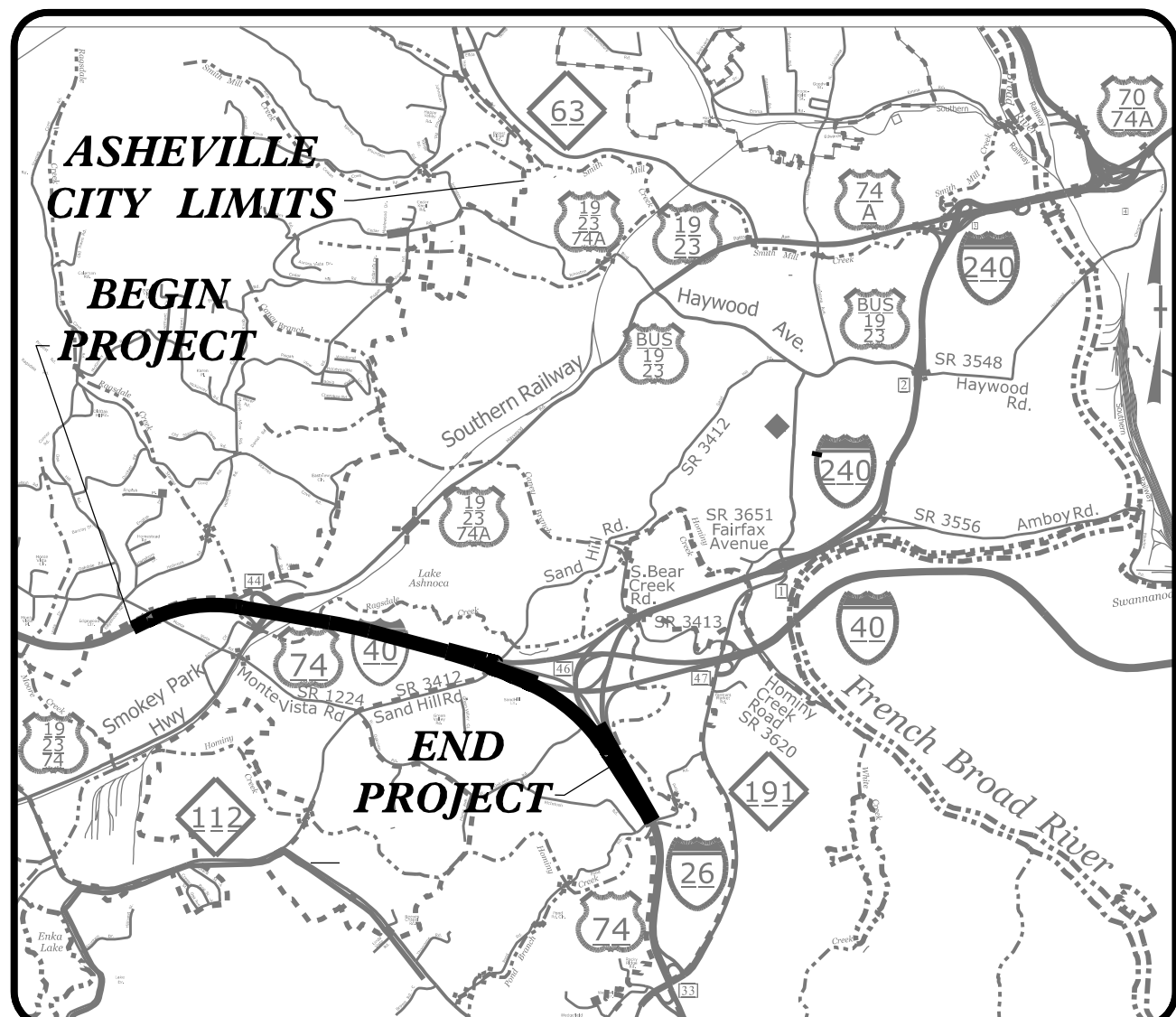


TIP PROJECT: I-2513AA/AB

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

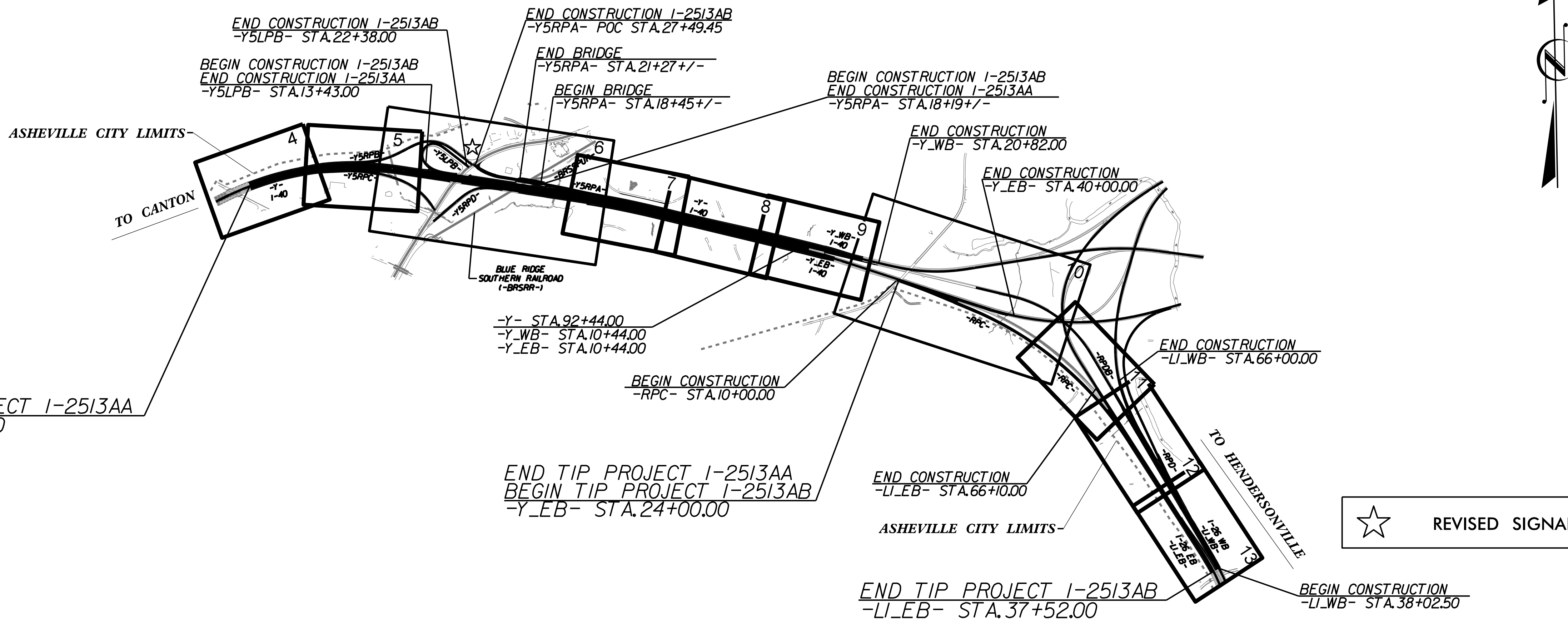
**BUNCOMBE COUNTY**

**LOCATION: I-40 FROM EAST OF SR 1224 (MONTE VISTA RD) TO WEST OF SR 3412 (SAND HILL RD) AND I-40 AT I-26 AND US19/23 INTERCHANGES.**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, RETAINING WALLS, SOUND WALLS, AND ITS**

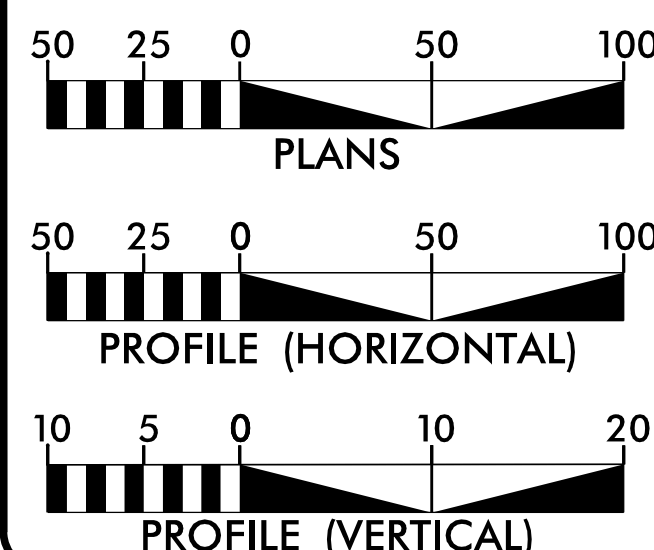
STRUCTURE PLANS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AA/AB		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34165.1.1\34165.1.12	0026024 /0026025	P.E.	
34165.2.14\34165.2.16	0026024 /0026025	R/W	
34165.2.15\34165.2.17	0026024 /0026025	UTIL.	
34165.3.6\34165.3.7	0026024 /0026025	CONST.	



★ REVISED SIGNAL

GRAPHIC SCALES



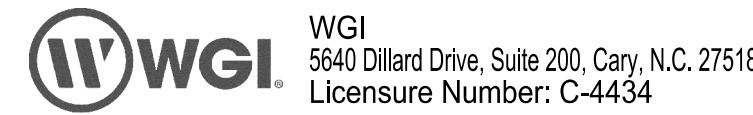
DESIGN DATA

ADT 2024 = 95,100  
 ADT 2040 = 118,800  
 K = 9 %  
 D = 55 %  
 T = 11 % \*  
 V = 60 MPH  
 \* TTST = 8% DUAL 3%  
 FUNC CLASS = INTERSTATE  
 STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-2513AA = 1.652 MI  
 LENGTH ROADWAY TIP PROJECT I-2513AB = 1.098 MI  
 TOTAL LENGTH TIP PROJECT I-2513AA/AB = 2.750 MI

Structure Plans Prepared in the Office of:



2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
NOVEMBER 18, 2022

LETTING DATE:  
JULY 16, 2024

CHARLES L. FLOWE, P.E.  
PROJECT ENGINEER

BARRY C. SMITH, P.E.  
PROJECT DESIGN ENGINEER

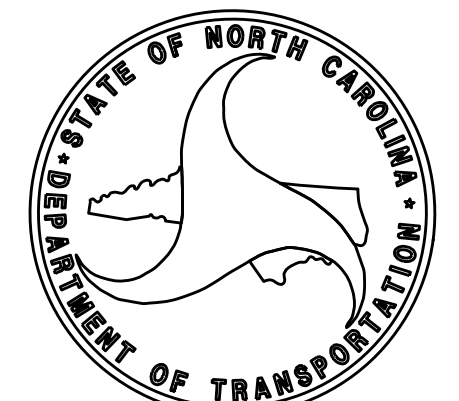
KEVIN E. MOORE, P.E.  
NCDOT CONTACT

STRUCTURE DESIGN ENGINEER



5/8/2024 | 10:16 AM PDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





### INDEX OF SHEETS

SHEET NO.	DESCRIPTION
S-1	GENERAL DRAWING FOR BRIDGE ON I-40 RAMP OVER BLUE RIDGE SOUTHERN RAILROAD BETWEEN I-26 AND ALT. US 74
S-2	GENERAL DRAWING FOR BRIDGE ON I-40 RAMP OVER BLUE RIDGE SOUTHERN RAILROAD BETWEEN I-26 AND ALT. US 74
S-3	PILE FOUNDATION TABLES
S-4	GENERAL DRAWING FOR BRIDGE ON I-40 RAMP OVER BLUE RIDGE SOUTHERN RAILROAD BETWEEN I-26 AND ALT. US 74
S-5	GENERAL DRAWING FOR BRIDGE ON I-40 RAMP OVER BLUE RIDGE SOUTHERN RAILROAD BETWEEN I-26 AND ALT. US 74
S-6	LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
S-7	SUPERSTRUCTURE TYPICAL SECTION
S-8	SUPERSTRUCTURE TYPICAL SECTION
S-9	SUPERSTRUCTURE TYPICAL SECTION
S-10	SUPERSTRUCTURE PLAN OF SPANS
S-11	SUPERSTRUCTURE PLAN OF SPANS
S-12	SUPERSTRUCTURE PLAN OF SPANS
S-13	SUPERSTRUCTURE PLAN OF SPANS
S-14	SUPERSTRUCTURE PLAN OF SPANS
S-15	SUPERSTRUCTURE ARC OFFSETS
S-16	SUPERSTRUCTURE FRAMING PLAN
S-17	SUPERSTRUCTURE 63" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN A)
S-18	SUPERSTRUCTURE 63" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN B)
S-19	SUPERSTRUCTURE 63" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN C)
S-20	SUPERSTRUCTURE 63" PRESTRESSED CONCRETE MODIFIED BULB TEE DETAILS
S-21	SUPERSTRUCTURE DEAD LOAD DEFLECTION AND GIRDER CAMBER (SPAN A)
S-22	SUPERSTRUCTURE DEAD LOAD DEFLECTION AND GIRDER CAMBER (SPAN B)
S-23	SUPERSTRUCTURE DEAD LOAD DEFLECTION AND GIRDER CAMBER (SPAN C)
S-24	SUPERSTRUCTURE INTERMEDIATE STEEL DIAPHRAGM FOR 63" PRESTRESSED CONCRETE MODIFIED BULB TEE
S-25	SUPERSTRUCTURE ELASTOMERIC BEARING DETAILS
S-26	SUPERSTRUCTURE CONCRETE BARRIER RAIL
S-27	SUPERSTRUCTURE CONCRETE BARRIER RAIL
S-28	SUPERSTRUCTURE GUARDRAIL ANCHORAGE FOR BARRIER RAIL
S-29	SUPERSTRUCTURE EXPANSION JOINT SEALS DETAILS
S-30	SUPERSTRUCTURE EXPANSION JOINT SEALS DETAILS FOR BARRIER RAIL
S-31	SUPERSTRUCTURE PAVEMENT MARKING DETAILS
S-32	SUPERSTRUCTURE BILL OF MATERIAL
S-33	SUPERSTRUCTURE BILL OF MATERIAL
S-34	SUBSTRUCTURE END BENT 1
S-35	SUBSTRUCTURE END BENT 1
S-36	SUBSTRUCTURE END BENT 1
S-37	SUBSTRUCTURE BENT 1
S-38	SUBSTRUCTURE BENT 1
S-39	SUBSTRUCTURE BENT 2
S-40	SUBSTRUCTURE BENT 2
S-41	SUBSTRUCTURE 24" STEEL PIPE PILE
S-42	SUBSTRUCTURE END BENT 2
S-43	SUBSTRUCTURE END BENT 2
S-44	ELECTRICAL CONDUIT SYSTEM DETAILS
S-45	ELECTRICAL CONDUIT SYSTEM DETAILS
S-46	SLOPE PROTECTION
S-47	BRIDGE APPROACH SLAB
S-48	BRIDGE APPROACH SLAB
S-49	BRIDGE APPROACH SLAB DETAILS
S2-1	GENERAL DRAWING FOR BRIDGE ON I-26 OVER HOMINY CREEK BETWEEN I-40 AND NC 191
S2-2	ELECTRICAL CONDUIT SYSTEM RETROFIT DETAILS
S2-3	ELECTRICAL CONDUIT SYSTEM RETROFIT DETAILS

### INDEX OF SHEETS

SHEET NO.	DESCRIPTION
C1-1	TRIPLE 7 FT. X 9 FT. CONCRETE BOX CULVERT
C1-2	TRIPLE 7 FT. X 9 FT. CONCRETE BOX CULVERT
C1-3	TRIPLE 7 FT. X 9 FT. CONCRETE BOX CULVERT
C1-4	TRIPLE 7 FT. X 9 FT. CONCRETE BOX CULVERT
C1-5	WINGS FOR CONCRETE BOX CULVERT
C1-6	WINGS FOR CONCRETE BOX CULVERT
C1-7	LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERT
C2-1	SINGLE 6 FT. X 9 FT. CONCRETE BOX CULVERT
C2-2	SINGLE 6 FT. X 9 FT. CONCRETE BOX CULVERT
C2-3	SINGLE 6 FT. X 9 FT. CONCRETE BOX CULVERT
C2-4	SINGLE 6 FT. X 9 FT. CONCRETE BOX CULVERT
C2-5	WINGS FOR CONCRETE BOX CULVERT
C2-6	LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
NW-1	SOUND BARRIER WALL -NW5A- AND -NW5B-
NW-2	SOUND BARRIER WALL DETAILS -NW5A- AND -NW5B-
NW-3	SOUND BARRIER WALL DETAILS -NW5A- AND -NW5B-
NW-4	SOUND BARRIER WALL (STEEL PILES) -NW5C-
NW-5	SOUND BARRIER WALL DETAILS (STEEL PILES) -NW5C-
W-1	RETAINING WALL NO. W602 WALL PLAN AND ENVELOPE
W-2	MSE ABUTMENT WALL WITH PANELS TYPICAL AND COPING DETAILS FOR RETAINING WALL NO. W602
W-3	RETAINING WALL NO. W1002 WALL PLAN AND ENVELOPE
W-4	MSE ABUTMENT WALL WITH PANELS TYPICAL AND COPING DETAILS FOR RETAINING WALL NO. W1002
W-5	MSE WALL WITH PANELS NOTES AND LEVELING PAD STEP DETAIL FOR RETAINING WALLS NO. W602 AND W1002
W-6	RETAINING WALL NO. W601 WALL PLAN AND ENVELOPE
W-7	RETAINING WALL NO. W1001 WALL PLAN AND ENVELOPE
W-8	RETAINING WALL NO. W1101 WALL PLAN AND ENVELOPE
W-9	SOIL NAIL WALL TYPICAL AND NOTES FOR RETAINING WALLS NO. W601, W1001, AND W1101
W-10	RETAINING WALL NO. W701 WALL PLAN AND ENVELOPE
W-11	SOLDIER PILE WALL TYPICAL AND NOTES FOR RETAINING WALL NO. W701

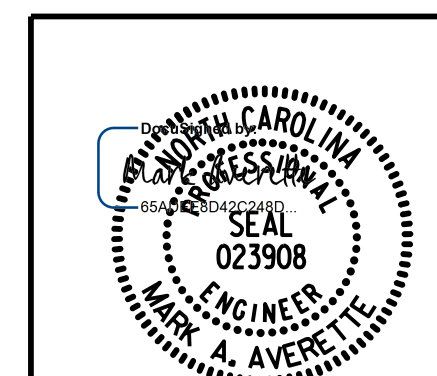
### INDEX OF STRUCTURES

STR. NO.	I.D. STATION	DESCRIPTION	BRIDGE NO.	WBS ELEMENT
S	20+16.70 -Y5RPA-	BRIDGE ON -Y5RPA- (RAMP A)	100920	34165.3.7
S2	35+60.00 -L1_EB-	BRIDGE ON -L1_EB_ (RETROFIT)	100238	34165.3.7
C1	59+50.00 -Y-	CULVERT EXTENSION AT STA. 59+50.00 -Y-	100320	34165.3.6
C2	24+63.79 -RPC-	CULVERT EXTENSION AT STA. 24+63.79 -RPC-	104007	34165.3.7
NW5A, NW5B & NW5C	63+46.57 -Y-	NOISEWALLS NW5A, NW5B, & NW5C	--	34165.3.6
W602	21+41.06 -Y5RPA-	RETAINING WALL W602	--	34165.3.7
W1002	23+68.60 -RPC-	RETAINING WALL W1002	--	34165.3.7
W601	22+00.00 -Y5RPA-	RETAINING WALL W601	--	34165.3.7
W1001	18+13.15 -RPC-	RETAINING WALL W1001	--	34165.3.7
W1101	33+78.15 -RPC-	RETAINING WALL W1101	--	34165.3.7
W701	66+46.00 -Y-	RETAINING WALL W701	--	34165.3.6

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### INDEX OF SHEETS



LICENSURE NO. C-4434

2/22/2024 | 5:49 AM PS

#### REVISIONS

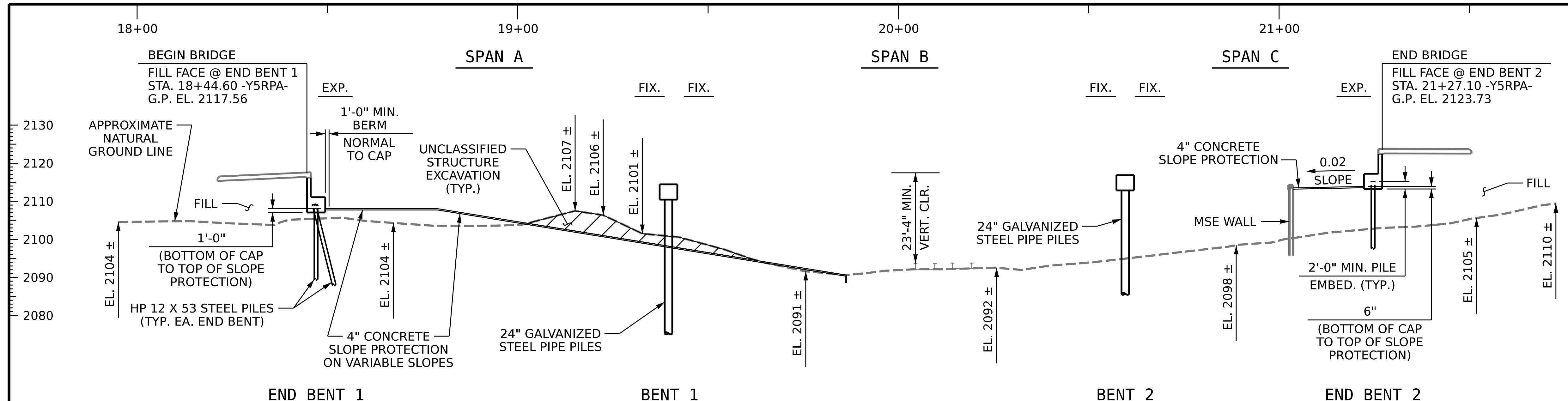
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2			4			

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

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DRAWN BY : T. BANKOVICH DATE : 12-23  
CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23





**GRADE DATA -Y5RPA-**

(+) 4.6050% (-) 4.7200%

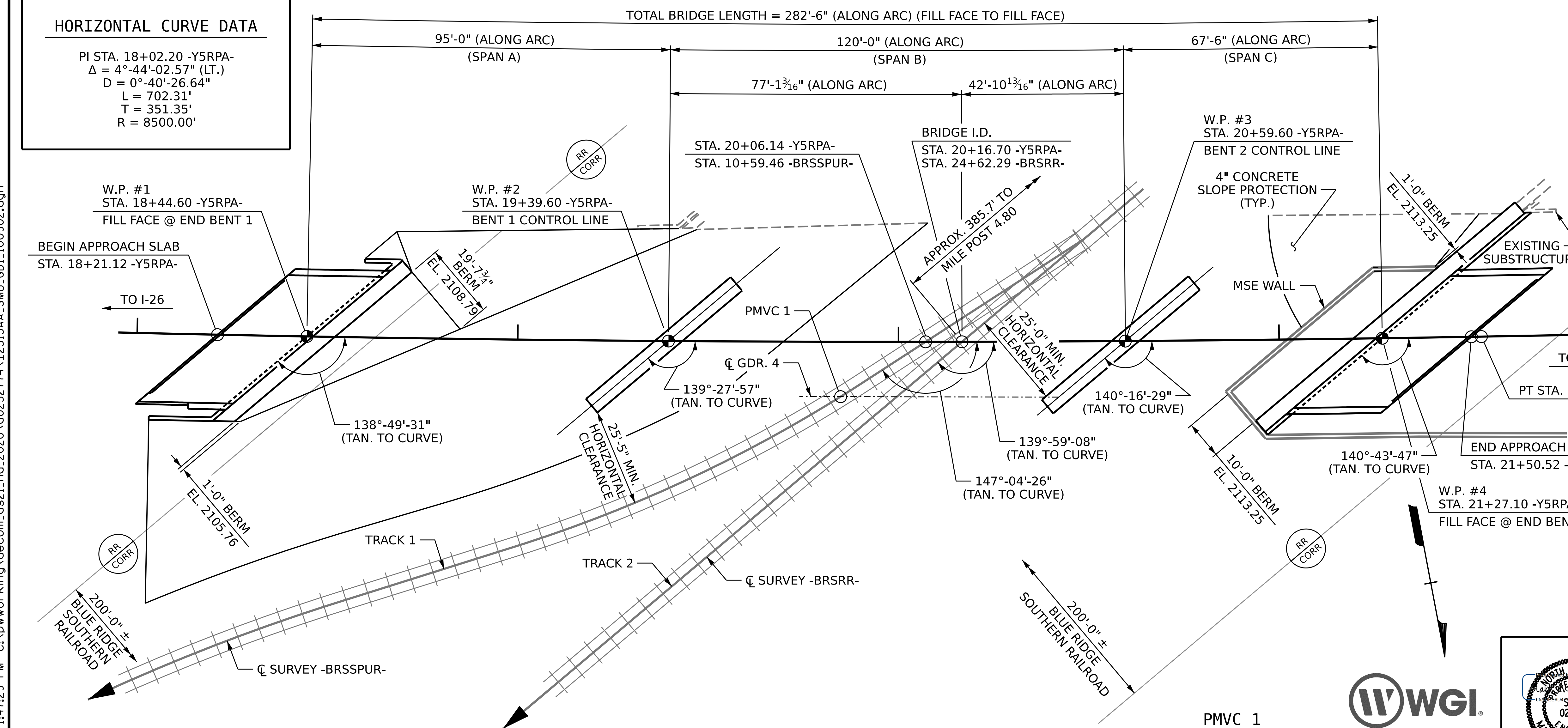
PVI STA. 21+30.00  
EL. = 2130.72  
VC = 600'

**TOP OF RAIL ELEVATIONS**  
DATE 9/6/2023

TRACK 1		TRACK 2	
STA. -BRSSPUR-	EL.	STA. -BRSRR-	EL.
10+00.00	2093.61	24+00.00	2093.73
10+05.00	2093.53	24+05.00	2093.68
10+10.00	2093.45	24+10.00	2093.62
10+15.00	2093.36	24+15.00	2093.57
10+20.00	2093.27	24+20.00	2093.51
10+25.00	2093.15	24+25.00	2093.45
10+30.00	2093.09	24+30.00	2093.36
10+35.00	2093.03	24+35.00	2093.27
10+40.00	2093.01	24+40.00	2093.19
10+45.00	2092.99	24+45.00	2093.10
10+50.00	2092.91	24+50.00	2093.01
10+55.00	2092.85	24+55.00	2092.93
10+60.00	2092.77	24+60.00	2092.84
10+65.00	2092.68	24+65.00	2092.70
10+70.00	2092.58	24+70.00	2092.60
10+75.00	2092.47	24+75.00	2092.51
10+80.00	2092.34	24+80.00	2092.42
10+85.00	2092.20	24+85.00	2092.34
10+90.00	2092.09	24+90.00	2092.25
10+95.00	2091.96	24+95.00	2092.17
11+00.00	2091.80	25+00.00	2092.08
11+05.00	2091.65	25+05.00	2091.99
11+10.00	2091.50	25+10.00	2091.89
11+15.00	2091.35	25+15.00	2091.79
11+20.00	2091.20	25+20.00	2091.69

**HORIZONTAL CURVE DATA**

PI STA. 18+02.20 -Y5RPA-  
Δ = 4°-44'-02.57" (LT.)  
D = 0°-40'-26.64"  
L = 702.31'  
T = 351.35'  
R = 8500.00'

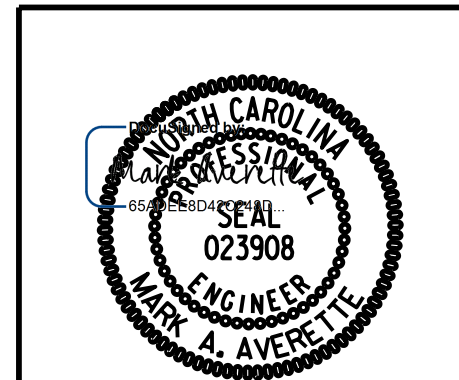


PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 6 BRIDGE #100902  
MILE POST 4.80

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE ON I-40 RAMP OVER  
BLUE RIDGE SOUTHERN RAILROAD  
BETWEEN I-26 AND ALT. US 74



DRAWN BY: S.D. COOPER DATE: 12-23  
CHECKED BY: M.A. AVERETTE DATE: 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 12-23

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

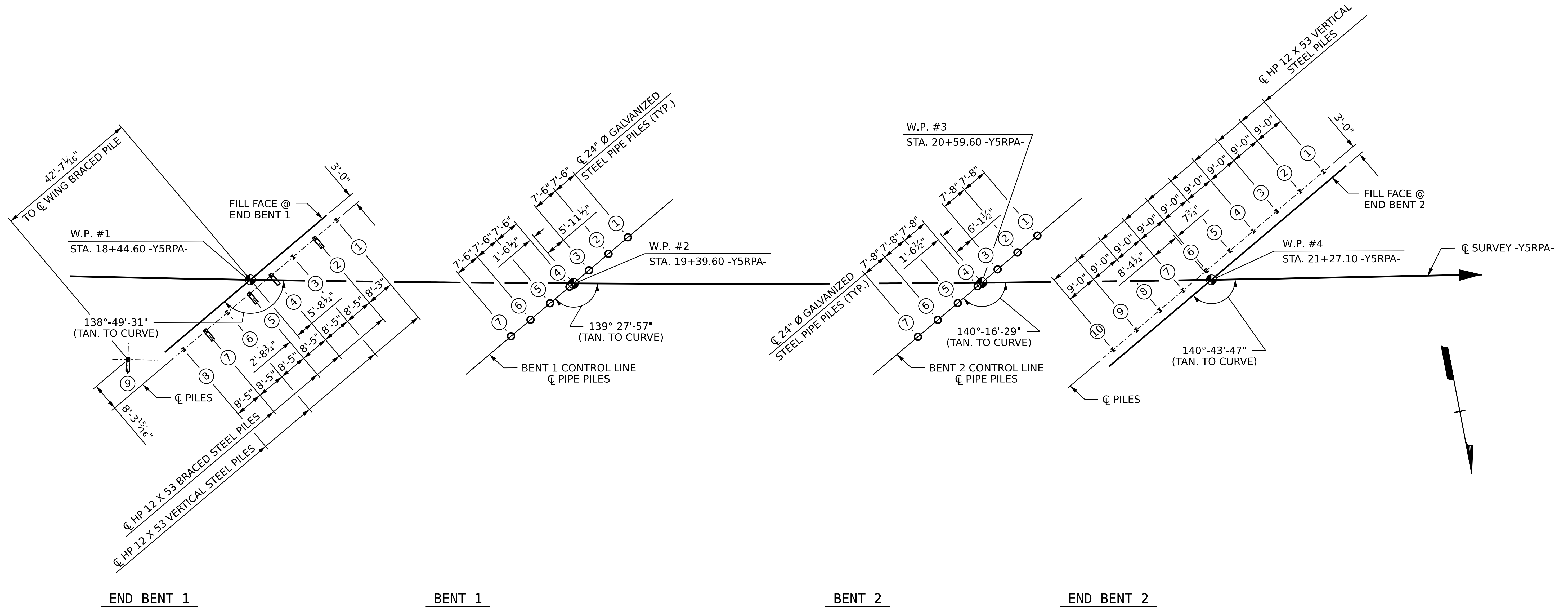
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TOTAL SHEETS 49

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LICENSURE NO. C-4434  
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



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### FOUNDATION LAYOUT

**NOTES:**

OBSERVE A 3 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 2.

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 55,000 TO 85,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT 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.

CONSTRUCT MSE WALL PRIOR TO INSTALLING PILES END BENT 2. INSTALL PILE SLEEVES AT ALL PILE LOCATIONS. THE CONTRACTOR SHOULD PARTIALLY DRIVE THE PILES FOR END BENT 2 TO A DEPTH OF 20 FEET BELOW THE TOP OF THE MSE WALL LEVELING PAD. AFTER SETTLEMENT MONITORING OF THE EMBANKMENT IS COMPLETE, DRIVE THE PILES TO THEIR REQUIRED DRIVING RESISTANCE.

INSTALL 2 SETTLEMENT GAUGES BEFORE CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE AT END BENT 2. THE ENGINEER MAY RELEASE PILE DRIVING AFTER THE SETTLEMENT RATE IS LESS THAN 1/10" PER 4 WEEK PERIOD. THE MONITORING PERIOD IS ESTIMATED TO BE 3 MONTHS.

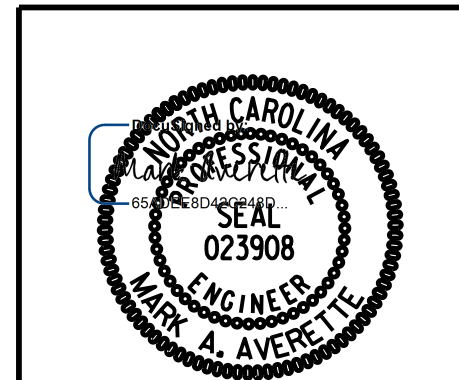
PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON I-40 RAMP OVER  
 BLUE RIDGE SOUTHERN RAILROAD  
 BETWEEN I-26 AND ALT. US 74



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					49

DRAWN BY :	S.D. COOPER	DATE :	12-23
CHECKED BY :	M.A. AVERETTE	DATE :	12-23
DESIGN ENGINEER OF RECORD:	M.A. AVERETTE	DATE :	12-23

LICENSURE NO. C-4434

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**



**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 Length 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 Exc 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 1-4	100	2108.06	85			170								
End Bent 1, Piles 5-9	100	2108.06	80			170								
End Bent 2, Piles 1-5	95	2113.75	60			160								
End Bent 2, Piles 6-10	95	2113.75	70			160								
Bent 1, Piles 1-3	190	2109.61	75		2076.0	320								
Bent 1, Piles 4-7	190	2109.61	85		2062.0	320								
Bent 2, Piles 1-3	170	2112.33	60		2068.0	285								
Bent 2, Piles 4-7	170	2112.33	65		2063.0	285								

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

**SUMMARY OF DPT/PILE ORDER LENGTHS**

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)				Pile Order Lengths	
End Bent/ Bent No	DPT Testing Required? YES or MAYBE	DPT Test Pile Length FT	Total DPT Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or DPT
End Bent 1, Piles 1-4	MAYBE		2		
End Bent 1, Piles 5-9	MAYBE				
End Bent 2, Piles 1-5	MAYBE				
End Bent 2, Piles 6-10	MAYBE				
Bent 1, Piles 1-3	MAYBE				
Bent 1, Piles 4-7	MAYBE				
Bent 2, Piles 1-3	MAYBE				
Bent 2, Piles 4-7	MAYBE				

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

**PILE DESIGN INFORMATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) ## (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-9	98.5			0.60			
End Bent 2, Piles 1-10	90.5			0.60			
Bent 1, Piles 1-7	186.4			0.60			
Bent 2, Piles 1-7	165.7			0.60			

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

PROJECT NO. I-2513AA

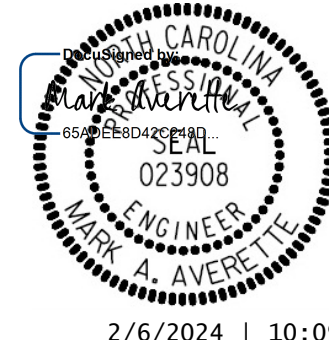
Buncombe COUNTY

STATION: -Y5RPA- 20+16.70

Bridge No. 902

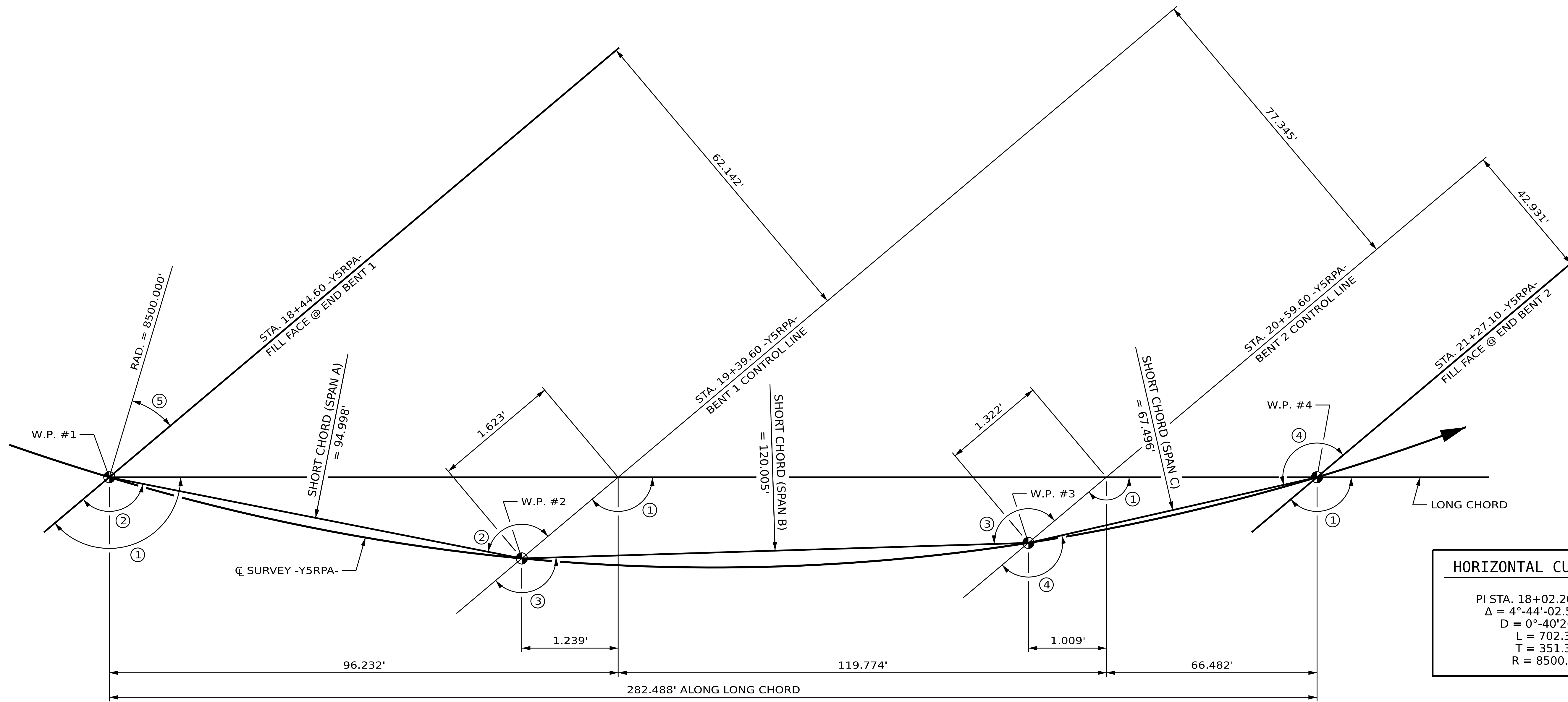
**NOTES:**

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Stephen C. Crockett, 048207) on 2/2/24.
- 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 DPT when DPT may be required.

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		<b>PILE FOUNDATION TABLES</b>		SHEET NO. S-3 TOTAL SHEETS 46		
	REVISIONS						
SIGNATURE _____ DATE _____		NO.	BY:	DATE:	NO.	BY:	DATE:
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		2			4		



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HORIZONTAL CURVE DATA	
PI STA.	18+02.20 -Y5RPA-
$\Delta$	4°-44'-02.57" (LT.)
D	0°-40'26.64"
L	702.31'
T	351.35'
R	8500.00'

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

**ANGLES**

- ① 139°-46'-39" (TO LONG CHORD)
- ② 139°-08'-44" (TO SHORT CHORD - SPAN A)
- ③ 139°-52'-13" (TO SHORT CHORD - SPAN B)
- ④ 140°-30'-08" (TO SHORT CHORD - SPAN C)
- ⑤ 48°-49'-31"

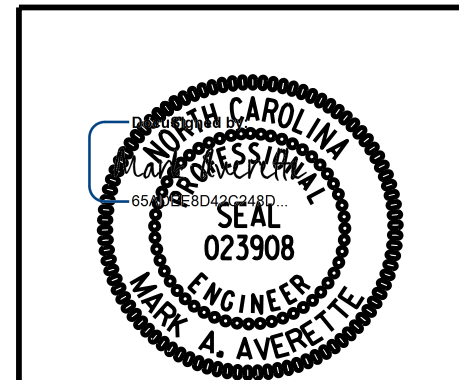
PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON I-40 RAMP OVER  
 BLUE RIDGE SOUTHERN RAILROAD  
 BETWEEN I-26 AND ALT. US 74



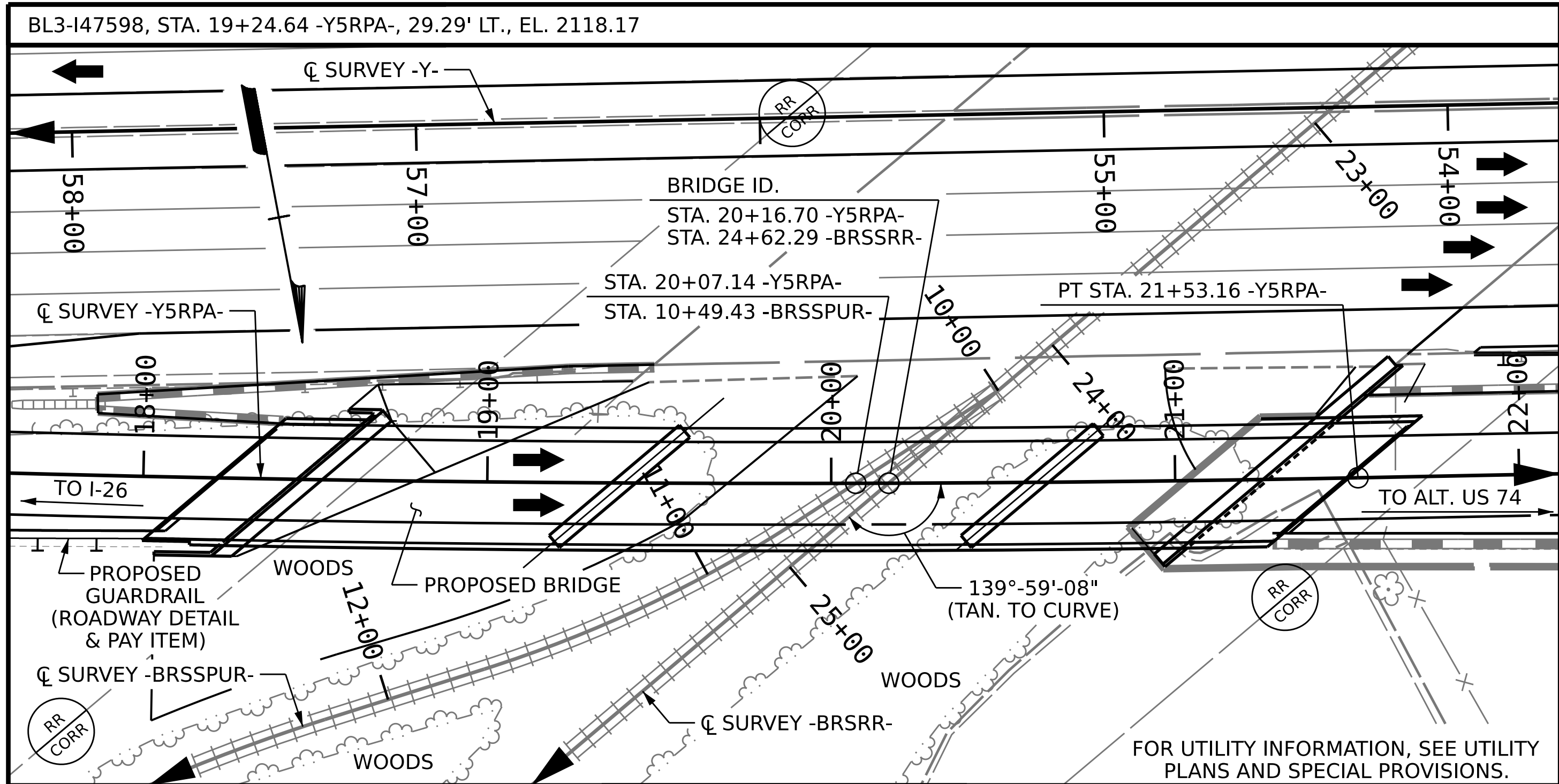
12/21/2023 | 11:09 AM

DRAWN BY :	S.D. COOPER	DATE :	12-23
CHECKED BY :	M.A. AVERETTE	DATE :	12-23
DESIGN ENGINEER OF RECORD:	M.A. AVERETTE	DATE :	12-23

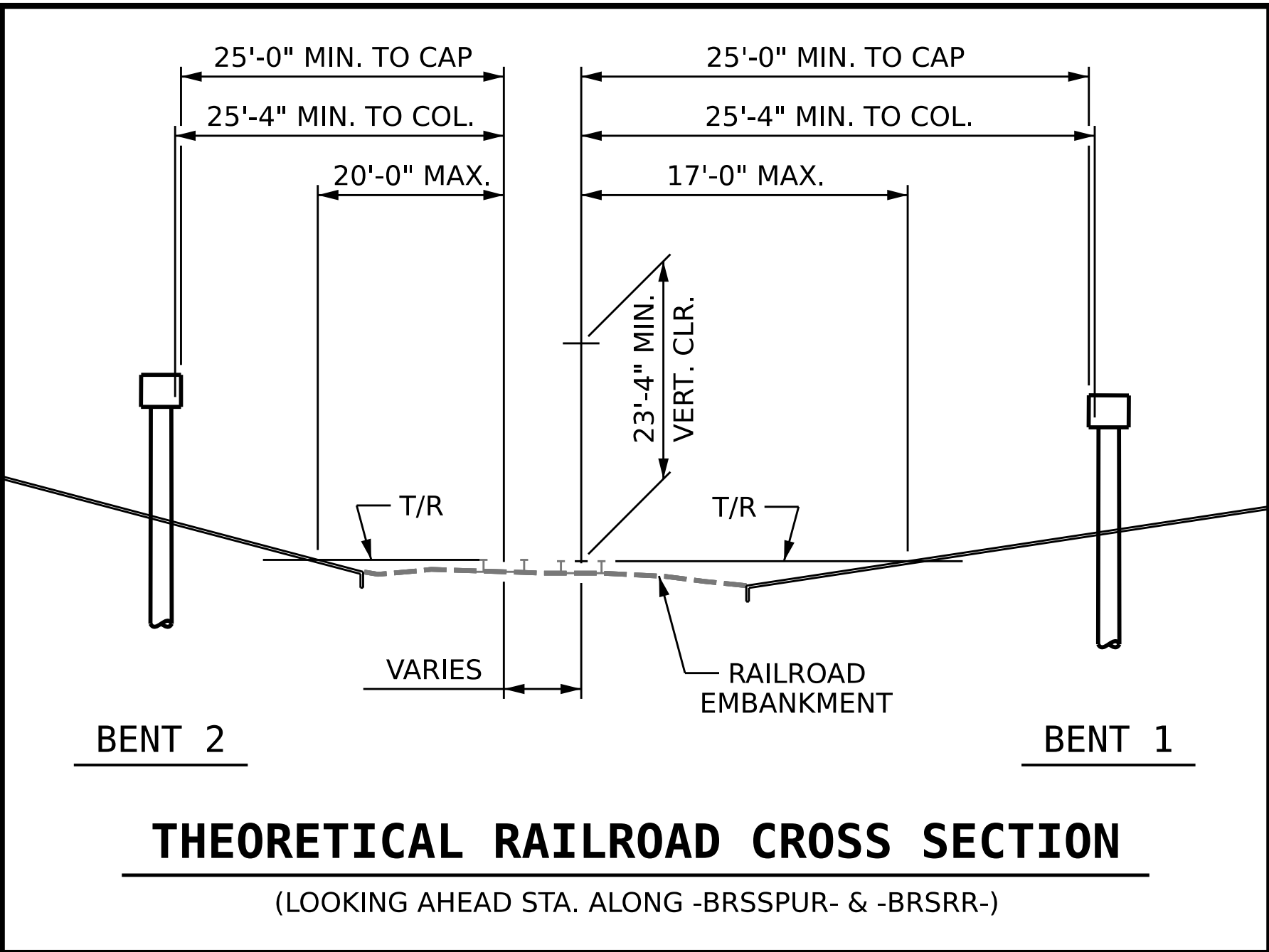
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			49

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**LOCATION SKETCH**



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

**TOTAL BILL OF MATERIAL**

	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB	REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 24 X 0.50 GALVANIZED STEEL PILES		DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	ELECTRICAL CONDUIT			
							NO.	LF		EA	EA							NO.	LF	EA
SUPERSTRUCTURE	LS	SF	SF	CY	LS	LB	12	1,092.50	EA	EA	NO.	LF	EA	LF	SY	LS	LS	LS		
END BENT 1		10,401	10,102	64.0	LS	8,776			9		9	740			1,194					
BENT 1				35.2		4,420				7		7	565							
BENT 2				34.7		4,542				7		7	440							
END BENT 2				88.0		9,863			10		10	650		180						
TOTAL	LS	10,401	10,102	221.9	LS	27,601	12	1,092.50	19	14	19	1,390	14	1005	2	643.40	1,374	LS	LS	LS

**NOTES:**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

FOR INTERIOR BENTS 1 & 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 5 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON I-40 RAMP OVER  
 BLUE RIDGE SOUTHERN RAILROAD  
 BETWEEN I-26 AND ALT. US 74



12/21/2023 | 11:09 AM

DRAWN BY :	S.D. COOPER	DATE :	12-23
CHECKED BY :	M.A. AVERETTE	DATE :	12-23
DESIGN ENGINEER OF RECORD:	M.A. AVERETTE	DATE :	12-23

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2			4			49

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

LEVEL	VEHICLE	WEIGHT (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE - LOAD FACTORS (γ <sub>LL</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>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	①	1.04	--	1.75	0.778	1.40	B	EL	59.3	1.178	1.06	B	I	11.3	0.80	0.778	1.04	B	EL	59.3		
	HL-93 (OPERATING)	N/A		1.40	--	1.35	0.778	1.81	B	EL	59.3	1.178	1.40	B	I	11.3	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	②	1.51	54.4	1.75	0.778	2.03	B	EL	59.3	1.178	1.51	B	I	11.3	0.80	0.778	1.52	B	EL	59.3		
	HS-20 OPERATING	36.000		1.98	71.3	1.35	0.757	2.64	A	EL	44.7	1.178	1.98	B	I	11.3	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		3.19	39.9	1.40	0.738	6.36	C	EL	30.8	1.178	5.31	B	I	11.3	0.80	0.778	3.19	B	EL	59.3	
		S3C	21.500		1.86	40.0	1.40	0.738	3.73	C	EL	30.8	1.178	3.07	B	I	11.3	0.80	0.778	1.86	B	EL	59.3	
		S3A	22.750		1.76	40.0	1.40	0.738	3.54	C	EL	30.8	1.178	2.90	B	I	11.3	0.80	0.778	1.76	B	EL	59.3	
		S4A	26.750		1.54	41.2	1.40	0.757	3.15	A	EL	44.7	1.178	2.50	B	I	11.3	0.80	0.778	1.54	B	EL	59.3	
		S5A	30.500		1.36	41.5	1.40	0.757	2.78	A	EL	44.7	1.178	2.25	B	I	11.3	0.80	0.778	1.36	B	EL	59.3	
		S6A	34.500		1.22	42.1	1.40	0.757	2.52	A	EL	44.7	1.178	2.00	B	I	11.3	0.80	0.778	1.22	B	EL	59.3	
		S7B	38.500		1.11	42.7	1.40	0.757	2.29	A	EL	44.7	1.178	1.84	B	I	11.3	0.80	0.778	1.11	B	EL	59.3	
		S7B	40.000	③	1.08	43.2	1.40	0.757	2.26	A	EL	44.7	1.178	1.85	B	I	11.3	0.80	0.778	1.08	B	EL	59.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.50	42.4	1.40	0.757	3.10	A	EL	44.7	1.178	2.40	B	I	11.3	0.80	0.778	1.50	B	EL	59.3	
		T5B	32.000		1.32	42.2	1.40	0.757	2.73	A	EL	44.7	1.178	2.22	B	I	11.3	0.80	0.778	1.32	B	EL	59.3	
EMERGENCY VEHICLE (EV)	EV2	28.750		1.85	53.2	1.30	0.757	3.30	A	EL	44.7	1.178	2.52	B	I	11.3	0.80	0.778	1.85	B	EL	59.3		
	EV3	43.000		1.22	52.5	1.30	0.757	2.17	A	EL	44.7	1.178	1.66	B	I	11.3	0.80	0.778	1.22	B	EL	59.3		

**LOAD FACTORS:**

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

**NOTES:**

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

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

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

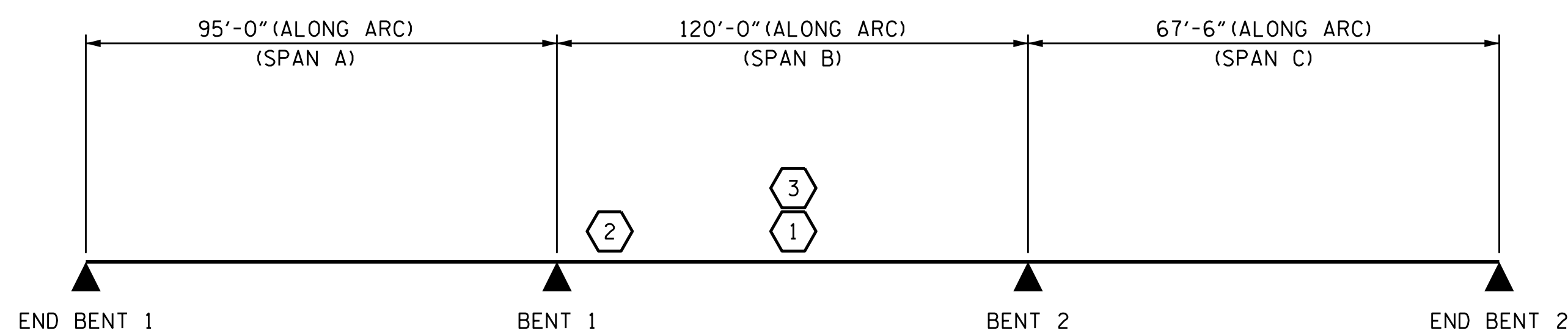
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

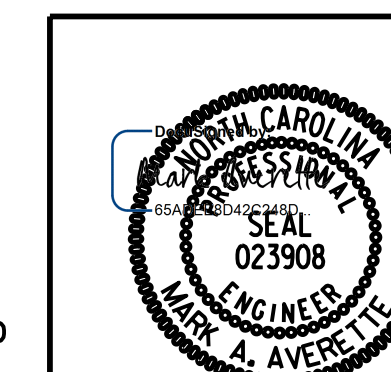
**SUPERSTRUCTURE**

**LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS**

(INTERSTATE TRAFFIC)

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

TOTAL SHEETS 49



LICENSURE NO. C-4434

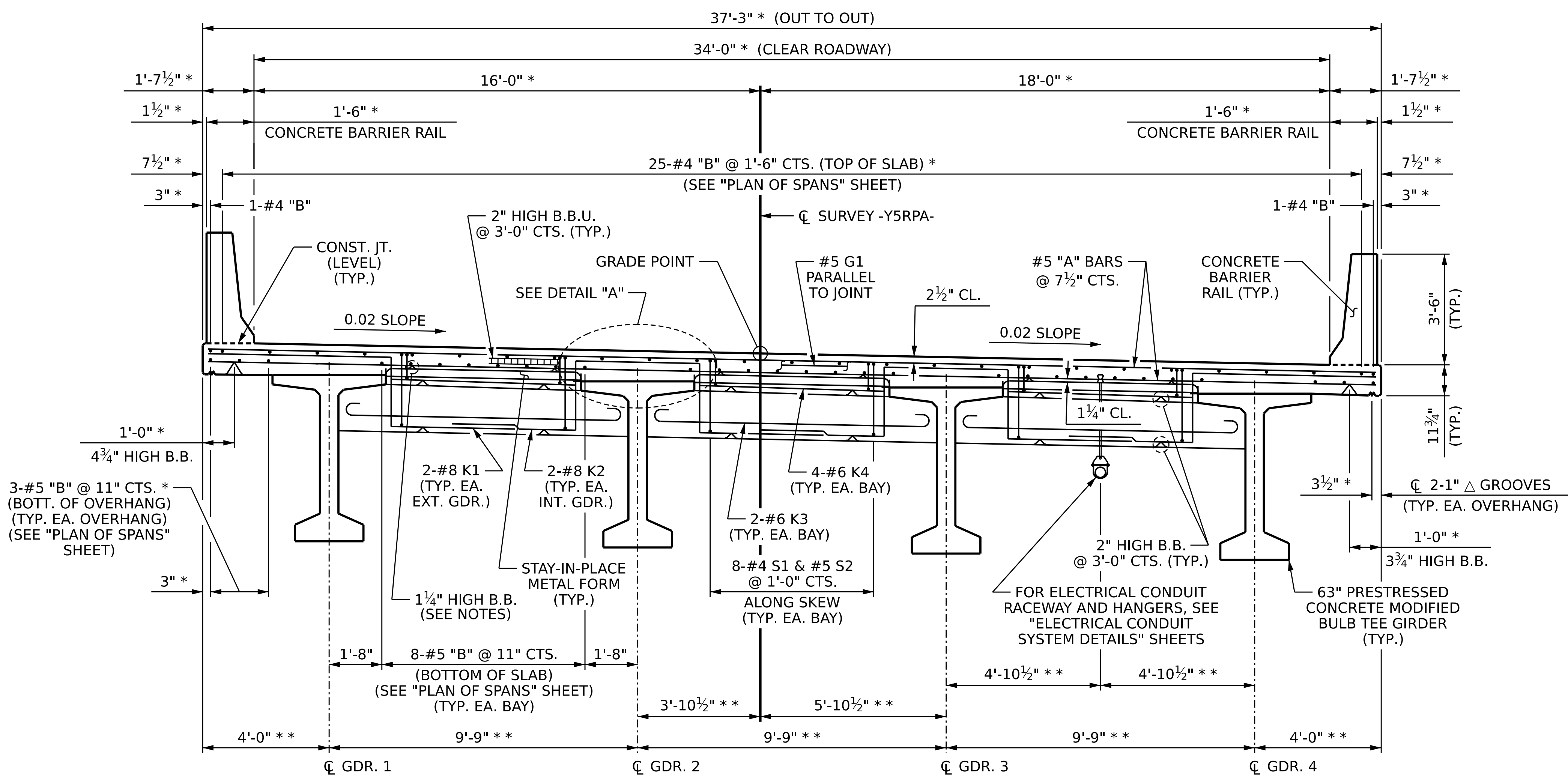
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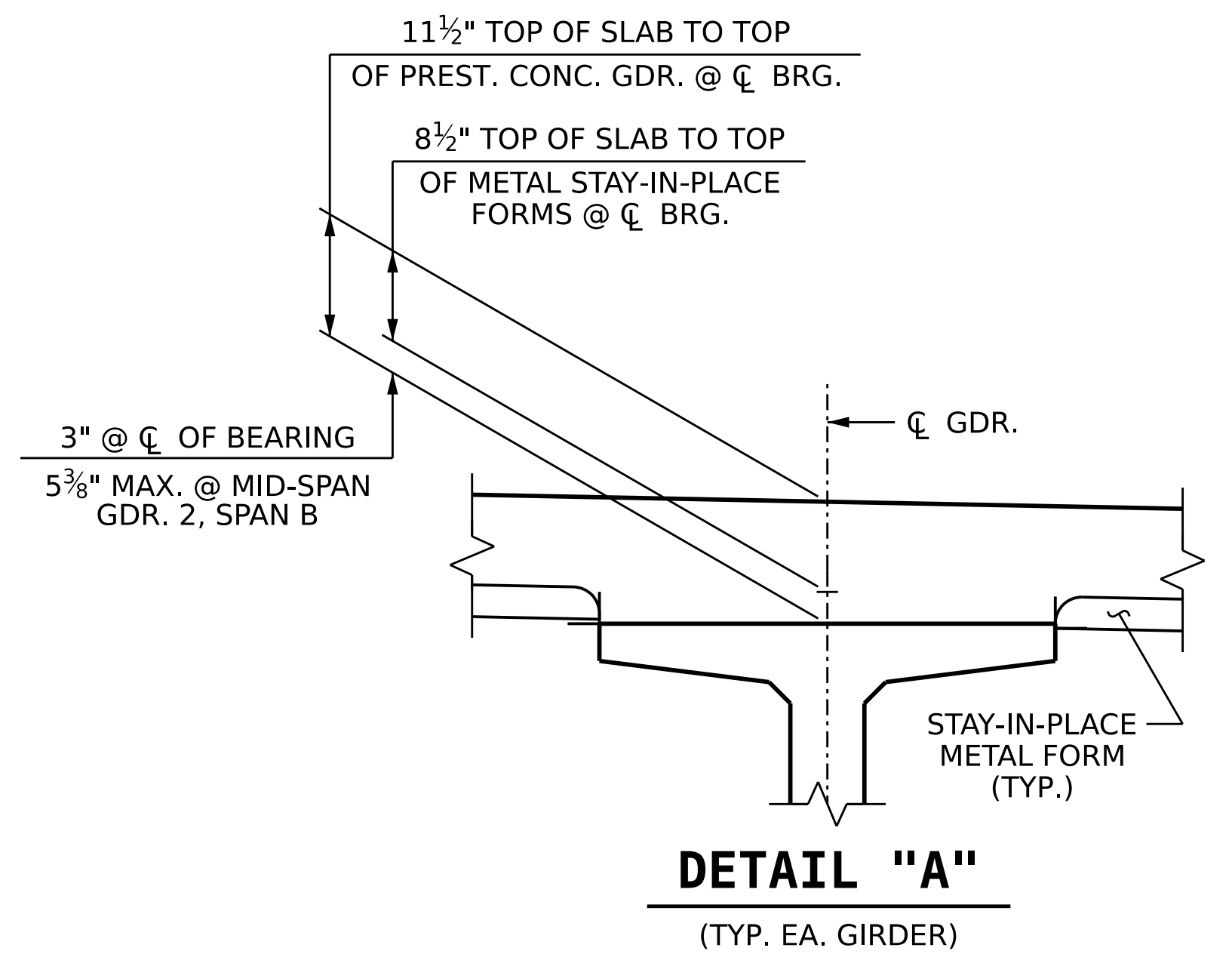
DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



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



**NOTES:**

PROVIDE 1 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 BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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.

\* RADIAL DIMENSION.

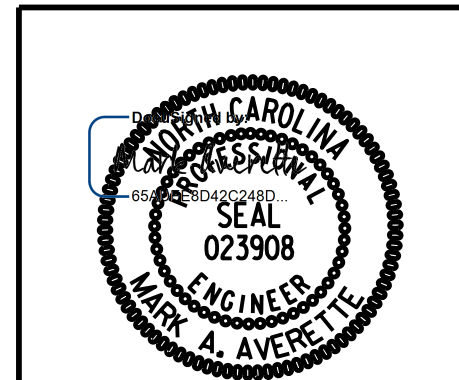
\*\* RADIAL DIMENSION AT W.P.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**



DRAWN BY : T. BANKOVICH DATE : 12-23  
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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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1			3			TOTAL SHEETS
2			4			49

LICENSURE NO. C-4434

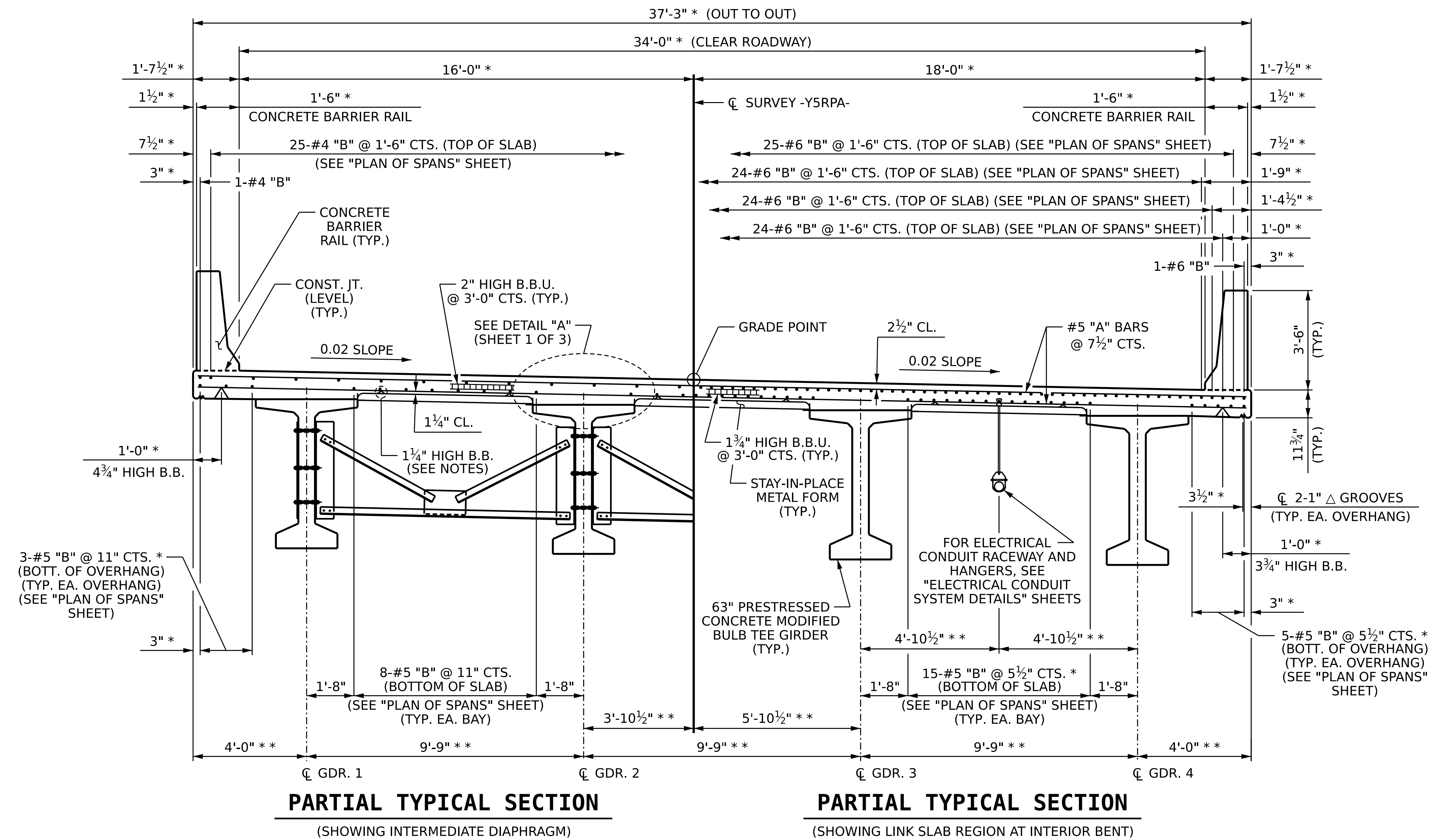
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NOTES:

\* RADIAL DIMENSION.

\*\* RADIAL DIMENSION AT W.P.



