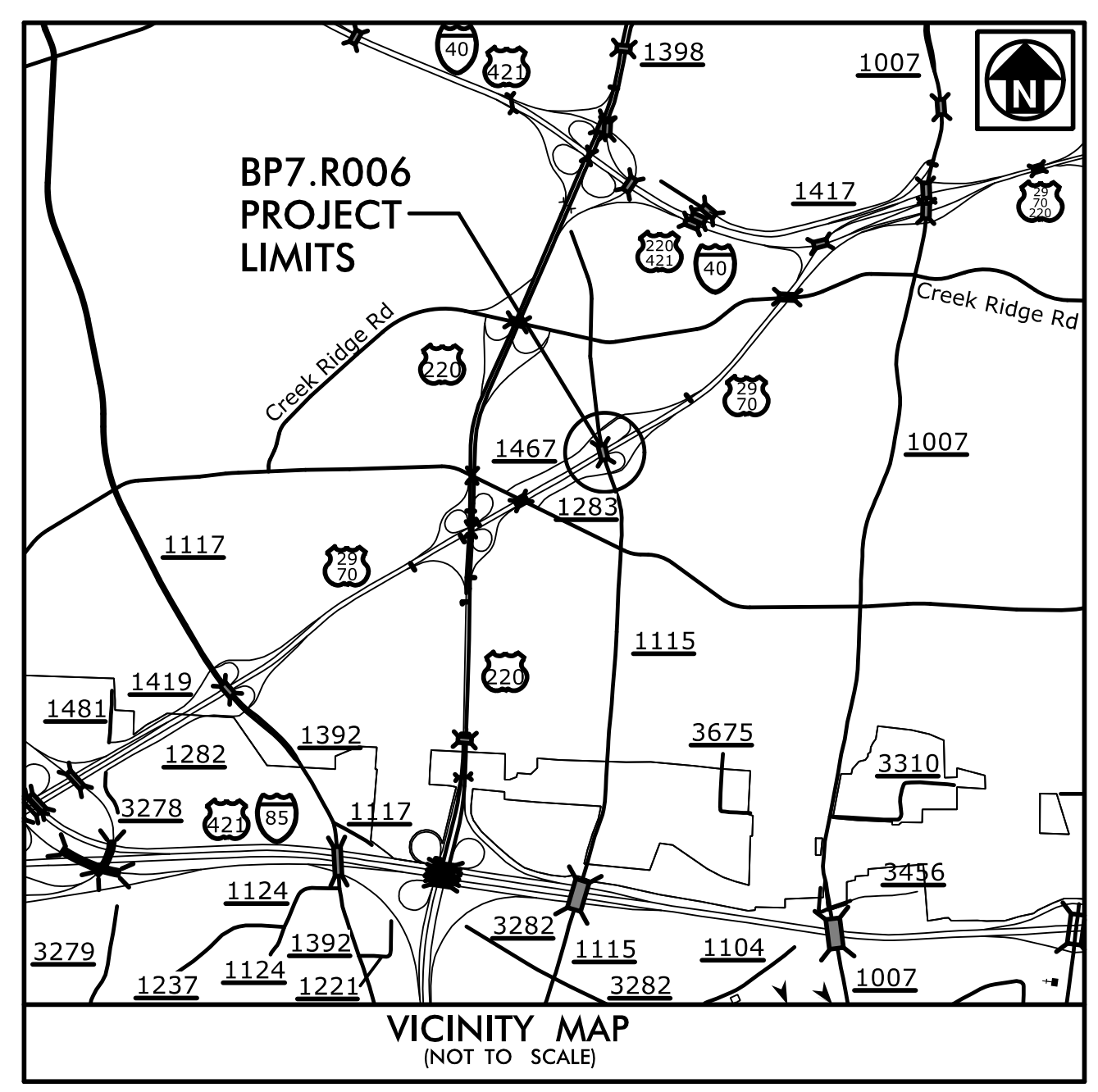


09, 02B, 019

PROJECT: BP7.R006

CONTRACT: C204813



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

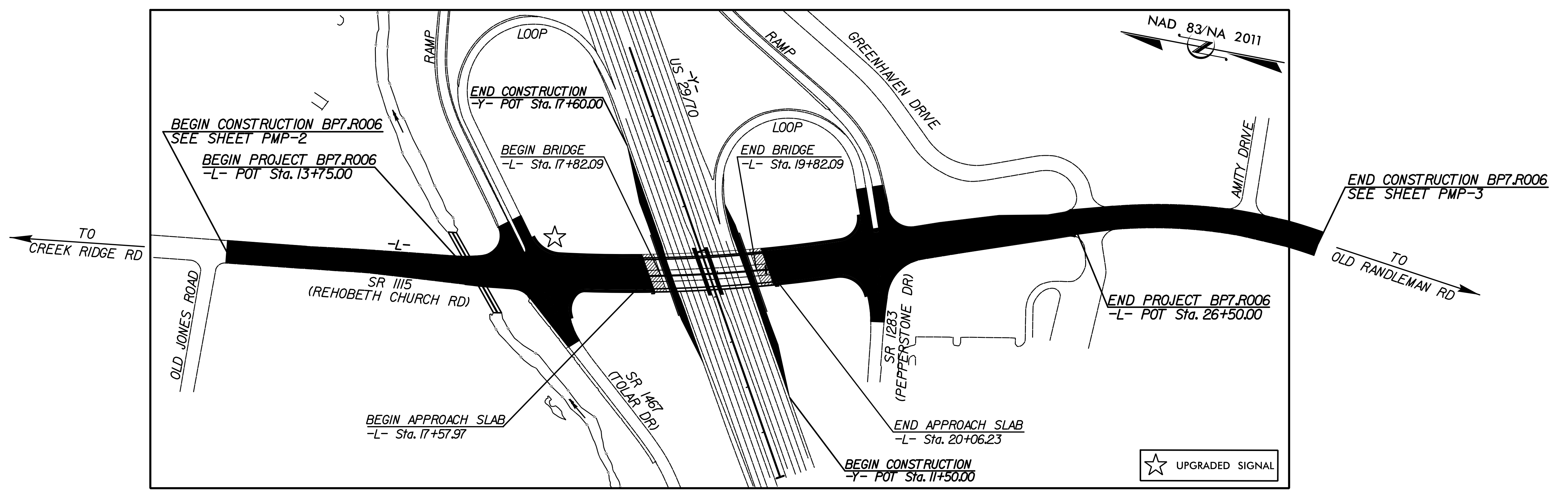
# GUILFORD COUNTY

LOCATION: BRIDGE NO. 225 OVER US 29/70 ON SR 1115  
(REHOBETH CHURCH ROAD) IN GREENSBORO

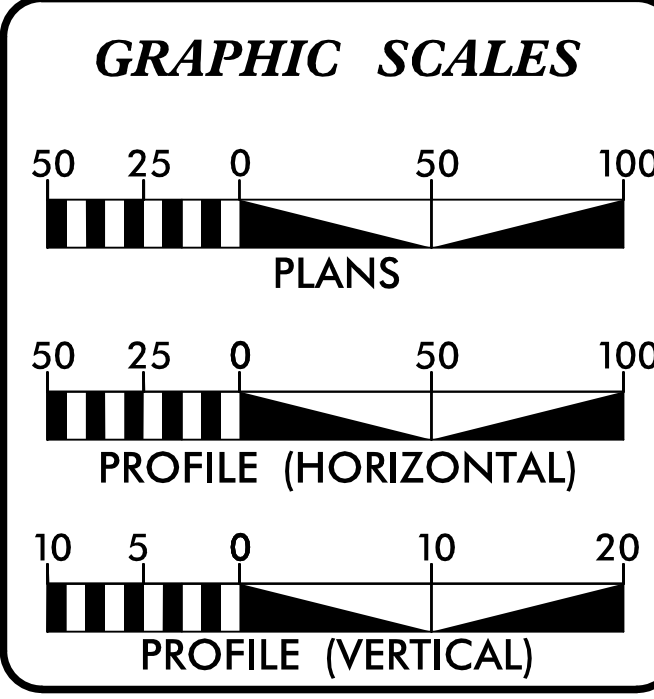
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNAL AND STRUCTURE

## STRUCTURE PLANS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP7.R006	1	58
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP7.R006.1		PE	
BP7.R006.2		ROW	
BP7.R006.3		CONSTRUCTION	



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT (2015) = 6,700  
ADT (2025) = 13,400

V = 35 MPH

FUNC CLASS =  
SUB REGIONAL TIER  
COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.203 MILES

LENGTH STRUCTURE PROJECT = 0.038 MILES

TOTAL LENGTH PROJECT = 0.241 MILES

Prepared In the Office of WGI for  
**DIVISION 7**  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: DAVID SIMPSON, PE  
PROJECT ENGINEER

LETTING DATE: REID B. ROBOL, PE  
APRIL 18, 2023  
HYDRAULIC ENGINEER

NCDOT CONTACT: TIM POWERS, PE  
DIVISION BRIDGE  
PROGRAM MANAGER

ENGINEER

2/7/2023 | 8:52 AM PST

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

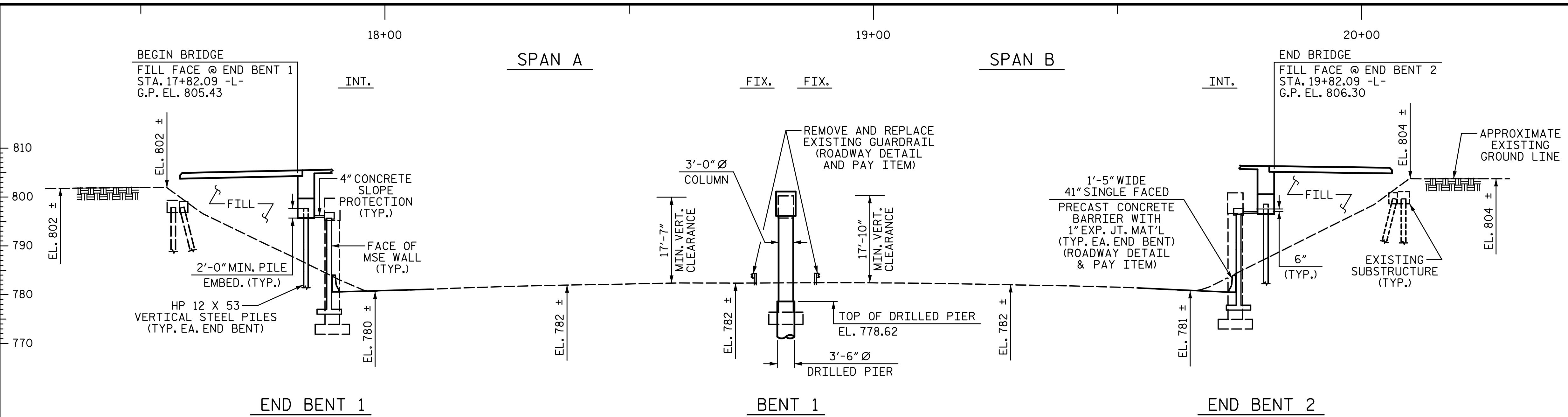
PLANS PREPARED BY:

5640 Dillard Drive, Suite 200  
Cary, NC 27518

LICENSURE NO. C-4434

\$\$\$ SYSTEM \$\$\$  
\$\$\$ DGN \$\$\$  
\$\$\$ USERNAME \$\$\$

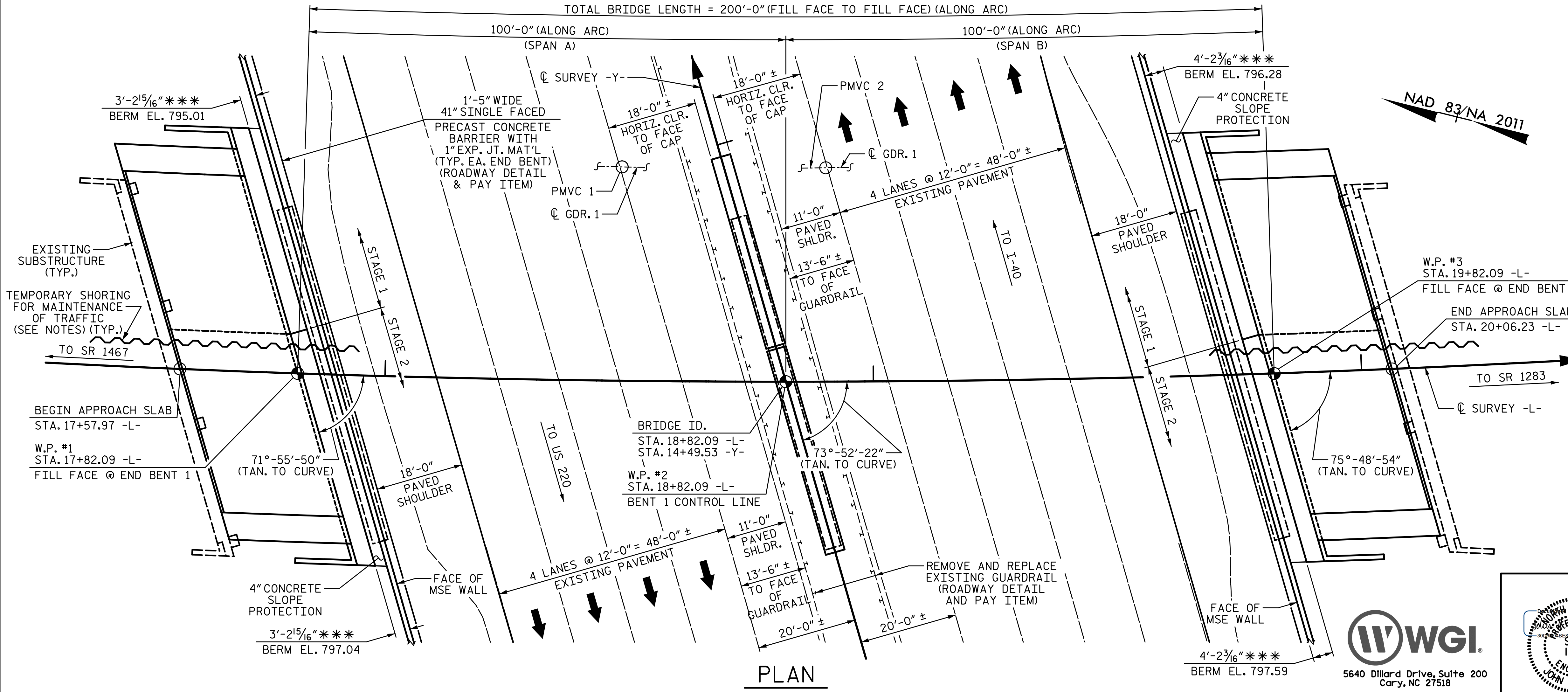
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(+3.4714%	(-1.5573%
PVI STA. 18+50.00 EL. = 808.40 VC = 310'	
GRADE DATA -L-	

PMVC 1	PMVC 2
STA. 18+48.05 -L- OFFSET 43.78' LT. BOTTOM OF GDR. EL. 800.01	STA. 18+90.37 -L- OFFSET 43.78' LT. BOTTOM OF GDR. EL. 800.28
STA. 15+01.09 -Y- OFFSET 20.00' LT. EL. 782.42	STA. 14+89.33 -Y- OFFSET 20.0' RT. EL. 782.39
PMVC = POINT OF MINIMUM VERTICAL CLEARANCE	

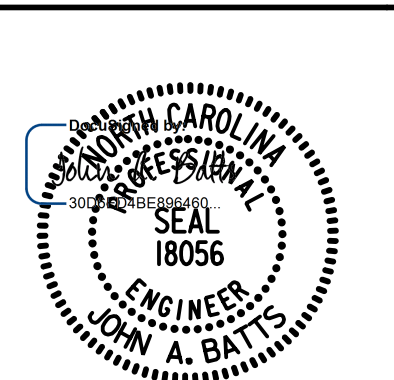
HORIZONTAL CURVE DATA	
PI STA. 18+52.99 -L-	Δ = 13°-04'-00.0" (LT.)
D = 1°-56'-32.0"	L = 672.77'
T = 337.85'	R = 2950.00'



PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
14+49.53 -Y-  
 SHEET 1 OF 6 REPLACES BRIDGE #400225

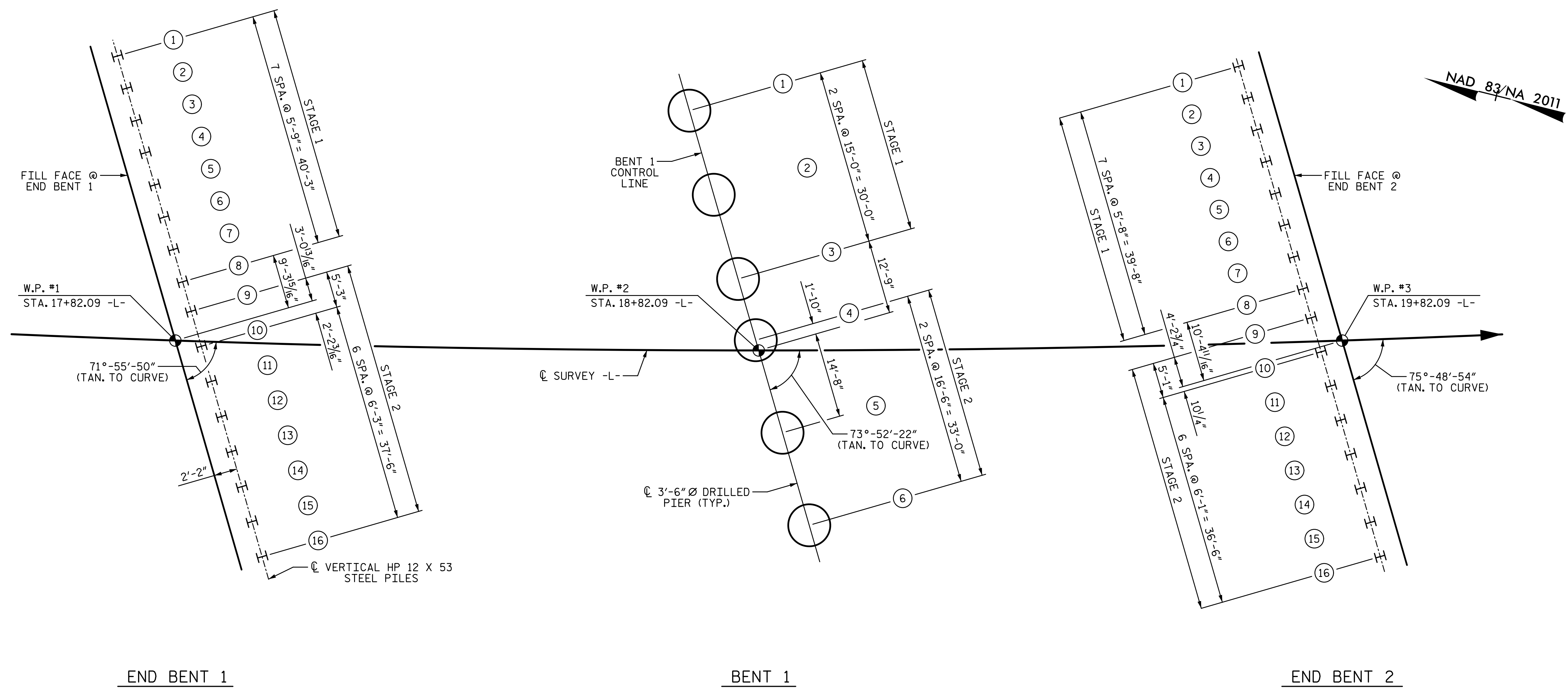
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 115  
 (REHOBETH CHURCH ROAD)  
 OVER US 29/70  
 BETWEEN SR 1467 AND SR 1283

DRAWN BY: S.D. COOPER	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22



REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS: 58

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END BENT 1

BENT 1

END BENT 2

### FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO BE THE CENTERLINE OF PILES)  
\* INDICATES PILE OR DRILLED PIER NUMBER

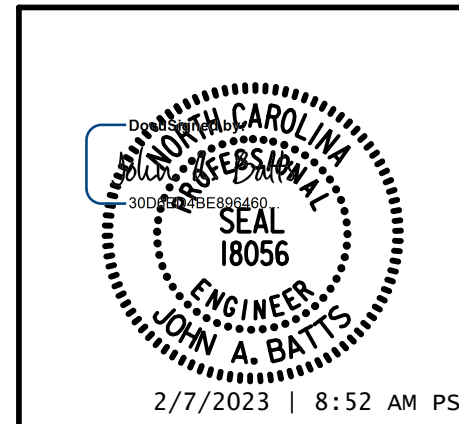
#### FOUNDATION NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20 TO 30 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENTS 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D) (2) OF THE STANDARD SPECIFICATIONS.
- CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT 1.
- PILE SLEEVES ARE REQUIRED TO BE INSTALLED AT END BENT 1 AND 2. THE SLEEVES SHALL BE 24-INCH DIA., 16 GAUGE CORRUGATED STEEL PIPE. SLEEVES SHALL BE INSTALLED AFTER PILE INSTALLATION. THE SLEEVES SHALL BE FILLED WITH LOOSE SAND.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1115  
 (REHOBETH CHURCH ROAD)  
 OVER US 29/70  
 BETWEEN SR 1467 AND SR 1283



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

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>2-22</u>
CHECKED BY: <u>J.A. BATTS</u>	DATE: <u>2-22</u>
DESIGN ENGINEER OF RECORD: <u>J.A. BATTS</u>	DATE: <u>2-22</u>

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TOTAL SHEETS 58

**SUMMARY OF PILE INFORMATION/INSTALLATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #:# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-16	115	797.72	30	-	768.3	195					768.3	2.0	8.0
End Bent 2, Piles 1-16	120	798.63	35	-		200							

\*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

\*\*RDR =  $\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \frac{\text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}} + \text{Nominal Downdrag Resistance}$

**SUMMARY OF PDA/PILE ORDER LENGTHS**

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1	MAYBE	35	1		
End Bent 2	MAYBE	40			

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

**SUMMARY OF PILE ACCESSORIES**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #:# (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 2, Piles 1-16					YES
<b>TOTAL QTY:</b>					16

**SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #:# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent 1, Piers 1-3	495	758.0	15	-	-	20.0		20.0			
Bent 1, Piers 4-6	495	743.0	15	-	-	35.0		35.0			

\*Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

**SUMMARY OF DRILLED PIER TESTING**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #:# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3	MAYBE	MAYBE	86	MAYBE	
Bent 1, Piers 4-6	MAYBE	MAYBE	146	MAYBE	
<b>TOTAL QTY:</b>	1	1	696	1	

\*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. BP7.R006.3

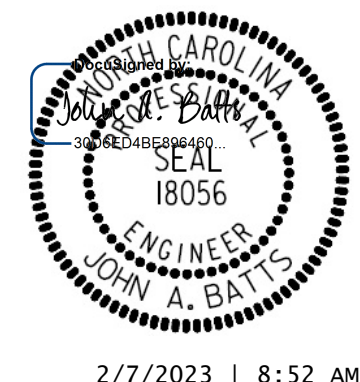
GUILFORD COUNTY

STATION: 18+82.09 -L- / 14+49.53 -Y-

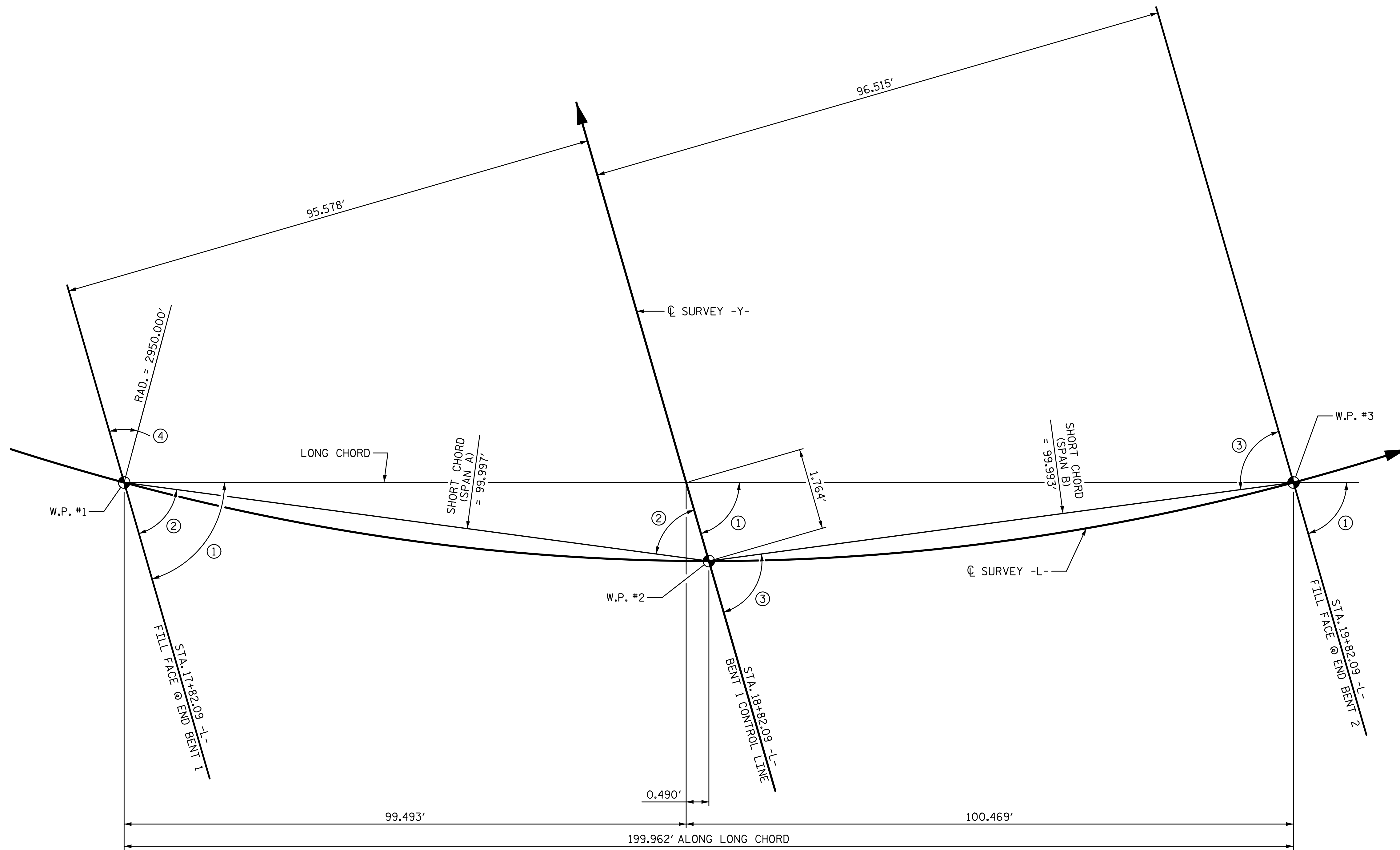
SHEET 3 OF 6

**NOTES:**

- The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Kenneth R. Bussey, Jr. and 038206) on 11-23-2021.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

 <p>STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH</p> <p><b>PILE AND DRILLED PIER FOUNDATION TABLES</b></p> <p>2/7/2023   8:52 AM PST</p> <p>SIGNATURE _____ DATE _____</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>						NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4			<p>SHEET NO. S-4</p> <p>TOTAL SHEETS 58</p>
	NO.	BY:	DATE:	NO.	BY:	DATE:																			
1			3																						
2			4																						
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>																									

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HORIZONTAL CURVE DATA	
PI	STA. 18+52.99 -L-
$\Delta$	= 13°-04'-00.0" (L.T.)
D	= 1°-56'-32.0"
L	= 672.77'
T	= 337.85'
R	= 2950.00'

**LONG CHORD LAYOUT**  
(ALL END BENTS AND BENT ARE PARALLEL)

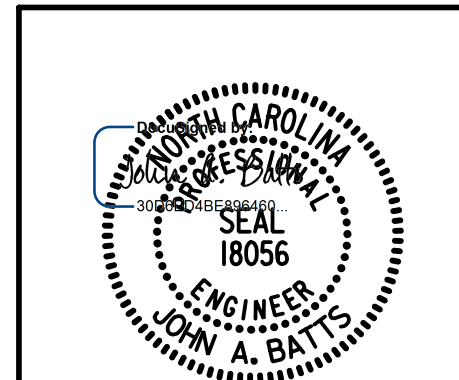
**ANGLES**

- ① 73°-52'-22" (TO LONG CHORD)
- ② 72°-54'-06" (TO SHORT CHORD - SPAN A)
- ③ 74°-50'-38" (TO SHORT CHORD - SPAN B)
- ④ 18°-04'-10"

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 115  
 (REHOBETH CHURCH ROAD)  
 OVER US 29/70  
 BETWEEN SR 1467 AND SR 1283

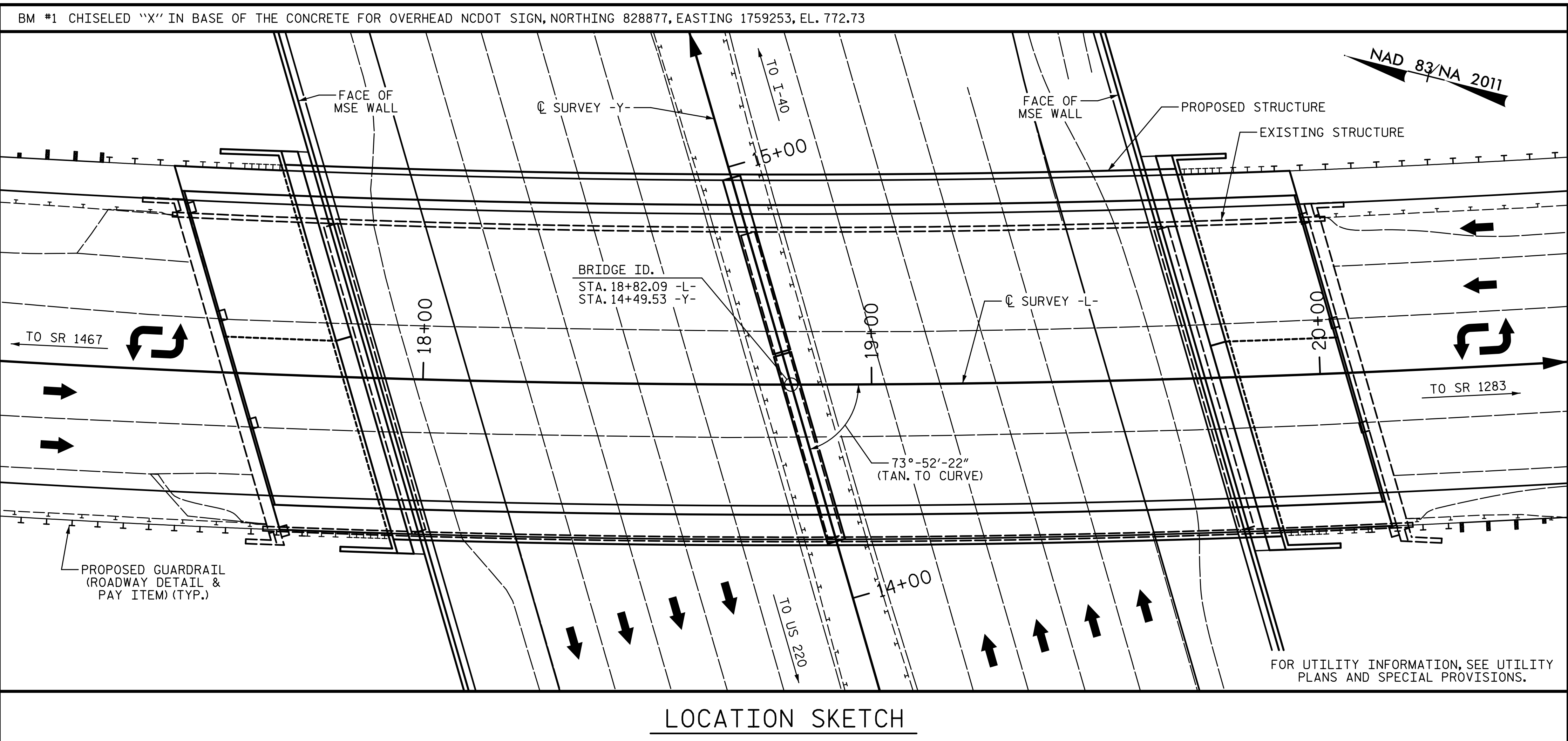


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			58

DRAWN BY:	S.D. COOPER	DATE:	2-22
CHECKED BY:	J.A. BATTS	DATE:	2-22
DESIGN ENGINEER OF RECORD:	J.A. BATTS	DATE:	2-22

LICENSURE NO. C-4434  
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**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 EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 4 SPANS, 1 SPAN @ 33'-10 1/2", 1 @ 92'-10 5/8", 1 @ 92'-0 3/8" AND 1 @ 35'-8 1/2" SHALL BE REMOVED. THE SUPERSTRUCTURE HAS A CLEAR ROADWAY WIDTH OF 68'-0" WITH REINFORCED CONCRETE DECK ON STEEL I-BEAMS. THE END BENTS CONSIST OF REINFORCED CONCRETE CAP AND STEEL PILES. INTERIOR BENTS CONSIST OF REINFORCED CONCRETE CAPS WITH 4 CONCRETE COLUMNS ON SPREAD FOOTINGS. THE EXISTING BRIDGE IS PRESENTLY NOT 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.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

ALL FALSEWORK AND FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST AND CURED.

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.

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

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

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

THE EXISTING BRIDGE WILL BE IN SERVICE DURING CONSTRUCTION OF THE REPLACEMENT STRUCTURE. FOR DETAILS REGARDING CONSTRUCTION STAGING AND REQUIREMENTS FOR TEMPORARY SHORING, SEE TRAFFIC MANAGEMENT PLANS.

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 18+82.09 -L-."

**LOCATION SKETCH**

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" DIA. DRILLED PIERS IN SOIL	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINF. CONC. DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINF. STEEL	SPIRAL COLUMN REINF. STEEL
	LS	LS	LF	LF	LF	EA	EA	EA	EA	SF	SF	CY	LS	LB	LB
SUPERSTRUCTURE										16,376	17,565				
END BENT 1			128.0	32.0								75.8		11,078	
BENT 1					169.5							92.8		21,899	5,884
END BENT 2												72.9		9,831	
<b>TOTAL</b>	LS	LS	128.0	32.0	169.5	1	1	1	1	16,376	17,565	241.5	LS	42,808	5,884

**TOTAL BILL OF MATERIAL**

	54" PREST. CONC. GDERS.		PILE DRIVING EQUIP. SETUP HP 12 X 53 STEEL PILES	HP 12X53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 3'-2 3/4" CONCRETE PARAPET	1'-2" X 3'-0" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	NO.	LF	EA	NO.	LF	EA	LF	LF	SY	LS
SUPERSTRUCTURE	20	1,965.99					380.92	198.54		LS
END BENT 1			16	16	480				26	
BENT 1										
END BENT 2			16	16	560	16			35	
<b>TOTAL</b>	20	1,965.99	32	32	1,040	16	380.92	198.54	61	LS

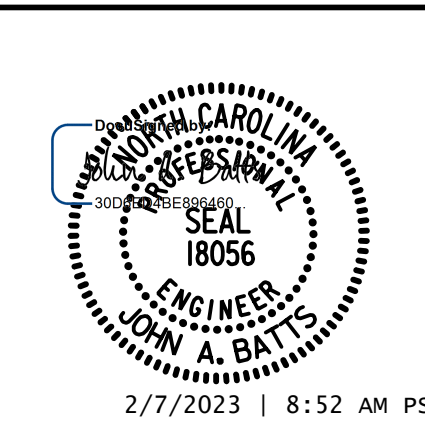
**NOTES:**

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.

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 5 OF 6

DRAWN BY: S.D. COOPER DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 1115  
 (REHOBETH CHURCH ROAD)  
 OVER US 29/70  
 BETWEEN SR 1467 AND SR 1283

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

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## LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>L</sub> )	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 <sub>L</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.17	--	1.75	0.847	1.58	A	ER	48.5	0.957	<b>1.17</b>	A	I	9.7	0.80	0.847	1.21	A	ER	48.5		
	HL-93 (OPERATING)	N/A		1.54	--	1.35	0.847	2.05	A	ER	48.5	0.957	1.54	A	I	9.7	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.00	②	1.59	57.2	1.75	0.847	2.20	A	ER	48.5	0.957	<b>1.59</b>	A	I	9.7	0.80	0.847	1.68	A	ER	48.5		
	HS-20 (OPERATING)	36.00		2.09	75.2	1.35	0.847	2.85	A	ER	48.5	0.957	2.09	A	I	9.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.97	53.6	1.40	0.847	6.49	A	ER	48.5	0.957	5.10	A	I	9.7	0.80	0.847	3.97	A	ER	48.5	
		SNGARBS2	20.000		2.88	57.6	1.40	0.847	4.71	A	ER	48.5	0.957	3.54	A	I	9.7	0.80	0.847	2.88	A	ER	48.5	
		SNAGRIS2	22.000		2.70	59.4	1.40	0.847	4.41	A	ER	48.5	0.957	3.26	A	I	9.7	0.80	0.847	2.70	A	ER	48.5	
		SNCOTTS3	27.250		1.97	53.7	1.40	0.847	3.23	A	ER	48.5	0.957	2.48	A	I	9.7	0.80	0.847	1.97	A	ER	48.5	
		SNAGGRS4	34.925		1.62	56.6	1.40	0.847	2.65	A	ER	48.5	0.957	2.01	A	I	9.7	0.80	0.847	1.62	A	ER	48.5	
		SNS5A	35.550		1.58	56.2	1.40	0.847	2.59	A	ER	48.5	0.957	2.01	A	I	9.7	0.80	0.847	1.58	A	ER	48.5	
		SNS6A	39.950		1.44	57.5	1.40	0.847	2.36	A	ER	48.5	0.957	1.81	A	I	9.7	0.80	0.847	1.44	A	ER	48.5	
	SNS7B	42.000		1.37	57.5	1.40	0.847	2.24	A	ER	48.5	0.957	1.76	A	I	9.7	0.80	0.847	1.37	A	ER	48.5		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.75	57.8	1.40	0.847	2.87	A	ER	48.5	0.957	2.19	A	I	9.7	0.80	0.847	1.75	A	ER	48.5	
		TNT4A	33.075		1.76	58.2	1.40	0.847	2.88	A	ER	48.5	0.957	2.15	A	I	9.7	0.80	0.847	1.76	A	ER	48.5	
		TNT6A	41.600		1.43	59.5	1.40	0.847	2.33	A	ER	48.5	0.957	1.85	A	I	9.7	0.80	0.847	1.43	A	ER	48.5	
		TNT7A	42.000		1.43	60.1	1.40	0.847	2.33	A	ER	48.5	0.957	1.82	A	I	9.7	0.80	0.847	1.43	A	ER	48.5	
		TNT7B	42.000		1.46	61.3	1.40	0.847	2.39	A	ER	48.5	0.957	1.73	A	I	9.7	0.80	0.847	1.46	A	ER	48.5	
		TNAGRIT4	43.000		1.40	60.2	1.40	0.847	2.29	A	ER	48.5	0.957	1.68	A	I	9.7	0.80	0.847	1.40	A	ER	48.5	
TNAGT5A		45.000		1.33	59.9	1.40	0.847	2.17	A	ER	48.5	0.957	1.65	A	I	9.7	0.80	0.847	1.33	A	ER	48.5		
TNAGT5B	45.000		③	1.32	59.4	1.40	0.847	2.15	A	ER	48.5	0.957	1.59	A	I	9.7	0.80	0.847	<b>1.32</b>	A	ER	48.5		

**LOAD FACTORS:**

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

**NOTES:**

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
 ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.  
 DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\bar{C}$  BEARING.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

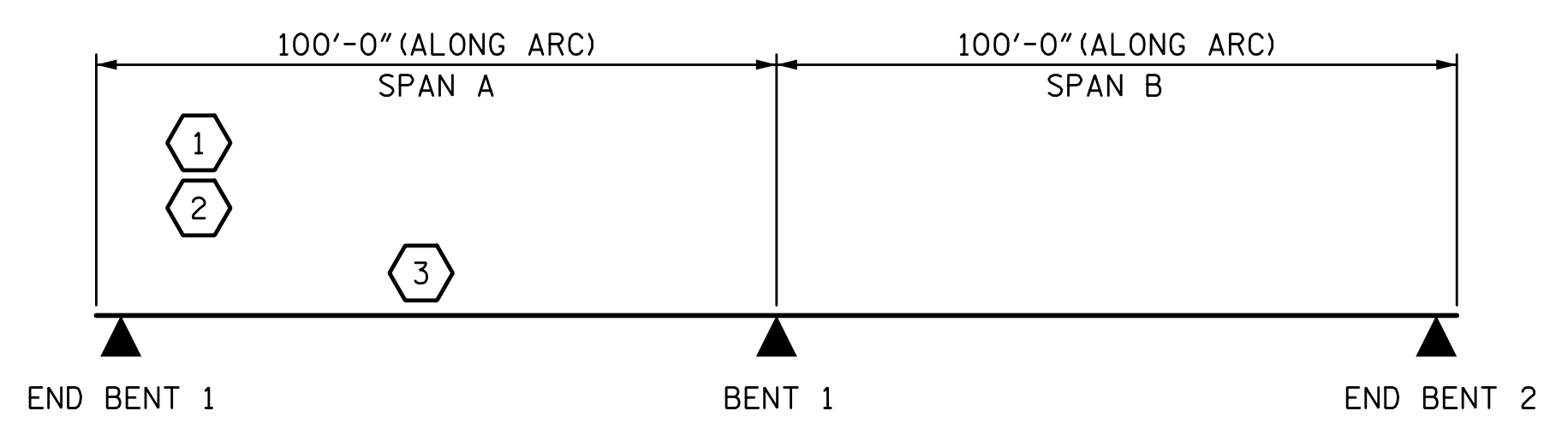
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

I - INTERIOR GIRDER  
EXT - EXTERIOR GIRDER

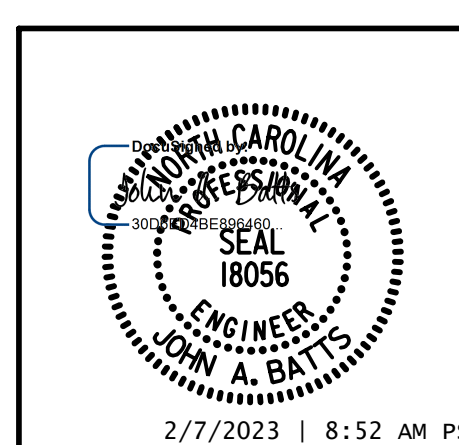


LRFR SUMMARY

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 6 OF 6

DRAWN BY: S.D. COOPER DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

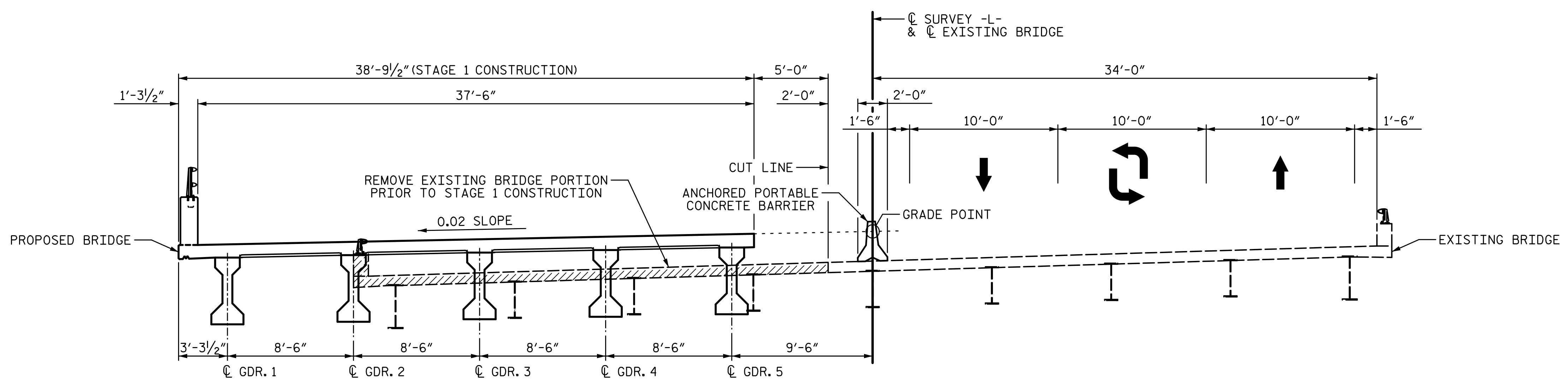


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 LRFR SUMMARY  
 FOR PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)

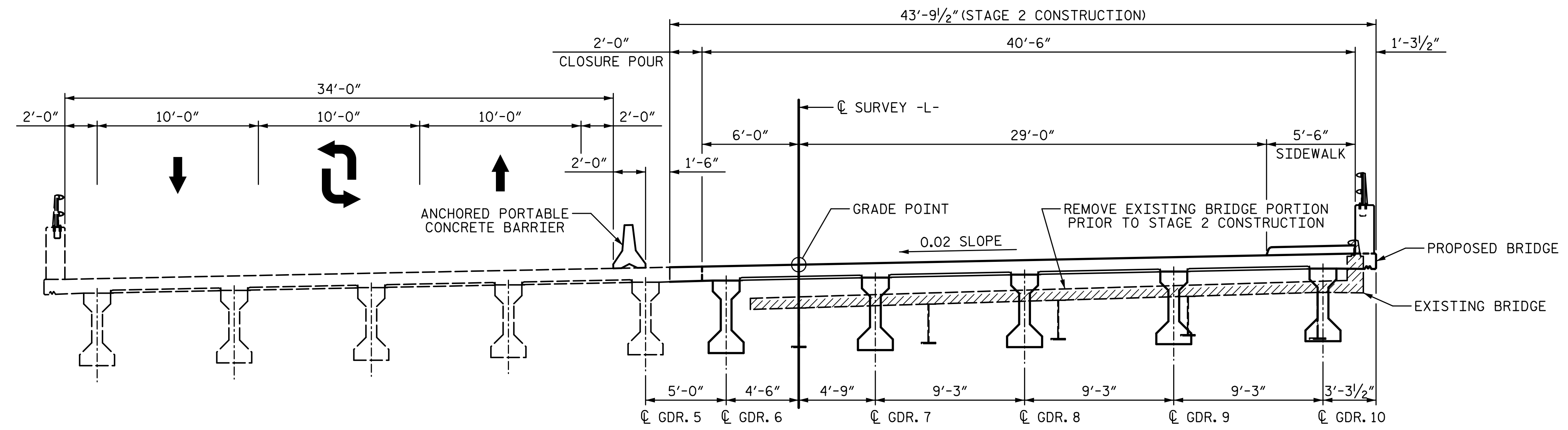
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1			3			TOTAL SHEETS
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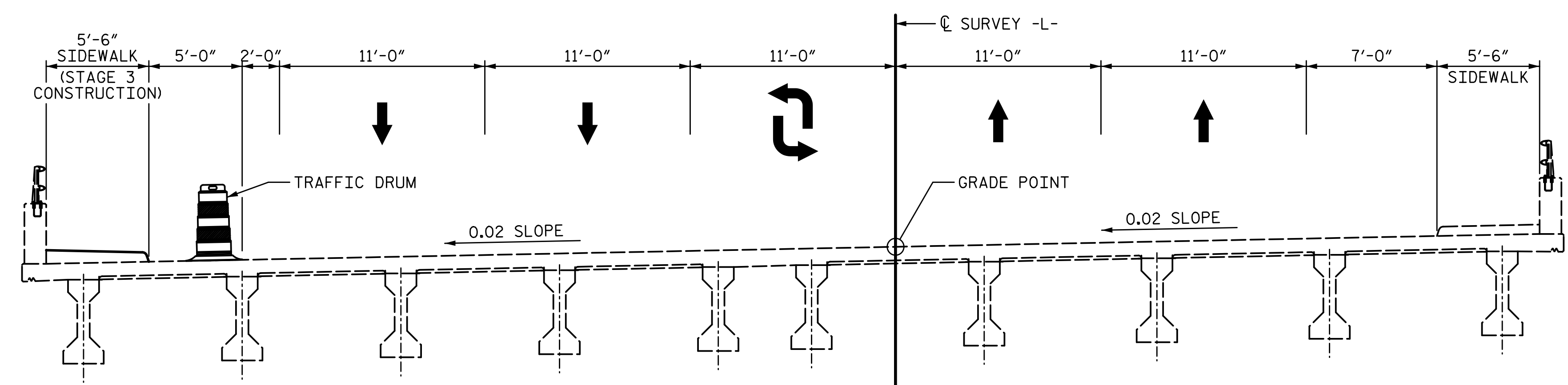
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STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION

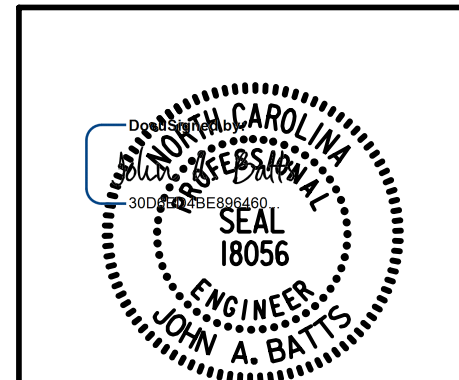


STAGE 3 CONSTRUCTION

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CONSTRUCTION SEQUENCE**



**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY: S.D. COOPER	DATE: 2-22
CHECKED BY: J.A. BATTIS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTIS	DATE: 2-22

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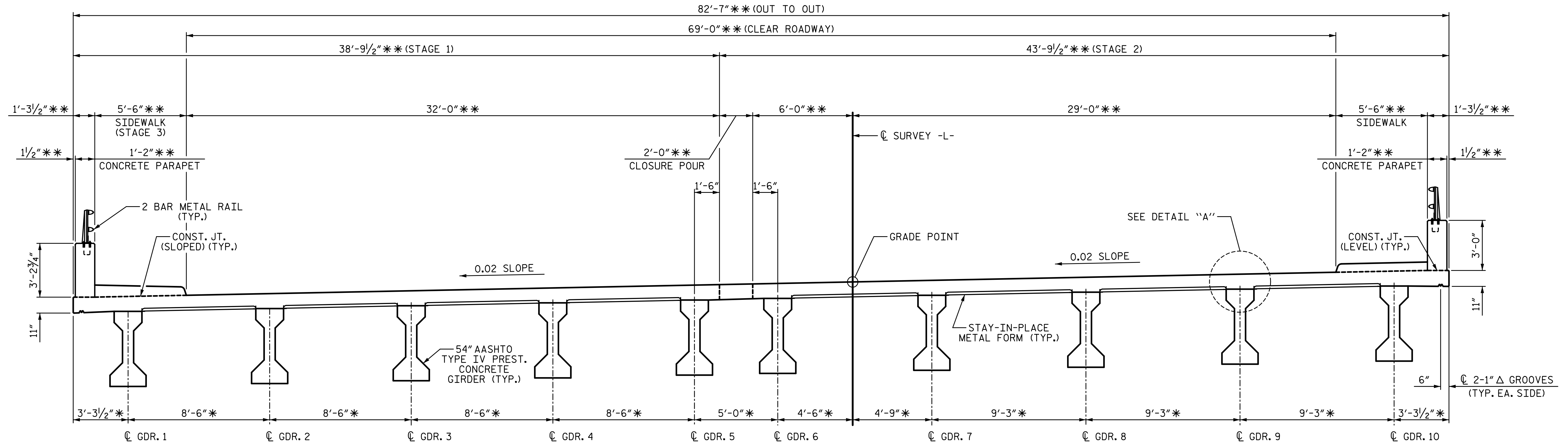
**NOTES:**

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

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

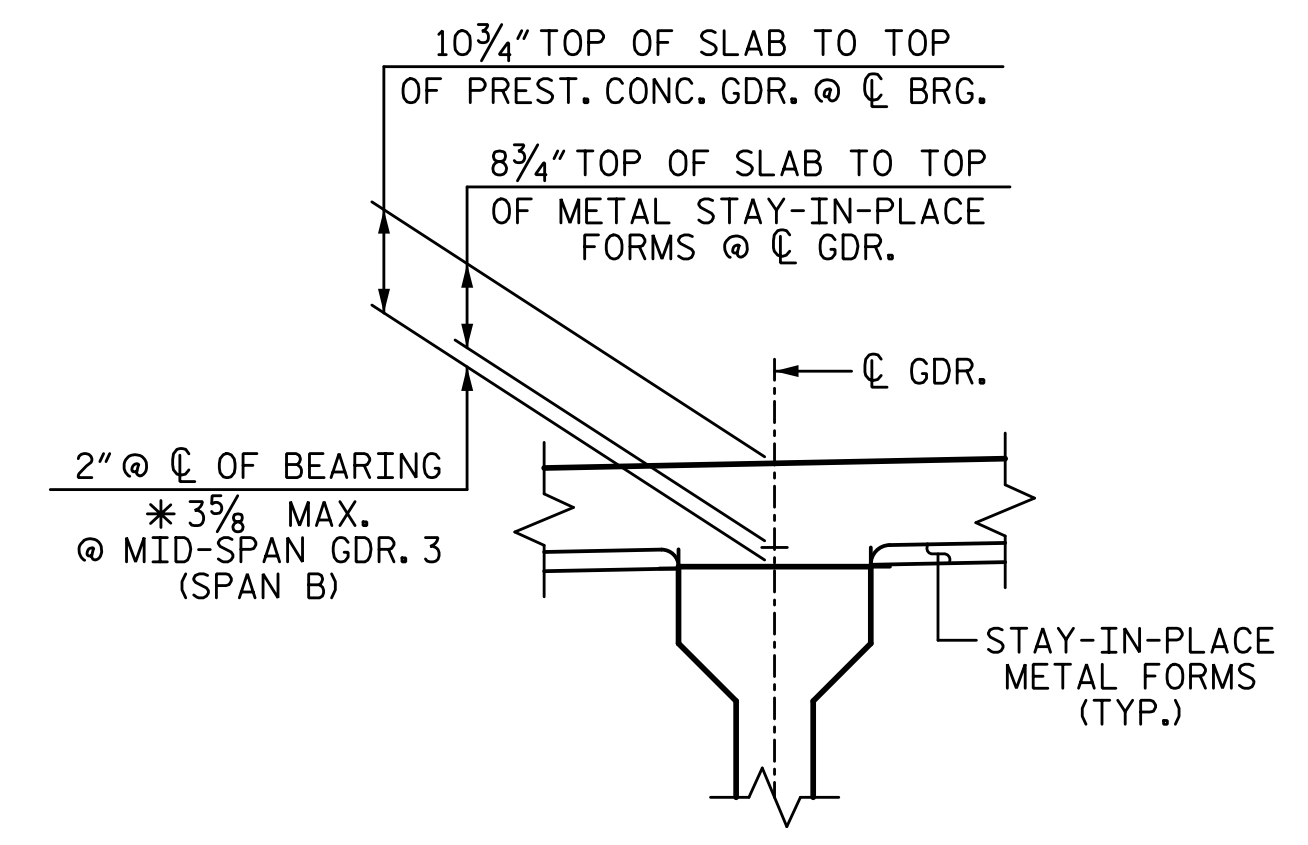
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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



**TYPICAL SECTION**

\* RADIAL DIMENSION THRU W.P.  
\*\* RADIAL DIMENSION



**DETAIL "A"**

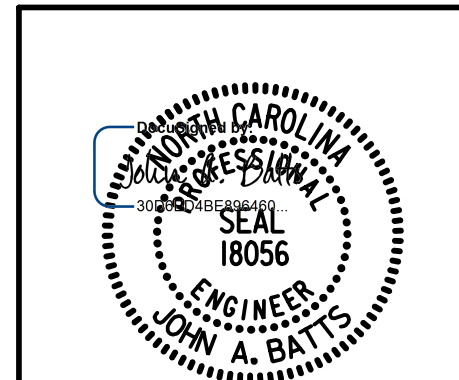
(TYP. EA. GDR.)

(\* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS)

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

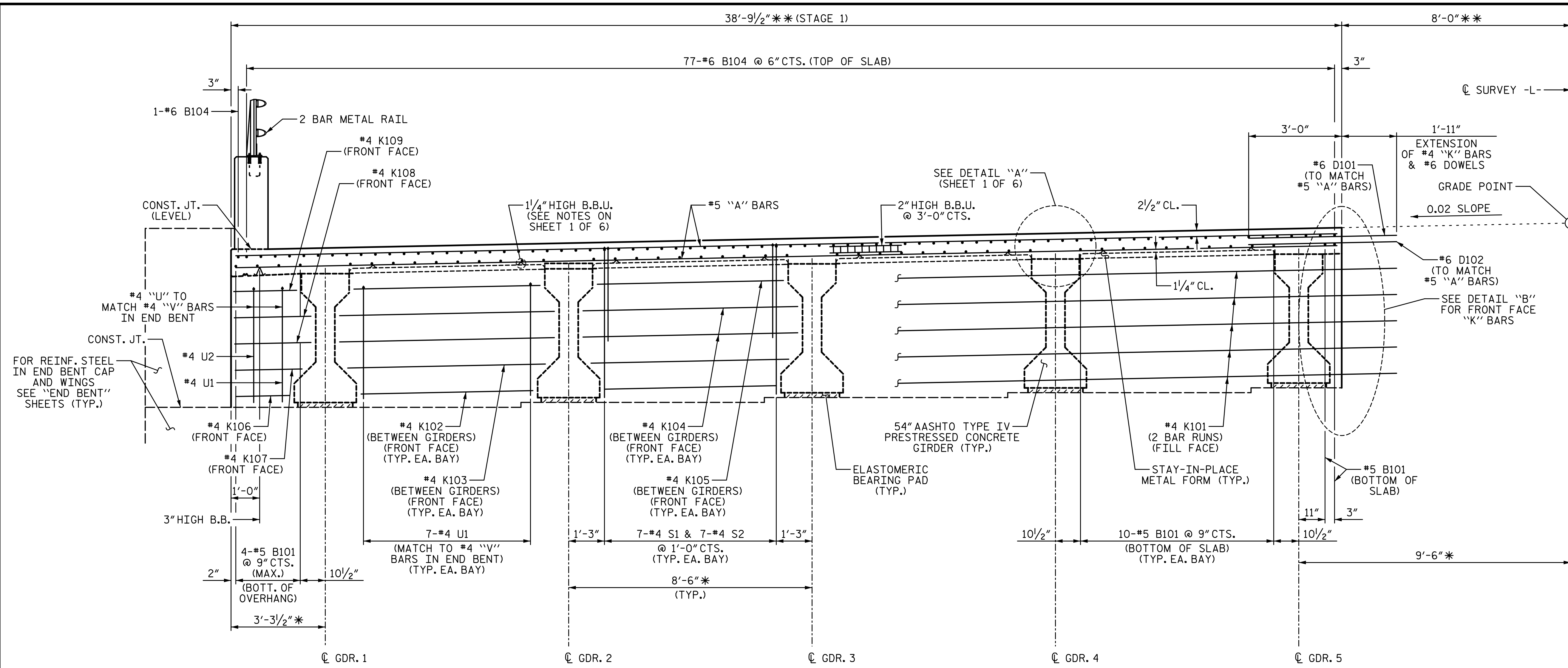


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1			3		
2			4		
					TOTAL SHEETS
					58

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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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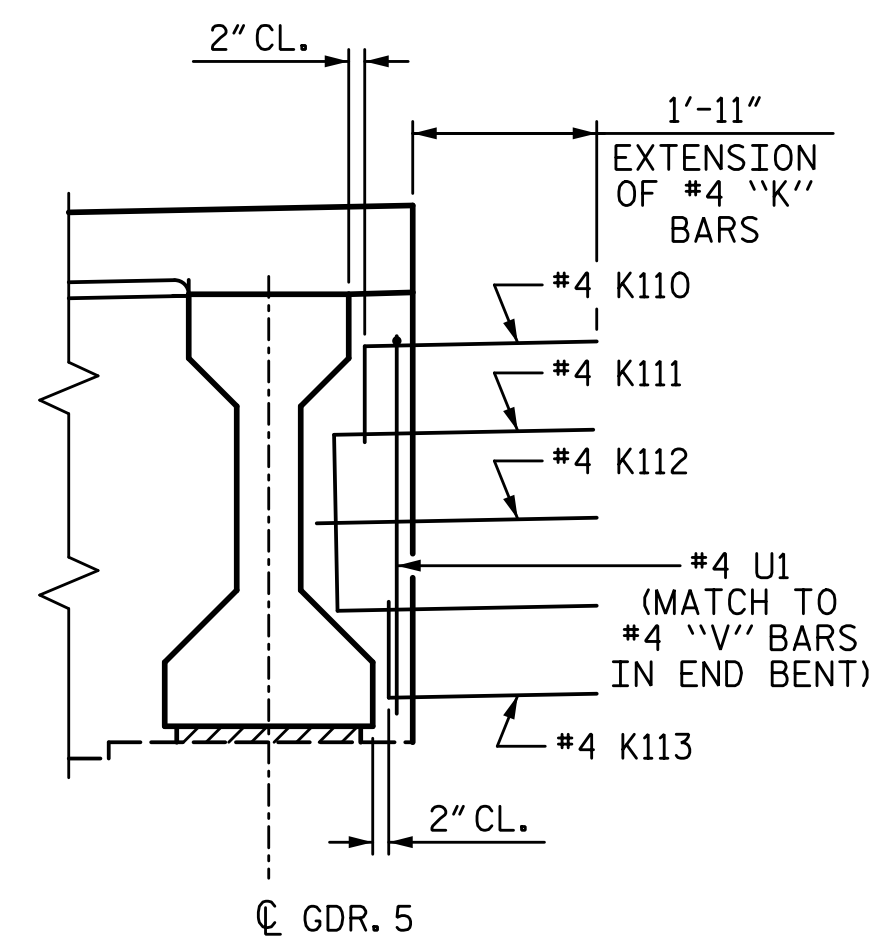
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**NOTES:**  
 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

**TYPICAL SECTION**  
 (SHOWING INTEGRAL END BENT)

\* RADIAL DIMENSION THRU W.P.  
 \*\* RADIAL DIMENSION



**DETAIL "B"**  
 FRONT FACE REINFORCING STEEL

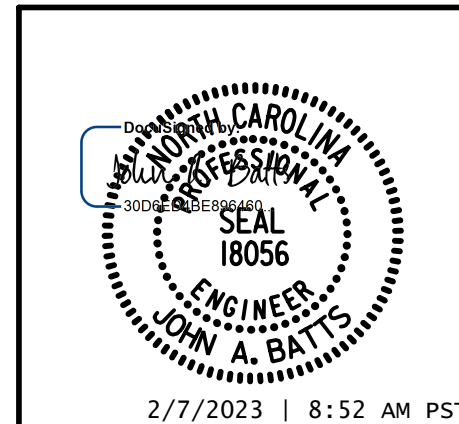
PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**

STAGE 1



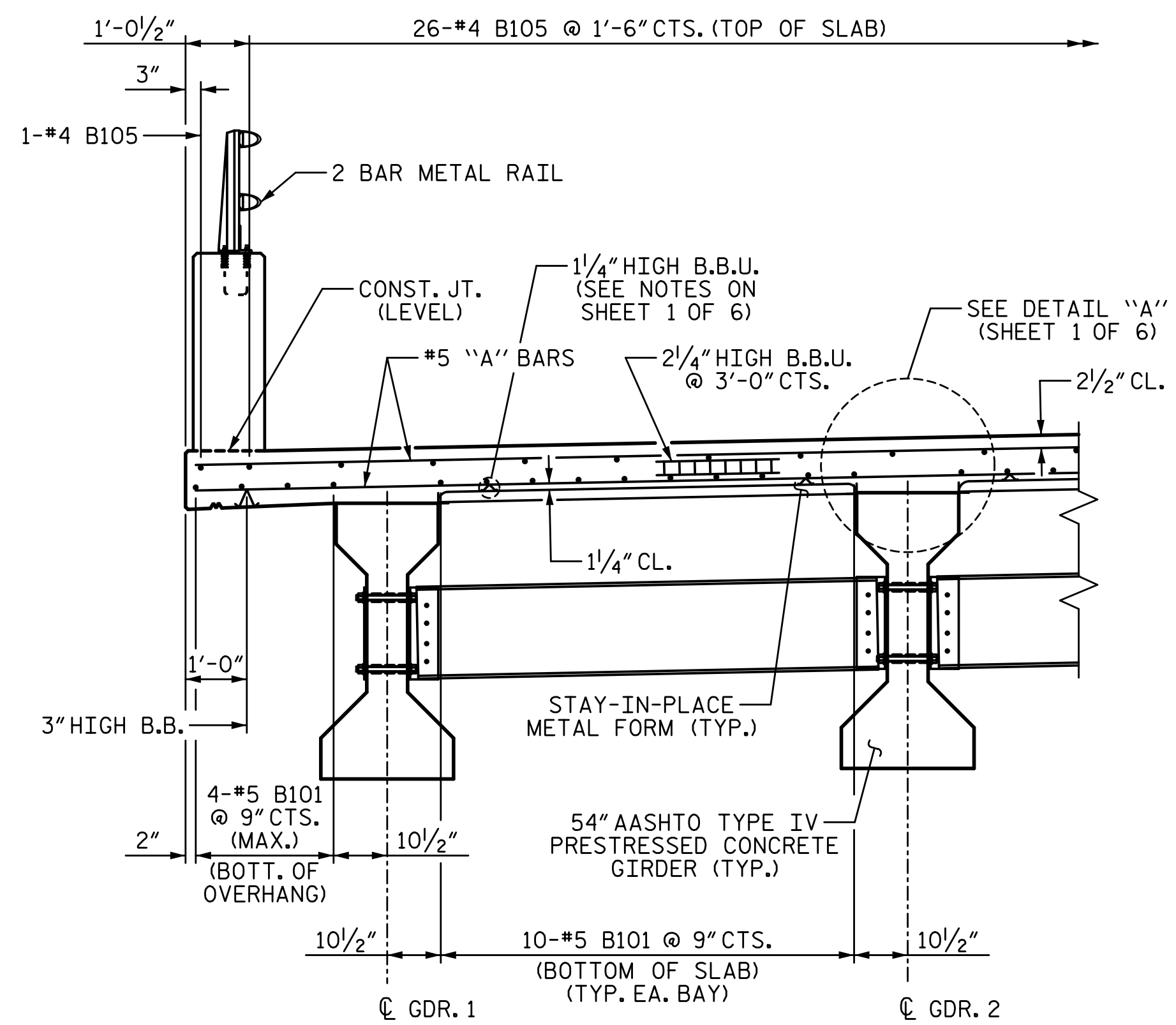
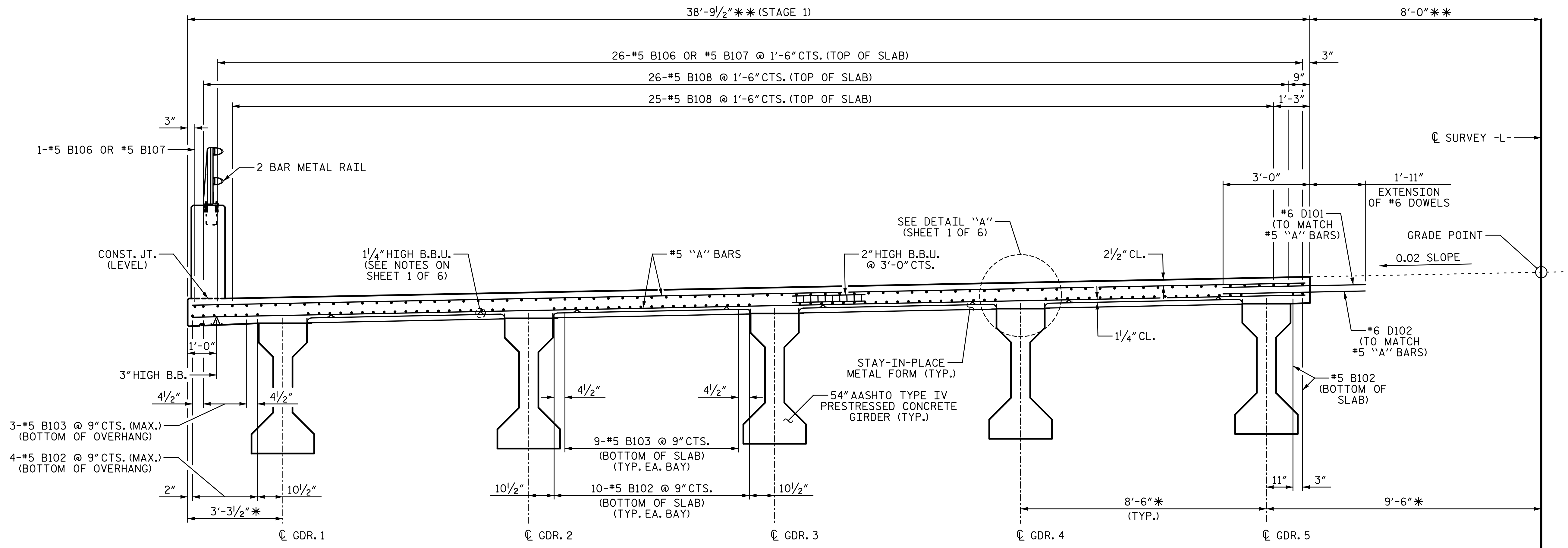
**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY: T. BANKOVICH	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
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2			4			58

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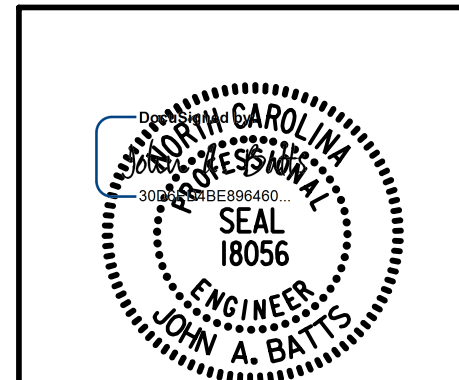


PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
 SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**

STAGE 1



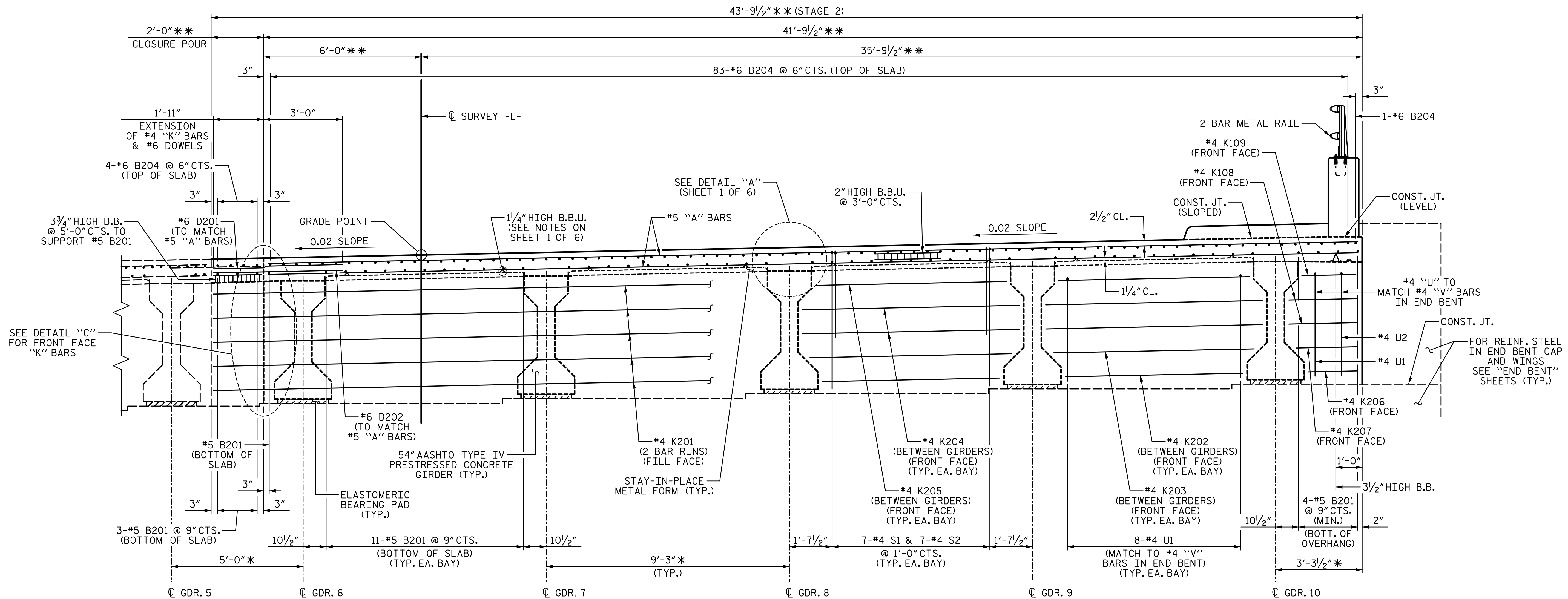
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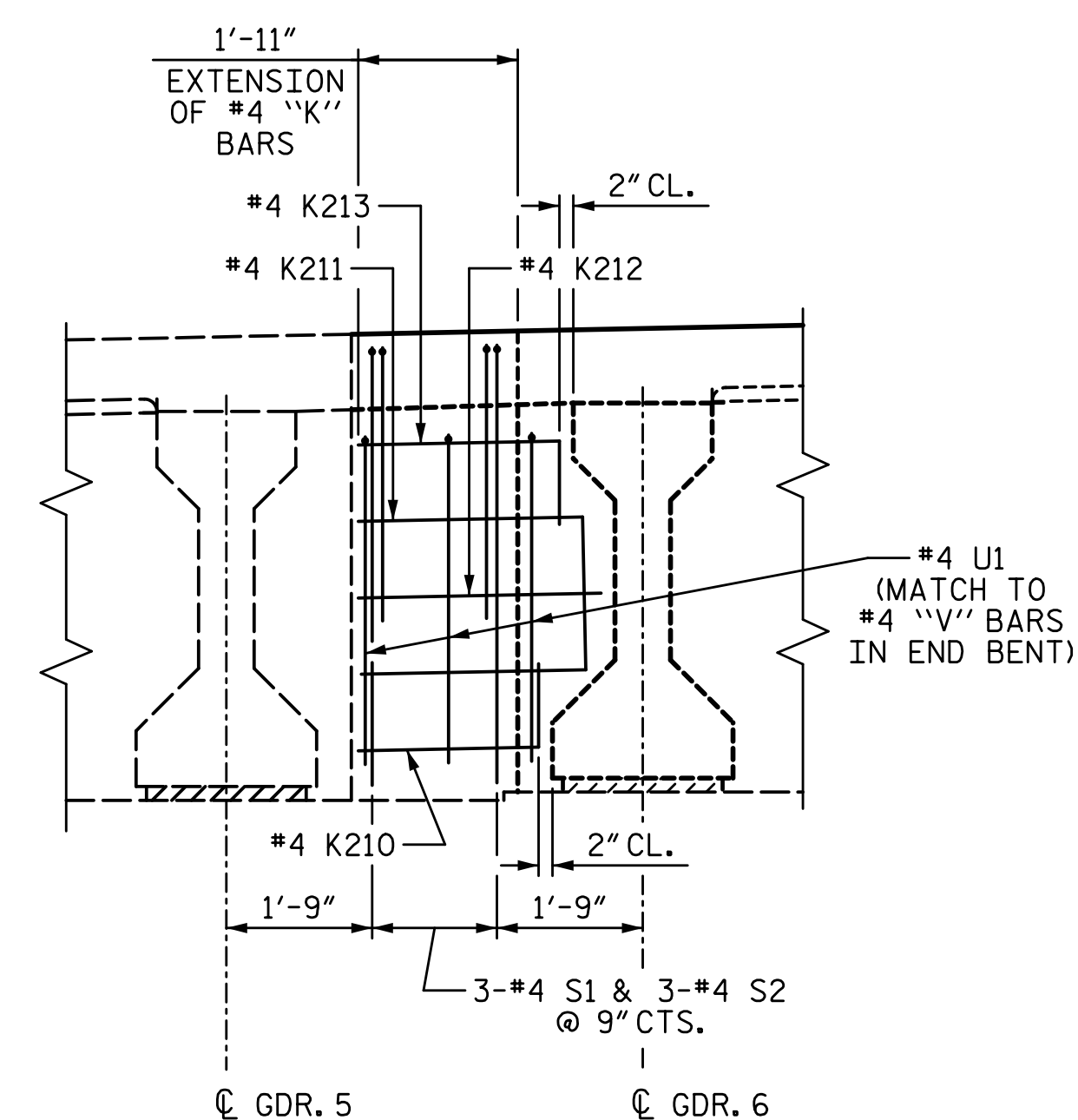
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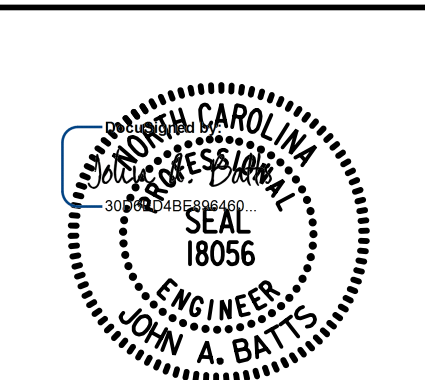
**TYPICAL SECTION**  
(SHOWING INTEGRAL END BENT)  
\* RADIAL DIMENSION THRU W.P.  
\*\* RADIAL DIMENSION



**DETAIL "C"**  
FRONT FACE REINFORCING STEEL

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
STATION: 18+82.09 -L-  
SHEET 4 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
TYPICAL SECTION					
STAGE 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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					TOTAL SHEETS 58

