

09/28/2018

TIP PROJECT: Y-4810K

CONTRACT: C204345

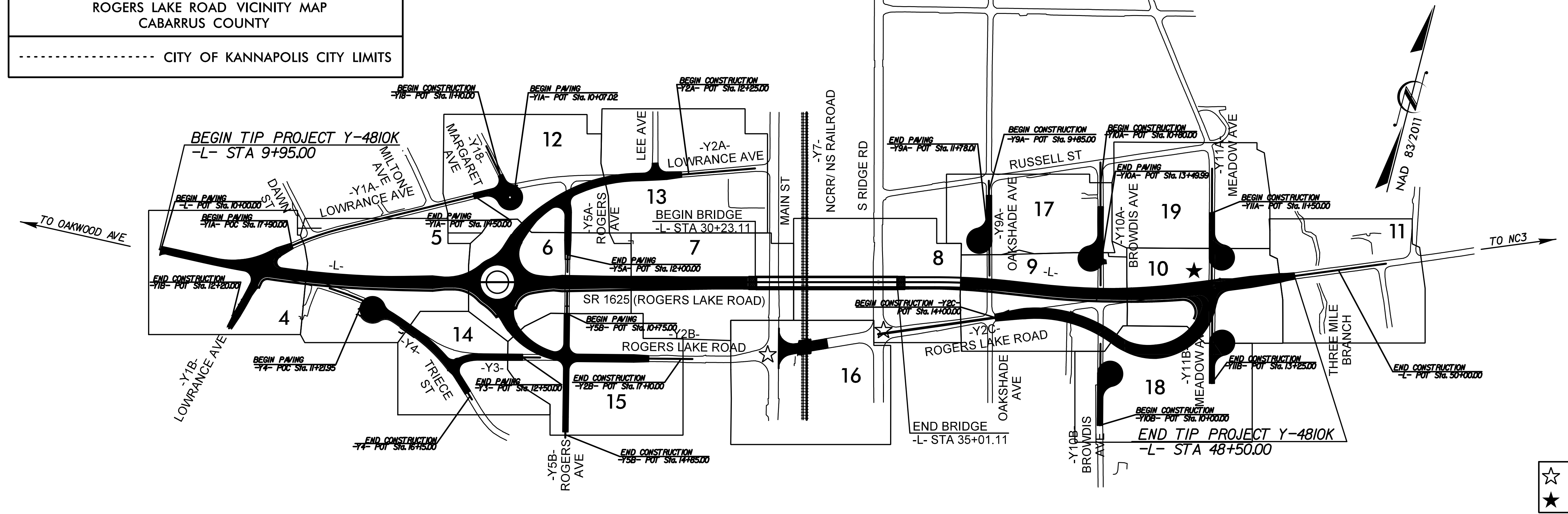
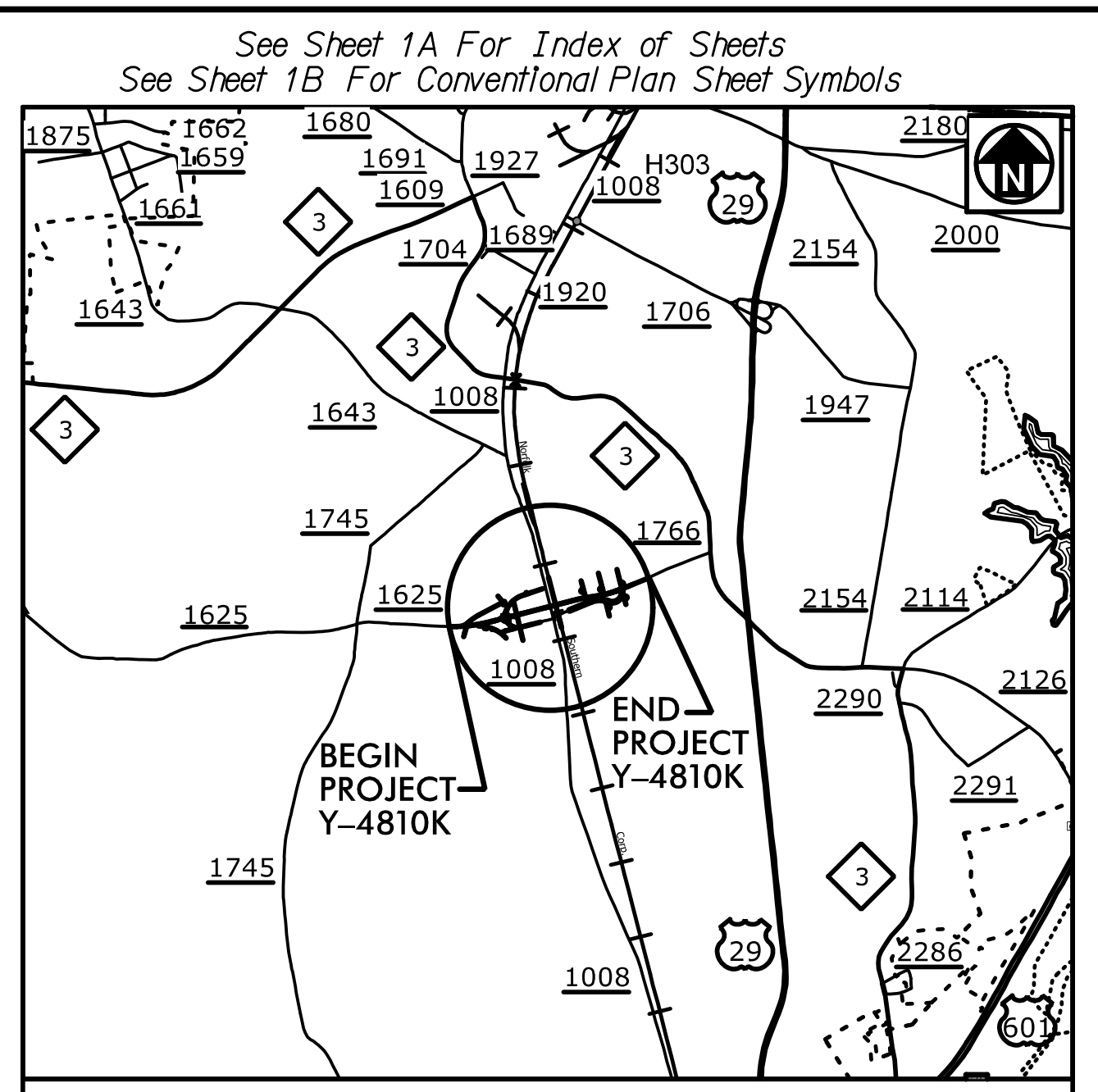
# STATE OF NORTH CAROLINA RAIL DIVISION CABARRUS COUNTY

LOCATION: GRADE SEPARATION AT SR 1625 (ROGERS LAKE ROAD)  
OVER NS/NCRR RAILROAD AND CLOSURE OF AT-GRADE  
CROSSING (#724408Y) IN KANNAPOLIS AT MILEPOST 350.73

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

## STRUCTURE PLANS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	Y-4810K	1	53
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40325.1.46	TCSP-1034(18)	P.E.	
40325.2.46	TCSP-1034(18)	RW	

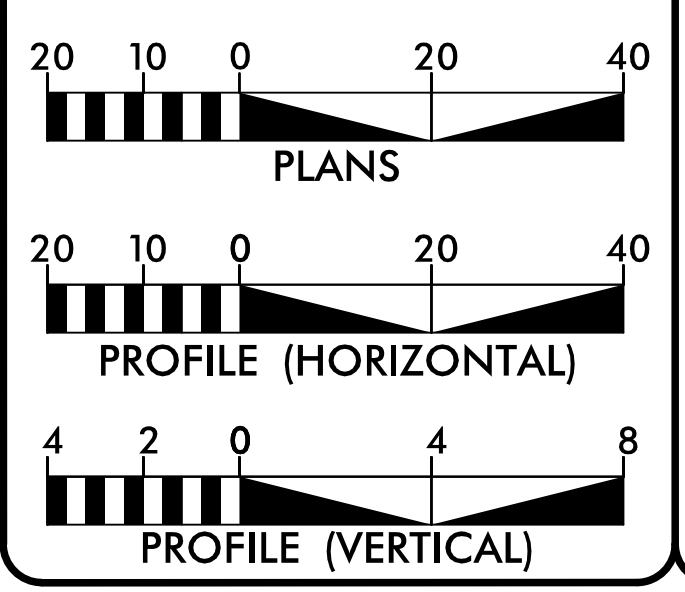


☆ EXISTING SIGNAL TO BE REMOVED  
★ PROPOSED SIGNAL

\*DESIGN EXCEPTION:  
LANE TAPER RATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

### GRAPHIC SCALES



### DESIGN DATA

ADT 2020 = 8,600  
ADT 2040 = 11,200  
K = 10 %  
D = 55 %  
T = 5 % \*  
V = 50 MPH  
\* TTST = 1% DUAL 4%  
FUNC CLASS =  
URBAN MAJOR COLLECTOR  
SUBREGIONAL TIER

### PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT Y-4810K = 0.639 MILES  
LENGTH STRUCTURE TIP PROJECT Y-4810K = 0.091 MILES  
TOTAL LENGTH OF TIP PROJECT Y-4810K = 0.730 MILES

### PLANS PREPARED FOR THE NCDOT BY:

**WGI** (WSP) 2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 14, 2018

LETTING DATE: NOVEMBER 15, 2022

ENGINEER: MICHAEL PEKAREK, PE (PROJECT ENGINEER), JORDAN WOODARD, PE (PROJECT DESIGN ENGINEER), KUMAR TRIVEDI, PE (NCDOT CONTACT)

### ENGINEER

Professional Engineer Seal for Michael Pezarek, No. 18056, State of North Carolina.

9/8/2022 | 7:33 AM PDT

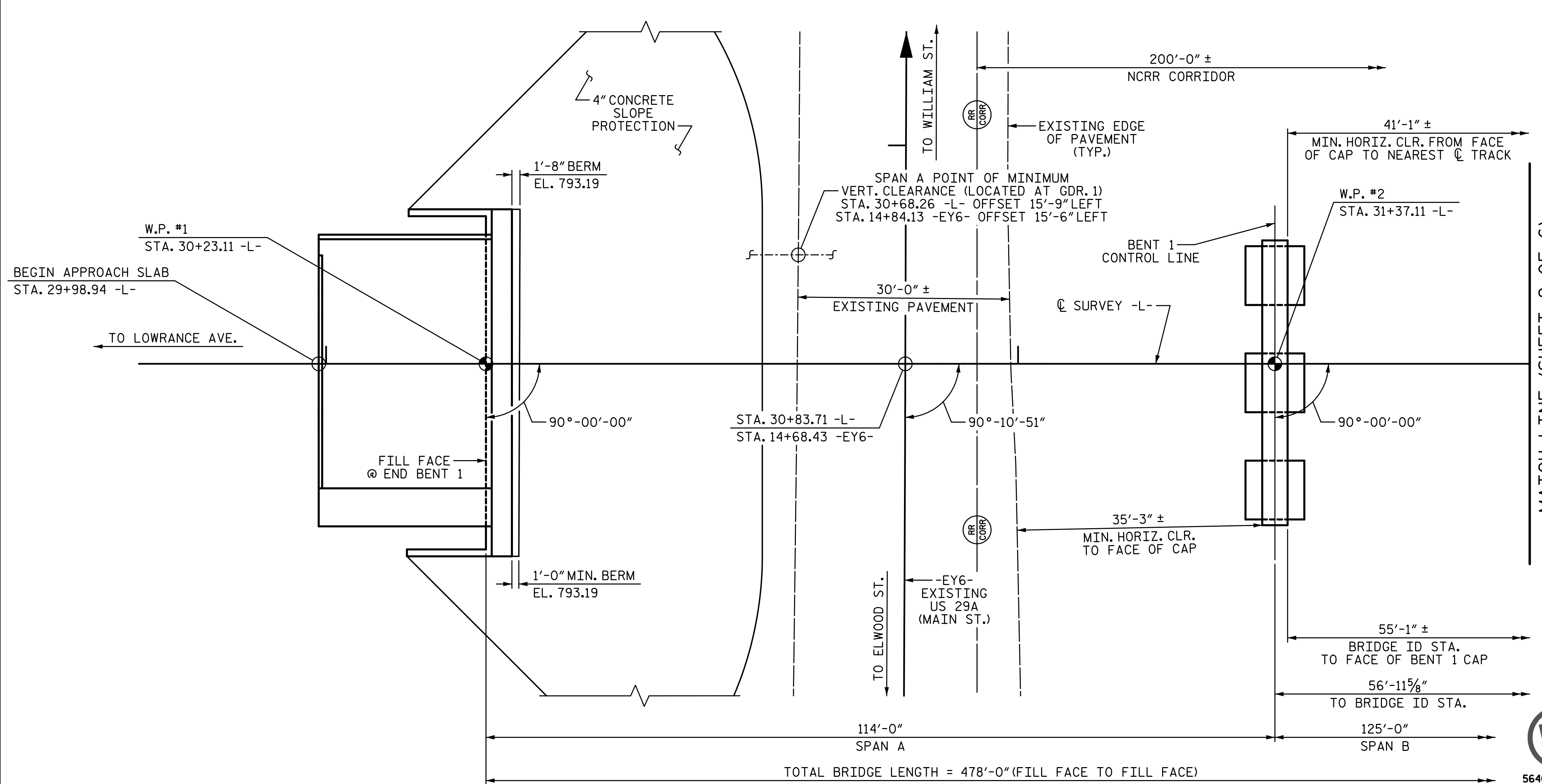
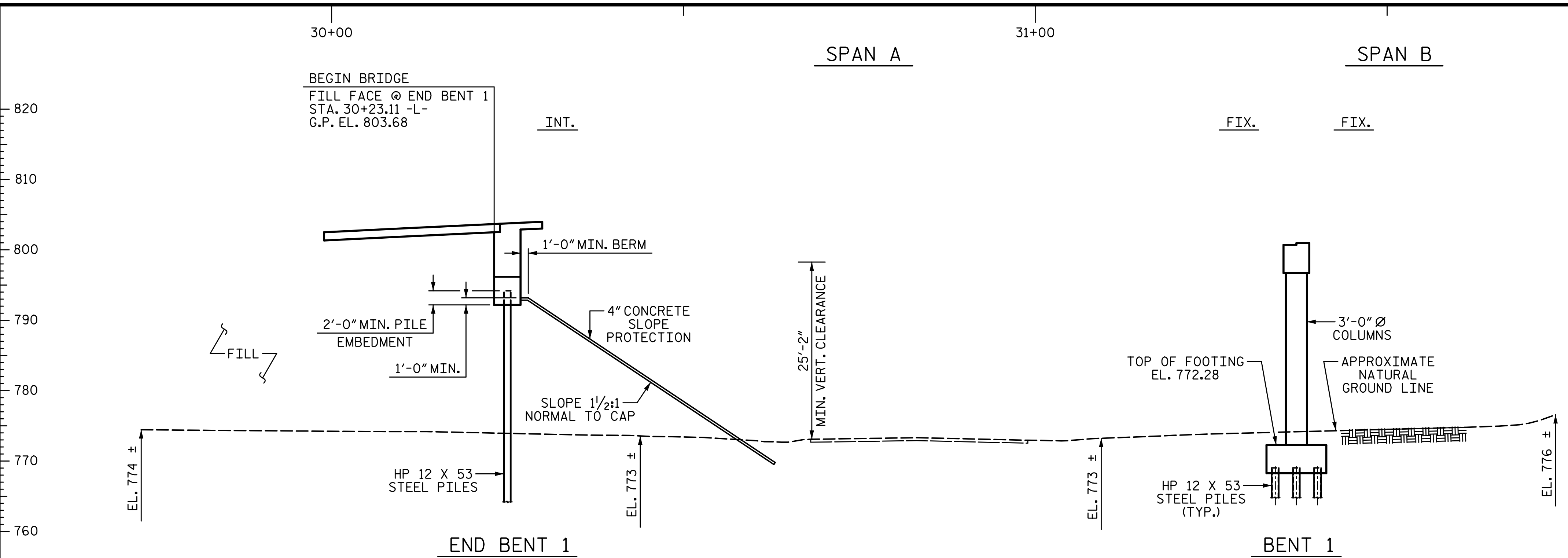
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### NC DEPARTMENT OF TRANSPORTATION RAIL DIVISION

1556 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1556  
(919) 707-4110  
(919) 707-4154 (FAX)

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

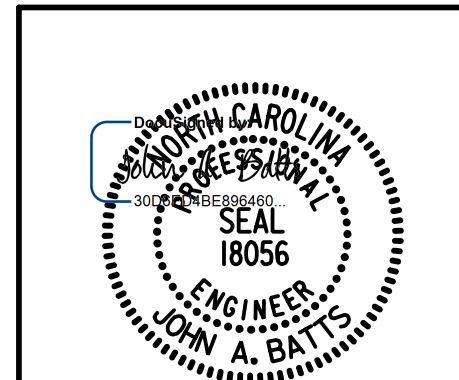
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### PART PLAN

(PILES AND COLUMNS NOT SHOWN IN PLAN VIEW)

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19



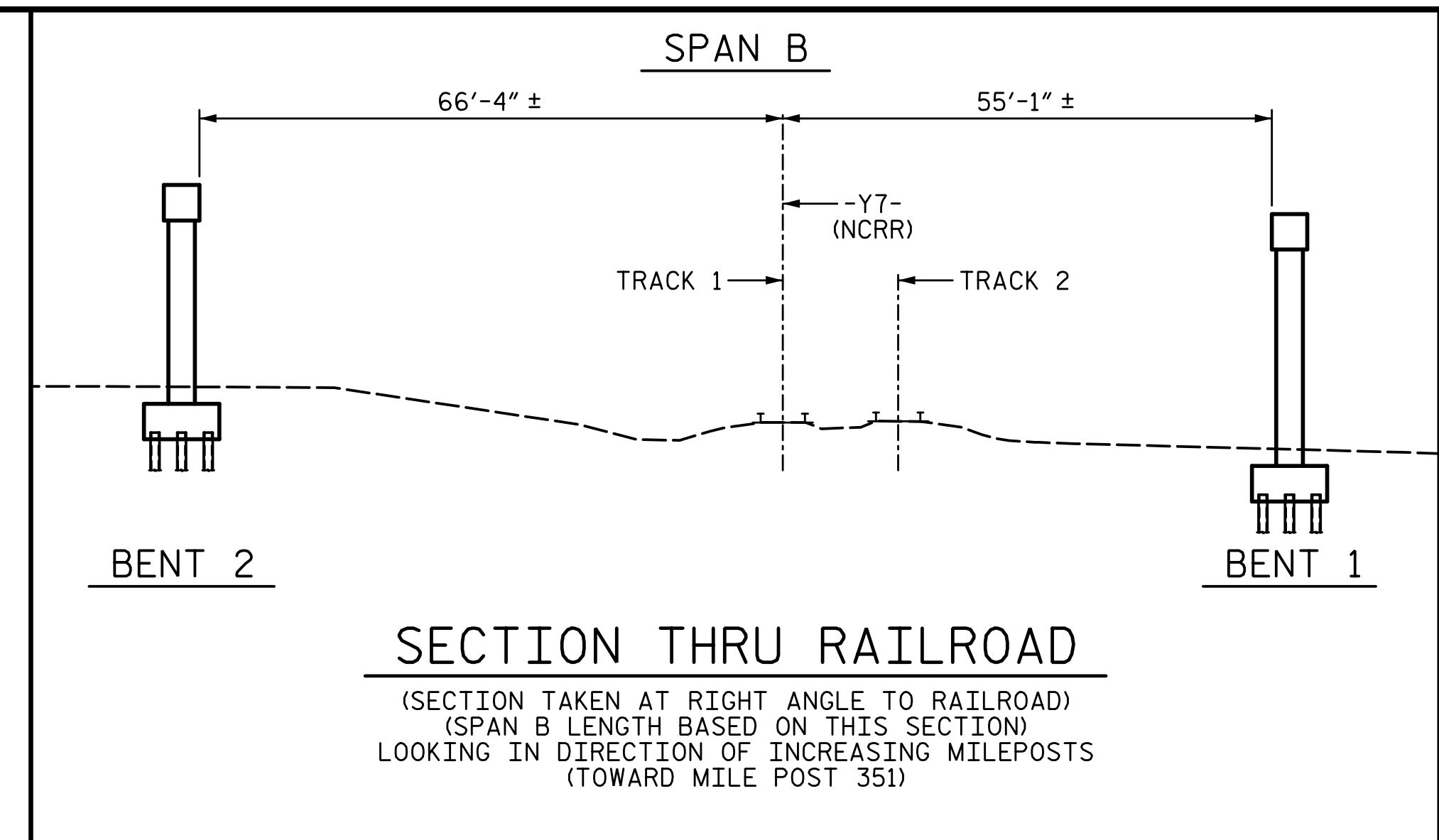
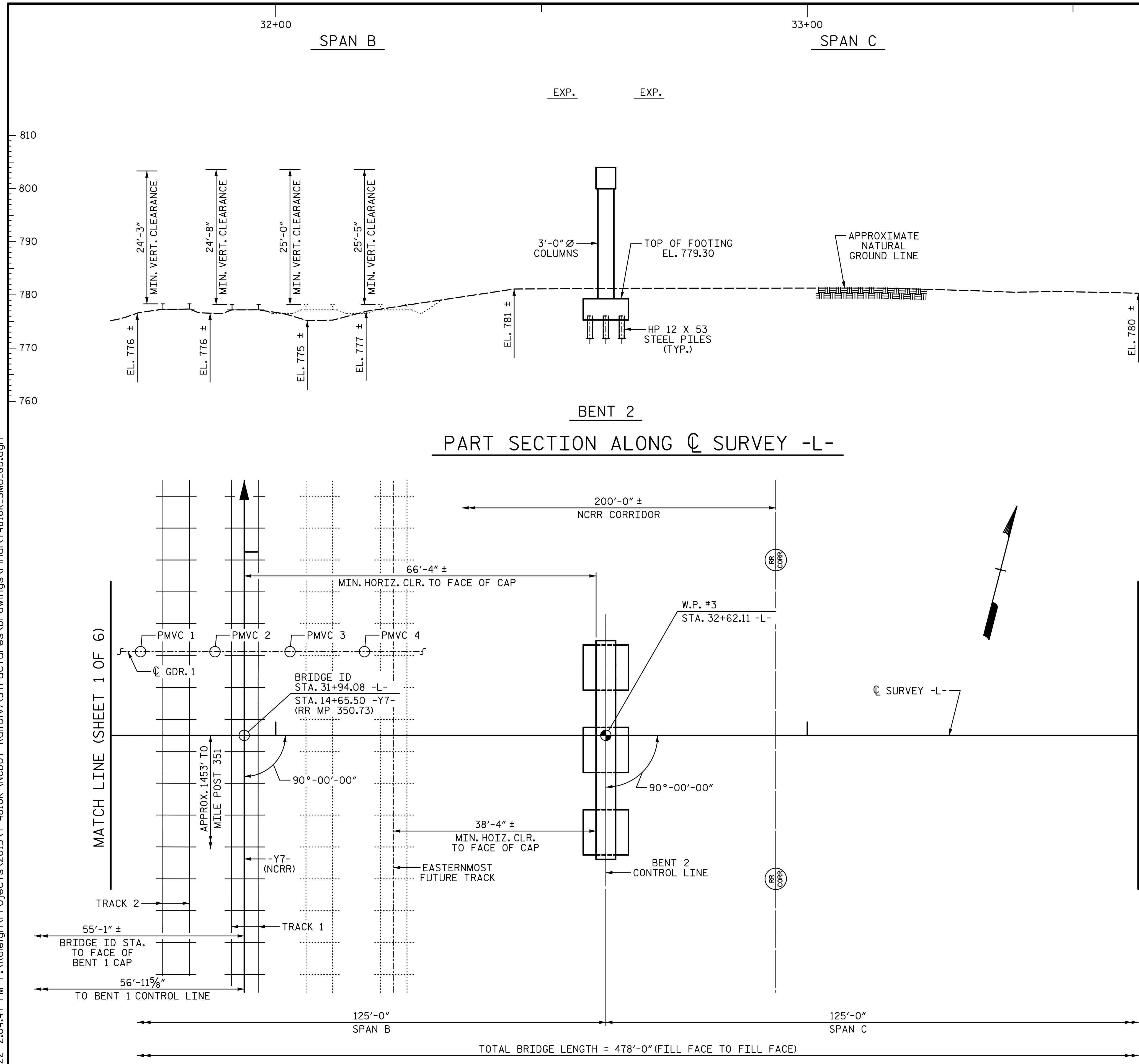
PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-  
14+65.50 -Y7-  
 SHEET 1 OF 6 BRIDGE #407  
 MILE POST 350.73

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON ROGERS LAKE RD.  
 OVER US 29A (MAIN ST.), NCCR (NS)  
 AND S. RIDGE AVE. BETWEEN  
 LOWRANCE AVE. AND MEADOW AVE.

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

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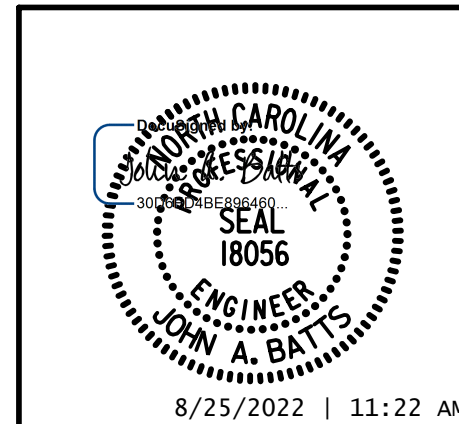
TRACK 2		TRACK 1	
STA. -Y7-	ELEVATION	STA. -Y7-	ELEVATION
14+15.00	777.00	14+16.62	777.00
14+20.00	777.02		
14+25.00	777.04		
14+30.00	777.06	14+32.32	777.07
14+35.00	777.08		
14+40.00	777.10	14+42.16	777.11
14+45.00	777.12		
14+50.00	777.14	14+52.84	777.15
14+55.00	777.16		
14+60.00	777.18		
14+65.00	777.20	14+67.16	777.20
14+70.00	777.21		
14+75.00	777.23		
14+80.00	777.25	14+82.86	777.26
14+85.00	777.27		
14+90.00	777.29	14+92.51	777.30
14+95.00	777.31		
15+00.00	777.33	15+03.06	777.34
15+05.00	777.35		
15+10.00	777.36		
15+15.00	777.37	15+17.28	777.38

<b>PMVC 1</b> STA. 31+74.58 -L- OFFSET 15'-9" LT. STA. 14+81.25 -Y7- OFFSET 19'-6" LT.	<b>PMVC 2</b> STA. 31+88.58 -L- OFFSET 15'-9" LT. STA. 14+81.25 -Y7- OFFSET 5'-6" LT.
<b>PMVC 3</b> STA. 32+02.58 -L- OFFSET 15'-9" LT. STA. 14+81.25 -Y7- OFFSET 8'-6" RT.	<b>PMVC 4</b> STA. 32+16.58 -L- OFFSET 15'-9" LT. STA. 14+81.25 -Y7- OFFSET 22'-6" RT.

PMVC = POINT OF MINIMUM VERTICAL CLEARANCE

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-  
14+65.50 -Y7-  
SHEET 2 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE ON ROGERS LAKE RD.  
OVER US 29A (MAIN ST.), NCRR (NS)  
AND S. RIDGE AVE. BETWEEN  
LOWRANCE AVE. AND MEADOW AVE.



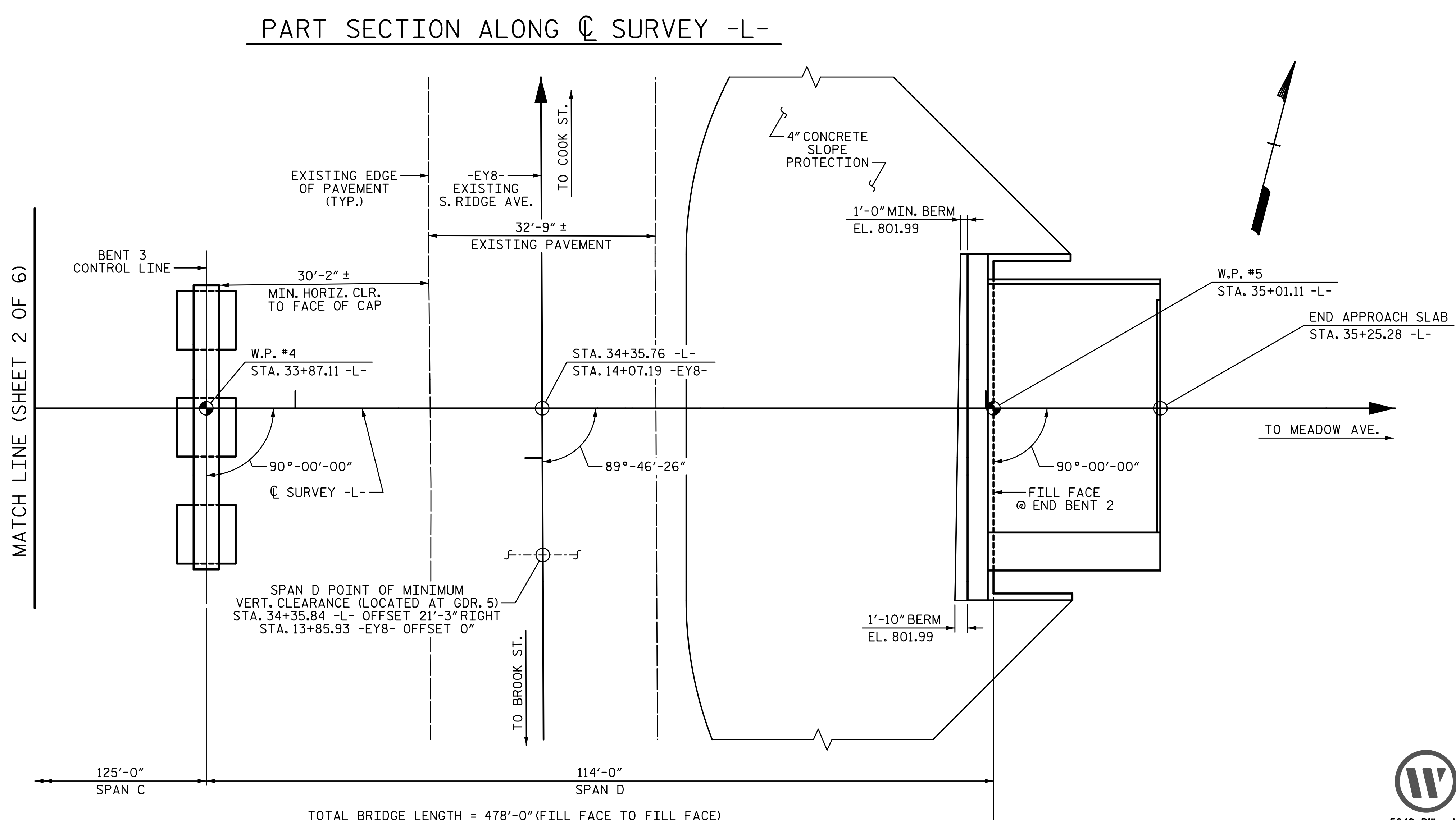
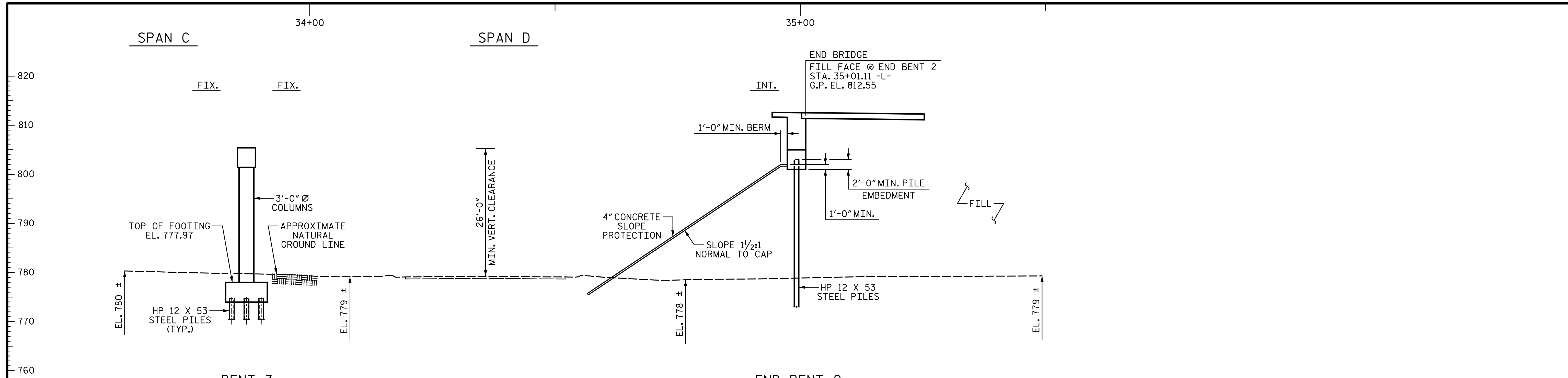
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2			4		

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DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

**PART PLAN**  
(PILES AND COLUMNS NOT SHOWN IN PLAN VIEW)

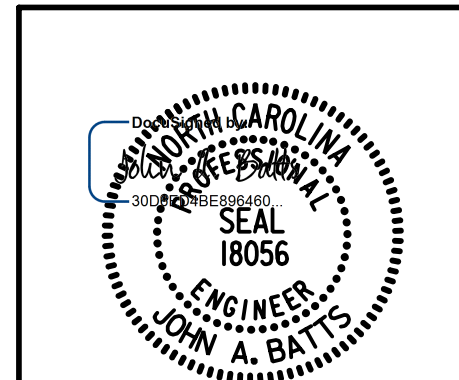
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(PILES AND COLUMNS NOT SHOWN IN PLAN VIEW)

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CABARRUS COUNTY  
 STATION: 31+94.08 -L-  
14+65.50 -Y7-

MILE POST 350.73  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON ROGERS LAKE RD.  
 OVER US 29A (MAIN ST.), NCRR (NS)  
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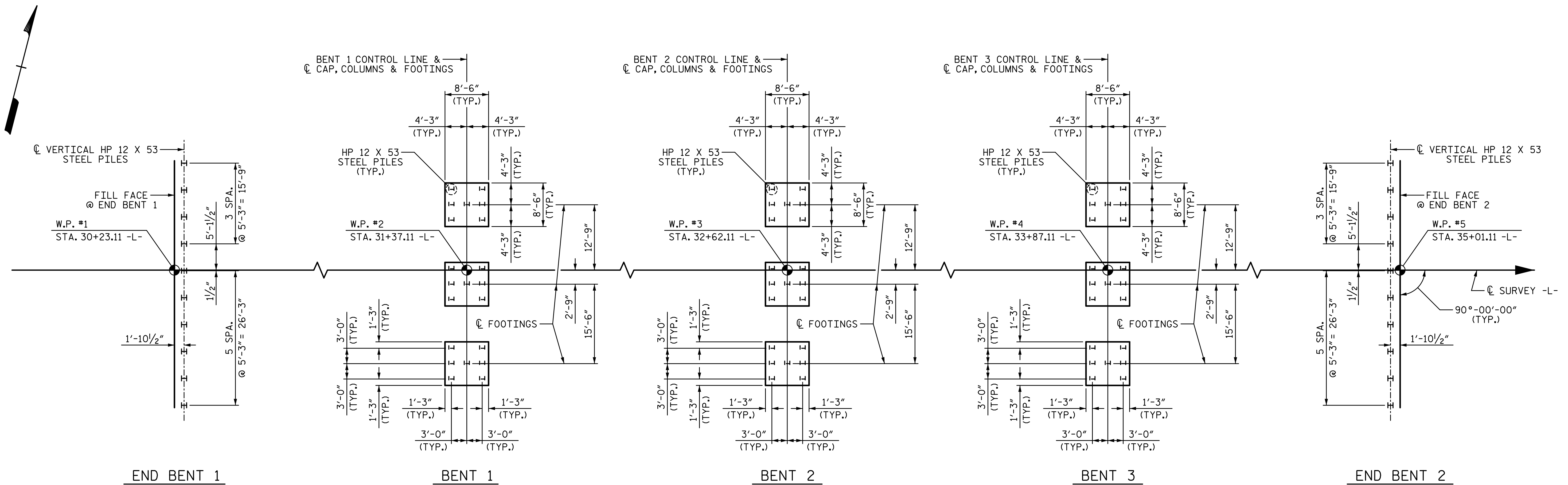
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### FOUNDATION LAYOUT

#### FOUNDATION NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1. 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 1.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, IF APPLICABLE, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT 1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.
- PILES AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.
- DRIVE PILES AT BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.
- IF NECESSARY, PREDRILL PILE LOCATIONS AT BENT 2. PREDRILL PILE LOCATIONS TO AN ELEVATION NO LOWER THAN 765 FT. WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 12". FOR PREDRILLING FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT 2. FOR STEEL PILE POINTS, SEE SECTIONS 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.
- DRIVE PILES AT BENT 3 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT 3. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED REISTANCE OF 108 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.

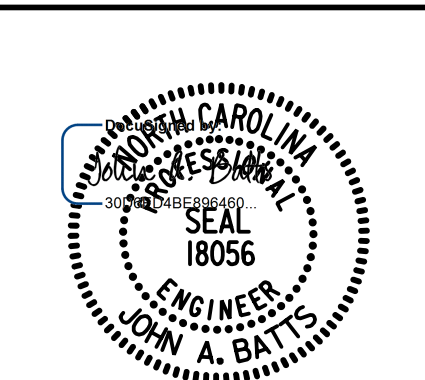
PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 4 OF 6 MILE POST 350.73

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

#### GENERAL DRAWING

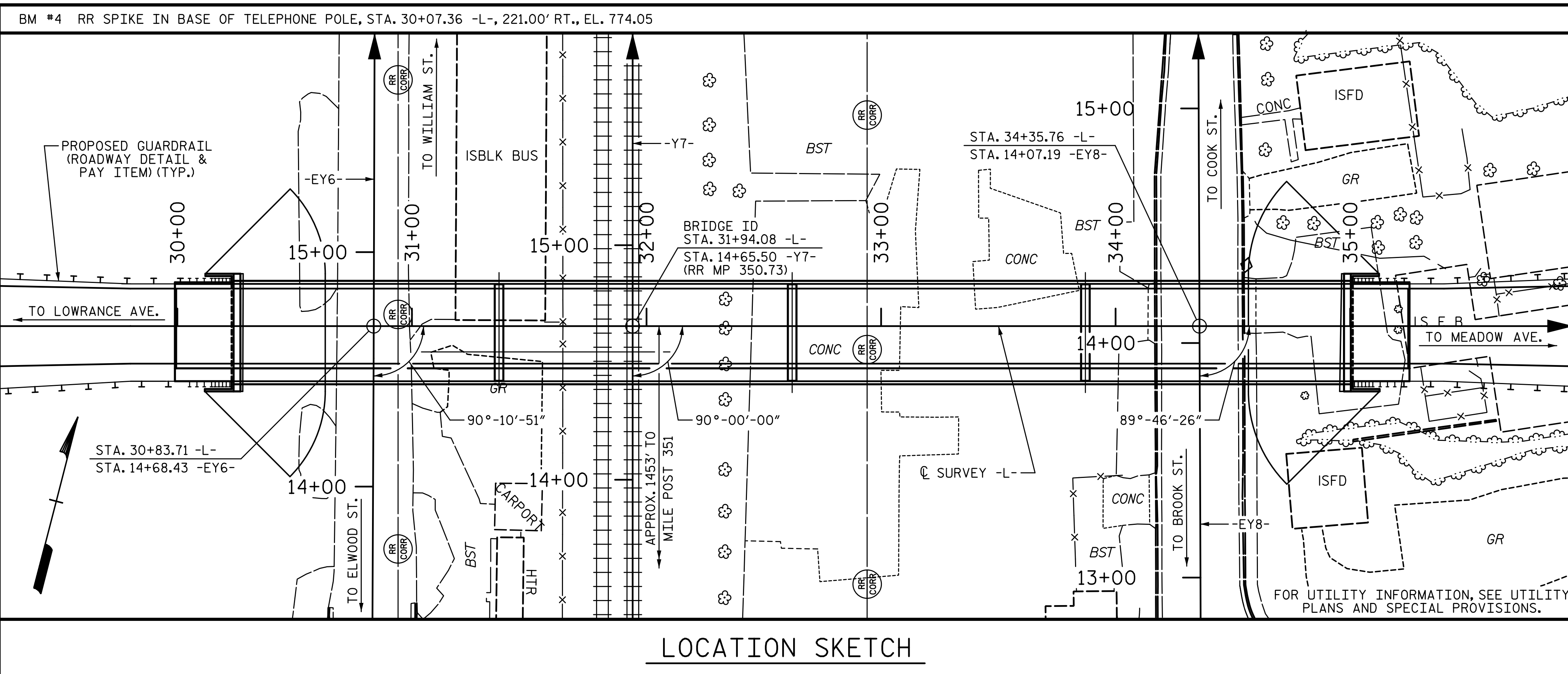
FOR BRIDGE ON ROGERS LAKE RD.  
 OVER US 29A (MAIN ST.), NCRR (NS)  
 AND S. RIDGE AVE. BETWEEN  
 LOWRANCE AVE. AND MEADOW AVE.



DRAWN BY: S.D. COOPER DATE: 2-19  
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1			3			TOTAL SHEETS
2			4			53

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LOCATION SKETCH

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 ELEVATIONS AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- 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 BED 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.
- ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.
- 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.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR DISPOSAL LOCATION OF FOUNDATION EXCAVATION MATERIALS FROM INTERIOR BENT FOOTINGS WITHIN THE RAILROAD CORRIDOR, SEE ROADWAY PLANS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONC GIRDERS		PILE DRIVING EQUIPMENT SETUP HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS
	LS	SF	SF	CY	LS	LB	LB	NO.	LF	EA	NO.	LF	NO.
SUPERSTRUCTURE		20,998	17,294					20	2,368.33				
END BENT 1				42.4		6,866				10	10	900	
BENT 1	LS			79.7		13,776	1,604			21	21	1,680	
BENT 2	LS			73.9		13,160	1,356			21	21	1,000	21
BENT 3	LS			78.6		13,621	1,538			21	21	630	21
END BENT 2				42.7		6,952				10	10	525	
TOTAL	LS	20,998	17,294	317.3	LS	54,375	4,498	20	2,368.33	83	83	4,735	42

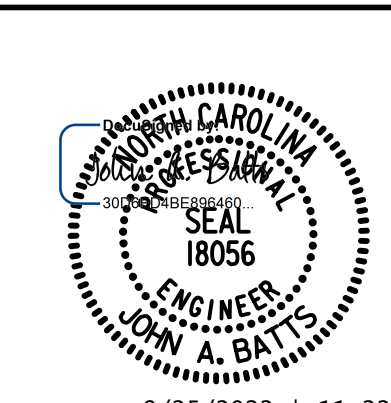
TOTAL BILL OF MATERIAL

	PREDRILLING FOR PILES	PILE REDRIVES	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	1'-2" X 3'-2 1/16" CONCRETE PARAPET	72" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LF	EA	LF	LF	LF	LF	SY	LS	LS
SUPERSTRUCTURE			937.67	476.33	476.33	400.00			
END BENT 1		10					500		
BENT 1									
BENT 2	120								
BENT 3									
END BENT 2							565		
TOTAL	120	10	937.67	476.33	476.33	400.00	1,065	LS	LS

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 5 OF 6

MILE POST 350.73  
 STATE OF NORTH CAROLINA  
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**GENERAL DRAWING**  
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LOAD FACTORS:

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

NOTES:

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

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

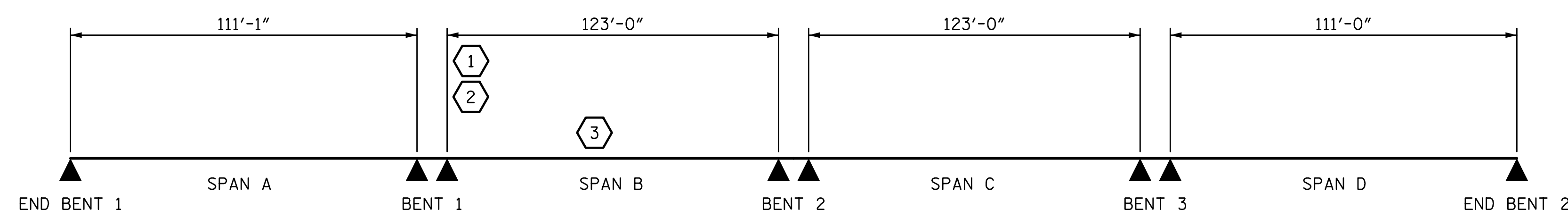
COMMENTS:

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\phi$  BEARING.

#	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	

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.05	--	1.75	0.843	1.37	B	EL	61.5	0.914	1.05	B	I	12.3	0.80	0.843	1.20	B	EL	61.5		
	HL-93 (OPERATING)	N/A		1.55	--	1.35	0.843	1.78	B	EL	61.5	0.914	1.55	B	I	12.3	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.73	62.3	1.75	0.843	2.02	B	EL	61.5	0.914	1.73	B	I	12.3	0.80	0.843	1.76	B	EL	61.5		
	HS-20 (OPERATING)	36.000		2.37	85.3	1.35	0.843	2.62	B	EL	61.5	0.914	2.37	B	I	12.3	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.42	46.2	1.40	0.843	6.14	B	EL	61.5	0.914	5.99	B	I	12.3	0.80	0.843	3.42	B	EL	61.5	
		SNGARBS2	20.000		2.44	48.8	1.40	0.843	4.38	B	EL	61.5	0.914	4.11	B	I	12.3	0.80	0.843	2.44	B	EL	61.5	
		SNAGRIS2	22.000		2.27	49.9	1.40	0.843	4.07	B	EL	61.5	0.914	3.76	B	I	12.3	0.80	0.843	2.27	B	EL	61.5	
		SNCOTTS3	27.250		1.70	46.3	1.40	0.843	3.05	B	EL	61.5	0.914	2.88	B	I	12.3	0.80	0.843	1.70	B	EL	61.5	
		SNAGGRS4	34.925		1.38	48.2	1.40	0.843	2.47	B	EL	61.5	0.914	2.29	B	I	12.3	0.80	0.843	1.38	B	EL	61.5	
		SNS5A	35.550		1.35	48.0	1.40	0.843	2.43	B	EL	61.5	0.914	2.29	B	I	12.3	0.80	0.843	1.35	B	EL	61.5	
		SNS6A	39.950		1.22	48.7	1.40	0.843	2.19	B	EL	61.5	0.914	2.03	B	I	12.3	0.80	0.843	1.22	B	EL	61.5	
		SNS7B	42.000		1.16	48.7	1.40	0.843	2.09	B	EL	61.5	0.914	1.97	B	I	12.3	0.80	0.843	1.16	B	EL	61.5	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.48	48.8	1.40	0.843	2.67	B	EL	61.5	0.914	2.49	B	I	12.3	0.80	0.843	1.48	B	EL	61.5	
		TNT4A	33.075		1.49	49.3	1.40	0.843	2.67	B	EL	61.5	0.914	2.45	B	I	12.3	0.80	0.843	1.49	B	EL	61.5	
		TNT6A	41.600		1.20	49.9	1.40	0.843	2.16	B	EL	61.5	0.914	2.05	B	I	12.3	0.80	0.843	1.20	B	EL	61.5	
		TNT7A	42.000		1.20	50.4	1.40	0.843	2.15	B	EL	61.5	0.914	2.01	B	I	12.3	0.80	0.843	1.20	B	EL	61.5	
		TNT7B	42.000		1.22	51.2	1.40	0.843	2.19	B	EL	61.5	0.914	1.93	B	I	12.3	0.80	0.843	1.22	B	EL	61.5	
		TNAGRIT4	43.000		1.17	50.3	1.40	0.843	2.11	B	EL	61.5	0.914	1.86	B	I	12.3	0.80	0.843	1.17	B	EL	61.5	
TNAGT5A	45.000	3	1.11	50.0	1.40	0.843	2.00	B	EL	61.5	0.914	1.80	B	I	12.3	0.80	0.843	1.11	B	EL	61.5			
TNAGT5B	45.000	3	1.11	50.0	1.40	0.843	1.99	B	EL	61.5	0.914	1.74	B	I	12.3	0.80	0.843	1.11	B	EL	61.5			

LRFR SUMMARY



PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 6 OF 6

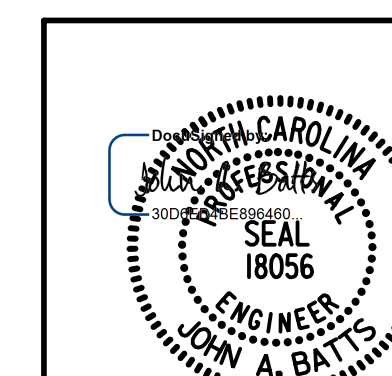
MILE POST 350.73

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



5640 Dillard Drive, Suite 200  
 Cary, NC 27518

LICENSURE NO. C-4434



8/25/2022 11:22 AM

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

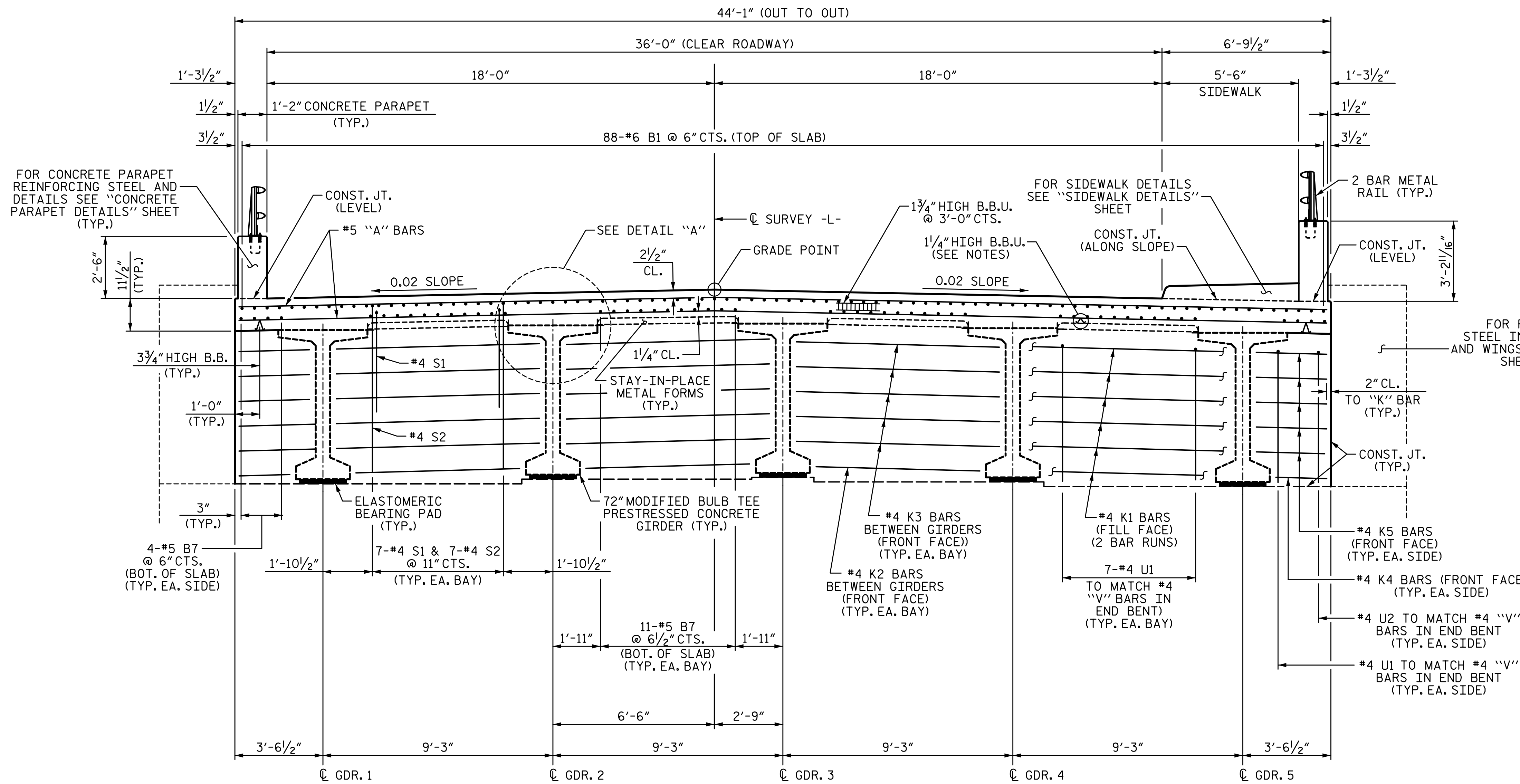
REVISIONS

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

SHEET NO. S-7  
 TOTAL SHEETS 53

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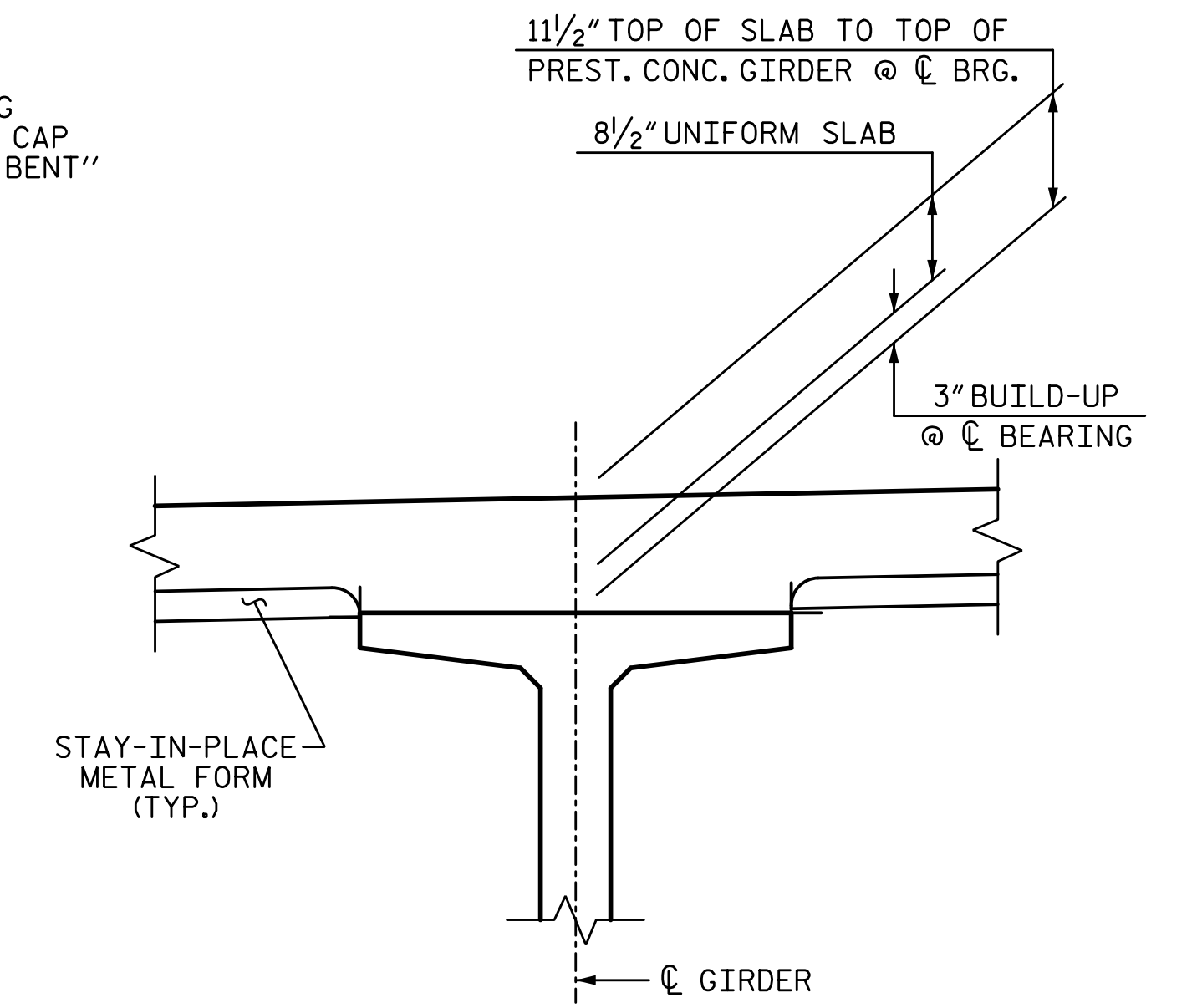
**NOTES:**

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

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

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

FOR REINFORCING STEEL IN END BENT CAP AND WINGS, SEE "END BENT" SHEETS (TYP.)

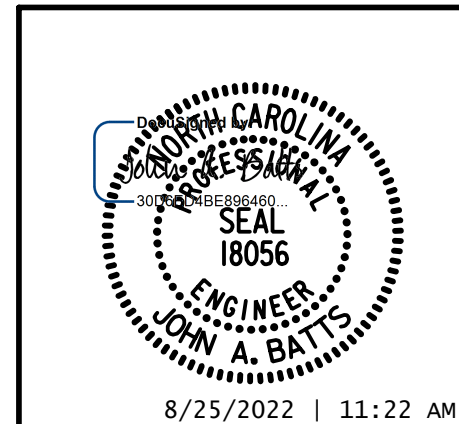


**DETAIL "A"**  
(TYP. EA. GIRDER)

**TYPICAL SECTION AT INTEGRAL END BENT**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 5



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

DRAWN BY: J.R. SEALEY	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			53

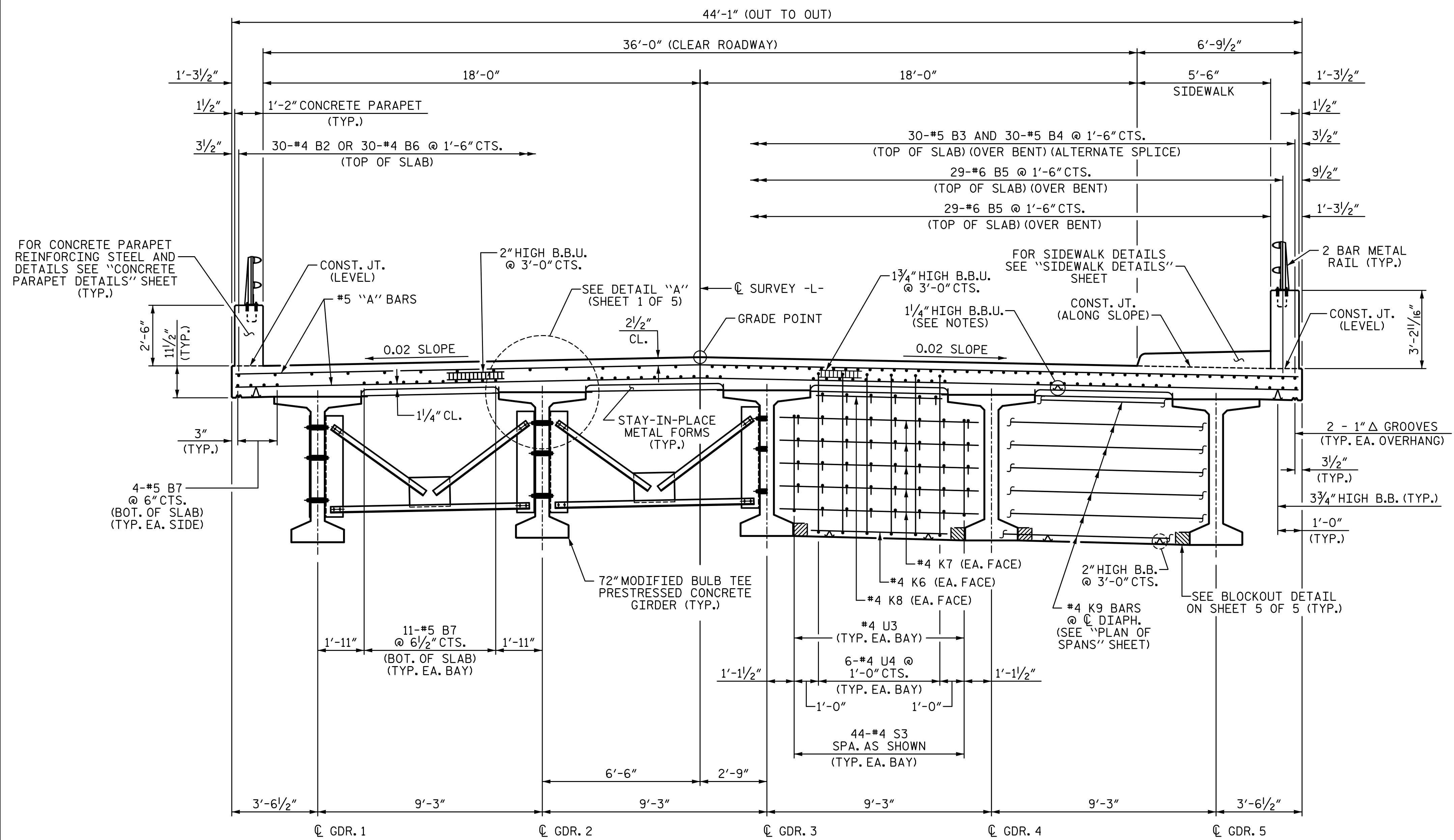
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**NOTES:**

BRIDGE MOUNTED CHAIN LINK FENCE NOT SHOWN FOR CLARITY. SEE "BRIDGE MOUNTED CHAIN LINK FENCE DETAILS" SHEETS.



**PARTIAL TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS IN SPANS A-D)

**PARTIAL TYPICAL SECTION**  
(SHOWING CONTINUOUS FOR LIVE LOAD DIAPHRAGMS @ BENTS 1 & 3)

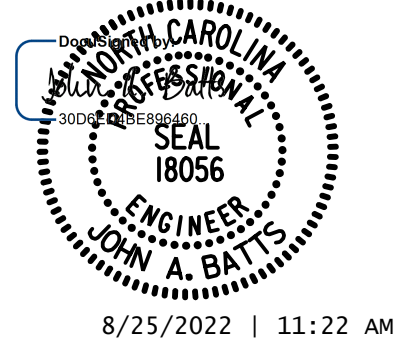
**TYPICAL SECTION**  
(FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" PRESTRESSED CONCRETE GIRDERS MODIFIED BULB TEE" SHEET)

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

TYPICAL SECTION



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			53

DRAWN BY: J.R. SEALEY DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

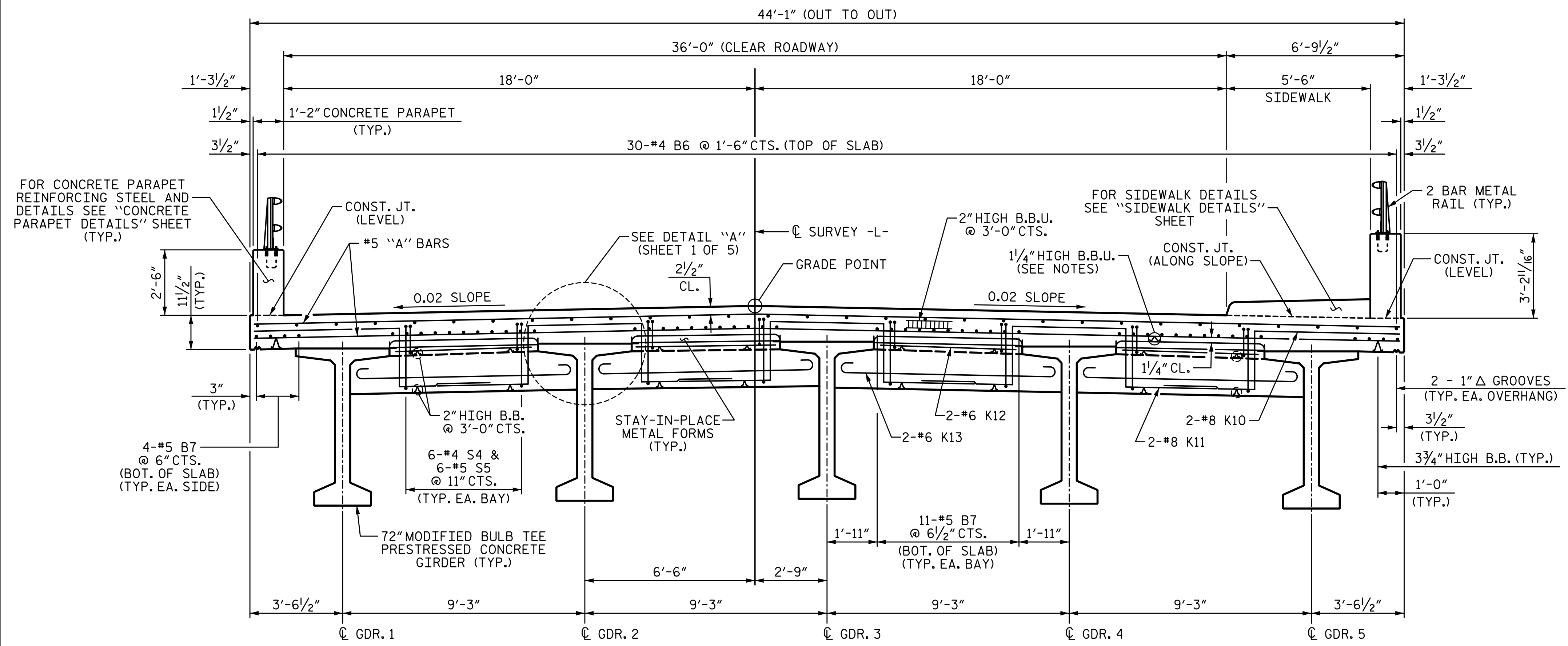
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UNLESS ALL SIGNATURES COMPLETED

LICENSURE NO. C-4434

8/25/2022 | 11:22 AM

**NOTES:**

BRIDGE MOUNTED CHAIN LINK FENCE NOT SHOWN FOR CLARITY. SEE "BRIDGE MOUNTED CHAIN LINK FENCE DETAILS" SHEETS.



**TYPICAL SECTION AT BENT 2**

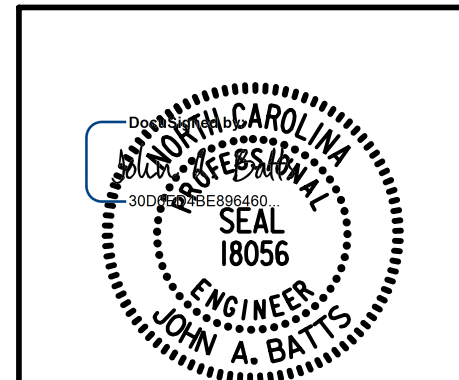
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PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**

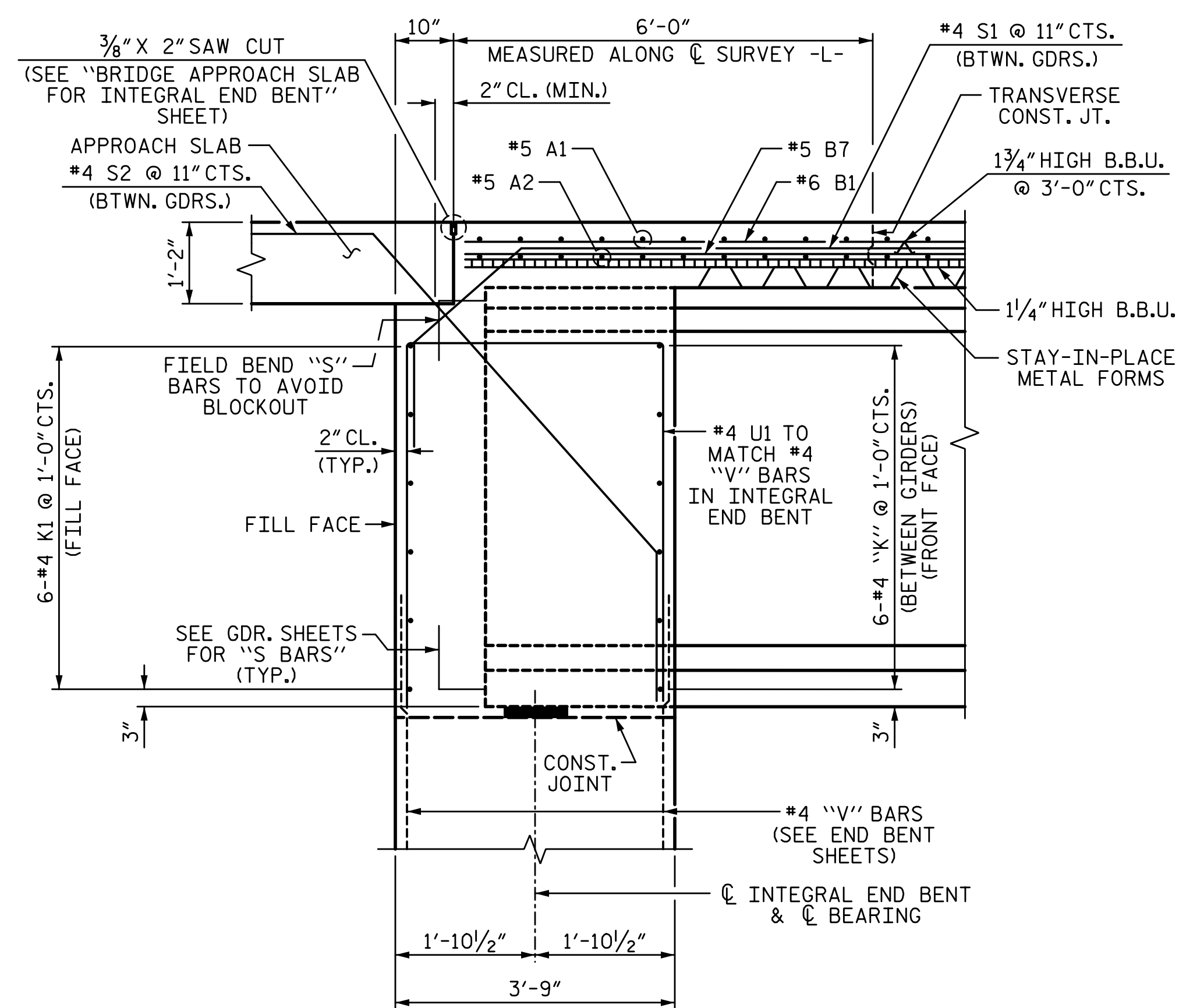


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CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

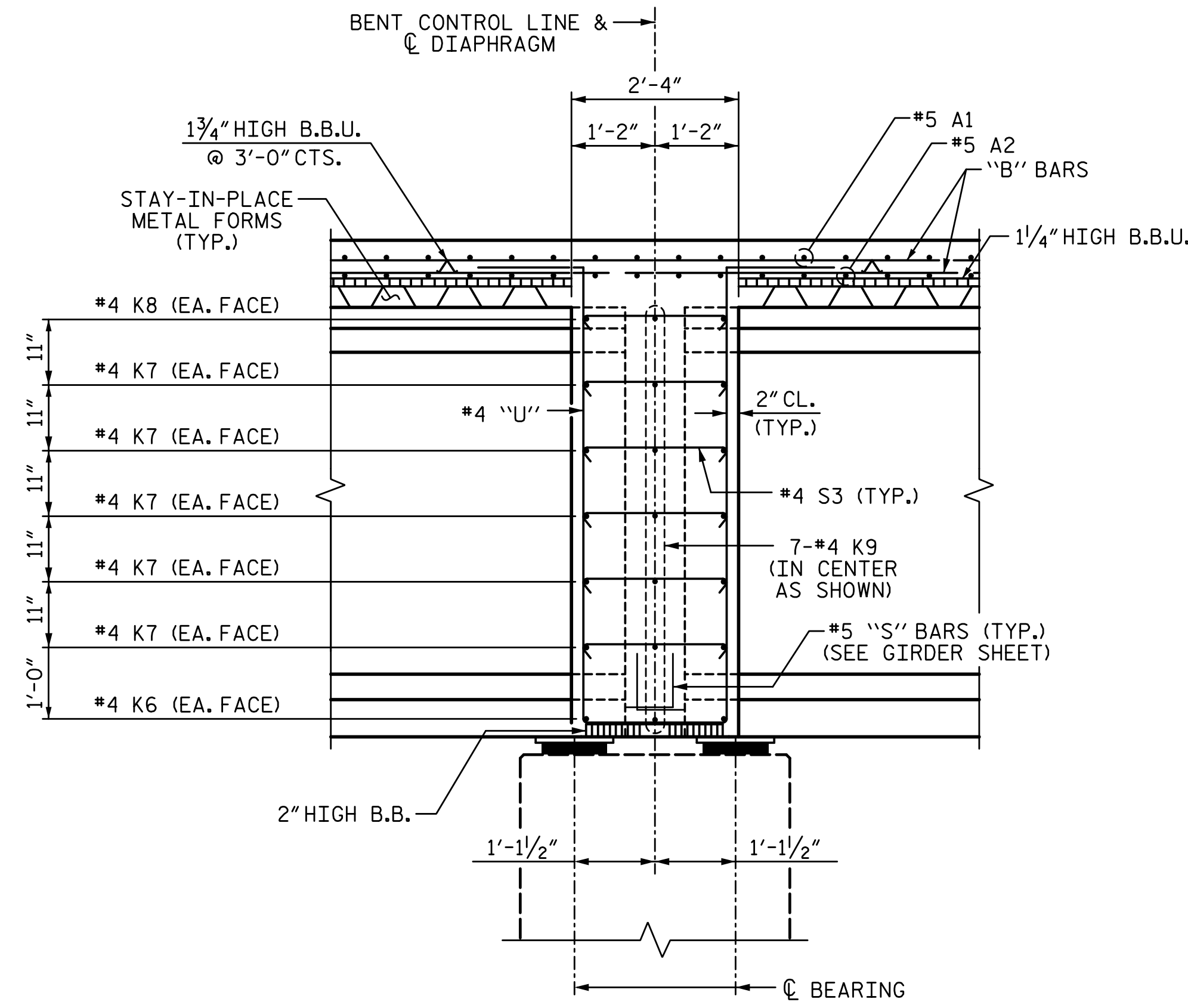
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			53

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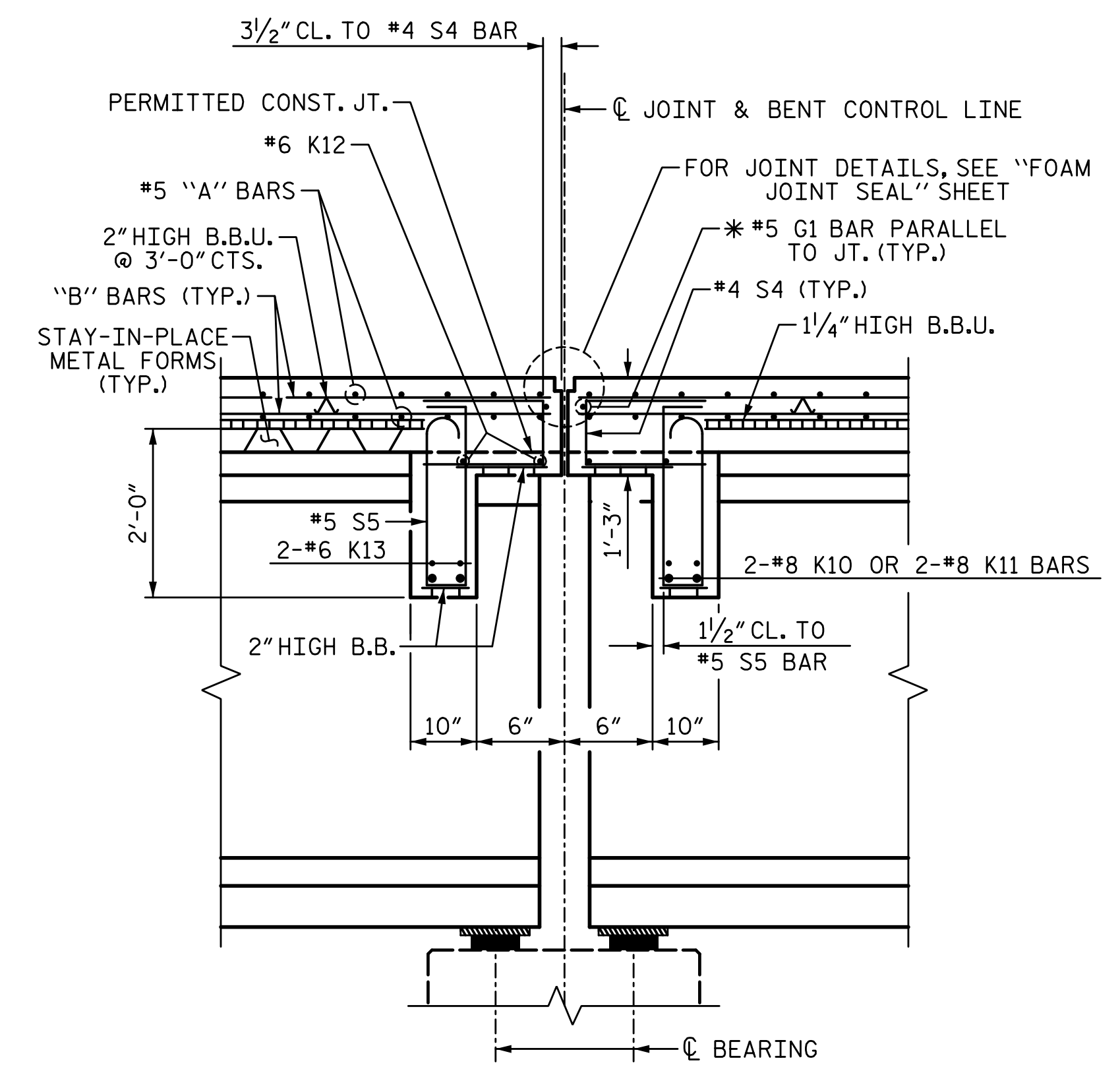
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**SECTION THROUGH END BENT DIAPHRAGM**  
 (SEE END BENT SHEETS FOR INTEGRAL END BENT REINFORCING DETAILS)  
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)



**SECTION THROUGH INTERIOR BENT DIAPHRAGM @ BENTS 1 & 3**

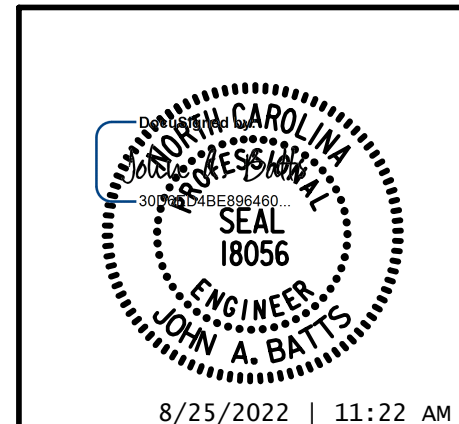


**SECTION THRU DIAPHRAGM @ BENT 2**  
 (\* #5 G1 BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY,  
 TO CLEAR REINFORCING STEEL AND STIRRUPS)