**PARTIAL TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGM)

**PARTIAL TYPICAL SECTION**  
(SHOWING LINK SLAB REGION AT INTERIOR BENT)

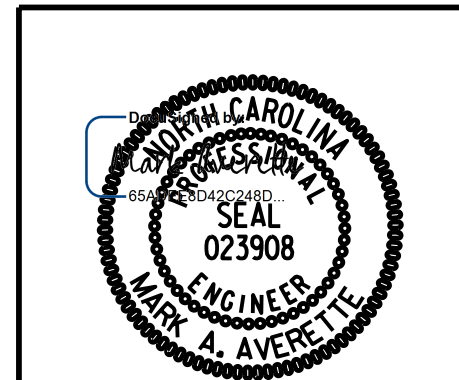
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PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**TYPICAL SECTION**



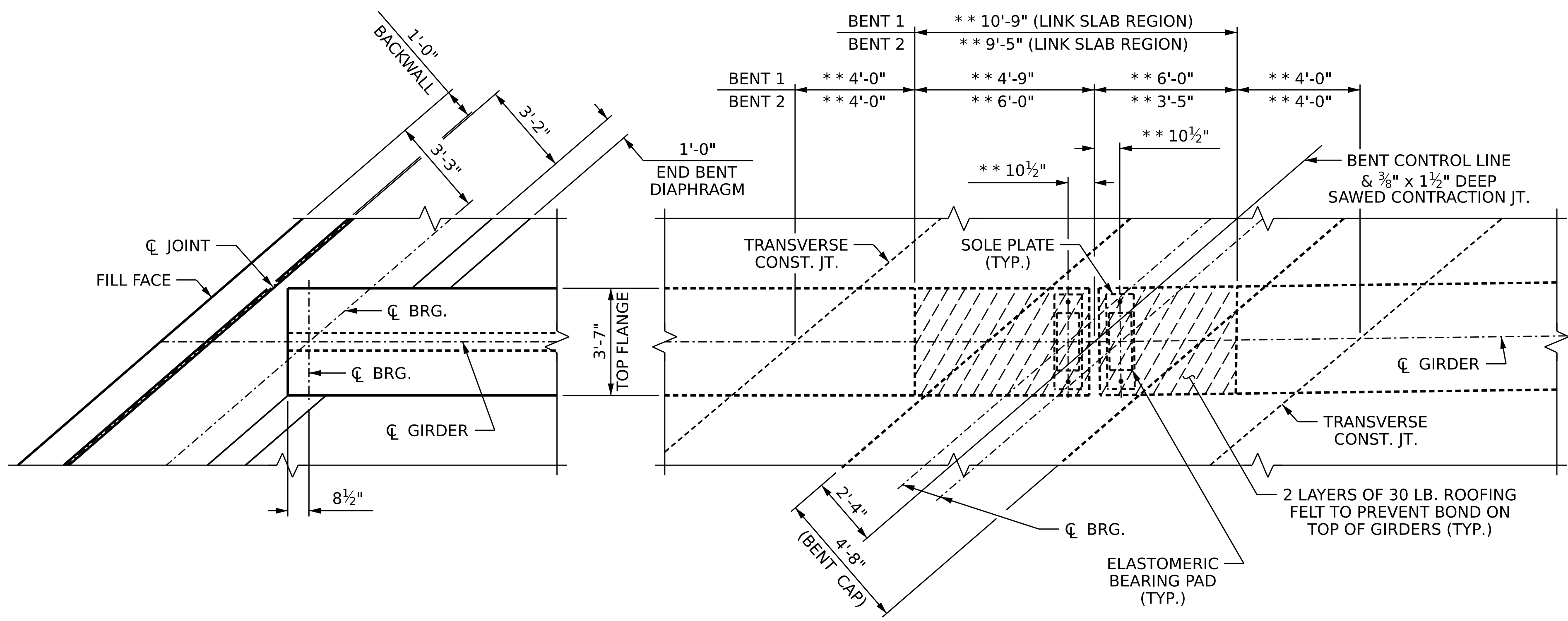
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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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1			3			TOTAL SHEETS
2			4			49

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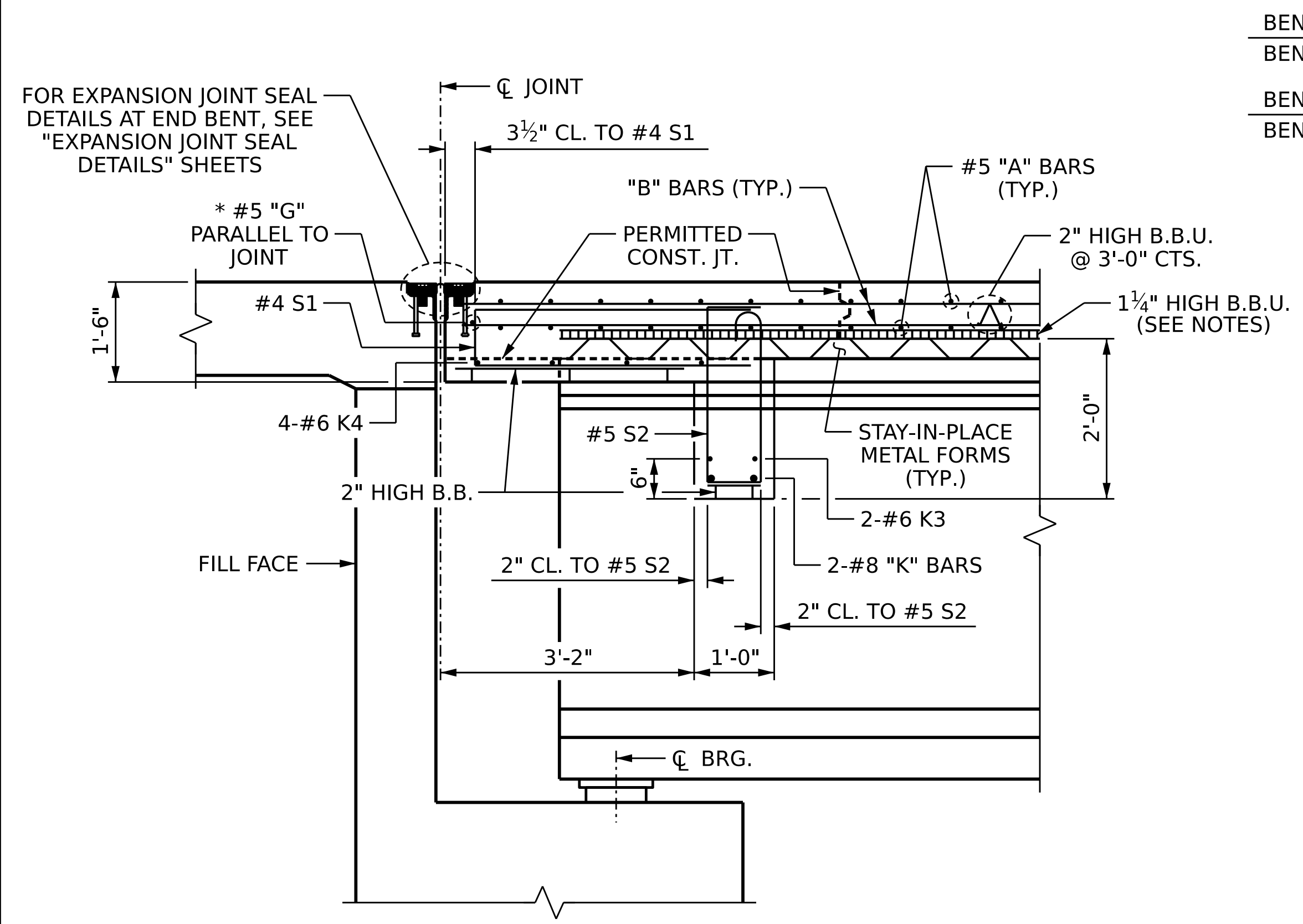




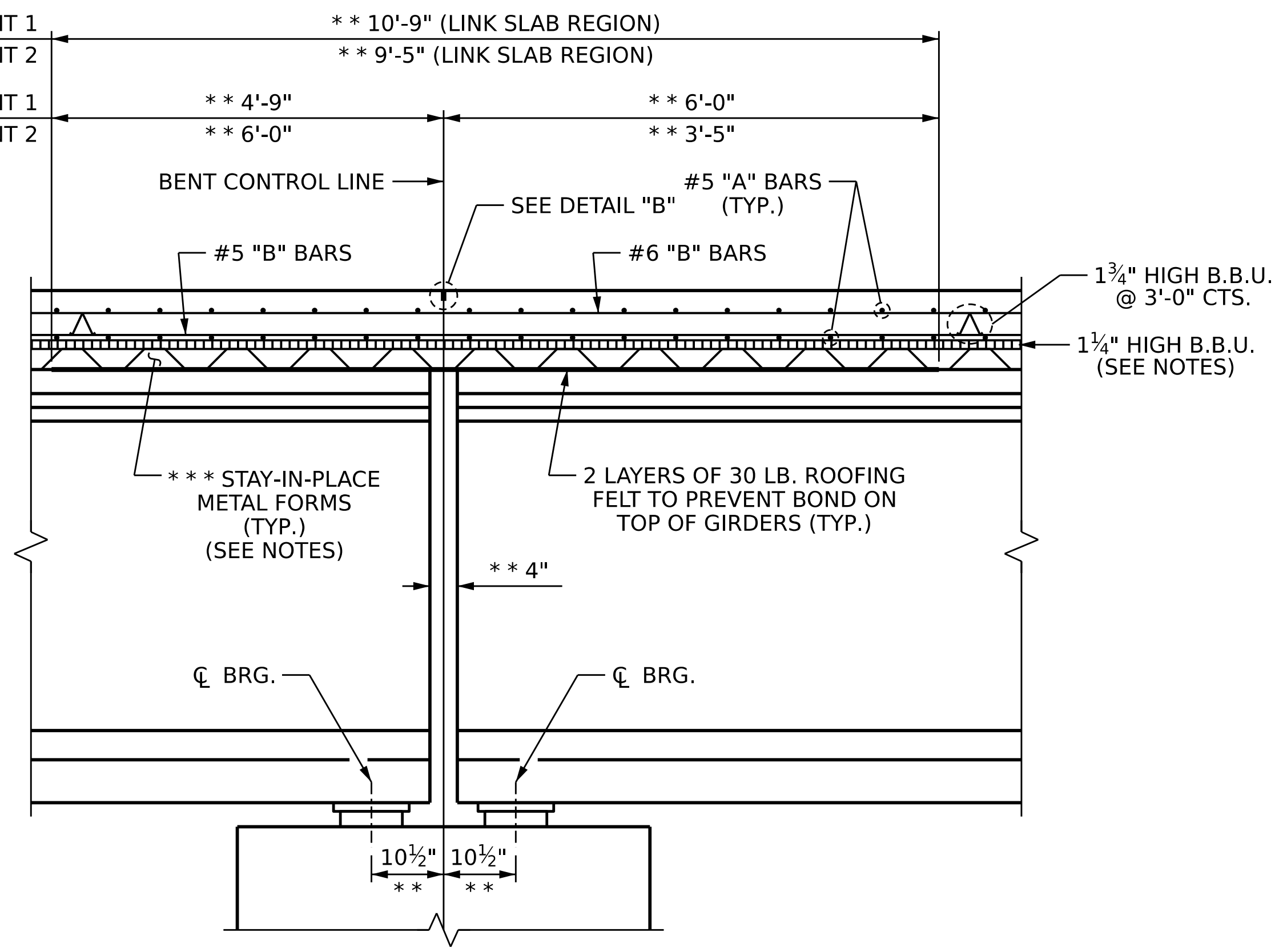
**PLAN OF GIRDER AT END BENT**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

**PLAN OF GIRDER AT BENT - LINK SLAB**

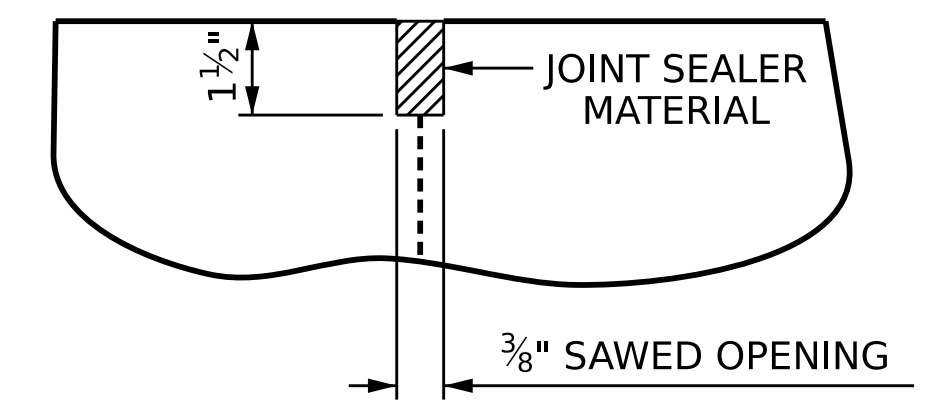
**NOTES:**  
 \*\* MEASURED ALONG  $\bar{C}$  GIRDER.  
 \*\*\* METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.  
 THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.



**SECTION A-A**  
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT UNLESS OTHERWISE NOTES)  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



**SECTION B-B**

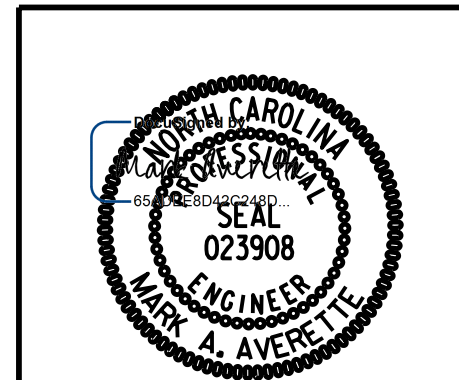


**DETAIL "B"**  
 A 1 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE LINK SLAB DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 3

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



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1			3			TOTAL SHEETS
2			4			49

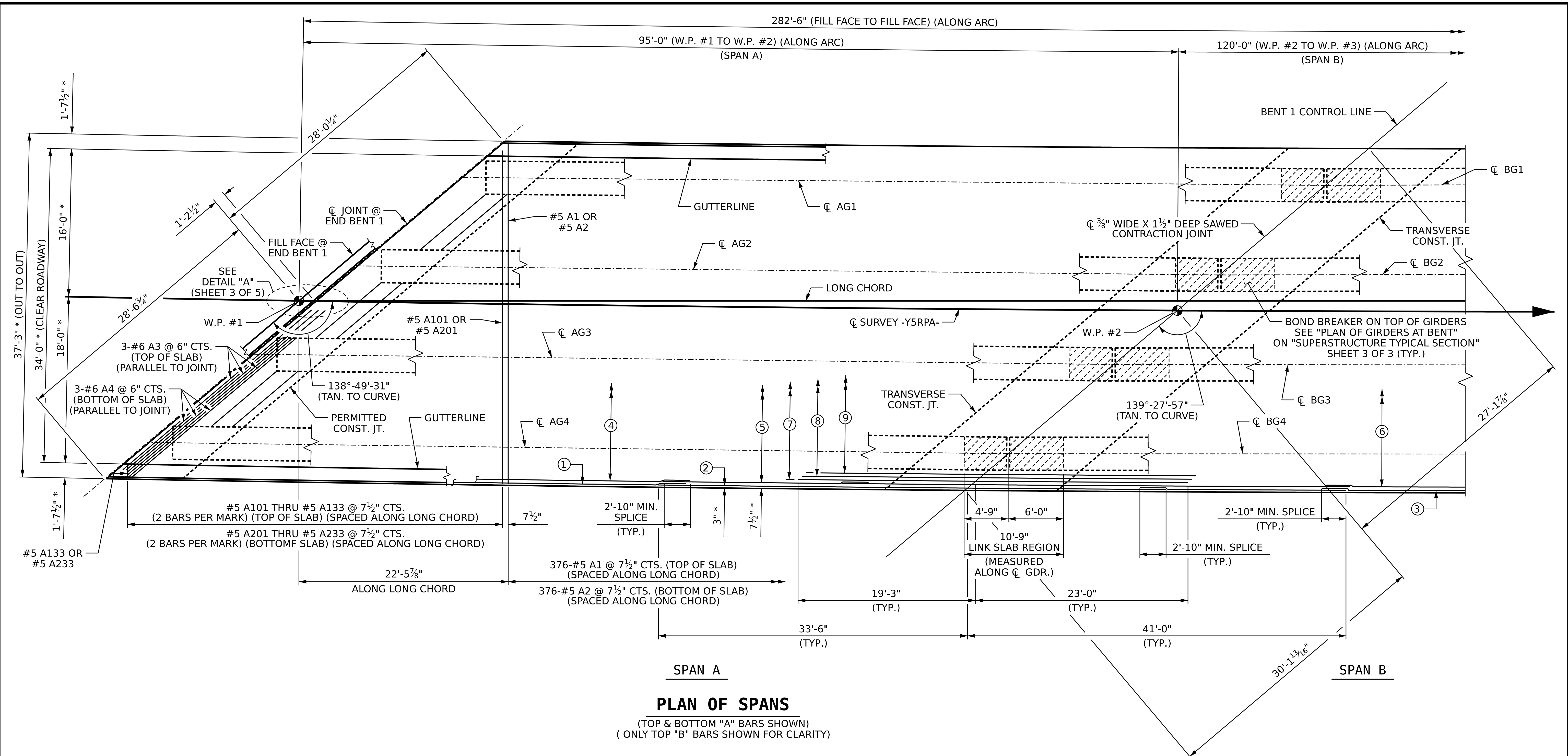
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\* #5 G1 BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.  
 DRAWN BY: T. BANKOVICH DATE: 12-23  
 CHECKED BY: M.A. AVERETTE DATE: 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 12-23



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### PLAN OF SPANS

(TOP & BOTTOM "A" BARS SHOWN)  
( ONLY TOP "B" BARS SHOWN FOR CLARITY)

- ① 1-#4 B9 (2 BAR RUNS) (TOP OF SLAB) (SEE TYPICAL SECTION)
- ② 1-#6 B10 OR B11 (TOP OF SLAB) (SEE TYPICAL SECTION)
- ③ 1-#4 B13 (2 BAR RUNS) (TOP OF SLAB) (SEE TYPICAL SECTION)
- ④ 25-#4 B9 @ 1'-6" CTS. (2 BAR RUNS) (TOP OF SLAB) (SEE TYPICAL SECTION)
- ⑤ 25-#6 B10 OR B11 @ 1'-6" CTS. (TOP OF SLAB) (SEE TYPICAL SECTION)
- ⑥ 25-#4 B13 @ 1'-6" CTS. (2 BAR RUNS) (TOP OF SLAB) (SEE TYPICAL SECTION)
- ⑦ 24-#6 B12 @ 1'-6" CTS. (TOP OF SLAB) (SEE TYPICAL SECTION)
- ⑧ 24-#6 B12 @ 1'-6" CTS. (TOP OF SLAB) (SEE TYPICAL SECTION)
- ⑨ 24-#6 B12 @ 1'-6" CTS. (TOP OF SLAB) (SEE TYPICAL SECTION)

#### NOTES:

FOR BOTTOM OF SLAB "B" BAR PLACEMENT DETAILS, SEE SHEET 3 OF 5.

FOR ADDITIONAL "B" BAR PLACEMENT DETAILS, SEE SHEET 5 OR 5.

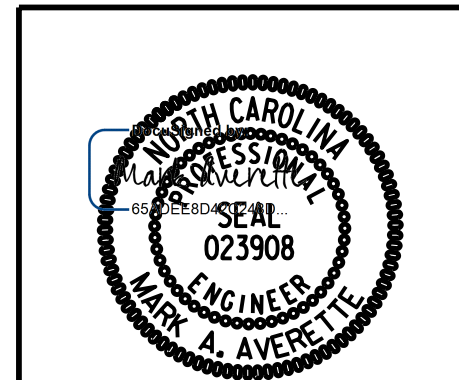
\* RADIAL DIMENSION

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
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## PLAN OF SPANS



DRAWN BY : T. BANKOVICH DATE : 12-23  
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2			4			49

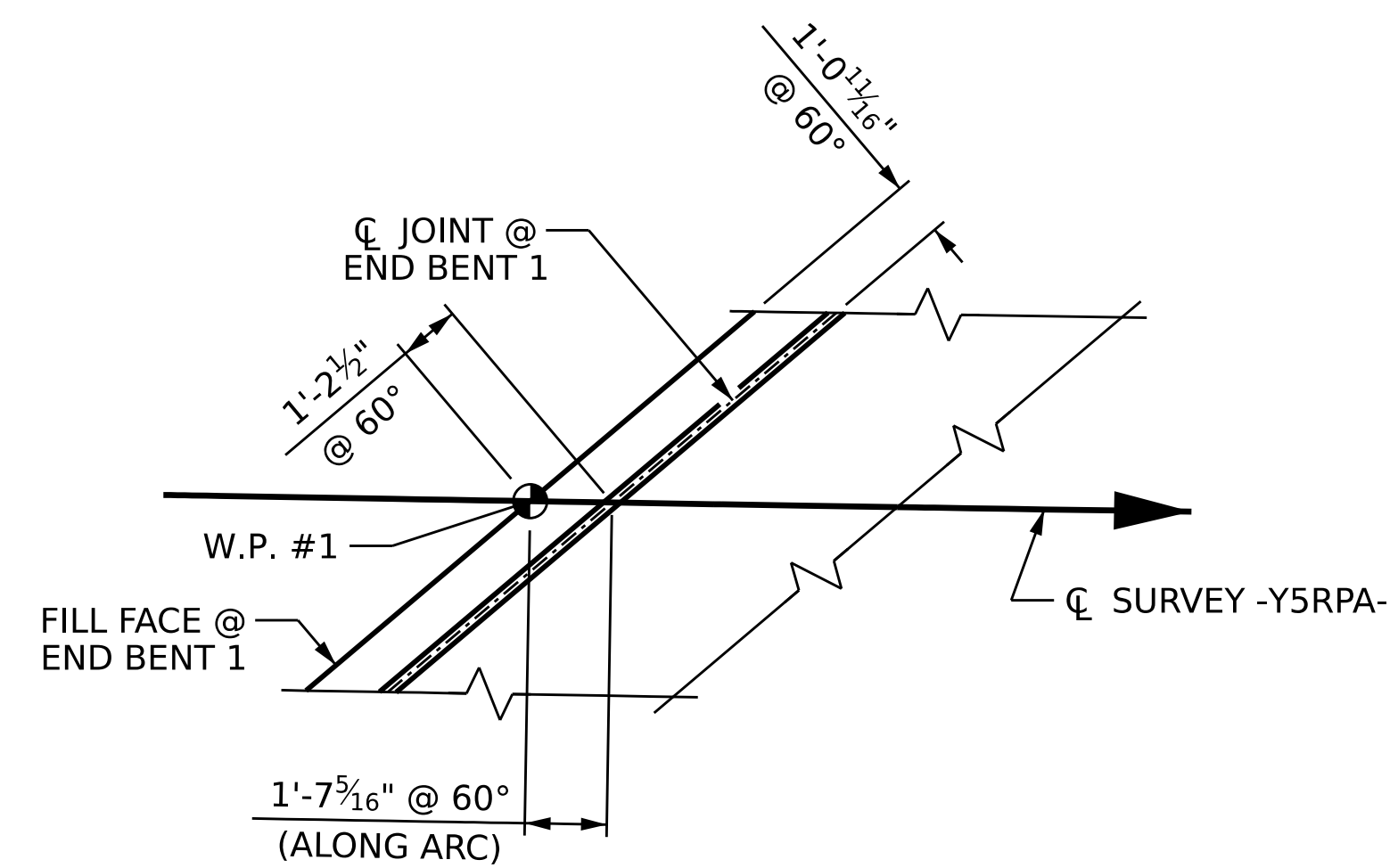
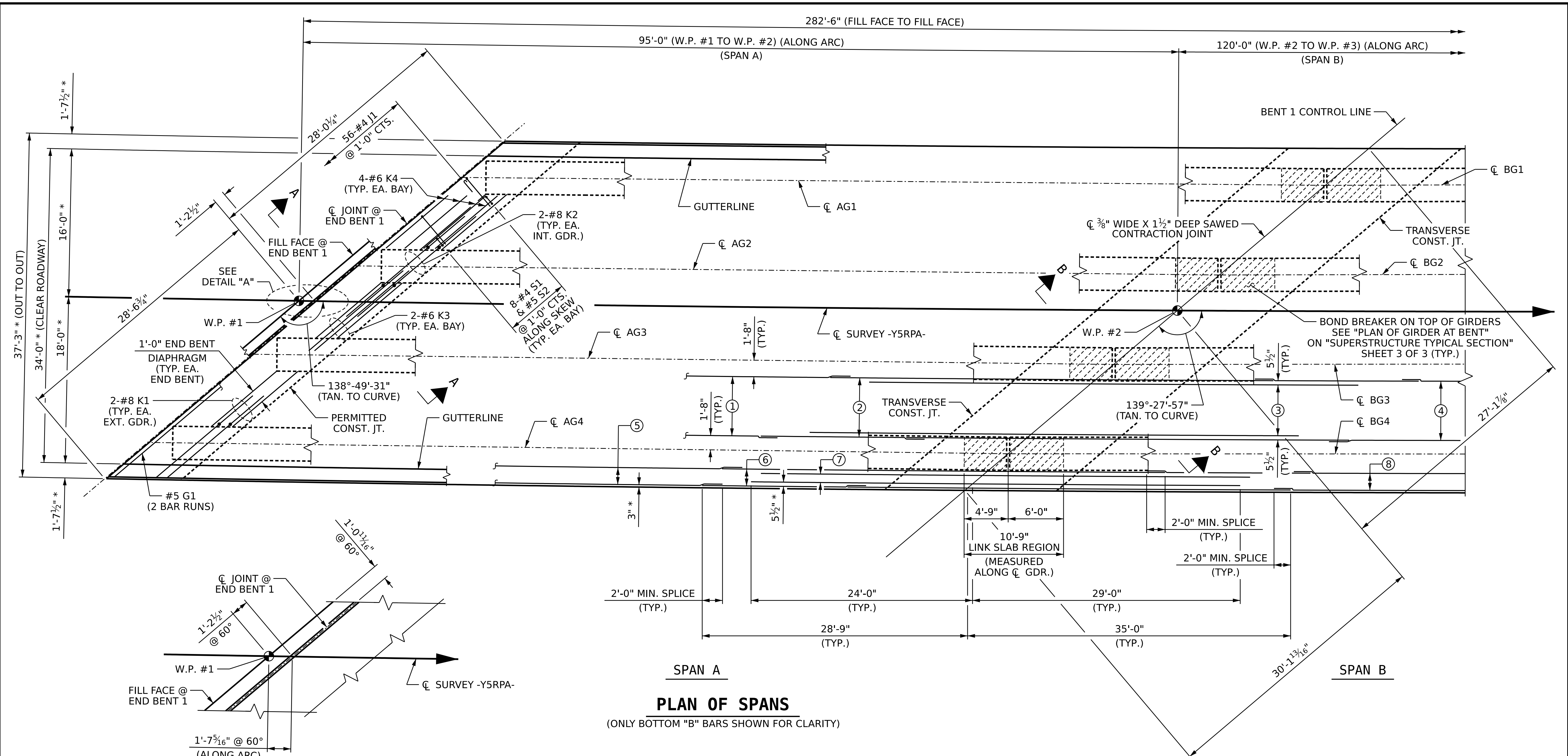
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### PLAN OF SPANS

(ONLY BOTTOM "B" BARS SHOWN FOR CLARITY)

- ① 8-#5 B1 @ 11" CTS. (2 BAR RUNS) (BOTTOM OF SLAB) (TYP. EA. BAY)
- ② 8-#5 B2 OR B3 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ③ 7-#5 B4 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ④ 8-#5 B5 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ⑤ 3-#5 B1 @ 11" CTS. (2 BAR RUNS) (BOTTOM OF OVERHANG)
- ⑥ 3-#5 B2 OR B3 @ 11" CTS. (BOTTOM OF OVERHANG)
- ⑦ 2-#5 B4 @ 11" CTS. (BOTTOM OF OVERHANG)
- ⑧ 3-#5 B5 @ 11" CTS. (BOTTOM OF OVERHANG)

#### NOTES:

FOR SECTIONS A-A AND B-B, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 3 OF 3.

FOR TOP OF SLAB "B" BAR PLACEMENT DETAILS, SEE SHEET 1 OF 5.

FOR "A" BAR SPACING, SEE SHEET 1 OF 5.

FOR ADDITIONAL "B" BARS PLACEMENT DETAILS, SEE SHEET 5 OF 5.

SEE "SUPERSTRUCTURE CONCRETE BARRIER RAIL" FOR ADDITIONAL REINFORCING STEEL IN DECK AND RAILS.

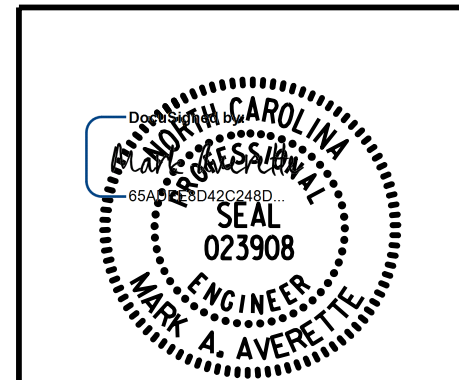
\* RADIAL DIMENSION

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

## PLAN OF SPANS



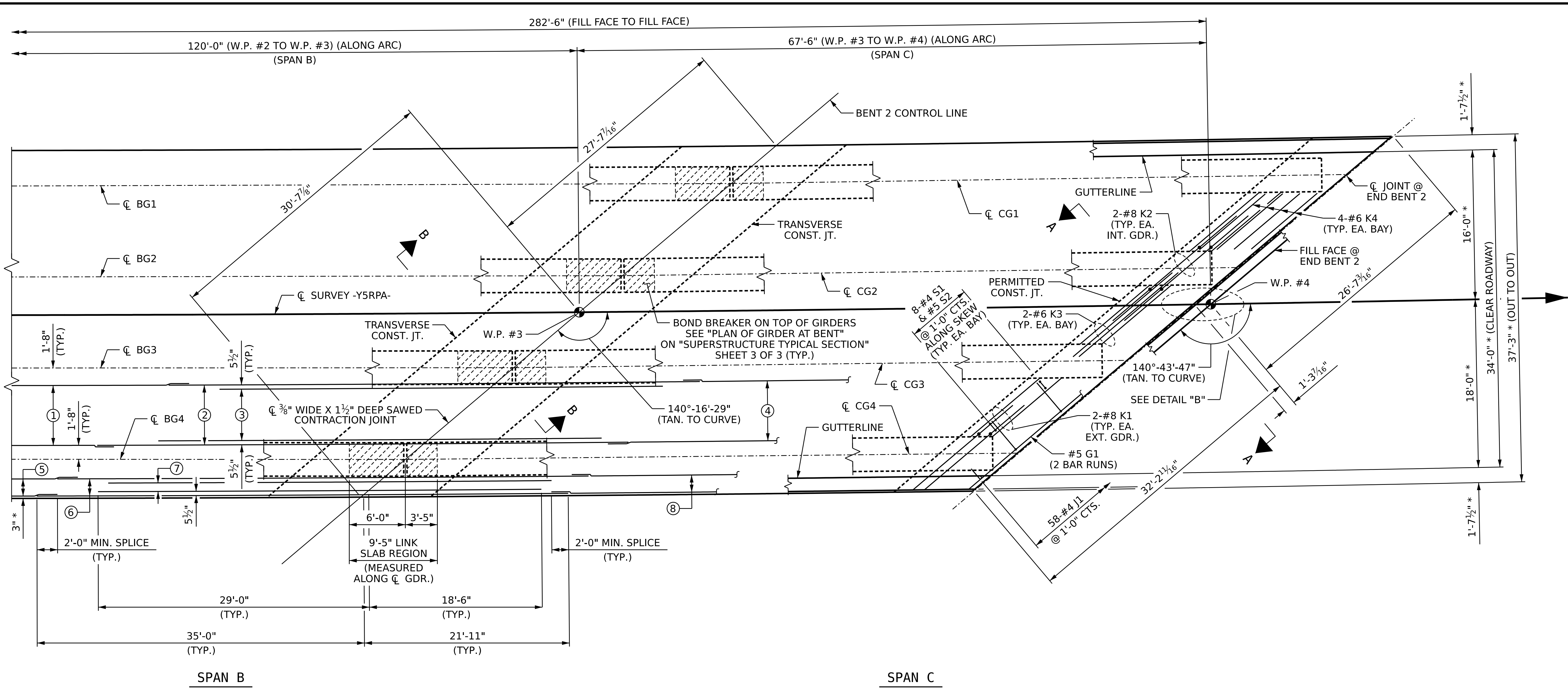
**WVGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-12
1			3			TOTAL SHEETS
2			4			49

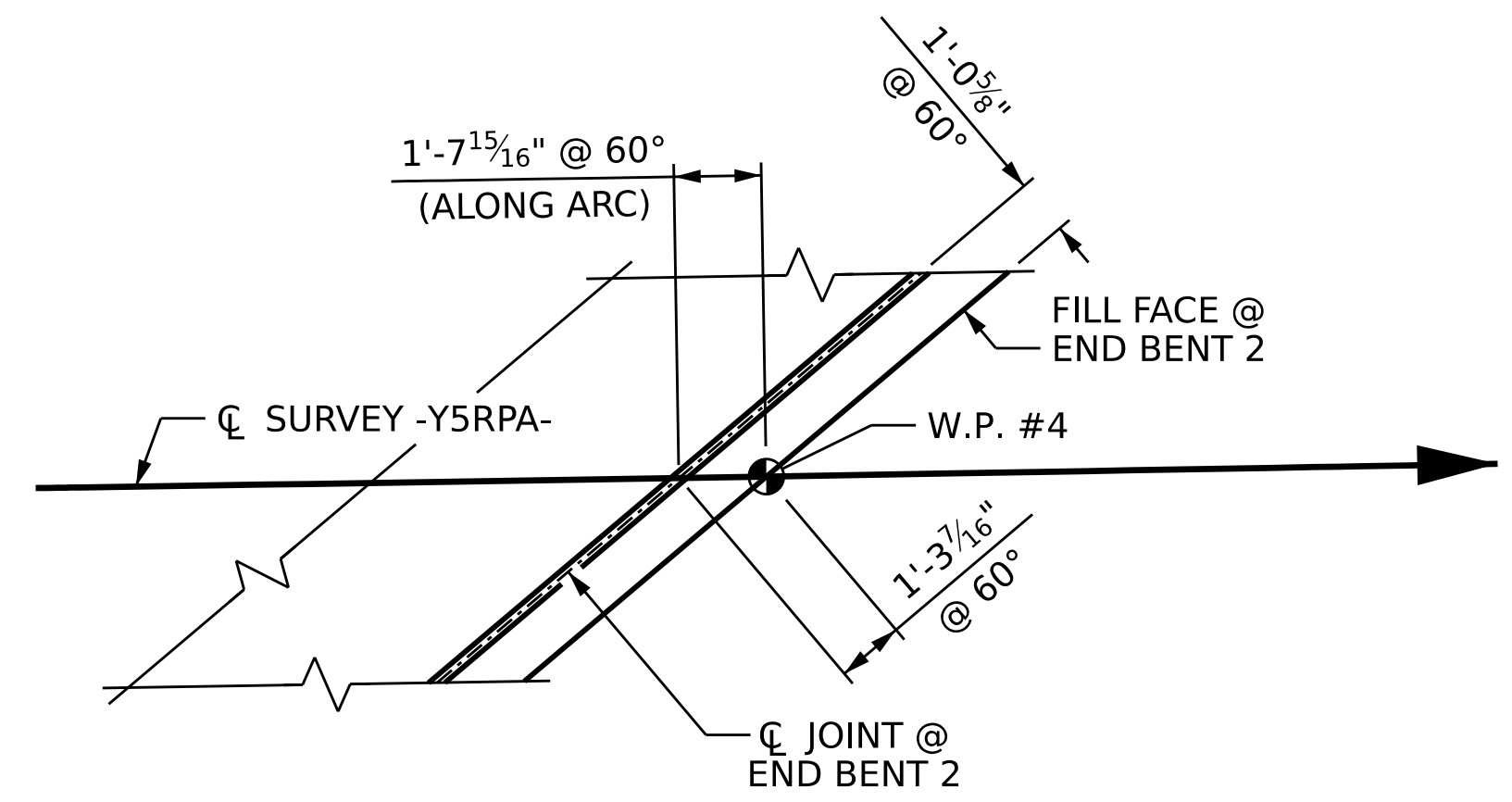
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





**PLAN OF SPANS**  
(ONLY BOTTOM "B" BARS SHOWN FOR CLARITY)

- ① 8-#5 B5 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ② 8-#5 B6 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ③ 7-#5 B7 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ④ 8-#5 B8 @ 11" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ⑤ 3-#5 B5 @ 11" CTS. (BOTTOM OF OVERHANG)
- ⑥ 3-#5 B6 @ 11" CTS. (BOTTOM OF OVERHANG)
- ⑦ 2-#5 B7 @ 11" CTS. (BOTTOM OF OVERHANG)
- ⑧ 3-#5 B8 @ 11" CTS. (BOTTOM OF OVERHANG)

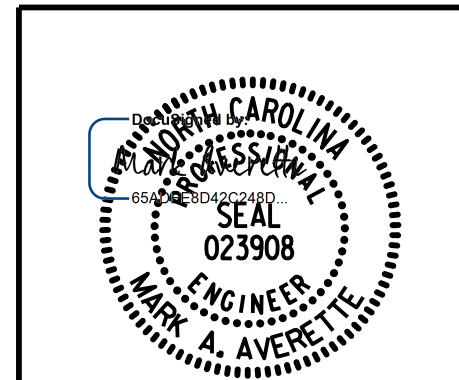


**DETAIL "B"**

**NOTES:**

- FOR SECTIONS A-A AND B-B, SEE "SUPERSTRUCTURE TYPICAL SECTION" SHEET 3 OF 3.
- FOR TOP OF SLAB "B" BAR PLACEMENT DETAILS, SEE SHEET 2 OF 5.
- FOR "A" BAR SPACING, SEE SHEET 2 OF 5.
- FOR ADDITIONAL "B" BARS PLACEMENT DETAILS, SEE SHEET 5 OF 5.
- SEE "SUPERSTRUCTURE CONCRETE BARRIER RAIL" FOR ADDITIONAL REINFORCING STEEL IN DECK AND RAILS.

\* RADIAL DIMENSION



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-  
 SHEET 4 OF 5

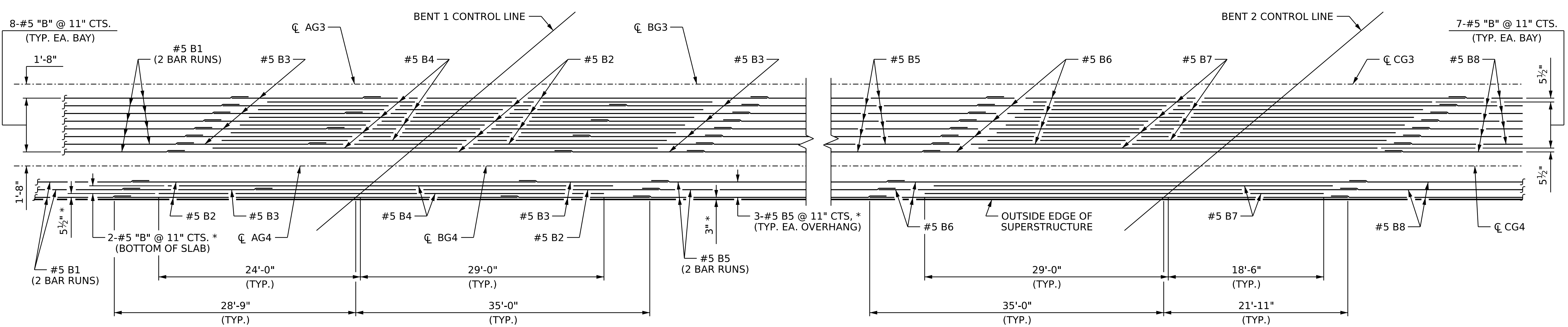
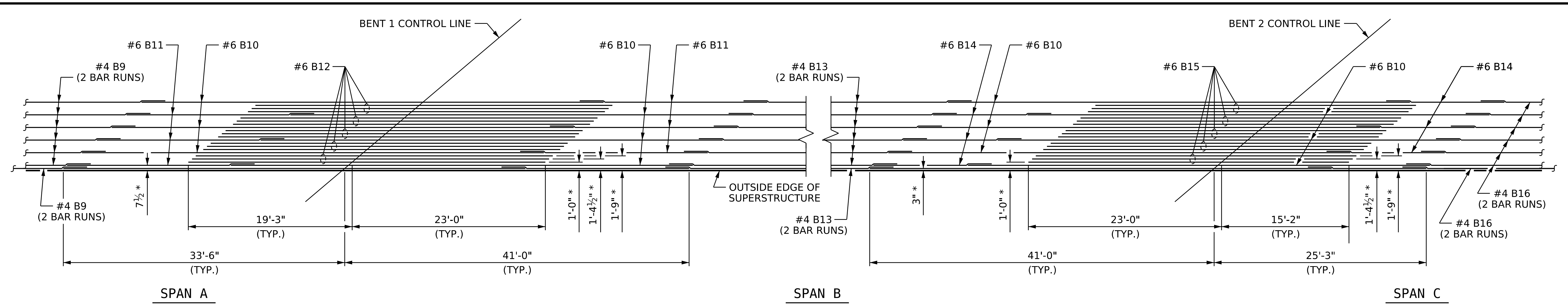
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**

DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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

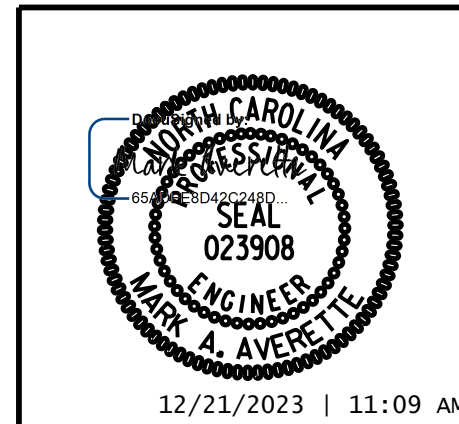
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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



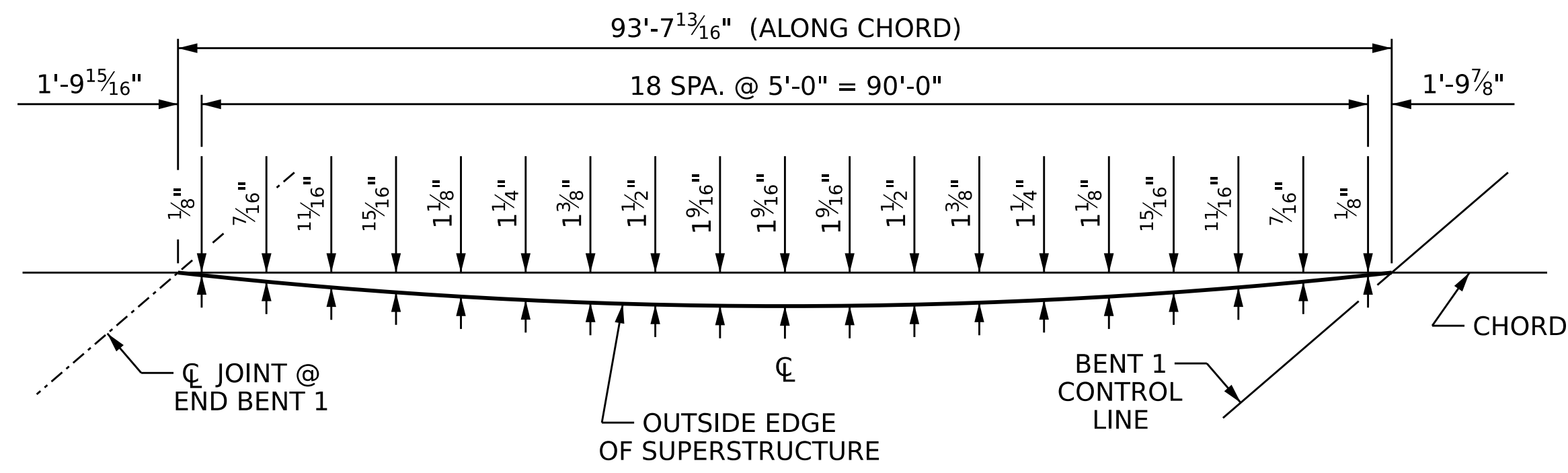
PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-  
 SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**

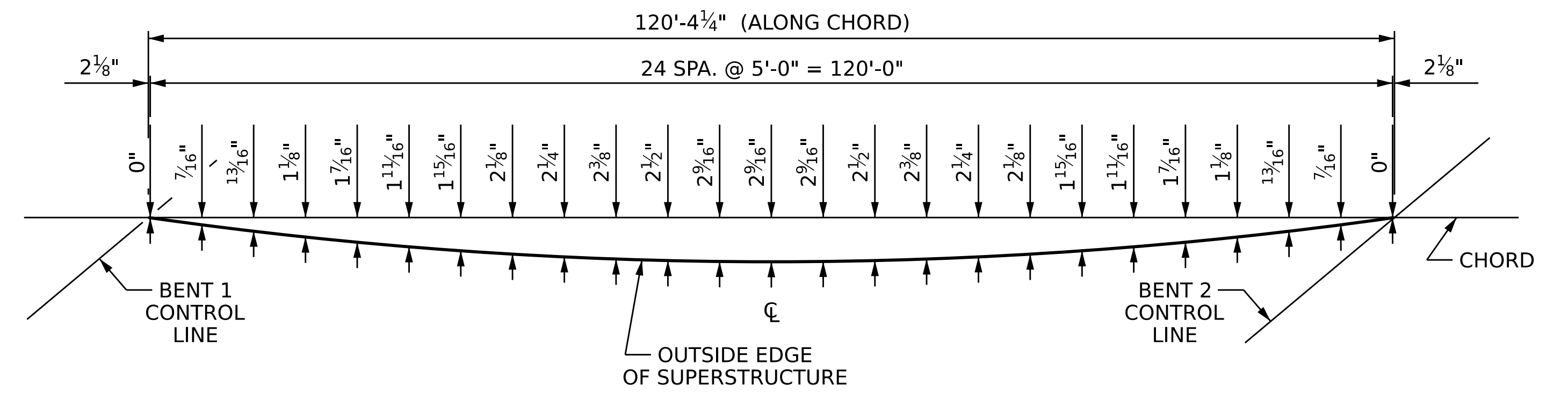
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

12/21/2023 | 11:09 AM  
 LICENSURE NO. C-4434  
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

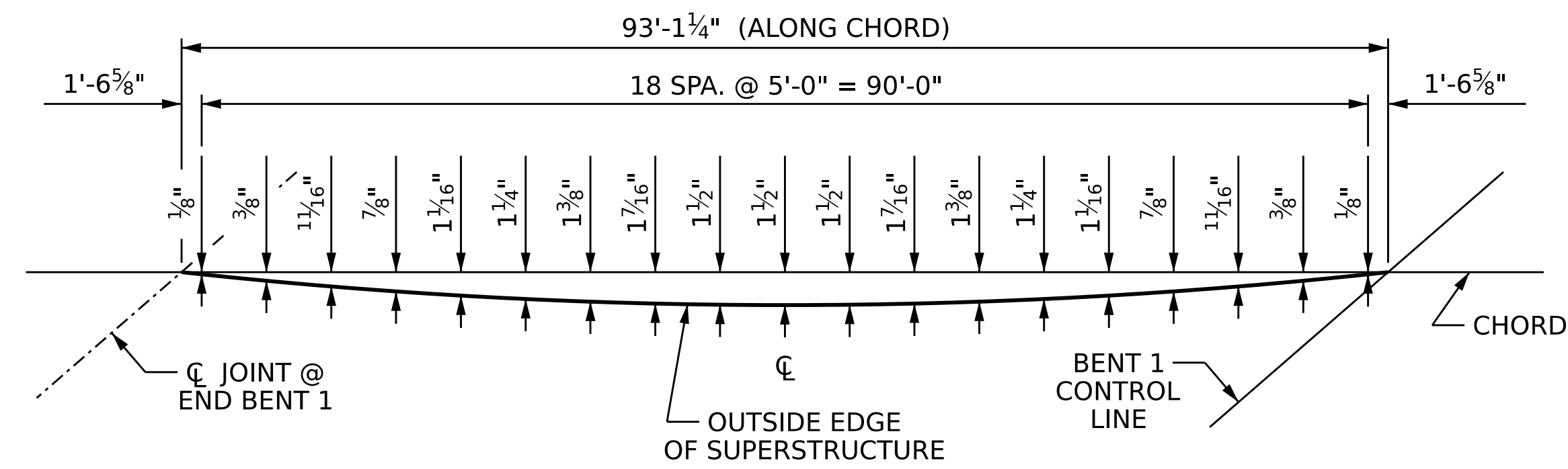
TOTAL SHEETS: 49



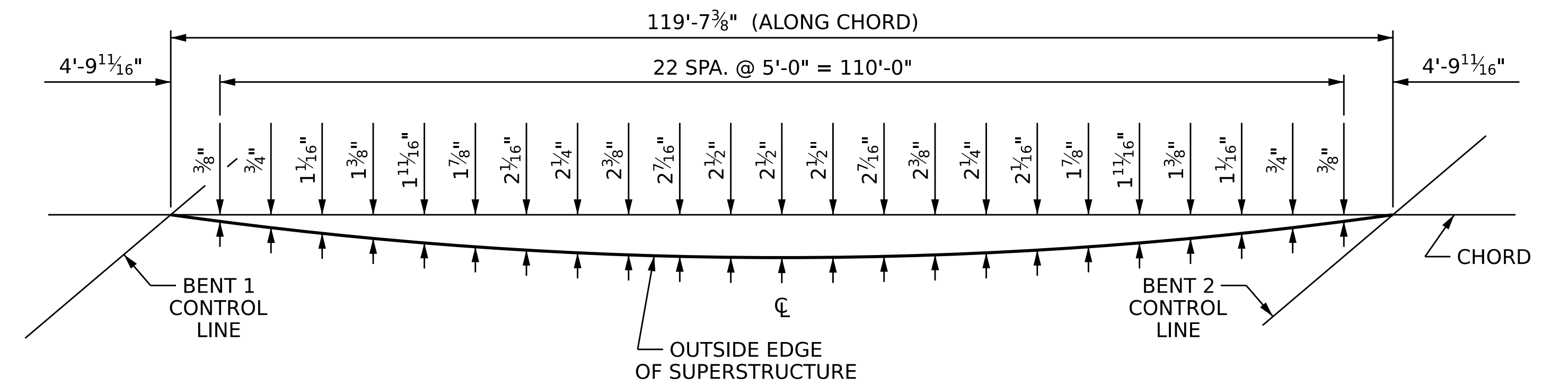
**SPAN A ARC OFFSETS (LT SIDE)**



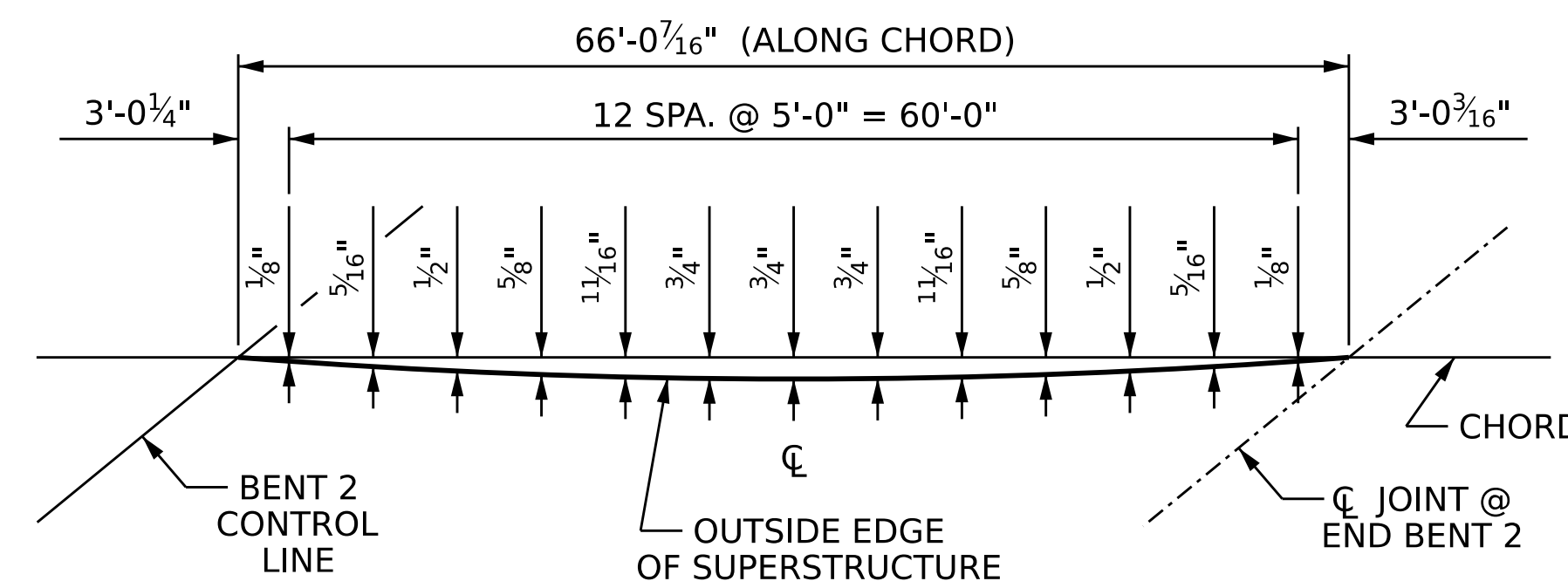
**SPAN B ARC OFFSETS (LT SIDE)**



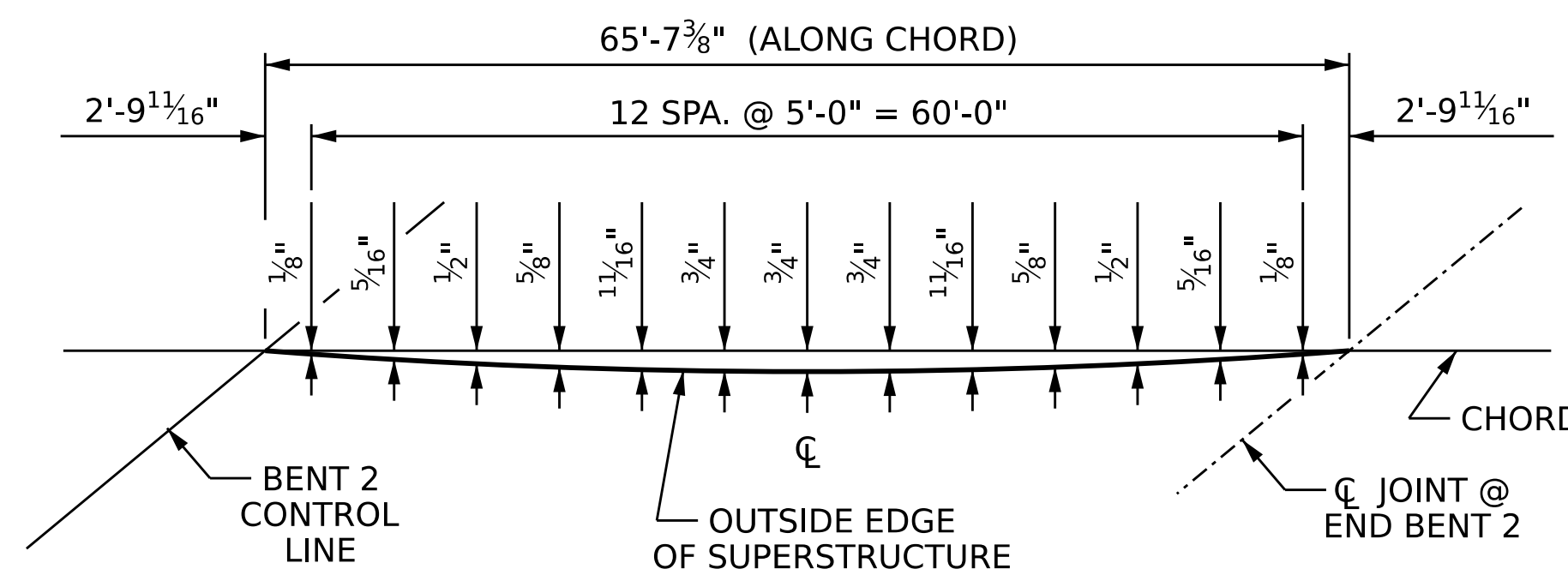
**SPAN A ARC OFFSETS (RT SIDE)**



**SPAN B ARC OFFSETS (RT SIDE)**



**SPAN C ARC OFFSETS (LT SIDE)**

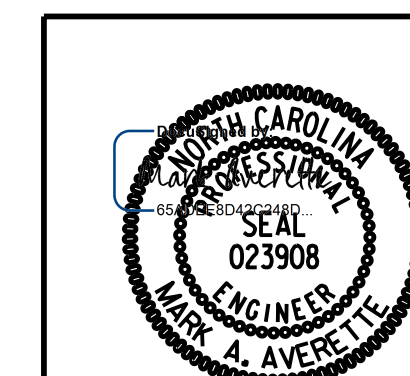


**SPAN C ARC OFFSETS (RT SIDE)**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**ARC OFFSETS**



12/21/2023 | 11:09 AM PST

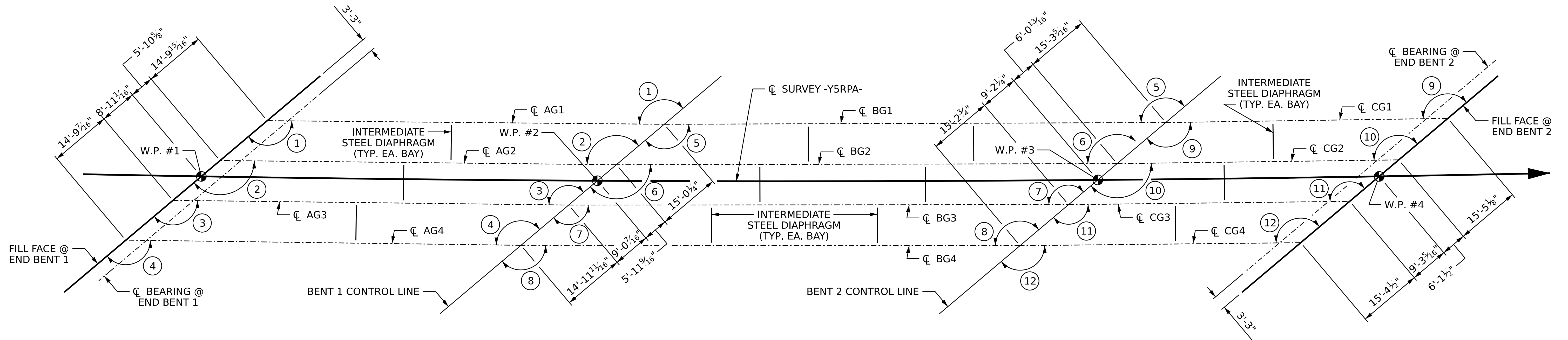
DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-15
1			3			TOTAL SHEETS
2			4			49

LICENSURE NO. C-4434  
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SPAN A

SPAN B

SPAN C

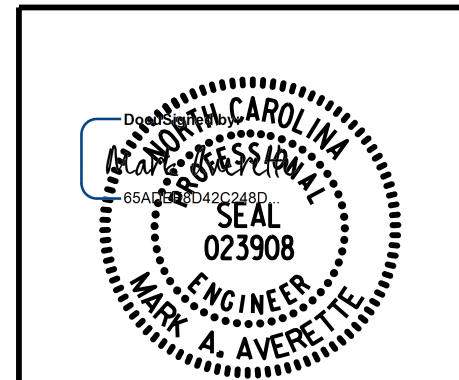
**FRAMING PLAN**

**ANGLES**

① 139°-15'-07"	⑦ 139°-49'-24"
② 139°-10'-33"	⑧ 139°-44'-44"
③ 139°-05'-59"	⑨ 140°-36'-50"
④ 139°-01'-27"	⑩ 140°-32'-02"
⑤ 139°-58'-46"	⑪ 140°-27'-15"
⑥ 139°-54'-04"	⑫ 140°-22'-29"

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**FRAMING PLAN**

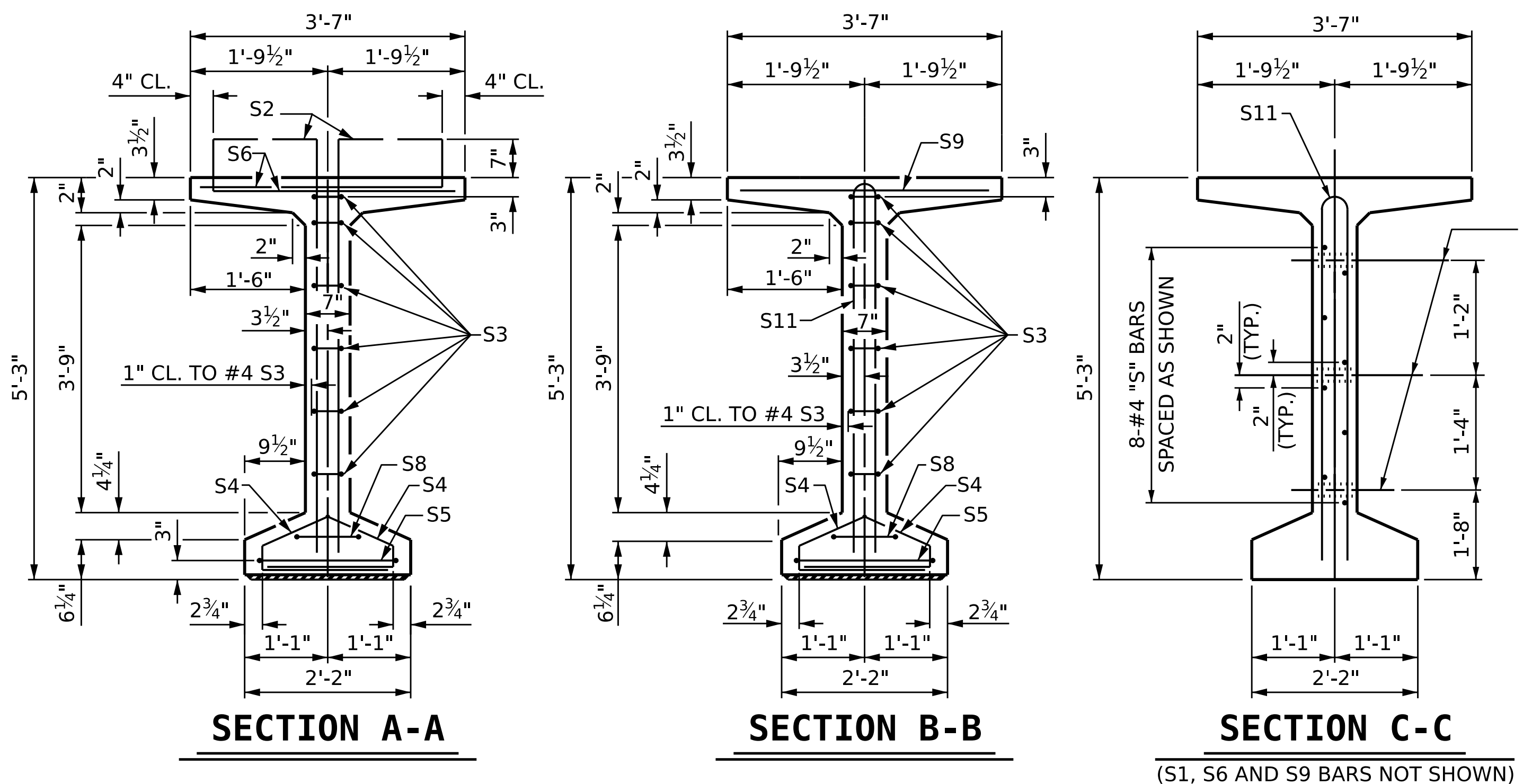


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			49

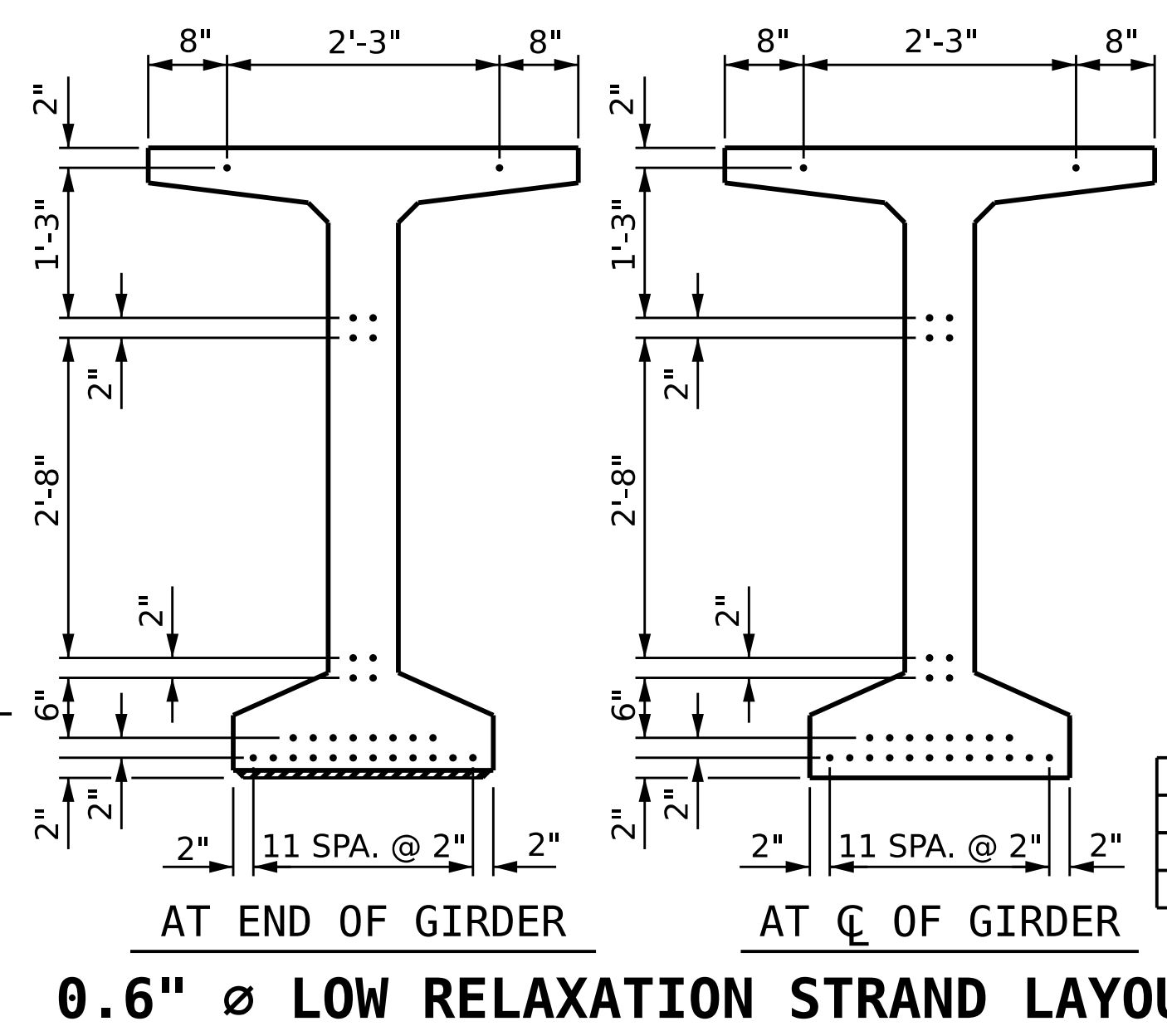
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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

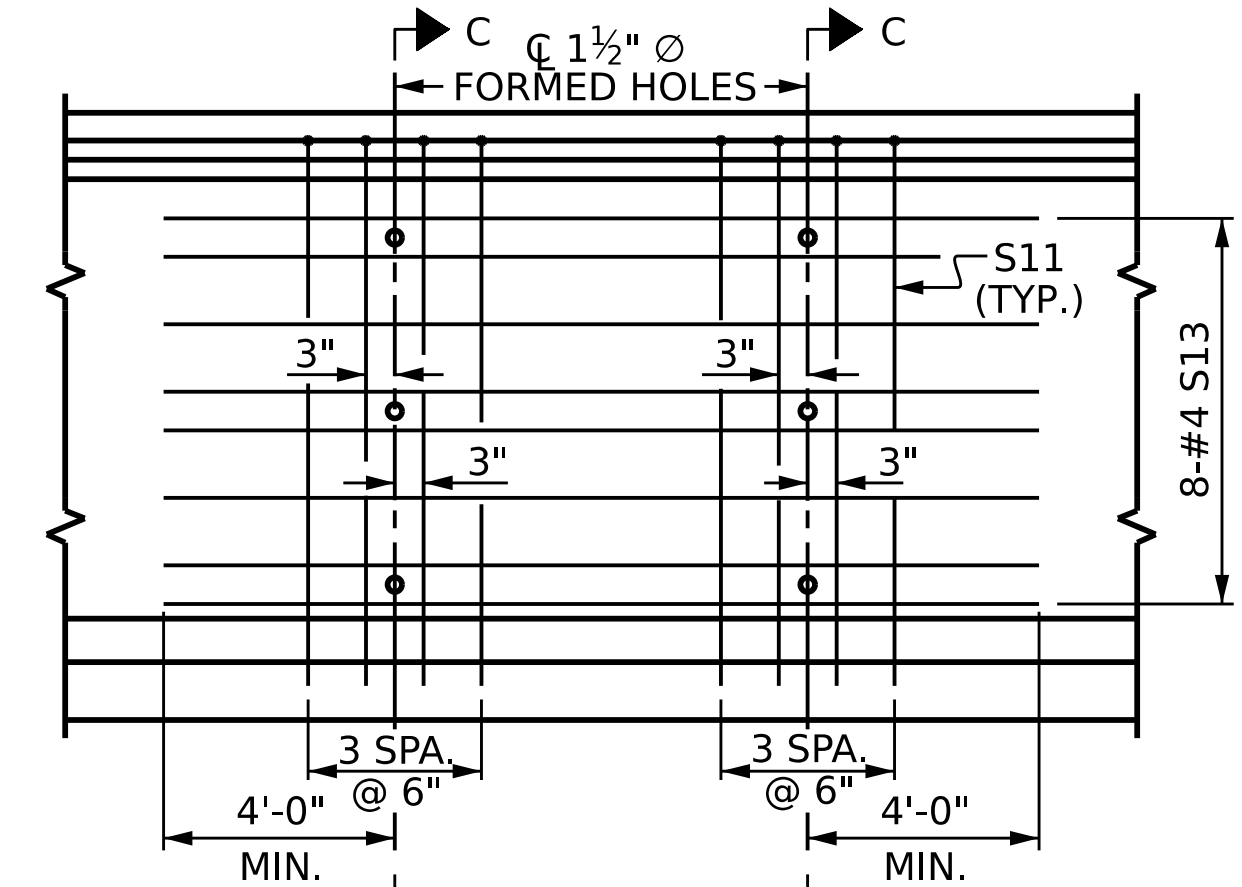
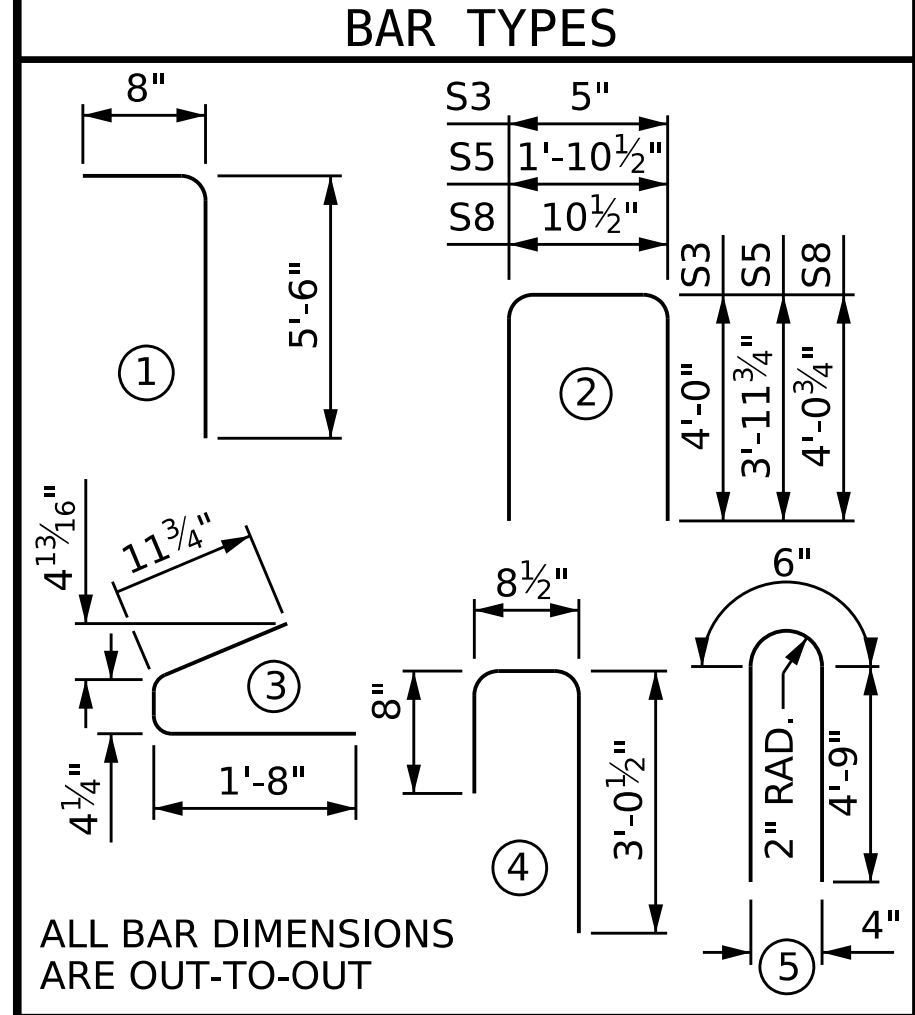


**DEBONDING LEGEND**  
 ● FULLY BONDED STRANDS

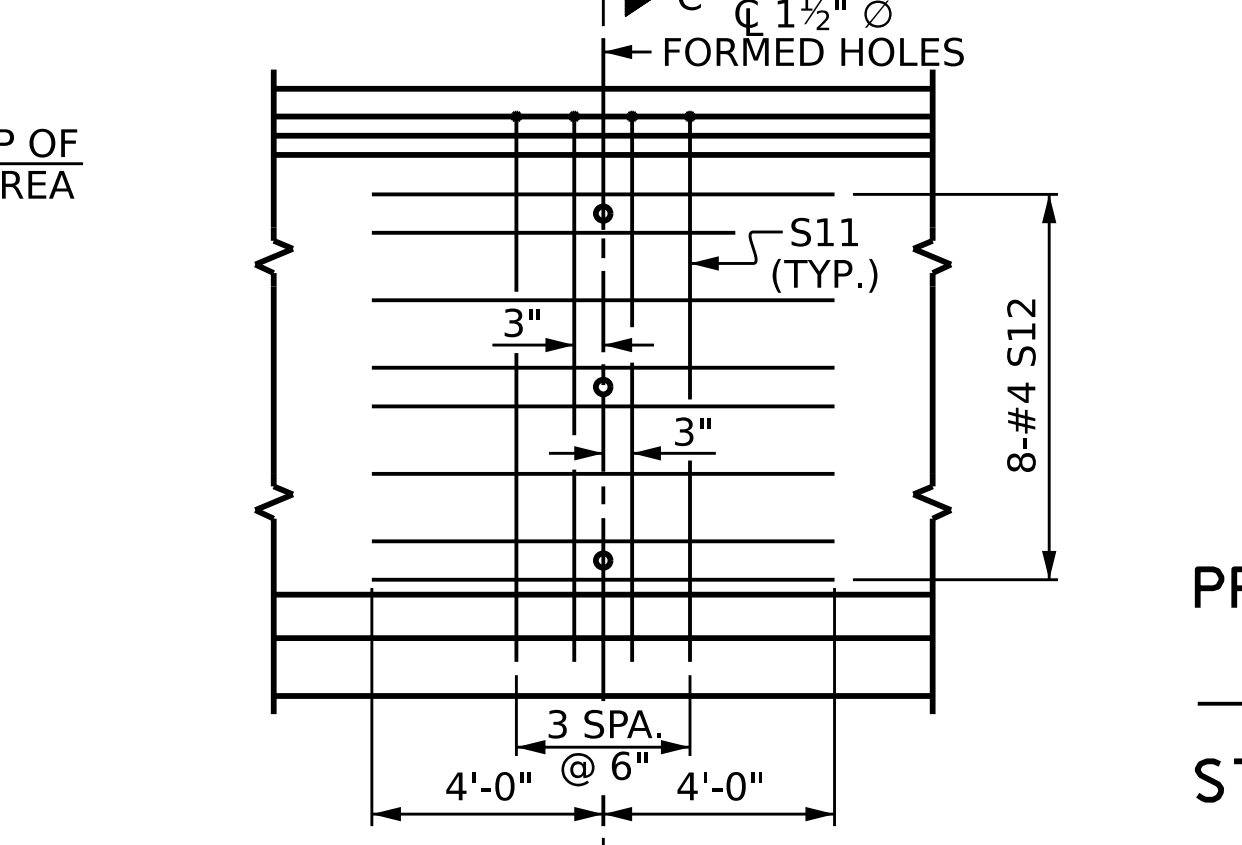


0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	186	#4	1	6'-2"	766
S2	18	#5	1	6'-2"	116
S3	12	#4	2	8'-5"	67
S4	100	#4	3	3'-0"	200
S5	2	#5	2	9'-10"	21
S6	204	#5	4	4'-5"	940
S8	2	#5	2	9'-0"	19
S9	15	#5	STR	3'-3"	51
EXTERIOR S11	16	#5	5	10'-0"	167
INTERIOR S11	20	#5	5	10'-0"	209
EXTERIOR S12	8	#4	STR	8'-0"	43
INTERIOR S13	8	#4	STR	19'-4"	103



**PARTIAL ELEVATION**  
 SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 2 & 3



**PARTIAL ELEVATION**  
 SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 1 & 4

QUANTITIES FOR ONE GIRDER			
GIRDERS	REINFORCING STEEL	6500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR	2,492	*	30
EXTERIOR	2,390	*	30

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	362.23

\* SEE "GIRDER DIMENSIONS" TABLE ON SHEET 4 OF 4.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**63" PRESTRESSED CONCRETE MODIFIED BULB TEE**

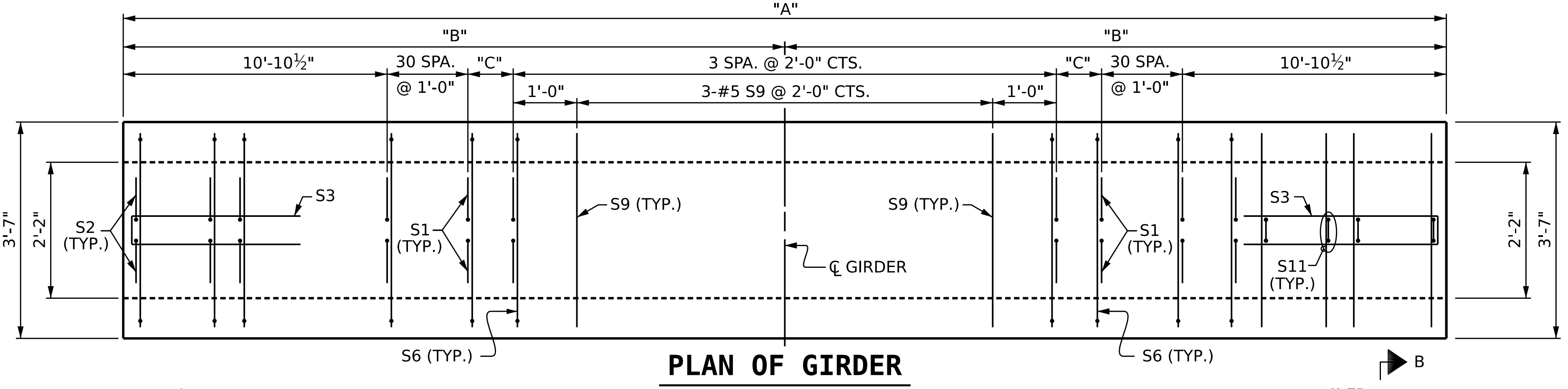
SPAN A



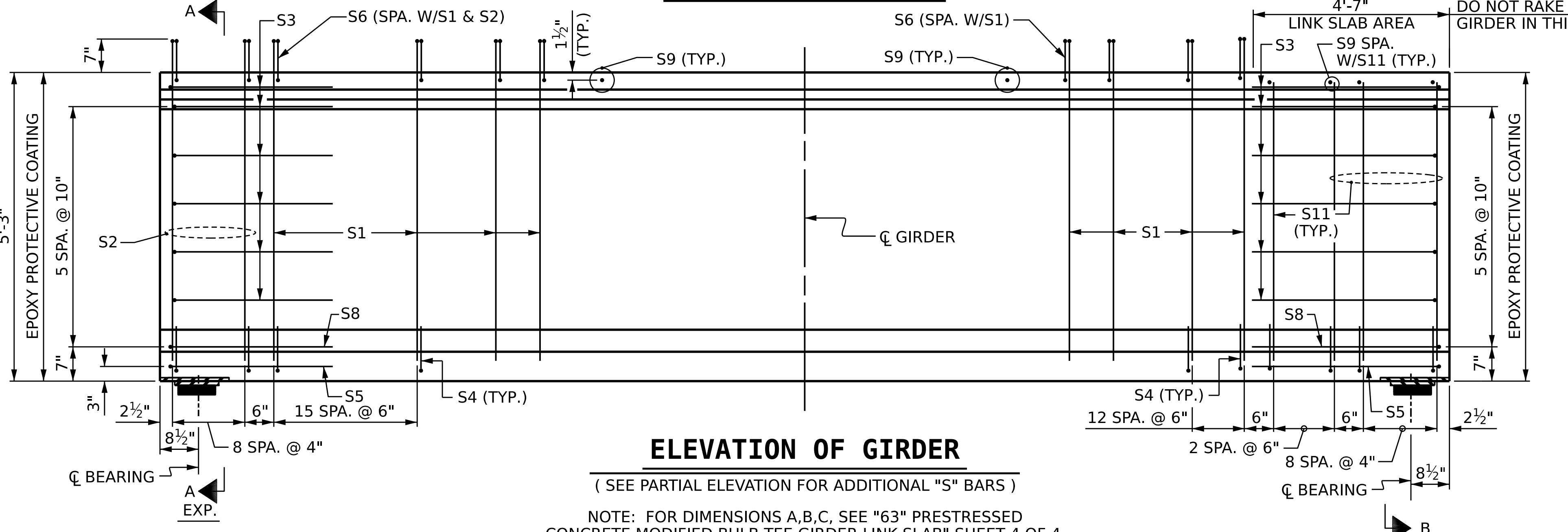
**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

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

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**PLAN OF GIRDER**



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

NOTE: FOR DIMENSIONS A,B,C, SEE "63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDER LINK SLAB" SHEET 4 OF 4.