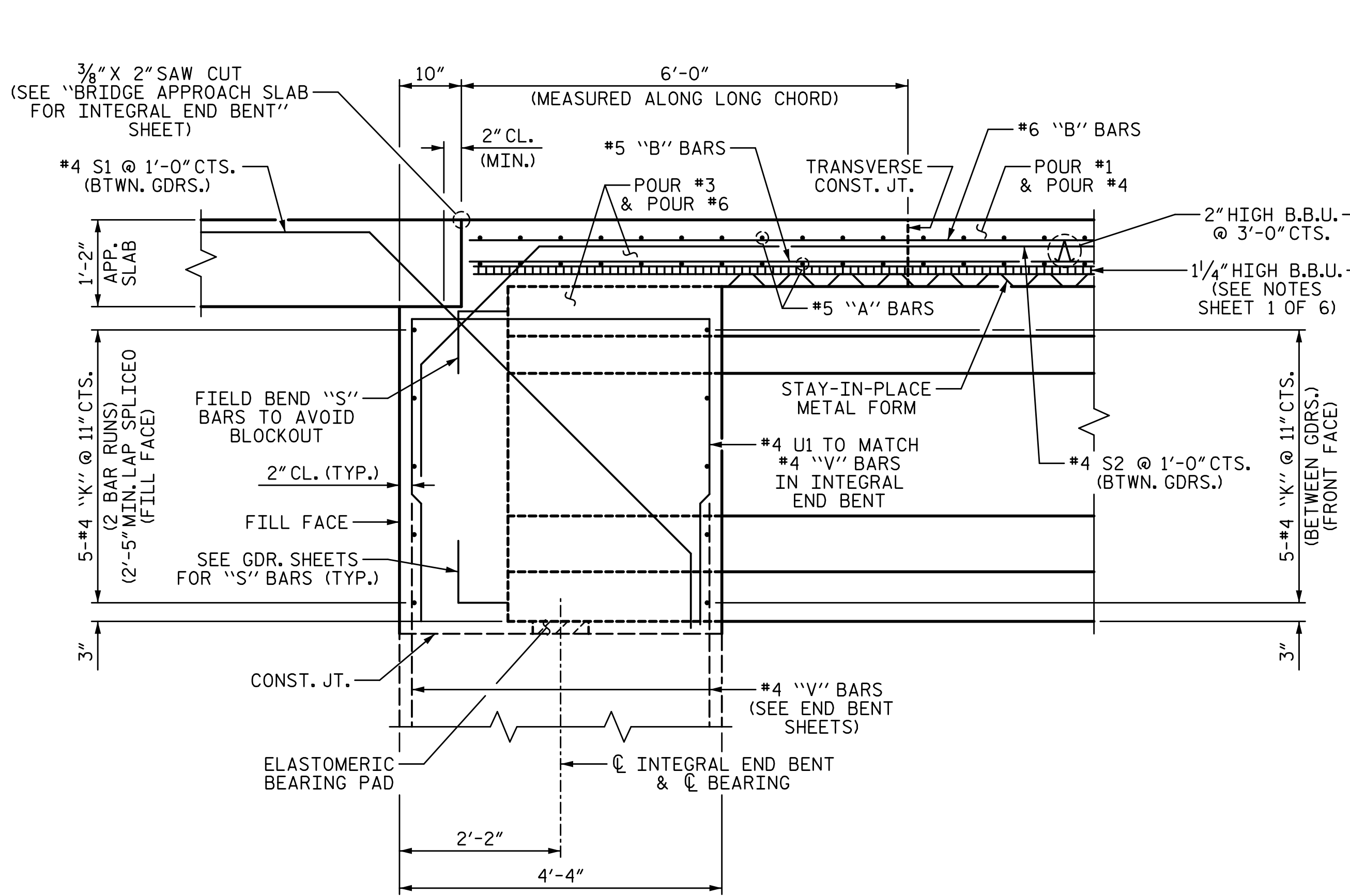


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DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

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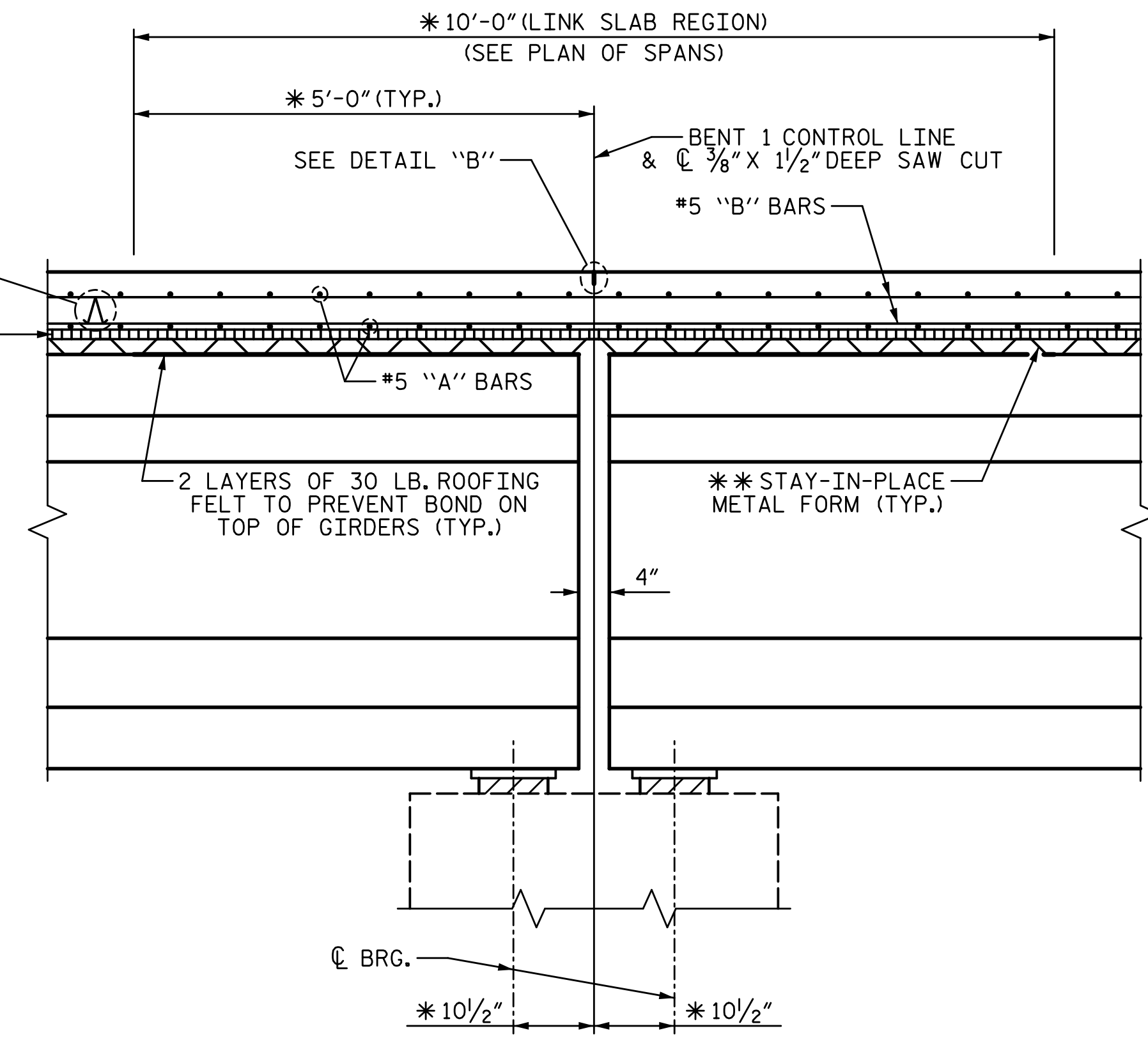


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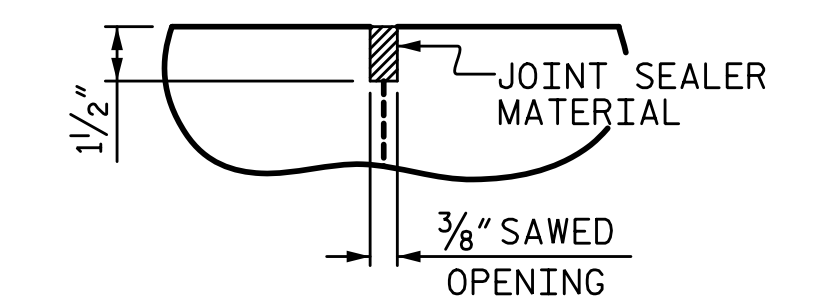


**SECTION A-A**

(SEE END BENT SHEETS FOR INTEGRAL END BENT REINFORCING DETAILS)  
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

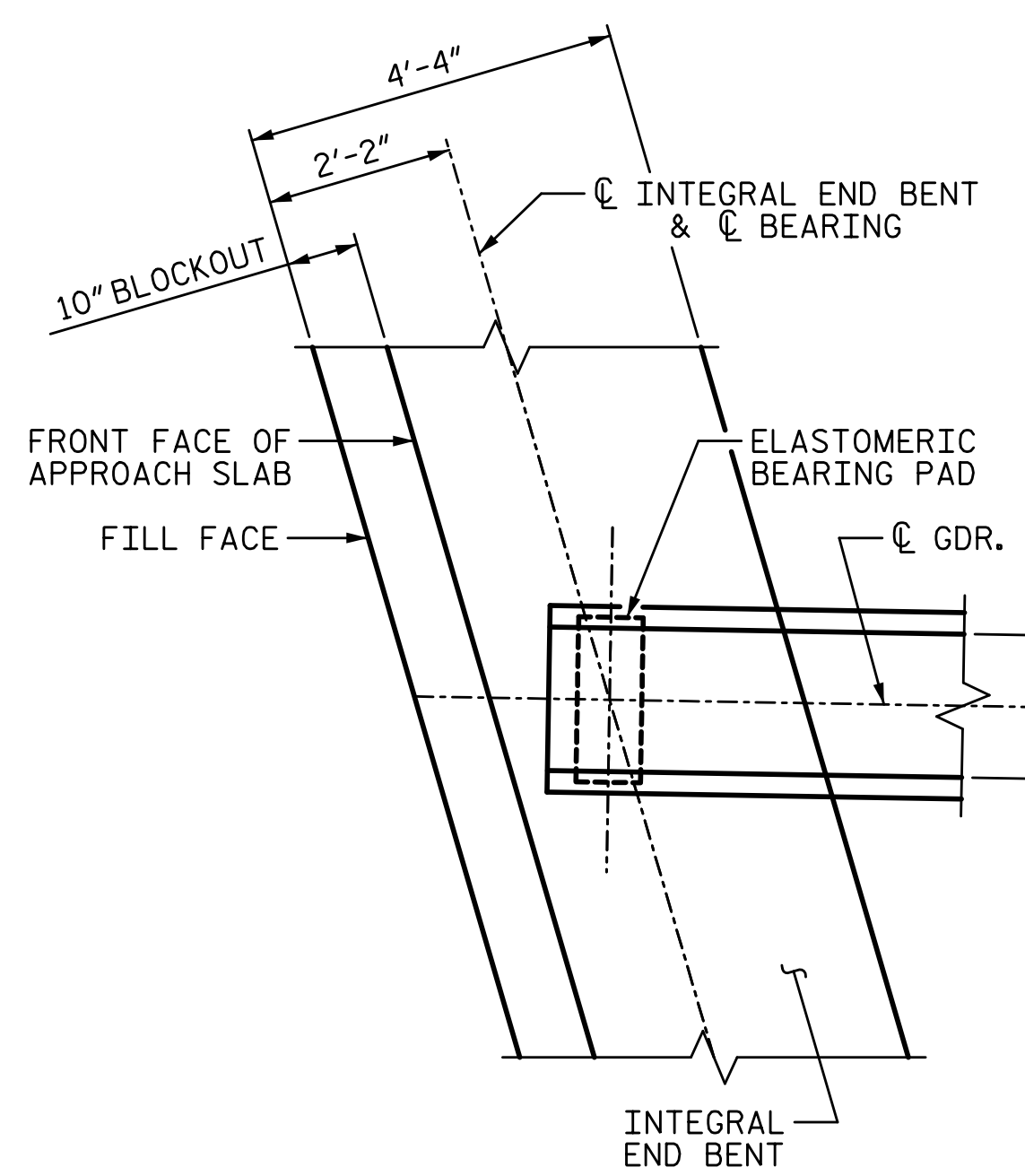


**SECTION B-B**



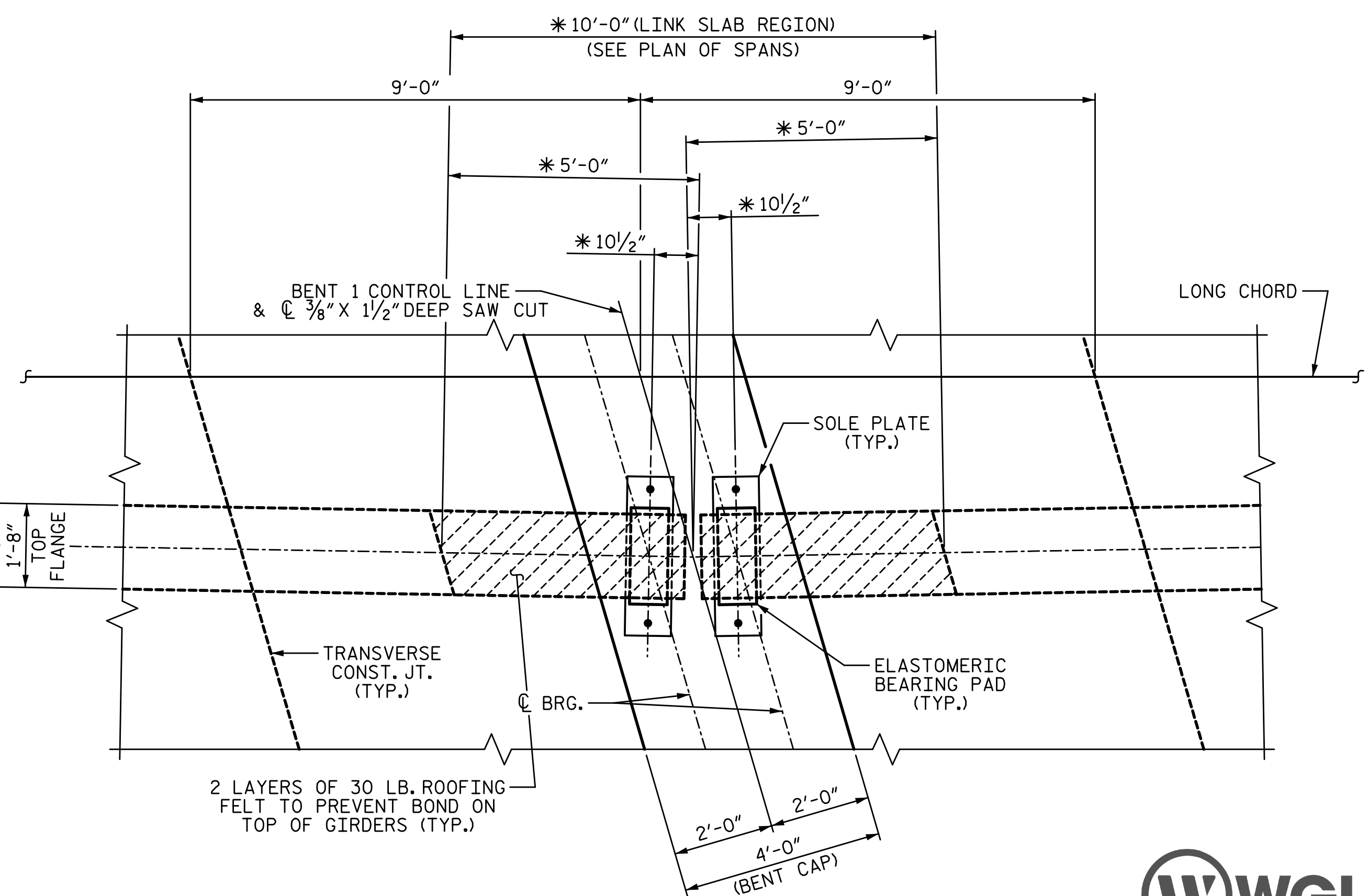
**DETAIL "B"**

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



**PLAN OF GIRDER AT END BENT**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)  
("S" BARS IN GIRDER NOT SHOWN FOR CLARITY)



**PLAN OF GIRDER AT BENT**

(TYP. LINK SLAB REGION)

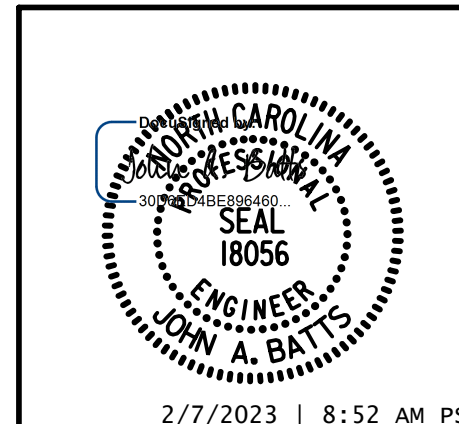
(THE TOP OF GIRDER IN THE LINK SLAB REGION SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS AND DECK FORMWORK ATTACHMENTS AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS)

\* MEASURED ALONG  $\phi$  GIRDER  
\*\* METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE REGION OF THE LINK SLAB

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
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SHEET 6 OF 6

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
**TYPICAL SECTION**

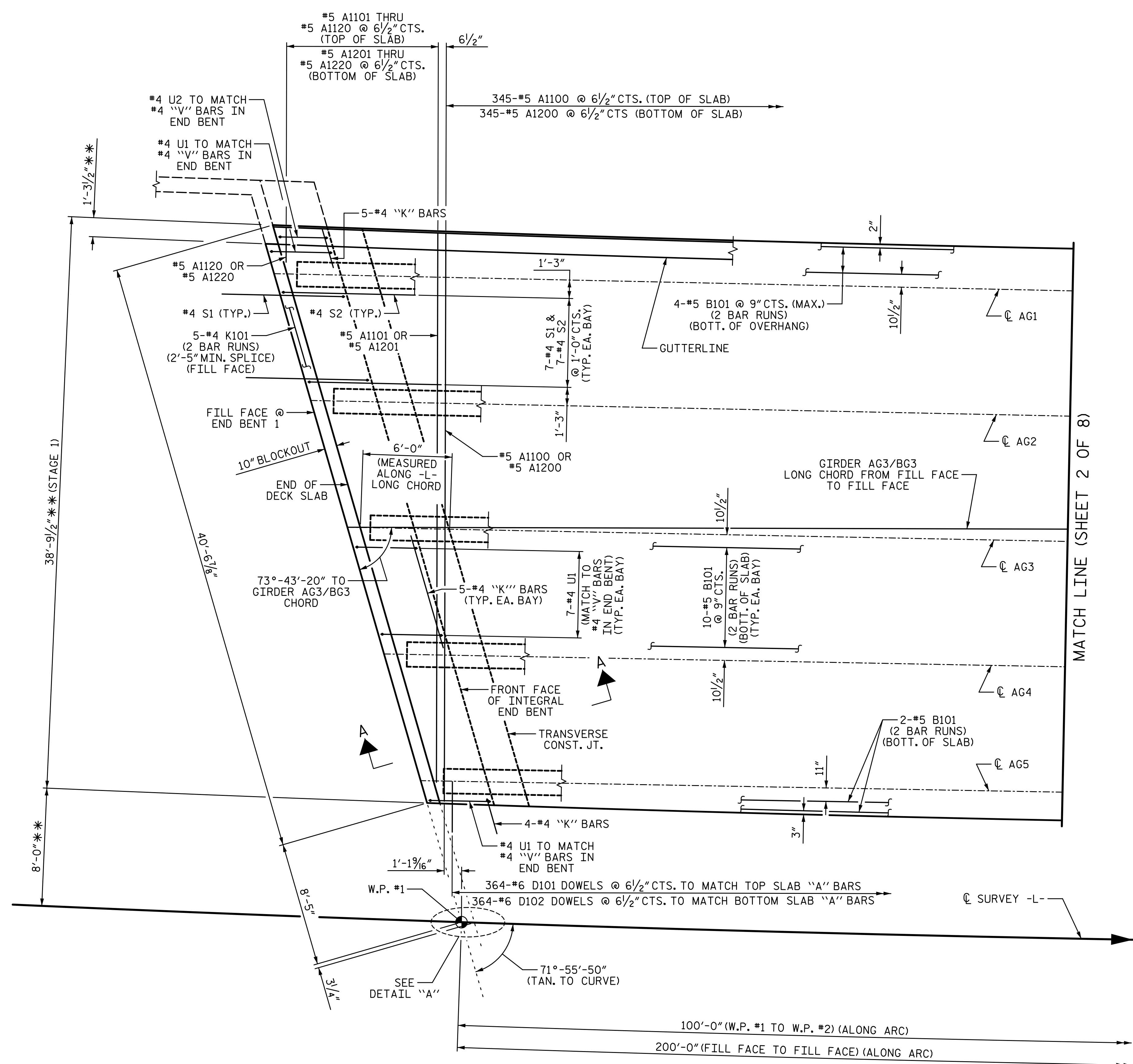


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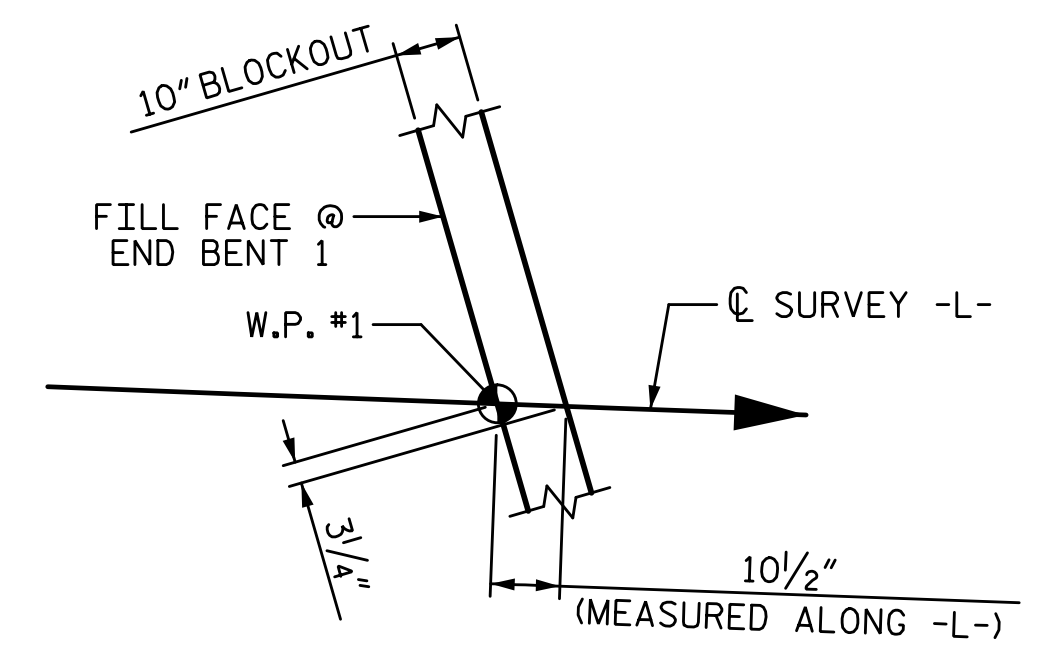


MATCH LINE (SHEET 2 OF 8)

### SPAN A PLAN OF SPANS

#### NOTES:

- FOR SECTION A-A, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 6 OF 6.
- FOR LOCATIONS OF INTERMEDIATE DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- SEE "SUPERSTRUCTURE CONCRETE PARAPET" SHEET FOR ADDITIONAL REINFORCING STEEL IN SLAB AND PARAPET.
- FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 1 OF 2.
- "A" BARS AND DOWELS TO BE PLACED PERPENDICULAR TO GIRDER AG3/BG3 LONG CHORD FROM FILL FACE TO FILL FACE.
- FOR "B" BARS IN TOP OF DECK, SEE SHEET 4 OF 8.
- \*\* RADIAL DIMENSION.

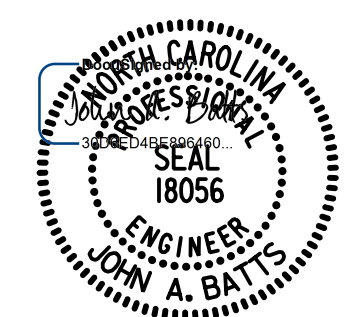


DETAIL "A"

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 STAGE 1

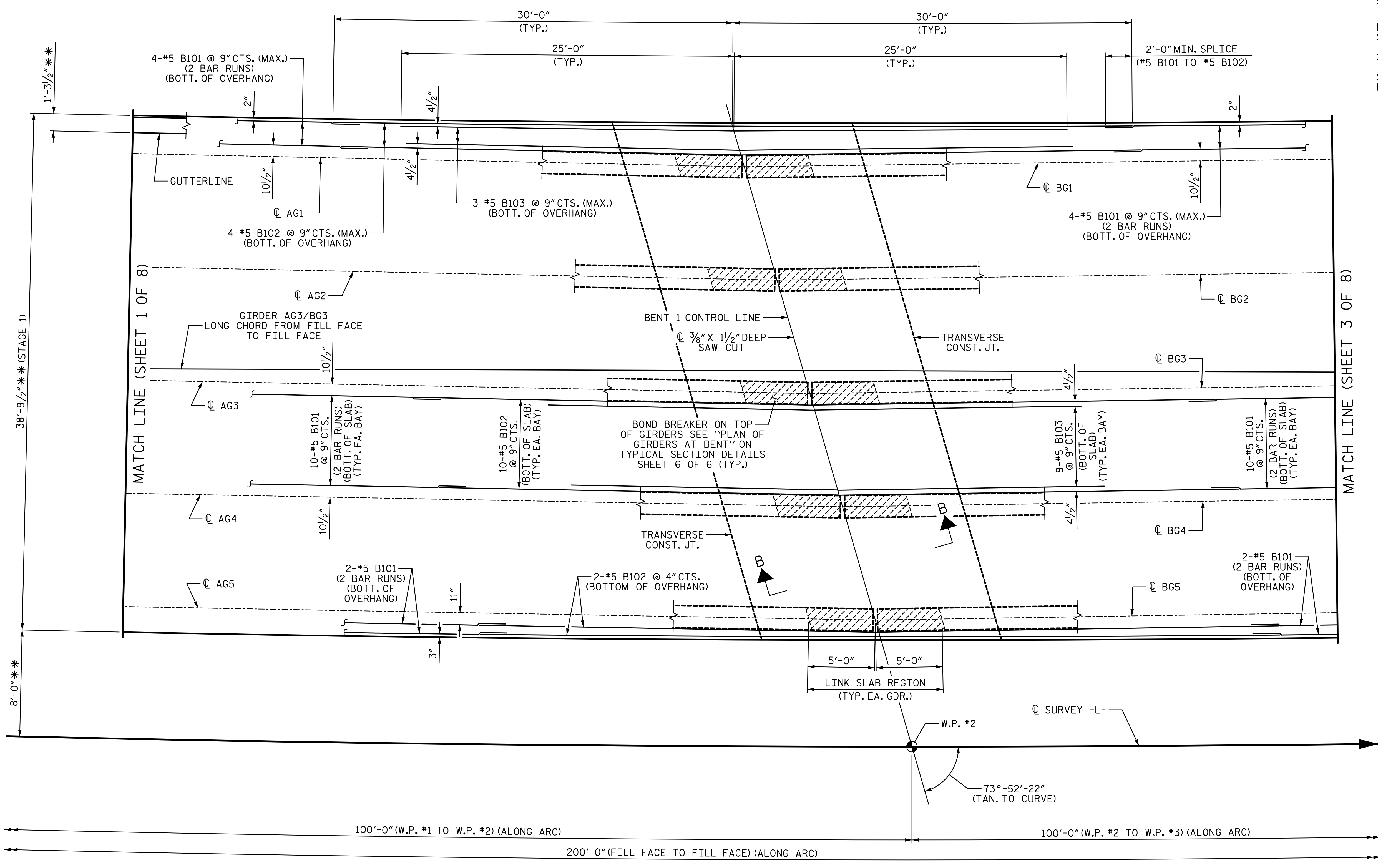


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CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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2			4			58

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**NOTES:**  
 FOR SECTION B-B, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 6 OF 6.  
 FOR "B" BARS IN TOP OF DECK, SEE SHEET 4 OF 8.  
 \*\* RADIAL DIMENSION.  
 SEE "PLAN OF SPANS" SHEET 1 OF 8 FOR ADDITIONAL NOTES.

### PLAN OF SPANS

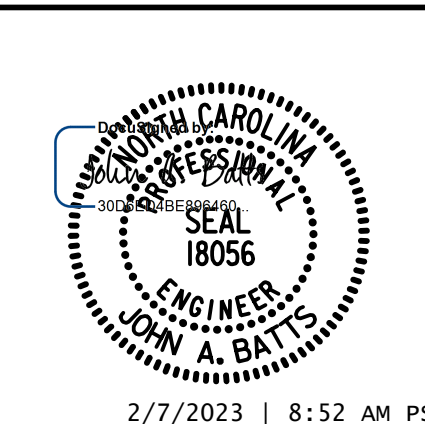
PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

PLAN OF SPANS

STAGE 1



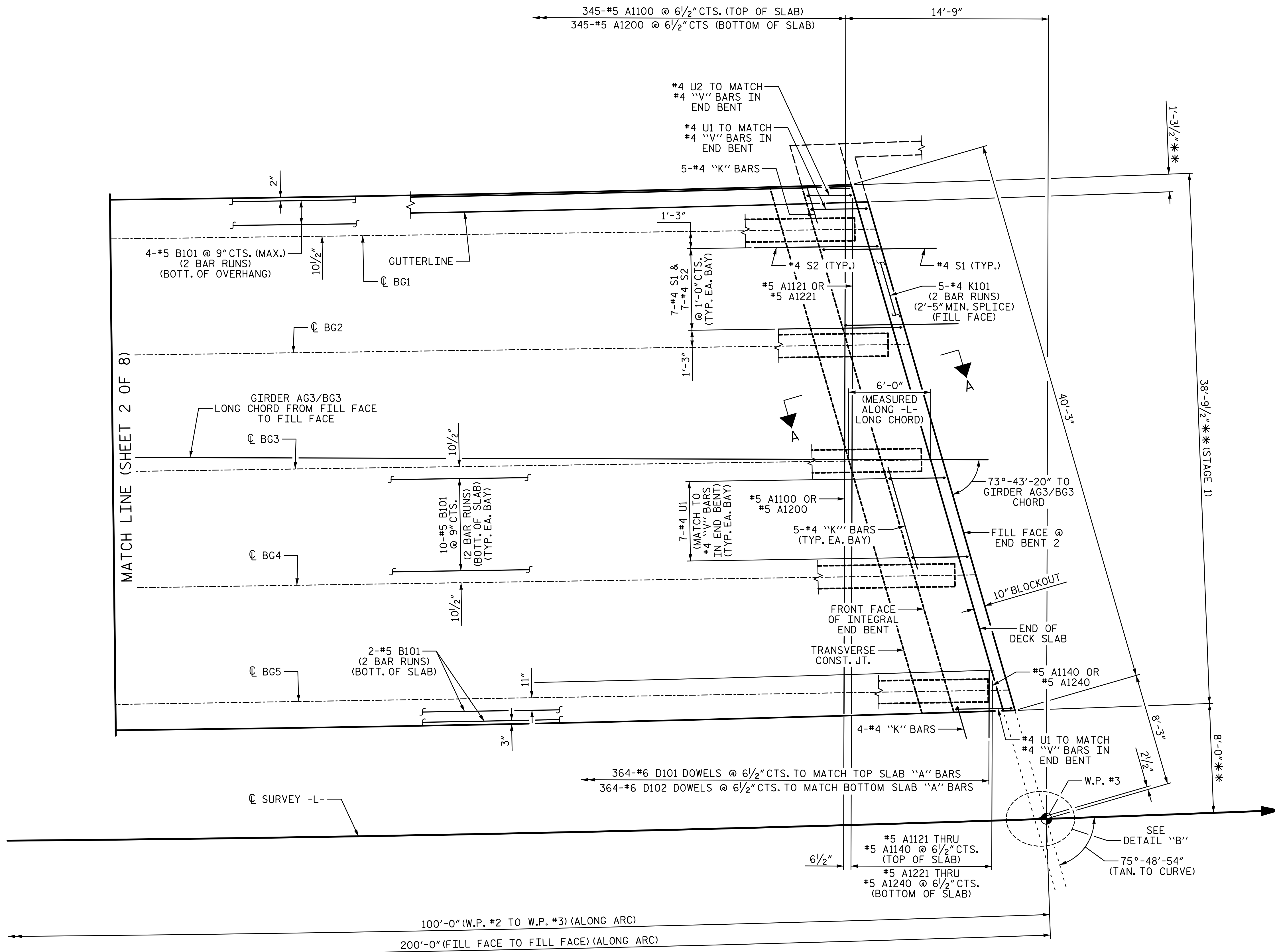
DRAWN BY: T. BANKOVICH	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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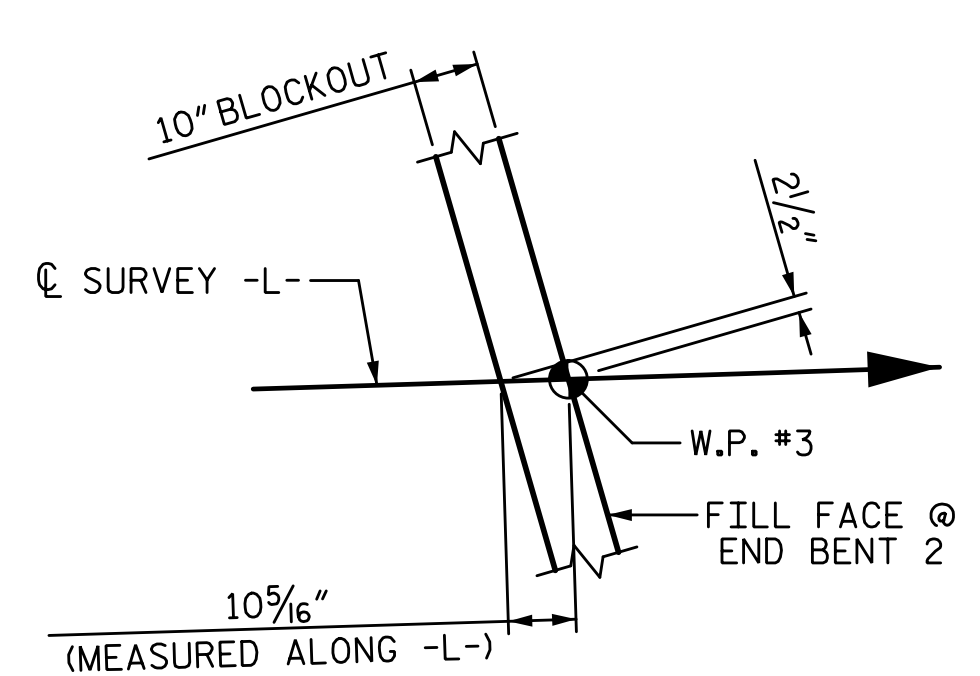


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**SPAN B**  
**PLAN OF SPANS**

**NOTES:**  
 FOR SECTION A-A, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 6 OF 6.  
 "A" BARS AND DOWELS TO BE PLACED PERPENDICULAR TO GIRDER AG3/BG3 LONG CHORD FROM FILL FACE TO FILL FACE.  
 FOR "B" BARS IN TOP OF DECK, SEE SHEET 4 OF 8.  
 \*\* RADIAL DIMENSION.  
 SEE "PLAN OF SPANS" SHEET 1 OF 8 FOR ADDITIONAL NOTES.



**DETAIL "B"**

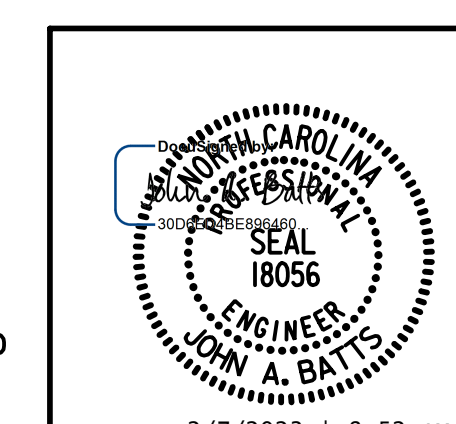
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GUILFORD COUNTY  
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SHEET 3 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**PLAN OF SPANS**

STAGE 1



**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518

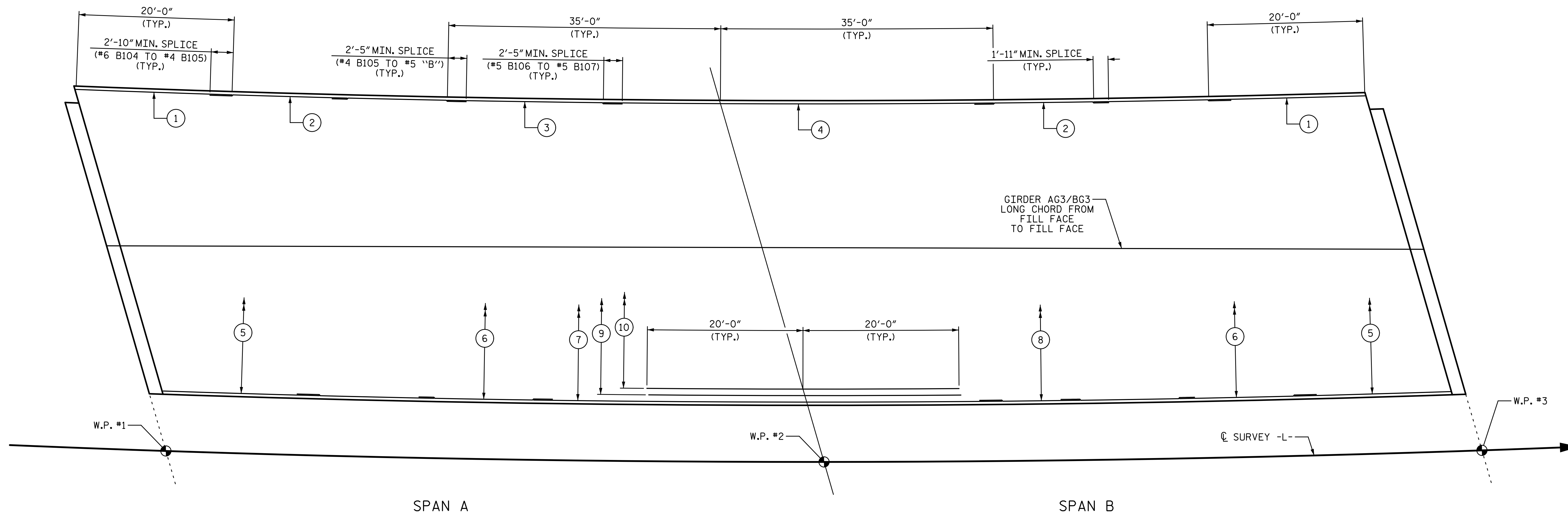
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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

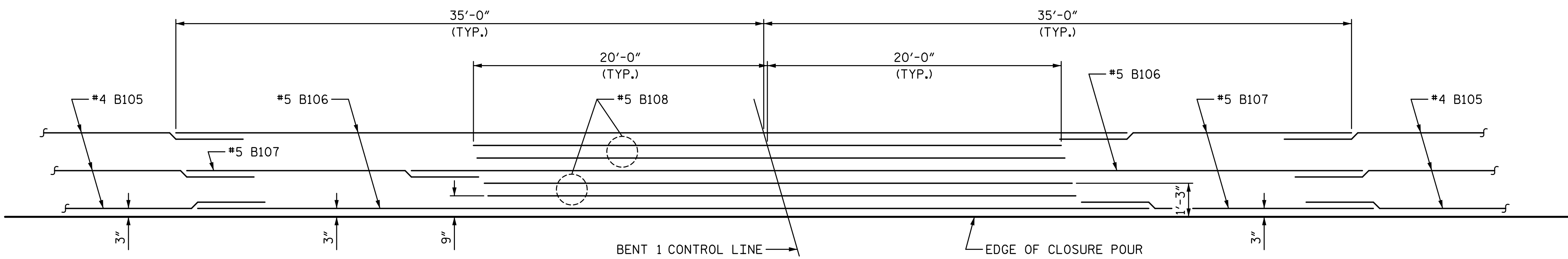
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**PLAN OF SPANS**  
TOP OF SLAB "B" BAR REINFORCEMENT LAYOUT



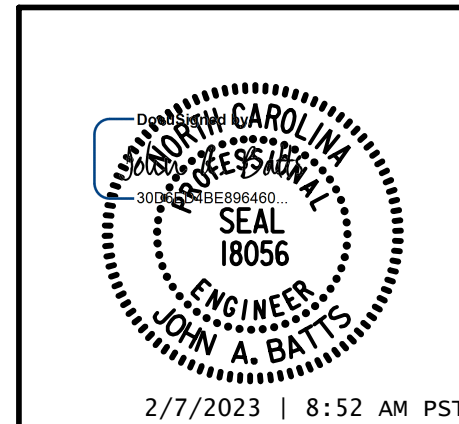
**TOP OF DECK "B" BAR PLACEMENT**  
AT BENT

- |  |   |
|--|---|
| ① 1-#6 B104 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)             | ⑥ 26-#4 B105 @ 1'-6" CTS. (2 BAR RUNS)<br>(TOP OF SLAB) (SEE TYPICAL SECTION) |
| ② 1-#4 B105 (2 BAR RUN) (TOP OF SLAB)<br>(SEE TYPICAL SECTION) | ⑦ 26-#5 B106 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              |
| ③ 1-#5 B107 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)             | ⑧ 26-#5 B107 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              |
| ④ 1-#5 B106 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)             | ⑨ 26-#5 B108 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              |
| ⑤ 77-#6 B104 @ 6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)  | ⑩ 25-#5 B108 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              |

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SHEET 4 OF 8

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
**PLAN OF SPANS**  
STAGE 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			58

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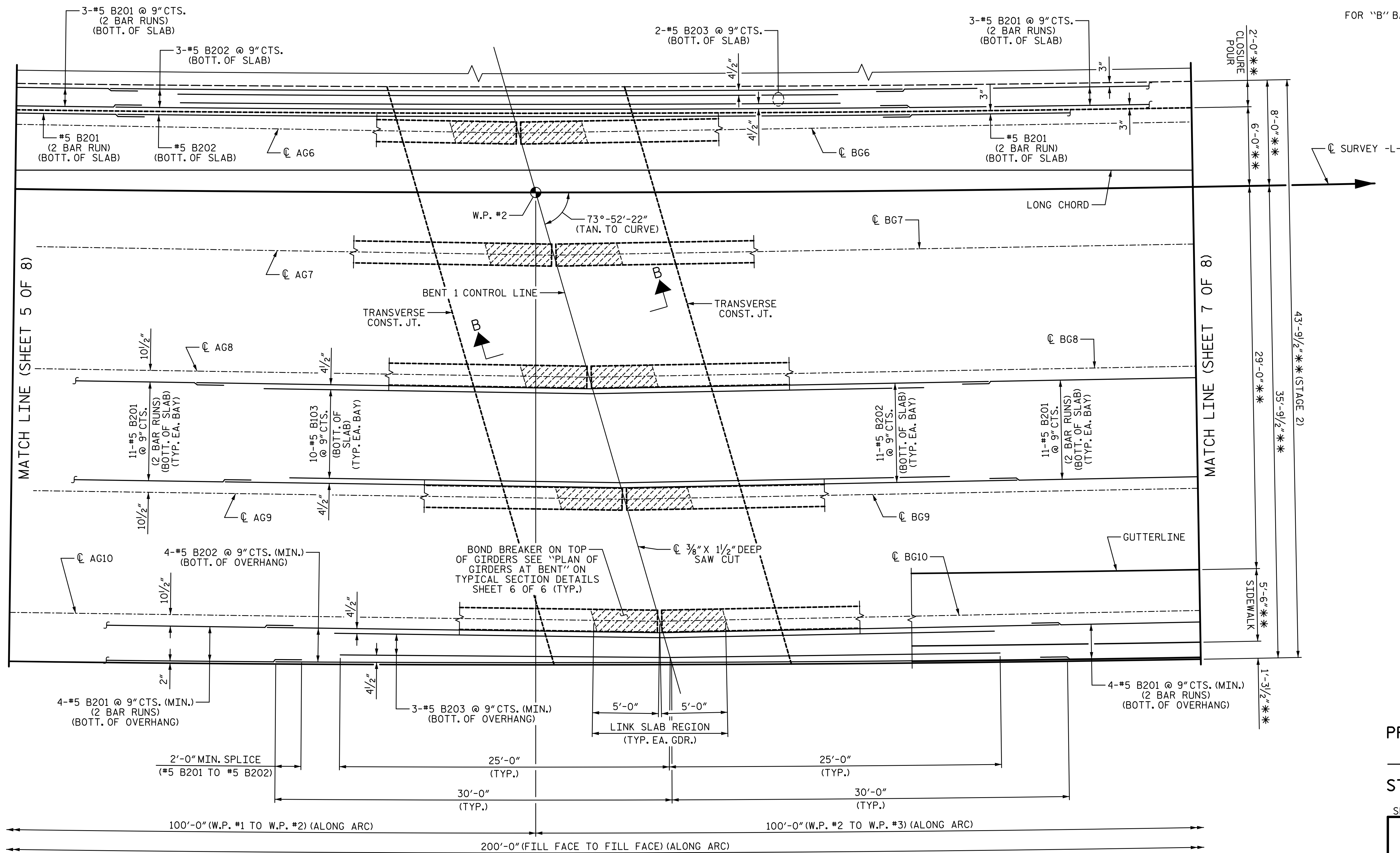
NOTES:

FOR SECTION B-B, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 6 OF 6.

FOR ADDITIONAL NOTES, SEE SHEET 5 OF 8.

\*\* RADIAL DIMENSION.

FOR "B" BARS IN TOP OF DECK, SEE SHEET 8 OF 8.



MATCH LINE (SHEET 5 OF 8)

MATCH LINE (SHEET 7 OF 8)

SPAN A

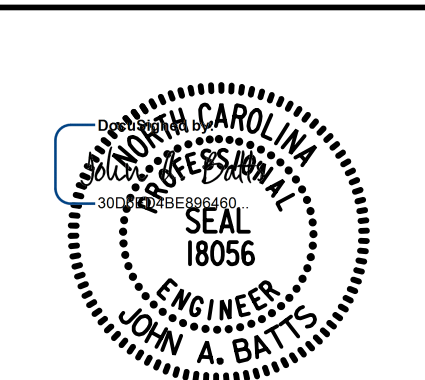
SPAN B

PLAN OF SPANS

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA  
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 SUPERSTRUCTURE  
 PLAN OF SPANS  
 STAGE 2



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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

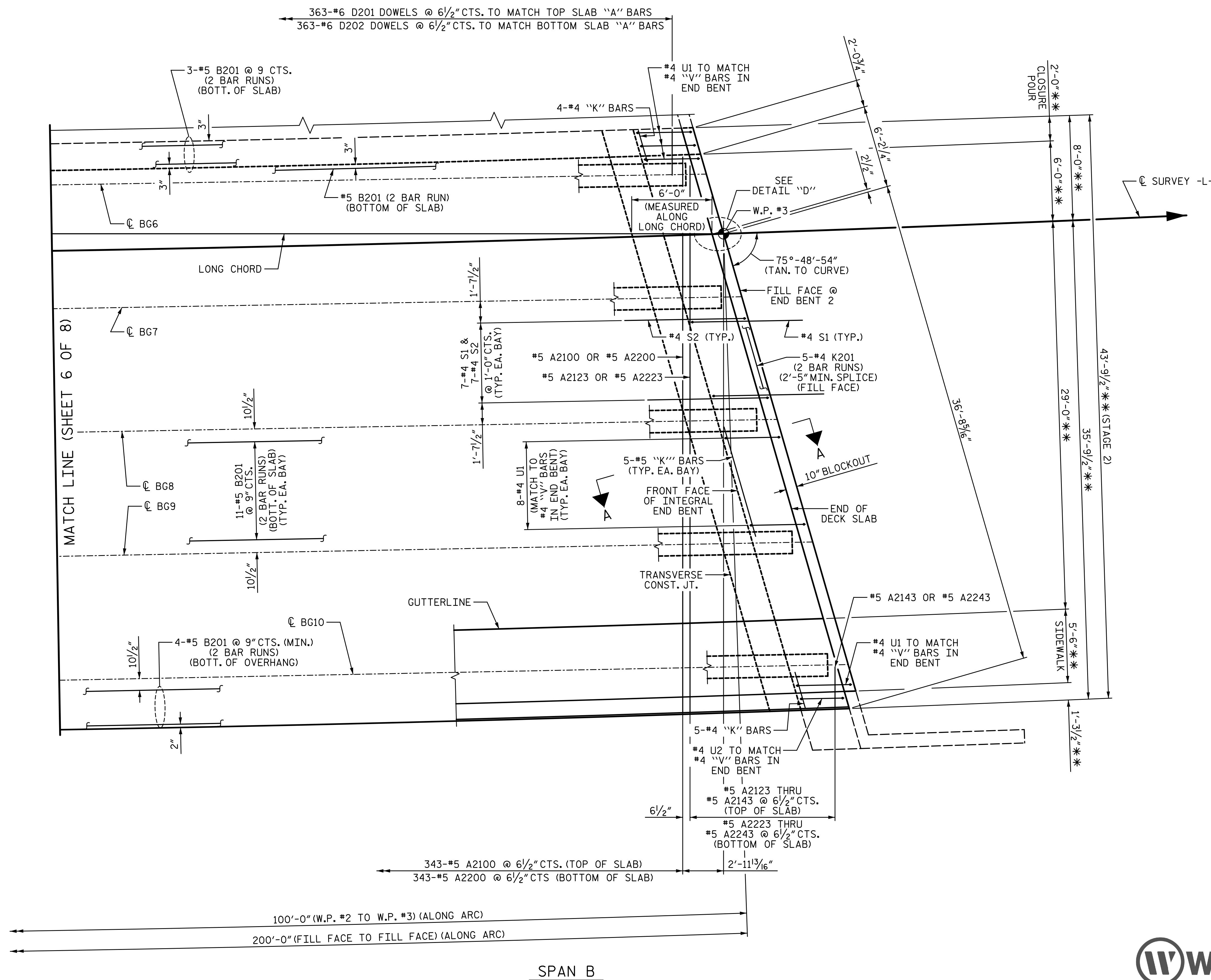
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**NOTES:**

FOR SECTION A-A, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 6 OF 6.

FOR LOCATIONS OF INTERMEDIATE DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.

SEE "SUPERSTRUCTURE CONCRETE PARAPET" SHEET FOR ADDITIONAL REINFORCING STEEL IN SLAB AND PARAPET.

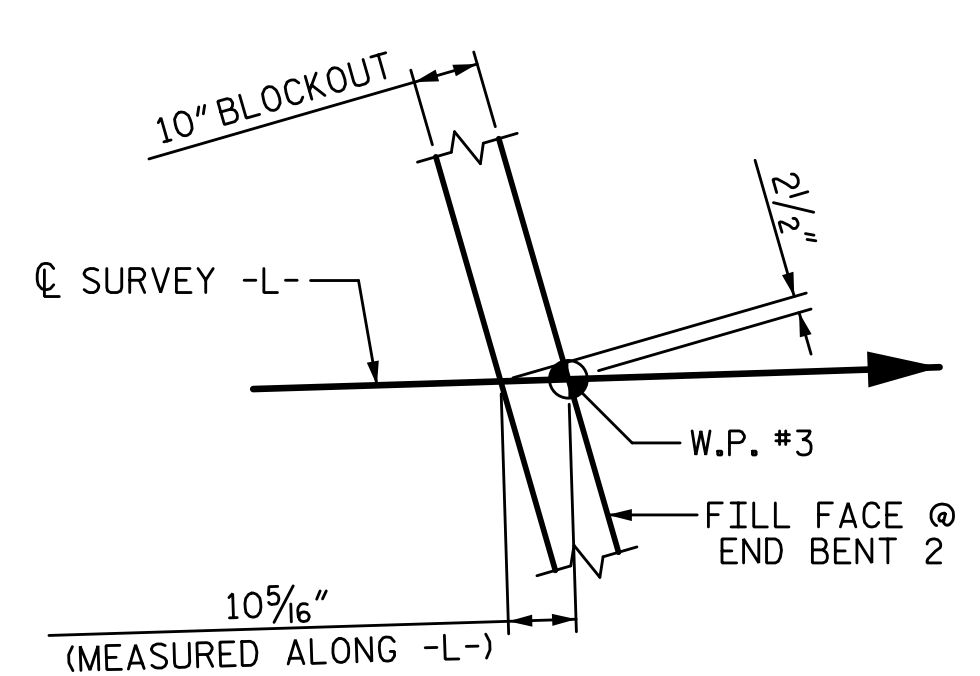
FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 1 OF 2.

"A" BARS AND DOWELS TO BE PLACED PERPENDICULAR TO LONG CHORD.

SEE "SIDEWALK DETAILS" SHEET FOR ADDITIONAL REINFORCING STEEL IN SLAB AND SIDEWALK.

FOR "B" BARS IN TOP OF DECK, SEE SHEET 8 OF 8.

\*\* RADIAL DIMENSION.



DETAIL "D"

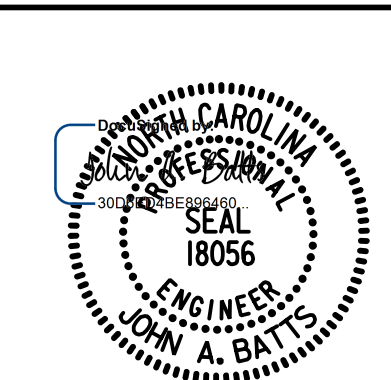
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GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 STAGE 2

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2			4		

TOTAL SHEETS: 58

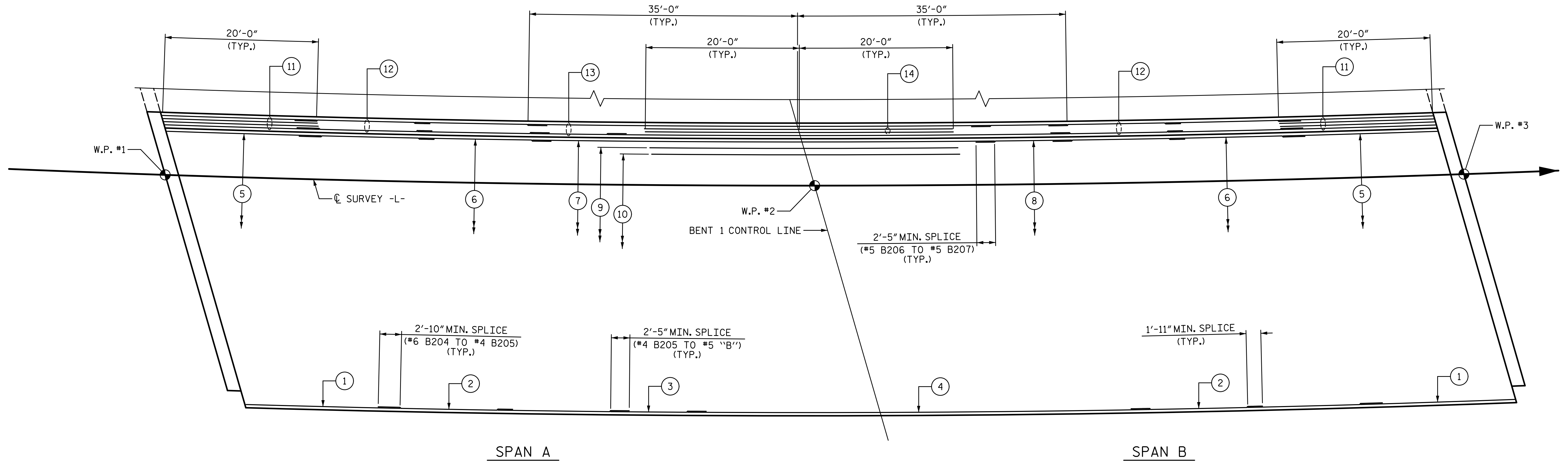


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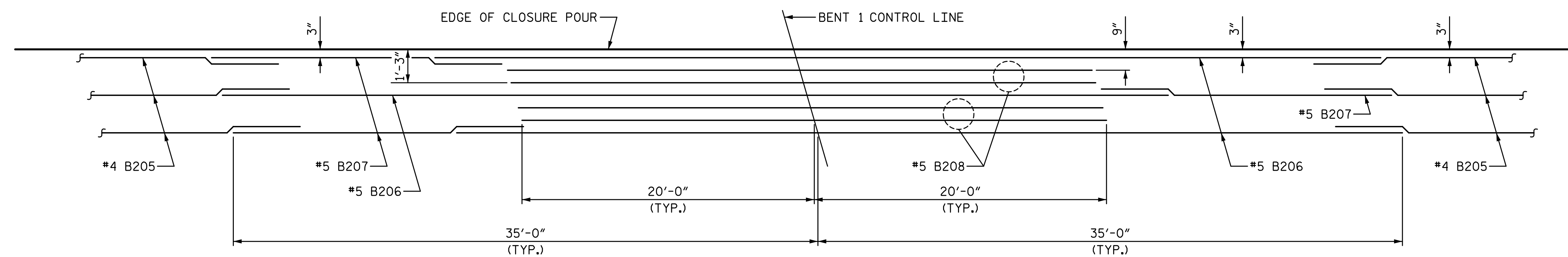
PLAN OF SPANS

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**PLAN OF SPANS**

TOP OF SLAB "B" BAR REINFORCEMENT LAYOUT



**TOP OF DECK "B" BAR PLACEMENT**

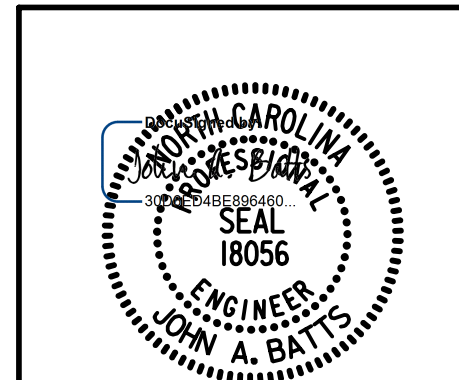
AT BENT

- |   |   |  |
|---|---|--|
| ① 1-#6 B204 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑥ 28-#4 B205 @ 1'-6" CTS. (2 BAR RUNS)<br>(TOP OF SLAB) (SEE TYPICAL SECTION) | ⑪ 4-#6 B204 @ 6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)               |
| ② 1-#4 B205 (2 BAR RUNS) (TOP OF SLAB)<br>(SEE TYPICAL SECTION) | ⑦ 28-#5 B206 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑫ 4-#4 B205 @ 6" CTS. (2 BAR RUNS)<br>(TOP OF SLAB) (SEE TYPICAL SECTION)  |
| ③ 1-#5 B207 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑧ 28-#5 B207 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑬ 2-#5 B206 OR #5 B207 @ 1'-6" CTS.<br>(TOP OF SLAB) (SEE TYPICAL SECTION) |
| ④ 1-#5 B206 (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑨ 28-#5 B208 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              | ⑭ 2-#5 B208 @ 6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)               |
| ⑤ 83-#6 B204 @ 6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)   | ⑩ 27-#5 B208 @ 1'-6" CTS. (TOP OF SLAB)<br>(SEE TYPICAL SECTION)              |  |

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SHEET 8 OF 8

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**  
 STAGE 2

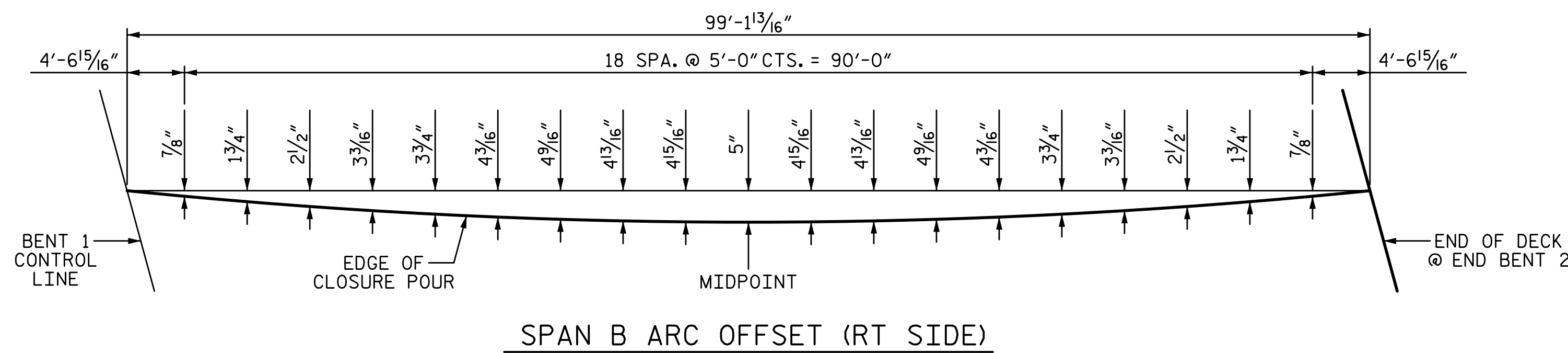
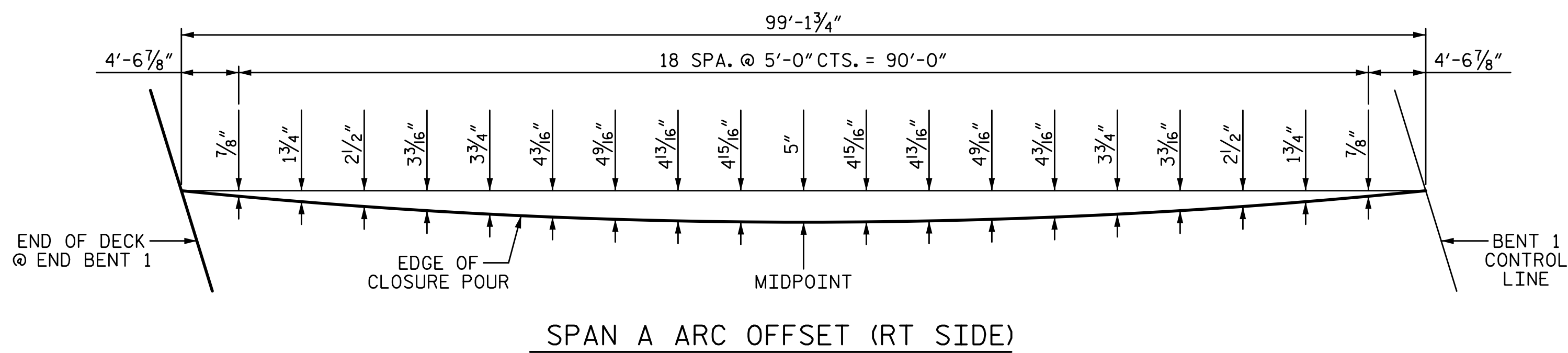
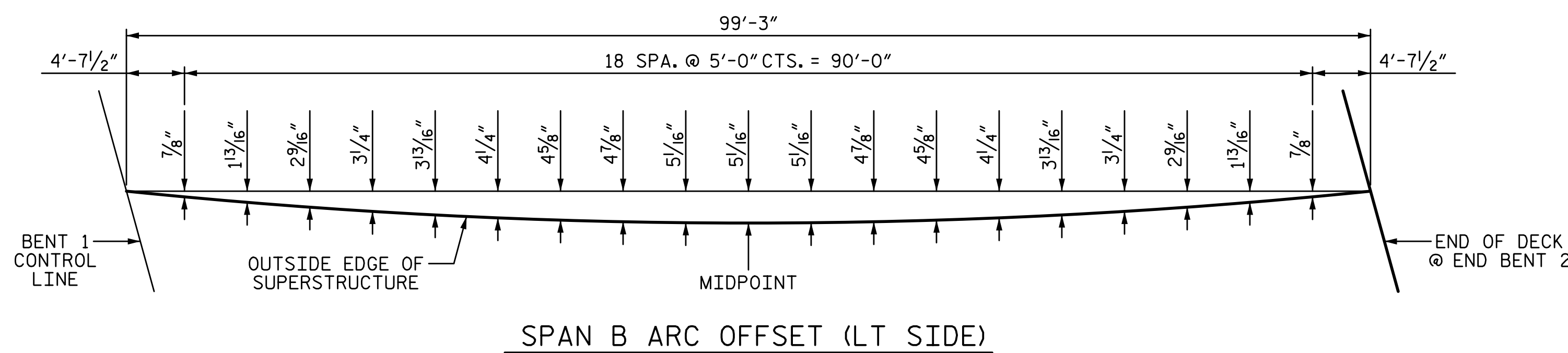
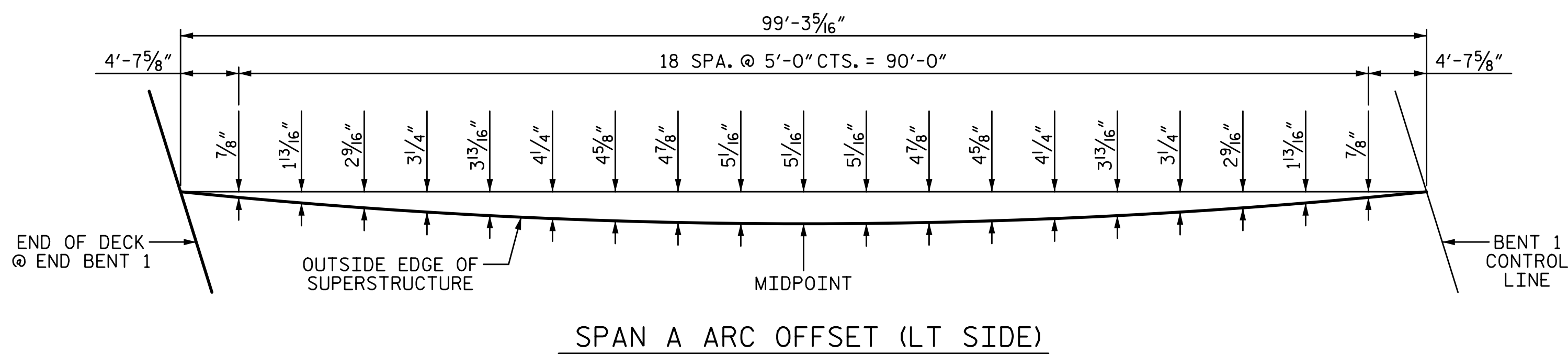


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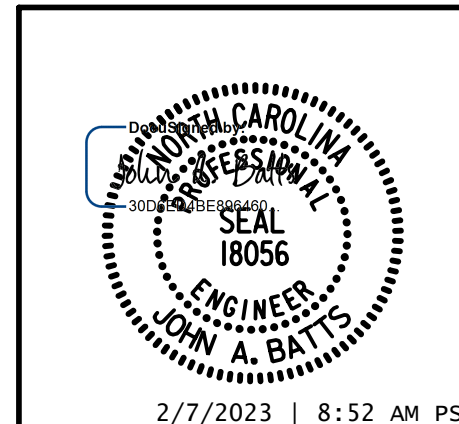
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**STAGE 1 ARC OFFSETS**

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 2

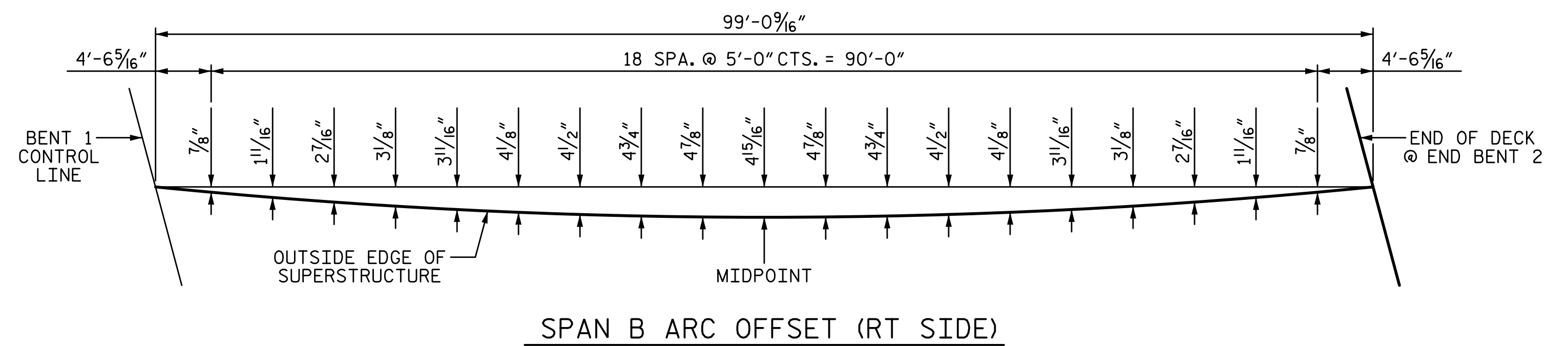
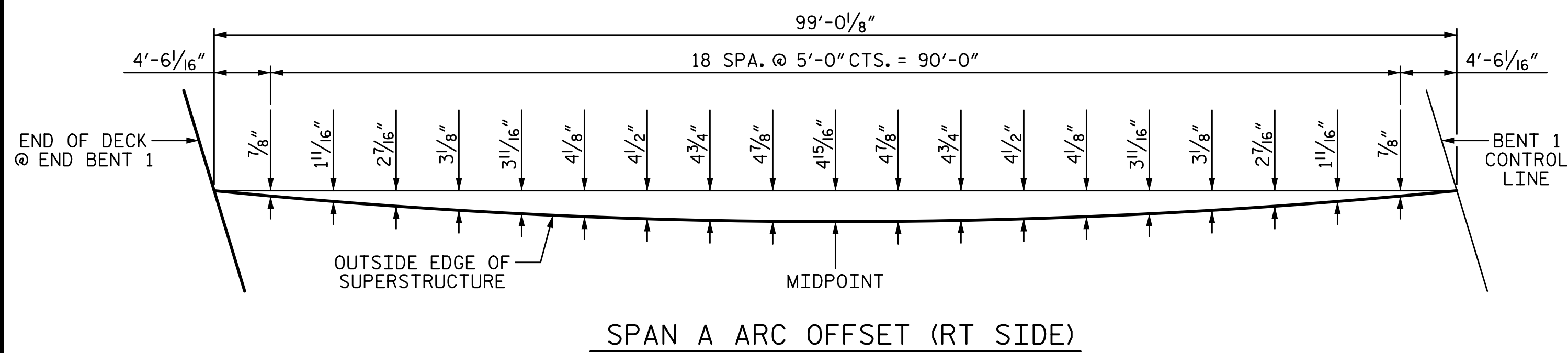
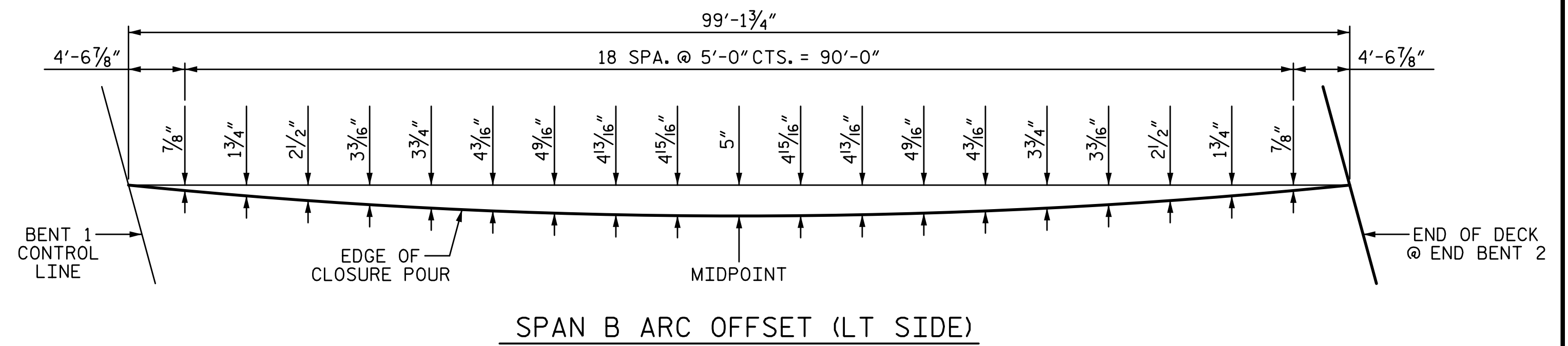
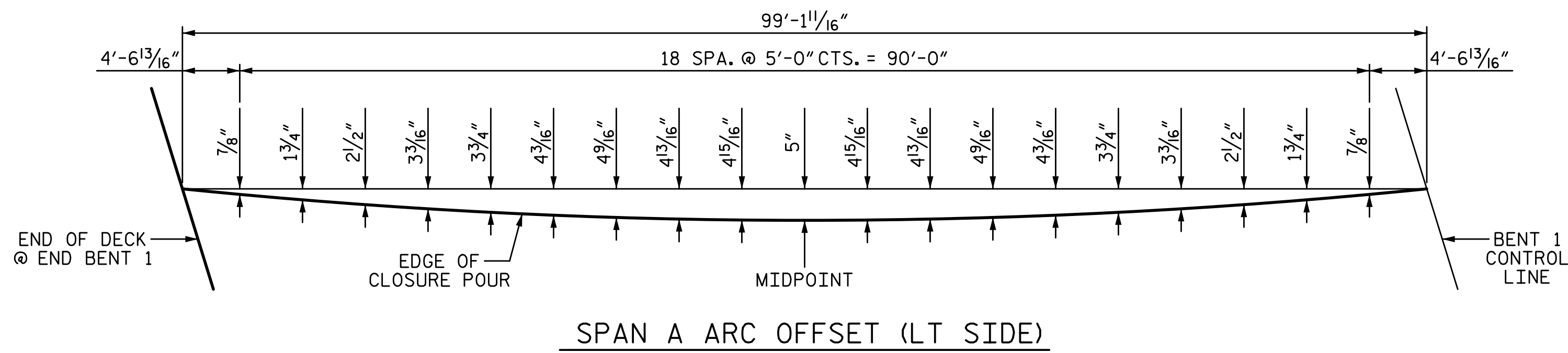


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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 ARC OFFSETS  
  
 STAGE 1

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STAGE 2 ARC OFFSETS

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
STATION: 18+82.09 -L-

SHEET 2 OF 2

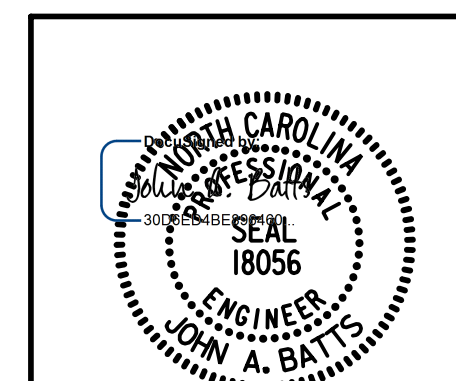
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
ARC OFFSETS

STAGE 2



5640 Dillard Drive, Suite 200  
Cary, NC 27518

LICENSURE NO. C-4434



2/7/2023 | 8:52 AM PST

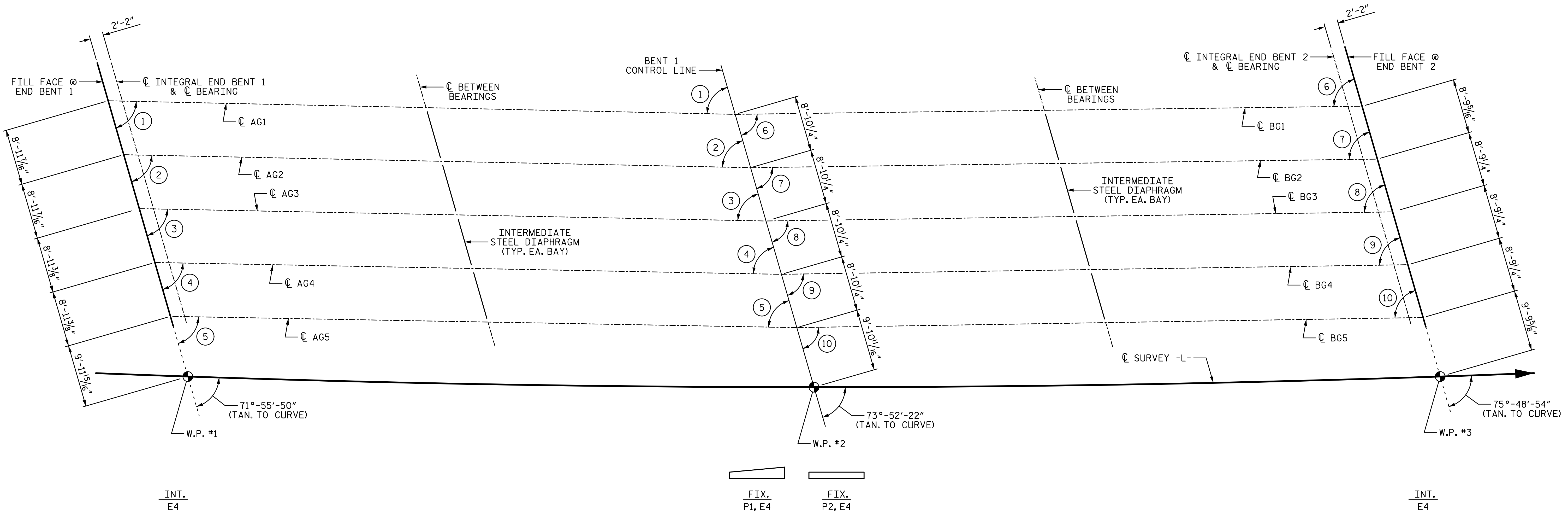
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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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1			3		
2			4		
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**FRAMING PLAN**

**ANGLES**

- |               |               |
|---------------|---------------|
| ① 72°-38'-15" | ⑥ 74°-36'-41" |
| ② 72°-41'-23" | ⑦ 74°-39'-26" |
| ③ 72°-44'-30" | ⑧ 74°-42'-11" |
| ④ 72°-47'-36" | ⑨ 74°-44'-55" |
| ⑤ 72°-50'-41" | ⑩ 74°-47'-37" |

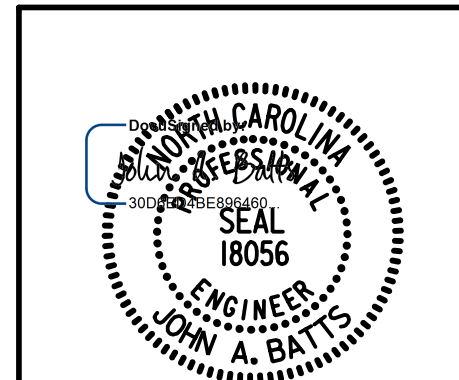
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GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**FRAMING PLAN**

STAGE 1

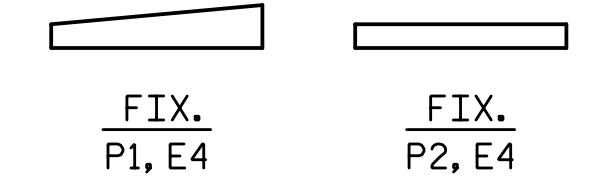
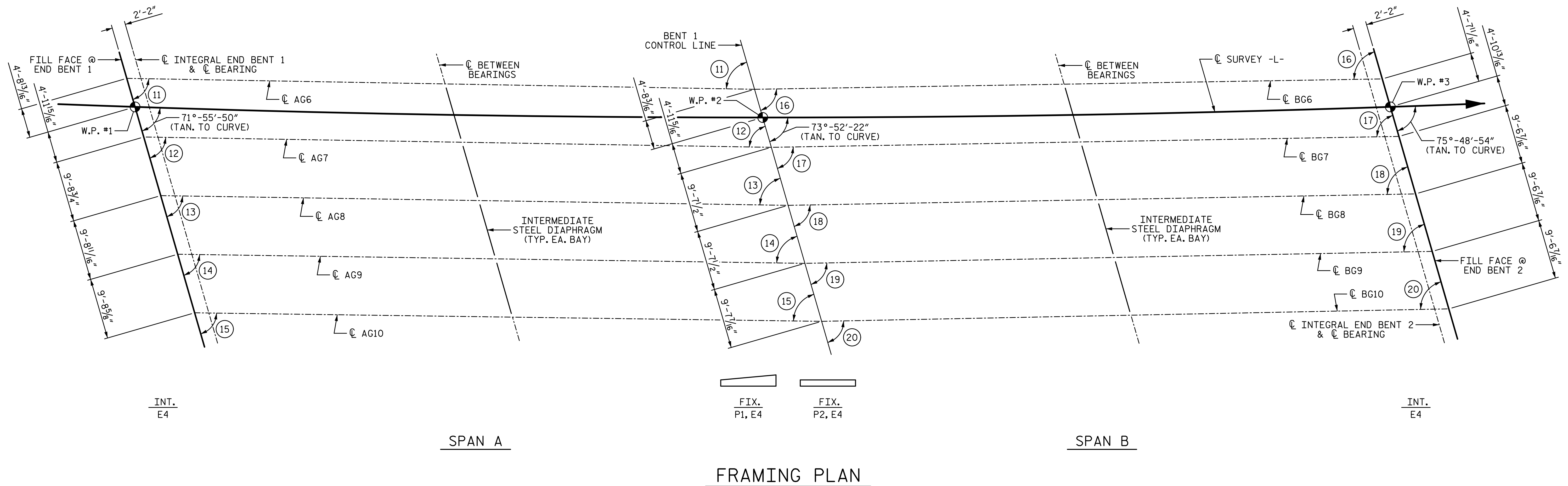