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS

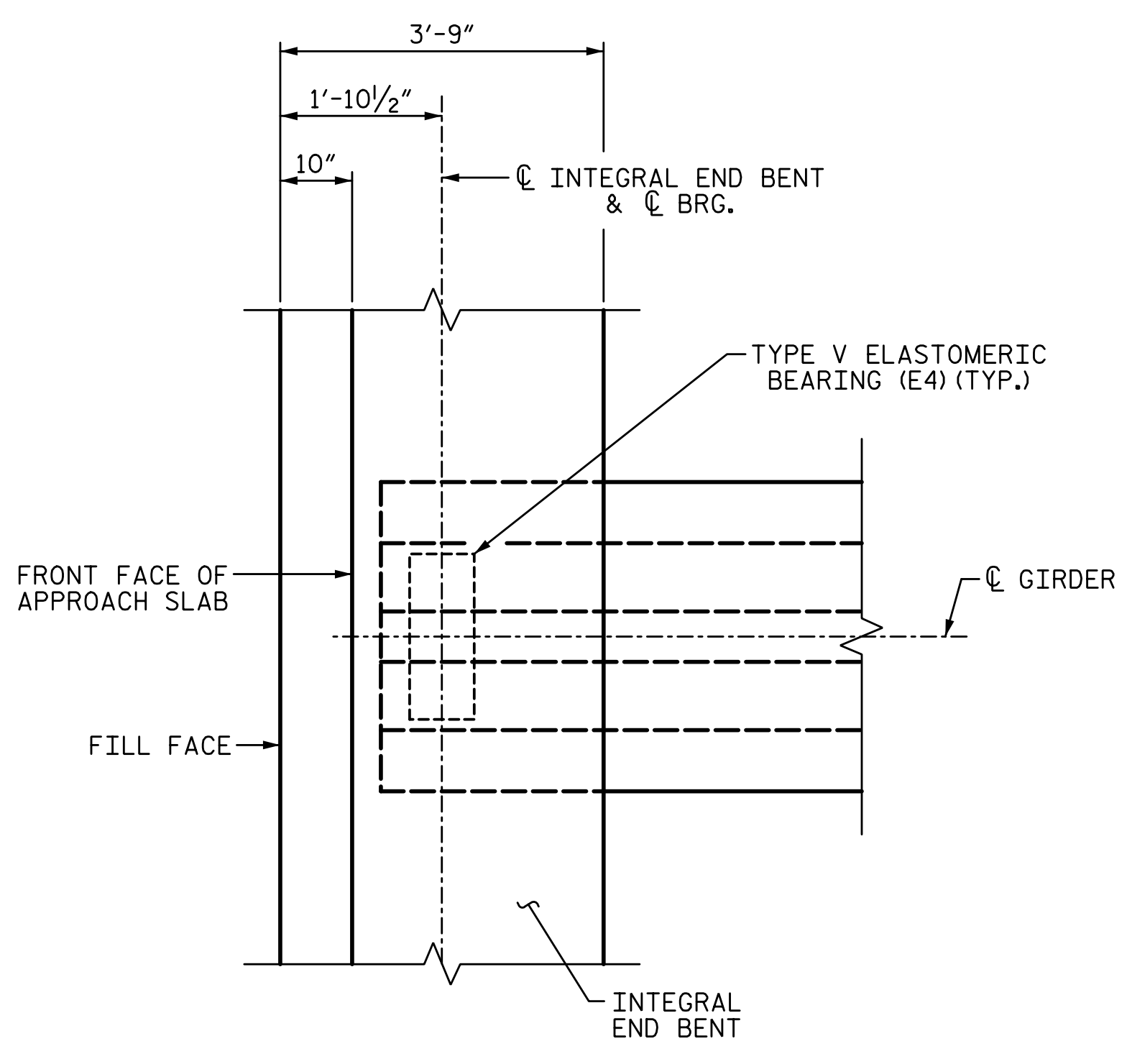


DRAWN BY: J.R. SEALEY	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

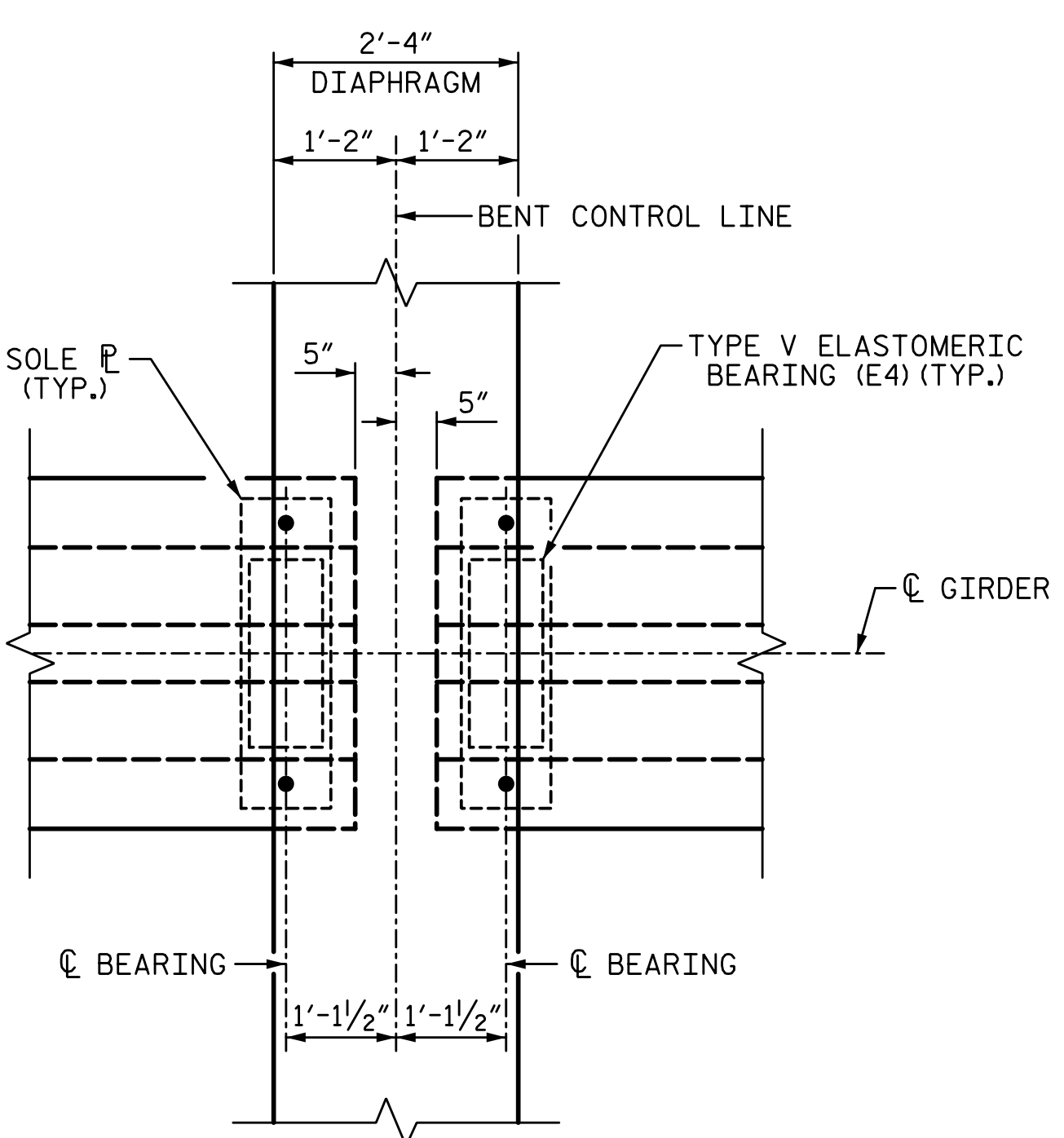
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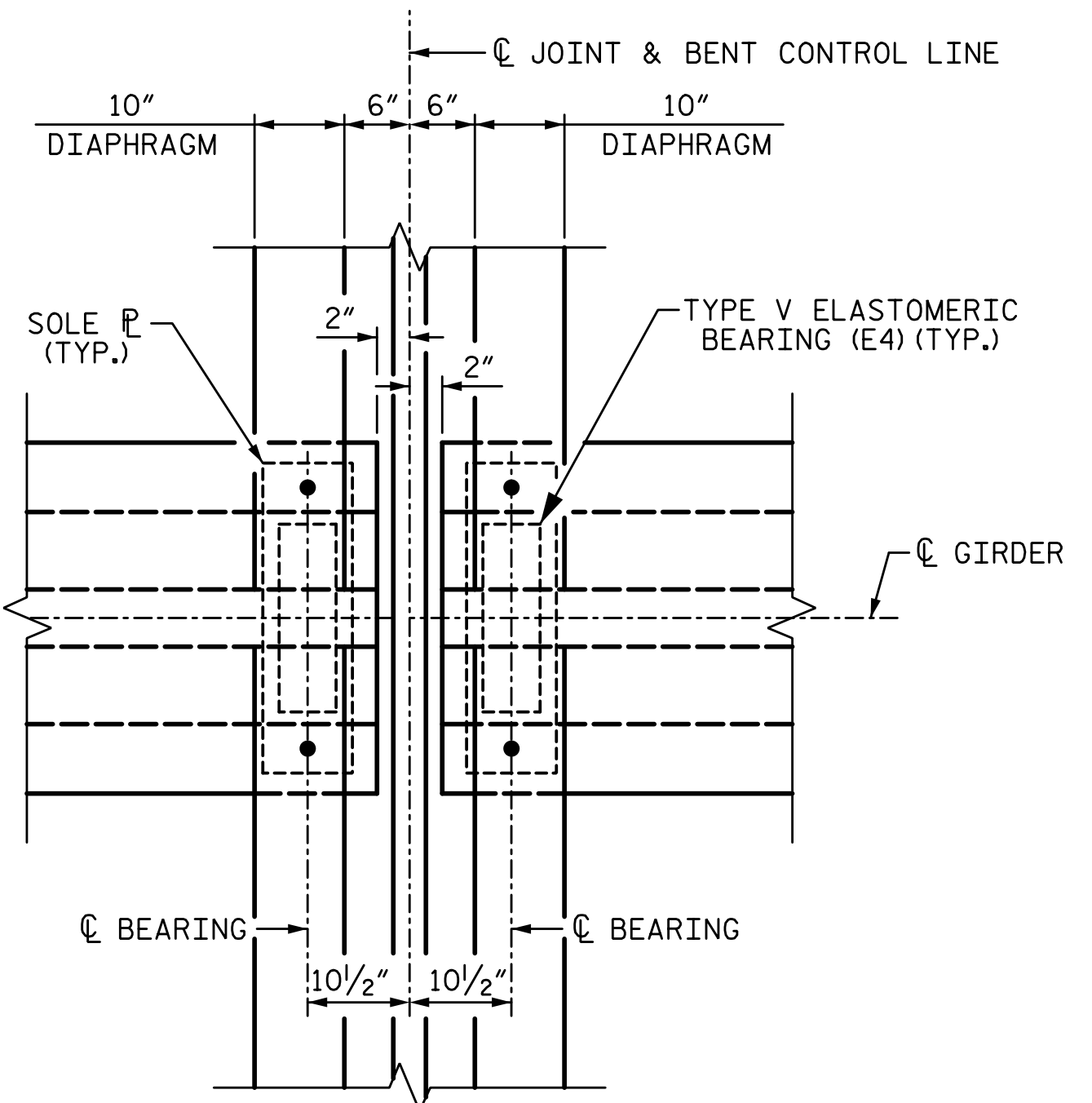
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**END BENT DIAPHRAGM**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

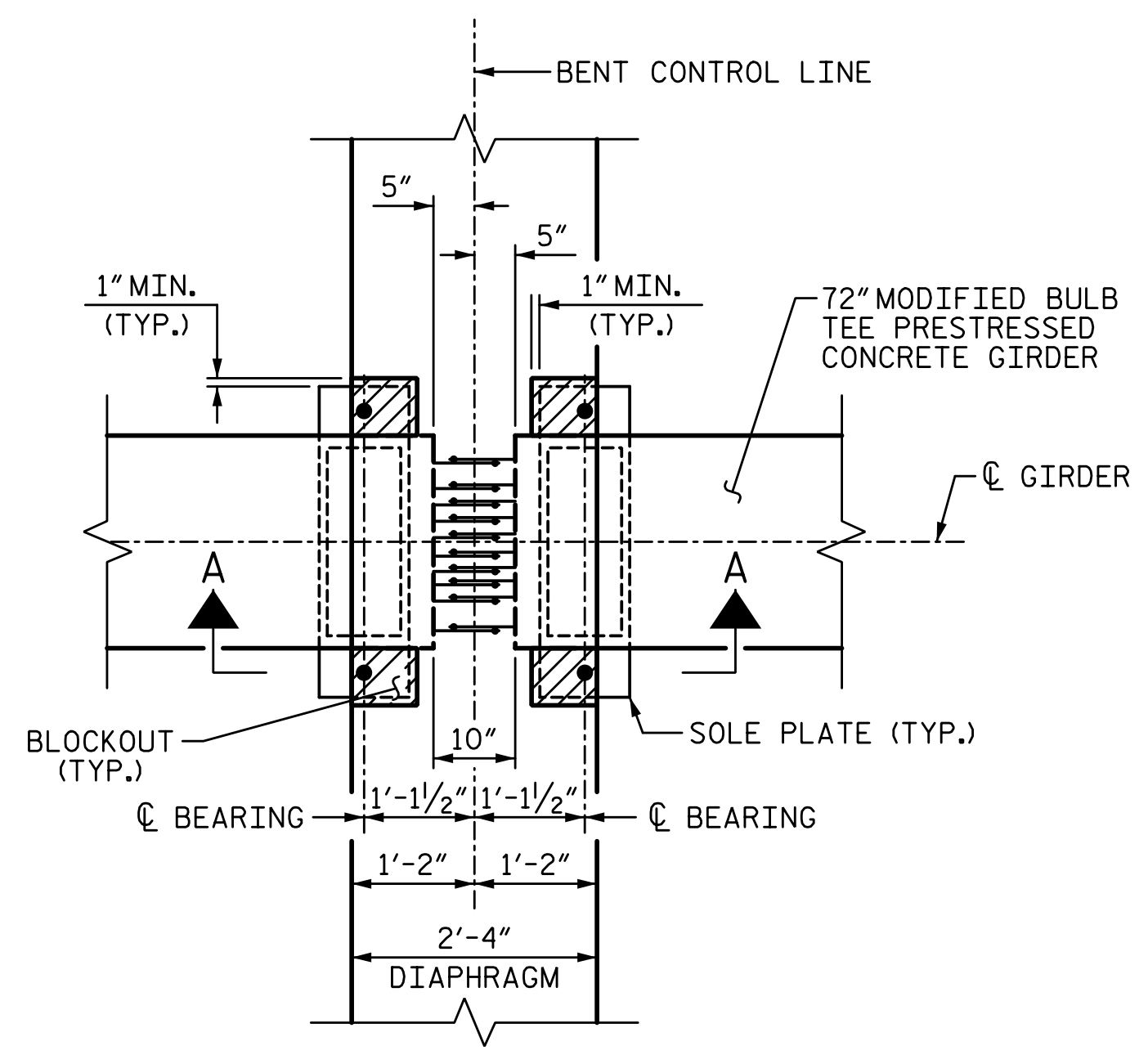


**CONTINUOUS BENT DIAPHRAGM**  
(@ BENTS 1 & 3)

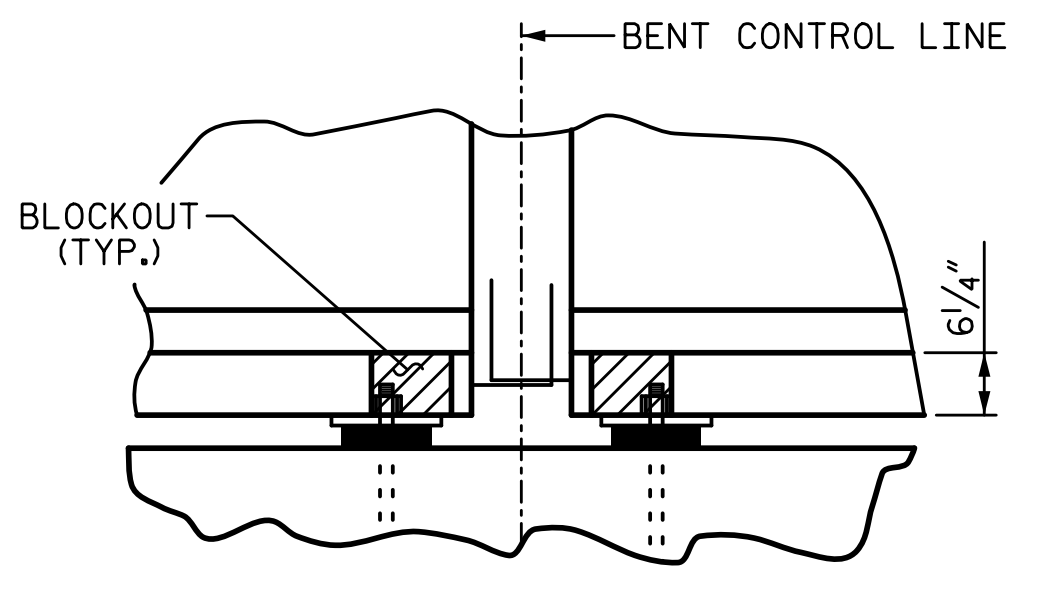


**BENT DIAPHRAGM**  
(@ BENT 2)

**PLAN OF DIAPHRAGMS**



**PLAN**



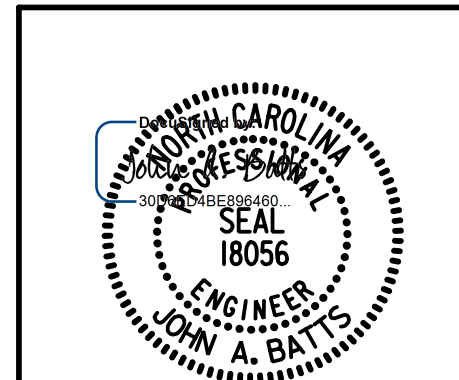
**SECTION A-A**

**CONTINUOUS BENT DIAPHRAGM BLOCK-OUT DETAIL**  
(@ BENTS 1 & 3)

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**TYPICAL SECTION DETAILS**

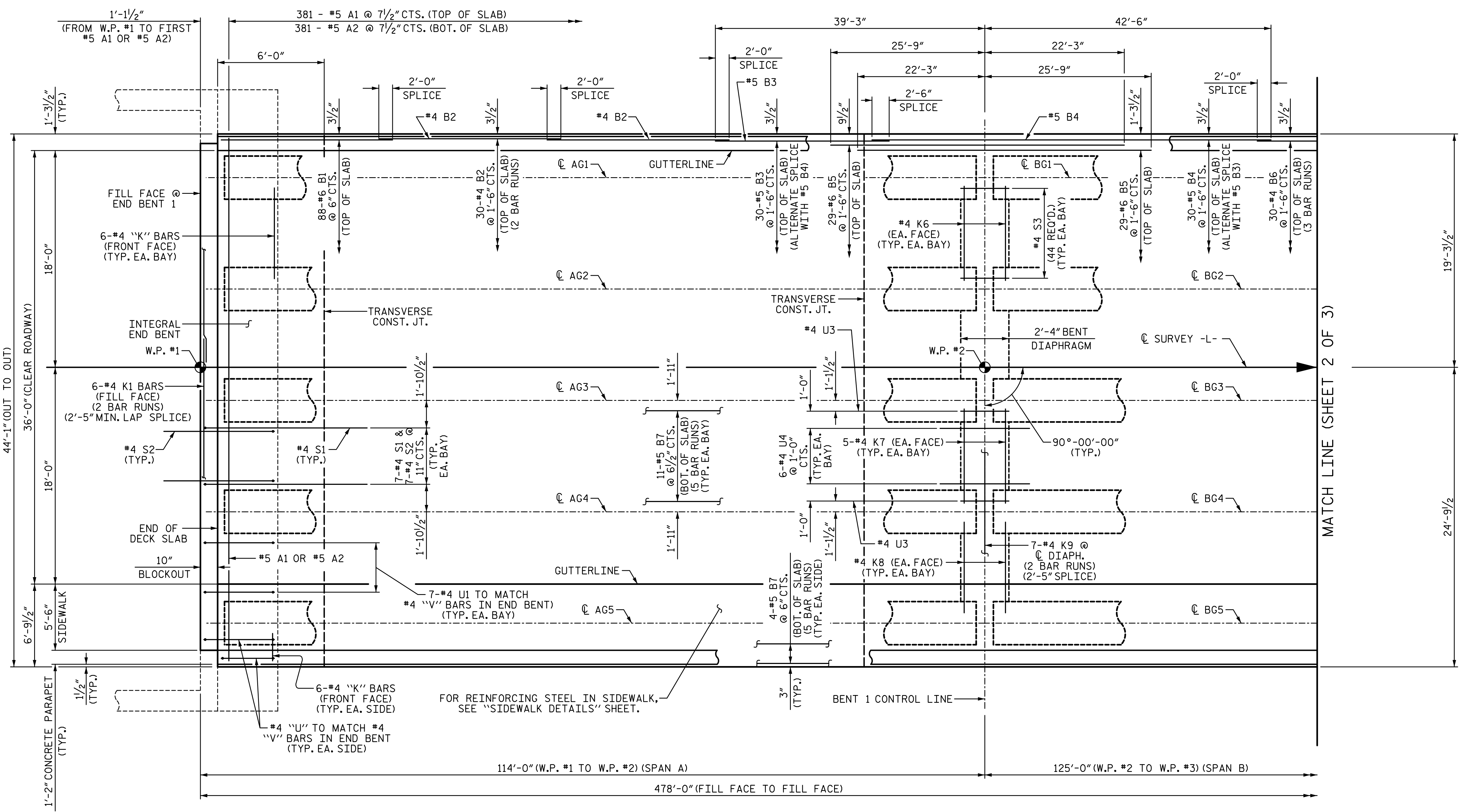


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-12
1			3			TOTAL SHEETS
2			4			53

DRAWN BY: <u>J.R. SEALEY</u>	DATE: <u>2-19</u>
CHECKED BY: <u>J. A. BATTS</u>	DATE: <u>2-19</u>
DESIGN ENGINEER OF RECORD: <u>J. A. BATTS</u>	DATE: <u>2-19</u>

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**NOTES:**

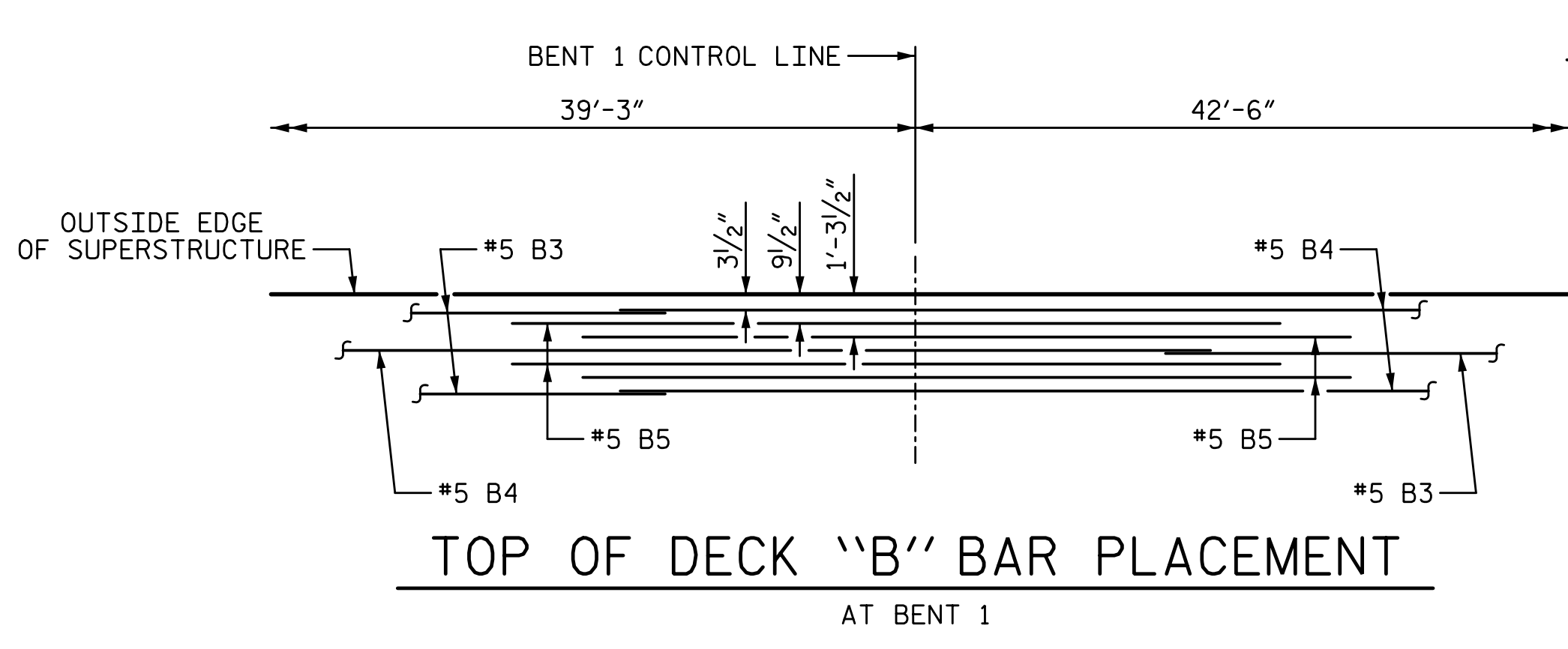
FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS SEE "FRAMING PLAN" SHEET.

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

FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.

FOR REINFORCING STEEL IN END BENT CAPS AND WINGS, SEE "END BENT" SHEETS.

FOR SPLICE LENGTH NOT SHOWN, REFER TO SPLICE CHART ON "BILL OF MATERIAL" SHEET 2 OF 2.



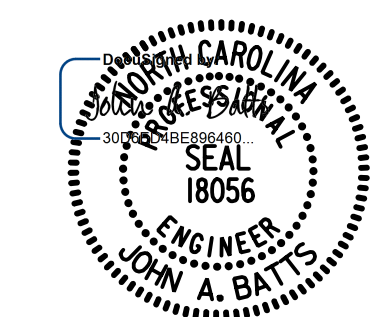
**PLAN OF SPANS**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**PLAN OF SPANS**

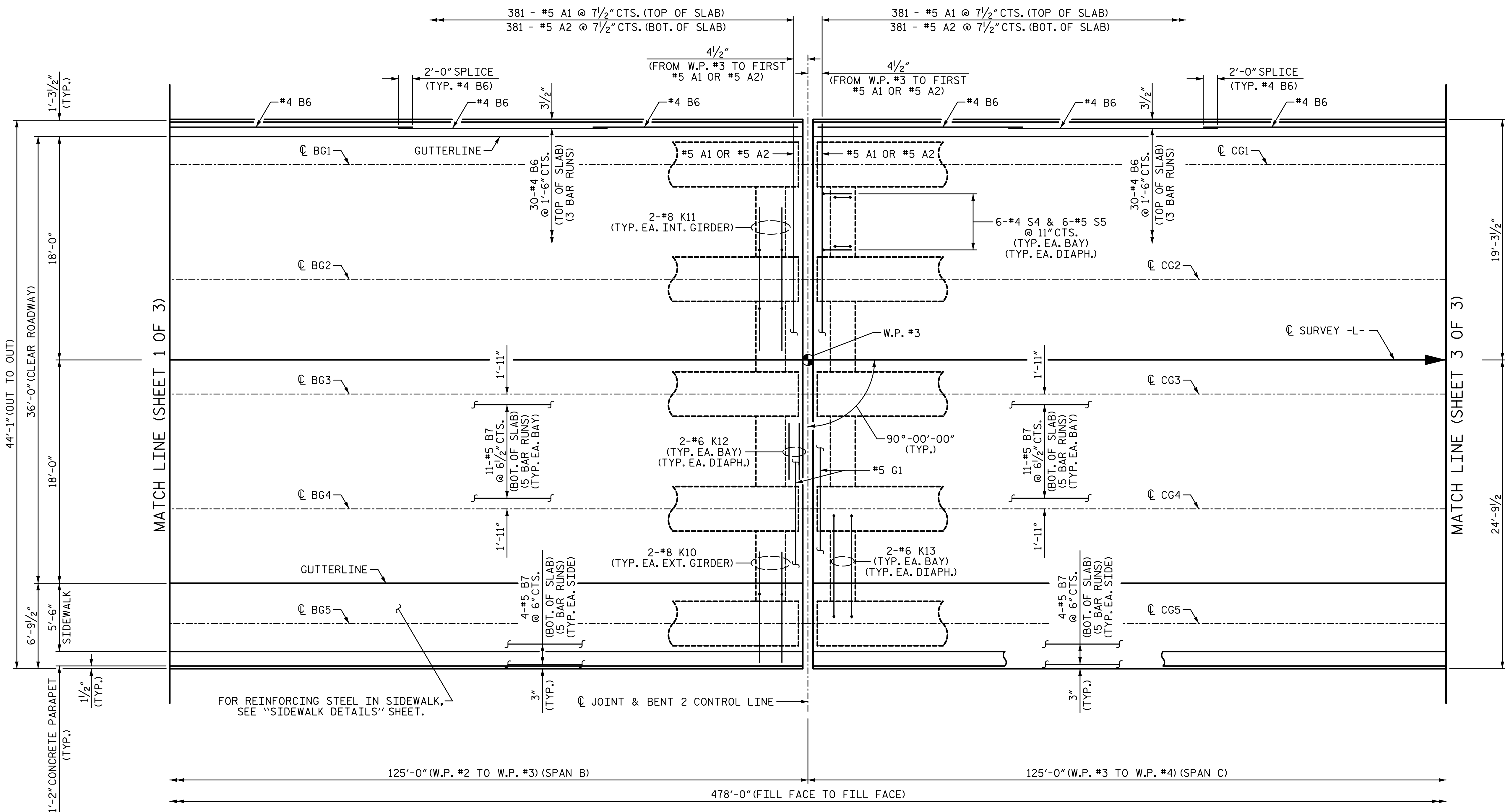


DRAWN BY: J. R. SEALEY	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

REVISIONS				SHEET NO. S-13
NO.	BY:	DATE:	TOTAL SHEETS 53	
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**NOTES:**

FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS SEE "FRAMING PLAN" SHEET.

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

FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.

FOR REINFORCING STEEL IN END BENT CAPS AND WINGS, SEE "END BENT" SHEETS.

FOR SPLICE LENGTH NOT SHOWN, REFER TO SPLICE CHART ON "BILL OF MATERIAL" SHEET 2 OF 2.

SPAN B

SPAN C

PLAN OF SPANS

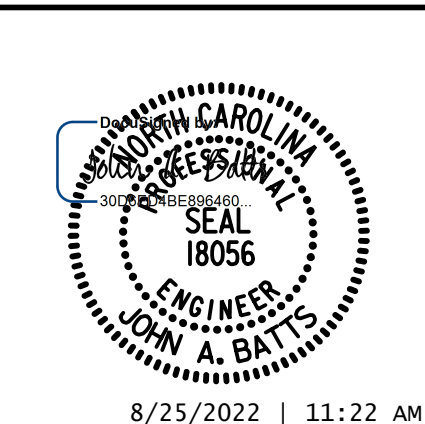
PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

PLAN OF SPANS

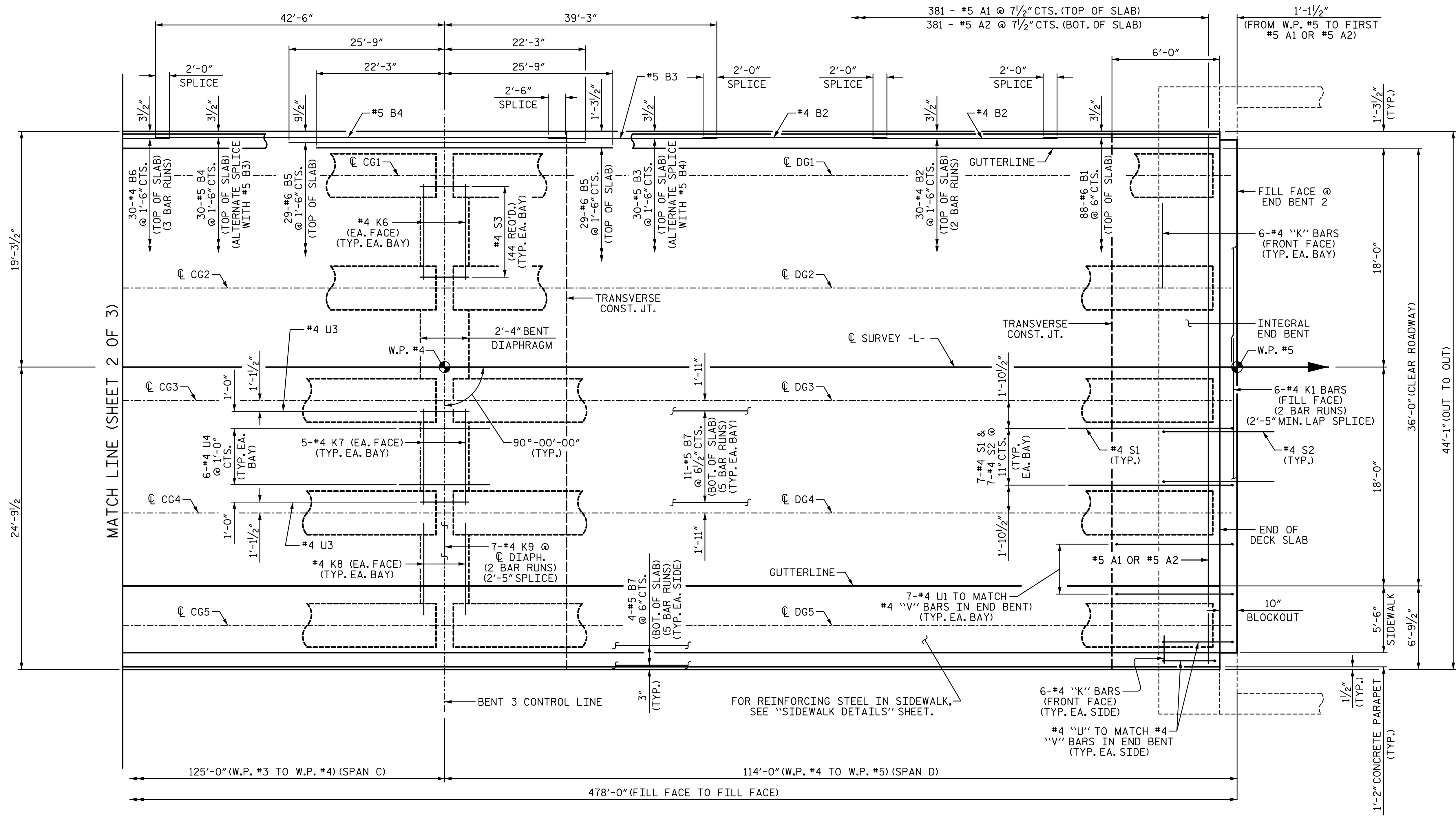
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LICENSURE NO. C-4434						8/25/2022   11:22 AM		REVISIONS		SHEET NO. S-14	
NO.	BY:	DATE:	NO.	BY:	DATE:					TOTAL SHEETS 53	
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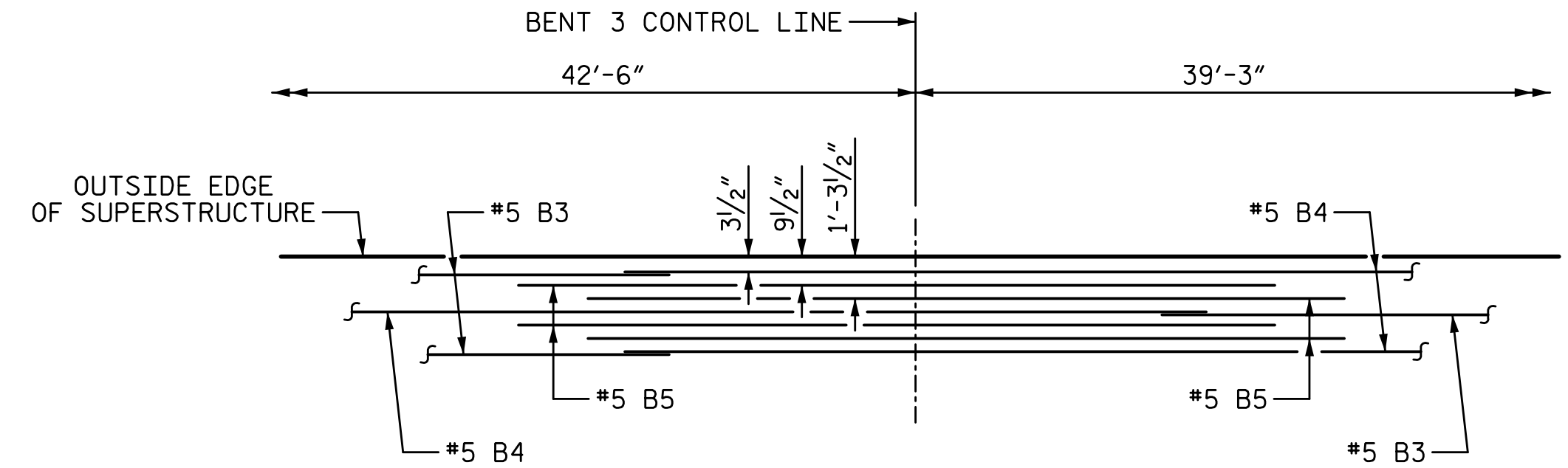
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SPAN C

SPAN D

PLAN OF SPANS



TOP OF DECK "B" BAR PLACEMENT

AT BENT 3

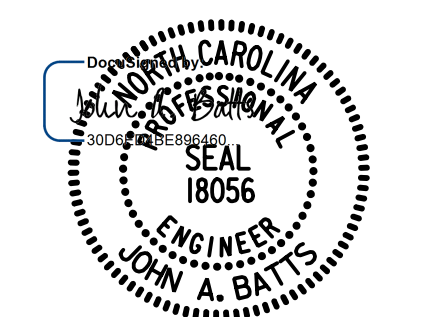
NOTES:

- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS SEE "FRAMING PLAN" SHEET.
- FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET 1 OF 2.
- FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.
- FOR REINFORCING STEEL IN END BENT CAPS AND WINGS, SEE "END BENT" SHEETS.
- FOR SPLICE LENGTH NOT SHOWN, REFER TO SPLICE CHART ON "BILL OF MATERIAL" SHEET 2 OF 2.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 3 OF 3

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

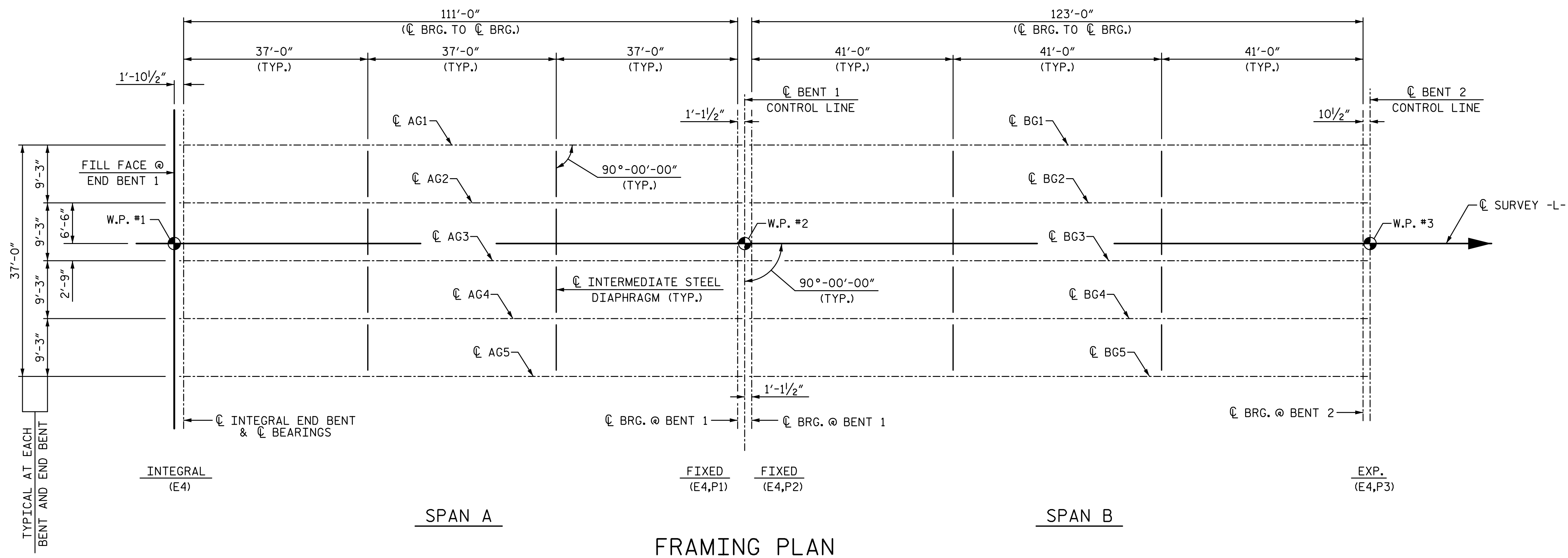


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NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			53

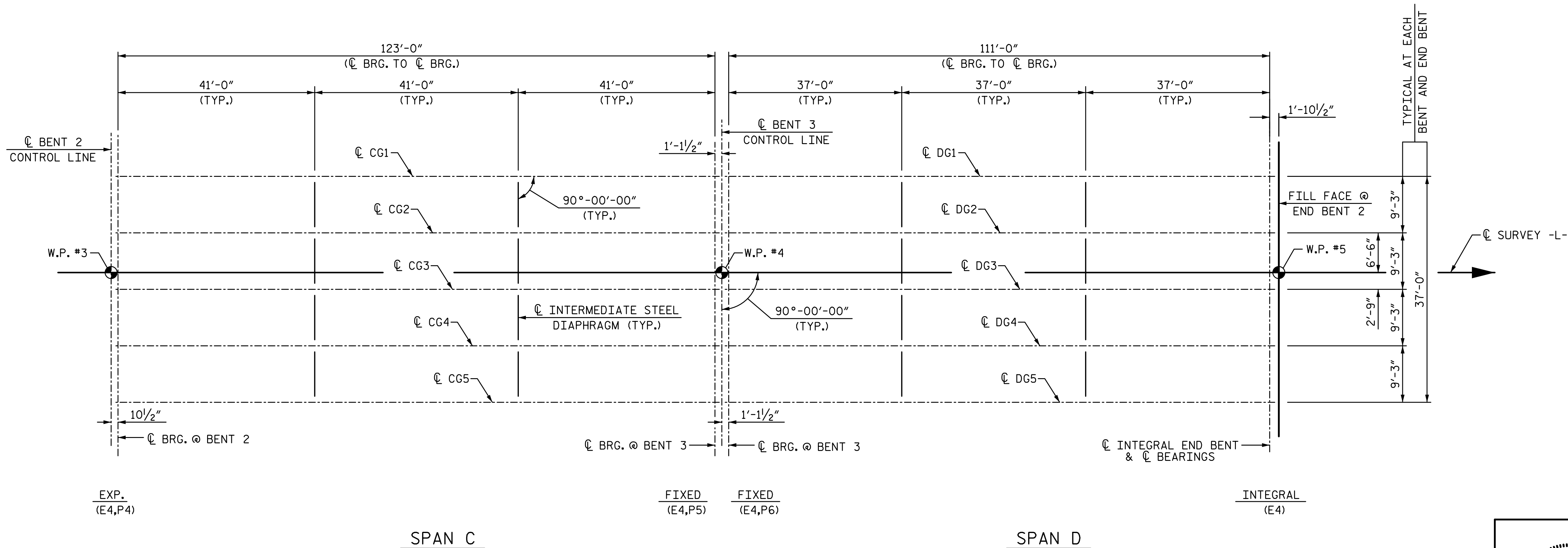
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**NOTES:**  
 FOR INTERMEDIATE STEEL DIAPHRAGM DETAIL, SEE  
 "INTERMEDIATE STEEL DIAPHRAGM FOR 72"  
 PRESTRESSED CONCRETE MODIFIED BULB TEE" SHEET.

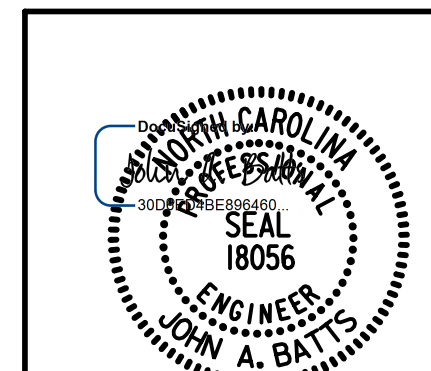
**FRAMING PLAN**



**FRAMING PLAN**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

DRAWN BY: J.R. SEALEY DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19



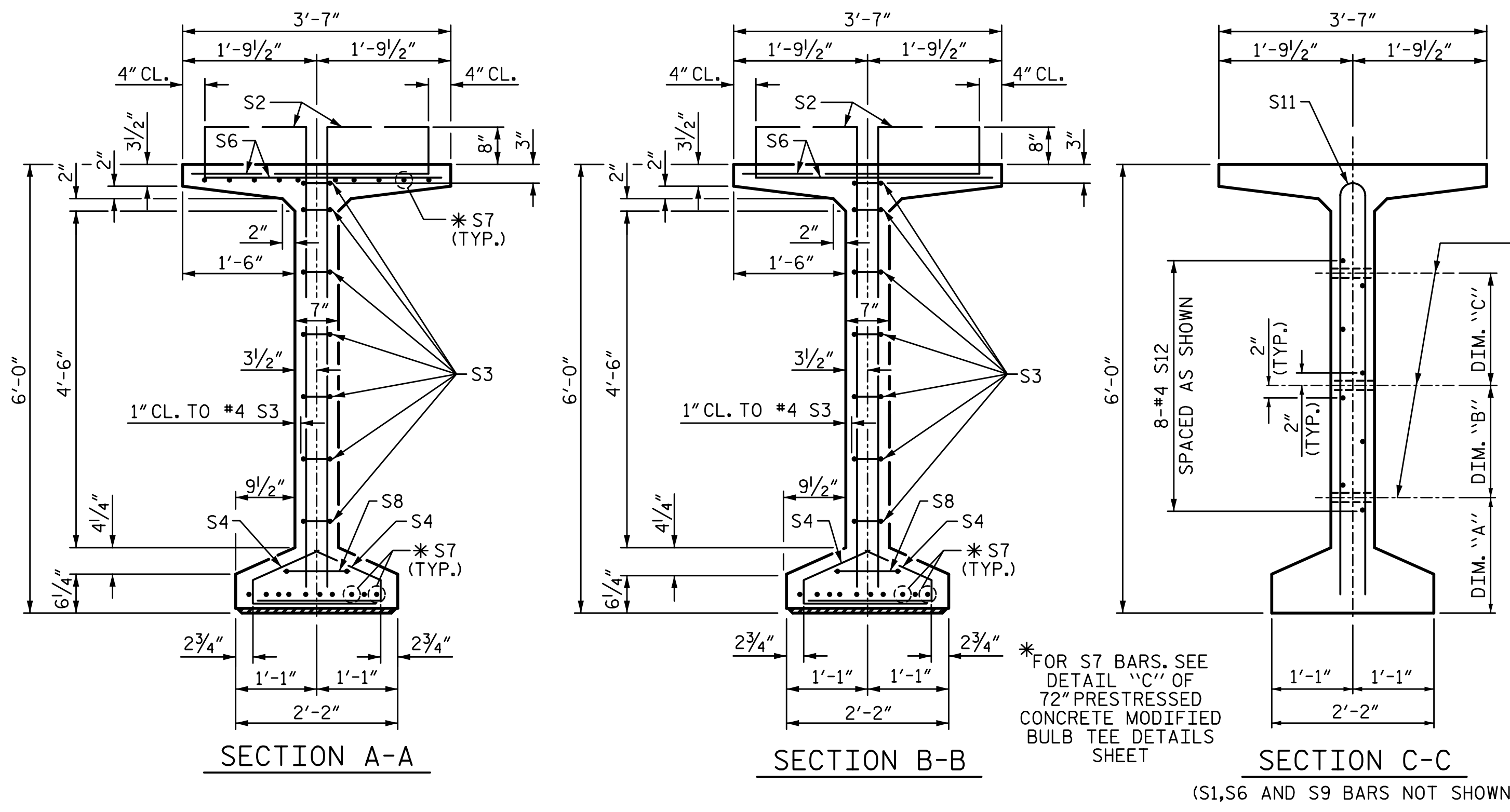
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**FRAMING PLAN**

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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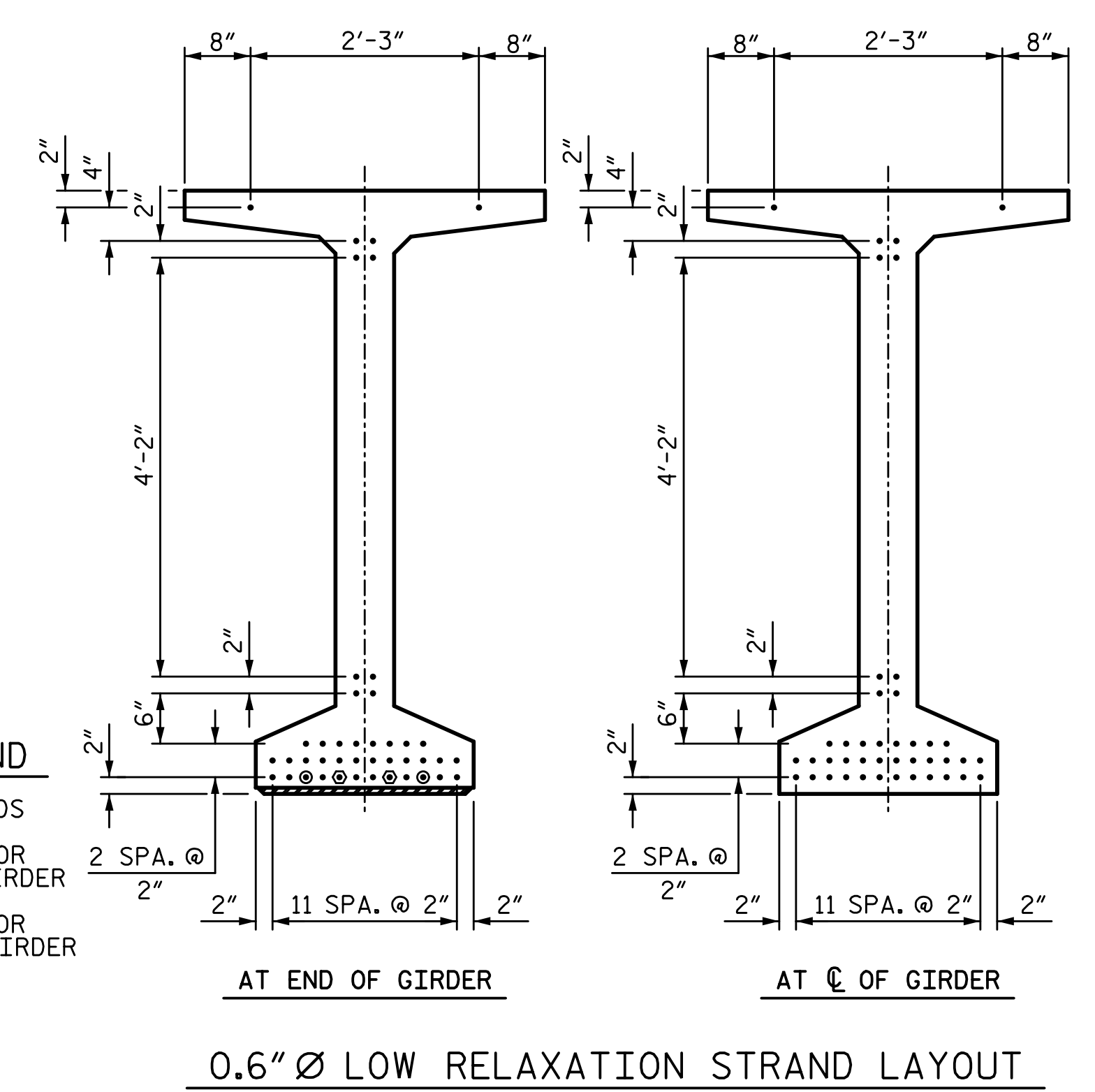


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1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.

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

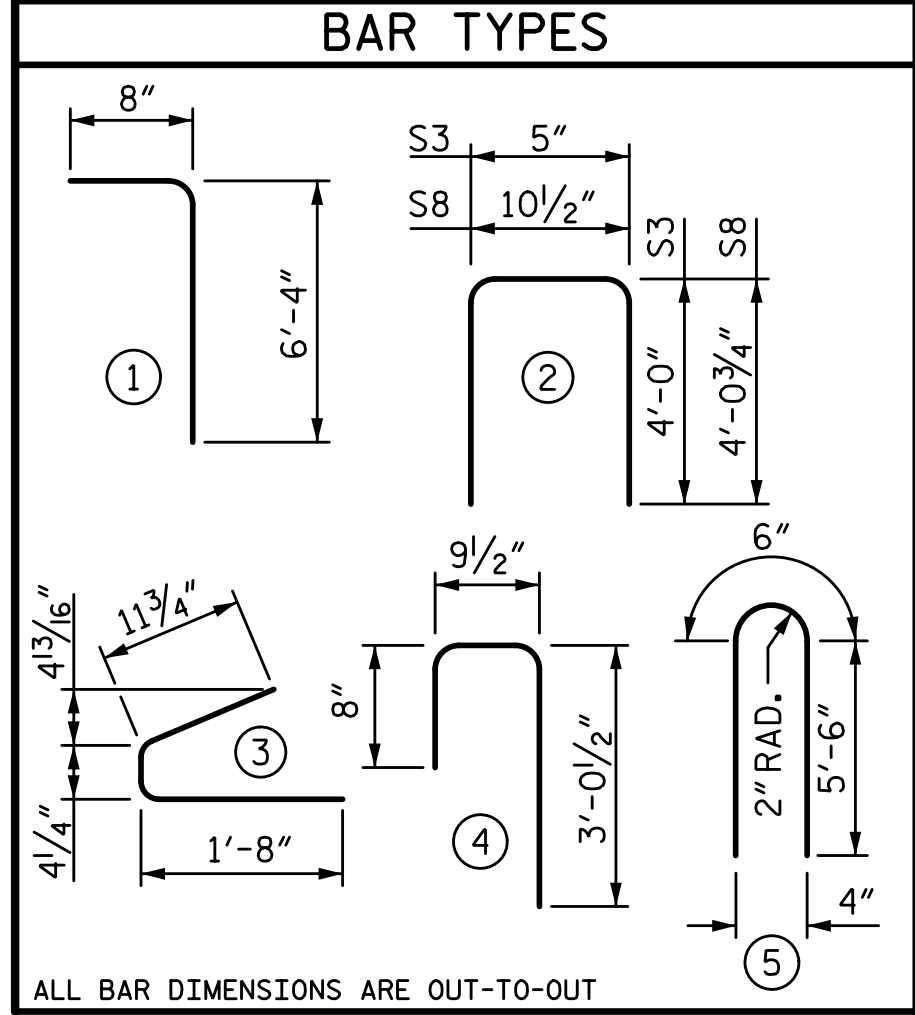


0.6" Ø LOW RELAXATION STRAND LAYOUT

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

REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	184	#4	1	7'-0"	860
S2	24	#5	1	7'-0"	175
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S6	208	#5	4	4'-6"	976
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	61	#5	STR	3'-3"	207
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	11'-6"	96
S12	16	#4	STR	8'-0"	86

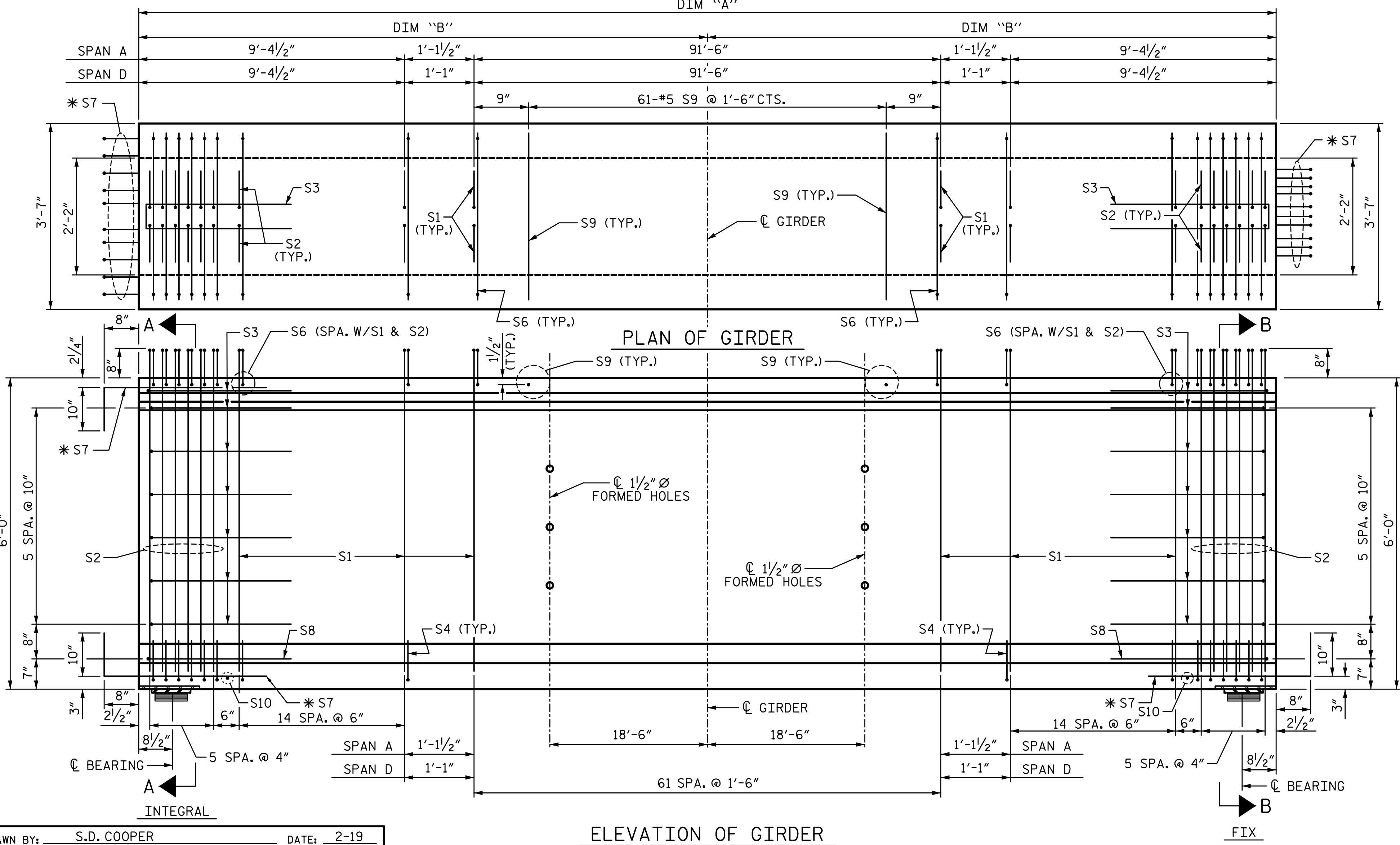
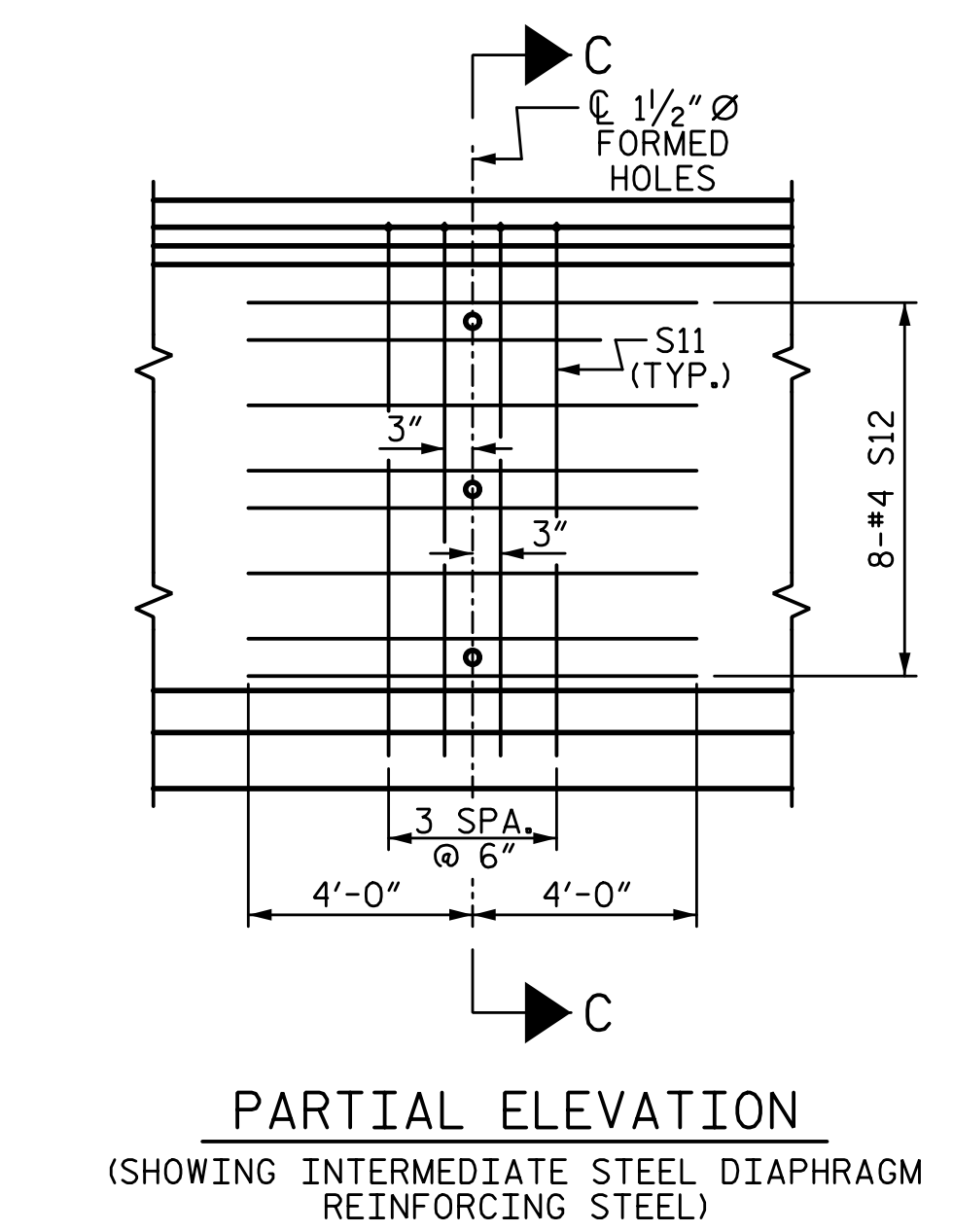
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
ALL GIRDERS	2782	24.1	42

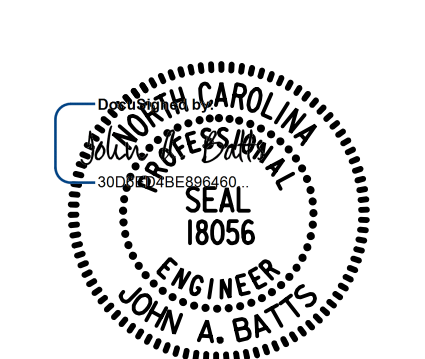
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
SPAN A	5	112'-6"
SPAN D	5	112'-5"

DIMENSION TABLE		
	"A"	"B"
SPAN A (SLOPED)	112'-6"	56'-3"
SPAN A (HORIZ.)	112'-5"	56'-2 1/2"
SPAN D	112'-5"	56'-2 1/2"



PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPANS A & D

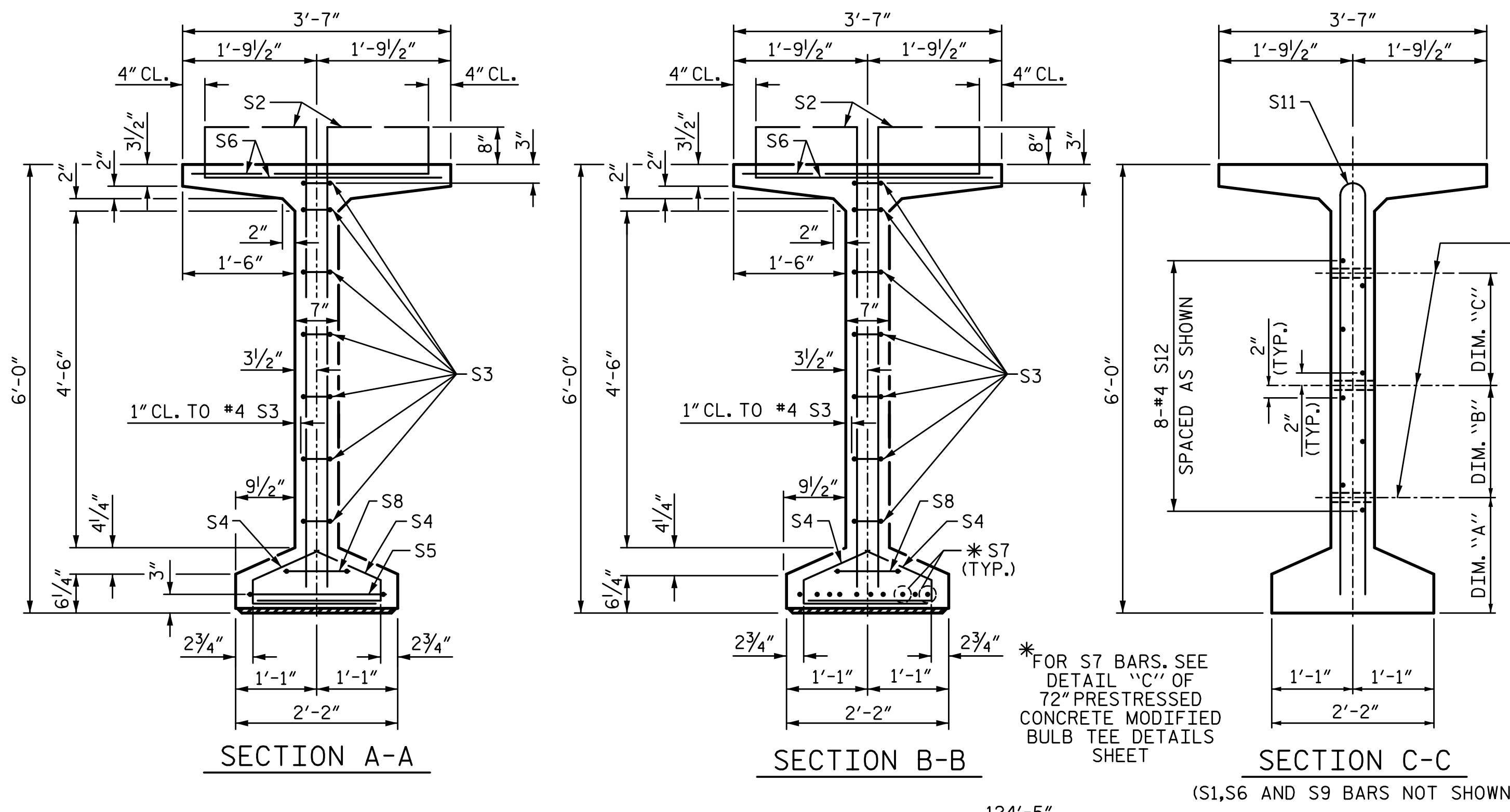


DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

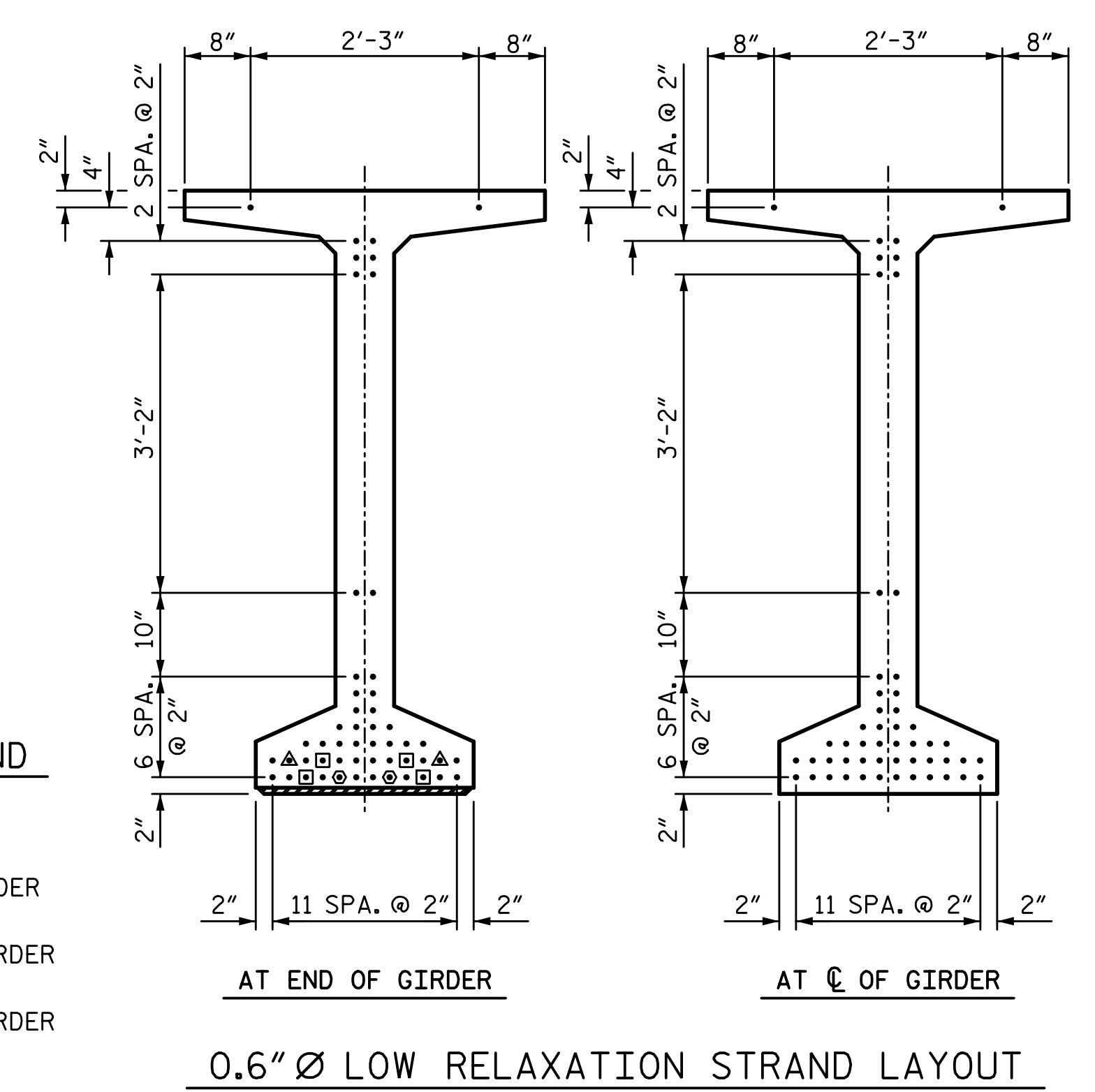
REVISIONS				SHEET NO.	
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2			4		

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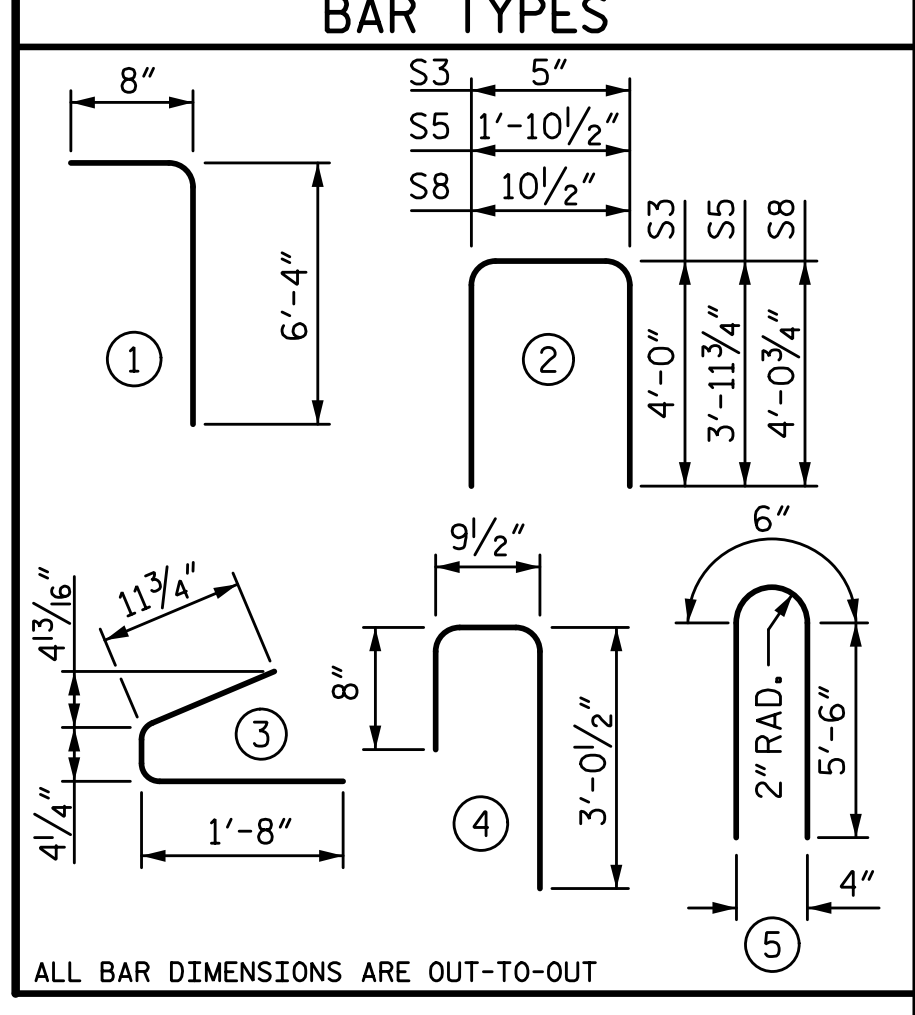
- DEBONDING LEGEND**
- FULLY BONDED STRAND
  - ▲ STRAND DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ◻ STRAND DEBONDED FOR 23'-0" FROM END OF GIRDER
  - ⊙ STRAND DEBONDED FOR 35'-0" FROM END OF GIRDER



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

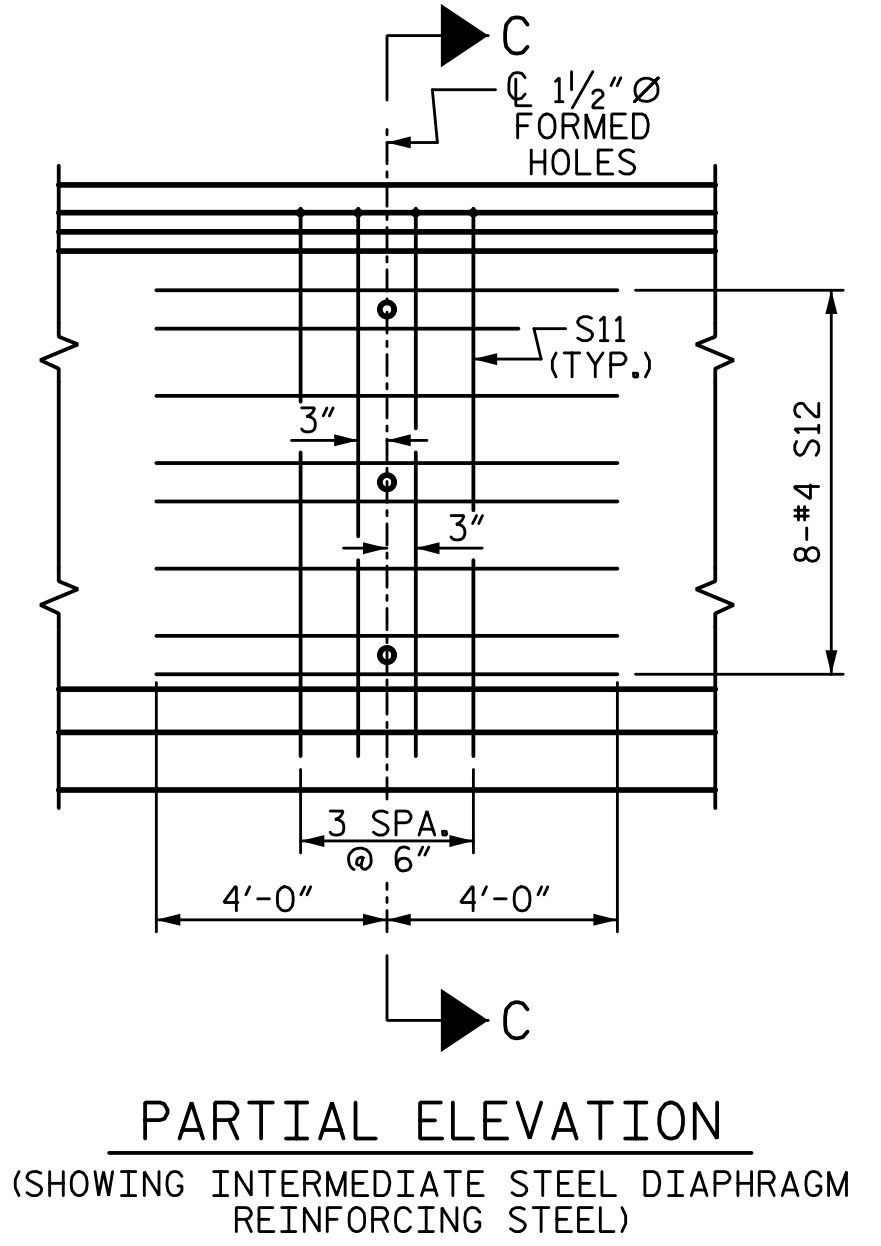
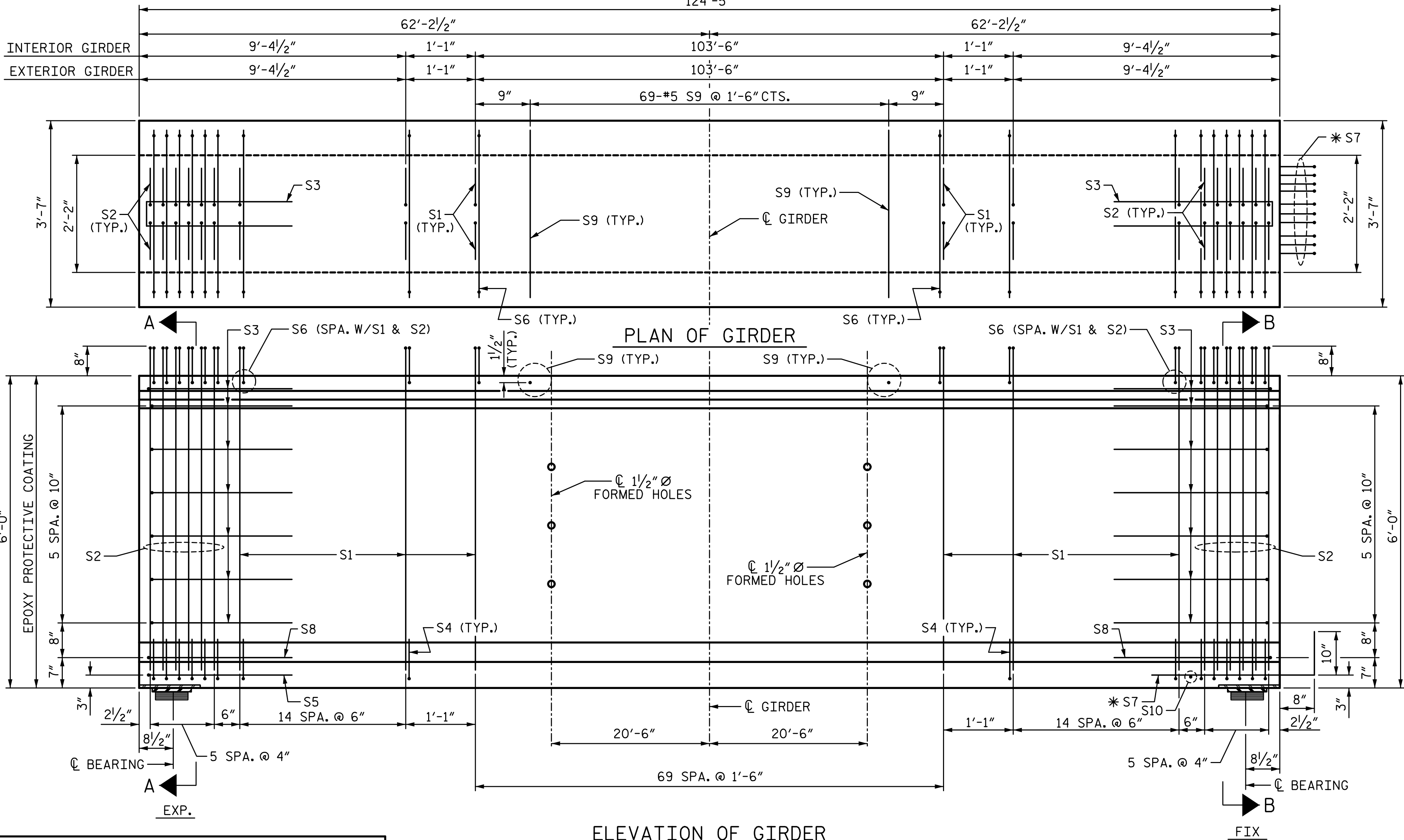
REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	200	#4	1	7'-0"	935
S2	24	#5	1	7'-0"	175
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	224	#5	4	4'-6"	1051
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	69	#5	STR	3'-3"	234
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	11'-6"	96
S12	16	#4	STR	8'-0"	86

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



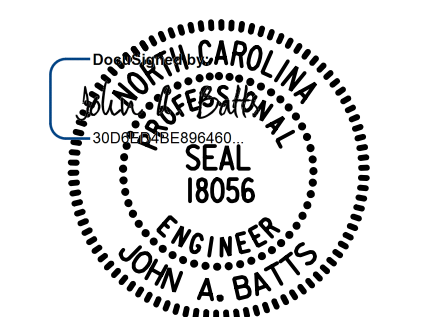
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
ALL GIRDERS	2892	26.7	52

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	124'-5"	1244'-2"



PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPANS B & C



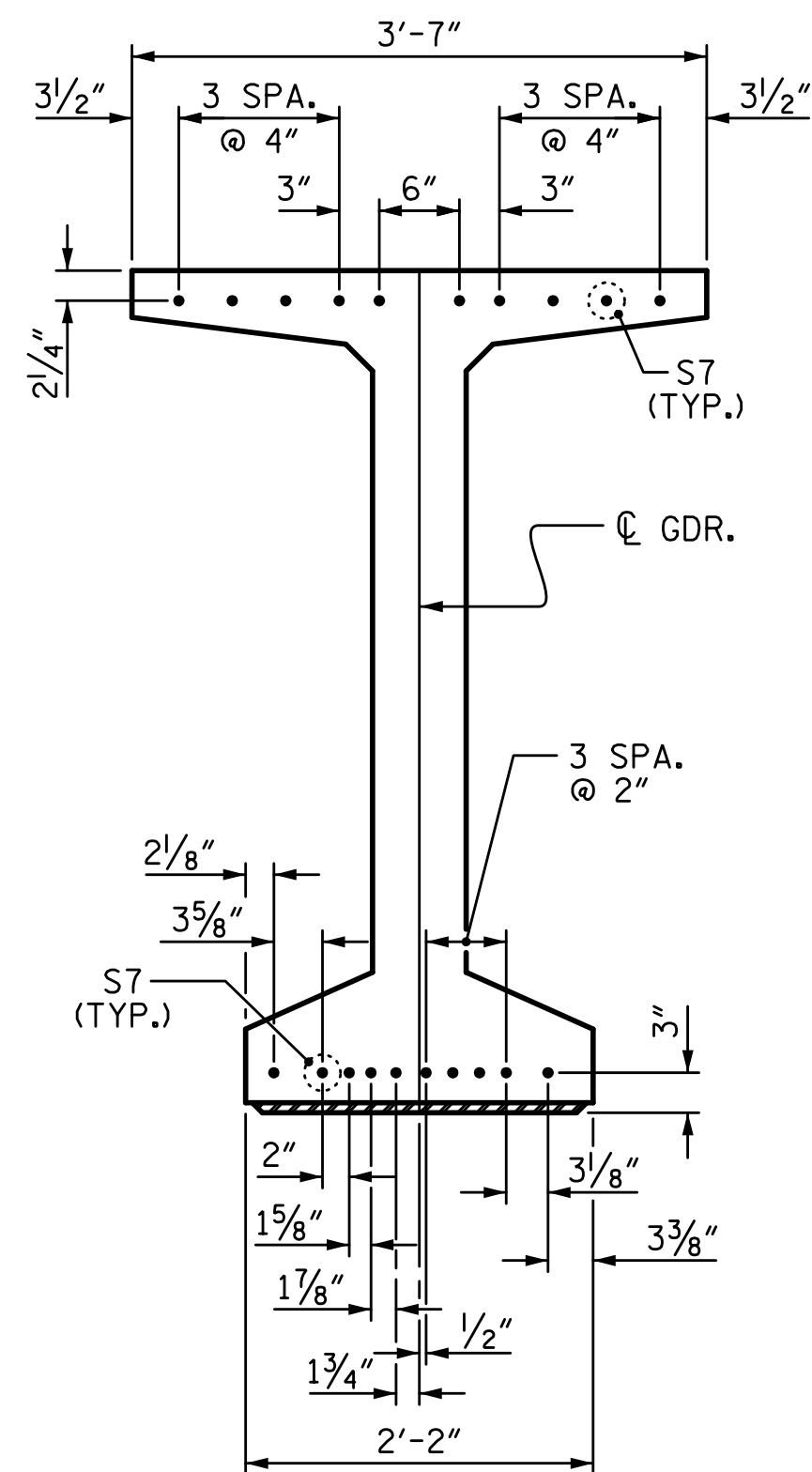
DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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2			4		

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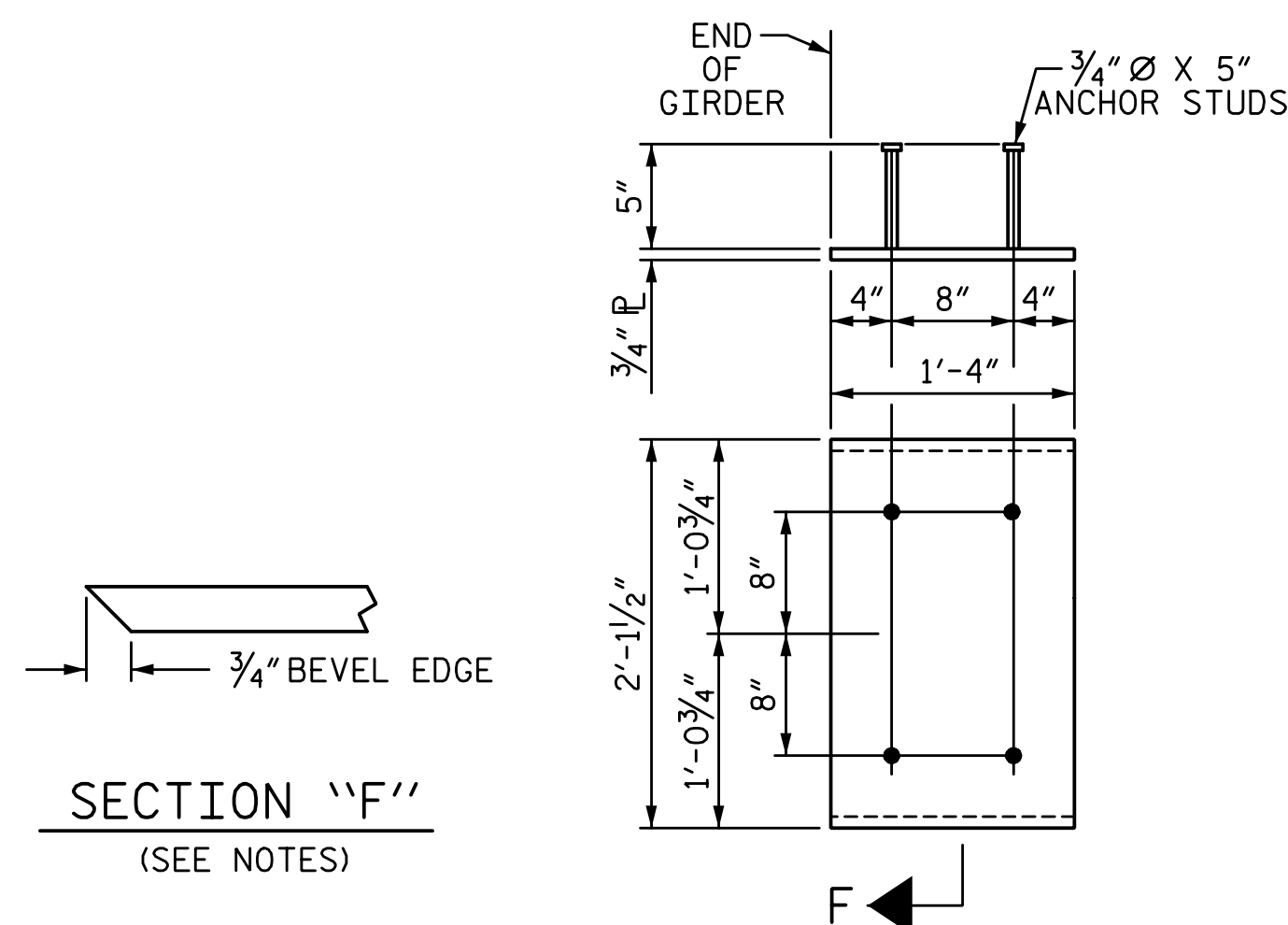
TOTAL SHEETS 53

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**DETAIL "C"**

SHOWN AT INTEGRAL END BENT.  
FOR CONTINUOUS BENTS, S7 IN BOTTOM FLANGE ONLY.