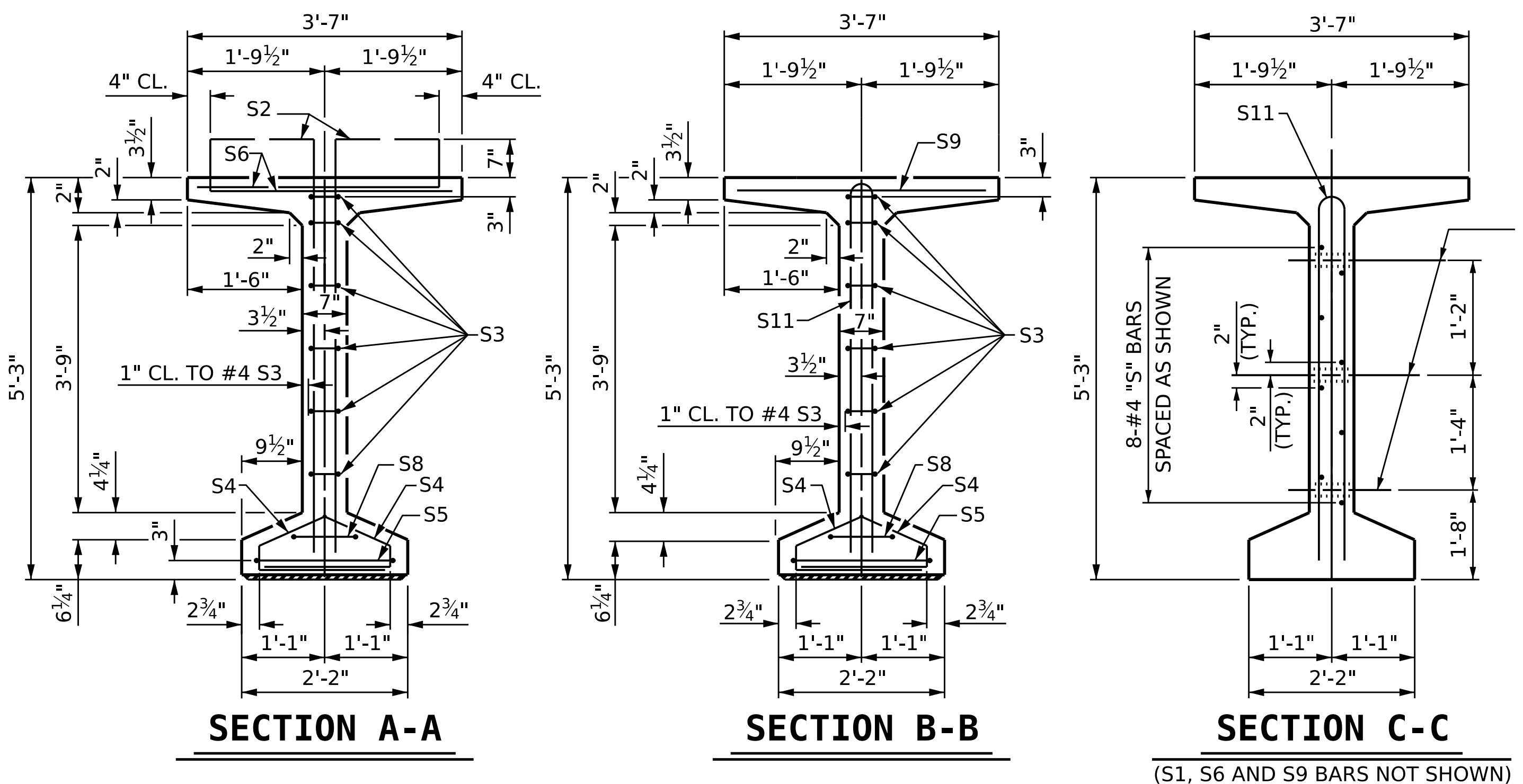
DRAWN BY: S.D. COOPER DATE: 12-23  
 CHECKED BY: M.A. AVERETTE DATE: 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 12-23

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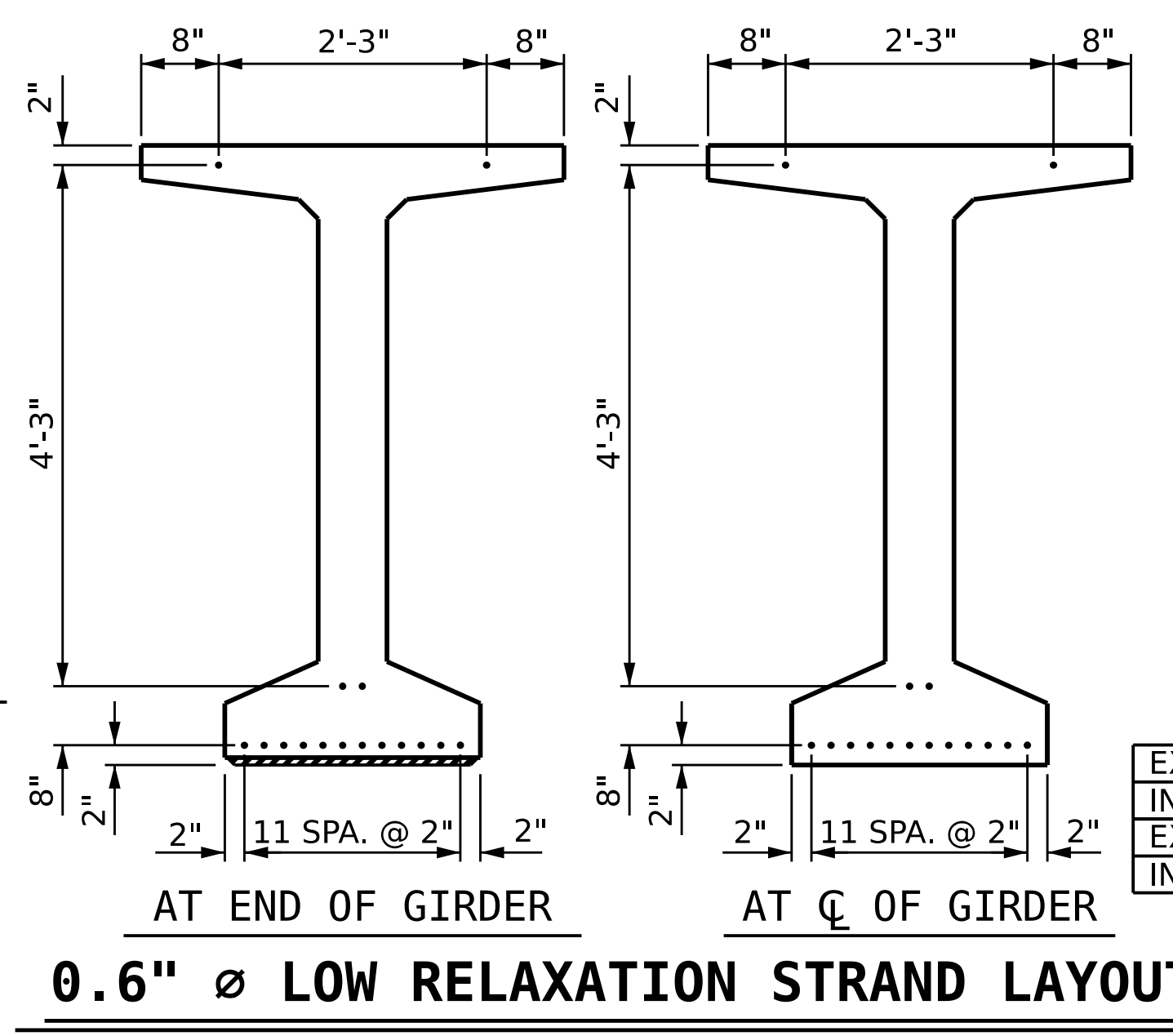






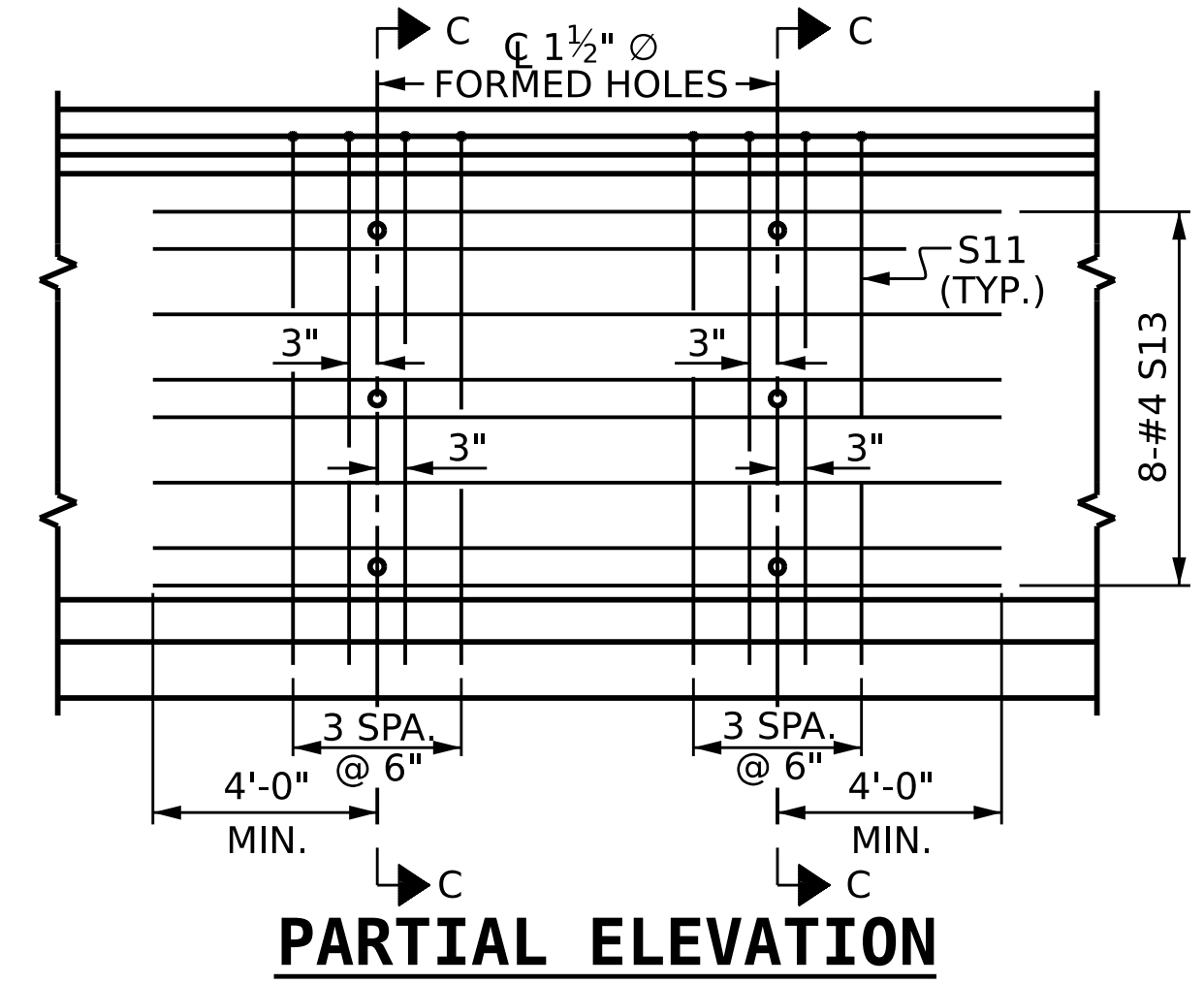
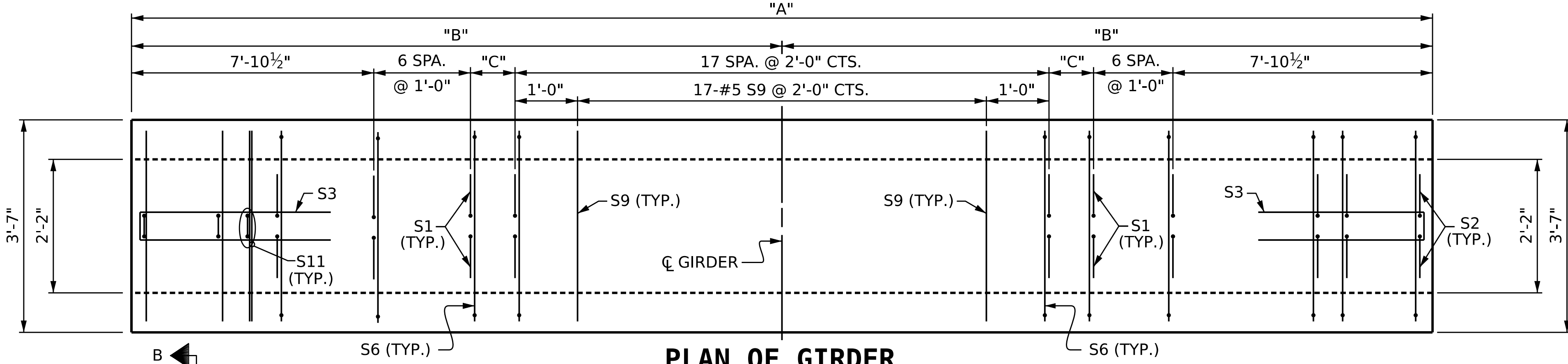
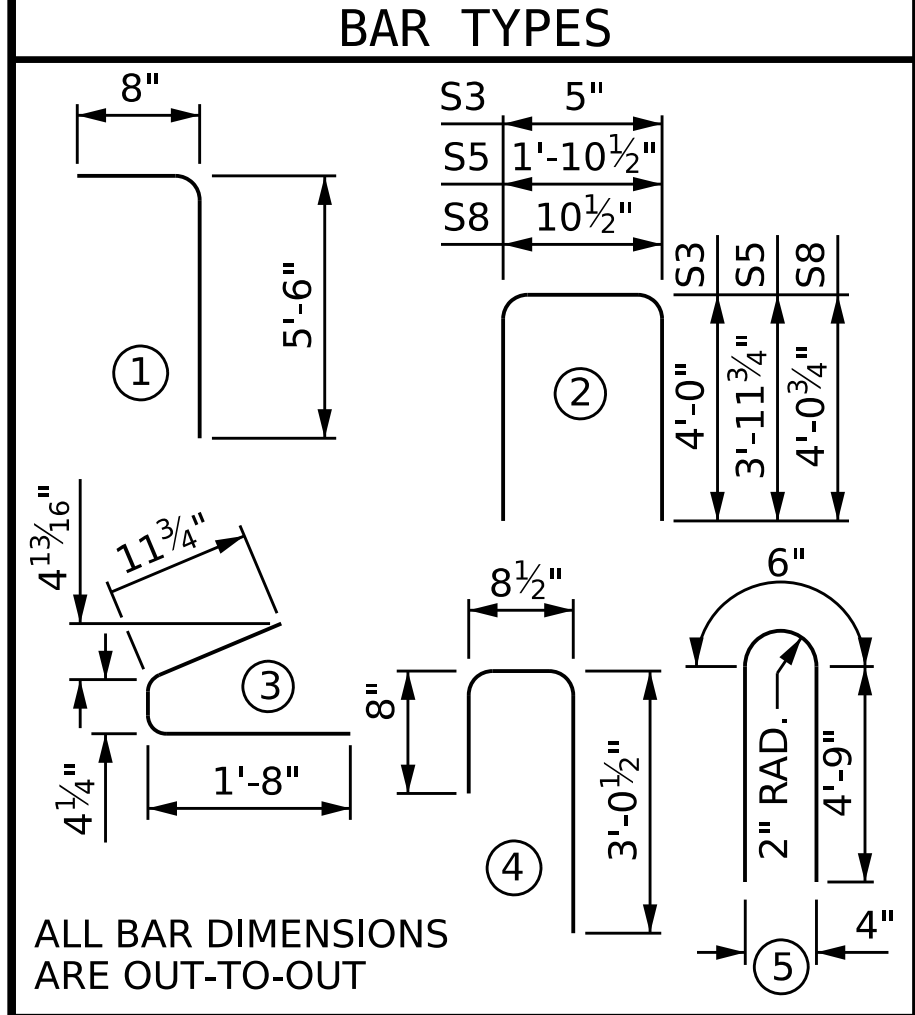


**DEBONDING LEGEND**  
 • FULLY BONDED STRANDS



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

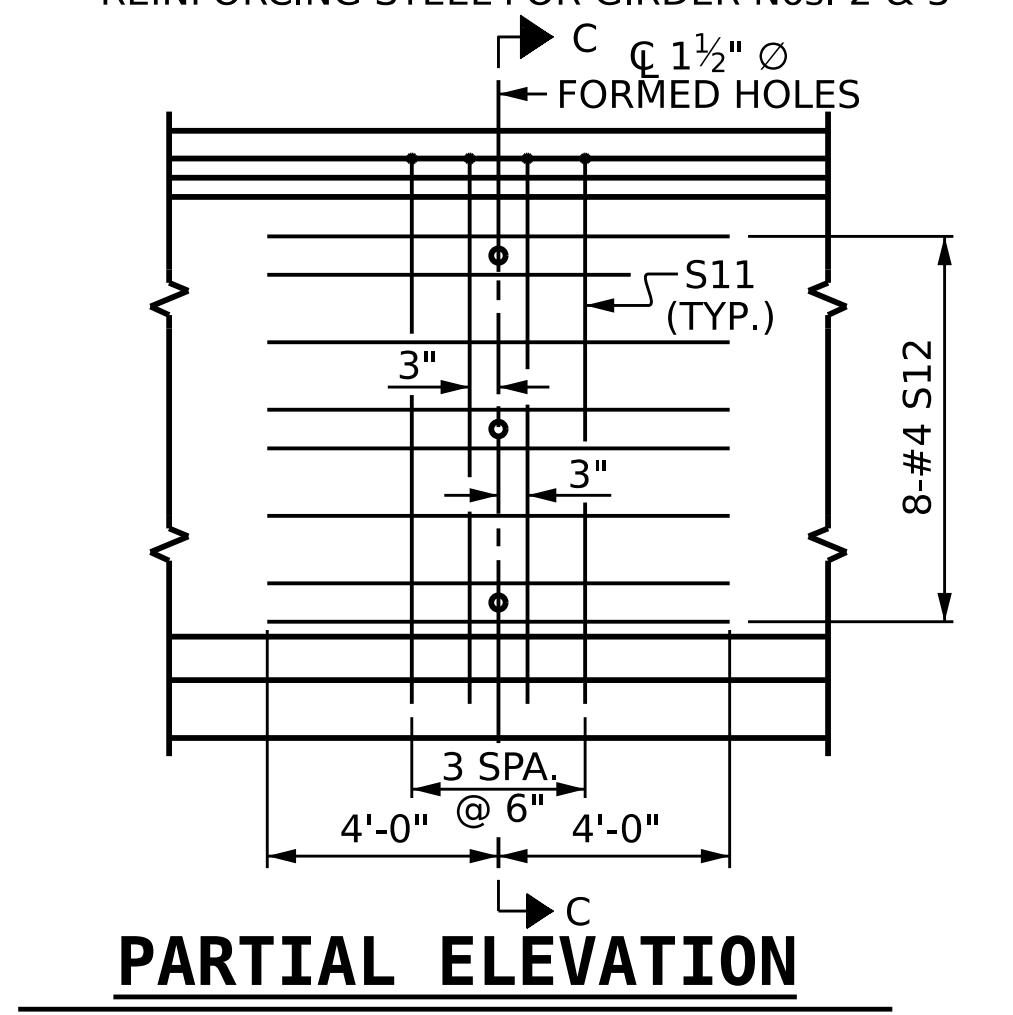
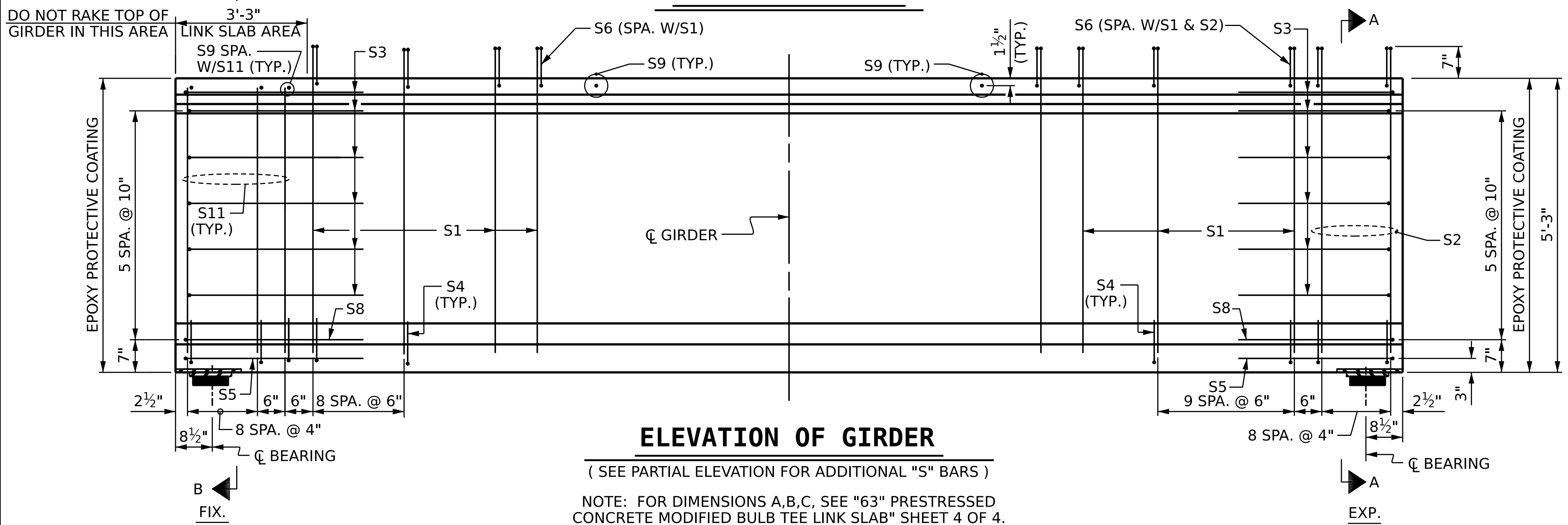
REINFORCING STEEL FOR ONE GDR					
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	#4		6'-2"	404	
S2	#5		6'-2"	116	
S3	#4		8'-5"	67	
S4	#4		3'-0"	152	
S5	#5		9'-10"	21	
S6	#5		4'-5"	534	
S8	#5		9'-0"	19	
S9	#5	STR	3'-3"	92	
EXTERIOR S11	#5		10'-0"	146	
INTERIOR S11	#5		10'-0"	188	
EXTERIOR S12	#4	STR	8'-0"	43	
INTERIOR S13	#4	STR	19'-11"	106	



QUANTITIES FOR ONE GIRDER			
GIRDERS	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR	1,699	*	16
EXTERIOR	1,594	*	16

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	VARIES	251.67

\* SEE "GIRDER DIMENSION" TABLE ON SHEET 4 OF 4.



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**63" PRESTRESSED CONCRETE MODIFIED BULB TEE**

SPAN C



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

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

NOTE: FOR DIMENSIONS A,B,C, SEE "63" PRESTRESSED CONCRETE MODIFIED BULB TEE LINK SLAB" SHEET 4 OF 4.

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### GIRDER DIMENSIONS

GIRDER	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"	"M"	CONCRETE (CY)
AG1	90'-9 $\frac{1}{8}$ "	45'-4 $\frac{3}{16}$ "	1'-6 $\frac{1}{16}$ "	39'-10 $\frac{9}{16}$ "	50'-10 $\frac{9}{16}$ "	--	--	--	--	--	--	--	--	18.0
AG2	90'-7 $\frac{1}{2}$ "	45'-3 $\frac{3}{4}$ "	1'-5 $\frac{1}{4}$ "	--	--	39'-9 $\frac{3}{4}$ "	11'-3 $\frac{3}{4}$ "	39'-6"	--	--	--	--	--	18.0
AG3	90'-5 $\frac{7}{8}$ "	45'-2 $\frac{15}{16}$ "	1'-4 $\frac{1}{16}$ "	--	--	39'-8 $\frac{15}{16}$ "	11'-3 $\frac{3}{8}$ "	39'-5 $\frac{9}{16}$ "	--	--	--	--	--	17.9
AG4	90'-4 $\frac{1}{4}$ "	45'-2 $\frac{1}{8}$ "	1'-3 $\frac{3}{8}$ "	50'-11 $\frac{1}{8}$ "	39'-5 $\frac{1}{8}$ "	--	--	--	--	--	--	--	--	17.9
BG1	119'-11 $\frac{1}{4}$ "	59'-11 $\frac{5}{8}$ "	1'-1 $\frac{1}{8}$ "	--	--	34'-4 $\frac{1}{8}$ "	39'-8 $\frac{1}{2}$ "	45'-10 $\frac{3}{8}$ "	--	--	--	--	--	23.8
BG2	119'-9"	59'-10 $\frac{1}{2}$ "	1'-0"	--	--	--	--	--	34'-3"	11'-7 $\frac{1}{4}$ "	28'-1 $\frac{1}{4}$ "	11'-7 $\frac{1}{4}$ "	34'-2 $\frac{1}{4}$ "	23.7
BG3	119'-6 $\frac{5}{8}$ "	59'-9 $\frac{5}{16}$ "	10 $\frac{3}{16}$ "	--	--	--	--	--	34'-1 $\frac{3}{4}$ "	11'-6 $\frac{7}{8}$ "	28'-1 $\frac{5}{8}$ "	11'-6 $\frac{7}{8}$ "	34'-1 $\frac{1}{2}$ "	23.7
BG4	119'-4 $\frac{3}{8}$ "	59'-8 $\frac{1}{16}$ "	9 $\frac{11}{16}$ "	--	--	45'-7 $\frac{1}{8}$ "	39'-8 $\frac{1}{2}$ "	34'-0 $\frac{3}{4}$ "	--	--	--	--	--	23.6
CG1	63'-0 $\frac{7}{8}$ "	31'-6 $\frac{1}{16}$ "	7 $\frac{15}{16}$ "	25'-6 $\frac{1}{16}$ "	37'-6 $\frac{1}{16}$ "	--	--	--	--	--	--	--	--	12.5
CG2	62'-11 $\frac{3}{8}$ "	31'-5 $\frac{13}{16}$ "	7 $\frac{3}{16}$ "	--	--	25'-5 $\frac{13}{16}$ "	11'-10 $\frac{3}{16}$ "	25'-7 $\frac{1}{2}$ "	--	--	--	--	--	12.5
CG3	62'-10 $\frac{3}{8}$ "	31'-5 $\frac{3}{16}$ "	6 $\frac{11}{16}$ "	--	--	25'-5 $\frac{3}{16}$ "	11'-9 $\frac{15}{16}$ "	25'-7 $\frac{1}{4}$ "	--	--	--	--	--	12.5
CG4	62'-9 $\frac{1}{8}$ "	31'-4 $\frac{9}{16}$ "	6 $\frac{1}{16}$ "	37'-2 $\frac{1}{8}$ "	25'-7"	--	--	--	--	--	--	--	--	12.4

### 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.

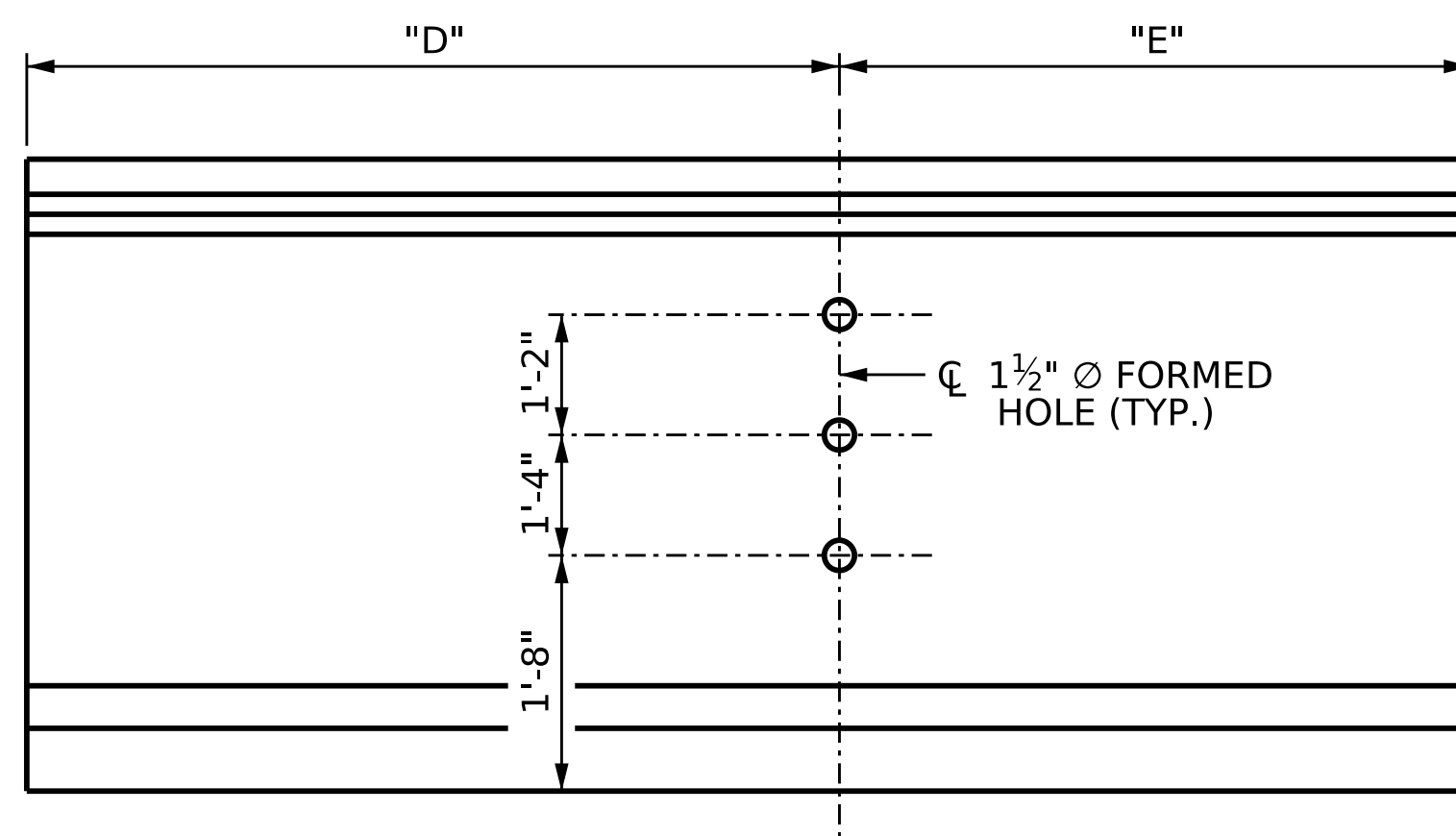
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5200 PSI (SPAN A), 6800 PSI (SPAN B), AND 4800 PSI (SPAN C).

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

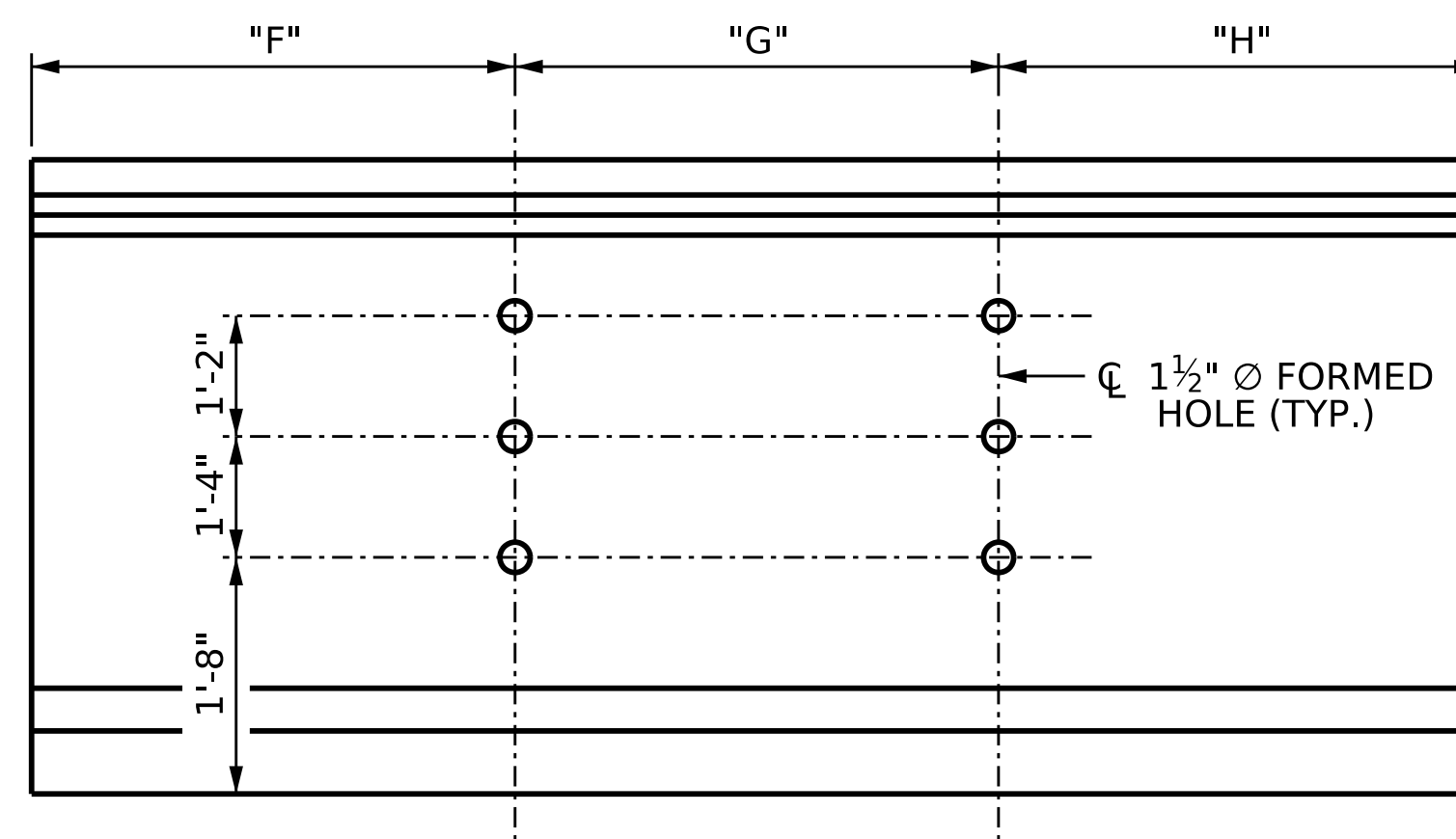
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF  $\frac{1}{4}$ " EXCEPT AS NOTED IN THE LINK SLAB REGION.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

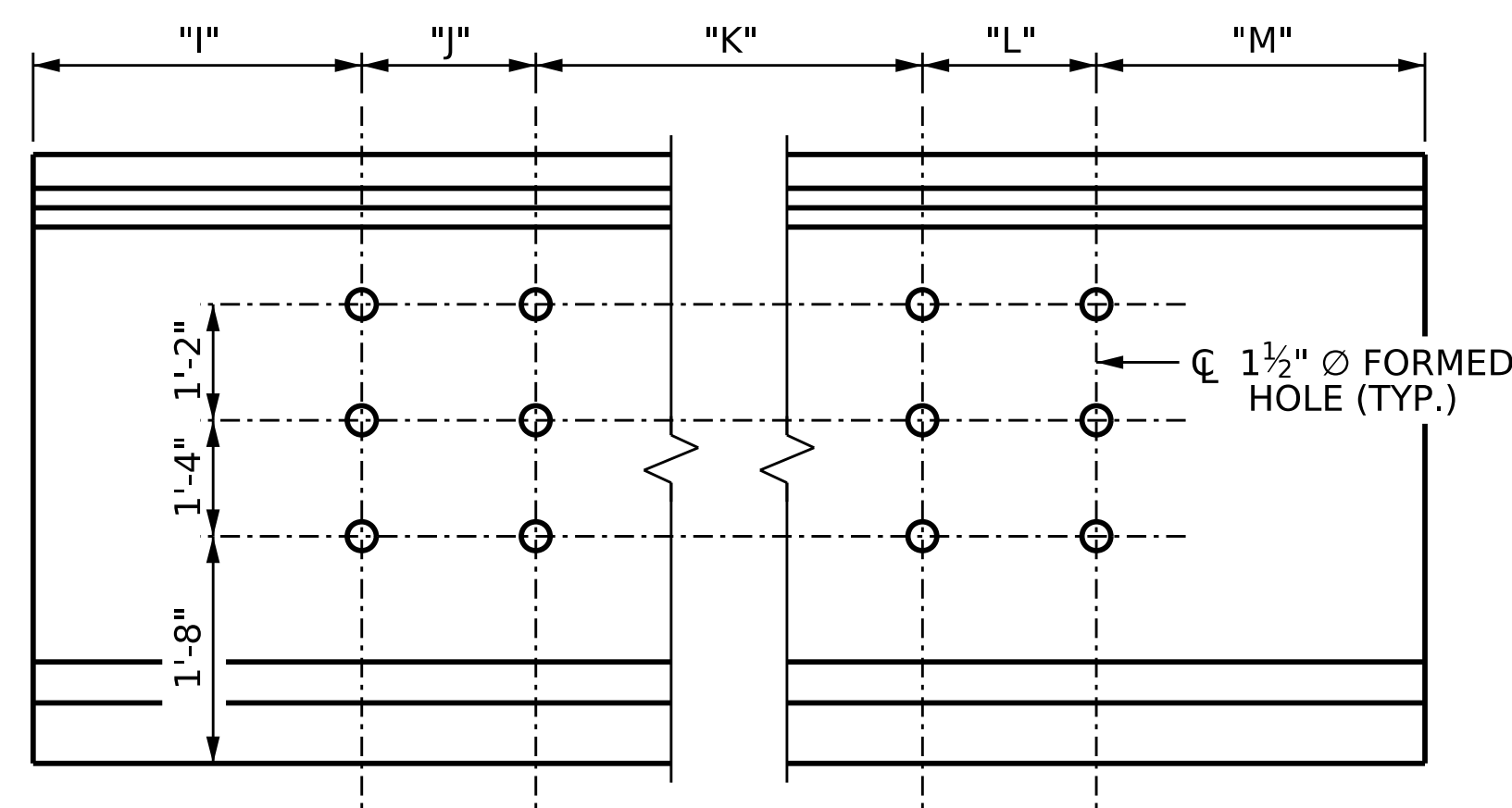
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



GIRDERS AG1, AG4, CG1 & CG4



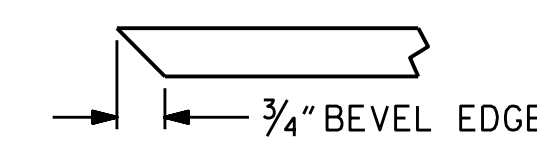
GIRDERS AG2, AG3, BG1, BG4, CG2 & CG3



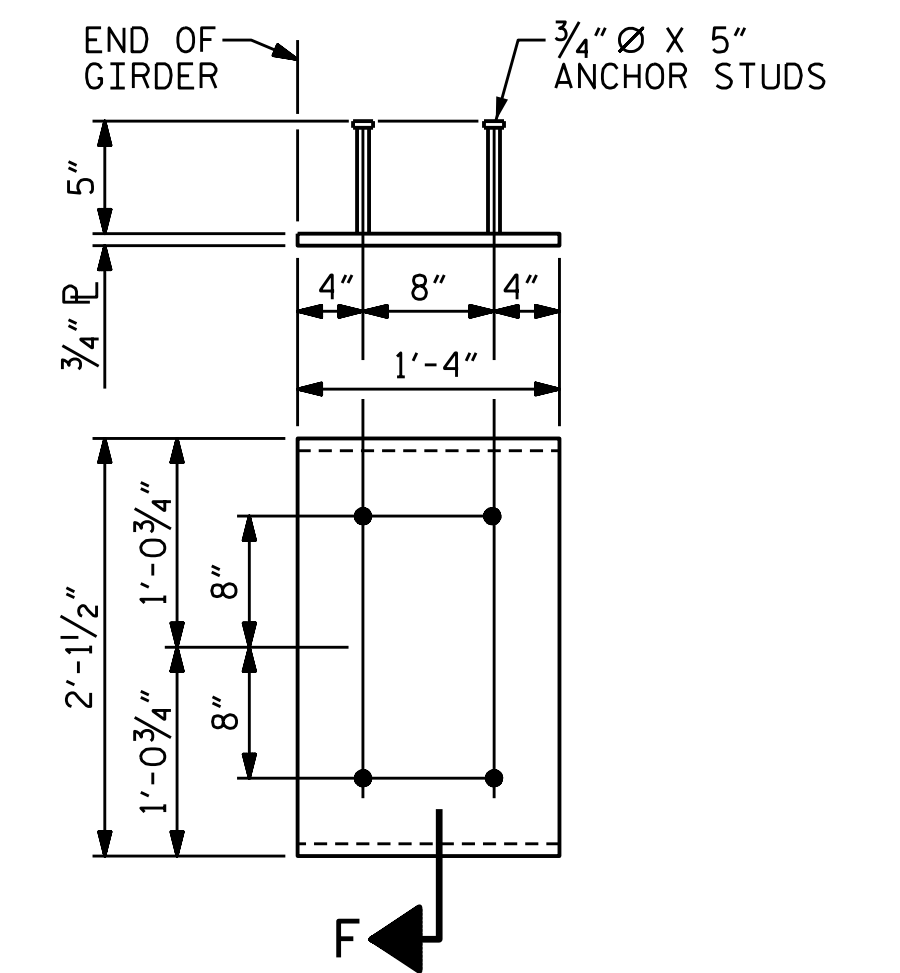
GIRDERS BG2 & BG3

### LOCATION OF 1 1/2" Ø FORMED HOLE

STATION AHEAD →



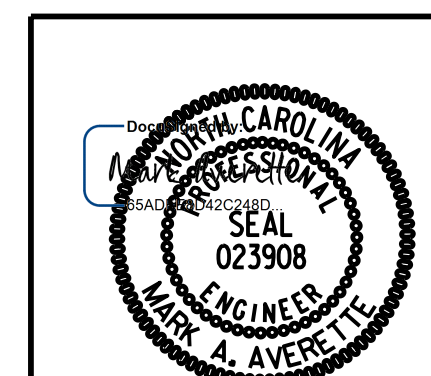
SECTION "F"  
(SEE NOTES)



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

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**63" PRESTRESSED  
 CONCRETE MODIFIED  
 BULB TEE DETAILS**

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-20
1			3			TOTAL SHEETS
2			4			49

LICENSURE NO. C-4434  
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN A																					
GIRDER G1																					
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	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.049	0.071	0.092	0.110	0.126	0.139	0.148	0.154	0.156	0.154	0.148	0.139	0.126	0.110	0.092	0.071	0.049	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.012	0.026	0.039	0.051	0.062	0.071	0.078	0.083	0.087	0.088	0.087	0.083	0.078	0.071	0.062	0.051	0.039	0.026	0.012	0
FINAL CAMBER ↑	0	3/16"	1/4"	3/8"	1/2"	9/16"	11/16"	3/4"	3/4"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	9/16"	1/2"	3/8"	1/4"	3/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN A																					
GIRDER G2-G3																					
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	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.049	0.071	0.092	0.110	0.126	0.139	0.148	0.154	0.156	0.154	0.148	0.139	0.126	0.110	0.092	0.071	0.049	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.013	0.027	0.041	0.053	0.065	0.074	0.082	0.087	0.091	0.092	0.091	0.087	0.082	0.074	0.065	0.053	0.041	0.027	0.013	0
FINAL CAMBER ↑	0	3/16"	1/4"	3/8"	7/16"	9/16"	5/8"	11/16"	3/4"	3/4"	3/4"	3/4"	3/4"	11/16"	5/8"	9/16"	7/16"	3/8"	1/4"	3/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN A																					
GIRDER G4																					
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	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.049	0.071	0.092	0.110	0.126	0.139	0.148	0.154	0.156	0.154	0.148	0.139	0.126	0.110	0.092	0.071	0.049	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.012	0.026	0.039	0.051	0.061	0.070	0.077	0.083	0.086	0.087	0.086	0.083	0.077	0.070	0.061	0.051	0.038	0.026	0.012	0
FINAL CAMBER ↑	0	3/16"	5/16"	3/8"	1/2"	9/16"	11/16"	3/4"	13/16"	13/16"	13/16"	13/16"	3/4"	11/16"	9/16"	1/2"	3/8"	5/16"	3/16"	0	0

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

12/21/2023 1:48:33 PM c:\pwworking\cecom\_ds21\_na\_2020\d0252774\I2513AA\_SMU\_DL1\_100902.dgn

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

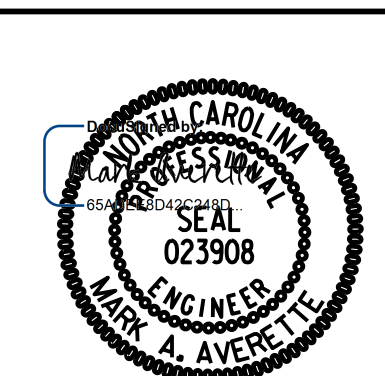
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**DEAD LOAD DEFLECTION  
AND GIRDER CAMBER**

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			49



12/21/2023 | 11:09 AM EST

LICENSURE NO. C-4434

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

DRAWN BY : S.D. COOPER DATE : 12-23  
CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



12/21/2023 1:48:34 PM c:\pwworking\cecom\_ds21\_na\_2020\d0252774\I2513AA\_SMU\_DL2\_100902.dgn

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G1 (0 THRU .500)																				
FORTIETH POINTS	0	.025	.050	.075	.100	.125	.150	.175	.200	.225	.250	.275	.300	.325	.350	.375	.400	.425	.450	.475	.500
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.053	0.079	0.105	0.130	0.154	0.177	0.199	0.220	0.239	0.257	0.273	0.287	0.300	0.311	0.319	0.326	0.331	0.334	0.336
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.016	0.036	0.056	0.075	0.094	0.112	0.130	0.146	0.162	0.177	0.190	0.202	0.213	0.223	0.231	0.238	0.243	0.247	0.250	0.250
FINAL CAMBER ↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	7/8"	15/16"	15/16"	1"	1"	1"	1"	1"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G1 (.500 THRU 1.000)																				
FORTIETH POINTS	.500	.525	.550	.575	.600	.625	.650	.675	.700	.725	.750	.775	.800	.825	.850	.875	.900	.925	.950	.975	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0.336	0.334	0.331	0.326	0.319	0.310	0.300	0.287	0.273	0.257	0.239	0.220	0.199	0.177	0.154	0.130	0.105	0.079	0.053	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.250	0.250	0.247	0.243	0.238	0.231	0.223	0.213	0.202	0.190	0.177	0.162	0.146	0.130	0.112	0.094	0.075	0.056	0.036	0.016	0
FINAL CAMBER ↑	1"	1"	1"	1"	1"	15/16"	15/16"	7/8"	7/8"	13/16"	3/4"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G2 THRU G3 (0 THRU .500)																				
FORTIETH POINTS	0	.025	.050	.075	.100	.125	.150	.175	.200	.225	.250	.275	.300	.325	.350	.375	.400	.425	.450	.475	.500
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.053	0.079	0.105	0.130	0.154	0.177	0.199	0.220	0.239	0.257	0.273	0.287	0.300	0.311	0.319	0.326	0.331	0.334	0.336
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.016	0.037	0.058	0.079	0.098	0.118	0.136	0.154	0.170	0.185	0.199	0.212	0.224	0.234	0.242	0.250	0.255	0.259	0.262	0.262
FINAL CAMBER ↑	0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	11/16"	3/4"	3/4"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G2 THRU G3 (.500 THRU 1.000)																				
FORTIETH POINTS	.500	.525	.550	.575	.600	.625	.650	.675	.700	.725	.750	.775	.800	.825	.850	.875	.900	.925	.950	.975	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0.336	0.334	0.331	0.326	0.319	0.310	0.300	0.287	0.273	0.257	0.239	0.220	0.199	0.177	0.154	0.130	0.105	0.079	0.053	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.262	0.262	0.259	0.255	0.250	0.243	0.234	0.224	0.212	0.199	0.185	0.170	0.154	0.136	0.118	0.098	0.079	0.058	0.037	0.016	0
FINAL CAMBER ↑	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	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).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G4 (0 THRU .500)																				
FORTIETH POINTS	0	.025	.050	.075	.100	.125	.150	.175	.200	.225	.250	.275	.300	.325	.350	.375	.400	.425	.450	.475	.500
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.026	0.053	0.079	0.105	0.130	0.154	0.177	0.199	0.220	0.239	0.257	0.273	0.287	0.300	0.311	0.319	0.326	0.331	0.334	0.336
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.015	0.035	0.055	0.074	0.093	0.111	0.128	0.145	0.161	0.175	0.188	0.200	0.211	0.221	0.229	0.236	0.241	0.245	0.247	0.248
FINAL CAMBER ↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	15/16"	1"	1"	1"	1 1/16"	1 1/16"	1 1/16"

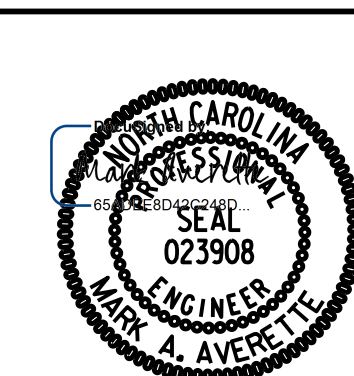
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B																					
0.6 ∅ LOW RELAXATION	GIRDER G4 (.500 THRU 1.000)																				
FORTIETH POINTS	.500	.525	.550	.575	.600	.625	.650	.675	.700	.725	.750	.775	.800	.825	.850	.875	.900	.925	.950	.975	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0.336	0.334	0.331	0.326	0.319	0.310	0.300	0.287	0.273	0.257	0.239	0.220	0.199	0.177	0.154	0.130	0.105	0.079	0.053	0.026	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.248	0.247	0.245	0.241	0.236	0.229	0.221	0.211	0.200	0.188	0.175	0.161	0.145	0.128	0.111	0.093	0.074	0.055	0.035	0.015	0
FINAL CAMBER ↑	1 1/16"	1 1/16"	1 1/16"	1"	1"	1"	15/16"	15/16"	7/8"	13/16"	3/4"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0

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

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE			
<b>DEAD LOAD DEFLECTION AND GIRDER CAMBER</b>			
SPAN B			
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			5-22
2			TOTAL SHEETS 49



12/21/2023 | 11:09 AM EST

DRAWN BY : S.D. COOPER DATE : 12-23  
CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

LICENSURE NO. C-4434

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN C																					
0.6 ∅ LOW RELAXATION																					
GIRDER G1																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.008	0.018	0.027	0.035	0.042	0.047	0.052	0.055	0.057	0.058	0.057	0.055	0.052	0.047	0.042	0.035	0.027	0.018	0.008	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.006	0.009	0.012	0.014	0.016	0.018	0.020	0.020	0.020	0.020	0.020	0.018	0.016	0.014	0.012	0.009	0.006	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	1/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN C																					
0.6 ∅ LOW RELAXATION																					
GIRDER G2 THRU G3																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.008	0.018	0.027	0.035	0.042	0.047	0.052	0.055	0.057	0.058	0.057	0.055	0.052	0.047	0.042	0.035	0.027	0.018	0.008	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.006	0.009	0.012	0.015	0.017	0.019	0.021	0.021	0.022	0.021	0.021	0.019	0.017	0.015	0.012	0.009	0.006	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	1/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN C																					
0.6 ∅ LOW RELAXATION																					
GIRDER G4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMER (GIRDER ALONG IN PLACE) ↑	0	0.008	0.018	0.027	0.035	0.042	0.047	0.052	0.055	0.057	0.058	0.057	0.055	0.052	0.047	0.042	0.035	0.027	0.018	0.008	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.006	0.009	0.012	0.014	0.016	0.018	0.019	0.020	0.020	0.020	0.019	0.018	0.016	0.014	0.012	0.009	0.006	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	1/16"	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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STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**DEAD LOAD DEFLECTION  
AND GIRDER CAMBER**

SPAN C

REVISIONS

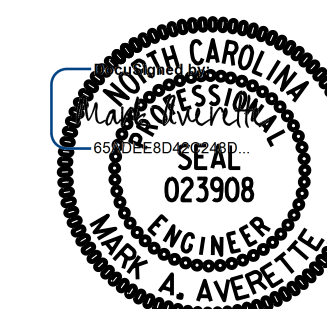
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2			4			



5640 Dillard Drive, Suite 200  
Cary, NC 27518

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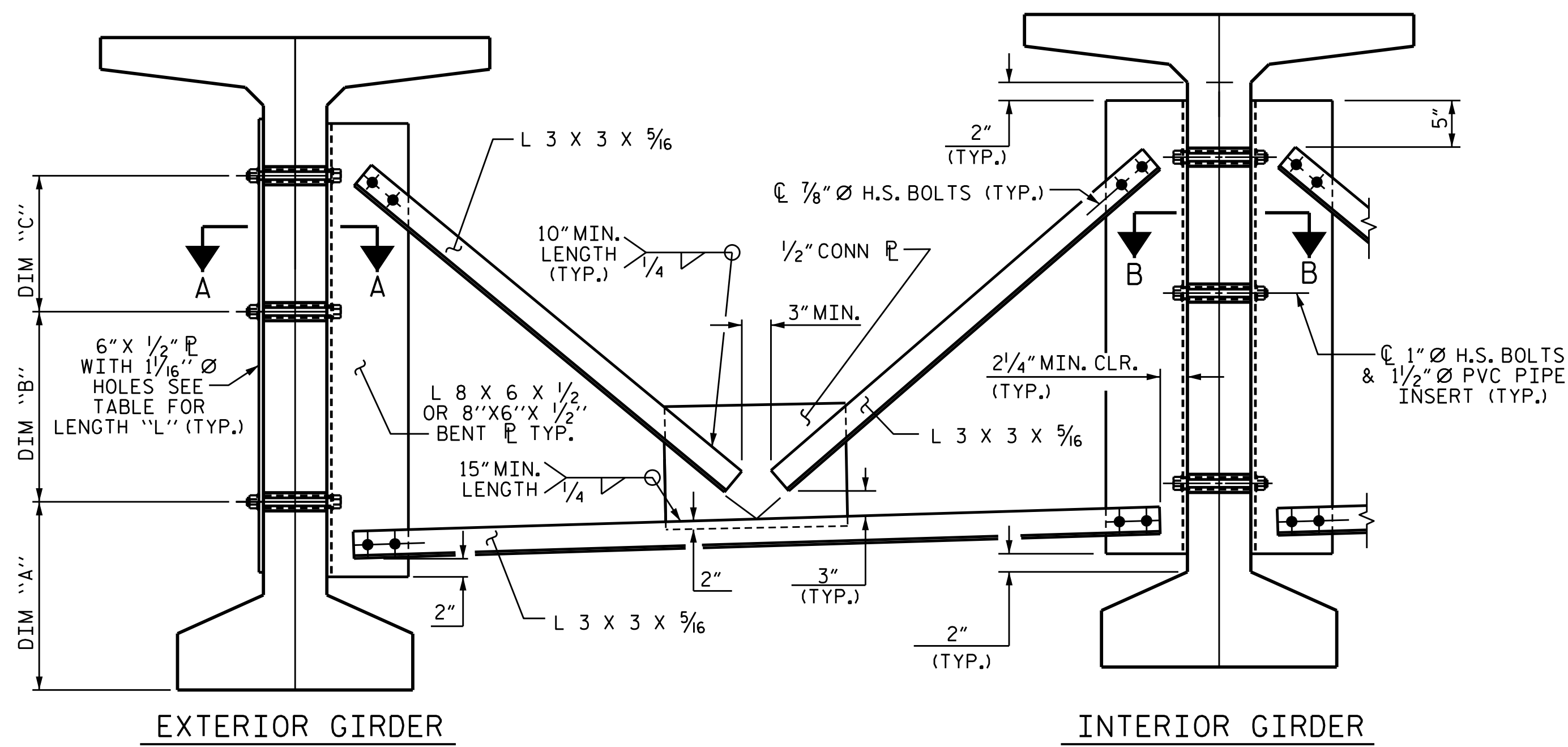


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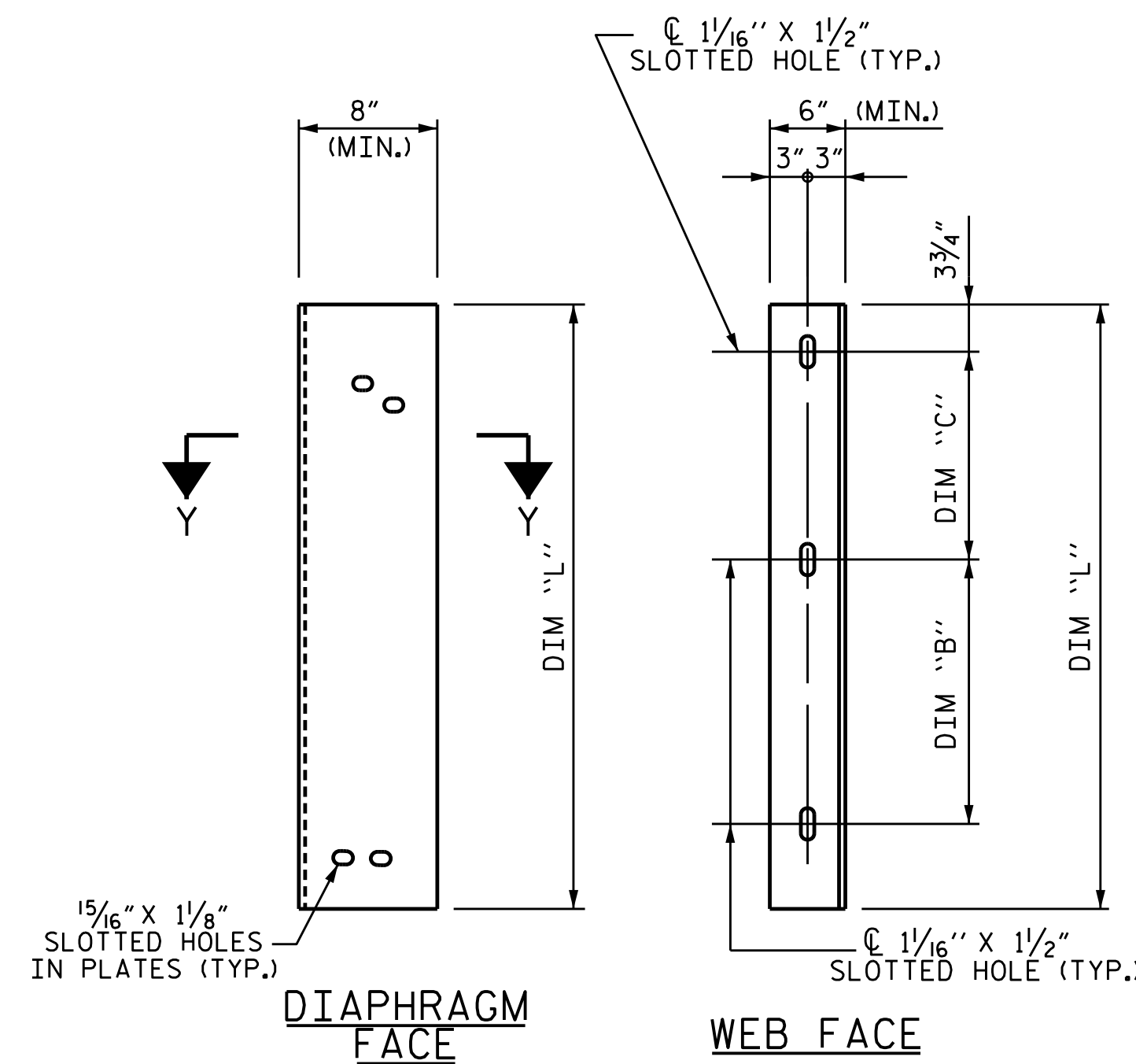
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CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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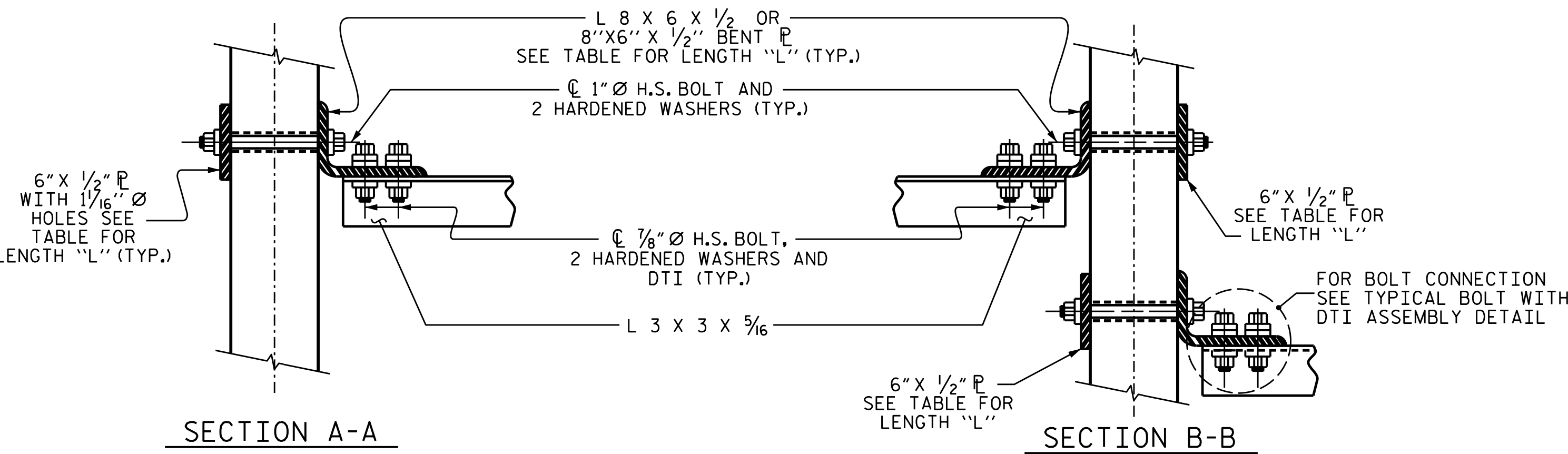




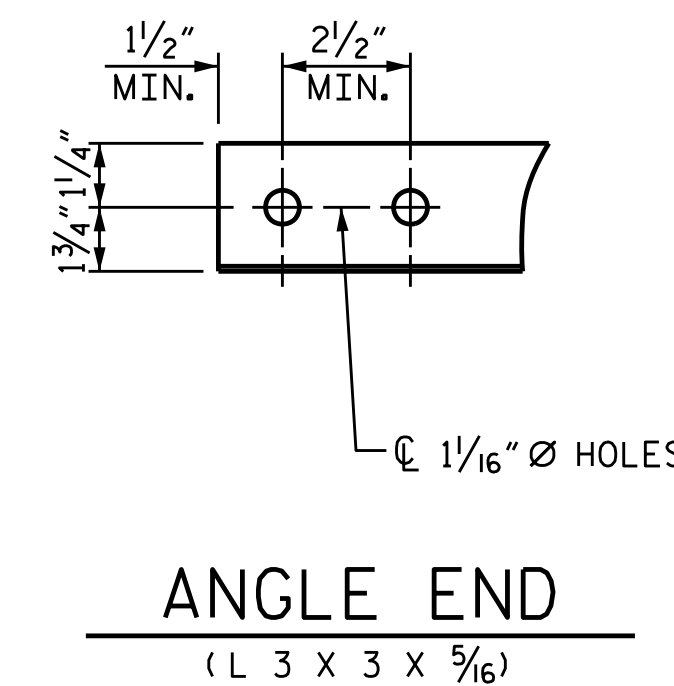
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
(63" BULB TEE GIRDER)



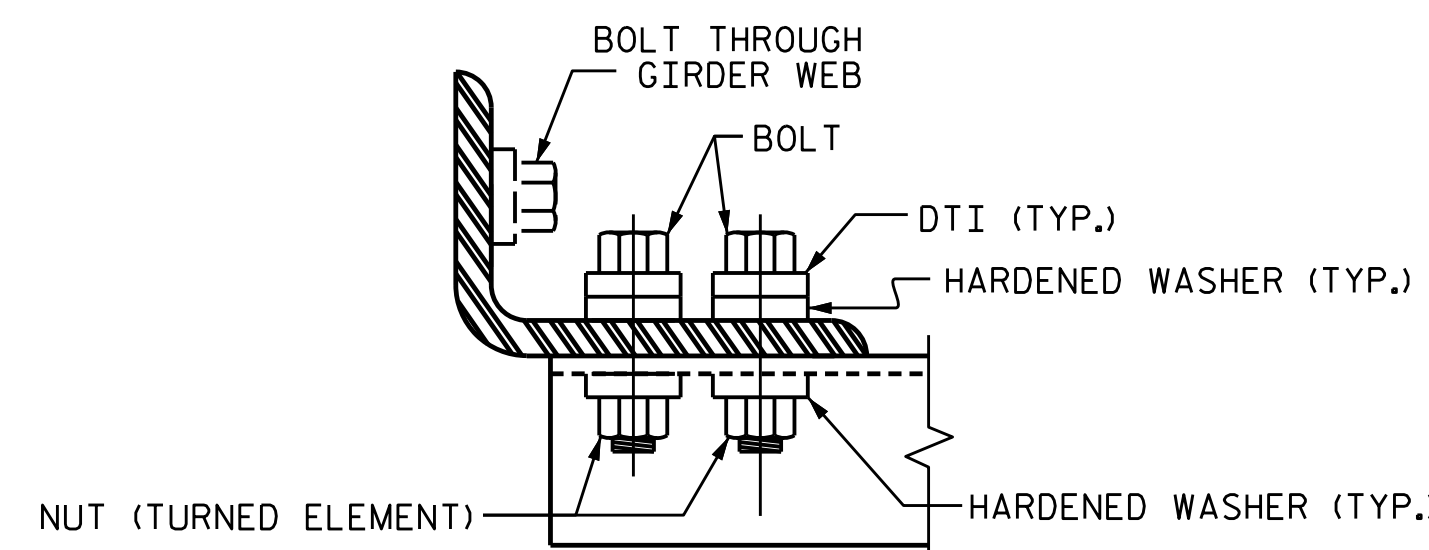
**CONNECTOR PLATE DETAIL**



**CONNECTION DETAILS**



**ANGLE END**  
(L 3 x 3 x 5/16)



**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 ANGLE 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, 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.