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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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**ANGLES**

- |               |               |
|---------------|---------------|
| ① 72°-52'-29" | ⑩ 74°-49'-12" |
| ② 72°-55'-48" | ⑪ 74°-52'-08" |
| ③ 72°-59'-05" | ⑫ 74°-55'-02" |
| ④ 73°-02'-22" | ⑬ 74°-57'-55" |
| ⑤ 73°-05'-37" | ⑭ 75°-00'-47" |

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

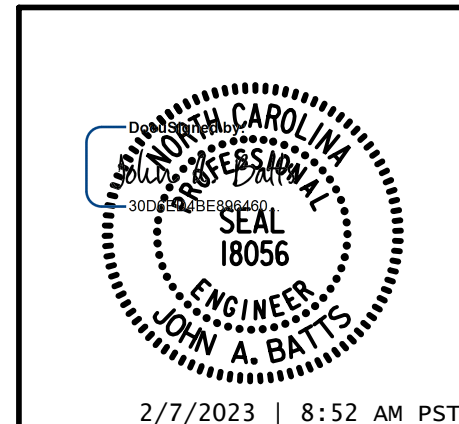
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**FRAMING PLAN**

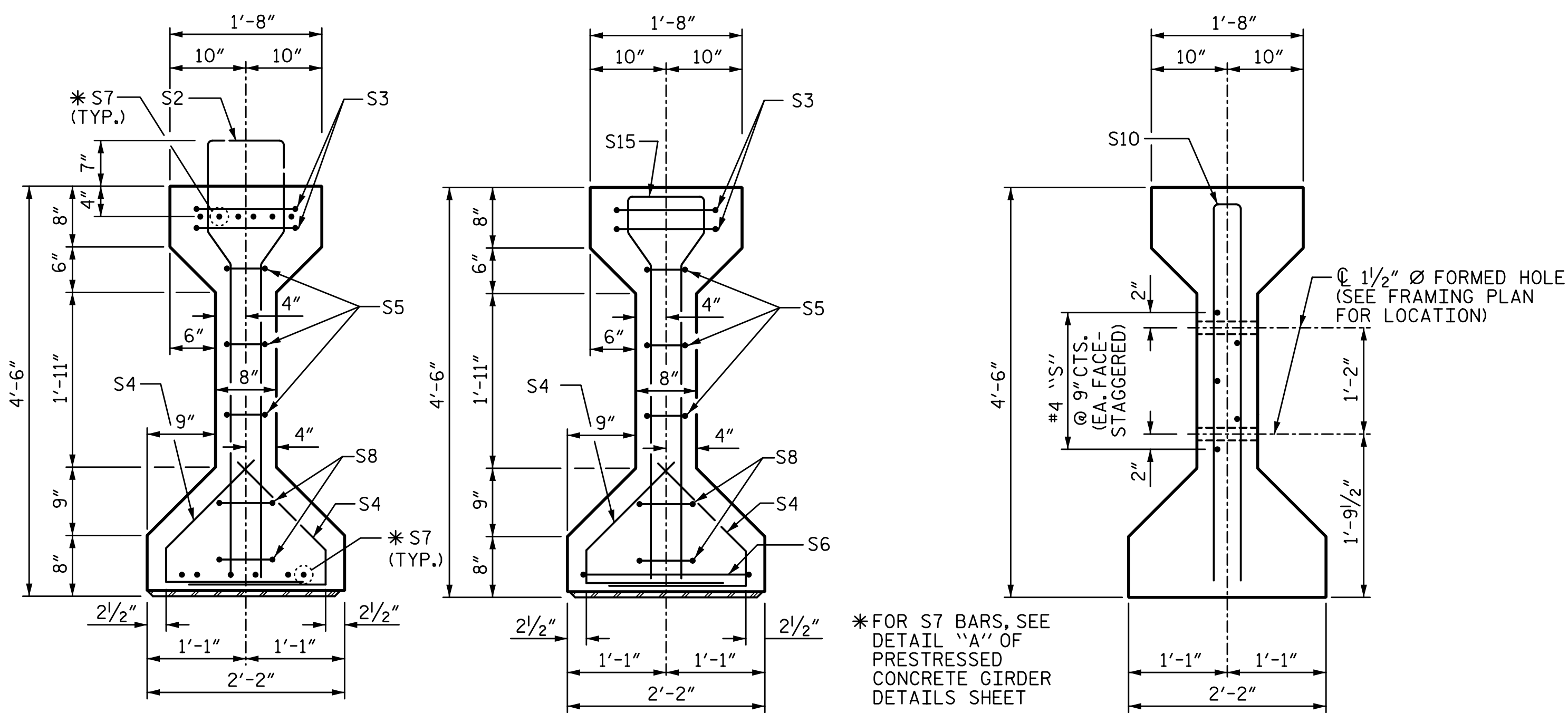
STAGE 2

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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22



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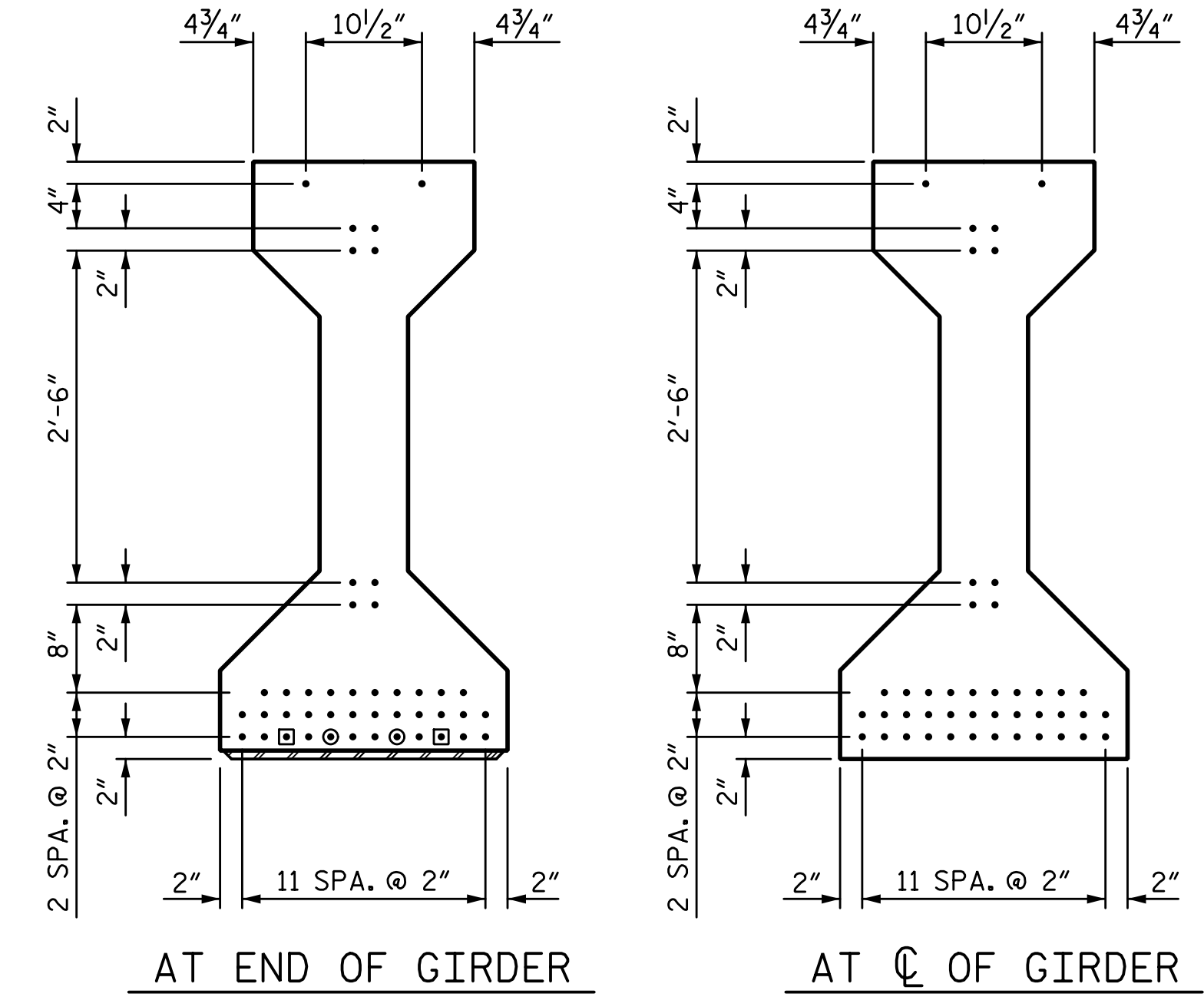
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SECTION A-A

SECTION B-B

SECTION C-C  
(S1 BARS NOT SHOWN)

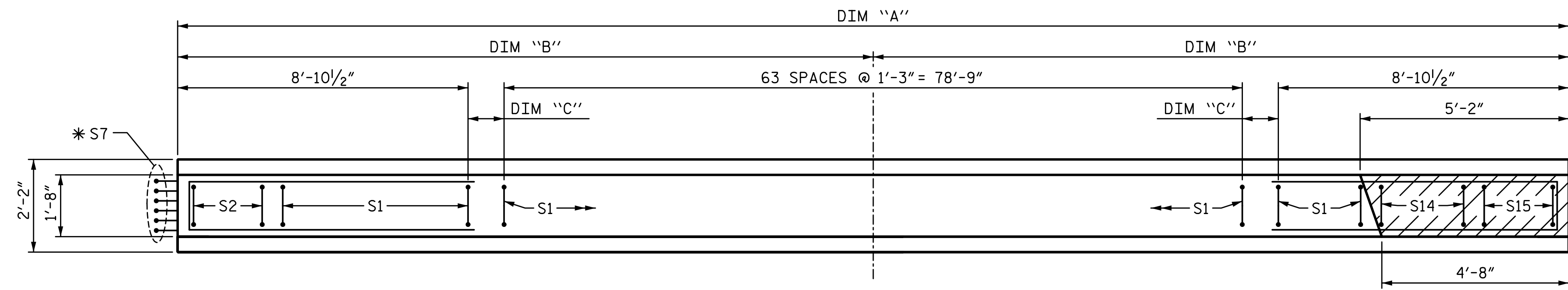
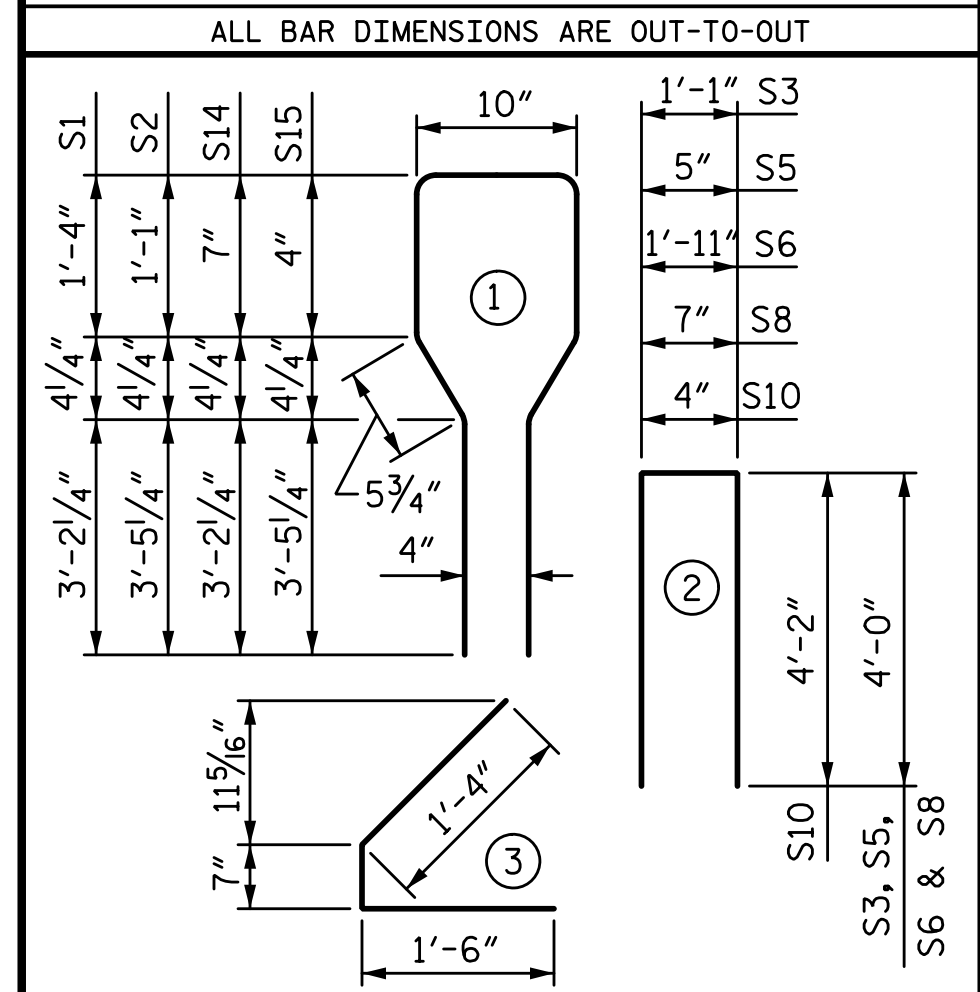


0.6" Ø LOW RELAXATION STRAND LAYOUT

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

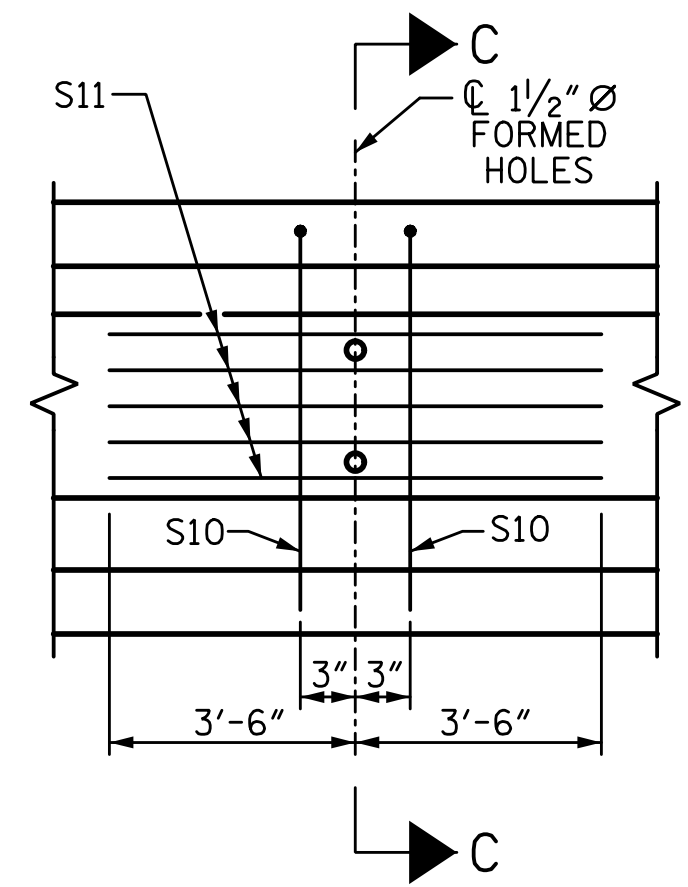
REINFORCING STEEL FOR ONE GIRDER					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	83	#4	1	10'-10"	601
S2	9	#5	1	10'-10"	102
S3	4	#4	2	9'-1"	24
S4	84	#4	3	3'-5"	192
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1
S14	5	#4	1	9'-4"	31
S15	9	#5	1	9'-4"	88

BAR TYPES

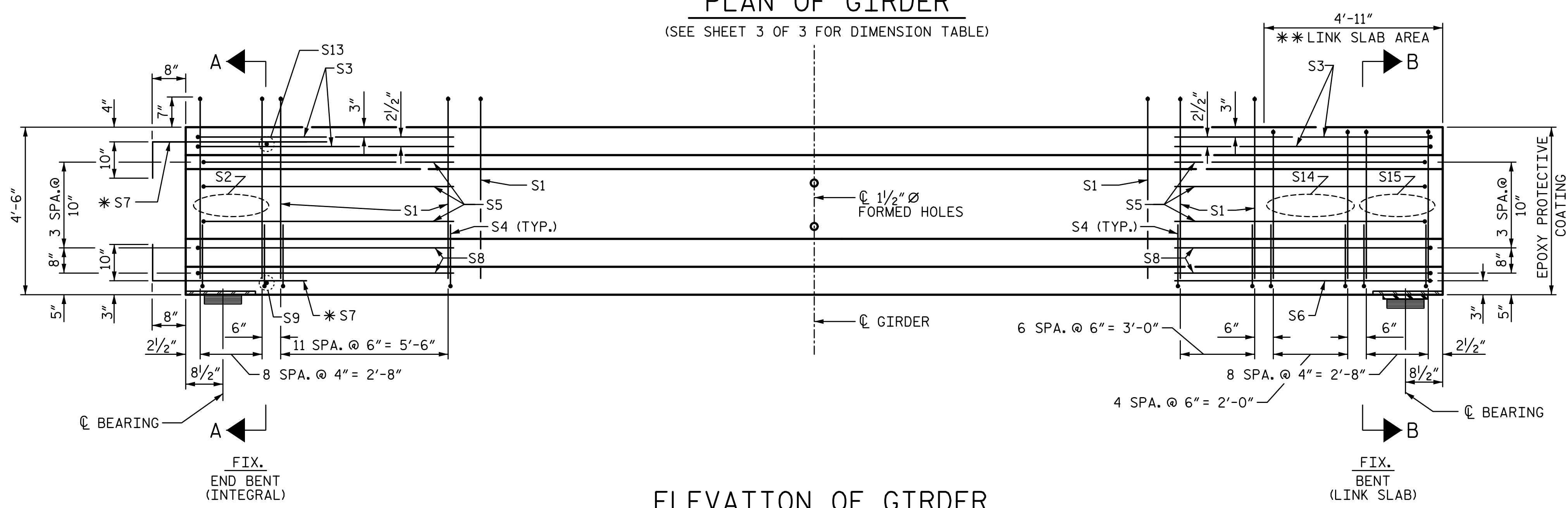


PLAN OF GIRDER  
(SEE SHEET 3 OF 3 FOR DIMENSION TABLE)

- DEBONDING LEGEND
- FULLY BONDED STRAND
  - STRAND DEBONDED FOR 18'-0" FROM END OF GIRDER
  - STRAND DEBONDED FOR 8'-0" FROM END OF GIRDER



PARTIAL ELEVATION  
(LINK SLAB)



ELEVATION OF GIRDER  
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

\*\* DO NOT ROUGHEN TOP OF GIRDER IN THIS AREA

GIRDER	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB	CY	No.
GIRDER	1191	20.0	44

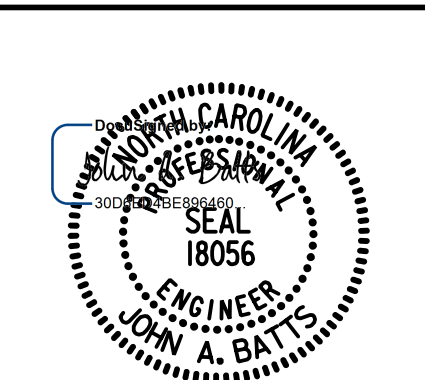
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	VARIES	983.56'

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE  
 GIRDERS 1-5  
 SPANS A & B (STAGE 1)

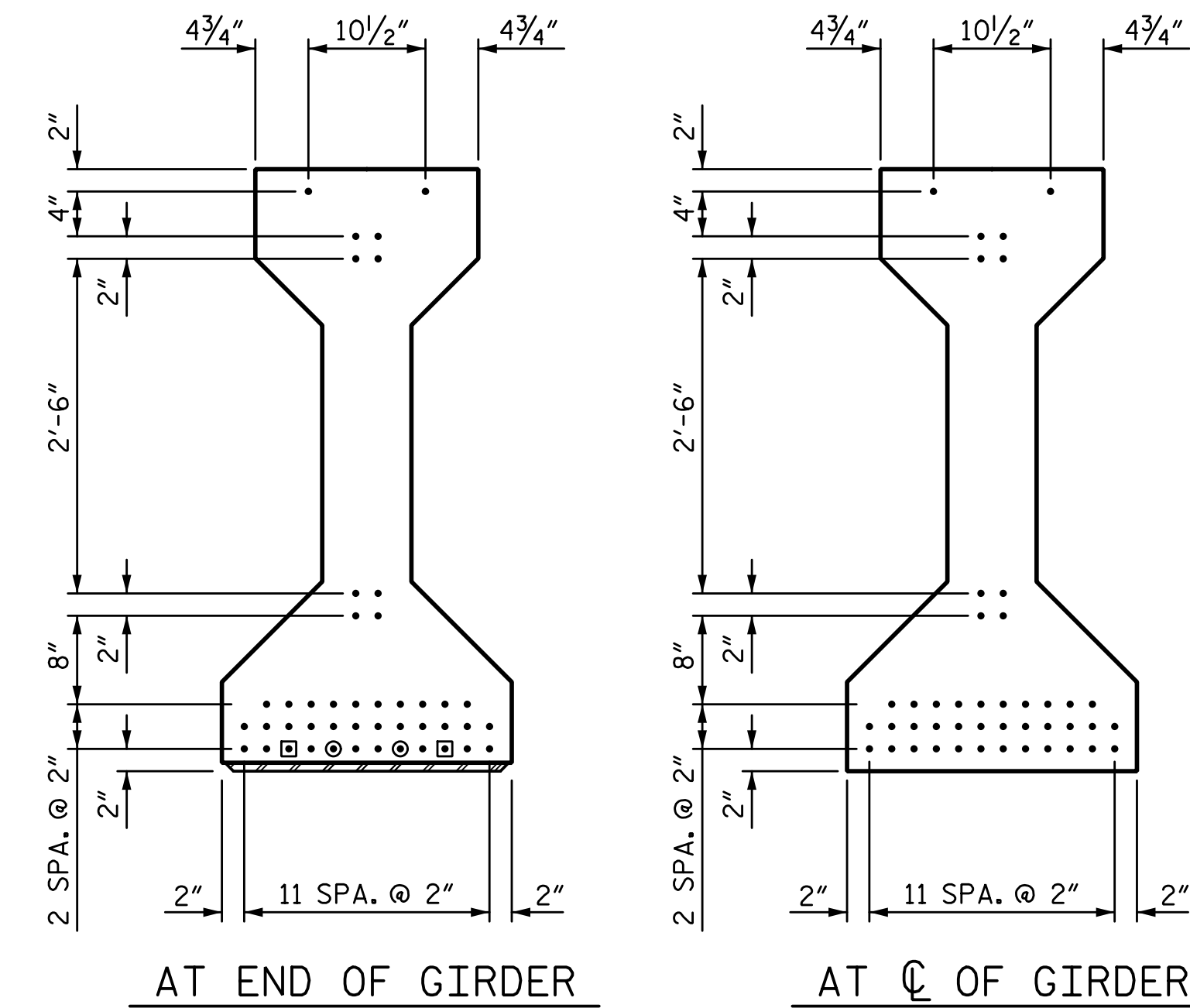
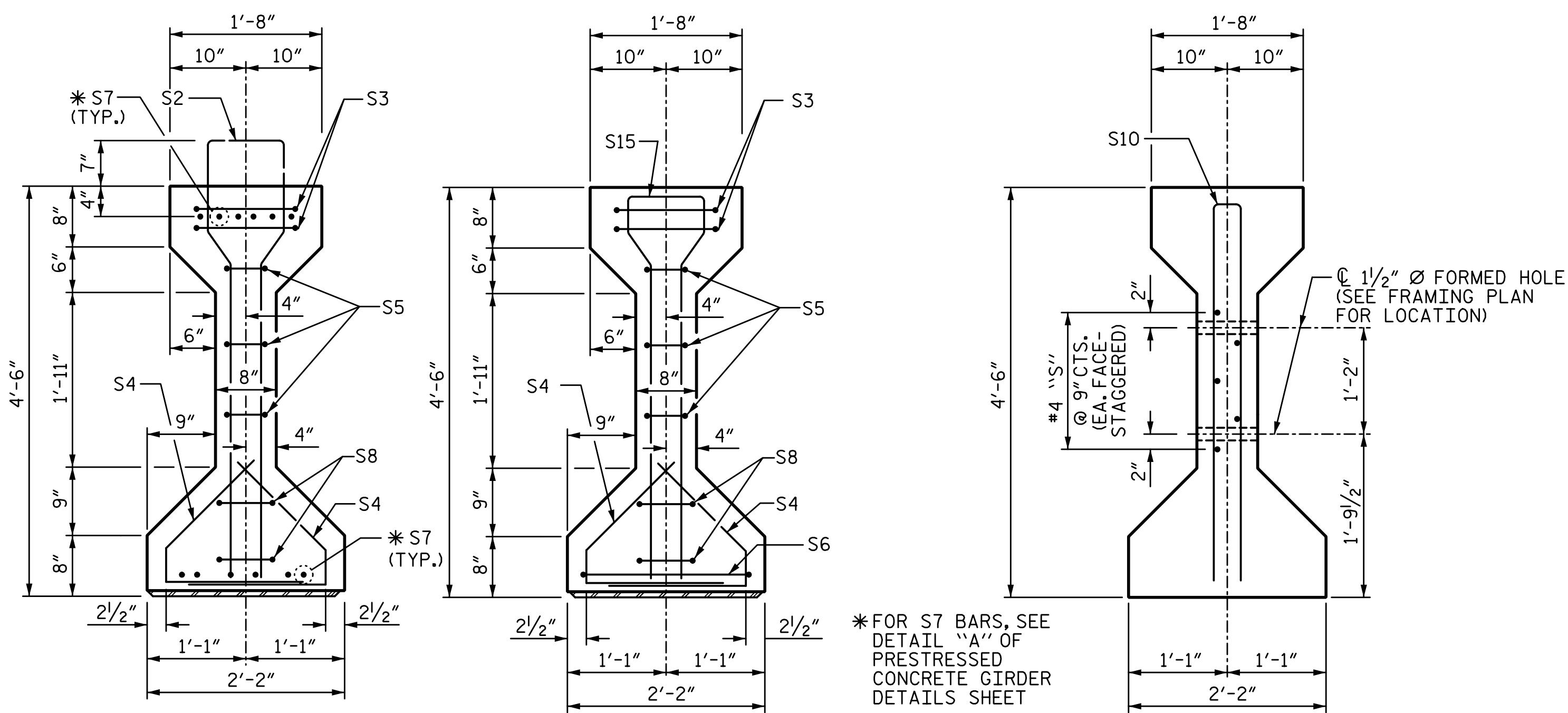
DRAWN BY: S.D. COOPER	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22



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2			4		

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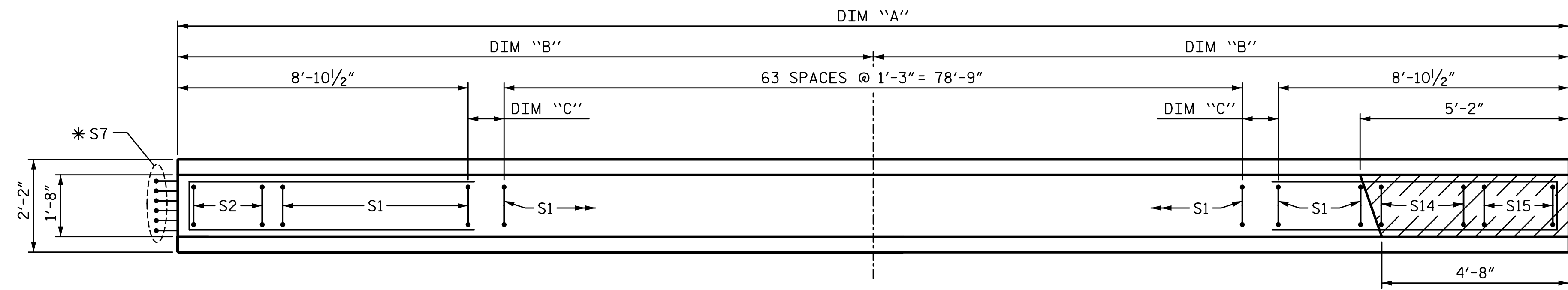
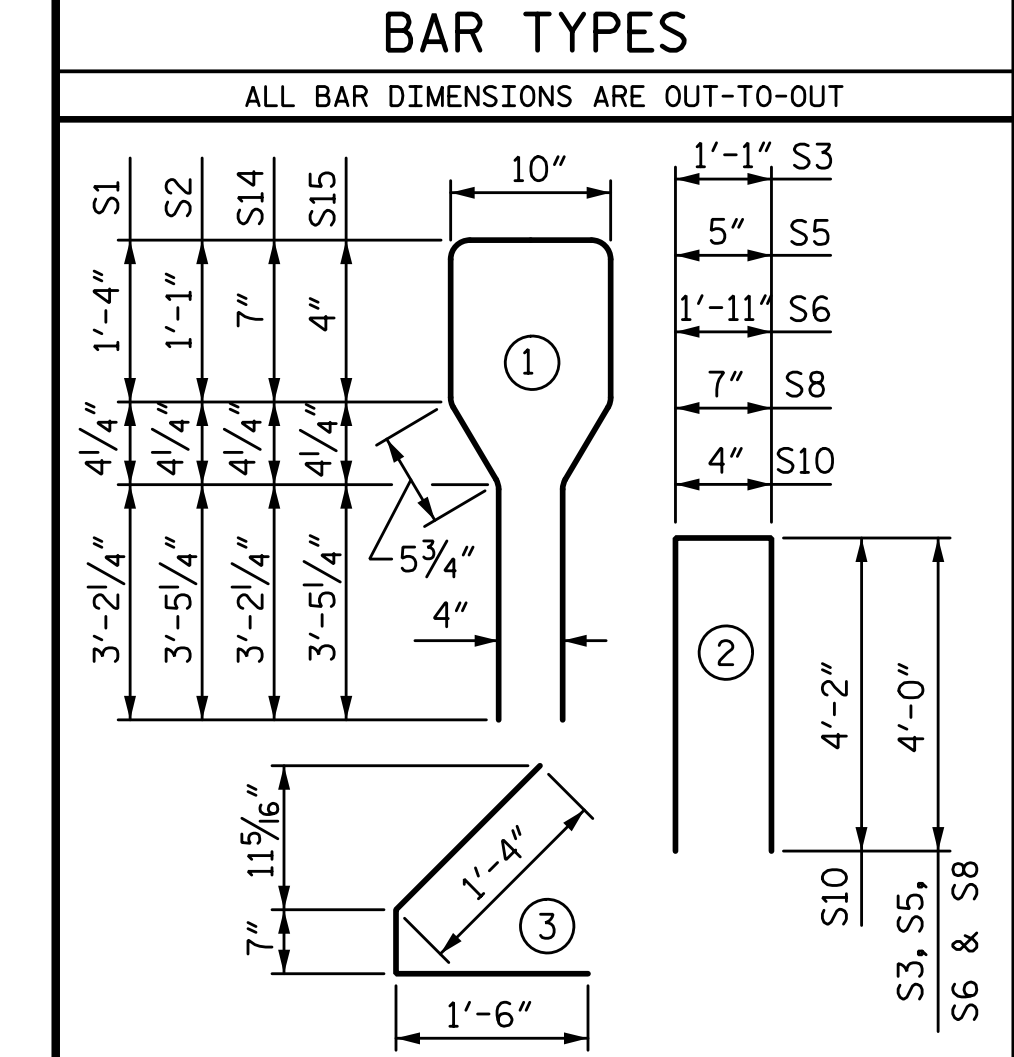
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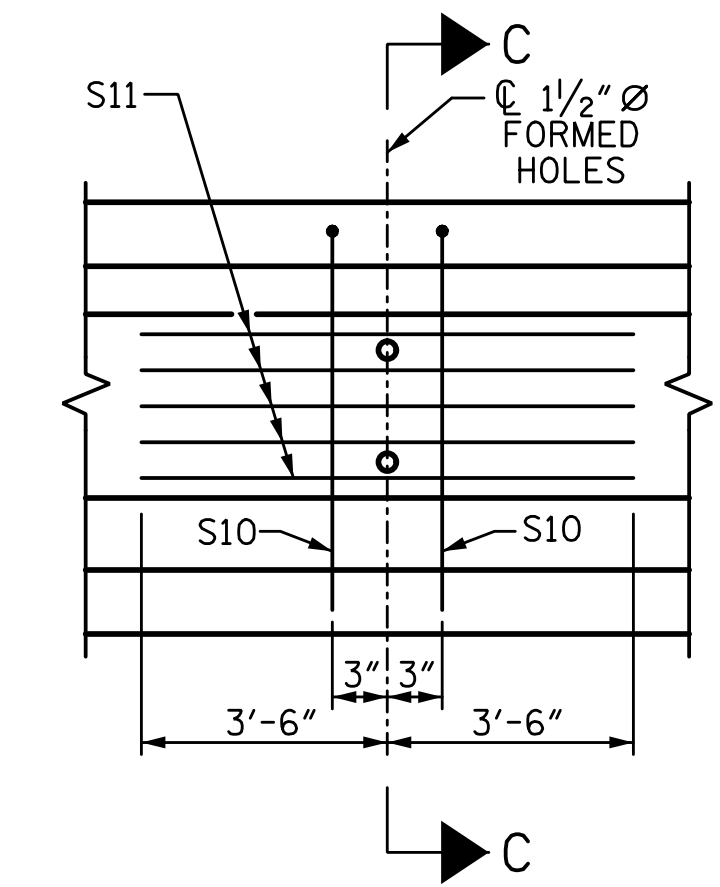
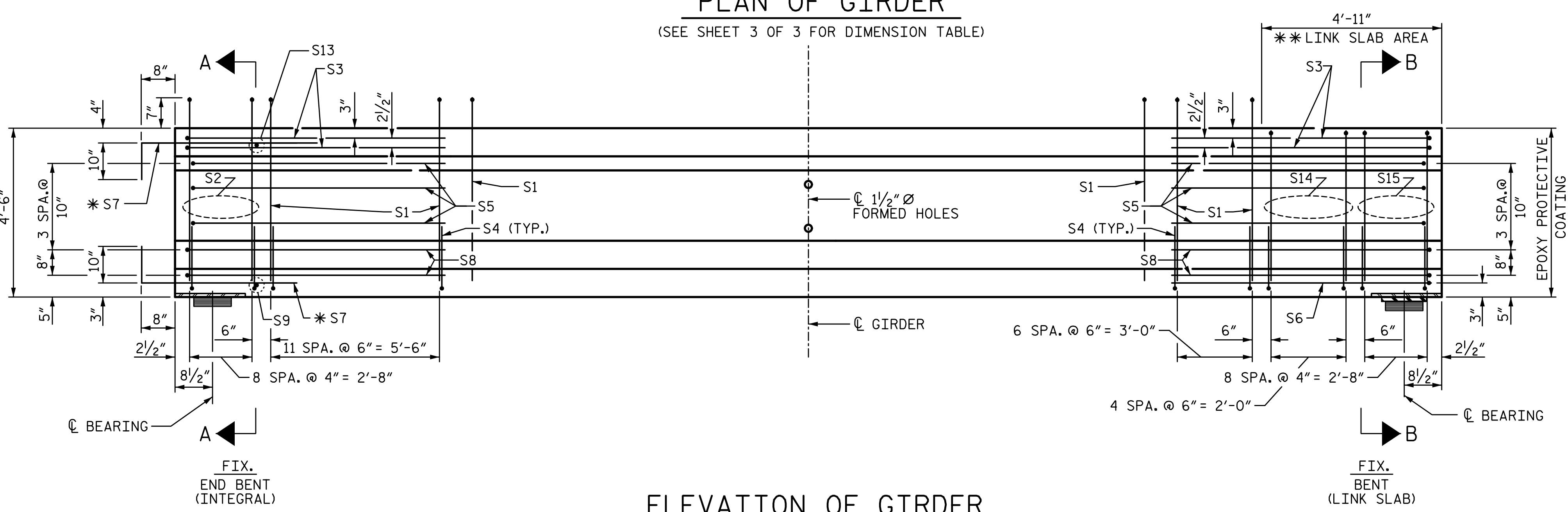
0.6" Ø LOW RELAXATION STRAND LAYOUT

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

REINFORCING STEEL FOR ONE GIRDER					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
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* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
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S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1
S14	5	#4	1	9'-4"	31
S15	9	#5	1	9'-4"	88



- DEBONDING LEGEND
- FULLY BONDED STRAND
  - STRAND DEBONDED FOR 18'-0" FROM END OF GIRDER
  - ◻ STRAND DEBONDED FOR 8'-0" FROM END OF GIRDER



	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB	CY	No.
GIRDER	1191	19.9	44

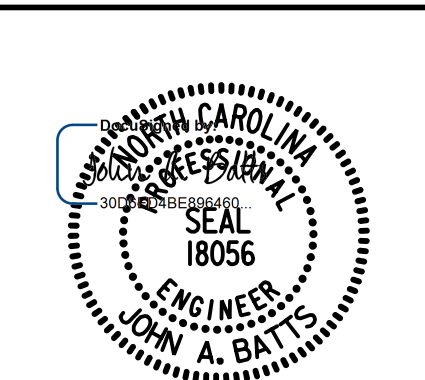
  

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	VARIES	982.43'

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE  
 GIRDERS 6-10  
 SPANS A & B (STAGE 2)

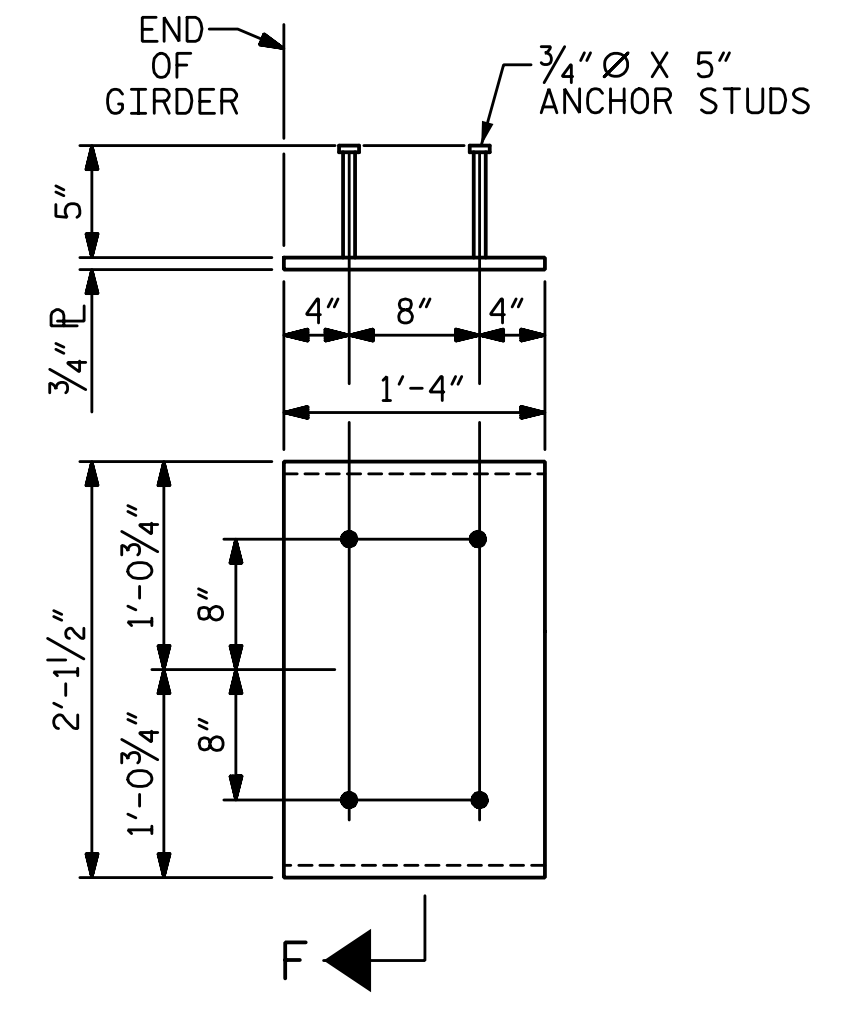


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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

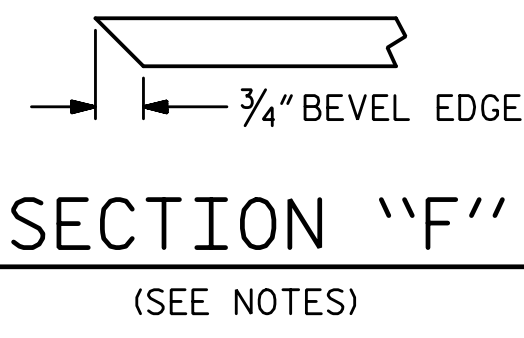
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2			4		

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**EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER**  
(2 REQ'D PER GIRDER)



**SECTION "F"**  
(SEE NOTES)

GIRDER DIMENSION TABLE			
STAGE 1			
GIRDER	DIM "A"	DIM "B"	DIM "C"
AG1	98'-5"	49'-2 1/2"	11 1/2"
AG2	98'-4 5/8"	49'-2 5/16"	11 5/16"
AG3	98'-4 1/4"	49'-2 1/8"	11 1/8"
AG4	98'-4"	49'-2"	11"
AG5	98'-3 3/8"	49'-1 13/16"	10 13/16"
BG1	98'-4 3/4"	49'-2 3/8"	11 3/8"
BG2	98'-4 1/2"	49'-2 1/4"	11 1/4"
BG3	98'-4 1/4"	49'-2 1/8"	11 1/8"
BG4	98'-4"	49'-2"	11"
BG5	98'-3 3/4"	49'-1 7/8"	10 7/8"
STAGE 2			
GIRDER	DIM "A"	DIM "B"	DIM "C"
AG6	98'-3 3/8"	49'-1 11/16"	10 11/16"
AG7	98'-3 1/8"	49'-1 9/16"	10 9/16"
AG8	98'-2 3/4"	49'-1 3/8"	10 3/8"
AG9	98'-2 3/8"	49'-1 3/16"	10 3/16"
AG10	98'-2 1/8"	49'-1 1/16"	10 1/16"
BG6	98'-3 5/8"	49'-1 13/16"	10 13/16"
BG7	98'-3 3/8"	49'-1 11/16"	10 11/16"
BG8	98'-3 1/8"	49'-1 9/16"	10 9/16"
BG9	98'-2 3/4"	49'-1 3/8"	10 3/8"
BG10	98'-2 1/2"	49'-1 1/4"	10 1/4"

**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.

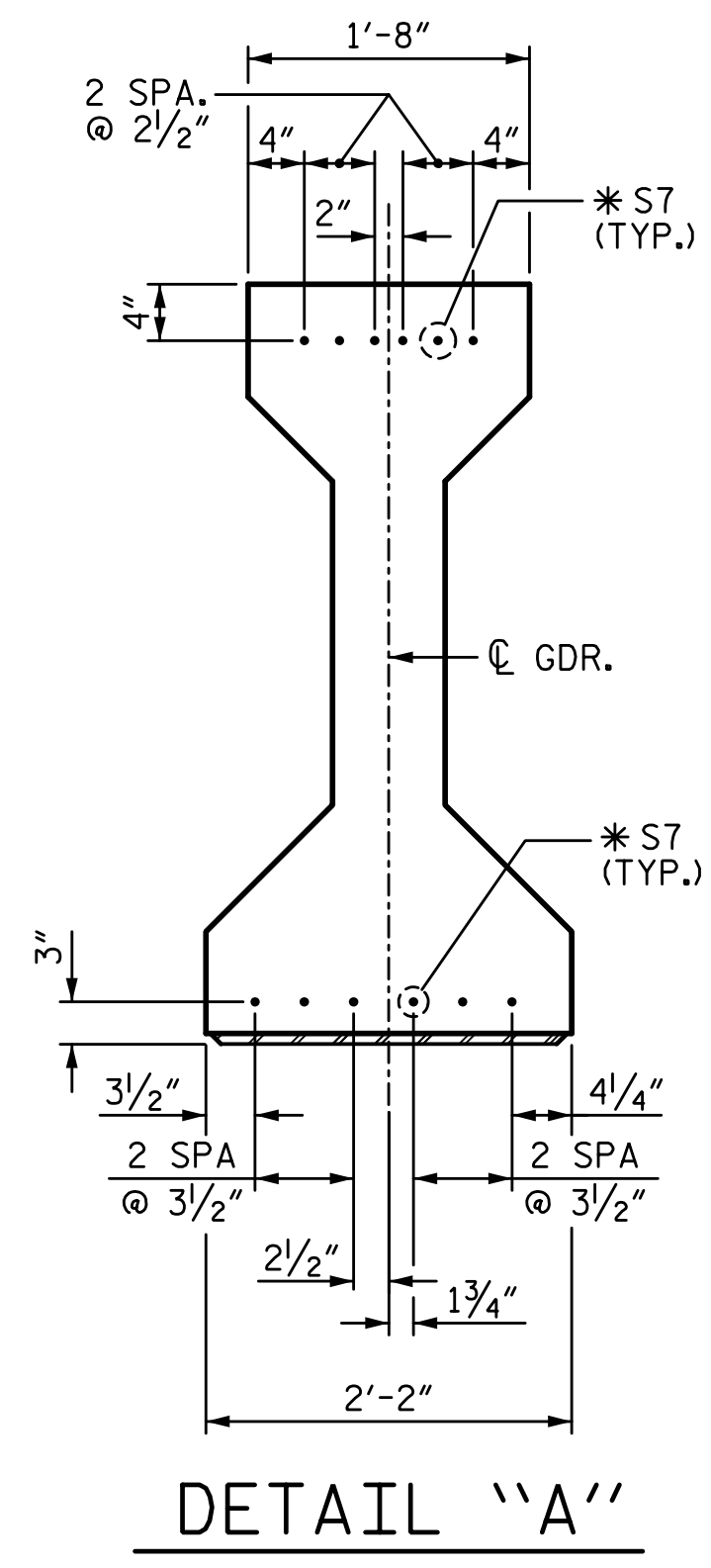
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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 6000 PSI.

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

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER AND IN THE LINK SLAB AREA.



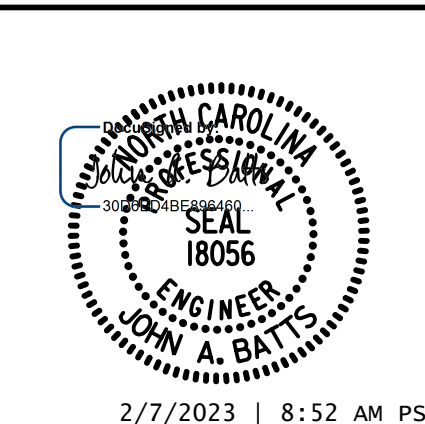
**DETAIL "A"**

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPAN A & SPAN B																						
0.6" Ø LOW RELAXATION																						
TWENTIETH POINTS																						
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.033	0.066	0.097	0.125	0.150	0.172	0.189	0.201	0.209	0.211	0.209	0.201	0.189	0.172	0.150	0.125	0.097	0.066	0.033	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.021	0.044	0.066	0.087	0.105	0.120	0.133	0.142	0.147	0.149	0.147	0.142	0.133	0.120	0.105	0.087	0.066	0.044	0.021	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	7/16"	9/16"	5/8"	11/16"	11/16"	3/4"	3/4"	3/4"	11/16"	11/16"	5/8"	9/16"	7/16"	3/8"	1/4"	1/8"	0
SPAN A & SPAN B																						
0.6" Ø LOW RELAXATION																						
TWENTIETH POINTS																						
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.033	0.066	0.097	0.125	0.150	0.172	0.189	0.201	0.209	0.211	0.209	0.201	0.189	0.172	0.150	0.125	0.097	0.066	0.033	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.024	0.051	0.076	0.100	0.121	0.139	0.153	0.163	0.170	0.172	0.170	0.163	0.153	0.139	0.121	0.100	0.077	0.051	0.024	0
FINAL CAMBER	↑	0	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	0	0
SPAN A & SPAN B																						
0.6" Ø LOW RELAXATION																						
TWENTIETH POINTS																						
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.033	0.066	0.097	0.125	0.150	0.172	0.189	0.201	0.209	0.211	0.209	0.201	0.189	0.172	0.150	0.125	0.097	0.066	0.033	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.022	0.047	0.070	0.092	0.111	0.128	0.141	0.151	0.156	0.158	0.156	0.151	0.141	0.128	0.112	0.092	0.071	0.047	0.022	0
FINAL CAMBER	↑	0	1/8"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	1/4"	1/8"	0

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

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GUILFORD COUNTY  
STATION: 18+82.09 -L-

SHEET 3 OF 3



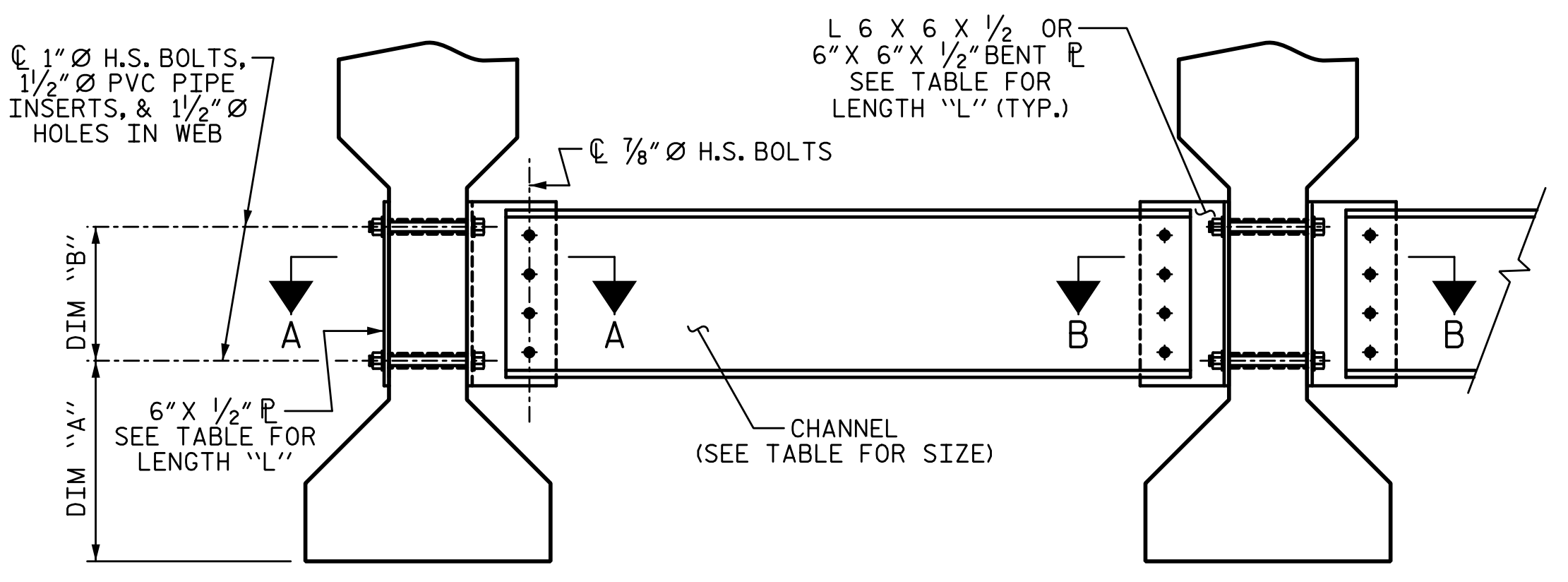
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**PRESTRESSED CONCRETE GIRDER DETAILS**

DRAWN BY: T. BANKOVICH DATE: 2-22  
CHECKED BY: J.A. BATTS DATE: 2-22  
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

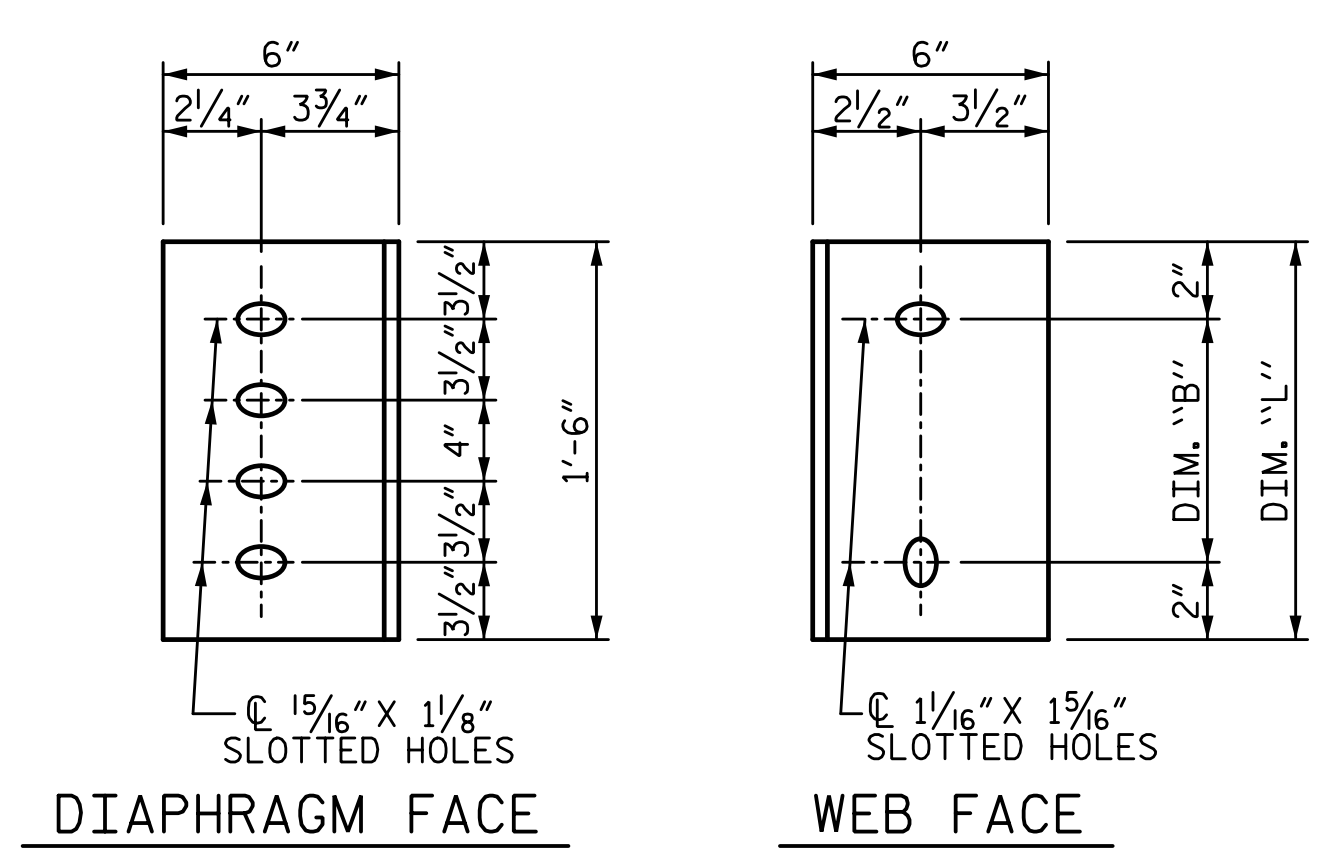
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EXTERIOR GIRDER INTERIOR GIRDER  
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE  
CONNECTOR PLATE DETAILS

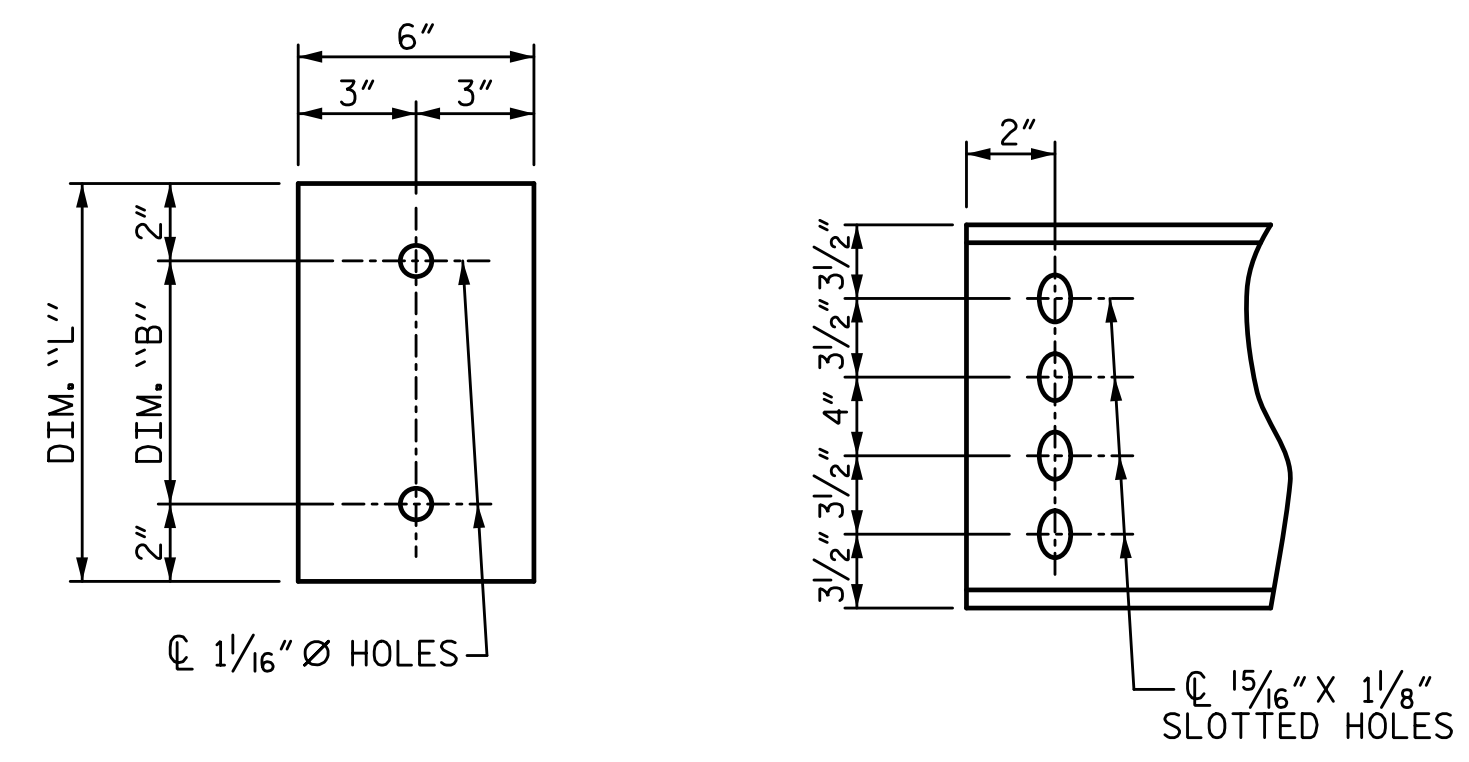
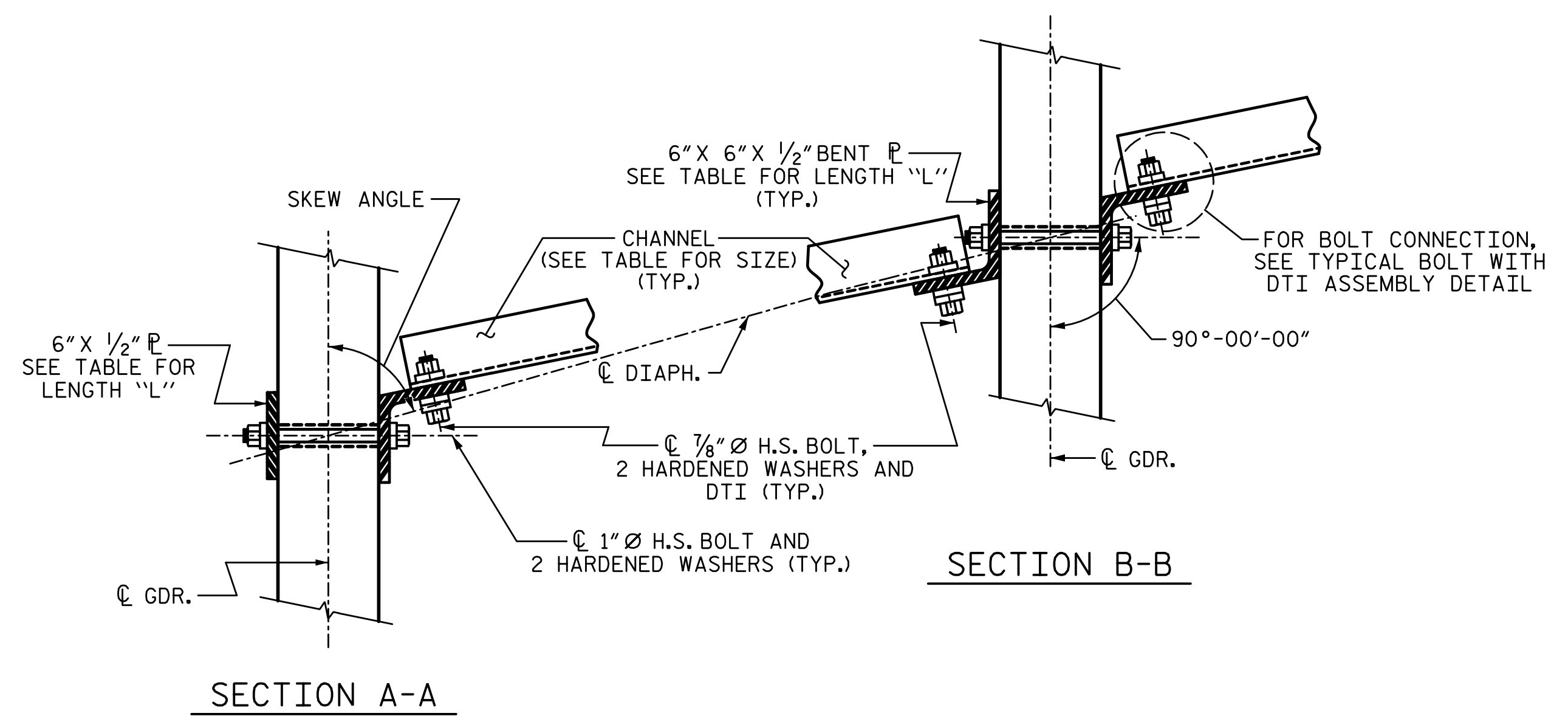
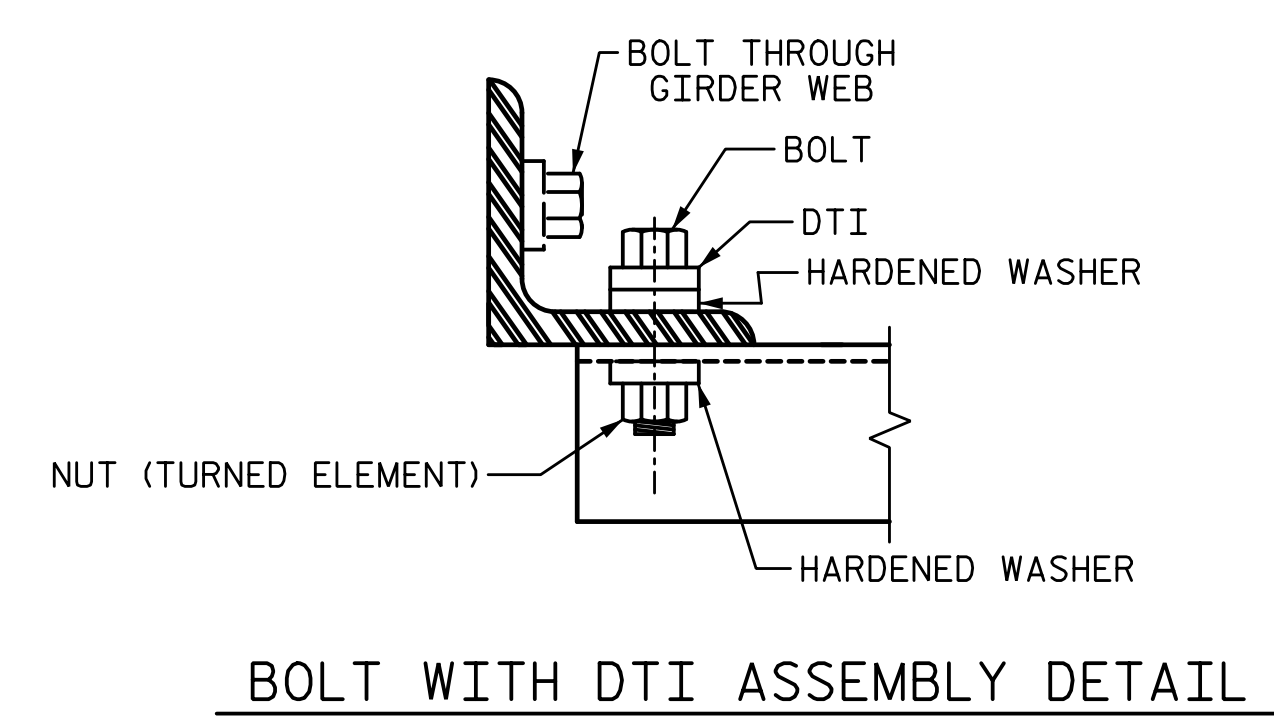


PLATE DETAILS CHANNEL END



SECTION A-A SECTION B-B  
CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

**STRUCTURAL STEEL NOTES:**

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

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

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

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

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

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

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

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

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

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

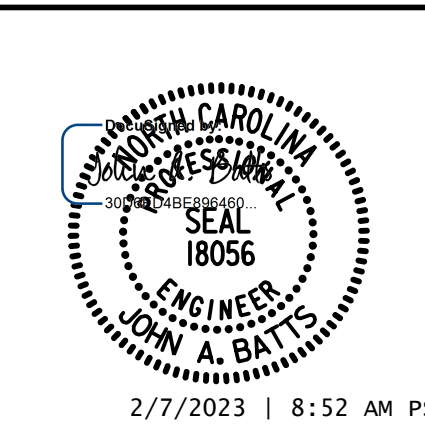
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

TABLE

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

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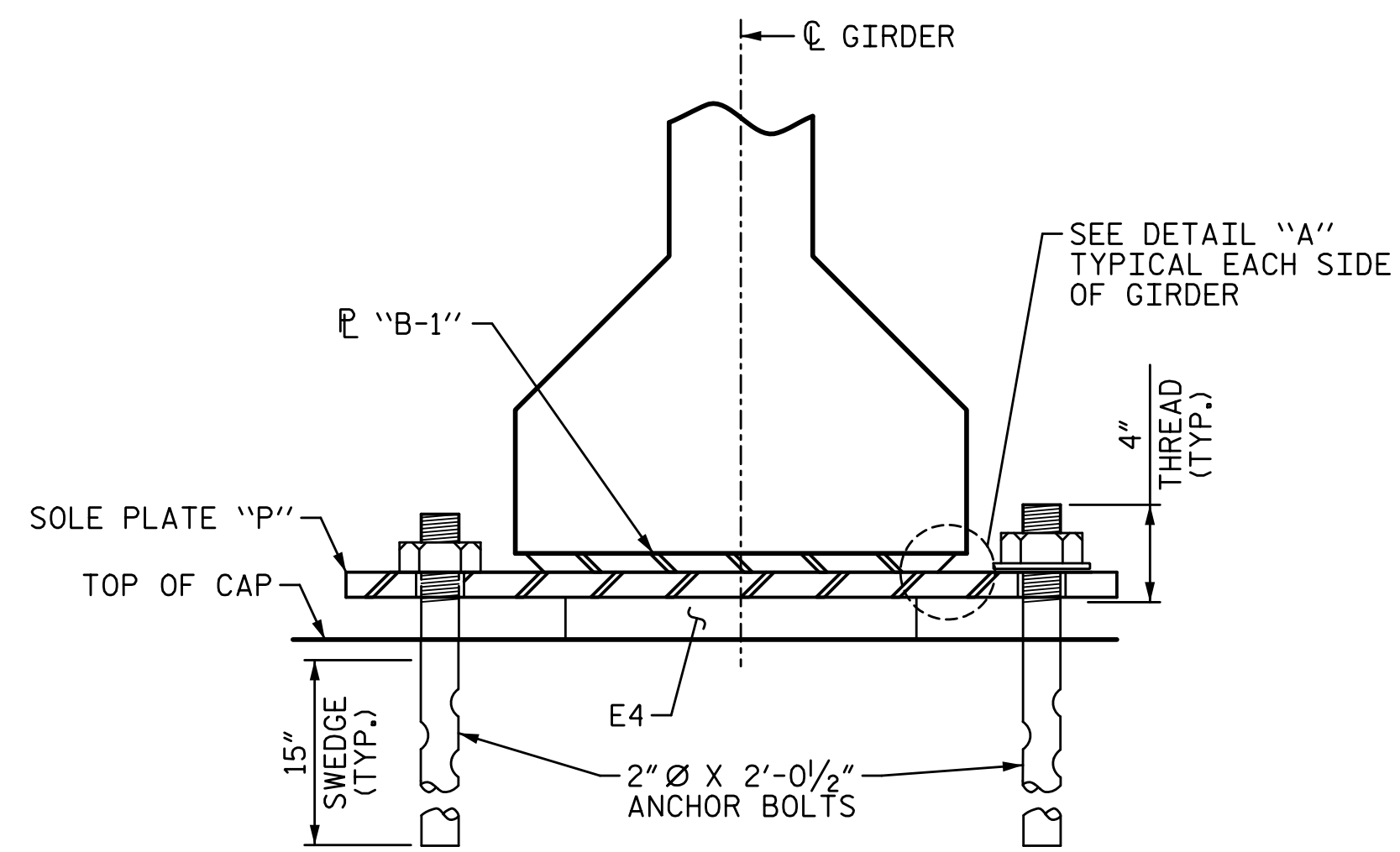
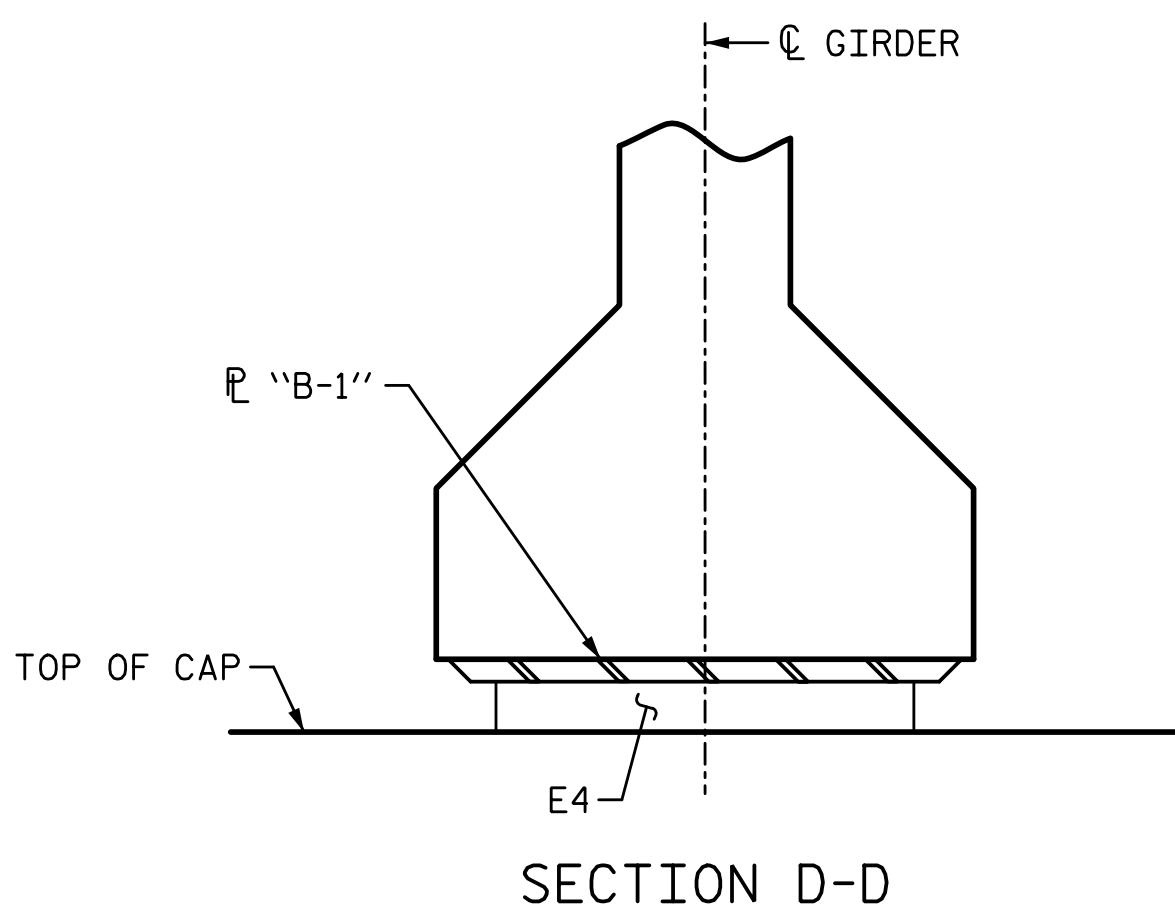
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 INTERMEDIATE STEEL  
 DIAPHRAGM FOR TYPE  
 IV PRESTRESSED  
 CONCRETE GIRDERS

DRAWN BY: T. BANKOVICH	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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2			4			58

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**NOTES:**

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

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 AND WASHERS, SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

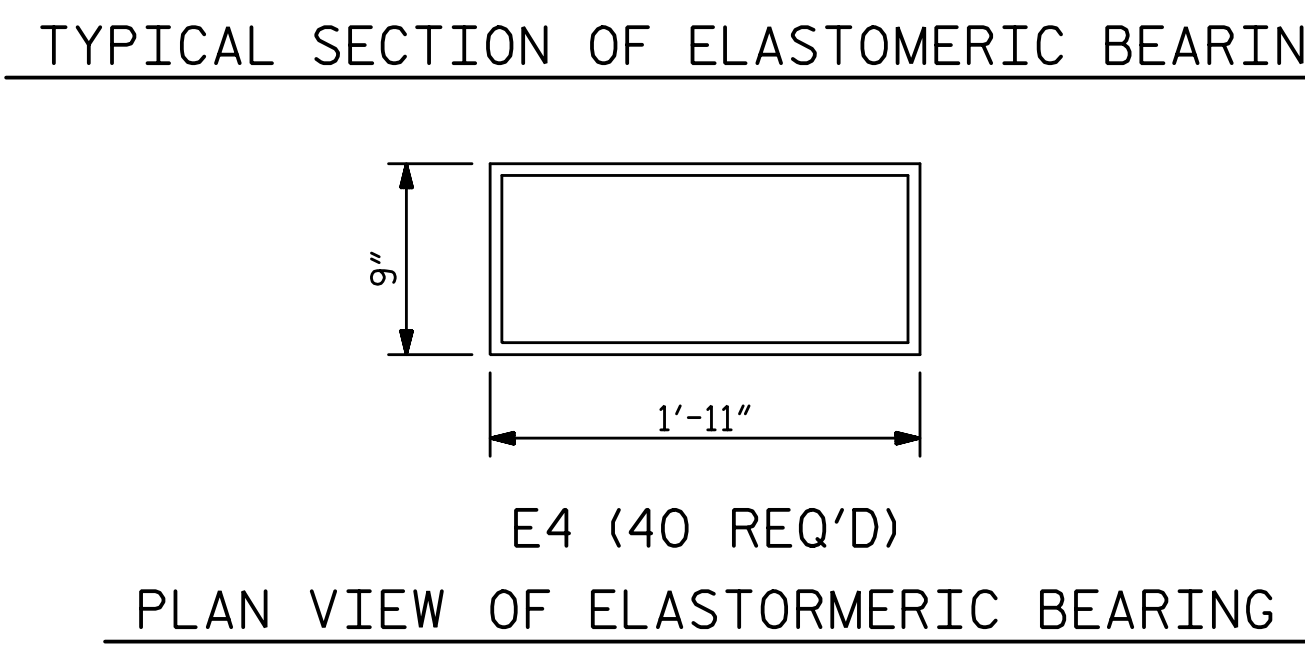
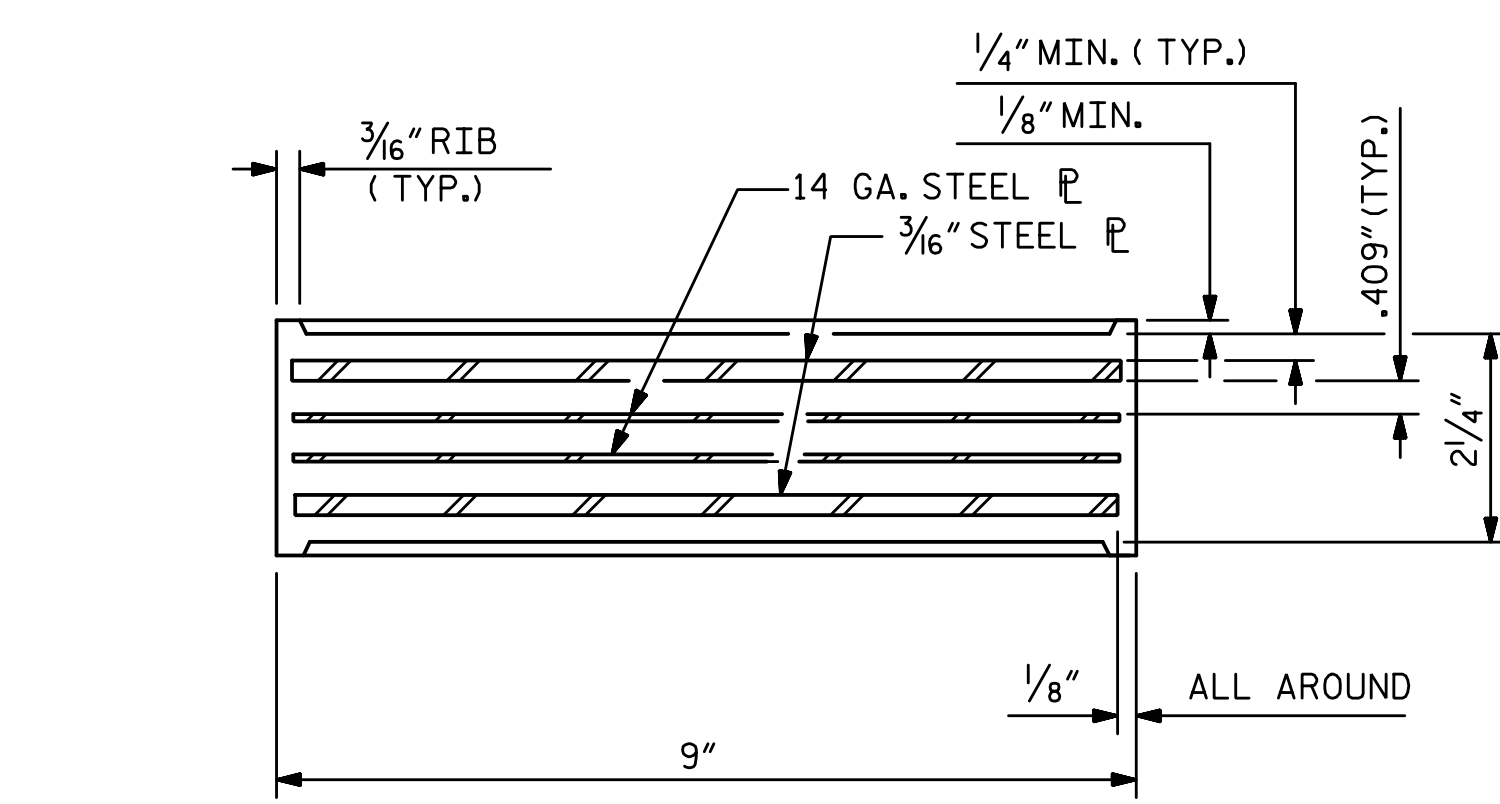
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