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

**EMBEDDED PLATE "B-1" DETAILS**

(2 REQ'D PER GIRDER)

**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 FOR SPANS B AND C.

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 7200 PSI.

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

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

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.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
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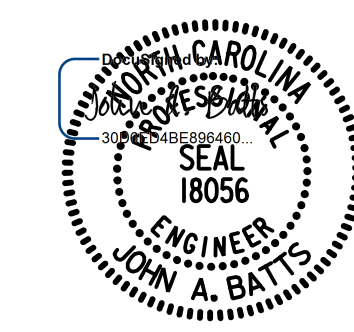
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

72" PRESTRESSED CONCRETE  
MODIFIED BULB TEE  
DETAILS



5640 Dillard Drive, Suite 200  
Cary, NC 27518

LICENSURE NO. C-4434



8/25/2022 | 11:22 AM

REVISIONS

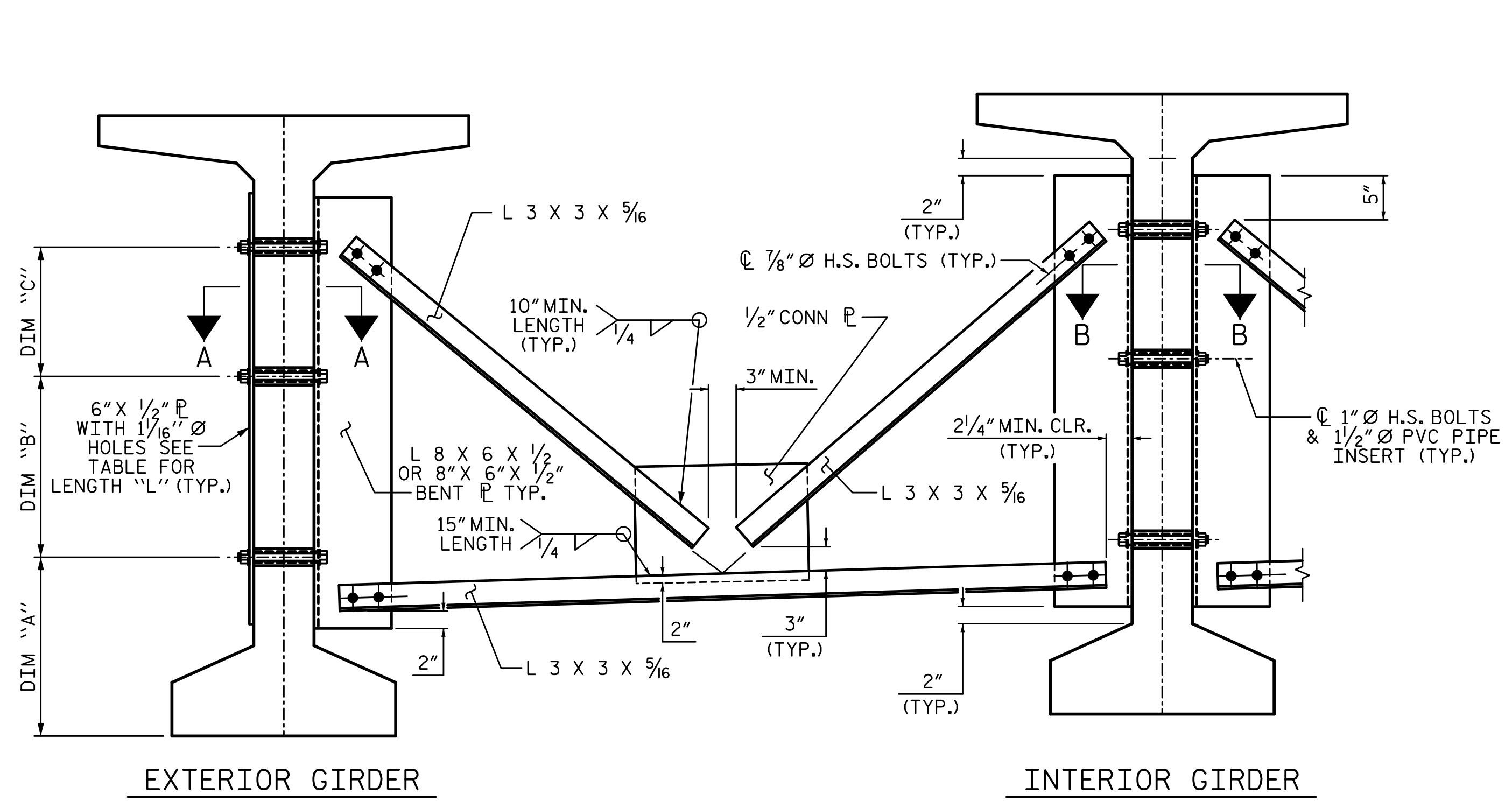
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SHEET NO.  
S-19  
TOTAL SHEETS  
53

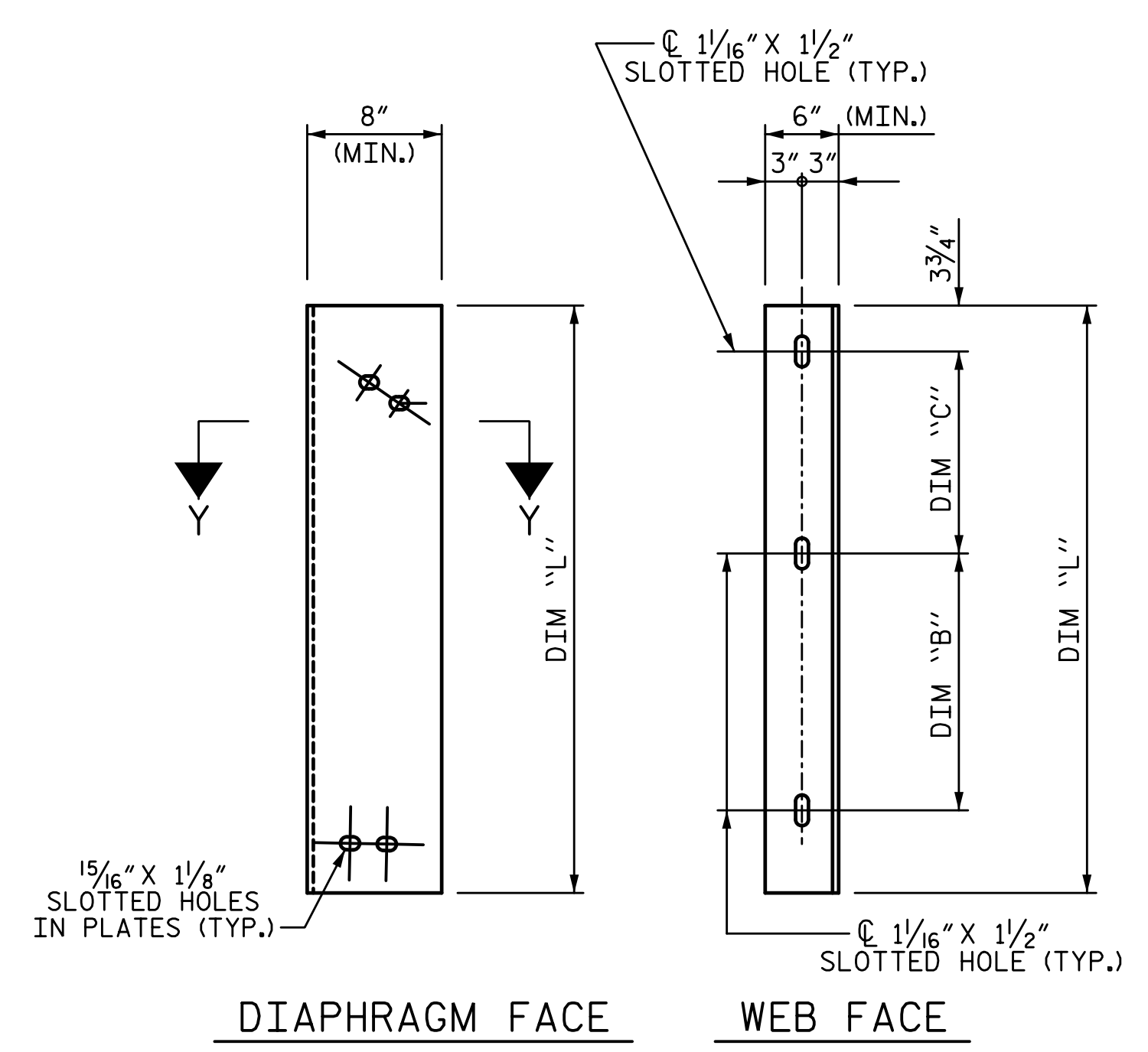
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CHECKED BY: <u>J. A. BATTS</u>	DATE: <u>2-19</u>
DESIGN ENGINEER OF RECORD: <u>J. A. BATTS</u>	DATE: <u>2-19</u>

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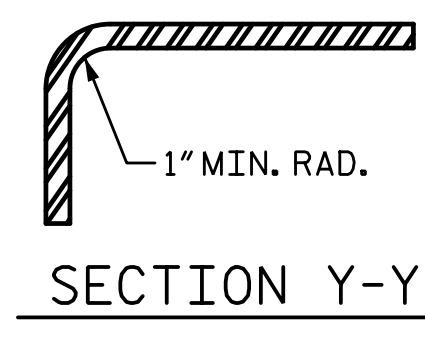
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**PART SECTION AT INTERMEDIATE DIAPHRAGM**



**DIAPHRAGM FACE WEB FACE**



**SECTION Y-Y CONNECTOR PLATE 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.

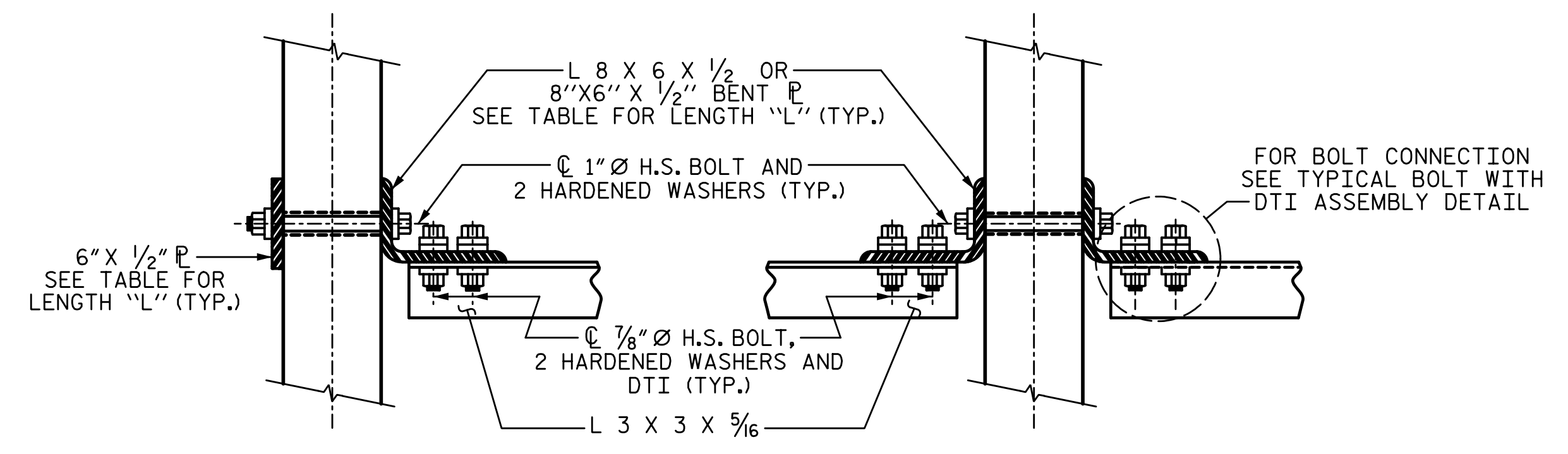
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

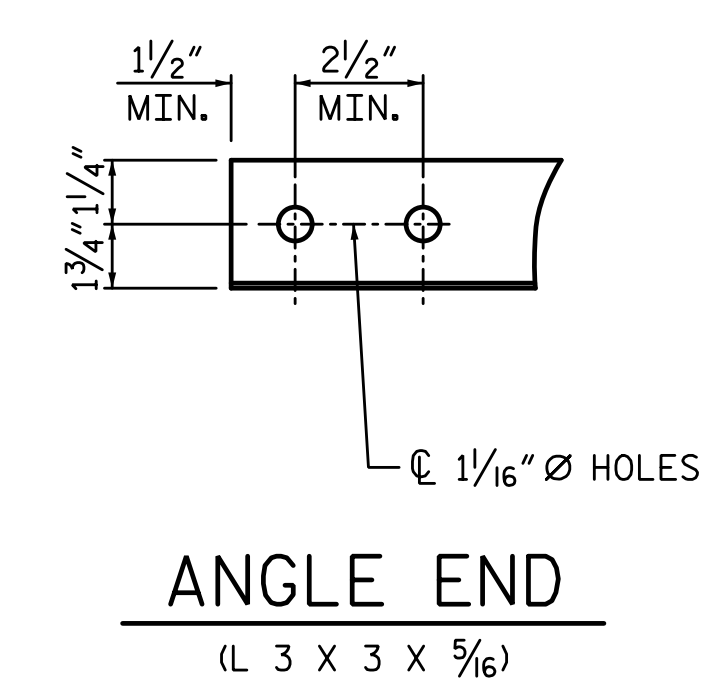
**TABLE**

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-7"	1'-9"	1'-6 3/4"	4'-2"

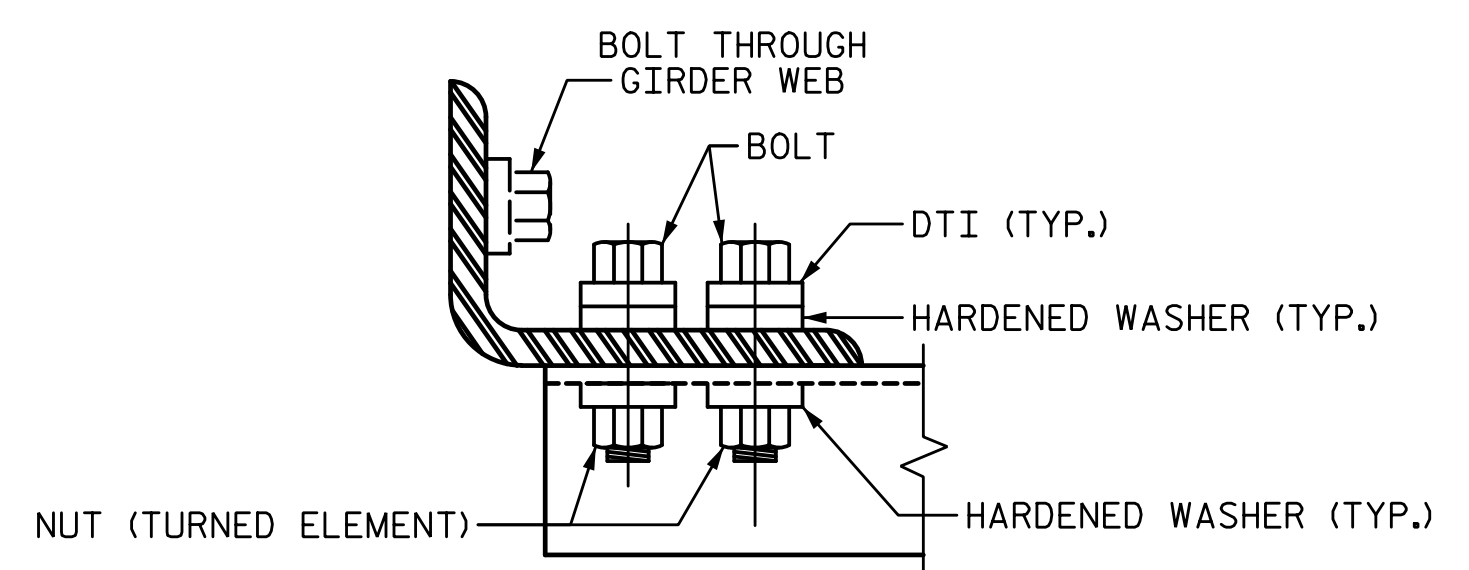


**SECTION A-A SECTION B-B**

**CONNECTION DETAILS**

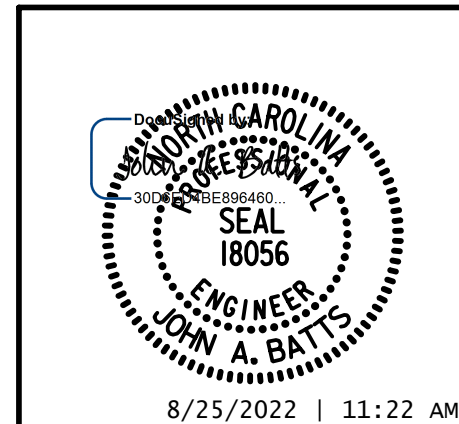


**ANGLE END (L 3 x 3 x 5/16)**



**BOLT WITH DTI ASSEMBLY DETAIL**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-



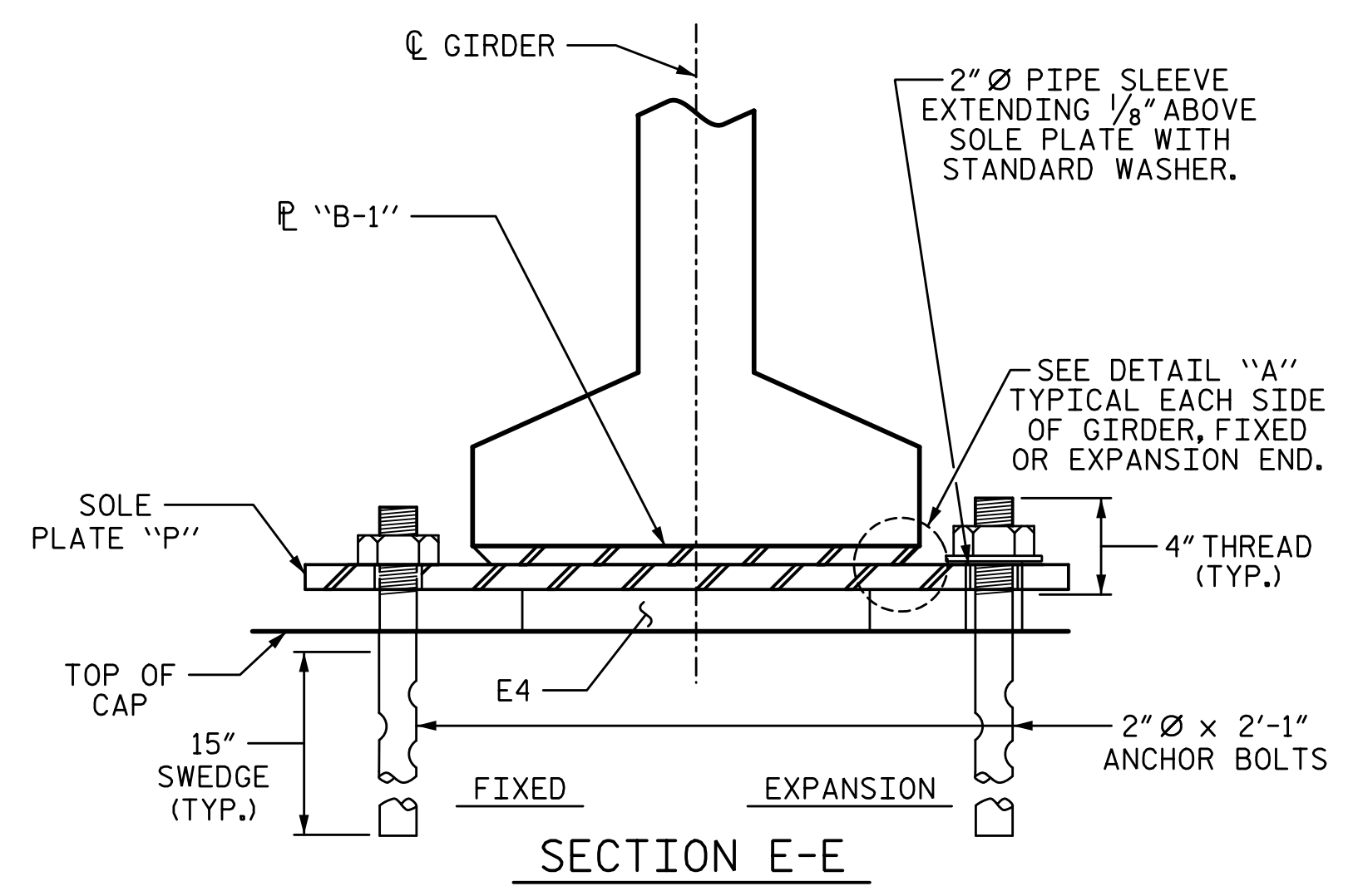
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**INTERMEDIATE STEEL DIAPHRAGM FOR 72" PRESTRESSED CONCRETE MODIFIED BULB TEE**

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTIS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTIS DATE: 2-19

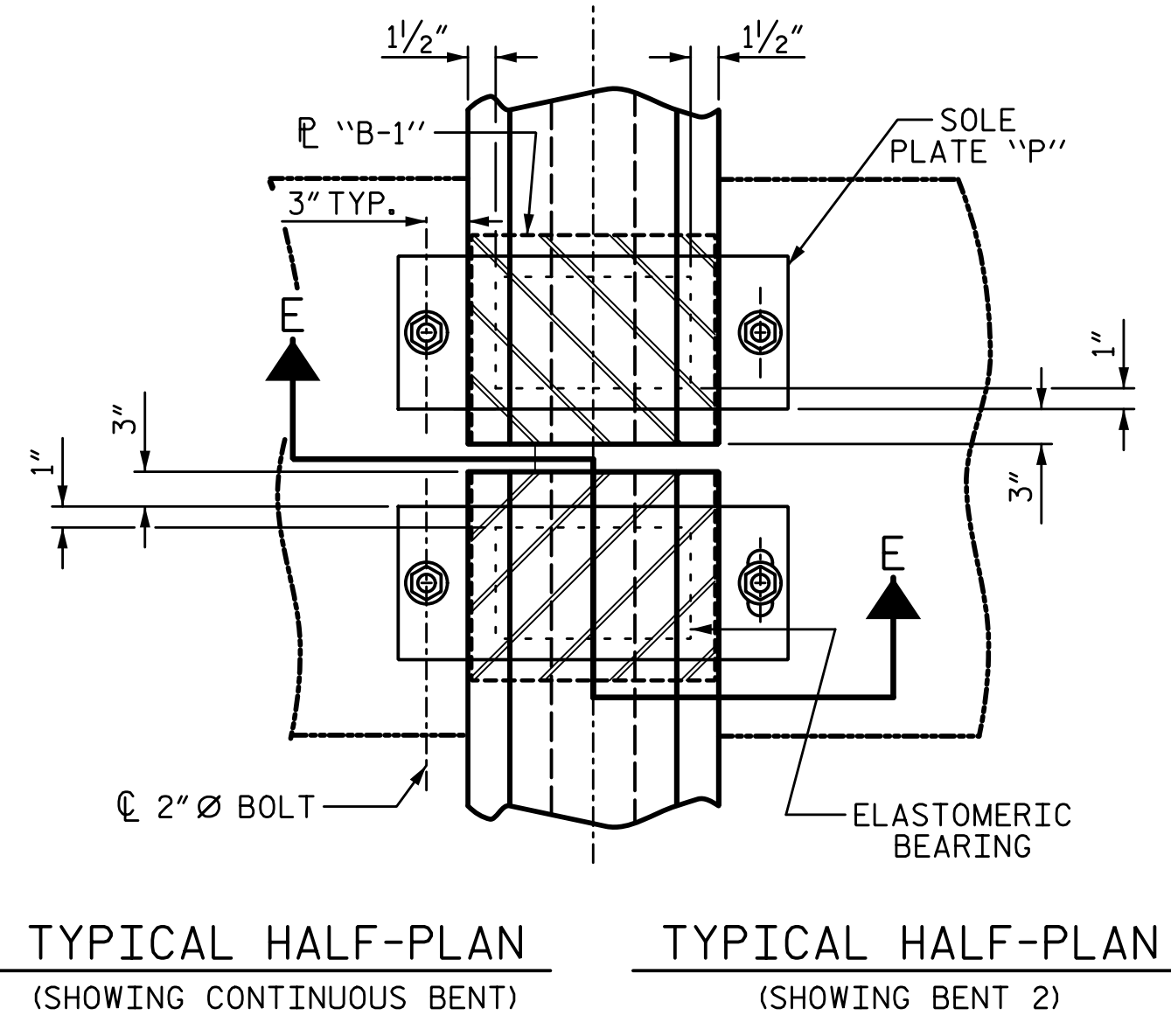
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2			4			53

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



**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 BURR WITH A SHARP POINTED TOOL.

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

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

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

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

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

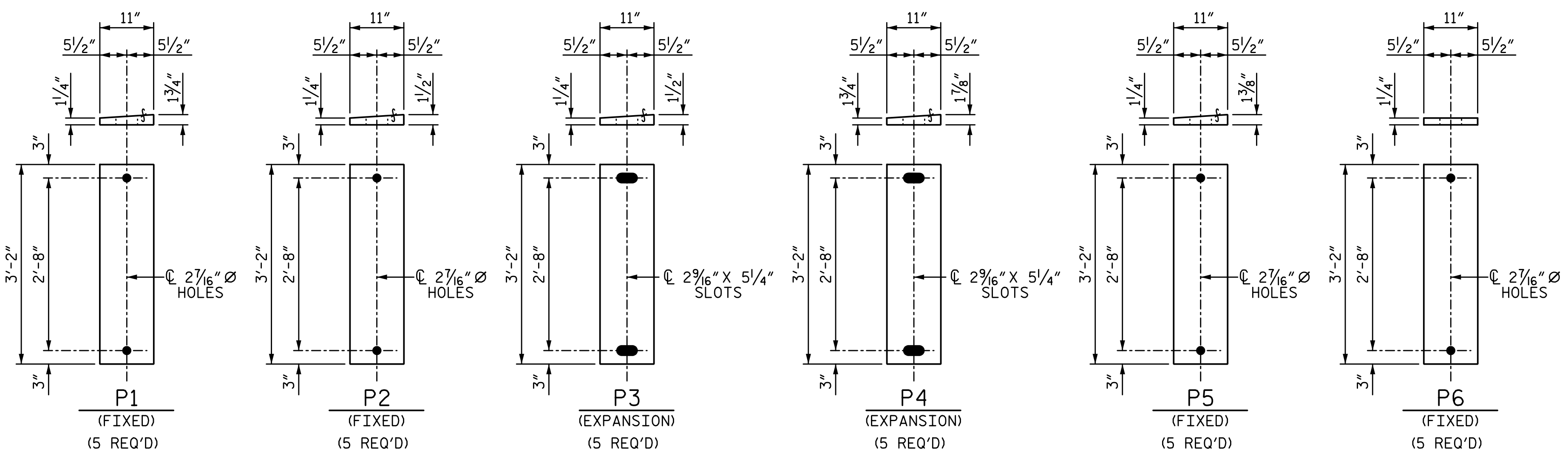
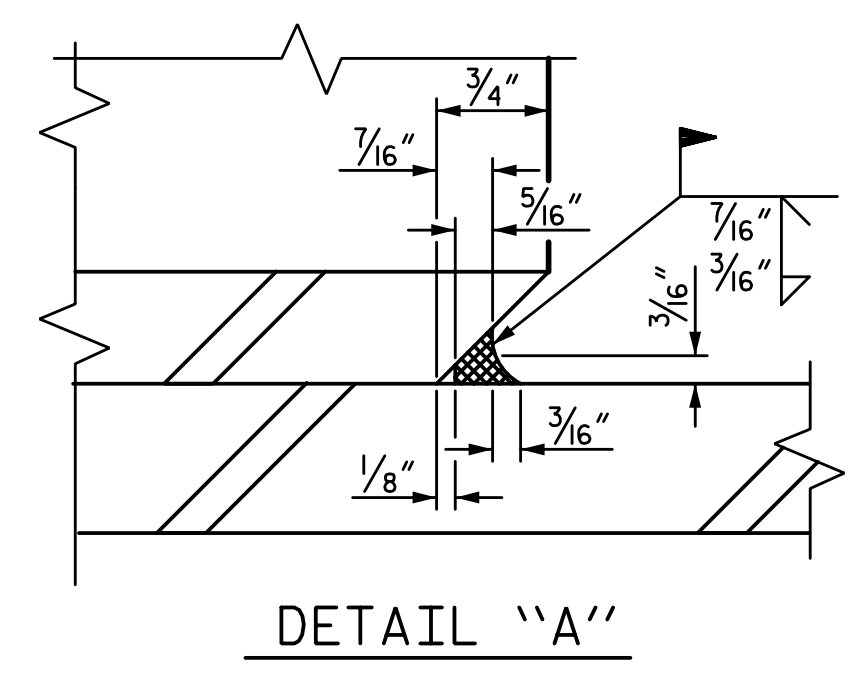
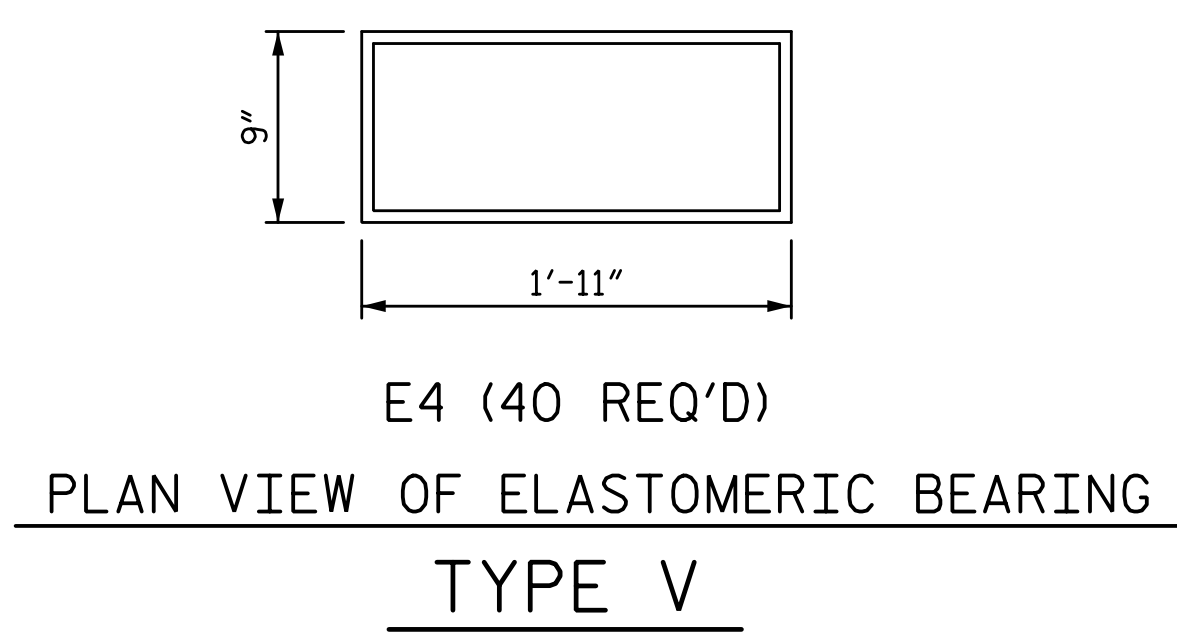
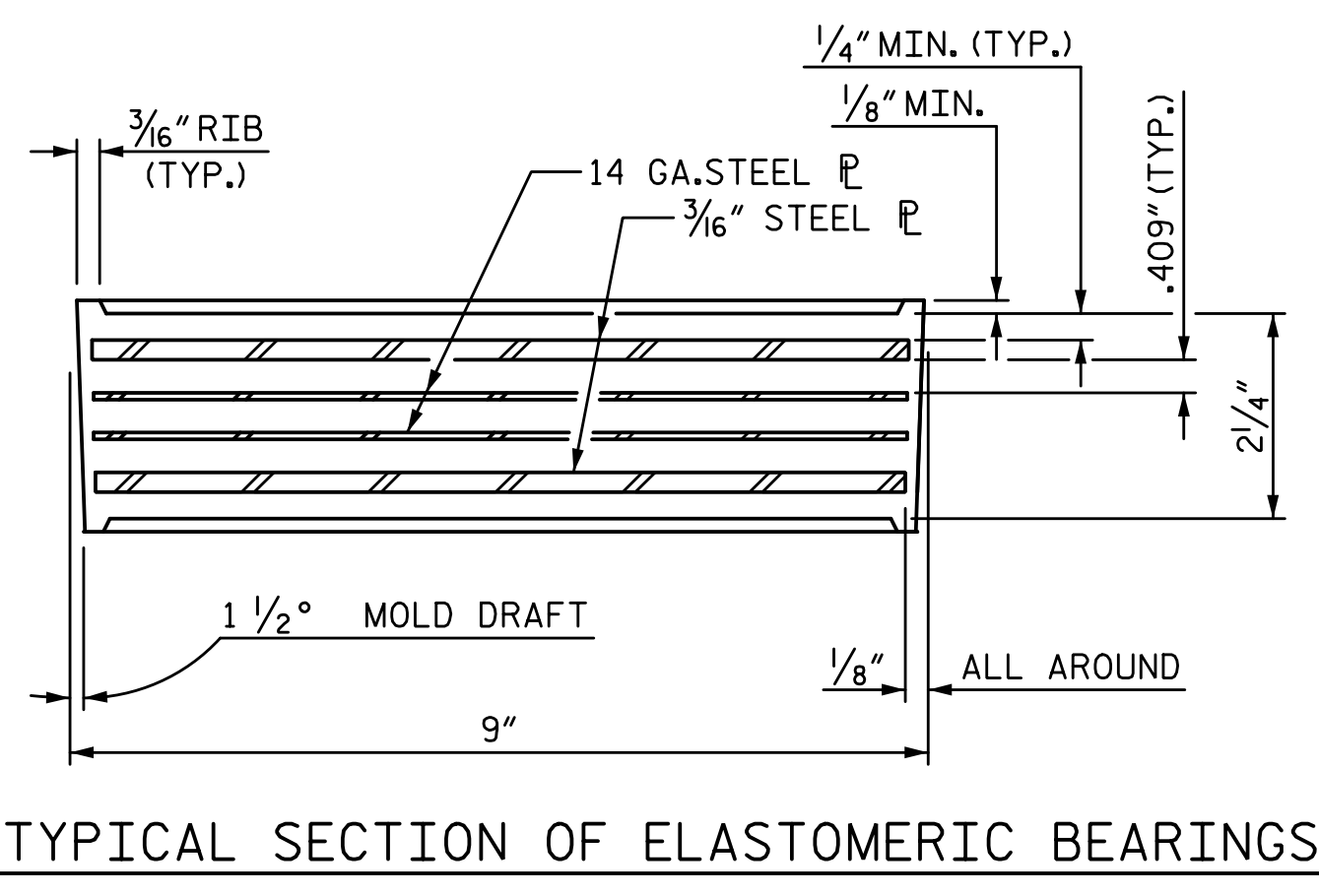
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

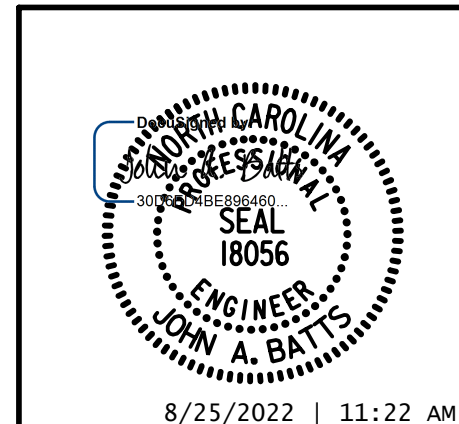
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



**SOLE PLATE DETAILS**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

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



DRAWN BY: S. D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTIS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTIS DATE: 2-19

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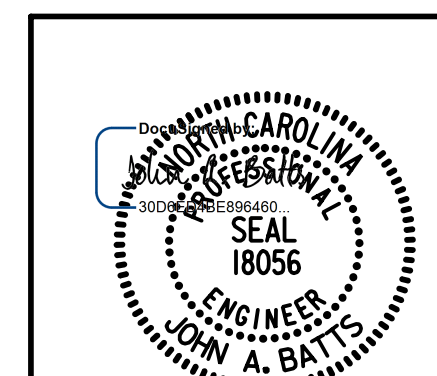
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPANS A & D																						
0.6" Ø LOW RELAXATION																						
GIRDER G1																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.036	0.071	0.104	0.135	0.162	0.185	0.203	0.216	0.224	0.227	0.224	0.216	0.203	0.185	0.162	0.135	0.104	0.071	0.036	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.017	0.036	0.054	0.071	0.085	0.098	0.107	0.115	0.119	0.121	0.119	0.115	0.107	0.098	0.085	0.071	0.054	0.036	0.017	0
FINAL CAMBER	↑	0	1/4"	7/16"	5/8"	3/4"	15/16"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1 1/16"	1 5/16"	3/4"	5/8"	7/16"	1/4"	0
0.6" Ø LOW RELAXATION																						
GIRDERS G2-G4																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.036	0.071	0.104	0.135	0.162	0.185	0.203	0.216	0.224	0.227	0.224	0.216	0.203	0.185	0.162	0.135	0.104	0.071	0.036	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.018	0.039	0.058	0.076	0.092	0.105	0.116	0.124	0.128	0.130	0.128	0.124	0.116	0.105	0.092	0.076	0.058	0.039	0.018	0
FINAL CAMBER	↑	0	3/16"	3/8"	9/16"	1 1/16"	7/8"	1 5/16"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 1/8"	1 1/8"	1 1/16"	1 5/16"	7/8"	1 1/16"	9/16"	3/8"	3/16"	0
0.6" Ø LOW RELAXATION																						
GIRDER G5																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.036	0.071	0.104	0.135	0.162	0.185	0.203	0.216	0.224	0.227	0.224	0.216	0.203	0.185	0.162	0.135	0.104	0.071	0.036	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.017	0.036	0.054	0.071	0.085	0.098	0.107	0.115	0.119	0.121	0.119	0.115	0.107	0.098	0.085	0.071	0.054	0.036	0.017	0
FINAL CAMBER	↑	0	1/4"	7/16"	5/8"	3/4"	15/16"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1 1/16"	1 5/16"	3/4"	5/8"	7/16"	1/4"	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																						
SPANS B & C																						
0.6" Ø 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	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.043	0.084	0.124	0.160	0.192	0.218	0.240	0.256	0.265	0.269	0.265	0.256	0.240	0.218	0.192	0.160	0.124	0.084	0.043	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.026	0.055	0.082	0.106	0.128	0.147	0.162	0.173	0.180	0.182	0.180	0.173	0.162	0.147	0.128	0.106	0.082	0.055	0.026	0
FINAL CAMBER	↑	0	3/16"	3/8"	1/2"	5/8"	3/4"	7/8"	1 5/16"	1"	1"	1 1/16"	1"	1"	1 5/16"	7/8"	3/4"	5/8"	1/2"	3/8"	3/16"	0
0.6" Ø LOW RELAXATION																						
GIRDERS G2-G4																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.043	0.084	0.124	0.160	0.192	0.218	0.240	0.256	0.265	0.269	0.265	0.256	0.240	0.218	0.192	0.160	0.124	0.084	0.043	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.028	0.059	0.088	0.115	0.138	0.158	0.174	0.186	0.193	0.196	0.193	0.186	0.174	0.158	0.138	0.115	0.088	0.059	0.028	0
FINAL CAMBER	↑	0	3/16"	5/16"	7/16"	9/16"	5/8"	1 1/16"	1 3/16"	1 3/16"	7/8"	7/8"	7/8"	1 3/16"	1 3/16"	1 1/16"	5/8"	9/16"	7/16"	5/16"	3/16"	0
0.6" Ø LOW RELAXATION																						
GIRDER G5																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.043	0.084	0.124	0.160	0.192	0.218	0.240	0.256	0.265	0.269	0.265	0.256	0.240	0.218	0.192	0.160	0.124	0.084	0.043	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.026	0.055	0.082	0.106	0.128	0.147	0.162	0.173	0.180	0.182	0.180	0.173	0.162	0.147	0.128	0.106	0.082	0.055	0.026	0
FINAL CAMBER	↑	0	3/16"	3/8"	1/2"	5/8"	3/4"	7/8"	1 5/16"	1"	1"	1 1/16"	1"	1"	1 5/16"	7/8"	3/4"	5/8"	1/2"	3/8"	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).

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-



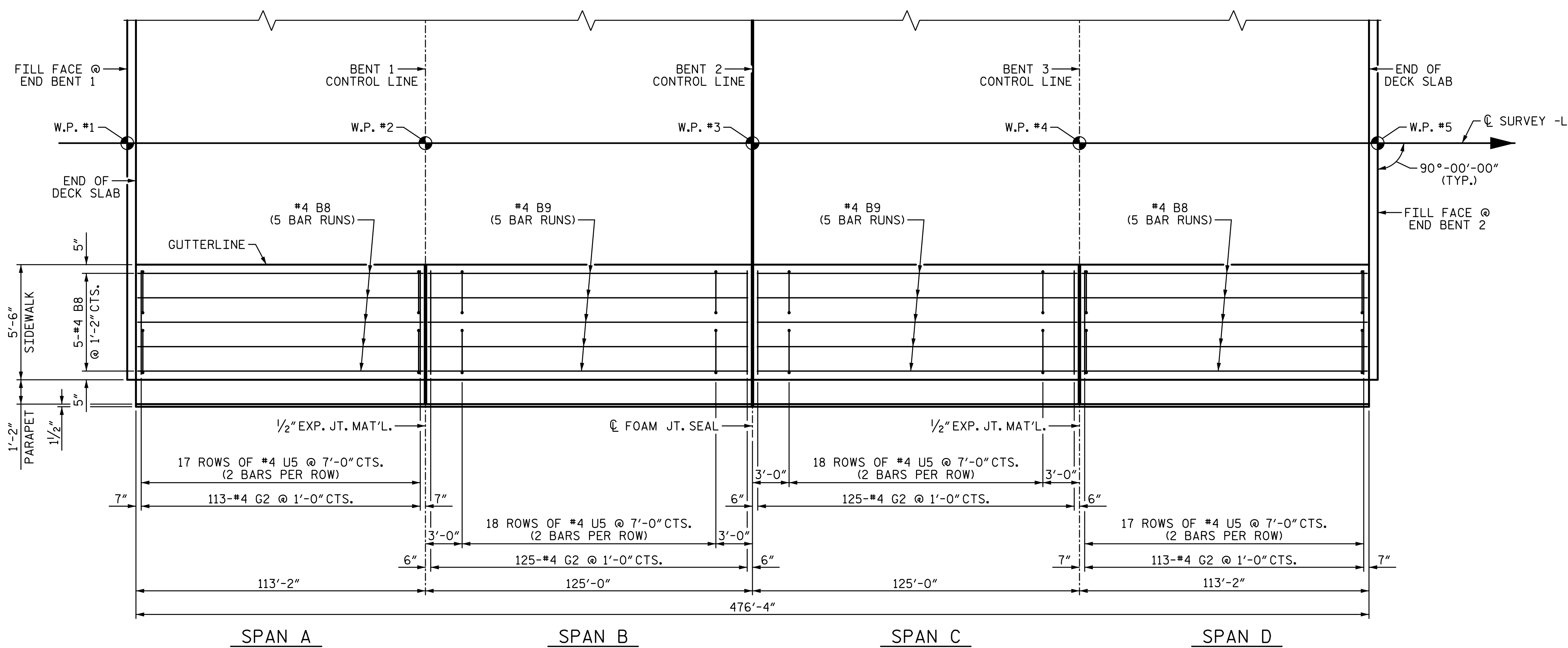
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION AND GIRDER CAMBER**

DRAWN BY: S.D. COOPER DATE: 2-19  
CHECKED BY: J. A. BATTS DATE: 2-19  
DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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

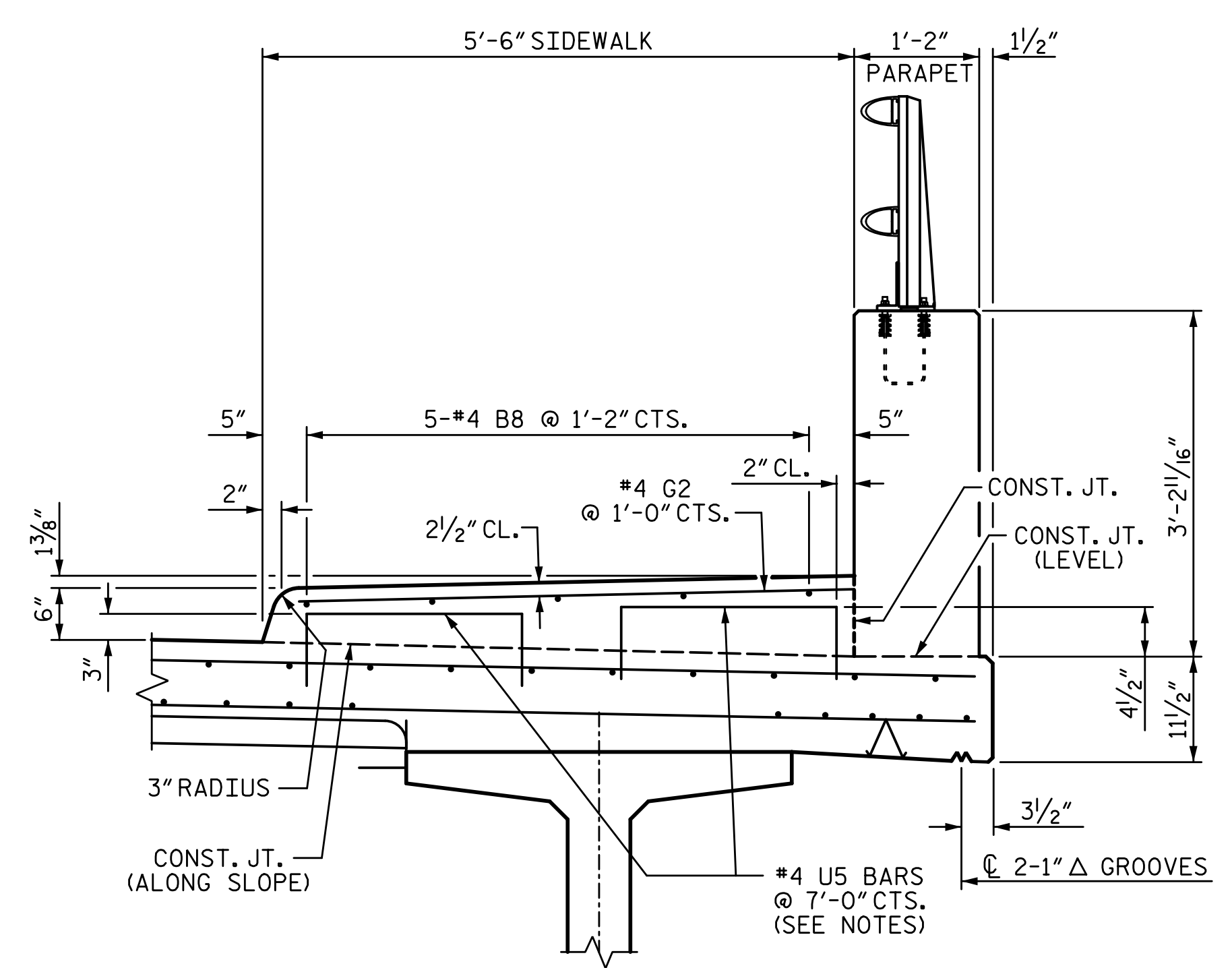
LICENSURE NO. C-4434  
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

8/25/2022 2:04:59 PM P:\Raleigh\Projects\2015\Y-4810K (NCDOT RailDiv)\Structures\Drawings\Final\Y4810K\_SMU\_SW.dgn



**PLAN OF SIDEWALK**

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE PARAPET.



**SECTION THRU SIDEWALK**

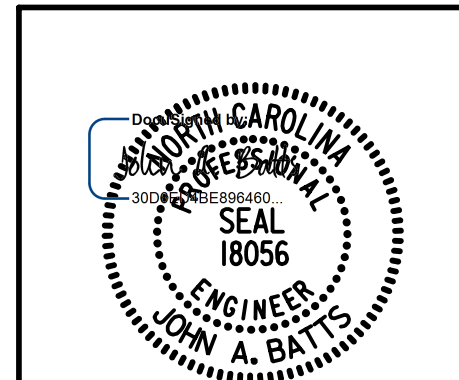
**NOTES:**

- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.
- U5 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
- THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**SIDEWALK DETAILS**



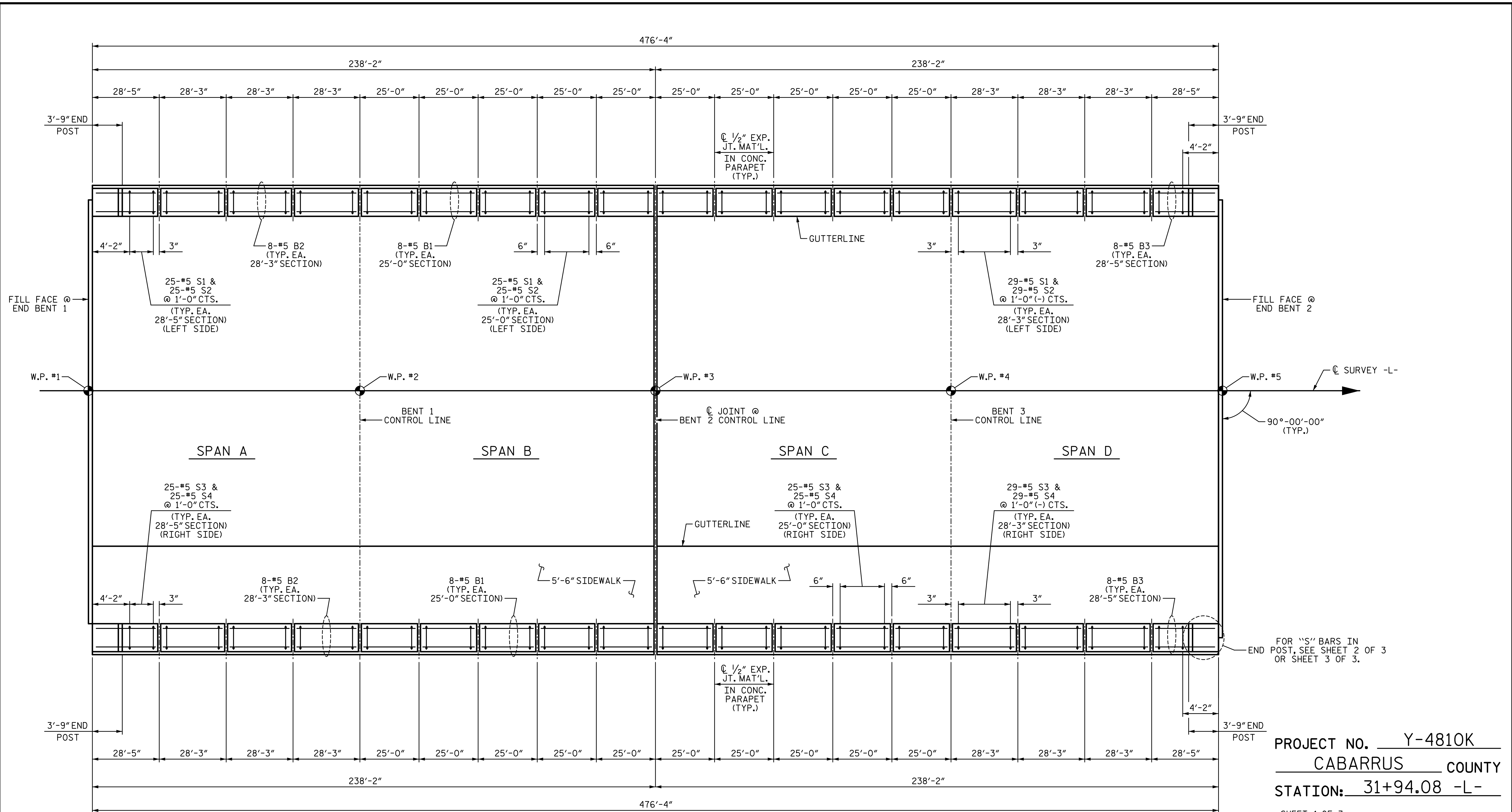
**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			53

**DOCUMENT NOT CONSIDERED FINAL  
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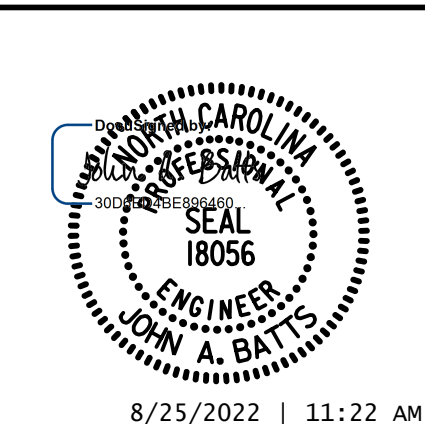
### PLAN OF PARAPET

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE PARAPET.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 3

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

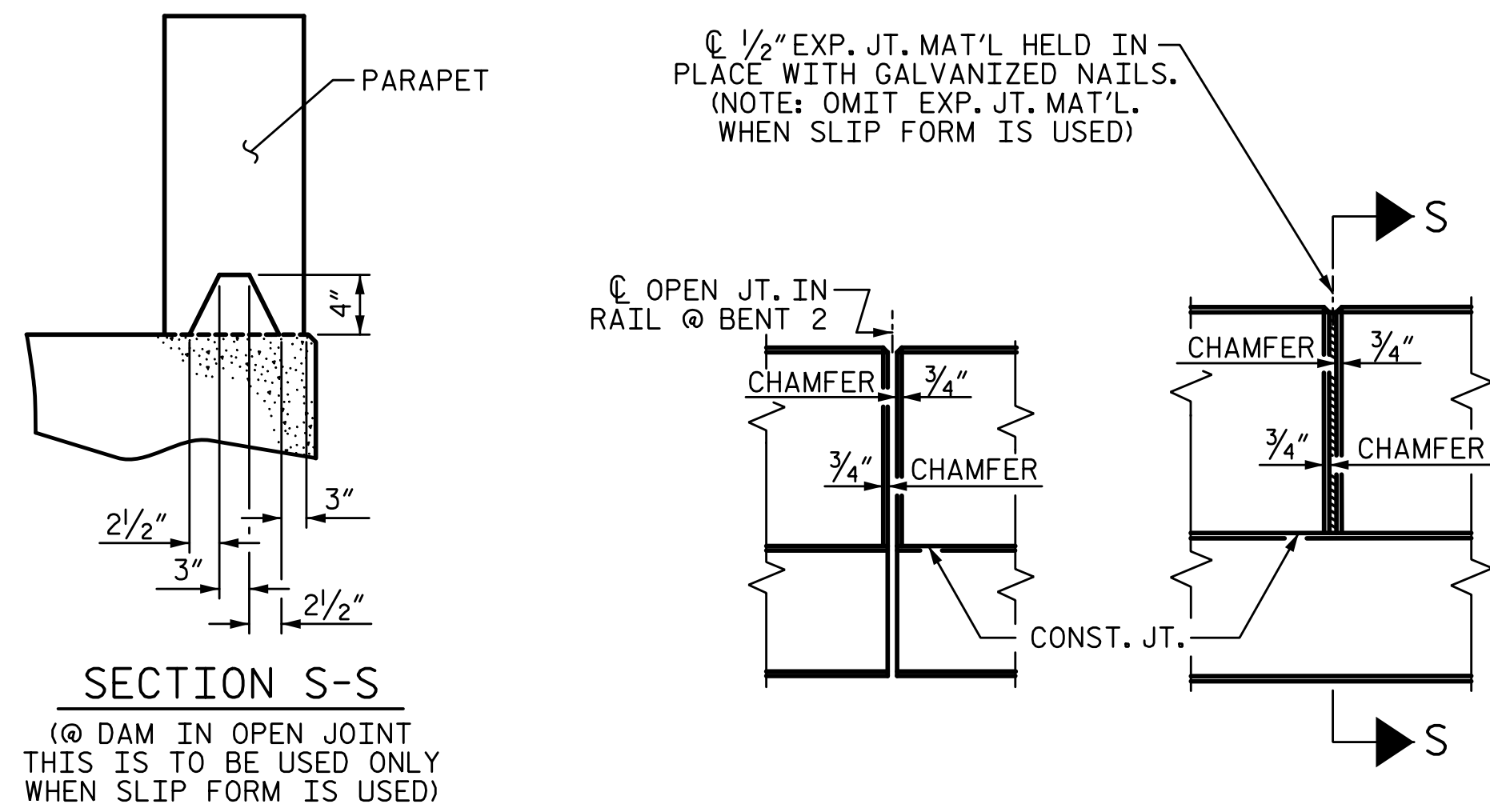


DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

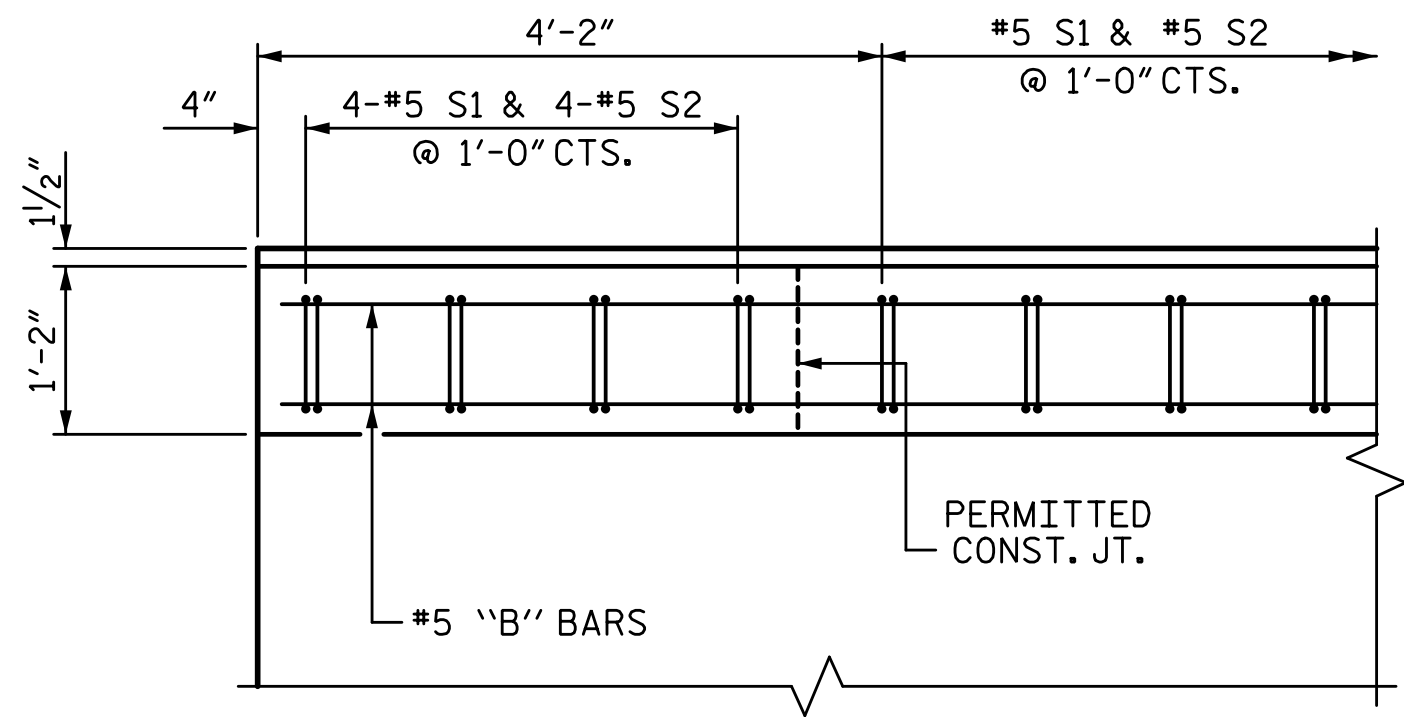
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			53

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

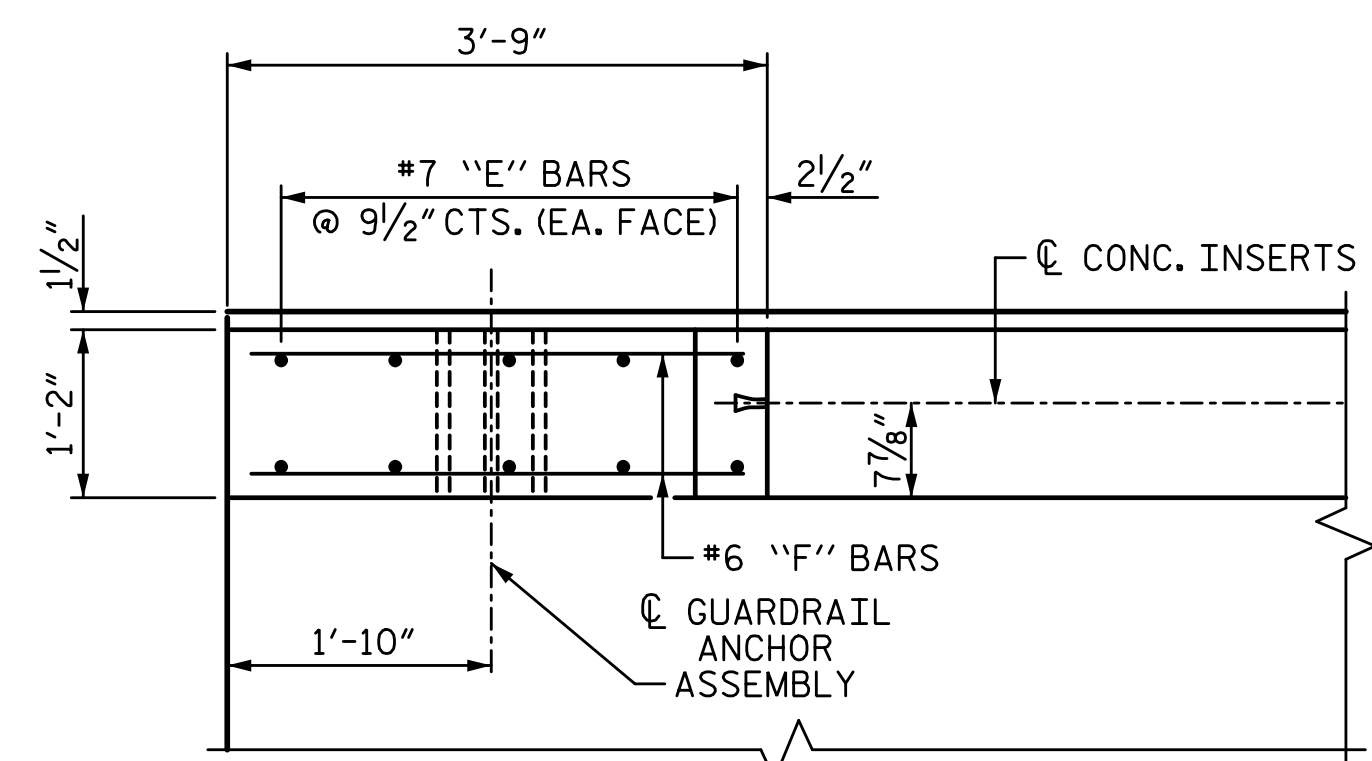




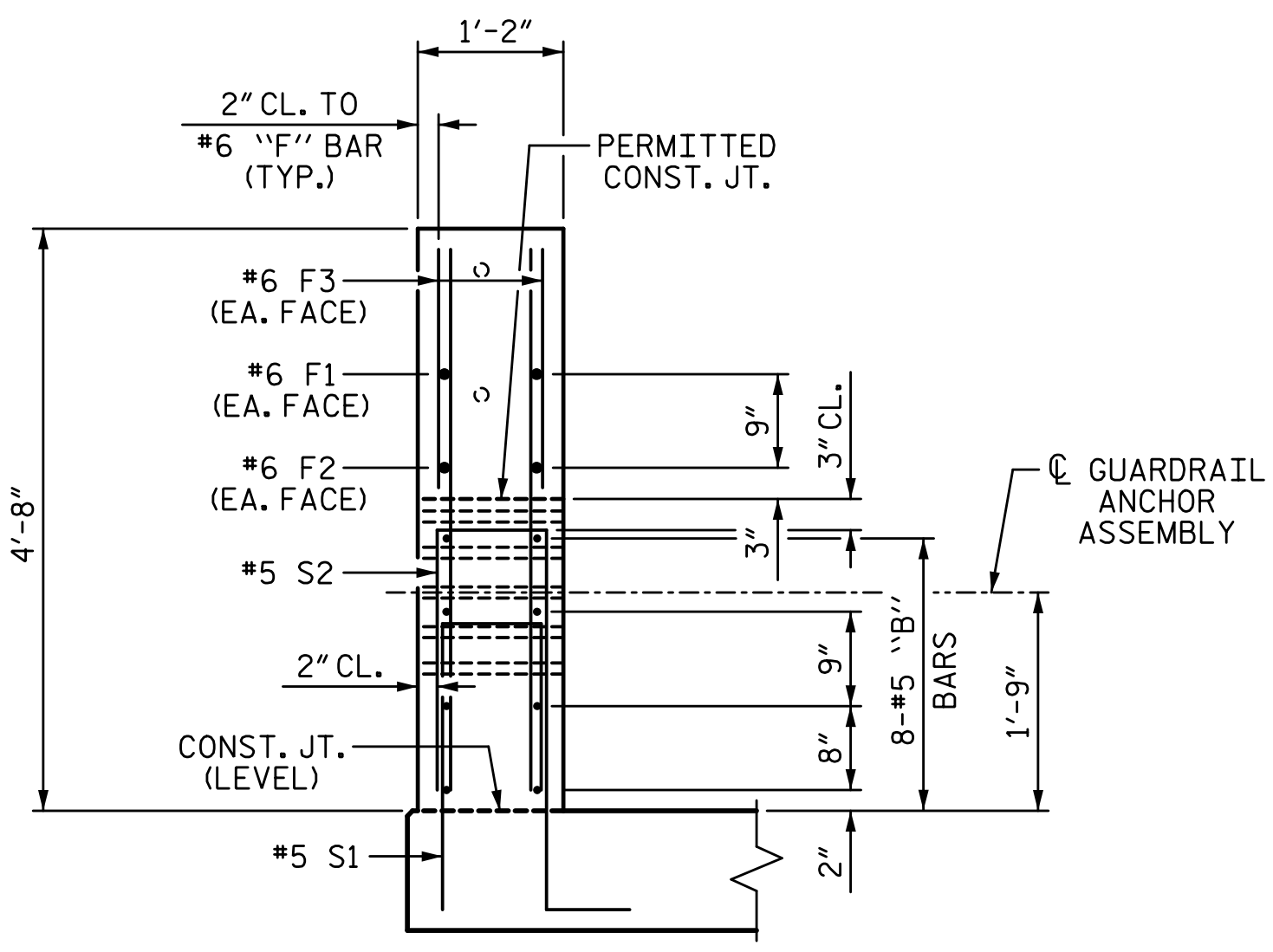
ELEVATION AT EXPANSION JOINTS



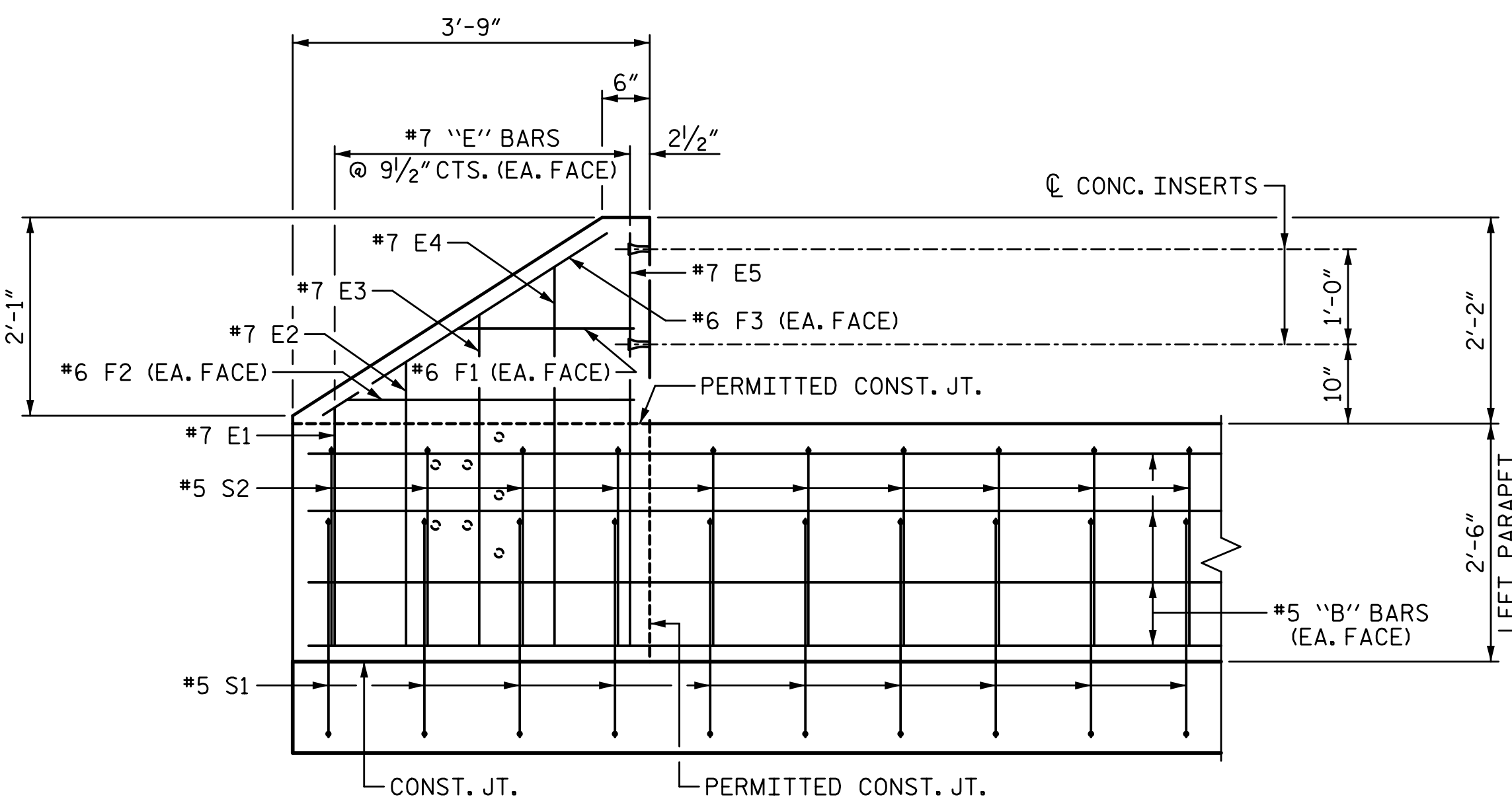
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

NOTES:

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

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

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

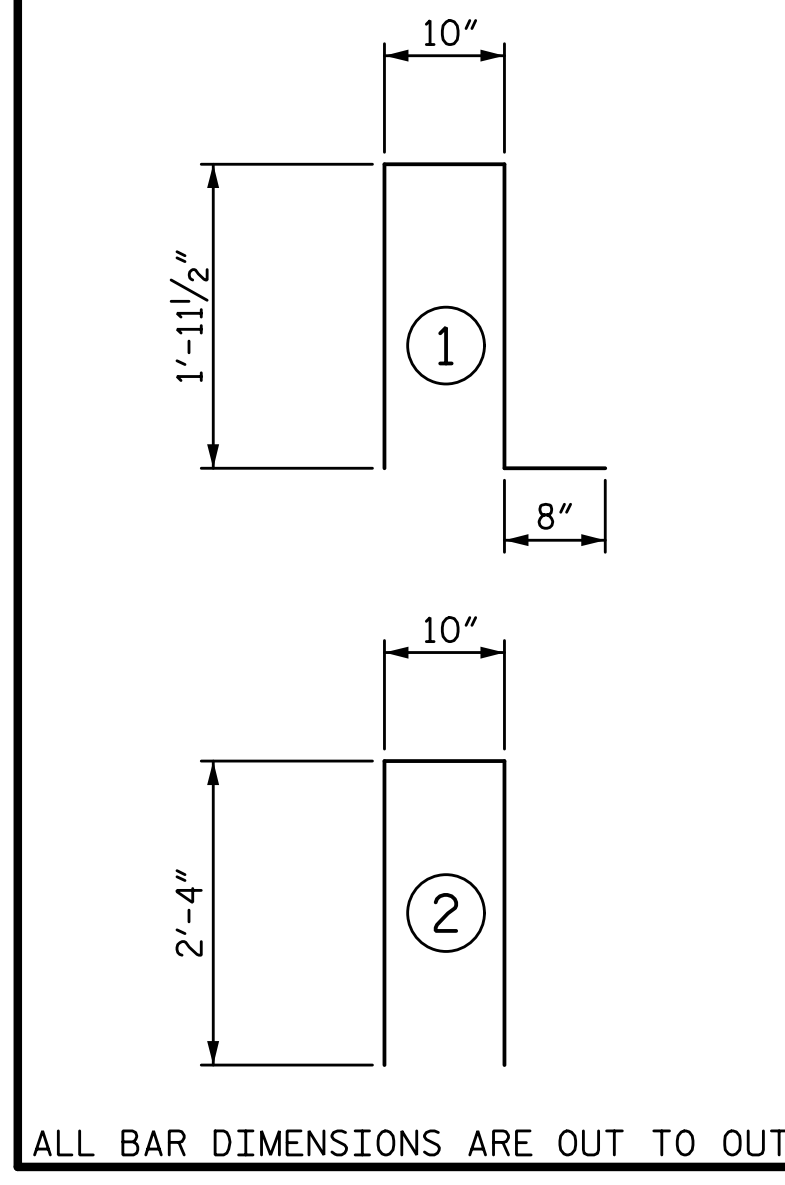
FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

THE JOINT IN THE DECK AT BENT 2 SHALL BE SAWED PRIOR TO CASTING OF THE PARAPET.