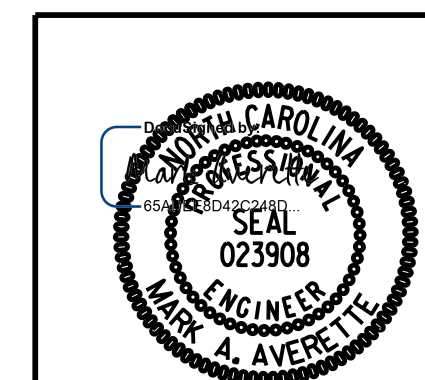
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

**TABLE**

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-8"	1'-4"	1'-2"	3'-5"

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-



STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
**INTERMEDIATE STEEL  
 DIAPHRAGM FOR 63"  
 PRESTRESSED CONCRETE  
 MODIFIED BULB TEE**

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2			4			49

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**NOTES**

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

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

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

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

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

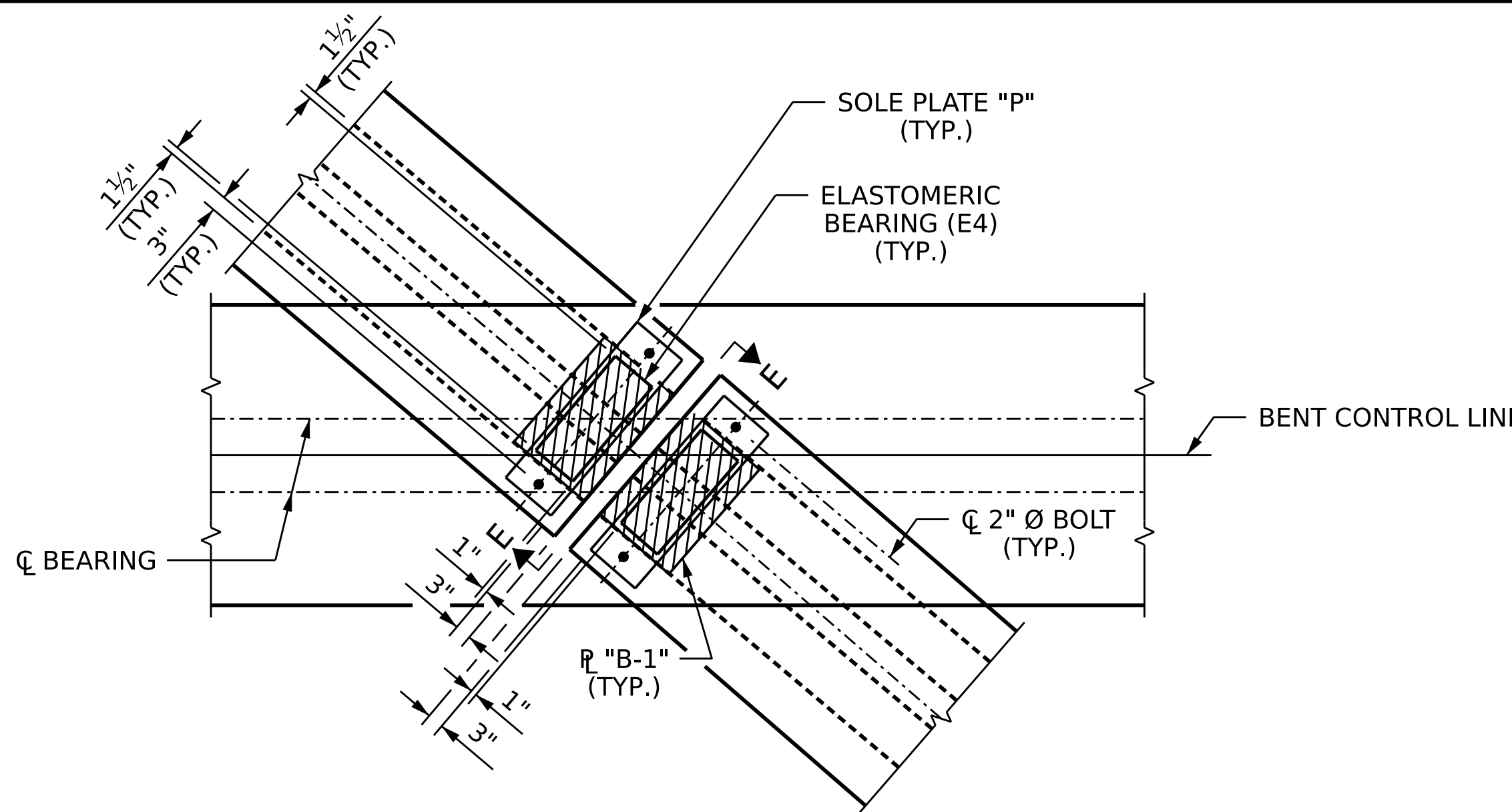
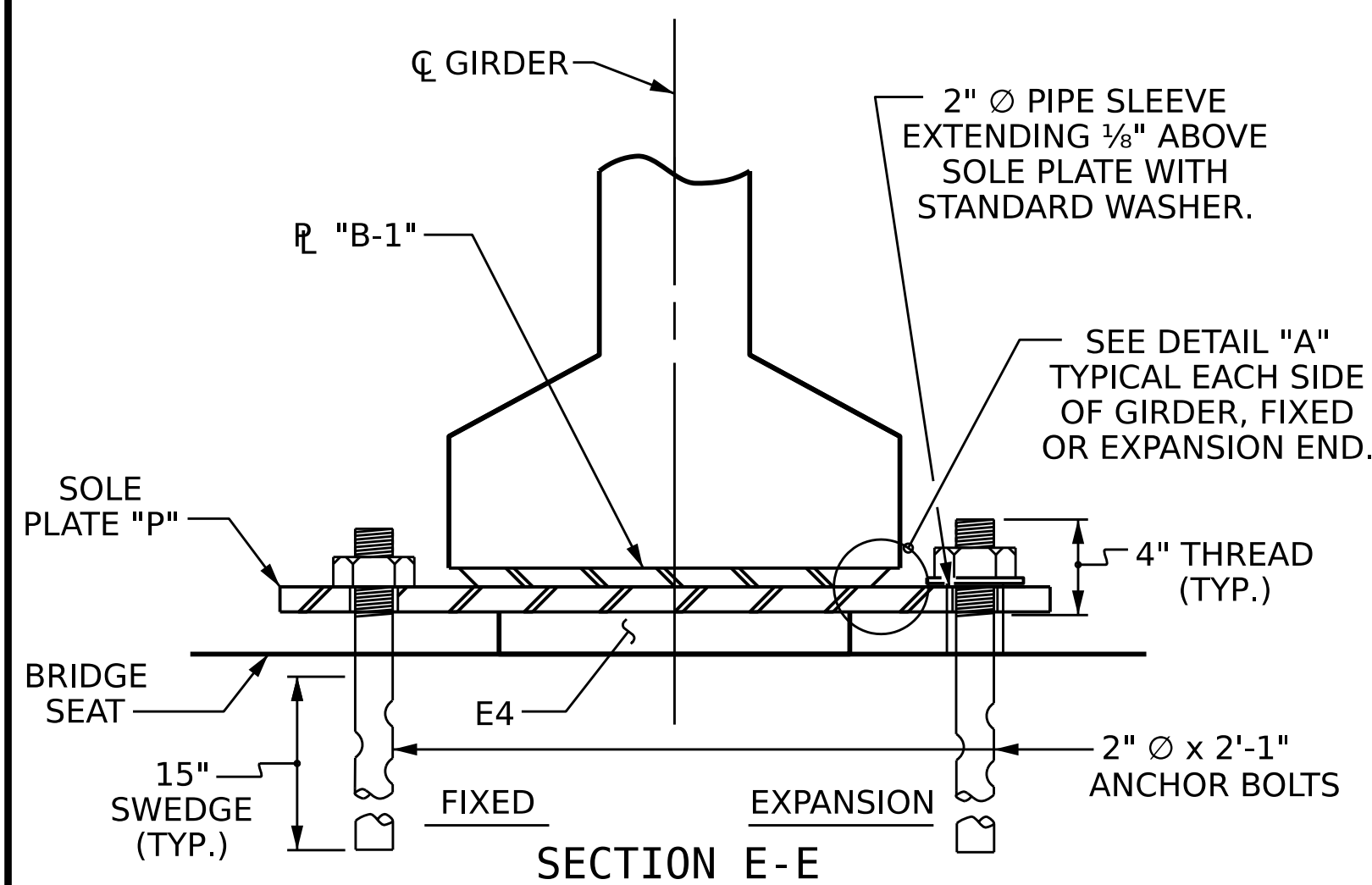
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

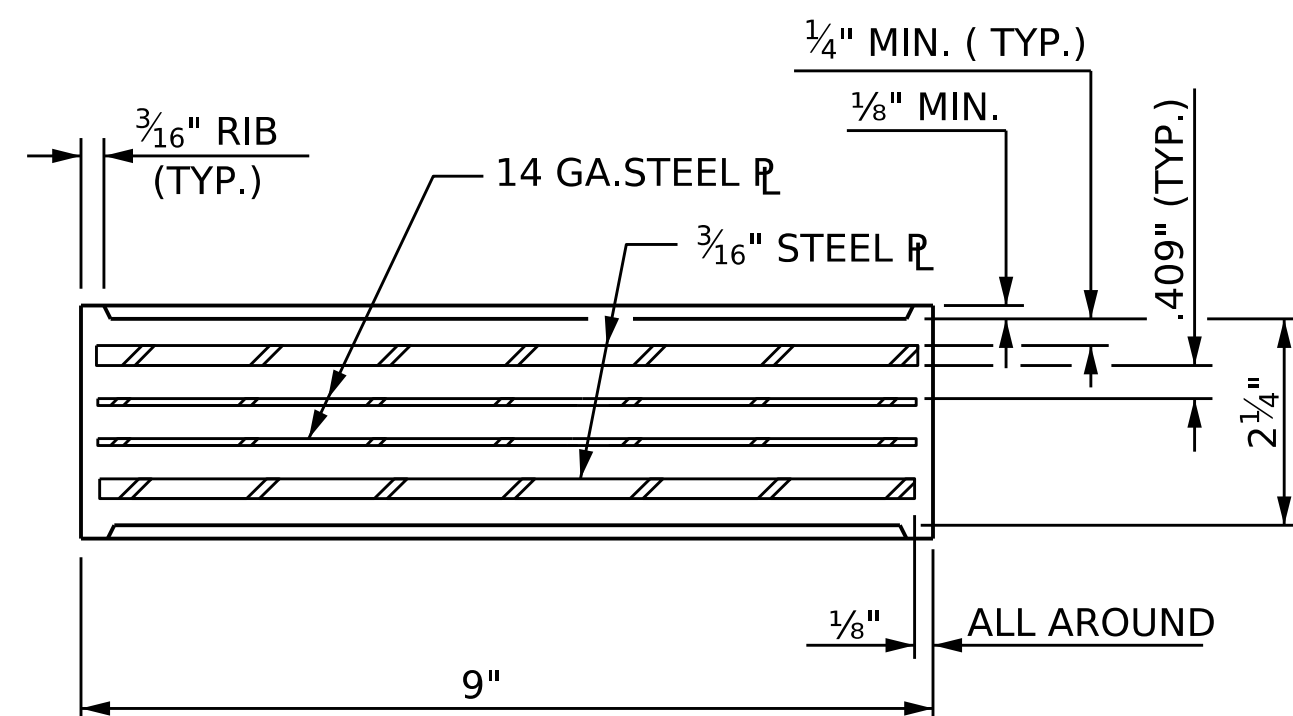
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

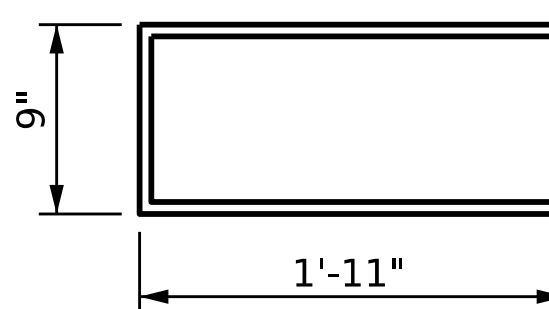
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



**TYPICAL PLAN**  
(SHOWING LINK SLAB BENT)

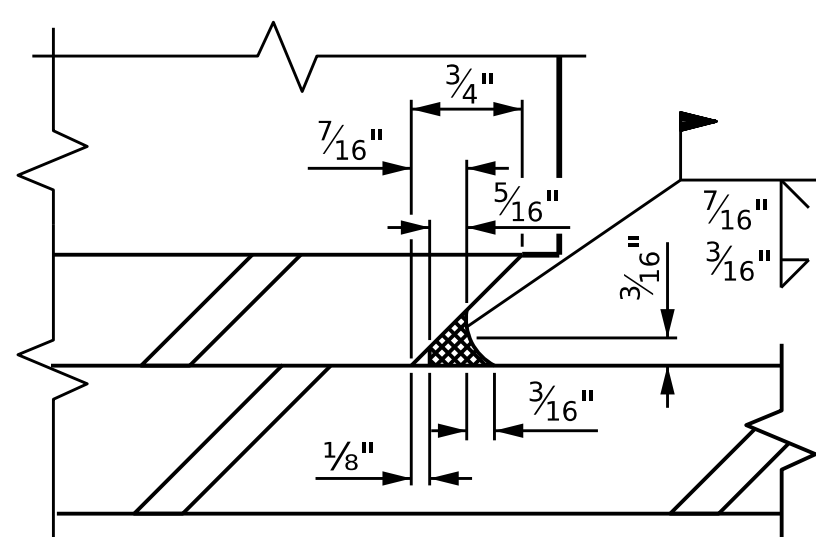


TYPICAL SECTION OF ELASTOMERIC BEARINGS

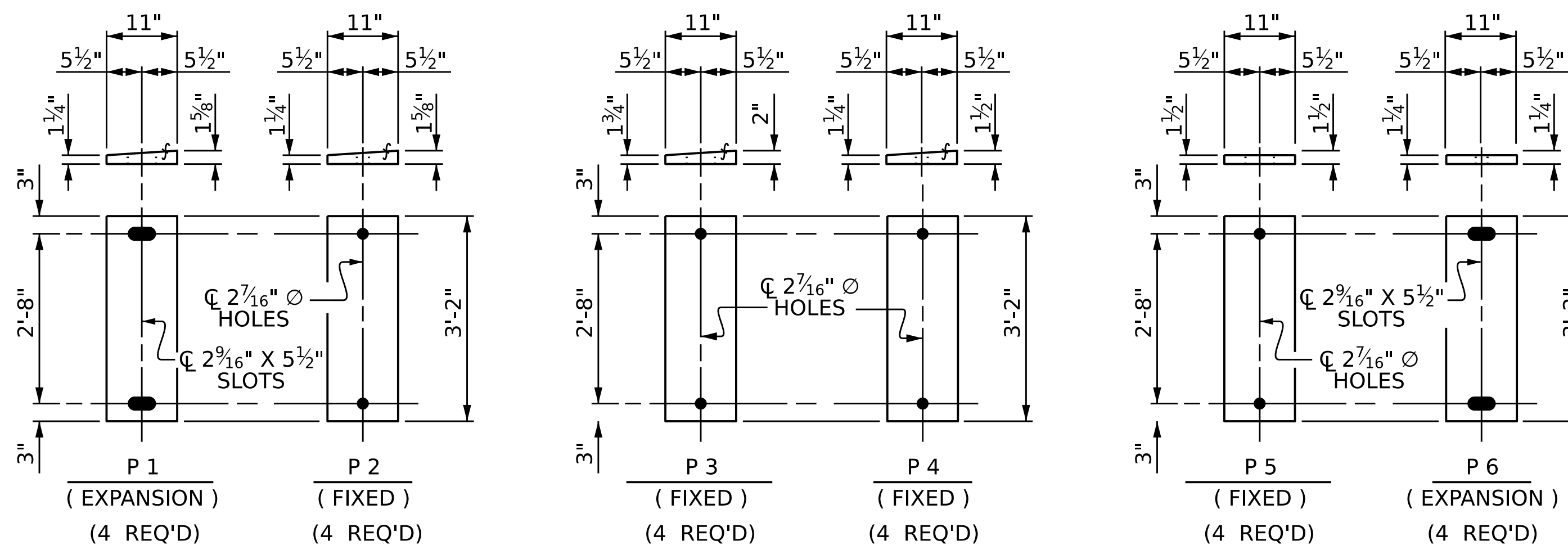


E4 (24 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

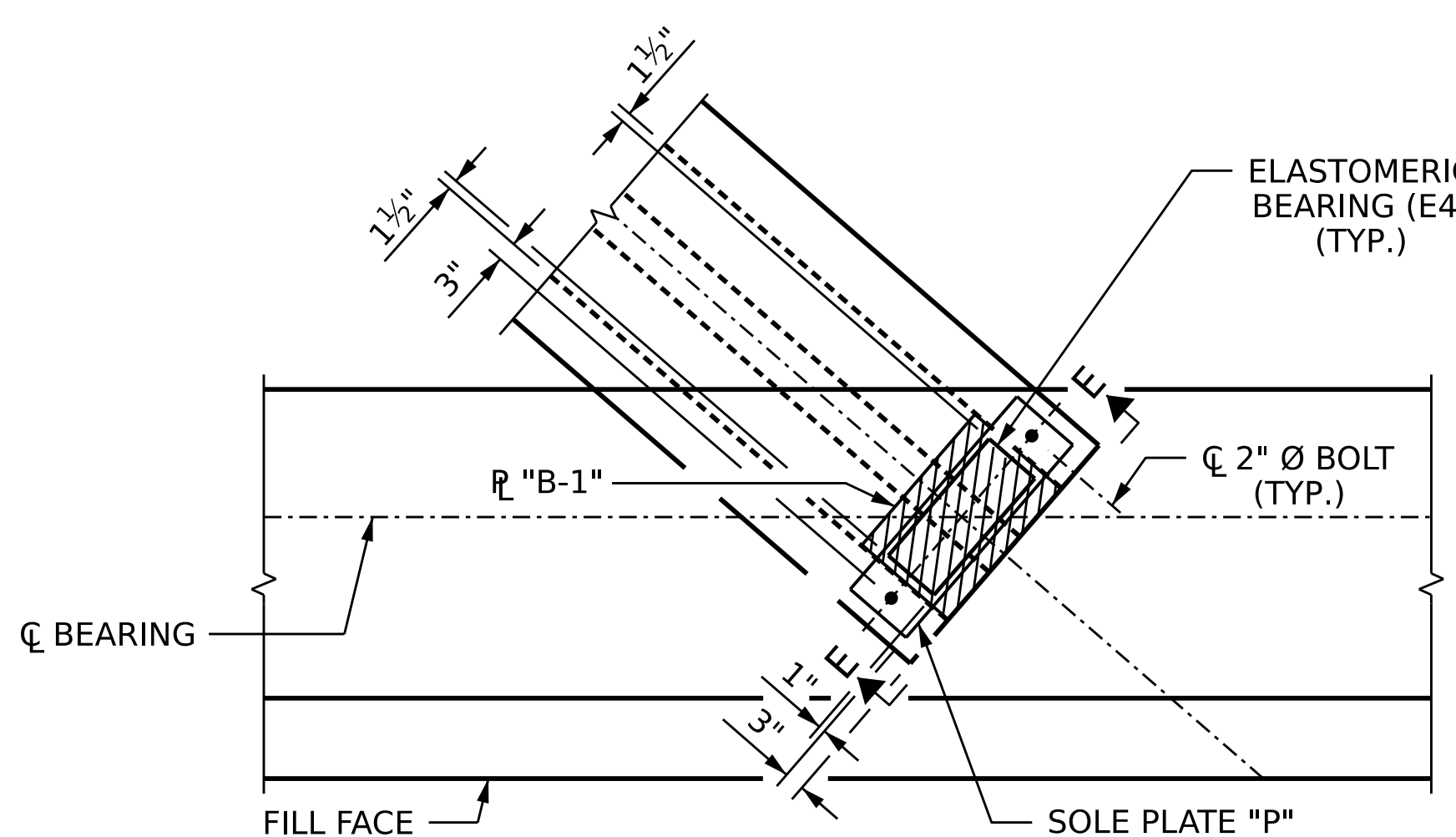
**TYPE V**



DETAIL "A"

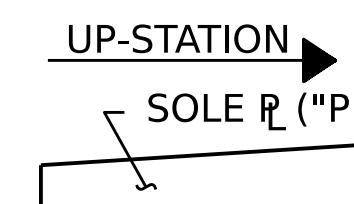


**SOLE PLATE DETAILS ( "P" )**



**TYPICAL PLAN**  
(SHOWING END BENT)

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

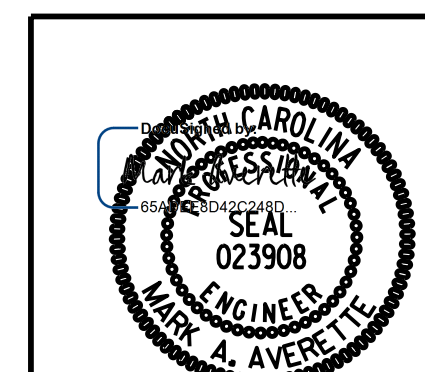


SOLE R PLACEMENT DETAIL

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**ELASTOMERIC BEARING DETAILS**



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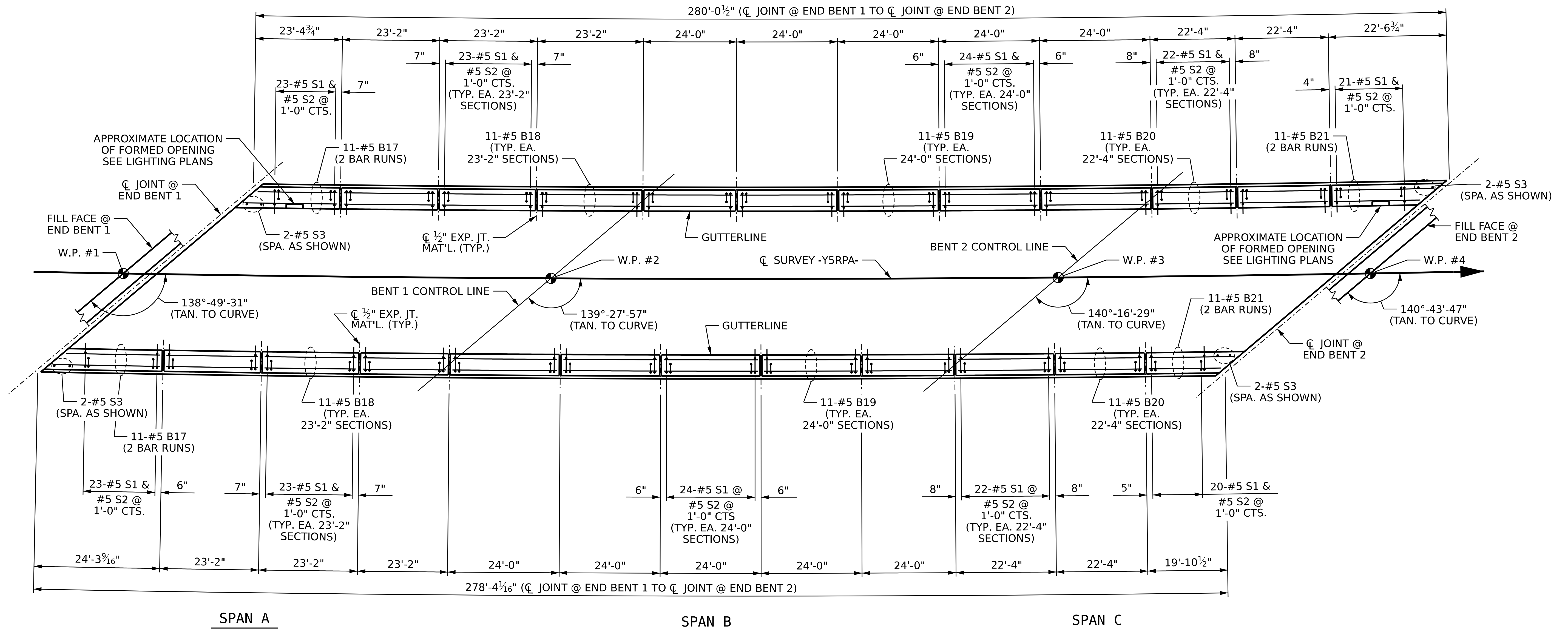
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**PLAN**  
DIMENSIONS SHOWN ALONG BACK FACE OF BARRIER RAIL

**NOTES:**

THE BARRIER RAIL SHALL NOT BE CAST IN A CONTINUOUS UNIT 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 BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5 S1 AND S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL.

THE #5 S1 BARS MAY BE SHIFTED SLIGHTLY OR FIELD BENT AS NECESSARY IN ORDER TO CLEAR THE EXPANSION JOINT SEAL COVER PLATE ASSEMBLY IN THE CONCRETE BARRIER RAIL AT THE END BENTS.

SEE "BRIDGE APPROACH SLAB" SHEET 2 OF 2 FOR EPOXY COATED REINFORCING STEEL, CLASS AA CONCRETE AND LINEAR FEET QUANTITIES FOR BARRIER RAILS ON THE APPROACH SLABS.

SEE LIGHTING PLANS FOR FORMED OPENING AND CONDUIT DETAILS IN BARRIER RAIL.

"B" BARS MAY BE CUT AS NECESSARY TO AVOID FORMED OPENING.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 2

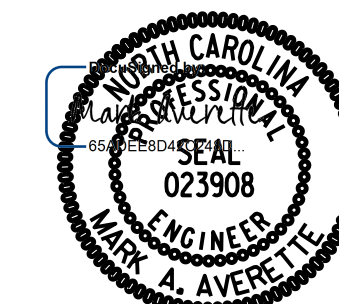
STATE OF NORTH CAROLINA  
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**CONCRETE BARRIER RAIL**



5640 Dillard Drive, Suite 200  
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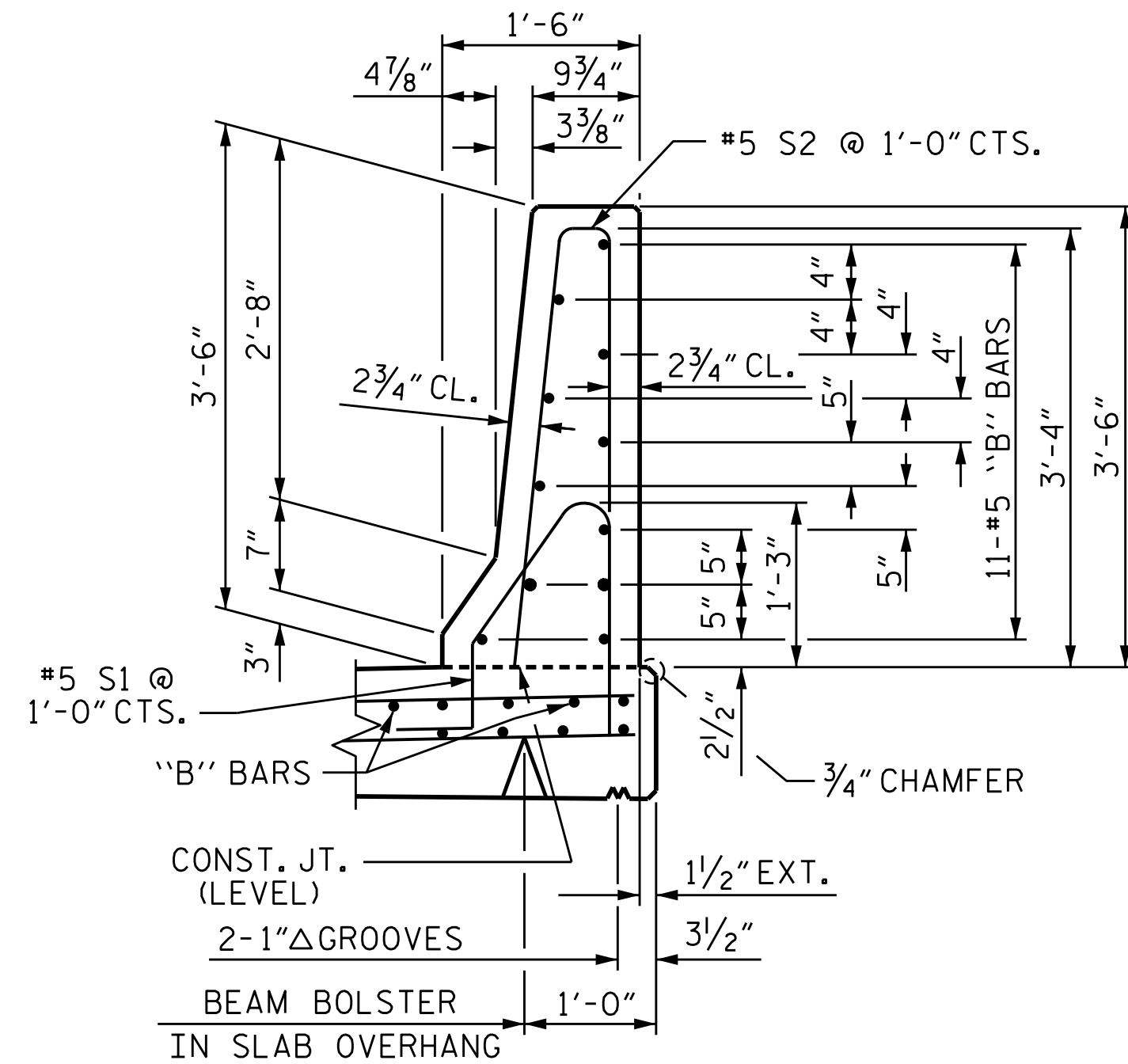


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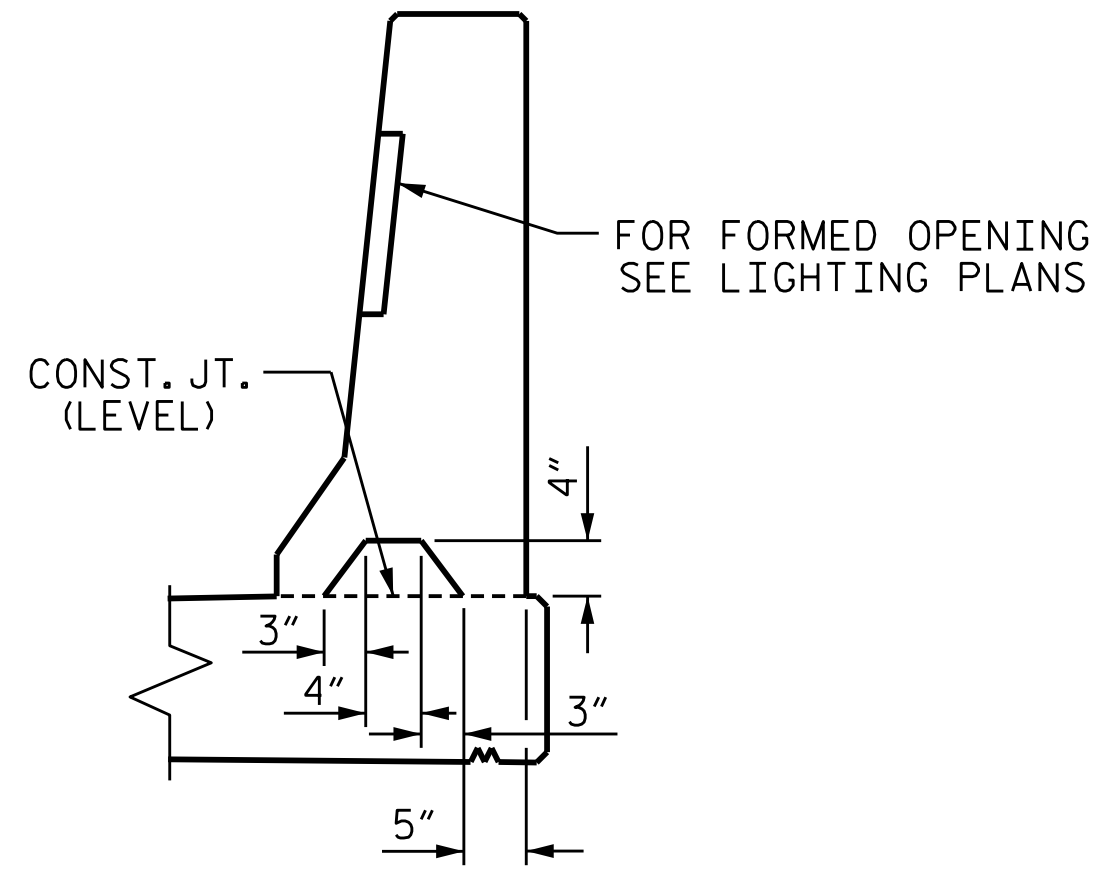
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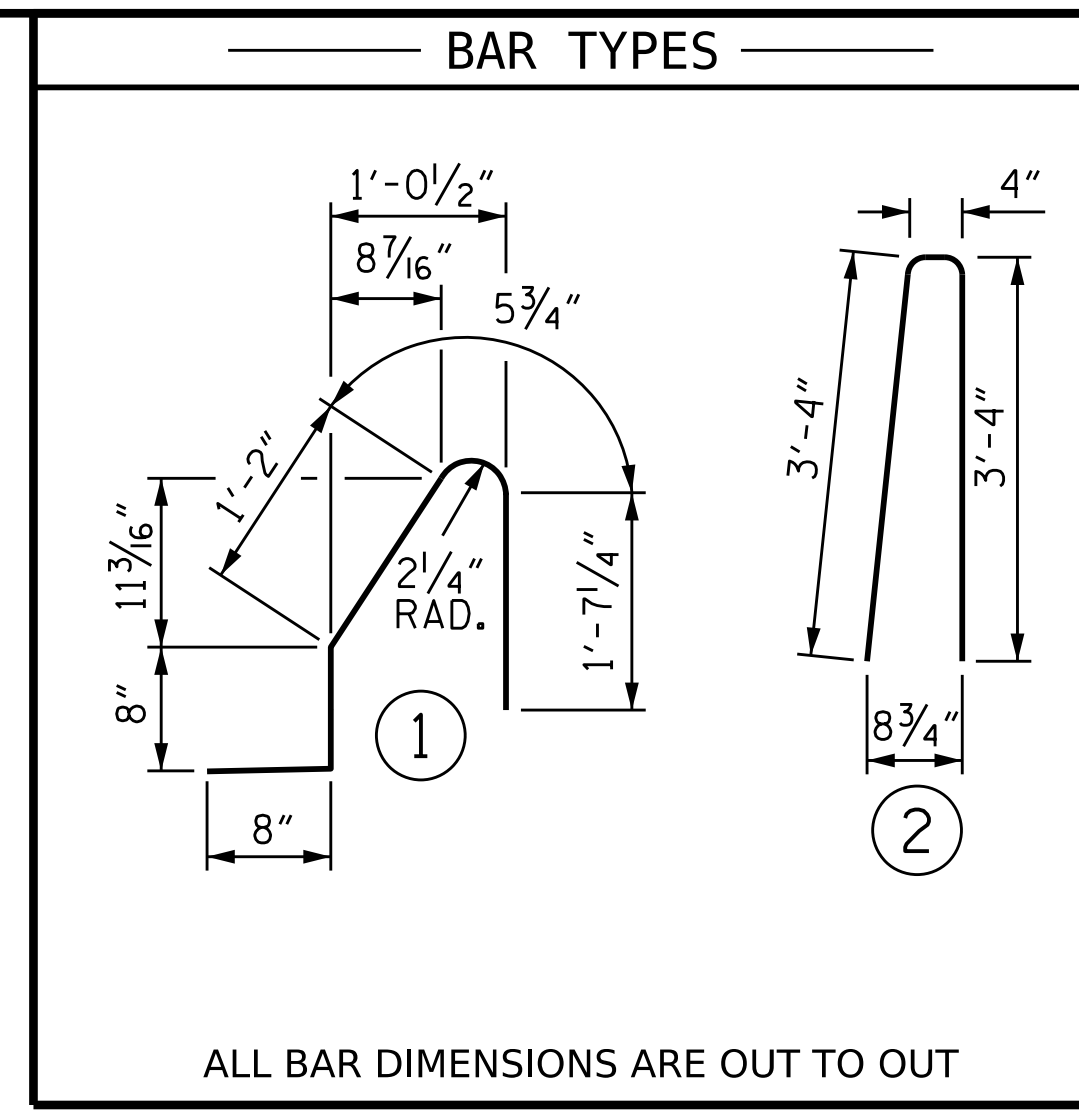
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SECTION THRU RAIL



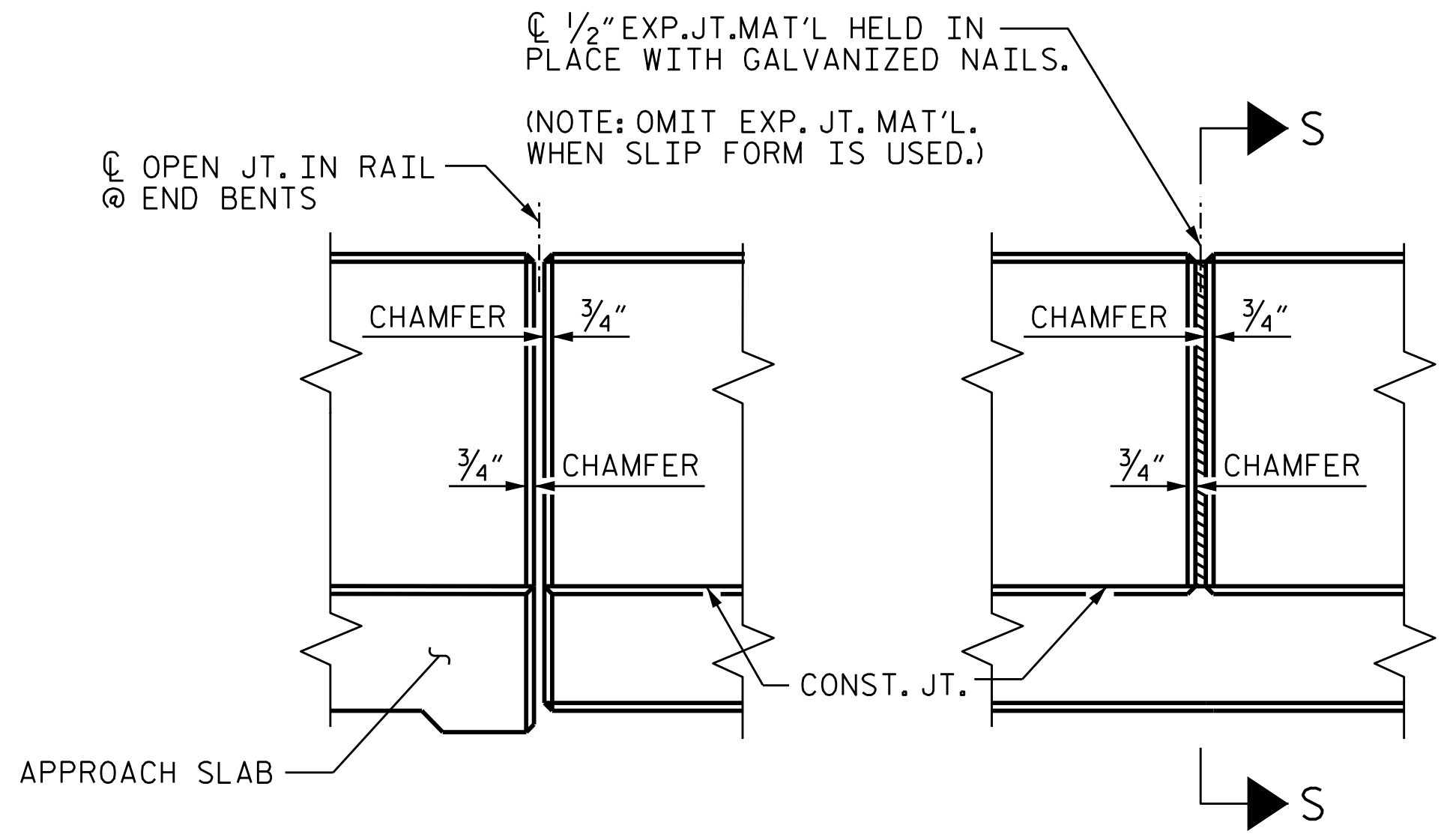
SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B17	44	#5	STR	13'-11"	639
* B18	66	#5	STR	22'-9"	1566
* B19	110	#5	STR	23'-7"	2706
* B20	44	#5	STR	21'-11"	1006
* B21	44	#5	STR	12'-8"	581
* S1	553	#5	1	4'-7"	2644
* S2	553	#5	2	7'-0"	4037
* S3	8	#5	STR	3'-10"	32
EPOXY COATED REINFORCING STEEL					13211 LB
CLASS AA CONCRETE					75.9 CY
CONCRETE BARRIER RAIL					558.4 LF

\* INDICATES EPOXY COATED REINFORCING STEEL



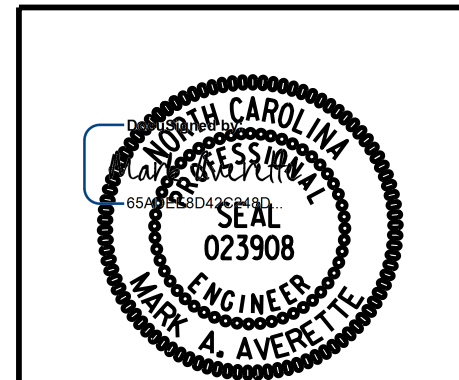
ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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**CONCRETE BARRIER RAIL**



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NOTES

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

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

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

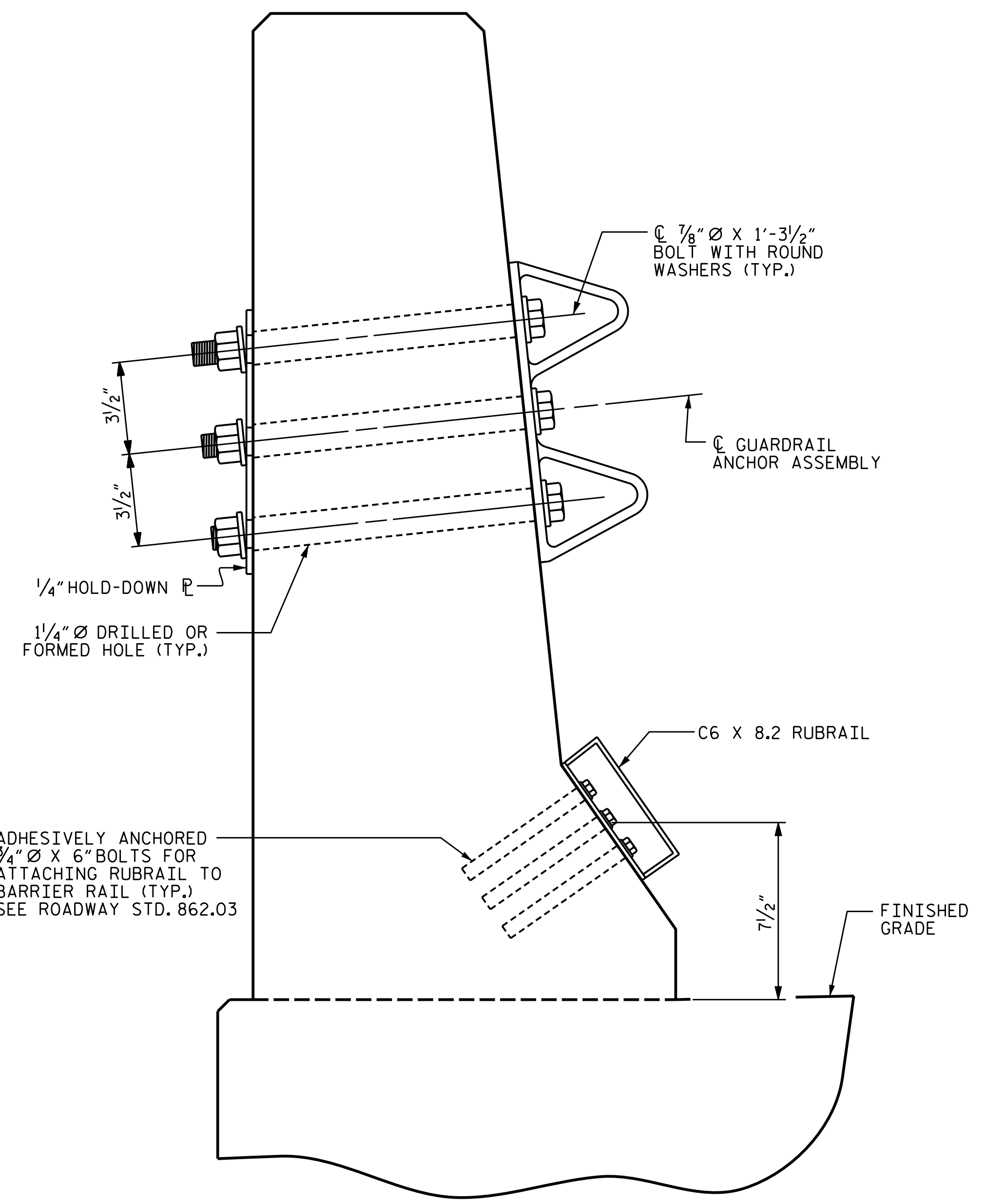
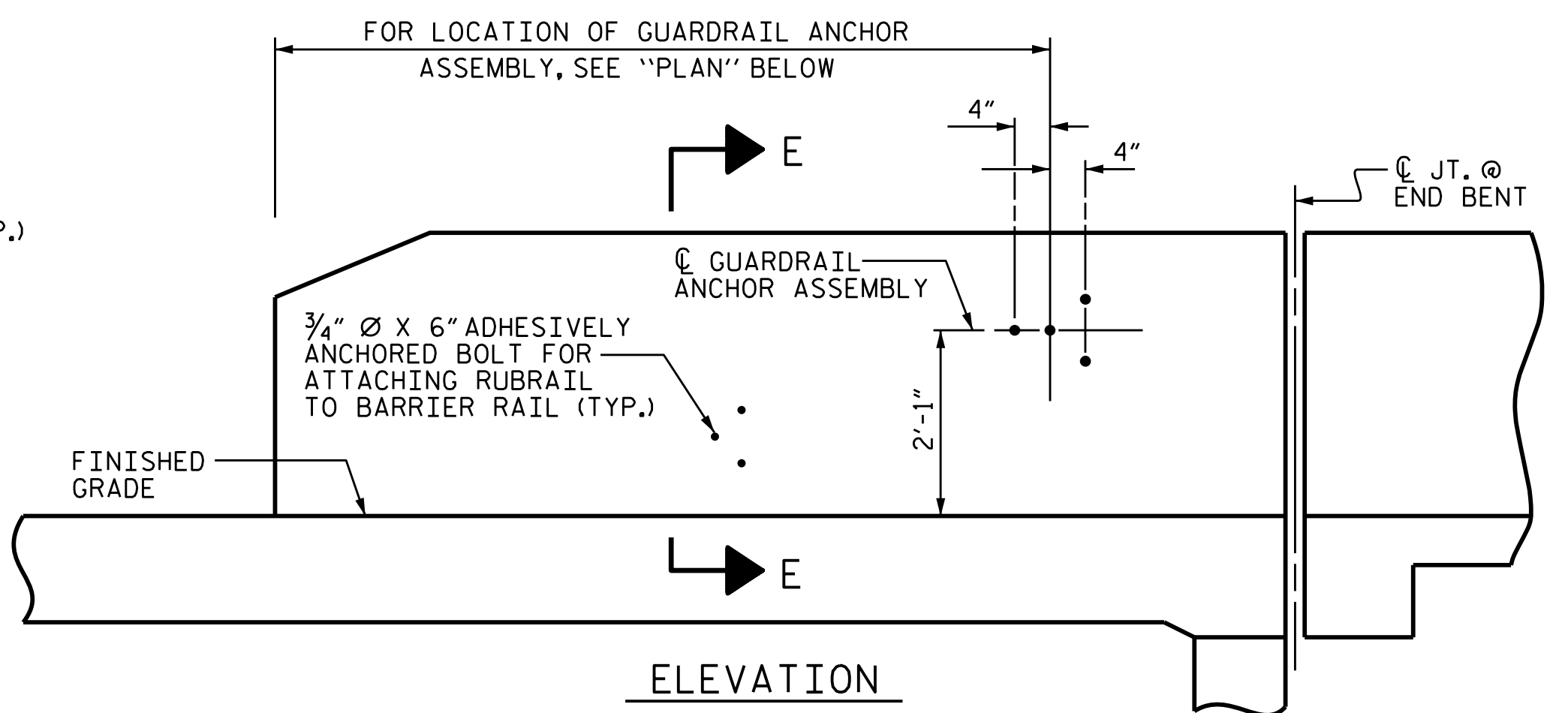
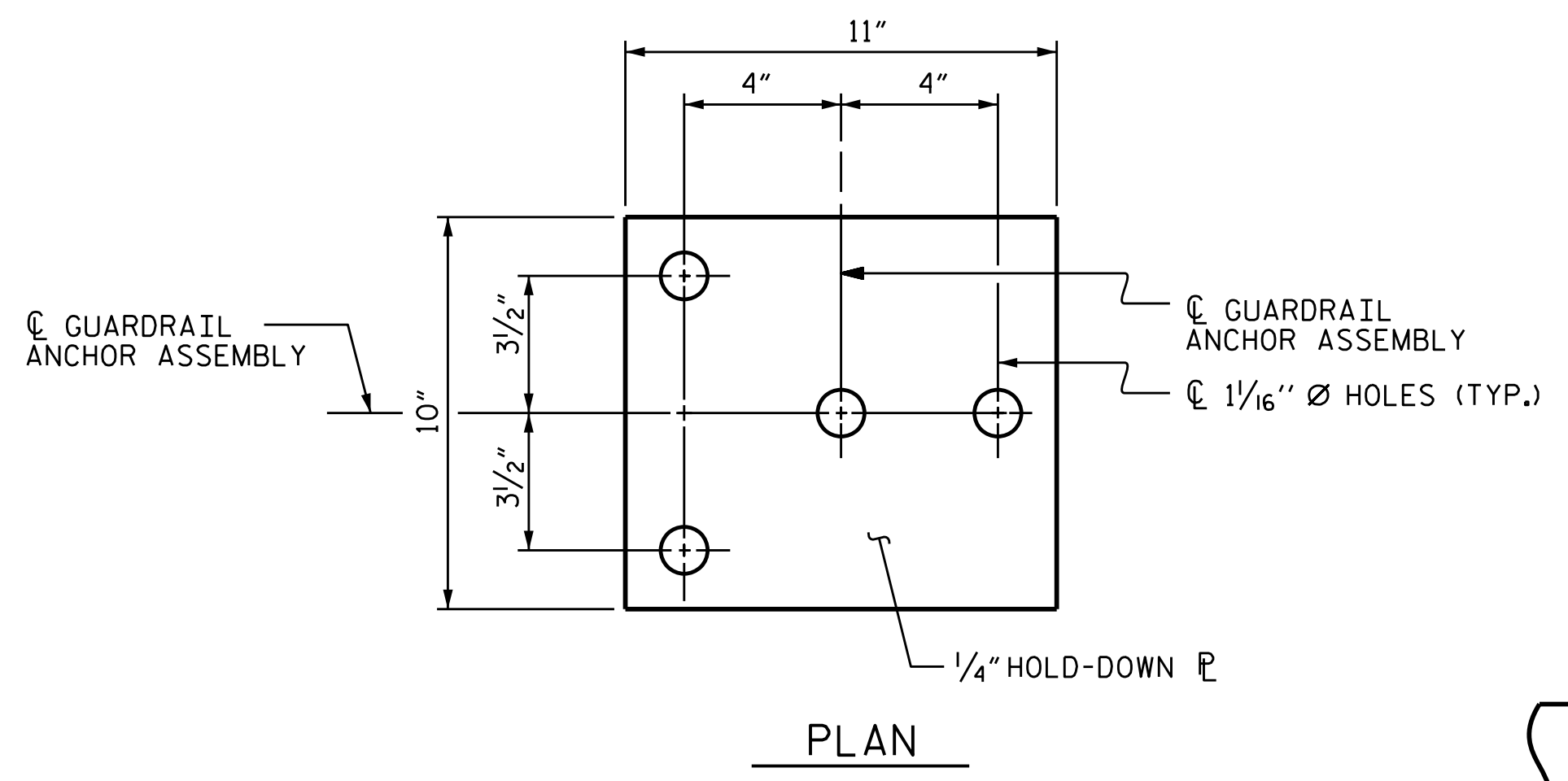
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

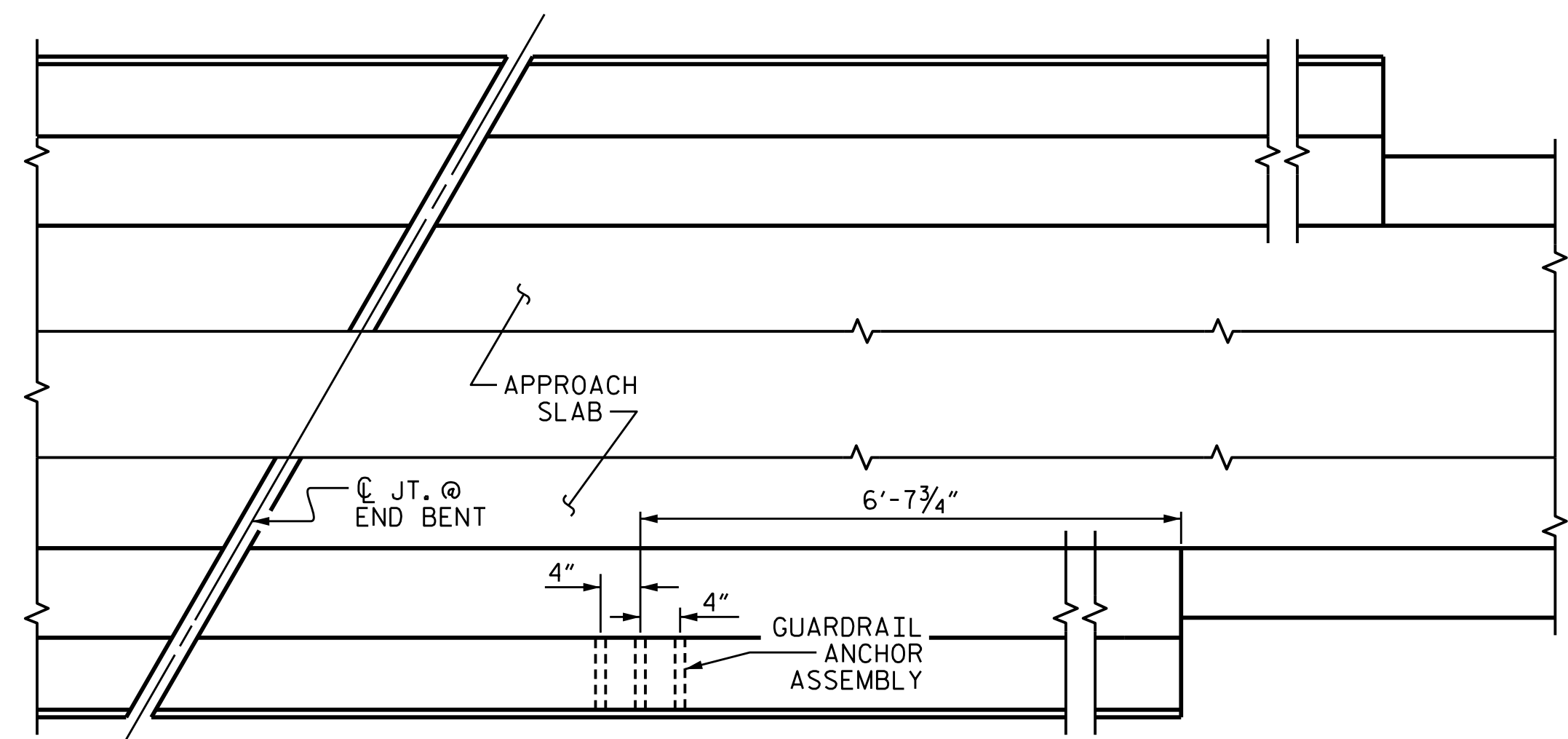
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

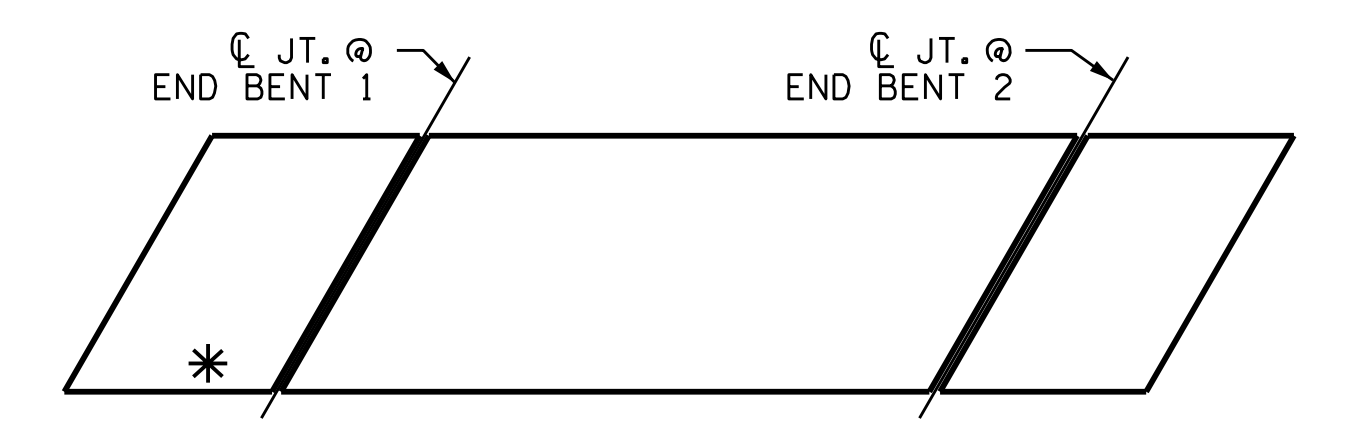
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



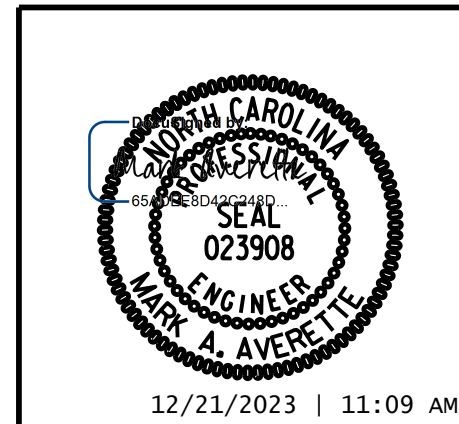
LOCATION OF ANCHORS FOR GUARDRAIL  
END BENT #2 SHOWN, END BENT #1 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS  
\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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STATION: 20+16.70 -Y5RPA-