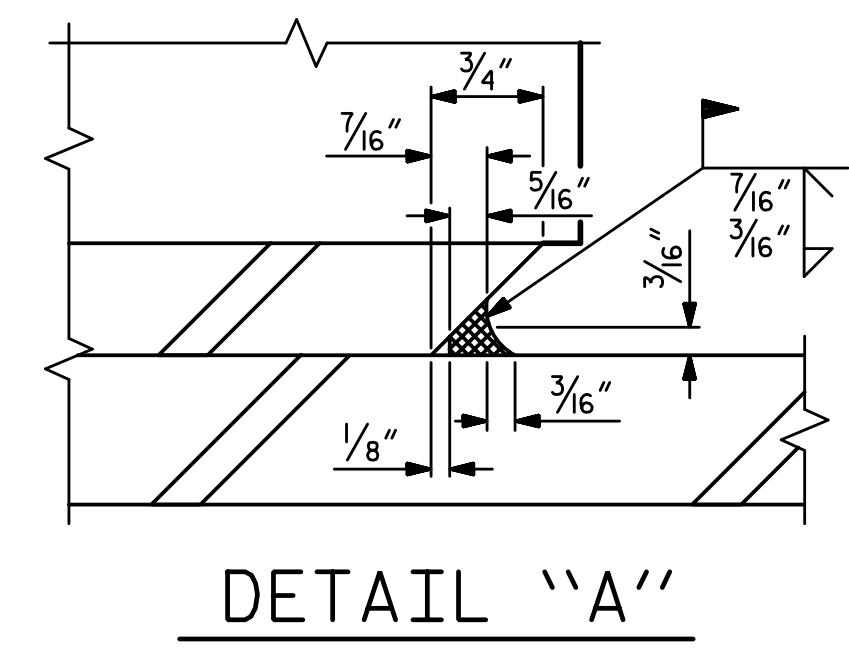
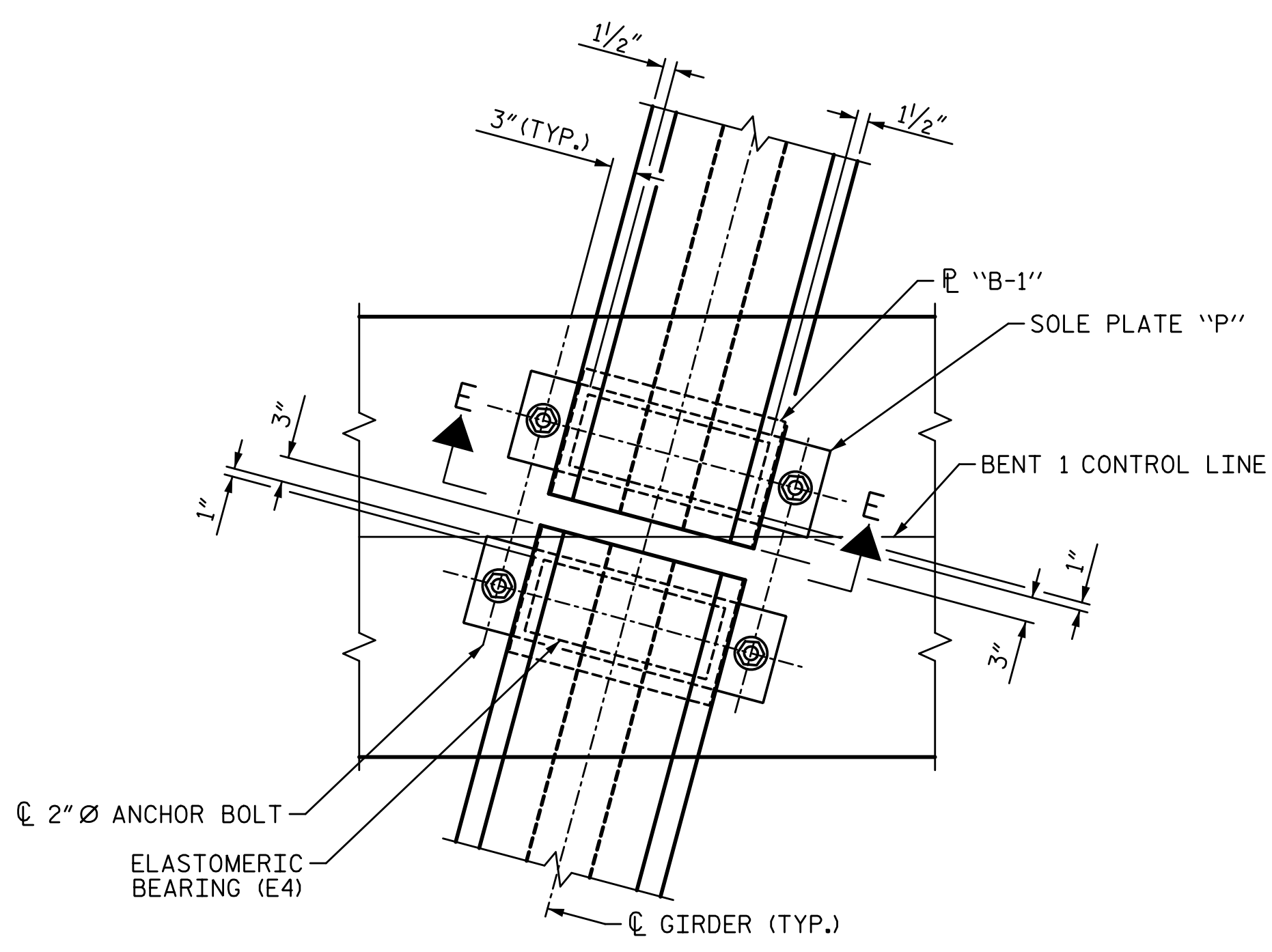
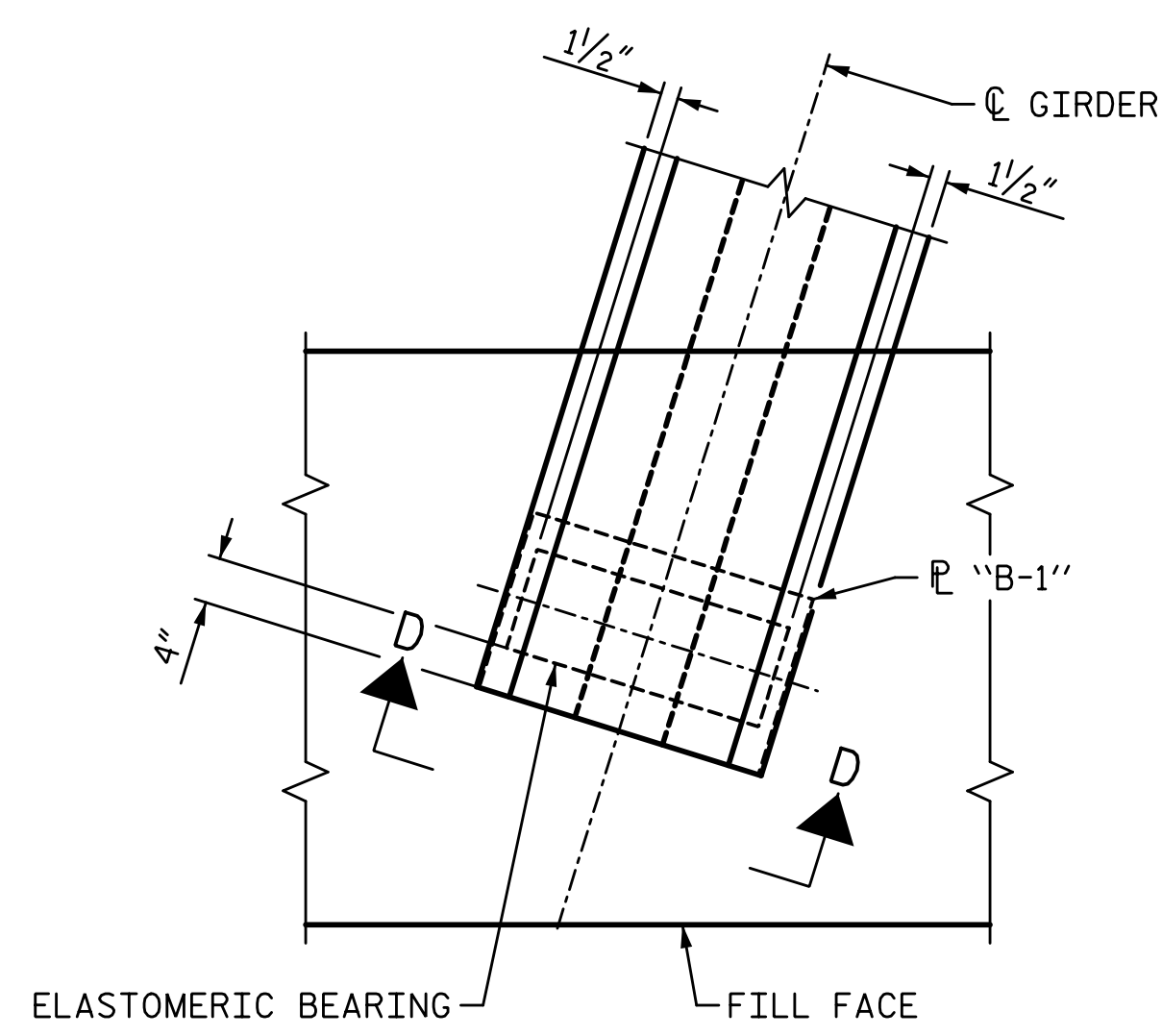
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

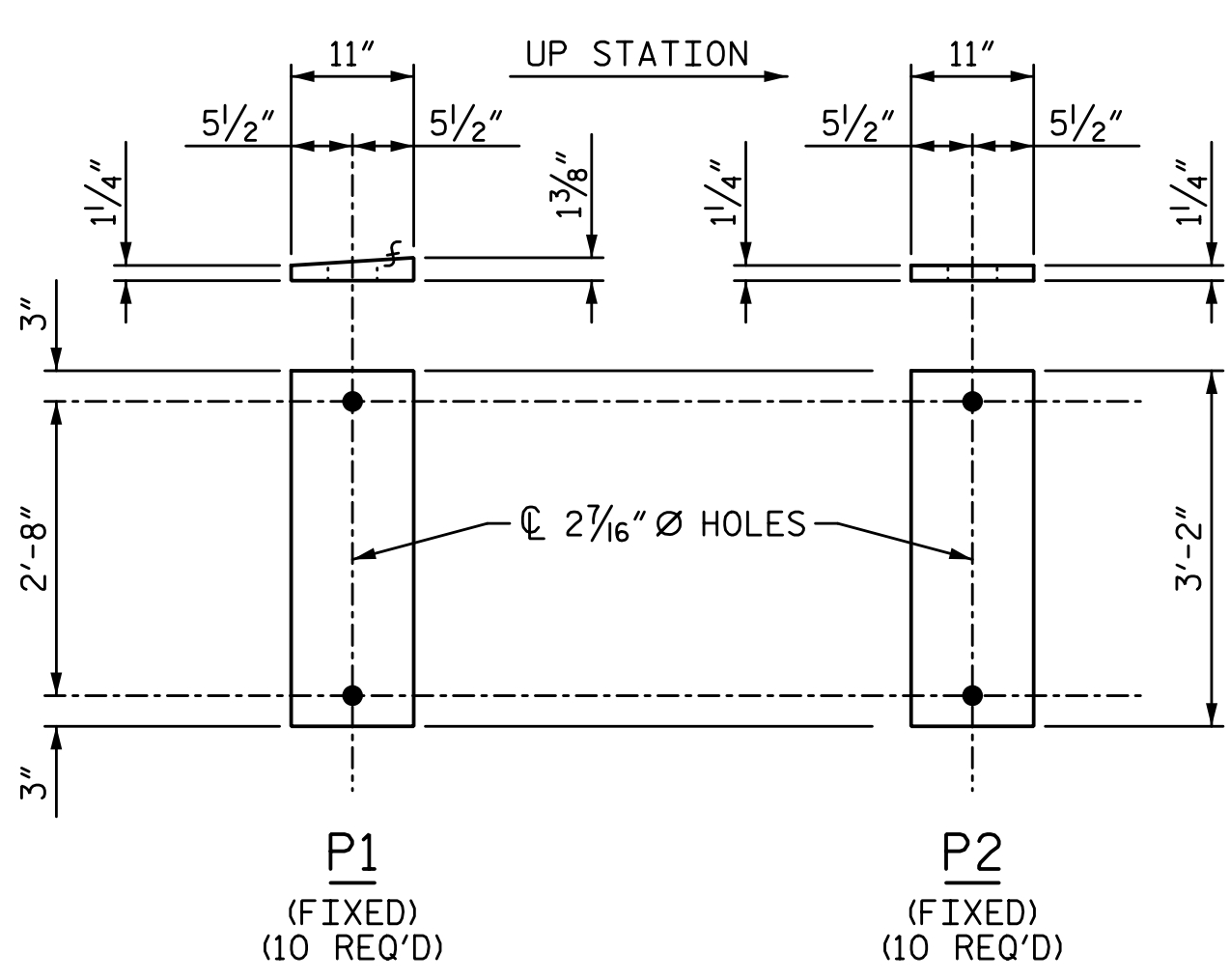
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



**TYPE V**

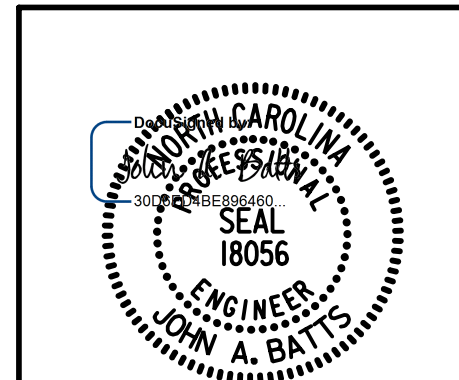


MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k



PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
STATION: 18+82.09 -L-

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



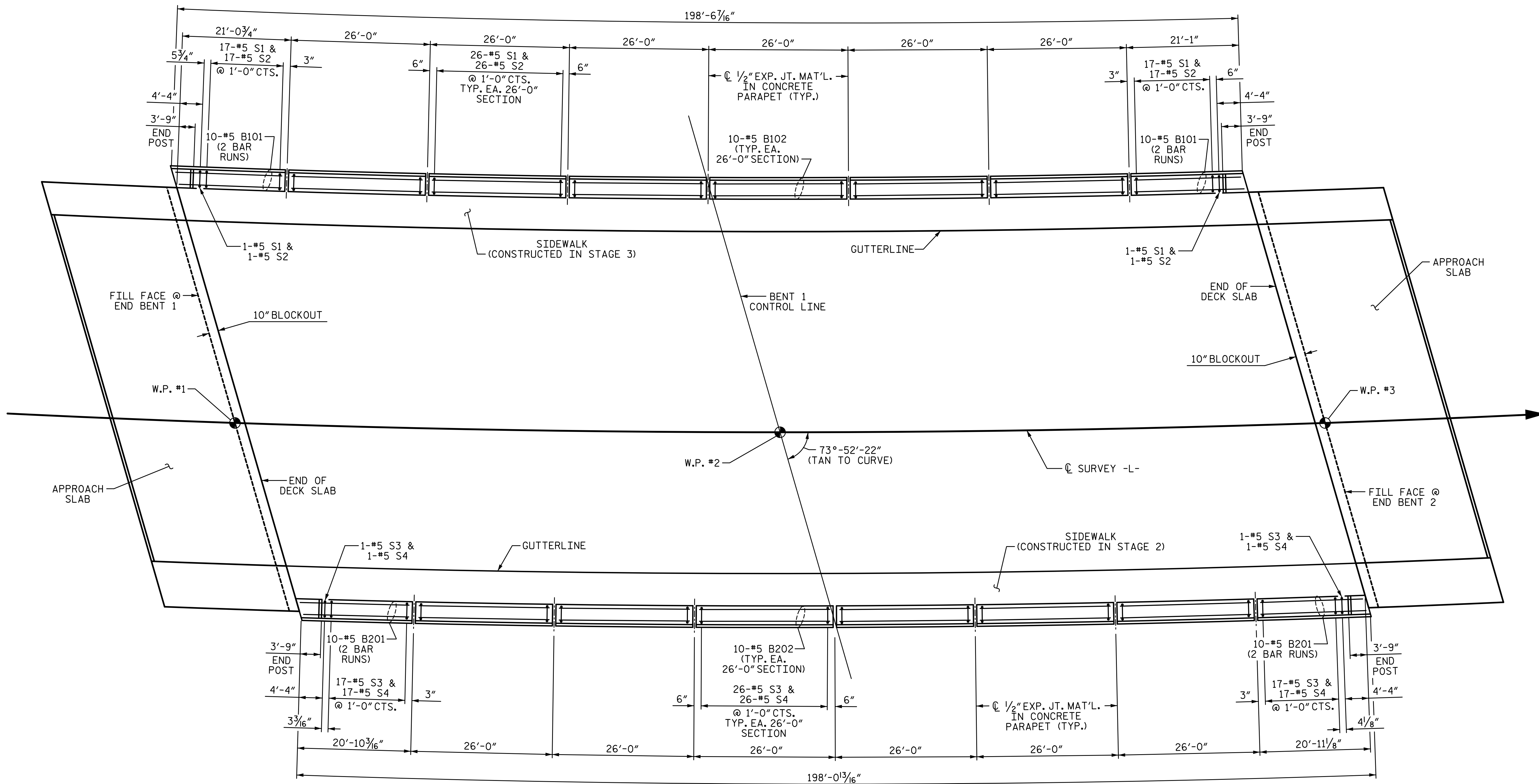
DRAWN BY: T. BANKOVICH DATE: 2-22  
CHECKED BY: J.A. BATTS DATE: 2-22  
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

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2			4		

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TOTAL SHEETS 58

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SPAN A SPAN B

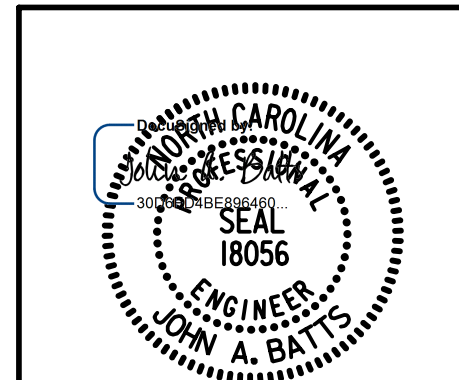
PLAN

NOTE: ALL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE OUTSIDE FACE OF CONCRETE PARAPET

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET



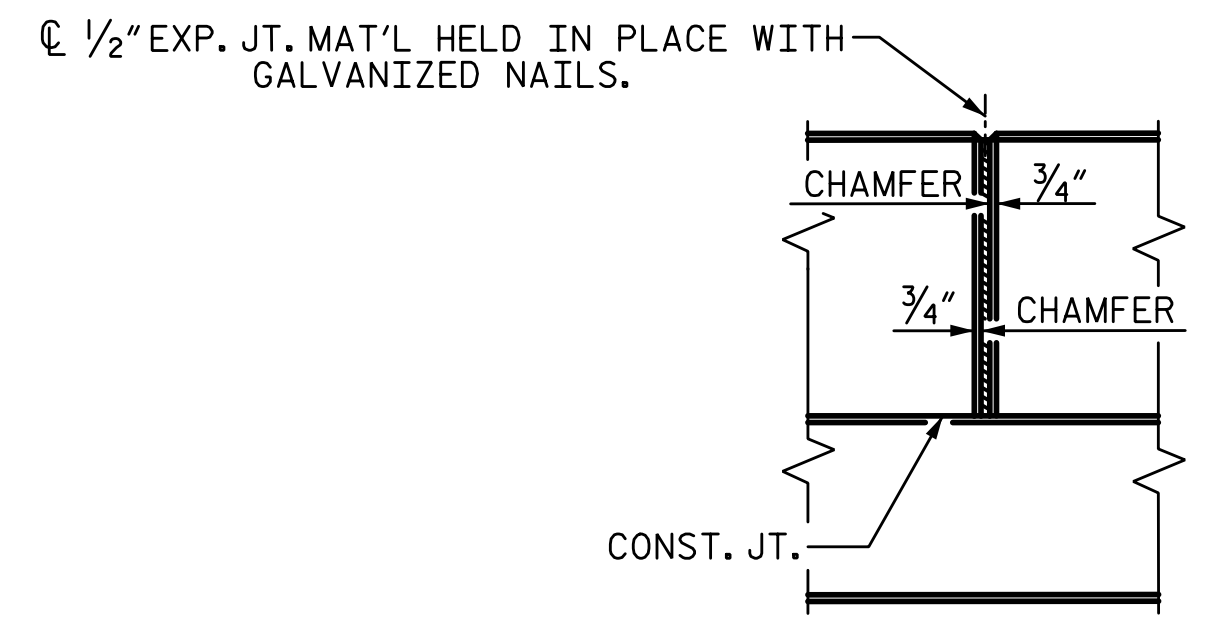
DRAWN BY: S.D. COOPER DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			58

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ELEVATION AT EXPANSION JOINTS

**NOTES:**

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

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

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

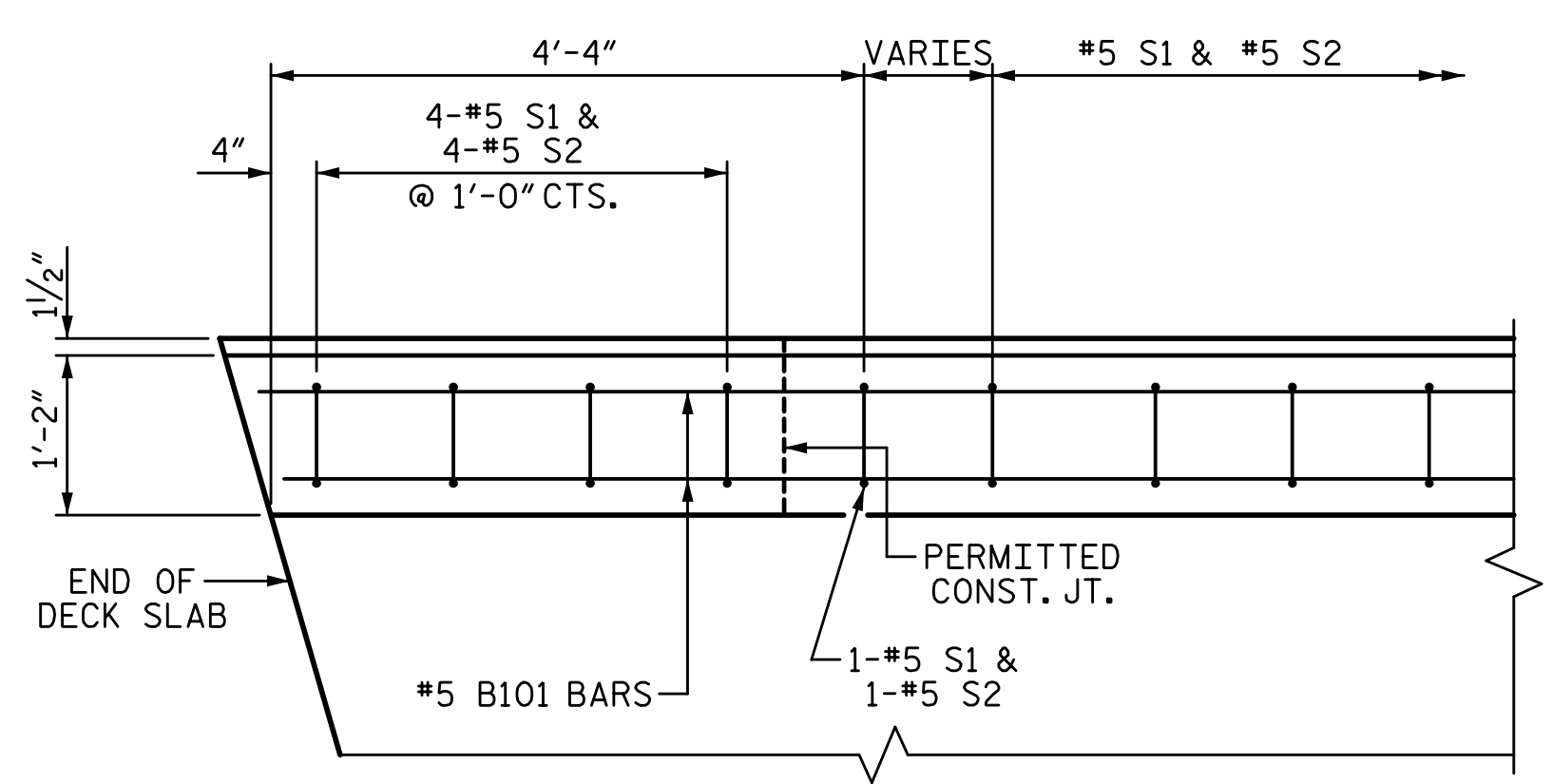
FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

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

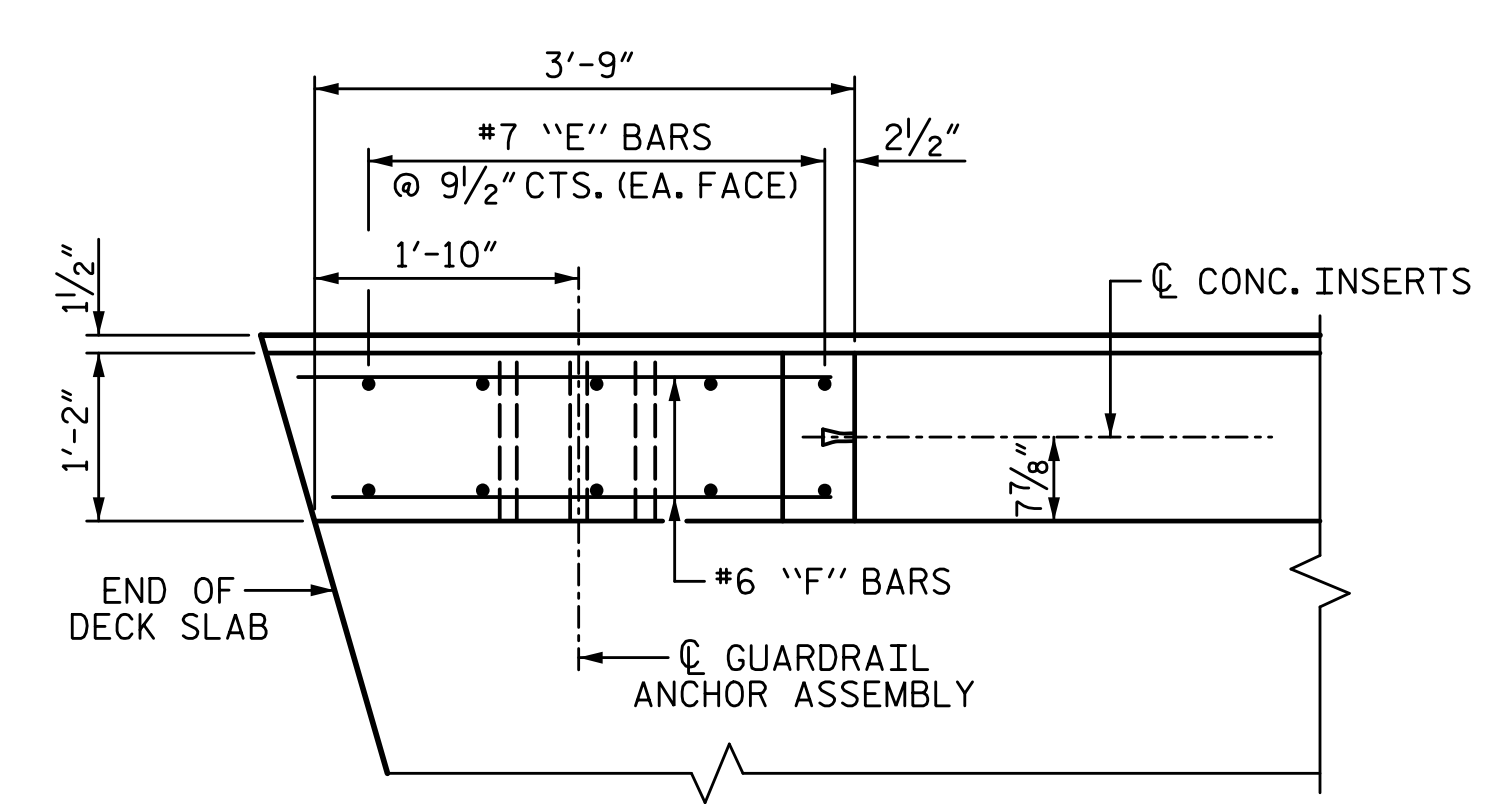
FOR DETAILS AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

BAR TYPES		BILL OF MATERIAL				
PARAPET AND END POSTS						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B101	40	#5	STR	12'-1"	504	
* B102	60	#5	STR	25'-7"	1601	
* E1	4	#7	STR	3'-3"	27	
* E2	4	#7	STR	3'-9"	31	
* E3	4	#7	STR	4'-2"	34	
* E4	4	#7	STR	4'-8"	38	
* E5	4	#7	STR	5'-0"	41	
* F1	4	#6	STR	1'-11"	12	
* F2	2	#6	STR	3'-4"	10	
* F3	2	#6	STR	3'-10"	12	
* F4	2	#6	STR	3'-1"	9	
* F5	2	#6	STR	3'-7"	11	
* S1	200	#5	1	6'-10"	1425	
* S2	200	#5	2	6'-6"	1356	
* EPOXY COATED REINFORCING STEEL					5111 LB	
CLASS AA CONCRETE					28.1 CY	
1'-2" X 3'-2 3/4" CONCRETE PARAPET					198.54 LF	

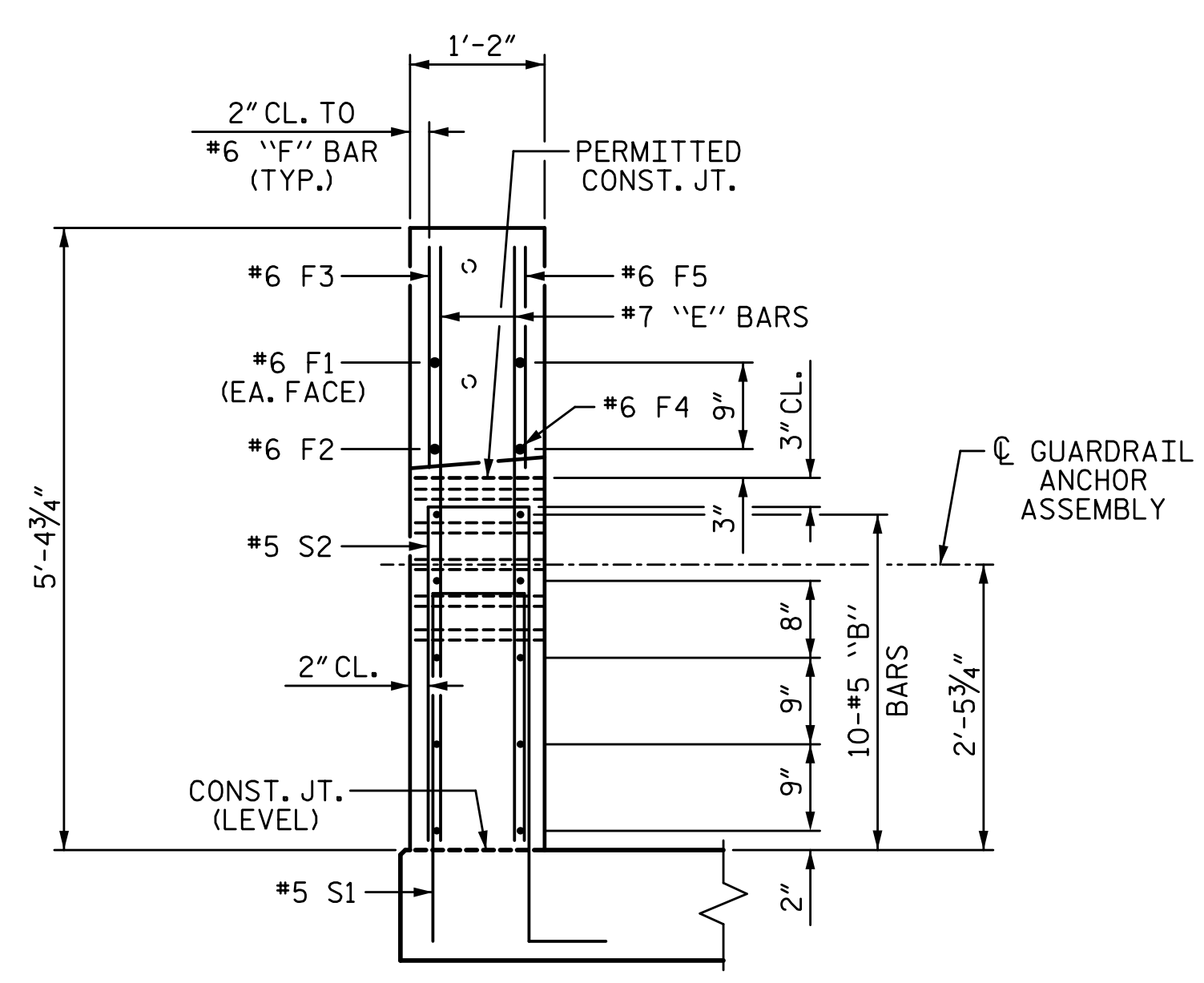
ALL BAR DIMENSIONS ARE OUT TO OUT



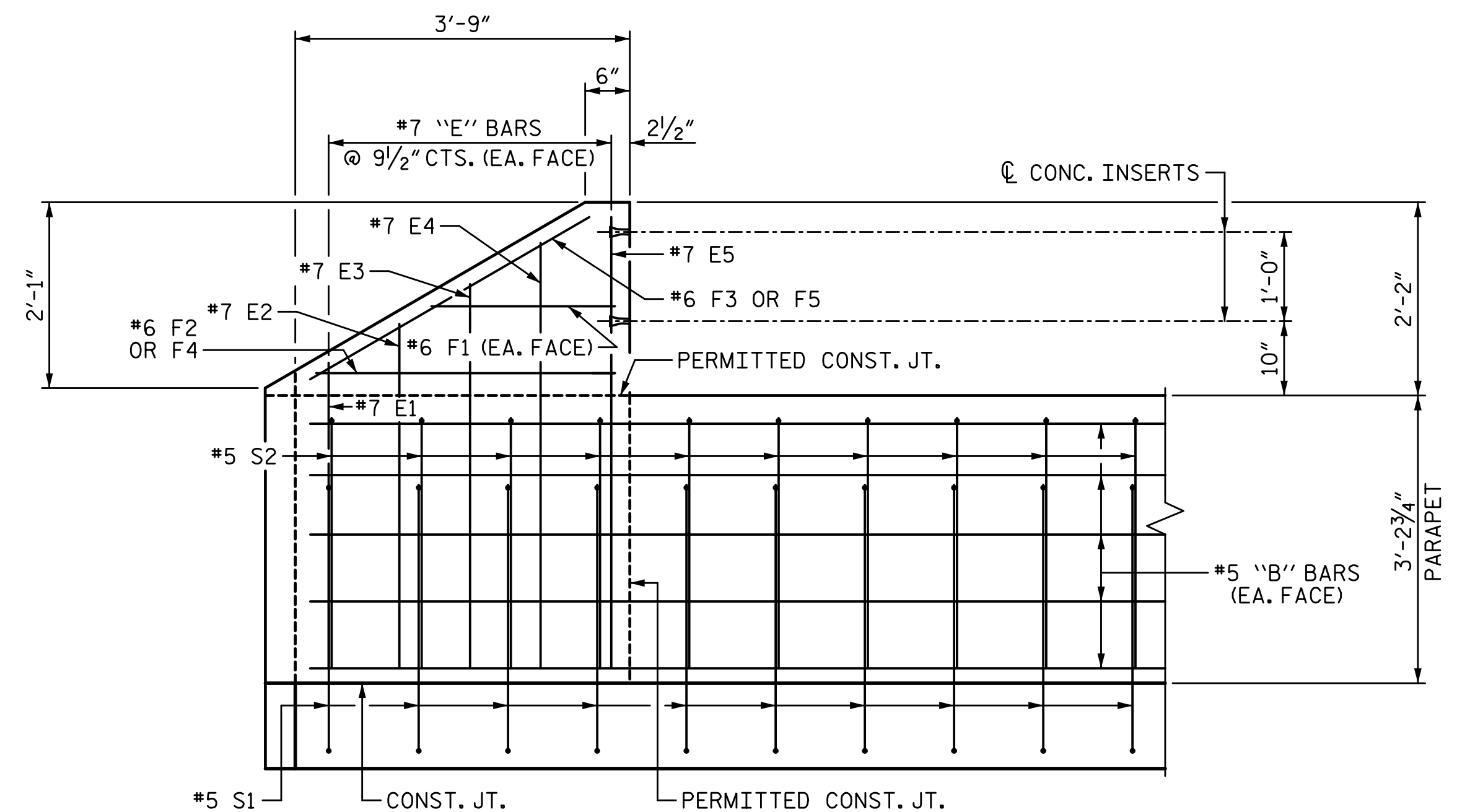
PLAN OF PARAPET @ END BENT 1  
END BENT 2 SIMILAR



PLAN OF END POST @ END BENT 1  
END BENT 2 SIMILAR



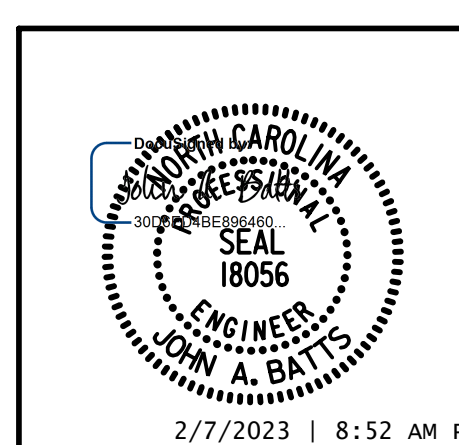
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL  
(1'-2" x 3'-2 3/4" PARAPET)

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GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
 SHEET 2 OF 3



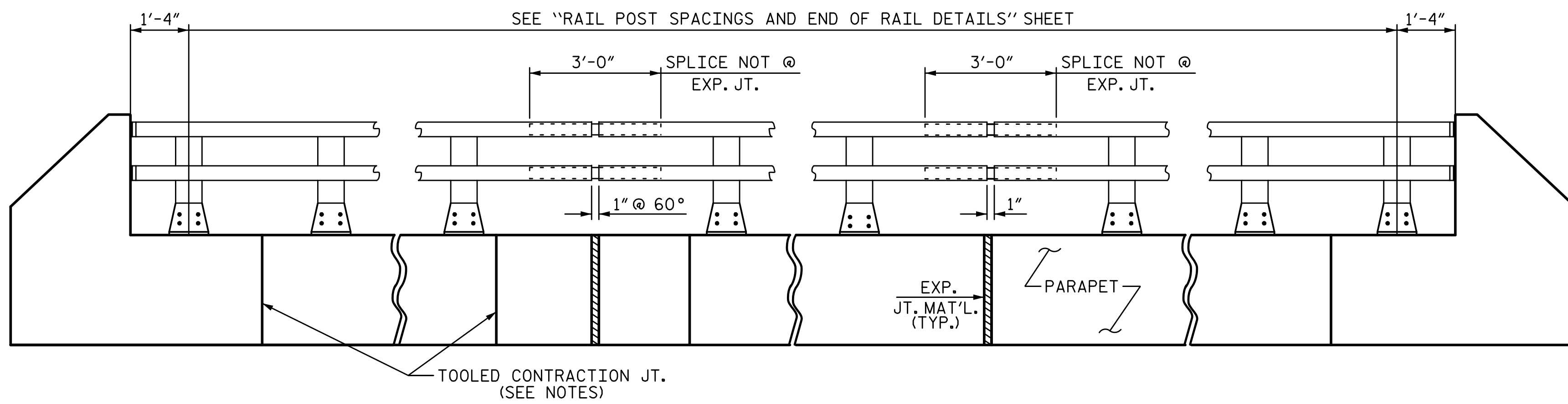
STATE OF NORTH CAROLINA			
DEPARTMENT OF TRANSPORTATION			
RALEIGH			
SUPERSTRUCTURE			
CONCRETE PARAPET DETAILS			
STAGE 1			
REVISIONS			
NO.	BY:	DATE:	
1			
2			
			SHEET NO. S-33
			TOTAL SHEETS 58

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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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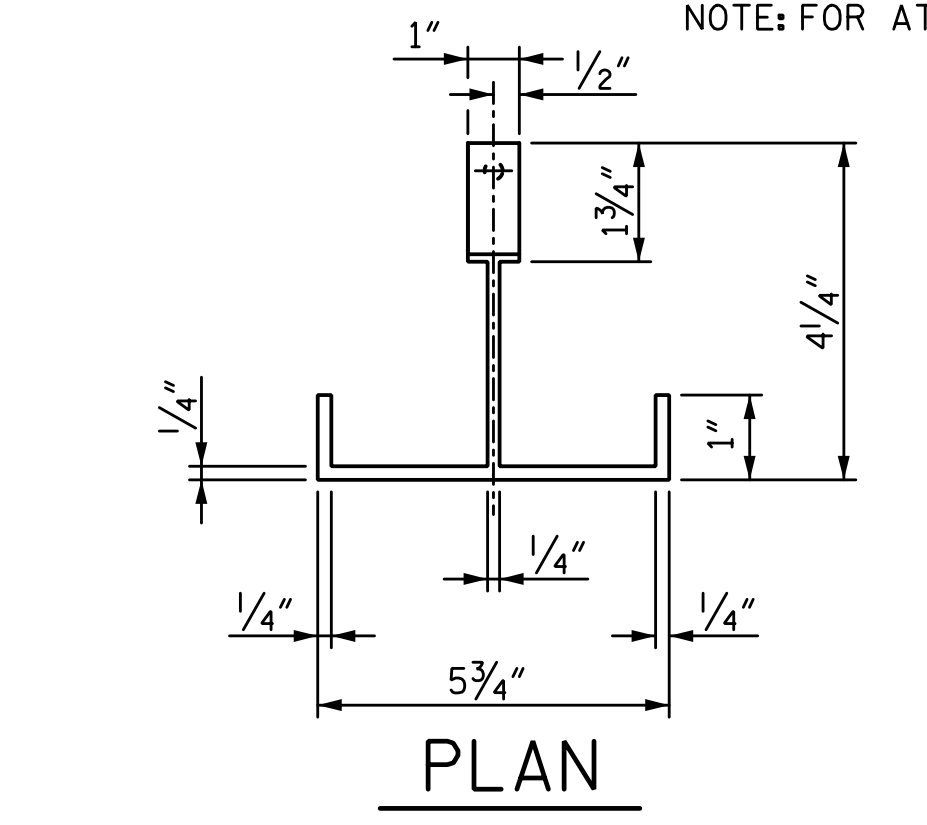


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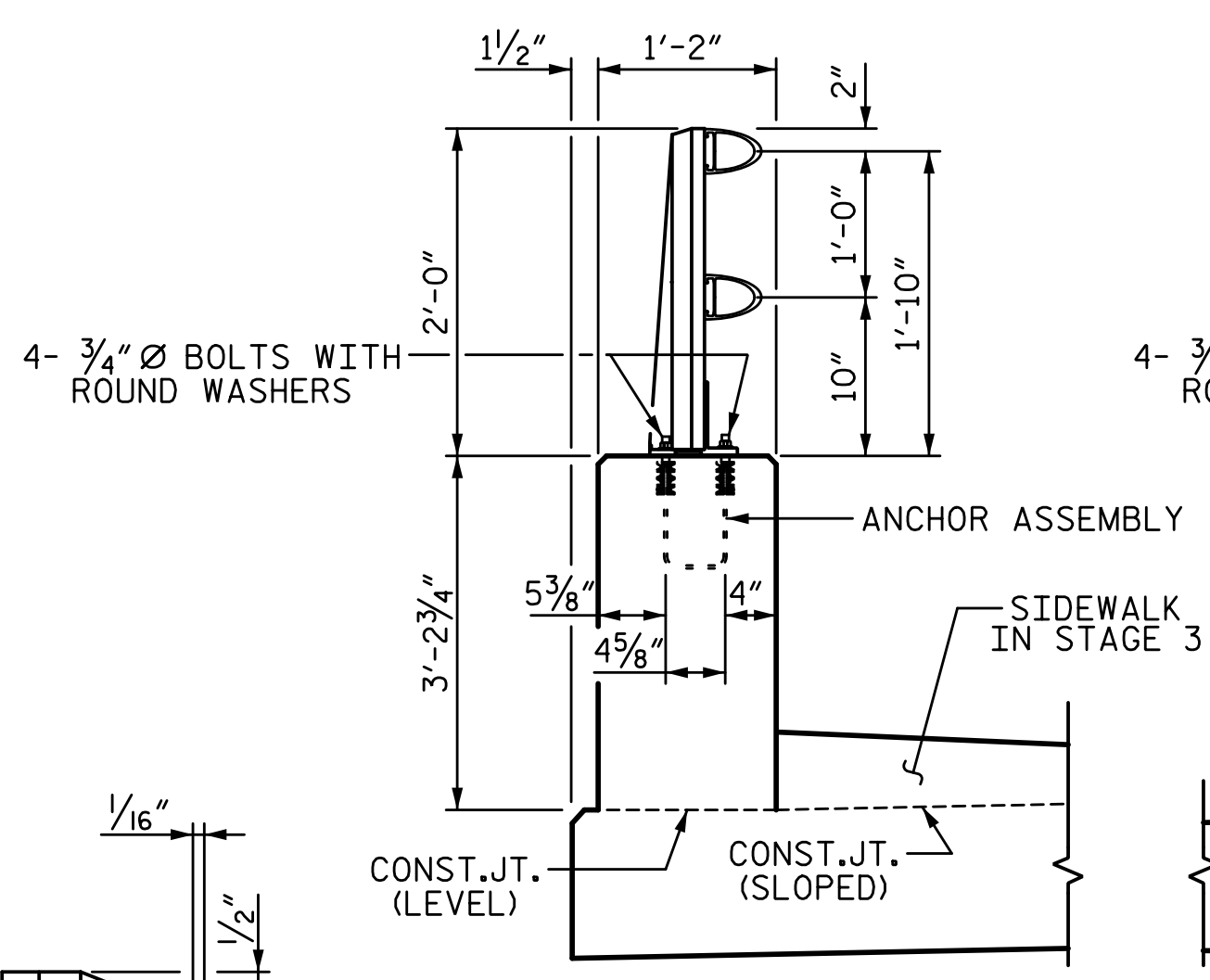


**ELEVATION**

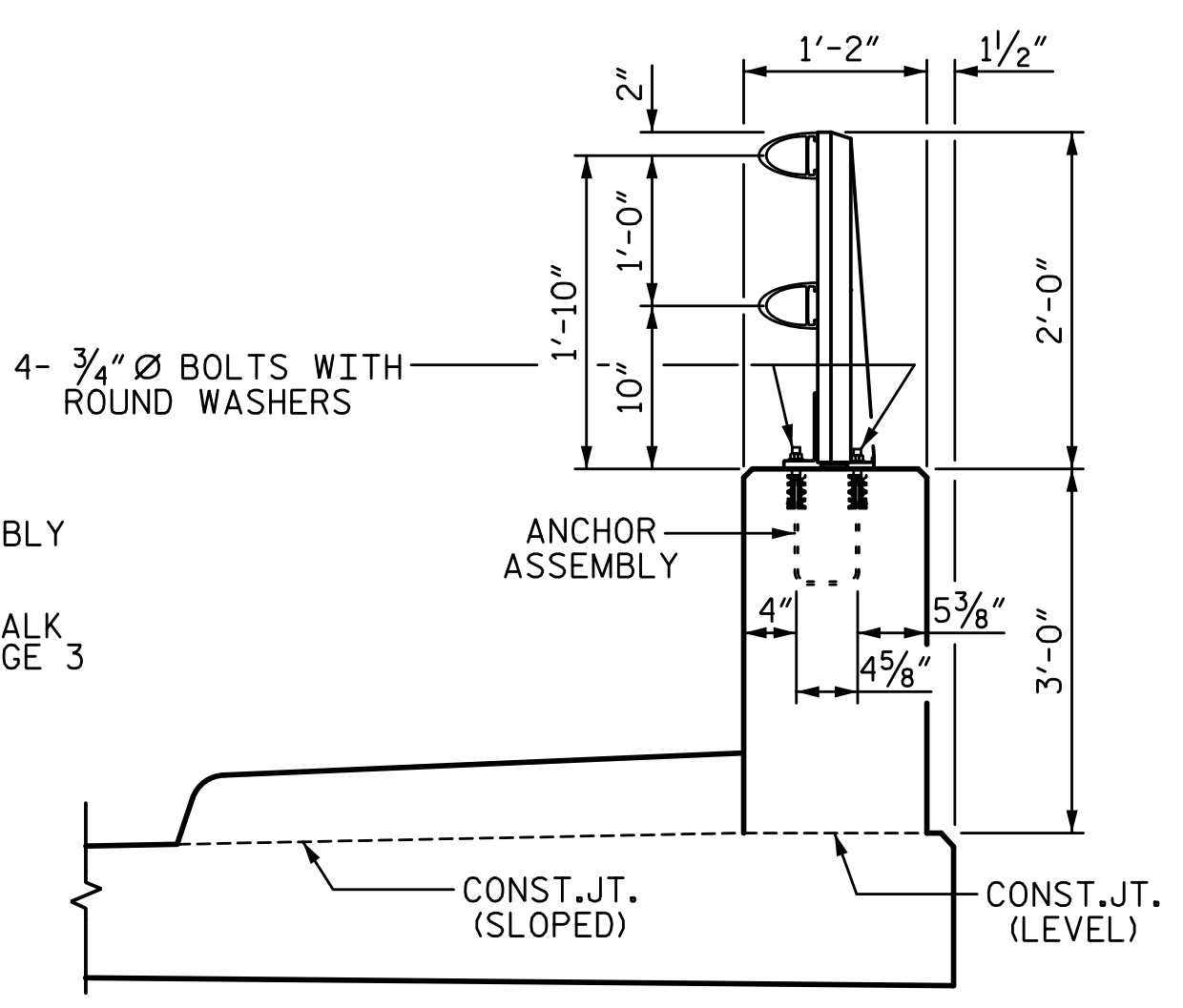
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET



**PLAN**

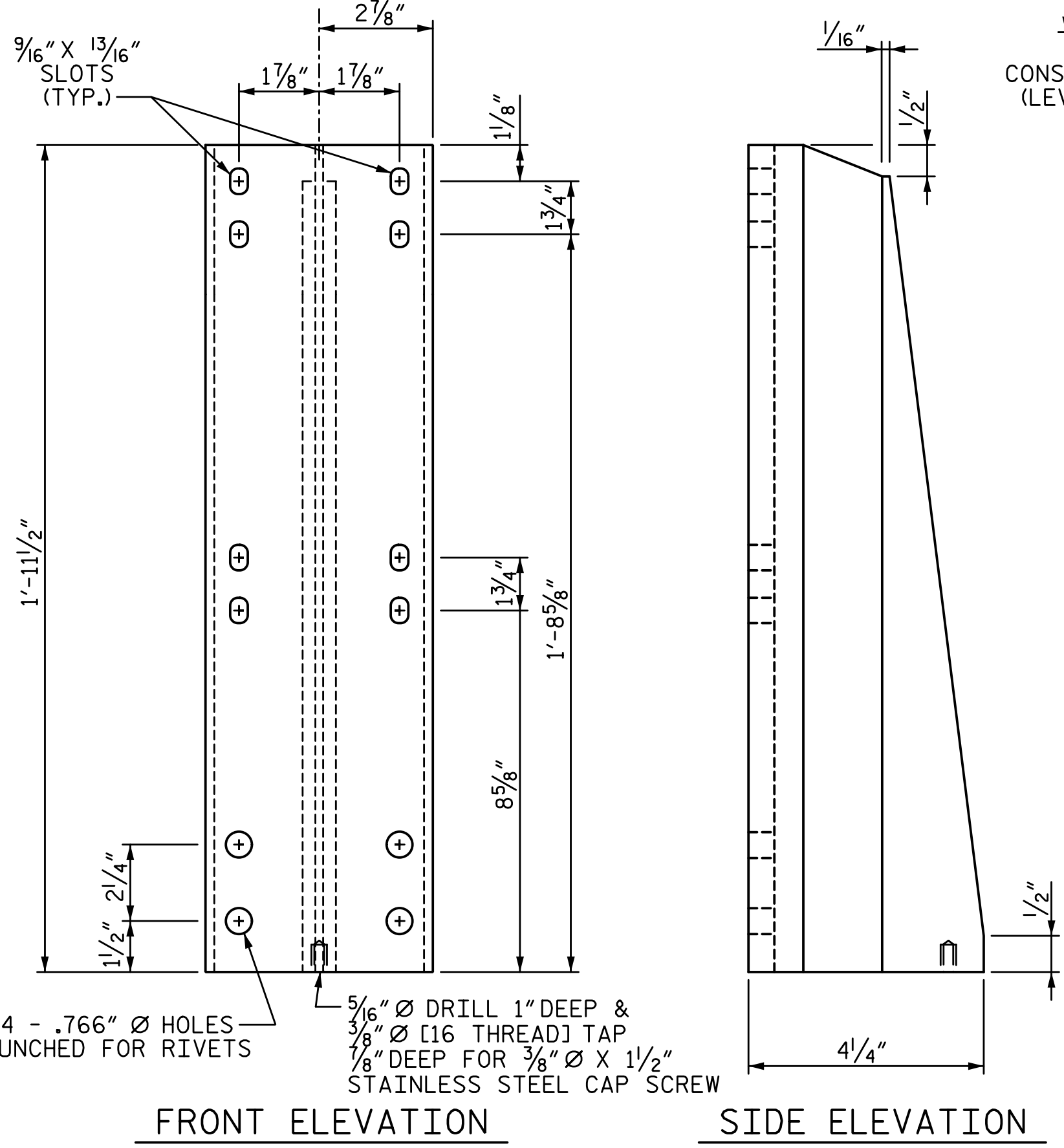


**STAGE 1**



**STAGE 2**

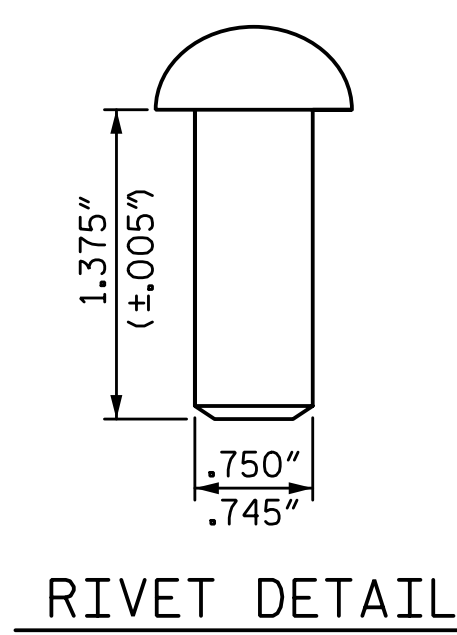
**SECTION THRU PARAPET AND RAIL**



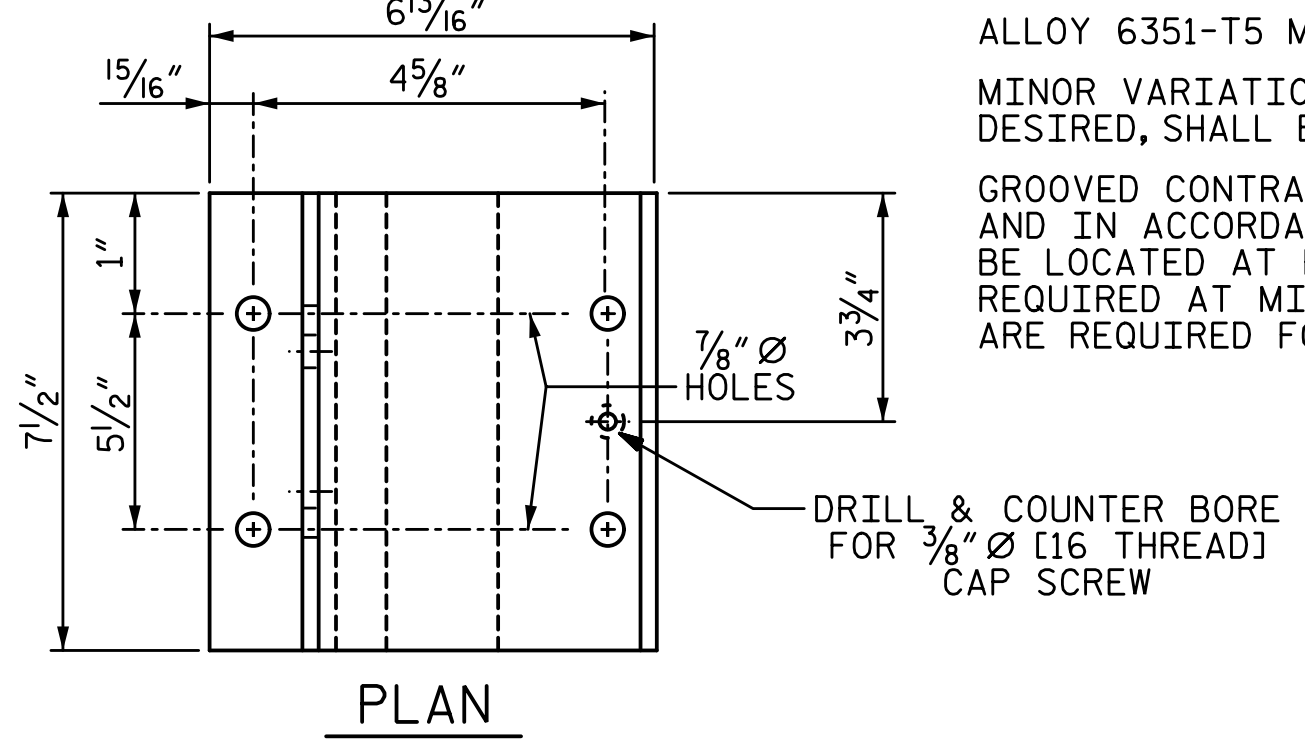
**FRONT ELEVATION**

**SIDE ELEVATION**

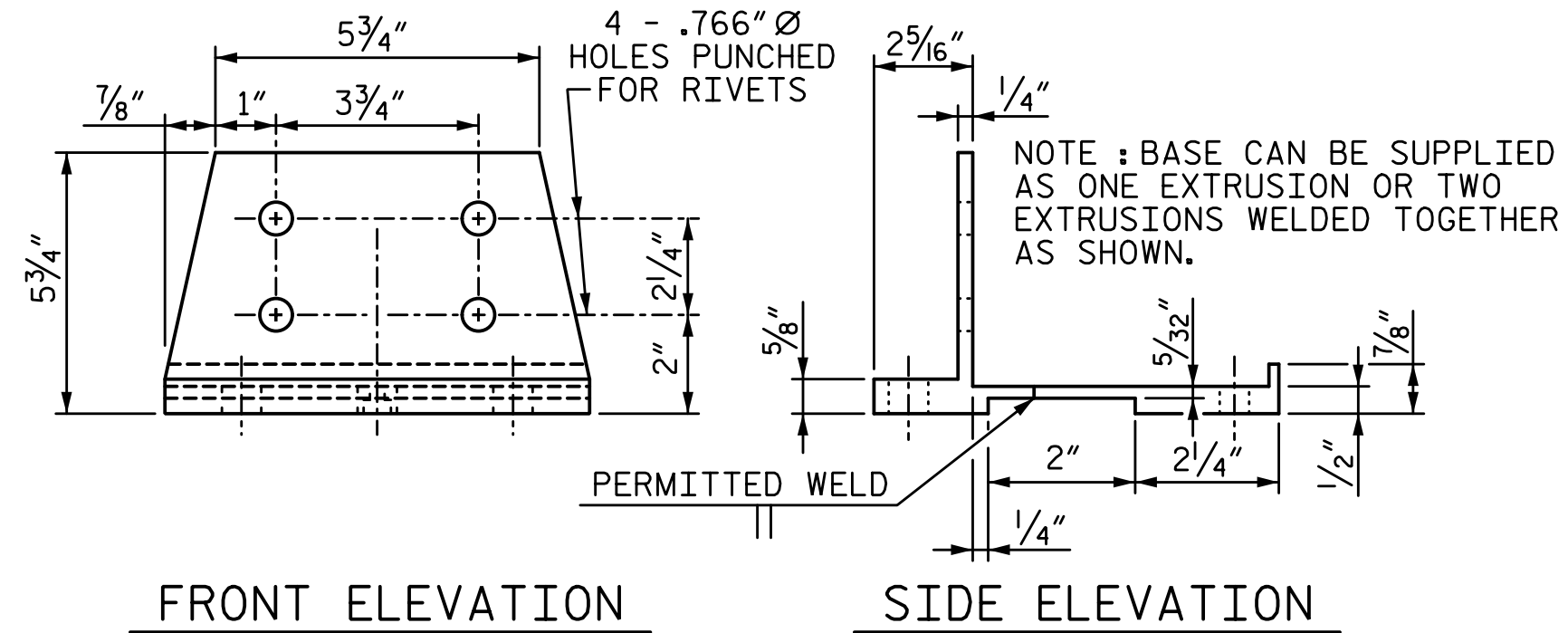
**DETAILS OF POST**



**RIVET DETAIL**



**PLAN**



**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**

**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 "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

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.

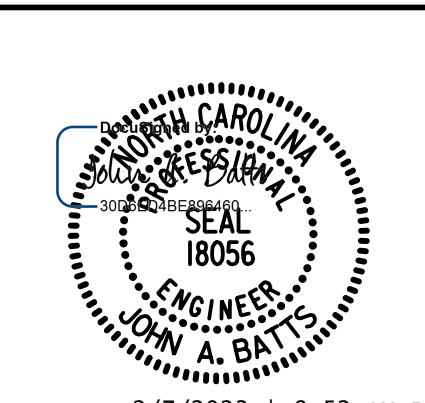
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT 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 = 380.92 LF

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 STATION: 18+82.09 -L-

SHEET 1 OF 2

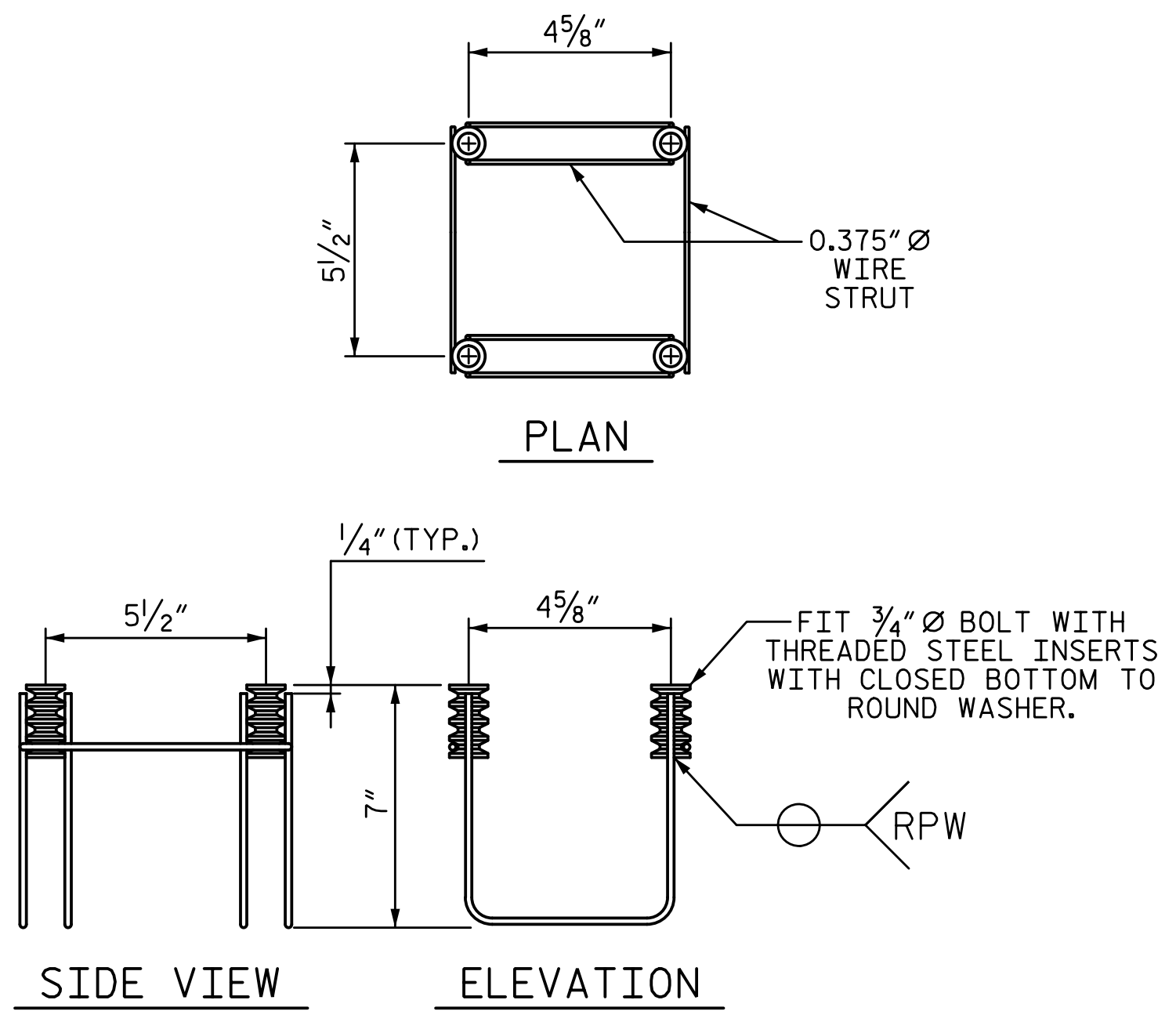
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 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
<b>2 BAR METAL RAIL</b>					
SHEET NO. S-35					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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**4-BOLT METAL RAIL ANCHOR ASSEMBLY**  
(94 ASSEMBLIES REQUIRED)

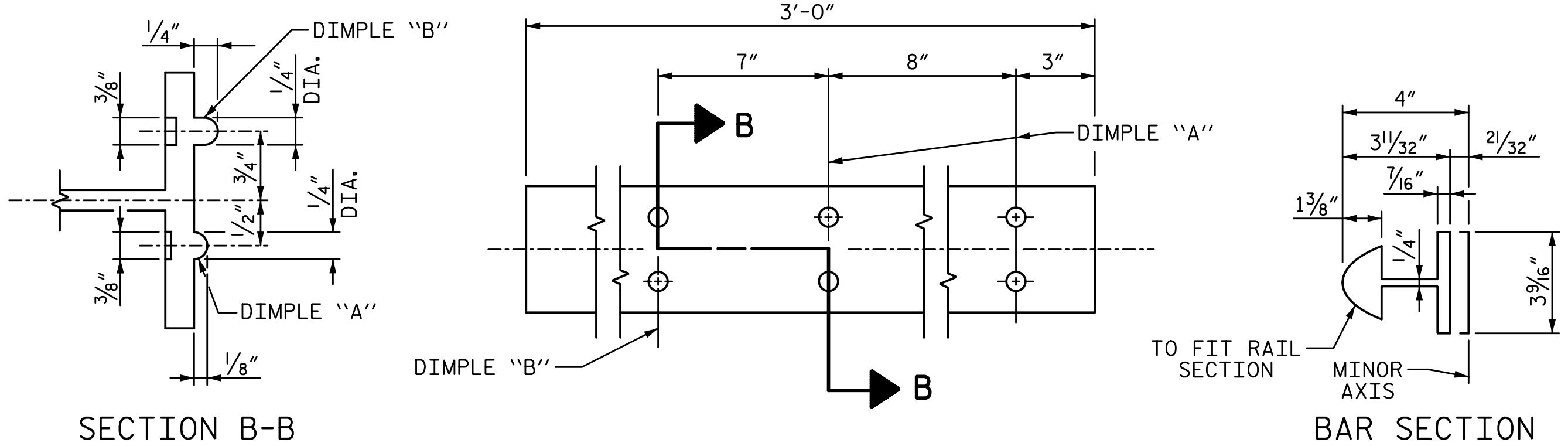
**NOTES:**

**STRUCTURAL CONCRETE ANCHOR ASSEMBLY**

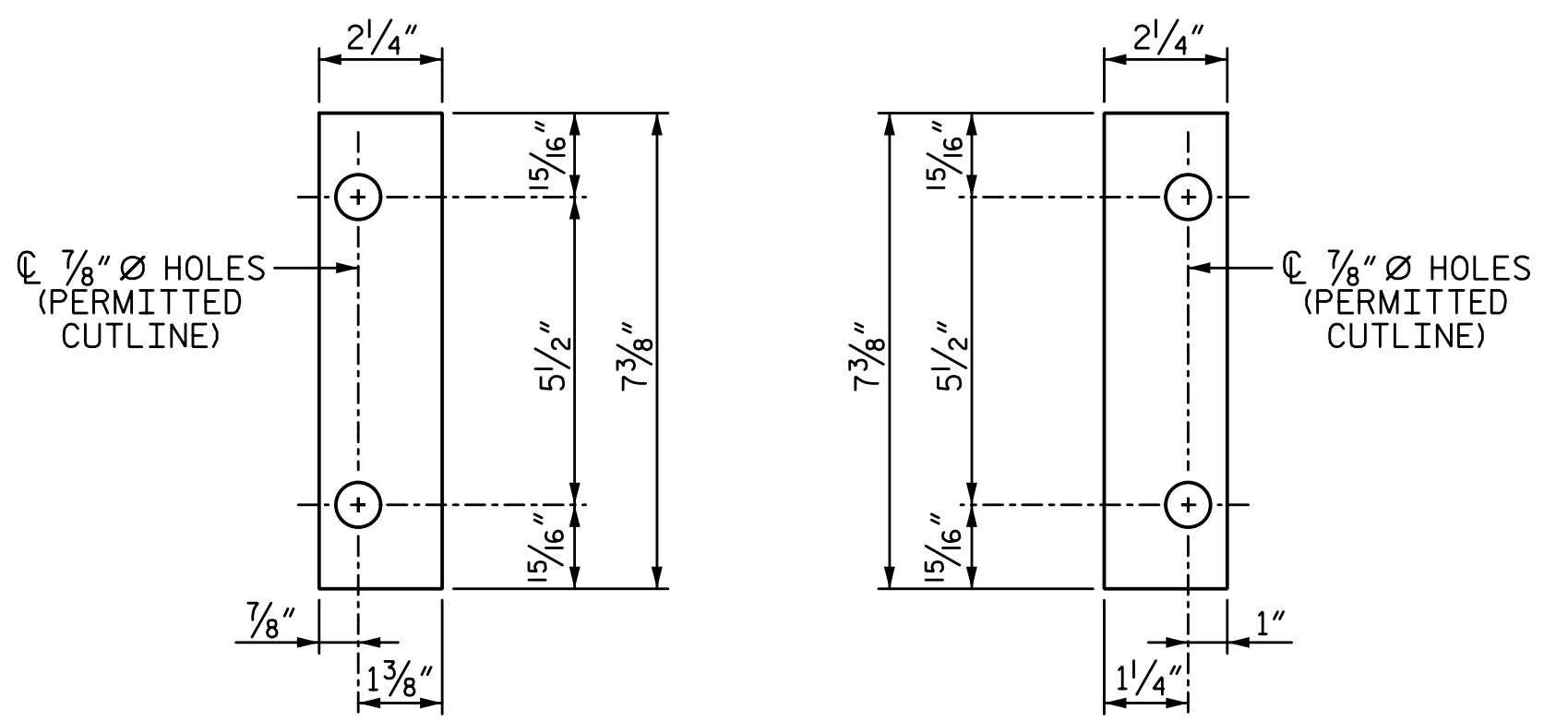
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
  - B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL 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 1/6" 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.

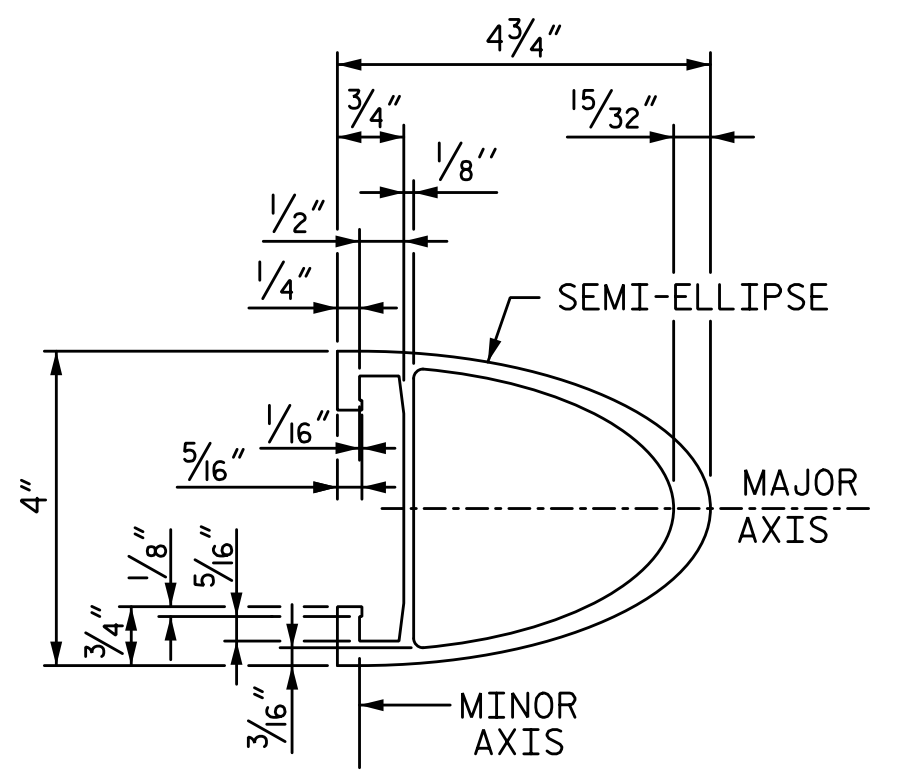


**EXPANSION BAR DETAILS**

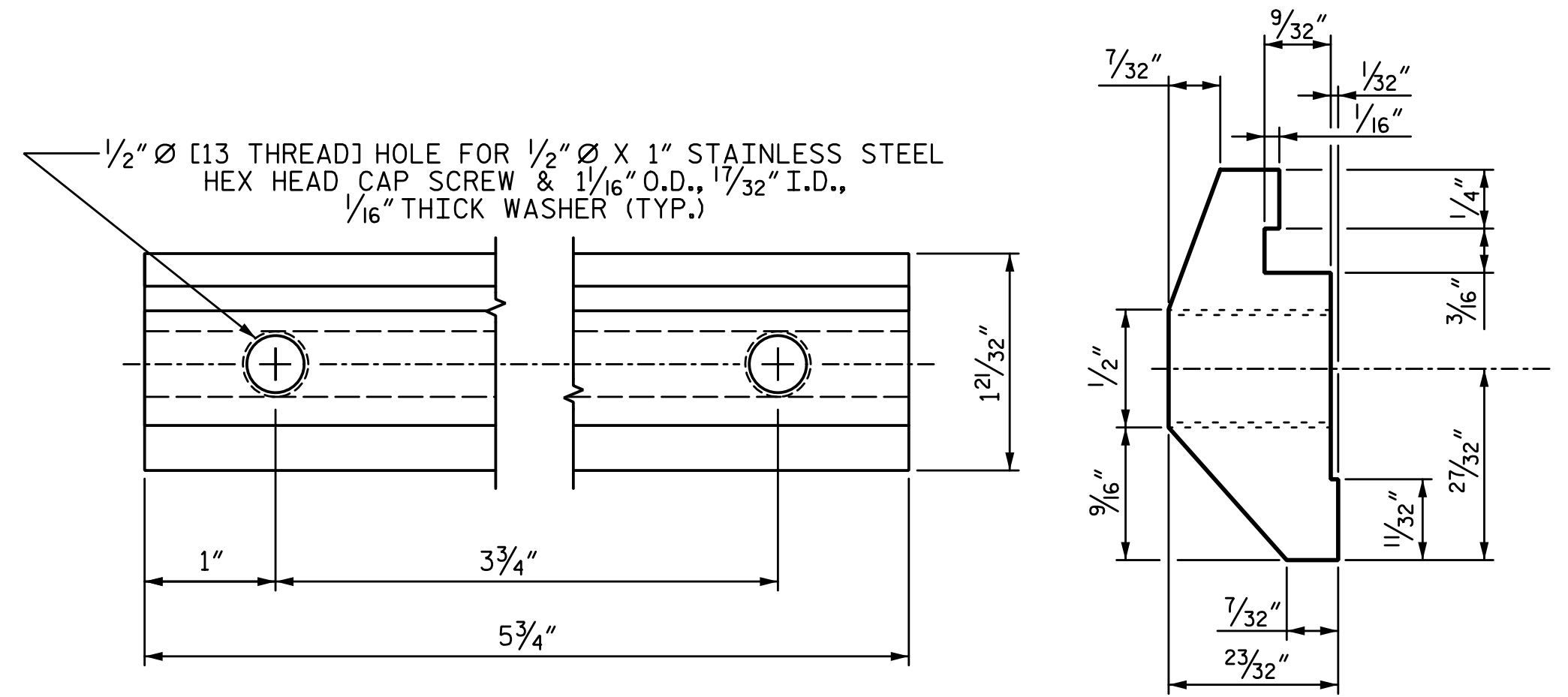


**SHIM DETAILS**

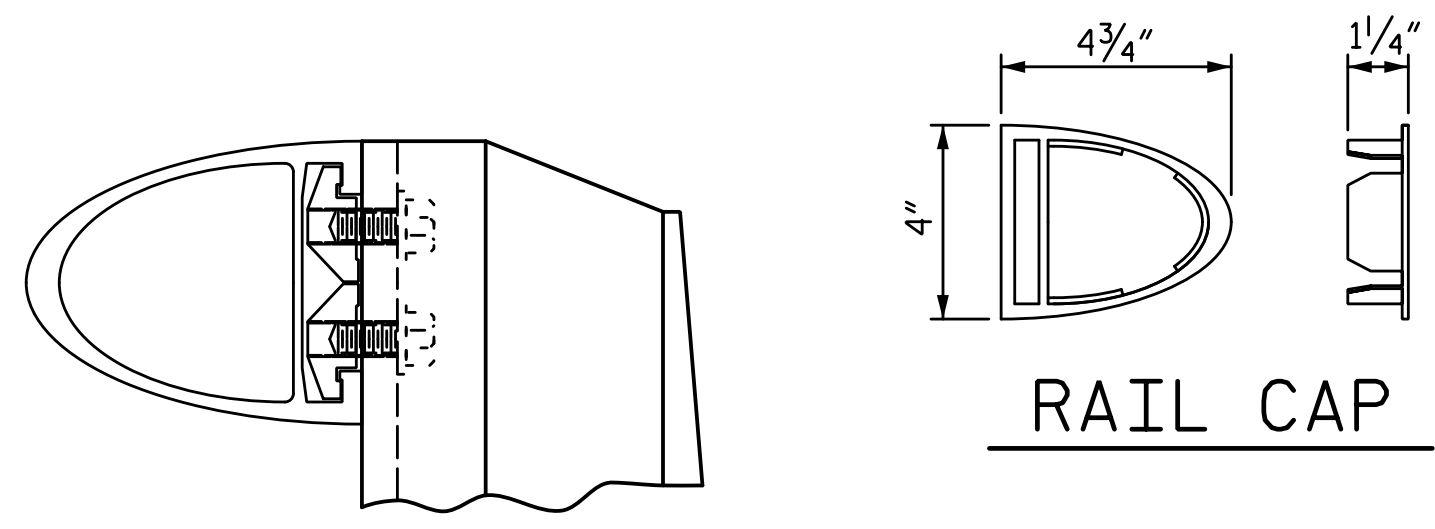
NOTE: SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLAEMENT.