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

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

BAR TYPES

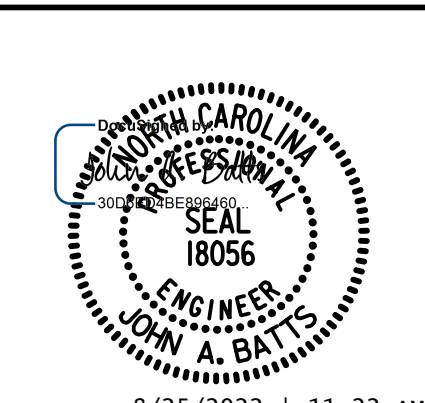


BILL OF MATERIAL

LT. PARAPET AND END POSTS					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	80	#5	STR	24'-7"	2051
*B2	48	#5	STR	27'-10"	1393
*B3	16	#5	STR	28'-0"	467
*E1	4	#7	STR	2'-6"	20
*E2	4	#7	STR	3'-0"	25
*E3	4	#7	STR	3'-6"	29
*E4	4	#7	STR	4'-0"	33
*E5	4	#7	STR	4'-4"	35
*F1	4	#6	STR	1'-10"	11
*F2	4	#6	STR	3'-0"	18
*F3	4	#6	STR	3'-5"	21
*S1	482	#5	1	5'-5"	2723
*S2	482	#5	2	5'-6"	2765
TOTAL REINFORCING STEEL					9591 LB
CLASS AA CONCRETE					51.9 CY
1'-2" X 2'-6" CONCRETE PARAPET					476.33 LF

8/25/2022 2:05:00 PM P:\RailDiv\Projects\2015\Y-4810K (NCDOT RailDiv)\Structures\Drawings\Final\Y4810K\_SMU\_BR.dgn

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

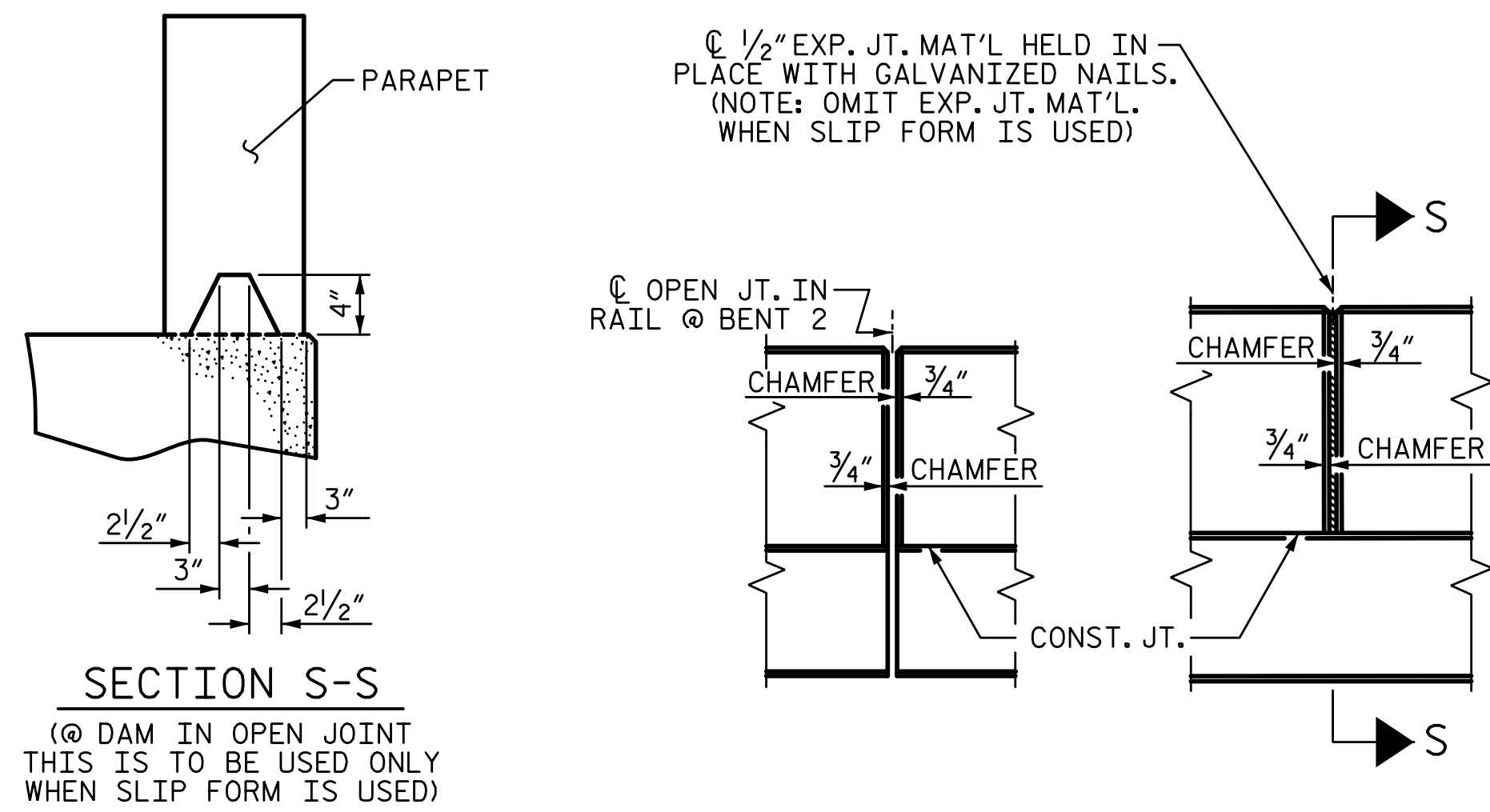


PROJECT NO. Y-4810K  
 CABARRUS COUNTY  
 STATION: 31+94.08 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE CONCRETE PARAPET DETAILS (LEFT SIDE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-25  
TOTAL SHEETS 53

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

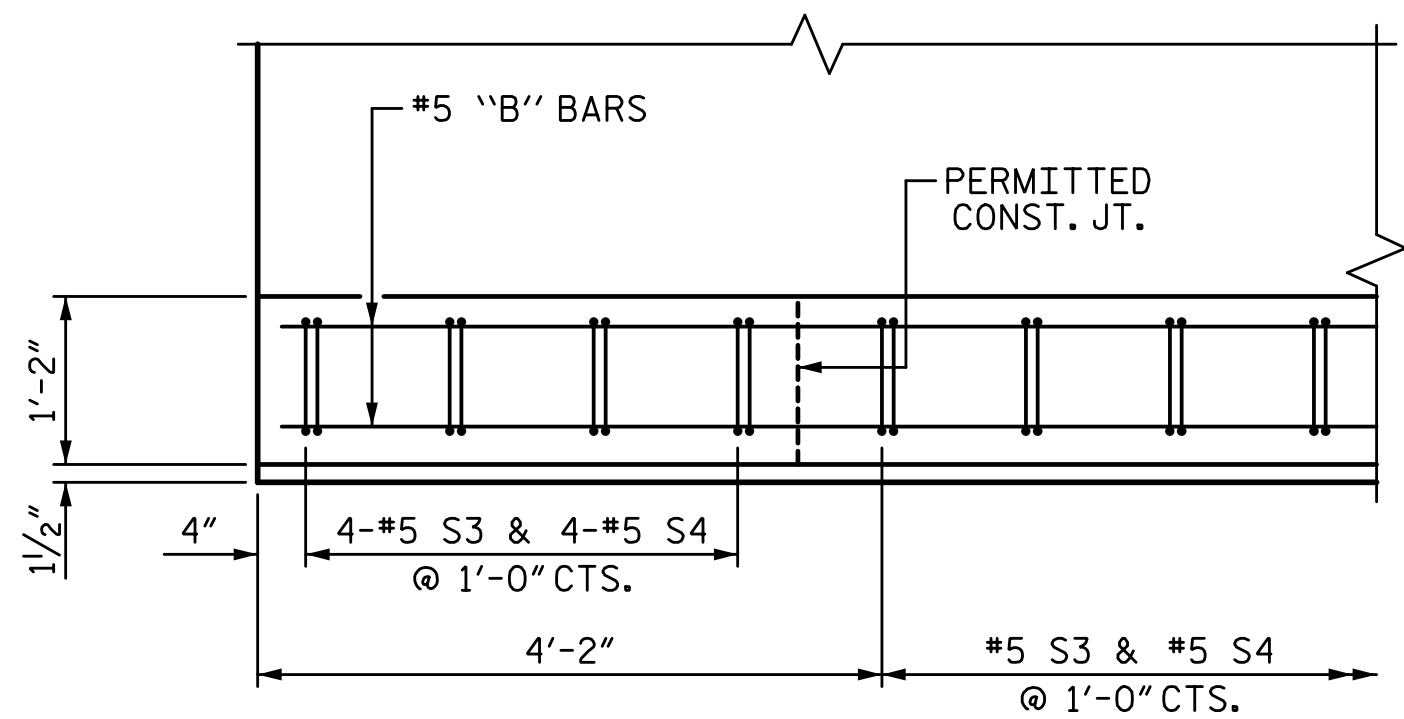


ELEVATION AT EXPANSION JOINTS

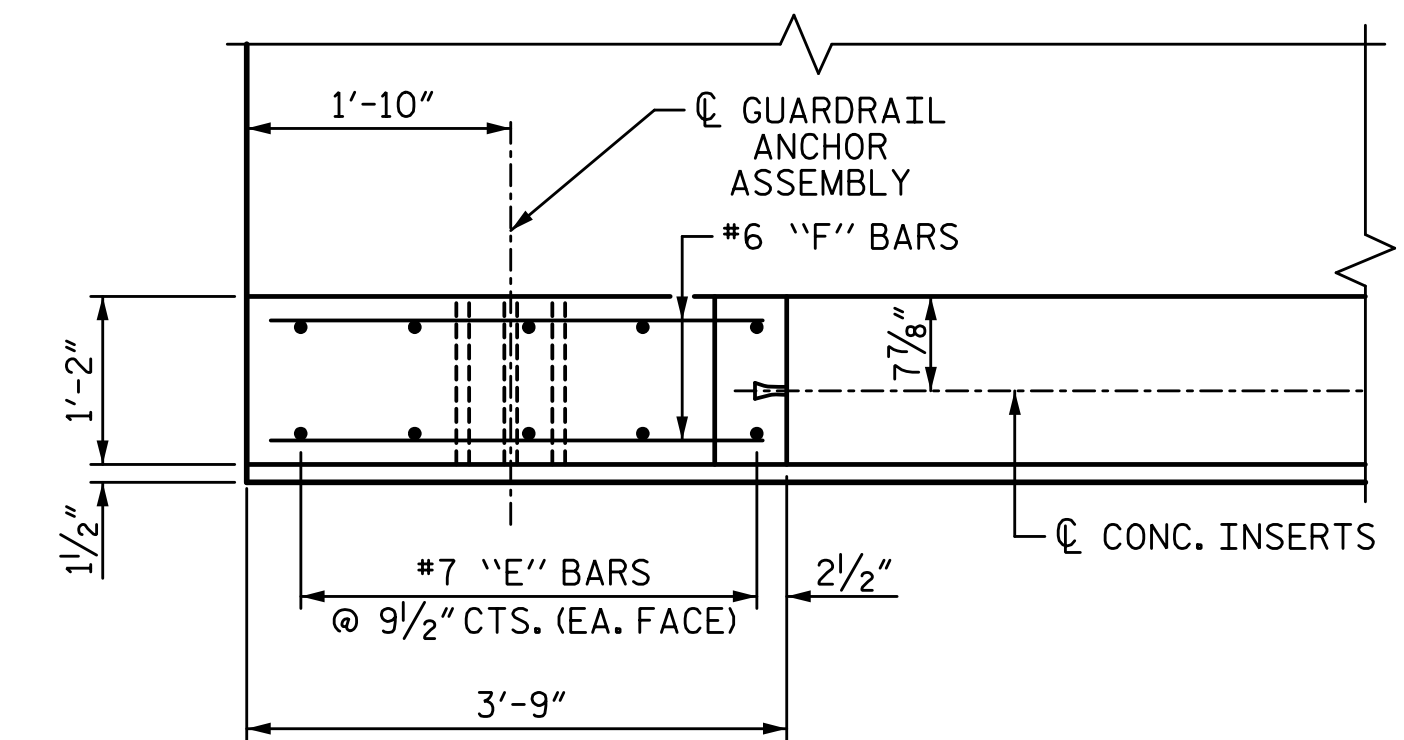
**NOTES:**  
 CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.  
 ALL REINFORCING STEEL IN PARAPET AND END POSTS SHALL BE EPOXY COATED.  
 THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JT. MATERIAL IN PARAPET.  
 FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.  
 THE JOINT IN THE DECK AT BENT 2 SHALL BE SAWED PRIOR TO CASTING OF THE PARAPET.  
 GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.  
 FOR DETAILS AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

BAR TYPES		BILL OF MATERIAL					
		RT. PARAPET AND END POSTS					
		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
		*B1	80	#5	STR	24'-7"	2051
		*B2	48	#5	STR	27'-10"	1393
		*B3	16	#5	STR	28'-0"	467
		*E6	4	#7	STR	3'-2"	26
		*E7	4	#7	STR	3'-8"	30
		*E8	4	#7	STR	4'-2"	34
		*E9	4	#7	STR	4'-8"	38
		*E10	4	#7	STR	5'-0"	41
*F1	4	#6	STR	1'-10"	11		
*F2	4	#6	STR	3'-0"	18		
*F3	4	#6	STR	3'-5"	21		
*S3	482	#5	1	6'-10"	3435		
*S4	482	#5	2	6'-10"	3435		
TOTAL REINFORCING STEEL					11000 LB		
CLASS AA CONCRETE					66.8 CY		
1'-2" X 3'-2 11/16"							
CONCRETE PARAPET					476.33 LF		

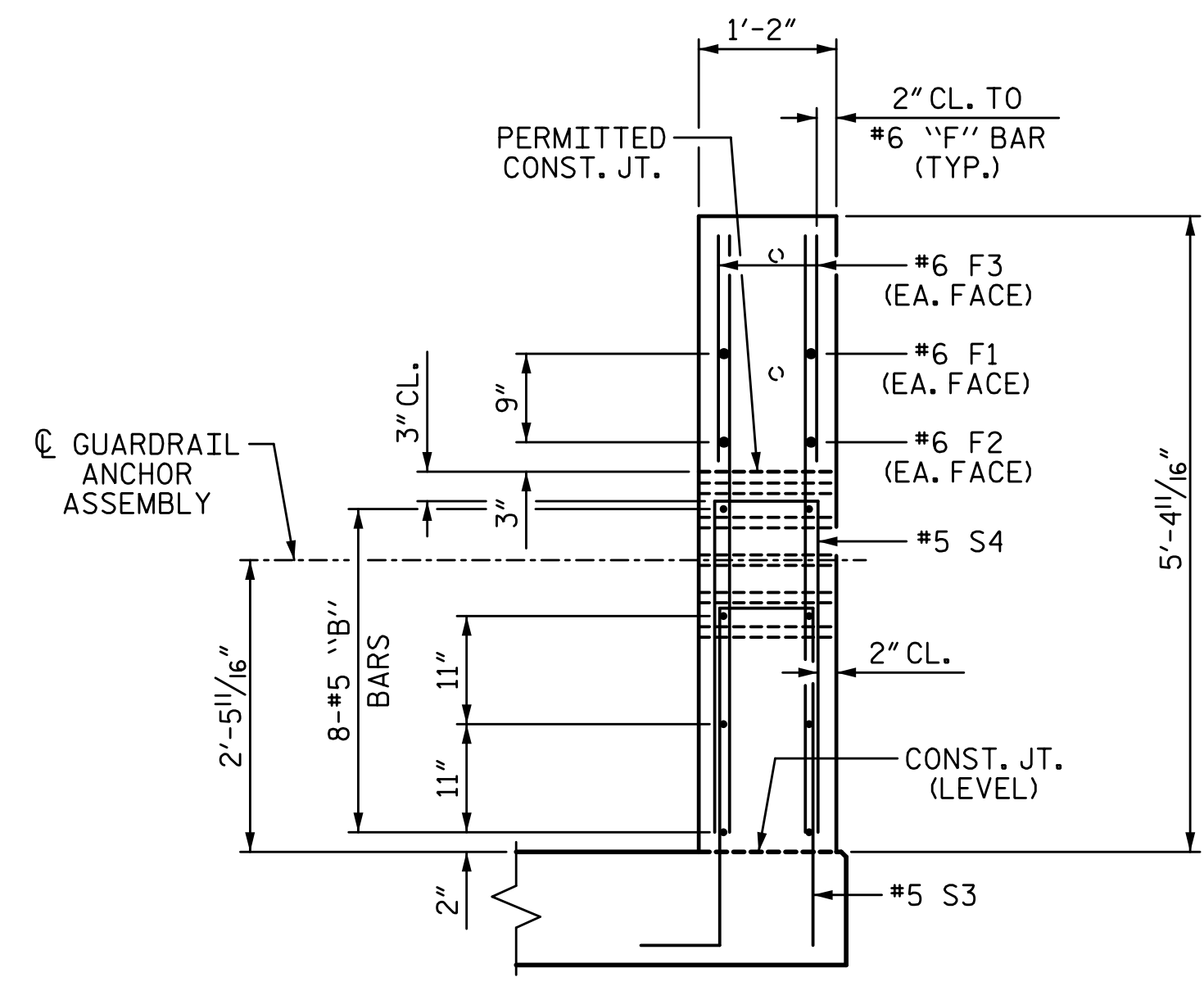
ALL BAR DIMENSIONS ARE OUT TO OUT



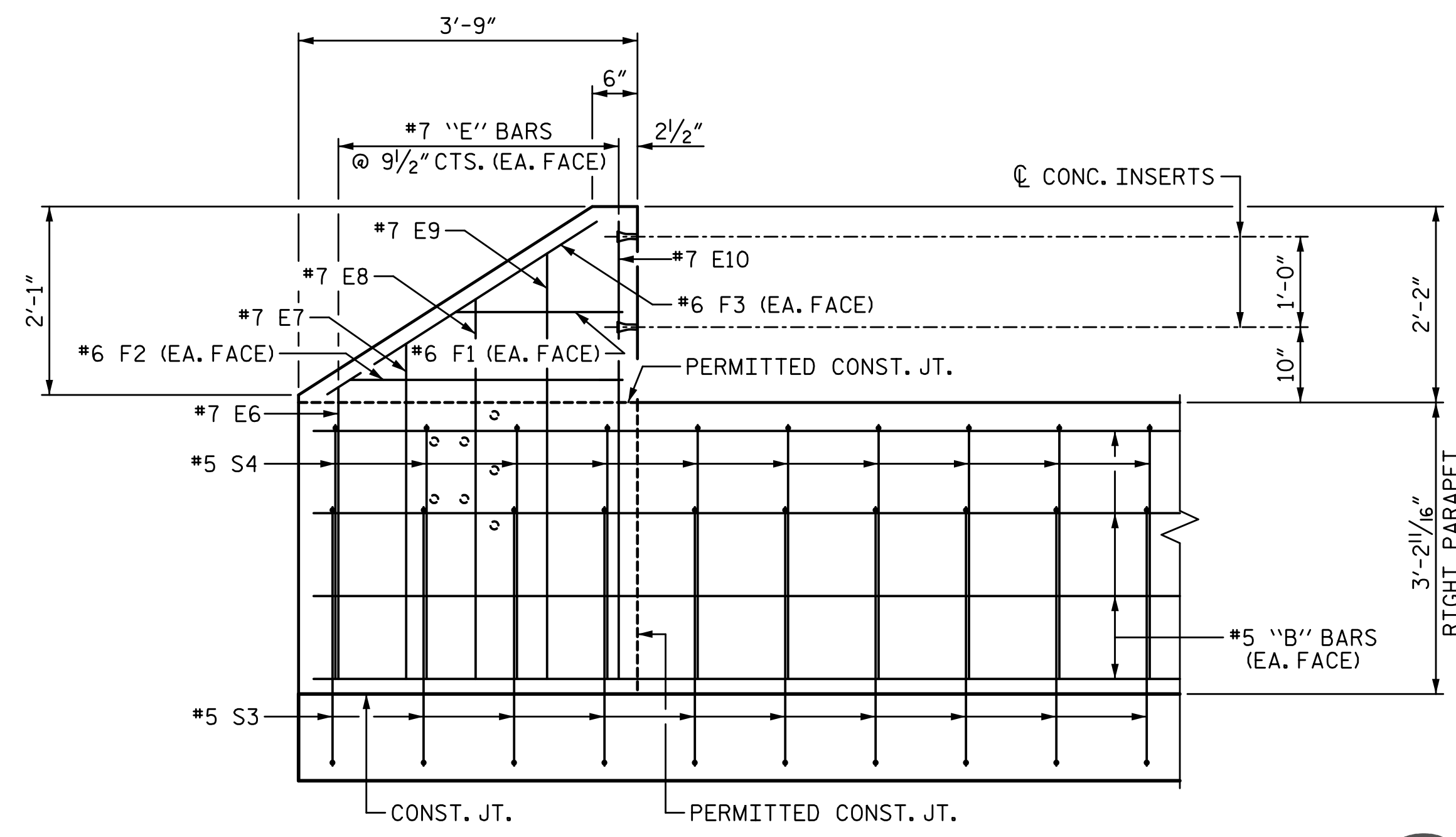
PLAN OF PARAPET



PLAN OF END POST



END VIEW



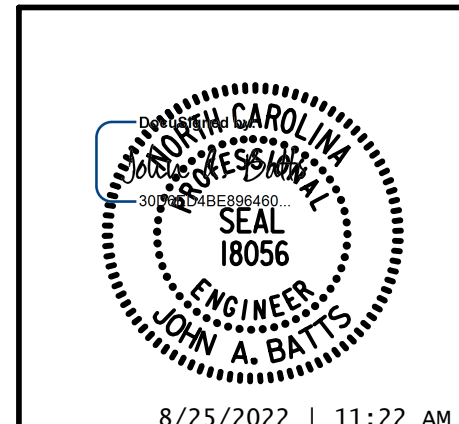
ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

(SIDEWALK NOT SHOWN FOR CLARITY)

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 DETAILS  
 (RIGHT SIDE)



LICENSURE NO. C-4434

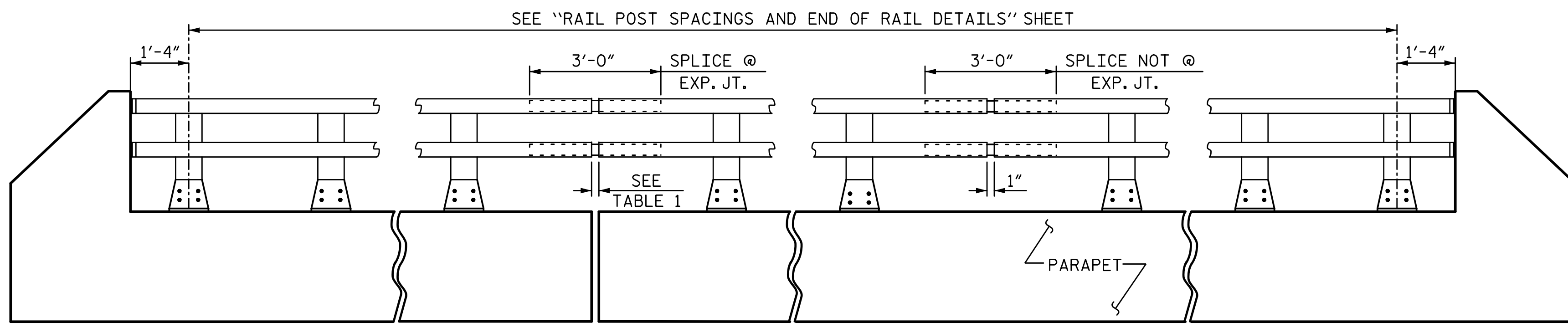
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					53

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DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

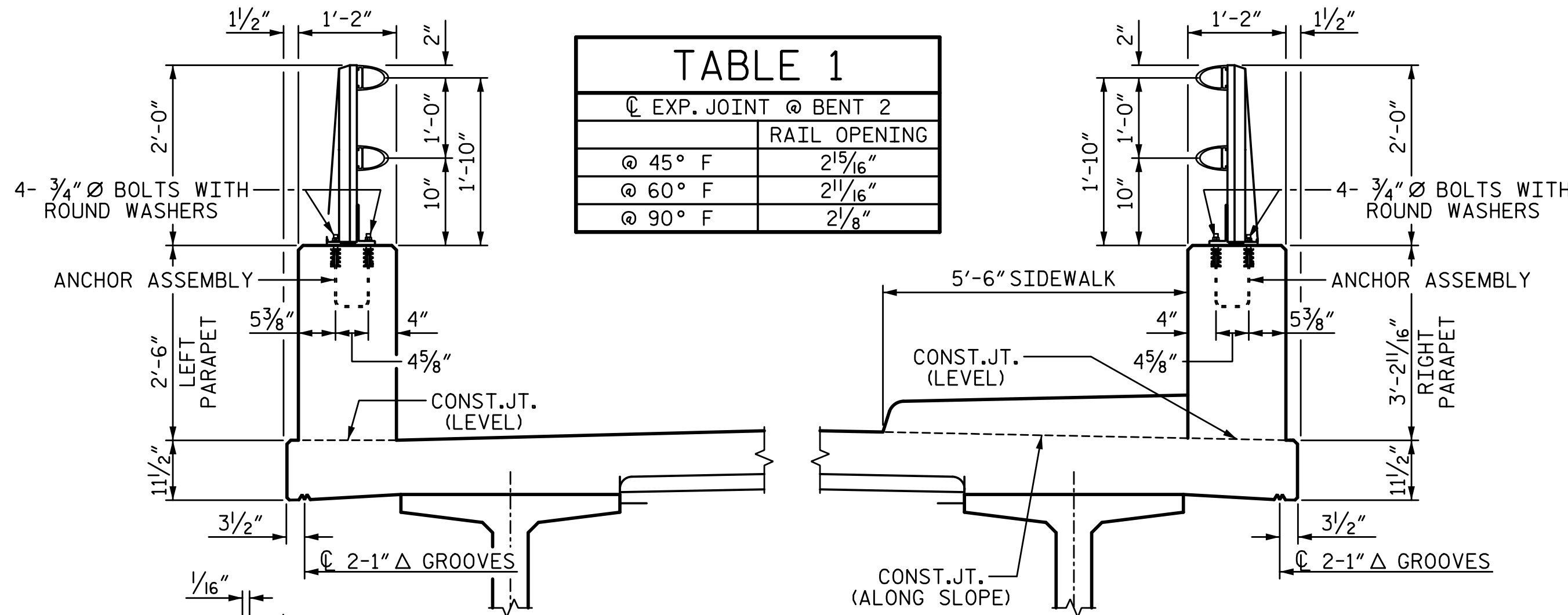
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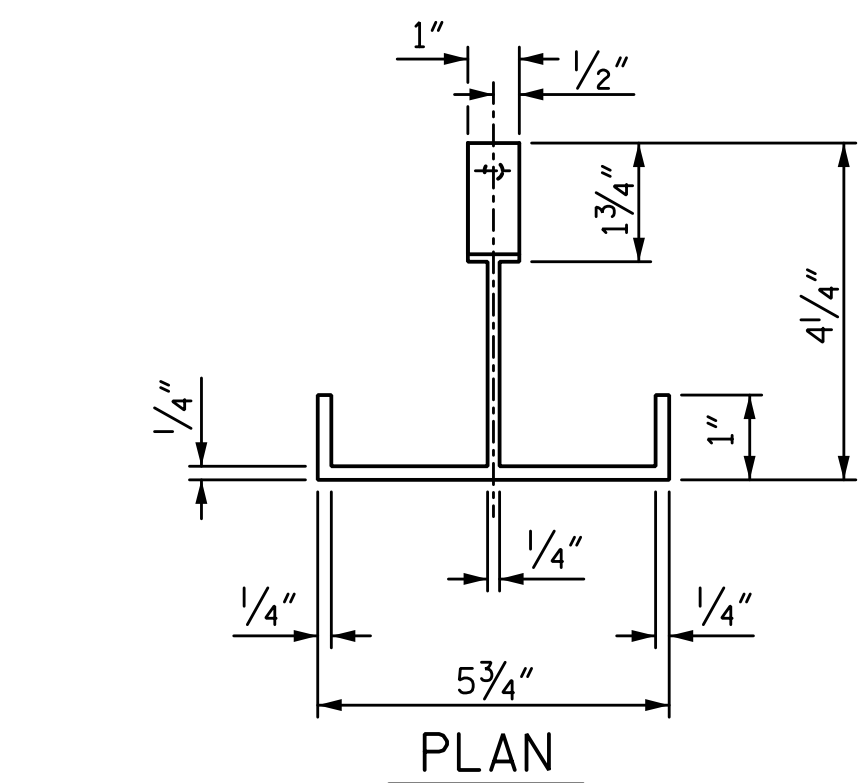
**ELEVATION**

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

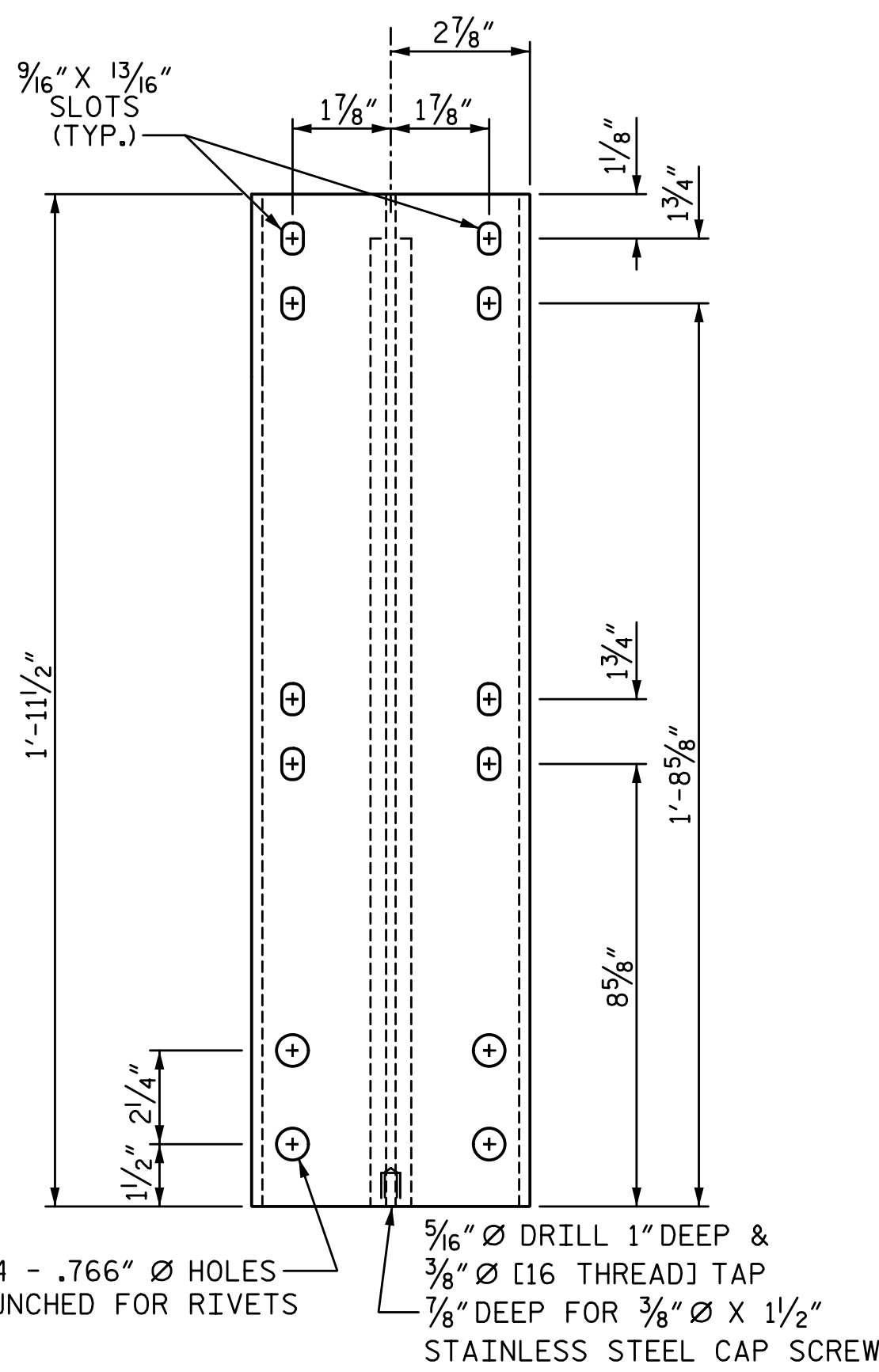
TABLE 1	
EXP. JOINT @ BENT 2	
RAIL OPENING	
@ 45° F	2 <sup>15</sup> / <sub>16</sub> "
@ 60° F	2 <sup>11</sup> / <sub>16</sub> "
@ 90° F	2 <sup>1</sup> / <sub>8</sub> "



**SECTION THRU PARAPET AND RAIL**



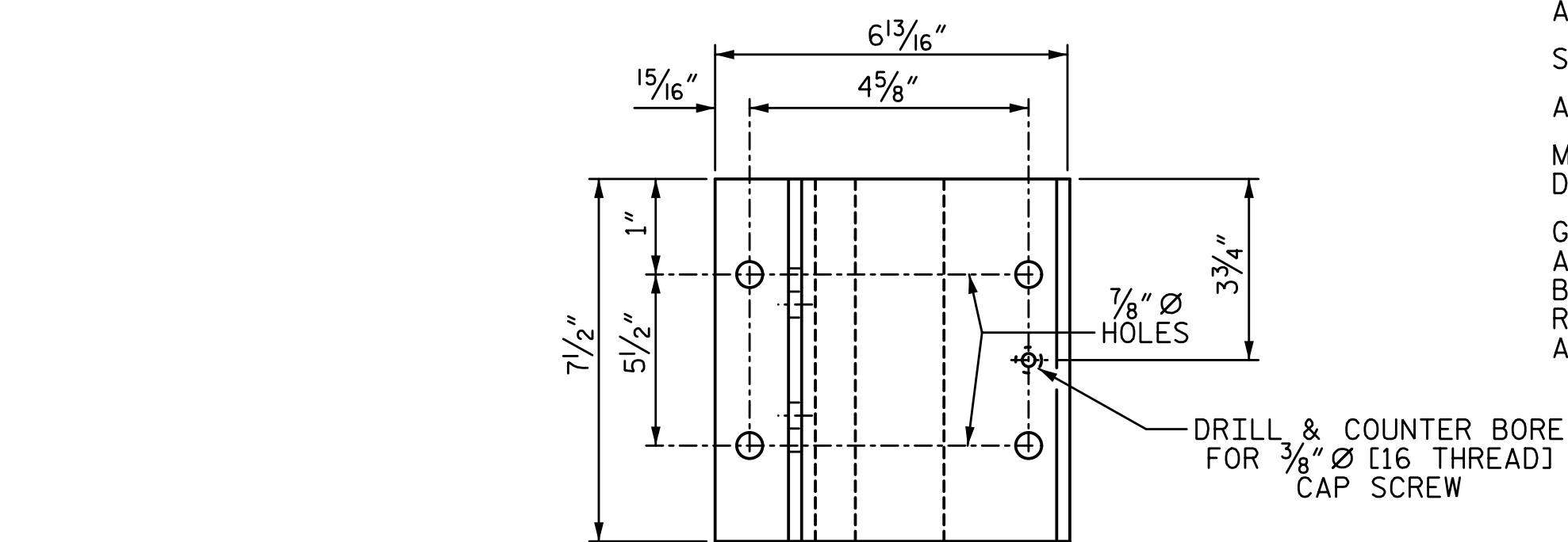
**PLAN**



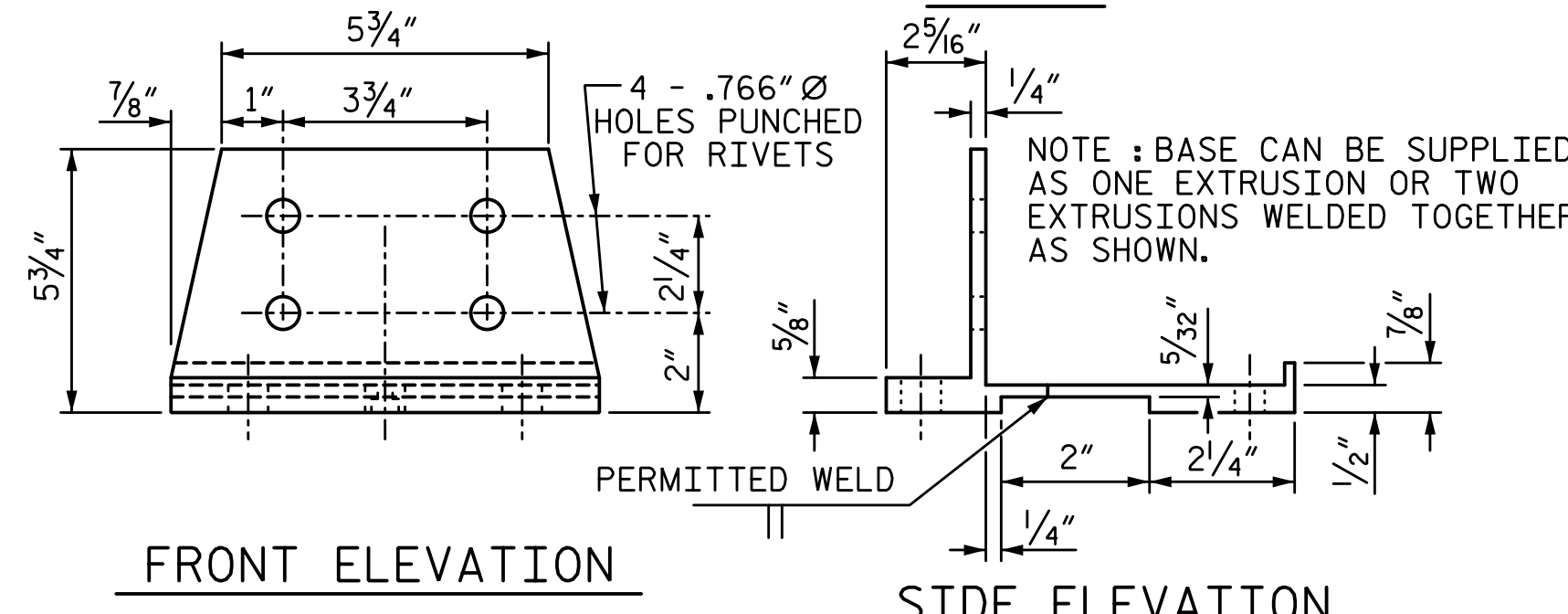
**FRONT ELEVATION**

**SIDE ELEVATION**

**DETAILS OF POST**



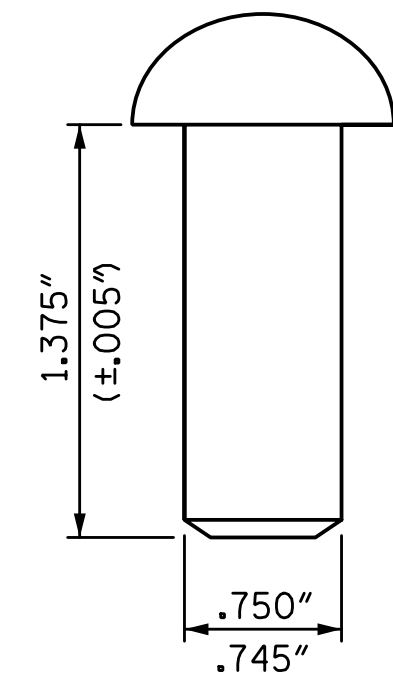
**PLAN**



**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**

**NOTES:**

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

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

**ALUMINUM RAILS:**

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

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

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

**GALVANIZED STEEL RAILS:**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

**GENERAL NOTES:**

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

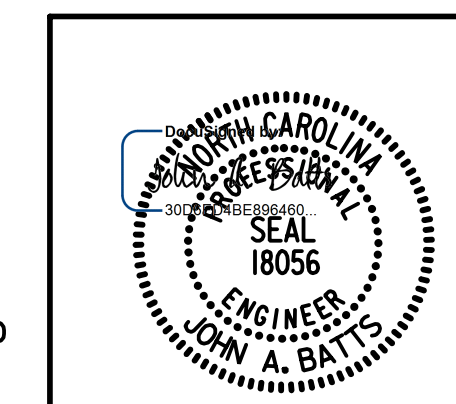
PAY LENGTH = 937.67 LF

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CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**2 BAR METAL RAIL**



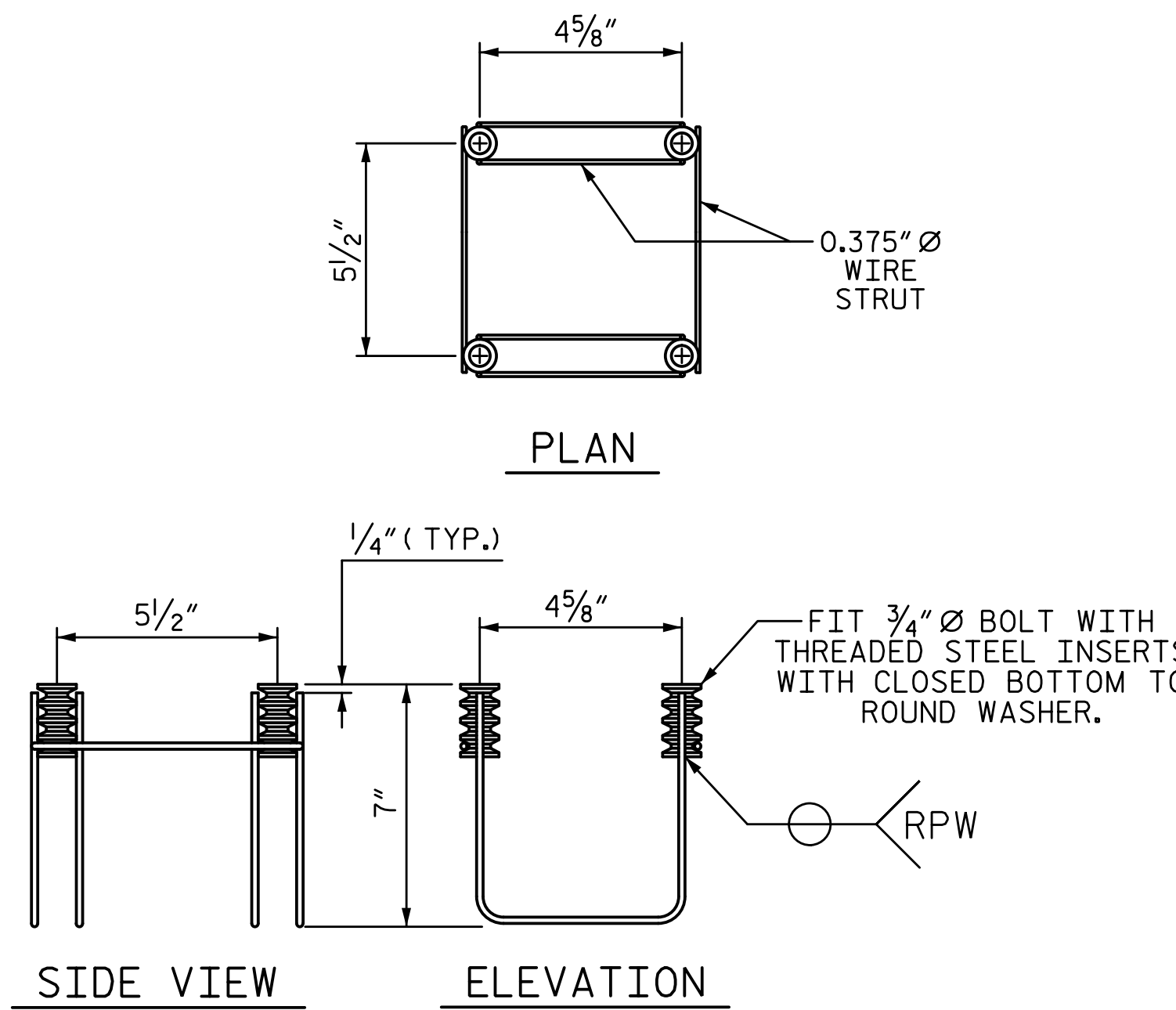
DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTIS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTIS DATE: 2-19

LICENSURE NO. C-4434

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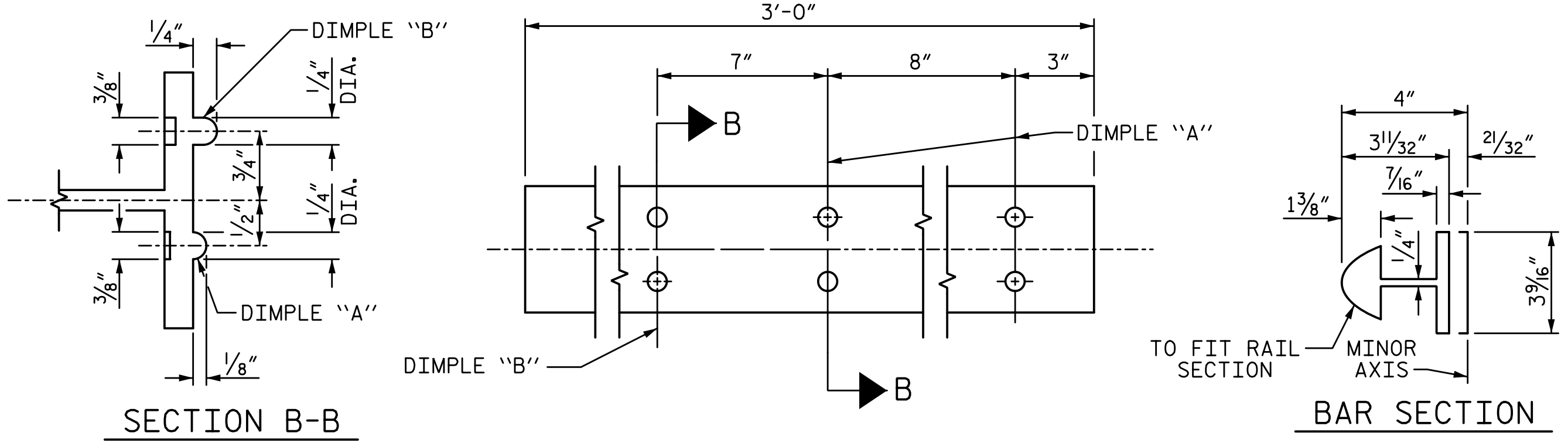
**4-BOLT METAL RAIL ANCHOR ASSEMBLY**  
 (156 ASSEMBLIES REQUIRED)

**STRUCTURAL CONCRETE ANCHOR ASSEMBLY NOTES:**

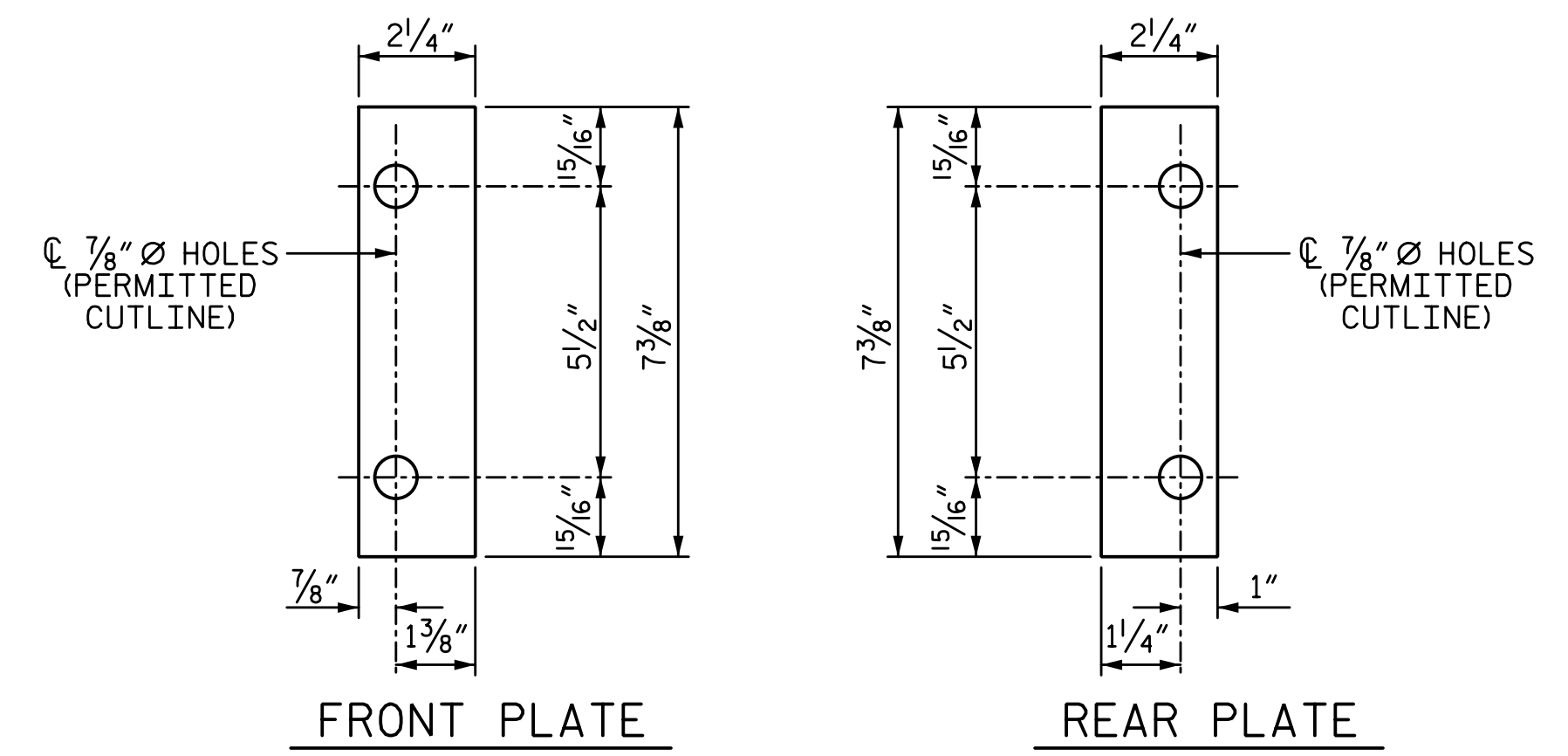
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
  - B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL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

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

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

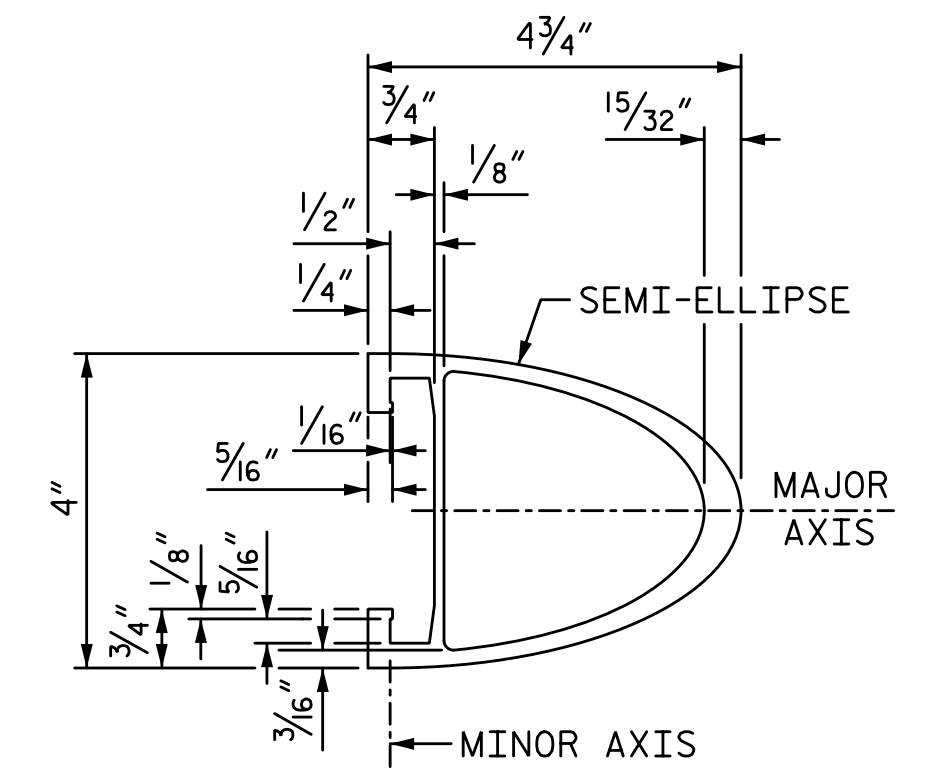


**EXPANSION BAR DETAILS**

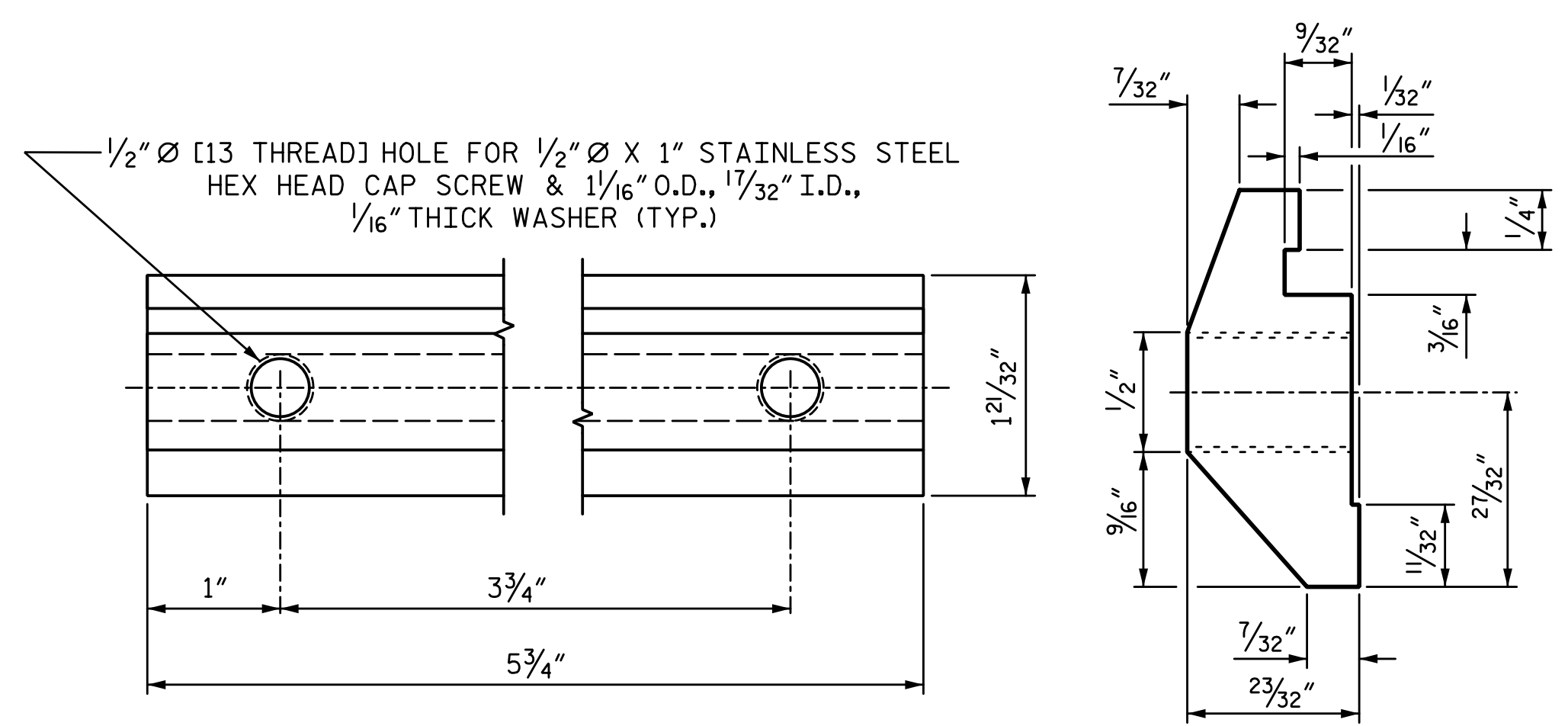


**SHIM DETAILS**

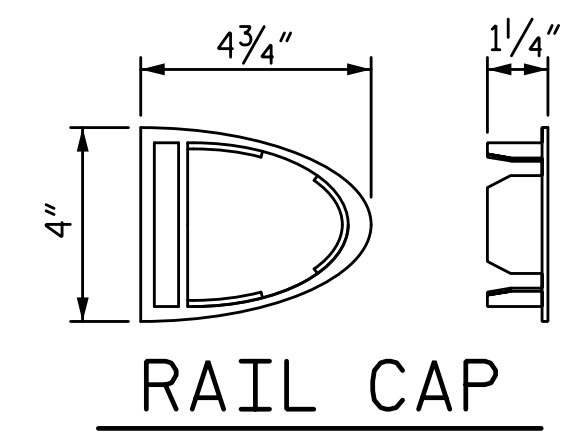
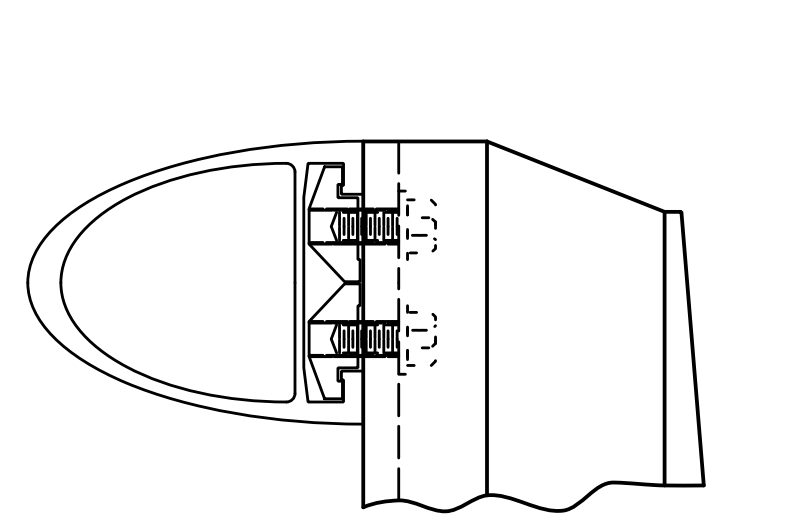
NOTE:  
 SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



**RAIL SECTION**



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



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 SUPERSTRUCTURE

**2 BAR METAL RAIL**

DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

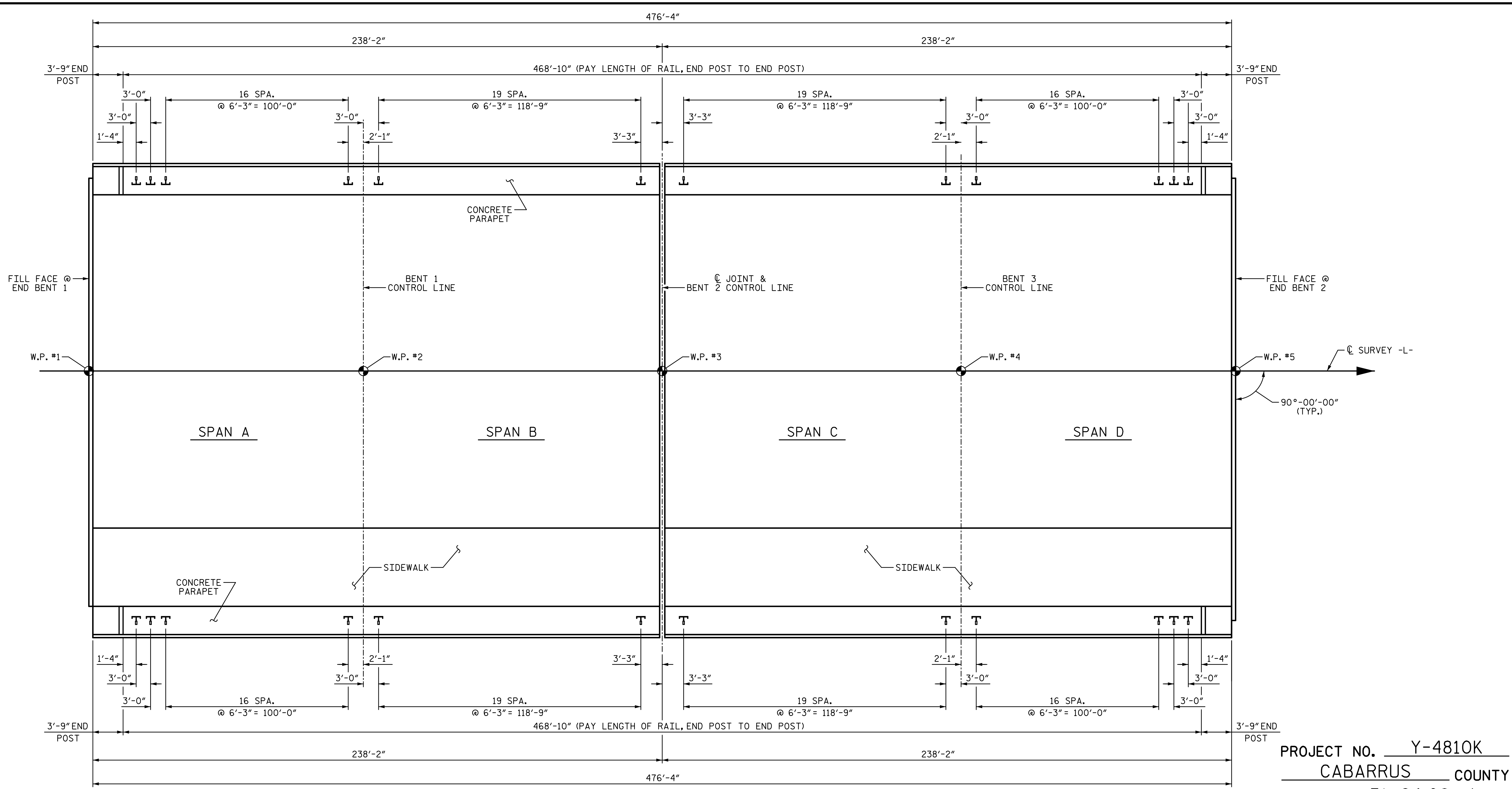
**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

NORTH CAROLINA  
 PROFESSIONAL SEAL  
 ENGINEER  
 JOHN A. BATTS  
 8/25/2022 | 11:22 AM

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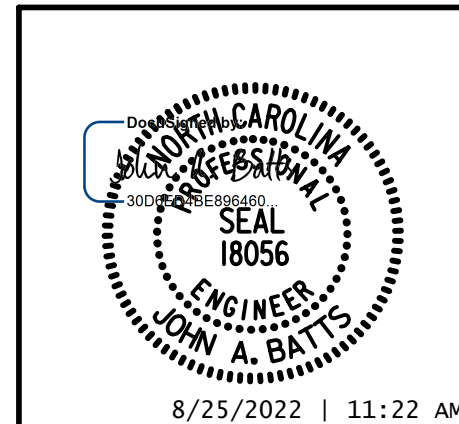
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**PLAN OF RAIL POST SPACING**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 2



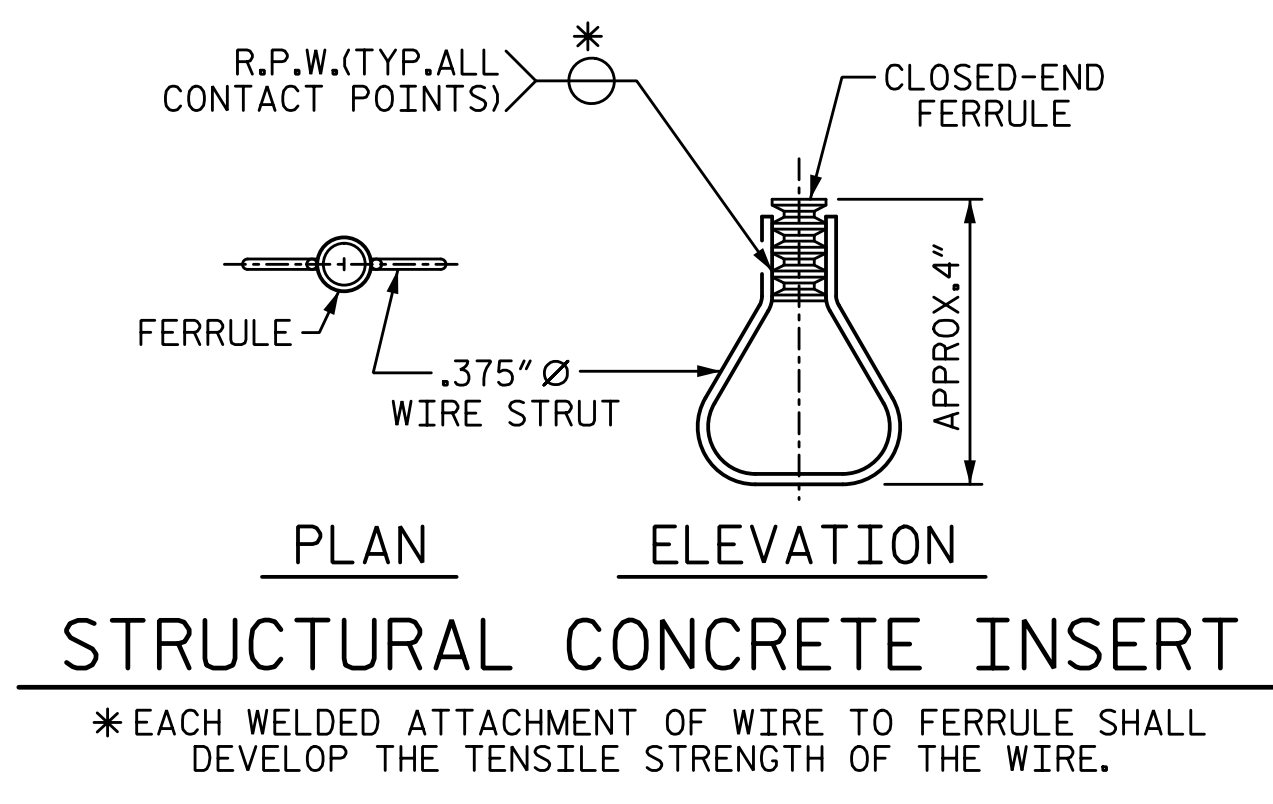
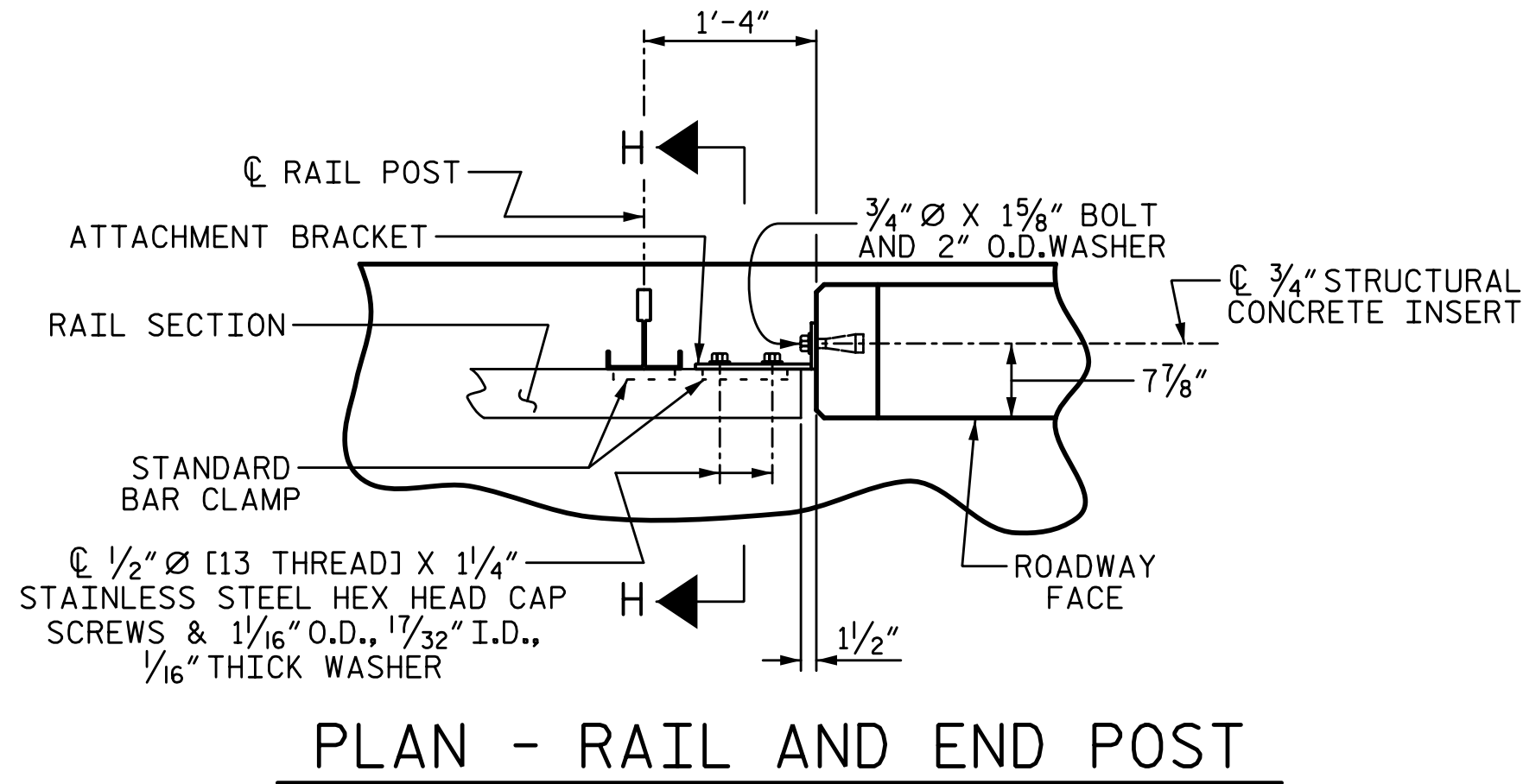
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**RAIL POST SPACING  
 AND  
 END OF RAIL DETAILS  
 FOR TWO BAR METAL RAILS**

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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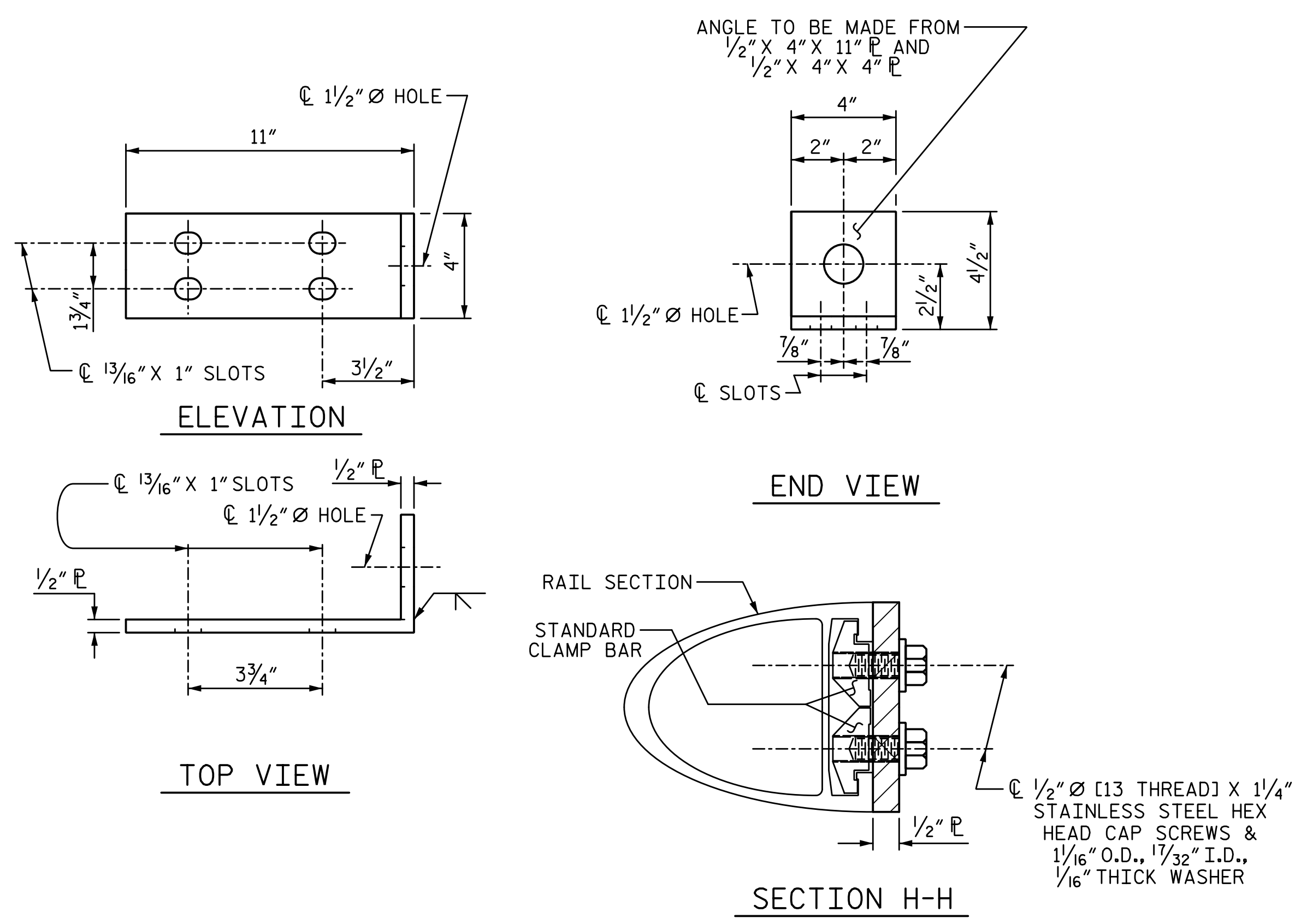
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- STRUCTURAL CONCRETE INSERT NOTES:**
- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF 1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

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



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

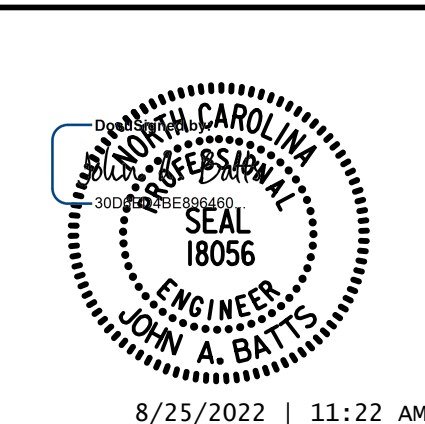
THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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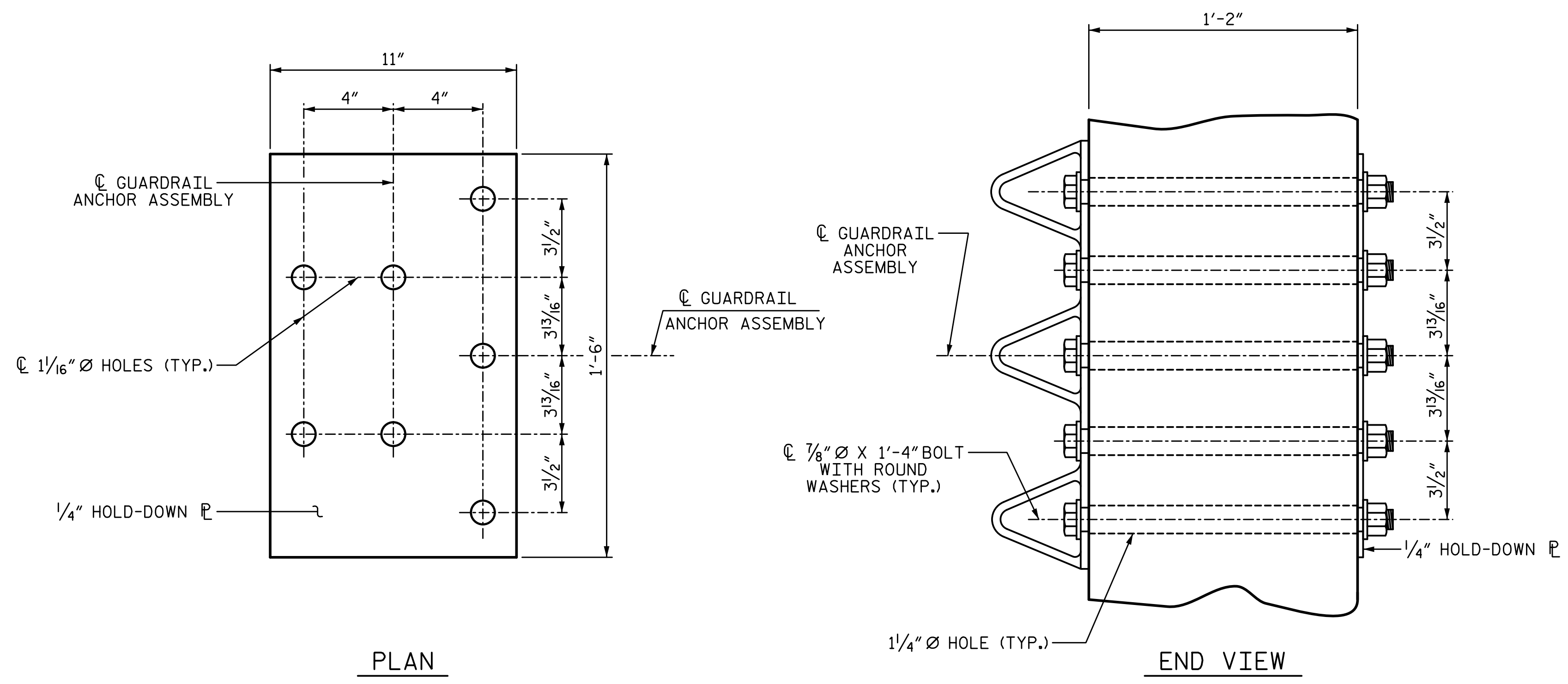
SHEET 2 OF 2

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



DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

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					SHEET NO. S-30
					TOTAL SHEETS 53



**GUARDRAIL ANCHOR ASSEMBLY DETAILS**

**NOTES:**

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

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

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

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

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

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

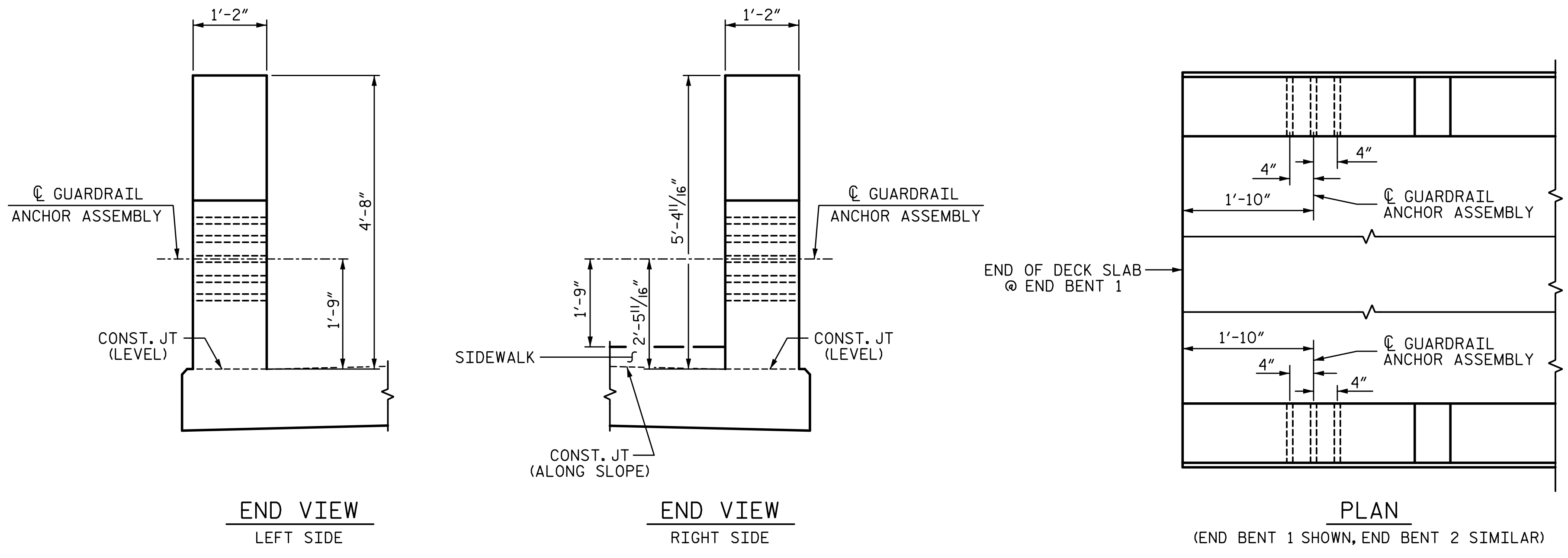
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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



**SKETCH SHOWING POINTS OF ATTACHMENT**

\* LOCATION OF GUARDRAIL ATTACHMENT

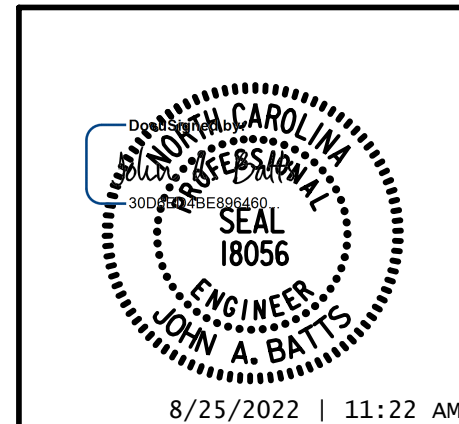


**LOCATION OF GUARDRAIL ANCHOR AT END POST**

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DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>2-19</u>
CHECKED BY: <u>J. A. BATTS</u>	DATE: <u>2-19</u>
DESIGN ENGINEER OF RECORD: <u>J. A. BATTS</u>	DATE: <u>2-19</u>

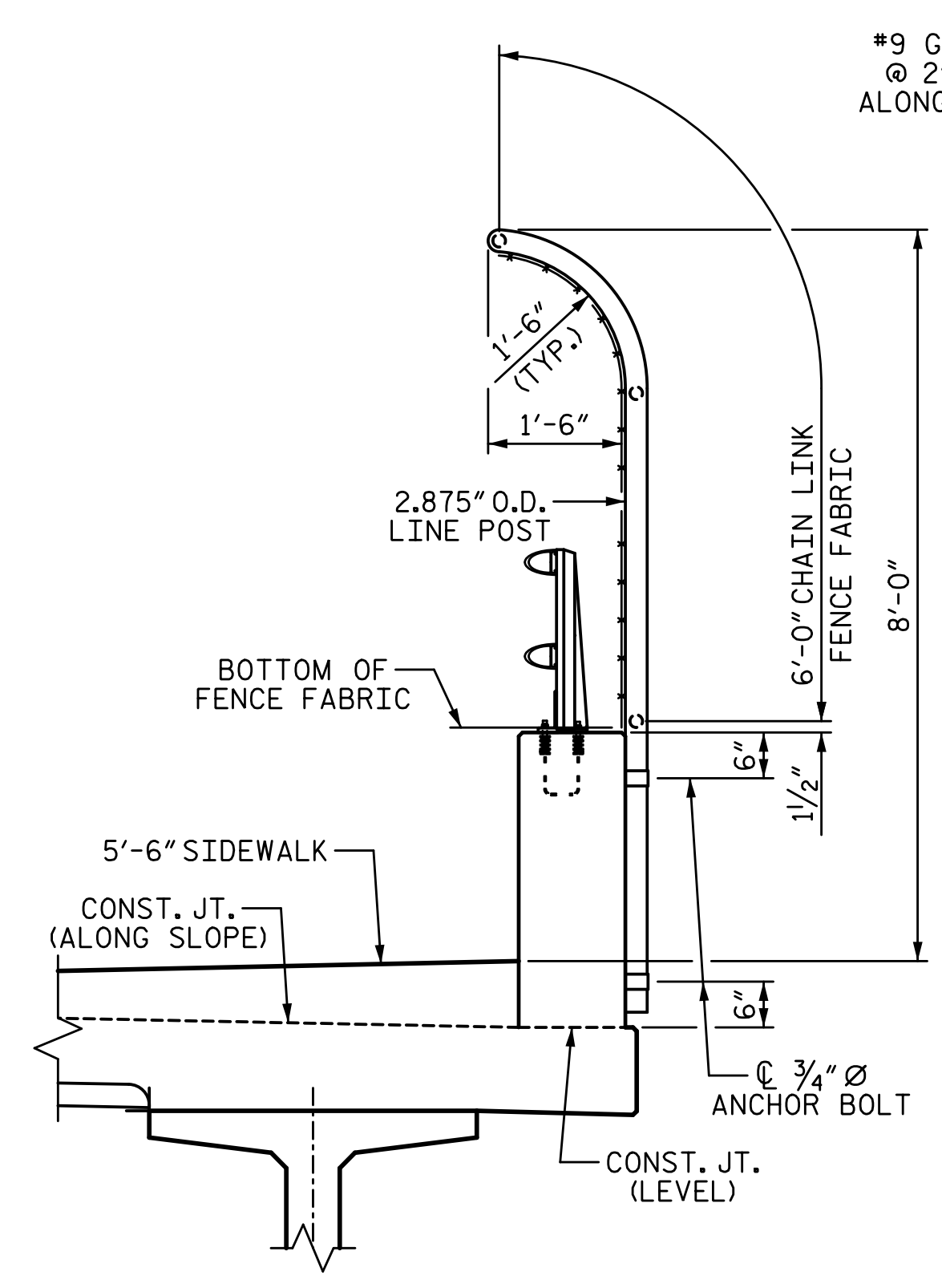


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 METAL RAILS**

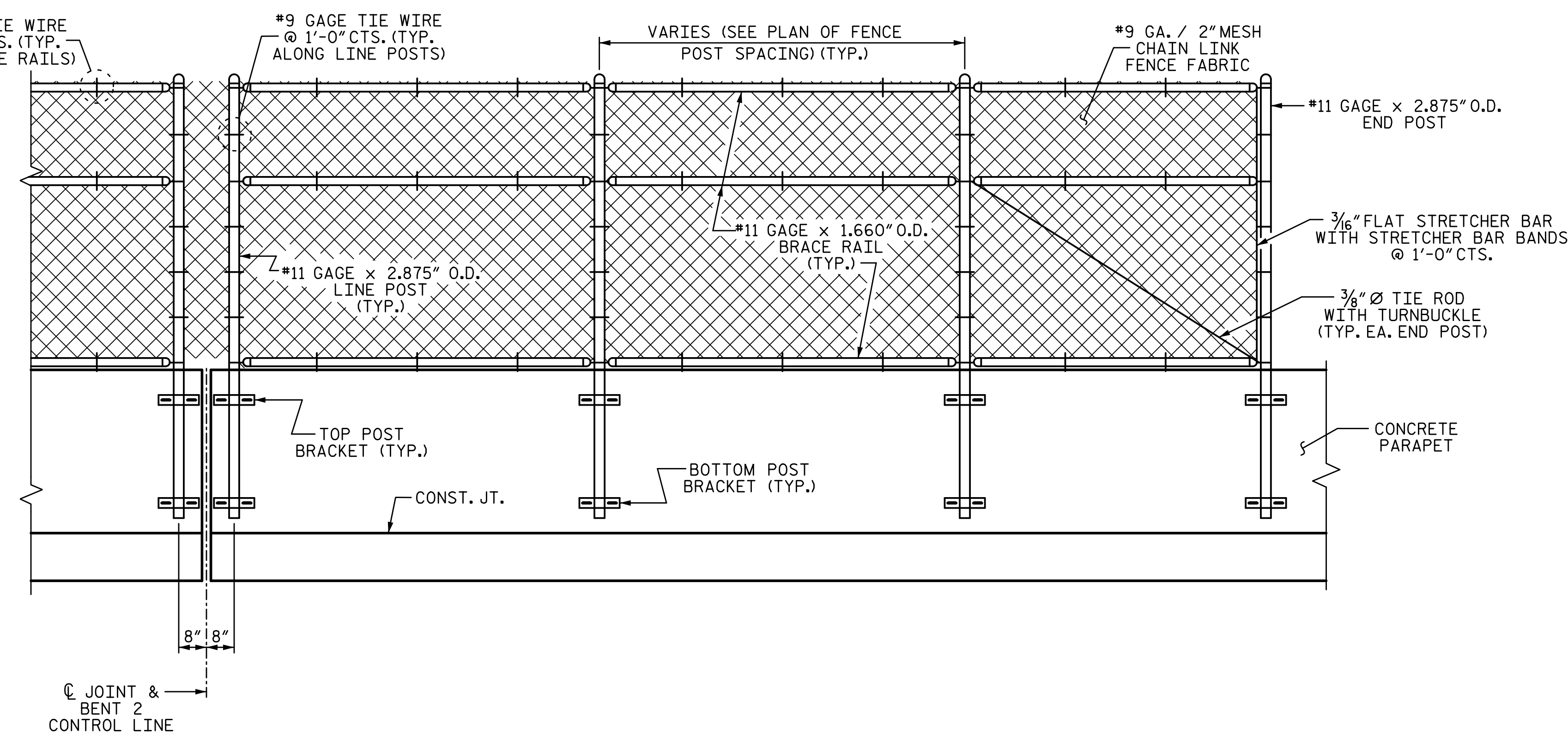
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**SECTION THRU FENCE**  
RIGHT SIDE SHOWN, LEFT SIDE SIMILAR



**PARTIAL ELEVATION**  
TWO BAR METAL RAIL NOT SHOWN FOR CLARITY

**NOTES:**

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

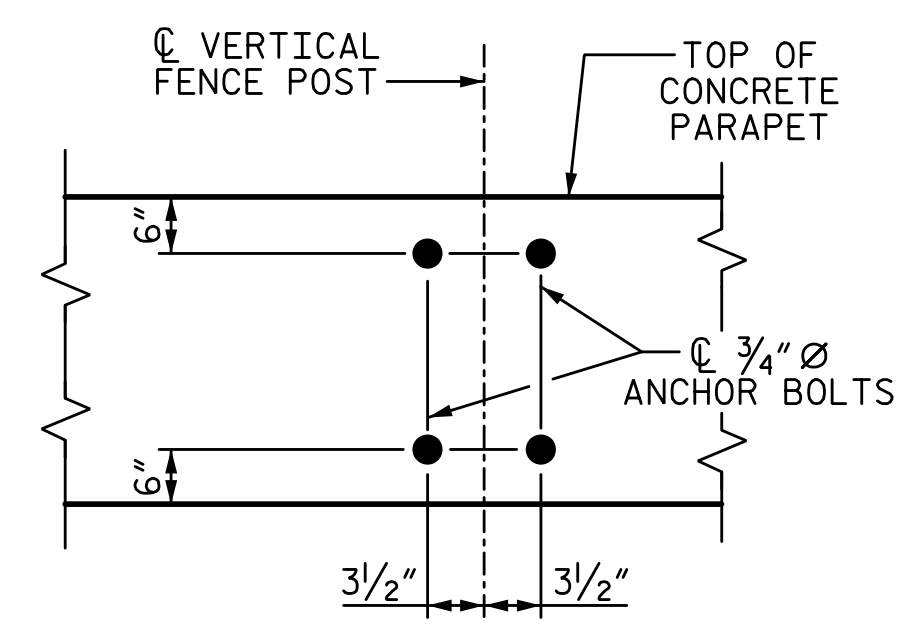
ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" (UNLESS OTHERWISE NOTED AT BENT 2) MINIMUM DISTANCE FROM C ANCHOR BOLT TO JOINTS IN CONCRETE PARAPET.