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



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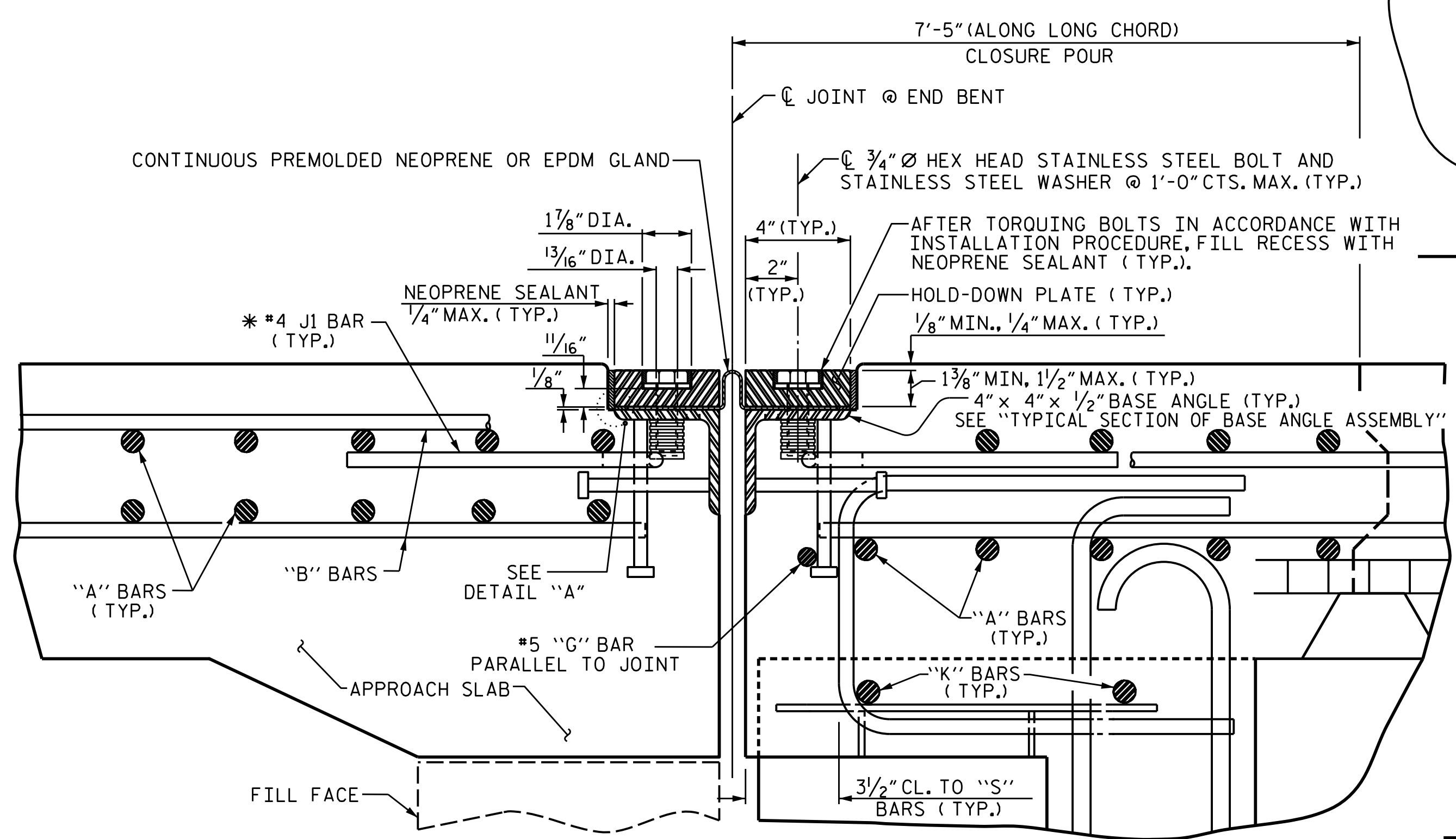
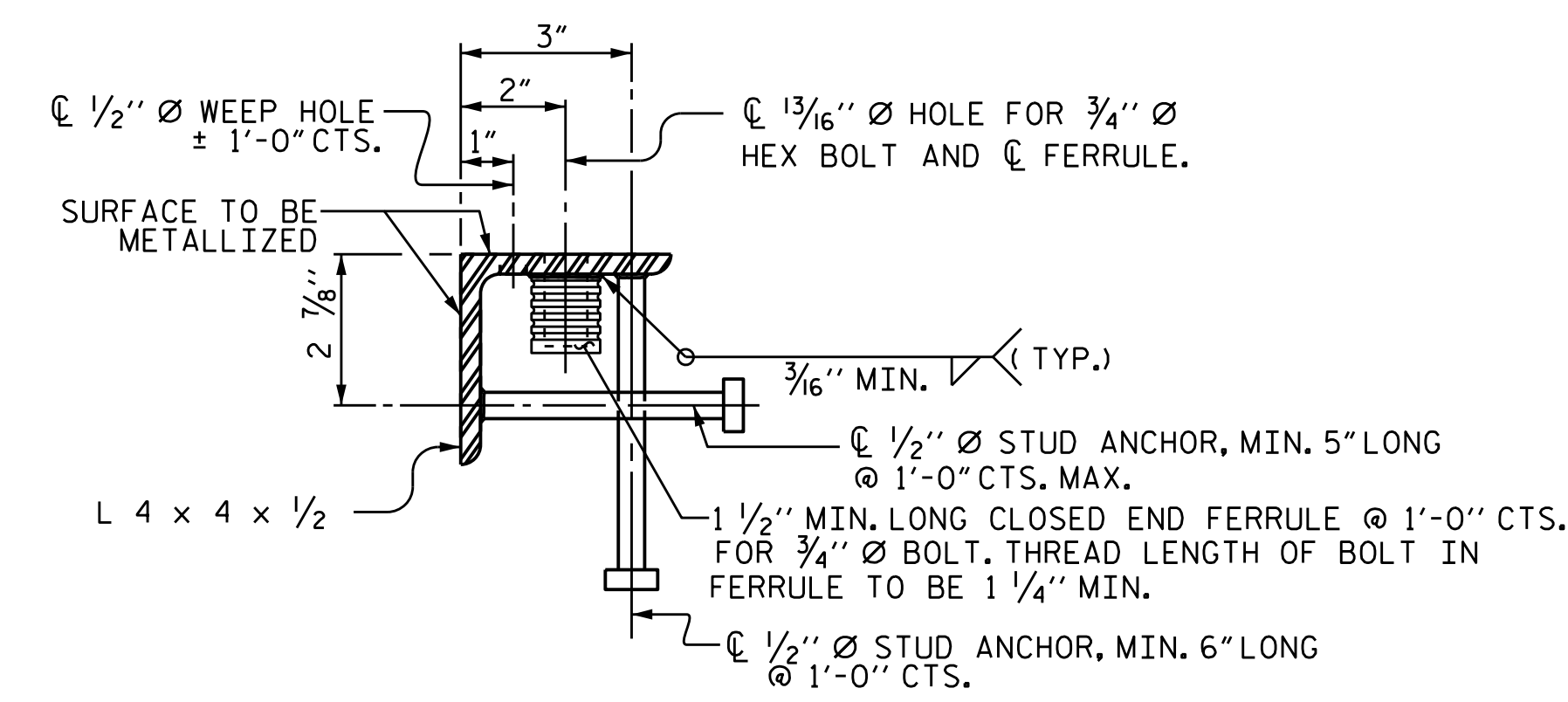
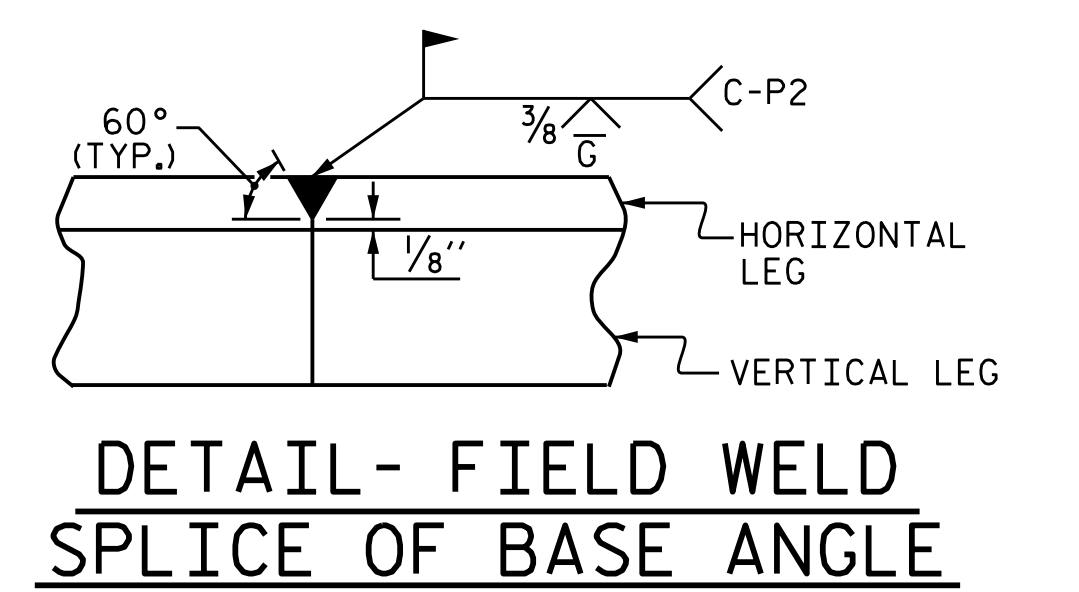
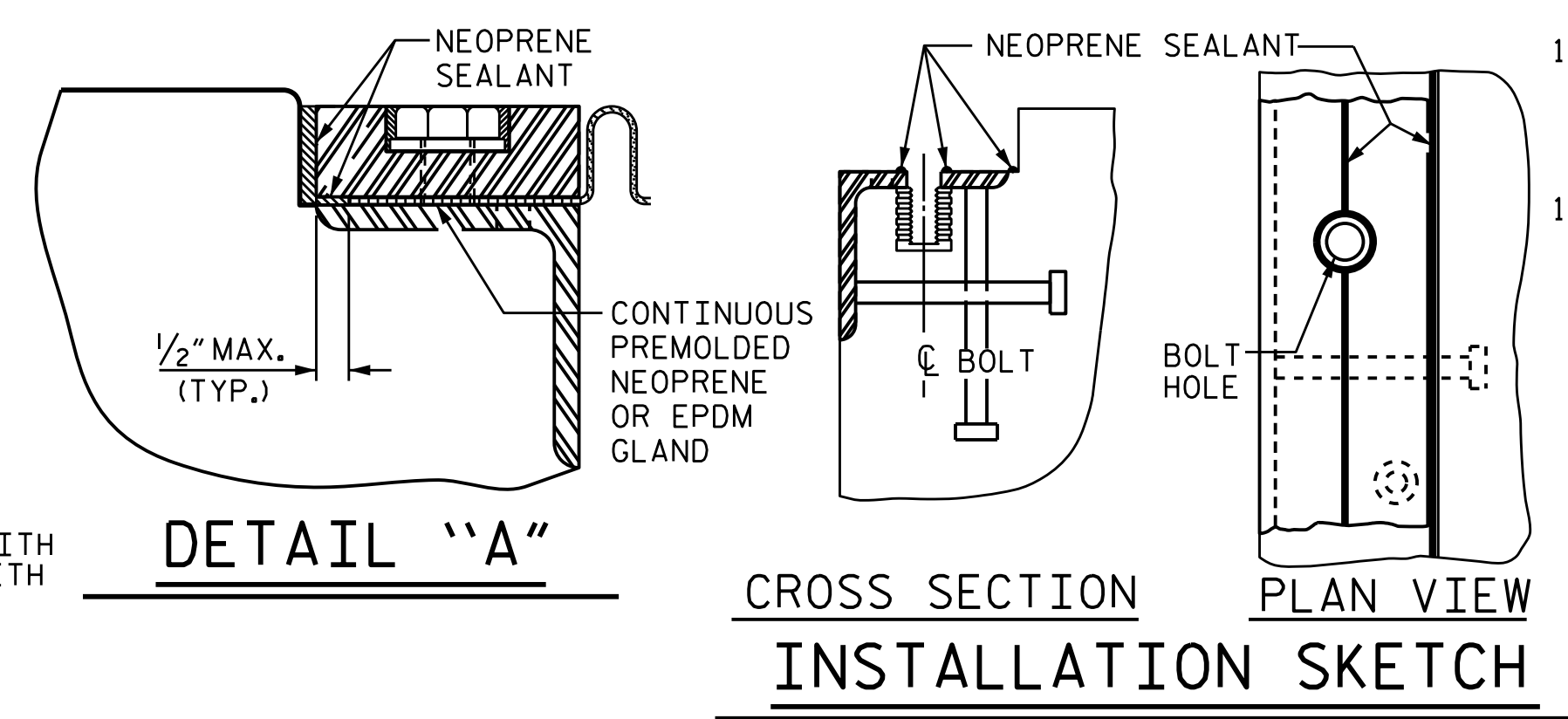


**INSTALLATION PROCEDURE**

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

**GENERAL NOTES**

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



**SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE**

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

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	138°-49'-31"	1"	1 1/2"	1 3/8"	1 1/8"
END BENT 2	140°-43'-47"	3/4"	1 3/8"	1 1/4"	1 1/16"



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**EXPANSION JOINT SEAL DETAILS**

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DRAWN BY : S.D. COOPER DATE : 12-23  
CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

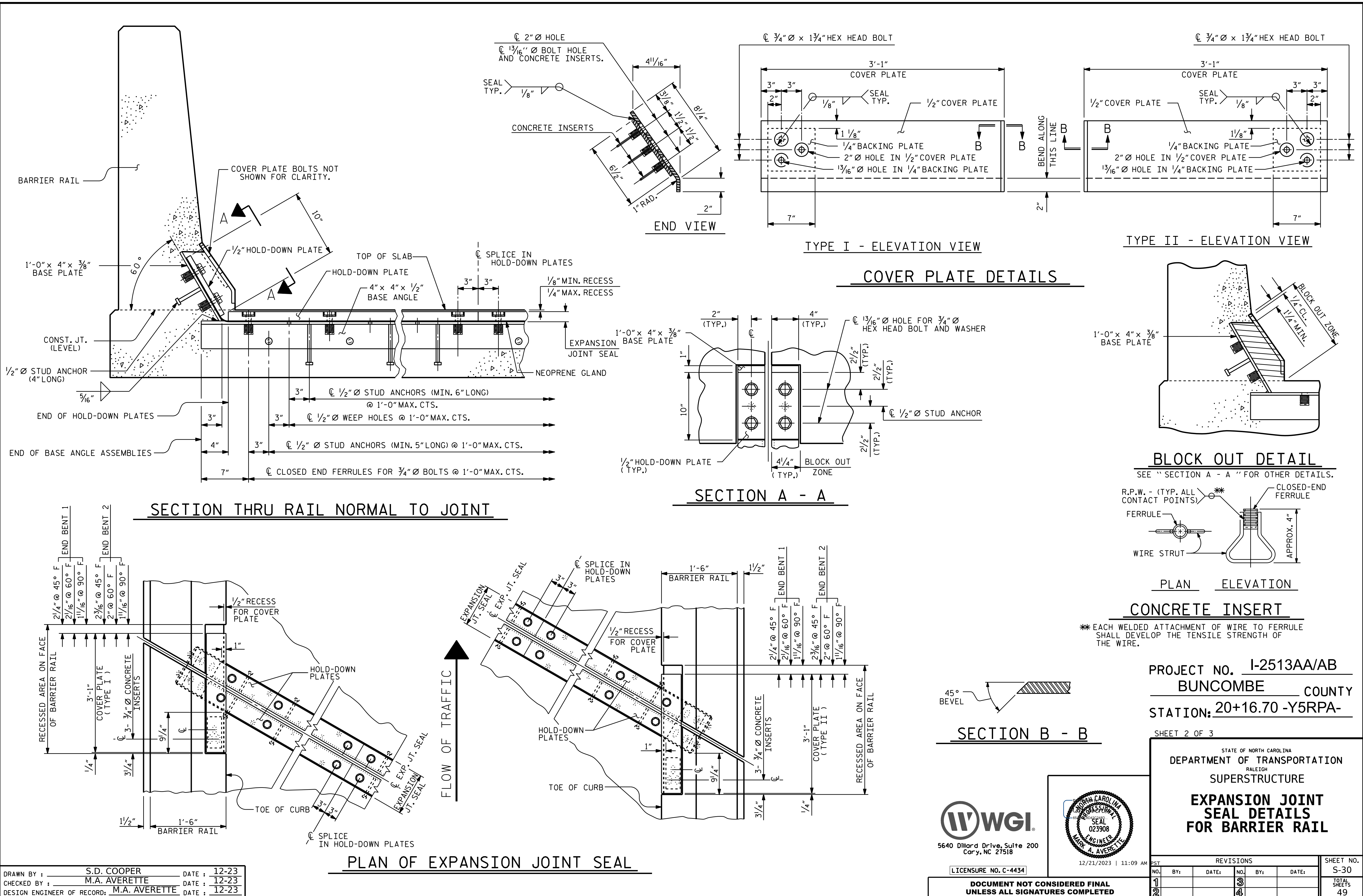
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NO.	BY:	DATE:	NO.	BY:	DATE:	5-29
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2			4			49

LICENSURE NO. C-4434

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**COVER PLATE DETAILS**

**BLOCK OUT DETAIL**

**SECTION A - A**

**SECTION THRU RAIL NORMAL TO JOINT**

**CONCRETE INSERT**

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

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL**

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

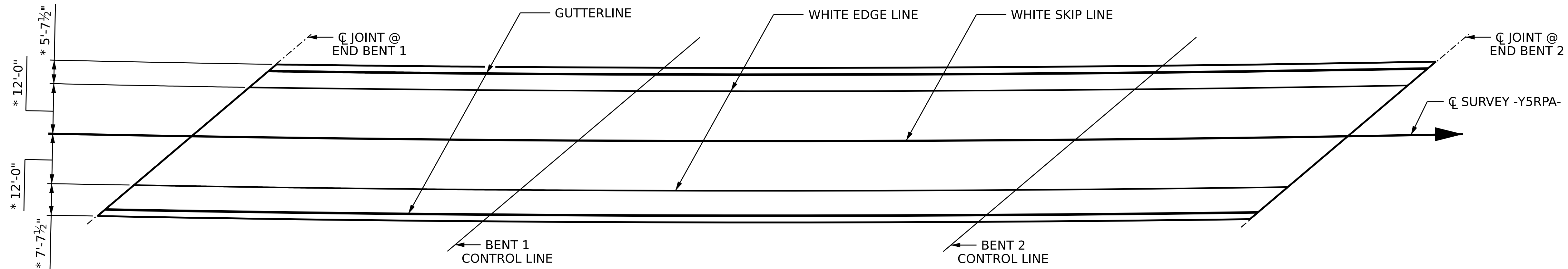
SEAL  
 023908  
 MARK A. AVERETTE  
 ENGINEER

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

**PLAN OF EXPANSION JOINT SEAL**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-30	
1			3			TOTAL SHEETS 49	
2			4				

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### PAVEMENT MARKING ALIGNMENT SKETCH

\* RADIAL DIMENSION

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BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 3

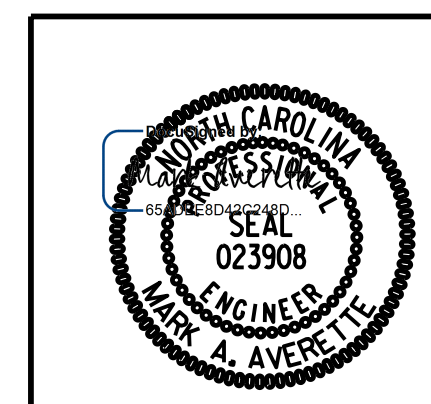
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

### PAVEMENT MARKING DETAILS



5640 Dillard Drive, Suite 200  
 Cary, NC 27518

LICENSURE NO. C-4434



12/21/2023 | 11:09 AM EST

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

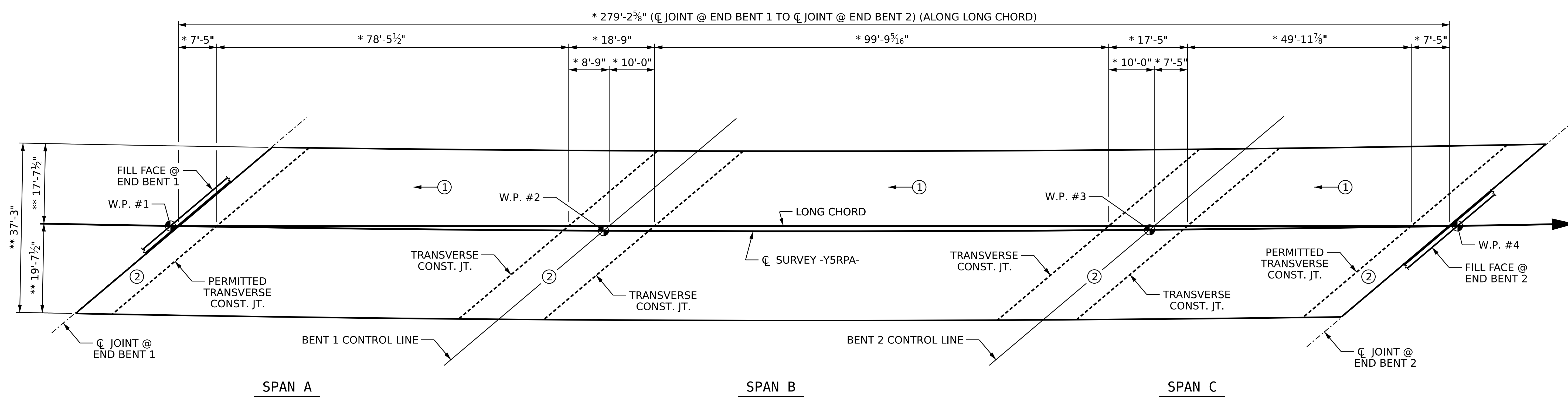
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SHEET NO.  
S-31  
TOTAL SHEETS  
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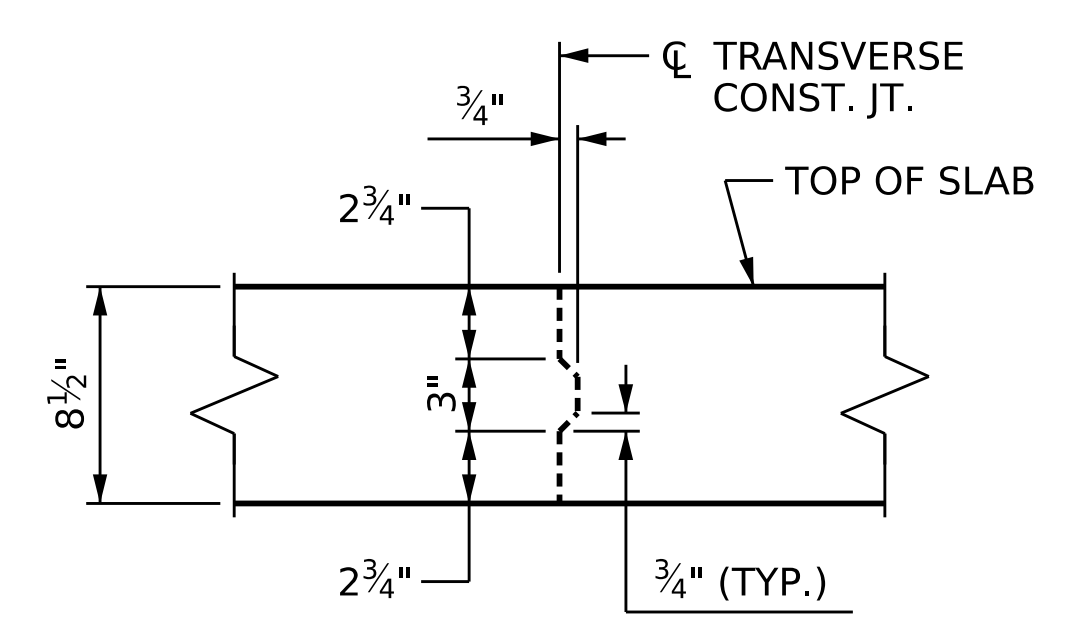




### POUR SEQUENCE AND AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 10,401)

- ← ⊕ # INDICATES POUR NUMBER AND DIRECTION OF POUR
- \* MEASURED ALONG LONG CHORD
- \*\* RADIAL DIMENSION



### TRANSVERSE CONSTRUCTION JOINT DETAIL

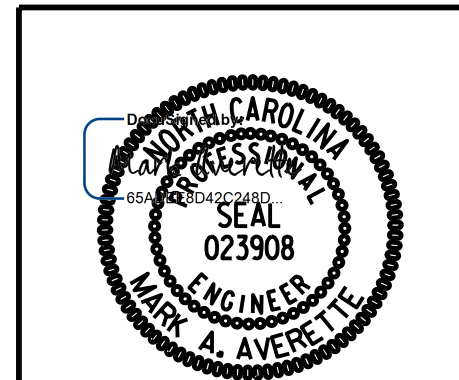
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
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SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE

## BILL OF MATERIAL



12/21/2023 | 11:09 AM PST

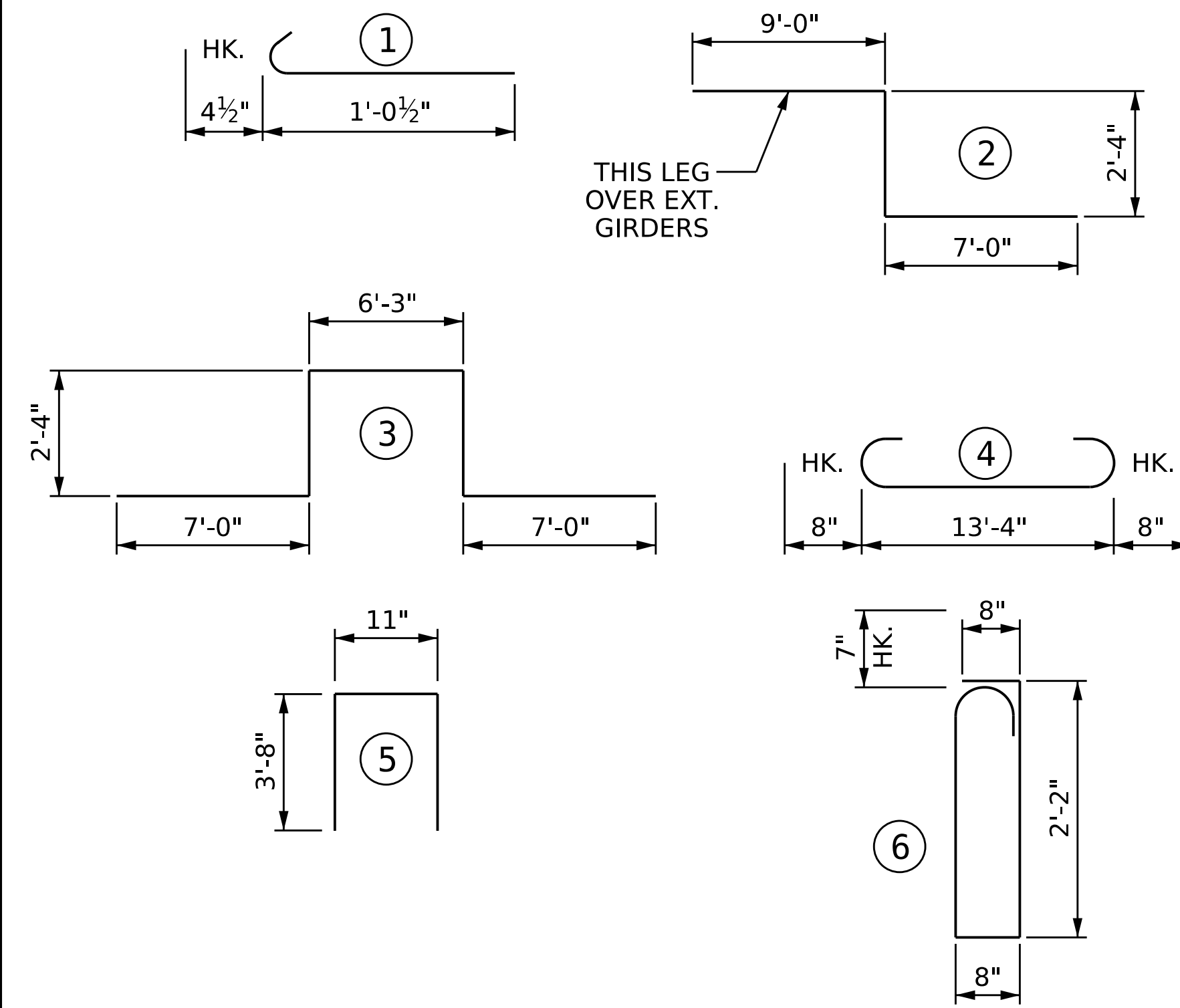
DRAWN BY :	T. BANKOVICH	DATE :	12-23
CHECKED BY :	M.A. AVERETTE	DATE :	12-23
DESIGN ENGINEER OF RECORD:	M.A. AVERETTE	DATE :	12-23

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A1	376	#5	STR	36'-11"	14478	* A136	2	#5	STR	33'-11"	71	A209	2	#5	STR	27'-5"	57	A254	2	#5	STR	15'-3"	32								
A2	376	#5	STR	36'-11"	14478	* A137	2	#5	STR	32'-11"	69	A210	2	#5	STR	26'-4"	55	A255	2	#5	STR	14'-2"	30								
* A3	6	#6	STR	29'-2"	263	* A138	2	#5	STR	31'-10"	66	A211	2	#5	STR	25'-3"	53	A256	2	#5	STR	13'-2"	27								
A4	6	#6	STR	24'-4"	219	* A139	2	#5	STR	30'-10"	64	A212	2	#5	STR	24'-2"	50	A257	2	#5	STR	12'-2"	25								
						* A140	2	#5	STR	29'-9"	62	A213	2	#5	STR	23'-1"	48	A258	2	#5	STR	11'-1"	23								
* A101	2	#5	STR	36'-0"	75	* A141	2	#5	STR	28'-9"	60	A214	2	#5	STR	22'-1"	46	A259	2	#5	STR	10'-1"	21								
* A102	2	#5	STR	34'-11"	73	* A142	2	#5	STR	27'-8"	58	A215	2	#5	STR	21'-0"	44	A260	2	#5	STR	9'-0"	19								
* A103	2	#5	STR	33'-11"	71	* A143	2	#5	STR	26'-8"	56	A216	2	#5	STR	19'-11"	42	A261	2	#5	STR	8'-0"	17								
* A104	2	#5	STR	32'-10"	68	* A144	2	#5	STR	25'-7"	53	A217	2	#5	STR	18'-10"	39	A262	2	#5	STR	6'-11"	14								
* A105	2	#5	STR	31'-9"	66	* A145	2	#5	STR	24'-7"	51	A218	2	#5	STR	17'-9"	37	A263	2	#5	STR	5'-11"	12								
* A106	2	#5	STR	30'-8"	64	* A146	2	#5	STR	23'-6"	49	A219	2	#5	STR	16'-8"	35	A264	2	#5	STR	4'-11"	10								
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* A109	2	#5	STR	27'-5"	57	* A149	2	#5	STR	20'-5"	43	A222	2	#5	STR	13'-5"	28	A267	2	#5	STR	1'-9"	4								
* A110	2	#5	STR	26'-4"	55	* A150	2	#5	STR	19'-5"	41	A223	2	#5	STR	12'-4"	26														
* A111	2	#5	STR	25'-3"	53	* A151	2	#5	STR	18'-4"	38	A224	2	#5	STR	11'-3"	23	B1	60	#5	STR	36'-0"	2253								
* A112	2	#5	STR	24'-2"	50	* A152	2	#5	STR	17'-4"	36	A225	2	#5	STR	10'-2"	21	B2	30	#5	STR	48'-0"	1502								
* A113	2	#5	STR	23'-1"	48	* A153	2	#5	STR	16'-3"	34	A226	2	#5	STR	9'-1"	19	B3	30	#5	STR	17'-9"	555								
* A114	2	#5	STR	22'-1"	46	* A154	2	#5	STR	15'-3"	32	A227	2	#5	STR	8'-0"	17	B4	25	#5	STR	53'-0"	1382								
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* A124	2	#5	STR	11'-3"	23	* A164	2	#5	STR	4'-11"	10	A237	2	#5	STR	32'-11"	69	* B14	27	#6	STR	14'-1"	571								
* A125	2	#5	STR	10'-2"	21	* A165	2	#5	STR	3'-10"	8	A238	2	#5	STR	31'-10"	66	* B15	72	#6	STR	38'-2"	4127								
* A126	2	#5	STR	9'-1"	19	* A166	2	#5	STR	2'-10"	6	A239	2	#5	STR	30'-10"	64	* B16	54	#4	STR	24'-0"	866								
* A127	2	#5	STR	8'-0"	17	* A167	2	#5	STR	1'-9"	4	A240	2	#5	STR	29'-9"	62														
* A128	2	#5	STR	6'-11"	14							A241	2	#5	STR	28'-9"	60	* G1	4	#5	STR	30'-6"	127								
* A129	2	#5	STR	5'-10"	12	A201	2	#5	STR	36'-0"	75	A242	2	#5	STR	27'-8"	58														
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* A132	2	#5	STR	2'-8"	6	A204	2	#5	STR	32'-10"	68	A245	2	#5	STR	24'-7"	51	* K1	8	#8	2	18'-4"	392								
* A133	2	#5	STR	1'-7"	3	A205	2	#5	STR	31'-9"	66	A246	2	#5	STR	23'-6"	49	* K2	8	#8	3	24'-11"	532								
* A134	2	#5	STR	36'-0"	75	A206	2	#5	STR	30'-8"	64	A247	2	#5	STR	22'-6"	47	* K3	12	#6	4	14'-8"	264								
* A135	2	#5	STR	35'-0"	73	A207	2	#5	STR	29'-7"	62	A248	2	#5	STR	21'-5"	45	* K4	24	#6	STR	8'-10"	318								
						A208	2	#5	STR	28'-6"	59	A249	2	#5	STR	20'-5"	43														
												A250	2	#5	STR	19'-5"	41	* S1	48	#4	5	8'-3"	265								
												A251	2	#5	STR	18'-4"	38	S2	48	#5	6	6'-3"	313								
												A252	2	#5	STR	17'-4"	36														
												A253	2	#5	STR	16'-3"	34														
																		REINFORCING STEEL						29609 LB							
																		* EPOXY COATED REINFORCING STEEL						36921 LB							
																		* INDICATES EPOXY COATED REINFORCING STEEL													

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	CY	LB	LB
POUR 1	276.0	--	--
POUR 2	67.0	--	--
TOTAL **	343.0	29,609	36,921

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

APPROACH SLABS	1,492	SQ. FT.
BRIDGE DECK	8,610	SQ. FT.
TOTAL	10,102	SQ. FT.



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 2

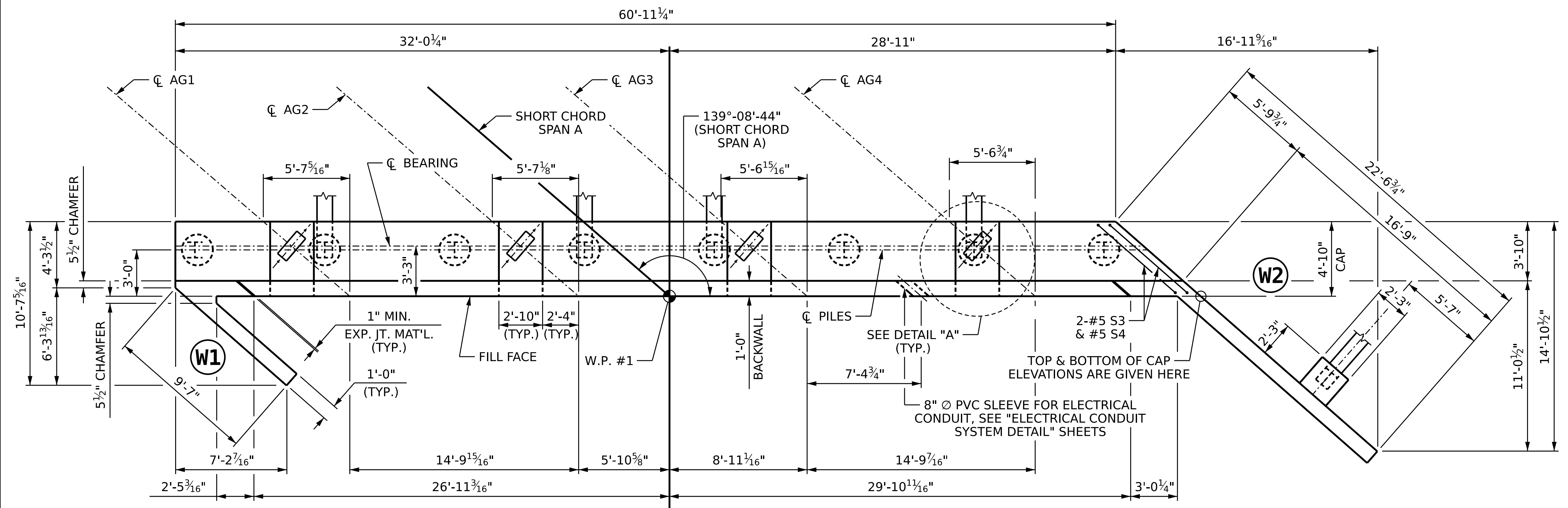
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2			4			TOTAL SHEETS 49

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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23





**PLAN**

**NOTES:**

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

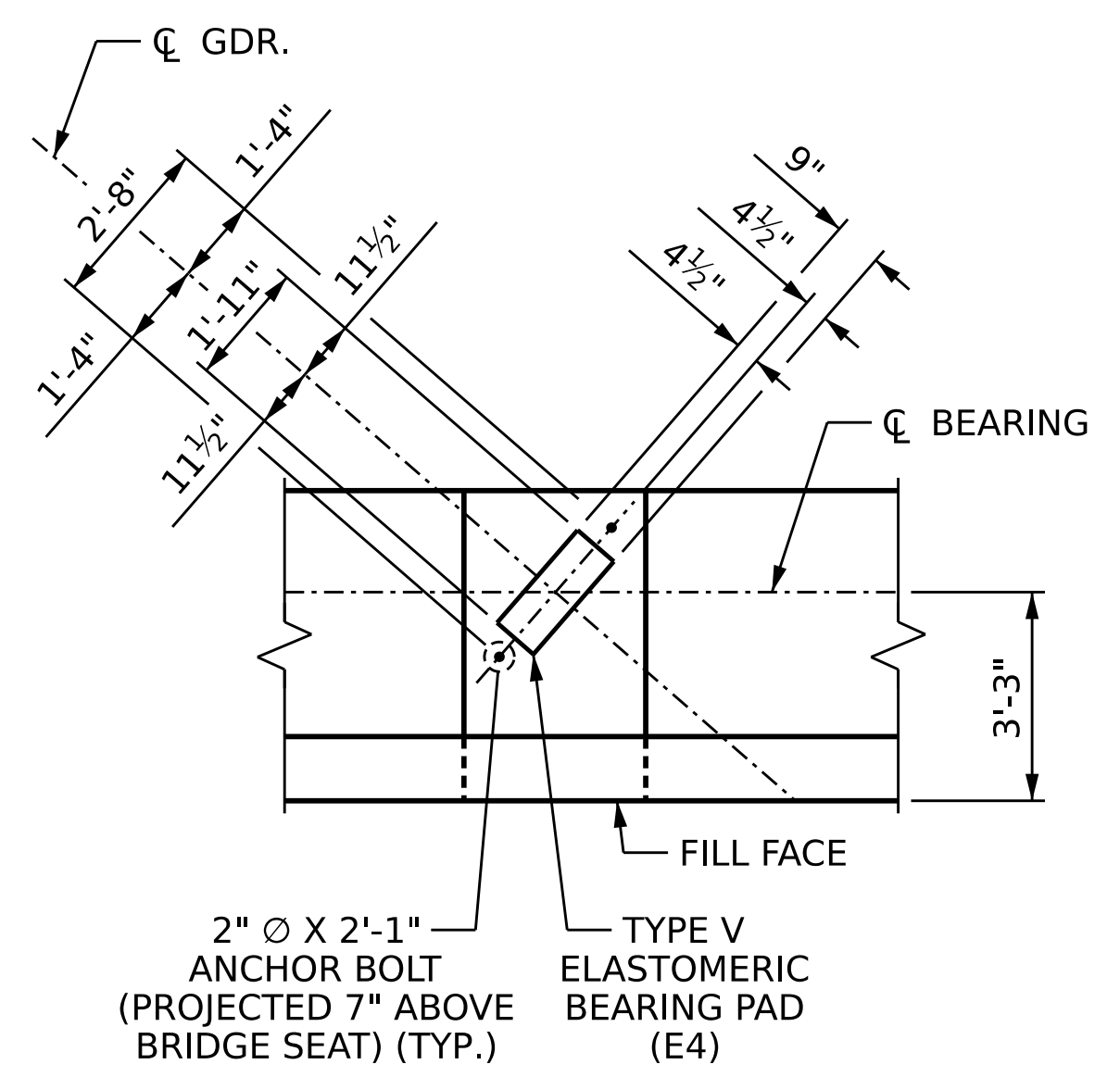
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

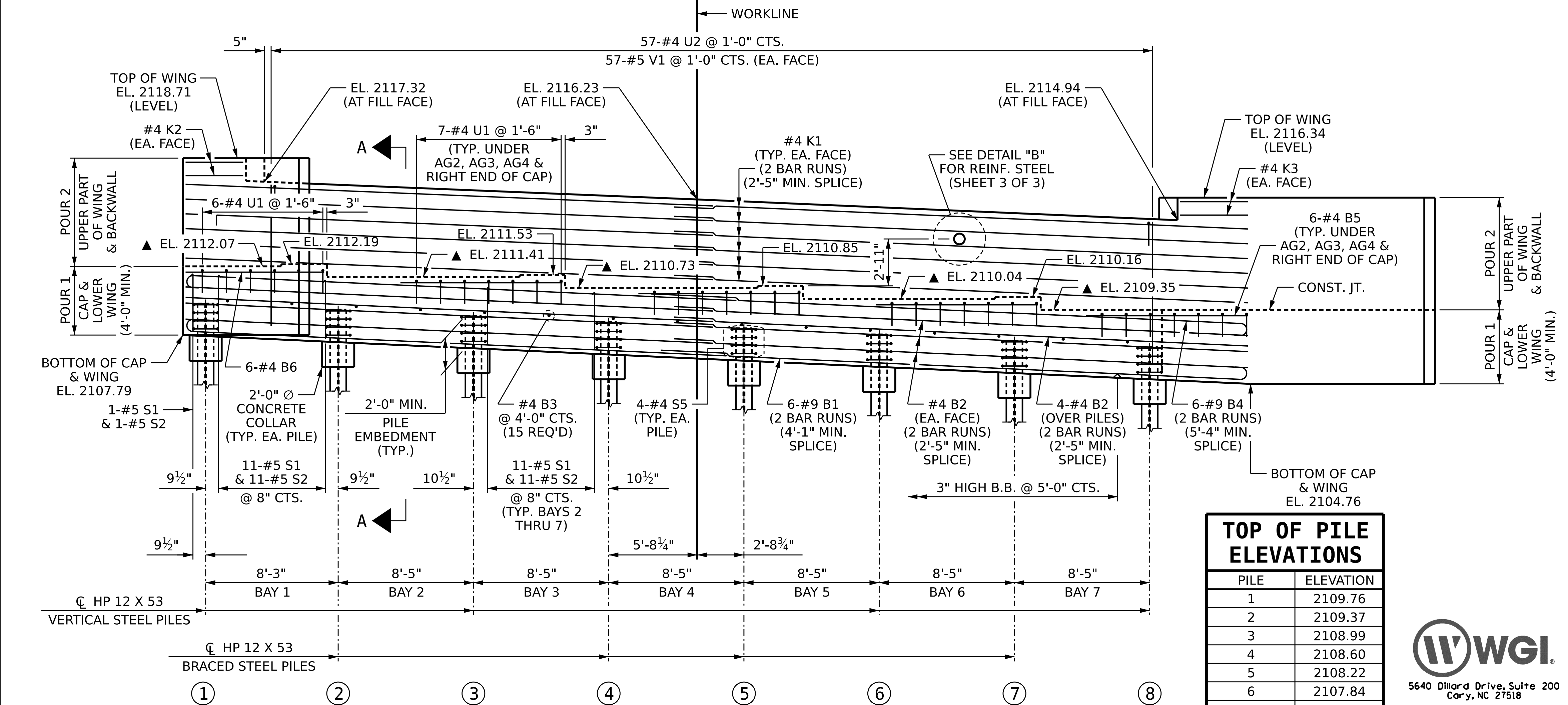
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE 2%.

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A SHEET 3 OF 3.

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



**DETAIL "A"**  
(TYP. EA. GIRDER)



**ELEVATION**

(WING PILE NOT SHOWN FOR CLARITY)

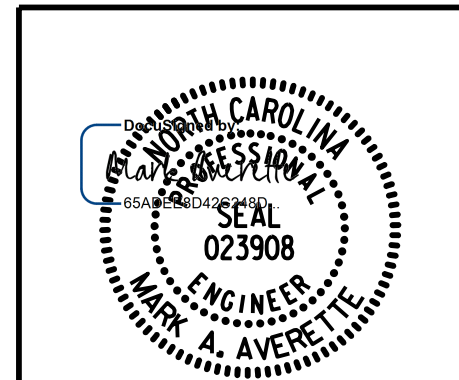
TOP OF PILE ELEVATIONS	
PILE	ELEVATION
1	2109.76
2	2109.37
3	2108.99
4	2108.60
5	2108.22
6	2107.84
7	2107.45
8	2107.07
WING PILE	2106.76

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**

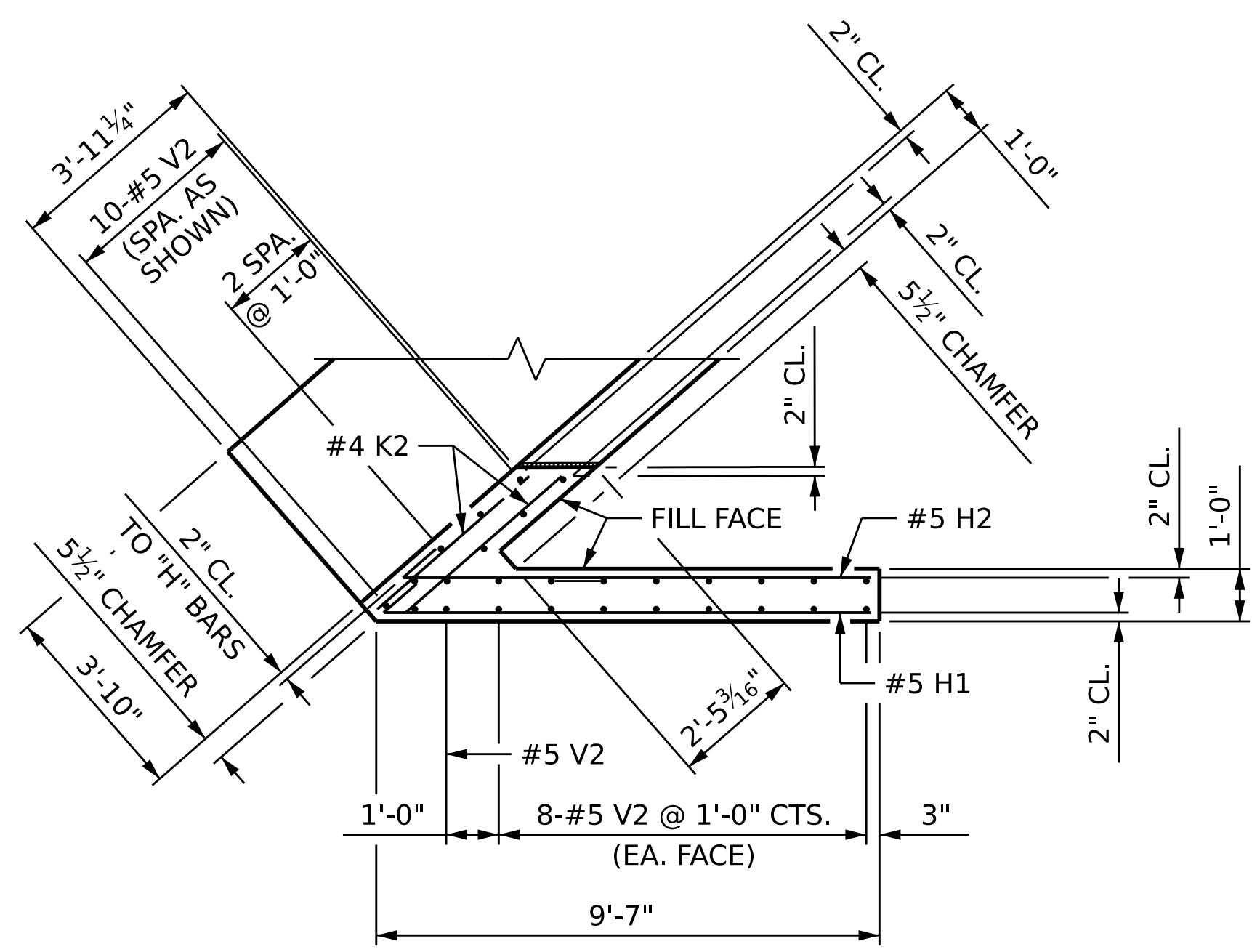


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-34
1			3			TOTAL SHEETS
2			4			49

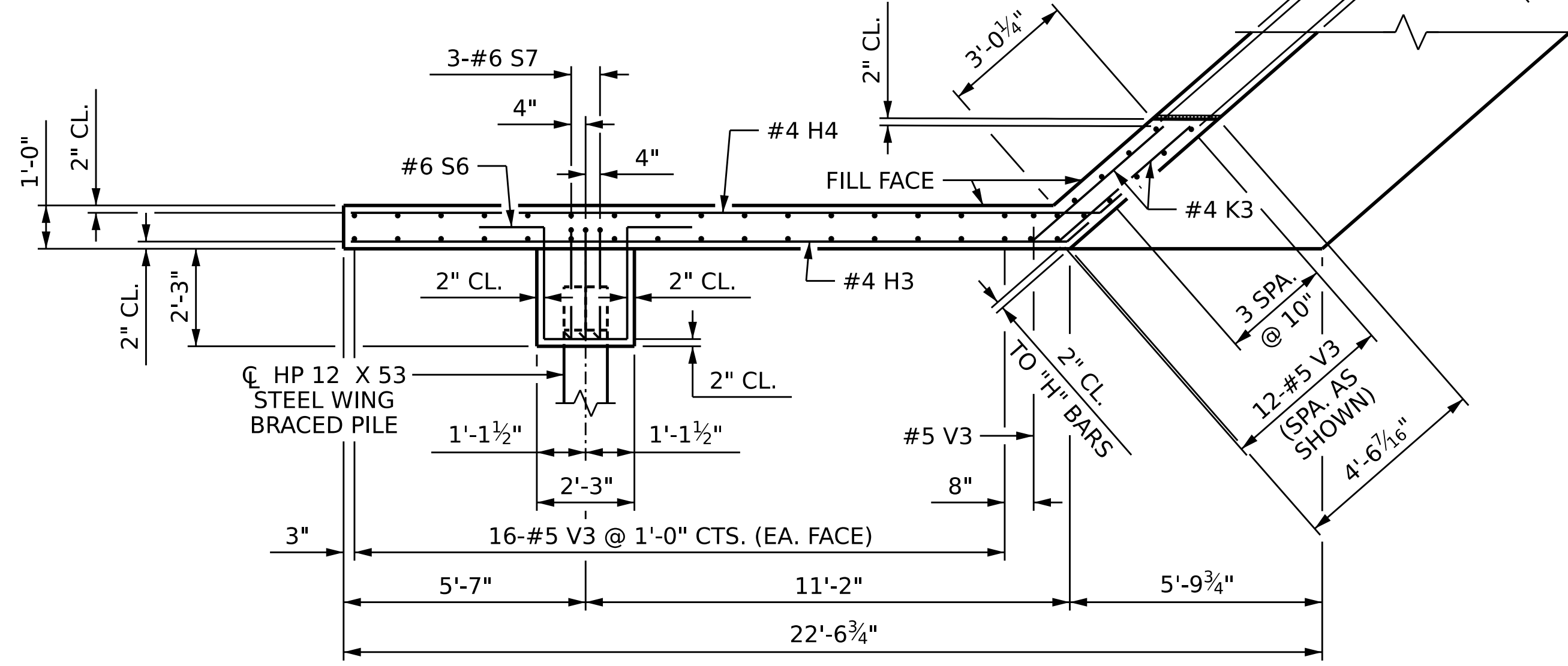
DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

LICENSURE NO. C-4434  
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

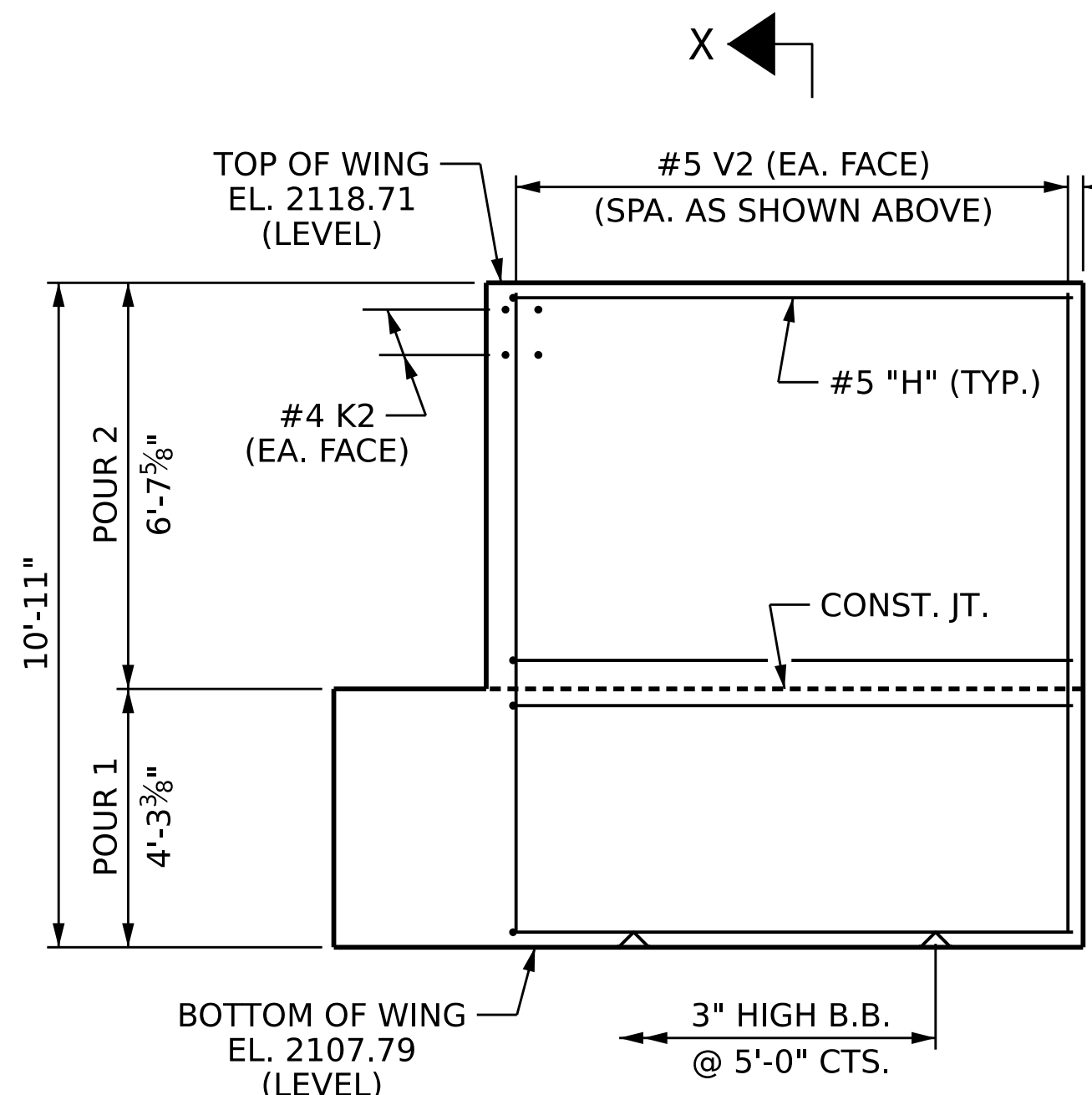
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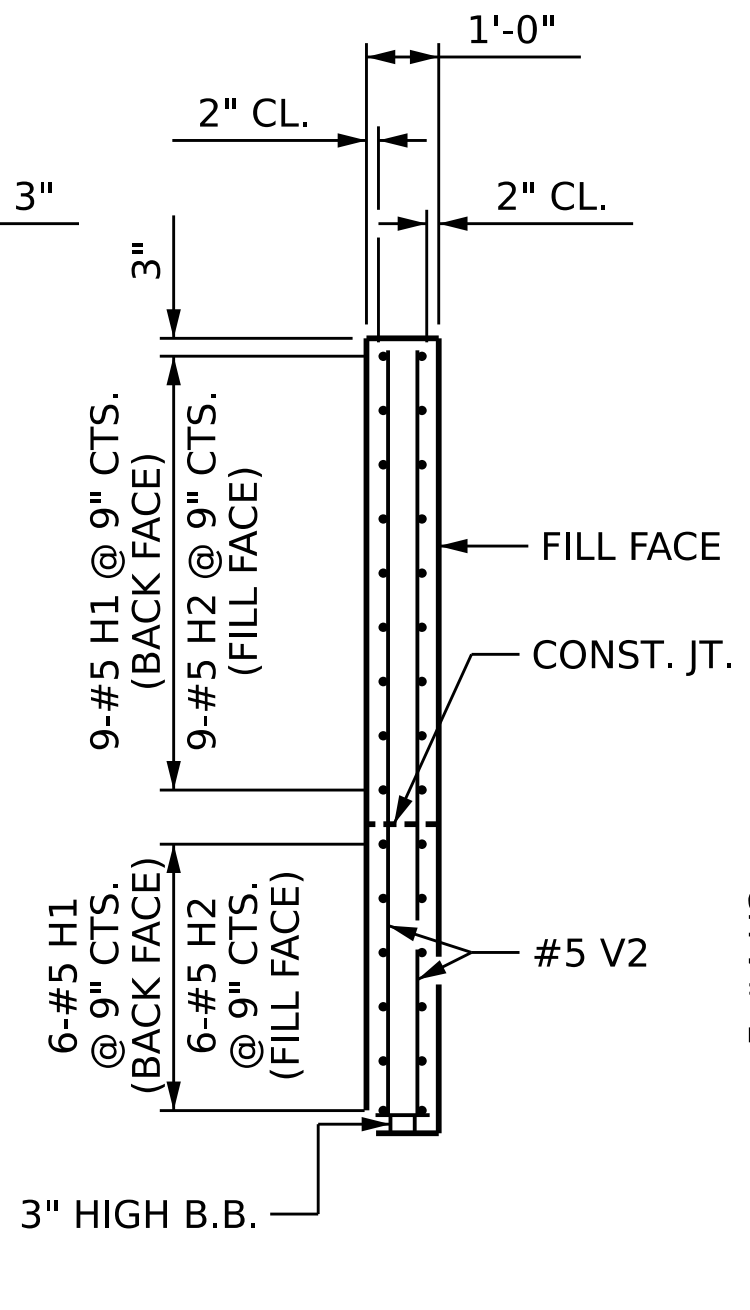
**PLAN OF WING W1**



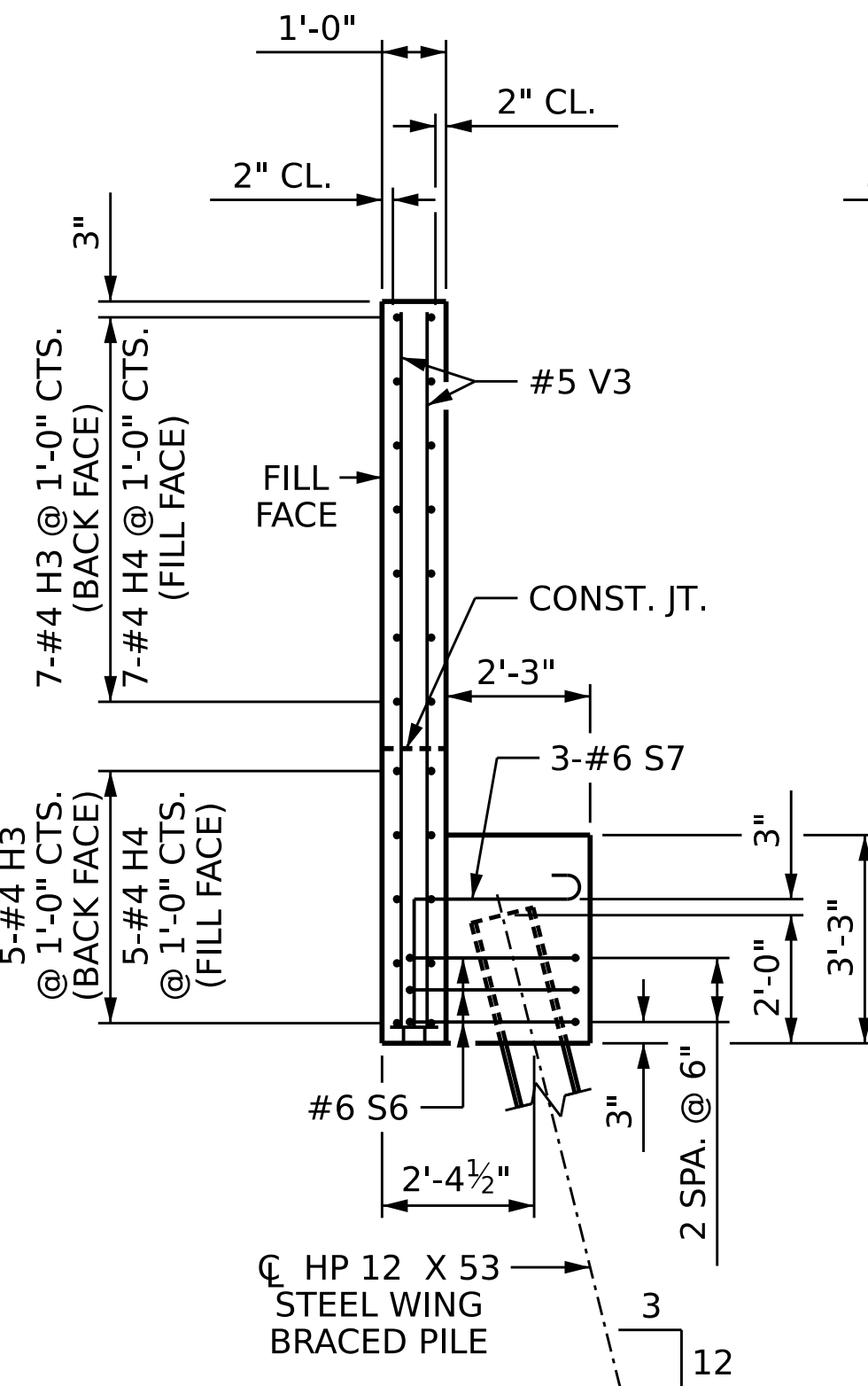
**PLAN OF WING W2**



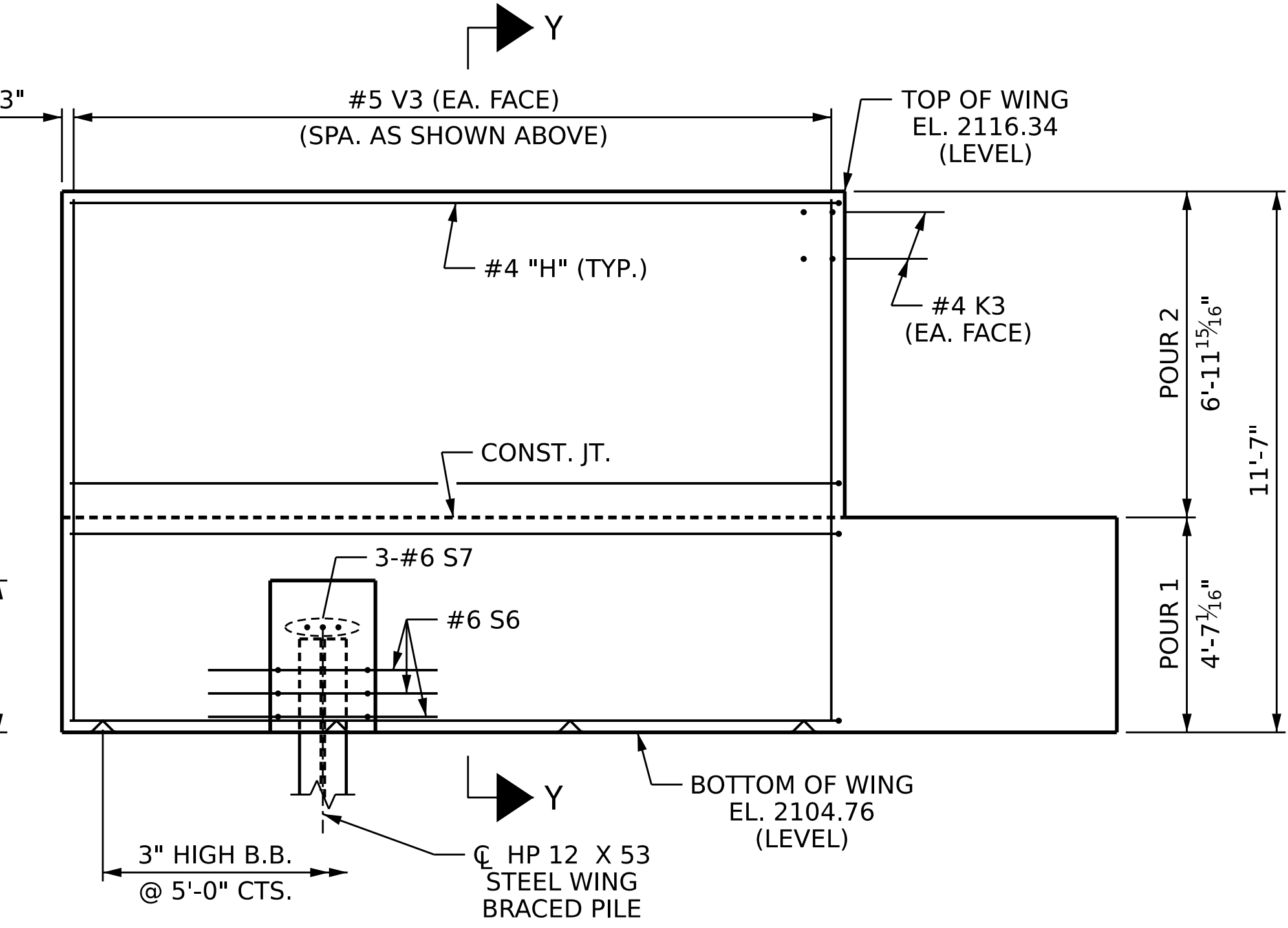
**ELEVATION OF WING W1**



**SECTION X-X**



**SECTION Y-Y**



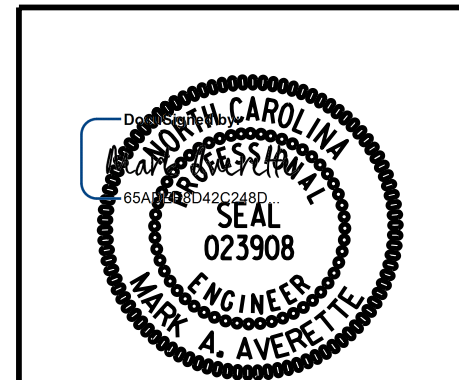
**ELEVATION OF WING W2**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**



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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

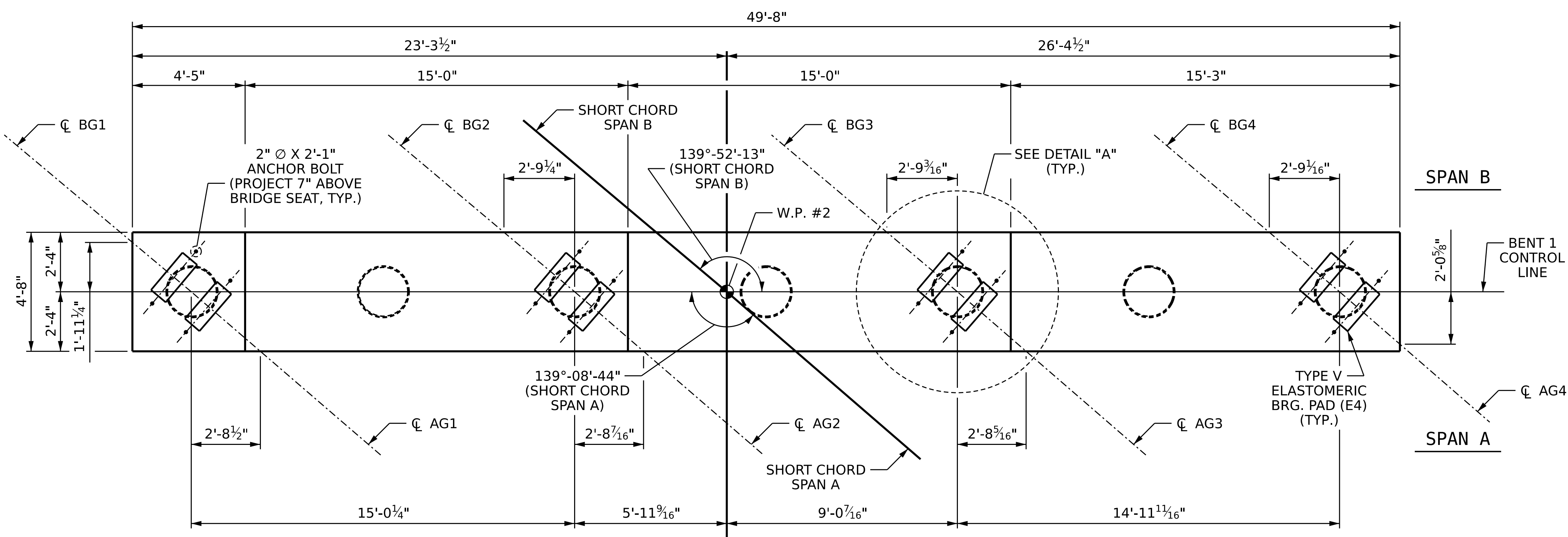
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NO.	BY:	DATE:	NO.	BY:	DATE:
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TOTAL SHEETS: 49

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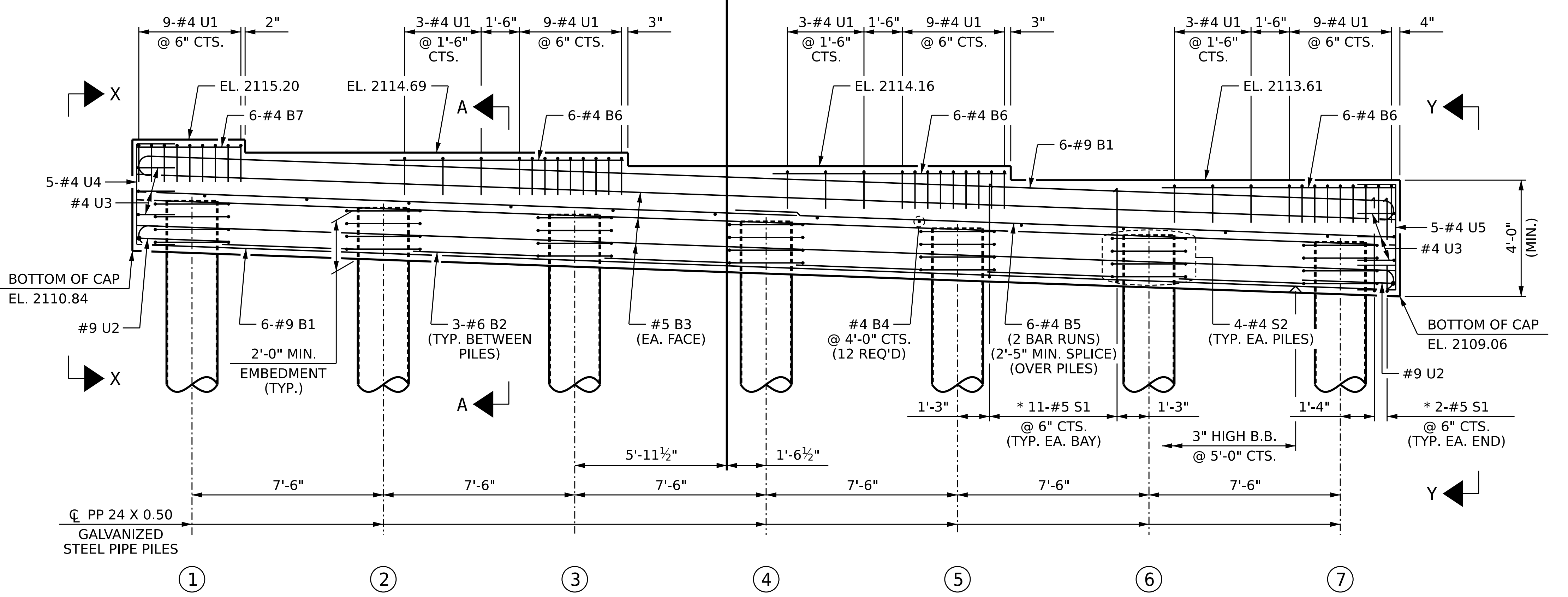
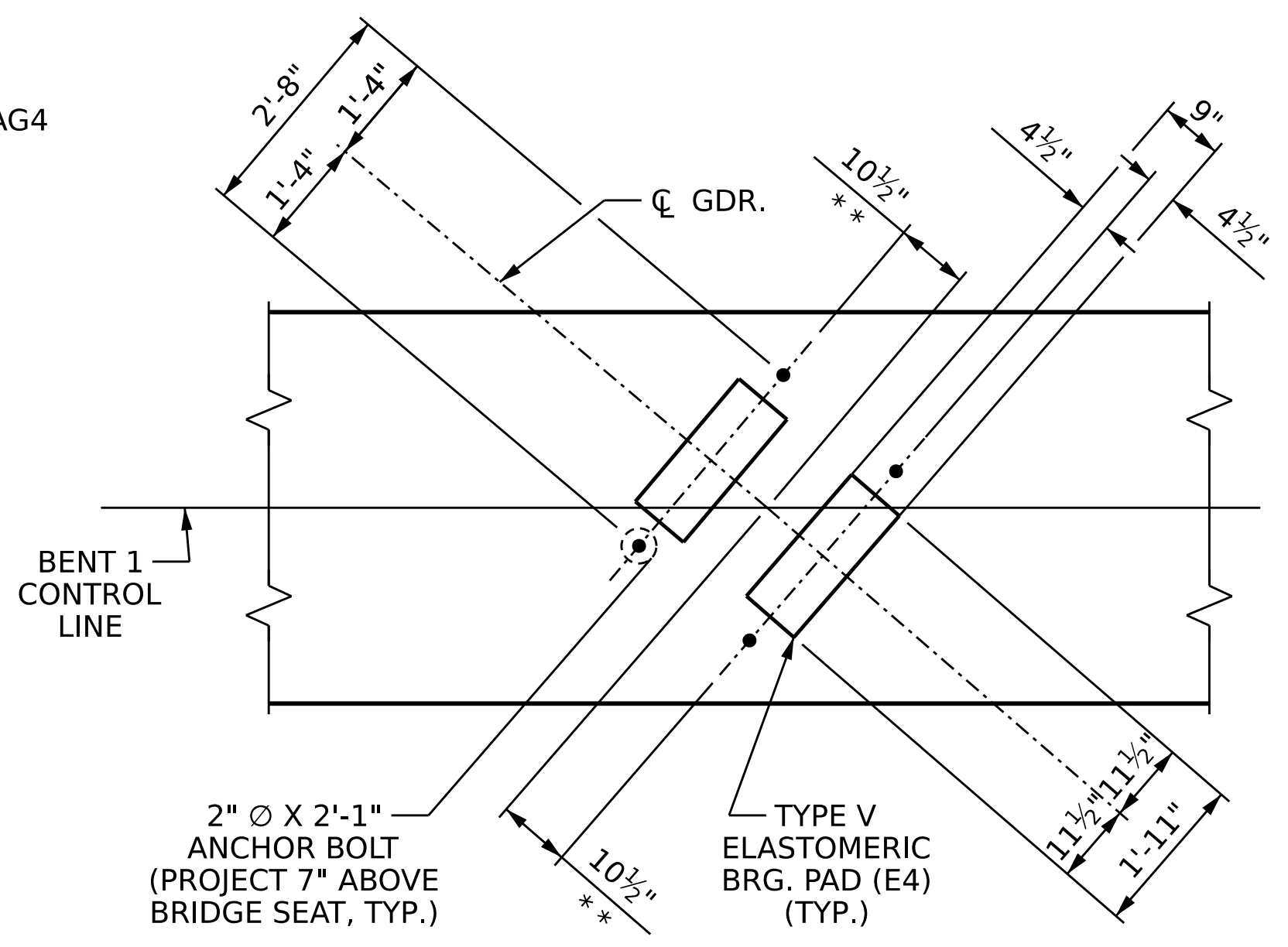






