

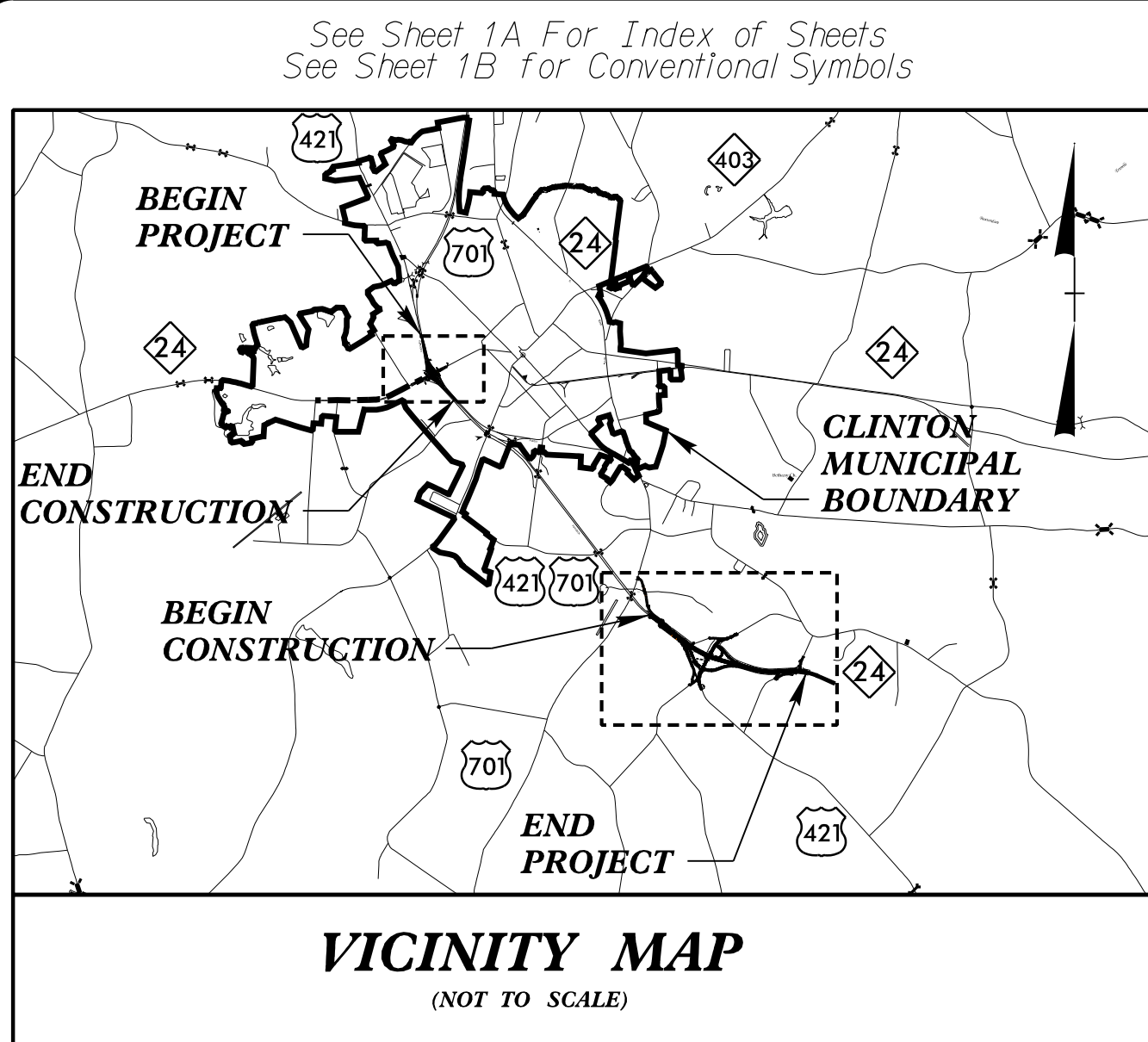
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with their signature on that page.**

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**CONTRACT: C204378** **TIP PROJECT: R-2303E**

**STRUCTURES**



**100% PLANS**

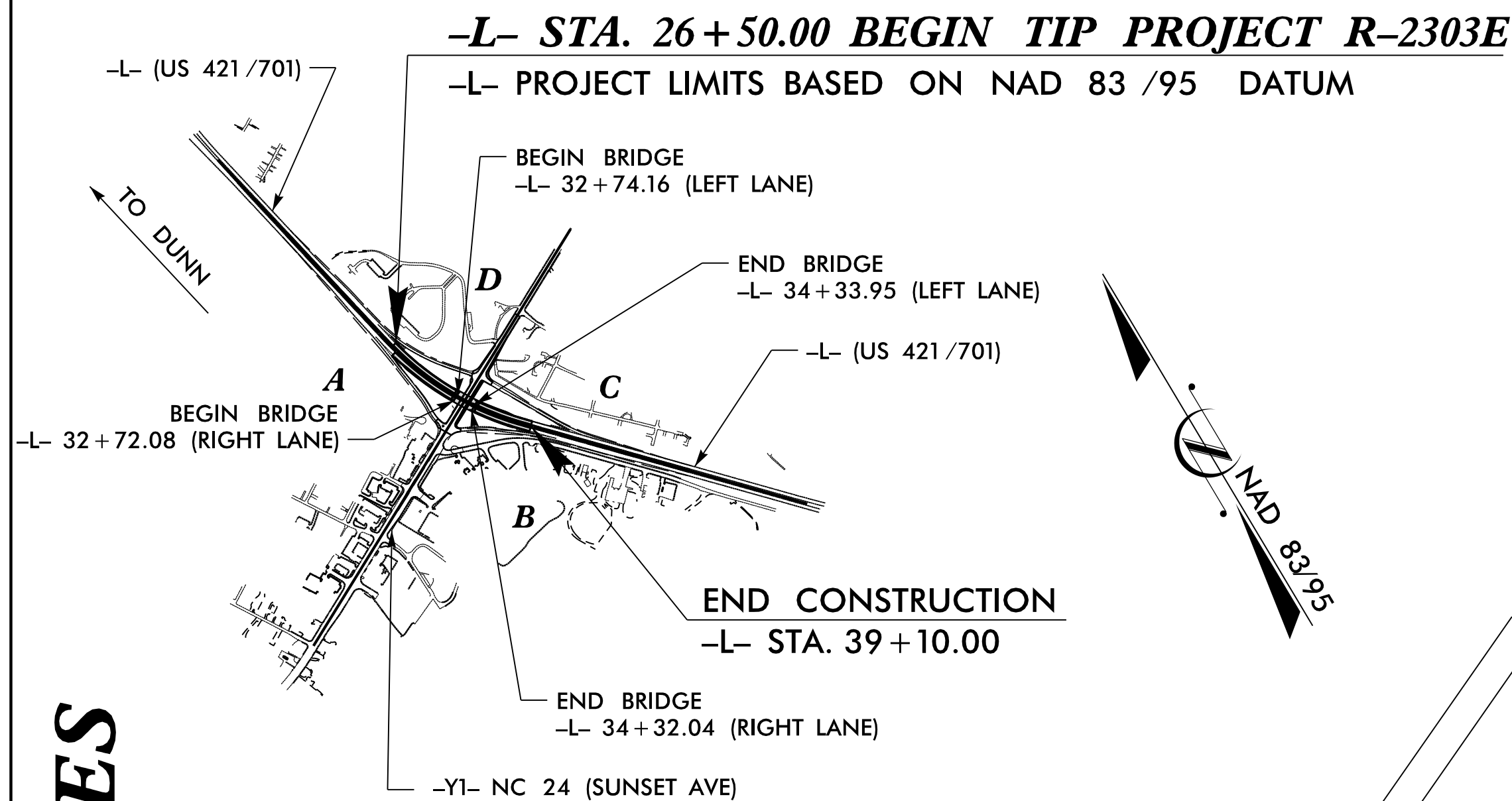
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**SAMPSON COUNTY**

**LOCATION:** NC 24 AT SR 1296 (SUNSET AVE) AND  
NC 24 FROM US 701 (SOUTHEAST BLVD.) TO  
EAST OF SR 1935 (CECIL-ODIE RD)

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

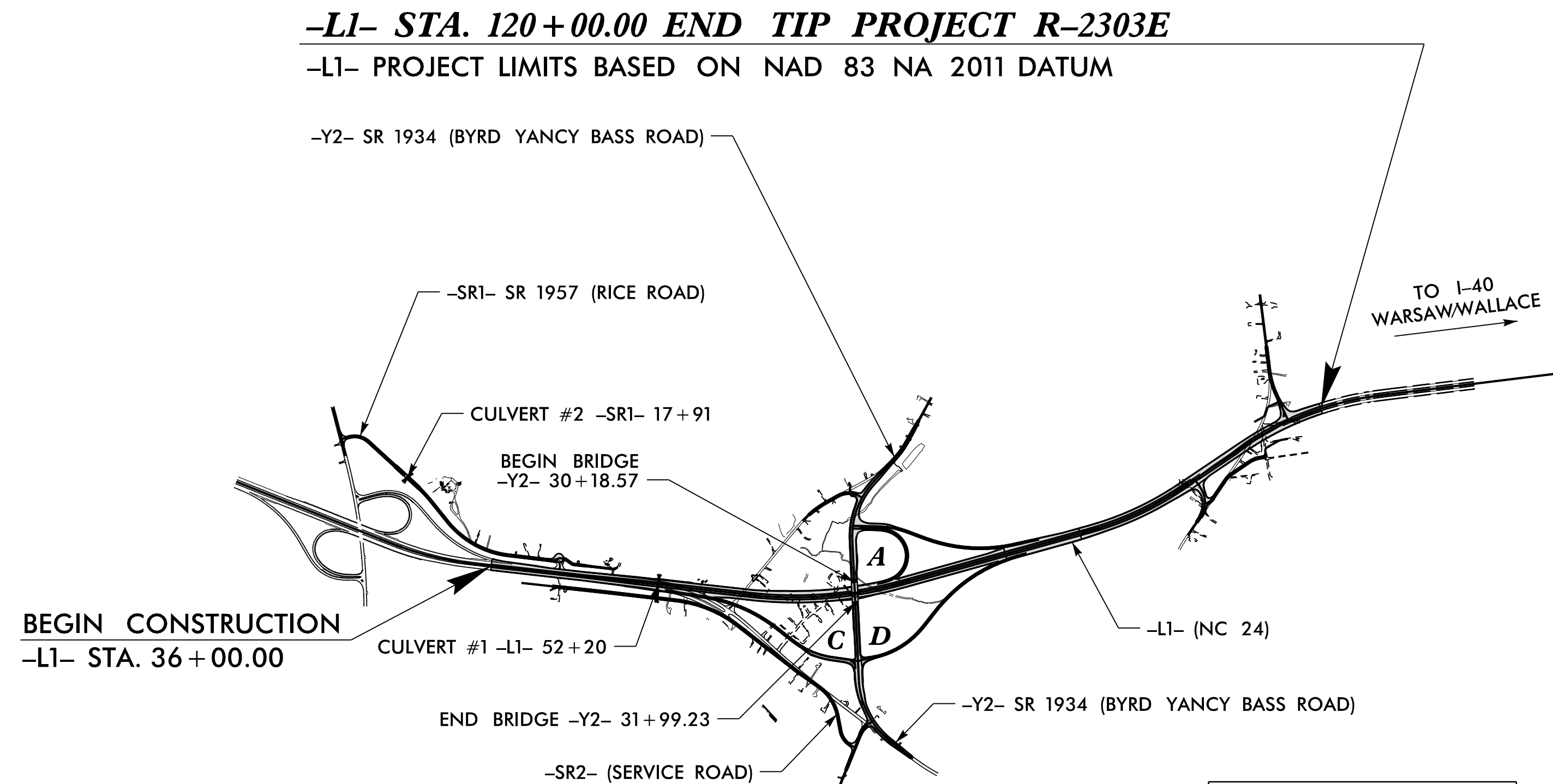
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2303E	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34416.1.S1		PE	
34416.2.8		RW /UTIL.	
34416.3.10		CONST.	



**PART 1 OF 2**

NCDOT CONTACT: BRIAN HARDING, P.E.  
NCDOT - HIGHWAY DIVISION 3

**PART 2 OF 2**



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**DESIGN DATA**

ADT 2019 = 11,900  
ADT 2030 = 15,100  
K = 9 %  
D = 60 %  
T = 14 % \*  
V = 60 MPH  
\* TTST 8% DUAL 6%  
FUNC CLASS =  
RURAL ARTERIAL  
STATEWIDE TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-2303E = 1.830 mi.  
LENGTH OF STRUCTURES TIP PROJECT R-2303E = 0.030 mi.  
LENGTH OF STATE PROJECT R-2303E = 1.800 mi.

**NOTES :**

- LENGTHS INCLUDE -L- AND -L1-
- LENGTH BASED ON NBL BRIDGES

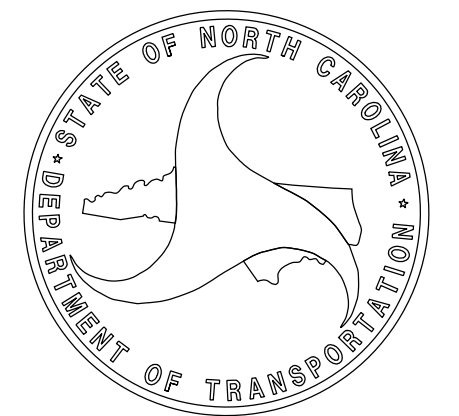
Prepared for NCDOT in the Office of:  
**moftatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX (F-0105)

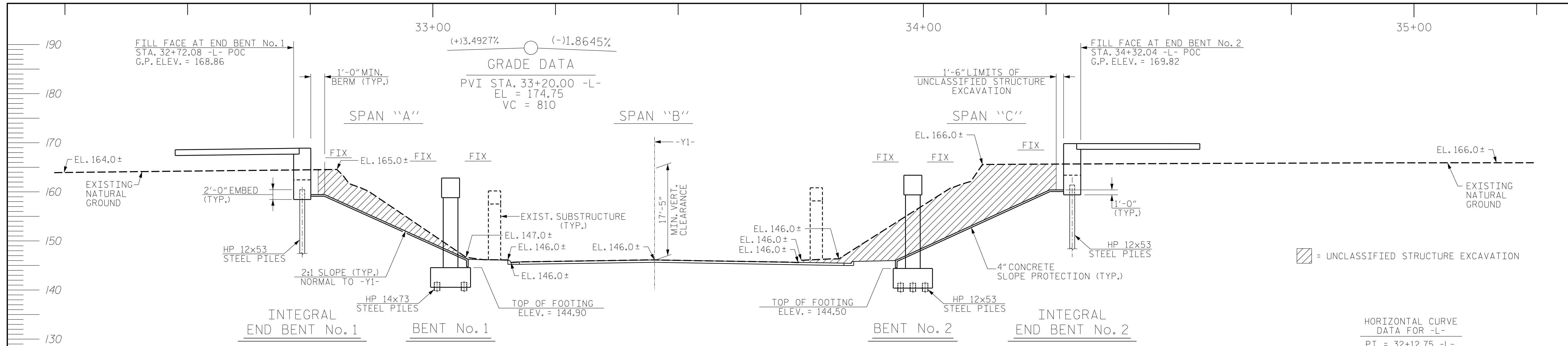
2018 STANDARD SPECIFICATIONS

**LETTING DATE:**  
DECEMBER 17, 2019

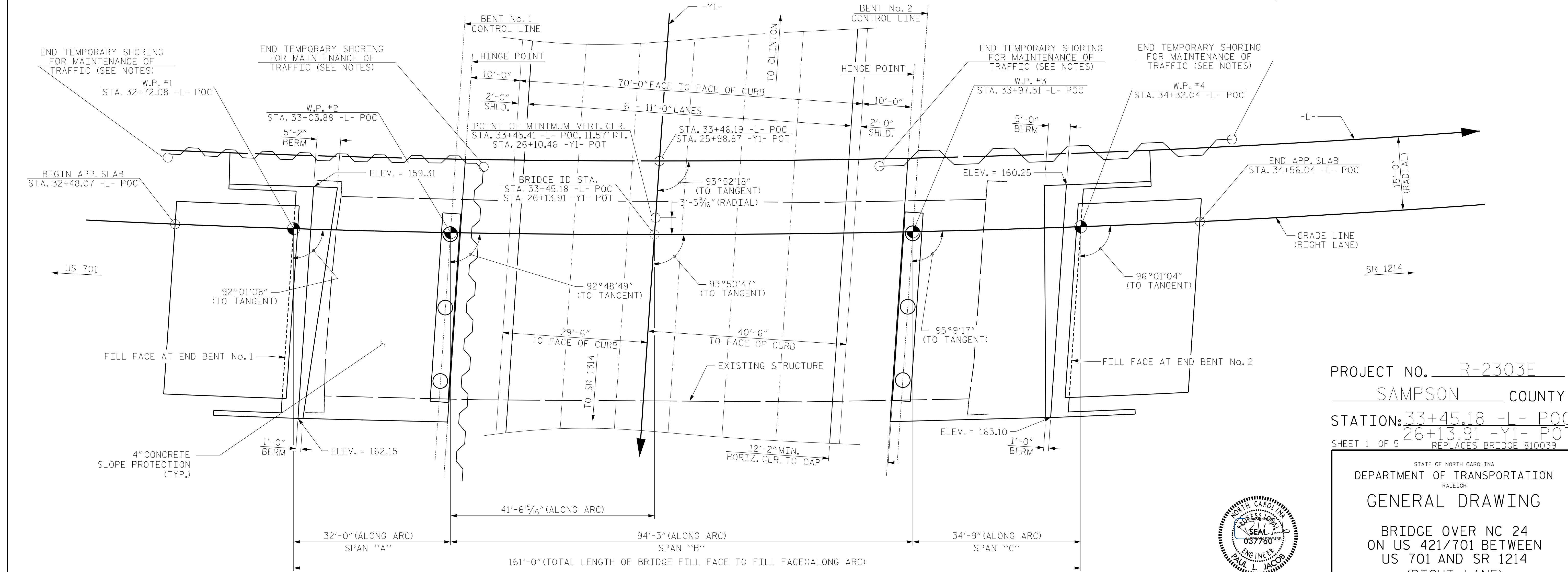
**TIM R. REID, P.E.**  
PROJECT ENGINEER

**PAUL L. JACOB, P.E.**  
PROJECT STRUCTURAL ENGINEER





SECTION ALONG RIGHT GRADE LINE  
(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENTS)

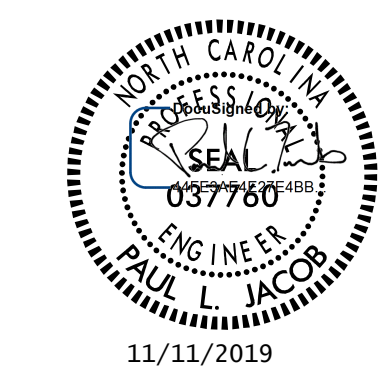


PLAN

DRAWN BY : J. WEIGER DATE : 09/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD : P. JACOB DATE : 09/2019

PILES NOT SHOWN FOR CLARITY  
 END BENTS AND BENTS ARE PARALLEL

**moffatt & nichol**  
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 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

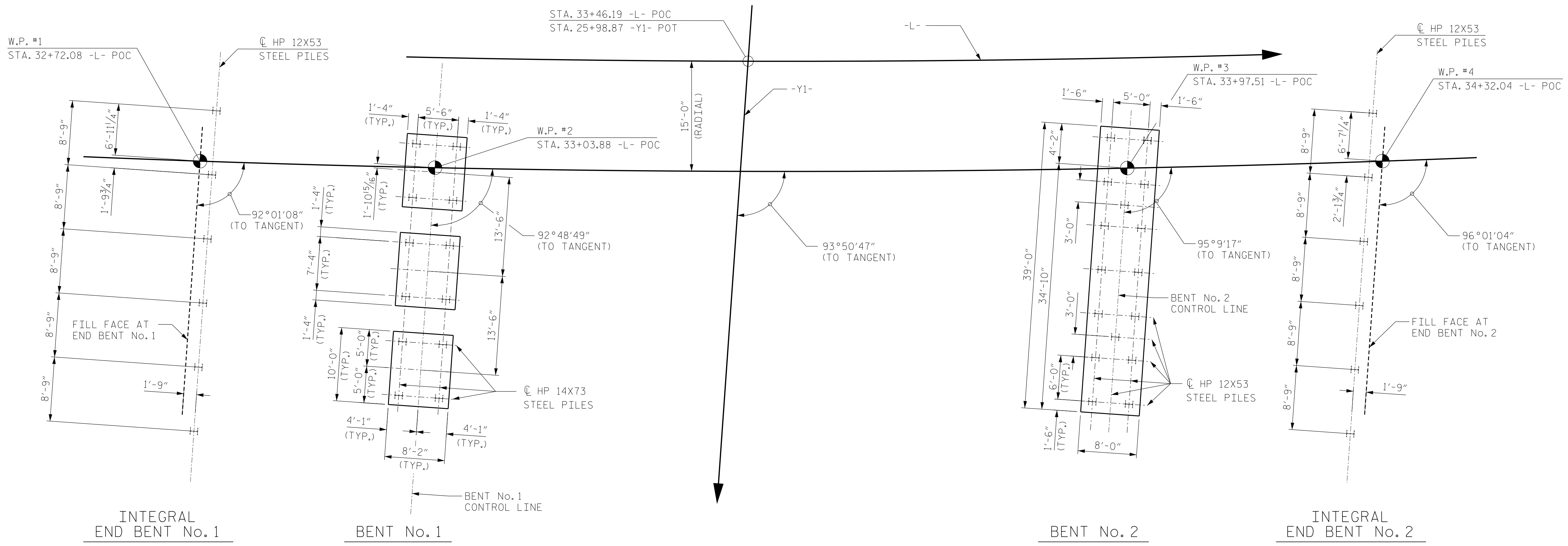


PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+45.18 -L- POC  
 26+13.91 -Y1- POT  
 SHEET 1 OF 5 REPLACES BRIDGE 810039

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER NC 24  
 ON US 421/701 BETWEEN  
 US 701 AND SR 1214  
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			35

Q:\RA\6522-07\Submittals\181107 - Site 1 Right Lane Structure Let Plans Rev\CADD Files\VR2303E\_SML\GDL\_001\_810039.dgn



FOUNDATION LAYOUT

NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO.1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 93 TONS PER PILE.
3. PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.
4. PILES AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
5. DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.
6. DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE.
7. DRIVE PILES AT BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 155 TONS PER PILE.
8. DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.
9. TESTING THE FIRST PRODUCTION PILE AT BENT NO.1 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
10. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1 AND END BENT NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**FOUNDATION LAYOUT**

(RIGHT LANE)

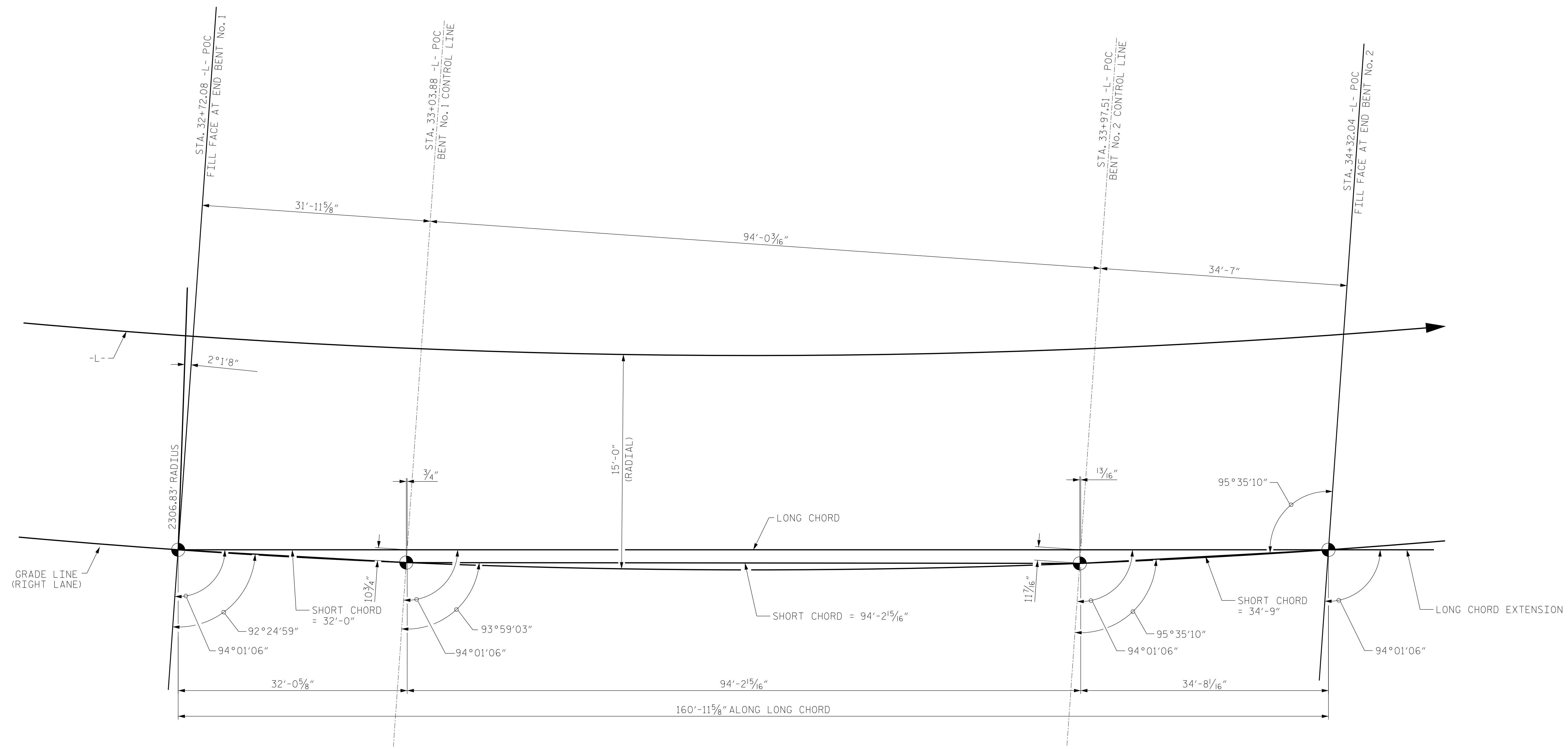
DRAWN BY :	J. WEIGER	DATE :	04/2019
CHECKED BY :	M. RAY	DATE :	07/2019
DESIGN ENGINEER OF RECORD:	P. JACOB	DATE :	09/2019

**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
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 NC License NO.: F-0105

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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			35

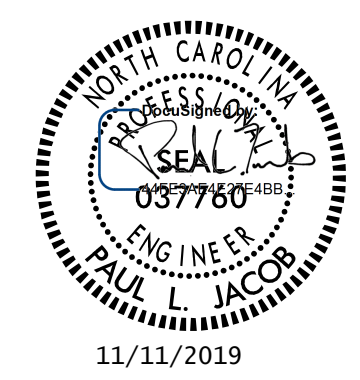
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**LONG CHORD LAYOUT**  
ALL BENTS ARE PARALLEL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

SHEET 3 OF 5

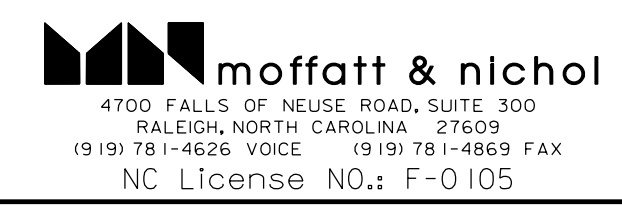


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**LONG CHORD LAYOUT**

(RIGHT LANE)

DRAWN BY : M. RAY DATE : 09/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

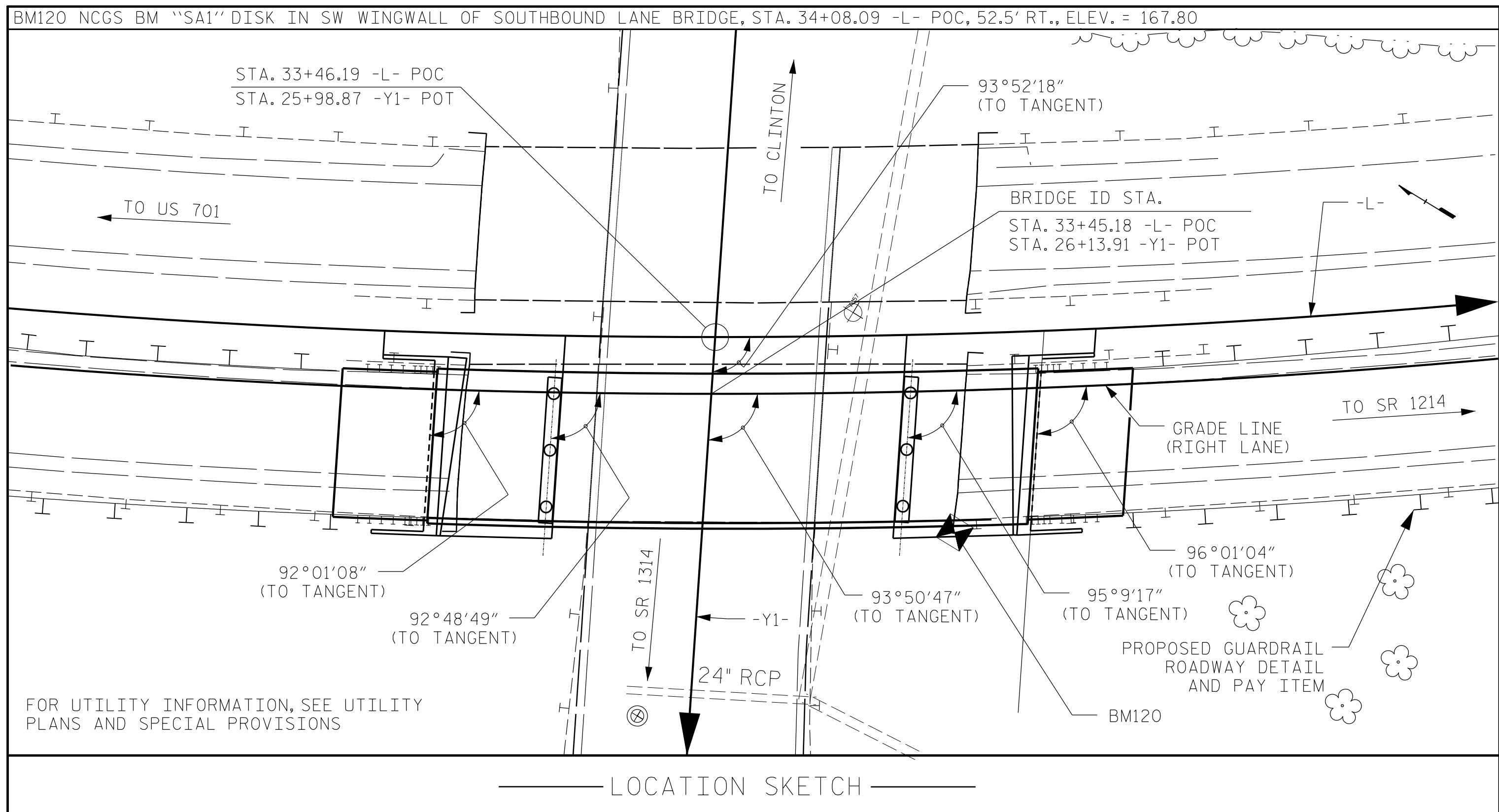


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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-3
1			3			TOTAL SHEETS
2			4			35

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 11/11/2019

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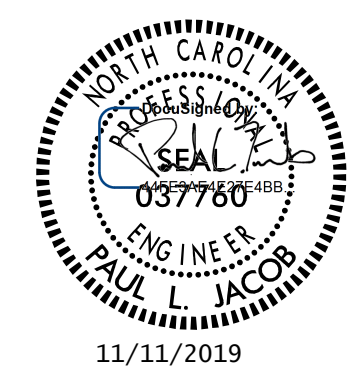


- NOTES:**
1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
  2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
  3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
  4. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
  5. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
  6. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
  7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
  8. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
  9. THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
  10. THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION 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.
  11. FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
  12. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
  13. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
  14. INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 33+45.18 -L-.
  15. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 26FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
  16. FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
  17. AFTER SERVING AS A TEMPORARY THE EXISTING STRUCTURE CONSISTING OF 33.83'-67.65'-32.0' STEEL I-BEAMS; 40.08' CLEAR ROADWAY WIDTH AND CONCRETE DECK LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
  18. THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
  19. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
  20. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE @ STA. 33+45.18 -L-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 33+45.18 -L-	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 33+45.18 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SO.FT.	SO.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO. LIN.FT.	EACH	EACH	NO. LIN.FT.	NO. LIN.FT.	EA.	LIN.FT.	SO.YDS.	LUMP SUM
SUPERSTRUCTURE						6573	7327					15 786.2						318.6		
END BENT NO.1								40.3		7615			6		6 480		3		208	
BENT NO.1			LUMP SUM					66.3		10405	1067			12		12 900		6		
BENT NO.2			LUMP SUM					87.2		12343	1133		16		16 1120		8			
END BENT NO.2								41.2		7577			6		6 360		3		218	
<b>TOTAL</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>1</b>	<b>6573</b>	<b>7327</b>	<b>235.0</b>	<b>LUMP SUM</b>	<b>37940</b>	<b>2200</b>	<b>15 786.2</b>	<b>28</b>	<b>12</b>	<b>28 1960</b>	<b>12 900</b>	<b>20</b>	<b>318.6</b>	<b>426</b>	<b>LUMP SUM</b>

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 4 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER NC 24  
 ON US 421/701 BETWEEN  
 US 701 AND SR 1214  
 (RIGHT LANE)

DRAWN BY : J. WEIGER DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			35

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.34	--	1.75	0.79	3.22	B	ER	46.00	0.87	1.34	A	I	20.67	0.80	0.76	2.72	B	ER	46.00		
	HL-93 (OPERATING)	N/A		1.75	--	1.35	0.79	4.17	B	ER	46.00	0.87	1.75	A	I	20.67	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.88	67.68	1.75	0.79	4.25	B	ER	46.00	0.87	1.88	A	I	20.67	0.80	0.76	3.59	B	ER	46.00		
	HS-20 (OPERATING)	36.000		2.45	88.20	1.35	0.79	5.51	B	ER	46.00	0.87	2.45	A	I	20.67	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		7.10	95.85	1.40	0.79	9.71	C	I	19.26	0.87	7.10	A	I	26.78	0.80	0.79	7.85	B	ER	46.00	
		SNGARBS2	20.000		5.46	109.20	1.40	0.92	8.07	C	I	19.26	0.87	5.46	A	I	26.78	0.80	0.79	5.95	B	ER	46.00	
		SNAGRIS2	22.000		5.24	115.28	1.40	0.92	7.98	C	I	22.59	0.87	5.24	A	I	26.78	0.80	0.79	5.68	B	ER	46.00	
		SNCOTTS3	27.250		3.56	97.01	1.40	0.92	4.91	C	I	15.93	0.87	3.56	C	I	2.62	0.80	0.79	3.94	B	ER	46.00	
		SNAGGRS4	34.925		3.26	115.89	1.40	0.92	4.56	C	I	19.26	0.87	3.22	A	I	26.78	0.80	0.79	3.34	B	ER	46.00	
		SNS5A	35.550		3.00	119.85	1.40	0.92	4.47	C	I	15.93	0.87	3.33	C	I	2.62	0.80	0.79	3.26	B	ER	46.00	
		SNS6A	39.950		2.86	120.12	1.40	0.92	4.29	C	I	15.93	0.87	3.11	C	I	2.62	0.80	0.79	3.00	B	ER	46.00	
		SNS7B	42.000		2.98	125.16	1.40	0.92	4.12	C	I	15.93	0.87	2.98	A	I	17.62	0.80	0.79	2.86	B	ER	46.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.55	117.15	1.40	0.92	5.46	B	ER	46.00	0.87	3.55	A	I	20.67	0.80	0.79	3.68	B	ER	46.00	
		TNT4A	33.075		3.49	115.43	1.40	0.92	5.30	C	I	15.93	0.87	3.49	C	I	2.62	0.80	0.79	3.67	B	ER	46.00	
		TNT6A	41.600		3.03	126.04	1.40	0.79	4.49	B	ER	46.00	0.87	3.06	A	I	17.62	0.80	0.79	3.03	B	ER	46.00	
		TNT7A	42.000		3.04	127.68	1.40	0.79	4.51	B	ER	46.00	0.87	3.04	A	I	17.62	0.80	0.79	3.05	B	ER	46.00	
		TNT7B	42.000		3.04	127.68	1.40	0.79	4.62	B	ER	46.00	0.87	3.04	B	I	8.63	0.80	0.79	3.12	B	ER	46.00	
		TNAGRIT4	43.000		2.94	126.42	1.40	0.79	4.47	B	ER	46.00	0.87	2.94	A	I	17.62	0.80	0.79	3.02	B	ER	46.00	
TNAGT5A	45.000		2.83	127.35	1.40	0.79	4.20	B	ER	46.00	0.87	2.83	A	I	17.62	0.80	0.79	2.84	B	ER	46.00			
TNAGT5B	45.000		③	2.79	125.55	1.40	0.79	4.15	B	ER	46.00	0.87	2.79	A	I	17.62	0.80	0.79	2.80	B	ER	46.00		

LOAD FACTORS:

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

**NOTES:**

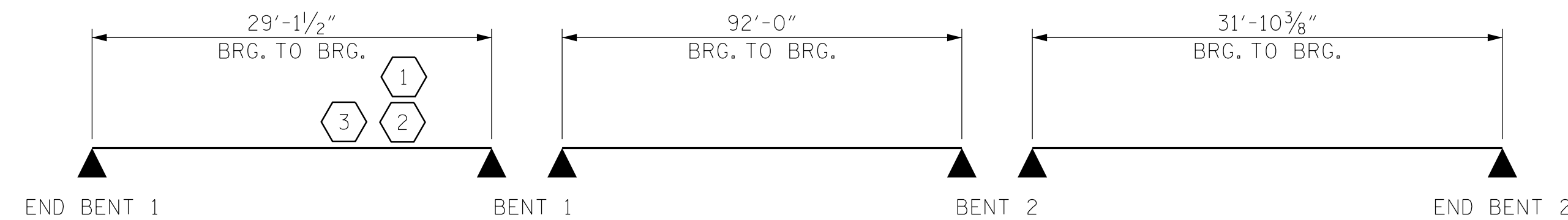
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

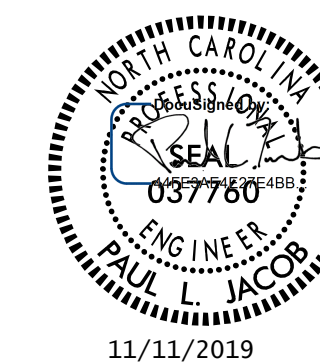
# CONTROLLING LOAD RATING
① DESIGN LOAD RATING (HL-93)
② DESIGN LOAD RATING (HS-20)
③ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)  
 (RIGHT LANE)

REVISIONS

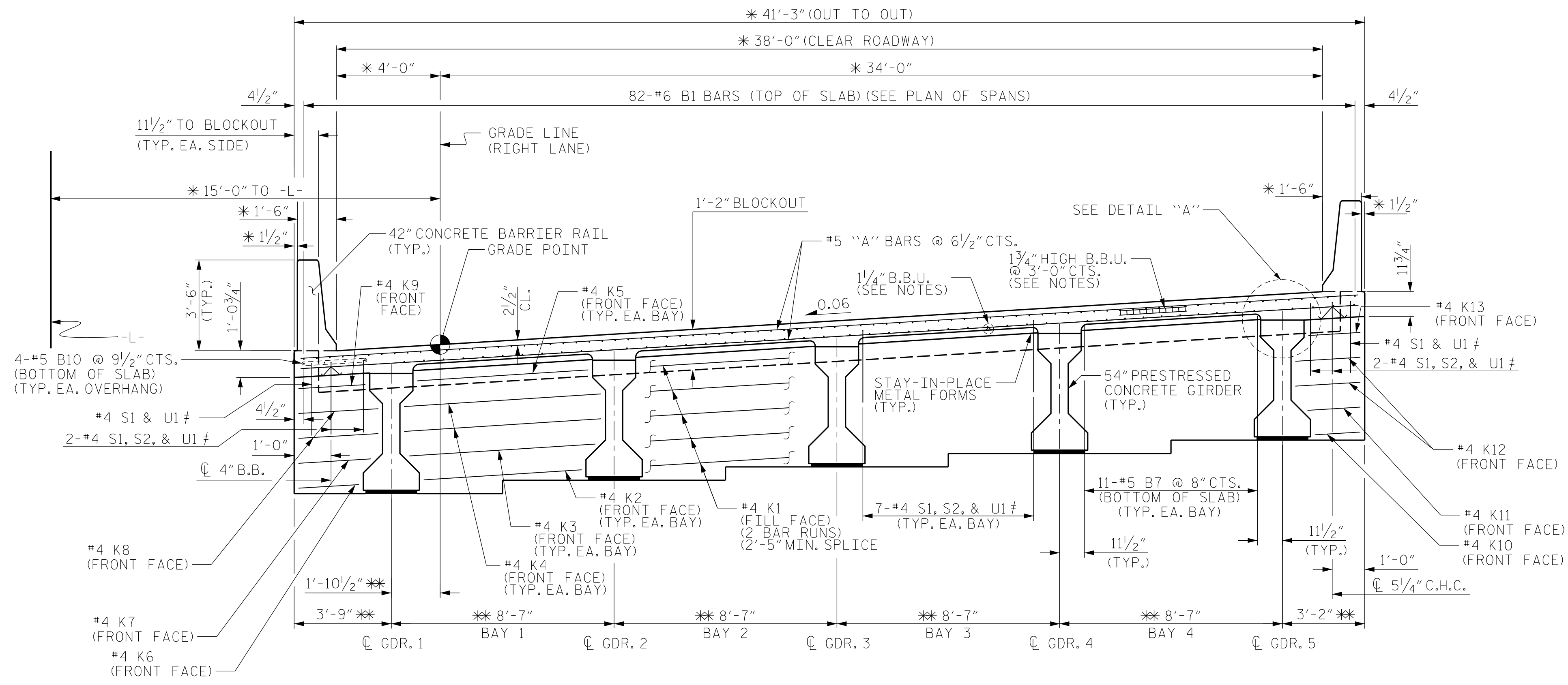
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1			3			S1-5
2			4			TOTAL SHEETS 35

ASSEMBLED BY : M. RAY	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

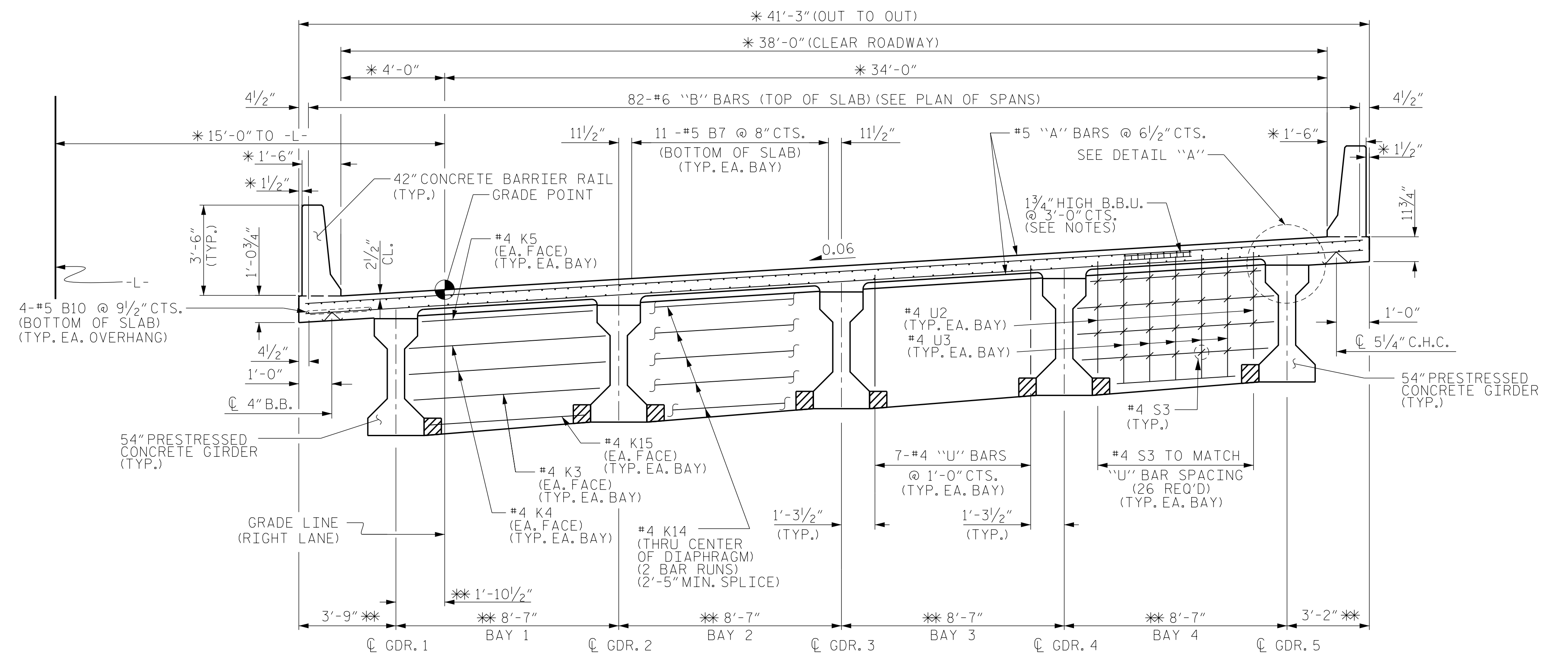
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 SIGNATURES COMPLETED

Q:\RA\6522-07\Submittals\191107 - Site 1 Right Lane Structure Let Plans Rev\CADD Files\VR2303E\_SML\05\_005\_810039.dgn



TYPICAL SECTION @ INTEGRAL END BENT

\* RADIAL DIMENSIONS TO GRADE LINE  
 \*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS  
 † TO MATCH V1 BARS IN END BENT

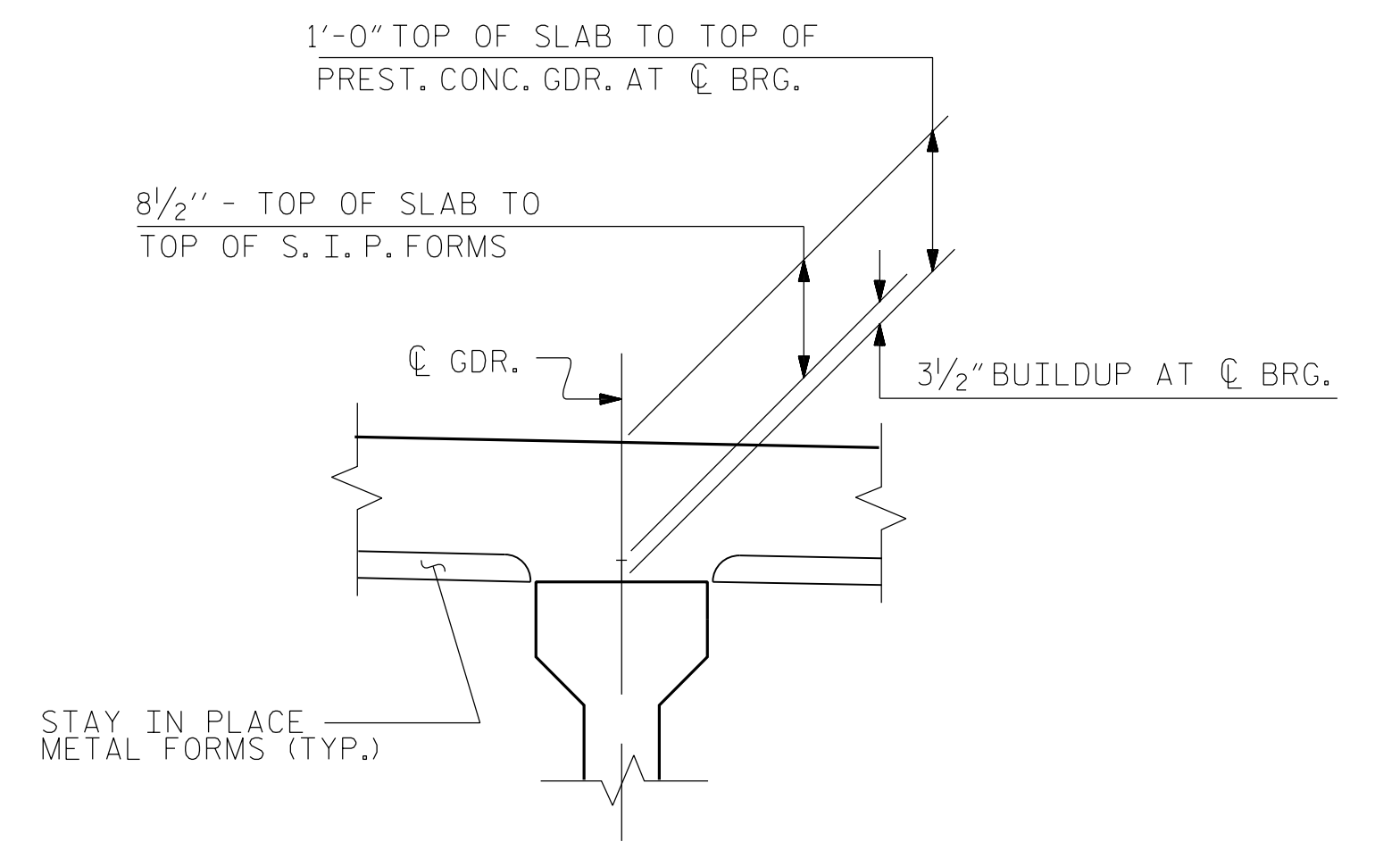


TYPICAL SECTION @ BENT DIAPHRAGM

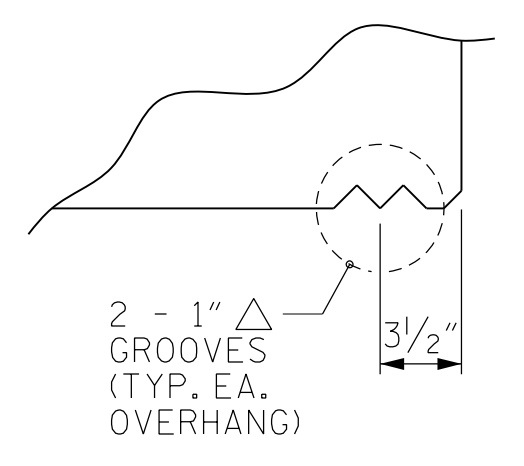
\* RADIAL DIMENSIONS TO GRADE LINE  
 \*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS

NOTES

- PROVIDE 1/4" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN UNIT HAS BEEN CAST AND HAS REACHED A COMPRESSIVE STRENGTH OF 3000 PSI.

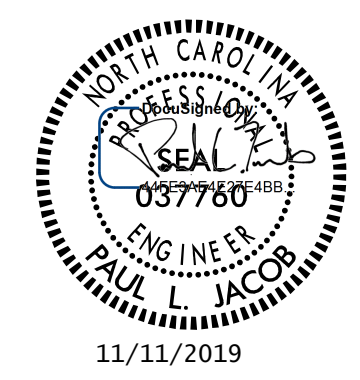


DETAIL "A"



DRIP GROOVE DETAIL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 1 OF 5



11/11/2019

DRAWN BY : M. RAY DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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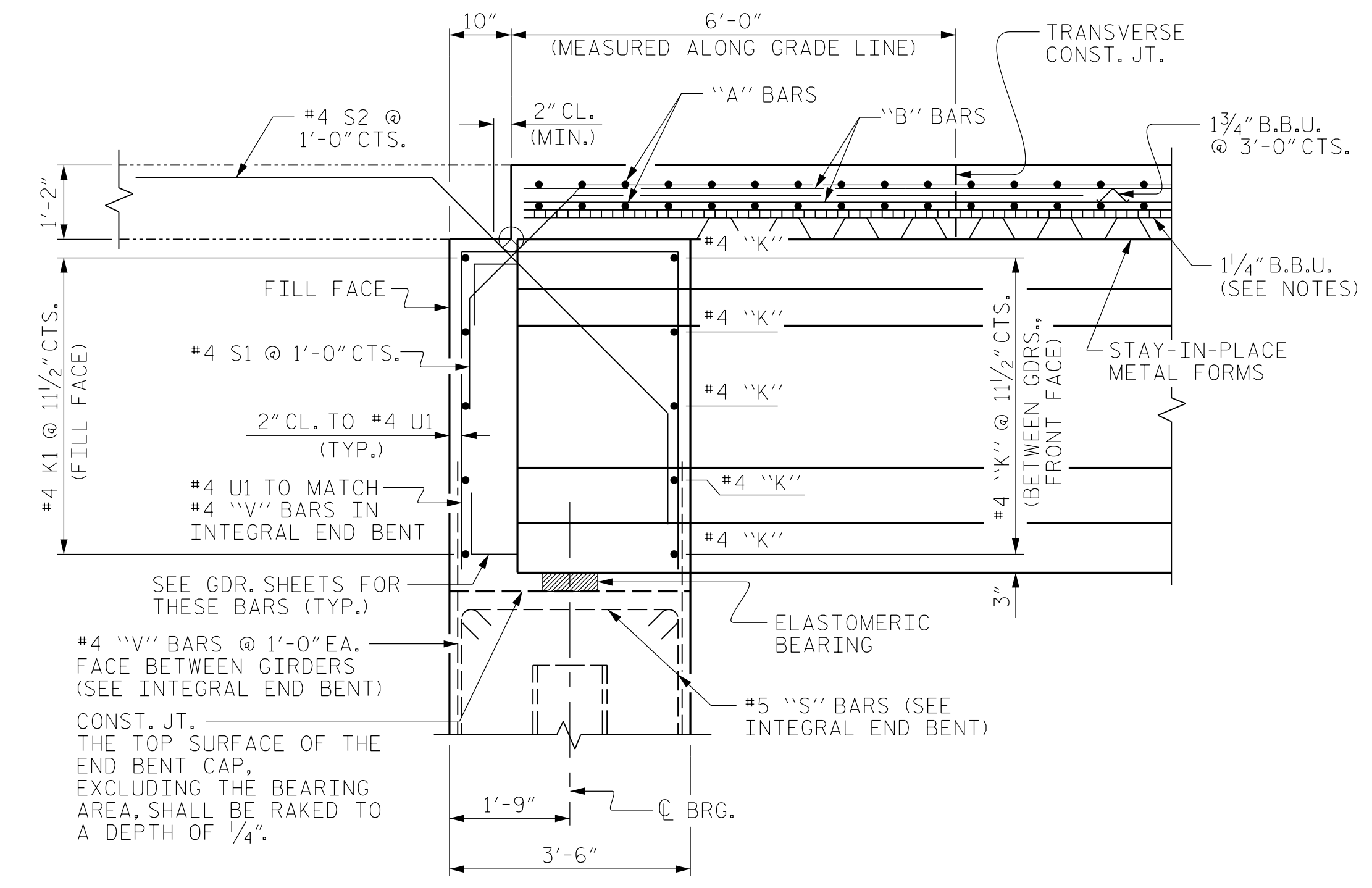
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
TYPICAL SECTION (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

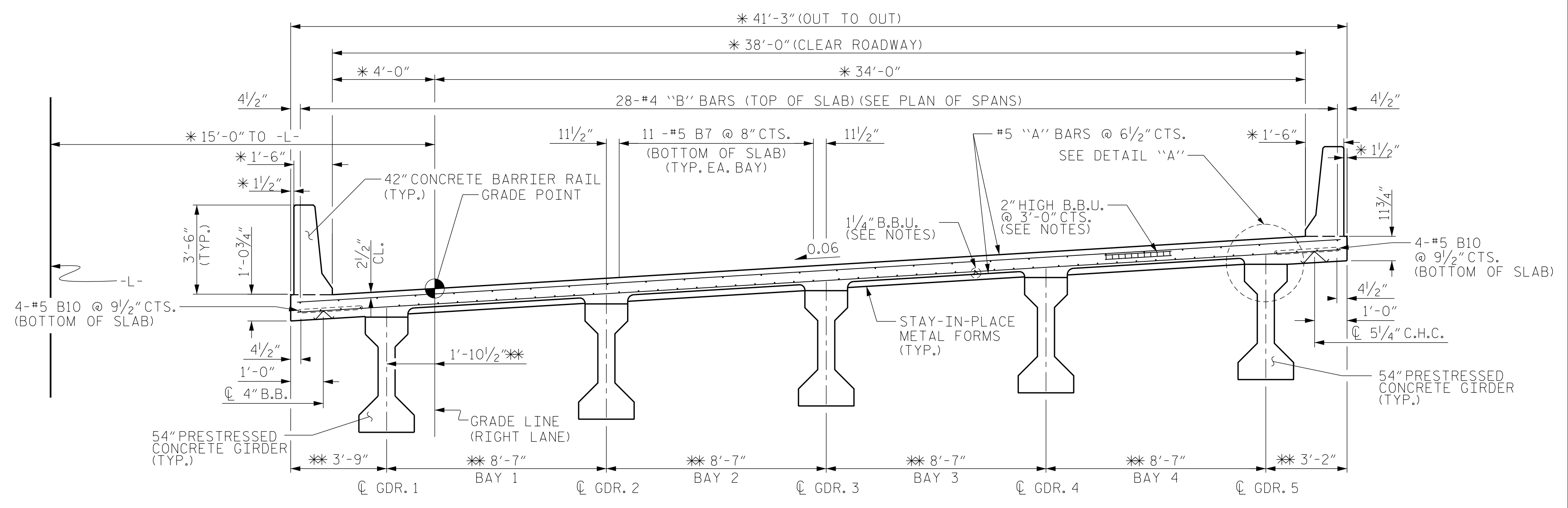
SHEET NO.	S1-6
TOTAL SHEETS	35



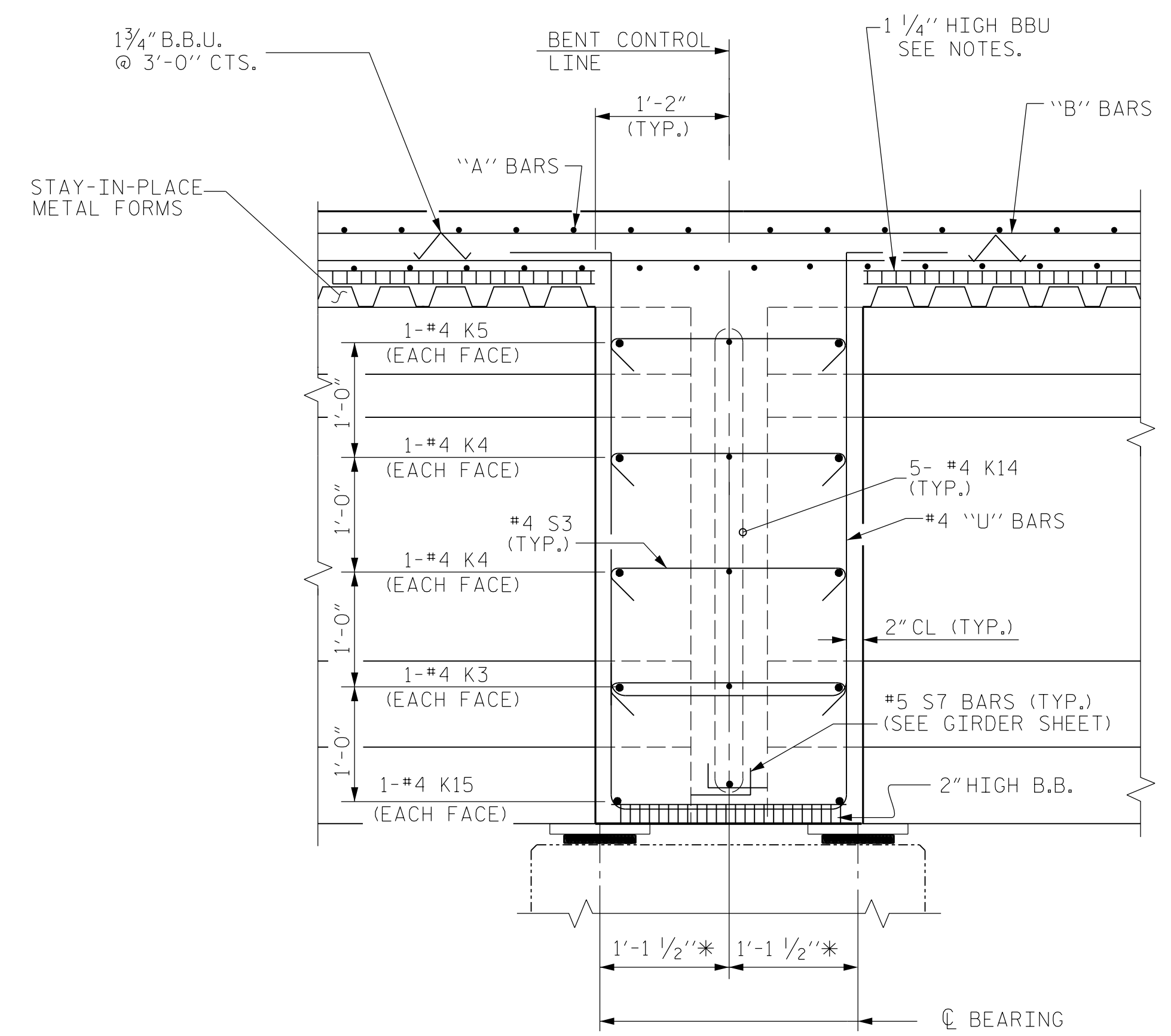
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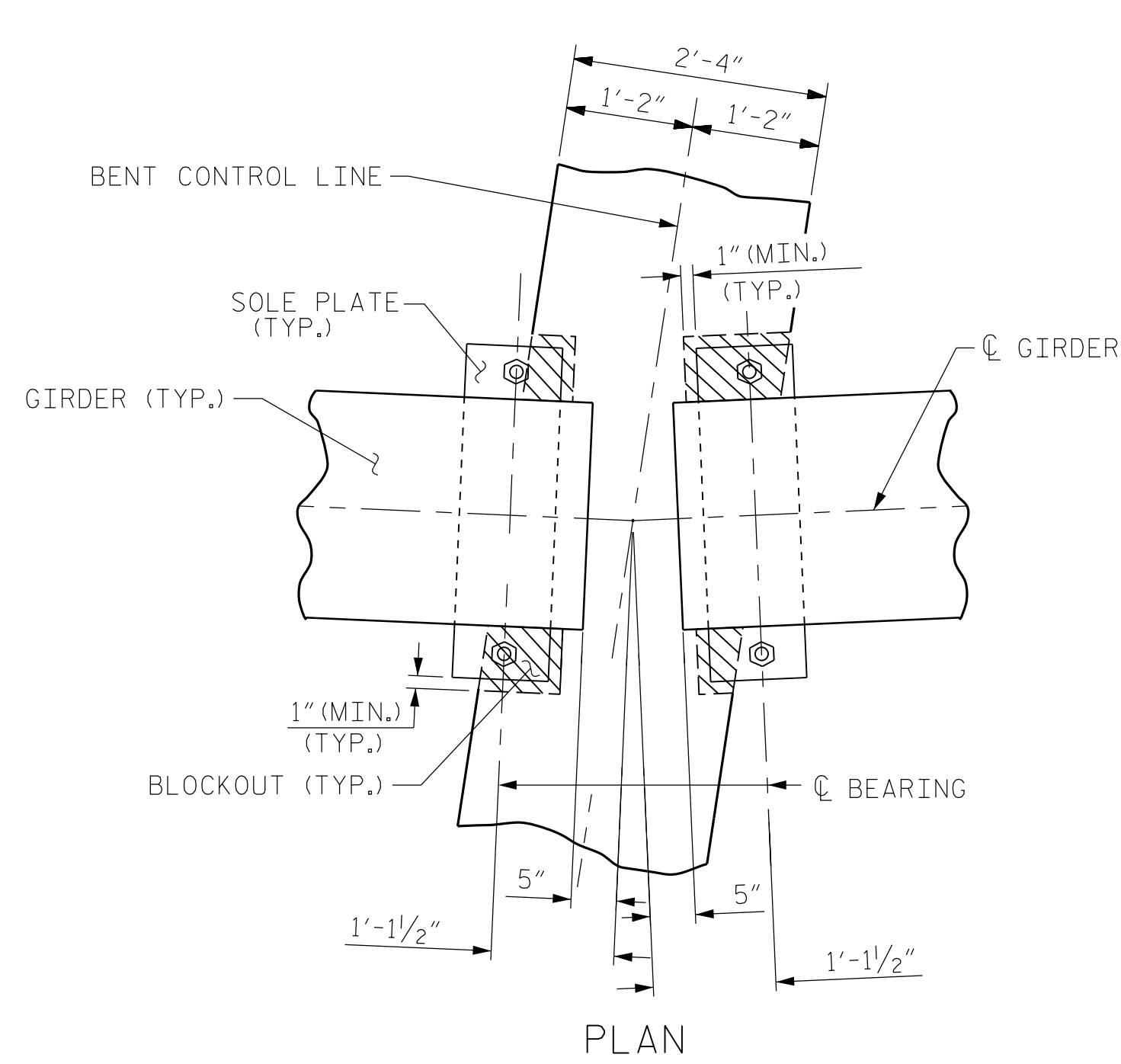
**END OF GIRDER DETAIL AT INTEGRAL END BENT NO. 1**  
 END BENT NO. 2 SIMILAR



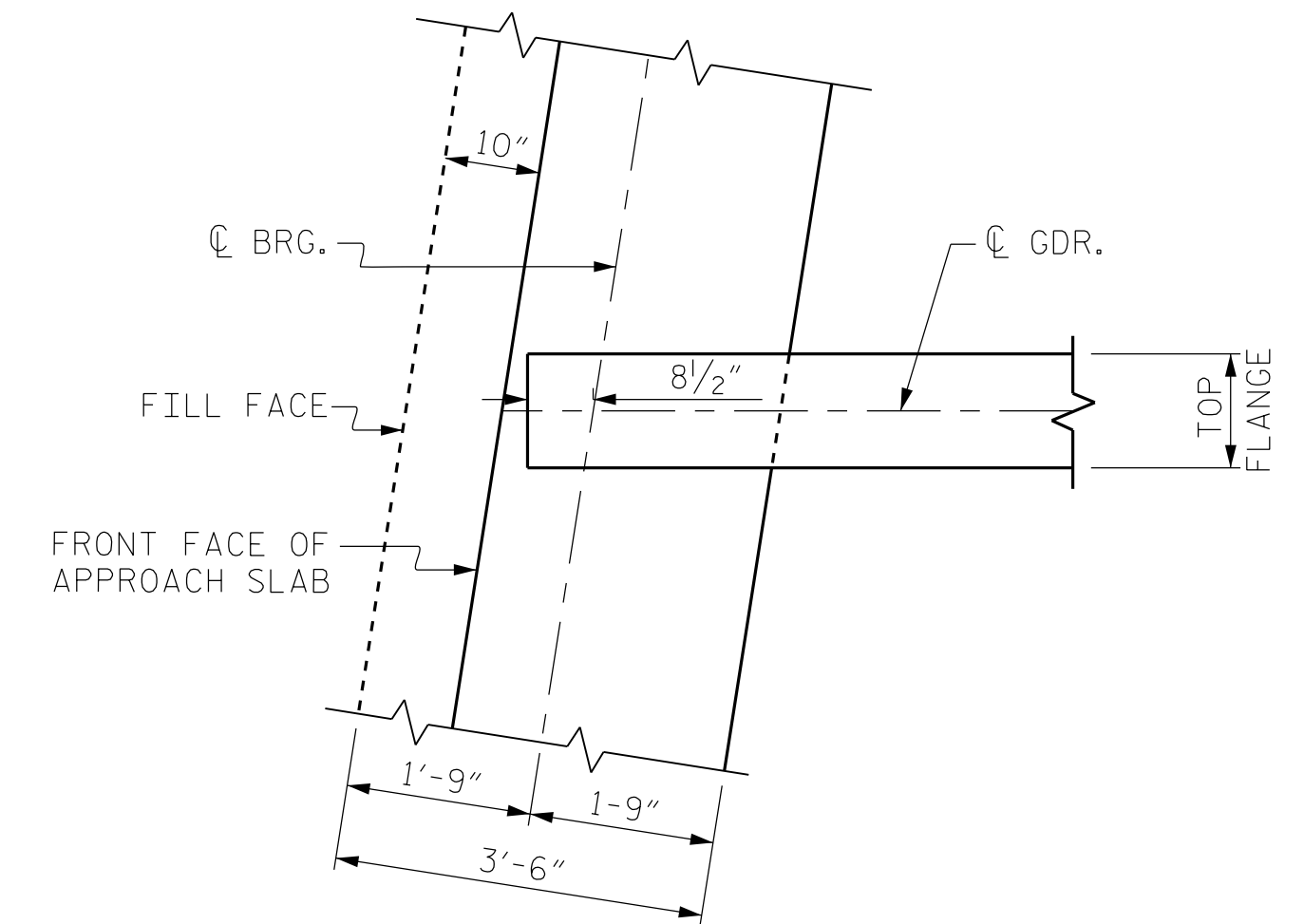
**TYPICAL SECTION @ BENT DIAPHRAGM**  
 \* RADIAL DIMENSIONS TO GRADE LINE  
 \*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS



**SECTION THROUGH BENT DIAPHRAGM**  
 \* MEASURED ALONG GIRDER LINE

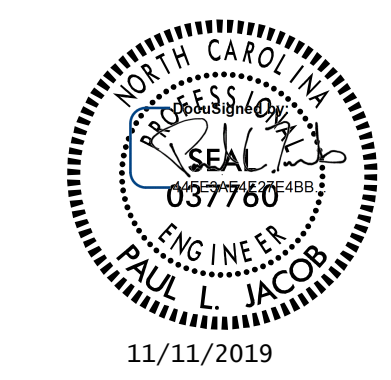


**BENT DIAPHRAGM BLOCK-OUT DETAIL**



**PLAN OF GIRDER AT INTEGRAL END BENT NO. 1**  
 END BENT NO. 2 SIMILAR

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 5



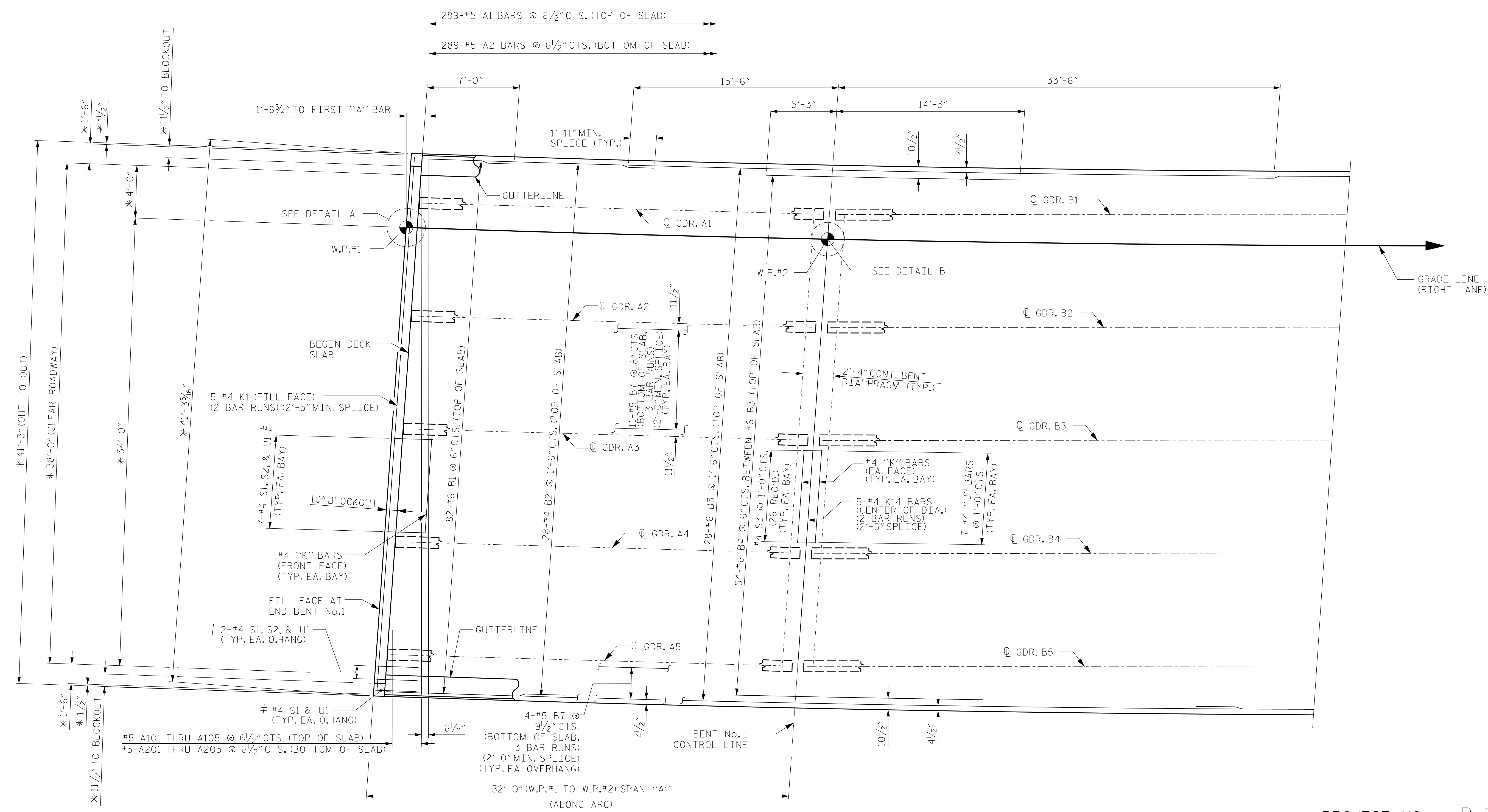
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**TYPICAL SECTION DETAILS**  
 (RIGHT LANE)

DRAWN BY : J. WEIGER DATE : 01/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD : P. JACOB DATE : 09/2019

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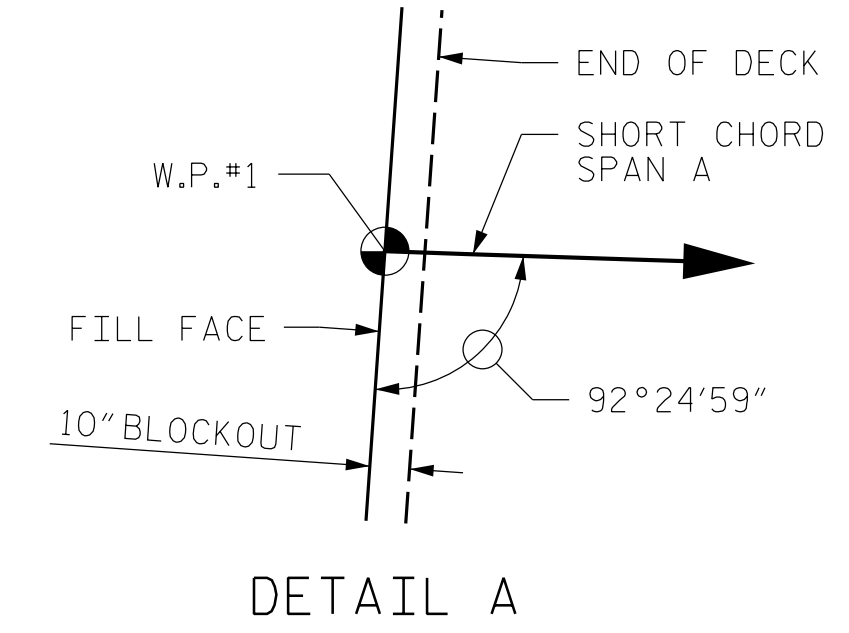
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REVISIONS		SHEET NO.	
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2			
3			
4			

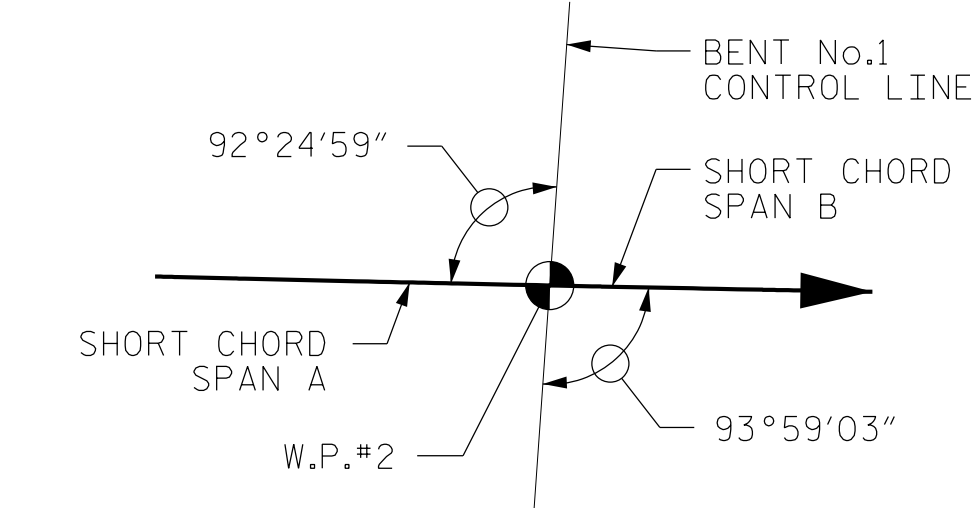


**PLAN OF SPAN "A"**

FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET  
 #5 "A" BARS PERPENDICULAR TO THE LONG CHORD  
 # TO MATCH V1 BARS IN END BENT  
 \* DENOTES RADIAL DIMENSION



DETAIL A



DETAIL B

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**  
**SPAN "A"**  
 (RIGHT LANE)



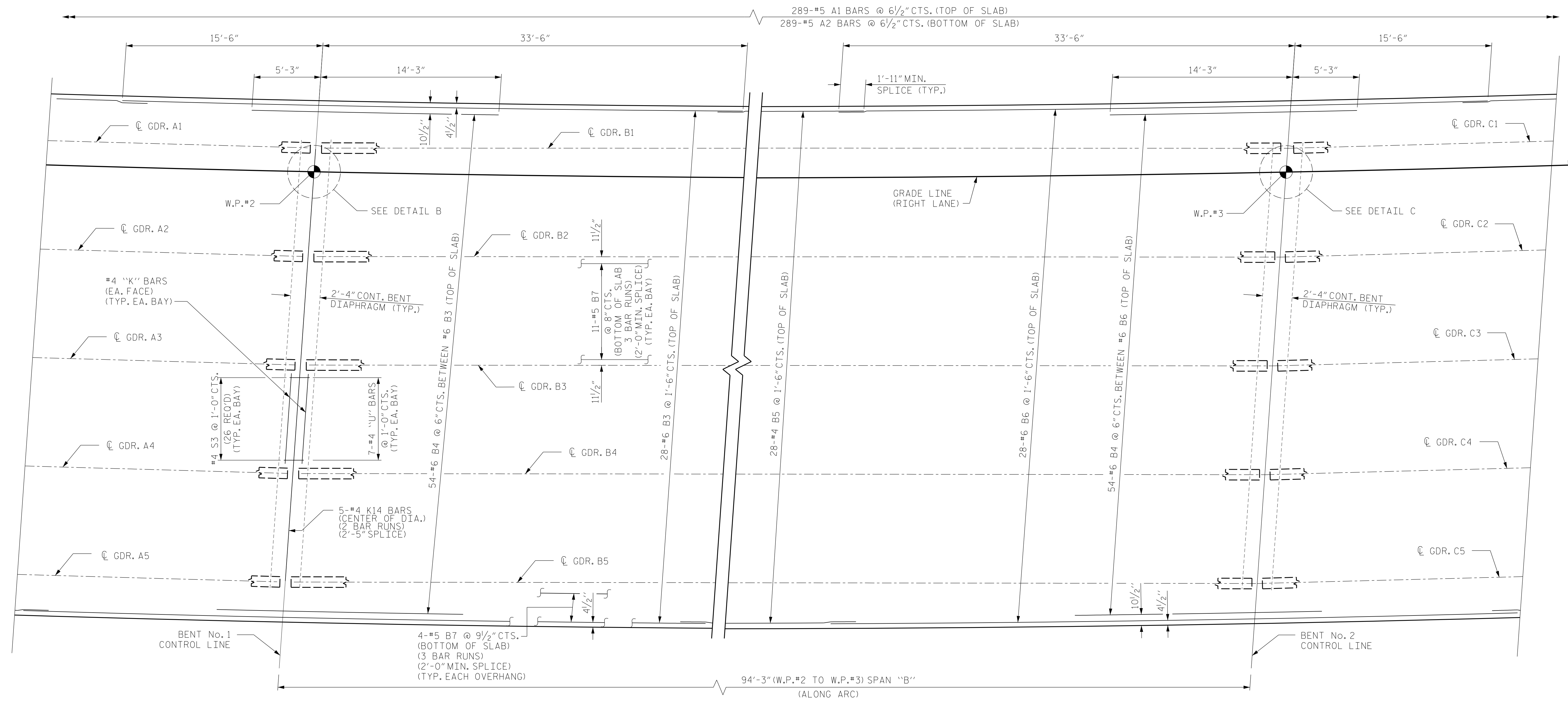
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 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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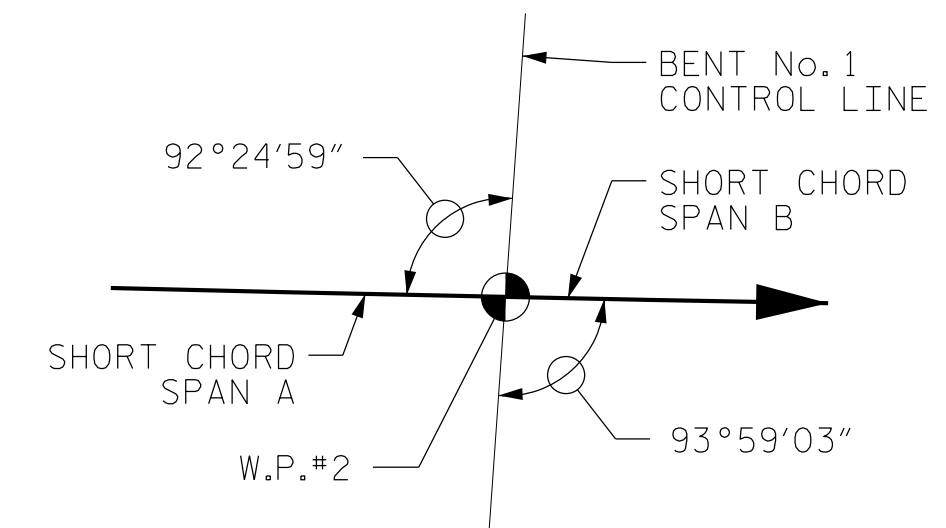
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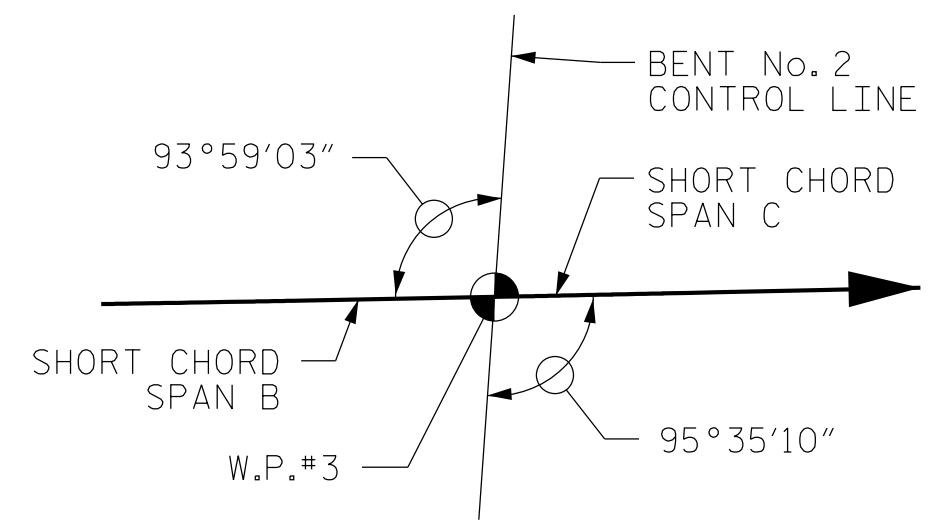


**PLAN OF SPAN "B"**

FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET.  
 #5 "A" BARS ARE PERPENDICULAR TO THE LONG CHORD.



DETAIL B



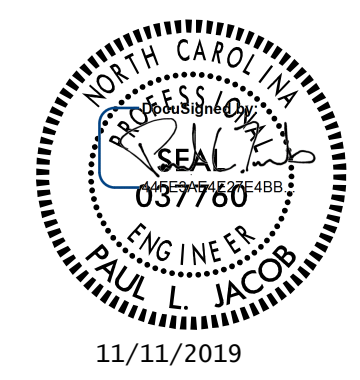
DETAIL C

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**PLAN OF SPANS  
 SPAN "B"**

(RIGHT LANE)



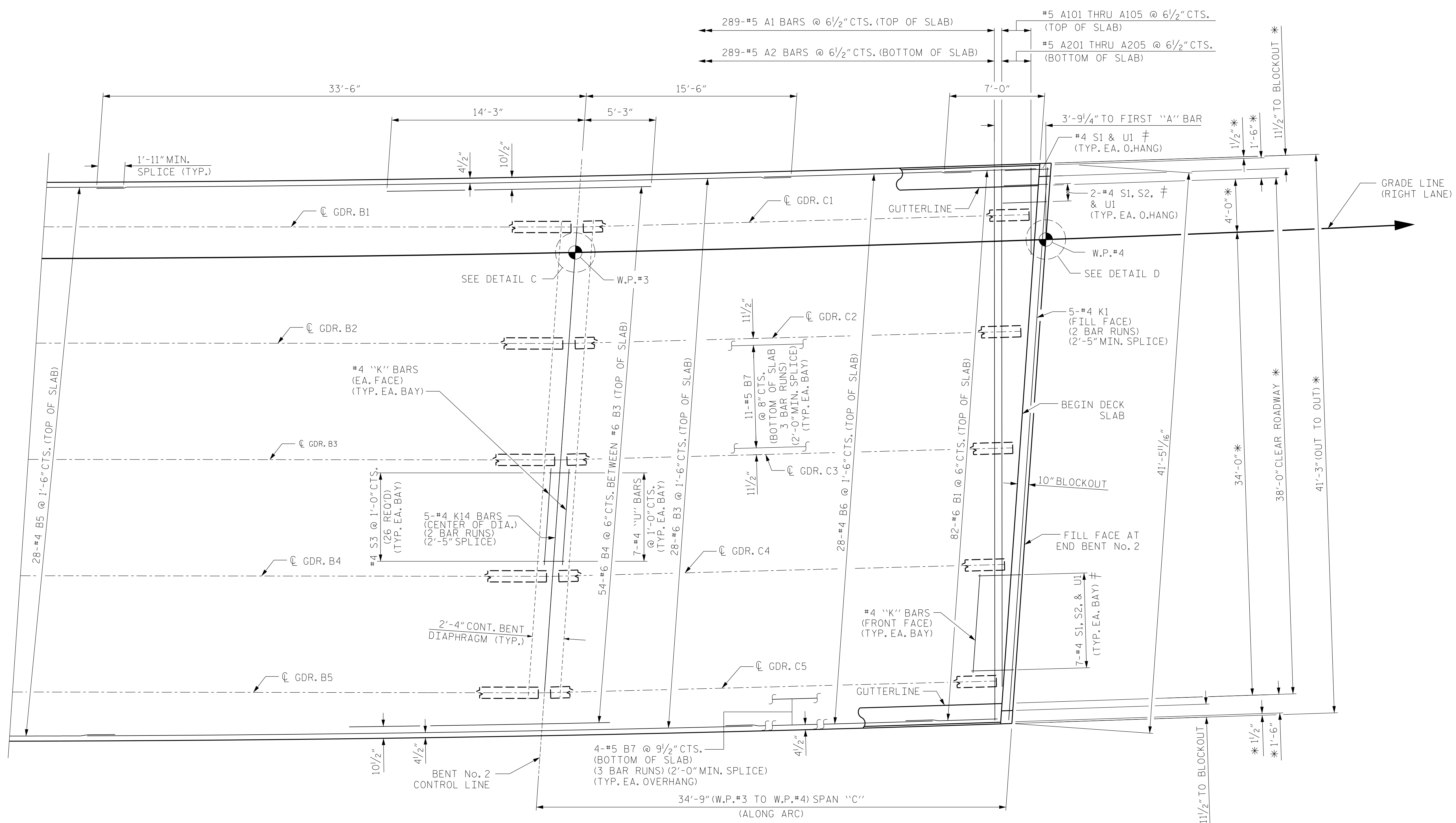
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 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

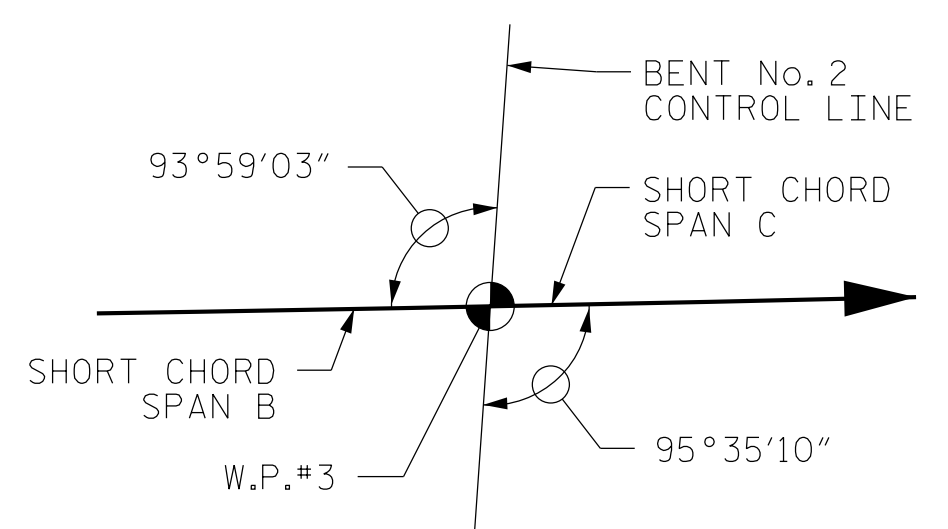
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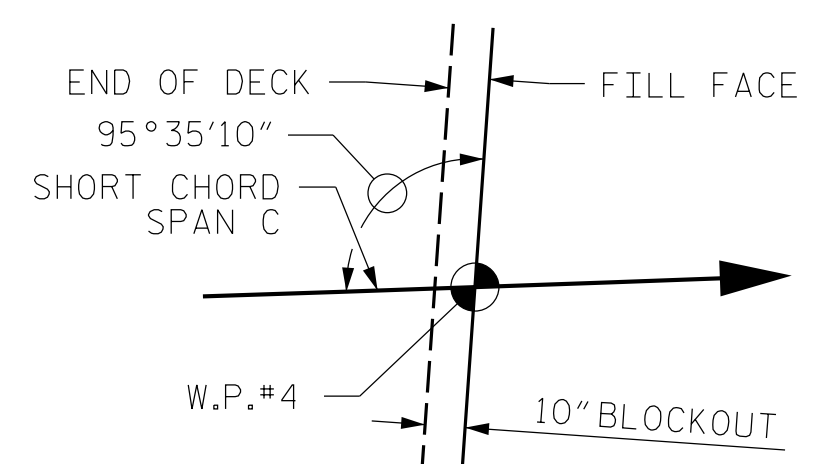


**PLAN OF SPAN "C"**

FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET.  
 #5 "A" BARS ARE PERPENDICULAR TO THE LONG CHORD.  
 † TO MATCH V1 BARS IN END BENT  
 \* DENOTES RADIAL DIMENSION



**DETAIL C**



**DETAIL D**

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 5 OF 5



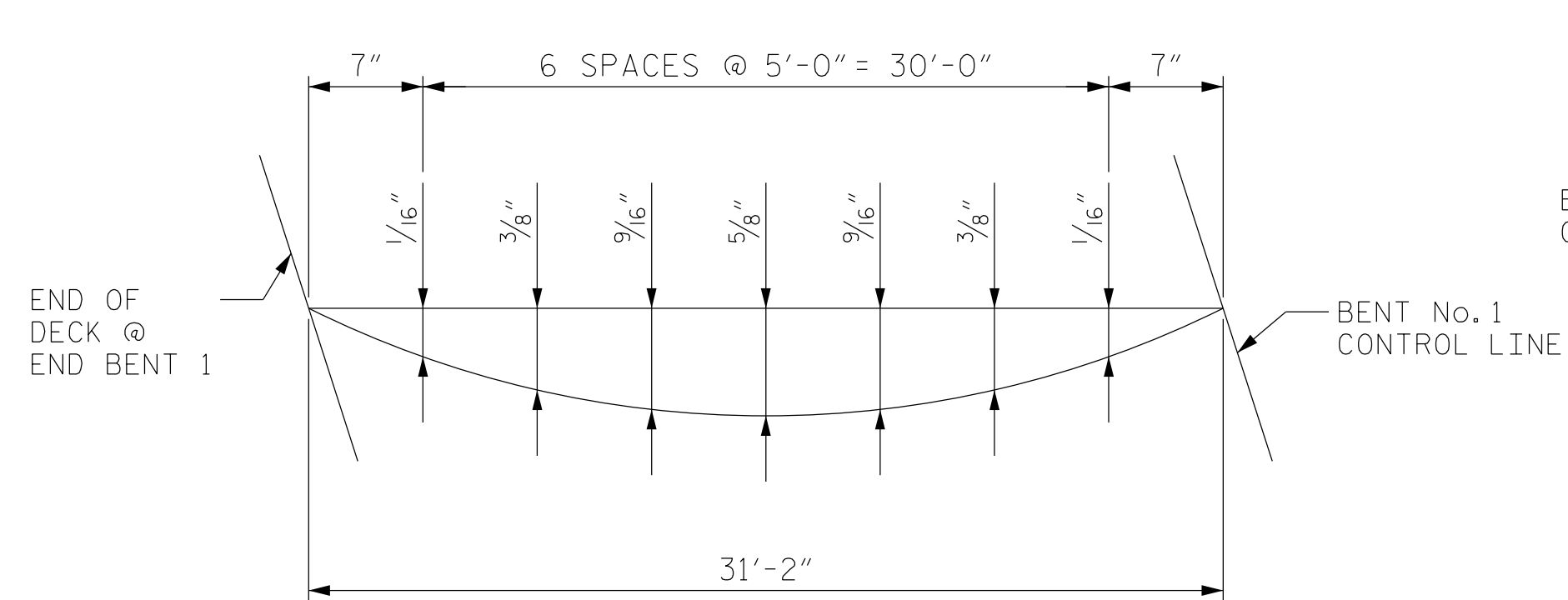
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**  
**SPAN "C"**  
 (RIGHT LANE)

DRAWN BY : M. RAY DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

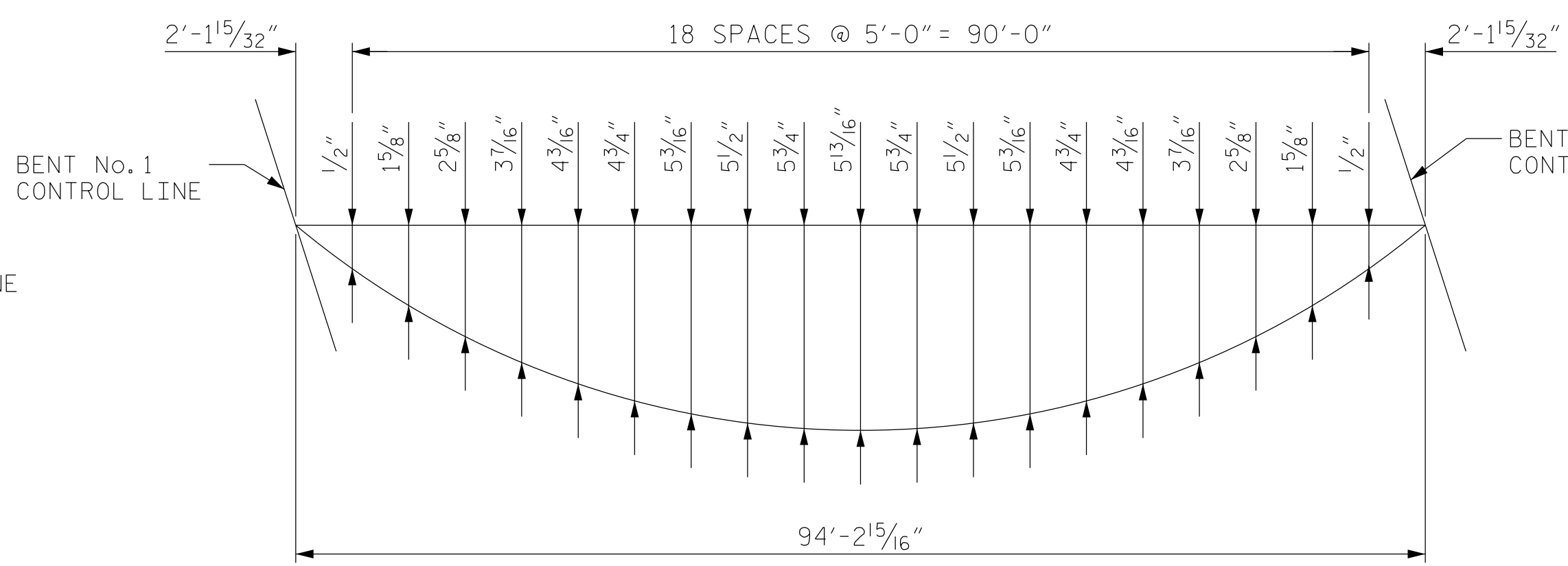
**moffatt & nichol**  
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DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

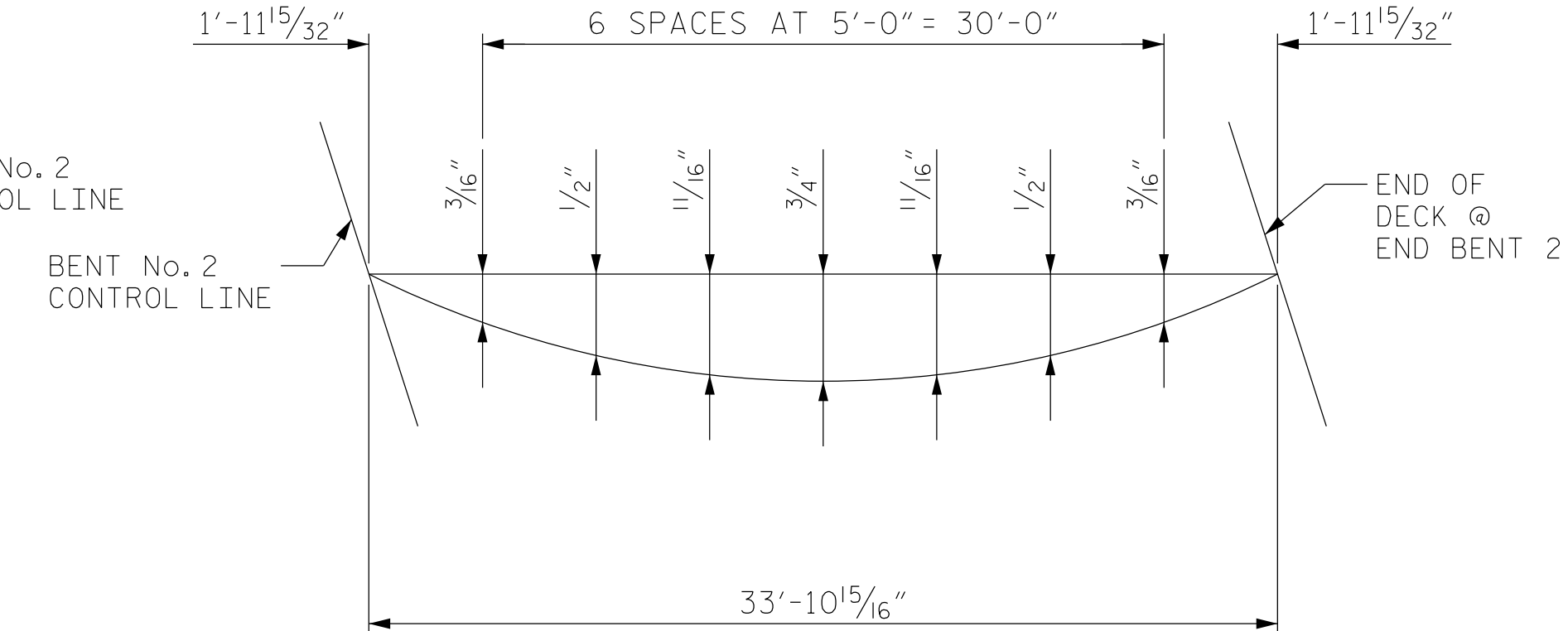
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2			4			35



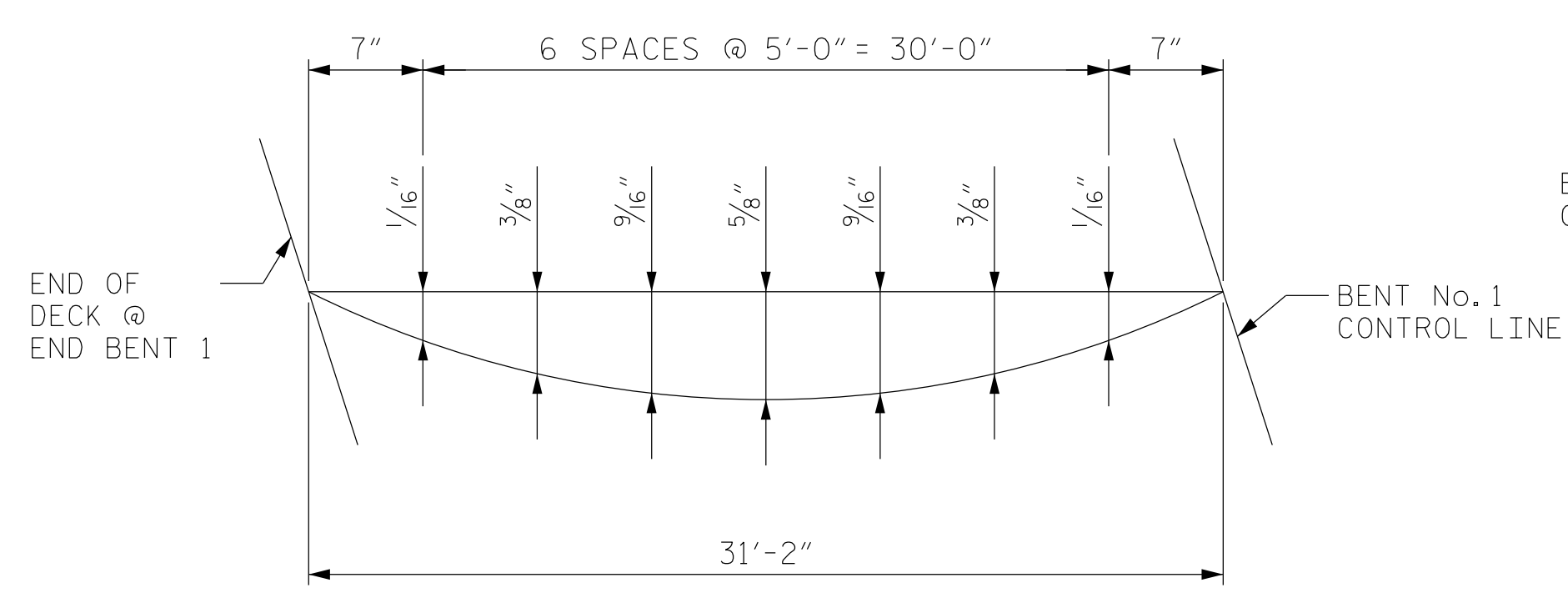
LEFT EDGE OF DECK ARC OFFSETS SPAN "A"



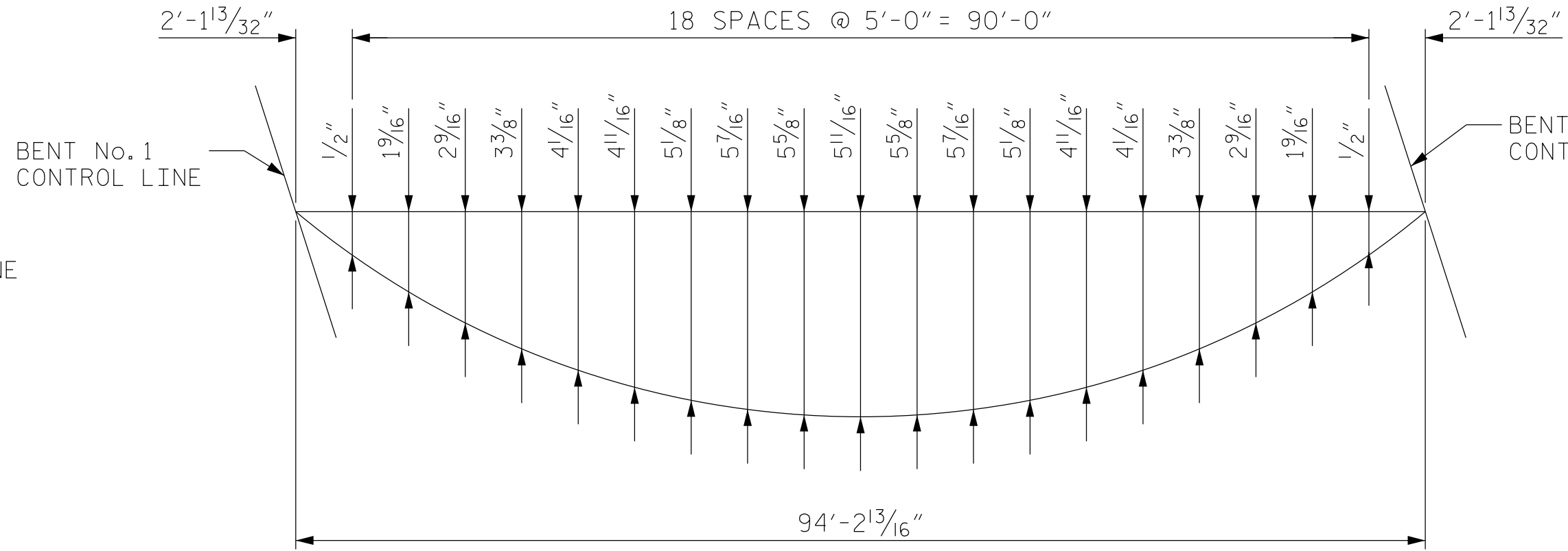
LEFT EDGE OF DECK ARC OFFSETS SPAN "B"



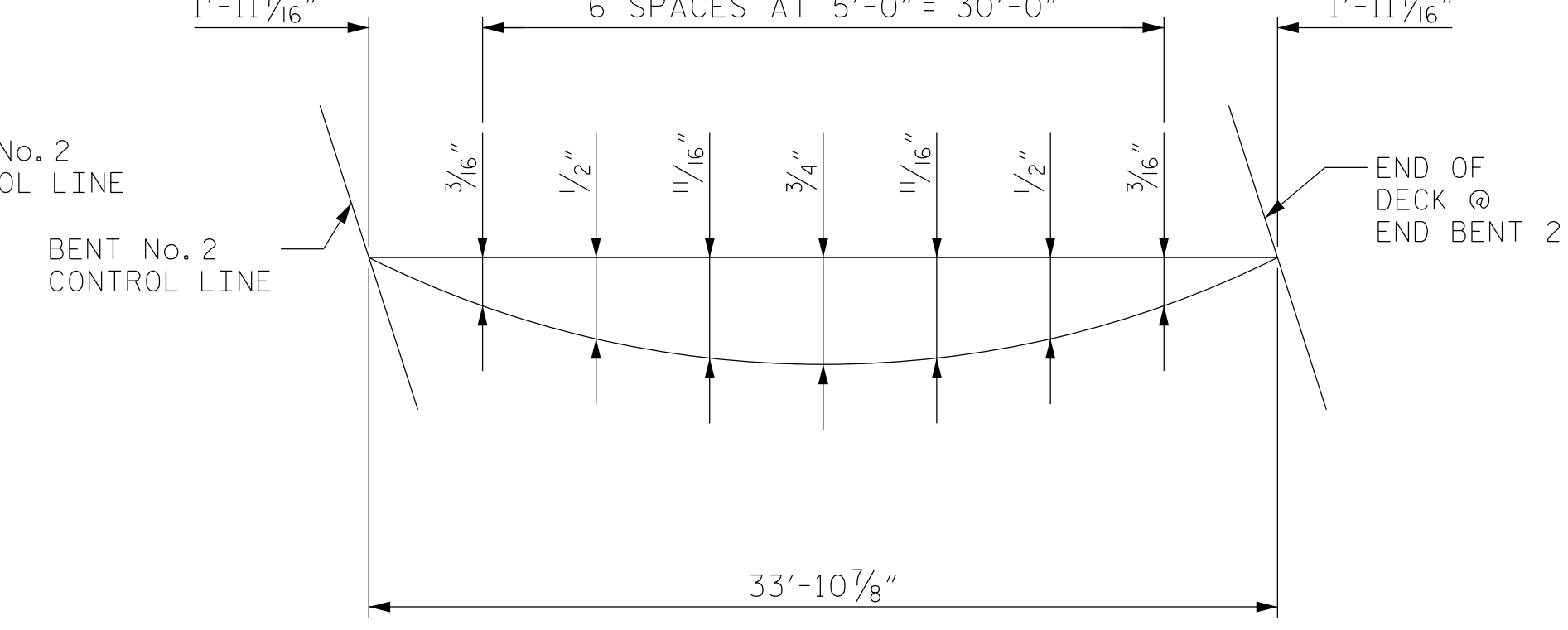
LEFT EDGE OF DECK ARC OFFSETS SPAN "C"



RIGHT EDGE OF DECK ARC OFFSETS SPAN "A"



RIGHT EDGE OF DECK ARC OFFSETS SPAN "B"



RIGHT EDGE OF DECK ARC OFFSETS SPAN "C"

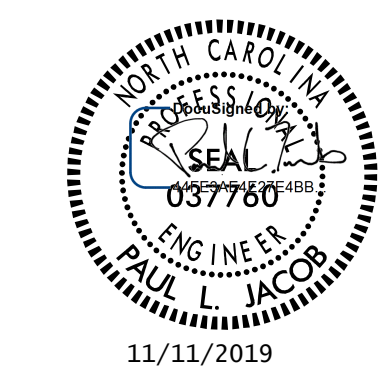
ARC OFFSETS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-

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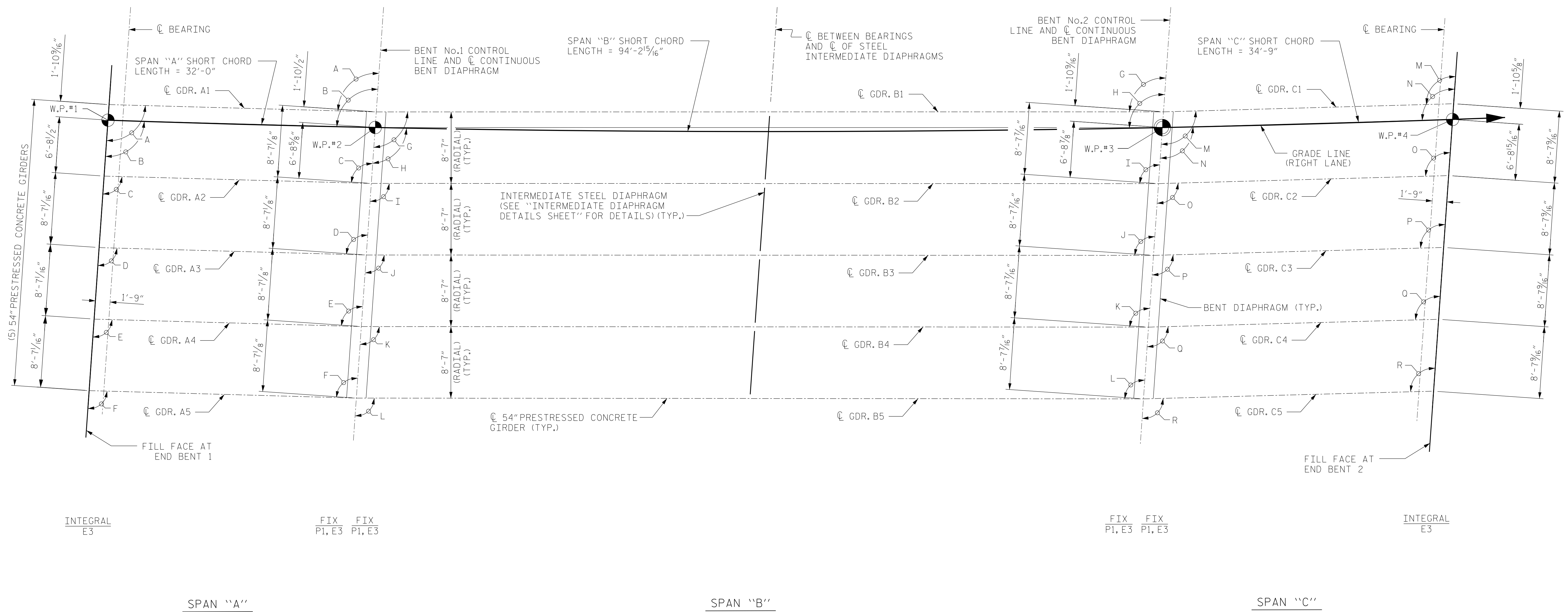
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 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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 NC License NO.: F-0105



DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
ARC OFFSETS (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S1-11 TOTAL SHEETS 35



**ANGLES**

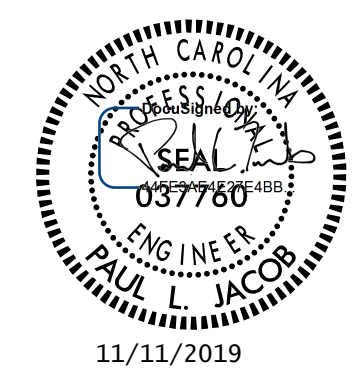
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C	92°24'34"	I	93°58'21"	O	95°34'12"
D	92°24'01"	J	93°57'28"	P	95°32'57"
E	92°23'30"	K	93°56'36"	Q	95°31'44"
F	92°22'58"	L	93°55'44"	R	95°30'30"

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-

GIRDER LAYOUT

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**FRAMING PLAN**  
 (RIGHT LANE)



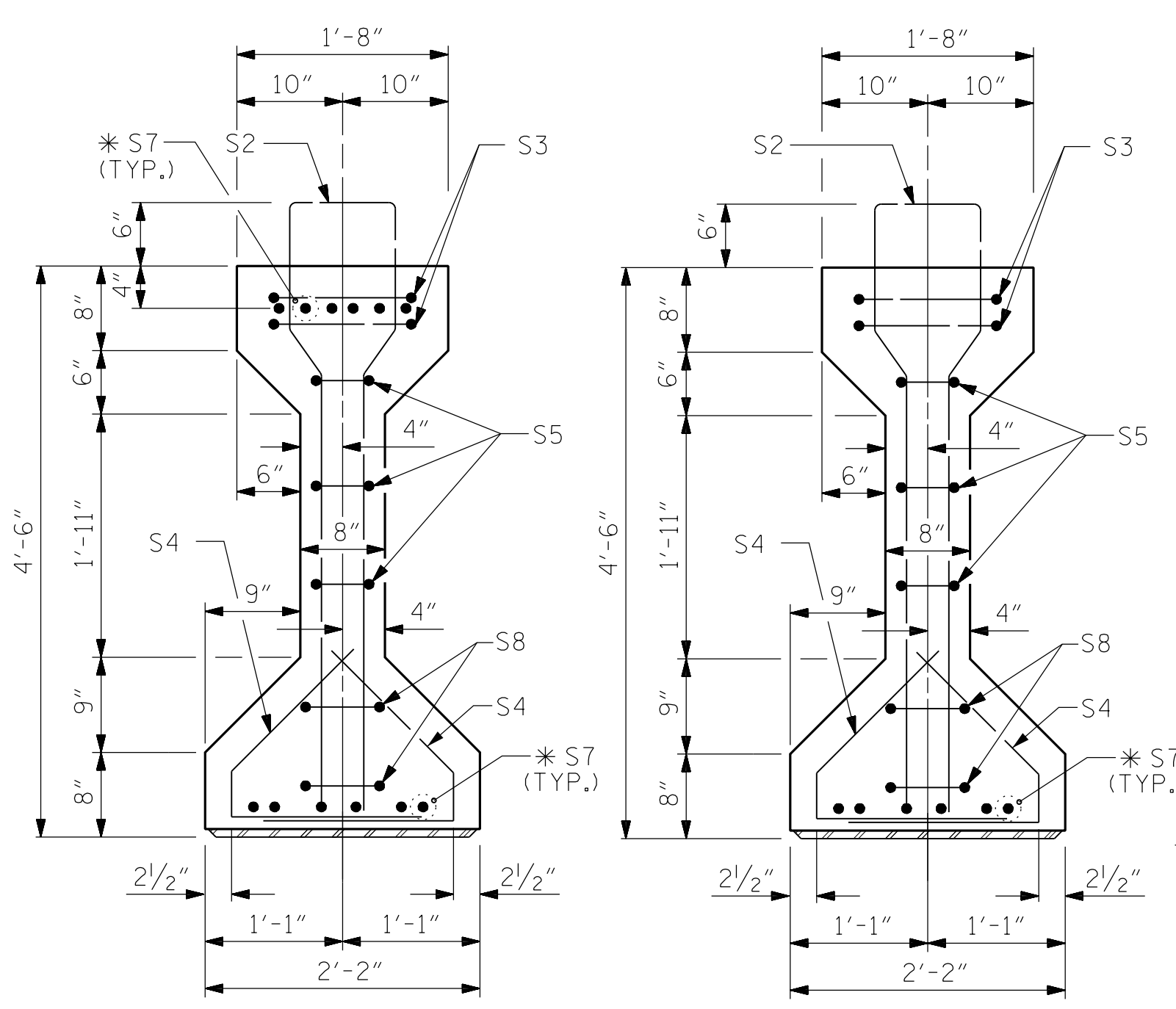
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 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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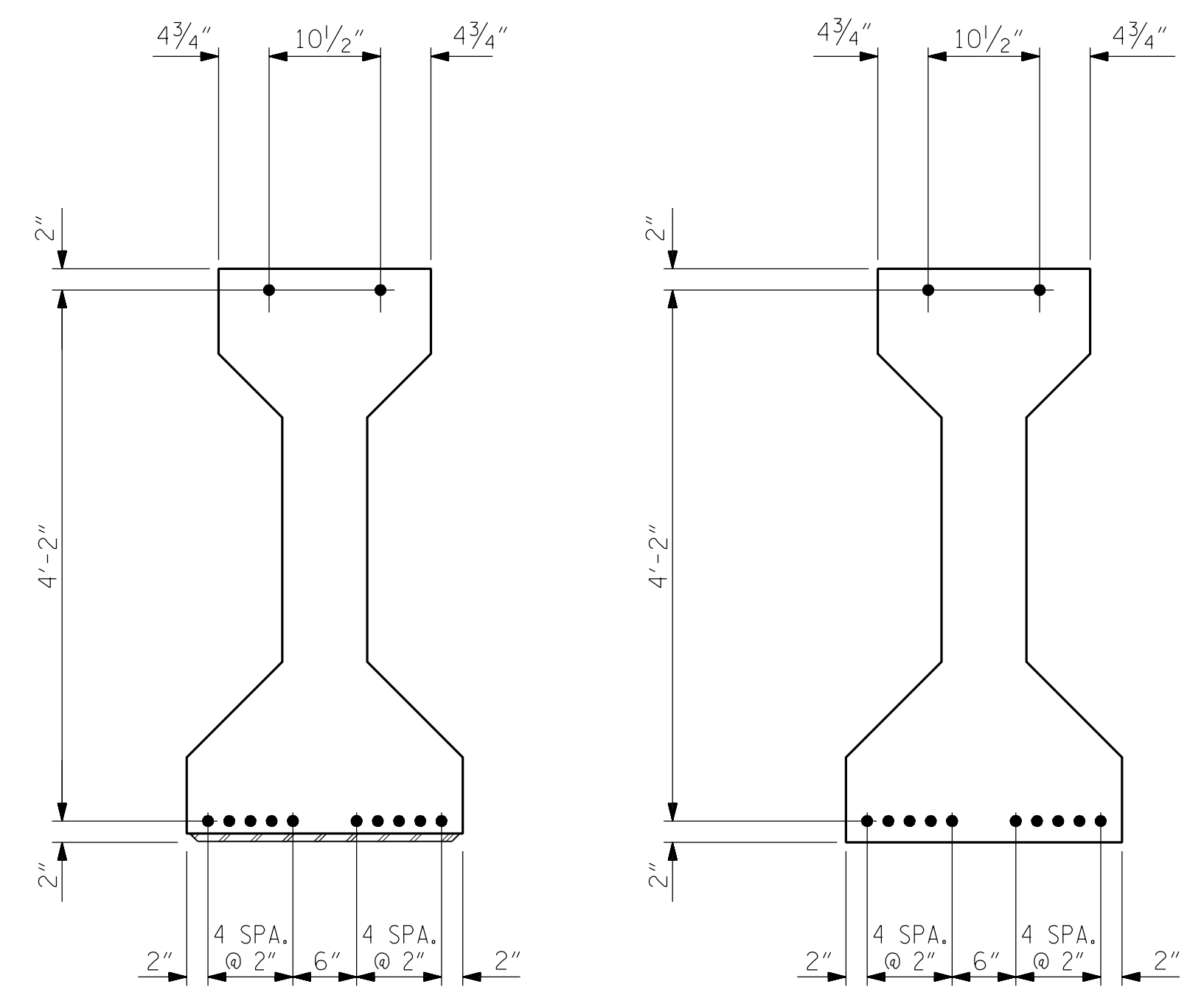
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
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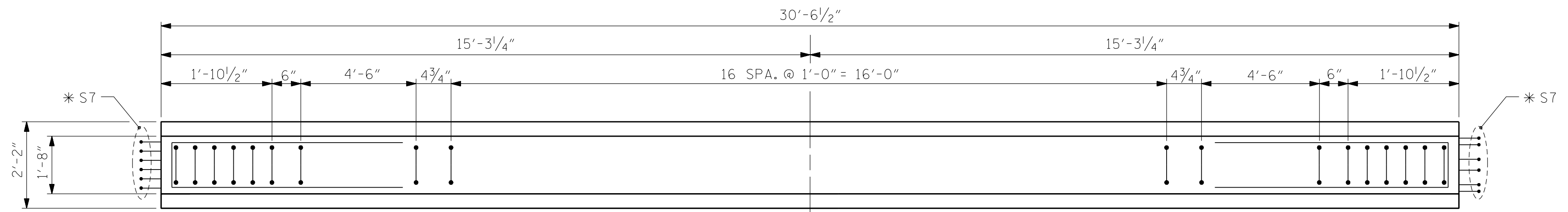


SECTION A-A SECTION B-B

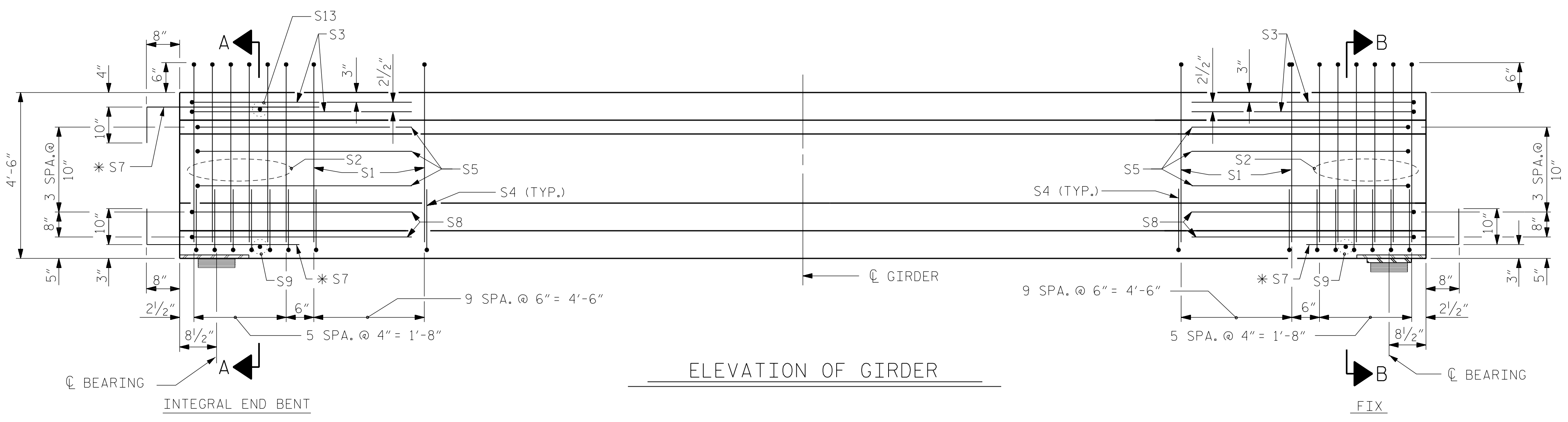
\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET



AT END OF GIRDER AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

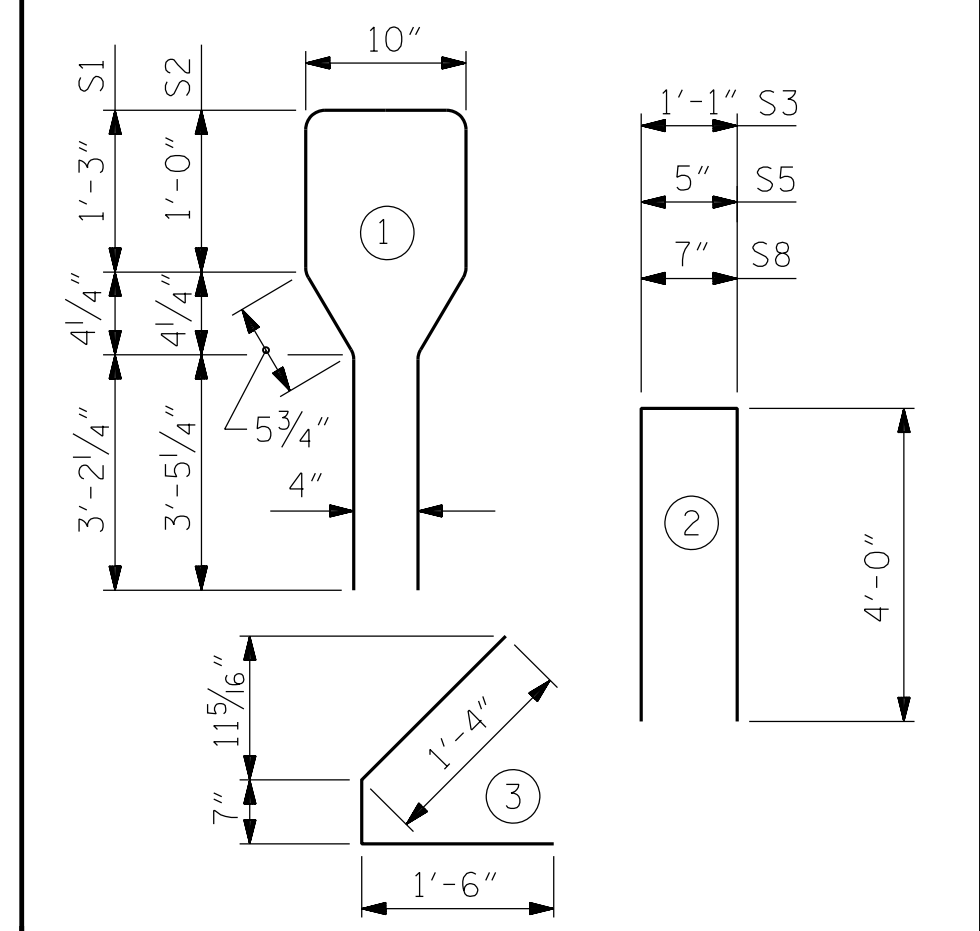
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	37	#5	1	10'-8"	412
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	902	6.2	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	30'-6 1/2"	152'-8 1/2"

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

SHEET 1 OF 4



11/11/2019

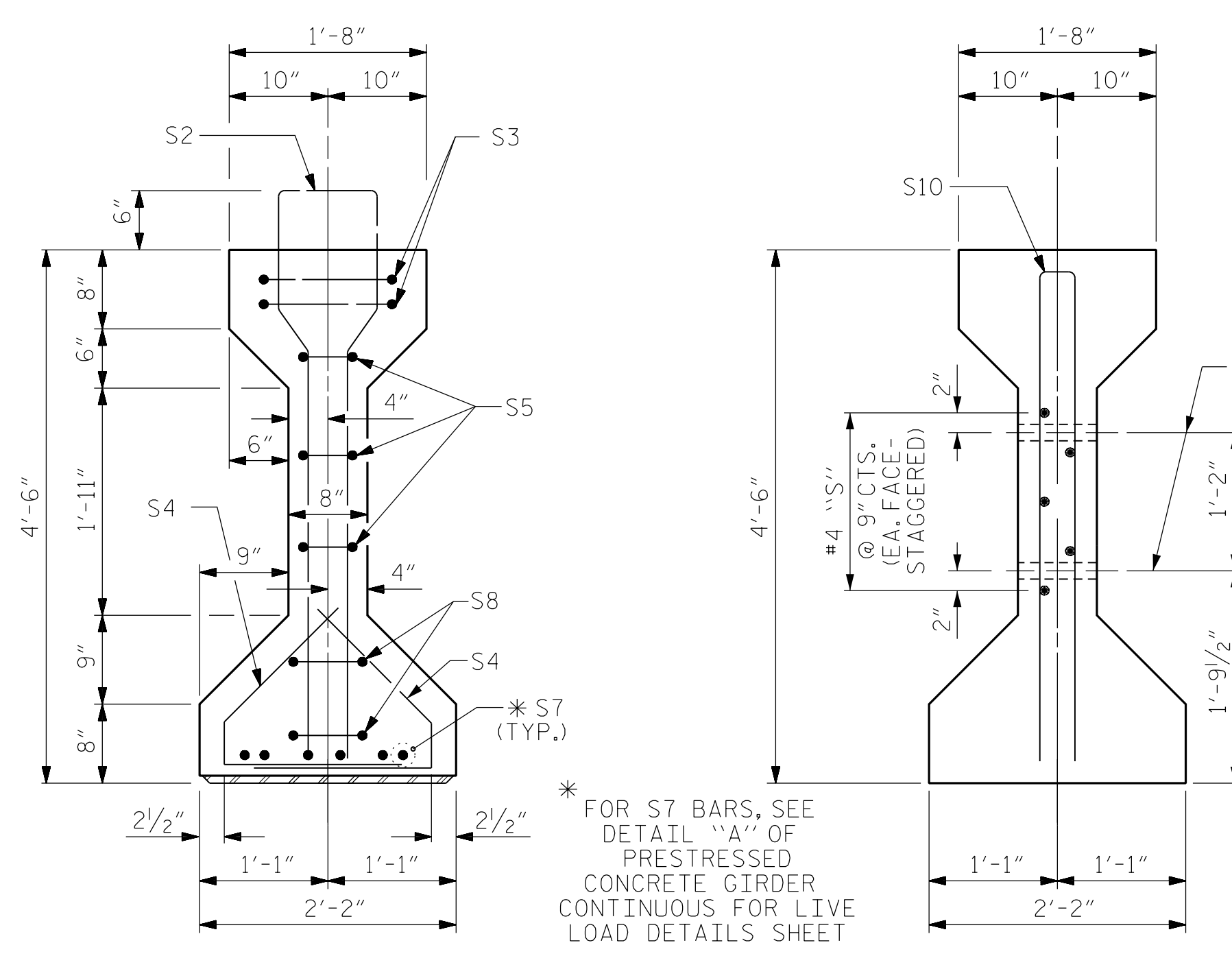
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CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMC
	REV. 12/17 MAA/THC

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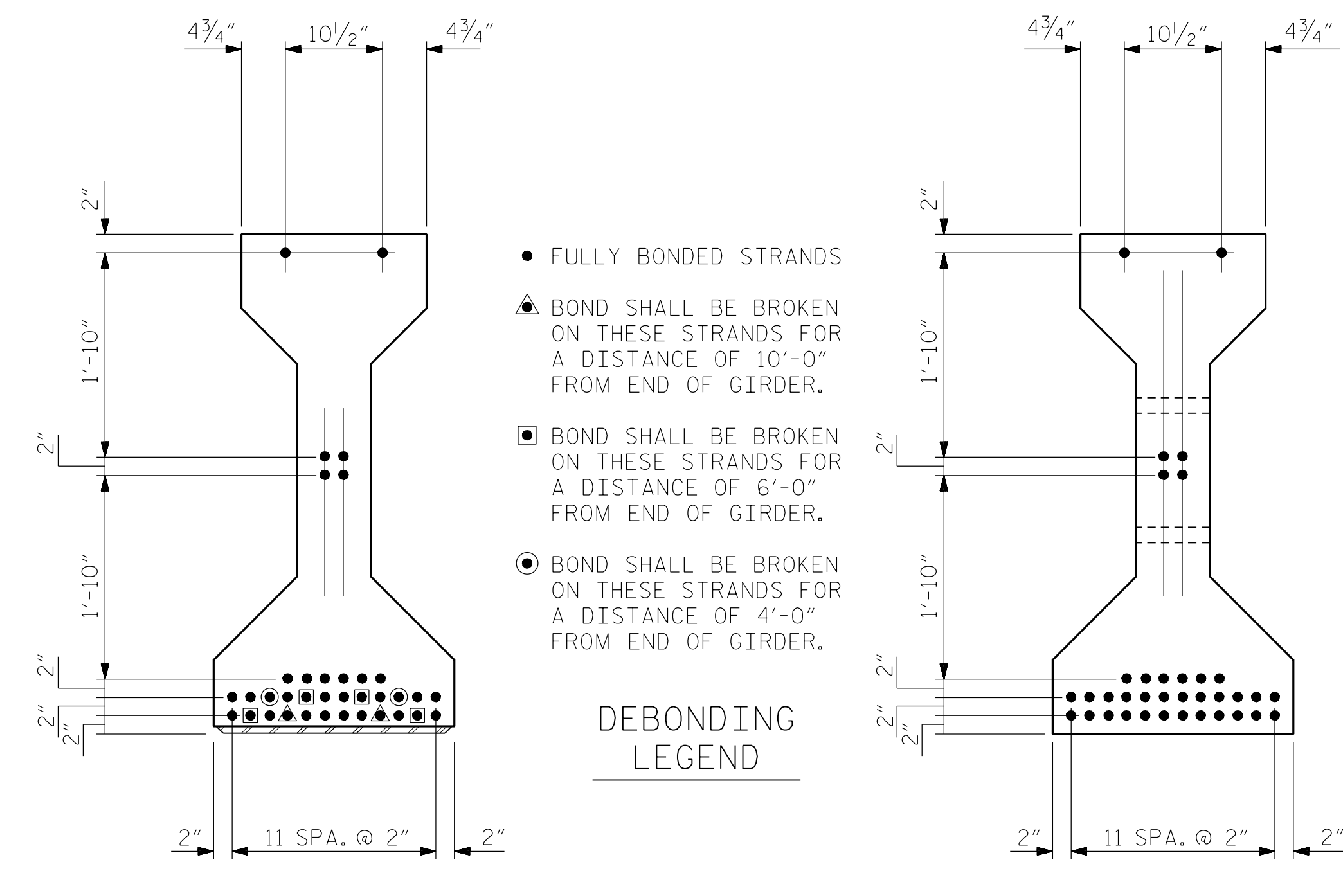
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FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			35

STD. NO. PCG6 (Sht. 2)



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



- FULLY BONDED STRANDS
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 10'-0" FROM END OF GIRDER.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF GIRDER.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF GIRDER.

DEBONDING LEGEND

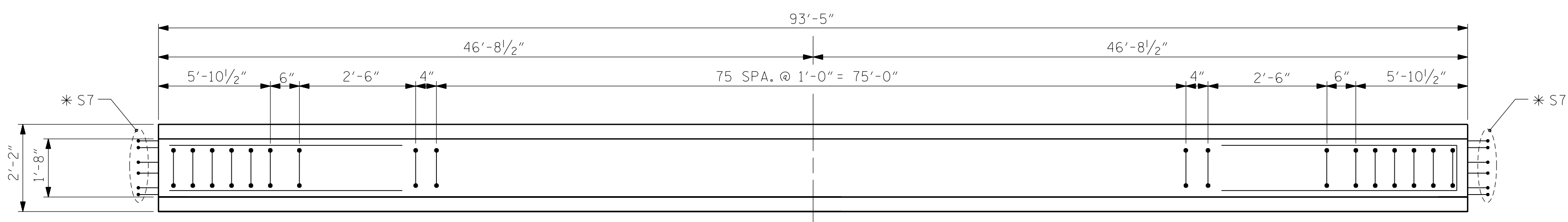
SECTION B-B

SECTION C-C  
(S1 BARS NOT SHOWN)

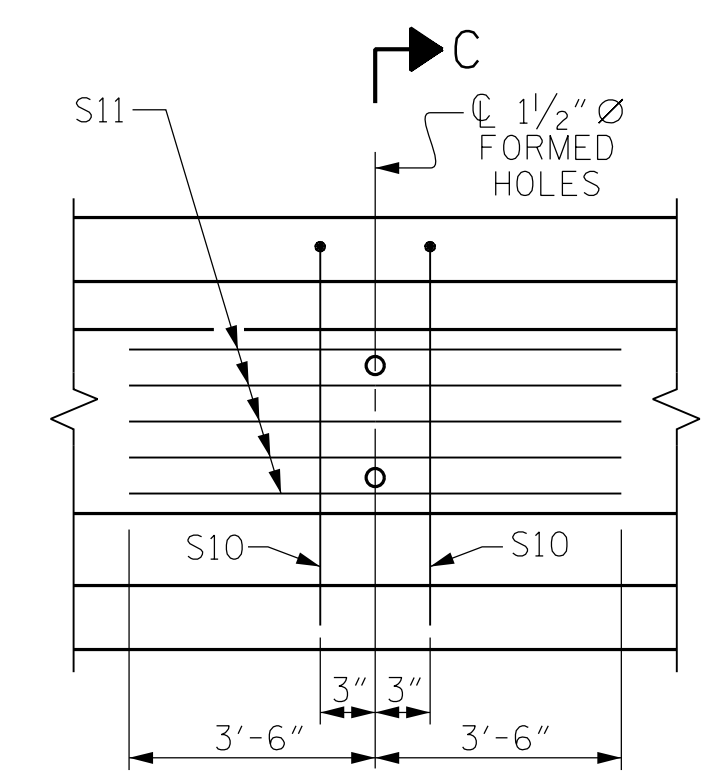
AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

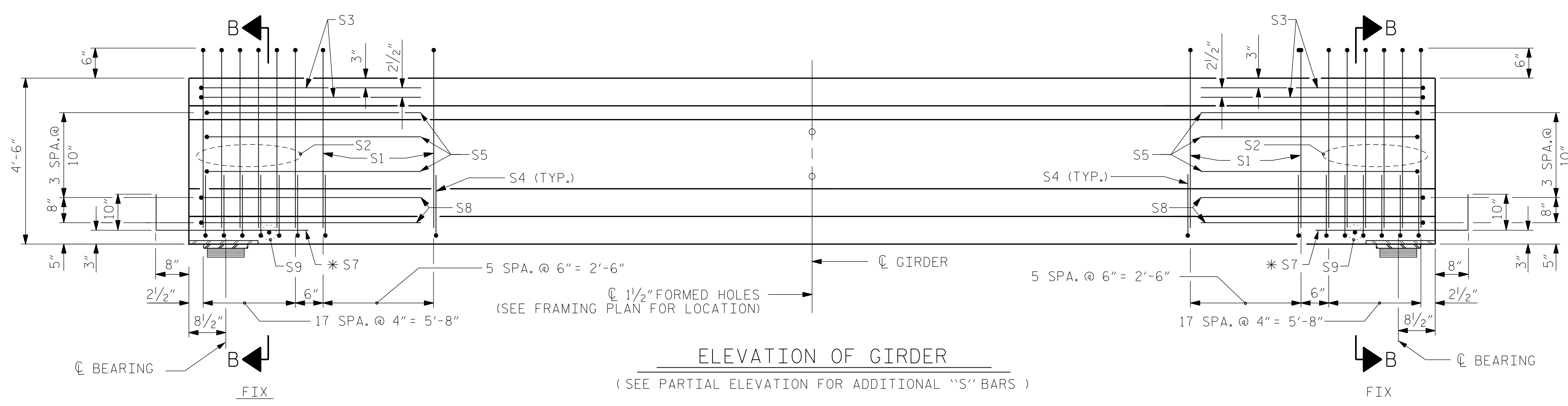


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 5



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

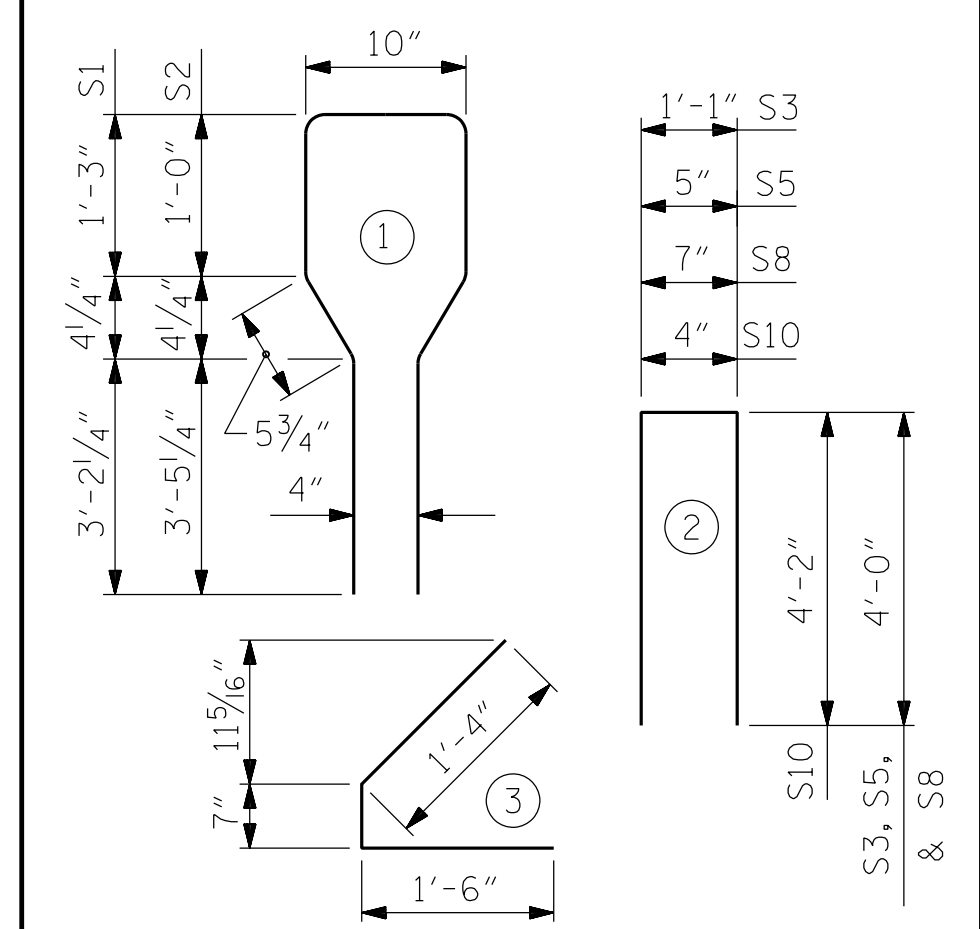
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#5	1	10'-8"	979
S2	36	#6	1	10'-8"	577
S3	4	#4	2	9'-1"	24
S4	96	#4	3	3'-5"	219
S5	6	#4	2	8'-5"	34
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	1944	19.0	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	93'-5"	467'-1"

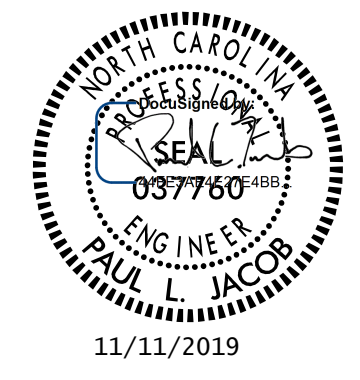
PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPAN "B"  
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS
2			4			35

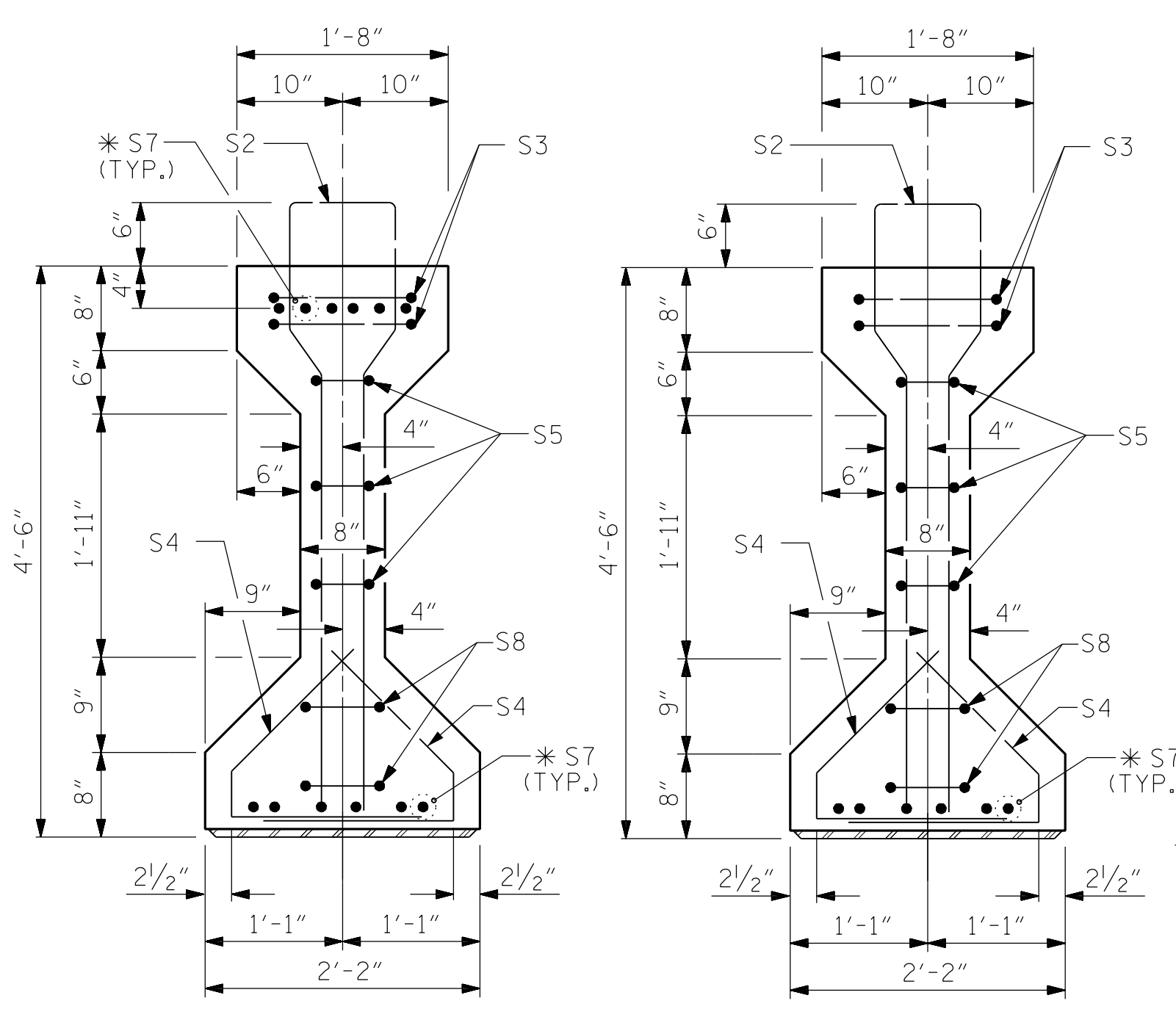
ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMC
	REV. 12/17 MAA/THC



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 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

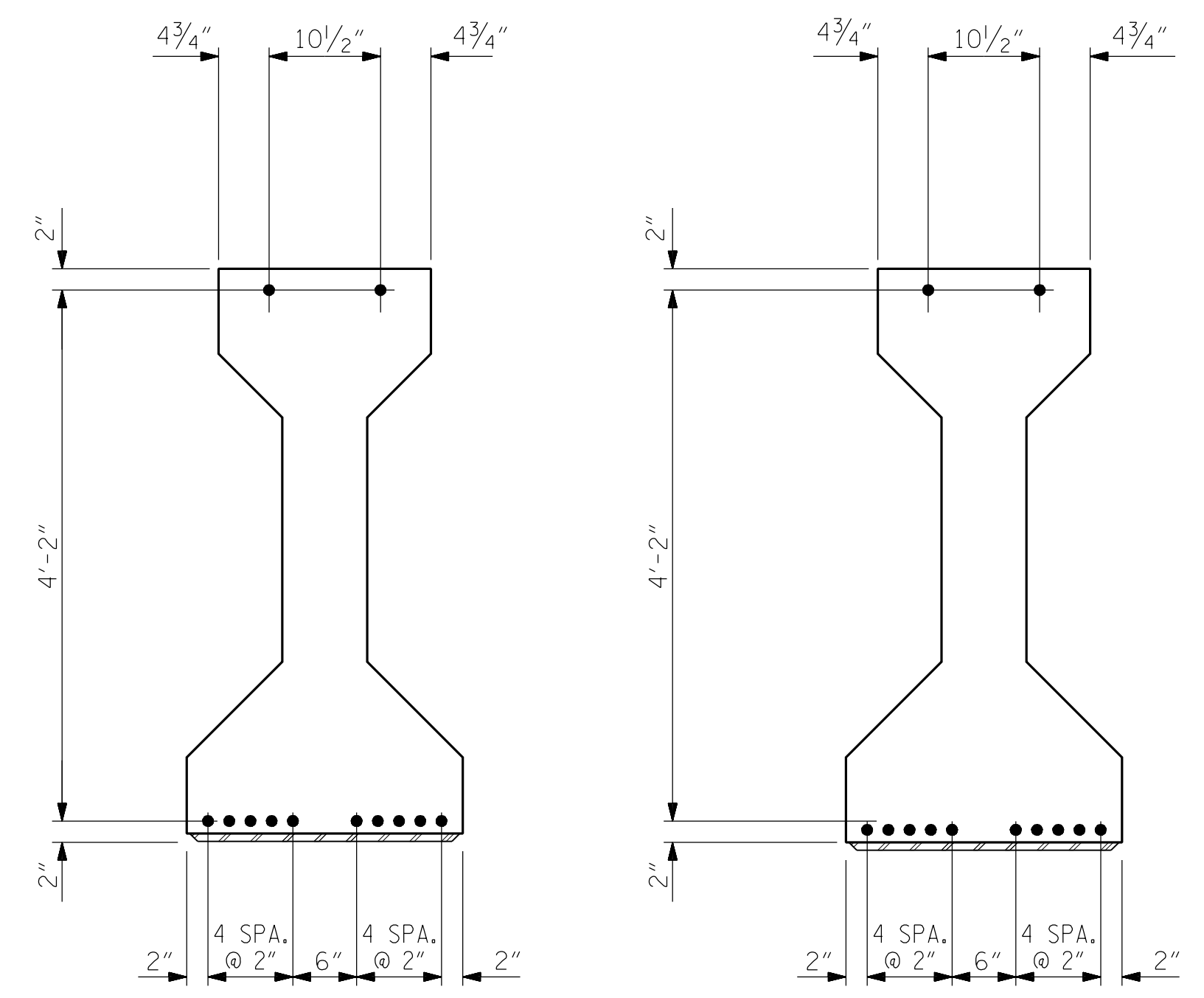




SECTION A-A

SECTION B-B

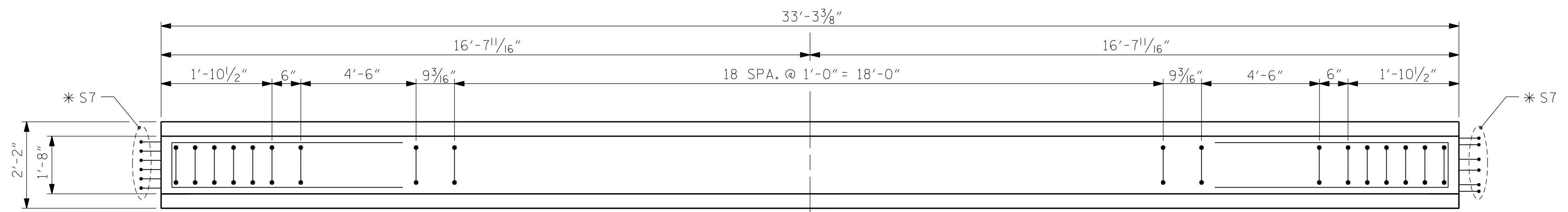
\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET



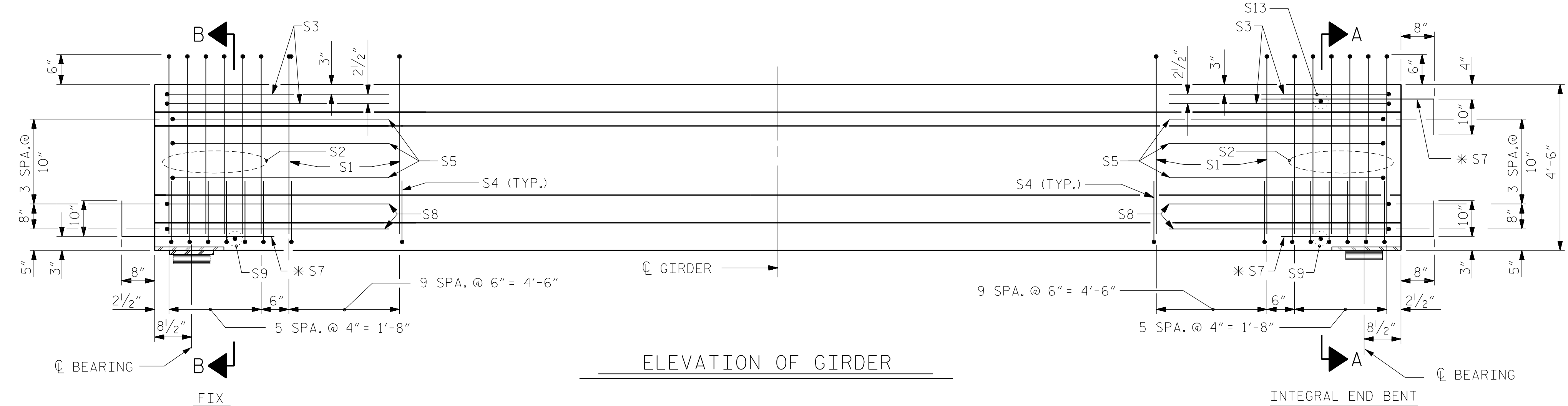
AT END OF GIRDER

AT C<sub>g</sub> OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

INTEGRAL END BENT

0.6" Ø L. R. GRADE 270 STRANDS

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

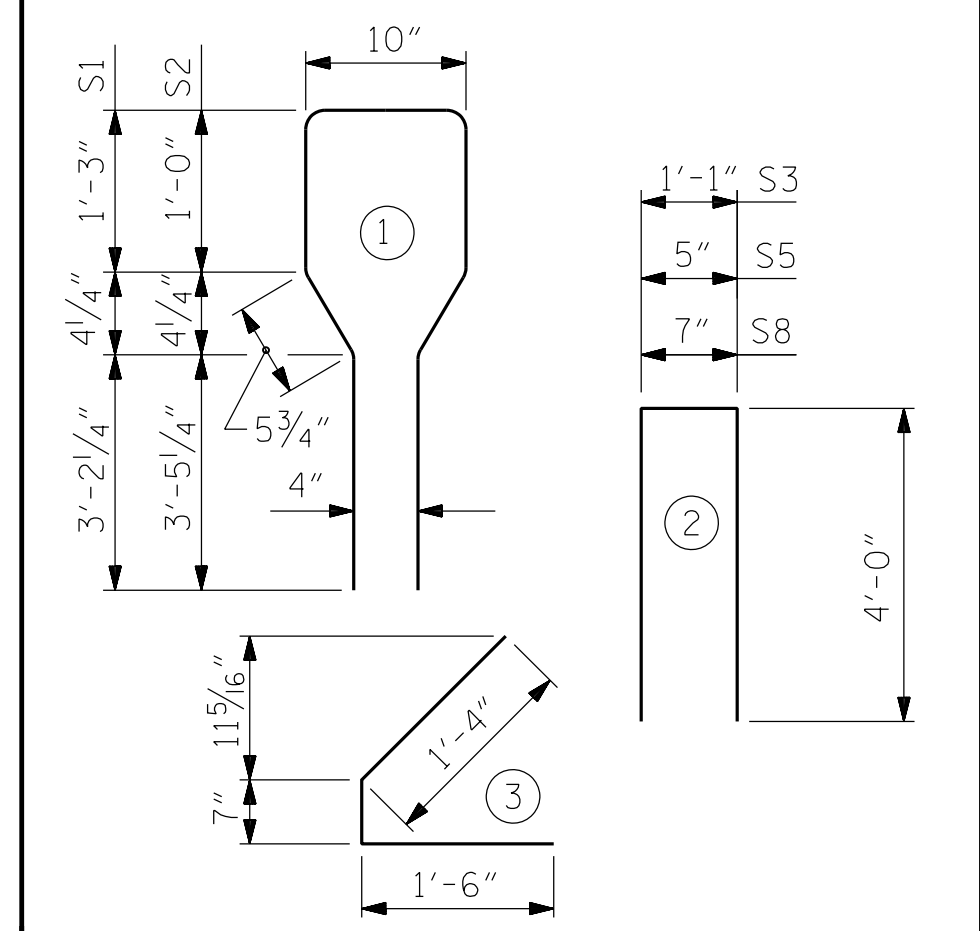
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	39	#5	1	10'-8"	434
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	924	6.8	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	33'-3 3/8"	166'-4 1/8"

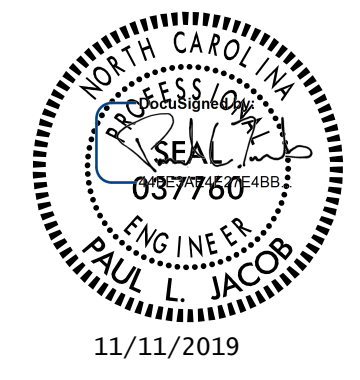
PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN "C"  
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMC
	REV. 12/17 MAA/THC



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NC License NO.: F-0105

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FINAL UNLESS ALL  
SIGNATURES COMPLETED

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

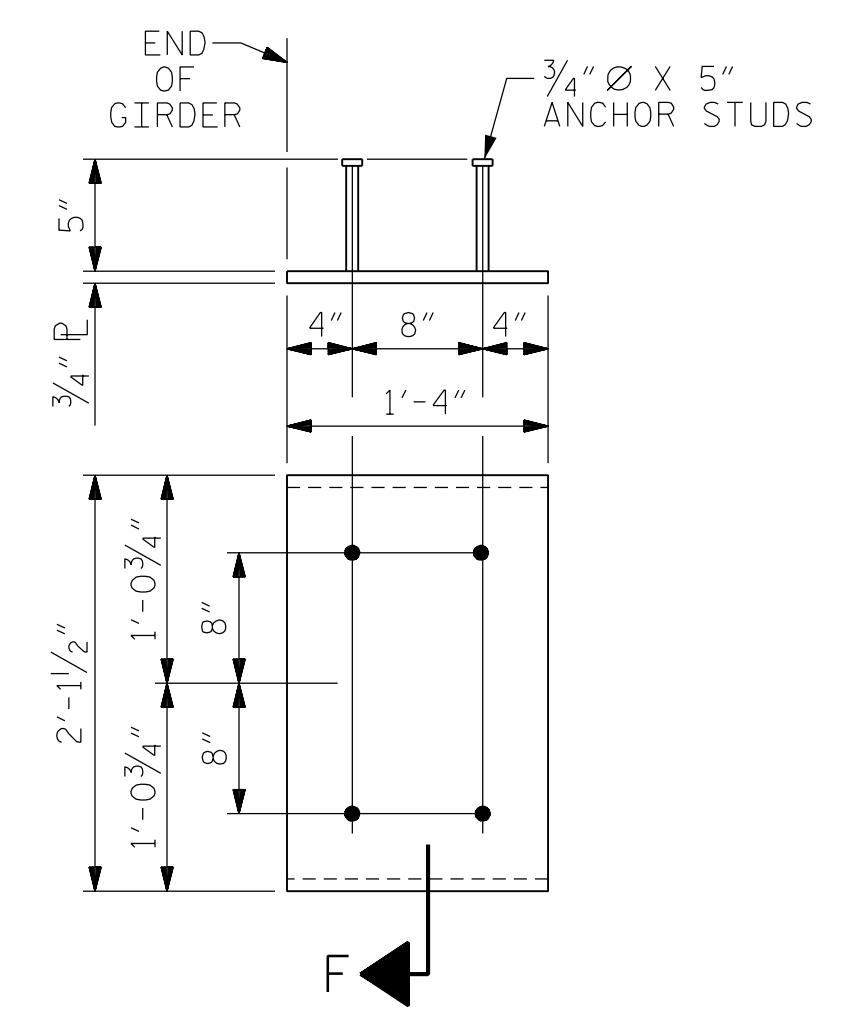
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI FOR SPAN "A" AND SPAN "C" AND NO LESS THAN 5700 PSI FOR SPAN "B".

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

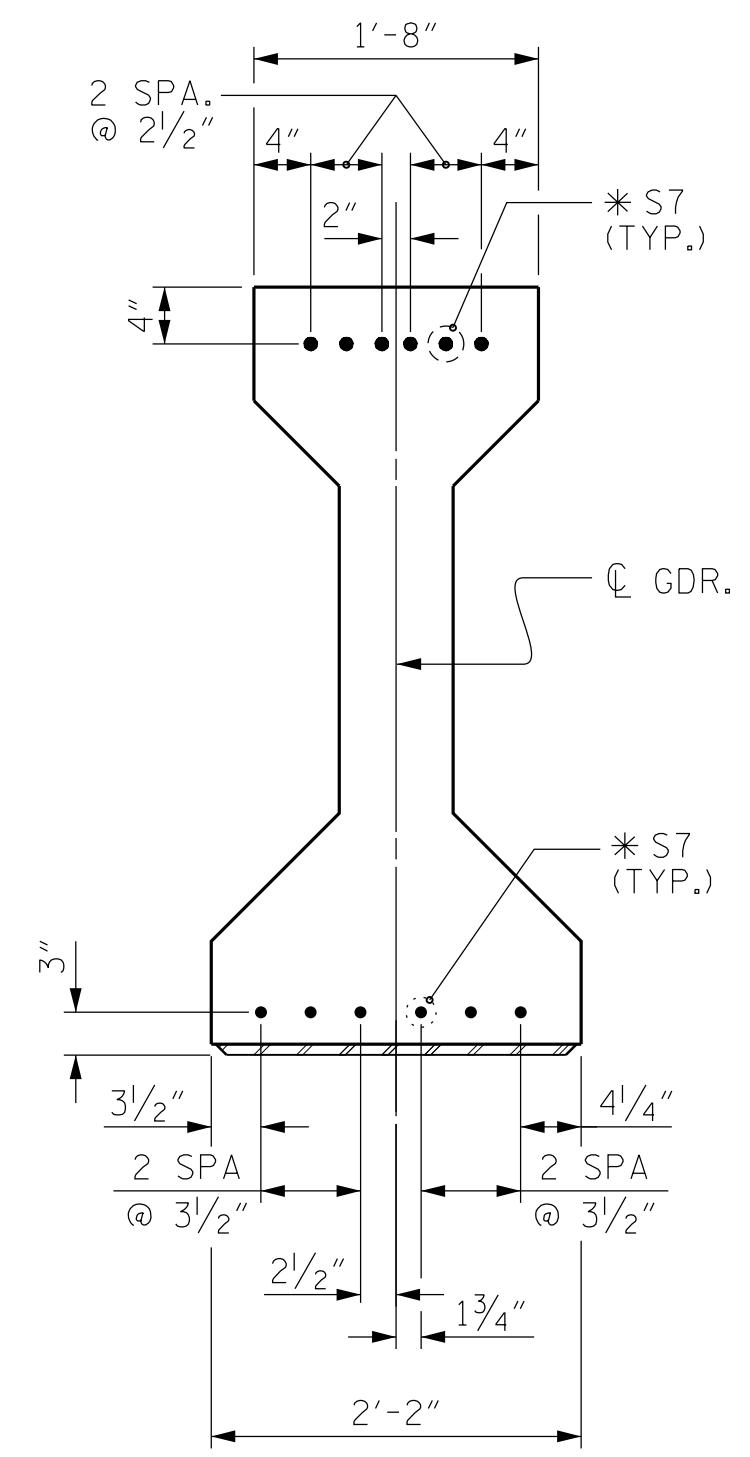
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.