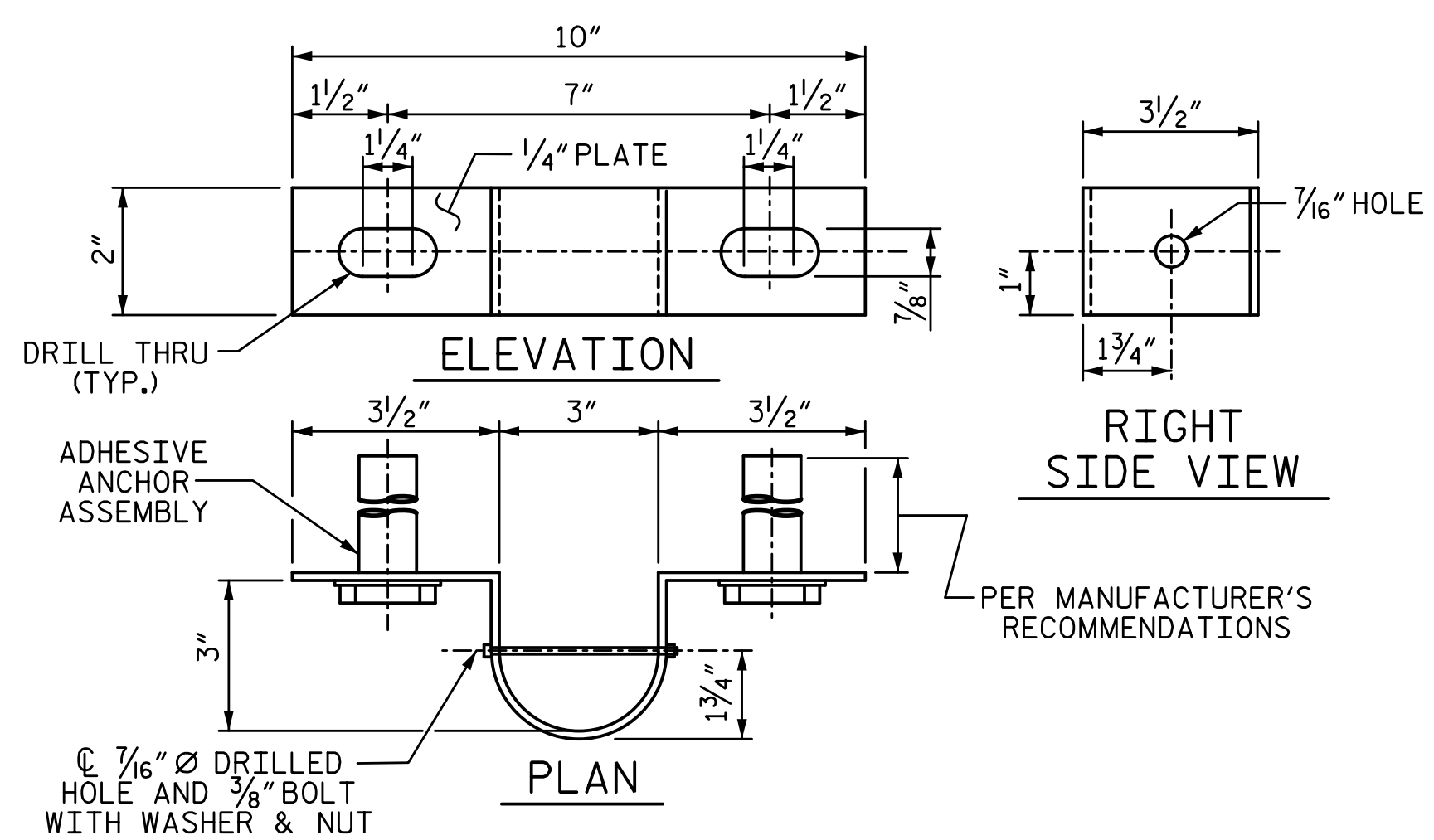
WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-18 OF STANDARD SPECIFICATIONS.

ADHESIVE BONDING SYSTEM SHALL HAVE MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

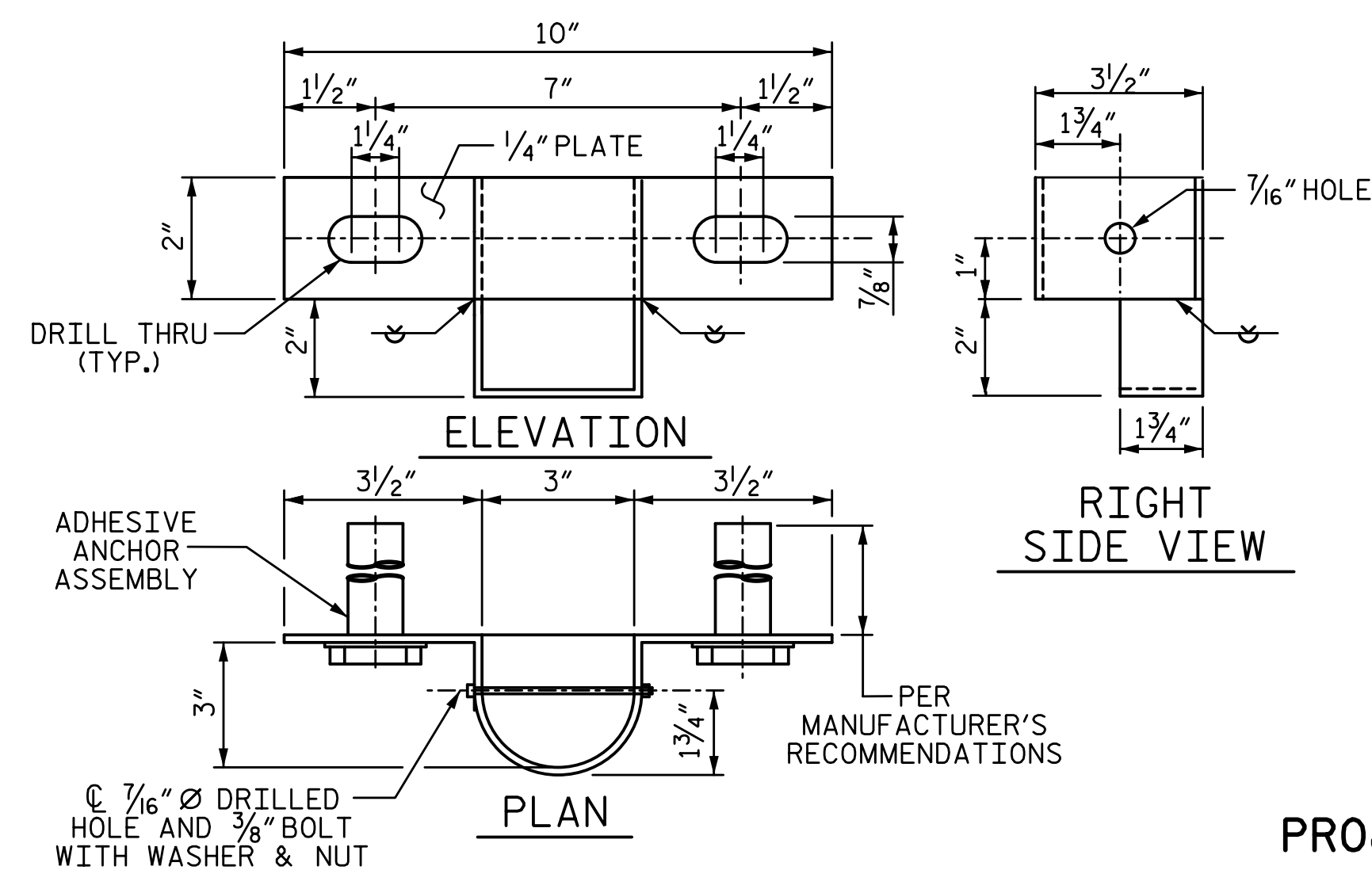
72" CHAIN LINK FENCE
TOTAL PAY LENGTH 400.00 LF



**BOLT SETTING DETAIL**



**TOP POST BRACKET**

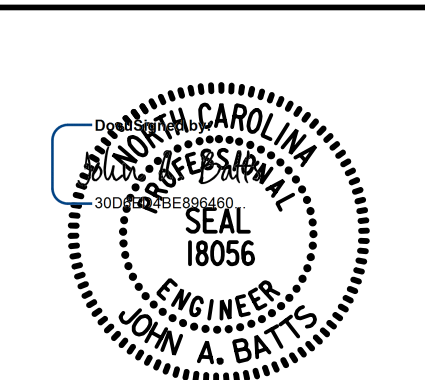


**BOTTOM POST BRACKET**

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SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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SUPERSTRUCTURE  
BRIDGE MOUNTED  
CHAIN LINK FENCE  
DETAILS



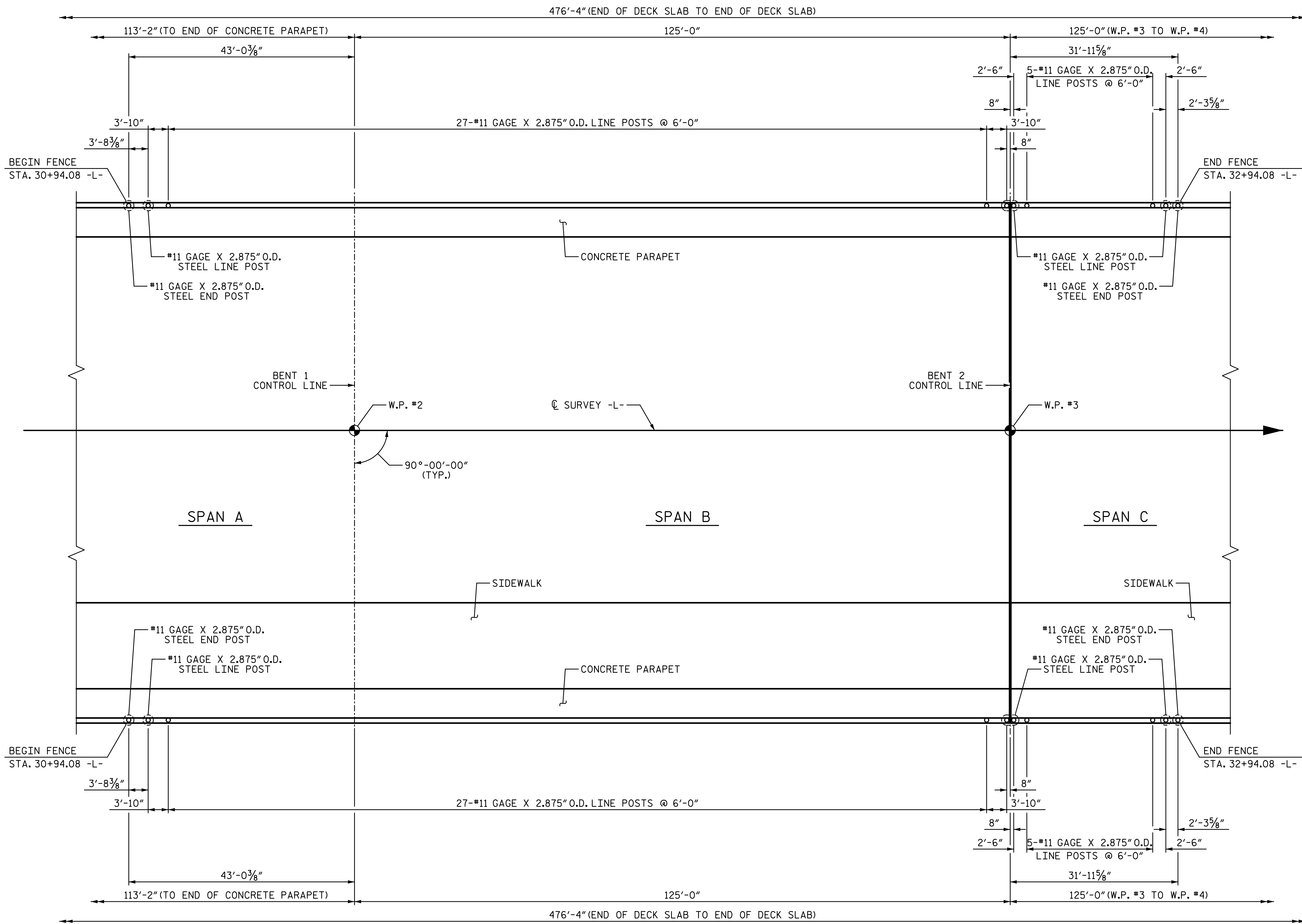
DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

REVISIONS						SHEET NO. S-32
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2			4			

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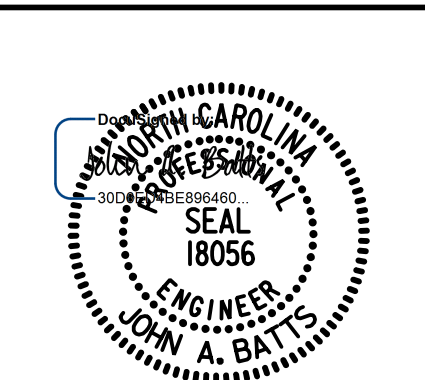
### PLAN OF FENCE POST SPACING

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE PARAPET

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 2

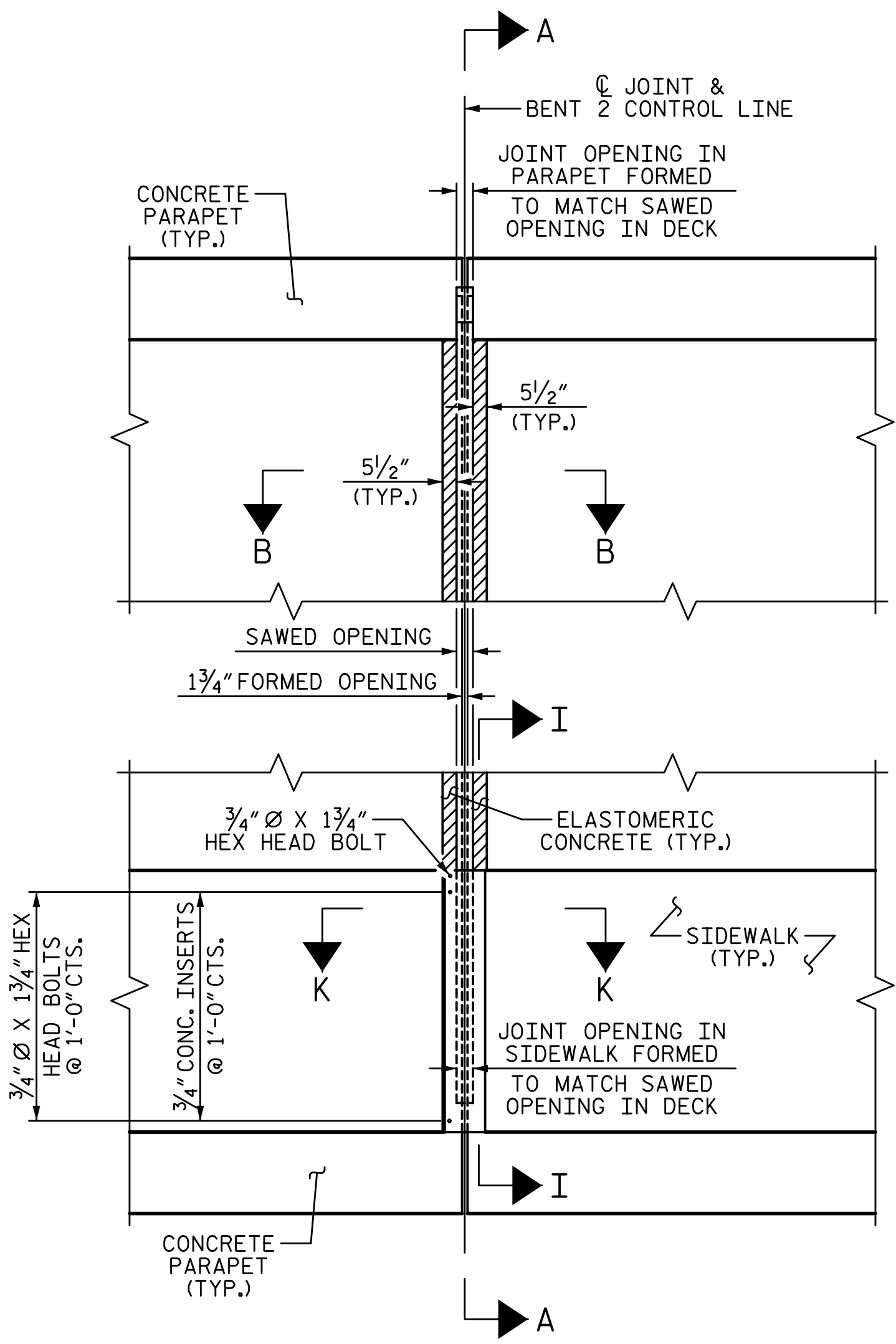
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE MOUNTED  
 CHAIN LINK FENCE  
 DETAILS



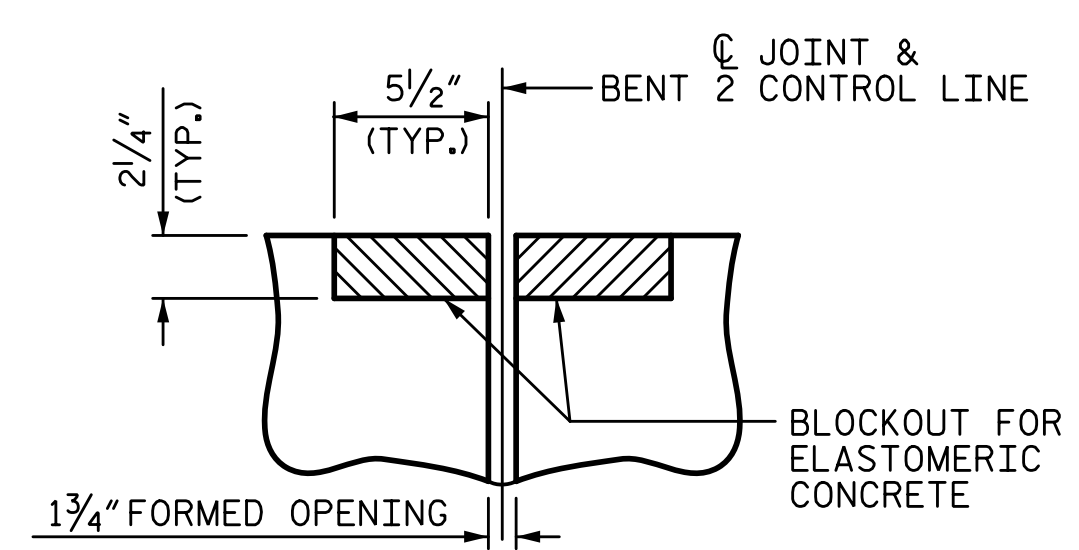
DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

LICENSURE NO. C-4434						8/25/2022   11:22 AM EDT					
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2			4			TOTAL SHEETS 53					

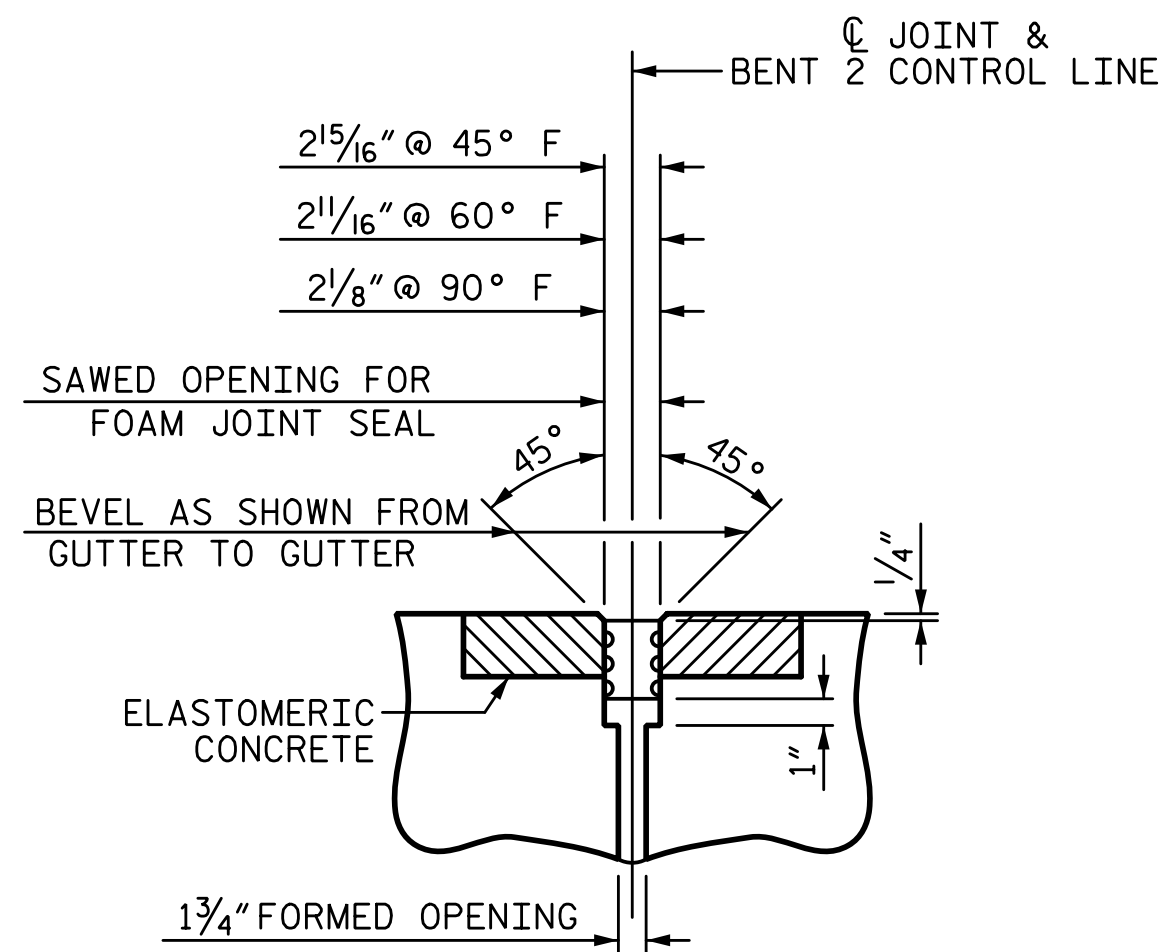
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PLAN OF FOAM JOINT SEAL WITH COVER PLATE



SECTION B-B  
FOAM JOINT SEAL  
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

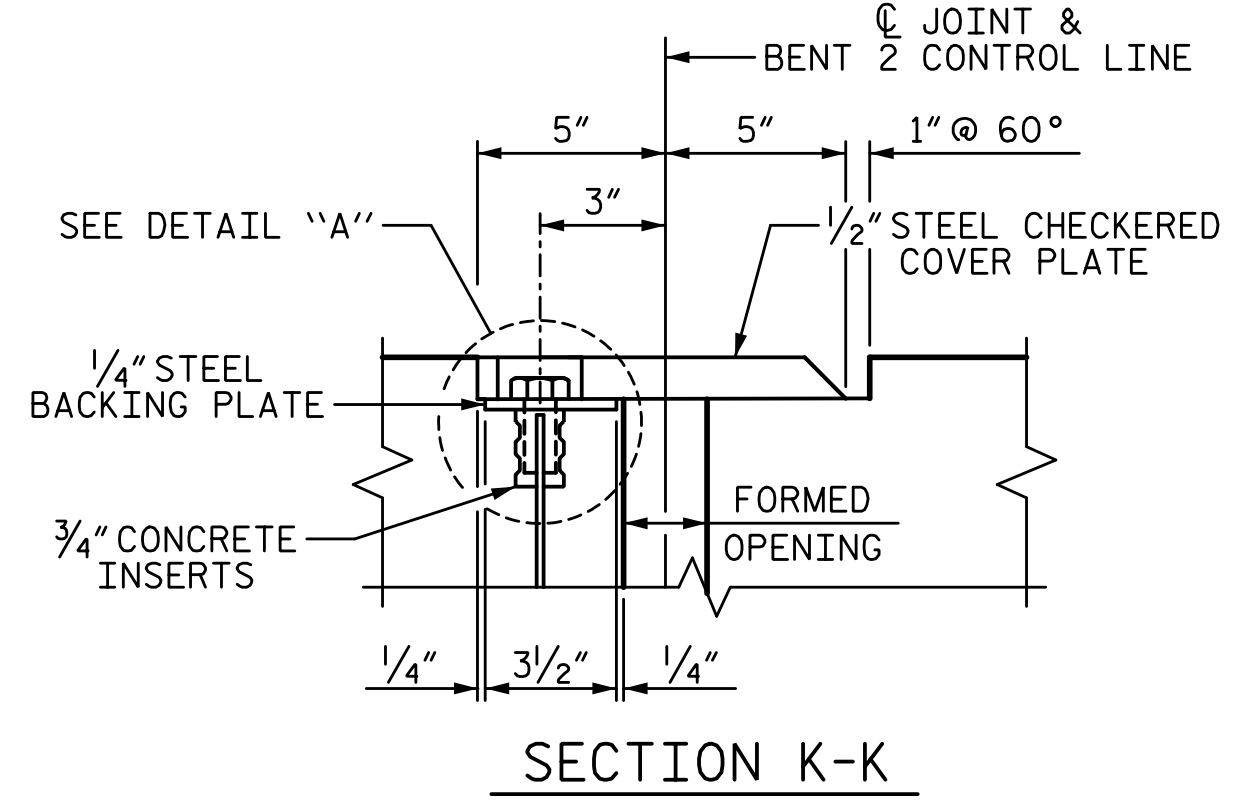


SECTION B-B  
FOAM JOINT SEAL  
(FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS)

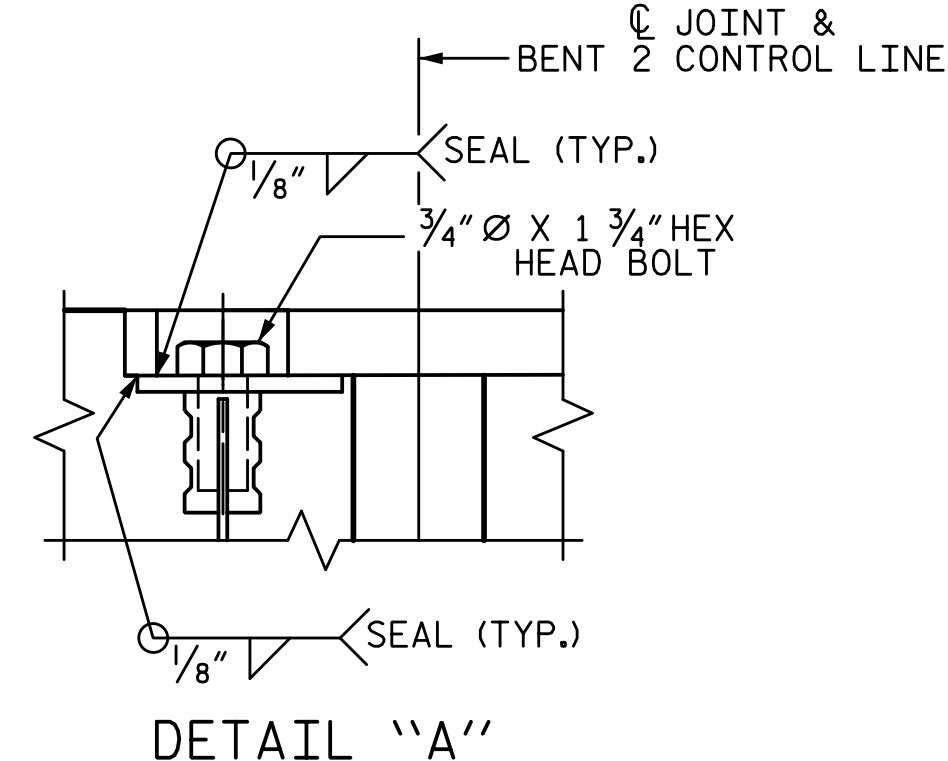
**ELASTOMERIC CONCRETE**

	ELASTOMERIC CONCRETE *
	CF
BENT 2	6.2

\*BASED ON THE MINIMUM BLOCKOUT SHOWN



SECTION K-K



DETAIL "A"

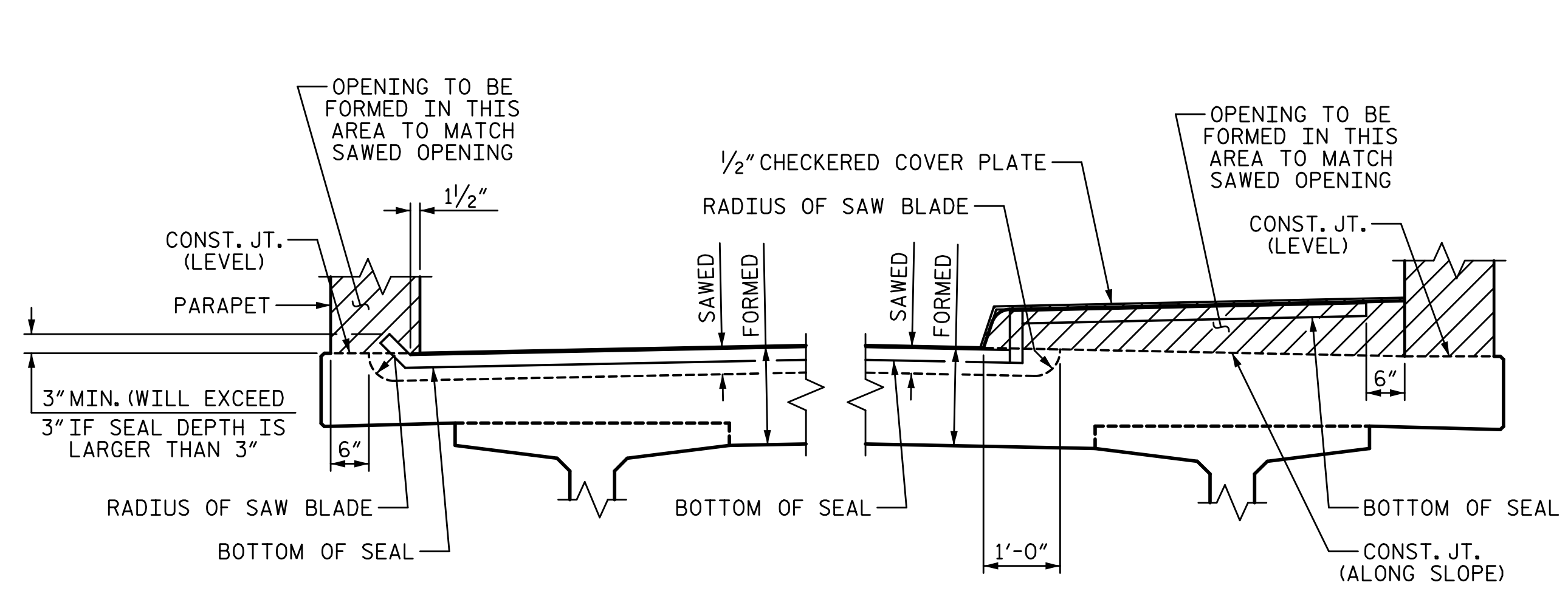
**NOTES:**

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

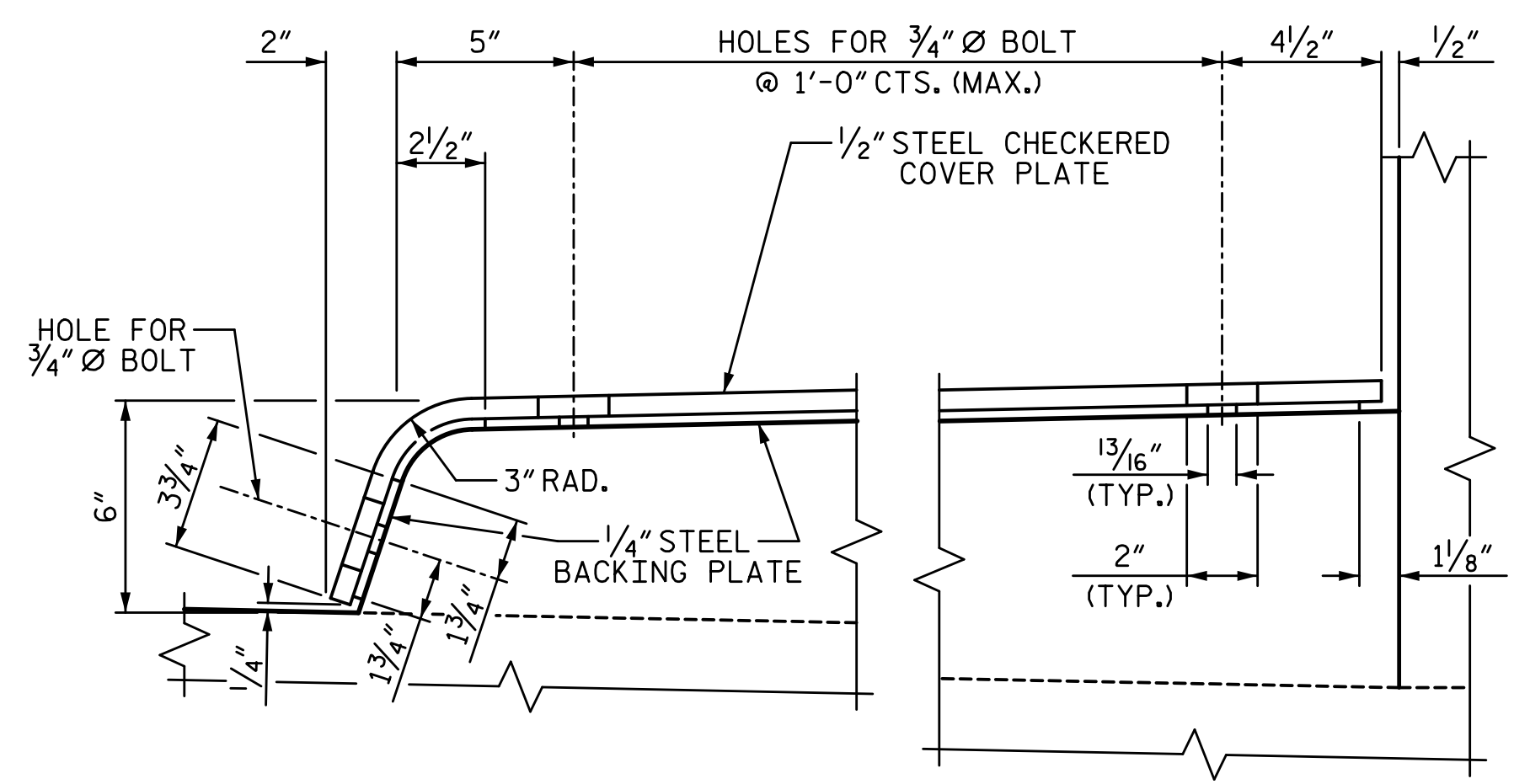
THE 3/4" Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14, AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR FOAM JOINT SEALS.



SECTION A-A

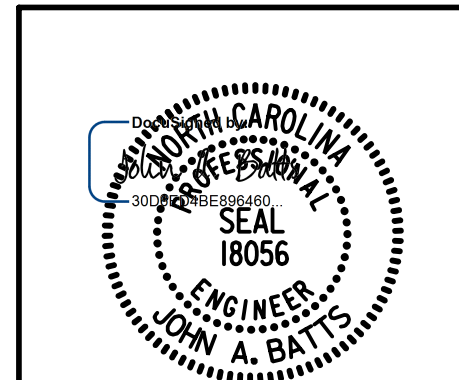


SECTION I-I

**FOAM JOINT SEAL DETAILS**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**FOAM JOINT SEAL**



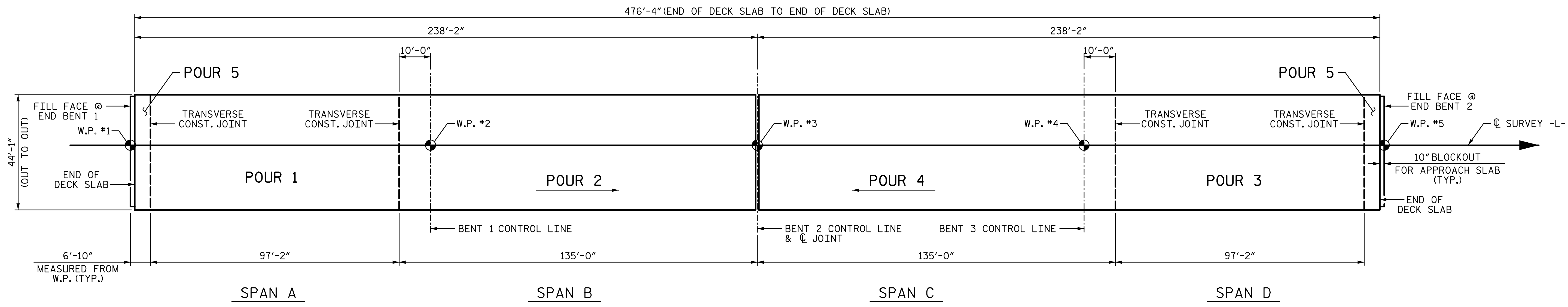
**W WGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY: T. BANKOVICH	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

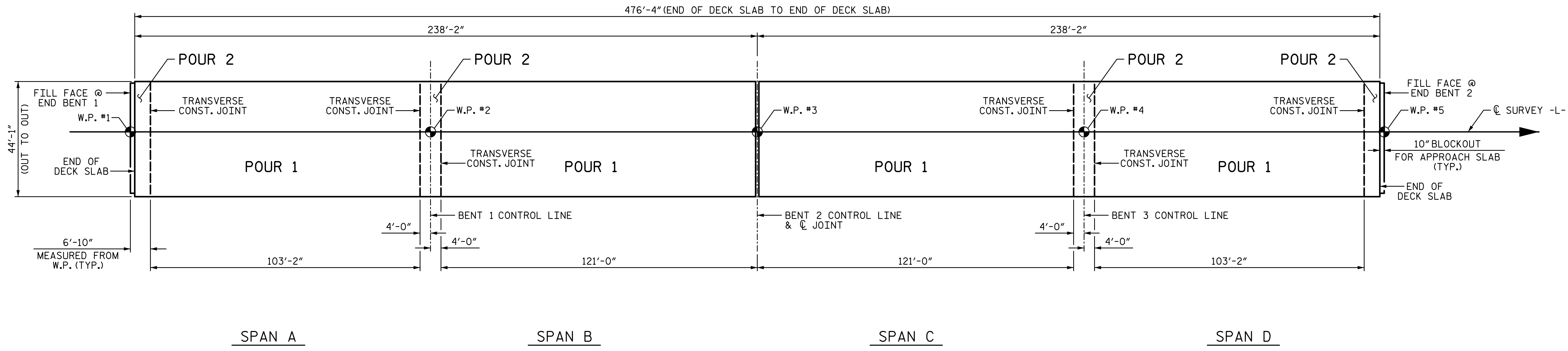
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
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2			4			53

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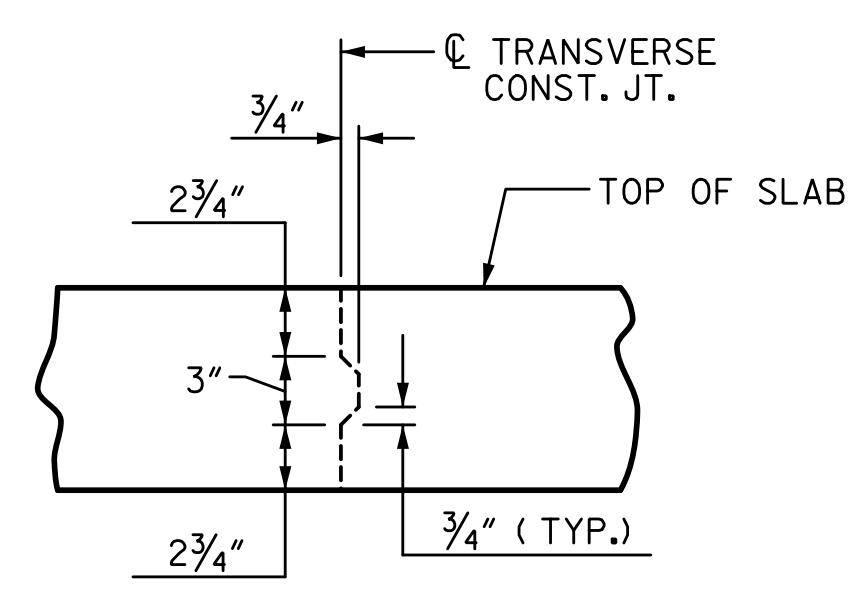
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LAYOUT FOR COMPUTING AREA OF REINFORCING DECK SLAB & POUR SEQUENCE  
(SF = 20998)



OPTIONAL POUR SEQUENCE  
(POUR 2 SHALL NOT BE STARTED UNTIL BOTH ADJACENT 1 POURS REACH A MINIMUM OF 3000 PSI)



TRANSVERSE CONSTRUCTION JOINT DETAIL

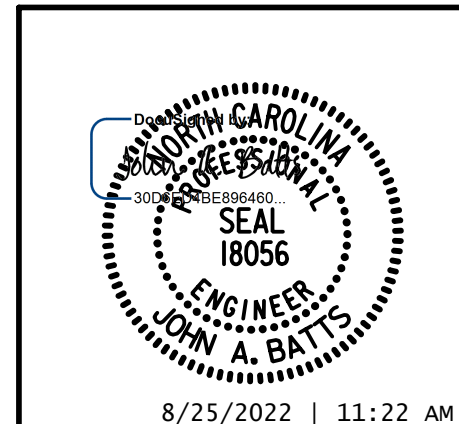
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE

BILL OF MATERIAL



DRAWN BY: J.R. SEALEY	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

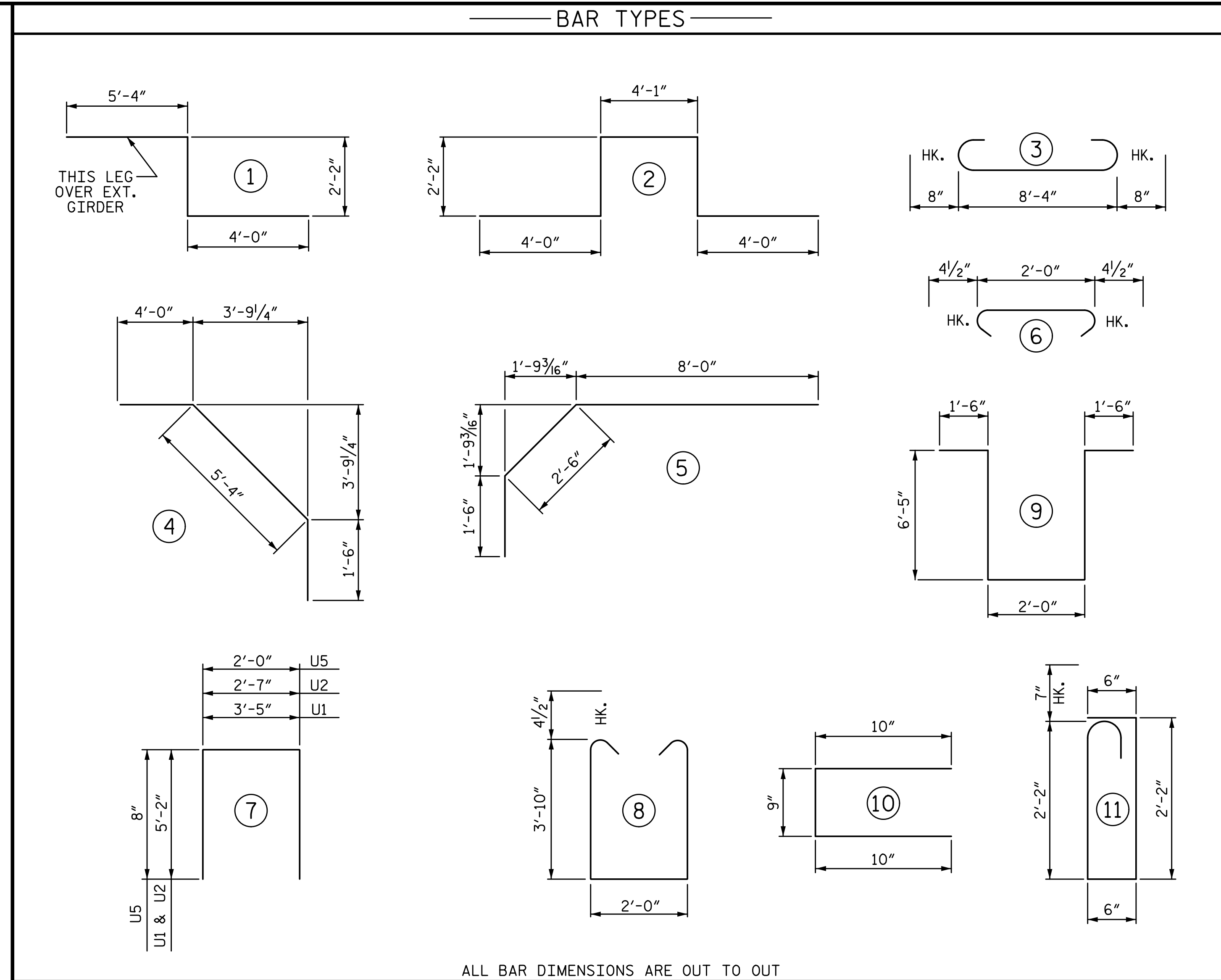
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SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED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

GROOVING BRIDGE FLOORS		
APPROACH SLABS	1,596	SF
BRIDGE DECK	15,698	SF
TOTAL	17,294	SF



BILL OF MATERIAL					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	762	#5	STR	43'-9"	34771
A2	762	#5	STR	43'-9"	34771
*B1	176	#6	STR	22'-10"	6036
*B2	120	#4	STR	28'-6"	2285
*B3	60	#5	STR	24'-3"	1518
*B4	60	#5	STR	60'-0"	3755
*B5	116	#6	STR	48'-0"	8363
*B6	180	#4	STR	29'-6"	3547
B7	520	#5	STR	49'-6"	26847
*B8	50	#4	STR	24'-9"	827
*B9	50	#4	STR	27'-2"	907
*G1	2	#5	STR	43'-9"	91
*G2	476	#4	STR	5'-0"	1590
K1	24	#4	STR	23'-3"	373
K2	8	#4	STR	6'-9"	36
K3	40	#4	STR	8'-4"	223
K4	4	#4	STR	2'-1"	6
K5	20	#4	STR	2'-11"	39
K6	16	#4	STR	5'-7"	60
K7	80	#4	STR	8'-4"	445
K8	16	#4	STR	5'-4"	57
K9	28	#4	STR	20'-2"	377
*K10	8	#8	1	11'-6"	246
*K11	12	#8	2	16'-5"	526
K12	16	#6	STR	5'-4"	128
K13	16	#6	3	9'-8"	232
*S1	56	#4	5	12'-0"	449
*S2	56	#4	4	10'-10"	405
S3	352	#4	6	2'-9"	647
*S4	48	#4	10	2'-5"	77
*S5	48	#5	11	5'-11"	296
U1	60	#4	7	13'-9"	551
U2	4	#4	7	12'-11"	35
U3	16	#4	8	10'-5"	111
U4	48	#4	9	17'-10"	572
*U5	140	#4	7	3'-4"	312

\* INDICATES EPOXY COATED REINFORCING STEEL

— SUPERSTRUCTURE BILL OF MATERIAL —			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	CY	LB	LB
POUR 1	138.4		
POUR 2	214.5		
POUR 3	138.4		
POUR 4	214.5		
POUR 5	89.4		
SIDEWALK	58.3		
TOTALS**	853.5	65,510	66,001

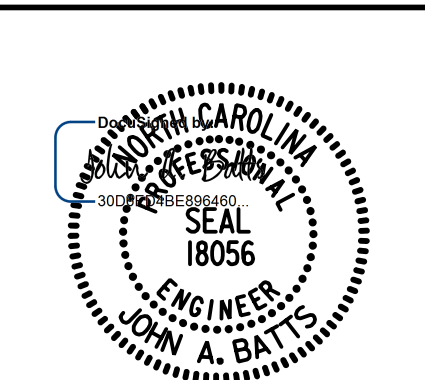
\*\* QUANTITIES FOR PARAPETS AND END POSTS ARE NOT INCLUDED

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

BILL OF MATERIAL



8/25/2022 | 11:22 AM

LICENSURE NO. C-4434

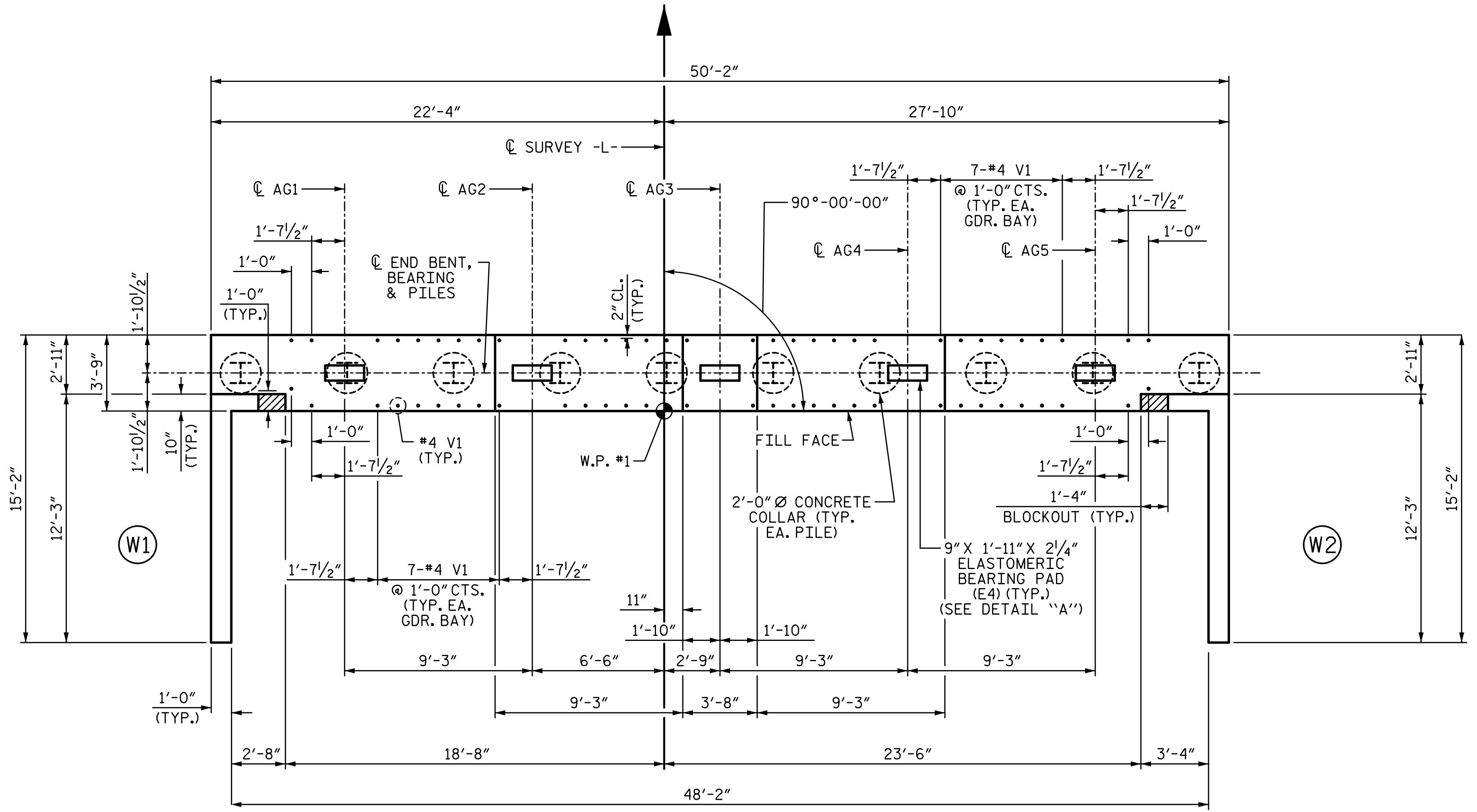
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2			4	

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DRAWN BY: J. R. SEALEY DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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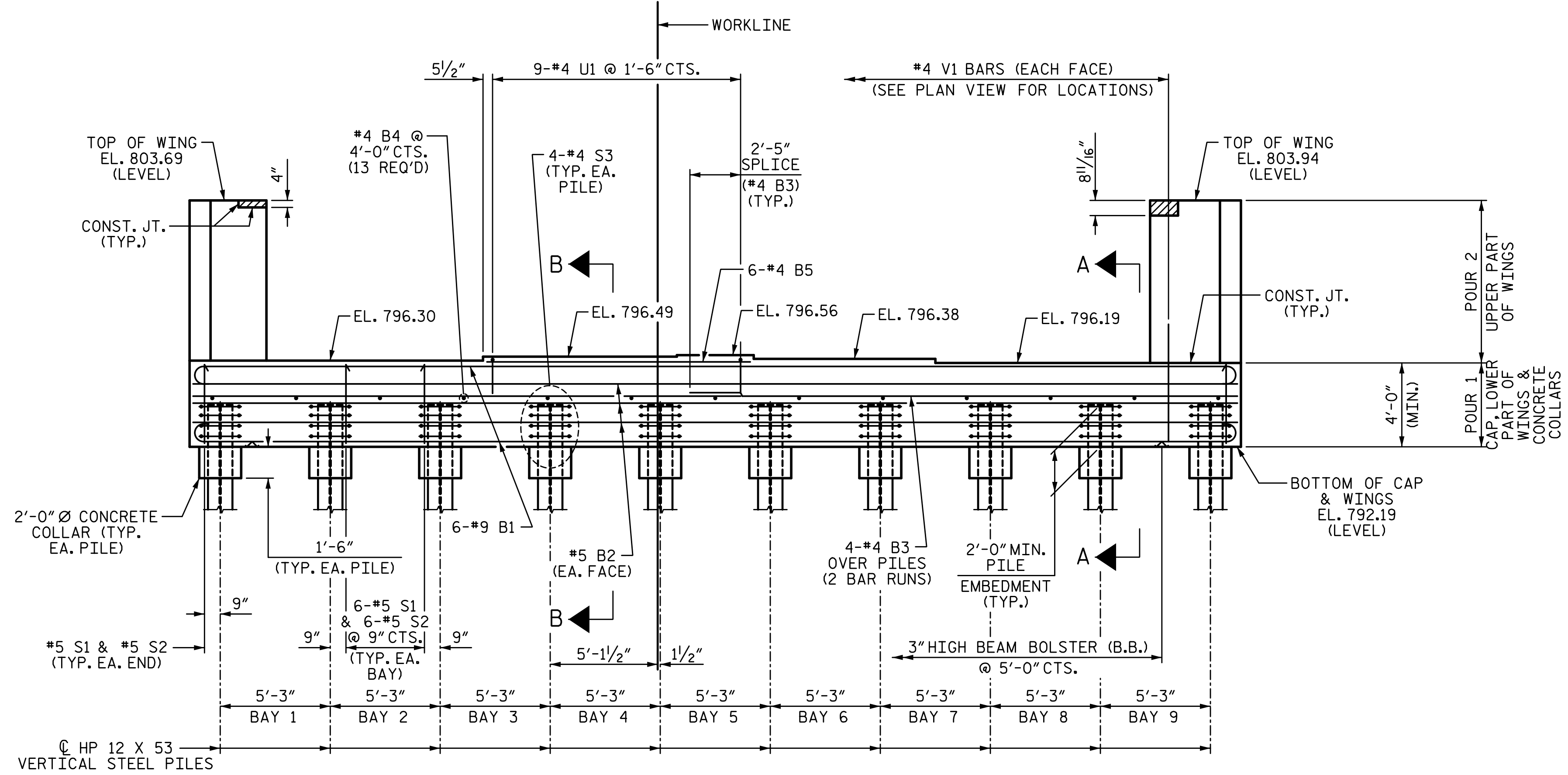
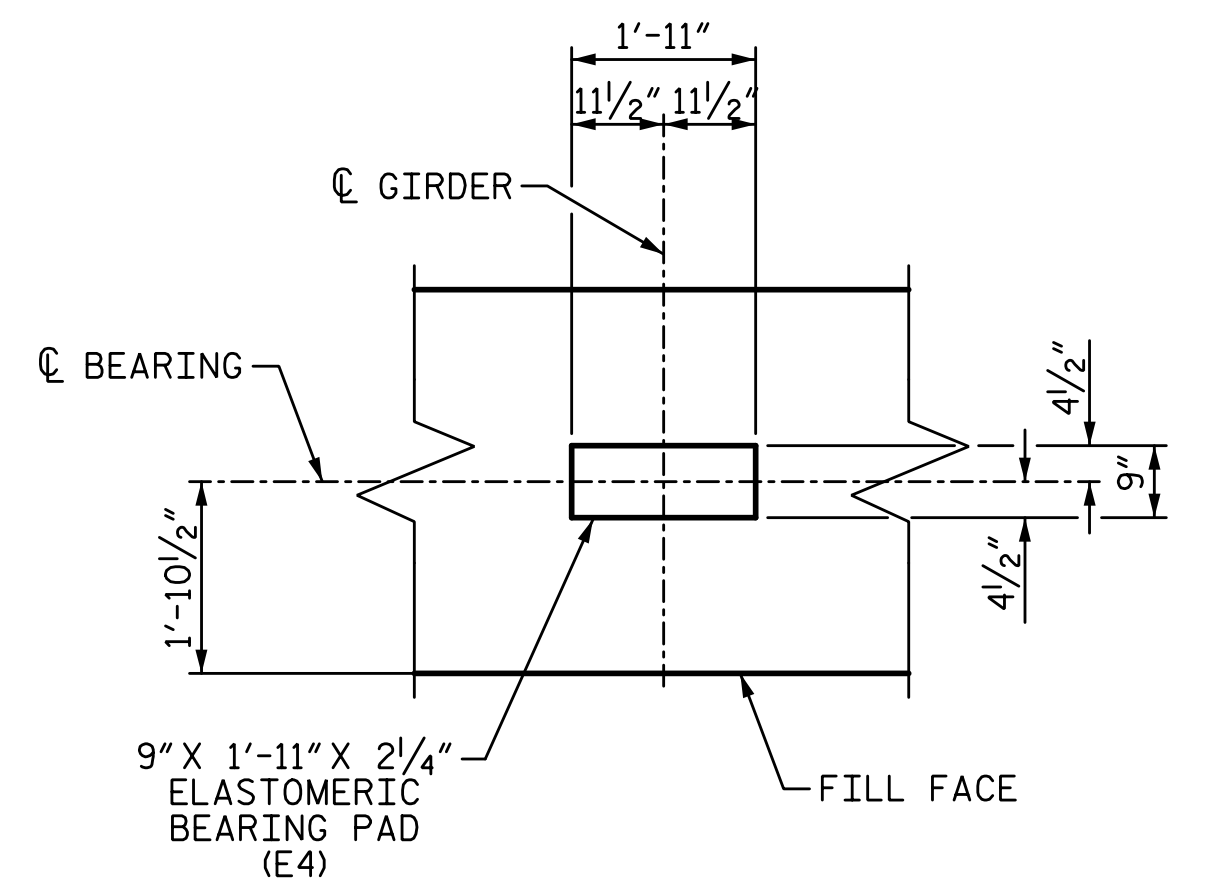
**NOTES:**

#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

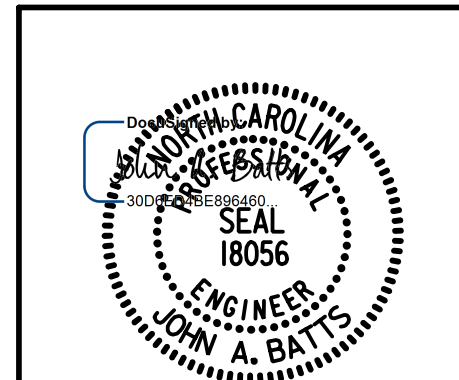


PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**



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

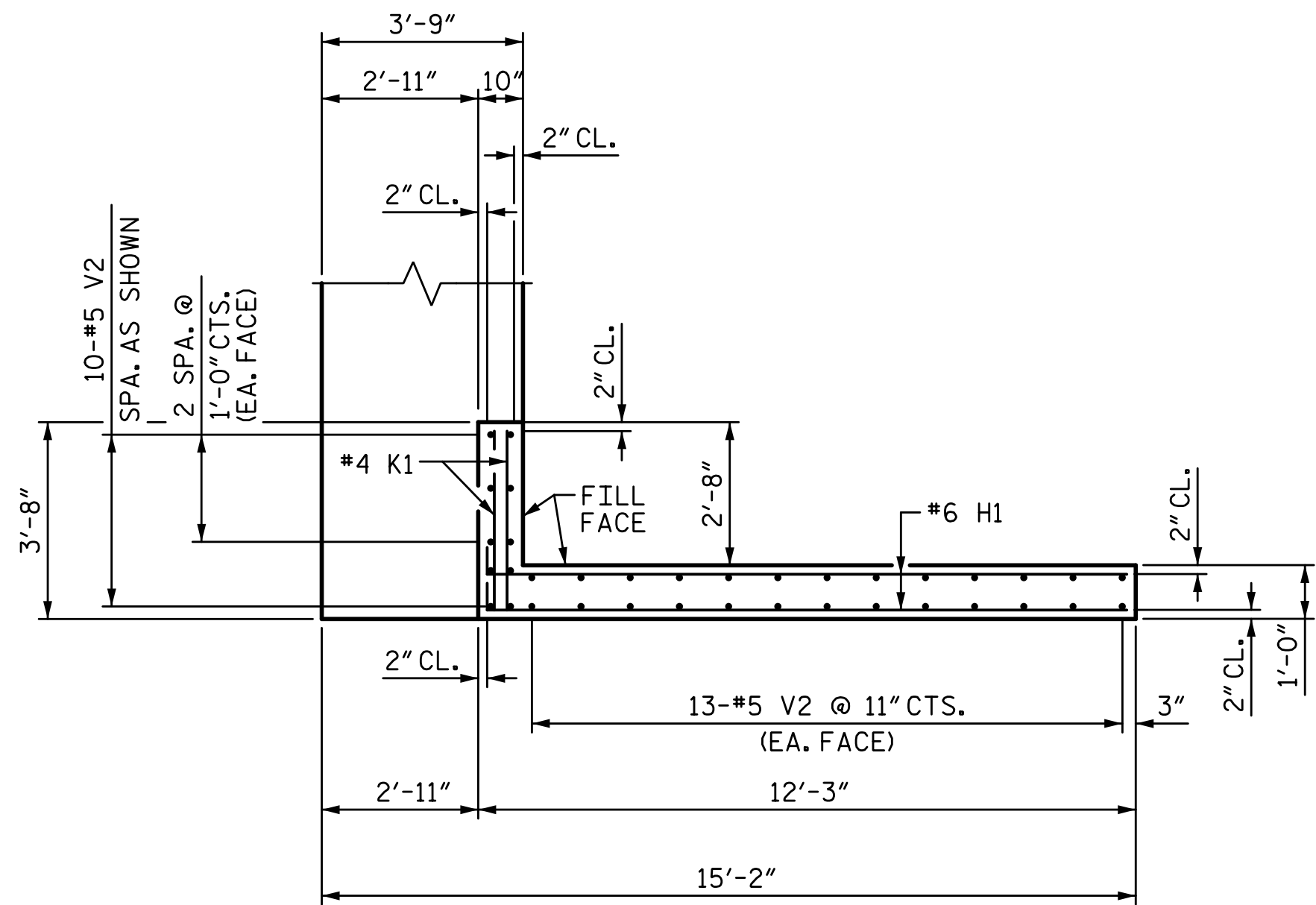
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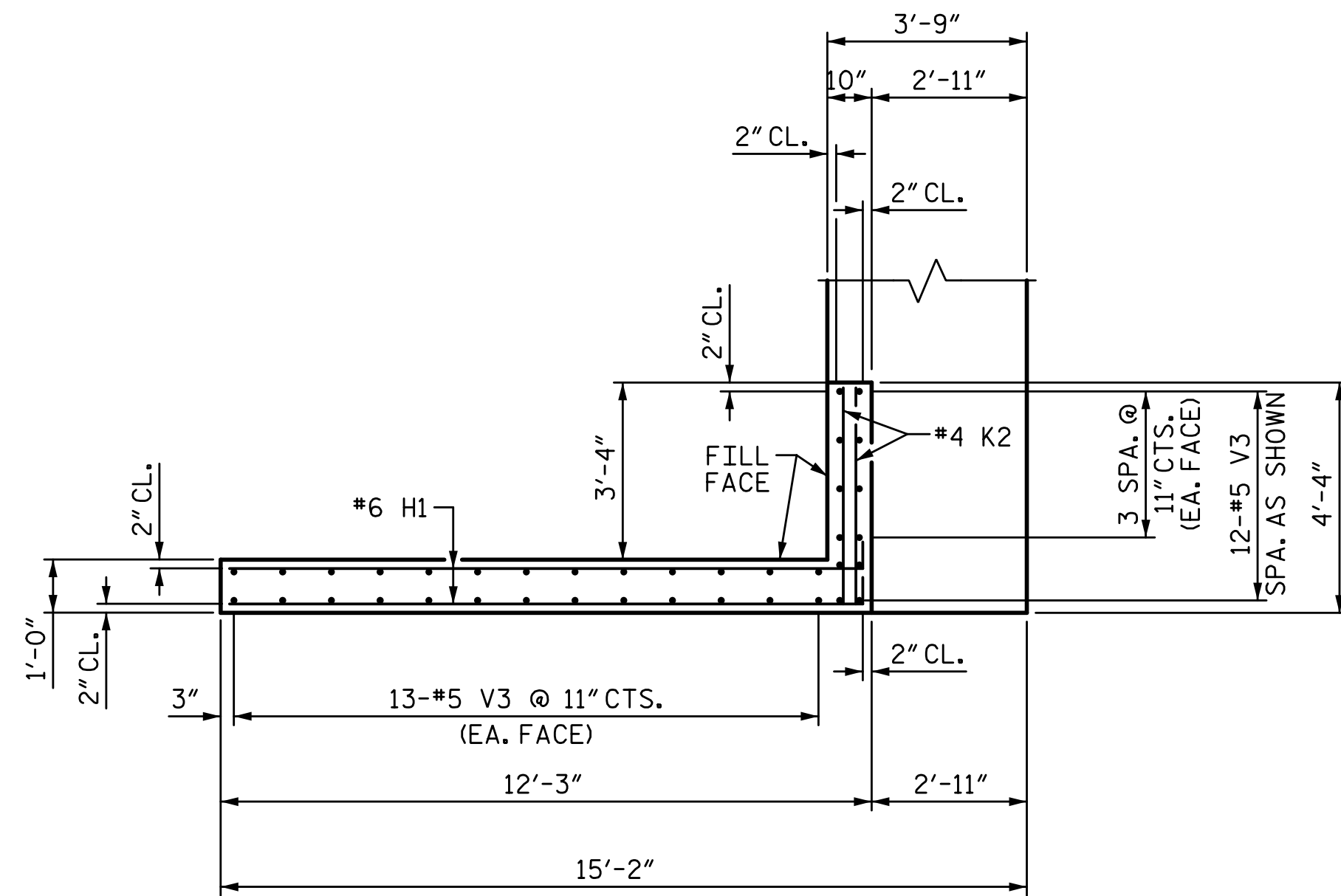
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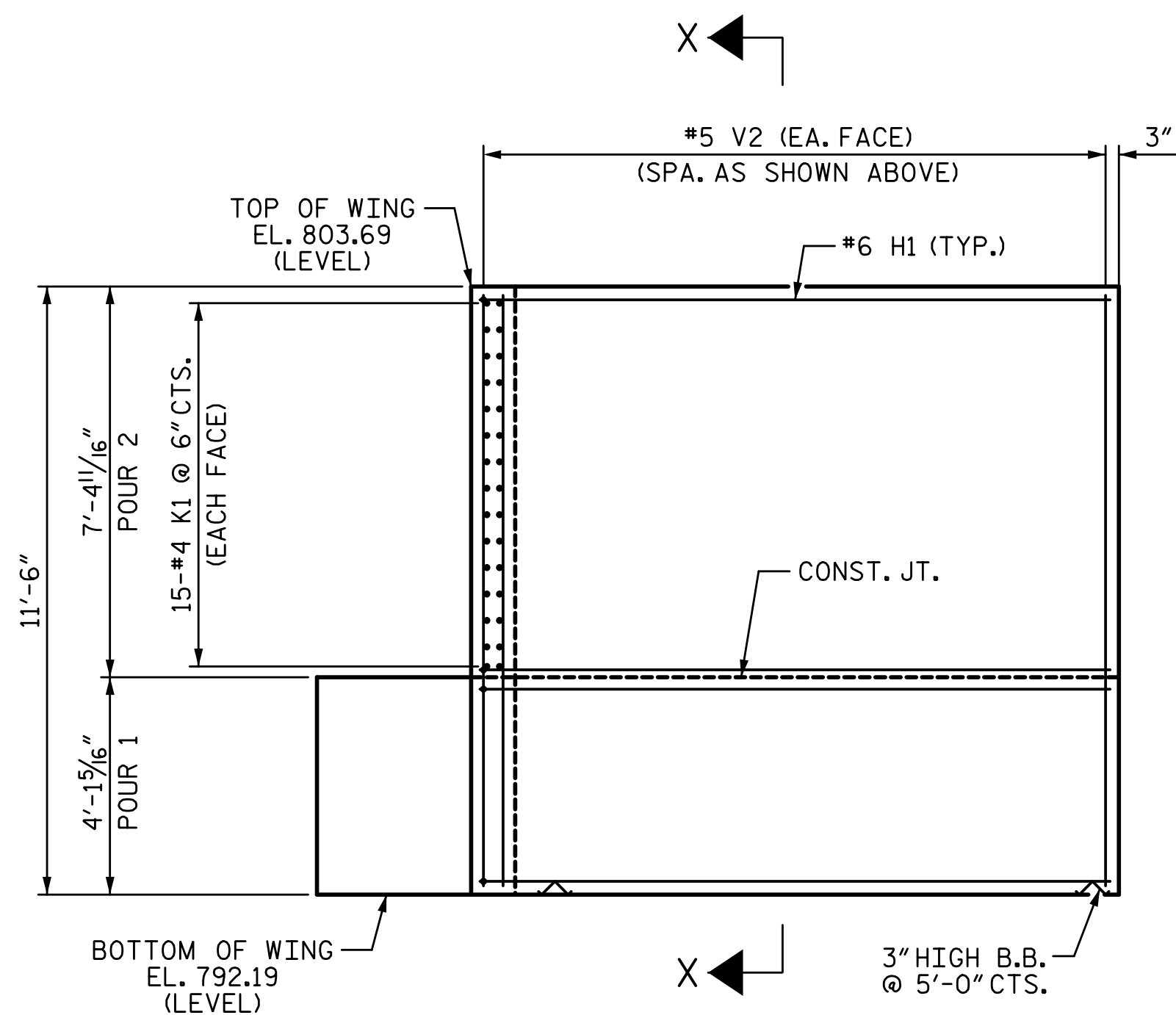
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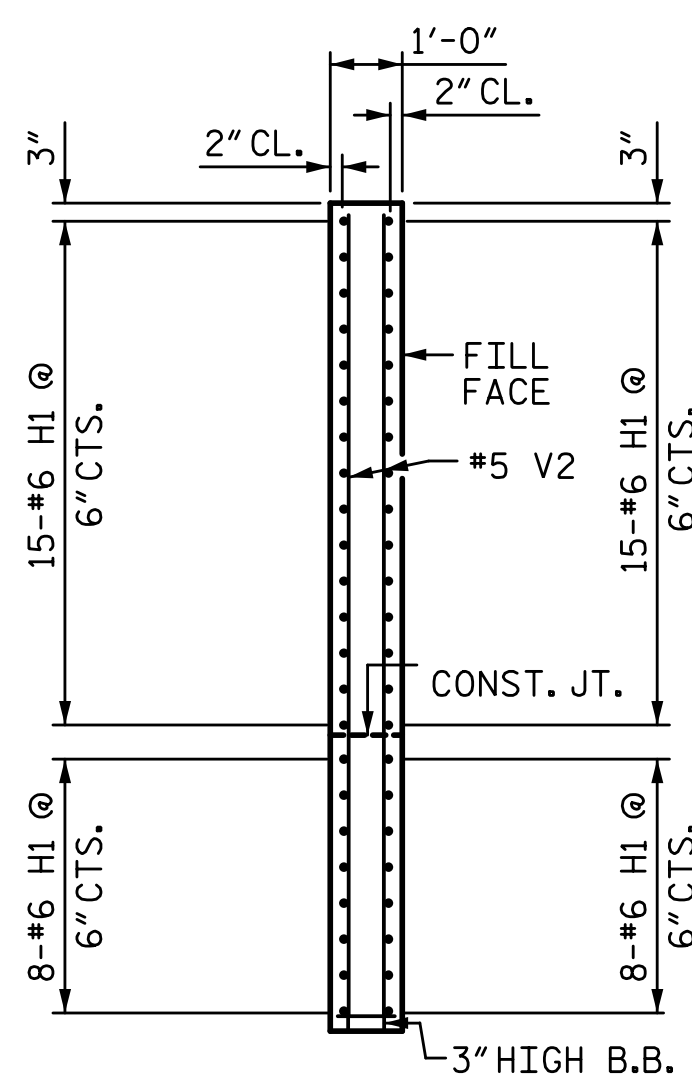
PLAN OF WING (W1)



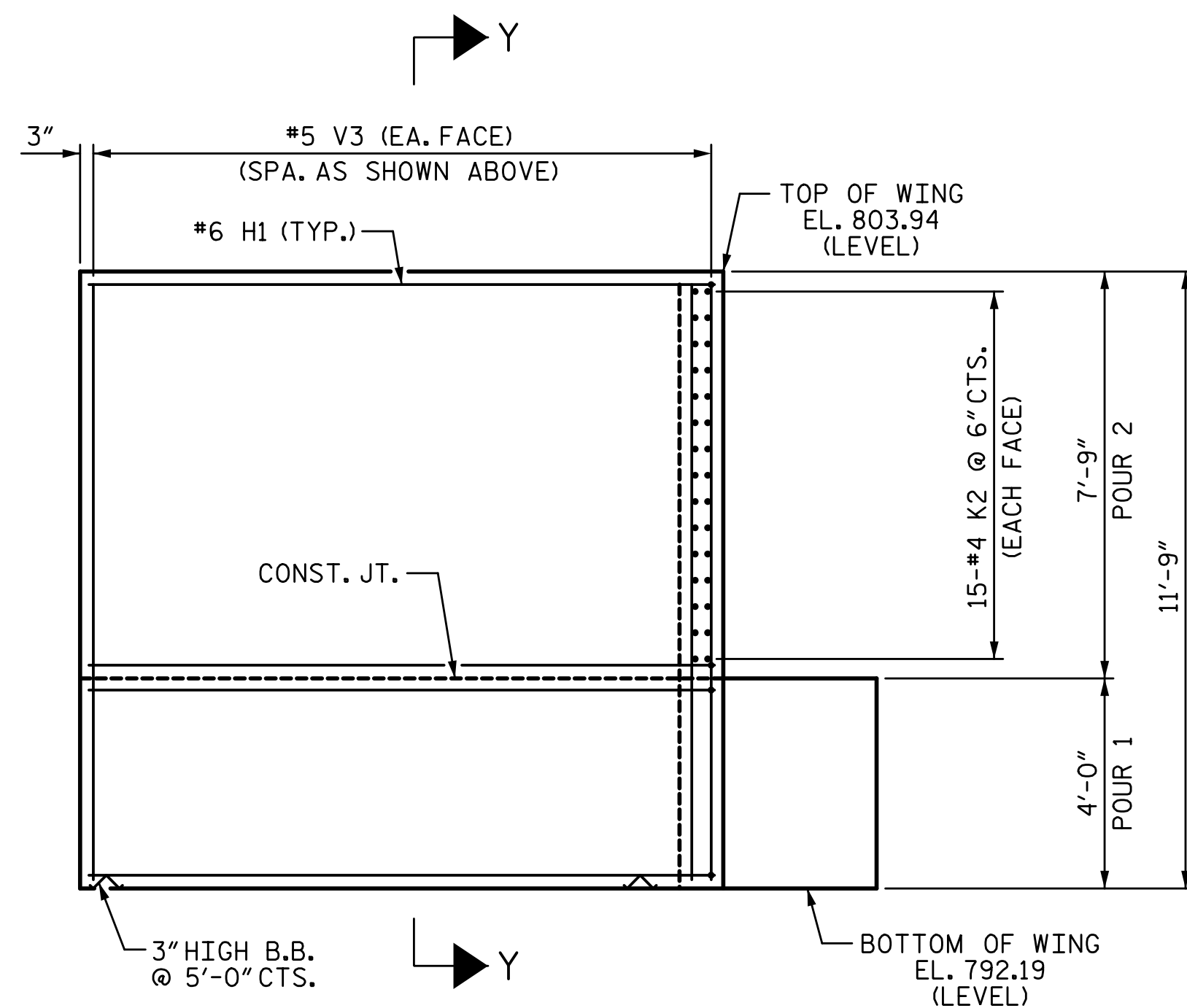
PLAN OF WING (W2)



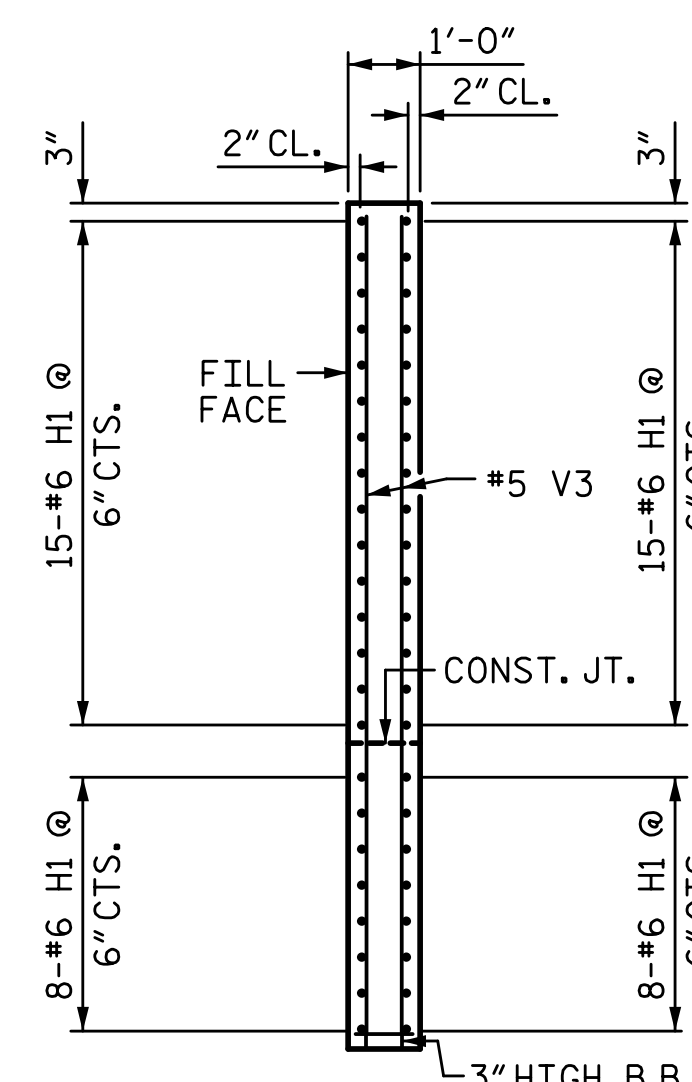
ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 3

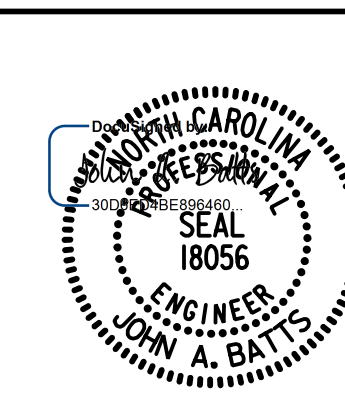
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 1



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 Cary, NC 27518

LICENSURE NO. C-4434



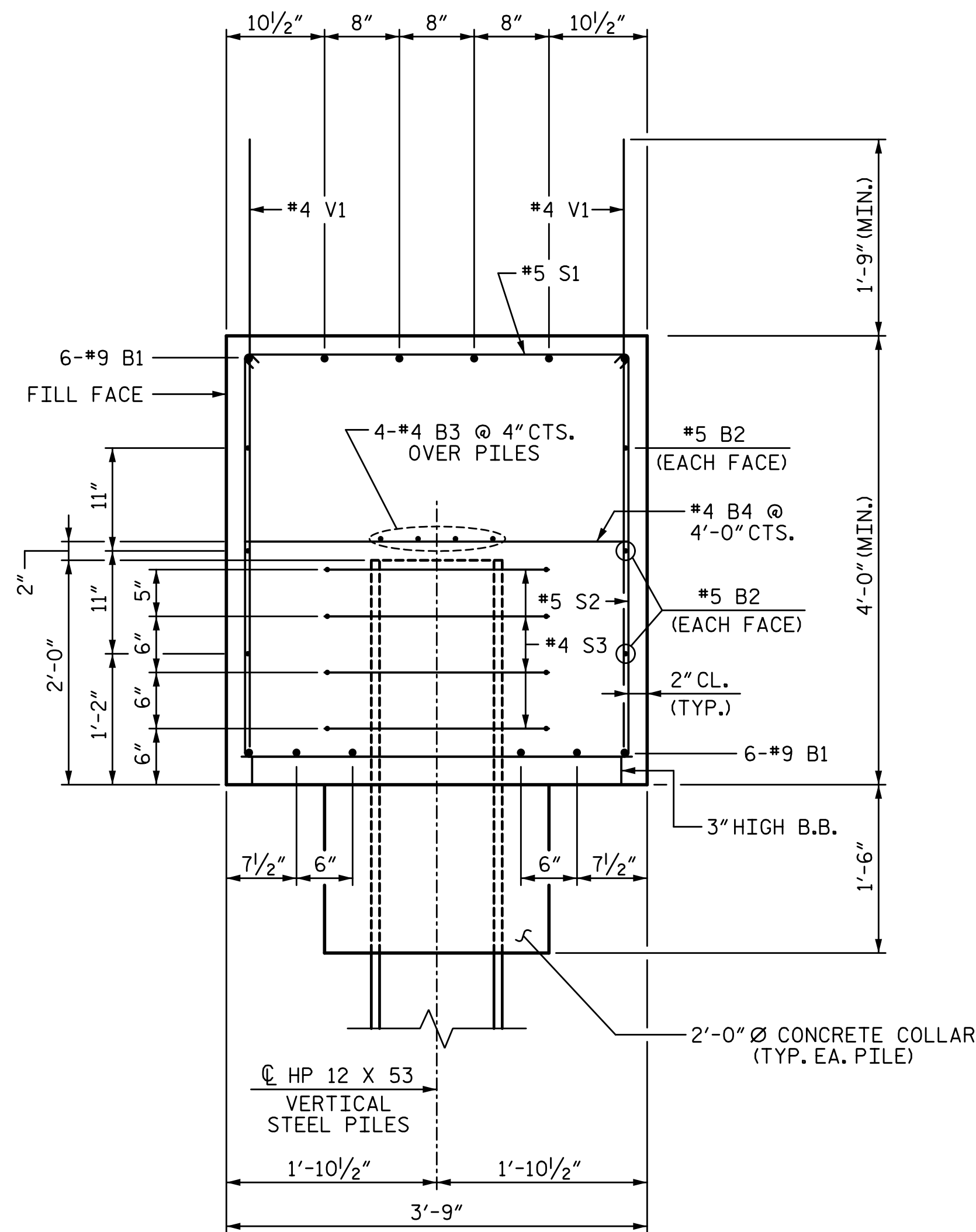
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CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

