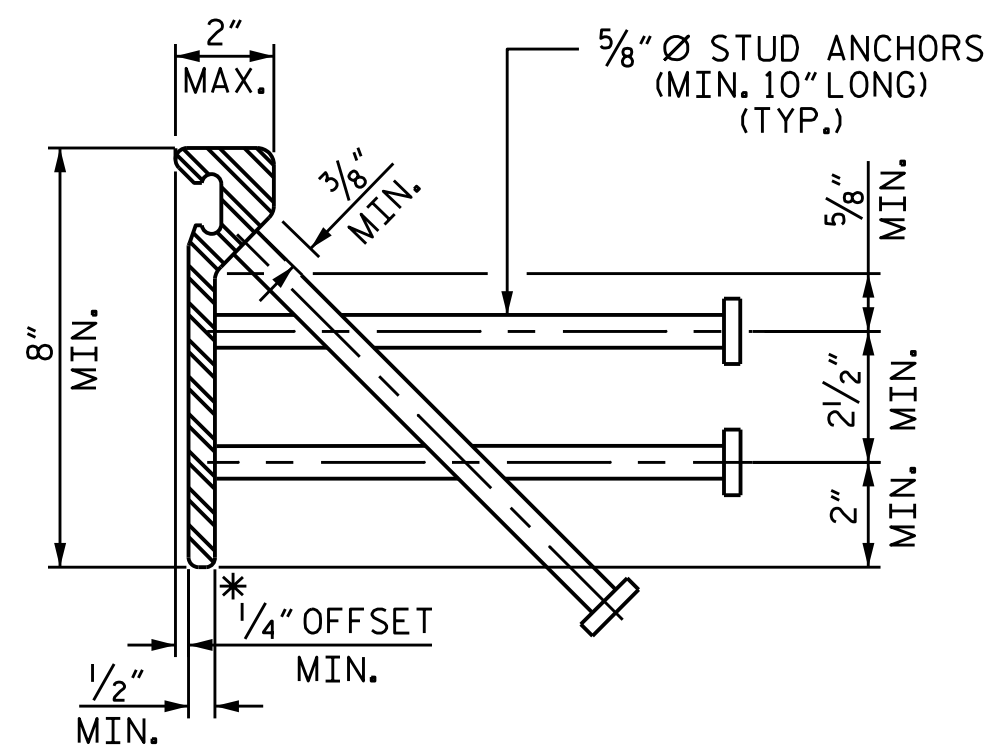
NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

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.

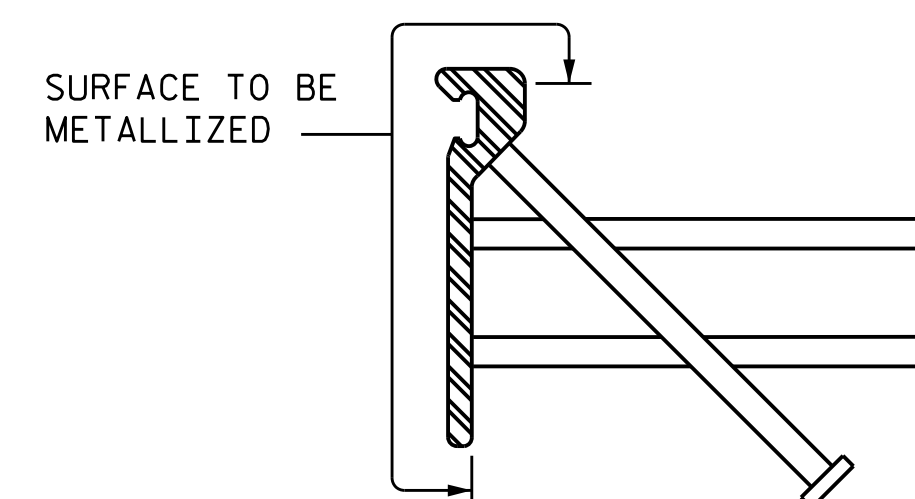


STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



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.



METALLIZING DETAIL

MOVEMENT AND SETTING AT JOINT

LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL. 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	130°56' 51"	3/16"	2 1/8"	2"	1 3/4"	2 5/8"	2 1/2"	2 1/4"
END BENT 2	139°03' 09"	3/16"	2 1/8"	2"	1 3/4"	2 5/8"	2 1/2"	2 1/4"

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE STANDARD
 STRIP SEAL EXPANSION JOINT DETAILS

Professional Engineer Seal: Marshall W. Cheek, Jr., No. 58022, Exp. 12/31/2025.

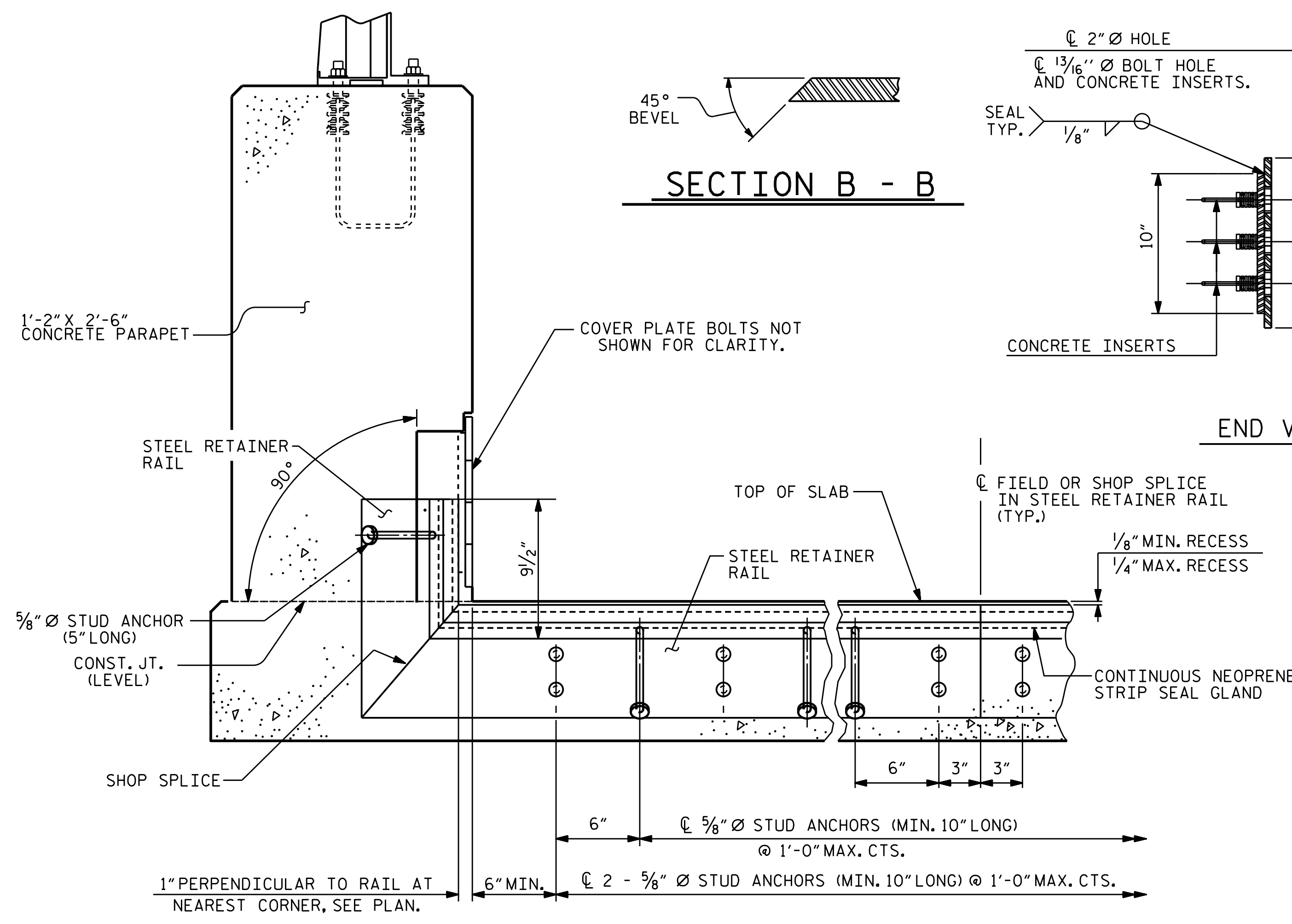
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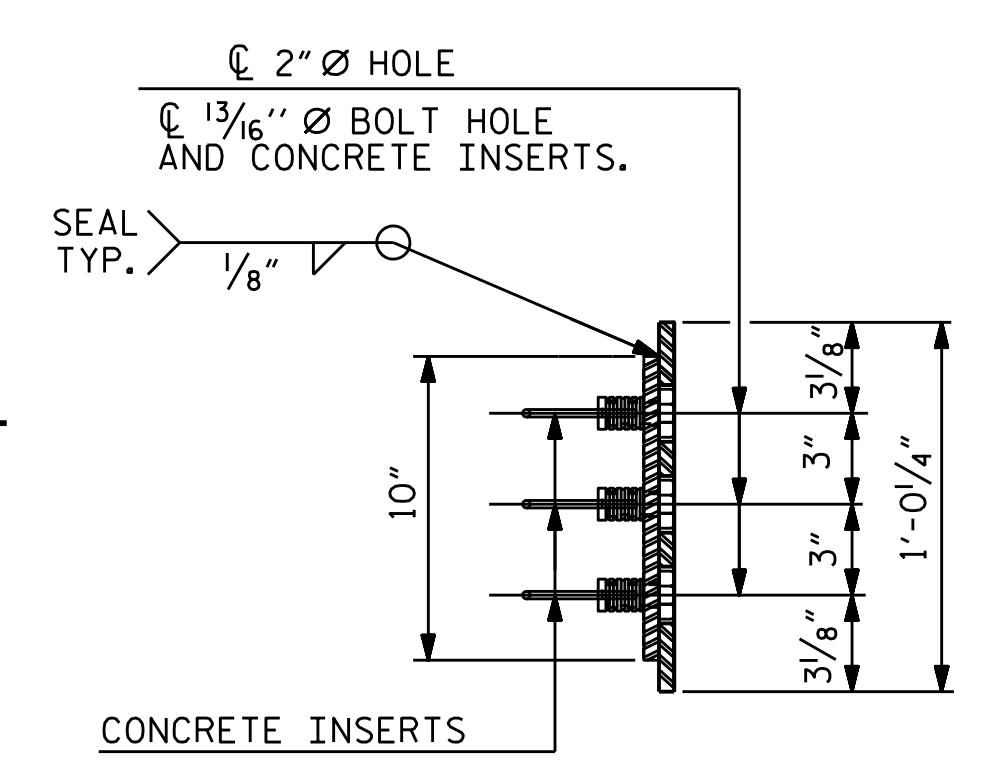
TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

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1			3			TOTAL SHEETS
2			4			47

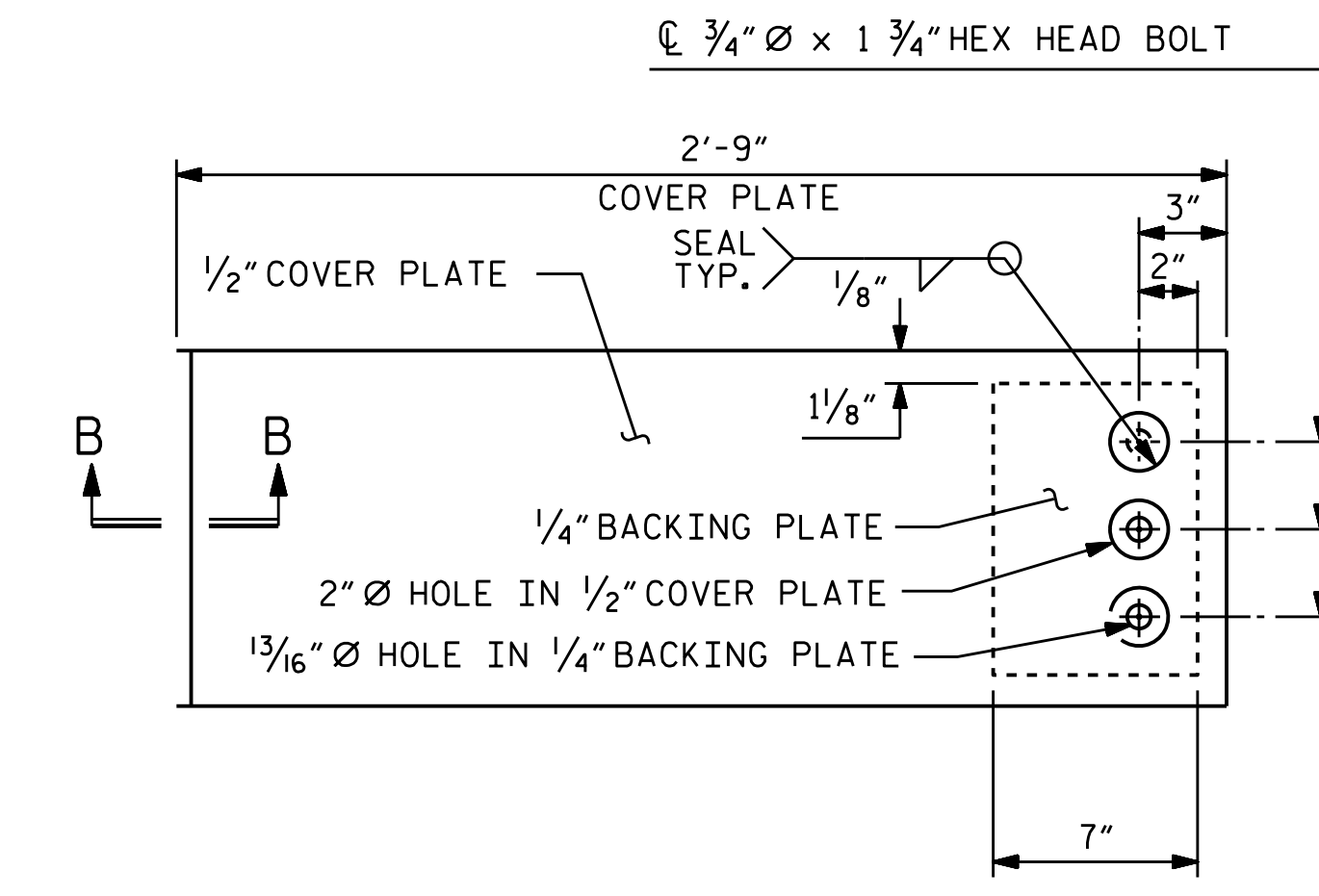
ASSEMBLED BY : NMW	DATE : 9/22
CHECKED BY : MGC	DATE : 9/22
DRAWN BY : MAA 6/20	
CHECKED BY : BNB 6/20	



SECTION B - B

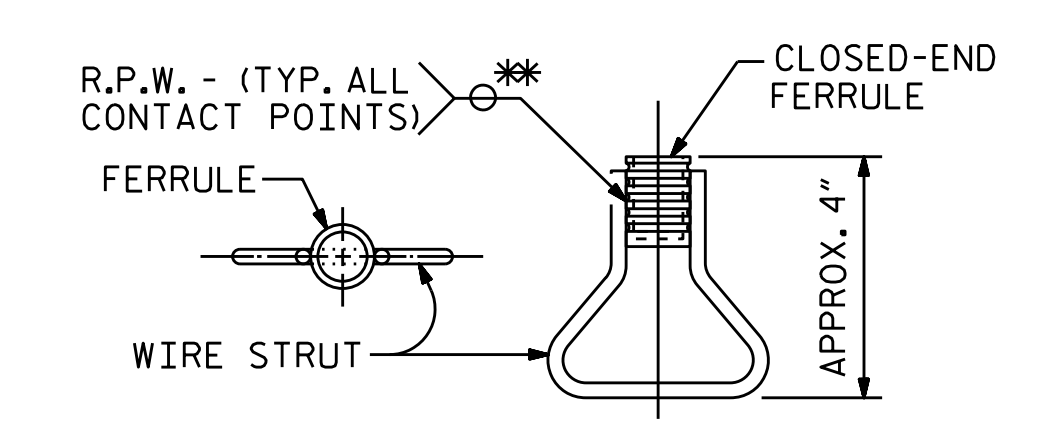


END VIEW



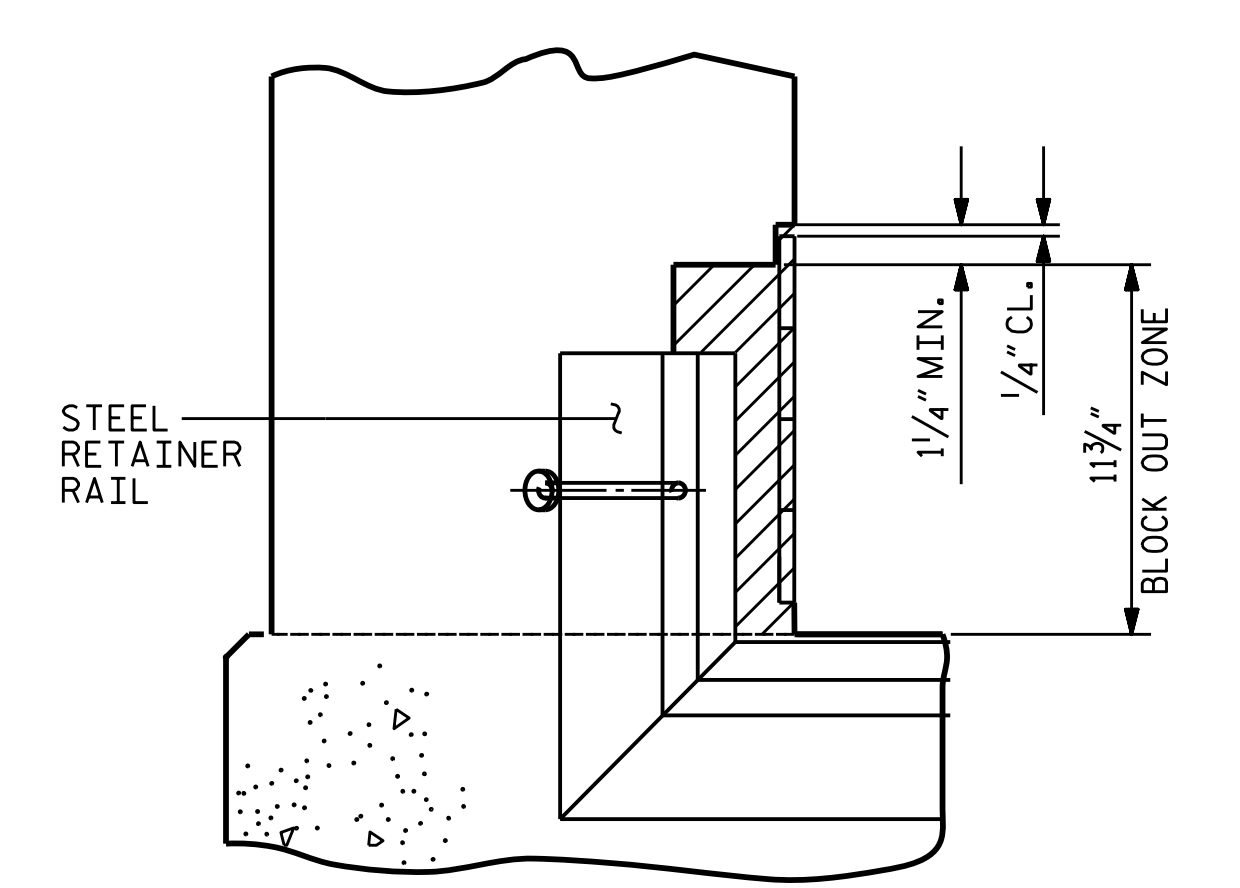
TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



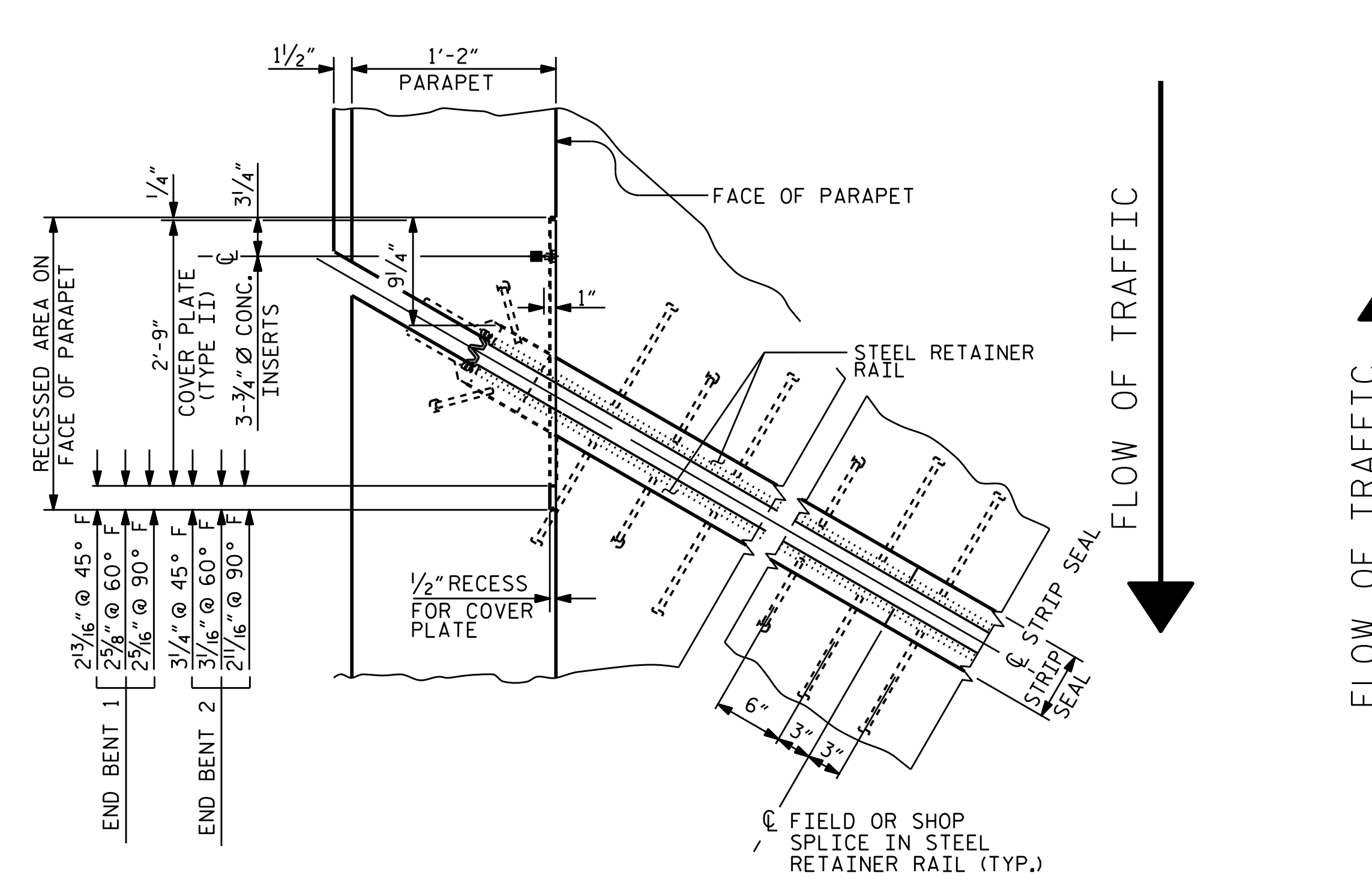
CONCRETE INSERT

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

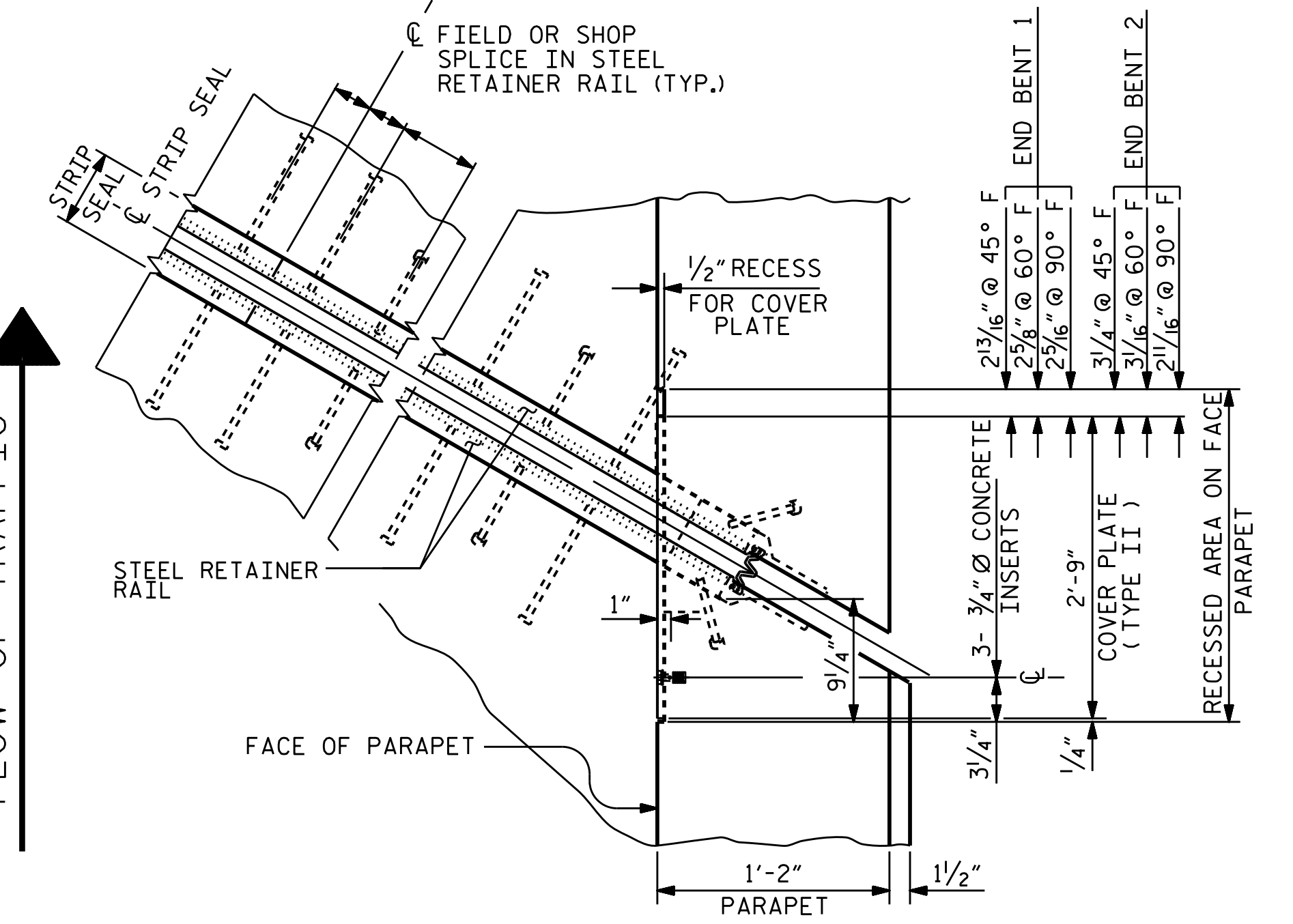


BLOCK OUT DETAIL

SECTION THRU RAIL NORMAL TO JOINT



PLAN OF STRIP SEAL EXPANSION JOINT LEFT SIDE PARAPET



PLAN OF STRIP SEAL EXPANSION JOINT RIGHT SIDE PARAPET

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

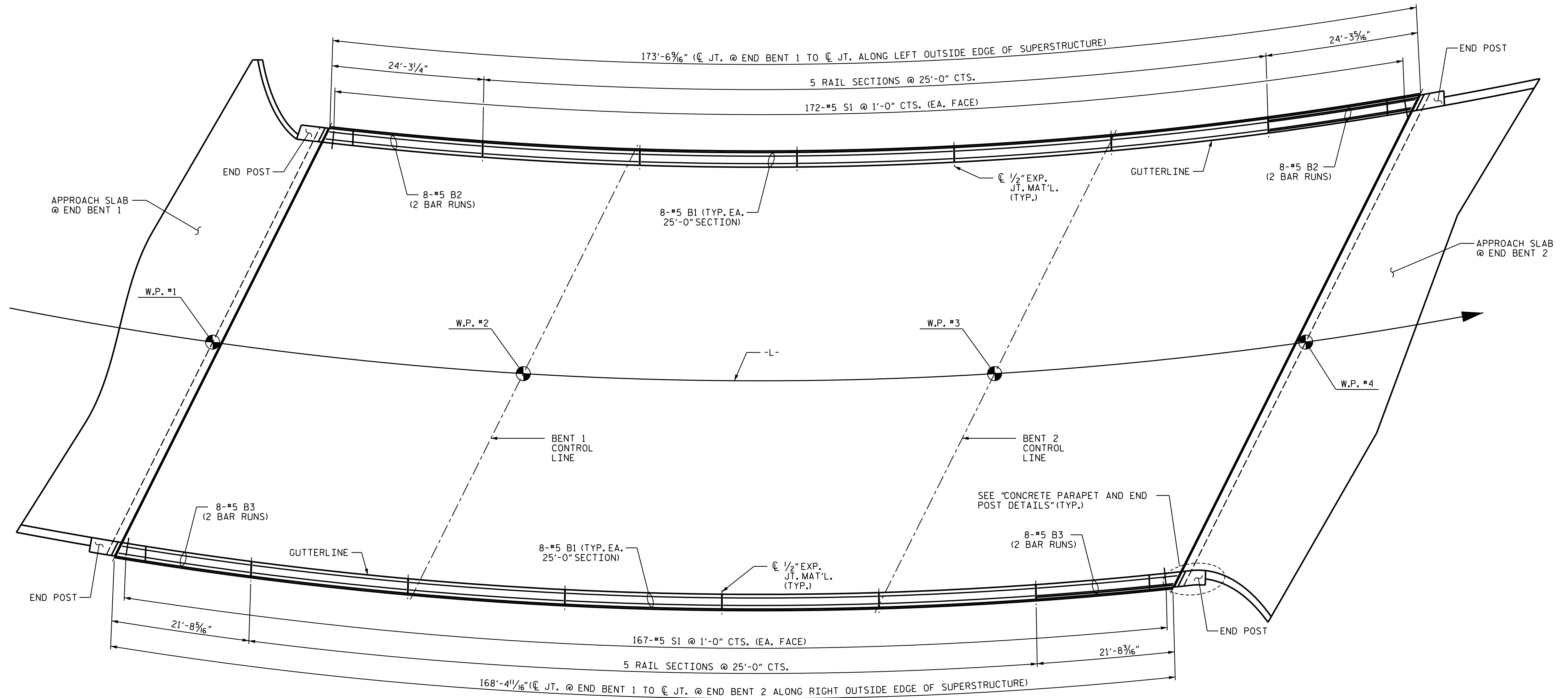
SEAL 20125
 MARSHALL G. CREECH, JR.
 ENGINEER
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1			3			TOTAL SHEETS 47
2			4			

ASSEMBLED BY : NMW DATE : 9/22
 CHECKED BY : MGC DATE : 9/22



PLAN OF CONCRETE PARAPET

NOTES

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

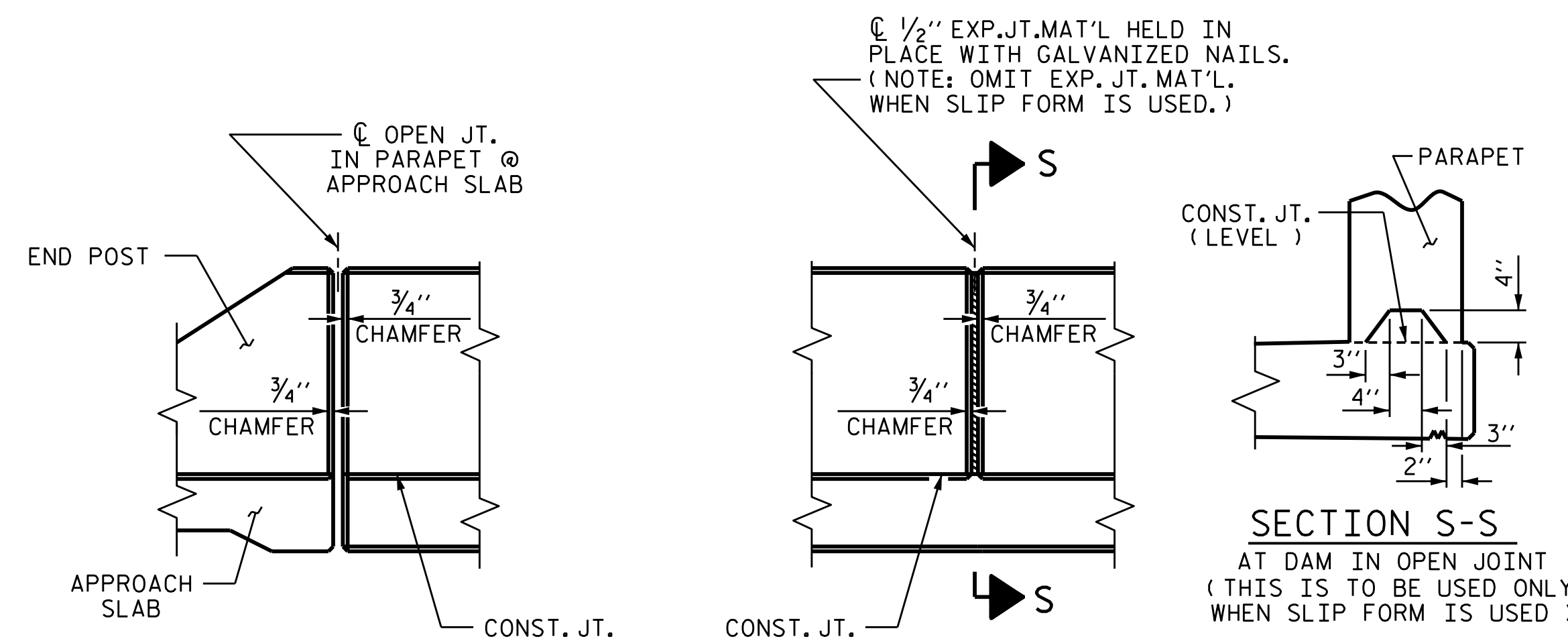
ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEETS.

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

PAYMENT FOR THE END POSTS ON THE APPROACH SLABS SHALL BE PAID FOR UNDER THE PRICE BID FOR LINEAR FEET OF CONCRETE PARAPET. REINFORCING STEEL AND CONCRETE QUANTITIES ARE INCLUDED WITH THE APPROACH SLABS.



ELEVATION AT EXPANSION JOINTS

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 20125
 TGS ENGINEERS
 201 W. MARION ST STE 200
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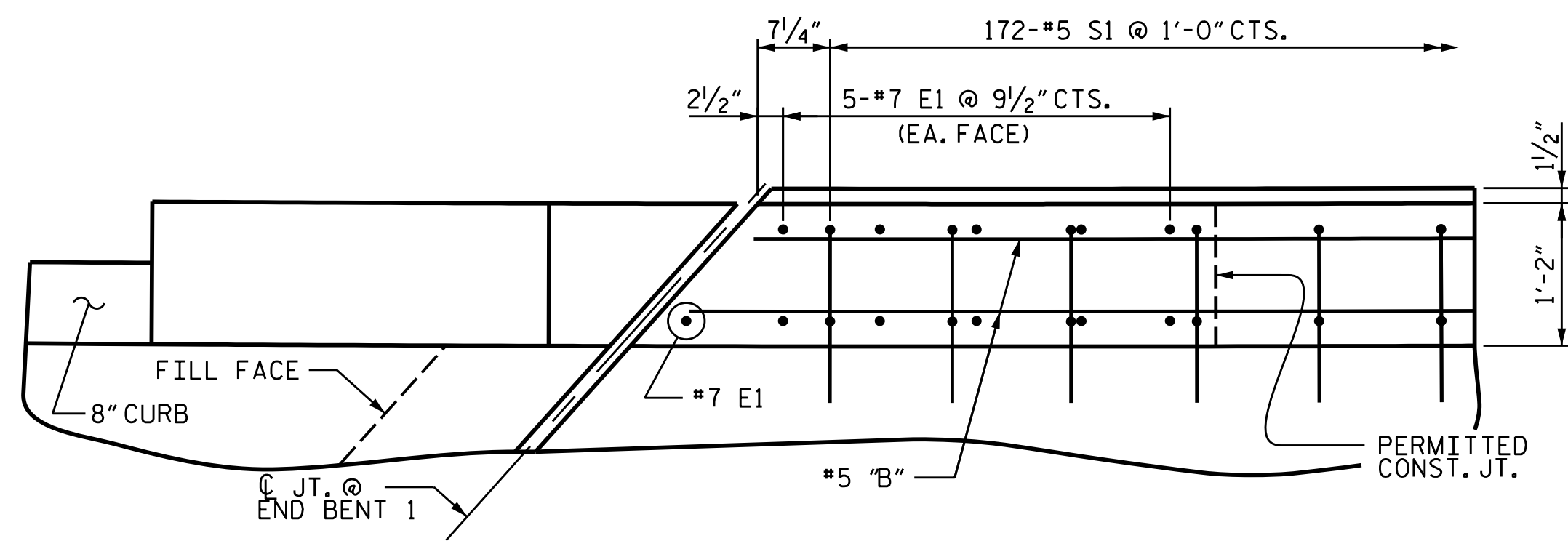
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DEPARTMENT OF TRANSPORTATION
 RALEIGH

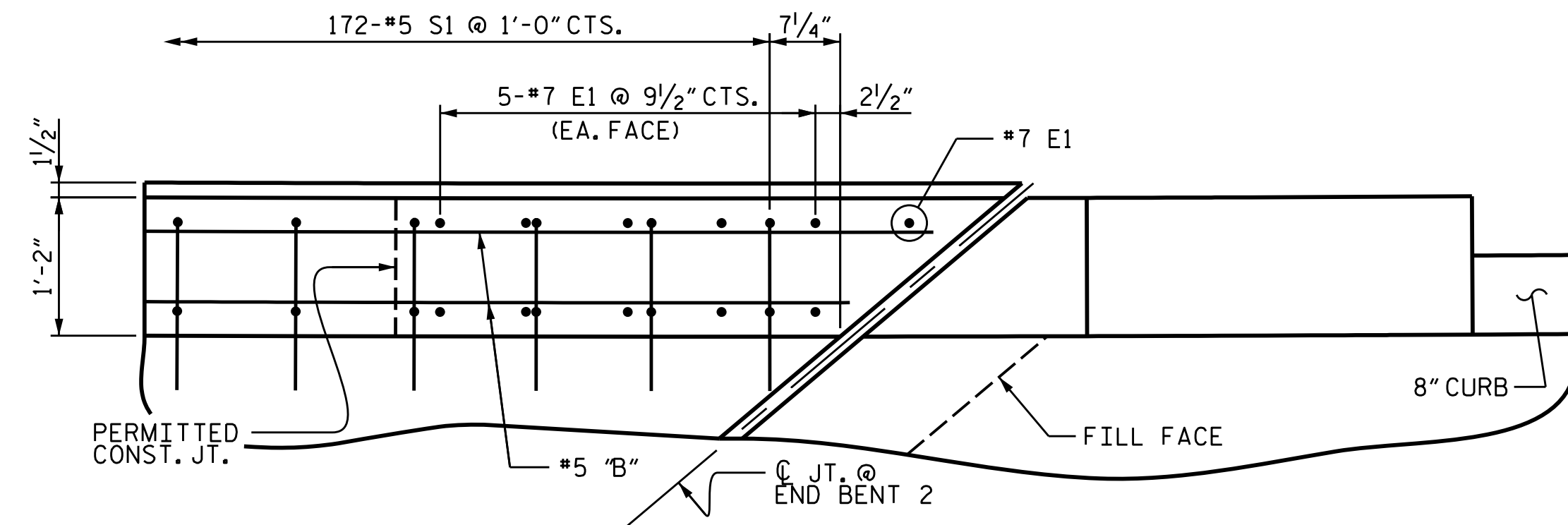
SUPERSTRUCTURE
 PLAN OF PARAPET FOR
 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-23
1			3			TOTAL SHEETS
2			4			47

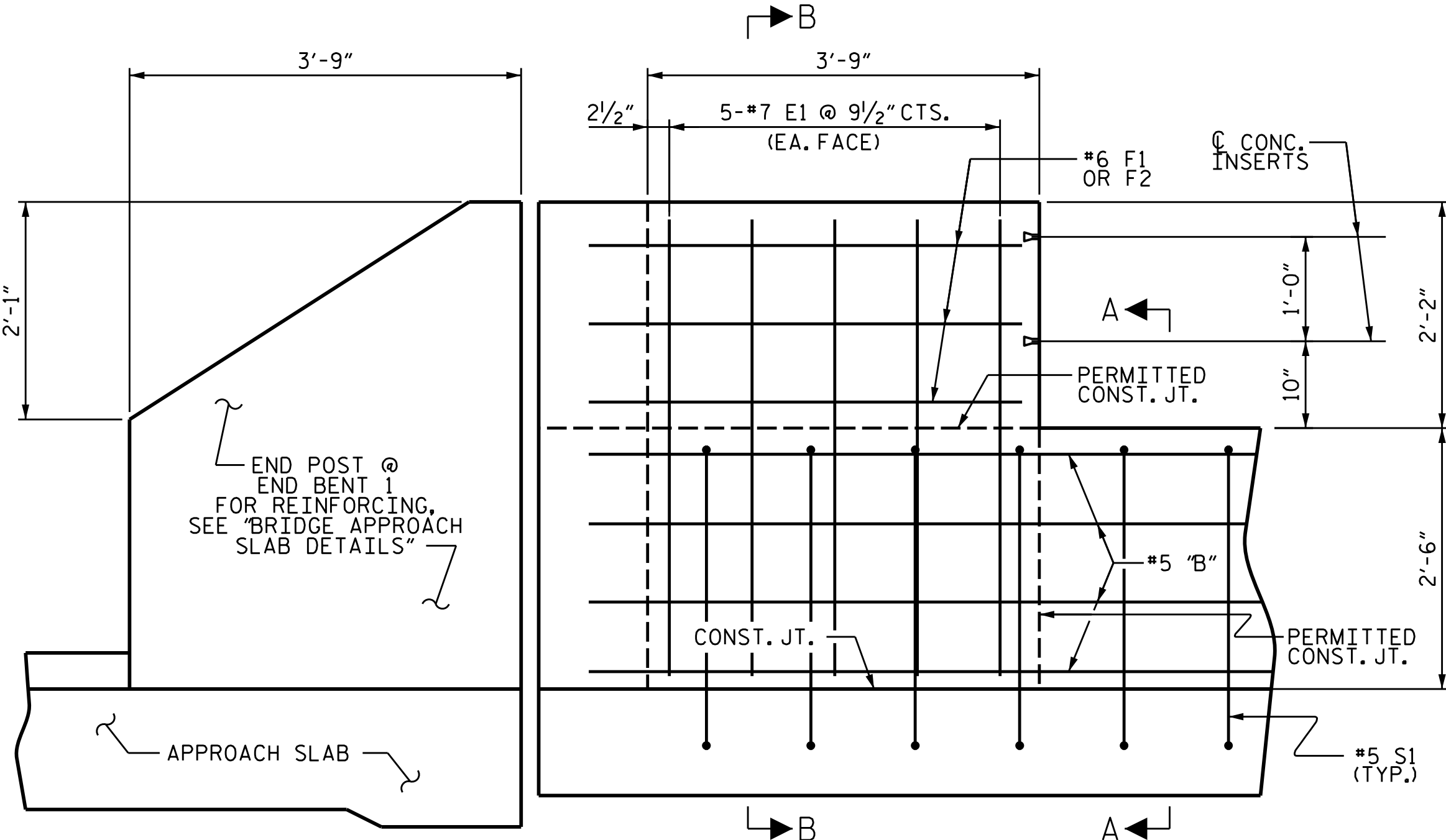
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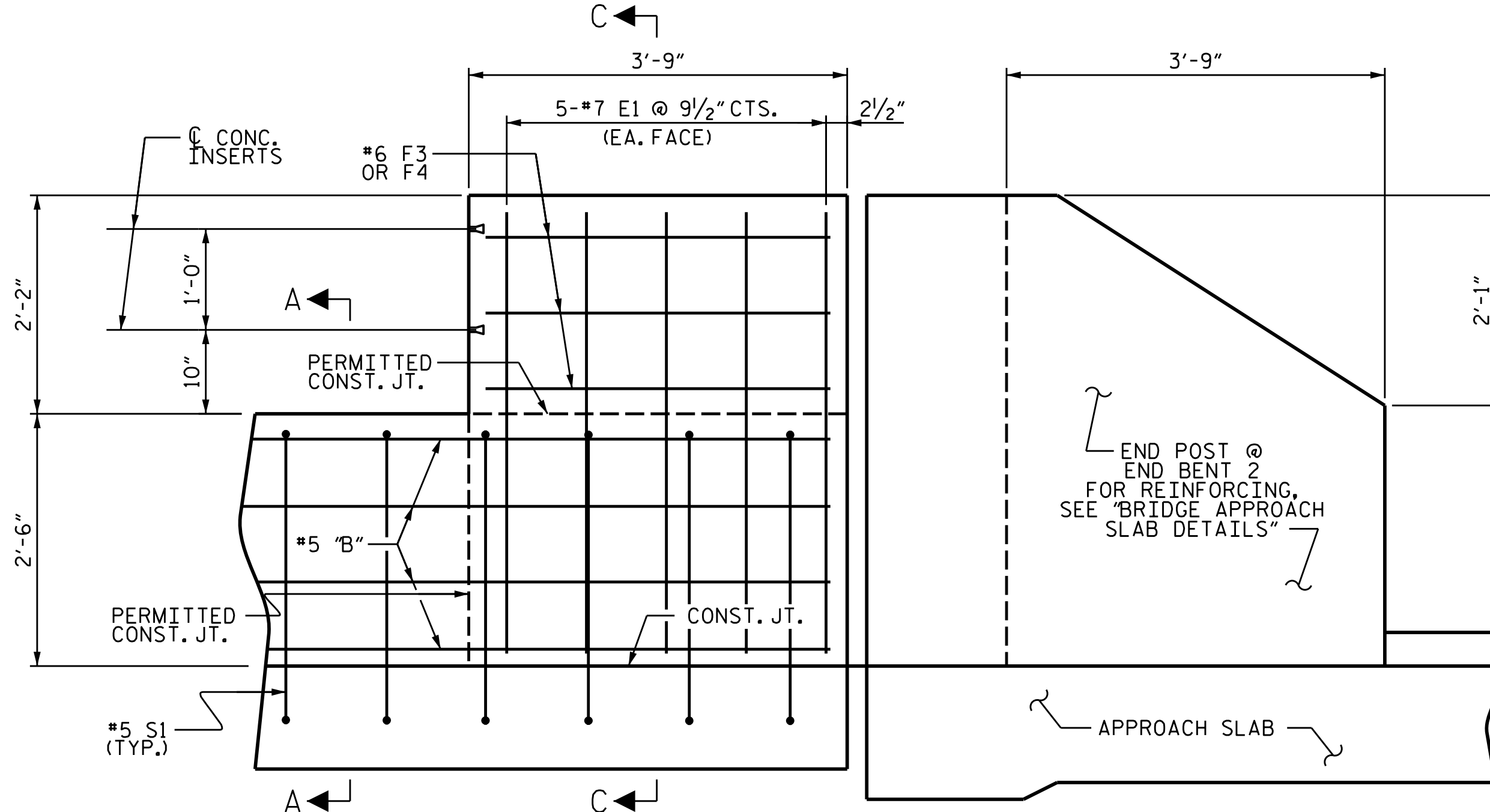
PLAN OF PARAPET
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