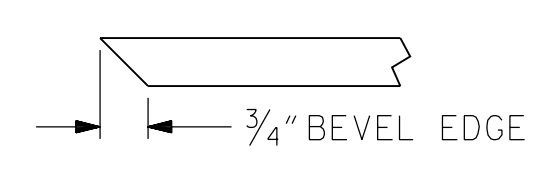
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

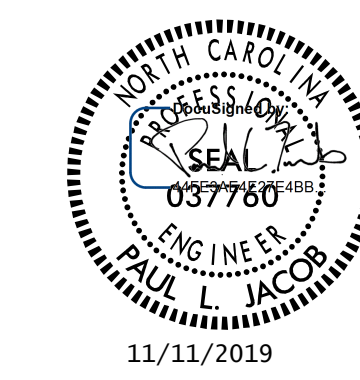


SECTION "F"

(SEE NOTES)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : M. RAY	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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 SIGNATURES COMPLETED

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**STRUCTURAL STEEL NOTES**

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

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

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

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

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

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

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

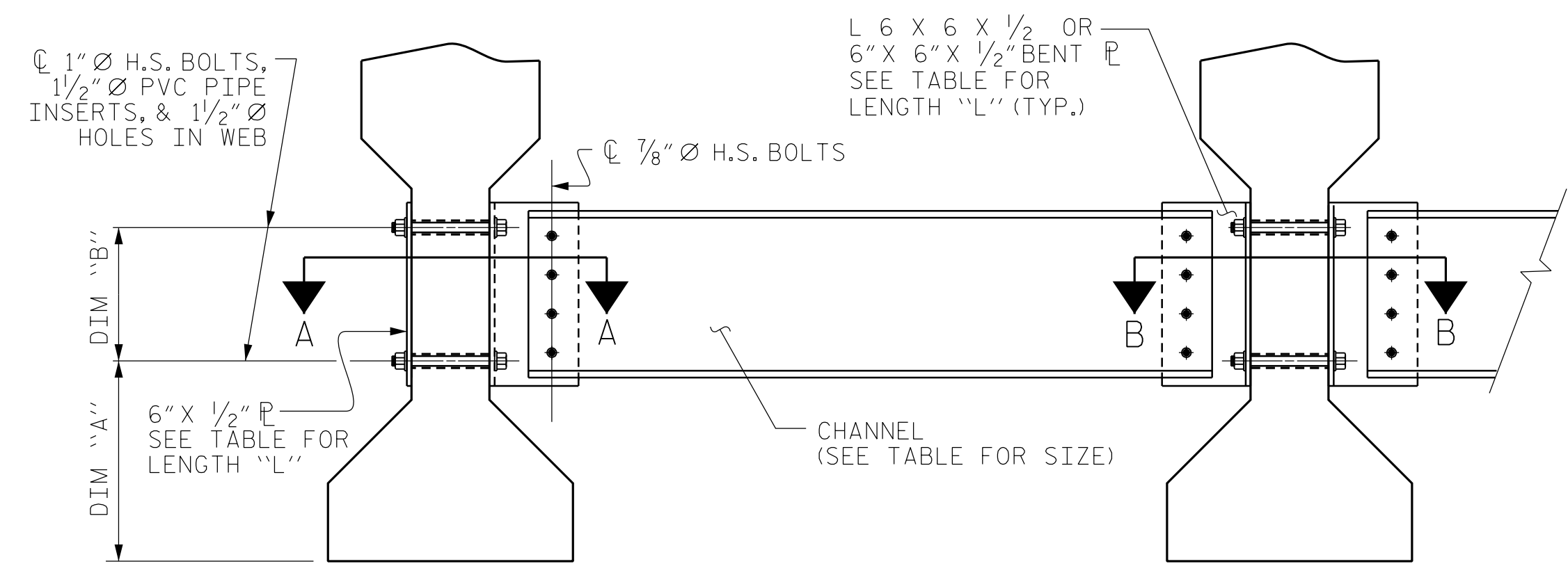
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

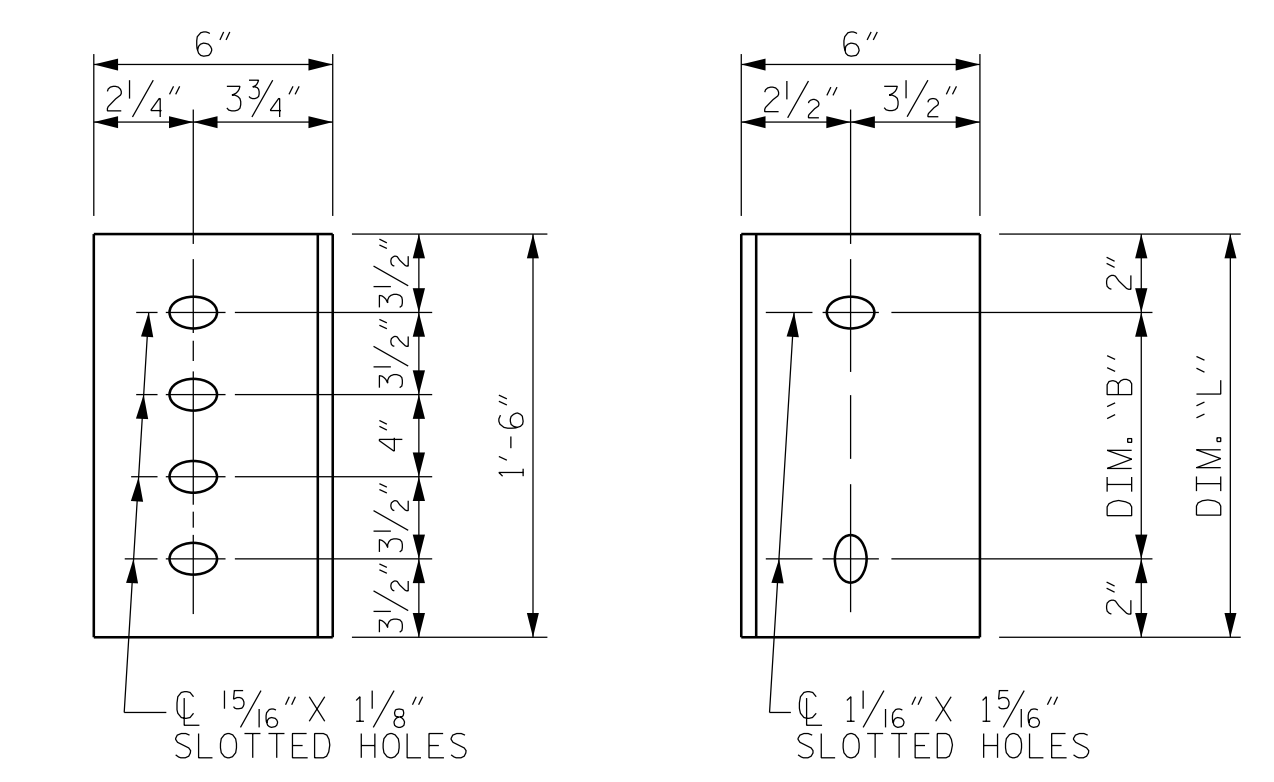
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

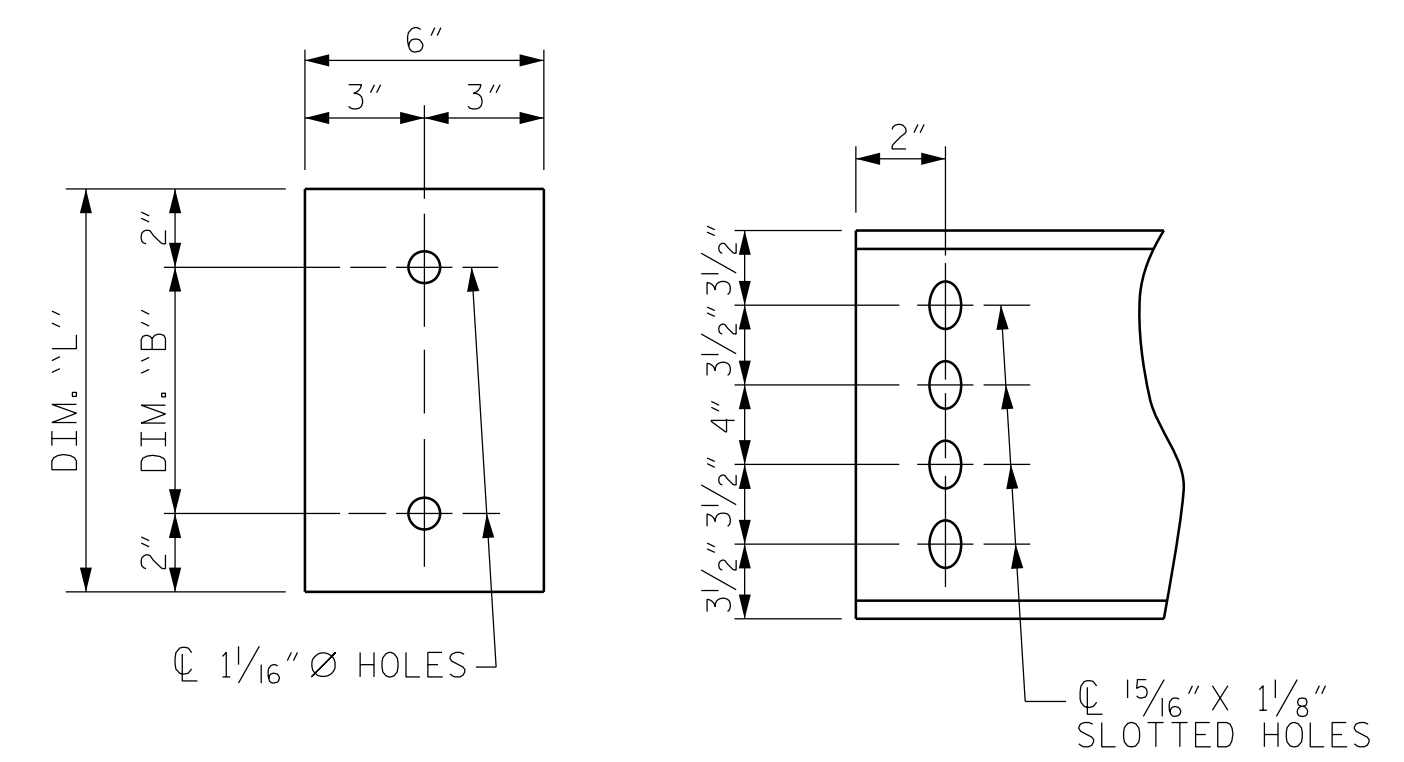
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



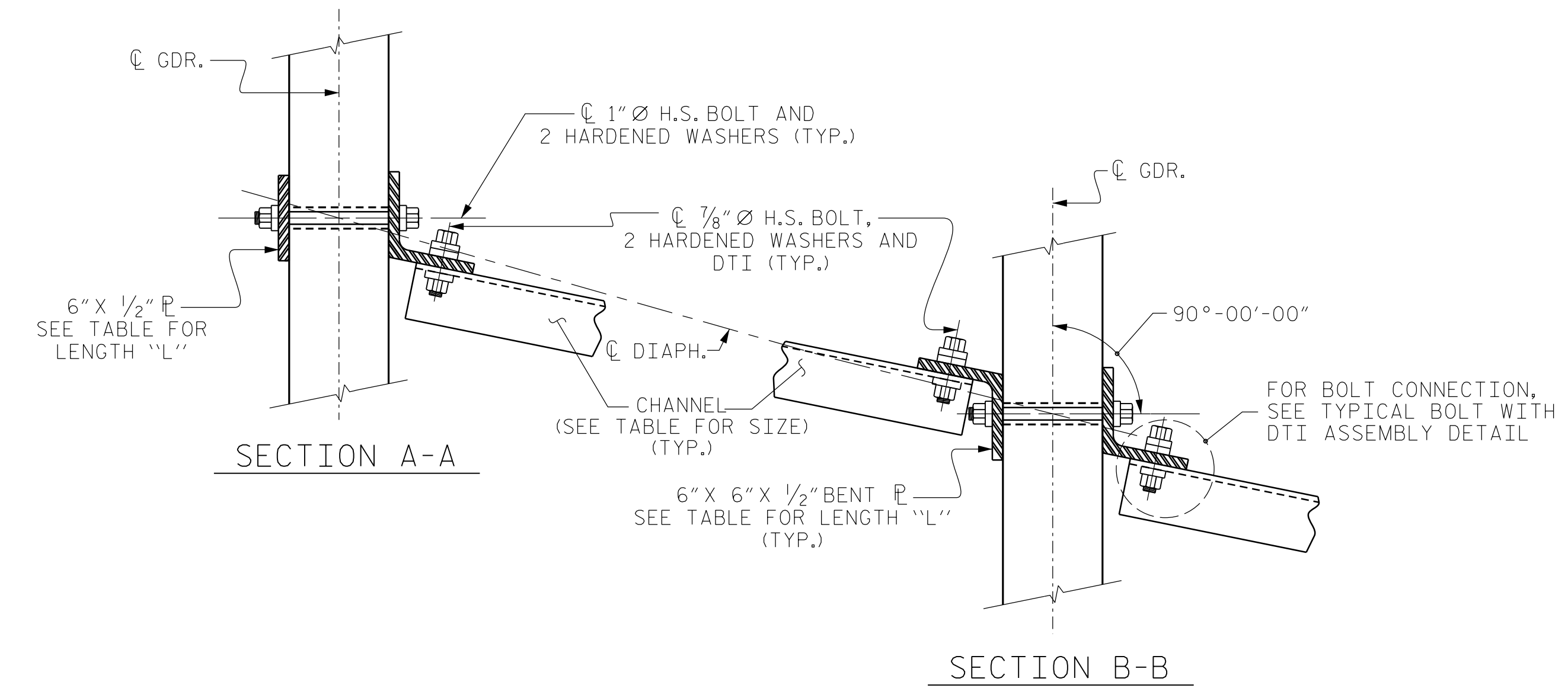
**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



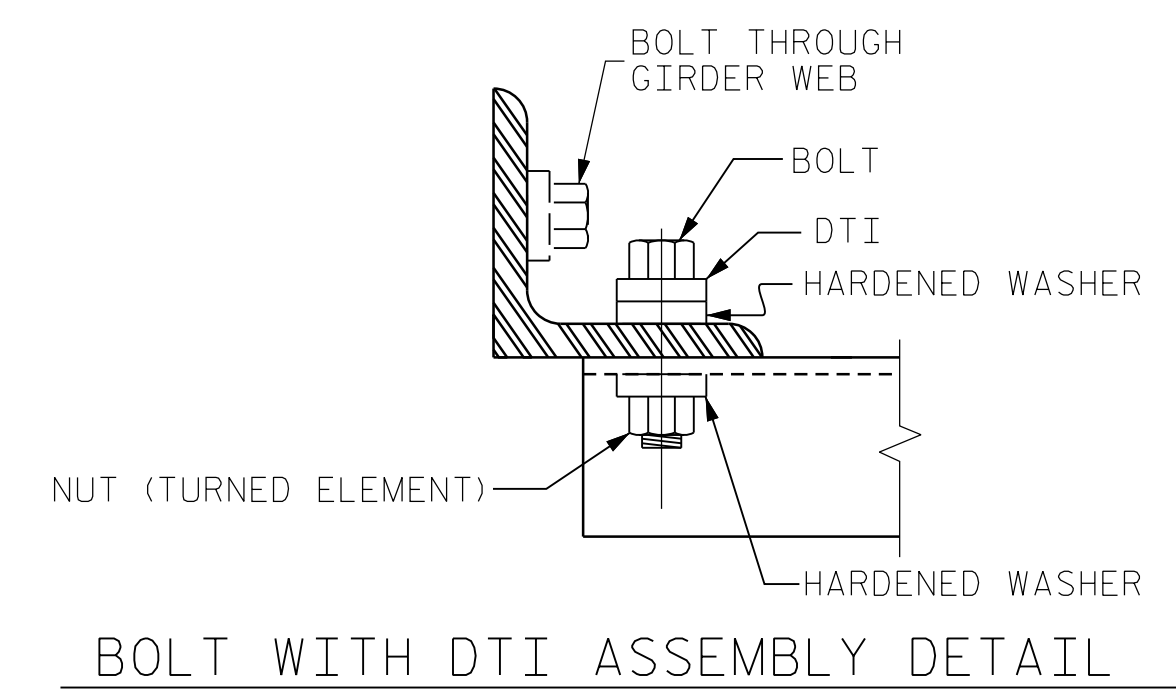
**DIAPHRAGM FACE**      **WEB FACE**  
**CONNECTOR PLATE DETAILS**



**PLATE DETAILS**      **CHANNEL END**



**CONNECTION DETAILS**

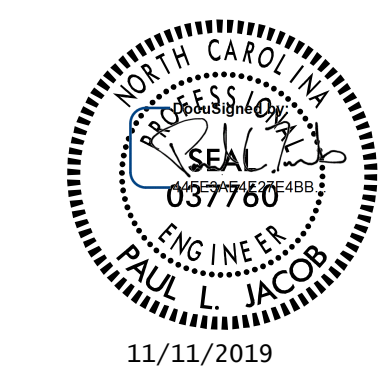


**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

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

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**INTERMEDIATE DIAPHRAGM DETAILS**  
(RIGHT LANE)

ASSEMBLED BY : M. RAY	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 6/05	REV. 5/1/06 KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NC License NO.: F-0105

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1			3			TOTAL SHEETS
2			4			35

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NOTES

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

STEEL SOLE PLATES, ANCHOR BOLTS, AND NUTS 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, AND NUTS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

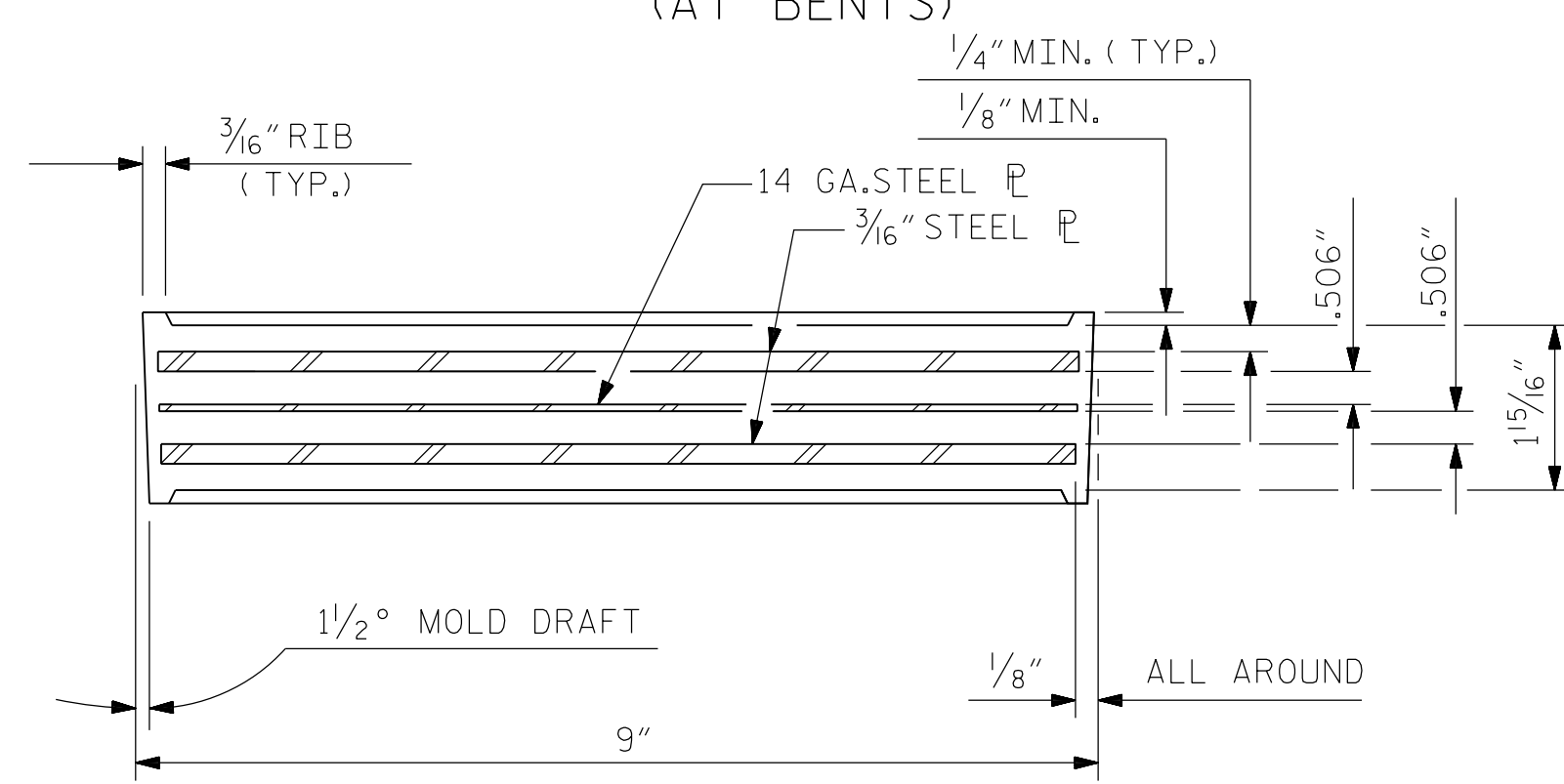
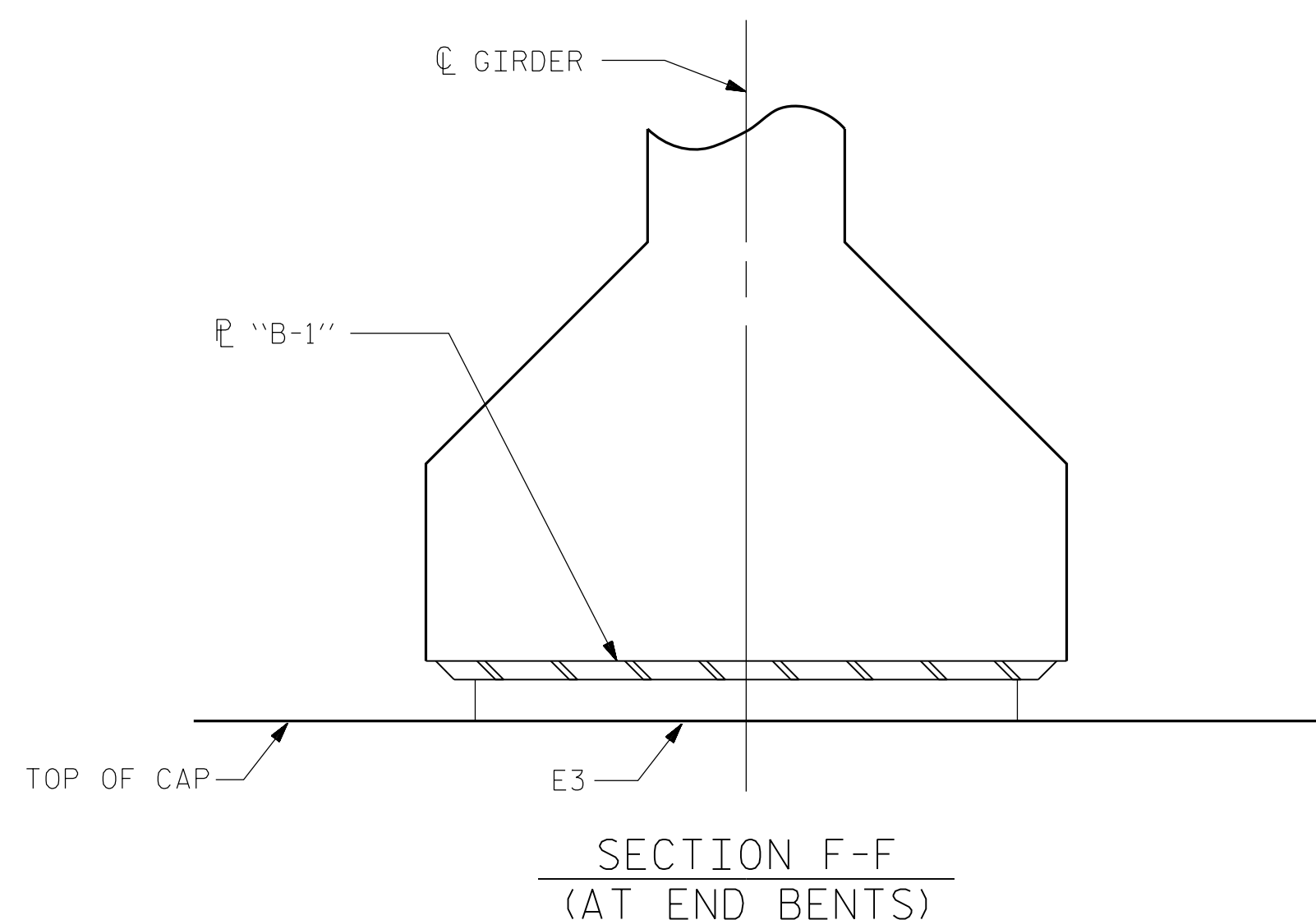
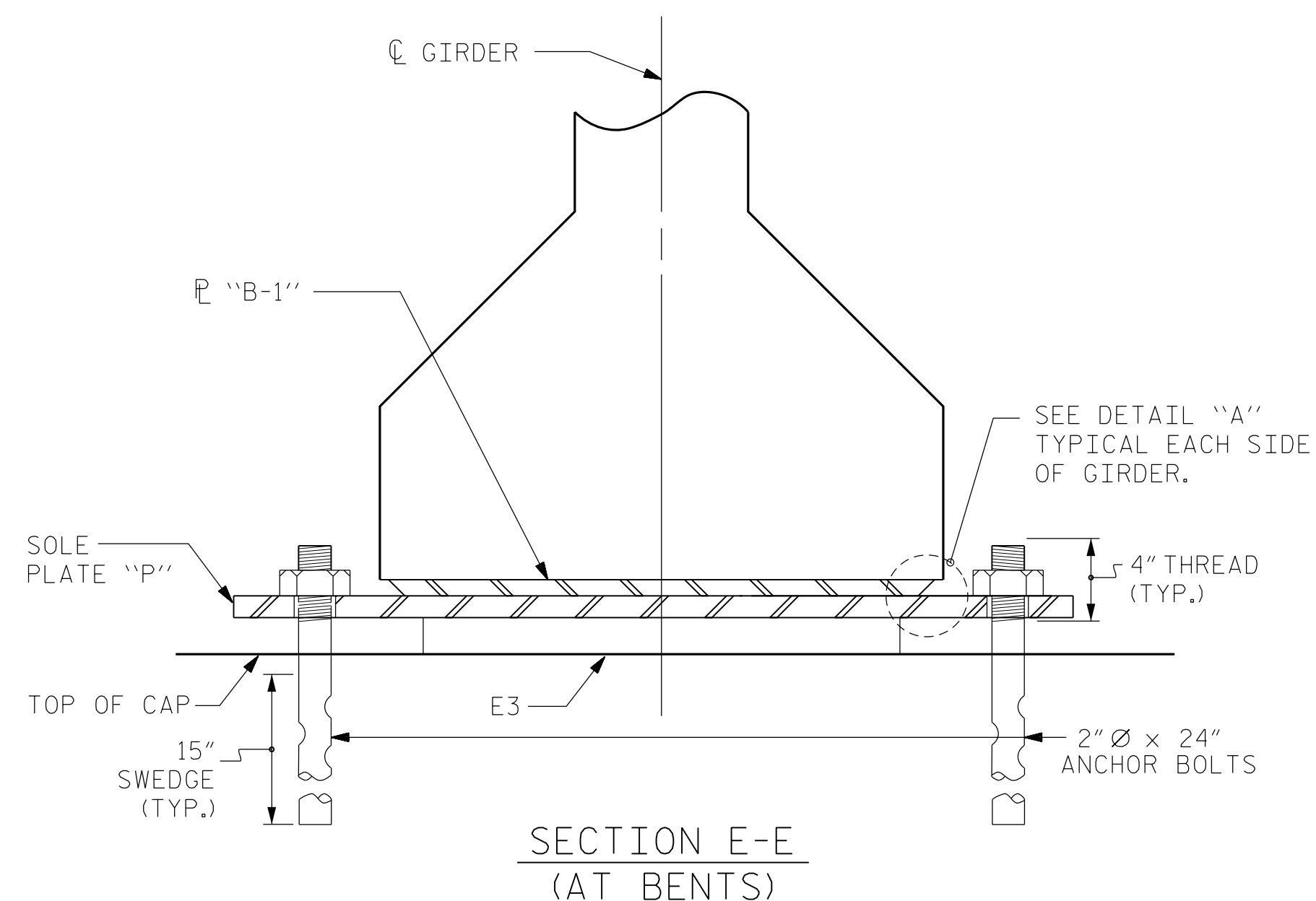
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

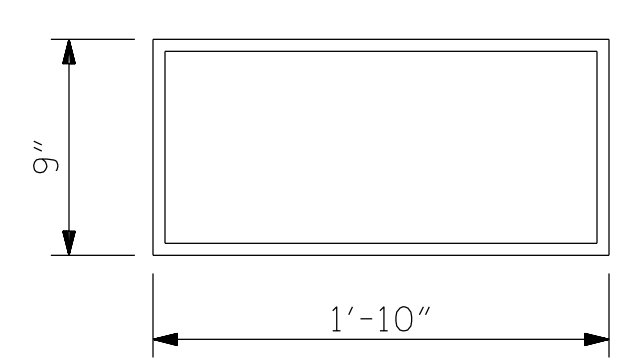
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

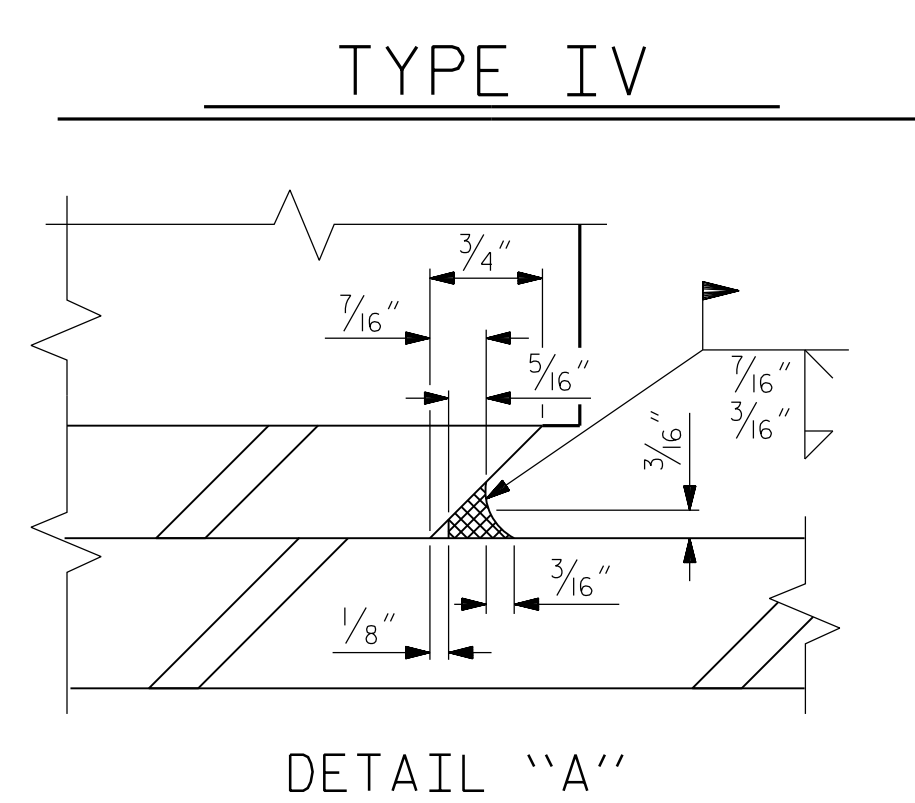
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



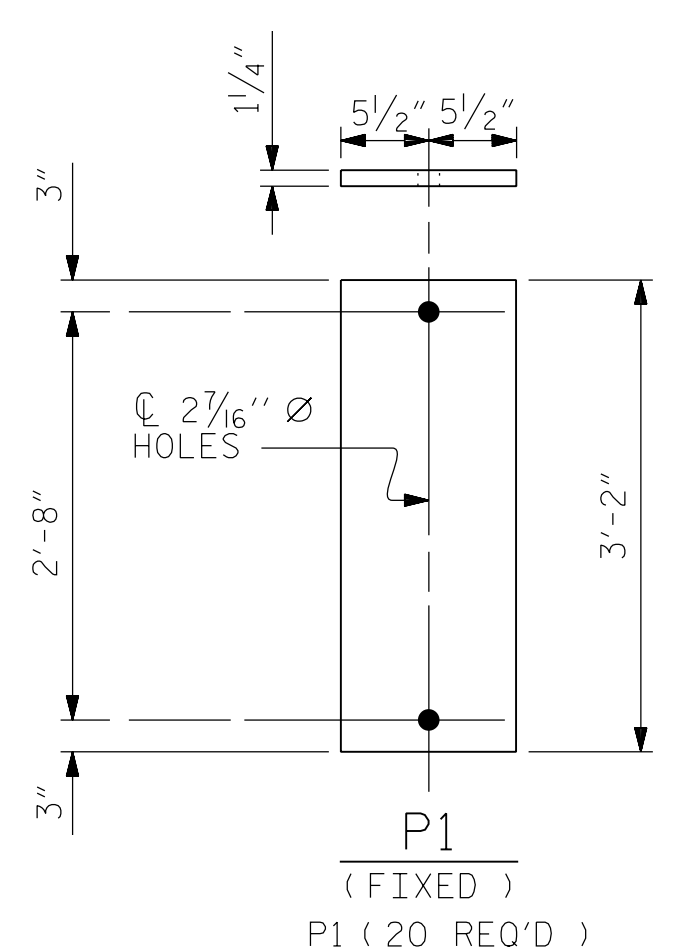
TYPICAL SECTION OF ELASTOMERIC BEARINGS



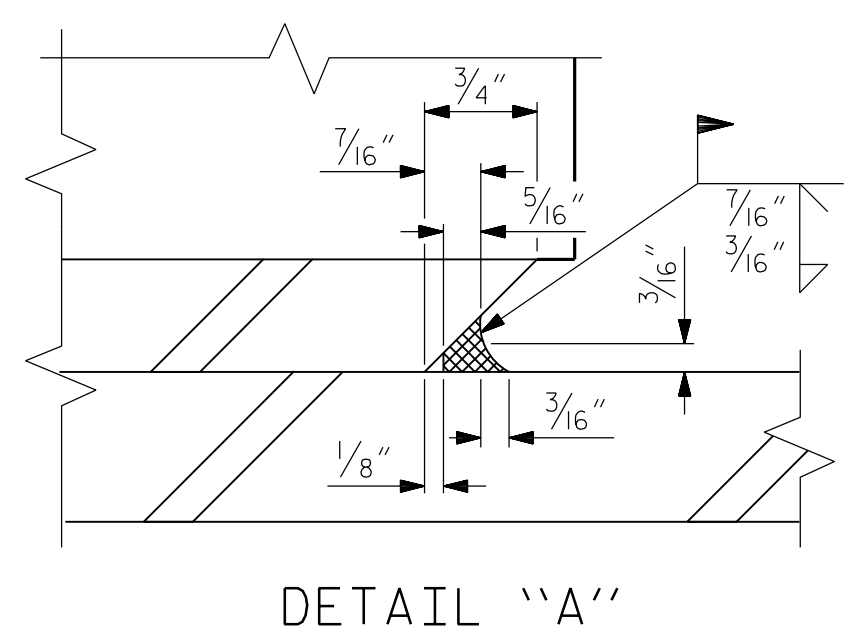
E3 (30 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE IV



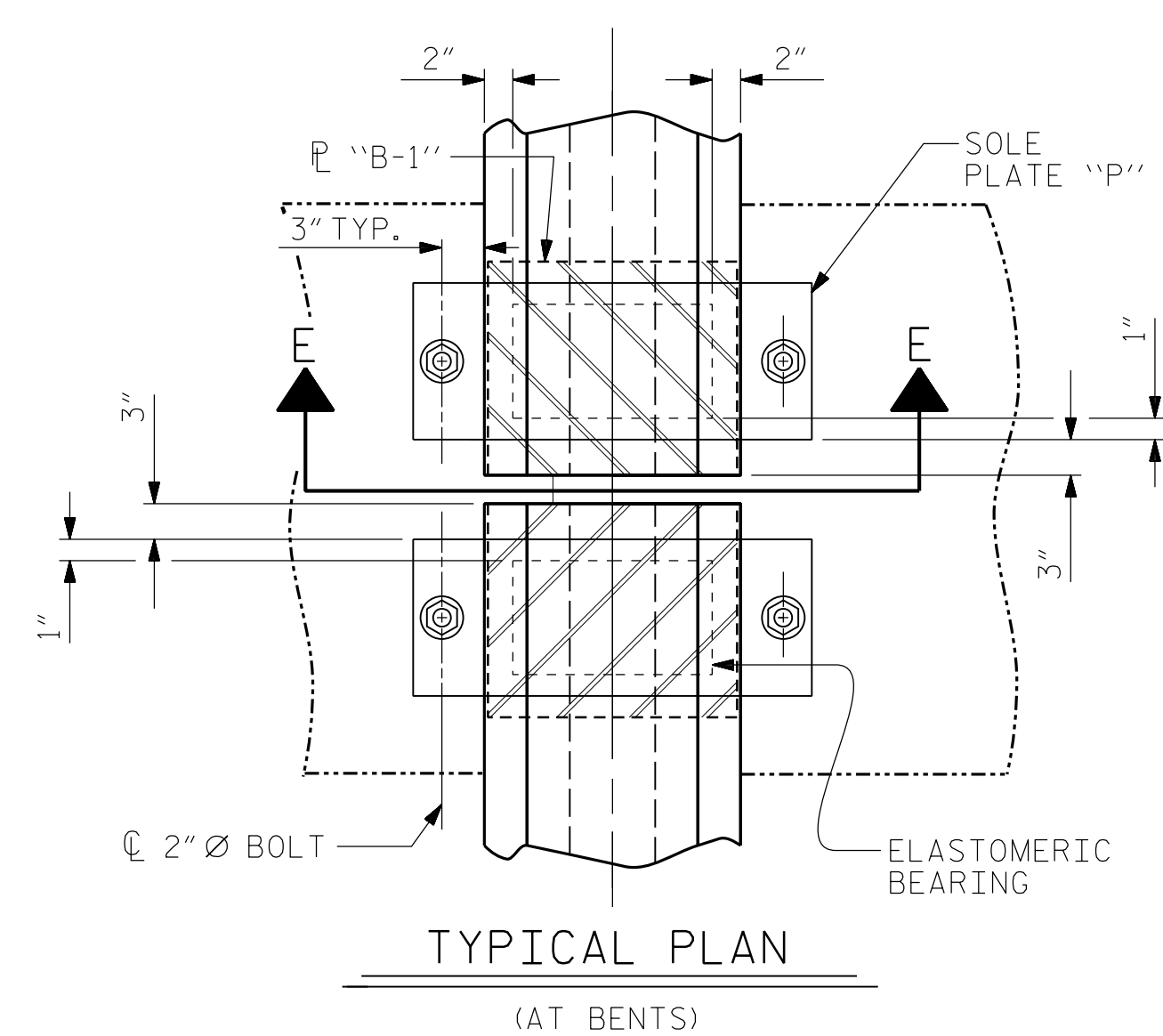
DETAIL "A"



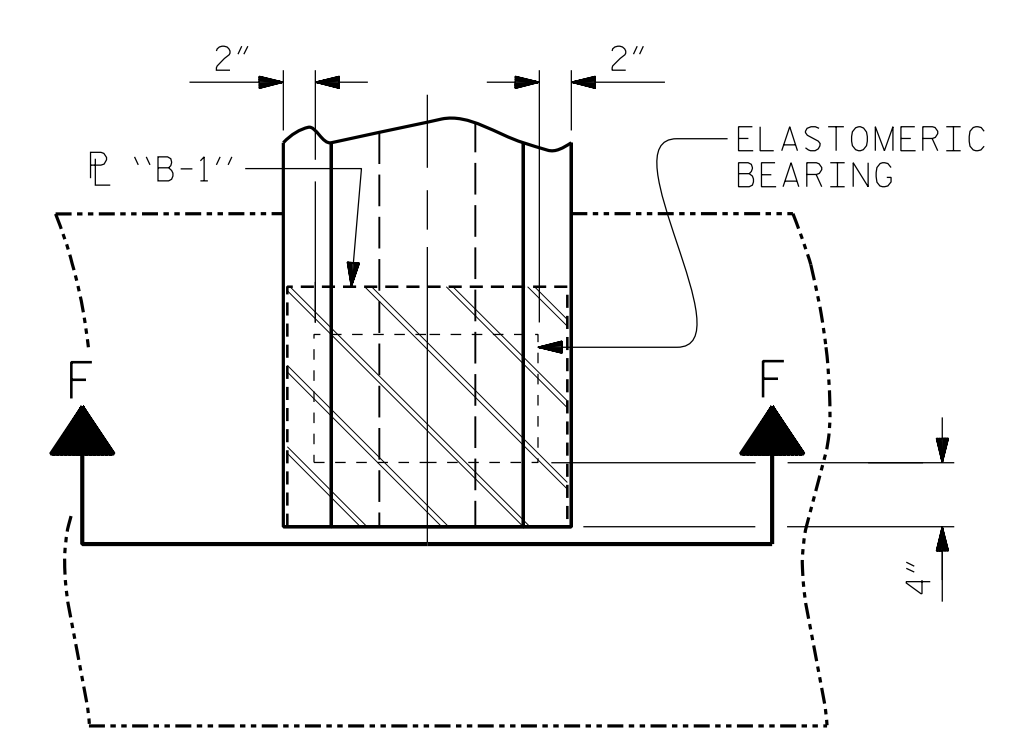
SOLE PLATE DETAILS ("P")



DETAIL "A"



TYPICAL PLAN  
(AT BENTS)

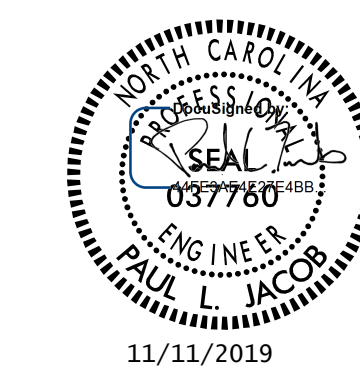


TYPICAL PLAN  
(AT END BENTS)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE  
(RIGHT LANE)



ASSEMBLED BY : M. RAY	DATE : 05/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : GRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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NC License NO.: F-0105

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			35

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																				
0.6"Ø LOW RELAXATION	SPAN "A"												SPAN "A"												SPAN "A"											
	GIRDER 1												GIRDERS 2, 3, AND 4												GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0			
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.004	0.008	0.011	0.013	0.013	0.015	0.011	0.008	0.004	0.000	0.000	0.004	0.008	0.011	0.013	0.013	0.013	0.011	0.008	0.004	0.000	0.000	0.004	0.008	0.011	0.013	0.013	0.013	0.011	0.008	0.004	0.000			
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000			
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	0"	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"			

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																				
0.6"Ø LOW RELAXATION	SPAN "B"												SPAN "B"												SPAN "B"											
	GIRDER 1												GIRDERS 2, 3, AND 4												GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0			
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.061	0.115	0.157	0.184	0.193	0.184	0.157	0.115	0.061	0.000	0.000	0.061	0.115	0.157	0.184	0.193	0.184	0.157	0.115	0.061	0.000	0.000	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.000			
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.033	0.066	0.091	0.108	0.113	0.108	0.091	0.066	0.033	0.000	0.000	0.035	0.070	0.097	0.115	0.121	0.115	0.097	0.070	0.035	0.000	0.000	0.035	0.070	0.097	0.114	0.120	0.114	0.097	0.070	0.035	0.000			
FINAL CAMBER ↑	0"	5/16"	9/16"	13/16"	15/16"	15/16"	15/16"	13/16"	9/16"	5/16"	0"	0"	5/16"	9/16"	11/16"	13/16"	7/8"	13/16"	11/16"	9/16"	5/16"	0"	0"	5/16"	9/16"	3/8"	15/16"	15/16"	15/16"	13/16"	9/16"	5/16"	0"			

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																				
0.6"Ø LOW RELAXATION	SPAN "C"												SPAN "C"												SPAN "C"											
	GIRDER 1												GIRDERS 2, 3, 4, AND 5												GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0			
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.000	0.000	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.000	0.000	0.005	0.009	0.013	0.015	0.016	0.015	0.013	0.009	0.005	0.000			
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000			
FINAL CAMBER ↑	0"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0"	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"	0"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0"			

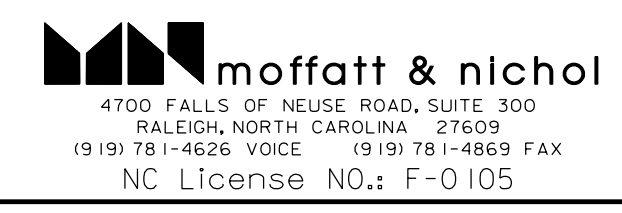
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**DEAD LOAD DEFLECTIONS  
FOR PRESTRESSED  
CONCRETE GIRDERS  
(RIGHT LANE)**

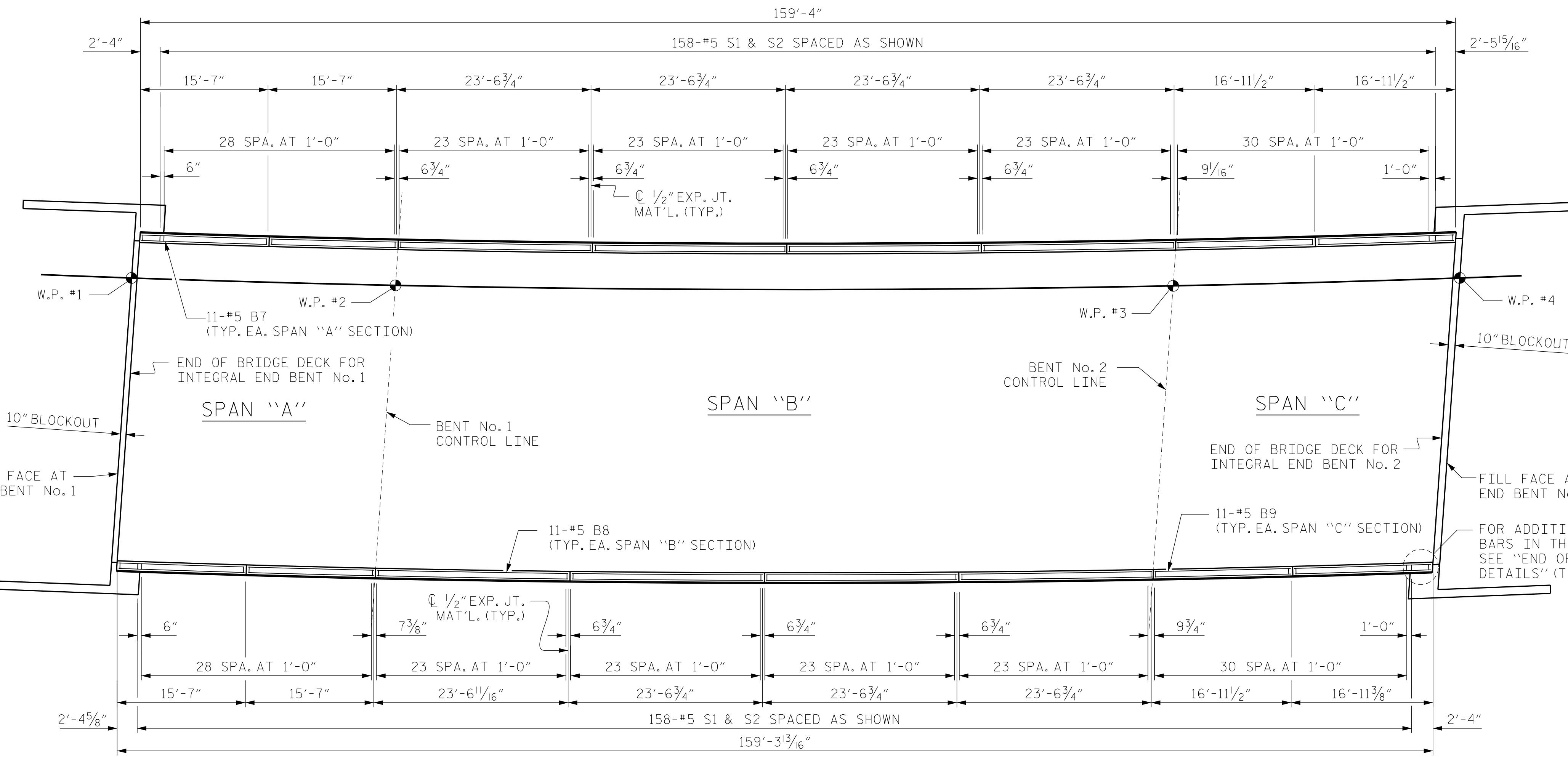
DRAWN BY : M. RAY DATE : 08/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			35

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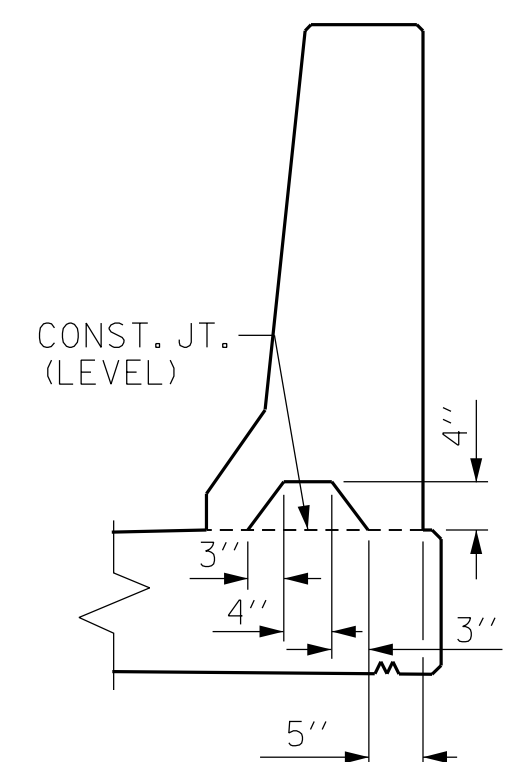


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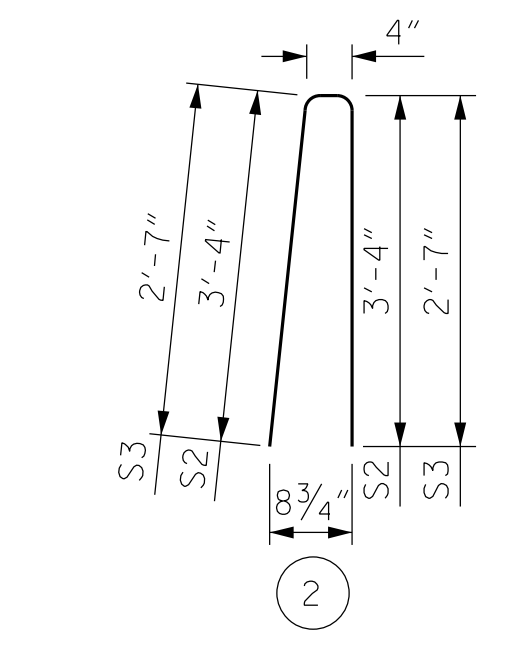
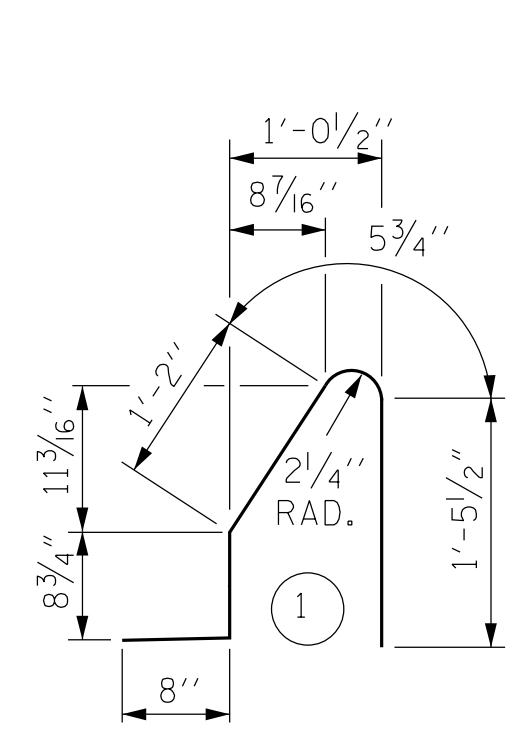
CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN UNIT HAS BEEN CAST AND HAS REACHED A COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

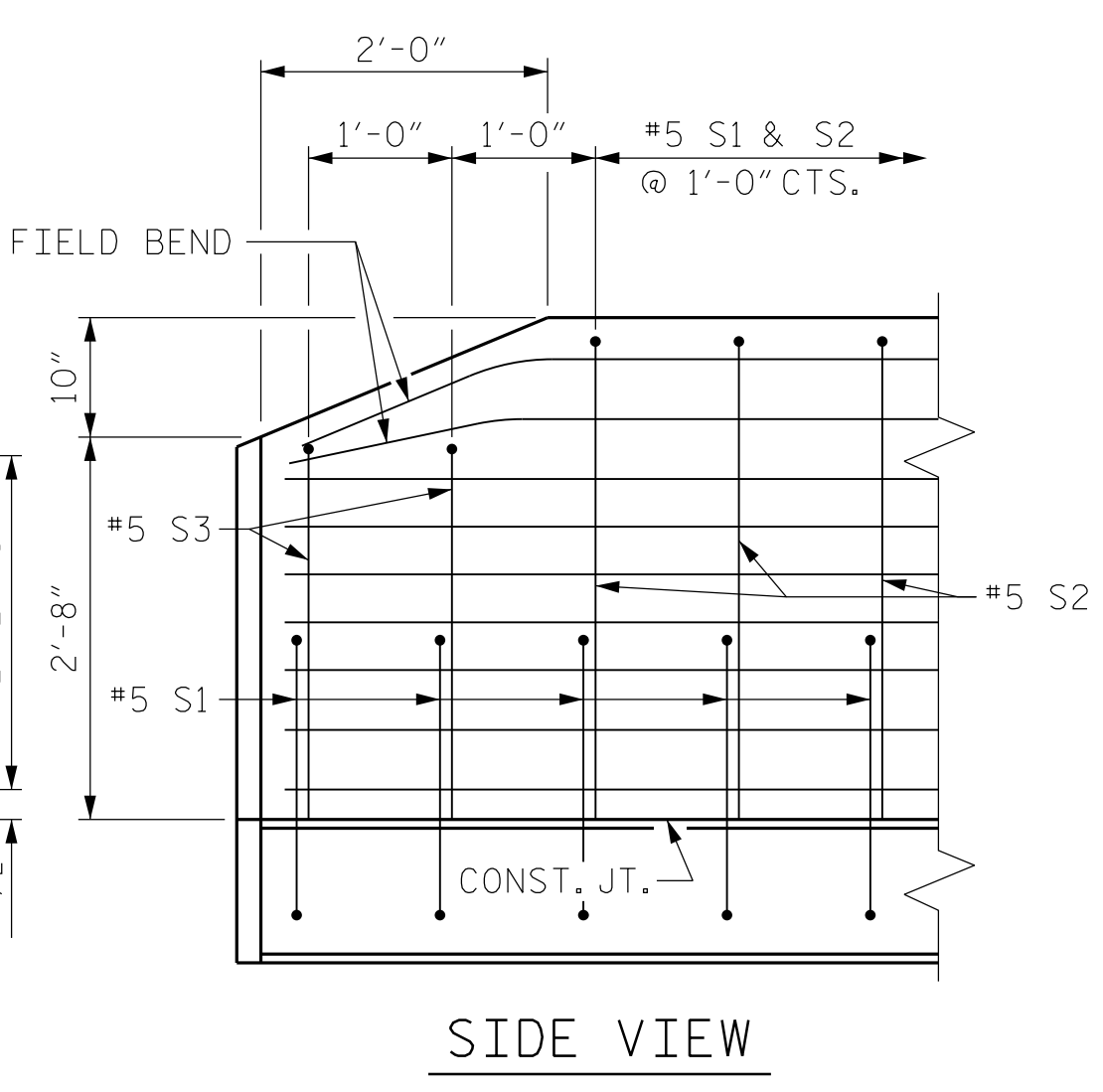
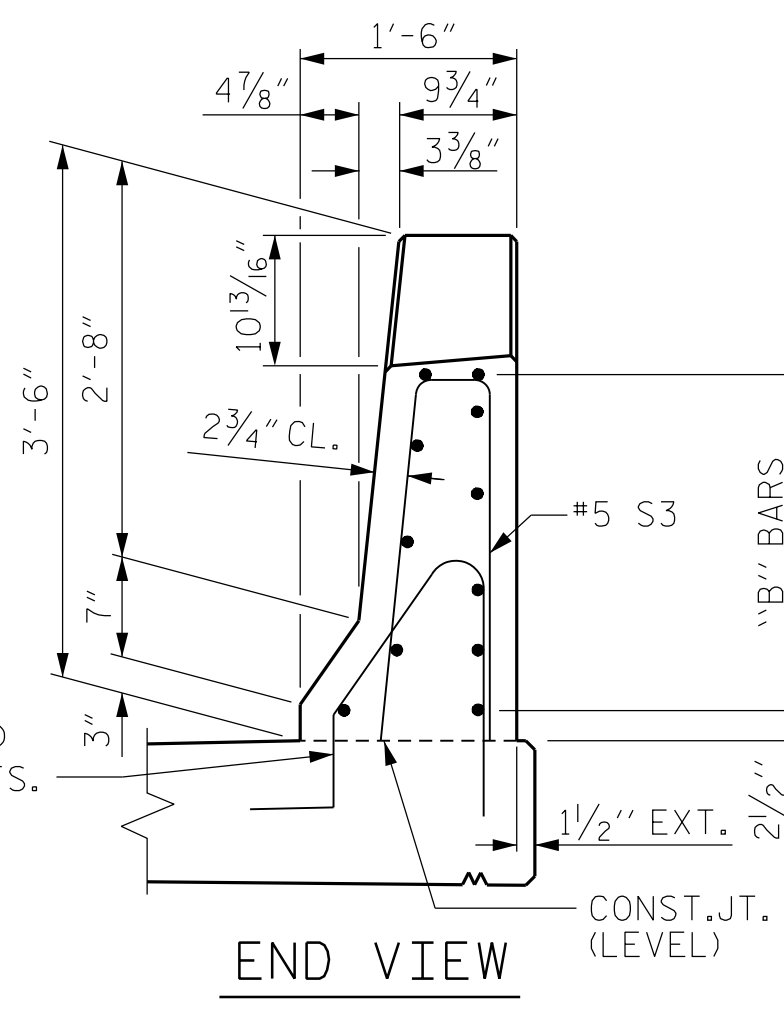
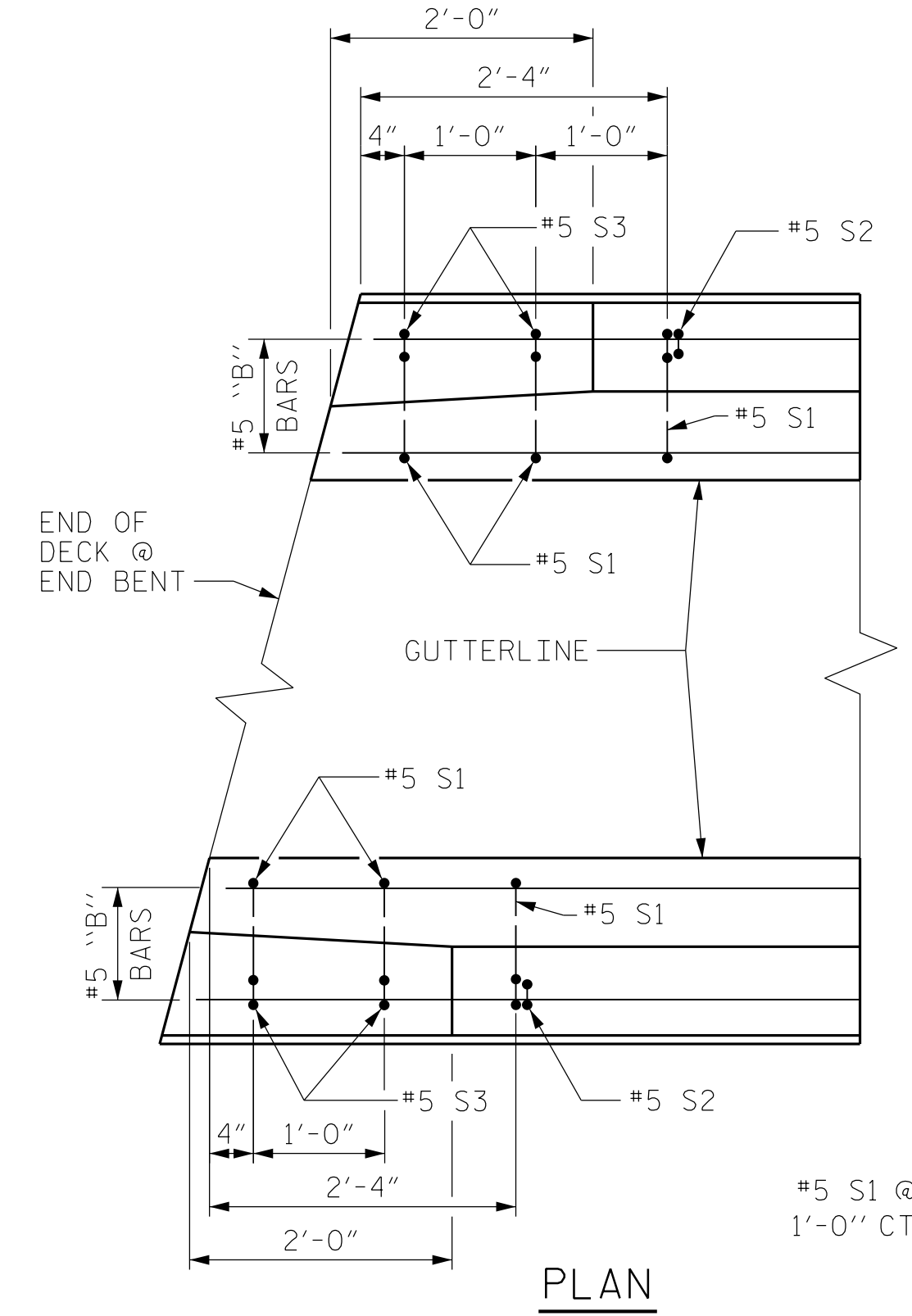
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	324	#5	1	4'-6"	1521
* S2	316	#5	2	7'-0"	2307
* S3	8	#5	2	5'-6"	46
* B7	44	#5	STR	15'-2"	696
* B8	88	#5	STR	23'-2"	2126
* B9	44	#5	STR	16'-6"	757

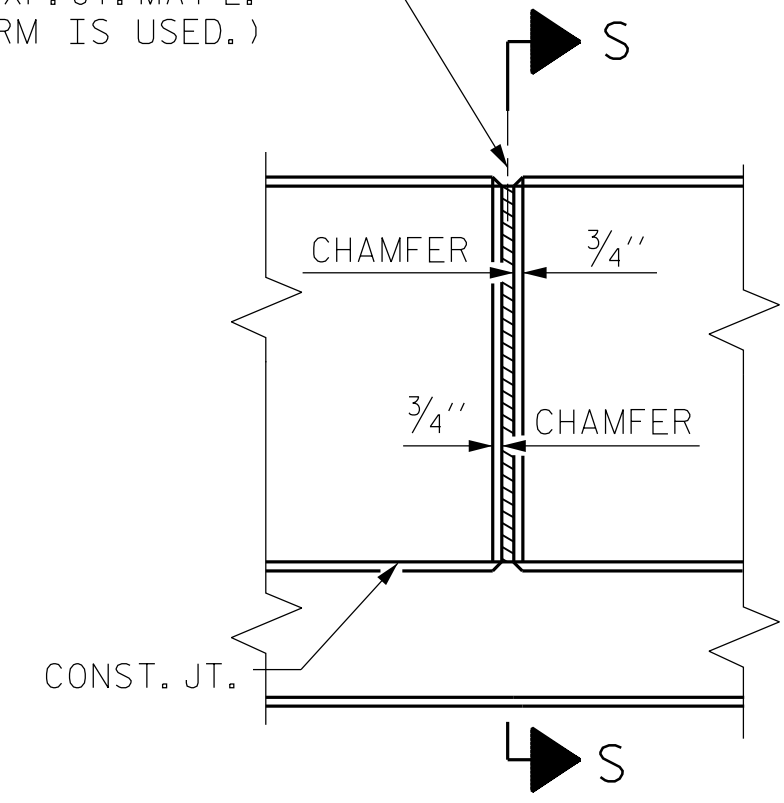
* EPOXY COATED REINFORCING STEEL	7453 LBS.
CLASS AA CONCRETE	37.9 CU. YDS.
CONCRETE BARRIER RAIL	318.6 LIN. FT.

PLAN OF CONCRETE BARRIER RAIL

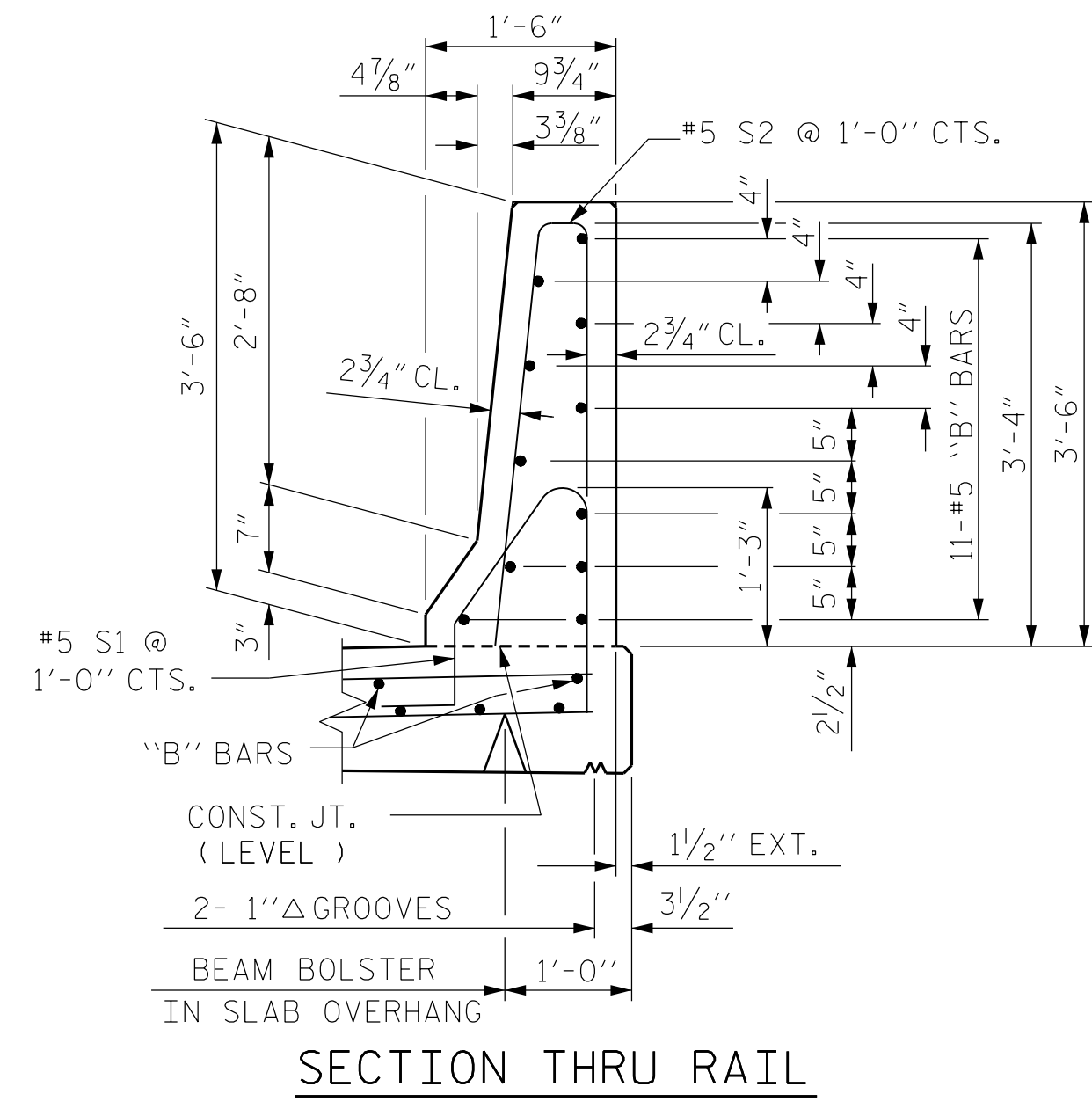
(MEASUREMENTS TAKEN ALONG ARC ON BACK FACE OF BARRIER RAIL) (EXPANSION JOINTS ARE RADIAL TO THE GRADE LINE)



1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



BARRIER RAIL DETAILS



ASSEMBLED BY : M. RAY	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ARB 5/8T	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/8T	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

moffatt & nichol

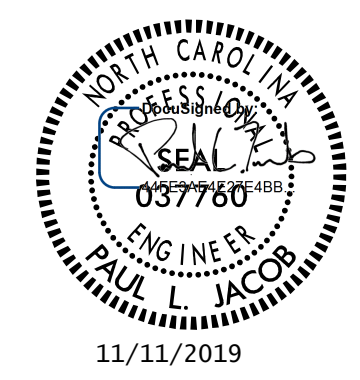
4700 FALLS OF NEUSE ROAD, SUITE 300

RALEIGH, NORTH CAROLINA 27609

(919) 781-4626 VOICE (919) 781-4869 FAX

NC License No.: F-0105

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PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 33+45.18 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD

CONCRETE BARRIER RAIL

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-20
1			3			TOTAL SHEETS
2			4			35

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

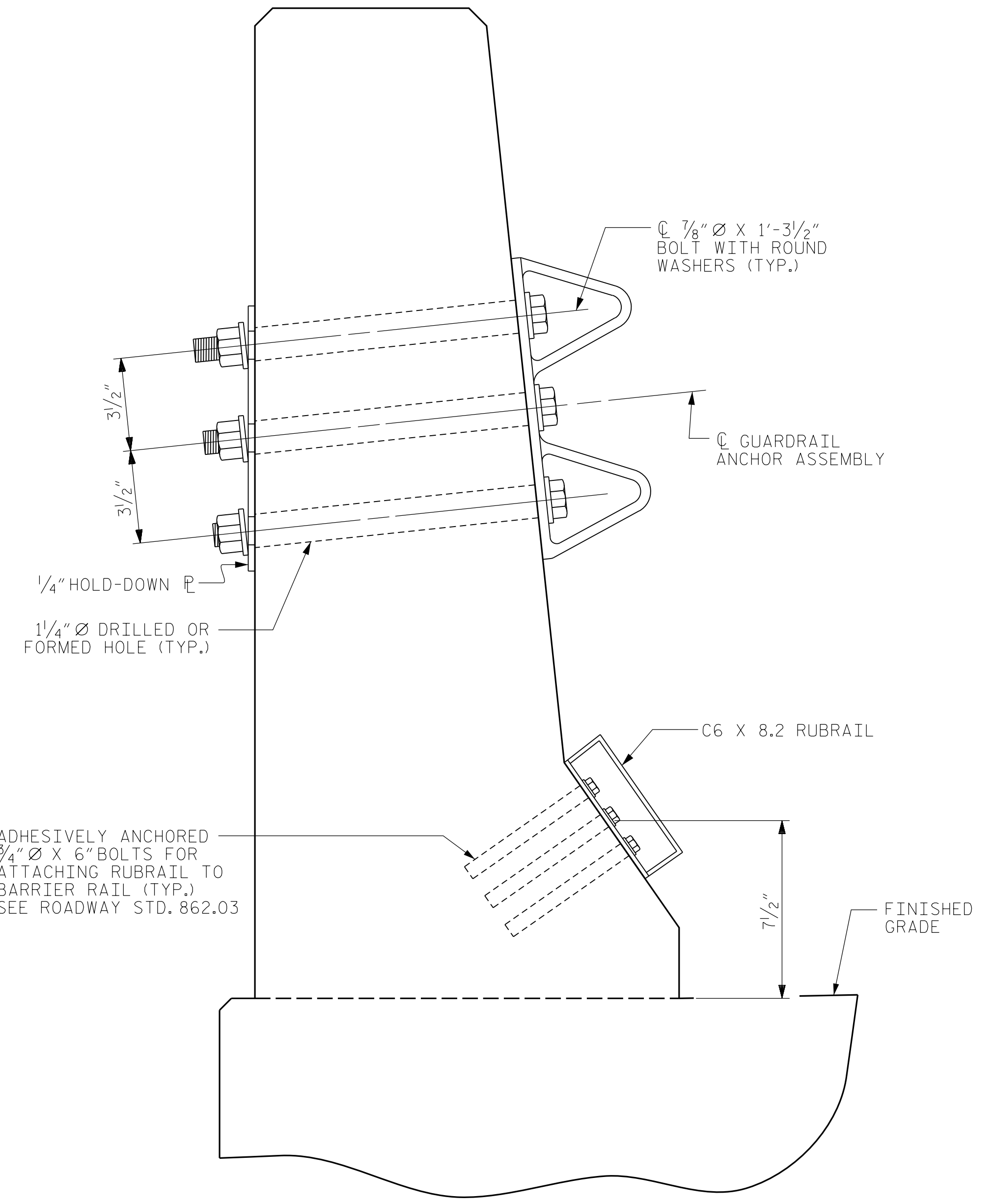
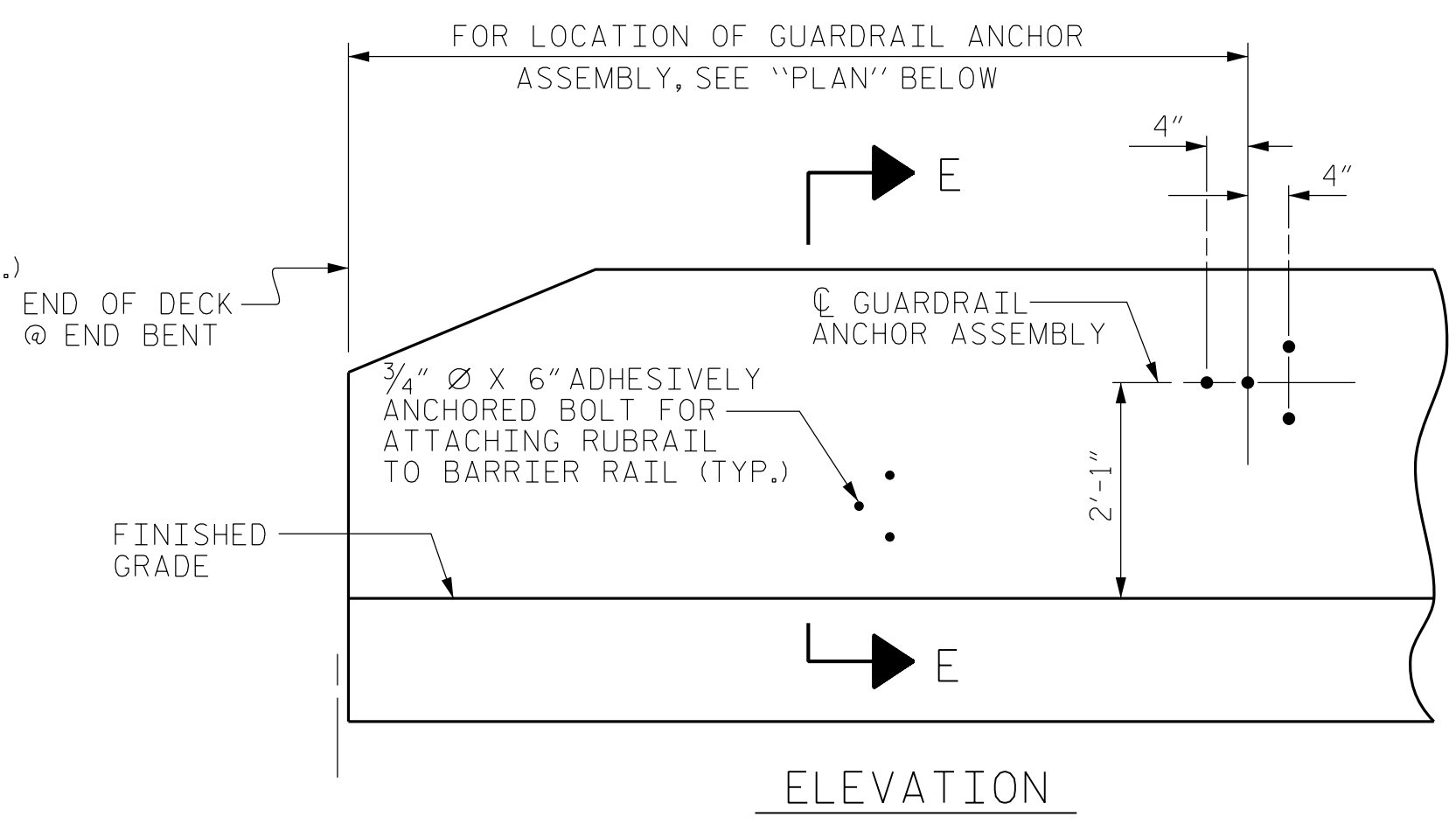
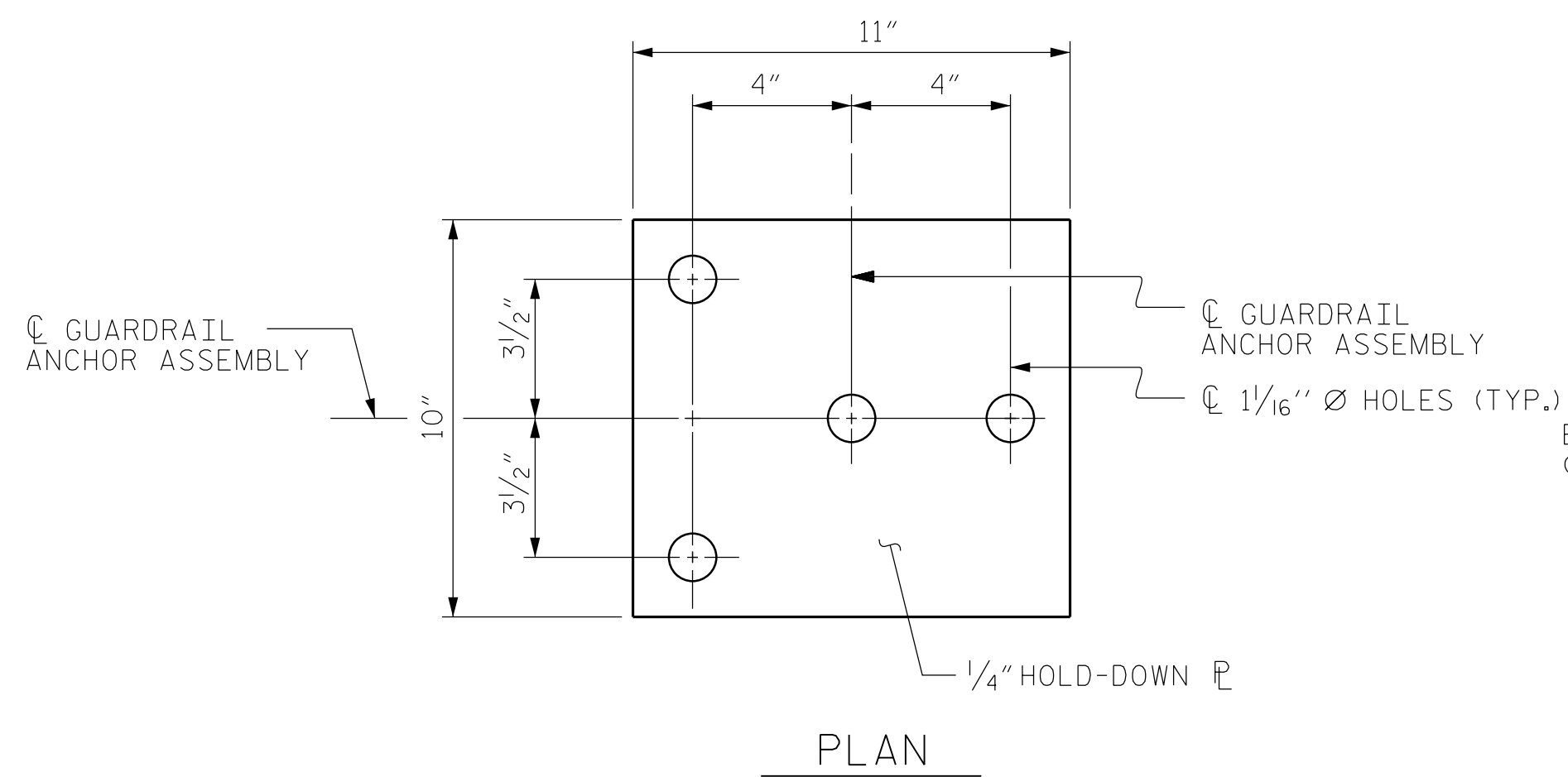
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

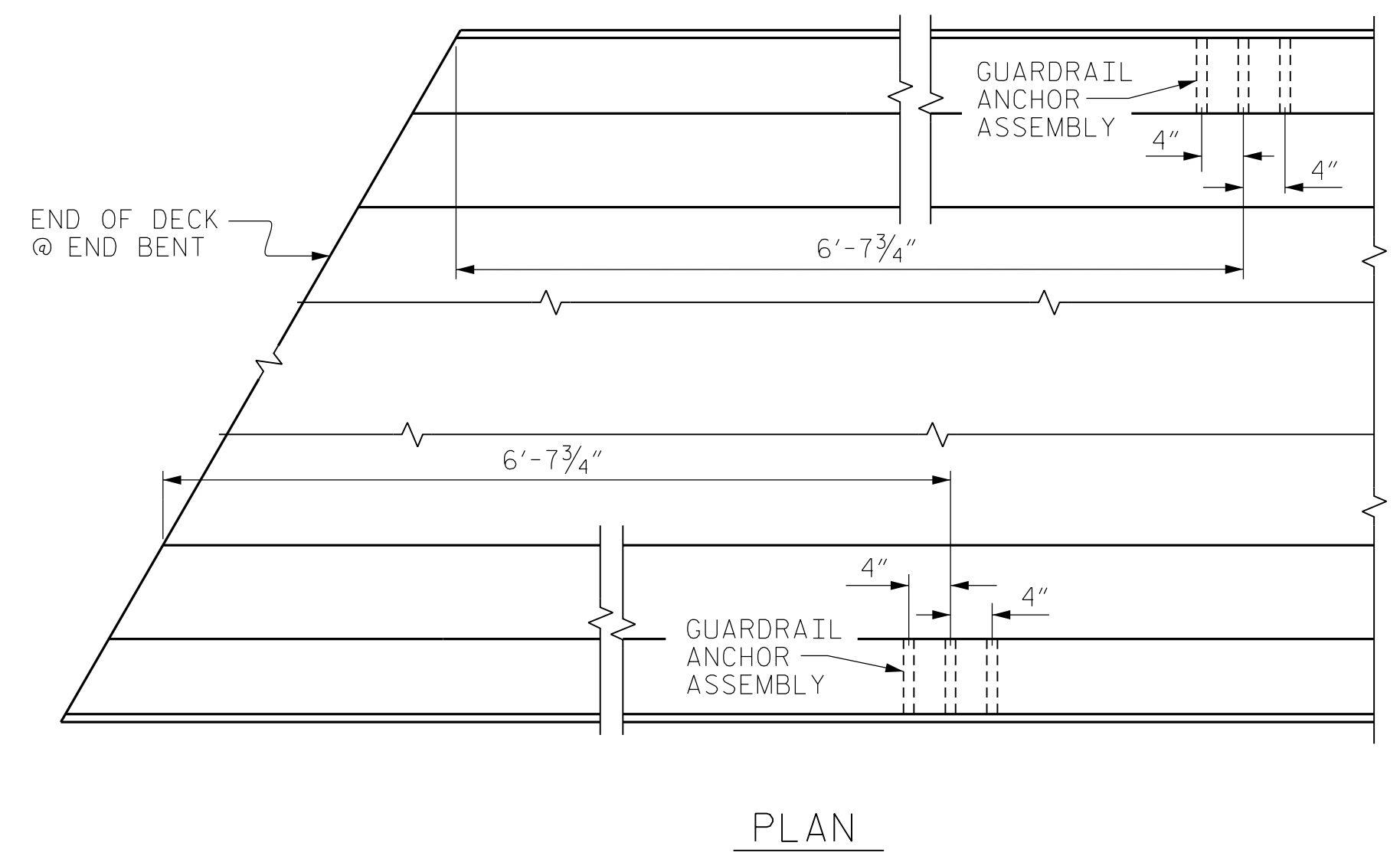
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

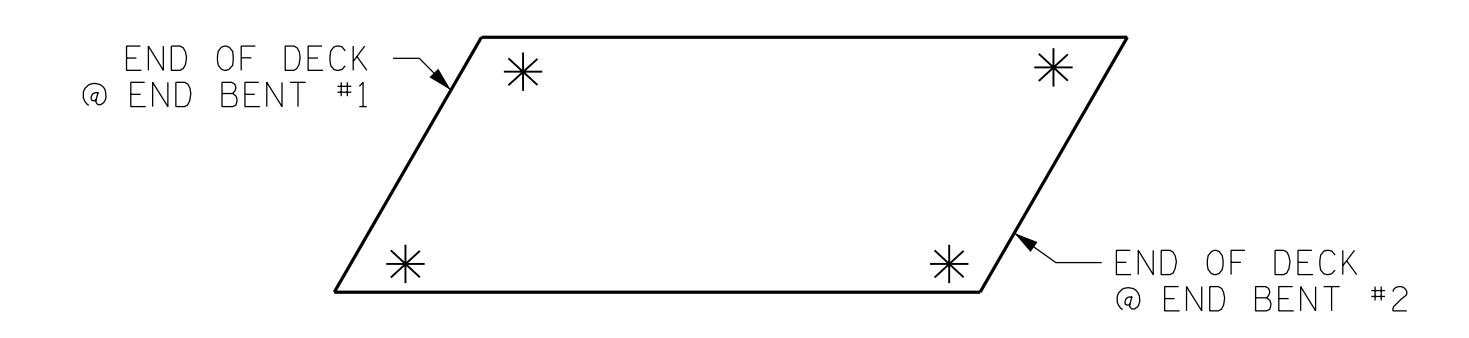


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

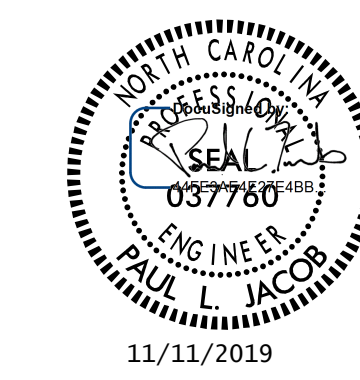


SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL  
(RIGHT LANE)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

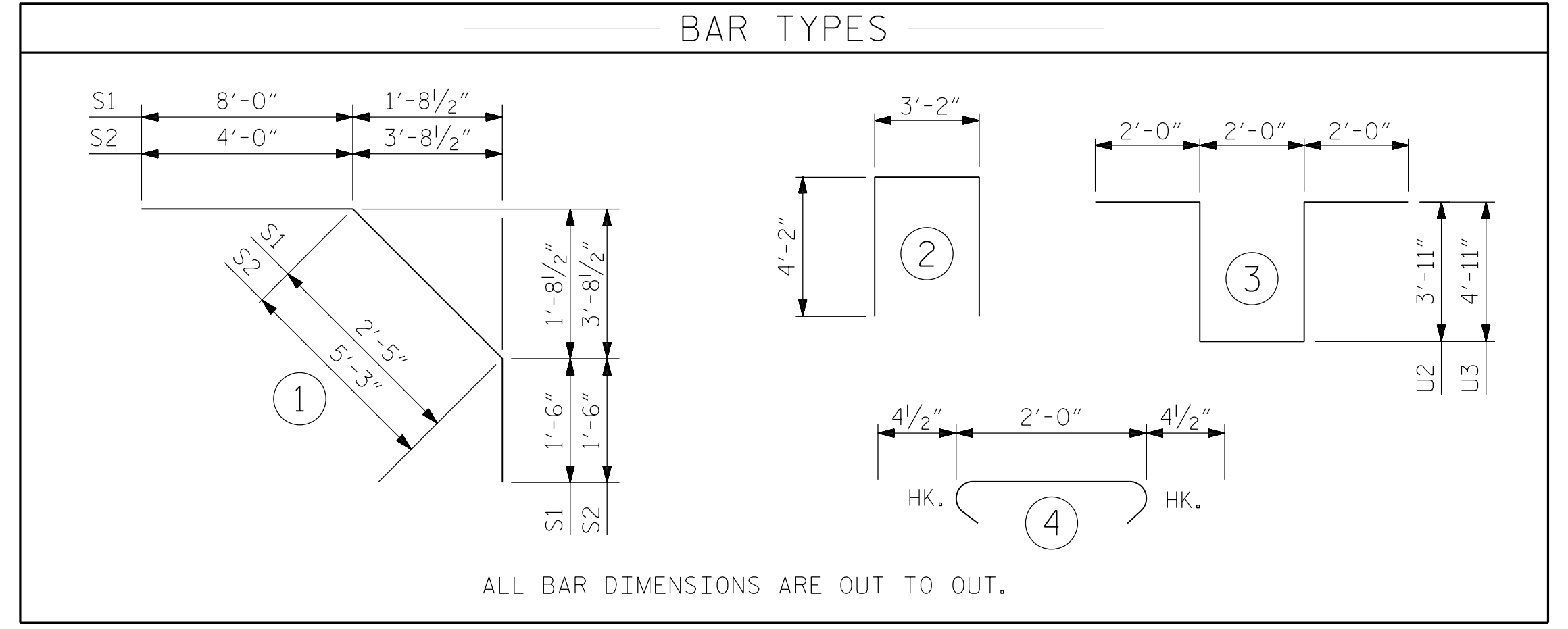
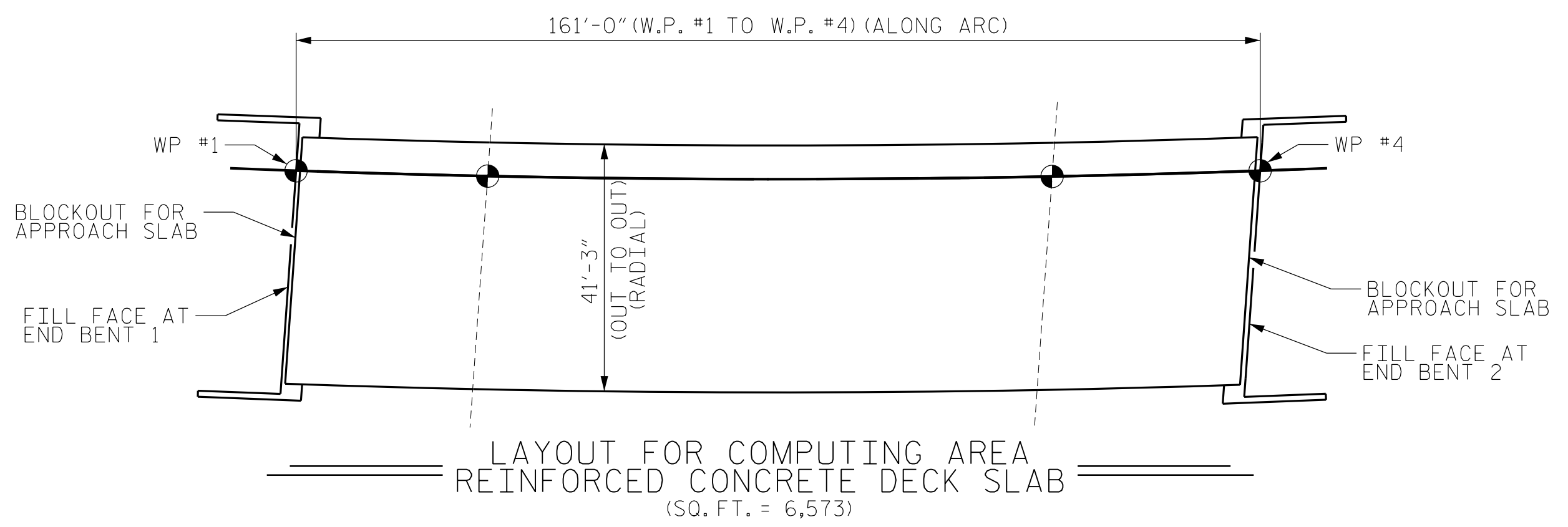
**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			35

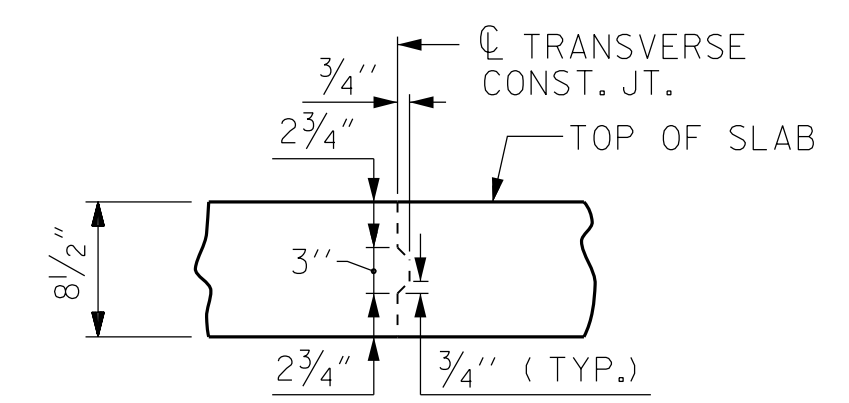
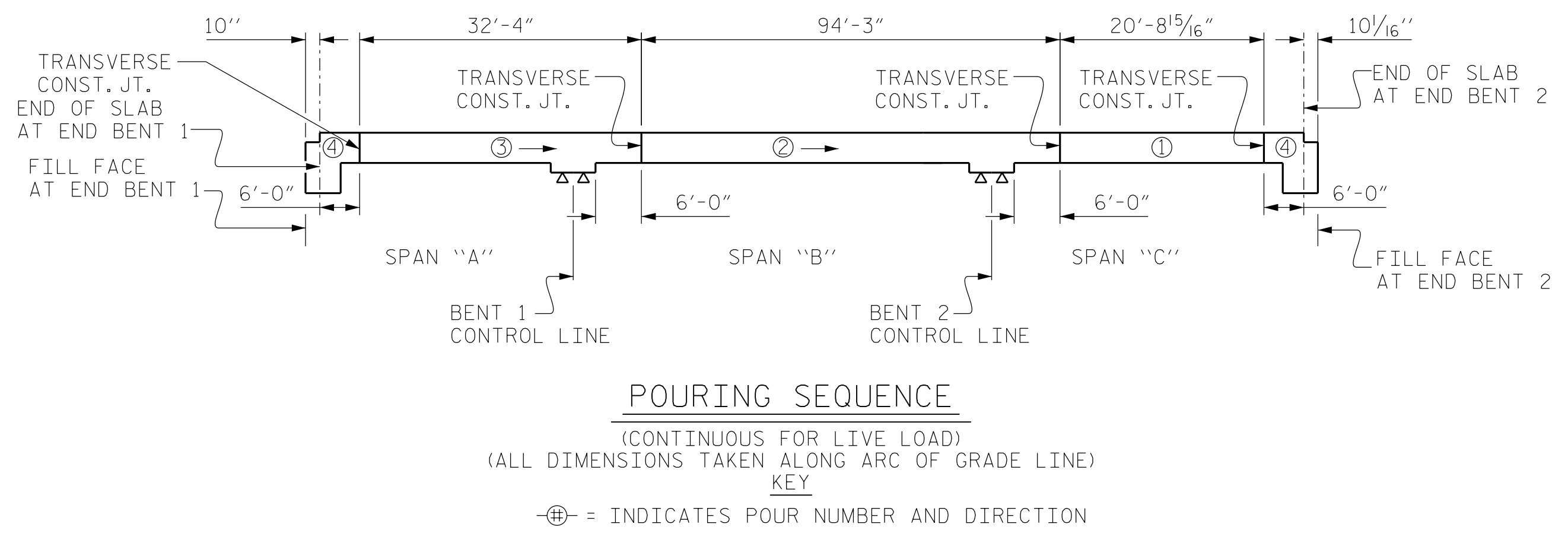
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BILL OF MATERIAL						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	289	5	STR	40'-11"	12333	
A2	289	5	STR	40'-11"	12333	
* A101	2	5	STR	6'-1"	13	
* A102	2	5	STR	13'-10"	29	
* A103	2	5	STR	21'-6"	45	
* A104	2	5	STR	29'-3"	61	
* A105	2	5	STR	36'-11"	77	
A201	2	5	STR	6'-1"	13	
A202	2	5	STR	13'-10"	29	
A203	2	5	STR	21'-6"	45	
A204	2	5	STR	29'-3"	61	
A205	2	5	STR	36'-11"	77	
* B1	164	6	STR	6'-10"	1683	
* B2	28	4	STR	13'-6"	253	
* B3	56	6	STR	49'-0"	4121	
* B4	108	6	STR	19'-6"	3163	
* B5	28	4	STR	31'-3"	585	
* B6	28	4	STR	16'-3"	304	
B7	156	5	STR	54'-4"	8840	
K1	20	4	STR	21'-10"	292	
K2	8	4	STR	6'-1"	33	
K3	24	4	STR	7'-1"	114	
K4	48	4	STR	7'-7"	243	
K5	24	4	STR	6'-7"	106	
K6	2	4	STR	2'-2"	3	
K7	2	4	STR	2'-9"	4	
K8	4	4	STR	2'-11"	8	
K9	2	4	STR	2'-5"	3	
K10	2	4	STR	1'-9"	2	
K11	2	4	STR	2'-3"	3	
K12	4	4	STR	2'-6"	7	
K13	2	4	STR	2'-0"	3	
K14	20	4	STR	18'-5"	246	
K15	16	4	STR	4'-10"	70	
* S1	68	4	1	11'-11"	541	
* S2	64	4	1	10'-9"	460	
S3	208	4	4	2'-9"	382	
U1	68	4	2	11'-6"	522	
U2	16	4	3	13'-10"	148	
U3	40	4	3	15'-10"	423	
REINFORCING STEEL				23992 LBS.		
* EPOXY COATED REINF. STEEL				23668 LBS.		

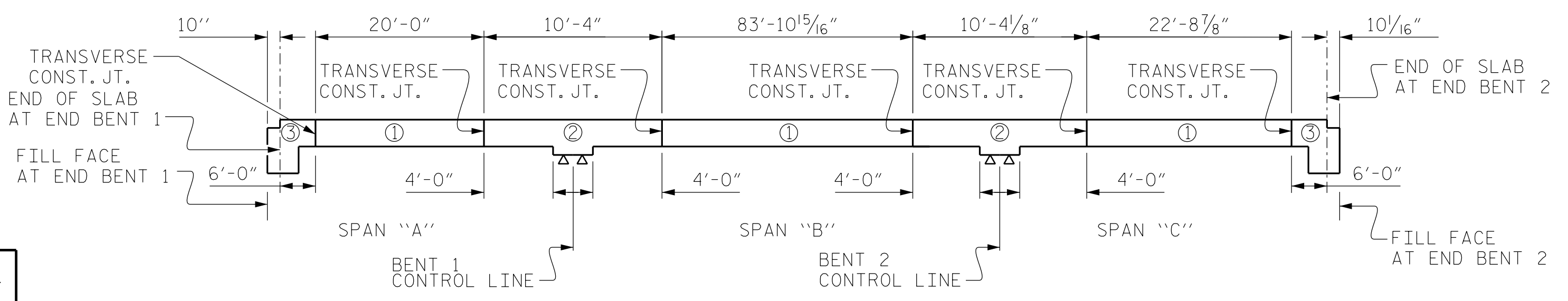


SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	25.5		
POUR #2	131.7		
POUR #3	55.6		
POUR #4 #	67.6		
TOTAL **	280.5	23992	23668

# POUR #4 QUANTITY INCLUDES UPPER POUR OF INTEGRAL END BENT.  
 \*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED.



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



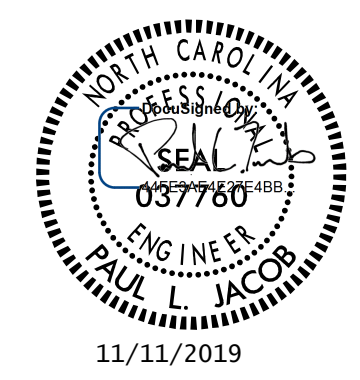
ALTERNATE POURING SEQUENCE  
 (CONTINUOUS FOR LIVE LOAD)  
 (ALL DIMENSIONS TAKEN ALONG ARC OF GRADE LINE)  
 KEY  
 ⊕ = INDICATES POUR NUMBER

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

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

GROOVING BRIDGE FLOORS		
APPROACH SLABS	1750	SQ. FT.
BRIDGE DECK	5577	SQ. FT.
TOTAL	7327	SQ. FT.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**BILL OF MATERIAL**  
 (RIGHT LANE)

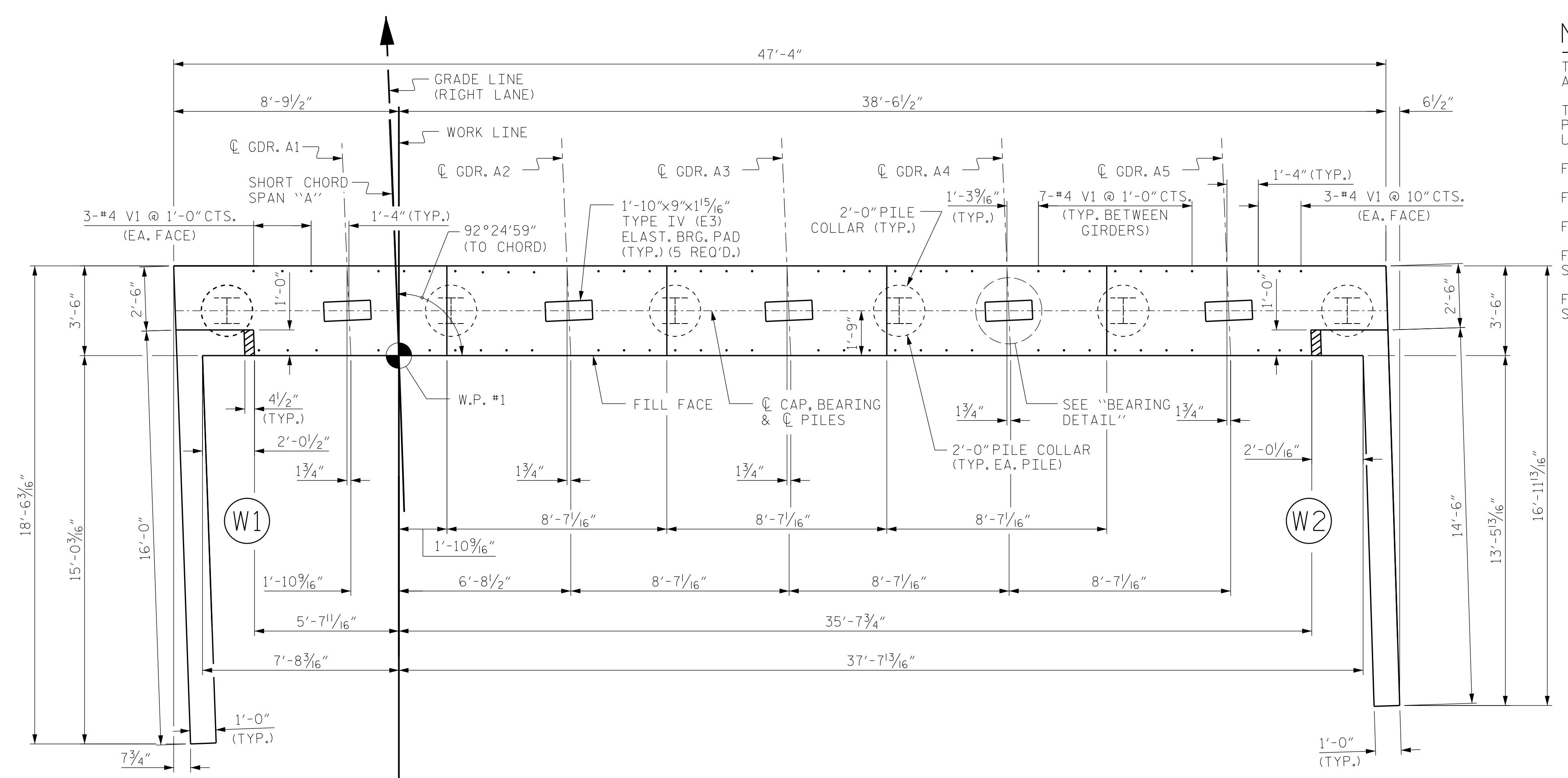
ASSEMBLED BY : M. RAY	DATE : 08/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 10/05	REV. 10/11/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

**moffatt & nichol**  
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 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

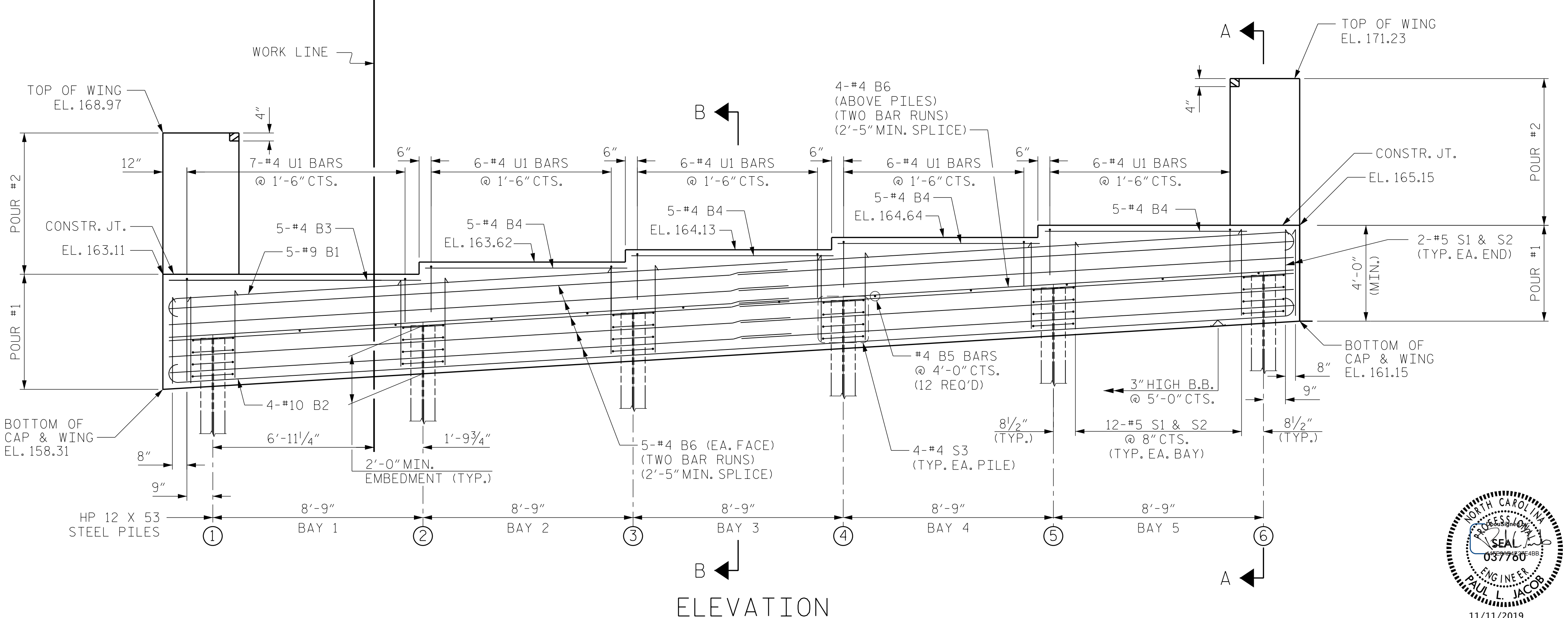
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			35





END BENT No.1 PLAN



ELEVATION

CONCRETE COLLARS NOT SHOWN FOR CLARITY  
WINGS NOT SHOWN FOR CLARITY  
V1 BARS NOT SHOWN FOR CLARITY

NOTES

- THE TOP SURFACE OF THE END BENT CAP, 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 BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR SECTION A-A AND B-B, SEE SHEET 3 OF 3.
- FOR PILE SPLICING DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR BEARING DETAIL, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
- FOR CONCRETE COLLAR DETAILS, SEE "CORROSION PROTECTION FOR STEEL PILES" ON SHEET 3 OF 3.

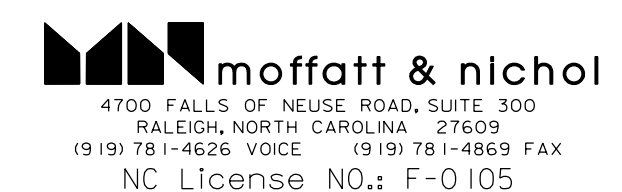
TOP OF PILE ELEVATIONS	
①	160.45
②	160.98
③	161.50
④	162.03
⑤	162.55
⑥	163.08

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-  
SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
**INTEGRAL END BENT  
No. 1 PLAN**  
(RIGHT LANE)

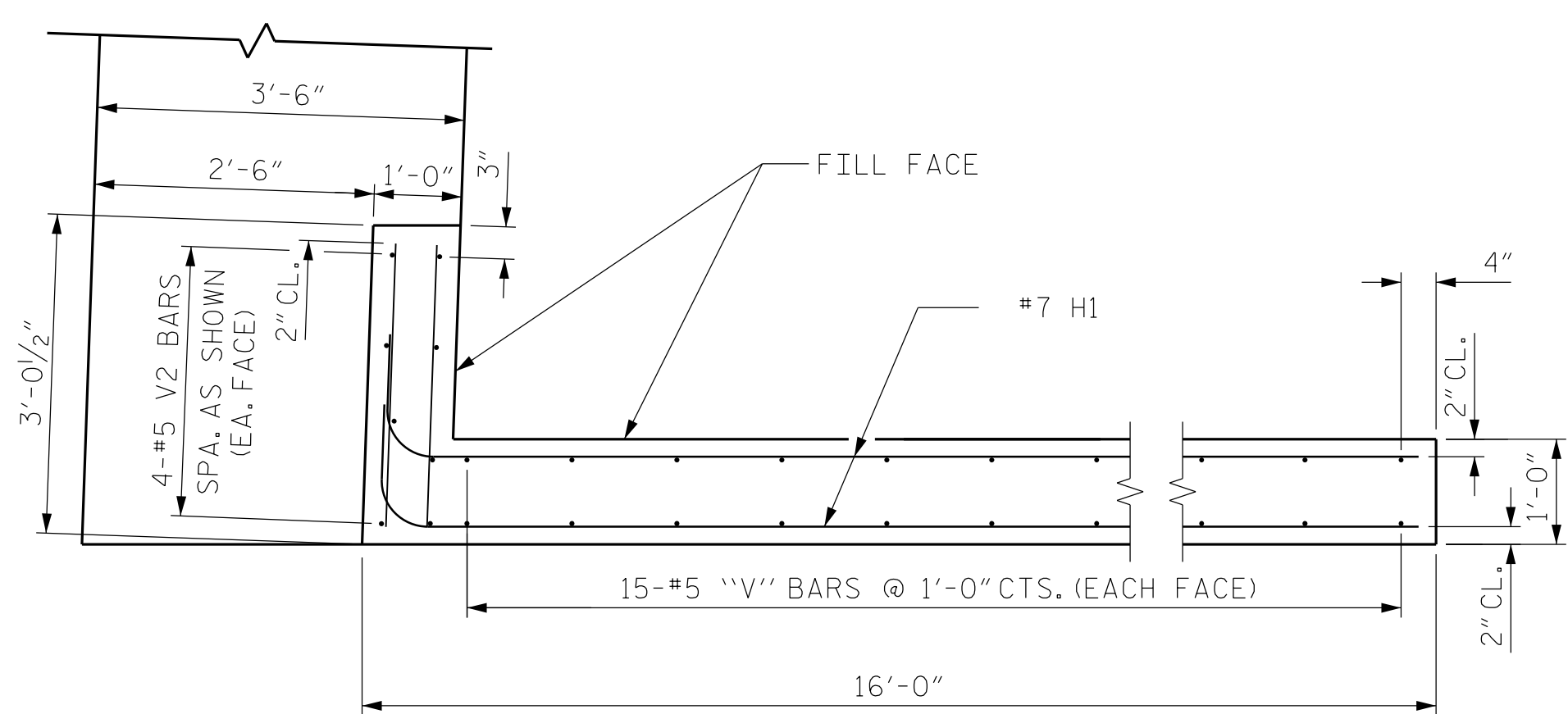
DRAWN BY : J. WEIGER DATE : 05/2019  
CHECKED BY : M. RAY DATE : 05/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



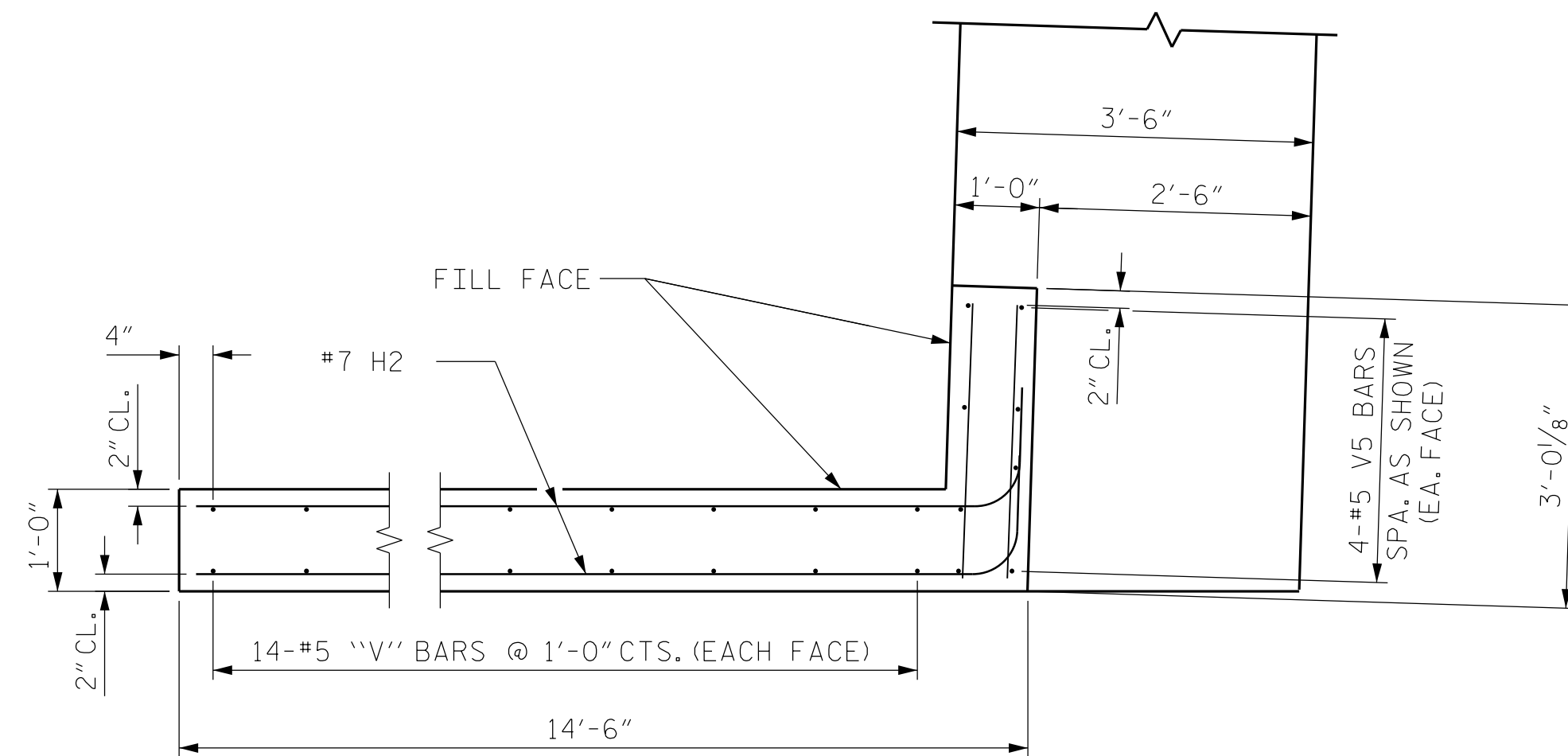
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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			35

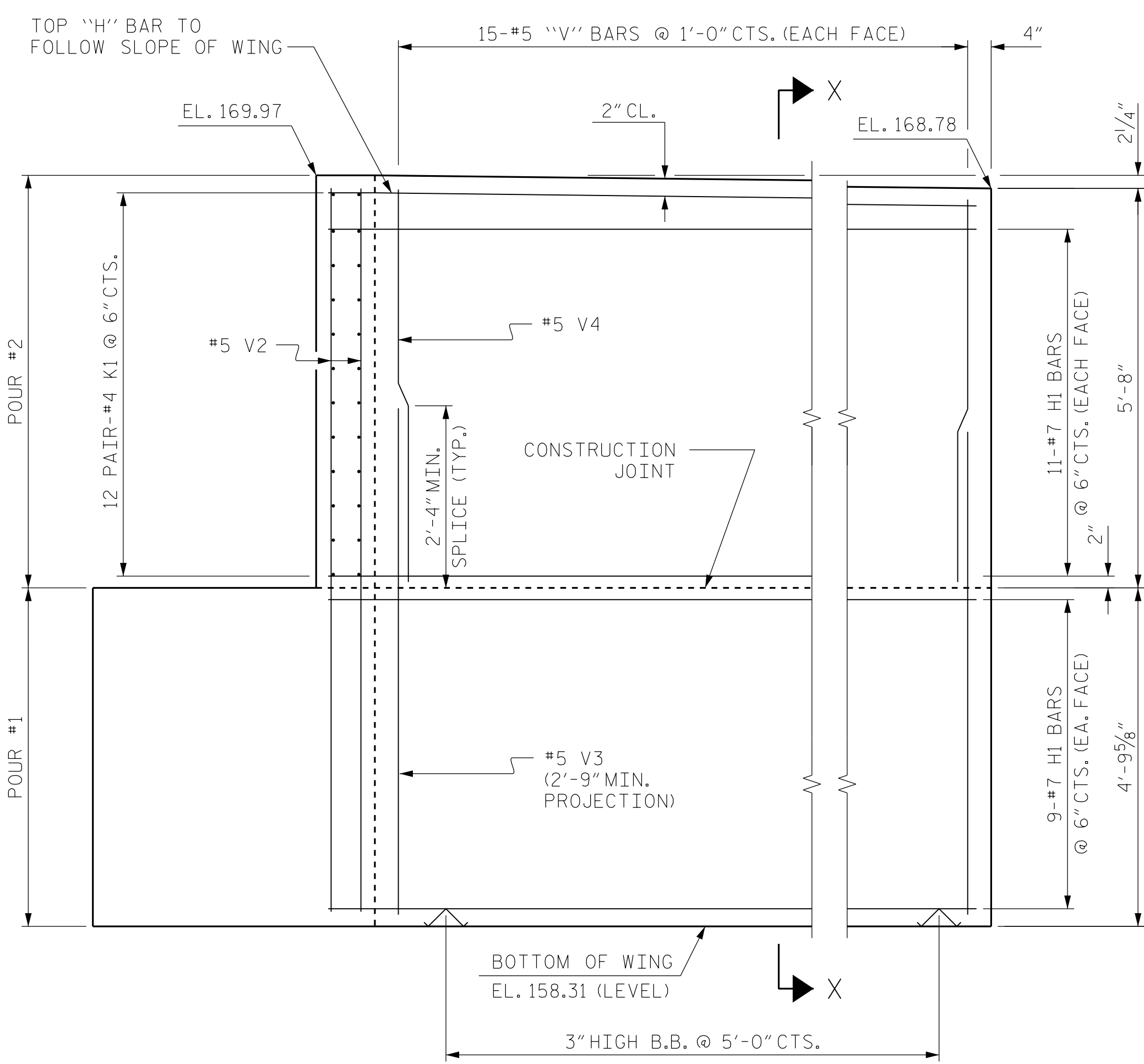
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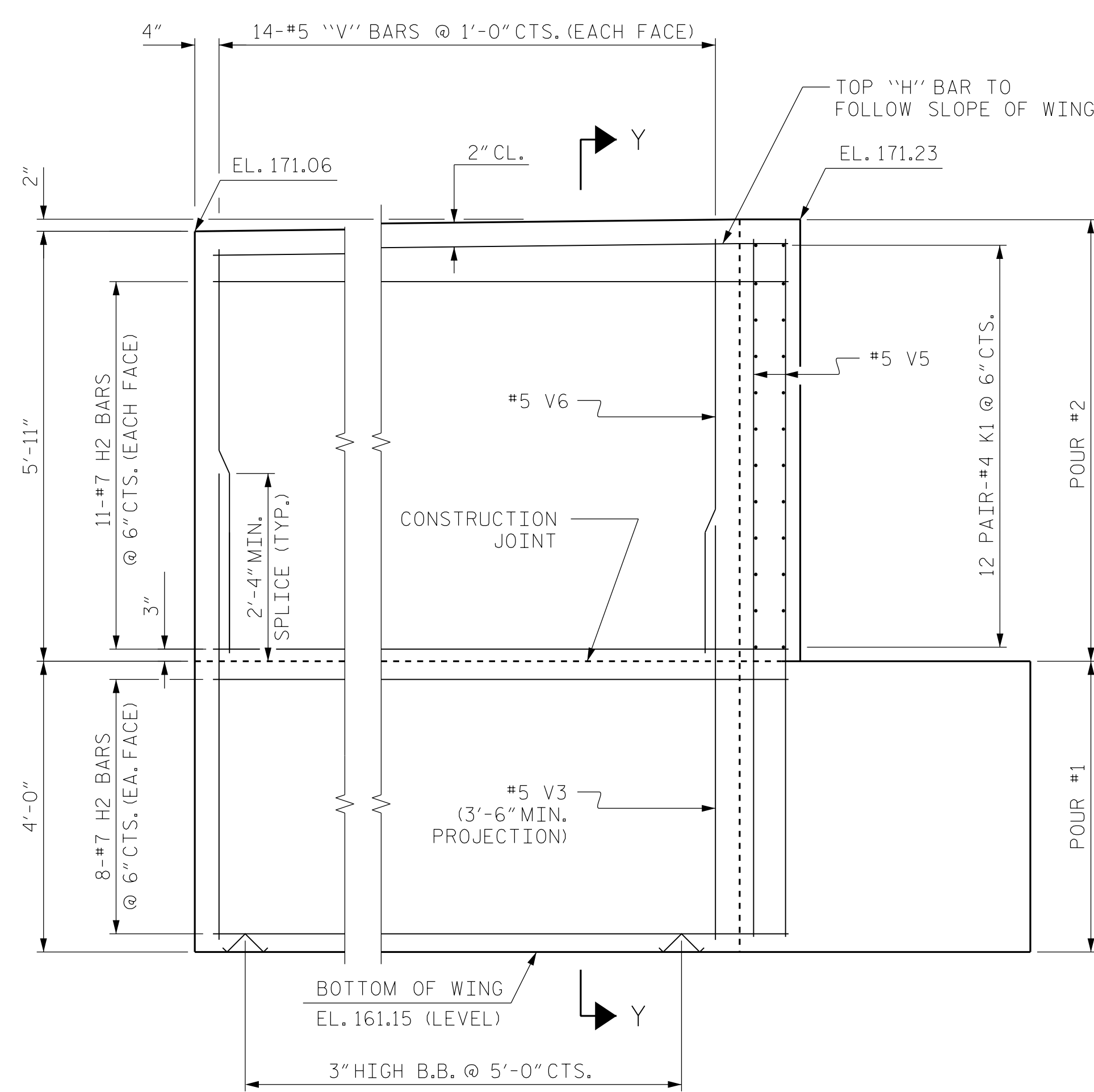
PLAN OF WING (W1)



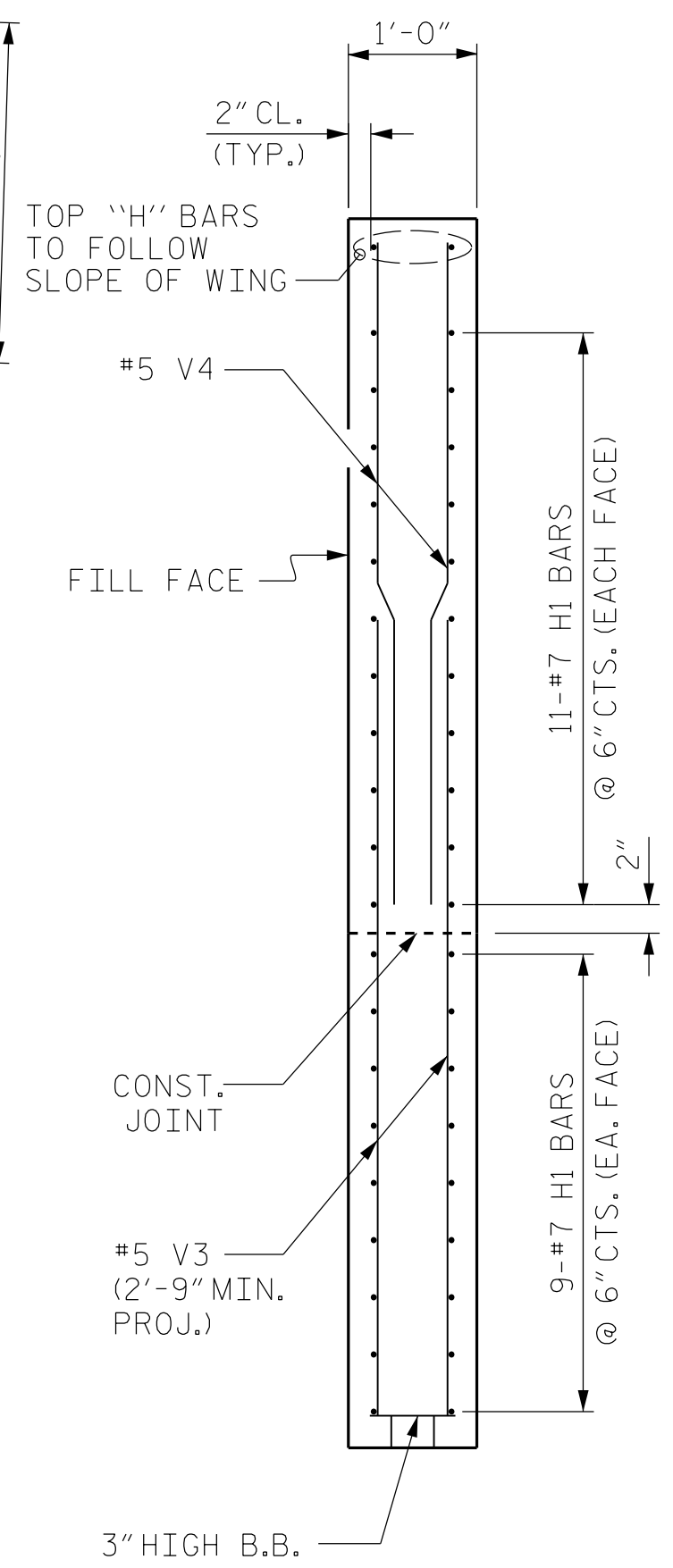
PLAN OF WING (W2)



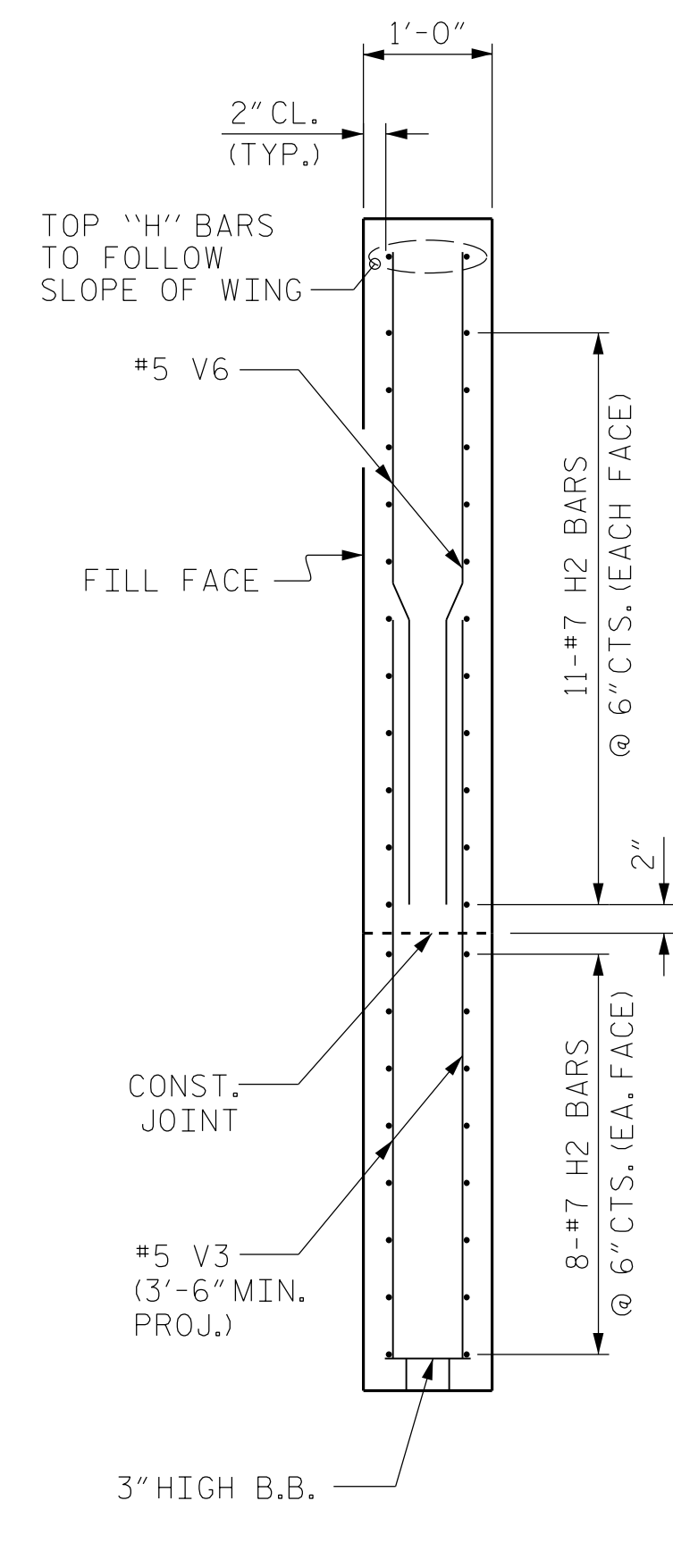
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

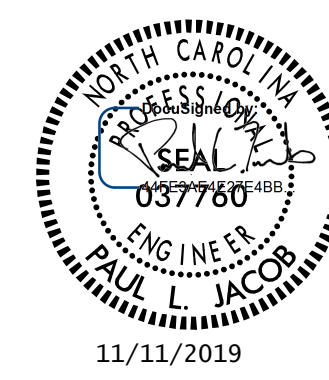


SECTION Y-Y

WING DETAILS

DRAWN BY : J. WEIGER DATE : 05/2019  
 CHECKED BY : M. RAY DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

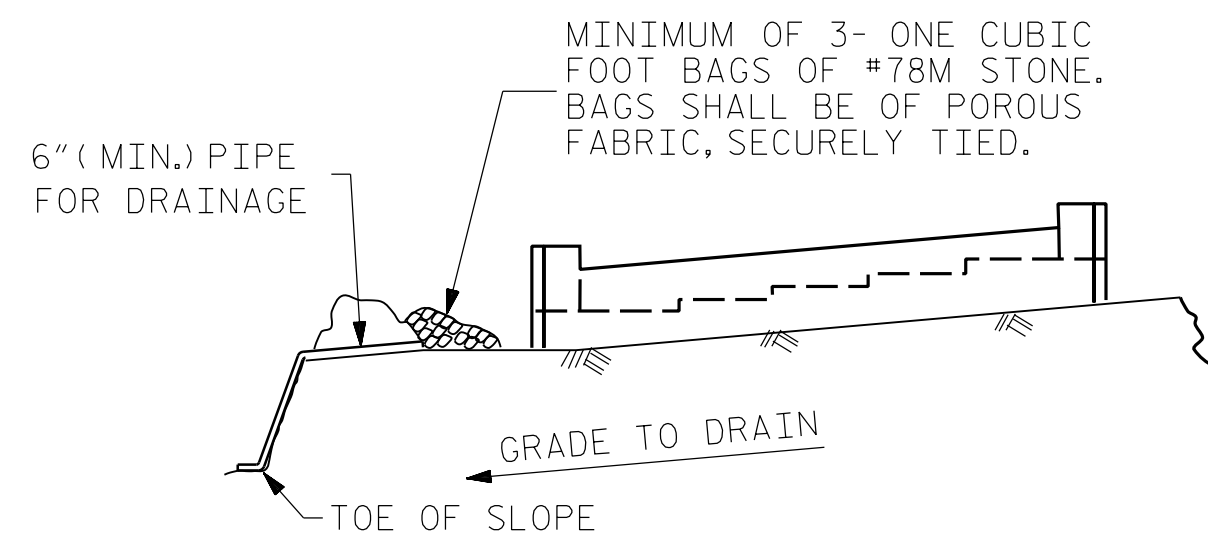
**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
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PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT No. 1 WING DETAILS (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-24
TOTAL SHEETS					35

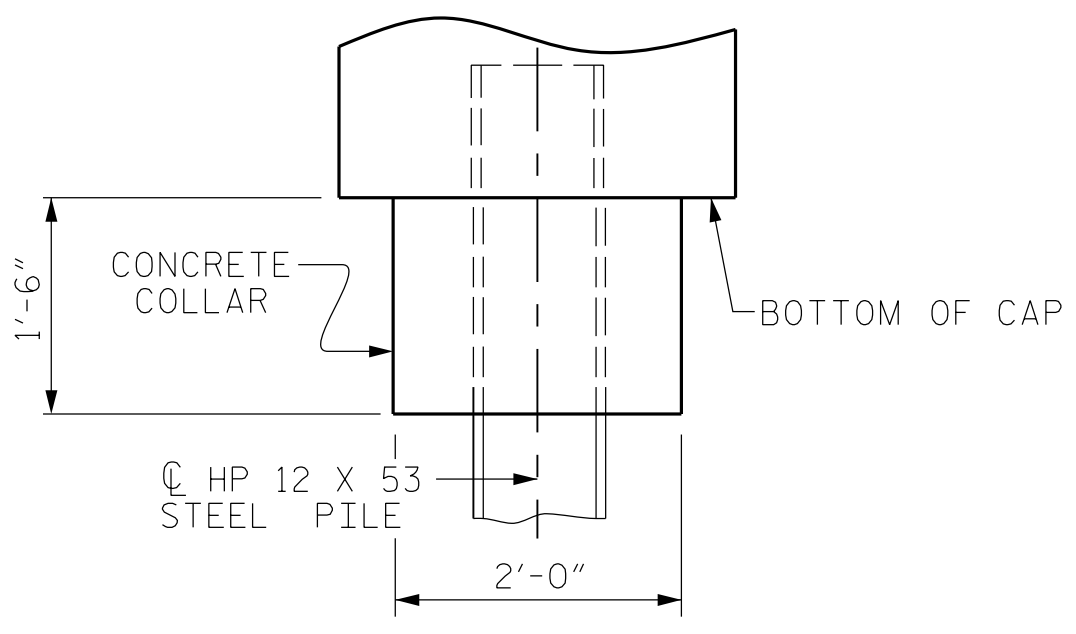
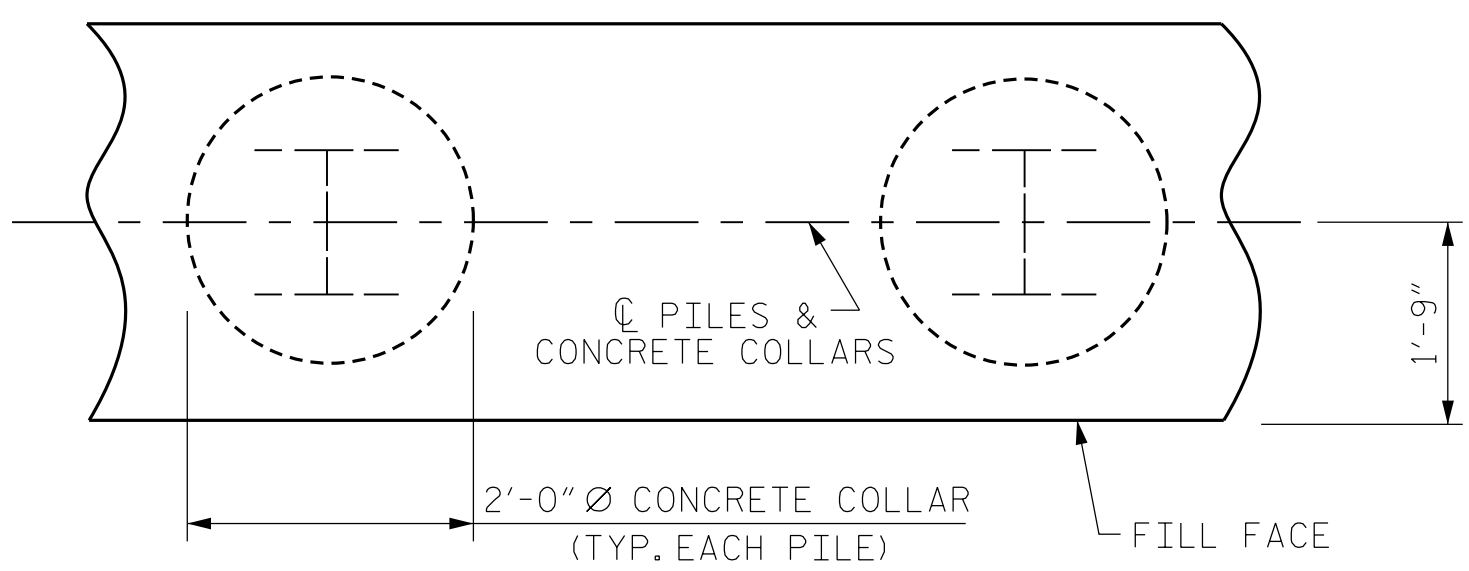


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

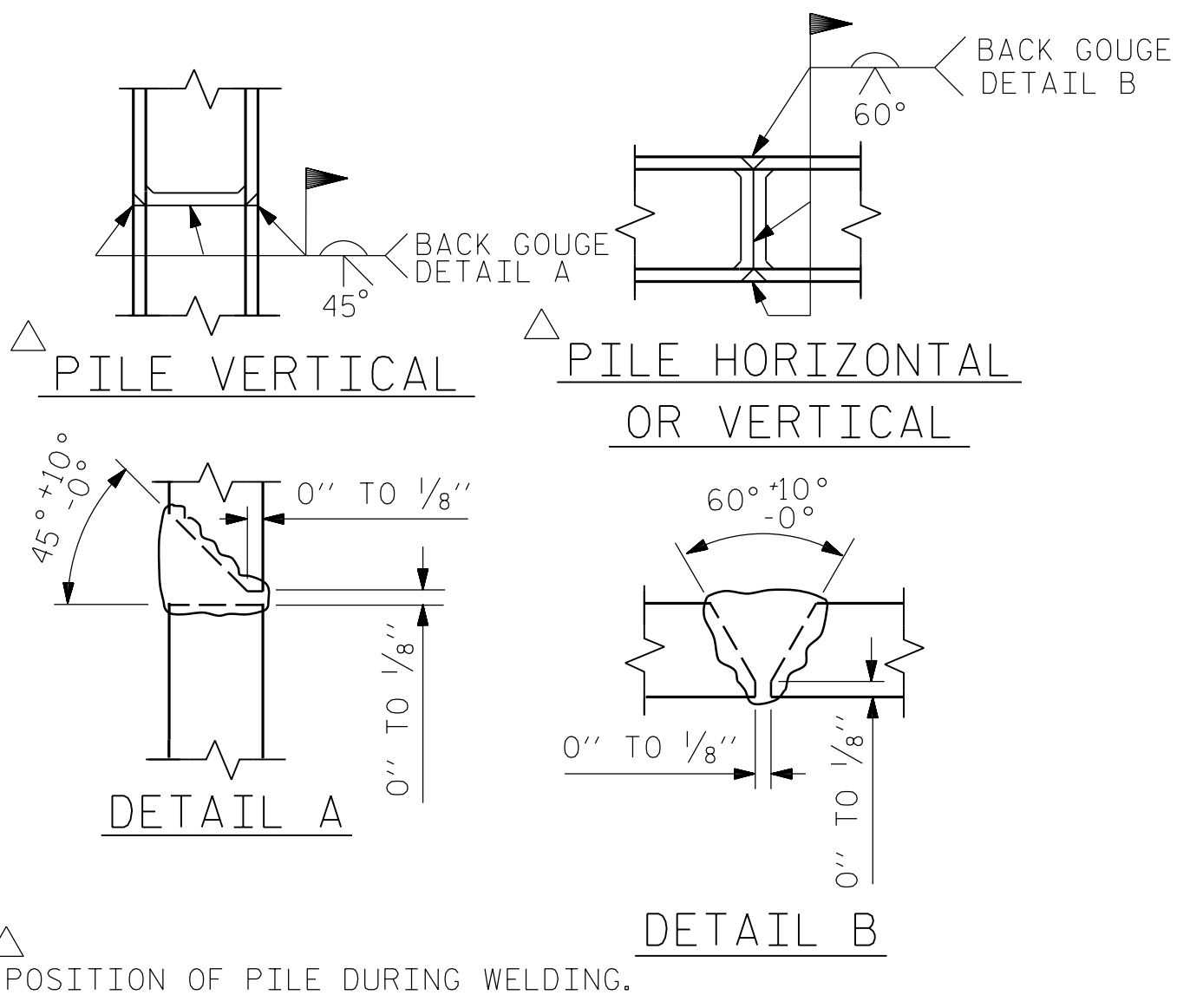
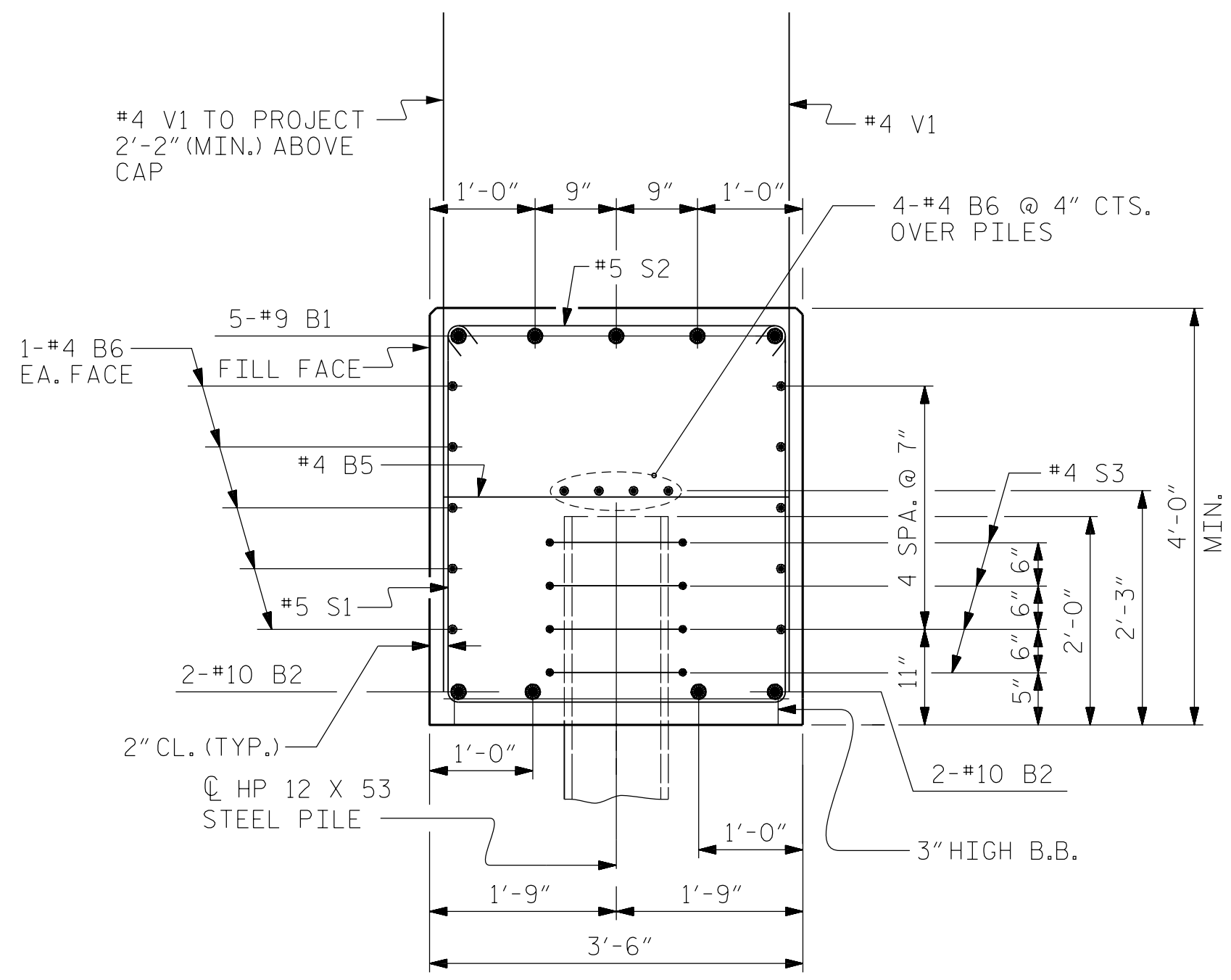
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

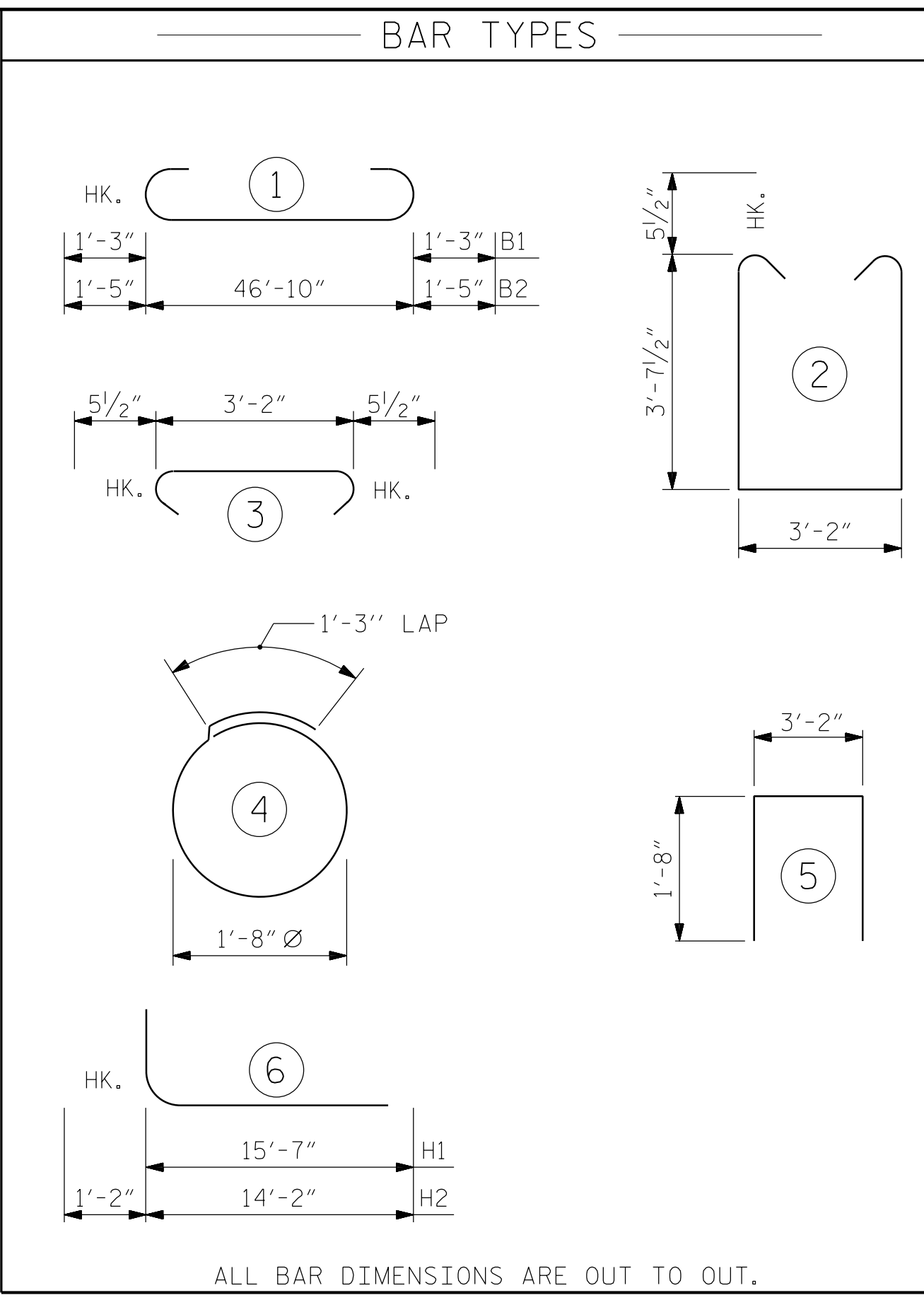
**TEMPORARY DRAINAGE AT END BENT**



**CORROSION PROTECTION FOR STEEL PILES DETAIL**

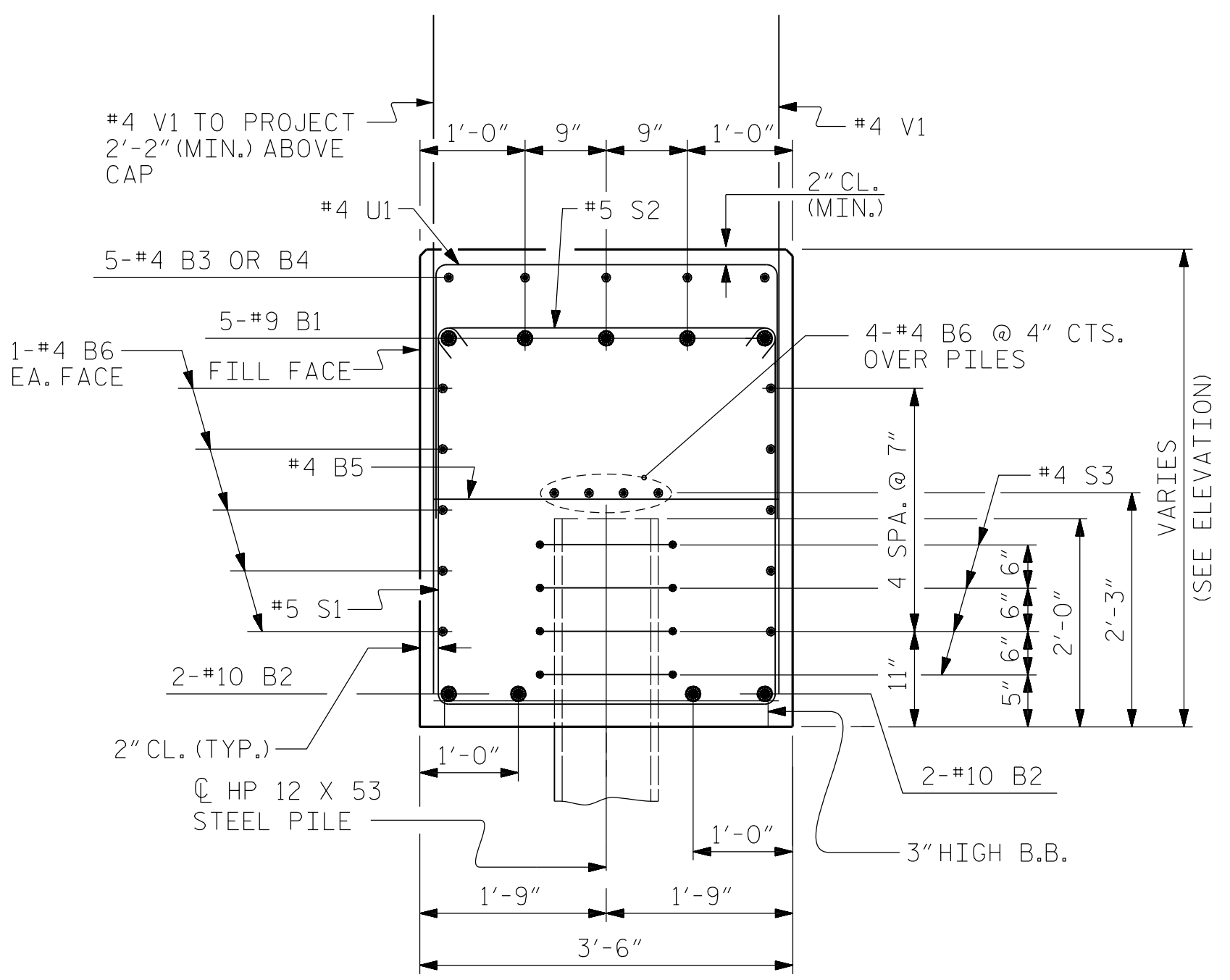


**PILE SPLICE DETAILS**



**BILL OF MATERIAL**

END BENT No. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#9	1	49'-4"	839	
B2	#10	1	49'-8"	855	
B3	#4	STR	10'-4"	35	
B4	#4	STR	8'-5"	112	
B5	#4	STR	3'-2"	25	
B6	#4	STR	24'-9"	463	
H1	#7	6	16'-9"	1438	
H2	#7	6	15'-4"	1254	
K1	#4	STR	2'-8"	86	
S1	#5	2	11'-4"	757	
S2	#5	3	4'-1"	273	
S3	#4	4	6'-6"	104	
U1	#4	5	6'-6"	135	
V1	#4	STR	6'-7"	299	
V2	#5	STR	10'-0"	83	
V3	#5	STR	7'-4"	444	
V4	#5	STR	5'-4"	167	
V5	#5	STR	9'-8"	81	
V6	#5	STR	4'-9"	165	
REINFORCING STEEL (FOR END BENT)					7615 LBS.
CLASS A CONCRETE POUR #1 CAP, LOWER PART OF WINGS & COLLARS					32.7 C.Y.
POUR #2 UPPER PART OF WINGS					7.5 C.Y.
TOTAL					40.3 C.Y.
HP 12 X 53 STEEL PILES NO: 6					LIN. FT. = 480
PILE REDRIVES					3 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					6 EA.