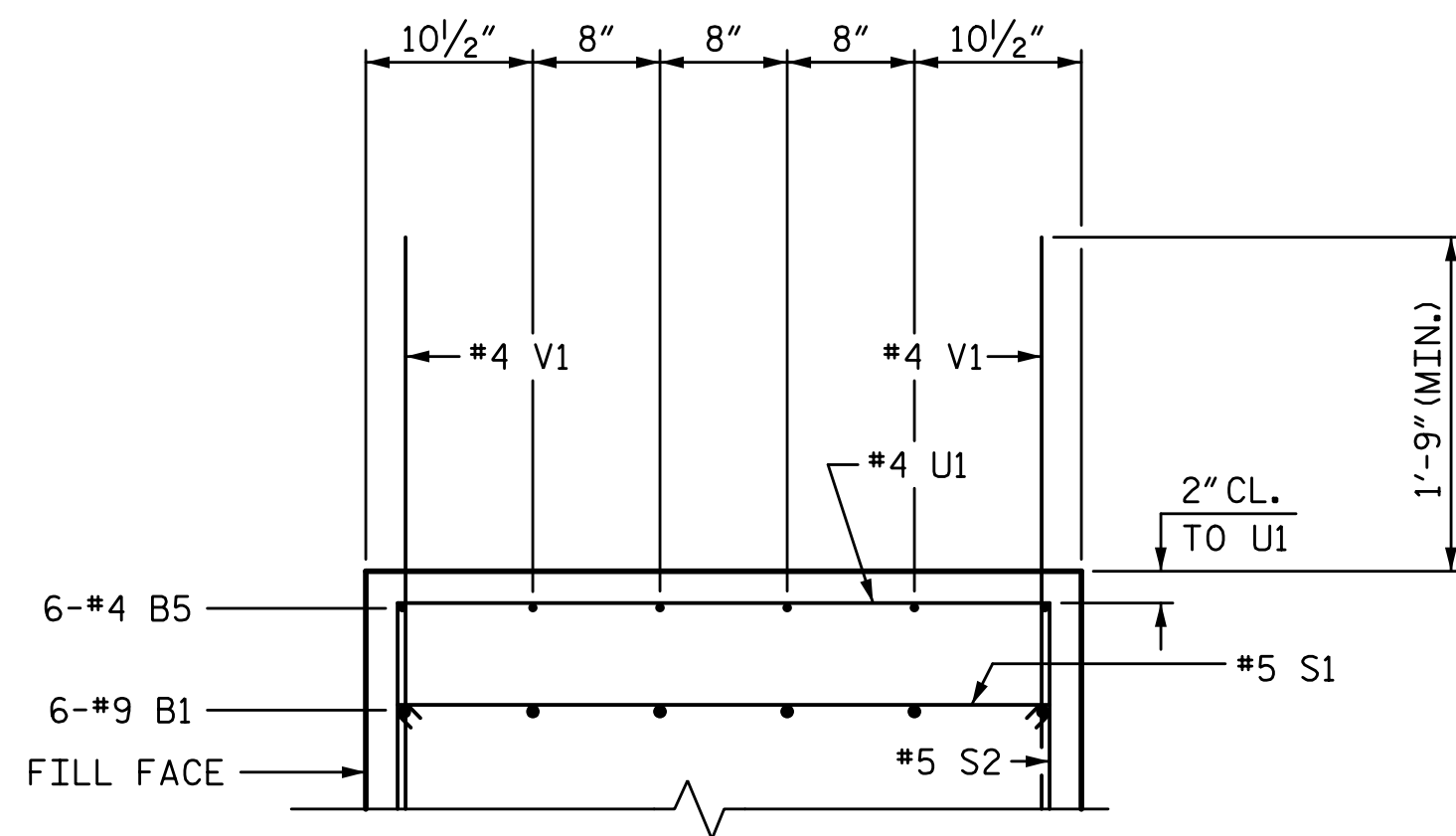
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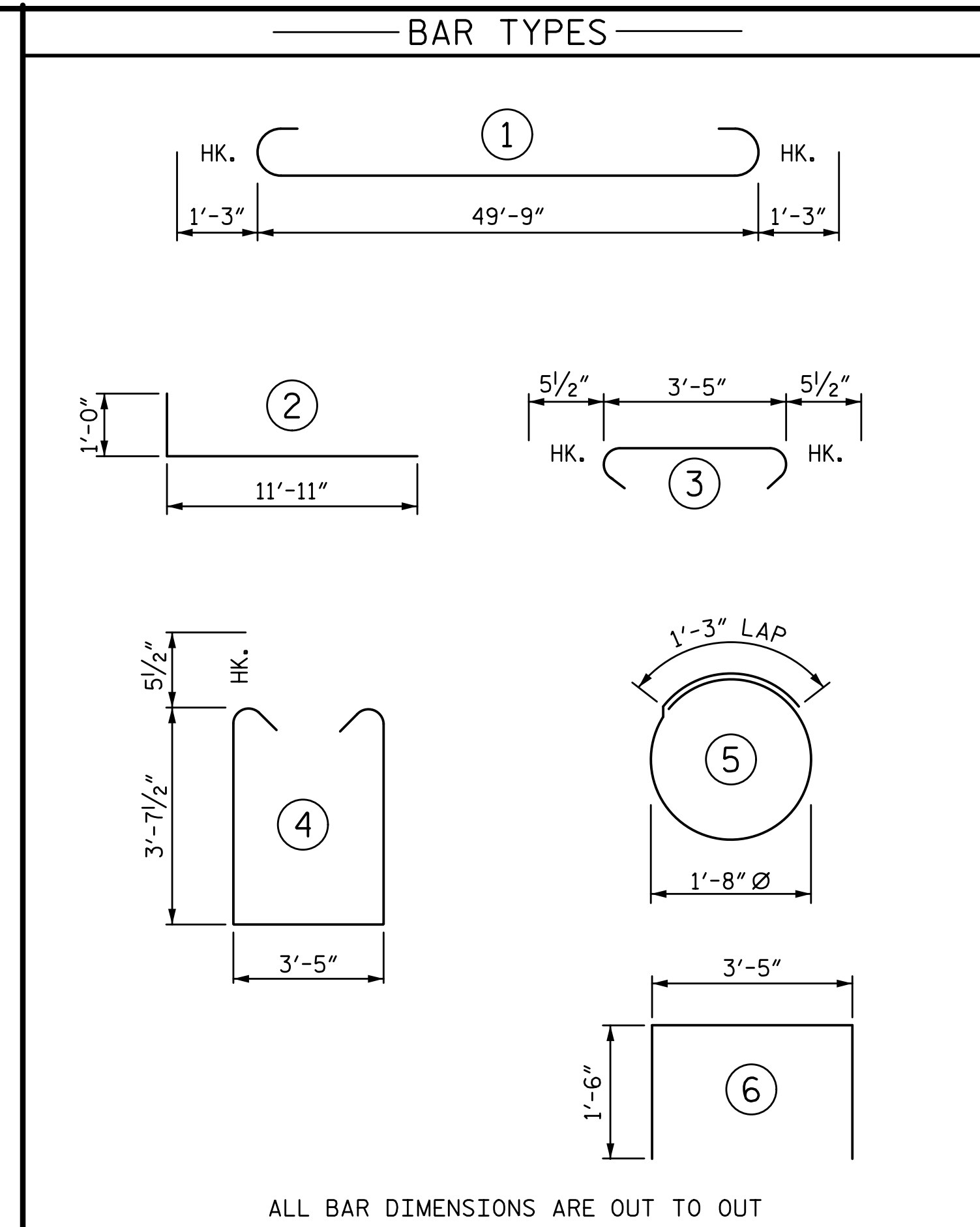
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SECTION A-A

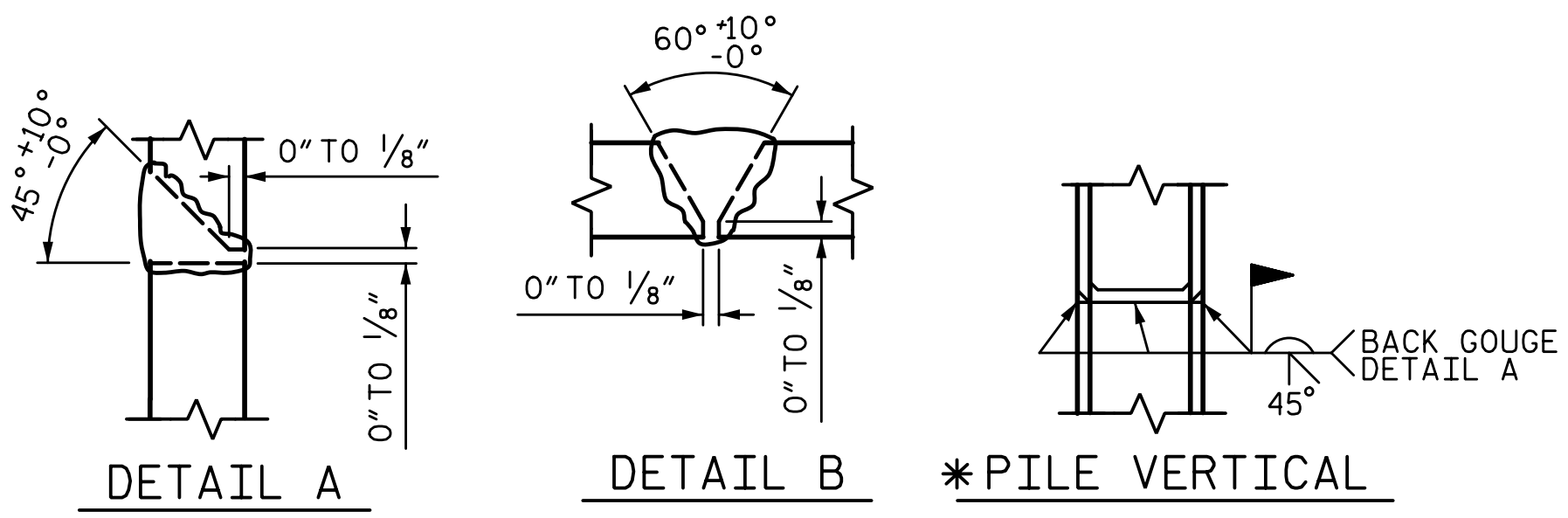


PARTIAL SECTION B-B

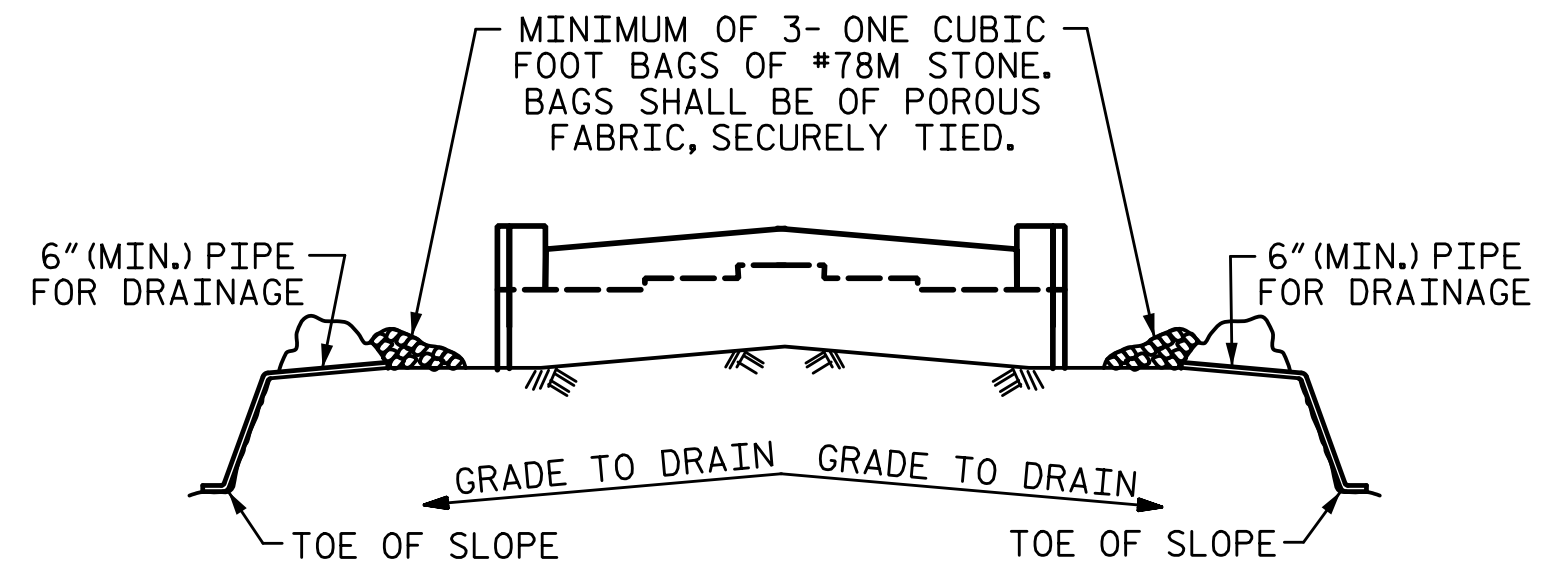


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9		52'-3"	2132
B2	6	#5	STR	49'-9"	311
B3	8	#4	STR	26'-2"	140
B4	13	#4	STR	3'-5"	30
B5	6	#4	STR	12'-6"	50
H1	92	#6	2	12'-11"	1785
K1	30	#4	STR	3'-4"	67
K2	30	#4	STR	4'-0"	80
S1	56	#5	3	4'-4"	253
S2	56	#5	4	11'-7"	677
S3	40	#4	5	6'-6"	174
U1	9	#4	6	6'-5"	39
V1	64	#4	STR	6'-0"	257
V2	36	#5	STR	11'-2"	419
V3	38	#5	STR	11'-5"	452
TOTAL REINFORCING STEEL					6866 LB
CLASS A CONCRETE					
POUR 1					
(CAP, COLLARS, & LOWER WINGS)					
					34.1 CY
POUR 2					
(UPPER WINGS)					
					8.3 CY
TOTAL CLASS A CONCRETE					42.4 CY
HP 12 X 53 STEEL PILES					
NO. 10					900 LF
PILE DRIVING EQUIPMENT SETUP					
HP 12 X 53 STEEL PILES					10 EA
PILE REDRIVES					10 EA



\*PILE VERTICAL  
\*PILE HORIZONTAL OR VERTICAL  
**PILE SPLICE DETAILS**  
\* POSITION OF PILE DURING WELDING



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

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-

SHEET 3 OF 3

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

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

SEAL  
18056  
ENGINEER  
JOHN A. BATTS

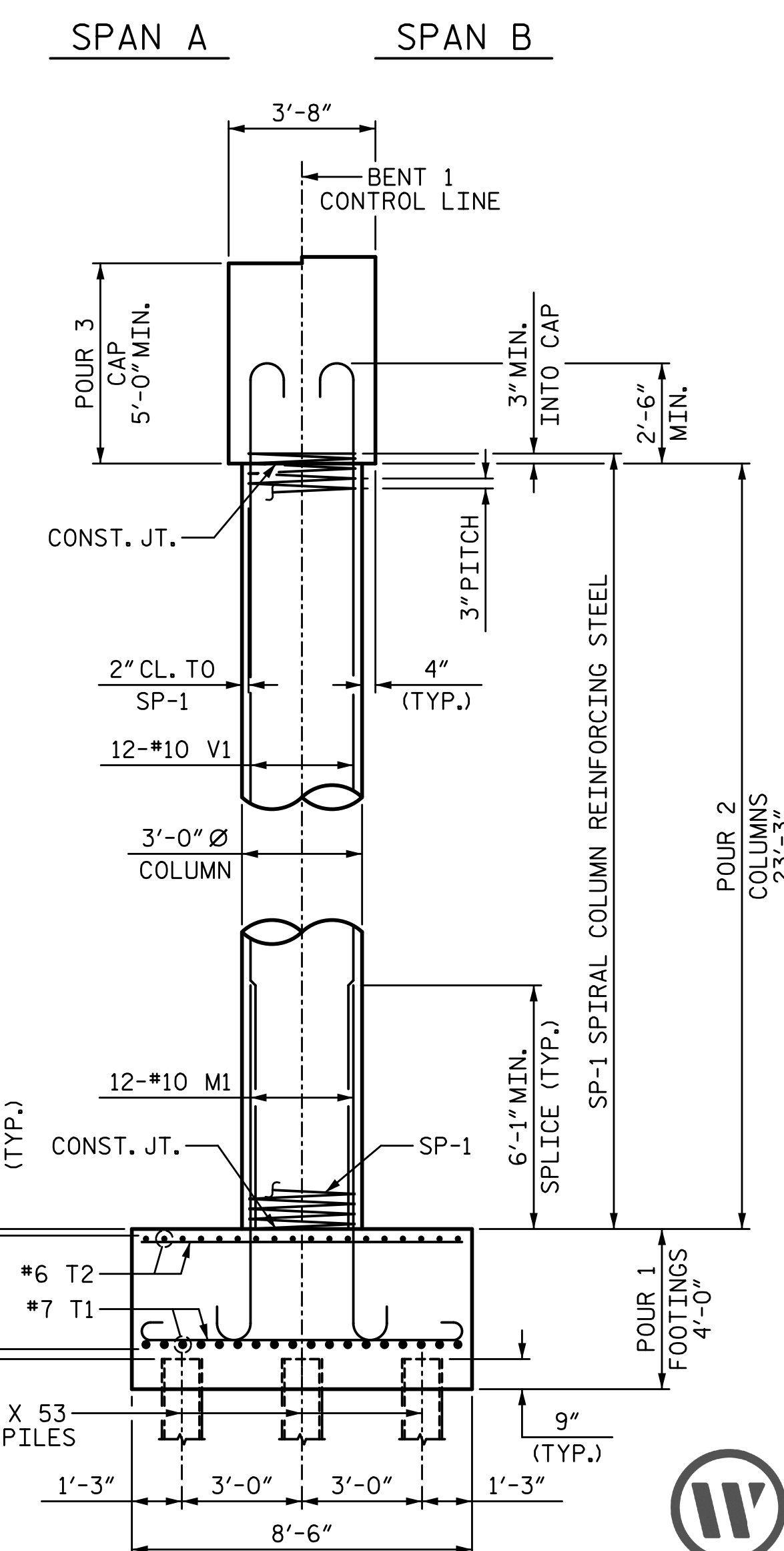
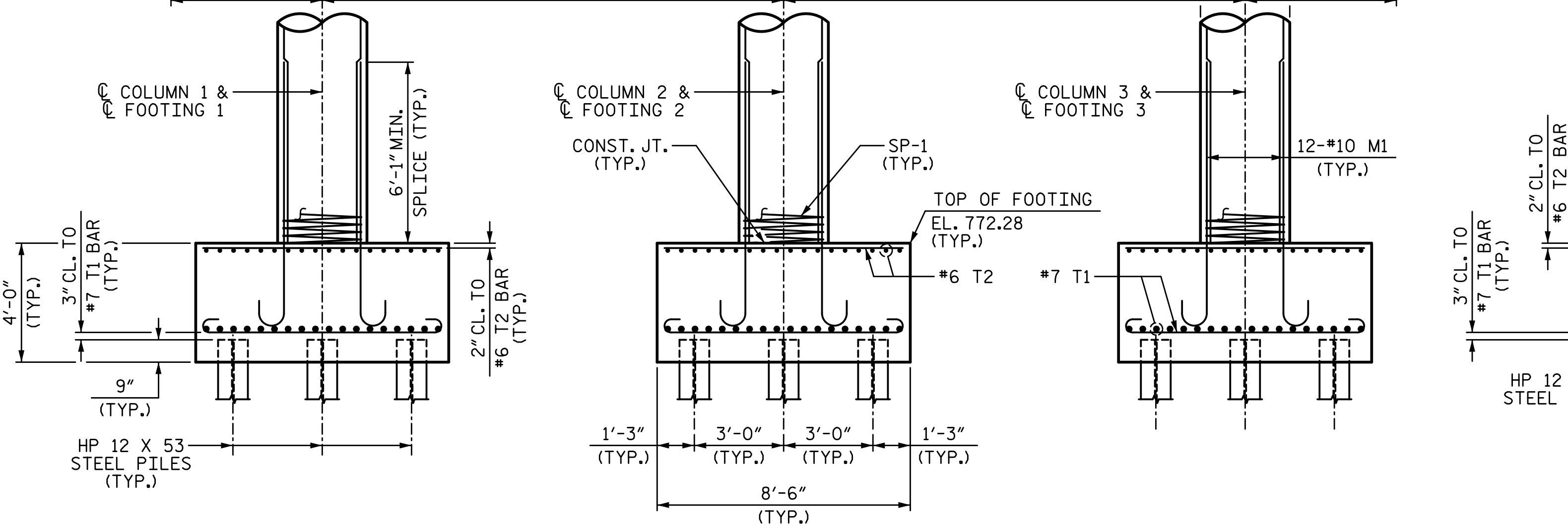
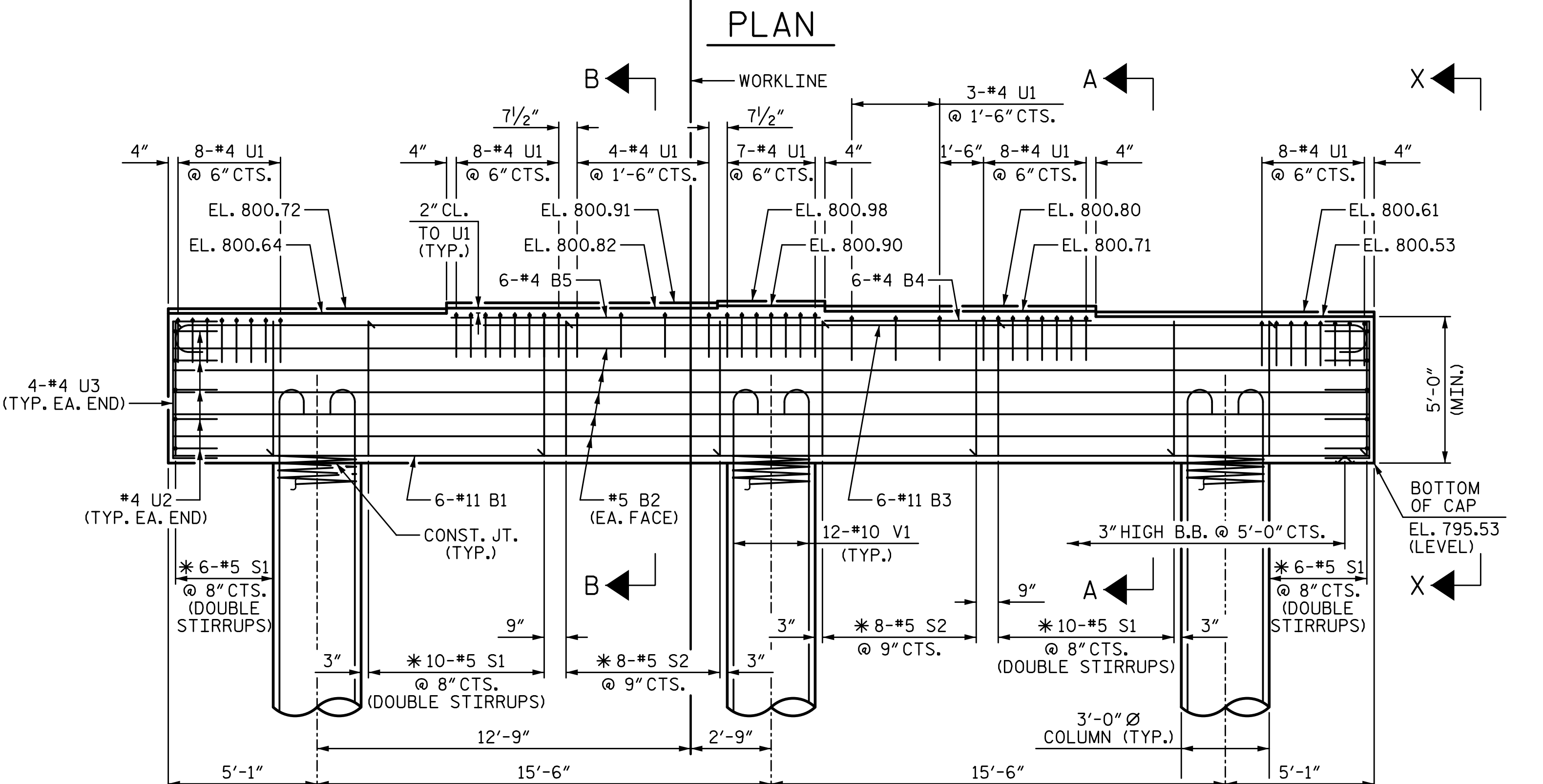
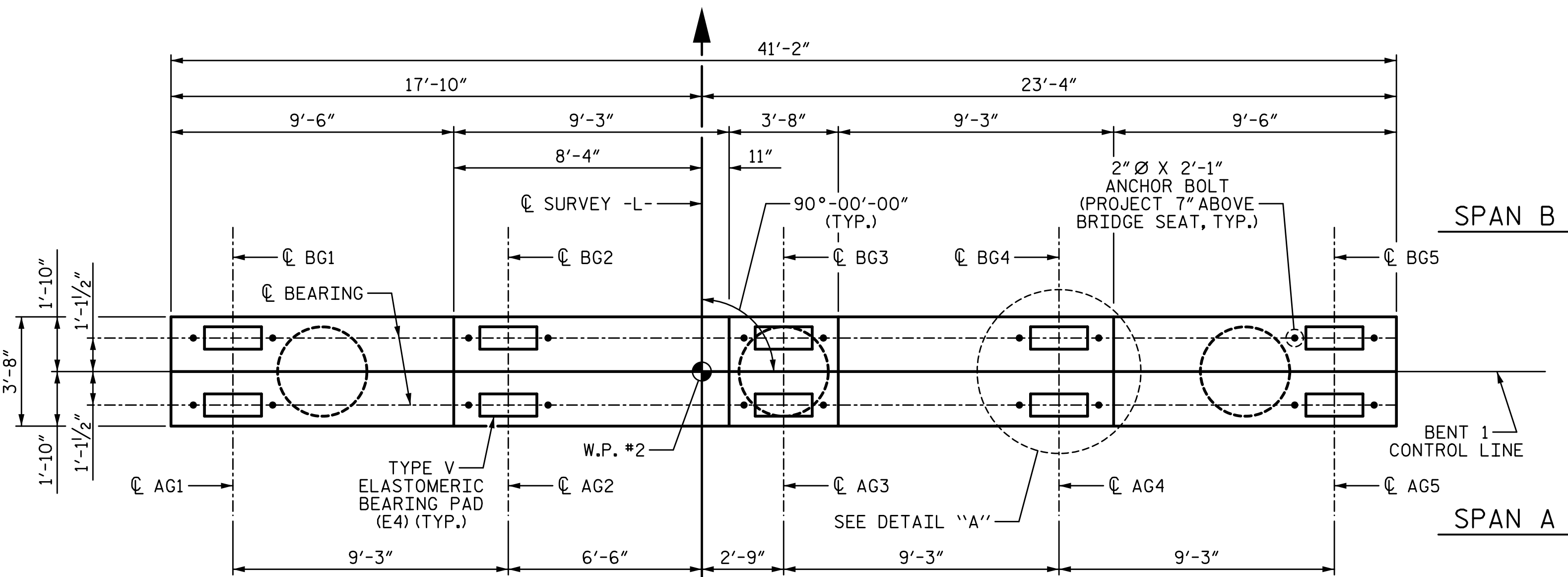
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2			4		

TOTAL SHEETS: 53

DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>2-19</u>
CHECKED BY: <u>J. A. BATTS</u>	DATE: <u>2-19</u>
DESIGN ENGINEER OF RECORD: <u>J. A. BATTS</u>	DATE: <u>2-19</u>

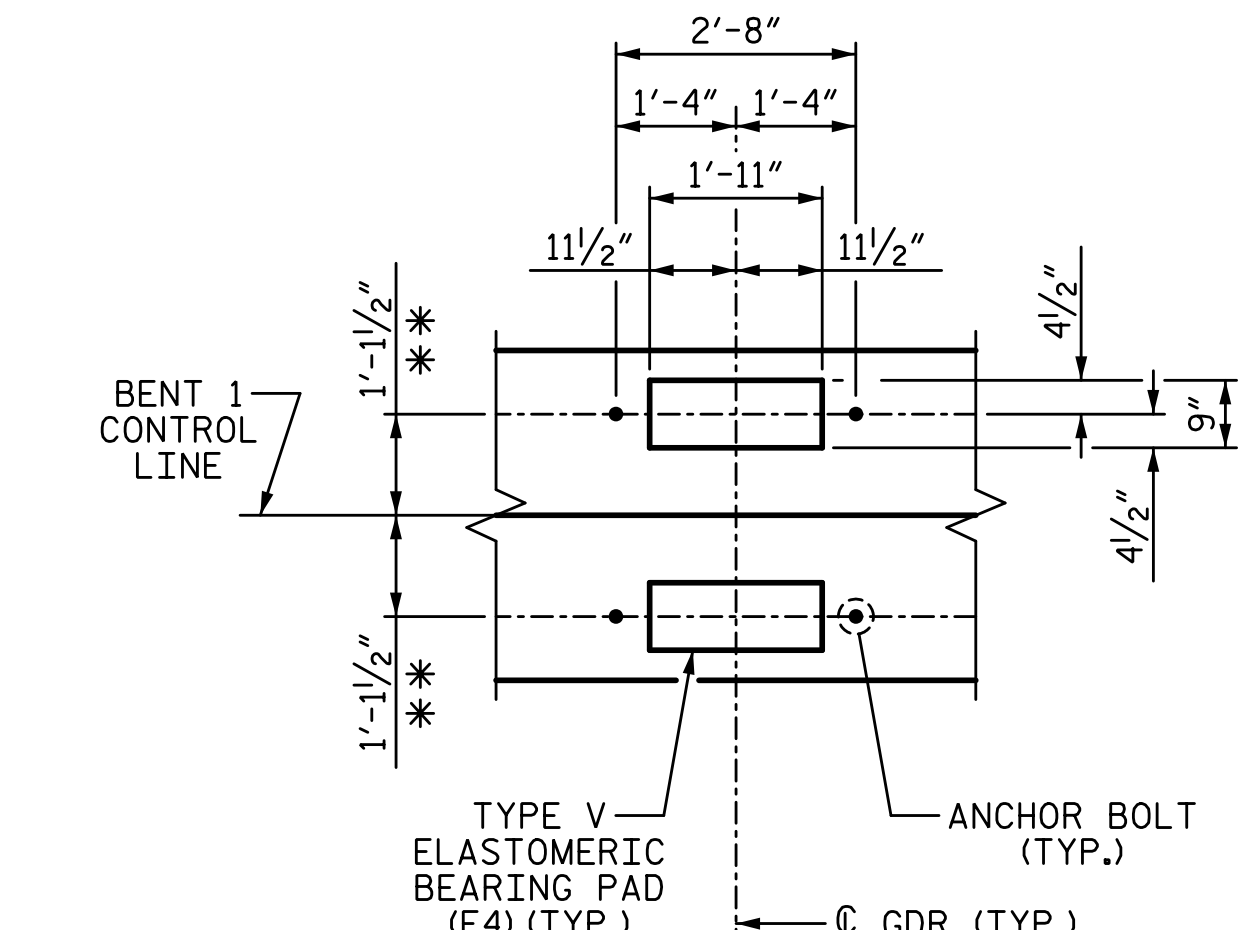
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**NOTES:**

- \* INVERT ALTERNATE STIRRUPS.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON M1 & V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.



PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

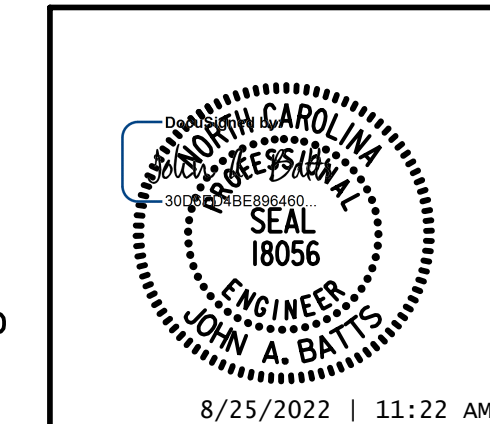
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

DRAWN BY: T. BANKOVICH DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

DETAILS, DIMENSIONS & REINF. STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING

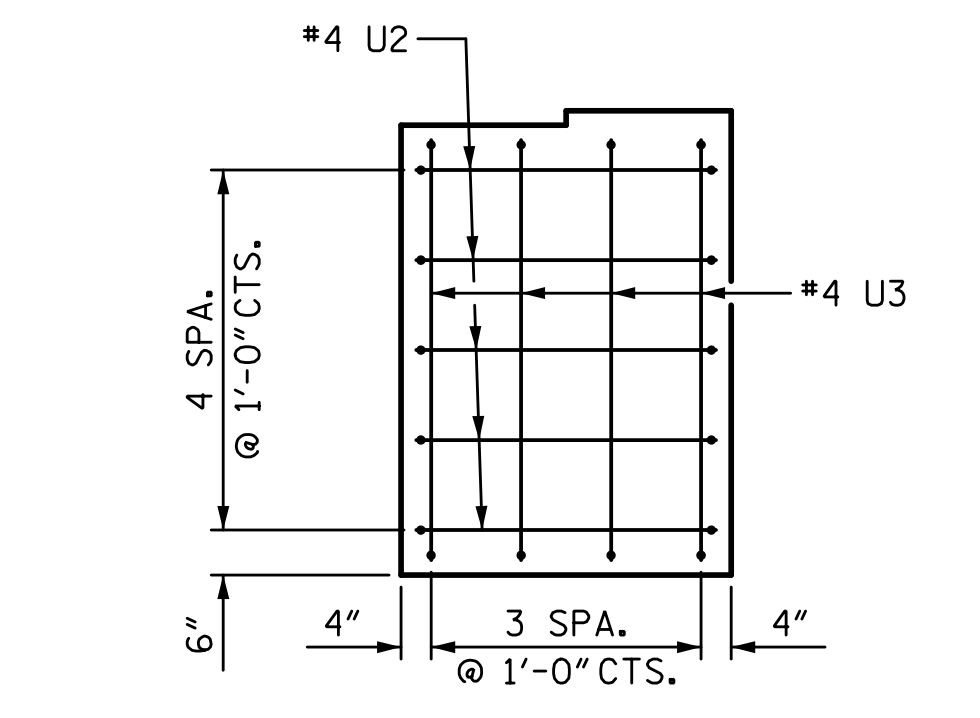


REVISIONS						SHEET NO. S-40
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

LICENSURE NO. C-4434  
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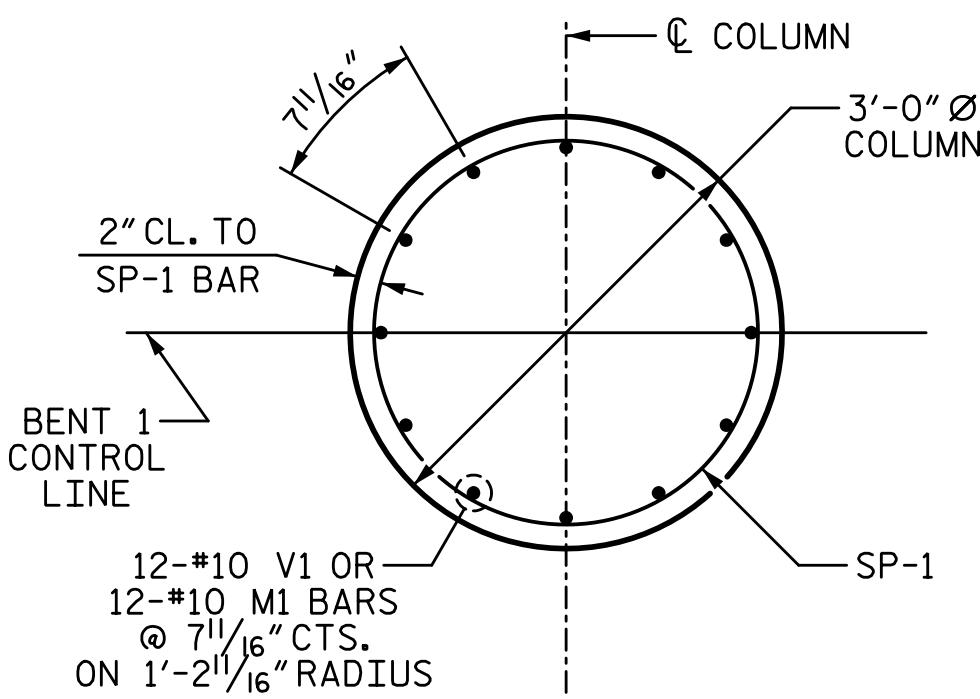


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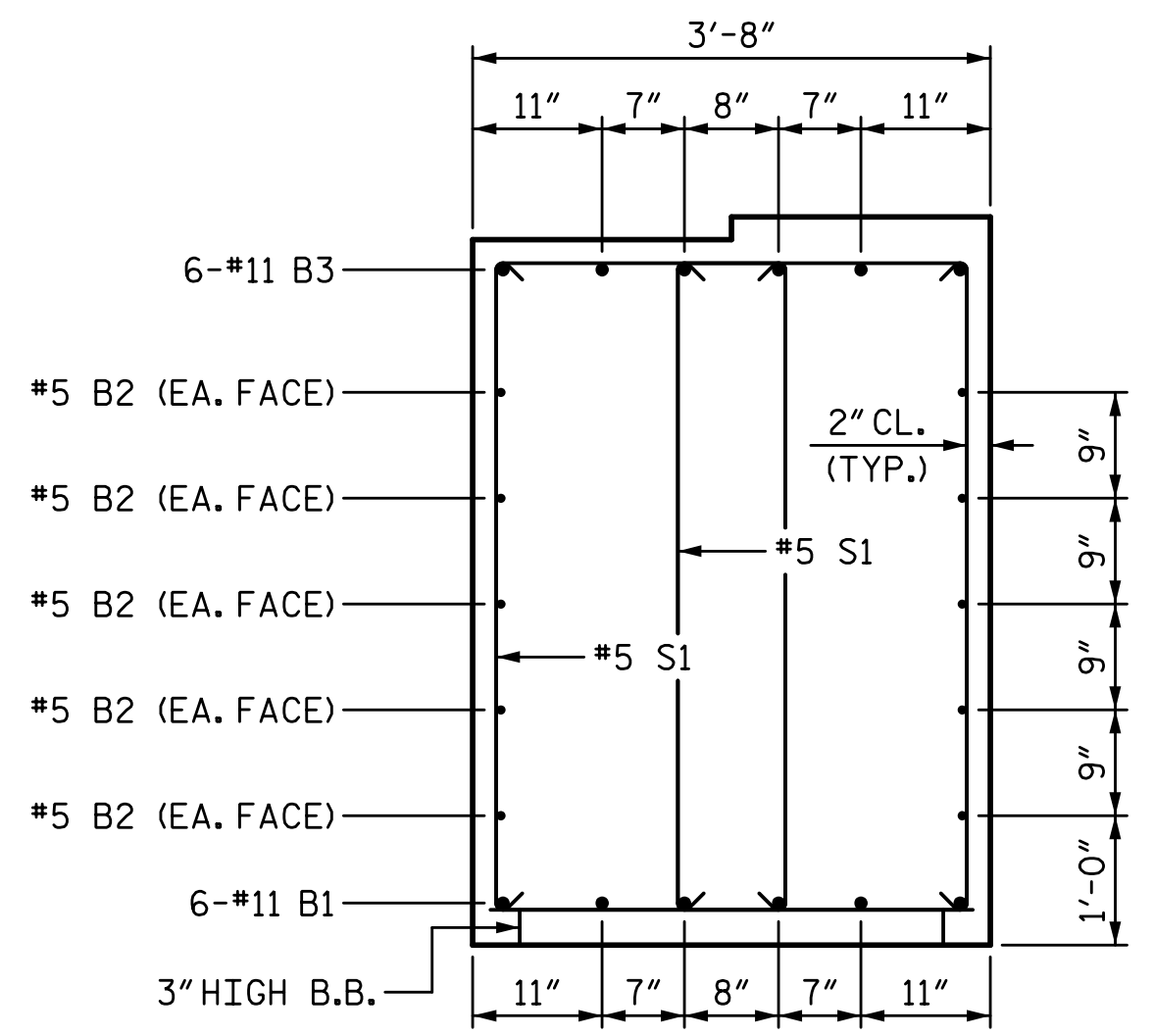
**VIEW X-X**

RIGHT END SHOWN, LEFT END SIMILAR

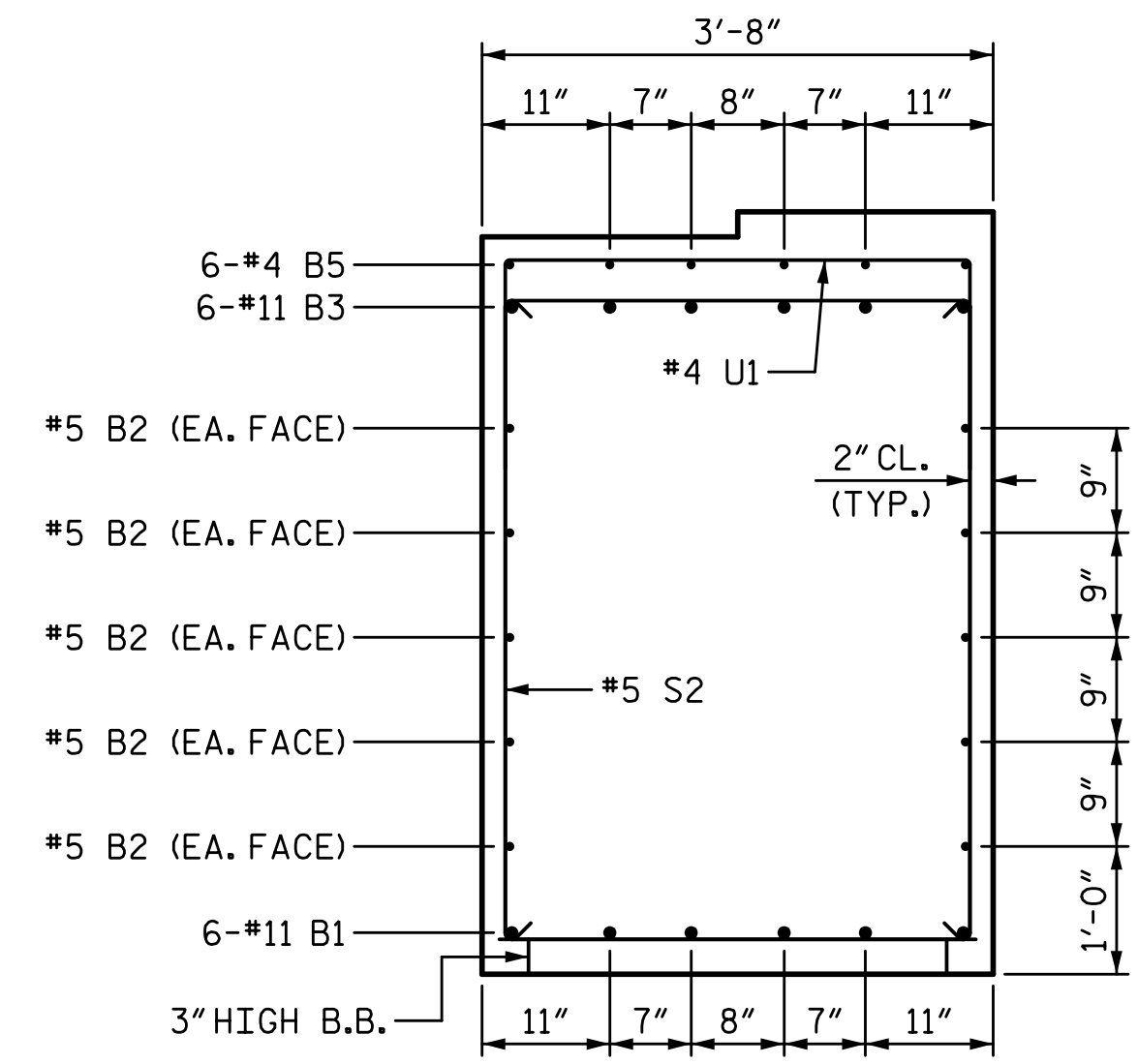


**PLAN OF COLUMN**

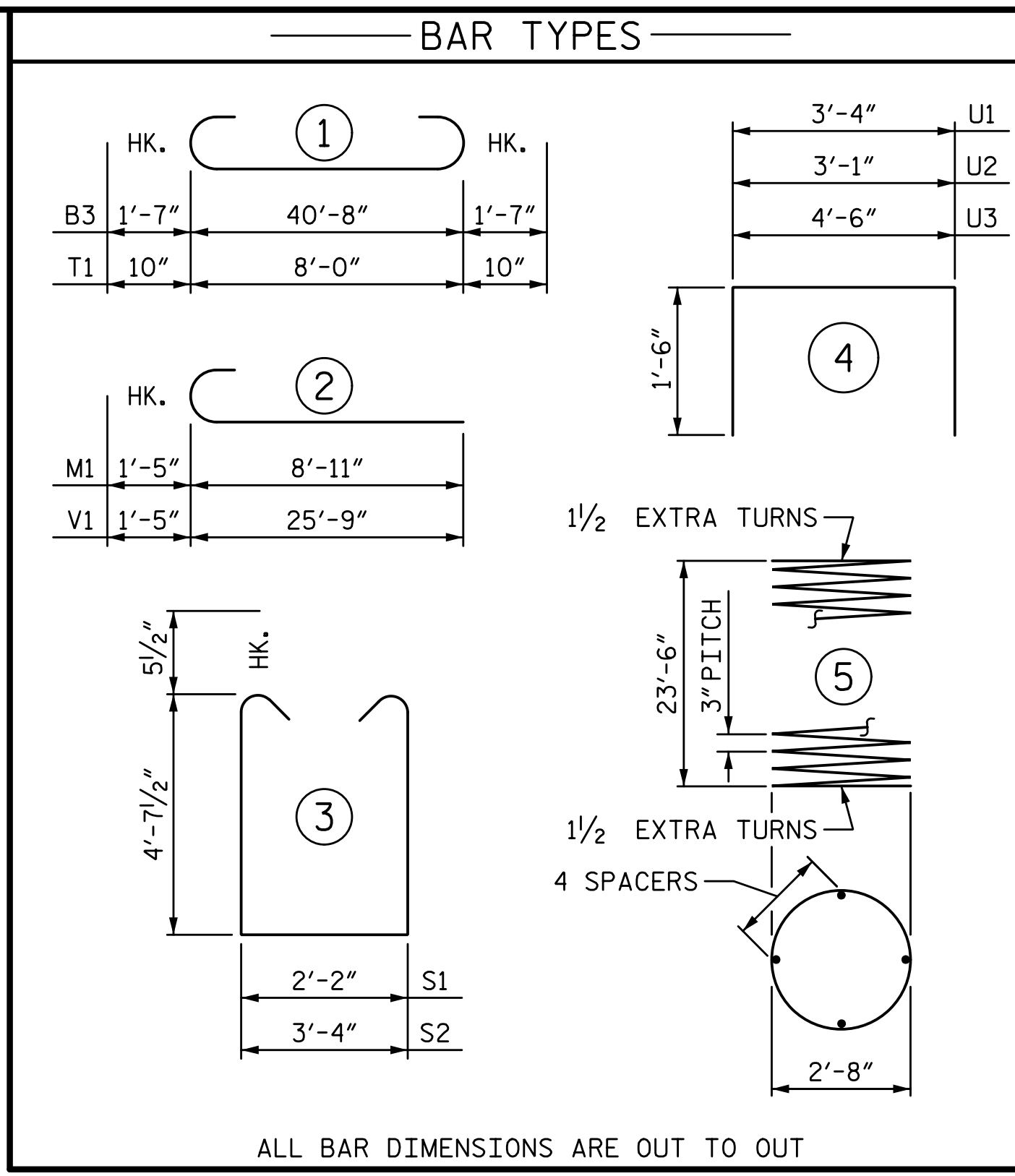
DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN



**SECTION A-A**



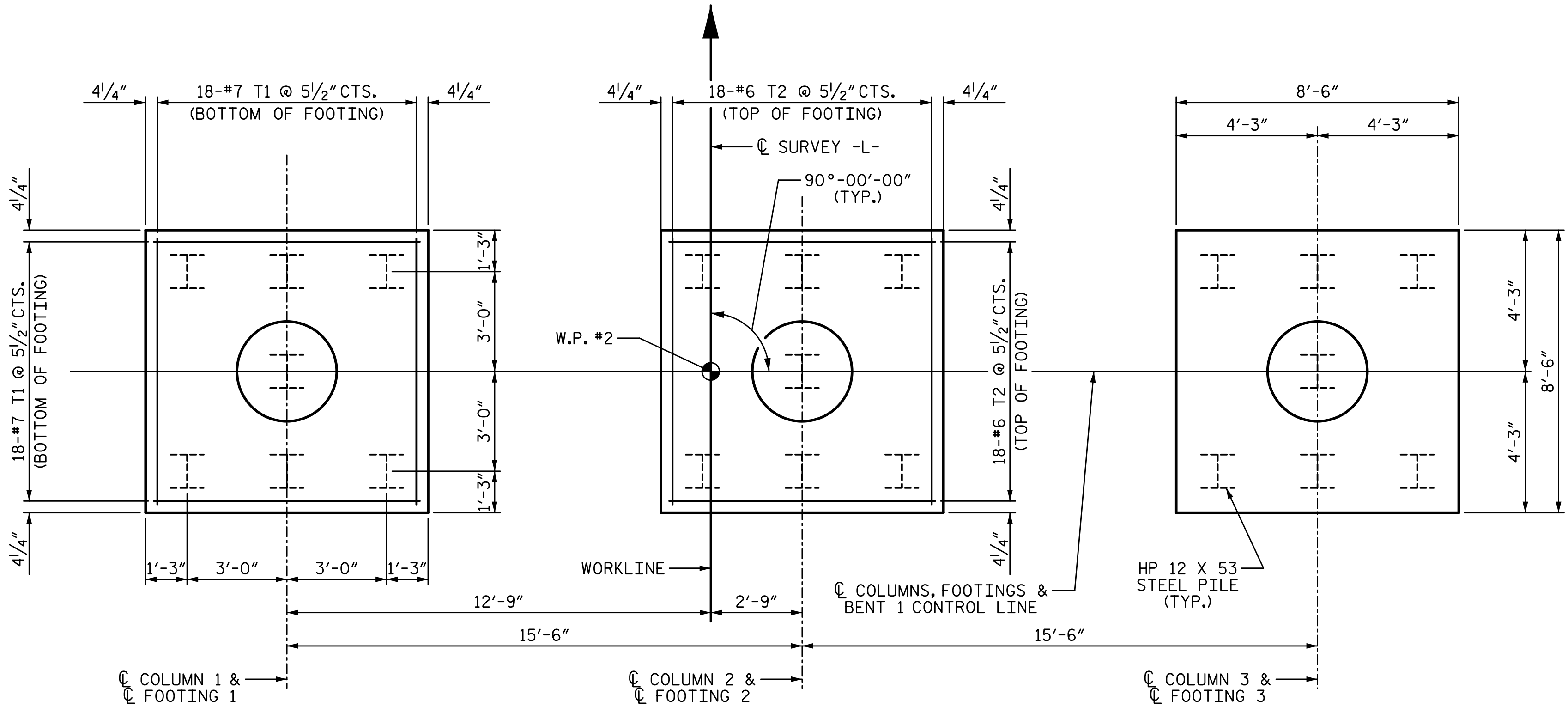
**SECTION B-B**



ALL BAR DIMENSIONS ARE OUT TO OUT

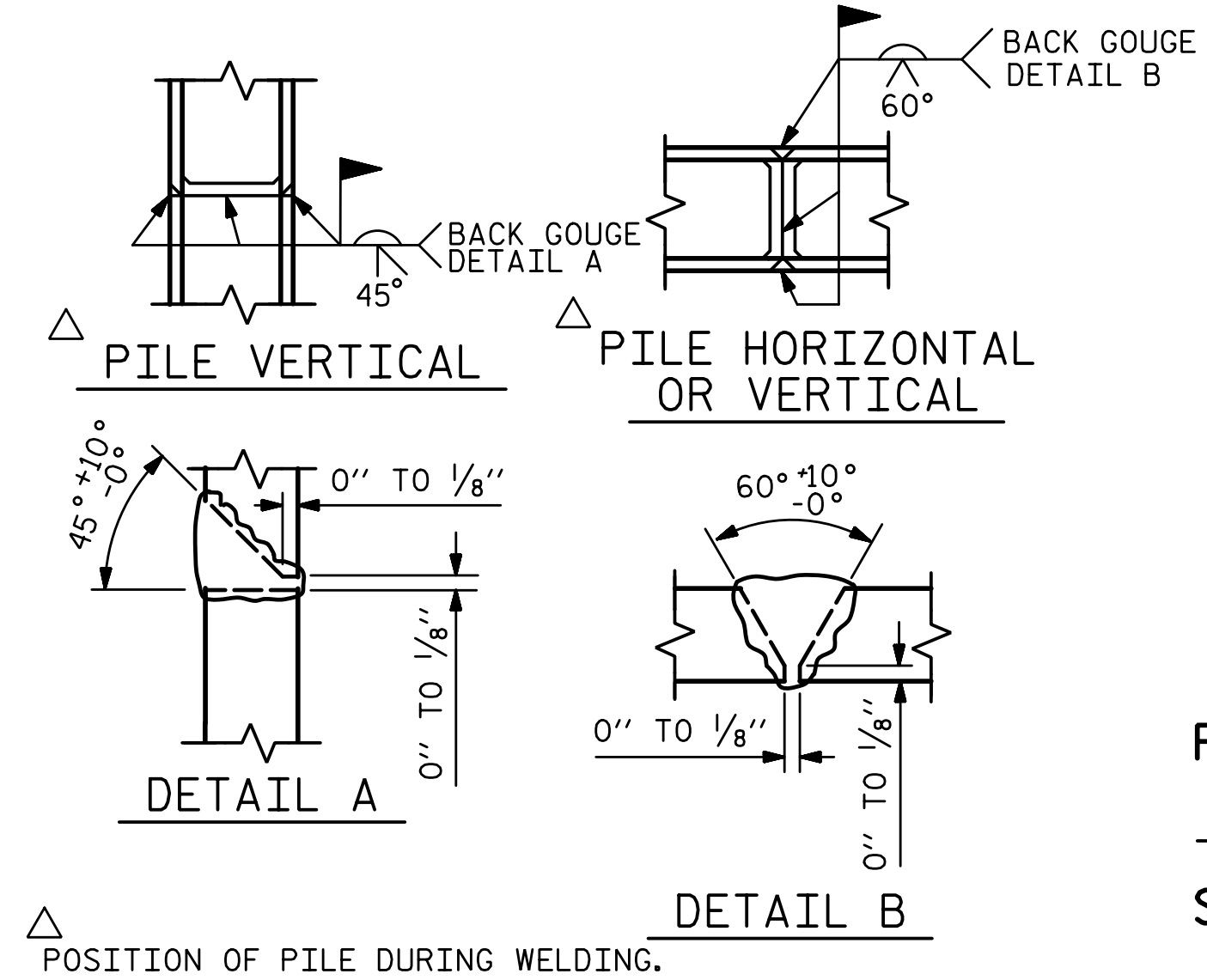
BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	STR	40'-10"	1302
B2	10	#5	STR	40'-10"	426
B3	6	#11	1	43'-10"	1397
B4	6	#4	STR	9'-1"	36
B5	6	#4	STR	12'-7"	50
M1	36	#10	2	10'-4"	1601
S1	64	#5	3	12'-4"	823
S2	16	#5	3	13'-6"	225
T1	108	#7	1	9'-8"	2134
T2	108	#6	STR	8'-0"	1298
U1	46	#4	4	6'-4"	195
U2	10	#4	4	6'-1"	41
U3	8	#4	4	7'-6"	40
V1	36	#10	2	27'-2"	4208
SP-1	3	*	5	800'-4"	1604
REINFORCING STEEL					13776 LB
SPIRAL COL. REINF. STEEL					1604 LB
CLASS A CONCRETE BREAKDOWN					
POUR 1 (FOOTINGS)					32.2 CY
POUR 2 (COLUMNS)					18.3 CY
POUR 3 (CAP)					29.2 CY
TOTAL					79.7 CY
HP 12 X 53 STEEL PILES					
NO. 21					1680 LF
PILE DRIVING EQUIPMENT SETUP					
HP 12 X 53 STEEL PILES					21 EA

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR



**PLAN OF FOOTINGS**

PILE PLACEMENT, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING



**PILE SPLICE DETAILS**

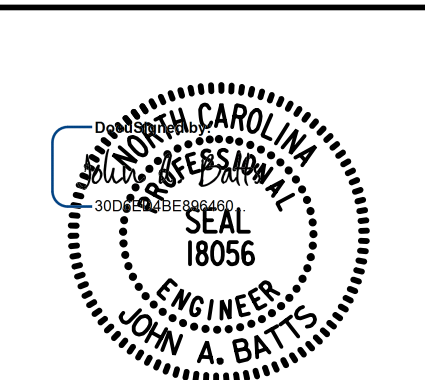
PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 1**

DRAWN BY: T. BANKOVICH DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

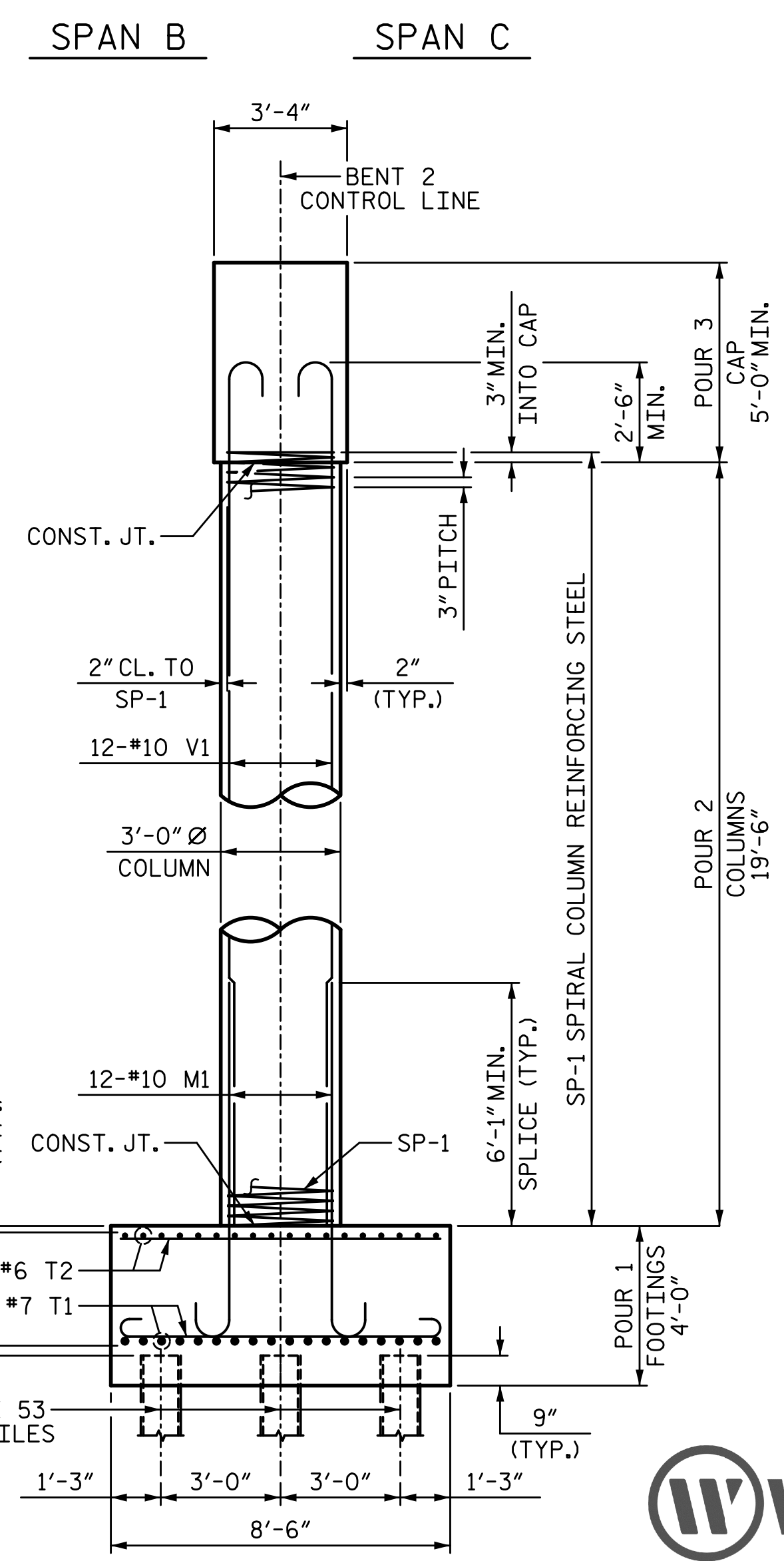
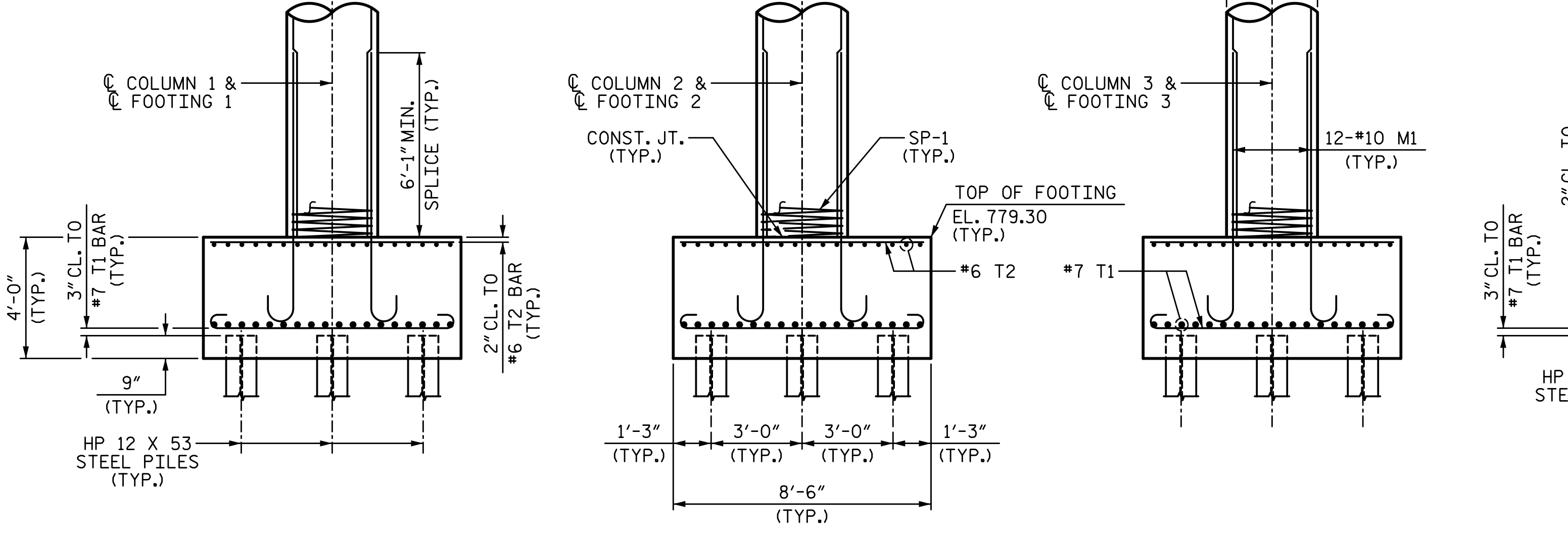
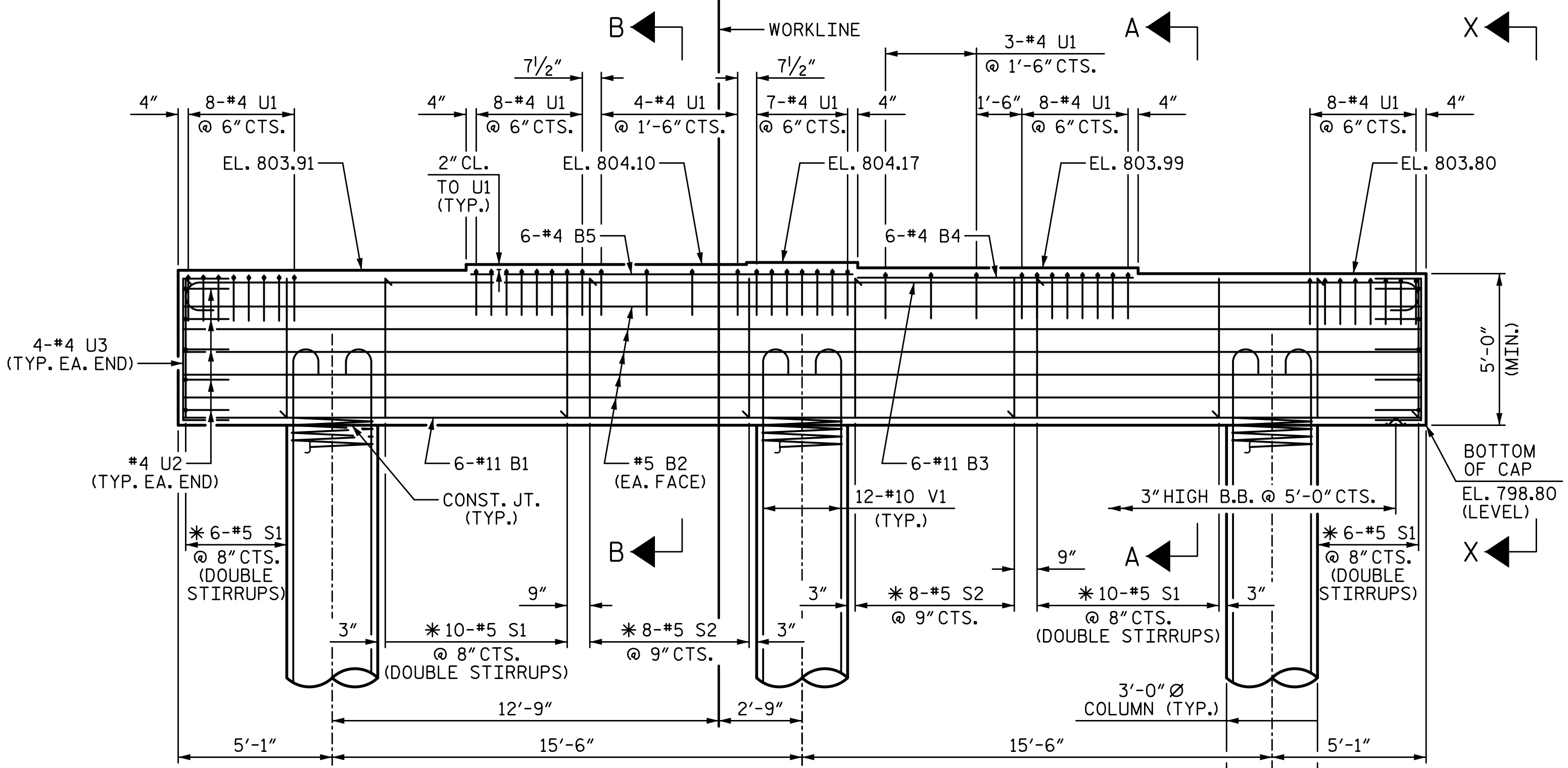
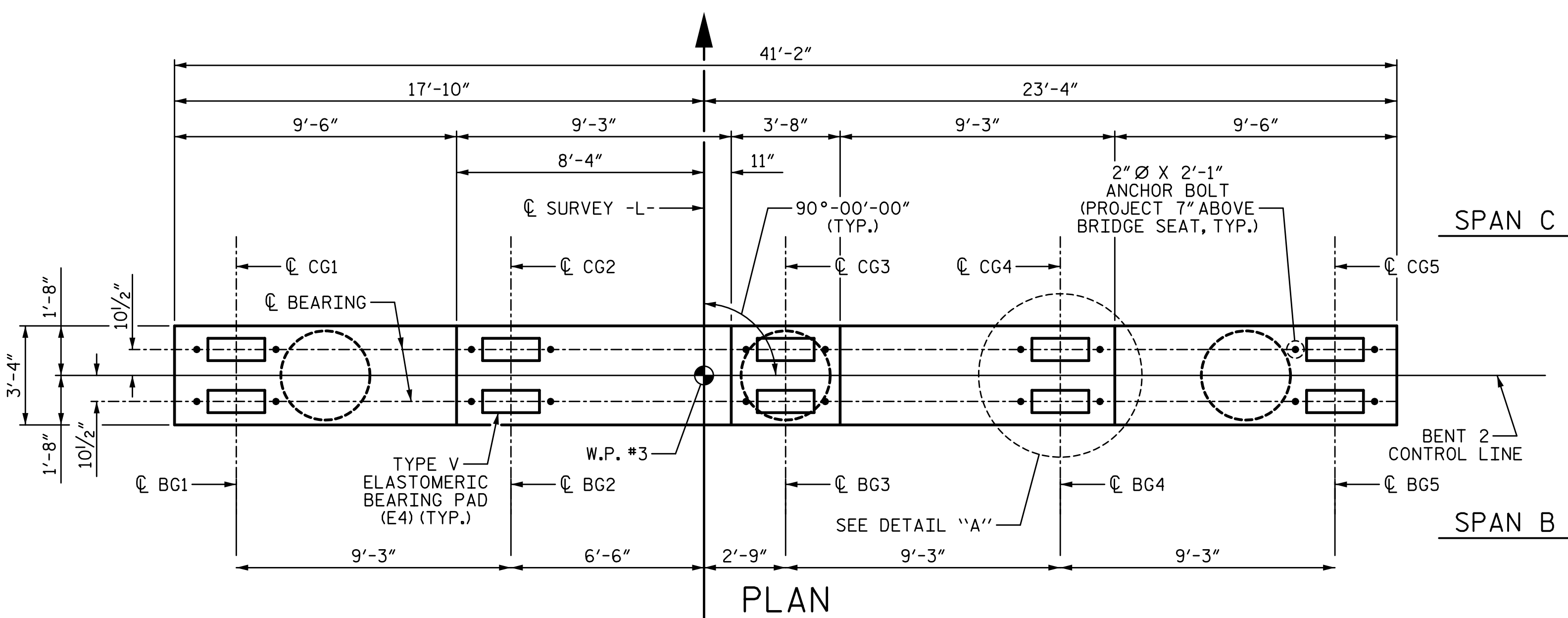


REVISIONS				SHEET NO.	
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2			4		

TOTAL SHEETS: 53

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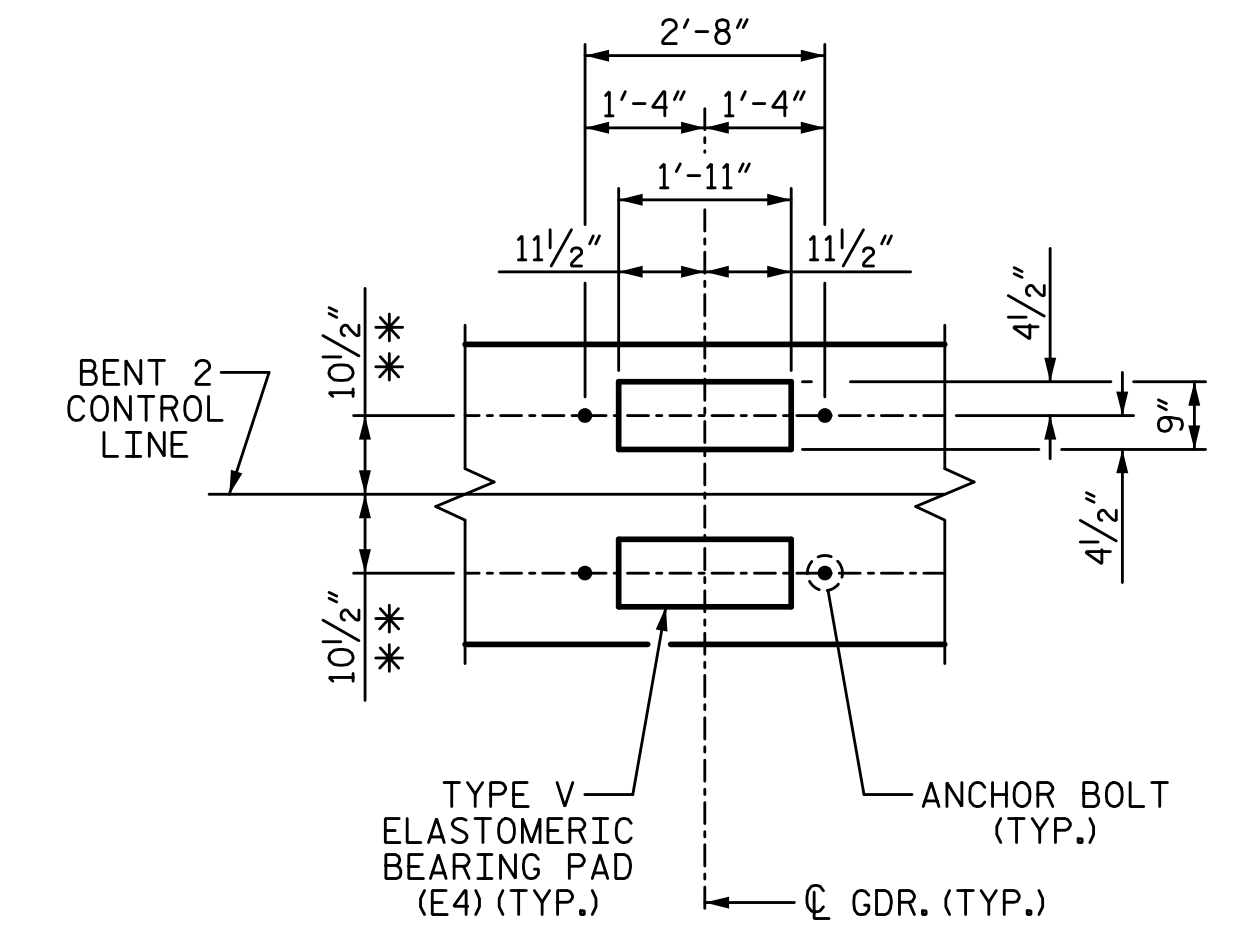


**END ELEVATION**

DETAILS, DIMENSIONS & REINF. STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING

**NOTES:**

- \* INVERT ALTERNATE STIRRUPS.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON M1 & V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.
- THE TOP SURFACE AREA OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.