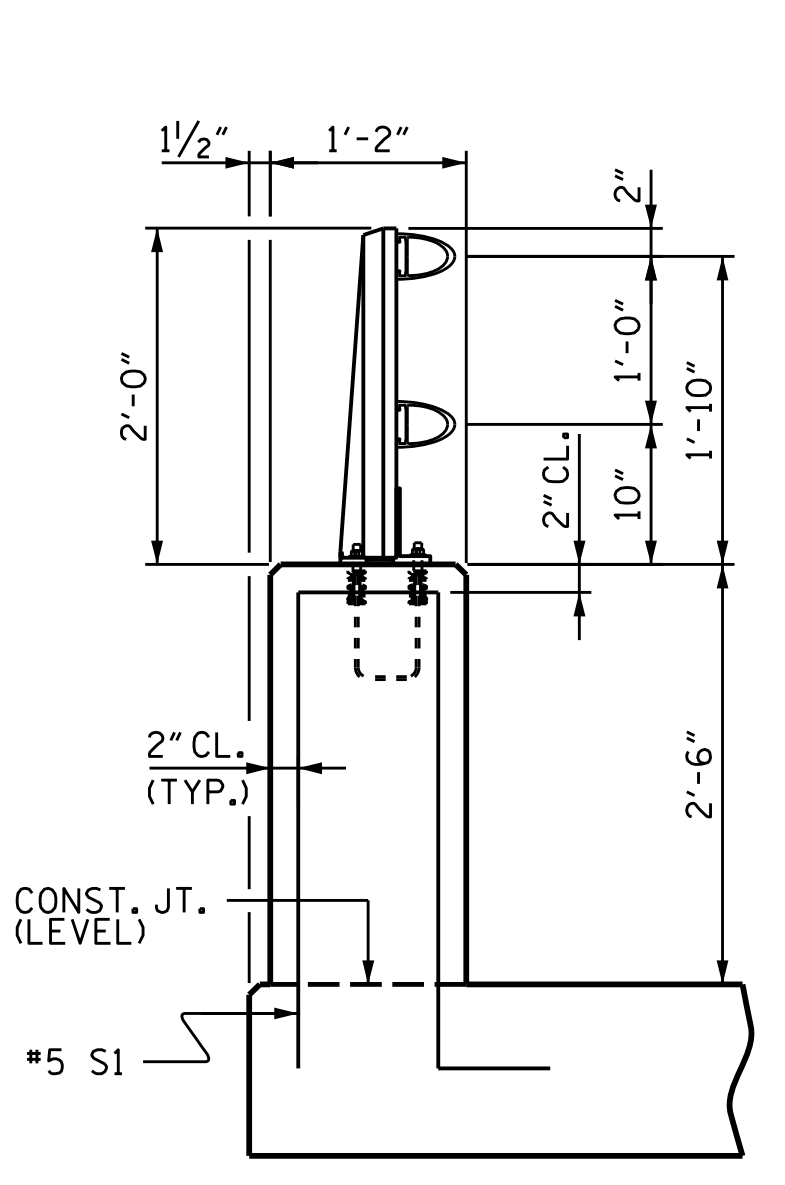
PLAN OF PARAPET
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



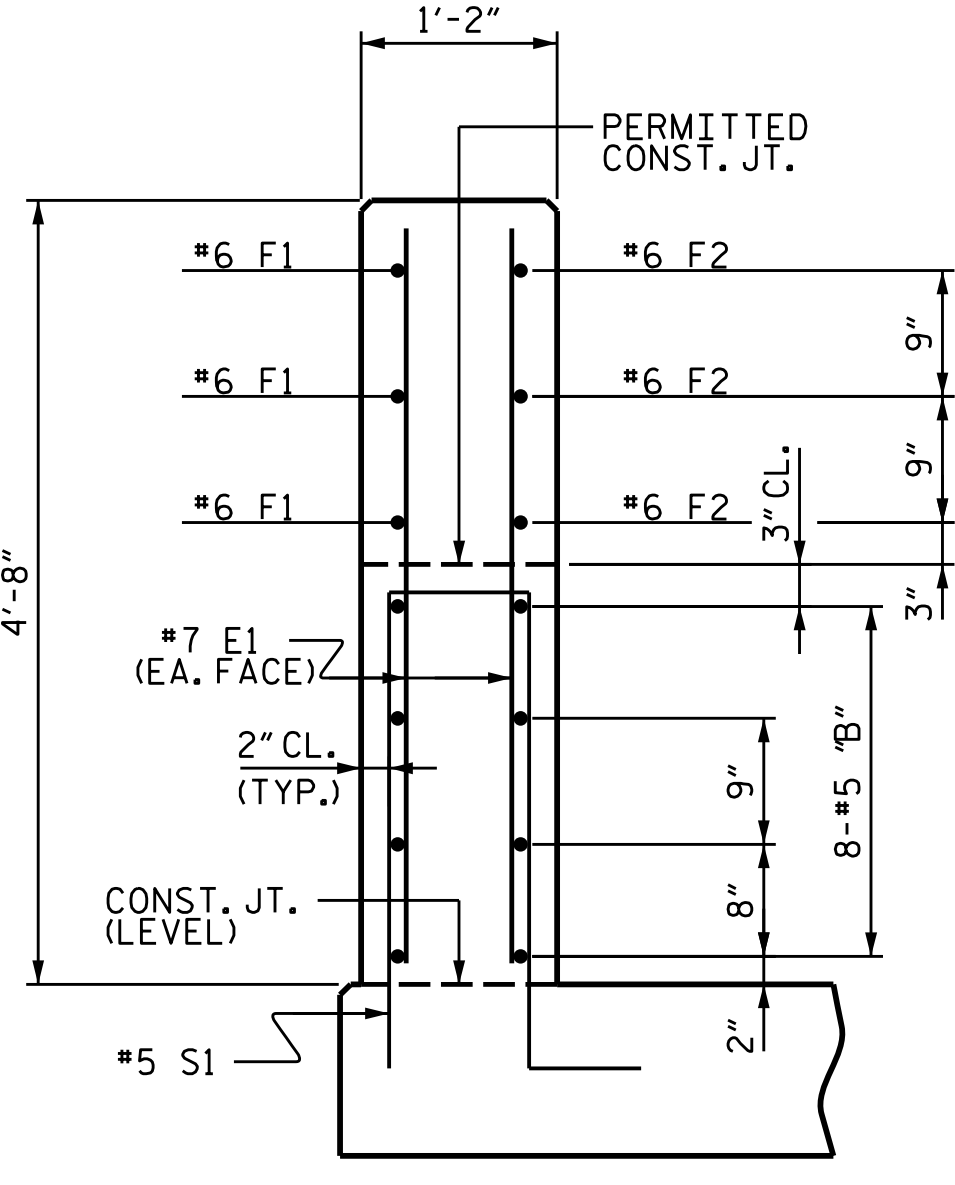
ELEVATION



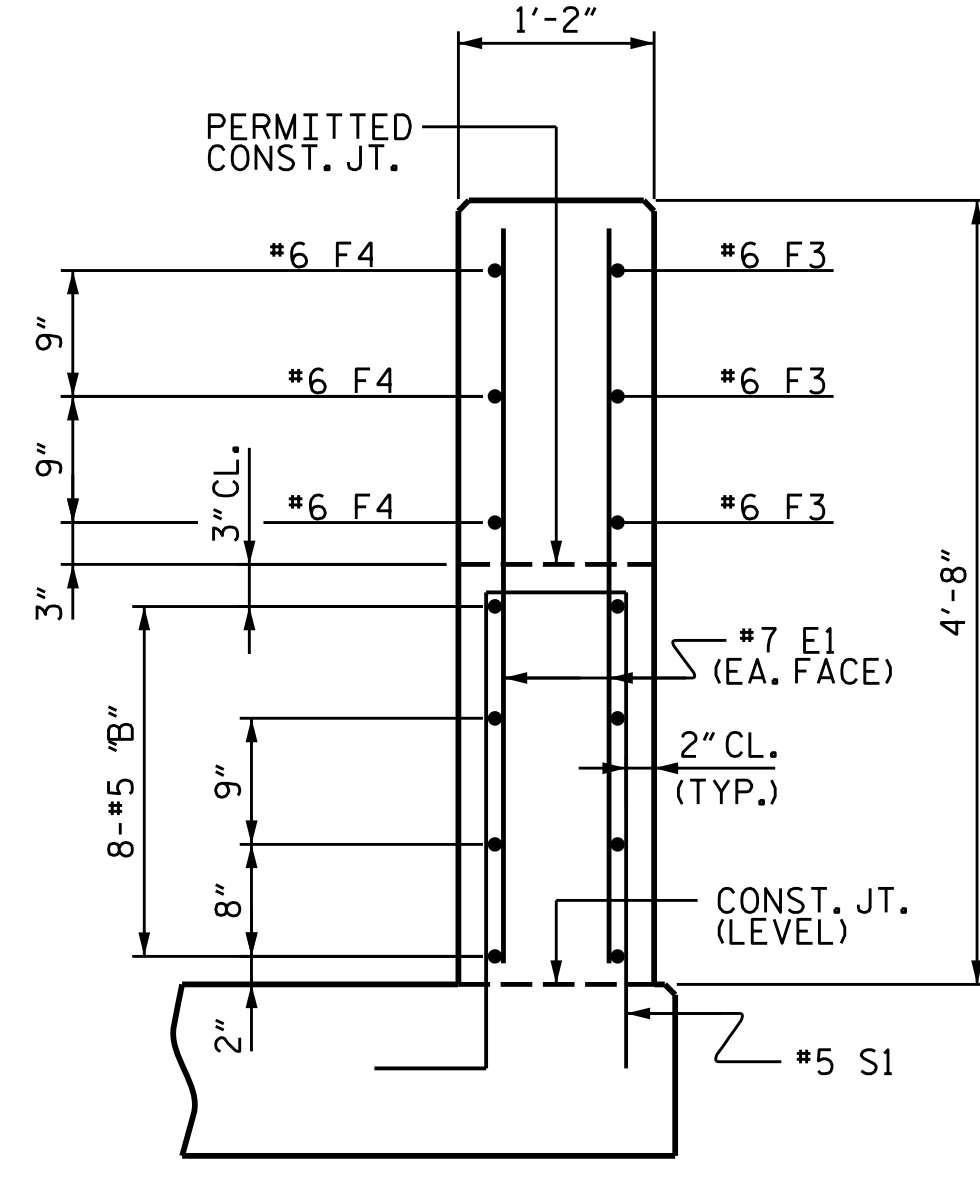
ELEVATION



SECTION A-A



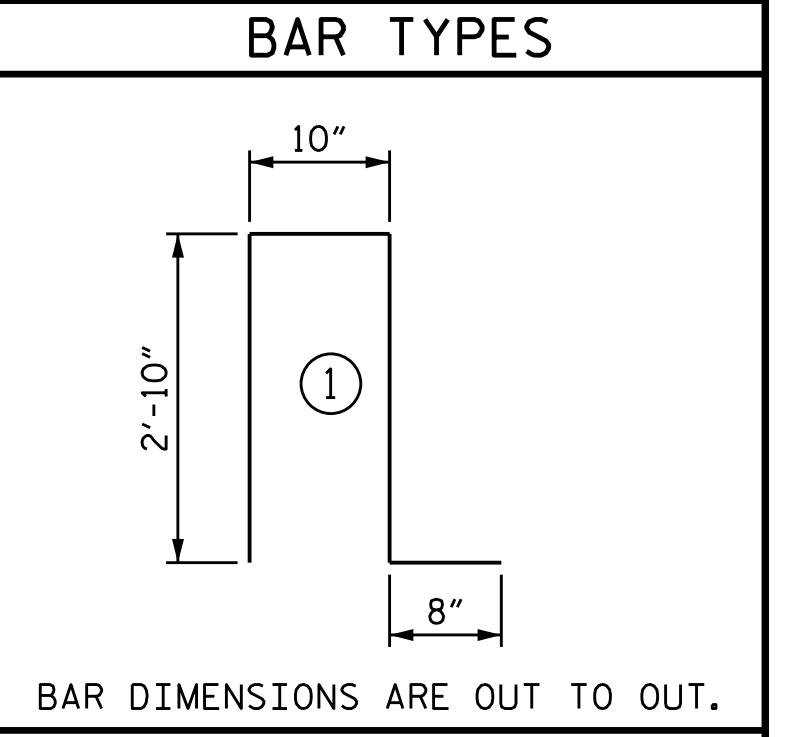
SECTION B-B



SECTION C-C

BILL OF MATERIAL FOR 1'-2" x 2'-6" PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	80	#5	STR.	24'-7"	2,051
*B2	32	#5	STR.	14'-2"	473
*B3	32	#5	STR.	12'-11"	431
*E1	44	#7	STR.	4'-4"	390
*F1	6	#6	STR.	3'-6"	32
*F2	6	#6	STR.	4'-1"	37
*F3	6	#6	STR.	4'-4"	39
*F4	6	#6	STR.	3'-7"	32
*S1	339	#5	1	7'-2"	2,534
*EPOXY COATED REINFORCING STEEL					6,019 LBS.
CLASS "AA" CONCRETE					40.2 C.Y.
1'-2" x 2'-6" CONCRETE PARAPET					359.30 L.F.



PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 2 OF 5

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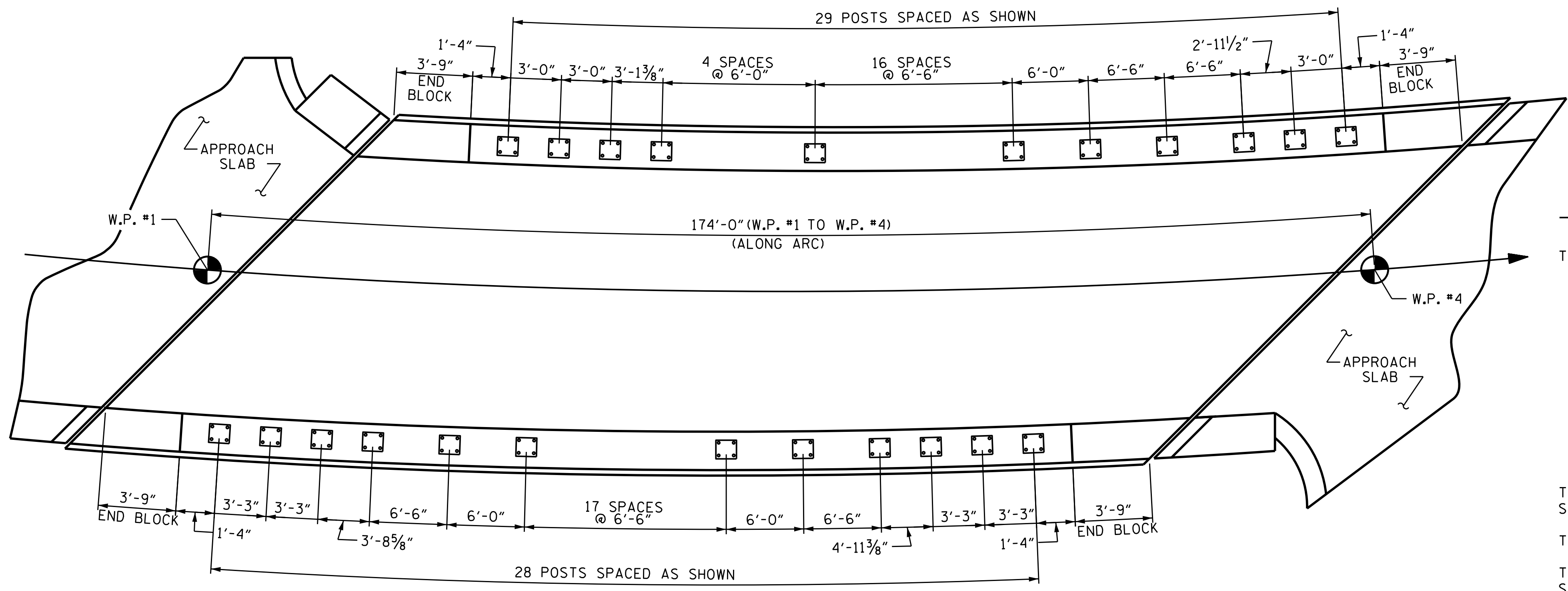
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
1'-2" x 2'-6" CONCRETE PARAPET AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 47
2			4			

DRAWN BY : JLA DATE : 9/22
 CHECKED BY : MGC DATE : 10/22



PLAN OF RAIL POST SPACINGS

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

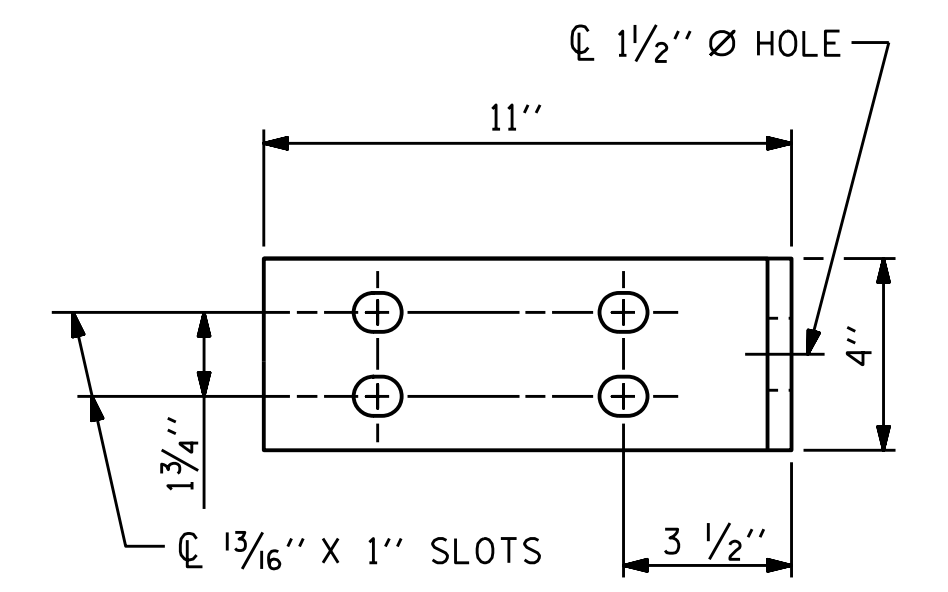
- NOTES**
METAL RAIL TO END POST CONNECTION
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF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

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

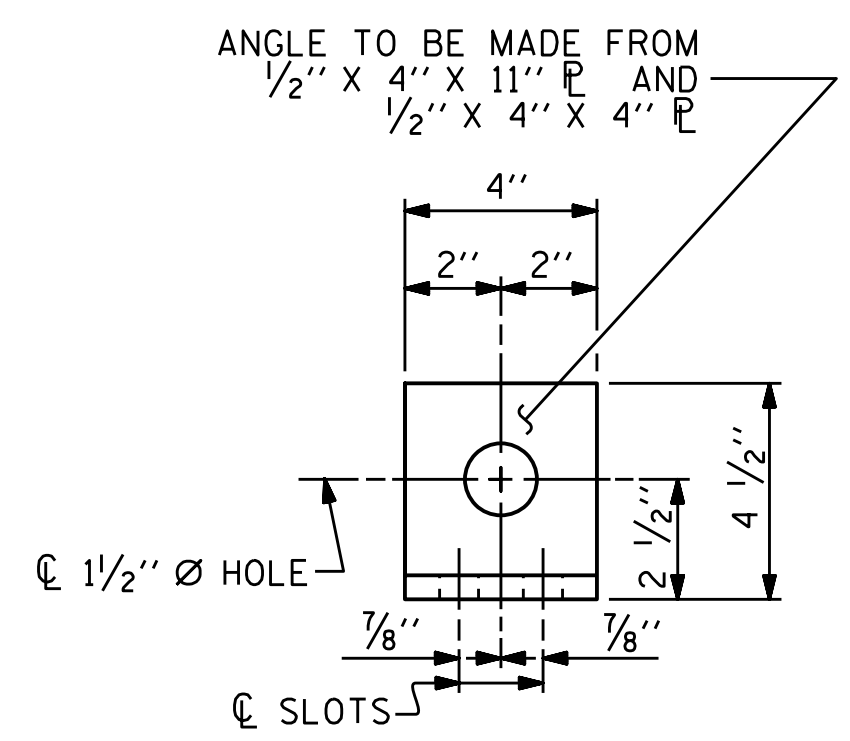
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

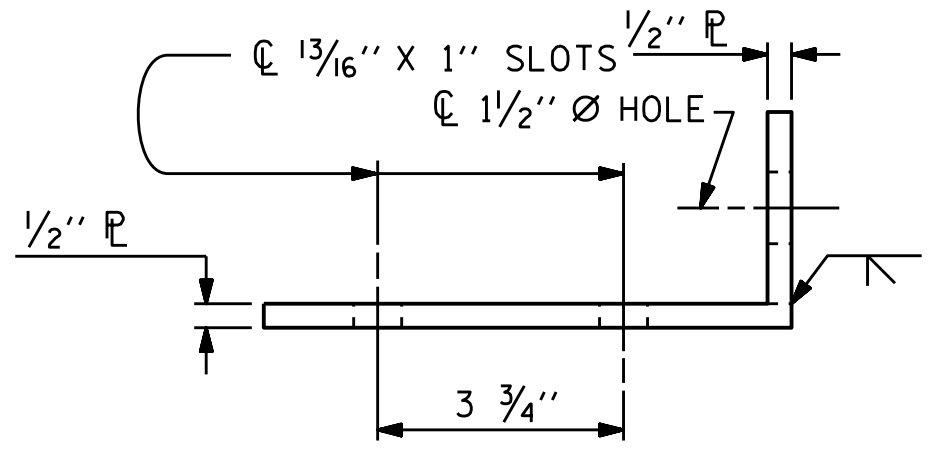
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



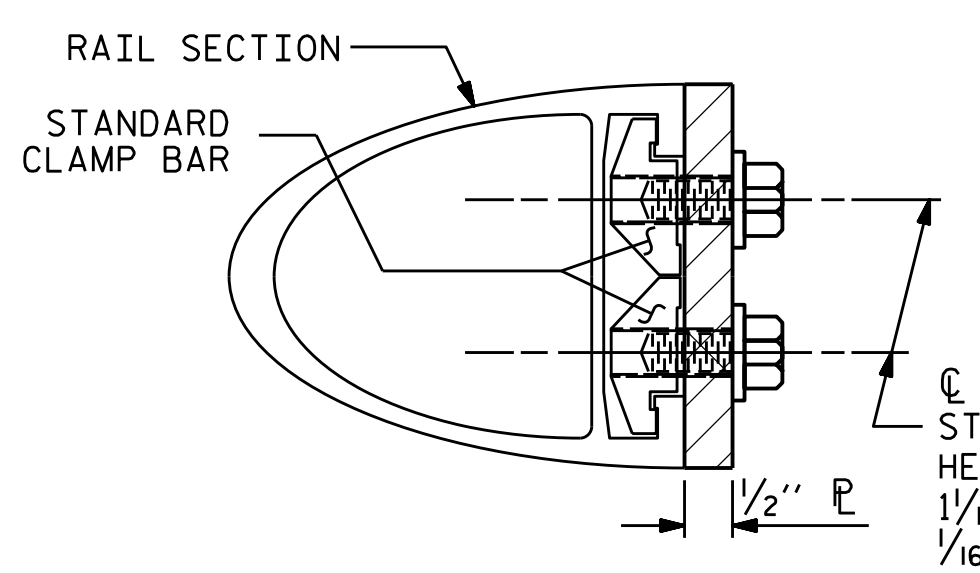
ELEVATION



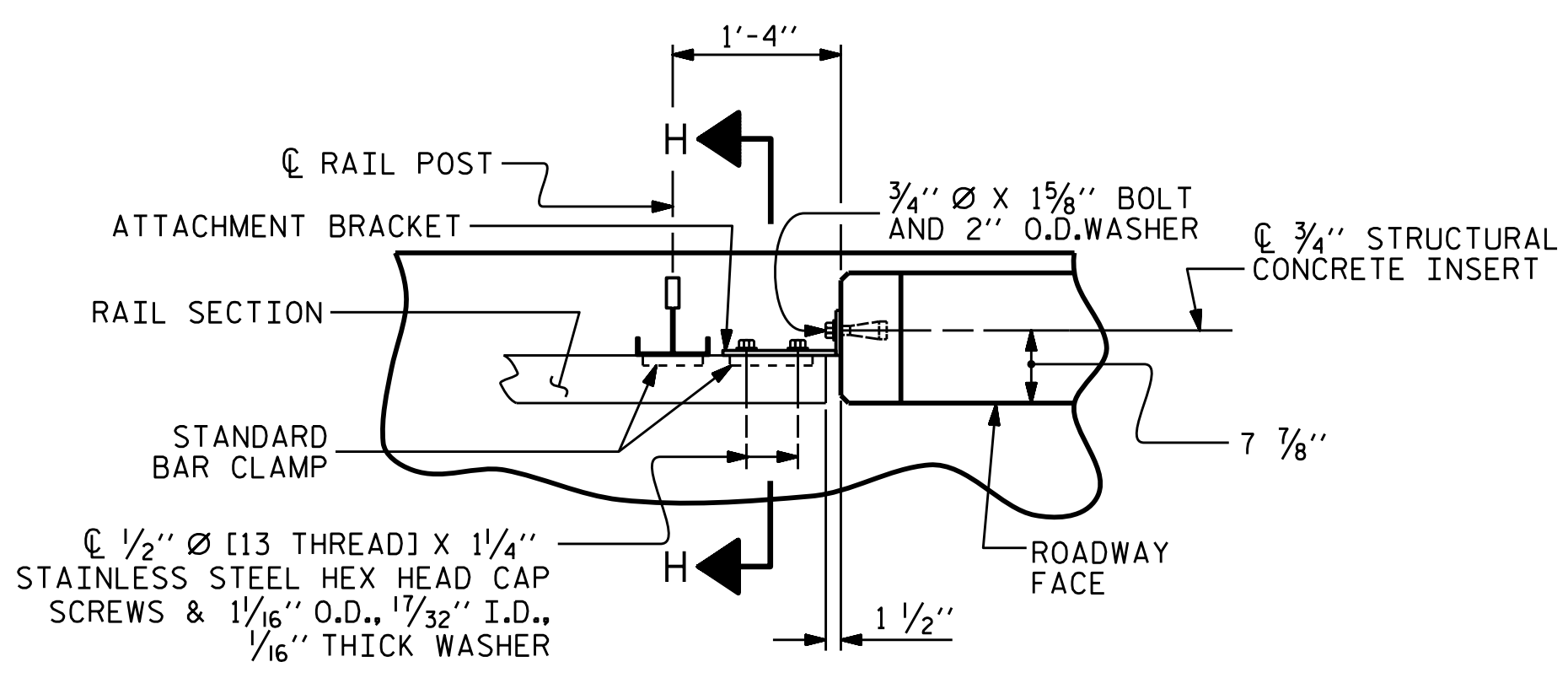
END VIEW (FIX)



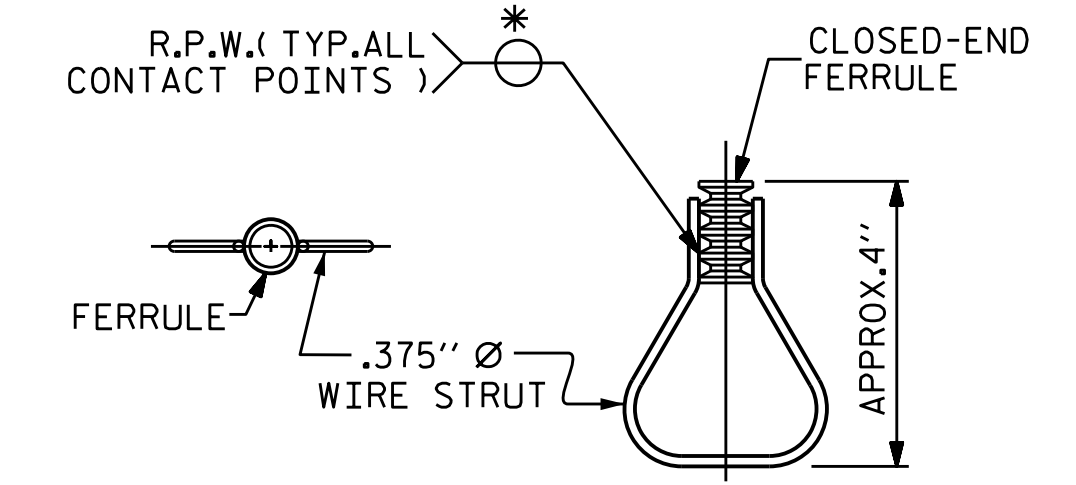
TOP VIEW



SECTION H-H (FIX)



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 20125
 MARSHALL D. CHEEK, JR.
 11/15/2023 | 7:42 AM EST
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-25	
SUPERSTRUCTURE STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS						TOTAL SHEETS 47	
FOR TWO BAR METAL RAILS							
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

ASSEMBLED BY :	JLA	DATE :	9/22
CHECKED BY :	MGC	DATE :	10/22
DRAWN BY :	FCJ	REV. 5/1/06	TLA/GM
CHECKED BY :	CRK	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

DETAILS FOR ATTACHING METAL RAIL TO END POST

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 SHEET 3 OF 5.

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 = 325.61 LIN. FT.

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 4 OF 5

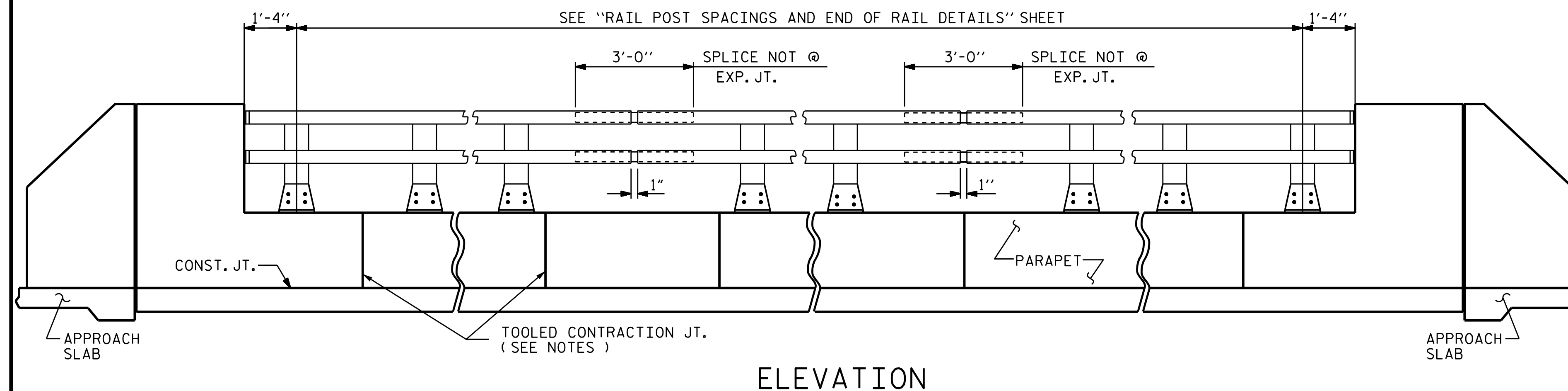
11/15/2023 | 7:42 AM EST

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH: (704) 476-0003
CORP. LICENSE NO.: C-0275

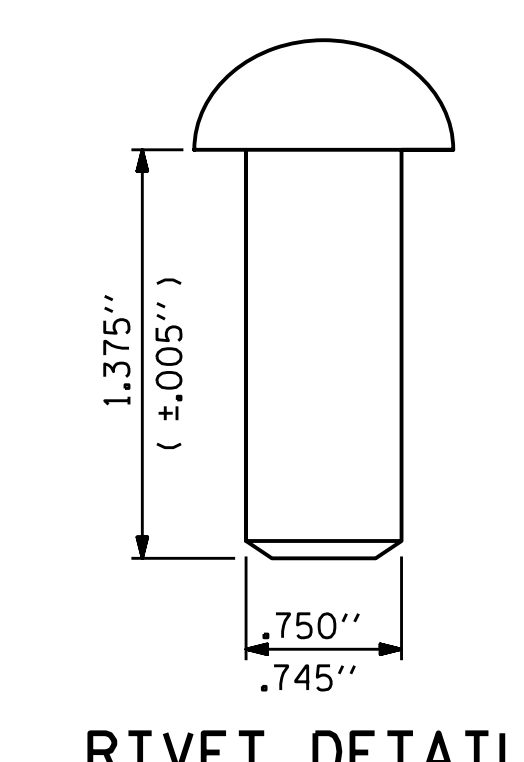
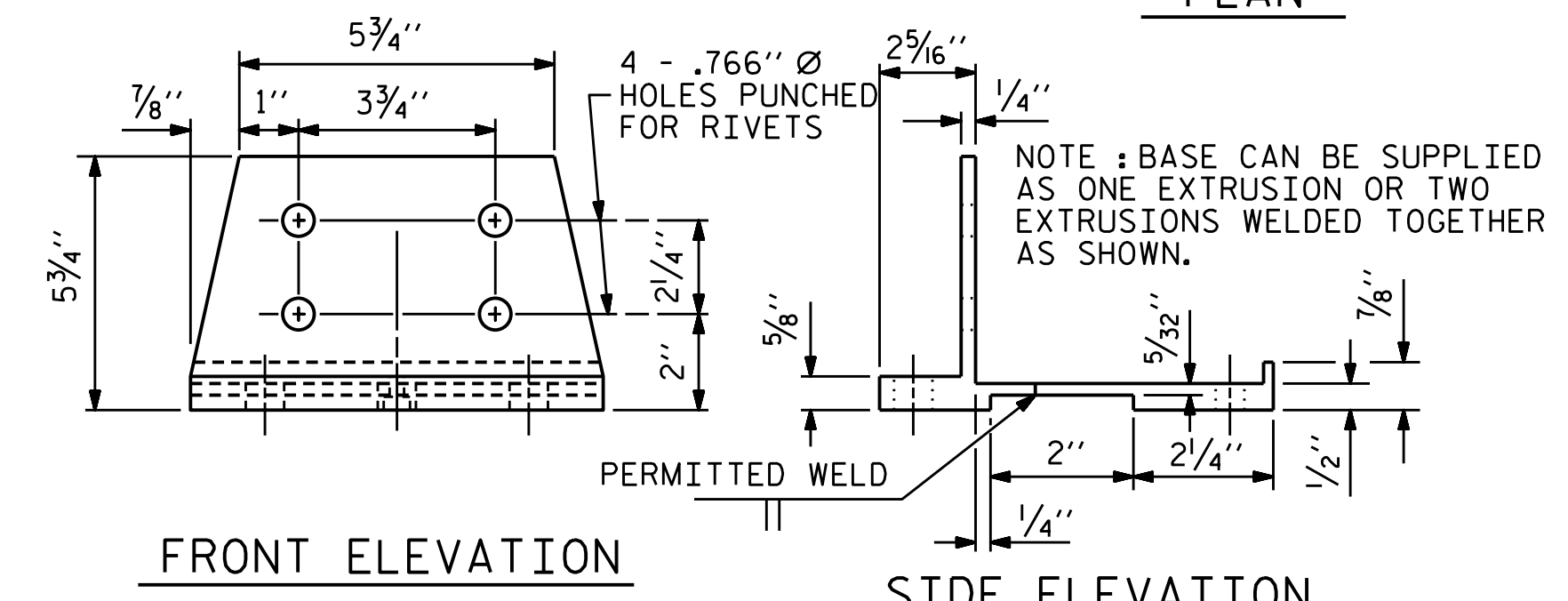
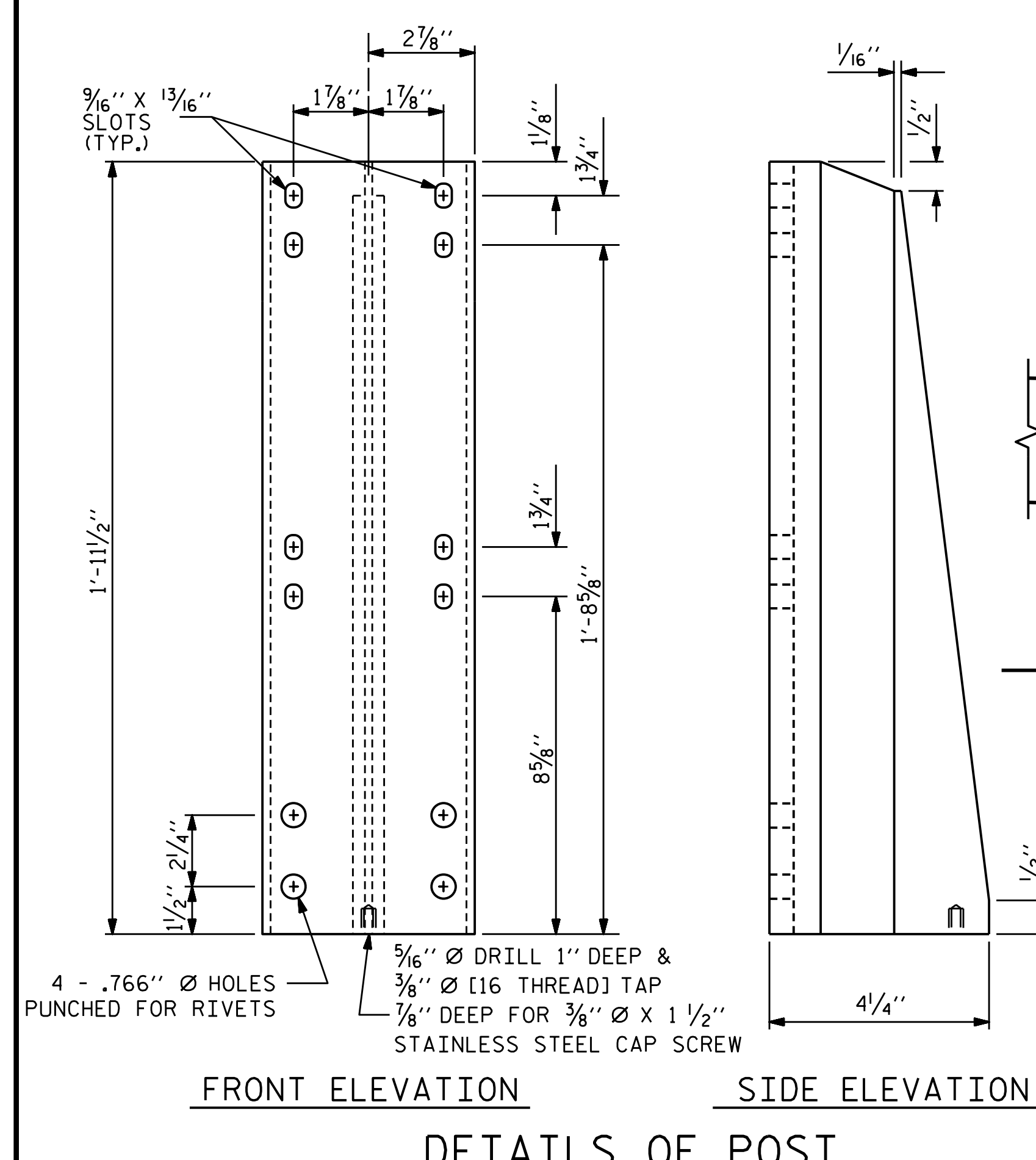
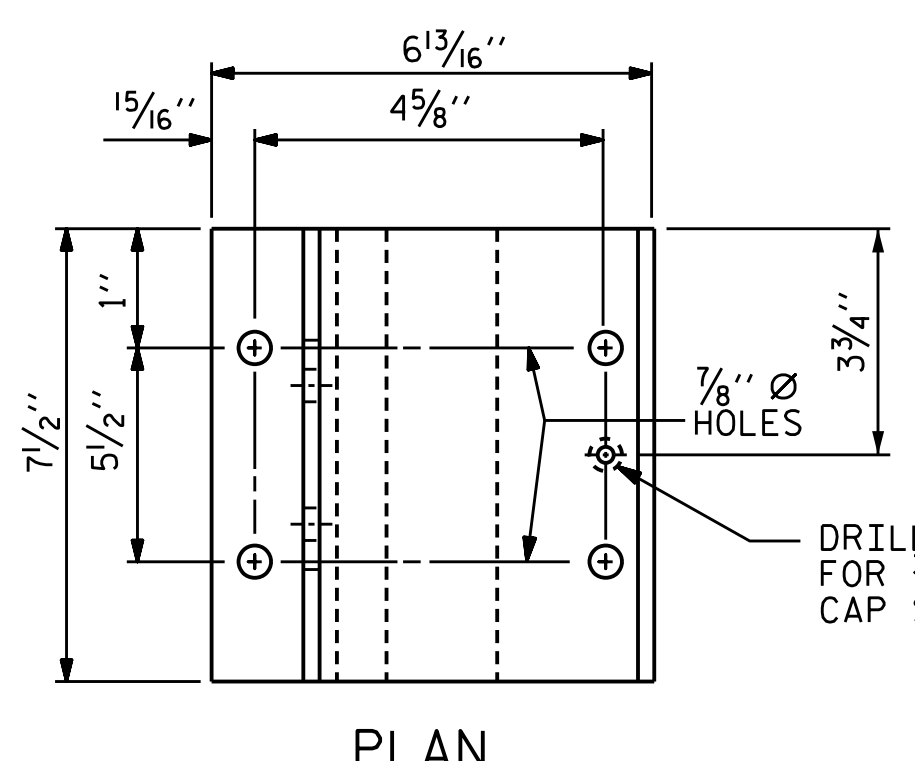
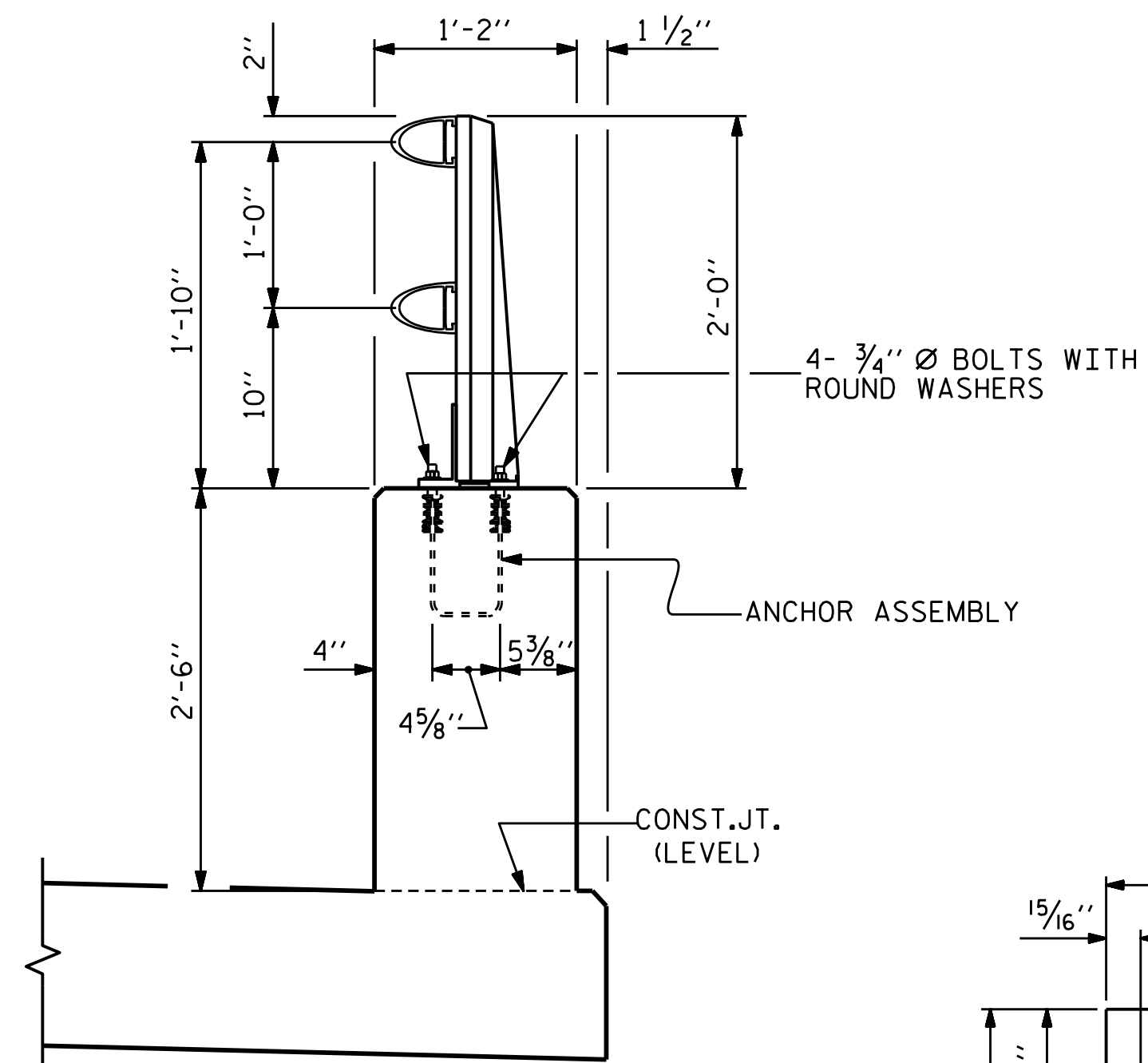
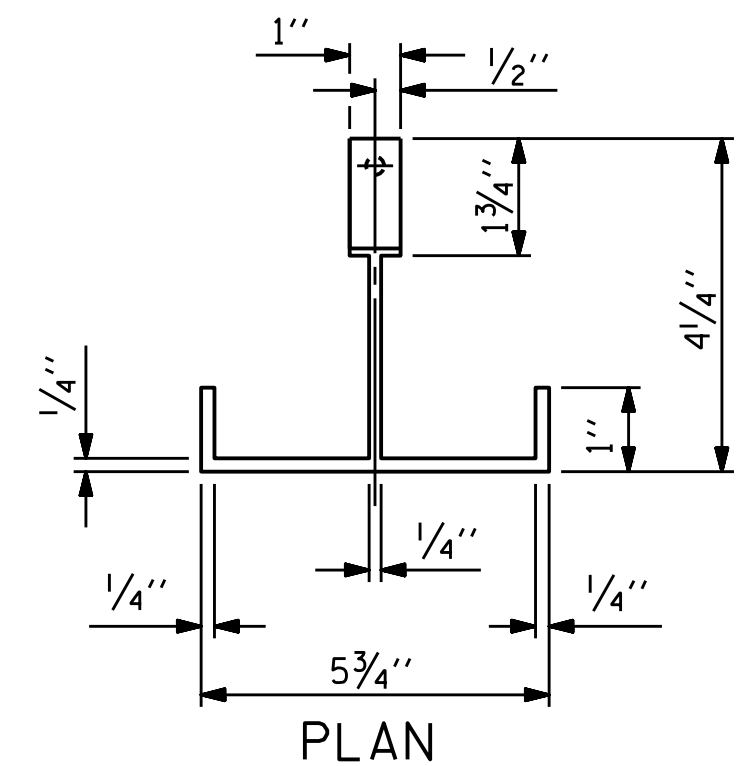
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE STANDARD						S-26
2 BAR METAL RAIL						TOTAL SHEETS
						47
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. BMR3



ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 5.