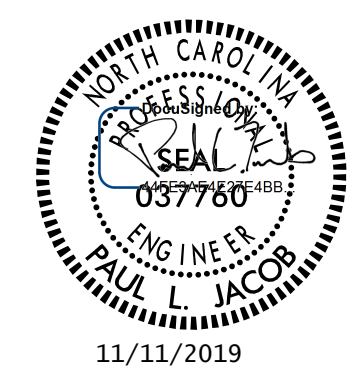


PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 33+45.18 -L-

SHEET 3 OF 3



DRAWN BY : J. WEIGER DATE : 01/2019

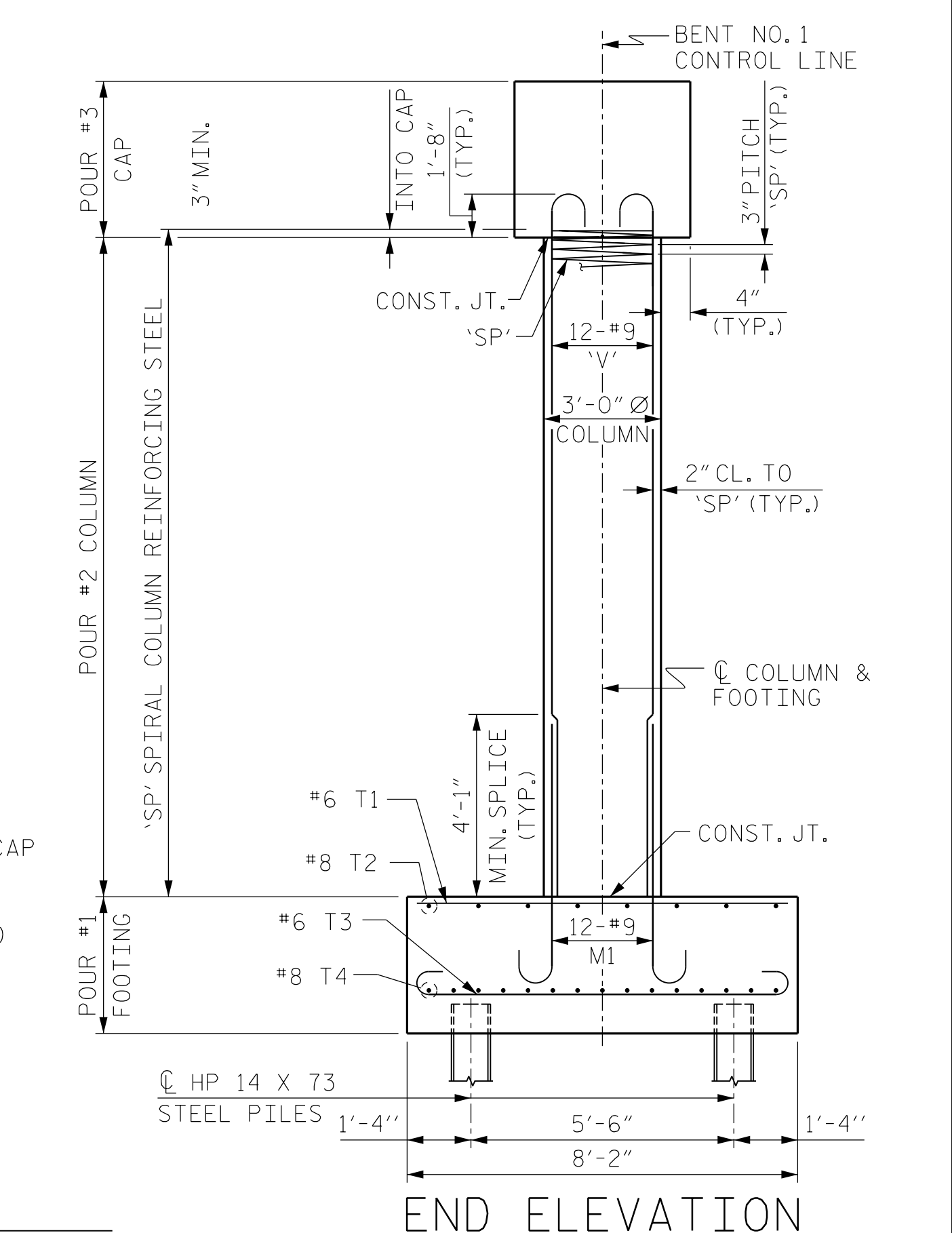
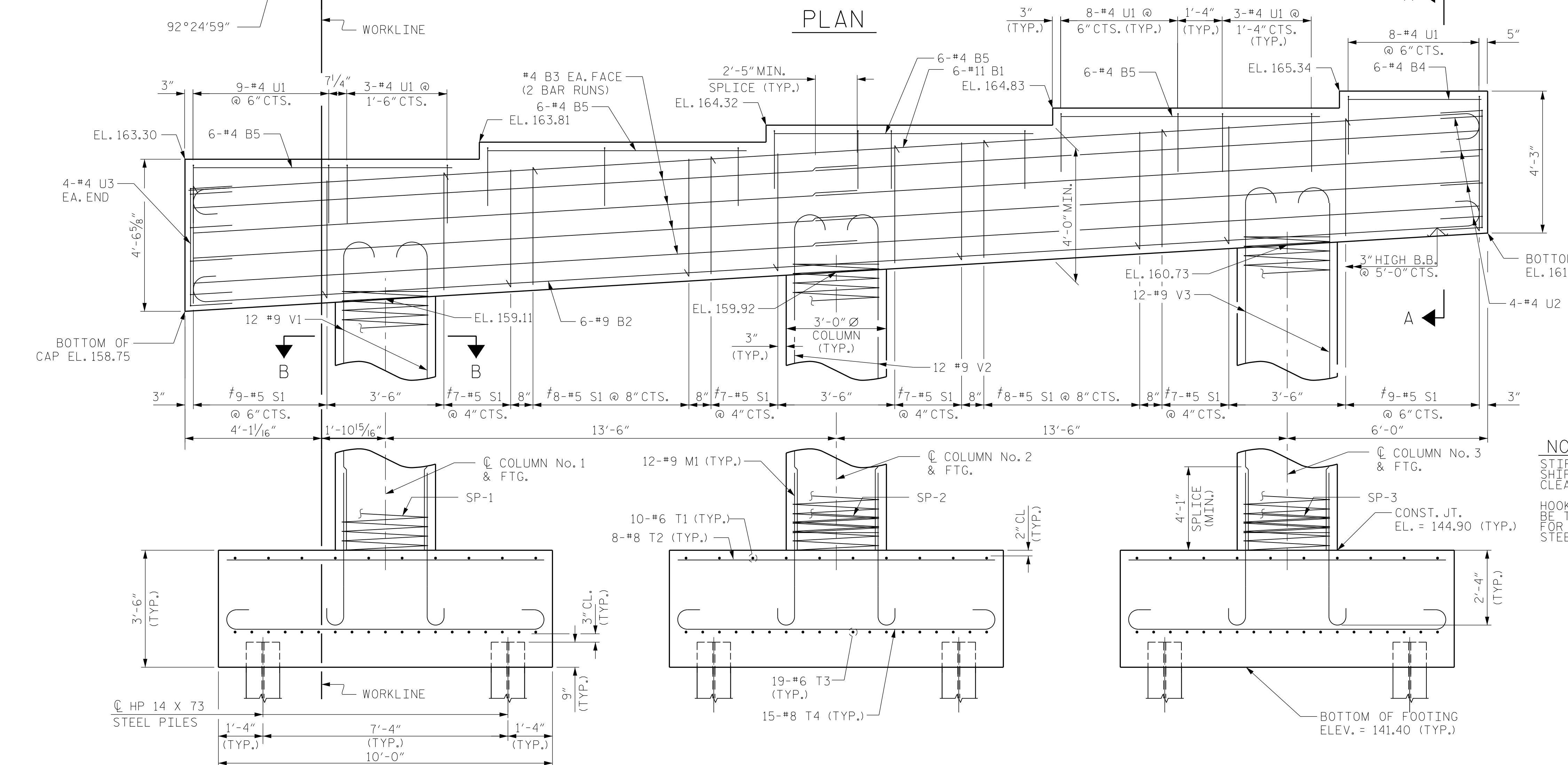
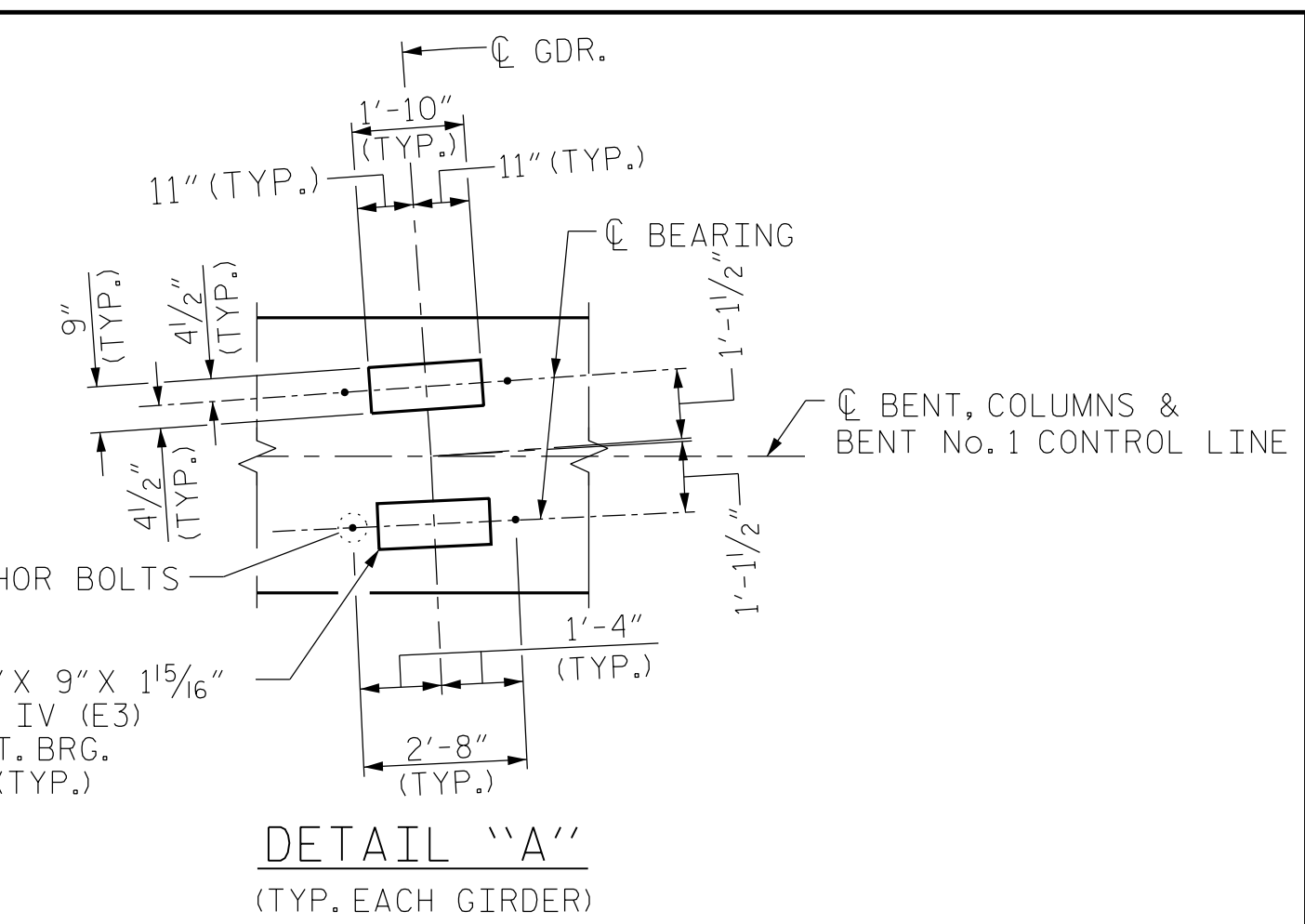
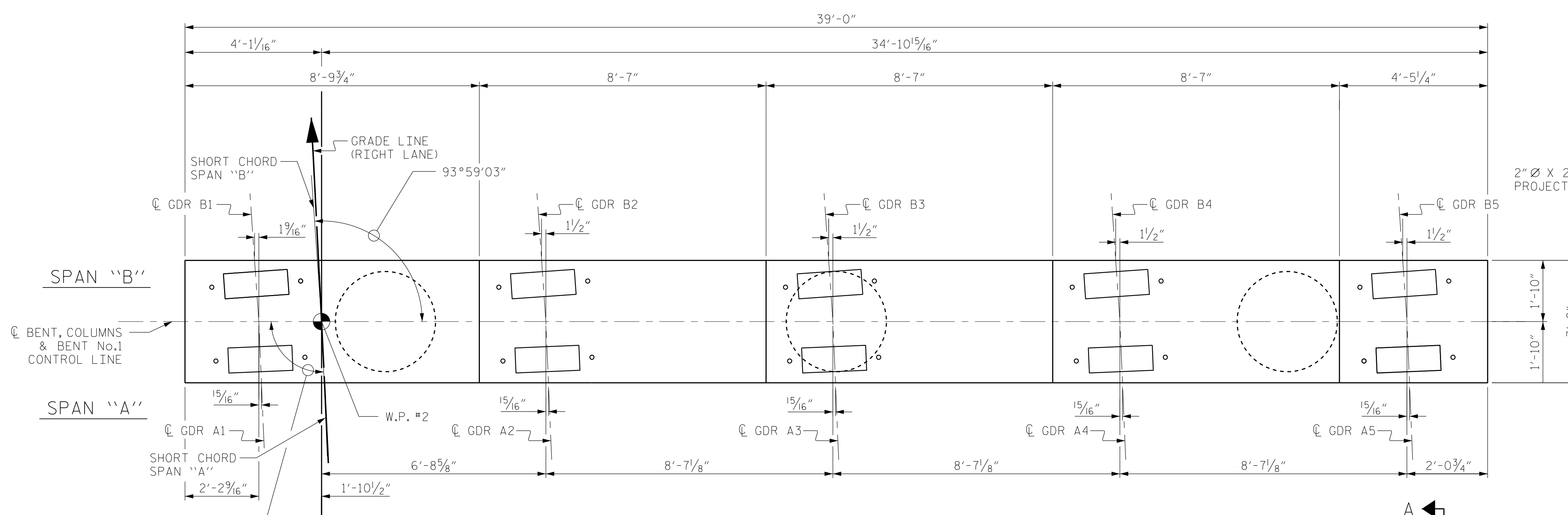
CHECKED BY : M. RAY DATE : 08/2019

DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

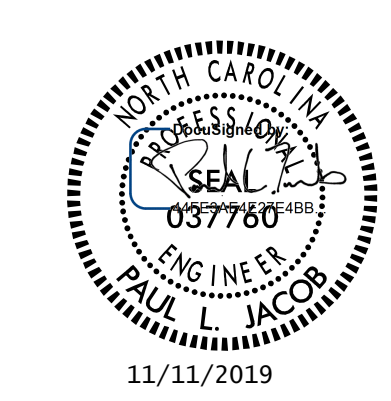
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-25
1			3			TOTAL SHEETS
2			4			35



**NOTES**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

### BENT No. 1 PLAN

(RIGHT LANE)

DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

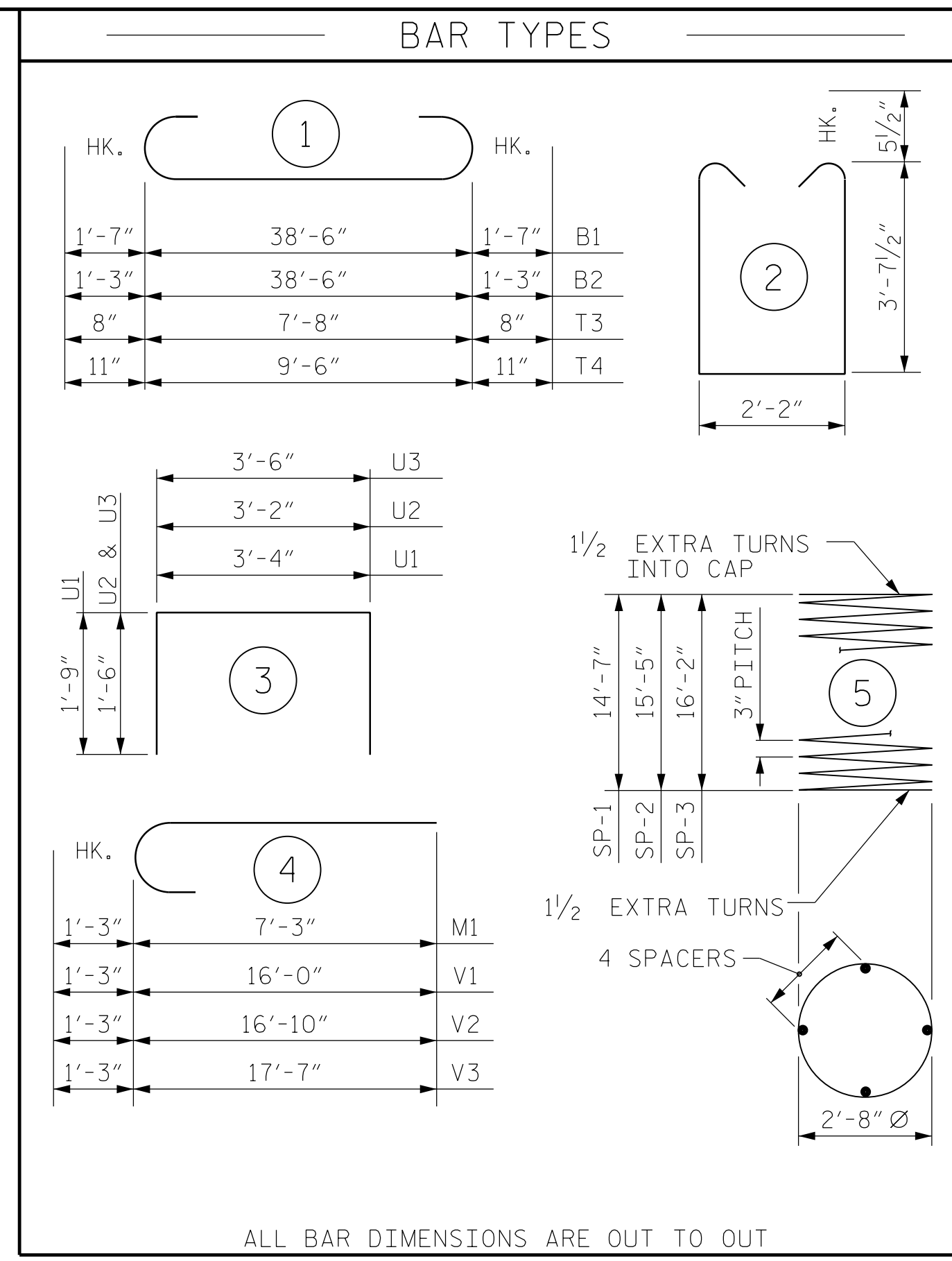
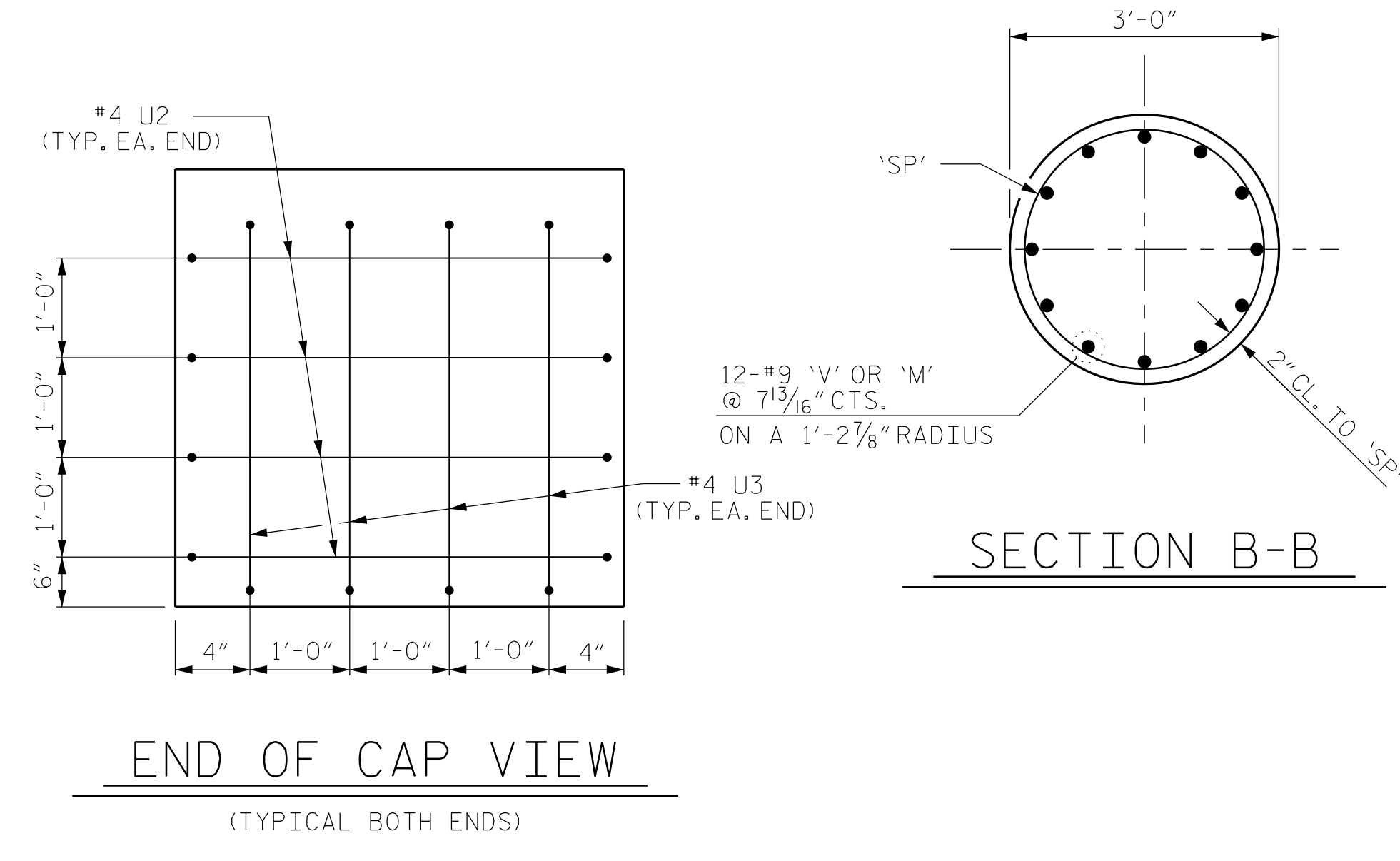
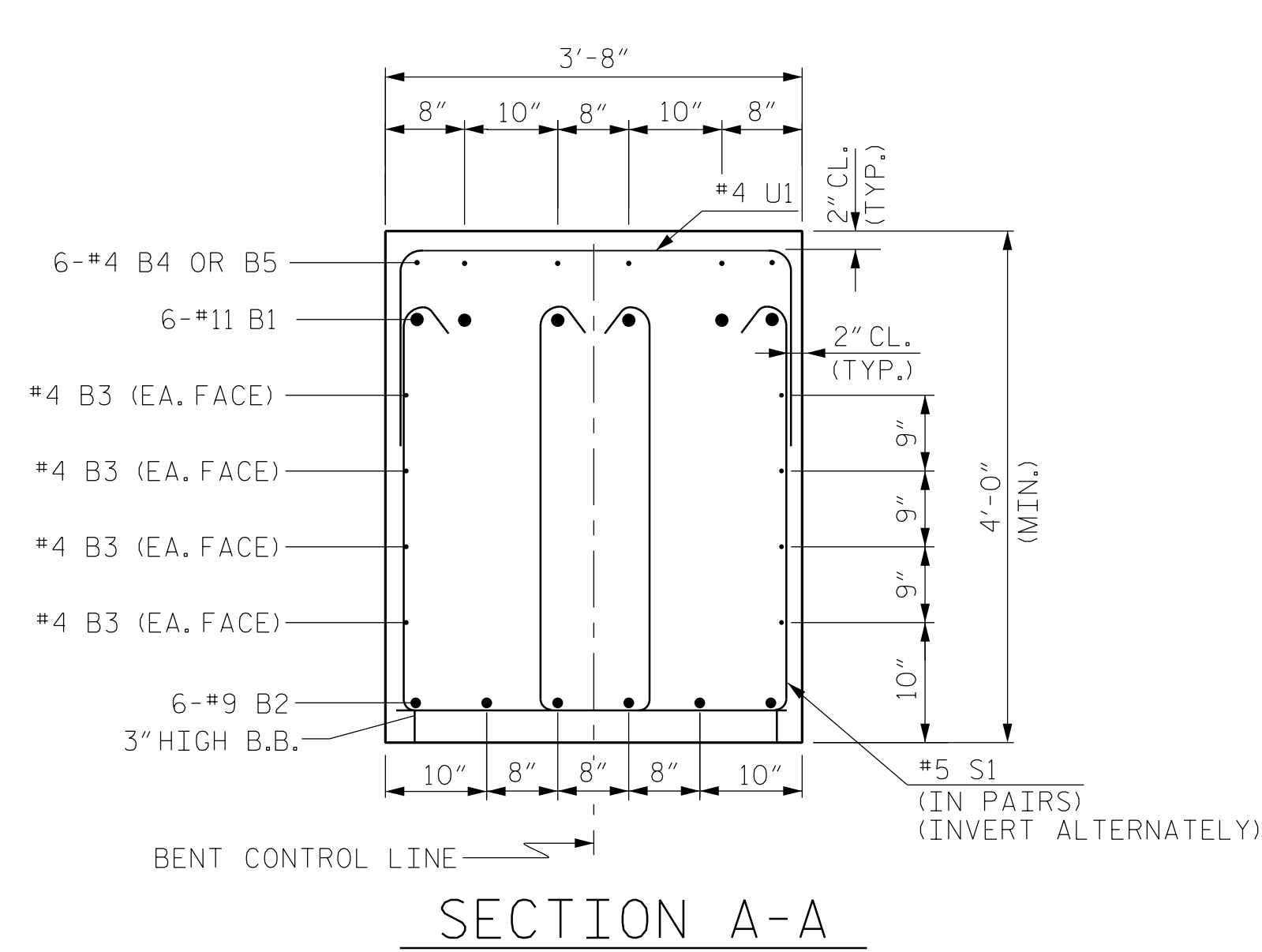
# IN PAIRS; INVERT STIRRUPS ALTERNATELY

**moffatt & nichol**  
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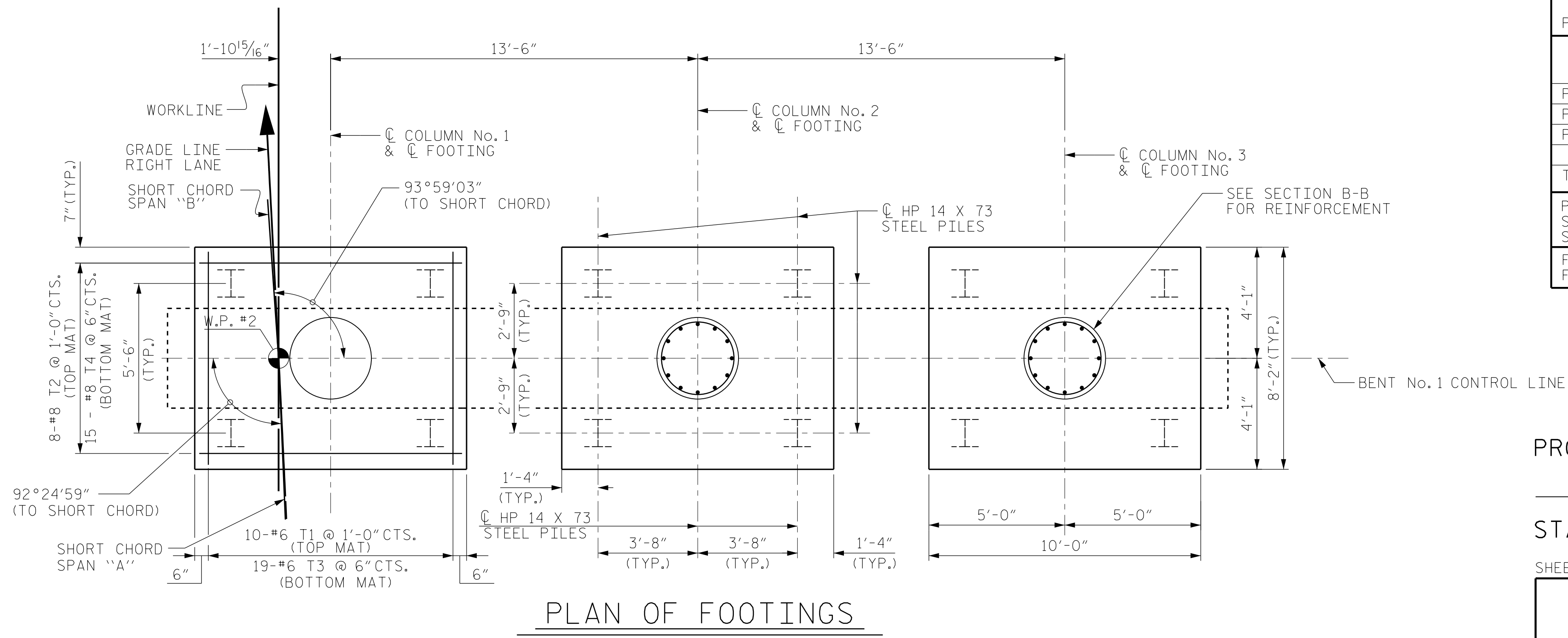
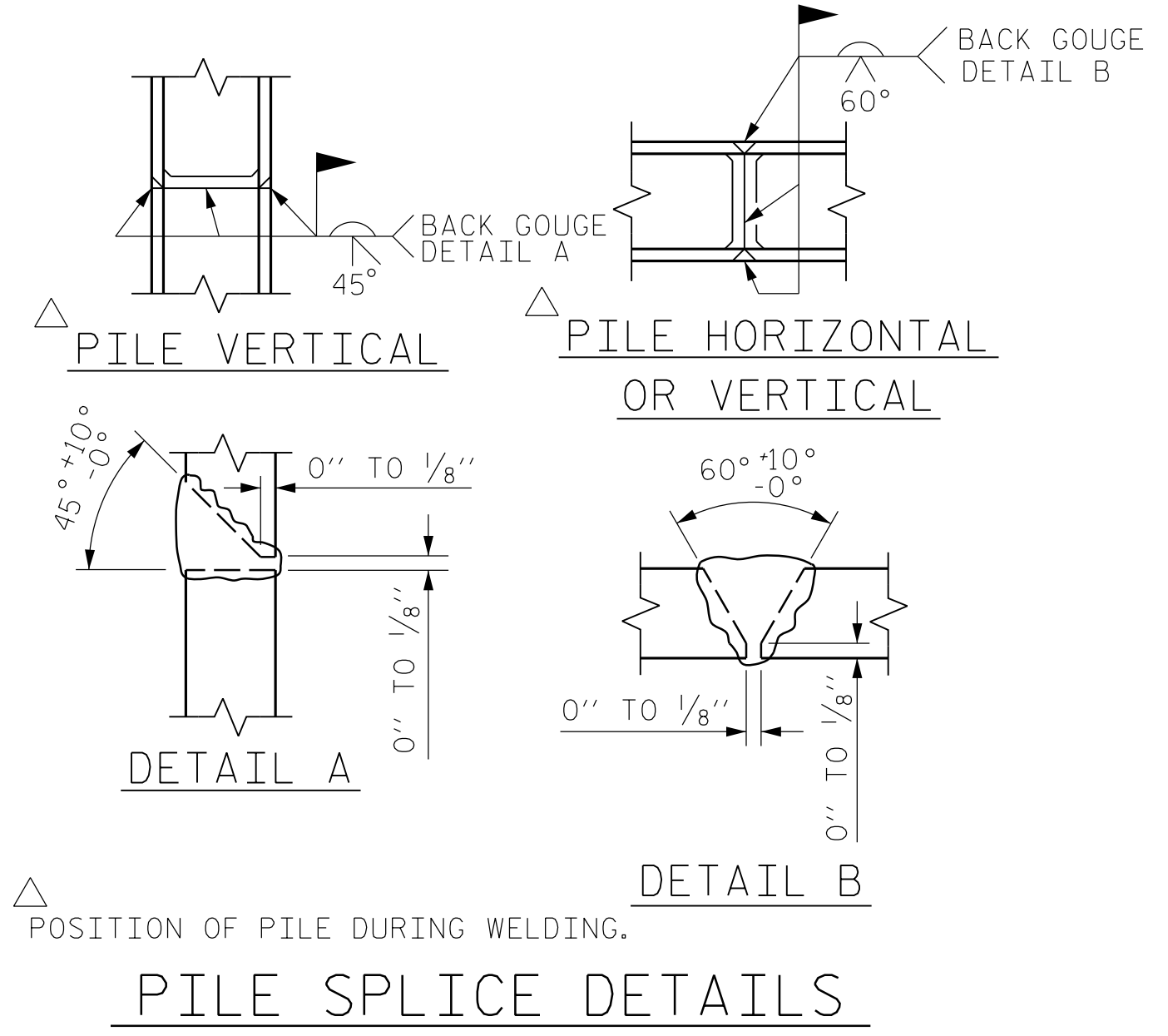
REVISIONS		SHEET NO.
NO.	BY: DATE:	S1-26
1		TOTAL SHEETS
2		35

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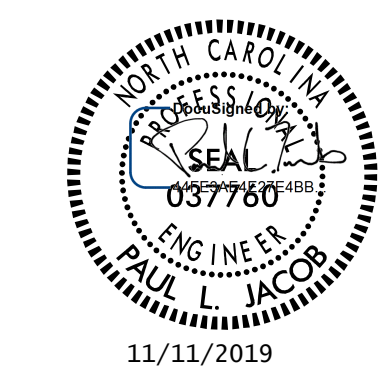
BILL OF MATERIAL					
BENT No. 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	41'-8"	1328
B2	6	#9	1	41'-0"	836
B3	16	#4	STR.	20'-7"	220
B4	6	#4	STR.	4'-0"	16
B5	24	#4	STR.	7'-9"	124
M1	36	#9	4	7'-8"	938
S1	124	#5	2	10'-4"	1336
T1	30	#6	STR.	7'-8"	345
T2	24	#8	STR.	9'-6"	609
T3	57	#6	1	9'-0"	771
T4	45	#8	1	11'-4"	1362
U1	53	#4	3	6'-10"	242
U2	8	#4	3	6'-2"	33
U3	8	#4	3	6'-6"	35
V1	12	#9	4	17'-3"	704
V2	12	#9	4	18'-1"	738
V3	12	#9	4	18'-10"	768
REINFORCING STEEL (FOR BENT NO. 1)					10405 LBS.
SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1)					1067 LBS.
* THE 'SP' SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
HP 14x73 STEEL PILES No. 12					LENGTH = 900 LIN. FT.
PILE REDRIVES					6 EA.
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1)					
POUR #1 (FOOTINGS)					31.8 C.Y.
POUR #2 (COLUMNS)					11.8 C.Y.
POUR #3 (CAP)					22.7 C.Y.
TOTAL CLASS A CONCRETE					66.3 C.Y.
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					12 EA.
FOUNDATION EXCAVATION FOR BENT NO. 1					LUMP SUM

ALL BAR DIMENSIONS ARE OUT TO OUT



PLAN OF FOOTINGS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 2



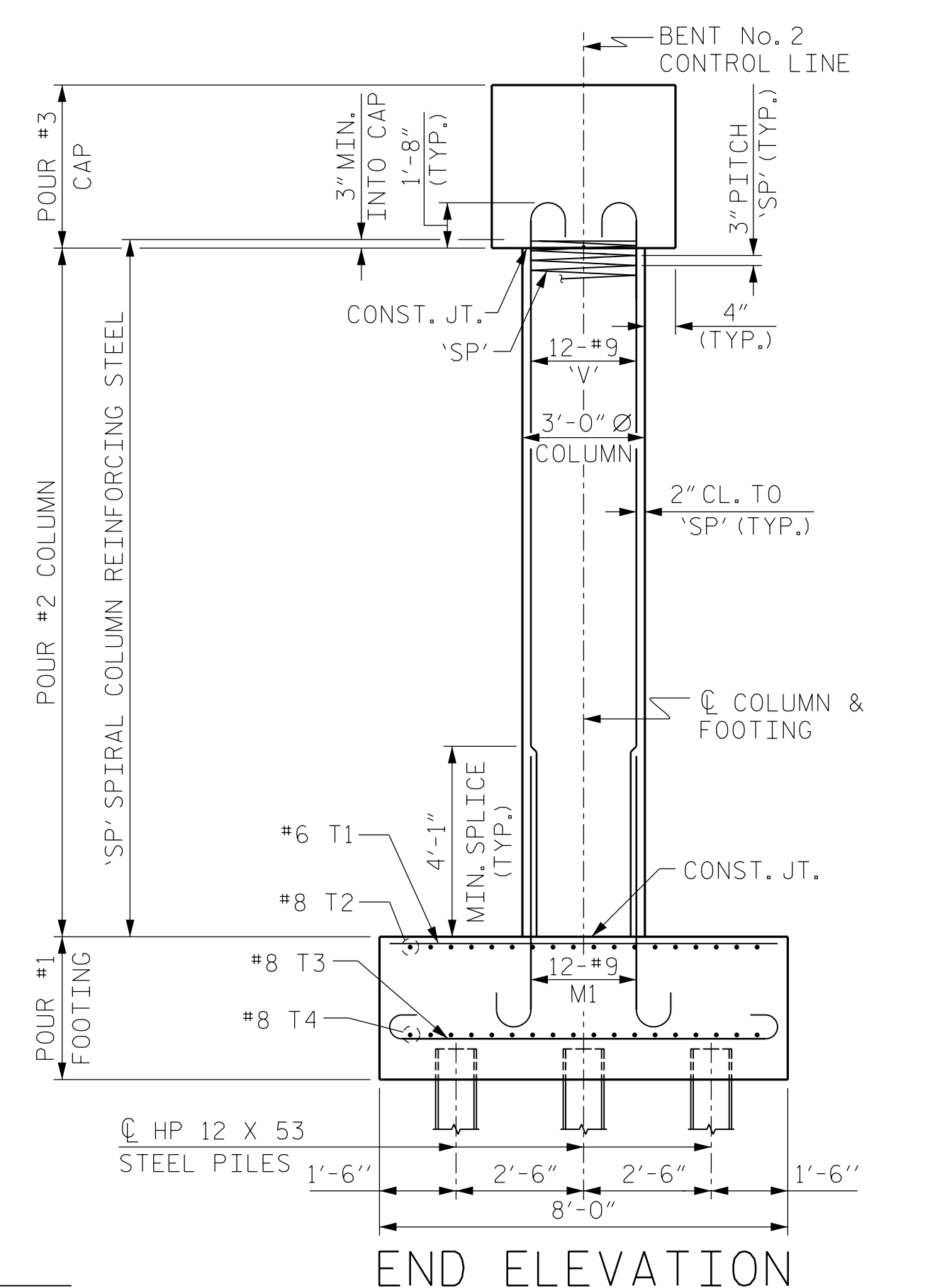
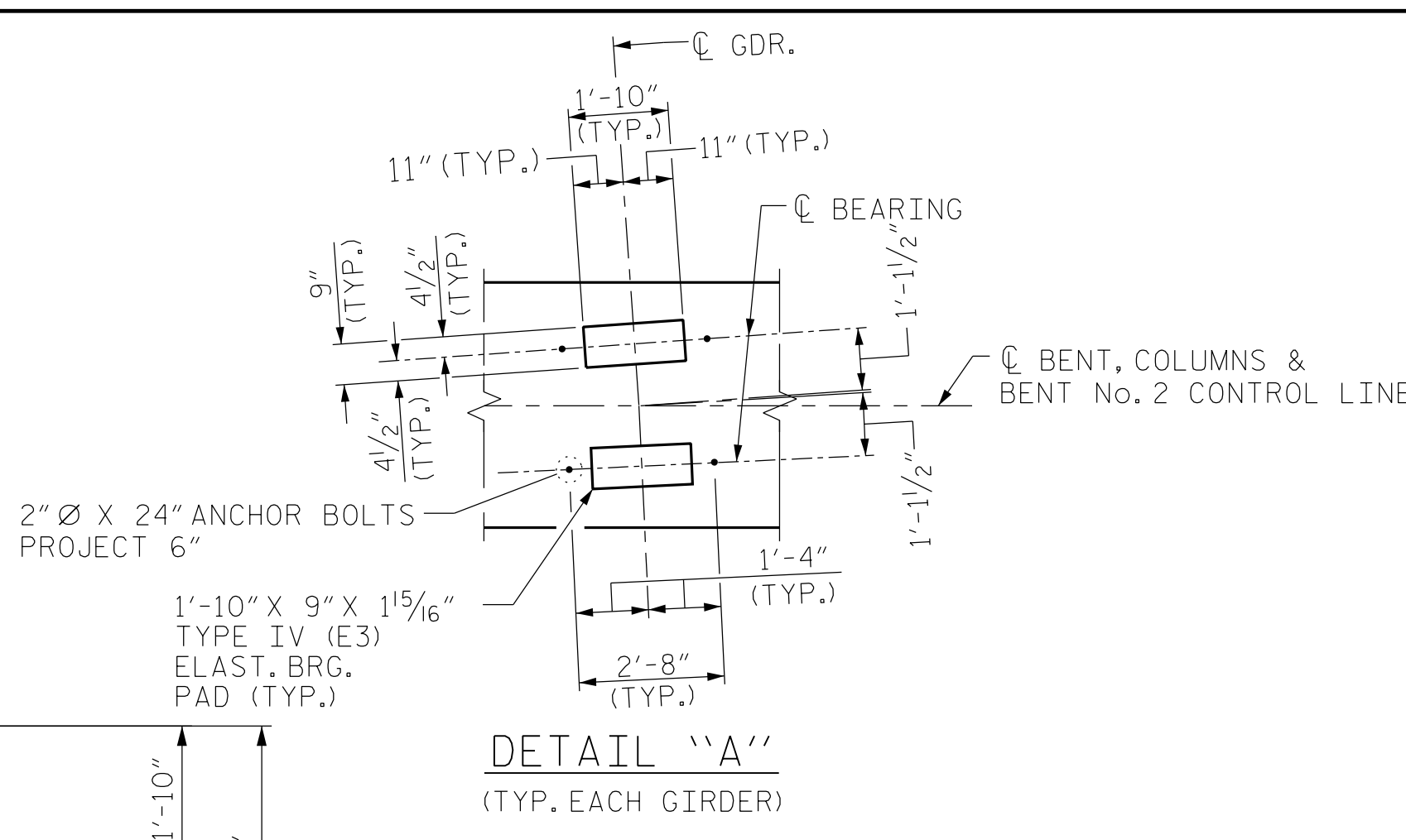
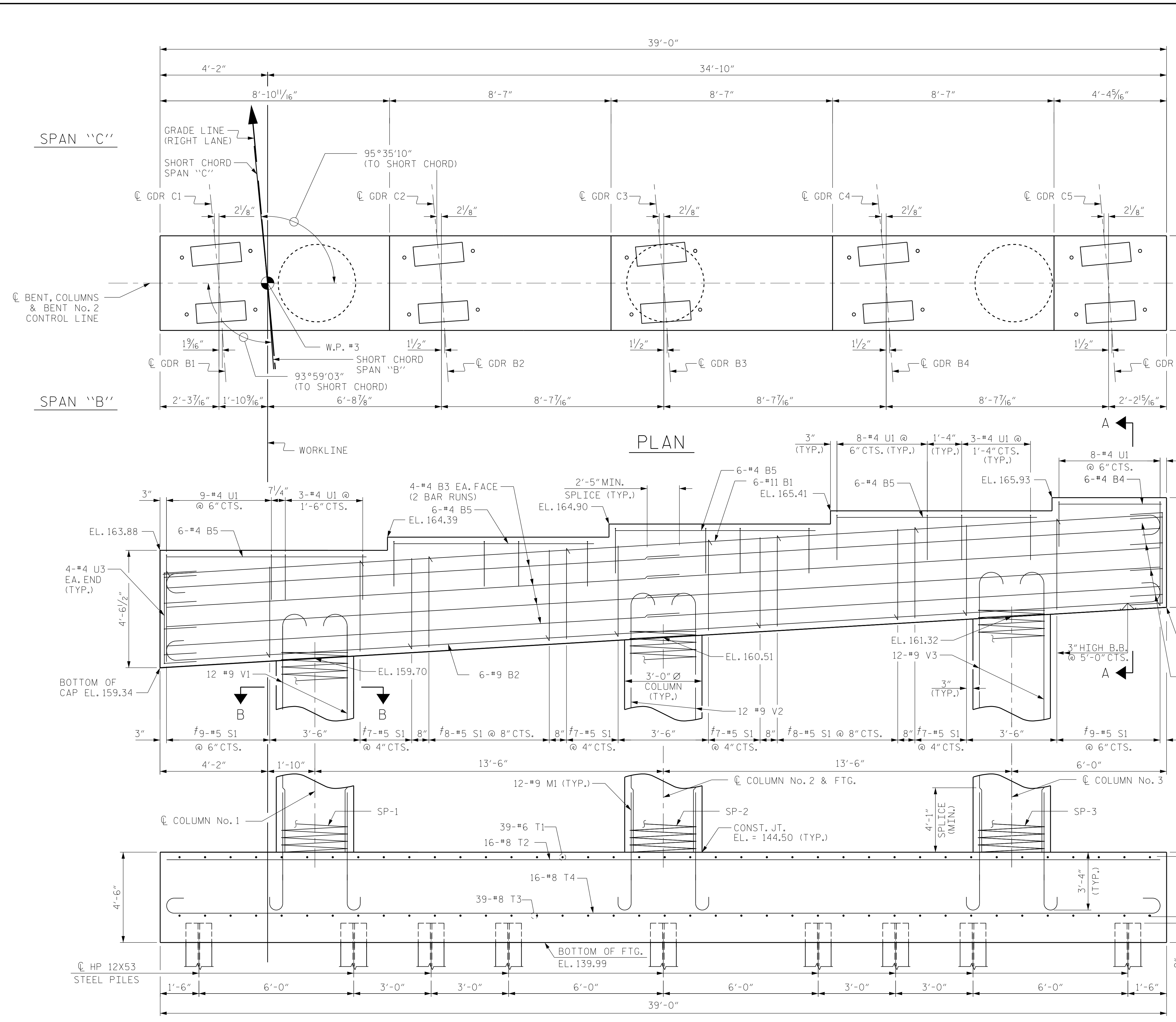
DRAWN BY : J. WEIGER DATE : 01/2019  
 CHECKED BY : M. RAY DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
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 NC License No.: F-0105

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

SHEET NO.  
S1-27  
 TOTAL SHEETS  
35



**NOTES**

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

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

PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 33+45.18 -L-

SHEET 1 OF 2



DRAWN BY : J. WEIGER DATE : 05/2019

CHECKED BY : M. RAY DATE : 05/2019

DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**ELEVATION**

‡ IN PAIRS; INVERT STIRRUPS ALTERNATELY

**moffatt & nichol**

4700 FALLS OF NEUSE ROAD, SUITE 300

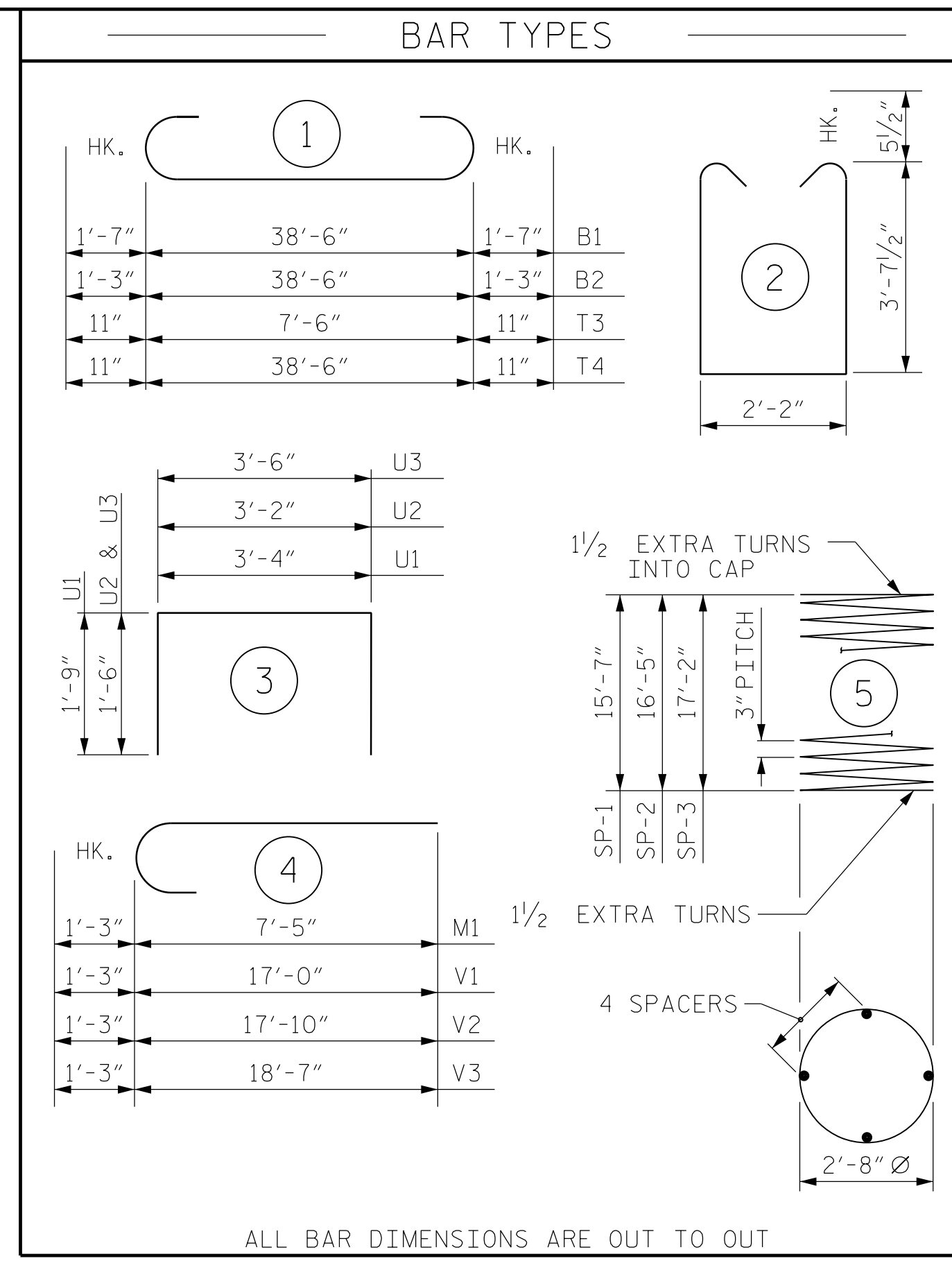
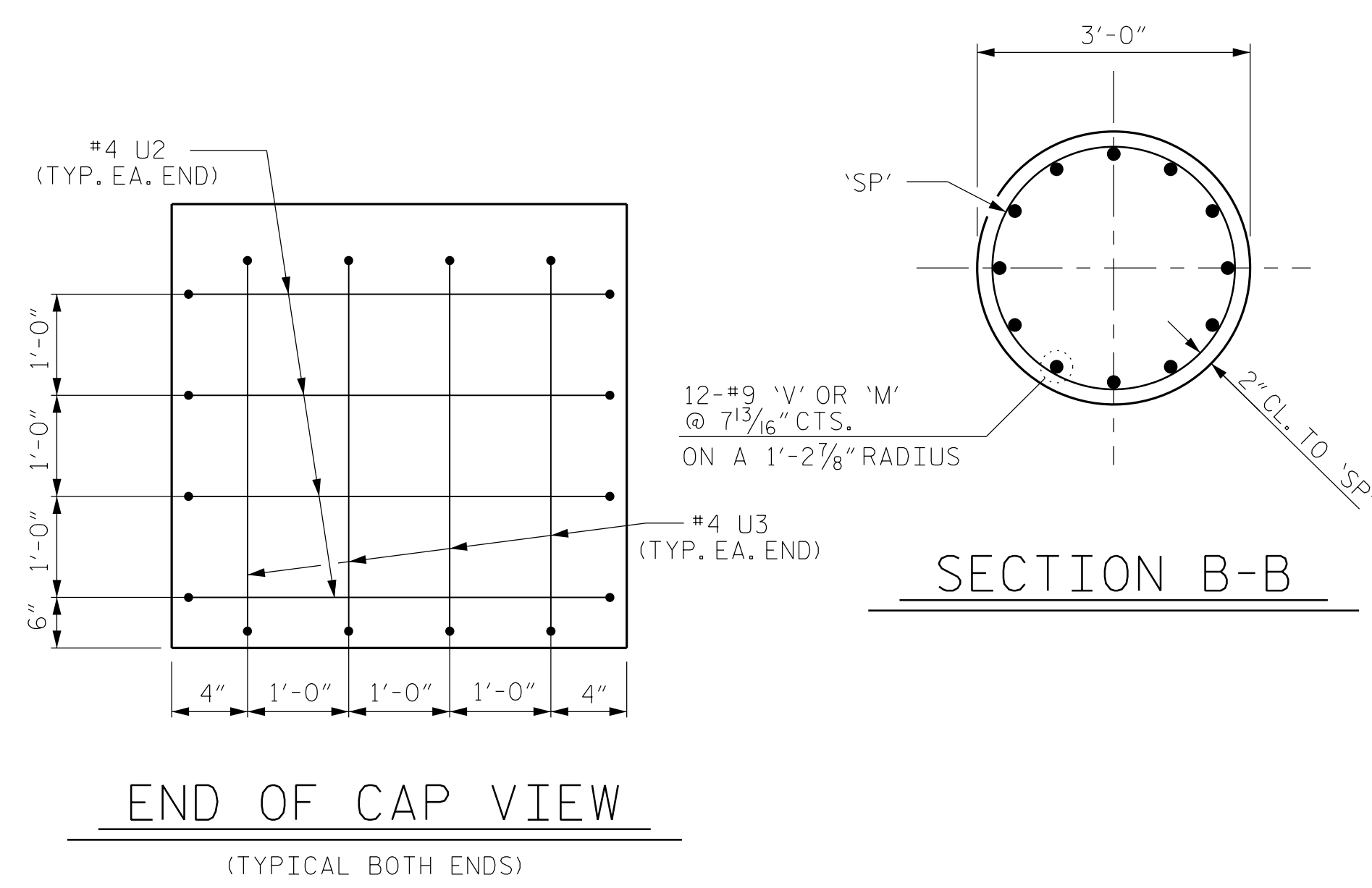
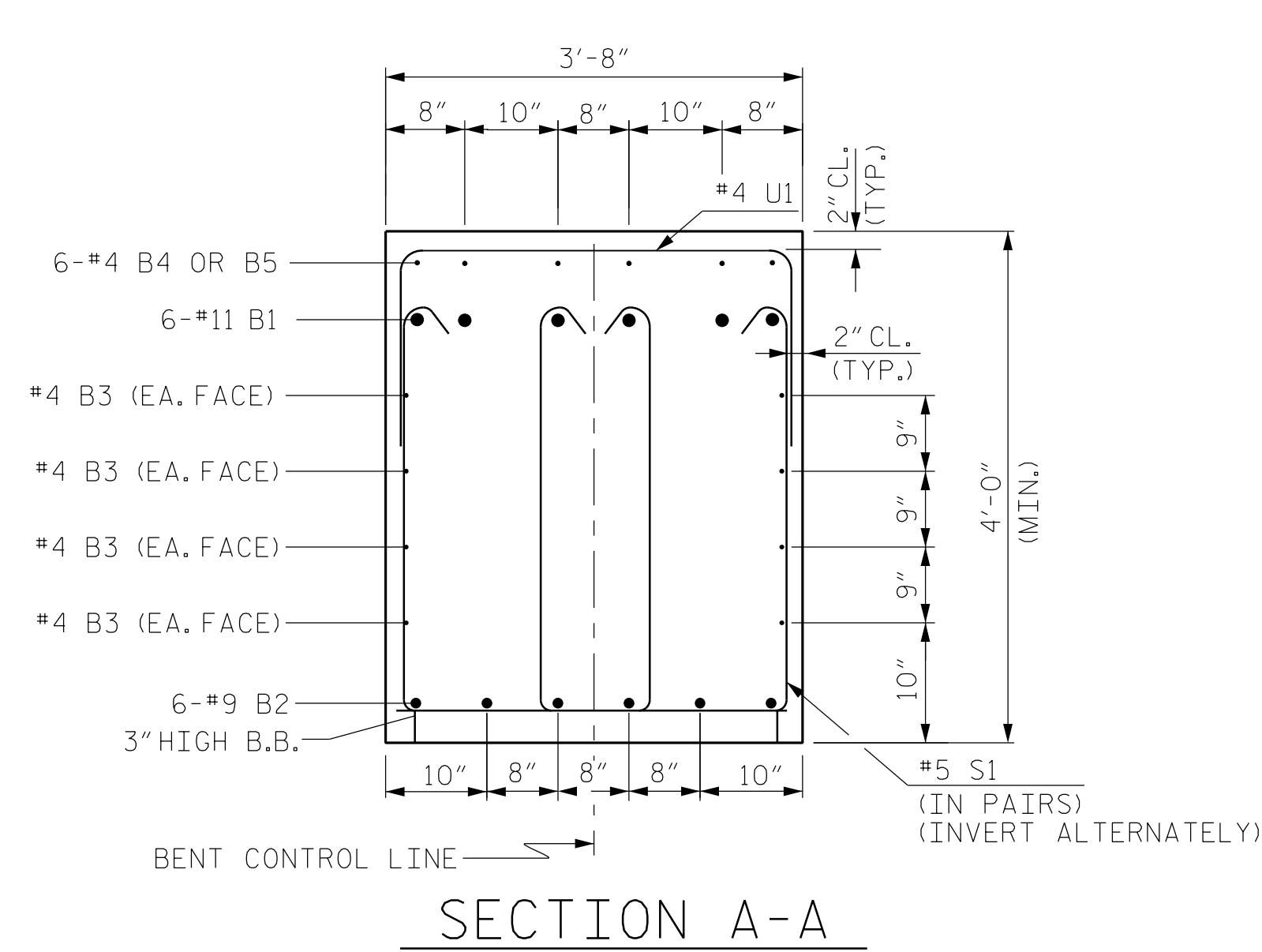
RALEIGH, NORTH CAROLINA 27609

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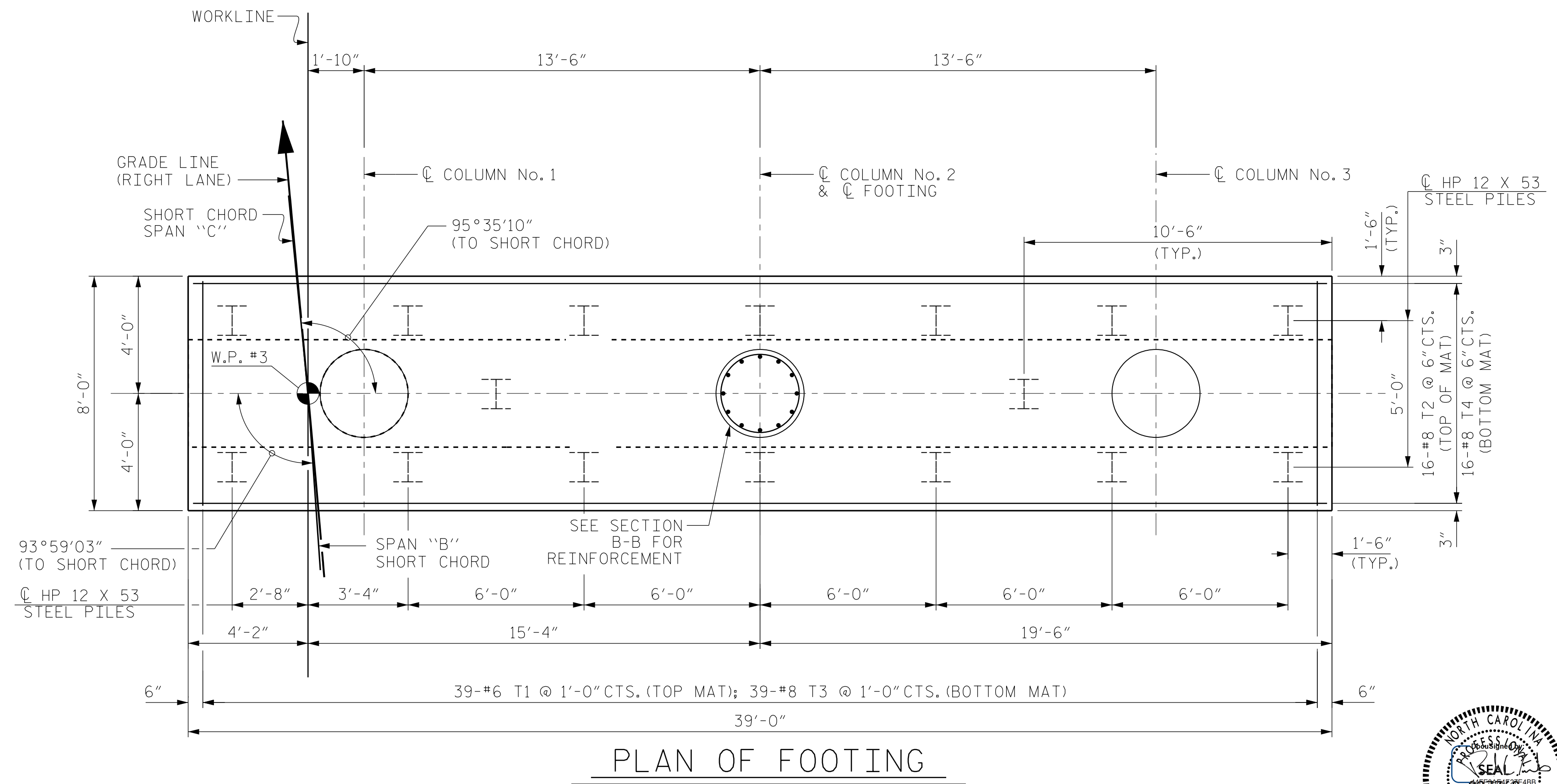
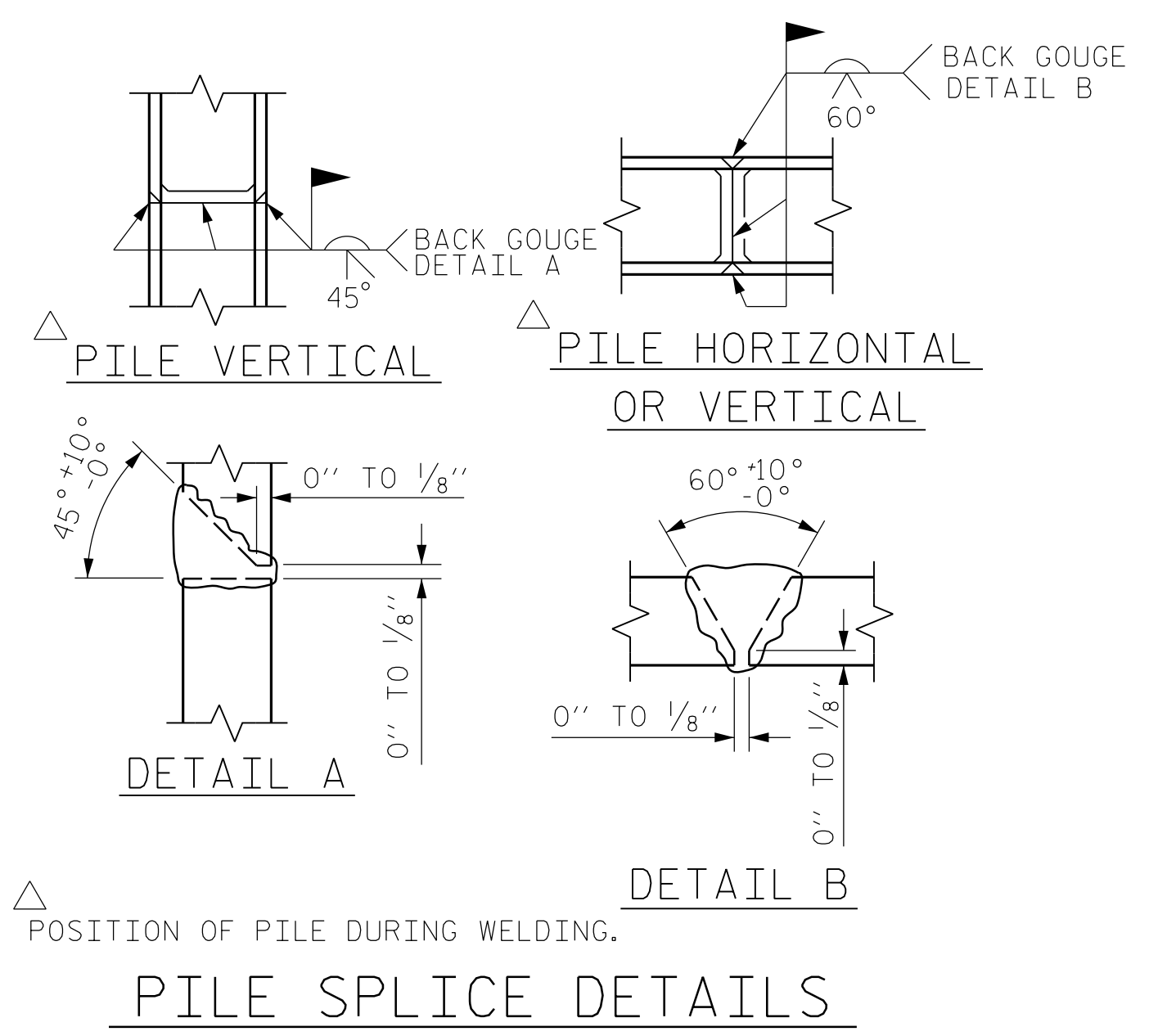
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STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
BENT No. 2 PLAN					
(RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-28
TOTAL SHEETS					35



BILL OF MATERIAL					
BENT No. 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	41'-8"	1328
B2	6	#9	1	41'-0"	836
B3	16	#4	STR.	20'-7"	220
B4	6	#4	STR.	4'-0"	16
B5	24	#4	STR.	7'-9"	124
M1	36	#9	4	8'-8"	1061
S1	124	#5	2	10'-3"	1336
T1	39	#6	STR.	7'-6"	439
T2	16	#8	STR.	38'-6"	1645
T3	39	#8	1	9'-4"	972
T4	16	#8	1	40'-4"	1723
U1	53	#4	3	6'-10"	242
U2	8	#4	3	6'-2"	33
U3	8	#4	3	6'-6"	35
V1	12	#9	4	18'-3"	745
V2	12	#9	4	19'-1"	779
V3	12	#9	4	19'-10"	809
REINFORCING STEEL (FOR BENT NO. 2)					12343 LBS.
SP-1	1	*	5	539'-1"	360
SP-2	1	*	5	566'-7"	378
SP-3	1	*	5	591'-4"	395
SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 2)					1133 LBS.
* THE 'SP' SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
HP 12x53 STEEL PILES No. 16					LENGTH = 1120 LIN. FT.
PILE REDRIVES					8 EA.
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 2)					
POUR #1 (FOOTINGS)					52.0 C.Y.
POUR #2 (COLUMNS)					12.6 C.Y.
POUR #3 (CAP)					22.6 C.Y.
TOTAL CLASS A CONCRETE					87.2 C.Y.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					16 EA.
FOUNDATION EXCAVATION FOR BENT NO. 2					LUMP SUM

ALL BAR DIMENSIONS ARE OUT TO OUT



PLAN OF FOOTING

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 2



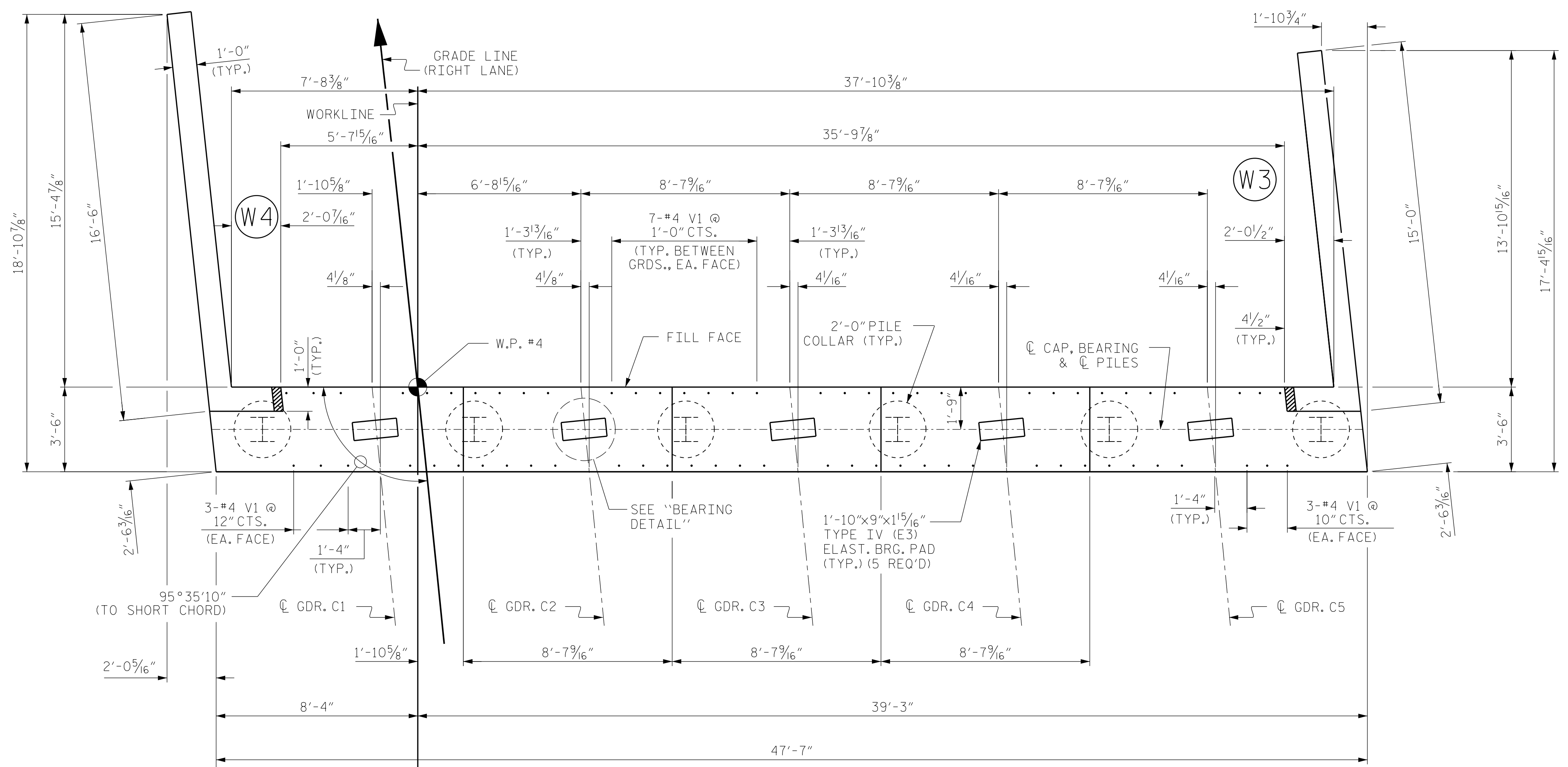
11/11/2019

DRAWN BY : M. RAY DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

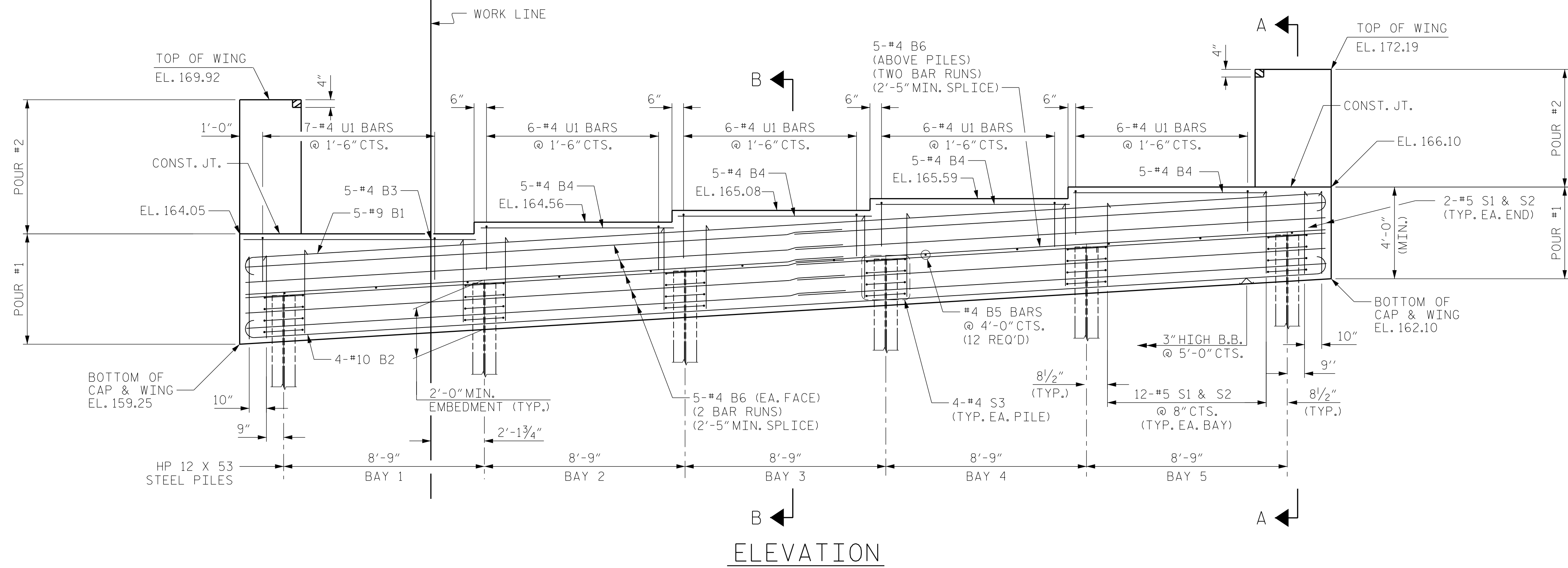
**moffatt & nichol**  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29
1			3			TOTAL SHEETS
2			4			35



END BENT No.2 PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY  
CONCRETE COLLARS NOT SHOWN FOR CLARITY  
V1 BARS NOT SHOWN FOR CLARITY

NOTES

- THE TOP SURFACE OF THE END BENT CAP, 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 BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR SECTION A-A AND B-B, SEE SHEET 3 OF 3.
- FOR PILE SPLICING DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR BEARING DETAIL, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
- FOR CONCRETE COLLAR DETAILS, SEE "CORROSION PREVENTION FOR STEEL PILES" DETAIL ON SHEET 3 OF 3.

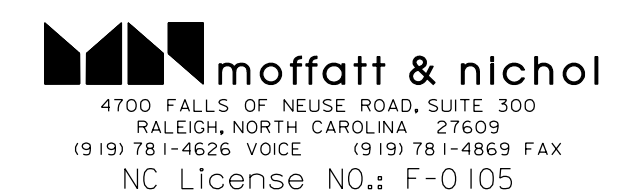
PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-  
SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

**INTEGRAL END BENT  
No. 2 PLAN  
(RIGHT LANE)**

DRAWN BY : J. WEIGER DATE : 05/2019  
CHECKED BY : M. RAY DATE : 05/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

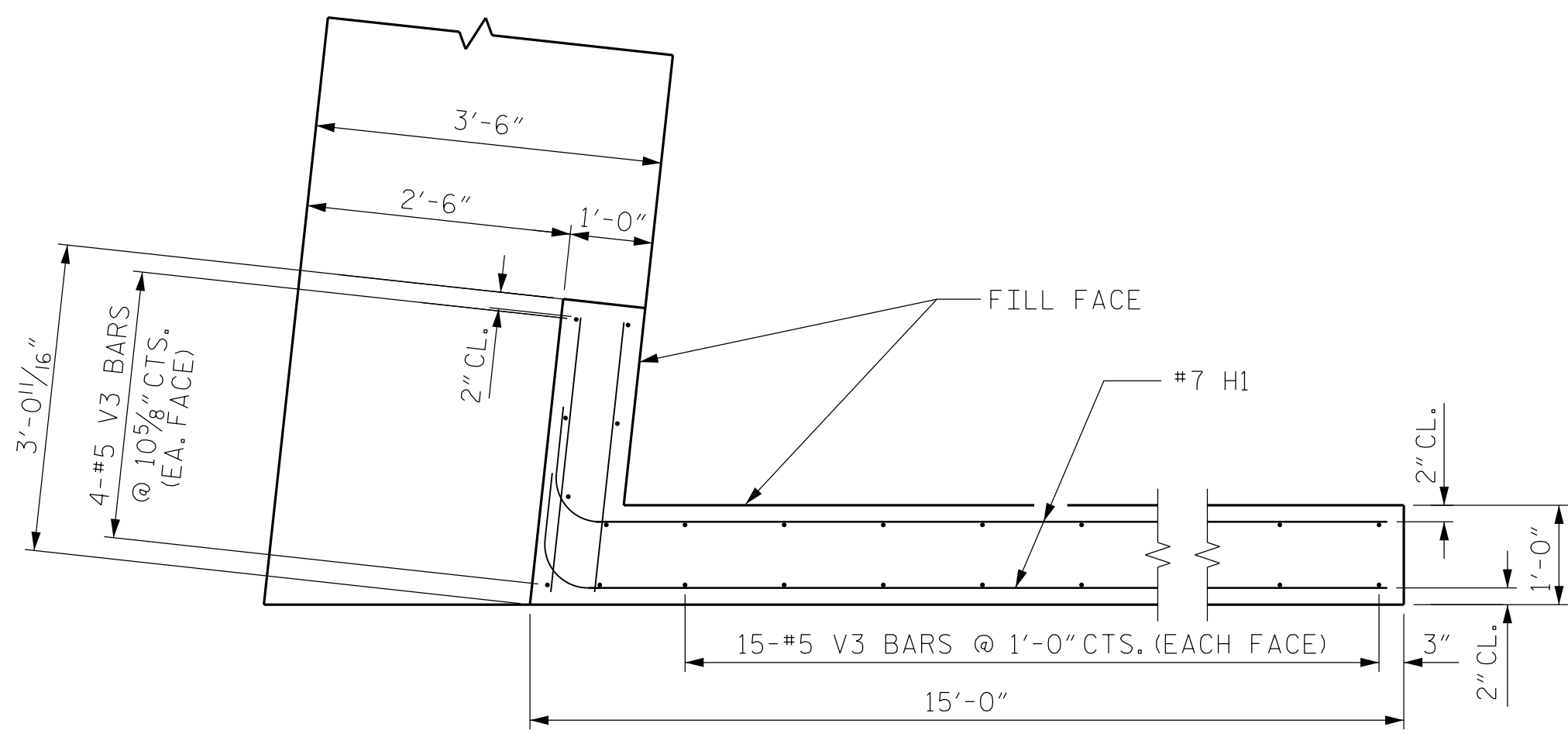


DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

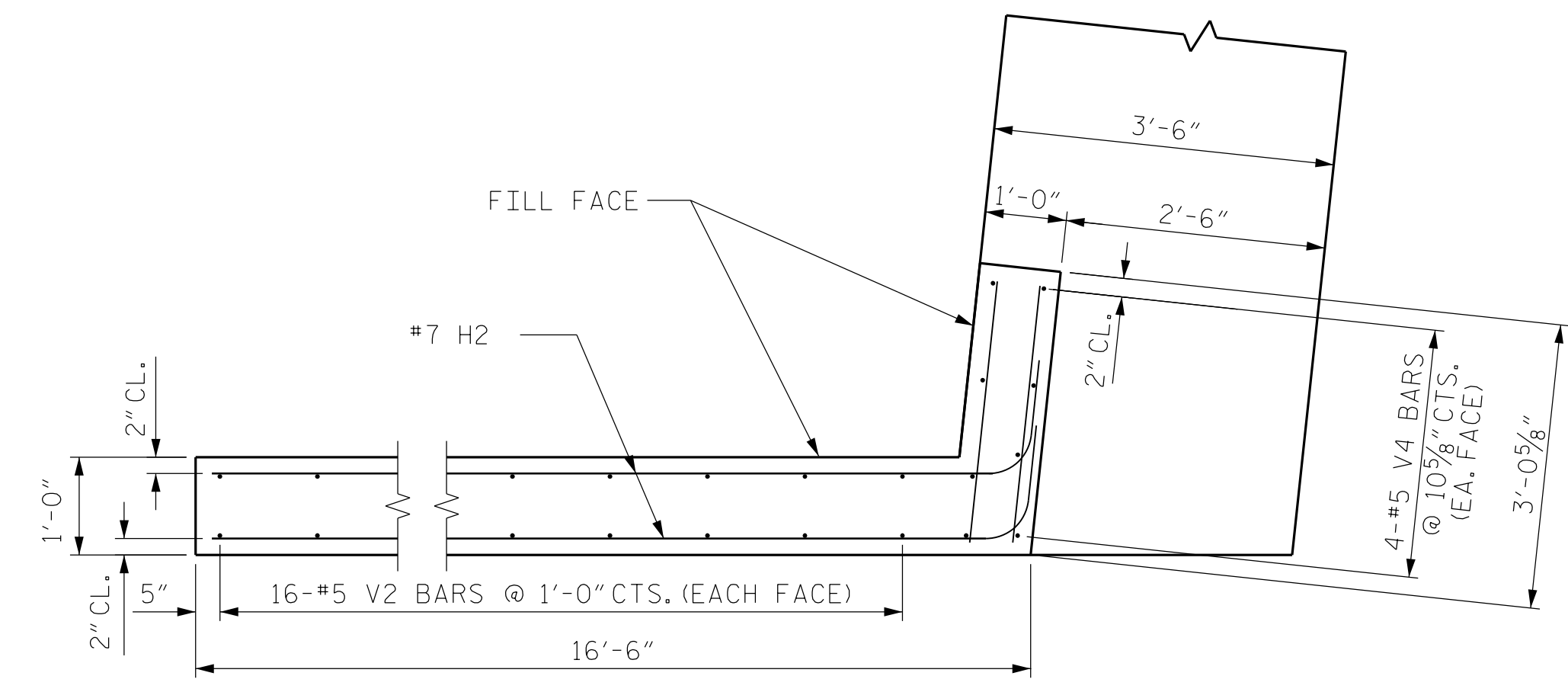
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS
2			4			35

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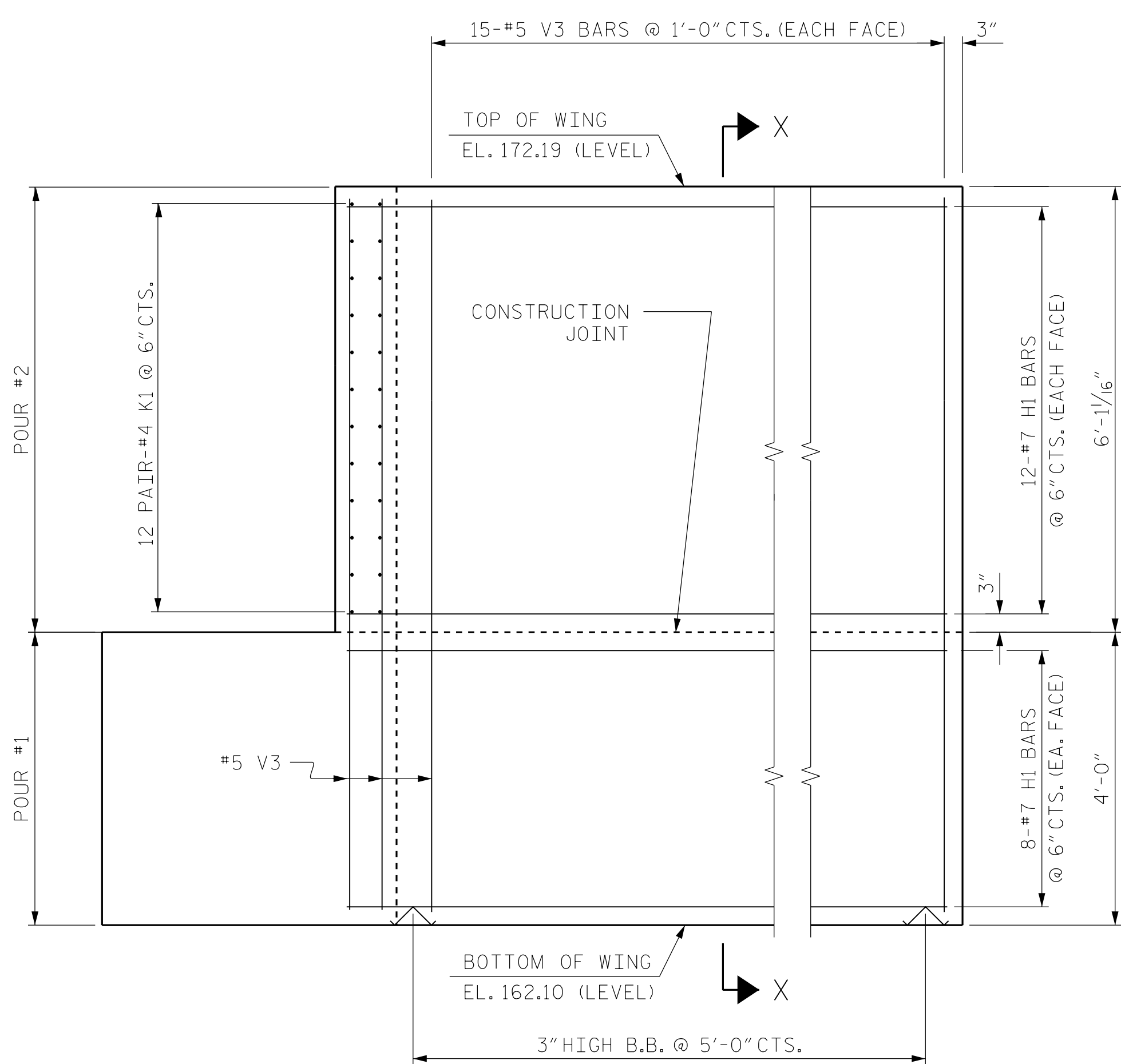




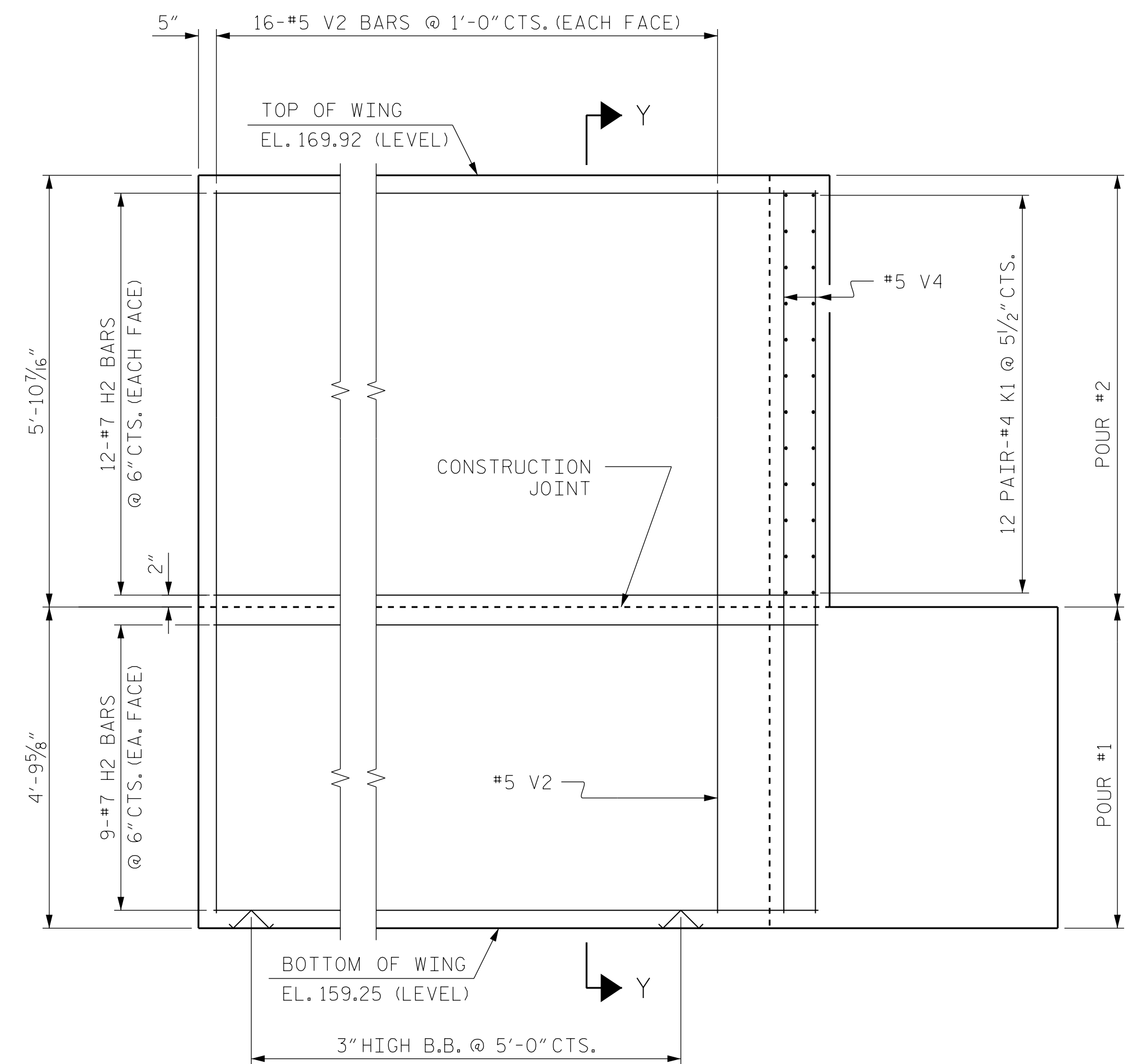
PLAN OF WING (W3)



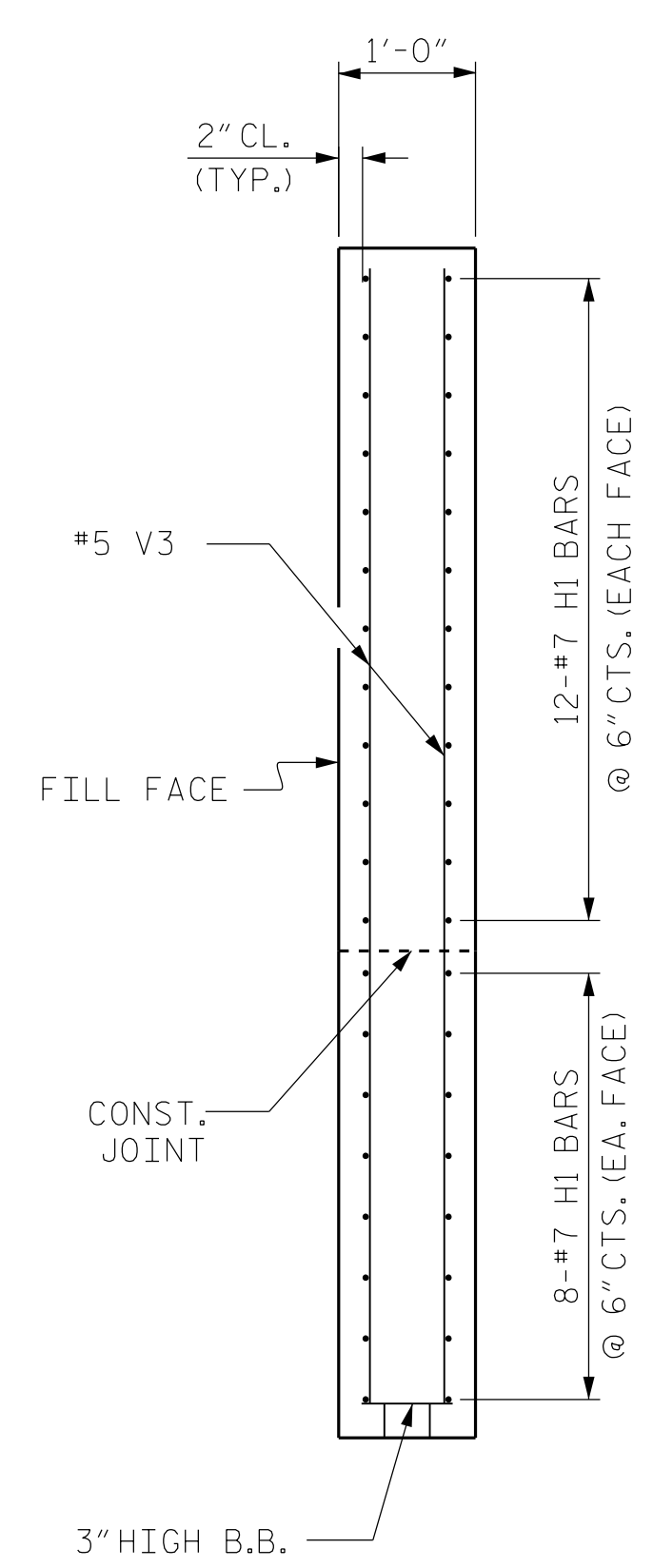
PLAN OF WING (W4)



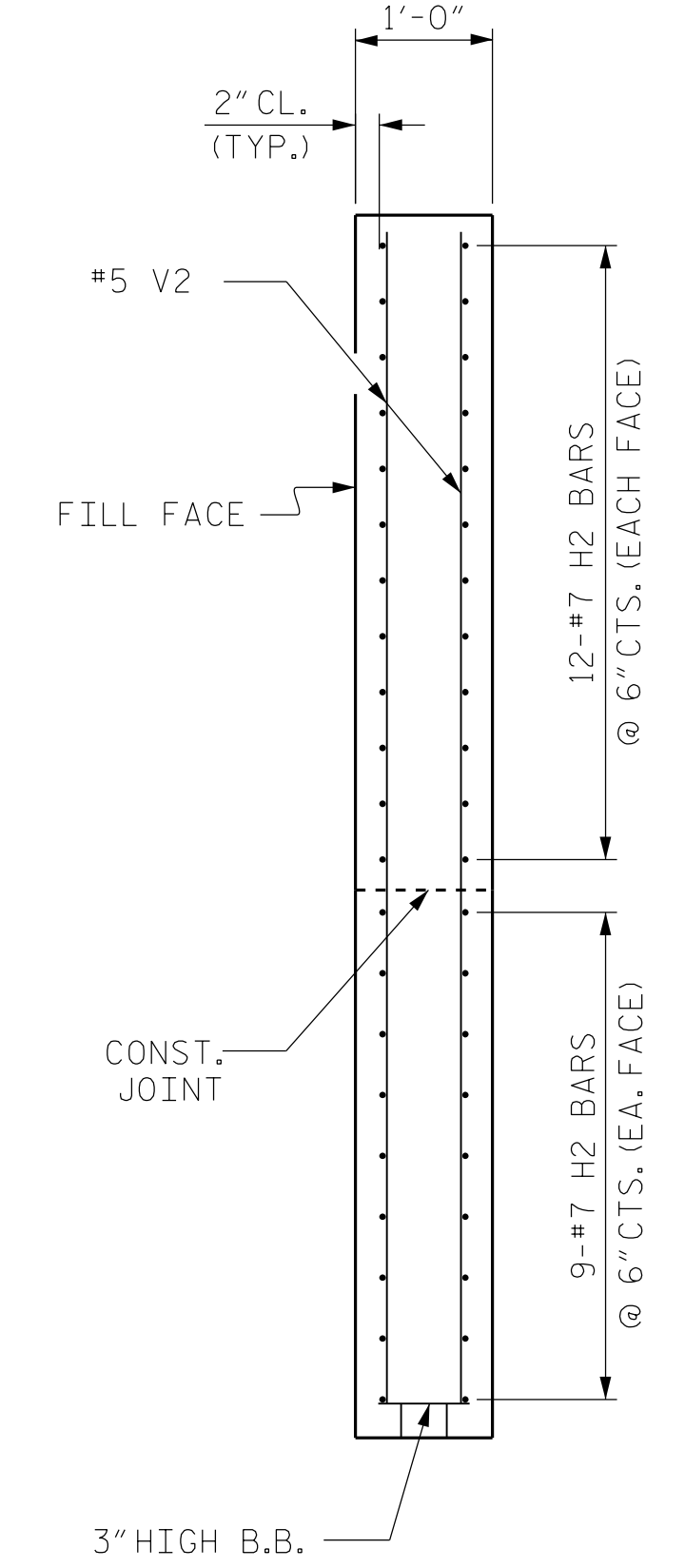
ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION X-X



SECTION Y-Y

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 2 OF 3



11/11/2019

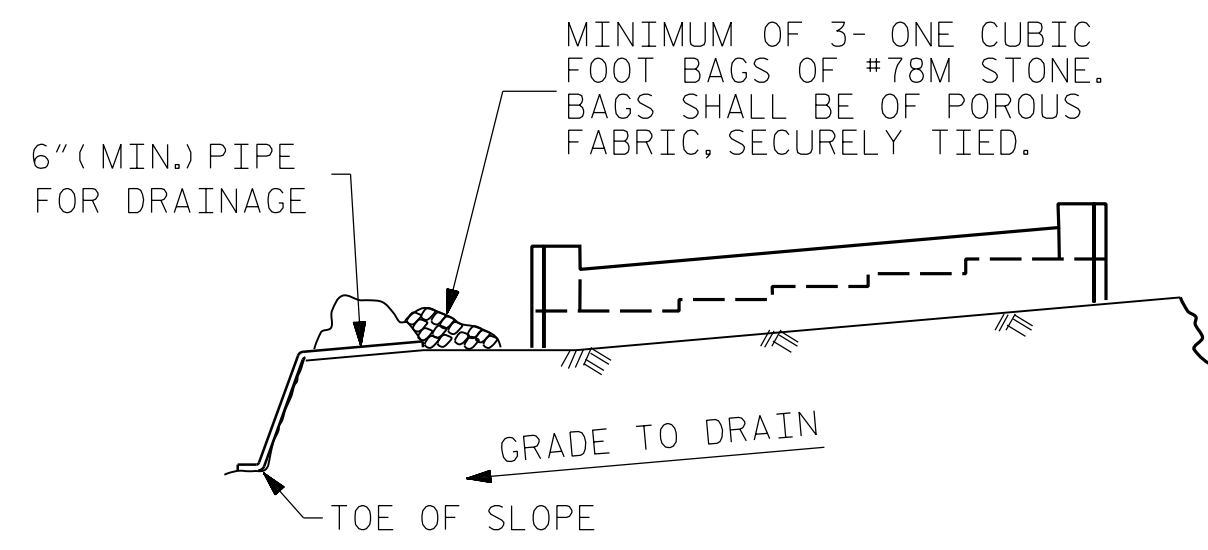
DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 10/2019

WING DETAILS

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT No. 2 WING DETAILS (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S1-31
TOTAL SHEETS					35

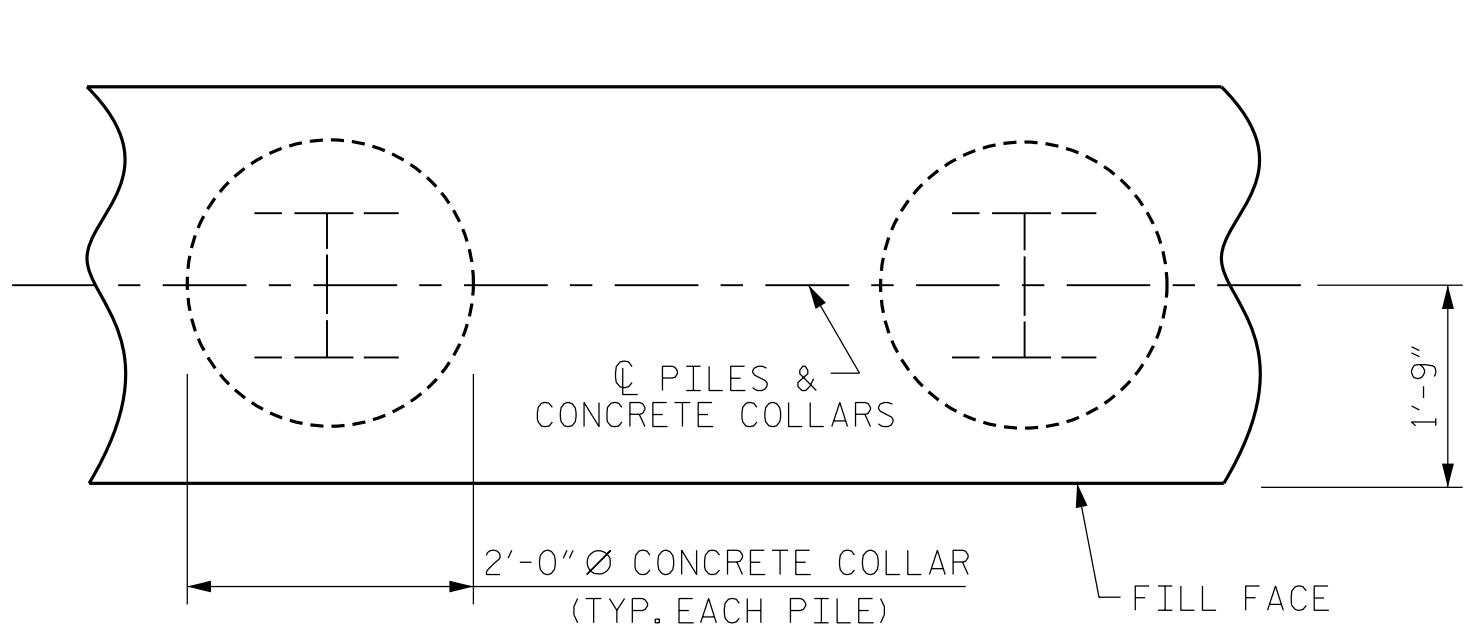


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

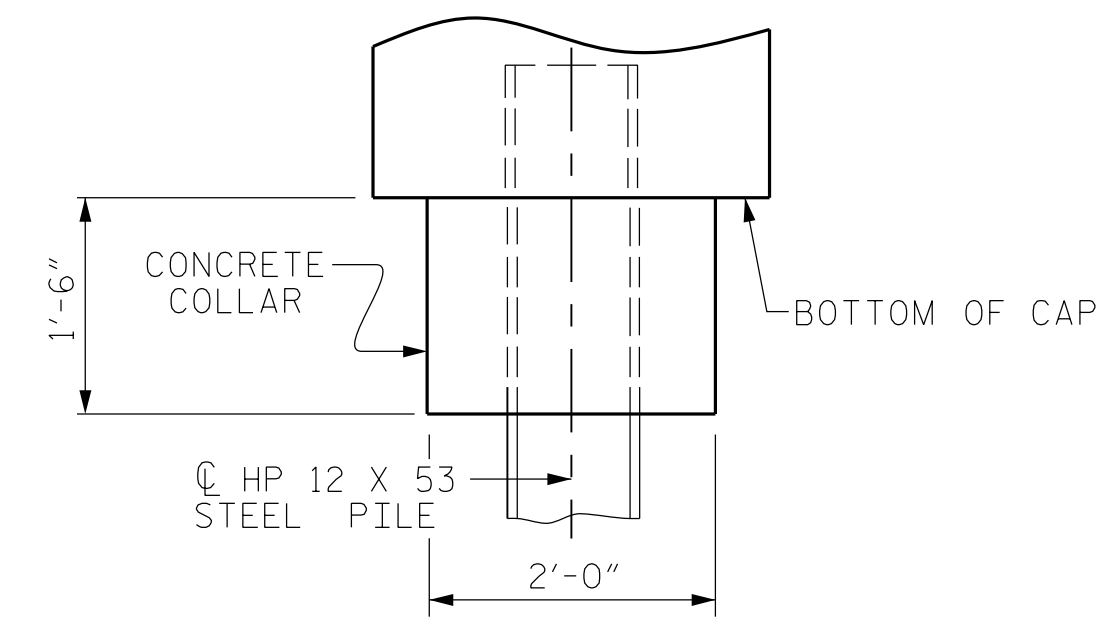
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

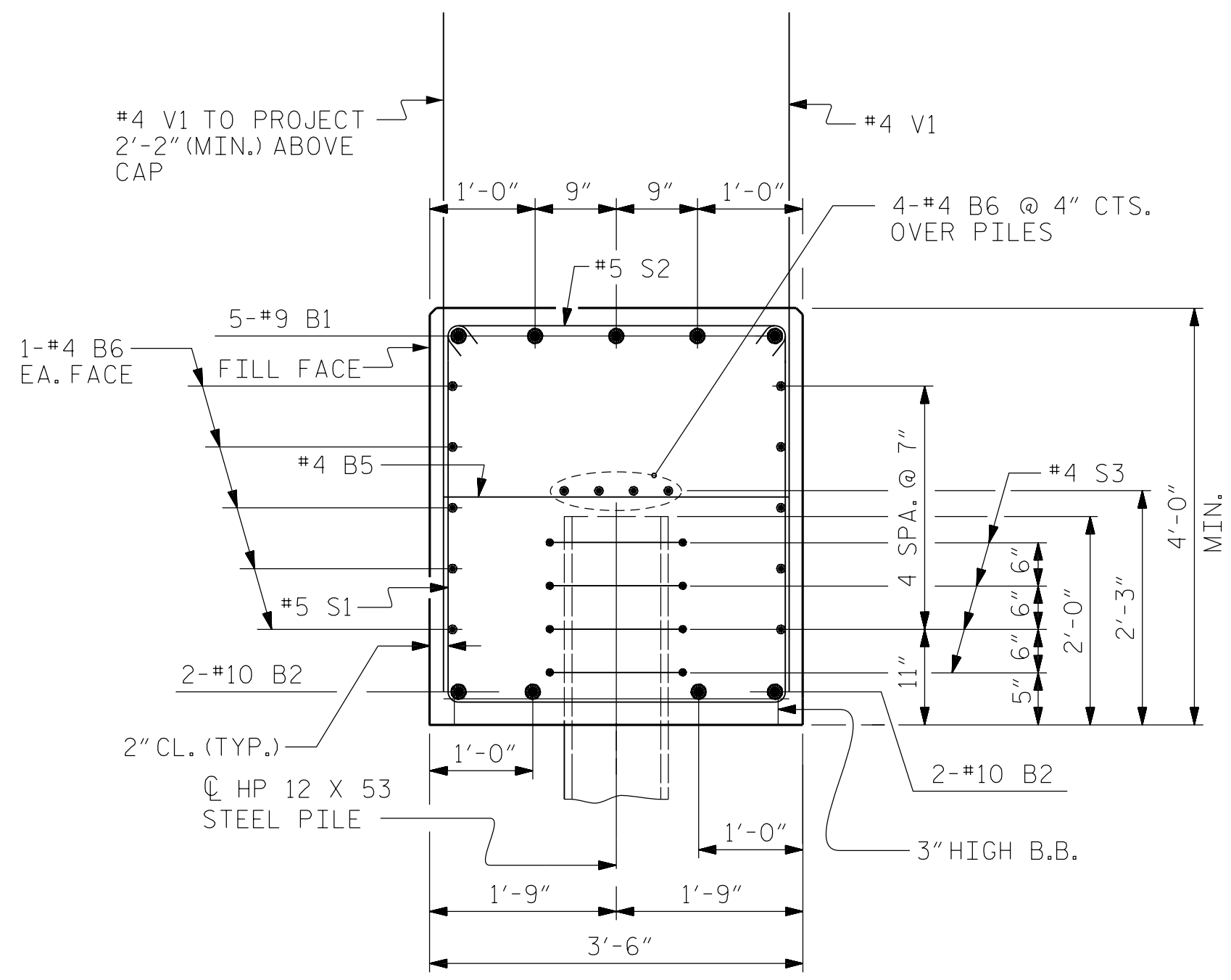


PLAN



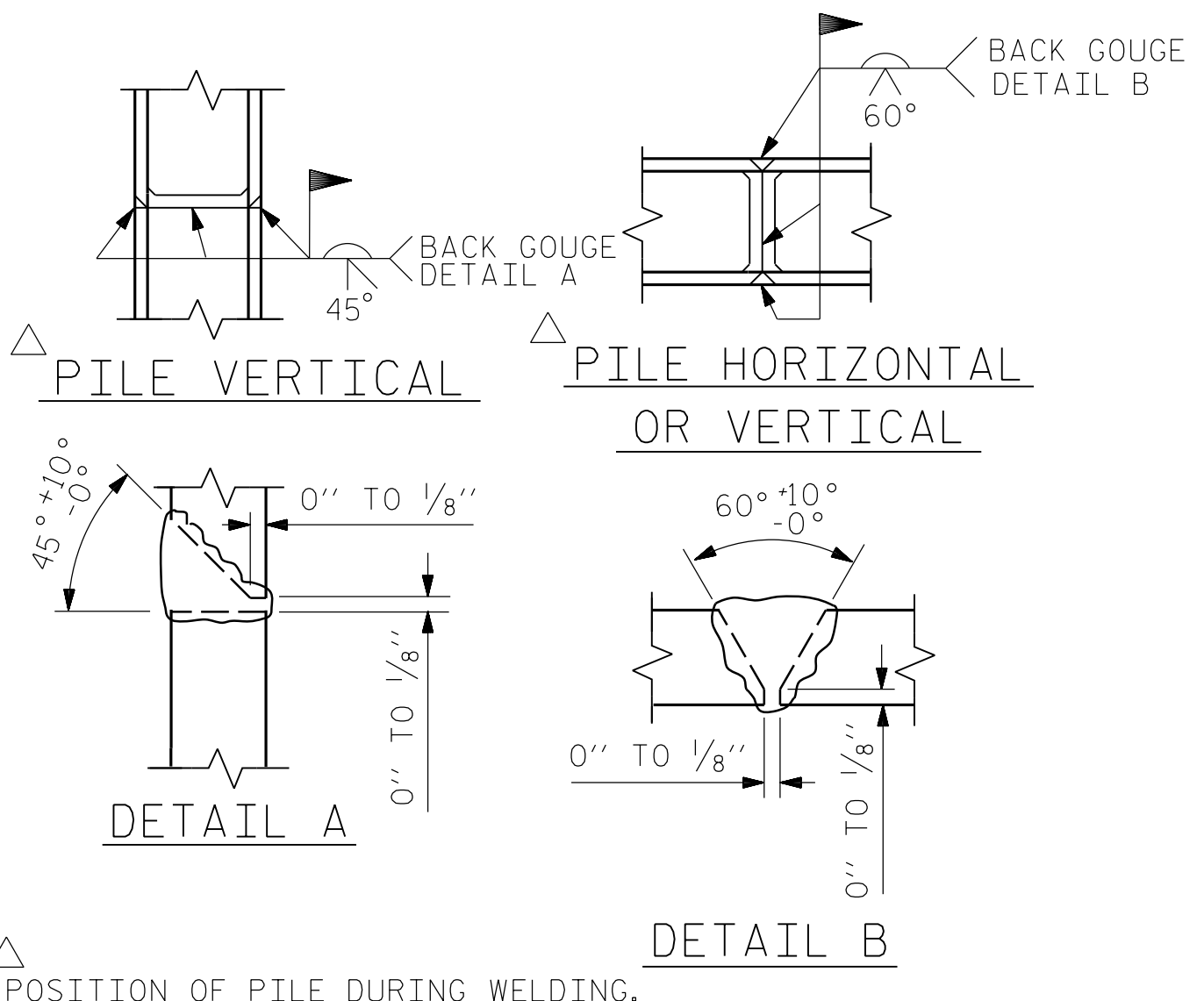
ELEVATION

**CORROSION PROTECTION FOR STEEL PILES DETAIL**

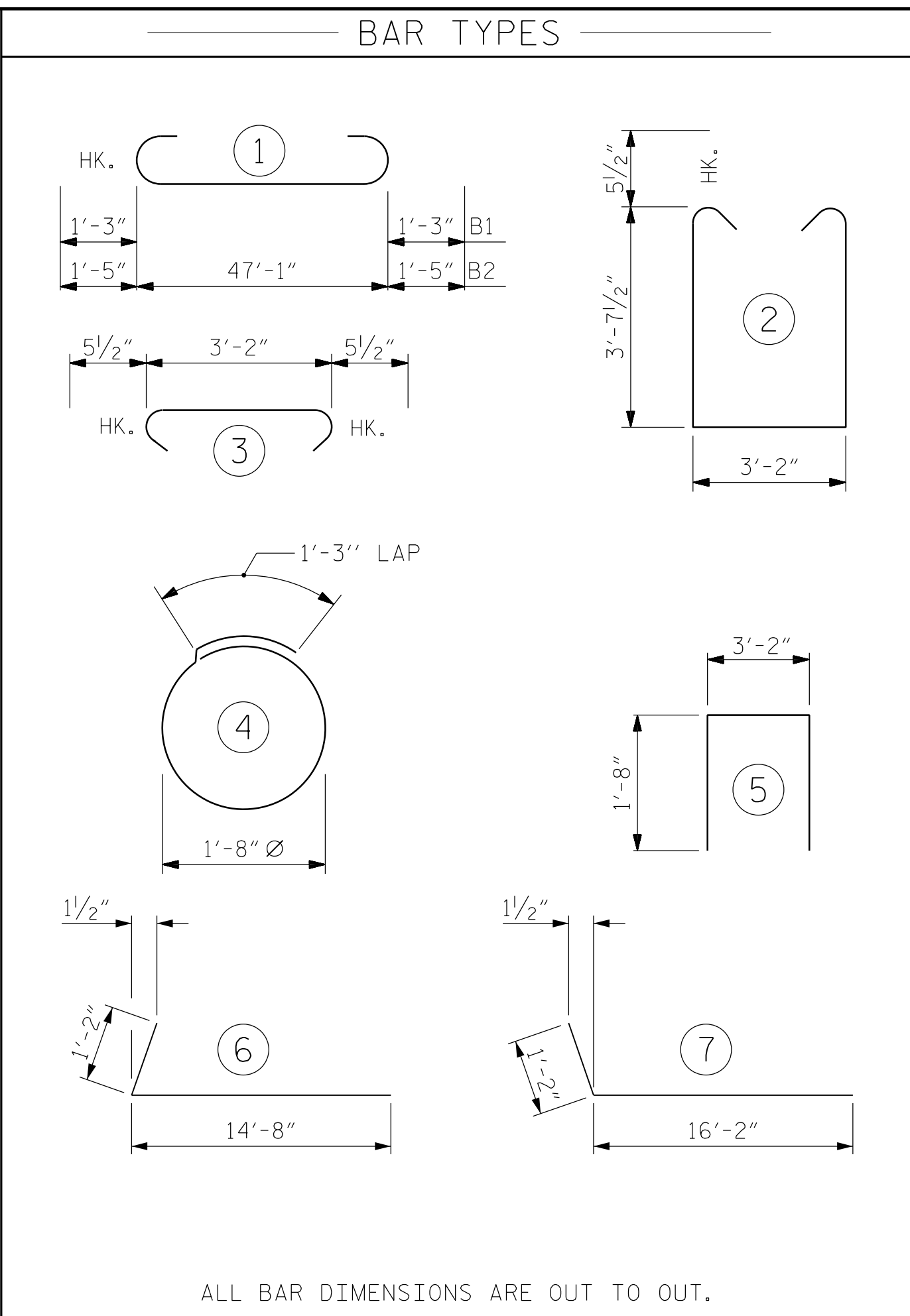


SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



**PILE SPLICE DETAILS**

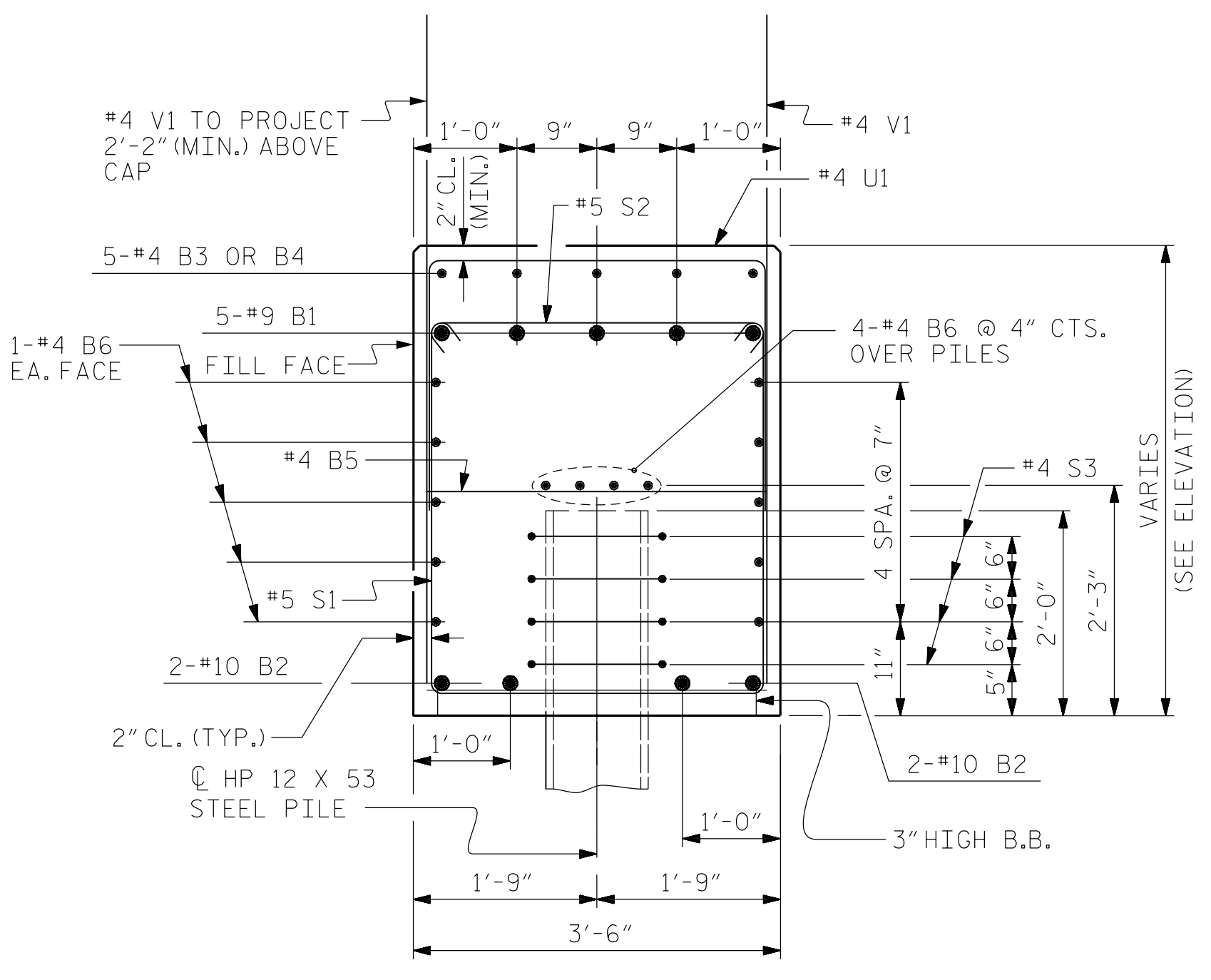


**BILL OF MATERIAL**

**END BENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	49'-7"	843
B2	4	#10	1	49'-11"	859
B3	5	#4	STR	10'-0"	33
B4	20	#4	STR	8'-5"	112
B5	12	#4	STR	3'-2"	25
B6	28	#4	STR	24'-10"	464
H1	40	#7	6	15'-10"	1295
H2	42	#7	7	17'-4"	1488
K1	48	#4	STR	2'-8"	86
S1	64	#5	2	11'-4"	757
S2	64	#5	3	4'-1"	273
S3	24	#4	4	6'-6"	104
U1	31	#4	5	6'-6"	135
V1	68	#4	STR	6'-7"	295
V2	32	#5	STR	10'-3"	342
V3	38	#5	STR	9'-8"	383
V4	8	#5	STR	10'-0"	83

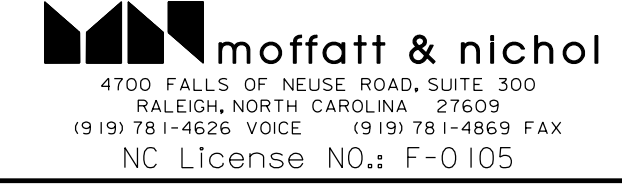
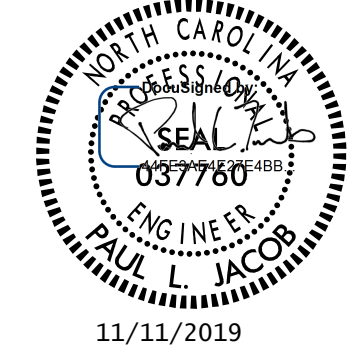
REINFORCING STEEL (FOR END BENT)	7577 LBS.
CLASS A CONCRETE	
POUR #1 CAP, LOWER PART OF WINGS AND COLLARS	33.2 C.Y.
POUR #2 UPPER PART OF WINGS	8.0 C.Y.
<b>TOTAL</b>	<b>41.2 C.Y.</b>
HP 12 X 53 STEEL PILES NO: 6	LIN. FT. = 360
PILE REDRIVES	3 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	6 EA.



SECTION B-B

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 3 OF 3

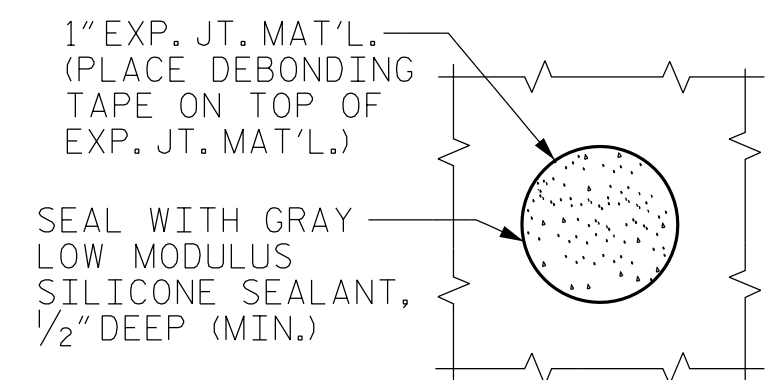
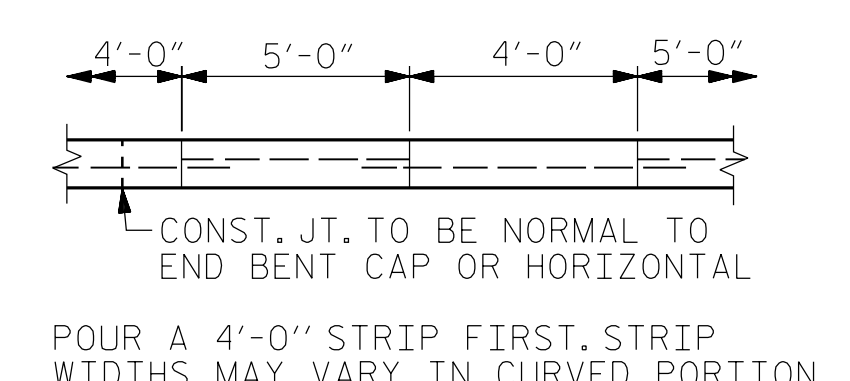
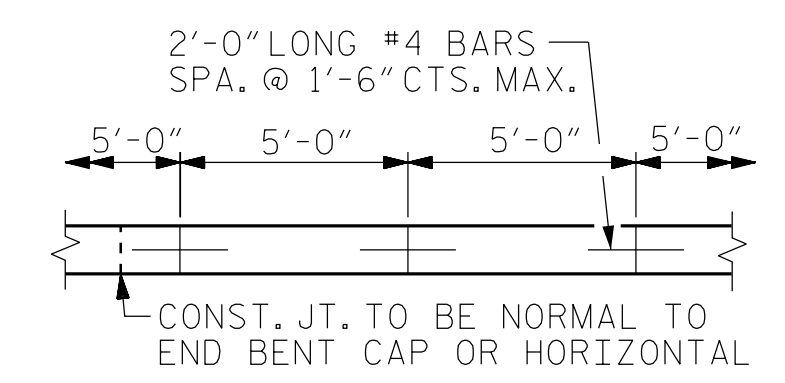
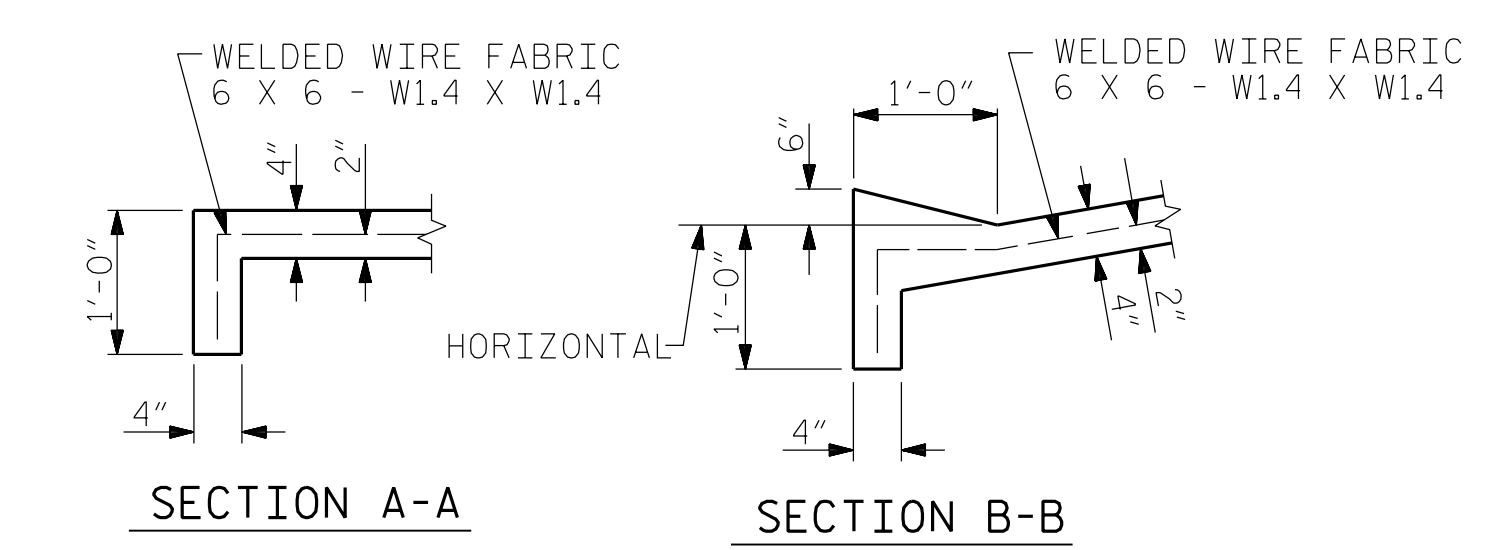
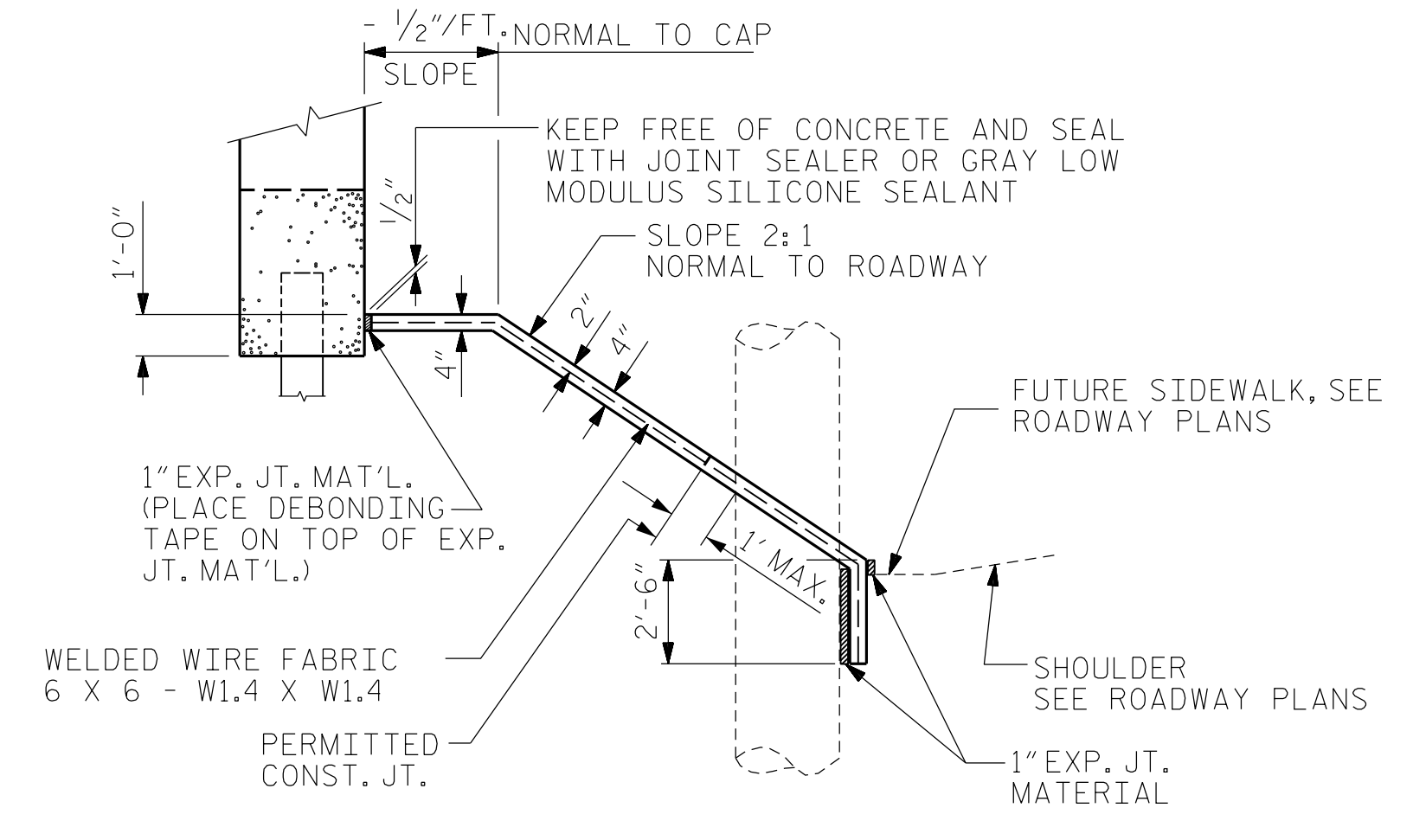
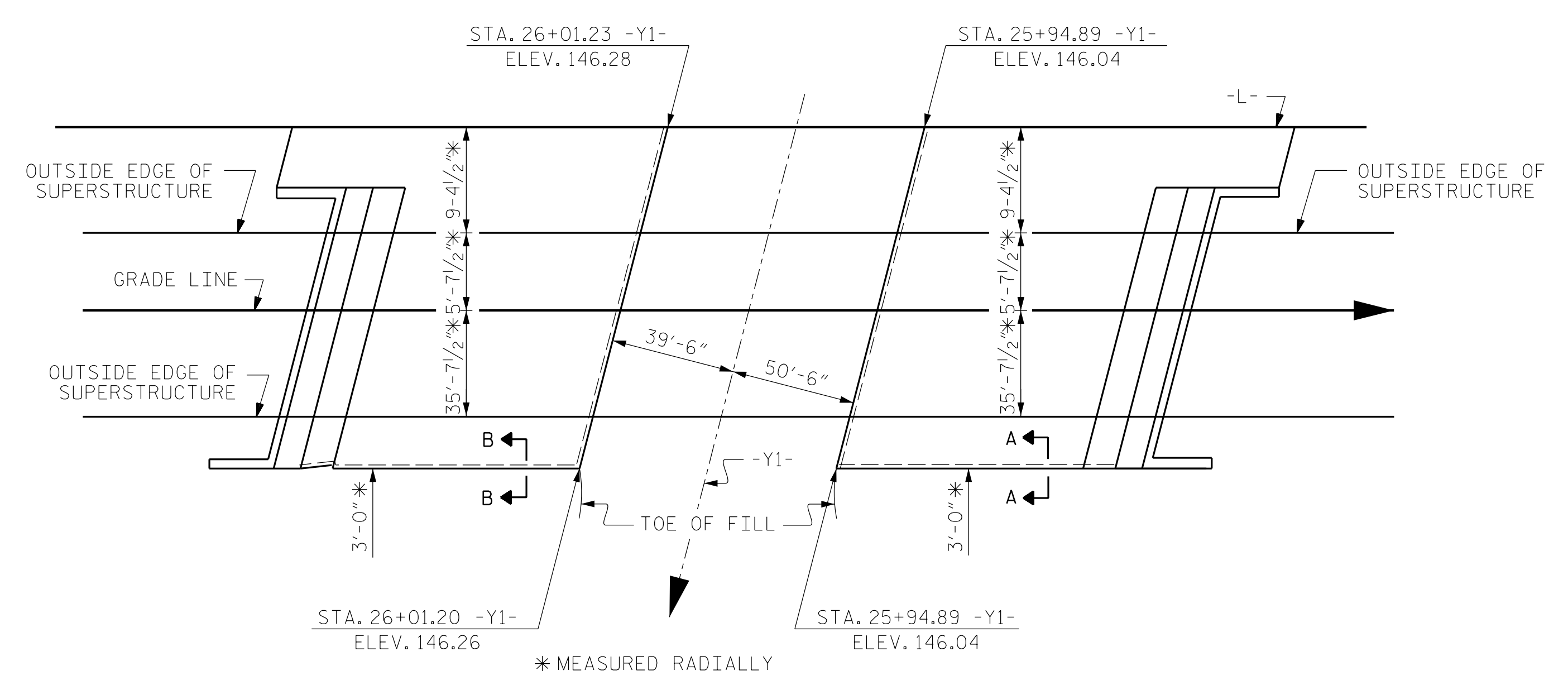


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL END BENT No. 2 DETAILS (RIGHT LANE)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-32
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : <u>J. WEIGER</u>	DATE : <u>01/2019</u>
CHECKED BY : <u>M. RAY</u>	DATE : <u>08/2019</u>
DESIGN ENGINEER OF RECORD: <u>P. JACOB</u>	DATE : <u>09/2019</u>



**GENERAL NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. 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.

**ALTERNATE "A"**

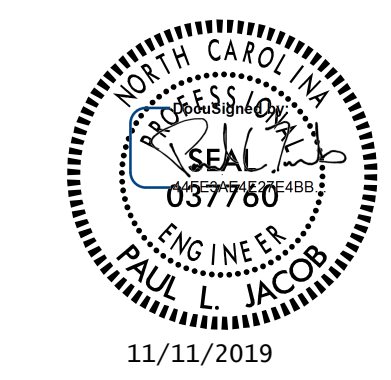
ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE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

FOR BERM WIDTH DIMENSIONS AND ELEVATIONS, SEE GENERAL DRAWING.

BRIDGE @ STA. 33+45.18 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	208	410
END BENT 2	218	440

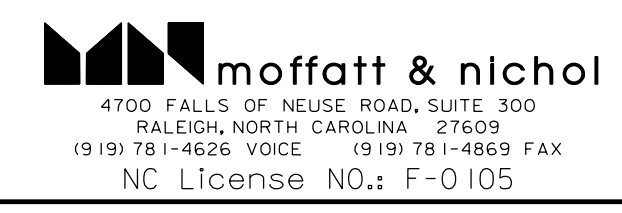
\* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**SLOPE PROTECTION DETAILS**  
 (RIGHT LANE)

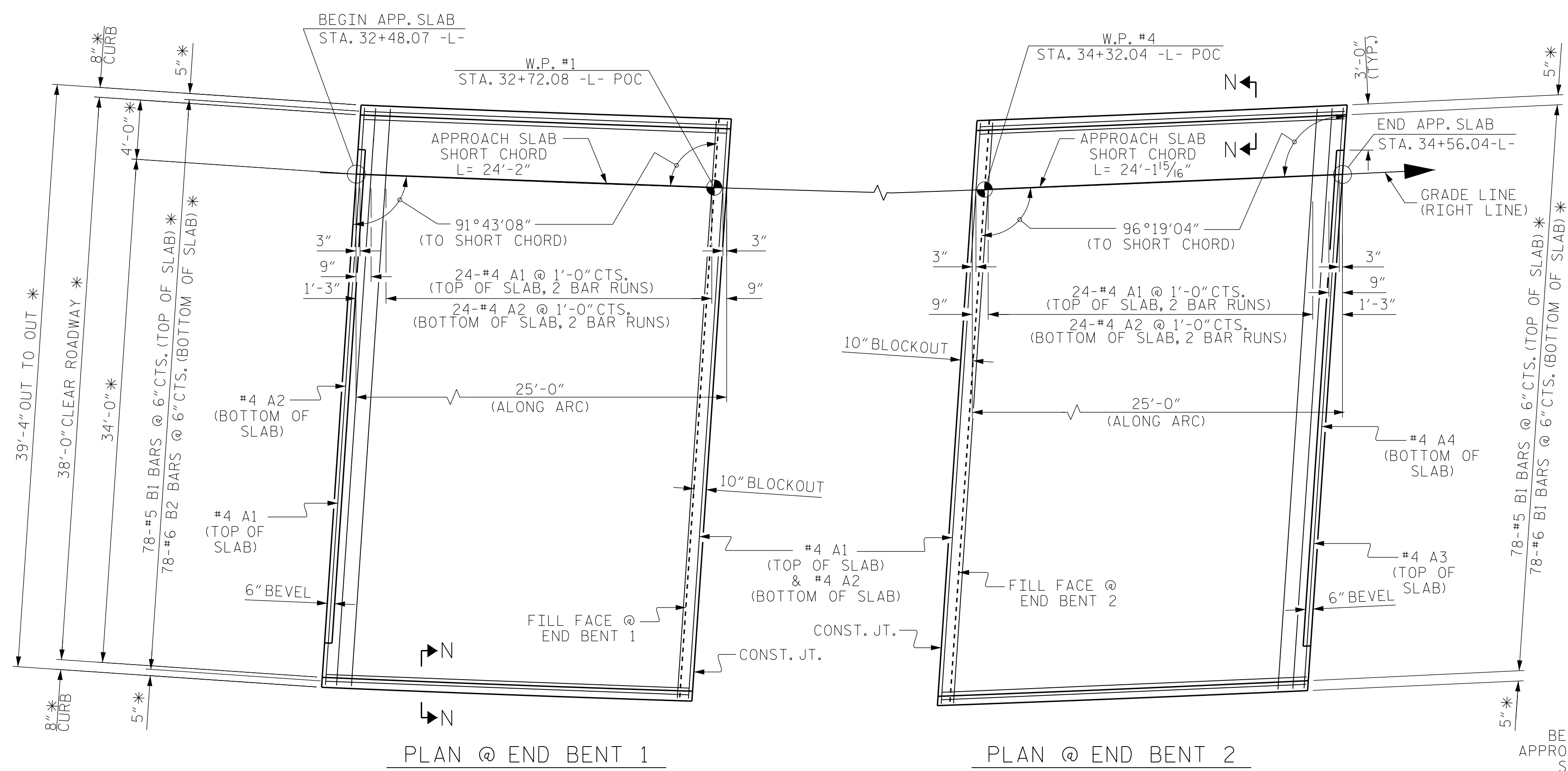
ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-33
1			3			TOTAL SHEETS
2			4			35

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**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 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.

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 2 FOR DETAILS AND NOTES.

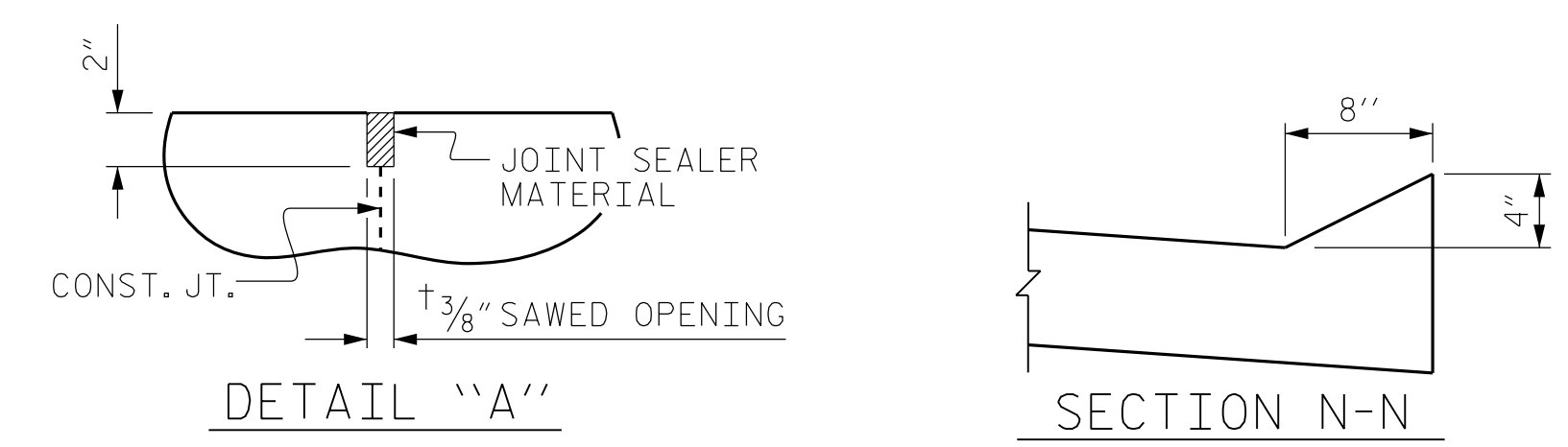
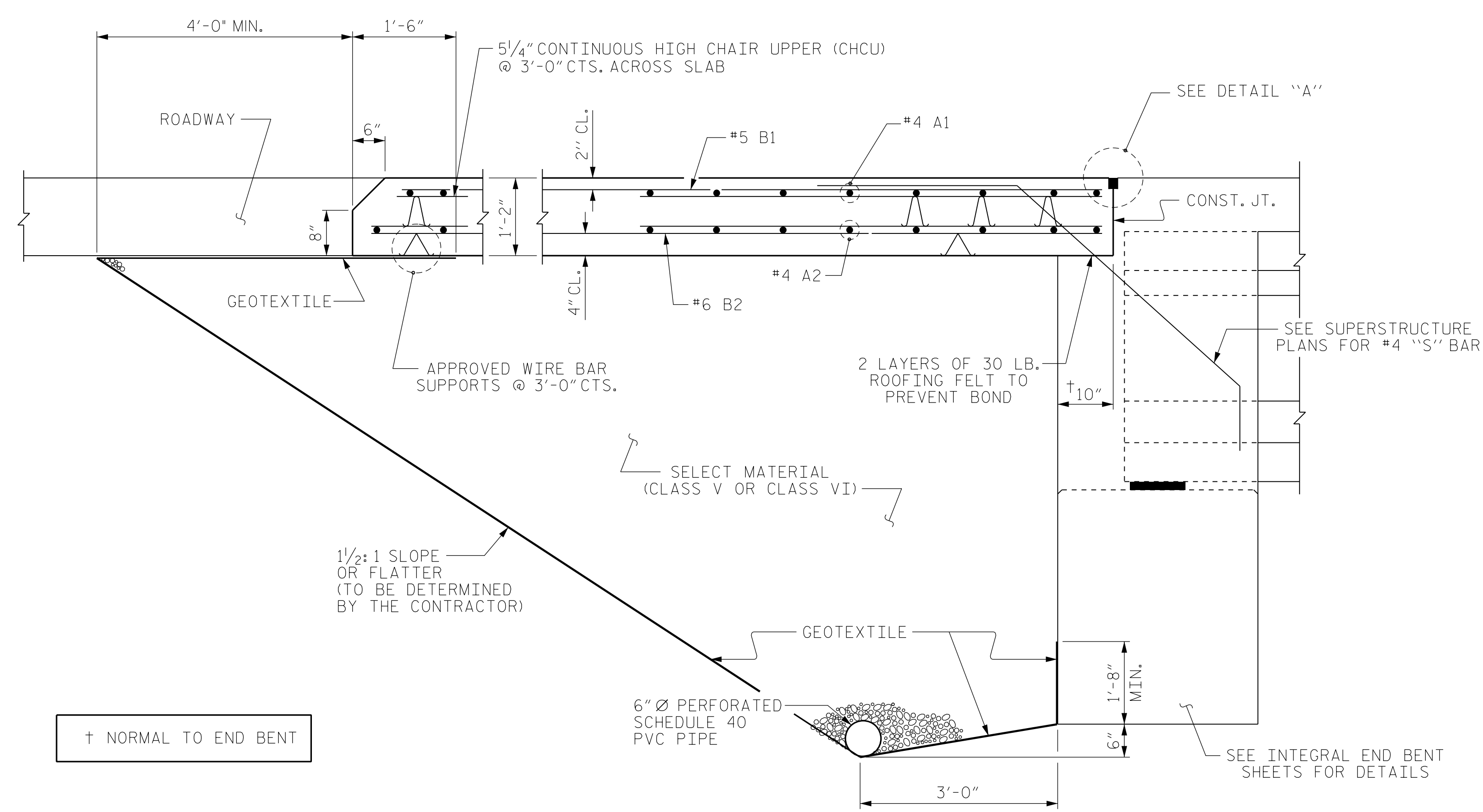
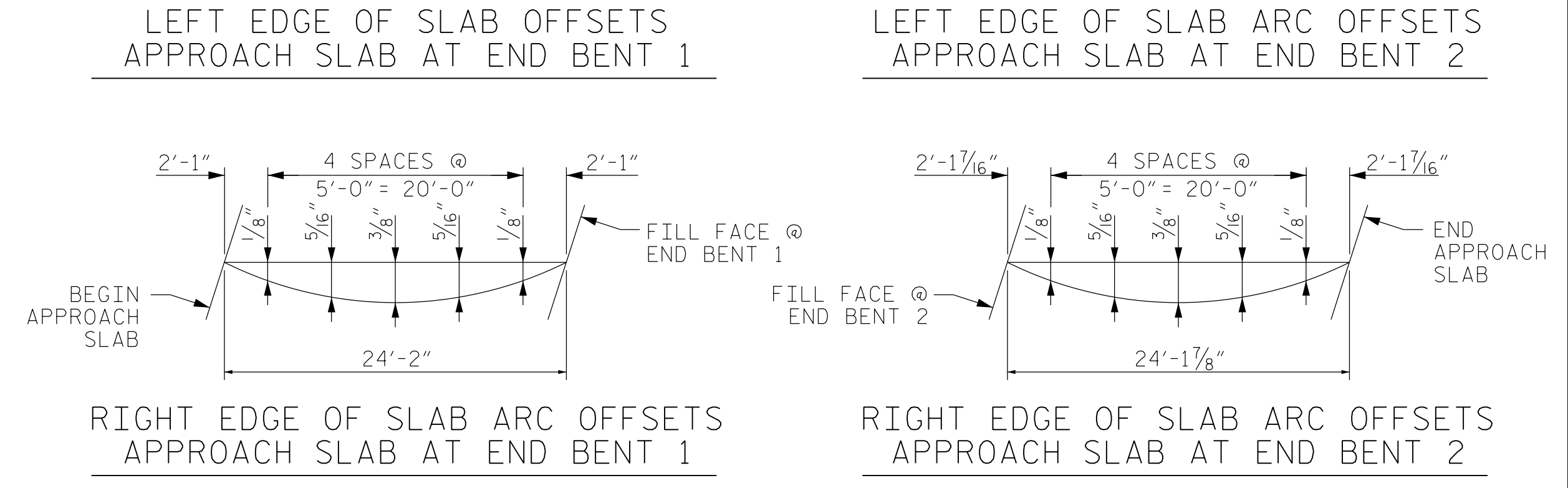
**BILL OF MATERIAL**

FOR ONE APPROACH SLAB (2 REQ'D)

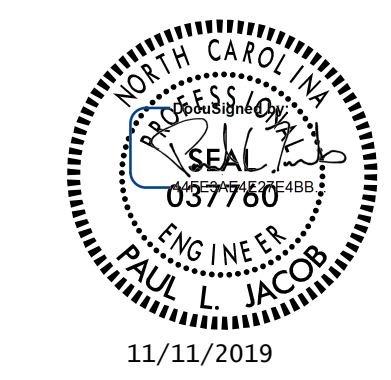
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	712
* B1	78	#5	STR	24'-2"	1966
B2	78	#6	STR	24'-8"	2890
REINFORCING STEEL				3602 LBS.	
* EPOXY COATED REINFORCING STEEL				2684 LBS.	
CLASS AA CONCRETE				42.6 C. Y.	

**SPLICE LENGTHS**

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



PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+45.18 -L-  
 SHEET 1 OF 2

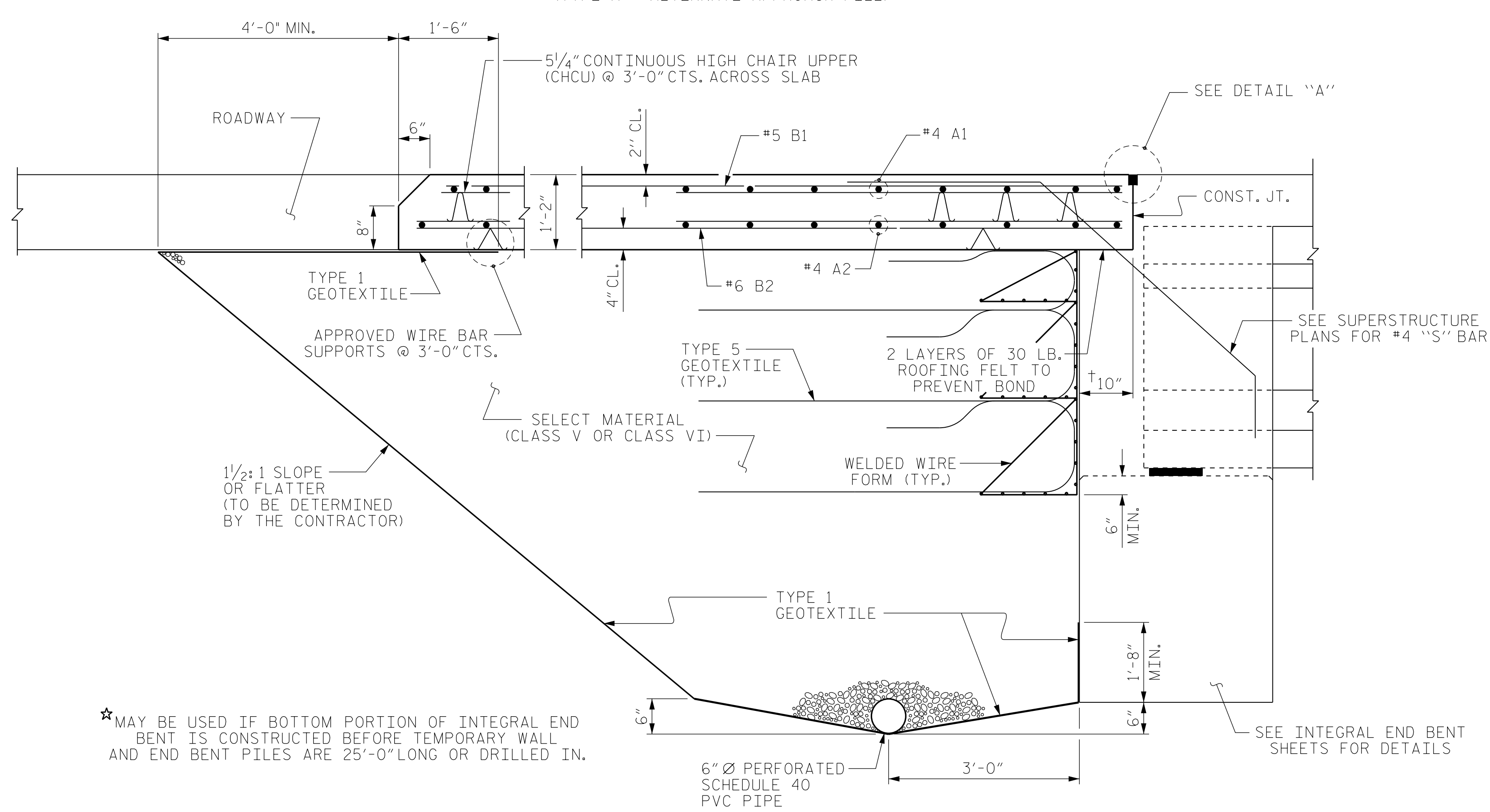
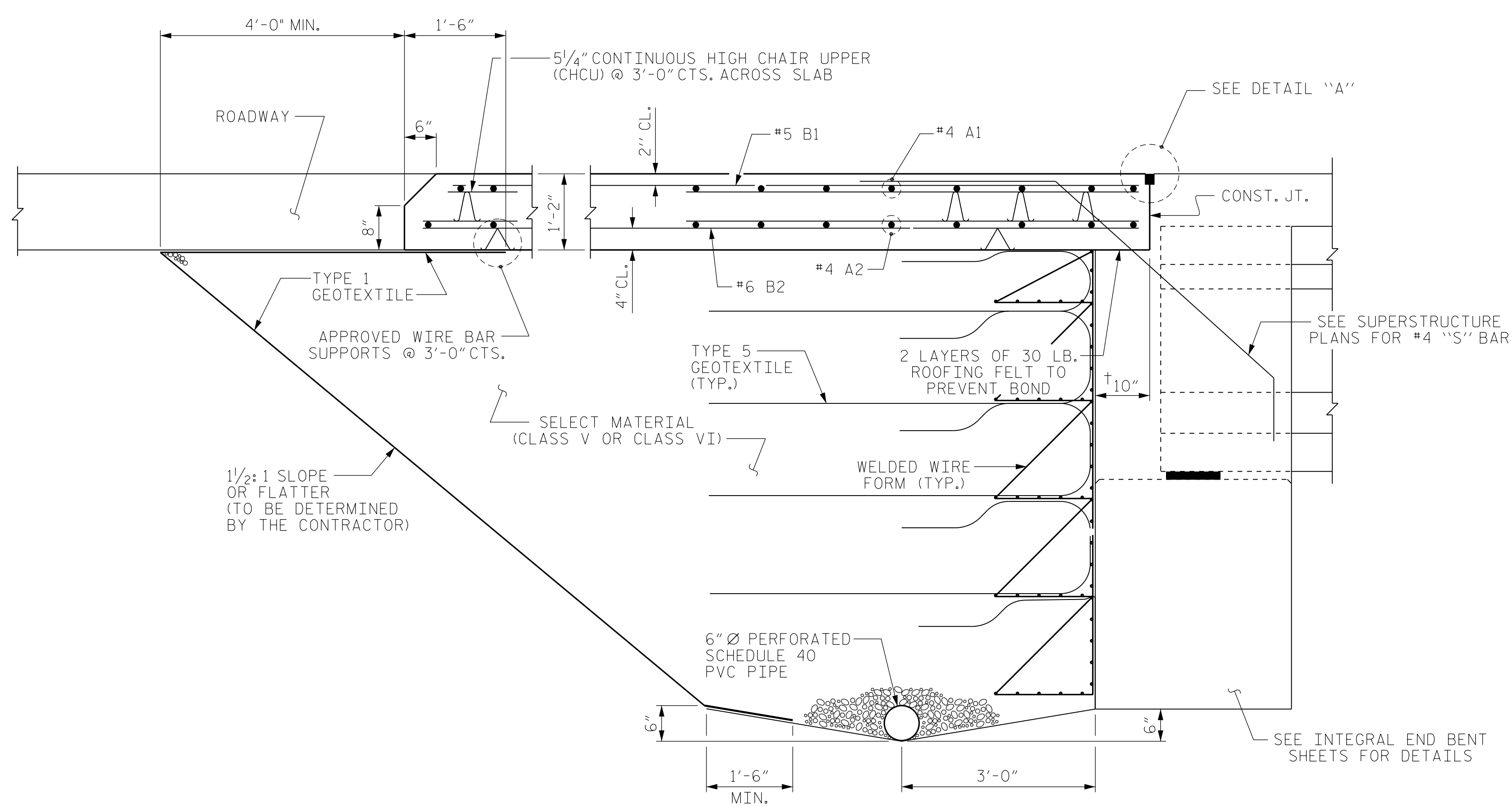


ASSEMBLED BY : J. WEIGER	DATE : 02/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : RH 5/99	REV. 6/13 MAA/GM
CHECKED BY : RDR 5/99	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
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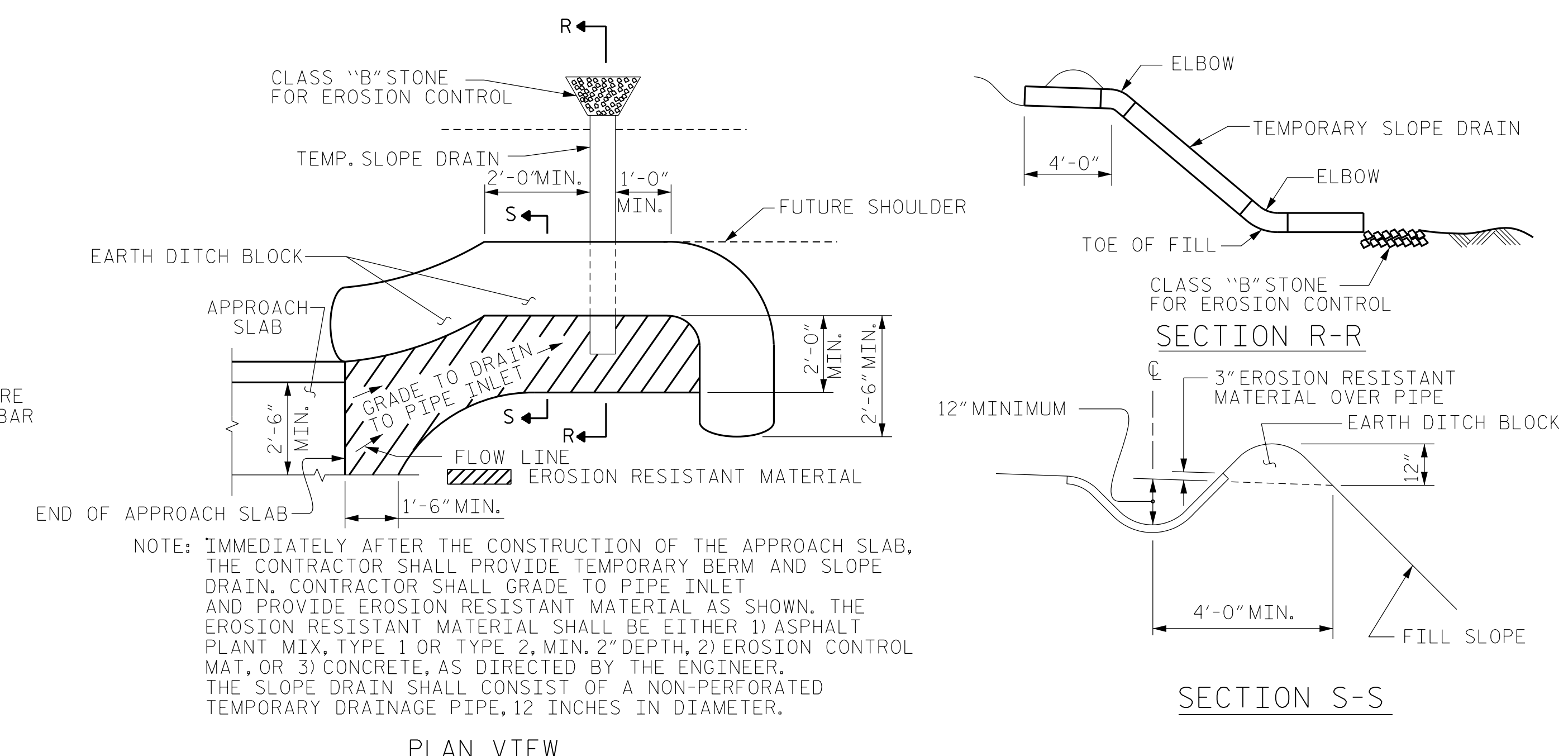
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-34
1			3			TOTAL SHEETS
2			4			35

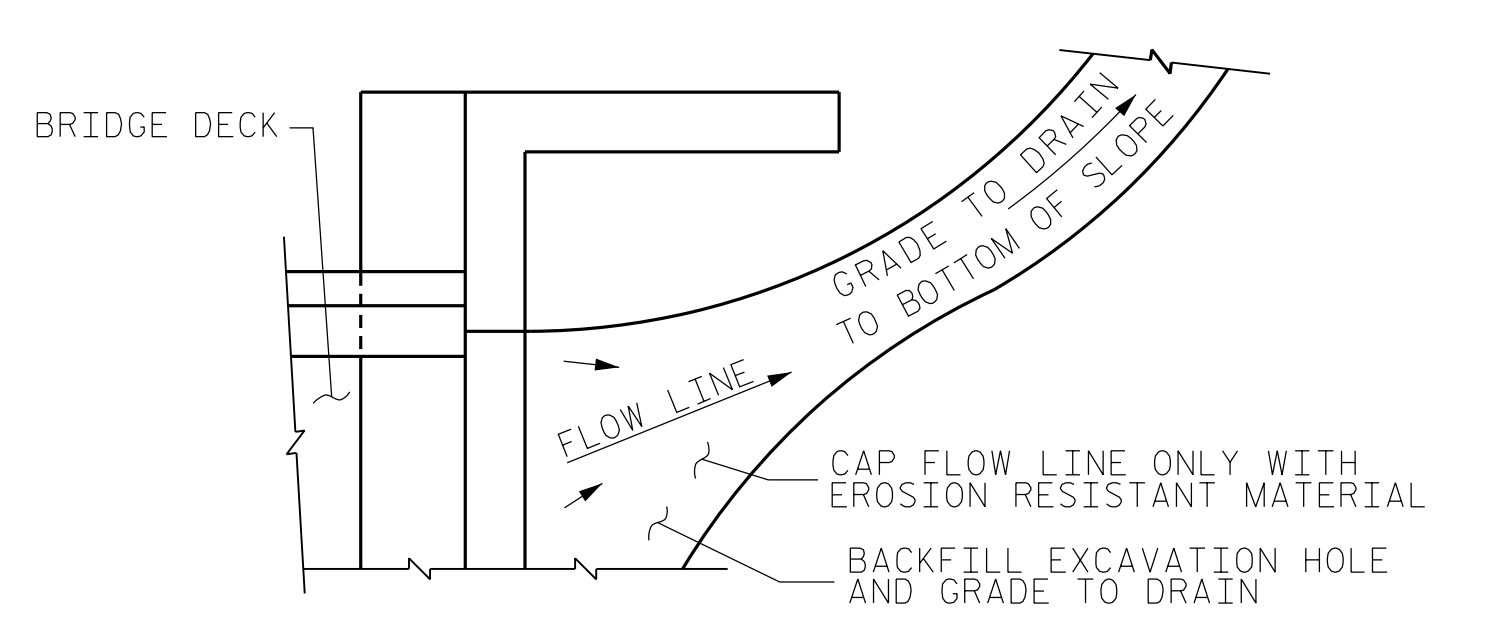


ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : RH 5/99	REV. 6/13 MAA/GM
CHECKED BY : RDR 5/99	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



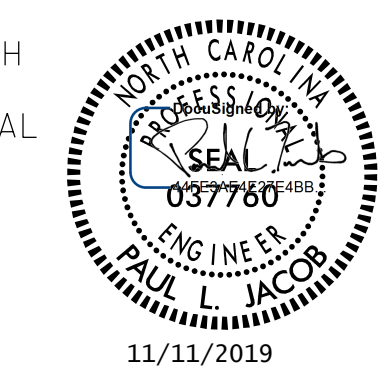
TEMPORARY BERM AND SLOPE DRAIN DETAILS  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

NOTES

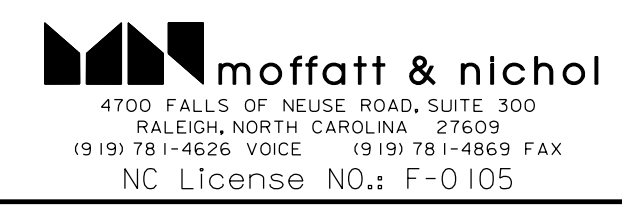
- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS 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. R-2303E  
SAMPSON COUNTY  
STATION: 33+45.18 -L-

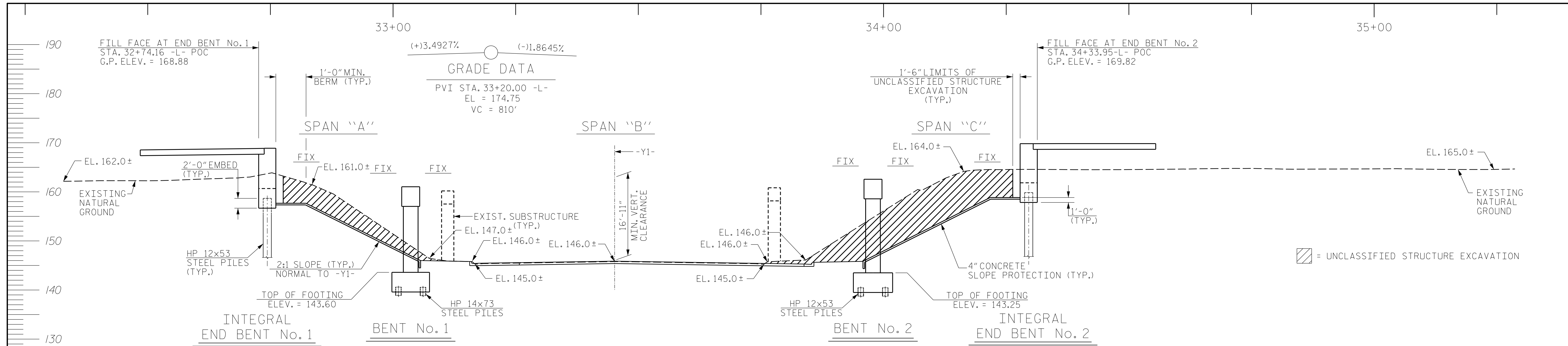
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



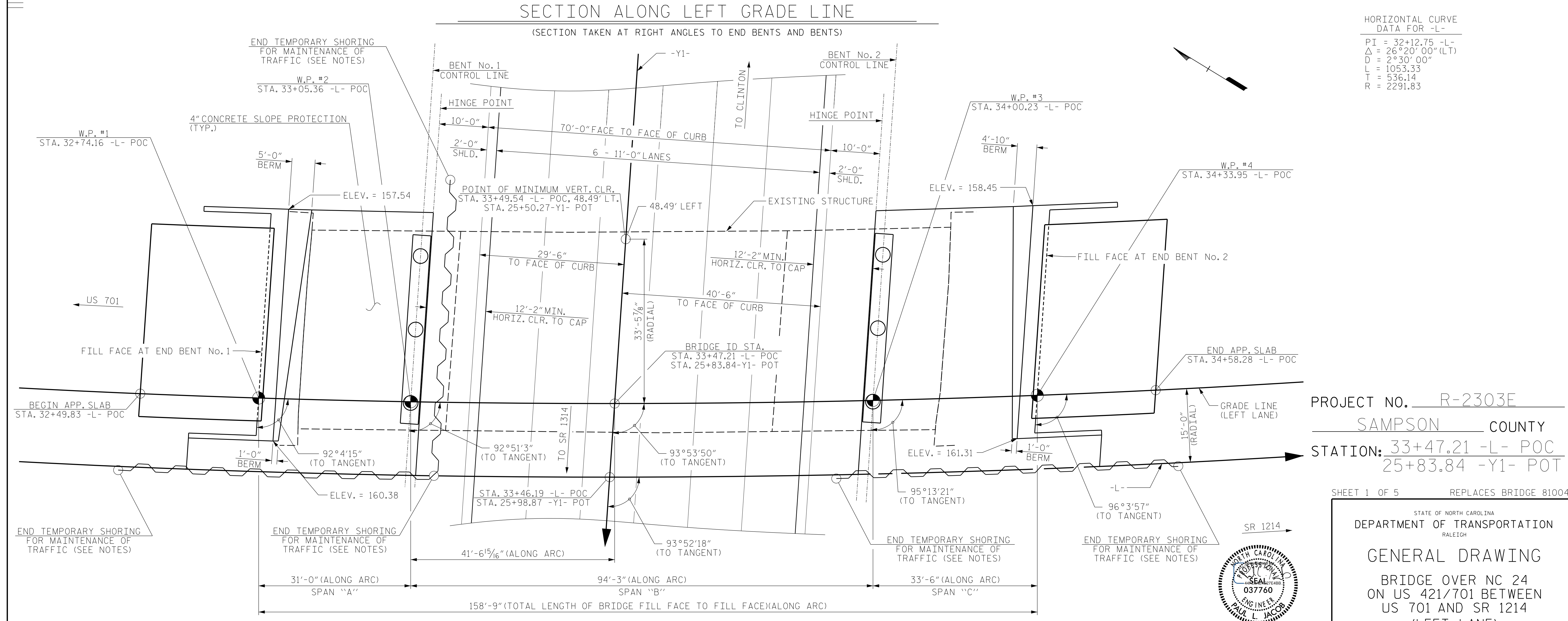
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET NO. S1-35	
TOTAL SHEETS 35	



HORIZONTAL CURVE DATA FOR -L-

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D	= 2°30'00"
L	= 1053.33
T	= 536.14
R	= 2291.83

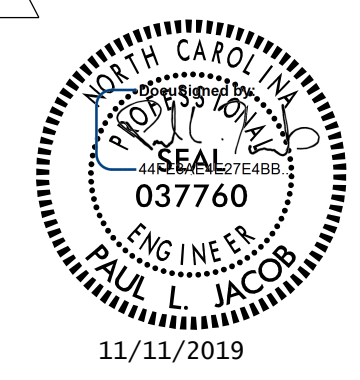


DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

PLAN  
 PILES NOT SHOWN FOR CLARITY  
 END BENTS AND BENTS ARE PARALLEL

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

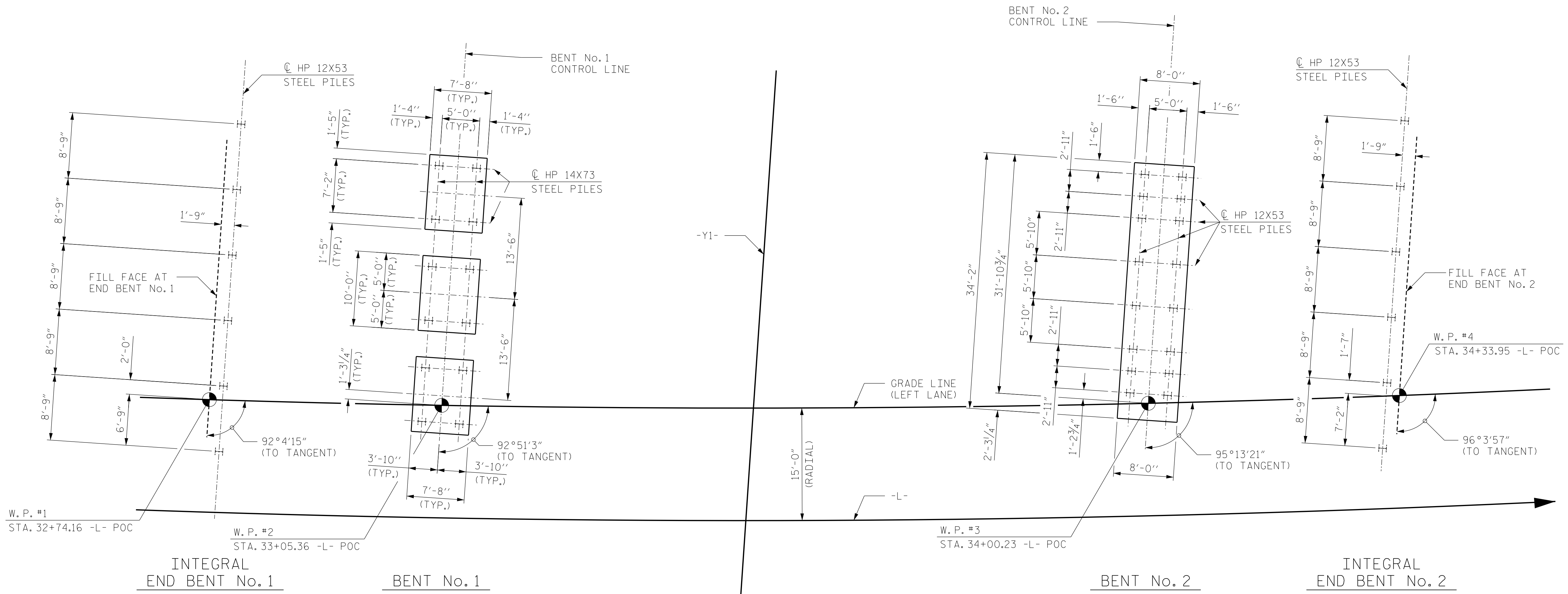


PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+47.21 -L- POC  
 25+83.84 -Y1- POT

SHEET 1 OF 5 REPLACES BRIDGE 810040

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER NC 24  
 ON US 421/701 BETWEEN  
 US 701 AND SR 1214  
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			35

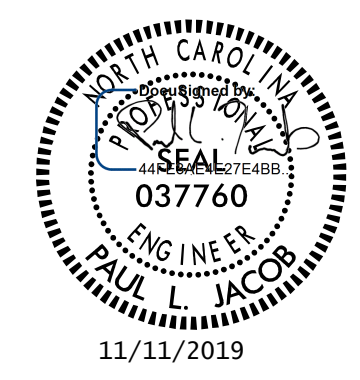


**FOUNDATION LAYOUT**

**NOTES:**

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO.1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 93 TONS PER PILE.
3. PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.
4. PILES AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
5. DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.
6. DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE.
7. DRIVE PILES AT BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 155 TONS PER PILE.
8. DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.
9. TESTING THE FIRST PRODUCTION PILE AT BENT NO.1 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
10. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTION THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1 AND END BENT NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 2 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**FOUNDATION LAYOUT**  
 (LEFT LANE)

