

09/28/19

11/8/2021 3:21:04 PM User: zblanning File: N:\NC Bridges\MT034 - U-5996 (VHB)\Final\U-5996\_Structures\Site\400\_001\_U5996\_TSH\_001.dgn

**TIP PROJECT: U-5996**

**CONTRACT: C204542**

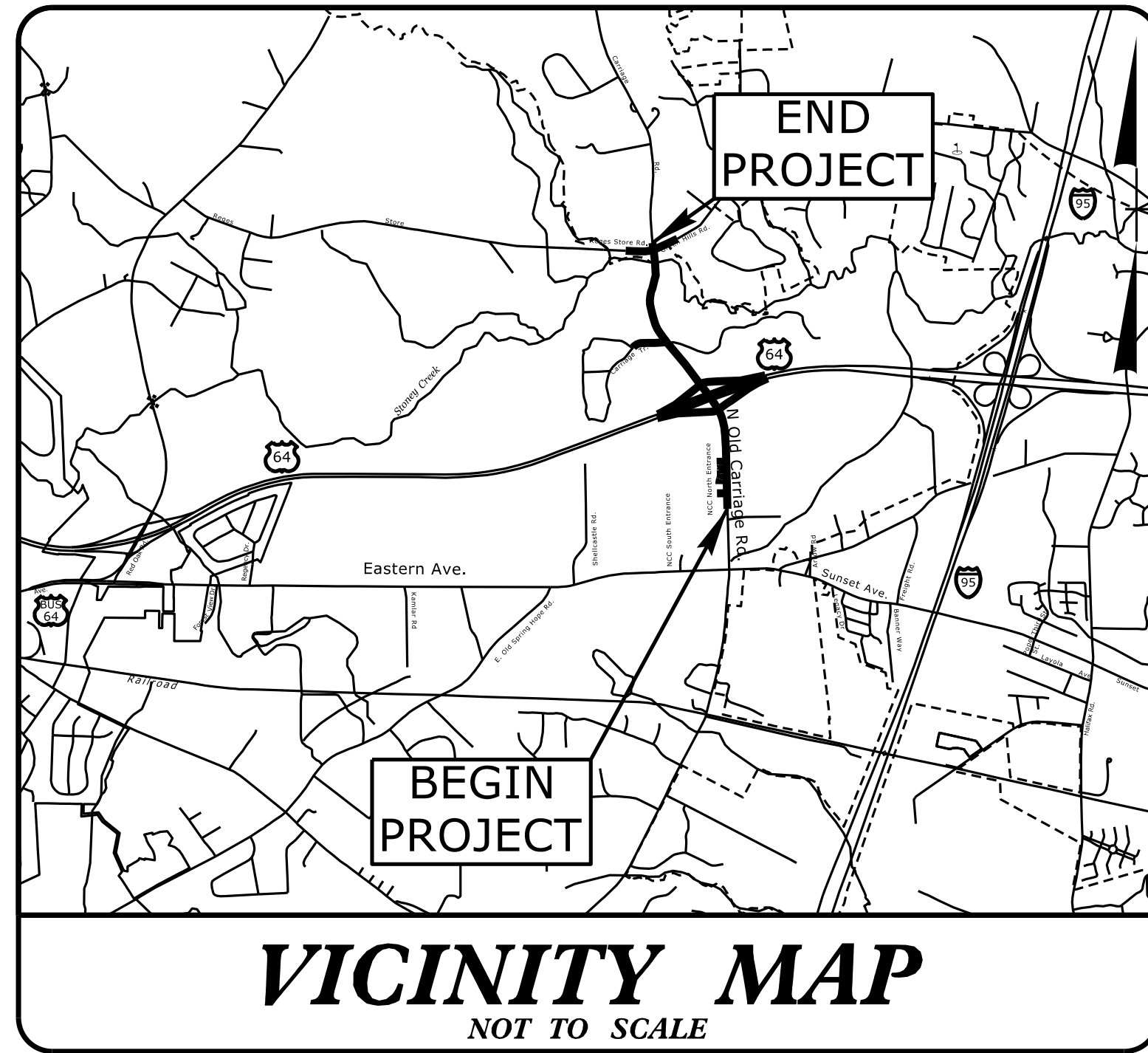
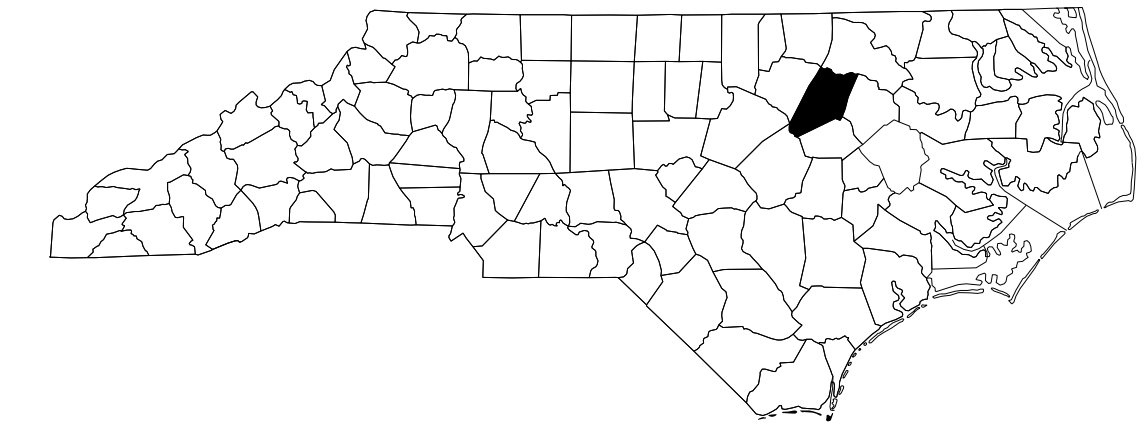
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**NASH COUNTY**