ASSEMBLED BY: JLA	DATE: 9/22
CHECKED BY: MGC	DATE: 10/22
DRAWN BY: EEM	6/94
CHECKED BY: RGW	6/94
REV. 10/11/11	MAA/GM
REV. 6/13	MAA/GM
REV. 12/17	MAA/THC

NOTES

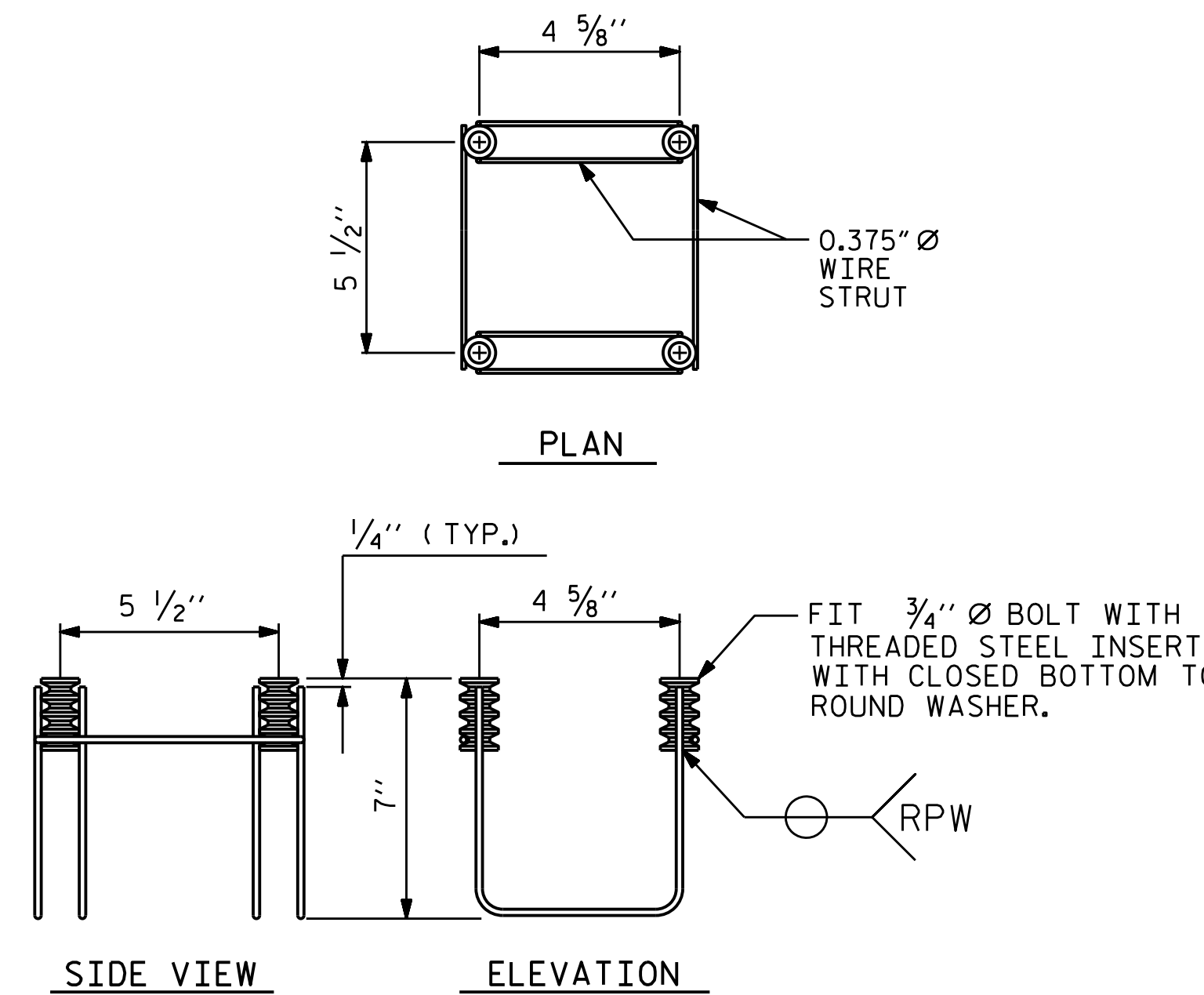
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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 1/16" 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.

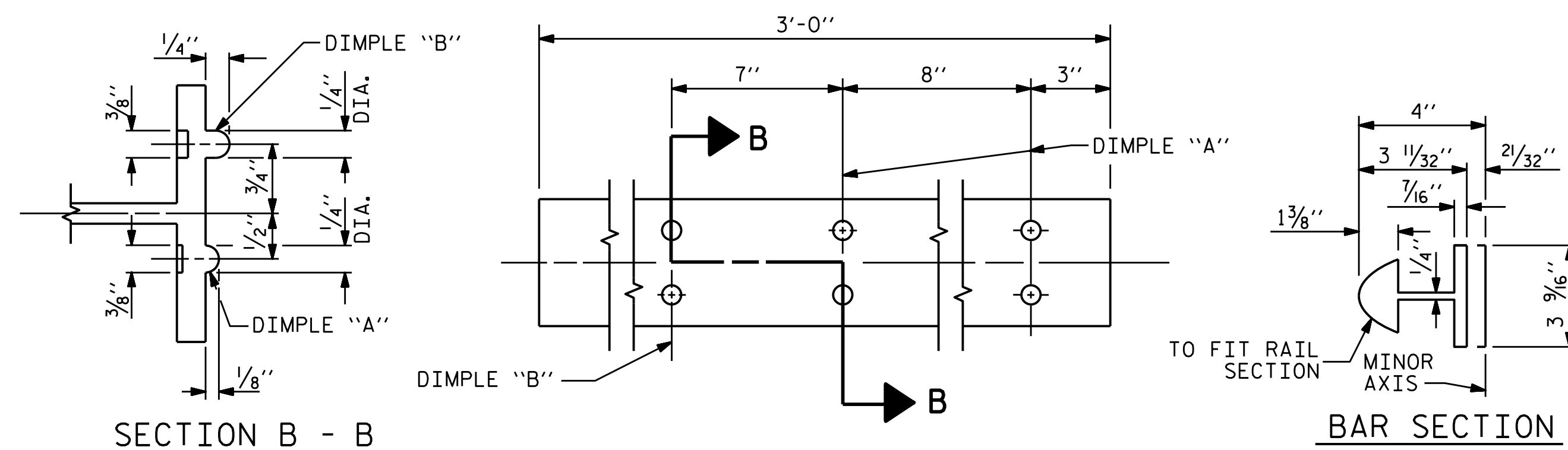
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.

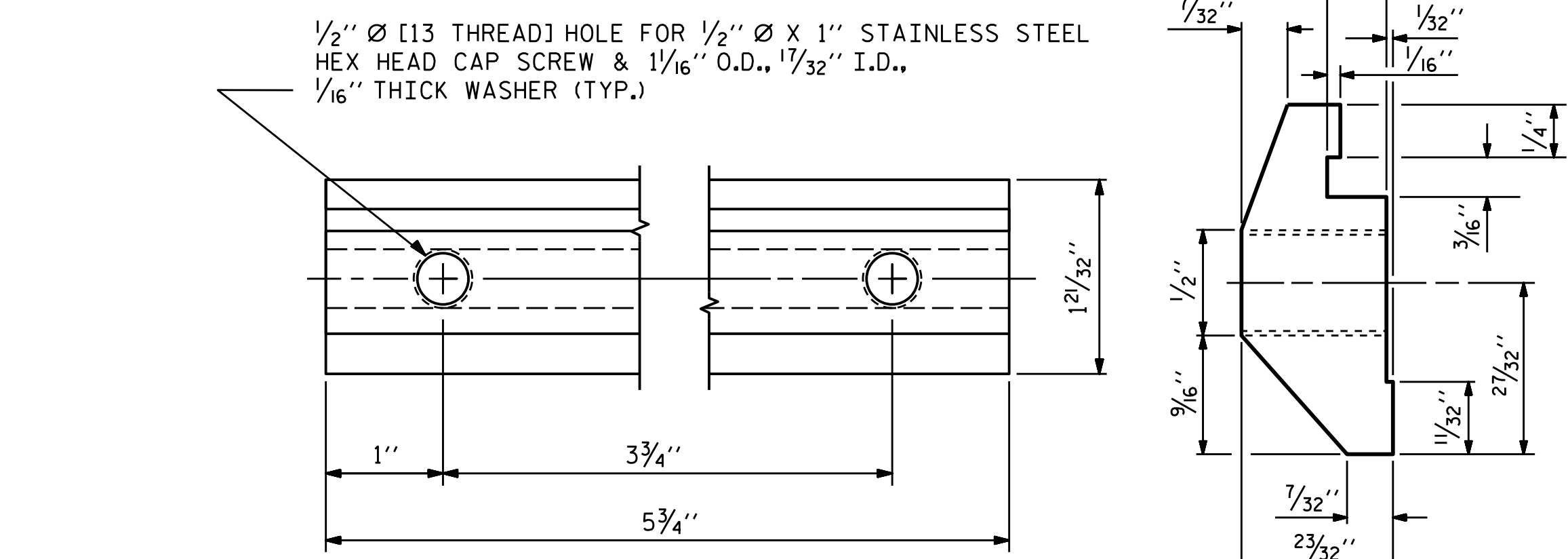


4-BOLT METAL RAIL ANCHOR ASSEMBLY

(57 ASSEMBLIES REQUIRED)

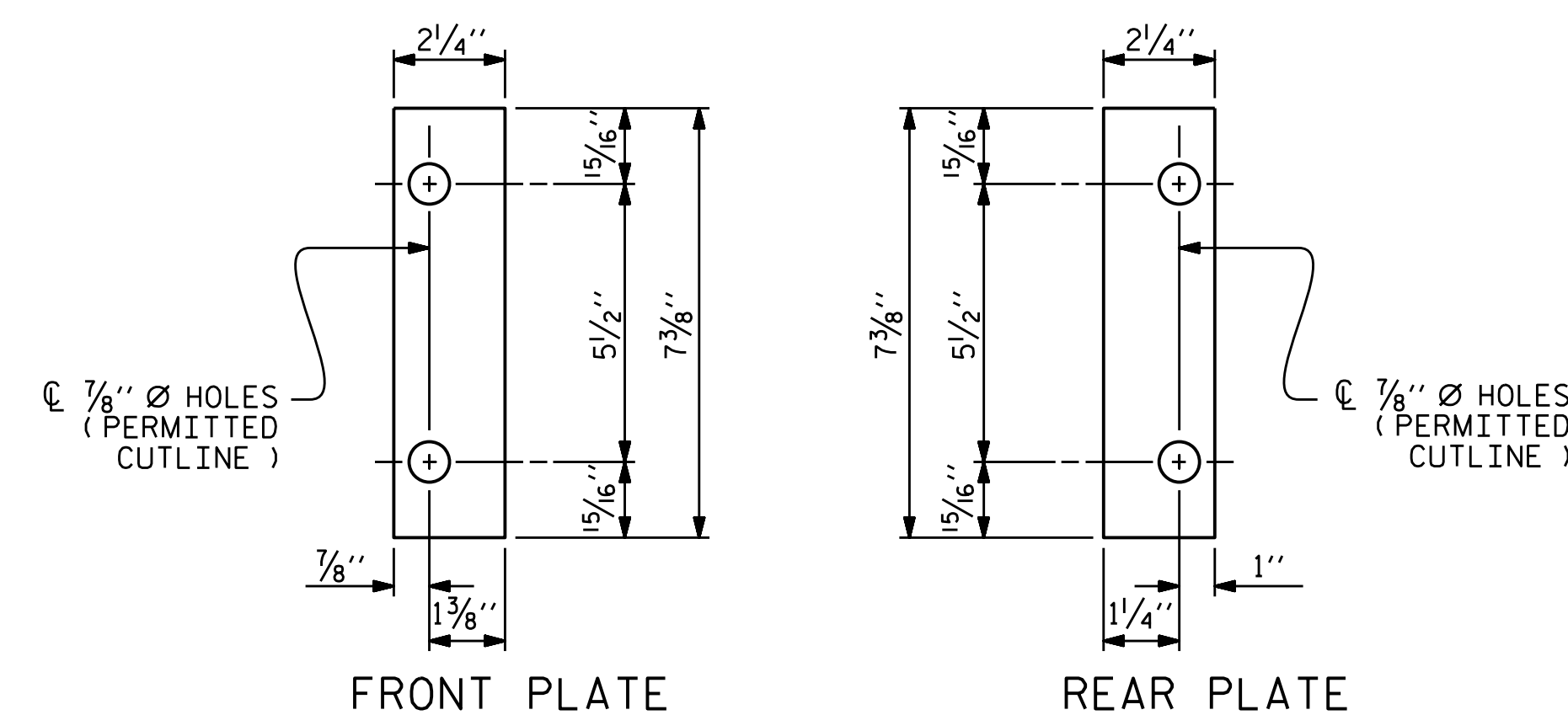


EXPANSION BAR DETAILS



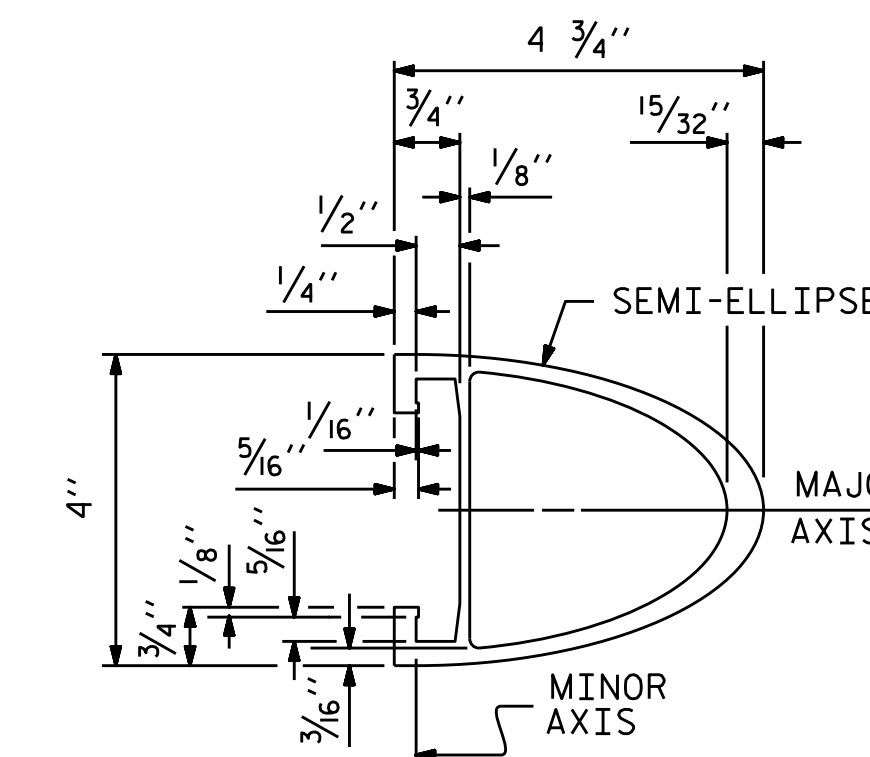
CLAMP BAR DETAIL

(4 REQUIRED PER POST)

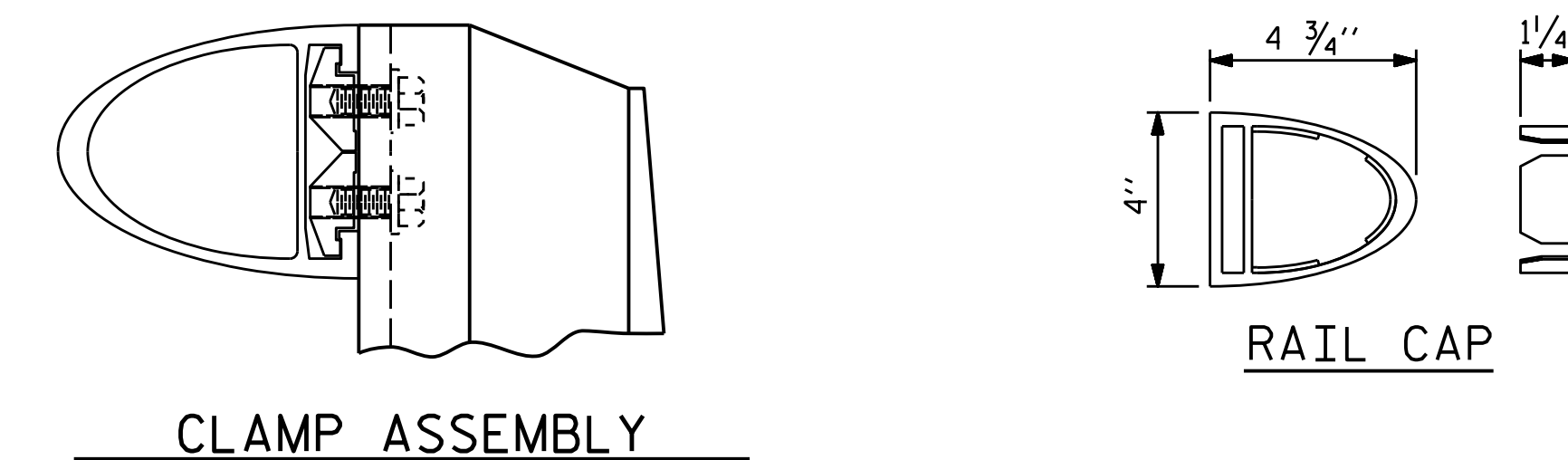


SHIM DETAILS

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



RAIL SECTION



CLAMP ASSEMBLY

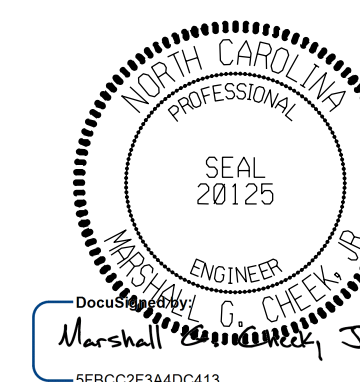
RAIL CAP

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 5 OF 5



11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STANDARD

2 BAR METAL RAIL

ASSEMBLED BY :	JLA	DATE :	9/22
CHECKED BY :	MGC	DATE :	10/22
DRAWN BY :	EEM	REV. 5/1/06R	KMM/GM
CHECKED BY :	RGW	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 47

STD. NO. BMR4

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

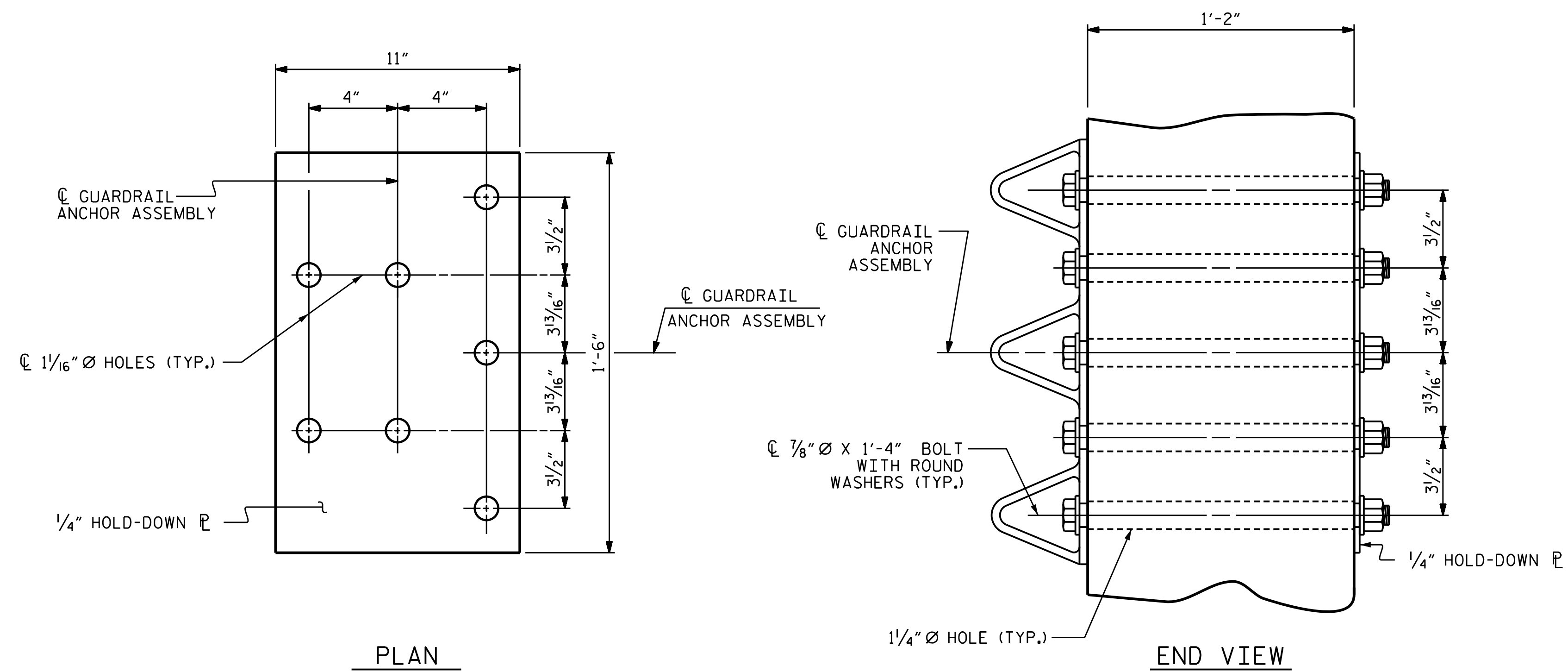
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET, FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

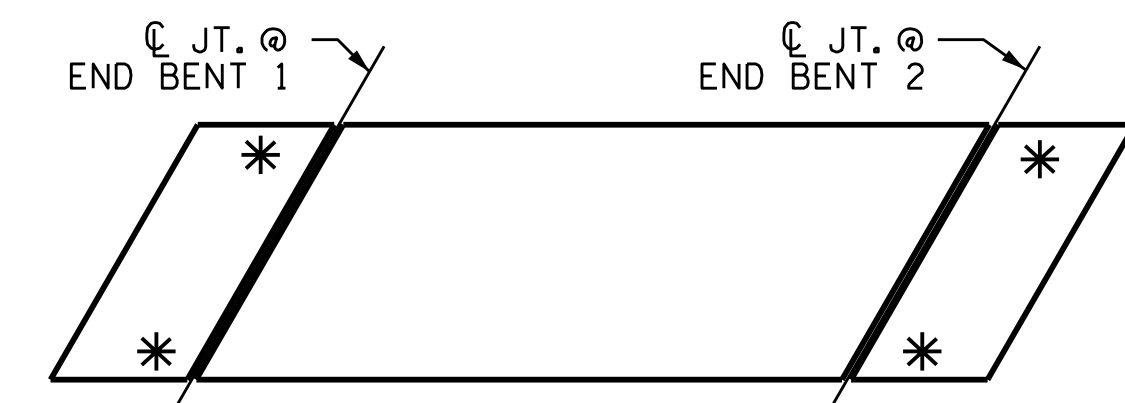
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

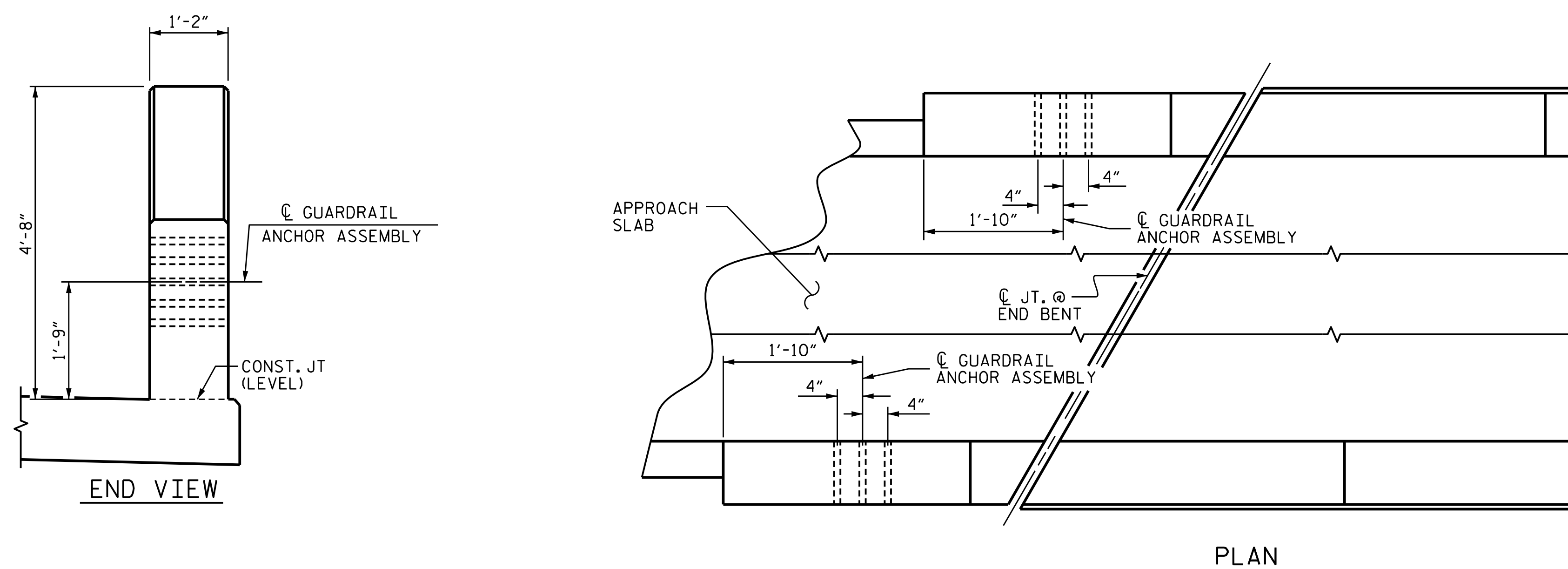


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

Professional Engineer Seal for Marshall G. Cheek, Jr., State of North Carolina, Seal 20125, License No. SFBCC234MDC413.

11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S-28	
SUPERSTRUCTURE STANDARD		TOTAL SHEETS 47	
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

ASSEMBLED BY :	JLA	DATE :	9/22
CHECKED BY :	MGC	DATE :	10/22
DRAWN BY :	MAA	REV. 1/15	MAA/TMG
CHECKED BY :	GM	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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

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

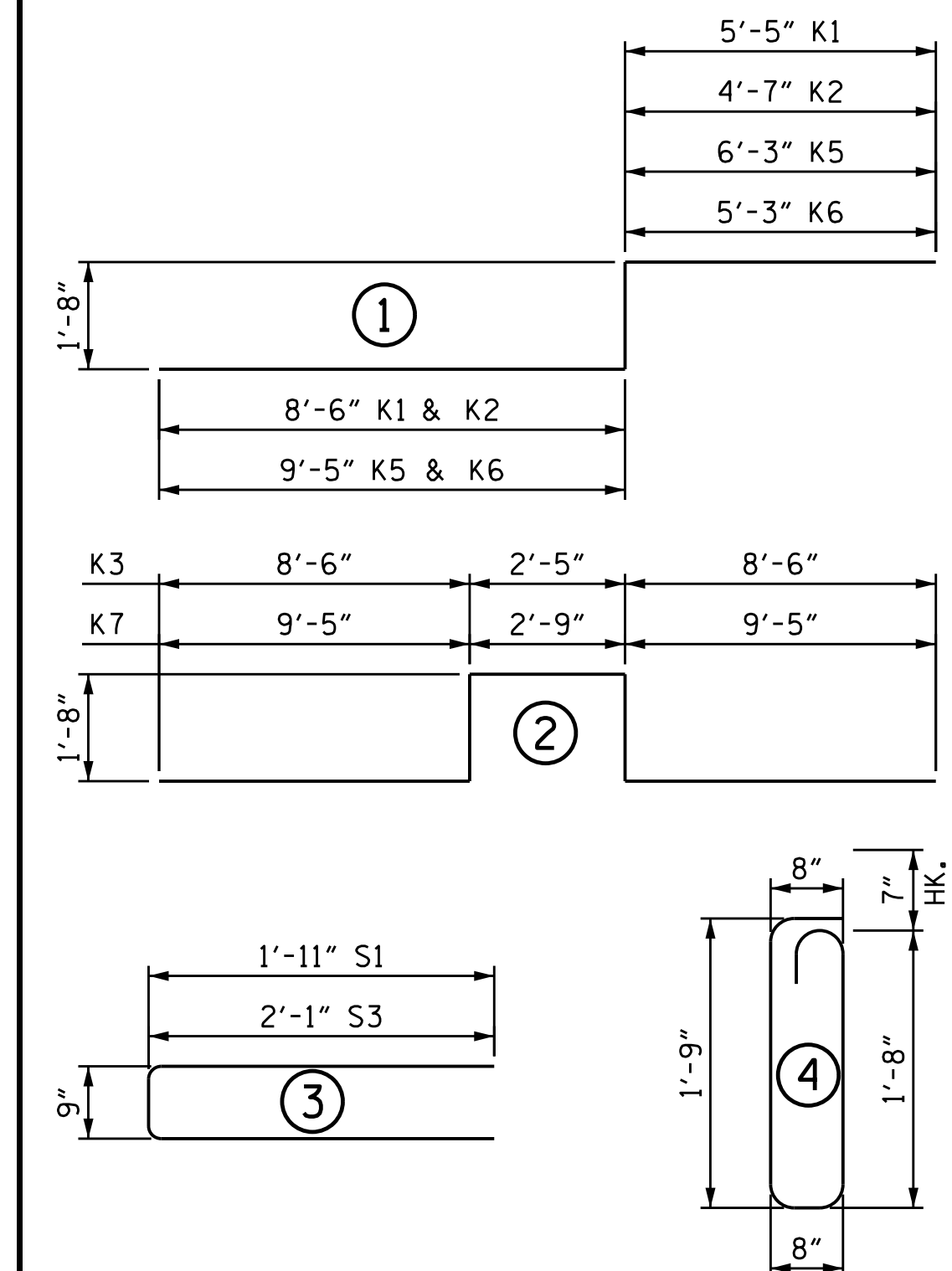
SUPERSTRUCTURE BILL OF MATERIAL

SPANS A, B & C	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
		(CU. YDS.)	(LBS.)
POUR #1	209.8	26,354	23,361
TOTAL **	209.8	26,354	23,361

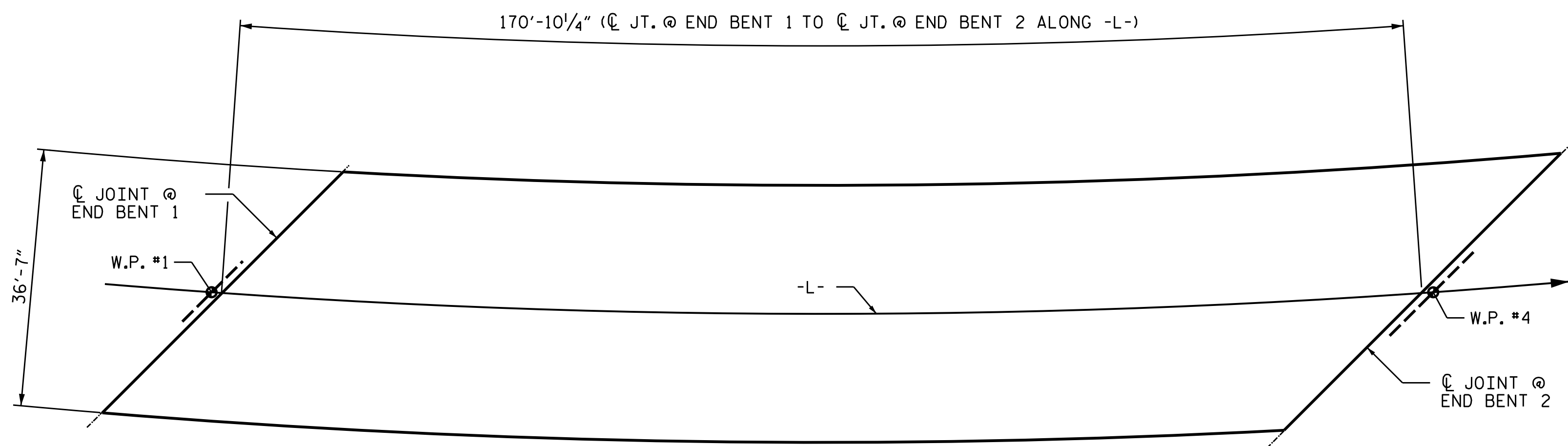
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,844	SO. FT.
BRIDGE DECK	5,808	SO. FT.
TOTAL	7,652	SO. FT.

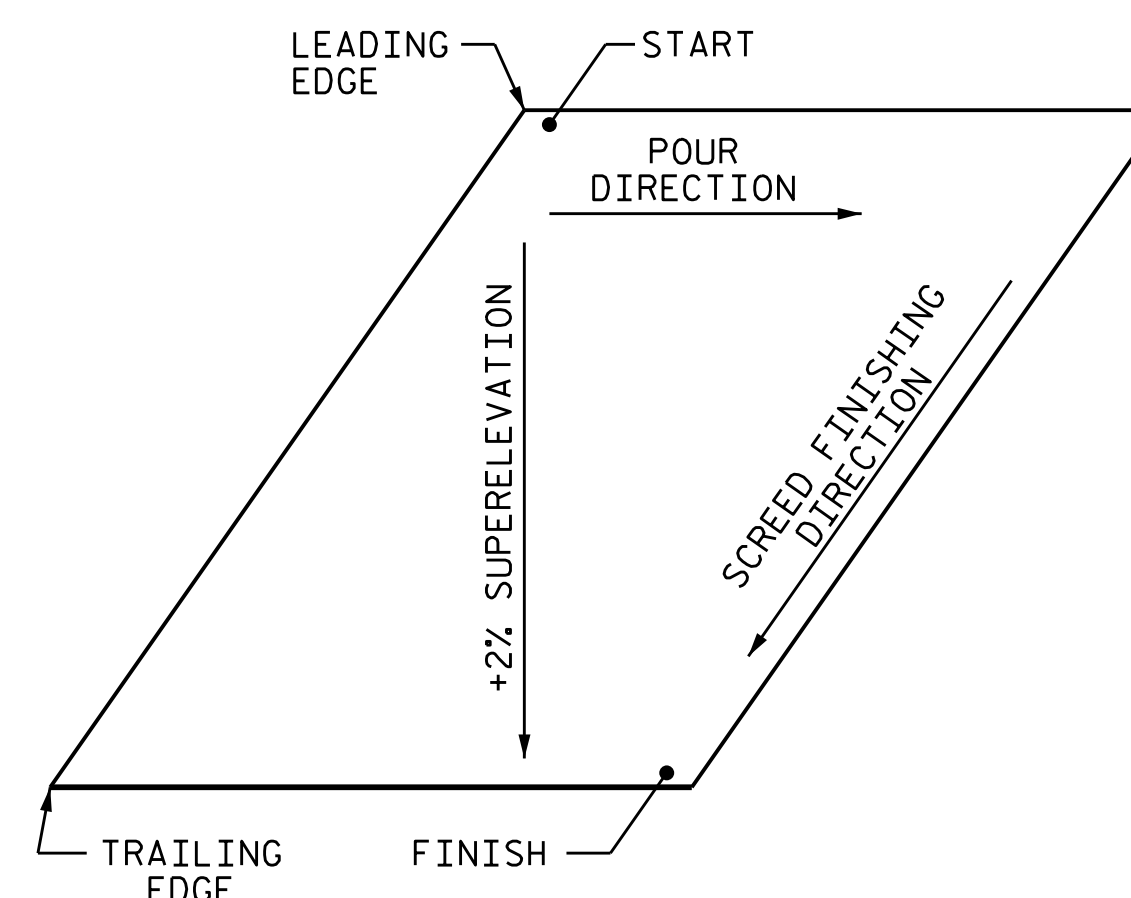
BAR TYPES



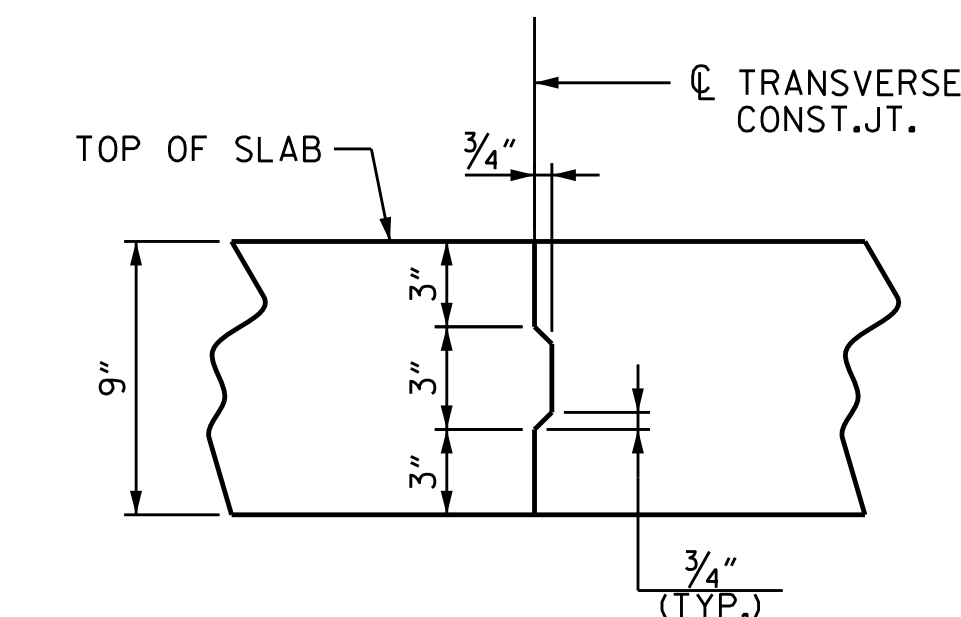
ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6,250)

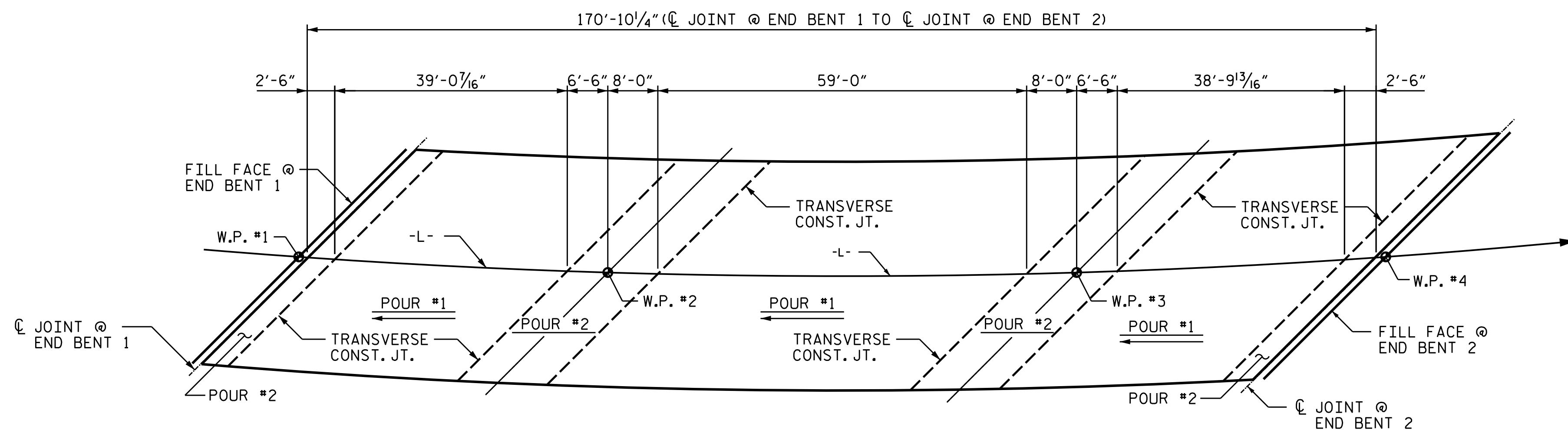


POUR DIRECTION FOR BRIDGE DECK



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POUR SEQUENCE

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 2 OF 2



11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

REVISIONS

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

SHEET NO.

S-30
TOTAL SHEETS 47

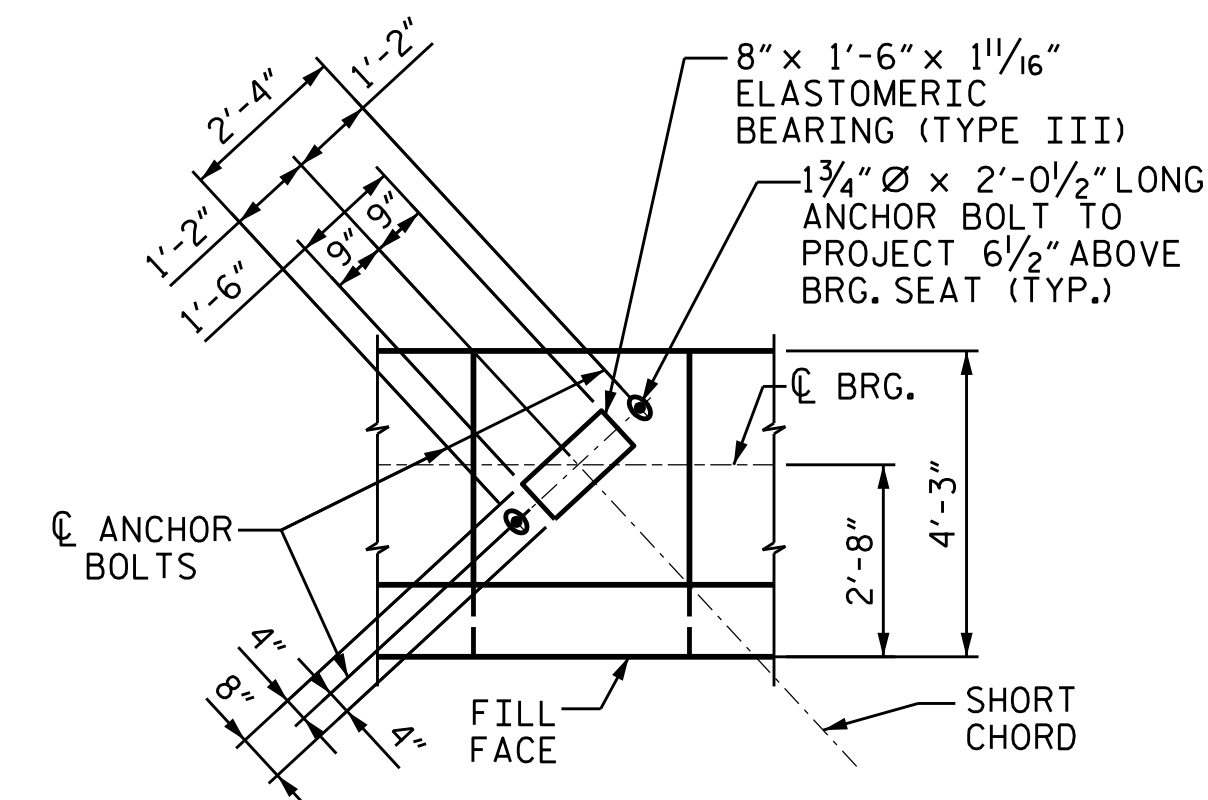
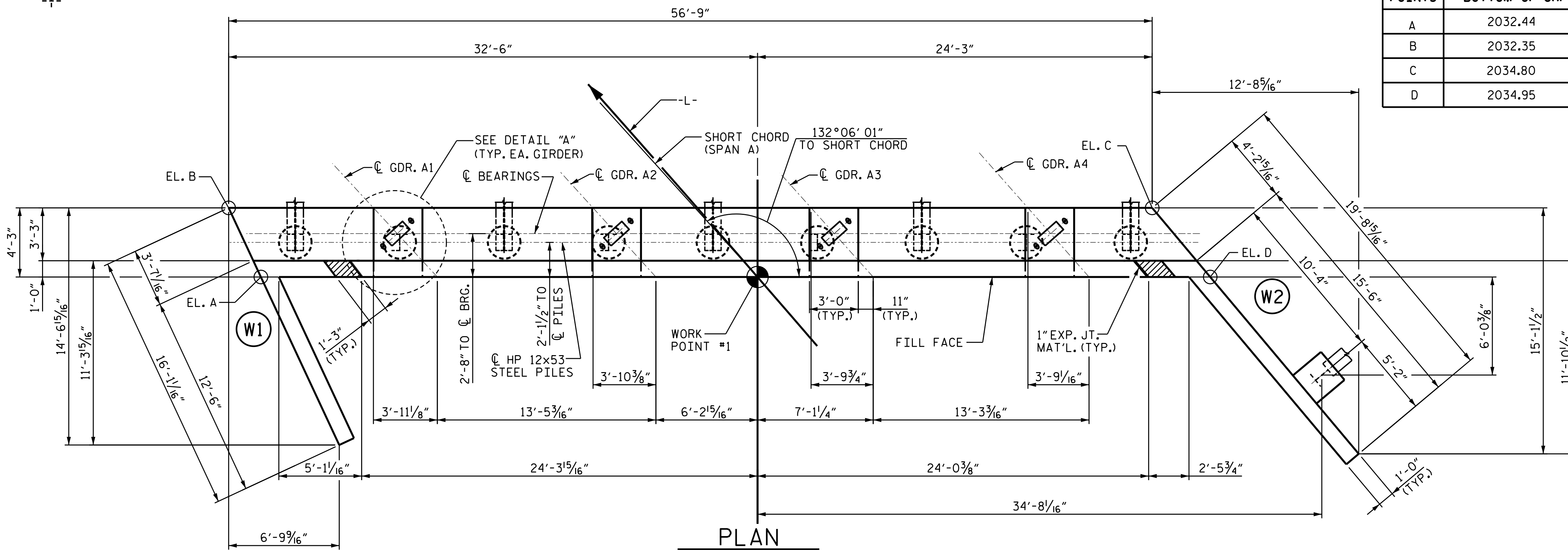
DRAWN BY: JLA DATE: 10/22
CHECKED BY: MGC DATE: 10/22

INDICATES 3:12 PILE BATTER
IN DIRECTION SHOWN.