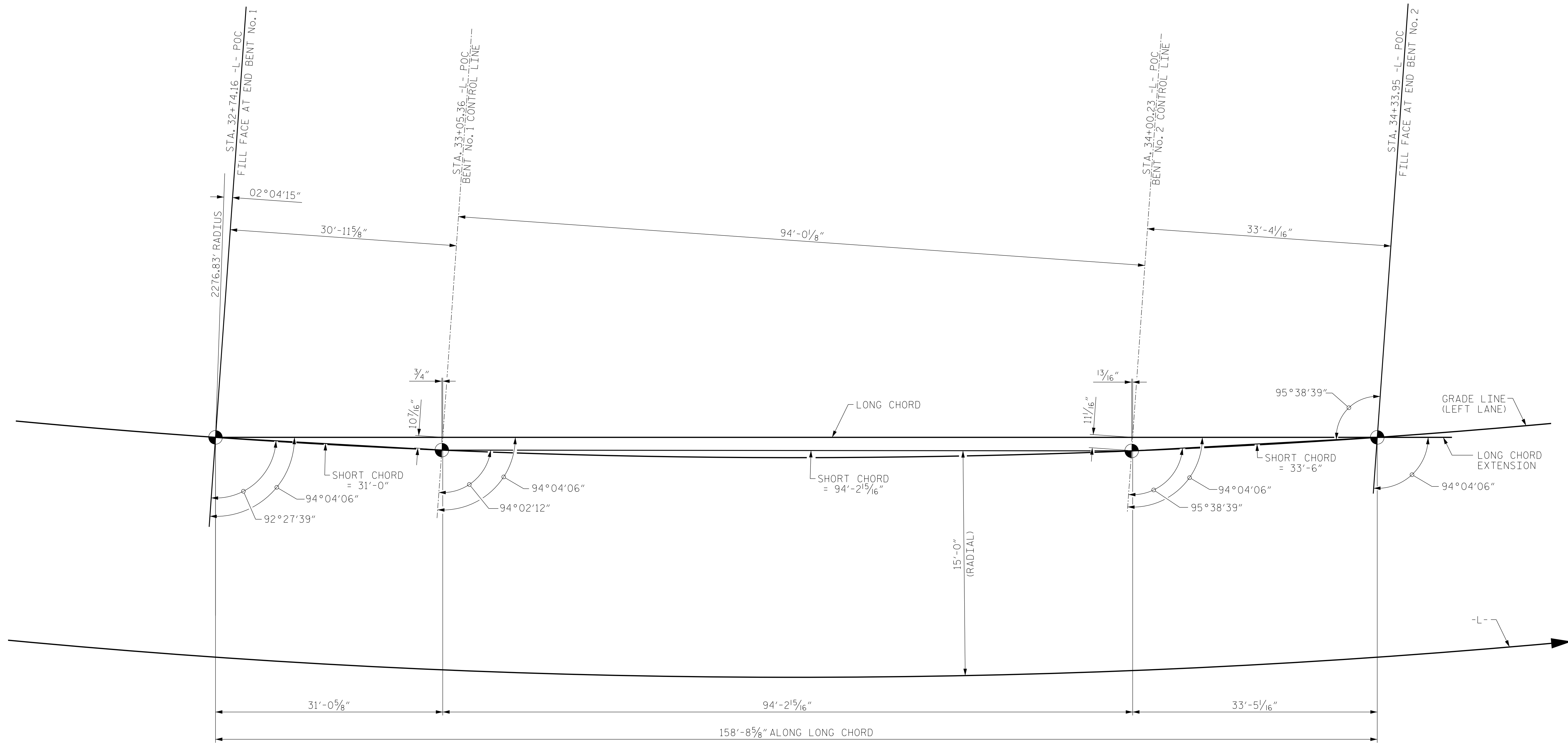
DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 08/2019

**moffatt & nichol**  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			35

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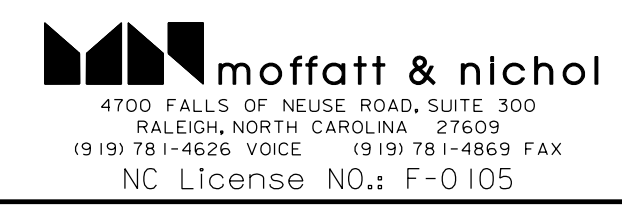
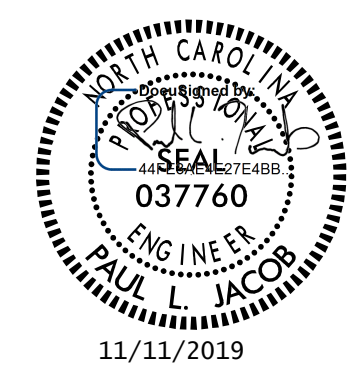
LONG CHORD LAYOUT  
ALL BENTS ARE PARALLEL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

LONG CHORD LAYOUT  
 (LEFT LANE)



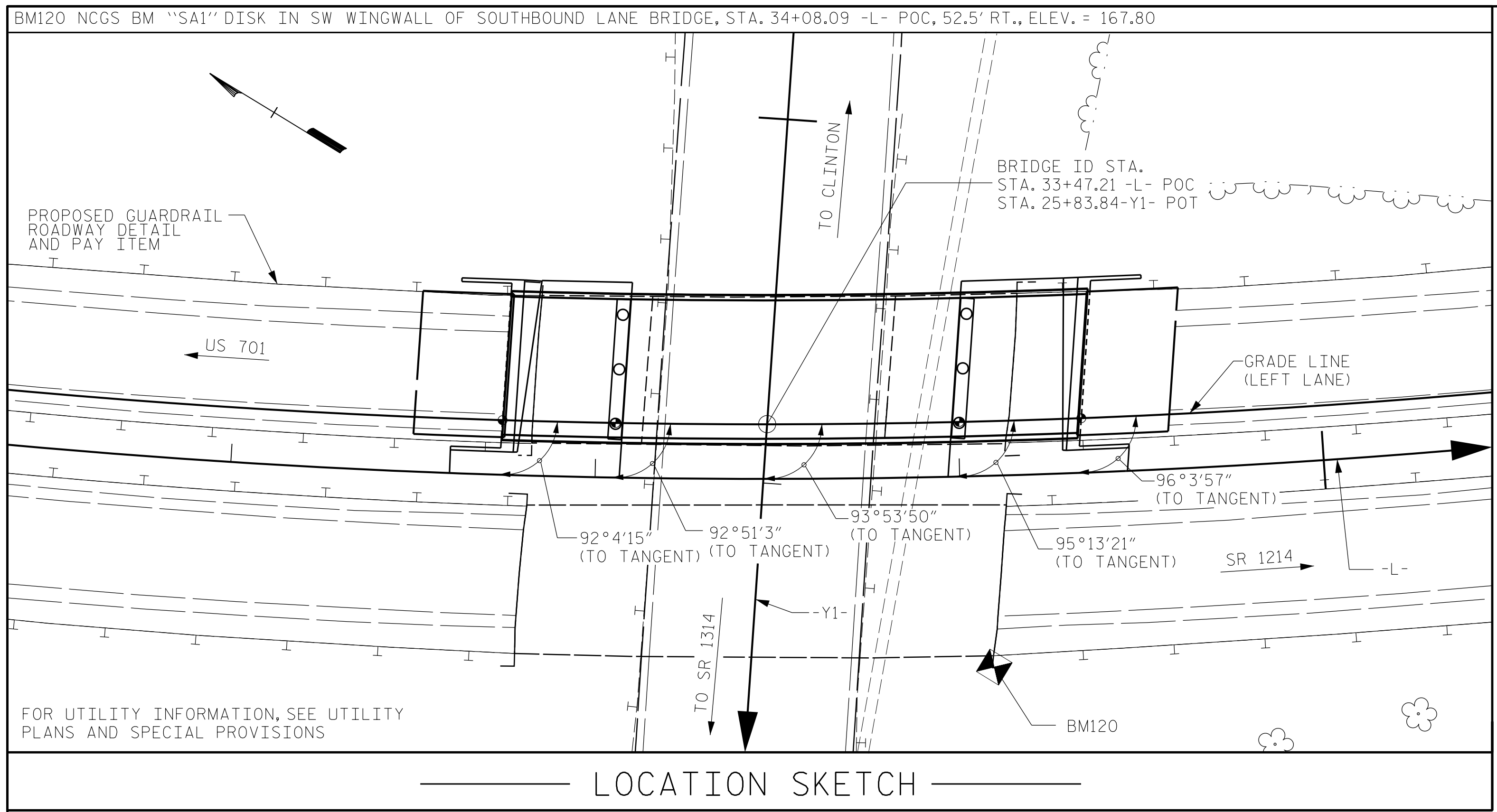
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 SIGNATURES COMPLETED

DRAWN BY : J. WEIGER DATE : 07/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			35

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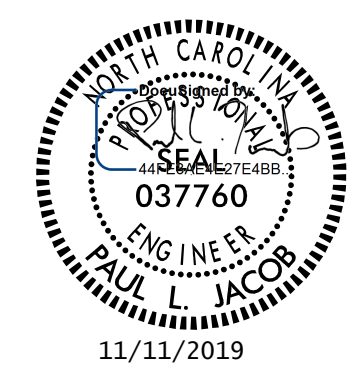
LOCATION SKETCH

- NOTES:**
1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
  2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
  3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
  4. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
  5. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
  6. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
  7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
  8. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
  9. THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
  10. THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION 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.
  11. FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
  12. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
  13. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
  14. INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 33+47.21 -L-.
  15. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 26FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
  16. FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
  17. THE EXISTING STRUCTURE CONSISTING OF 33.17'-66.58'-31.29' STEEL I-BEAMS; 40' CLEAR ROADWAY WIDTH AND CONCRETE DECK LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
  18. THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
  19. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
  20. FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 33+47.21-L-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 33+47.21-L-	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 33+47.21-L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO. LIN.FT.	EACH	EACH	NO. LIN.FT.	NO. LIN.FT.	EA.	LIN.FT.	SO.YDS.	LUMP SUM
SUPERSTRUCTURE						6480	7201					15 775						314.2		
END BENT NO.1									40.4	7482			6		6 360		3		199	
BENT NO.1			LUMP SUM						63.9	10294	1038			12		12 840	6			
BENT NO.2			LUMP SUM						70.3	11861	1097				16 1120		8			
END BENT NO.2									41.1	7393			6		6 480		3		216	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	1	6480	7201	215.7	LUMP SUM	37030	2135	15 775	28	12	28 1960	12 840	20	314.2	415	LUMP SUM

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 4 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER NC 24  
 ON US 421/701 BETWEEN  
 US 701 AND SR 1214  
 (LEFT LANE)

DRAWN BY : J. WEIGER DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS 35
2			4			S2-4

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ <sub>L1</sub> )	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ <sub>L1</sub> )	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	1.26	--	1.75	0.79	3.24	B	ER	46.00	0.87	1.26	A	I	19.97	0.80	0.79	2.73	B	ER	46.00		
	HL-93 (OPERATING)	N/A		1.64	--	1.35	0.79	4.20	B	ER	46.00	0.87	1.64	A	I	19.97	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.76	63.36	1.75	0.79	4.28	B	ER	46.00	0.87	1.76	A	I	19.97	0.80	0.79	3.60	B	ER	46.00		
	HS-20 (OPERATING)	36.000		2.29	82.44	1.35	0.79	5.54	B	ER	46.00	0.87	2.29	A	I	19.97	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		6.95	93.82	1.40	0.93	10.38	C	I	18.51	0.87	6.95	C	I	2.50	0.80	0.79	7.89	B	ER	46.00	
		SNGARBS2	20.000		5.41	108.20	1.40	0.93	8.65	C	I	21.72	0.87	5.41	C	I	2.50	0.80	0.79	5.98	B	ER	46.00	
		SNAGRIS2	22.000		5.20	114.40	1.40	0.79	8.46	B	ER	46.00	0.87	5.20	C	I	2.50	0.80	0.79	5.71	B	ER	46.00	
		SNCOTTS3	27.250		3.41	92.92	1.40	0.93	5.13	C	I	15.31	0.87	3.41	C	I	2.50	0.80	0.79	3.96	B	ER	46.00	
		SNAGGRS4	34.925		3.18	111.06	1.40	0.93	4.82	C	I	18.51	0.87	3.18	C	I	2.50	0.80	0.79	3.35	B	ER	46.00	
		SNS5A	35.550		3.26	115.89	1.40	0.93	4.70	C	I	15.31	0.87	3.26	C	I	2.50	0.80	0.79	3.28	B	ER	46.00	
		SNS6A	39.950		2.91	116.25	1.40	0.79	4.47	B	ER	46.00	0.87	2.91	A	I	17.02	0.80	0.79	3.02	B	ER	46.00	
		SNS7B	42.000		2.77	116.34	1.40	0.79	4.27	B	ER	46.00	0.87	2.77	A	I	17.02	0.80	0.79	2.88	B	ER	46.00	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.30	108.90	1.40	0.79	5.49	B	ER	46.00	0.87	3.30	A	I	19.97	0.80	0.79	3.70	B	ER	46.00	
		TNT4A	33.075		3.54	117.08	1.40	0.79	5.47	B	ER	46.00	0.87	3.54	A	I	17.02	0.80	0.79	3.69	B	ER	46.00	
		TNT6A	41.600		2.84	118.14	1.40	0.79	4.51	B	ER	46.00	0.87	2.84	A	I	17.02	0.80	0.79	3.04	B	ER	46.00	
		TNT7A	42.000		2.82	118.44	1.40	0.79	4.54	B	ER	46.00	0.87	2.82	A	I	17.02	0.80	0.79	3.06	B	ER	46.00	
		TNT7B	42.000		2.85	119.70	1.40	0.79	4.65	B	ER	46.00	0.87	2.85	A	I	17.02	0.80	0.79	3.14	B	ER	46.00	
		TNAGRIT4	43.000		2.72	116.96	1.40	0.79	4.50	B	ER	46.00	0.87	2.72	A	I	17.02	0.80	0.79	3.03	B	ER	46.00	
TNAGT5A	45.000		2.62	117.90	1.40	0.79	4.23	B	ER	46.00	0.87	2.62	A	I	17.02	0.80	0.79	2.85	B	ER	46.00			
TNAGT5B	45.000		③	2.59	116.55	1.40	0.79	4.17	B	ER	46.00	0.87	2.59	A	I	17.02	0.80	0.79	2.81	B	ER	46.00		

LOAD FACTORS:

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

**NOTES:**

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

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

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

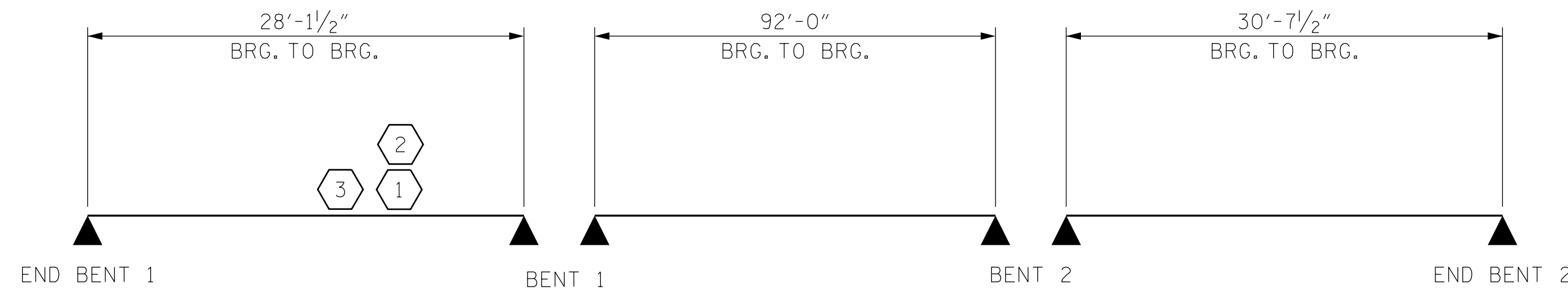
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

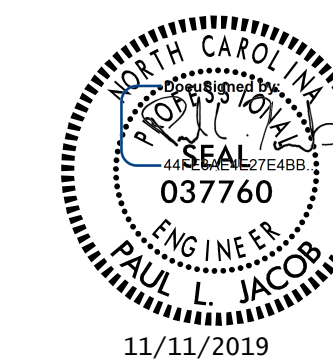
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

SHEET 5 OF 5



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

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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1			3			TOTAL SHEETS
2			4			35

STD. NO. LRFR1

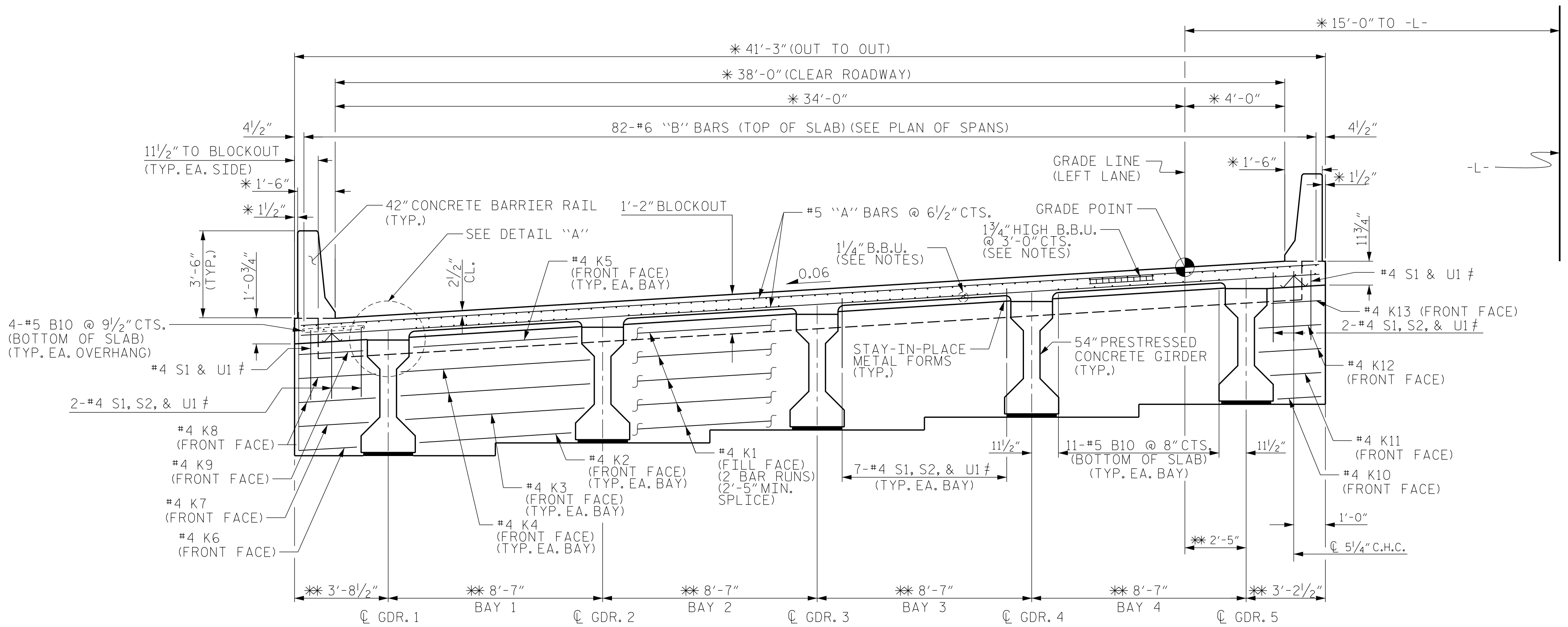
**NOTES**

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

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

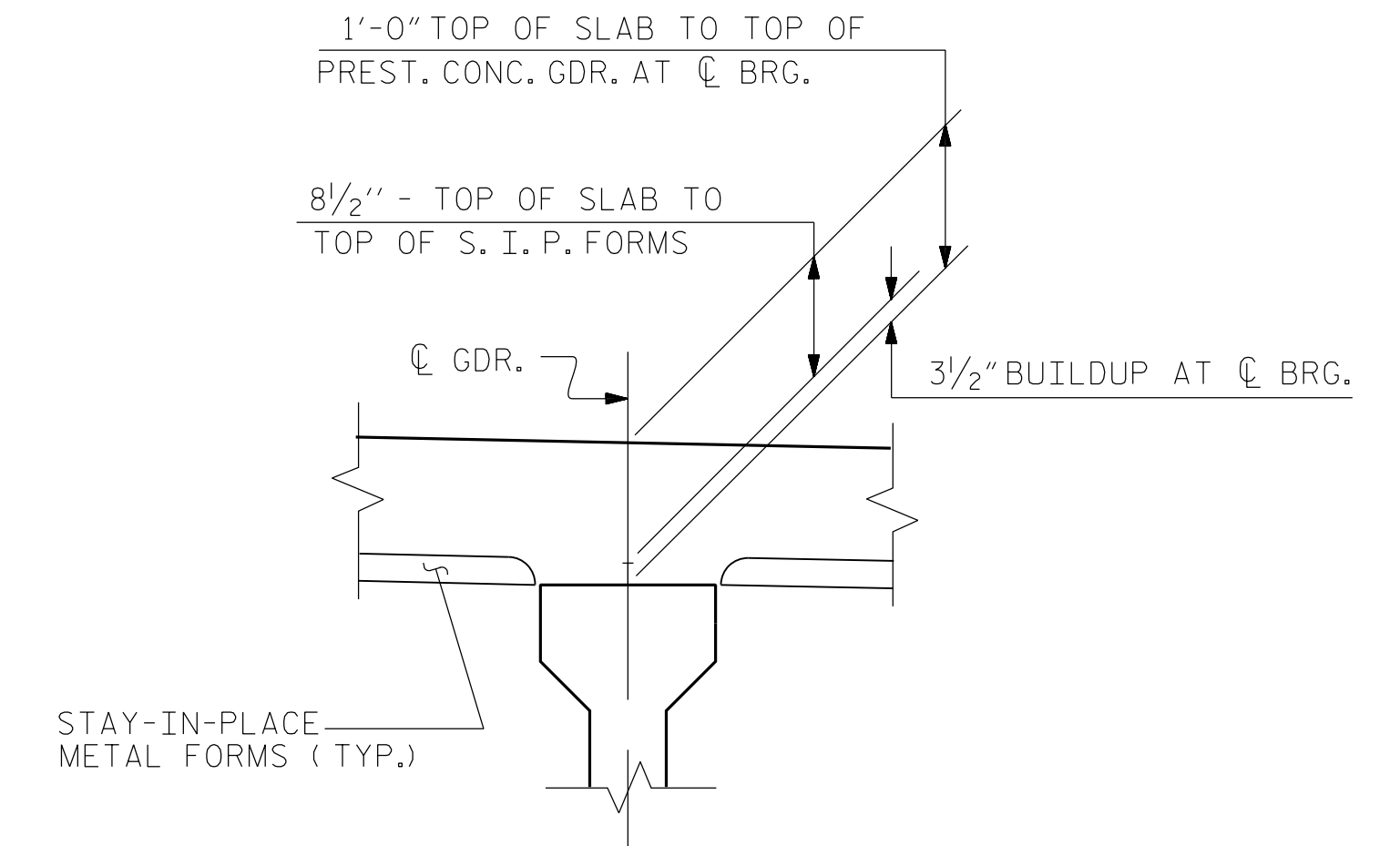
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

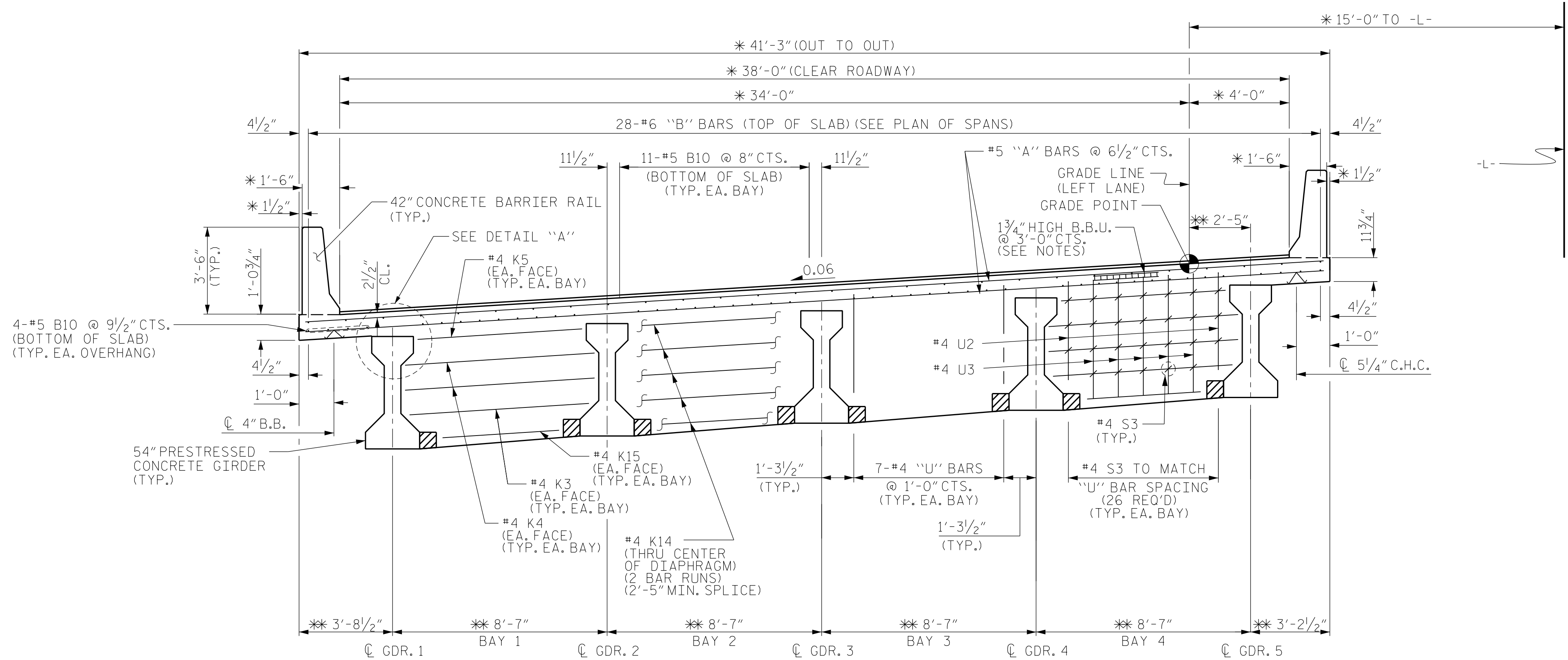


**TYPICAL SECTION @ INTEGRAL END BENT**

\* RADIAL DIMENSIONS TO GRADE LINE  
 \*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS  
 † TO MATCH V1 BARS IN END BENT

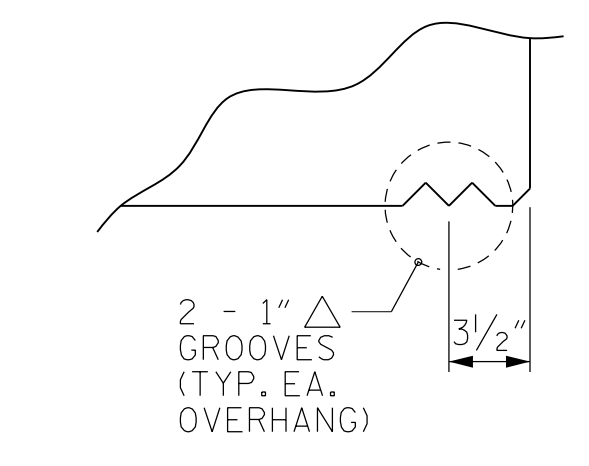


**DETAIL "A"**



**TYPICAL SECTION @ BENT DIAPHRAGM**

\* RADIAL DIMENSIONS TO GRADE LINE  
 \*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS



**DRIP GROOVE DETAIL**

PROJECT NO. R-2303E

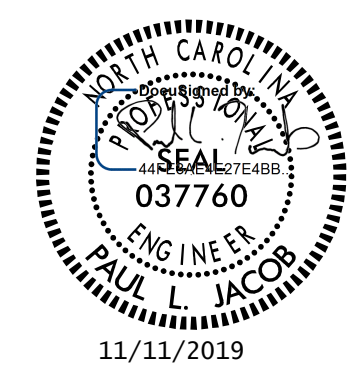
SAMPSON COUNTY

STATION: 33+47.21 -L-

SHEET 1 OF 5

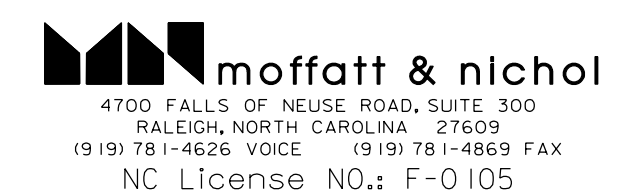
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**  
 (LEFT LANE)



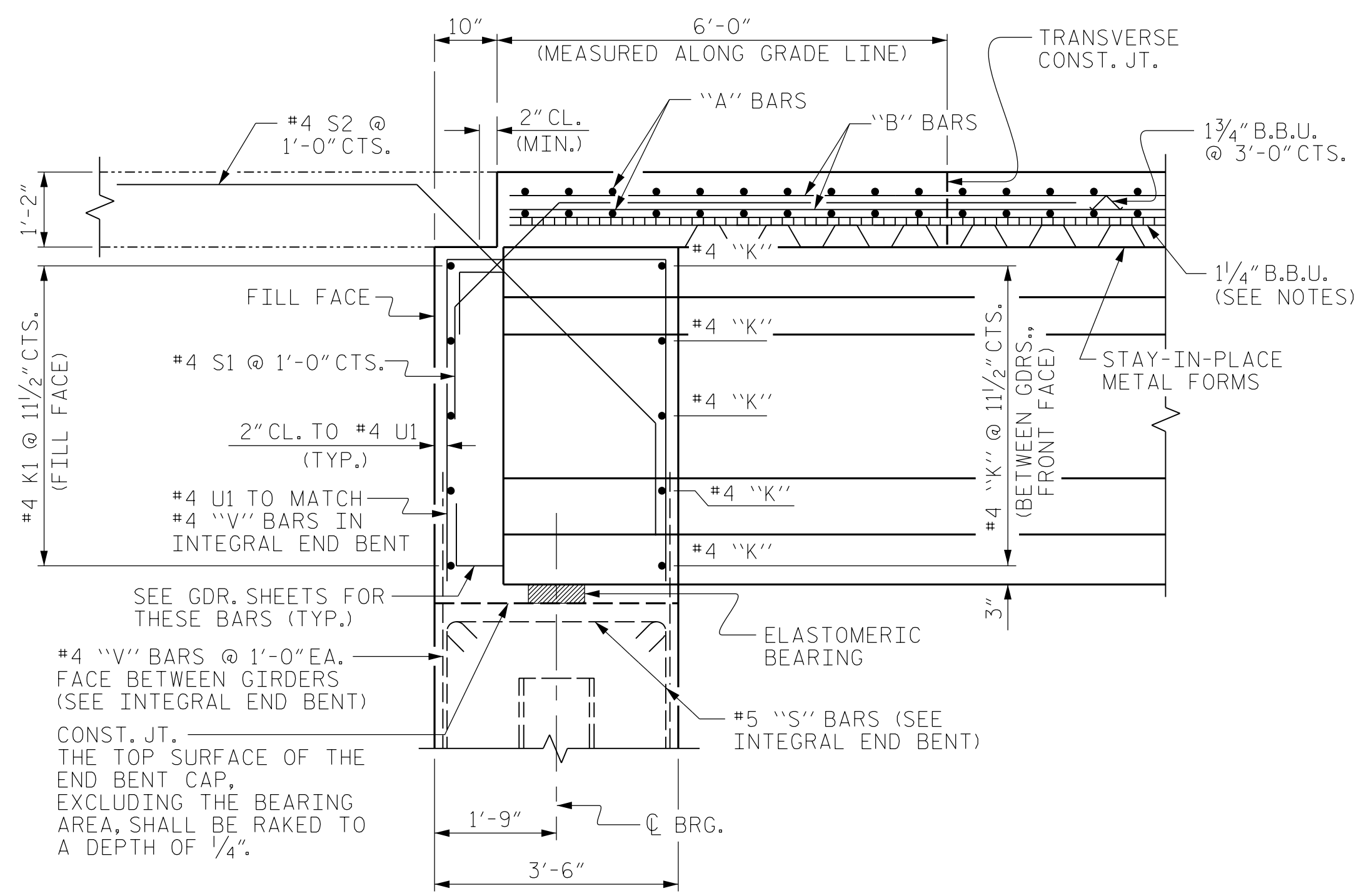
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. WEIGER DATE : 01/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



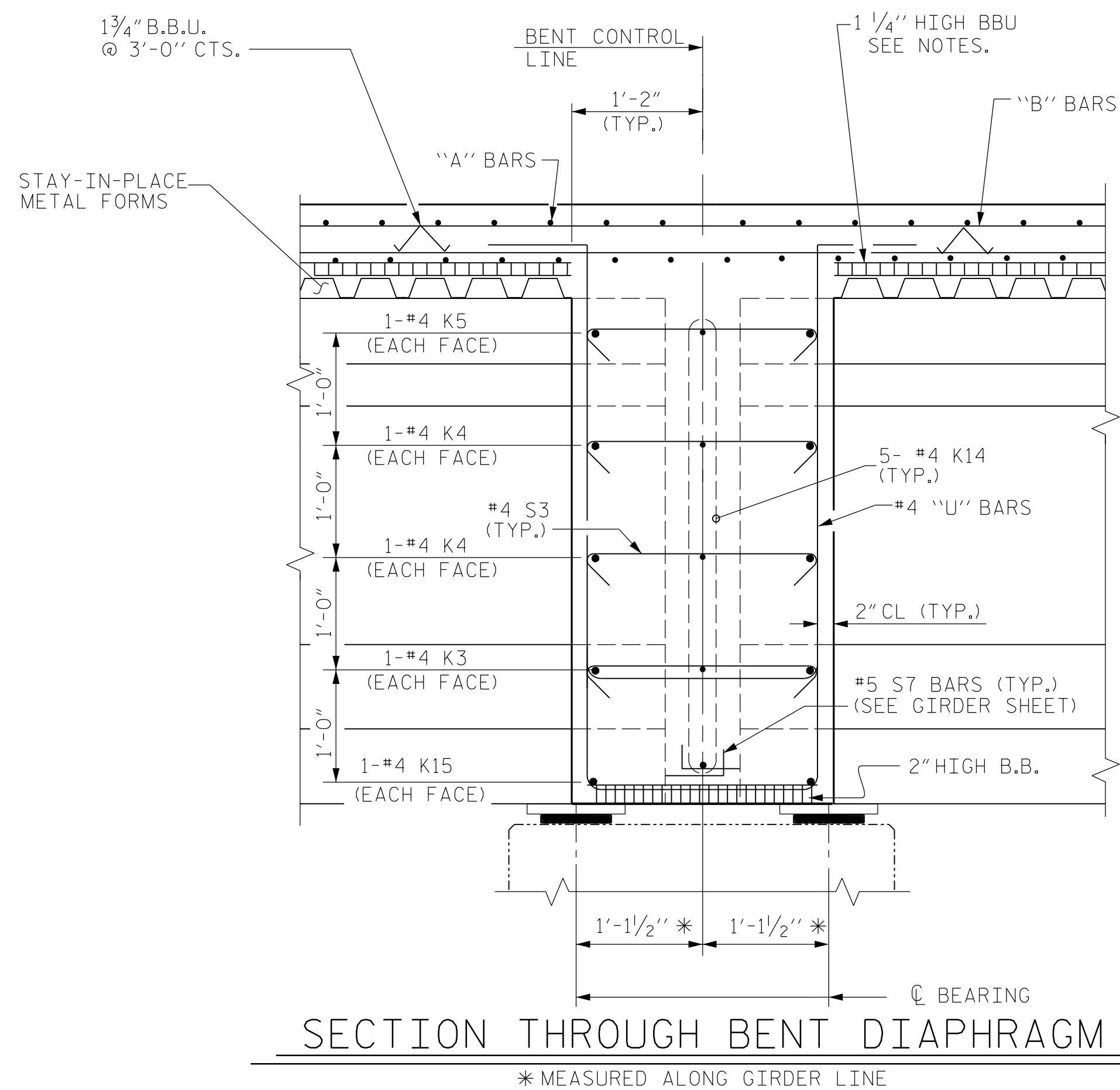
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 SIGNATURES COMPLETED

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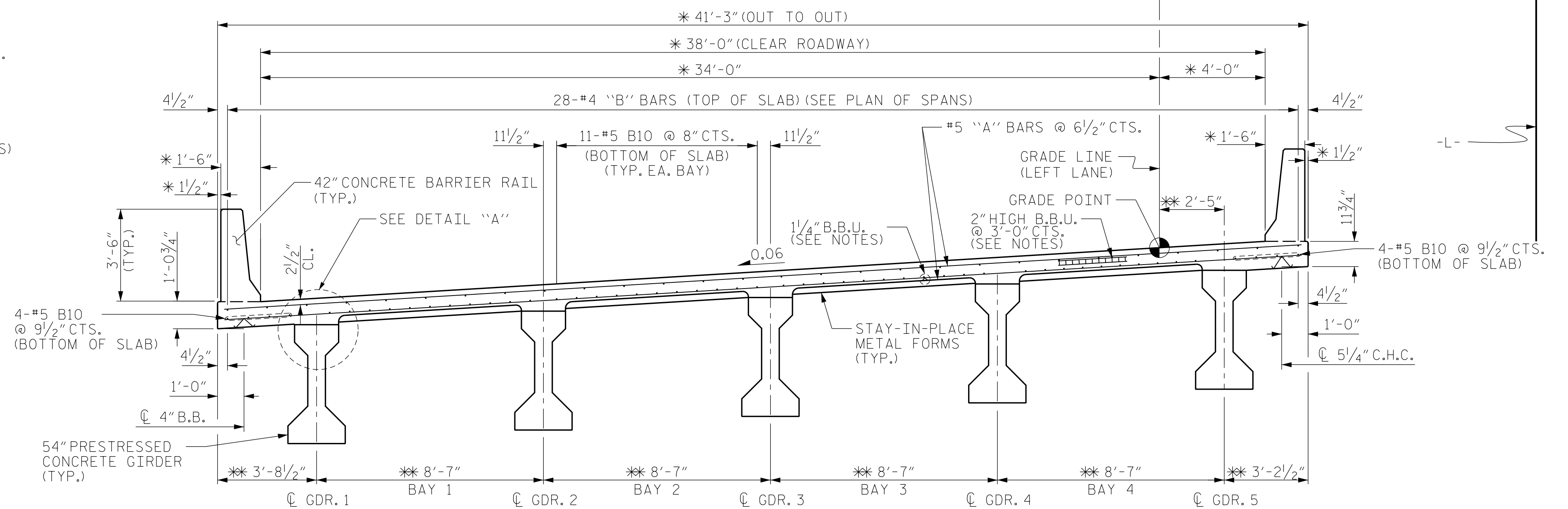
**END OF GIRDER DETAIL AT INTEGRAL END BENT NO. 1**

END BENT NO. 2 SIMILAR



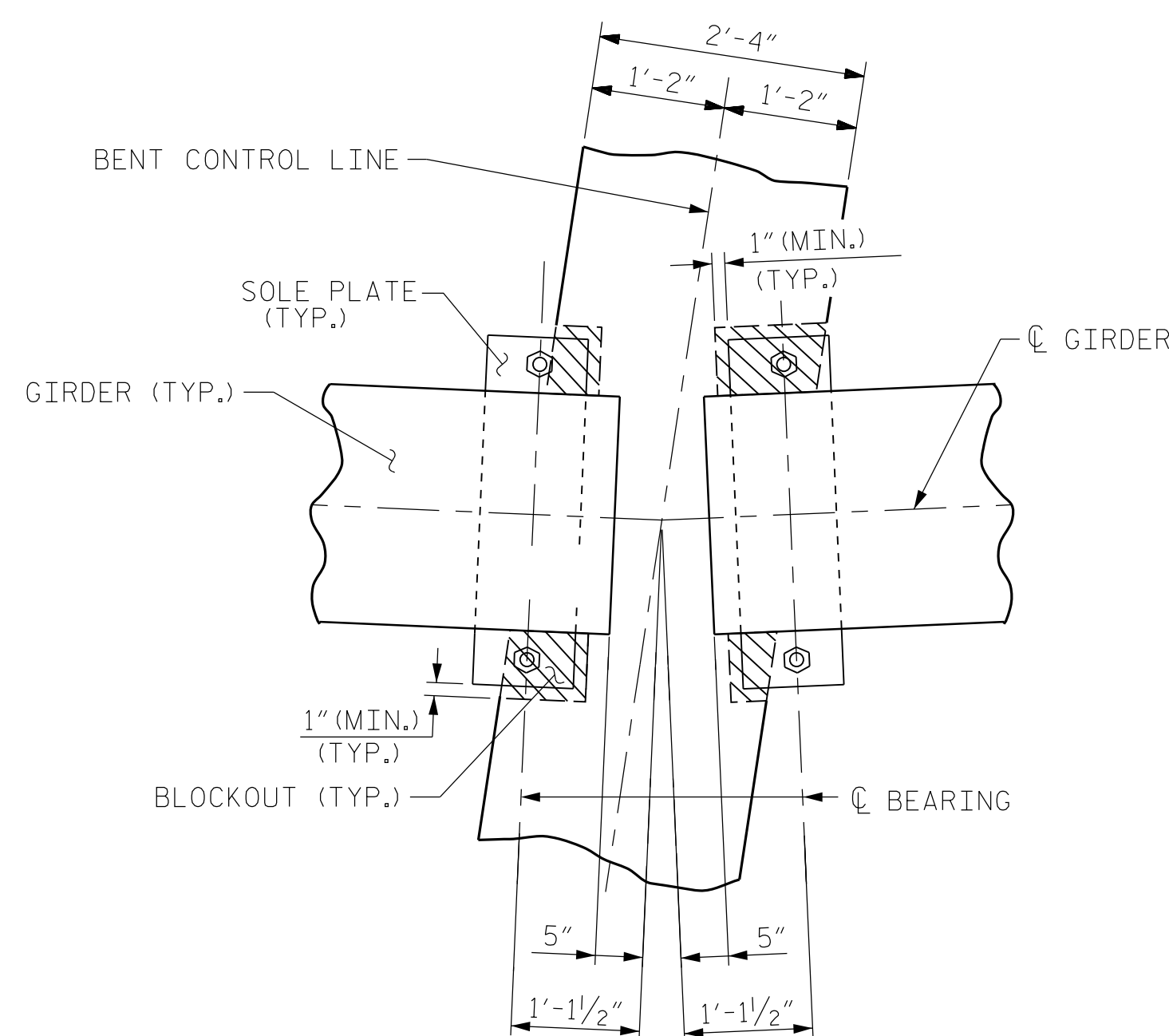
**SECTION THROUGH BENT DIAPHRAGM**

\* MEASURED ALONG GIRDER LINE



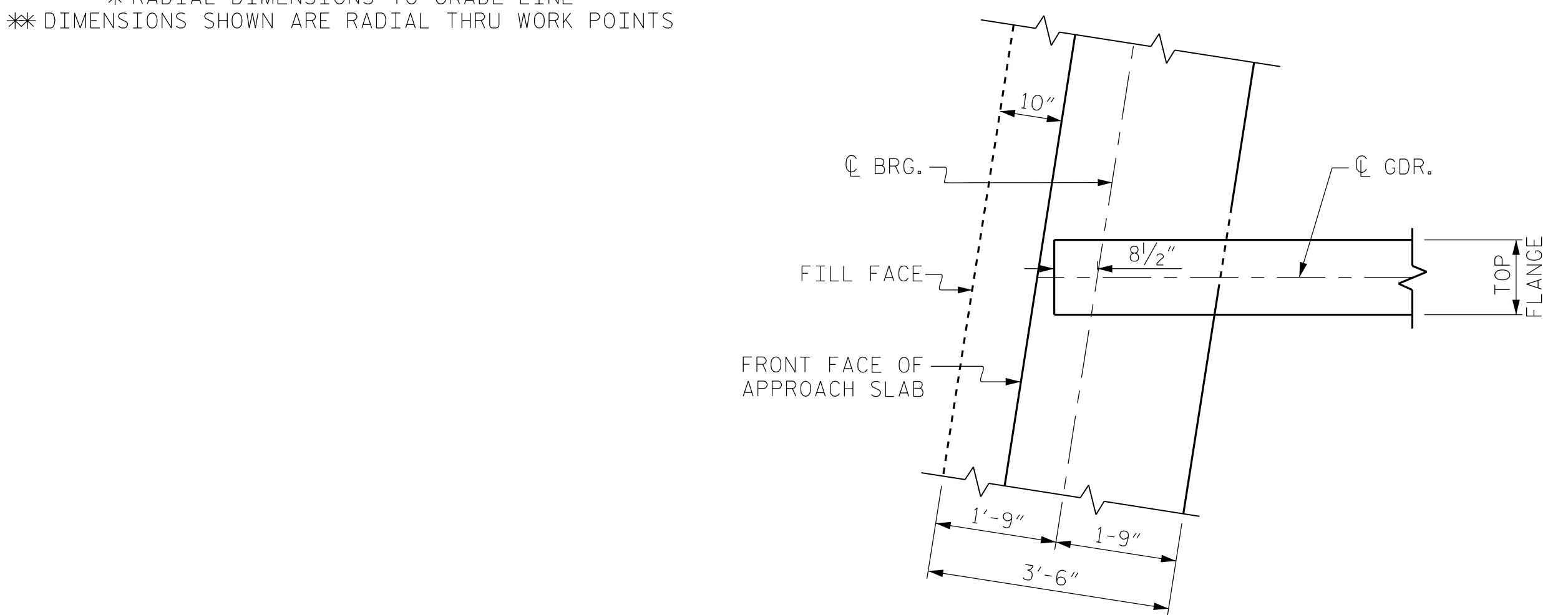
**TYPICAL SECTION NEAR MIDSPAN**

\* RADIAL DIMENSIONS TO GRADE LINE  
\*\* DIMENSIONS SHOWN ARE RADIAL THRU WORK POINTS



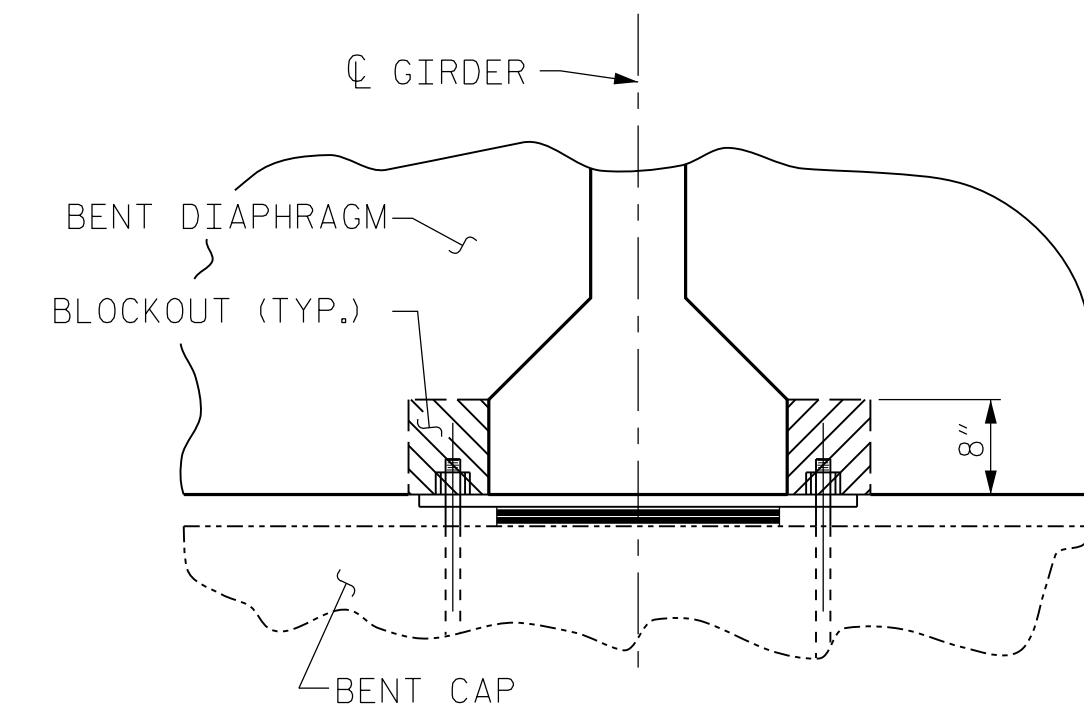
**PLAN**

**BENT DIAPHRAGM BLOCK-OUT DETAIL**



**PLAN OF GIRDER AT INTEGRAL END BENT NO. 1**

END BENT NO. 2 SIMILAR



**SECTION**

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**TYPICAL SECTION DETAILS**

(LEFT LANE)

DRAWN BY : J. WEIGER DATE : 01/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

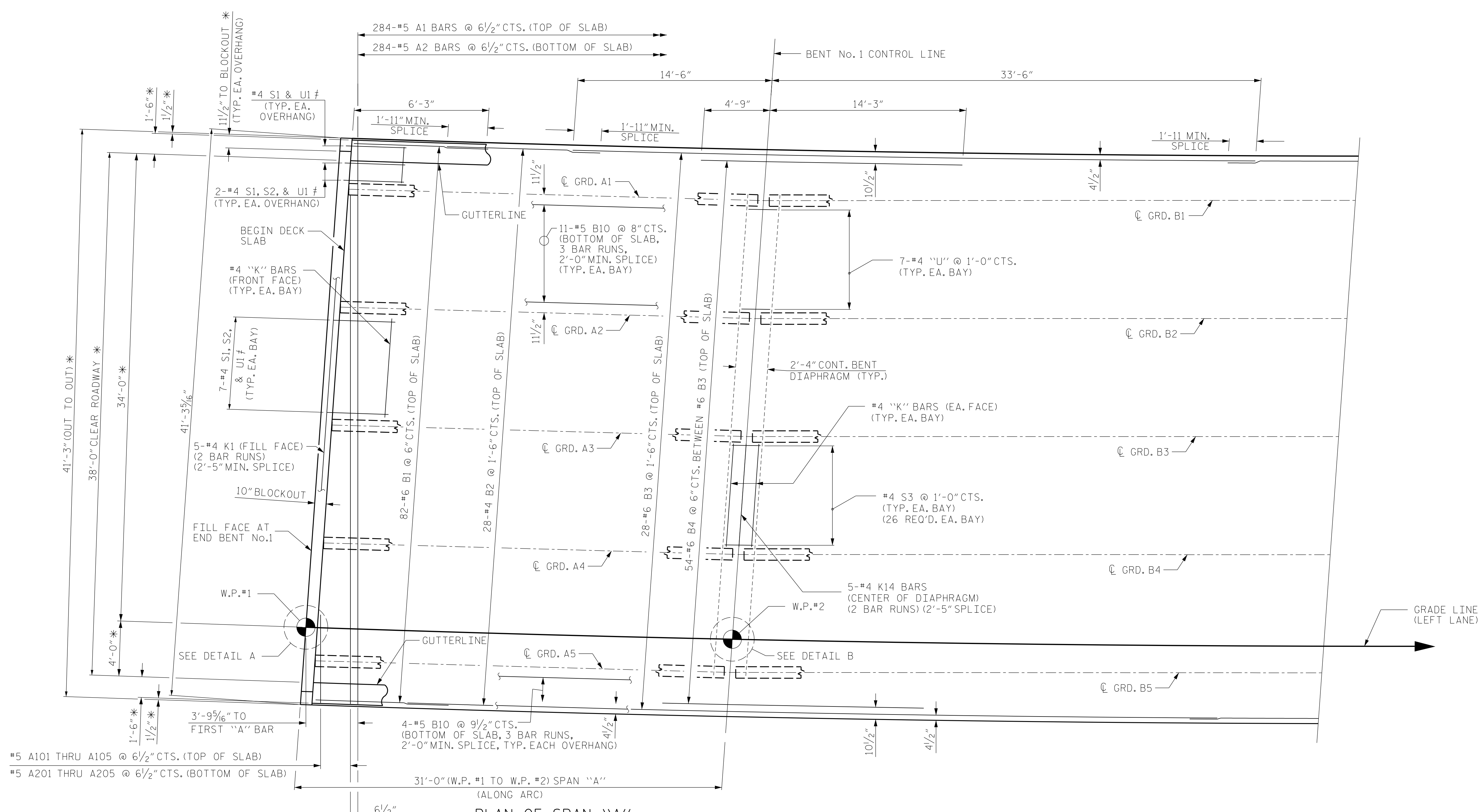
**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

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REVISIONS				SHEET NO.	
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1			3		
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TOTAL SHEETS: 35

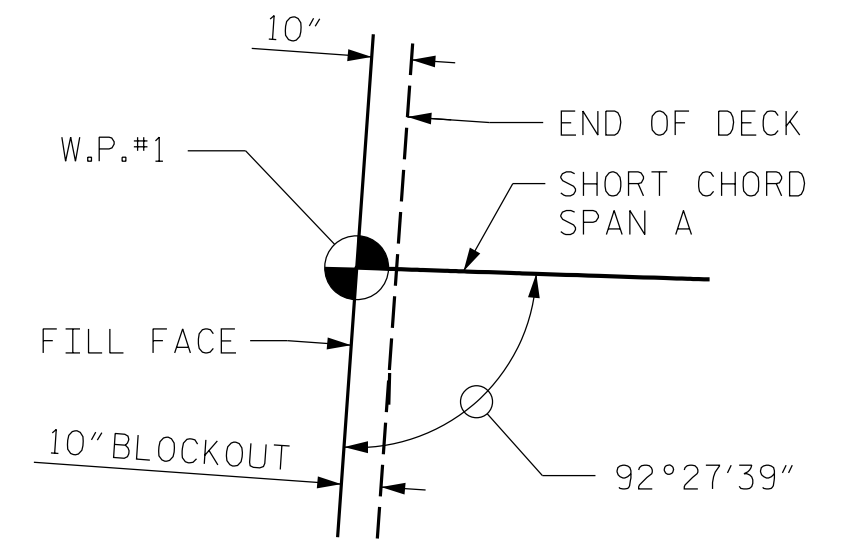


PLAN OF SPAN "A"

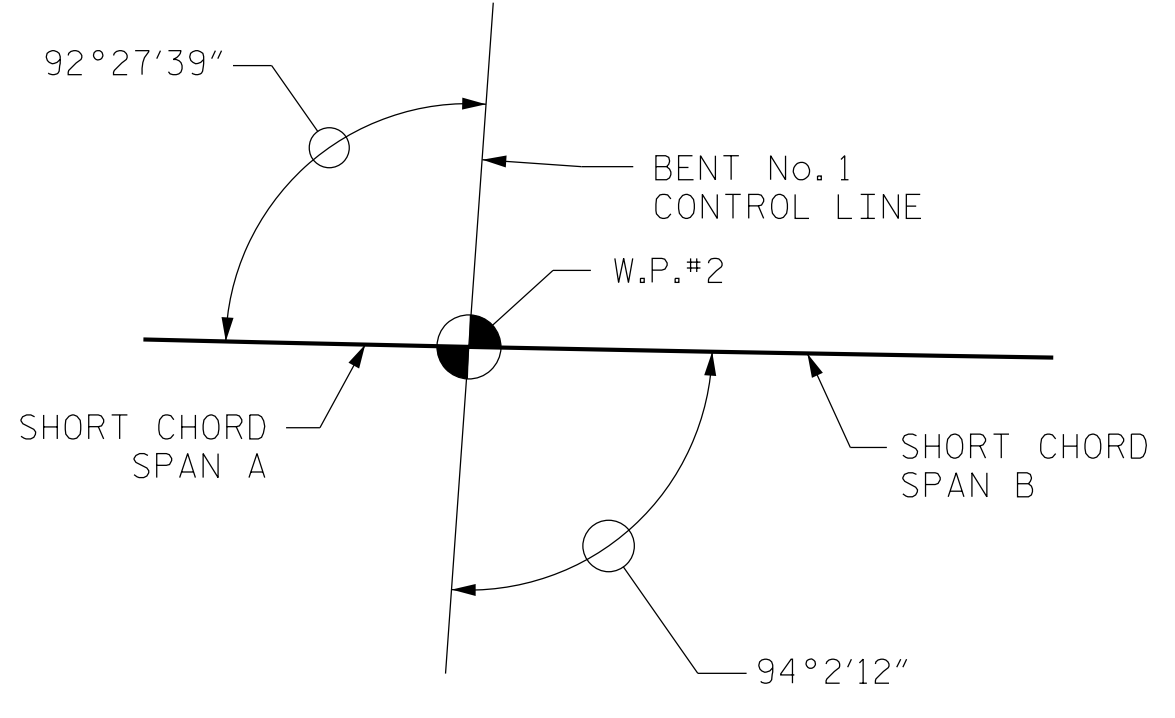
FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET.

#5 "A" BARS ARE PERPENDICULAR TO THE LONG CHORD.

† TO MATCH V1 BARS IN END BENT  
\* DENOTES RADIAL DIMENSION



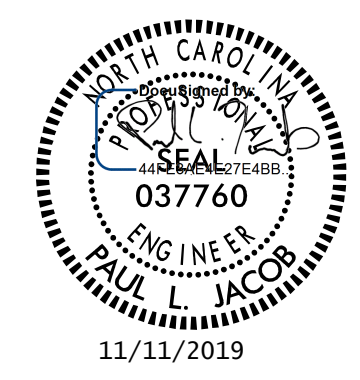
DETAIL A



DETAIL B

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPAN "A"  
 (LEFT LANE)



11/11/2019

DRAWN BY : J. WEIGER DATE : 05/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 05/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

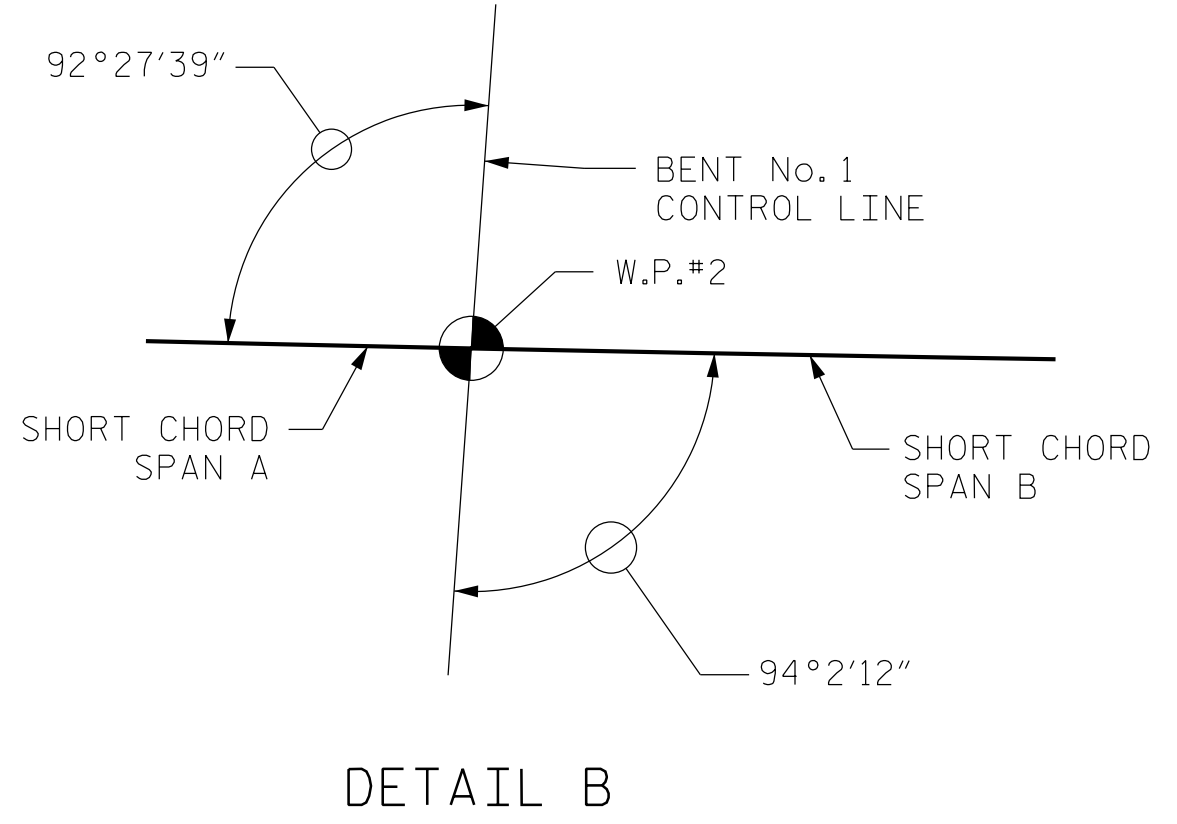
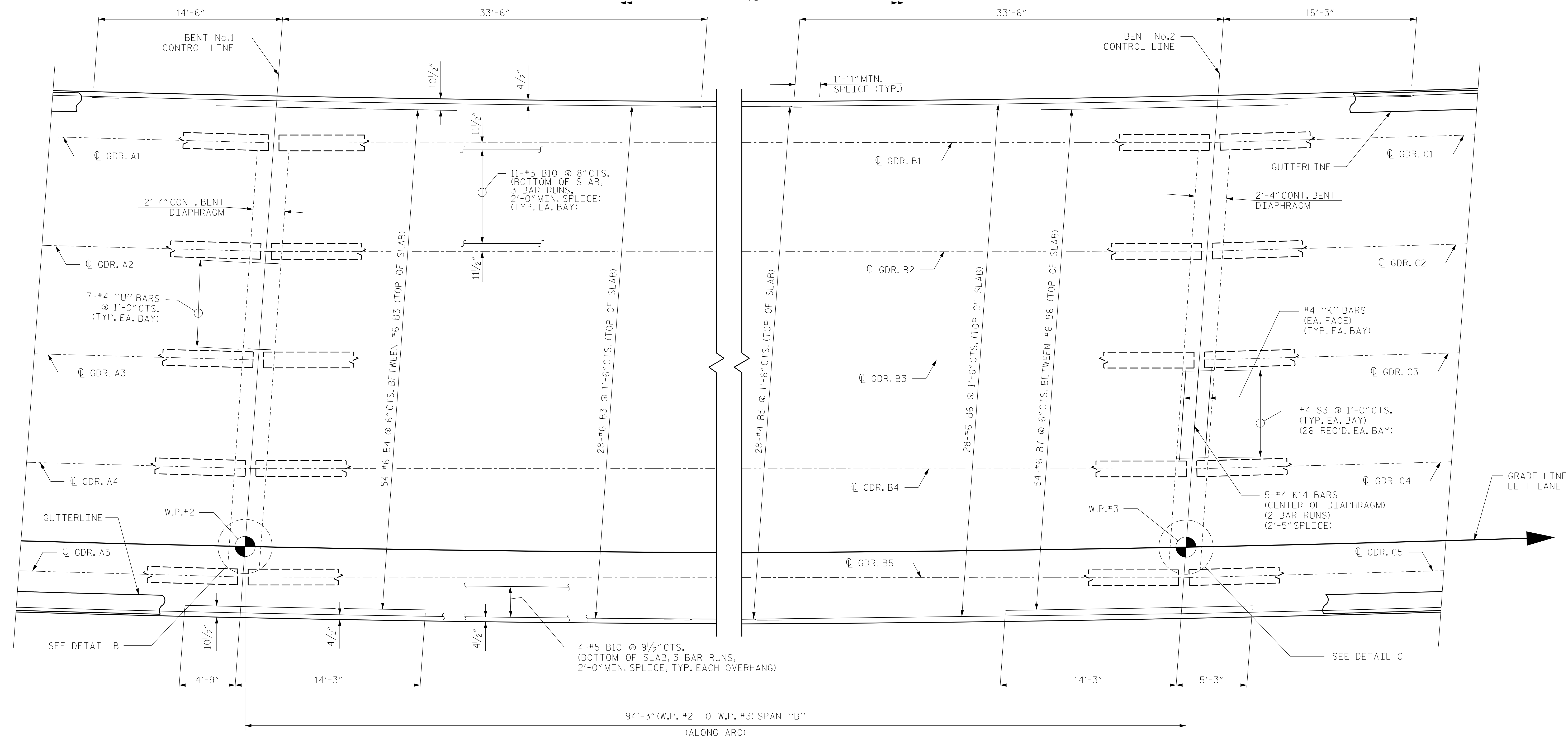
**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
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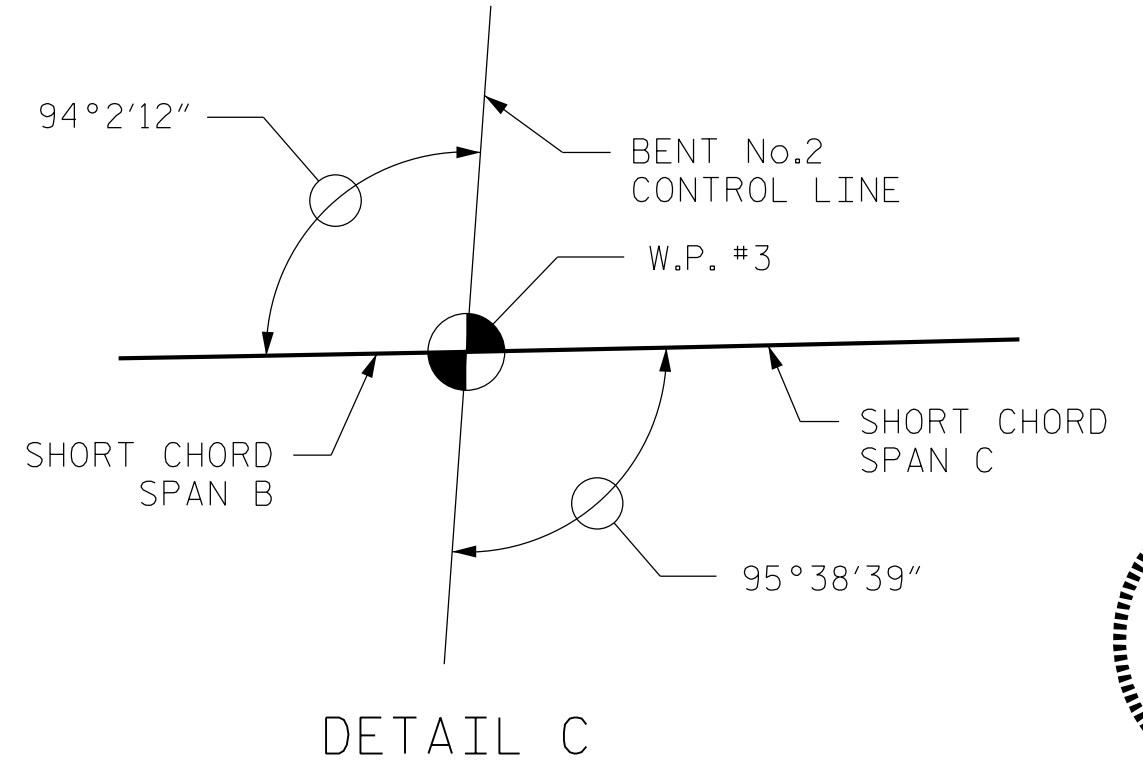
C:\RA\6522-07\Submittals\191107 - Site 1 Left Lane Structures Let Plans Rev\CADD Files\R2303E\_SMU\_S1\_008\_810040.dgn

284-#5 A1 BARS @ 6 1/2" CTS. (TOP OF SLAB)  
 284-#5 A2 BARS @ 6 1/2" CTS. (BOTTOM OF SLAB)



DETAIL B

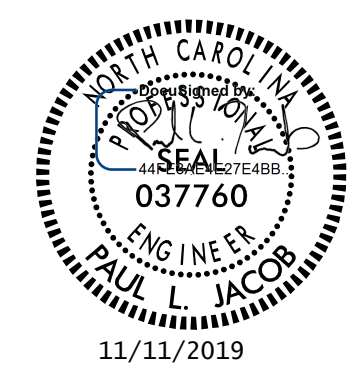
**PLAN OF SPAN "B"**  
 FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET.  
 #5 "A" BARS ARE PERPENDICULAR TO THE LONG CHORD.



DETAIL C

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**  
**SPAN "B"**  
 (LEFT LANE)



DRAWN BY : J. WEIGER DATE : 05/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 05/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

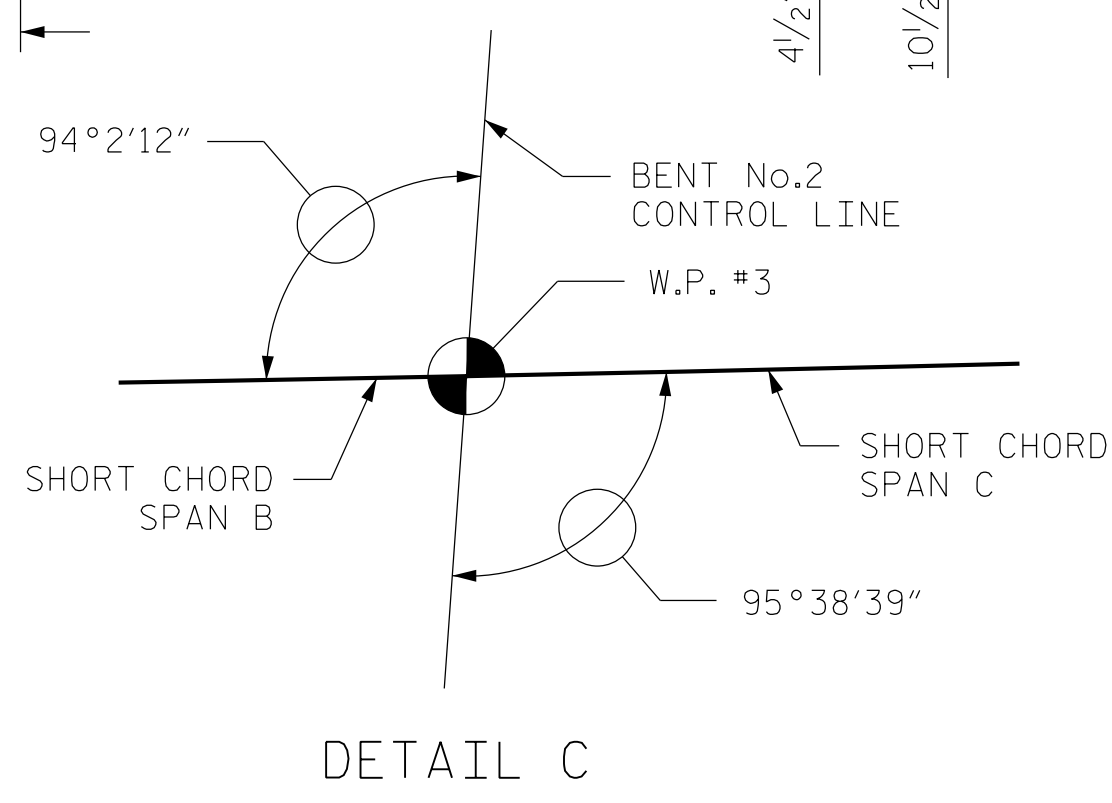
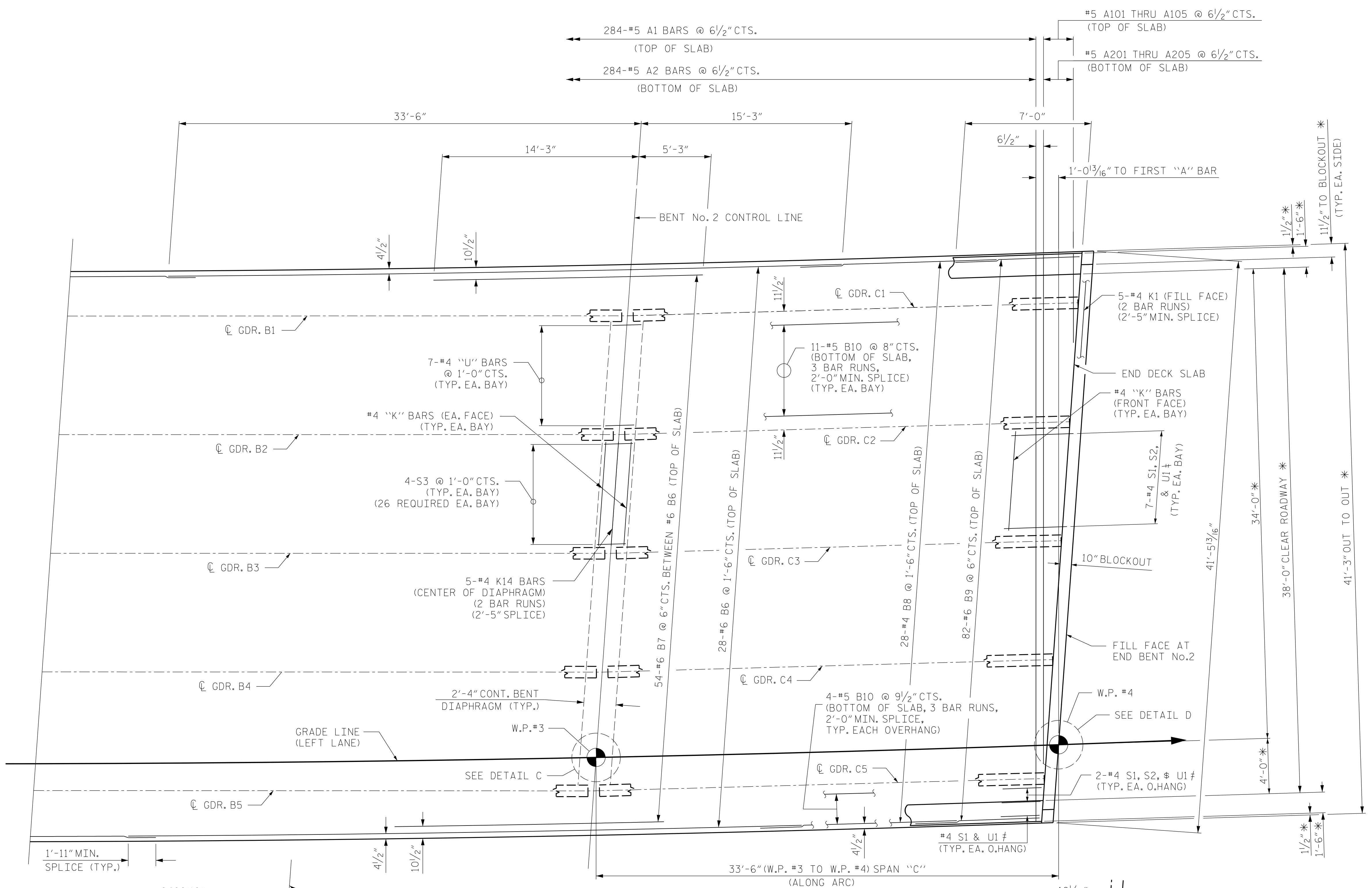
**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
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 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

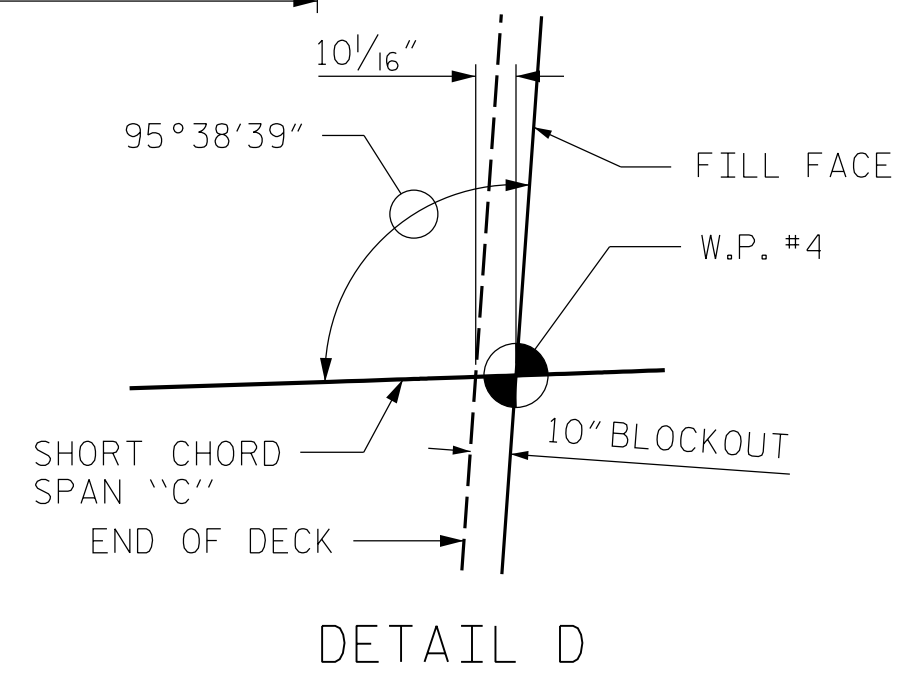
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-9	
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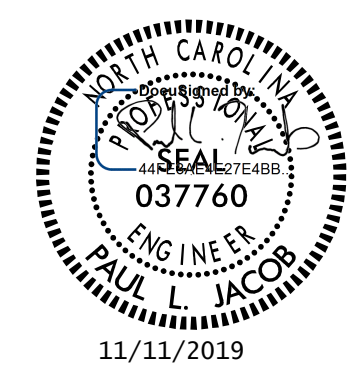


**PLAN OF SPAN "C"**  
 FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS,  
 SEE POURING SEQUENCE ON "BILL OF MATERIAL" SHEET.  
 #5 "A" BARS ARE PERPENDICULAR TO THE LONG CHORD.  
 ‡ TO MATCH V1 BARS IN END BENT  
 \* DENOTES RADIAL DIMENSION



PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**PLAN OF SPANS**  
**SPAN "C"**  
 (LEFT LANE)

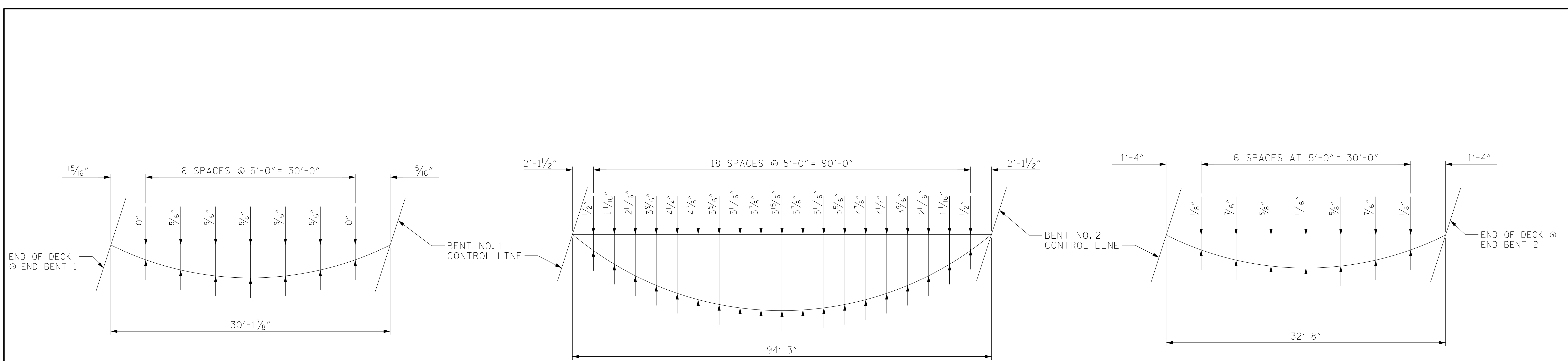


DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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 NC License No.: F-0105

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 SIGNATURES COMPLETED

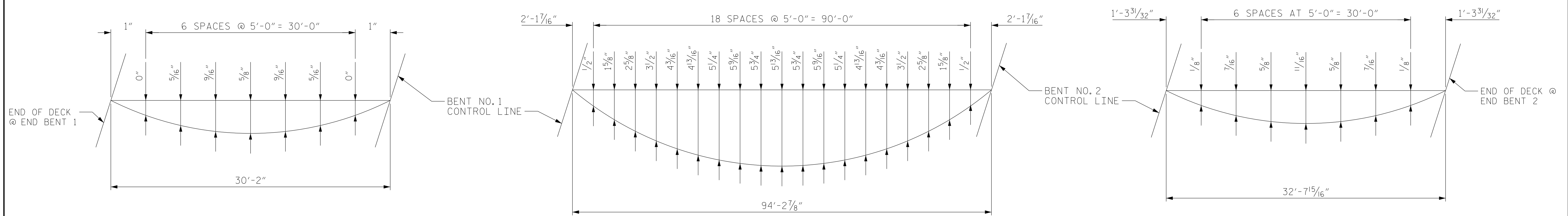
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
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LEFT EDGE OF DECK ARC OFFSETS SPAN "A"

LEFT EDGE OF DECK ARC OFFSETS SPAN "B"

LEFT EDGE OF DECK ARC OFFSETS SPAN "C"



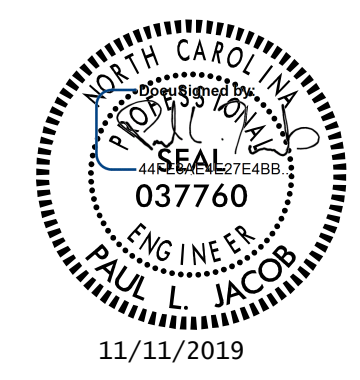
RIGHT EDGE OF DECK ARC OFFSETS SPAN "A"

RIGHT EDGE OF DECK ARC OFFSETS SPAN "B"

RIGHT EDGE OF DECK ARC OFFSETS SPAN "C"

ARC OFFSETS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**ARC OFFSETS**  
 (LEFT LANE)

DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

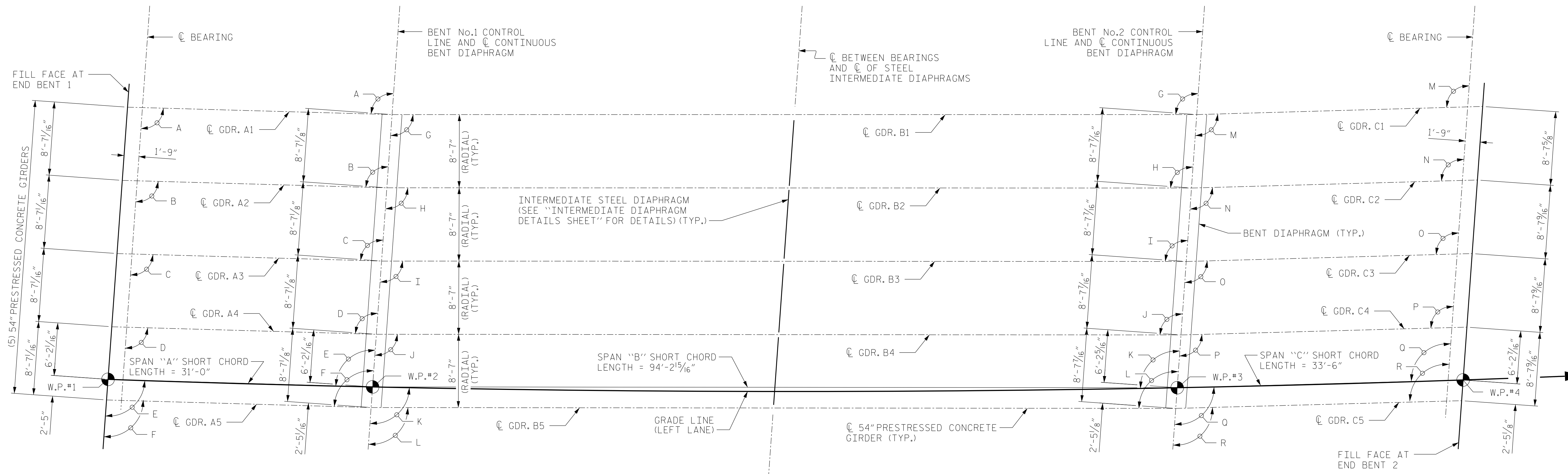
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS
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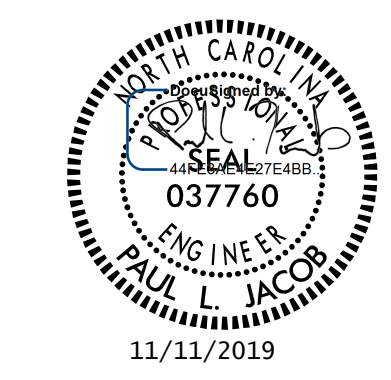
INTEGRAL E3      FIX P1, E3      FIX P1, E3      FIX P1, E3      FIX P1, E3      INTEGRAL E3

SPAN "A"      SPAN "B"      SPAN "C"

**GIRDER LAYOUT**

ANGLES					
A	92°29'45"	G	94°05'40"	M	95°43'29"
B	92°29'11"	H	94°04'43"	N	95°42'10"
C	92°28'37"	I	94°03'47"	O	95°40'52"
D	92°28'03"	J	94°02'52"	P	95°39'34"
E	92°27'39"	K	94°02'12"	Q	95°38'39"
F	92°27'30"	L	94°01'57"	R	95°38'17"

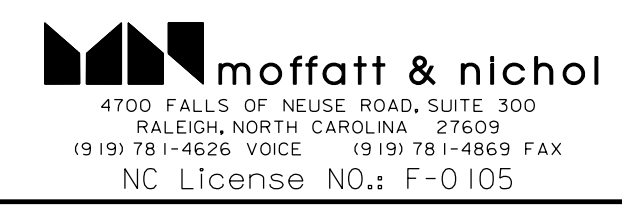
PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**FRAMING PLAN**  
 (LEFT LANE)

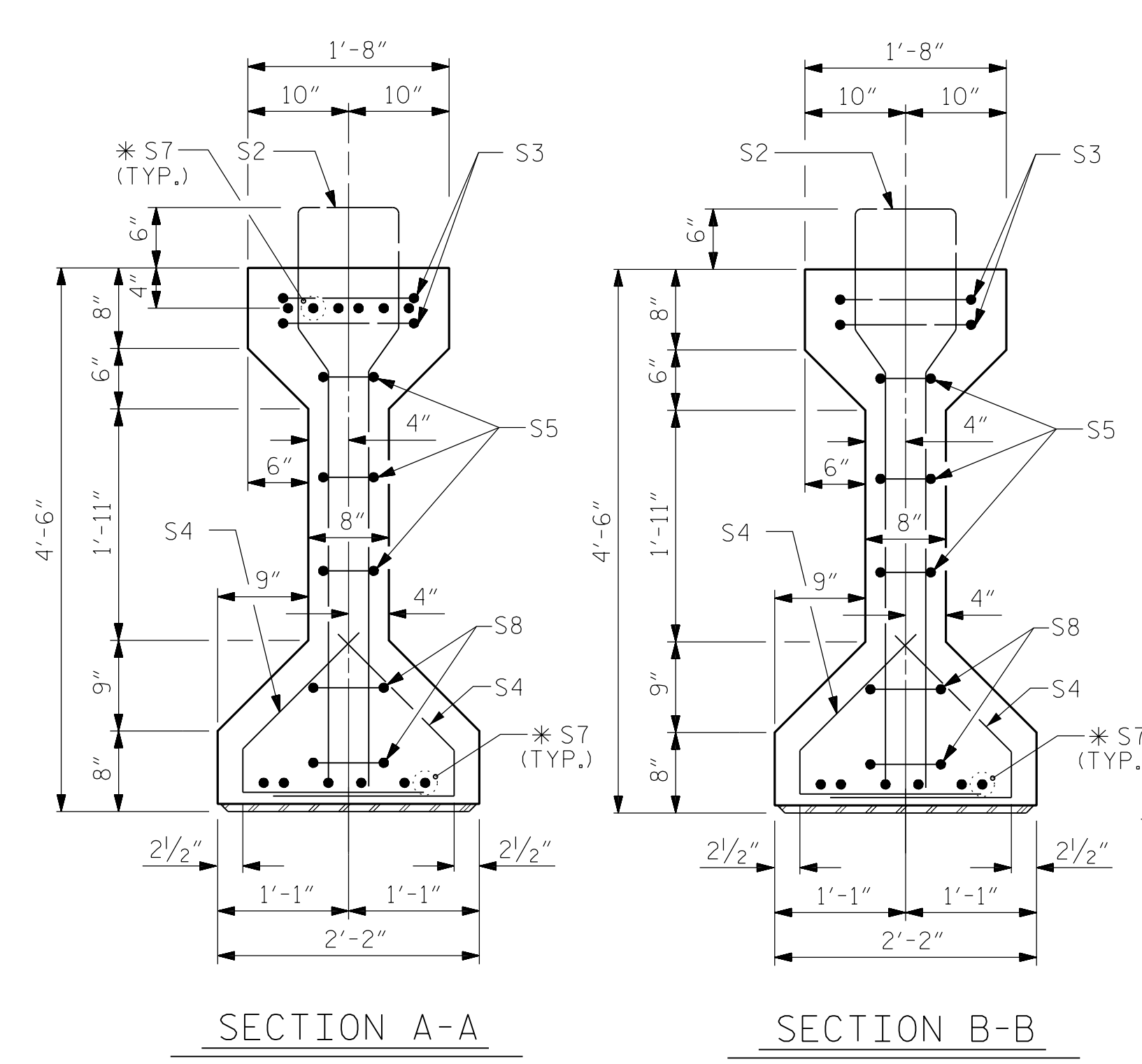
DRAWN BY : J. WEIGER      DATE : 02/2019  
 CHECKED BY : P. JACOB      DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB      DATE : 09/2019



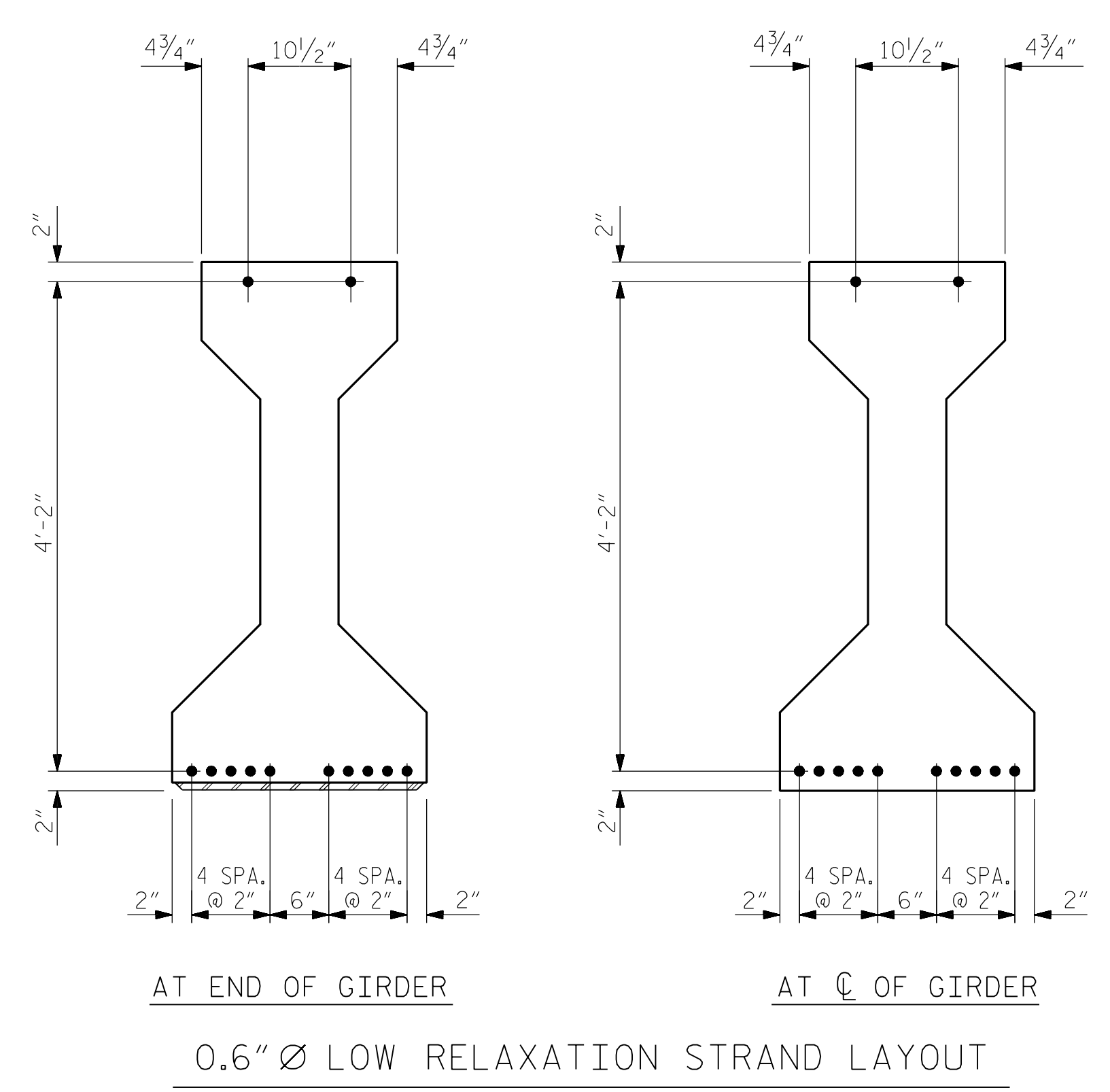
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 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
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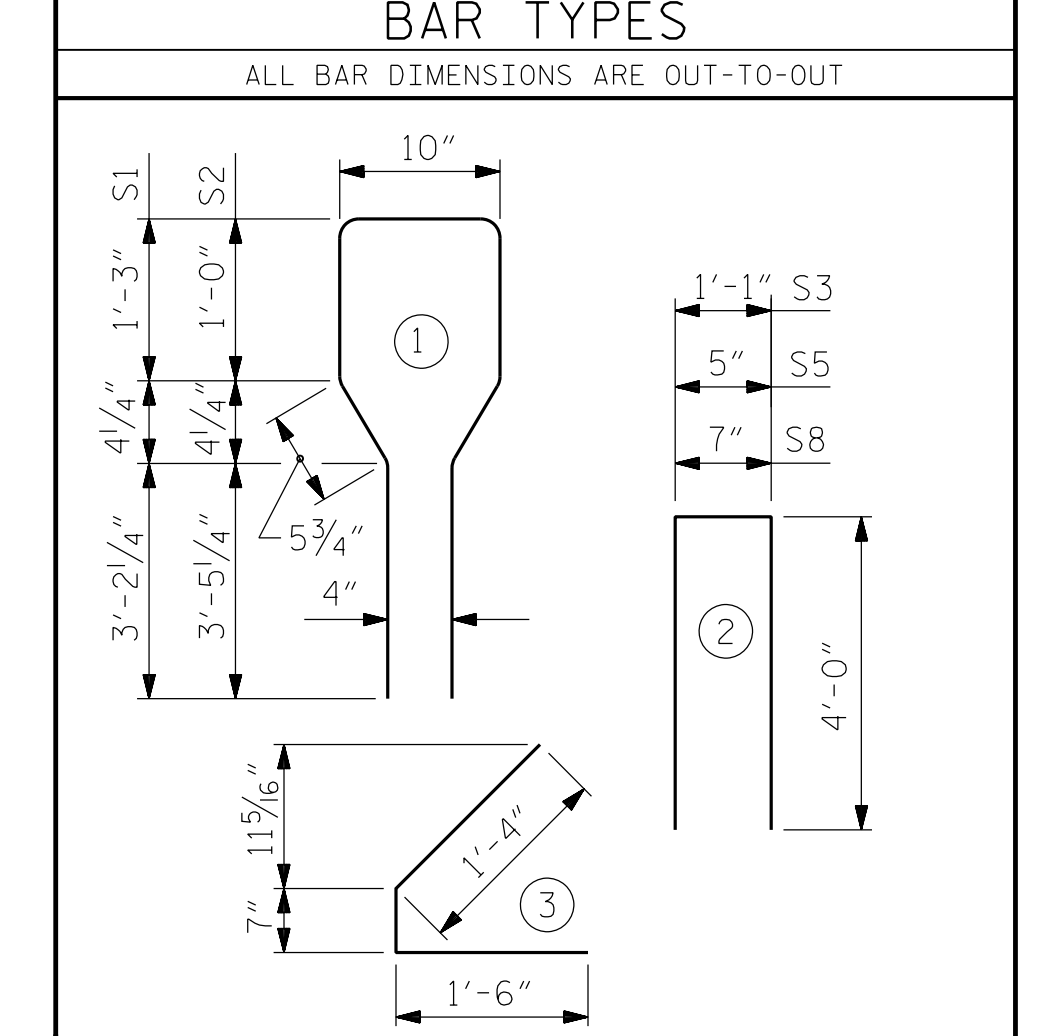
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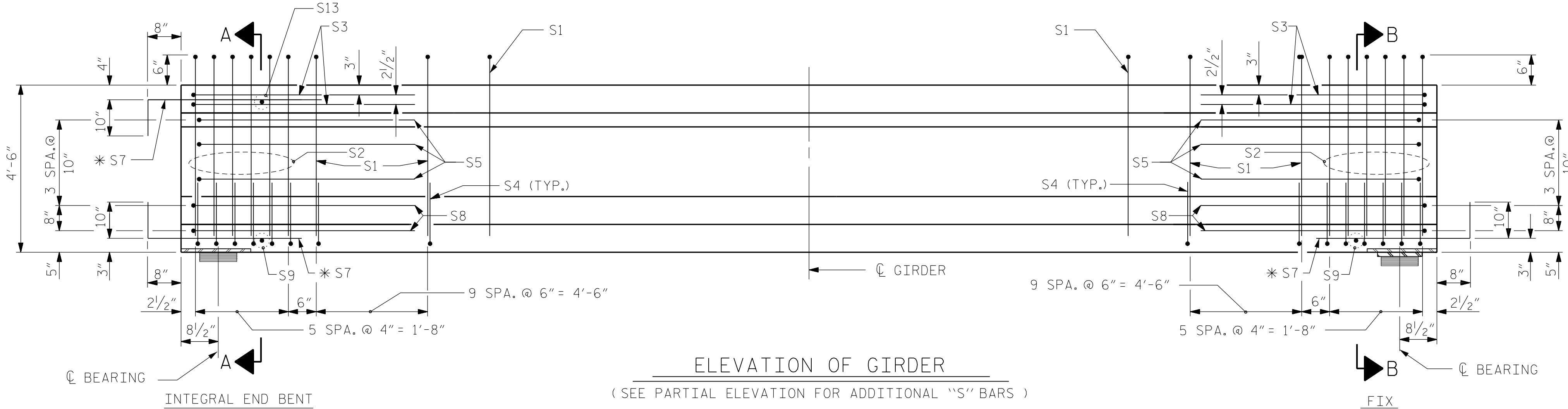
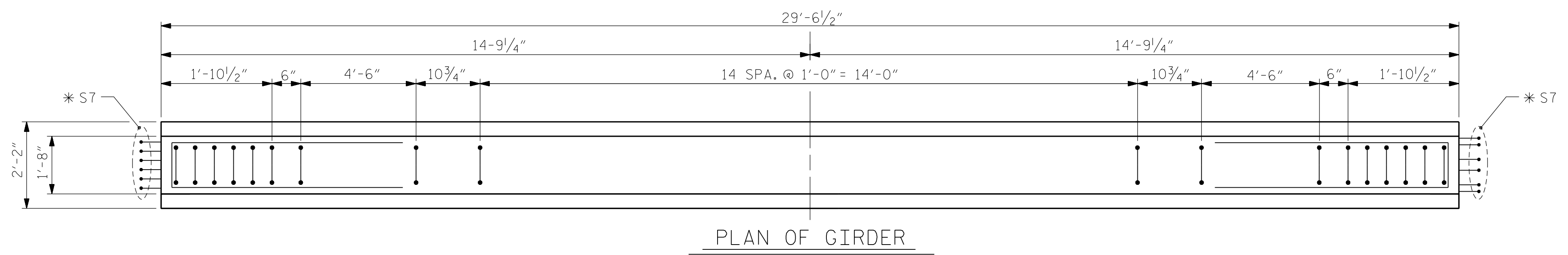
\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET



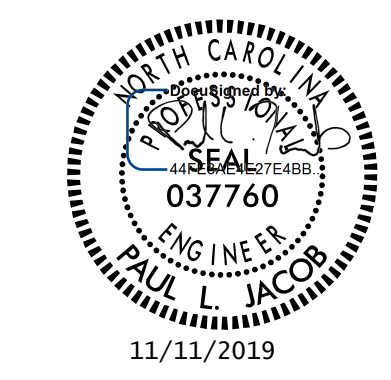
0.6" Ø L. R. GRADE 270 STRANDS					
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)			
0.217	58,600	43,950			
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	35	#5	1	10'-8"	389
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S13	1	#3	STR	1'-4"	1



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
54" PRESTRESSED CONCRETE GIRDER	879	6.0	12
GIRDERS REQUIRED			
NUMBER	LENGTH	TOTAL LENGTH	
5	29'-6 1/2"	147'-8 1/2"	



PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 1 OF 4



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 NC License No.: F-0105

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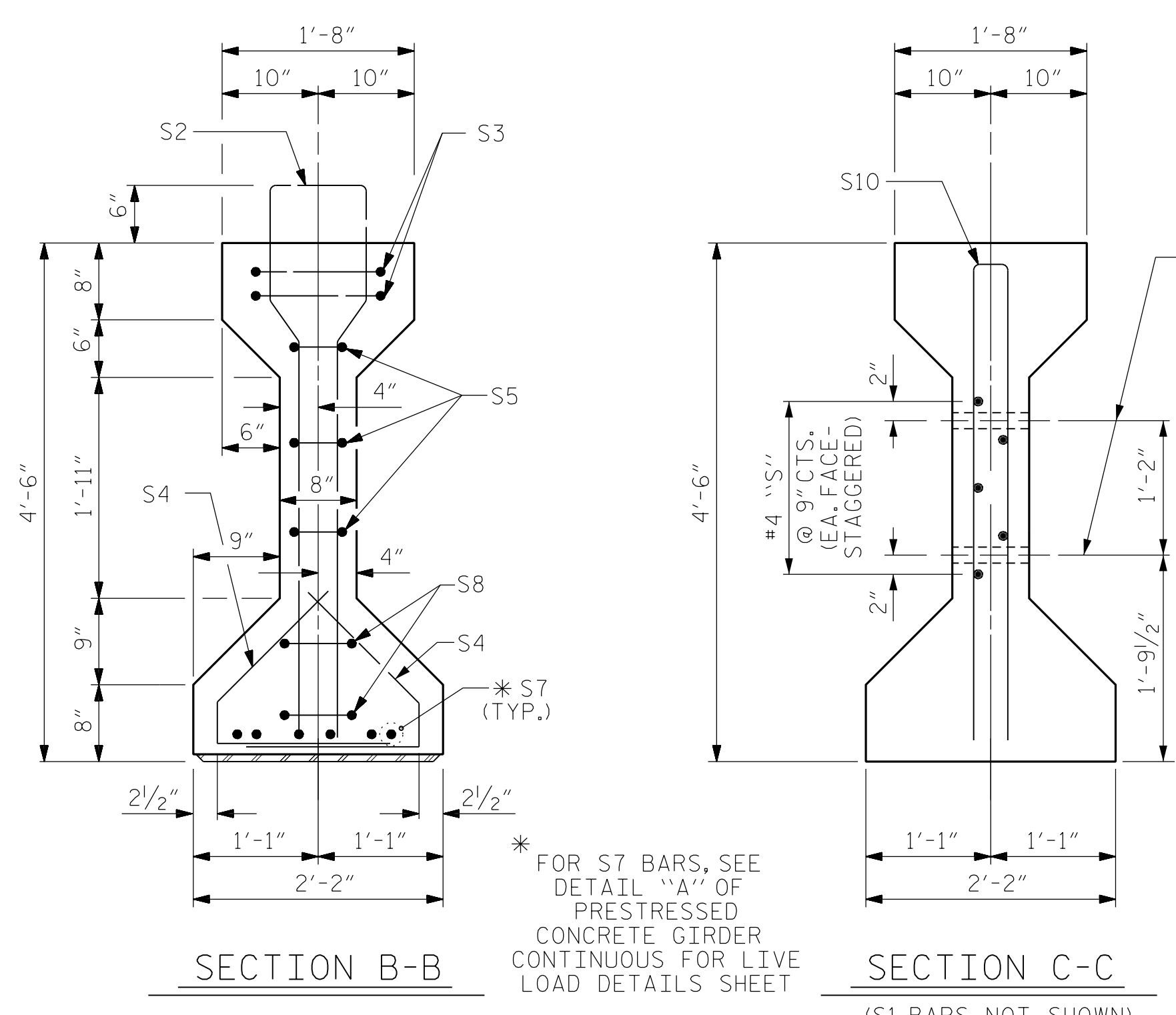
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPAN "A"  
 (LEFT LANE)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMC
	REV. 12/17 MAA/THC

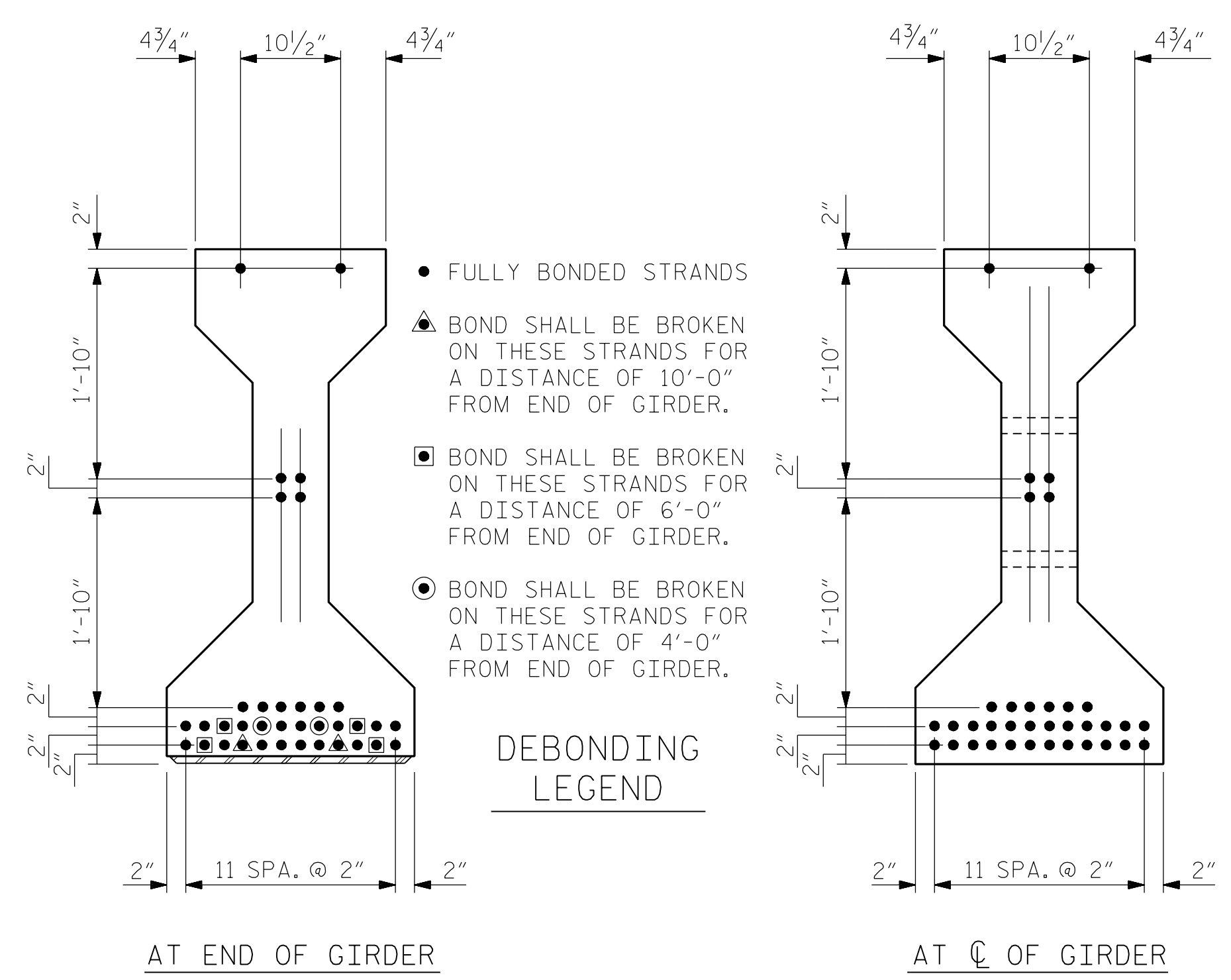
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TOTAL SHEETS: 35

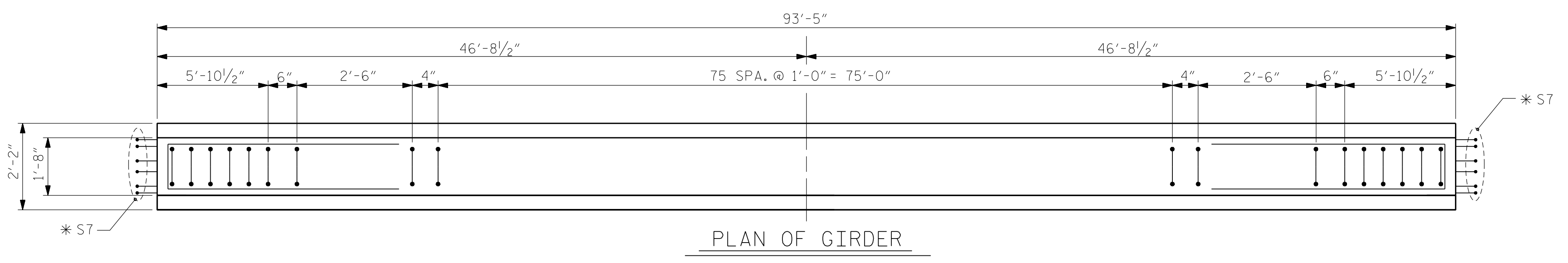
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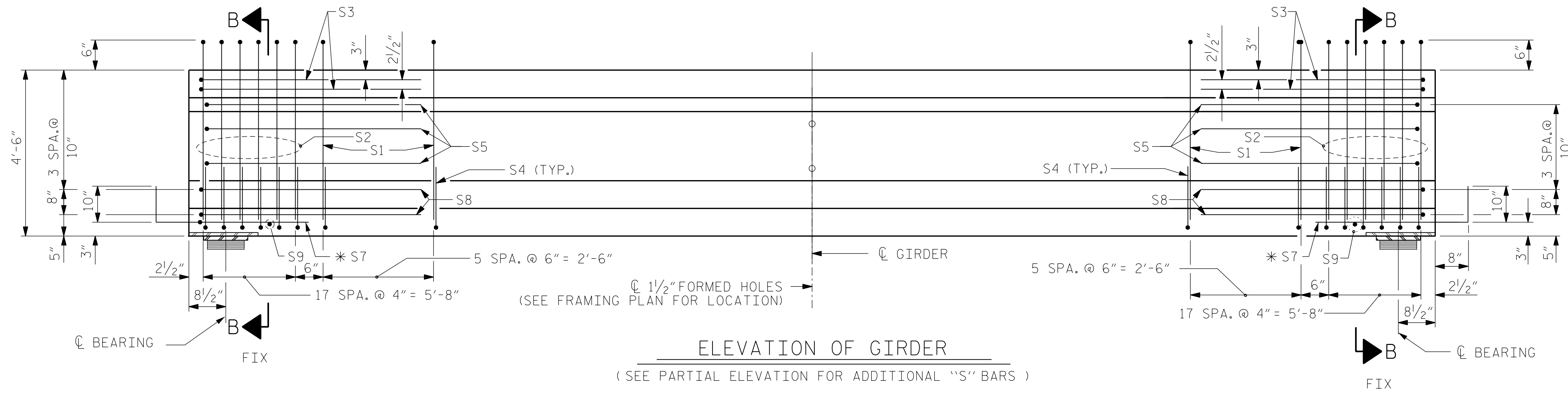
\* FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



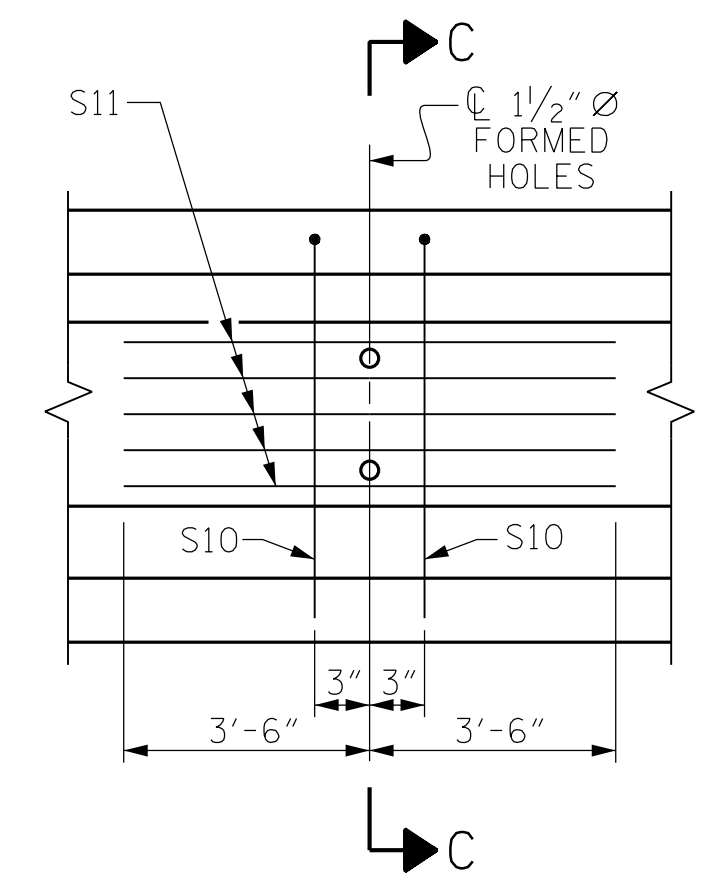
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



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



PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos.1 THRU 5

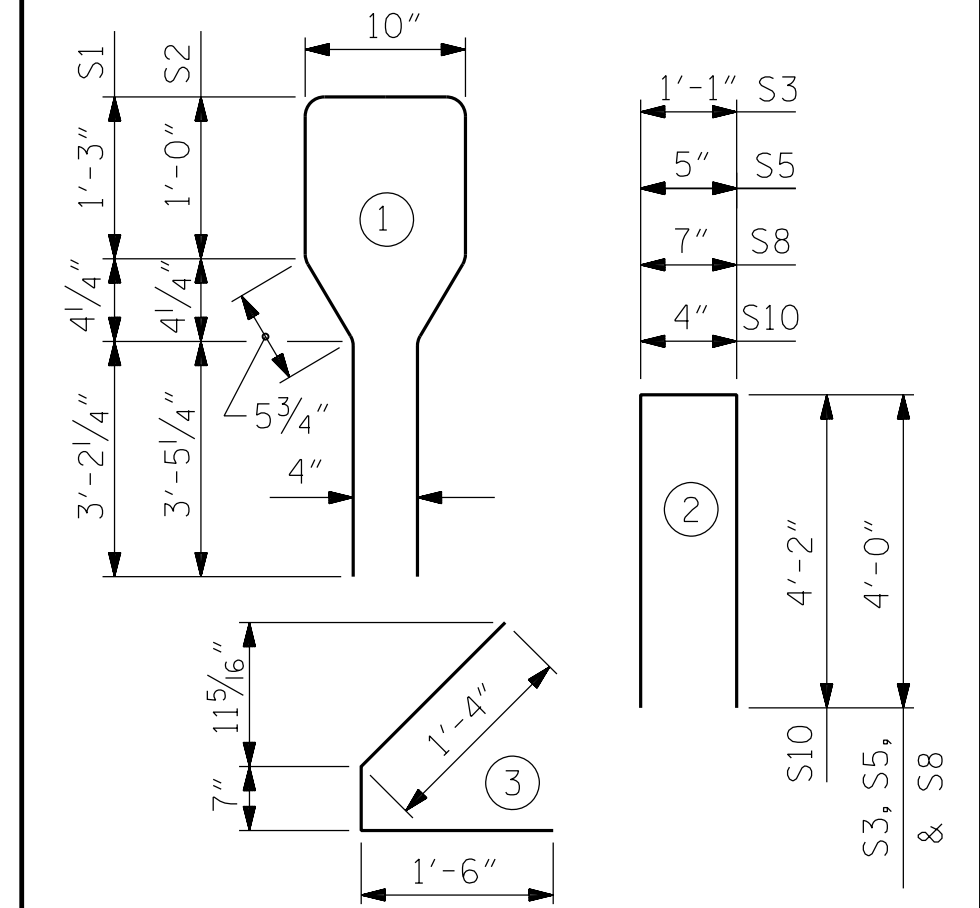
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#5	1	10'-8"	979
S2	36	#6	1	10'-8"	577
S3	4	#4	2	9'-1"	24
S4	96	#4	3	3'-5"	219
S5	6	#4	2	8'-5"	34
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	1944	19.0	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	93'-5"	467'-1"

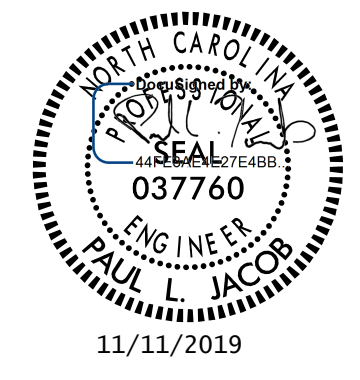
PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN "B"  
(LEFT LANE)

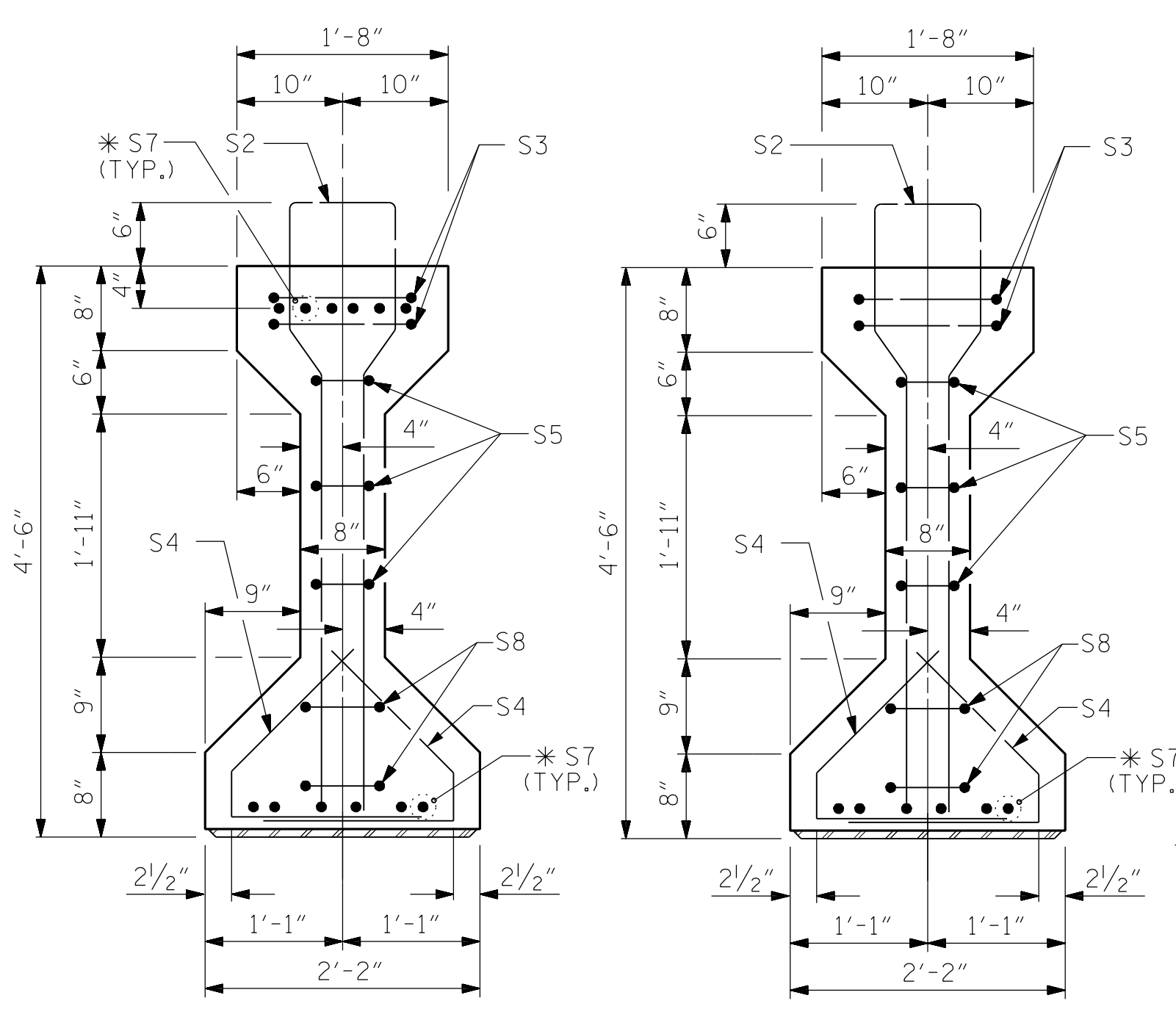
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC



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RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

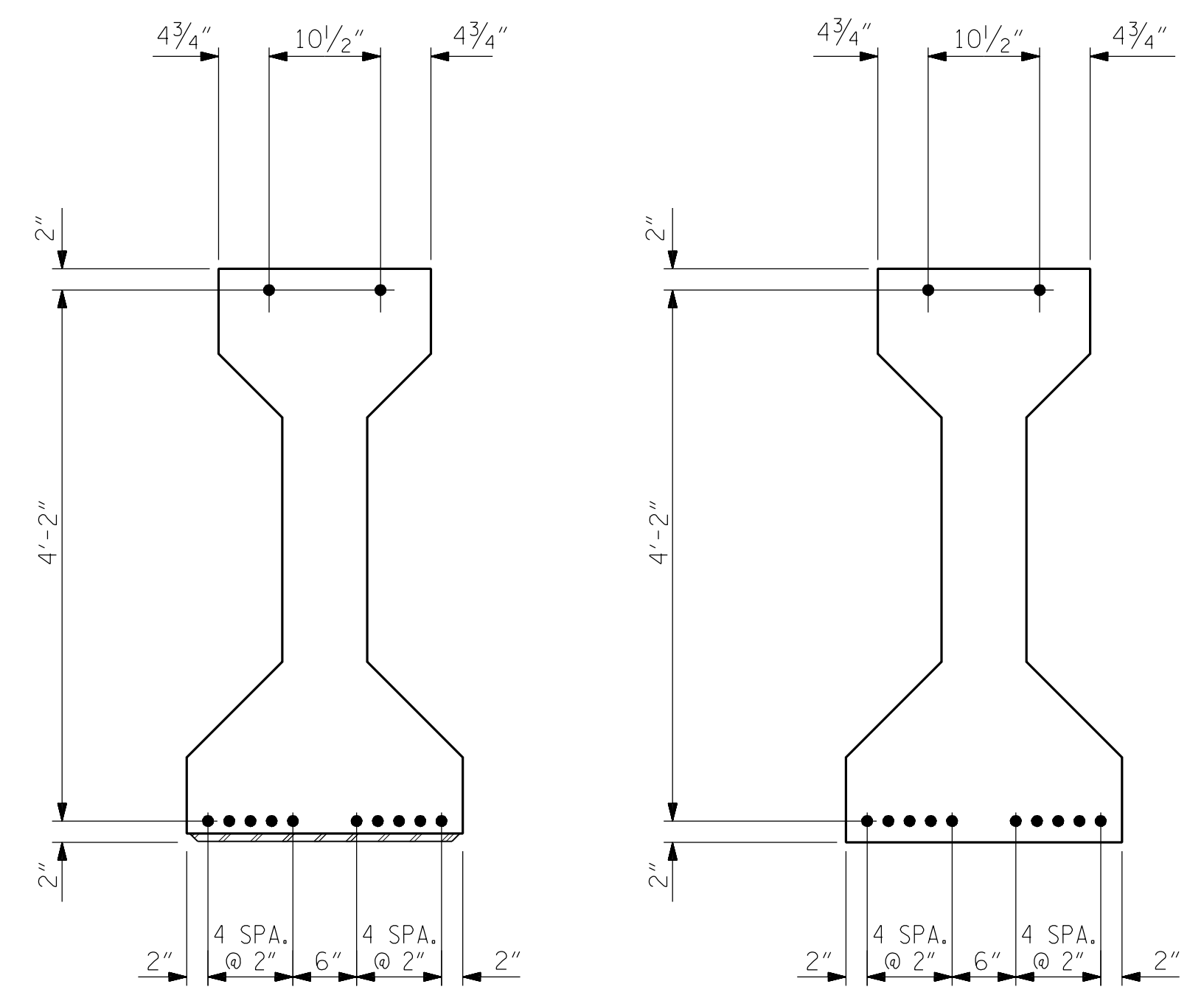
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



SECTION A-A

SECTION B-B

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



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

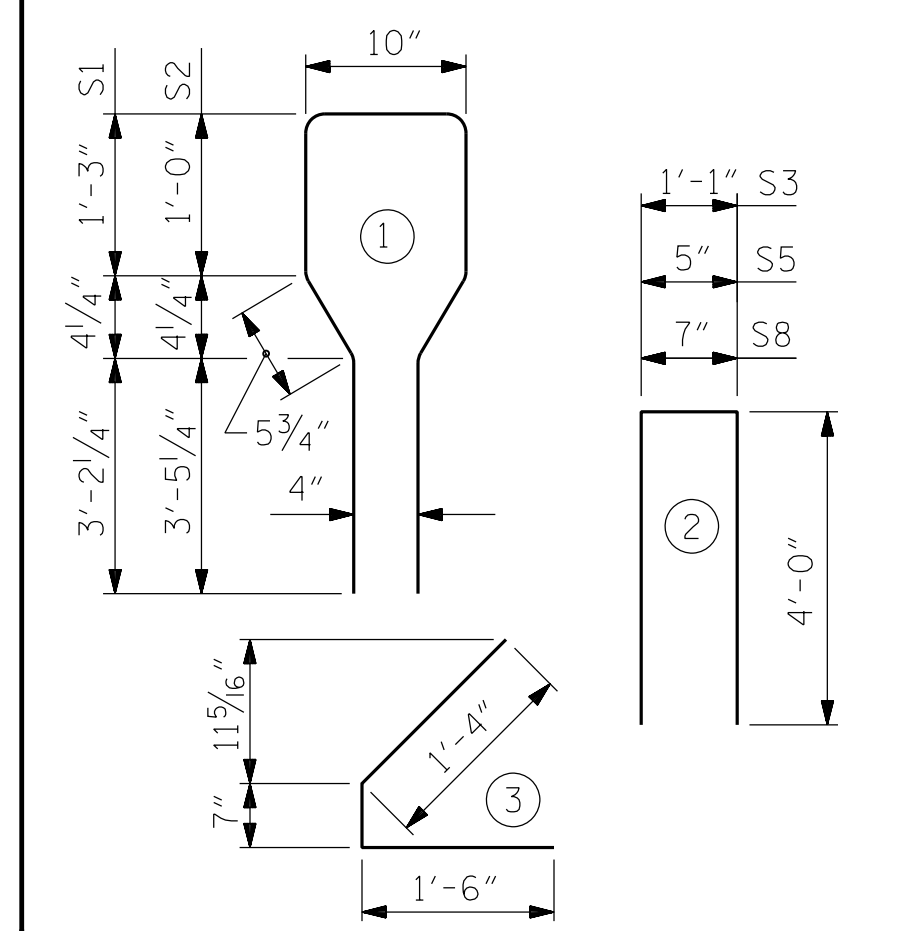
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	38	#5	1	10'-8"	423
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

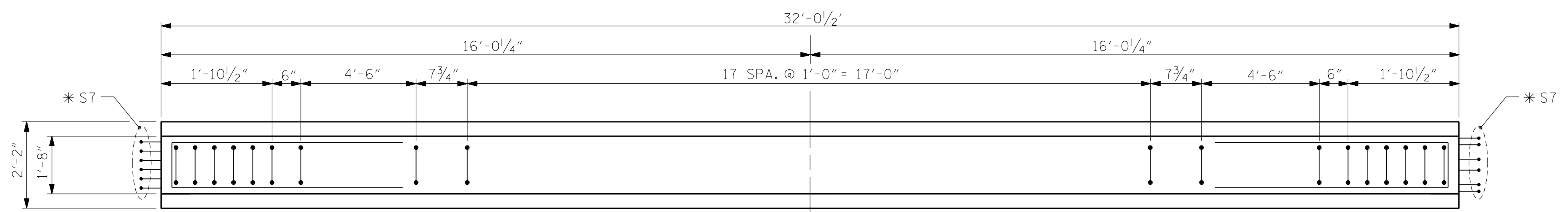


QUANTITIES FOR ONE GIRDER

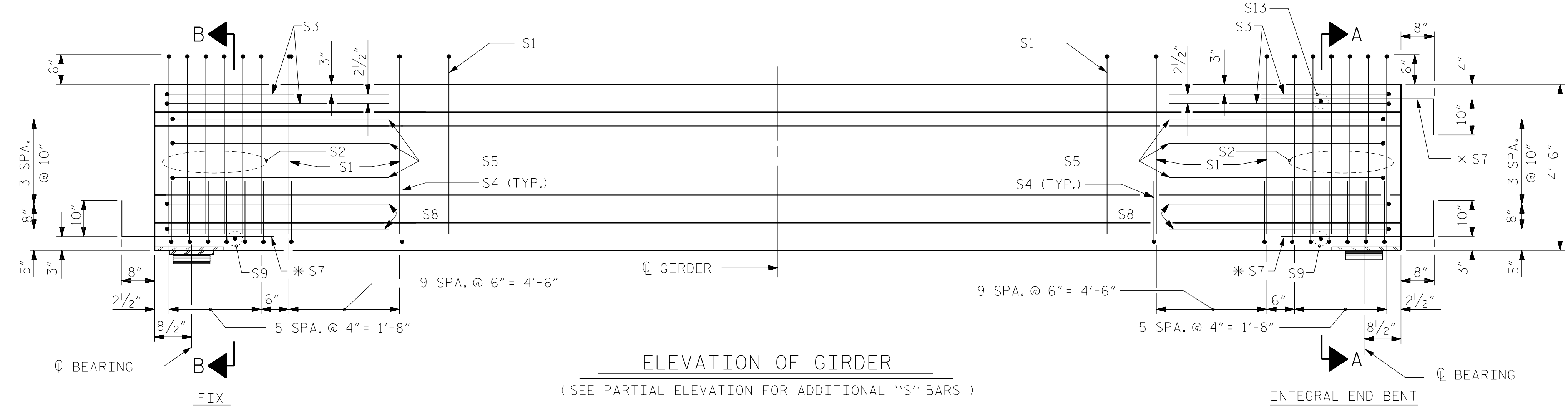
	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	913	6.5	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	32'-0 1/2"	160'-2 1/2"



PLAN OF GIRDER

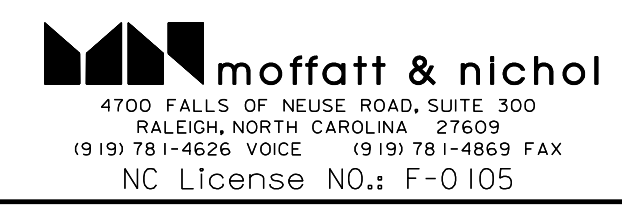
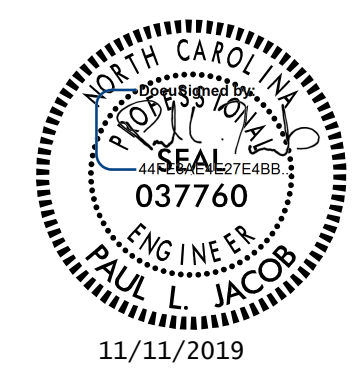


ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-

SHEET 3 OF 4



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SIGNATURES COMPLETED

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN "C"  
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			35

STD. NO. PCG6 (Sht. 2)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

Q:\RA\6522-07\Submittals\181107 - Site 1 Left Lane Structures Let Plans Rev\ACADD Files\R2303E\_SMU\_G3\_015\_81000.dgn

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

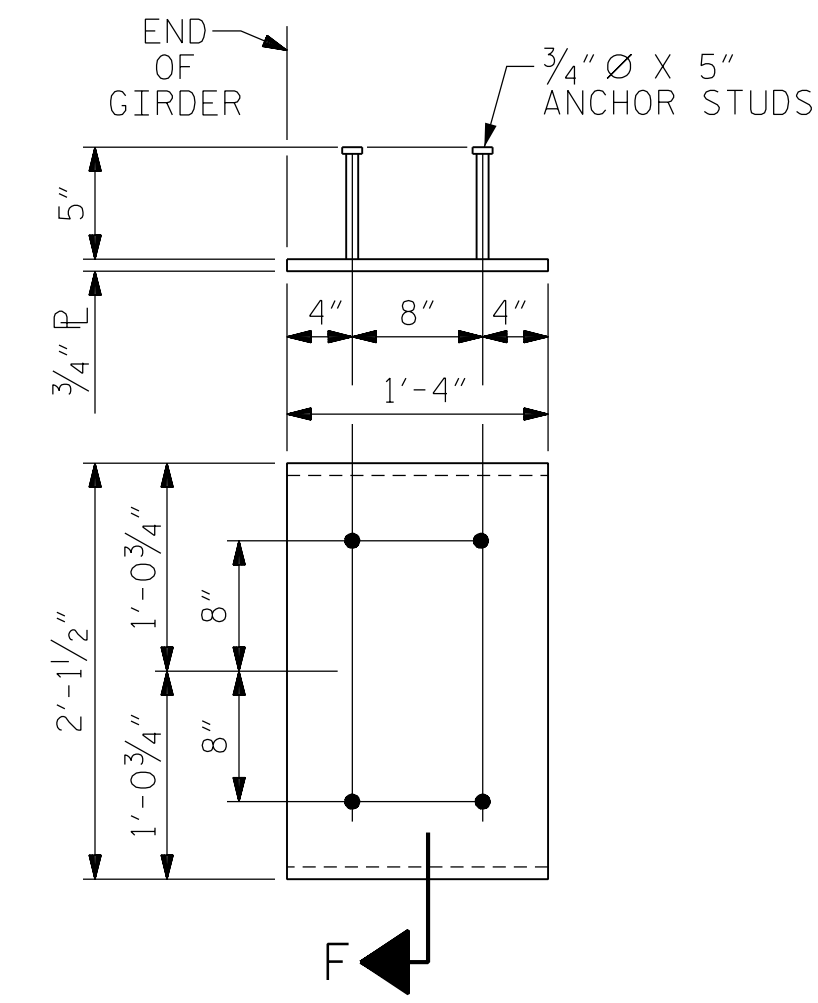
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI FOR SPAN "A" AND SPAN "C" AND NO LESS THAN 5700 PSI FOR SPAN "B".

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

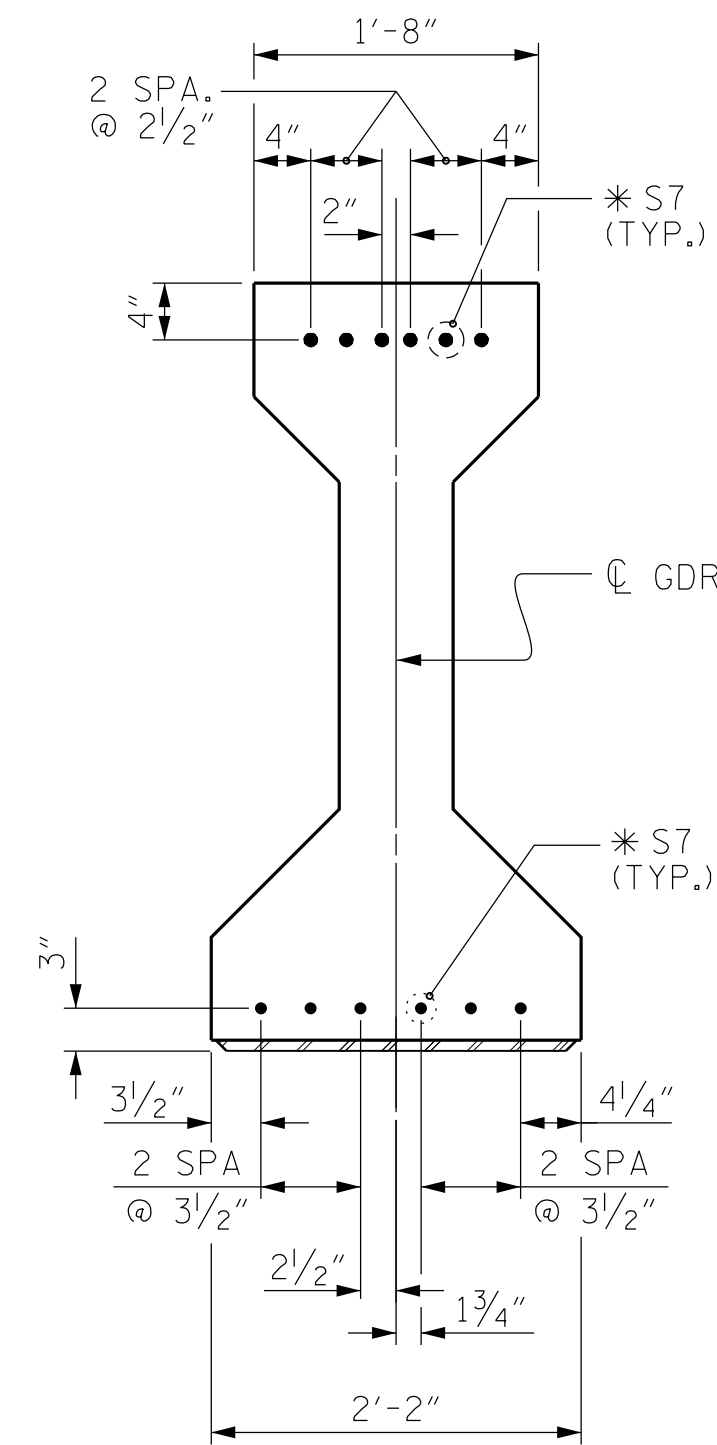
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.



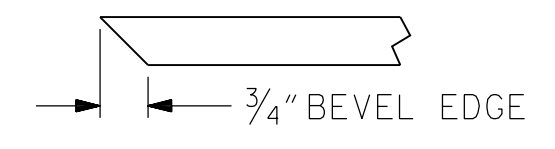
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

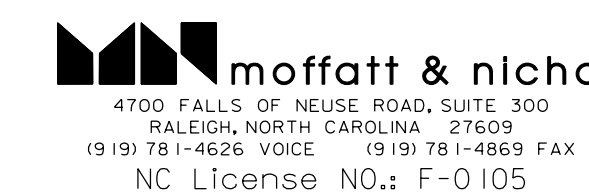
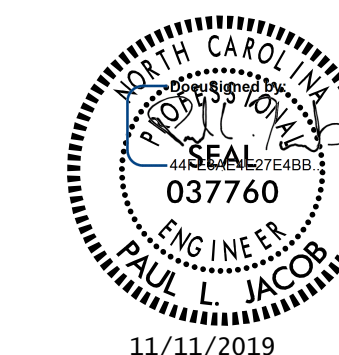


SECTION "F"

(SEE NOTES)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

SHEET 4 OF 4



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			35

ASSEMBLED BY : J. WEIGER	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

**STRUCTURAL STEEL NOTES**

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

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

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

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

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

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

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

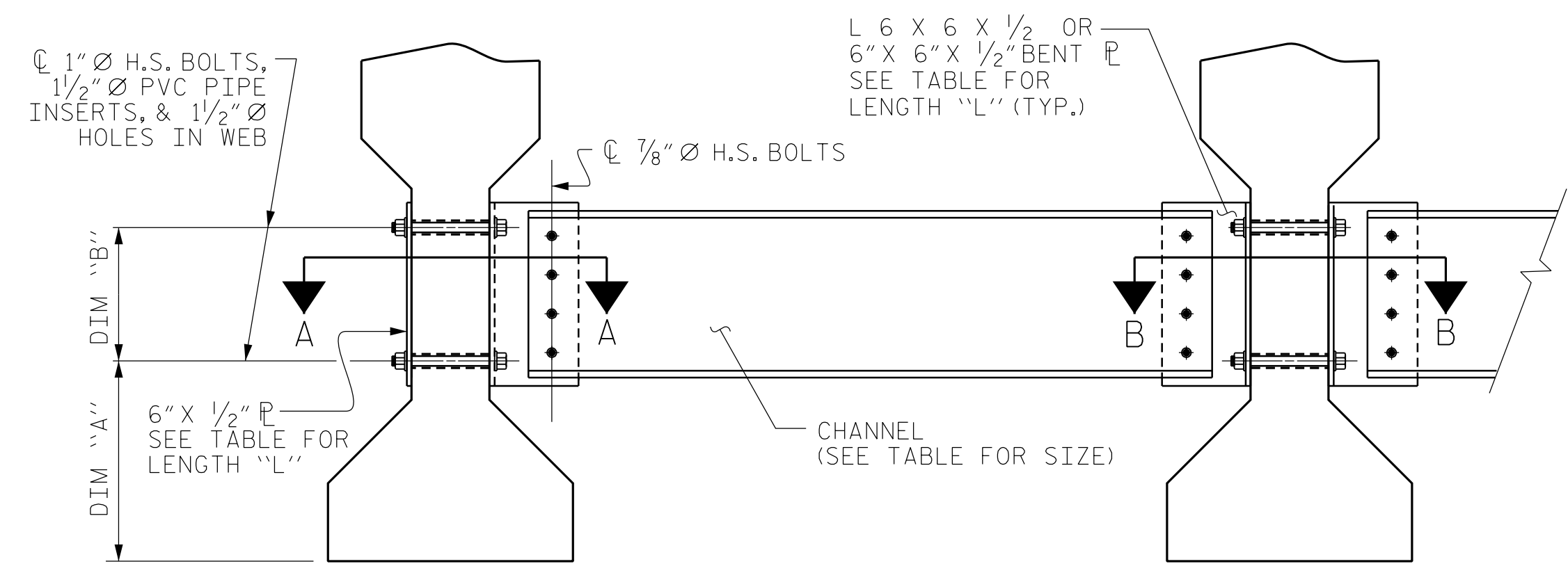
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

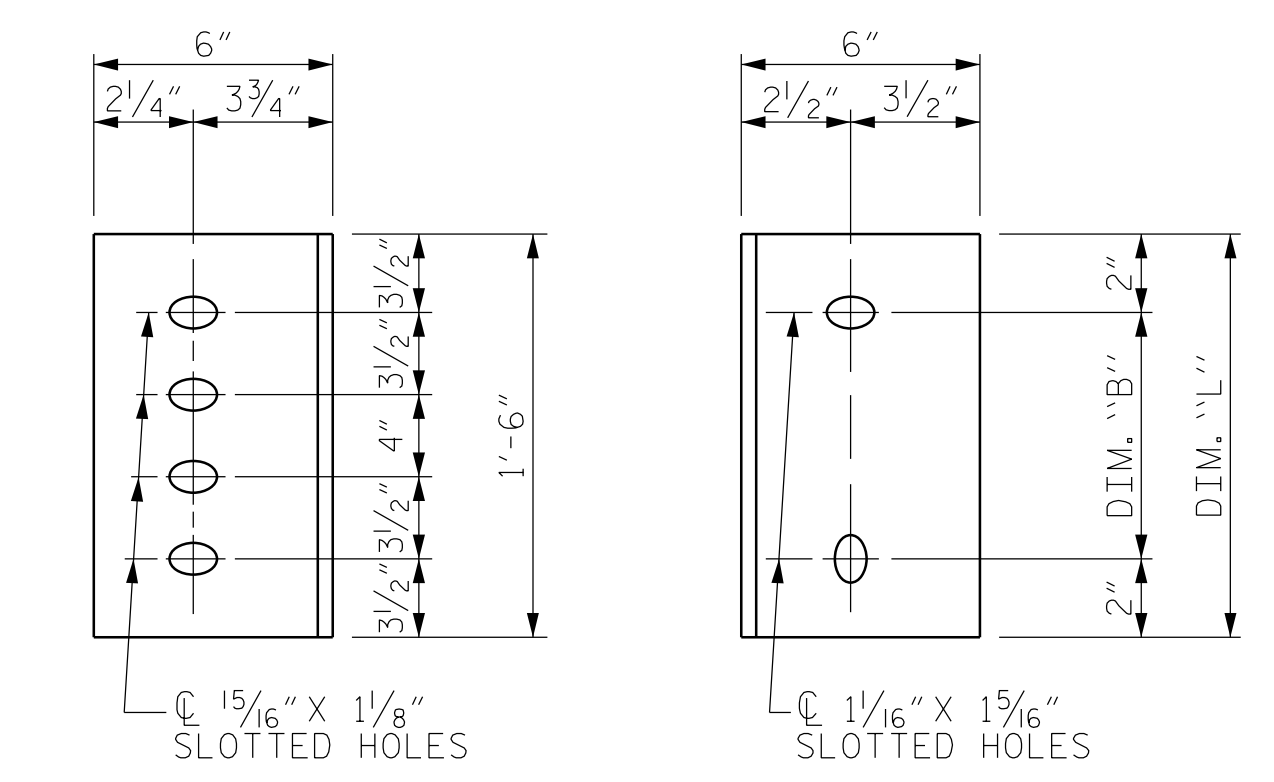
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

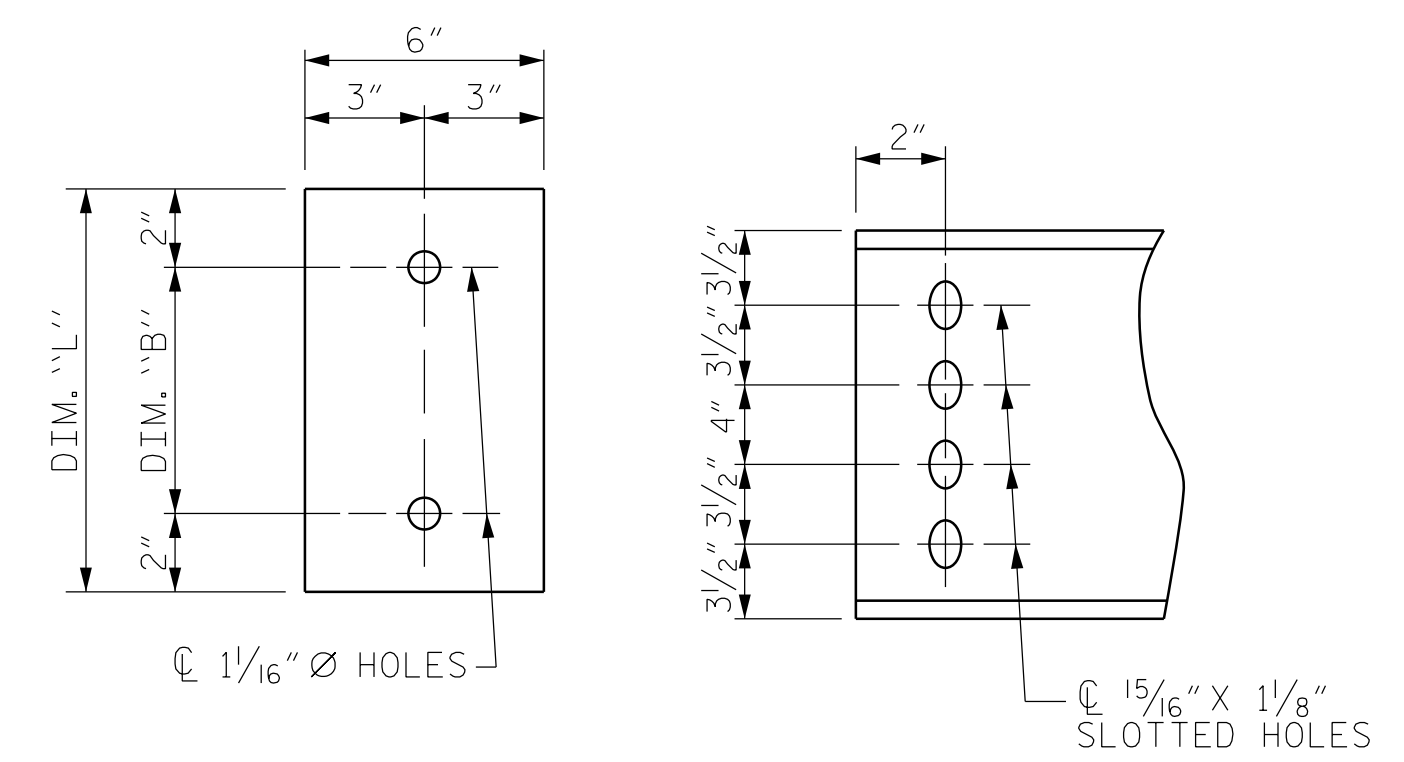
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



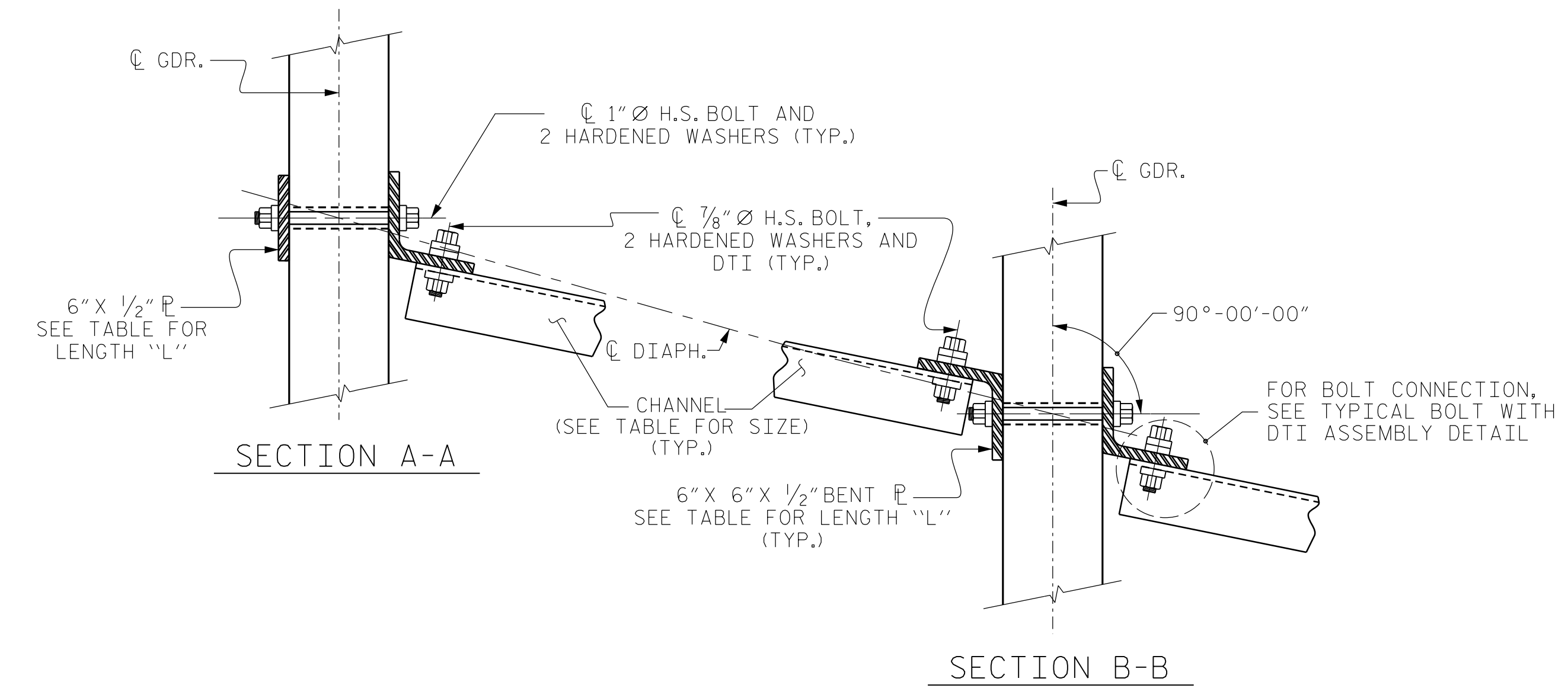
**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



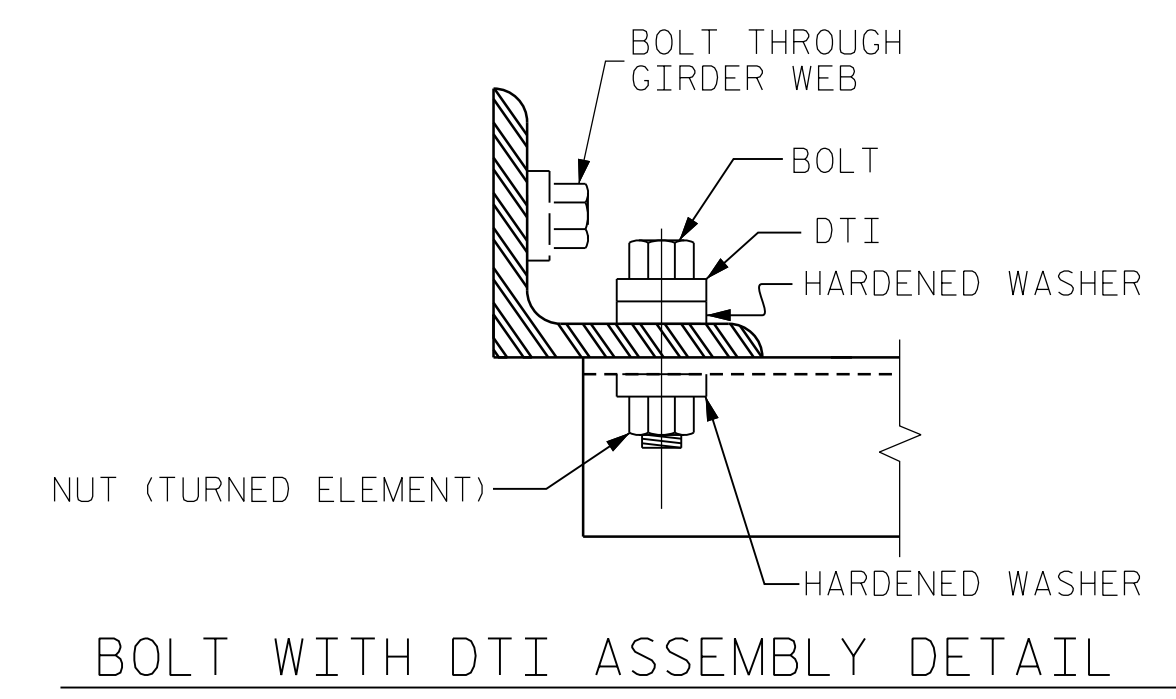
**DIAPHRAGM FACE**      **WEB FACE**  
**CONNECTOR PLATE DETAILS**



**PLATE DETAILS**      **CHANNEL END**



**CONNECTION DETAILS**

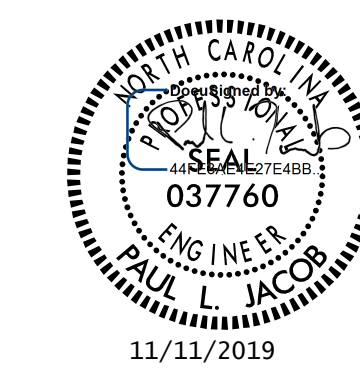


**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

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

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**INTERMEDIATE DIAPHRAGM DETAILS**  
(LEFT LANE)

ASSEMBLED BY : A. CHILKEPALLI	DATE : 05/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 6/05	REV. 5/1/06 KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License NO.: F-0105

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			35

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NOTES

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

STEEL SOLE PLATES, ANCHOR BOLTS, AND NUTS 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 "P1", BOLTS, AND NUTS 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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

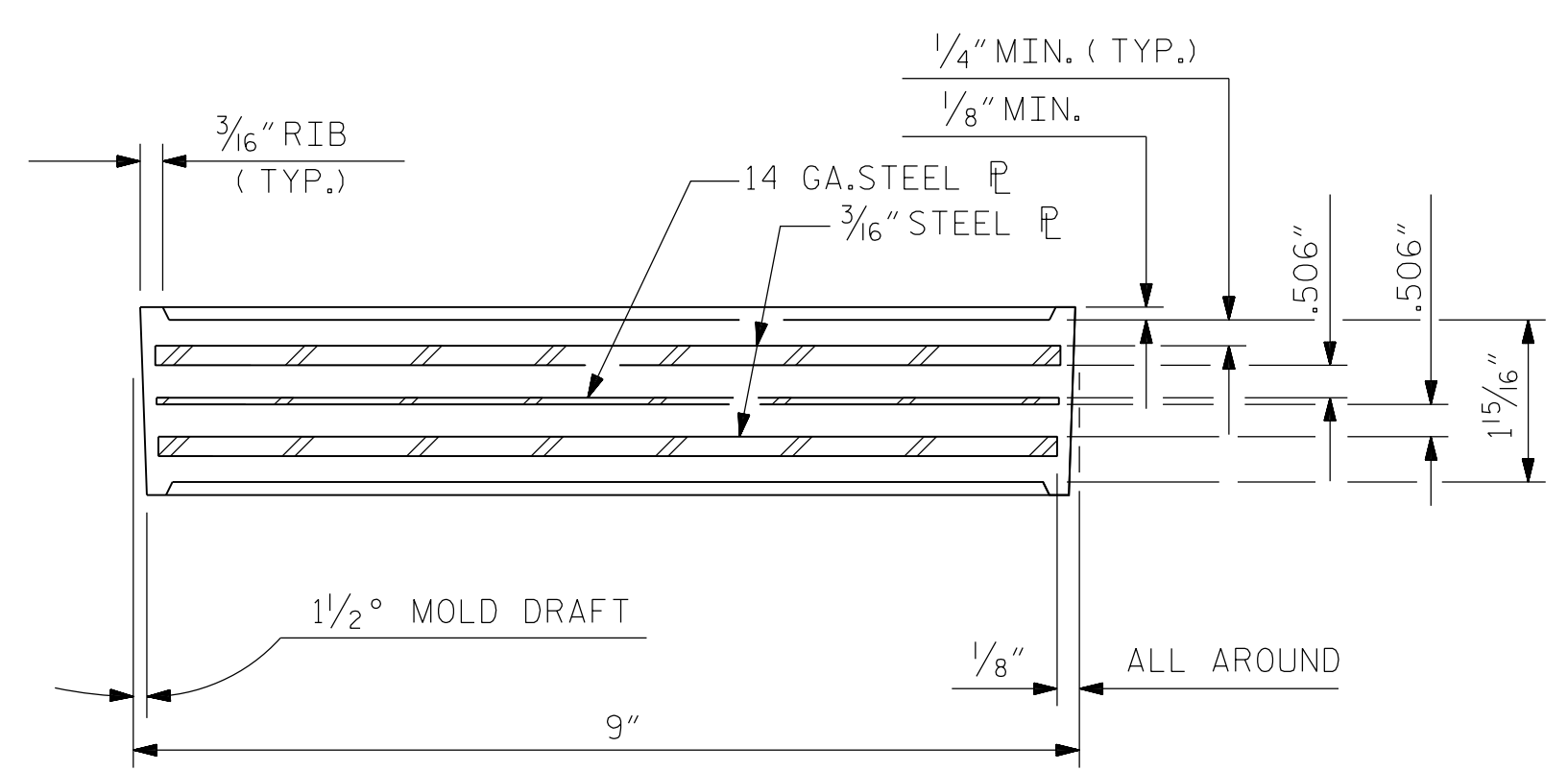
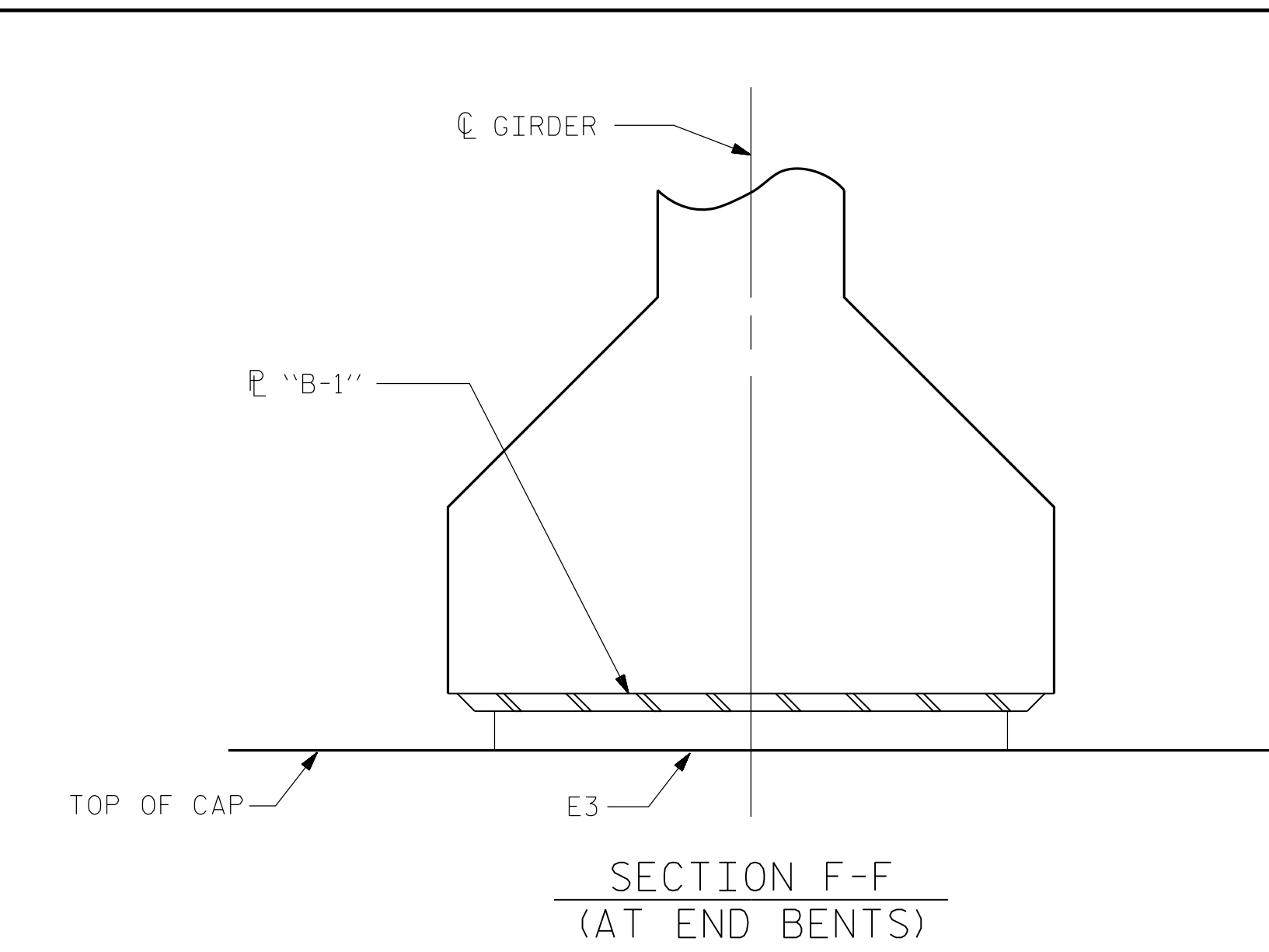
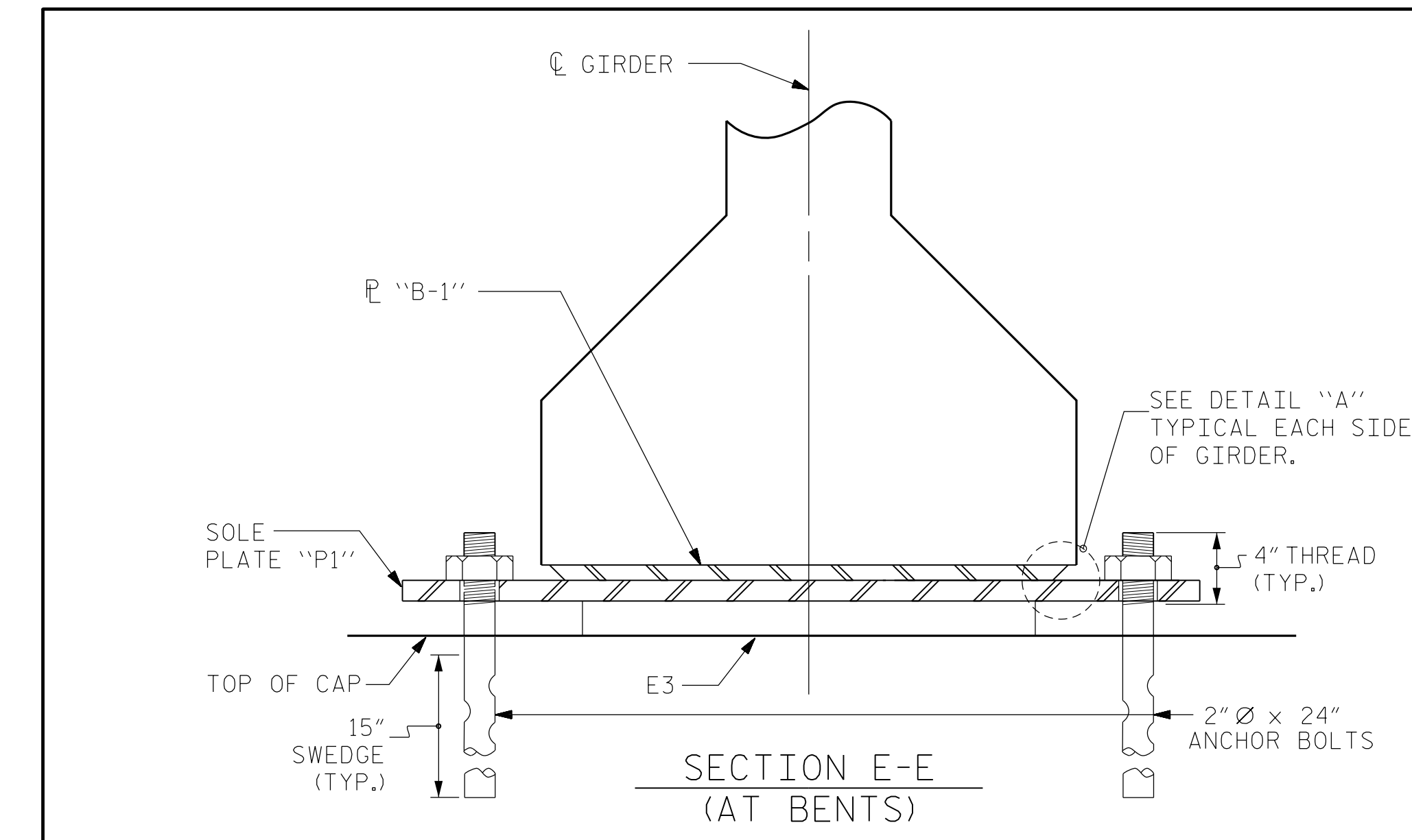
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**ELASTOMERIC BEARING DETAILS**  
 PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (LEFT LANE)