**RAIL SECTION**



**CLAMP BAR DETAIL**  
(4 REQUIRED PER POST)



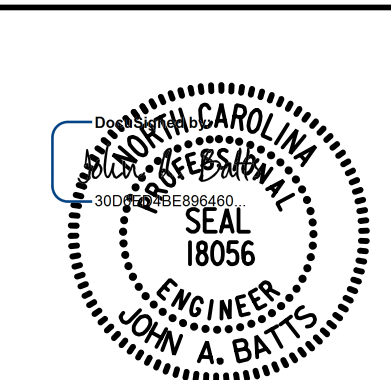
**CLAMP ASSEMBLY**

**RAIL CAP**

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STATION: 18+82.09 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**2 BAR METAL RAIL**



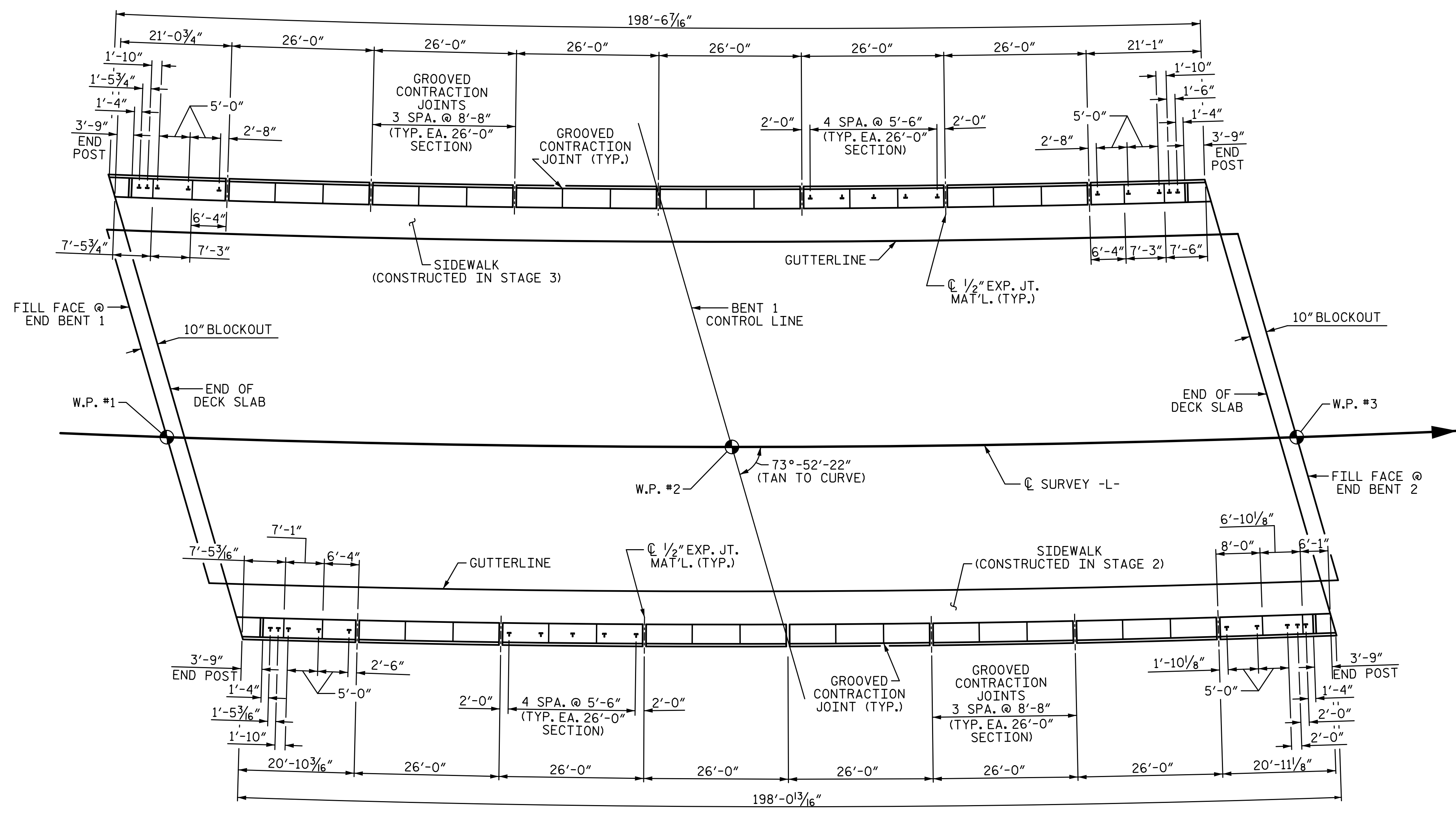
DRAWN BY: S.D. COOPER	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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1			3		
2			4		

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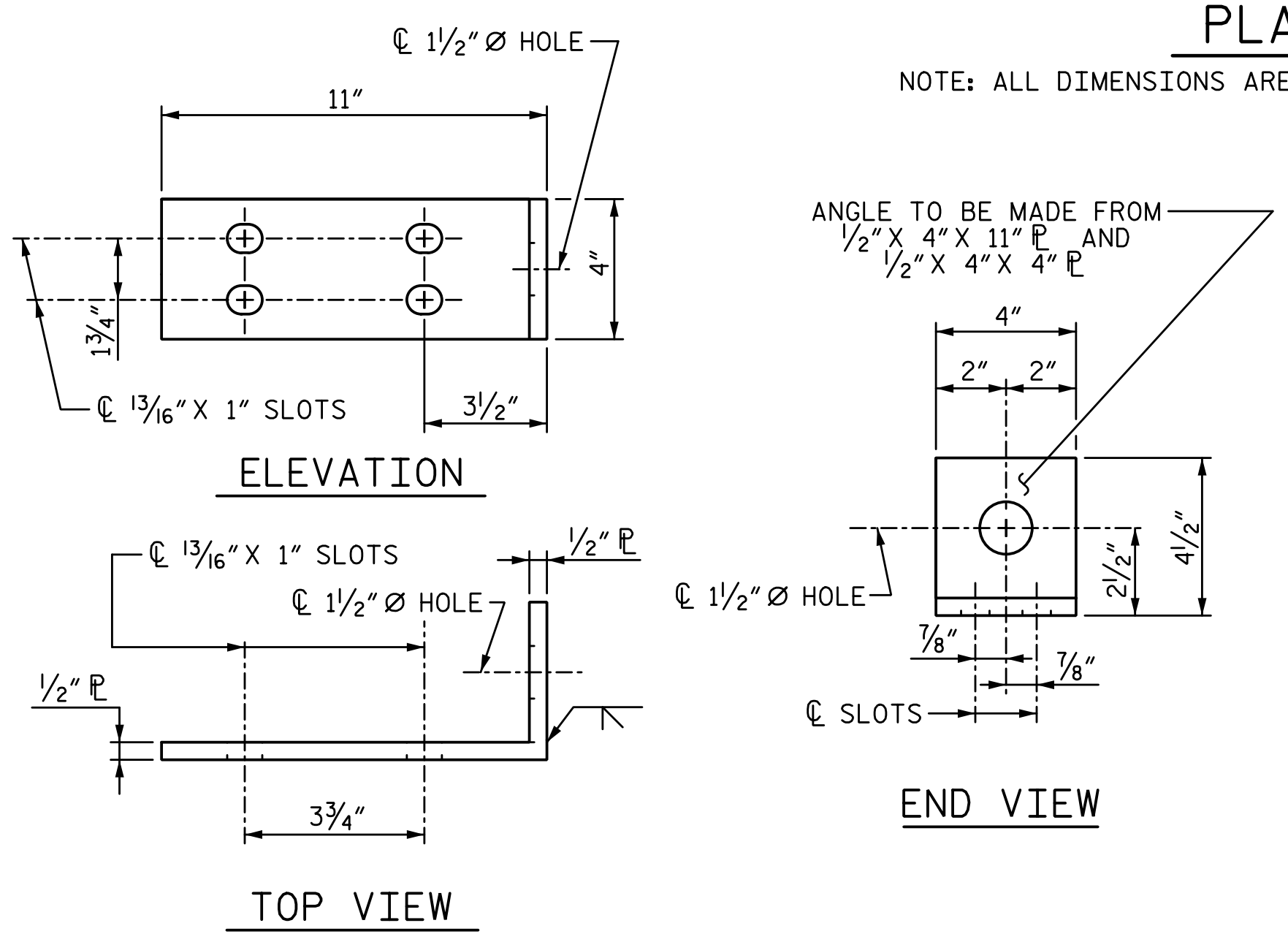
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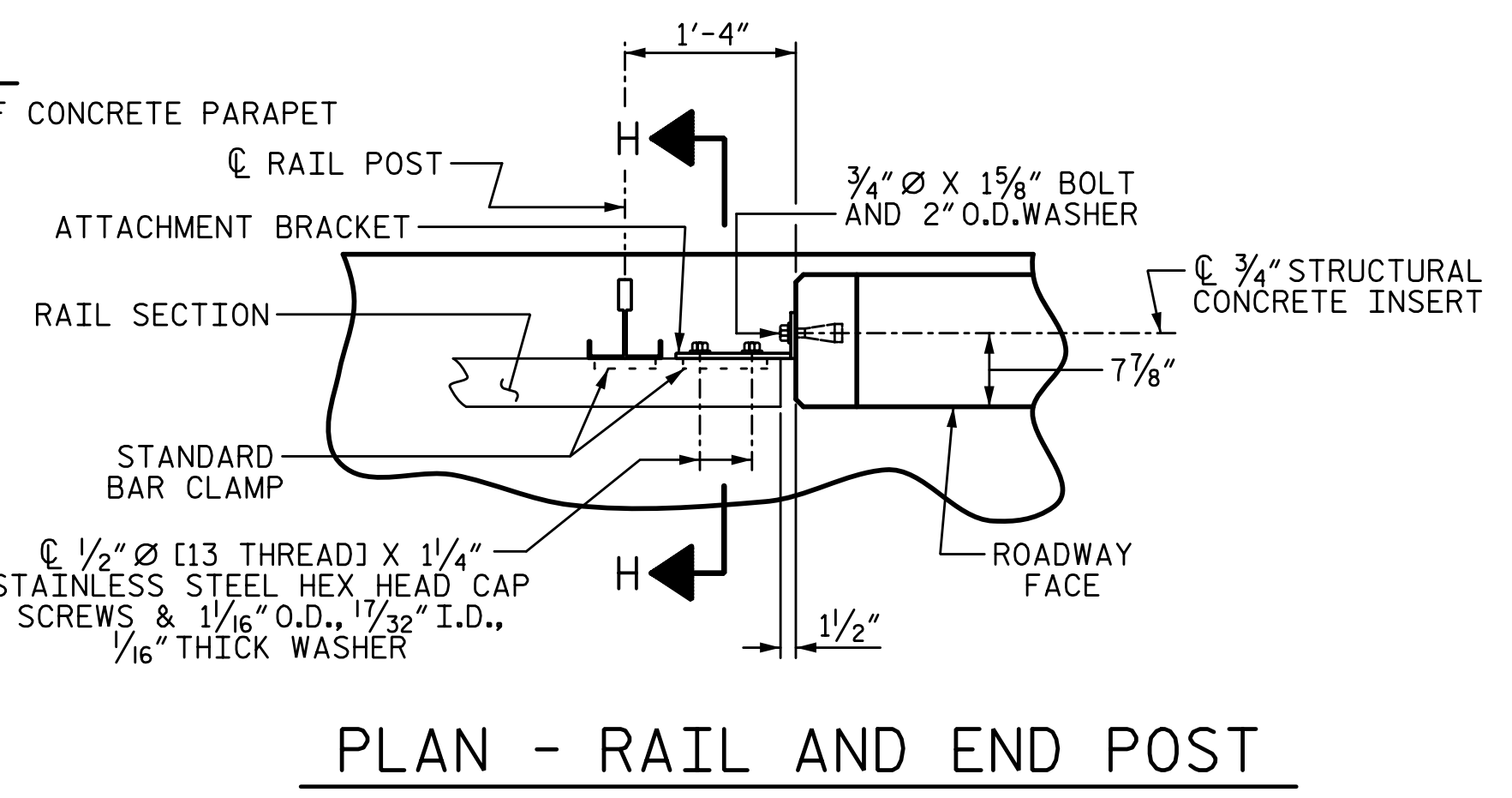
SPAN A SPAN B

**PLAN OF RAIL POST SPACING**

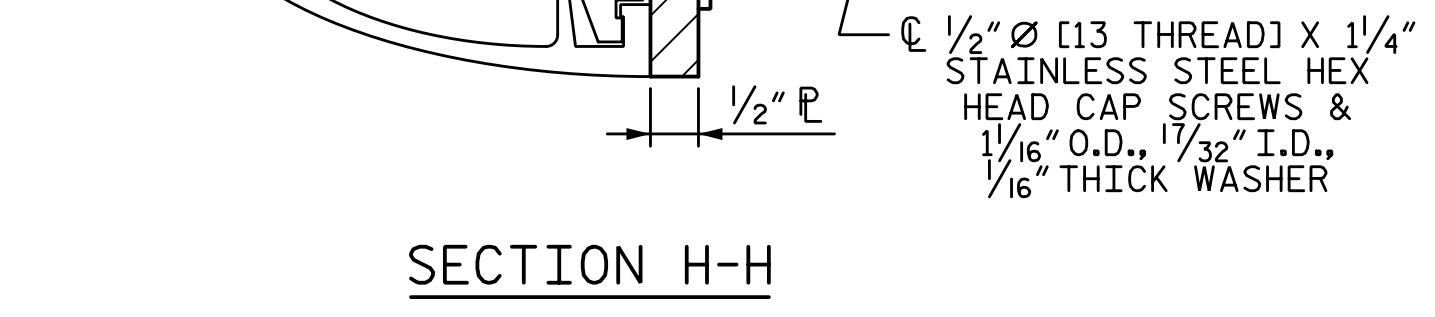
NOTE: ALL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE OUTSIDE FACE OF CONCRETE PARAPET



FIXED



PLAN - RAIL AND END POST



SECTION H-H

**DETAILS FOR ATTACHING METAL RAIL TO END POST**

**NOTES:**

**STRUCTURAL CONCRETE INSERT**

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

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

**METAL RAIL TO END POST CONNECTION**

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

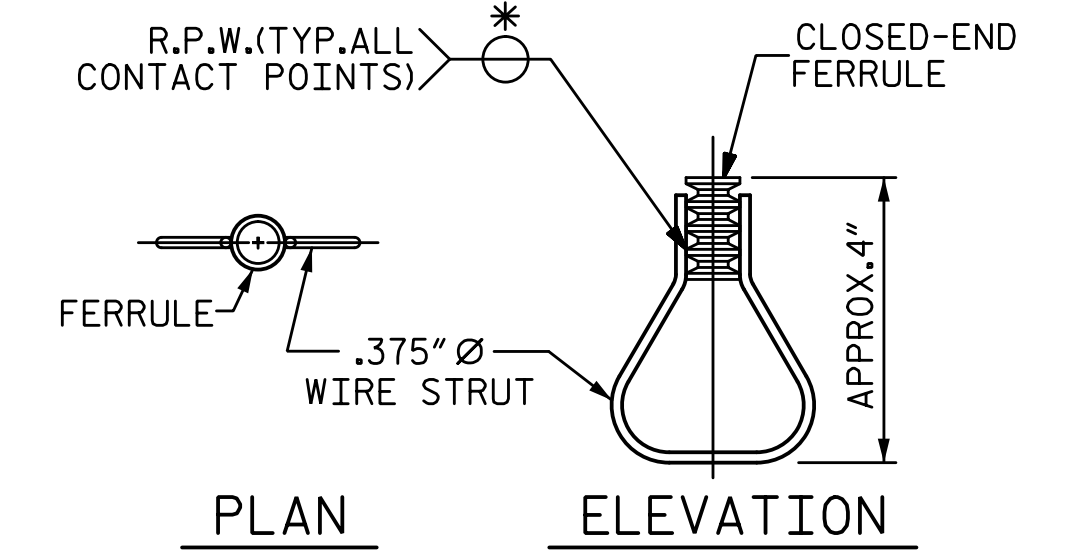
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" x 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" x 1 1/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. 1/2" 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 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" x 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" x 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" x 1 1/8" BOLT SHALL APPLY TO THE 3/4" x 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

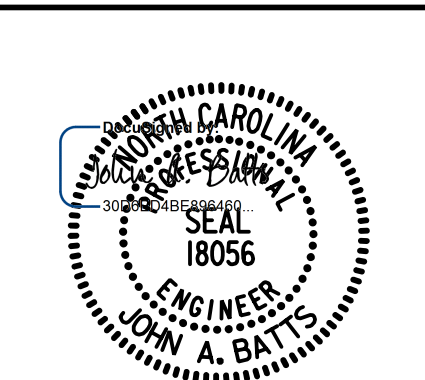


**STRUCTURAL CONCRETE INSERT**

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

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DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

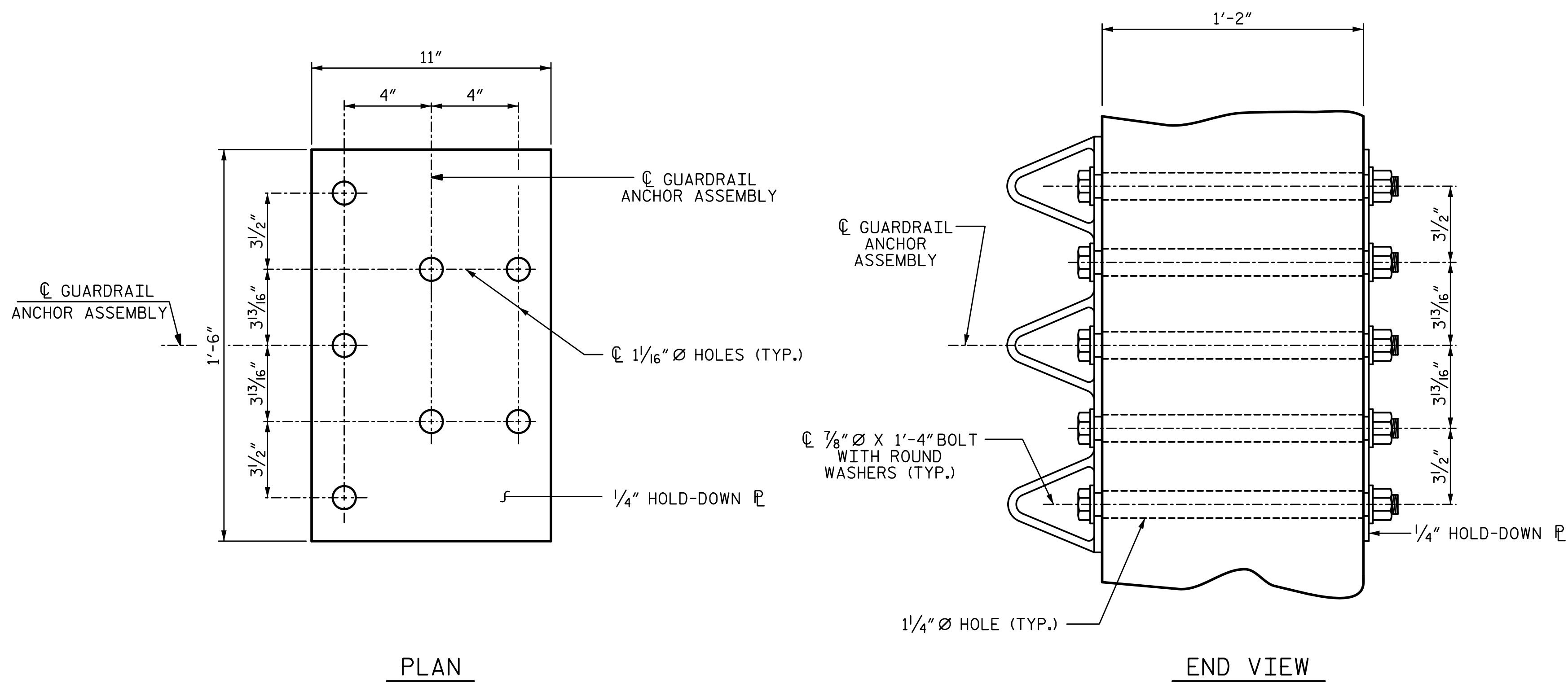


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 SUPERSTRUCTURE  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS

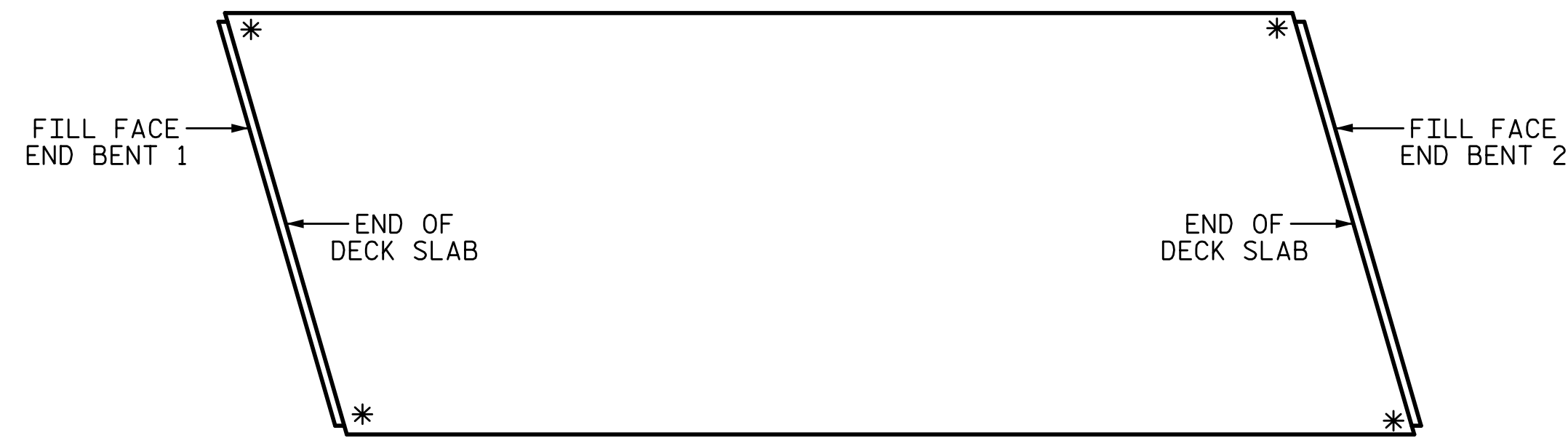
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**GUARDRAIL ANCHOR ASSEMBLY DETAILS**



**NOTES:**

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

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

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

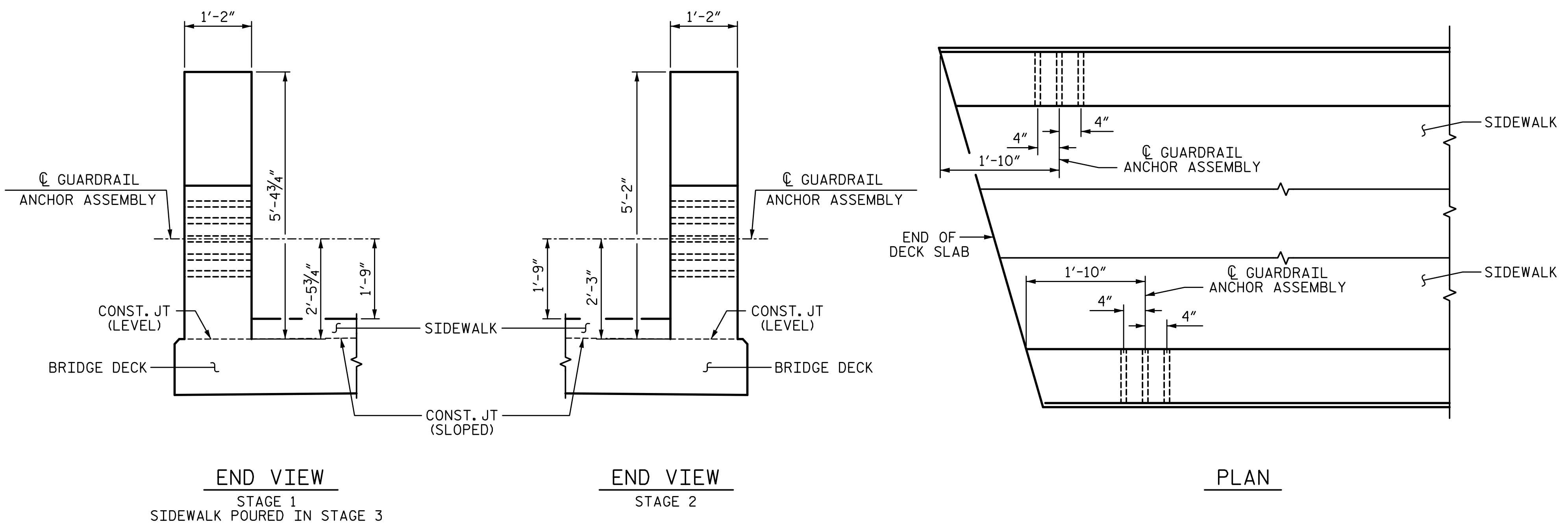
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

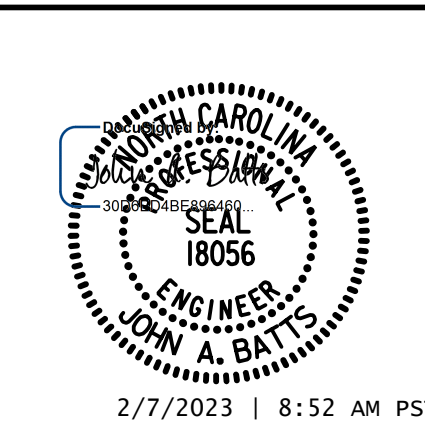
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



**LOCATION OF GUARDRAIL ANCHOR @ END POST**

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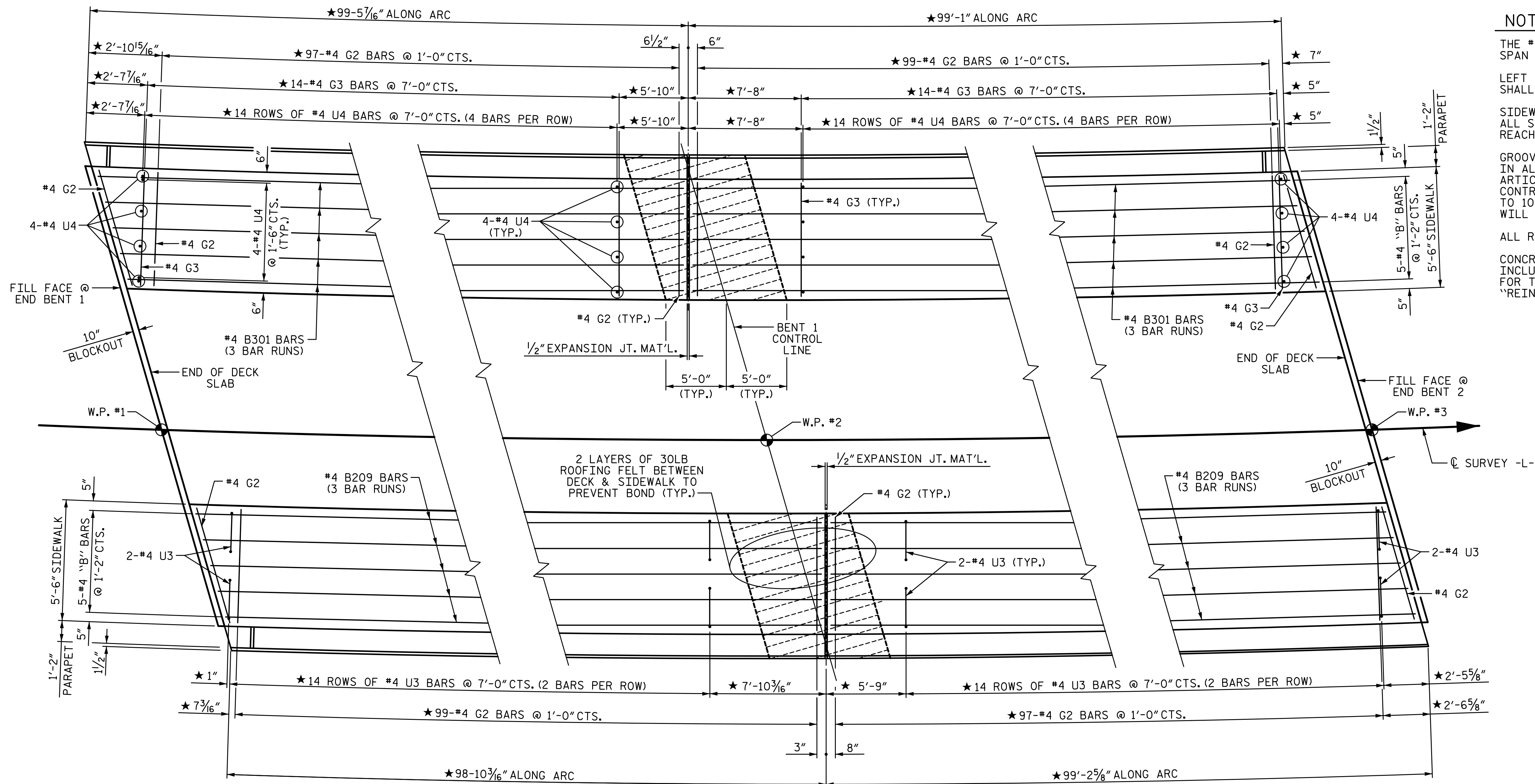


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**GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 METAL RAILS**

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**NOTES:**

THE #4 U3 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF FOR STAGE 2 SIDEWALK.

LEFT SIDEWALK SHALL BE POURED IN STAGE 3. #4 U4 BARS SHALL BE DRILLED AND GROUTED IN PLACE.

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

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

ALL REINFORCING STEEL IN SIDEWALKS SHALL BE EPOXY COATED.

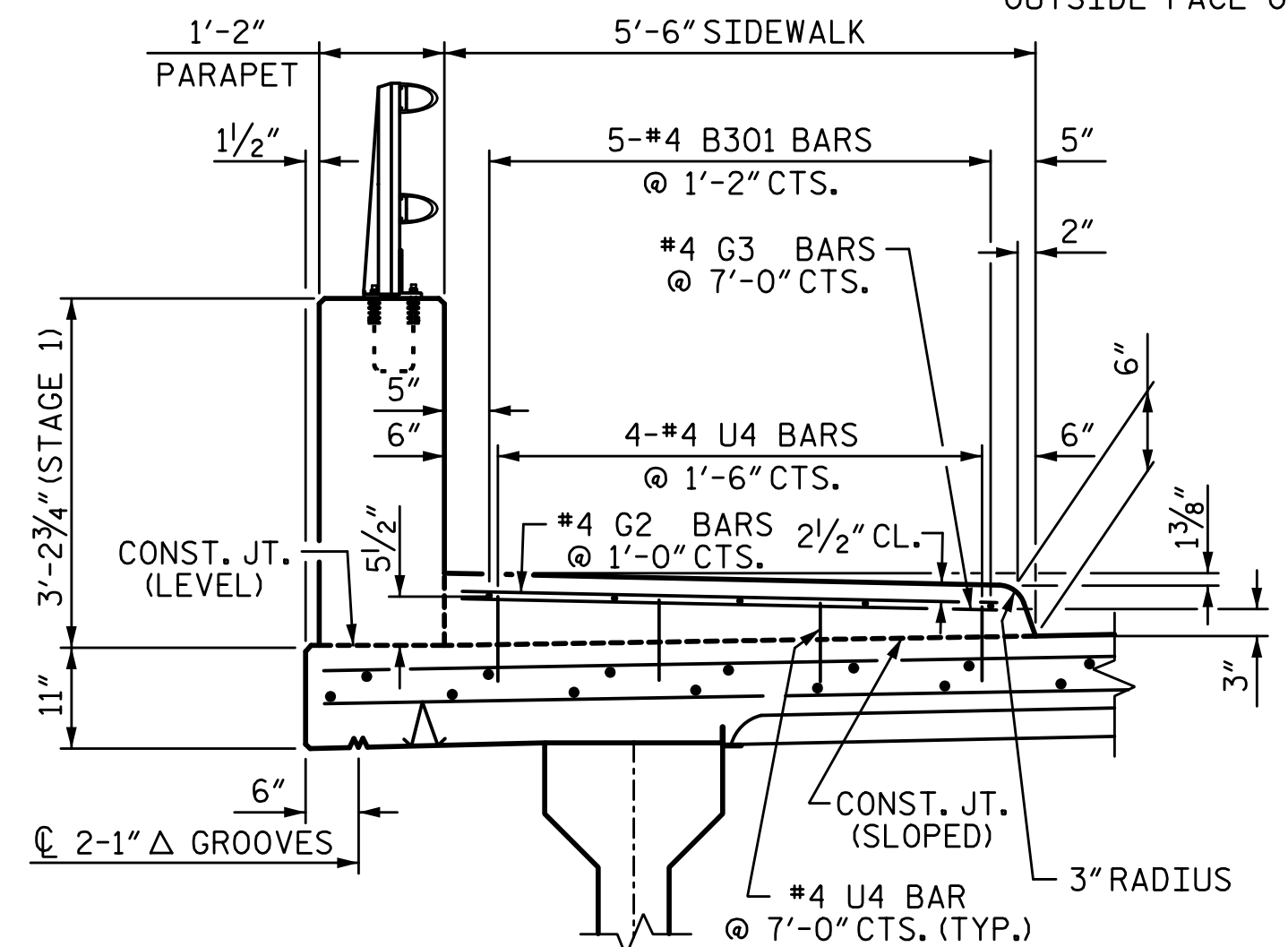
CONCRETE AND REINFORCING STEEL FOR THE SIDEWALKS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB".

SPAN A

SPAN B

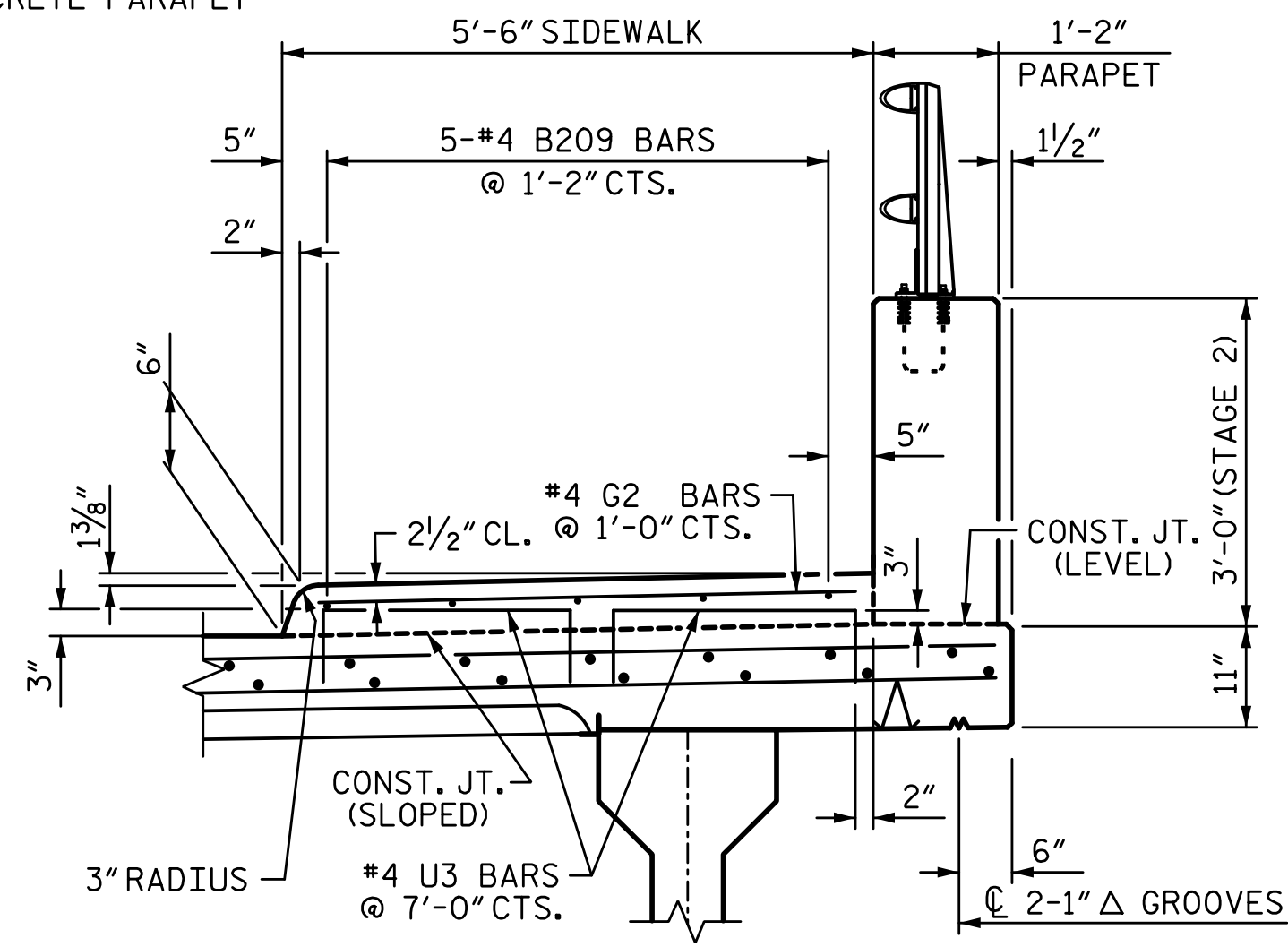
**PLAN OF SIDEWALK**

★ DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE PARAPET



**SECTION THRU SIDEWALK-STAGE 3**

SEE NOTES FOR PLACEMENT OF #4 U4 BARS.



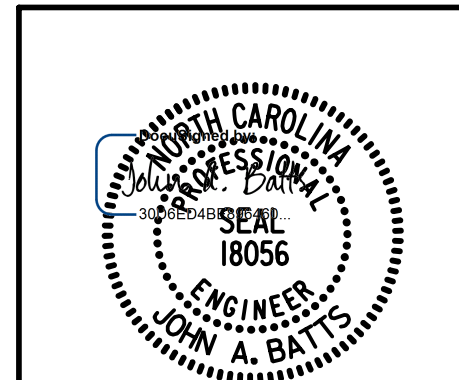
**SECTION THRU SIDEWALK-STAGE 2**

SEE NOTES FOR PLACEMENT OF #4 U3 BARS.

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**SIDEWALK DETAILS**



**WVGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
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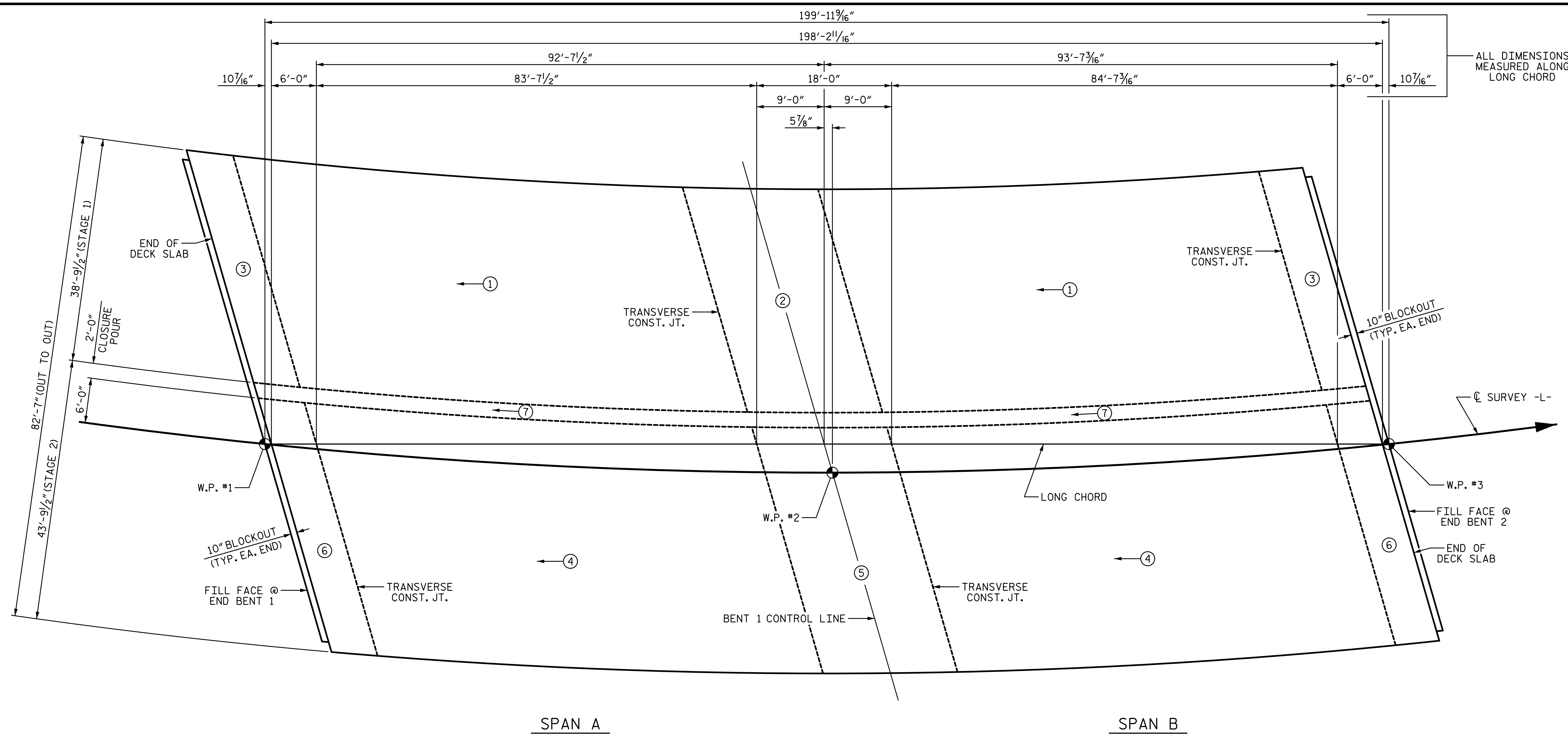
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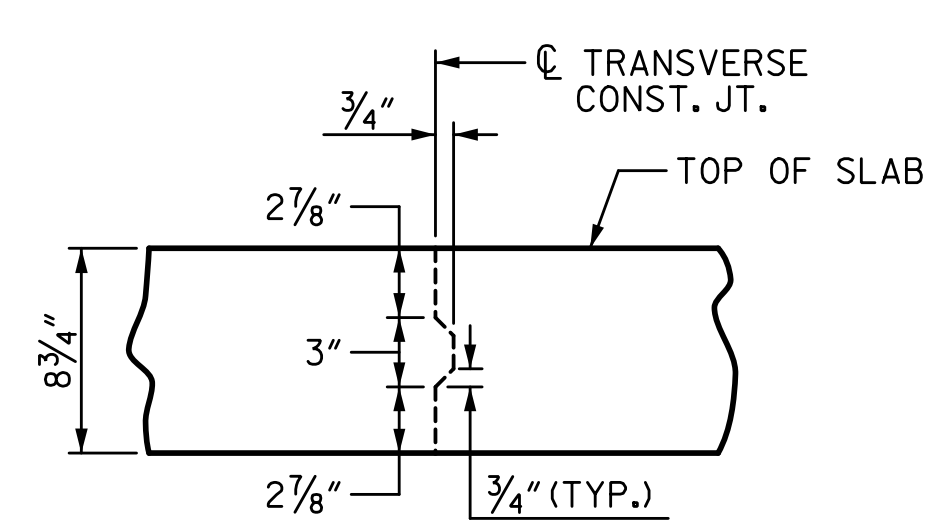


ALL DIMENSIONS MEASURED ALONG LONG CHORD

### POUR SEQUENCE AND AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 16,376)

⊙ # INDICATES POUR NUMBER AND DIRECTION OF POUR



### TRANSVERSE CONSTRUCTION JOINT DETAIL

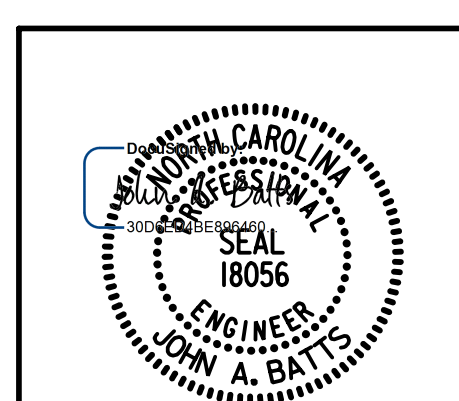
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

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SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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## BILL OF MATERIAL



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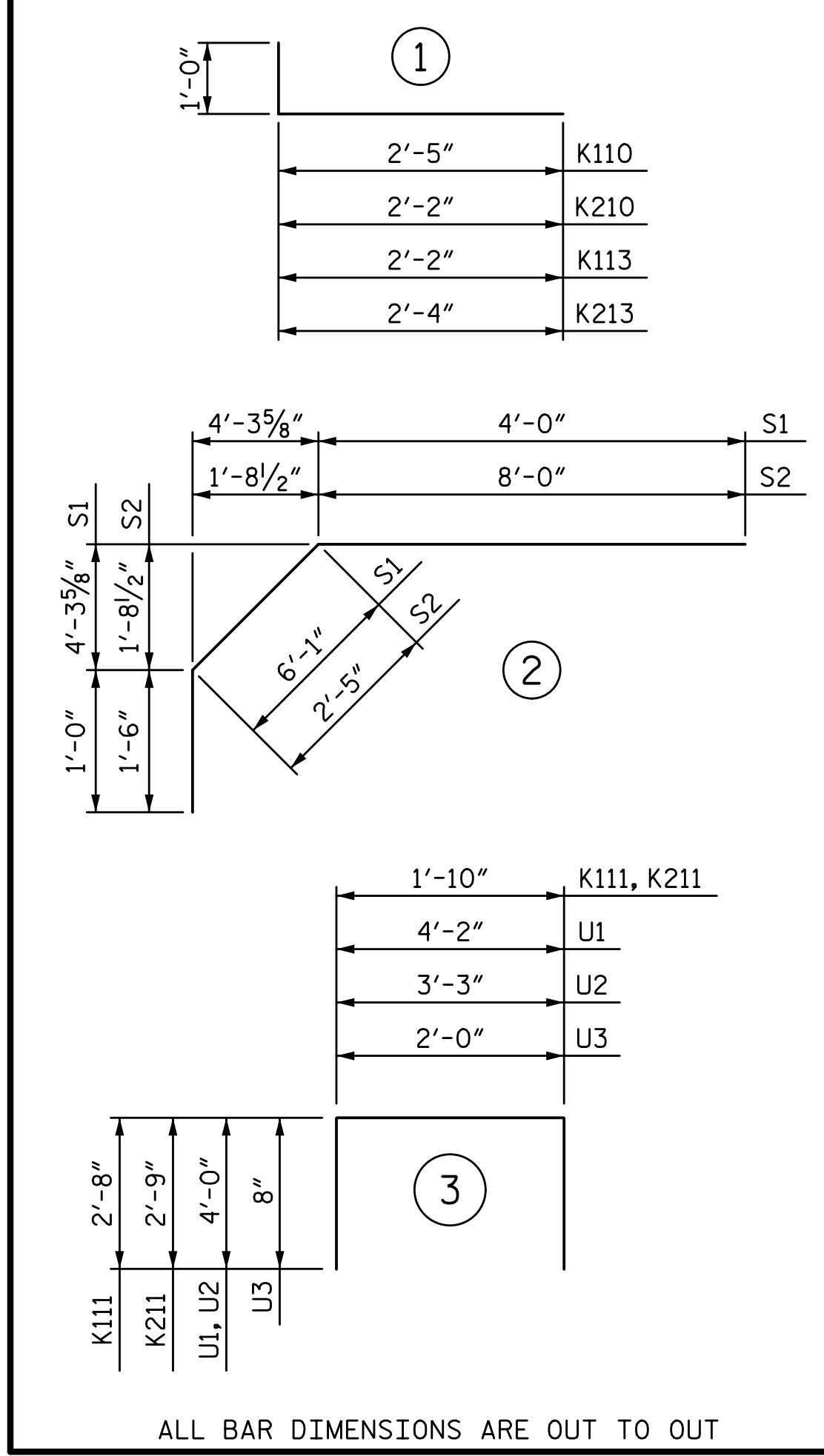
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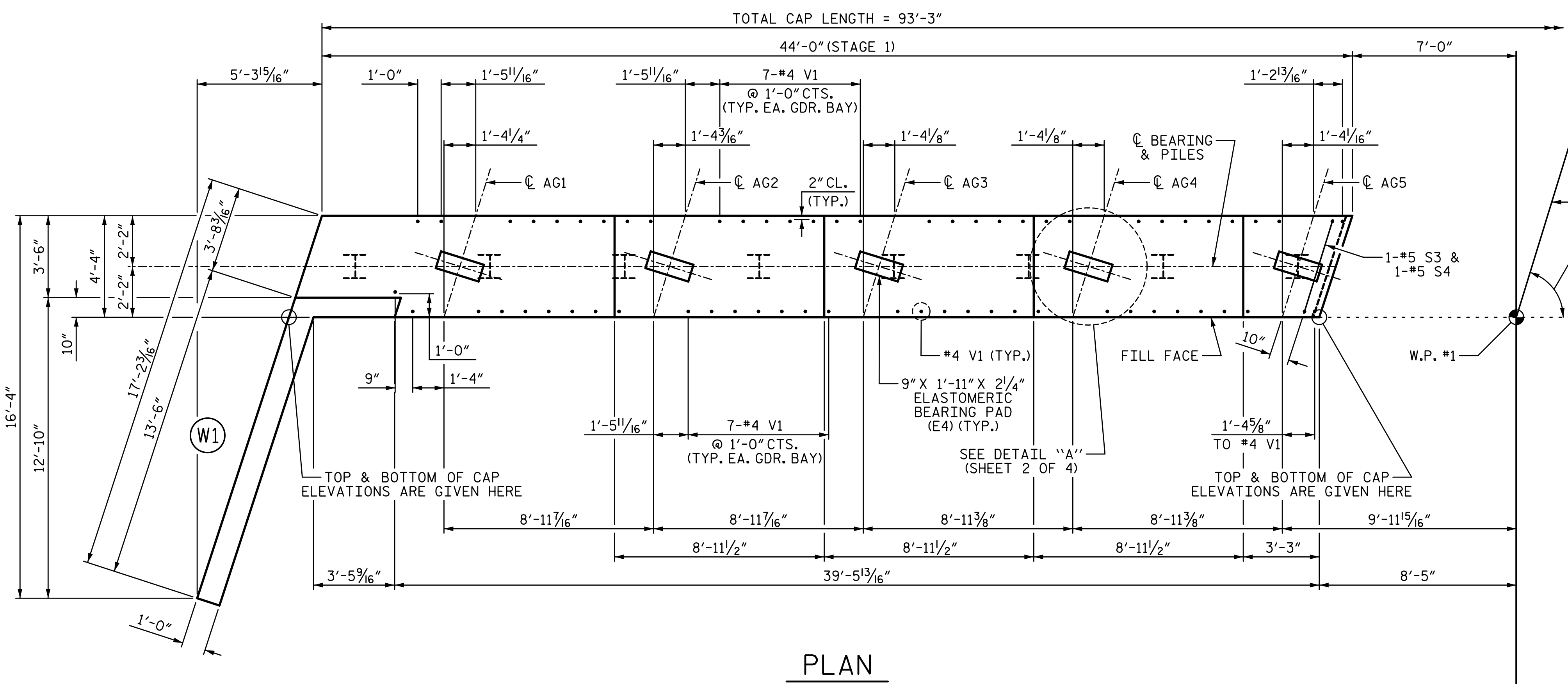
**BAR TYPES**



**BILL OF MATERIAL**

STAGE 1											STAGE 2																		
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT						
* A1100	345	#5	STR	38'-5"	13824	A1215	1	#5	STR	11'-8"	12	* A2100	343	#5	STR	41'-5"	14817	A2209	1	#5	STR	25'-8"	27	K206	2	#4	STR	1'-11"	3
A1200	345	#5	STR	38'-5"	13824	A1216	1	#5	STR	9'-10"	10	A2200	343	#5	STR	41'-5"	14817	A2210	1	#5	STR	23'-10"	25	K207	2	#4	STR	2'-5"	3
						A1217	1	#5	STR	8'-0"	8							A2211	1	#5	STR	22'-0"	23	K208	4	#4	STR	2'-8"	7
* A1101	1	#5	STR	37'-5"	39	A1218	1	#5	STR	6'-2"	6	* A2101	1	#5	STR	40'-6"	42	A2212	1	#5	STR	20'-1"	21	K209	2	#4	STR	2'-1"	3
* A1102	1	#5	STR	35'-6"	37	A1219	1	#5	STR	4'-4"	5	* A2102	1	#5	STR	38'-8"	40	A2213	1	#5	STR	18'-3"	19	K210	2	#4	1	3'-2"	4
* A1103	1	#5	STR	33'-8"	35	A1220	1	#5	STR	2'-6"	3	* A2103	1	#5	STR	36'-10"	38	A2214	1	#5	STR	16'-5"	17	K211	2	#4	3	7'-4"	10
* A1104	1	#5	STR	31'-10"	33	A1221	1	#5	STR	37'-4"	39	* A2104	1	#5	STR	35'-0"	37	A2215	1	#5	STR	14'-7"	15	K212	2	#4	STR	2'-11"	4
* A1105	1	#5	STR	30'-0"	31	A1222	1	#5	STR	35'-6"	37	* A2105	1	#5	STR	33'-1"	35	A2216	1	#5	STR	12'-8"	13	K213	2	#4	1	3'-4"	4
* A1106	1	#5	STR	28'-2"	29	A1223	1	#5	STR	33'-7"	35	* A2106	1	#5	STR	31'-3"	33	A2217	1	#5	STR	10'-10"	11						
* A1107	1	#5	STR	26'-4"	27	A1224	1	#5	STR	31'-9"	33	* A2107	1	#5	STR	29'-5"	31	A2218	1	#5	STR	9'-0"	9	* S1	62	#4	2	11'-1"	459
* A1108	1	#5	STR	24'-6"	26	A1225	1	#5	STR	29'-10"	31	* A2108	1	#5	STR	27'-7"	29	A2219	1	#5	STR	7'-2"	7	S2	62	#4	2	11'-11"	494
* A1109	1	#5	STR	22'-8"	24	A1226	1	#5	STR	28'-0"	29	* A2109	1	#5	STR	25'-8"	27	A2220	1	#5	STR	5'-3"	5						
* A1110	1	#5	STR	20'-10"	22	A1227	1	#5	STR	26'-2"	27	* A2110	1	#5	STR	23'-10"	25	A2221	1	#5	STR	3'-5"	4	U1	72	#4	3	12'-2"	585
* A1111	1	#5	STR	19'-0"	20	A1228	1	#5	STR	24'-3"	25	* A2111	1	#5	STR	22'-0"	23	A2222	1	#5	STR	1'-7"	2	U2	2	#4	3	11'-3"	15
* A1112	1	#5	STR	17'-2"	18	A1229	1	#5	STR	22'-5"	23	* A2112	1	#5	STR	20'-1"	21	A2223	1	#5	STR	40'-6"	42	* U3	56	#4	3	3'-4"	125
* A1113	1	#5	STR	15'-4"	16	A1230	1	#5	STR	20'-6"	21	* A2113	1	#5	STR	18'-3"	19	A2224	1	#5	STR	38'-8"	40						
* A1114	1	#5	STR	13'-6"	14	A1231	1	#5	STR	18'-8"	19	* A2114	1	#5	STR	16'-5"	17	A2225	1	#5	STR	36'-9"	38	REINFORCING STEEL					33658 LB
* A1115	1	#5	STR	11'-8"	12	A1232	1	#5	STR	16'-9"	17	* A2115	1	#5	STR	14'-7"	15	A2226	1	#5	STR	34'-10"	36						
* A1116	1	#5	STR	9'-10"	10	A1233	1	#5	STR	14'-11"	16	* A2116	1	#5	STR	12'-8"	13	A2227	1	#5	STR	33'-0"	34	* EPOXY COATED					
* A1117	1	#5	STR	8'-0"	8	A1234	1	#5	STR	13'-0"	14	* A2117	1	#5	STR	10'-10"	11	A2228	1	#5	STR	31'-1"	32	REINFORCING STEEL					32657 LB
* A1118	1	#5	STR	6'-2"	6	A1235	1	#5	STR	11'-2"	12	* A2118	1	#5	STR	9'-0"	9	A2229	1	#5	STR	29'-2"	30						
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* A1120	1	#5	STR	2'-6"	3	A1237	1	#5	STR	7'-5"	8	* A2120	1	#5	STR	5'-3"	5	A2231	1	#5	STR	25'-5"	27						
* A1121	1	#5	STR	37'-4"	39	A1238	1	#5	STR	5'-6"	6	* A2121	1	#5	STR	3'-5"	4	A2232	1	#5	STR	23'-6"	25						
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* A1123	1	#5	STR	33'-7"	35	A1240	1	#5	STR	1'-9"	2	* A2123	1	#5	STR	40'-6"	42	A2234	1	#5	STR	19'-9"	21						
* A1124	1	#5	STR	31'-9"	33							* A2124	1	#5	STR	38'-8"	40	A2235	1	#5	STR	17'-10"	19						
* A1125	1	#5	STR	29'-10"	31	B101	184	#5	STR	36'-7"	7021	* A2125	1	#5	STR	36'-9"	38	A2236	1	#5	STR	15'-11"	17						
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* A1127	1	#5	STR	26'-2"	27	B103	39	#5	STR	50'-0"	2034	* A2127	1	#5	STR	33'-0"	34	A2238	1	#5	STR	12'-2"	13						
* A1128	1	#5	STR	24'-3"	25	* B104	156	#6	STR	20'-0"	4686	* A2128	1	#5	STR	31'-1"	32	A2239	1	#5	STR	10'-3"	11						
* A1129	1	#5	STR	22'-5"	23	* B105	108	#4	STR	25'-8"	1852	* A2129	1	#5	STR	29'-2"	30	A2240	1	#5	STR	8'-4"	9						
* A1130	1	#5	STR	20'-6"	21	* B106	27	#5	STR	60'-0"	1690	* A2130	1	#5	STR	27'-4"	29	A2241	1	#5	STR	6'-6"	7						
* A1131	1	#5	STR	18'-8"	19	* B107	27	#5	STR	12'-5"	350	* A2131	1	#5	STR	25'-5"	27	A2242	1	#5	STR	4'-7"	5						
* A1132	1	#5	STR	16'-9"	17	* B108	51	#5	STR	40'-0"	2128	* A2132	1	#5	STR	23'-6"	25	A2243	1	#5	STR	2'-8"	3						
* A1133	1	#5	STR	14'-11"	16							* A2133	1	#5	STR	21'-7"	23												
* A1134	1	#5	STR	13'-0"	14	* D101	364	#6	STR	4'-11"	2688	* A2134	1	#5	STR	19'-9"	21	B201	208	#5	STR	36'-7"	7937						
* A1135	1	#5	STR	11'-2"	12	D102	364	#6	STR	4'-11"	2688	* A2135	1	#5	STR	17'-10"	19	B202	52	#5	STR	60'-0"	3254						
* A1136	1	#5	STR	9'-3"	10							* A2136	1	#5	STR	15'-11"	17	B203	45	#5	STR	50'-0"	2347						
* A1137	1	#5	STR	7'-5"	8	K101	20	#4	STR	22'-0"	294	* A2137	1	#5	STR	14'-1"	15	* B204	176	#6	STR	20'-0"	5287						
* A1138	1	#5	STR	5'-6"	6	K102	8	#4	STR	6'-3"	33	* A2138	1	#5	STR	12'-2"	13	* B205	132	#4	STR	25'-8"	2263						
* A1139	1	#5	STR	3'-8"	4	K103	8	#4	STR	7'-2"	38	* A2139	1	#5	STR	10'-3"	11	* B206	31	#5	STR	60'-0"	1940						
* A1140	1	#5	STR	1'-9"	2	K104	16	#4	STR	7'-10"	84	* A2140	1	#5	STR	8'-4"	9	* B207	31	#5	STR	12'-5"	401						
						K105	8	#4	STR	6'-10"	37	* A2141	1	#5	STR	6'-6"	7	* B208	57	#5	STR	40'-0"	2378						
A1201	1	#5	STR	37'-5"	39	K106	2	#4	STR	1'-10"	2	* A2142	1	#5	STR	4'-7"	5	* B209	30	#4	STR	34'-3"	686						
A1202	1	#5	STR	35'-6"	37	K107	2	#4	STR	2'-3"	3	* A2143	1	#5	STR	2'-8"	3												
A1203	1	#5	STR	33'-8"	35	K108	4	#4	STR	2'-7"	7							* D201	363	#6	STR	4'-11"	2681						
A1204	1	#5	STR	31'-10"	33	K109	2	#4	STR	2'-2"	3	A2201	1	#5	STR	40'-6"	42	D202	363	#6	STR	4'-11"	2681						
A1205	1	#5	STR	30'-0"	31	K110	2	#4	1	3'-5"	5	A2202	1	#5	STR	38'-8"	40												
A1206	1	#5	STR	28'-2"	29	K111	2	#4	3	7'-2"	10	A2203	1	#5	STR	36'-10"	38	* G2	198	#4	STR	5'-0"	661						
A1207	1	#5	STR	26'-4"	27	K112	2	#4	STR	2'-11"	4	A2204	1	#5	STR	35'-0"	37												
A1208	1	#5	STR	24'-6"	26	K113	2	#4	1	3'-2"	4	A2205	1	#5	STR	33'-1"	35	K201	20	#4	STR	23'-9"	317						
A1209	1	#5	STR	22'-8"	24							A2206	1	#5	STR	31'-3"	33	K202	8	#4	STR	7'-1"	38						
A1210	1	#5	STR	20'-10"	22	* S1	56	#4	2	11'-1"	415	A2207	1	#5	STR	29'-5"	31	K203	8	#4	STR	7'-11"	42						
A1211	1	#5	STR	19'-0"	20	S2	56	#4	2	11'-11"	446	A2208	1	#5	STR	27'-7"	29	K204	16	#4	STR	8'-8"	93						

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**NOTES:**

\*4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.  
 FOR SECTIONS A-A AND B-B, SEE SHEET 4 OF 4.

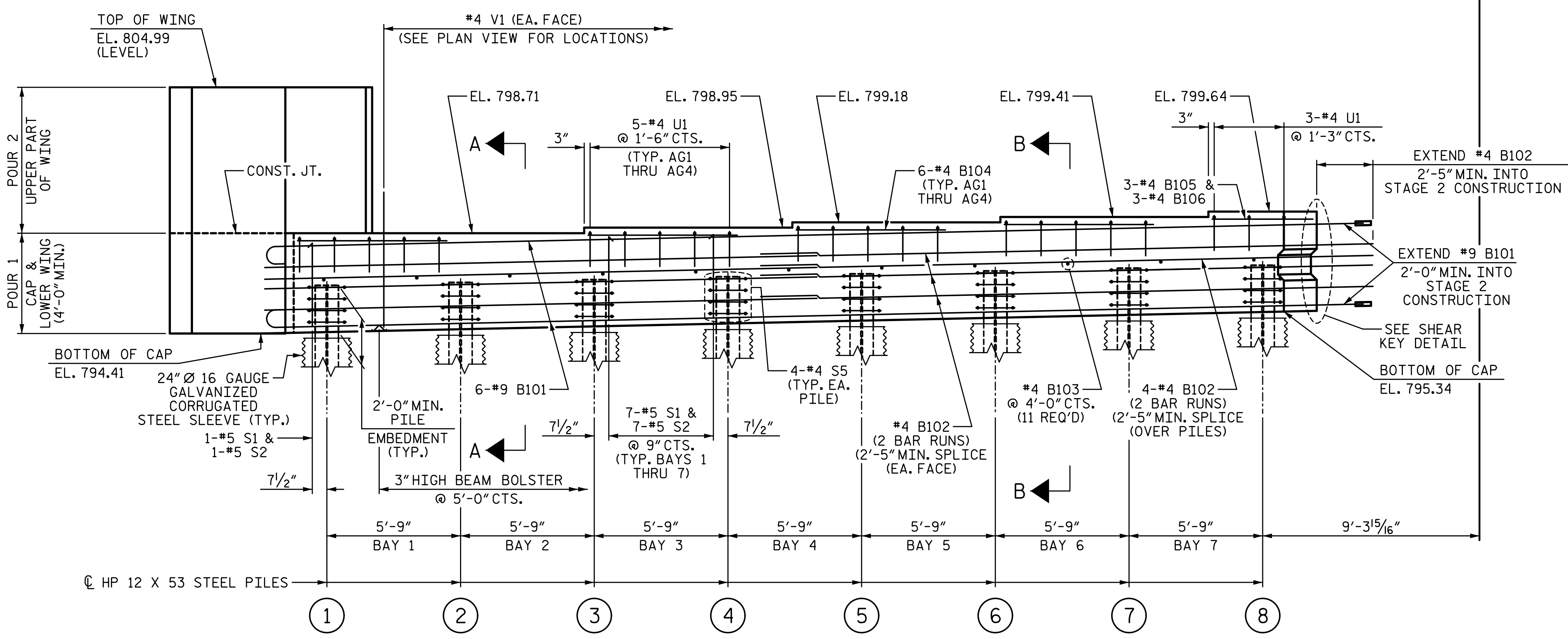
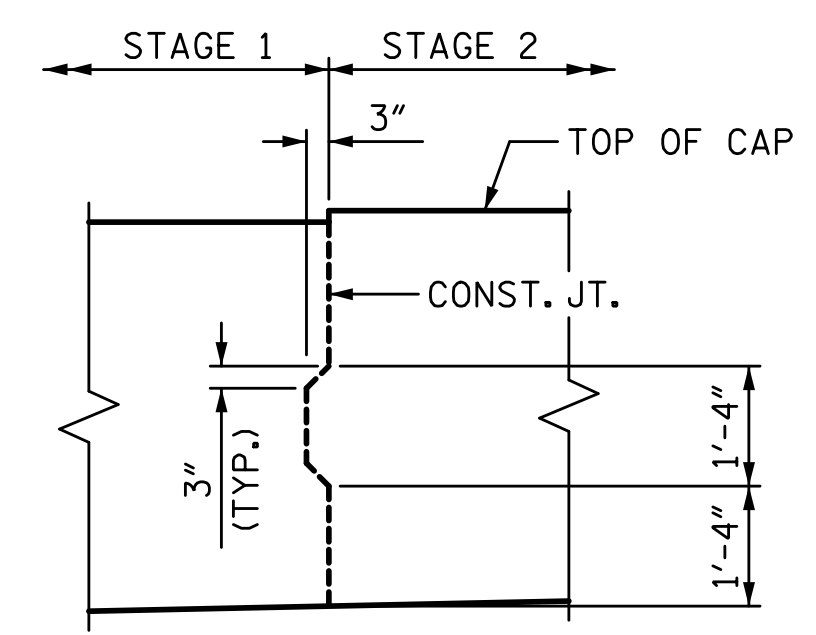
MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE 1 WITH THE #9 "B" BARS IN STAGE 2. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE 1 BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE 2 CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1 AND 3), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.



TOP OF PILE ELEVATION	
PILE	ELEVATION
1	796.48
2	796.60
3	796.72
4	796.84
5	796.97
6	797.09
7	797.21
8	797.33

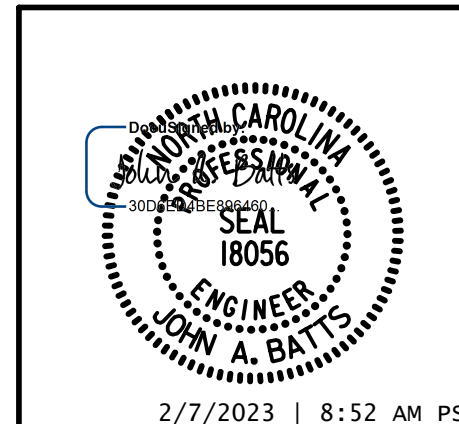
PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**

STAGE 1



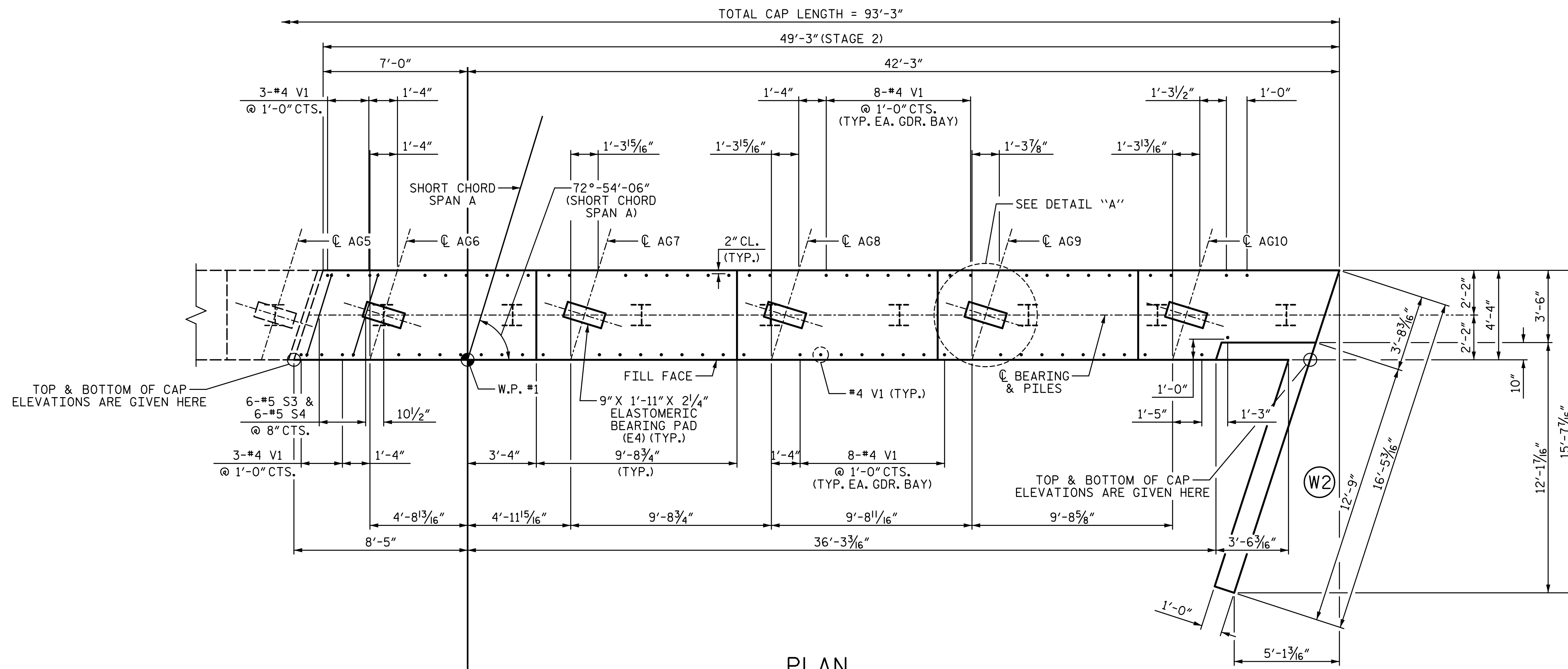
DRAWN BY: T. BANKOVICH DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

**ELEVATION**  
 FOR LOCATION S3 AND S4 BARS, SEE PLAN VIEW.

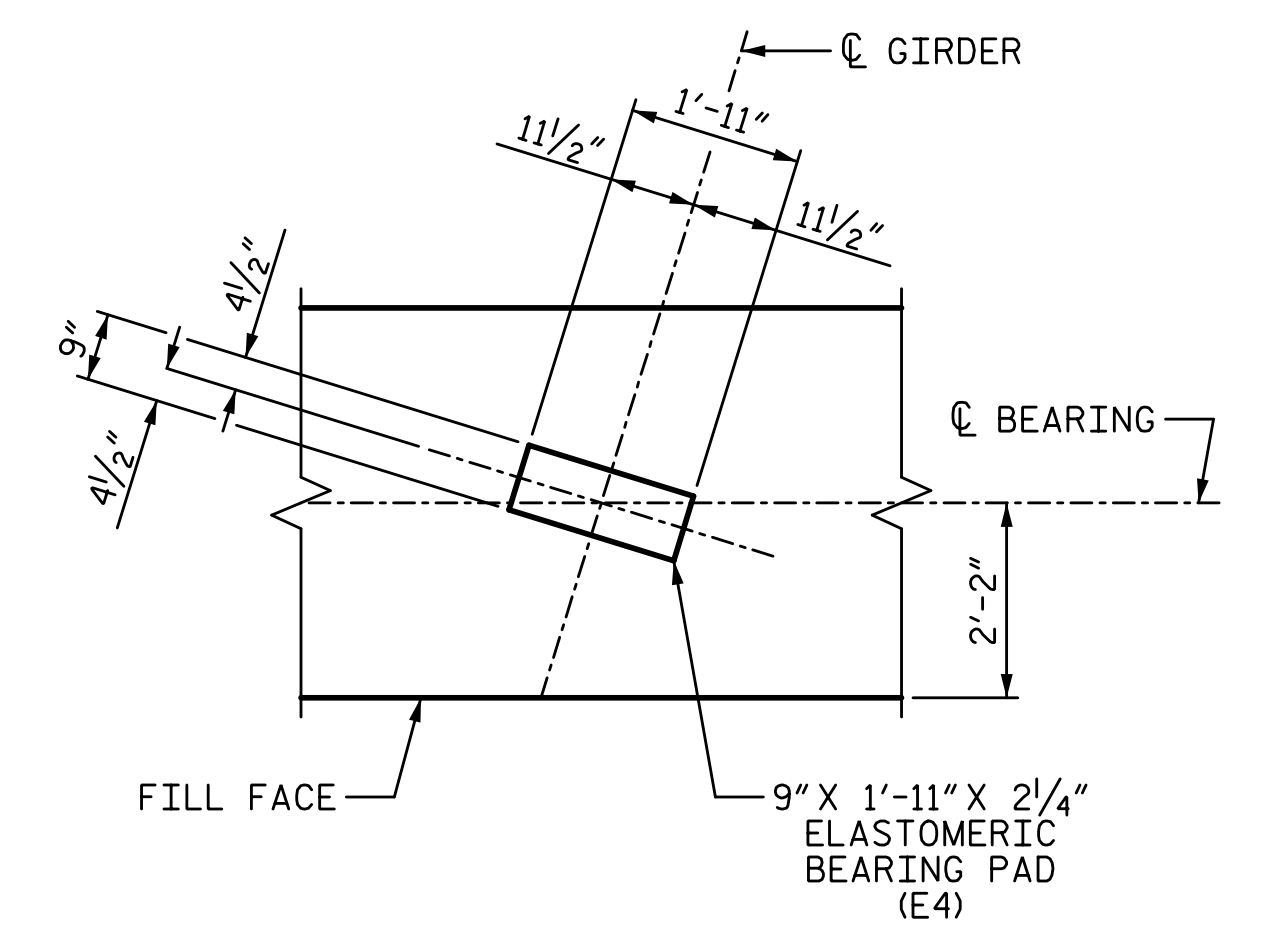
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			58

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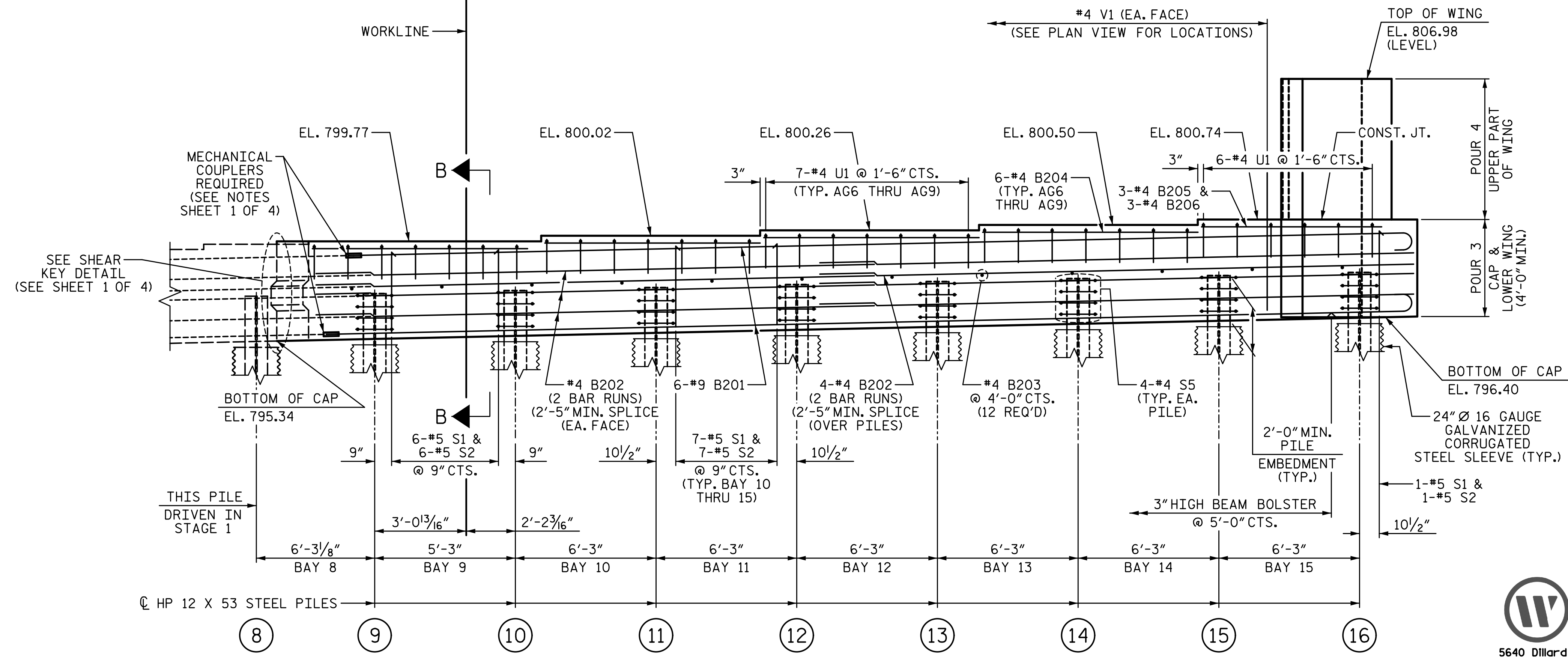


PLAN



DETAIL "A"  
(TYP. EA. GIRDER)

TOP OF PILE ELEVATION	
PILE	ELEVATION
9	797.47
10	797.58
11	797.71
12	797.85
13	797.98
14	798.12
15	798.25
16	798.38

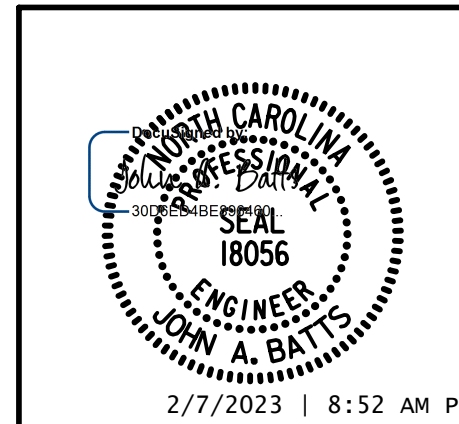


ELEVATION

FOR LOCATIONS OF S3 AND S4 BARS, SEE PLAN VIEW.