CAP ELEVATIONS	
POINTS	BOTTOM OF CAP
A	2032.44
B	2032.35
C	2034.80
D	2034.95

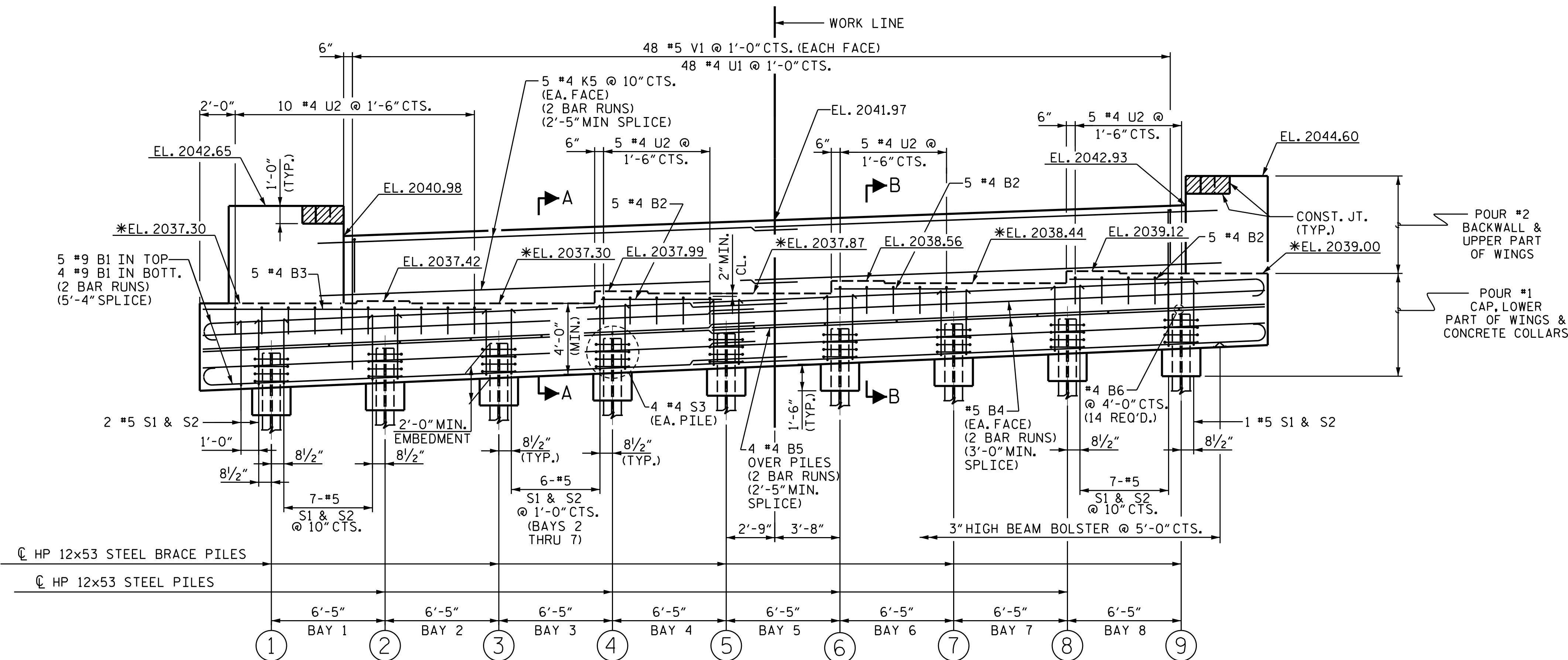
NOTES :

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- 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 SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS POURED IF SLIP FORMING IS USED.



PLAN

DETAIL A



TOP OF PILE ELEVATIONS	
1	2034.53
2	2034.81
3	2035.08
4	2035.36
5	2035.64
6	2035.92
7	2036.20
8	2036.48
9	2036.75

ELEVATION

(WINGS NOT SHOWN FOR CLARITY)
FOR SECTION A-A AND B-B SEE SHEET 4 OF 4

*FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE TYPICAL SECTION

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00-L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

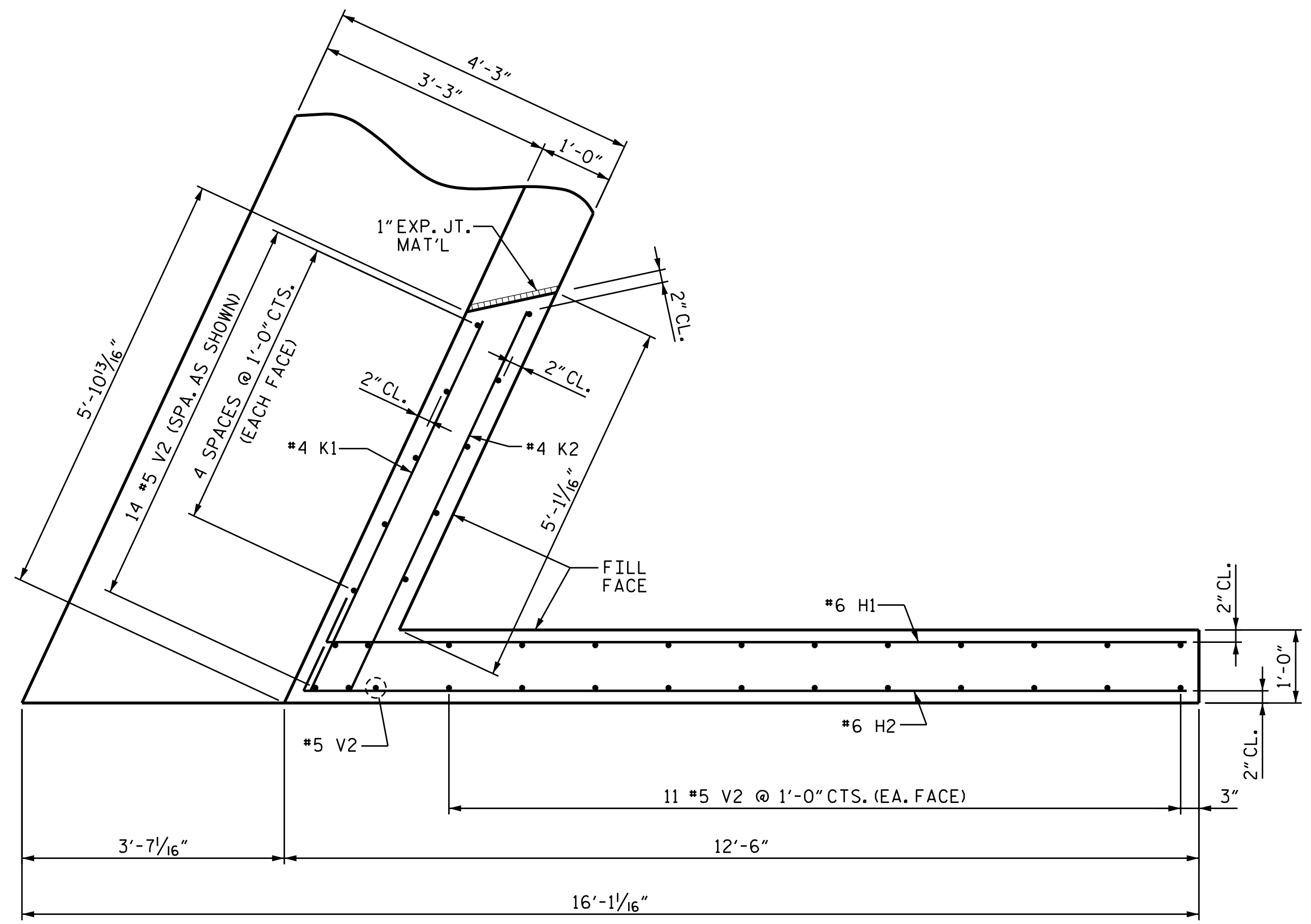
SEAL 20125
ENGINEER
G. CHESTNUT
MARSHALL COUNTY, NC
11/15/2023 | 7:42 AM EST

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UNLESS ALL SIGNATURES COMPLETED

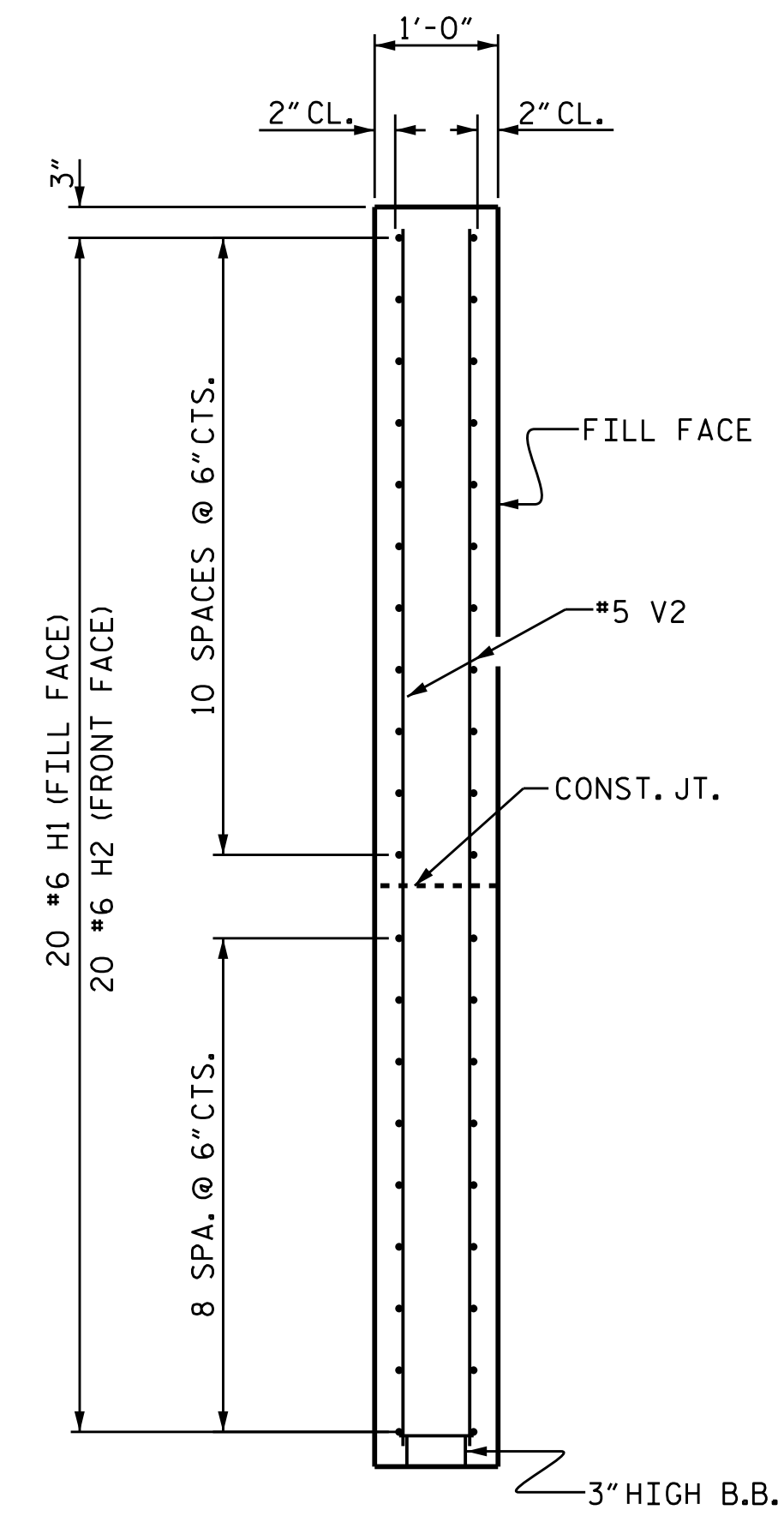
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS 47
2			4			

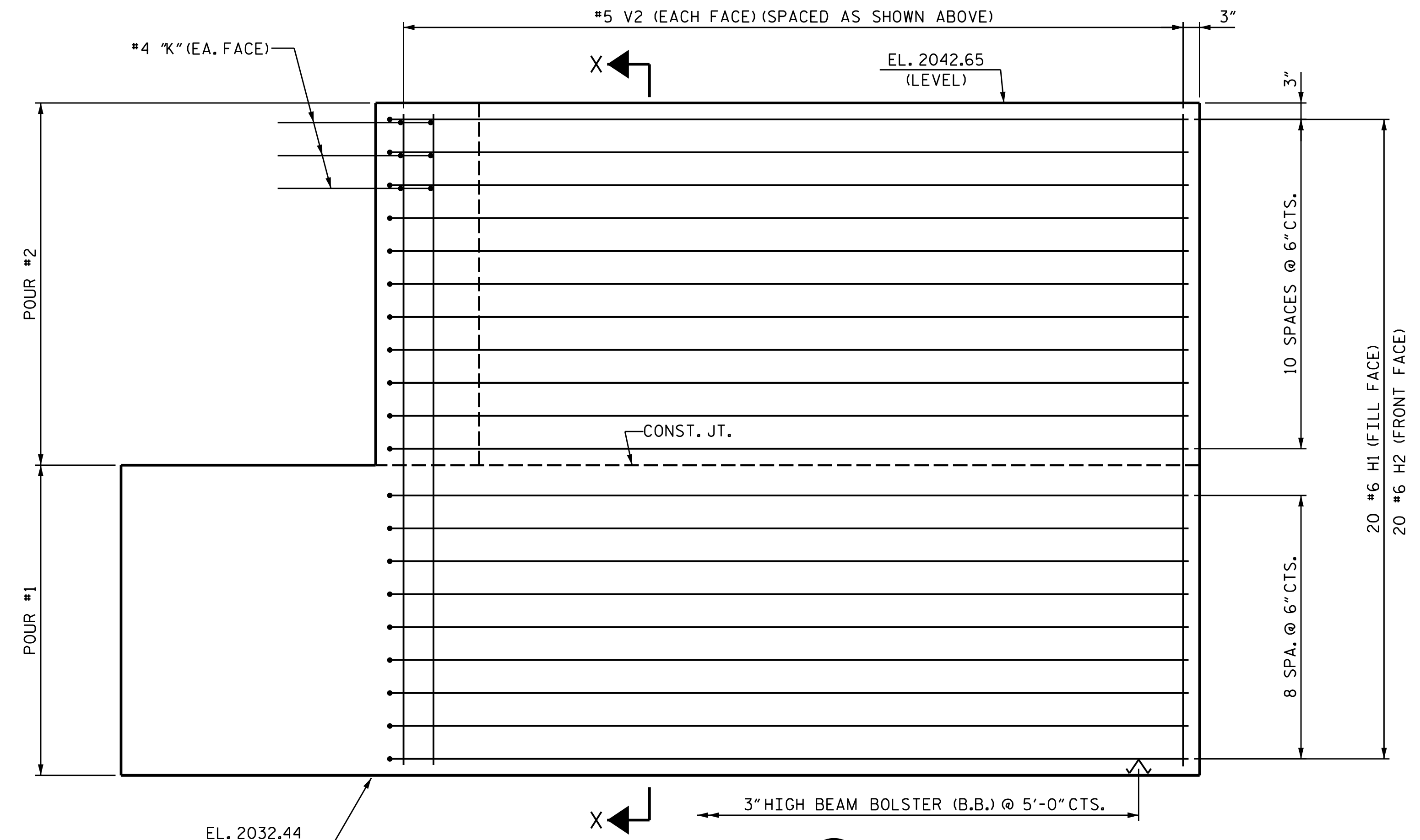
DRAWN BY : NMW DATE : 7/22
CHECKED BY : MGC DATE : 10/22
DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23



PLAN OF WING (W1)



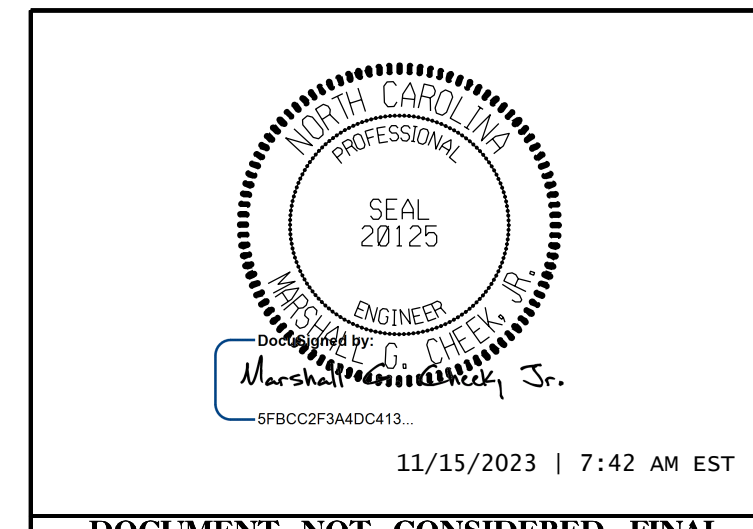
SECTION X-X



ELEVATION OF WING (W1)

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 2 OF 4

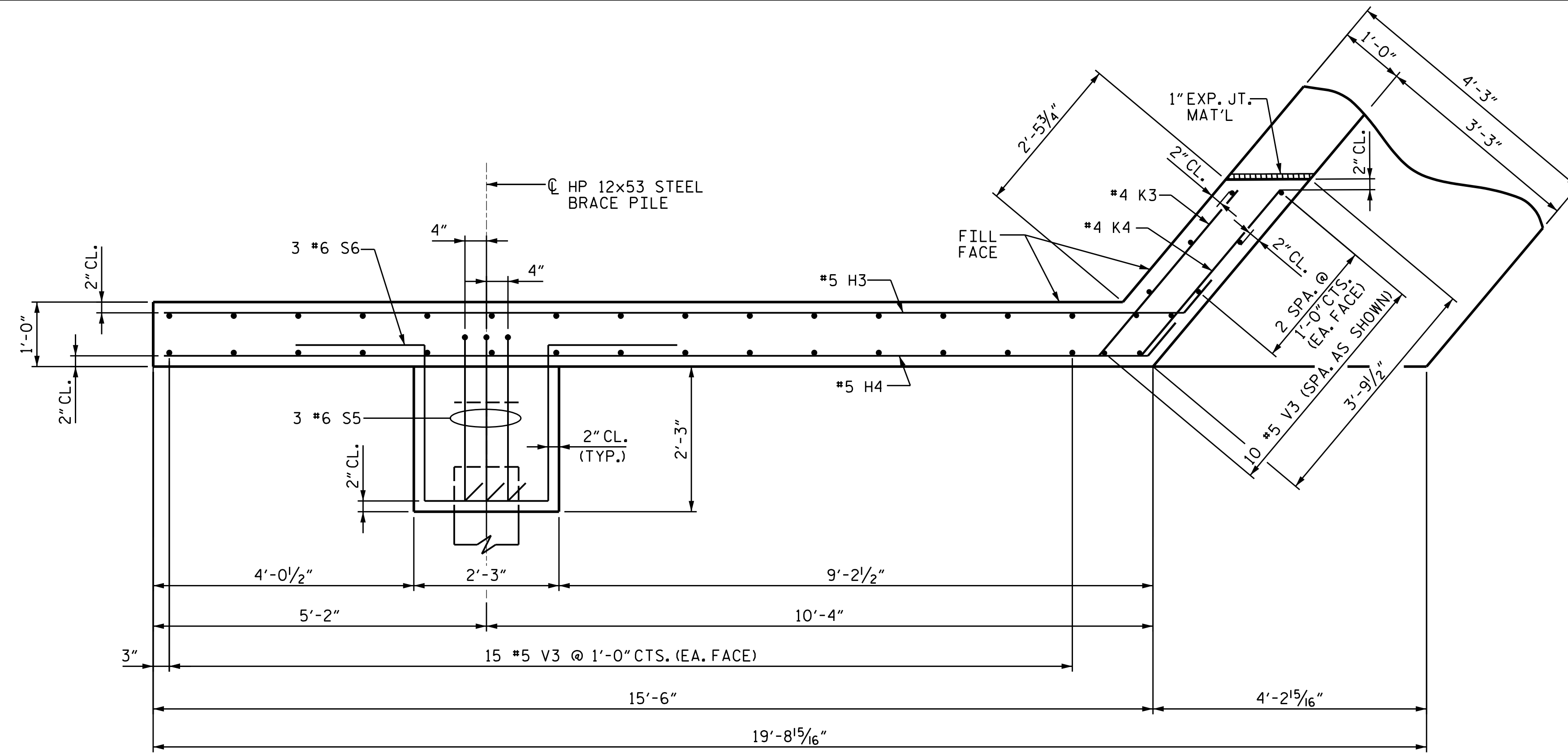


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 WING DETAILS

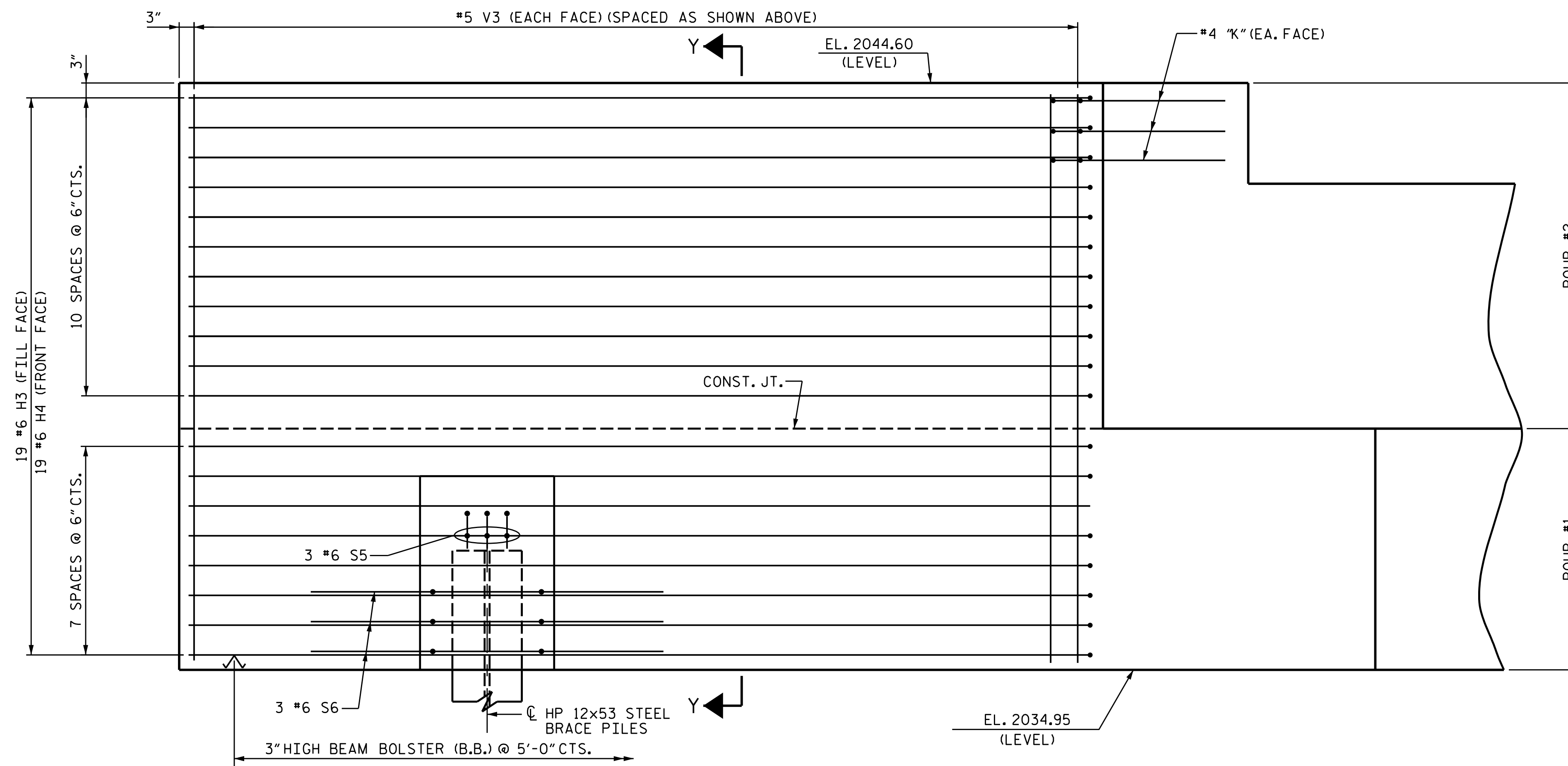
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 TGS ENGINEERS
 201 W. MARION ST STE 200
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REVISIONS						SHEET NO.
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2			4			TOTAL SHEETS 47

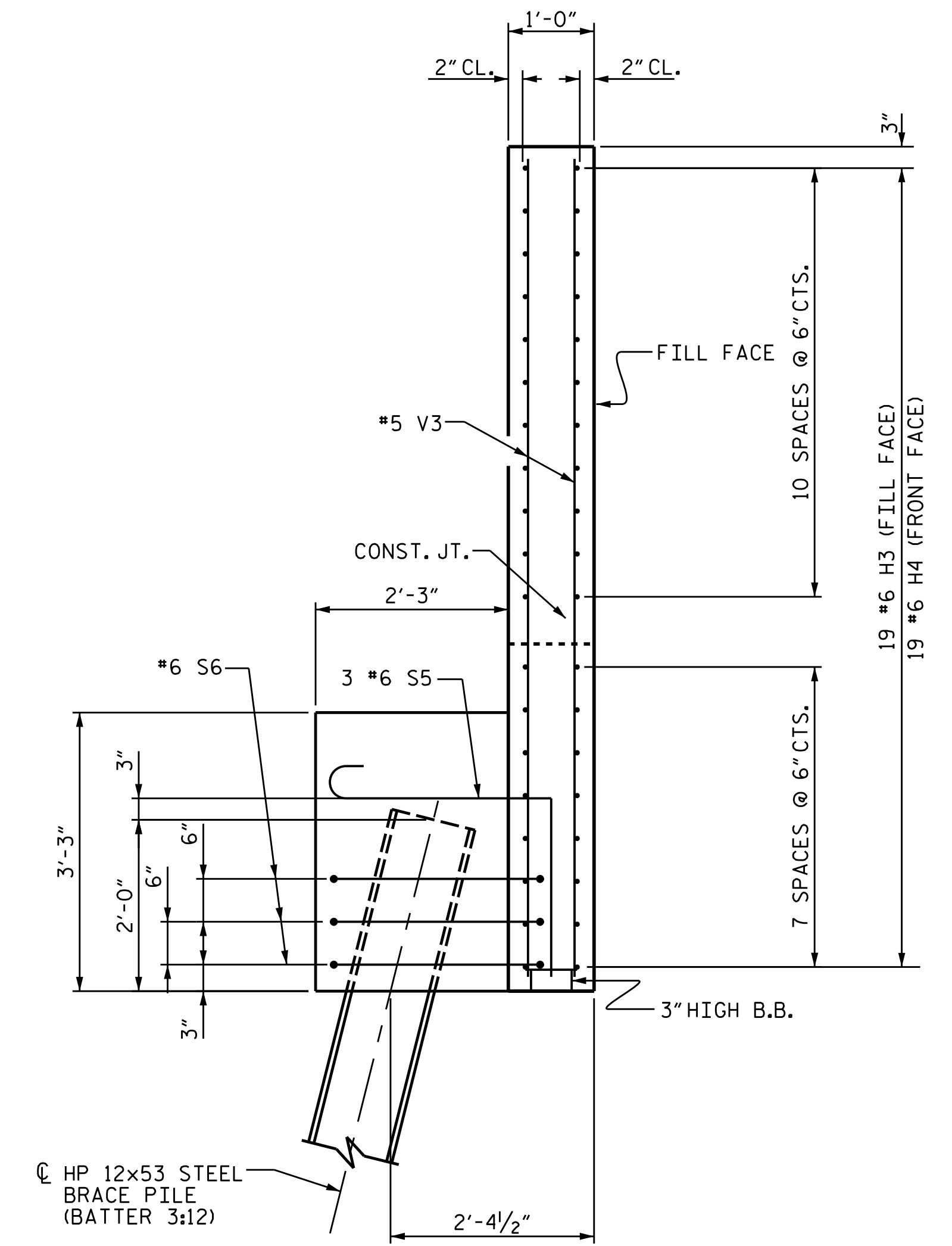
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 CHECKED BY : MGC DATE : 10/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23



PLAN OF WING (W2)



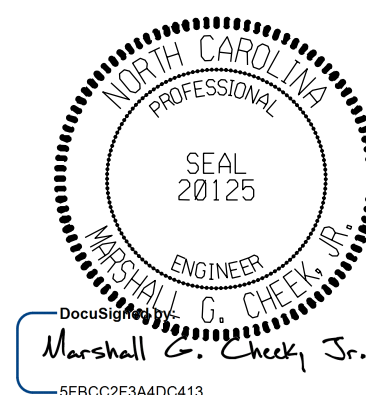
ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 3 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

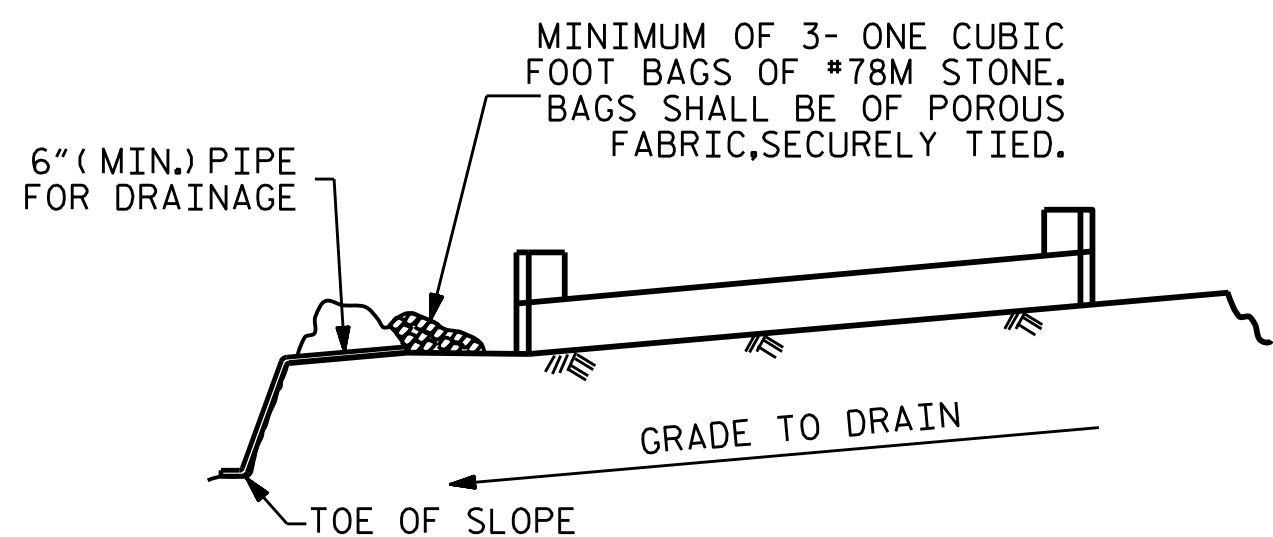
SUBSTRUCTURE
 END BENT 1
 WING DETAILS

REVISIONS

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

SHEET NO.
 S-33
 TOTAL SHEETS
 47

DRAWN BY : NMW DATE : 8/22
 CHECKED BY : MGC DATE : 10/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN

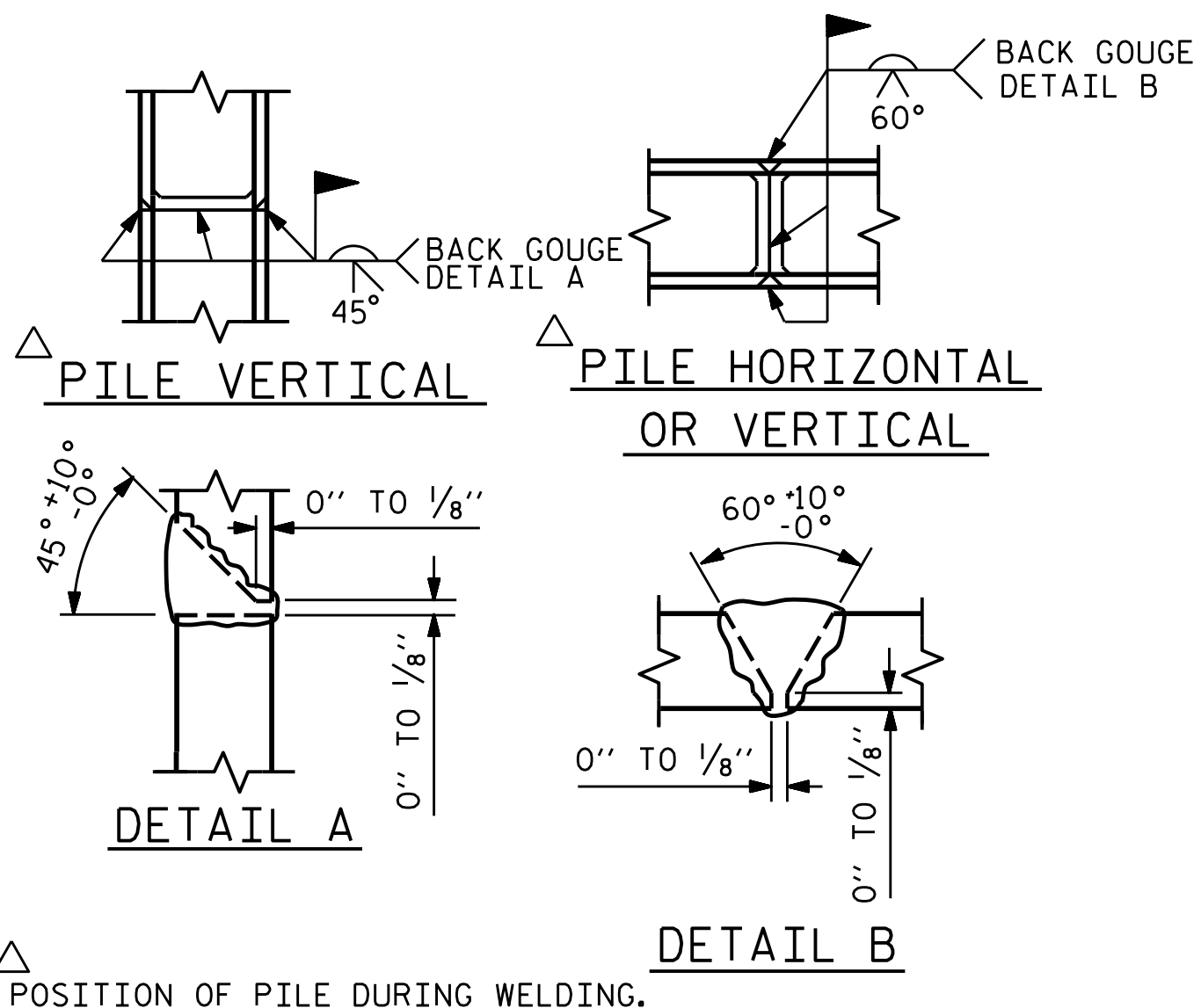
TOE OF SLOPE

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

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

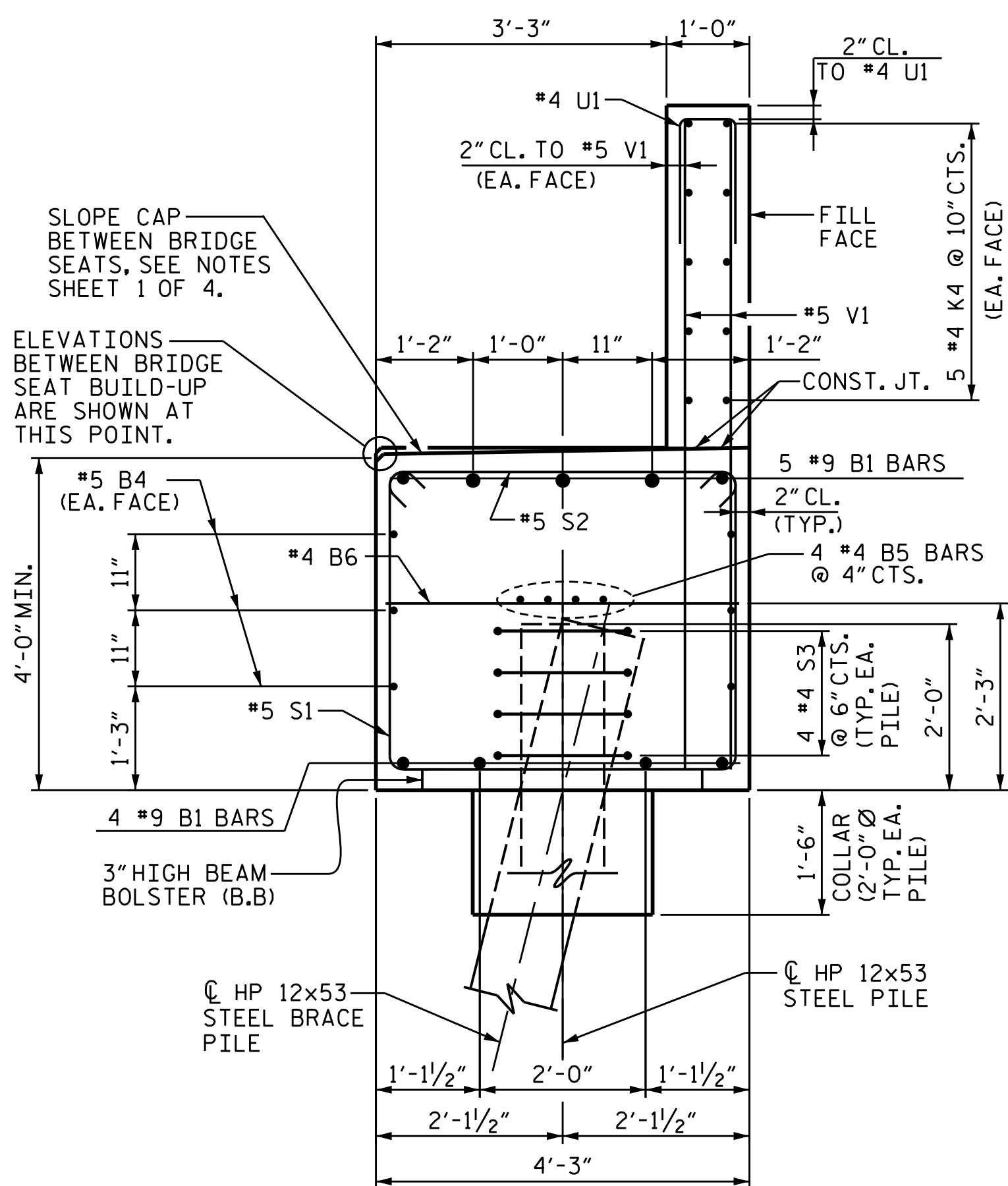
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

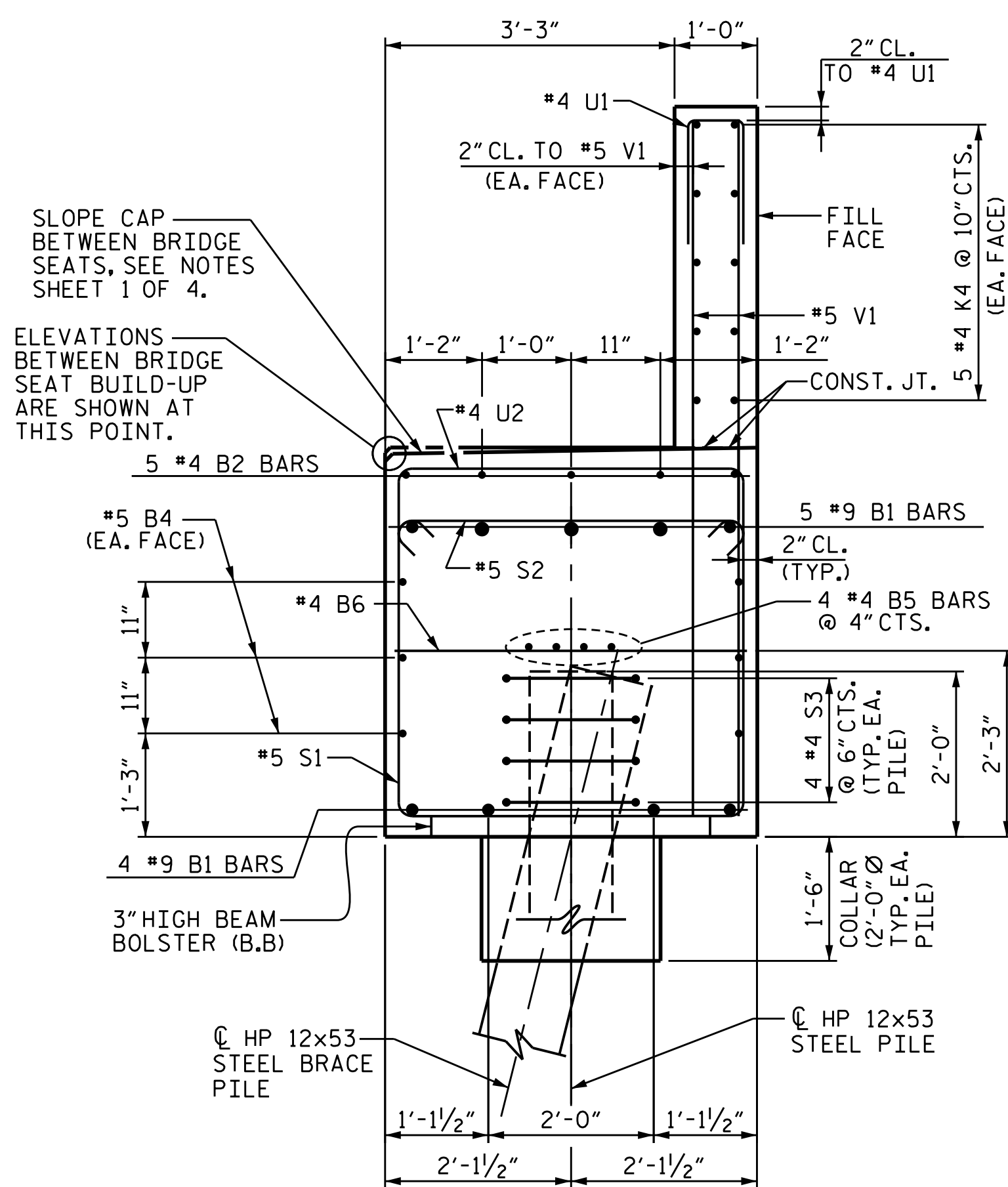


PILE SPLICE DETAILS

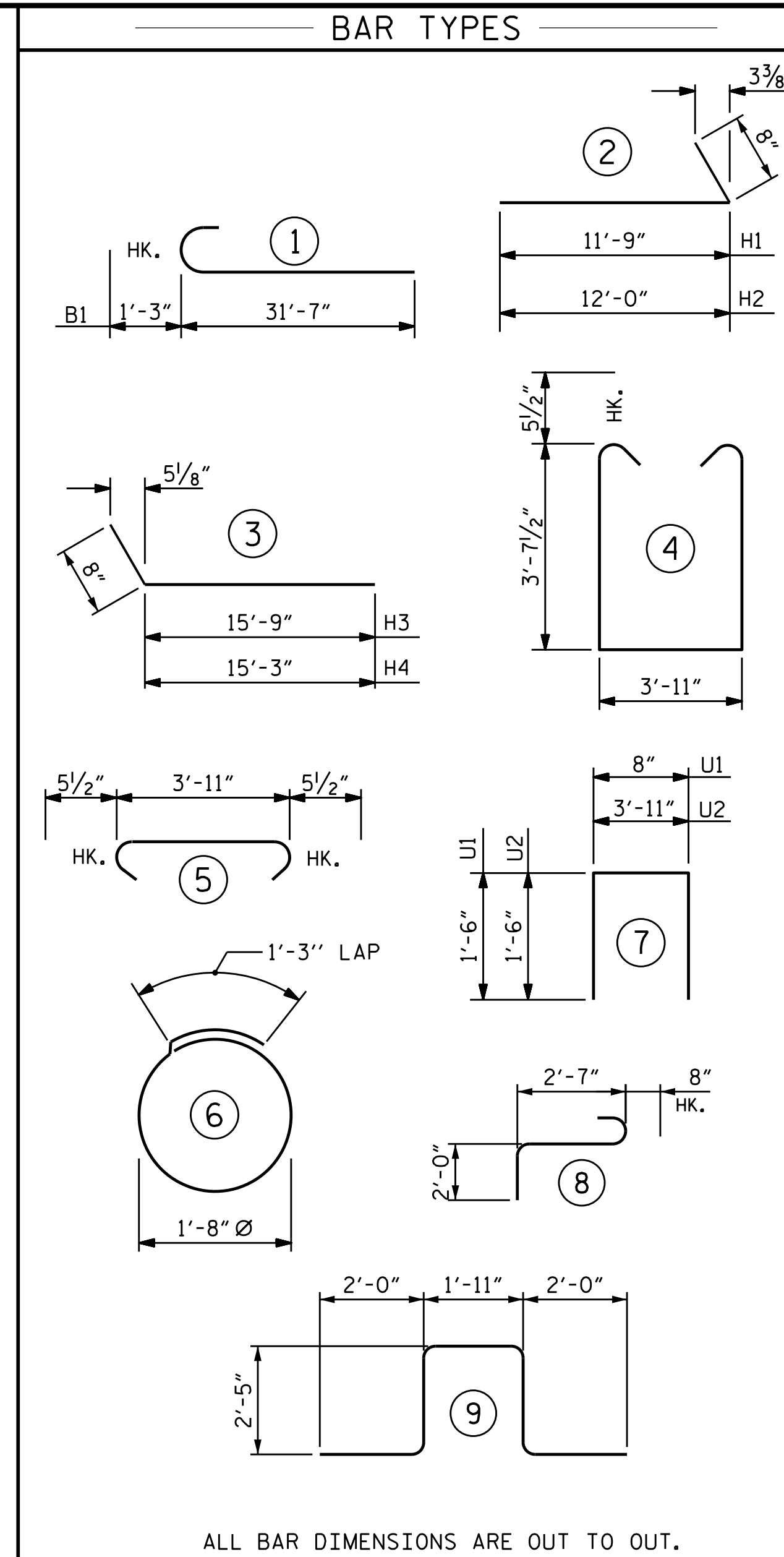
POSITION OF PILE DURING WELDING.



SECTION A-A



SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	18	#9		32'-10"	2009
B2	15	#4	STR	7'-0"	70
B3	5	#4	STR	16'-3"	54
B4	12	#5	STR	30'-5"	381
B5	8	#4	STR	30'-0"	160
B6	14	#4	STR	3'-11"	37
H1	20	#6	2	12'-5"	373
H2	20	#6	2	12'-8"	381
H3	19	#6	3	16'-5"	468
H4	19	#6	3	15'-11"	454
K1	3	#4	STR	5'-6"	11
K2	3	#4	STR	5'-8"	11
K3	3	#4	STR	3'-4"	7
K4	3	#4	STR	3'-2"	6
K5	20	#4	STR	30'-0"	401
S1	53	#5	4	12'-1"	668
S2	53	#5	5	4'-10"	267
S3	36	#4	6	6'-6"	156
S5	3	#6	8	5'-3"	24
S6	3	#6	9	10'-9"	48
U1	48	#4	7	3'-8"	118
U2	25	#4	7	6'-11"	116
V1	96	#5	STR	7'-9"	776
V2	37	#5	STR	9'-10"	379
V3	40	#5	STR	9'-3"	386

REINFORCING STEEL	7761 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	48.0 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	15.3 C.Y.
TOTAL CLASS A CONCRETE	63.3 C.Y.
HP 12 X 53 STEEL PILES	
NO: 10	150 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	10 EA.
PILE EXCAVATION IN SOIL	94.00 L.F.
PILE EXCAVATION NOT IN SOIL	14.00 L.F.