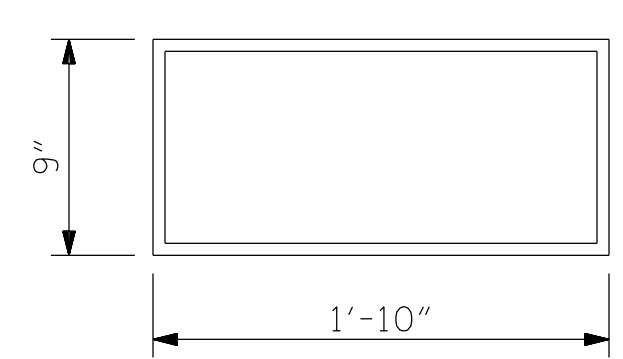
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			35

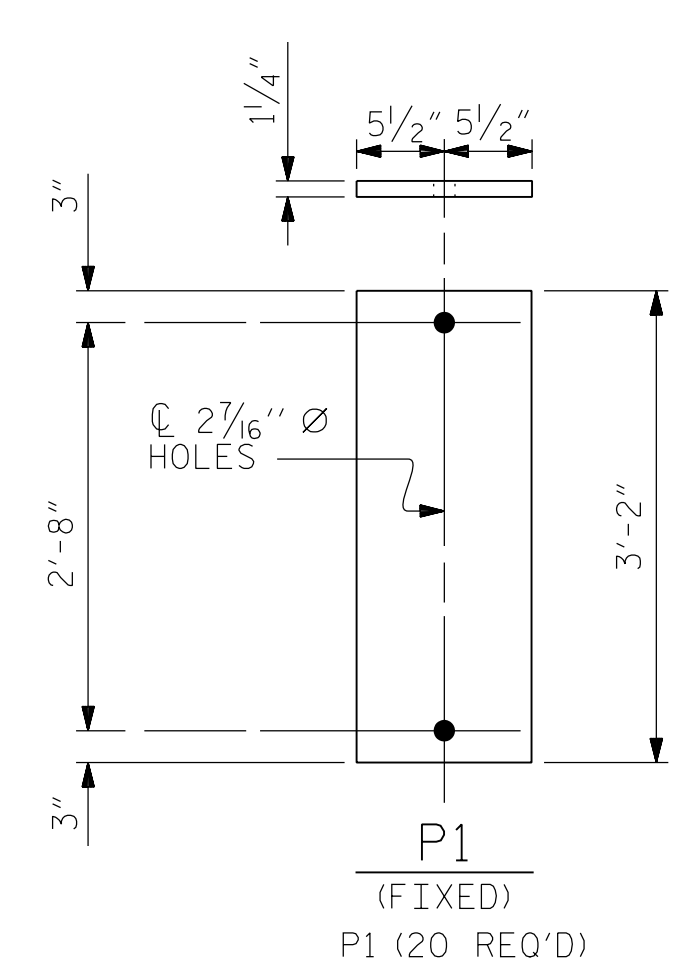
**moffatt & nichol**  
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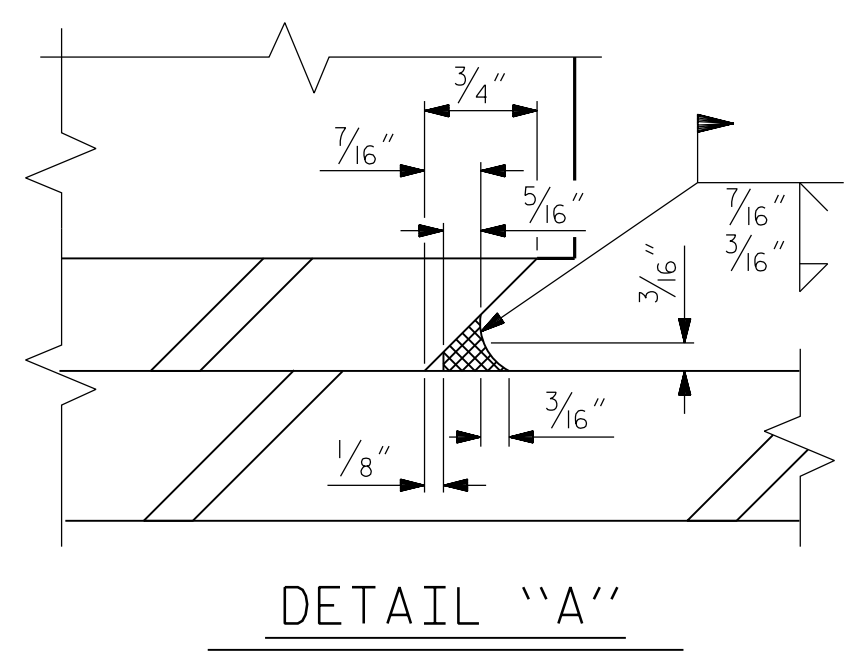
TYPICAL SECTION OF ELASTOMERIC BEARINGS



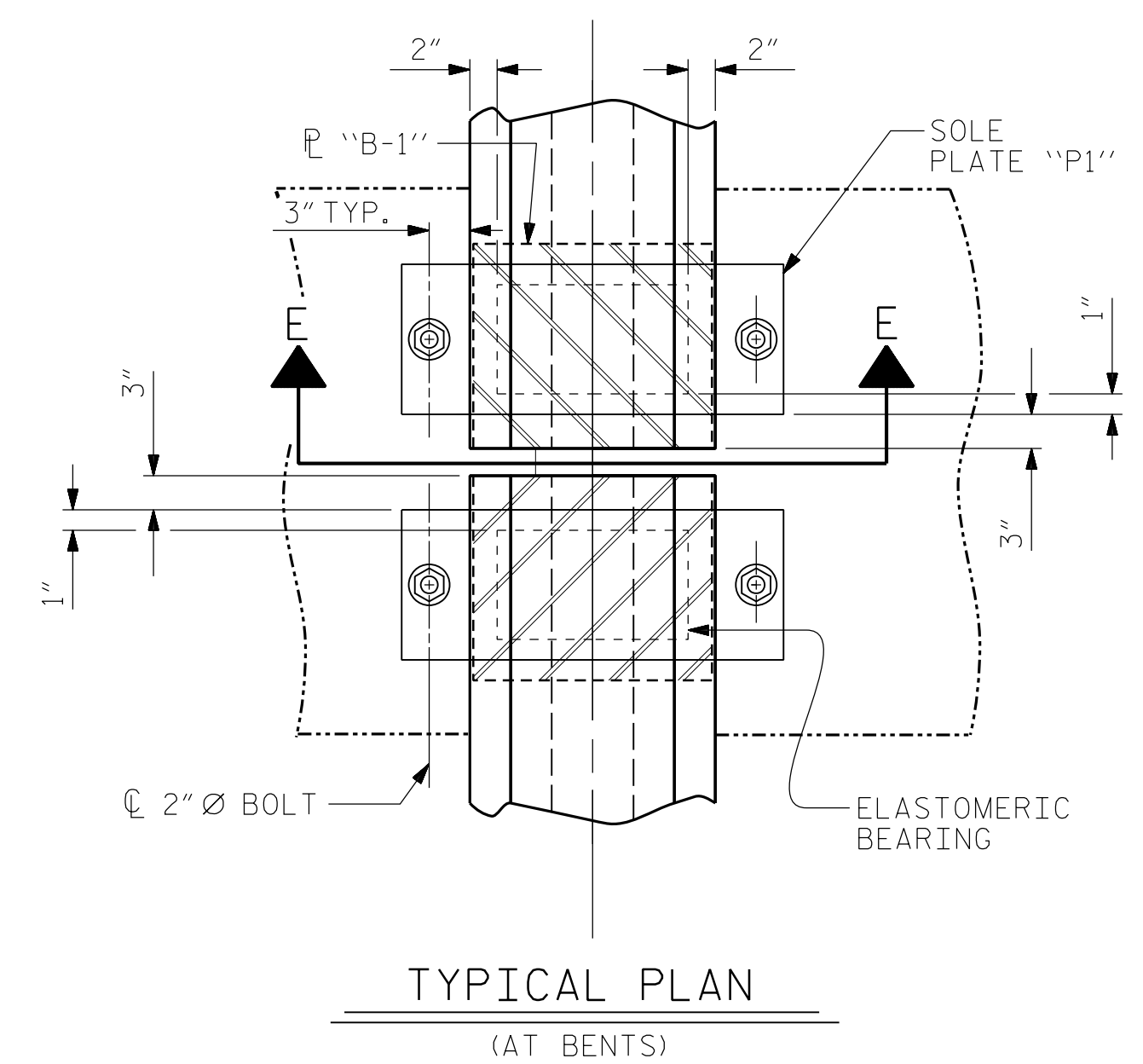
E3 (30 REQ'D)  
 PLAN VIEW OF ELASTOMERIC BEARING  
 TYPE IV



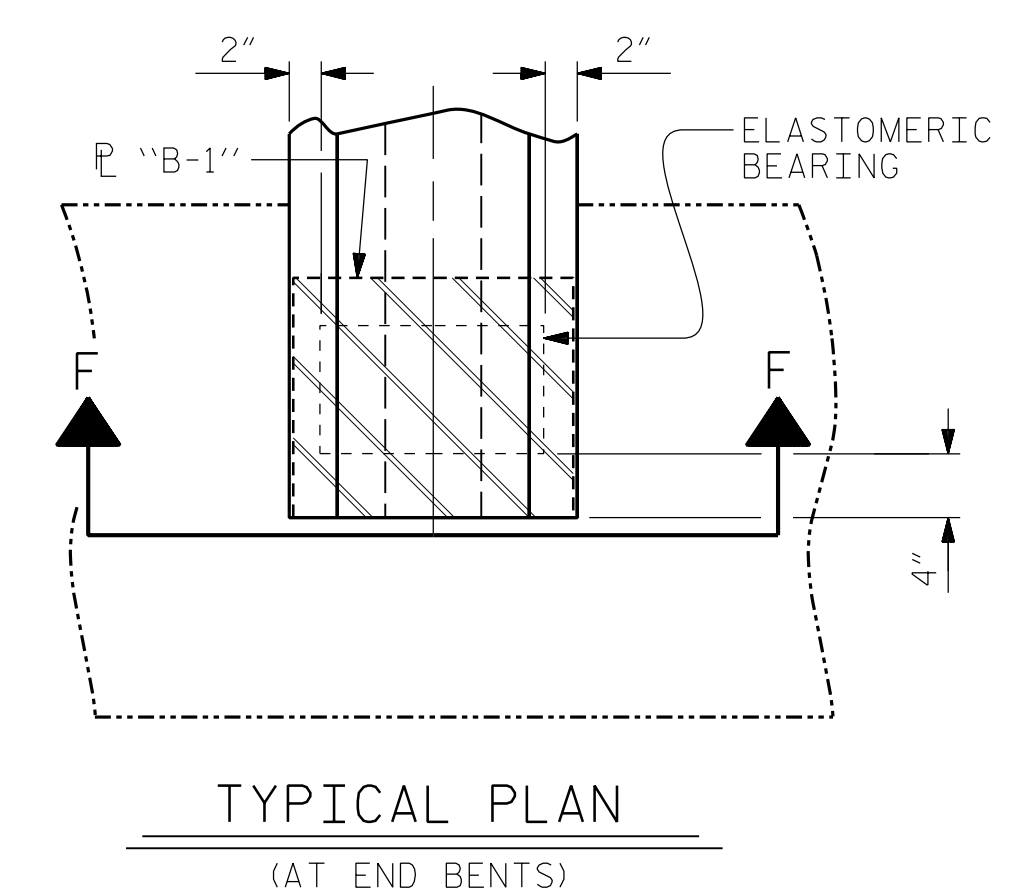
SOLE PLATE DETAILS ("P1")



DETAIL "A"



TYPICAL PLAN (AT BENTS)



TYPICAL PLAN (AT END BENTS)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : GRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6"Ø LOW RELAXATION	SPAN "A"												SPAN "A"										
	GIRDERS 1 AND 5												GIRDERS 2, 3, AND 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.004	0.008	0.010	0.012	0.013	0.012	0.010	0.008	0.004	0.000	0.000	0.004	0.008	0.010	0.012	0.013	0.012	0.010	0.008	0.004	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	0"	

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

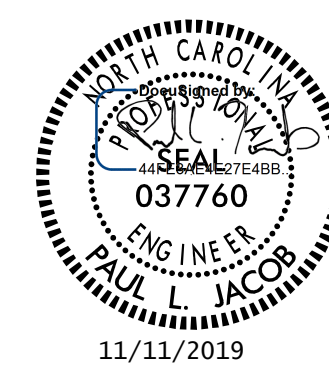
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																	
0.6"Ø LOW RELAXATION	SPAN "B"												SPAN "B"										SPAN "C"										
	GIRDER 1												GIRDERS 2, 3, AND 4										GIRDER 5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.061	0.115	0.157	0.184	0.193	0.184	0.157	0.115	0.061	0.000	0.000	0.061	0.115	0.157	0.184	0.193	0.184	0.157	0.115	0.061	0.000	0.000	0.061	0.115	0.157	0.184	0.193	0.184	0.157	0.115	0.061	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.033	0.066	0.091	0.108	0.113	0.108	0.091	0.066	0.033	0.000	0.000	0.035	0.070	0.097	0.115	0.121	0.115	0.097	0.070	0.035	0.000	0.000	0.035	0.070	0.097	0.115	0.121	0.115	0.097	0.070	0.035	0.000
FINAL CAMBER ↑	0"	5/16"	9/16"	13/16"	15/16"	15/16"	15/16"	13/16"	9/16"	5/16"	0"	0"	5/16"	9/16"	3/4"	13/16"	7/8"	13/16"	11/16"	9/16"	5/16"	0"	0"	5/16"	9/16"	3/4"	13/16"	7/8"	13/16"	3/4"	9/16"	5/16"	0"

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																								
0.6"Ø LOW RELAXATION	SPAN "C"												SPAN "C"											
	GIRDER 1												GIRDERS 2, 3, 4, AND 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0		
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.005	0.009	0.012	0.014	0.015	0.014	0.012	0.009	0.005	0.000	0.000	0.005	0.009	0.012	0.014	0.015	0.014	0.012	0.009	0.005	0.000		
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000		
FINAL CAMBER ↑	0"	1/16"	1/8"	1/8"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	0"	0"	1/16"	1/8"	1/8"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	0"		

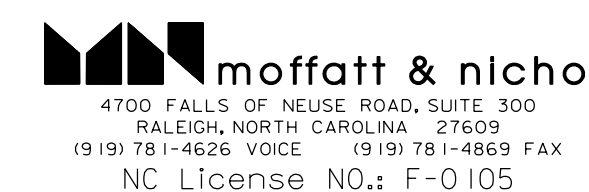
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
DEAD LOAD DEFLECTIONS  
FOR PRESTRESSED  
CONCRETE GIRDERS  
(LEFT LANE)

DRAWN BY : J. WEIGER DATE : 01/2019  
CHECKED BY : A. CHILKEPALLI DATE : 07/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

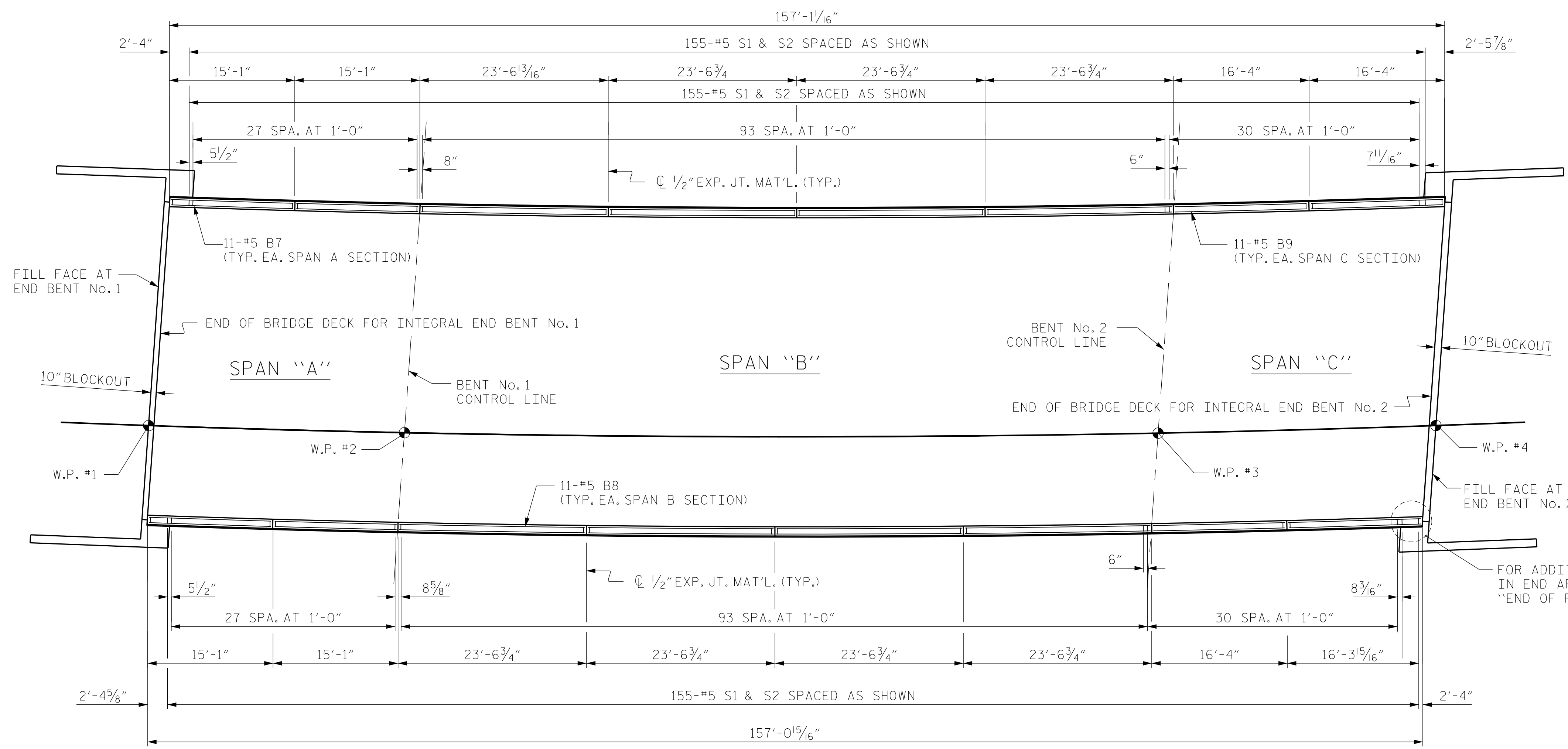


DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			35

G:\RA\6522-07\Submittals\191107 - Site 1 Left Lane Structures Let Plans Rev\CADD Files\R2303E\_SMU\_DL\_019\_81000.dgn



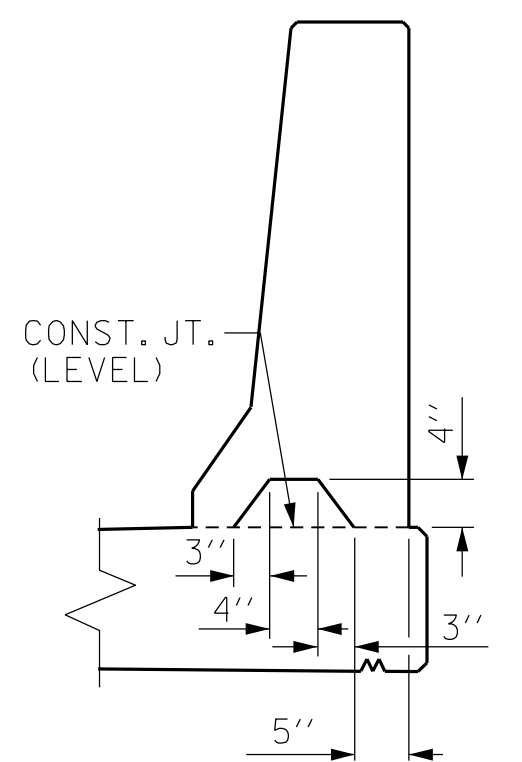


**NOTES**

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

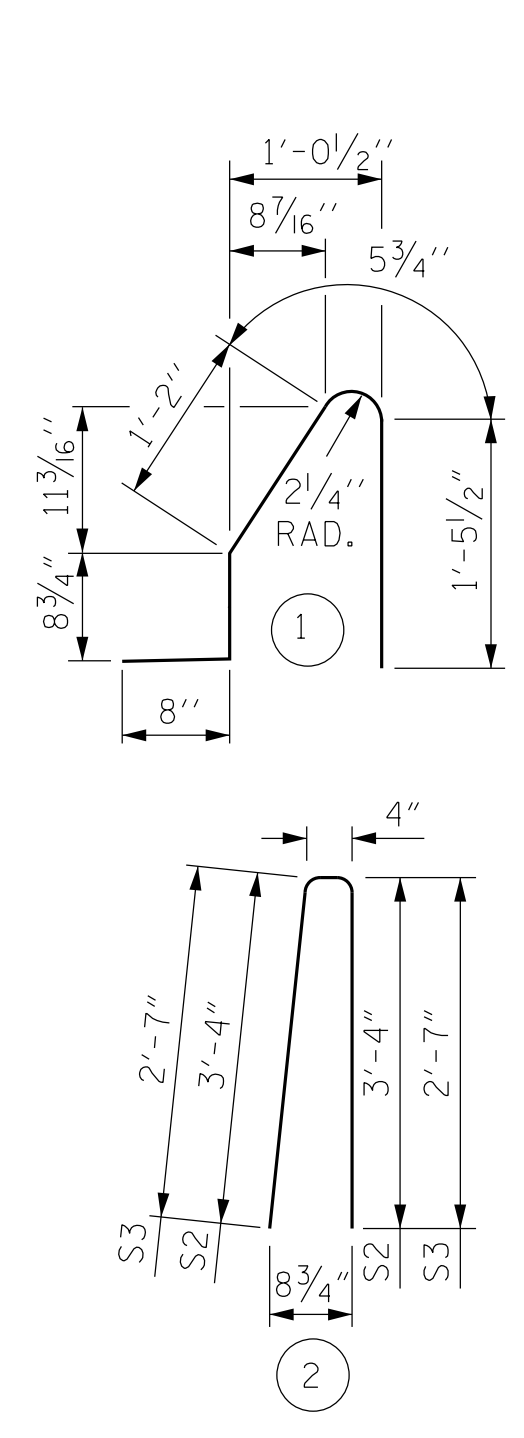
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



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

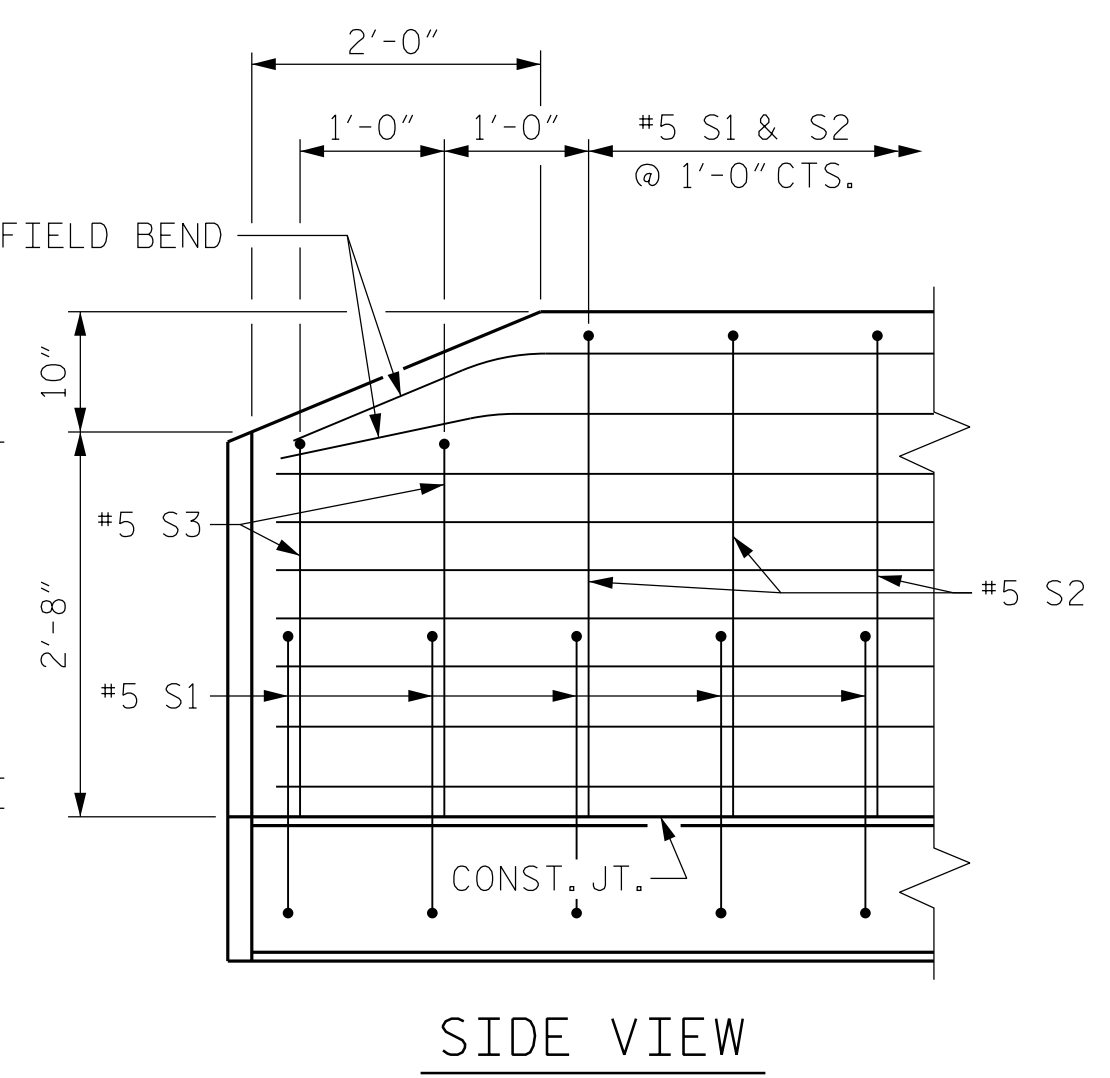
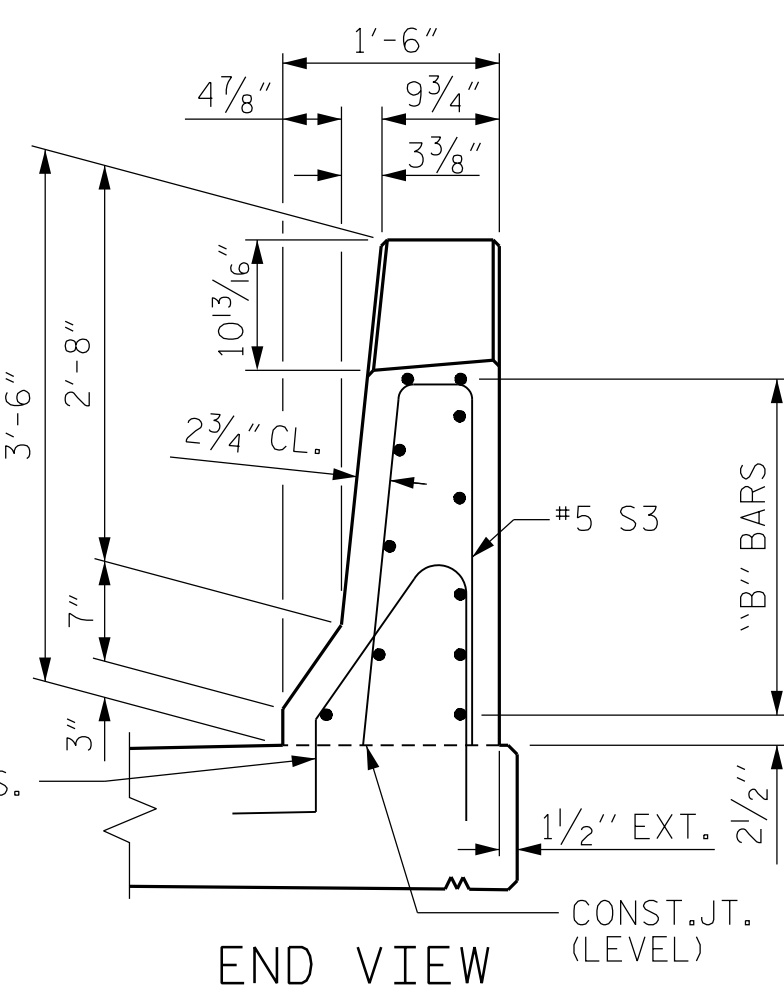
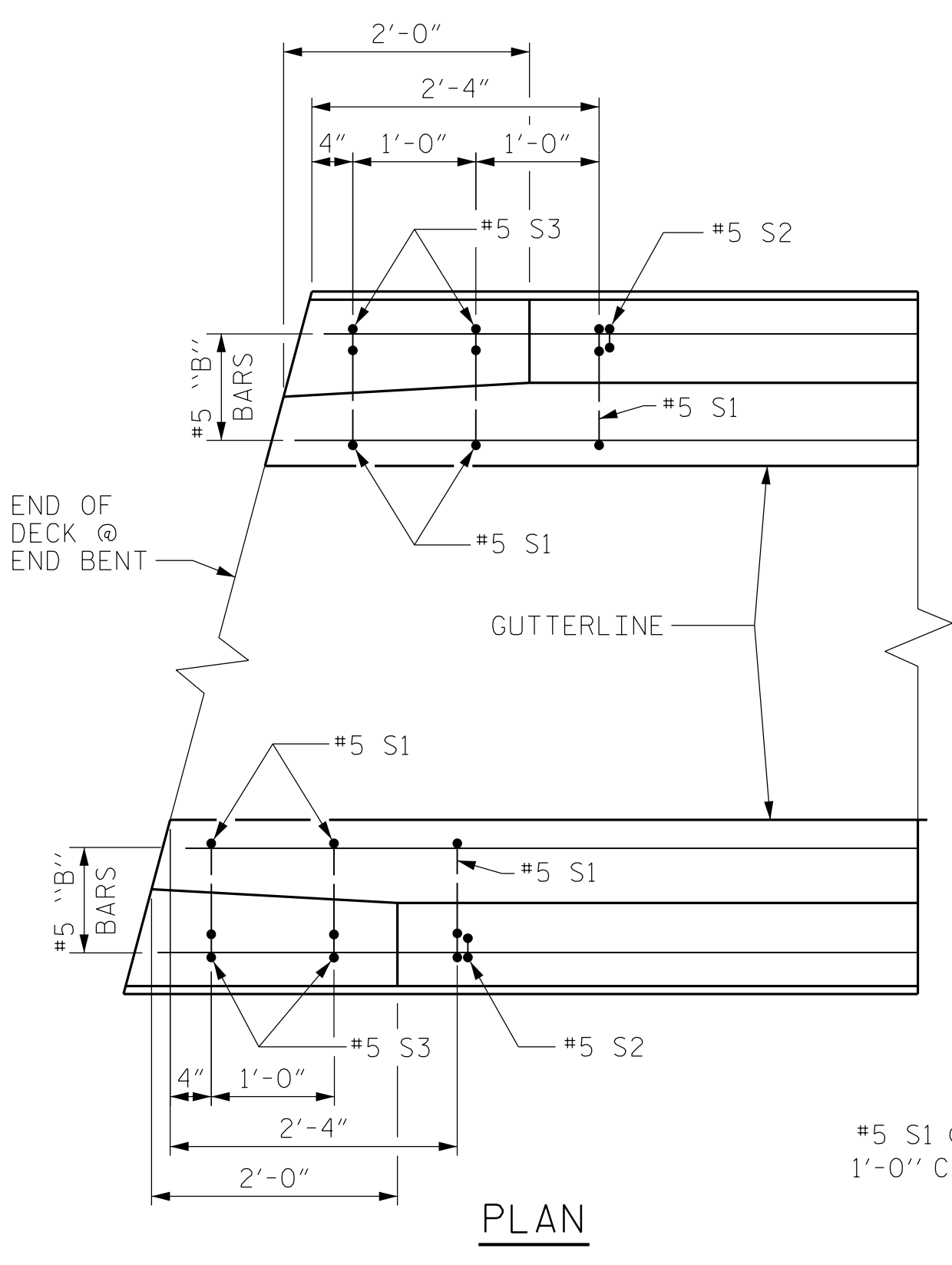
**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

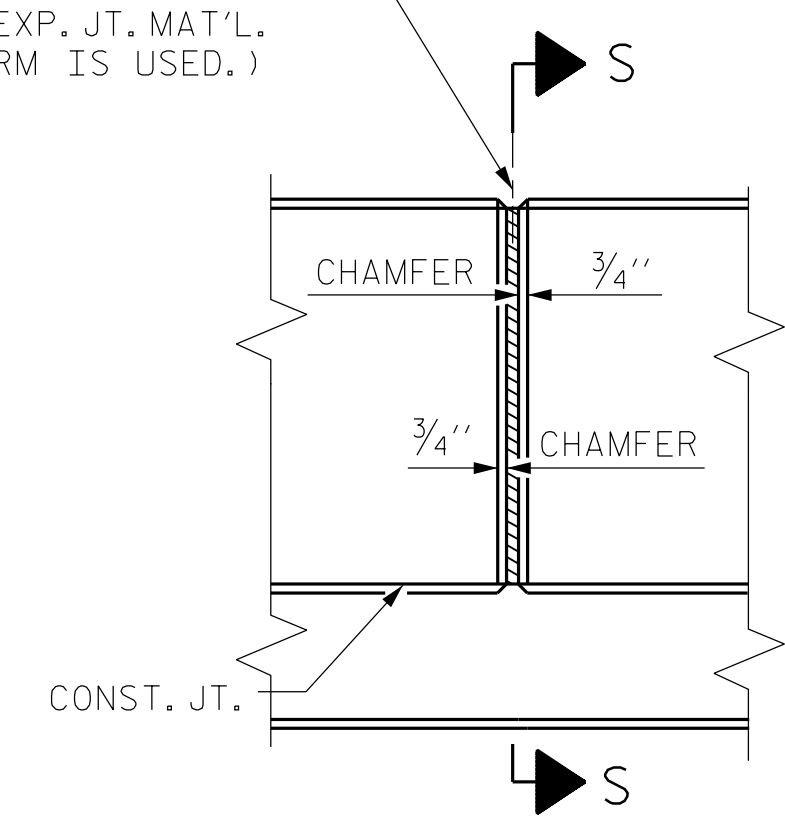
BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	322	#5	1	4'-6"	1511
* S2	314	#5	2	7'-0"	2293
* S3	8	#5	2	5'-6"	46
* B7	44	#5	STR	14'-7"	669
* B8	88	#5	STR	23'-2"	2126
* B9	44	#5	STR	15'-10"	727
* EPOXY COATED REINFORCING STEEL					7372 LBS.
CLASS AA CONCRETE					37.4 CU. YDS.
CONCRETE BARRIER RAIL					314.2 LTN. FT.

**PLAN OF CONCRETE BARRIER RAIL**  
(MEASUREMENTS TAKEN ALONG ARC ON BACK FACE OF BARRIER RAIL)  
(EXPANSION JOINTS ARE RADIAL TO THE GRADE LINE)

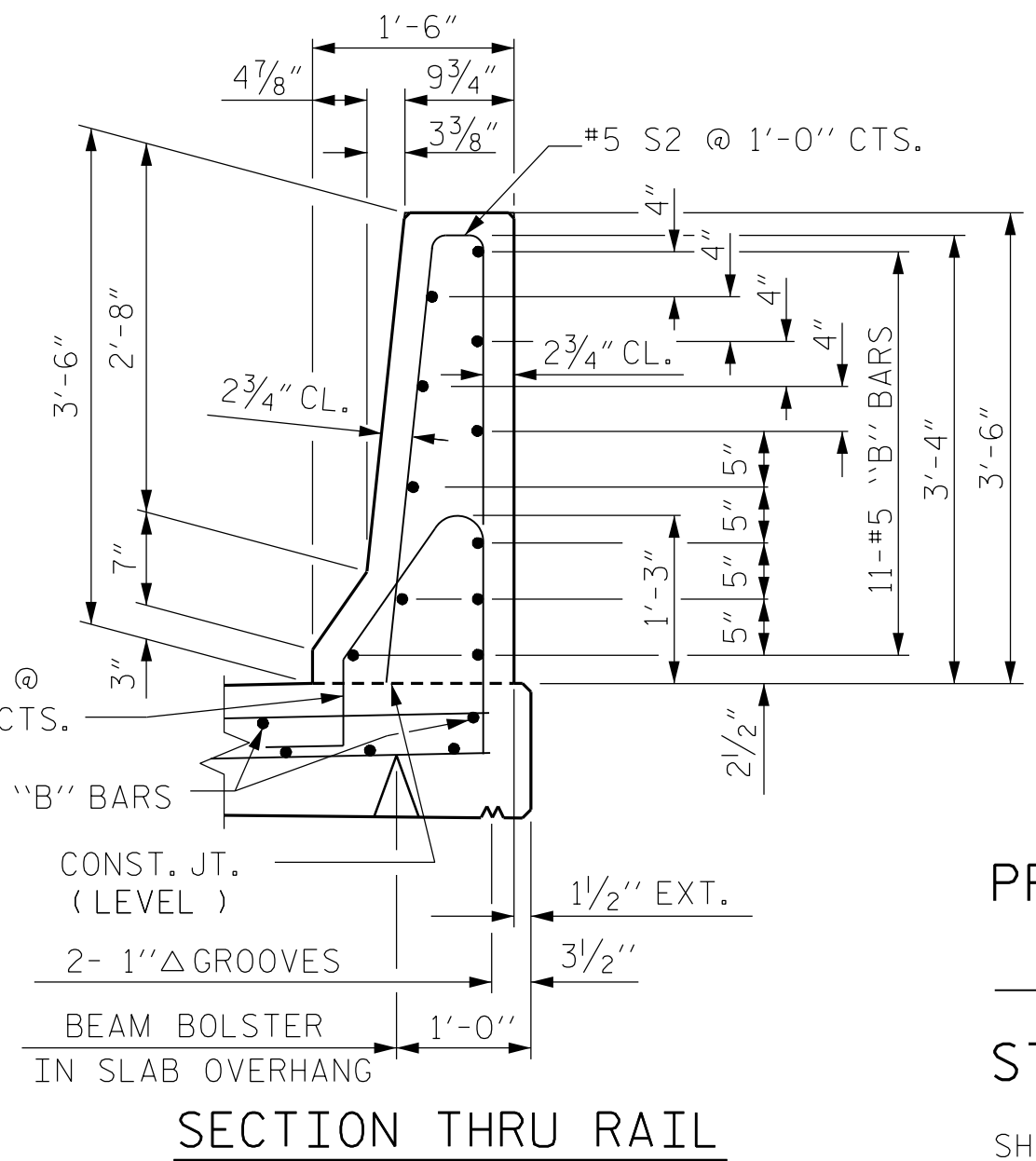


**END OF RAIL DETAILS**

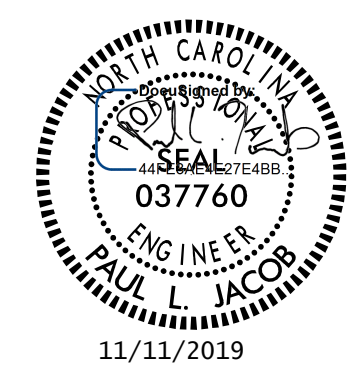
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED.)



**ELEVATION AT EXPANSION JOINTS**  
**BARRIER RAIL DETAILS**



**SECTION THRU RAIL**



PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-  
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
CONCRETE BARRIER RAIL (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

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FINAL UNLESS ALL  
SIGNATURES COMPLETED

SHEET NO.	
S2-20	TOTAL SHEETS 35

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

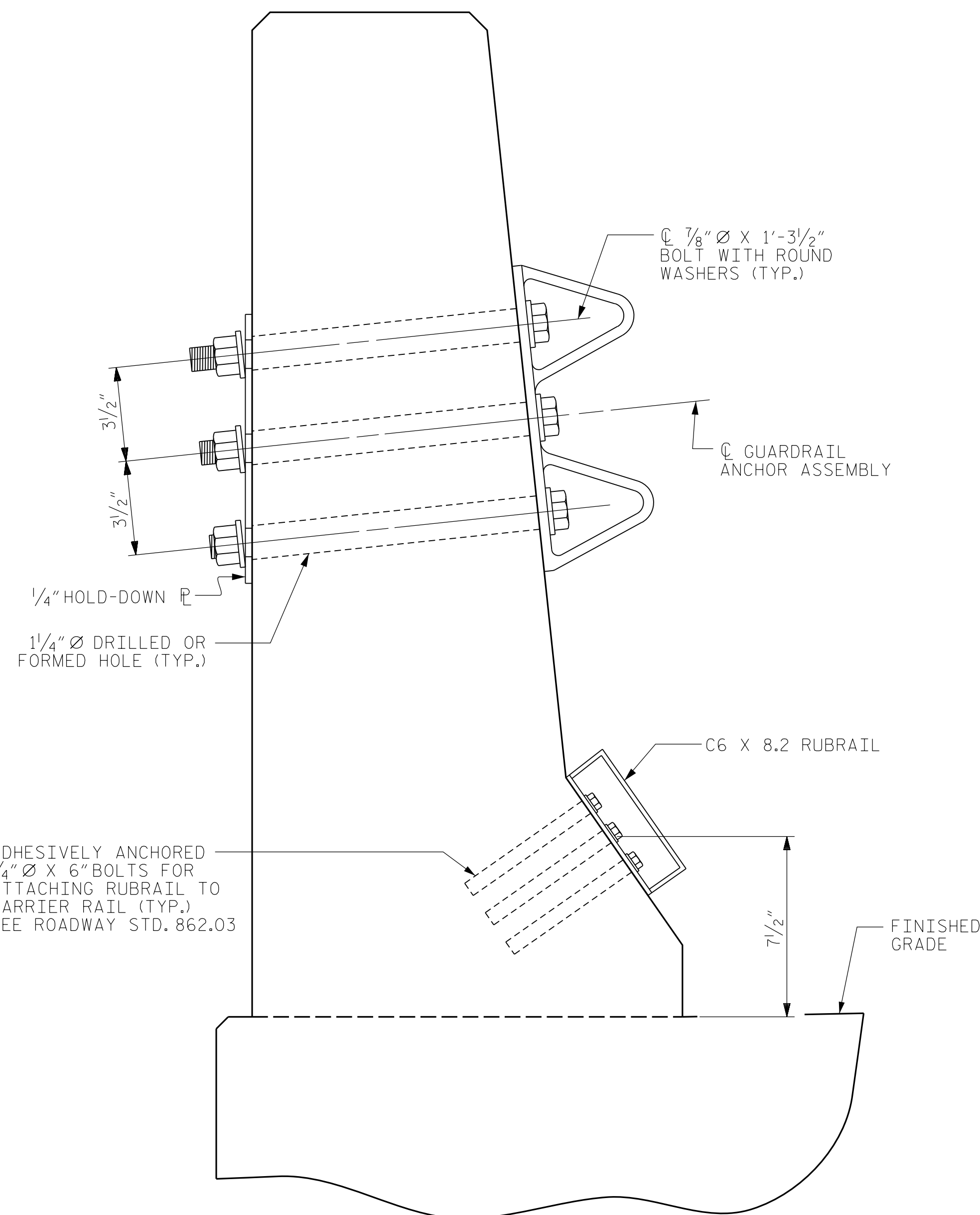
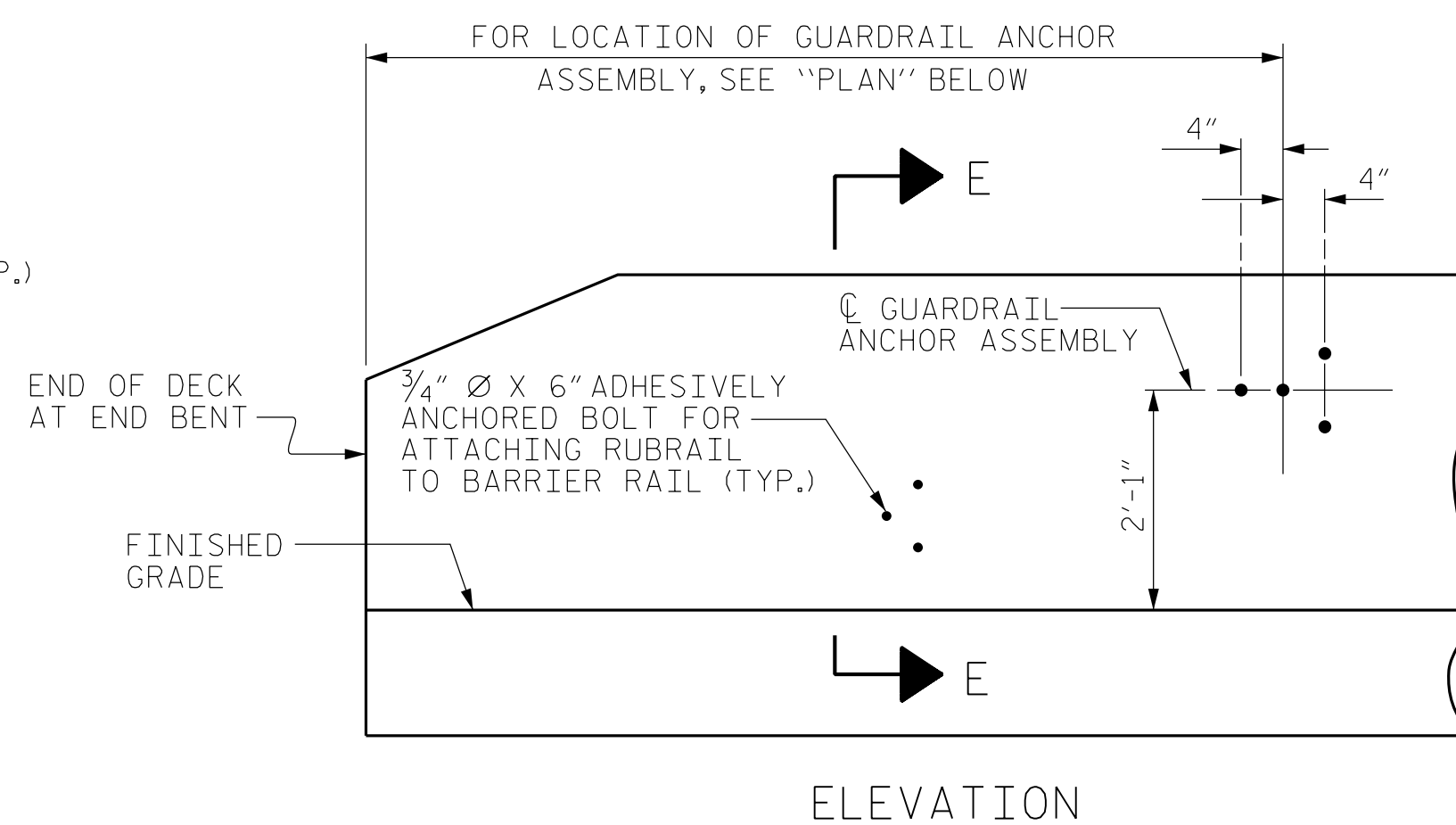
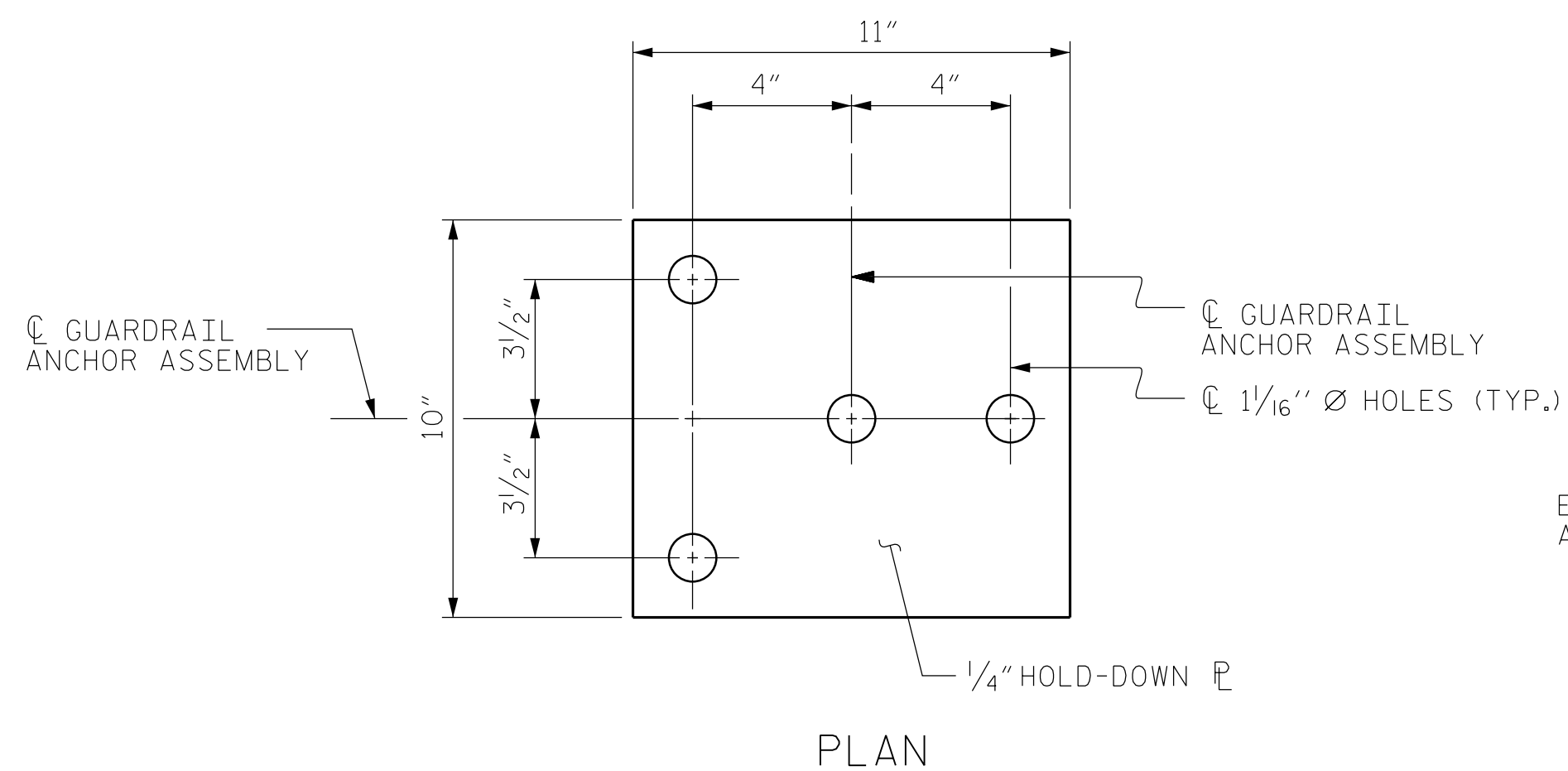
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

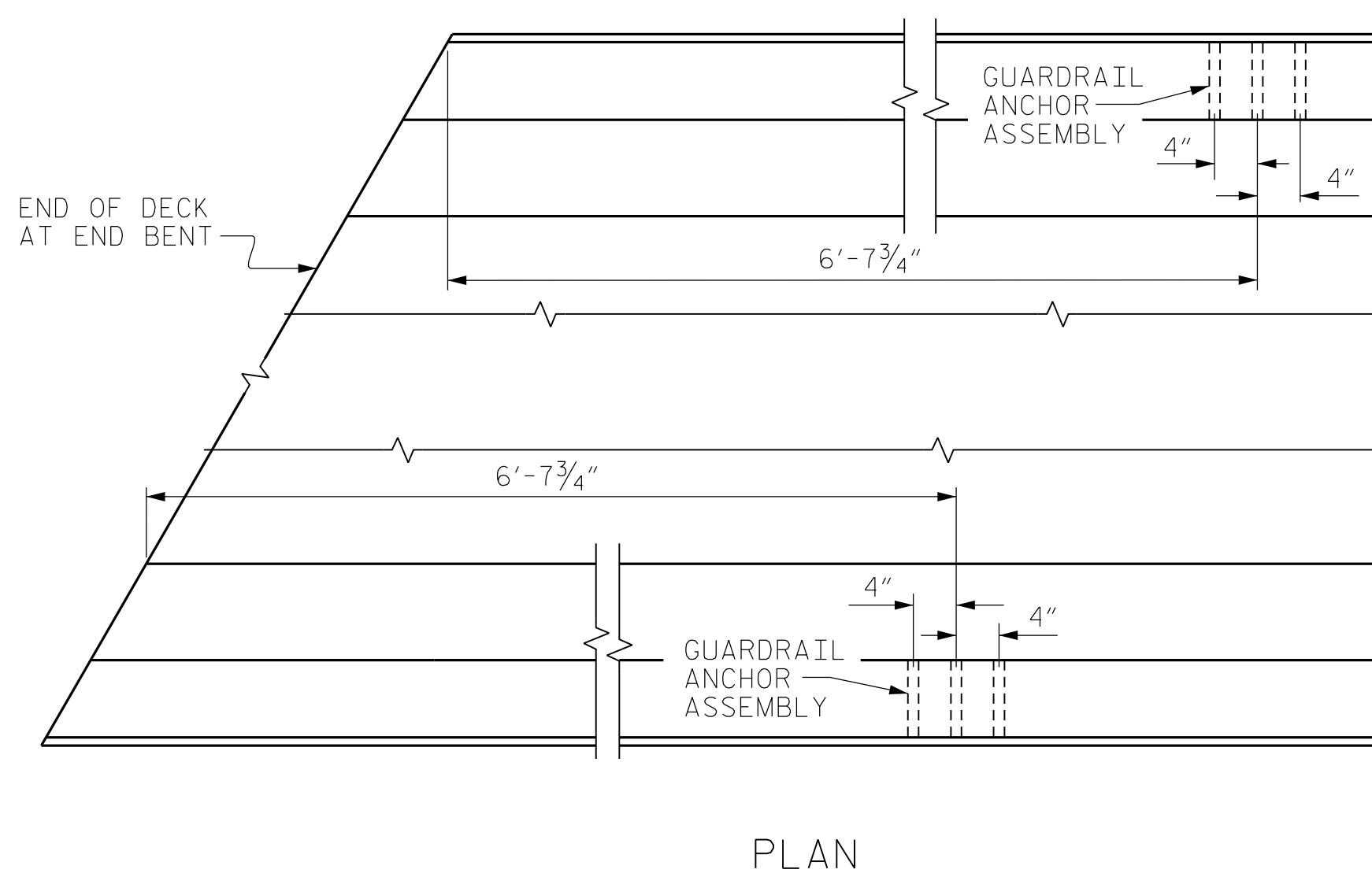
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

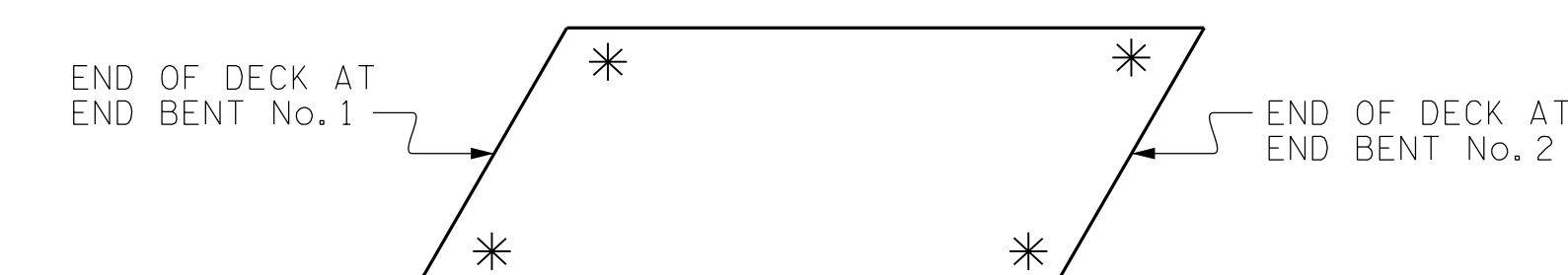


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

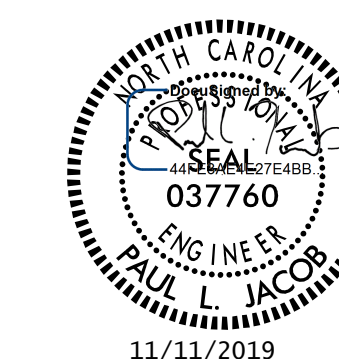


SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL  
(LEFT LANE)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

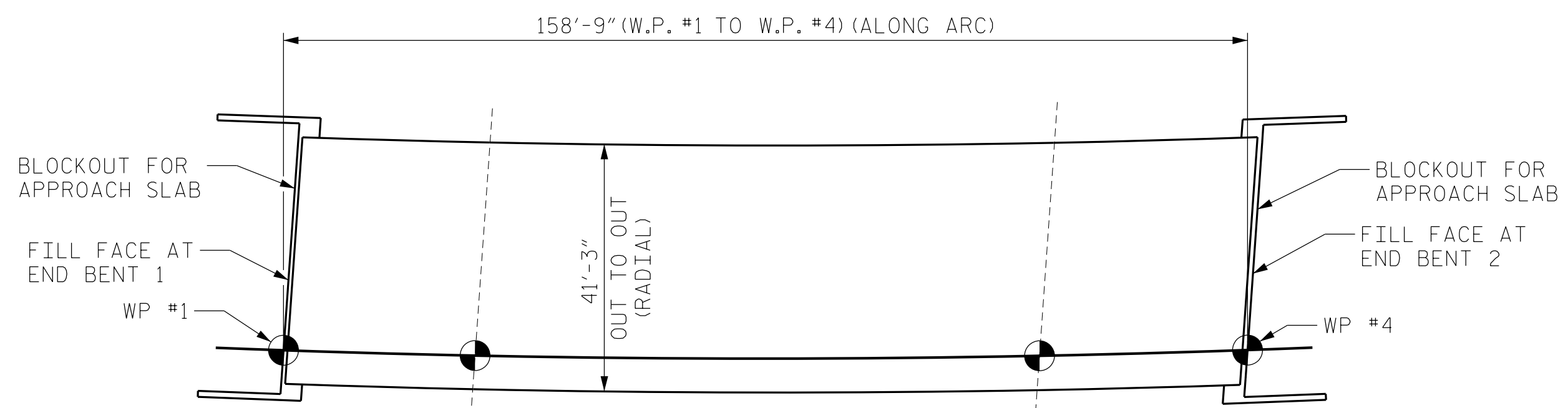
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-21
1			3			TOTAL SHEETS
2			4			35

Q:\RA\6522-07\Submittals\191107 - Site 1 Left Lane Structures Let Plans Rev\CADD Files\R2303E\_SMU\_GR2\_021\_810040.dgn

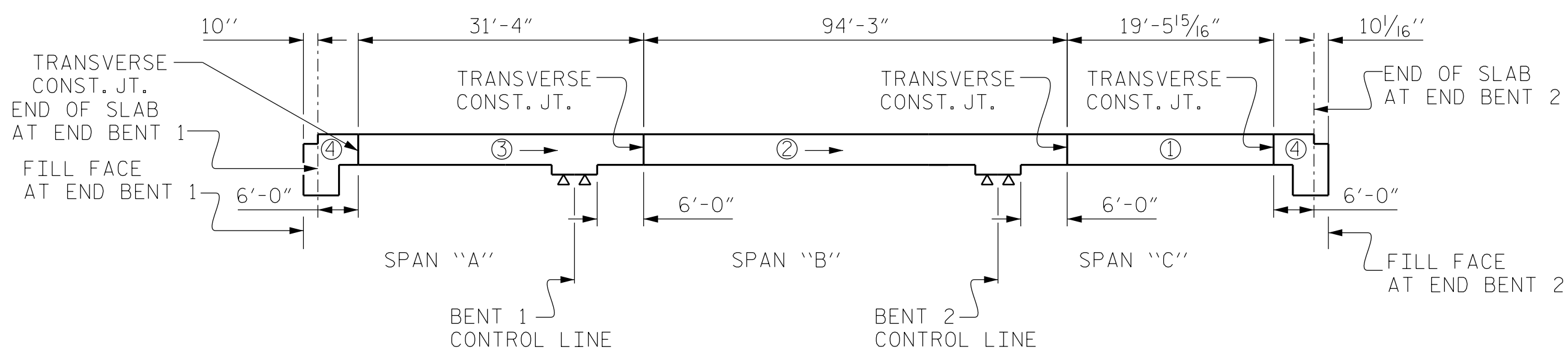
BILL OF MATERIAL						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	284	5	STR	40'-10"	12095	
A2	284	5	STR	40'-10"	12095	
* A101	2	5	STR	6'-2"	13	
* A102	2	5	STR	13'-10"	29	
* A103	2	5	STR	21'-5"	45	
* A104	2	5	STR	29'-0"	60	
* A105	2	5	STR	36'-8"	76	
A201	2	5	STR	6'-2"	13	
A202	2	5	STR	13'-10"	29	
A203	2	5	STR	21'-5"	45	
A204	2	5	STR	29'-0"	60	
A205	2	5	STR	36'-8"	76	
* B1	82	6	STR	6'-3"	770	
* B2	28	4	STR	14'-1"	263	
* B3	28	6	STR	48'-0"	2019	
* B4	54	6	STR	19'-0"	1541	
* B5	28	4	STR	31'-3"	585	
* B6	28	6	STR	48'-9"	2050	
* B7	54	6	STR	19'-6"	1582	
* B8	28	4	STR	15'-1"	282	
* B9	82	6	STR	7'-0"	862	
B10	156	5	STR	54'-5"	8854	
K1	20	4	STR	21'-10"	292	
K2	8	4	STR	6'-1"	33	
K3	24	4	STR	7'-1"	114	
K4	48	4	STR	7'-7"	243	
K5	24	4	STR	6'-7"	106	
K6	2	4	STR	2'-3"	3	
K7	2	4	STR	2'-9"	4	
K8	4	4	STR	3'-0"	8	
K9	2	4	STR	2'-6"	3	
K10	2	4	STR	1'-9"	2	
K11	2	4	STR	2'-3"	3	
K12	4	4	STR	2'-6"	7	
K13	2	4	STR	2'-0"	3	
K14	20	4	STR	18'-2"	243	
K15	16	4	STR	4'-10"	52	
* S1	68	4	1	11'-11"	541	
* S2	64	4	1	10'-9"	460	
S3	208	4	4	2'-9"	382	
U1	68	4	2	11'-6"	522	
U2	16	4	3	13'-10"	148	
U3	40	4	3	15'-10"	423	

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS						
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS	
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED		
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"	
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"	
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"	
#7	4'-2"	2'-9"				
#8	4'-9"	3'-2"				

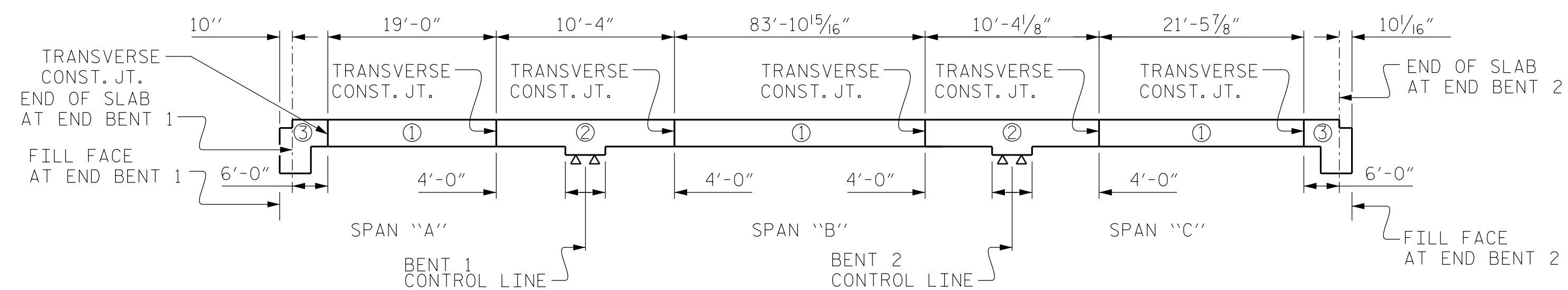
REINFORCING STEEL 23763 LBS.  
 \* EPOXY COATED REINF. STEEL 23273 LBS.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB  
 (SQ. FT. = 6,480)

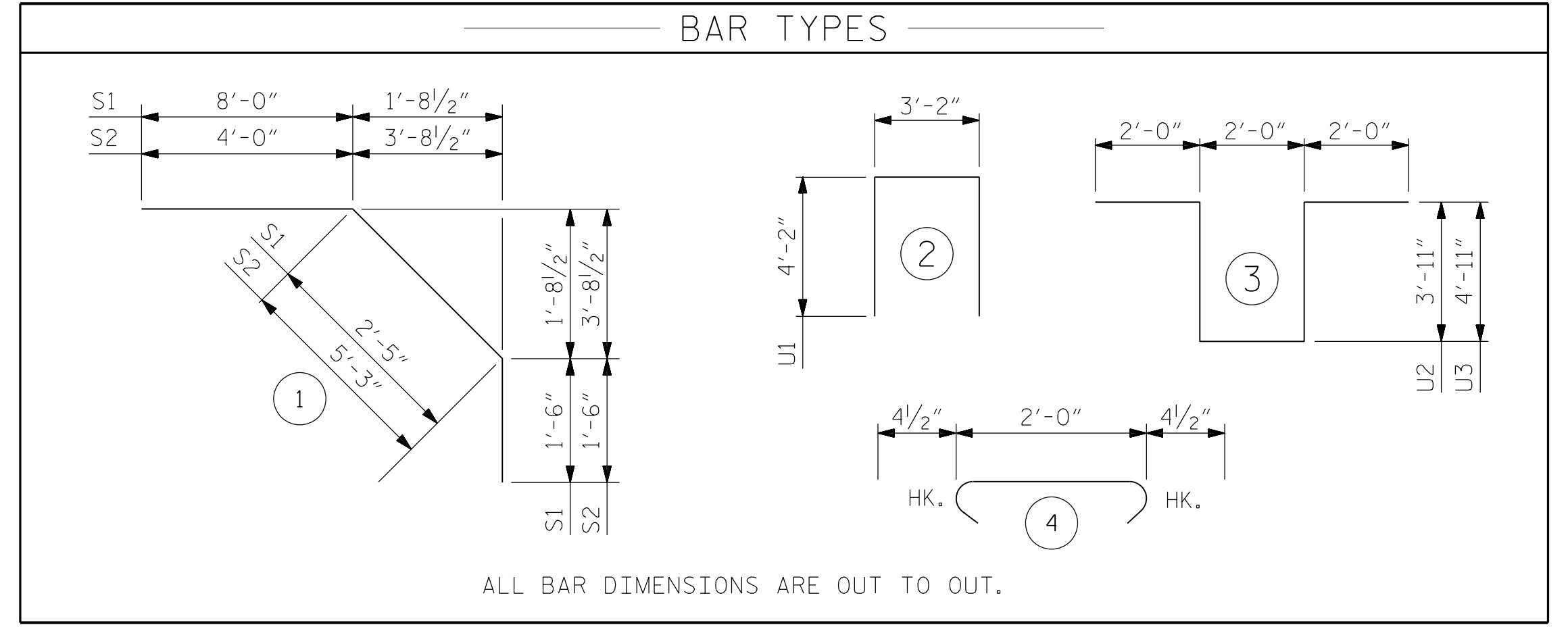


POURING SEQUENCE  
 (CONTINUOUS FOR LIVE LOAD)  
 (ALL DIMENSIONS ALONG ARC OF GRADE LINE)  
 KEY  
 ⊕ = INDICATES POUR NUMBER AND DIRECTION



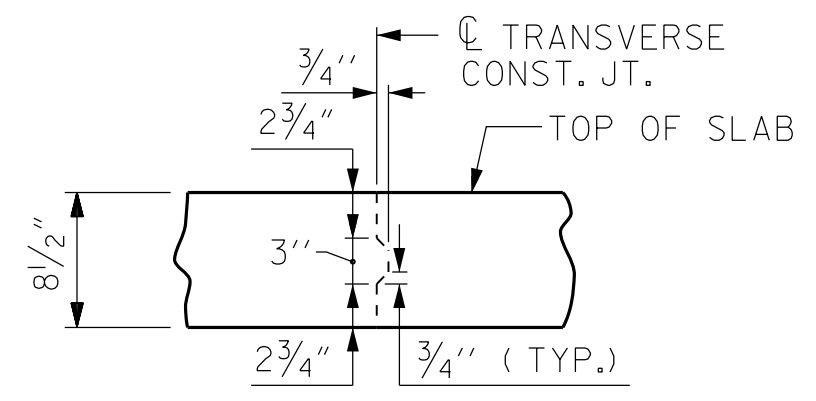
ALTERNATE POURING SEQUENCE  
 (CONTINUOUS FOR LIVE LOAD)  
 (ALL DIMENSIONS ALONG ARC OF GRADE LINE)  
 KEY  
 ⊕ = INDICATES POUR NUMBER

GROOVING BRIDGE FLOORS			
APPROACH SLABS	1703	SQ. FT.	
BRIDGE DECK	5498	SQ. FT.	
TOTAL	7201	SQ. FT.	



SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	24.0		
POUR #2	128.9		
POUR #3	51.5		
POUR #4*	61.1		
TOTAL **	265.5	23763	23273

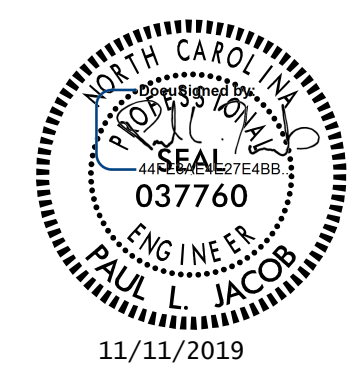
\* QUANTITY INCLUDES UPPER POUR OF INTEGRAL END BENT.  
 \*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-



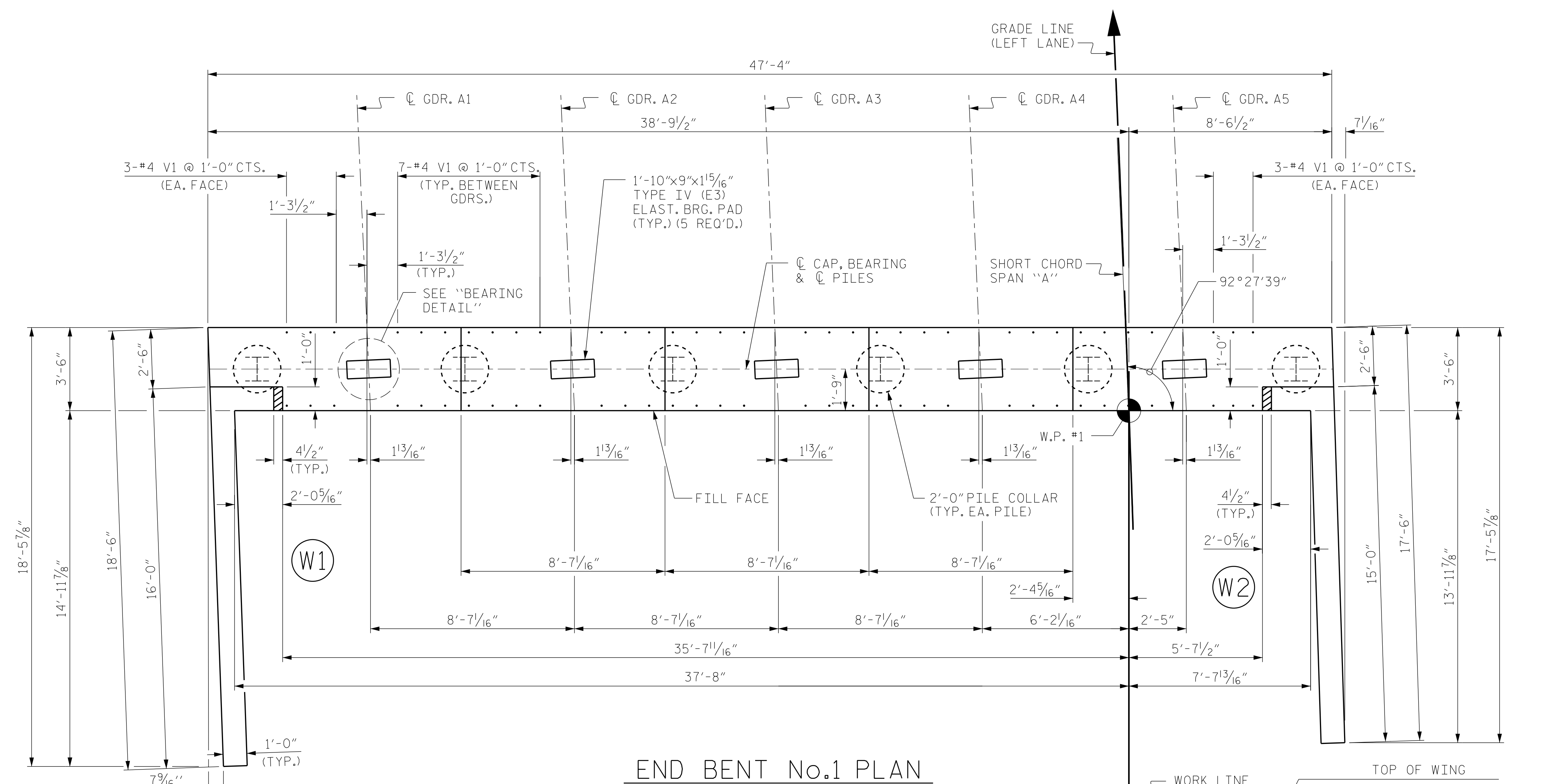
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**BILL OF MATERIAL**  
 (LEFT LANE)

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 10/05	REV. 10/11/11 MAA/GM
CHECKED BY : GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

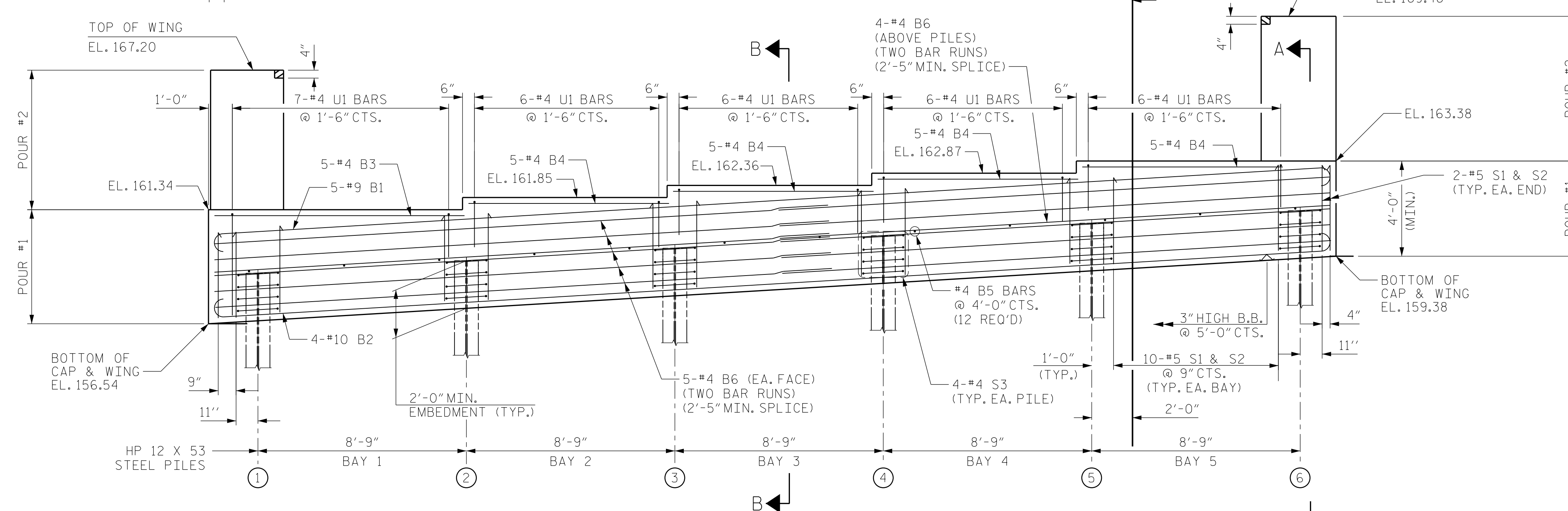
**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-22
1			3			TOTAL SHEETS
2			4			35



END BENT No.1 PLAN



ELEVATION

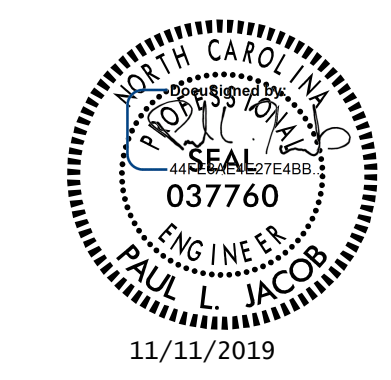
CONCRETE COLLARS NOT SHOWN FOR CLARITY  
WINGS NOT SHOWN FOR CLARITY  
V1 BARS NOT SHOWN FOR CLARITY

NOTES

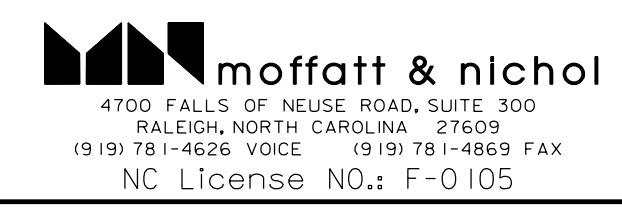
- THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR SECTION A-A AND B-B, SEE SHEET 3 OF 3.
- FOR PILE SPLICING DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR BEARING DETAIL, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
- FOR CONCRETE COLLAR DETAILS, SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL" ON SHEET 3 OF 3.

TOP OF PILE ELEVATIONS	
①	158.68
②	159.20
③	159.73
④	160.25
⑤	160.78
⑥	161.30

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-  
SHEET 1 OF 3



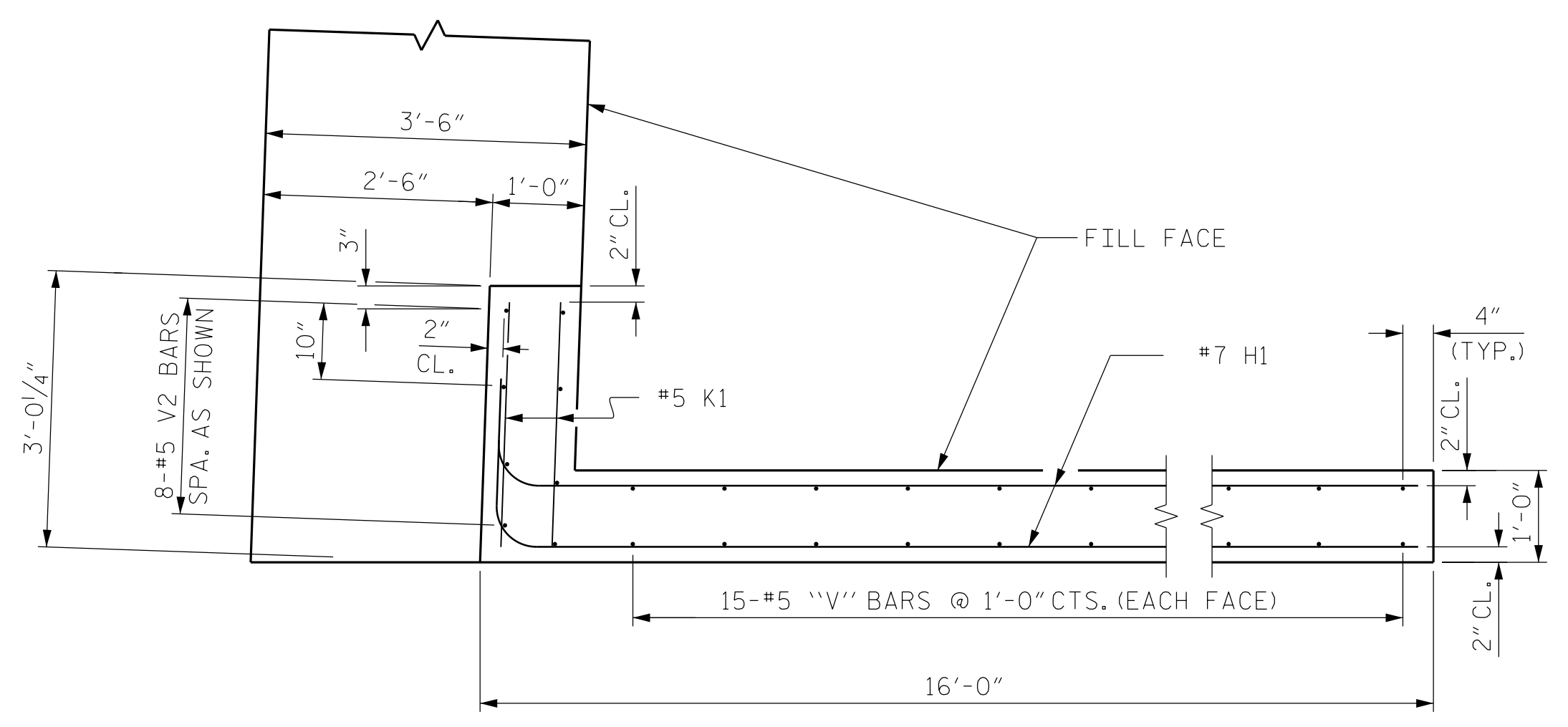
DRAWN BY : J. WEIGER DATE : 04/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



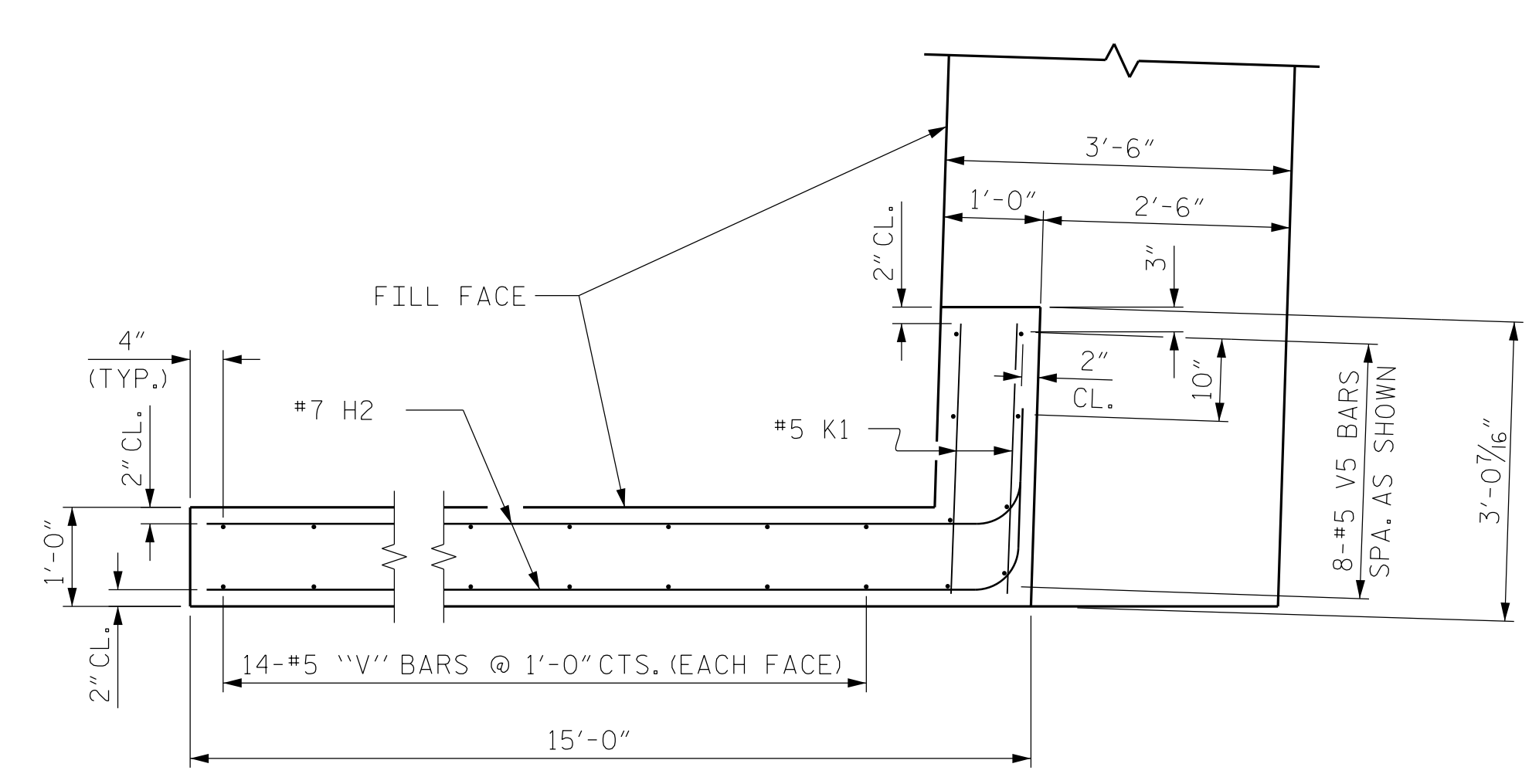
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-23
1			3			TOTAL SHEETS
2			4			35

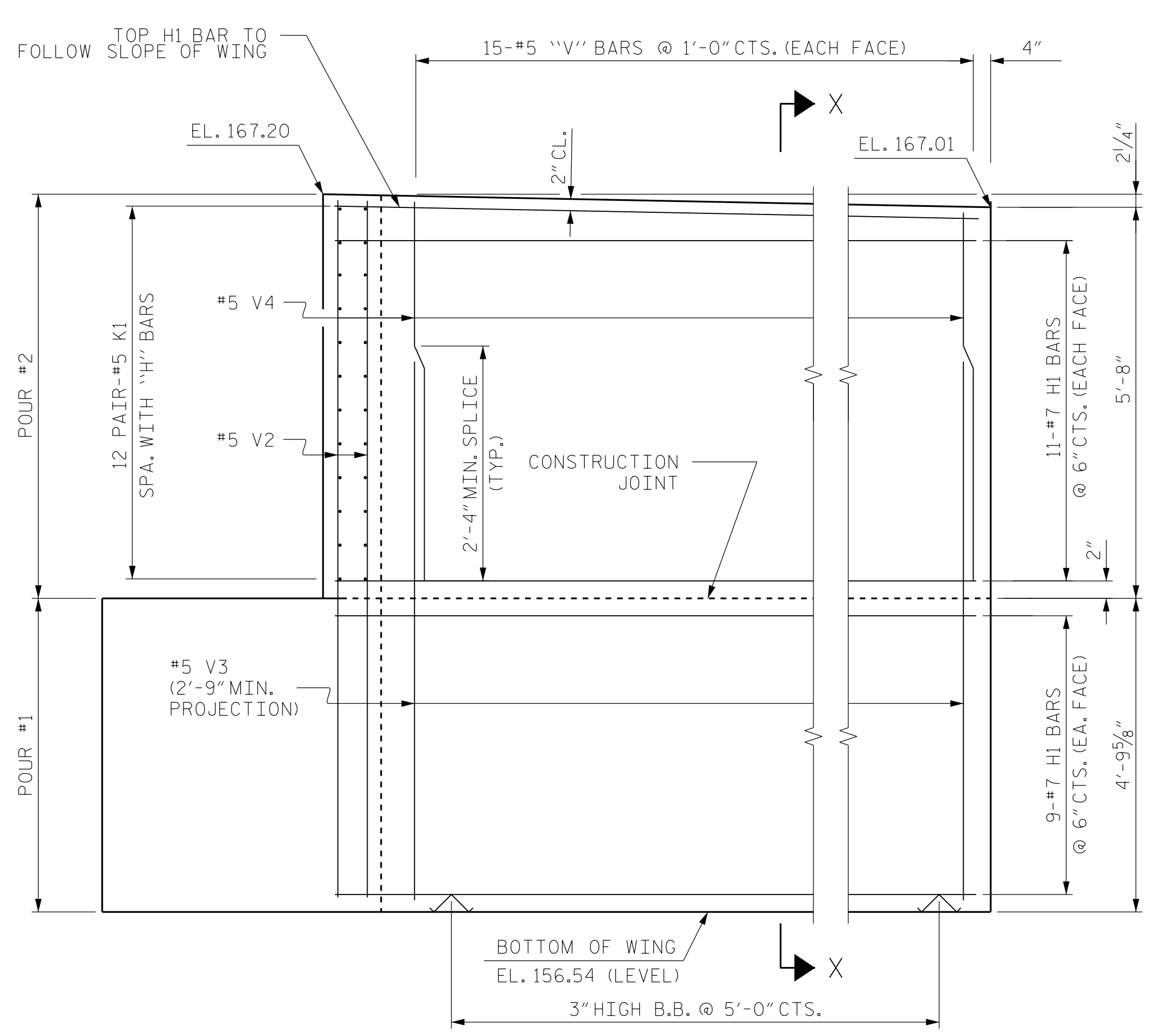
Q:\RA\6522-07\Submittals\191107 - Site 1 Left Lane Structures Let Plans Rev\CADD Files\R2303E\_SMU\_EL\_023\_810040.dgn



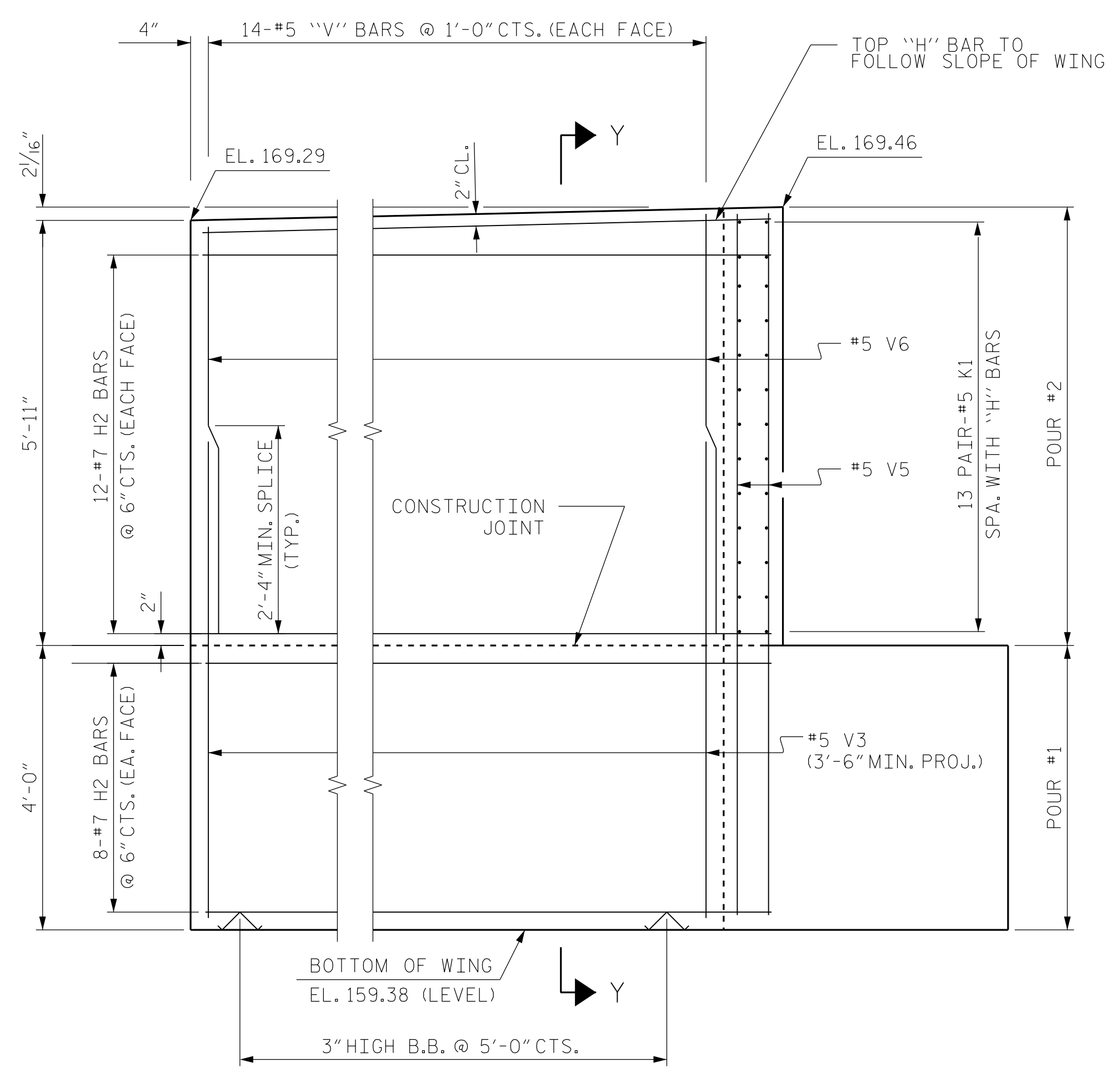
PLAN OF WING (W1)



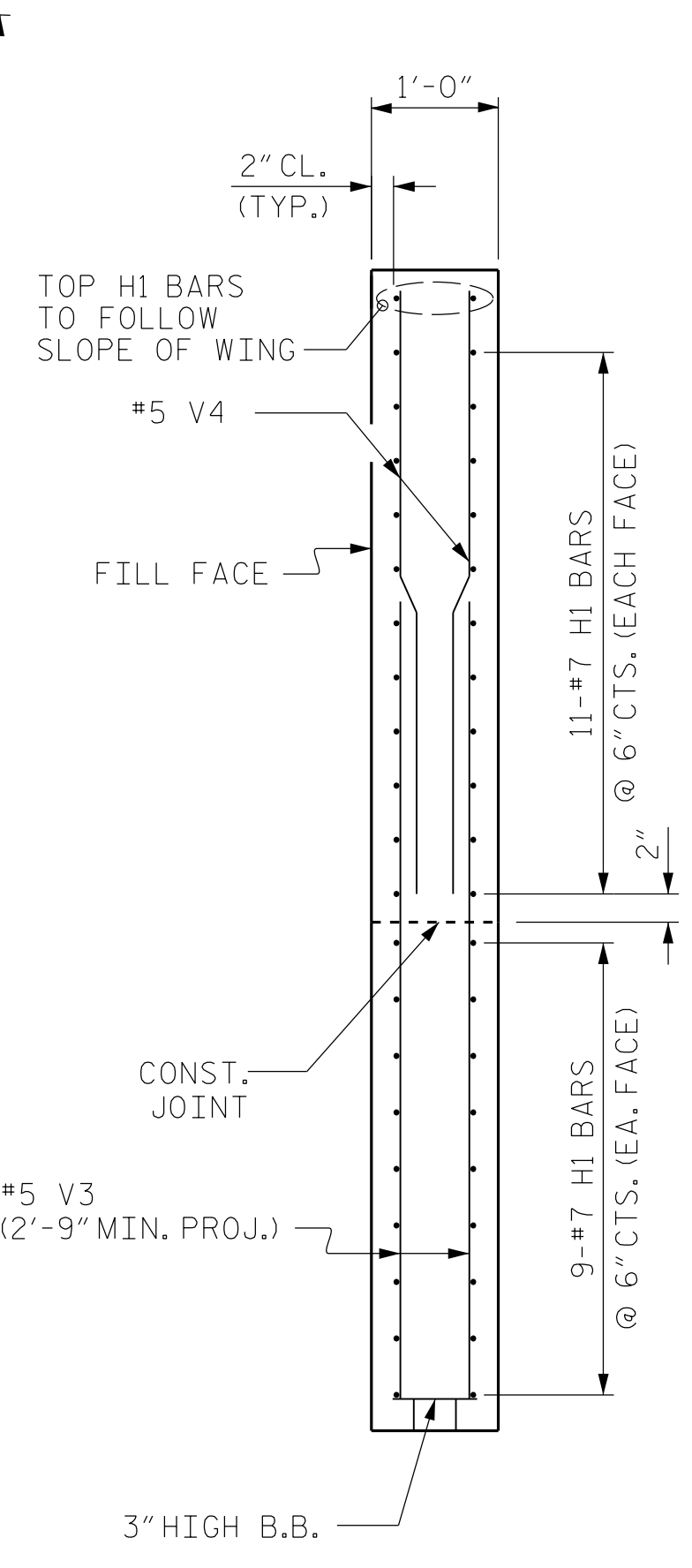
PLAN OF WING (W2)



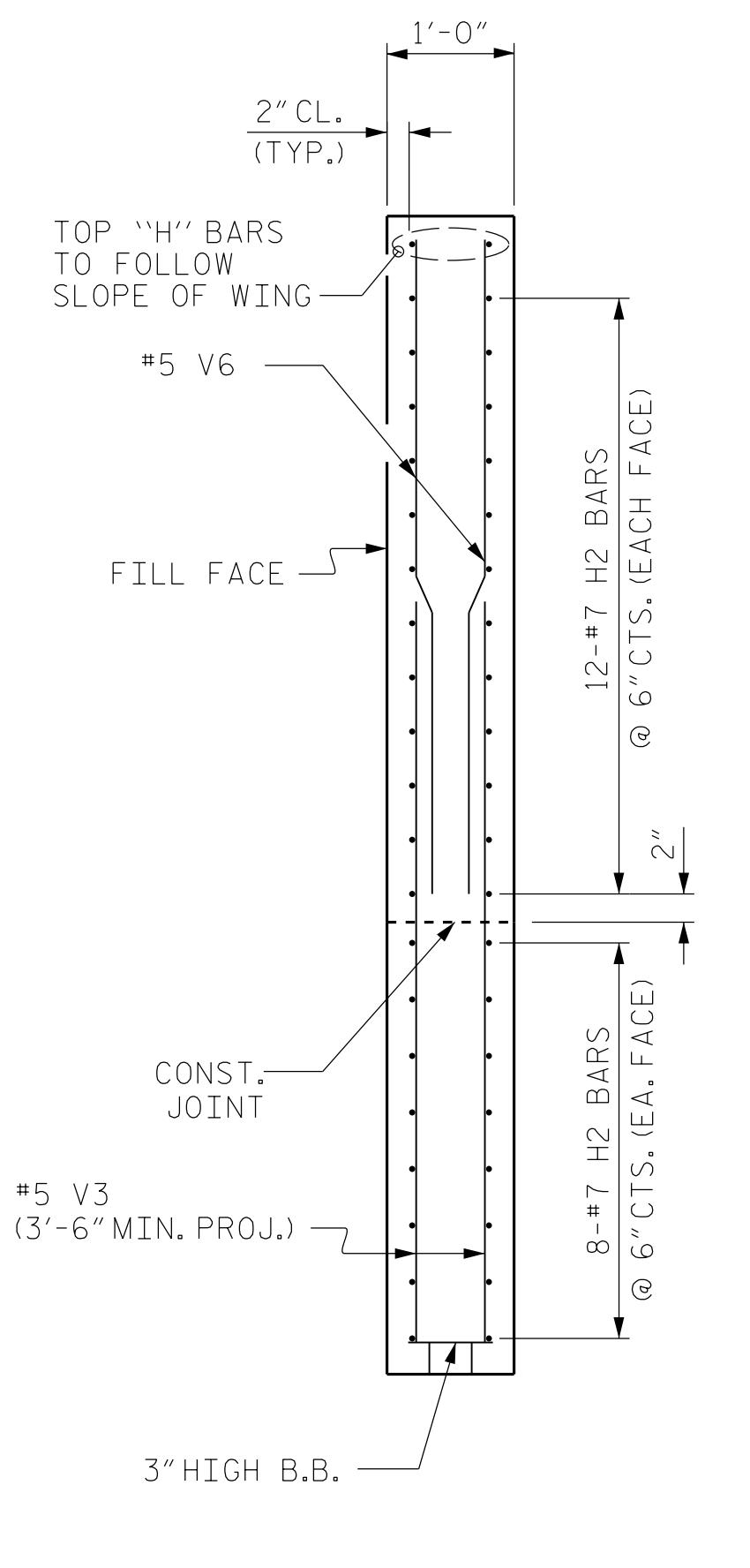
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



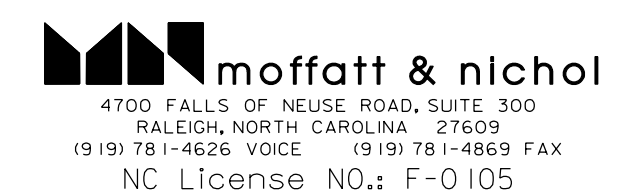
SECTION X-X



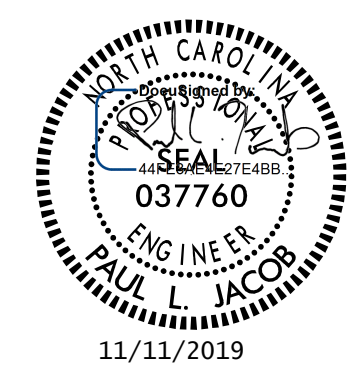
SECTION Y-Y

WING DETAILS

DRAWN BY : J. WEIGER DATE : 05/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



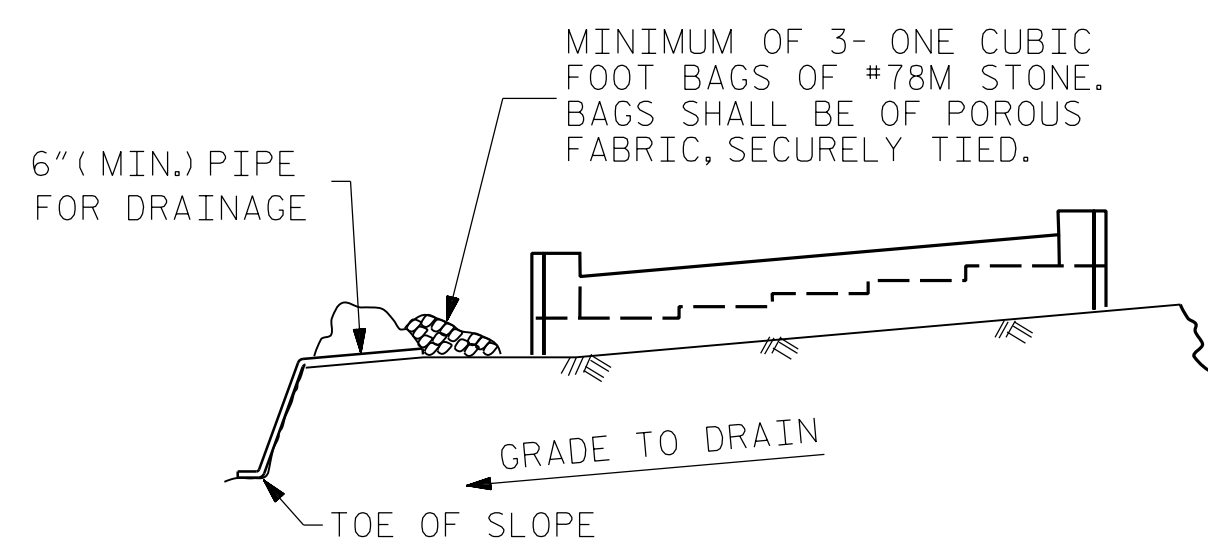
DOCUMENT NOT CONSIDERED  
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PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT  
 No. 1 WING DETAILS  
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-24
1			3			TOTAL SHEETS
2			4			35

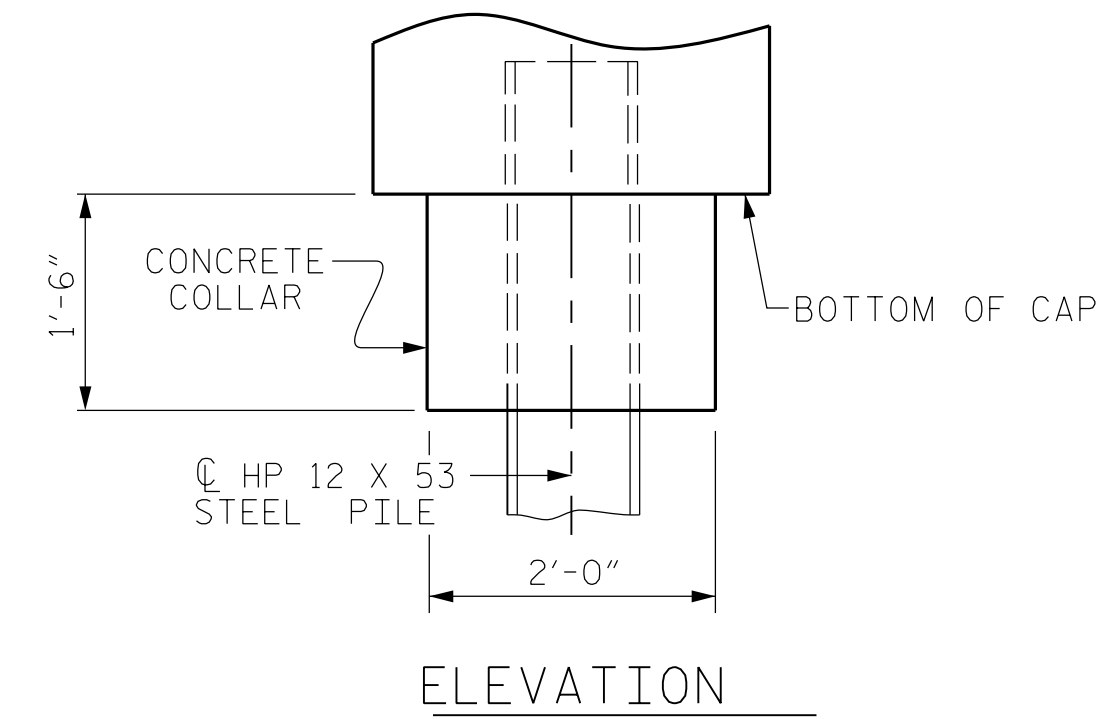
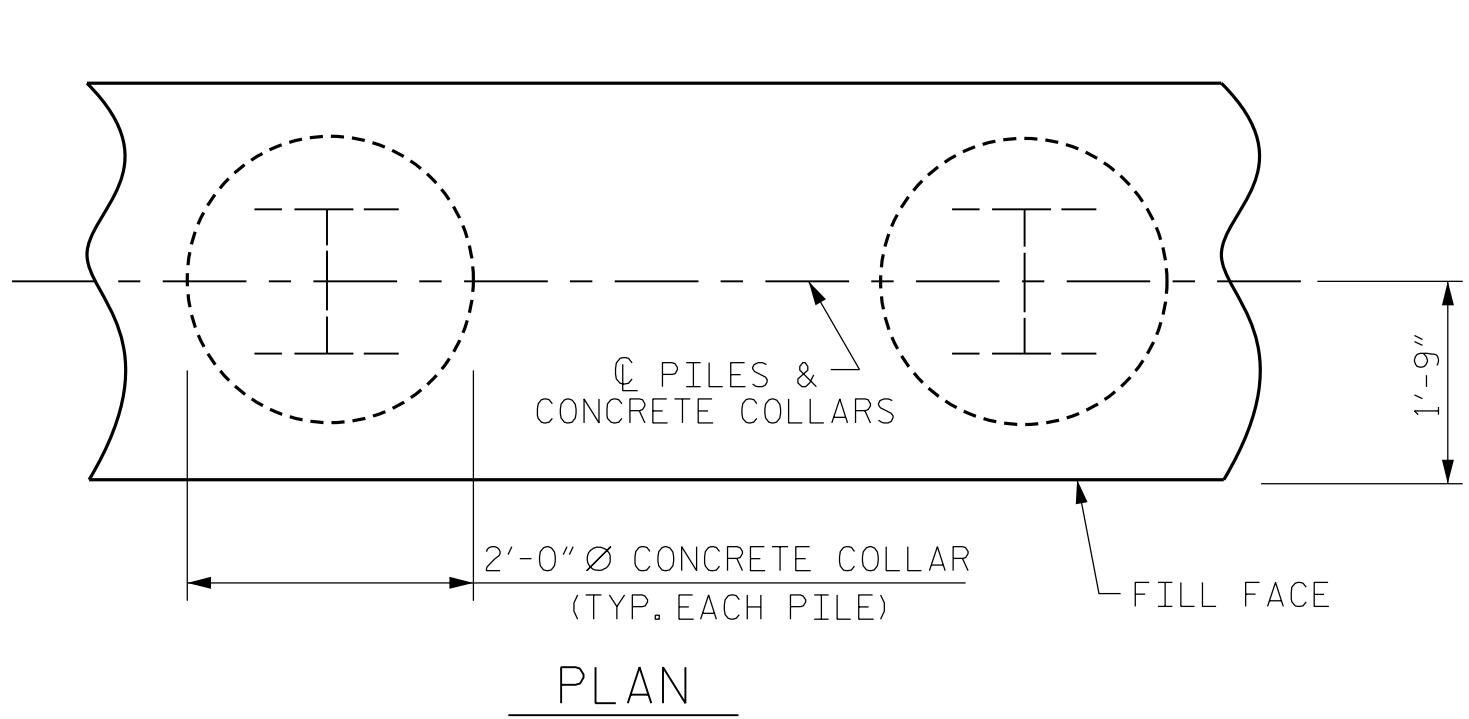


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

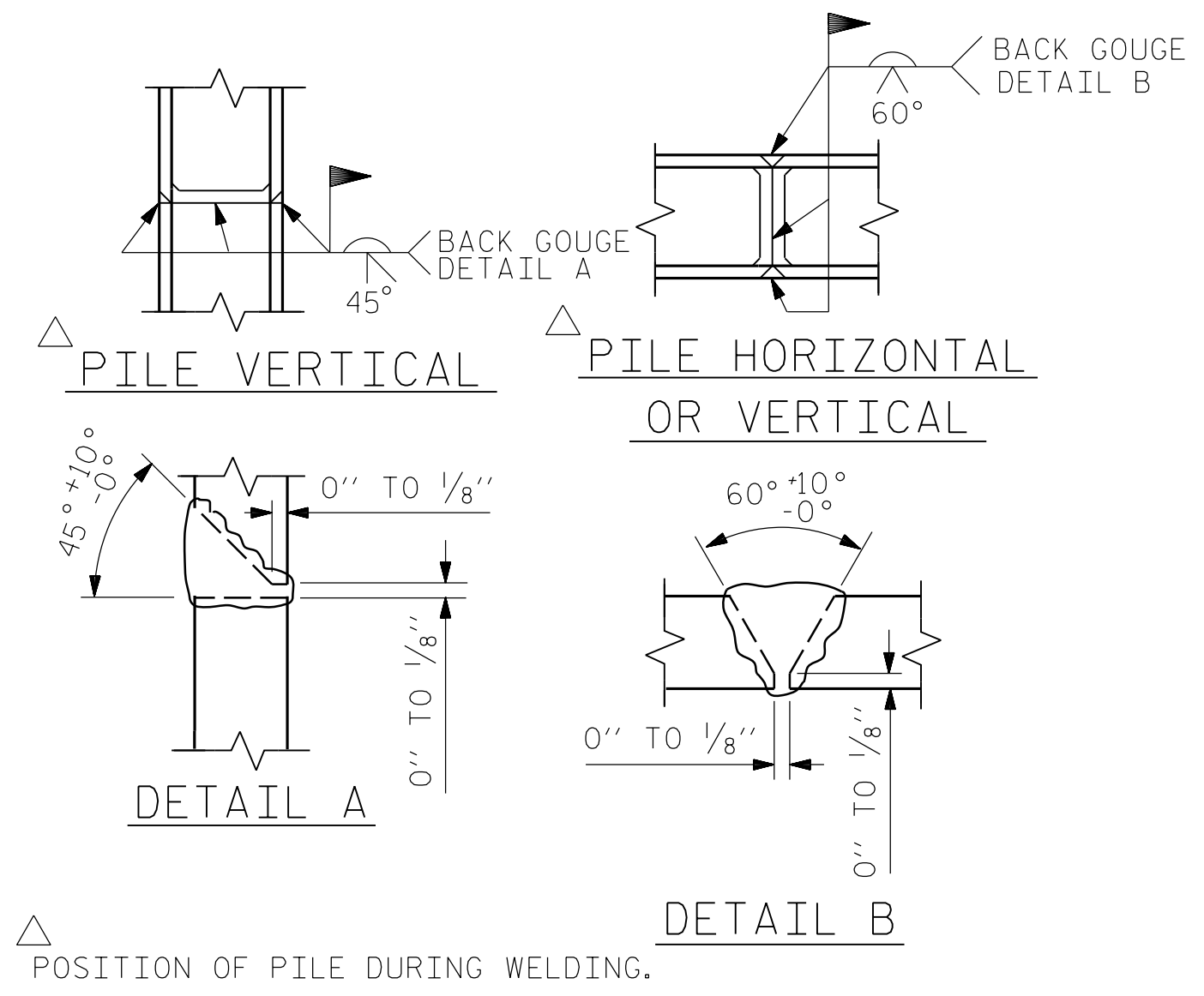
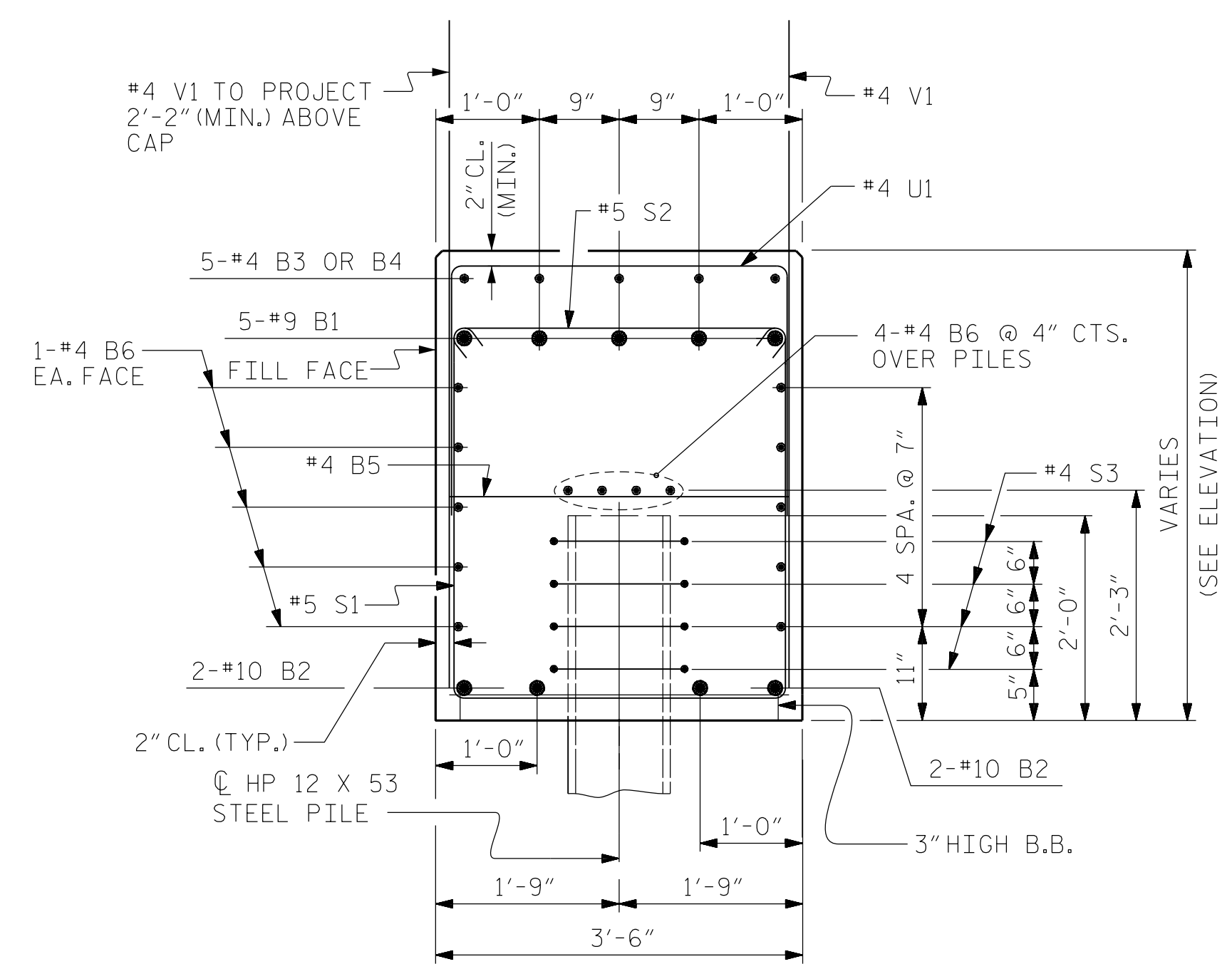
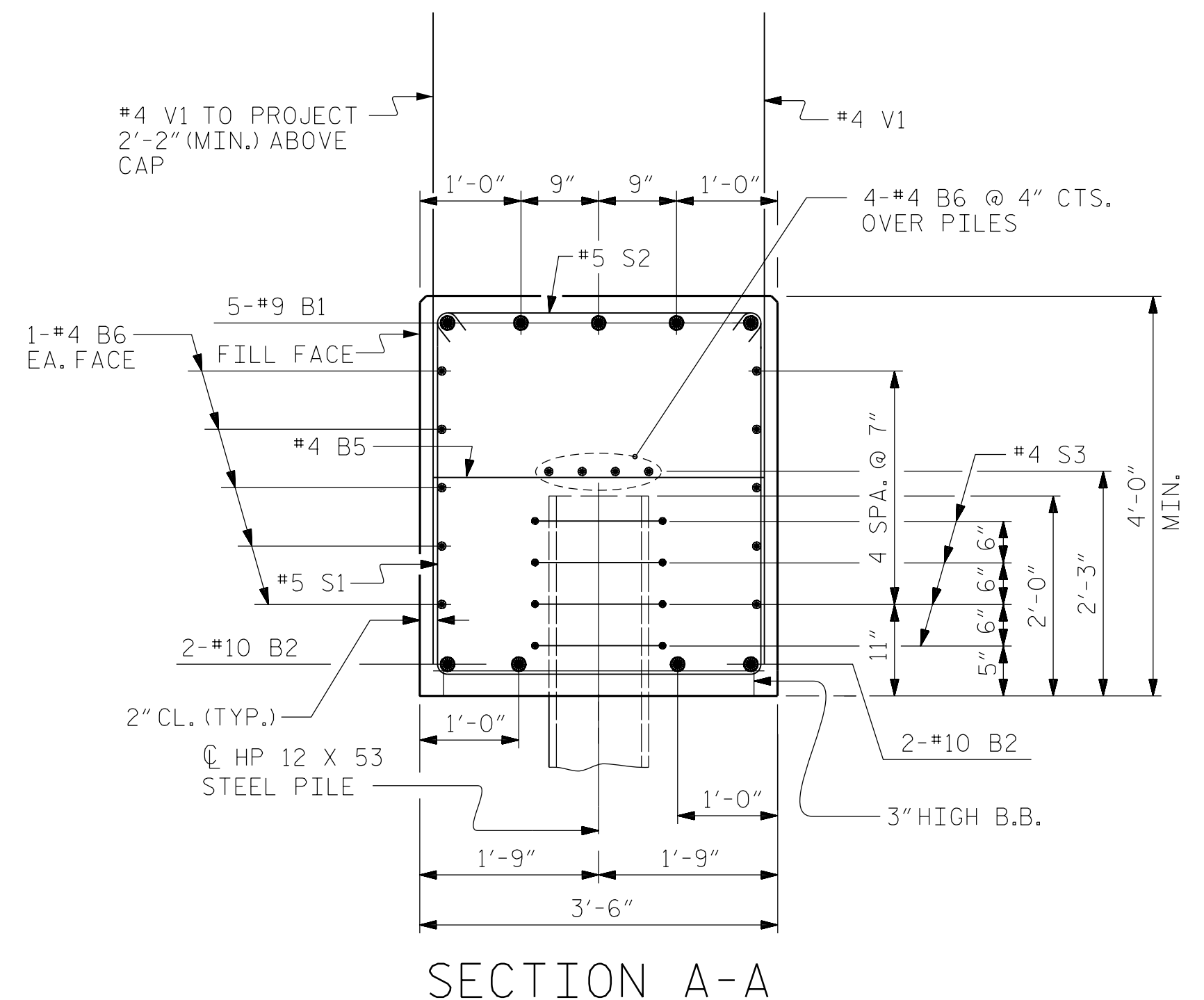
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**

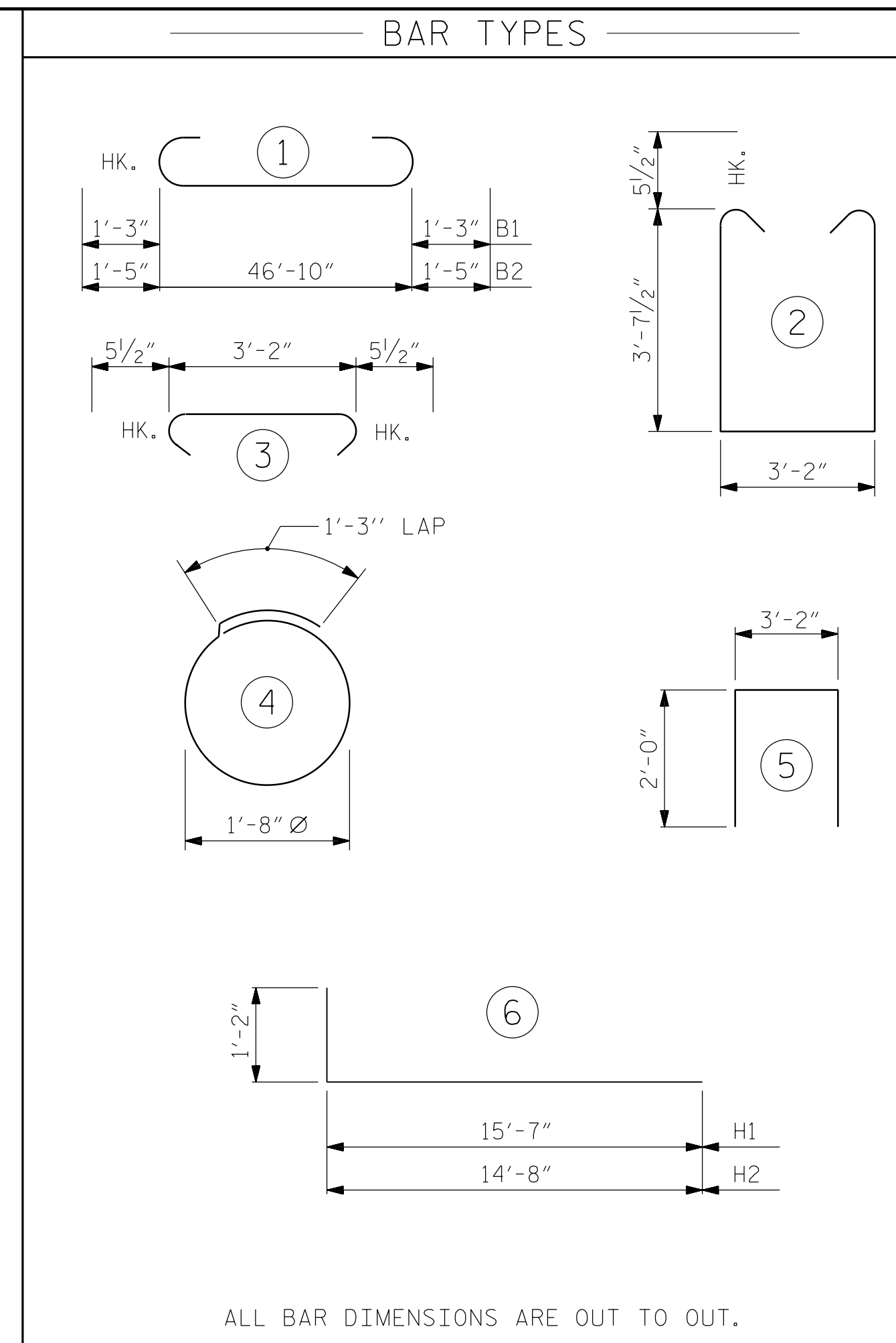


**CORROSION PROTECTION FOR STEEL PILES DETAIL**

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



**PILE SPLICE DETAILS**



BILL OF MATERIAL					
END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	49'-4"	839
B2	4	#10	1	49'-8"	855
B3	5	#4	STR	10'-6"	35
B4	20	#4	STR	8'-5"	112
B5	12	#4	STR	3'-2"	25
B6	28	#4	STR	24'-9"	463
H1	42	#7	6	16'-9"	1438
H2	40	#7	6	15'-10"	1295
K1	50	#4	STR	2'-8"	89
S1	54	#5	2	11'-4"	638
S2	54	#5	3	4'-1"	230
S3	24	#4	4	6'-6"	104
U1	31	#4	5	7'-2"	148
V1	68	#4	STR	6'-5"	291
V2	8	#5	STR	10'-0"	83
V3	58	#5	STR	7'-4"	444
V4	30	#5	STR	5'-4"	167
V5	8	#5	STR	9'-7"	80
V6	28	#5	STR	5'-0"	146
REINFORCING STEEL (FOR END BENT)					7482 LBS.
CLASS A CONCRETE					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					32.8 C.Y.
POUR #2 UPPER PART OF WINGS					7.6 C.Y.
TOTAL					40.4 C.Y.
HP 12 X 53 STEEL PILES NO: 6					LIN. FT. = 360
PILE REDRIVES					3 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					6 EA.

PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 33+47.21 -L-

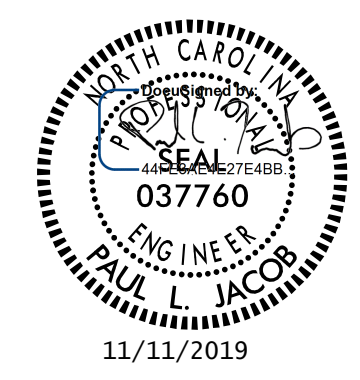
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

**INTEGRAL END BENT No. 1 DETAILS**

(LEFT LANE)



DRAWN BY : J. WEIGER DATE : 04/2019

CHECKED BY : P. JACOB DATE : 09/2019

DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**

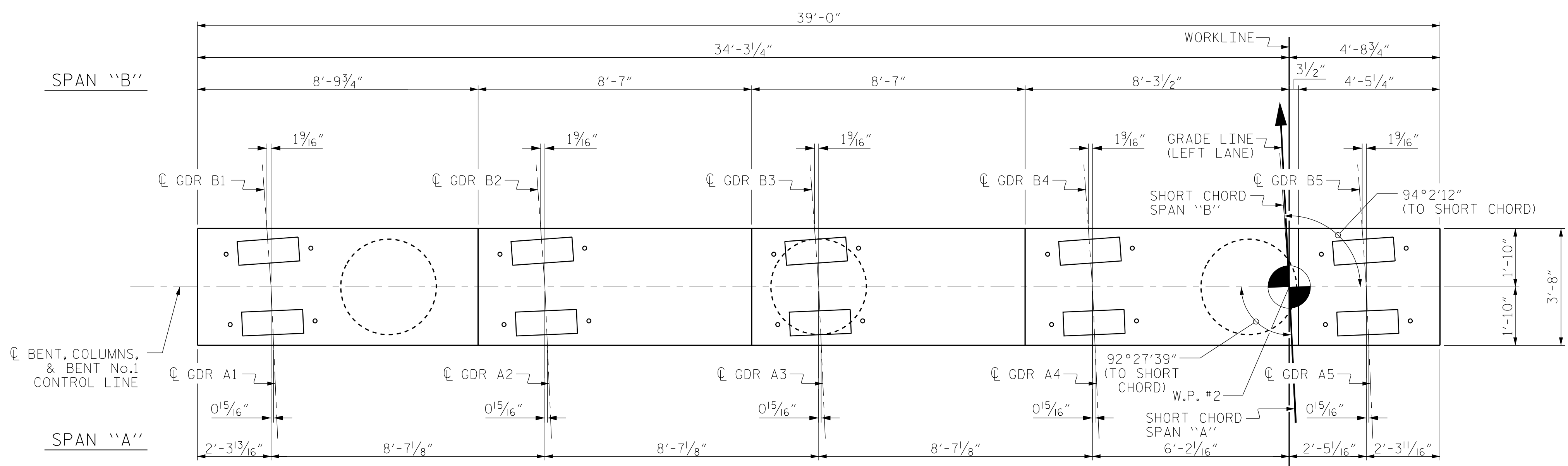
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

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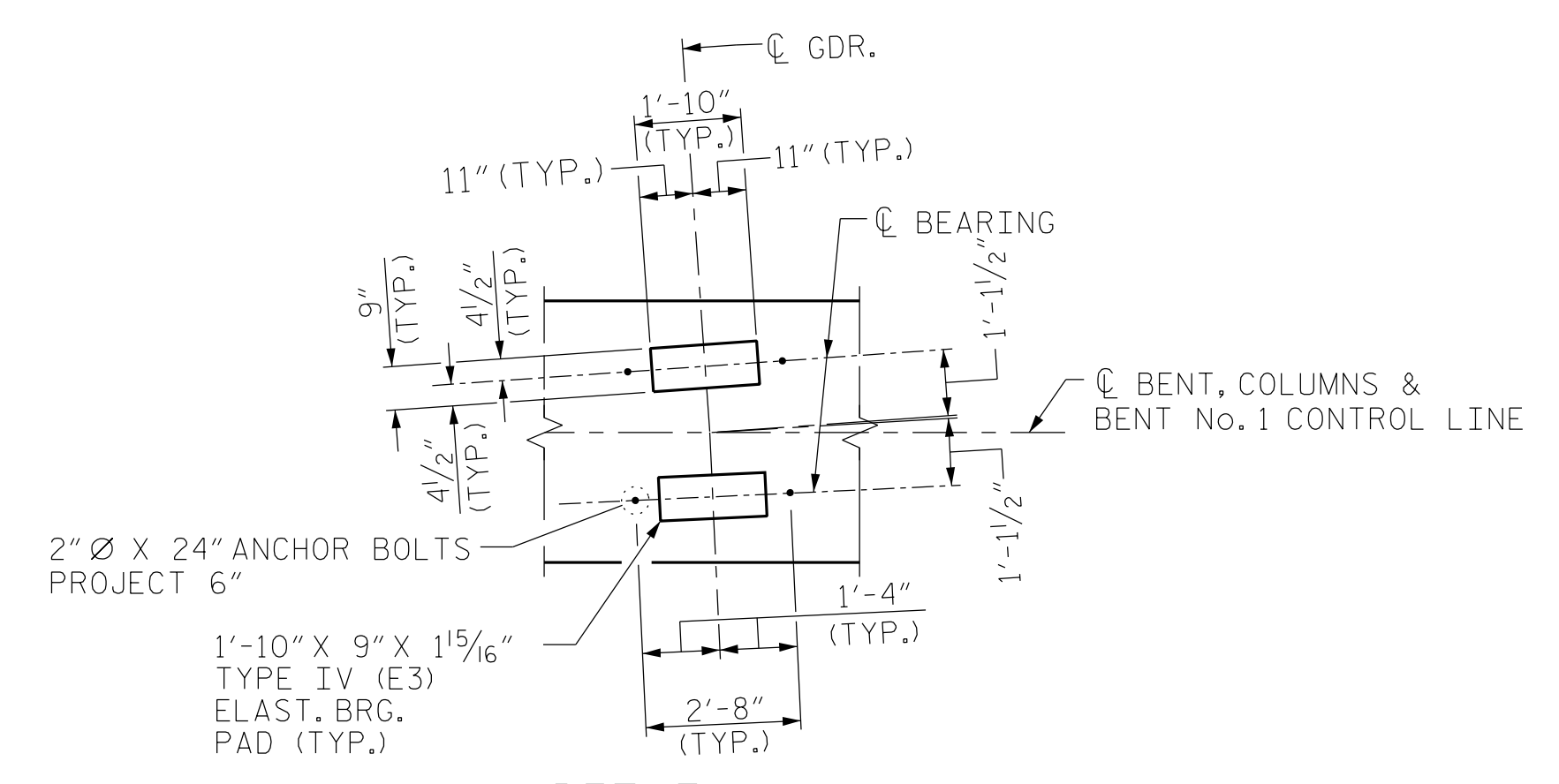
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S2-25

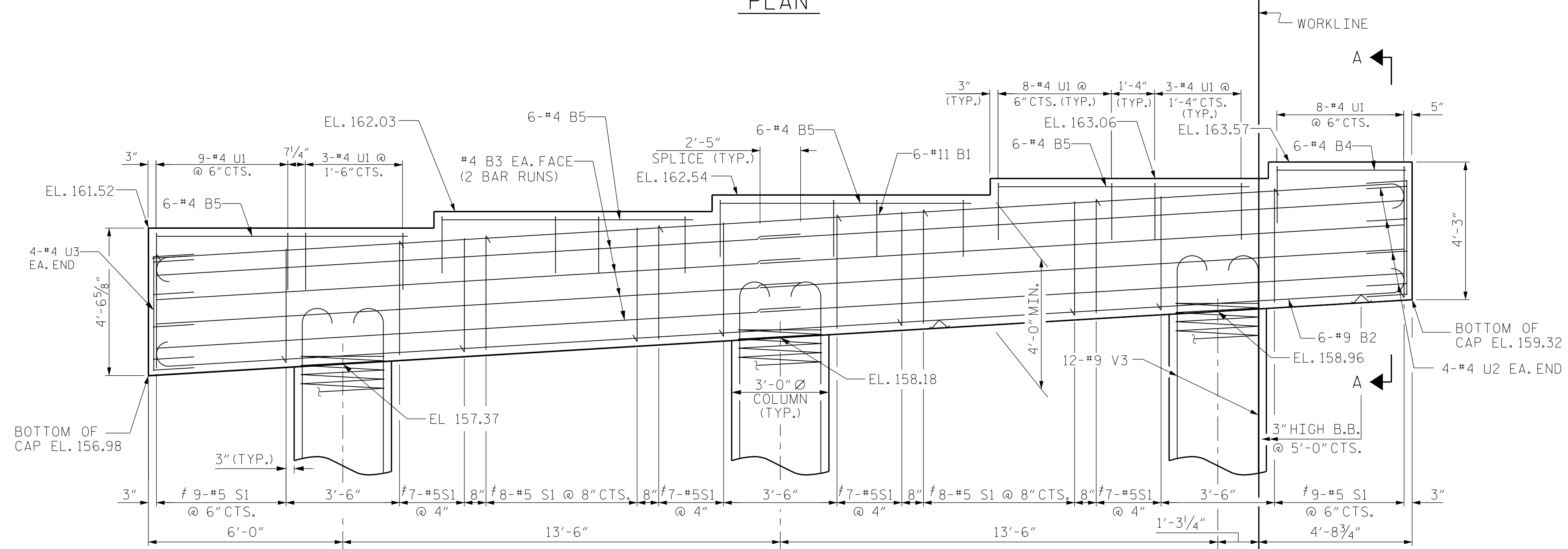
TOTAL SHEETS 35



PLAN



DETAIL 'A'  
(TYP. EACH GIRDER)

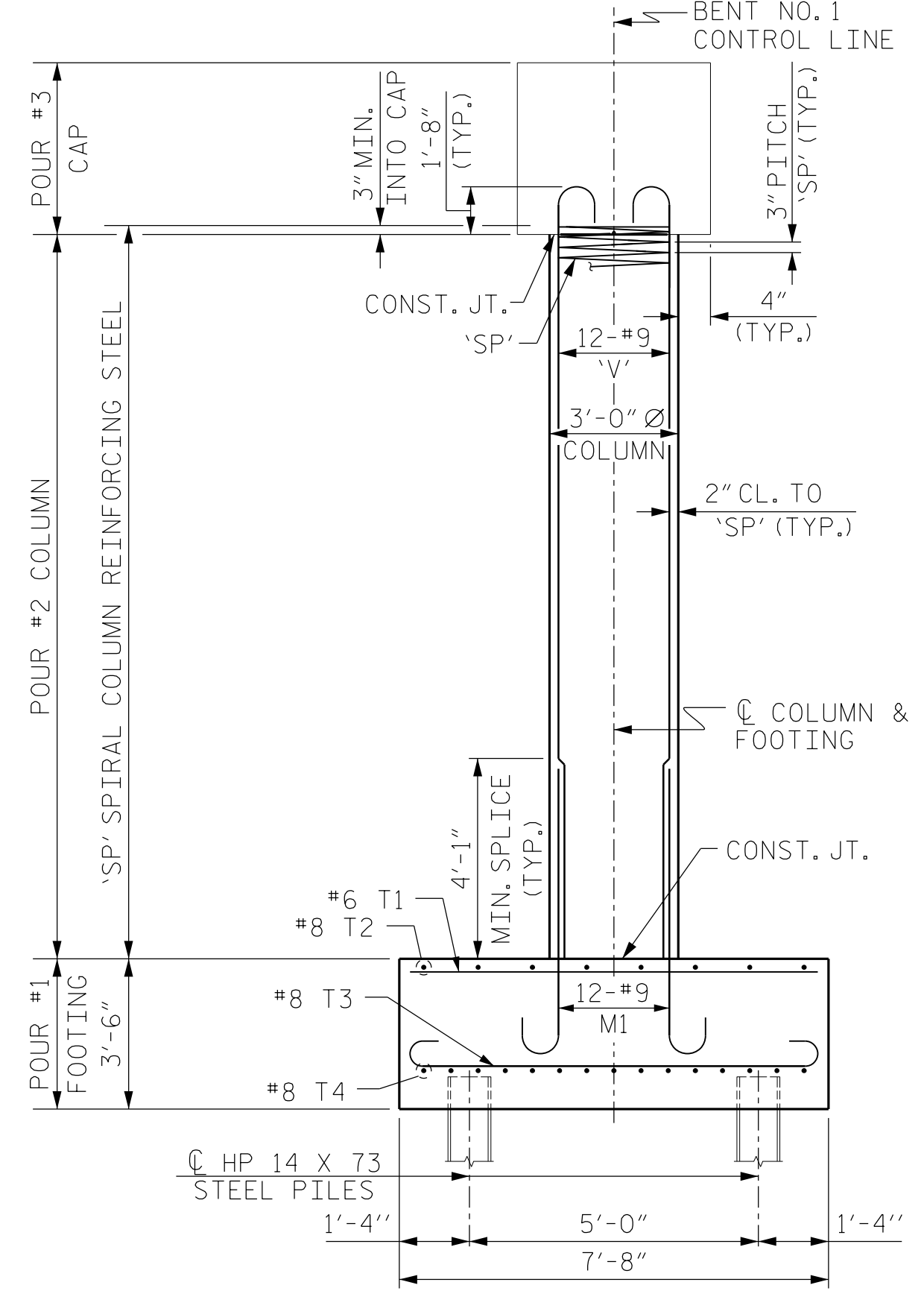


ELEVATION

f IN PAIRS  
INVERT STIRRUPS ALTERNATELY

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



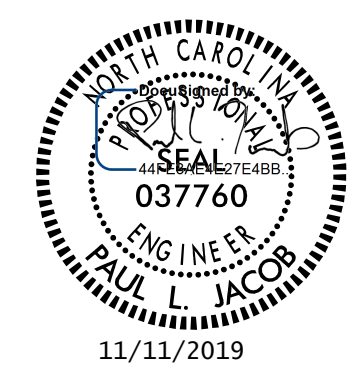
END ELEVATION

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

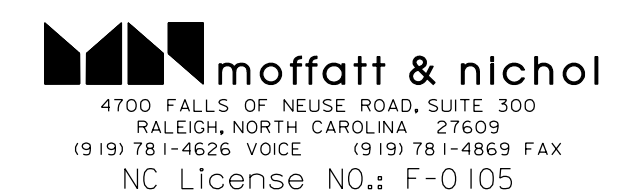
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**BENT No.1 PLAN**  
 (LEFT LANE)



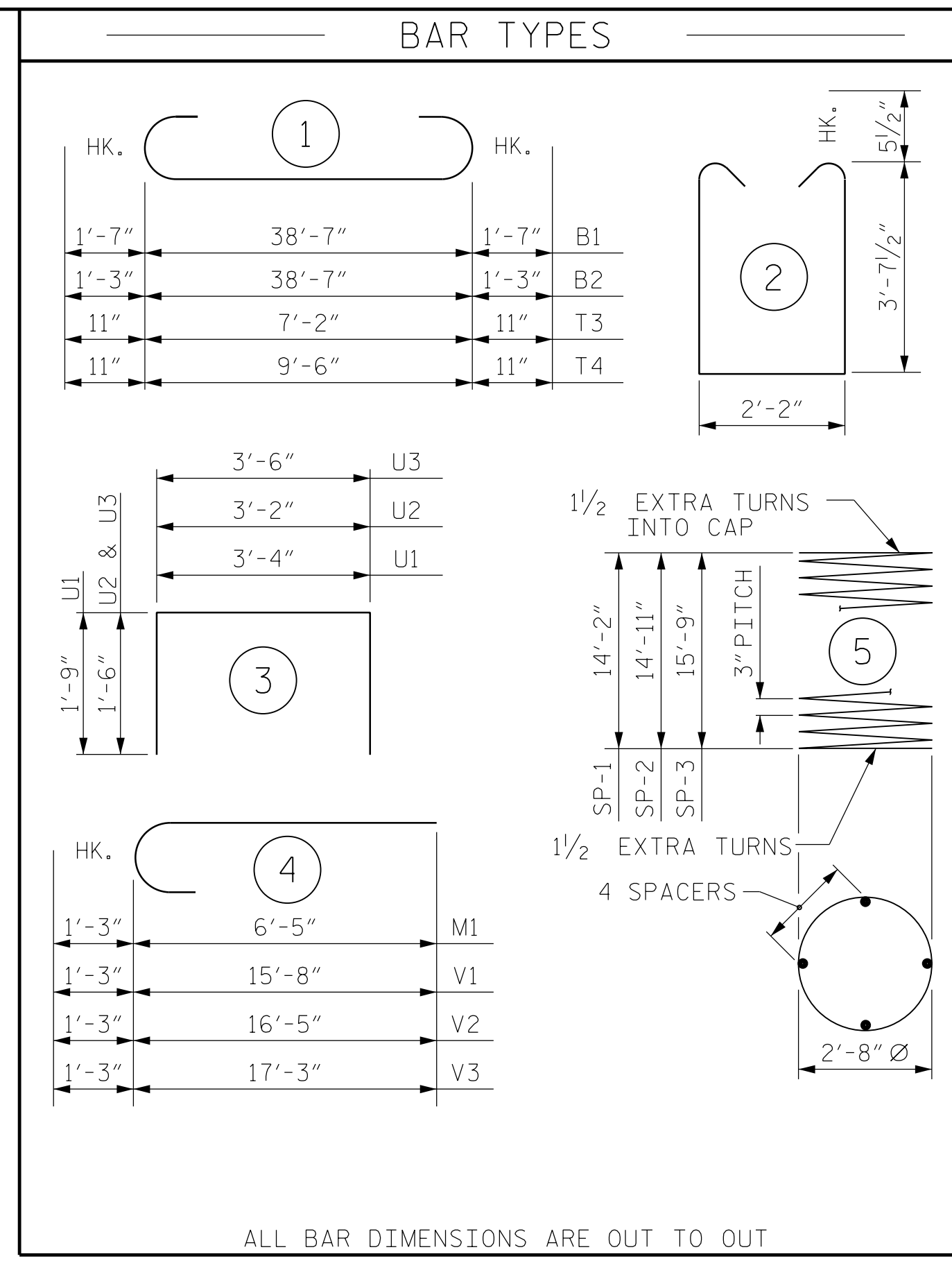
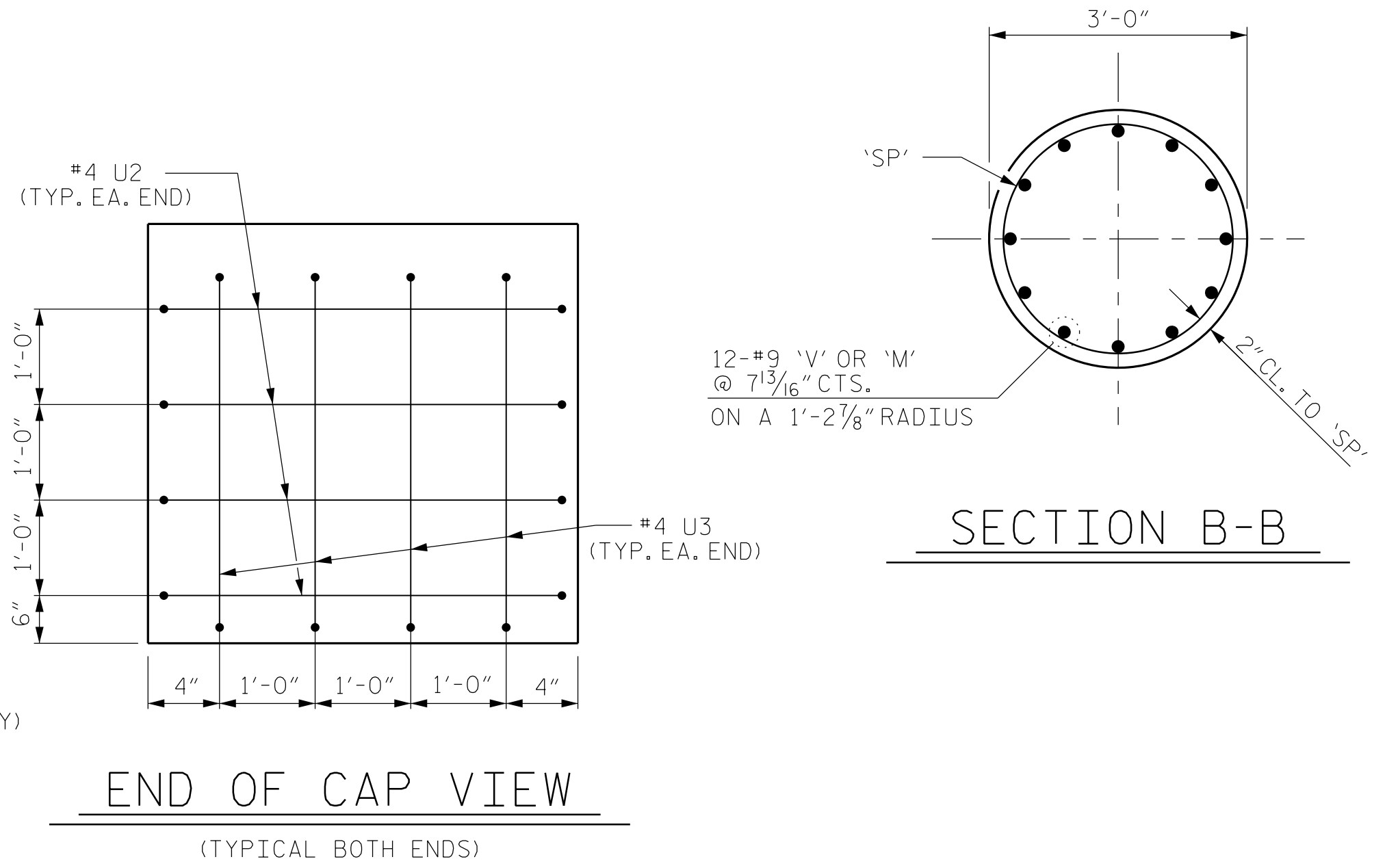
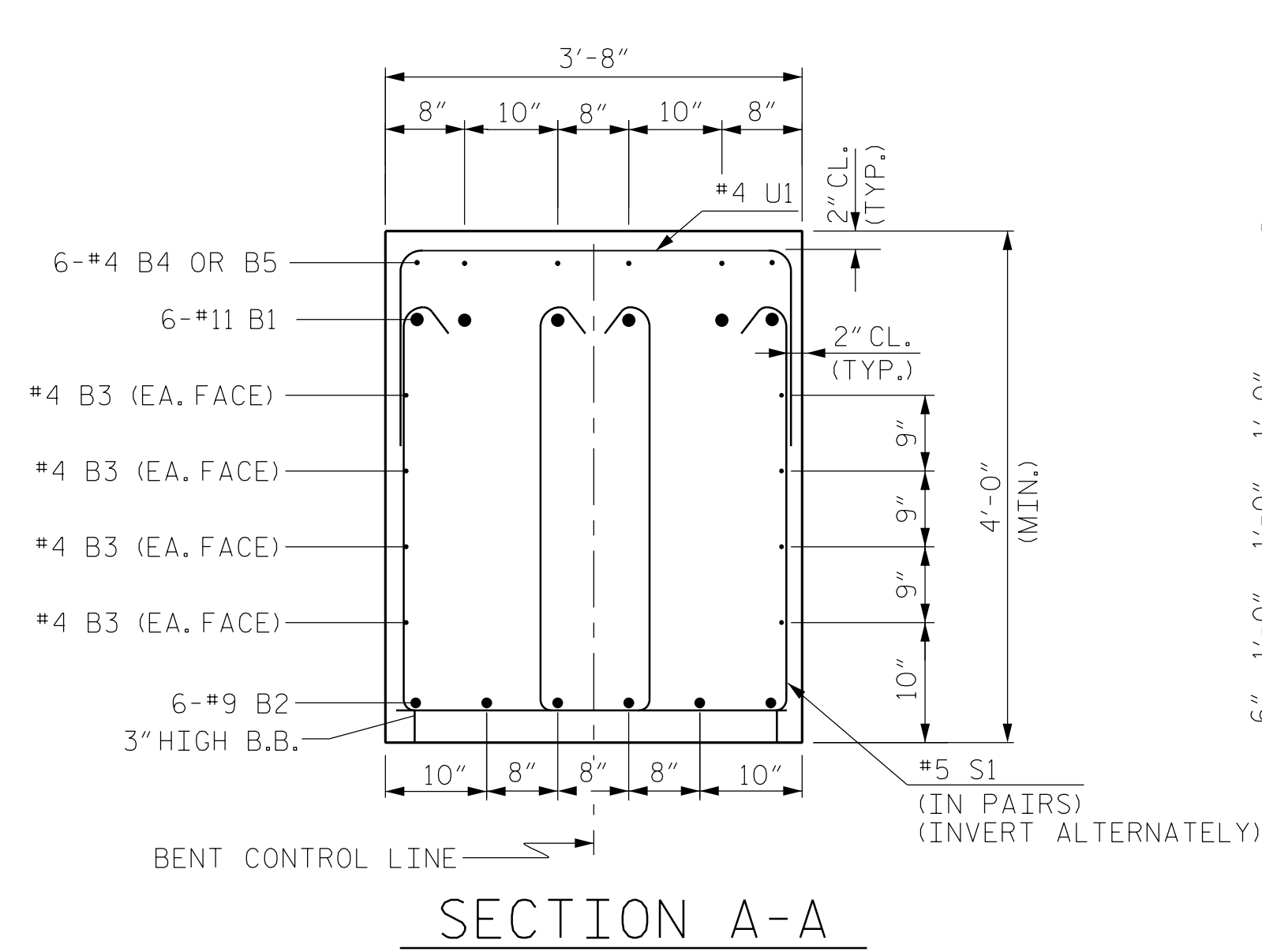
DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



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REVISIONS		SHEET NO.	
NO.	BY:	DATE:	TOTAL SHEETS
1			35
2			
3			
4			

C:\RA\6522-07\Submittals\191107 - Site 1 Left Lane Structures Let Plans Rev\ACADD Files\R2303E\_SMU\_B1\_026\_810040.dgn



BILL OF MATERIAL

**BENT No. 1**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#6	#11	1	41'-9"	1331
B2	#6	#9	1	41'-1"	838
B3	16	#4	STR.	20'-7"	220
B4	6	#4	STR.	4'-0"	16
B5	24	#4	STR.	7'-9"	124
M1	36	#9	4	7'-8"	938
S1	124	#5	2	10'-4"	1336
T1	30	#6	STR.	7'-2"	323
T2	24	#8	STR.	9'-6"	609
T3	30	#8	1	9'-0"	721
T4	45	#8	1	11'-4"	1362
U1	53	#4	3	6'-10"	242
U2	8	#4	3	6'-2"	33
U3	8	#4	3	6'-6"	35
V1	12	#9	4	16'-11"	690
V2	12	#9	4	17'-8"	721
V3	12	#9	4	18'-6"	755

REINFORCING STEEL (FOR BENT NO. 1) 10294 LBS.

SP-1	1	*	5	492'-2"	329
SP-2	1	*	5	516'-11"	345
SP-3	1	*	5	544'-7"	364

SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1) 1038 LBS.

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

HP 14x73 STEEL PILES No. 12 LENGTH = 840 LIN. FT. PILE REDRIVES 6 EA.

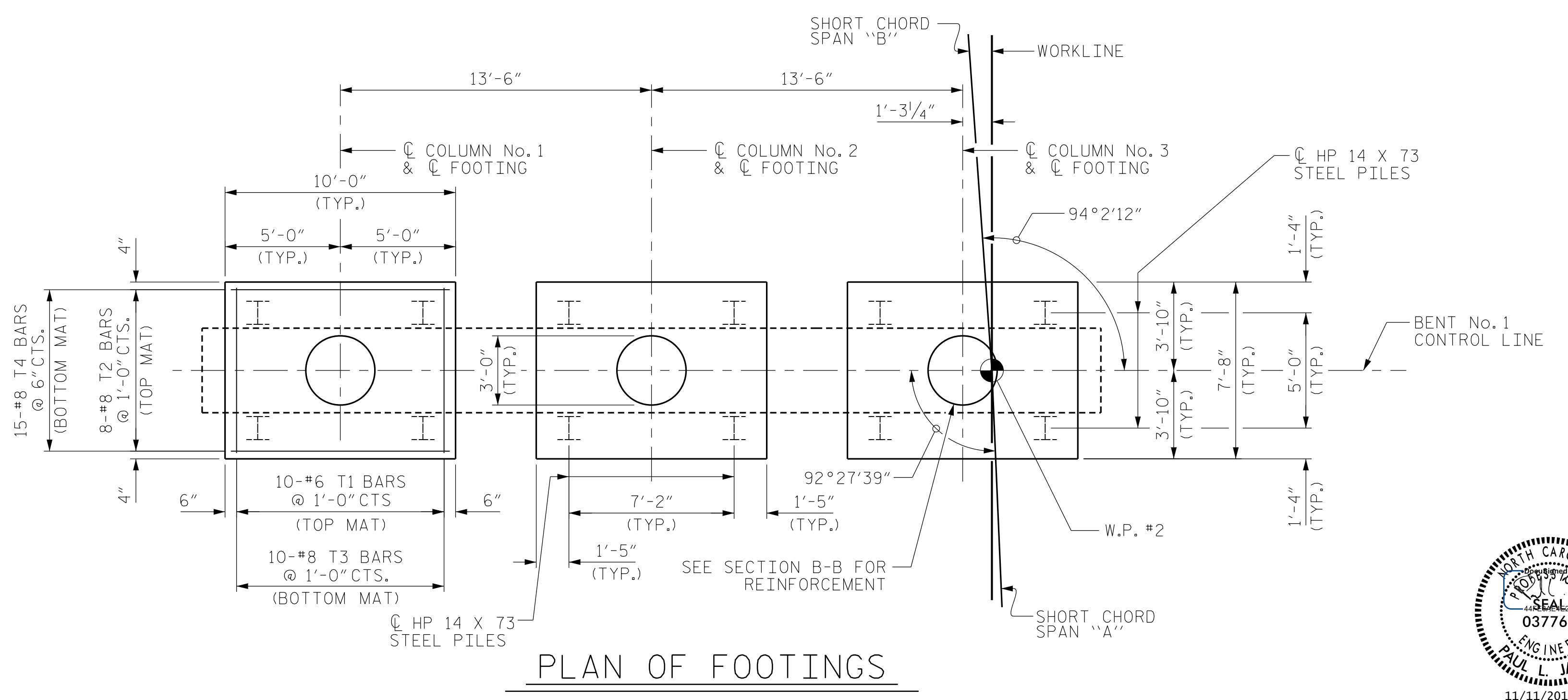
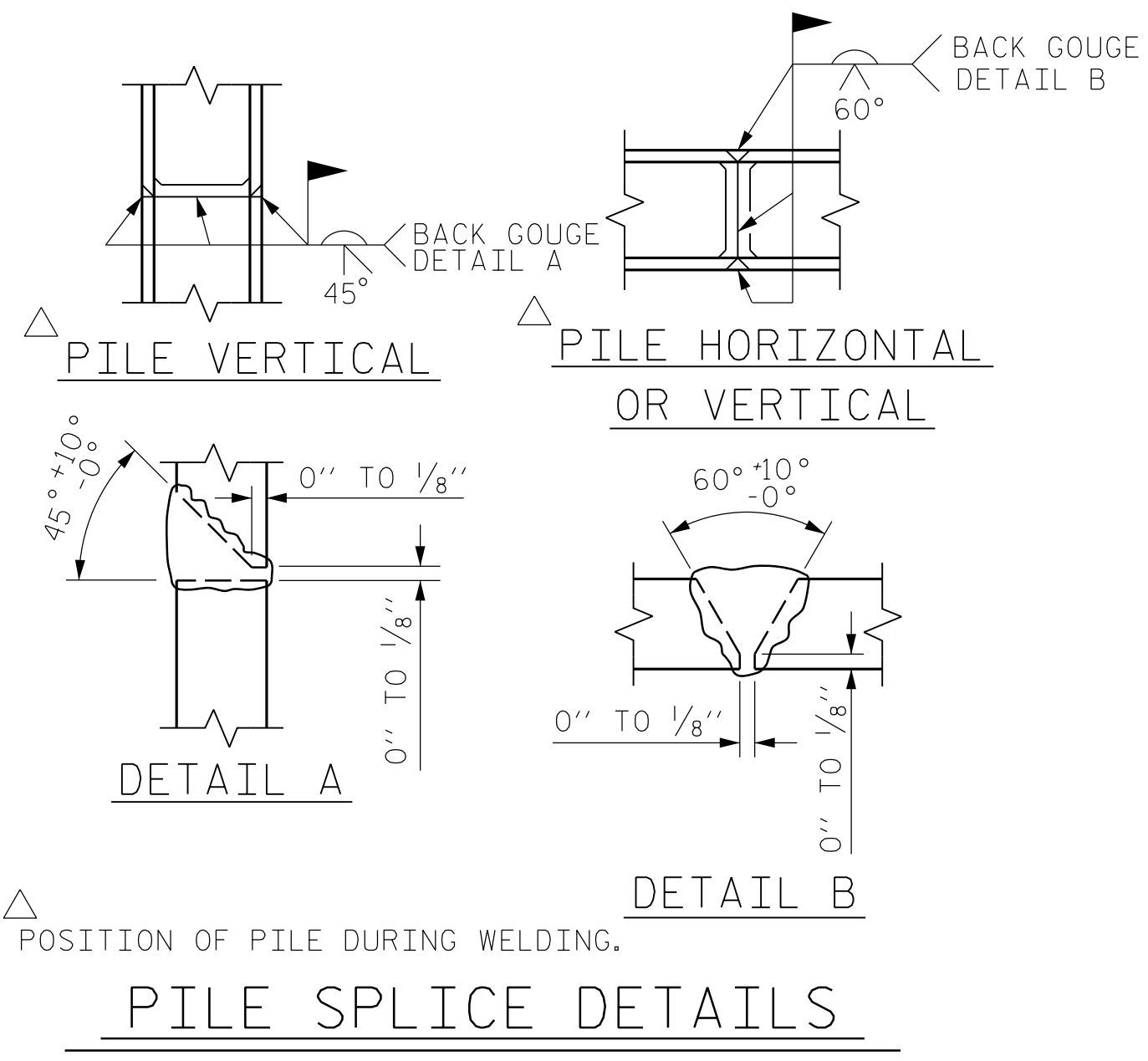
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1)

POUR #1 (FOOTINGS)	29.8 C.Y.
POUR #2 (COLUMNS)	11.4 C.Y.
POUR #3 (CAP)	22.7 C.Y.

TOTAL CLASS A CONCRETE 63.9 C.Y.

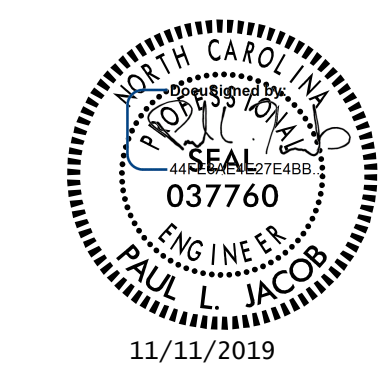
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES 12 EA.