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
 SHEET 2 OF 4

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

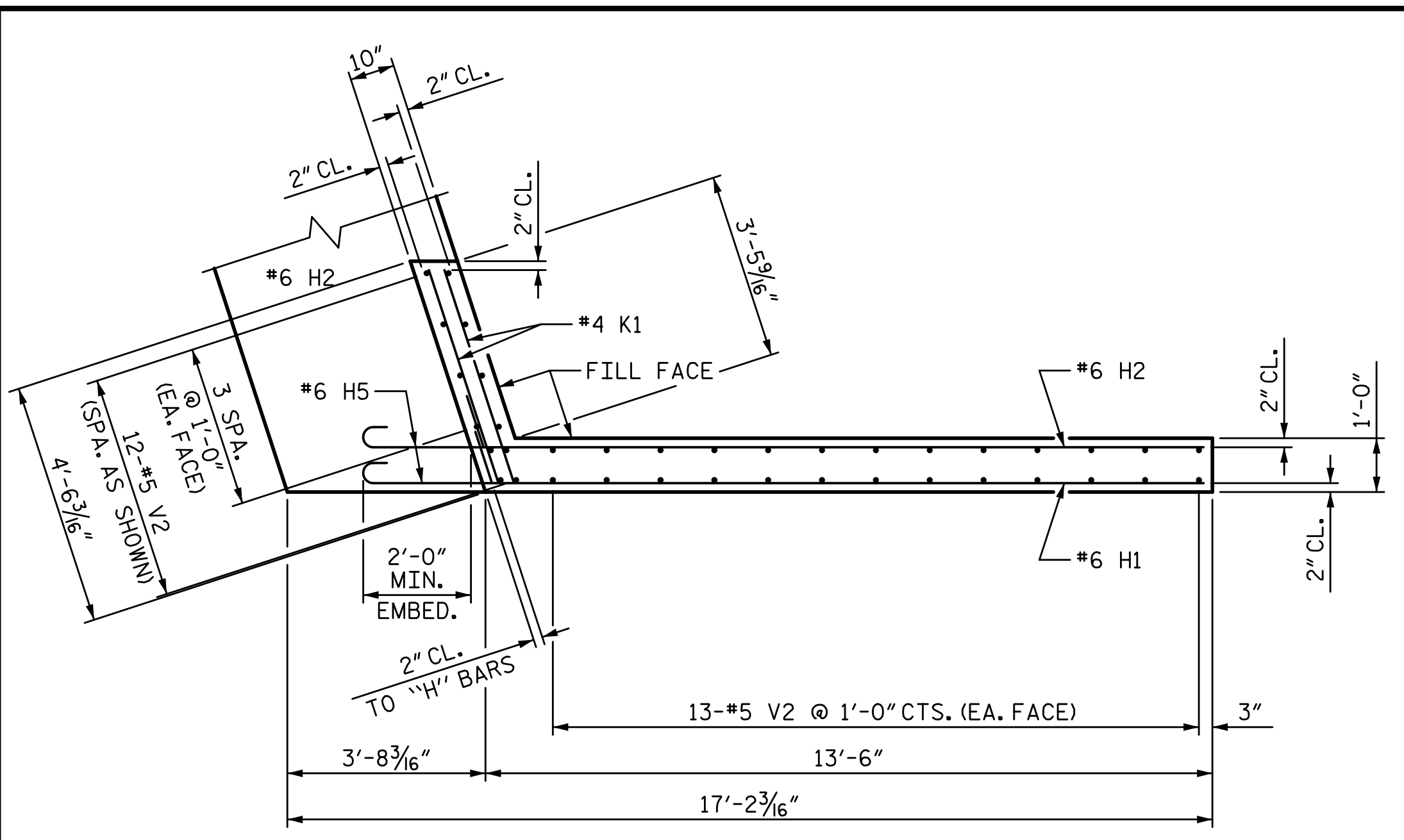


DRAWN BY: T. BANKOVICH	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

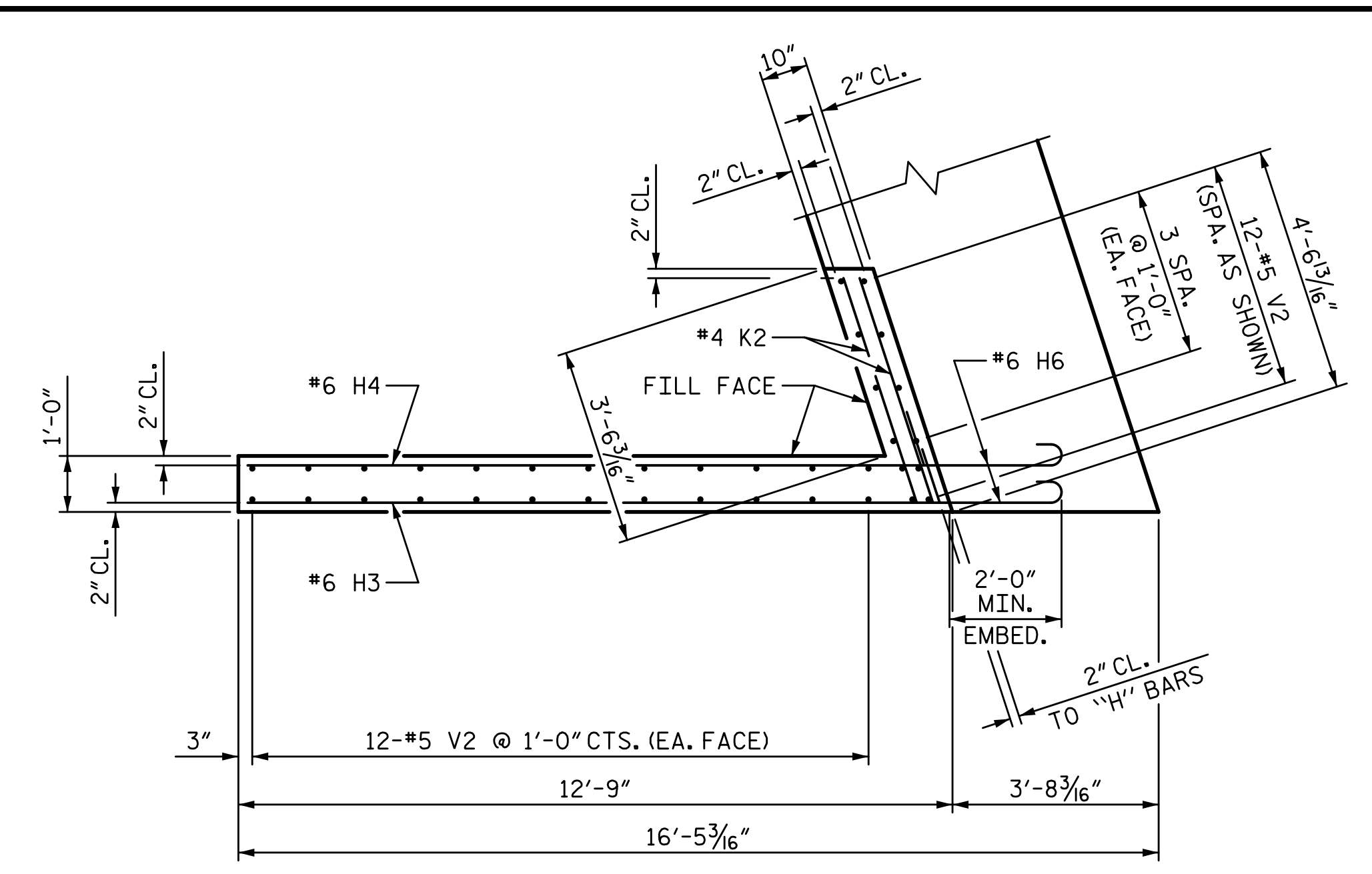
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			58

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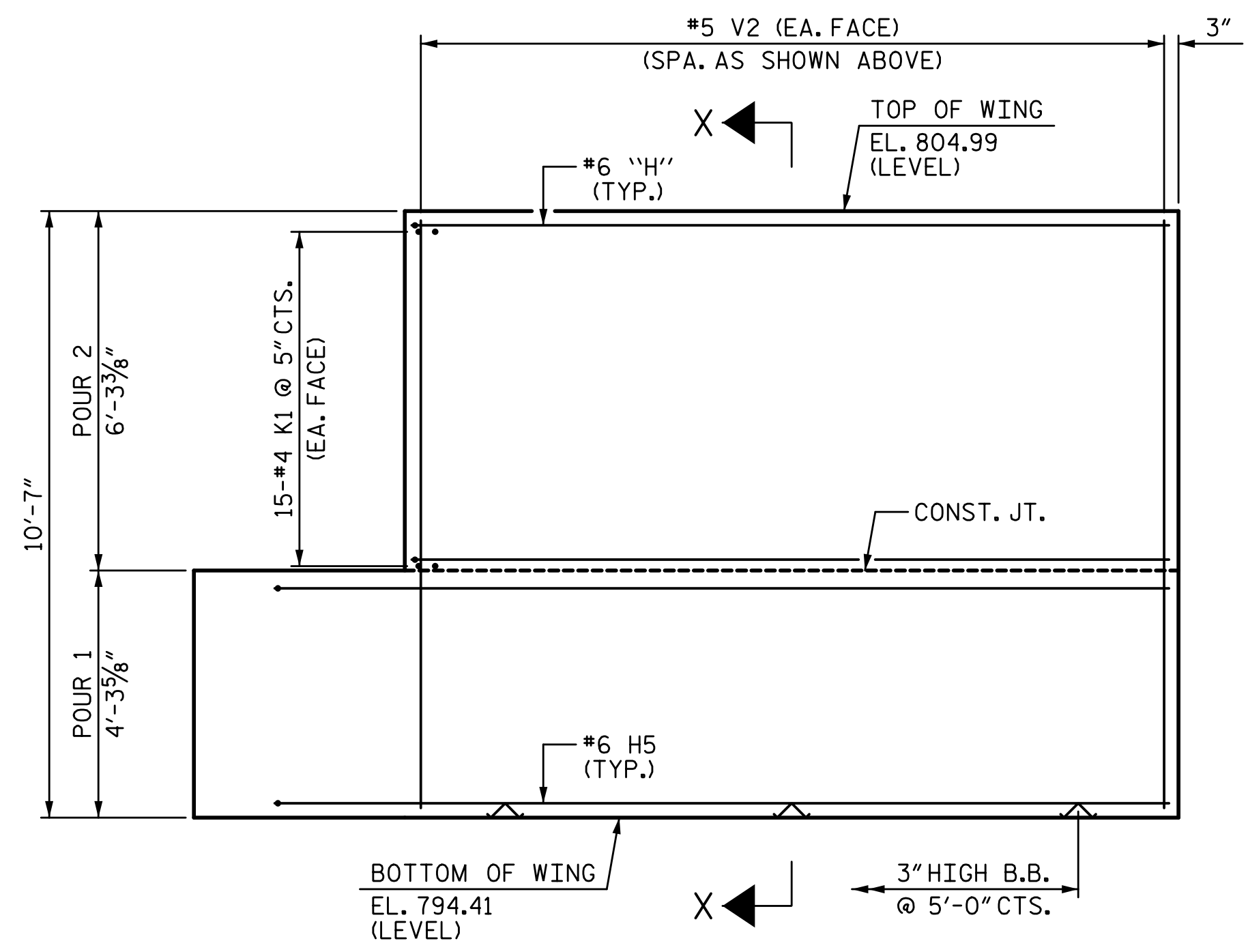
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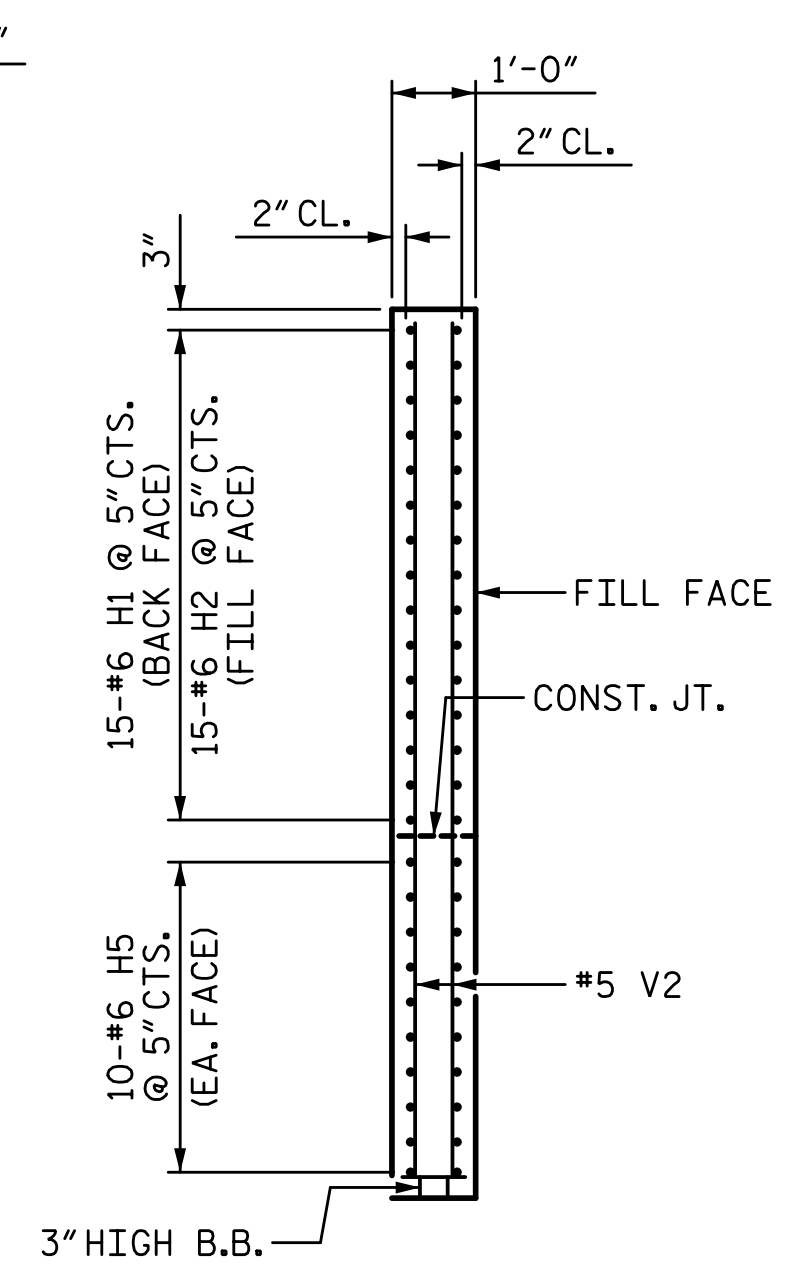
PLAN OF WING (W1)



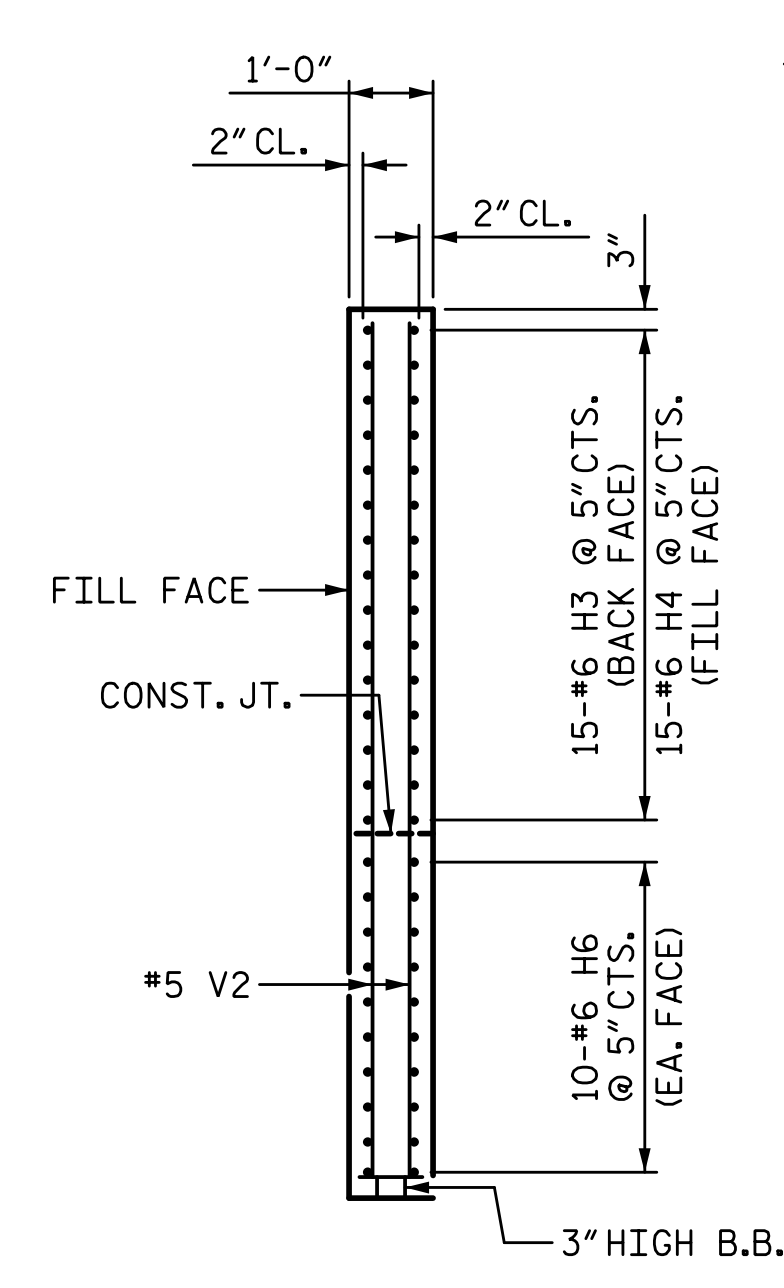
PLAN OF WING (W2)



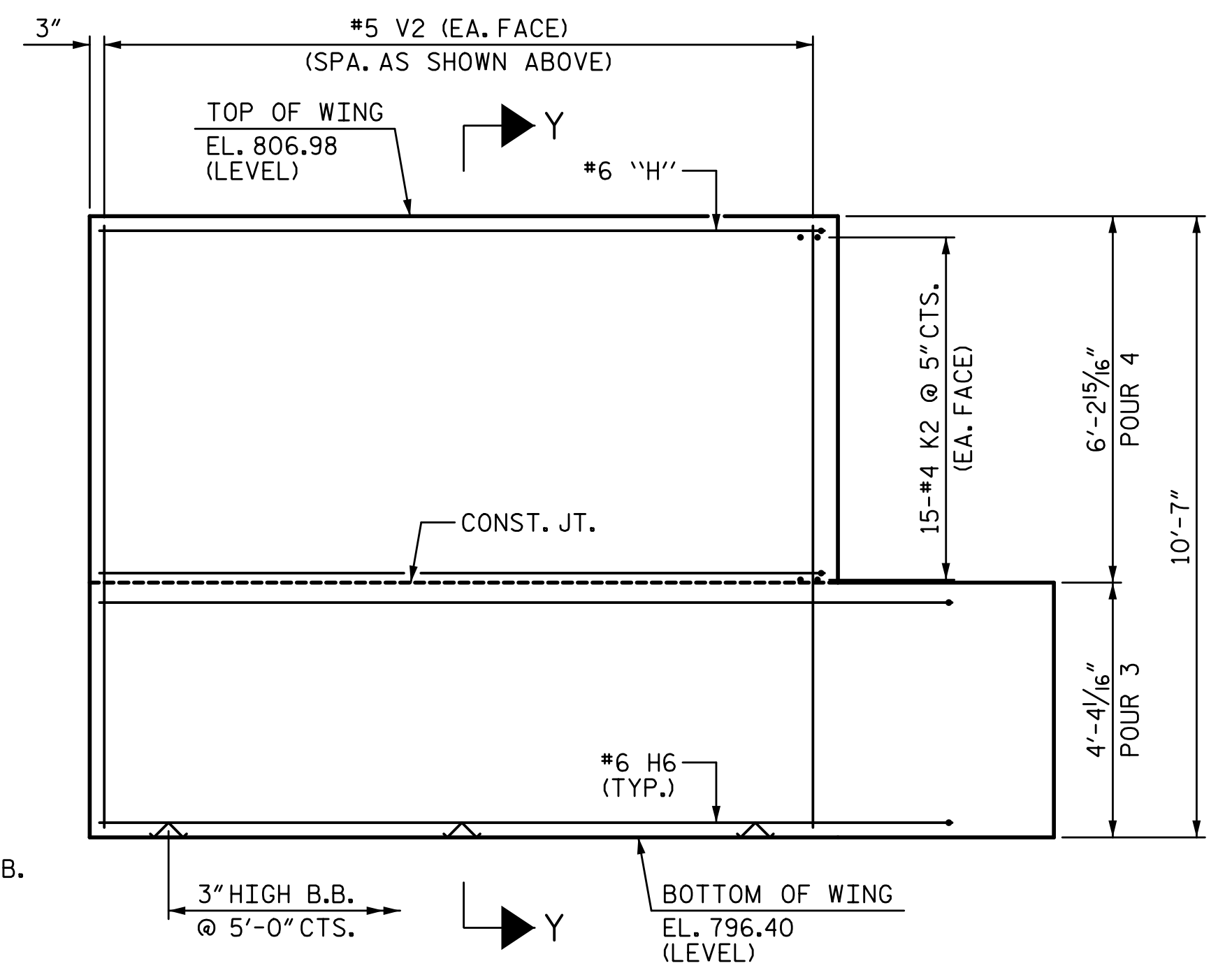
ELEVATION OF WING (W1)



SECTION X-X



SECTION Y-Y

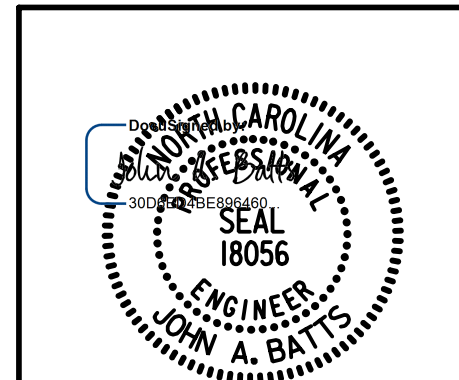


ELEVATION OF WING (W2)

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 3 OF 4

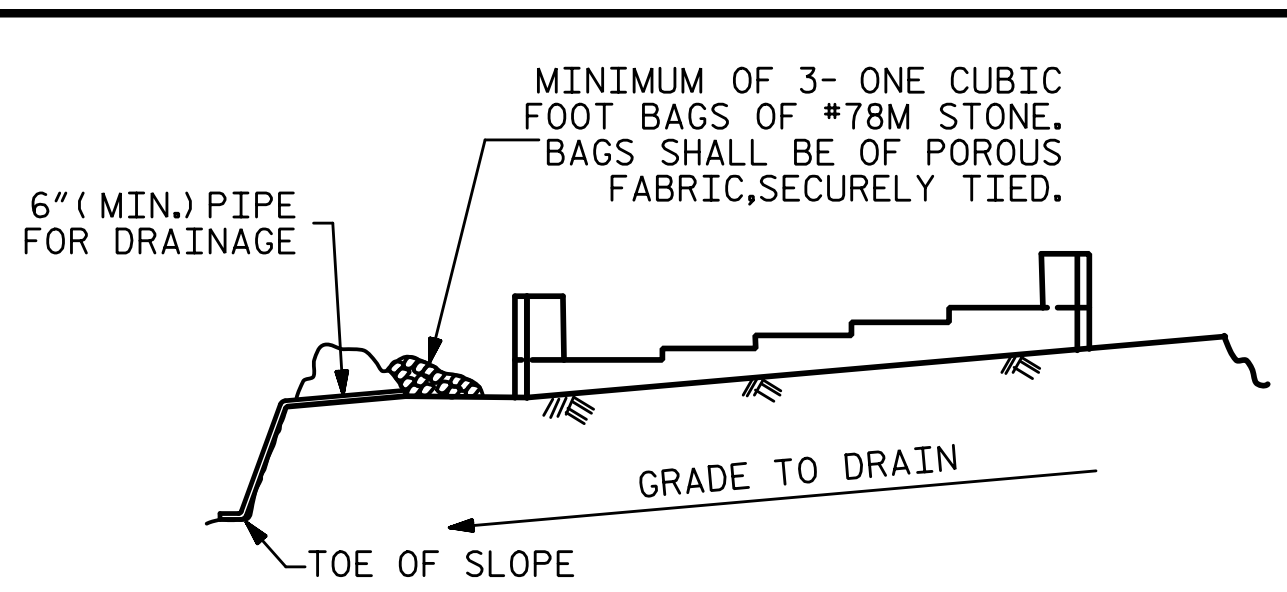
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1



DRAWN BY: T. BANKOVICH	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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2			4		
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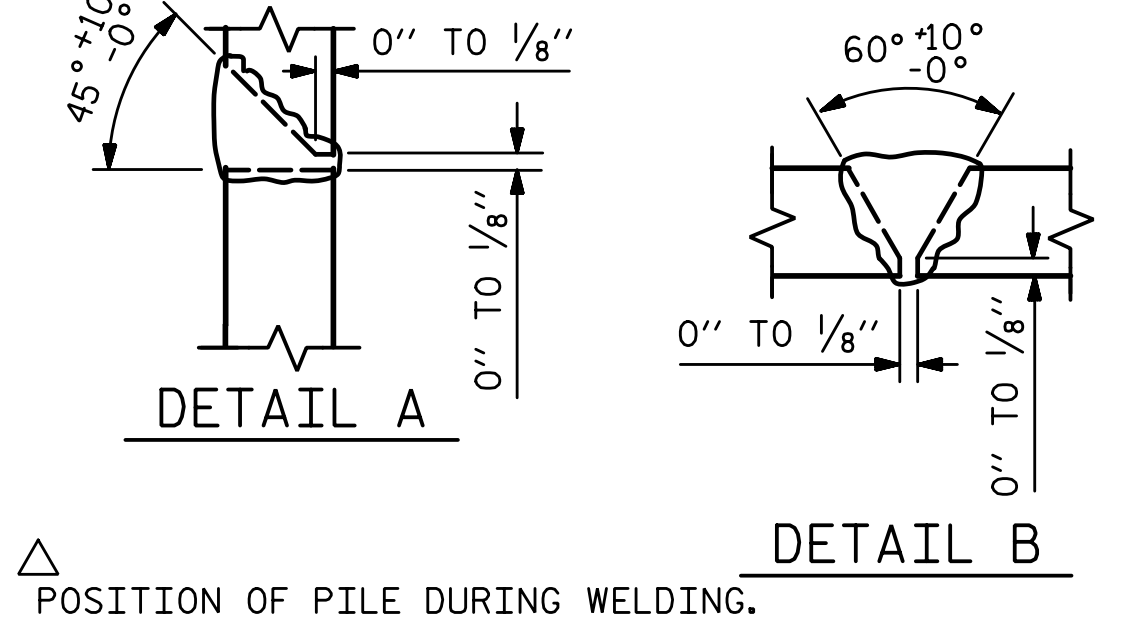
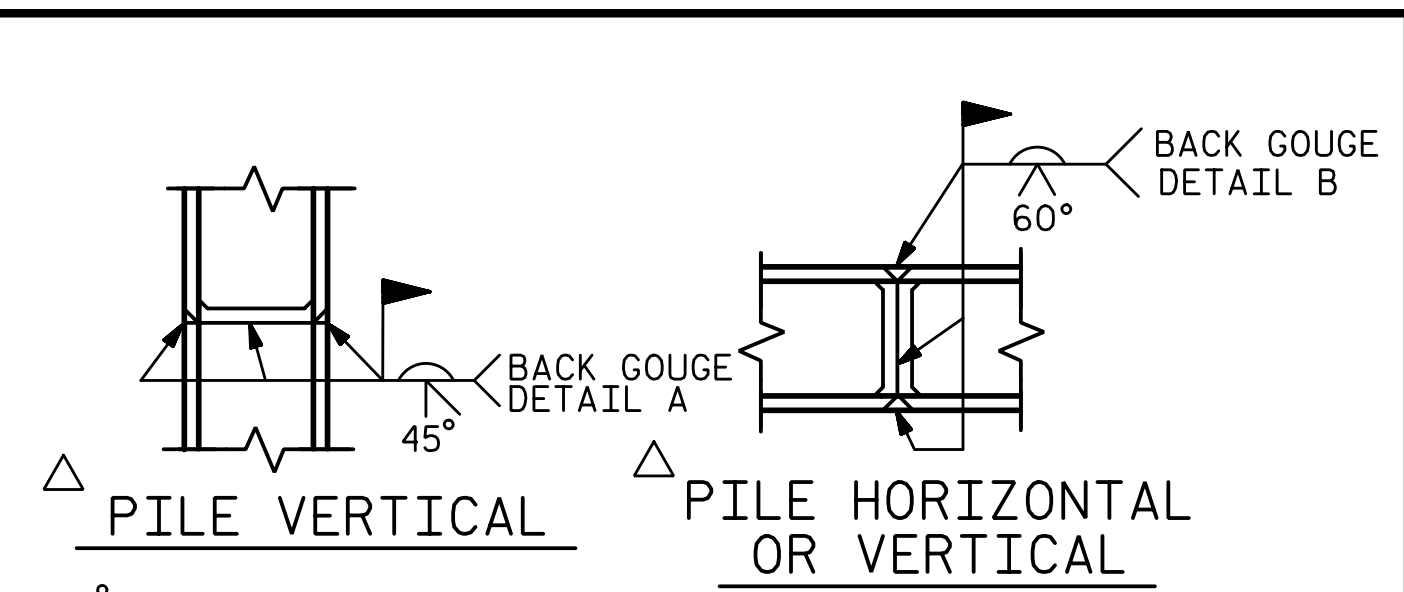


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

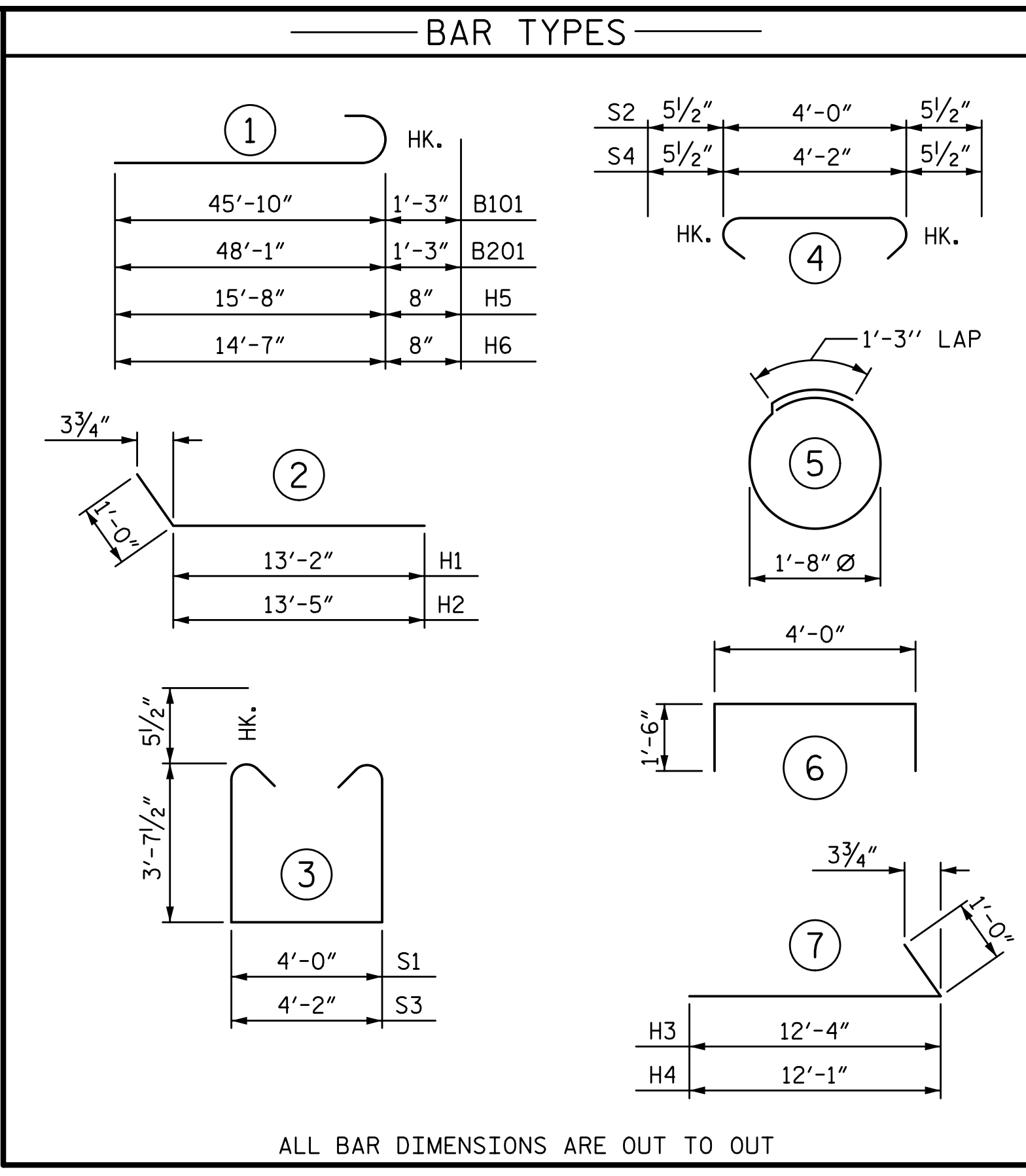
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

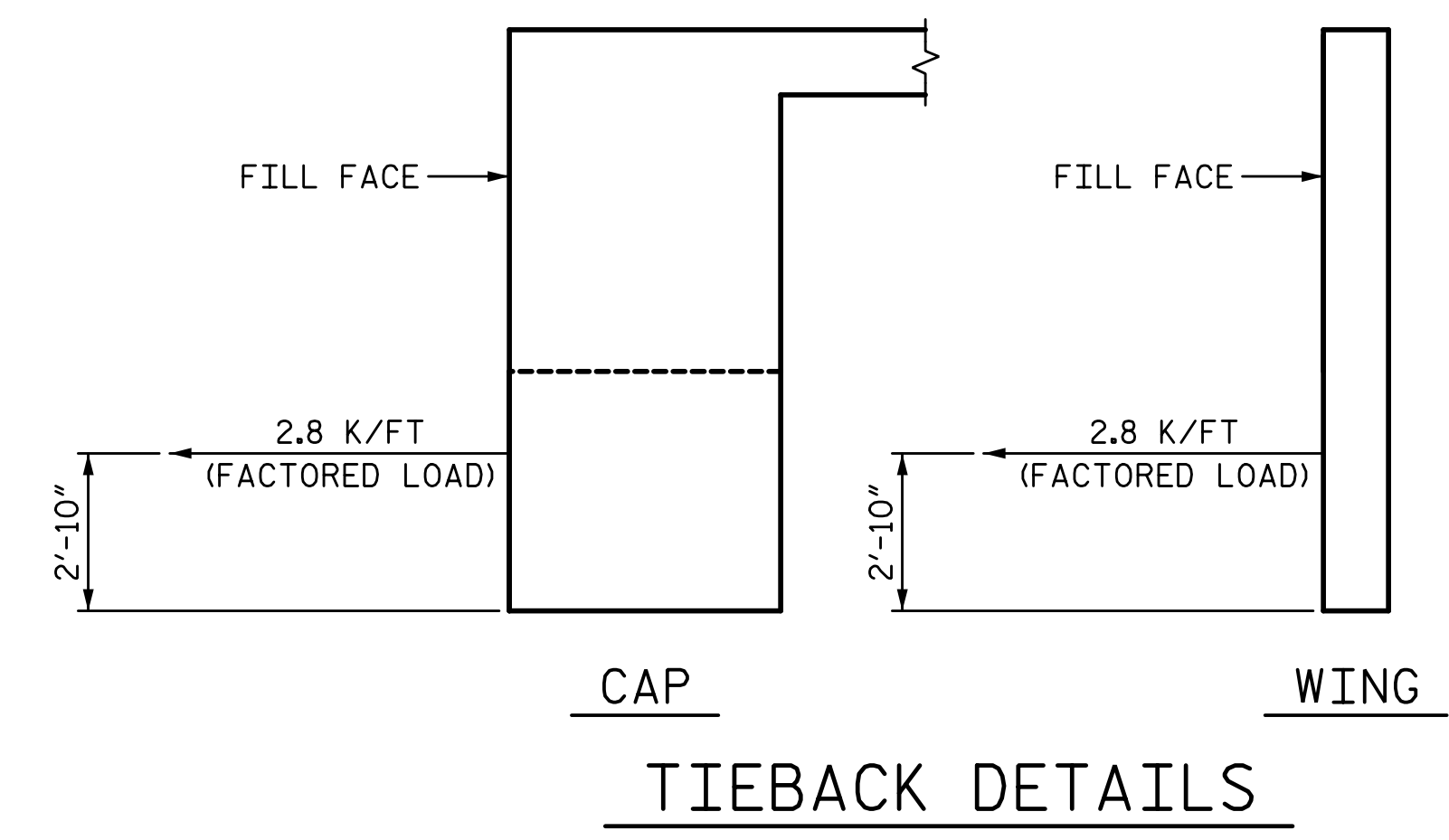
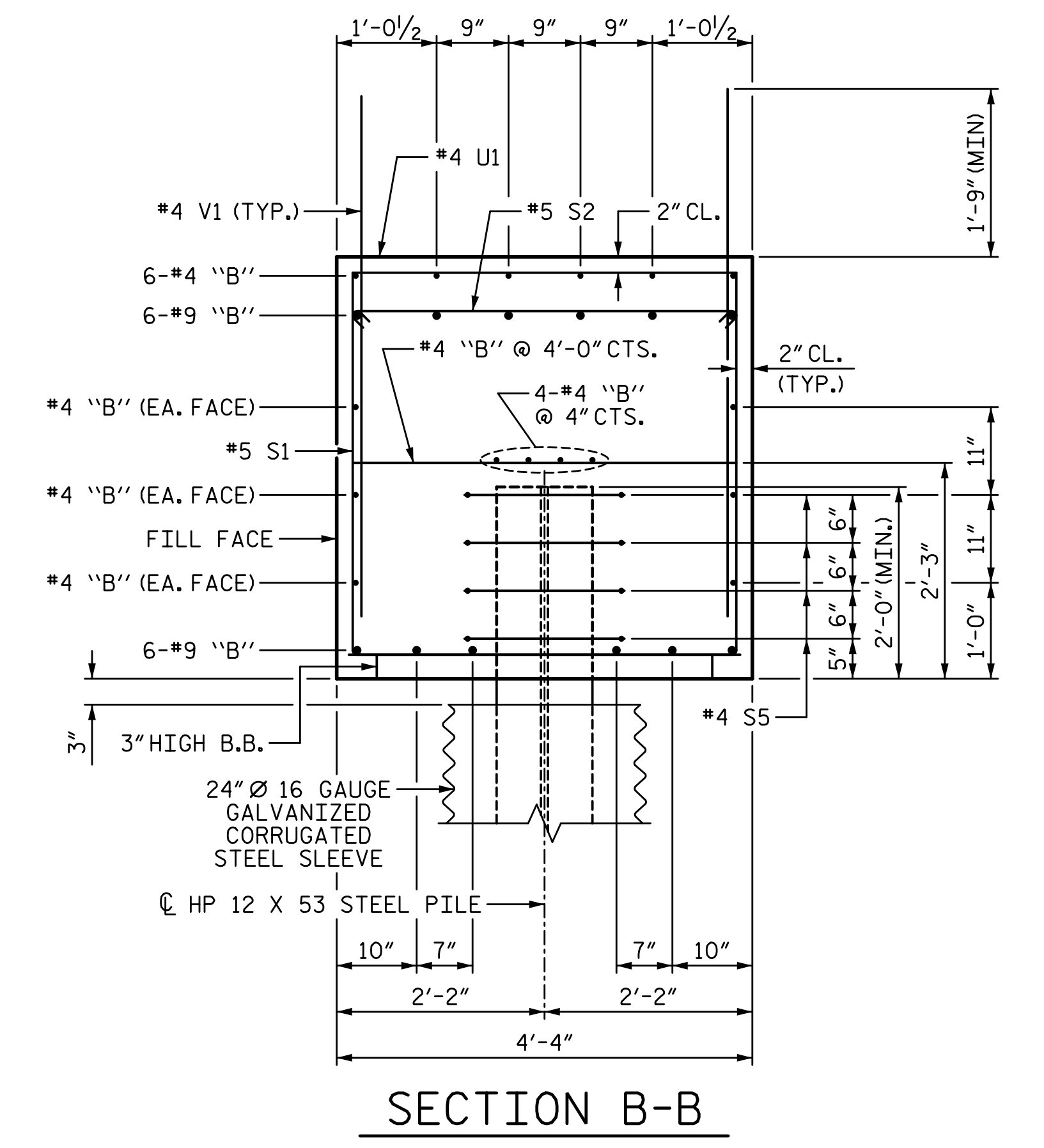
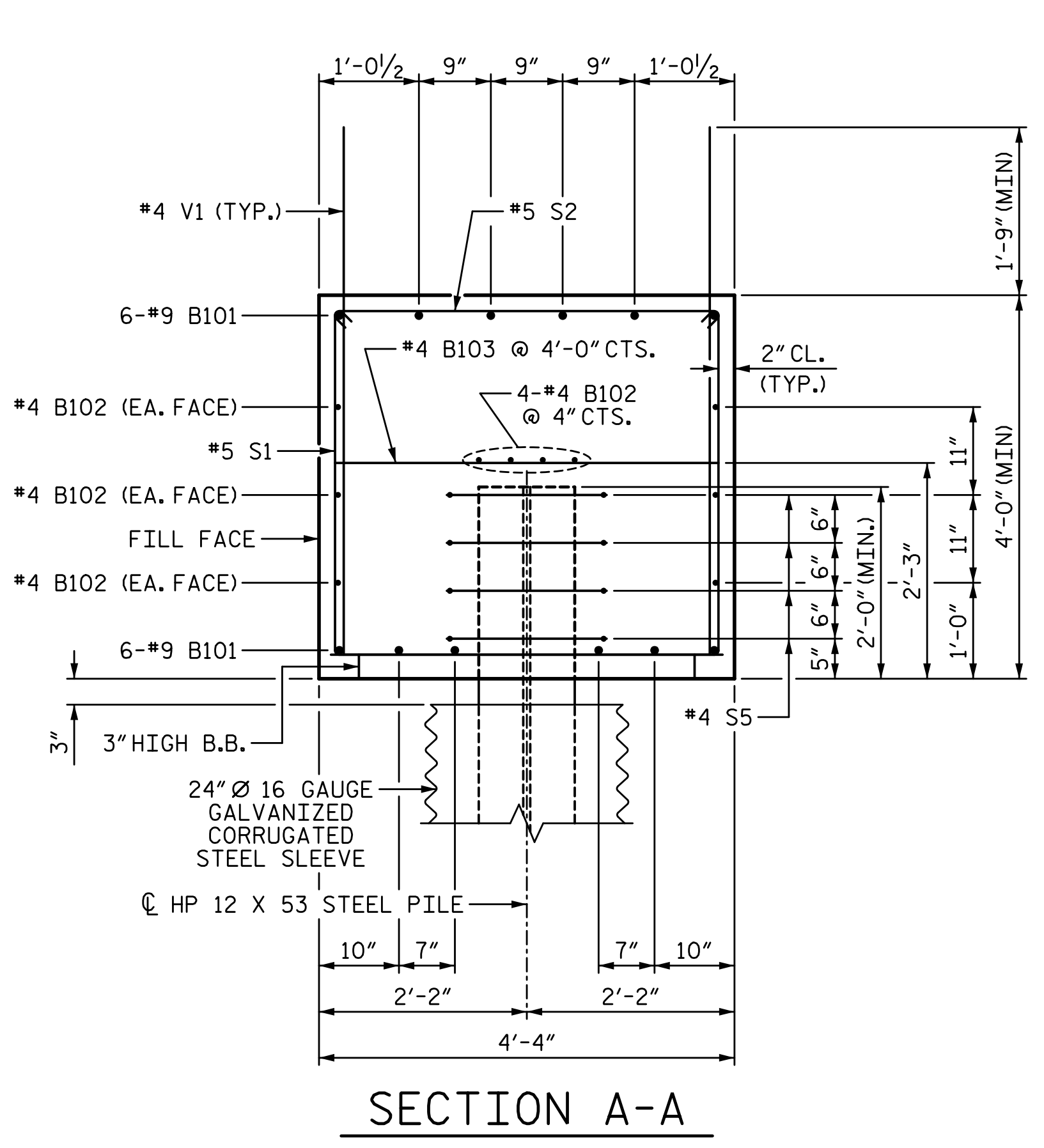
### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS



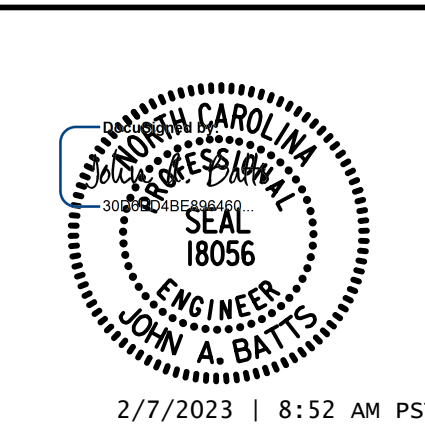
BILL OF MATERIAL STAGE 1					BILL OF MATERIAL STAGE 2						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B101	12	#9	1	47'-1"	1921	B201	12	#9	1	49'-4"	2013
B102	20	#4	STR	24'-5"	326	B202	20	#4	STR	25'-8"	343
B103	11	#4	STR	4'-0"	29	B203	12	#4	STR	4'-0"	32
B104	24	#4	STR	6'-5"	103	B204	24	#4	STR	9'-6"	152
B105	3	#4	STR	2'-11"	6	B205	3	#4	STR	8'-1"	16
B106	3	#4	STR	3'-8"	7	B206	3	#4	STR	8'-9"	18
H1	15	#6	2	14'-2"	319	H3	15	#6	7	13'-4"	300
H2	15	#6	2	14'-5"	325	H4	15	#6	7	13'-1"	295
H5	20	#6	1	16'-4"	491	H6	20	#6	1	15'-3"	458
K1	30	#4	STR	4'-2"	84	K2	30	#4	STR	4'-2"	84
S1	50	#5	3	12'-2"	634	S1	49	#5	3	12'-2"	622
S2	50	#5	4	4'-11"	256	S2	49	#5	4	4'-11"	251
S3	1	#5	3	12'-4"	13	S3	6	#5	3	12'-4"	77
S4	1	#5	4	5'-1"	5	S4	6	#5	4	5'-1"	32
S5	32	#4	5	6'-6"	139	S5	32	#4	5	6'-6"	139
U1	23	#4	6	7'-0"	108	U1	34	#4	6	7'-0"	159
V1	62	#4	STR	5'-10"	242	V1	74	#4	STR	5'-10"	288
V2	38	#5	STR	10'-3"	406	V2	36	#5	STR	10'-3"	385
TOTAL REINFORCING STEEL				5414 LB	TOTAL REINFORCING STEEL				5664 LB		
CLASS A CONCRETE BREAKDOWN POUR 1 (CAP & LOWER WINGS)					32.3 CY	CLASS A CONCRETE BREAKDOWN POUR 3 (CAP & LOWER WINGS)					36.1 CY
POUR 2 (UPPER WINGS)					3.8 CY	POUR 4 (UPPER WINGS)					3.6 CY
TOTAL CLASS A CONCRETE					36.1 CY	TOTAL CLASS A CONCRETE					39.7 CY



END BENT 1 TOTAL QUANTITIES		
	REINFORCING STEEL	CLASS A CONCRETE
	LB	CY
STAGE 1	5,414	36.1
STAGE 2	5,664	39.7
TOTAL	11,078	75.8

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
 SHEET 4 OF 4

DRAWN BY: T. BANKOVICH DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

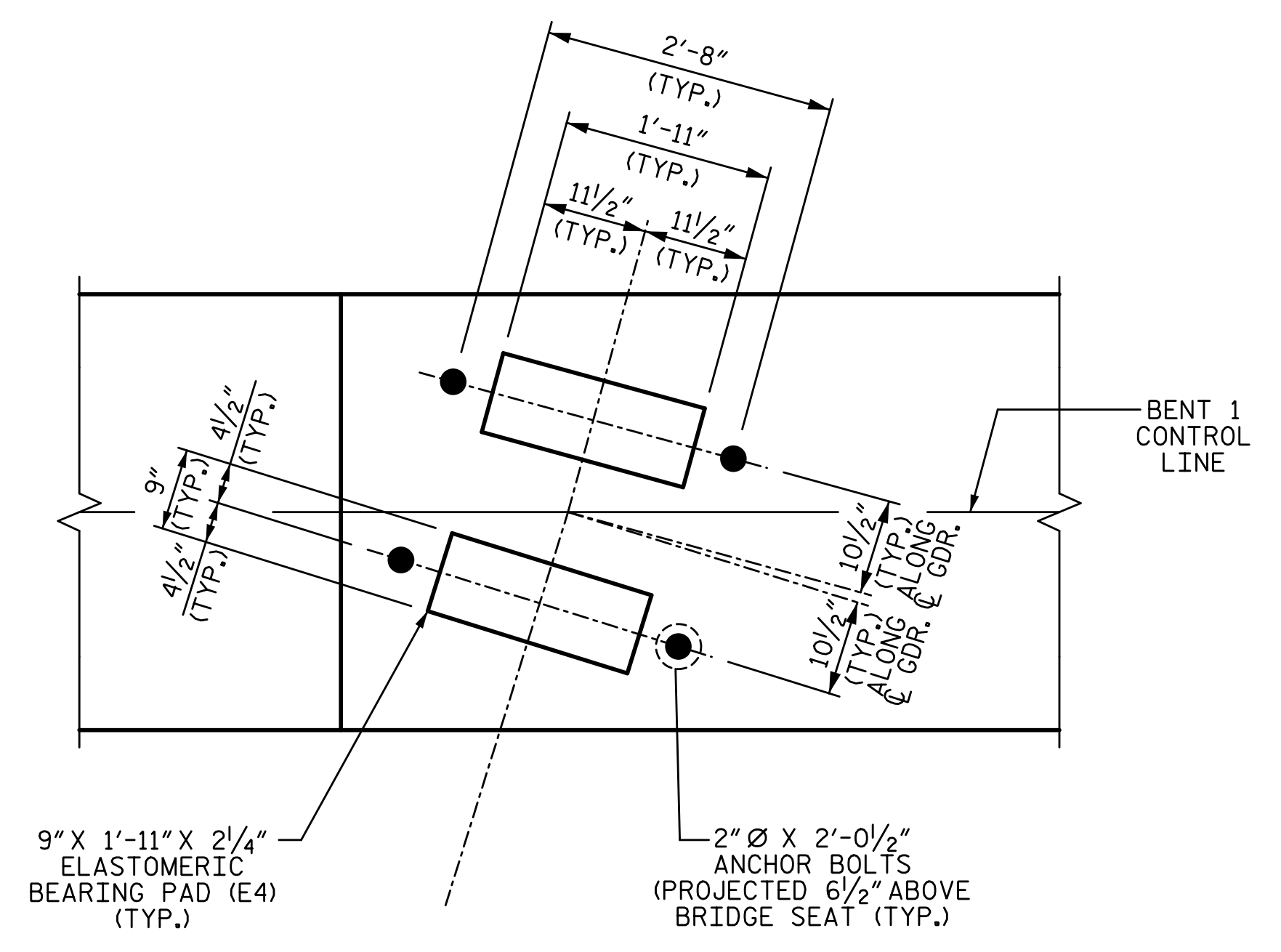
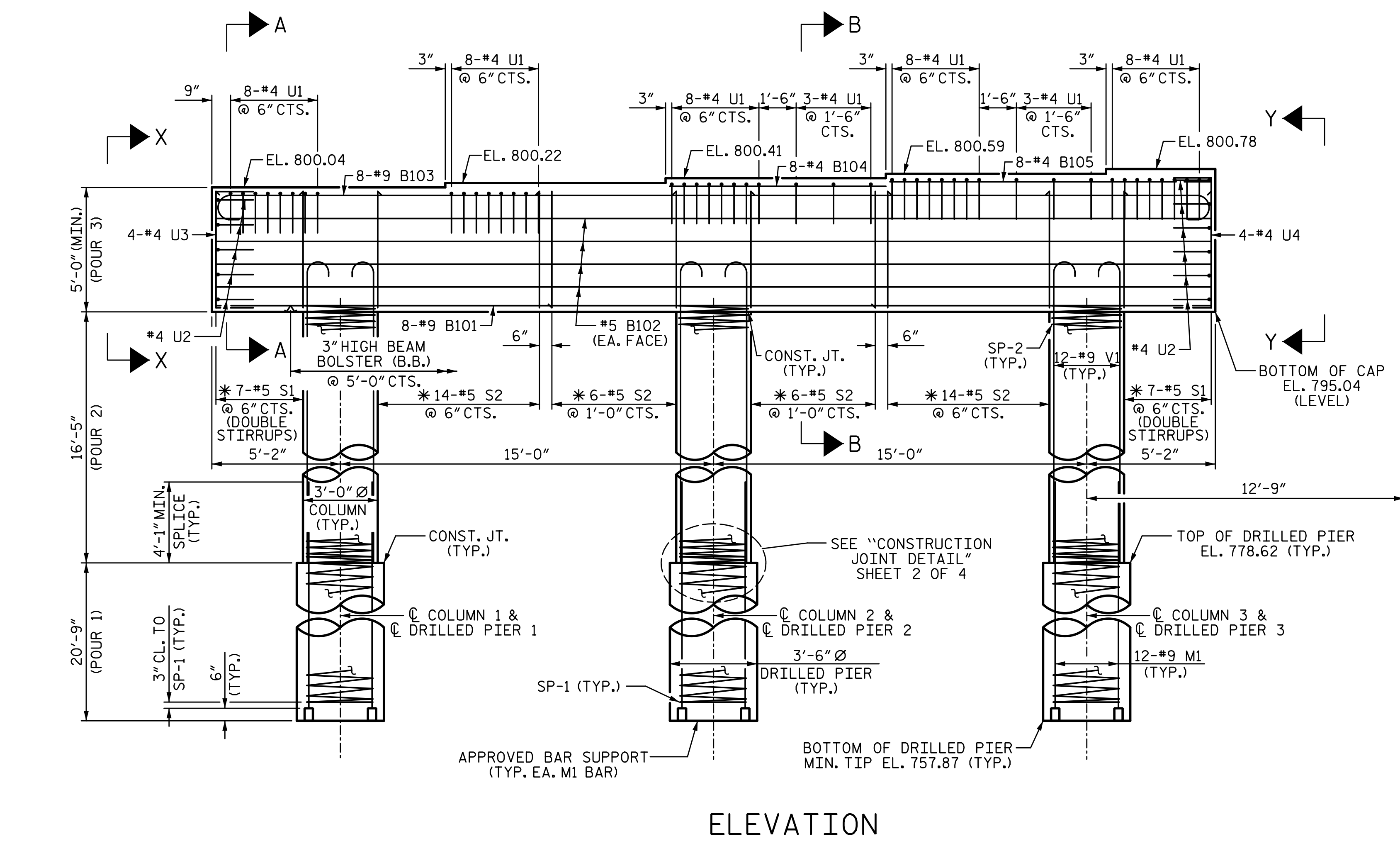
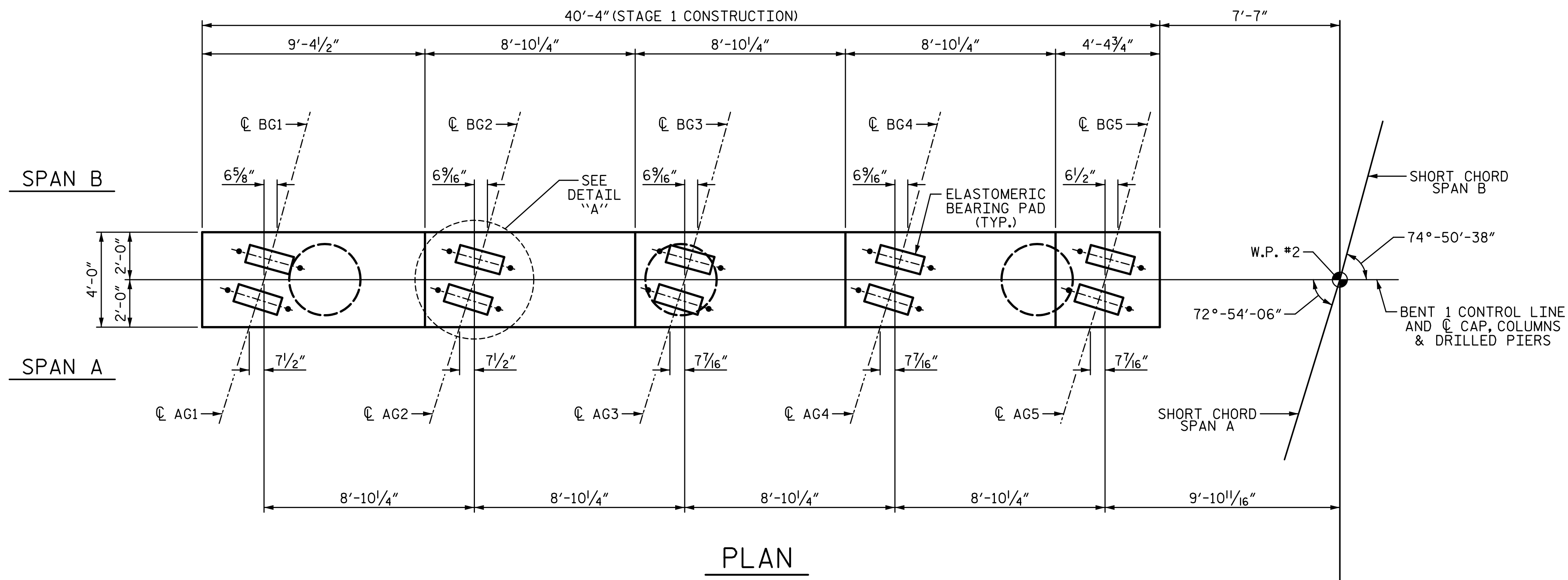


REVISIONS					SHEET NO.
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2			4		

SHEET NO. S-45  
 TOTAL SHEETS 58

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**NOTES:**

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

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

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

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON THE APPROXIMATE MEDIAN ELEVATION. THE TOP OF DRILLED PIER SHALL BE ADJUSTED AS REQUIRED TO MAINTAIN THE DRILLED PIER 1 FOOT BELOW THE MEDIAN ELEVATION.

\* INVERT ALTERNATE STIRRUPS.

PROJECT NO. BP7.R006.3

GUILFORD COUNTY

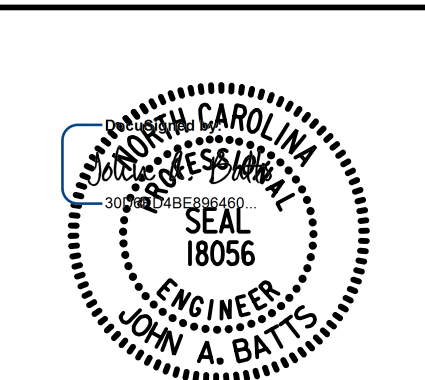
STATION: 18+82.09 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**BENT 1**

**STAGE 1**



DRAWN BY: S.D. COOPER DATE: 2-22

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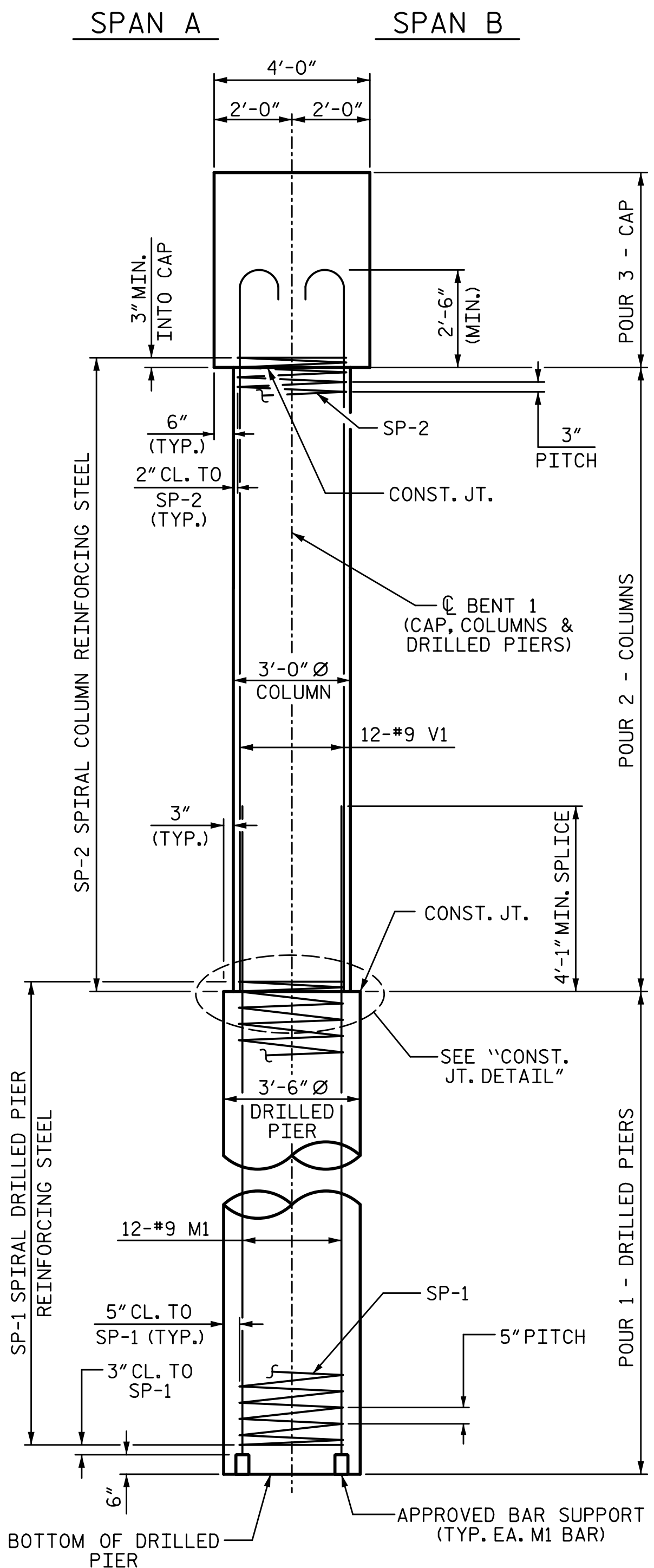
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

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

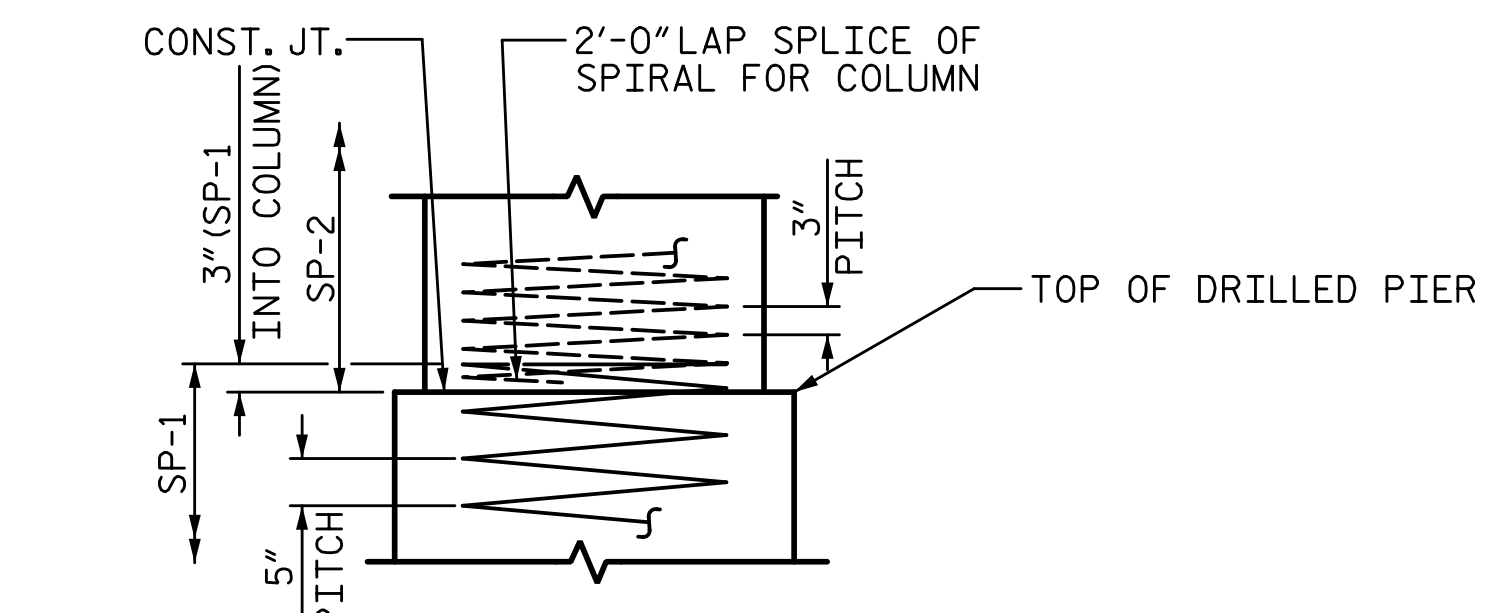
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TOTAL SHEETS: 58

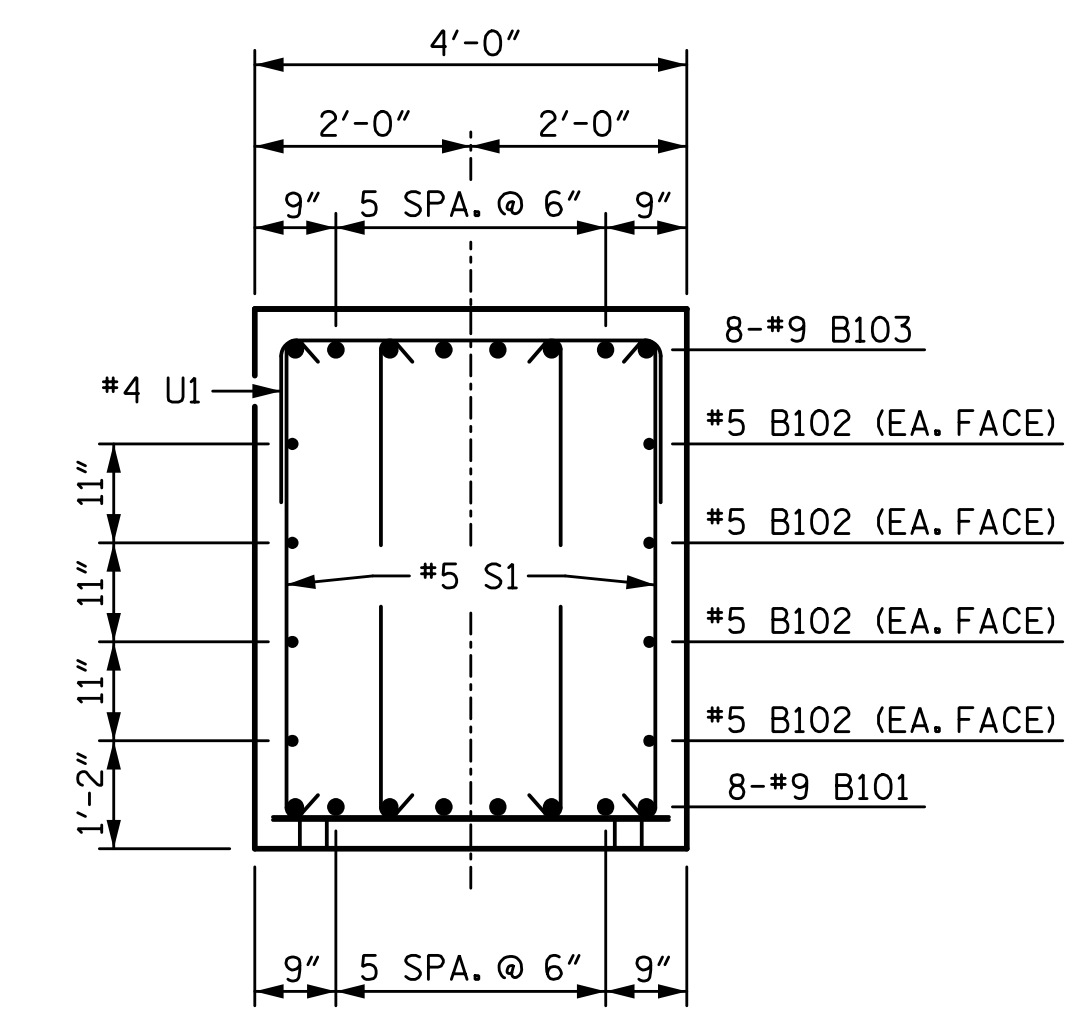
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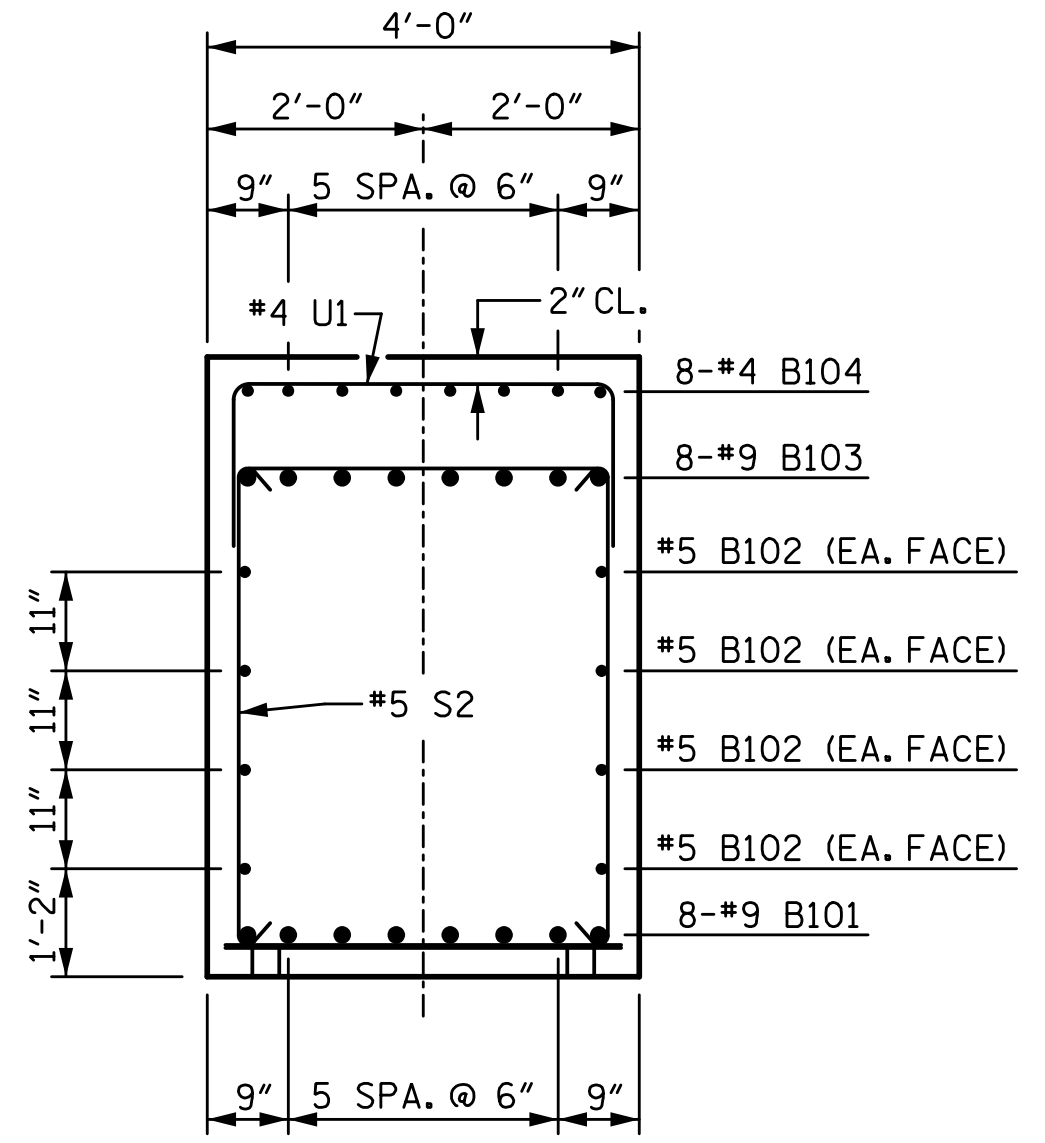
END ELEVATION