PROJECT NO. Y-4810K

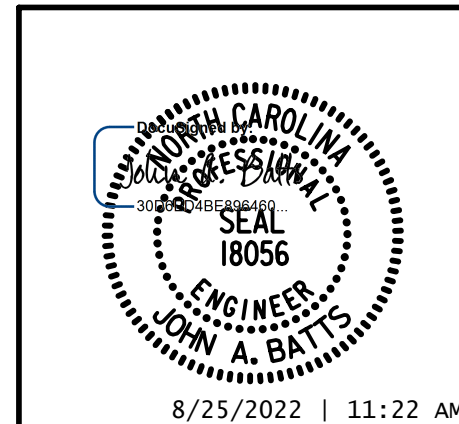
CABARRUS COUNTY

STATION: 31+94.08 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**BENT 2**



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CHECKED BY: J. A. BATTS DATE: 2-19

DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

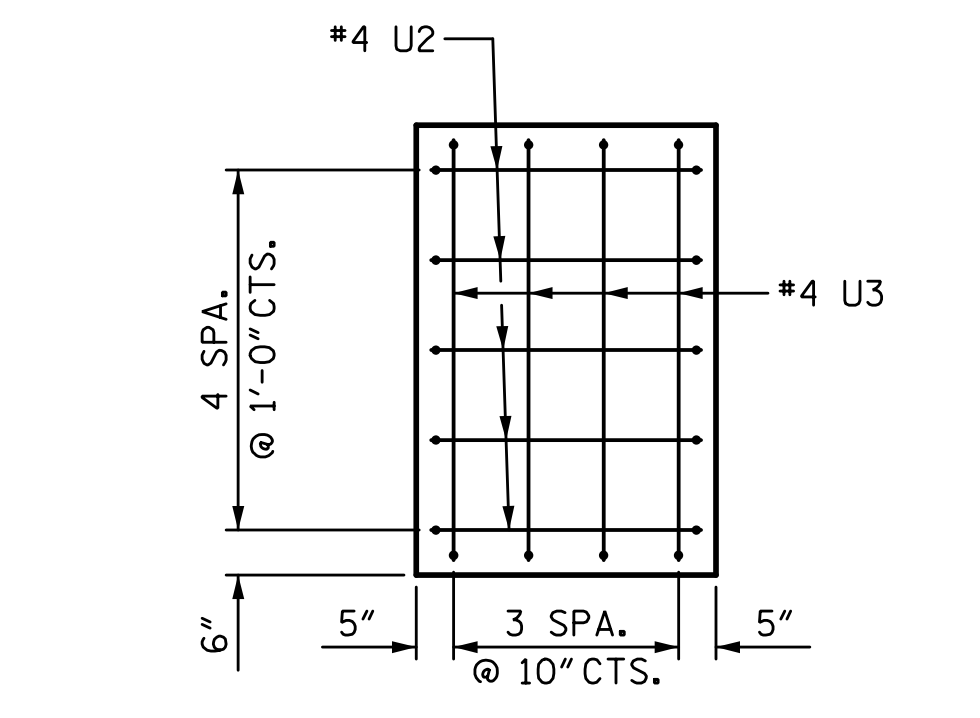
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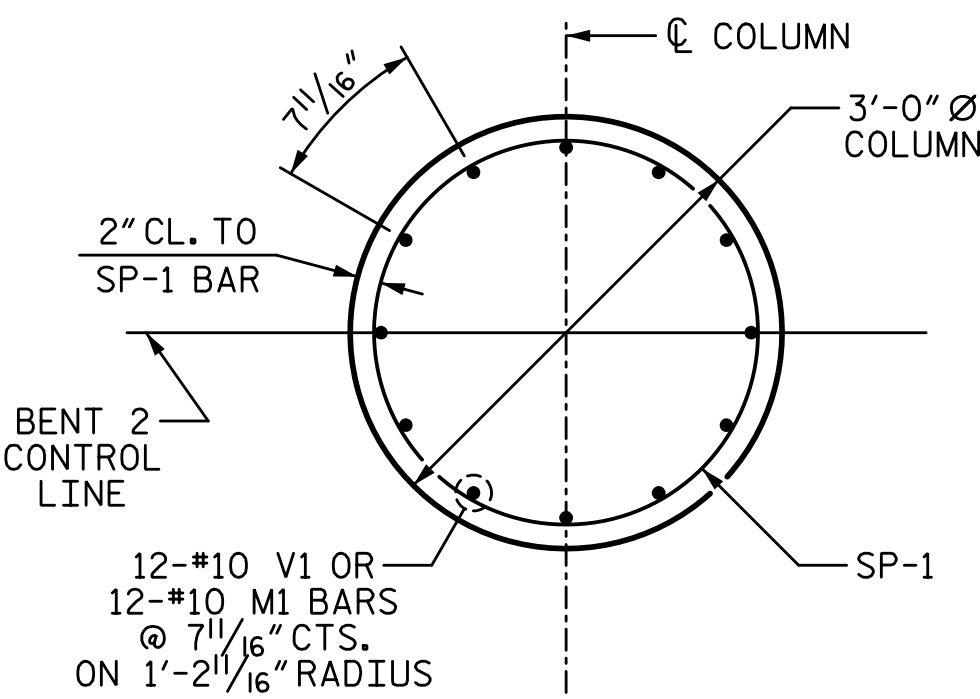
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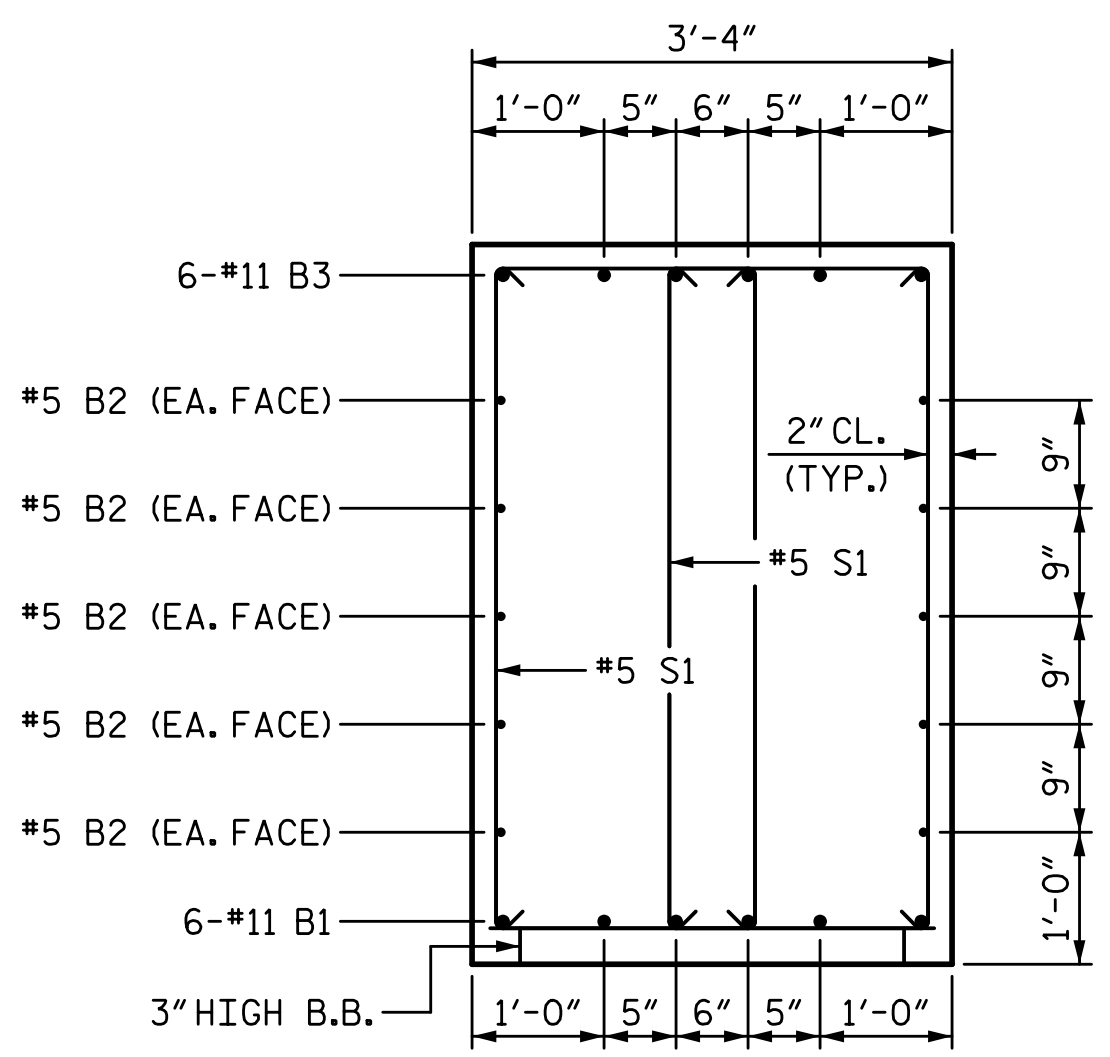
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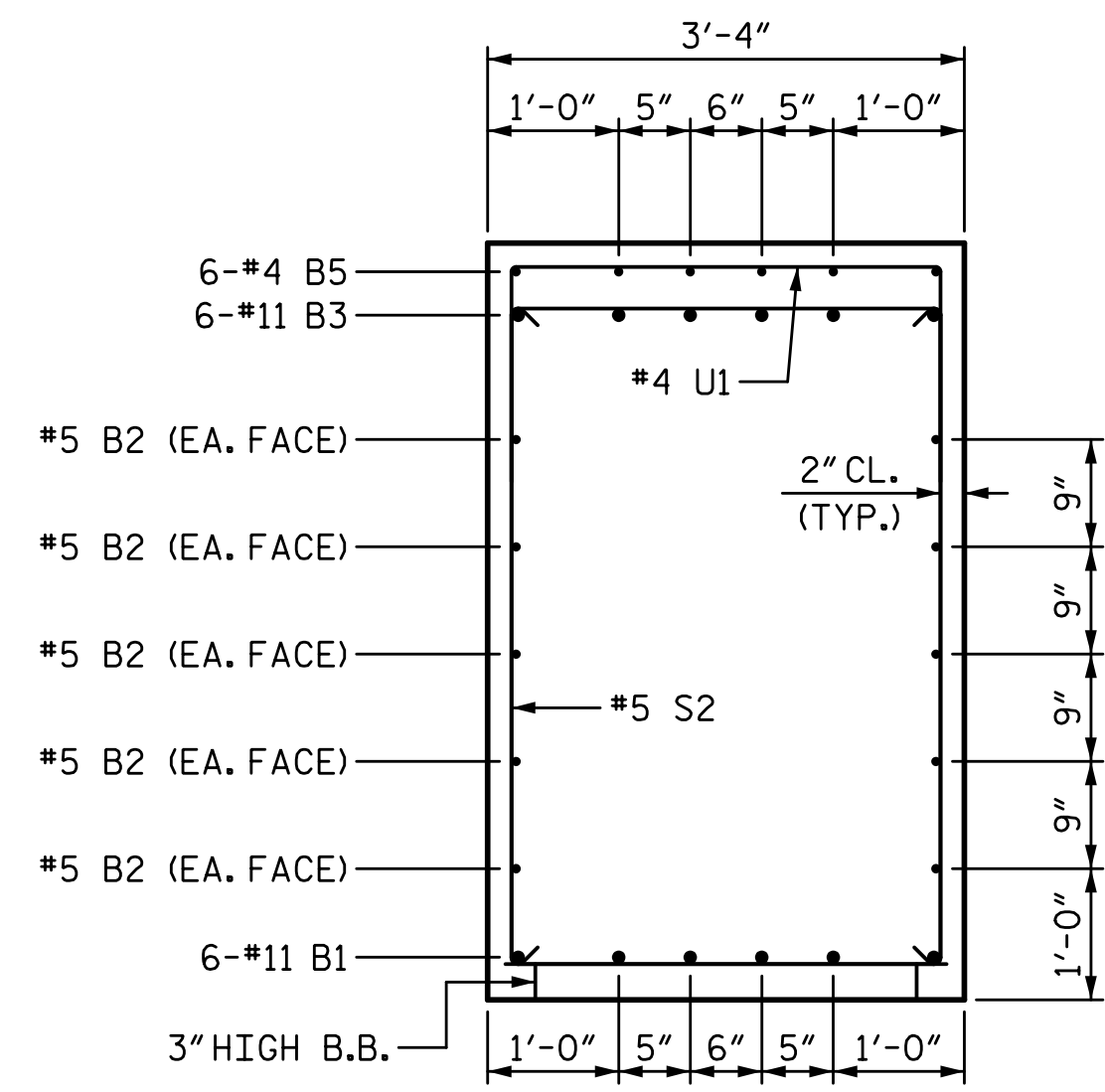
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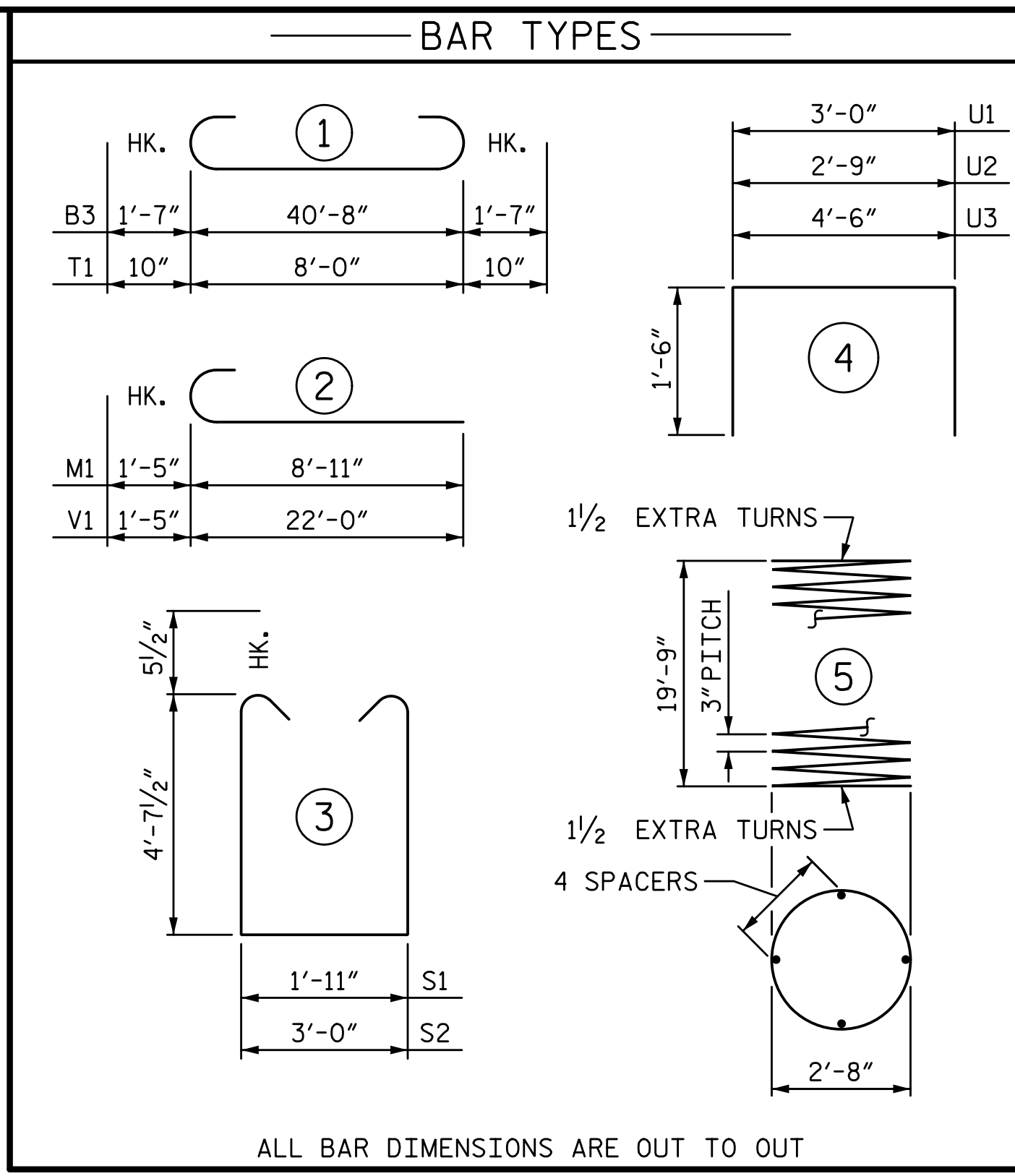
**PLAN OF COLUMN**  
DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN



**SECTION A-A**

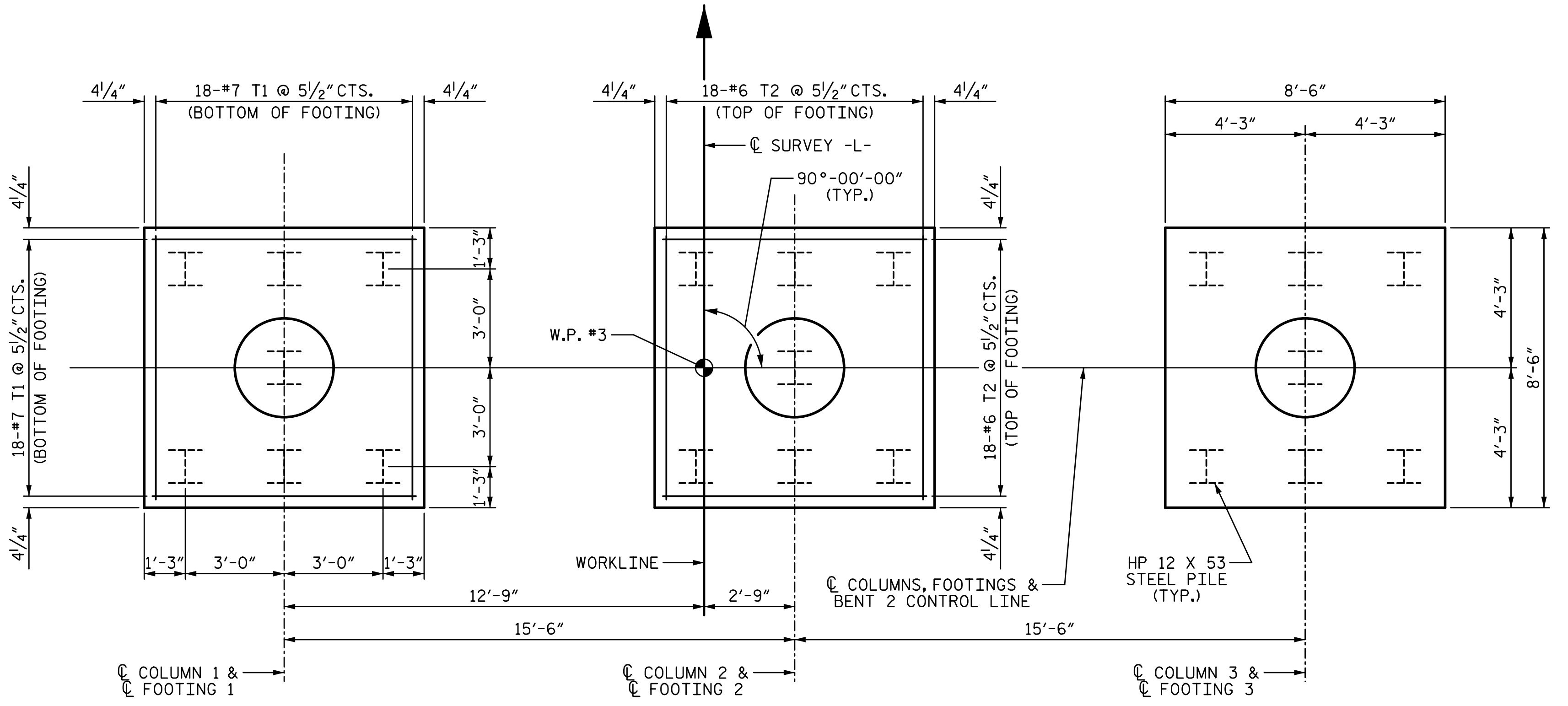


**SECTION B-B**

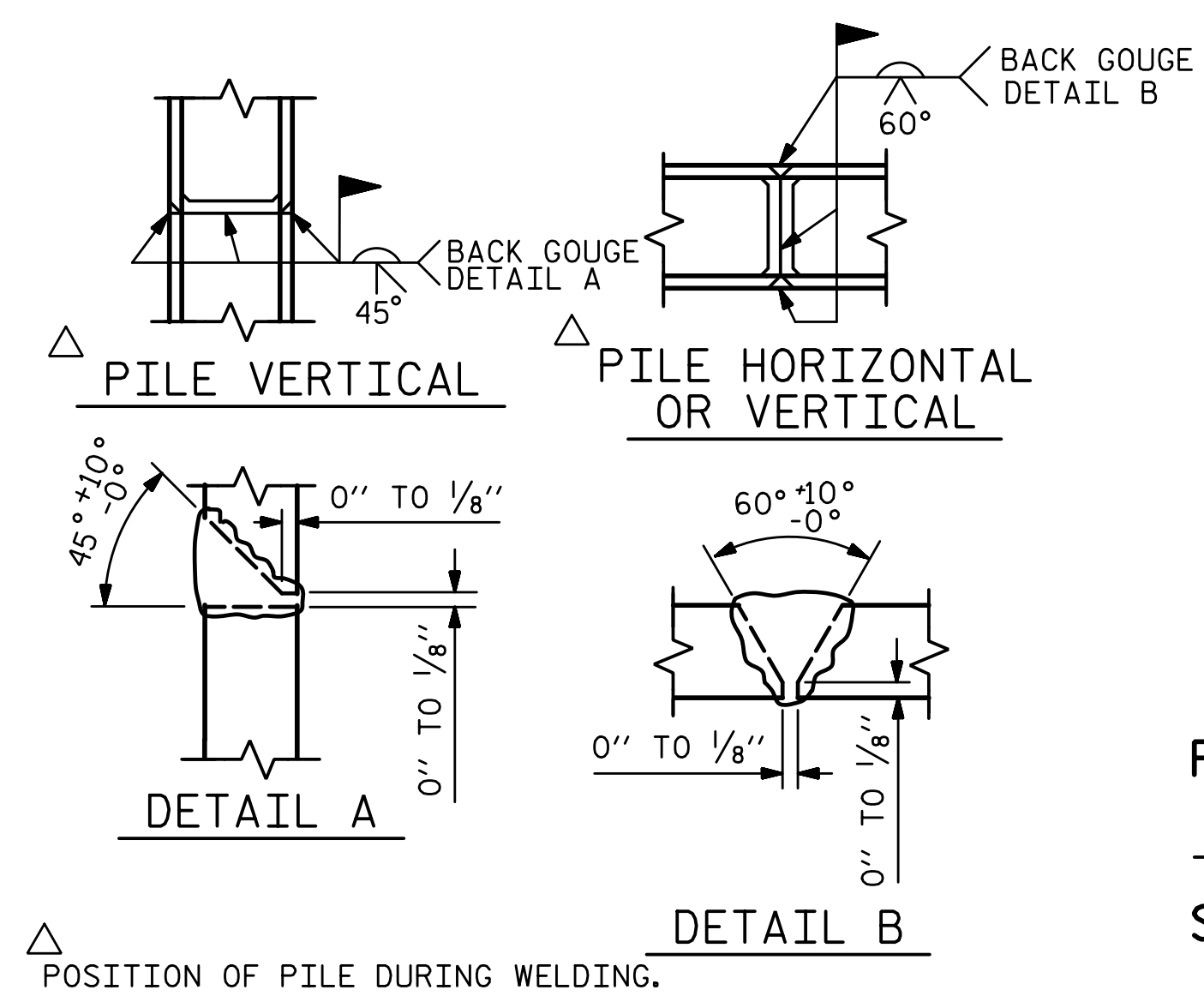


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	STR	40'-10"	1302
B2	10	#5	STR	40'-10"	426
B3	6	#11	1	43'-10"	1397
B4	6	#4	STR	9'-1"	36
B5	6	#4	STR	12'-7"	50
M1	36	#10	2	10'-4"	1601
S1	64	#5	3	12'-1"	807
S2	16	#5	3	13'-2"	220
T1	108	#7	1	9'-8"	2134
T2	108	#6	STR	8'-0"	1298
U1	46	#4	4	6'-0"	184
U2	10	#4	4	5'-9"	38
U3	8	#4	4	7'-6"	40
V1	36	#10	2	23'-5"	3627
SP-1	3	*	5	676'-7"	1356
REINFORCING STEEL					13160 LB
SPIRAL COL. REINF. STEEL					1356 LB
CLASS "A" CONCRETE BREAKDOWN					
POUR 1 (FOOTINGS)					32.2 CY
POUR 2 (COLUMNS)					15.4 CY
POUR 3 (CAP)					26.3 CY
TOTAL					73.9 CY



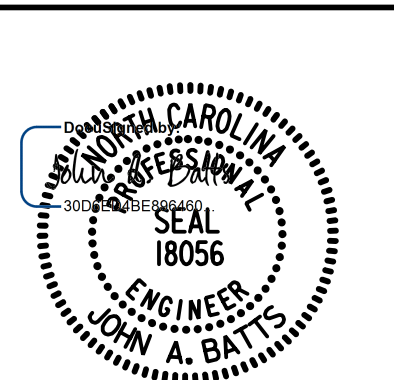
**PLAN OF FOOTINGS**  
PILE PLACEMENT, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING



**PILE SPLICE DETAILS**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-  
SHEET 2 OF 2

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



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

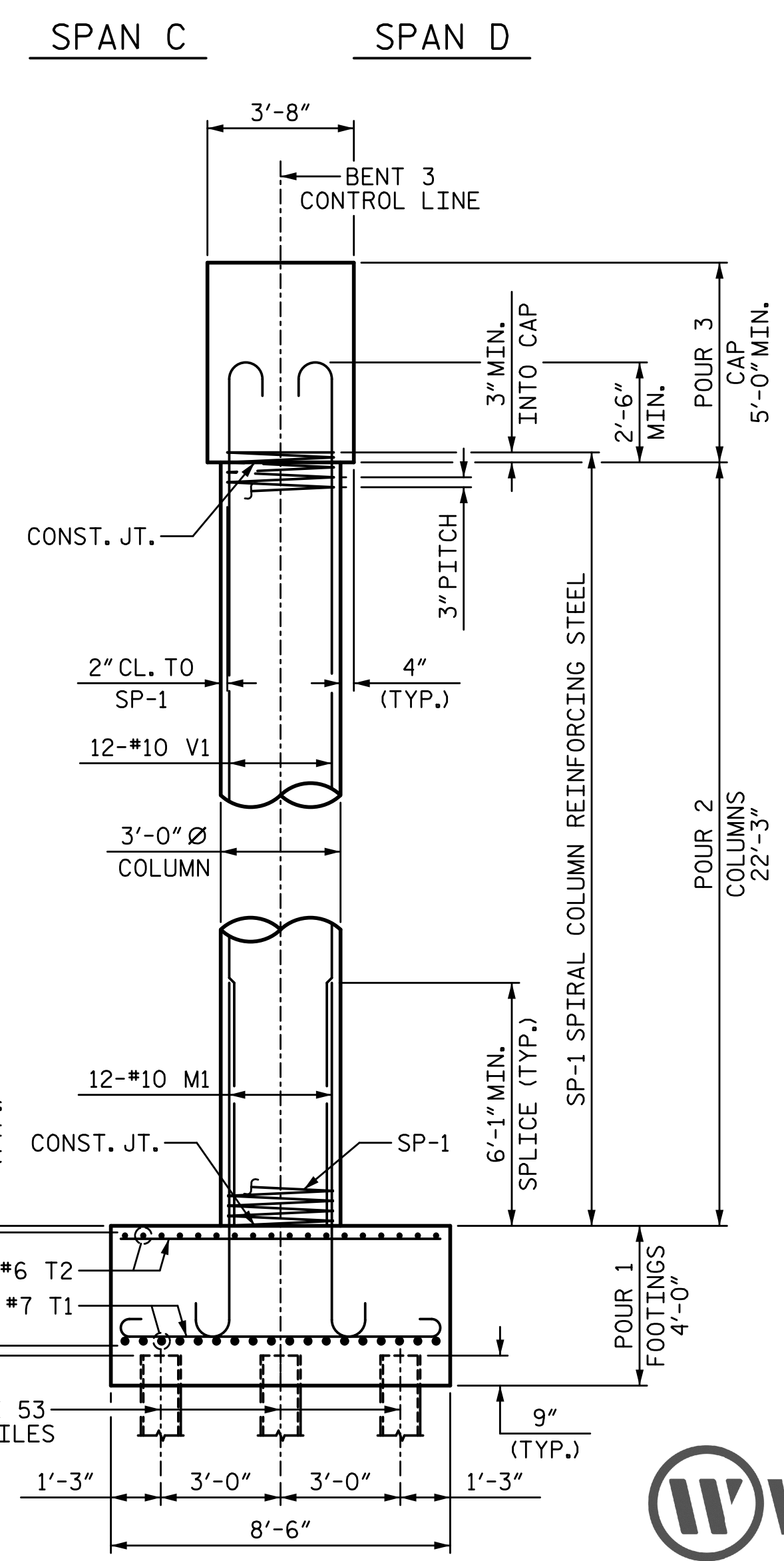
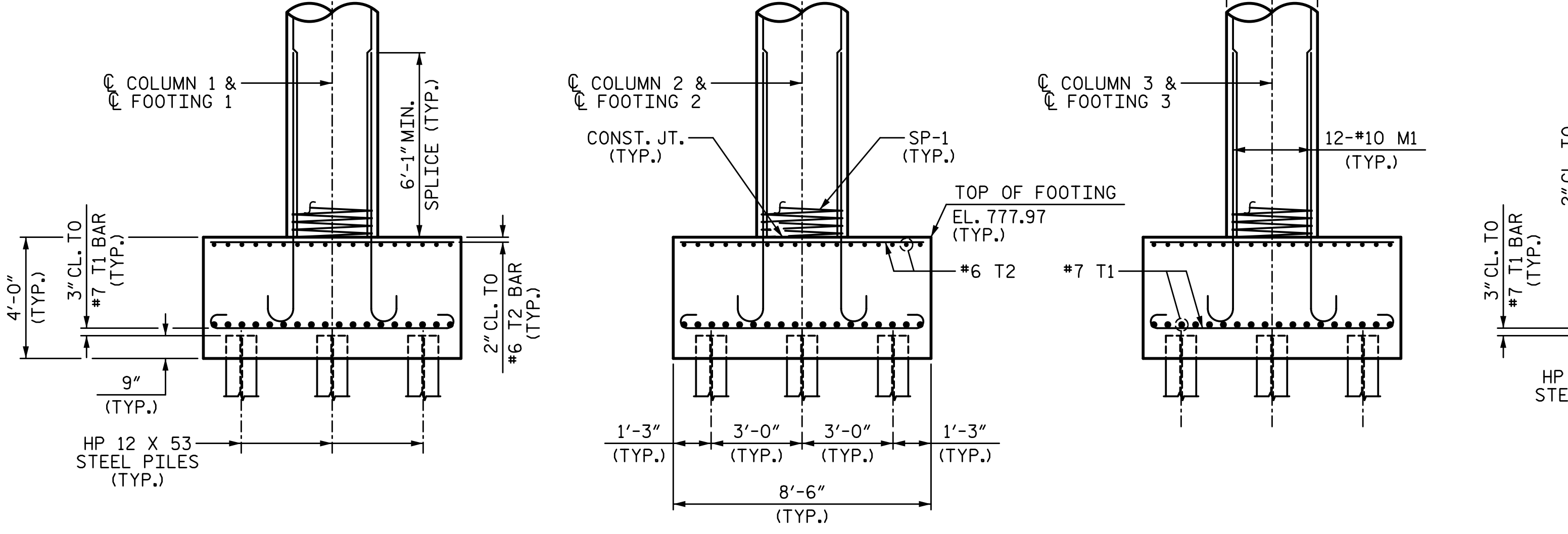
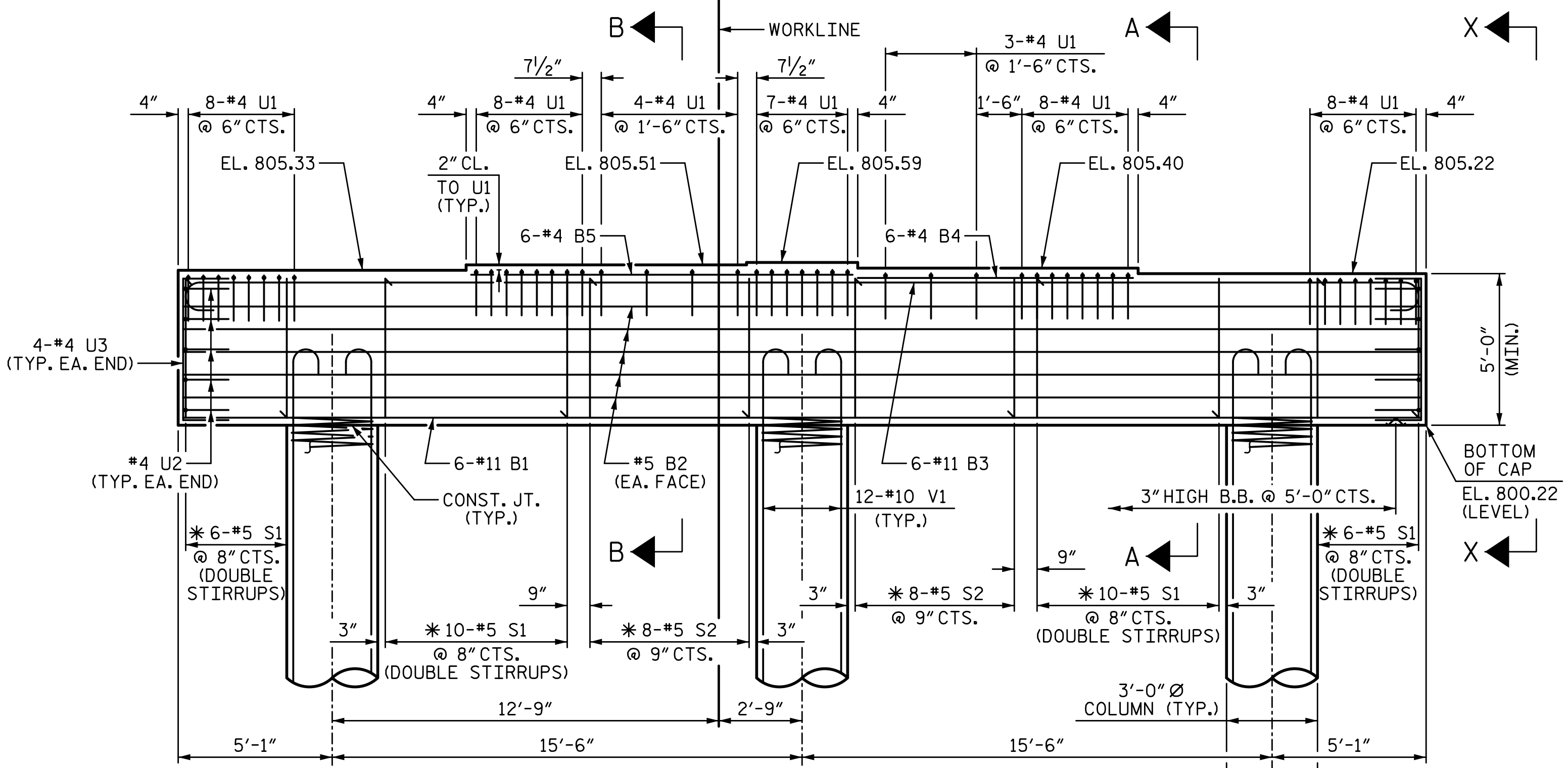
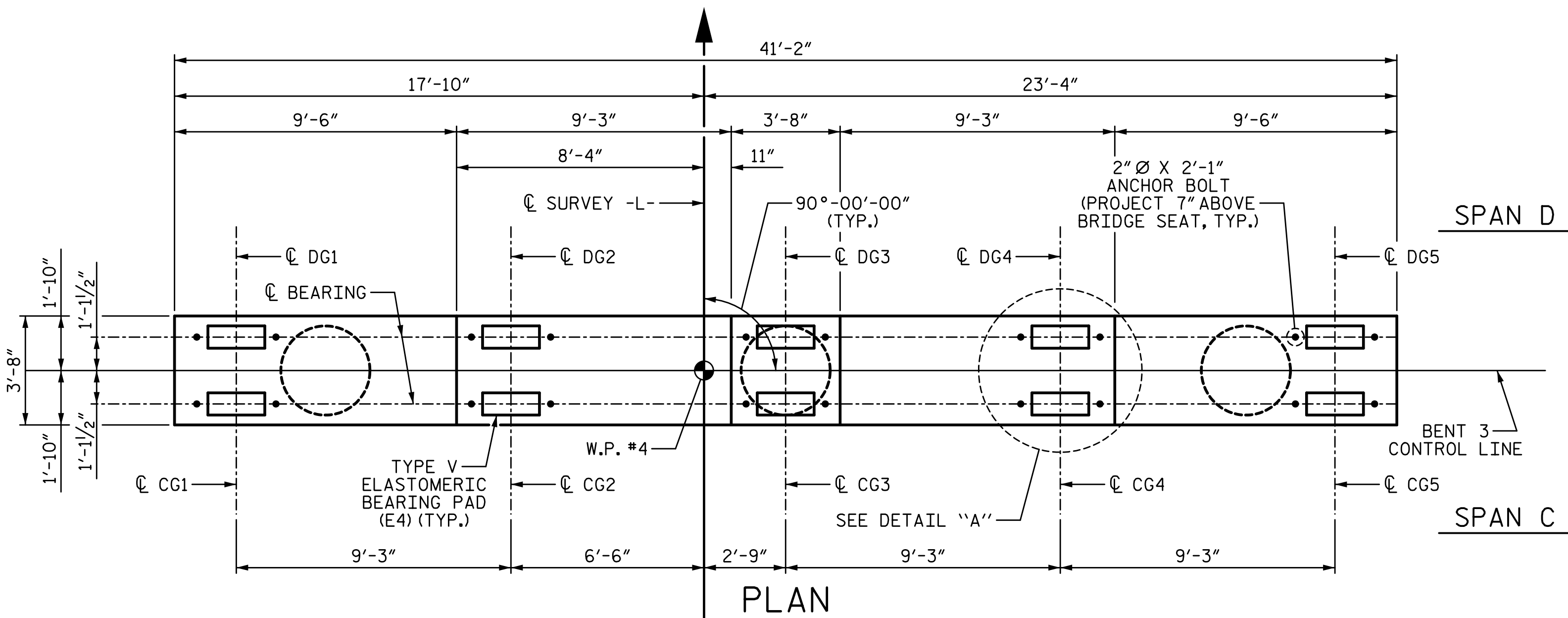
DRAWN BY: T. BANKOVICH DATE: 2-19  
CHECKED BY: J. A. BATTS DATE: 2-19  
DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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

TOTAL SHEETS: 53

DOCUMENT NOT CONSIDERED FINAL  
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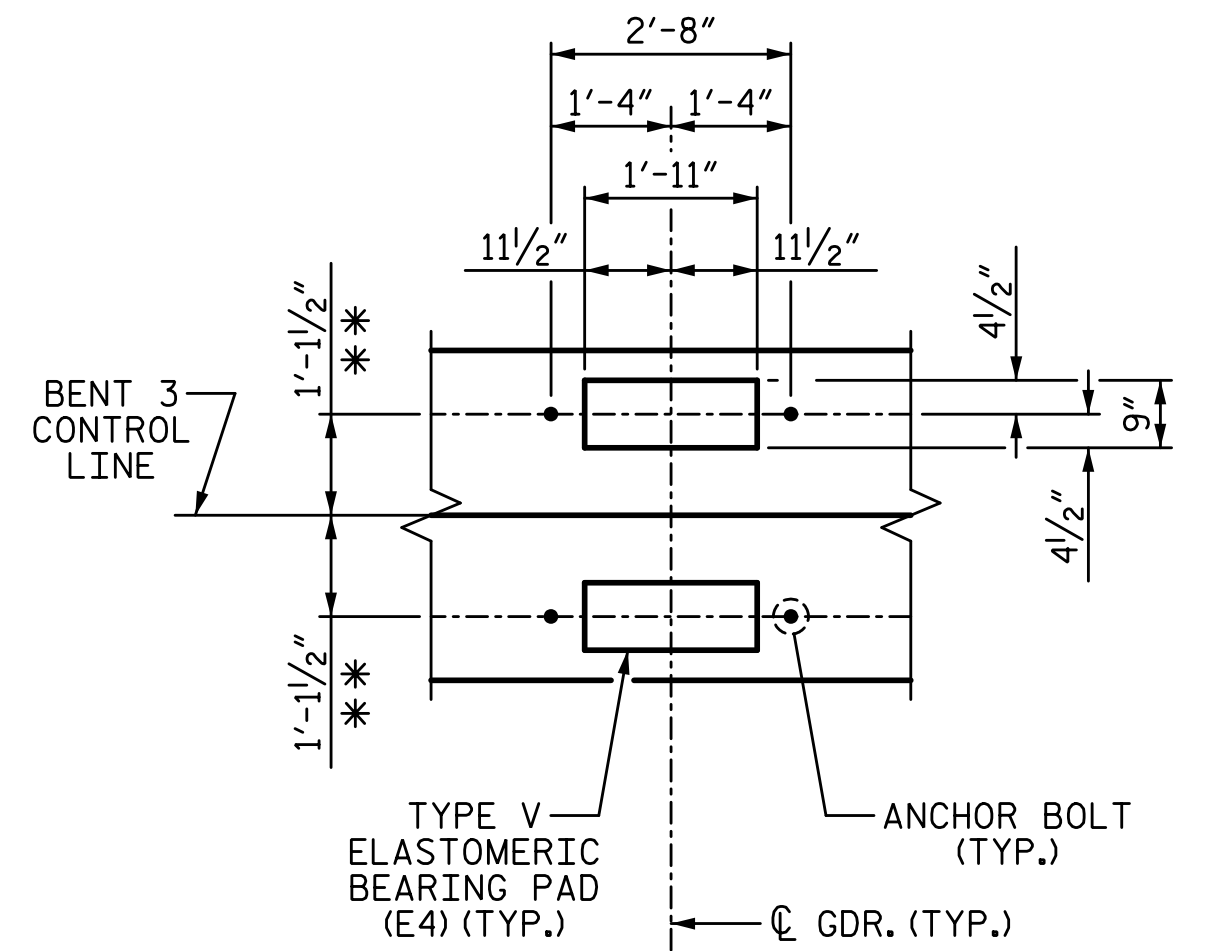
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**END ELEVATION**  
 DETAILS, DIMENSIONS & REINF. STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING

**NOTES:**

- \* INVERT ALTERNATE STIRRUPS.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON M1 & V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

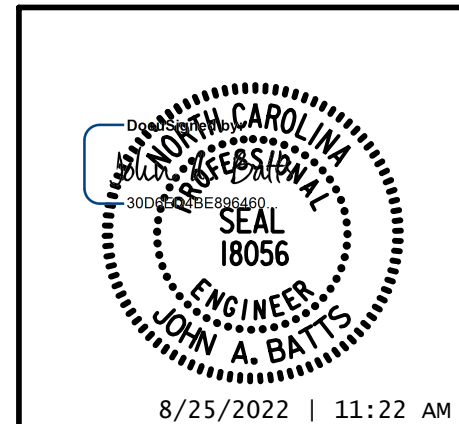


PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 3**



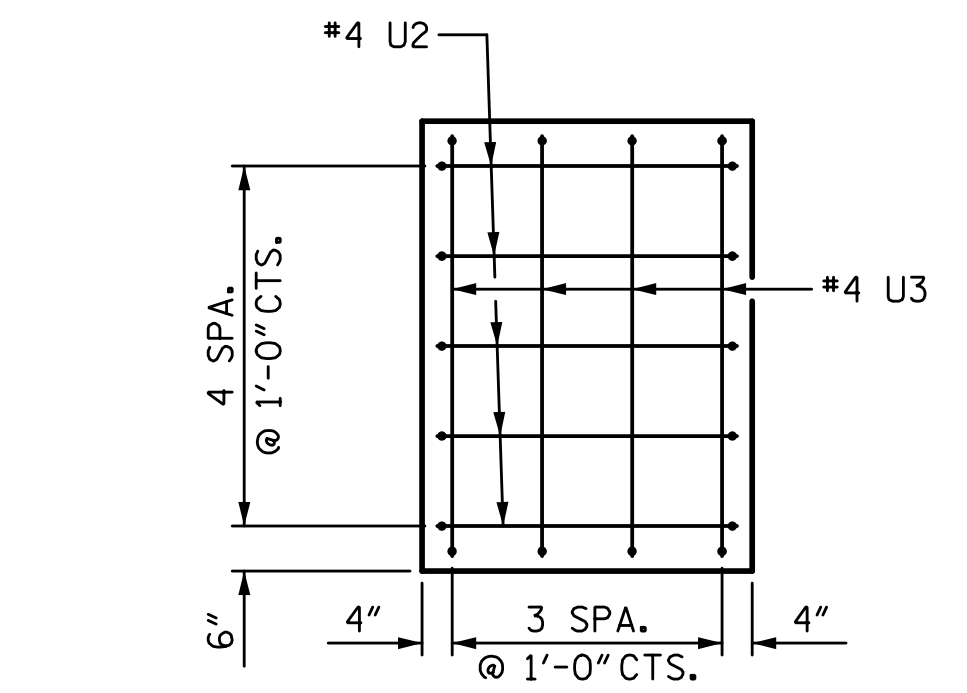
DRAWN BY: T. BANKOVICH DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
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TOTAL SHEETS: 53

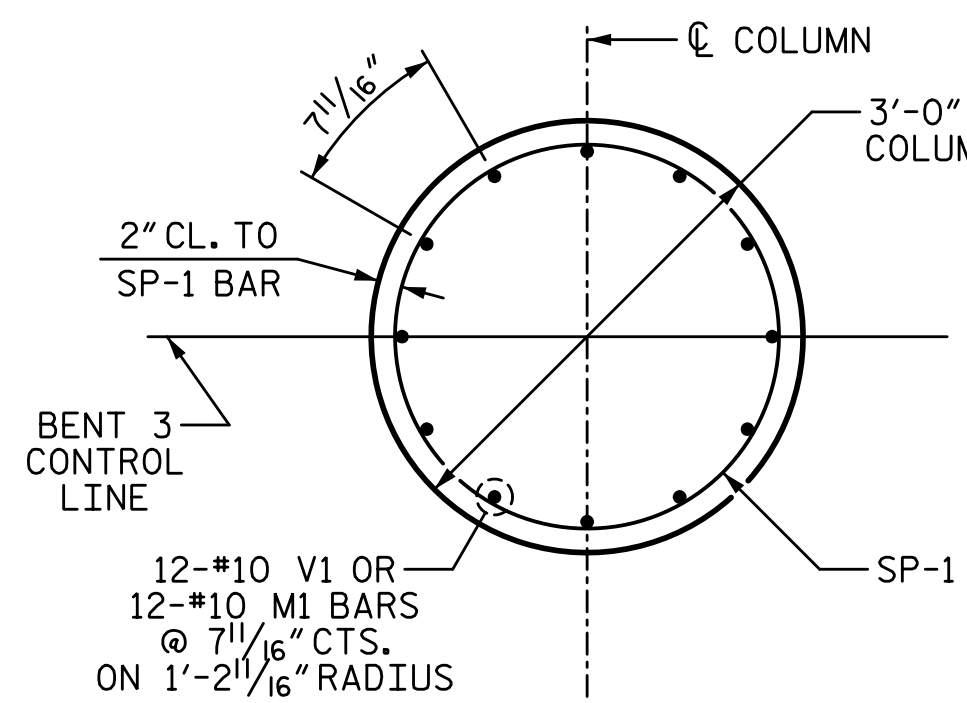
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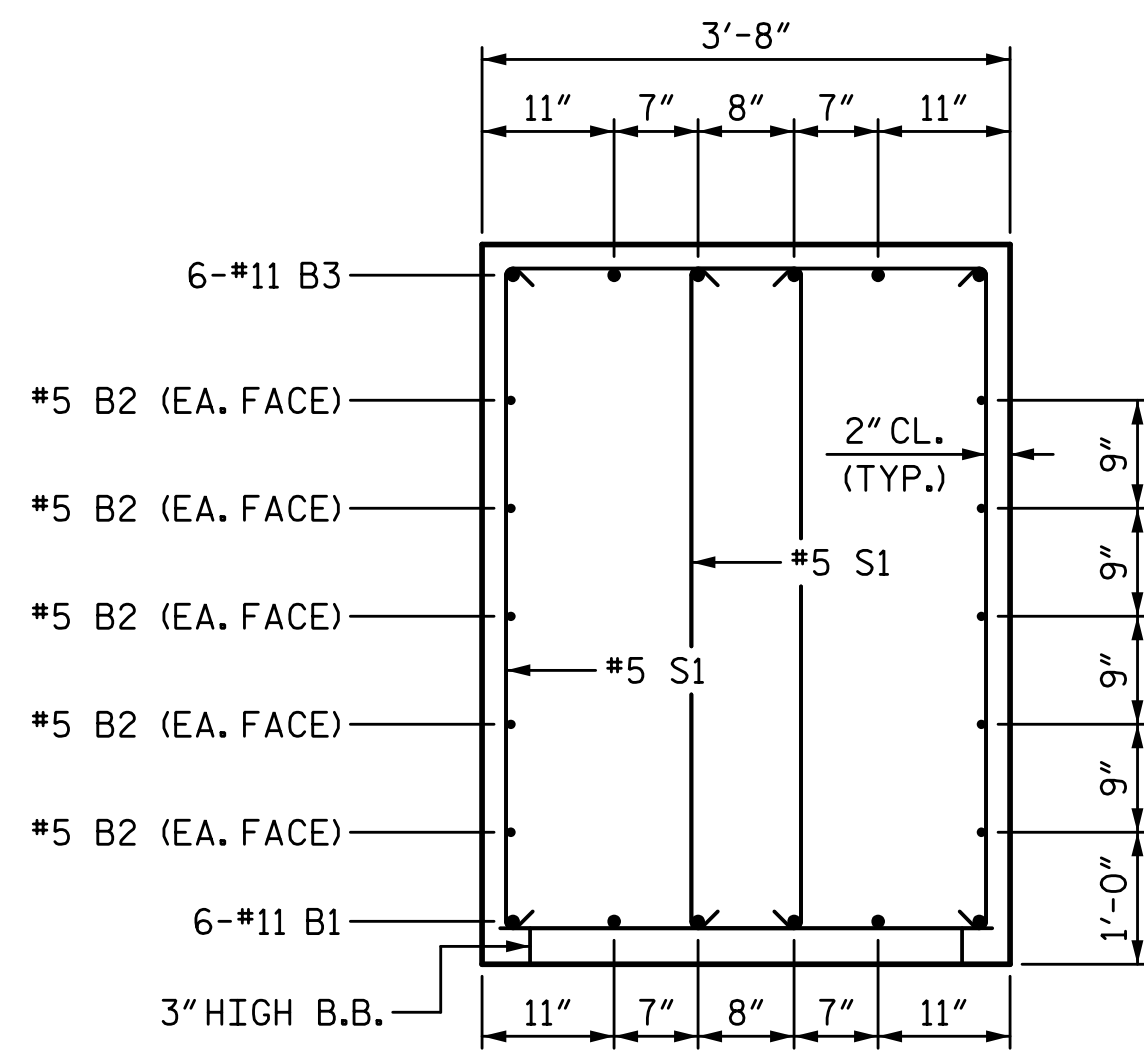
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RIGHT END SHOWN, LEFT END SIMILAR

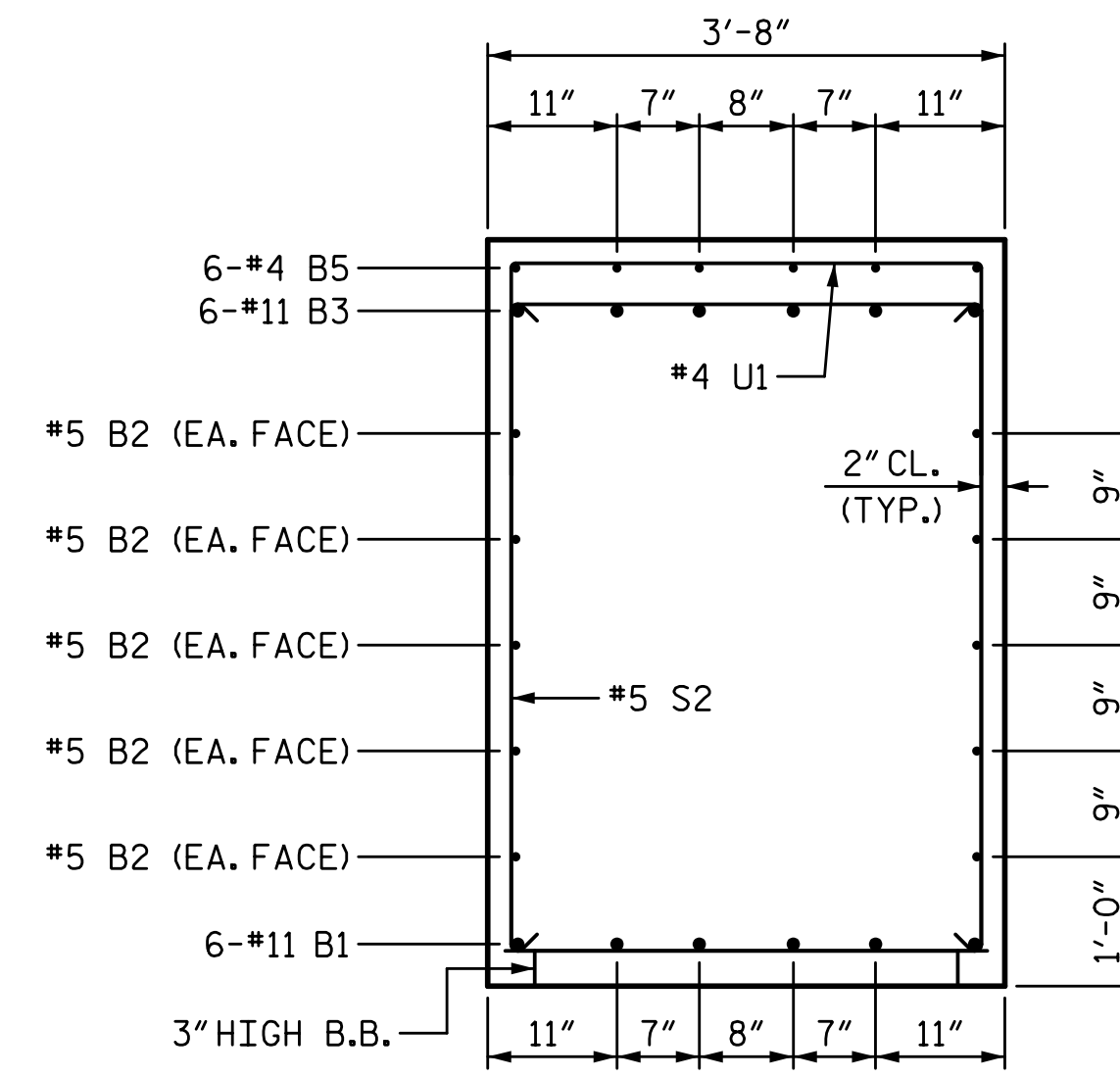


**PLAN OF COLUMN**

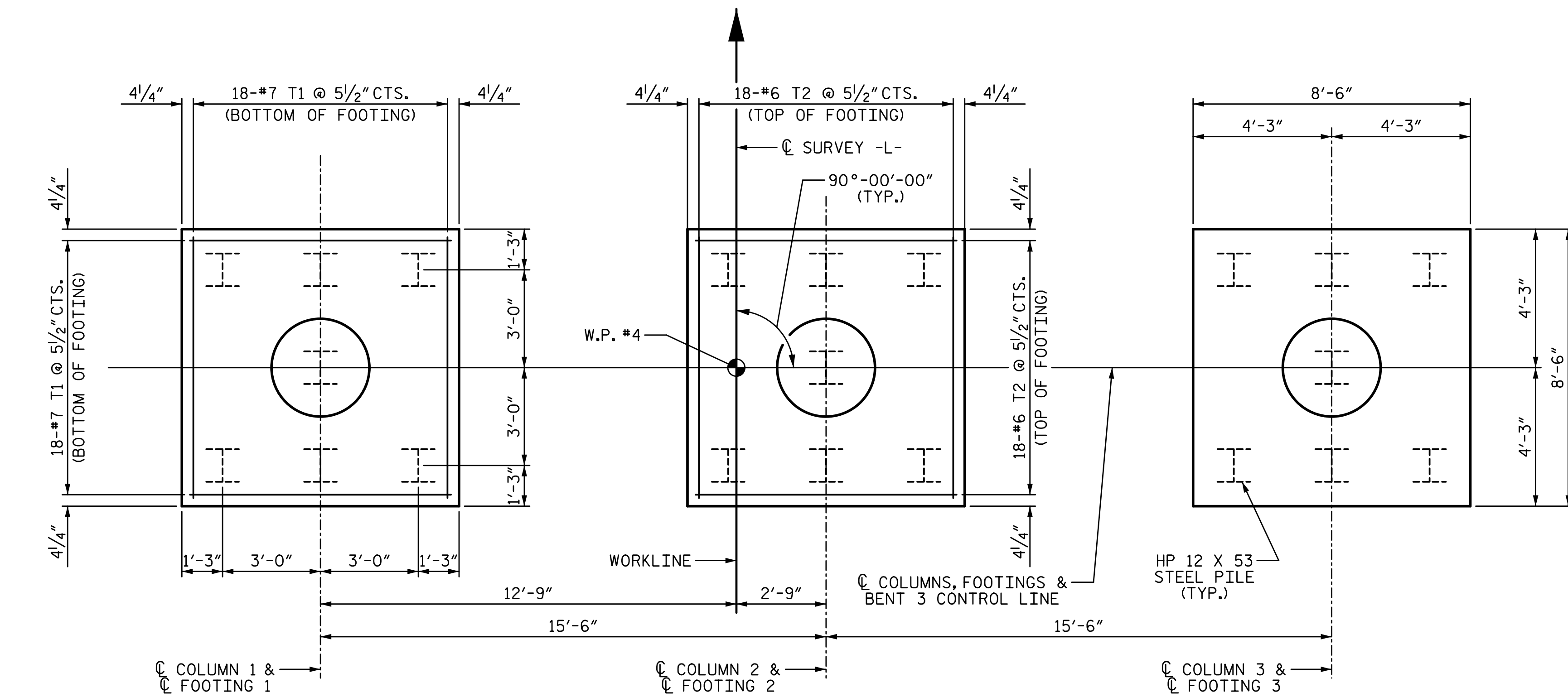
DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN



**SECTION A-A**

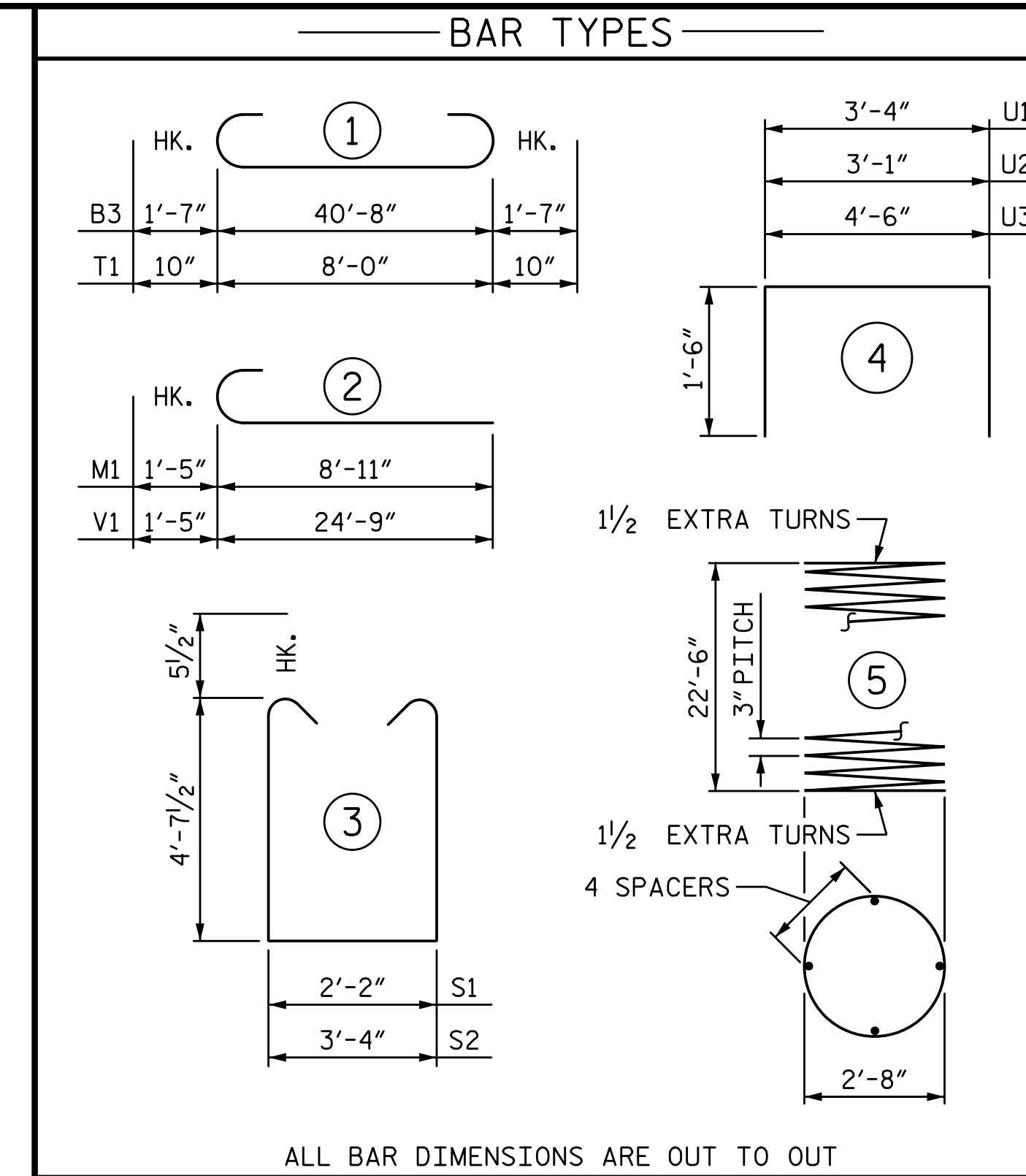


**SECTION B-B**



**PLAN OF FOOTINGS**

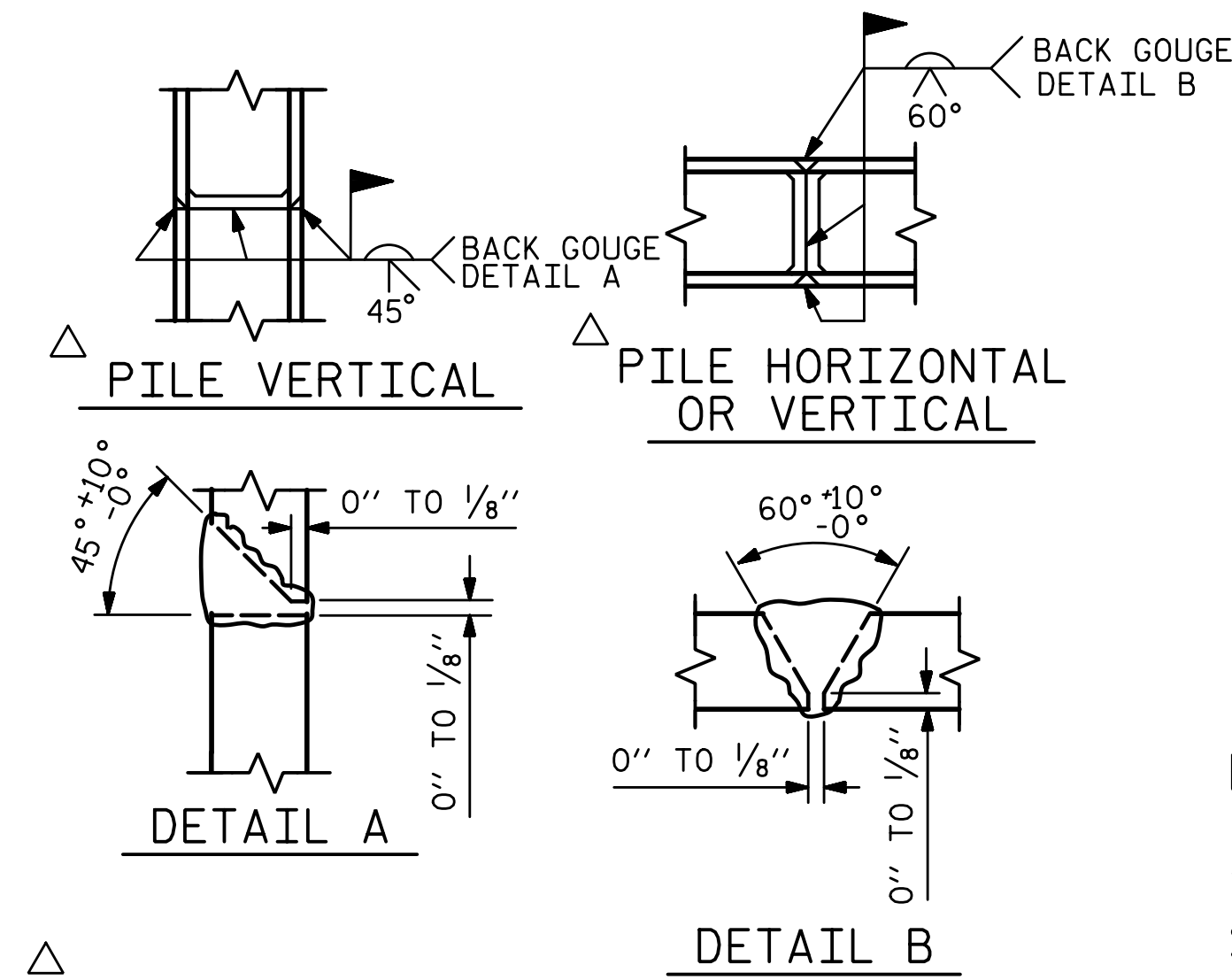
PILE PLACEMENT, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT 3					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	STR	40'-10"	1302
B2	10	#5	STR	40'-10"	426
B3	6	#11	1	43'-10"	1397
B4	6	#4	STR	9'-1"	36
B5	6	#4	STR	12'-7"	50
M1	36	#10	2	10'-4"	1601
S1	64	#5	3	12'-4"	823
S2	16	#5	3	13'-6"	225
T1	108	#7	1	9'-8"	2134
T2	108	#6	STR	8'-0"	1298
U1	46	#4	4	6'-4"	195
U2	10	#4	4	6'-1"	41
U3	8	#4	4	7'-6"	40
V1	36	#10	2	26'-2"	4053
SP-1	3	*	5	767'-4"	1538
REINFORCING STEEL					13621 LB
SPIRAL COL. REINF. STEEL					1538 LB
CLASS A CONCRETE BREAKDOWN					
POUR 1 (FOOTINGS)					32.2 CY
POUR 2 (COLUMNS)					17.5 CY
POUR 3 (CAP)					28.9 CY
TOTAL					78.6 CY
HP 12 X 53 STEEL PILES					
NO. 21					630 LF
STEEL PILE POINTS					NO. 21
PILE DRIVING EQUIPMENT SETUP					
HP 12 X 53 STEEL PILES					21 EA

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR



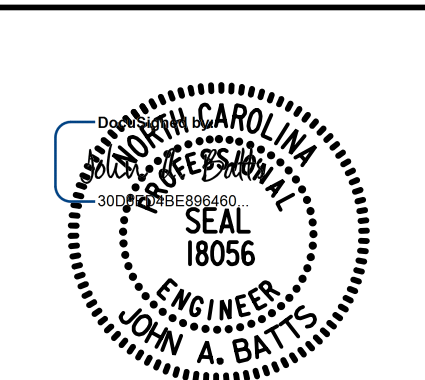
**PILE SPLICE DETAILS**

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT 3**

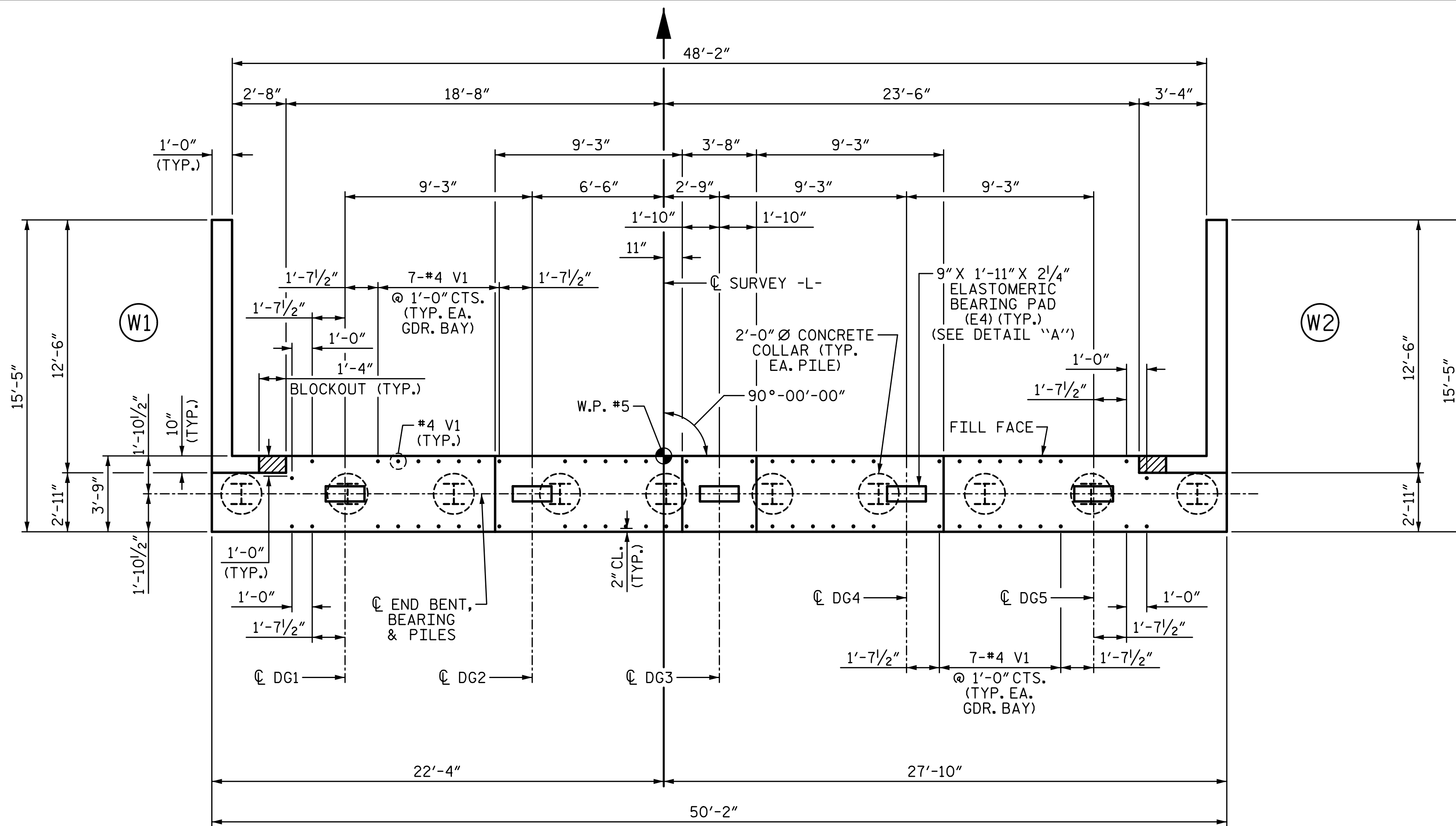


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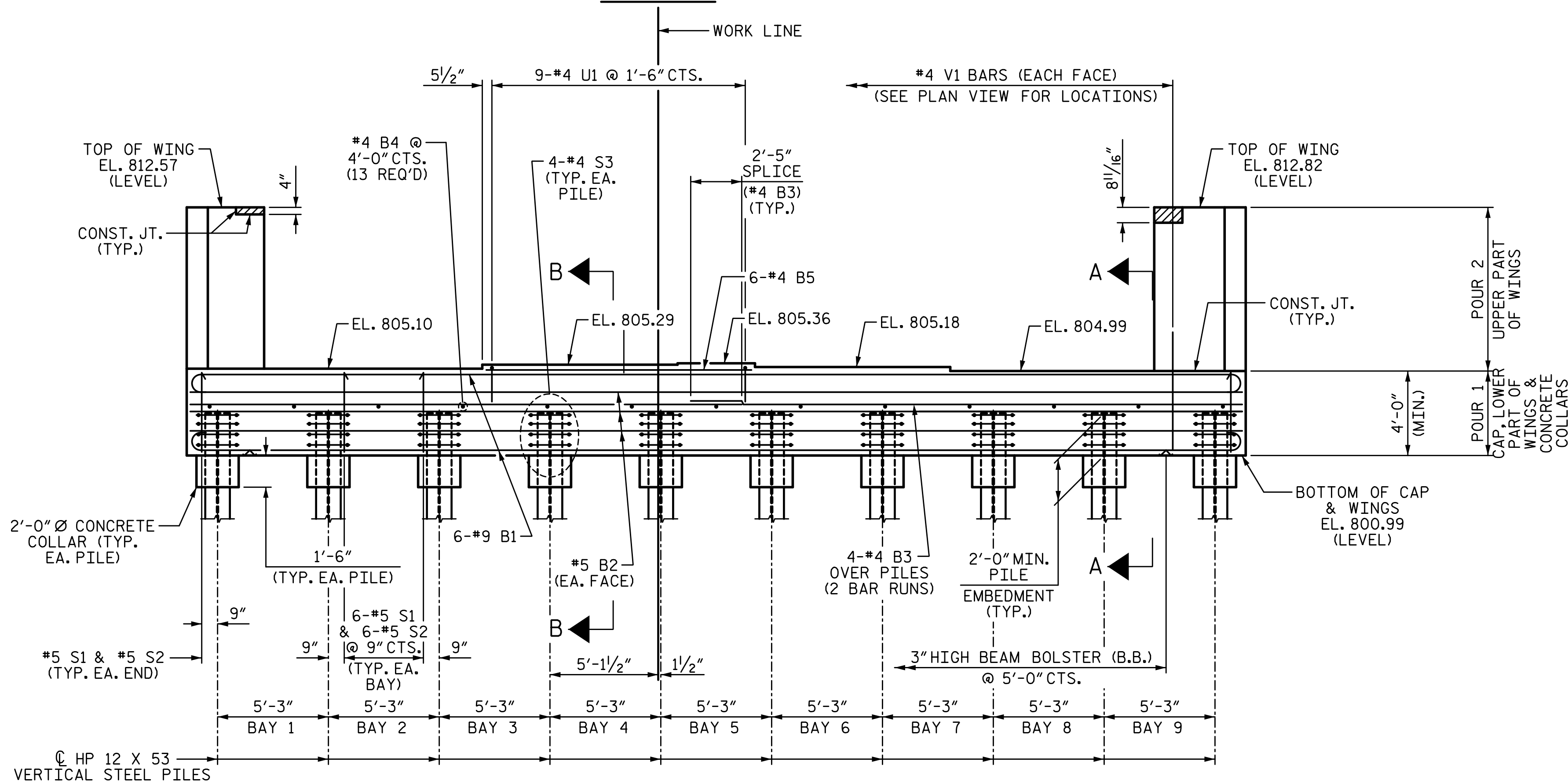
DRAWN BY: T. BANKOVICH	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

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

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PLAN



ELEVATION

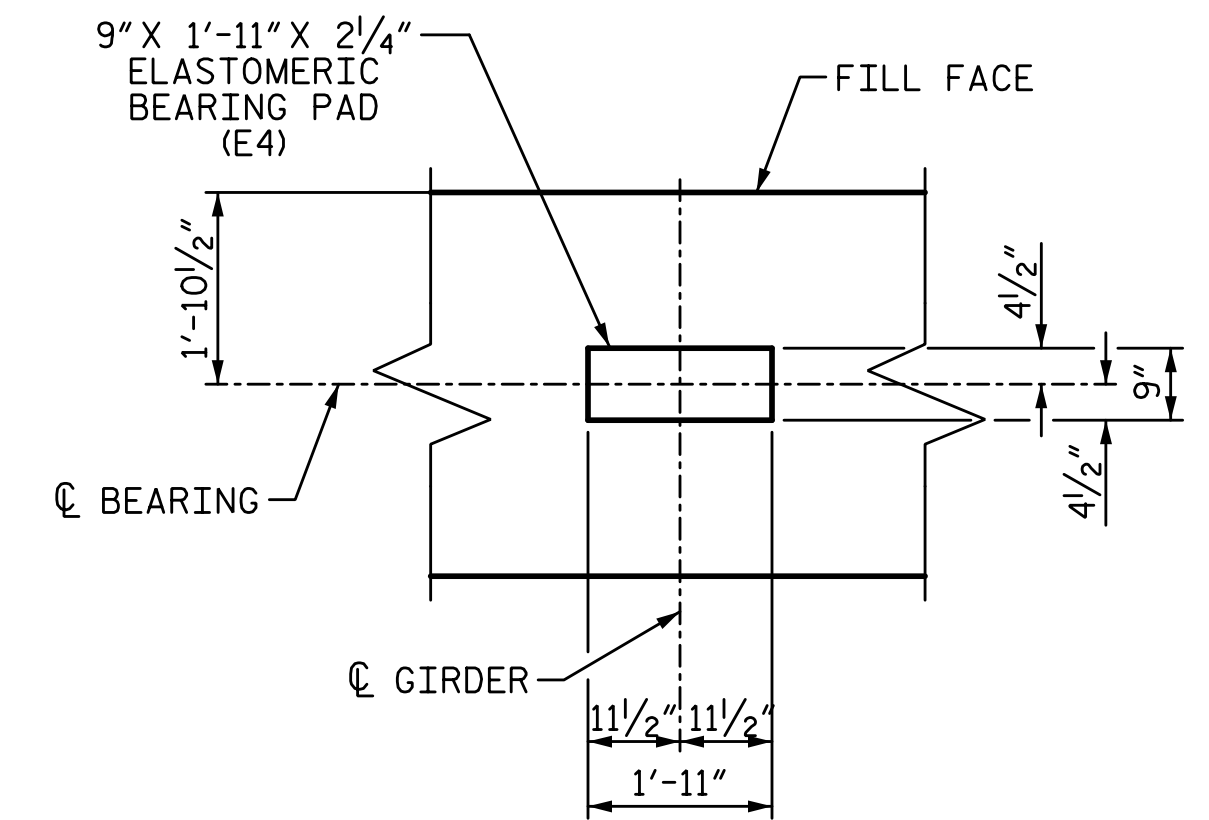
NOTES:

#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.



DETAIL "A"

(TYP. EA. GIRDER)

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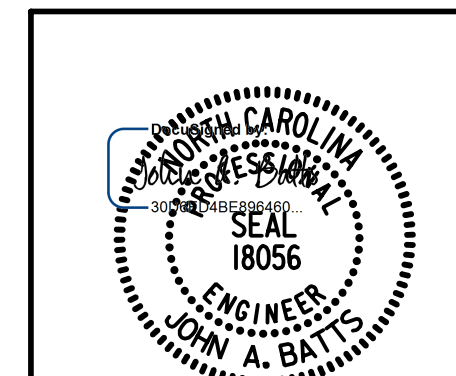
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PROJECT NO. Y-4810K  
 CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2



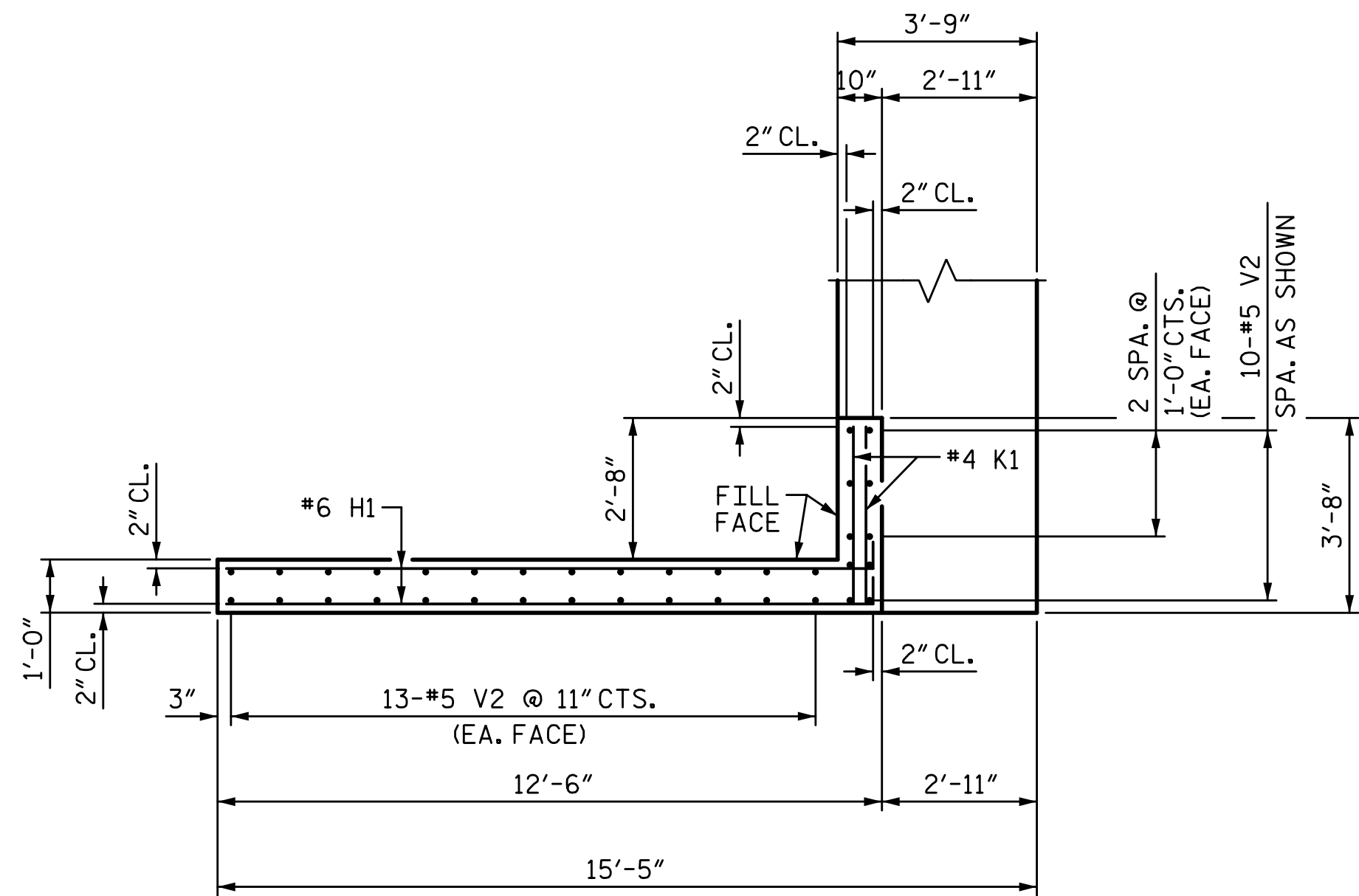
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LICENSURE NO. C-4434

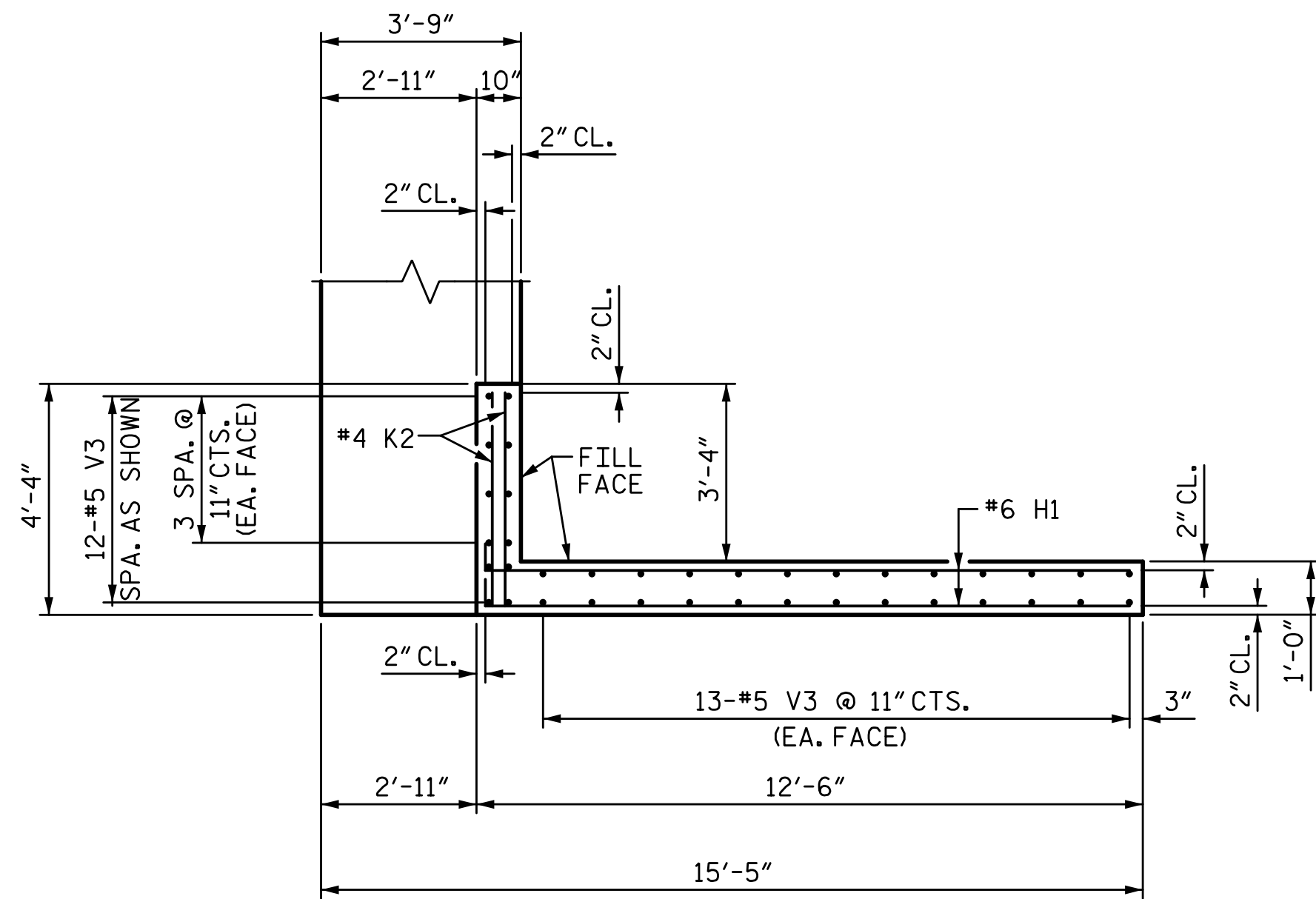
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			53

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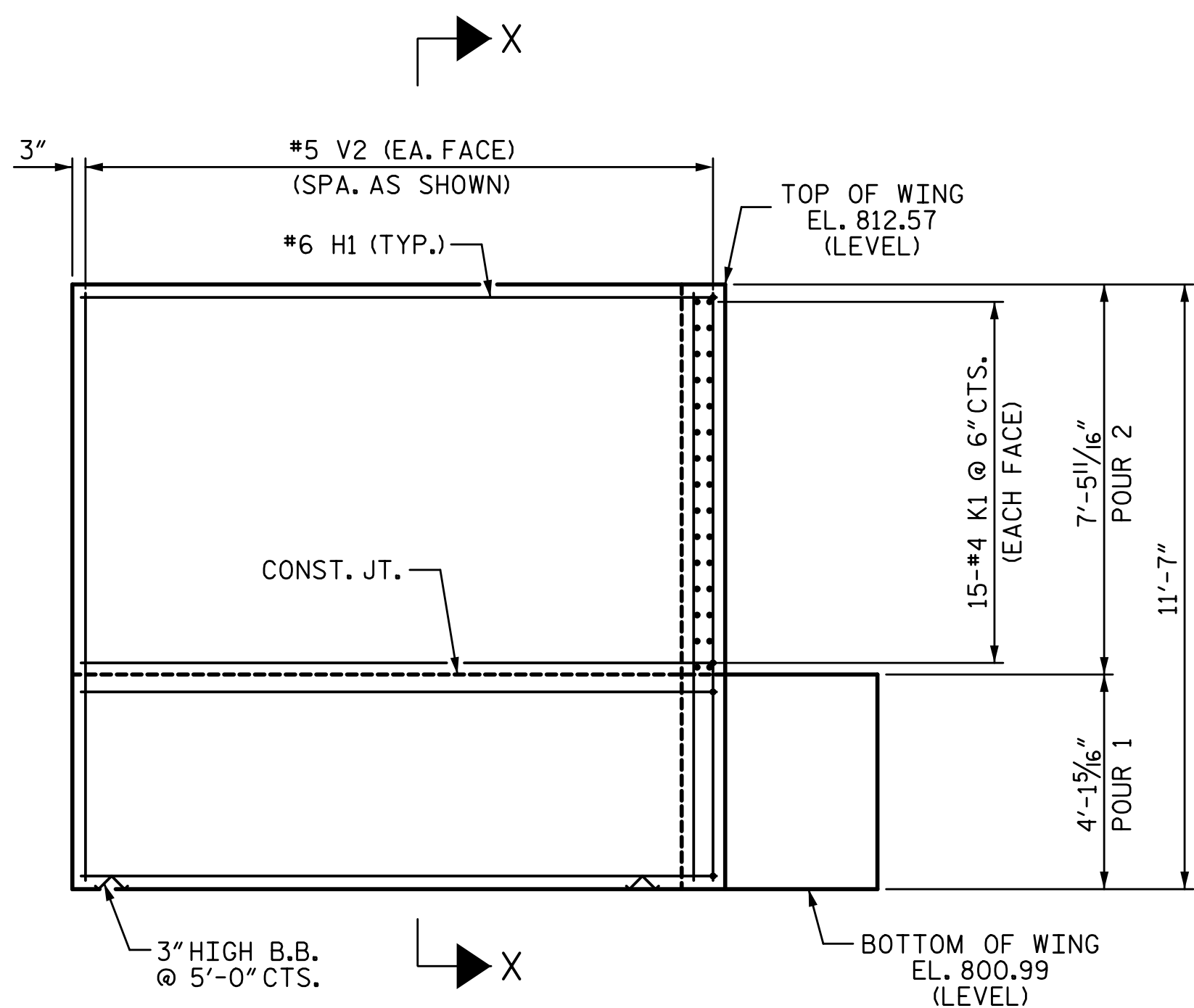
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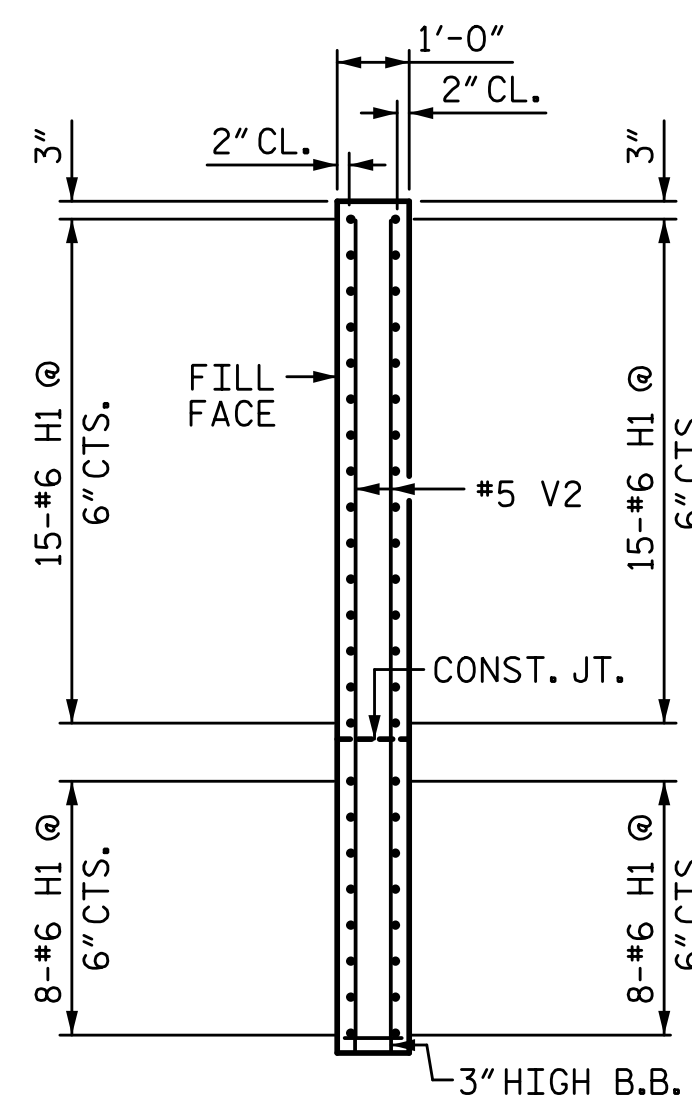
PLAN OF WING (W1)