FOUNDATION EXCAVATION FOR BENT NO. 1 LUMP SUM



DRAWN BY : J. WEIGER DATE : 07/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 07/2019  
 DESIGN ENGINEER OF RECORD : P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105



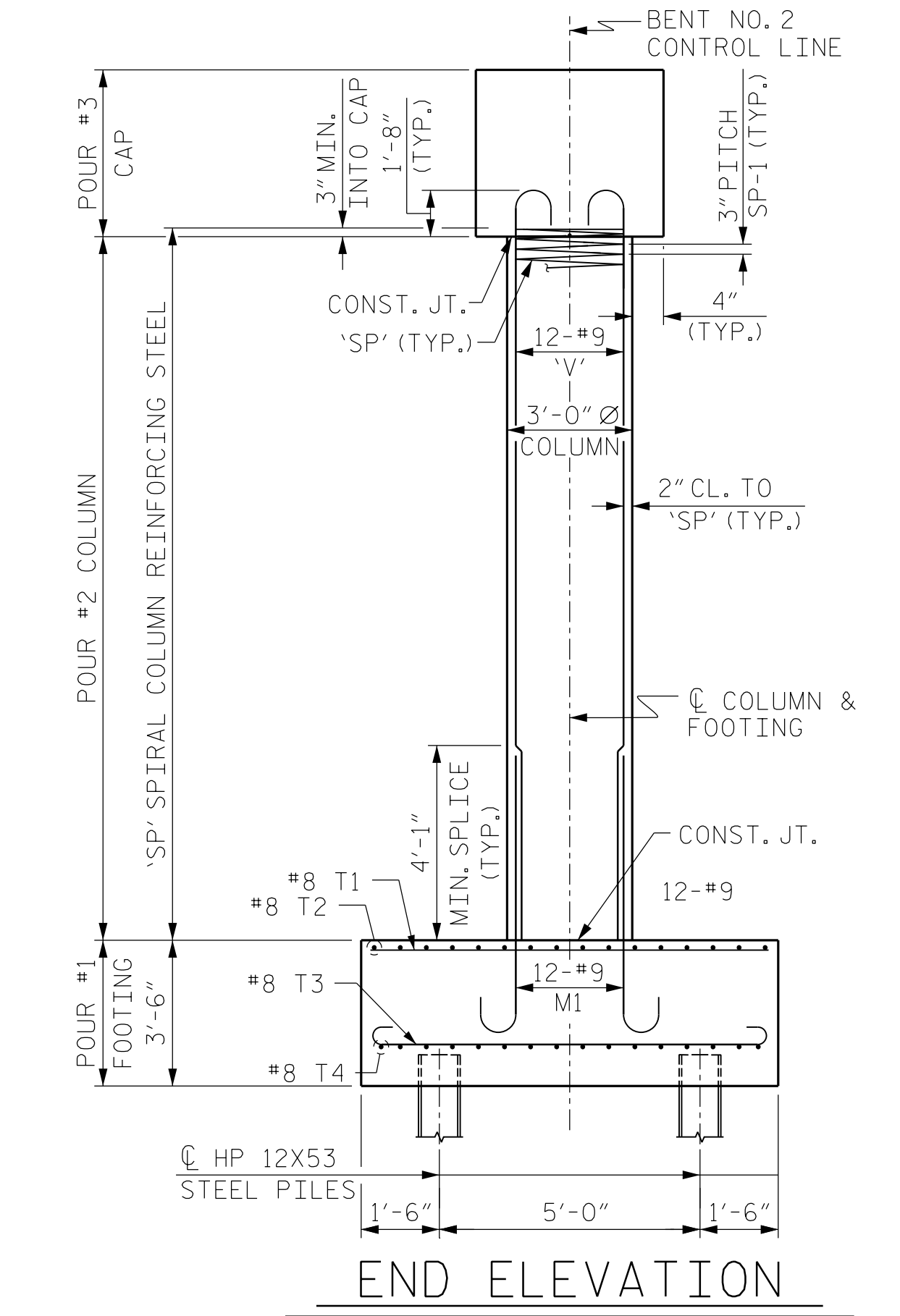
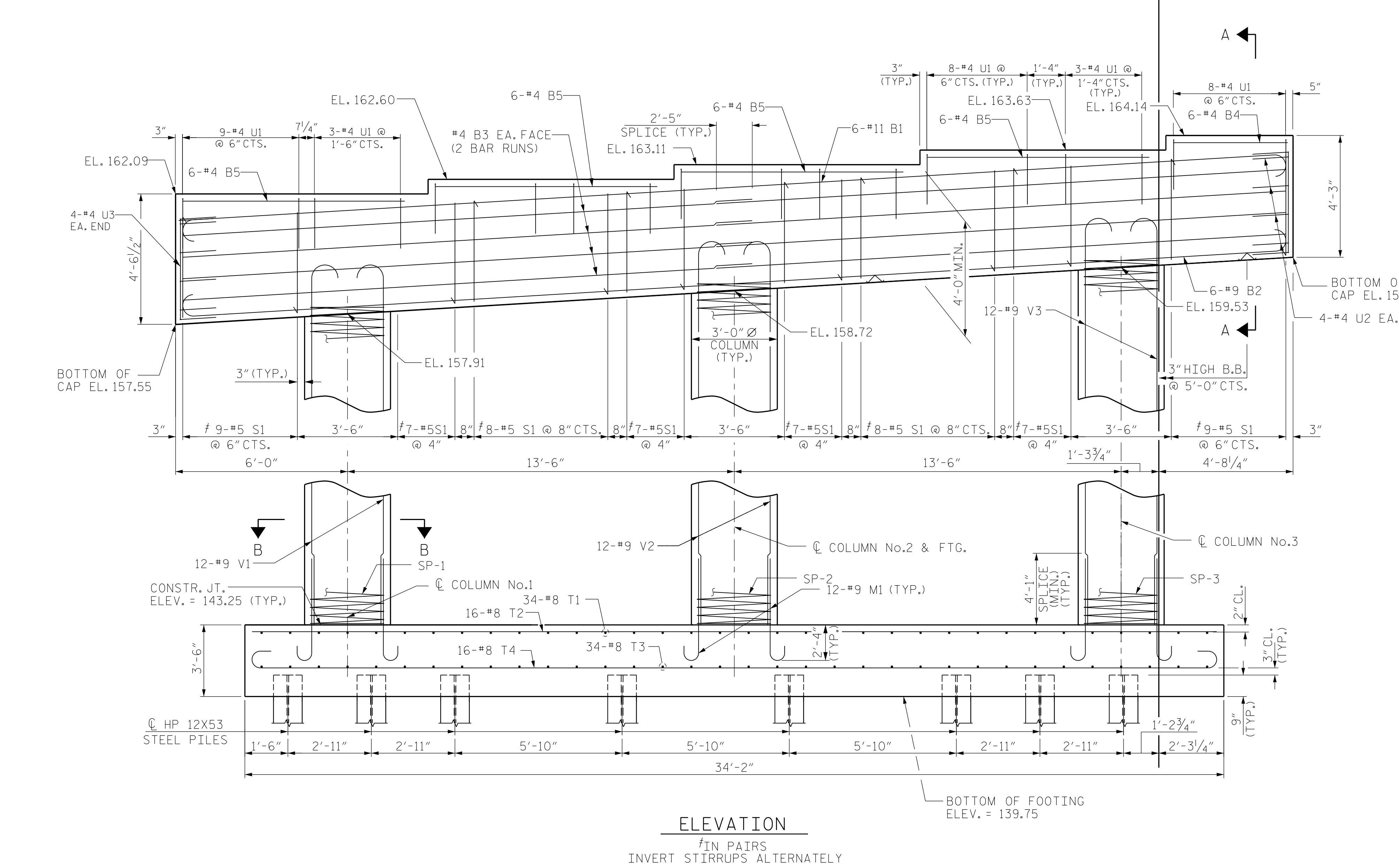
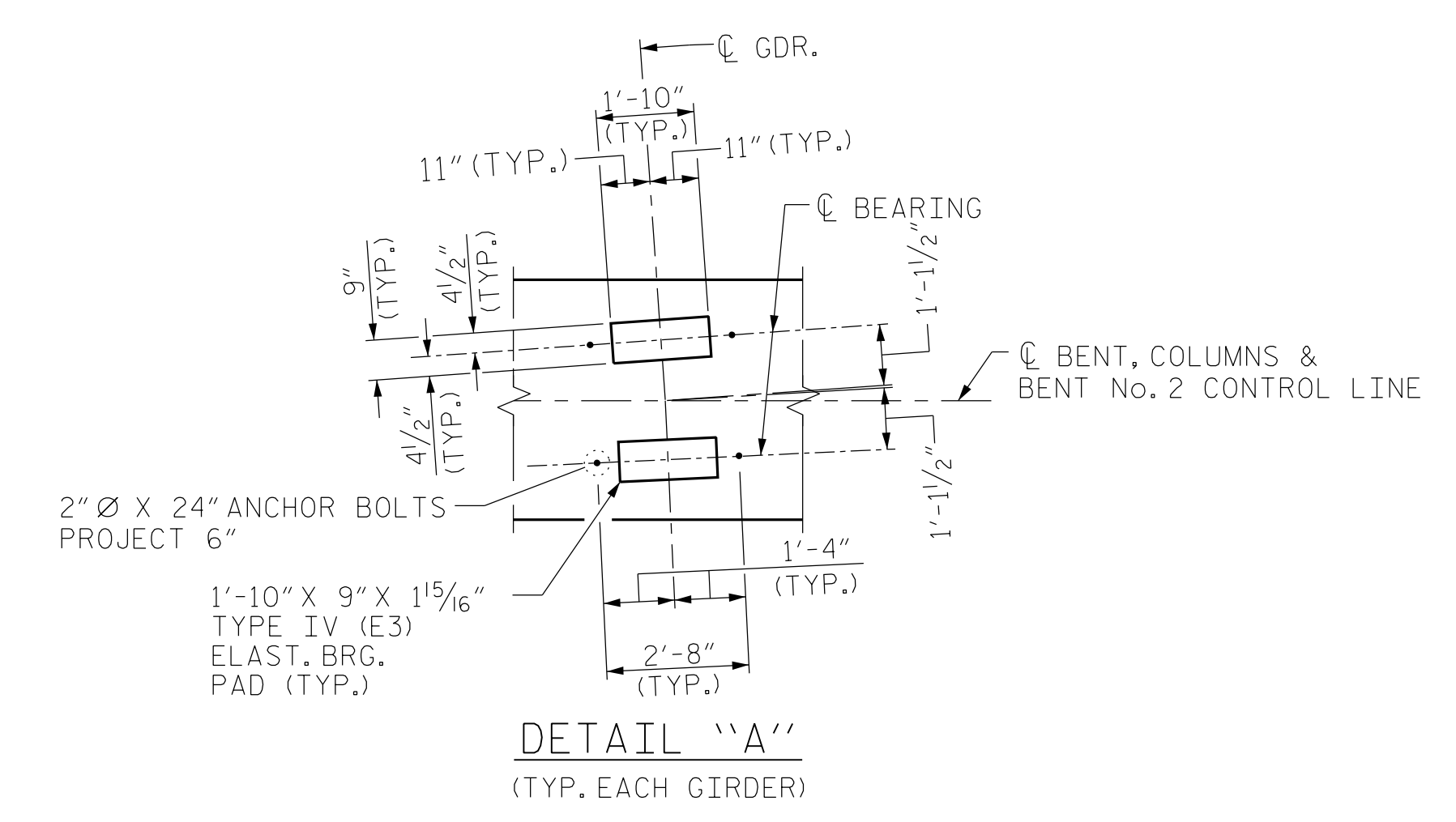
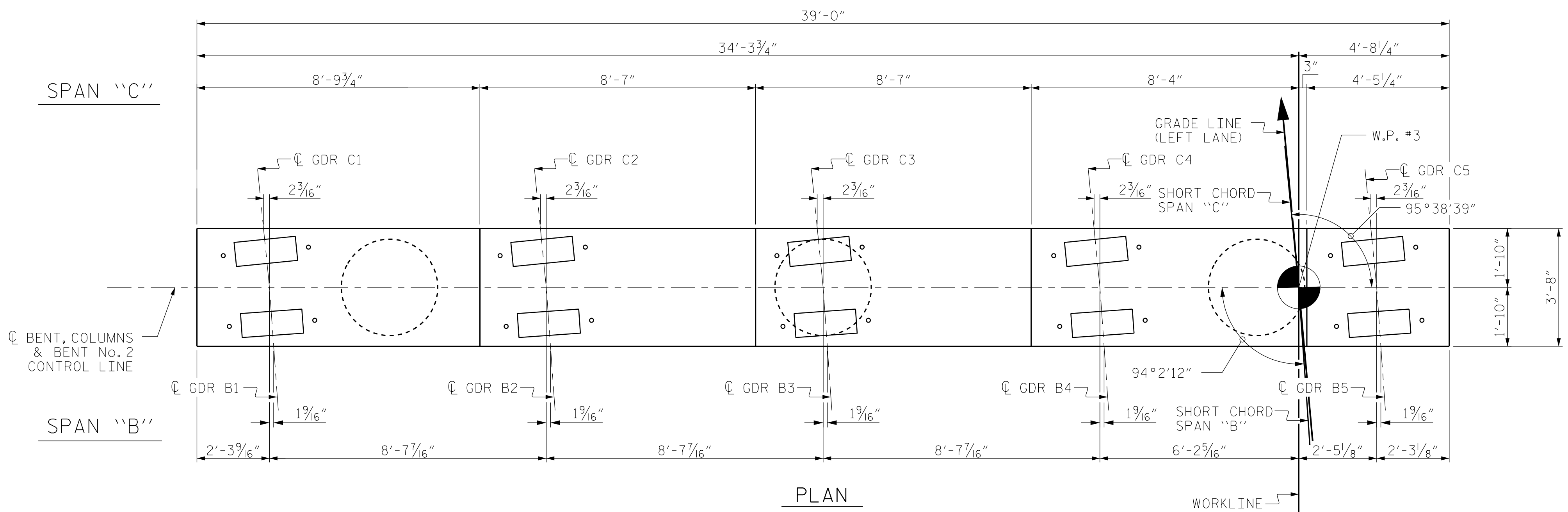
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT No.1 DETAILS (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	
S2-27	TOTAL SHEETS 35





**NOTES**

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

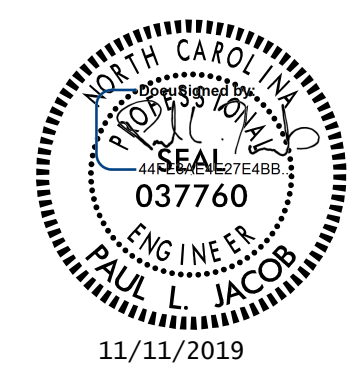
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 33+47.21 -L-

SHEET 1 OF 2



DRAWN BY : J. WEIGER DATE : 07/2019

CHECKED BY : A. CHILKEPALLI DATE : 07/2019

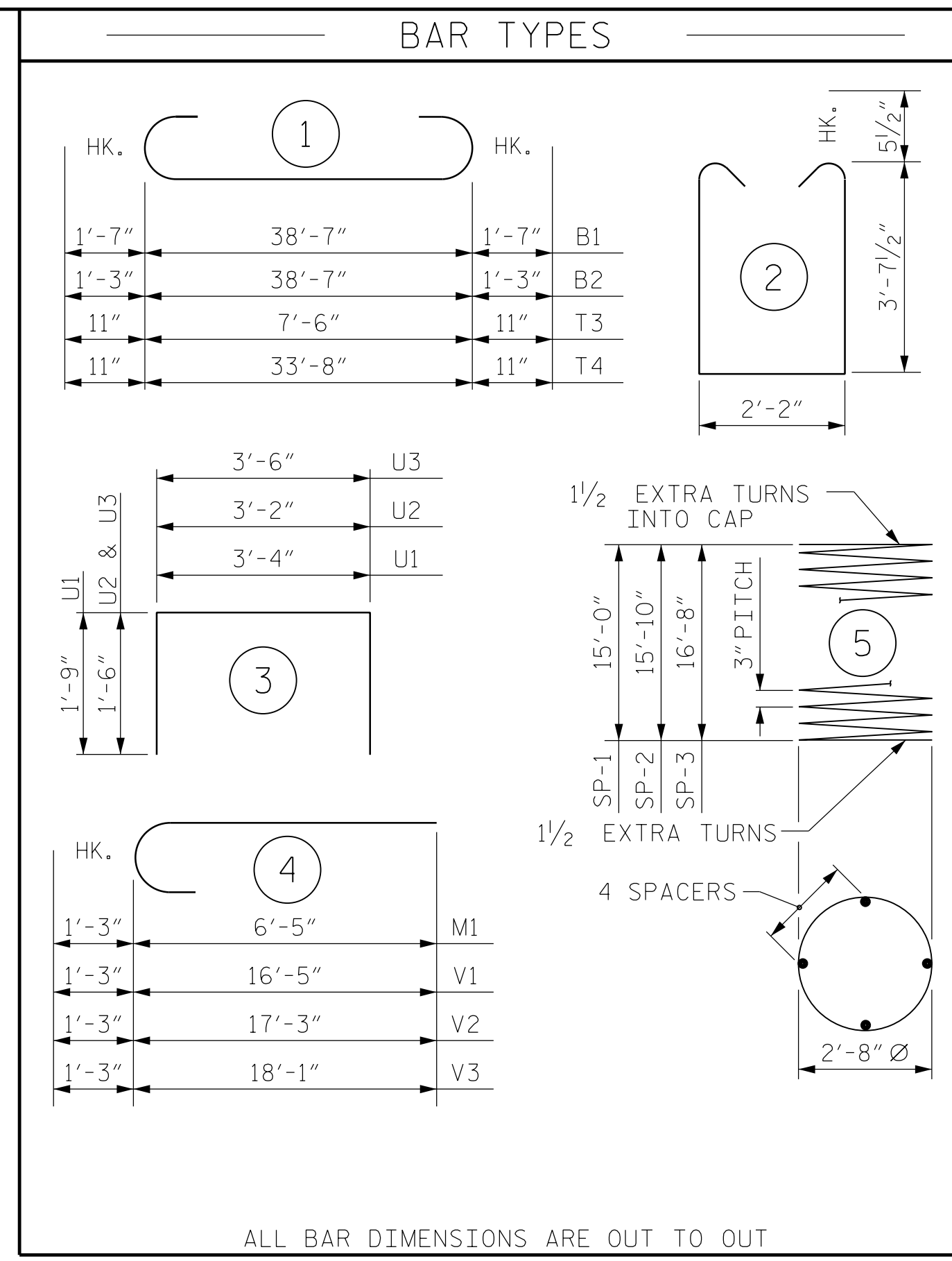
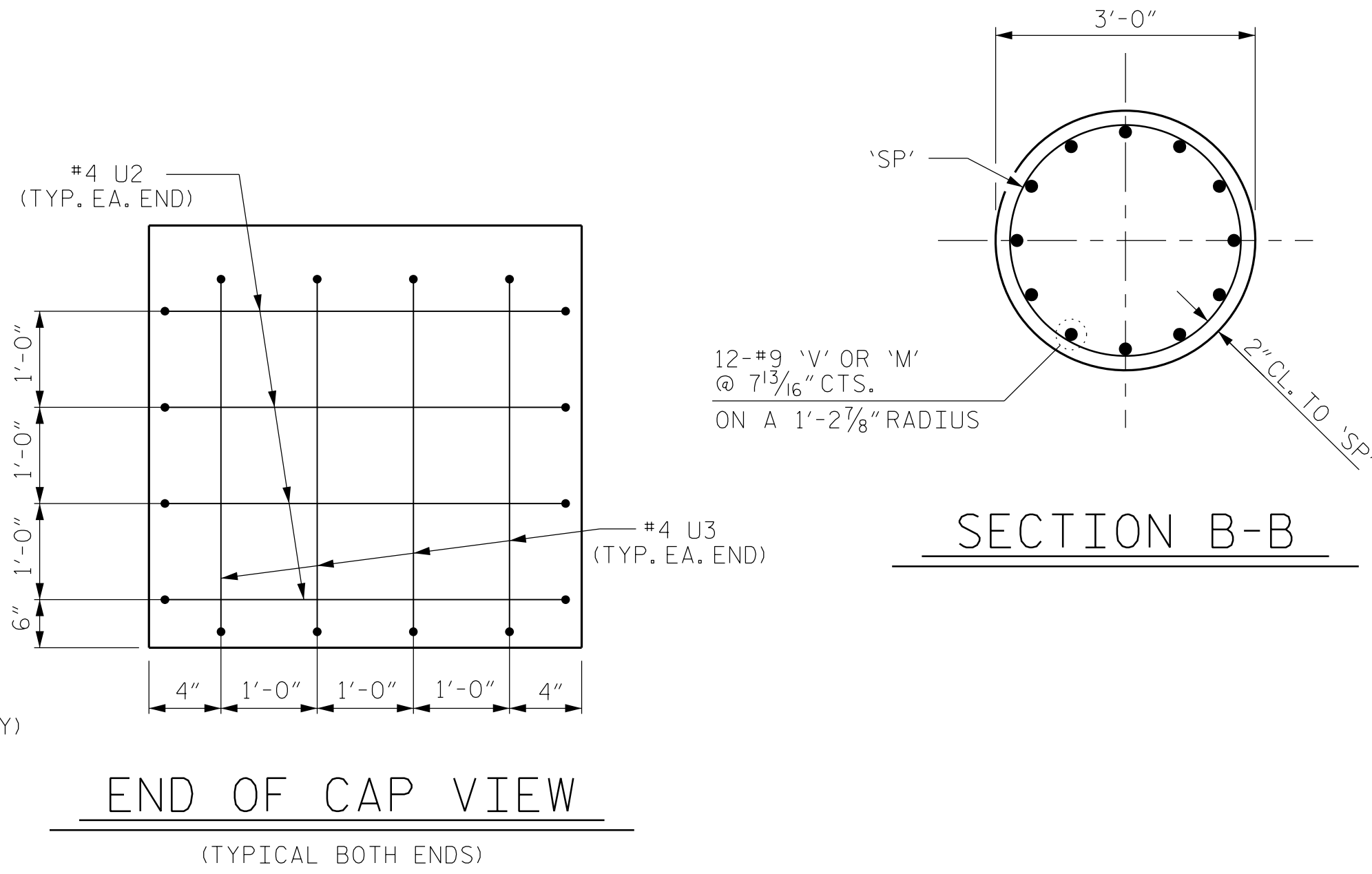
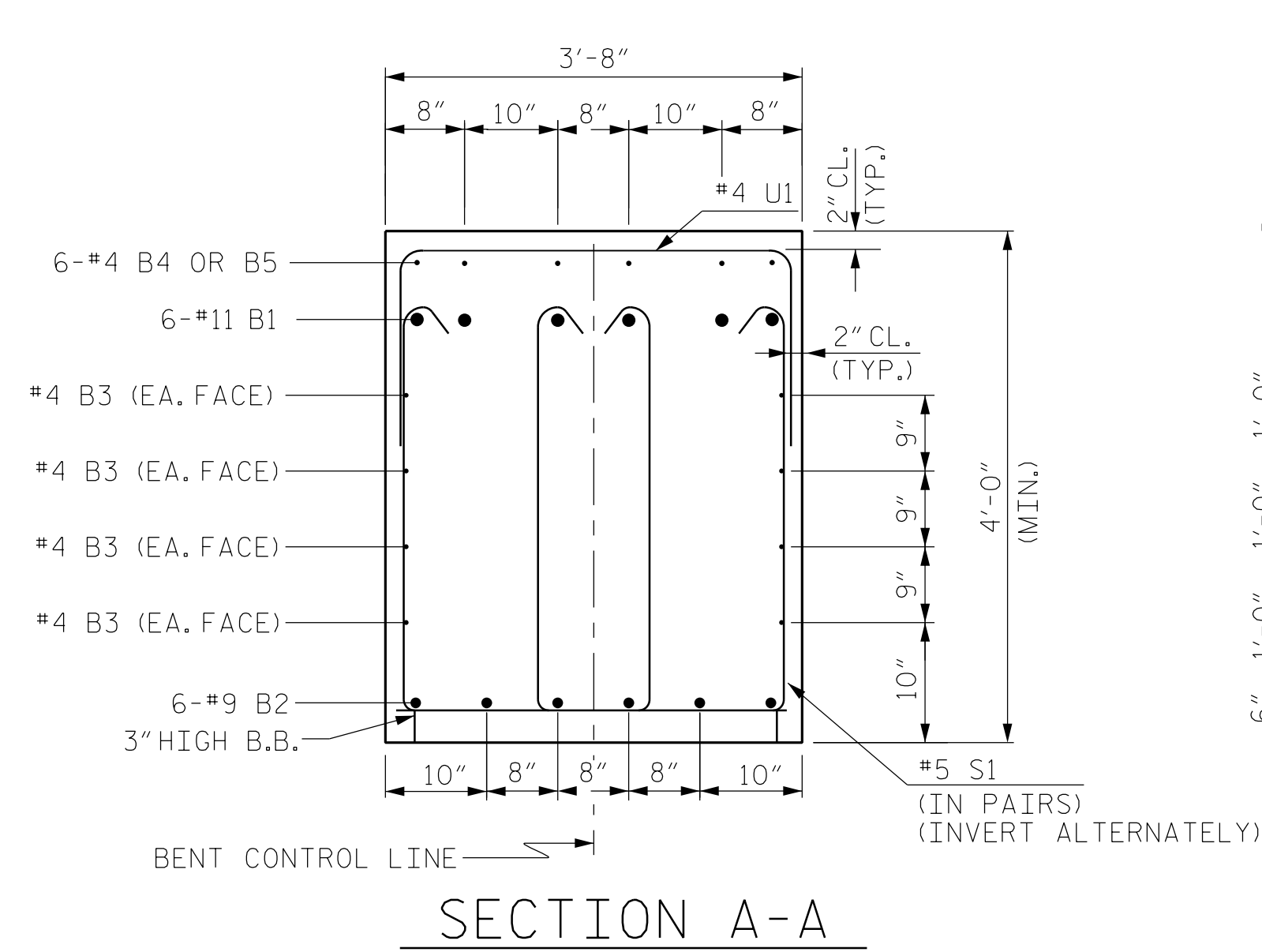
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**

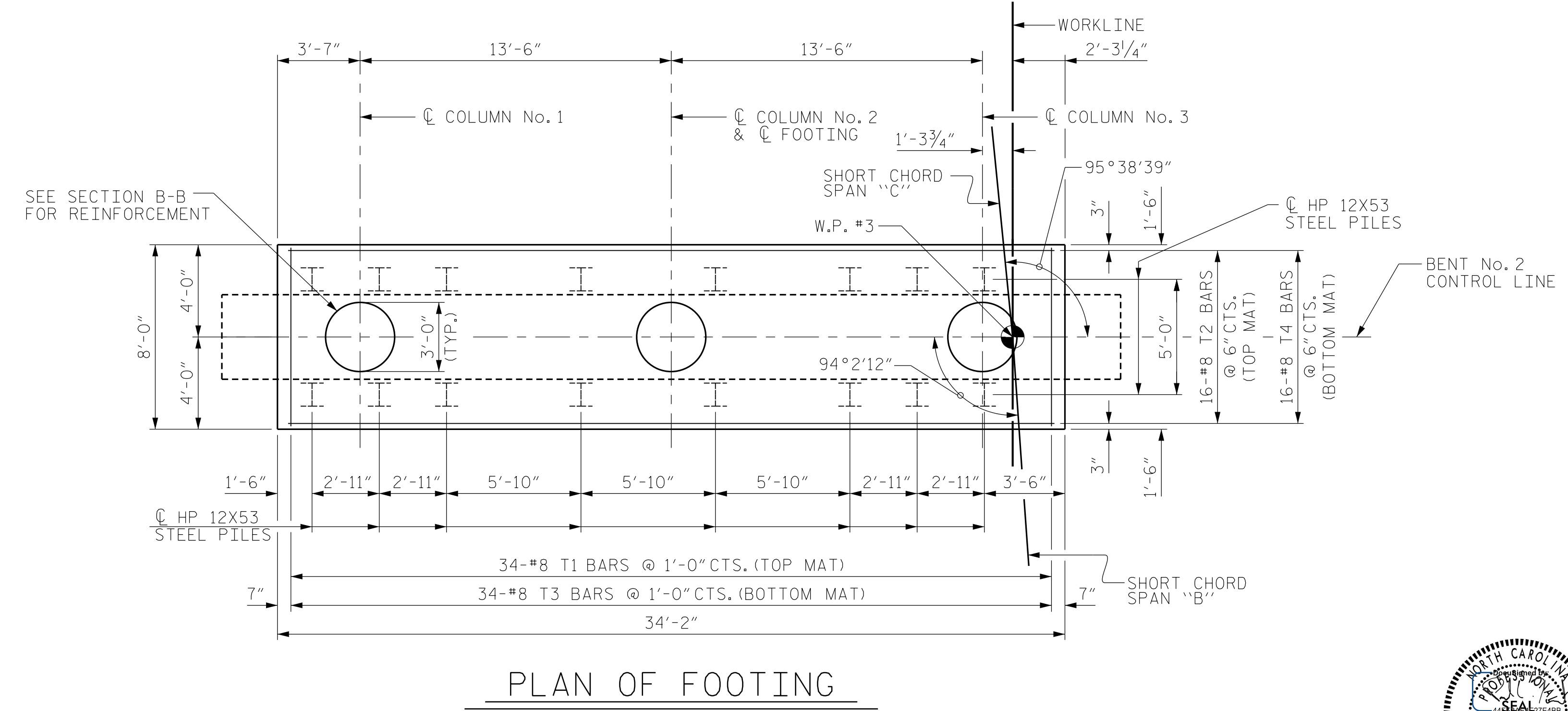
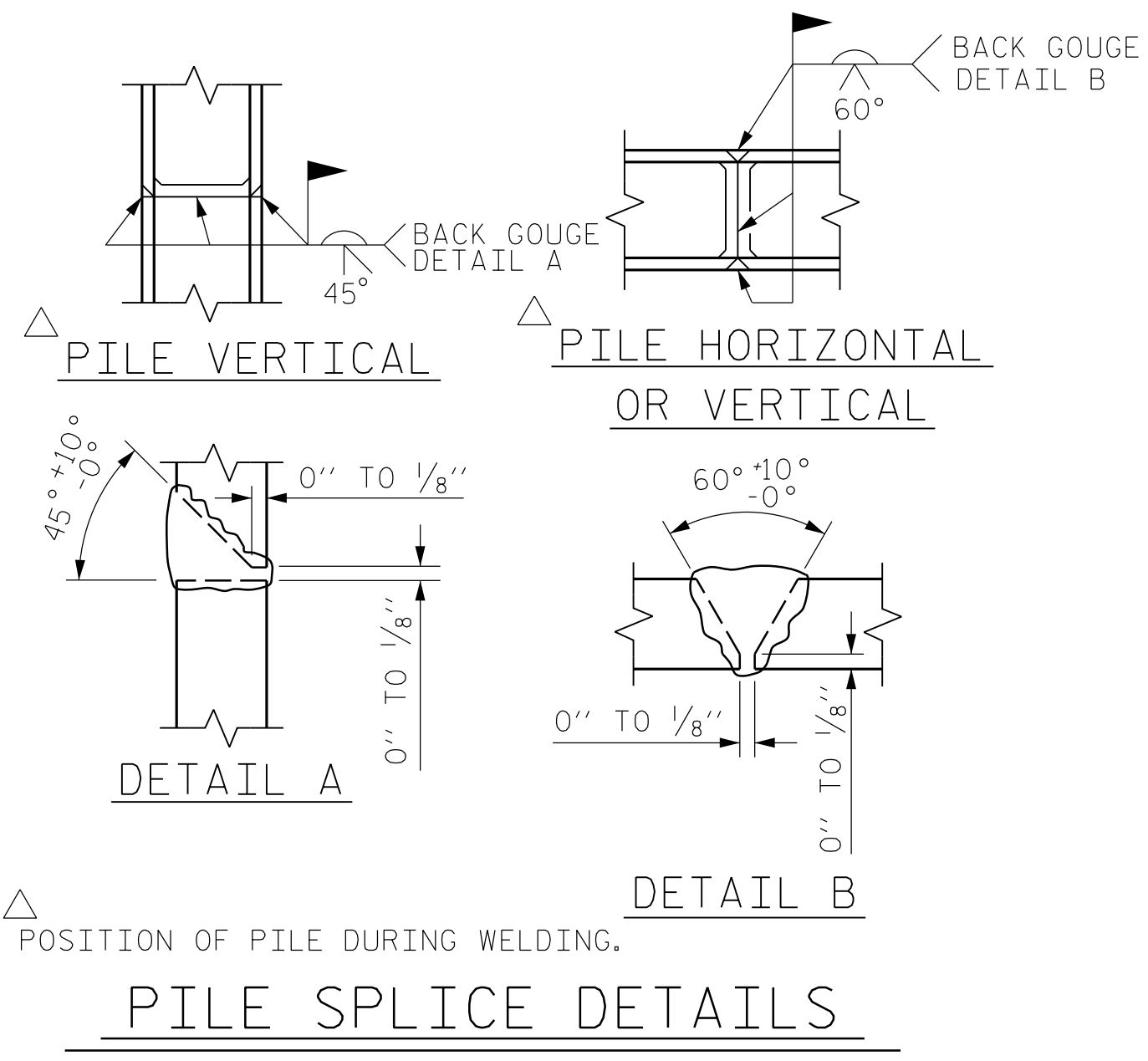
4700 FALLS OF NEUSE ROAD, SUITE 300  
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NC License No.: F-0105

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
<b>BENT No.2 PLAN</b>					
<b>(LEFT LANE)</b>					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 35

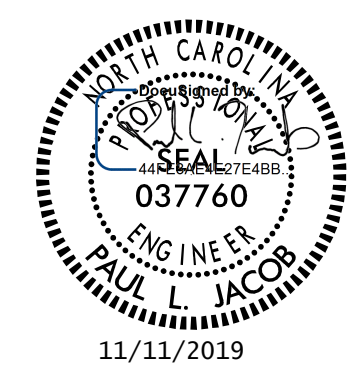


BILL OF MATERIAL					
BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	41'-9"	1331
B2	6	#9	1	41'-1"	838
B3	16	#4	STR.	20'-7"	220
B4	6	#4	STR.	4'-0"	16
B5	24	#4	STR.	7'-9"	124
M1	36	#9	4	7'-8"	938
S1	124	#5	2	10'-4"	1336
T1	34	#8	STR.	7'-6"	681
T2	16	#8	STR.	33'-8"	1438
T3	34	#8	1	9'-4"	847
T4	16	#8	1	35'-6"	1517
U1	53	#4	3	6'-10"	242
U2	8	#4	3	6'-2"	33
U3	8	#4	3	6'-6"	35
V1	12	#9	4	17'-8"	721
V2	12	#9	4	18'-6"	755
V3	12	#9	4	19'-4"	789
REINFORCING STEEL (FOR BENT NO. 2)					11861 LBS.
SP-1	1	*	5	519'-10"	347
SP-2	1	*	5	547'-4"	366
SP-3	1	*	5	574'-10"	384
SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1)					1097 LBS.
* THE 'SP' SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
HP 12x53 STEEL PILES No. 16					LENGTH = 1120 LIN. FT.
PILE REDRIVES					8 EA.
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 2)					
POUR #1 (FOOTINGS)					35.4 C.Y.
POUR #2 (COLUMNS)					12.2 C.Y.
POUR #3 (CAP)					22.7 C.Y.
TOTAL CLASS A CONCRETE					70.3 C.Y.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					16 EA.
FOUNDATION EXCAVATION FOR BENT No. 2					LUMP SUM



DRAWN BY : J. WEIGER DATE : 01/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 07/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
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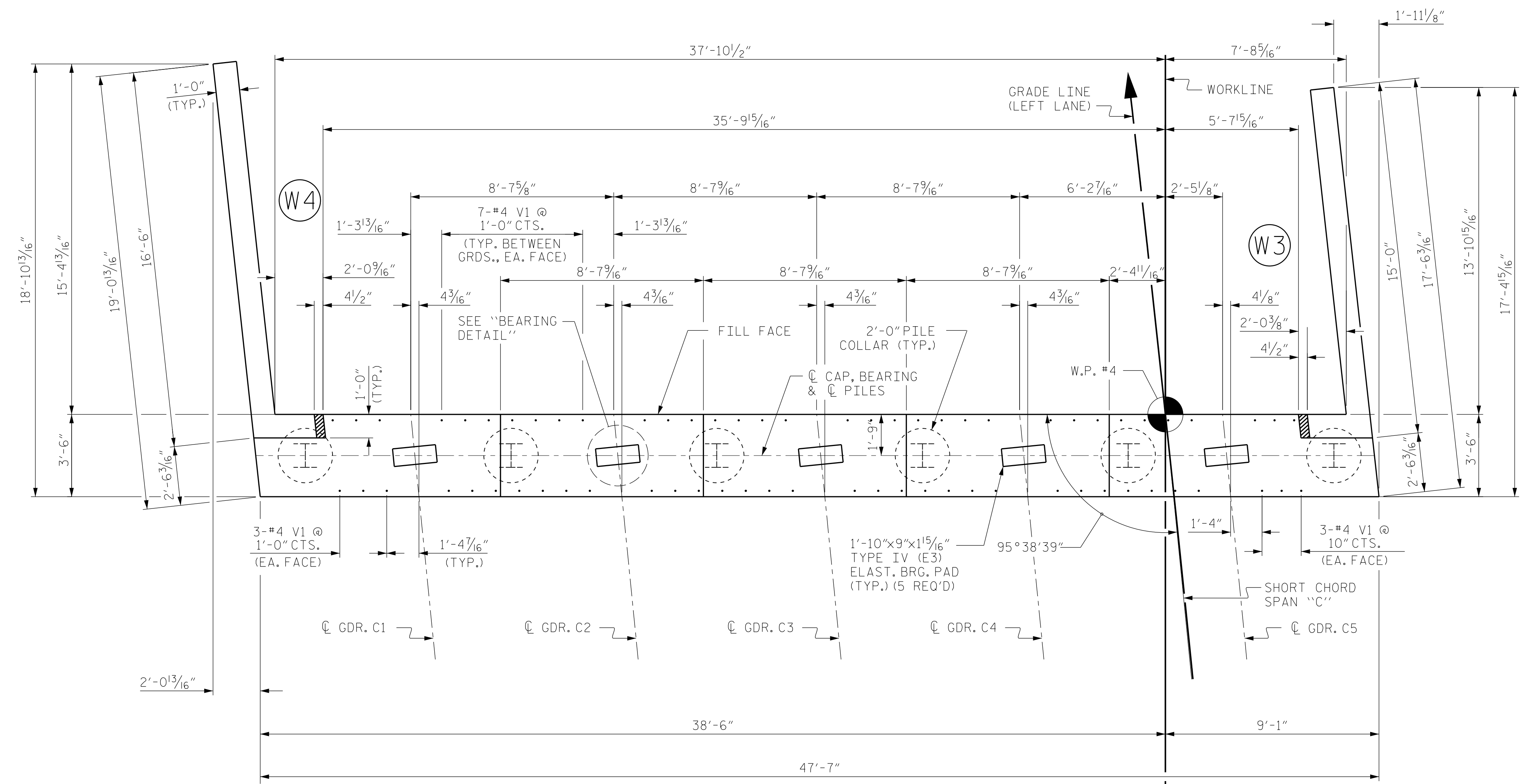
PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT No.2 DETAILS (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

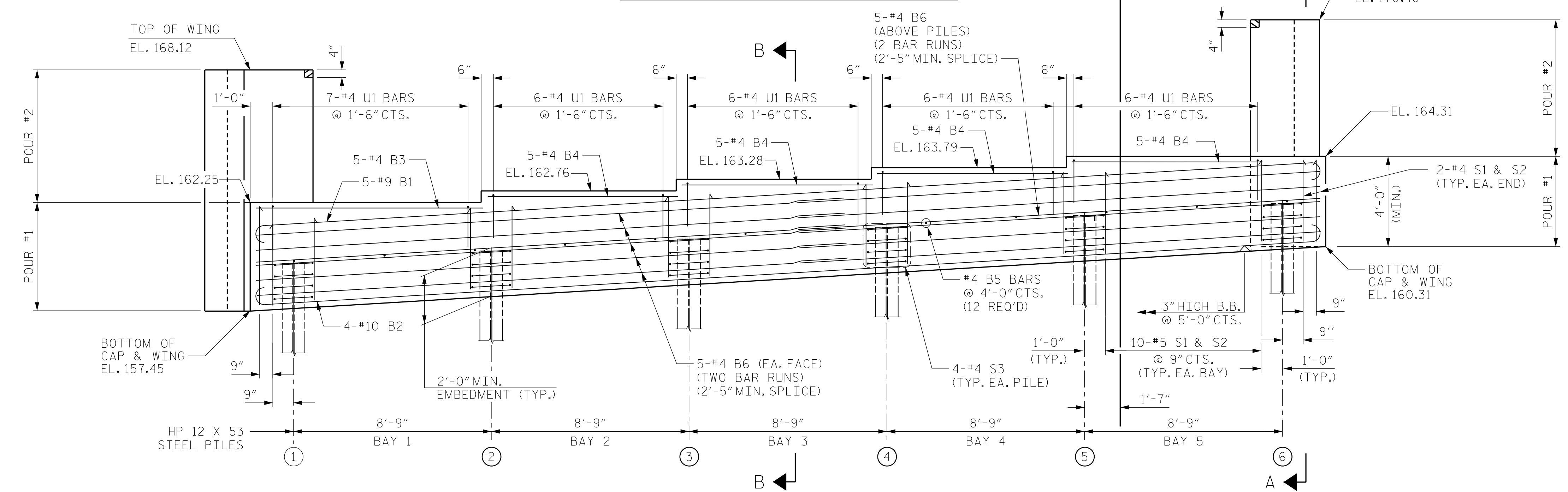
SHEET NO. S2-29				
TOTAL SHEETS 35				

**NOTES**

- THE TOP SURFACE OF THE END BENT CAP, 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 BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR SECTION A-A AND B-B, SEE SHEET 3 OF 3.
- FOR PILE SPLICING DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR BEARING DETAIL, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
- FOR CONCRETE COLLAR DETAILS, SEE "CORROSION PROTECTION OF STEEL PILES DETAIL" ON SHEET 3 OF 3.



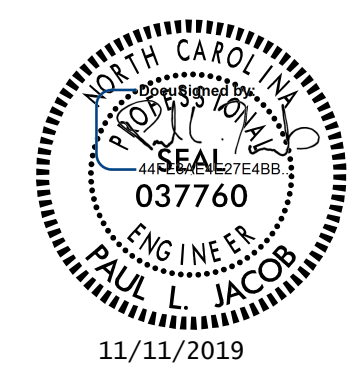
**END BENT No.2 PLAN**



**ELEVATION**

TOP OF PILE ELEVATIONS	
①	159.60
②	160.12
③	160.65
④	161.17
⑤	161.70
⑥	162.22

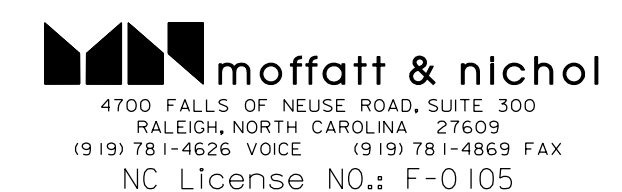
PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL END BENT No. 2 PLAN**  
 (LEFT LANE)

DRAWN BY : J. WEIGER DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

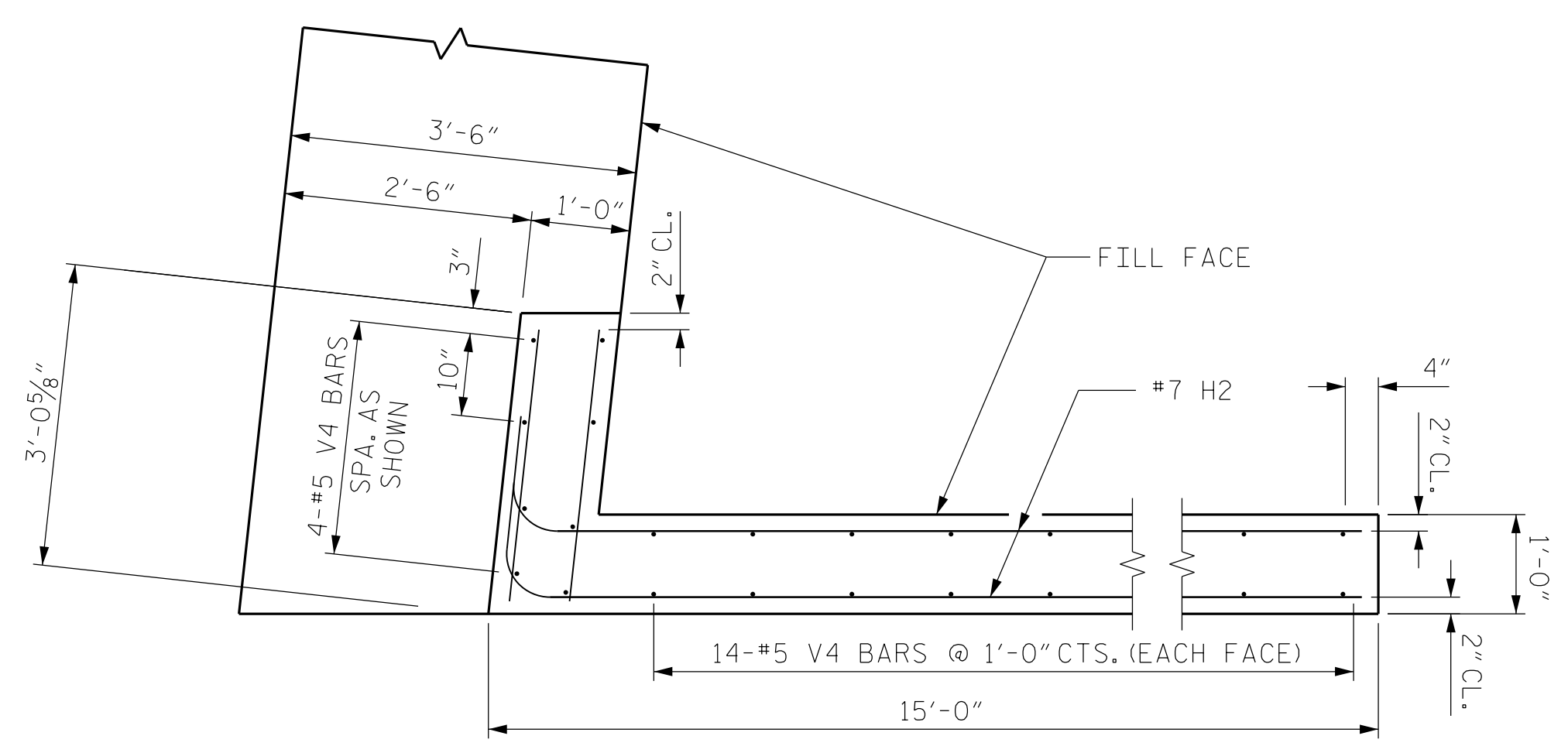
CONCRETE COLLARS NOT SHOWN FOR CLARITY  
 V1 BARS NOT SHOWN FOR CLARITY



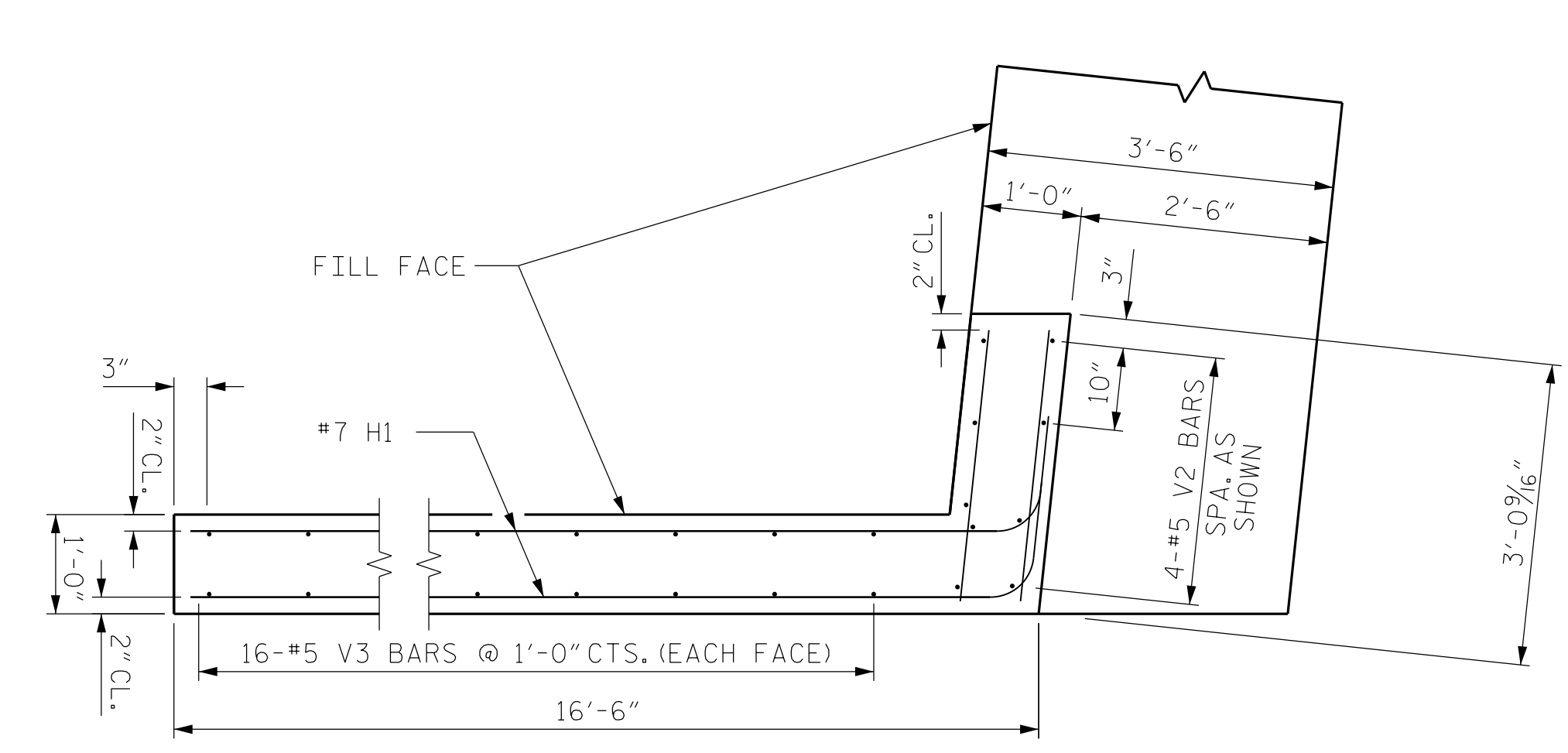
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-30
1			3			TOTAL SHEETS
2			4			35

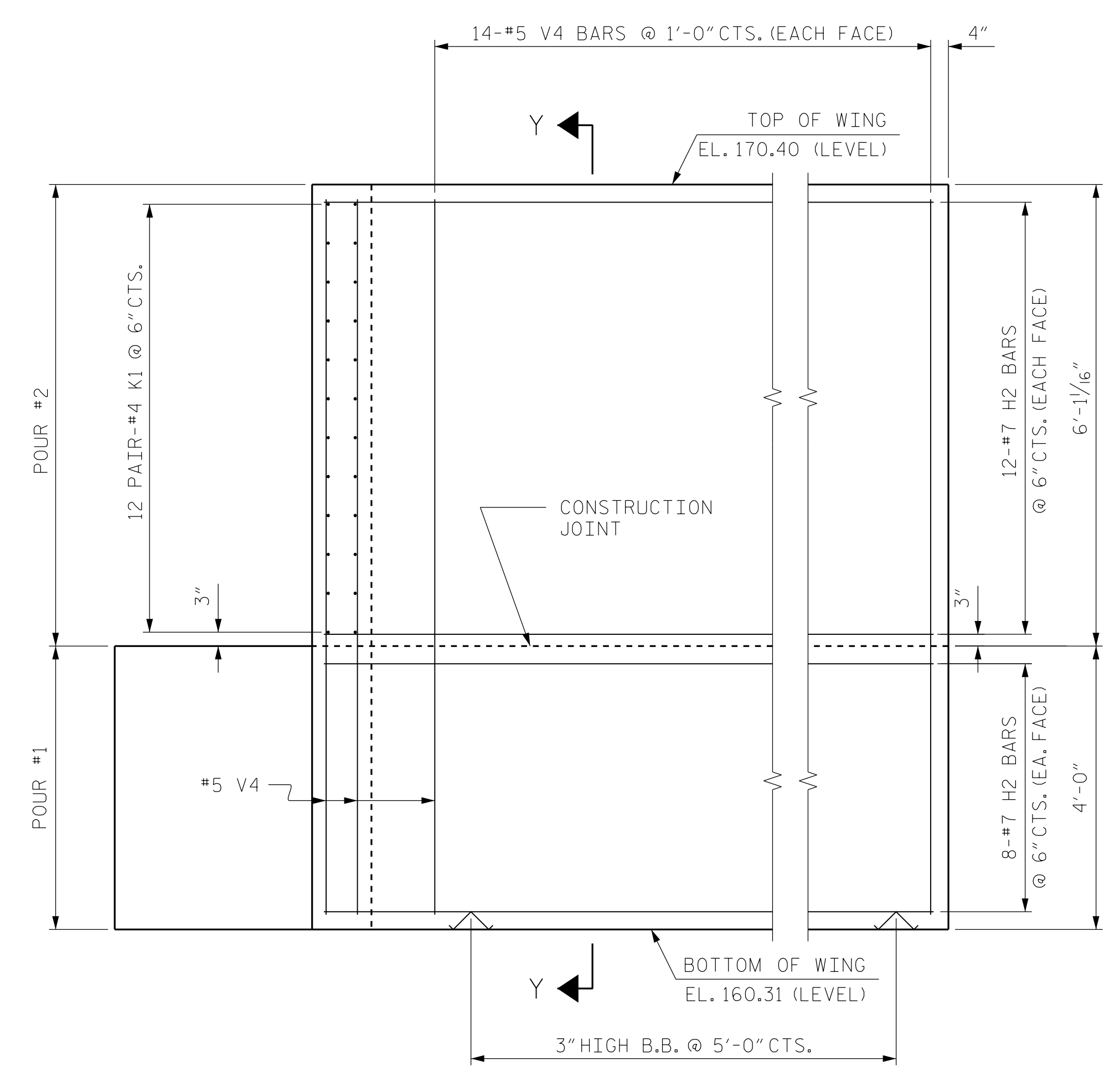
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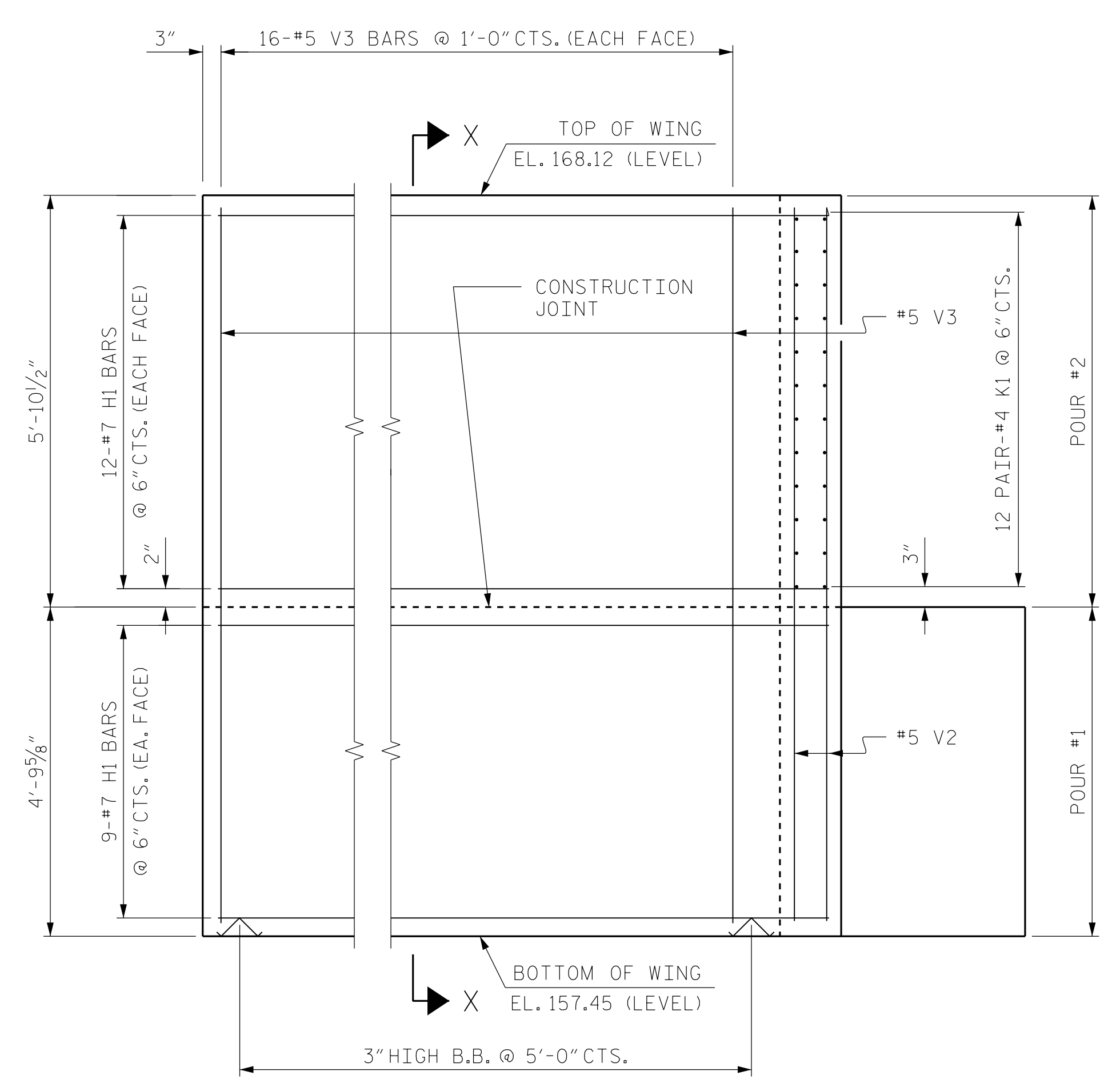
PLAN OF WING (W3)



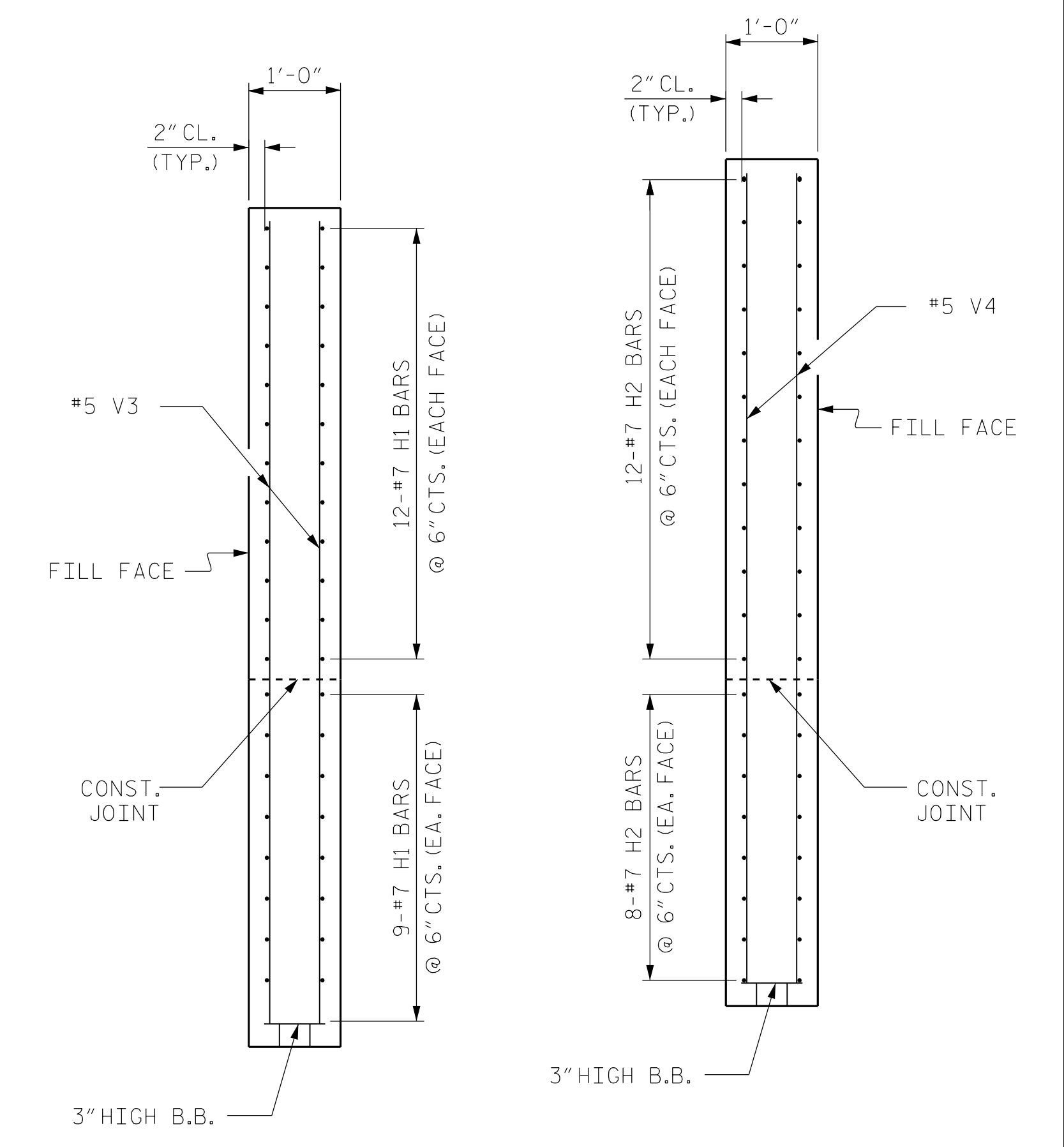
PLAN OF WING (W4)



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

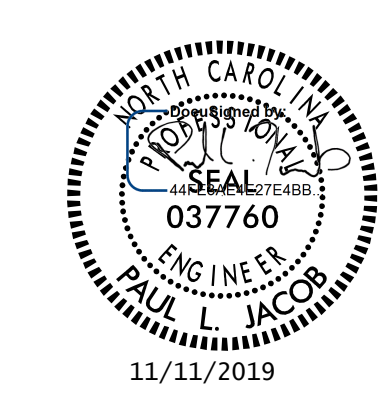


SECTION X-X

SECTION Y-Y

TITLE TEXT

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-  
SHEET 2 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
INTEGRAL END BENT  
No. 2 WING DETAILS  
(LEFT LANE)

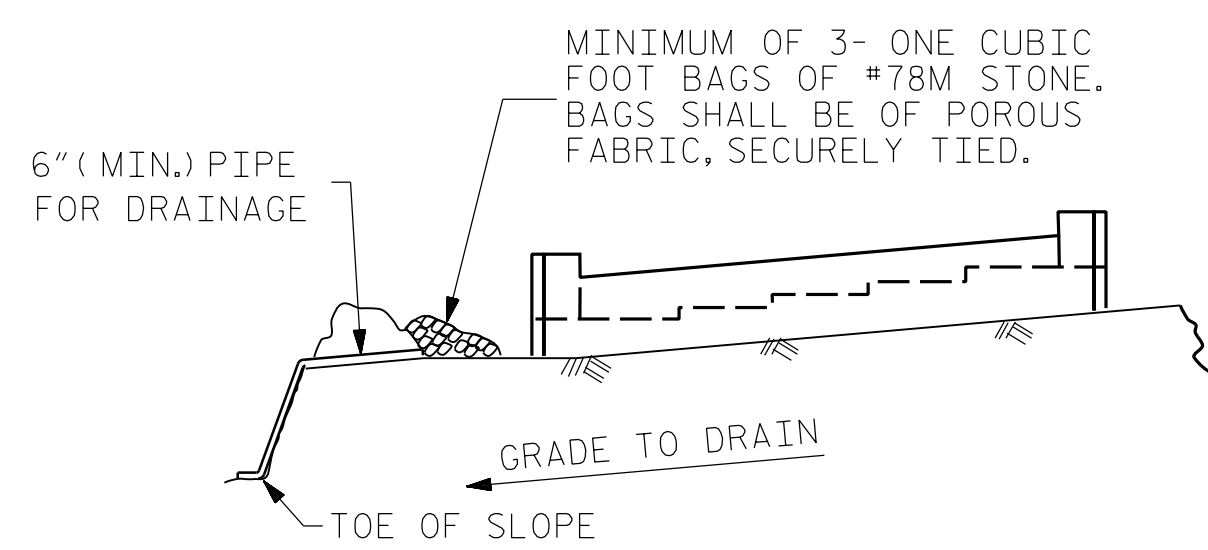
DRAWN BY : J. WEIGER DATE : 08/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD : P. JACOB DATE : 09/2019

WING DETAILS

moffatt & nichol  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License NO.: F-0105

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
2			4			35

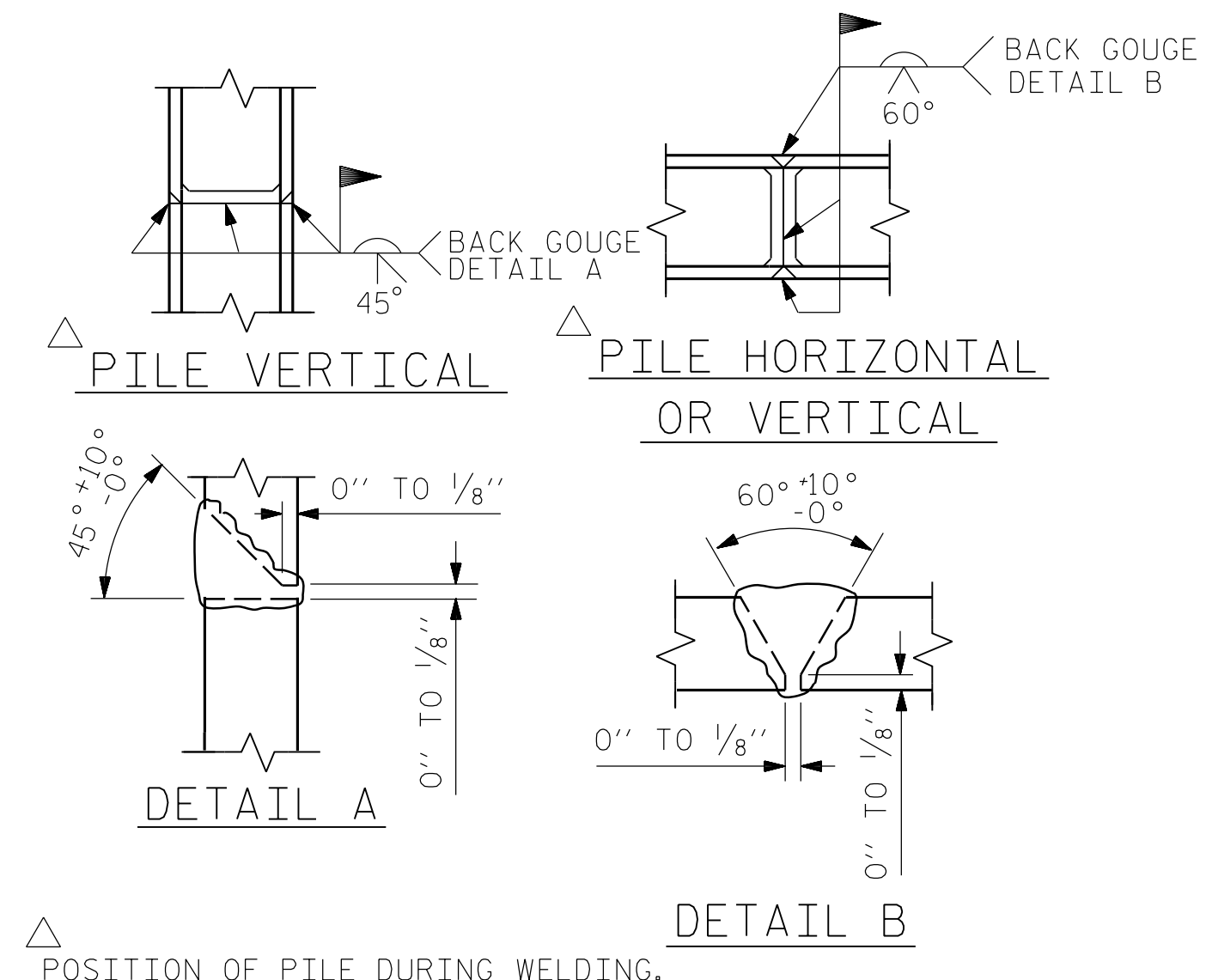
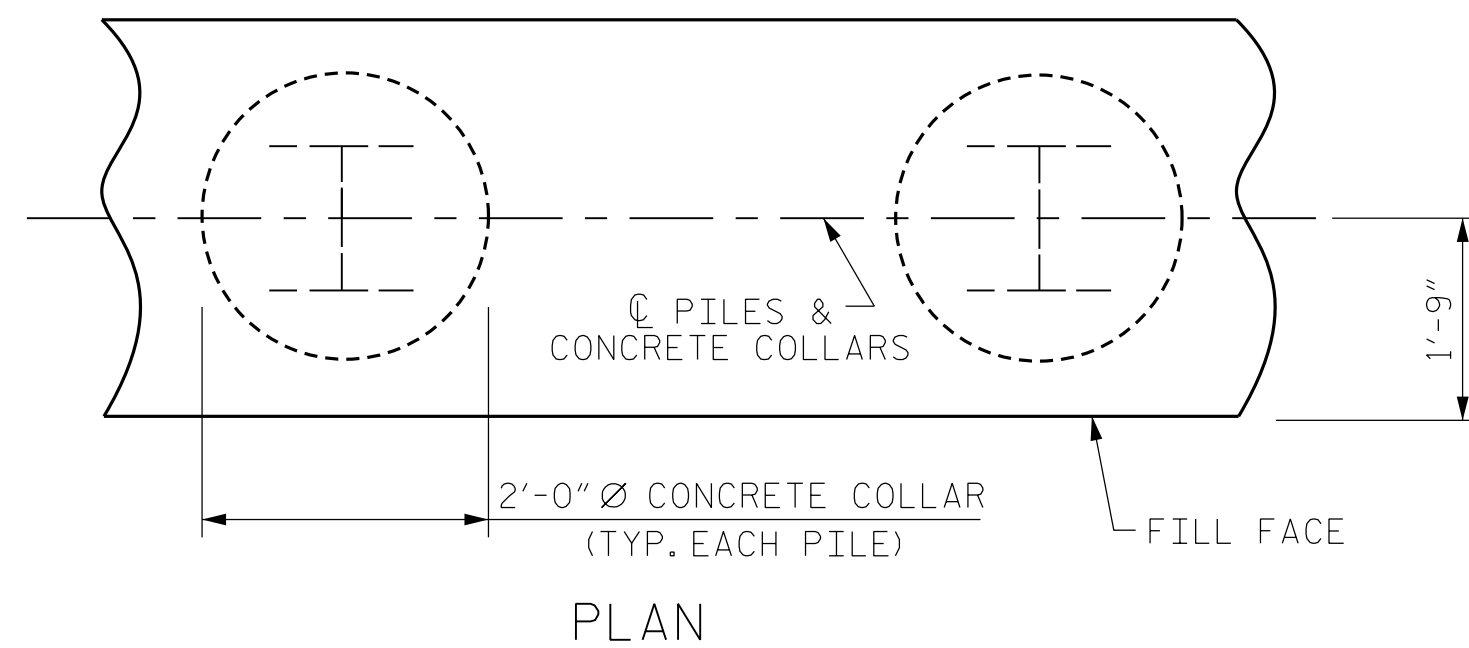


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

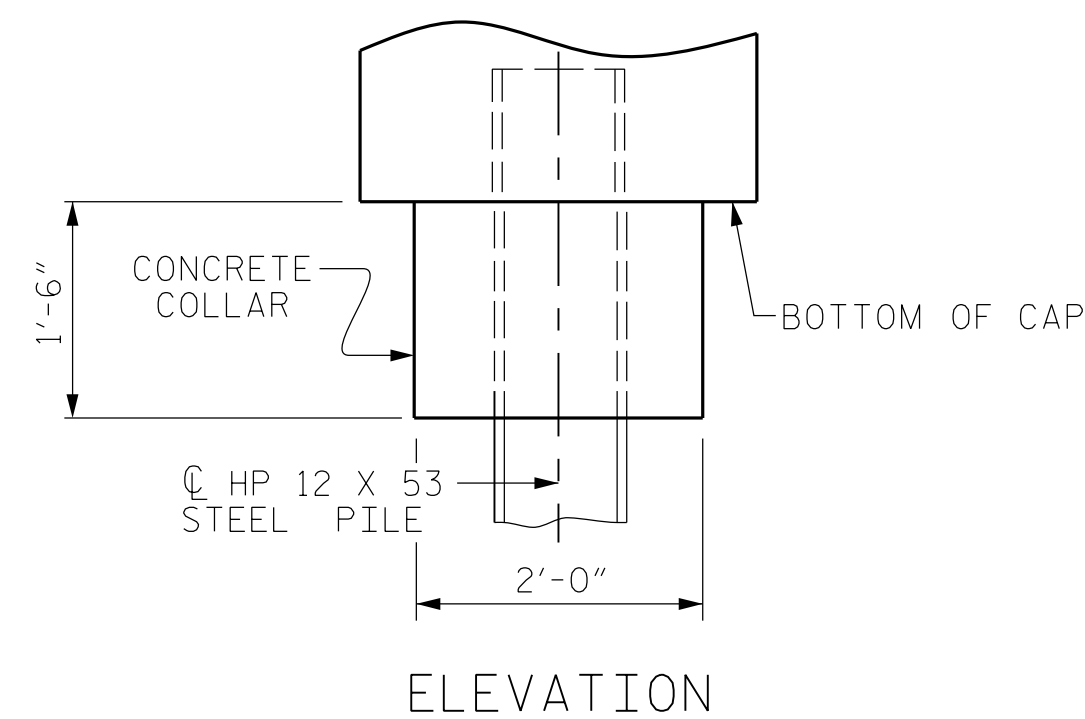
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

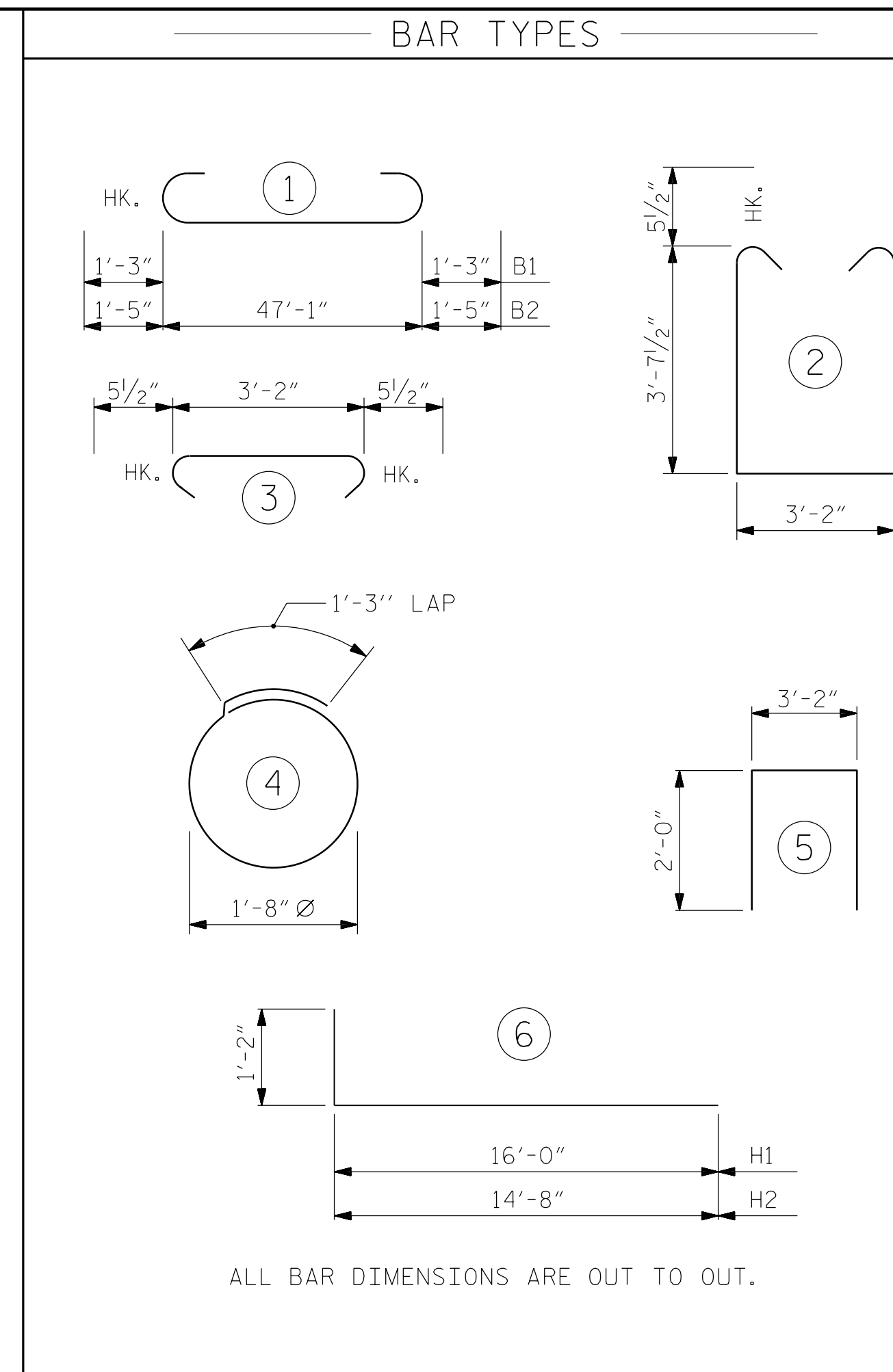
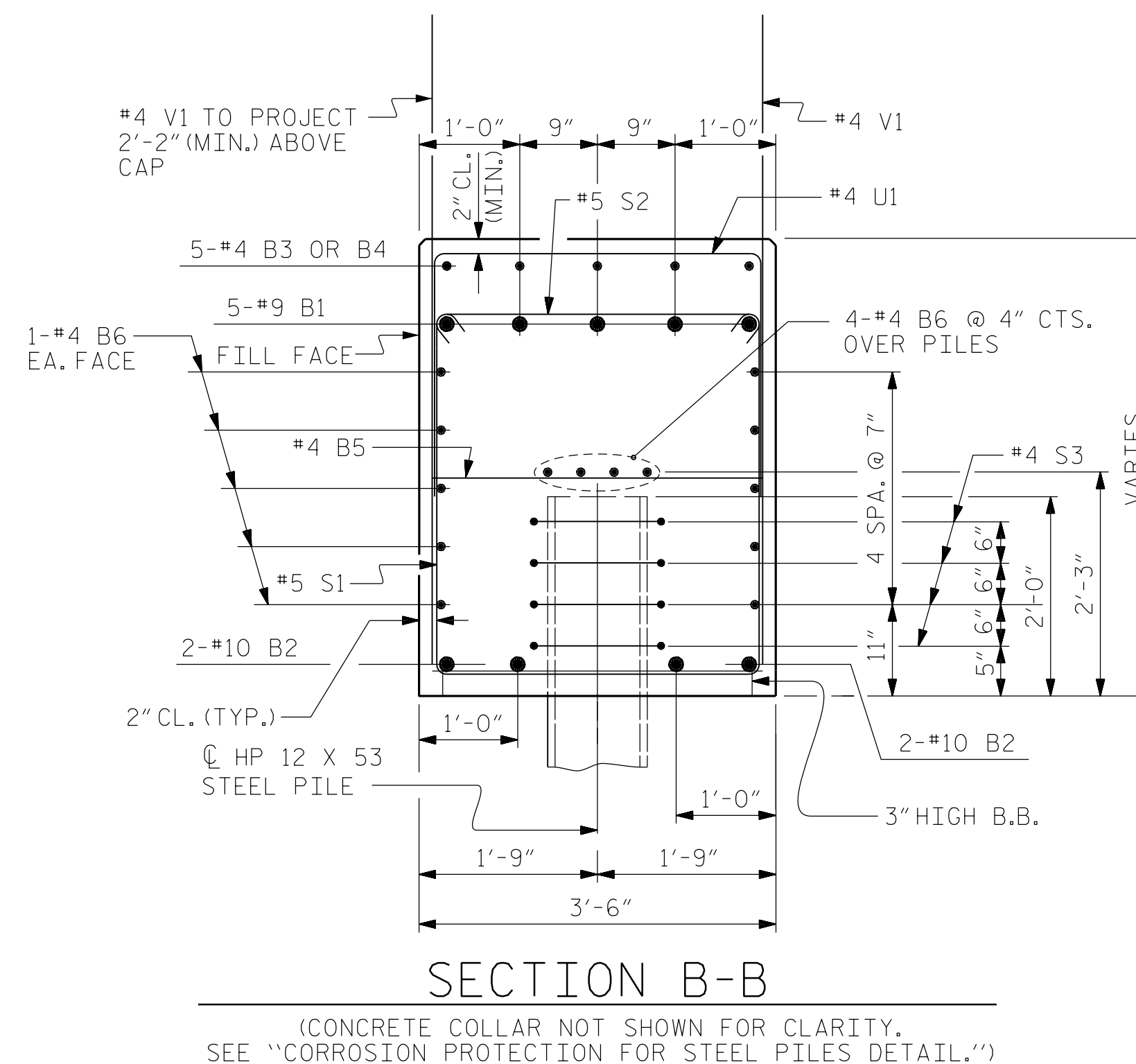
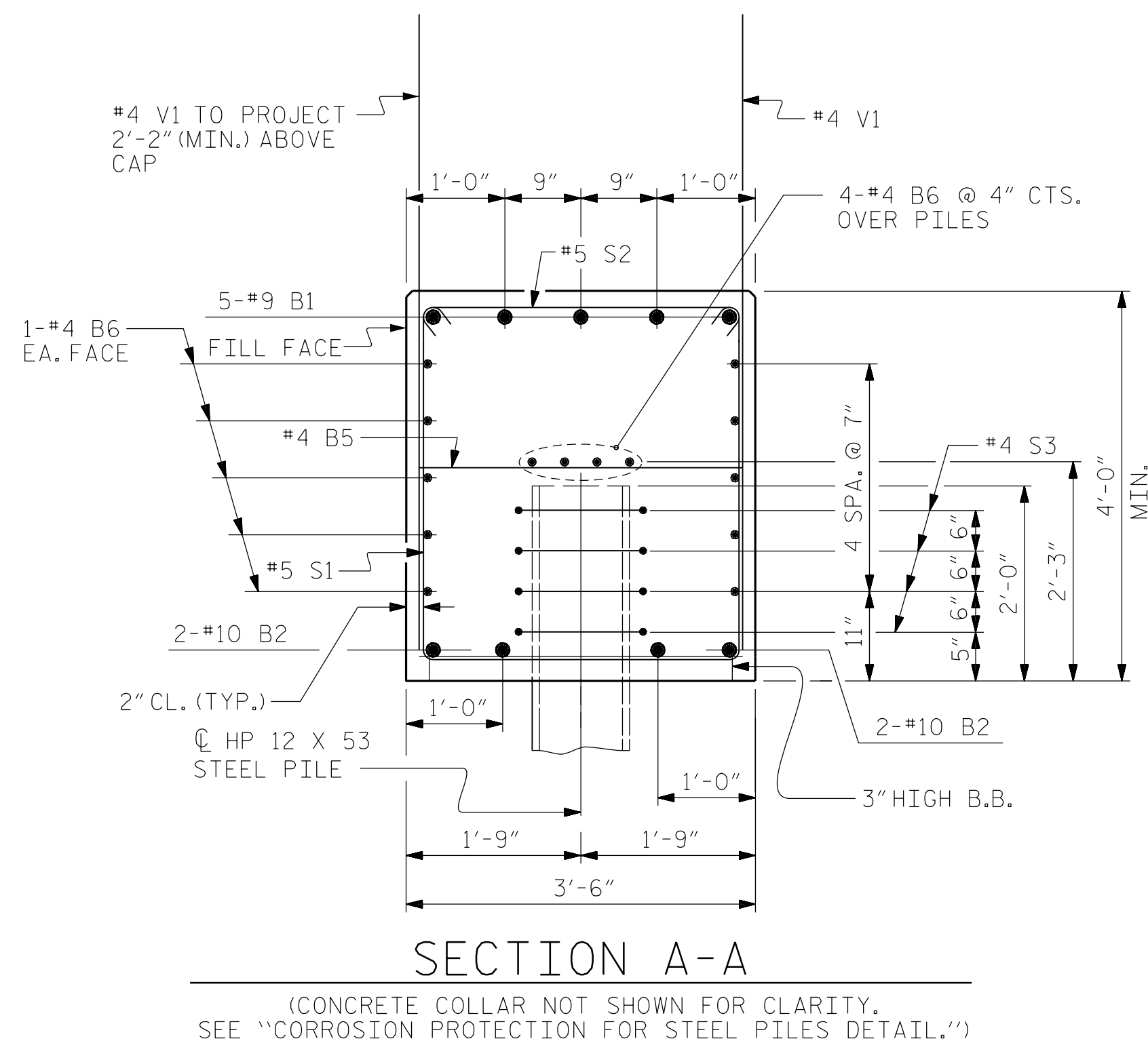
### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

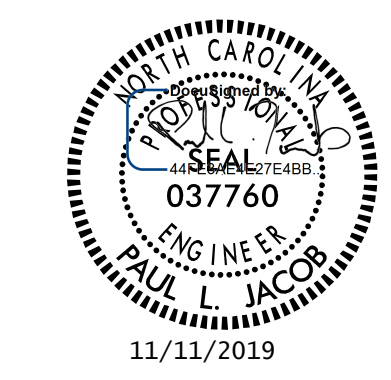


### CORROSION PROTECTION FOR STEEL PILES DETAIL



BILL OF MATERIAL					
END BENT No.2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	49'-7"	843
B2	4	#10	1	49'-11"	859
B3	5	#4	STR	10'-0"	33
B4	20	#4	STR	8'-5"	112
B5	12	#4	STR	3'-2"	25
B6	28	#4	STR	24'-10"	464
H1	42	#7	6	17'-2"	1474
H2	40	#7	6	15'-10"	1295
K1	50	#4	STR	2'-8"	89
S1	54	#5	2	11'-4"	638
S2	54	#5	3	4'-1"	230
S3	24	#4	4	6'-6"	104
U1	31	#4	5	7'-2"	148
V1	68	#4	STR	6'-5"	291
V2	8	#5	STR	10'-0"	83
V3	32	#5	STR	10'-3"	342
V4	36	#5	STR	9'-8"	363
REINFORCING STEEL (FOR END BENT)					7393 LBS.
CLASS A CONCRETE					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					33.2 C.Y.
POUR #2 UPPER PART OF WINGS					7.9 C.Y.
TOTAL					41.1 C.Y.
HP 12 X 53 STEEL PILES NO: 6					LIN. FT. = 480
PILE REDRIVES					3 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					6 EA.

PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 33+47.21 -L-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**INTEGRAL END BENT No. 2 DETAILS**  
 (LEFT LANE)

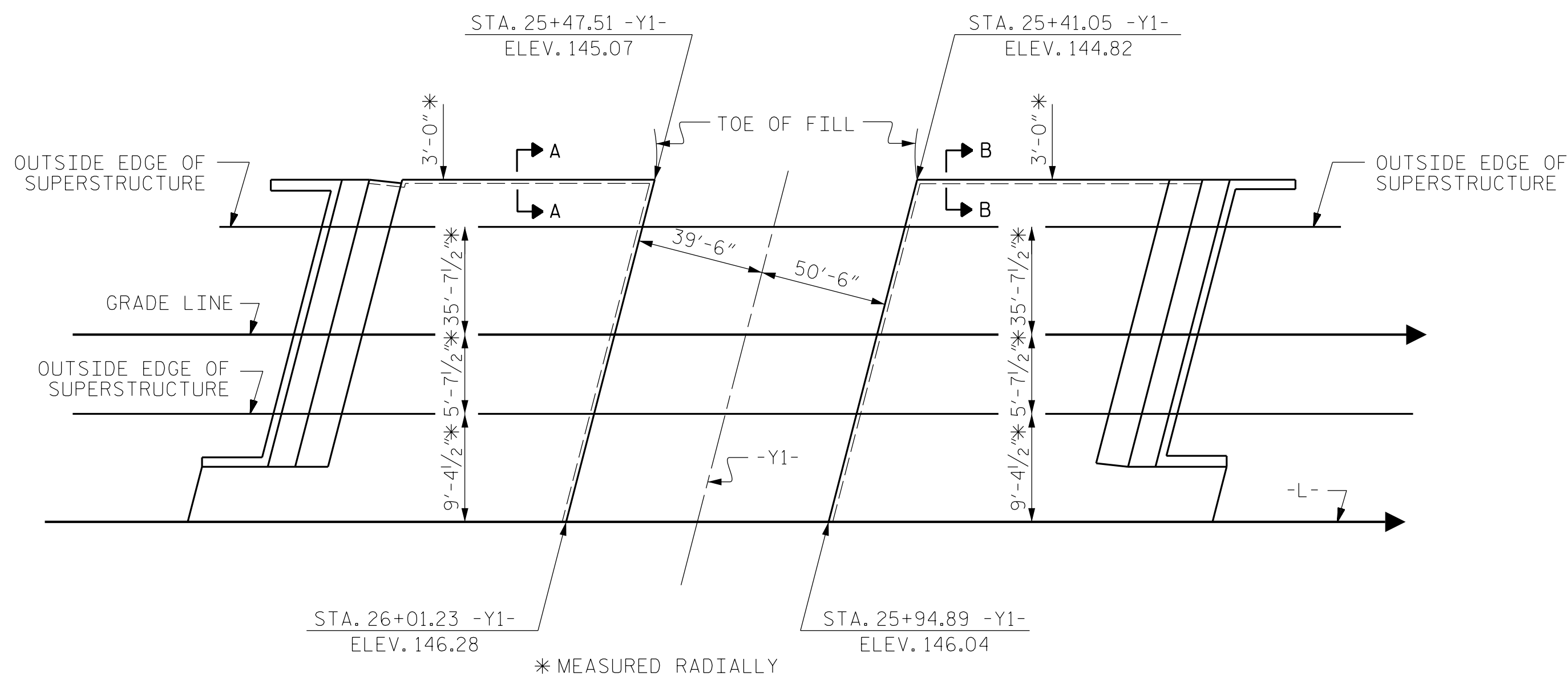
DRAWN BY : J. WEIGER DATE : 08/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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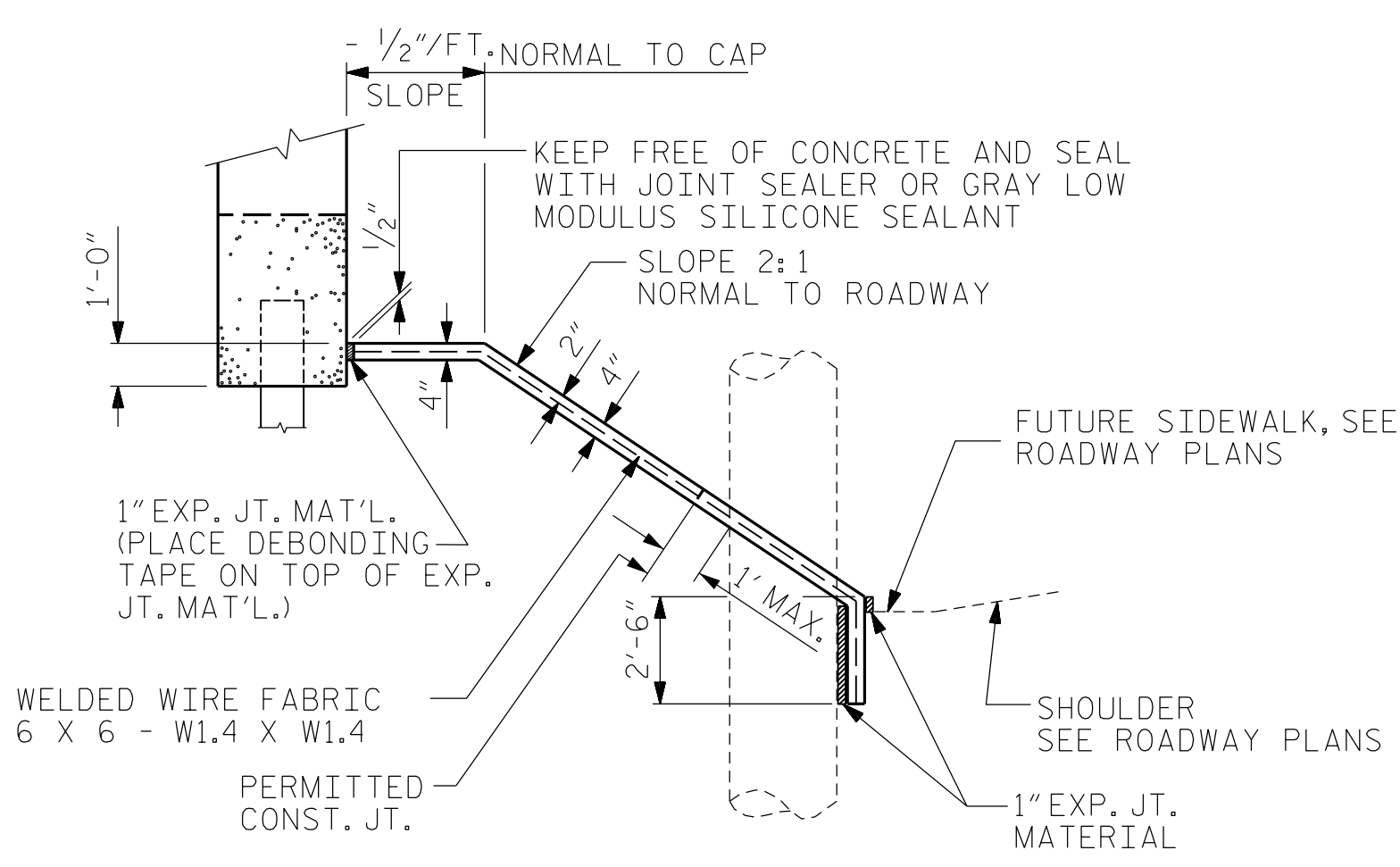
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			35
2			4			

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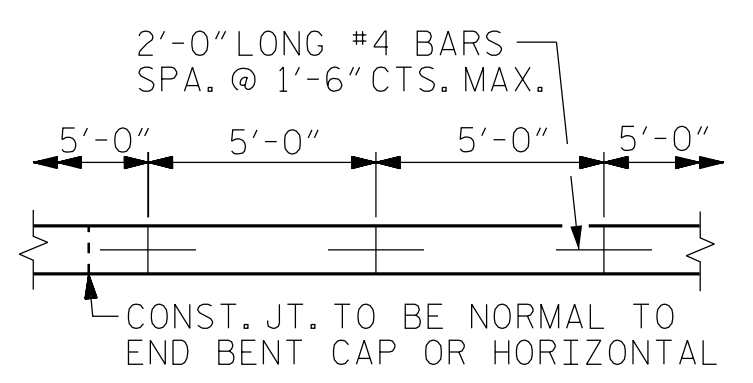
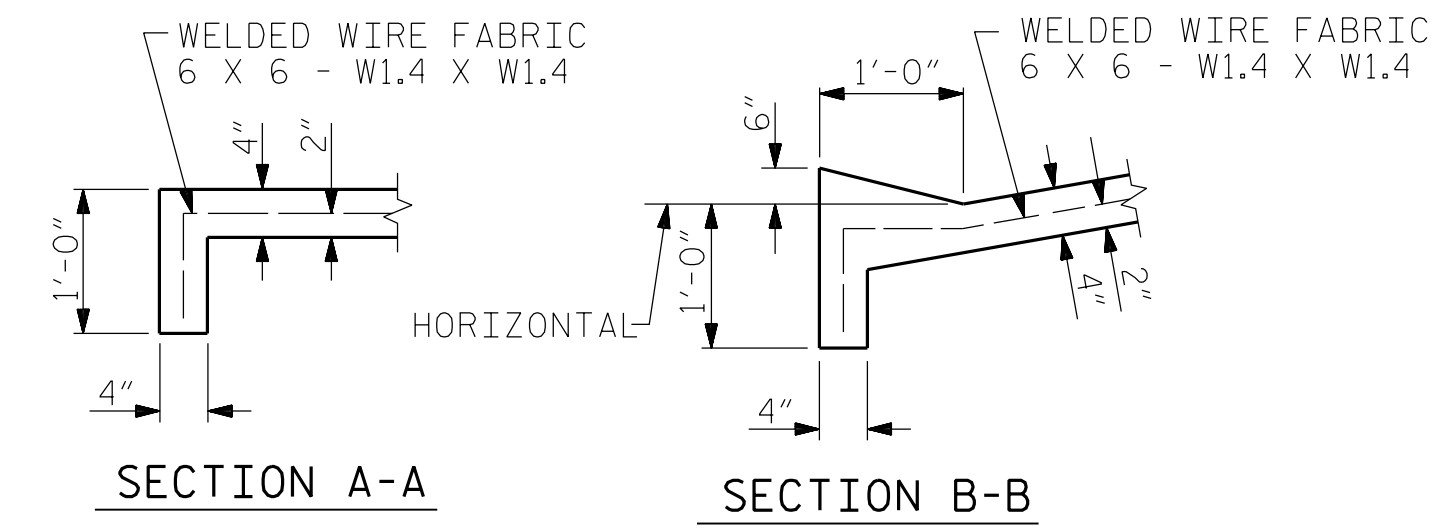


PLAN

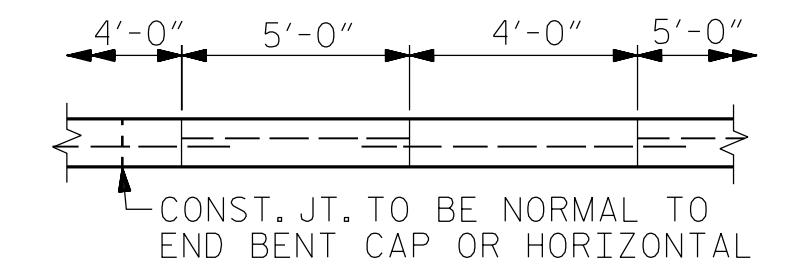


SECTION ALONG C SURVEY WITH SHOULDER PIER

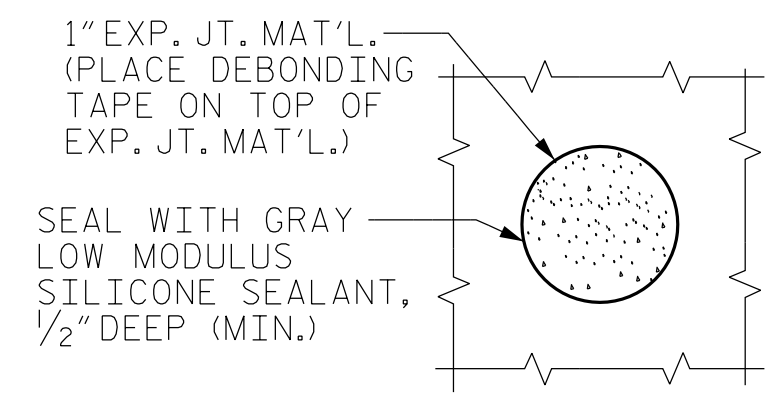
DETAILS FOR ALTERNATE "A"



POURING DETAIL



OPTIONAL POURING DETAIL



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

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. 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.

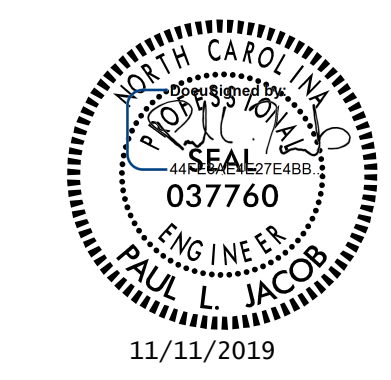
ALTERNATE "A"

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

BRIDGE @ STA. 33+47.21 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	199	435
END BENT 2	216	470

\* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

**SLOPE PROTECTION  
 DETAILS**  
 (LEFT LANE)

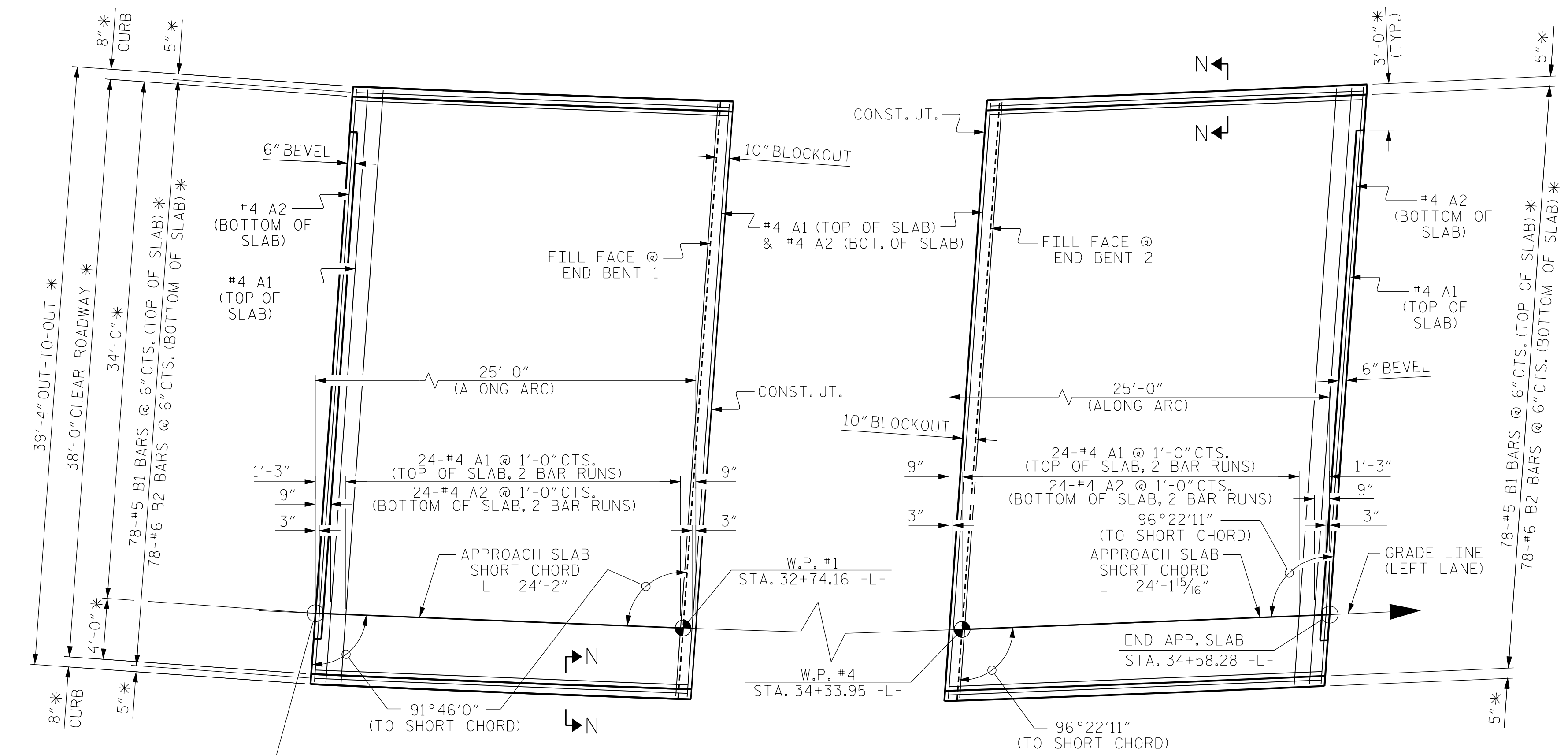
ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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 NC License NO.: F-0105

DOCUMENT NOT CONSIDERED  
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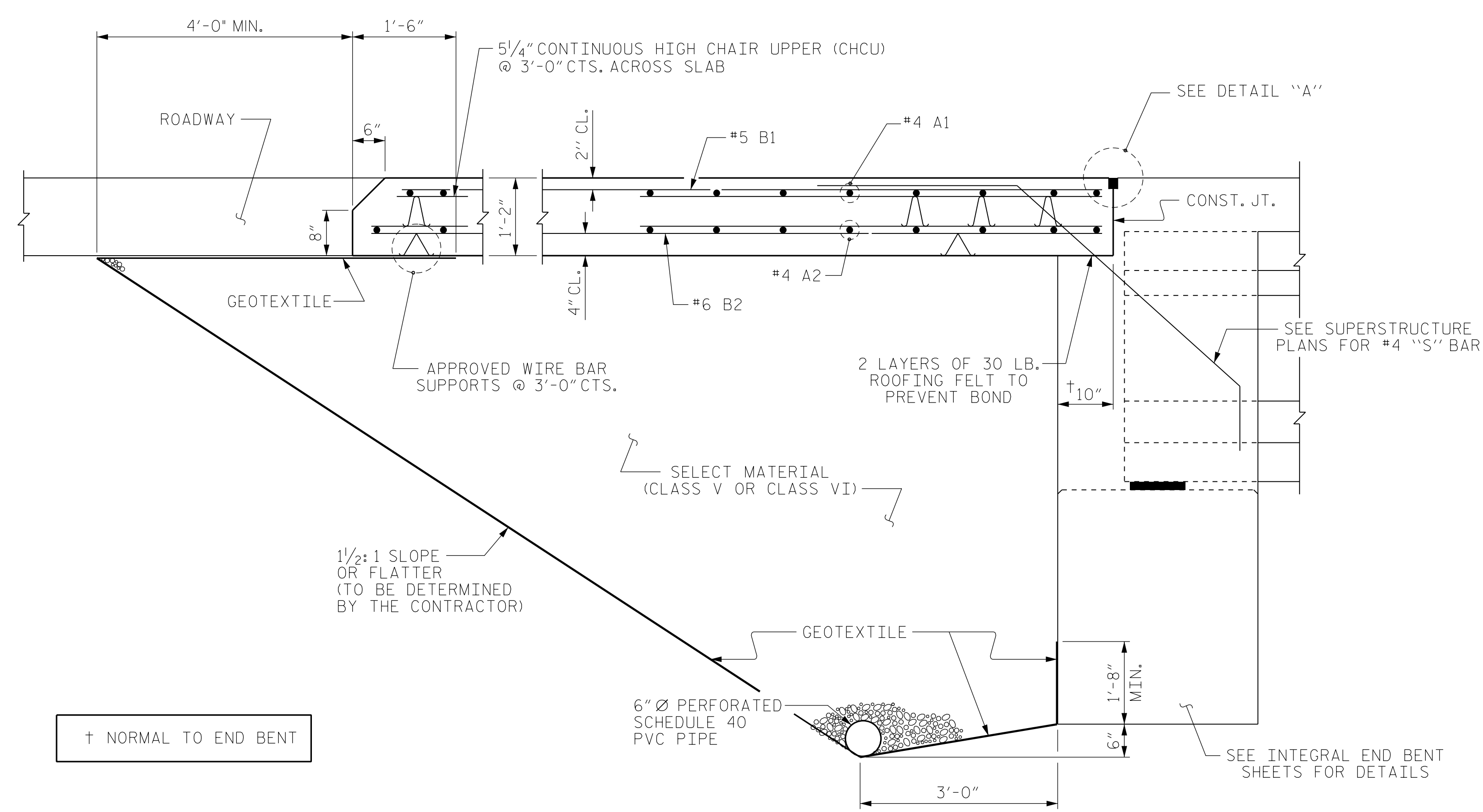
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-33
1			3			TOTAL SHEETS
2			4			35

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PLAN @ END BENT 1  
PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS  
\* DENOTES RADIAL DIMENSION



SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

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 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.

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 2 FOR DETAILS AND NOTES.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	713
* B1	78	#5	STR	24'-2"	1967
B2	78	#6	STR	24'-8"	2890

REINFORCING STEEL	3603 LBS.
* EPOXY COATED REINFORCING STEEL	2685 LBS.
CLASS AA CONCRETE	42.5 C. Y.

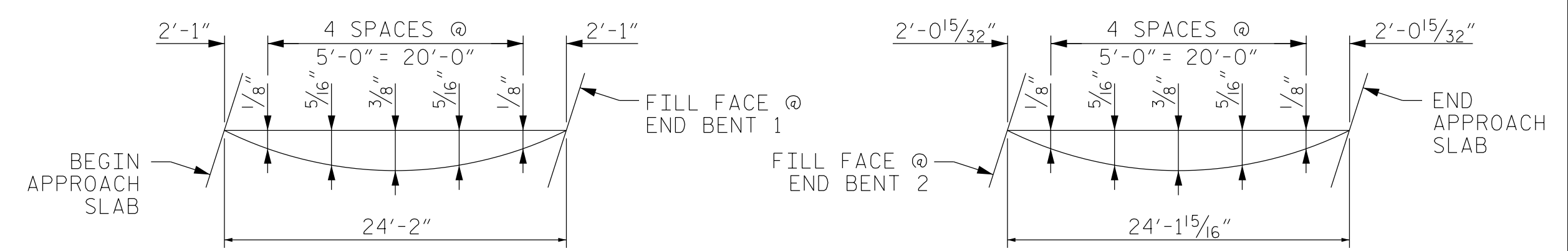
SPLICE LENGTHS

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



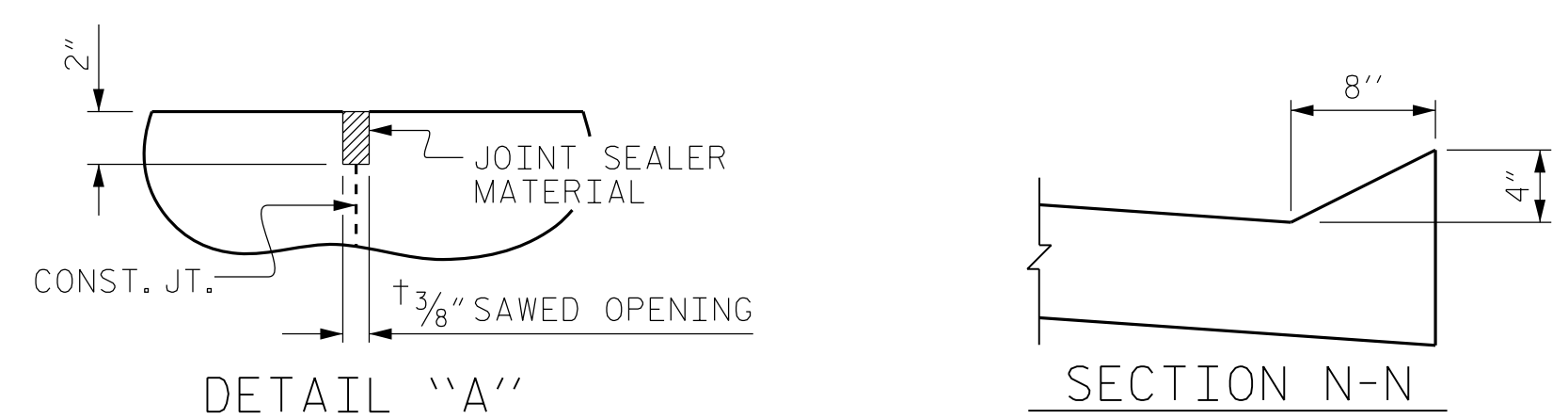
LEFT EDGE OF SLAB ARC OFFSETS  
APPROACH SLAB AT END BENT 1

LEFT EDGE OF SLAB ARC OFFSETS  
APPROACH SLAB AT END BENT 2



RIGHT EDGE OF SLAB ARC OFFSETS  
APPROACH SLAB AT END BENT 1

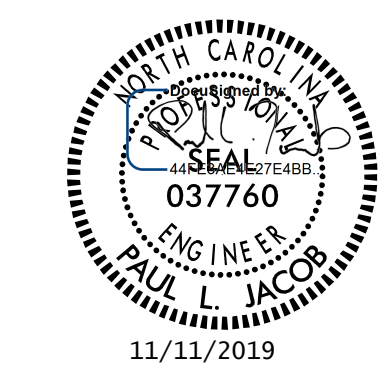
RIGHT EDGE OF SLAB ARC OFFSETS  
APPROACH SLAB AT END BENT 2



DETAIL "A"

SECTION N-N

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 33+47.21 -L-  
SHEET 1 OF 2



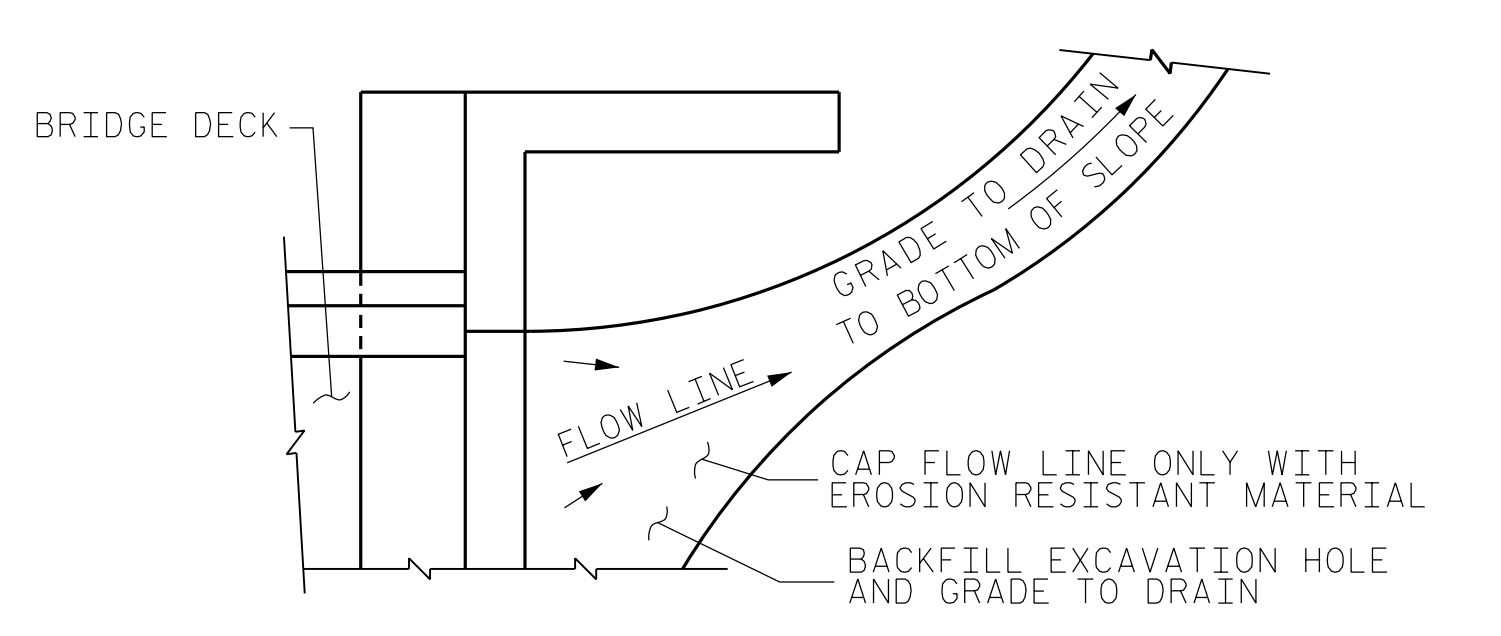
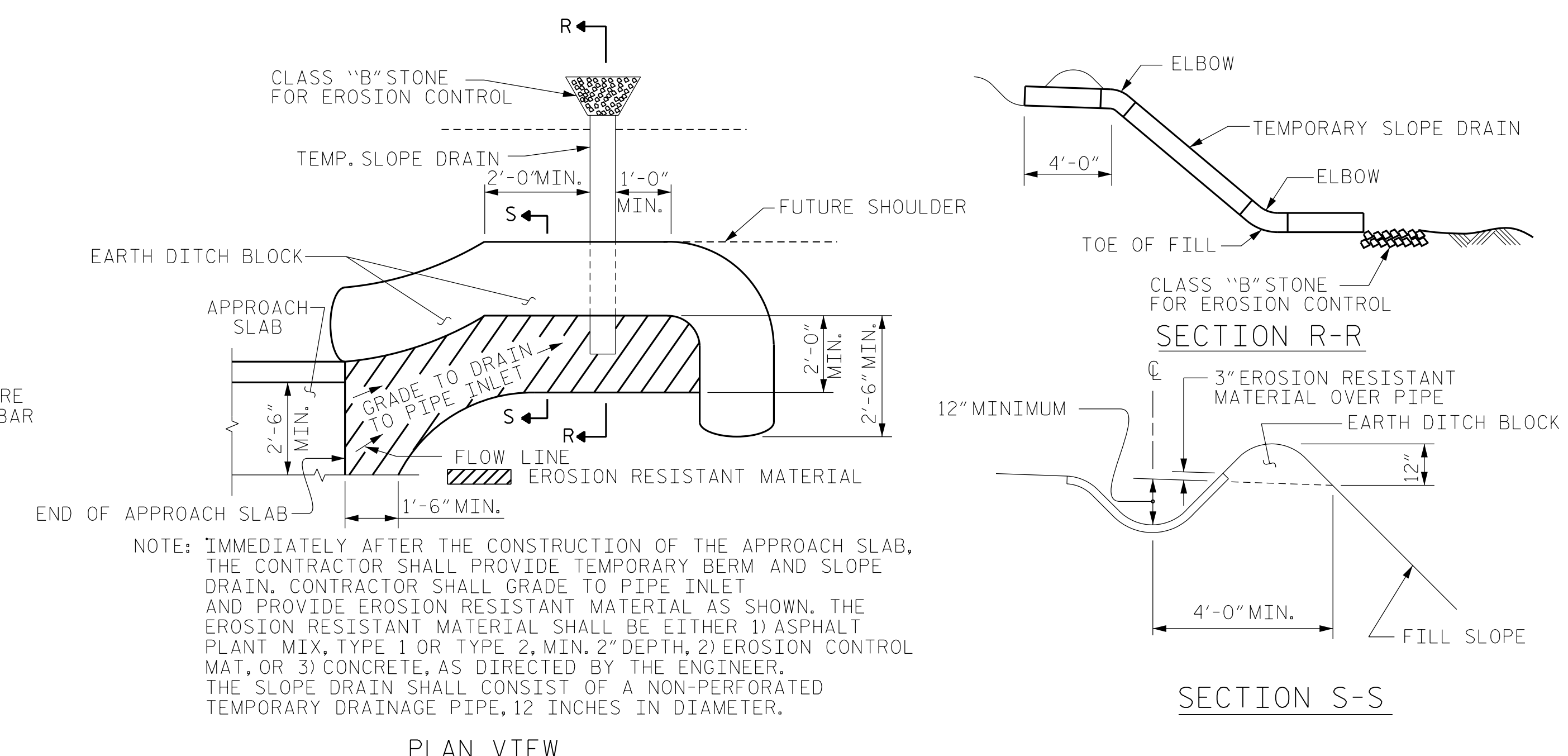
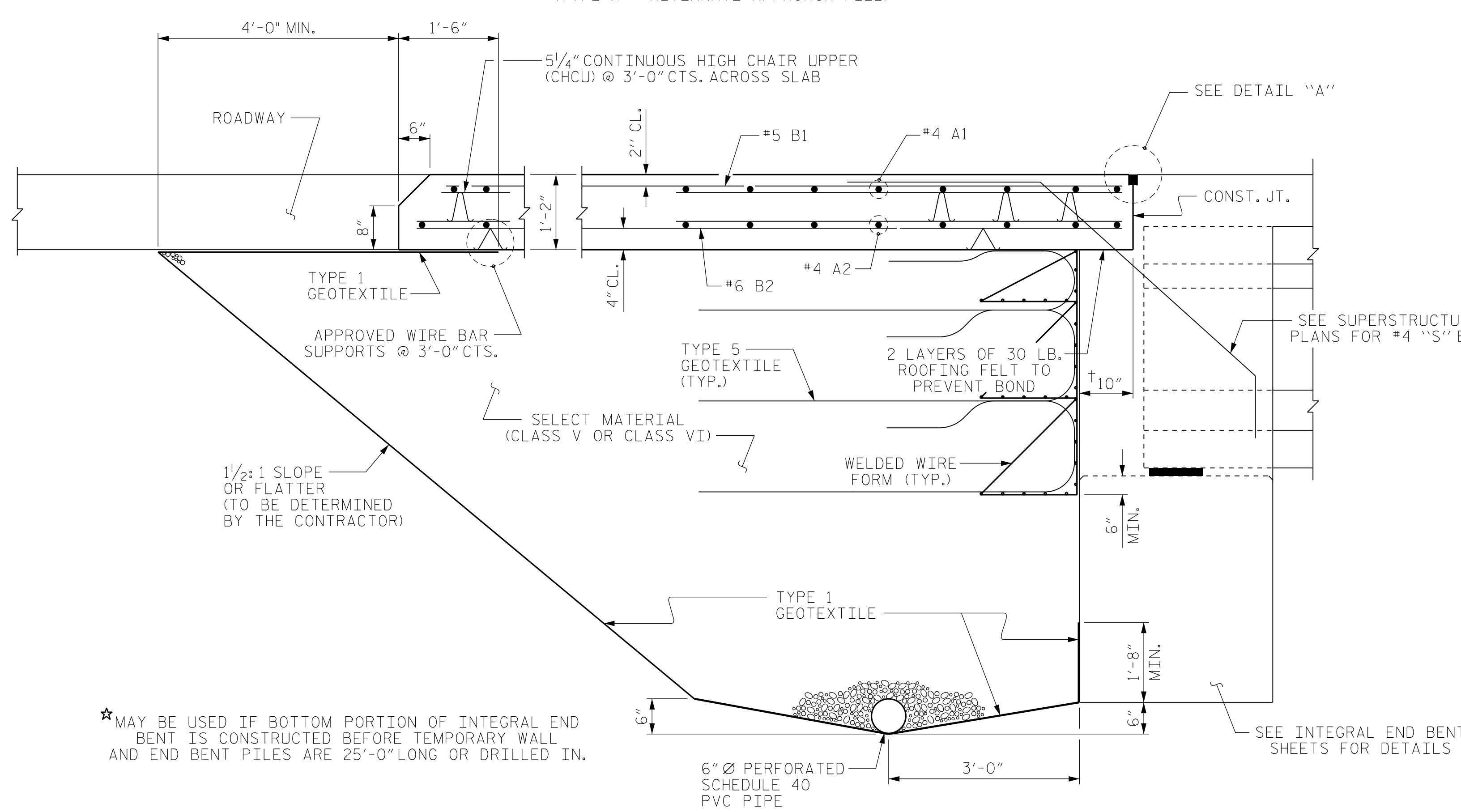
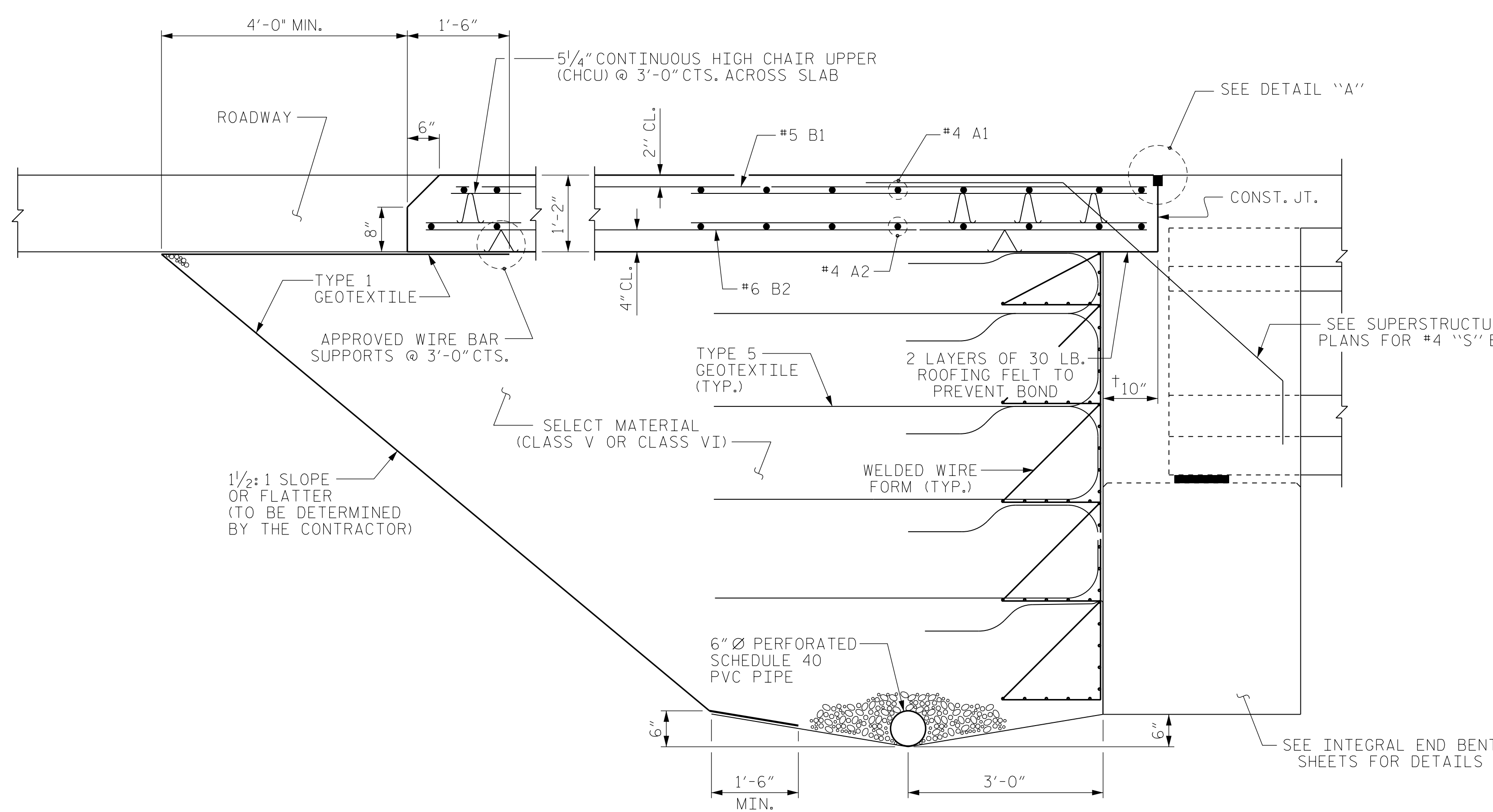
ASSEMBLED BY : J. WEIGER	DATE : 02/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : RH 5/99	REV. 6/13 MAA/GM
CHECKED BY : RDR 5/99	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

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NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S2-34
TOTAL SHEETS	35



**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 BACKFILL 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.

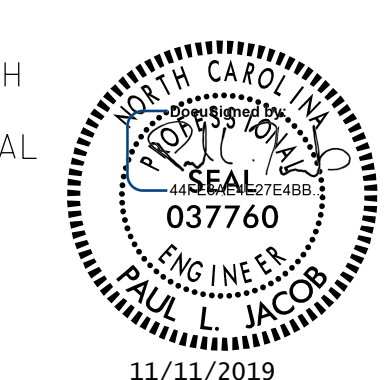
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 33+47.21 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

**BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT (LEFT LANE)**



ASSEMBLED BY : J. WEIGER	DATE : 07/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : RH 5/99	REV. 6/13 MAA/GM
CHECKED BY : RDR 5/99	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

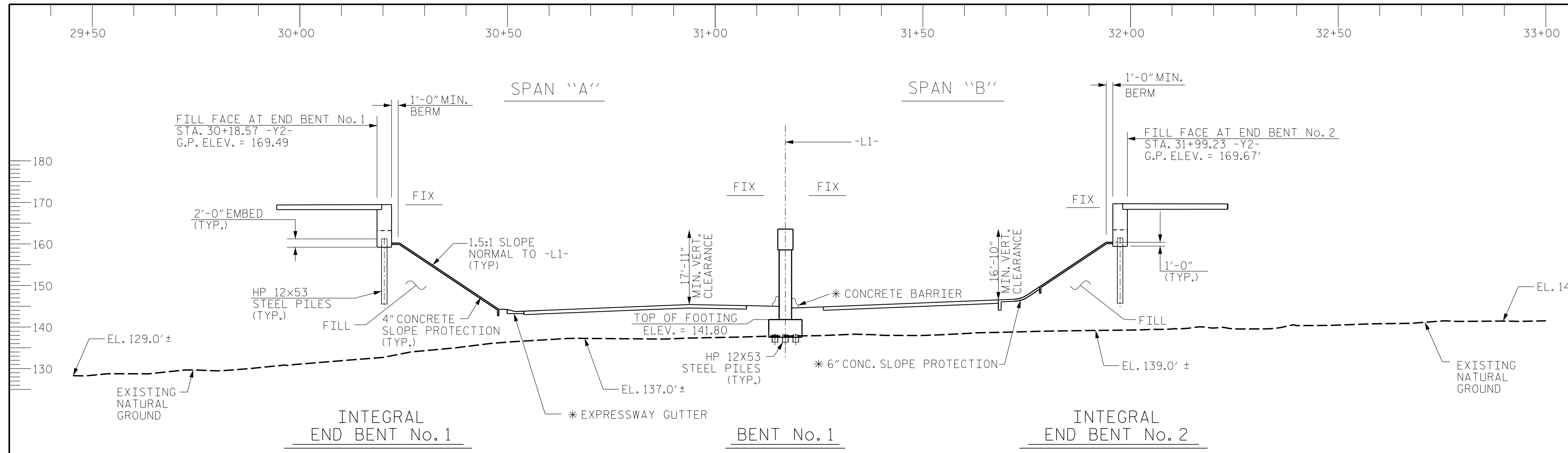
**SECTION THRU SLAB**  
 (TYPE A - ALTERNATE APPROACH FILL)

**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
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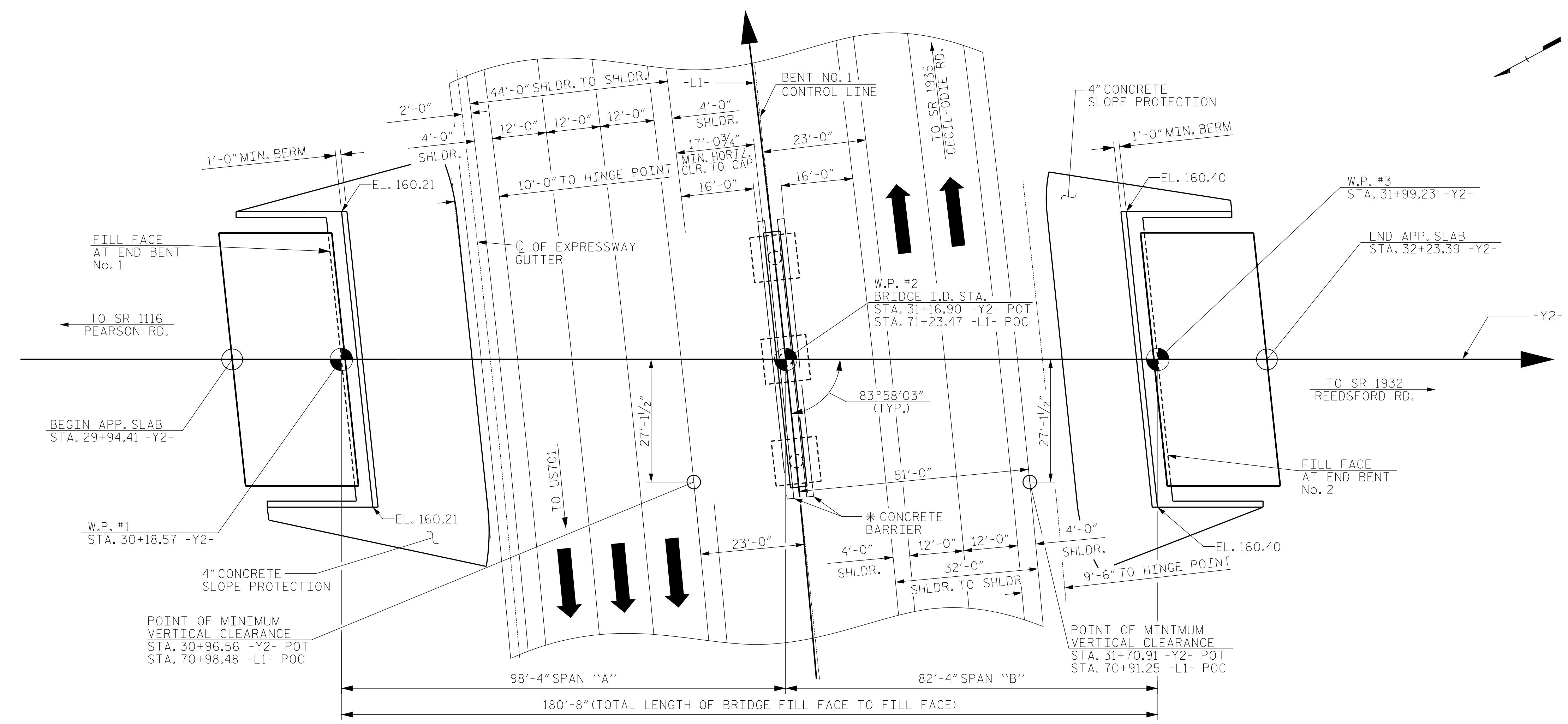
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			35
2			4			





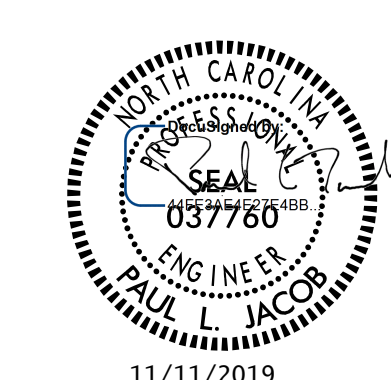
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 EL = 176.00  
 VC = 900'

**HORIZONTAL CURVE DATA FOR -L1-**  
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 Δ = 18°54'47" LT.  
 D = 1°30'28"  
 L = 1254.35'  
 T = 632.93'  
 R = 3800.00'



PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
71+23.47 -L1-  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER US 421  
 ON SR 1934 BETWEEN  
 SR 1116 AND SR 1932



DRAWN BY : J. WEIGER DATE : 04/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

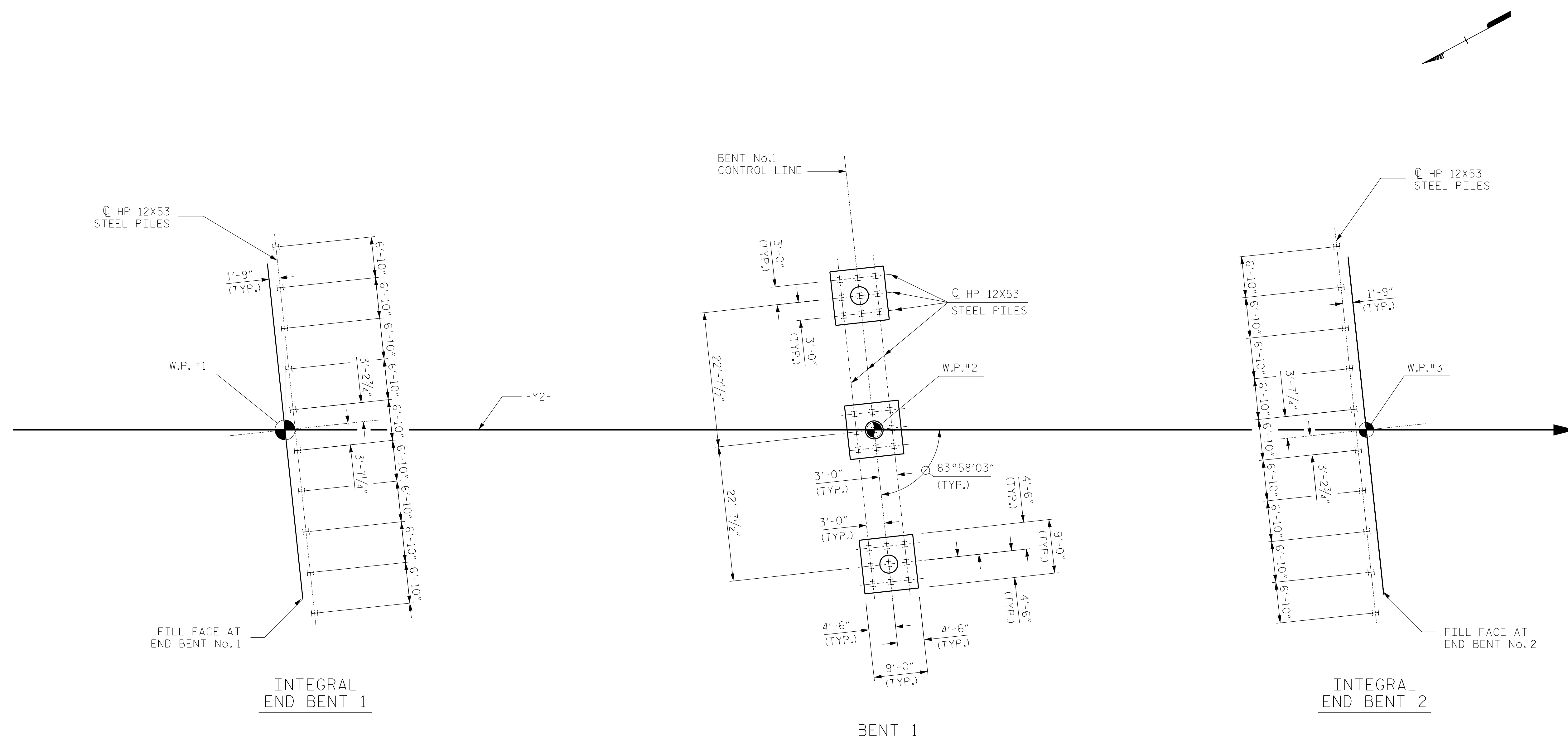
(PILES NOT SHOWN FOR CLARITY)  
 \* ROADWAY DETAIL AND PAY ITEM

**moffatt & nichol**  
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NO.	BY:	DATE:	NO.	BY:	DATE:	S3-1
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2			4			30

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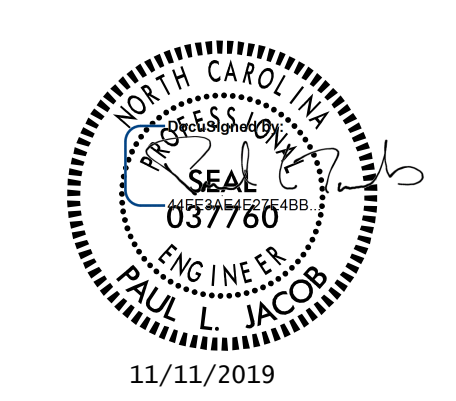


**FOUNDATION LAYOUT**

**NOTES:**

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 123 TONS PER PILE.
3. DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 205 TONS PER PILE.
4. PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 113 TONS PER PILE.
5. DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE.
6. PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
7. DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
8. TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
9. OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, IF APPLICABLE, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT NO.1 AND END BENT NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**FOUNDATION LAYOUT**

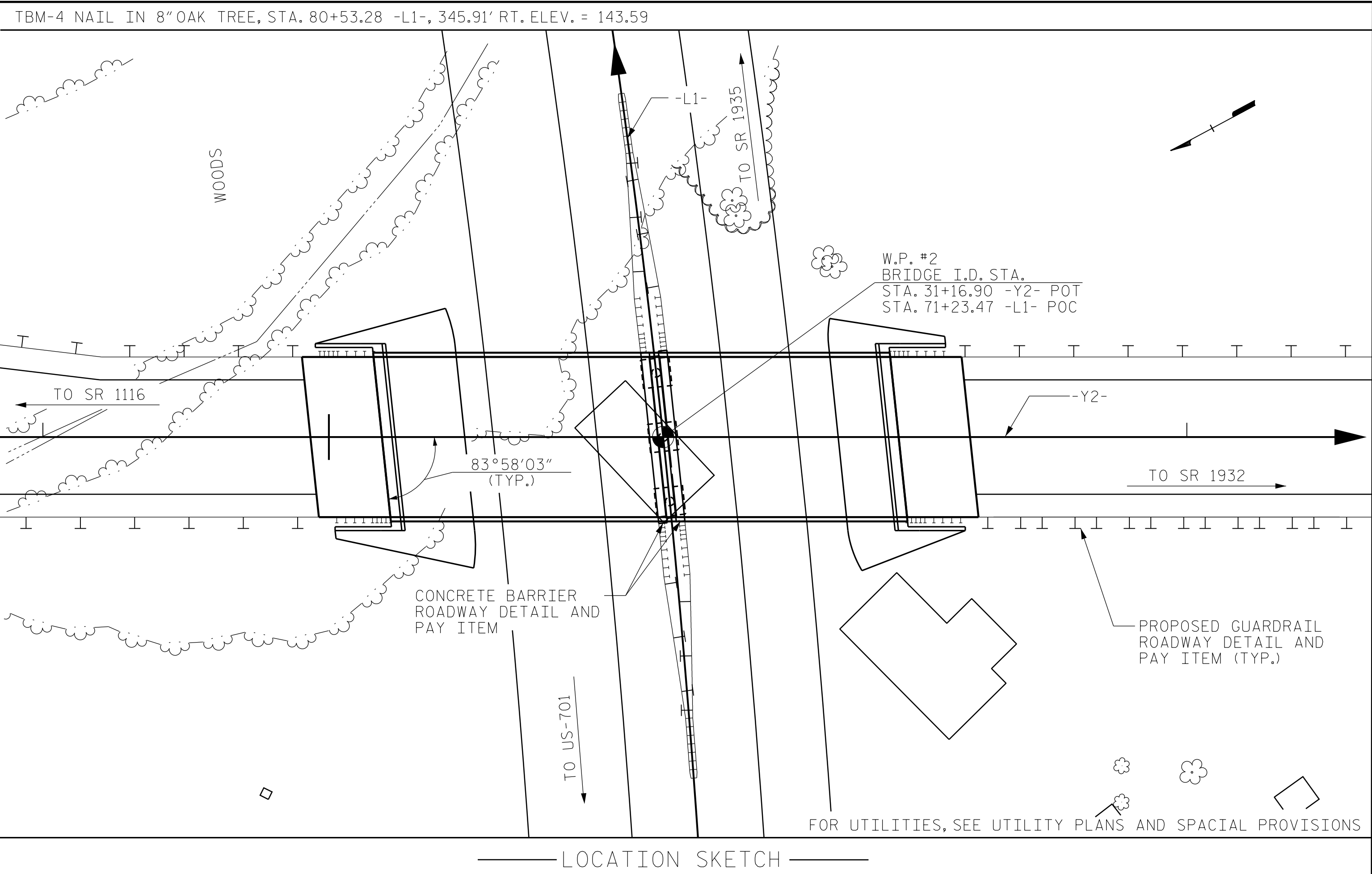
DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27603  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

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1			3			TOTAL SHEETS
2			4			30

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**NOTES**

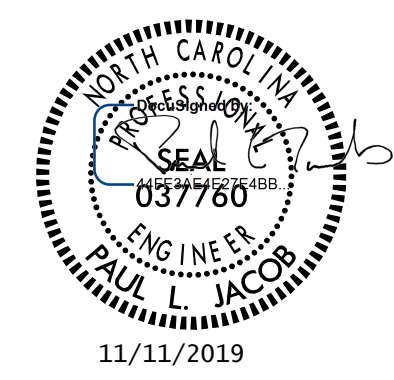
1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
4. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
5. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
6. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
8. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
9. PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-INPLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
10. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
11. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
12. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

**TOTAL BILL OF MATERIAL**

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ STA. 31+16.90 -Y2-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO. LIN.FT.	EACH	NO. LIN.FT.	EA.	LIN.FT.	SQ.YDS.	LUMP SUM
SUPERSTRUCTURE			10605	12137					12 1066.4				358		
END BENT NO.1					46.2		6167			10	10 650	5		315	
BENT NO.1	LUMP SUM				95.9		19281	1168		27	27 1620	14			
END BENT NO.2					46.2		6045			10	10 650	5		225	
<b>TOTAL</b>	LUMP SUM	1	10605	12137	188.3	LUMP SUM	31493	1168	12 1066.4	47	47 2920	24	358	540	LUMP SUM

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

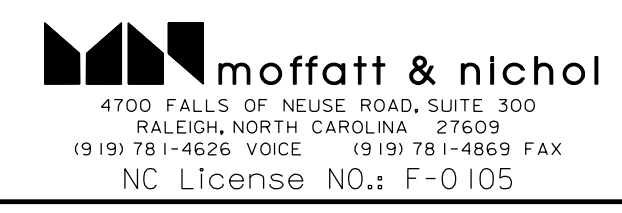
SHEET 3 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER US 421  
 ON SR 1934 BETWEEN  
 SR 1116 AND SR 1932

DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>L</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ <sub>L</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.15	--	1.75	0.85	2.16	B	EL	39.72	0.86	1.15	B	EL	7.37	0.80	0.79	1.75	A	I	47.72		
	HL-93 (OPERATING)	N/A		1.49	--	1.35	0.85	2.80	B	EL	39.72	0.86	1.49	B	EL	7.37	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	2.39	86.04	1.75	0.85	2.86	B	EL	39.72	1.01	2.65	A	I	76.78	0.80	0.79	2.39	A	I	47.72		
	HS-20 (OPERATING)	36.000		3.47	124.92	1.35	0.85	3.70	B	EL	39.72	1.01	3.47	A	I	76.78	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.57	75.19	1.40	0.85	8.13	B	EL	39.72	1.01	8.79	B	I	15.46	0.80	0.79	5.57	A	I	47.72	
		SNGARBS2	20.000		4.06	81.20	1.40	0.85	6.00	B	EL	39.72	1.01	6.14	A	I	76.78	0.80	0.79	4.06	A	I	47.72	
		SNAGRIS2	22.000		3.80	83.60	1.40	0.85	5.65	B	EL	39.72	1.01	5.66	A	I	76.78	0.80	0.79	3.80	A	I	47.72	
		SNCOTTS3	27.250		2.76	75.21	1.40	0.85	4.02	B	EL	39.72	1.01	4.27	B	I	15.46	0.80	0.79	2.76	A	I	47.72	
		SNAGGRS4	34.925		2.28	79.62	1.40	0.85	3.36	B	EL	39.72	1.01	3.36	A	I	76.78	0.80	0.79	2.28	A	I	47.72	
		SNS5A	35.550		2.25	79.98	1.40	0.85	3.30	B	EL	39.72	1.01	3.37	A	I	76.78	0.80	0.79	2.25	A	I	47.72	
		SNS6A	39.950		2.05	81.89	1.40	0.85	3.02	B	EL	47.81	1.01	3.05	A	I	76.78	0.80	0.79	2.05	A	I	47.72	
		SNS7B	42.000		1.95	81.90	1.40	0.85	2.88	B	EL	39.72	1.01	2.96	A	I	76.78	0.80	0.79	1.95	A	I	47.72	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.50	82.50	1.40	0.85	3.70	B	EL	39.72	1.01	3.62	A	I	76.78	0.80	0.79	2.50	A	I	47.72	
		TNT4A	33.075		2.49	82.35	1.40	0.85	3.68	B	EL	47.81	1.01	3.78	A	I	76.78	0.80	0.79	2.49	A	I	47.72	
		TNT6A	41.600		2.03	84.44	1.40	0.85	3.02	B	EL	39.72	1.01	3.11	A	I	76.78	0.80	0.79	2.03	A	I	47.72	
		TNT7A	42.000		2.03	85.26	1.40	0.85	3.03	B	EL	47.81	1.01	3.06	A	I	76.78	0.80	0.79	2.03	A	I	47.72	
		TNT7B	42.000		2.07	86.94	1.40	0.85	3.07	B	EL	47.81	1.01	2.92	A	I	76.78	0.80	0.79	2.07	A	I	47.72	
		TNAGRIT4	43.000		2.00	86.00	1.40	0.85	2.96	B	EL	47.81	1.01	2.87	A	I	76.78	0.80	0.79	2.00	A	I	47.72	
TNAGT5A	45.000		1.90	85.50	1.40	0.85	2.83	B	EL	39.72	1.01	2.74	A	I	76.78	0.80	0.79	1.90	A	I	47.72			
TNAGT5B	45.000		③	1.87	84.15	1.40	0.85	2.78	B	EL	47.81	1.01	2.71	A	I	76.78	0.80	0.79	1.87	A	I	47.72		

LOAD FACTORS:

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

**NOTES:**

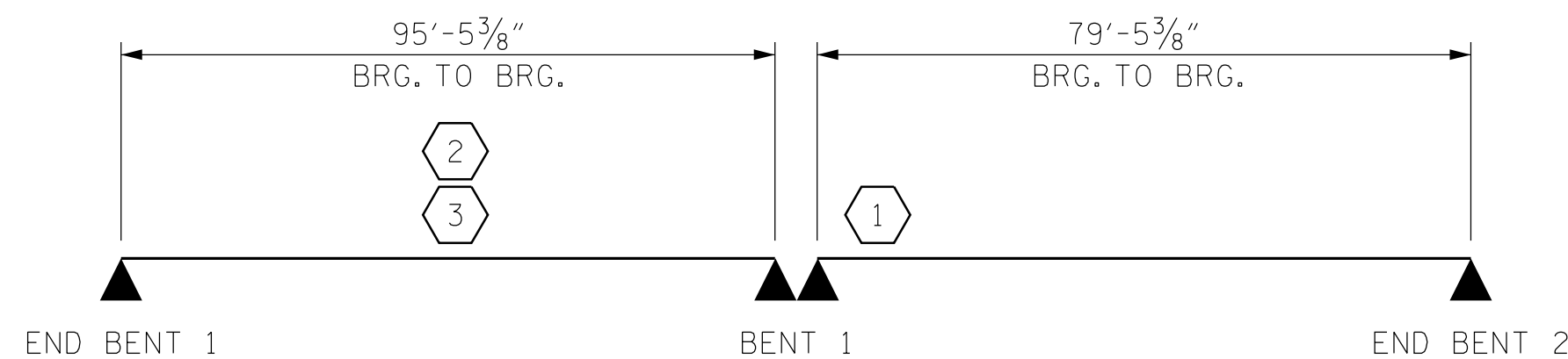
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

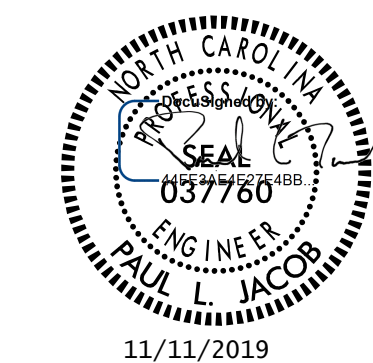
# CONTROLLING LOAD RATING
① DESIGN LOAD RATING (HL-93)
② DESIGN LOAD RATING (HS-20)
③ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 4 OF 4



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

DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

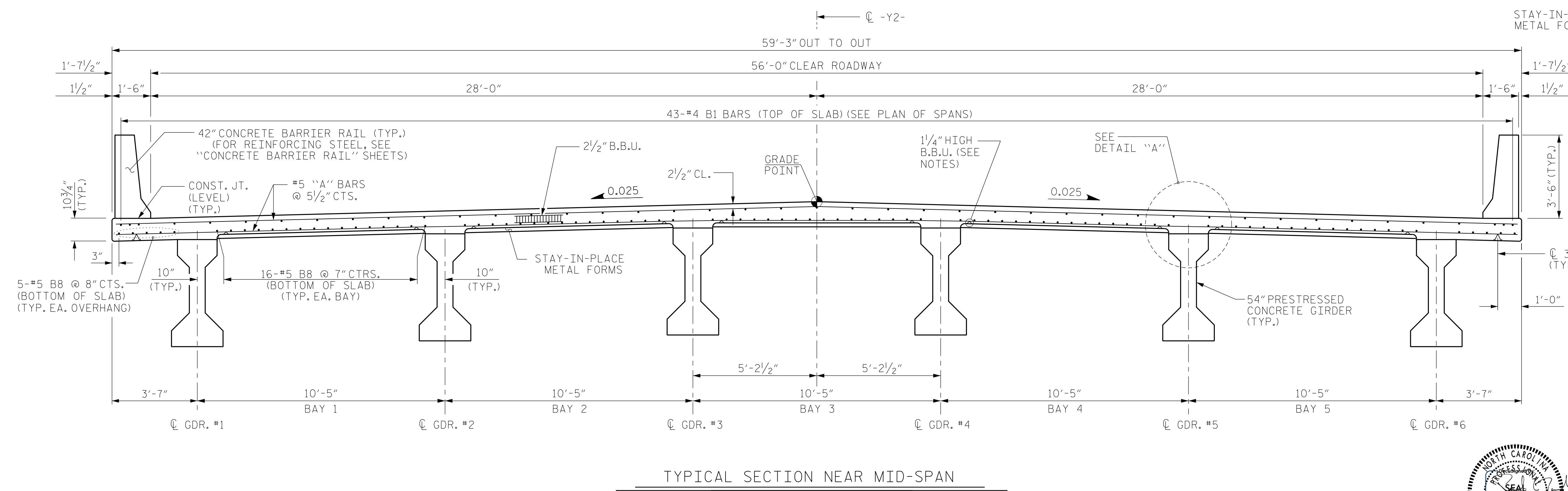
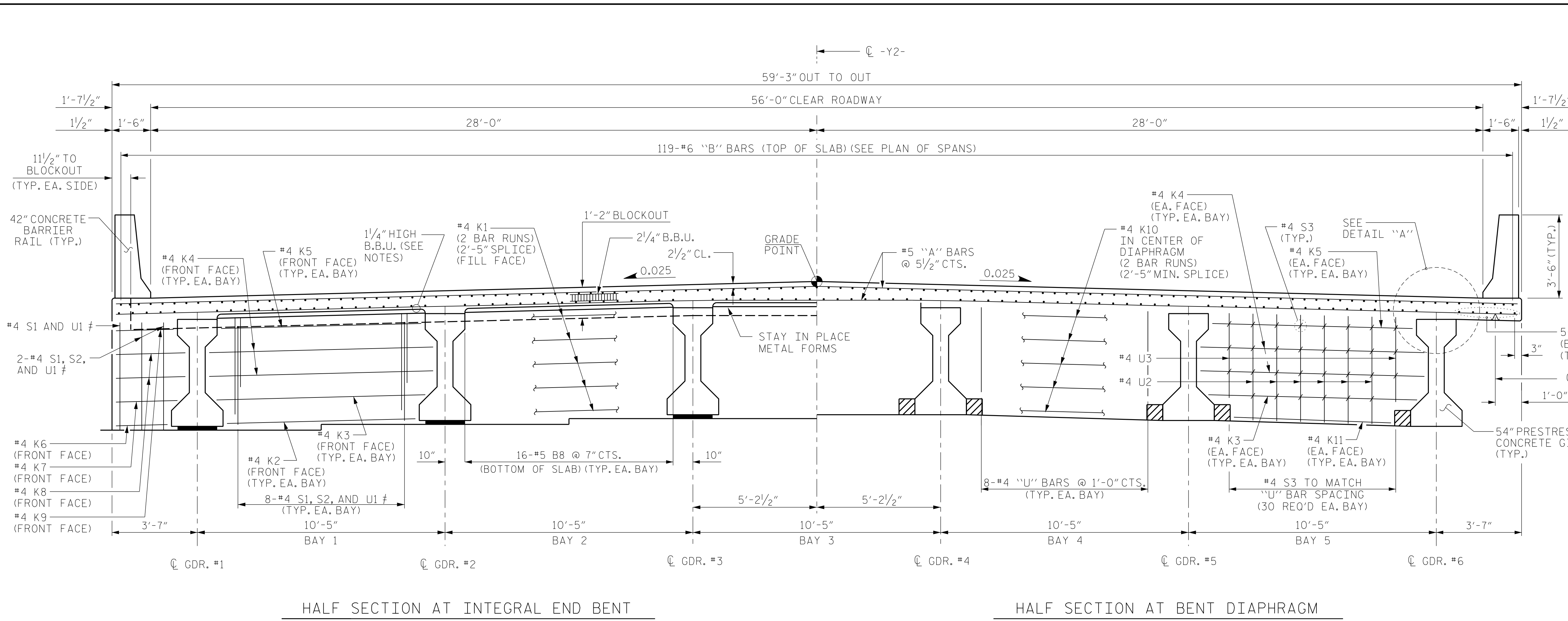
**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

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2			4			

STD. NO. LRFR1

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**NOTES**

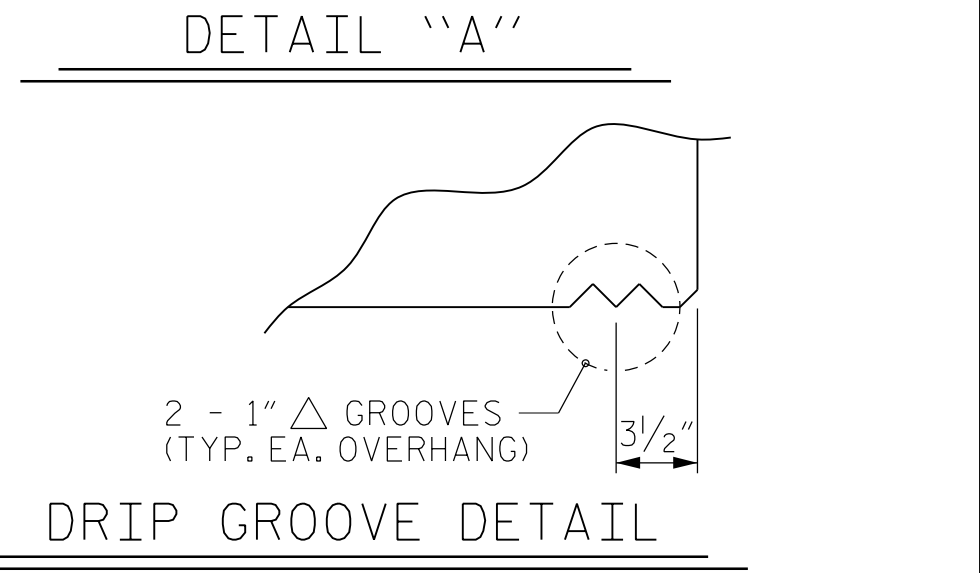
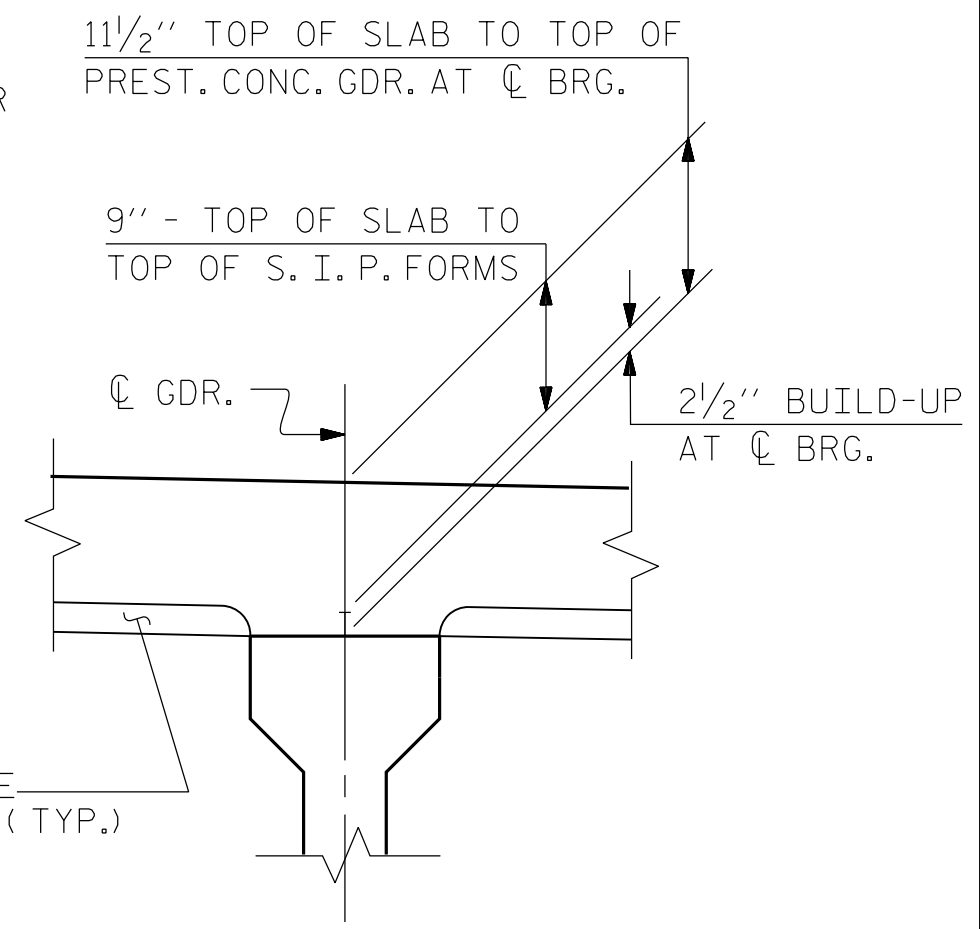
PROVIDE 1/4" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2"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

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

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

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

# TO MATCH V1 BARS IN END BENT.

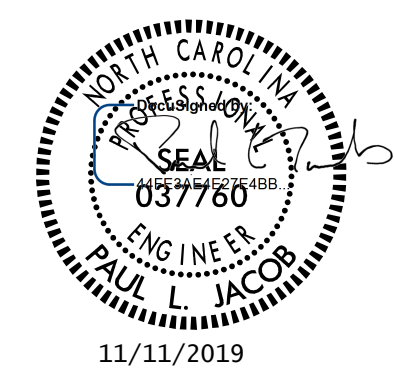


PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

**TYPICAL SECTION**



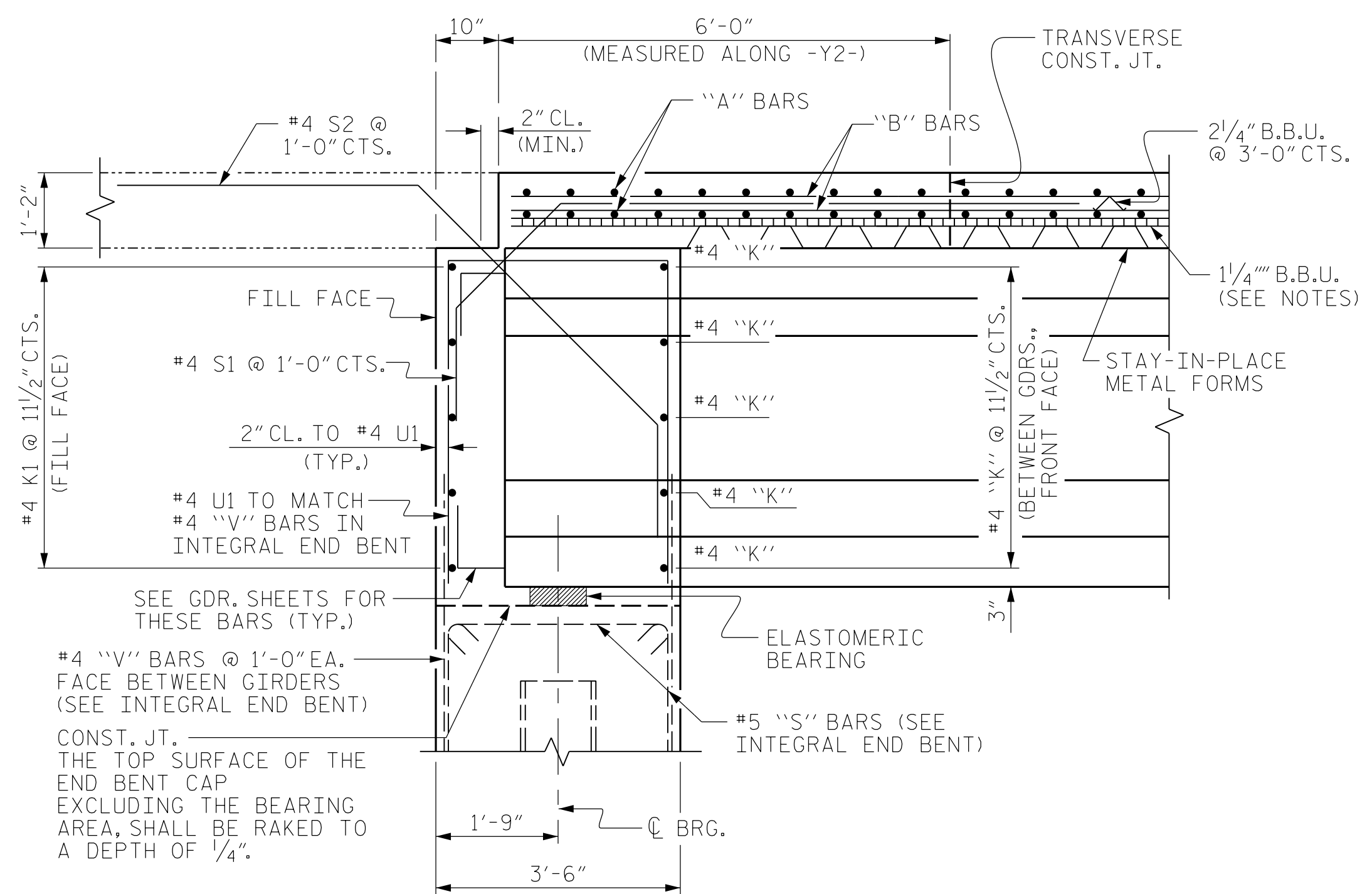
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 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
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 NC License No.: F-0105