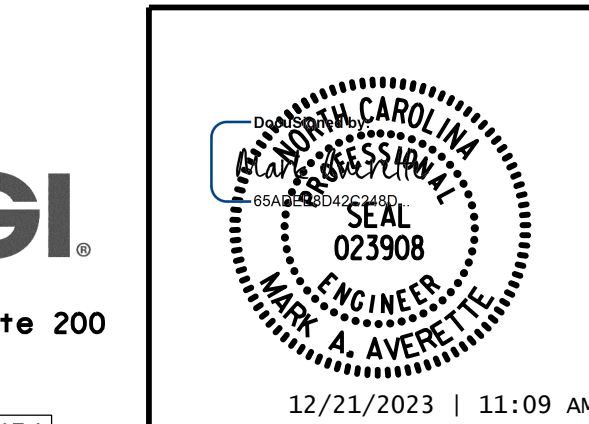
**NOTES:**

- \* INVERT ALTERNATE STIRRUPS.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR ADDITIONAL REINFORCING STEEL IN PP 24 X 0.50 GALVANIZED STEEL PILES, SEE 24" STEEL PIPE PILE SHEET.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 36 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



TOP OF PILE ELEVATIONS	
PILE	ELEVATION
1	2112.79
2	2112.53
3	2112.26
4	2111.99
5	2111.72
6	2111.44
7	2111.18

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-  
 SHEET 1 OF 2



REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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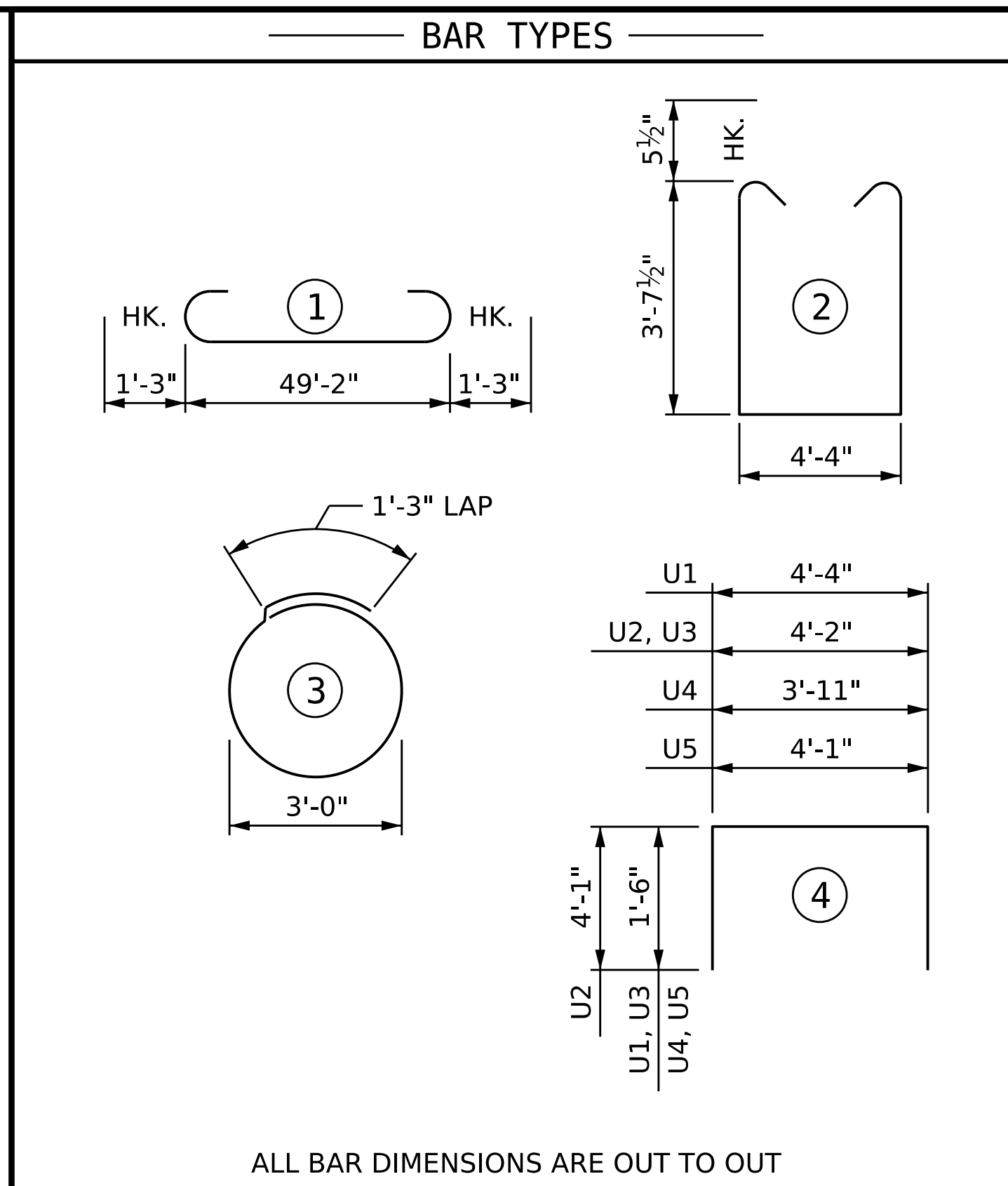
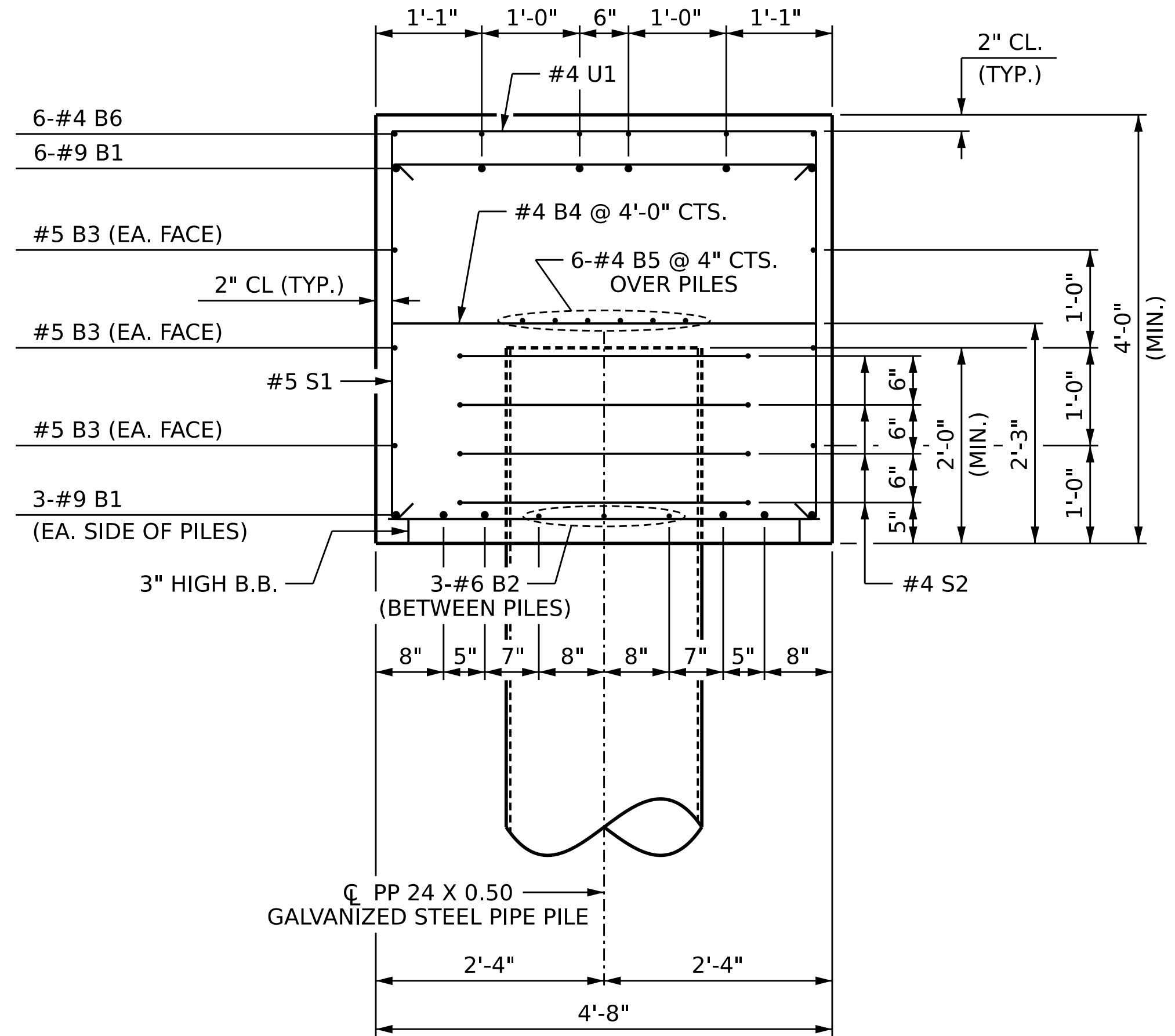
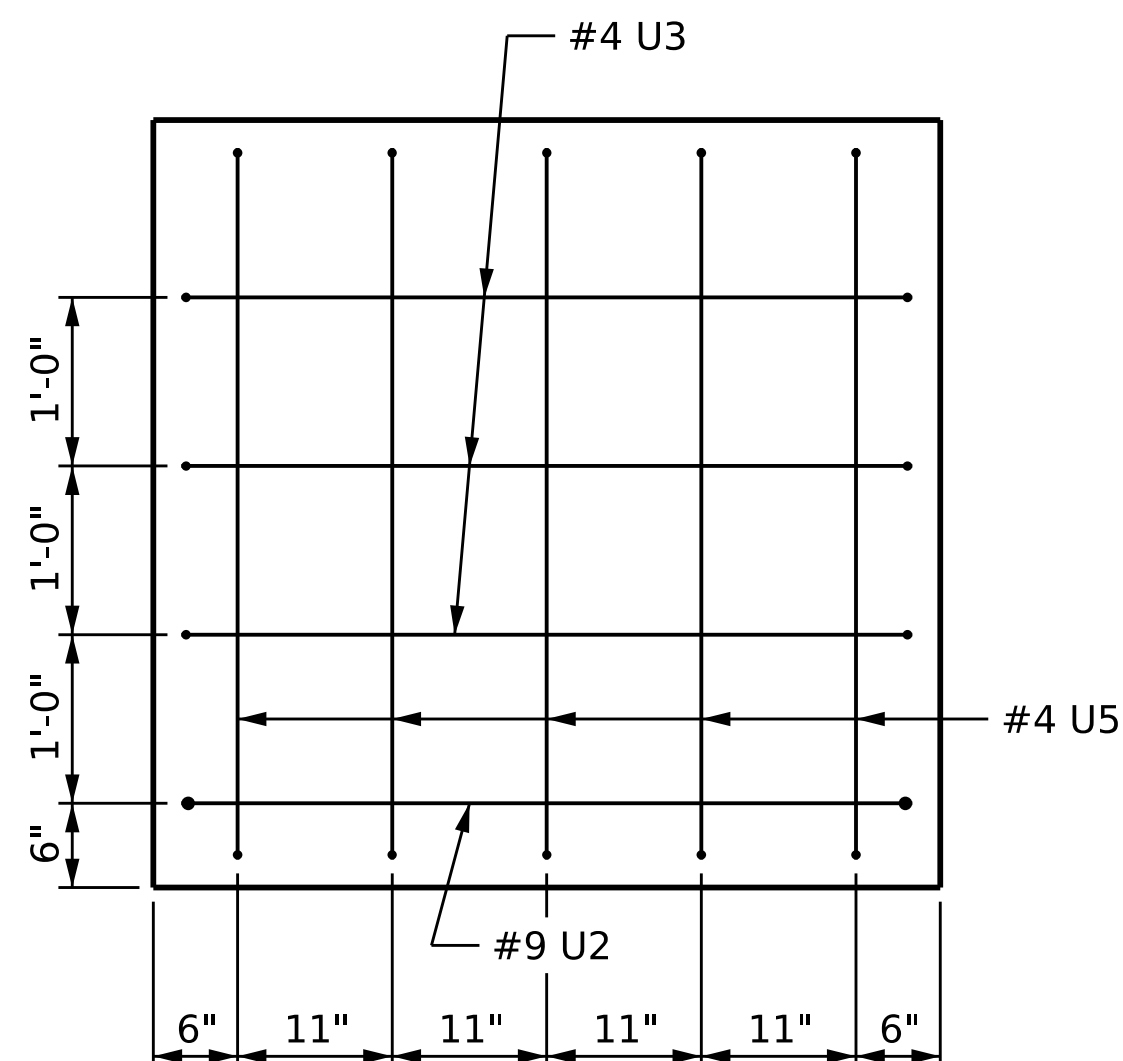
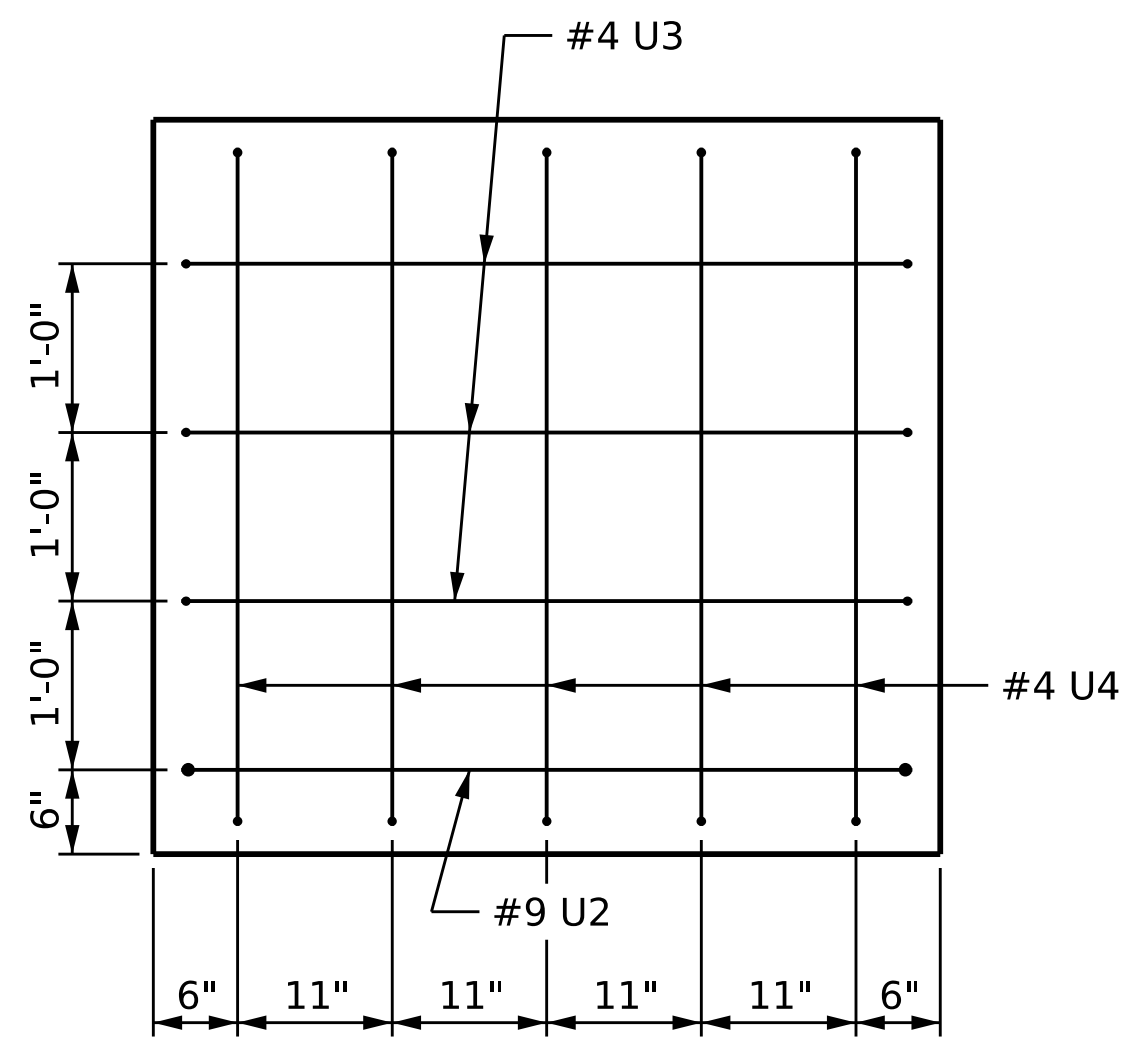


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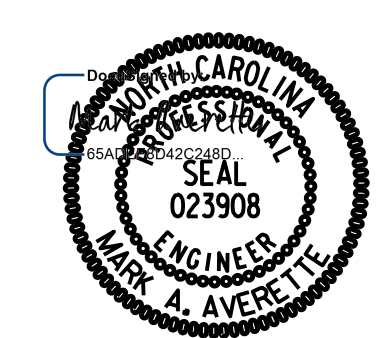


BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	51'-8"	2108
B2	18	#6	STR	5'-2"	140
B3	6	#5	STR	49'-4"	309
B4	12	#4	STR	4'-4"	35
B5	12	#4	STR	25'-11"	208
B6	18	#4	STR	9'-2"	110
B7	6	#4	STR	4'-1"	16
S1	70	#5	2	12'-6"	913
S2	28	#4	3	10'-9"	201
U1	45	#4	4	7'-4"	220
U2	2	#9	4	12'-4"	84
U3	6	#4	4	7'-2"	29
U4	5	#4	4	6'-11"	23
U5	5	#4	4	7'-1"	24
TOTAL REINFORCING STEEL					4420 LB
TOTAL CLASS A CONCRETE					*** 35.2 CY

\*\*\* CONCRETE DISPLACED BY THE PP 24 X 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

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DRAWN BY : T. BANKOVICH DATE : 12-23  
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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

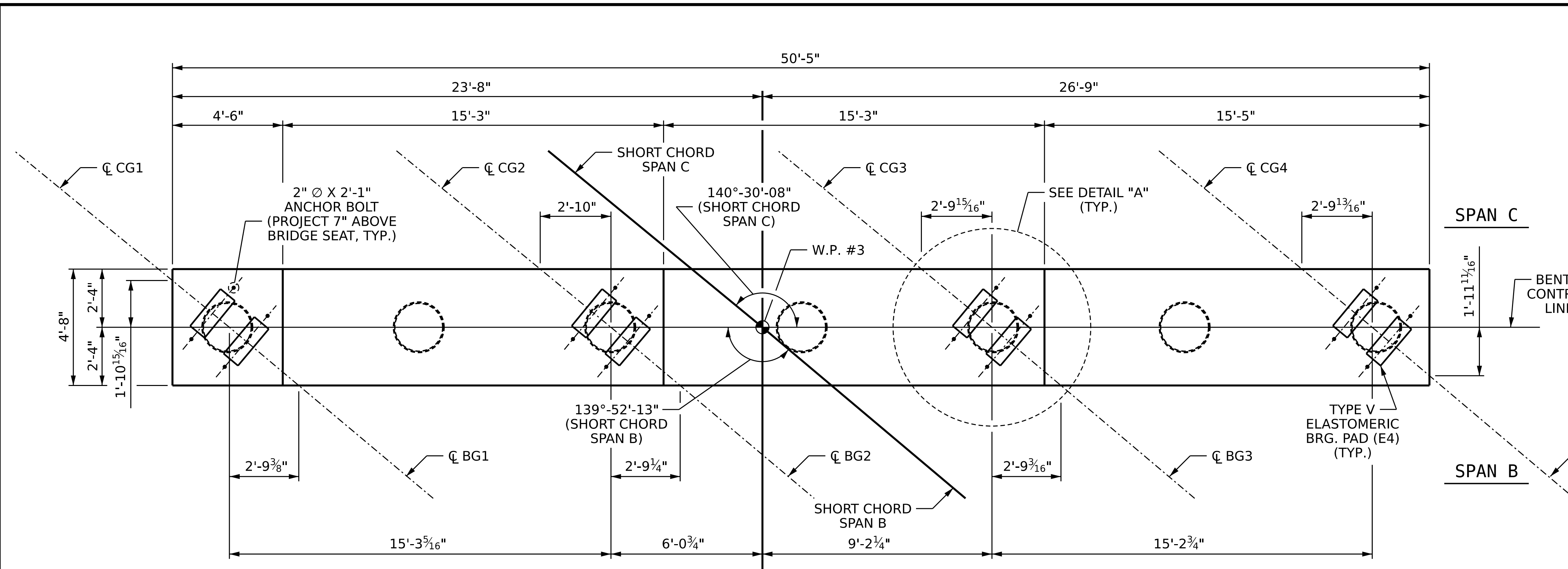
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

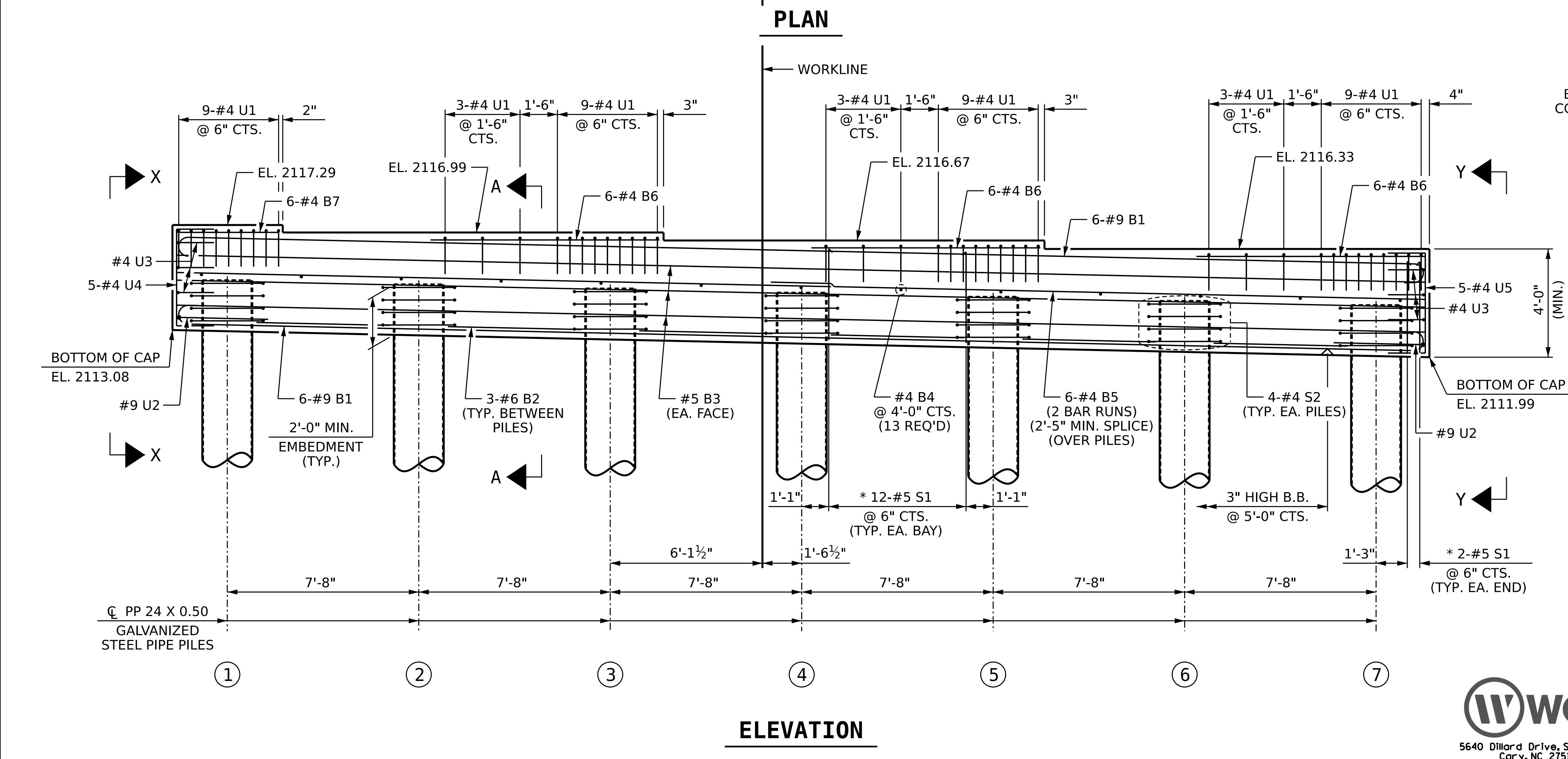
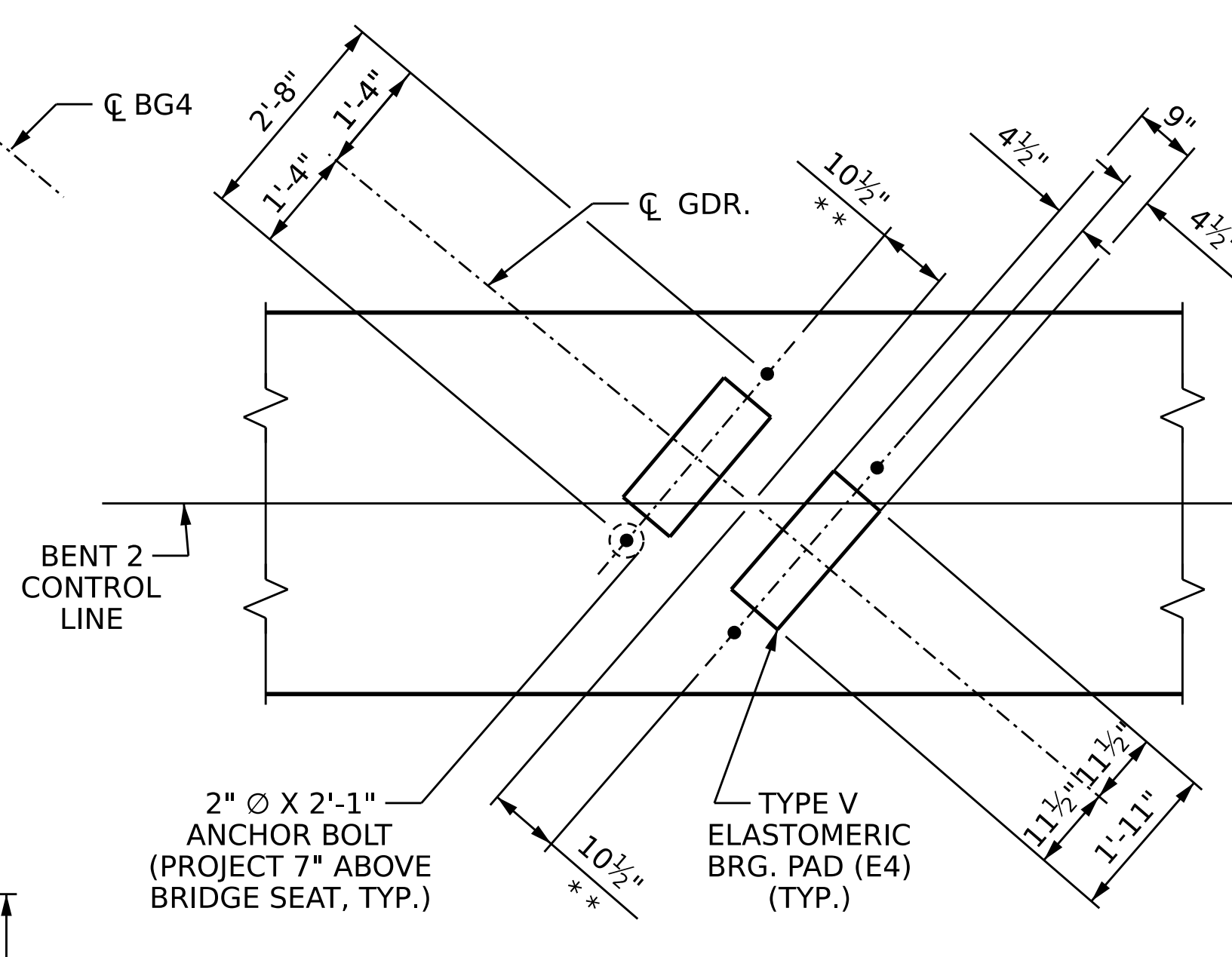
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NO.	BY:	DATE:	NO.	BY:	DATE:	5-38
1			3			TOTAL SHEETS
2			4			49

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**NOTES:**

- \* INVERT ALTERNATE STIRRUPS.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- FOR ADDITIONAL REINFORCING STEEL IN PP 24 X 0.50 GALVANIZED STEEL PILES, SEE 24" STEEL PIPE PILE SHEET.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 41 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



**TOP OF PILE ELEVATIONS**

PILE	ELEVATION
1	2115.07
2	2114.91
3	2114.74
4	2114.58
5	2114.41
6	2114.24
7	2114.08

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 2**



DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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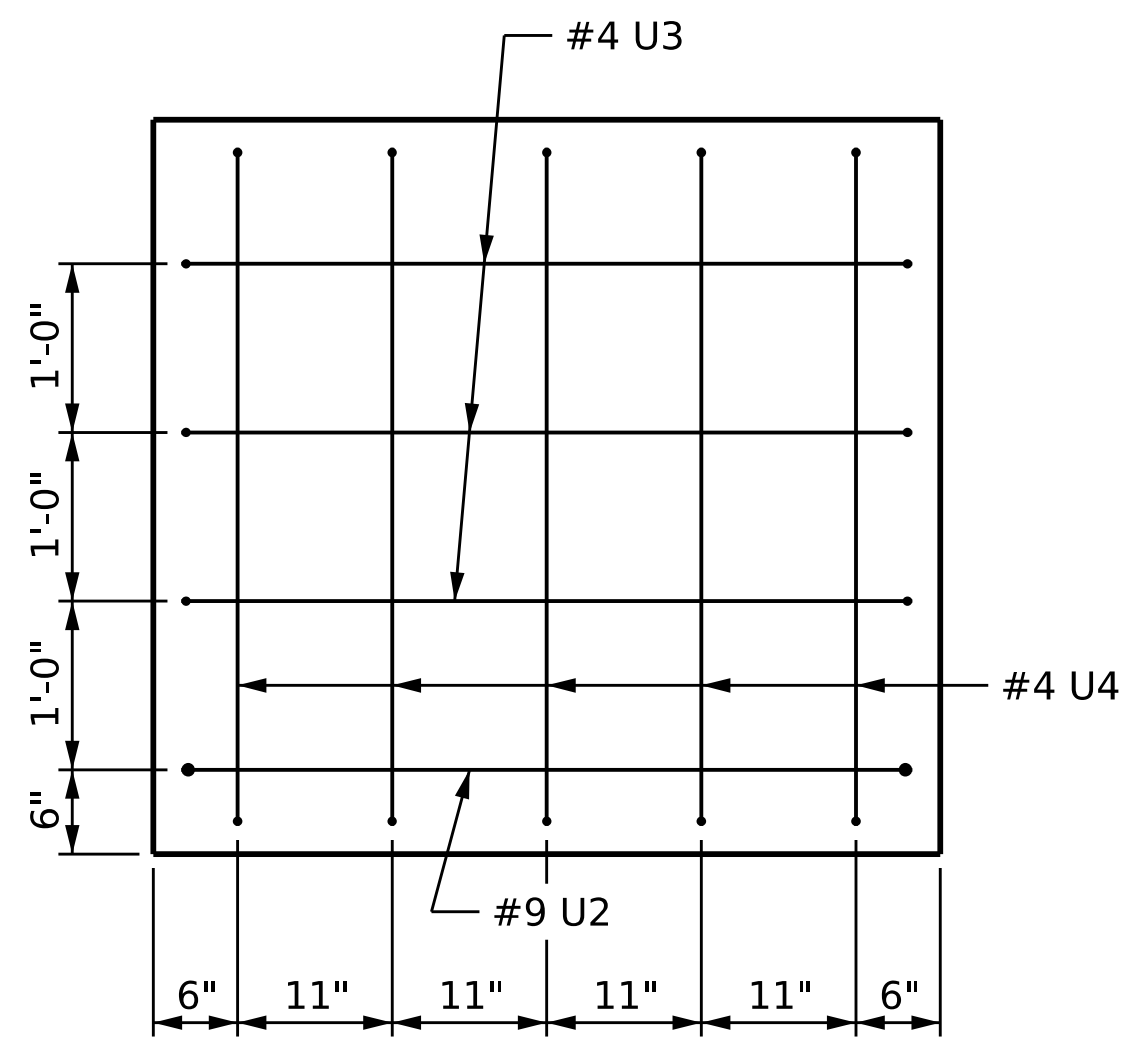
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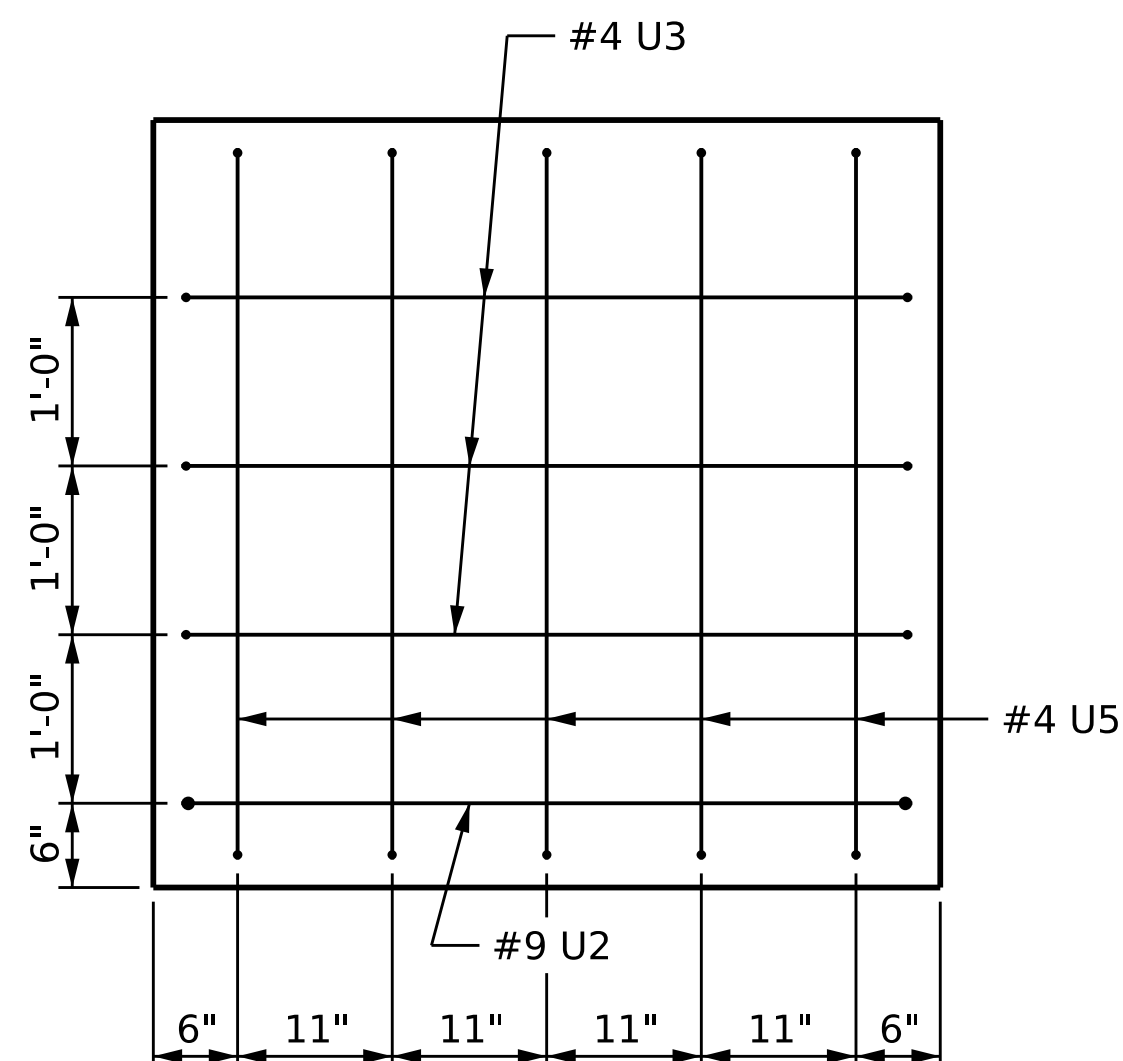
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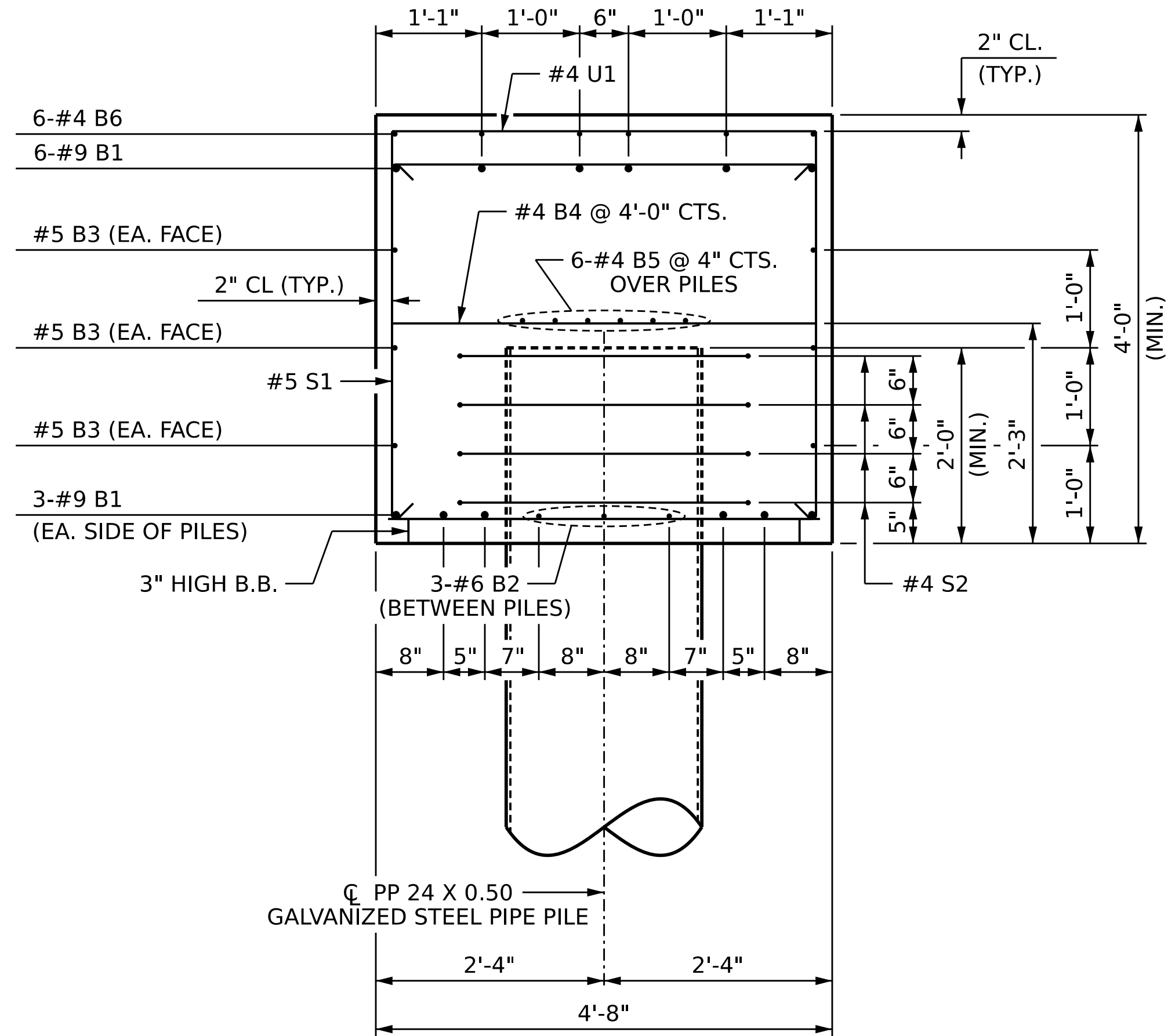




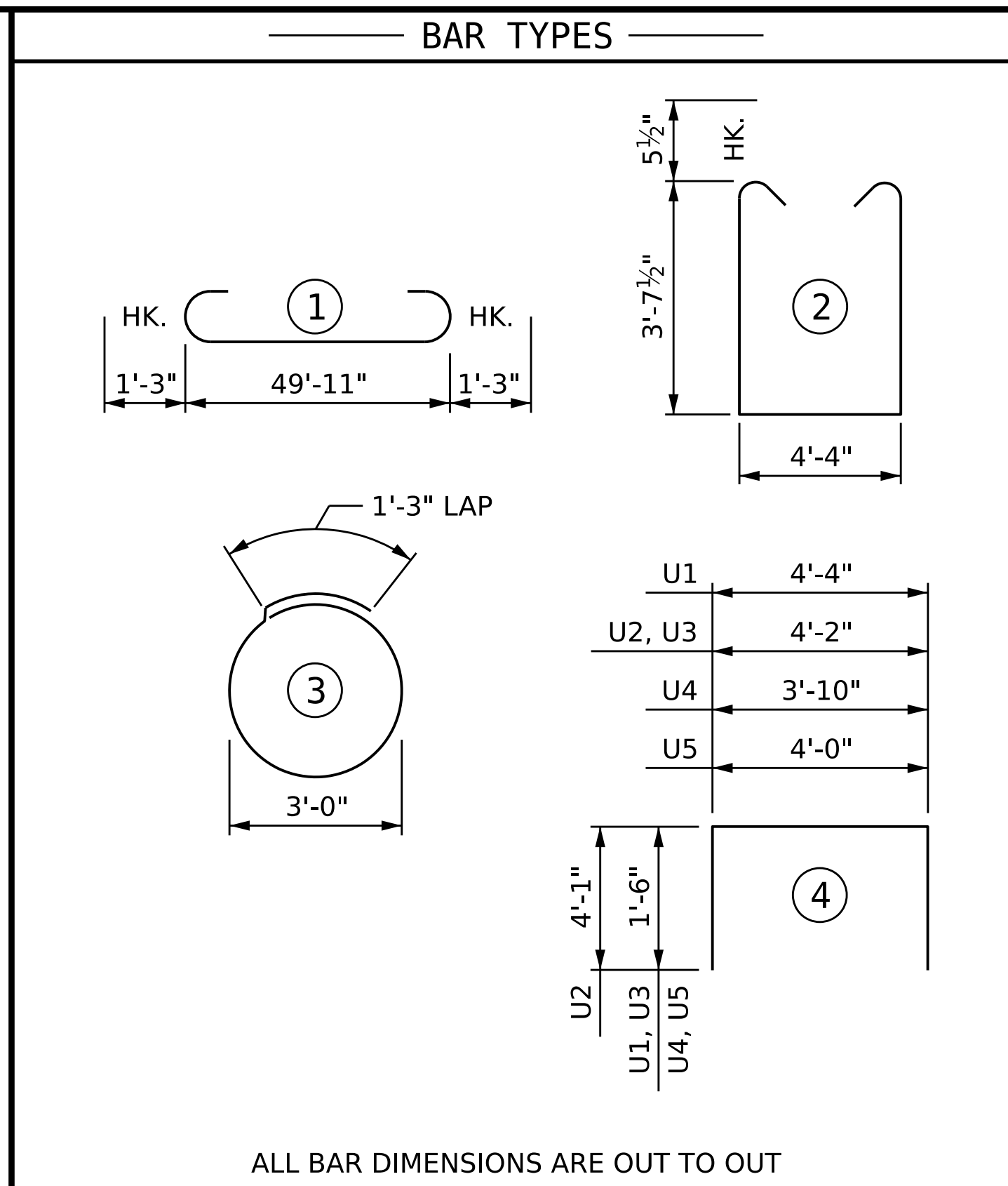
**VIEW X-X**



**VIEW Y-Y**



**SECTION A-A**



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	52'-5"	2139
B2	18	#6	STR	5'-4"	144
B3	6	#5	STR	50'-1"	313
B4	13	#4	STR	4'-4"	38
B5	12	#4	STR	26'-3"	210
B6	18	#4	STR	9'-2"	110
B7	6	#4	STR	4'-2"	17
S1	76	#5	2	12'-6"	991
S2	28	#4	3	10'-9"	201
U1	45	#4	4	7'-4"	220
U2	2	#9	4	12'-4"	84
U3	6	#4	4	7'-2"	29
U4	5	#4	4	6'-10"	23
U5	5	#4	4	7'-0"	23
TOTAL REINFORCING STEEL					4542 LB
TOTAL CLASS A CONCRETE					*** 34.7 CY

\*\*\* CONCRETE DISPLACED BY THE PP 24 X 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

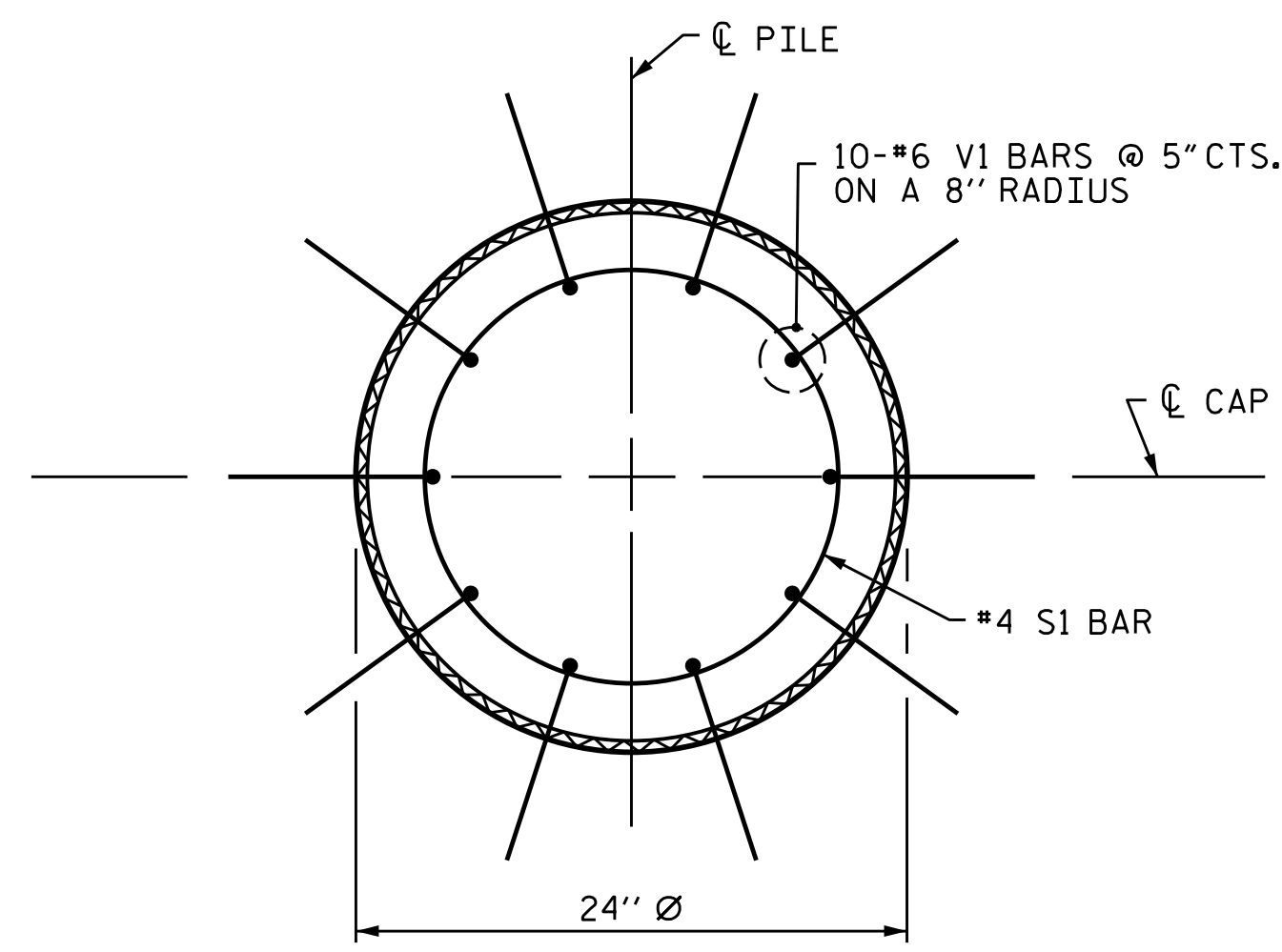
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

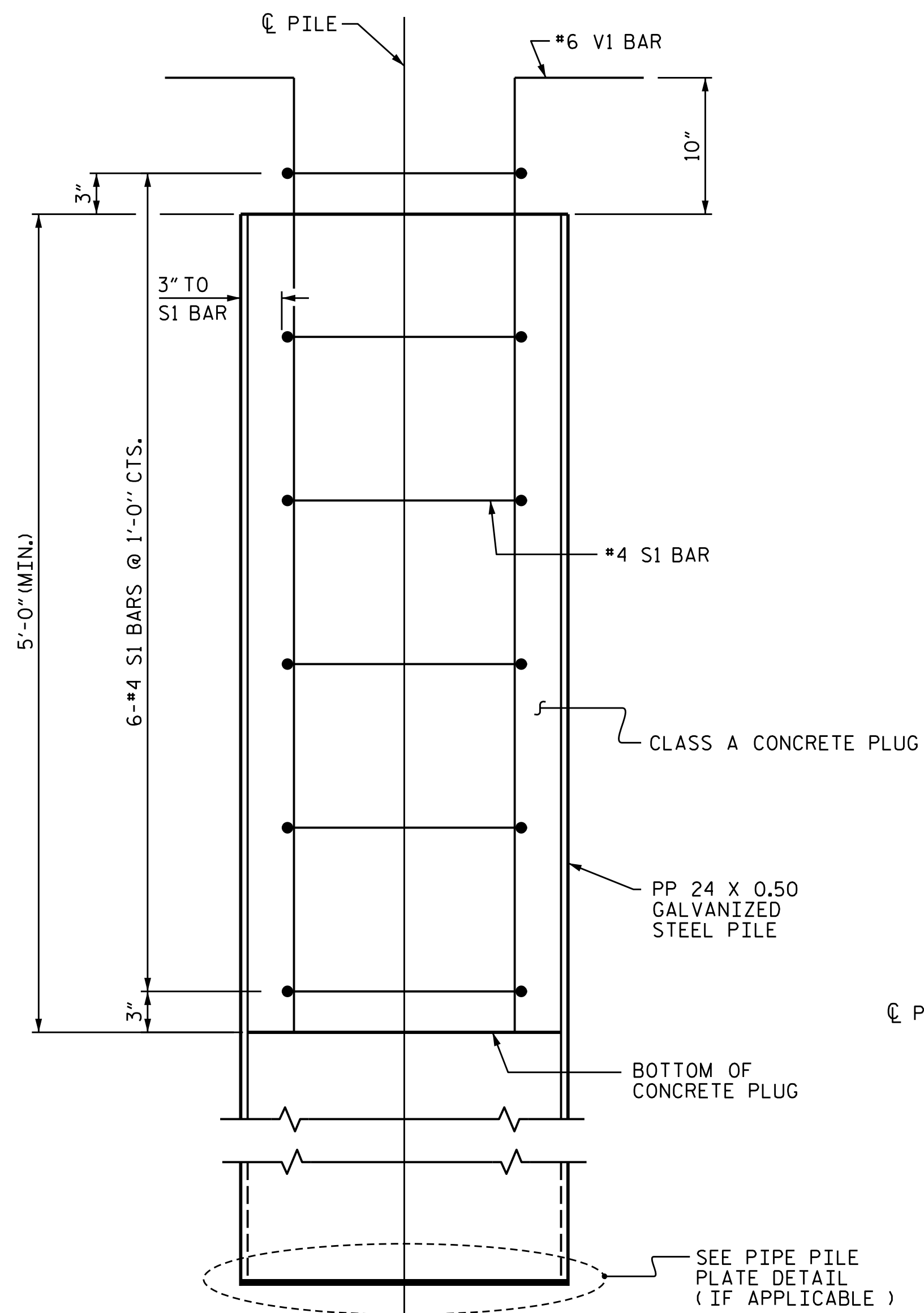
**BENT 2**

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NO.	BY:	DATE:	NO.	BY:	DATE:	5-40
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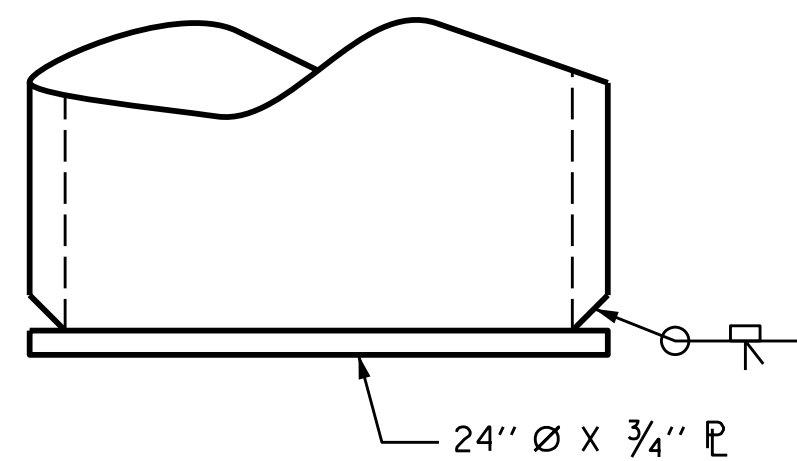
PLAN



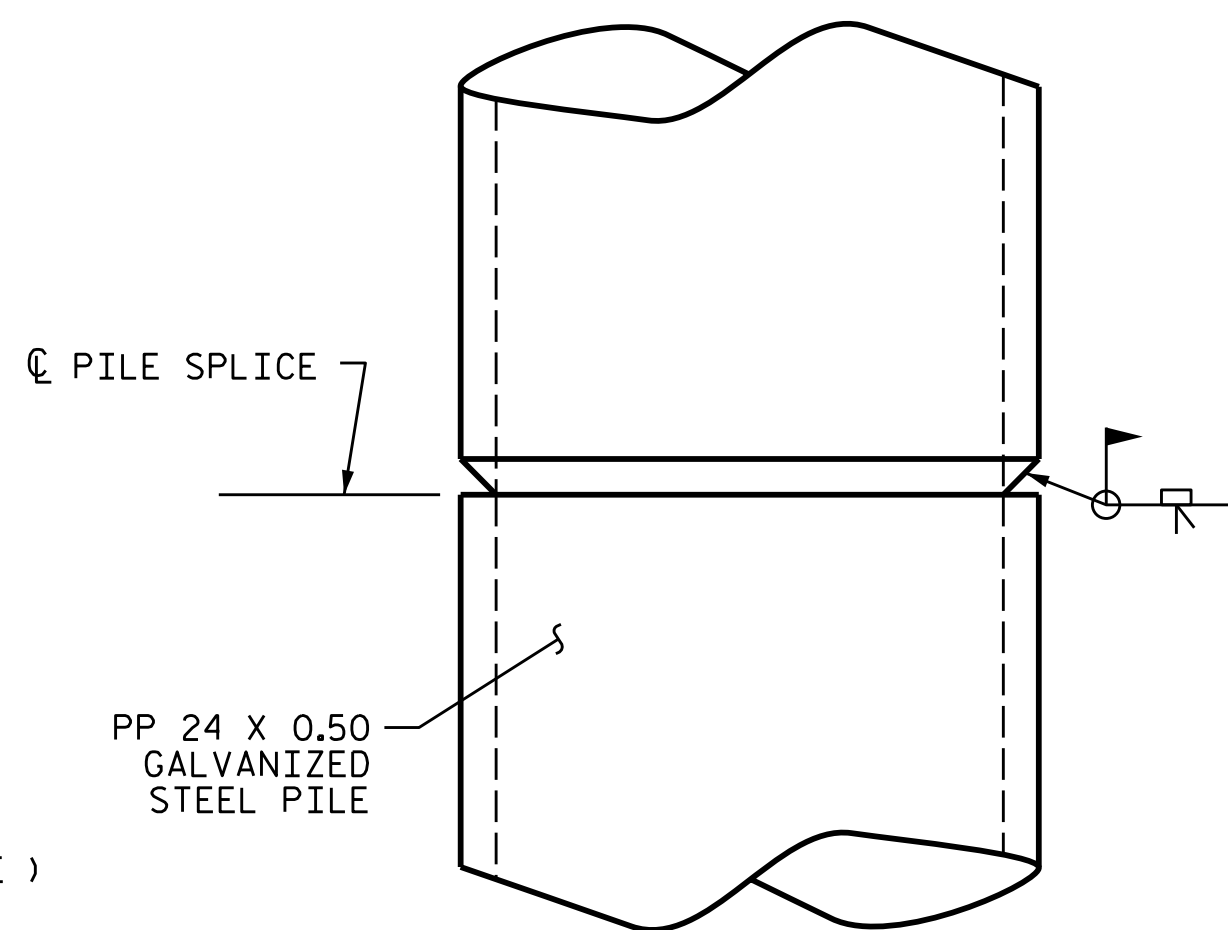
ELEVATION

PP 24 X 0.50 GALVANIZED STEEL PILE

(OPEN OR CLOSED END)



PIPE PILE PLATE DETAIL  
( IF APPLICABLE )



PIPE PILE SPLICE DETAIL

NOTES

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

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

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

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

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

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

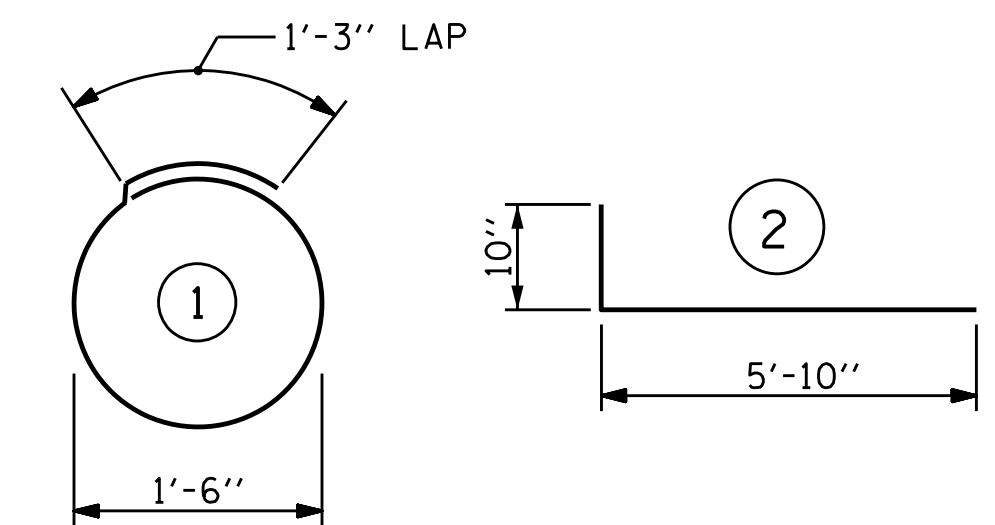
BILL OF MATERIAL FOR ONE  
PP 24 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100
REINFORCING STEEL =				124	lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG	0.5 CY
--------------------	--------

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

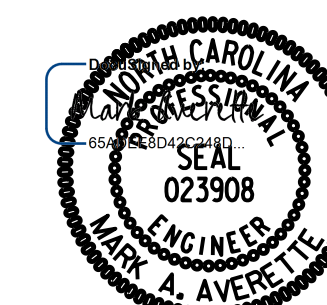
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

24" STEEL PIPE PILE



5640 Dillard Drive, Suite 200  
 Cary, NC 27518

LICENSURE NO. C-4434



12/21/2023 | 11:09 AM

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SHEET NO.

5-41

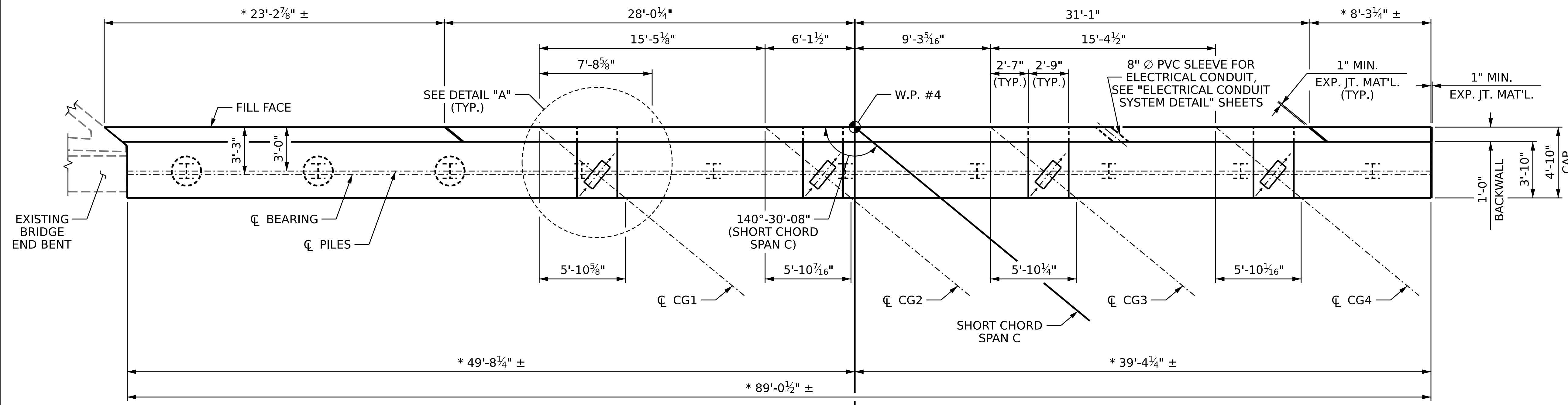
TOTAL SHEETS  
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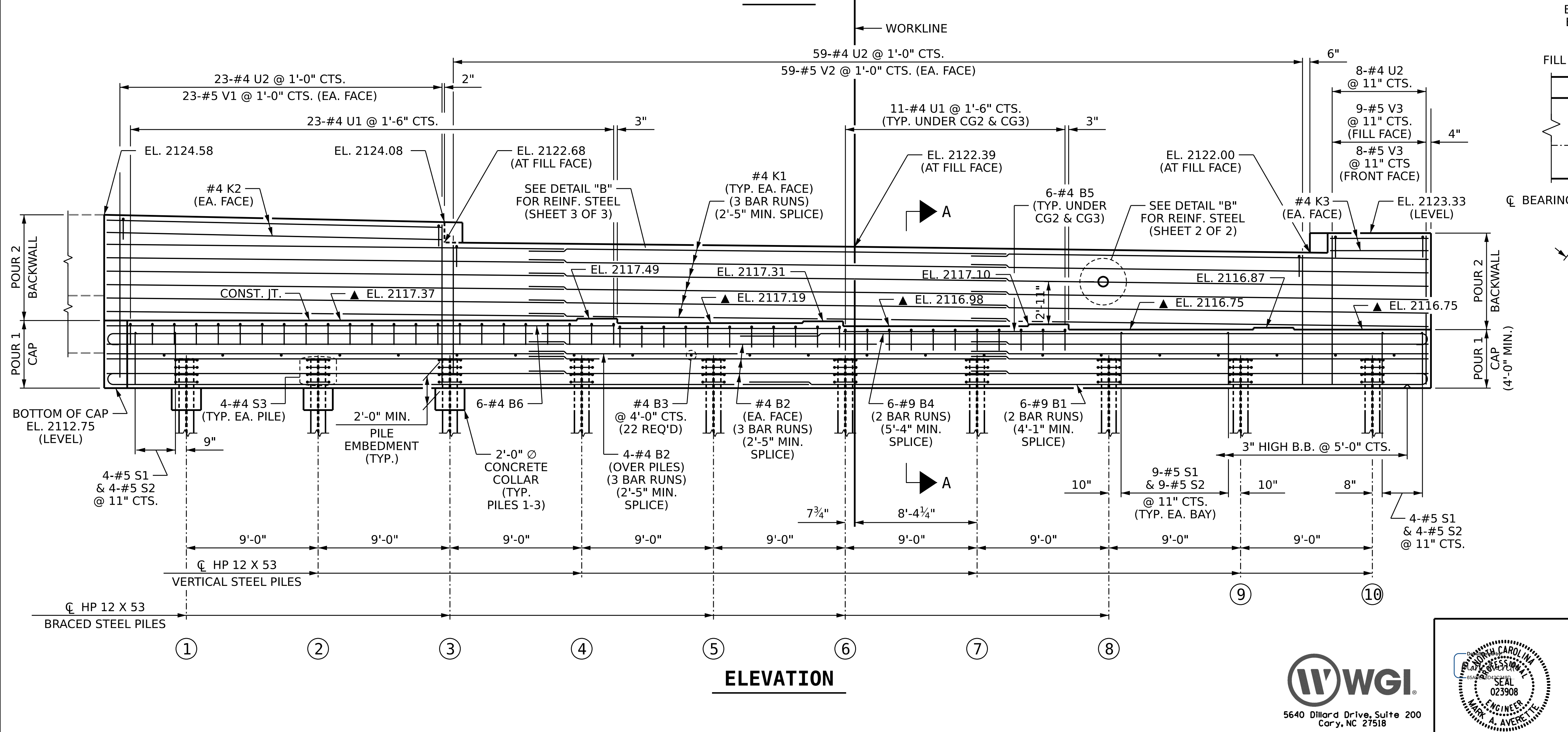
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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



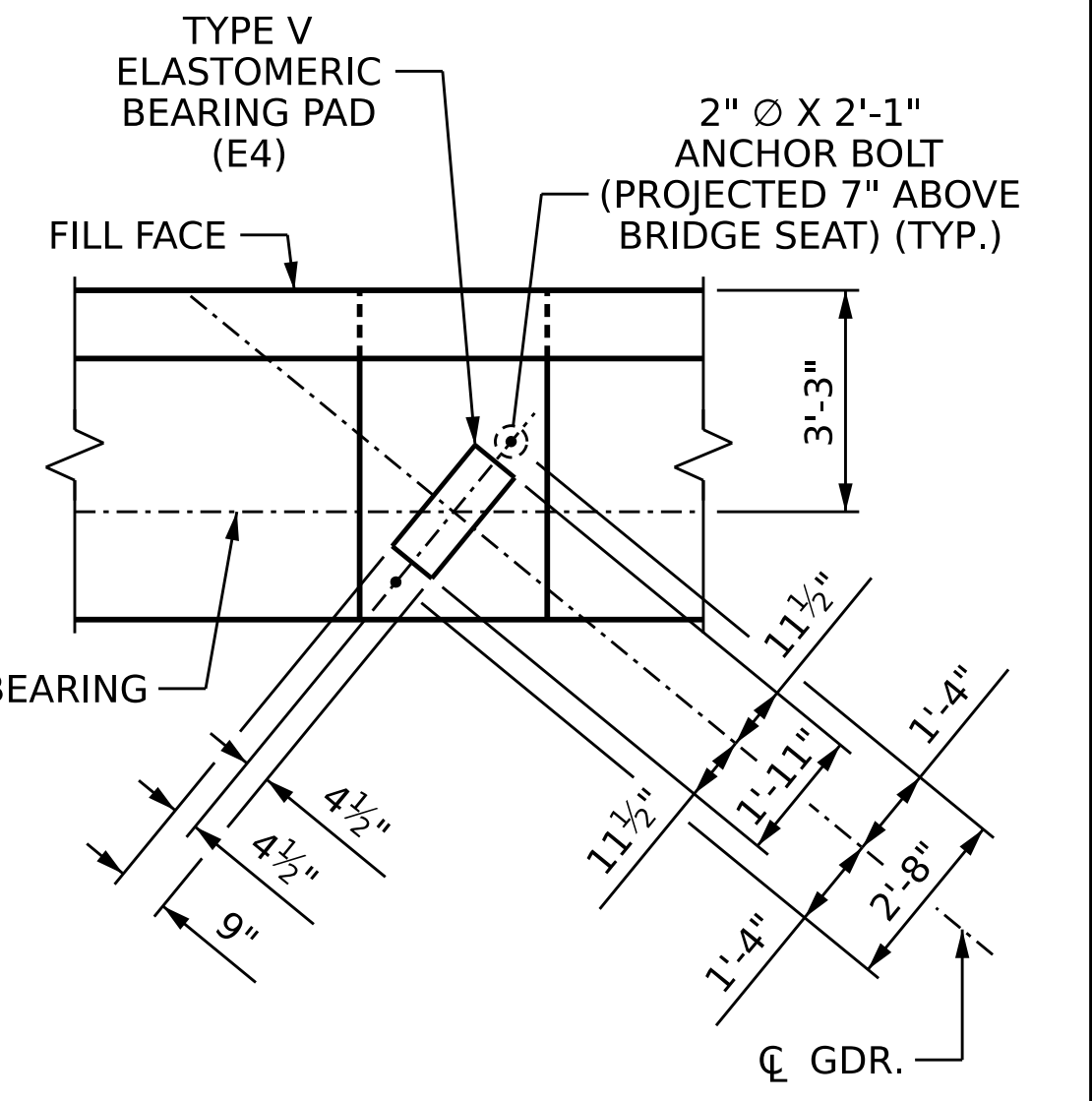


**PLAN**



**ELEVATION**

**NOTES:**  
 STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
 THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE 2%.  
 ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A SHEET 2 OF 2.  
 SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.  
 \* END BENT IS EXTENDED TO MEET EXISTING END BENT ON LEFT AND MSE WALL ON RIGHT.