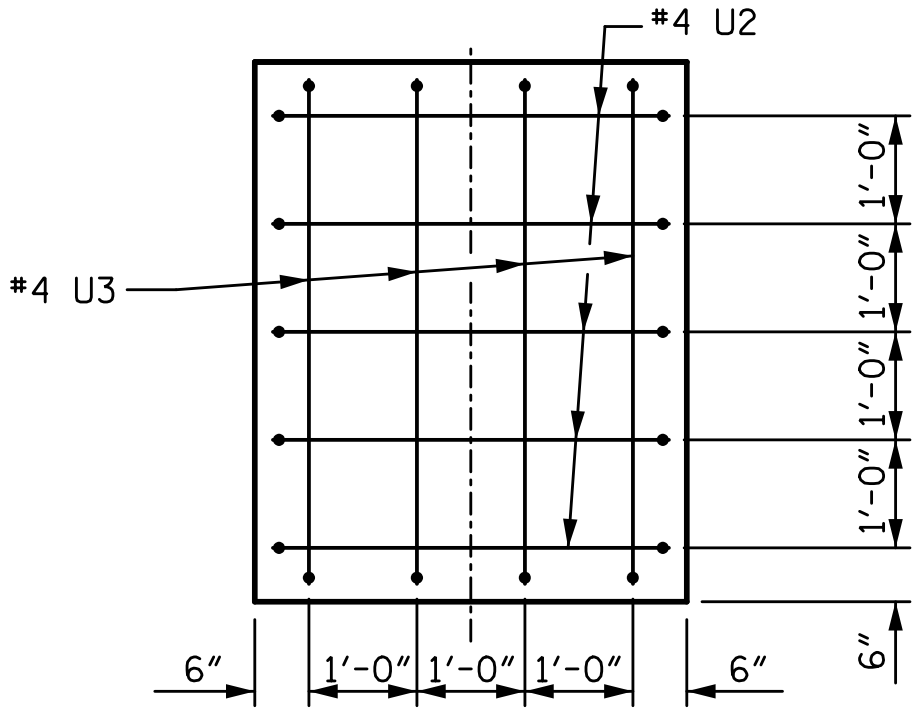
CONSTRUCTION JOINT DETAIL



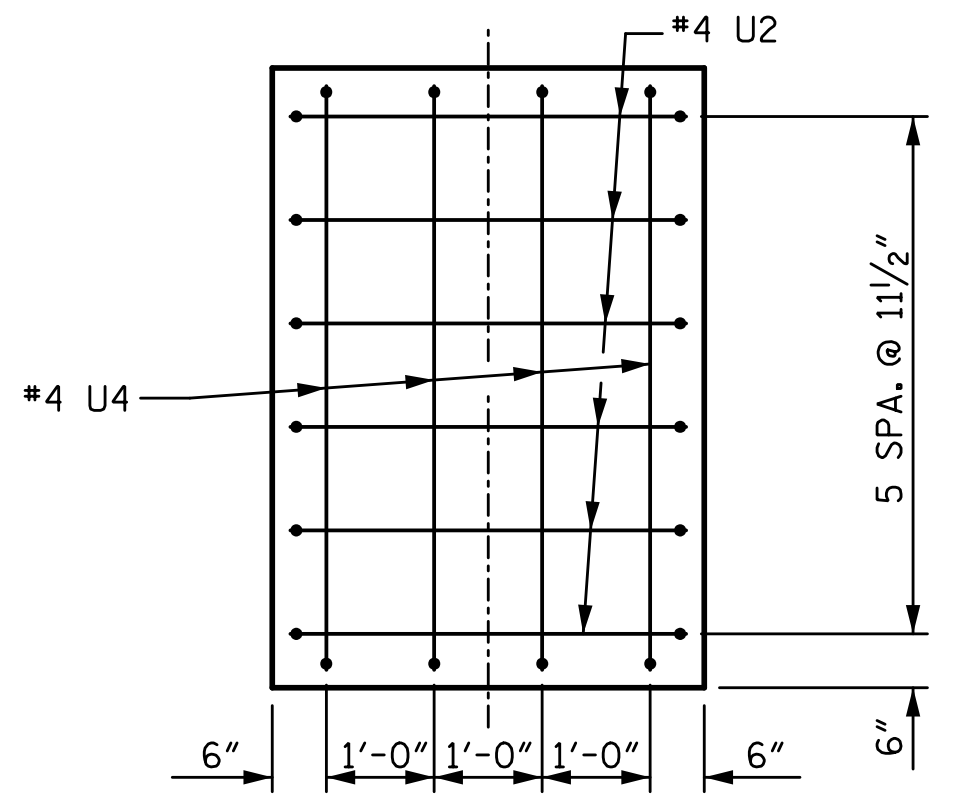
SECTION A-A



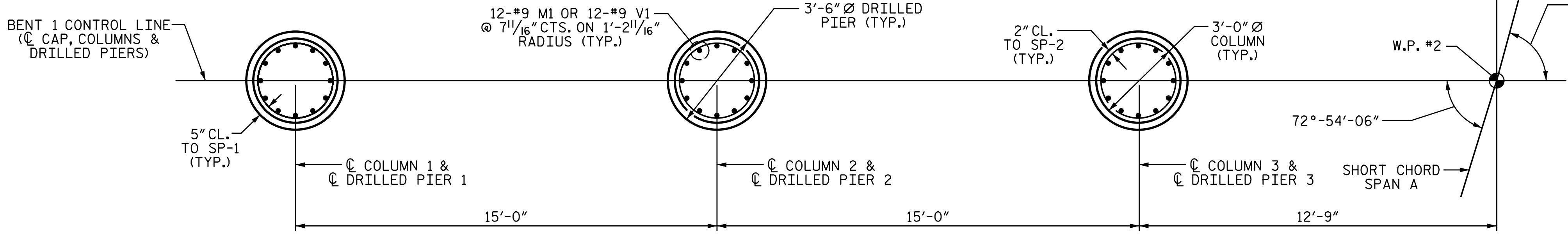
SECTION B-B



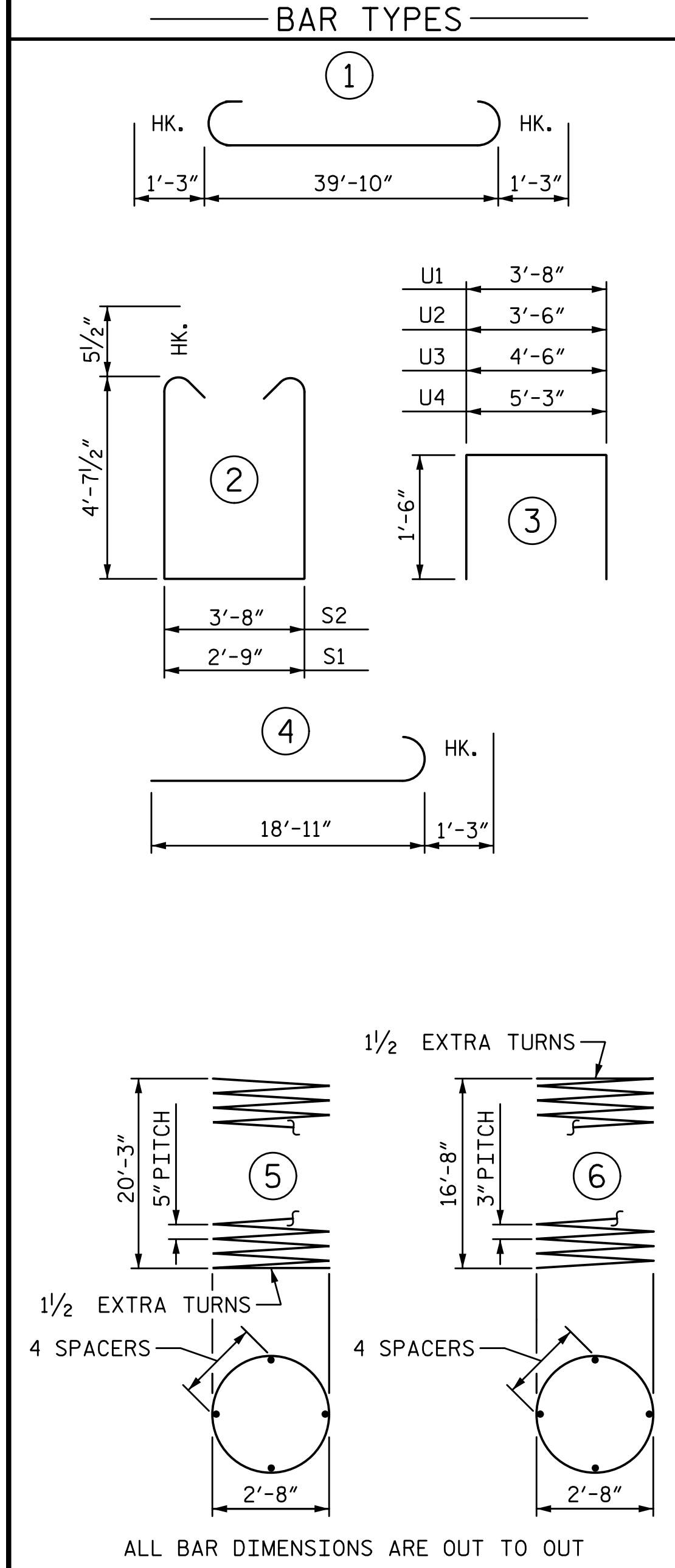
VIEW X-X



VIEW Y-Y



PLAN OF DRILLED PIERS AND COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT  
 \* THE "SP-1" SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \* THE "SP-2" SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT 1 (STAGE 1)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B101	8	#9	STR	40'-0"	1088
B102	8	#5	STR	40'-0"	334
B103	8	#9	1	42'-4"	1151
B104	8	#4	STR	8'-10"	47
B105	8	#4	STR	12'-10"	69
M1	36	#9	STR	28'-0"	3427
S1	28	#5	2	12'-11"	377
S2	40	#5	2	13'-10"	577
U1	46	#4	3	6'-8"	205
U2	11	#4	3	6'-6"	48
U3	4	#4	3	7'-6"	20
U4	4	#4	3	8'-3"	22
V1	36	#9	4	20'-2"	2468
SP-1	3	**	5	419'-6"	1313
SP-2	3	*	6	569'-4"	1141
REINFORCING STEEL					9833 LB
SPIRAL COL. REINF. STEEL					2454 LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)					12.9 CY
POUR 3 (CAP)					31.9 CY
TOTAL					44.8 CY

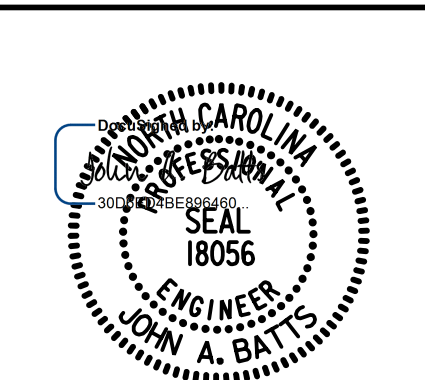
PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

STAGE 1

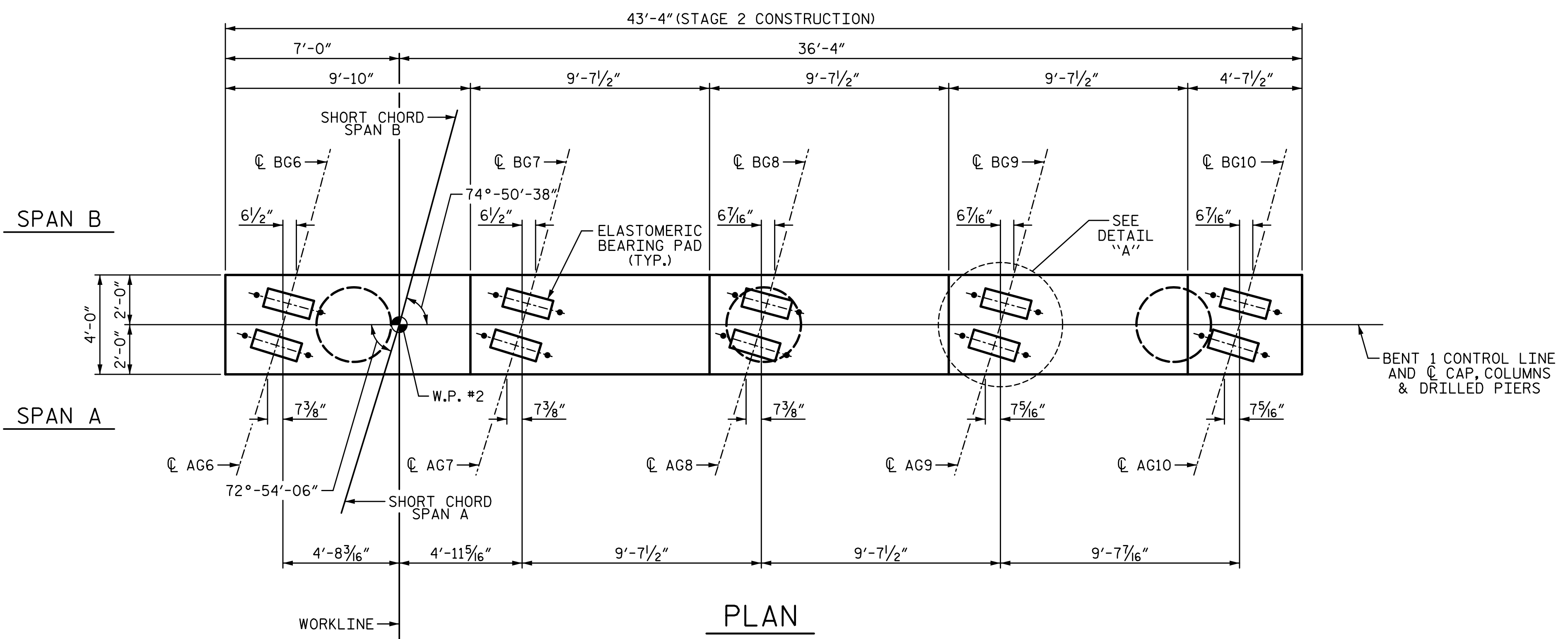


DRAWN BY: S.D. COOPER DATE: 2-22  
 CHECKED BY: J.A. BATTS DATE: 2-22  
 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

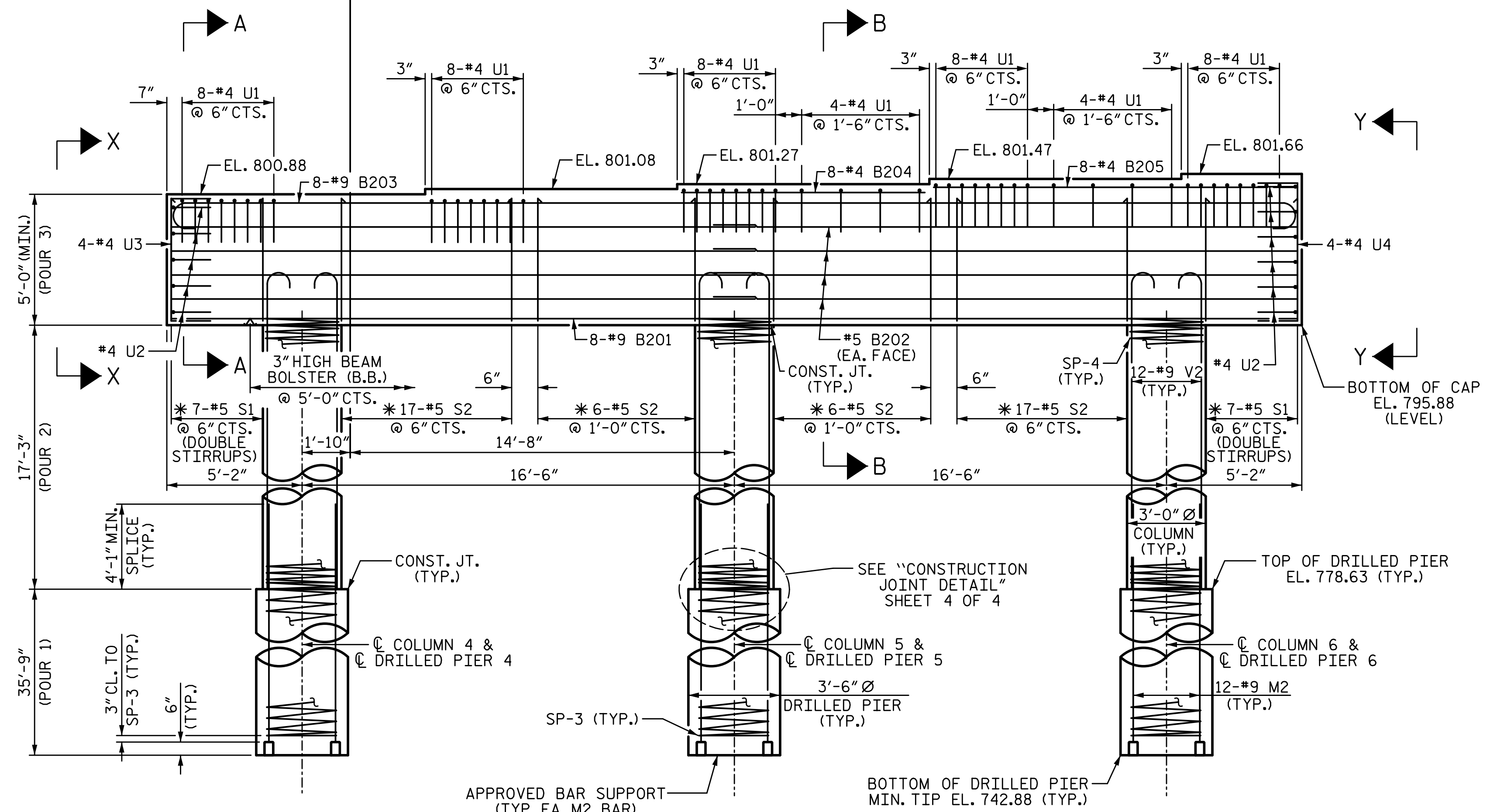
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

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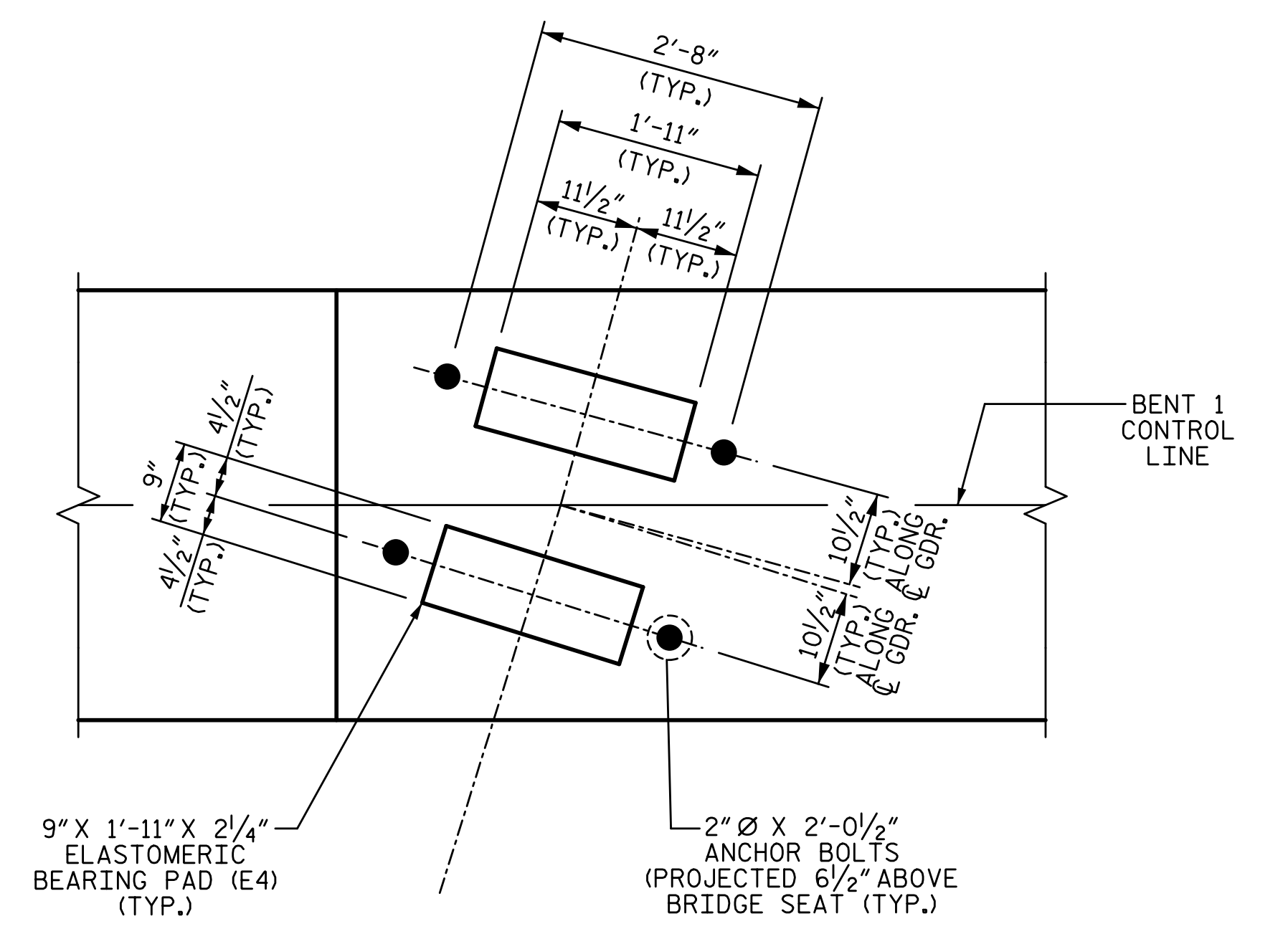
PLAN



ELEVATION

NOTES:

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- THE TOP SURFACES AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON THE APPROXIMATE MEDIAN ELEVATION. THE TOP OF DRILLED PIER SHALL BE ADJUSTED AS REQUIRED TO MAINTAIN THE DRILLED PIER 1 FOOT BELOW THE MEDIAN ELEVATION.
- \* INVERT ALTERNATE STIRRUPS.



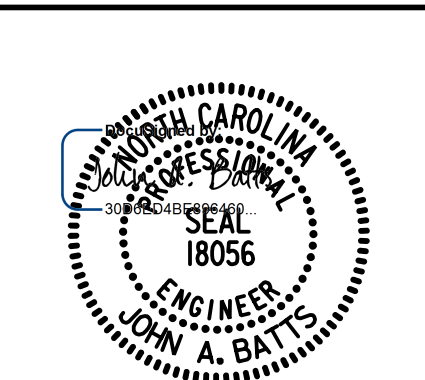
DETAIL "A"  
(TYP. EA. GIRDER)

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

BENT 1  
 STAGE 2



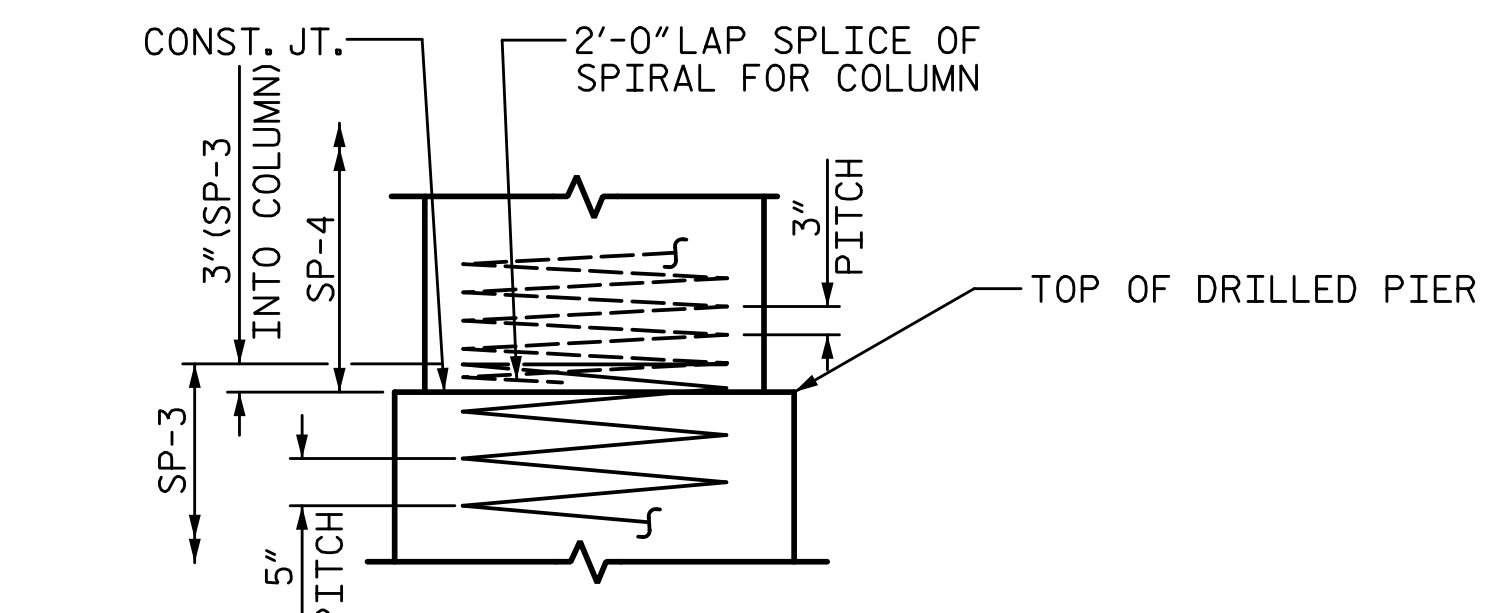
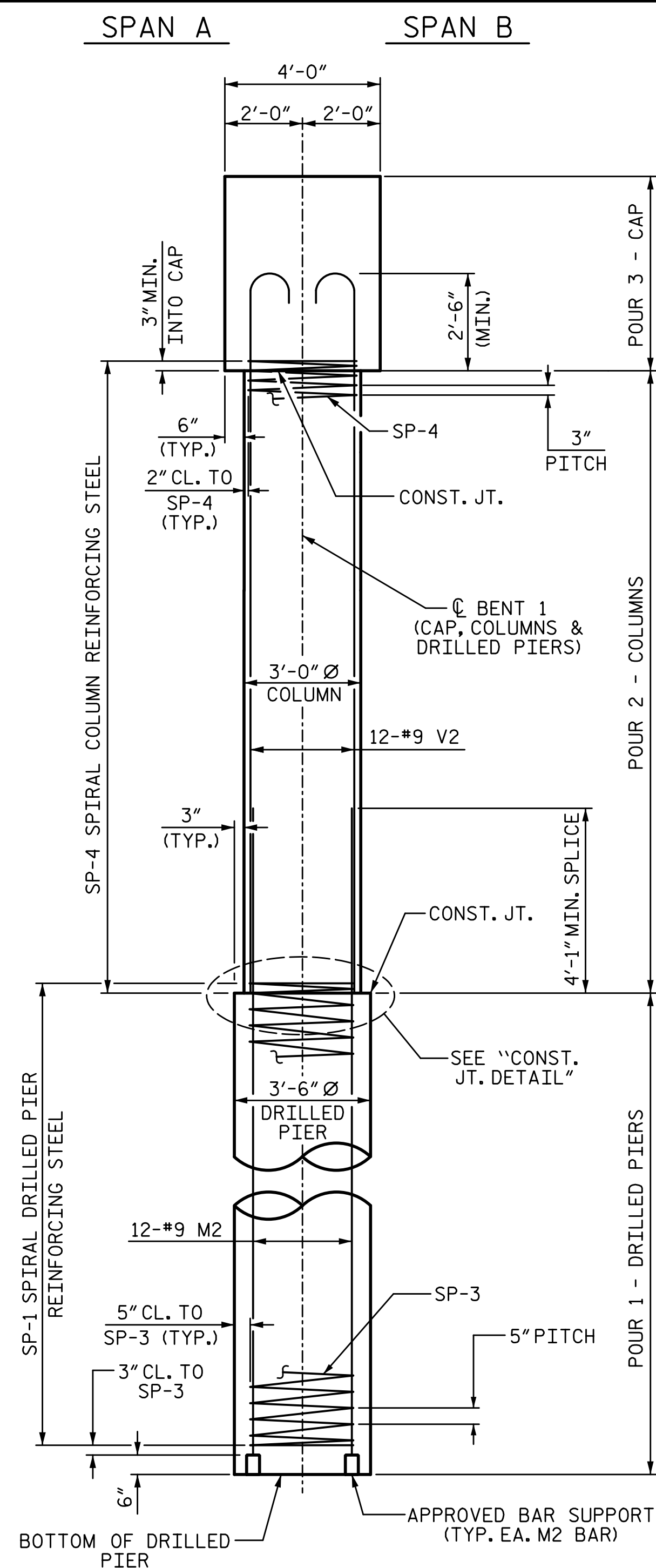
DRAWN BY: S.D. COOPER	DATE: 2-22
CHECKED BY: J.A. BATTS	DATE: 2-22
DESIGN ENGINEER OF RECORD: J.A. BATTS	DATE: 2-22

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

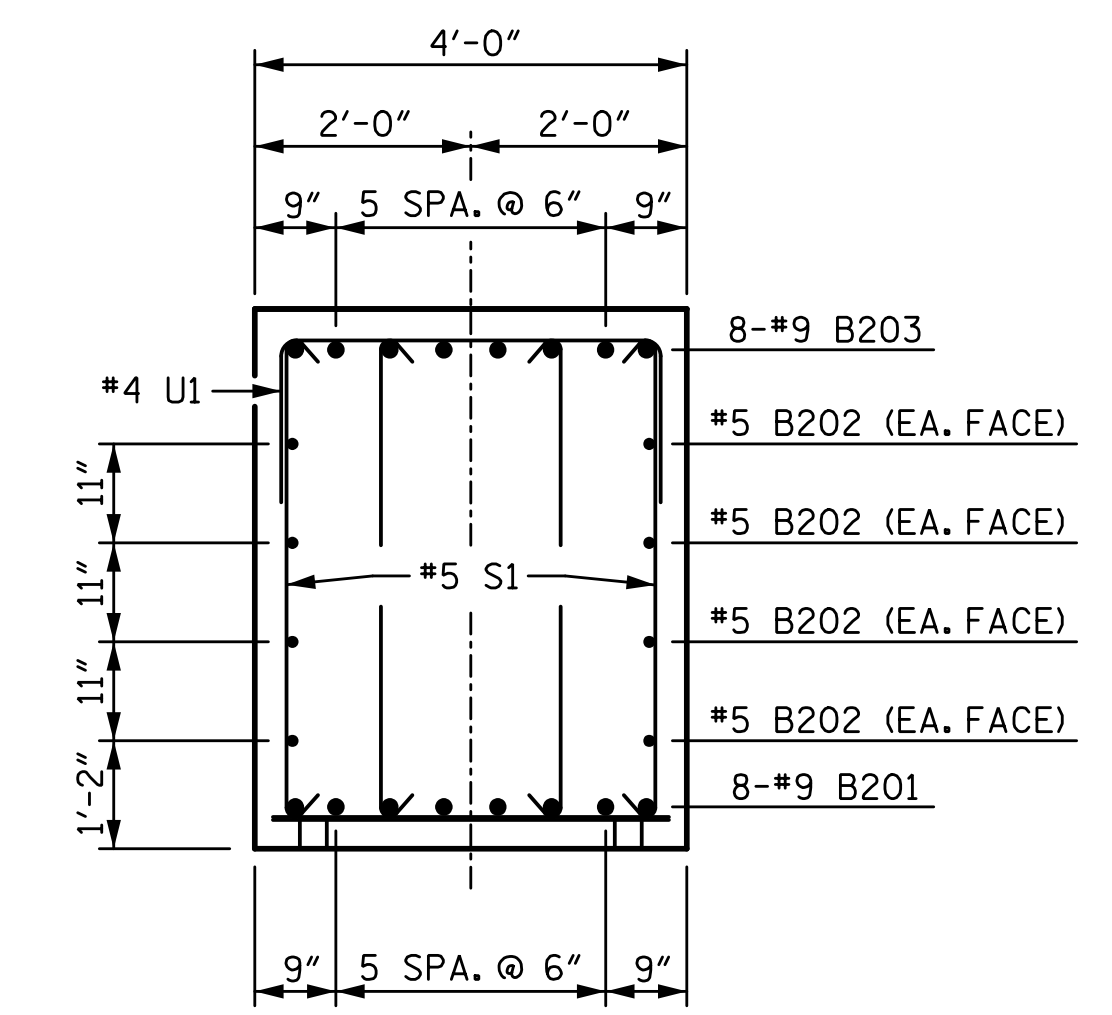
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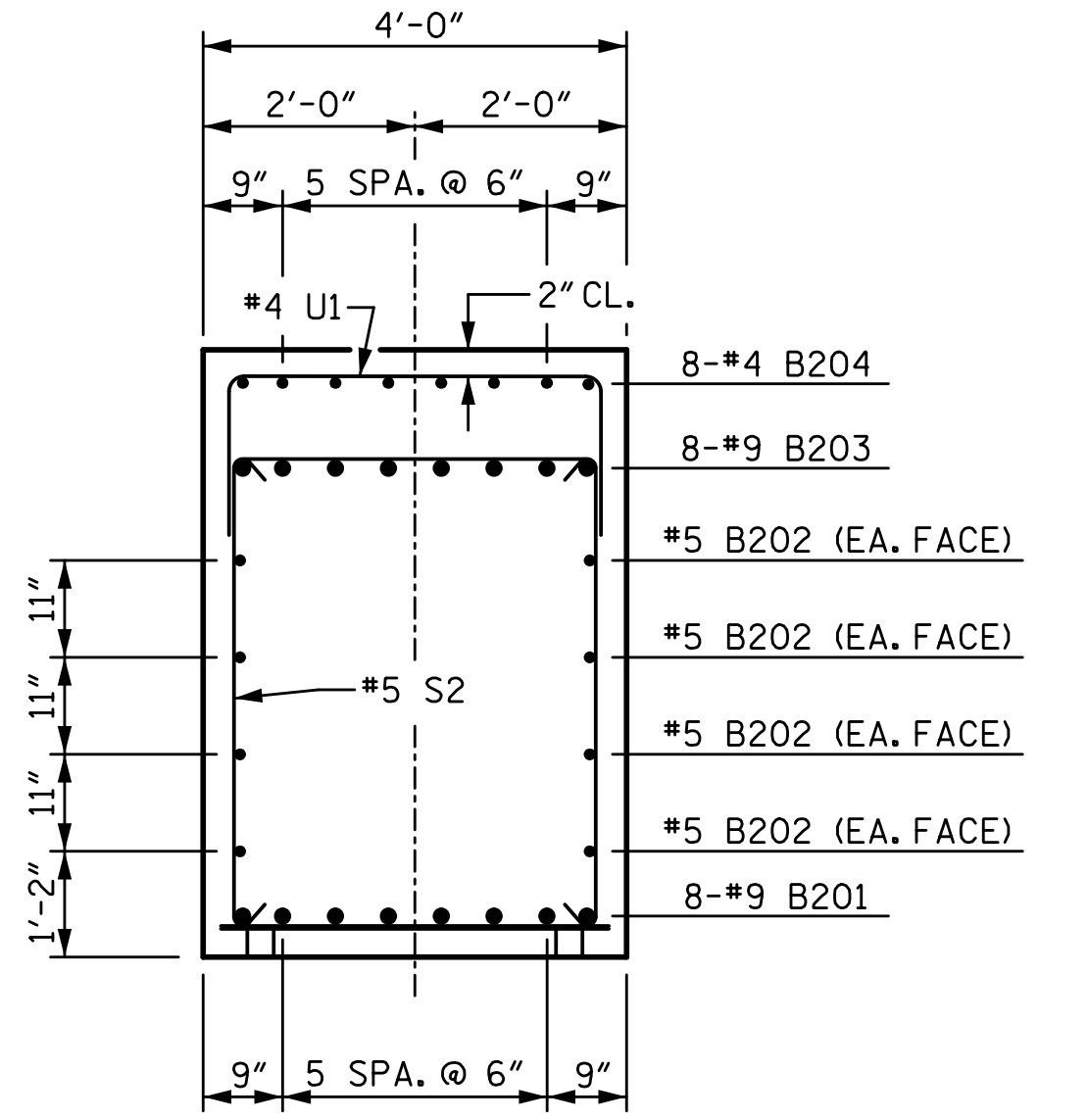
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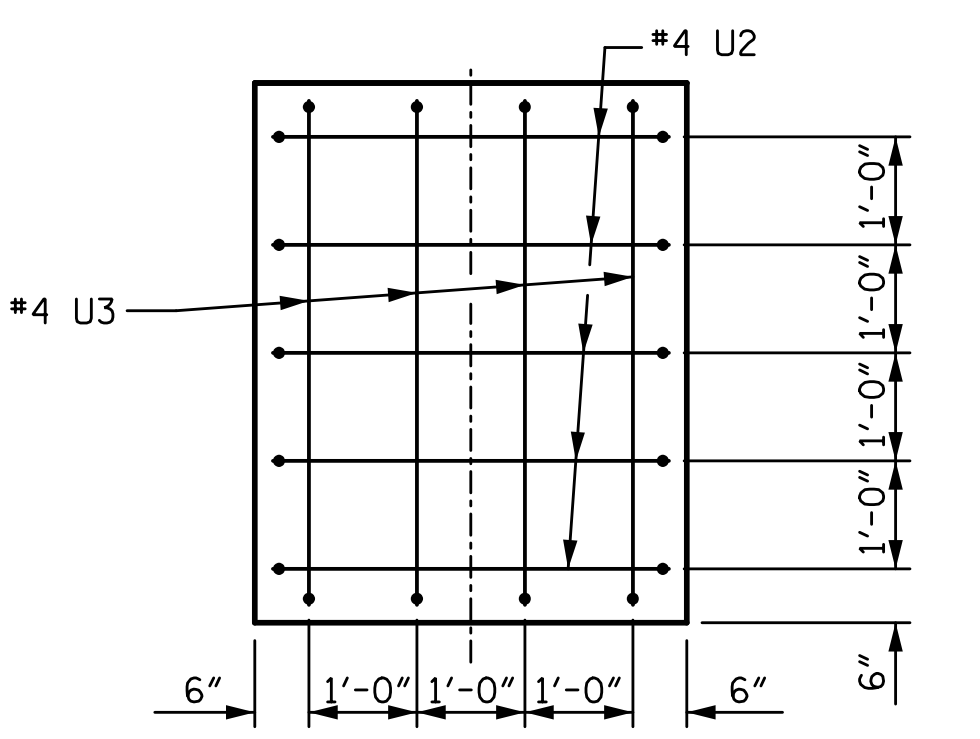
CONSTRUCTION JOINT DETAIL



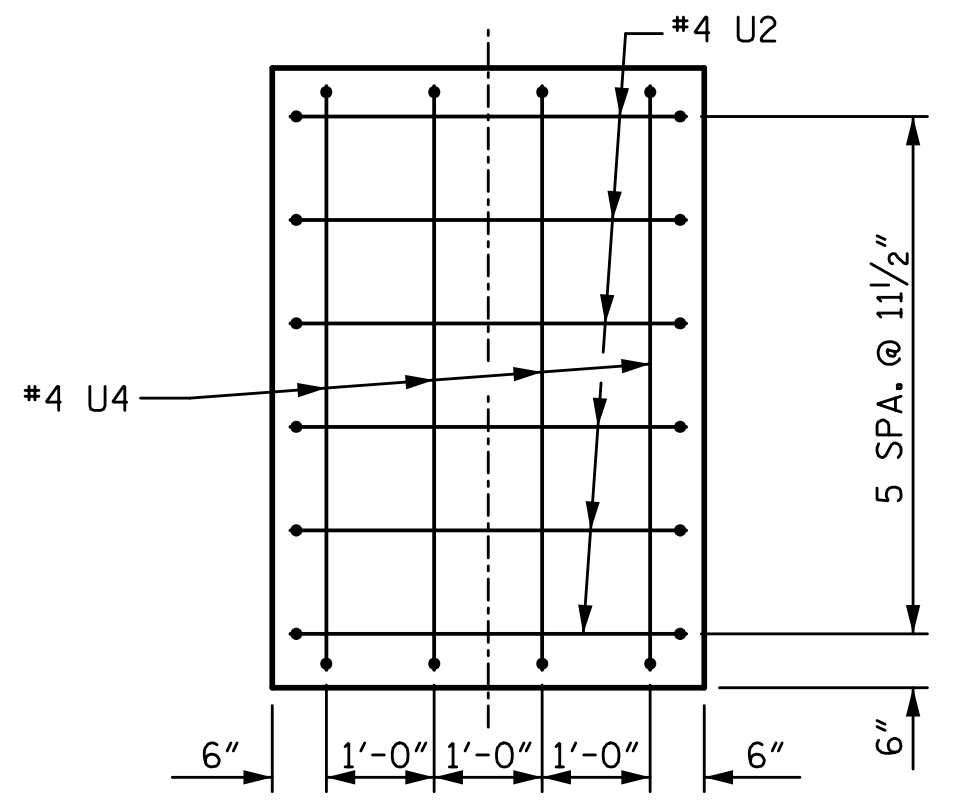
SECTION A-A



SECTION B-B

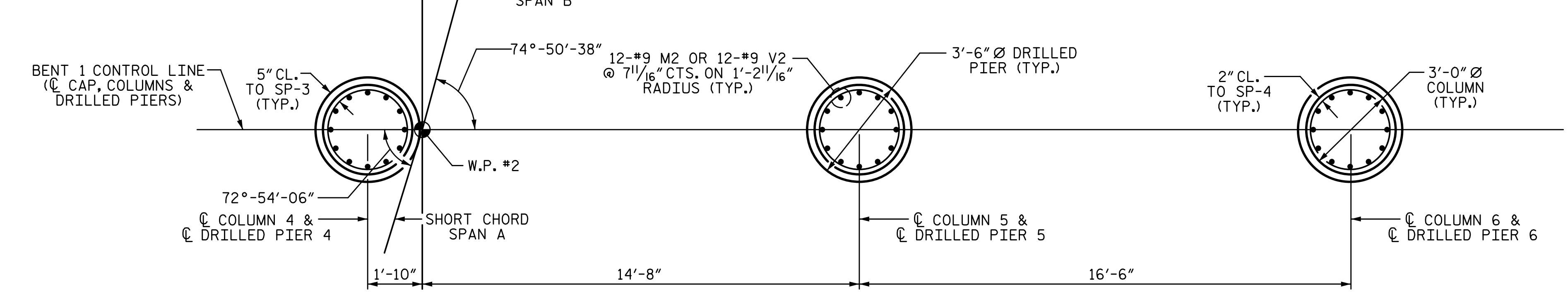


VIEW X-X

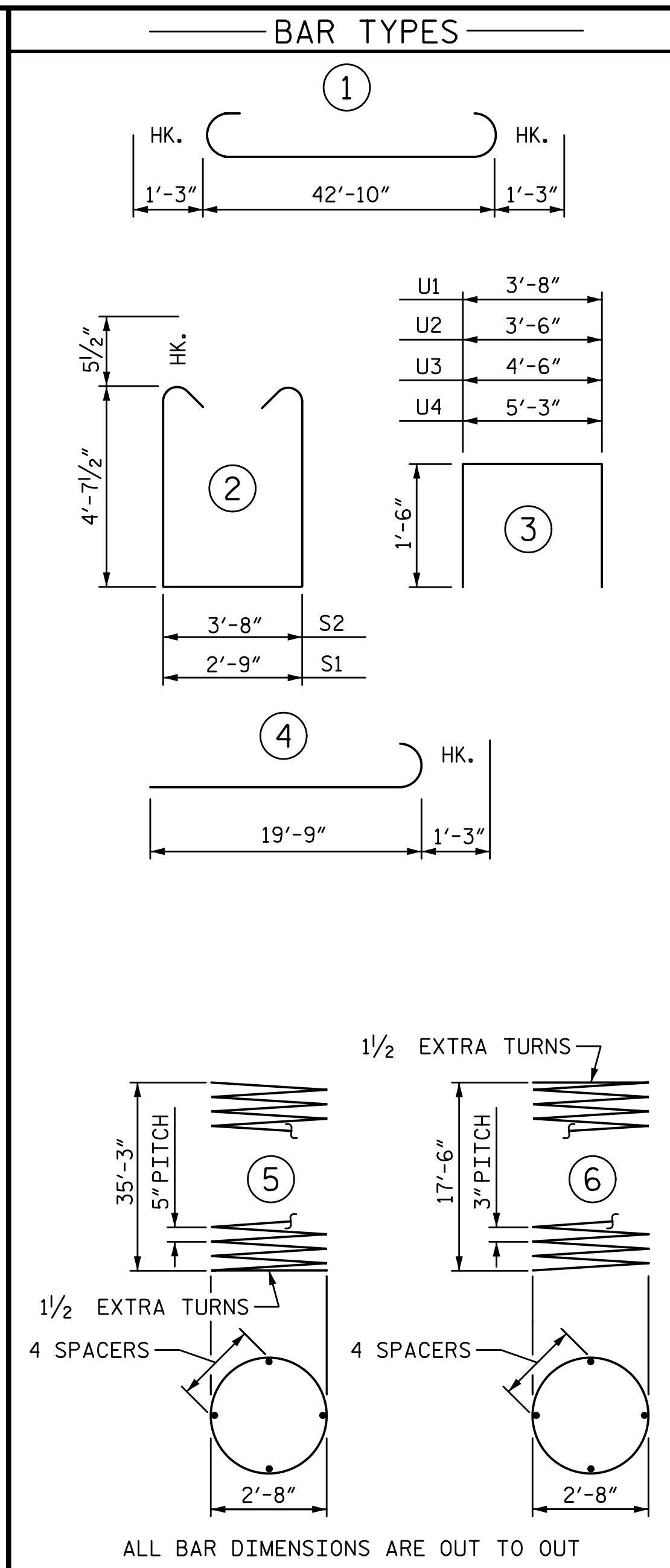


VIEW Y-Y

END ELEVATION



PLAN OF DRILLED PIERS AND COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* THE "SP-3" SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \* THE "SP-4" SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT 1 (STAGE 2)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B201	8	#9	STR	43'-0"	1170
B202	8	#5	STR	43'-0"	359
B203	8	#9	1	45'-4"	1233
B204	8	#4	STR	9'-8"	52
B205	8	#4	STR	13'-10"	74
M2	36	#9	STR	43'-0"	5263
S1	28	#5	2	12'-11"	377
S2	46	#5	2	13'-10"	664
U1	48	#4	3	6'-8"	214
U2	11	#4	3	6'-6"	48
U3	4	#4	3	7'-6"	20
U4	4	#4	3	8'-3"	22
V2	36	#9	4	21'-0"	2570
SP-3	3	**	5	715'-7"	2239
SP-4	3	*	6	594'-1"	1191
REINFORCING STEEL					12066 LB
SPIRAL COL. REINF. STEEL					3430 LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)					13.6 CY
POUR 3 (CAP)					34.4 CY
TOTAL					48.0 CY

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 4 OF 4

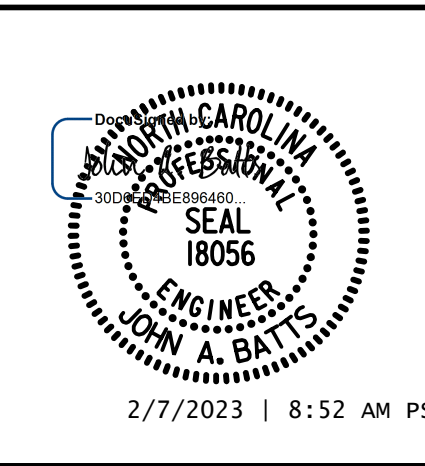
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

**STAGE 2**

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

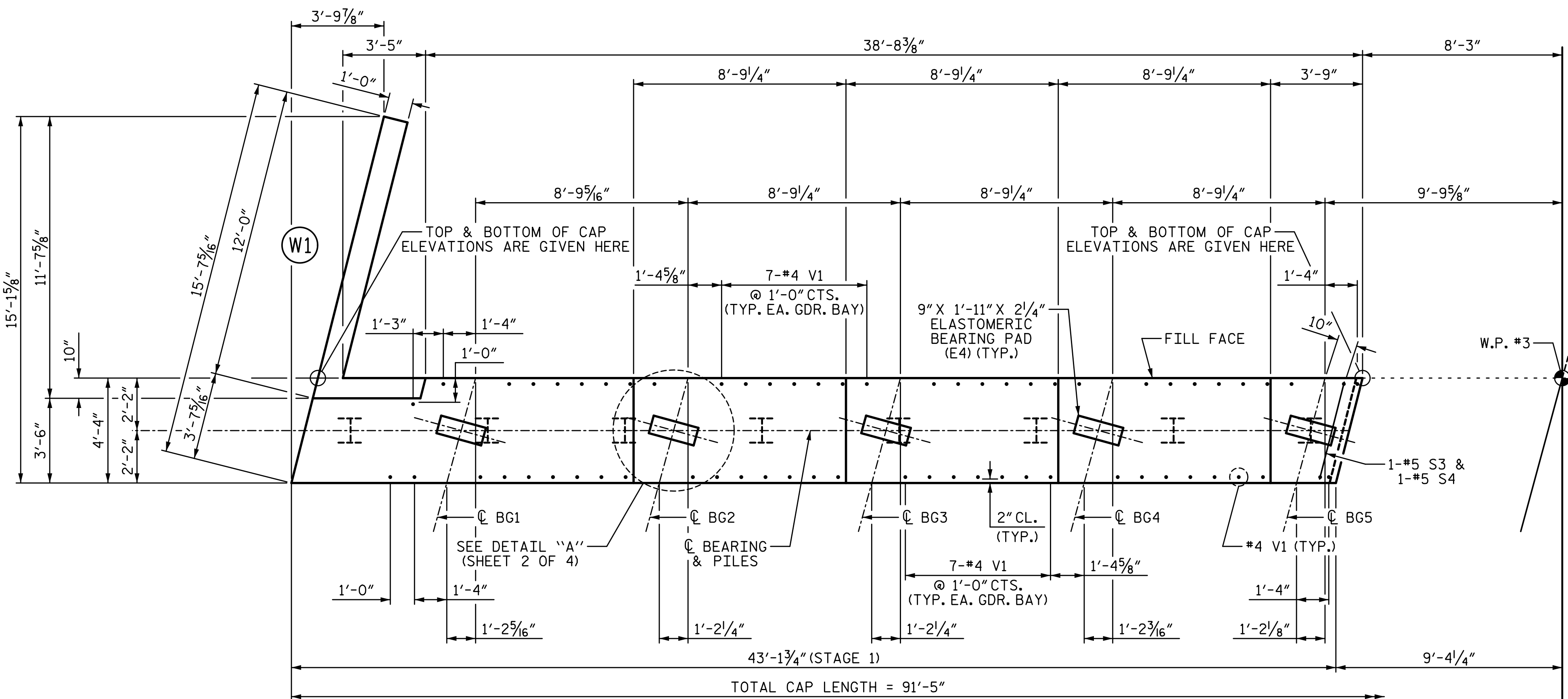
SHEET NO. S-49  
 TOTAL SHEETS 58



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**NOTES:**

\*4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP. FOR SECTIONS A-A AND B-B, SEE SHEET 4 OF 4.

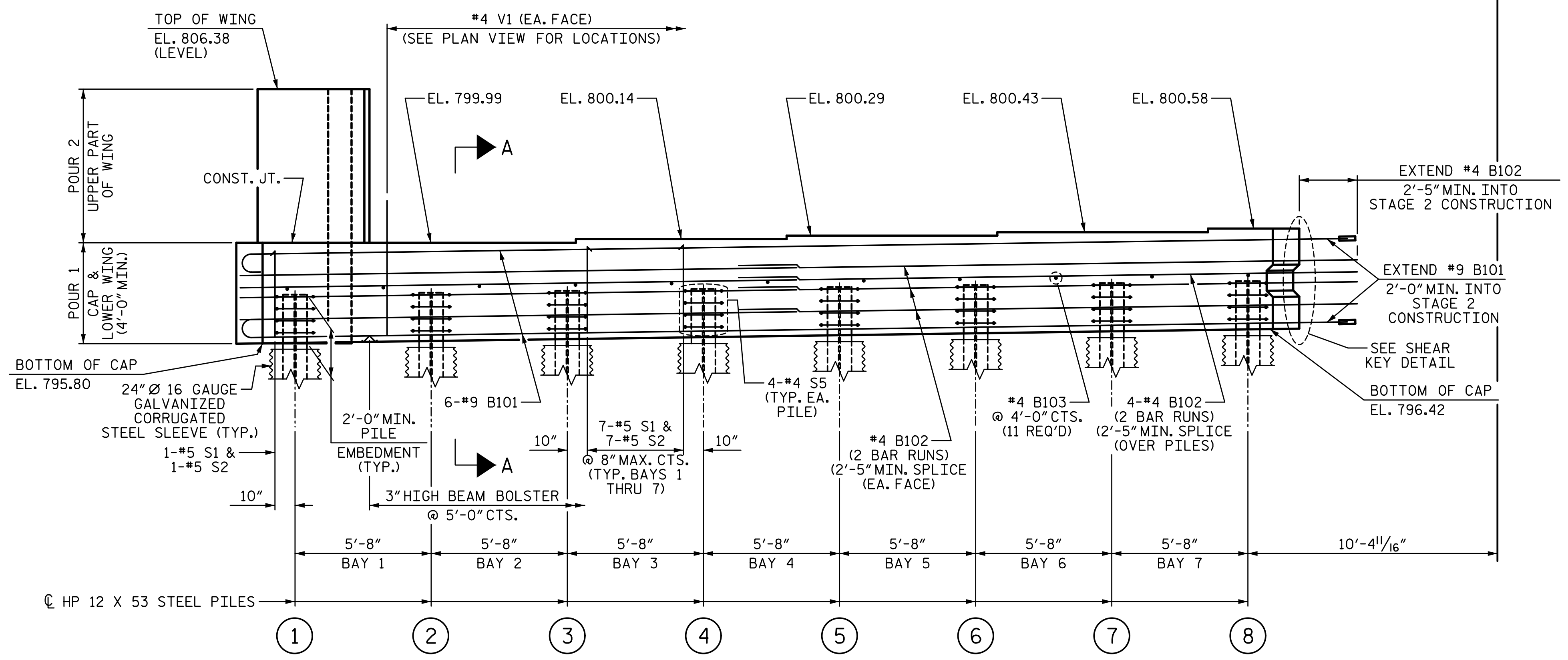
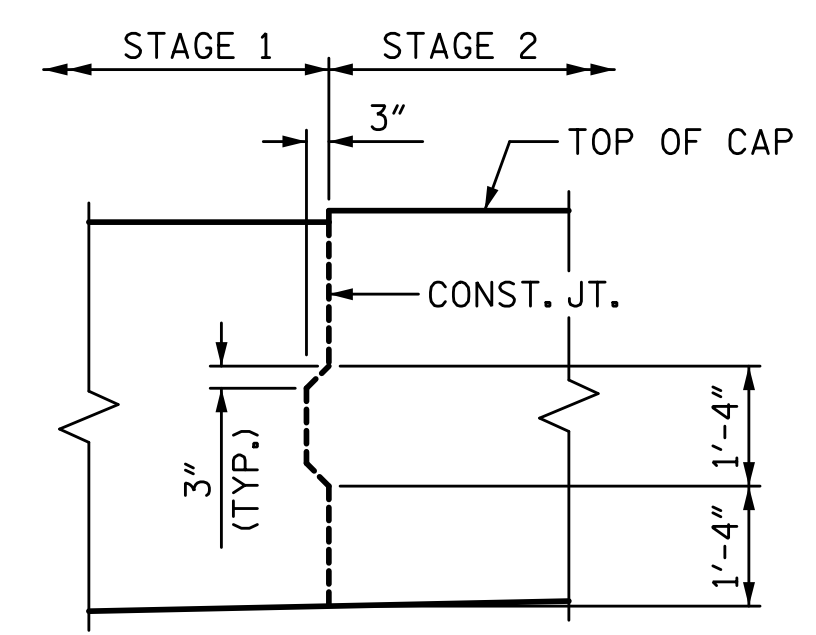
MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 "B" BARS IN STAGE 1 WITH THE #9 "B" BARS IN STAGE 2. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 1 FOOT AND THE STAGE 1 BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 2'-0" EXTENSION INTO STAGE 2 CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICE FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS IN THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1 AND 3), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.



TOP OF PILE ELEVATION	
PILE	ELEVATION
1	797.83
2	797.91
3	797.99
4	798.07
5	798.15
6	798.23
7	798.32
8	798.40

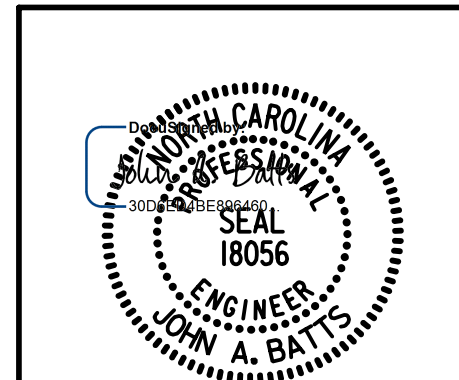
PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 2**

STAGE 1



DRAWN BY: T. BANKOVICH DATE: 2-22  
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 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

**ELEVATION**  
 FOR LOCATION OF S3 AND S4 BARS, SEE PLAN VIEW.

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

5-50  
 TOTAL SHEETS  
 58

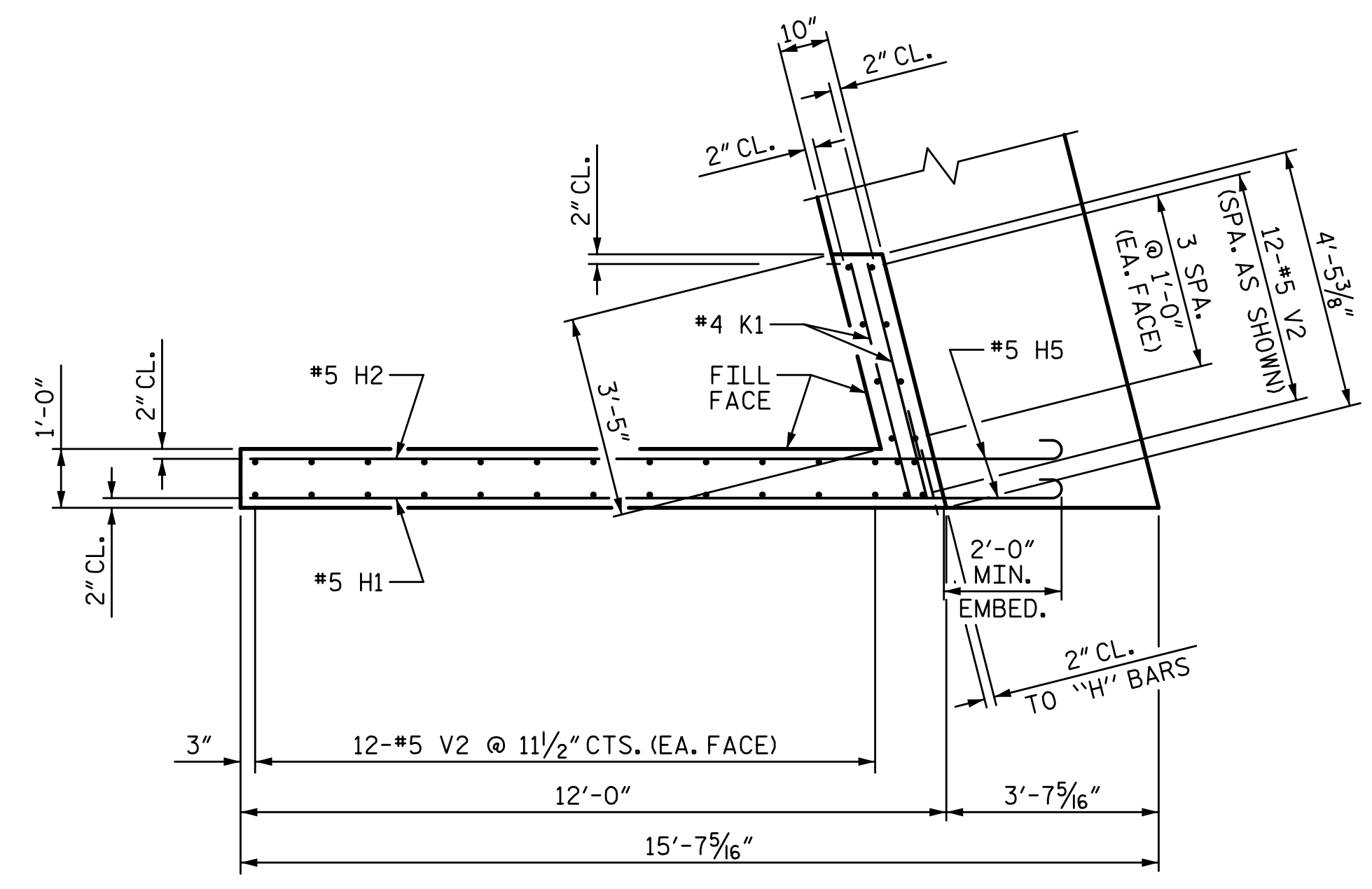
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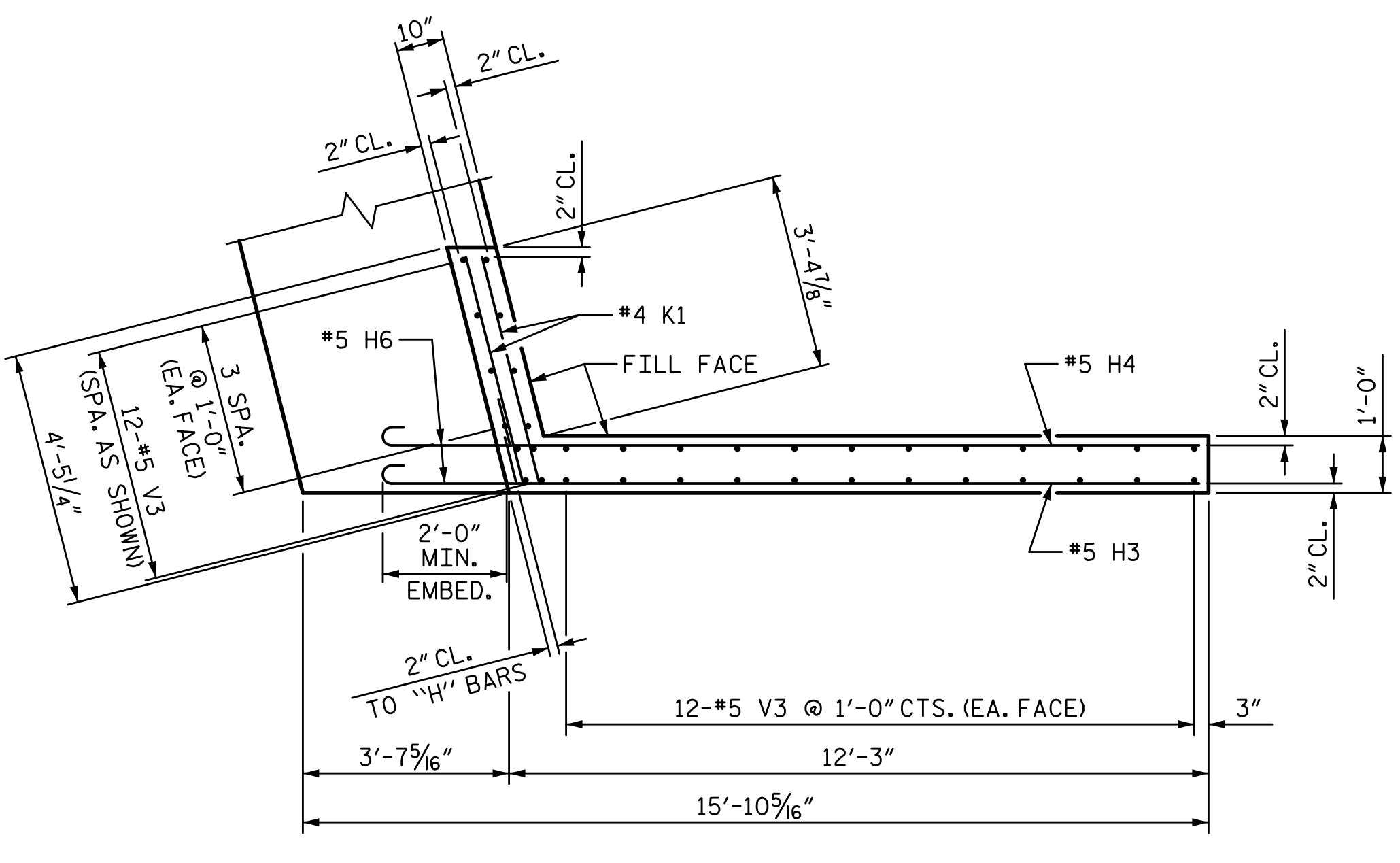
LICENSURE NO. C-4434



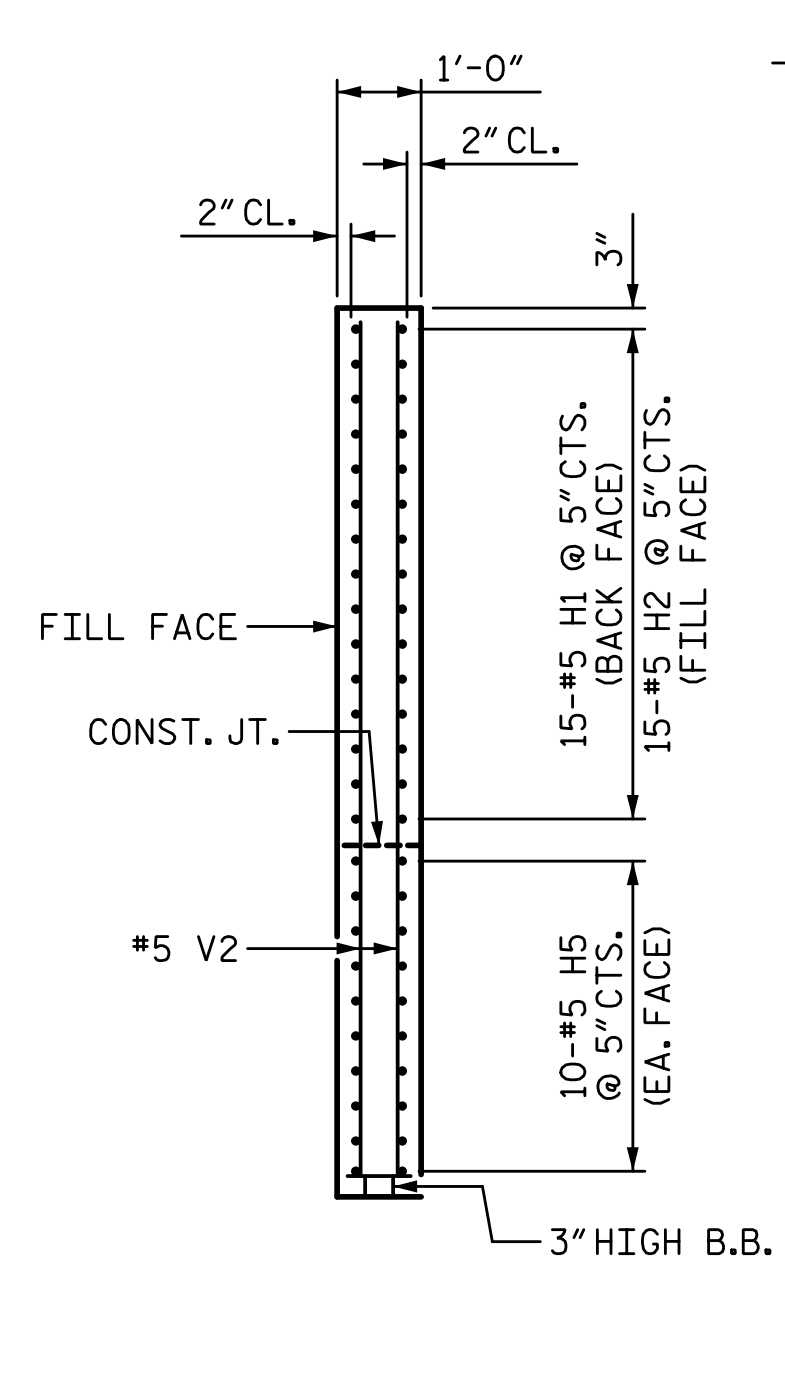
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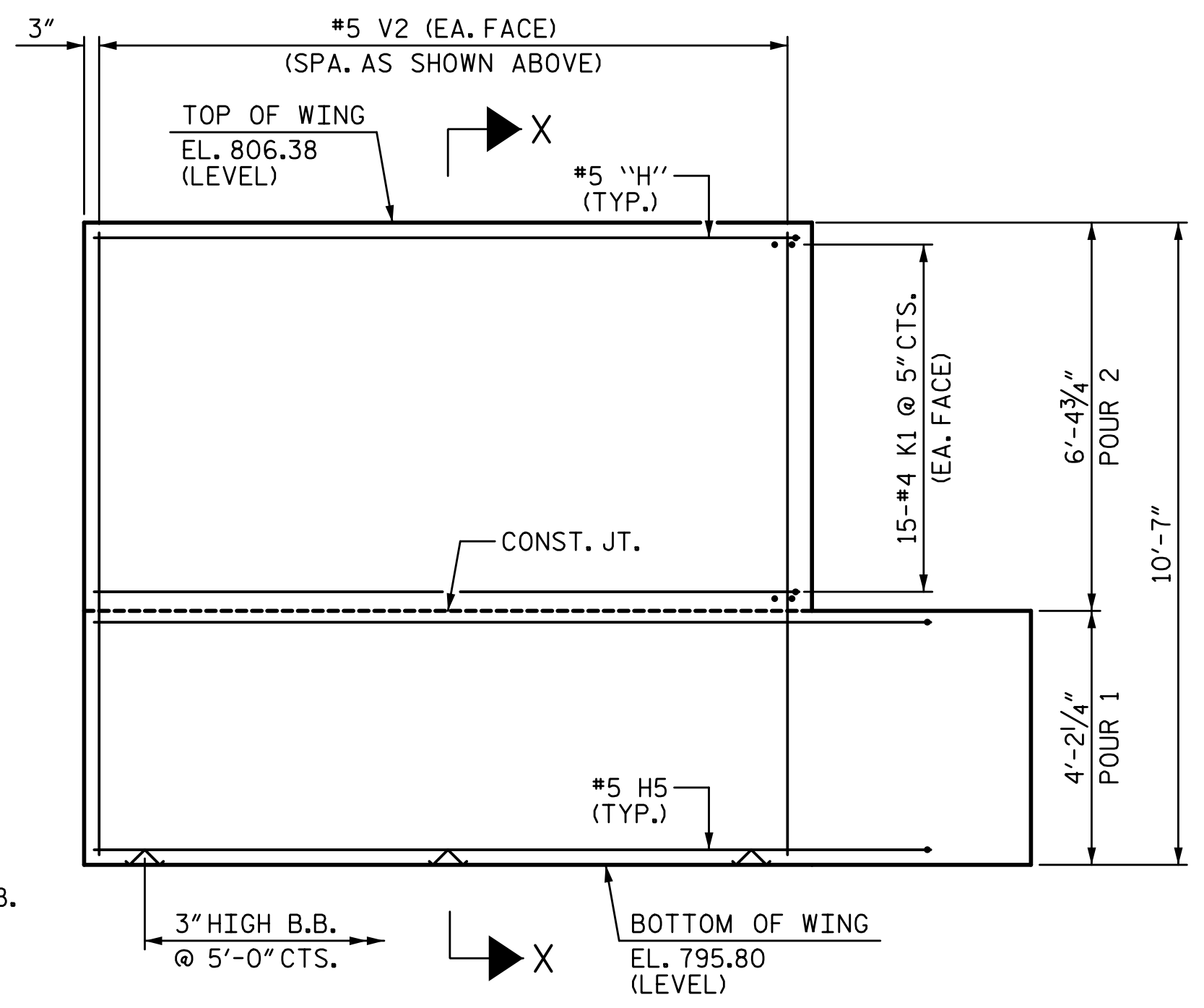
PLAN OF WING (W1)



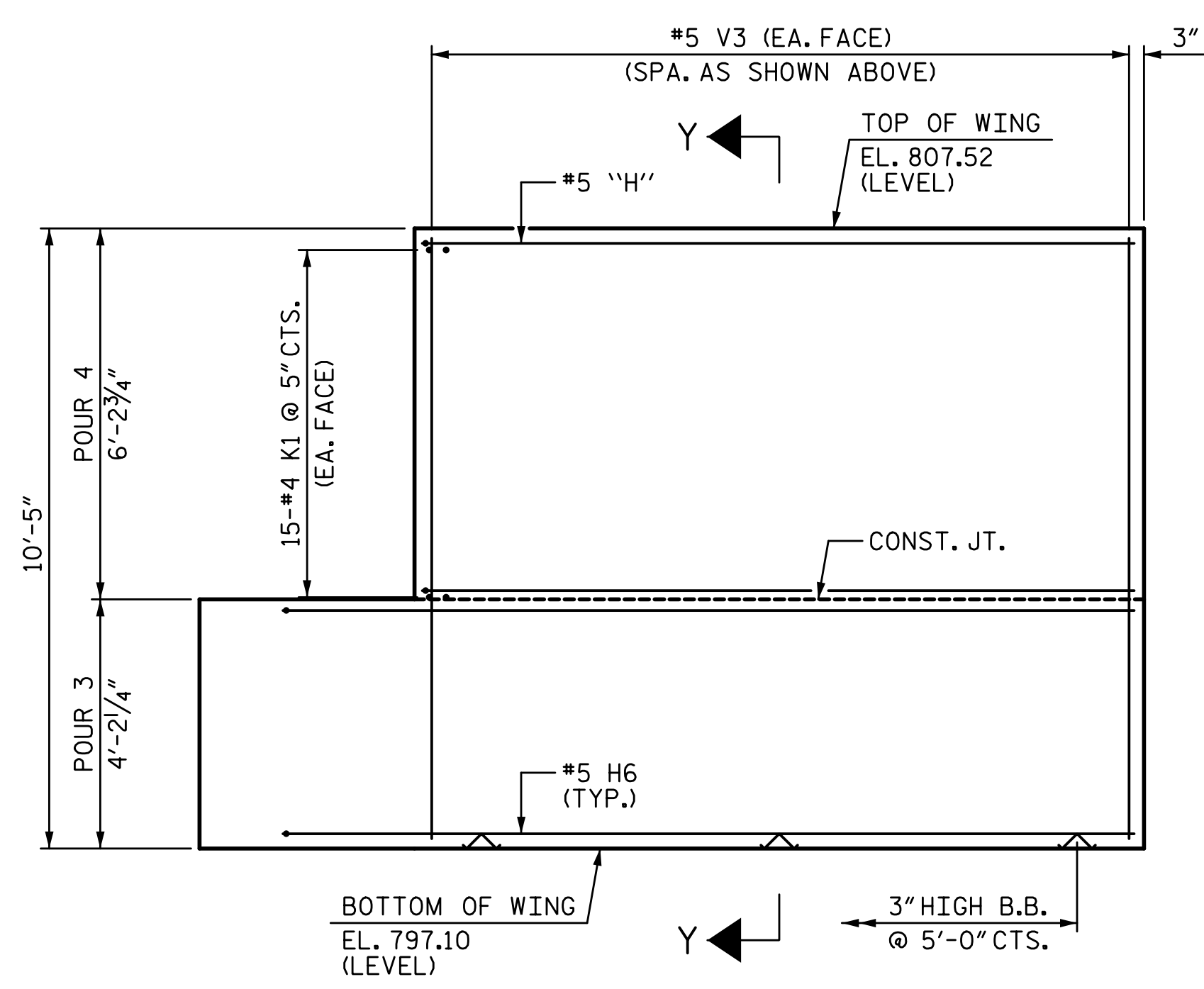
PLAN OF WING (W2)



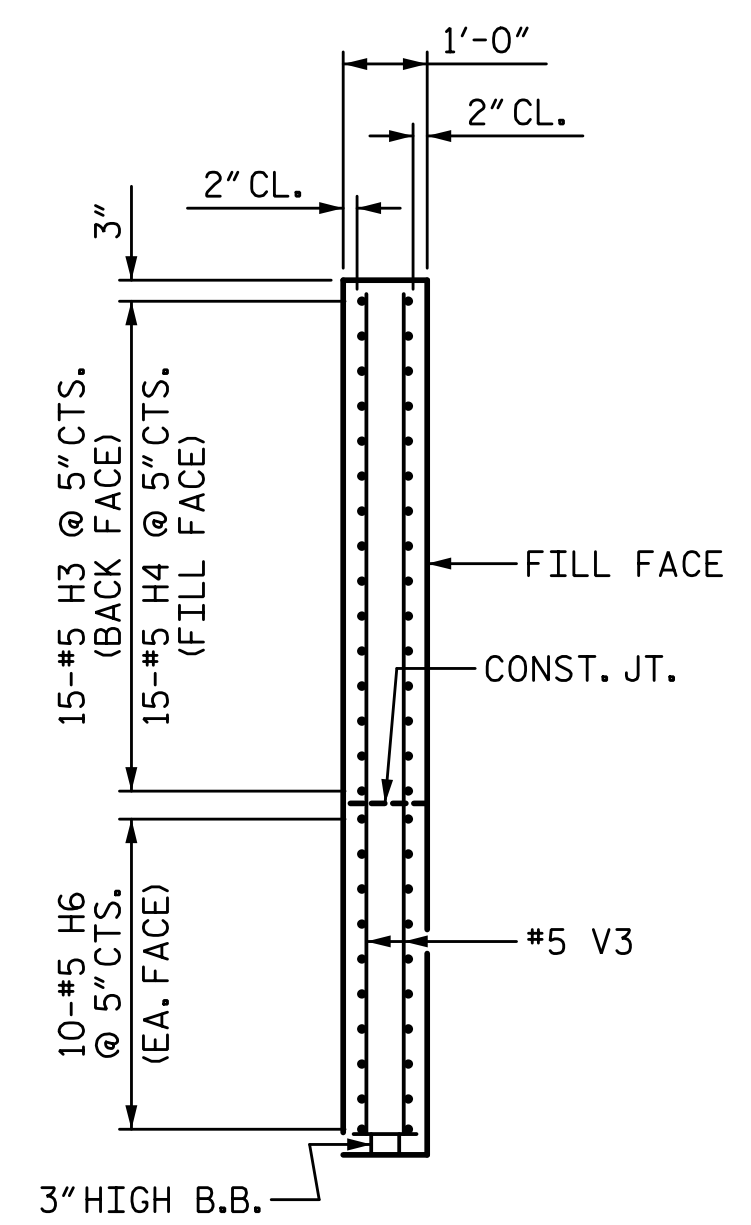
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



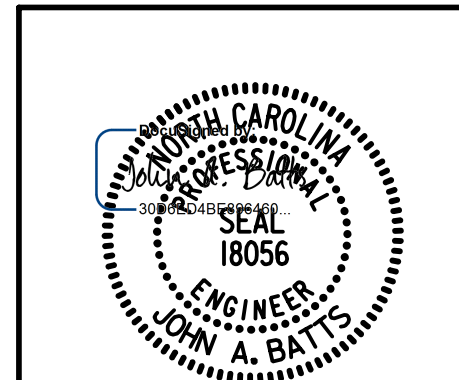
SECTION Y-Y

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2

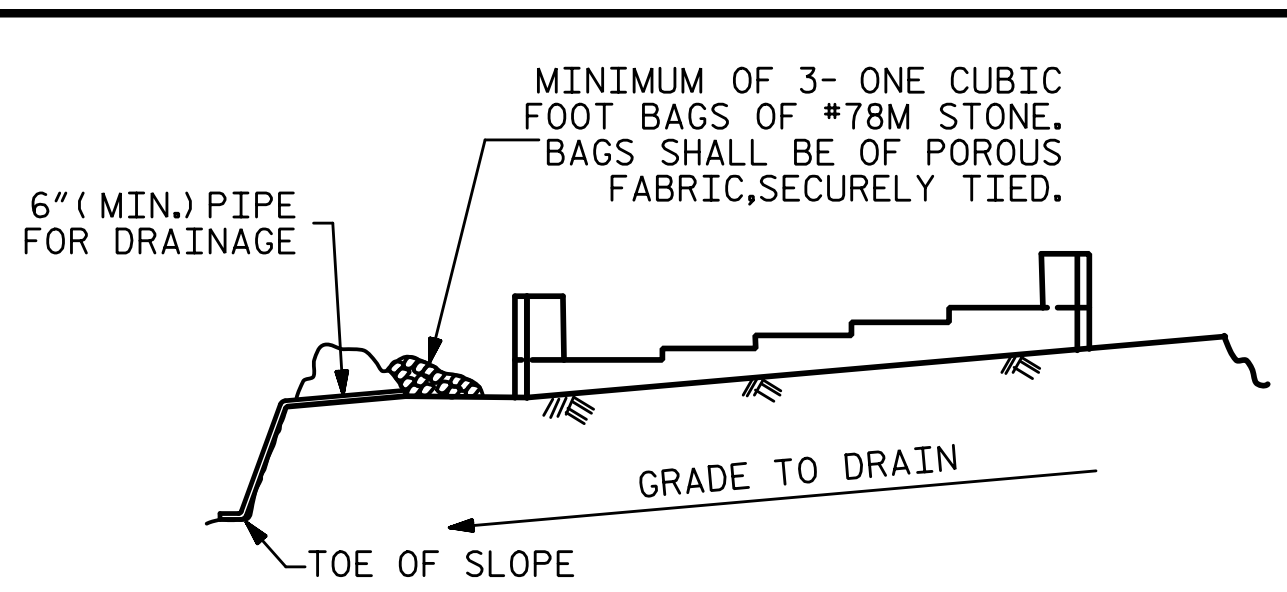


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			58

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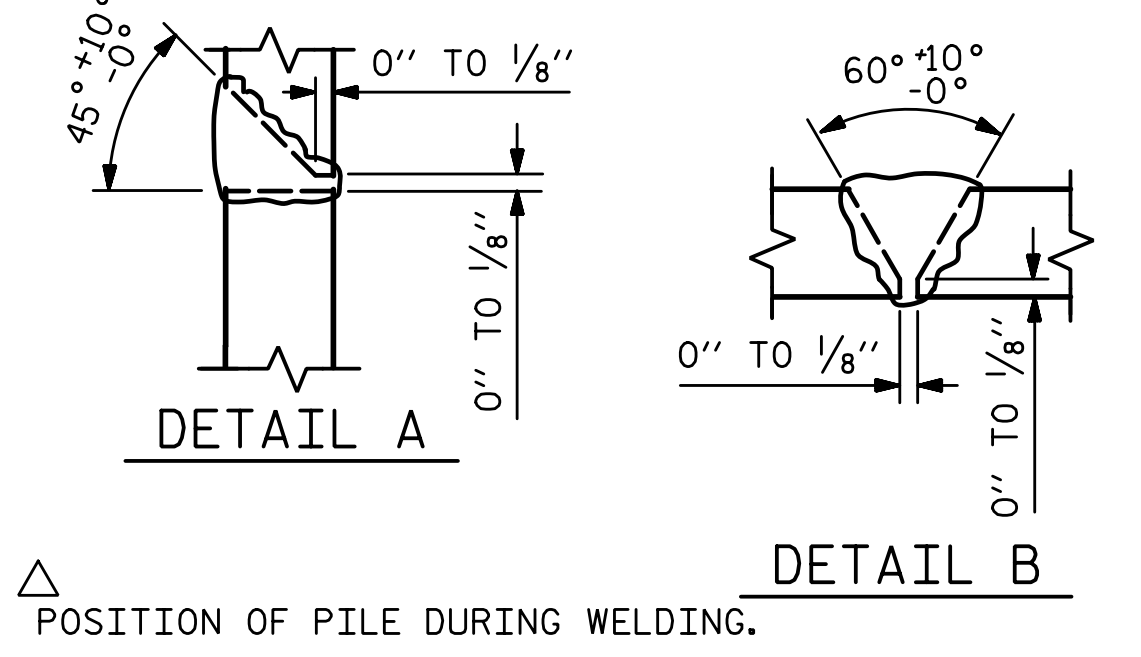
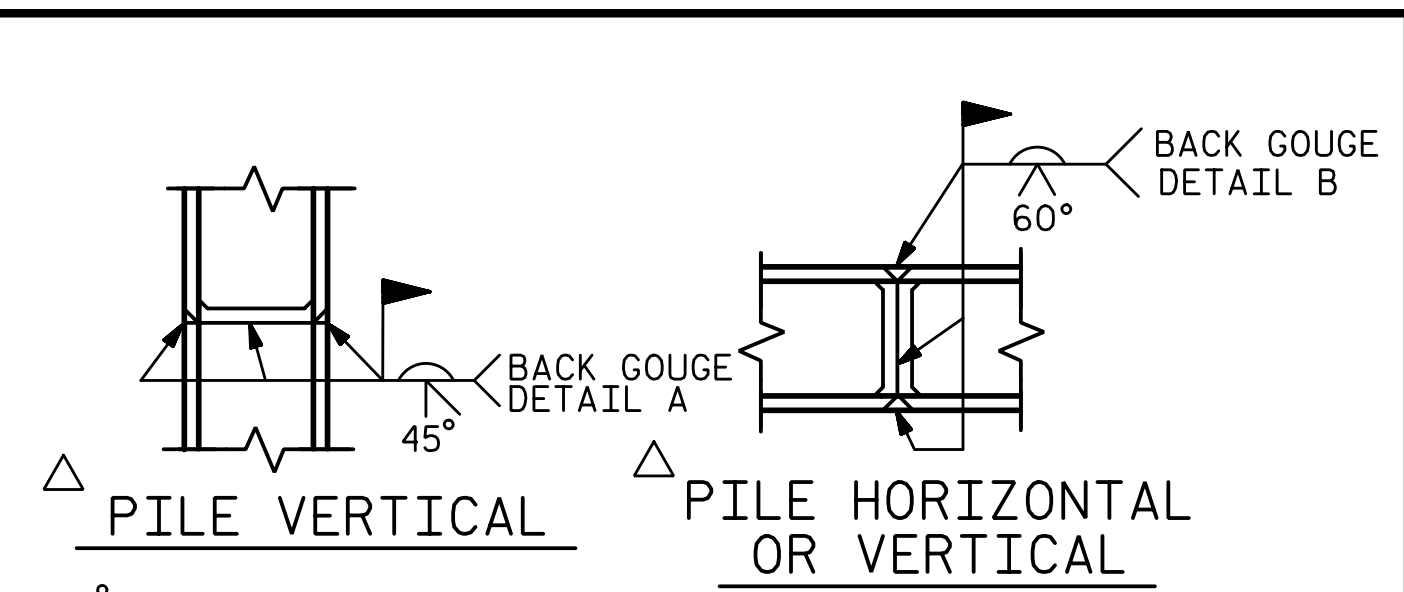