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 4 OF 4

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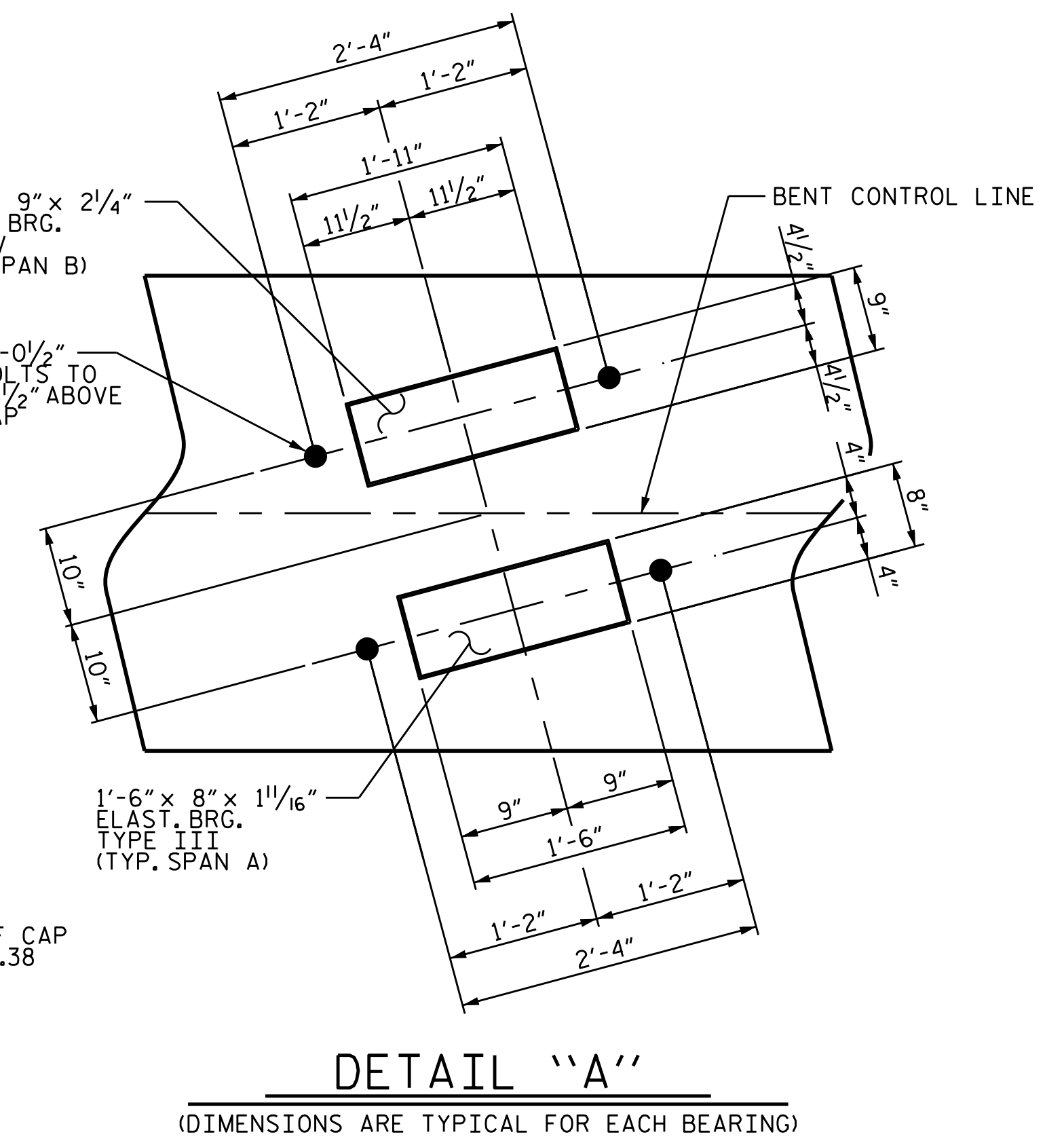
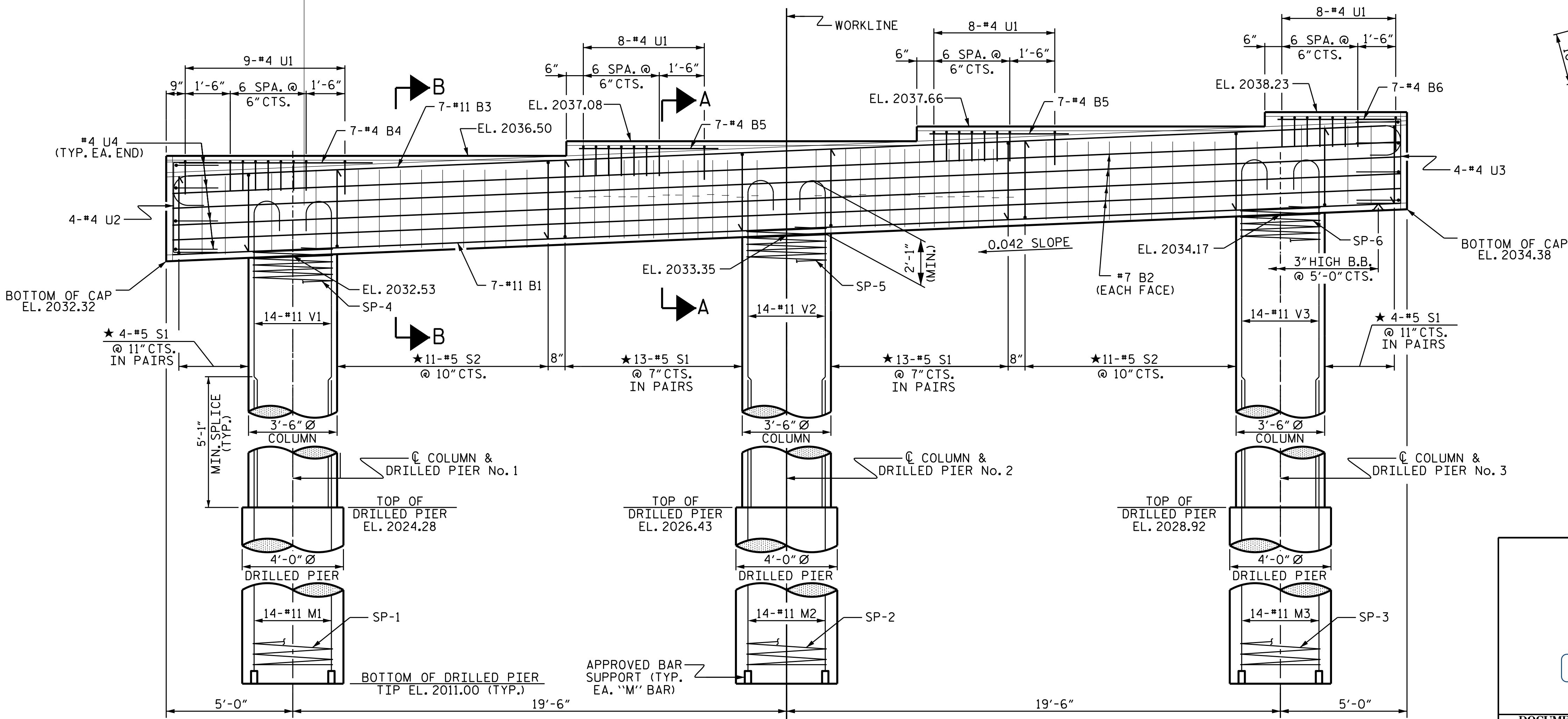
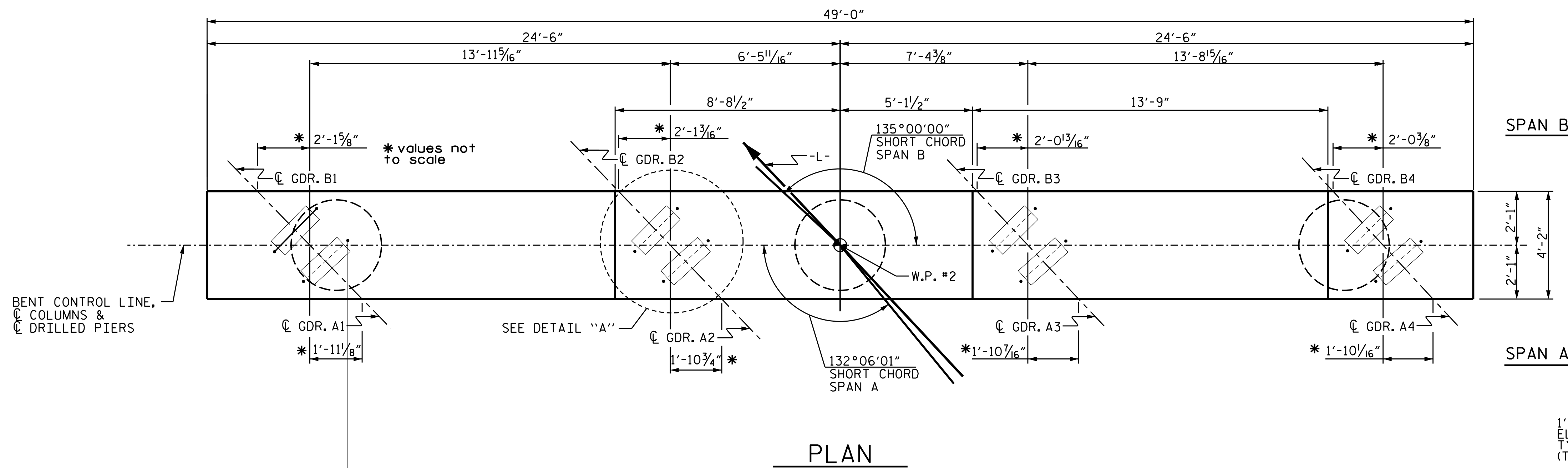
TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-34
2			4			TOTAL SHEETS 47

DRAWN BY: NMW DATE: 8/22
 CHECKED BY: MGC DATE: 10/22
 DESIGN ENGINEER OF RECORD: ZCS DATE: 1/23

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- ★ INVERT ALTERNATE STIRRUPS.
- DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± BELOW GROUND SURFACE ELEVATION FOR SHAFTS LOCATED IN GROUND.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00 -L-

SHEET 1 OF 2

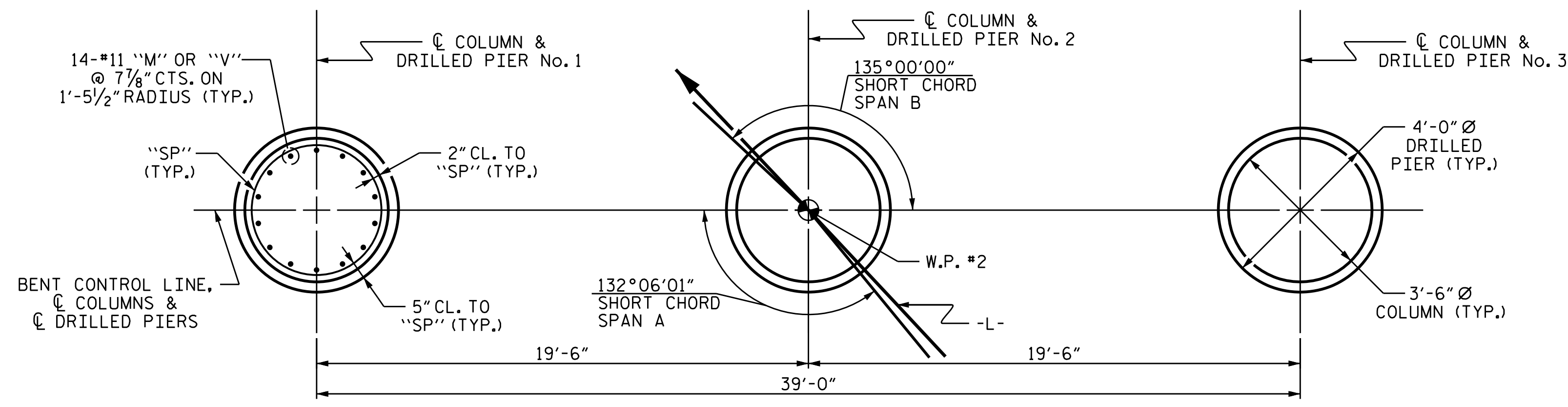
STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 20125
 MARSHALL G. CHEEK, JR.
 11/15/2023 | 7:42 AM EST
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DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
BENT 1

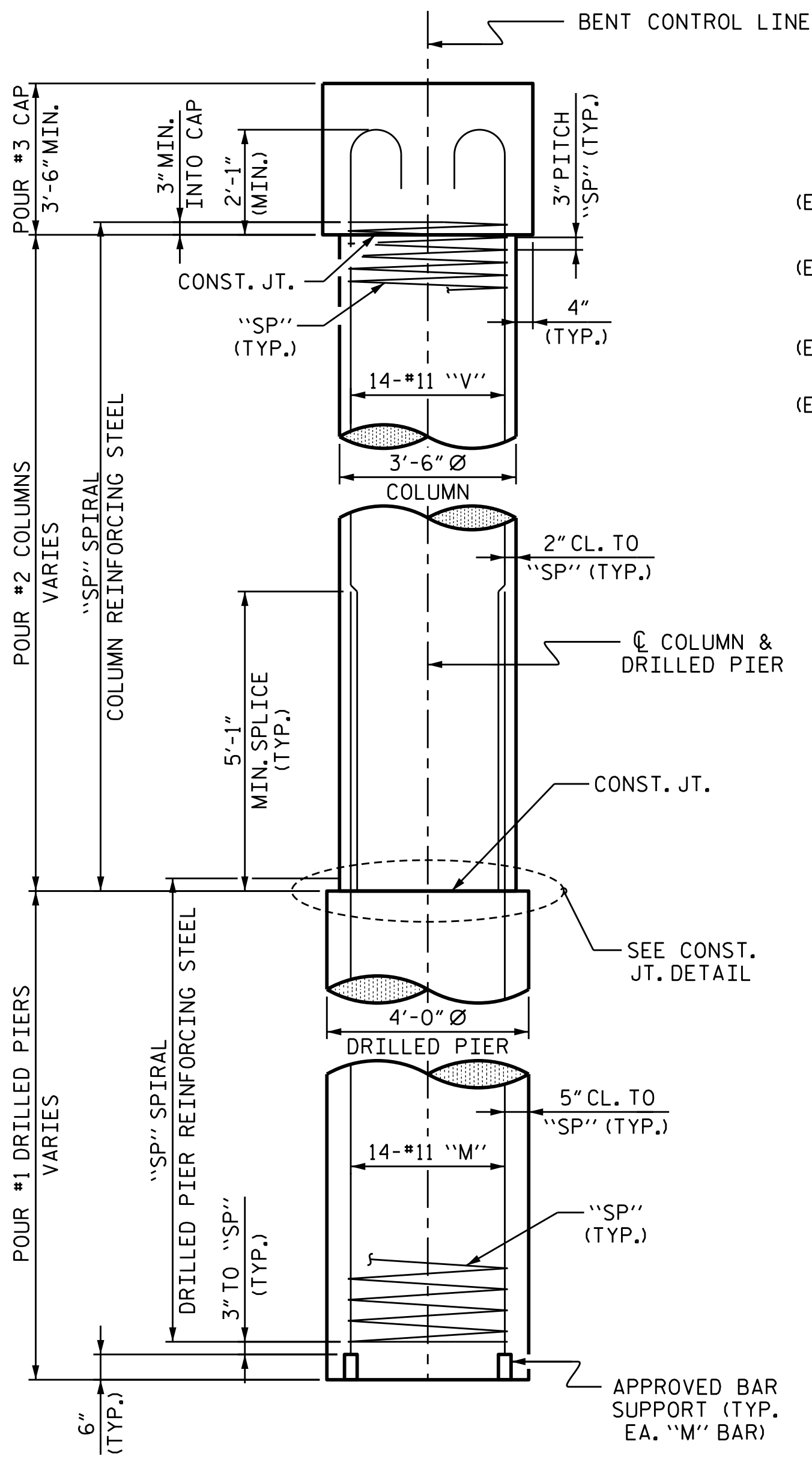
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1			3			TOTAL SHEETS 47
2			4			

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 DESIGN ENGINEER OF RECORD : ZCS DATE : 12/22

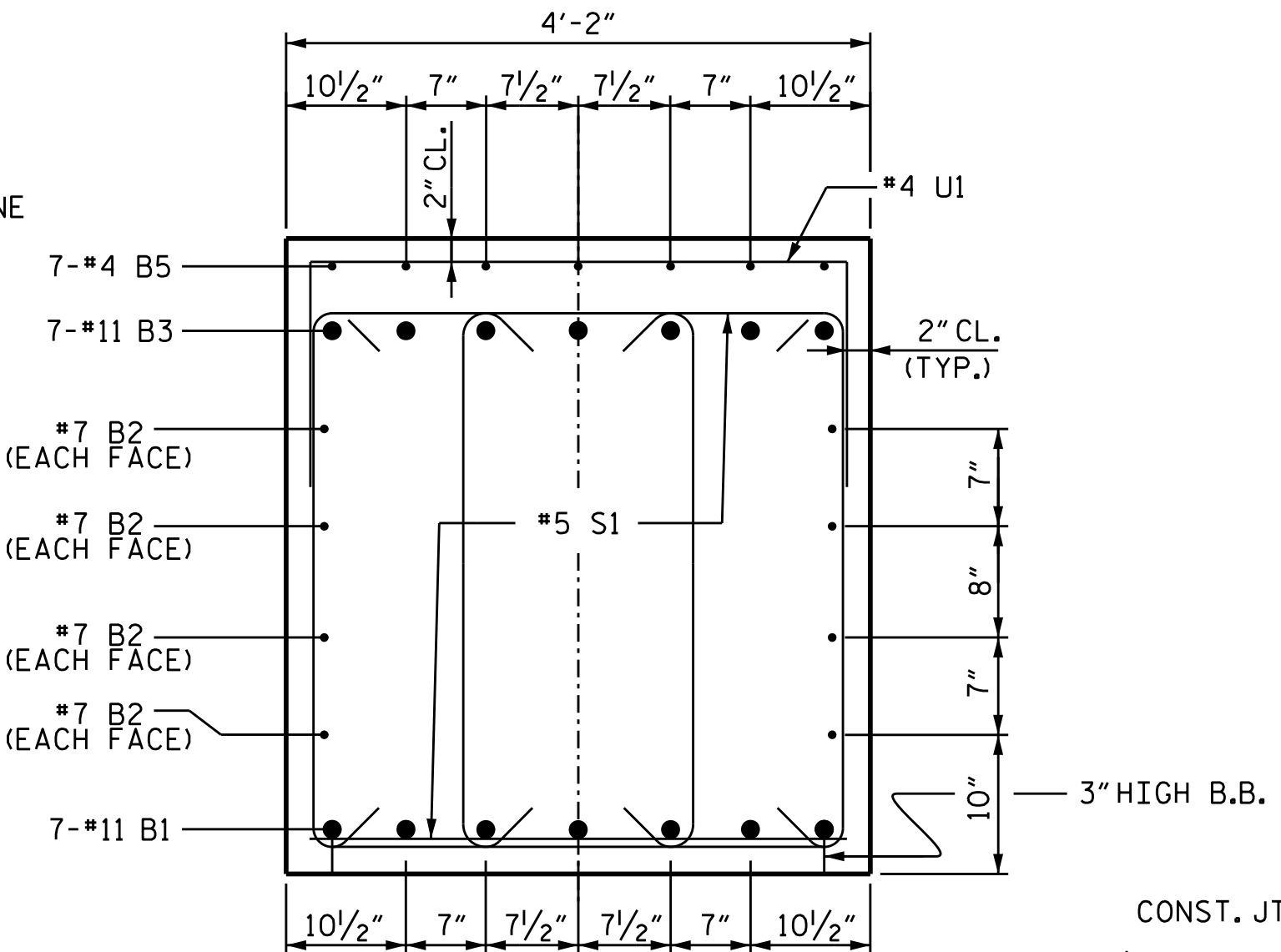
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



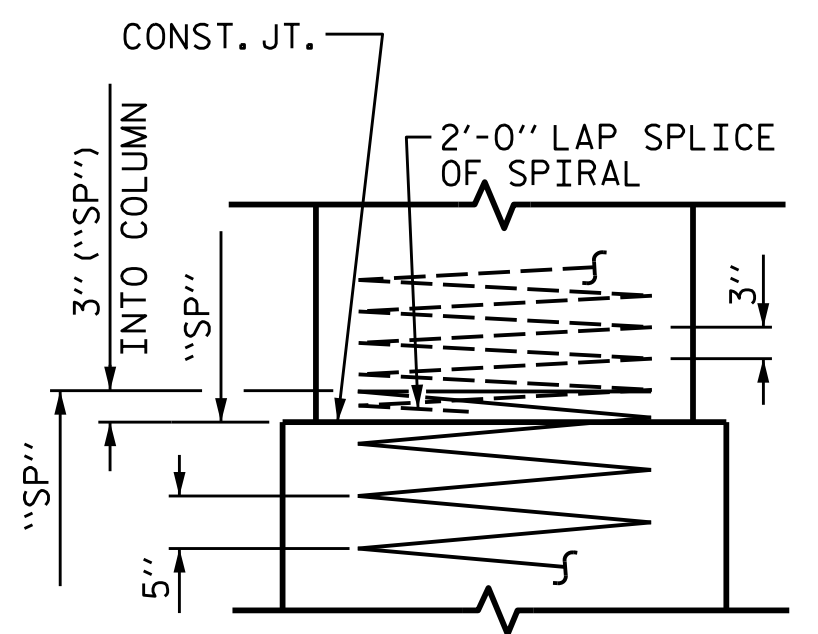
PLAN OF DRILLED PIERS & COLUMNS



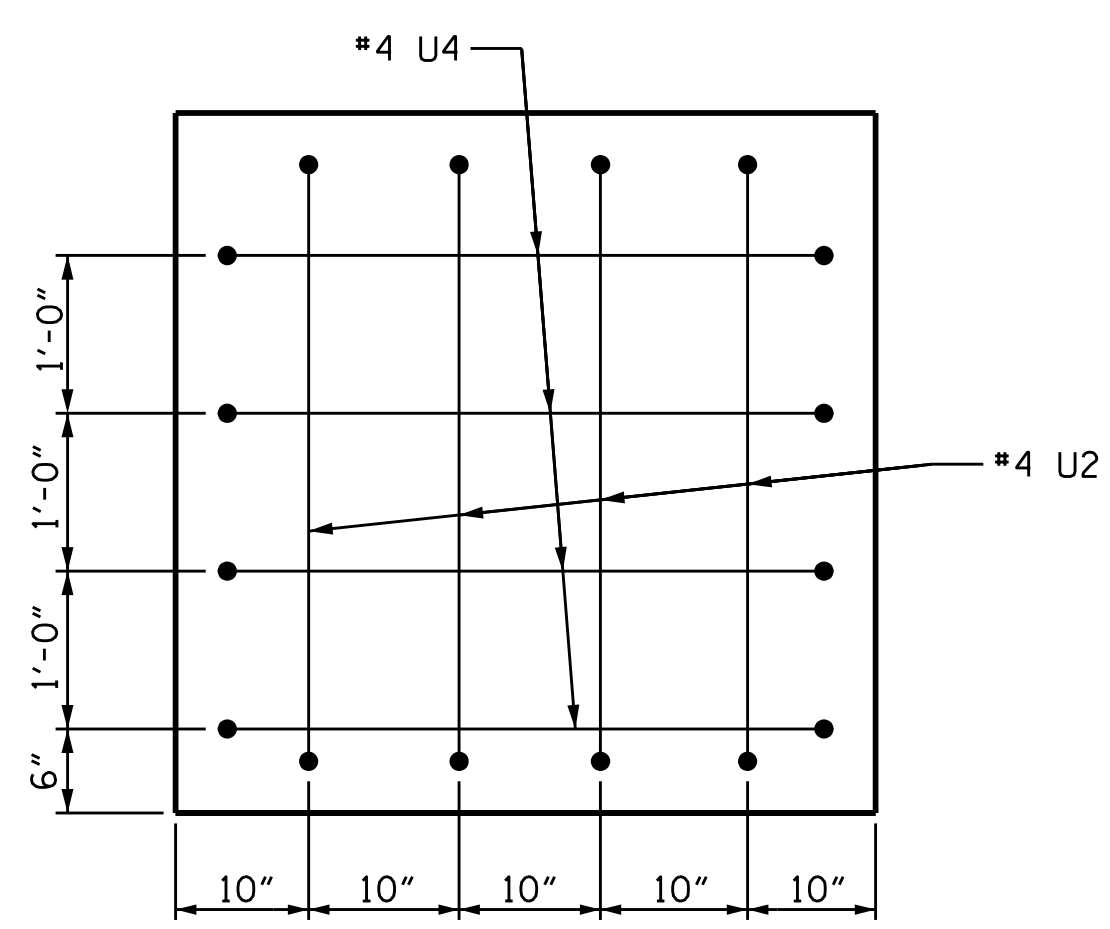
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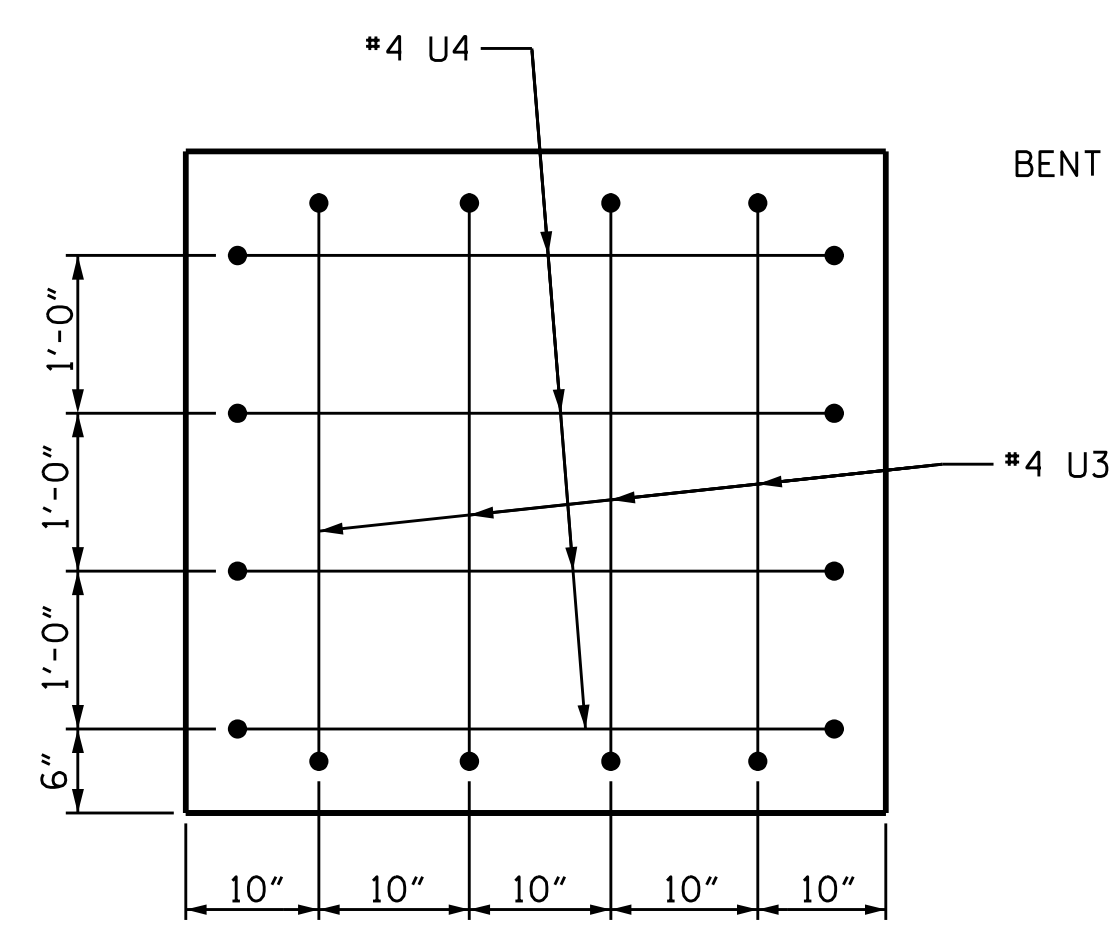
SECTION A-A



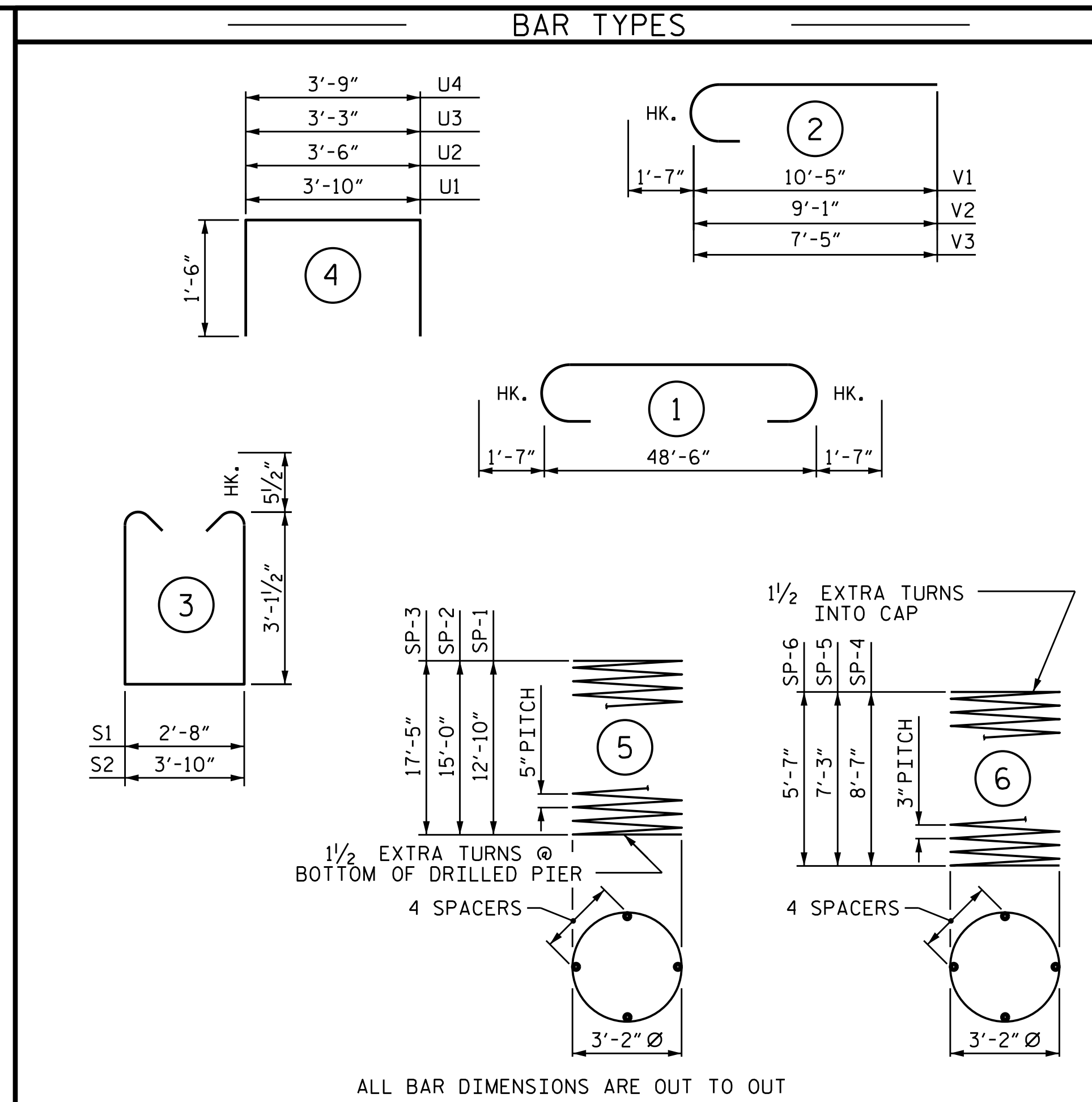
CONSTRUCTION JOINT DETAIL



LEFT END VIEW



RIGHT END VIEW



BAR TYPES

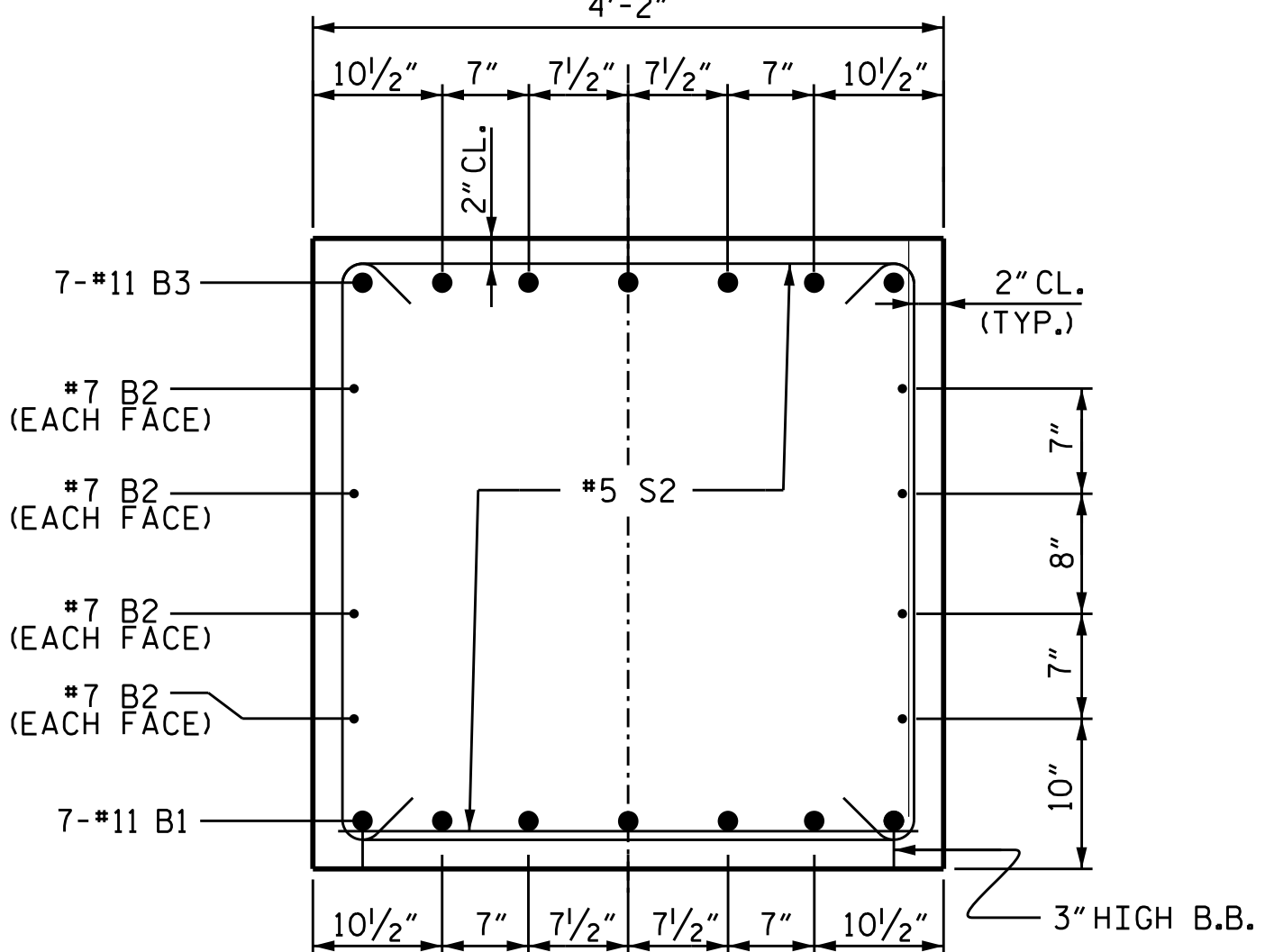
BILL OF MATERIAL					
BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#11	STR	48'-8"	1810
B2	8	#7	STR	48'-8"	796
B3	7	#11	1	51'-8"	1922
B4	7	#4	STR	7'-6"	35
B5	14	#4	STR	5'-6"	51
B6	7	#4	STR	5'-0"	23
M1	14	#11	STR	20'-11"	1556
M2	14	#11	STR	23'-1"	1717
M3	14	#11	STR	25'-6"	1897
S1	68	#5	3	9'-10"	697
S2	22	#5	3	11'-0"	252
U1	33	#4	4	6'-10"	151
U2	4	#4	4	6'-6"	17
U3	4	#4	4	6'-3"	17
U4	8	#4	4	6'-9"	36
V1	14	#11	2	12'-0"	893
V2	14	#11	2	10'-8"	793
V3	14	#11	2	9'-0"	669

REINFORCING STEEL					
					13,332 LBS.
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
SP-1	1	*	5	323'-3"	337
SP-2	1	*	5	372'-2"	388
SP-3	1	*	5	431'-0"	450
SP-4	1	**	6	353'-7"	236
SP-5	1	**	6	304'-6"	203
SP-6	1	**	6	235'-9"	157

SPIRAL COLUMN REINFORCING STEEL
1,771 LBS.

* THE SP-1, SP-2, SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-4, SP-5, SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR



SECTION B-B

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
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CORP. LICENSE NO.: C-0275

REVISIONS

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

SHEET NO. S-36
TOTAL SHEETS 47

DRAWN BY: ZCS DATE: 10/22
CHECKED BY: MGC DATE: 10/22
DESIGN ENGINEER OF RECORD: ZCS DATE: 12/22

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

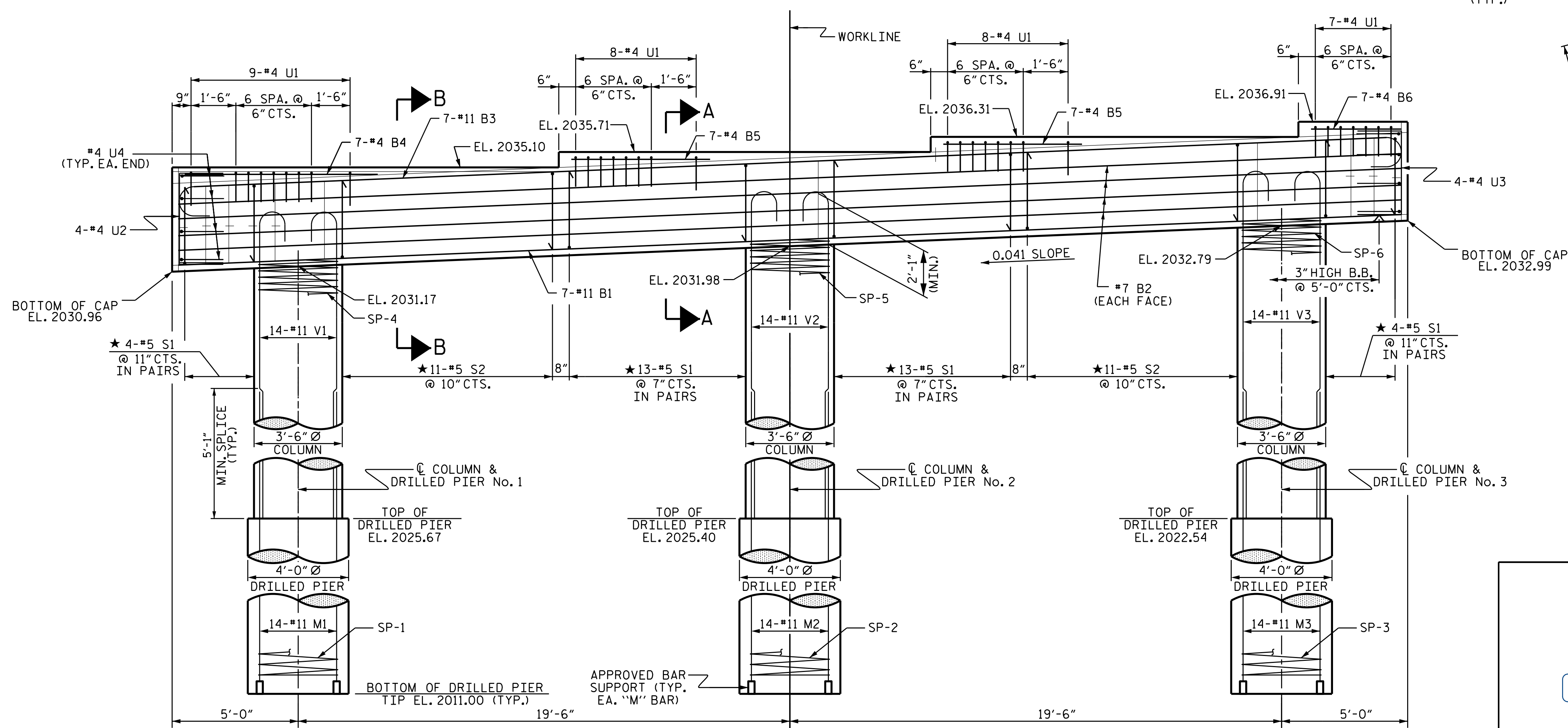
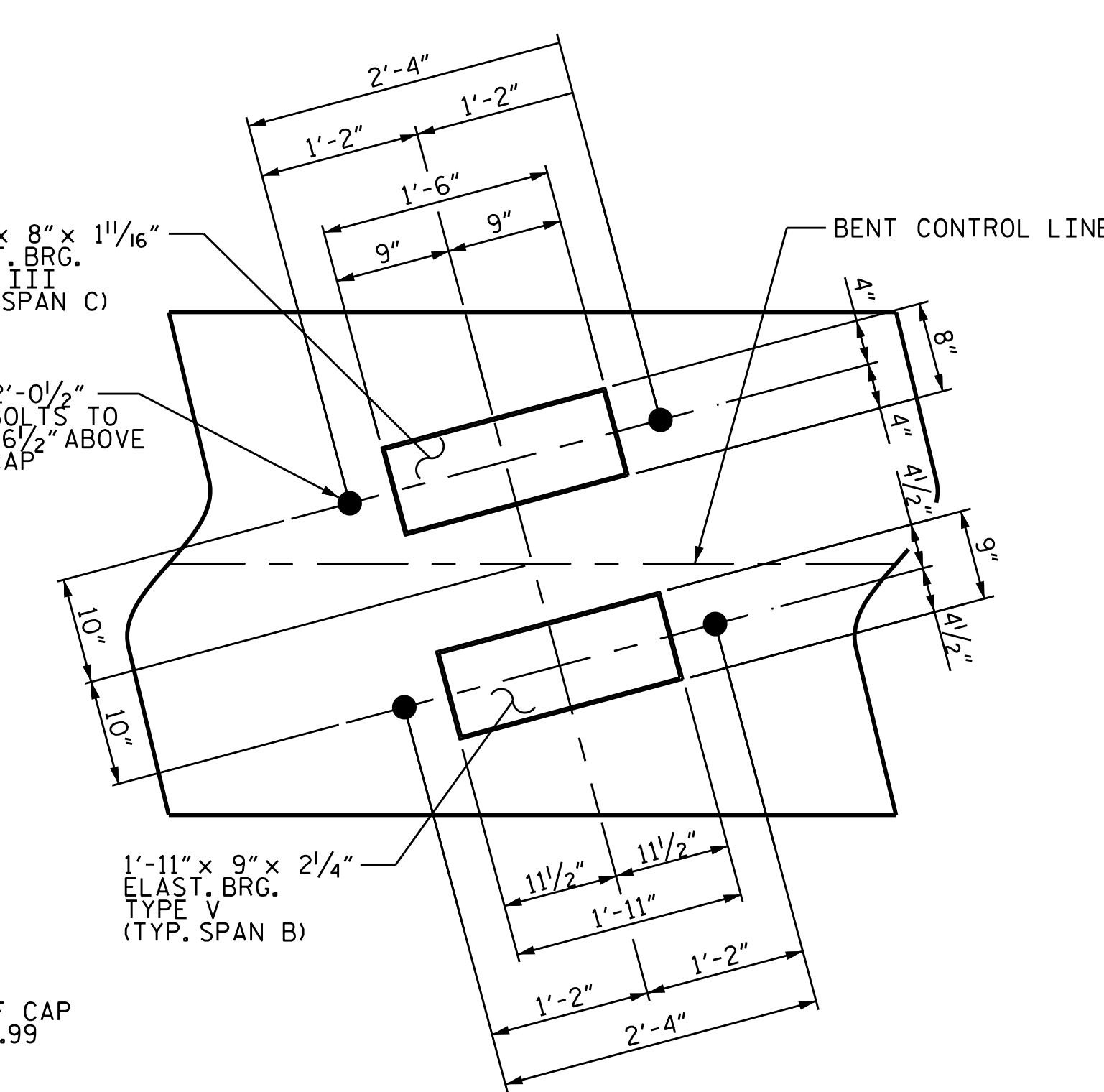
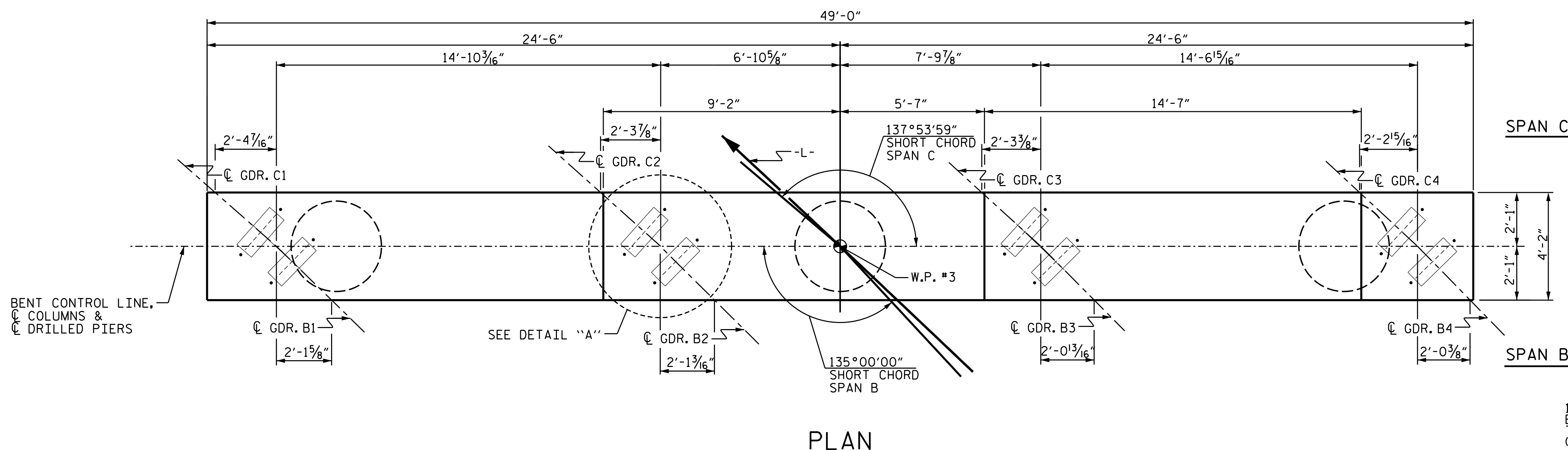
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

★ INVERT ALTERNATE STIRRUPS.