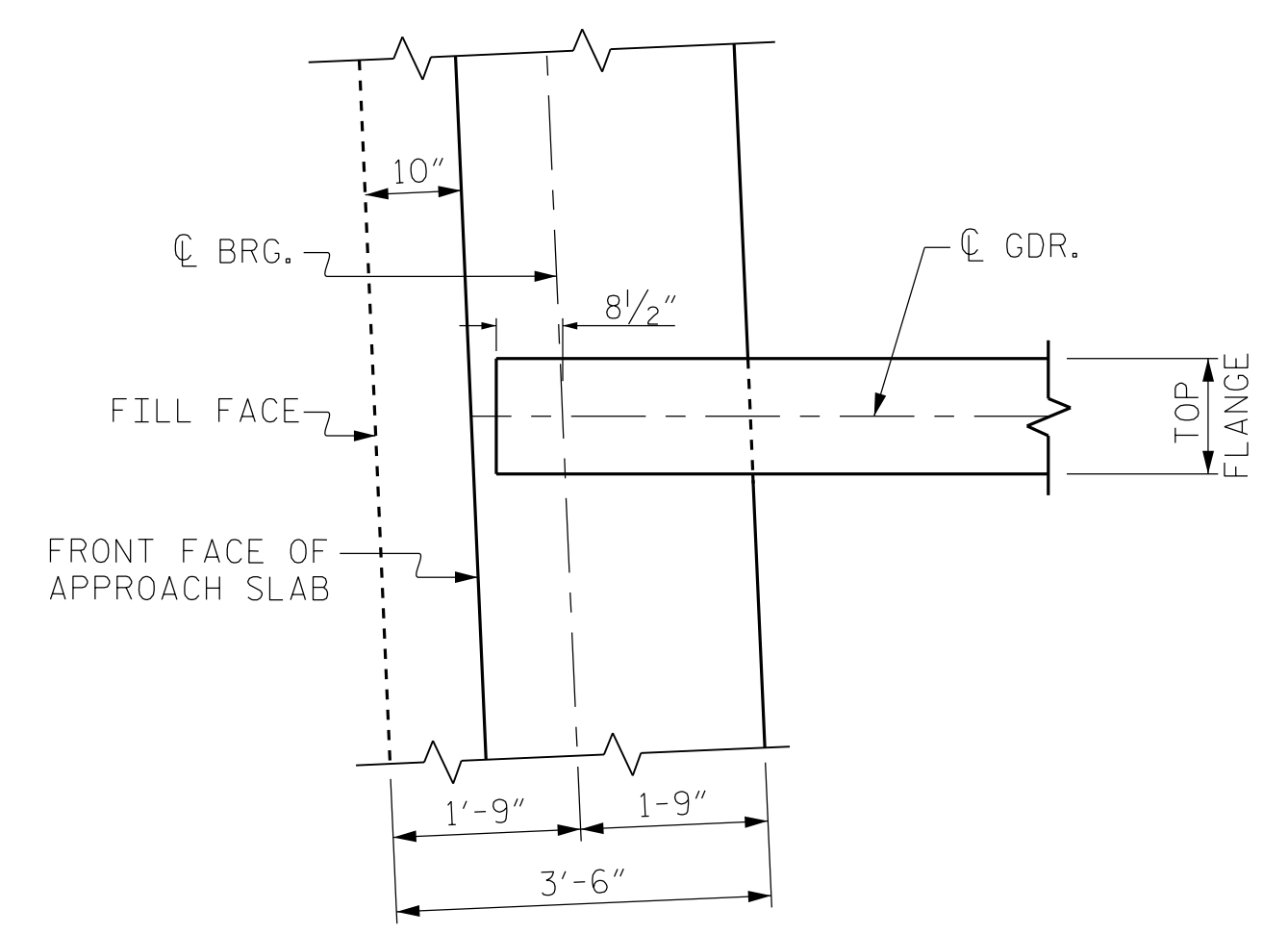
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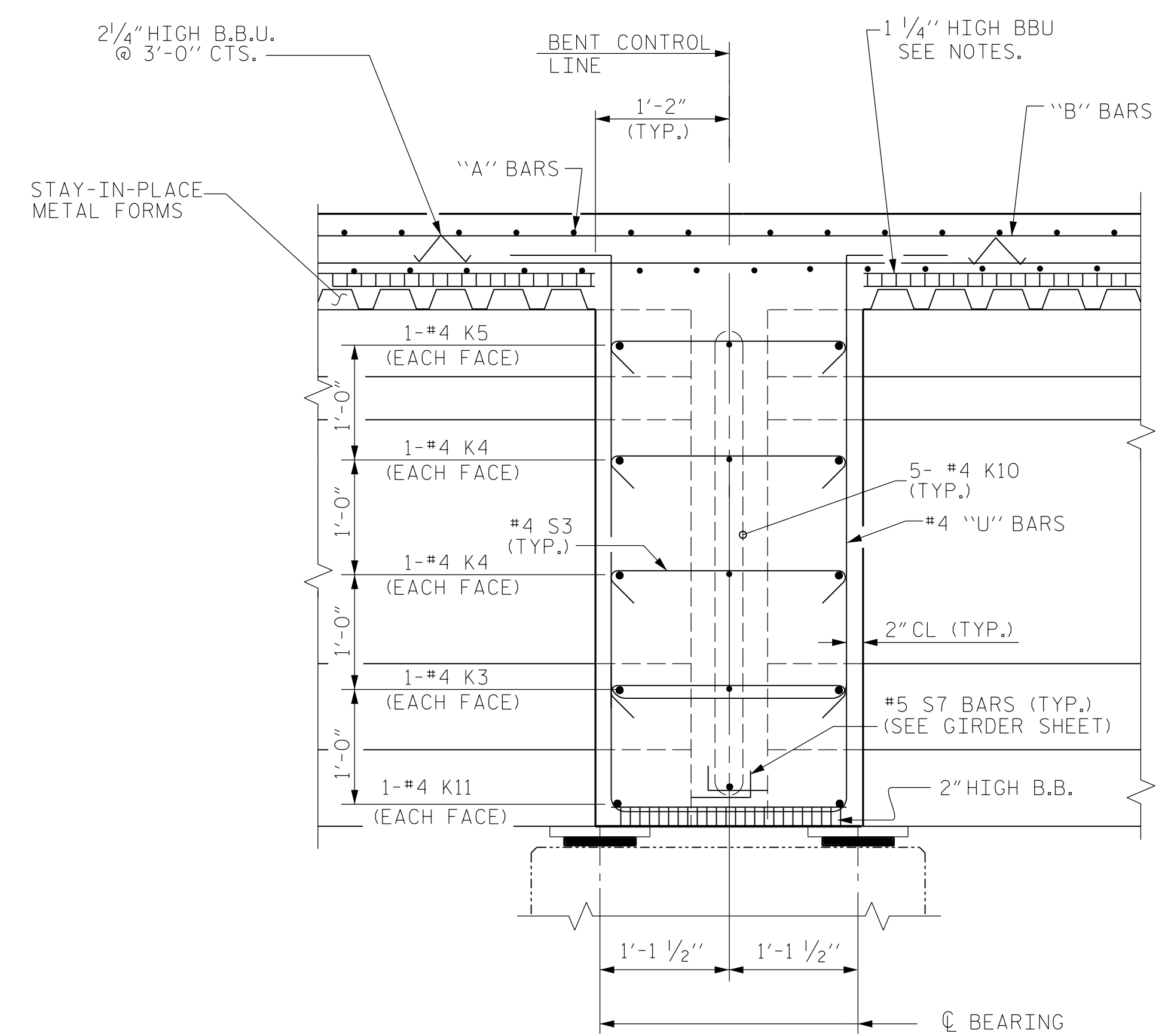
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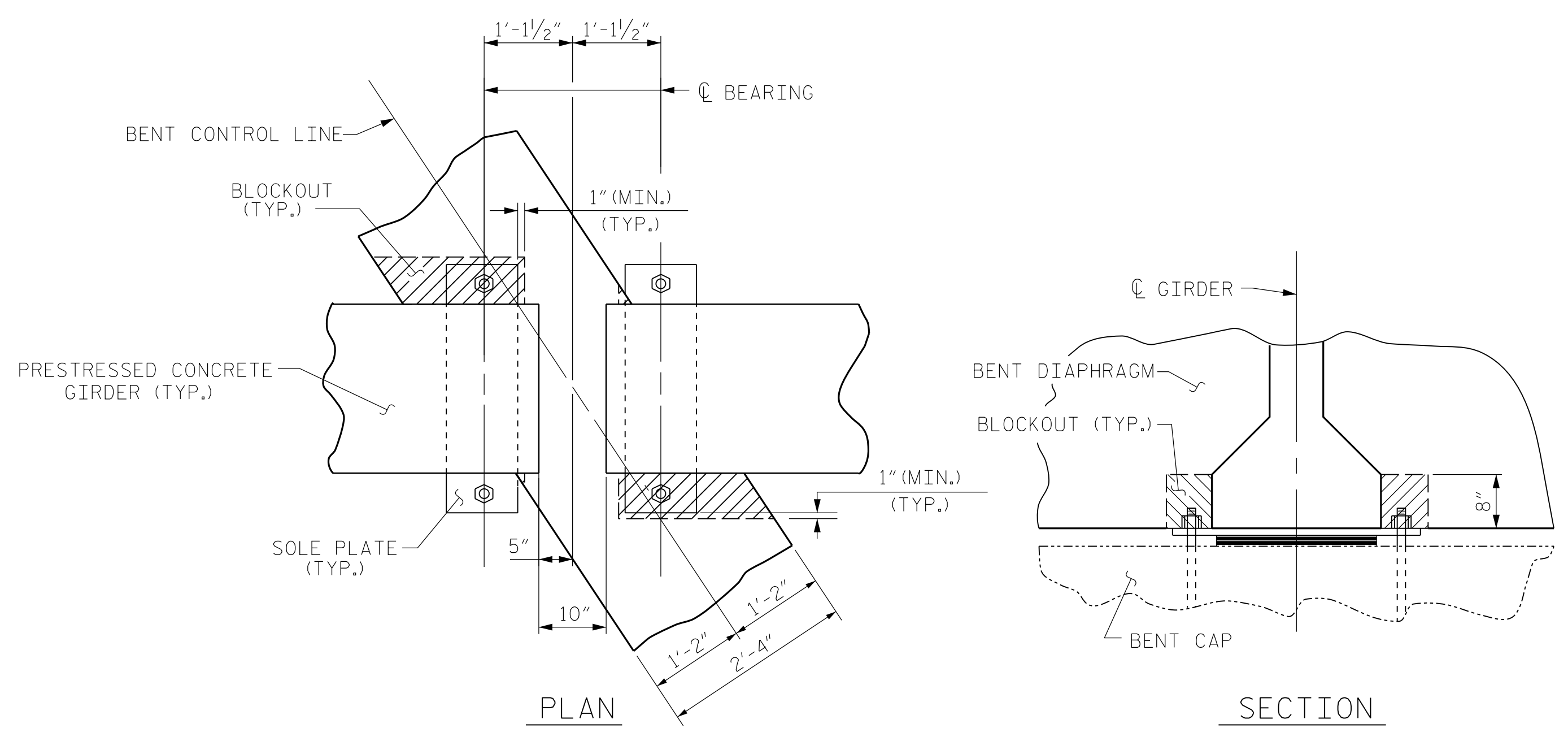
END OF GIRDER DETAIL  
AT INTEGRAL END BENT NO. 1  
END BENT NO. 2 SIMILAR



PLAN OF GIRDER AT INTEGRAL  
END BENT NO. 2 IS SIMILAR

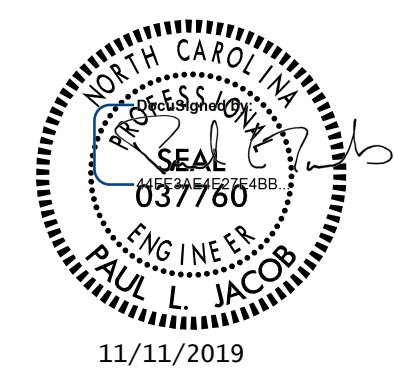


SECTION THRU BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-  
SHEET 2 OF 5



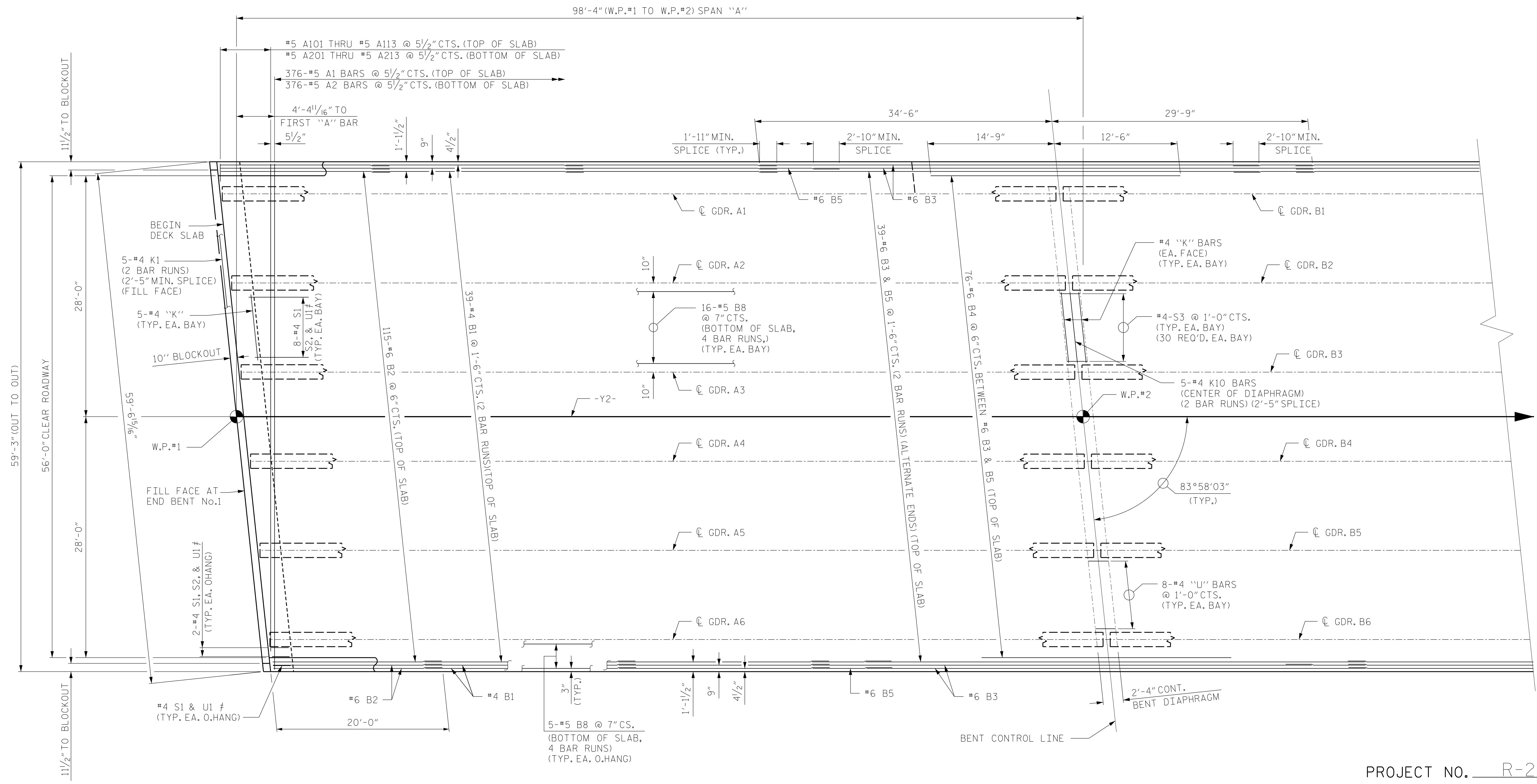
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CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION DETAILS					
REVISIONS					
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SHEET NO.					S3-6
TOTAL SHEETS					30

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### PLAN OF SPAN "A"

FOR LOCATION OF TRANSVERSE JOINTS, SEE  
POURING SEQUENCE ON "BILL OF MATERIALS" SHEET  
# TO MATCH V1 BARS IN END BENT

PROJECT NO. R-2303E

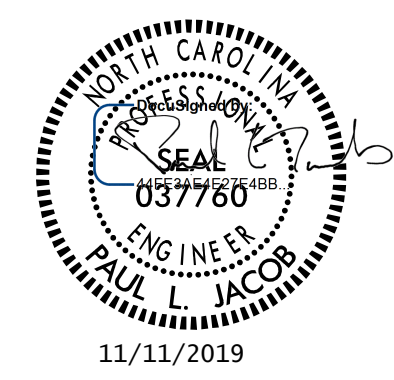
SAMPSON COUNTY

STATION: 31+16.90 -Y2-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPANS  
SPAN "A"



11/11/2019

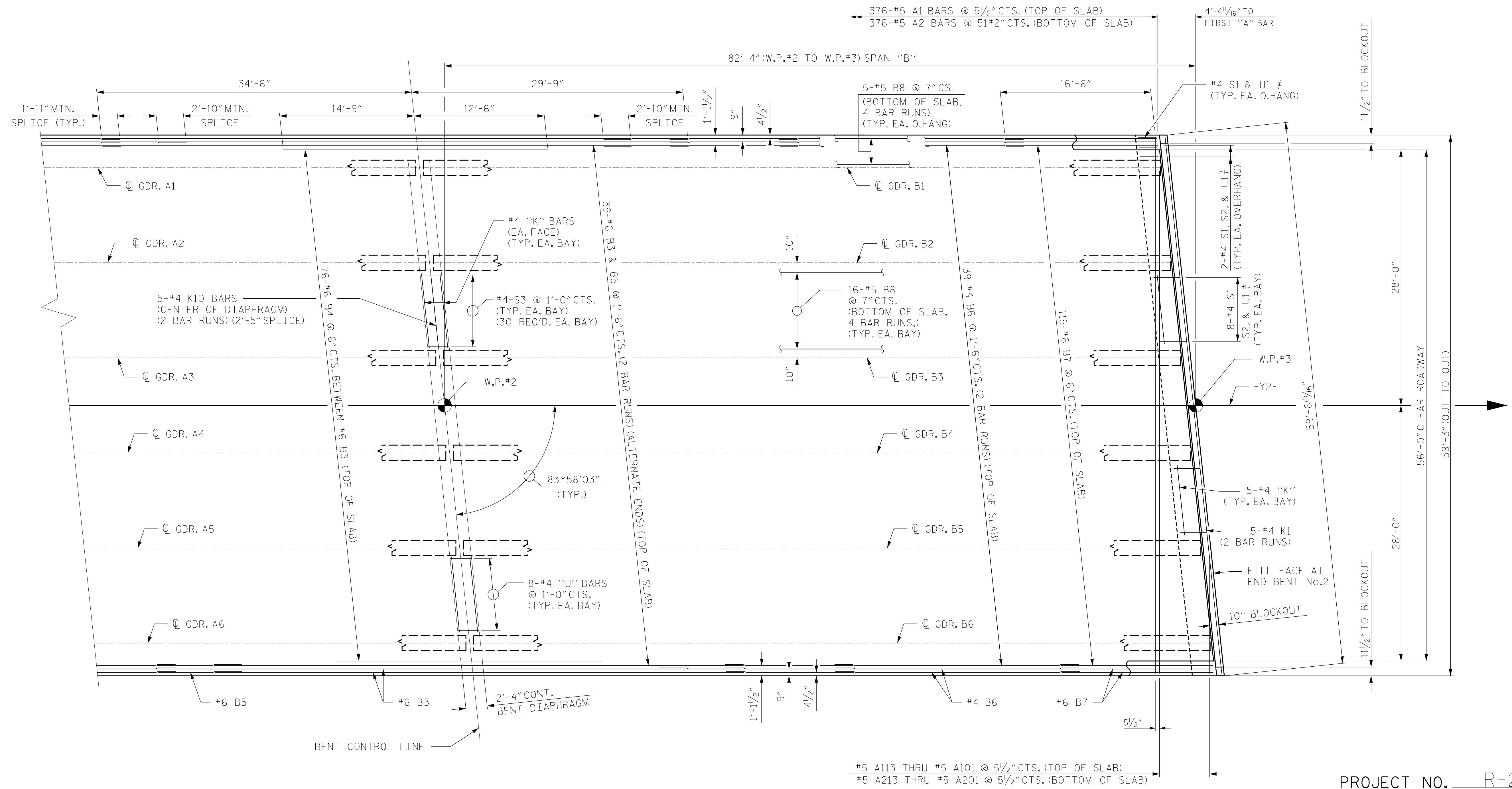
DRAWN BY : J. WEIGER DATE : 08/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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1			3			TOTAL SHEETS
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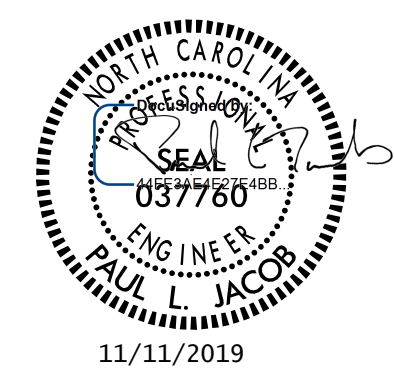
**PLAN OF SPAN "B"**

FOR LOCATION OF TRANSVERSE JOINTS, SEE  
POURING SEQUENCE ON "BILL OF MATERIALS" SHEET  
# TO MATCH V1 BARS IN END BENT

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-  
SHEET 4 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
**PLAN OF SPANS  
SPAN "B"**



**moffatt & nichol**  
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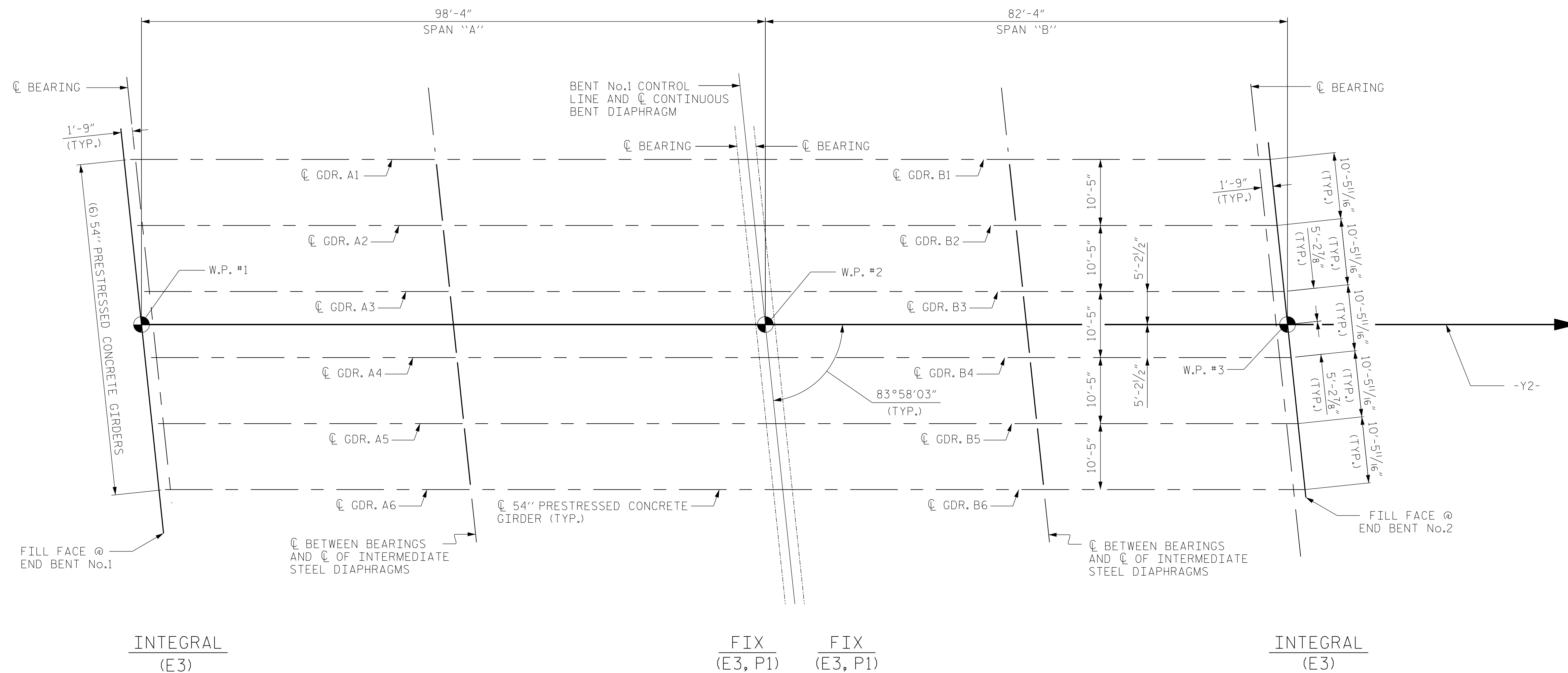
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SIGNATURES COMPLETED

DRAWN BY : J. WEIGER DATE : 08/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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SPAN "A"

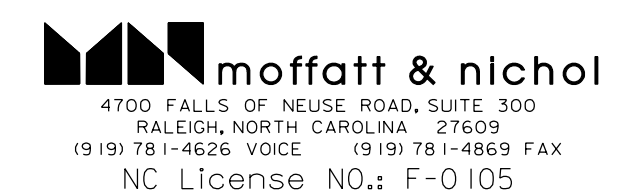
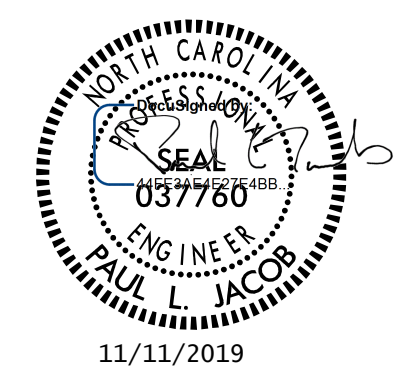
SPAN "B"

GIRDER LAYOUT

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 5 OF 5

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

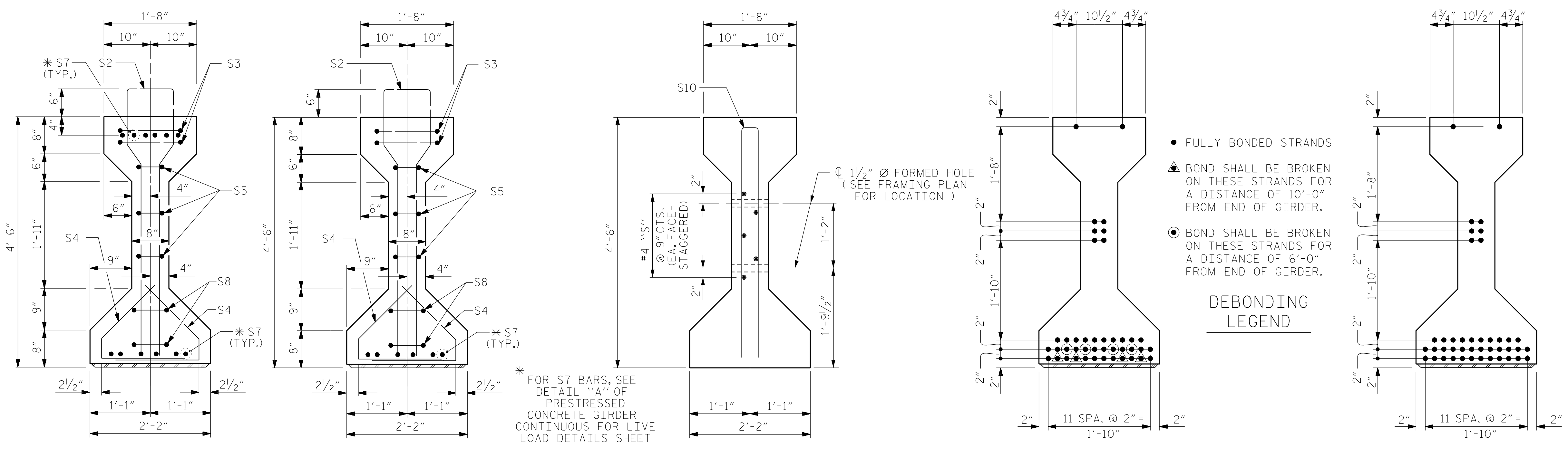


DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

DRAWN BY : J. WEIGER DATE : 02/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-9
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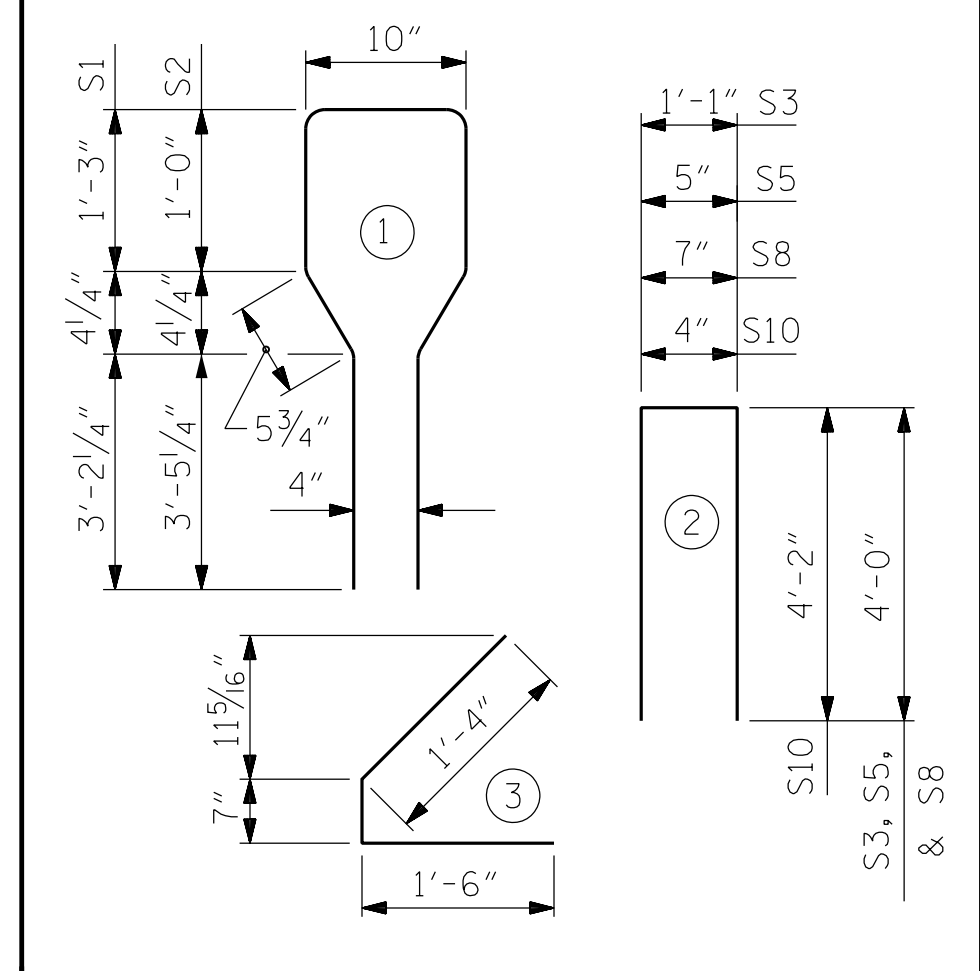


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

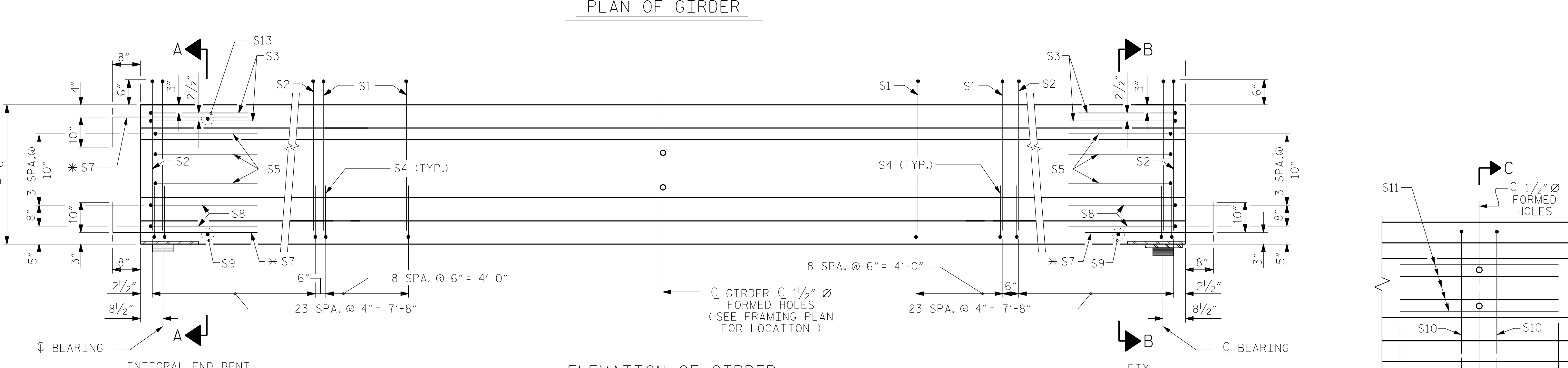
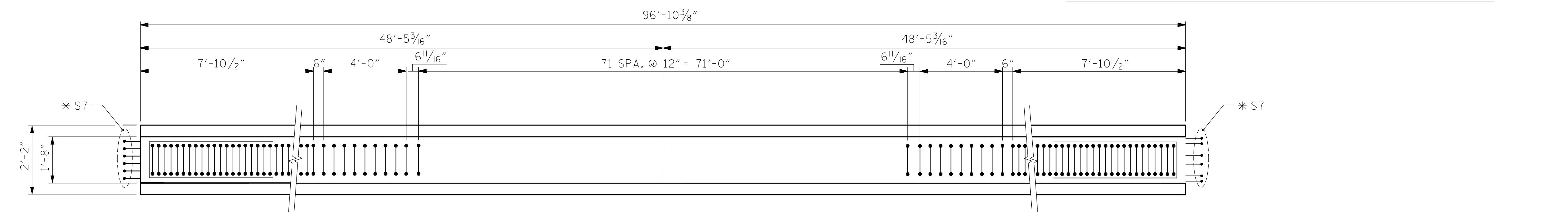
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	90	#5	1	10'-8"	1001
S2	48	#6	1	10'-8"	769
S3	4	#4	2	9'-1"	24
S4	132	#4	3	3'-5"	301
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

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

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



SECTION A-A SECTION B-B SECTION C-C (S1 BARS NOT SHOWN) AT END OF GIRDER AT C OF GIRDER

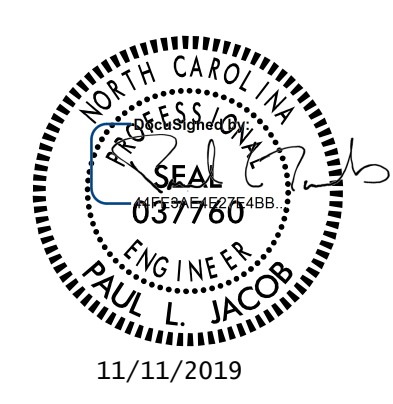


PLAN OF GIRDER ELEVATION OF GIRDER (SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

- FULLY BONDED STRANDS
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 10'-0" FROM END OF GIRDER.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF GIRDER.

DEBONDING LEGEND

ASSEMBLED BY : J. WEIGER	DATE : 03/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMC
	REV. 12/17 MAA/THC



**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

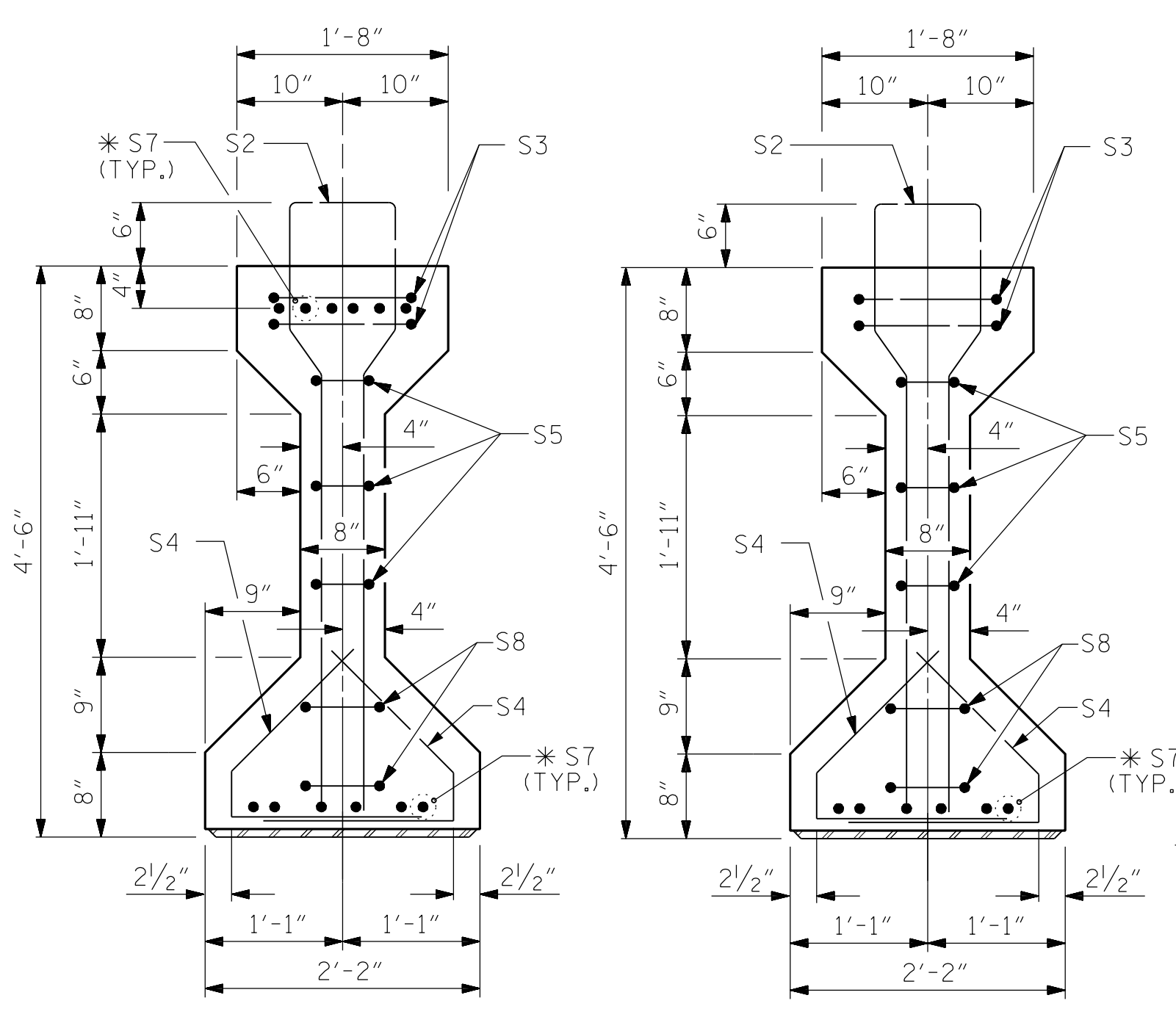
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	2264	19.7	42

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
6	96'-10 <sup>3</sup> / <sub>8</sub> "	581'-2 <sup>1</sup> / <sub>4</sub> "

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-  
SHEET 1 OF 3

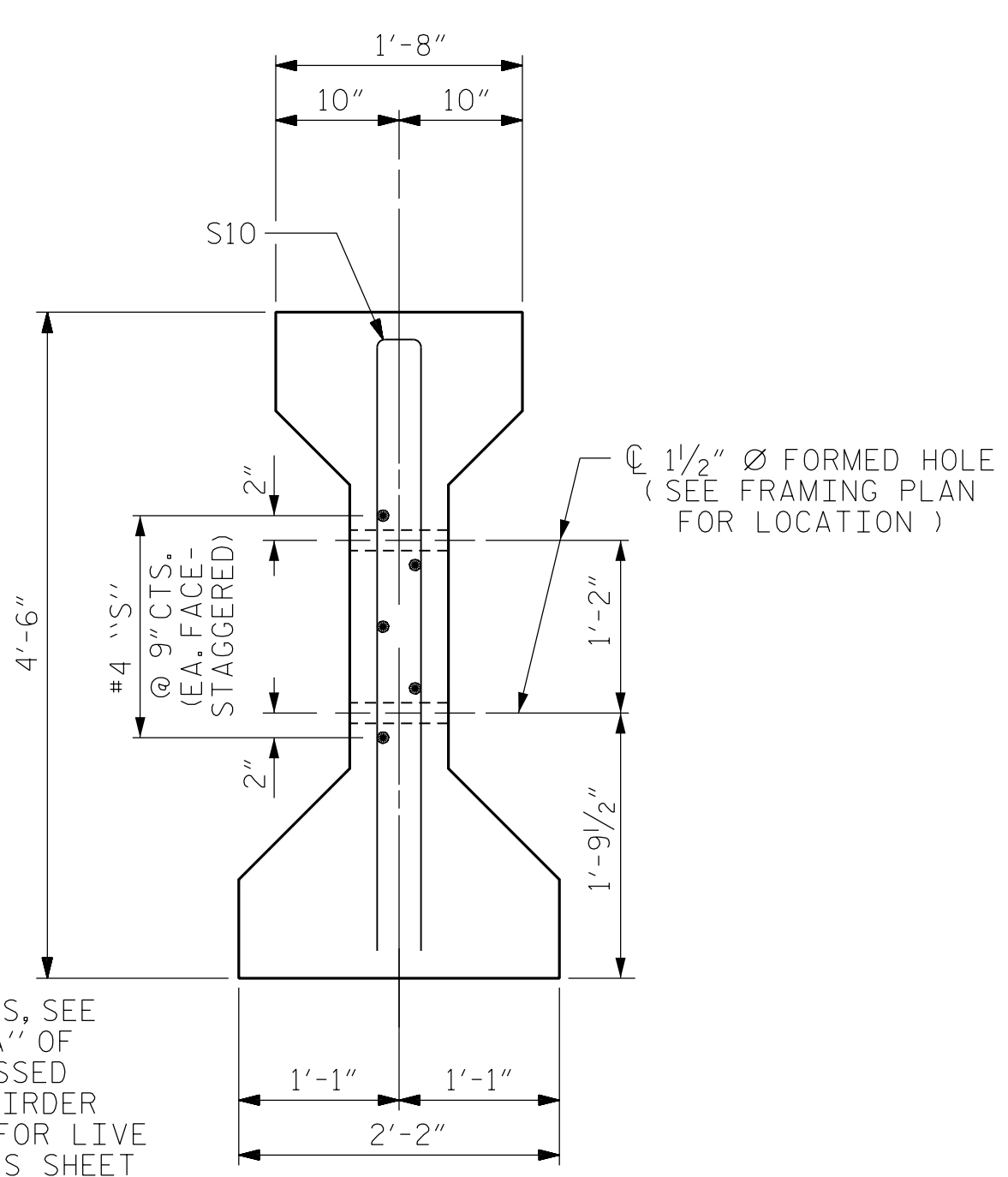
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-10
1			3			TOTAL SHEETS 30
2			4			



SECTION A-A

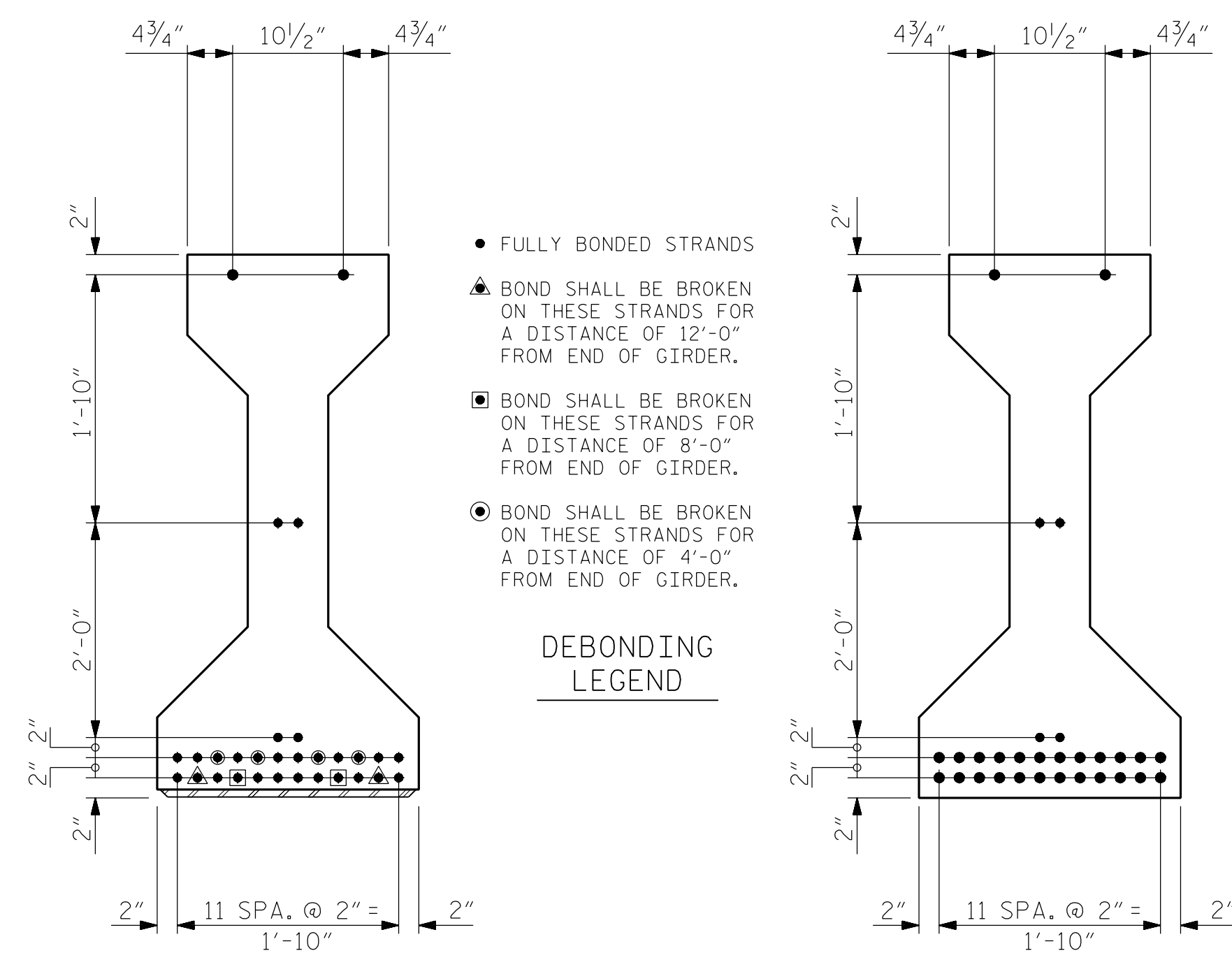
SECTION B-B



SECTION C-C

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

(S1 BARS NOT SHOWN)



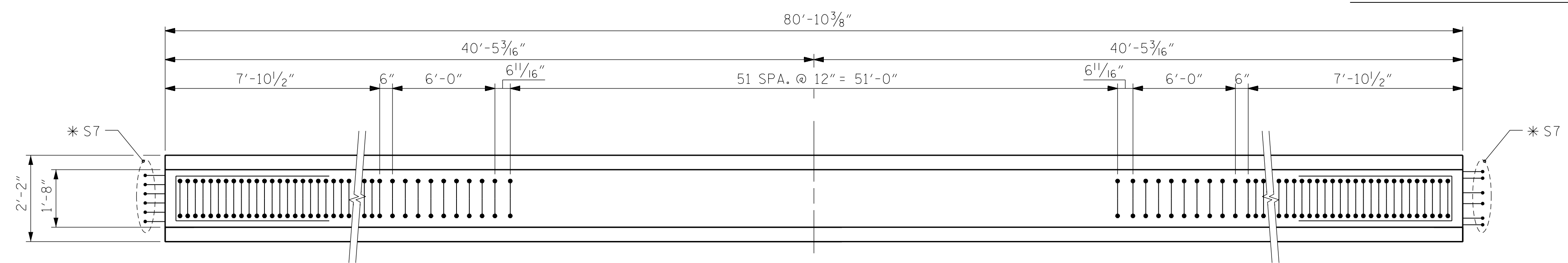
AT END OF GIRDER

AT C OF GIRDER

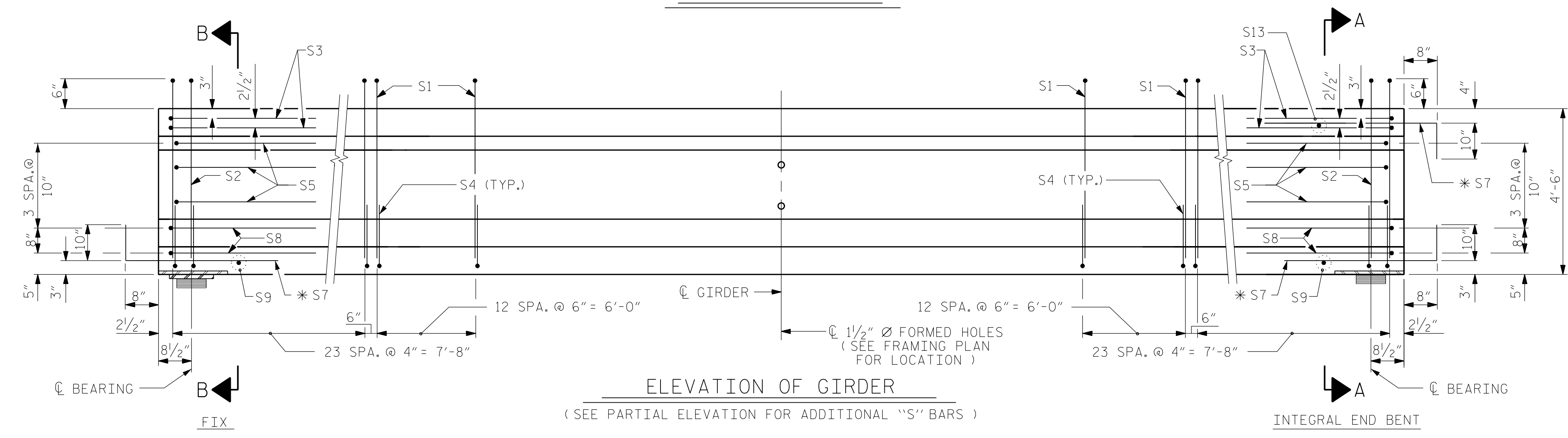
0.6" Ø LOW RELAXATION STRAND LAYOUT

- FULLY BONDED STRANDS
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF GIRDER.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 8'-0" FROM END OF GIRDER.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF GIRDER.

DEBONDING LEGEND

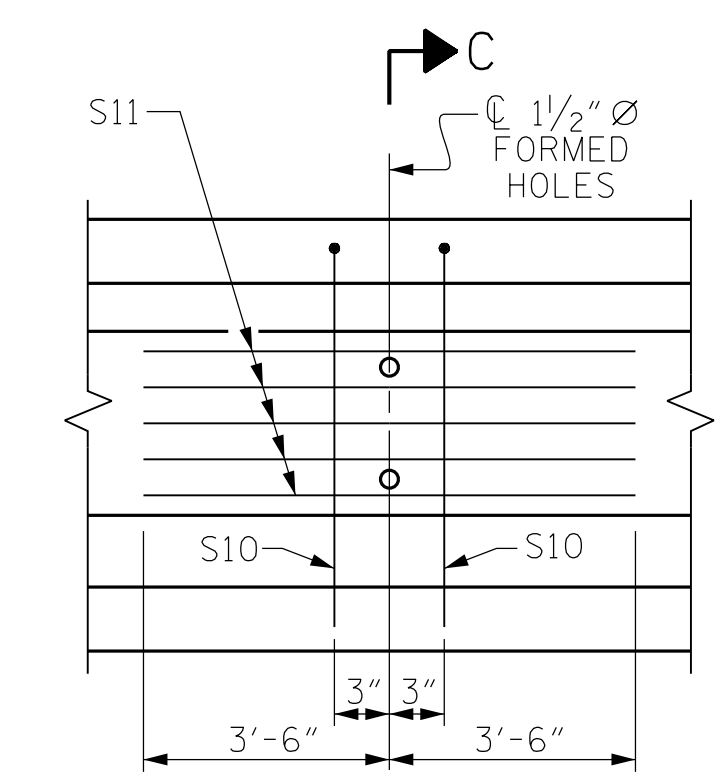


PLAN OF GIRDER



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

INTEGRAL END BENT



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 6

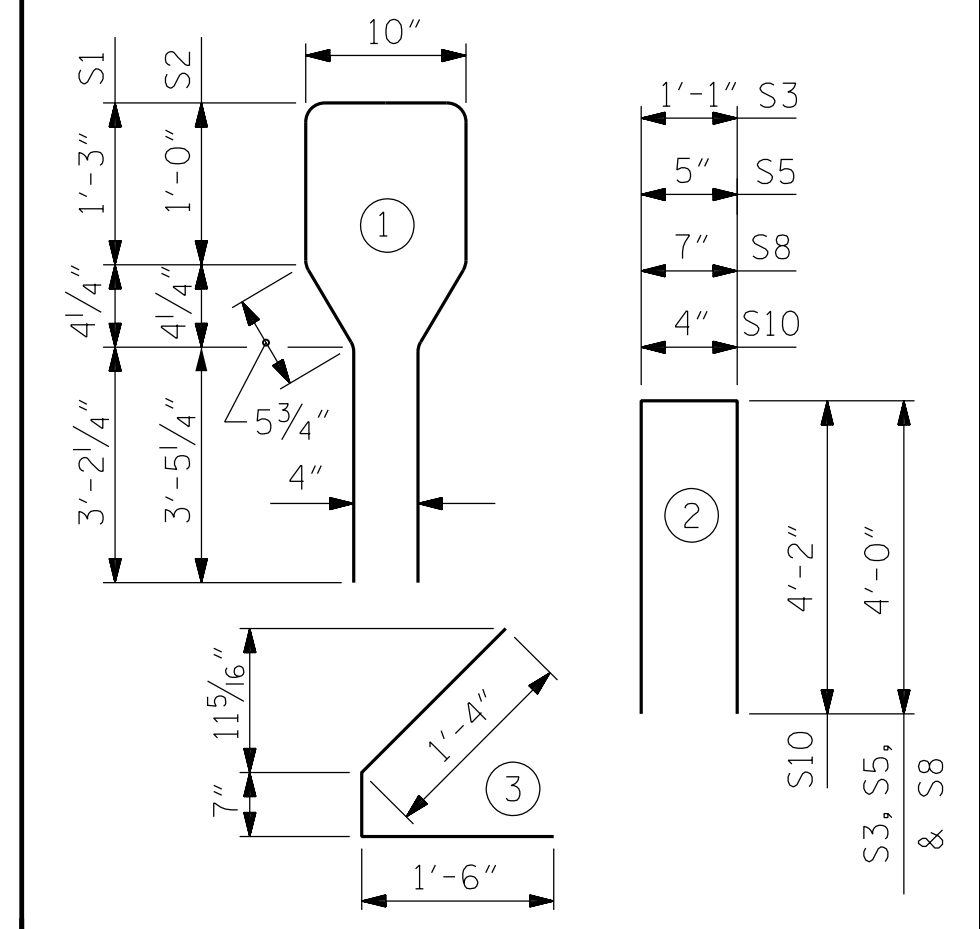
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	78	#5	1	10'-8"	868
S2	48	#6	1	10'-8"	769
S3	4	#4	2	9'-1"	24
S4	148	#4	3	3'-5"	338
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
54" PRESTRESSED CONCRETE GIRDER	2167	16.4	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	80'-10 <sup>3</sup> / <sub>8</sub> "	485'-2 <sup>1</sup> / <sub>4</sub> "

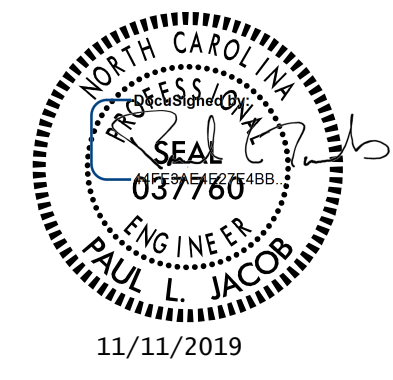
PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPAN "B"

REVISIONS						SHEET NO. S3-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 30
2			4			

ASSEMBLED BY : J. WEIGER	DATE : 03/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : JMB 12/87	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 12/87	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC



**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

AT 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.

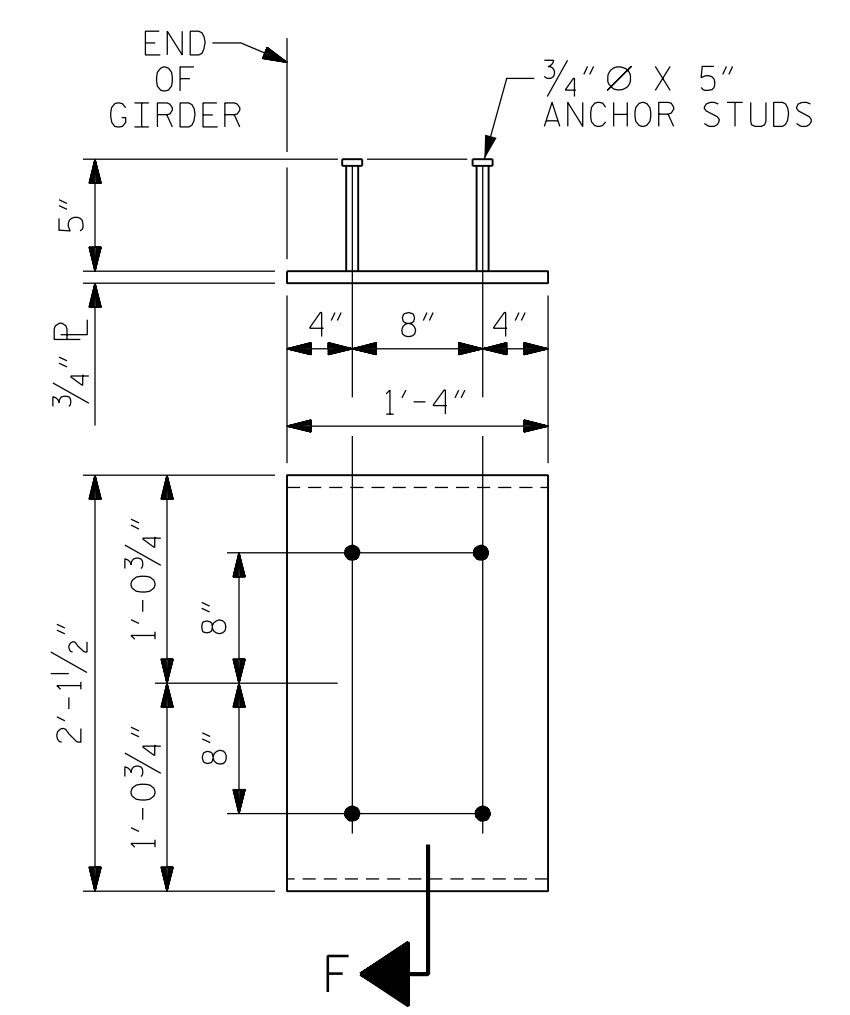
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE SPAN 1 GIRDERS SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE SPAN 2 GIRDERS SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4700 PSI.

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

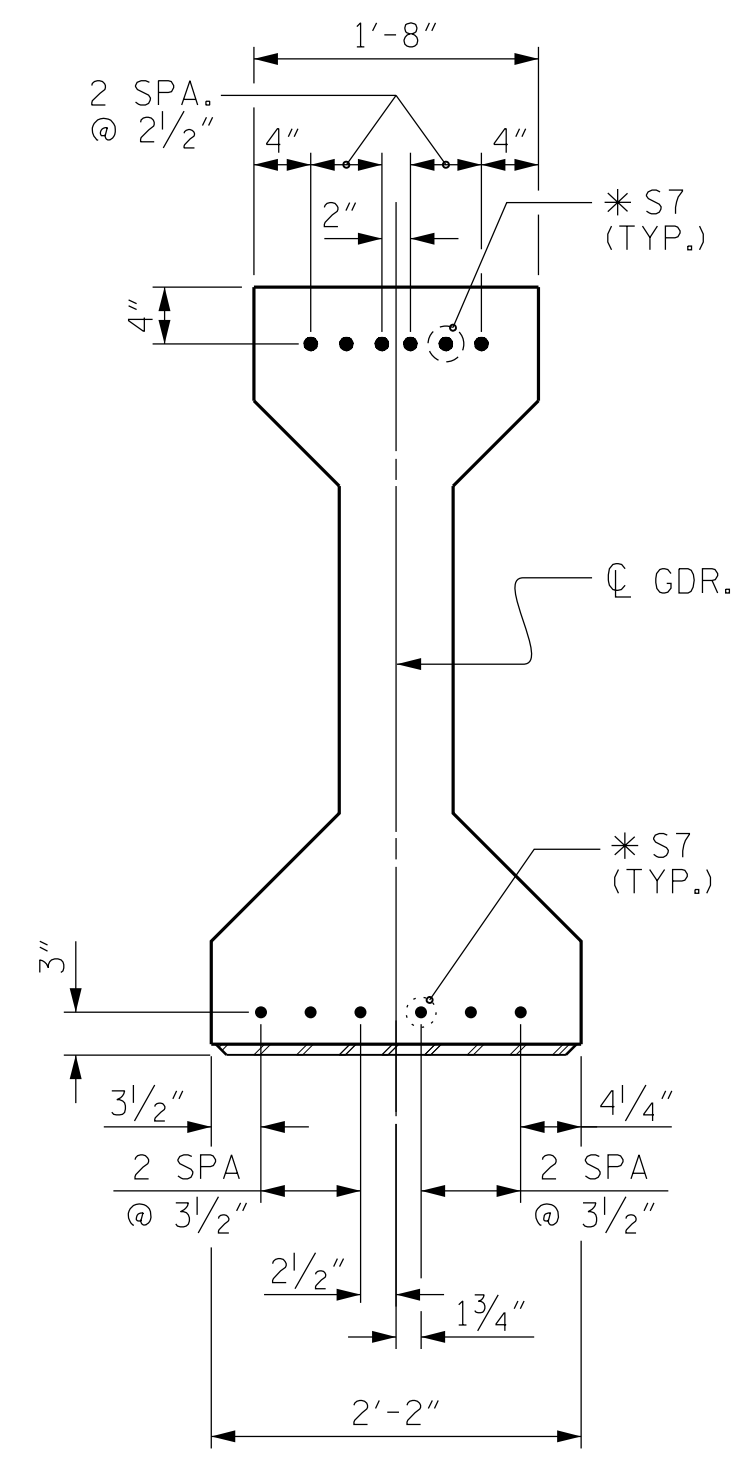
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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



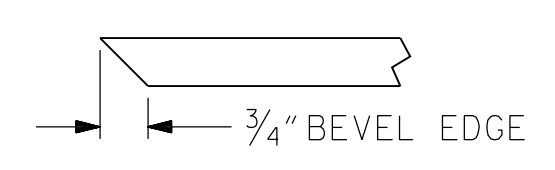
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

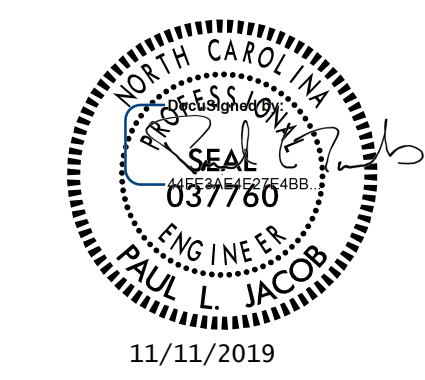


SECTION "F"

(SEE NOTES)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 3 OF 3



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-12
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

**moffatt & nichol**  
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 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License NO.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

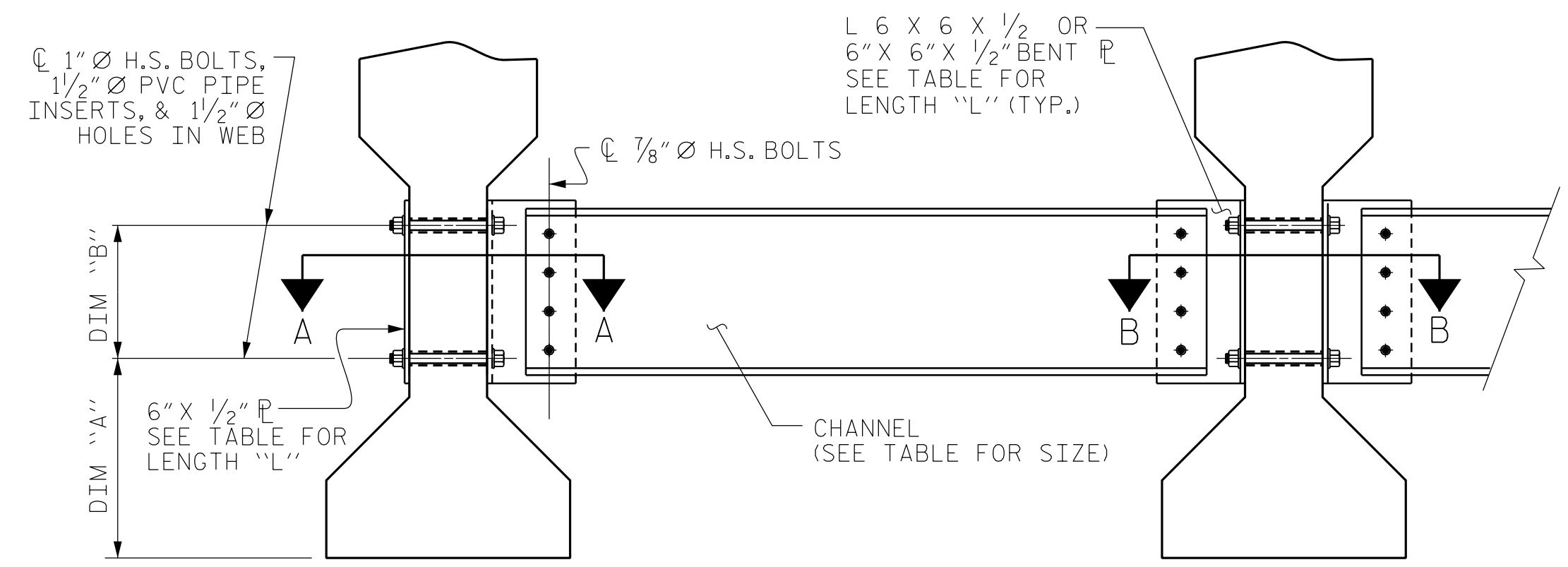
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

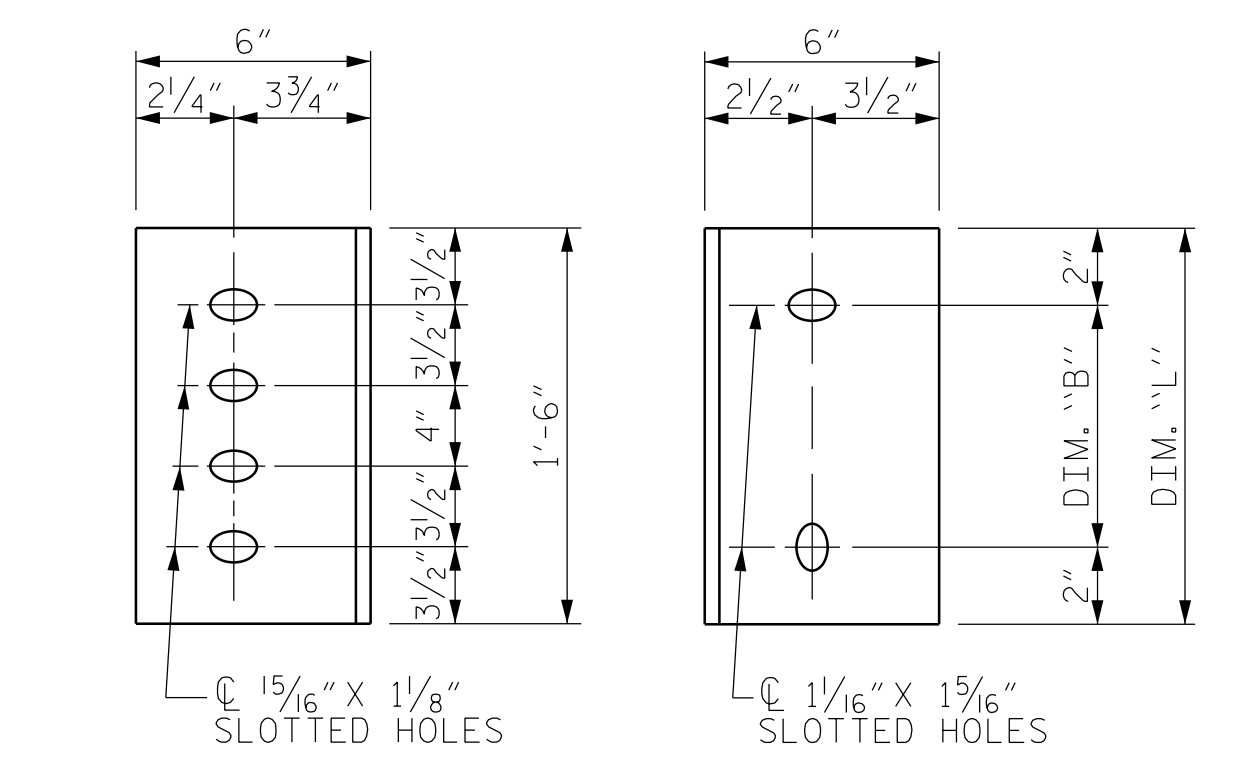
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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



EXTERIOR GIRDER  
INTERIOR GIRDER  
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE  
WEB FACE  
CONNECTOR PLATE DETAILS

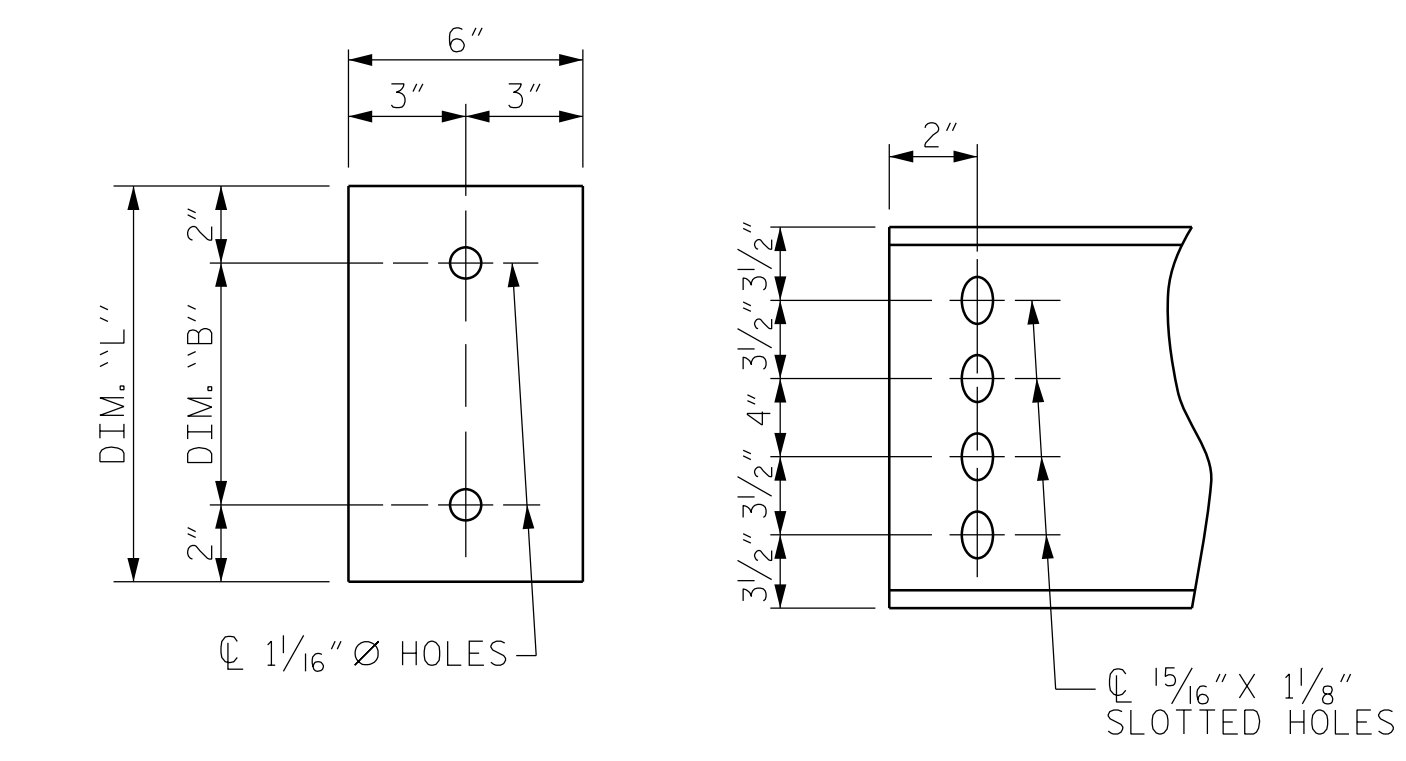
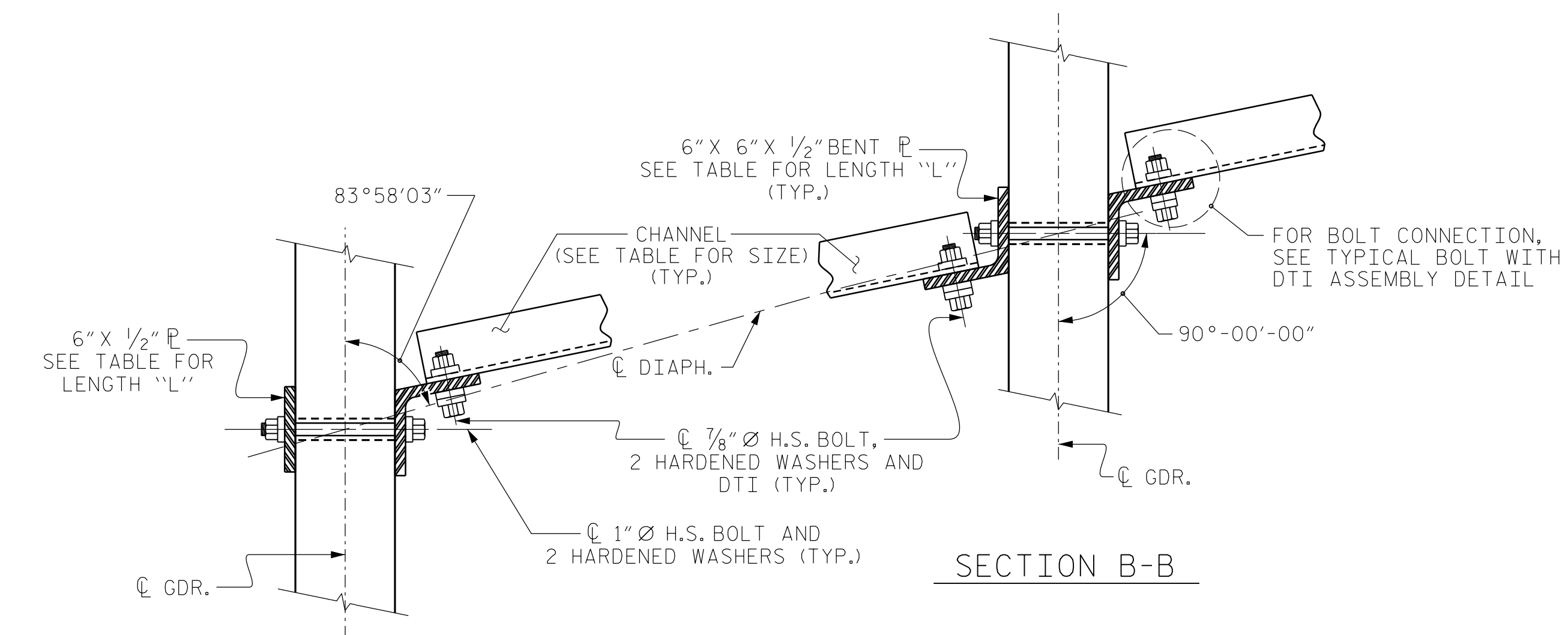


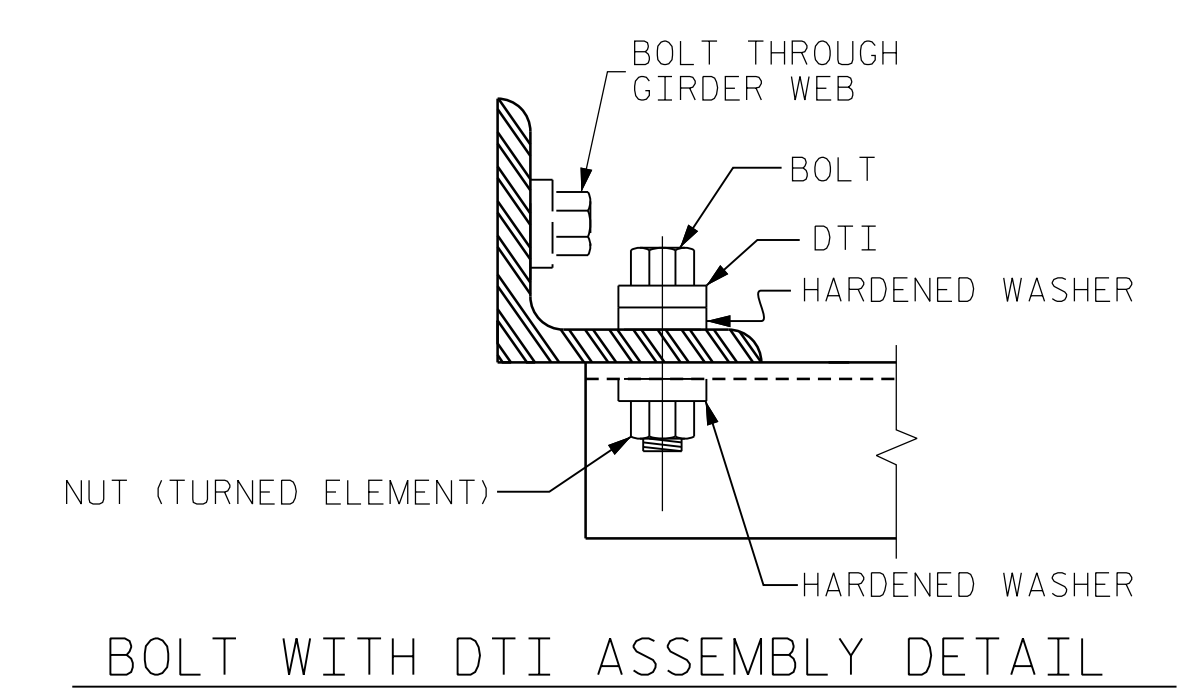
PLATE DETAILS  
CHANNEL END

TABLE

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

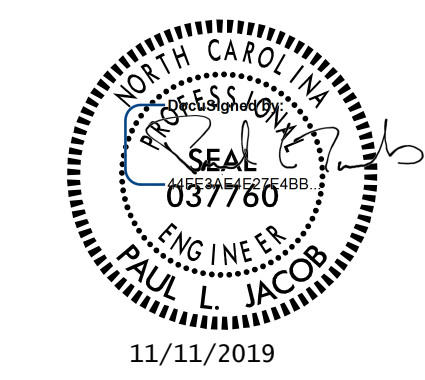


SECTION A-A  
SECTION B-B  
CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-



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

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
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RALEIGH, NORTH CAROLINA 27609  
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NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
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1			3			30
2			4			

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NOTES

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

STEEL SOLE PLATES, ANCHOR BOLTS, AND NUTS 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 "P1", BOLTS AND NUTS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

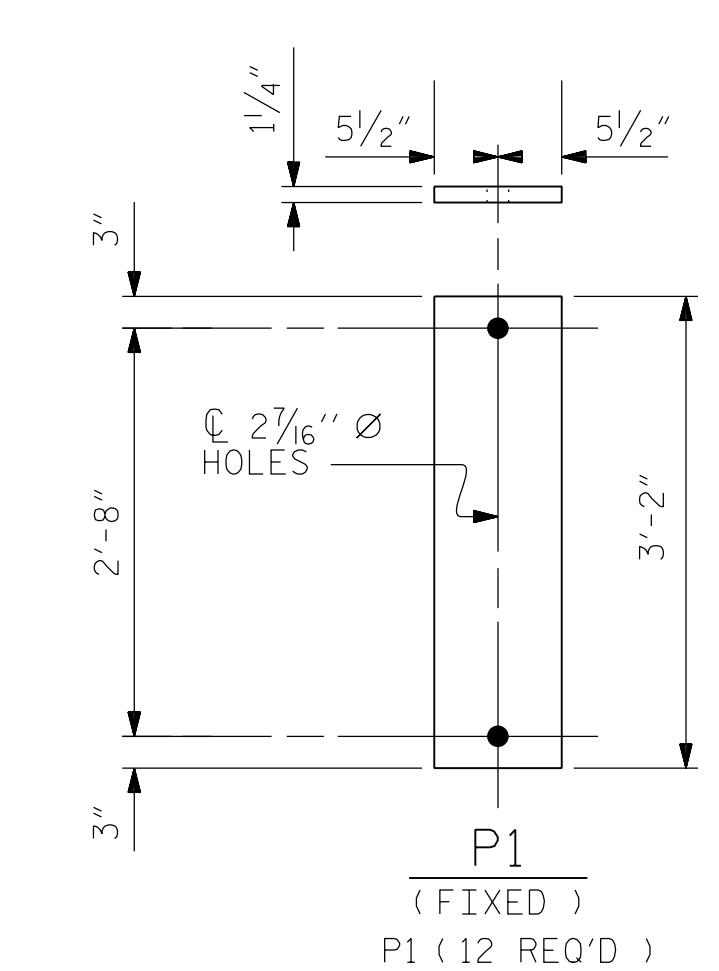
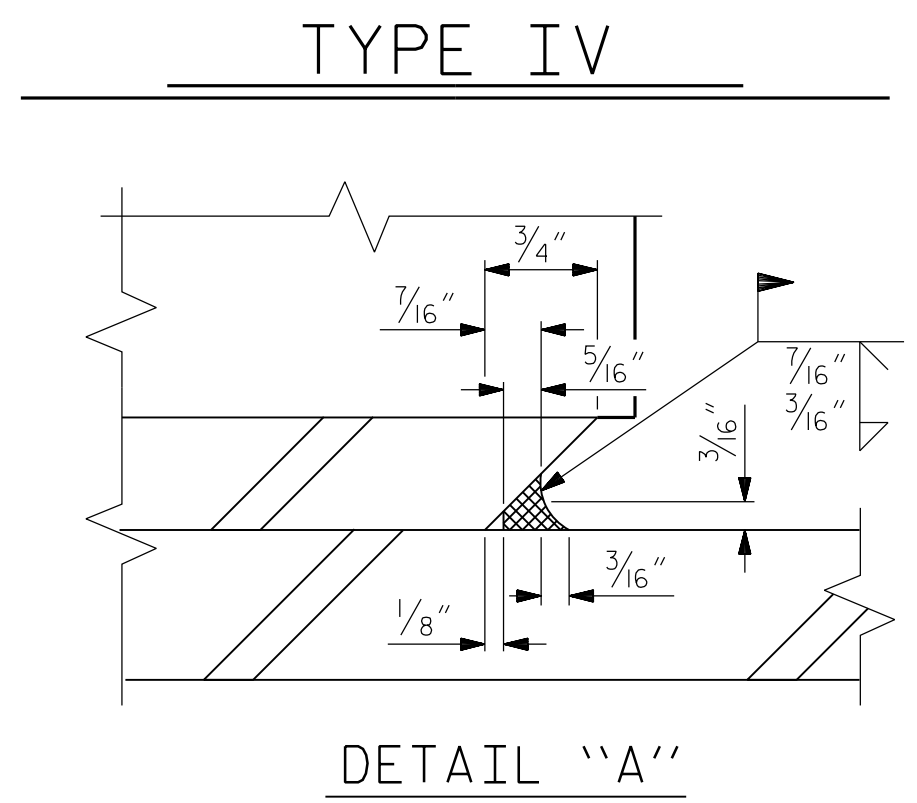
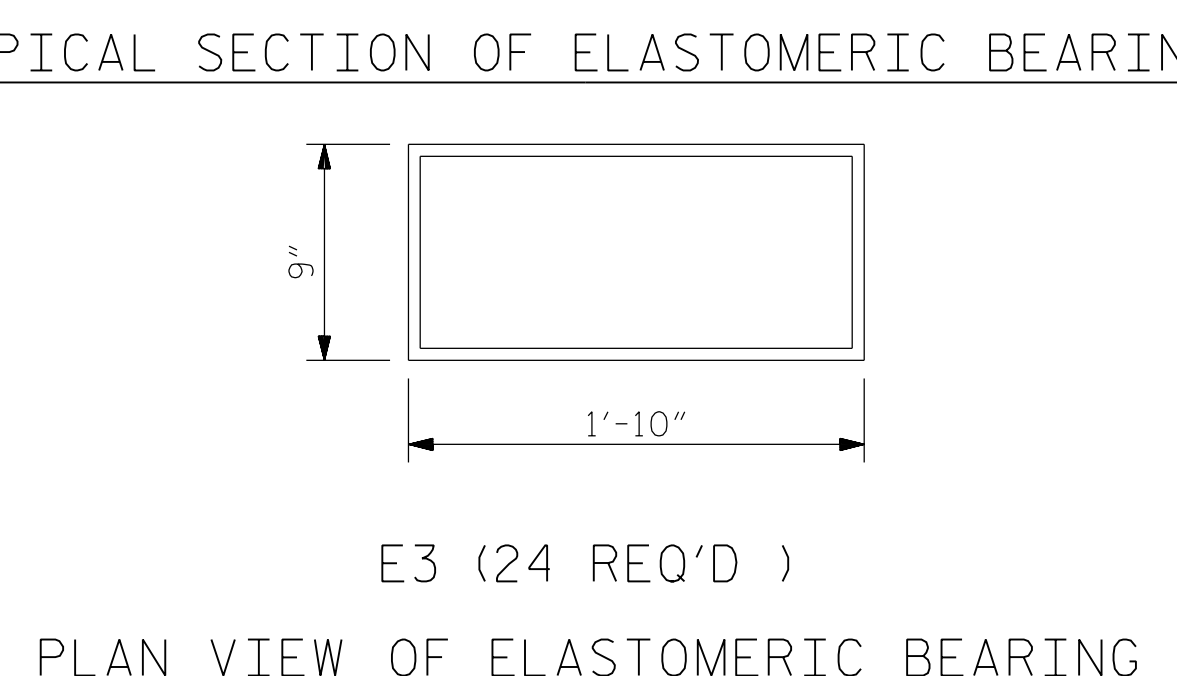
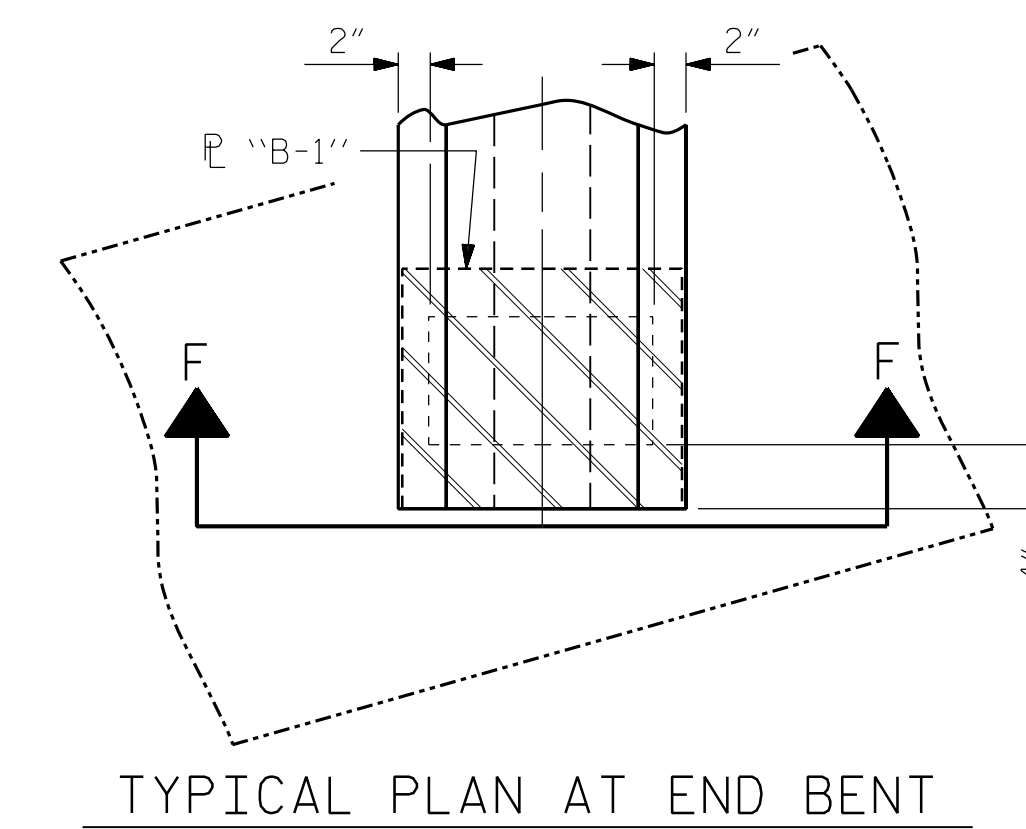
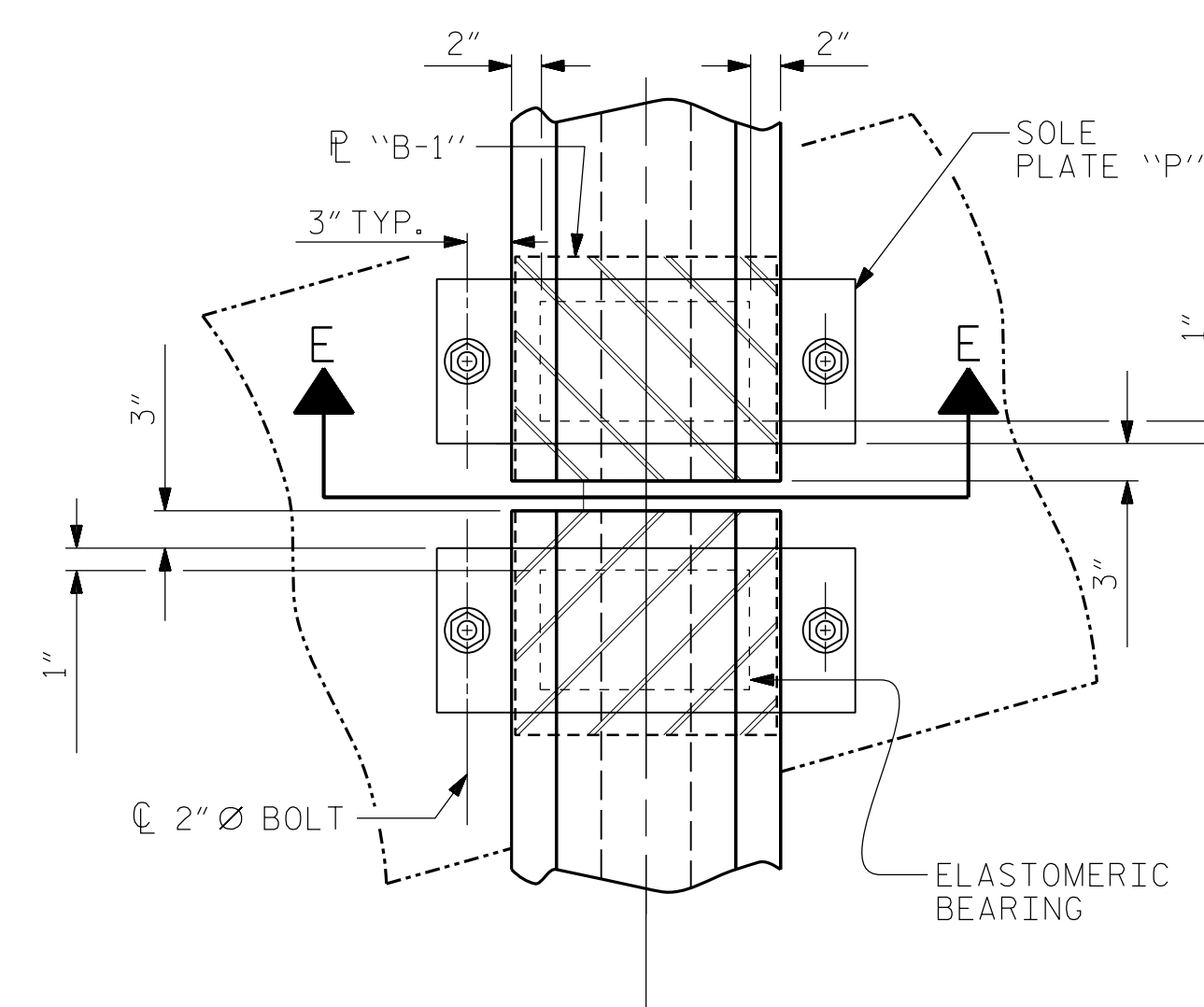
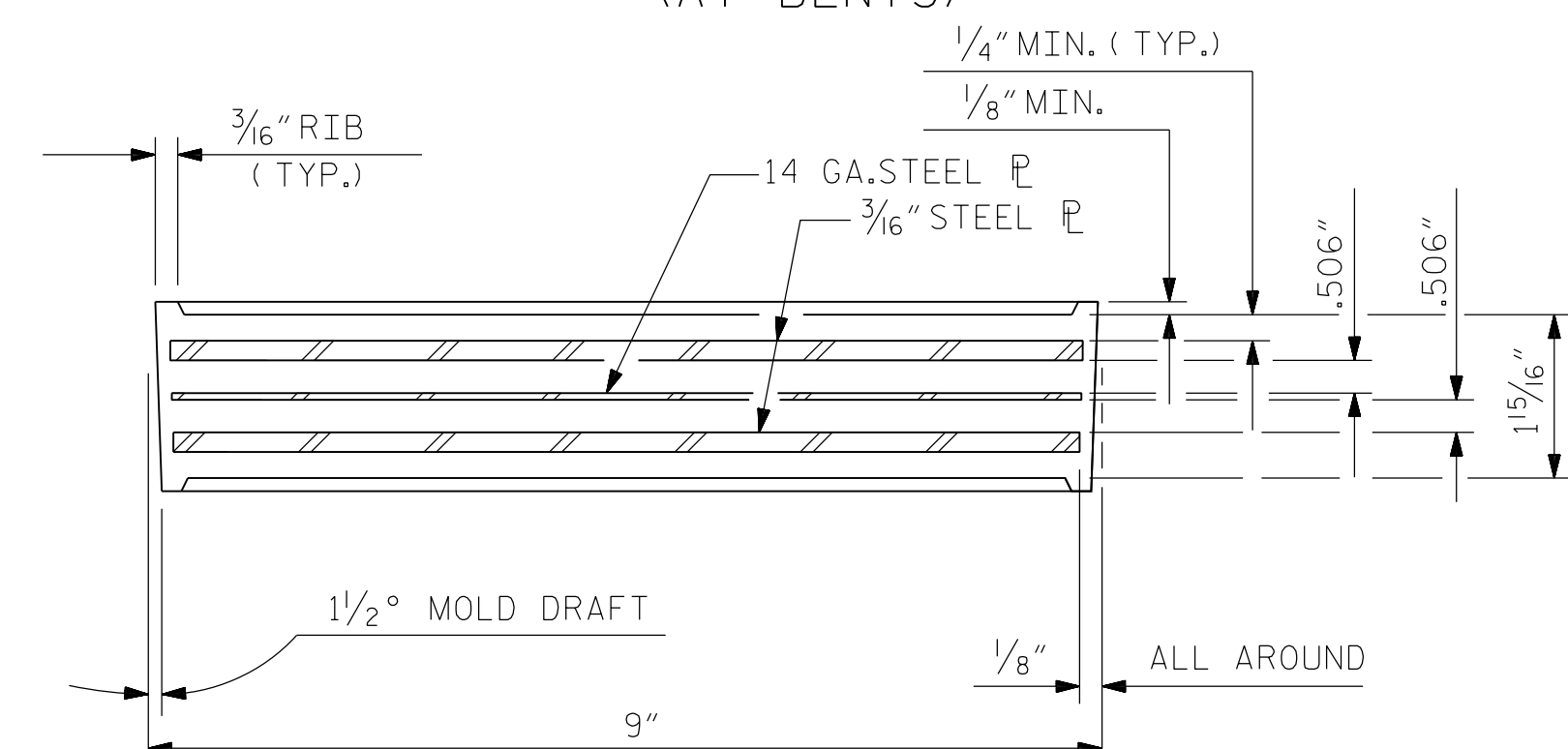
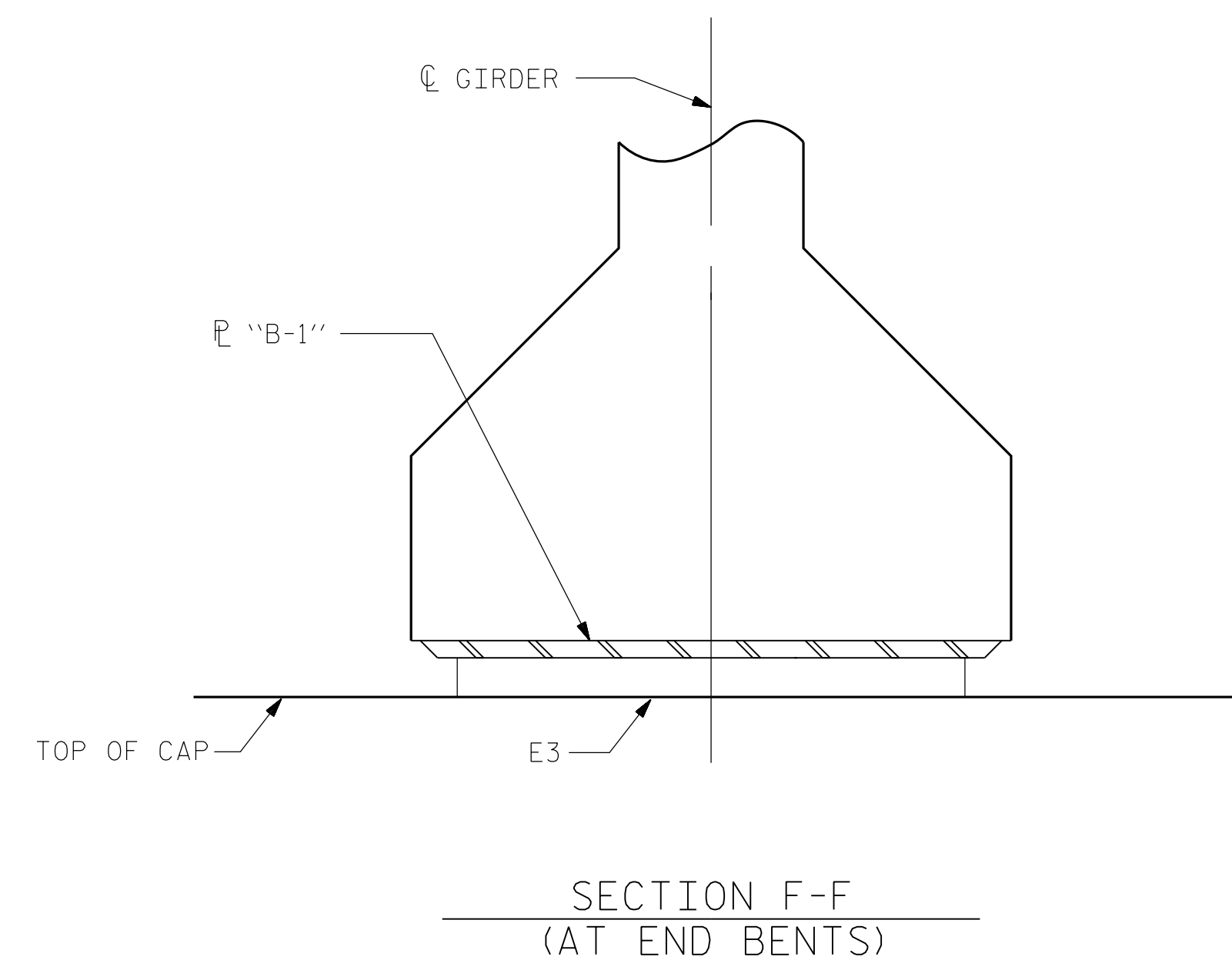
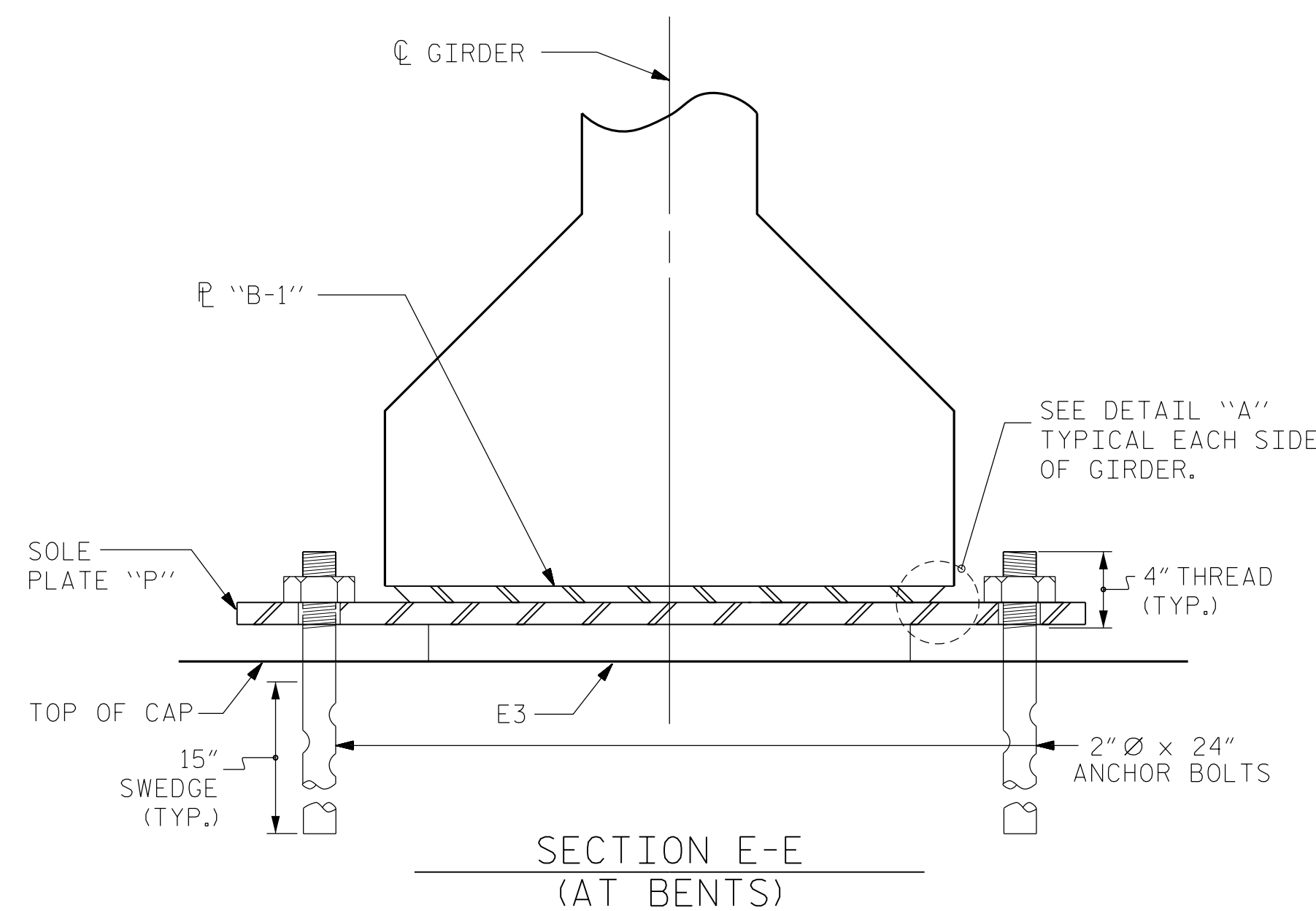
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

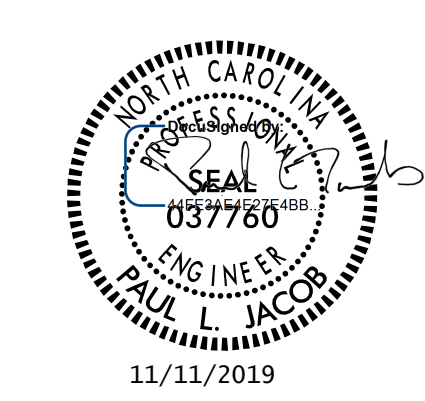
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-



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

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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 NC License NO.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-14
1			3			TOTAL SHEETS 30
2			4			

Q:\RA\6522-07\Submittals\191108 - Site 2 Structures Let Plans Rev\CAOD Files\AR2303E\_SML.G5\_014.dgn

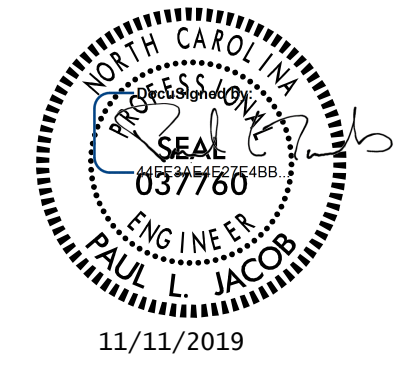
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																	
0.6" Ø LOW RELAXATION	SPAN "A"												SPAN "A"										SPAN "A"										
	GIRDERS 1 AND 6												GIRDERS 2, AND 5										GIRDERS 3 AND 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.067	0.127	0.174	0.204	0.214	0.204	0.174	0.127	0.067	0.000	0.000	0.067	0.127	0.174	0.204	0.214	0.204	0.174	0.127	0.067	0.000	0.000	0.067	0.127	0.174	0.204	0.214	0.204	0.174	0.127	0.067	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.044	0.087	0.120	0.142	0.148	0.140	0.118	0.084	0.043	0.000	0.000	0.050	0.098	0.136	0.160	0.168	0.159	0.134	0.096	0.048	0.000	0.000	0.050	0.098	0.135	0.159	0.167	0.158	0.134	0.096	0.048	0.000
FINAL CAMBER ↑	0"	1/4"	1/2"	5/8"	3/4"	13/16"	3/4"	11/16"	1/2"	5/16"	0"	0"	3/16"	3/8"	7/16"	1/2"	9/16"	9/16"	1/2"	3/8"	1/4"	0"	0"	3/16"	3/8"	7/16"	9/16"	9/16"	9/16"	1/2"	3/8"	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																																	
0.6" Ø LOW RELAXATION	SPAN "B"												SPAN "B"										SPAN "B"										
	GIRDERS 1 AND 6												GIRDERS 2 AND 5										GIRDERS 3 AND 4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.048	0.091	0.124	0.145	0.152	0.145	0.124	0.091	0.048	0.000	0.000	0.048	0.091	0.124	0.145	0.152	0.145	0.124	0.091	0.048	0.000	0.000	0.048	0.091	0.124	0.145	0.152	0.145	0.124	0.091	0.048	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.058	0.070	0.074	0.070	0.060	0.043	0.022	0.000	0.000	0.024	0.048	0.067	0.080	0.085	0.081	0.069	0.050	0.025	0.000	0.000	0.024	0.048	0.067	0.080	0.084	0.080	0.068	0.049	0.025	0.000
FINAL CAMBER ↑	0"	5/16"	5/8"	13/16"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0"	0"	5/16"	1/2"	11/16"	13/16"	13/16"	3/4"	11/16"	1/2"	1/4"	0"	0"	5/16"	1/2"	11/16"	13/16"	13/16"	3/4"	11/16"	1/2"	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 ).

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**DEAD LOAD DEFLECTIONS FOR PRESTRESSED CONCRETE GIRDERS**

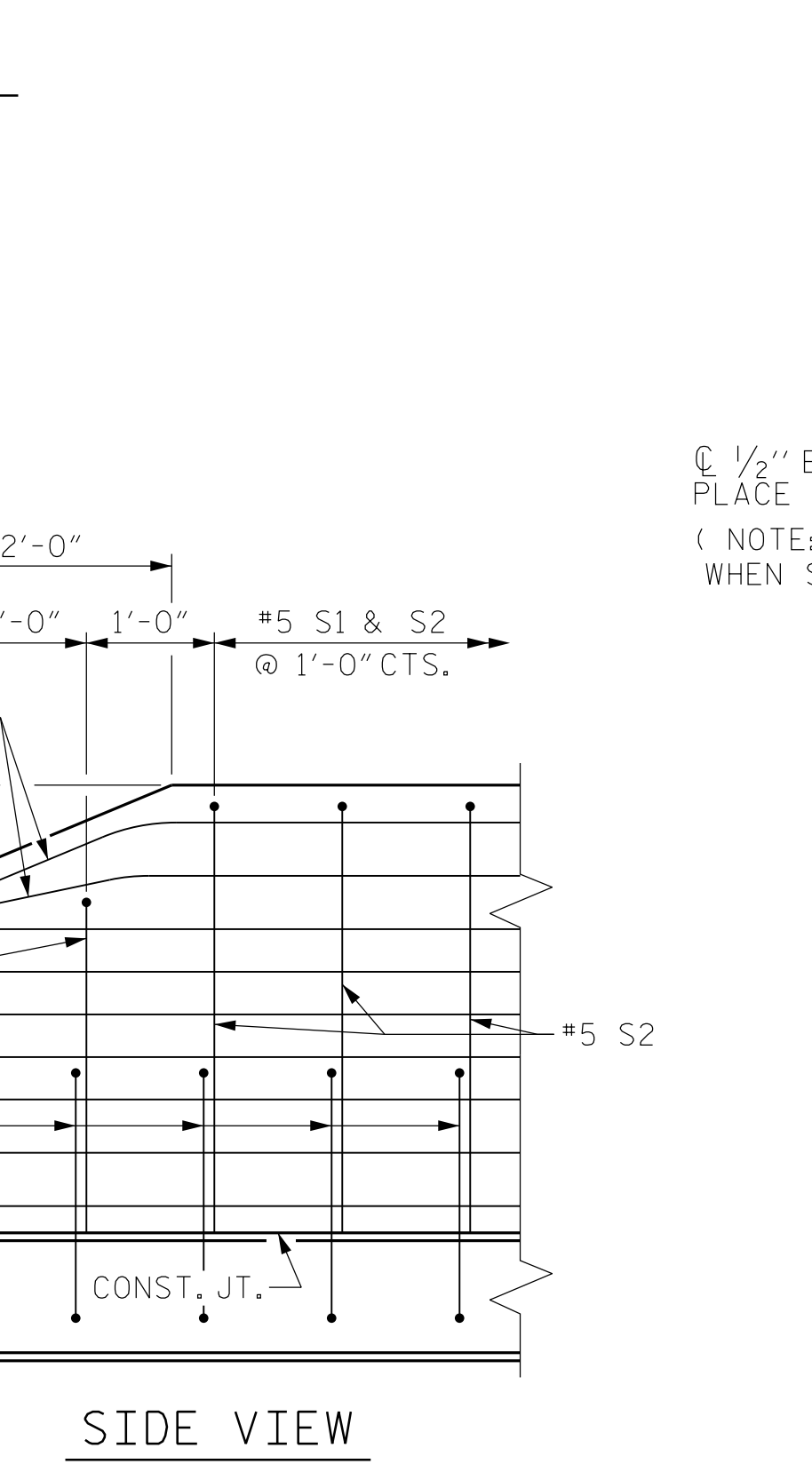
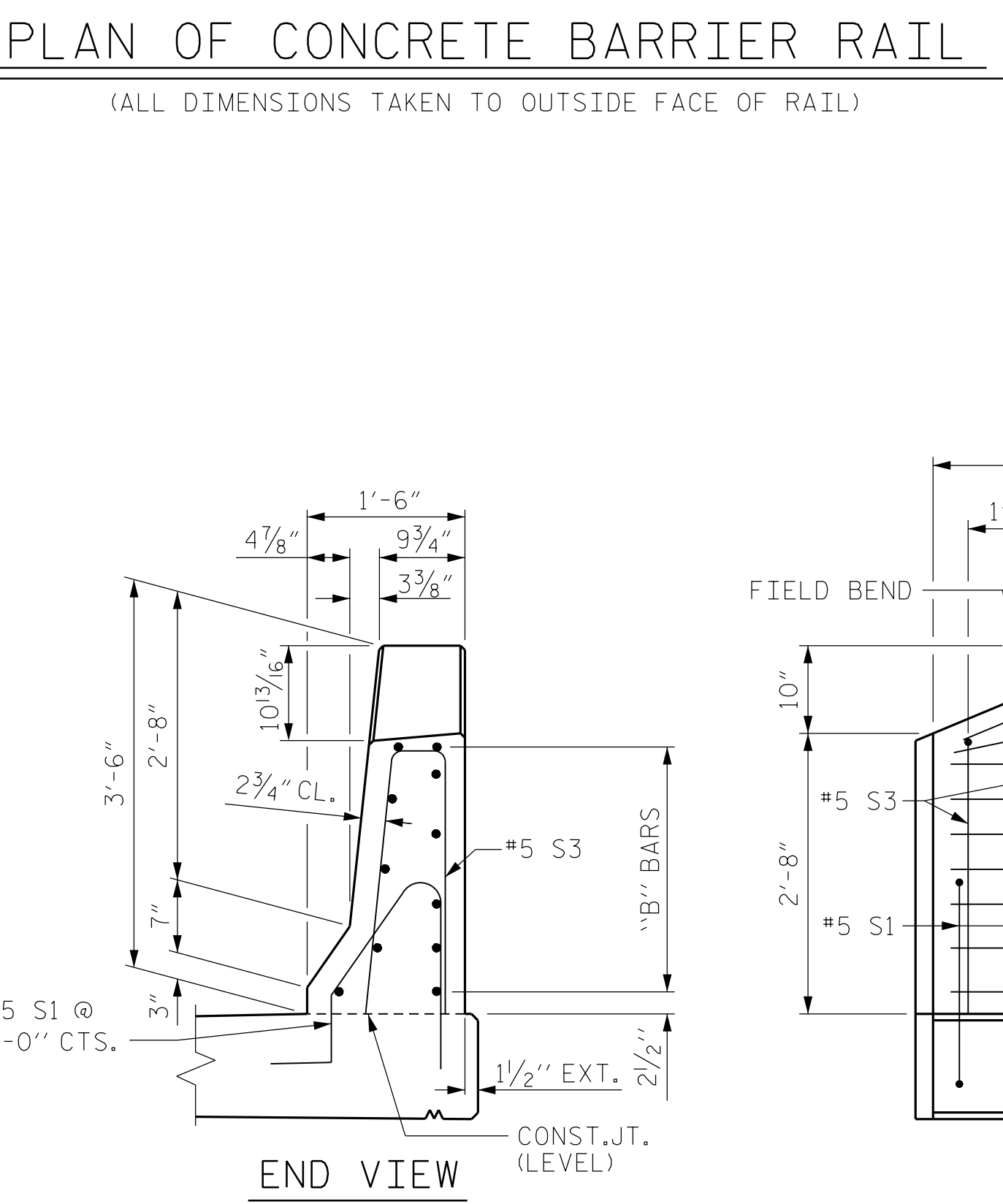
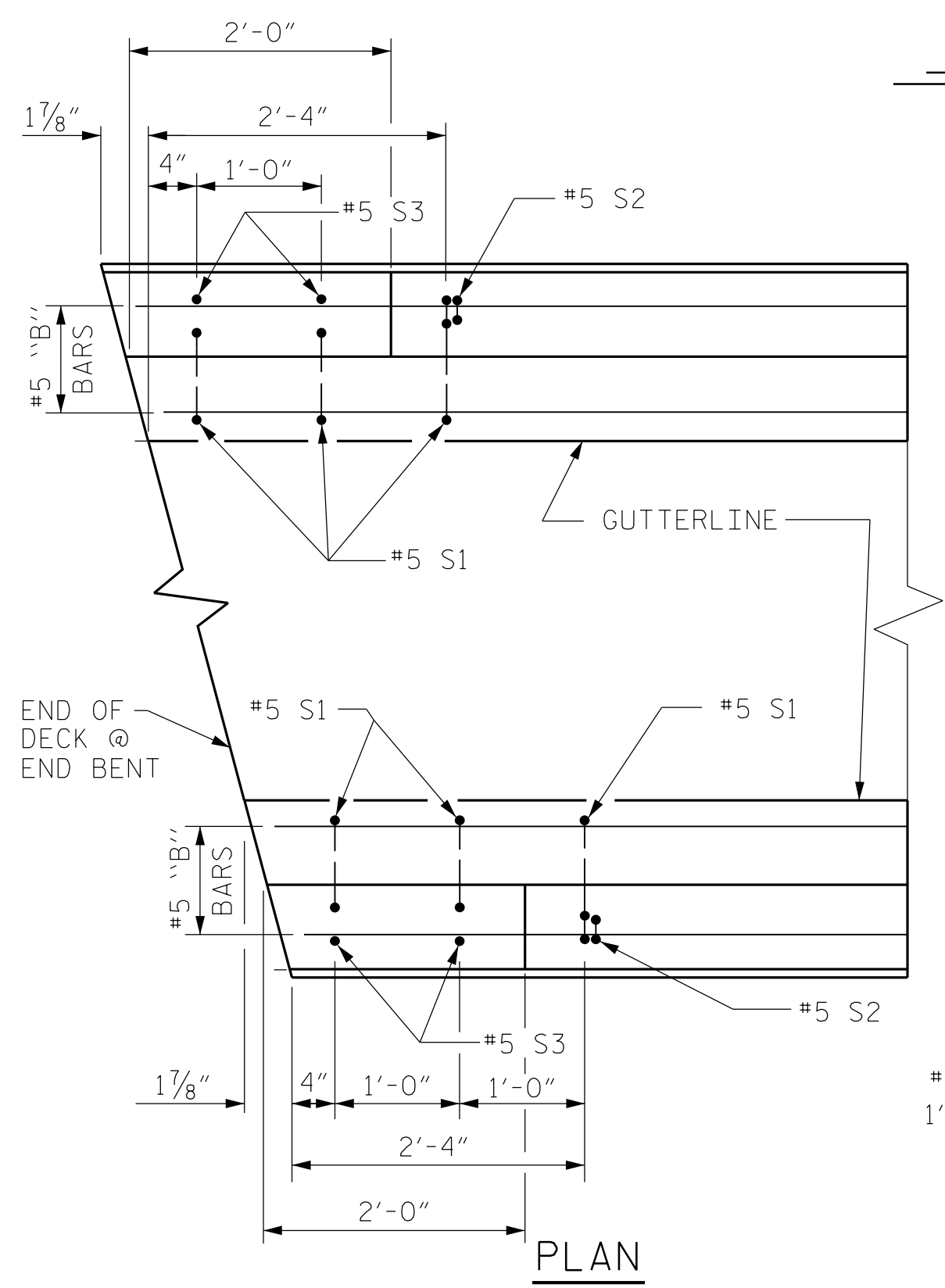
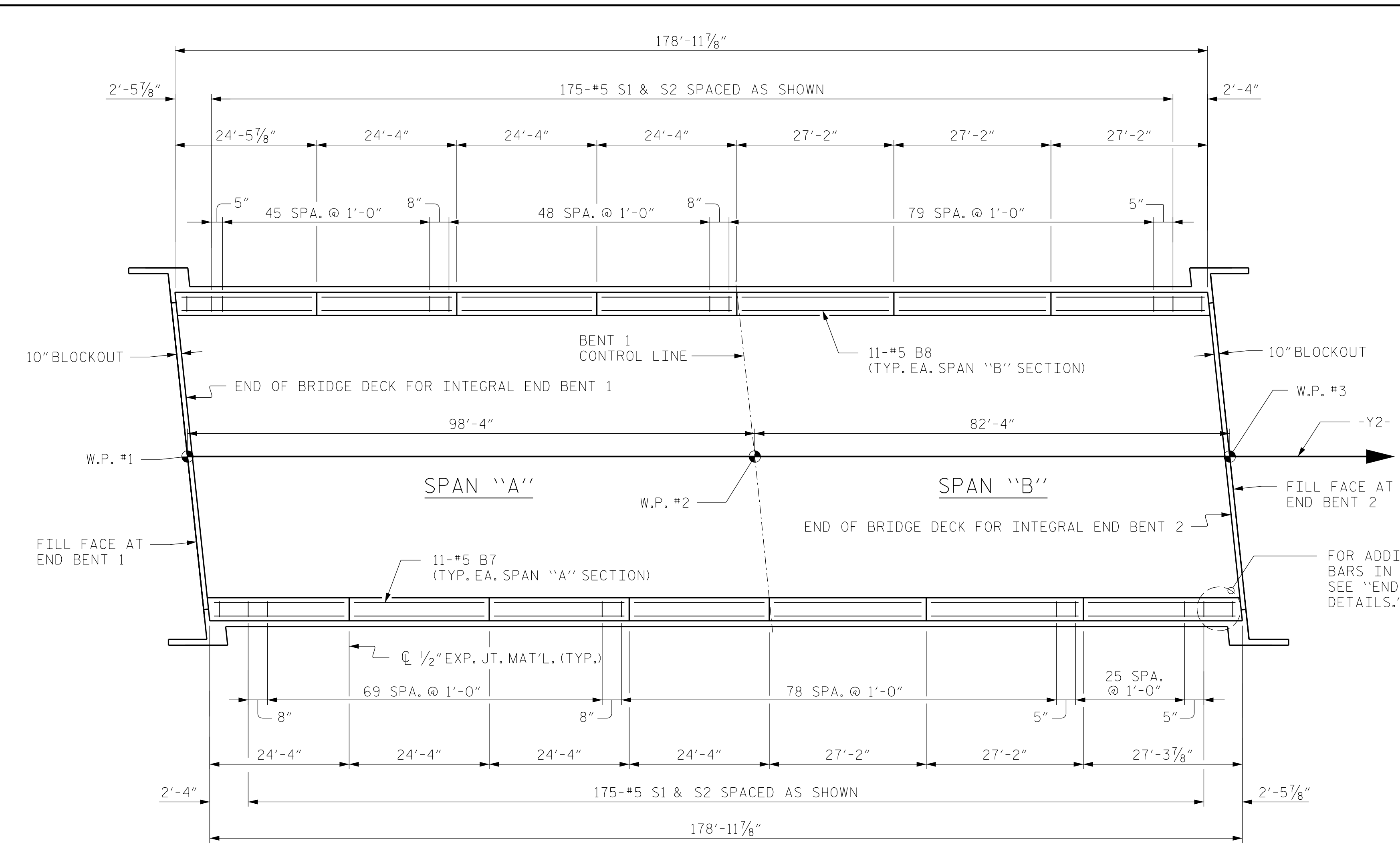
DRAWN BY : J. WEIGER DATE : 03/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License NO.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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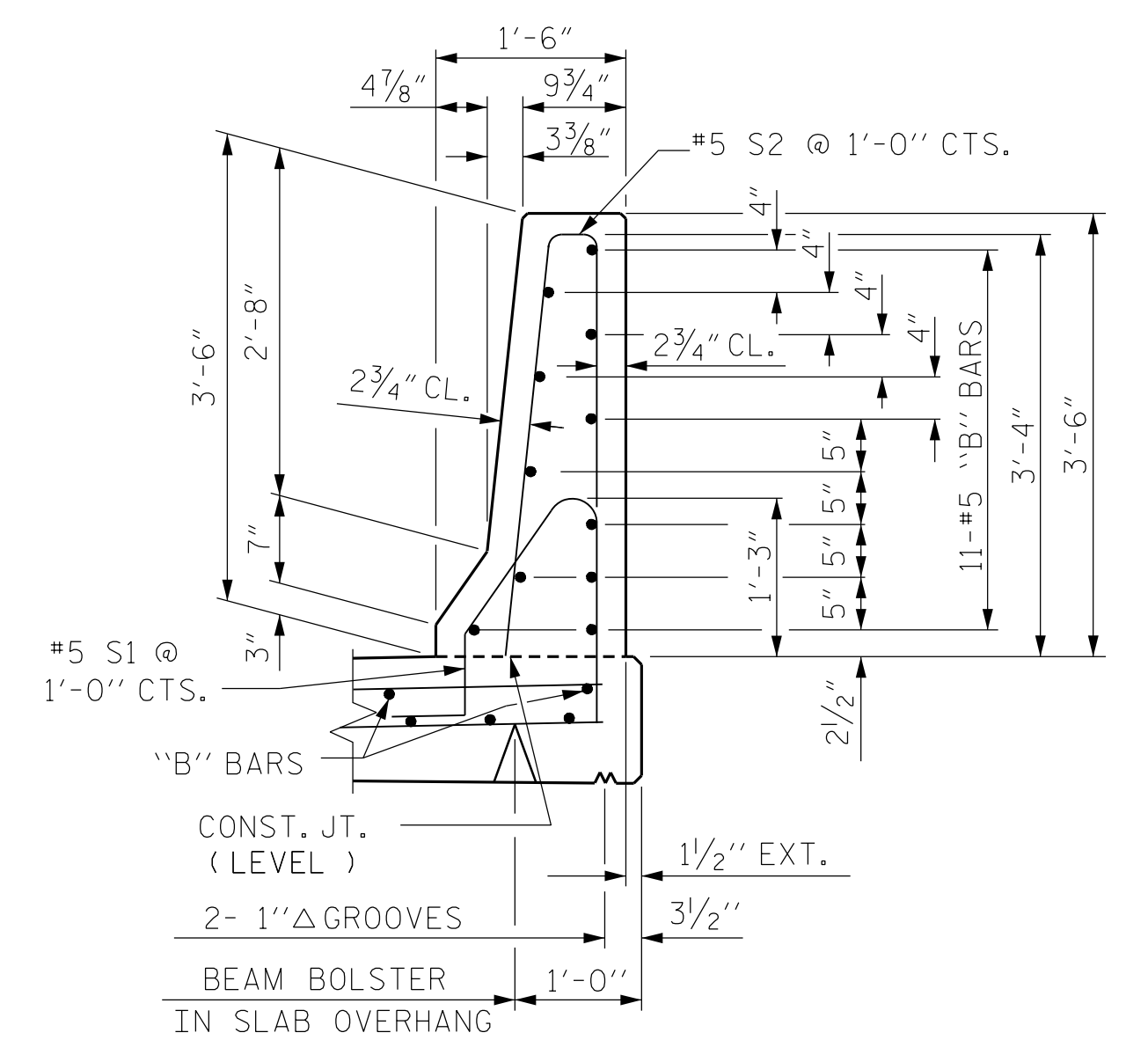
**END OF RAIL DETAILS**

**NOTES**

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

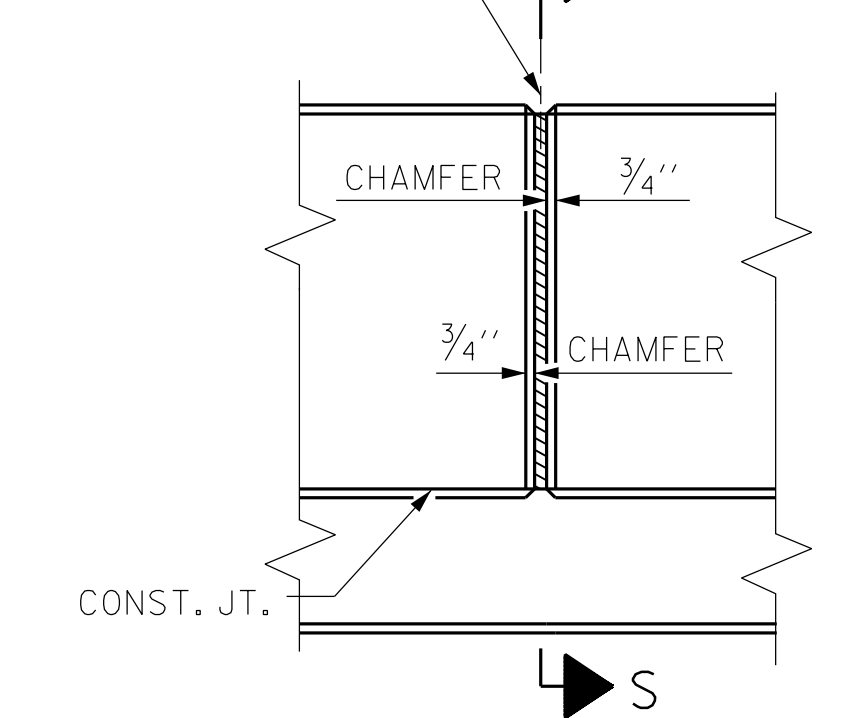
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

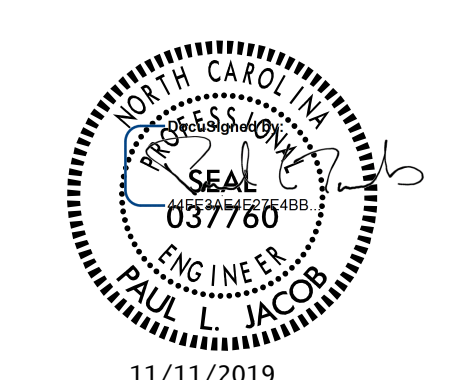
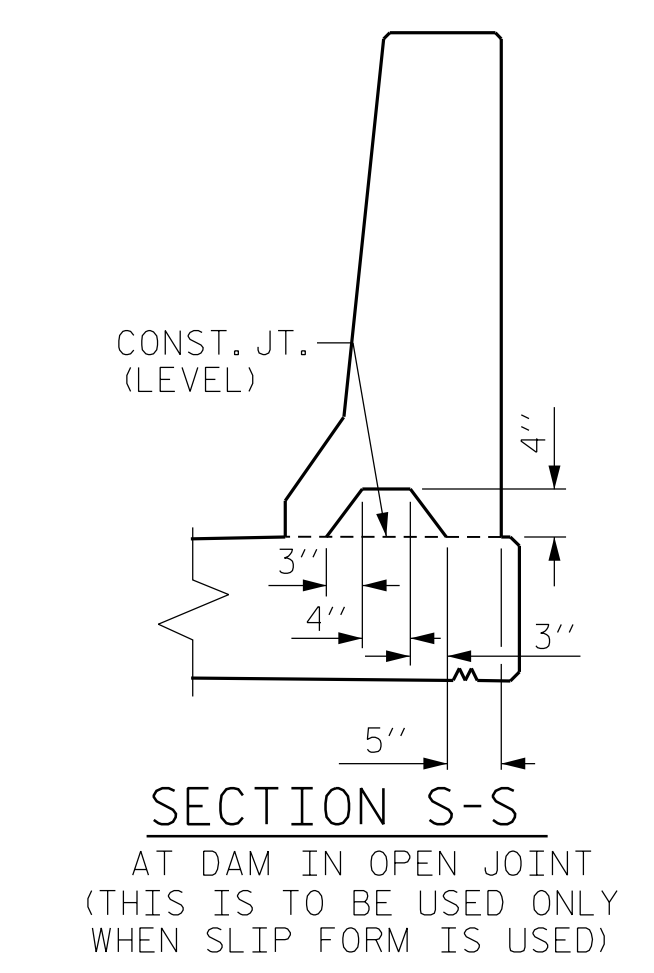


**SECTION THRU RAIL**

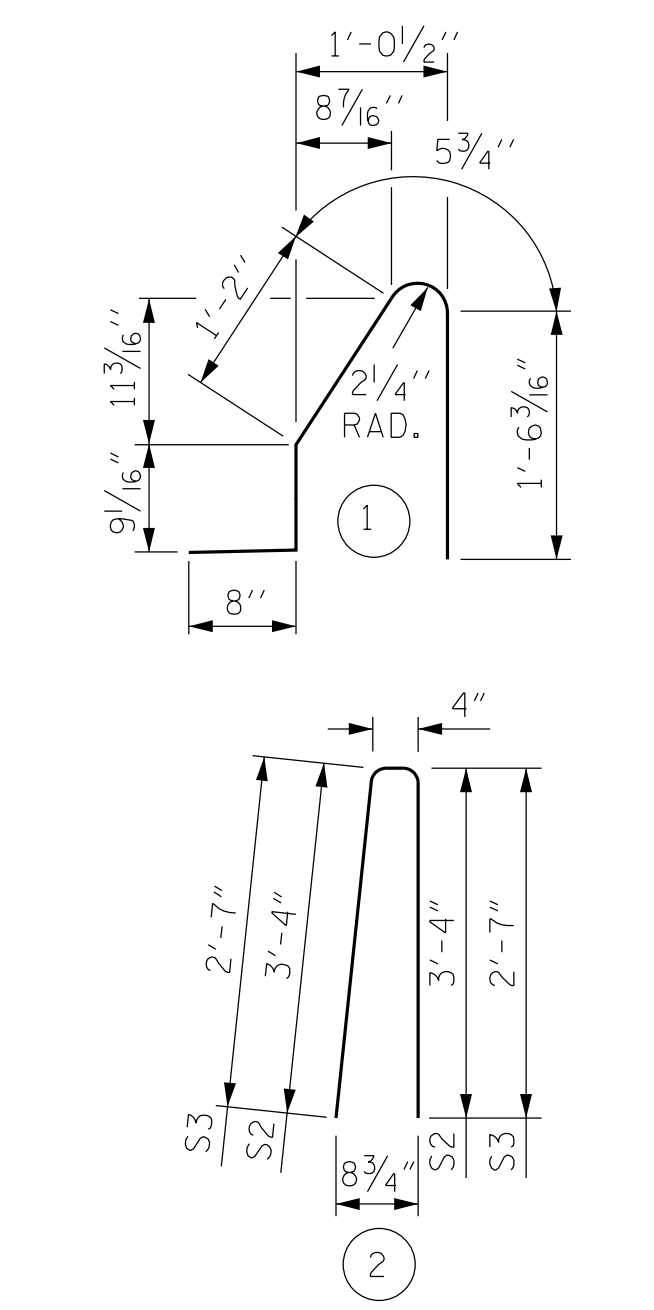
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L, WHEN SLIP FORM IS USED.)



**BARRIER RAIL DETAILS**



**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	358	#5	1	4'-7"	1711
* S2	350	#5	2	7'-0"	2555
* S3	8	#5	2	5'-6"	46
* B7	88	#5	STR	23'-11"	2195
* B8	66	#5	STR	26'-8"	1836
* EPOXY COATED REINFORCING STEEL					8343 LBS.
CLASS AA CONCRETE					48.6 CU. YDS.
CONCRETE BARRIER RAIL					358 LIN. FT.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-  
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
CONCRETE  
BARRIER RAIL

ASSEMBLED BY : J. WEIGER	DATE : 04/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

**moffatt & nichol**  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4626 VOICE (919) 781-4869 FAX  
NC License No.: F-0105

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1			3			TOTAL SHEETS 30
2			4			



NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

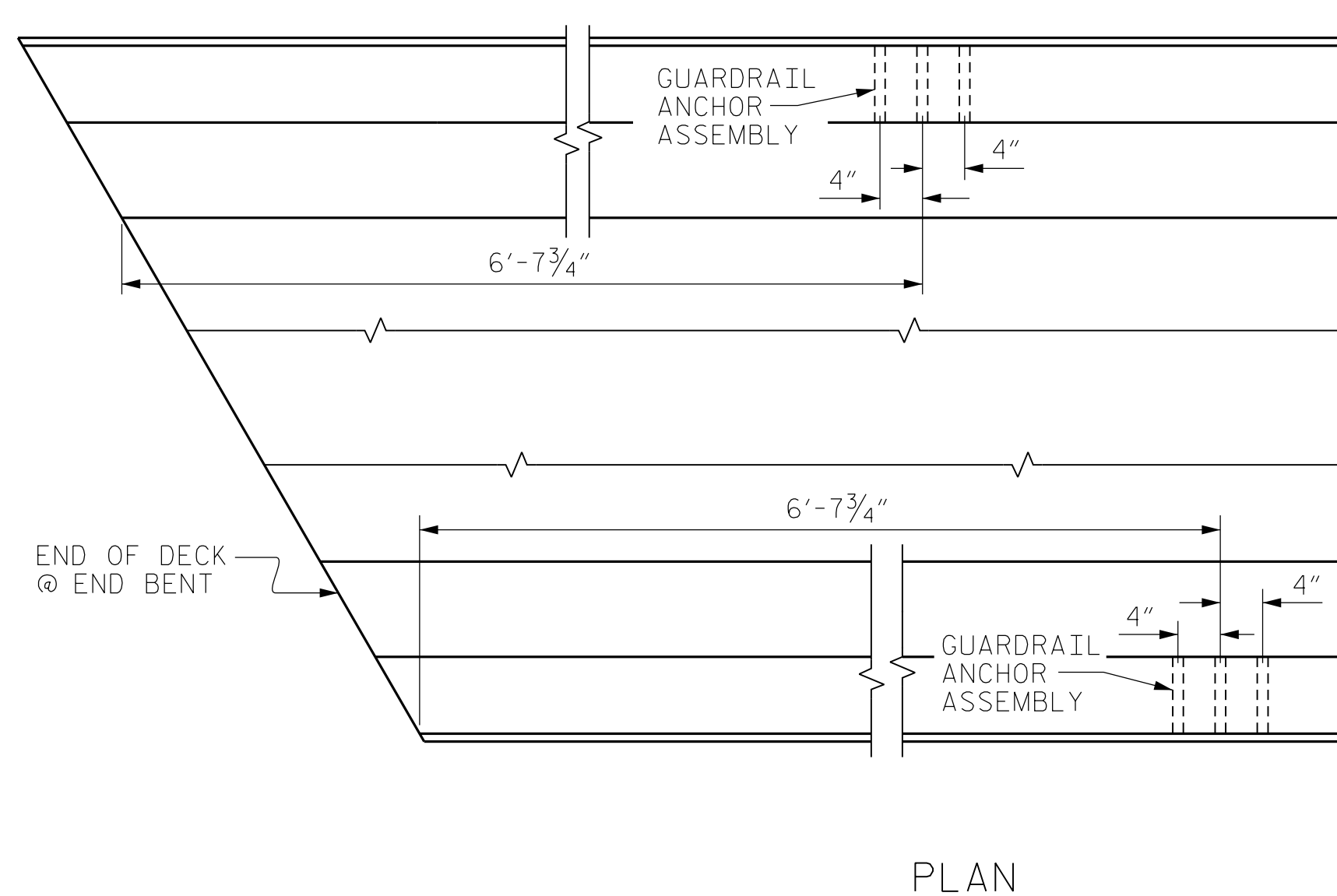
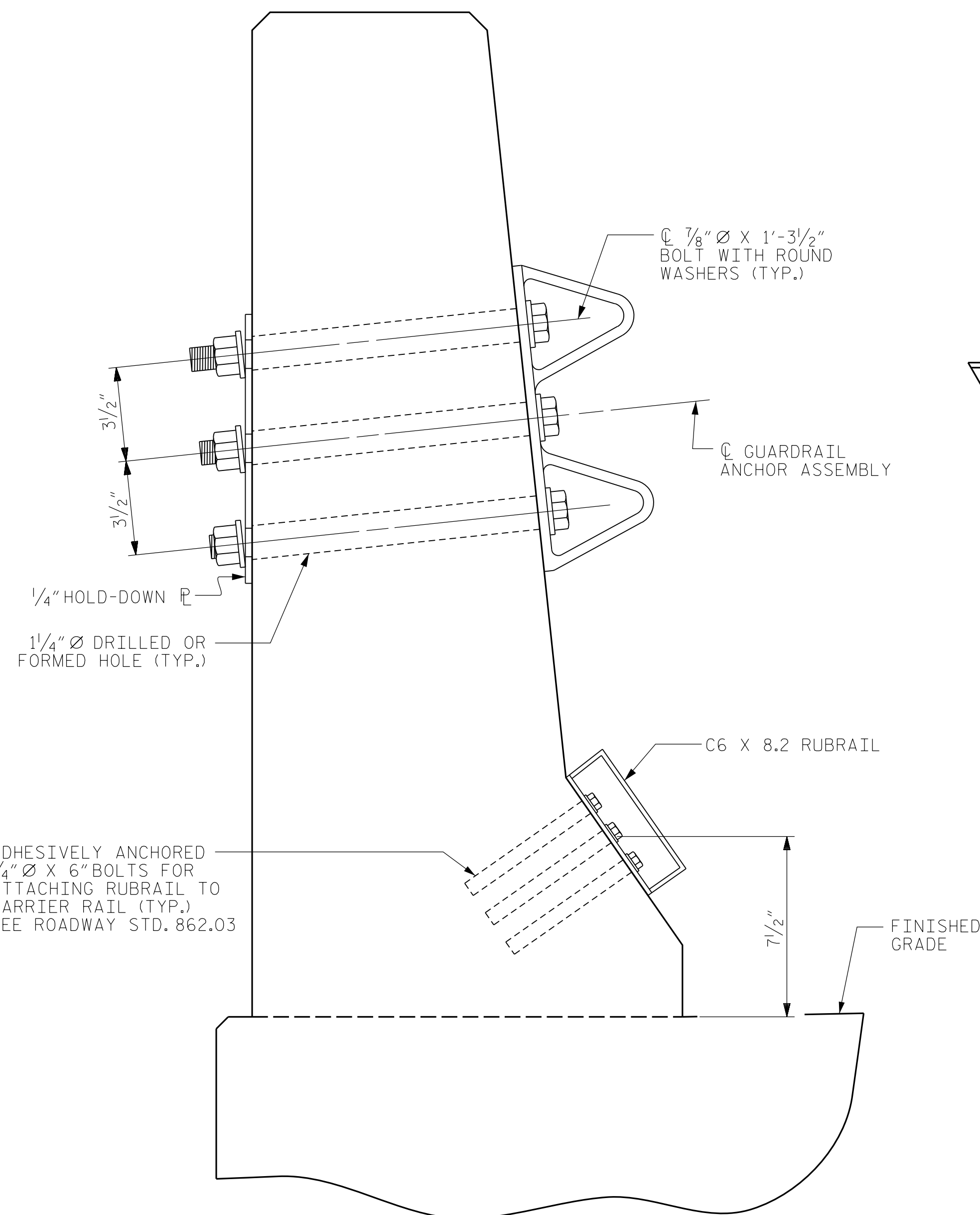
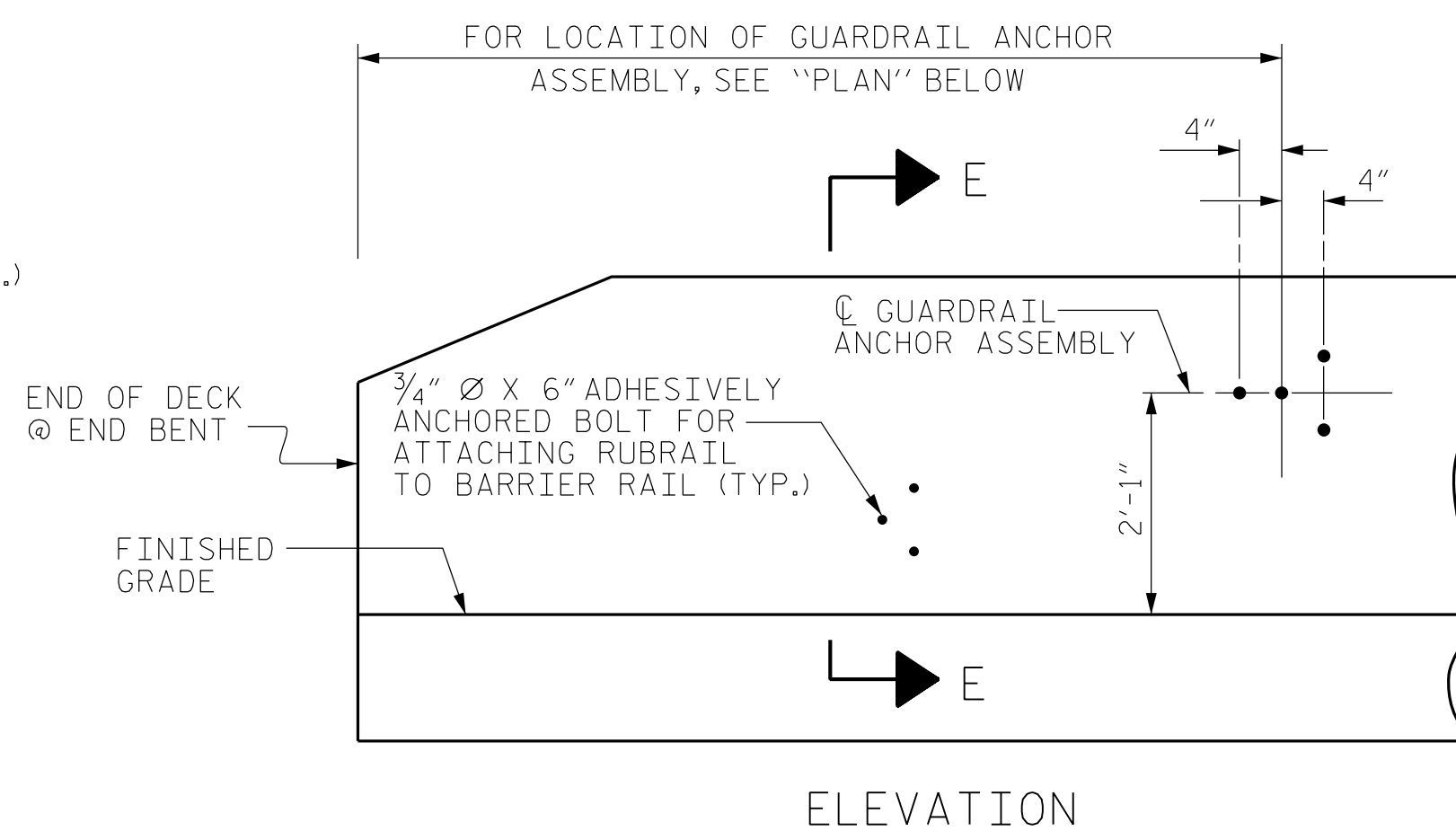
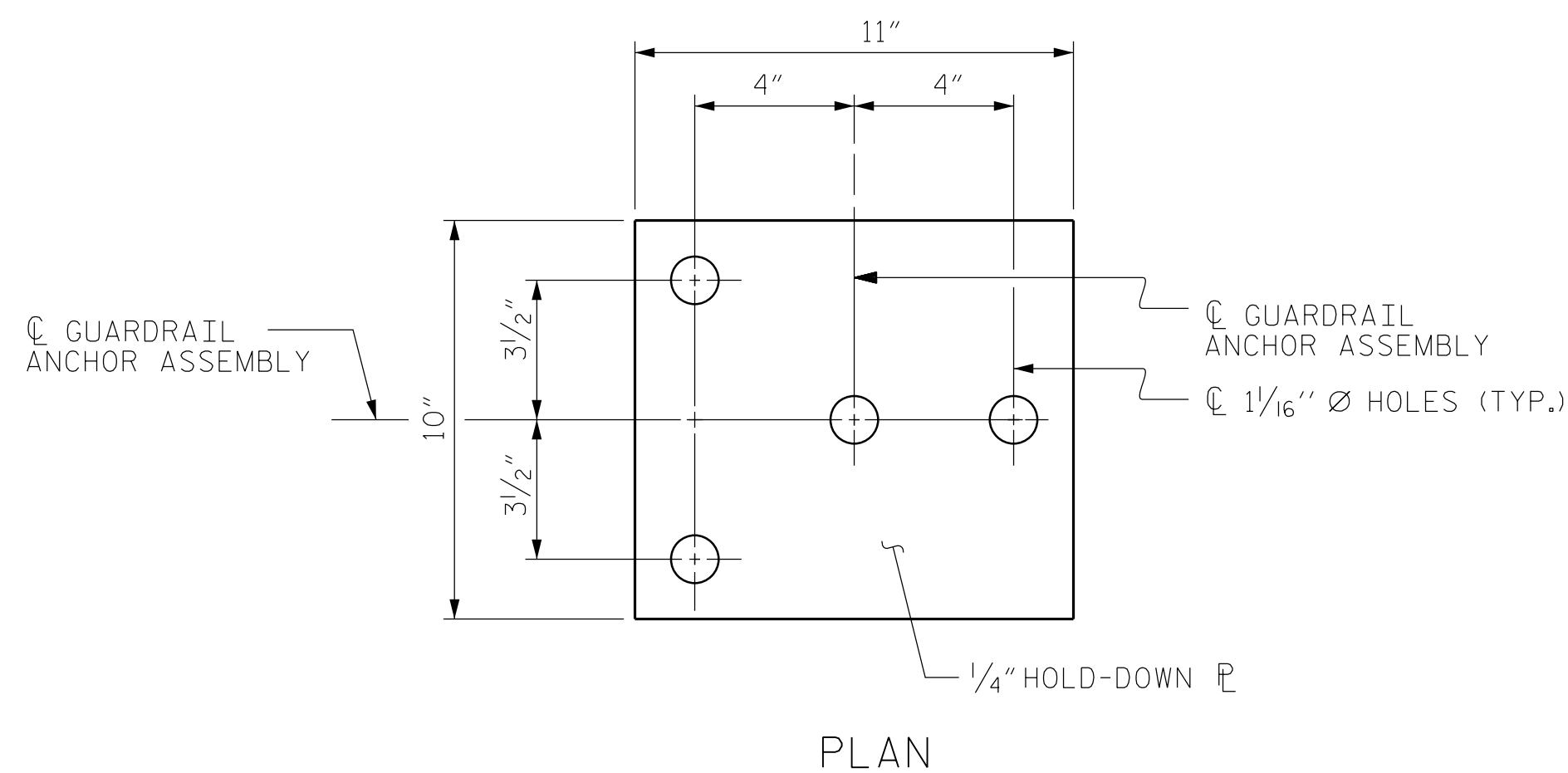
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

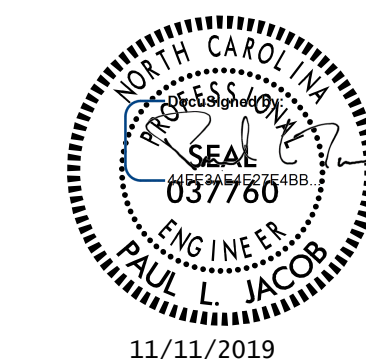
SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL



**moffatt & nichol**  
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2			4			30

(SHT 1a) STD. NO. GRA2

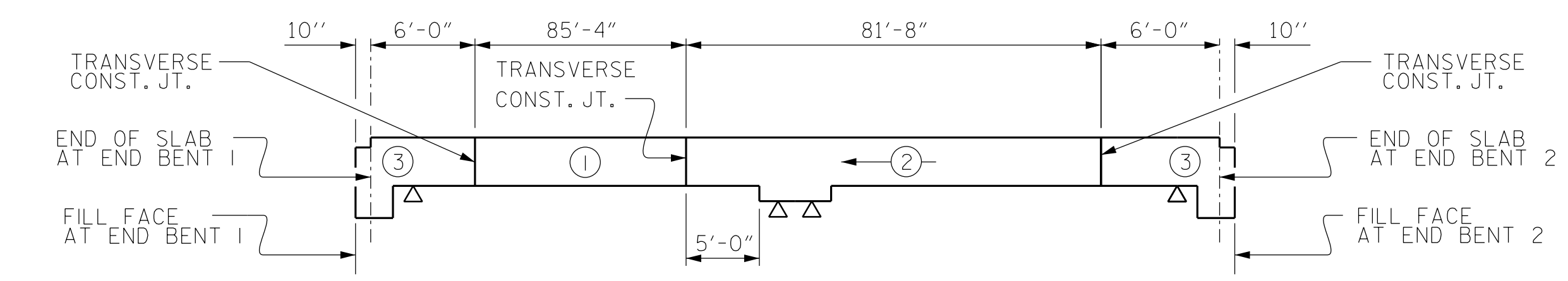
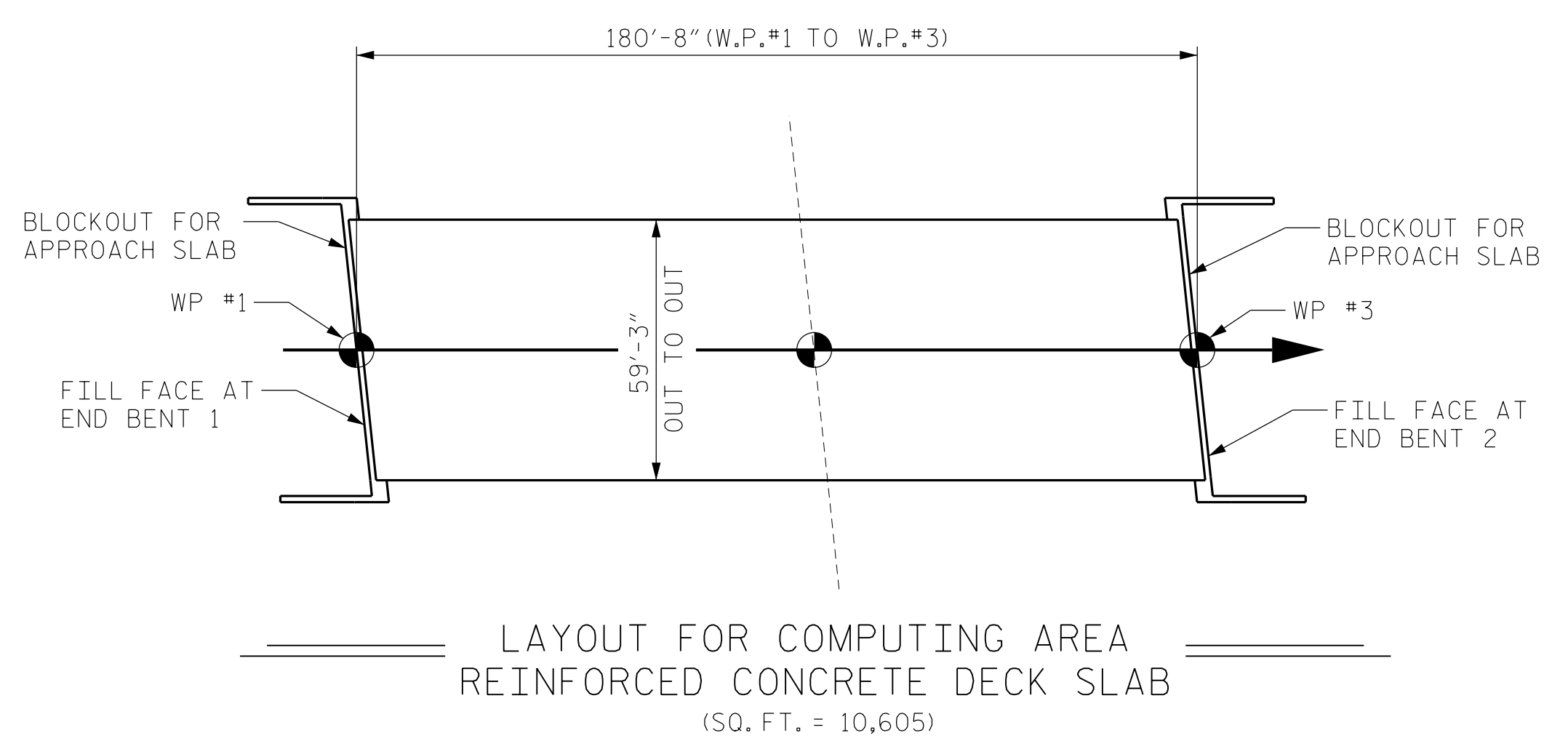
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ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	376	5	STR	58'-11"	23105
A2	376	5	STR	58'-11"	23105
*A101	2	5	STR	2'-10"	6
*A102	2	5	STR	7'-2"	15
*A103	2	5	STR	11'-6"	24
*A104	2	5	STR	15'-10"	33
*A105	2	5	STR	20'-2"	42
*A106	2	5	STR	24'-7"	51
*A107	2	5	STR	28'-11"	60
*A108	2	5	STR	33'-3"	69
*A109	2	5	STR	37'-7"	78
*A110	2	5	STR	41'-11"	87
*A111	2	5	STR	46'-3"	96
*A112	2	5	STR	50'-7"	106
*A113	2	5	STR	54'-11"	115
A201	2	5	STR	2'-10"	6
A202	2	5	STR	7'-2"	15
A203	2	5	STR	11'-6"	24
A204	2	5	STR	15'-10"	33
A205	2	5	STR	20'-2"	42
A206	2	5	STR	24'-7"	51
A207	2	5	STR	28'-11"	60
A208	2	5	STR	33'-3"	69
A209	2	5	STR	37'-7"	78
A210	2	5	STR	41'-11"	87
A211	2	5	STR	46'-3"	96
A212	2	5	STR	50'-7"	106
A213	2	5	STR	54'-11"	115
*B1	86	4	STR	24'-11"	1431
*B2	119	6	STR	19'-10"	3545
*B3	43	6	STR	55'-0"	3552
*B4	76	6	STR	27'-3"	3111
*B5	43	6	STR	13'-3"	856
*B6	86	4	STR	21'-1"	1211
*B7	119	6	STR	16'-4"	2919
B8	360	5	STR	45'-8"	17147
K1	20	4	STR	30'-9"	411
K2	10	4	STR	7'-11"	53
K3	20	4	STR	9'-0"	120
K4	40	4	STR	7'-3"	194
K5	20	4	STR	8'-5"	112
K6	4	4	STR	2'-2"	6
K7	4	4	STR	2'-8"	7
K8	8	4	STR	2'-11"	16
K9	4	4	STR	2'-5"	6
K10	10	4	STR	27'-2"	181
K11	10	4	STR	6'-9"	45
S1	92	4	1	11'-11"	732
S2	88	4	1	10'-9"	632
S3	150	4	4	2'-9"	276
U1	92	4	2	4'-2"	707
U2	30	4	3	15'-10"	317
U3	10	4	3	13'-10"	92

REINFORCING STEEL 43577 LBS.  
\* EPOXY COATED REINF. STEEL 41876 LBS.

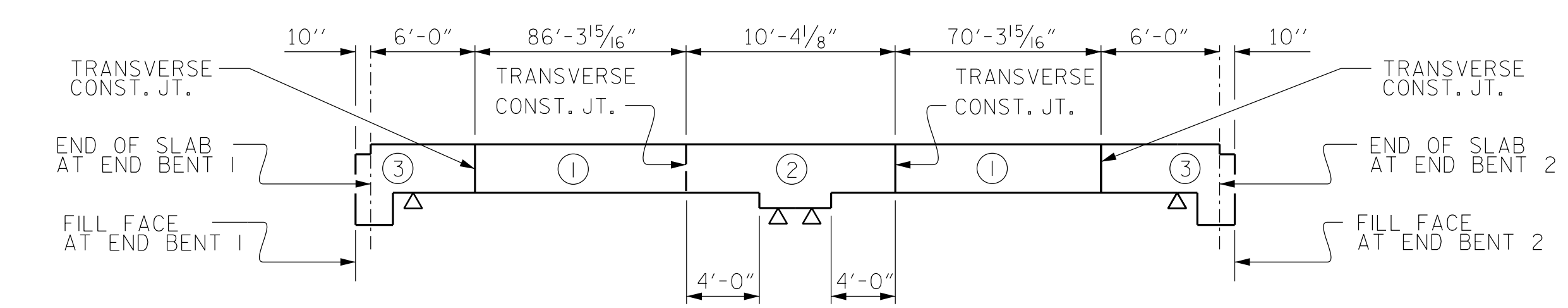


**POURING SEQUENCE**

(CONTINUOUS FOR LIVE LOAD)

**KEY**

⊙ = INDICATES POUR NUMBER AND DIRECTION

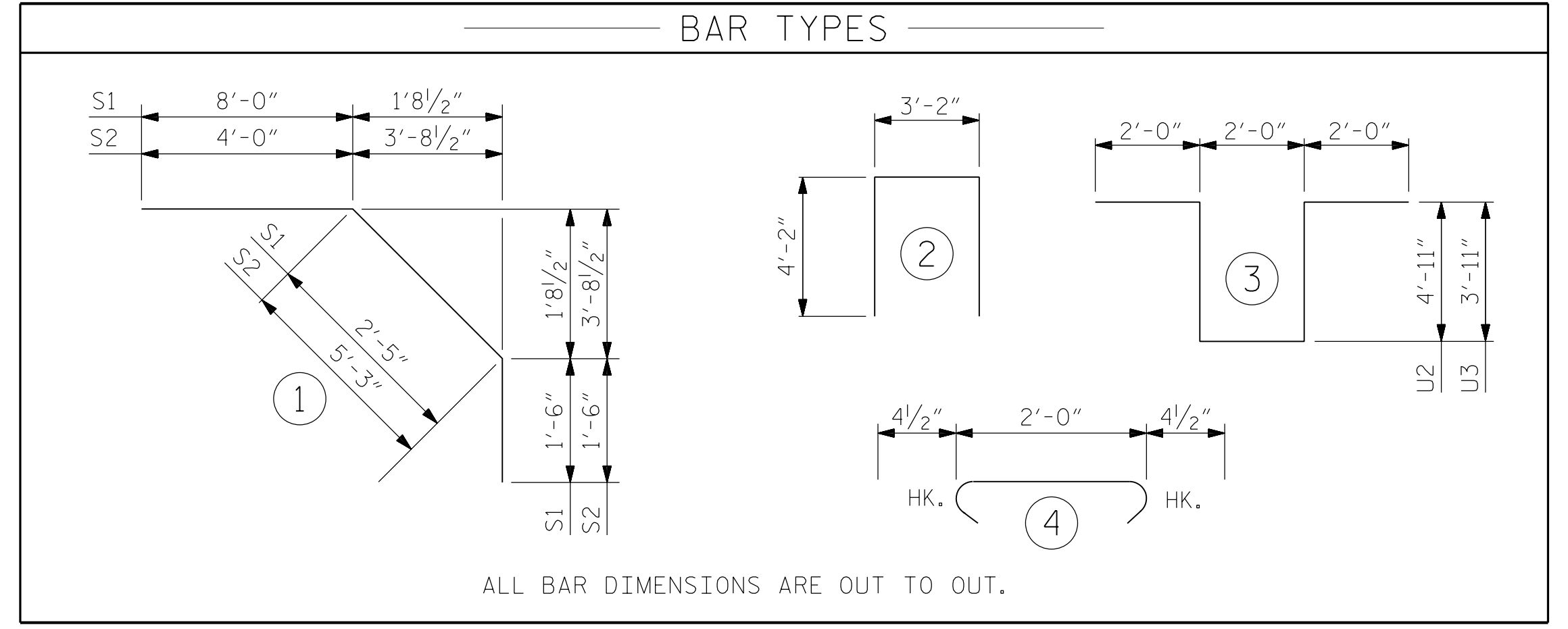


**ALTERNATE POURING SEQUENCE**

(CONTINUOUS FOR LIVE LOAD)

**KEY**

⊙ = INDICATES POUR NUMBER



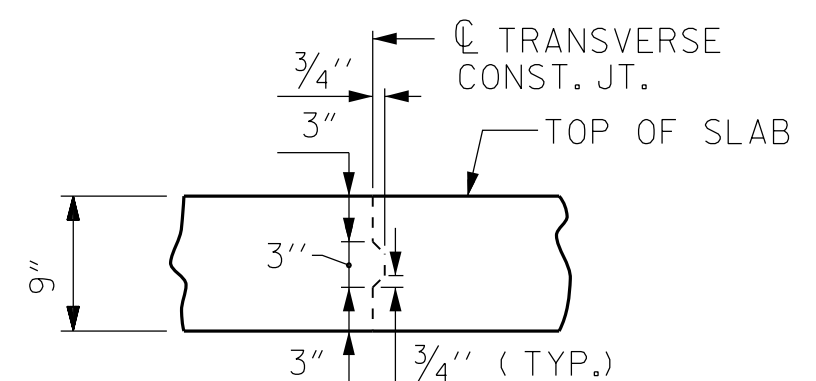
ALL BAR DIMENSIONS ARE OUT TO OUT.

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	150.6		
POUR #2	168.1		
POUR #3 #	97.8		
TOTAL **	416.6	43577	41876

# POUR #3 QUANTITY INCLUDES UPPER POUR OF INTEGRAL END BENT.

\*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED.



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

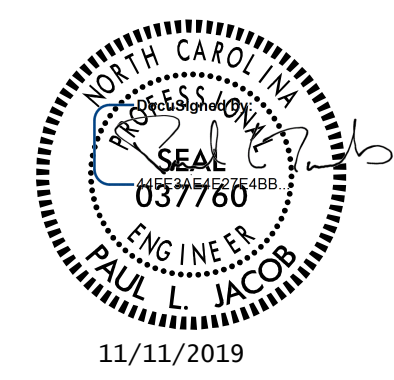
**SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS**

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

**GROOVING BRIDGE FLOORS**

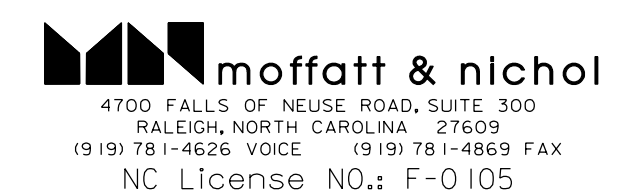
APPROACH SLABS	2650	SQ. FT.
BRIDGE DECK	9487	SQ. FT.
TOTAL	12137	SQ. FT.