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

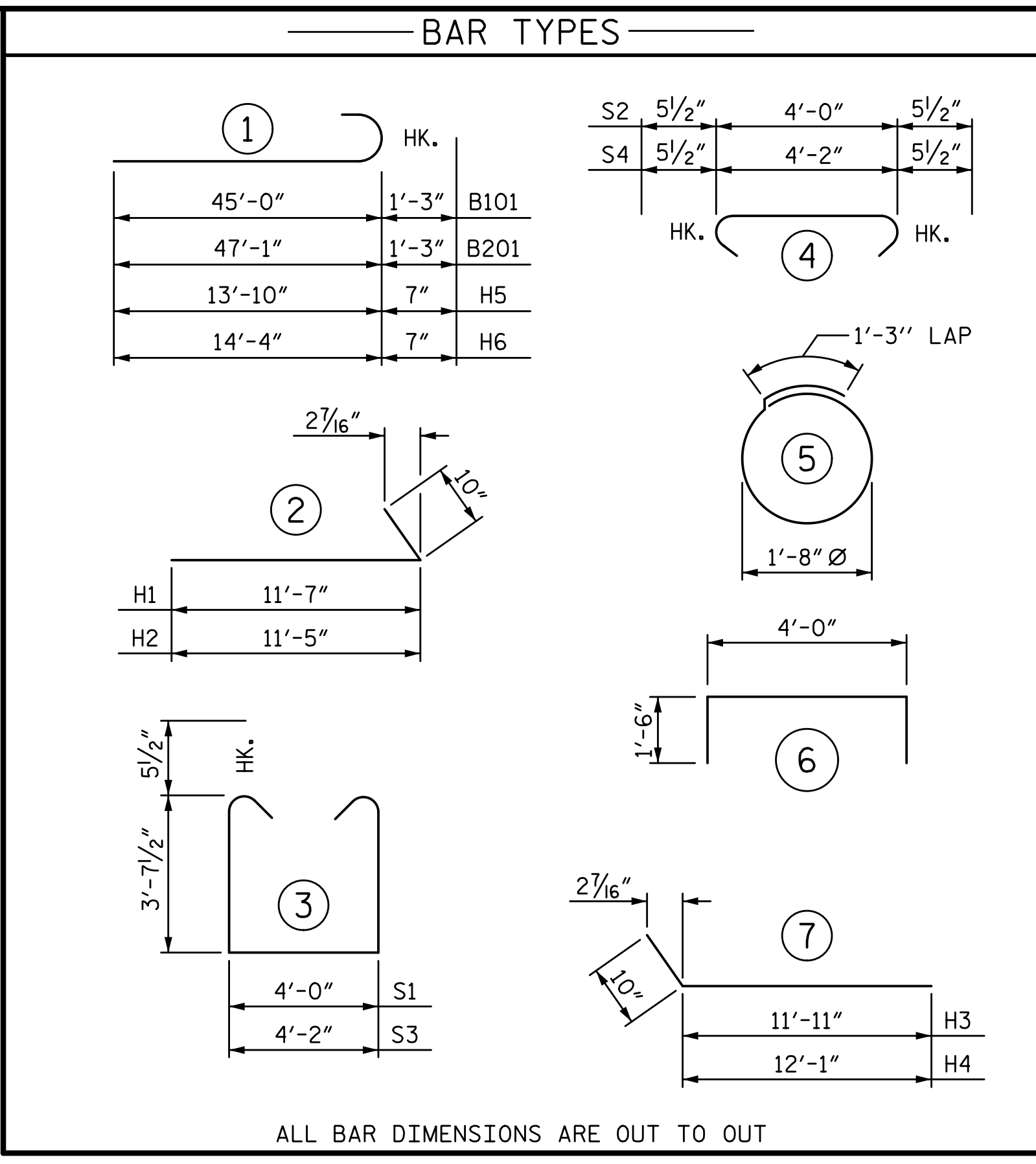
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT



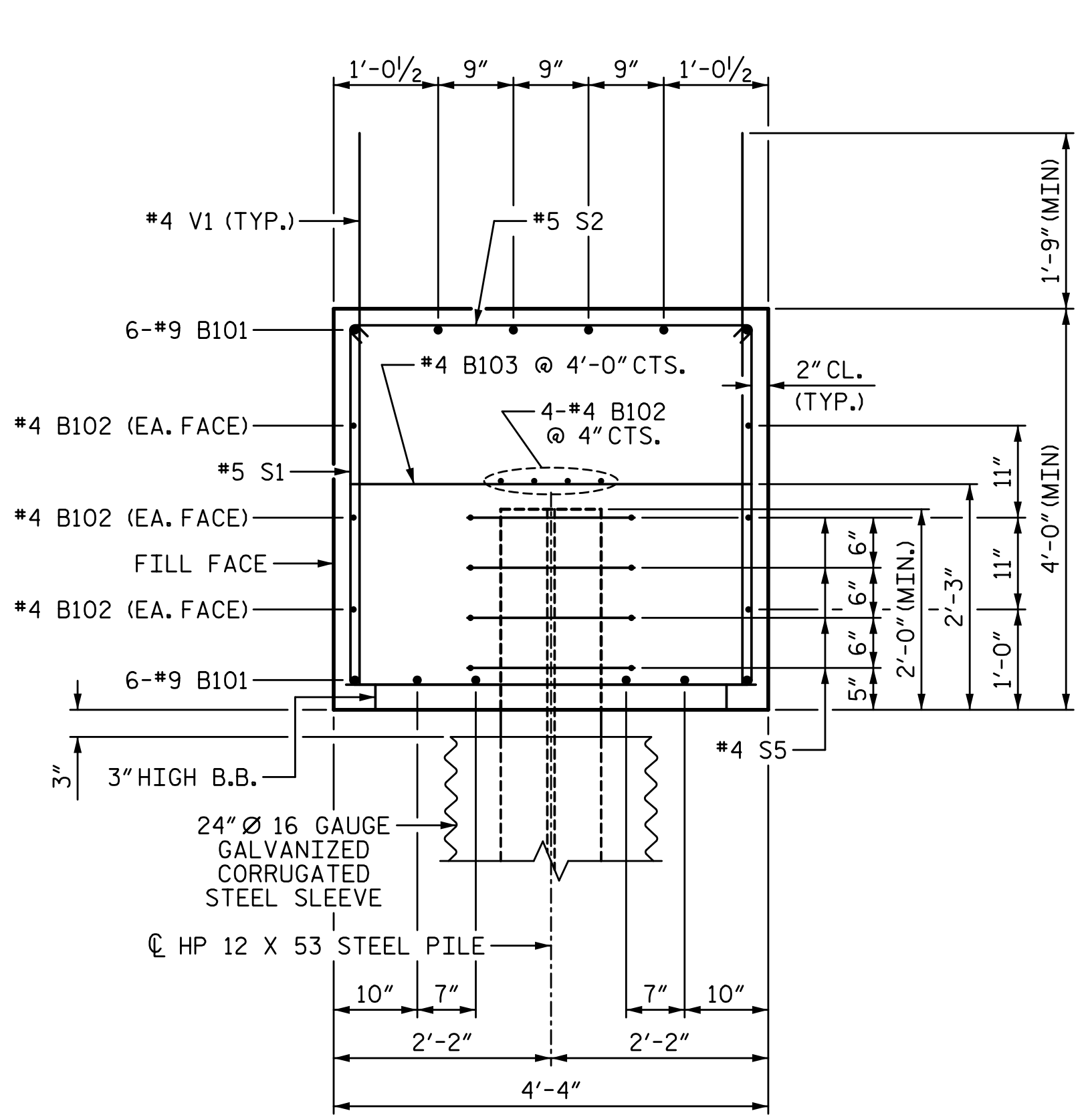
### PILE SPLICE DETAILS



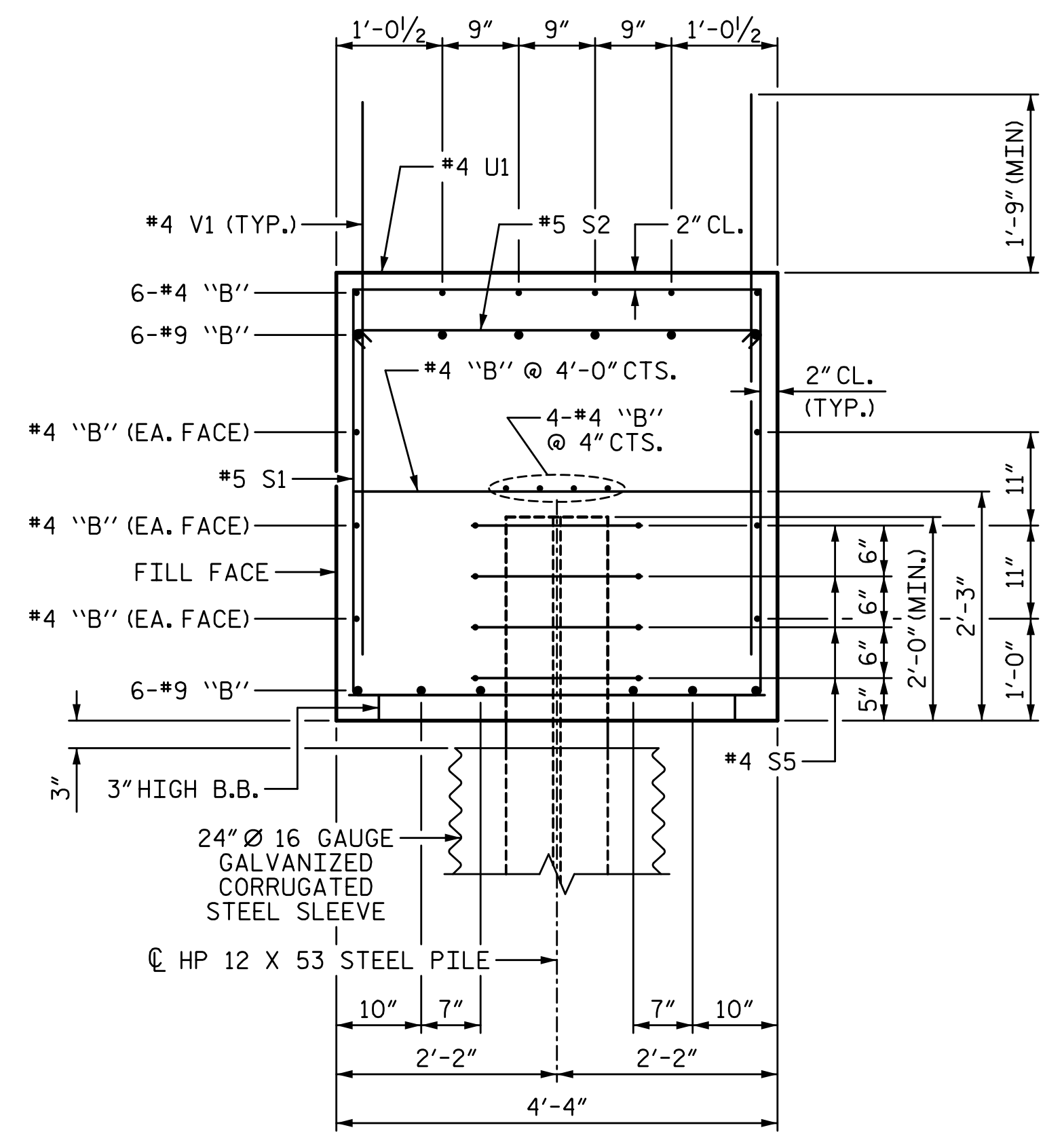
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL STAGE 1					BILL OF MATERIAL STAGE 2						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B101	12	#9	1	46'-3"	1887	B201	12	#9	1	48'-4"	1972
B102	20	#4	STR	24'-0"	321	B202	20	#4	STR	25'-3"	337
B103	11	#4	STR	4'-0"	29	B203	12	#4	STR	4'-0"	32
						B204	30	#4	STR	6'-5"	129
H1	15	#5	2	12'-5"	194	H3	15	#5	7	12'-9"	199
H2	15	#5	2	12'-3"	192	H4	15	#5	7	12'-11"	202
H5	20	#5	1	14'-5"	301	H6	20	#5	1	14'-11"	311
K1	30	#4	STR	4'-1"	82						
						K1	30	#4	STR	4'-1"	82
S1	50	#5	3	12'-2"	634	S1	49	#5	3	12'-2"	622
S2	50	#5	4	4'-11"	256	S2	49	#5	4	4'-11"	251
S3	1	#5	3	12'-4"	13	S3	5	#5	3	12'-4"	64
S4	1	#5	4	5'-1"	5	S4	5	#5	4	5'-1"	27
S5	32	#4	5	6'-6"	139	S5	32	#4	5	6'-6"	139
V1	62	#4	STR	5'-10"	242						
V2	36	#5	STR	10'-3"	385	U1	25	#4	6	7'-0"	117
						V1	74	#4	STR	5'-10"	288
						V3	36	#5	STR	10'-1"	379
TOTAL REINFORCING STEEL				4680 LB	TOTAL REINFORCING STEEL				5151 LB		
CLASS A CONCRETE BREAKDOWN					CLASS A CONCRETE BREAKDOWN						
POUR 1 (CAP & LOWER WINGS)					31.3 CY	POUR 3 (CAP & LOWER WINGS)					34.7 CY
POUR 2 (UPPER WINGS)					3.4 CY	POUR 4 (UPPER WINGS)					3.5 CY
TOTAL CLASS A CONCRETE					34.7 CY	TOTAL CLASS A CONCRETE					38.2 CY

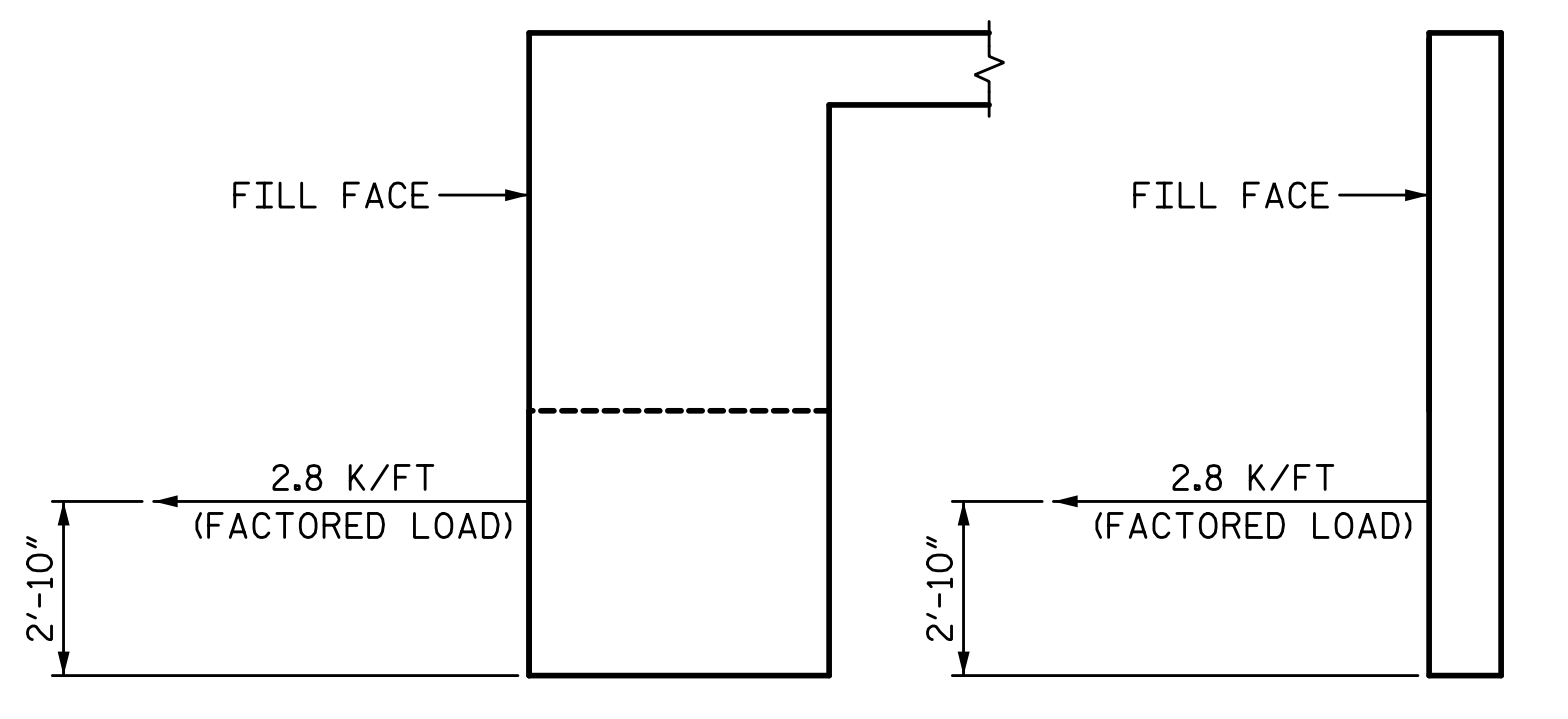
END BENT 2 TOTAL QUANTITIES		
	REINFORCING STEEL	CLASS A CONCRETE
	LB	CY
STAGE 1	4,680	34.7
STAGE 2	5,151	38.2
TOTAL	9,831	72.9



### SECTION A-A



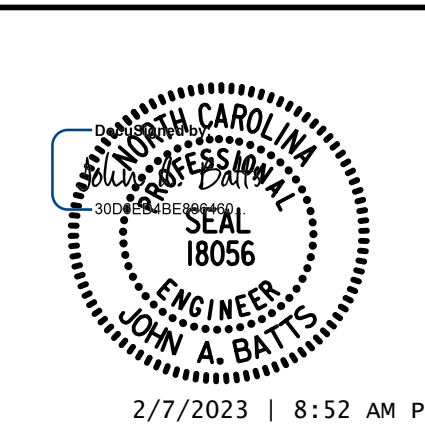
### SECTION B-B



### TIEBACK DETAILS

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-  
 SHEET 4 OF 4

DRAWN BY: T. BANKOVICH DATE: 2-22  
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 DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

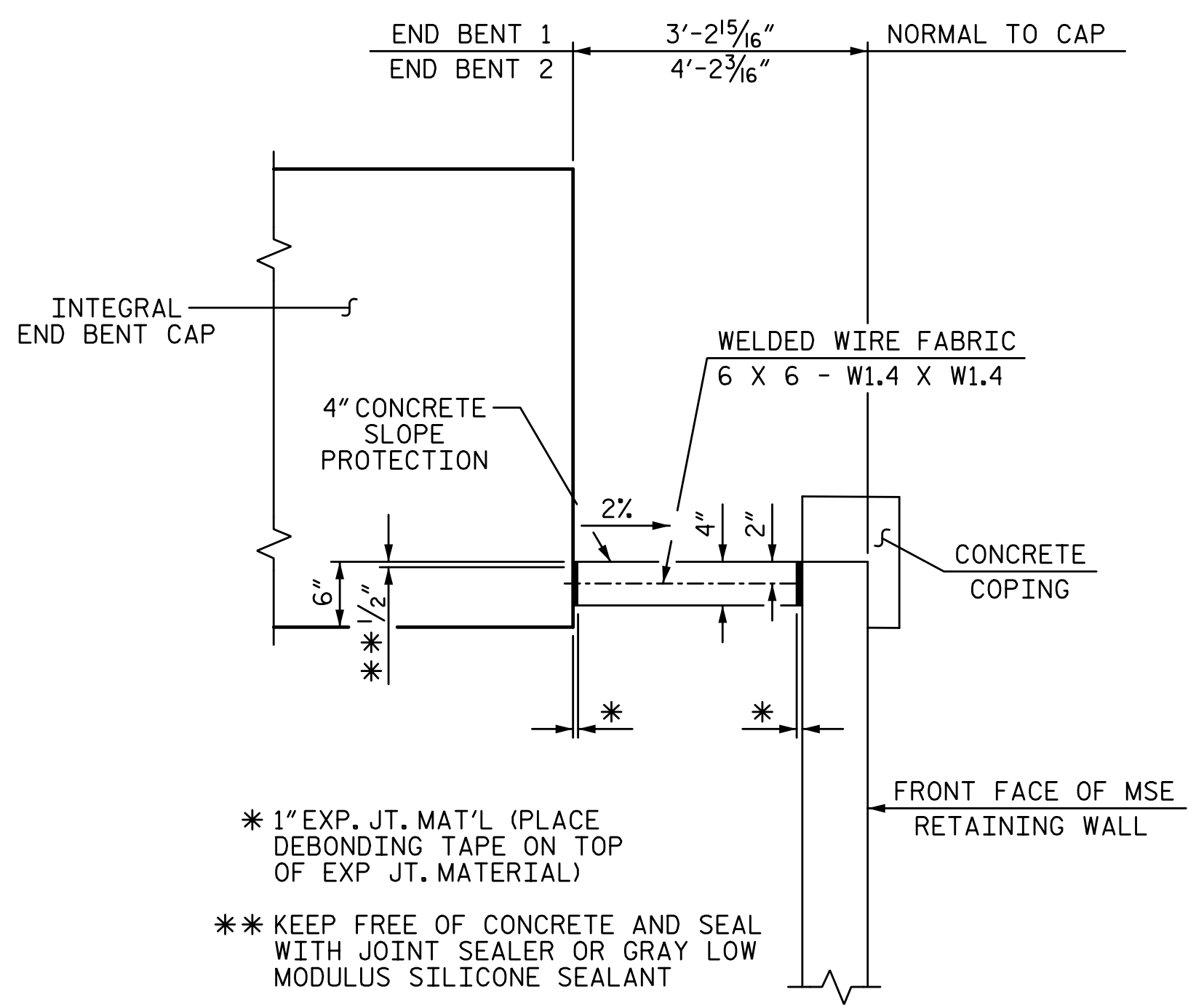


REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-53  
TOTAL SHEETS 58

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SECTION A-A

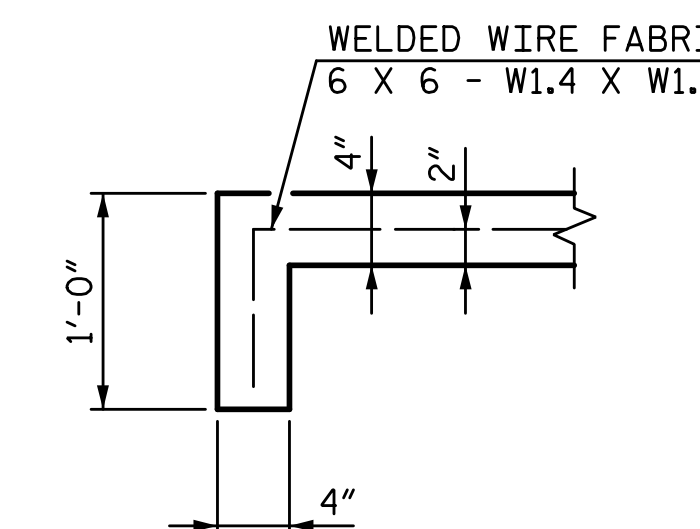
BRIDGE @ STA. 18+82.09 -L-	4" SLOPE PROTECTION	** WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	26	47
END BENT 2	35	63

\*\* QUANTITIES SHOWN ARE BASED ON 5' POURS

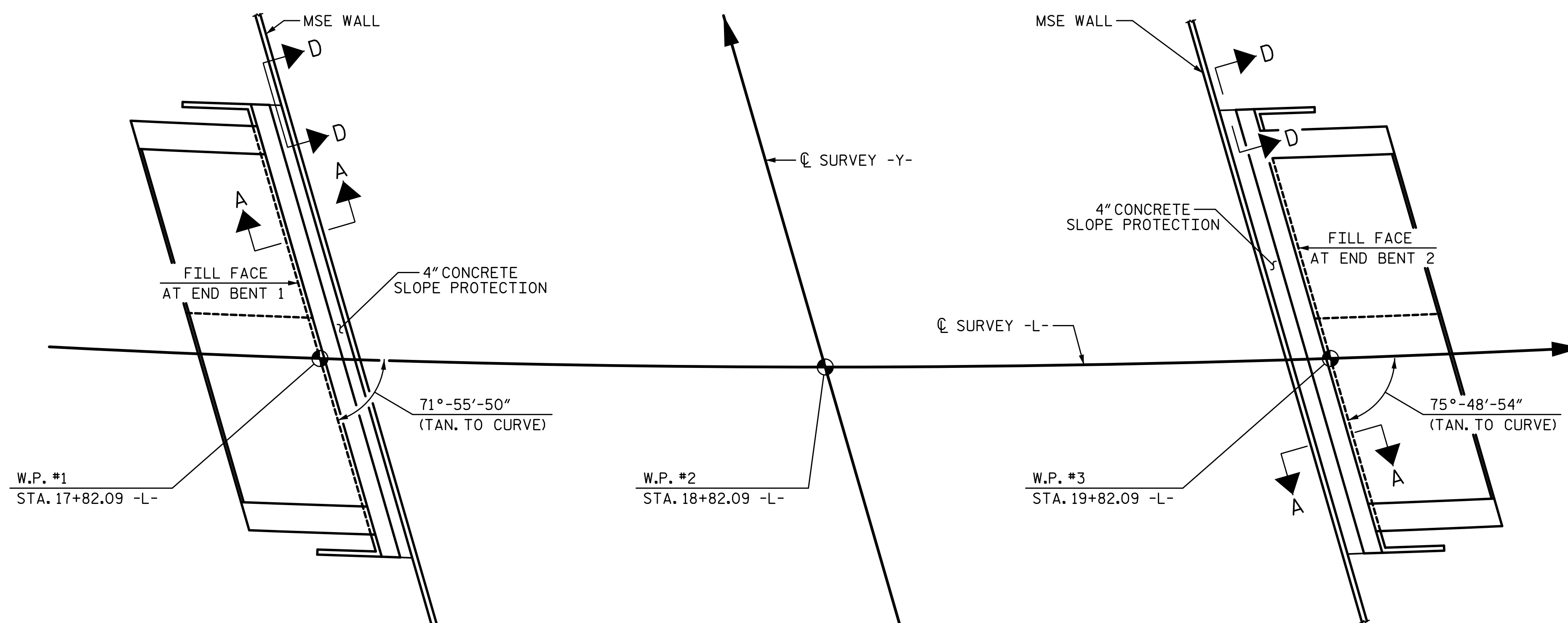
NOTES:

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN SECTION D-D. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT.

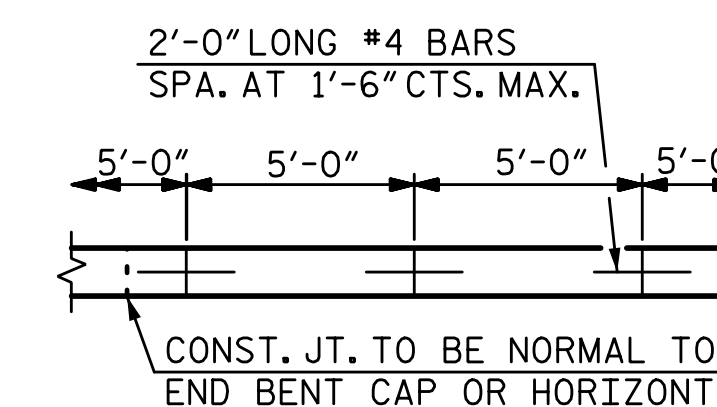
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE SECTIONS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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



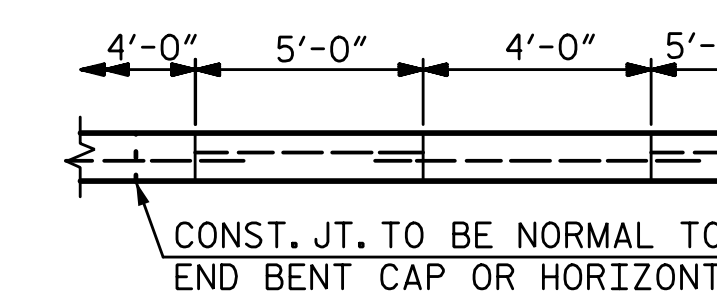
SECTION D-D



PLAN



POURING DETAIL

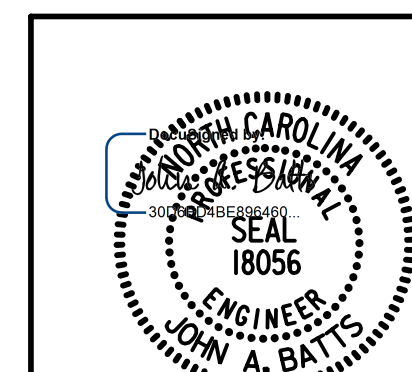


OPTIONAL POURING DETAIL  
POUR A 4'-0" STRIP FIRST.

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
STATION: 18+82.09 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SLOPE PROTECTION



DRAWN BY: S.D. COOPER DATE: 2-22  
CHECKED BY: J.A. BATTS DATE: 2-22  
DESIGN ENGINEER OF RECORD: J.A. BATTS DATE: 2-22

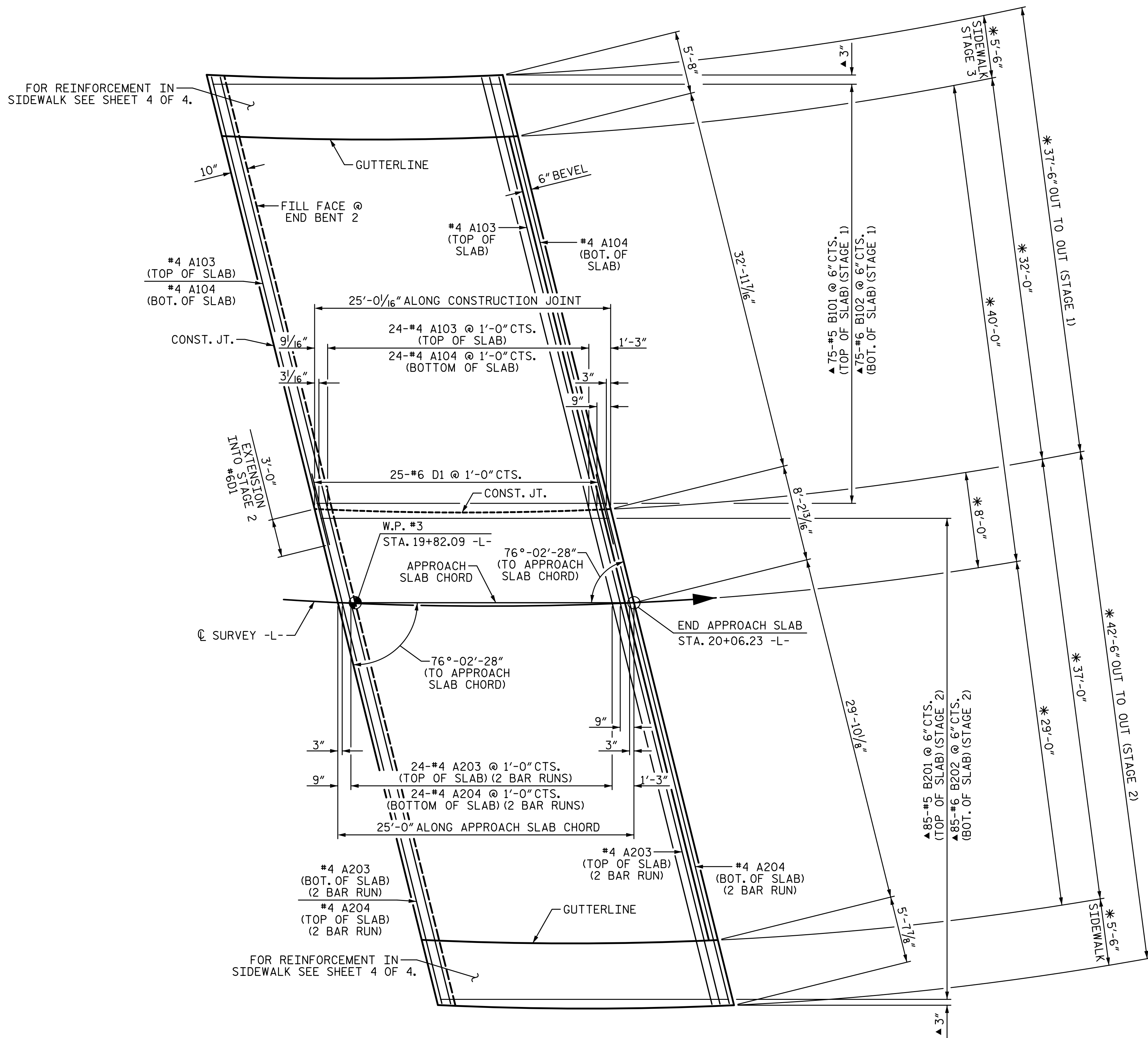
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			58

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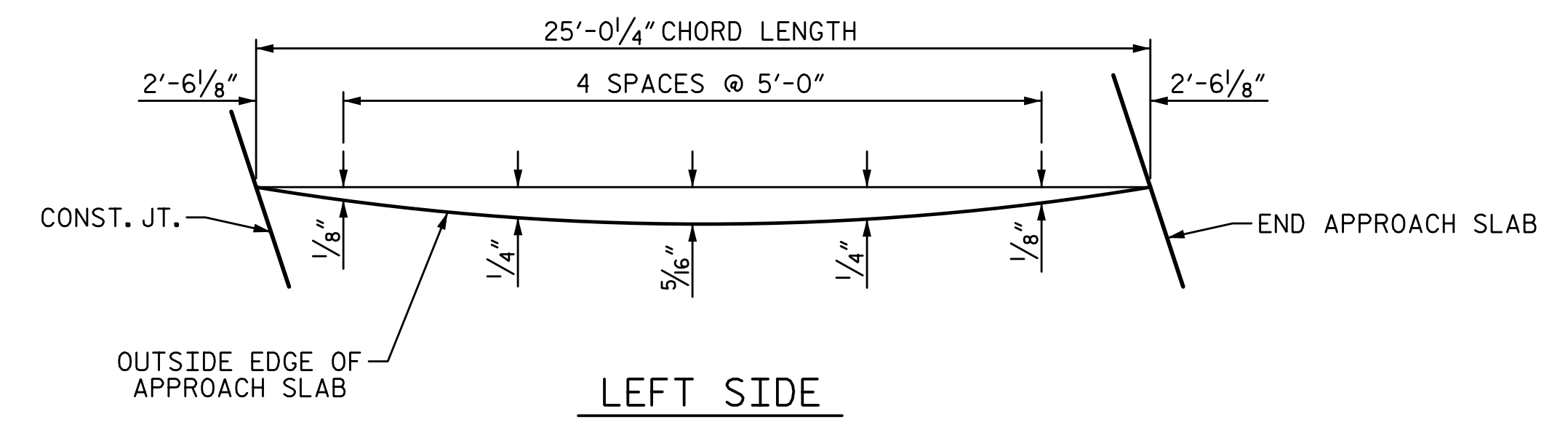


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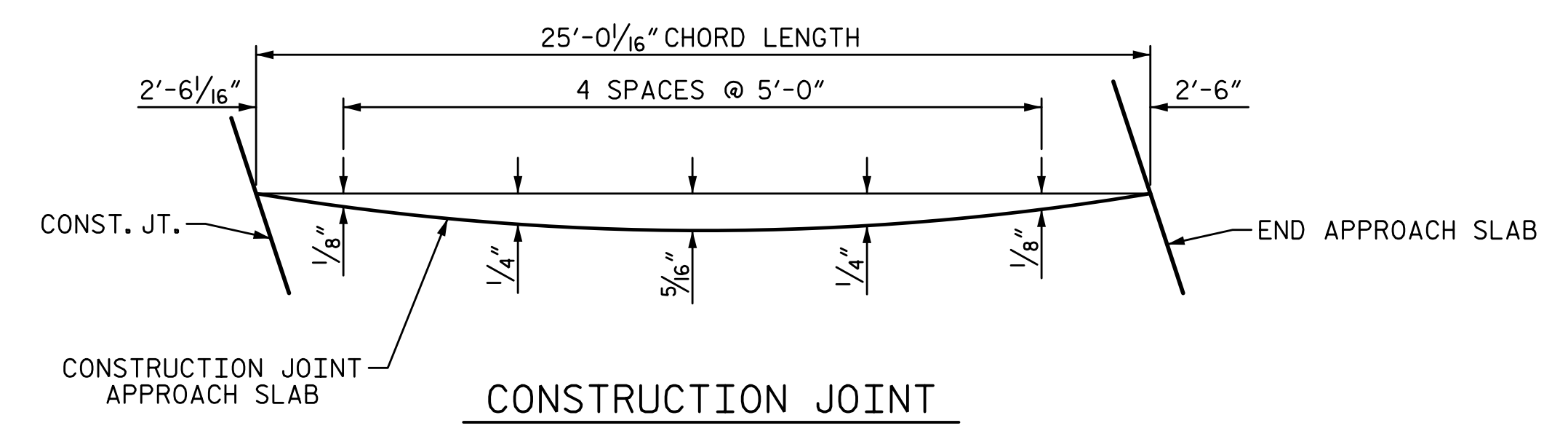


**PLAN @ END BENT 2**

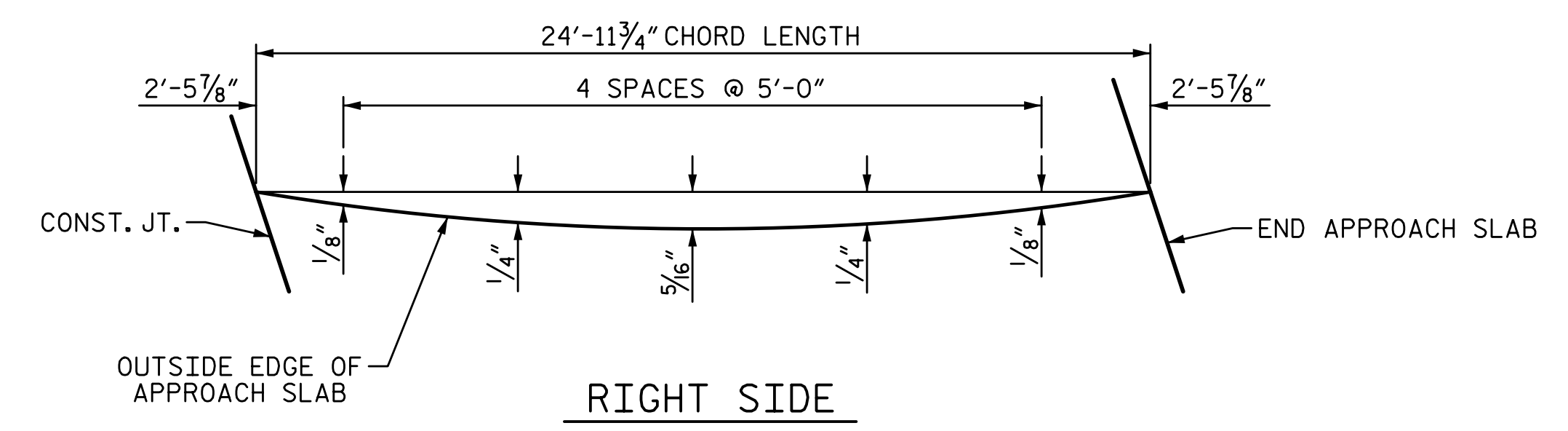
\* RADIAL DIMENSIONS  
▲ "B" BARS PLACED PARALLEL TO APPROACH SLAB CHORD



**LEFT SIDE**



**CONSTRUCTION JOINT**



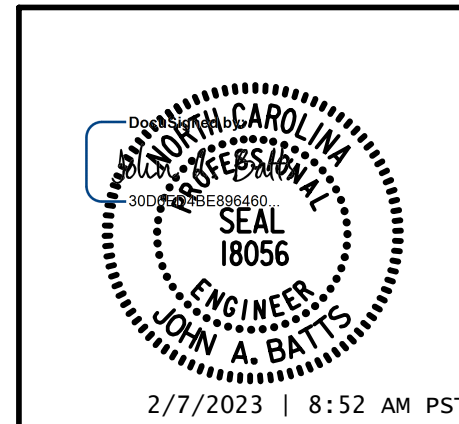
**RIGHT SIDE**

**ARC OFFSETS @ END BENT 2**

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**BRIDGE APPROACH SLAB  
 FOR INTEGRAL  
 END BENT**



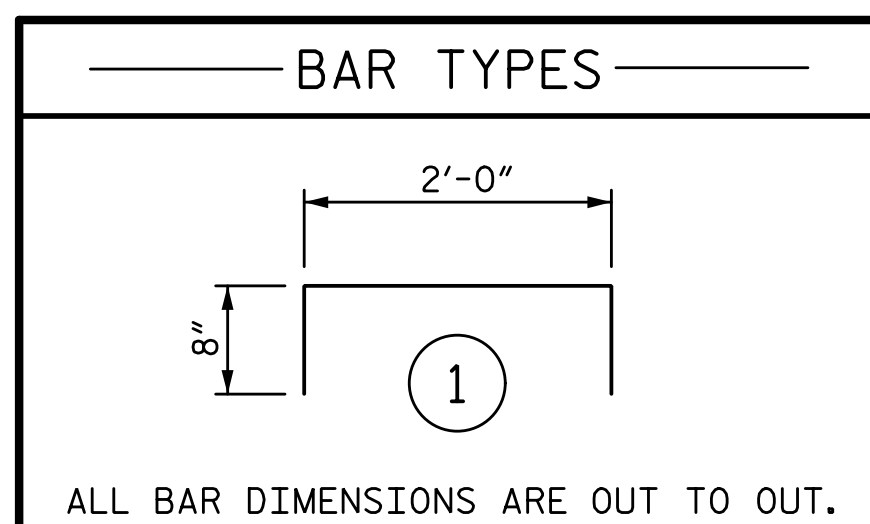
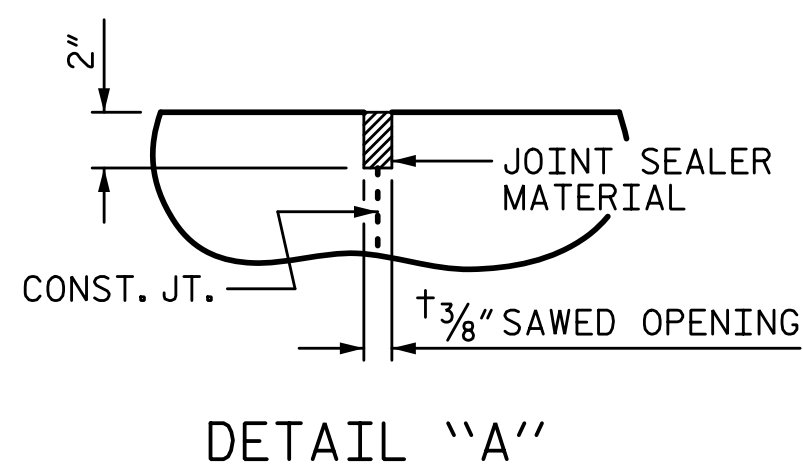
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			58

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>2-22</u>
CHECKED BY: <u>J.A. BATTS</u>	DATE: <u>2-22</u>
DESIGN ENGINEER OF RECORD: <u>J.A. BATTS</u>	DATE: <u>2-22</u>

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

**NOTES:**

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

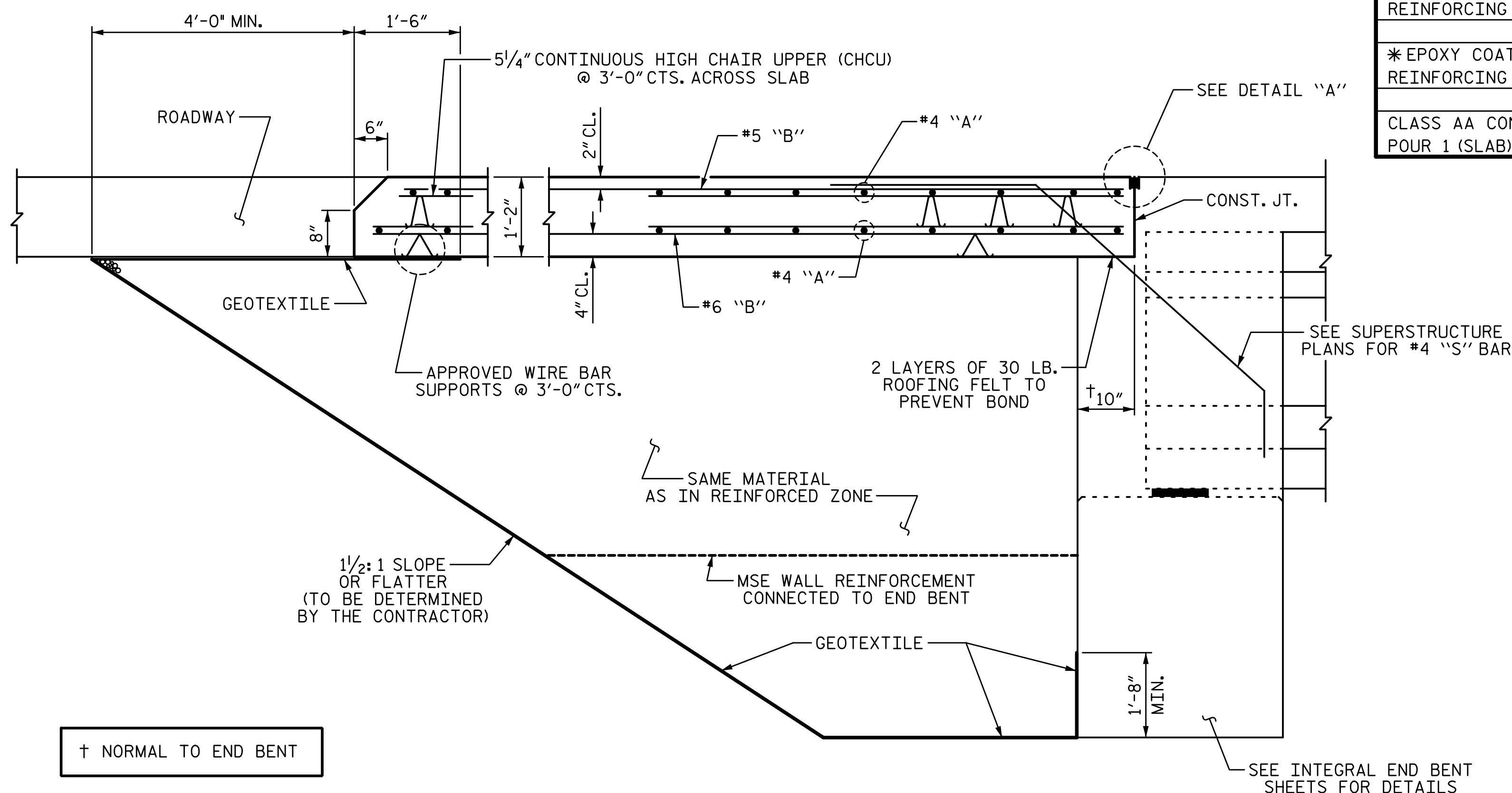
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SEE MSE WALL NOTES FOR MORE INFORMATION ABOUT MSE BACKWALL MATERIAL.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB FOR EACH STAGE.

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

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



BILL OF MATERIAL FOR ONE APPROACH SLAB @ END BENT 1 (STAGE 1)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A101	26	#4	STR	39'-1"	679
A102	26	#4	STR	39'-1"	679
* B101	75	#5	STR	24'-1"	1884
B102	75	#6	STR	24'-7"	2769
* D1	25	#6	STR	6'-0"	225
REINFORCING STEEL					3448 LB
* EPOXY COATED REINFORCING STEEL					2788 LB
CLASS AA CONCRETE BREAKDOWN POUR 1 (SLAB)					40.4 CY

BILL OF MATERIAL FOR ONE APPROACH SLAB @ END BENT 1 (STAGE 2)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A201	52	#4	STR	23'-3"	808
A202	52	#4	STR	23'-0"	799
* B201	85	#5	STR	24'-1"	2135
B202	85	#6	STR	24'-7"	3139
* B203	4	#4	STR	24'-7"	66
* G1	25	#4	STR	5'-2"	86
* U1	8	#4	1	3'-4"	18
REINFORCING STEEL					3938 LB
* EPOXY COATED REINFORCING STEEL					3113 LB
CLASS AA CONCRETE BREAKDOWN POUR 1 (SLAB)					45.7 CY
POUR 2 (SIDEWALK)					2.5 CY
TOTAL					48.2 CY

BILL OF MATERIAL FOR TWO SIDEWALKS (STAGE 3)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B301	8	#4	STR	24'-7"	131
* G1	50	#4	STR	5'-2"	173
* G2	8	#4	STR	5'-2"	28
* U2	32	#4	STR	9"	16
* EPOXY COATED REINFORCING STEEL					348 LB
CLASS AA CONCRETE BREAKDOWN SIDEWALK					6.2 CY

BILL OF MATERIAL FOR ONE APPROACH SLAB @ END BENT 2 (STAGE 1)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A103	26	#4	STR	38'-3"	664
A104	26	#4	STR	38'-3"	664
* B101	75	#5	STR	24'-1"	1884
B102	75	#6	STR	24'-7"	2769
* D1	25	#6	STR	6'-0"	225
REINFORCING STEEL					3433 LB
* EPOXY COATED REINFORCING STEEL					2773 LB
CLASS AA CONCRETE BREAKDOWN POUR 1 (SLAB)					40.4 CY

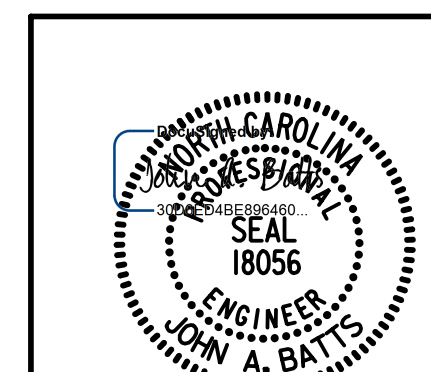
BILL OF MATERIAL FOR ONE APPROACH SLAB @ END BENT 2 (STAGE 2)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A203	52	#4	STR	22'-8"	787
A204	52	#4	STR	22'-6"	782
* B201	85	#5	STR	24'-1"	2135
B202	85	#6	STR	24'-7"	3139
* B203	4	#4	STR	24'-7"	66
* G1	25	#4	STR	5'-2"	86
* U1	8	#4	1	3'-4"	18
REINFORCING STEEL					3921 LB
* EPOXY COATED REINFORCING STEEL					3092 LB
CLASS AA CONCRETE BREAKDOWN POUR 1 (SLAB)					45.7 CY
POUR 2 (SIDEWALK)					2.5 CY
TOTAL					48.2 CY

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
 STATION: 18+82.09 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL END BENT



LICENSURE NO. C-4434

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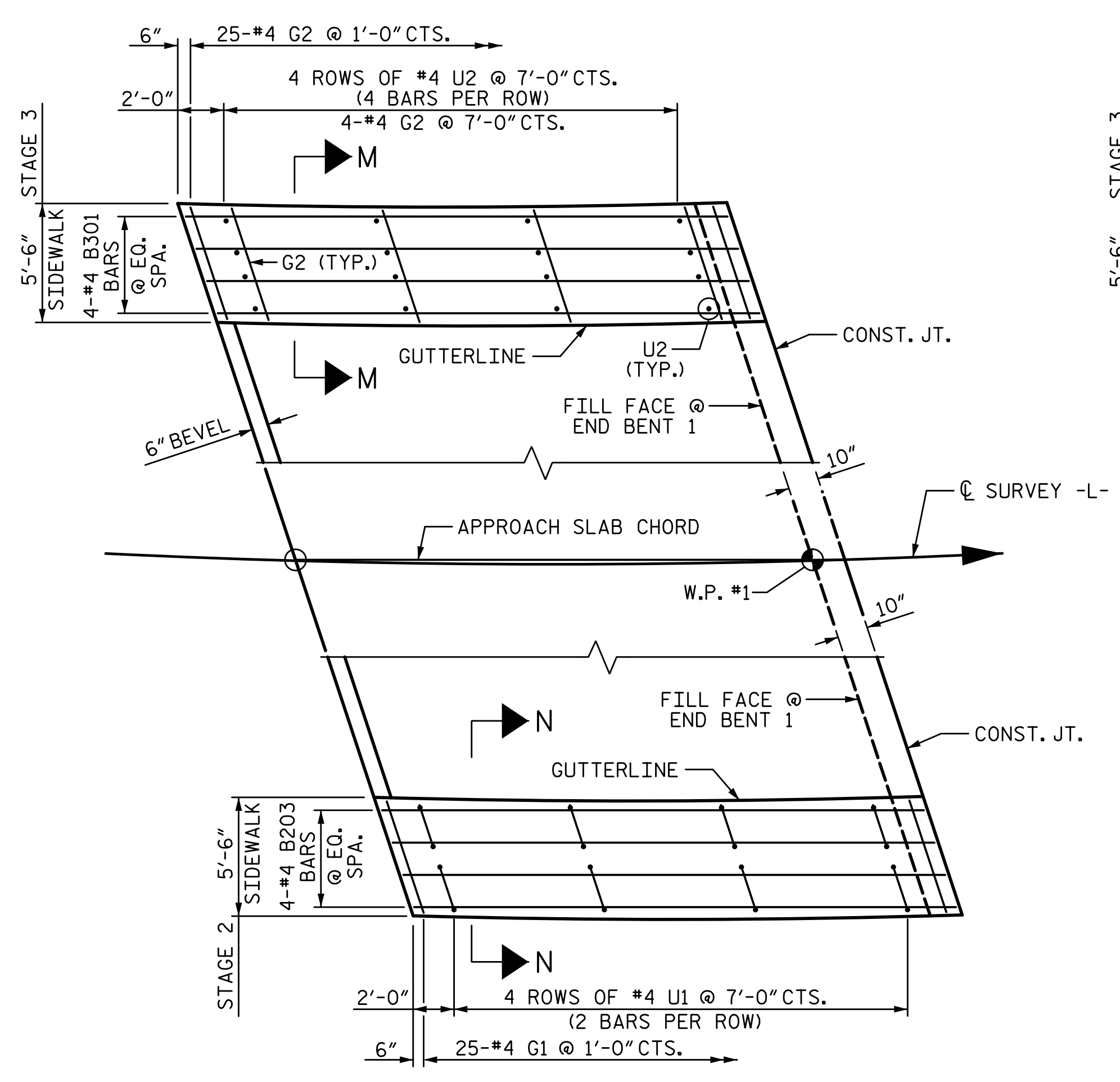
DRAWN BY: S.D. COOPER	DATE: 2-22
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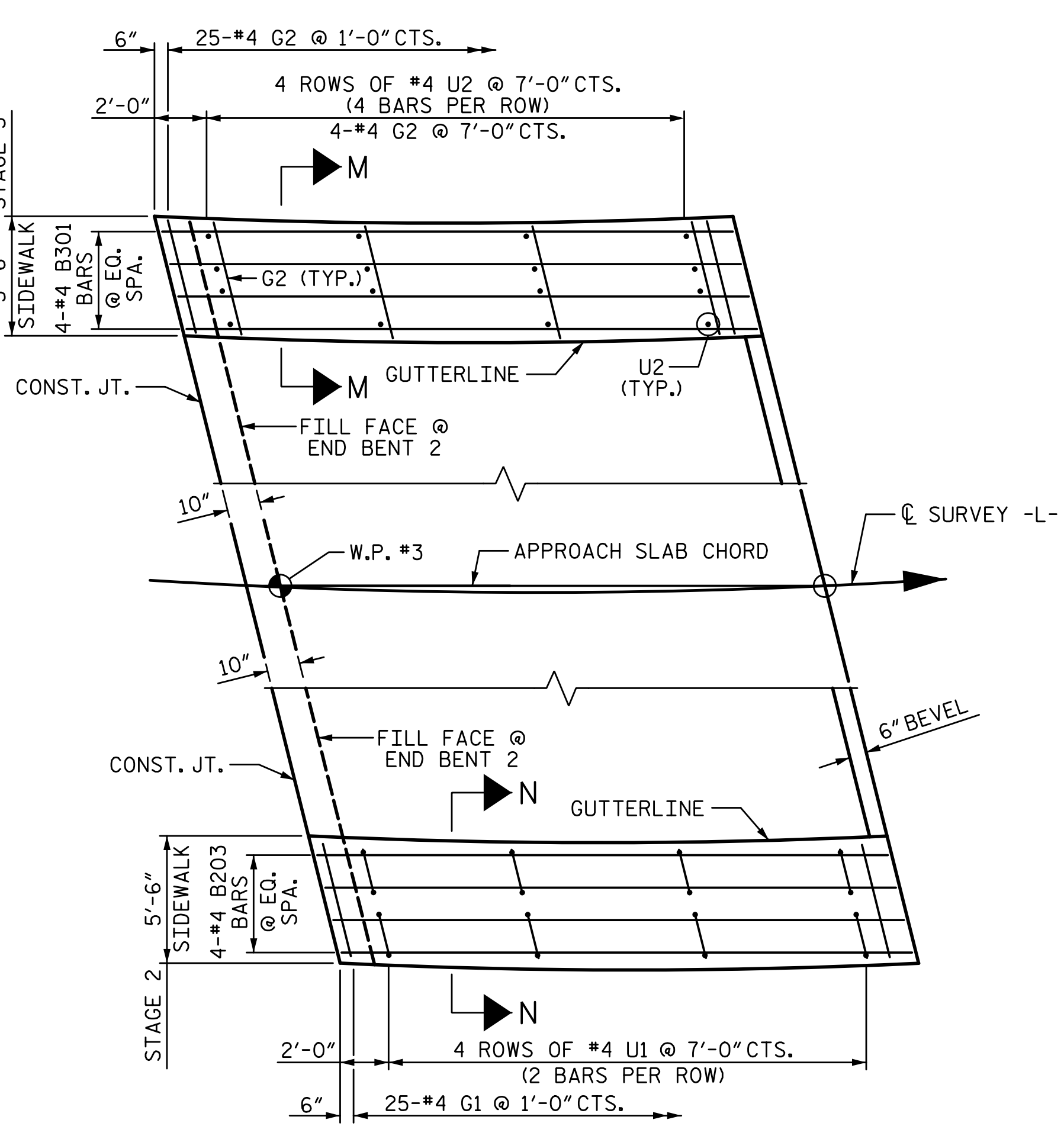
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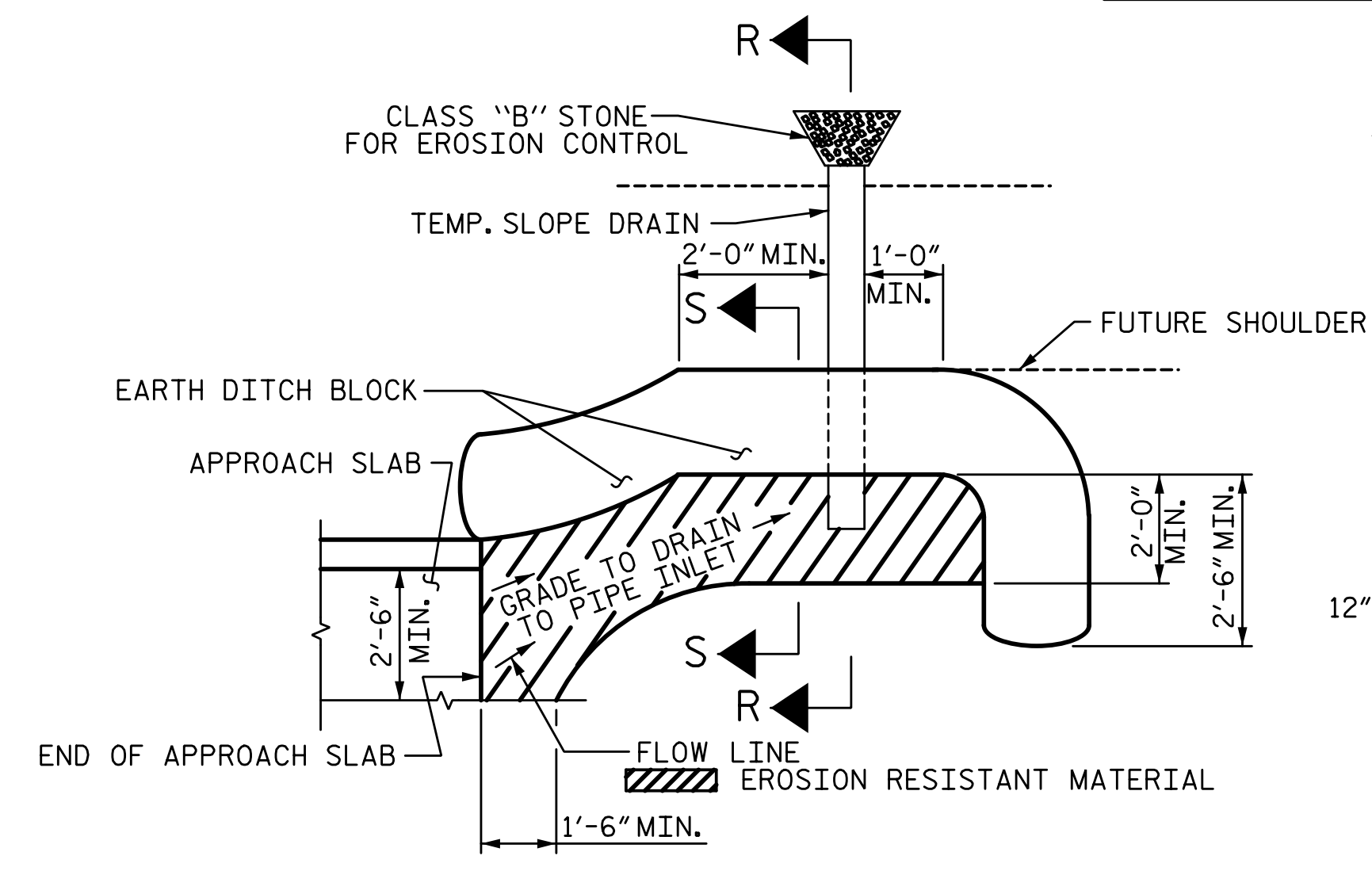


APPROACH SLAB @ END BENT 1



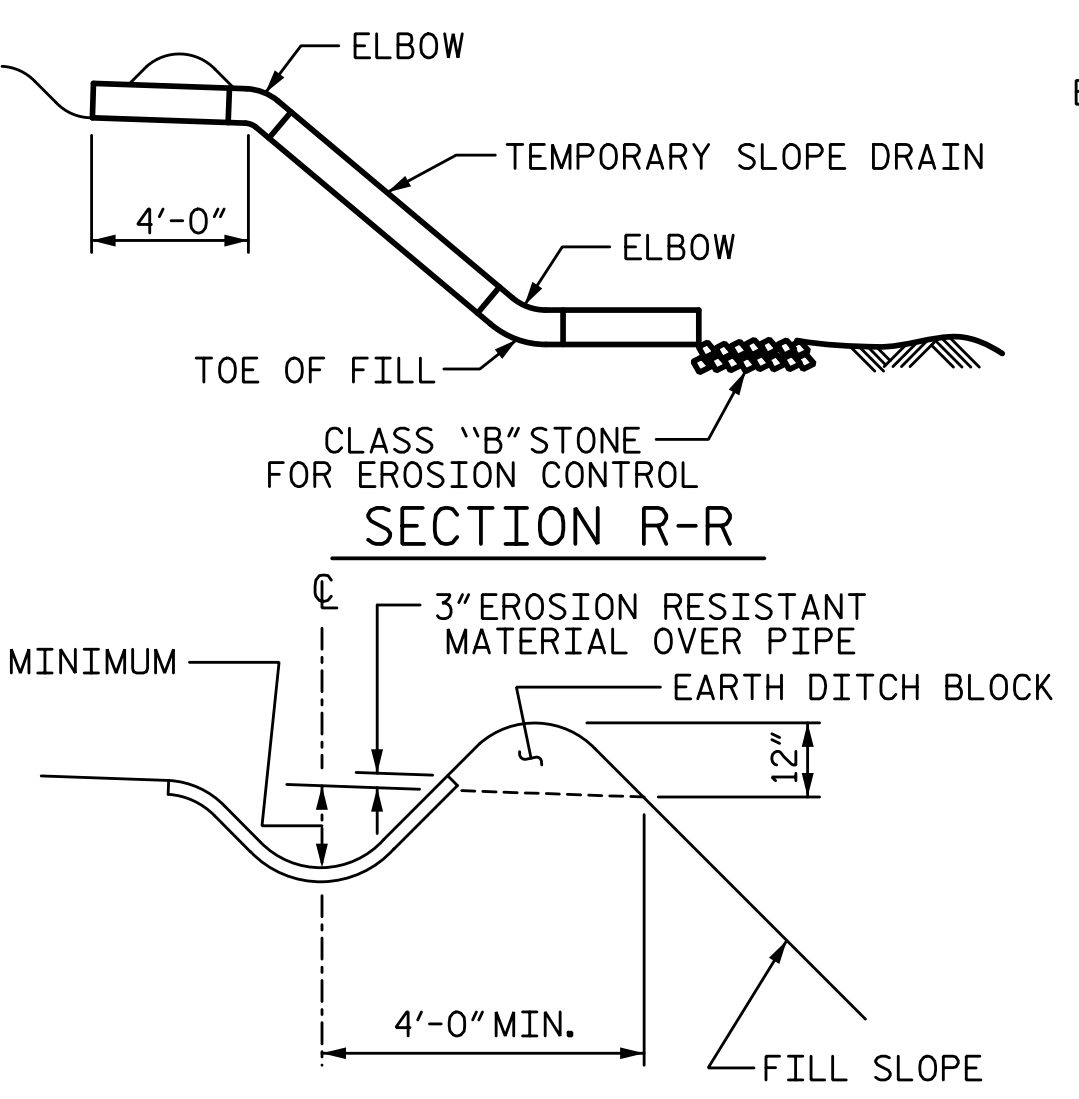
APPROACH SLAB @ END BENT 2

PLAN OF SIDEWALKS

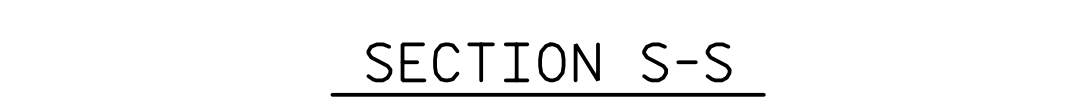


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

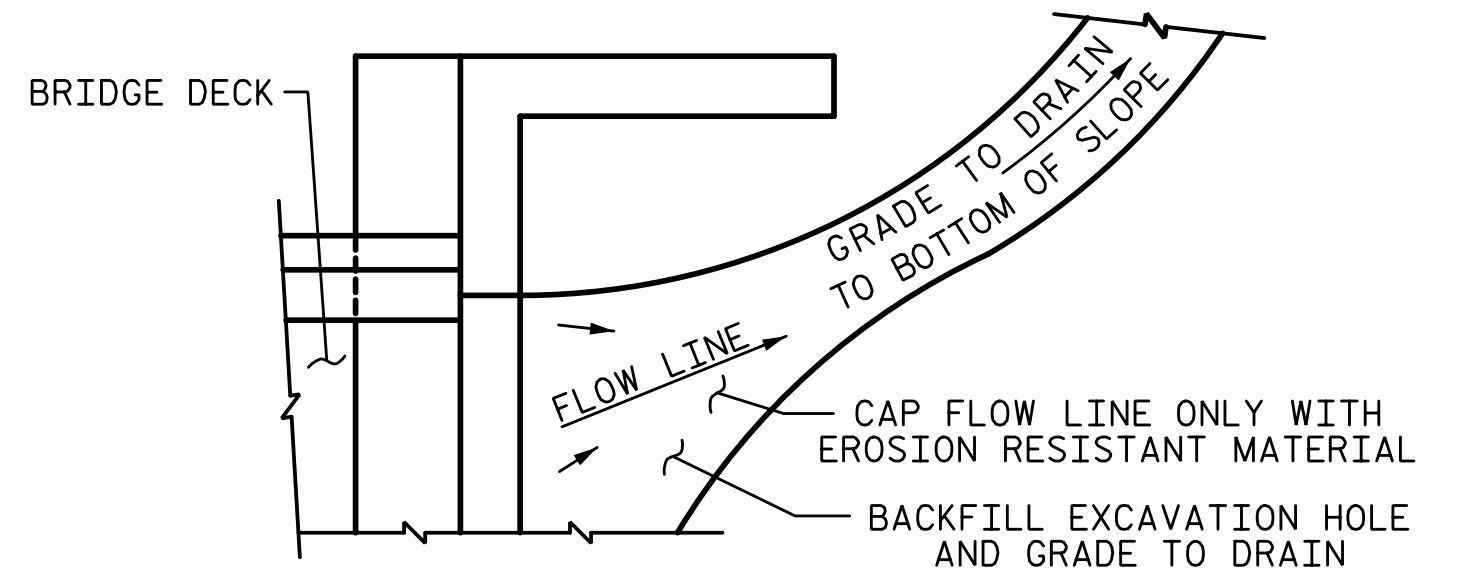
PLAN VIEW



SECTION R-R



SECTION S-S

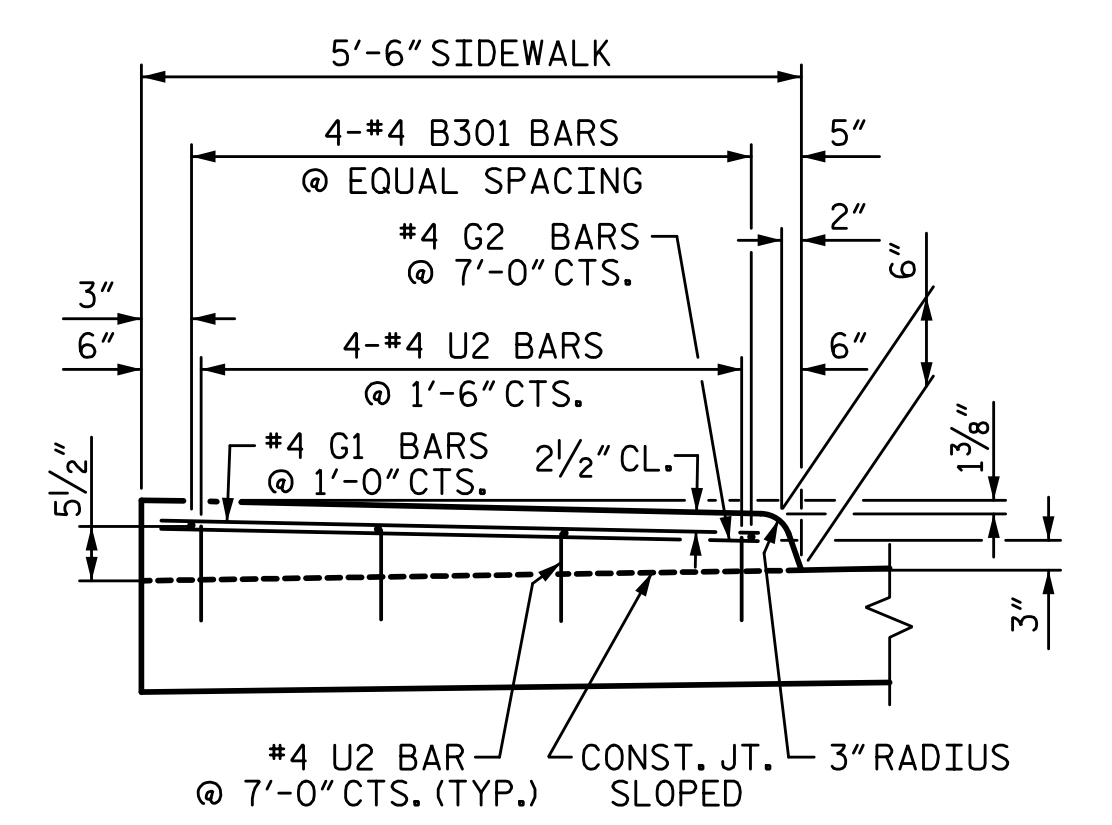


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

NOTES:

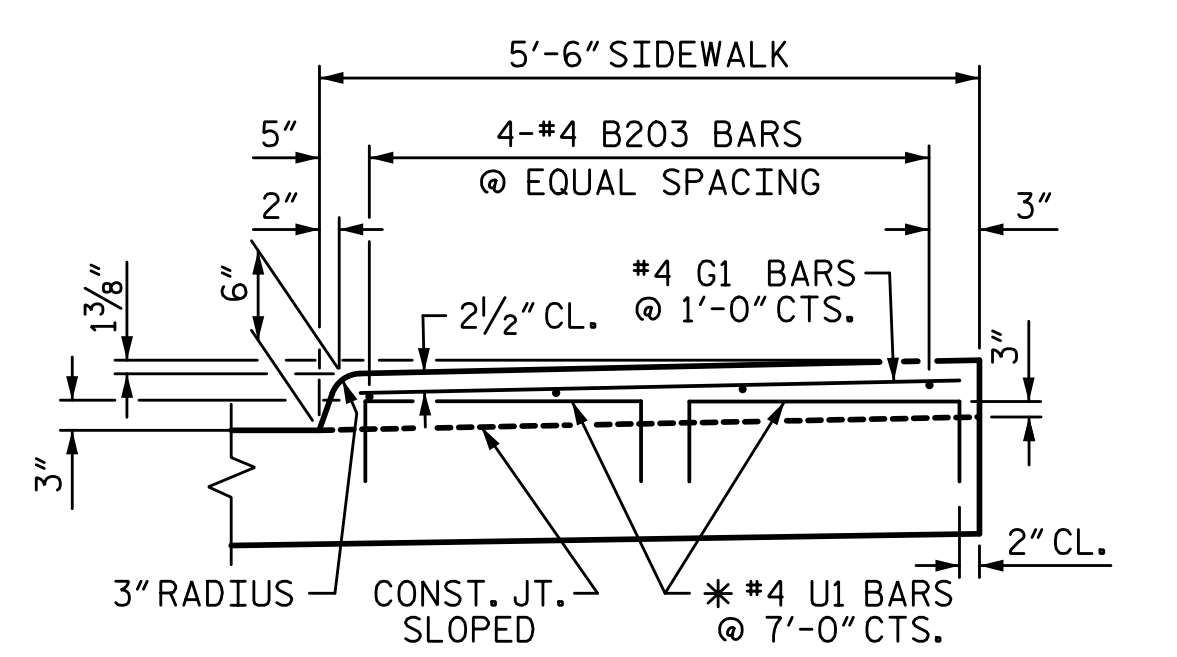
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.  
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH THE ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT.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



SECTION M-M

SIDEWALK DETAILS - STAGE 3

\*U2 BARS SHALL BE DRILLED AND GROUTED IN STAGE 3.



SECTION N-N

SIDEWALK DETAILS - STAGE 2

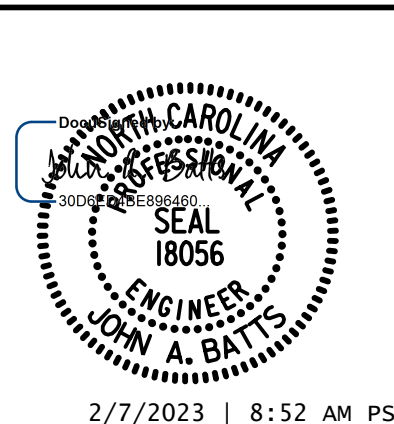
\*U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER THE APPROACH SLAB HAS BEEN SCREEDED OFF.

PROJECT NO. BP7.R006.3  
GUILFORD COUNTY  
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SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

BRIDGE APPROACH  
SLAB FOR INTEGRAL  
END BENT



DRAWN BY: S.D. COOPER	DATE: 2-22
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TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

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## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990