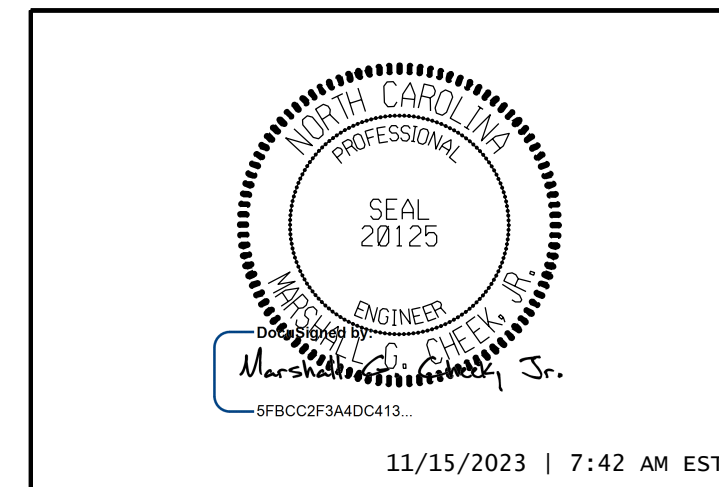
DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± BELOW GROUND SURFACE ELEVATION FOR SHAFTS LOCATED IN GROUND.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



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

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00 -L-
SHEET 1 OF 2

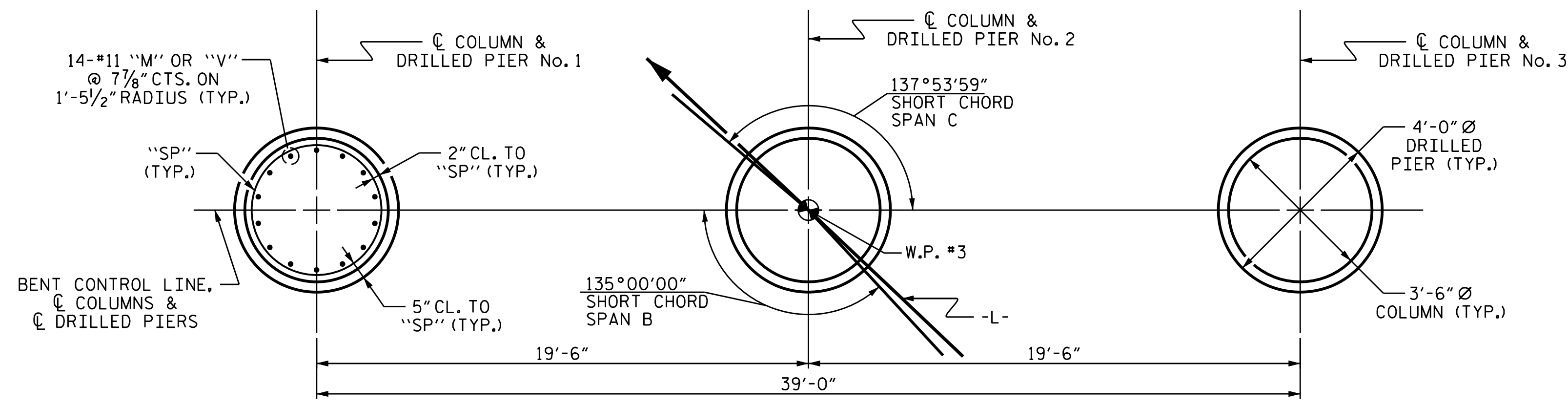


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 2

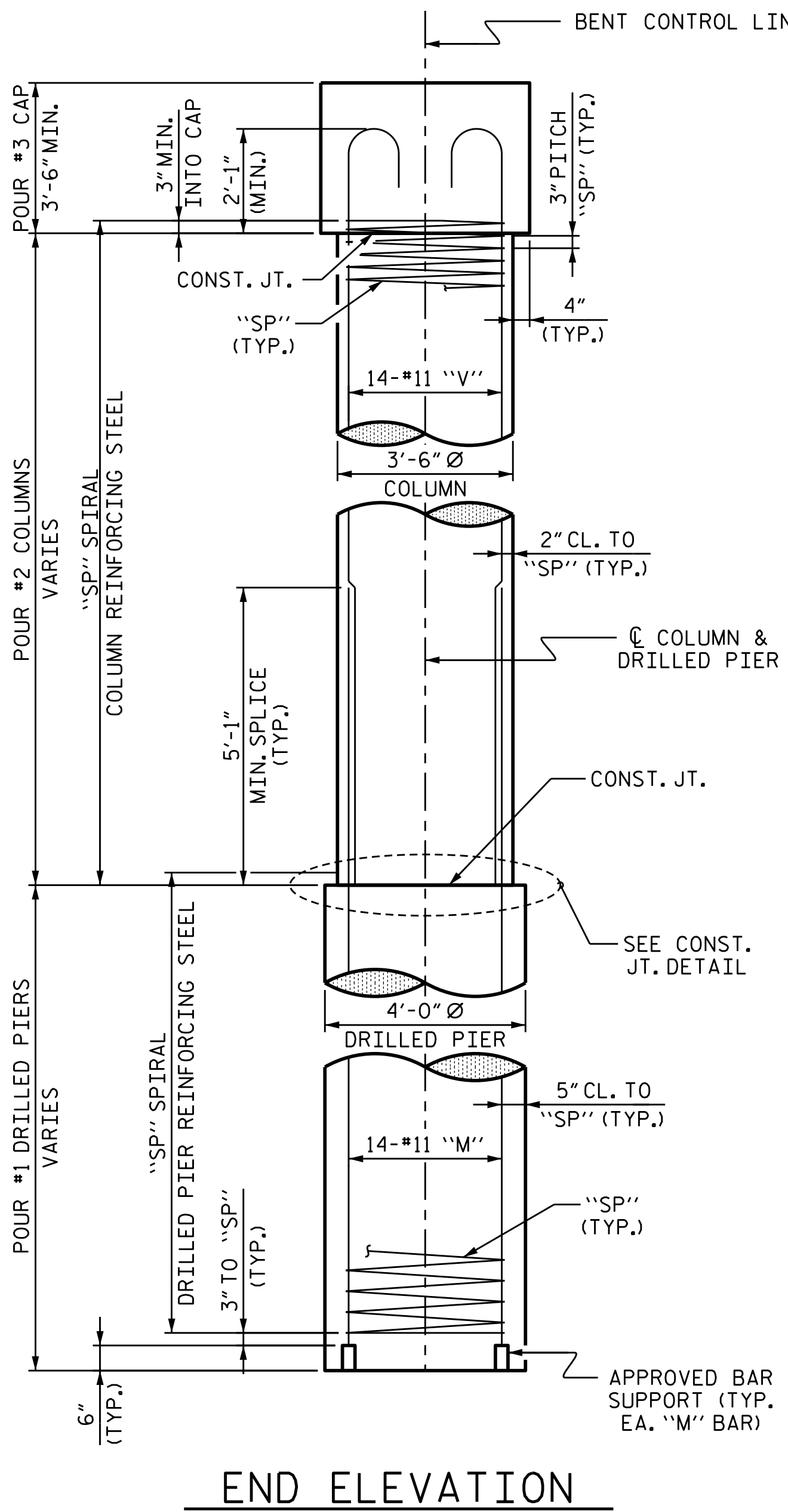
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CHECKED BY : MGC DATE : 10/22
DESIGN ENGINEER OF RECORD : ZCS DATE : 12/22

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-37			
1			3			TOTAL SHEETS 47			
2			4						

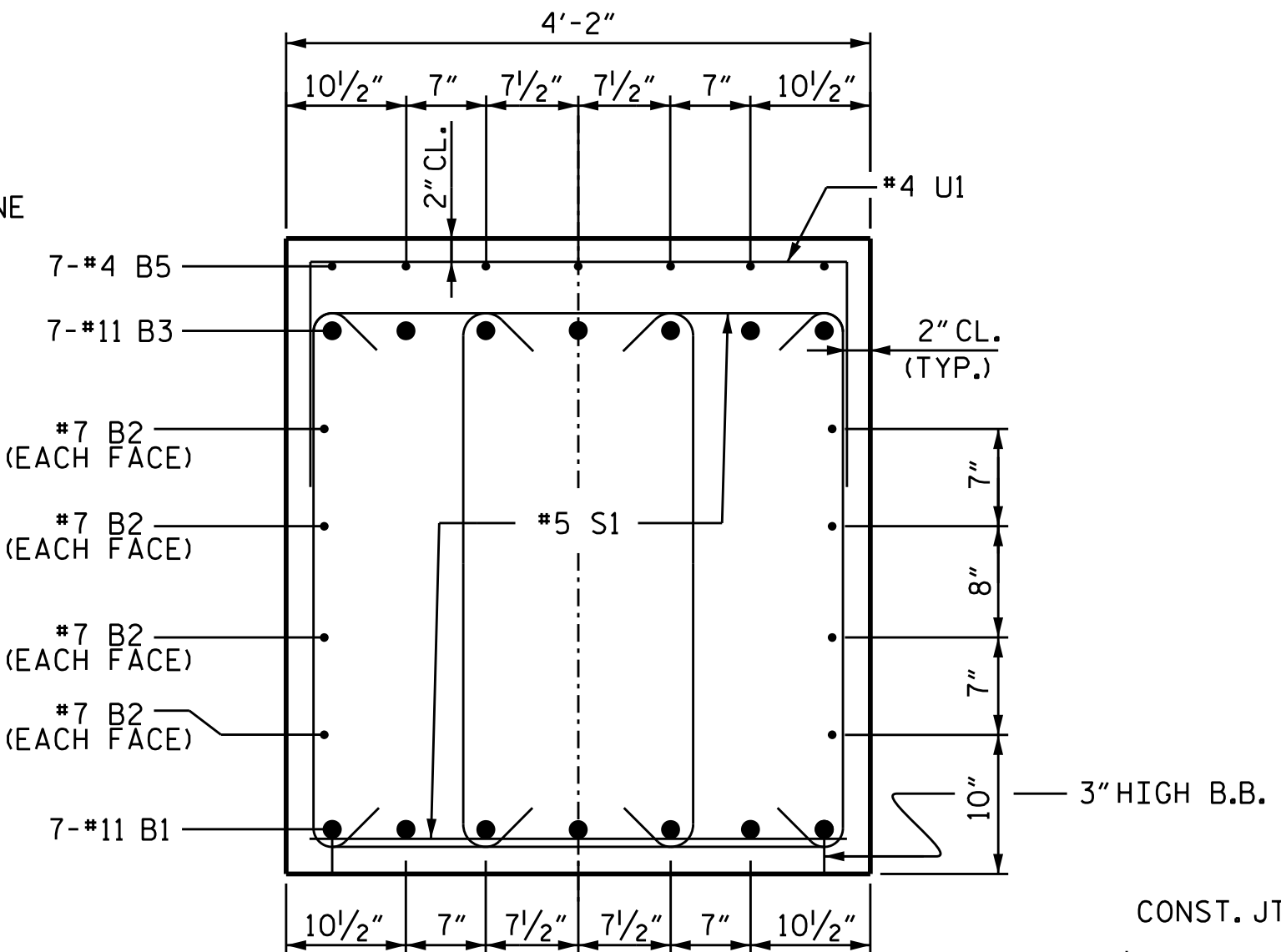
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275



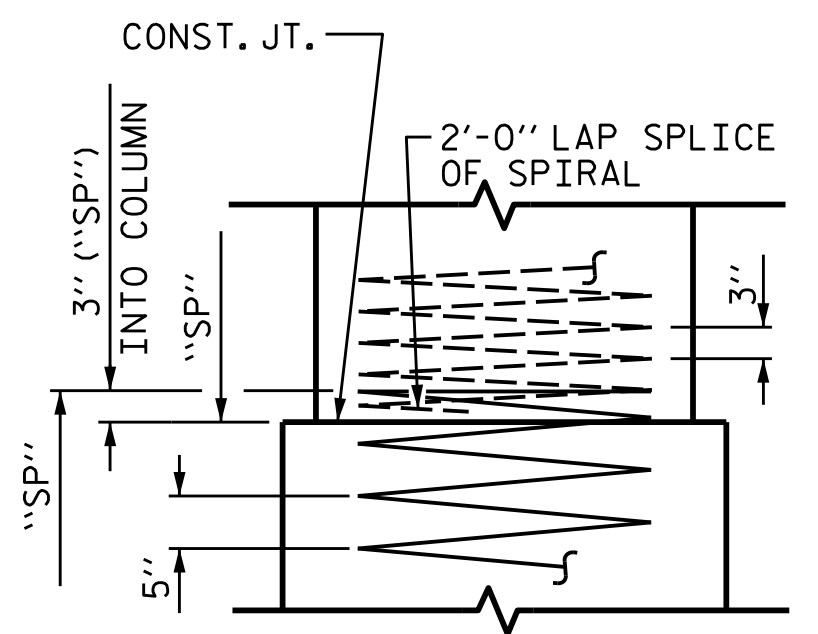
PLAN OF DRILLED PIERS & COLUMNS



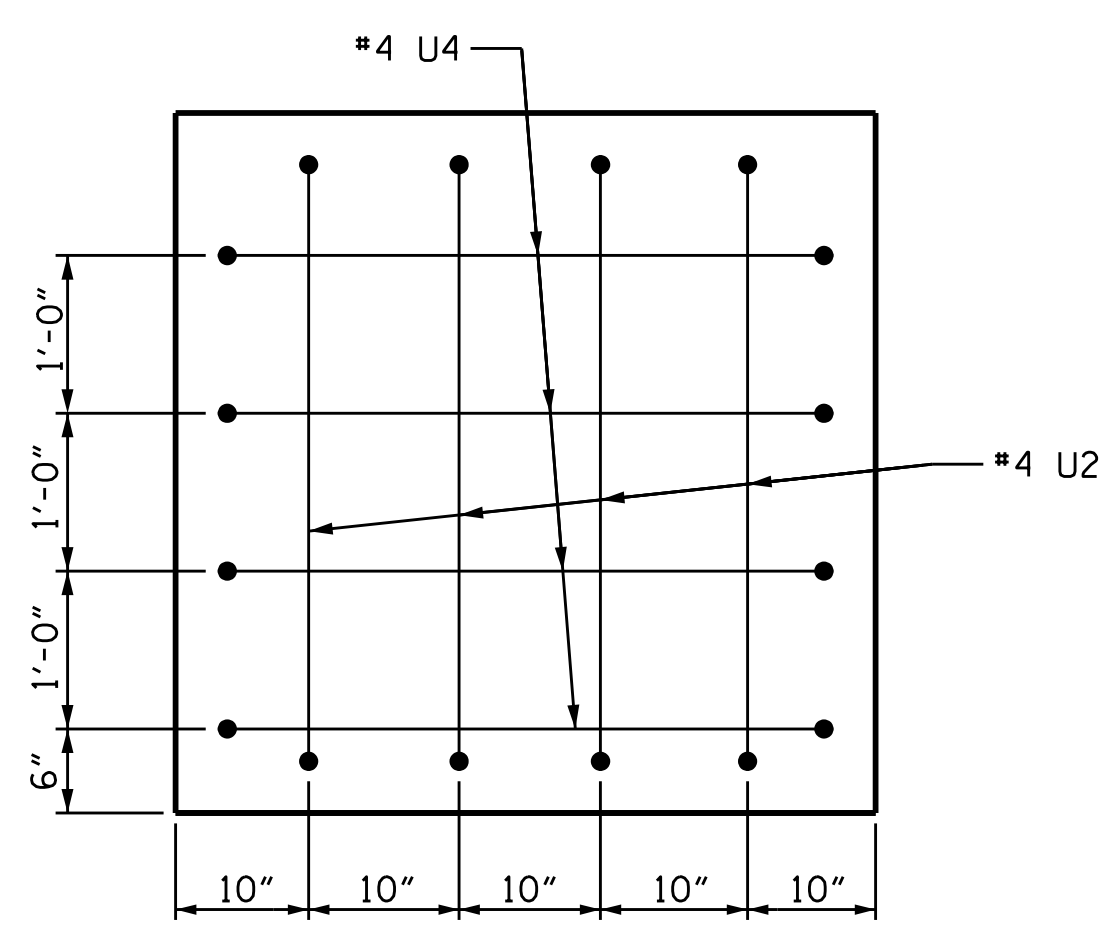
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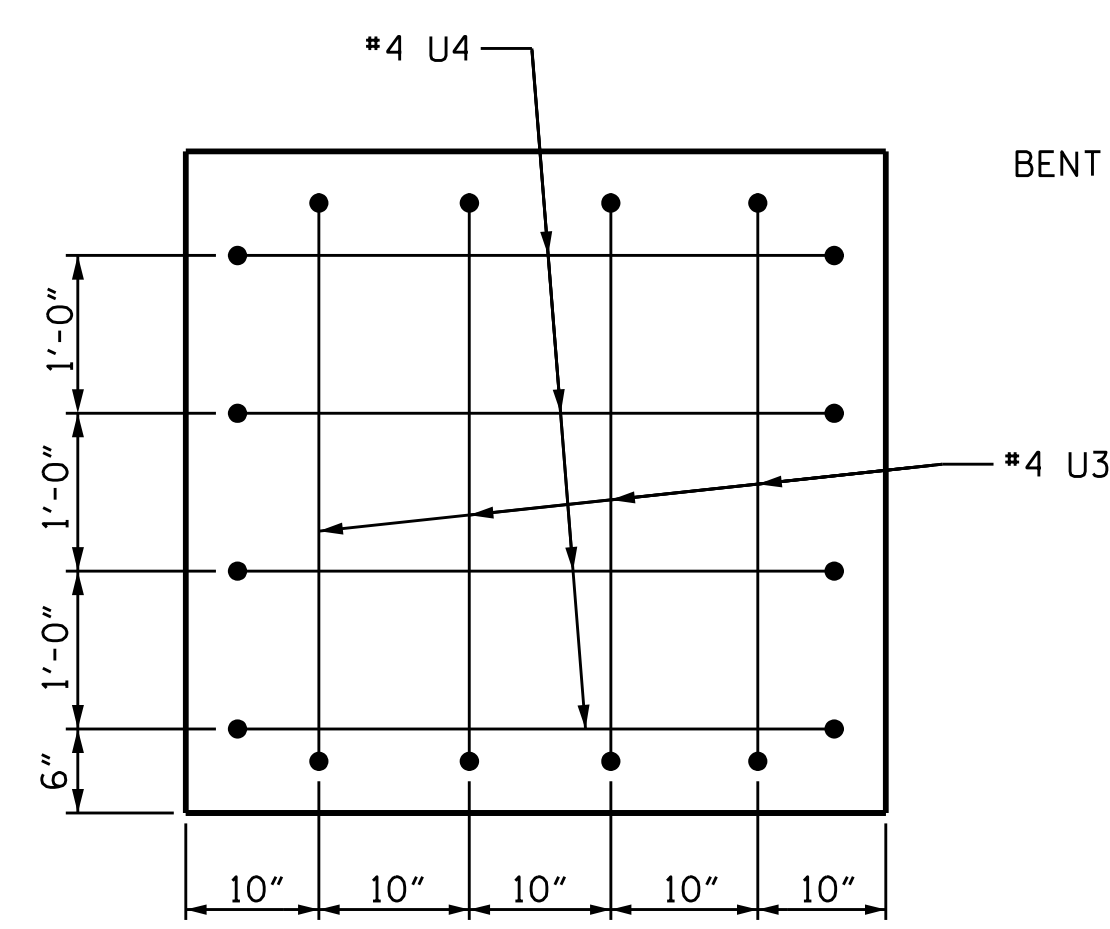
SECTION A-A



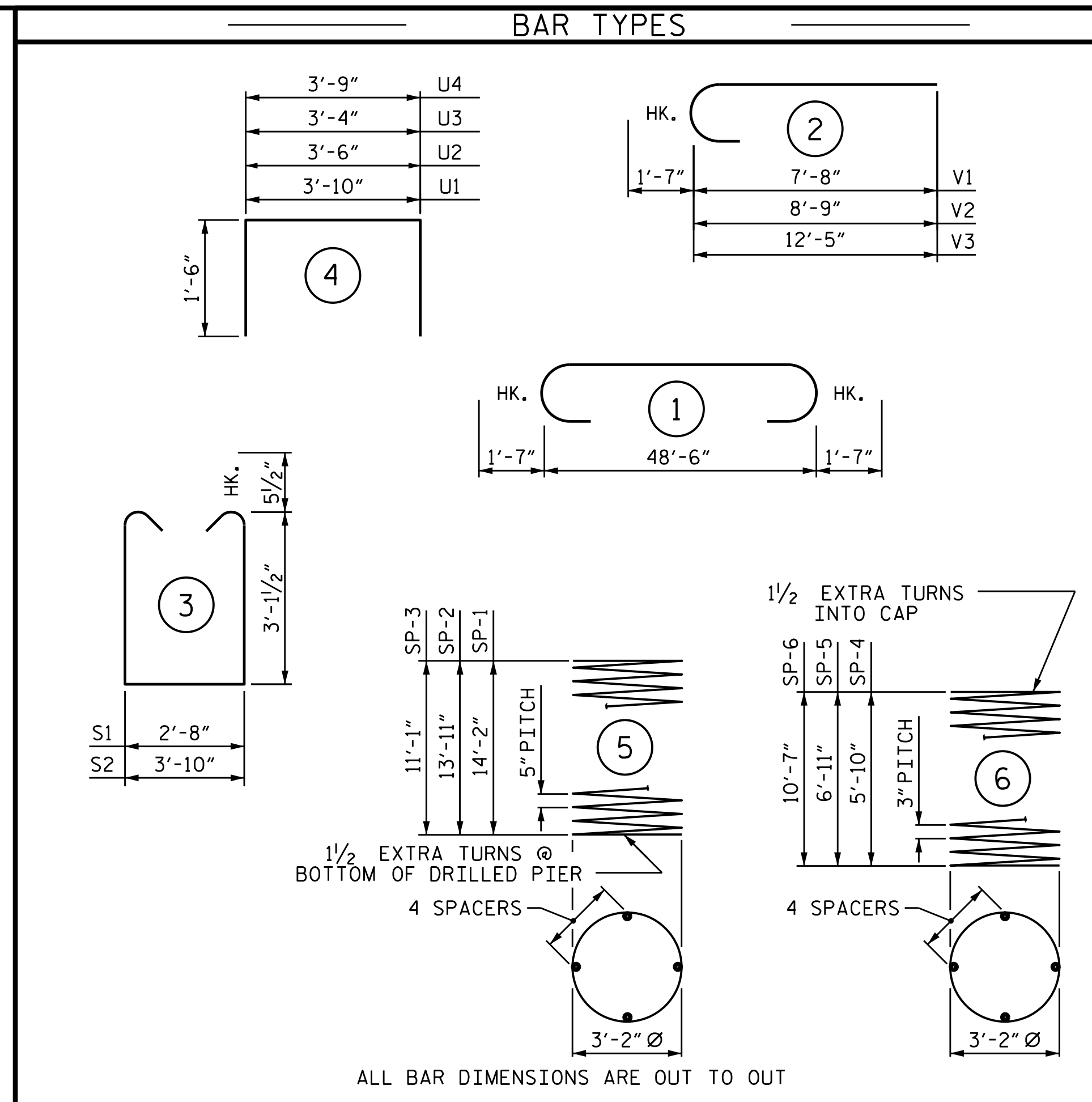
CONSTRUCTION JOINT DETAIL



LEFT END VIEW



RIGHT END VIEW



BAR TYPES

BILL OF MATERIAL

BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#11	STR	48'-8"	1810
B2	8	#7	STR	48'-8"	796
B3	7	#11	1	51'-8"	1922
B4	7	#4	STR	7'-6"	35
B5	14	#4	STR	5'-6"	51
B6	7	#4	STR	3'-7"	17
M1	14	#11	STR	22'-3"	1655
M2	14	#11	STR	22'-0"	1636
M3	14	#11	STR	19'-2"	1426
S1	68	#5	3	9'-10"	697
S2	22	#5	3	11'-0"	252
U1	32	#4	4	6'-10"	146
U2	4	#4	4	6'-6"	17
U3	4	#4	4	6'-4"	17
U4	8	#4	4	6'-9"	36
V1	14	#11	2	9'-3"	688
V2	14	#11	2	10'-4"	769
V3	14	#11	2	14'-0"	1041

REINFORCING STEEL					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
SP-1	1	*	5	352'-7"	368
SP-2	1	*	5	342'-10"	358
SP-3	1	*	5	284'-1"	296
SP-4	1	**	6	245'-7"	164
SP-5	1	**	6	294'-8"	197
SP-6	1	**	6	432'-2"	289

SPIRAL COLUMN REINFORCING STEEL
1,672 LBS.

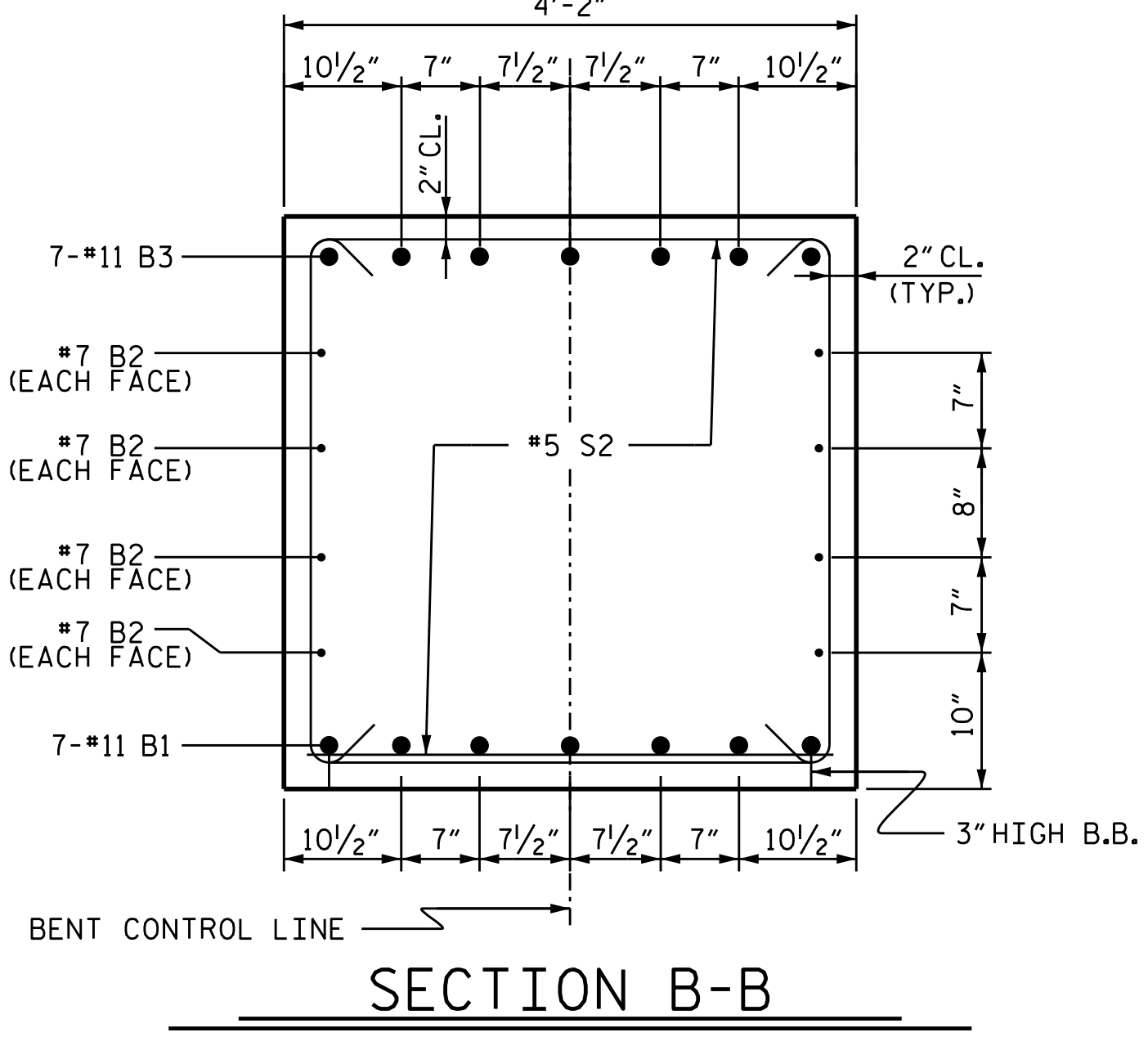
* THE SP-1, SP-2, SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-4, SP-5, SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)	8.0	C.Y.
POUR #3 (CAP)	27.2	C.Y.
TOTAL CLASS A CONCRETE	35.2	C.Y.

DRILLED PIERS:
POUR #1
4'-0" Ø DRILLED PIERS NOT IN SOIL 18.9 C.Y.
25.00 LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL 15.61 LIN. FT.
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIERS 16.61 LIN. FT.
CSL TUBES 180.50 LIN. FT.

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00 -L-
SHEET 2 OF 2



SECTION B-B

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 2

11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

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

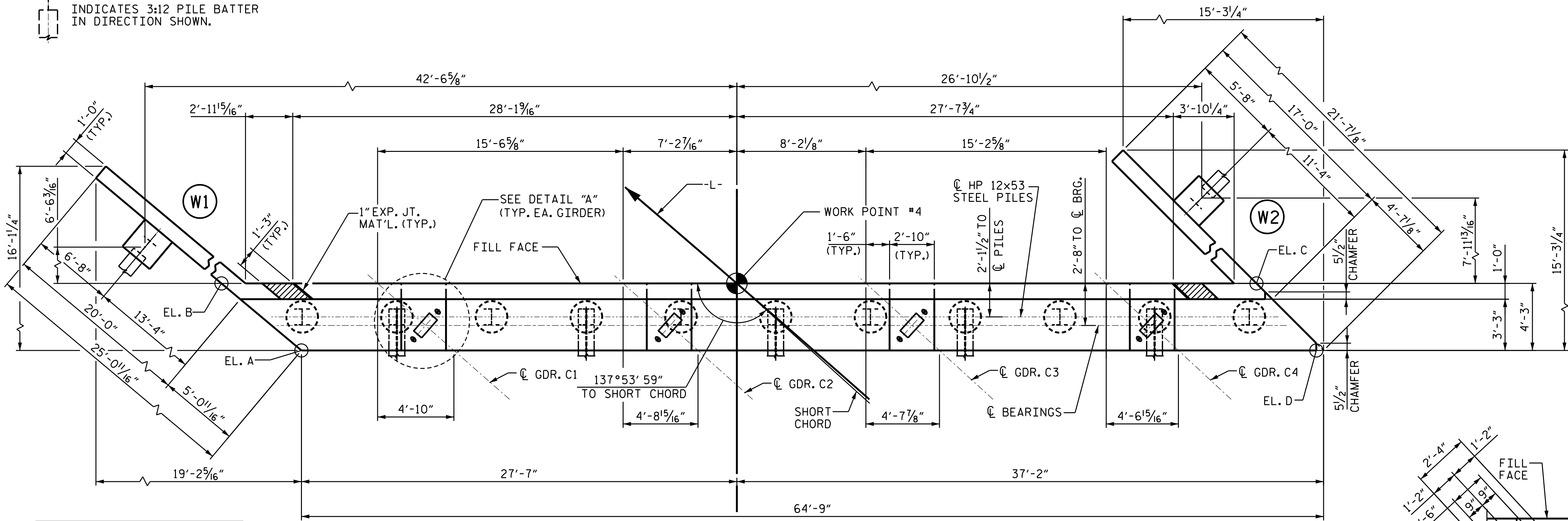
SHEET NO. S-38
TOTAL SHEETS 47

DRAWN BY: ZCS DATE: 10/22
CHECKED BY: MGC DATE: 10/22
DESIGN ENGINEER OF RECORD: ZCS DATE: 12/22

INDICATES 3:12 PILE BATTER
IN DIRECTION SHOWN.

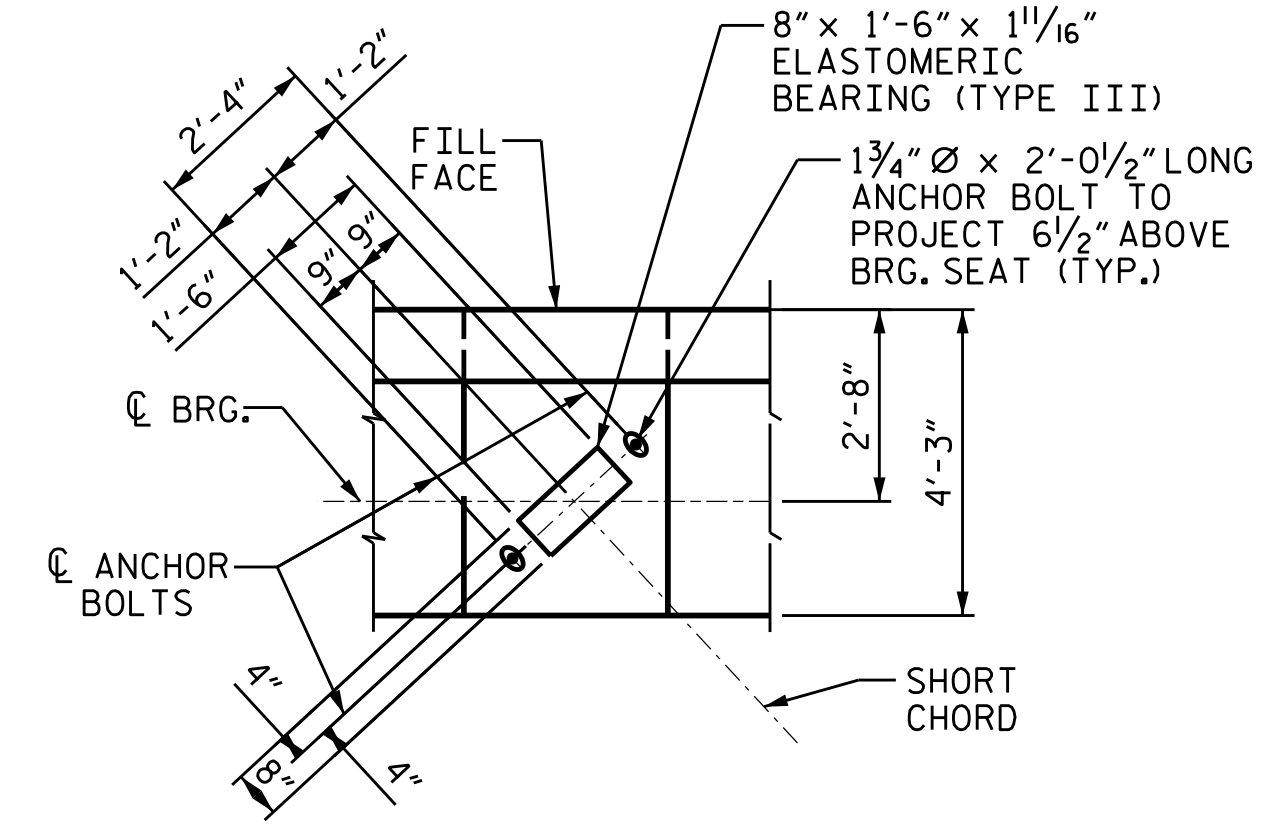
NOTES :

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 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 SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS POURED IF SLIP FORMING IS USED.



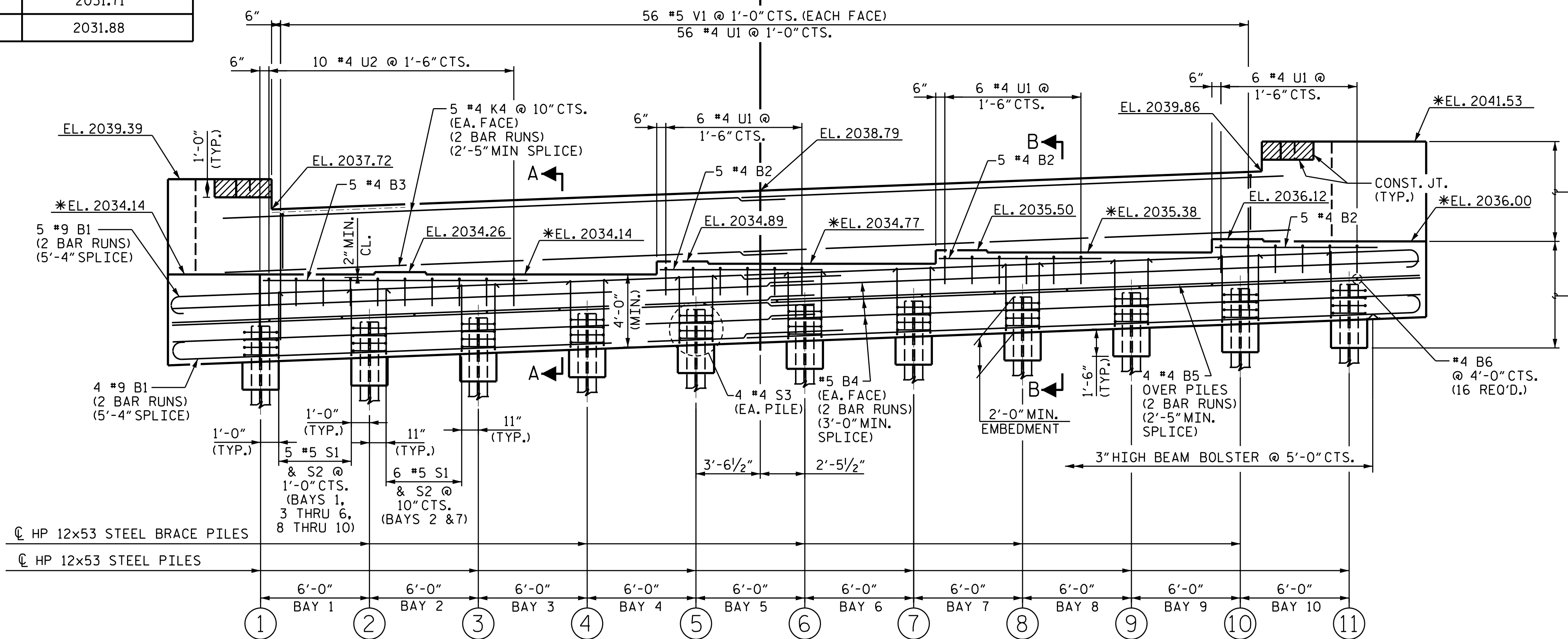
CAP ELEVATIONS	
POINTS	BOTTOM OF CAP
A	2029.23
B	2029.02
C	2031.71
D	2031.88

TOP OF PILE ELEVATIONS	
1	2031.27
2	2031.51
3	2031.76
4	2032.00
5	2032.25
6	2032.50
7	2032.74
8	2032.99
9	2033.23
10	2033.48
11	2033.73



PLAN

DETAIL A



ELEVATION

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 1 OF 4

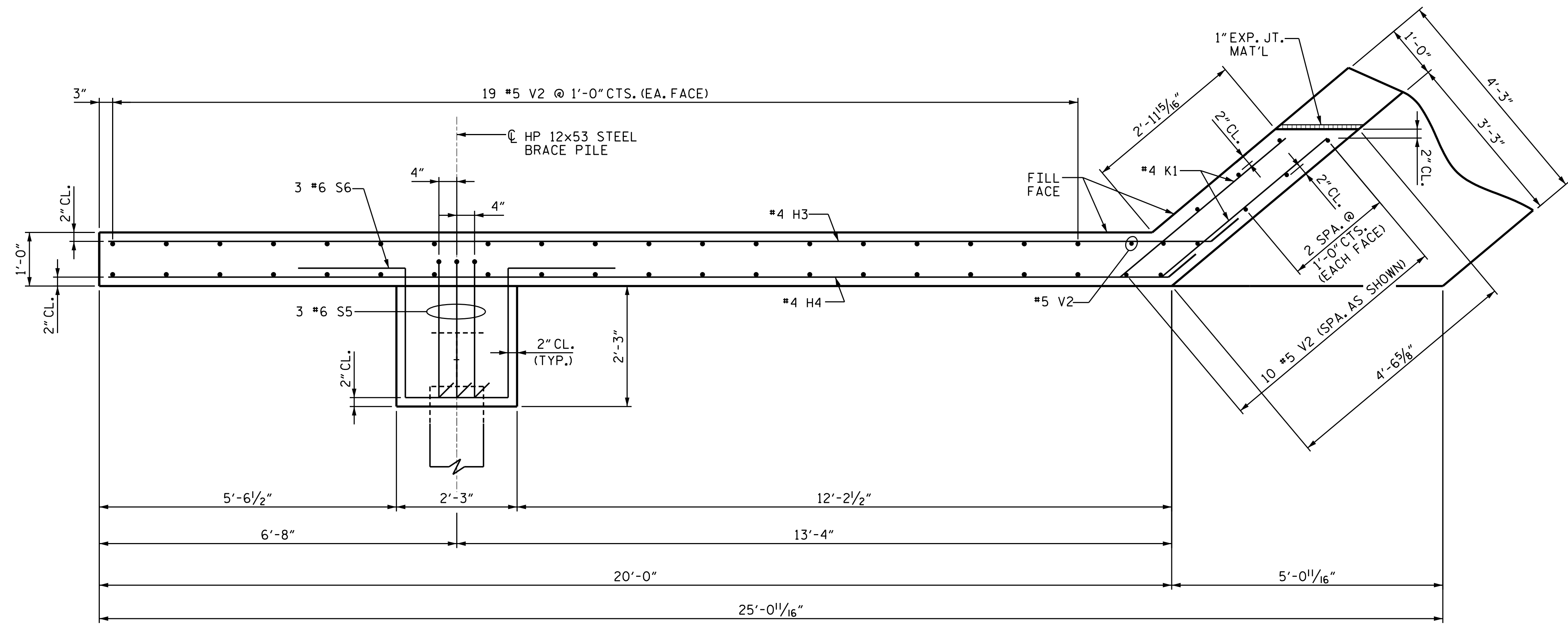
STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 20125
 MARSHALL G. CHESTNUT, JR.
 11/15/2023 | 7:42 AM EST
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DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2

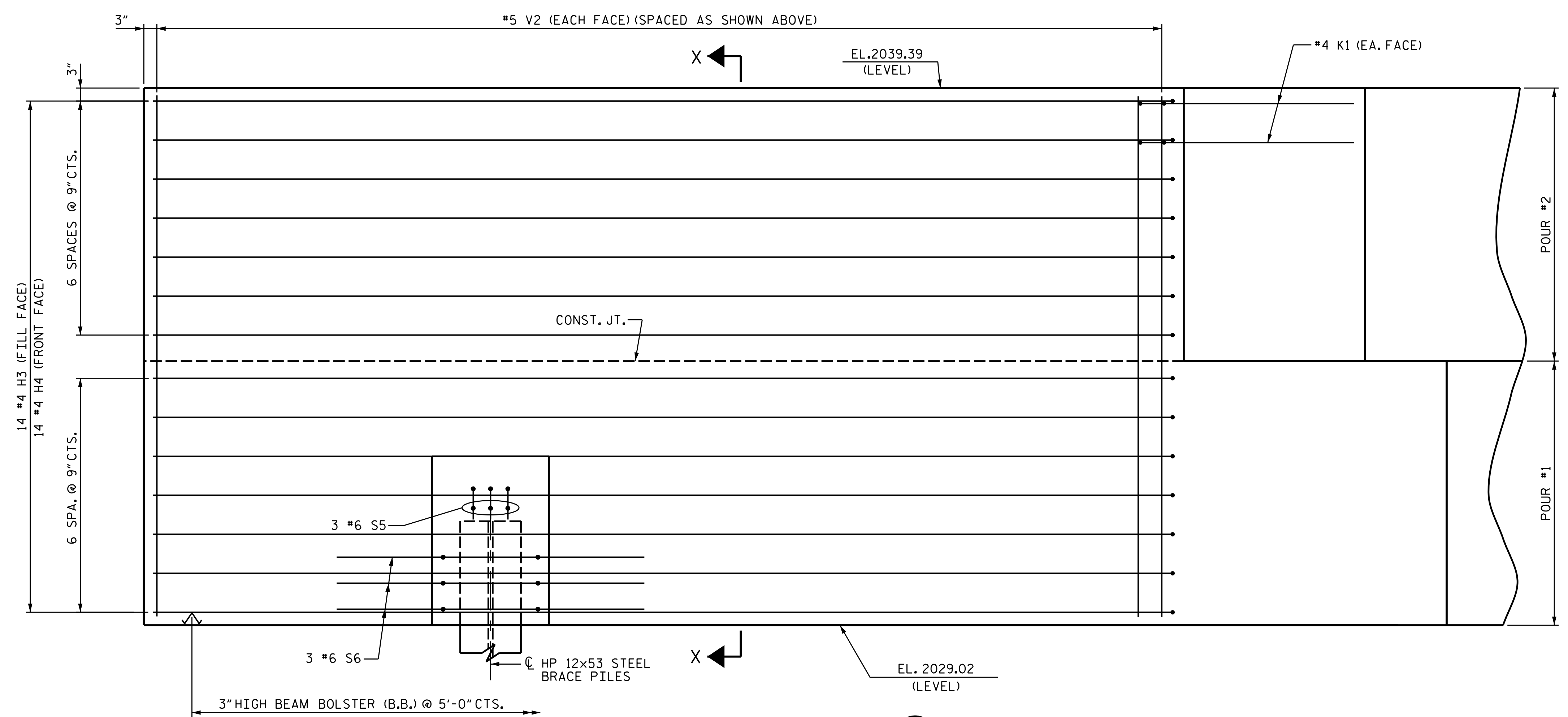
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-39
2			4			TOTAL SHEETS 47

DRAWN BY : NMW DATE : 7/22
 CHECKED BY : MGC DATE : 10/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23

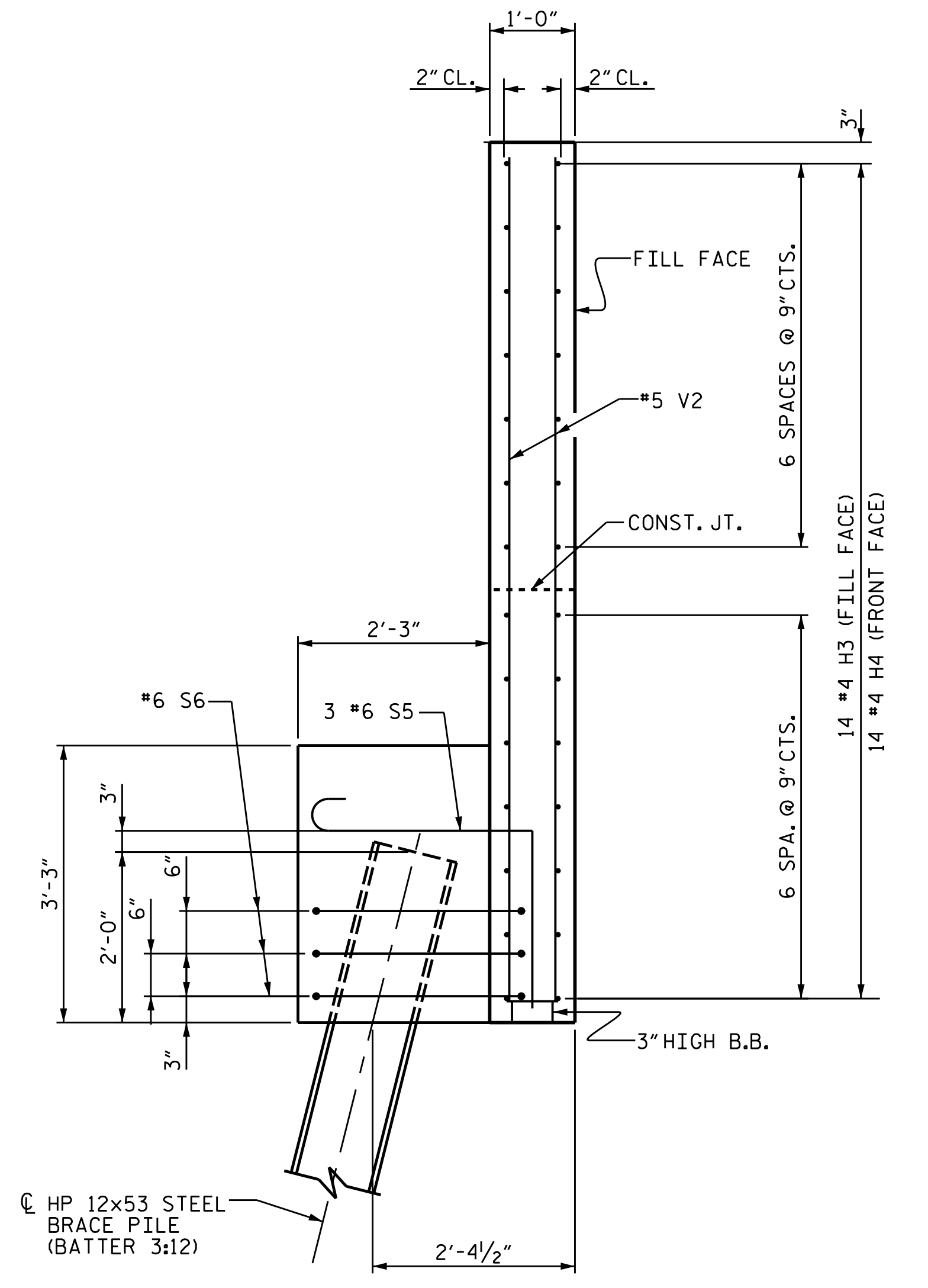
(WINGS NOT SHOWN FOR CLARITY)
 FOR SECTION A-A AND B-B SEE SHEET 4 OF 4
 *FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE TYPICAL SECTION