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-



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

DRAWN BY : J. WEIGER DATE : 07/2019  
CHECKED BY : P. JACOB DATE : 09/2019  
DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

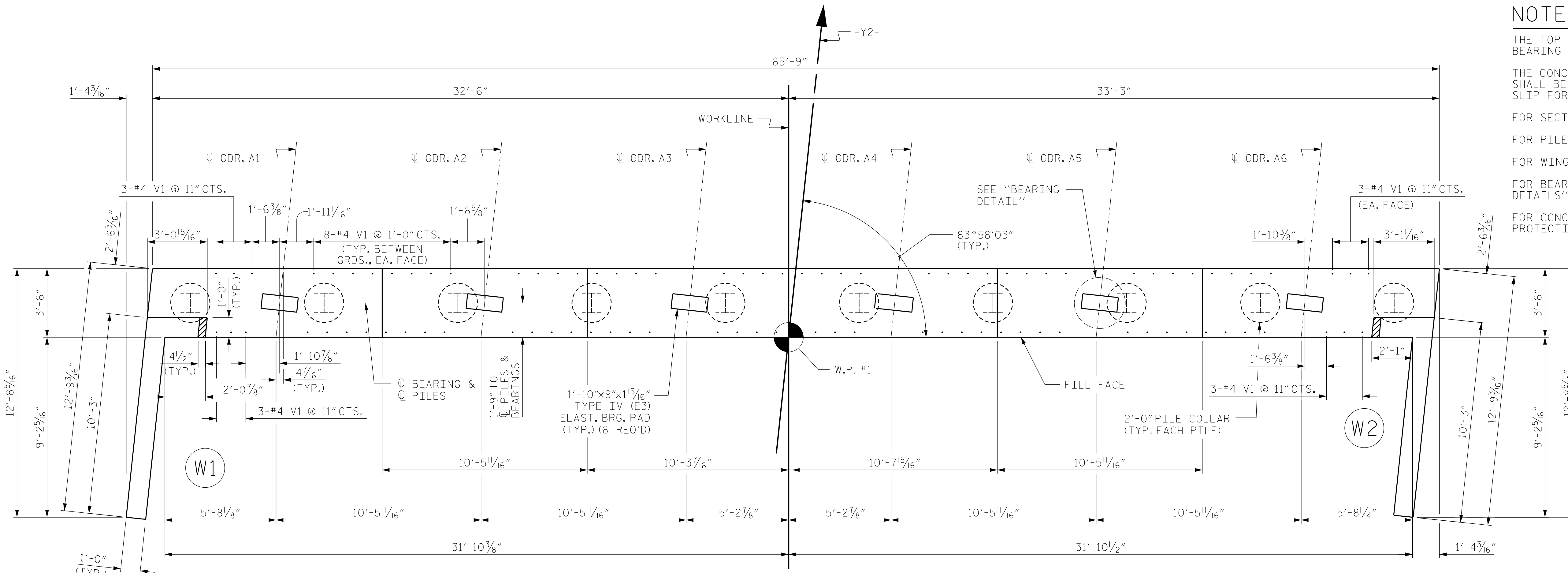


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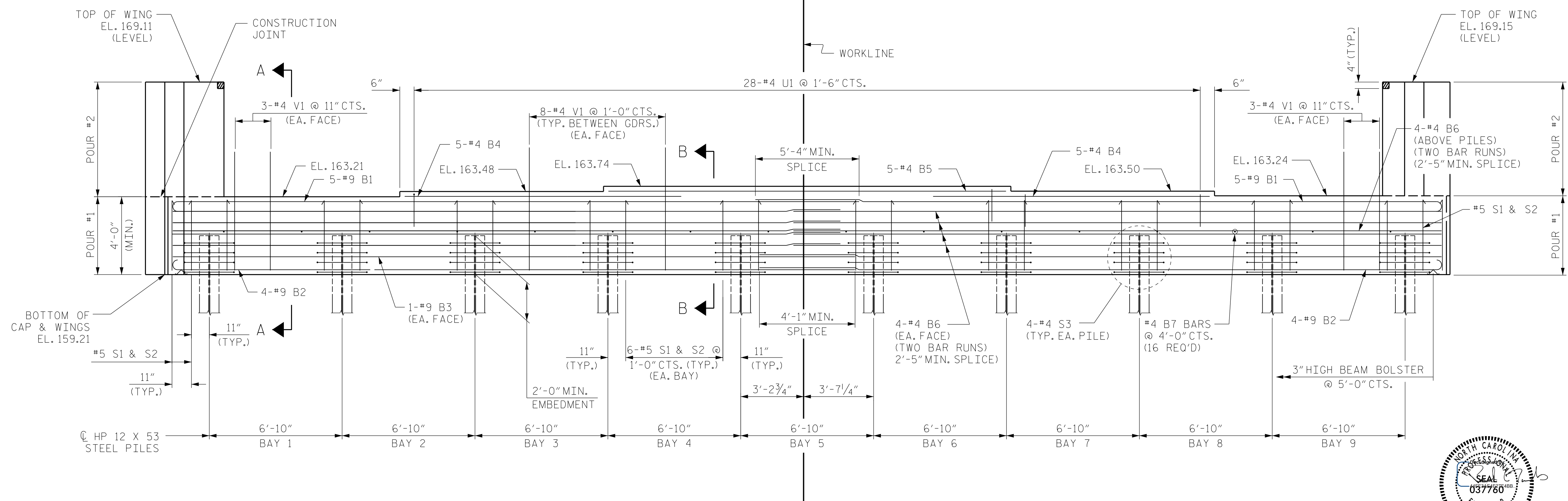
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			30

NOTES

- THE TOP SURFACE OF THE END BENT CAP, 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 BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR SECTION A-A AND B-B, SEE SHEET 3 OF 3.
- FOR PILE SPlicing DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR BEARING DETAIL, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
- FOR CONCRETE COLLAR DETAILS, SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.



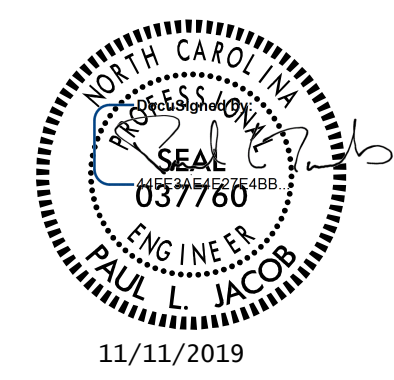
PLAN



ELEVATION

CONCRETE COLLARS NOT SHOWN FOR CLARITY

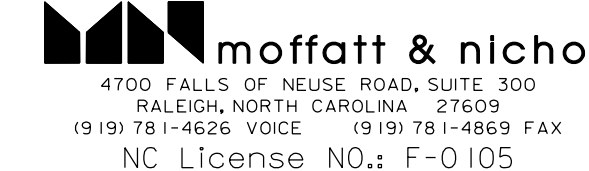
PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 INTEGRAL END BENT  
 NO. 1 PLAN

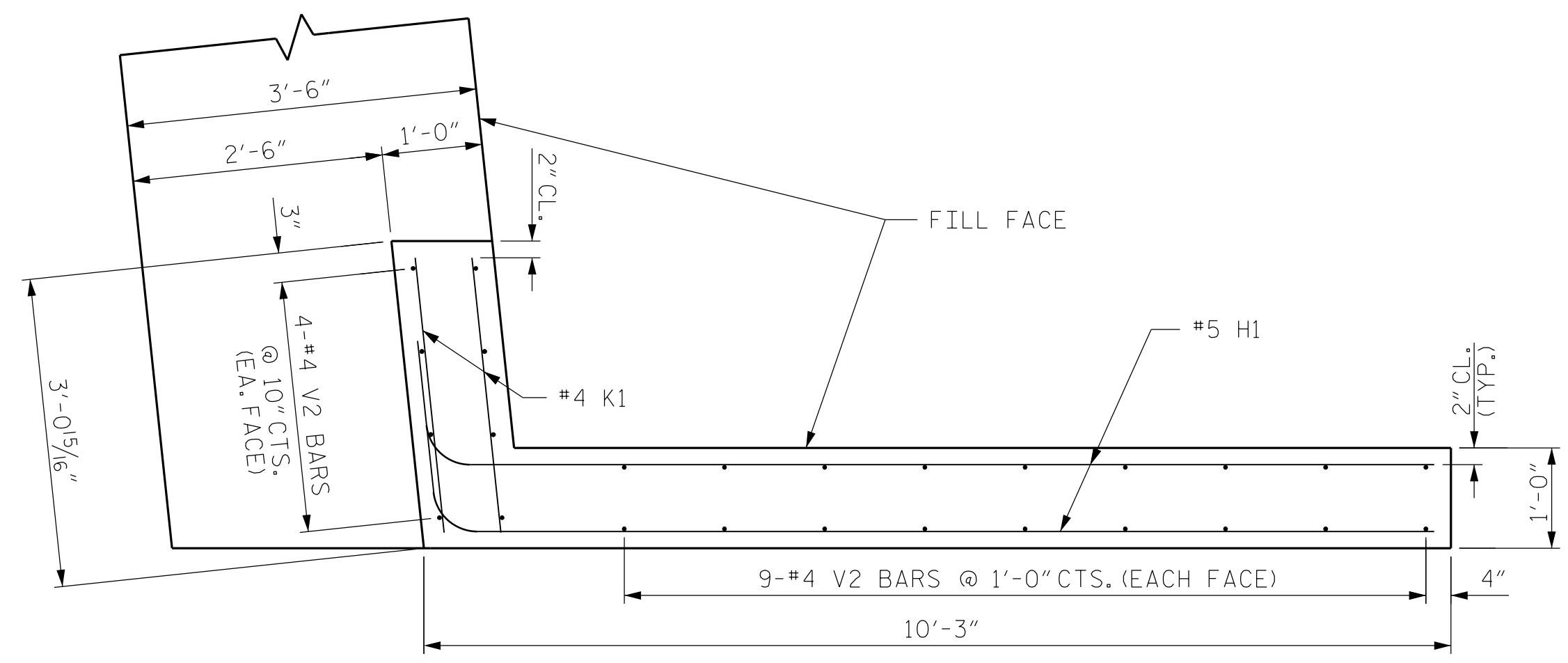
DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



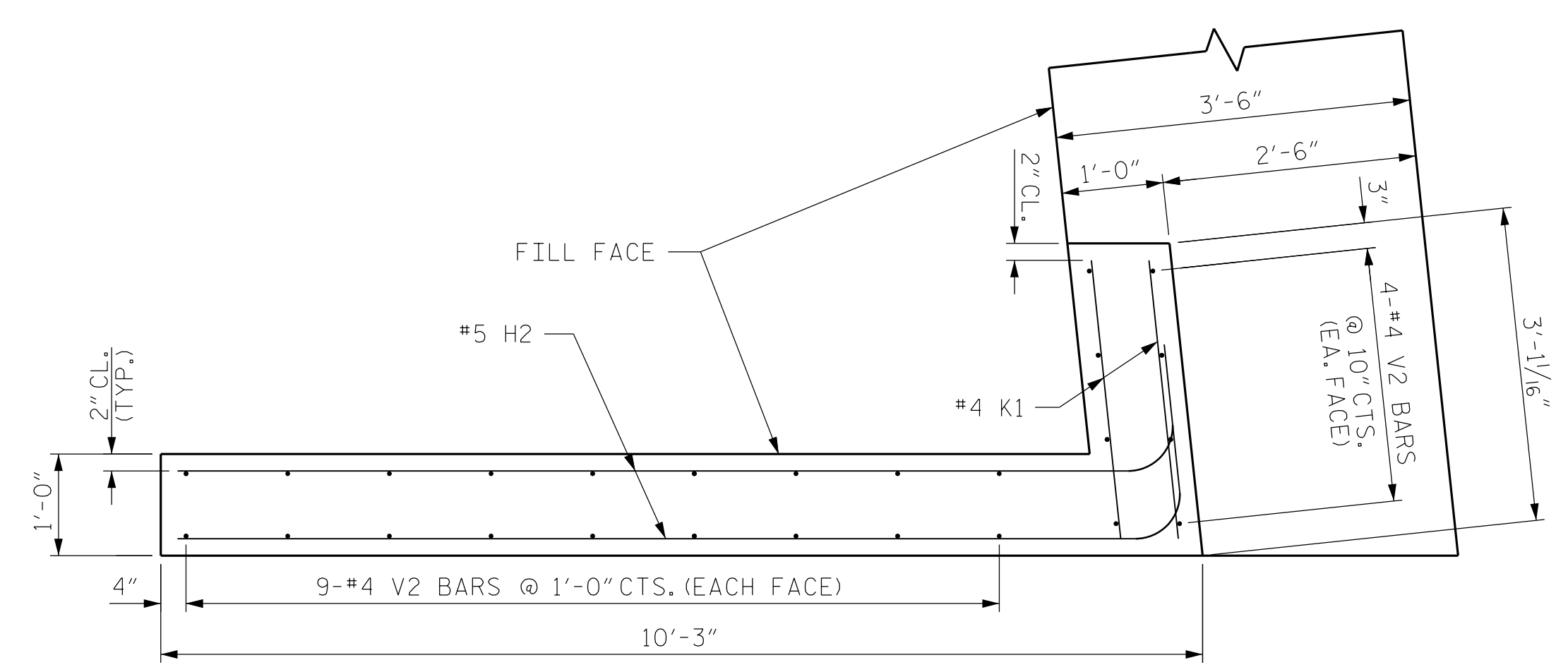
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

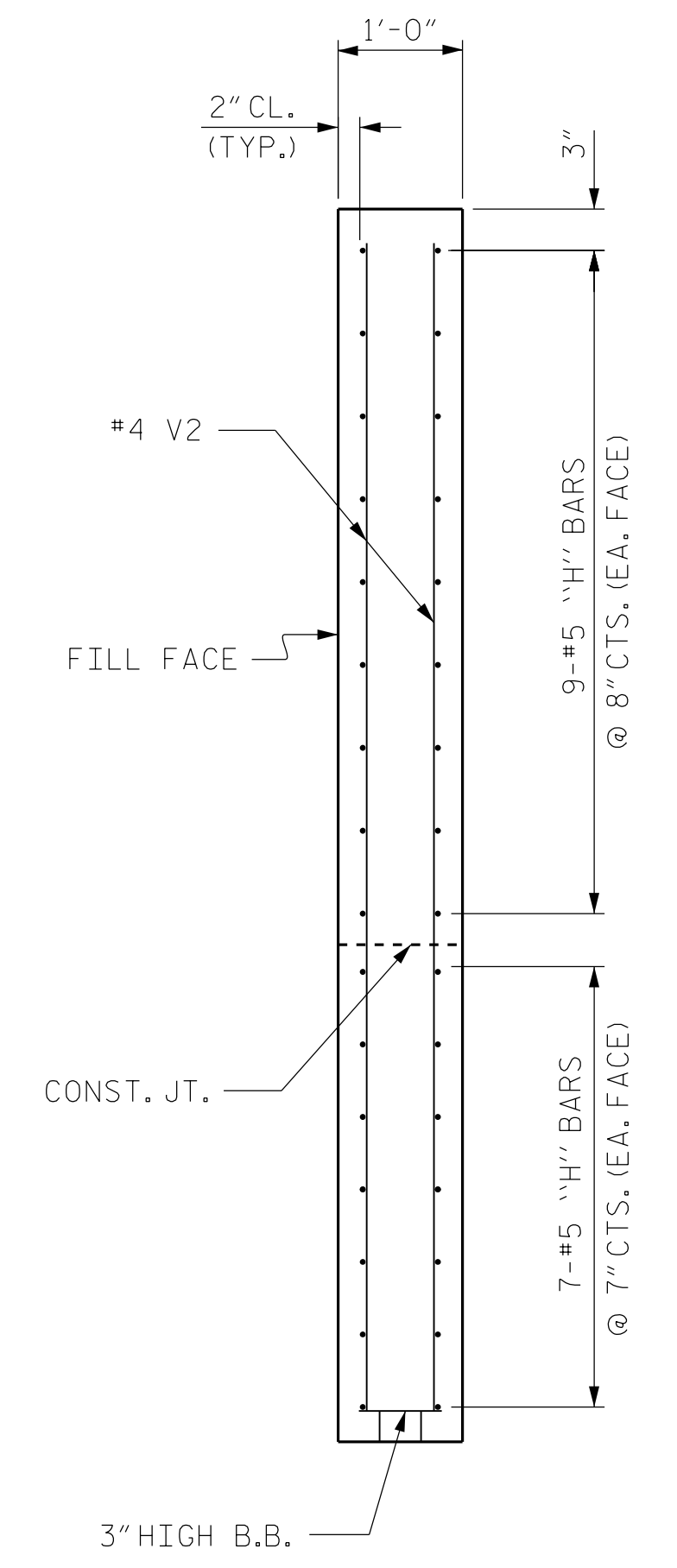
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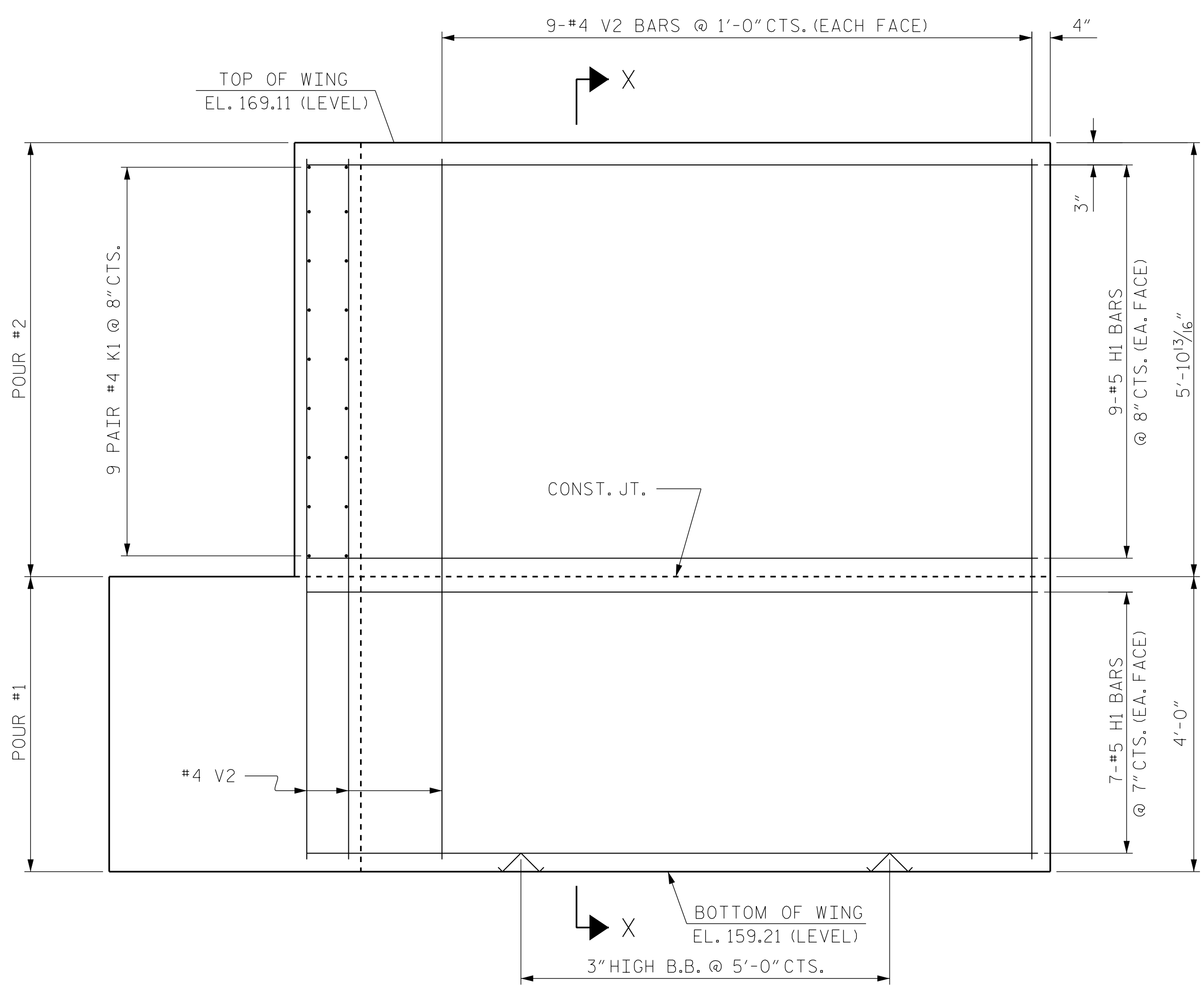
PLAN OF WING (W1)



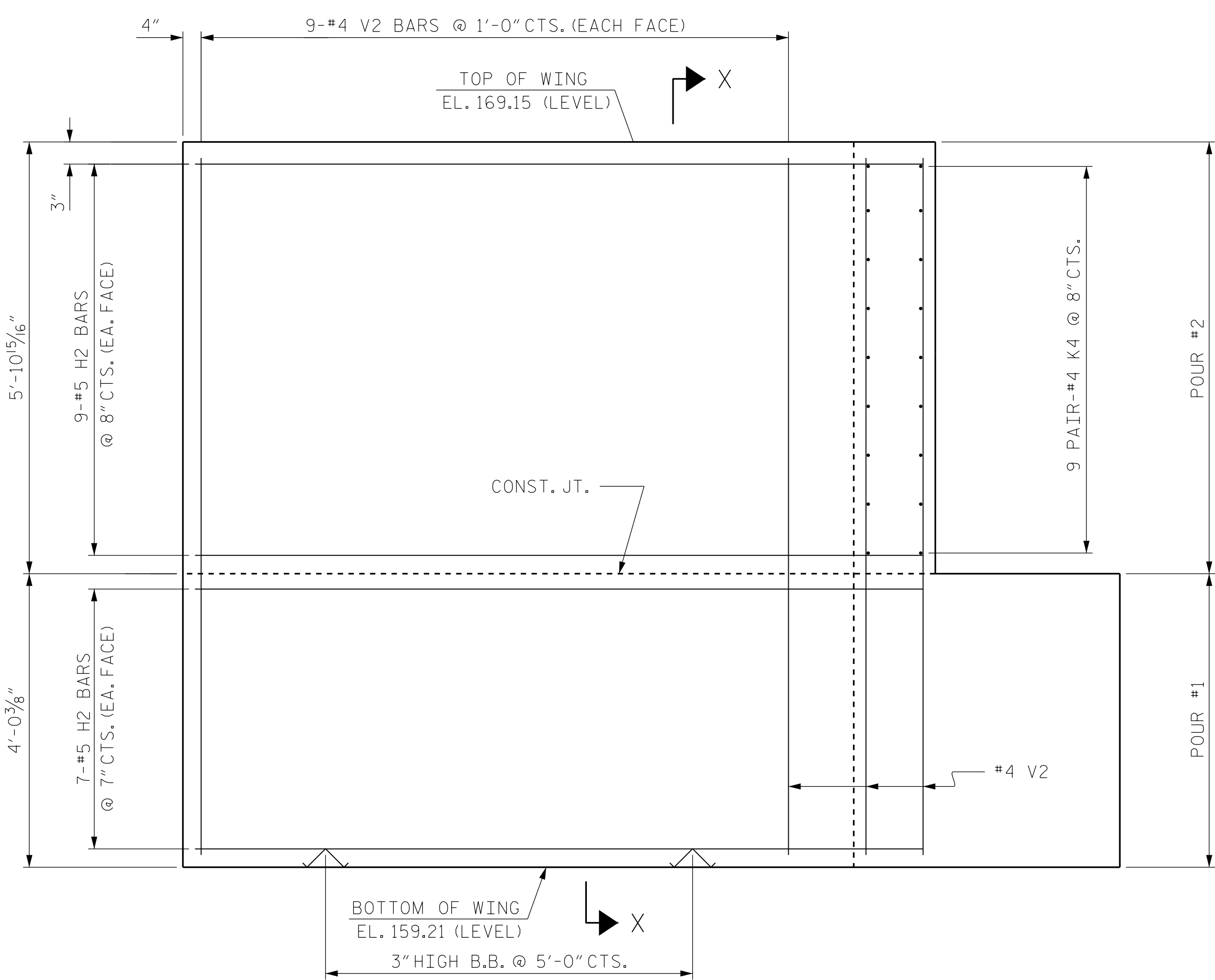
PLAN OF WING (W2)



SECTION X-X

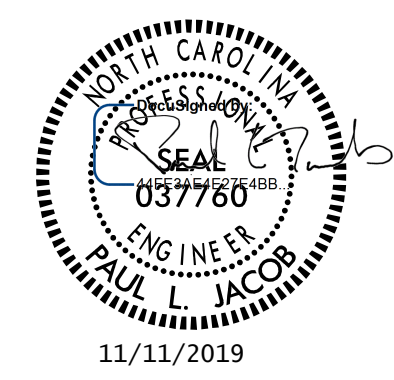


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 2 OF 3



11/11/2019

WING DETAILS

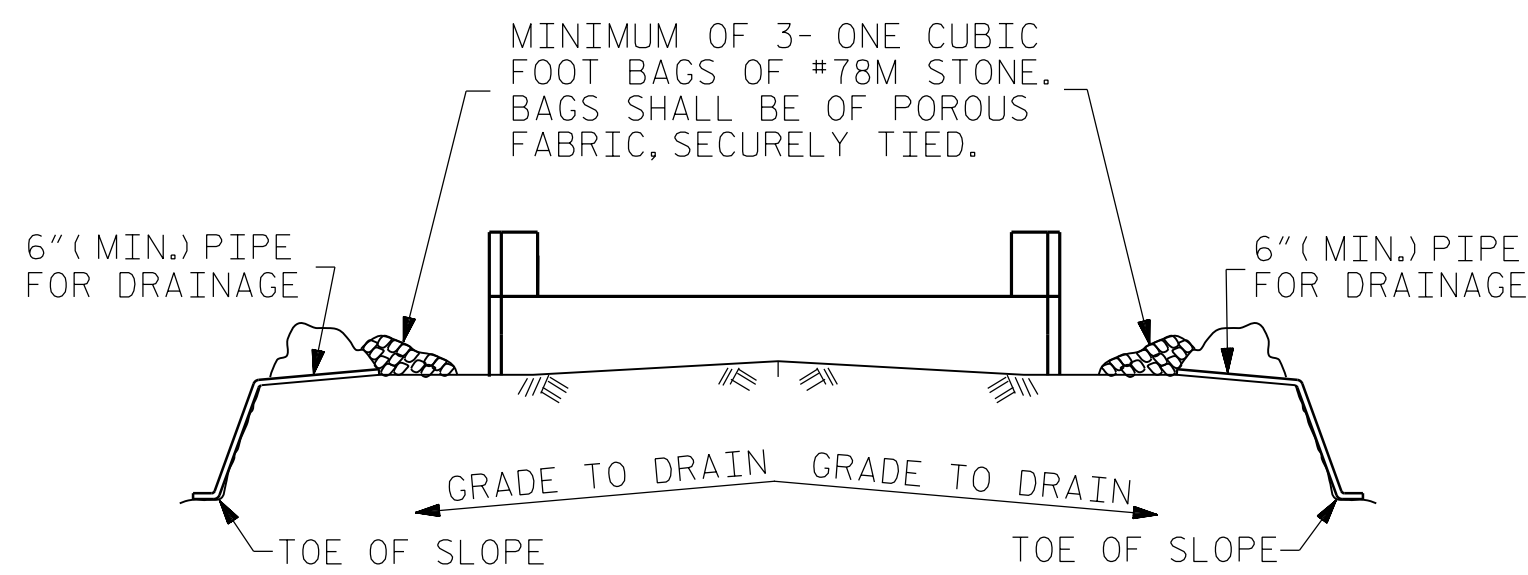
DRAWN BY : J. WEIGER DATE : 09/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT NO. 1 WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S3-20
TOTAL SHEETS 30

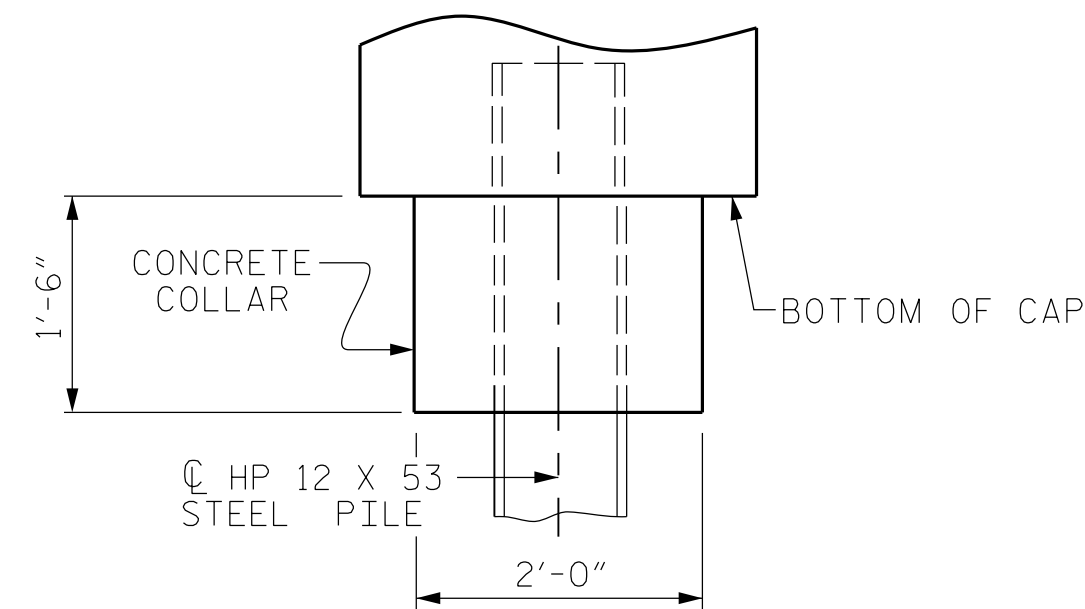
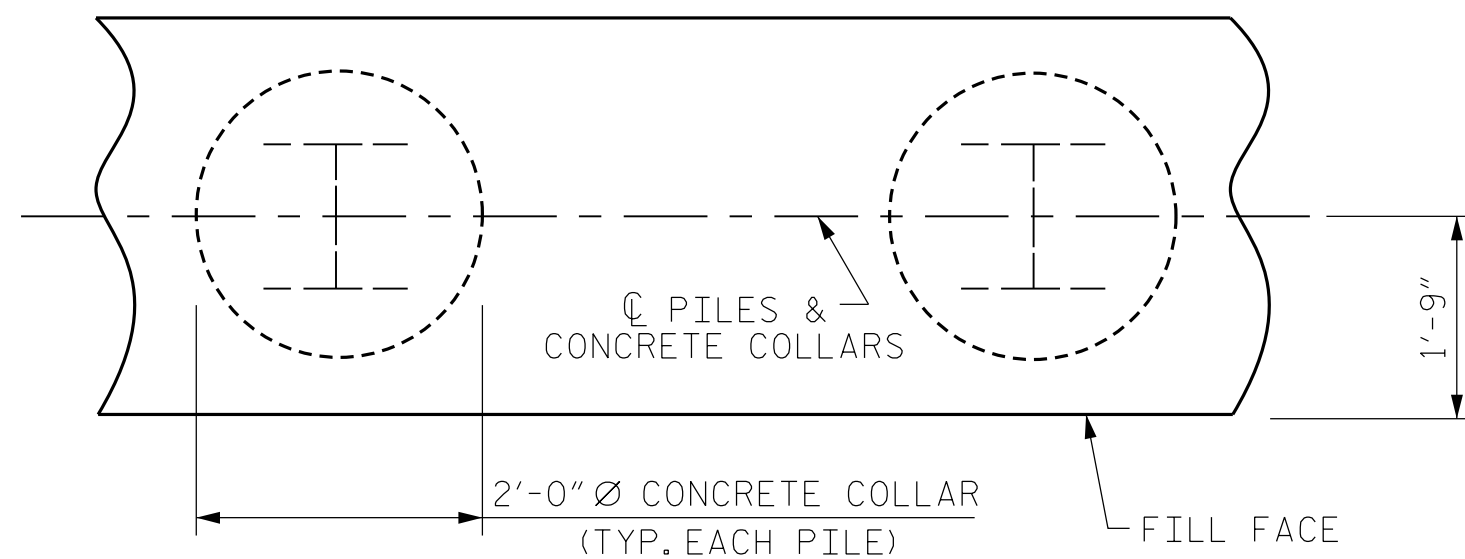


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

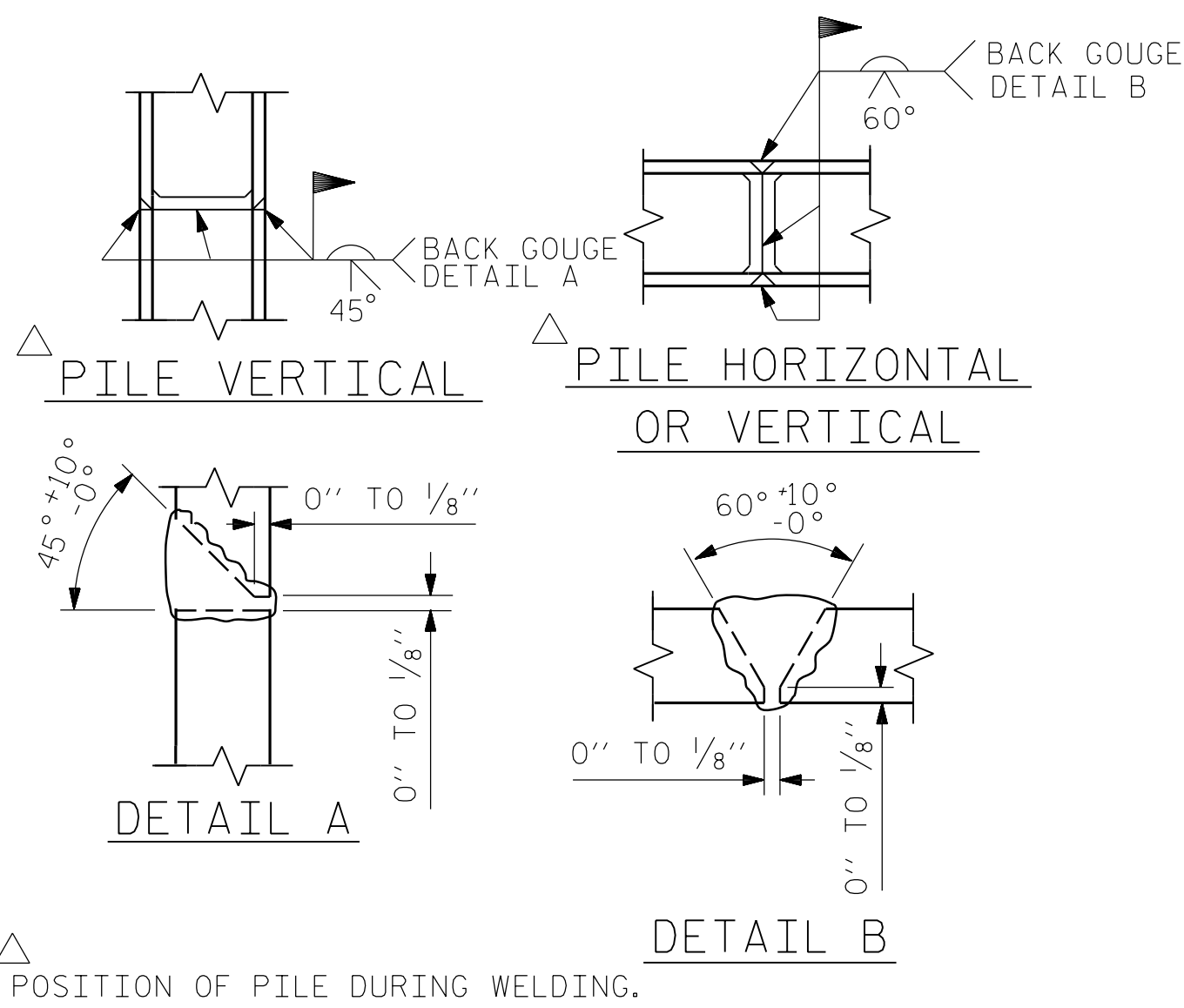
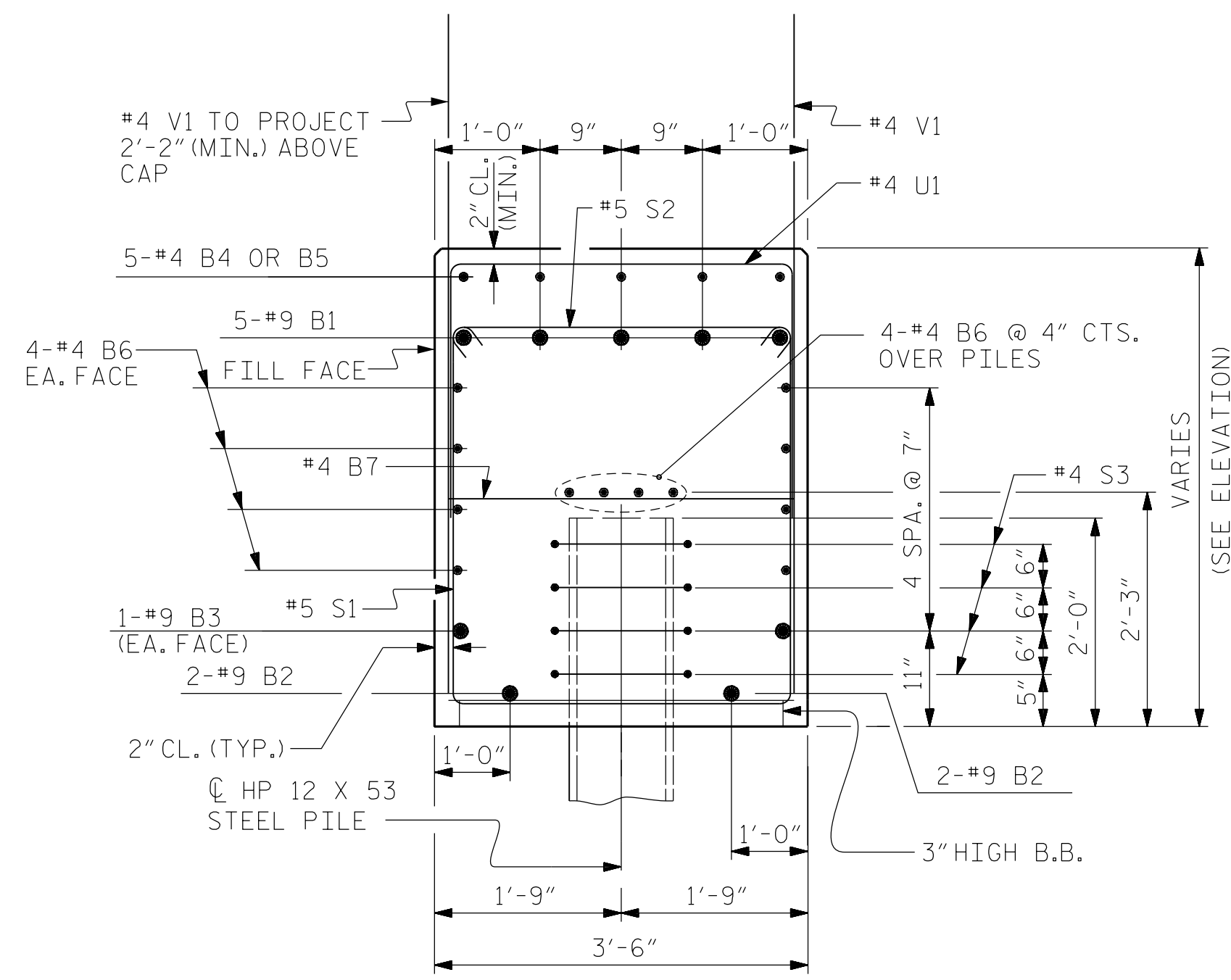
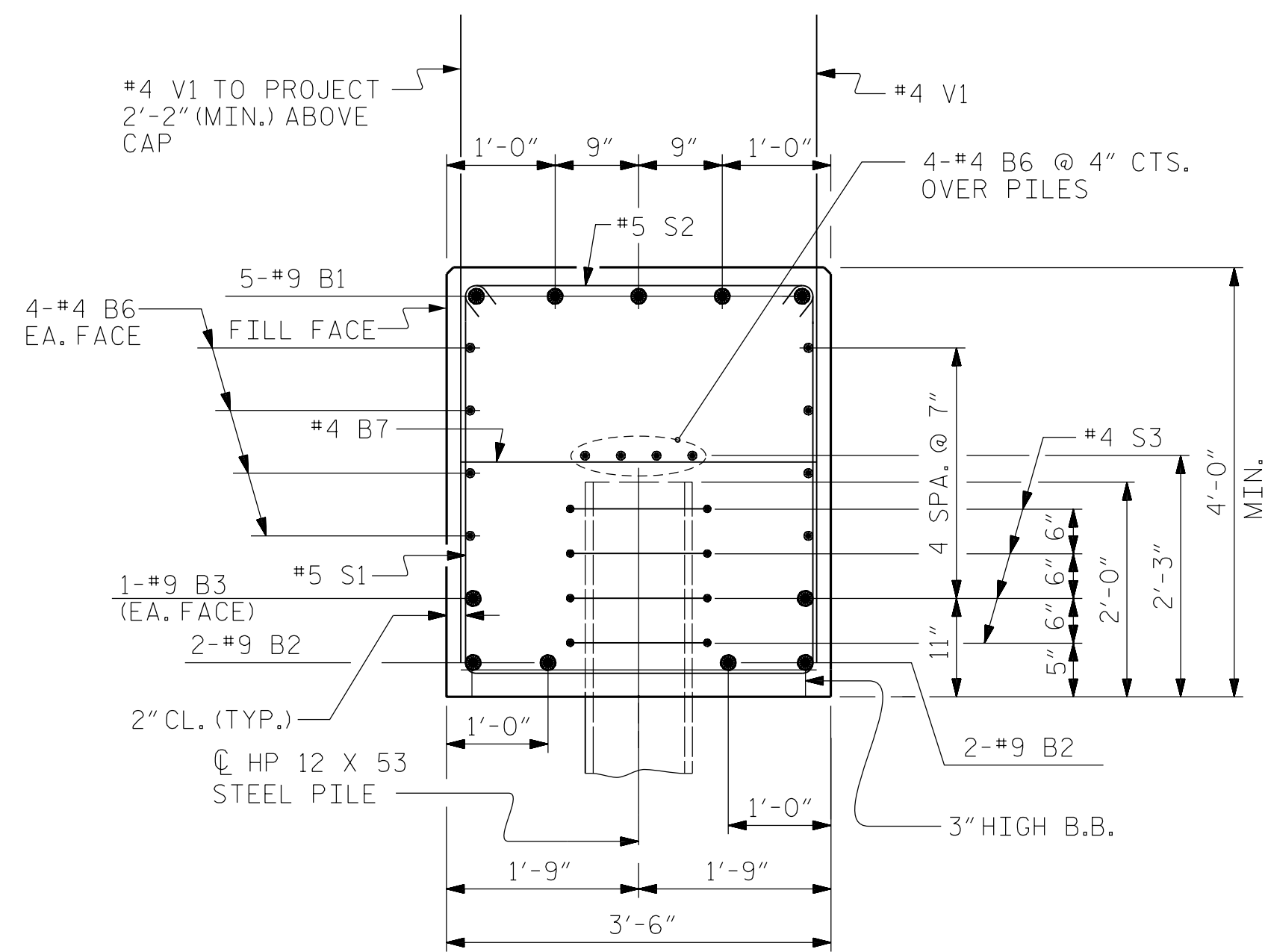
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

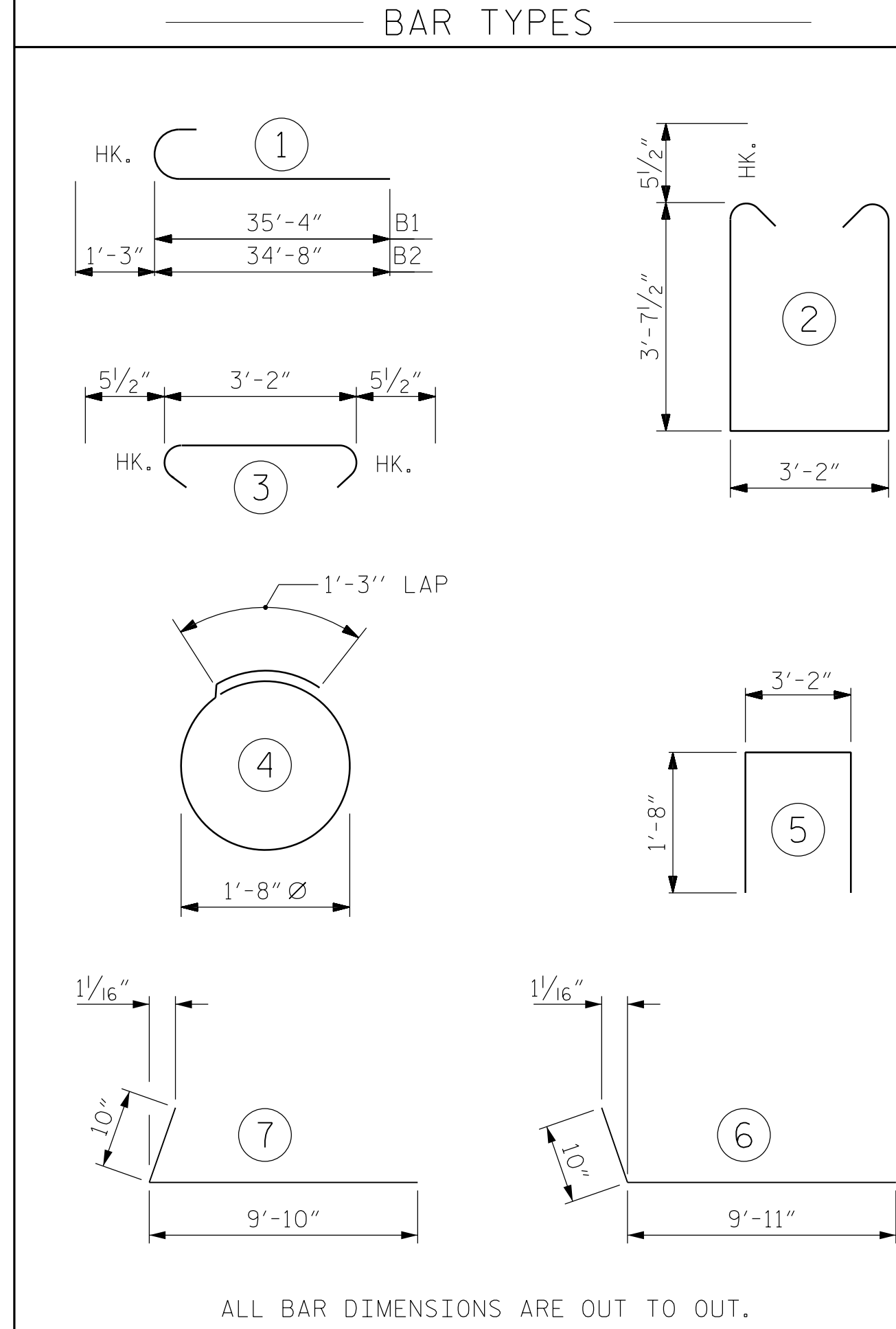
**TEMPORARY DRAINAGE AT END BENT**



**CORROSION PROTECTION FOR STEEL PILES DETAIL**



**PILE SPLICE DETAILS**



**BILL OF MATERIAL**

**END BENT NO. 1**

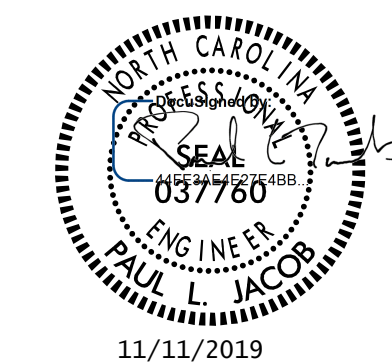
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	36'-7"	1244
B2	8	#9	1	35'-11"	977
B3	4	#9	STR	35'-1"	477
B4	10	#4	STR	12'-9"	85
B5	5	#4	STR	20'-5"	68
B6	24	#4	STR	33'-11"	544
B7	16	#4	STR	3'-2"	34
H1	32	#5	6	10'-9"	359
H2	32	#5	7	10'-8"	356
K1	36	#4	STR	2'-6"	60
S1	58	#5	2	11'-4"	686
S2	58	#5	3	4'-1"	247
S3	40	#4	4	6'-6"	174
U1	30	#4	5	6'-6"	130
V1	92	#4	STR	6'-6"	399
V2	52	#4	STR	9'-5"	327
REINFORCING STEEL (FOR END BENT)					6167 LBS.
CLASS A CONCRETE					
POUR No.1 CAP, LOWER PART OF WINGS & COLLARS					40.8 C.Y.
POUR No.2 UPPER PART OF WINGS					5.4 C.Y.
TOTAL					46.2 C.Y.
HP 12 X 53 STEEL PILES NO: 10					LN. FT. = 650
PILE REDRIVES					5 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					10 EA.

PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 31+16.90 -Y2-

SHEET 3 OF 3



DRAWN BY : J. WEIGER DATE : 01/2019

CHECKED BY : P. JACOB DATE : 09/2017

DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2017

**moffatt & nichol**

4700 FALLS OF NEUSE ROAD, SUITE 300  
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NC License NO.: F-0105

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

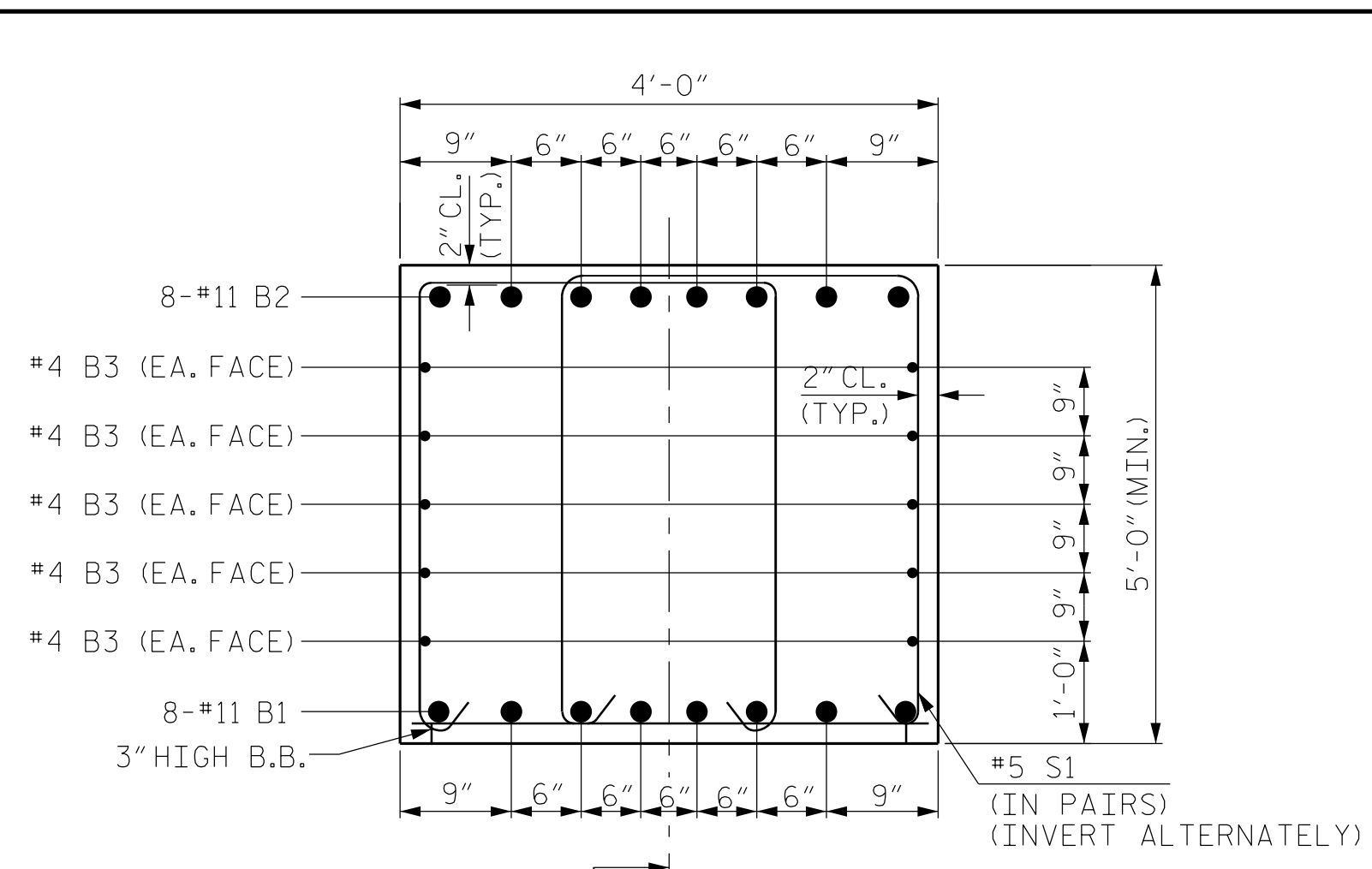
REVISIONS

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

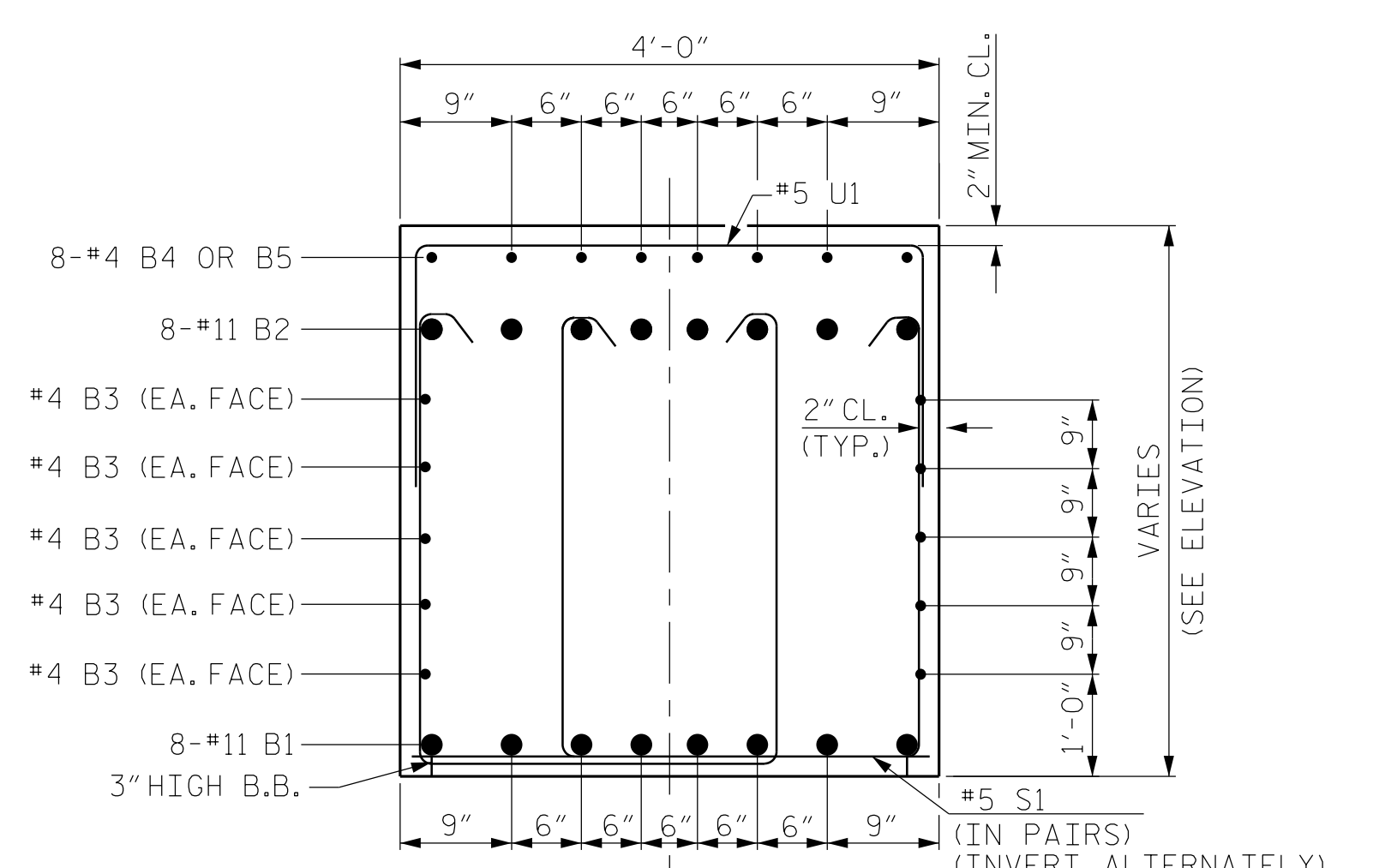
SHEET NO. S3-21

TOTAL SHEETS 30

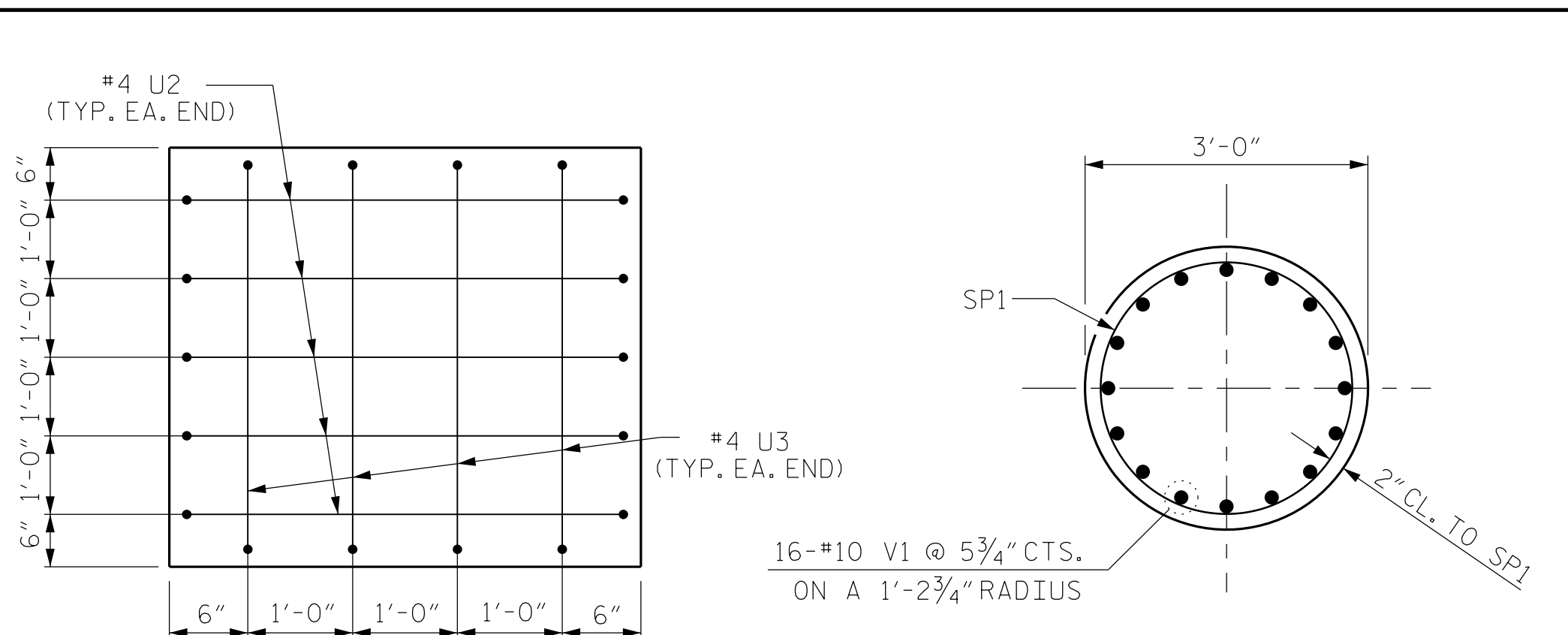




SECTION A-A

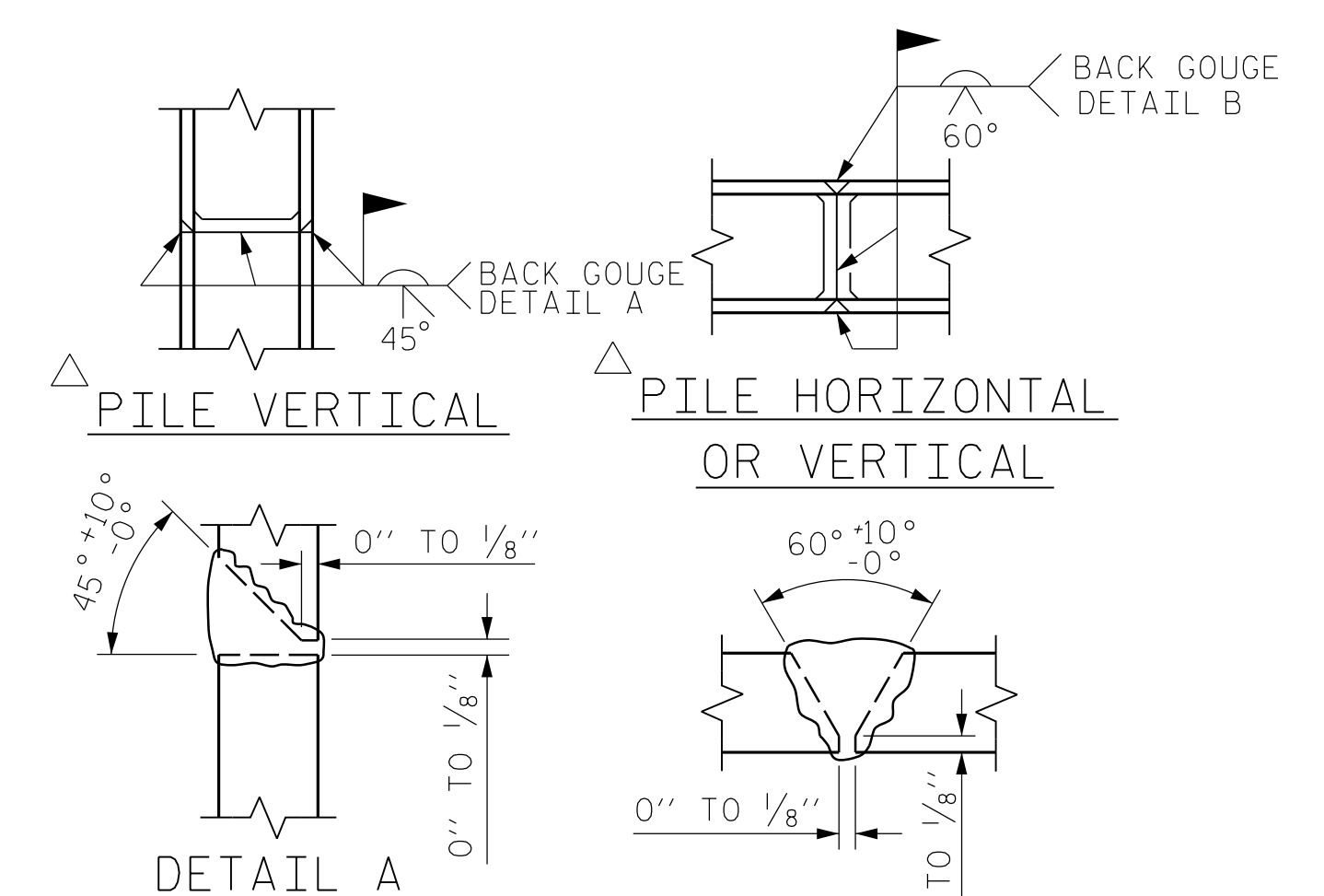


SECTION B-B

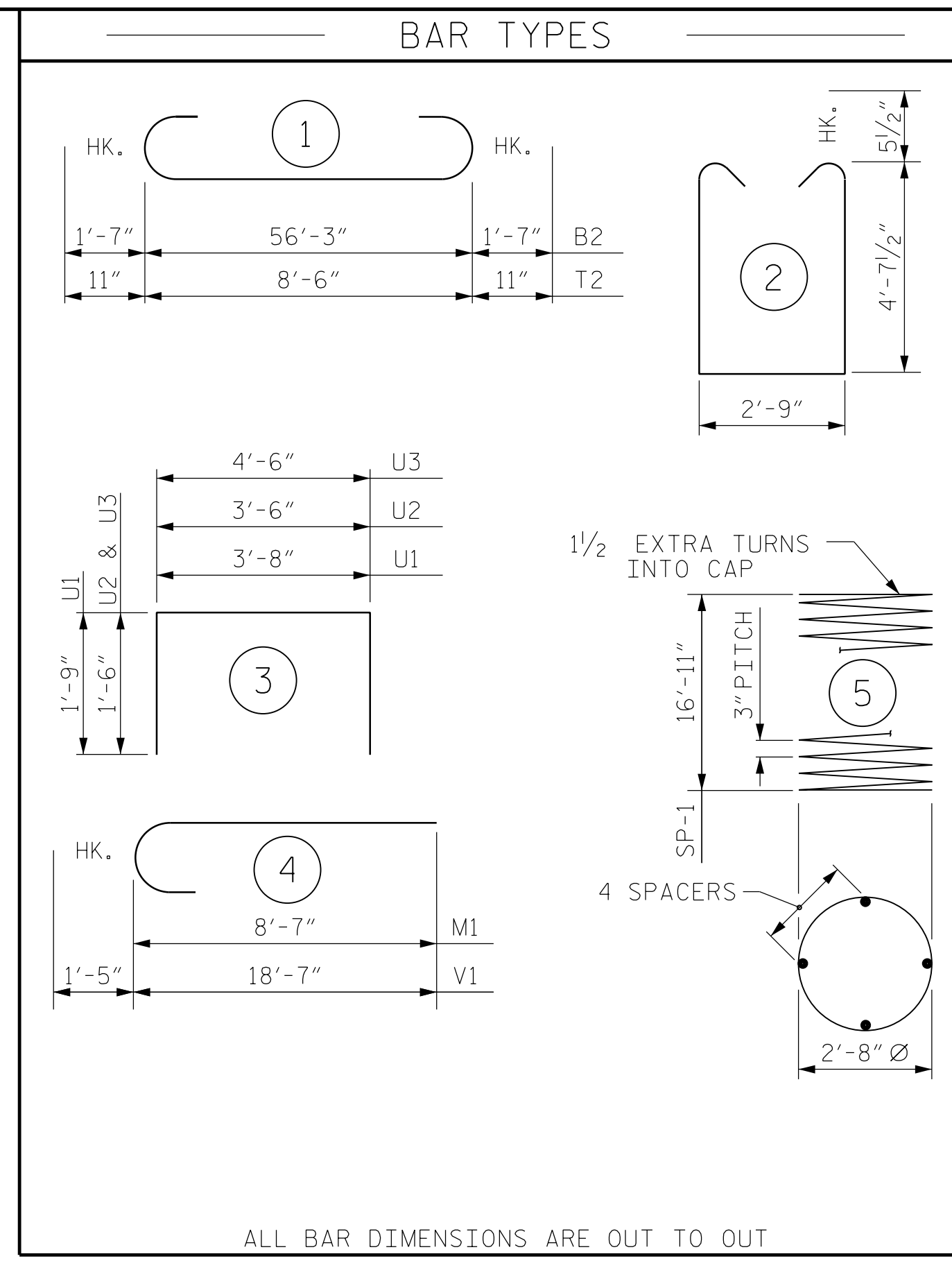


END OF CAP VIEW

SECTION C-C

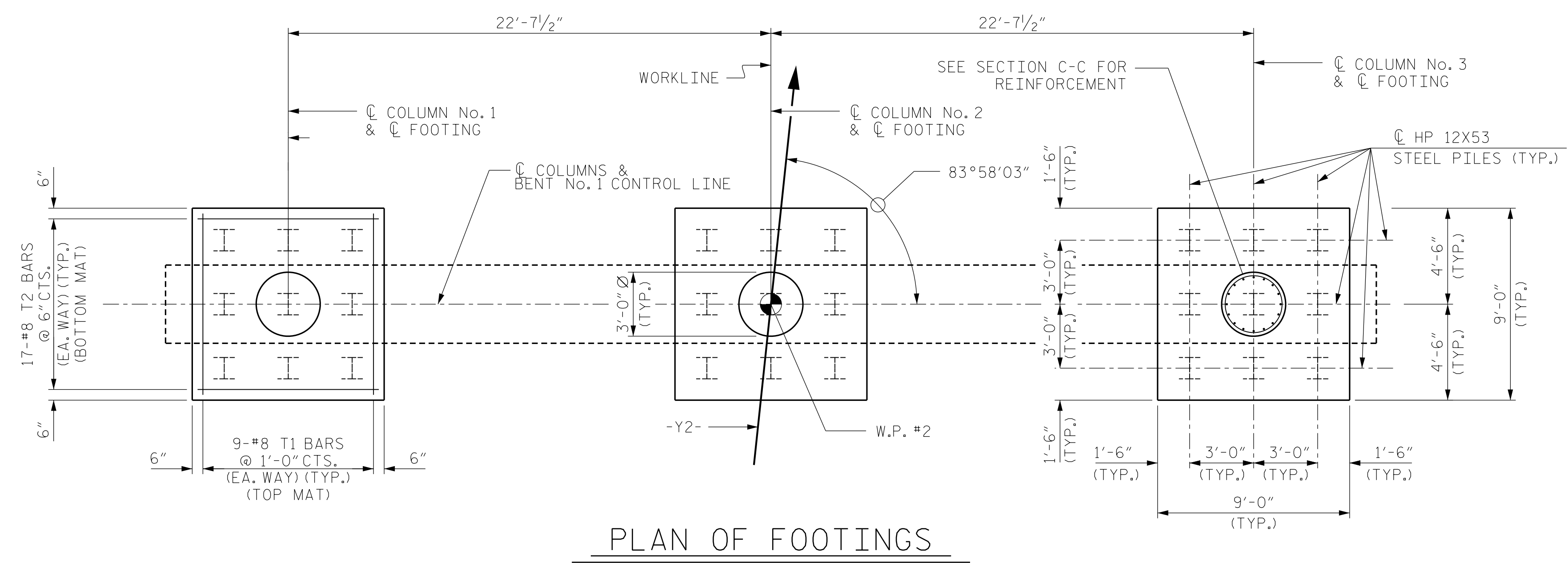


PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

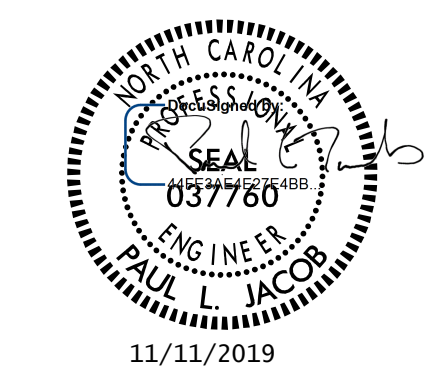
BILL OF MATERIAL					
BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR.	56'-3"	2391
B2	8	#11	1	59'-5"	2525
B3	20	#4	STR.	29'-5"	393
B4	16	#4	STR.	12'-10"	137
B5	8	#4	STR.	20'-5"	109
M1	48	#10	4	10'-0"	2065
S1	228	#5	2	12'-11"	3072
T1	54	#8	STR.	8'-6"	1226
T2	102	#8	1	10'-4"	2814
U1	70	#4	3	7'-2"	335
U2	10	#4	3	6'-6"	43
U3	8	#4	3	7'-6"	40
V1	48	#10	4	20'-0"	4131
REINFORCING STEEL (FOR BENT NO. 1)					19281 LBS.
SP-1	3	*	5	583'-1"	1168
SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1)					1168 LBS.
* THE 'SP' SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
HP 12x53 STEEL PILES No. 27					LENGTH = 1620 LIN. FT.
PILE REDRIVES					14 EA.
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1)					
POUR #1 (FOOTINGS)					38.3 C.Y.
POUR #2 (COLUMNS)					13.1 C.Y.
POUR #3 (CAP)					44.5 C.Y.
TOTAL CLASS A CONCRETE					95.9 C.Y.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					27 EA.
FOUNDATION EXCAVATION FOR BENT					LUMP SUM



PLAN OF FOOTINGS

DRAWN BY : J. WEIGER DATE : 06/2019  
 CHECKED BY : P. JACOB DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

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11/11/2019

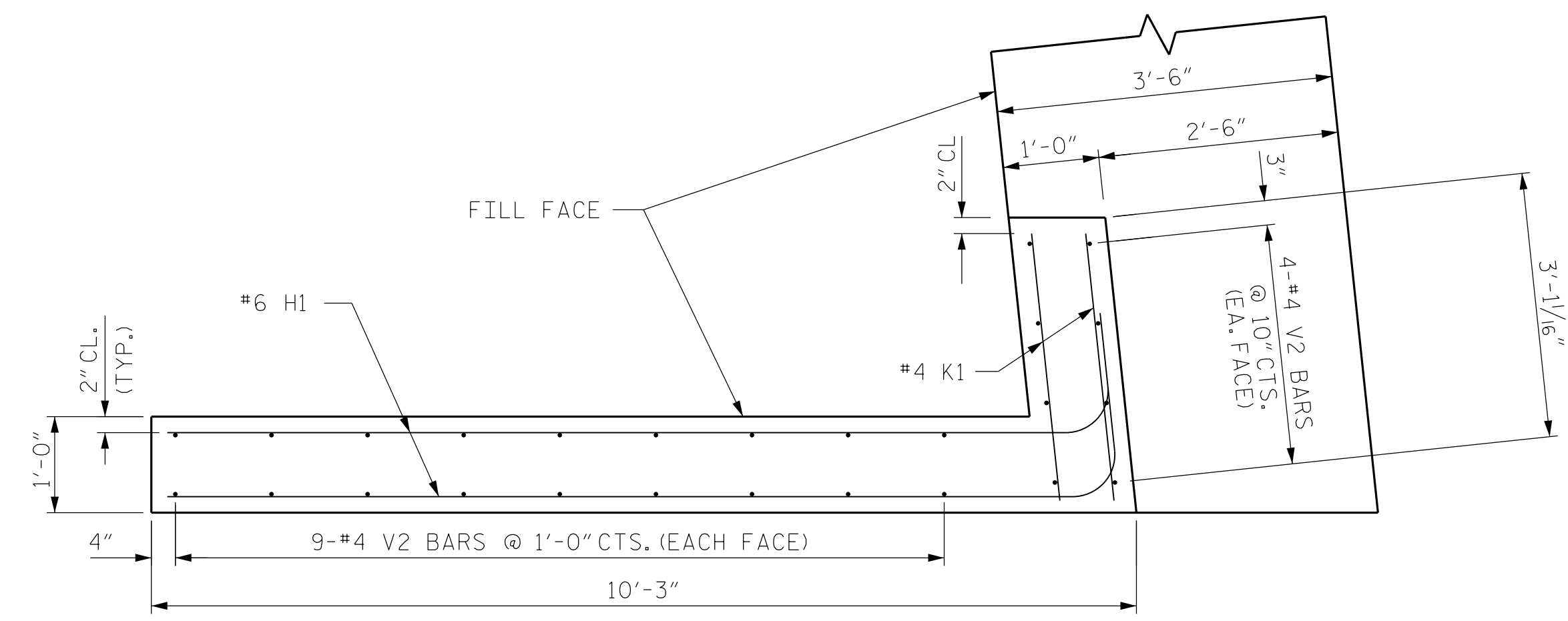
PROJECT NO. R-2303E  
 SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

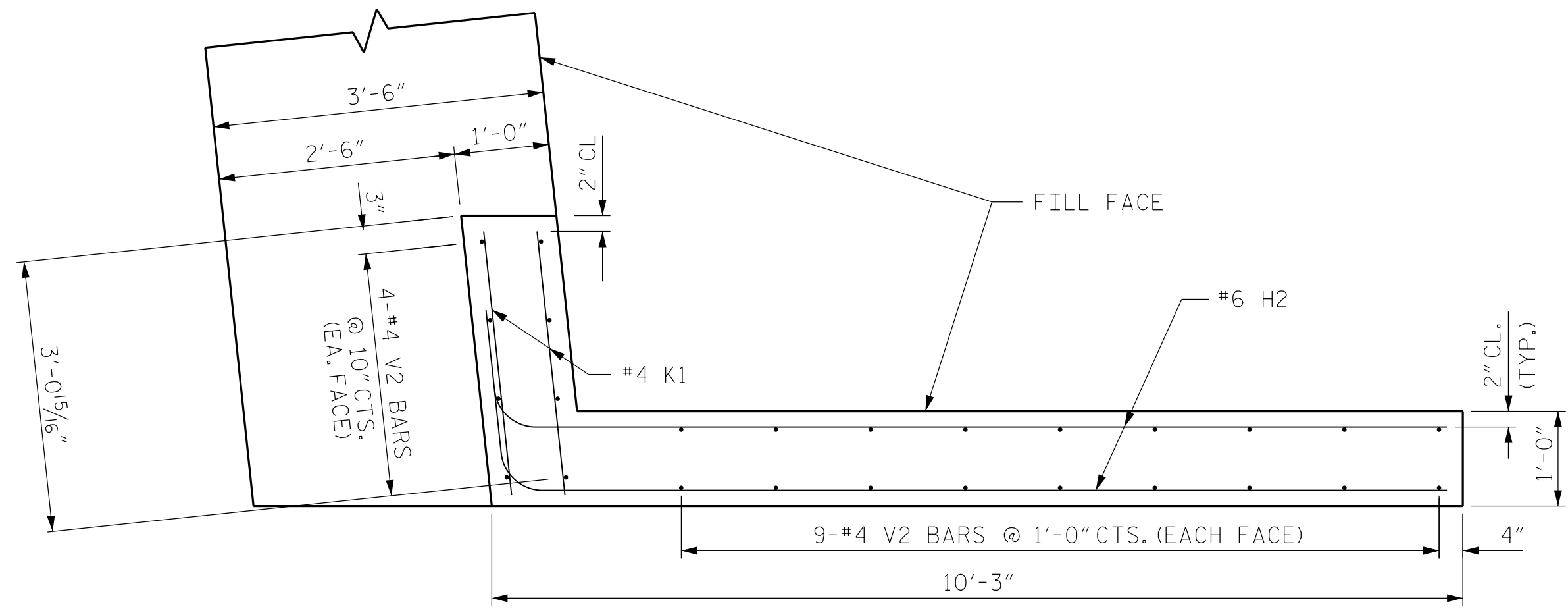
SHEET NO. S3-23  
 TOTAL SHEETS 30



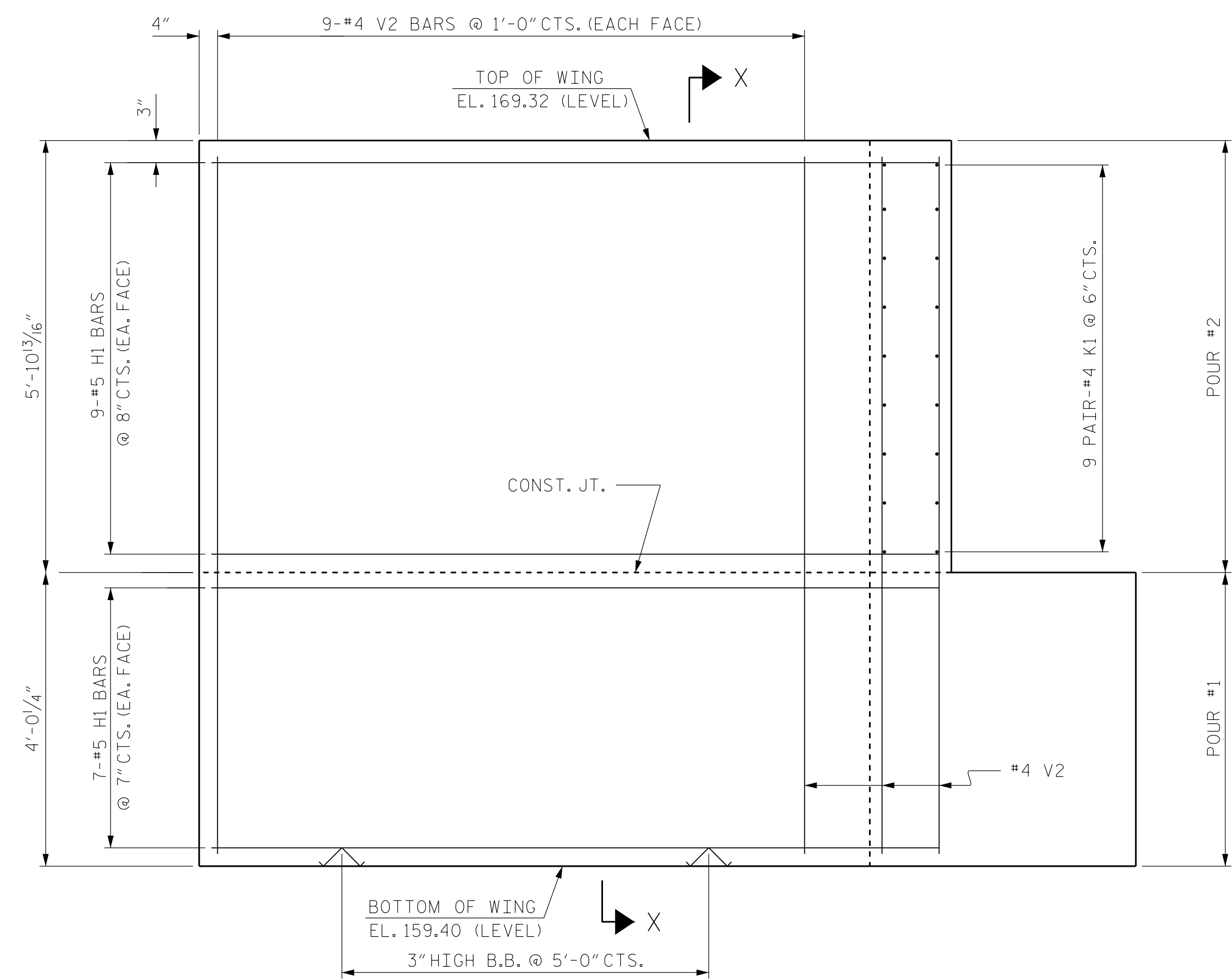




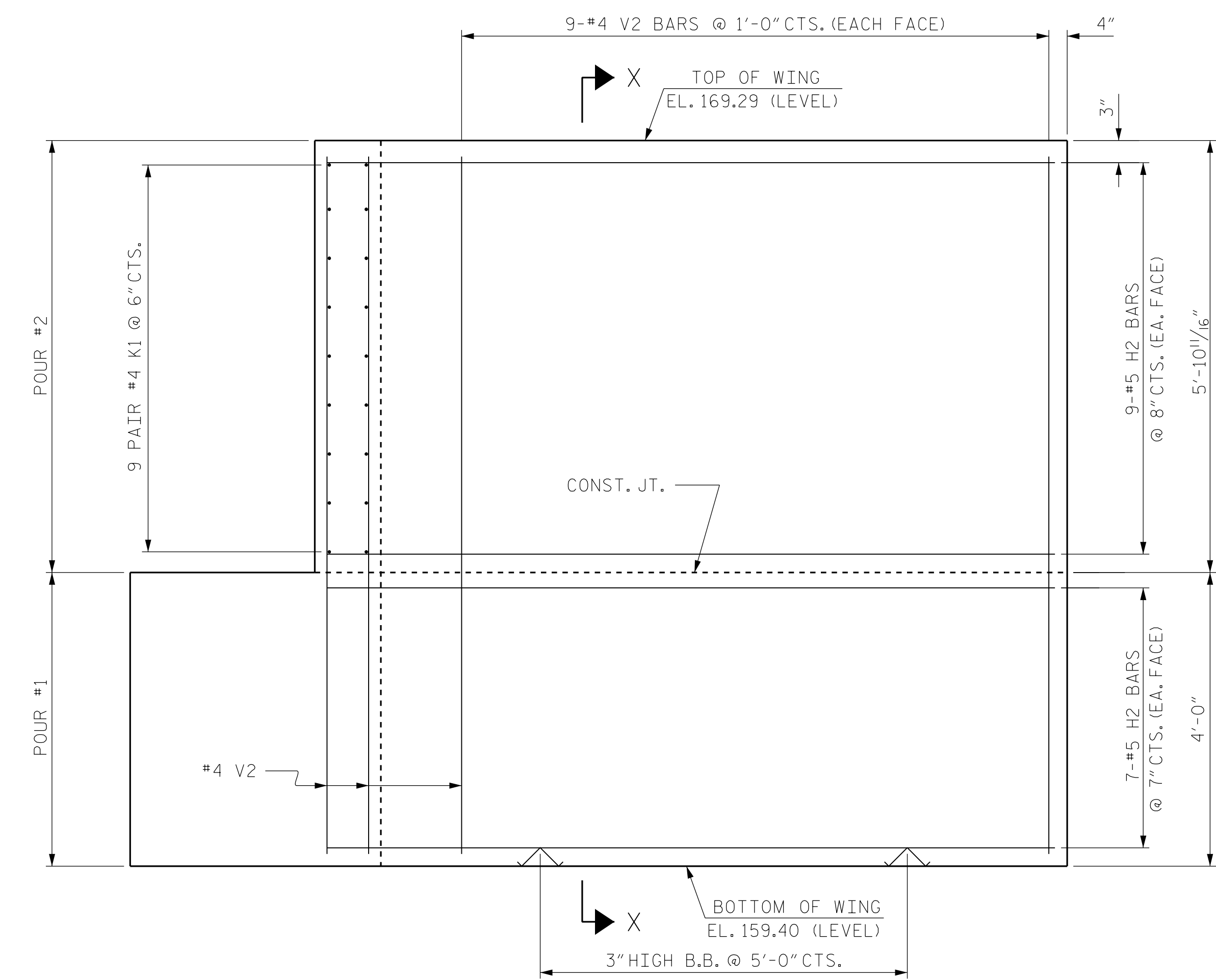
PLAN OF WING (W3)



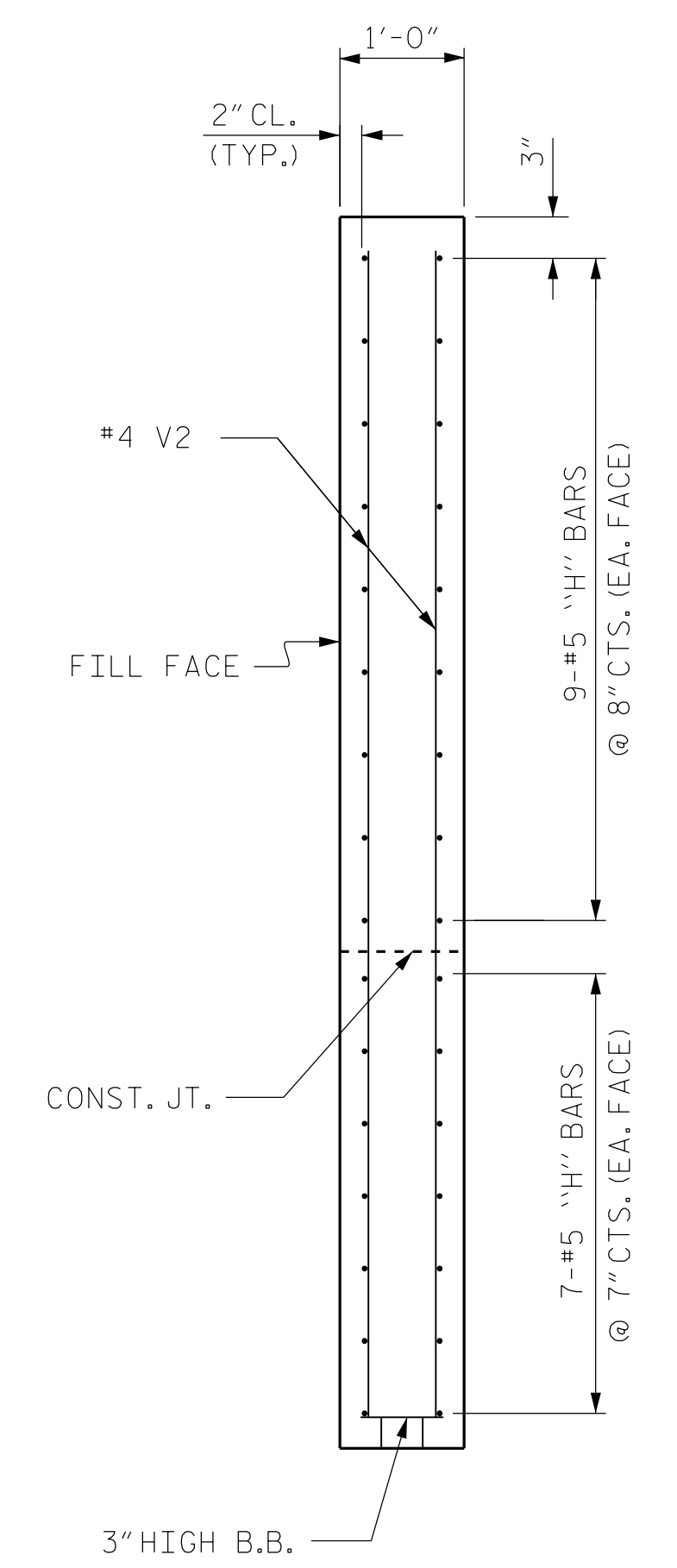
PLAN OF WING (W4)



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

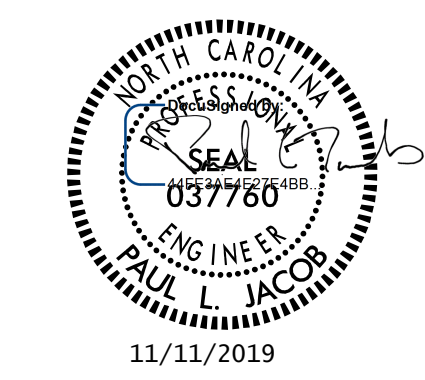


SECTION X-X

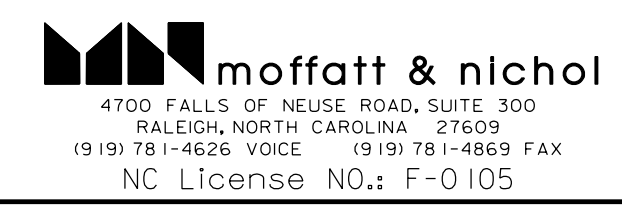
WING DETAILS

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**INTEGRAL  
 END BENT No. 2  
 WING DETAILS**



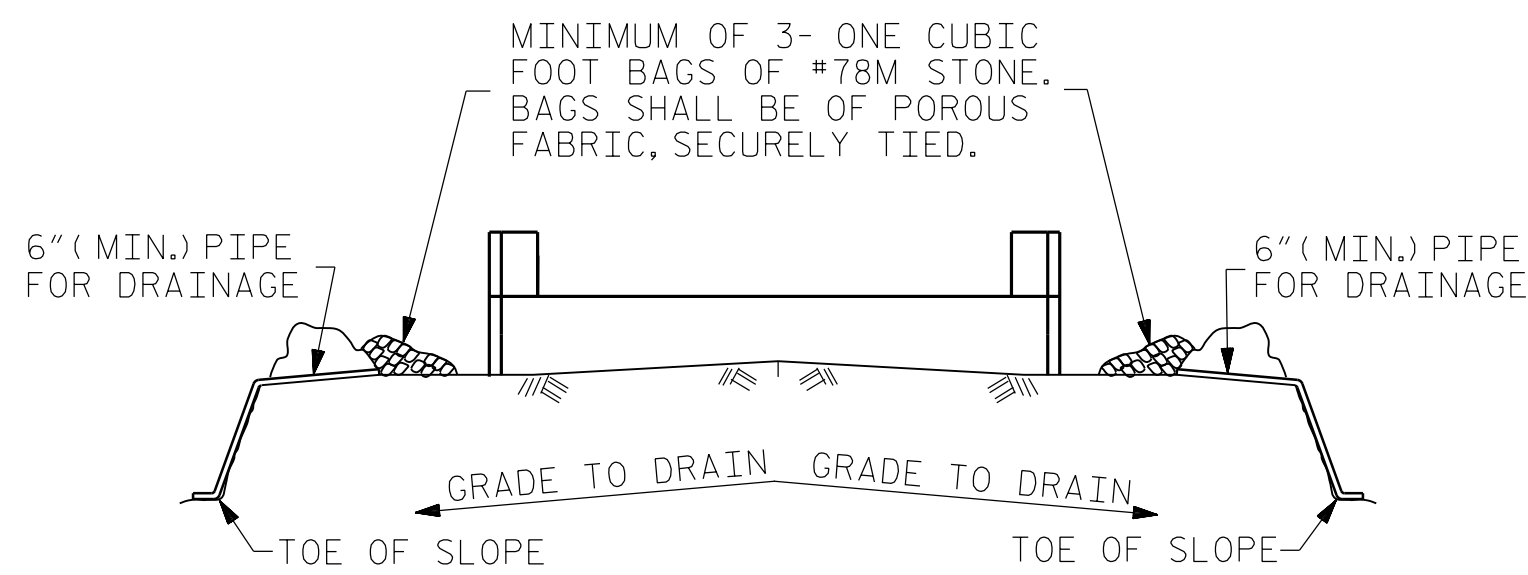
DRAWN BY : J. WEIGER DATE : 09/2019  
 CHECKED BY : A. CHILKEPALLI DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019



DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-25
1			3			TOTAL SHEETS
2			4			30

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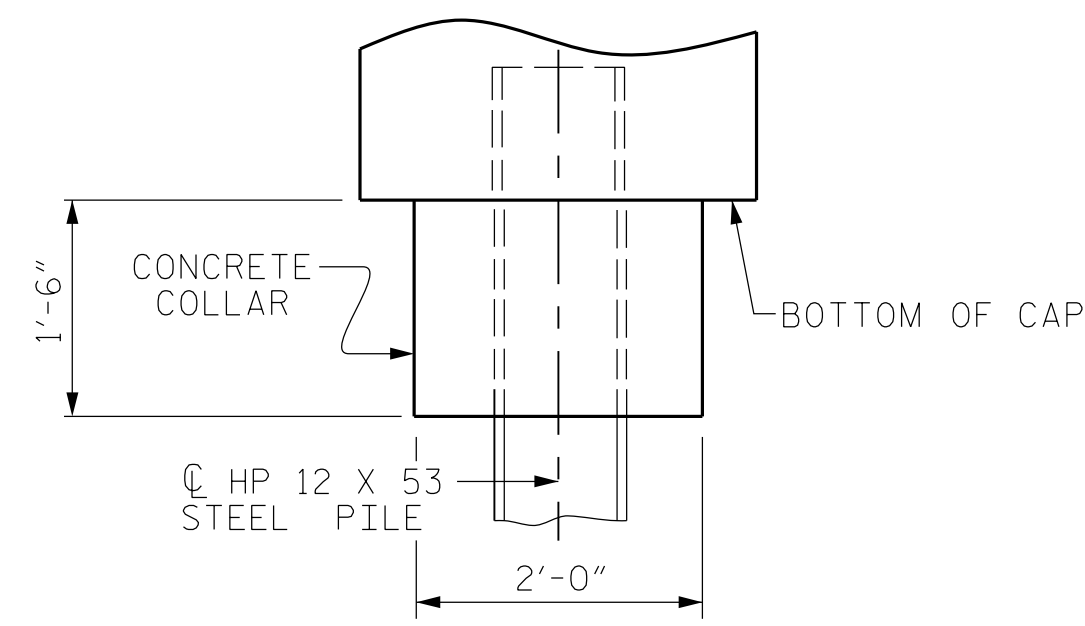
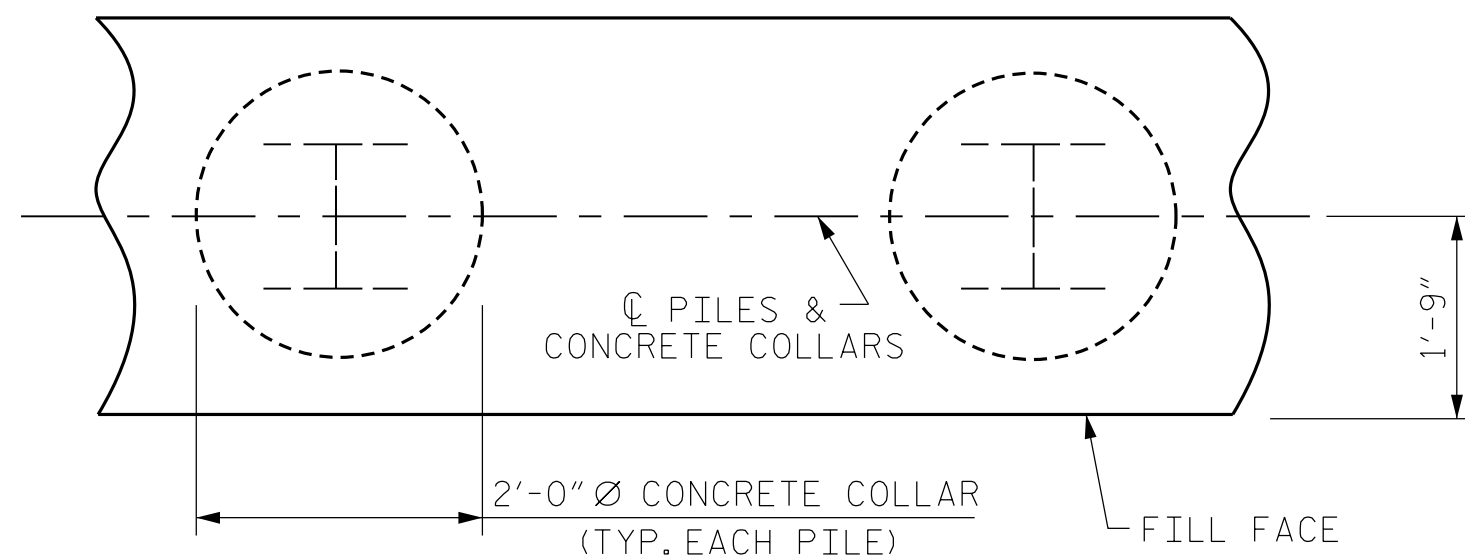


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

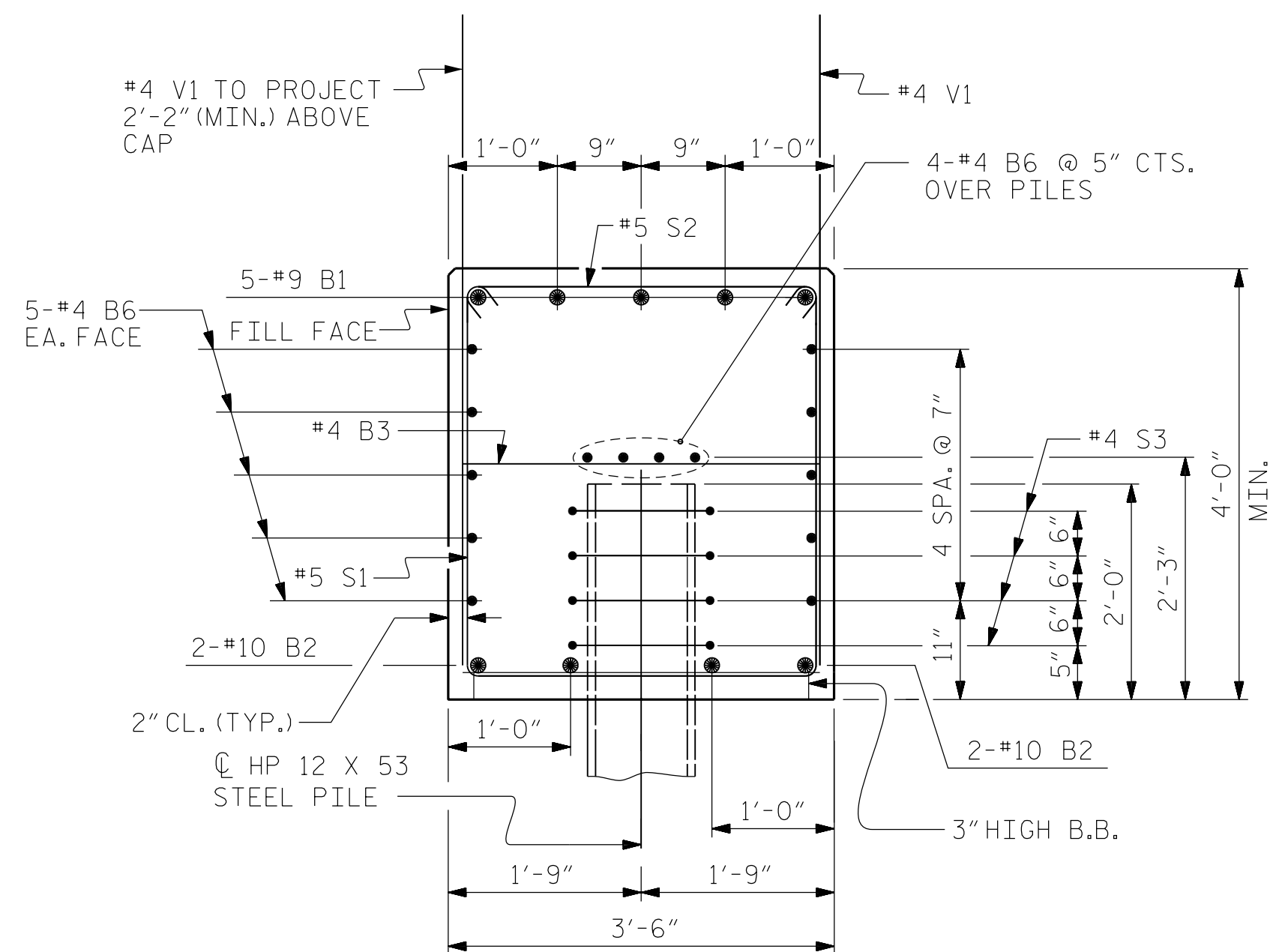
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NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

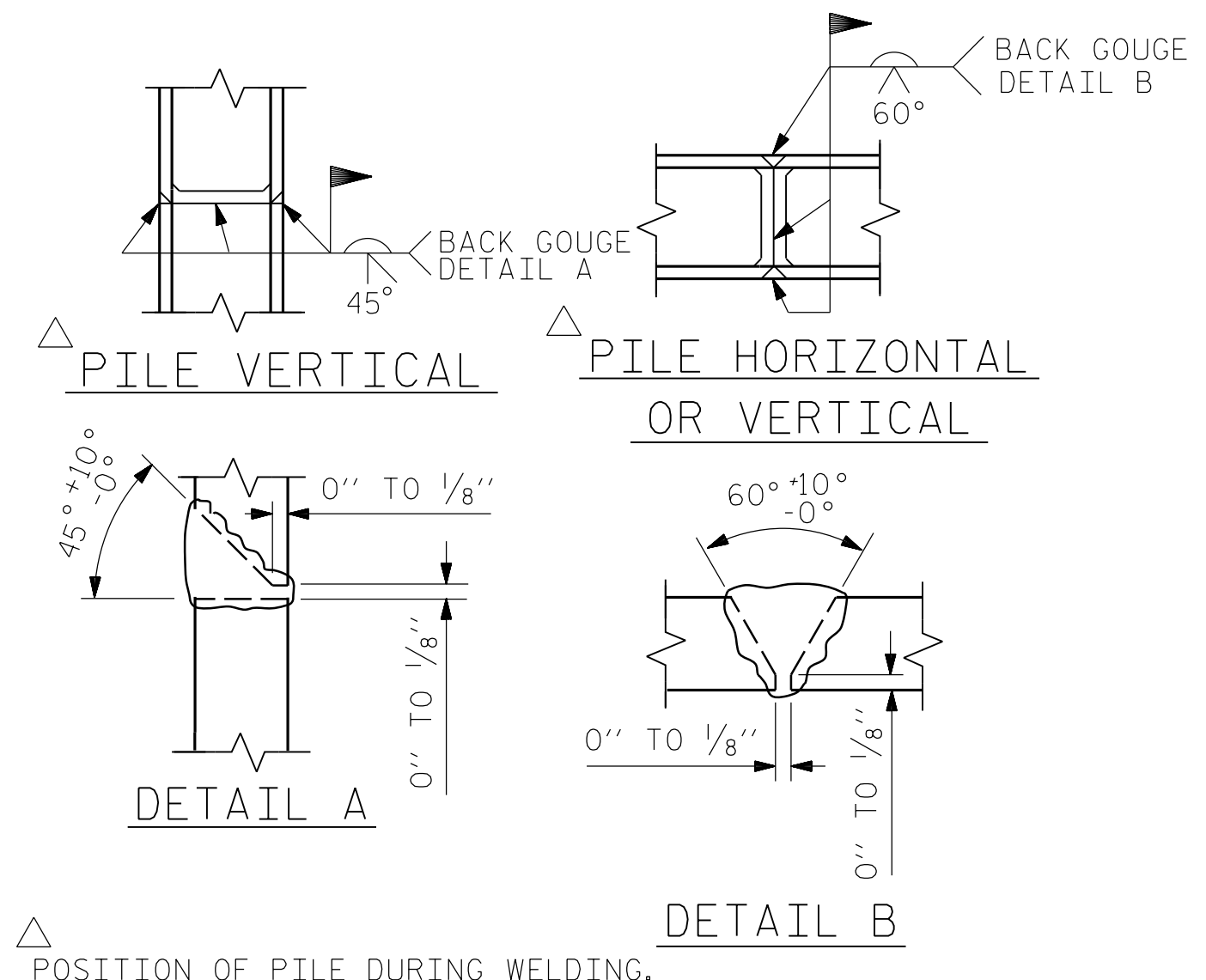
**TEMPORARY DRAINAGE AT END BENT**



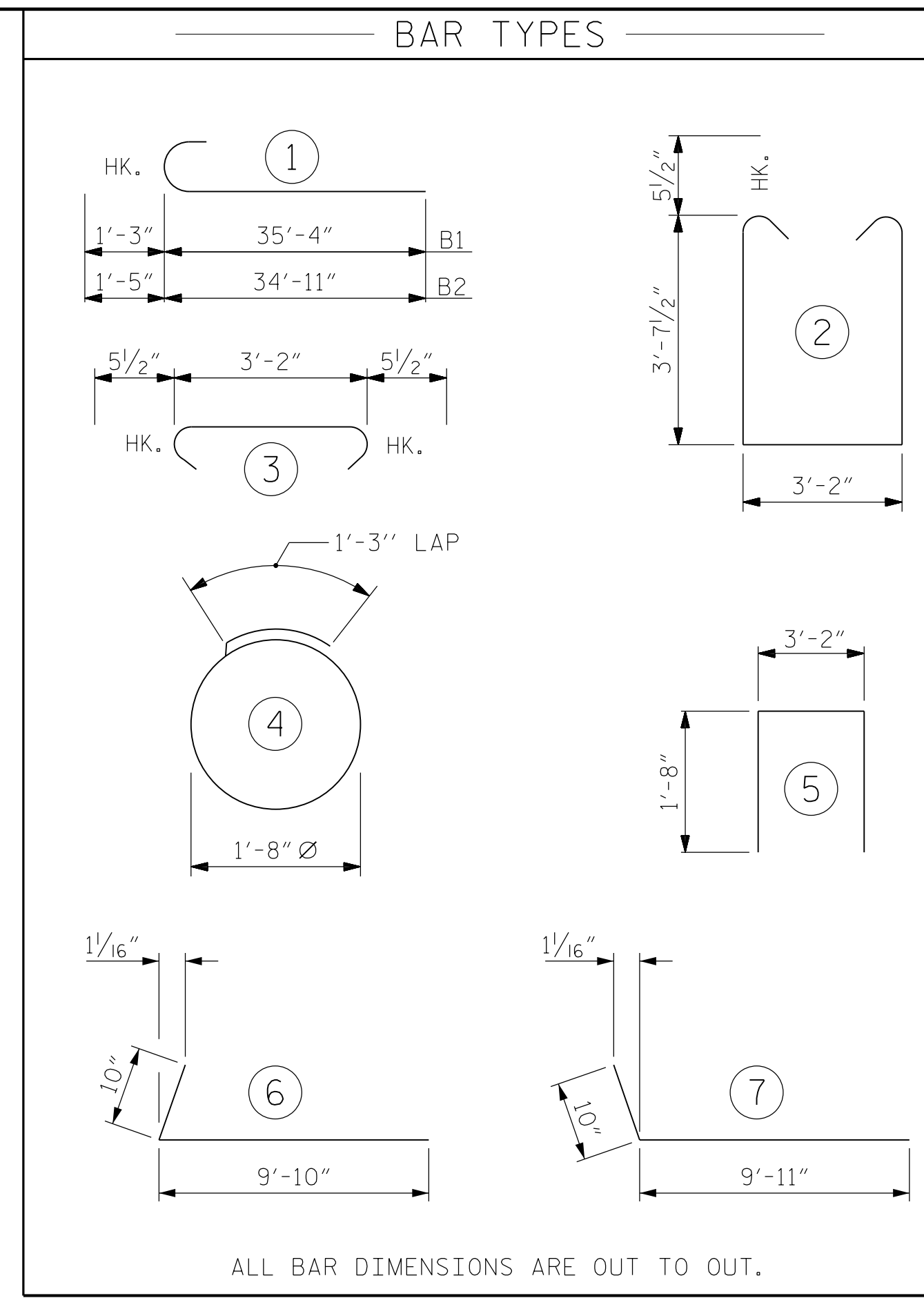
**CORROSION PROTECTION FOR STEEL PILES DETAIL**



(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



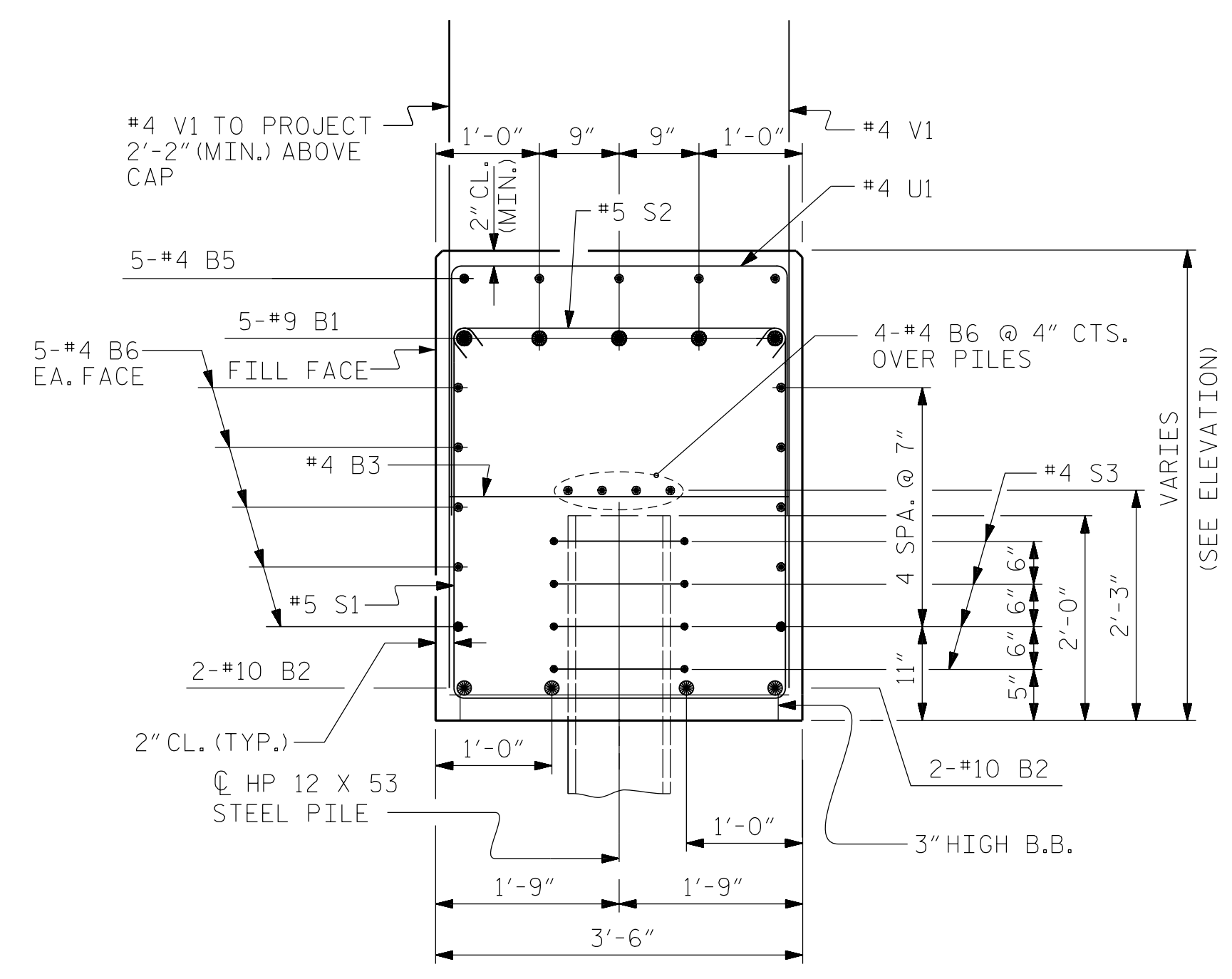
**PILE SPLICE DETAILS**



**BILL OF MATERIAL**

**END BENT No. 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	36'-7"	1244
B2	8	#10	1	36'-4"	1251
B3	16	#4	STR	3'-2"	34
B4	10	#4	STR	12'-9"	85
B5	5	#4	STR	20'-5"	68
B6	28	#4	STR	33'-11"	634
H1	32	#5	6	10'-8"	356
H2	32	#5	7	10'-9"	359
K1	36	#4	STR	2'-6"	60
S1	58	#5	2	11'-4"	685
S2	58	#5	3	4'-1"	247
S3	40	#4	4	6'-6"	174
U1	28	#4	5	6'-6"	122
V1	92	#4	STR	6'-6"	399
V2	52	#4	STR	9'-5"	327
REINFORCING STEEL (FOR END BENT)					6045 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					40.8 C.Y.
POUR #2 UPPER PART OF WINGS					5.4 C.Y.
TOTAL					46.2 C.Y.
HP 12 X 53 STEEL PILES NO: 10					LIN. FT. = 650
PILE REDRIVES					5 EA.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					10 EA.



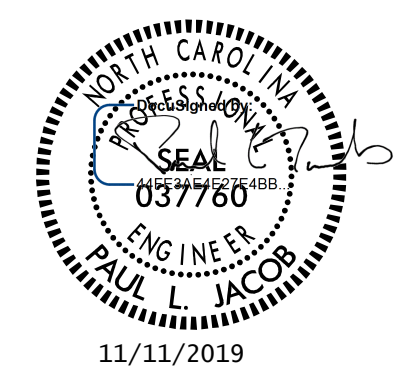
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. R-2303E

SAMPSON COUNTY

STATION: 31+16.90 -Y2-

SHEET 3 OF 3



DRAWN BY : J. WEIGER DATE : 01/2019

CHECKED BY : P. JACOB DATE : 09/2019

DESIGN ENGINEER OF RECORD: P. JACOB DATE : 09/2019

**moffatt & nichol**

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 RALEIGH, NORTH CAROLINA 27609  
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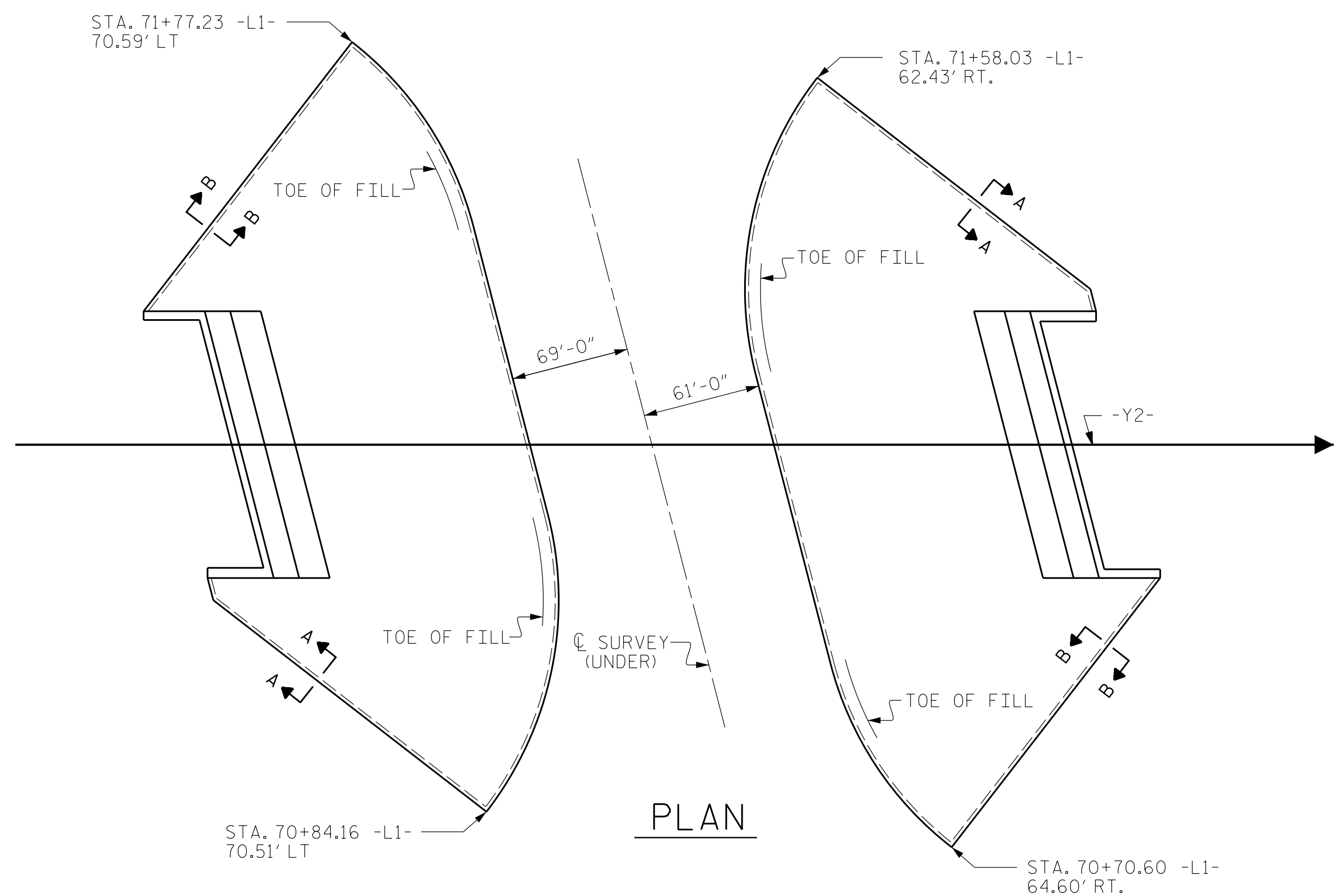
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

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

SHEET NO. S3-26

TOTAL SHEETS 30

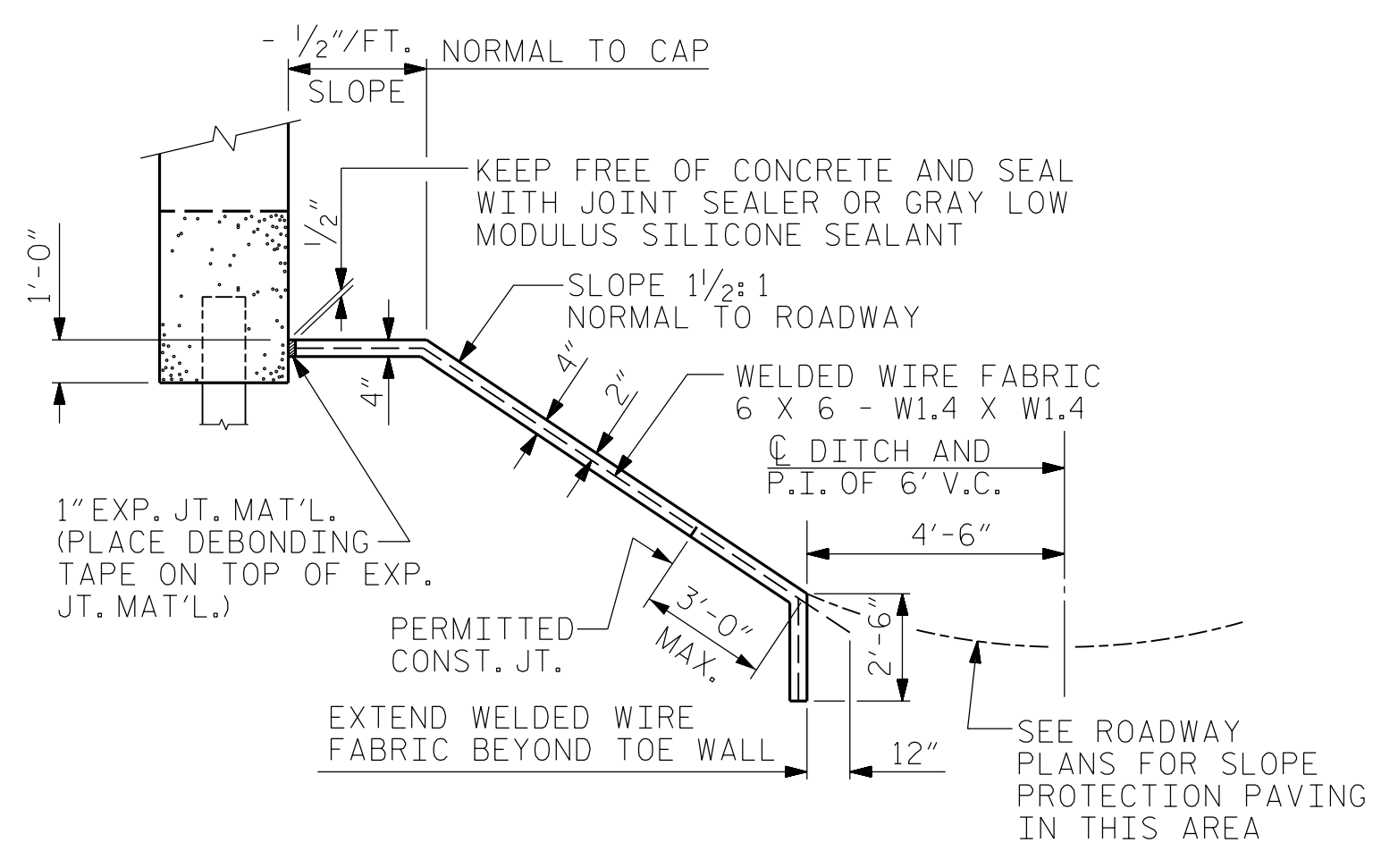


**GENERAL NOTES**

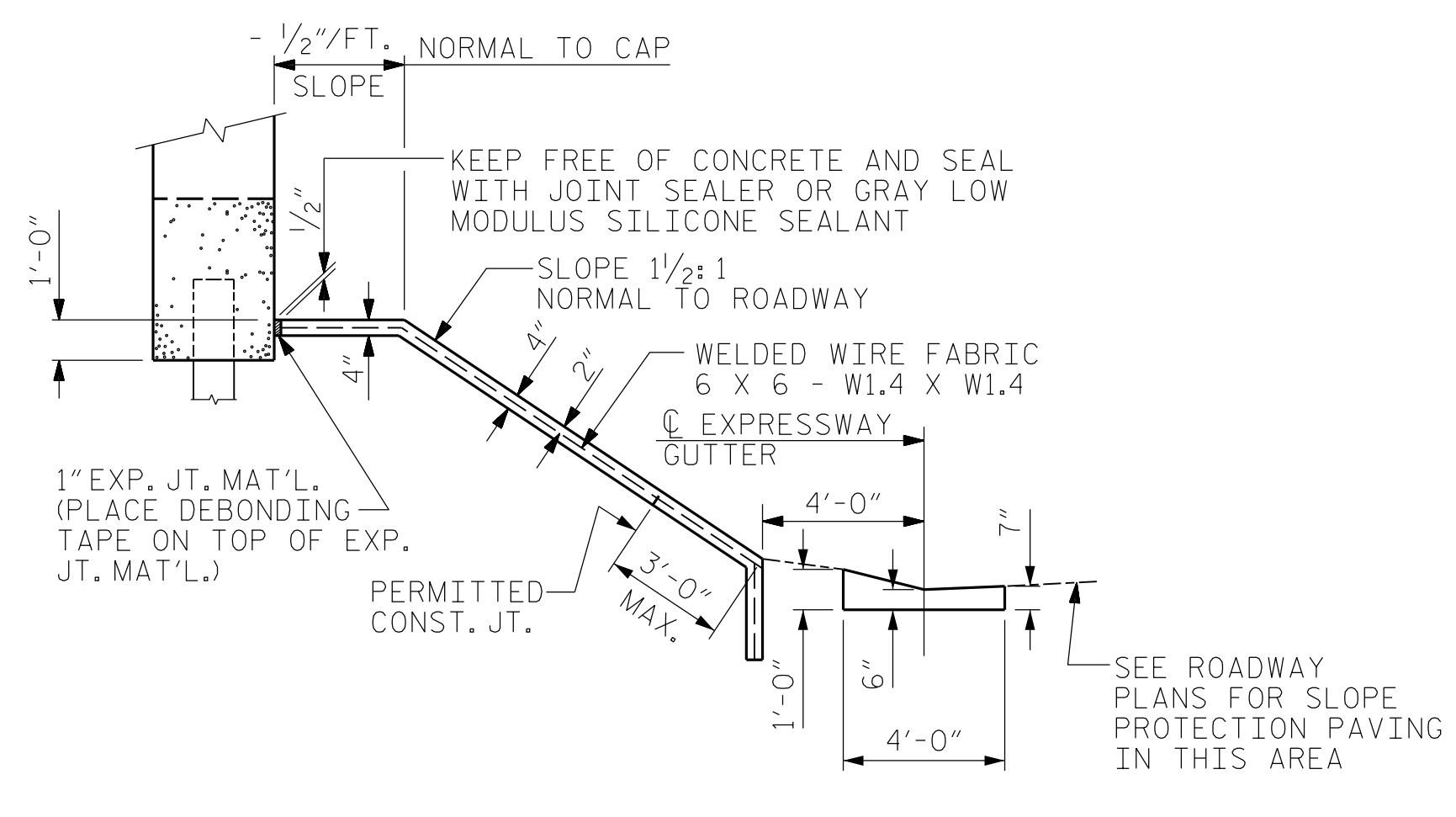
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE 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+16.90 -Y2-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	315.0	530
END BENT 2	225.0	350

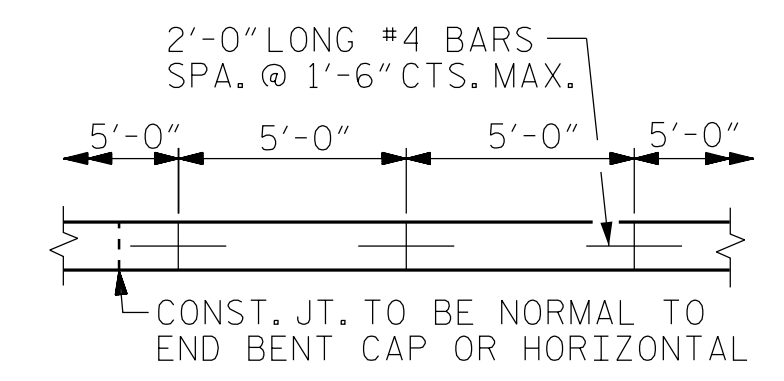
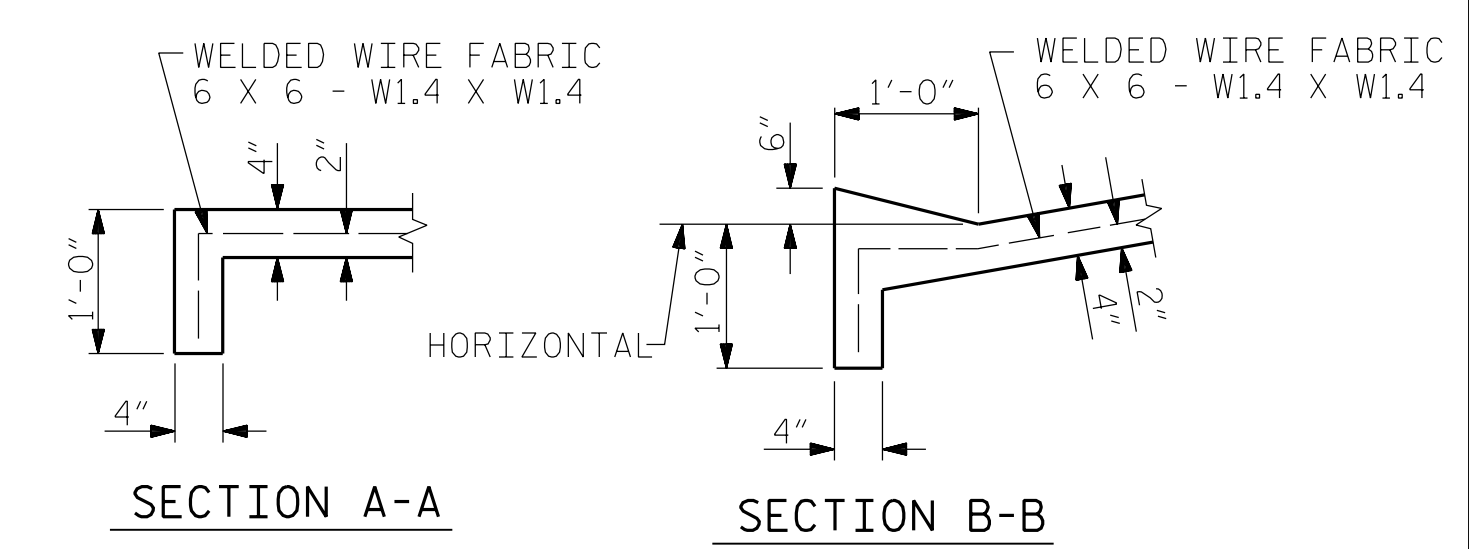
\* QUANTITY SHOWN IS BASED ON 5' POURS.



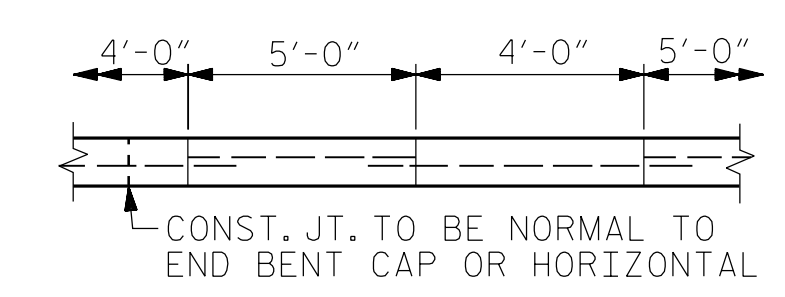
SECTION ALONG SURVEY WHEN FILL CATCHES IN DITCH



SECTION ALONG SURVEY WHEN FILL CATCHES IN EXPRESSWAY GUTTER



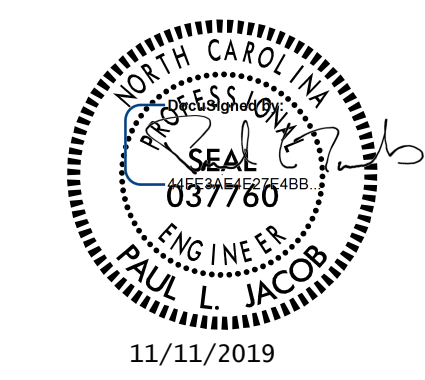
POURING DETAIL



OPTIONAL POURING DETAIL

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
**SLOPE PROTECTION**

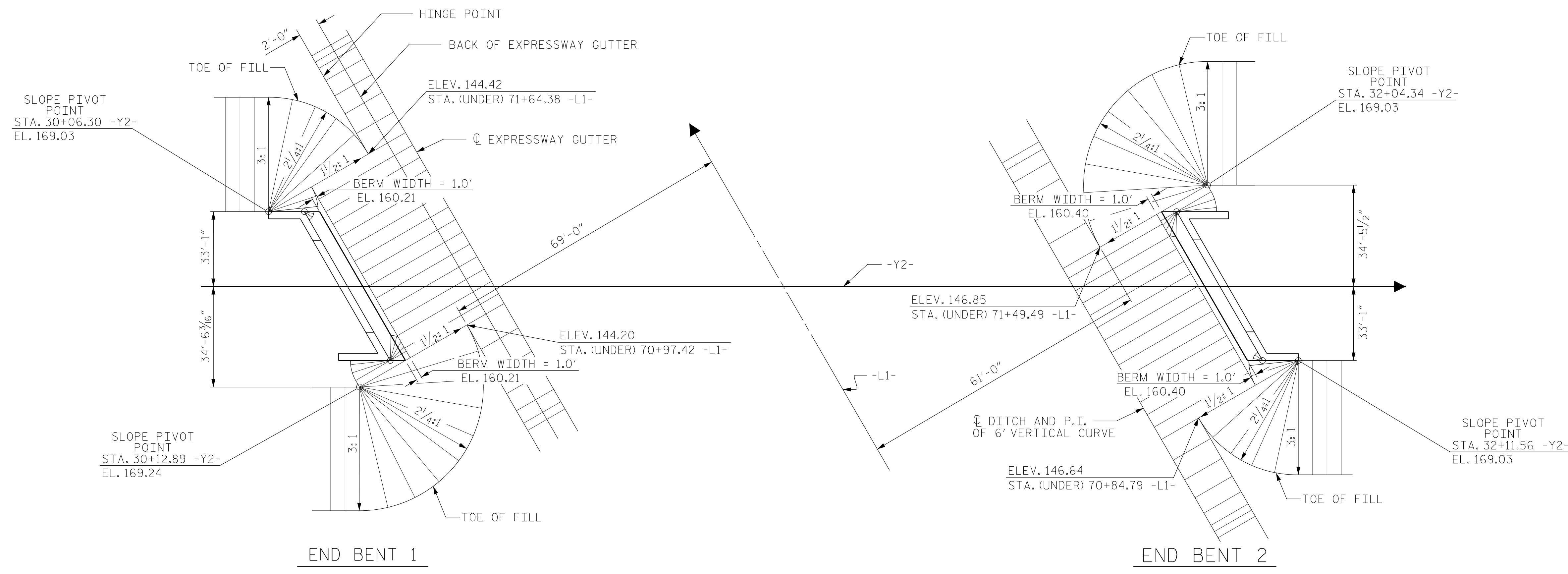
ASSEMBLED BY : J. SWYERS	DATE : 06/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

**moffatt & nichol**  
 4700 FALLS OF NEUSE ROAD, SUITE 300  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 781-4626 VOICE (919) 781-4869 FAX  
 NC License No.: F-0105

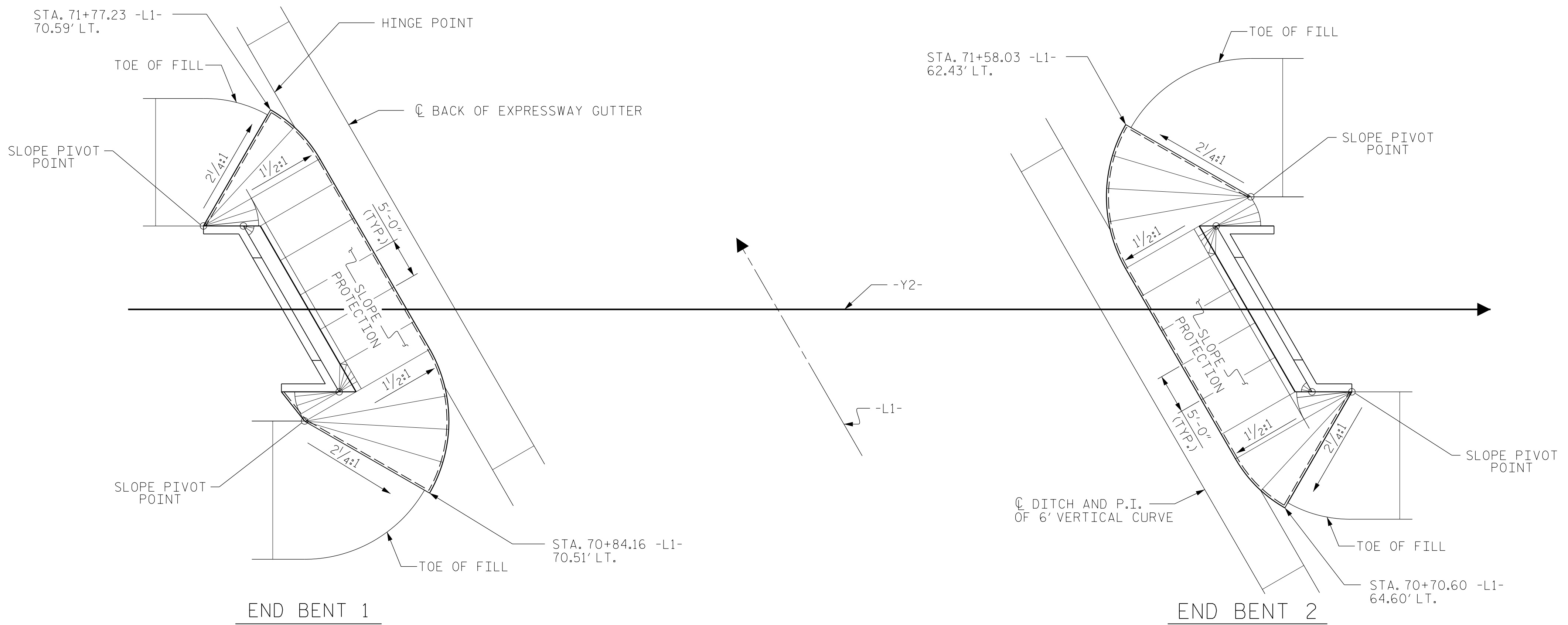
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 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			30

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PLAN - GRADING

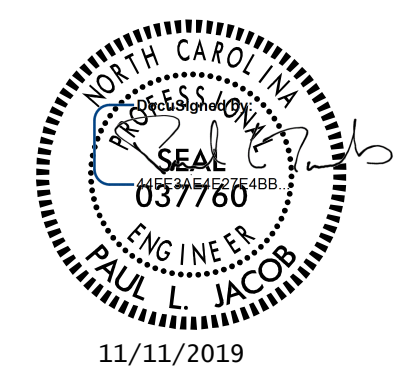


PLAN - CONCRETE PLACEMENT

PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 SLOPE PROTECTION



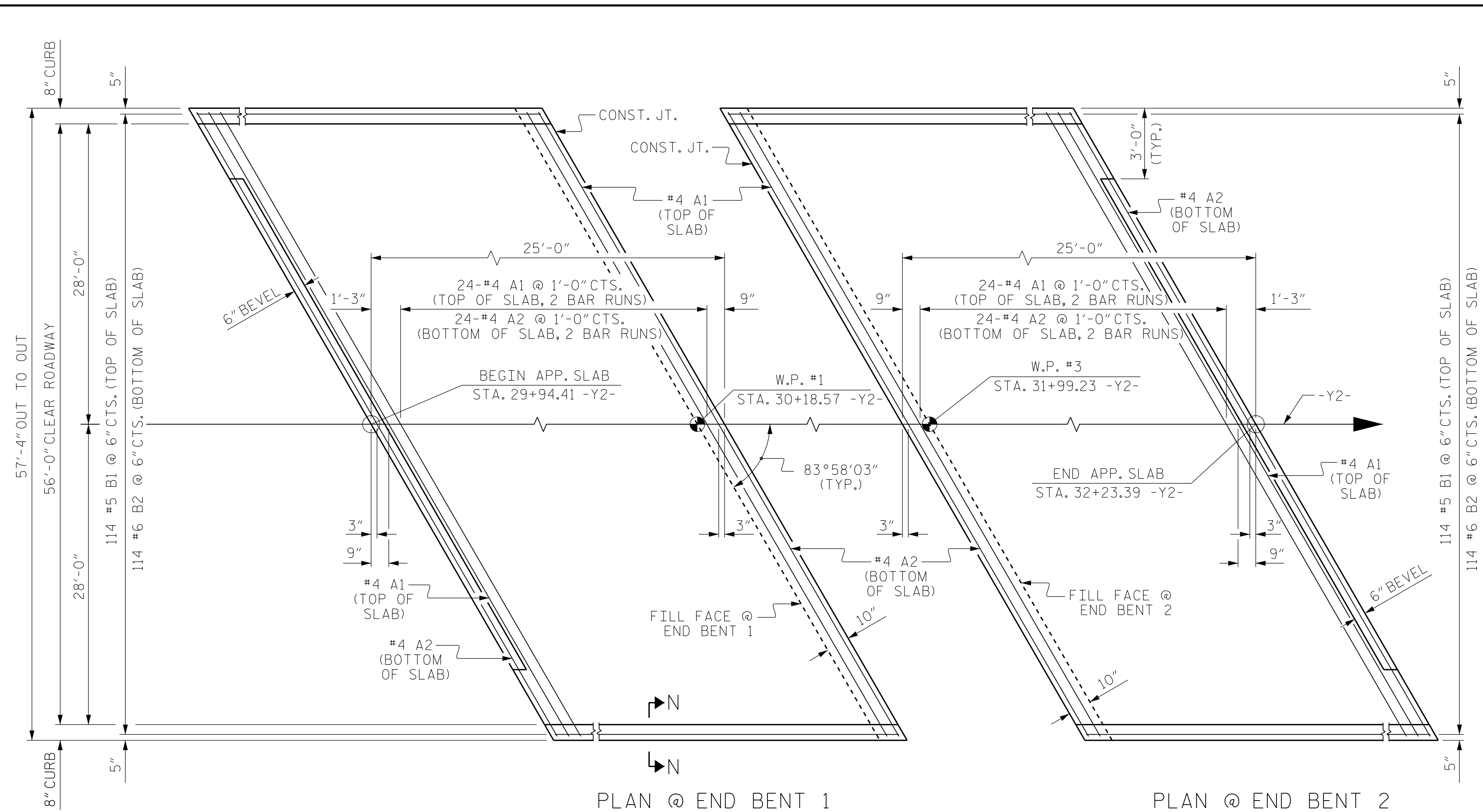
ASSEMBLED BY : J. WEIGER	DATE : 06/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-28
1			3			TOTAL SHEETS 30
2			4			

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PLAN @ END BENT 1      PLAN @ END BENT 2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

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.

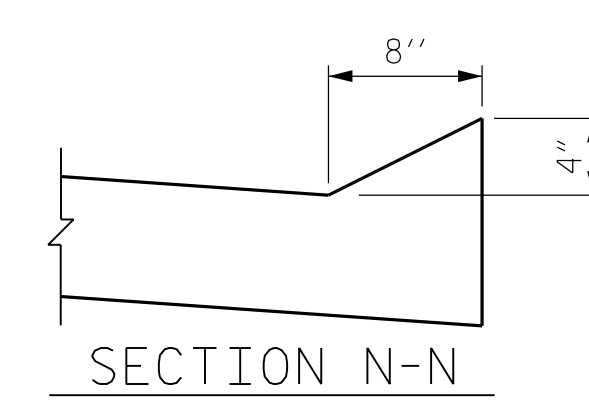
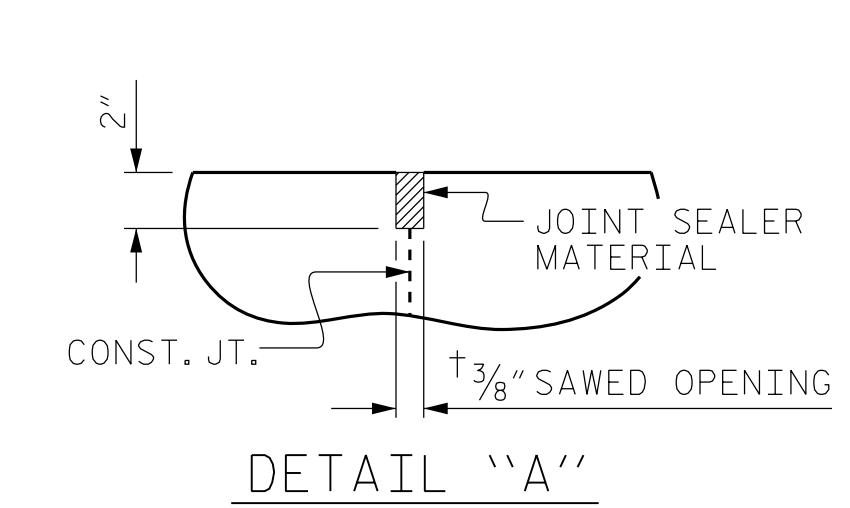
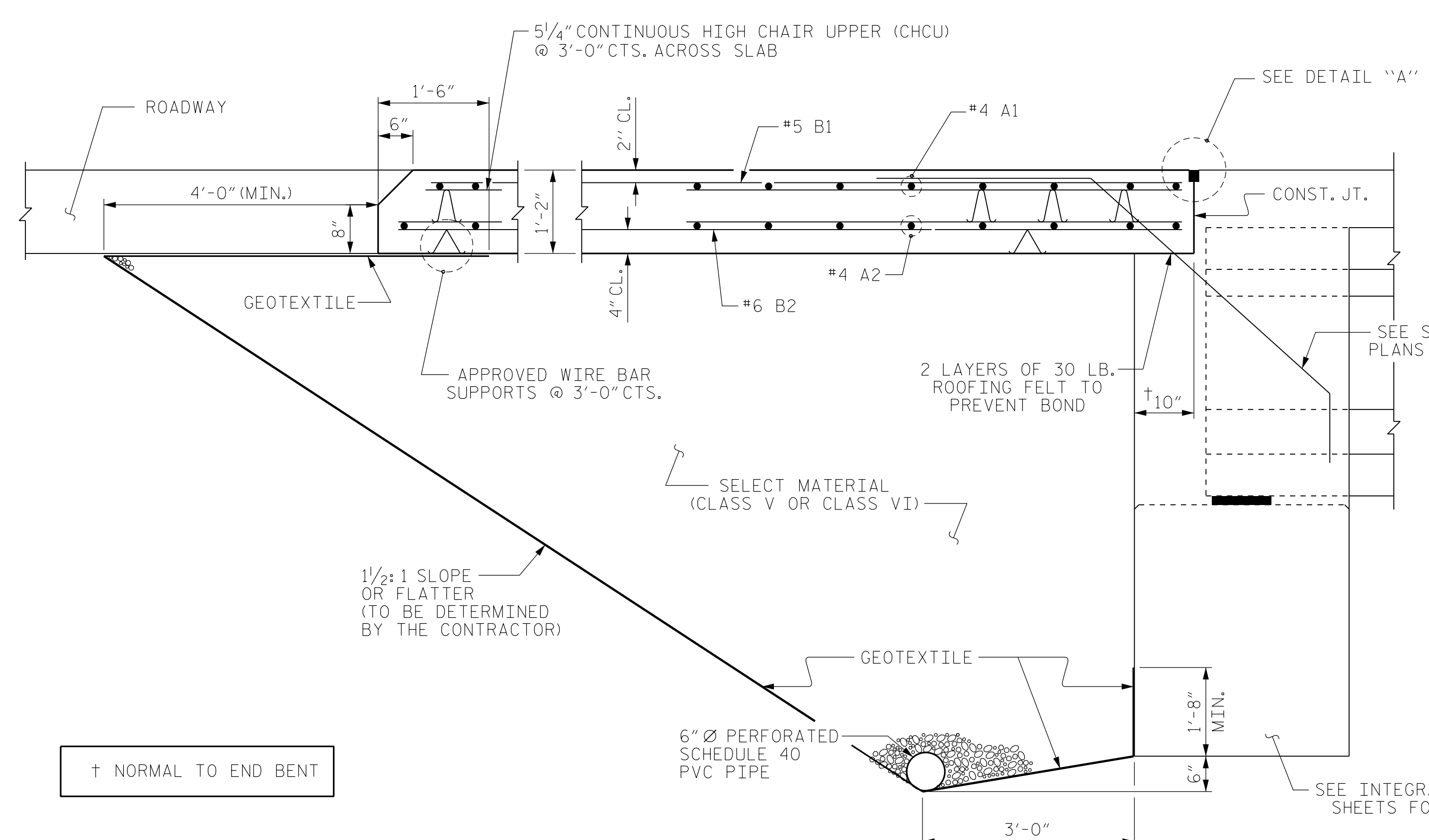
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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.

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 2 FOR DETAILS AND NOTES.

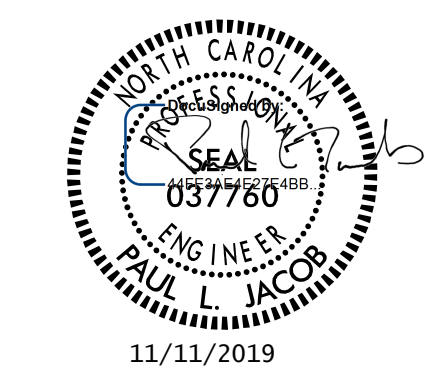
BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	29'-8"	1031
A2	52	#4	STR	29'-7"	1028
* B1	114	#5	STR	24'-0"	2854
B2	114	#6	STR	24'-6"	4196
REINFORCING STEEL				LBS.	5224
* EPOXY COATED REINFORCING STEEL				LBS.	3885
CLASS AA CONCRETE				C. Y.	61.9

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



SECTION THRU SLAB  
(TYPE I - STANDARD APPROACH FILL)

PROJECT NO. R-2303E  
SAMPSON COUNTY  
STATION: 31+16.90 -Y2-  
SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR INTEGRAL  
ABUTMENT WITH  
FLEXIBLE PAVEMENT

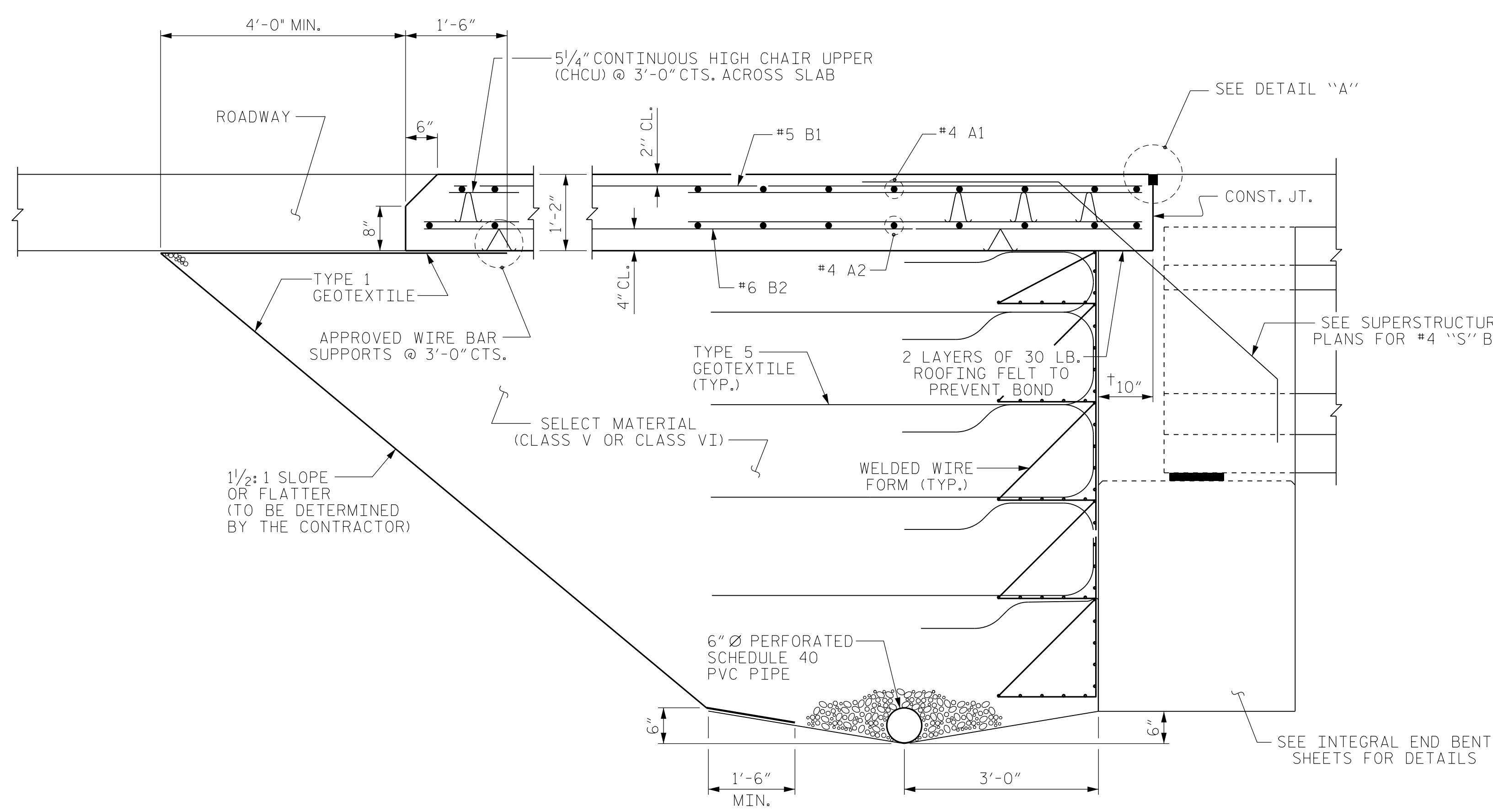
ASSEMBLED BY : J. WEIGER	DATE : 02/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
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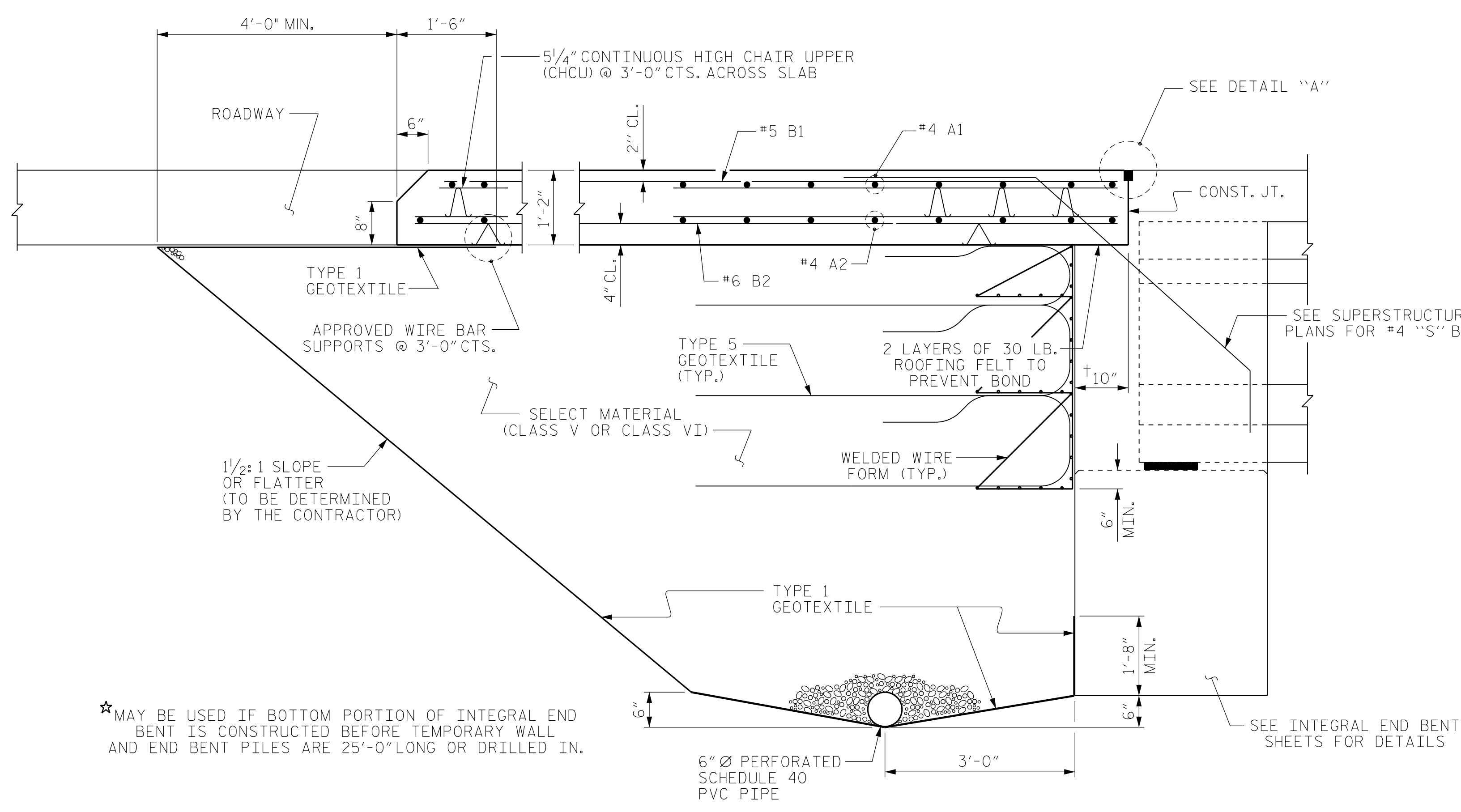
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S3-29
2			4			TOTAL SHEETS 30

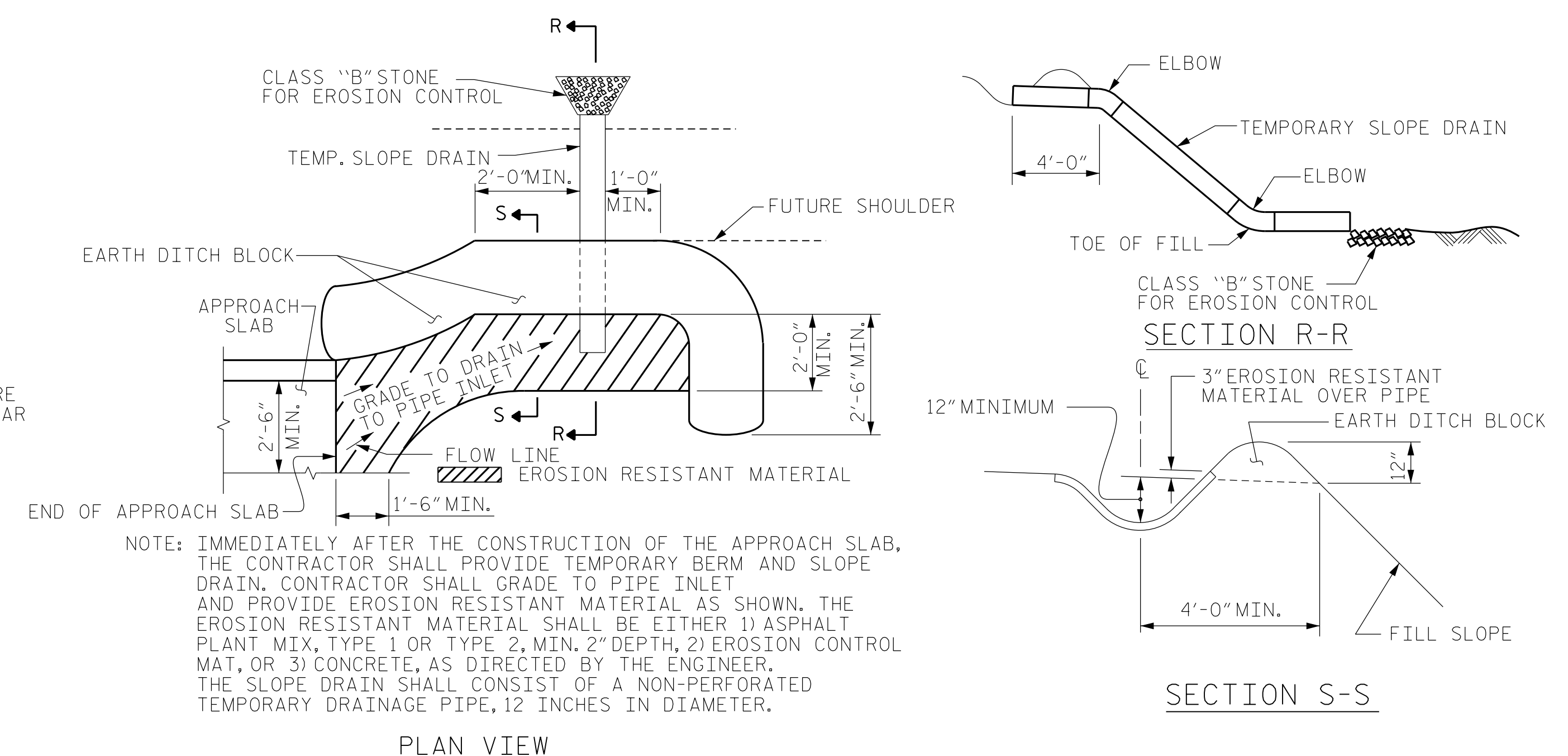
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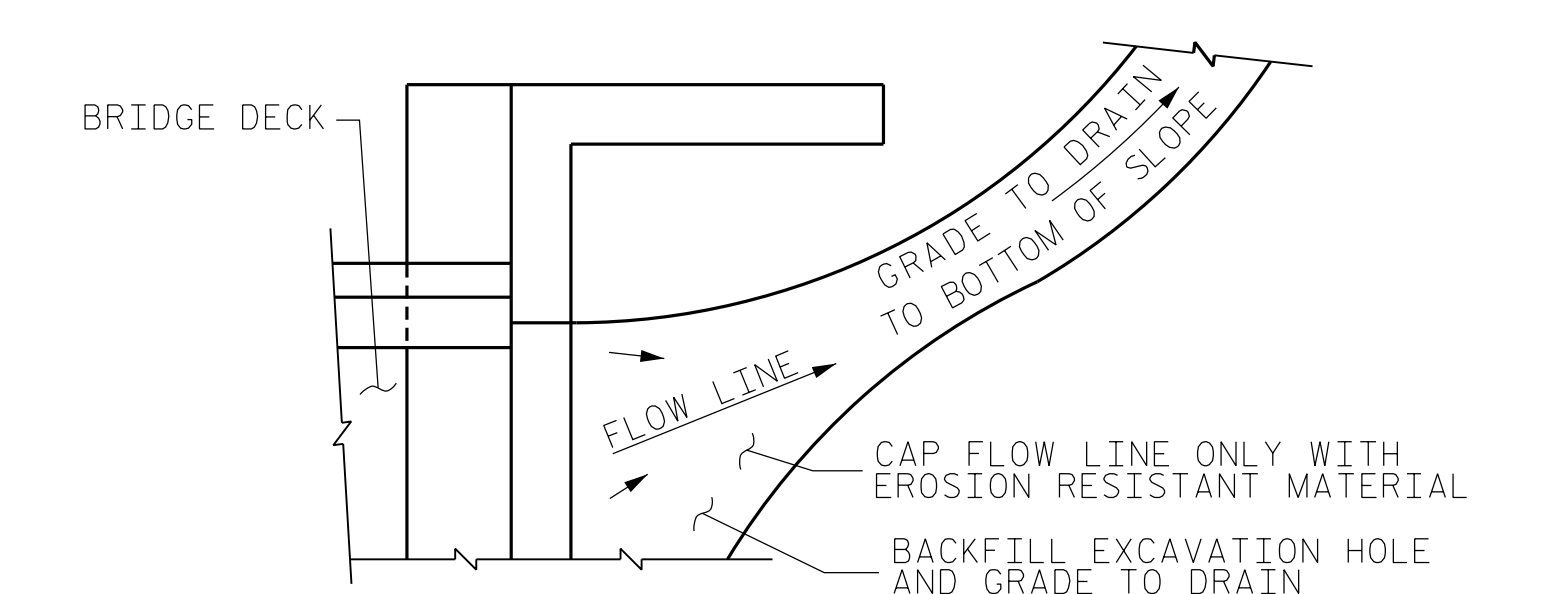
SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



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



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

**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.

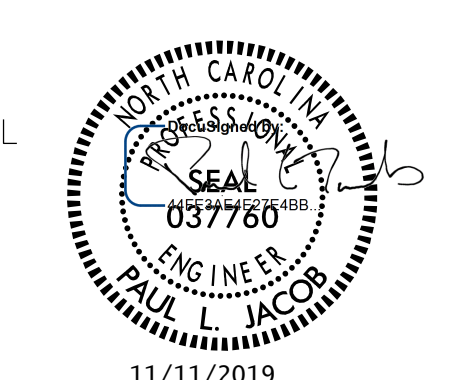
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWS NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

★ 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.

ASSEMBLED BY : J. WEIGER	DATE : 01/2019
CHECKED BY : P. JACOB	DATE : 09/2019
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
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	REV. 12/17 MAA/GM



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PROJECT NO. R-2303E  
SAMPSON COUNTY  
 STATION: 31+16.90 -Y2-

SHEET 2 OF 2

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 30
2			4			30