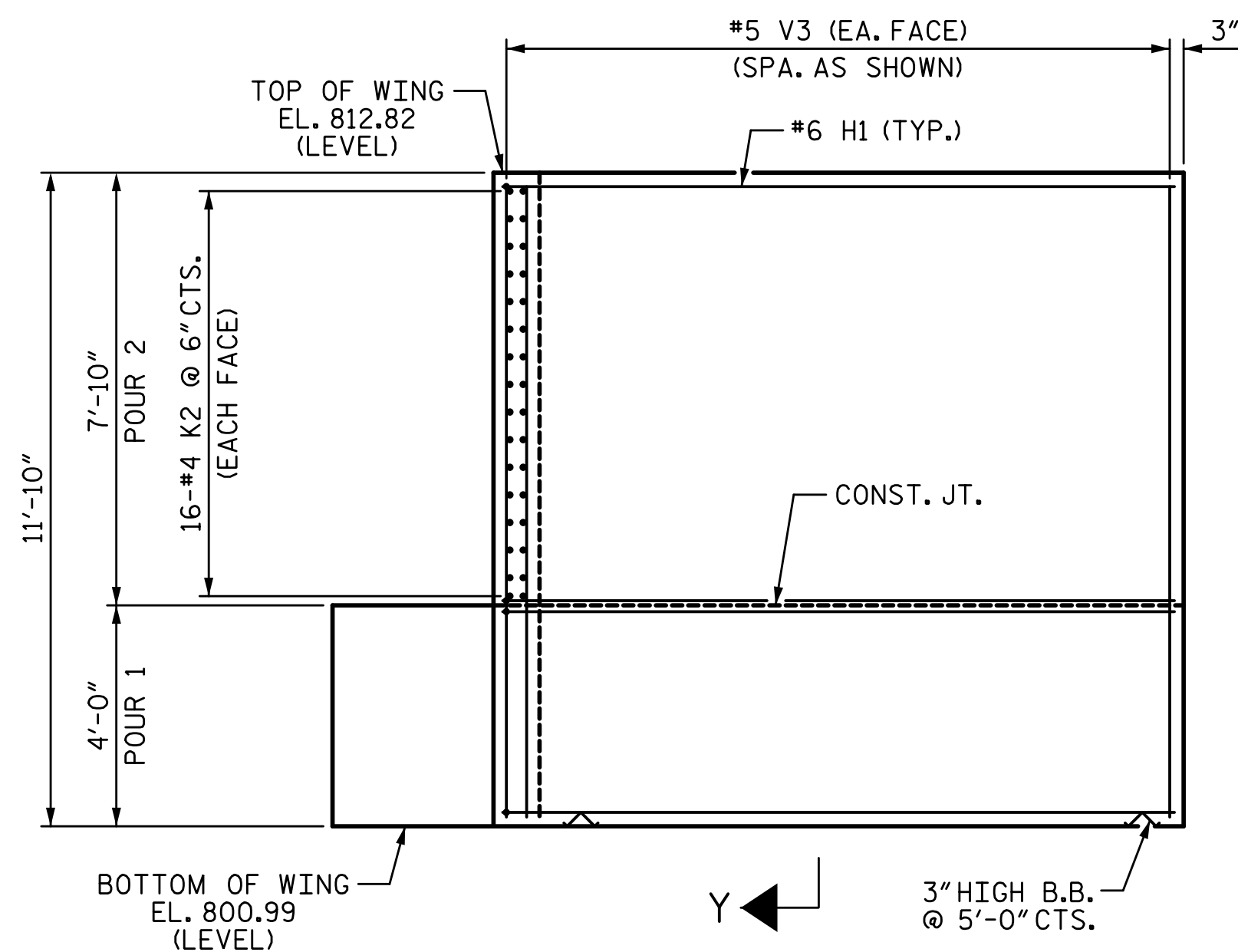
PLAN OF WING (W2)



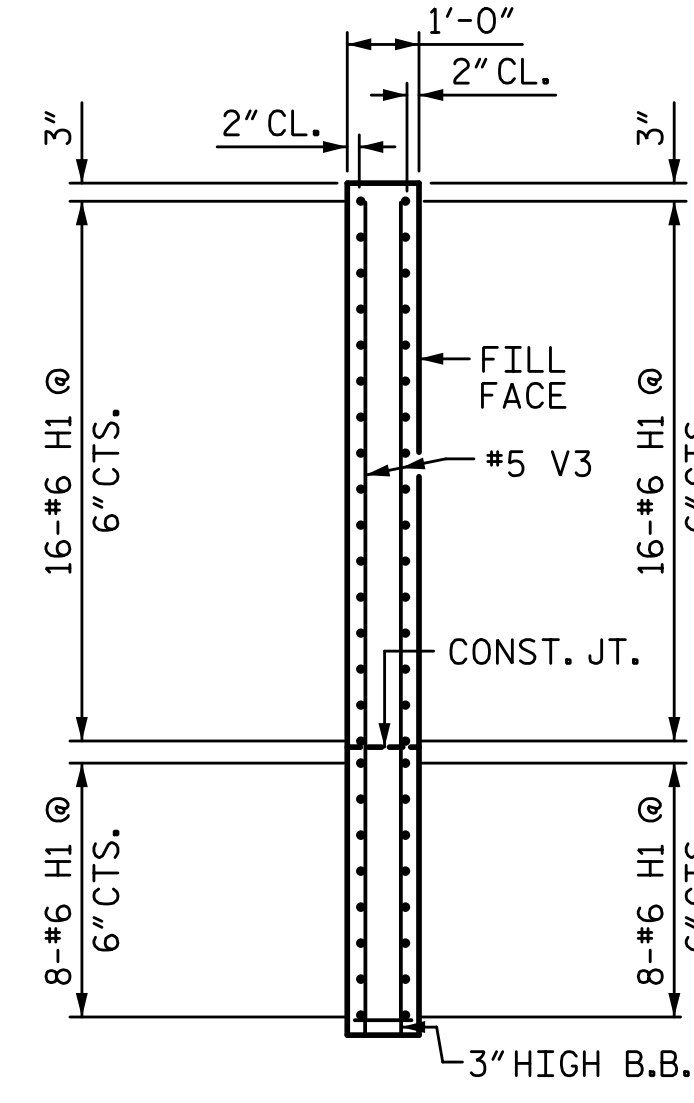
ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)



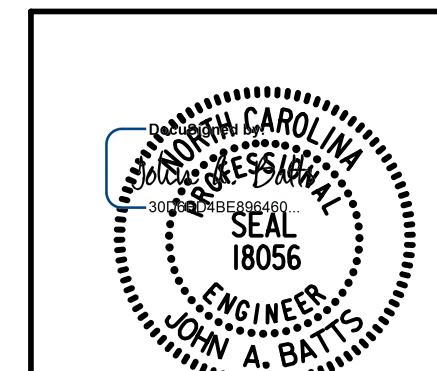
SECTION Y-Y

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2



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 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

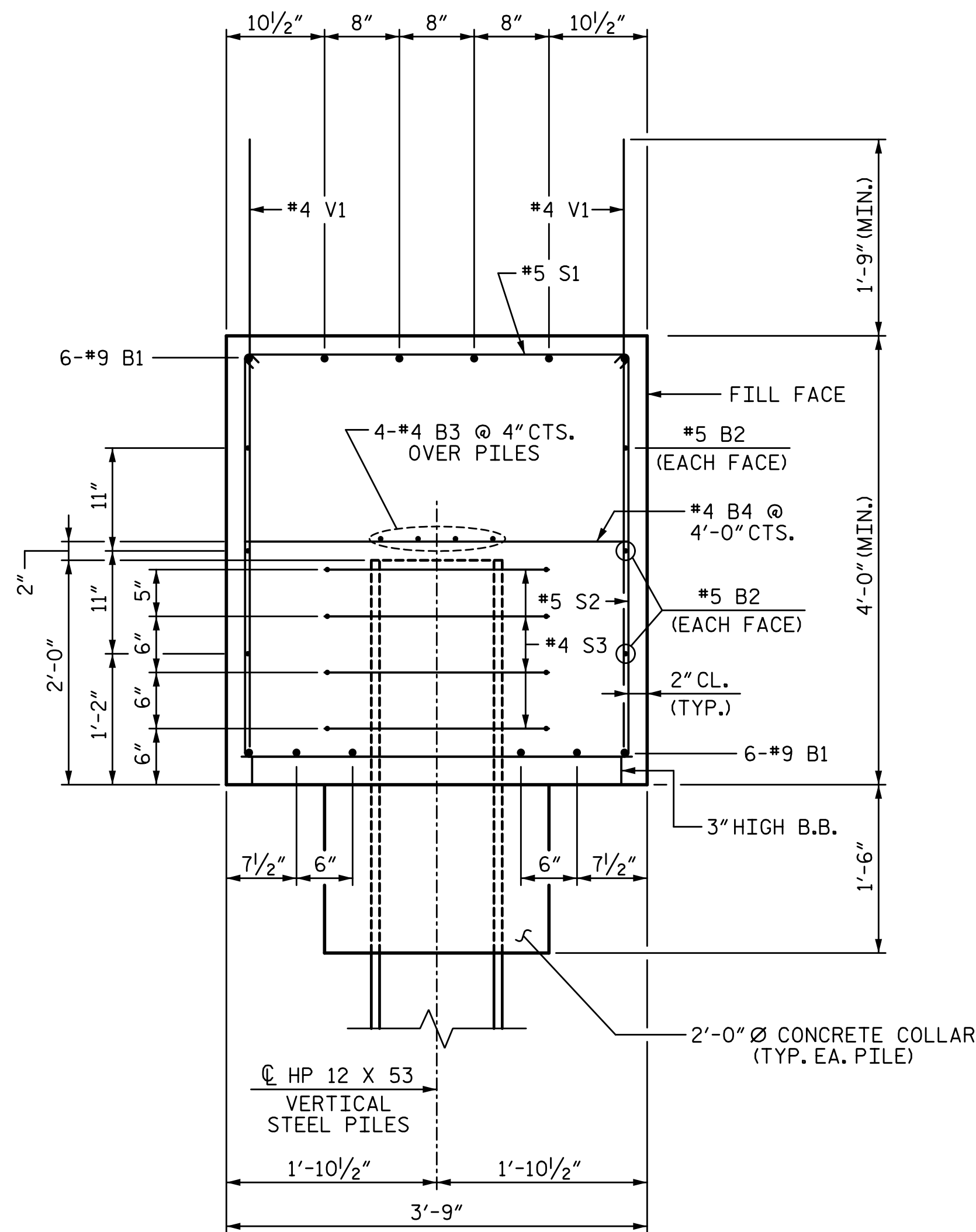
LICENSURE NO. C-4434

8/25/2022 | 11:22 AM

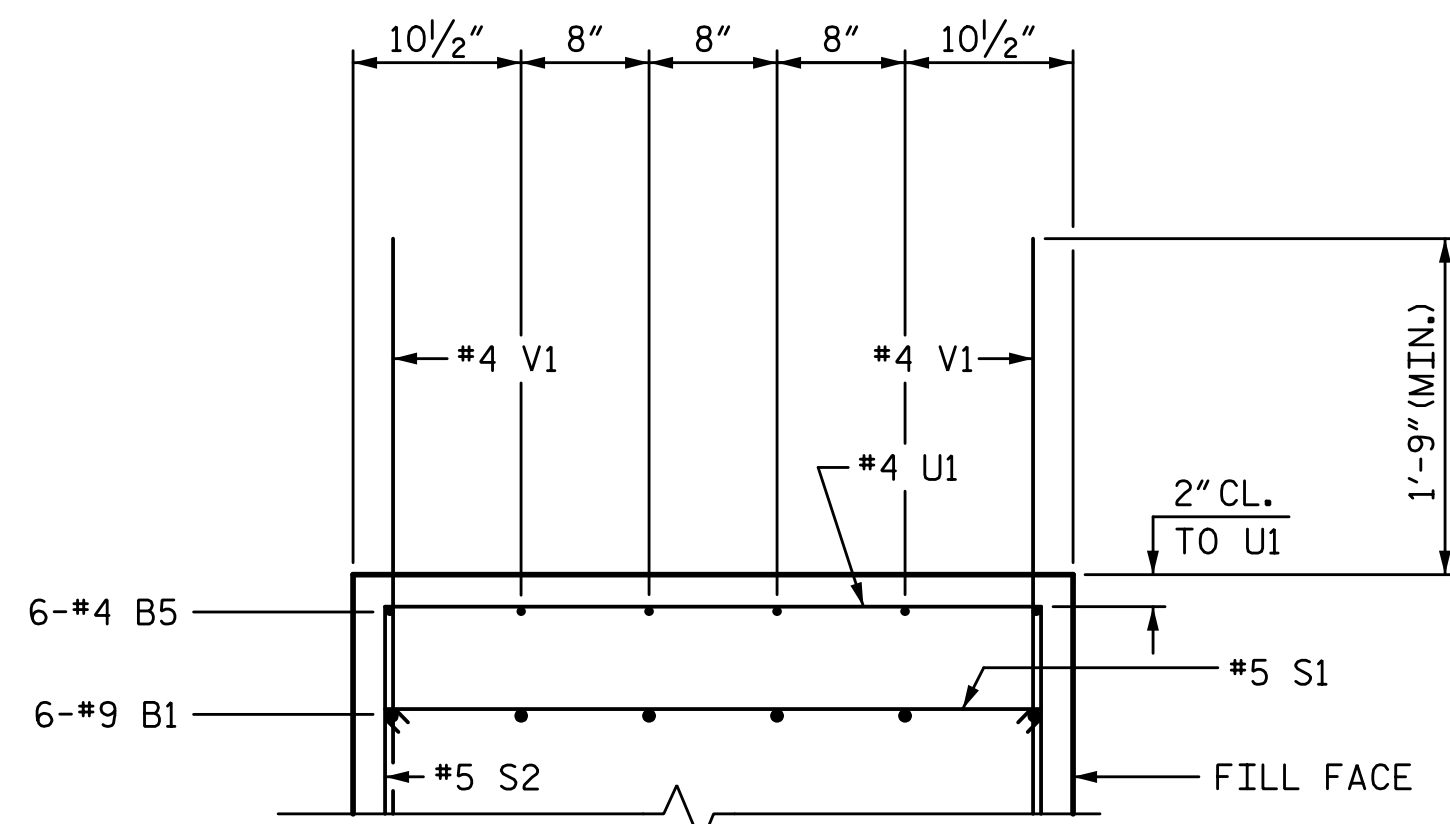
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
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2			4			53

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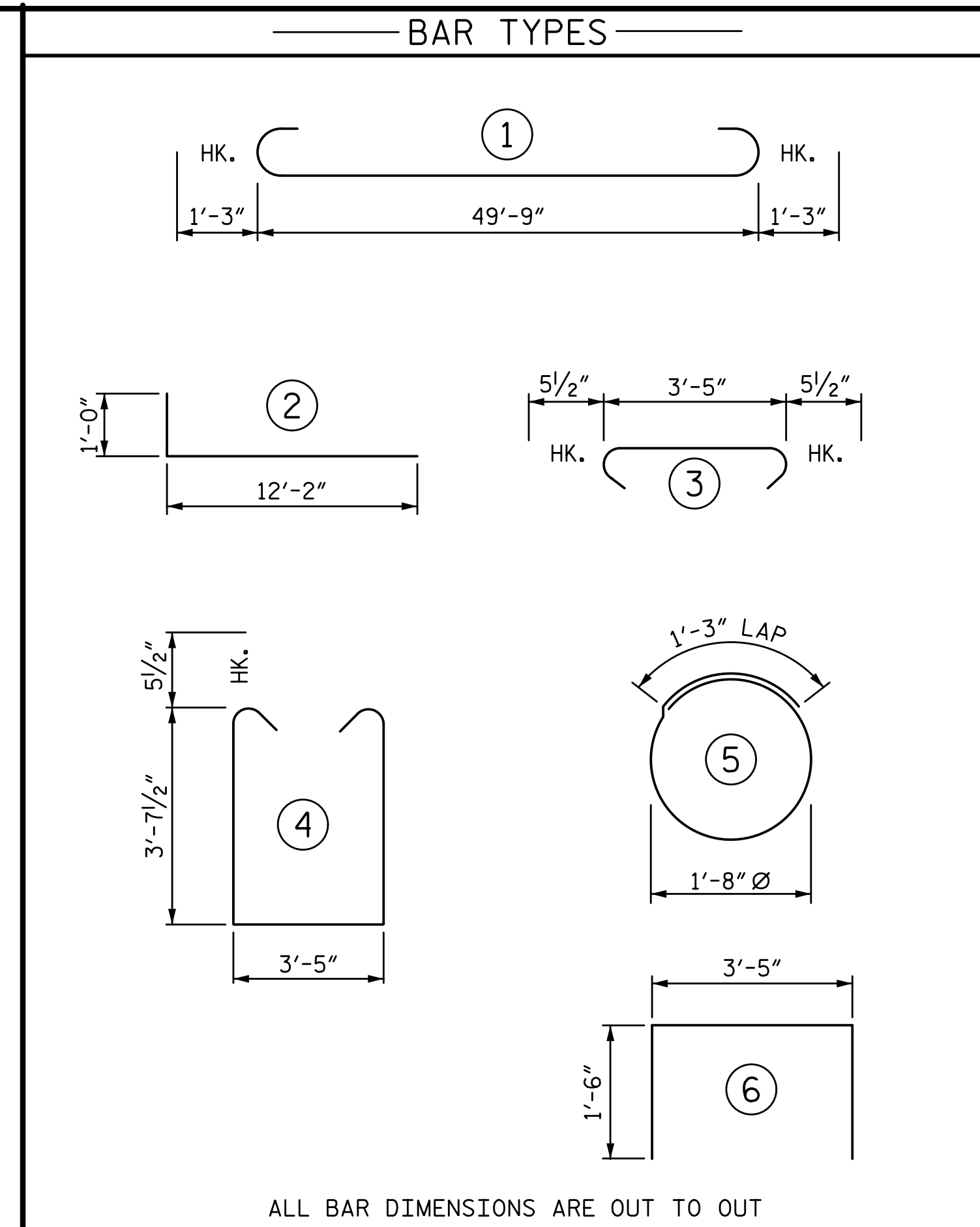
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SECTION A-A

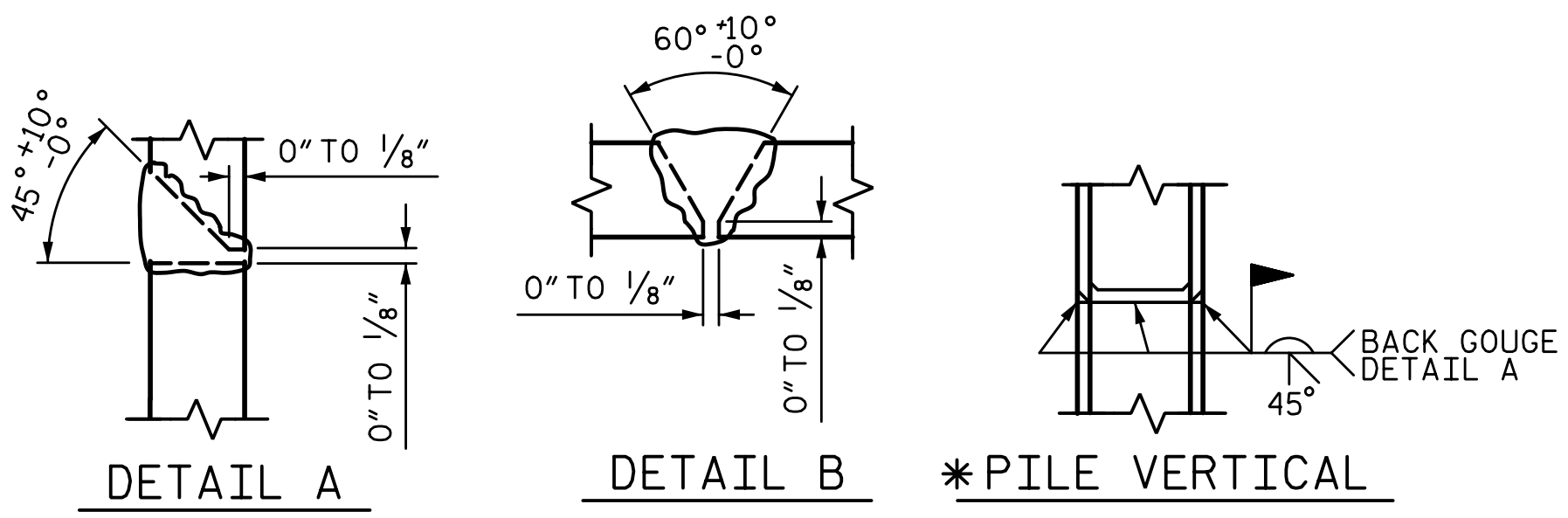


PARTIAL SECTION B-B

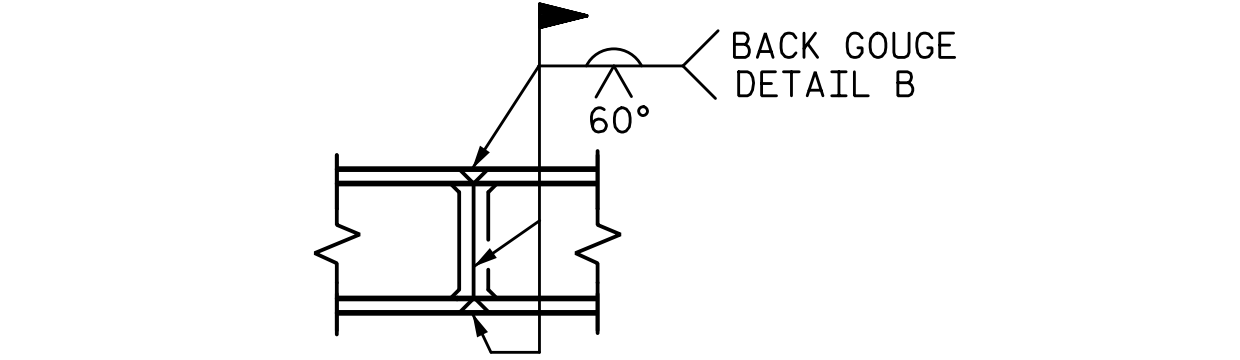


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	52'-3"	2132
B2	6	#5	STR	49'-9"	311
B3	8	#4	STR	26'-2"	140
B4	13	#4	STR	3'-5"	30
B5	6	#4	STR	12'-6"	50
H1	94	#6	2	13'-2"	1859
K1	30	#4	STR	3'-4"	67
K2	32	#4	STR	4'-0"	86
S1	56	#5	3	4'-4"	253
S2	56	#5	4	11'-7"	677
S3	40	#4	5	6'-6"	174
U1	9	#4	6	6'-5"	39
V1	64	#4	STR	6'-0"	257
V2	36	#5	STR	11'-3"	422
V3	38	#5	STR	11'-6"	456
TOTAL REINFORCING STEEL				6953	LB
CLASS A CONCRETE					
POUR 1					
(CAP, COLLARS, & LOWER WINGS)				34.2	CY
POUR 2					
(UPPER WINGS)				8.5	CY
TOTAL CLASS A CONCRETE				42.7	CY
HP 12 X 53 STEEL PILES					
NO. 10				525.0	LF
PILE DRIVING EQUIPMENT SETUP					
HP 12 X 53 STEEL PILES				10	EA

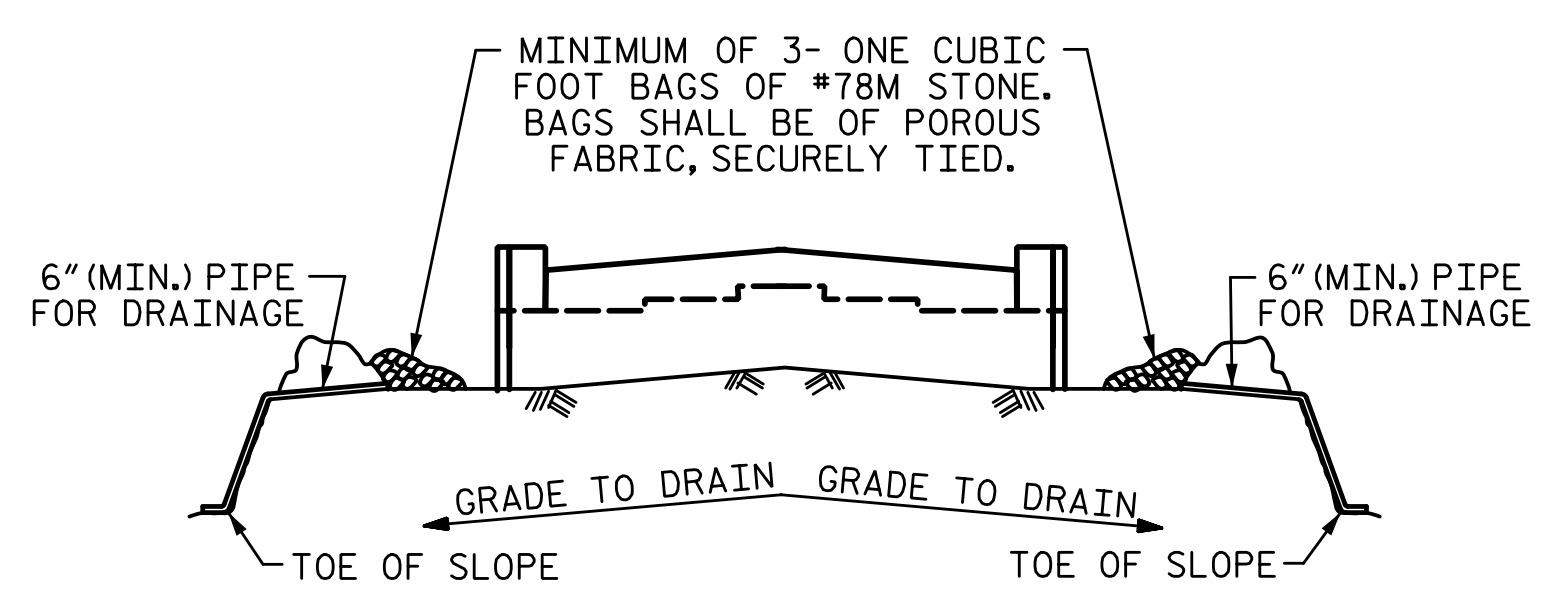


\*PILE VERTICAL



\*PILE HORIZONTAL OR VERTICAL

PILE SPLICE DETAILS  
\* POSITION OF PILE DURING WELDING



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

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
STATION: 31+94.08 -L-

SHEET 3 OF 3

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

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

STATE OF NORTH CAROLINA  
SEAL  
18056  
ENGINEER  
JOHN A. BATTS

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

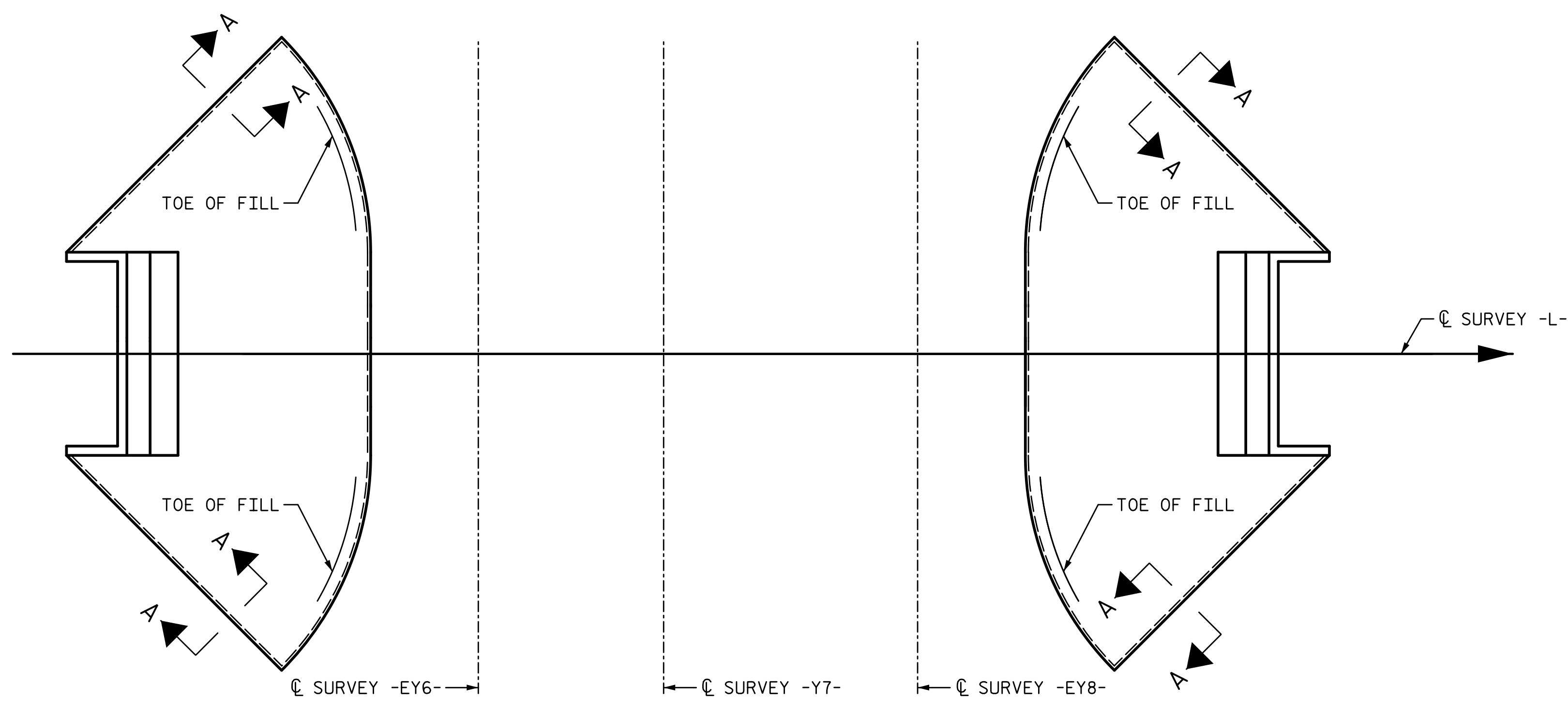
TOTAL SHEETS: 53

DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

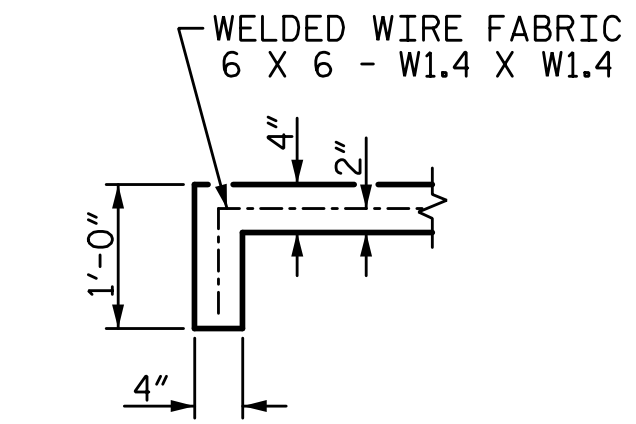
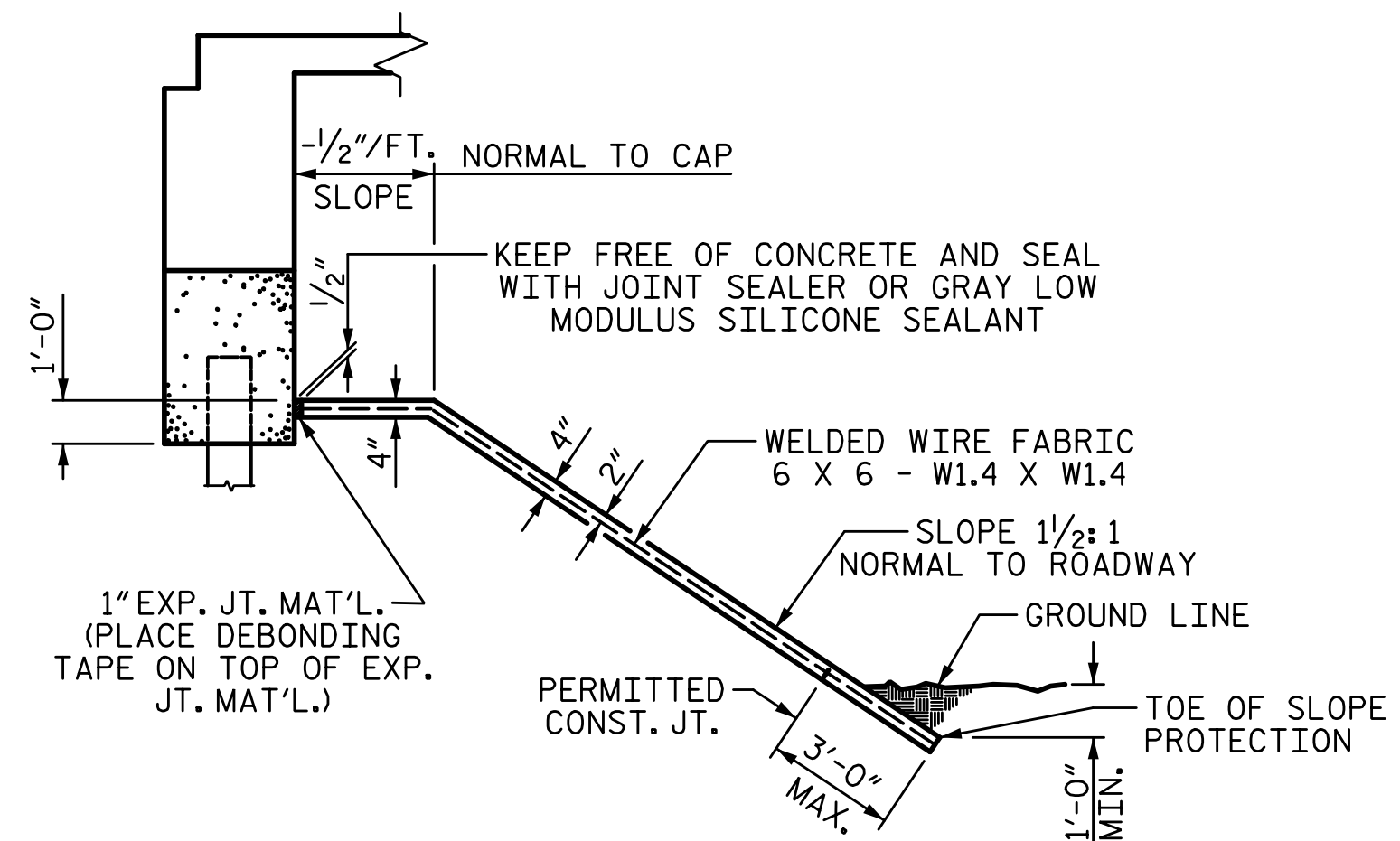
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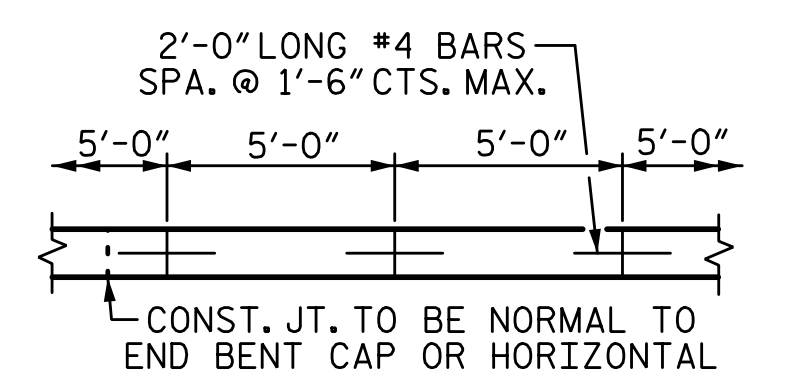


PLAN



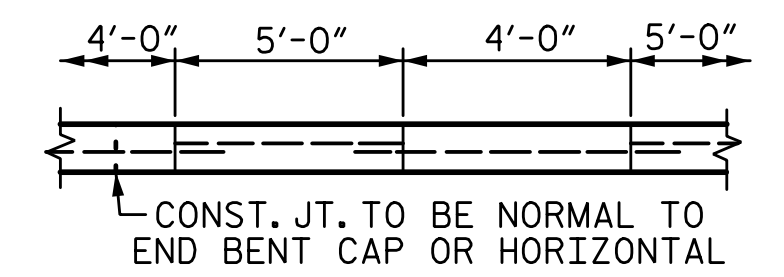
SECTION A-A

SECTION ALONG CL SURVEY -L-



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

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 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 31+94.08 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	500	900
END BENT 2	565	1020

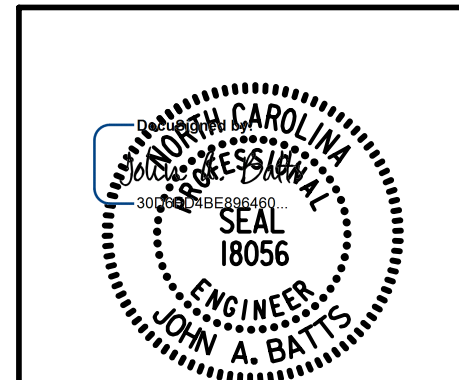
\* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION DETAILS**



LICENSURE NO. C-4434

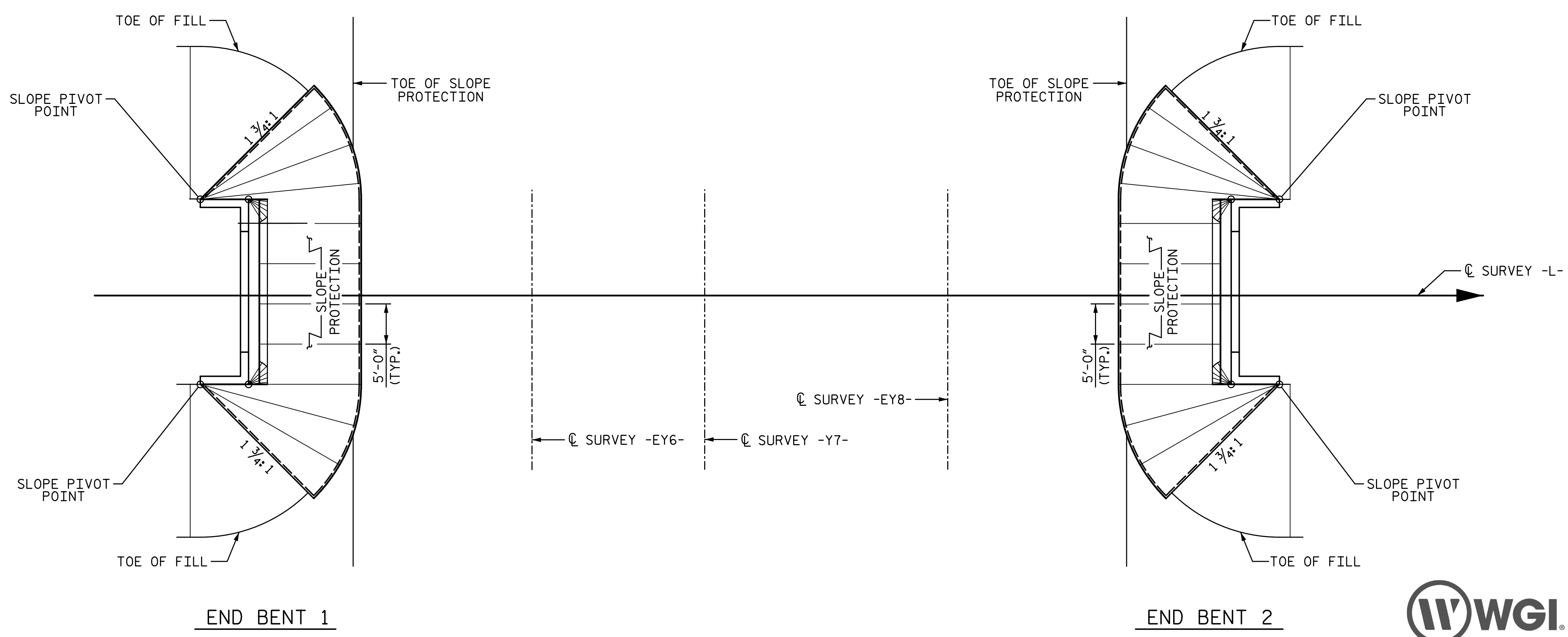
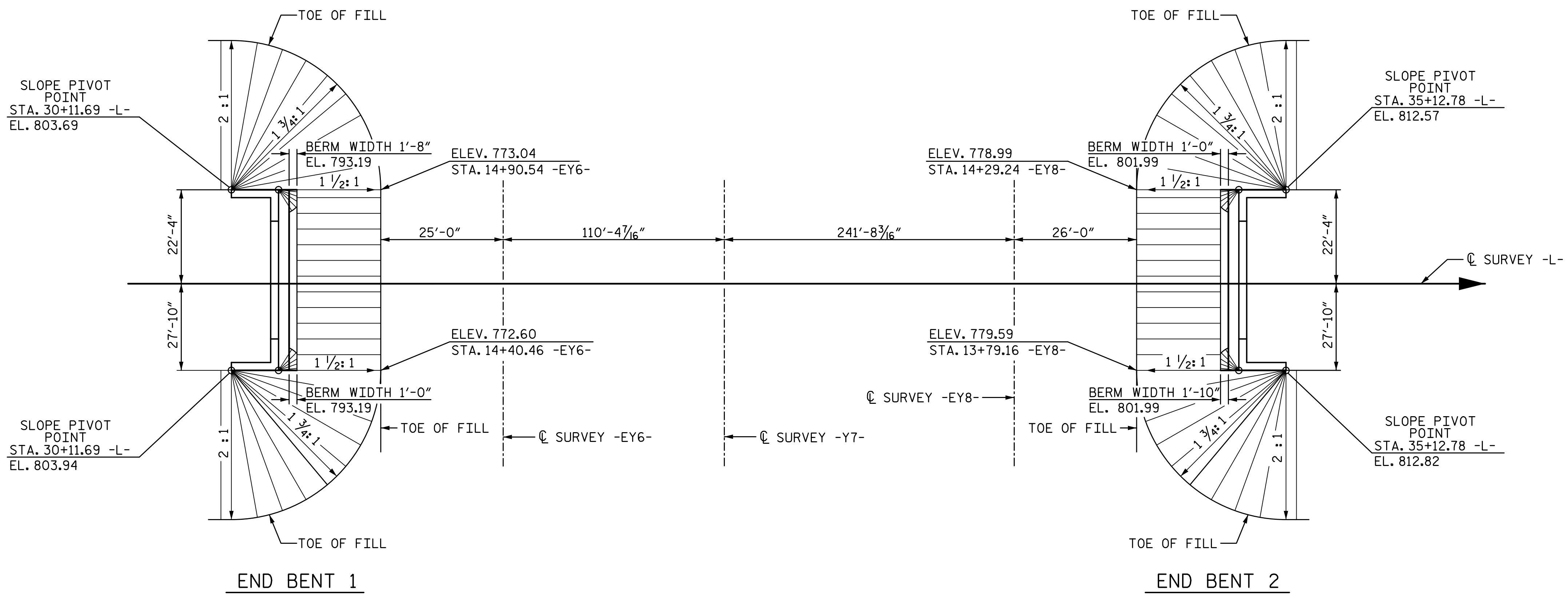
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 53

DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

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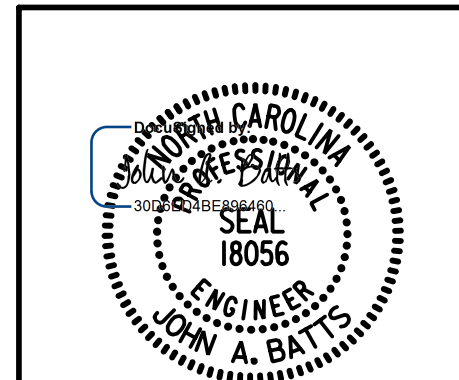


PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**

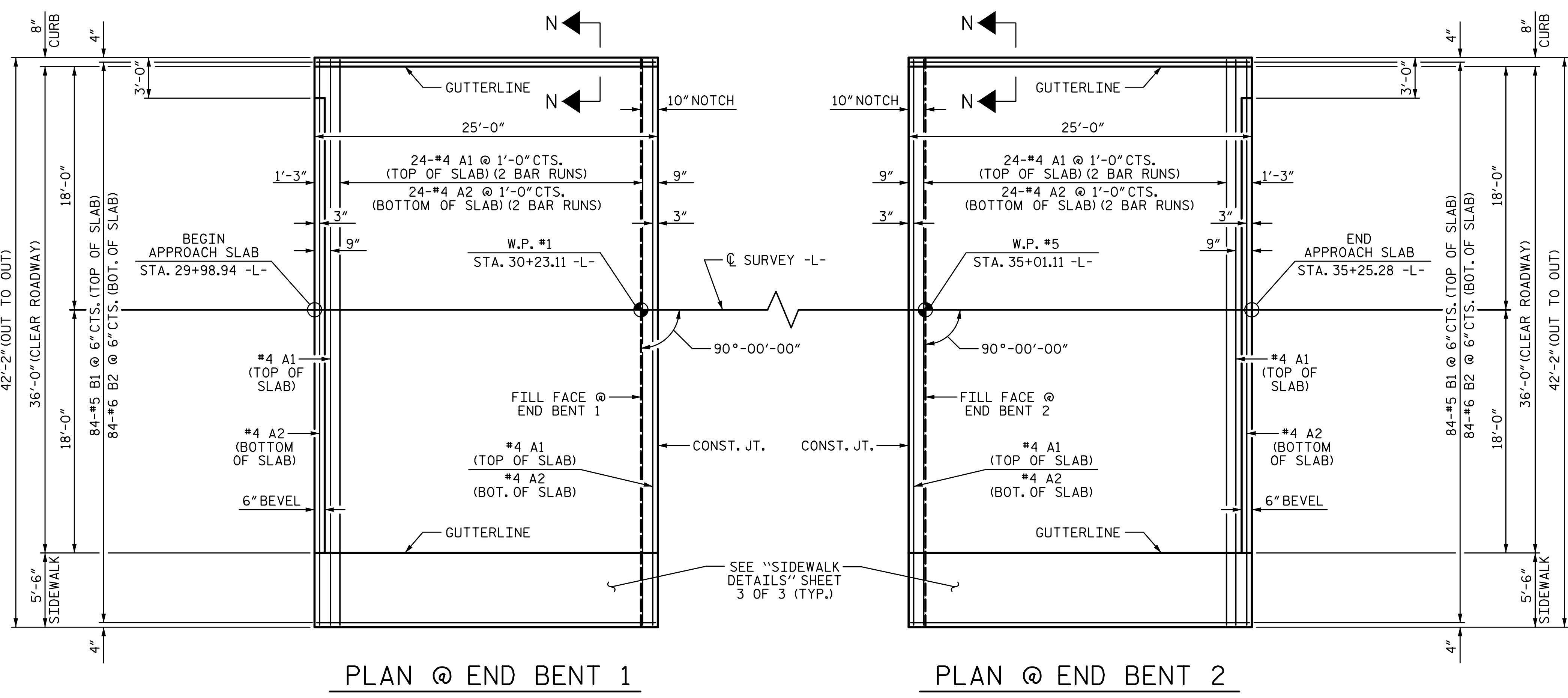


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 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

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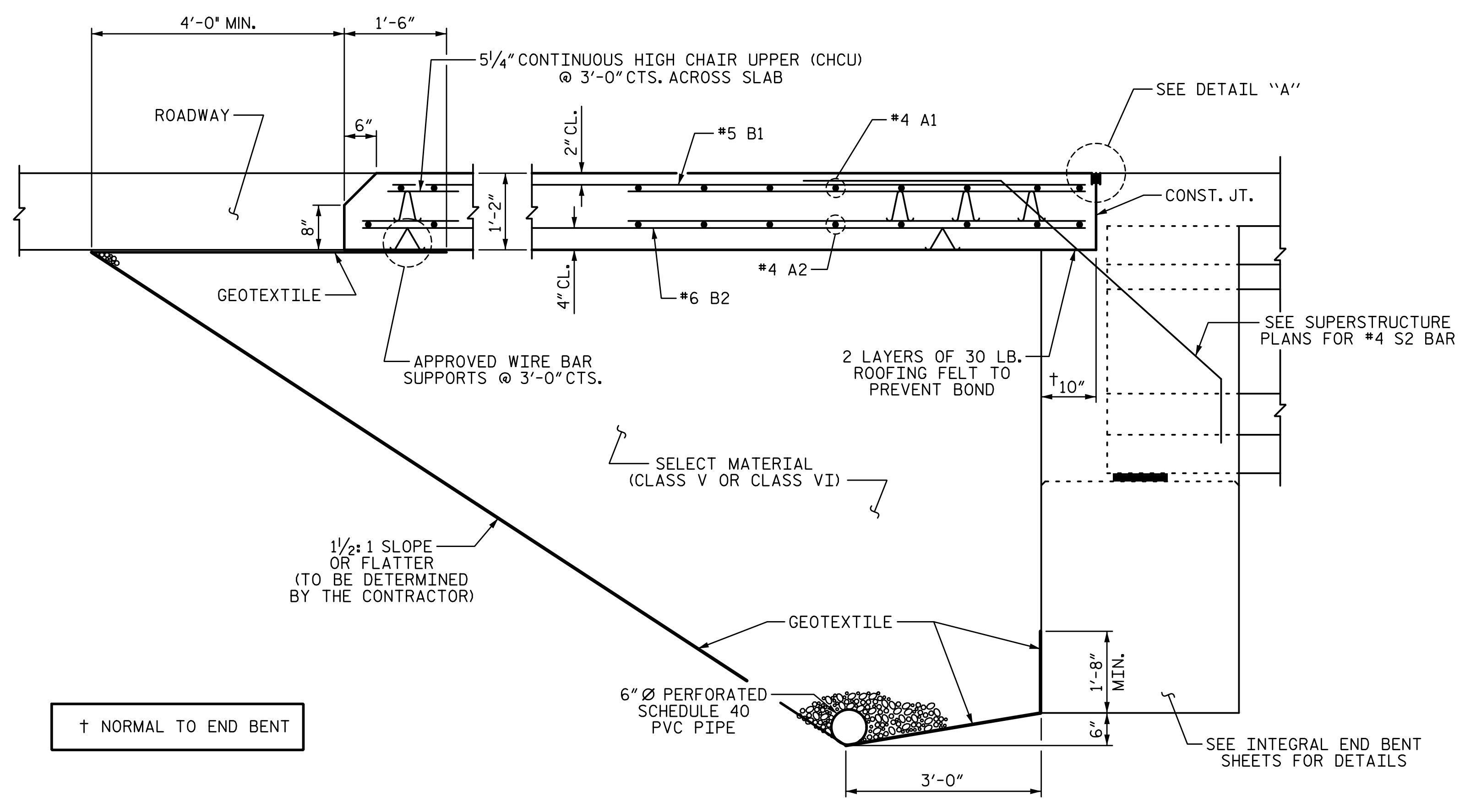
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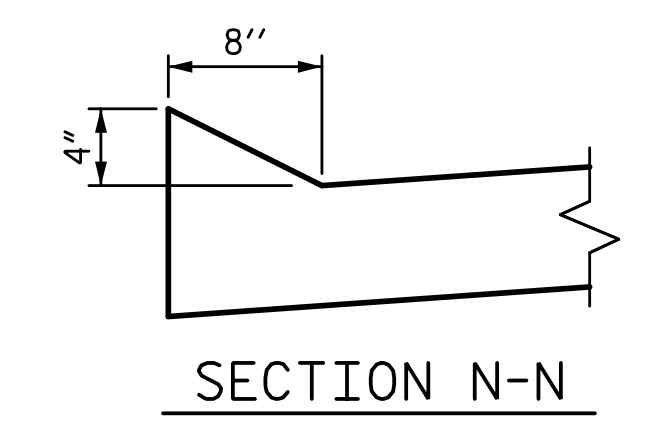


PLAN @ END BENT 1

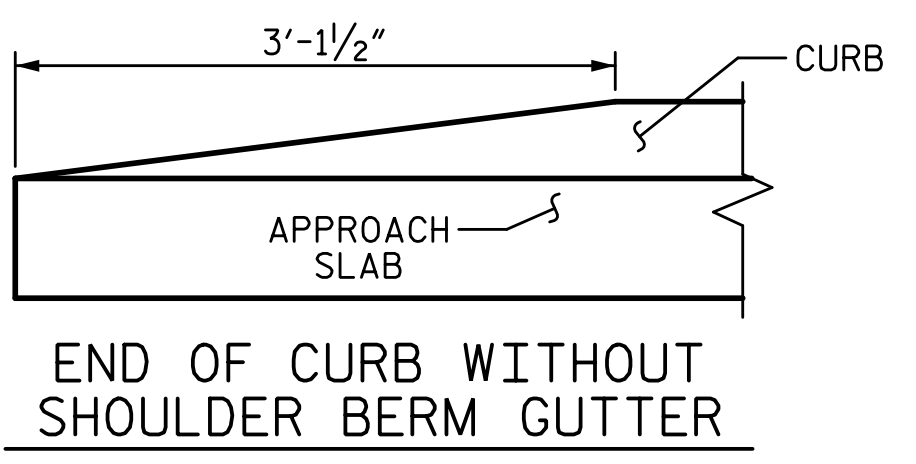
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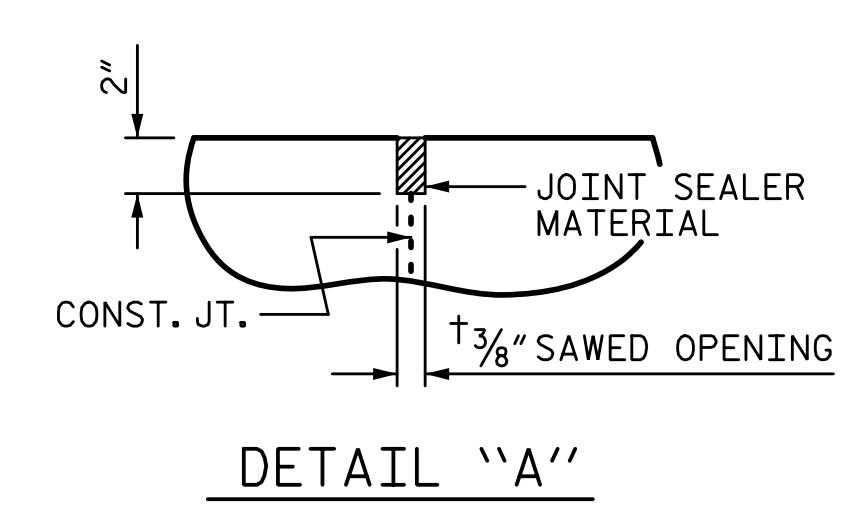
SECTION THRU SLAB  
(TYPE I - STANDARD APPROACH FILL)



SECTION N-N



CURB DETAILS



DETAIL "A"

**NOTES:**

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

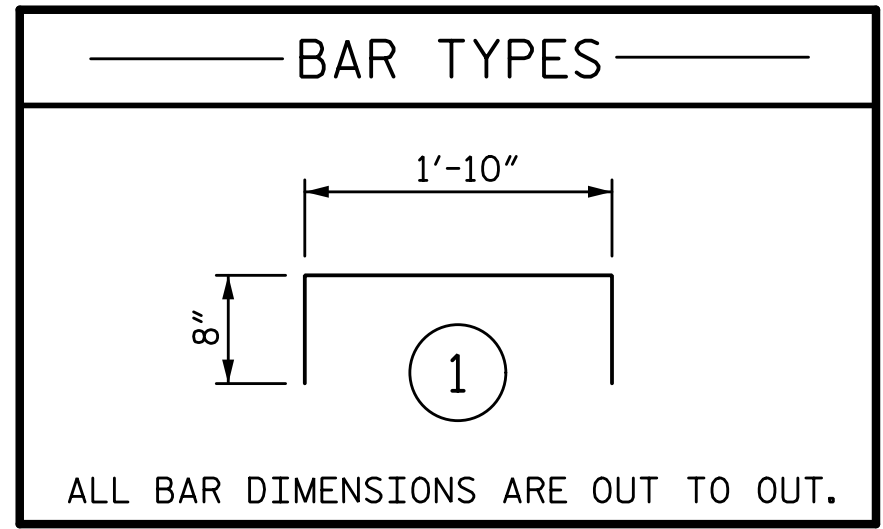
AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 3 FOR DETAILS AND NOTES.

**BILL OF MATERIAL FOR APPROACH SLAB @ END BENT 1**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	21'-11"	761
A2	52	#4	STR	21'-10"	758
*B1	84	#5	STR	24'-2"	2117
B2	84	#6	STR	24'-8"	3112
*B3	4	#4	STR	24'-8"	66
*G1	25	#4	STR	4'-11"	82
*U1	8	#4	1	3'-2"	17
REINFORCING STEEL					3870 LB
EPOXY COATED REINFORCING STEEL					3043 LB
CLASS AA CONCRETE					
POUR 1 (SLAB & CURB)					45.5 CY
POUR 2 (SIDEWALK)					3.1 CY
TOTAL					48.6 CY

**BILL OF MATERIAL FOR APPROACH SLAB @ END BENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	21'-11"	761
A2	52	#4	STR	21'-10"	758
*B1	84	#5	STR	24'-2"	2117
B2	84	#6	STR	24'-8"	3112
*B3	4	#4	STR	24'-8"	66
*G1	25	#4	STR	4'-11"	82
*U1	8	#4	1	3'-2"	17
REINFORCING STEEL					3870 LB
EPOXY COATED REINFORCING STEEL					3043 LB
CLASS AA CONCRETE					
POUR 1 (SLAB & CURB)					45.5 CY
POUR 2 (SIDEWALK)					3.1 CY
TOTAL					48.6 CY



**SPLICE CHART**

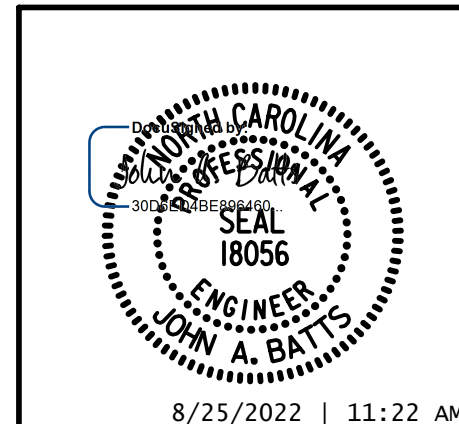
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB FOR INTEGRAL END BENT**



DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

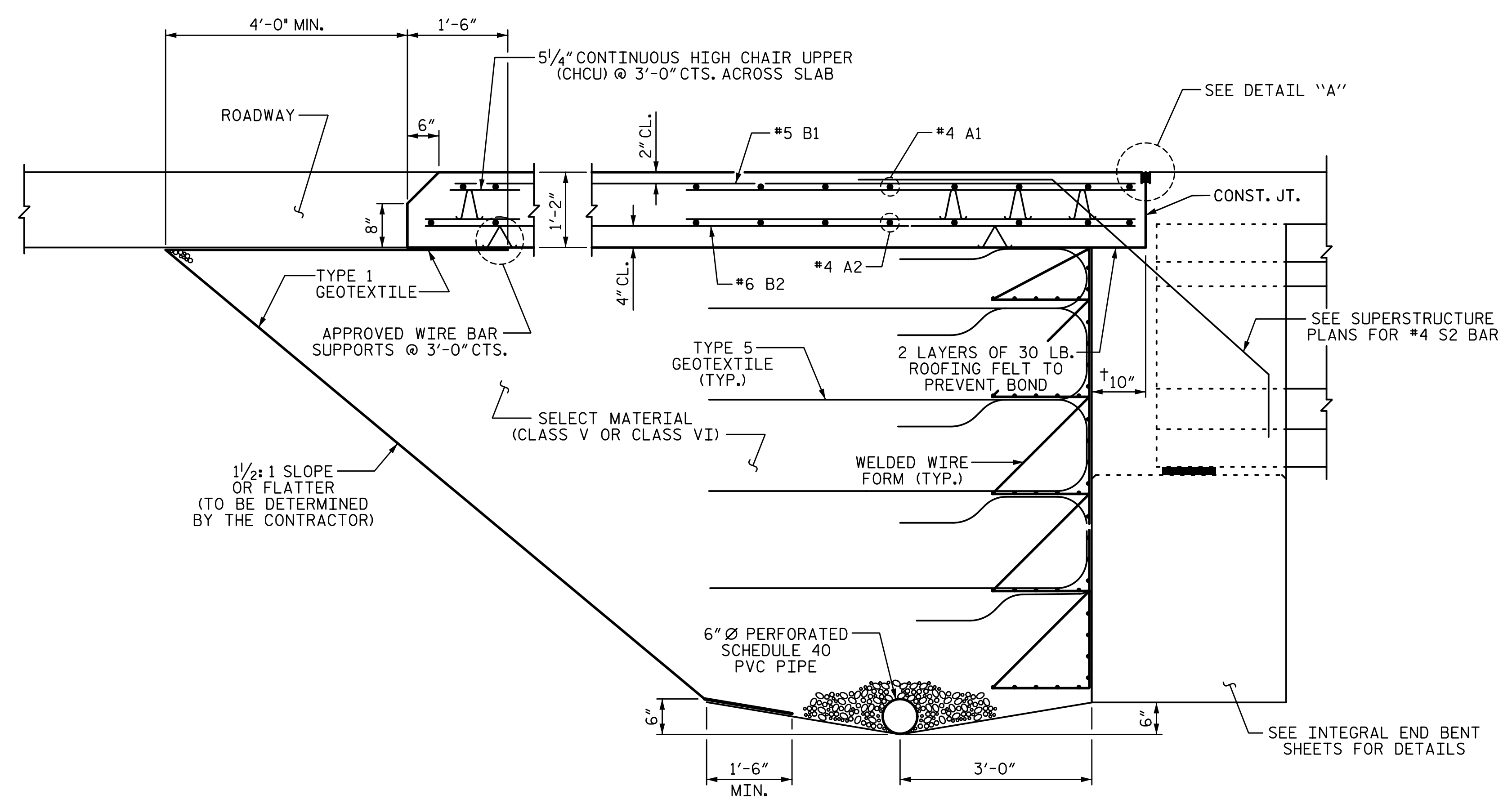
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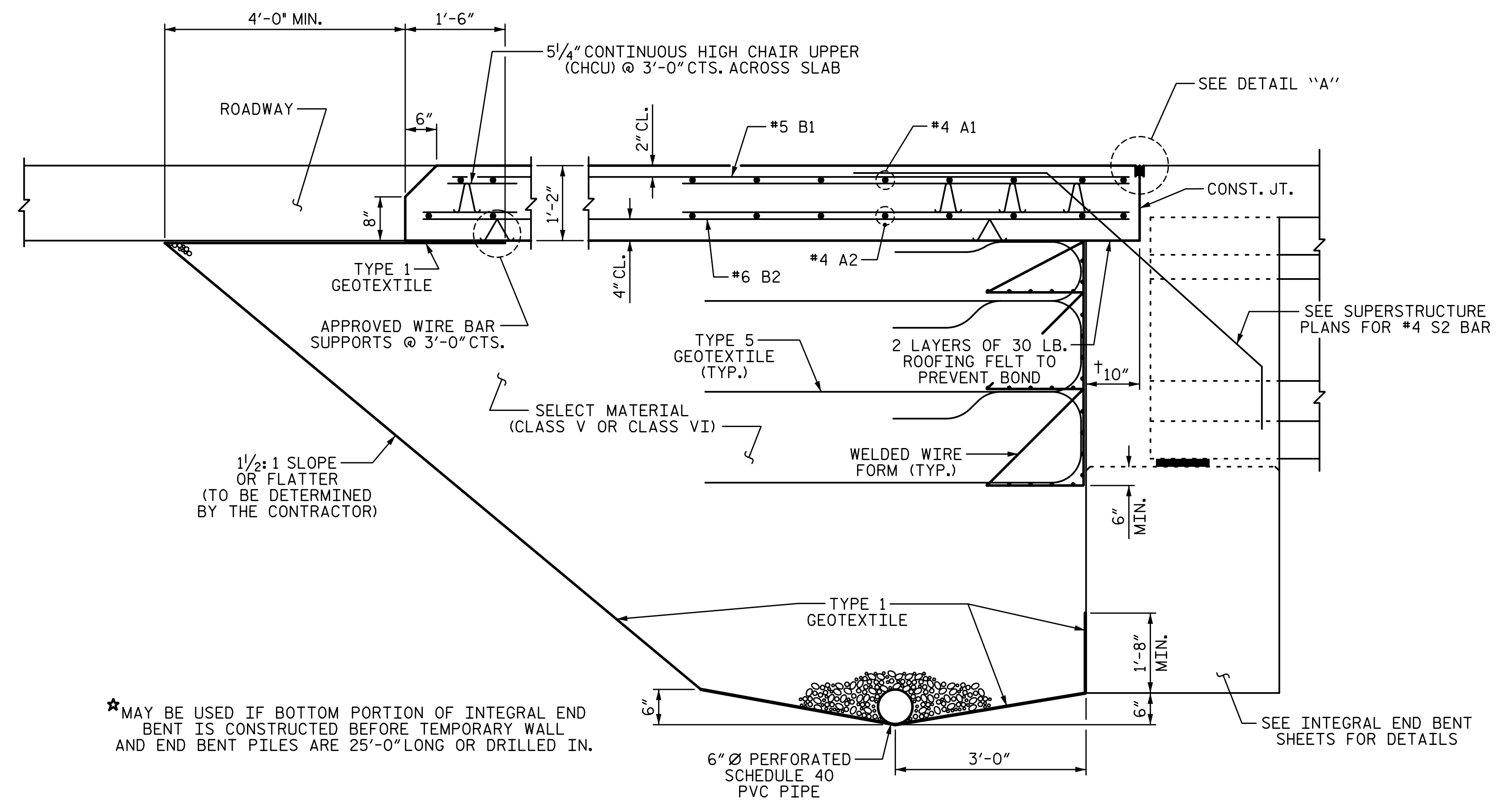
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SECTION THRU SLAB (TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB (TYPE A - ALTERNATE APPROACH FILL)

\*MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

**NOTES:**

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

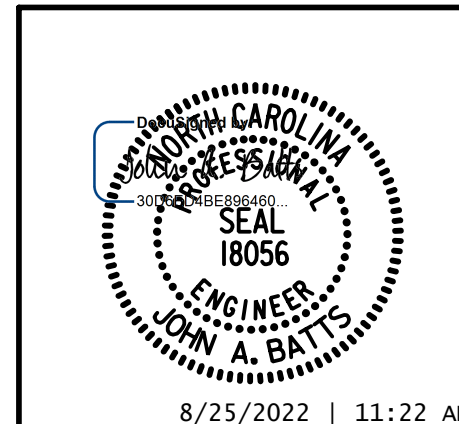
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR INTEGRAL  
 END BENT



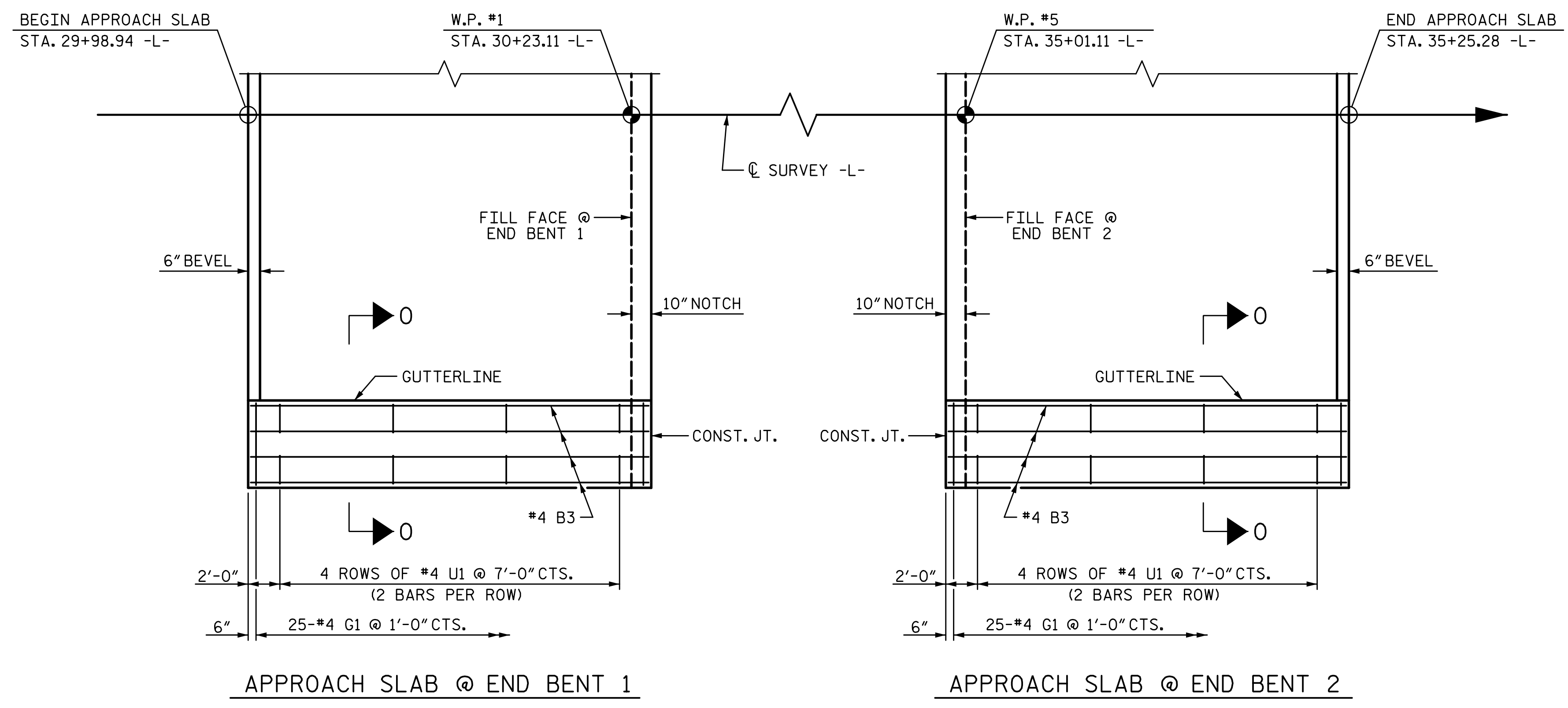
**WVGI**  
 5640 Dillard Drive, Suite 200  
 Cary, NC 27518  
 LICENSURE NO. C-4434

DRAWN BY: S.D. COOPER DATE: 2-19  
 CHECKED BY: J. A. BATTS DATE: 2-19  
 DESIGN ENGINEER OF RECORD: J. A. BATTS DATE: 2-19

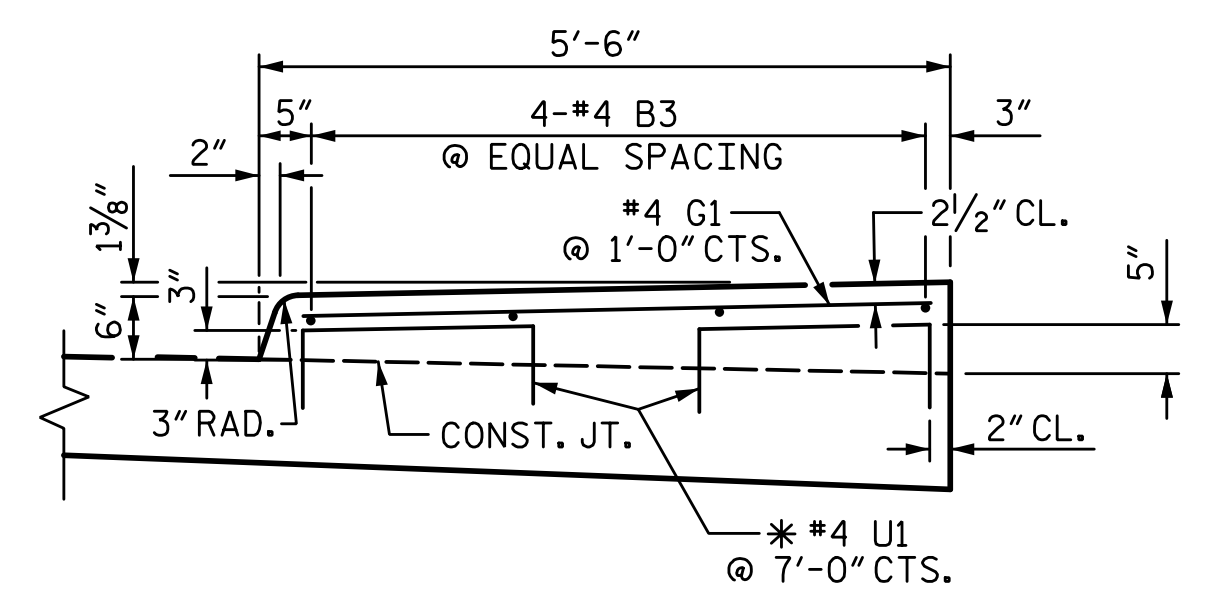
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**PLAN OF SIDEWALKS**



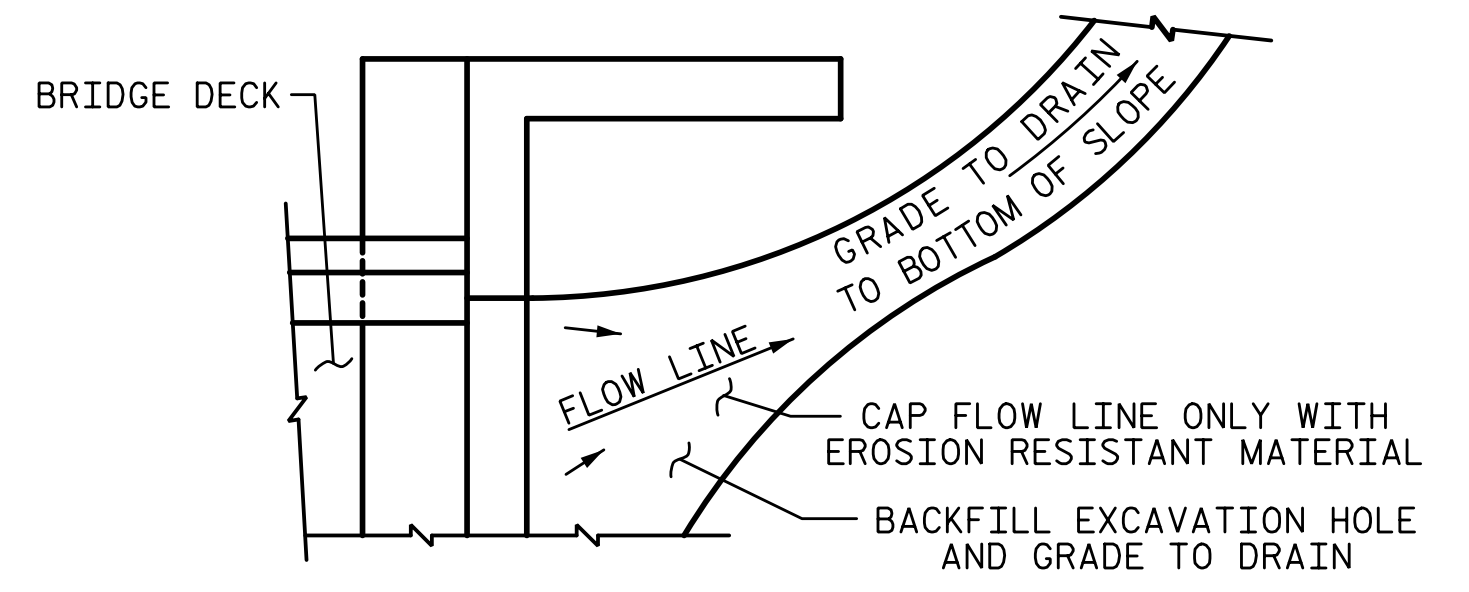
**SECTION 0-0  
SIDEWALK DETAILS**

**NOTES:**

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

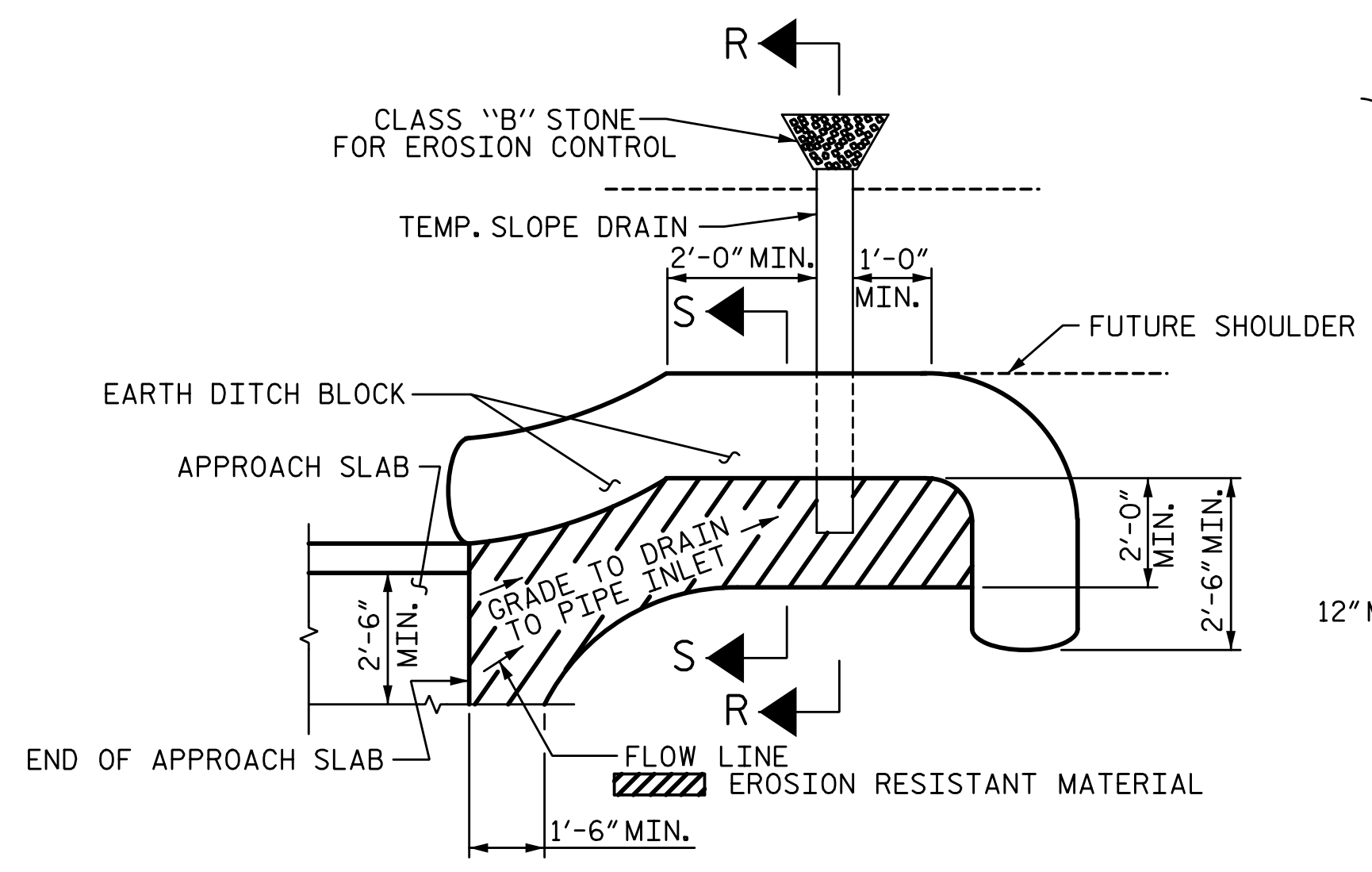
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH THE ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED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

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



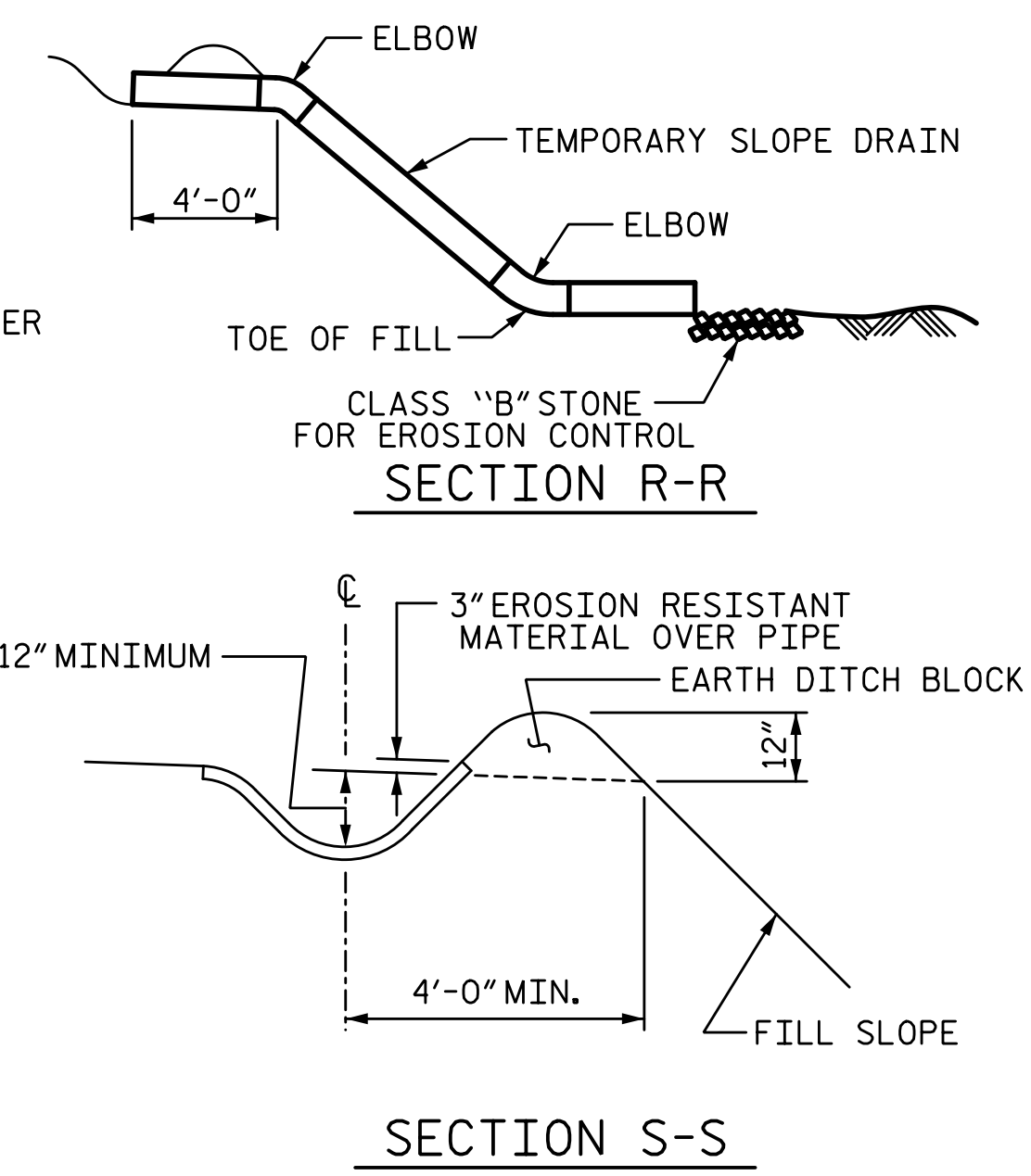
**NOTE:** IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**



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

**PLAN VIEW  
TEMPORARY BERM AND SLOPE DRAIN DETAILS  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)**



PROJECT NO. Y-4810K  
CABARRUS COUNTY  
 STATION: 31+94.08 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH  
 SLAB FOR INTEGRAL  
 END BENT**

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

STATE OF NORTH CAROLINA  
 ENGINEER  
 JOHN A. BATTS  
 SEAL  
 18056  
 8/25/2022 | 11:22 AM

DRAWN BY: S.D. COOPER	DATE: 2-19
CHECKED BY: J. A. BATTS	DATE: 2-19
DESIGN ENGINEER OF RECORD: J. A. BATTS	DATE: 2-19

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

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

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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ENGLISH

JANUARY, 1990