PLAN OF WING (W1)



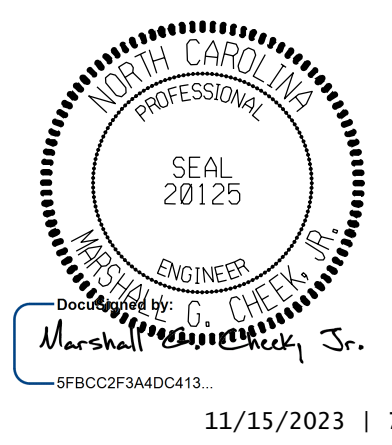
ELEVATION OF WING (W1)



SECTION X-X

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-

SHEET 2 OF 4



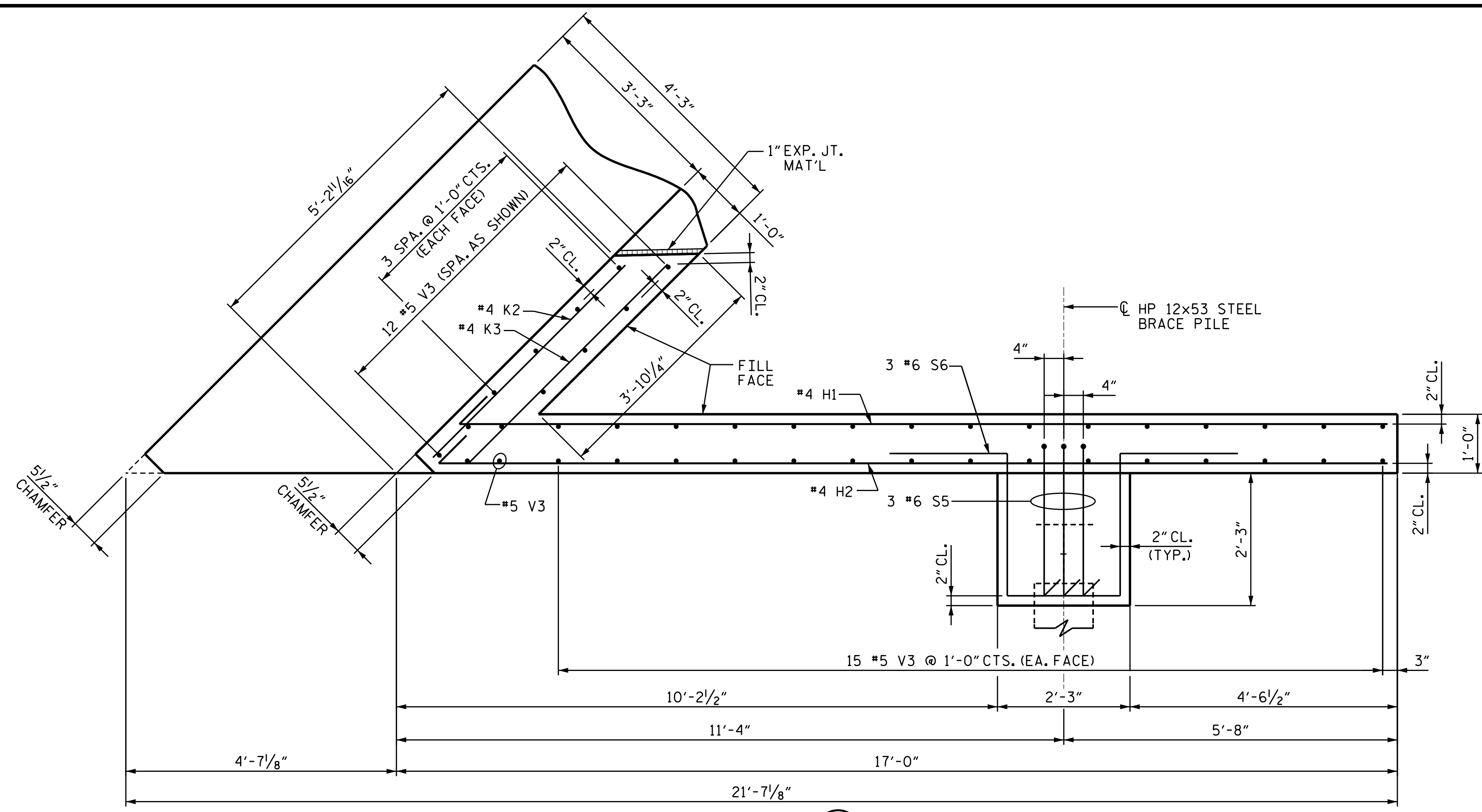
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 WING DETAILS

DOCUMENT NOT CONSIDERED FINAL
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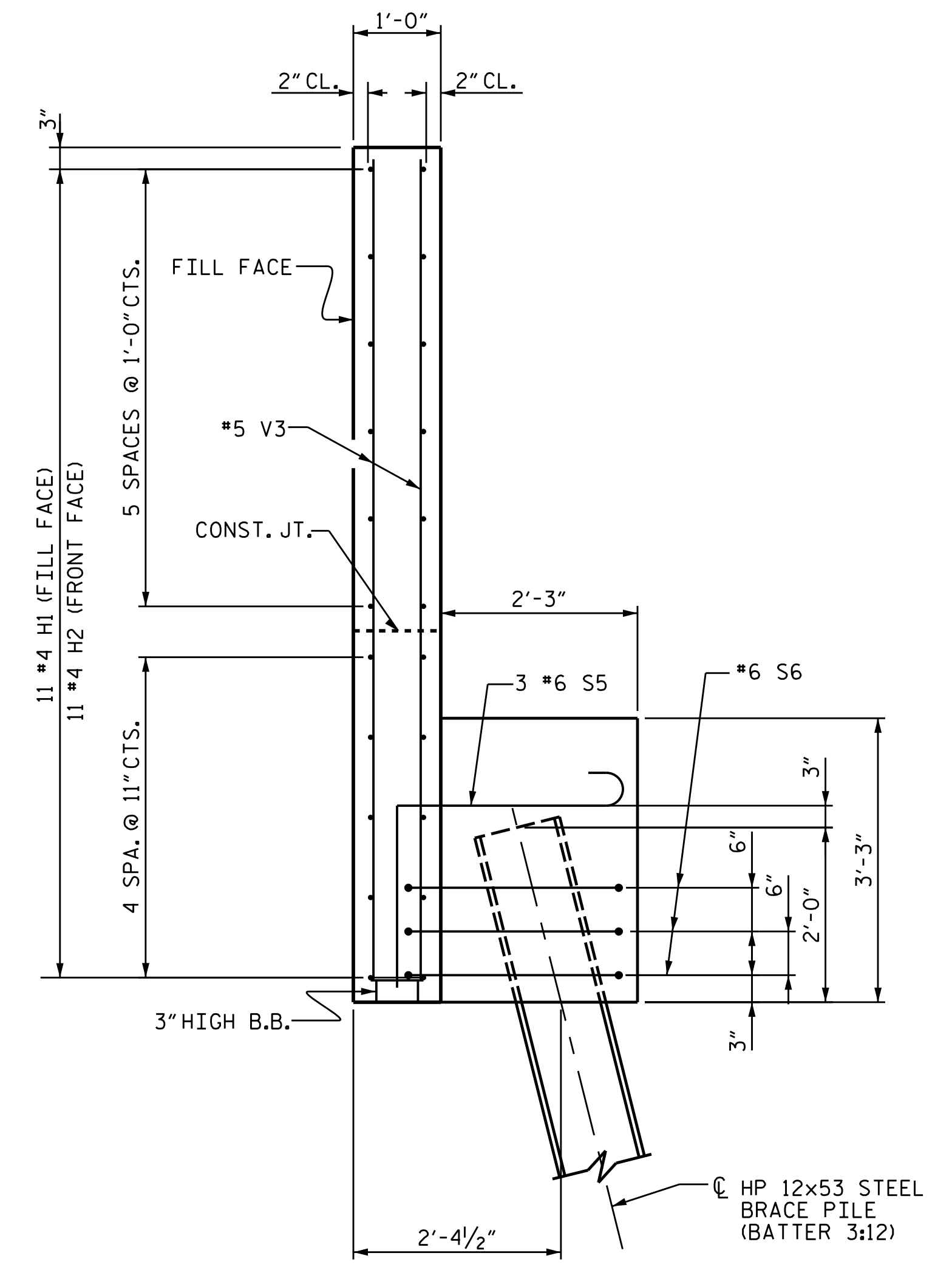
TGS ENGINEERS
 201 W. MARION ST STE 200
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-40
1			3			TOTAL SHEETS
2			4			47

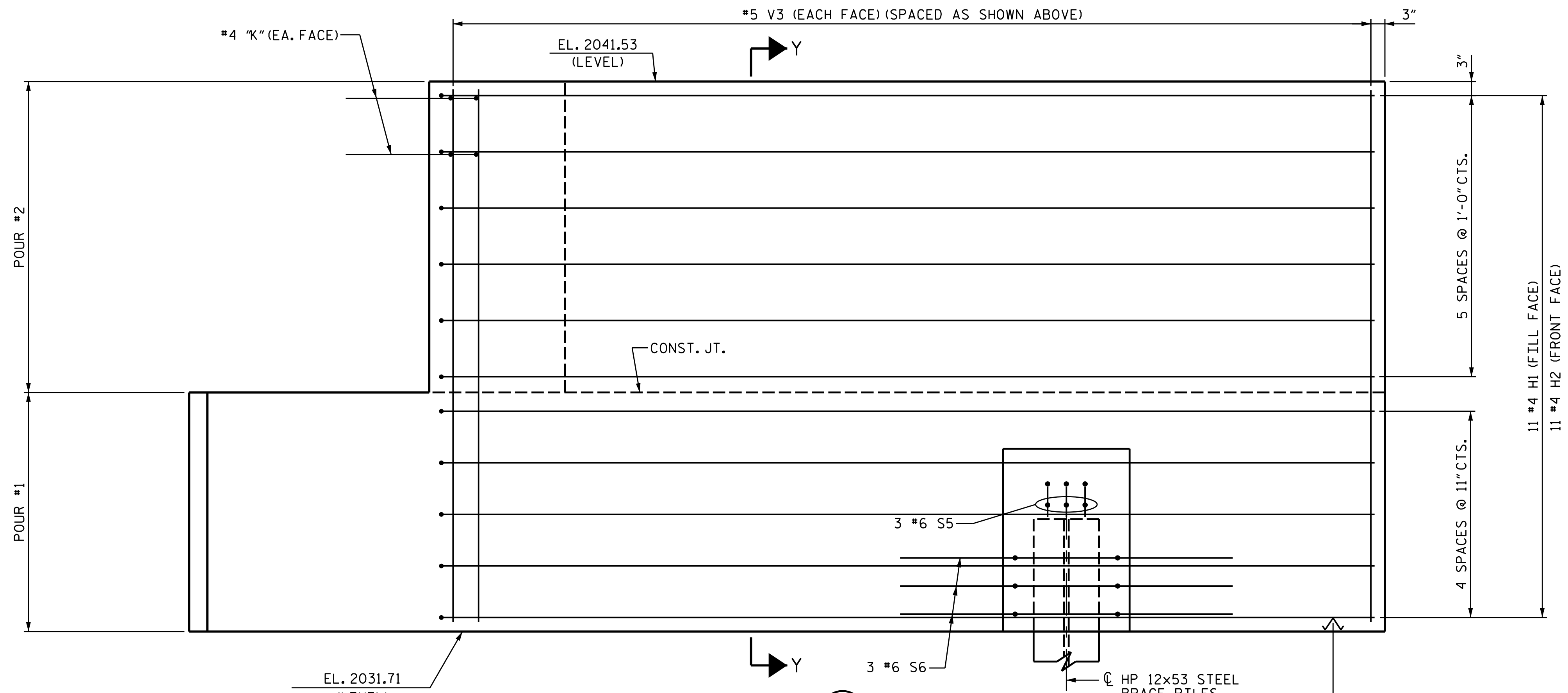
DRAWN BY : NMW DATE : 8/22
 CHECKED BY : MGC DATE : 10/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23



PLAN OF WING (W2)



SECTION Y-Y



ELEVATION OF WING (W2)

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 3 OF 4

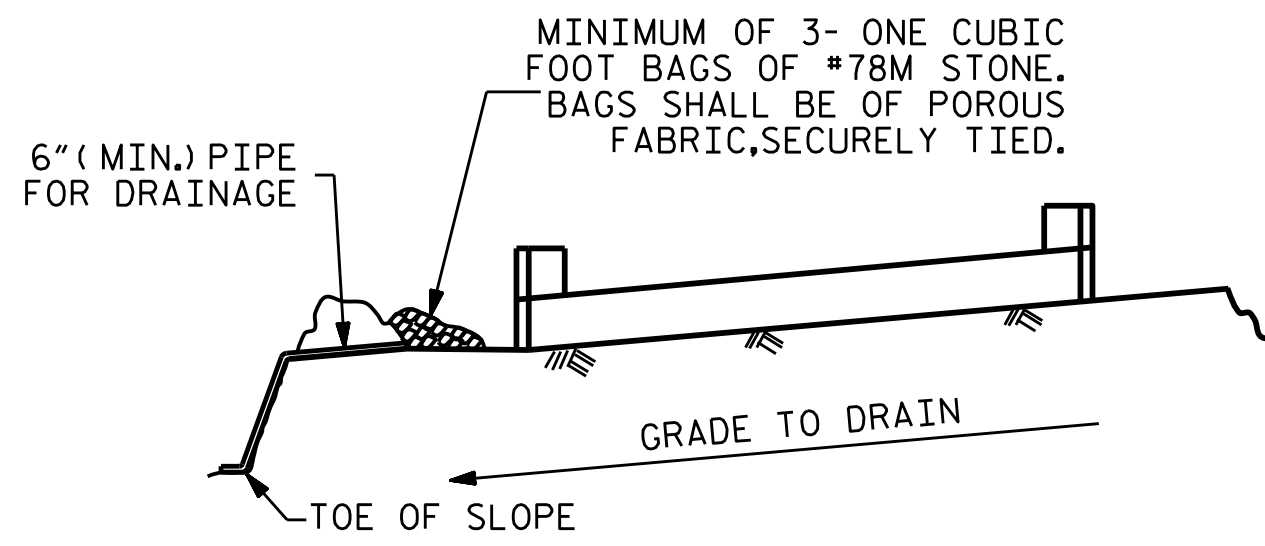
STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 20125
 MARSHALL G. CHEEK JR.
 11/15/2023 | 7:42 AM EST

DOCUMENT NOT CONSIDERED FINAL
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-41
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : NMW DATE : 8/22
 CHECKED BY : MGC DATE : 10/22
 DESIGN ENGINEER OF RECORD : ZCS DATE : 1/23

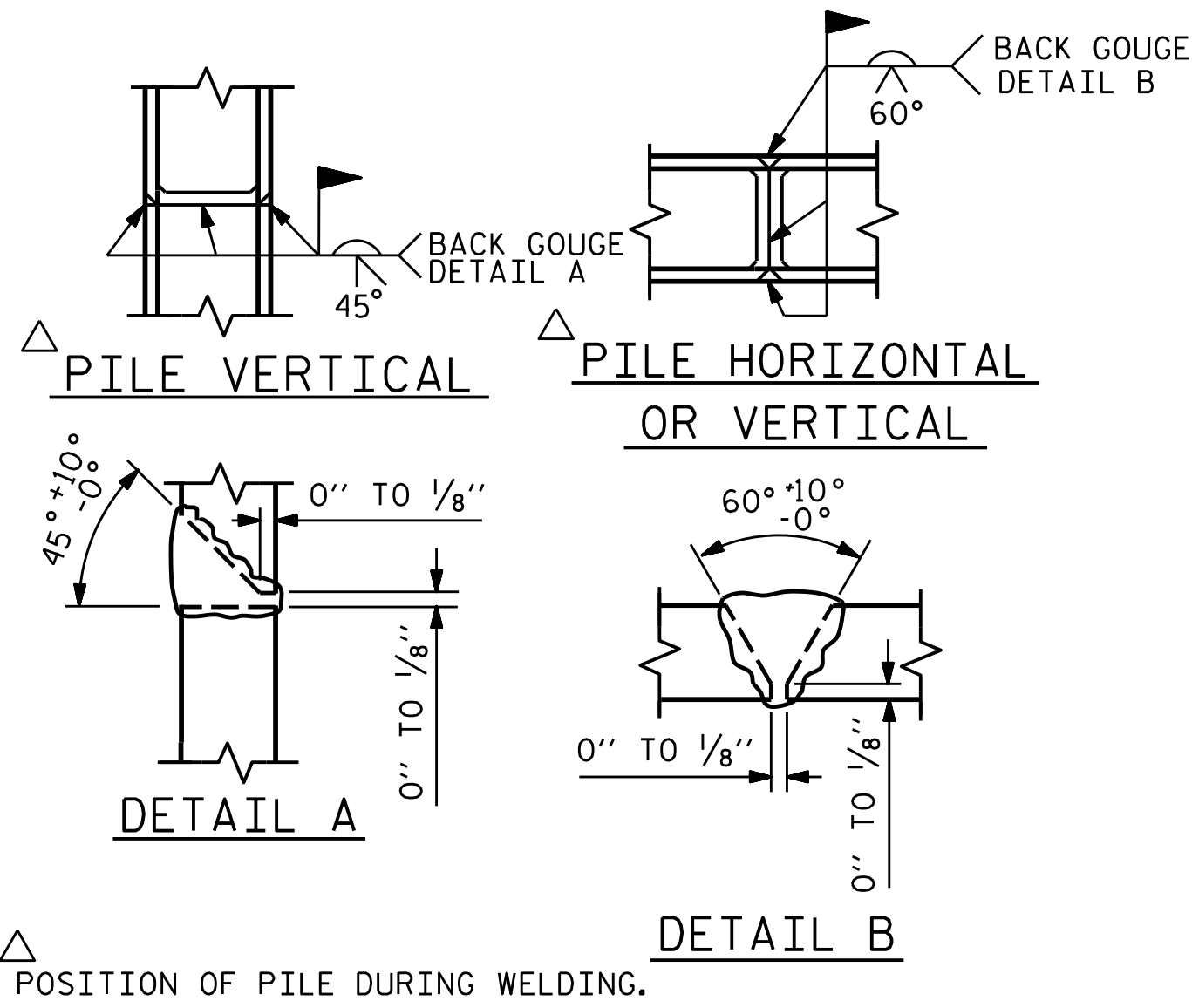


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

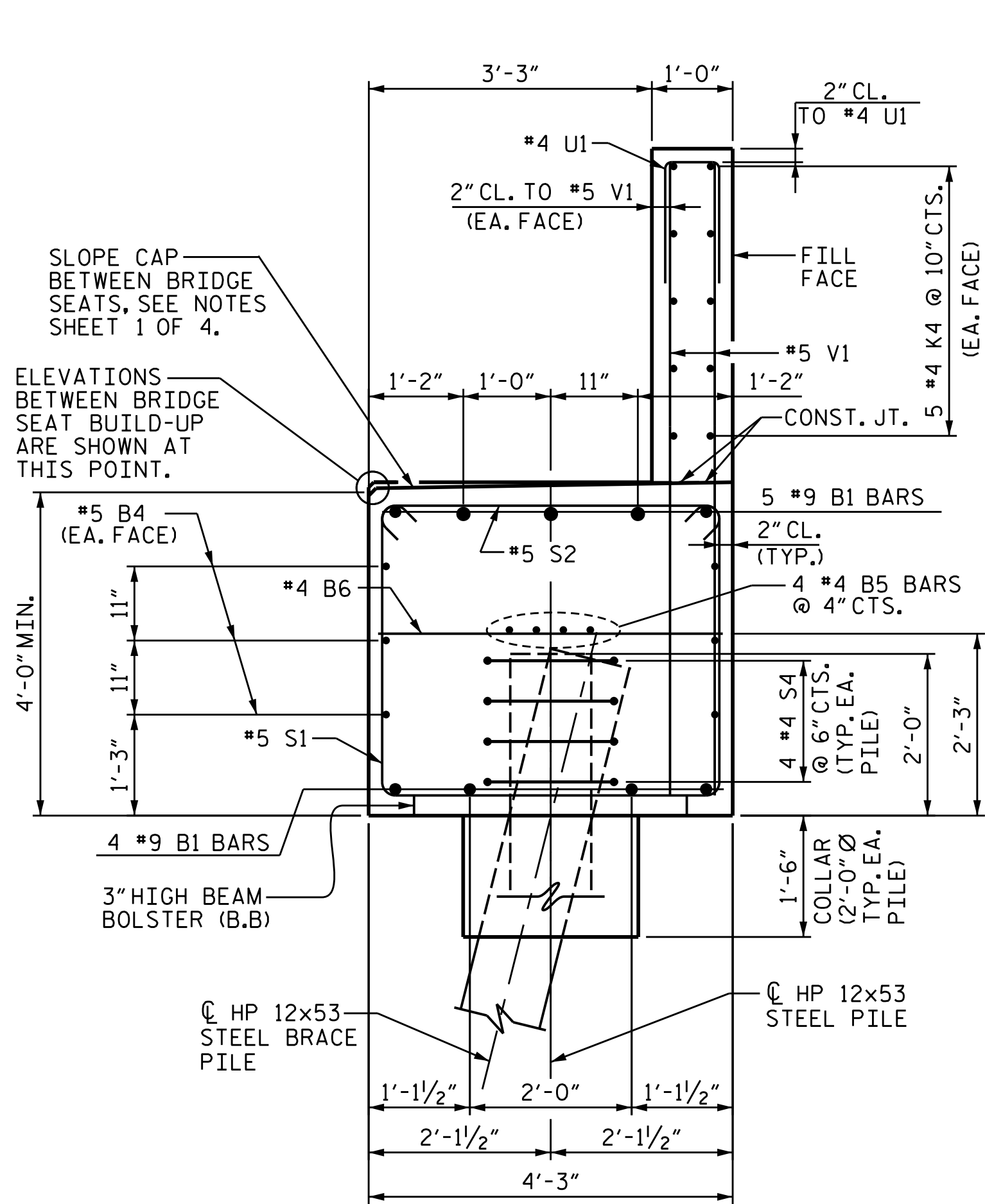
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

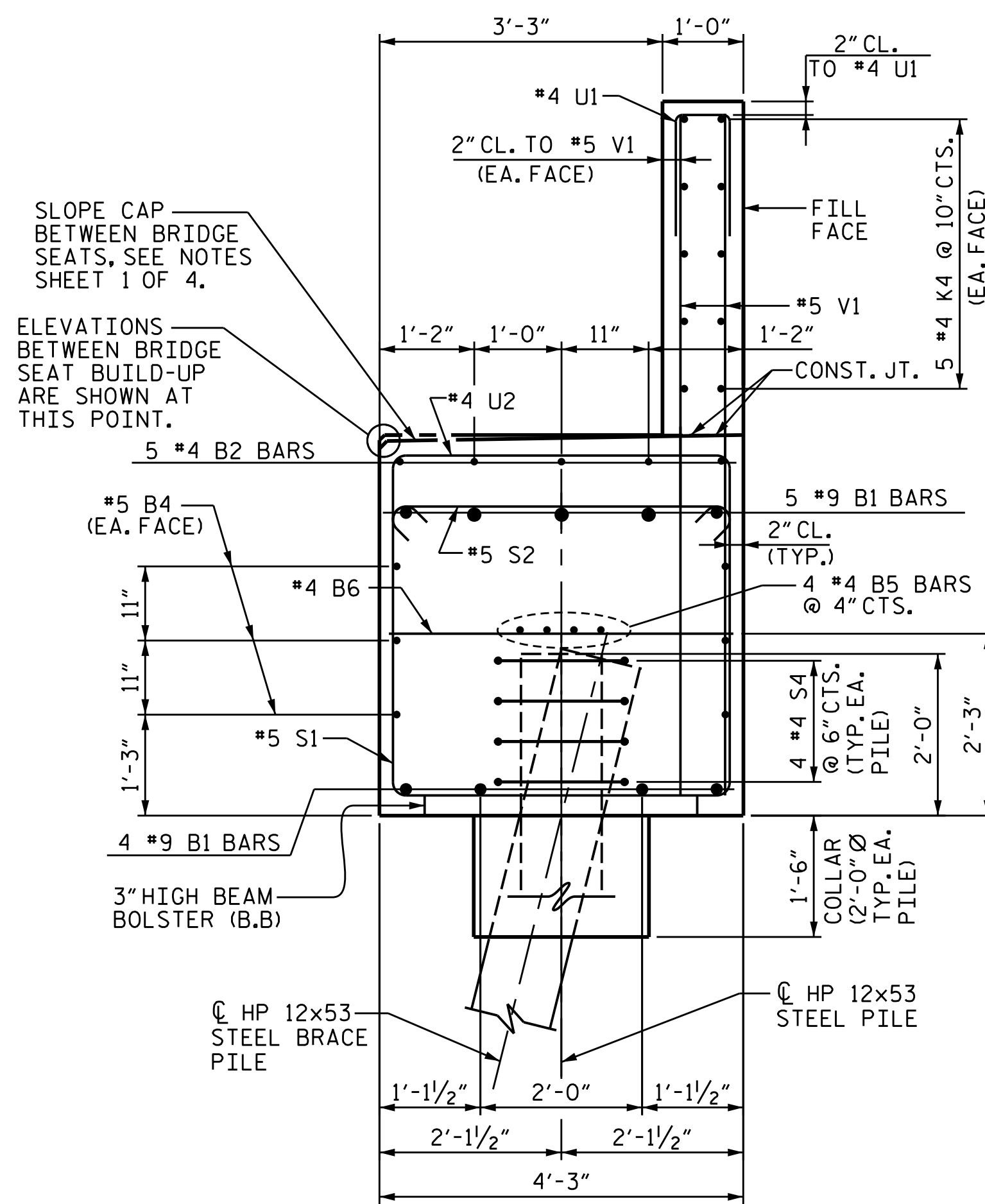
TEMPORARY DRAINAGE AT END BENT



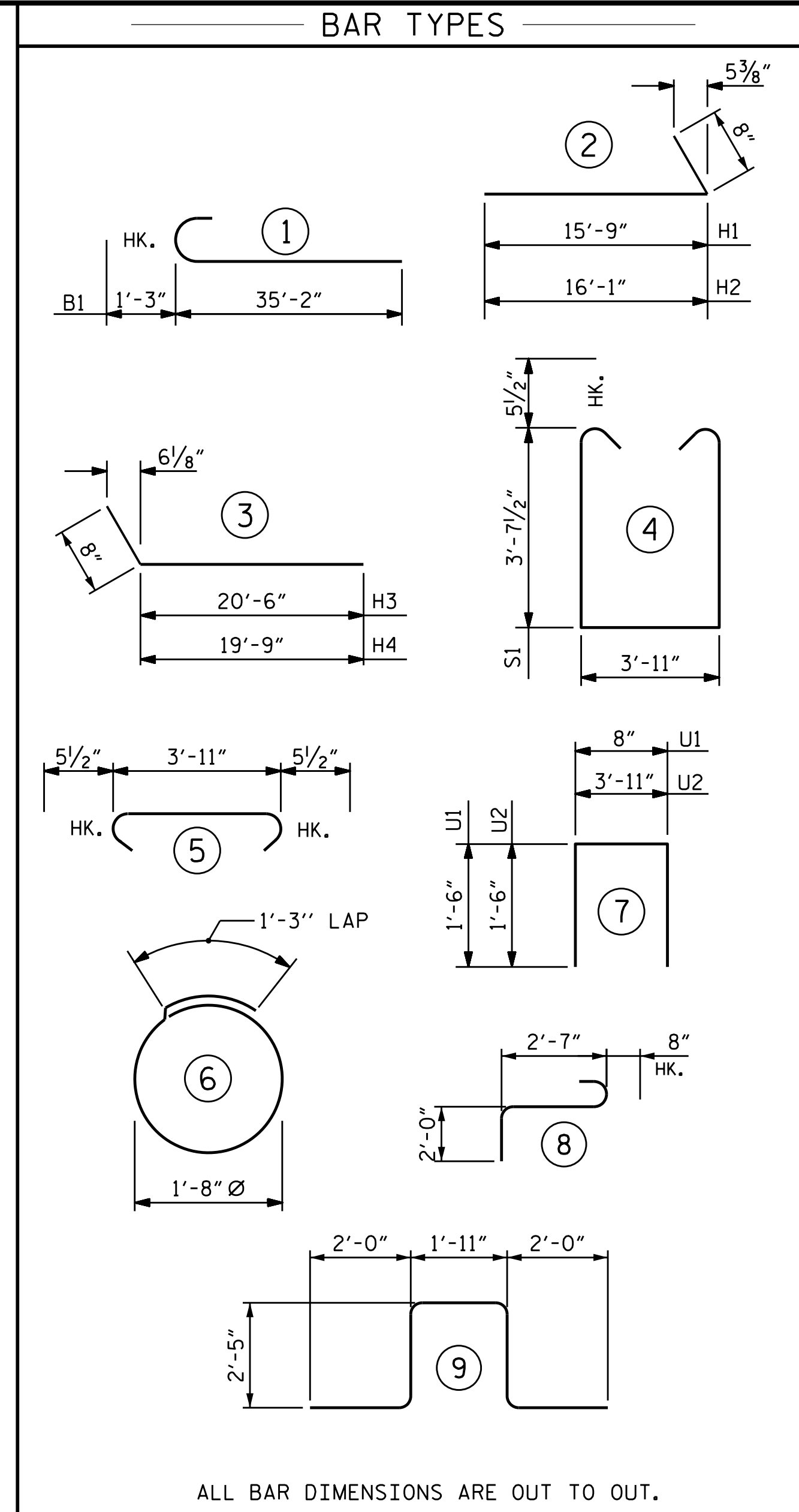
PILE SPLICE DETAILS



SECTION A-A



SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL END BENT 2

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9	1	36'-5"	2229
B2	#4	STR	9'-0"	90
B3	#4	STR	14'-7"	49
B4	#5	STR	34'-2"	428
B5	#4	STR	33'-9"	180
B6	#4	STR	3'-11"	42
H1	#4	2	16'-5"	121
H2	#4	2	16'-9"	123
H3	#4	3	21'-2"	198
H4	#4	3	20'-5"	191
K1	#4	STR	4'-0"	11
K2	#4	STR	4'-7"	6
K3	#4	STR	4'-9"	6
K4	#4	STR	34'-2"	456
S1	#5	4	12'-1"	655
S2	#5	5	4'-10"	262
S3	#4	6	6'-6"	191
S5	#6	8	5'-3"	47
S6	#6	9	10'-9"	97
U1	#4	7	3'-8"	137
U2	#4	7	6'-11"	129
V1	#5	STR	7'-11"	925
V2	#5	STR	10'-0"	511
V3	#5	STR	9'-5"	422

REINFORCING STEEL 7506 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS	54.2 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	16.7 C.Y.
TOTAL CLASS A CONCRETE	70.9 C.Y.

HP 12 X 53 STEEL PILES
NO: 13 195 LIN. FT.

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES 13 EA.

PILE EXCAVATION IN SOIL 90.00 L.F.

PILE EXCAVATION NOT IN SOIL 20.00 L.F.

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 4 OF 4

DRAWN BY: NMW DATE: 8/22
CHECKED BY: MGC DATE: 10/22
DESIGN ENGINEER OF RECORD: ZCS DATE: 1/23

Professional Engineer Seal for Marshall G. Cheek, Jr., License No. 58002P3400413, dated 11/15/2023.

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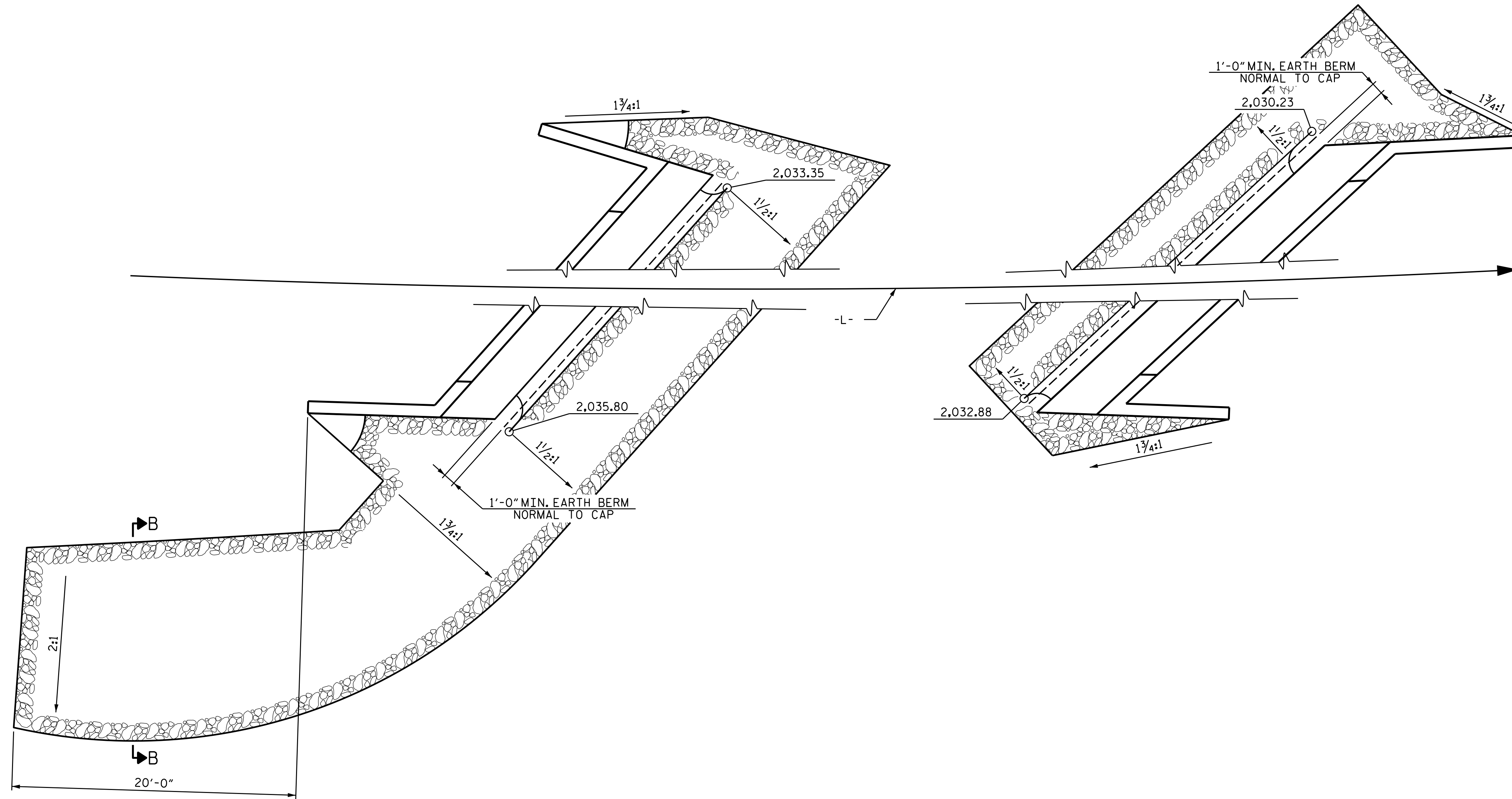
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
DETAILS

REVISIONS			SHEET NO.
NO.	BY	DATE	S-42
1			TOTAL SHEETS 47
2			

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



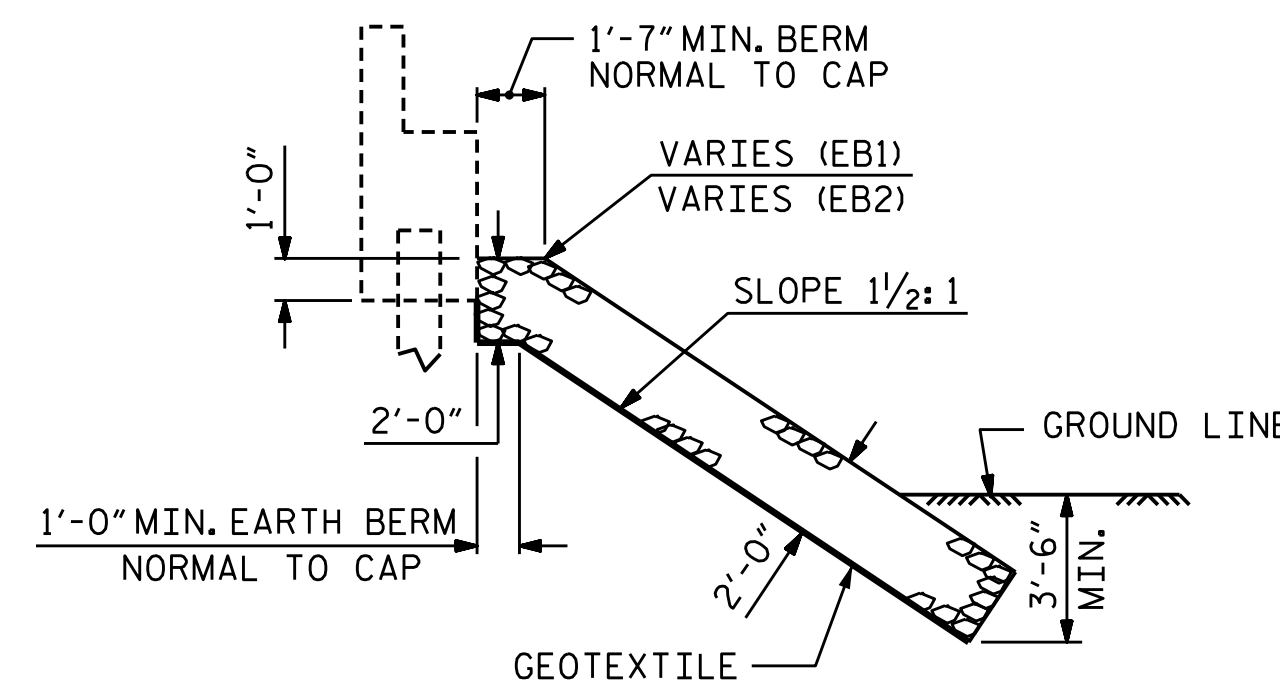
END BENT 1

END BENT 2

PLAN

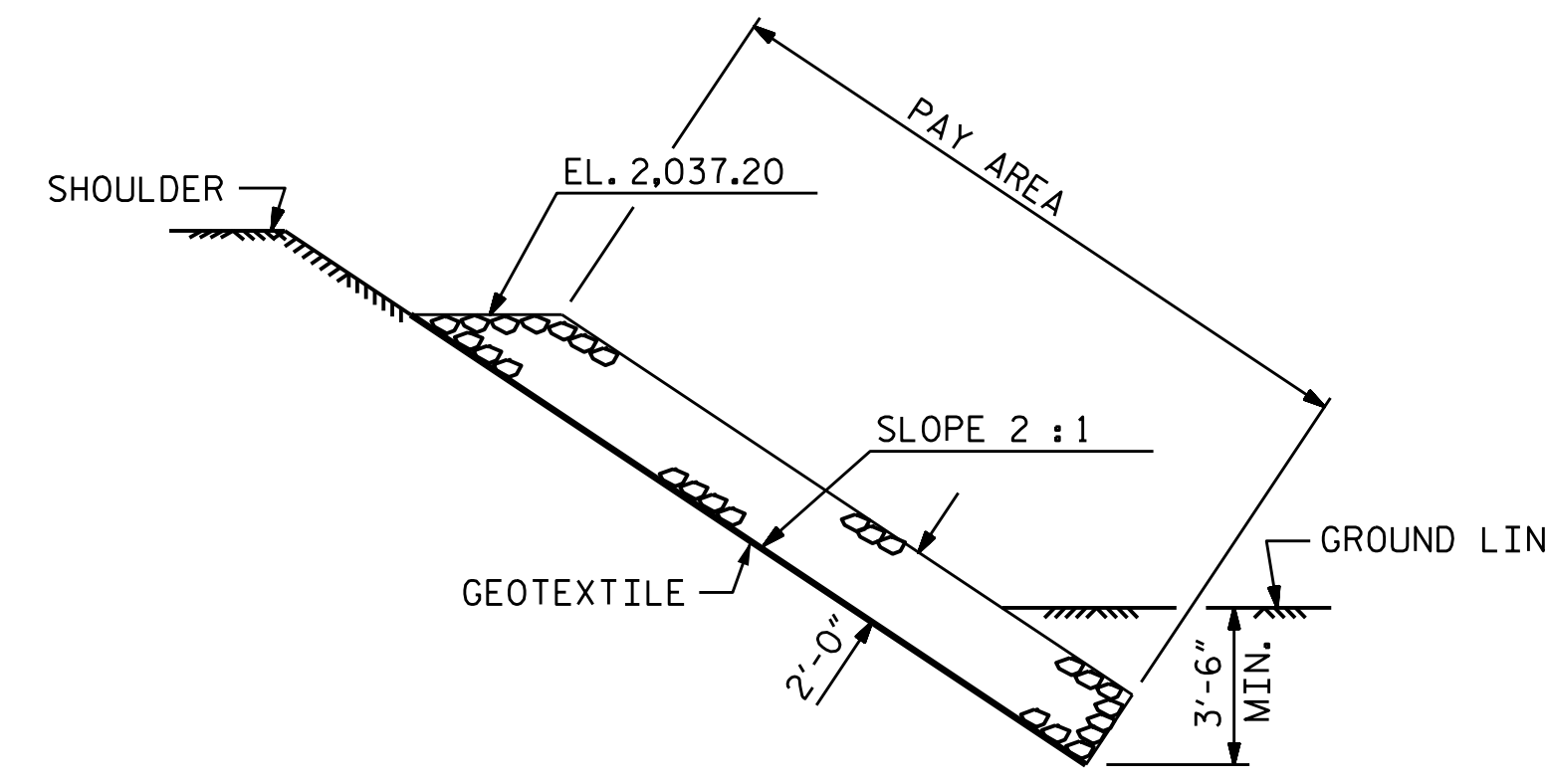
ESTIMATED QUANTITIES		
BRIDGE @ STA. 24+58.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	165	180
END BENT 2	70	80

PROJECT NO. 17BP.14.R.204
JACKSON COUNTY
STATION: 24+58.00-L-

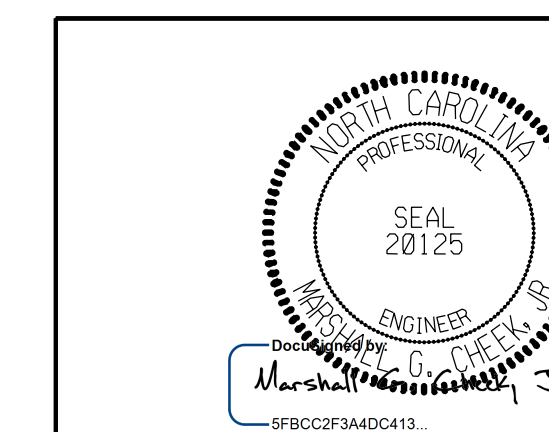


SECTION C-C

BERM RIP RAPPED



SECTION B-B



11/15/2023 | 7:42 AM EST

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

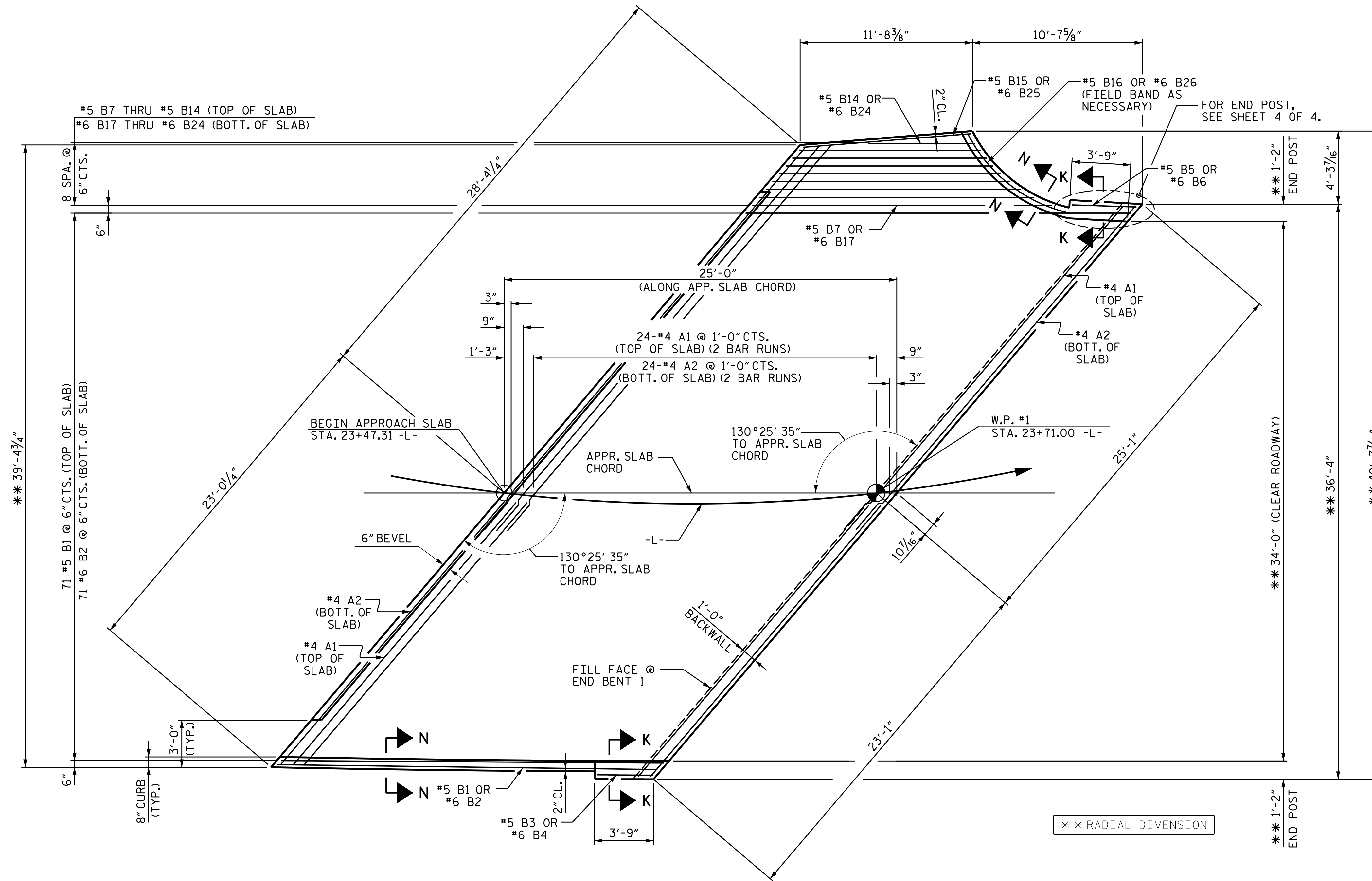
RIP RAP DETAILS

DRAWN BY : JLA DATE : 10/22
CHECKED BY : MGC DATE : 10/22

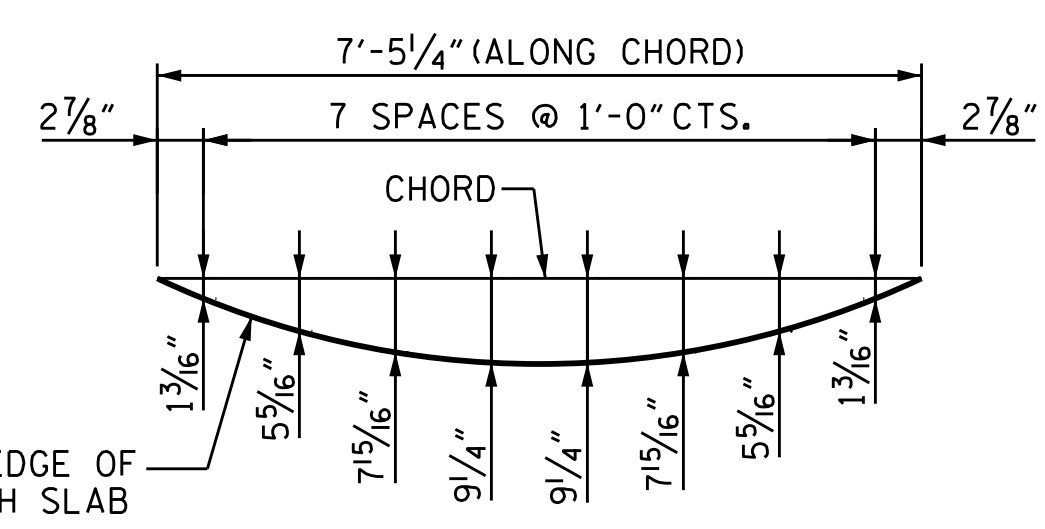
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			47



PLAN OF APPROACH SLAB @ END BENT 1



ARC OFFSETS - LEFT SIDE
RIGHT SIDE ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE, NOT PROVIDED.