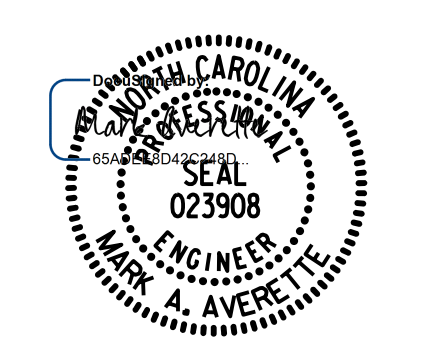


**DETAIL "A"**  
 (TYP. EA. GIRDER)

PROJECT NO. **I-2513AA/AB**  
**BUNCOMBE** COUNTY  
 STATION: **20+16.70 -Y5RPA-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**END BENT 2**



DRAWN BY : **T. BANKOVICH** DATE : **12-23**  
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 DESIGN ENGINEER OF RECORD: **M.A. AVERETTE** DATE : **12-23**

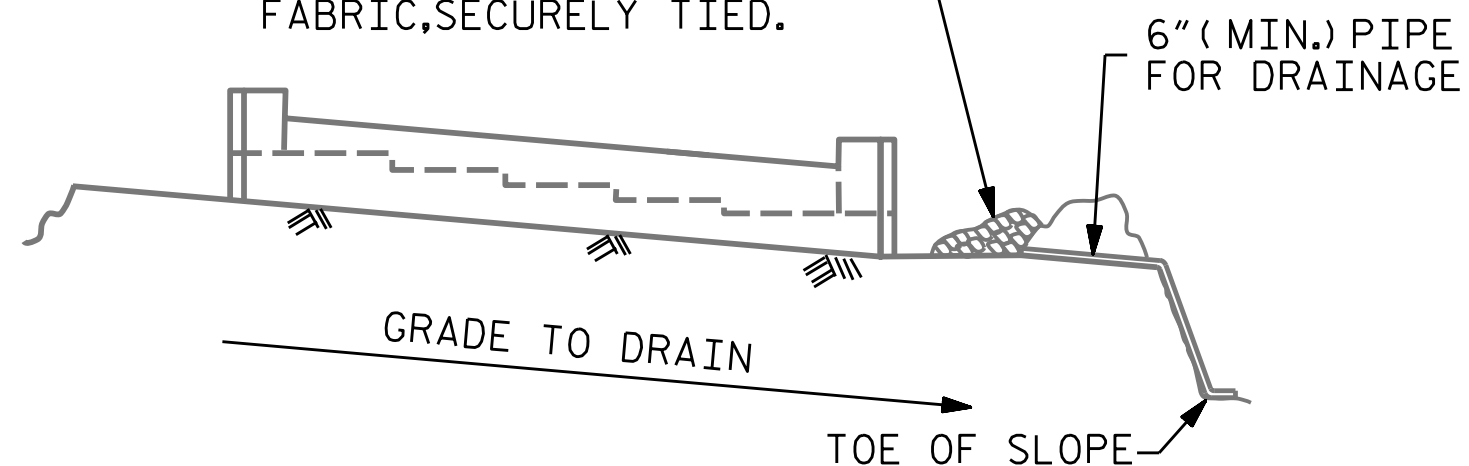
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TOTAL SHEETS: 49

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 UNLESS ALL SIGNATURES COMPLETED

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

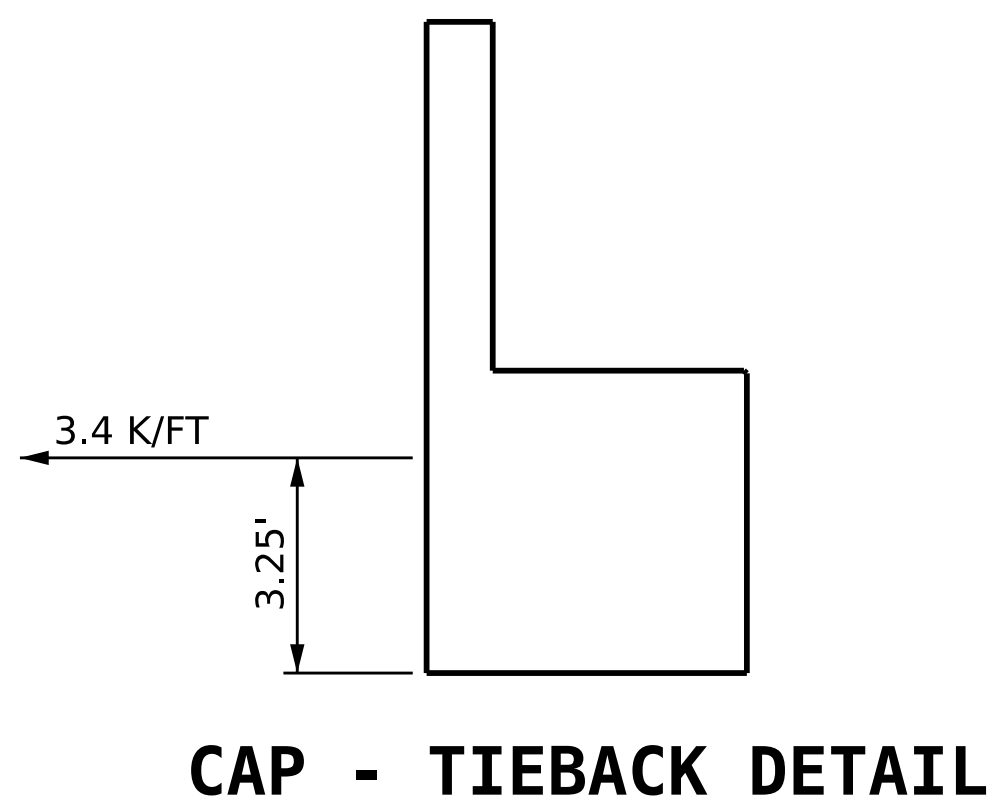


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

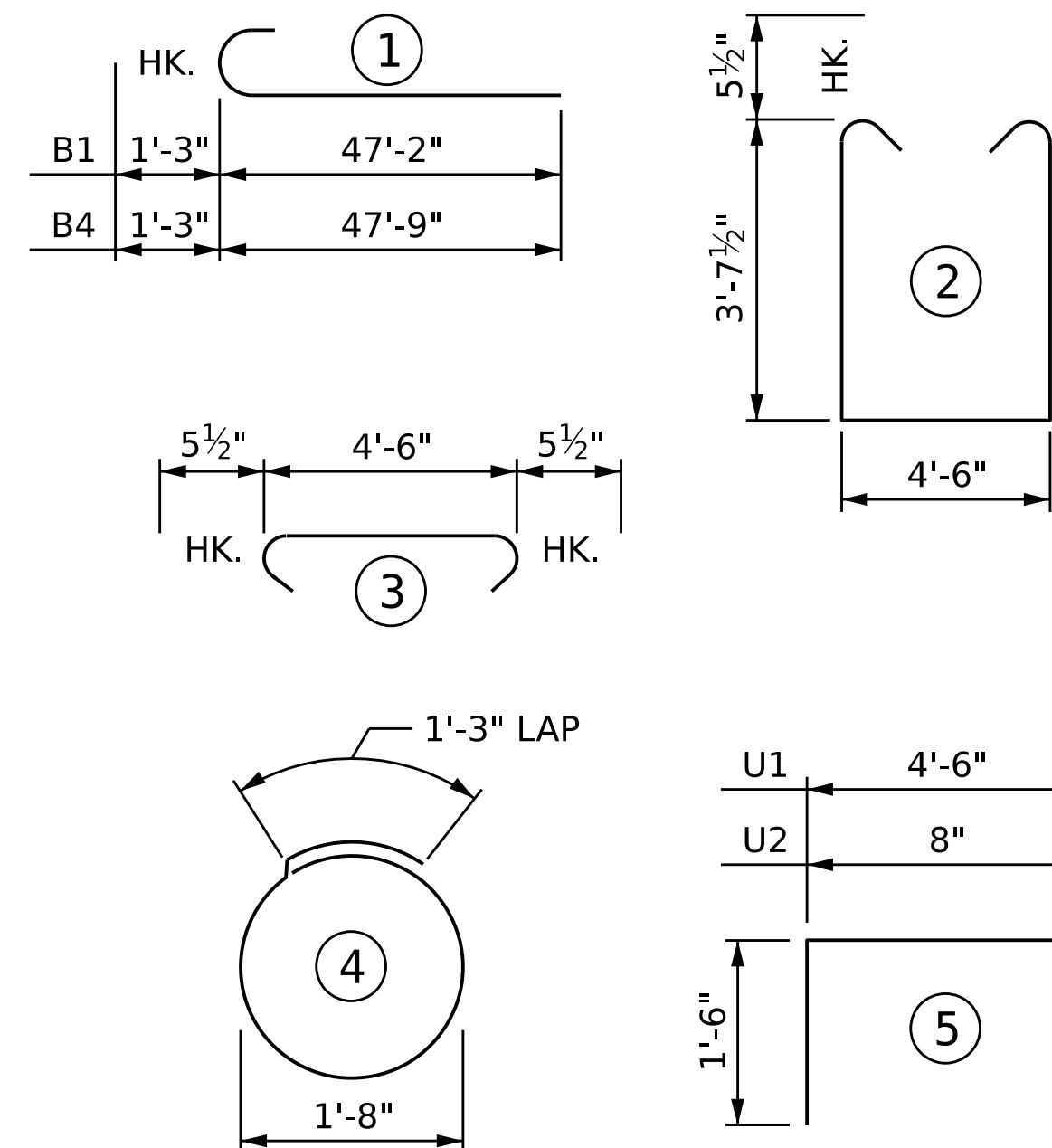
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



**CAP - TIEBACK DETAIL**

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL

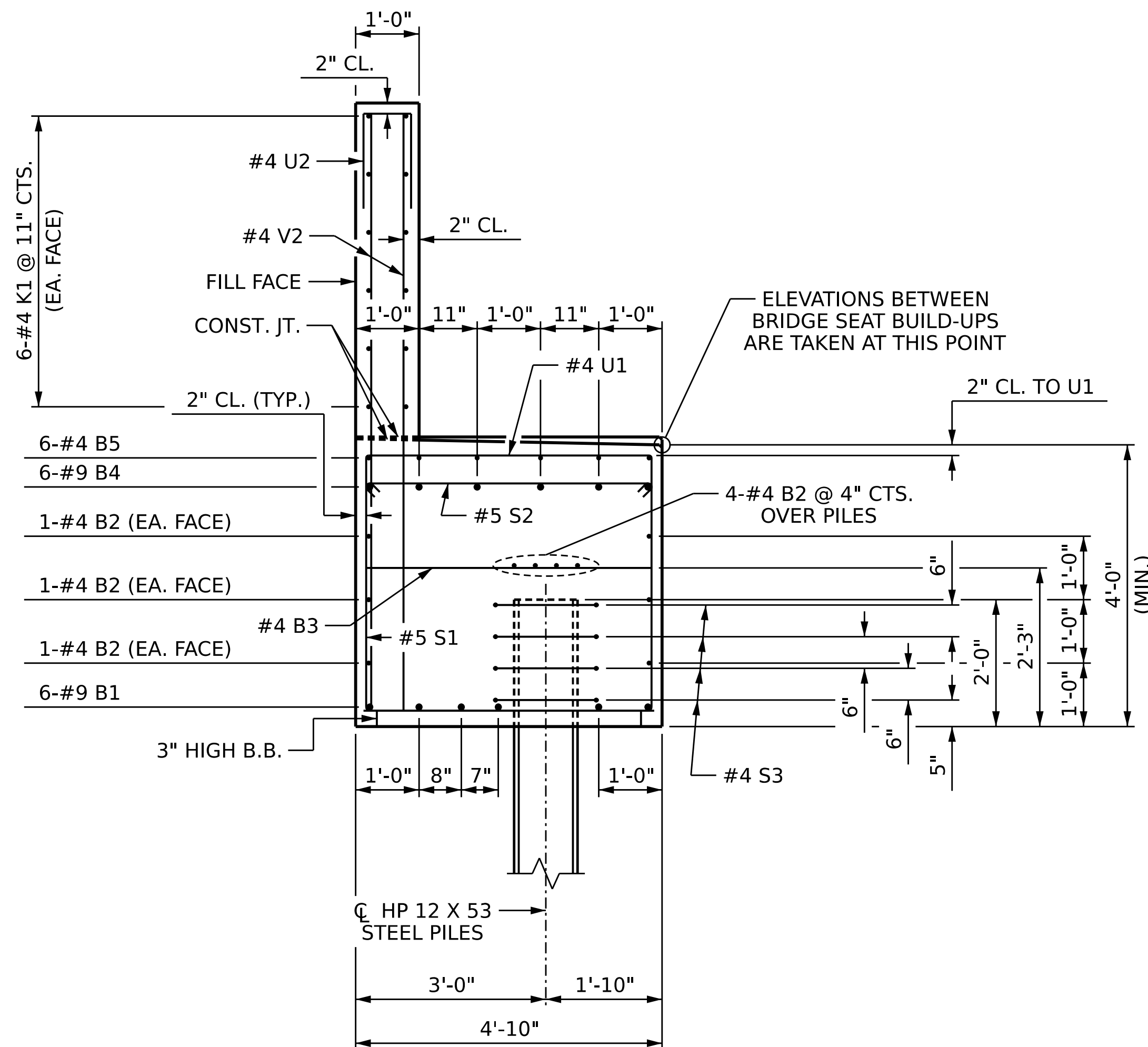
#### END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	48'-5"	1975
B2	30	#4	STR	31'-9"	636
B3	22	#4	STR	4'-6"	66
B4	12	#9	1	49'-0"	1999
B5	12	#4	STR	15'-2"	122
B6	6	#4	STR	33'-1"	133
K1	36	#4	STR	31'-9"	764
K2	4	#4	STR	22'-10"	61
K3	4	#4	STR	6'-10"	18
S1	89	#5	2	12'-8"	1176
S2	89	#5	3	5'-5"	503
S3	40	#4	4	6'-6"	174
T1	16	#5	STR	2'-5"	40
U1	45	#4	5	7'-6"	225
U2	90	#4	5	3'-8"	220
V1	46	#5	STR	10'-11"	524
V2	118	#5	STR	8'-10"	1087
V3	17	#5	STR	10'-2"	180

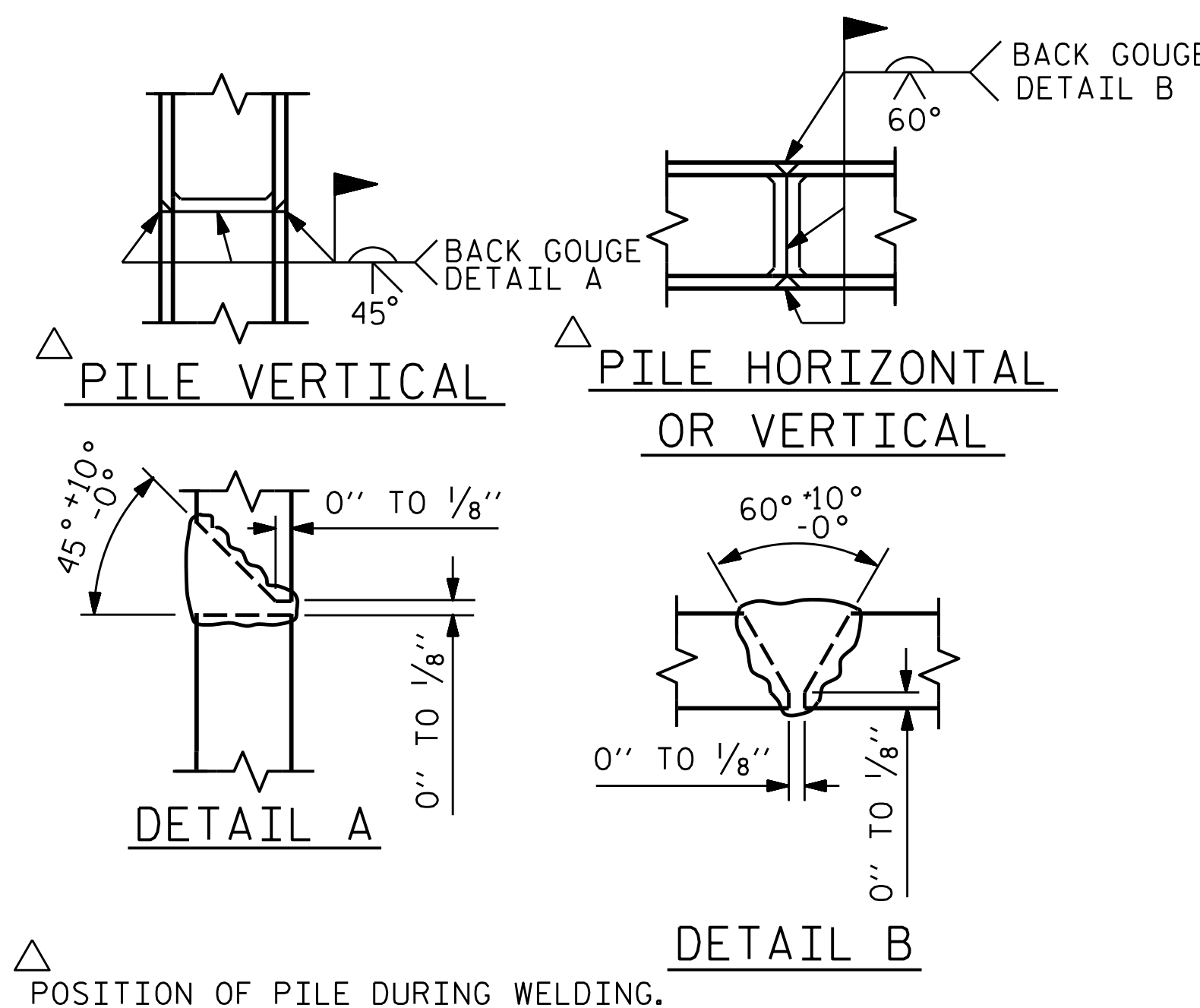
TOTAL REINFORCING STEEL 9903 LB

#### CLASS A CONCRETE BREAKDOWN

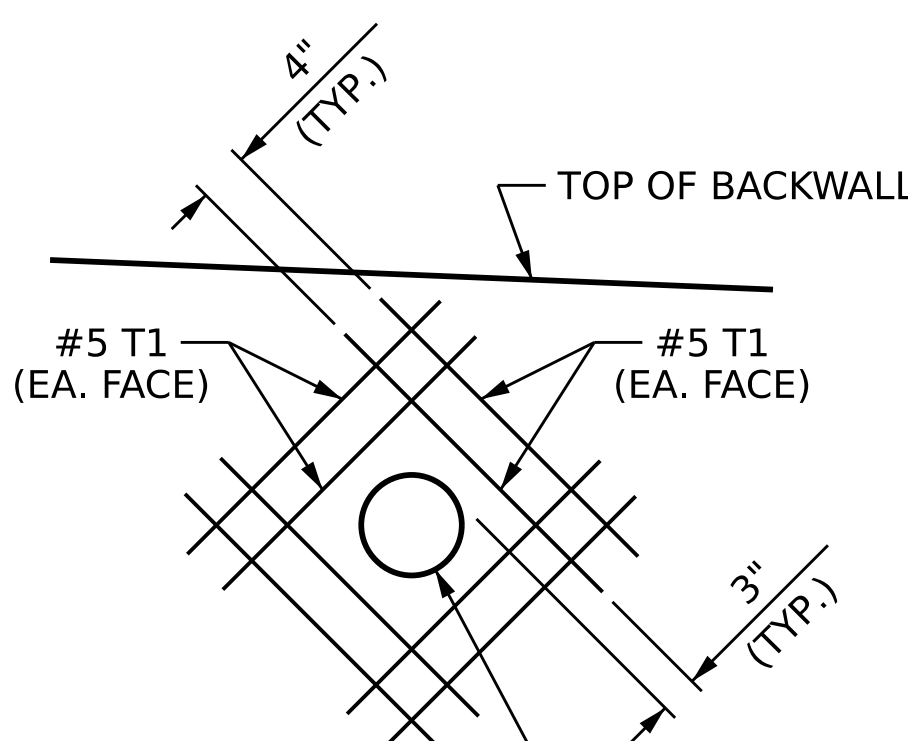
POUR 1 (CAP, & COLLARS)	68.4 CY
POUR 2 (BACKWALL)	19.6 CY
<b>TOTAL</b>	<b>88.0 CY</b>



**SECTION A-A**



### PILE SPLICE DETAILS



8" Ø PVC SLEEVE FOR ELECTRICAL CONDUIT, SEE "ELECTRICAL CONDUIT SYSTEM DETAILS" SHEET

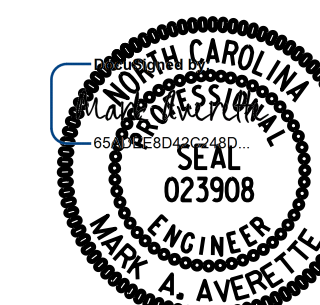
**DETAIL "B"**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

### END BENT 2



12/21/2023 | 11:09 AM

#### REVISIONS

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

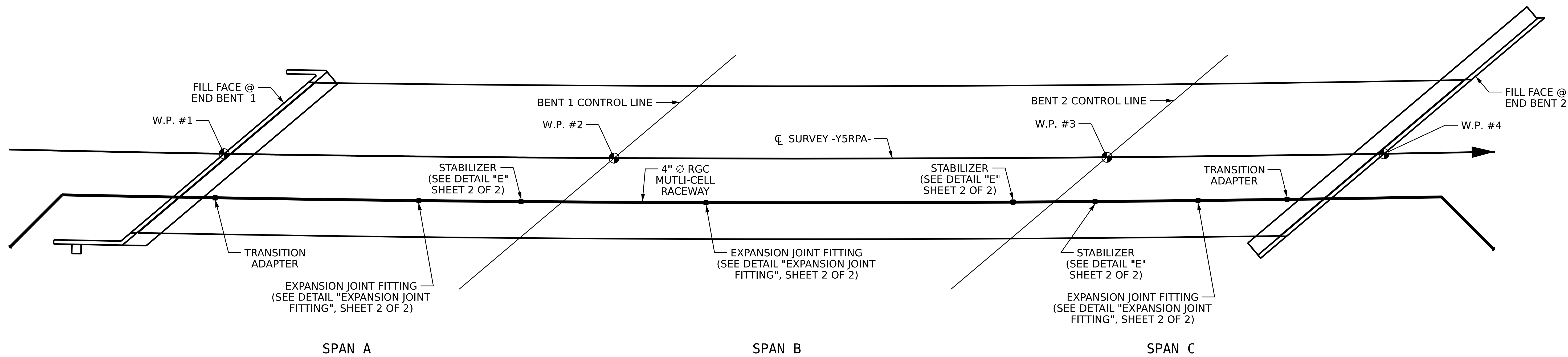
SHEET NO. 5-43  
 TOTAL SHEETS 49

DOCUMENT NOT CONSIDERED FINAL  
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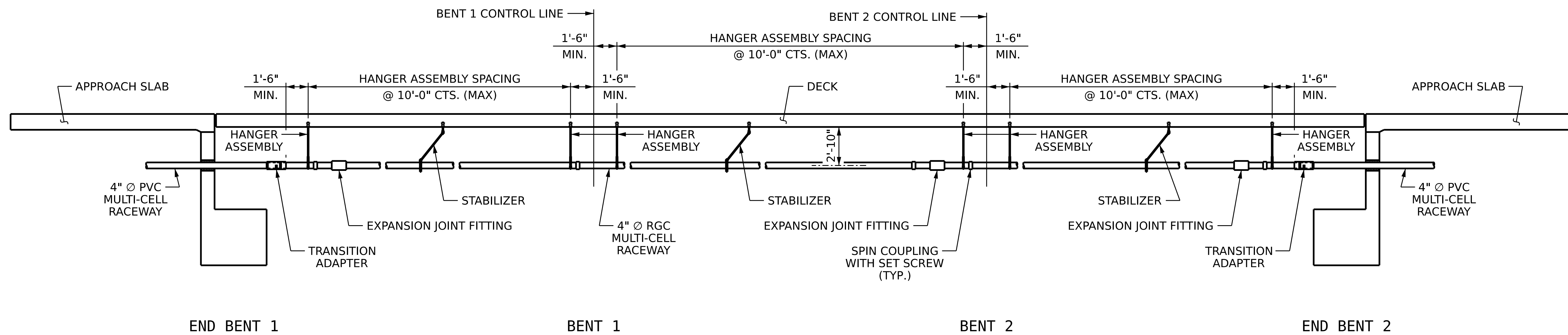
12/21/2023 1:49:50 PM c:\pwworking\cecom\_ds21\_na\_2020\d0252774\I2513AA\_SMU\_EB5\_100902.dgn

DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

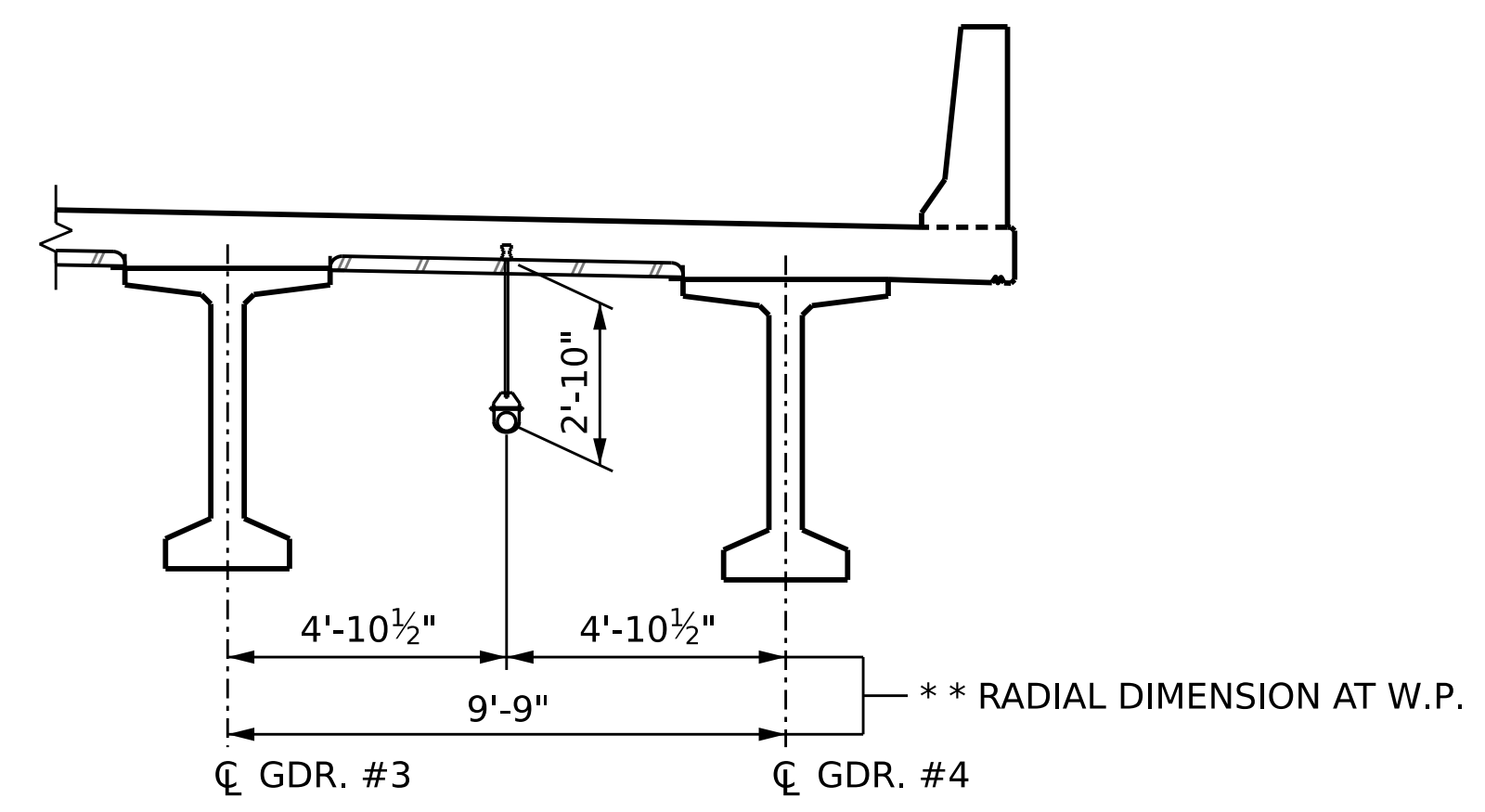




**ELECTRIC CONDUIT LAYOUT**



**ELEVATION**



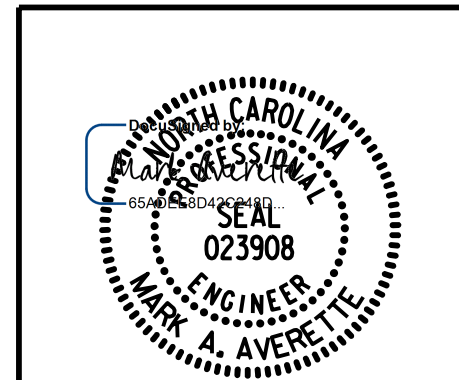
**CONDUIT LOCATION**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**ELECTRICAL CONDUIT SYSTEM DETAILS**

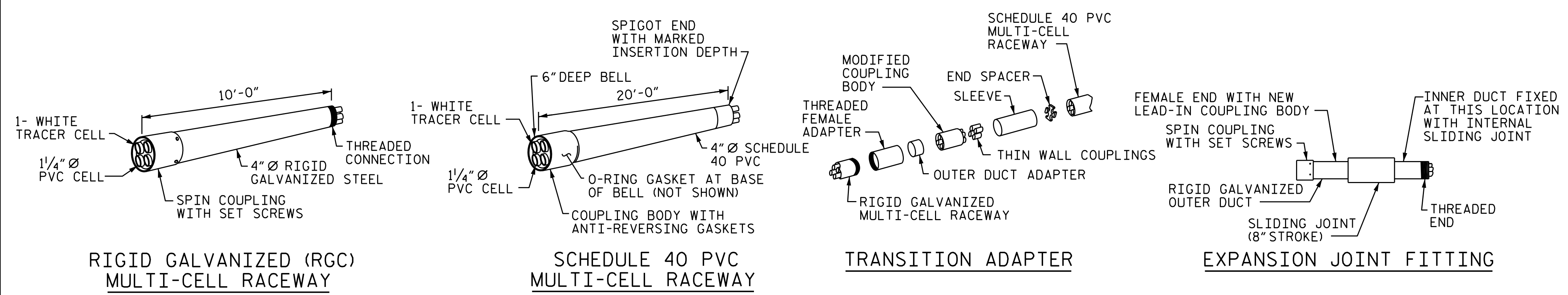


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-44
1			3			TOTAL SHEETS
2			4			49

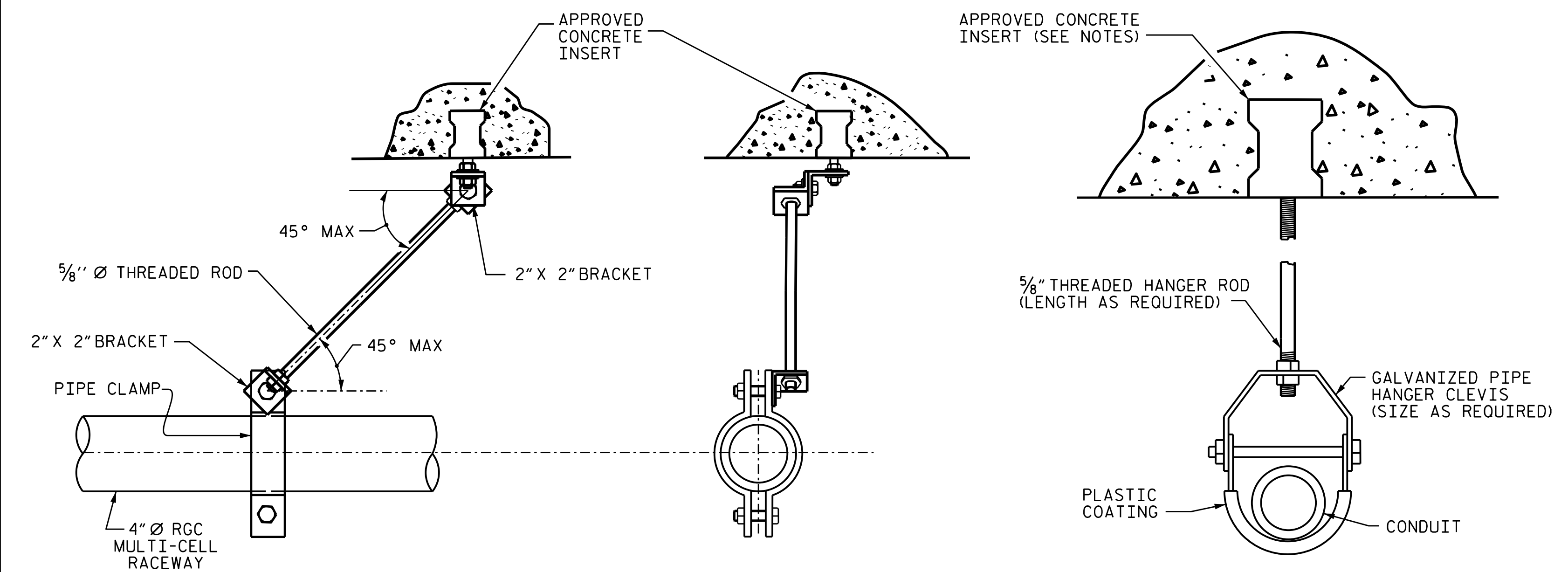
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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23



**DETAIL "D"**  
 4" MULTI-CELL COMPONENTS



**NOTES:**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

PROVIDE TRANSITION ADAPTER AND EXPANSION JOINT FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL ONE STABILIZERS PER SPAN. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

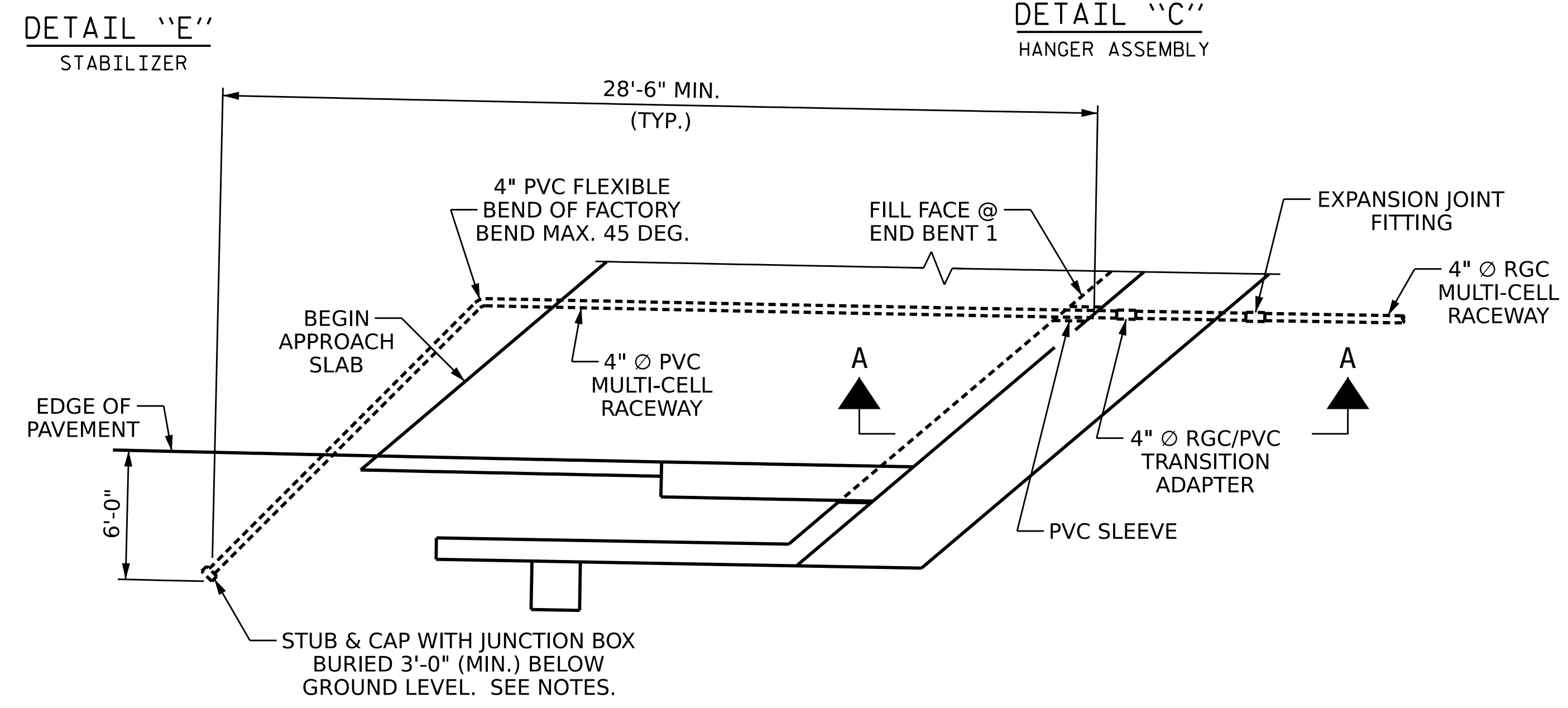
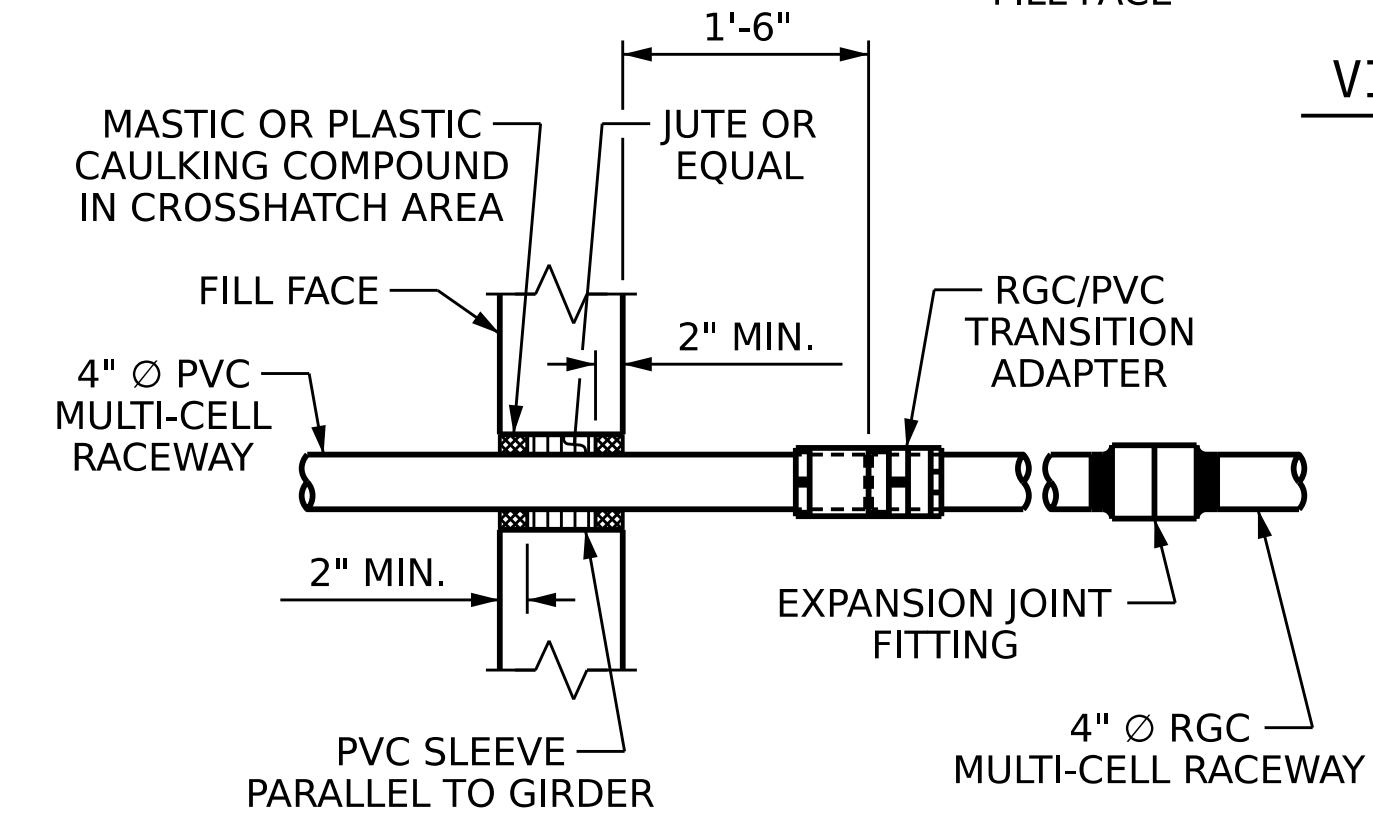
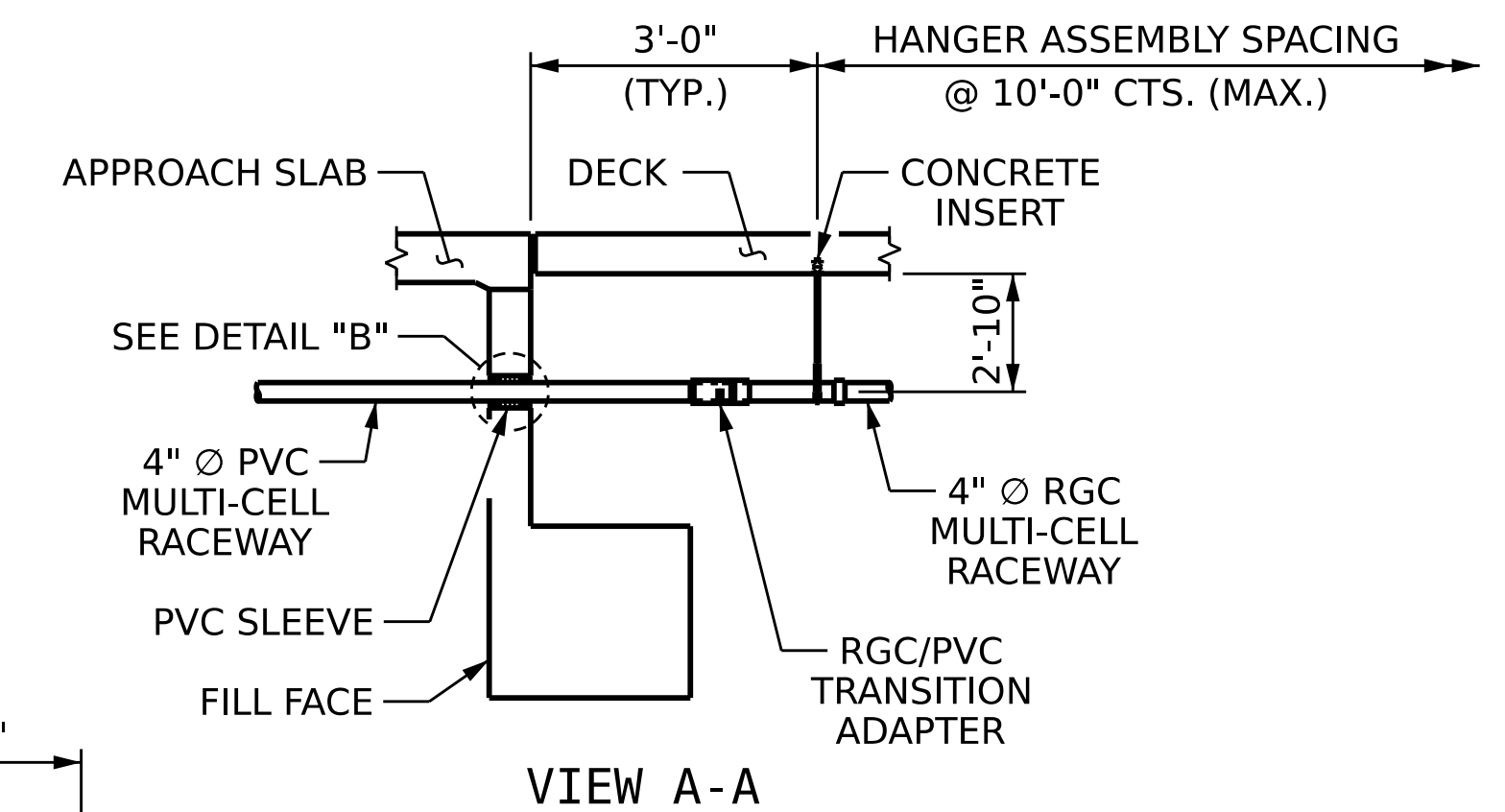
PROVIDE ONE EXPANSION JOINT FITTING PER SPAN.

THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

FOR OVERSIZED JUNCTION BOX, SEE ARTICLE 1098-5 OF THE STANDARD SPECIFICATIONS.

LOCATION OF STABILIZER INSERTS MAY BE ADJUSTED IN THE FIELD TO AVOID CONFLICT WITH LINK SLAB DETAILS.



PROJECT NO. I-2513AA/AB  
 BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**ELECTRICAL CONDUIT SYSTEM DETAILS**

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

STATE OF NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 SEAL 023908  
 MARK A. AVERETTE  
 12/21/2023 | 11:09 AM PST

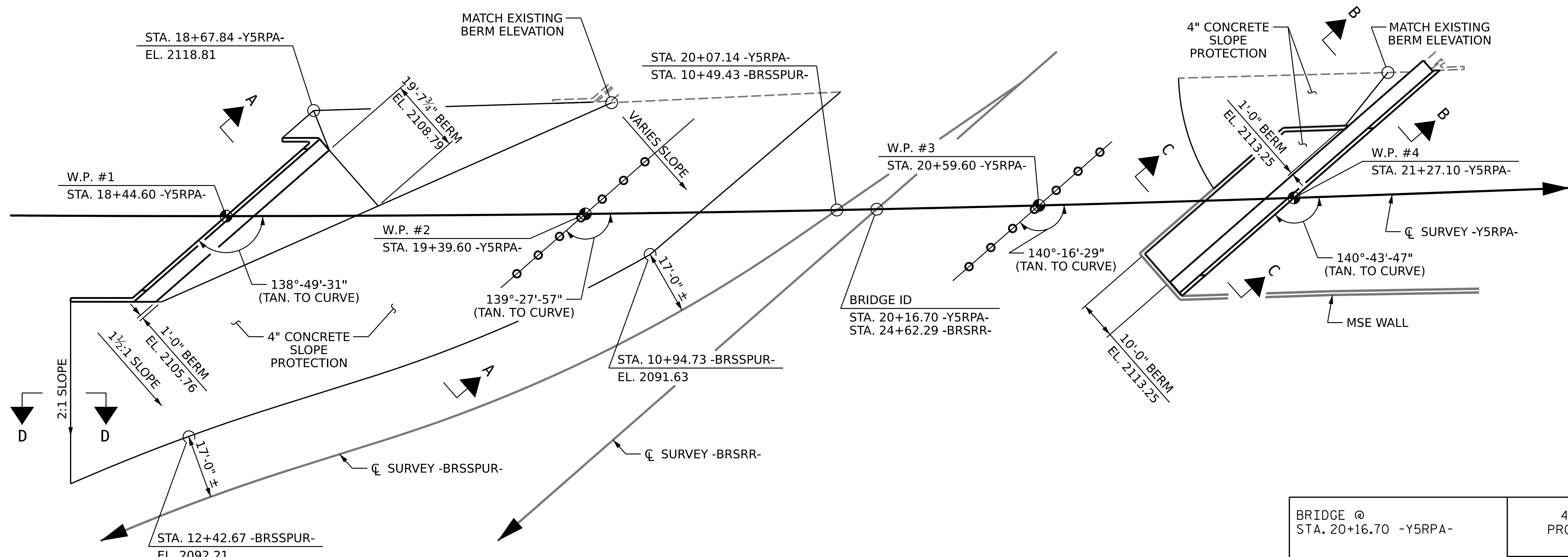
REVISIONS				SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:	5-45	
1			3			TOTAL SHEETS	
2			4			49	

**ELECTRICAL CONDUIT DETAILS**

DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

12/21/2023 1:50:11 PM c:\pwworking\cecom\_ds21\_na\_2020\d0252774-I-2513AA-SMU\_UT2\_100902.dgn



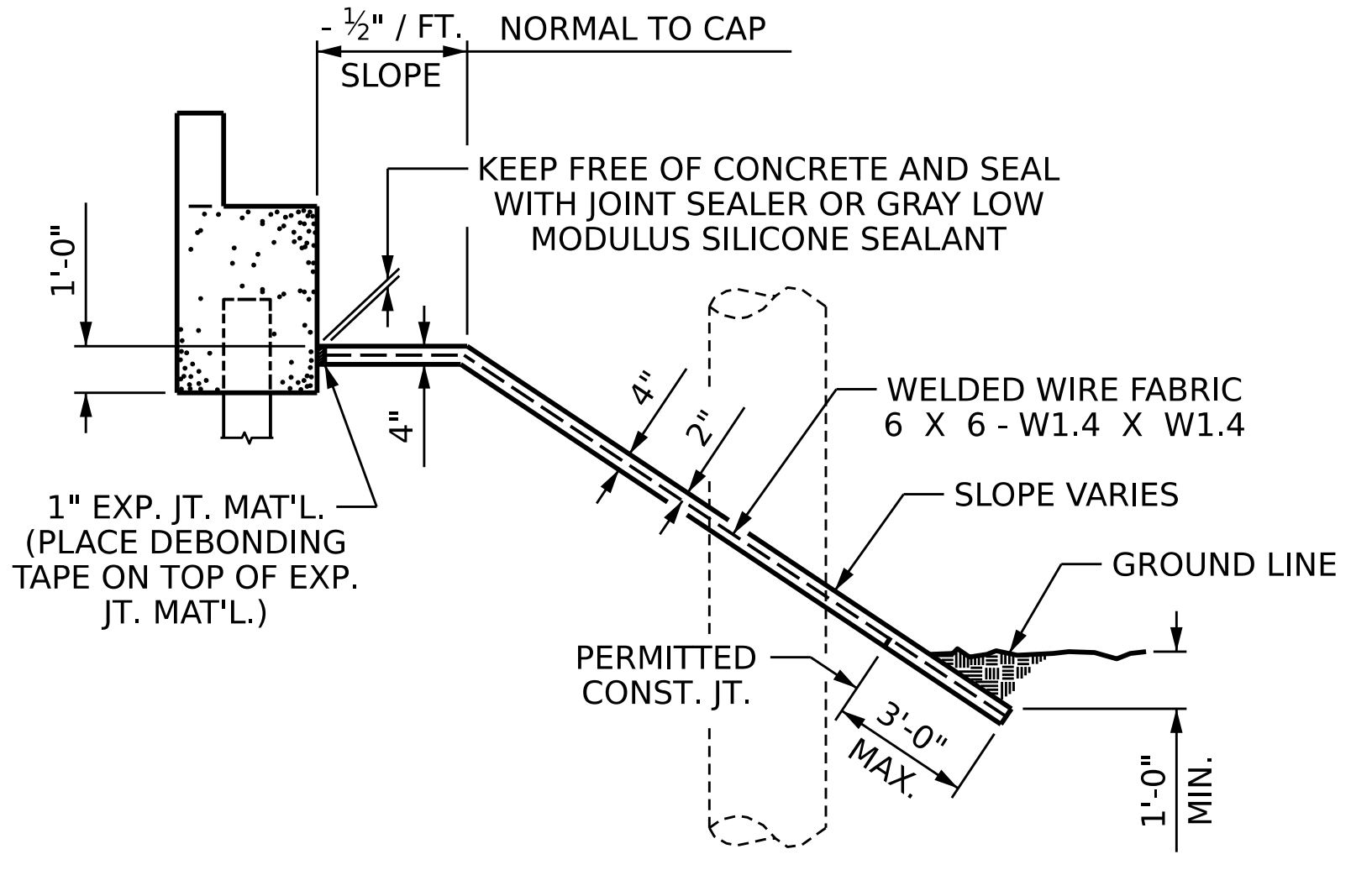


PLAN

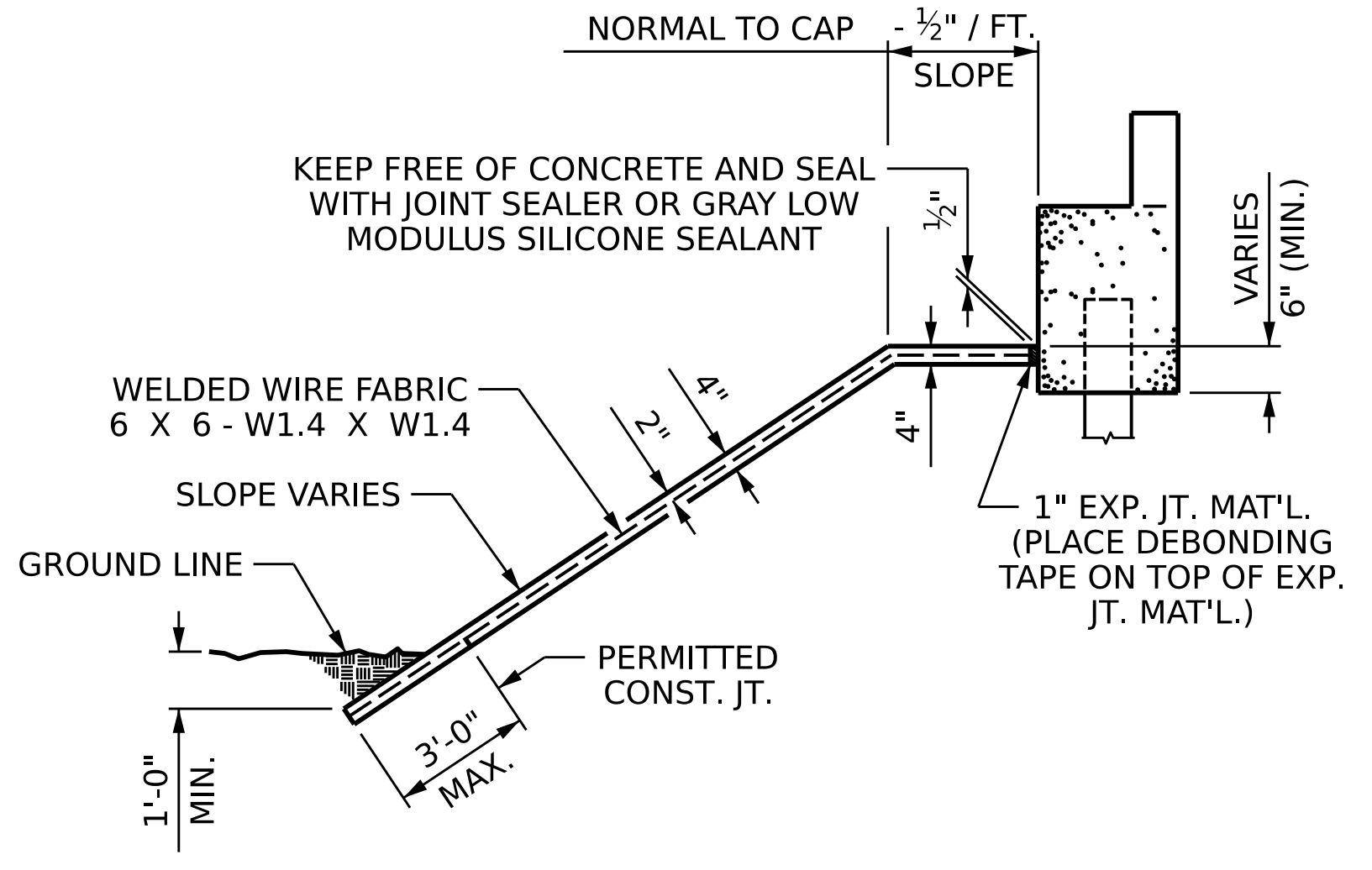
NOTES: STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4" AND 5" STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 20+16.70 -Y5RPA-	4" SLOPE PROTECTION	** WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	1194	2155
END BENT 2	180	325

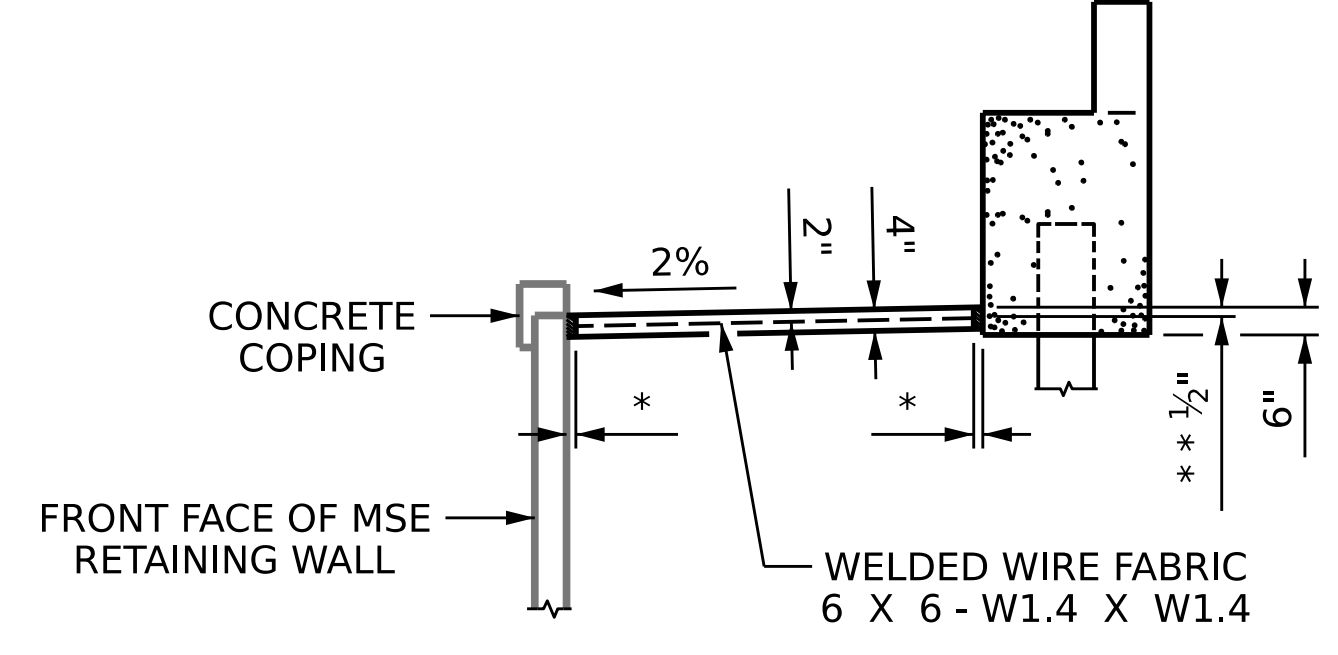
\*\* QUANTITIES SHOWN ARE BASED ON 5' POURS



SECTION A-A

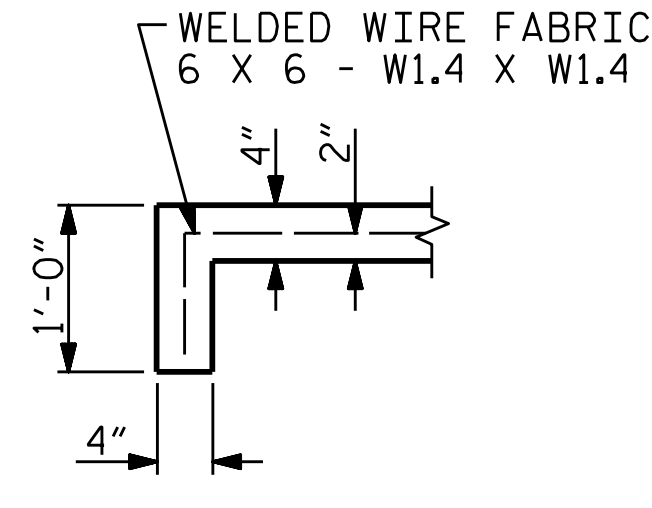


SECTION B-B

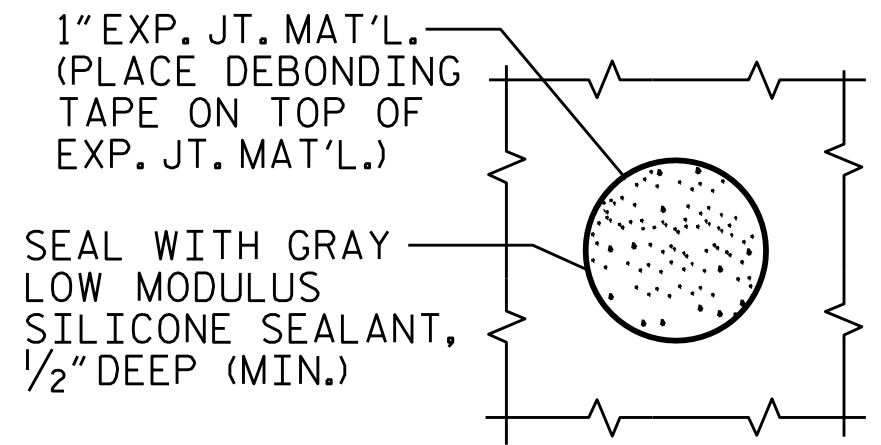


SECTION C-C

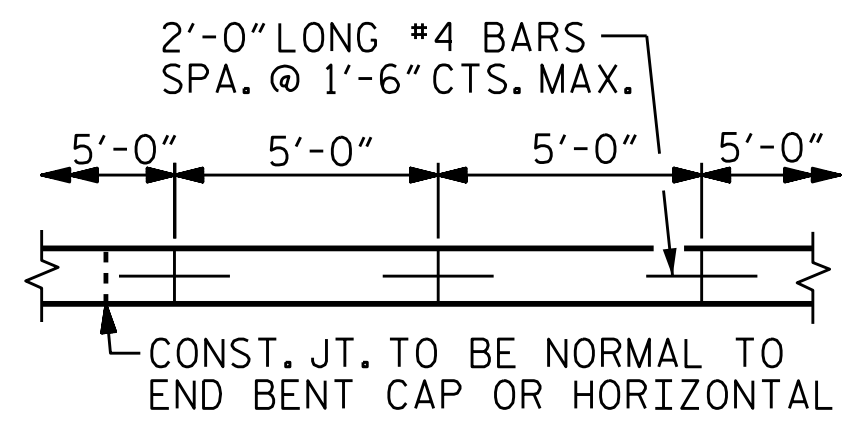
\* 1" EXP. JT. MAT'L (PLACE DEBONDING TAPE ON TOP OF EXP. JT. MATERIAL)  
\*\* KEEP FREE OF CONCRETE AND SEAL WITH JOINT SEALER OR GRAY LOW MODULUS SILICONE SEALANT



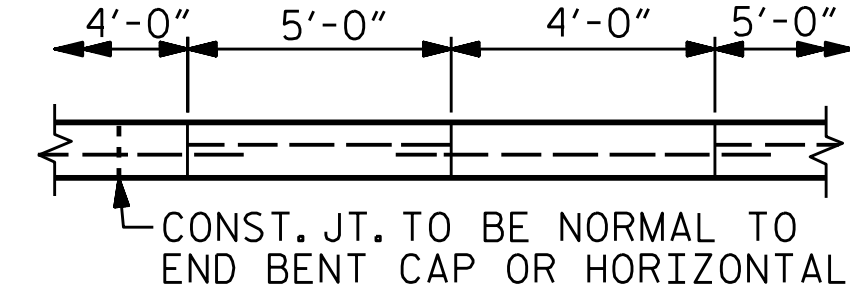
SECTION D-D



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



POURING DETAIL



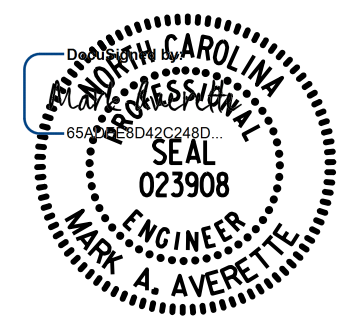
OPTIONAL POURING DETAIL

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
STATION: 20+16.70 -Y5RPA-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SLOPE PROTECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-46
1			3			TOTAL SHEETS
2			4			49



12/21/2023 | 11:09 AM

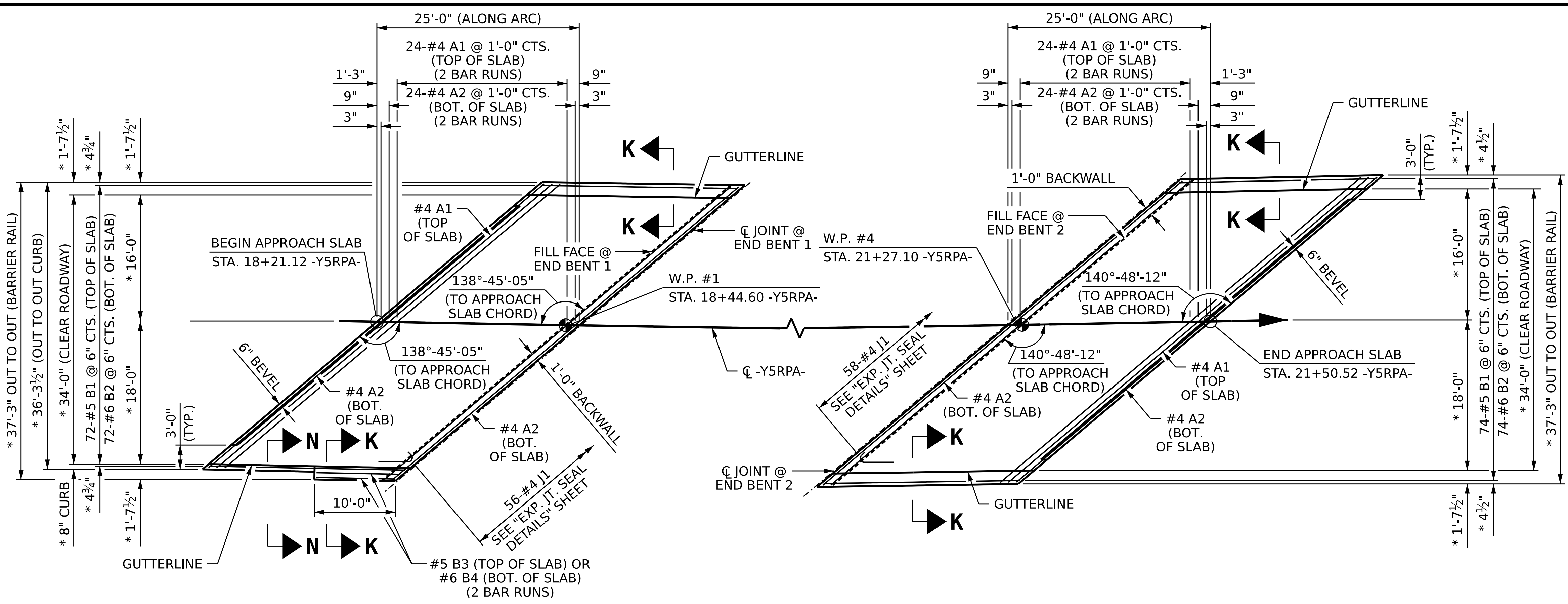
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DRAWN BY : T. BANKOVICH DATE : 12-23  
CHECKED BY : M.A. AVERETTE DATE : 12-23  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

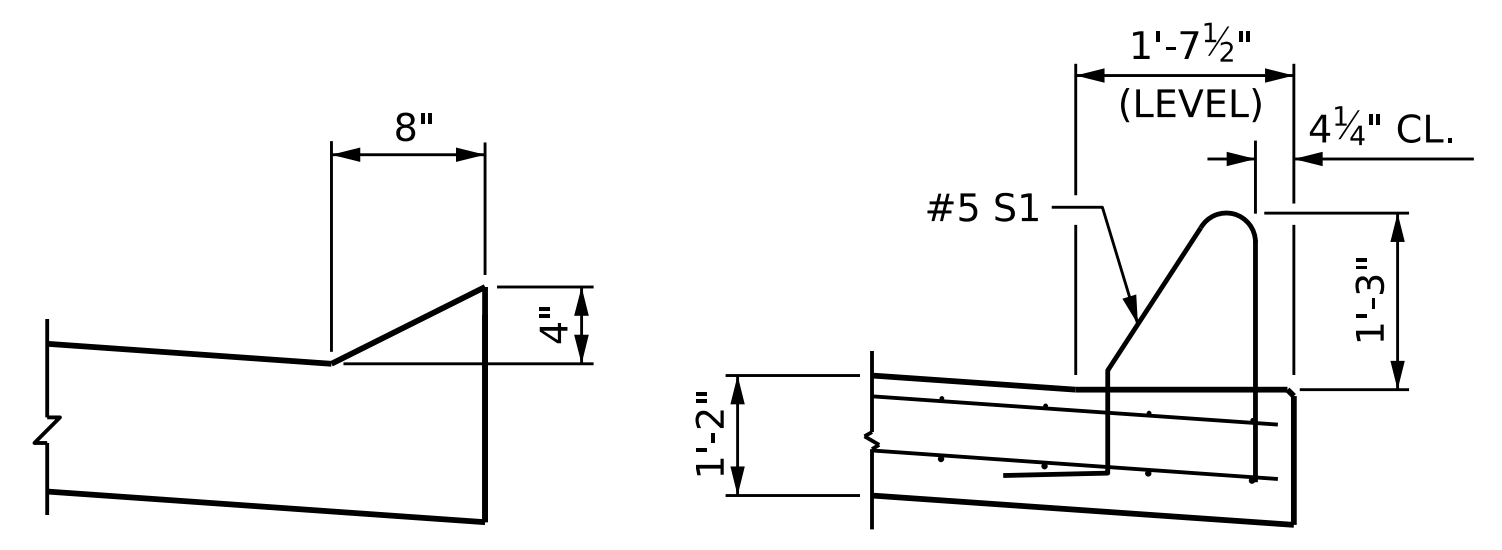


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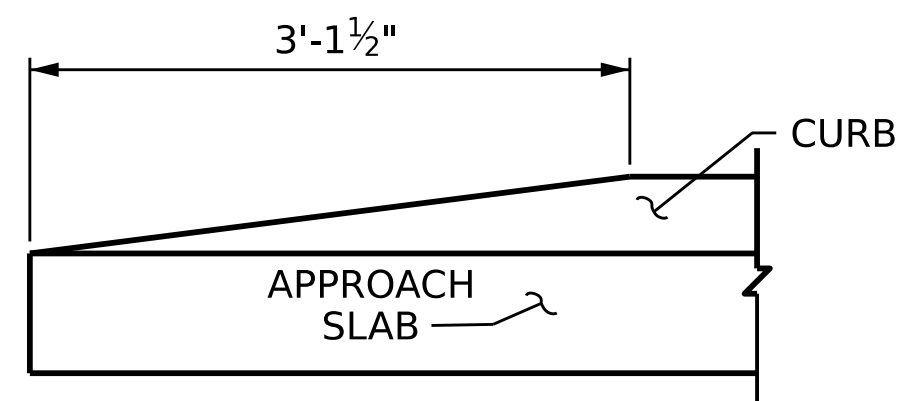
**PLAN @ END BENT 1**

**PLAN @ END BENT 2**



**SECTION N-N**

**SECTION K-K**



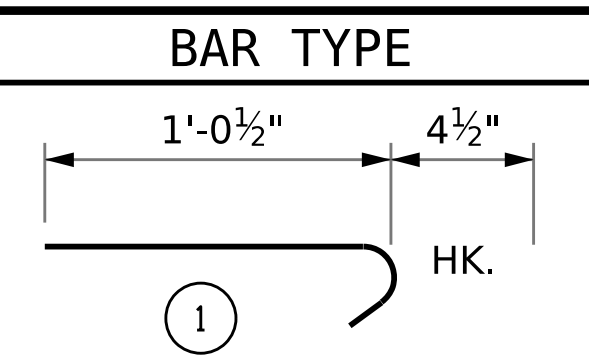
**END OF CURB WITHOUT SHOULDER BERM GUTTER**

**CURB DETAILS**

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	29'-10"	996
A2	52	#4	STR	29'-8"	1031
* B1	72	#5	STR	23'-8"	1777
B2	72	#6	STR	24'-8"	2668
* B3	2	#5	STR	7'-0"	15
B4	2	#6	STR	7'-1"	21
* J1	56	#4	STR	1'-5"	53
REINFORCING STEEL					3720 LB
* EPOXY COATED REINFORCING STEEL					2841 LB
CLASS AA CONCRETE					40.0 CY

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	29'-10"	996
A2	52	#4	STR	29'-8"	1031
* B1	74	#5	STR	23'-8"	1827
B2	74	#6	STR	24'-8"	2742
* J1	58	#4	STR	1'-5"	55
REINFORCING STEEL					3773 LB
* EPOXY COATED REINFORCING STEEL					2878 LB
CLASS AA CONCRETE					44.7

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



ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* QUANTITIES FOR BARRIAR RAIL OR END POST ARE NOT INCLUDED. SEE SHEET 2 OF 2.  
 THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH

**BRIDGE APPROACH SLAB**

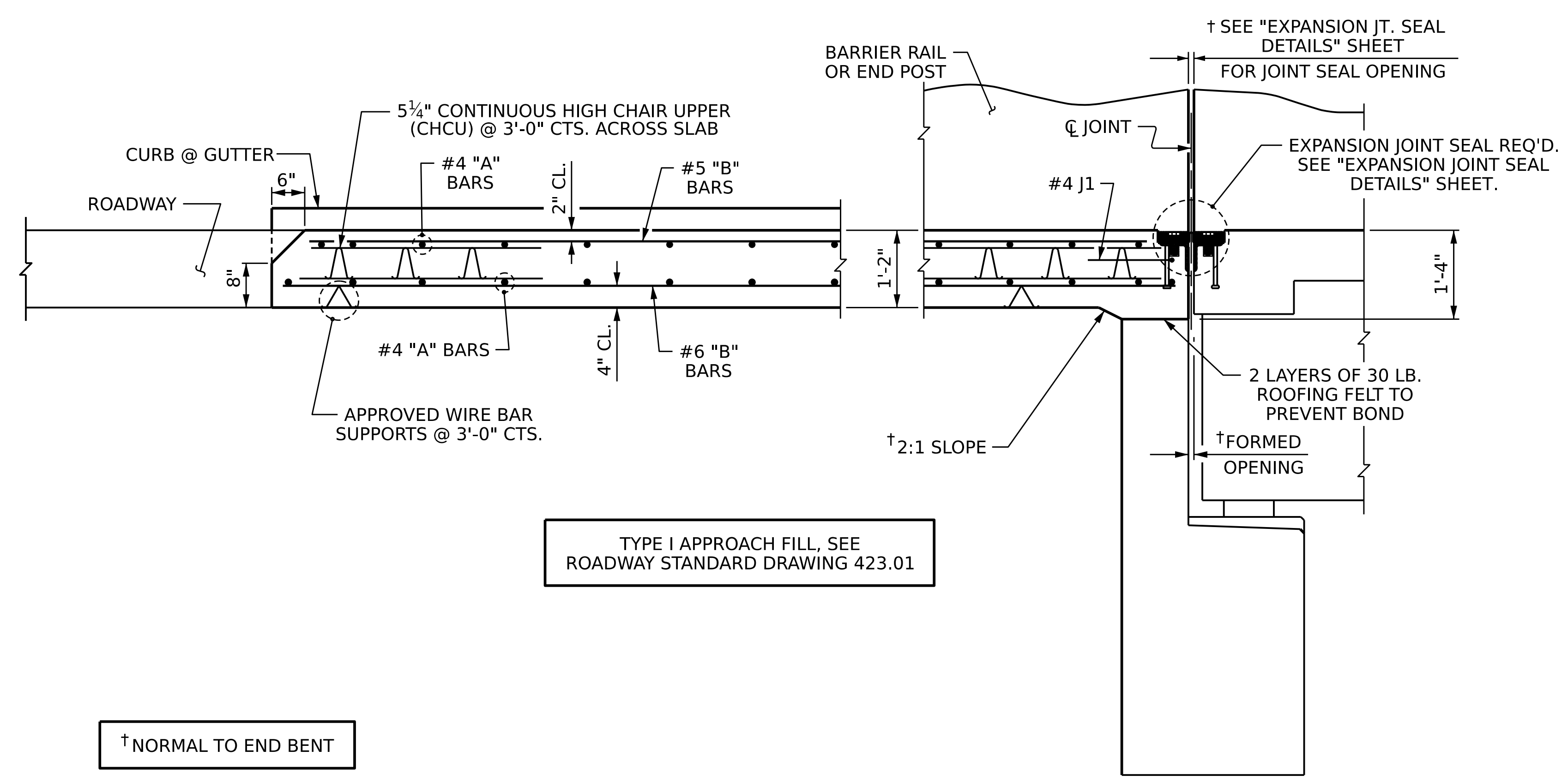


DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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NO.	BY:	DATE:	NO.	BY:	DATE:	5-47
1			3			TOTAL SHEETS
2			4			49

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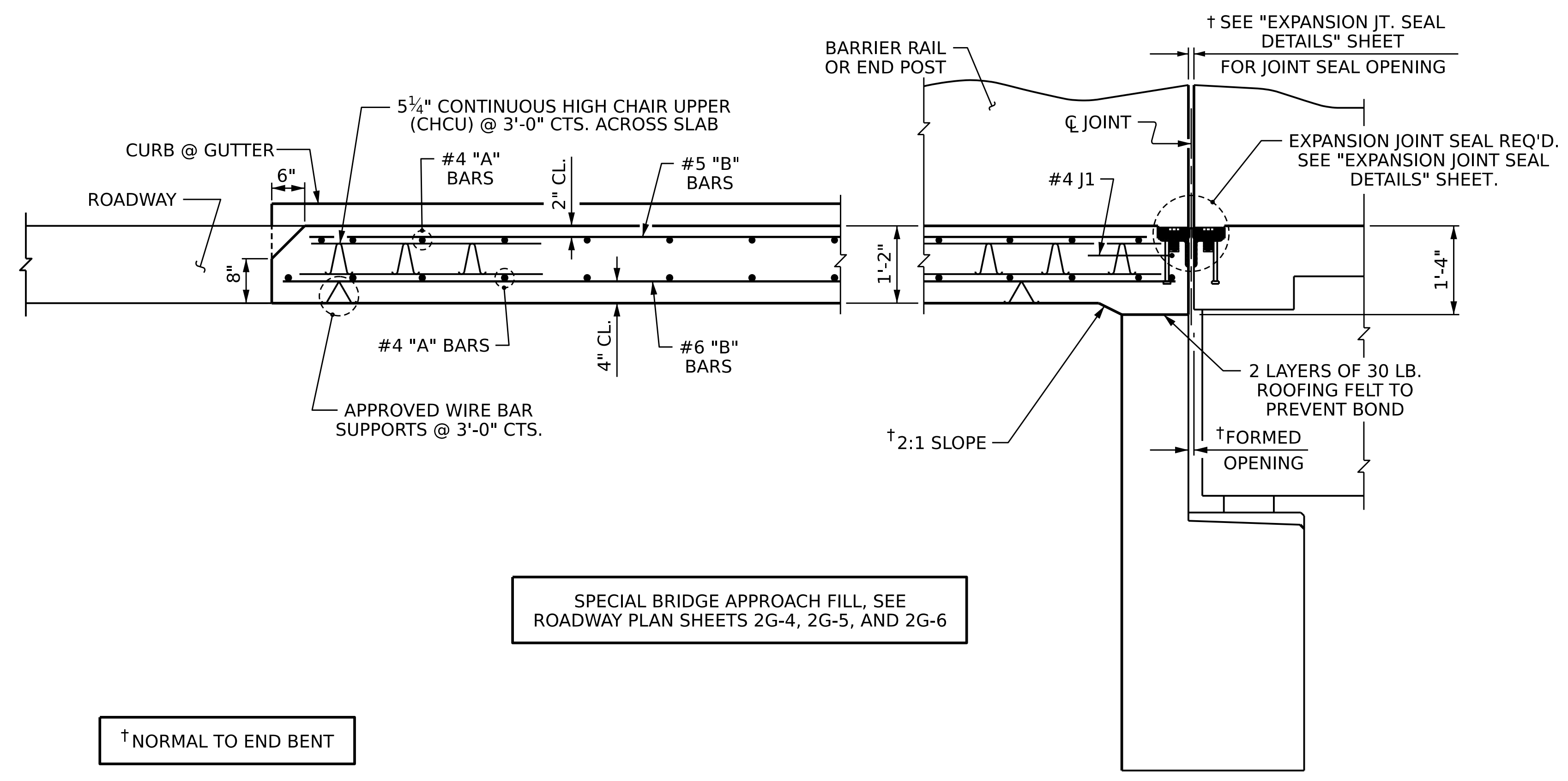




TYPE I APPROACH FILL, SEE ROADWAY STANDARD DRAWING 423.01

† NORMAL TO END BENT

**SECTION THRU SLAB @ END BENT 1**  
(TYPE I - STANDARD APPROACH FILL)



SPECIAL BRIDGE APPROACH FILL, SEE ROADWAY PLAN SHEETS 2G-4, 2G-5, AND 2G-6

† NORMAL TO END BENT

**SECTION THRU SLAB @ END BENT 2**  
(SPECIAL BRIDGE APPROACH FILL)

**NOTES: (TYPE I)**

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.  
 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.

**NOTES: (SPECIAL BRIDGE APPROACH FILL)**

FOR SPECIAL BRIDGE APPROACH FILL, SEE ROADWAY PLAN SHEETS 2G-4, 2G-5, AND 2G-6.  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.  
 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.

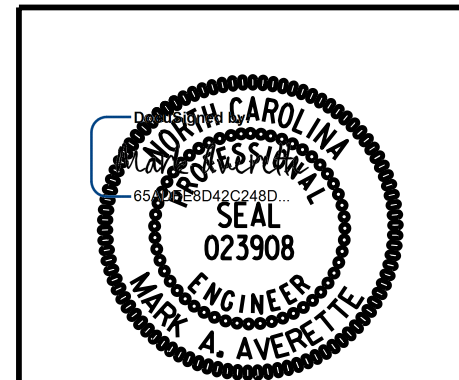
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PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB**



2/6/2024 | 10:09 AM PST

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

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

5-48  
 TOTAL SHEETS 49

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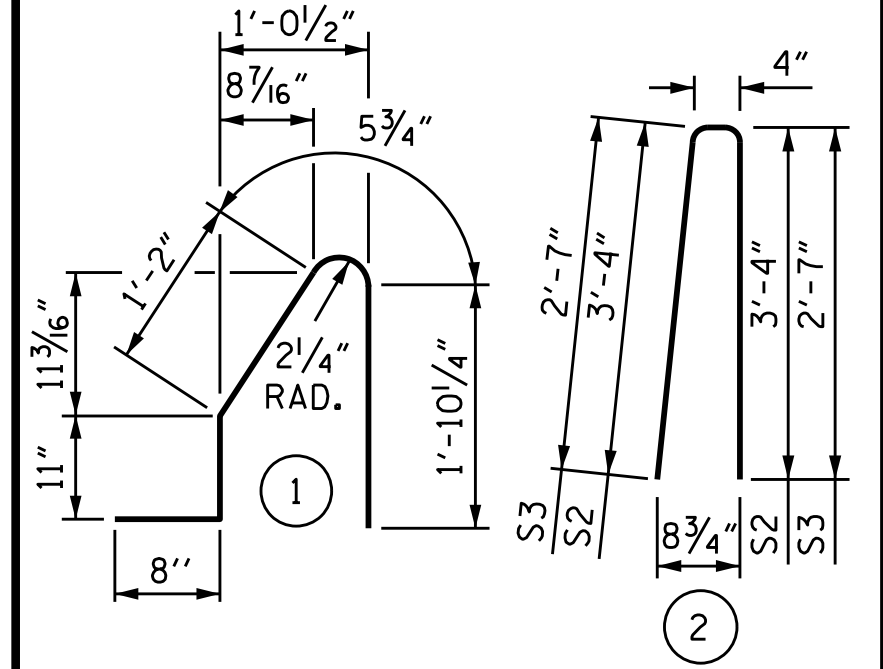
**NOTES**

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

**BAR TYPES**



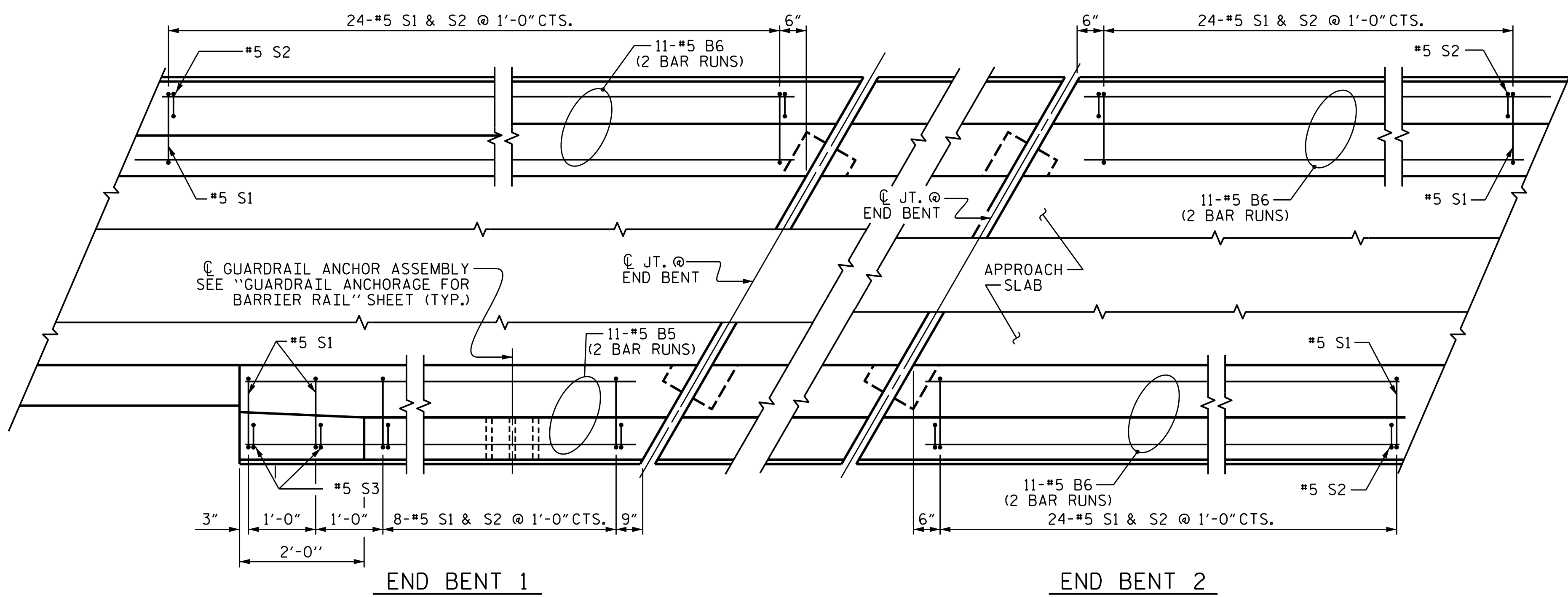
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

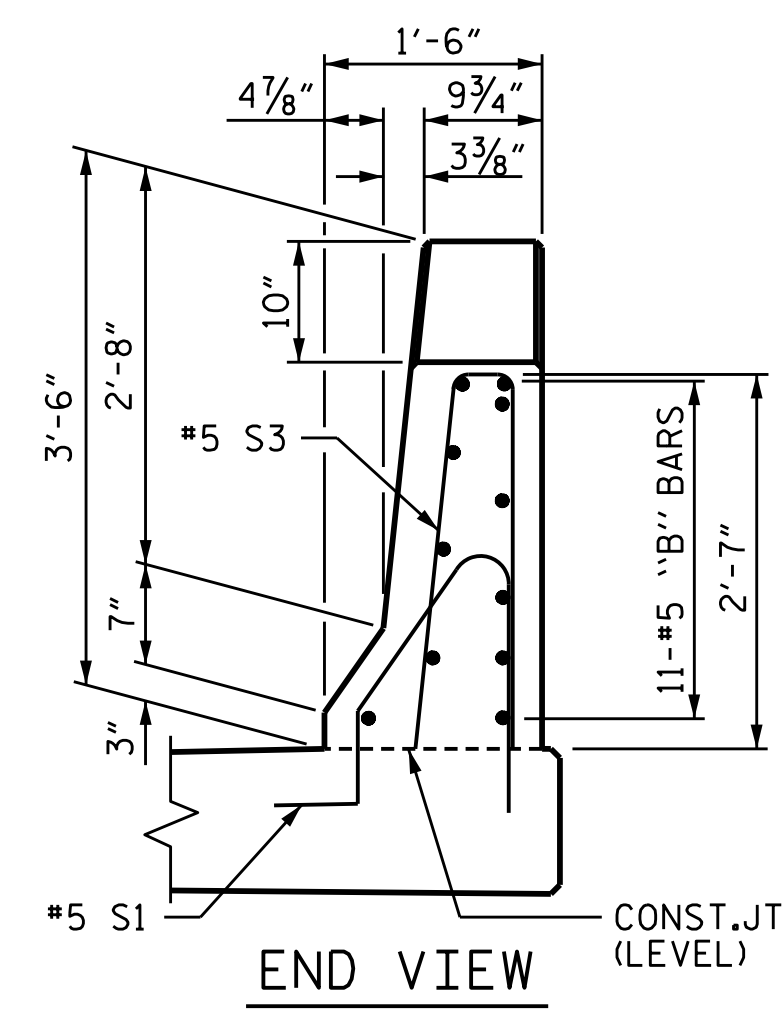
BARRIER RAIL ONLY					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B5	22	#5	STR	7'-1"	163
* B6	66	#5	STR	13'-10"	952
* S1	82	#5	1	5'-1"	435
* S2	80	#5	2	7'-0"	584
* S3	2	#5	2	5'-6"	11
* EPOXY COATED REINFORCING STEEL				2145 LB	
CLASS AA CONCRETE				10.8 CY	
CONCRETE BARRIER RAIL				85.0	

**SPLICE CHART BARRIER RAIL**

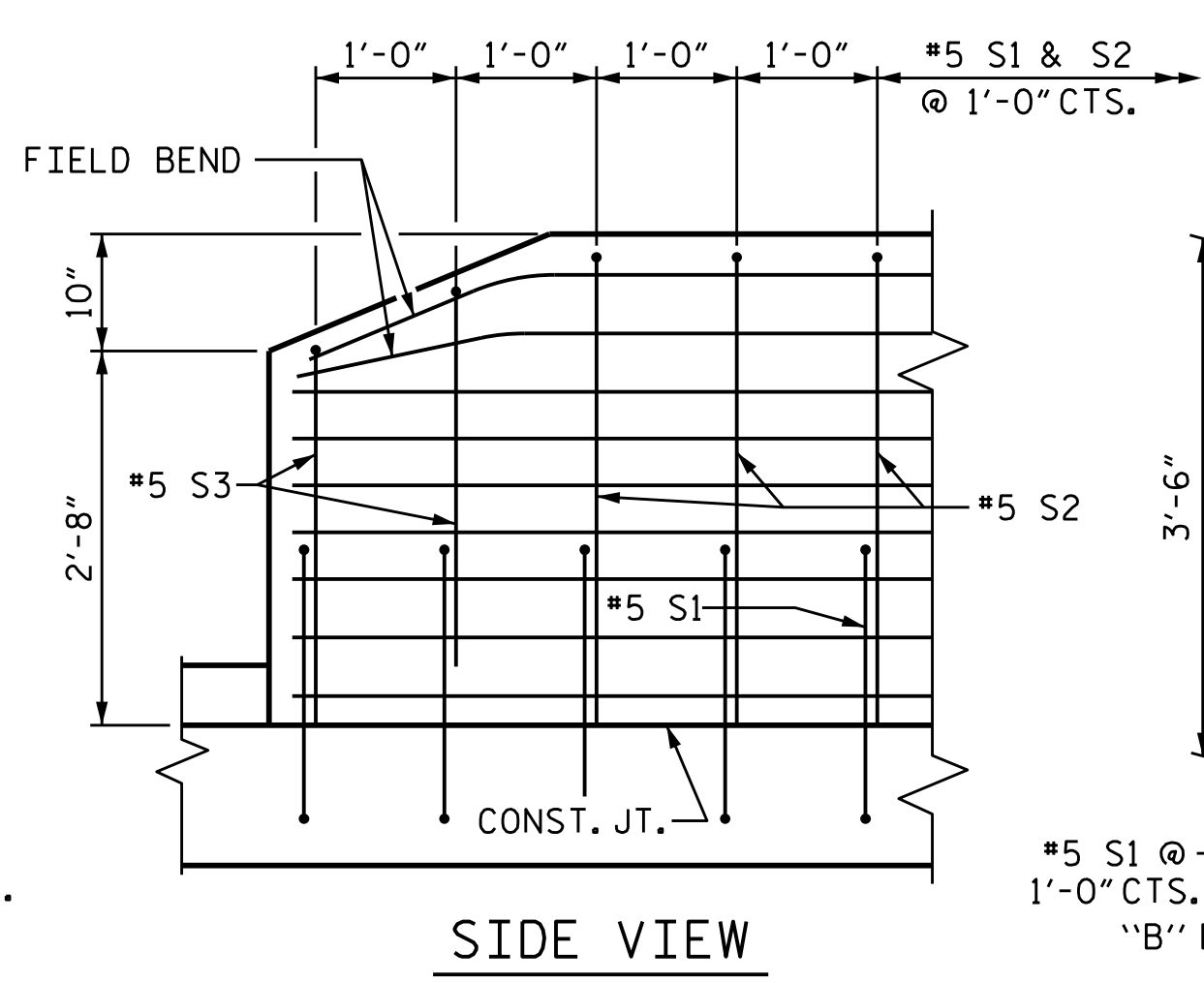
BAR SIZE	EPOXY COATED
#5	3'-1"



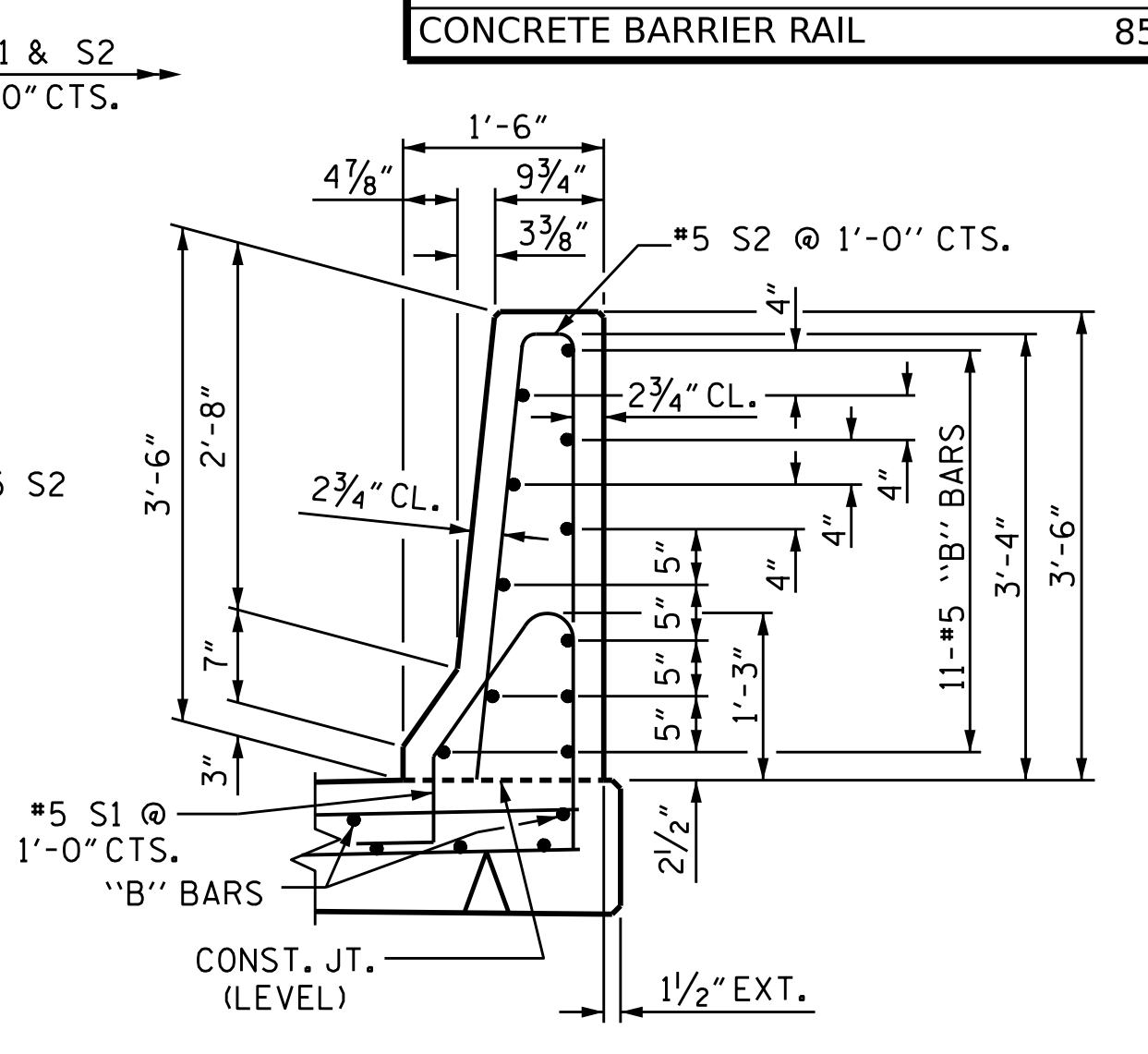
**PLAN OF BARRIER RAIL**



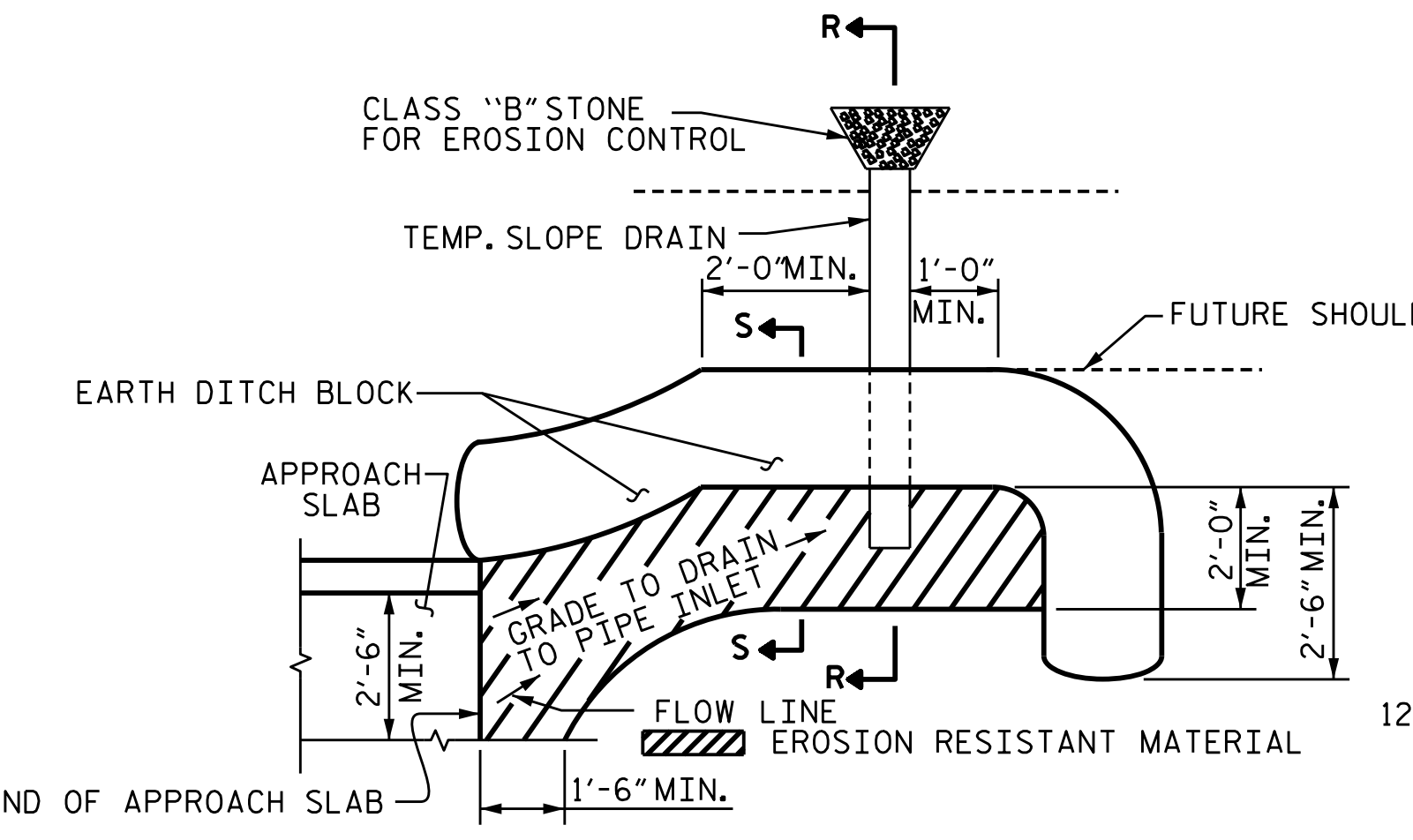
**END VIEW**



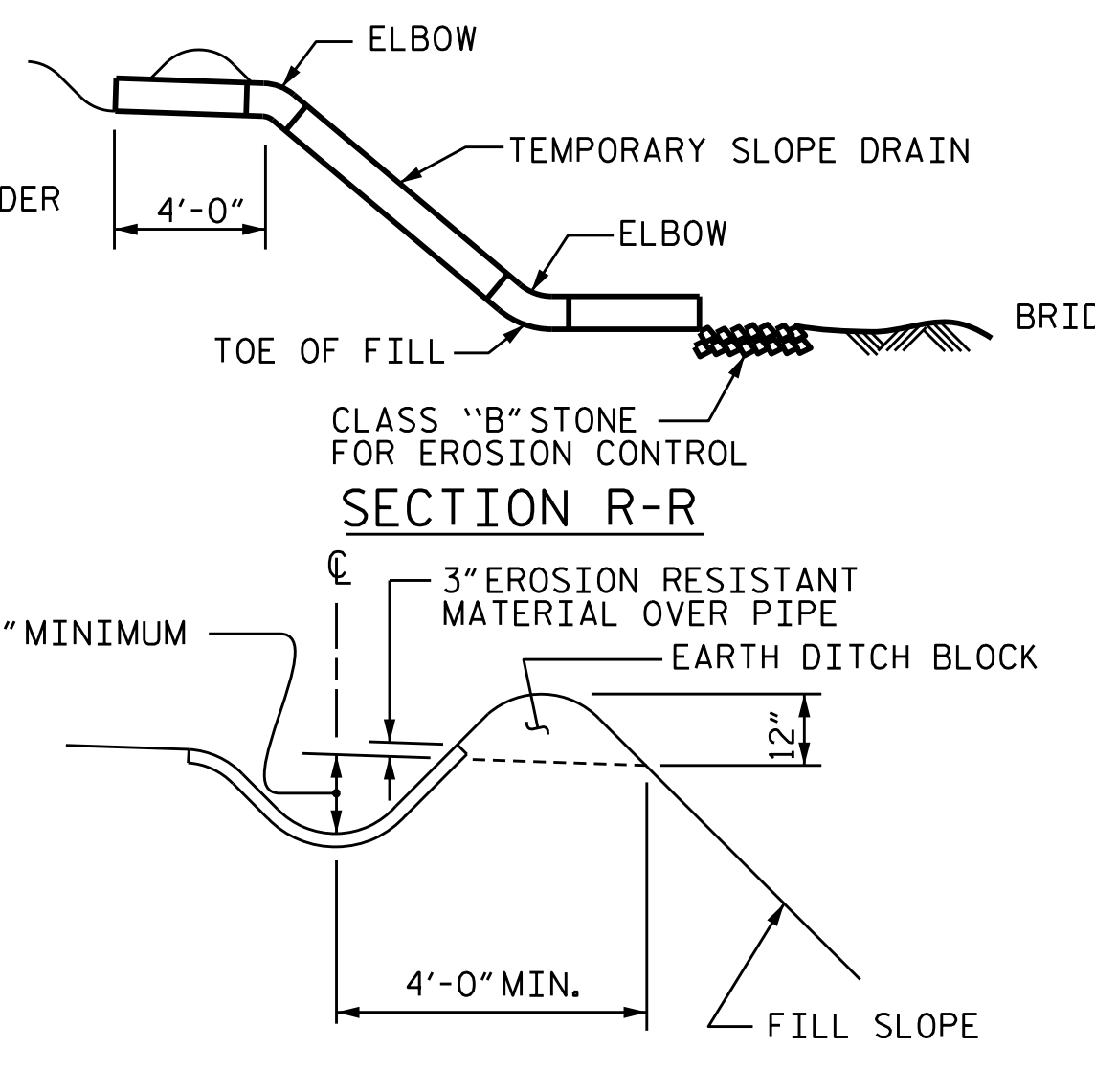
**SIDE VIEW**



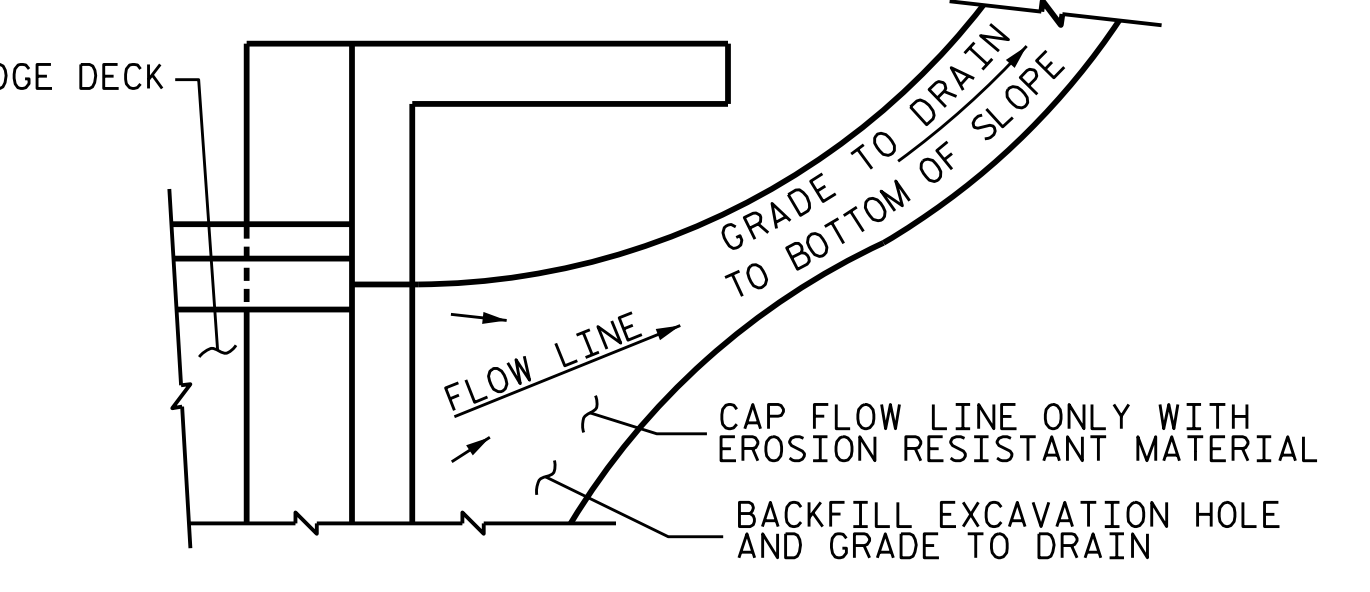
**SECTION THRU RAIL**



**PLAN VIEW**



**SECTION S-S**



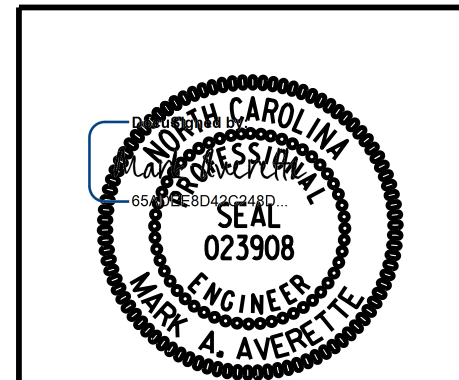
**TEMPORARY DRAINAGE DETAIL**

DRAWN BY : S.D. COOPER DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD : M.A. AVERETTE DATE : 12-23

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

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



PROJECT NO. I-2513AA/AB  
 BUNCOMBE COUNTY  
 STATION: 20+16.70 -Y5RPA-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB DETAILS**

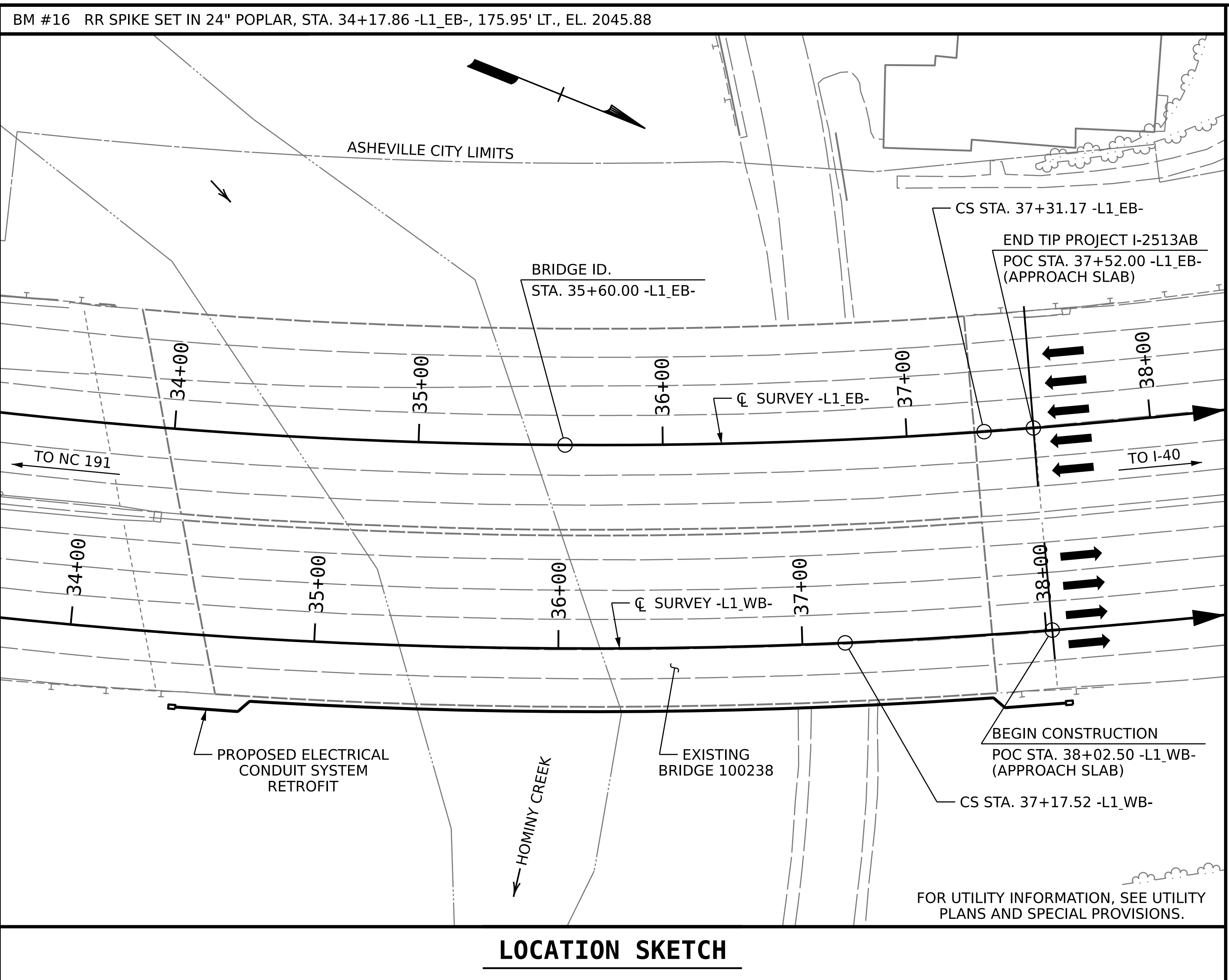
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TOTAL SHEETS: 49

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**LOCATION SKETCH**

TOTAL BILL OF MATERIAL	
	ELECTRICAL CONDUIT
	LS
SUPERSTRUCTURE	LS
TOTAL	LS

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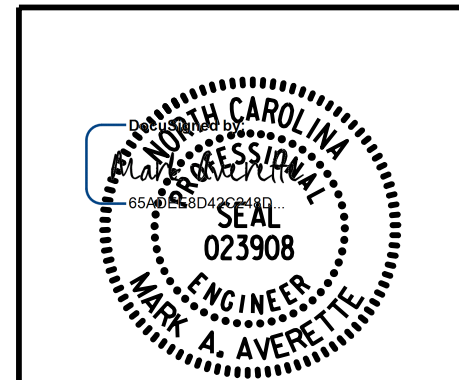
DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 35+60.00 -L1\_EB-

SHEET 1 OF 3 BRIDGE #100238

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

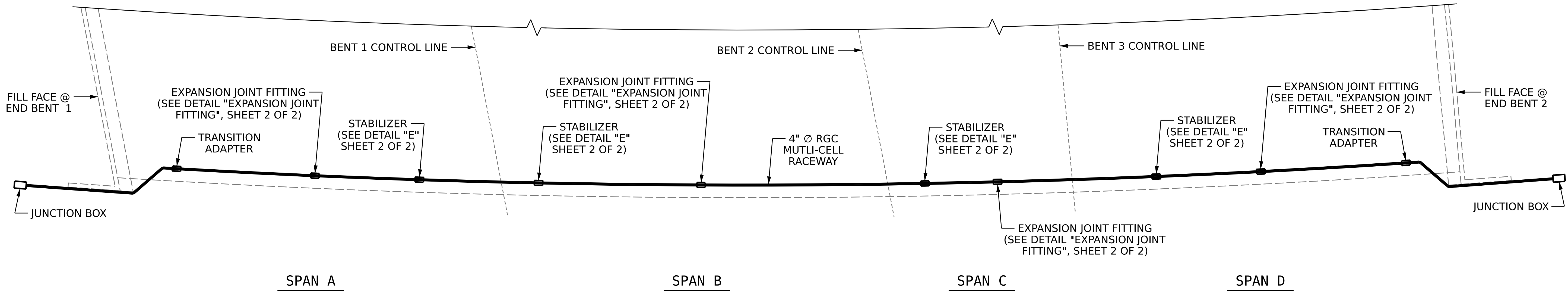
**GENERAL DRAWING**  
 FOR BRIDGE ON I-26  
 OVER HOMINY CREEK  
 BETWEEN I-40 AND NC 191



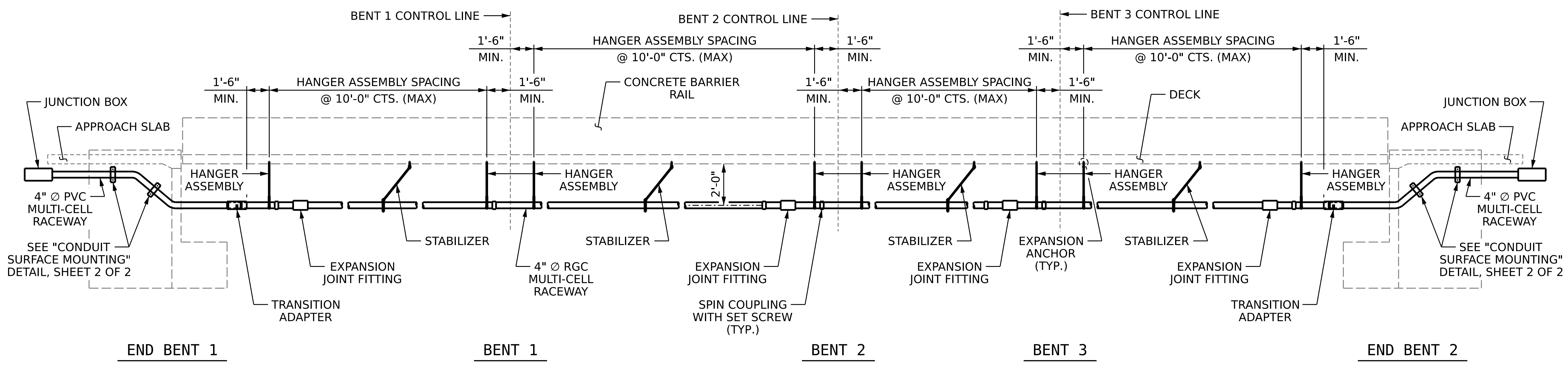
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REVISIONS						SHEET NO.
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2			4			3

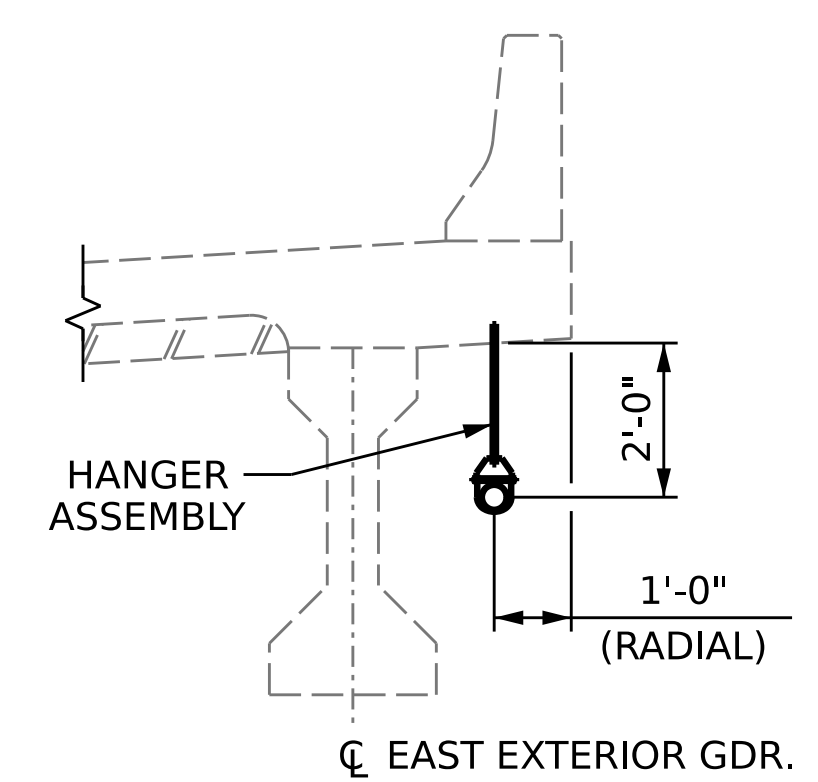
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 UNLESS ALL SIGNATURES COMPLETED**



**ELECTRIC CONDUIT LAYOUT**



**ELEVATION**

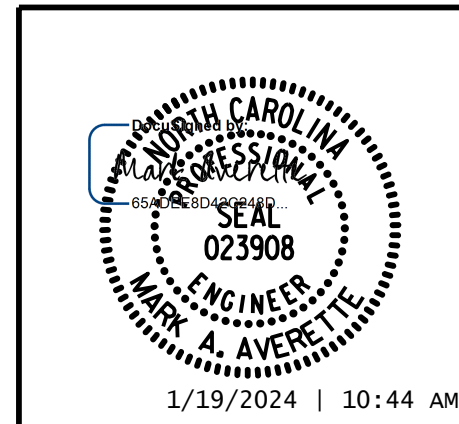


**CONDUIT LOCATION**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 35+60.00 -L1\_EB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**ELECTRICAL CONDUIT  
 SYSTEM RETROFIT  
 DETAILS**



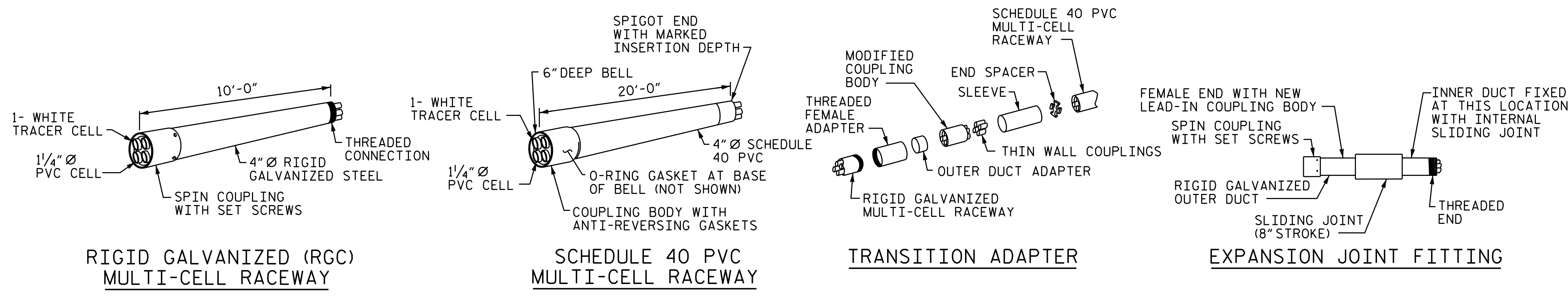
DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
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**NOTES:**  
 INSTALL CONDUIT IN OVERHANG OF BRIDGE STRUCTURES. CONDUIT SHALL NOT BE CARRIED THROUGH EXISTING BACKWALL, WINGWALL ELEMENTS, OR INTERIOR GIRDER BAYS.  
 USE TORQUE CONTROLLED MECHANICAL EXPANSION ANCHORS THAT ARE APPROVED FOR USE IN CRACKED CONCRETE BY THE INTERNATIONAL CODE COUNCIL, EVALUATION SERVICE (ICC-ES). THE CHOSEN ANCHOR PRODUCT SHALL HAVE A DESIGNATED ICC-ES EVALUATION REPORT NUMBER, AND ITS APPROVAL STATUS SHALL BE MAINTAINED ON THE ICC-ESS WEBSITE UNDER DIVISION 031600 FOR CONCRETE ANCHORS.

HANGER RODS SHALL BE ASTM A193, GRADE B7 OR CARBON STEEL ALL-THREAD HANGER RODS.  
 NUTS SHALL BE ASTM A194, GRADE 2H, HEAVY HEX NUTS.

WASHERS SHALL BE ASTM F436.  
 ALL STRUCTURAL STEEL SHALL BE ASTM A36.

ALL METALLIC COMPONENTS SHALL BE HOT-DIPPED GALVANIZED PER NCDOT STANDARDS SPECIFICATIONS.

ADHESIVE ANCHORS SHALL NOT BE USED.  
 USE ANCHORS MANUFACTURED WITH STAINLESS STEEL EXPANSION WEDGES.

PRIOR TO HOLE DRILLING, USE REBAR LOCATOR TO ENSURE CLEARANCE FROM EXISTING DECK REINFORCEMENT.

USE ANCHORS OF MINIMUM 1600 LBS TENSILE CAPACITY (MINIMUM OF STEEL, CONCRETE BREAKOUT, AND CONCRETE PULLOUT STRENGTHS AS DETERMINED BY ACI 318 APPENDIX D).

MAINTAIN 6" MINIMUM CLEARANCE FROM EXPANSION ANCHOR TO EDGE OF CONCRETE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, EXPANSION ANCHORS AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

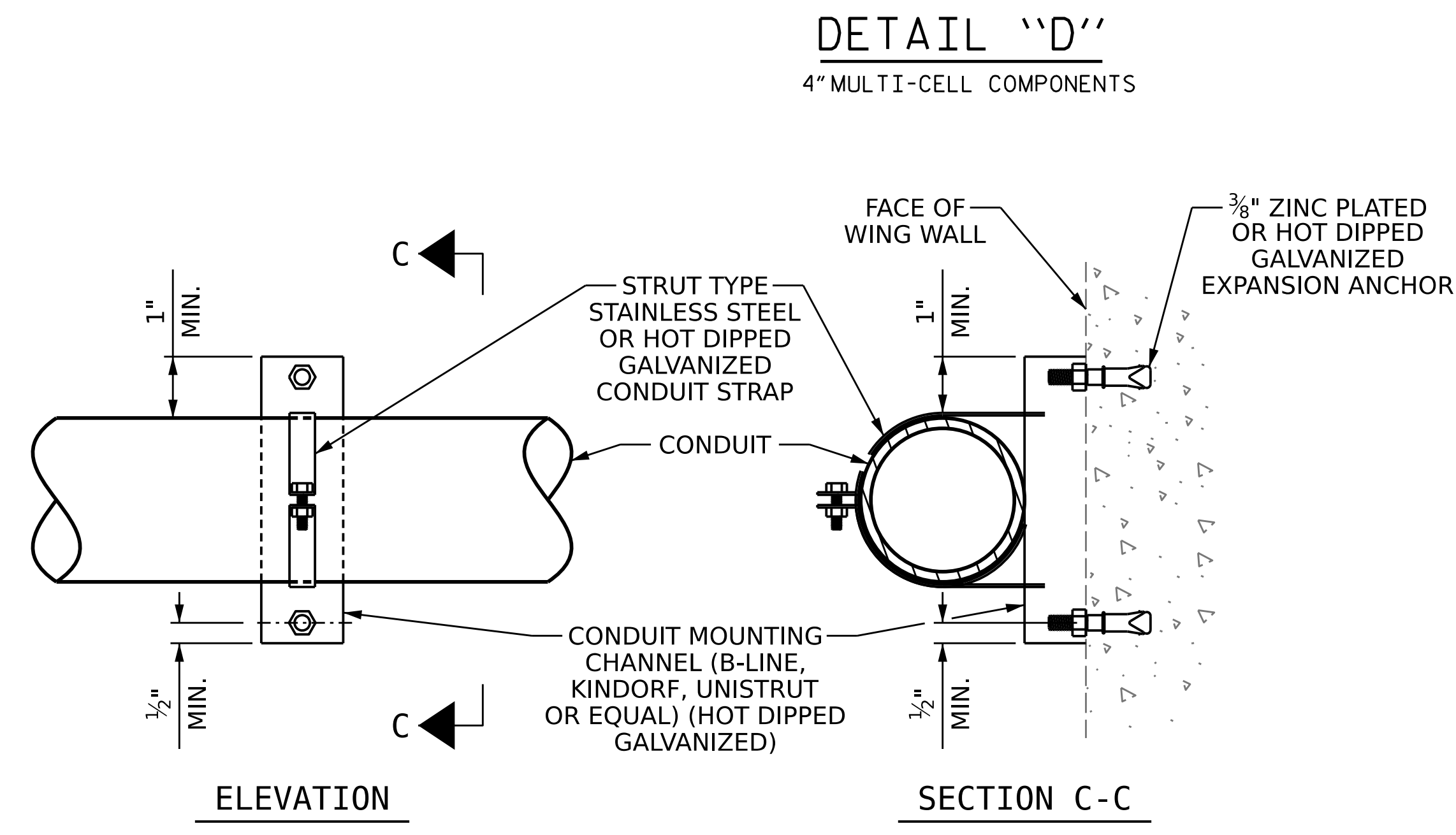
SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

PROVIDE TRANSITION ADAPTER FOR CONDUIT AT END BENT 1 AND END BENT 2.

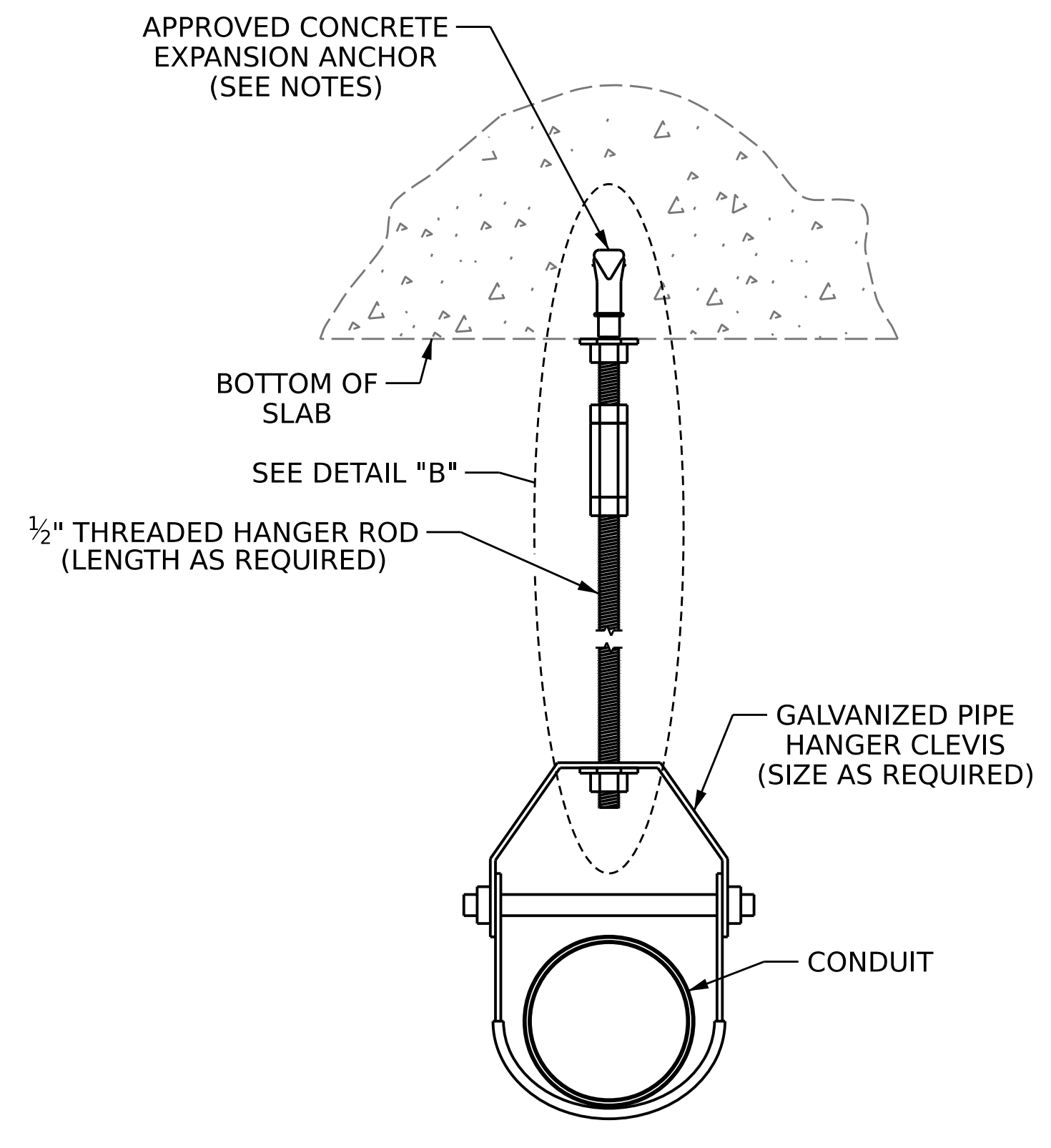
PROVIDE ONE EXPANSION JOINT FITTING PER SPAN.

INSTALL ONE STABILIZER PER SPAN, STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

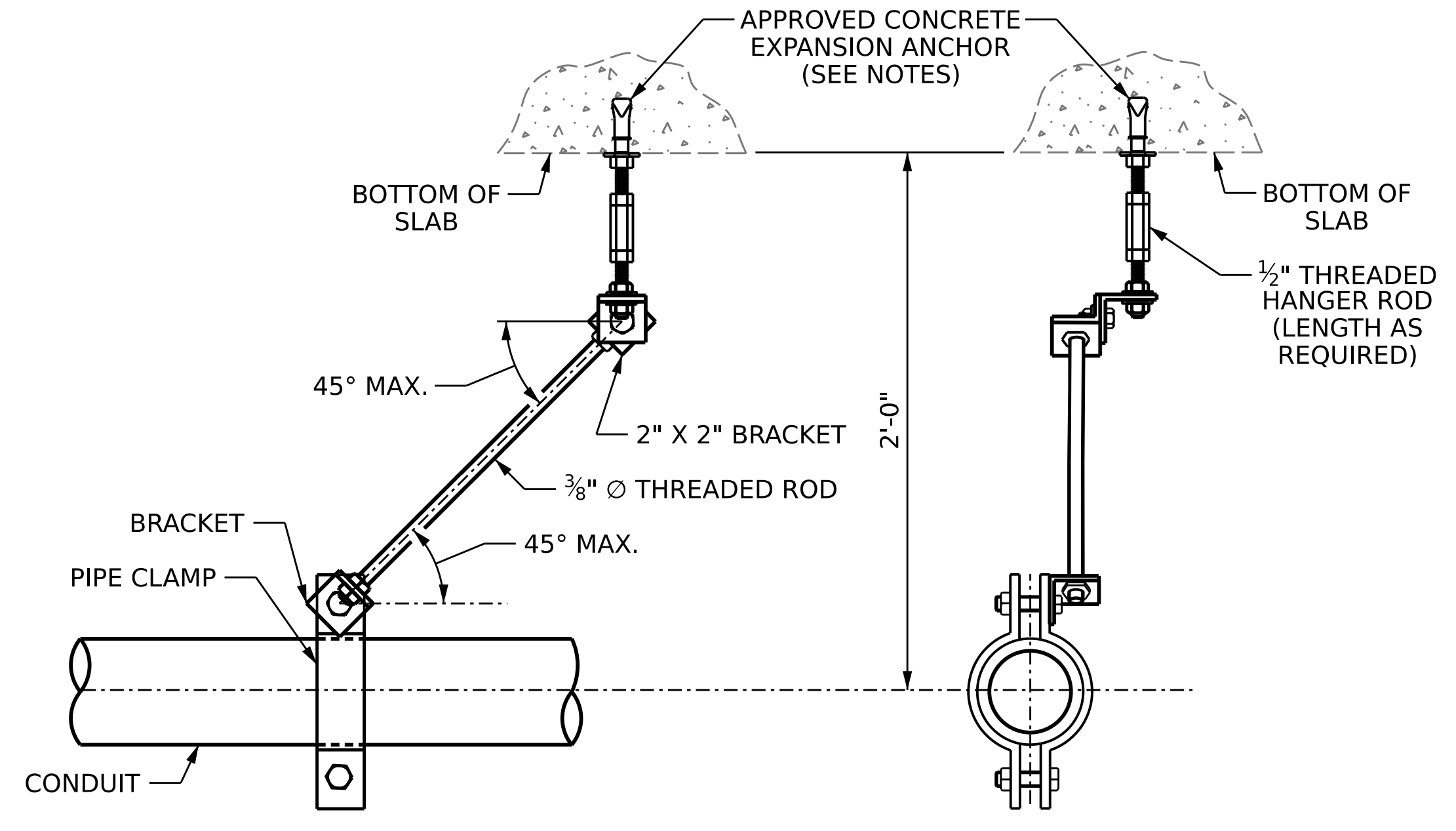
FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.



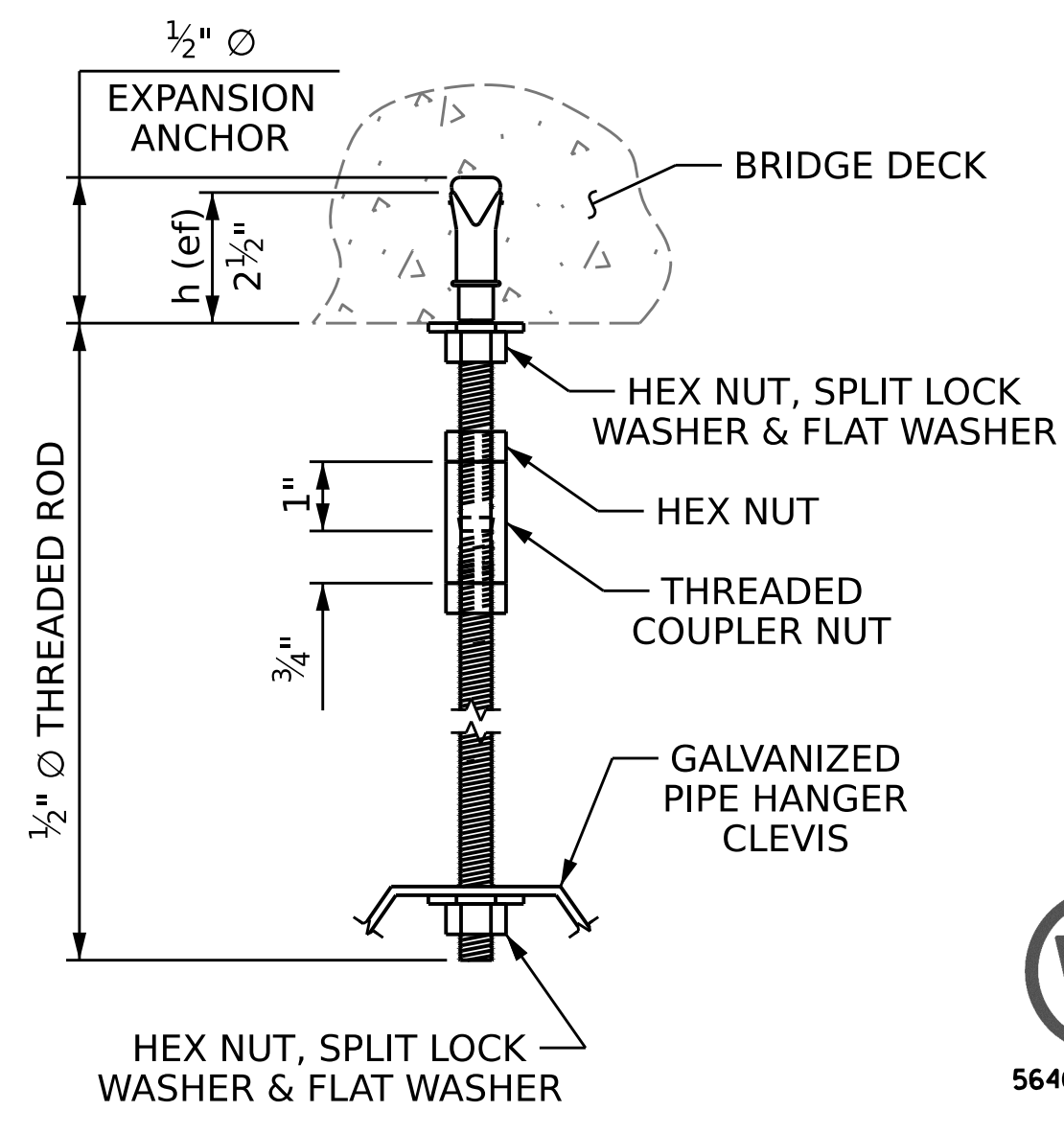
**CONDUIT SURFACE MOUNTING**  
 ATTACHMENT TO VERTICAL OR HORIZONTAL CONCRETE SURFACES (EXCLUDES DECK OVERHANG)



**DETAIL "C"**  
 HANGER ASSEMBLY



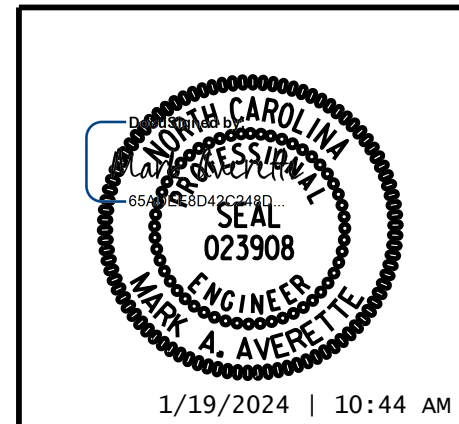
**DETAIL "E"**  
 STABILIZER



**DETAIL "B"**

PROJECT NO. I-2513AA/AB  
BUNCOMBE COUNTY  
 STATION: 35+60.00 -L1\_EB-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**ELECTRICAL CONDUIT SYSTEM RETROFIT DETAILS**



LICENSURE NO. C-4434

REVISIONS						SHEET NO.
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DRAWN BY : T. BANKOVICH DATE : 12-23  
 CHECKED BY : M.A. AVERETTE DATE : 12-23  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE : 12-23

## 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 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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# ENGLISH

JANUARY, 1990