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	26'-4"	915
A2	52	#4	STR	26'-0"	903
*B1	72	#5	STR	23'-9"	1784
B2	72	#6	STR	24'-5"	2641
*B3	1	#5	STR	3'-7"	4
B4	1	#6	STR	3'-7"	5
*B5	1	#5	STR	4'-0"	4
B6	1	#6	STR	4'-0"	6
*B7	1	#5	STR	18'-5"	19
*B8	1	#5	STR	17'-0"	18
*B9	1	#5	STR	15'-9"	16
*B10	1	#5	STR	14'-9"	15
*B11	1	#5	STR	13'-9"	14
*B12	1	#5	STR	12'-10"	13
*B13	1	#5	STR	12'-0"	13
*B14	1	#5	STR	4'-1"	4
*B15	1	#5	STR	9'-3"	10
*B16	1	#5	STR	7'-10"	8
B17	1	#6	STR	18'-5"	28
B18	1	#6	STR	17'-0"	26
B19	1	#6	STR	15'-9"	24
B20	1	#6	STR	14'-9"	22
B21	1	#6	STR	13'-9"	21
B22	1	#6	STR	12'-10"	19
B23	1	#6	STR	12'-0"	18
B24	1	#6	STR	4'-1"	6
B25	1	#6	STR	9'-3"	14
B26	1	#6	STR	7'-10"	12
REINFORCING STEEL				LBS.	3745
* EPOXY COATED REINFORCING STEEL				LBS.	2837
CLASS AA CONCRETE				C. Y.	42.2

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

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB

11/15/2023 | 7:42 AM EST

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TGS ENGINEERS
 201 W. MARION ST STE 200
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 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS 47
2			4			

DRAWN BY : NMW DATE : 9/22
 CHECKED BY : SBW DATE : 9/22

BILL OF MATERIAL
APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	33'-1"	1149
A2	52	#4	STR	32'-11"	1143
*B1	71	#5	STR	23'-9"	1759
B2	71	#6	STR	24'-5"	2604
*B3	1	#5	STR	3'-7"	4
B4	1	#6	STR	3'-7"	5
*B5	1	#5	STR	4'-3"	4
B6	1	#6	STR	4'-3"	6
*B7	1	#5	STR	16'-10"	18
*B8	1	#5	STR	14'-7"	15
*B9	1	#5	STR	12'-8"	13
*B10	1	#5	STR	11'-0"	12
*B11	1	#5	STR	9'-6"	11
*B12	1	#5	STR	8'-1"	8
*B13	1	#5	STR	6'-9"	7
*B14	1	#5	STR	5'-6"	6
*B15	1	#5	STR	4'-4"	5
*B16	1	#5	STR	3'-11"	4
*B17	1	#5	STR	2'-10"	3
*B18	1	#5	STR	2'-6"	3
*B19	1	#5	STR	14'-1"	15
B20	1	#6	STR	17'-7"	26
B21	1	#6	STR	15'-4"	23
B22	1	#6	STR	13'-5"	20
B23	1	#6	STR	11'-9"	18
B24	1	#6	STR	10'-3"	15
B25	1	#6	STR	8'-10"	13
B26	1	#6	STR	7'-6"	11
B27	1	#6	STR	6'-3"	9
B28	1	#6	STR	5'-1"	8
B29	1	#6	STR	3'-11"	6
B30	1	#6	STR	2'-10"	4
B31	1	#6	STR	2'-5"	4
B32	1	#6	STR	14'-1"	21
REINFORCING STEEL				LBS.	3936
* EPOXY COATED REINFORCING STEEL				LBS.	3034
CLASS AA CONCRETE				C. Y.	41.7

SPLICE LENGTHS

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

PROJECT NO. 17BP.14.R.204
 JACKSON COUNTY
 STATION: 24+58.00-L
 SHEET 2 OF 4

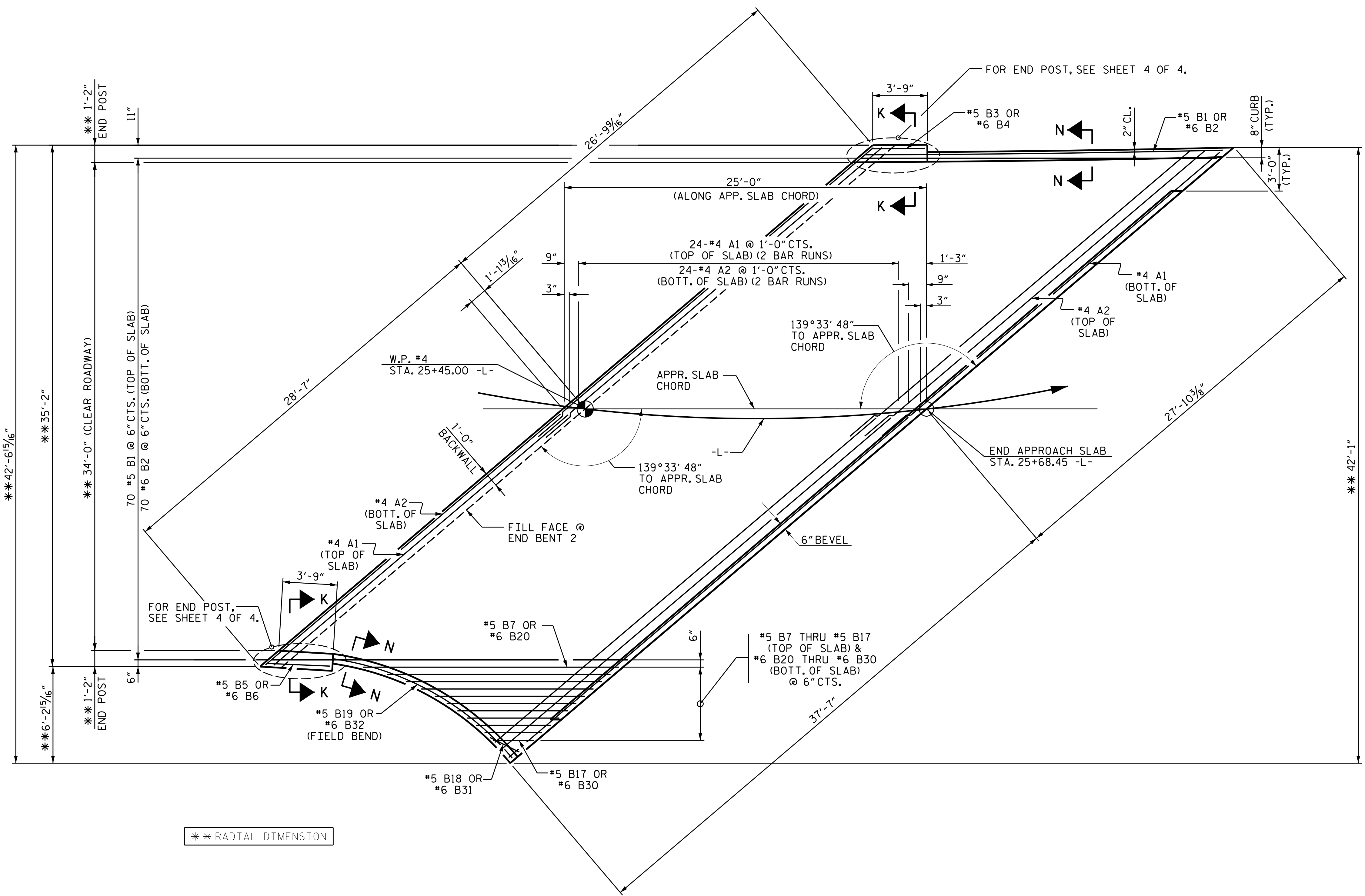
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLABS

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

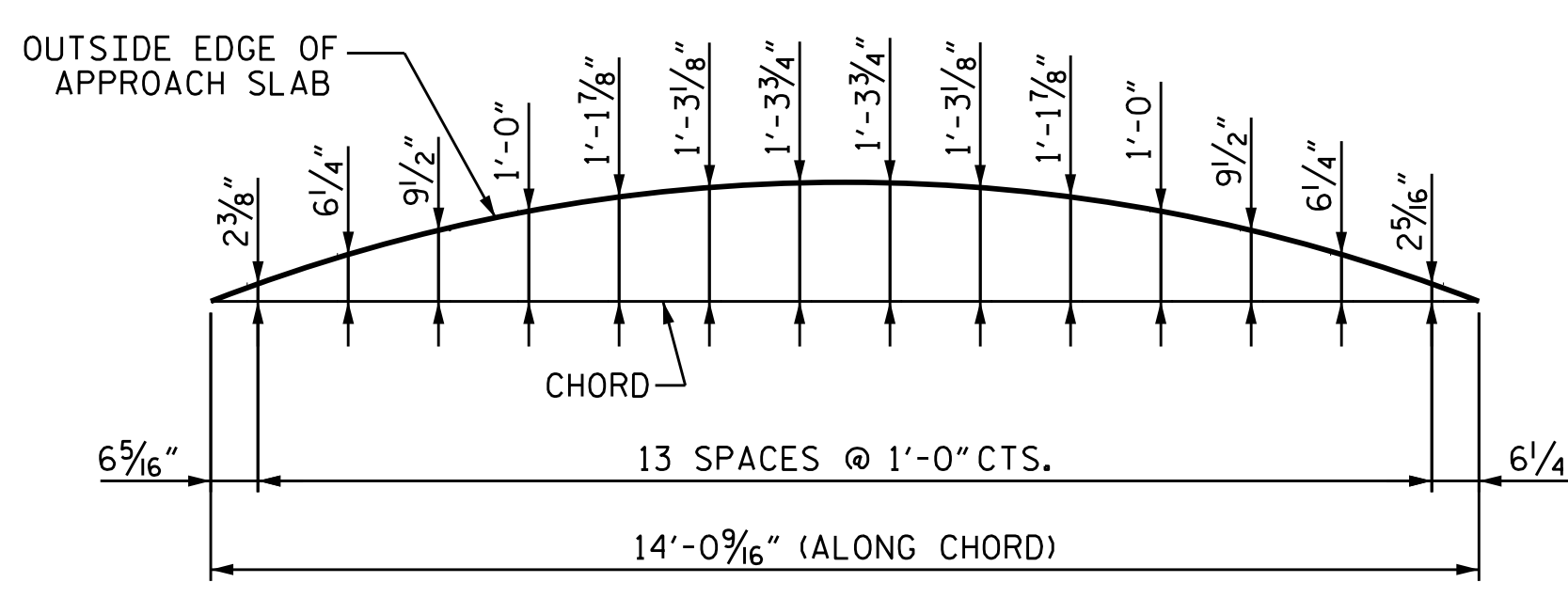
TGS ENGINEERS
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 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			47



** RADIAL DIMENSION

PLAN OF APPROACH SLAB @ END BENT 2



ARC OFFSETS - RIGHT SIDE

LEFT SIDE ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE, NOT PROVIDED.

DRAWN BY: NMW DATE: 9/22
 CHECKED BY: SBW DATE: 9/22

NOTES

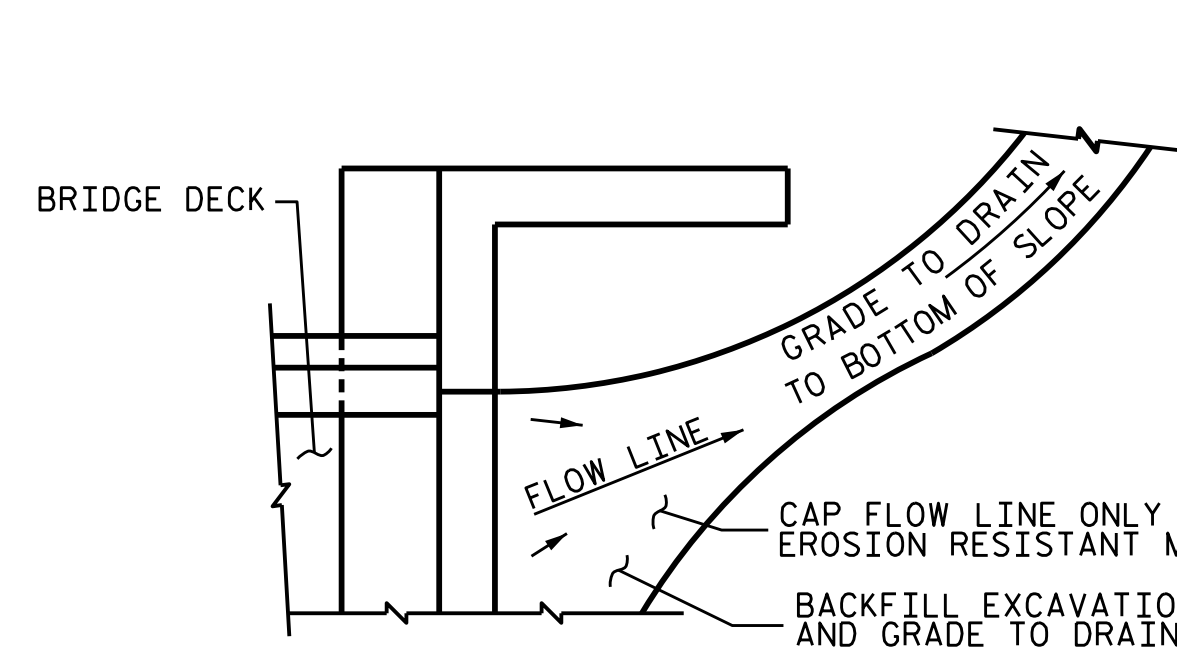
FOR APPROACH FILL, SEE ROADWAY PLANS.

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

APPROACH SLAB GROOVING IS REQUIRED.

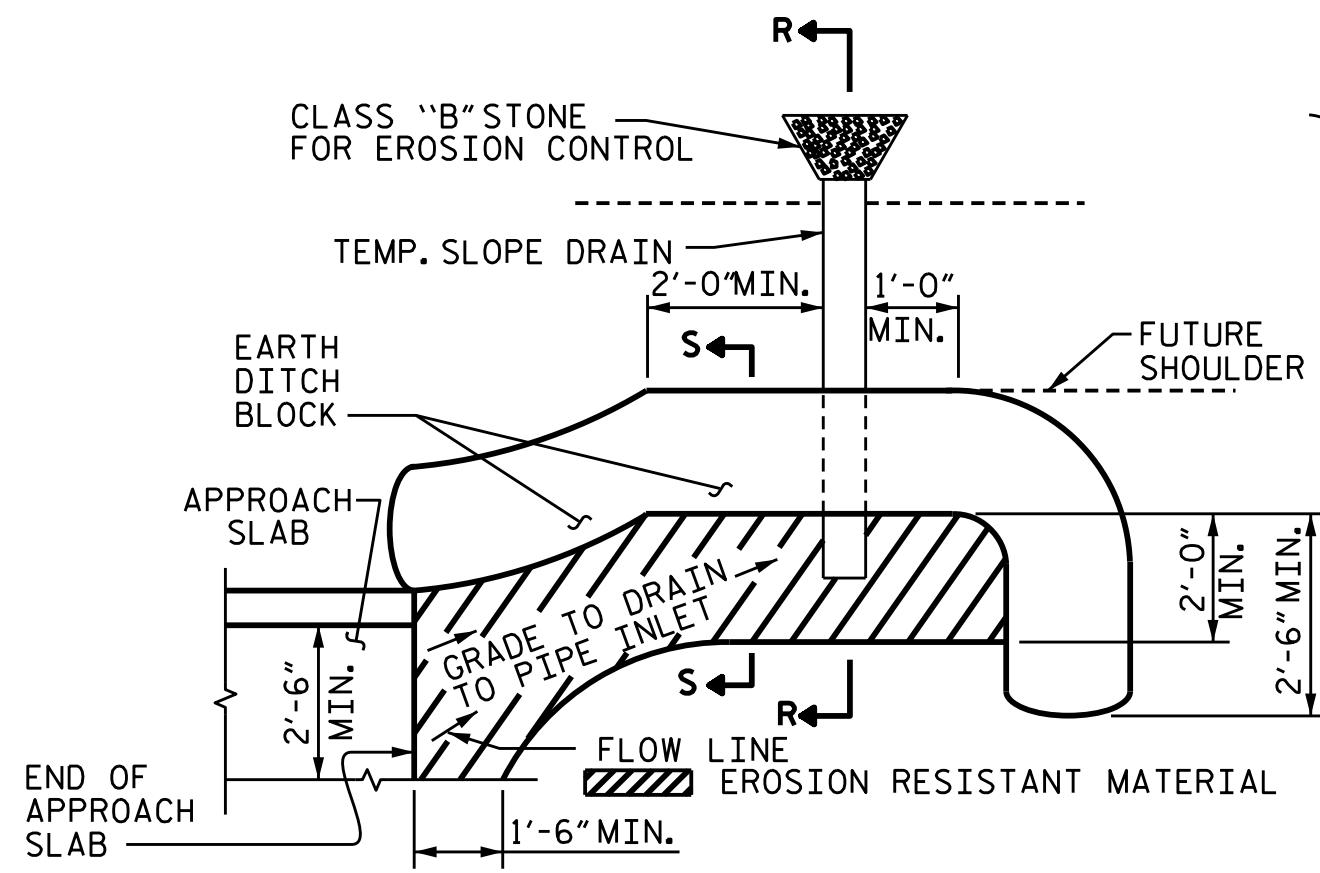
PAYMENT FOR APPROACH SLAB GROOVING IS INCLUDED IN "GROOVING BRIDGE FLOORS" PAY ITEM

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



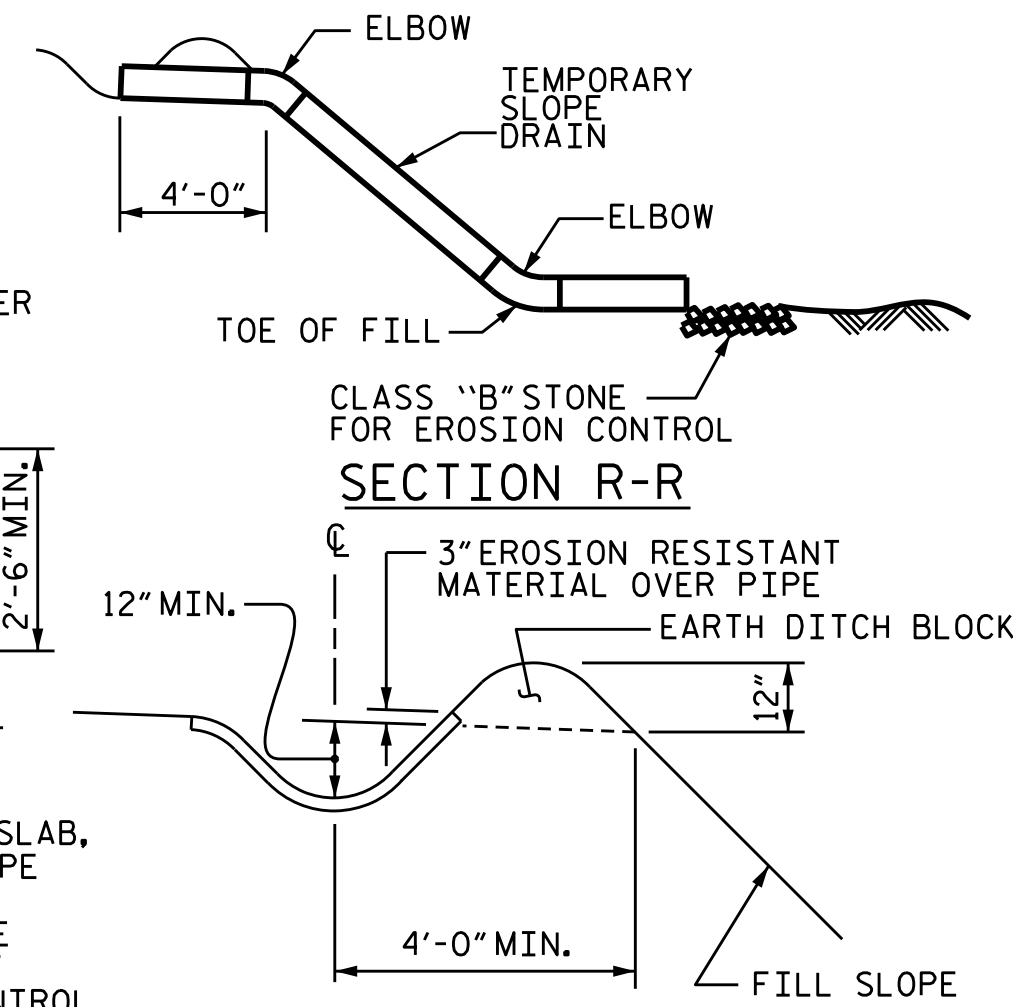
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

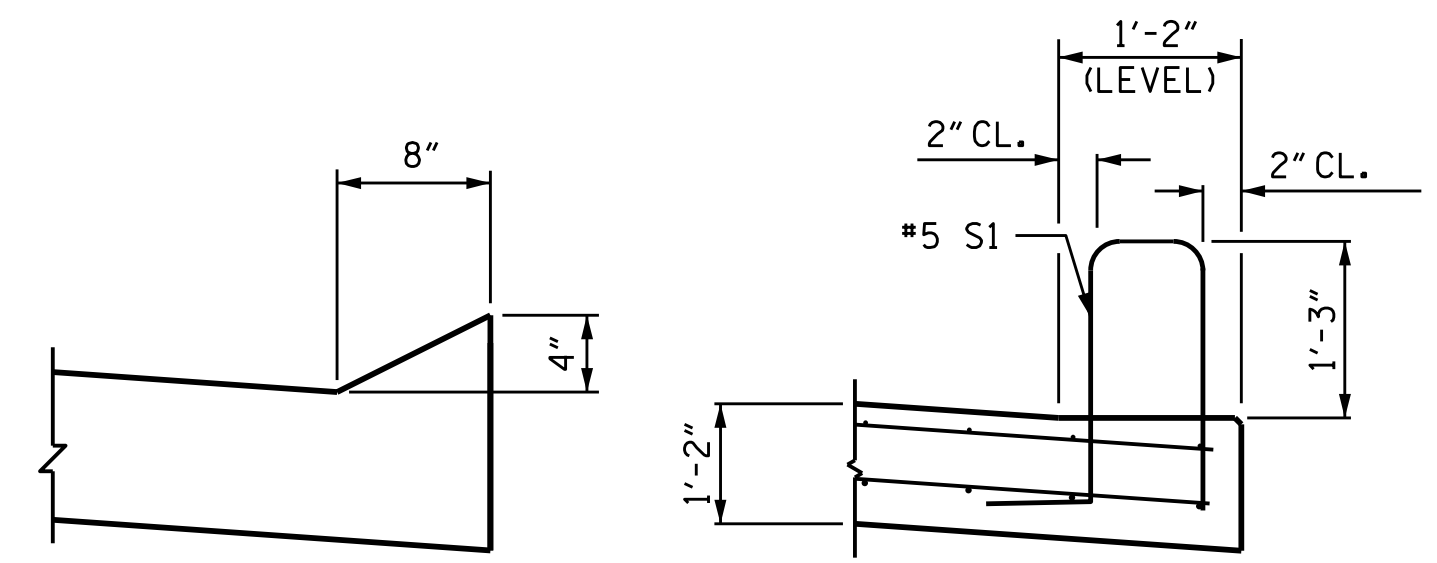
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

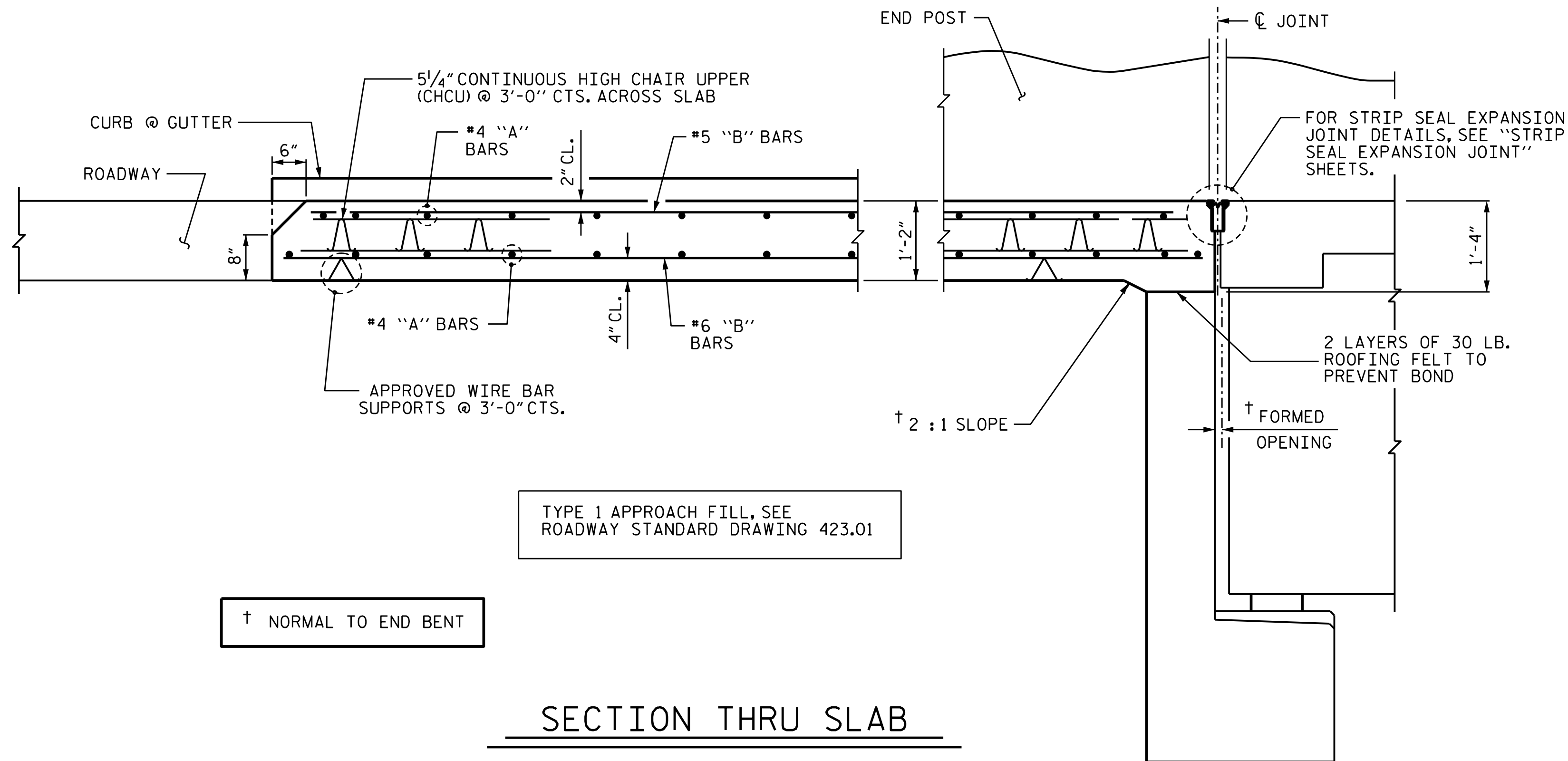
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

SECTION K-K

CURB DETAILS



TYPE 1 APPROACH FILL, SEE ROADWAY STANDARD DRAWING 423.01

† NORMAL TO END BENT

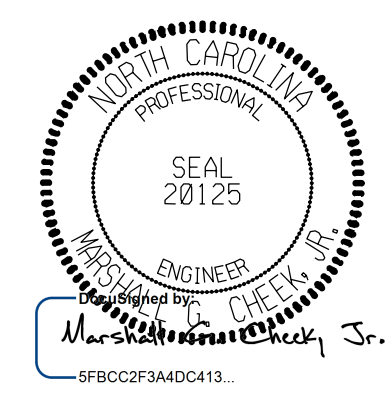
SECTION THRU SLAB

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 3 OF 4



11/15/2023 | 7:42 AM EST

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE
APPROACH SLABS

ASSEMBLED BY : NMW	DATE : 9/22
CHECKED BY : SBW	DATE : 9/22
DRAWN BY : EEM 3/95	REV. 6/13 MAA/GM
CHECKED BY : VAP 3/95	REV. 12/17 MAA/THC
	REV. 07/23 BNB/SNM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS					
201 W. MARION ST STE 200					
SHELBY, NC 28150					
PH (704) 476-0003					
CORP. LICENSE NO.: C-0275					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-46
TOTAL SHEETS					47

STD. NO. BAS2

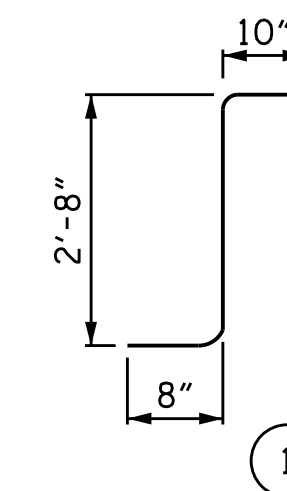
NOTES

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.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL END POSTS @ EB1

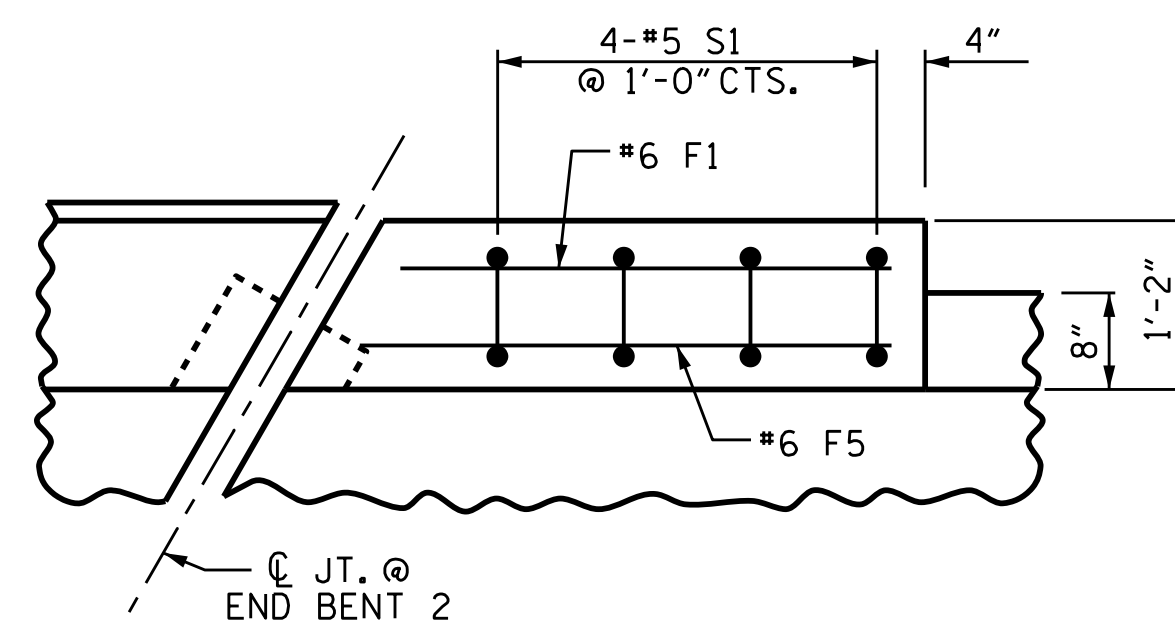
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	4	#7	STR	2'-7"	21
*E2	4	#7	STR	2'-11"	24
*E3	4	#7	STR	3'-4"	27
*E4	4	#7	STR	3'-8"	30
*E5	4	#7	STR	4'-0"	33
*E6	2	#7	STR	4'-5"	18
*F1	8	#6	STR	3'-6"	42
*F2	2	#6	STR	3'-2"	10
*F3	2	#6	STR	1'-8"	5
*F4	2	#6	STR	4'-0"	12
*F5	8	#6	STR	4'-1"	49
*F6	2	#6	STR	3'-9"	11
*F7	2	#6	STR	2'-3"	7
*F8	2	#6	STR	4'-7"	14
*S1	8	#5	1	6'-10"	57

* EPOXY COATED REINFORCING STEEL LBS. 360
CLASS AA CONCRETE CU.YDS. 1.5

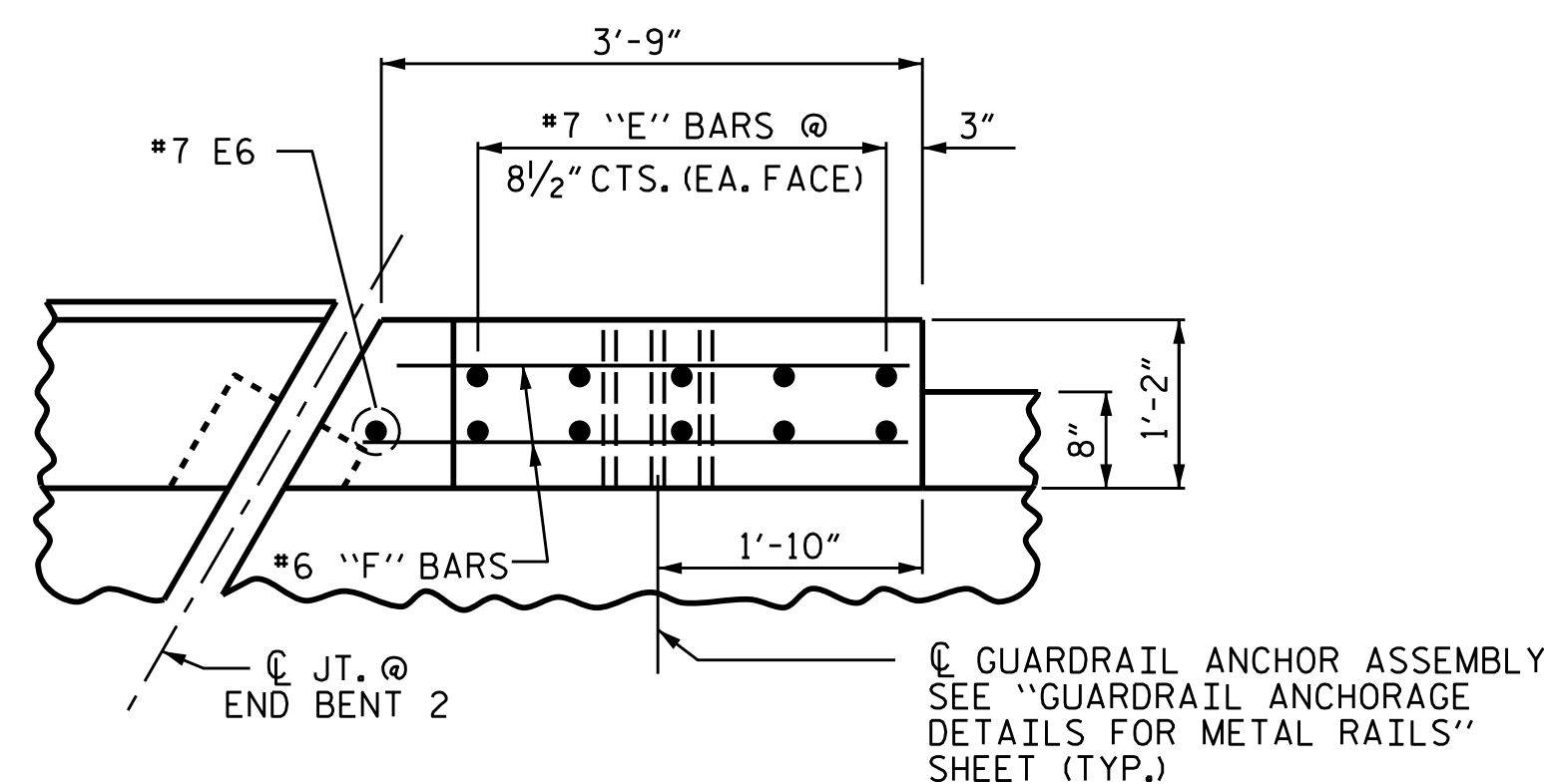
BILL OF MATERIAL FOR END POSTS @ EB2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	4	#7	STR	2'-6"	20
*E2	4	#7	STR	2'-10"	23
*E3	4	#7	STR	3'-2"	26
*E4	4	#7	STR	3'-6"	29
*E5	4	#7	STR	3'-10"	31
*E6	2	#7	STR	4'-6"	18
*F1	8	#6	STR	3'-6"	42
*F2	2	#6	STR	3'-3"	10
*F3	2	#6	STR	1'-8"	5
*F4	2	#6	STR	4'-1"	12
*F5	8	#6	STR	4'-3"	51
*F6	2	#6	STR	4'-0"	12
*F7	2	#6	STR	2'-5"	7
*F8	2	#6	STR	4'-10"	15
*S1	8	#5	1	6'-10"	57

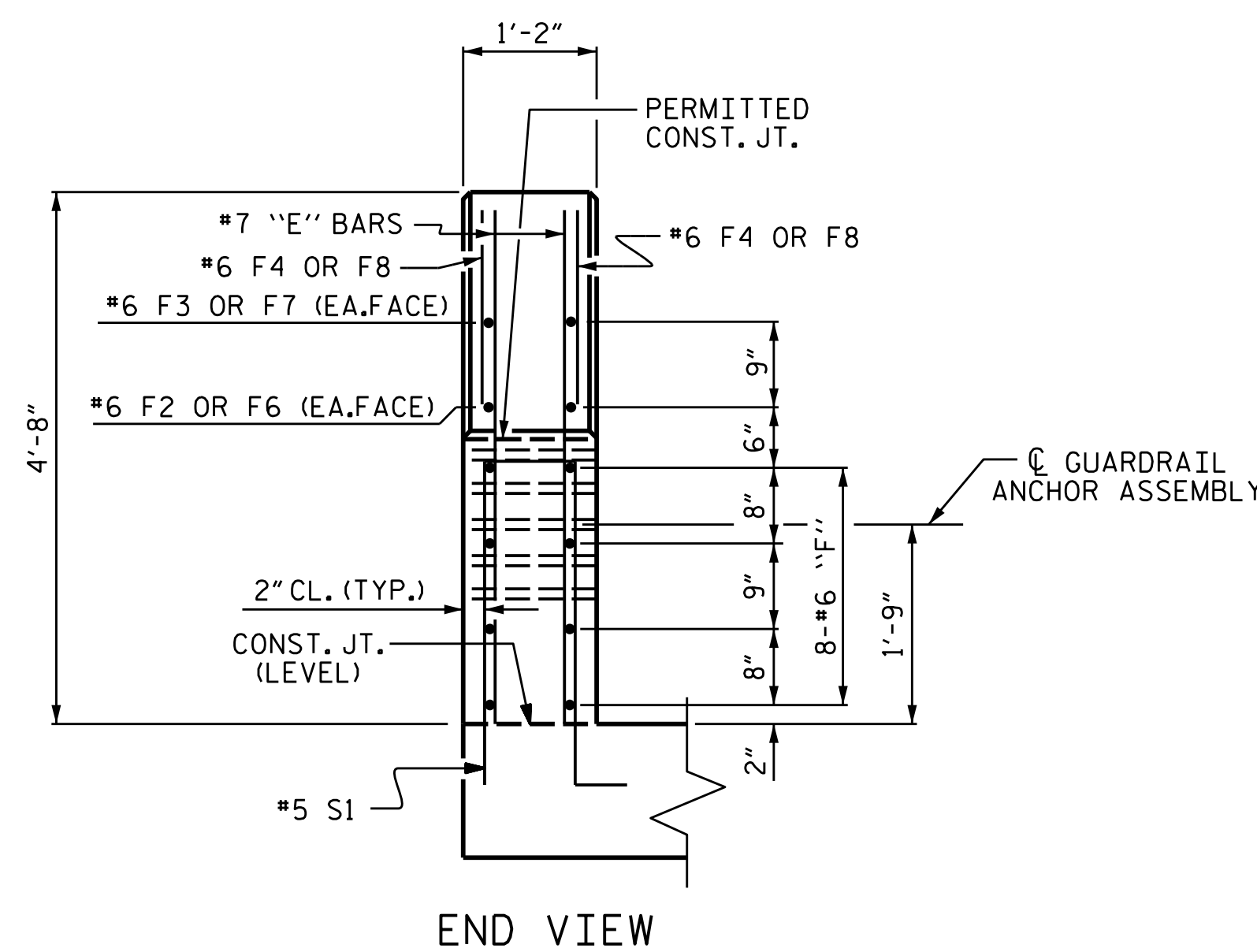
* EPOXY COATED REINFORCING STEEL LBS. 358
CLASS AA CONCRETE CU.YDS. 1.5



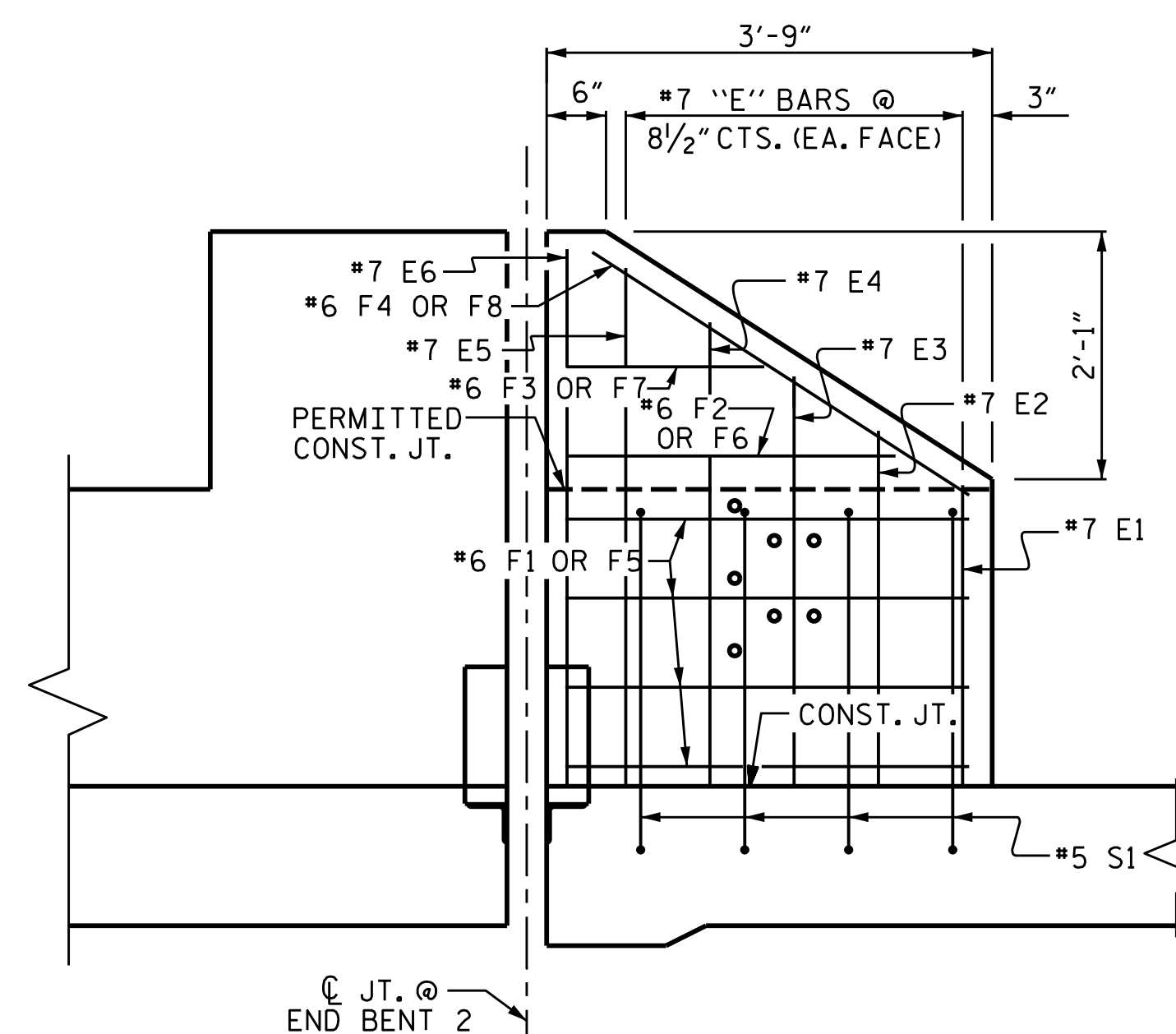
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

END POST FOR TWO BAR RAIL

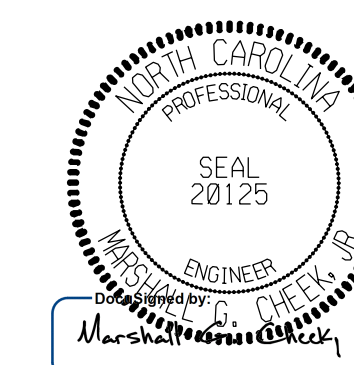
END BENT 2 SHOWN, END BENT 1 SIMILAR

PROJECT NO. 17BP.14.R.204

JACKSON COUNTY

STATION: 24+58.00-L-

SHEET 4 OF 4



11/15/2023 | 7:42 AM EST

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH
SLAB DETAILS

REVISIONS

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

SHEET NO.

S-47

TOTAL SHEETS

47

STD. NO. BAS4

ASSEMBLED BY :	NMW	DATE :	9/22
CHECKED BY :	SBW	DATE :	9/22
DRAWN BY :	FCJ	11/88	REV. 6/13
CHECKED BY :	ARB	11/88	REV. 12/17
			REV. 5/18
			MAA/GM
			MAA/THC
			MAA/THC

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$ " 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 $\frac{1}{16}$ " OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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