**LOCATION: WIDEN SR 1603 (N. OLD CARRIAGE RD.)  
FROM NORTH OF SR 1770 (EASTERN AVE./SUNSET AVE.)  
TO SR 1601 (REGES STORE RD.)/SR 1609 (GREEN HILLS RD.).**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURE, AND  
RETAINING WALLS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5996	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47133.1.1		PE	
47133.2.1		RW & UTILITIES	
47133.3.1		CONSTRUCTION	



**BEGIN TIP PROJECT U-5996**

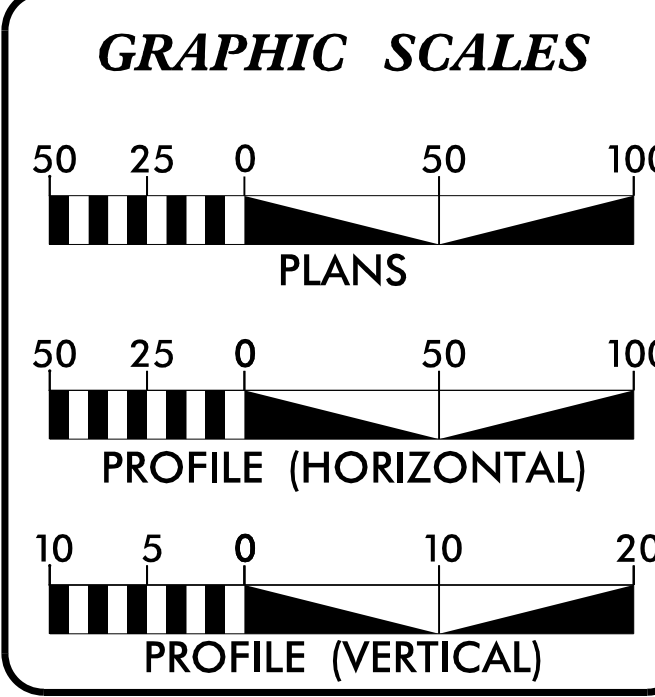
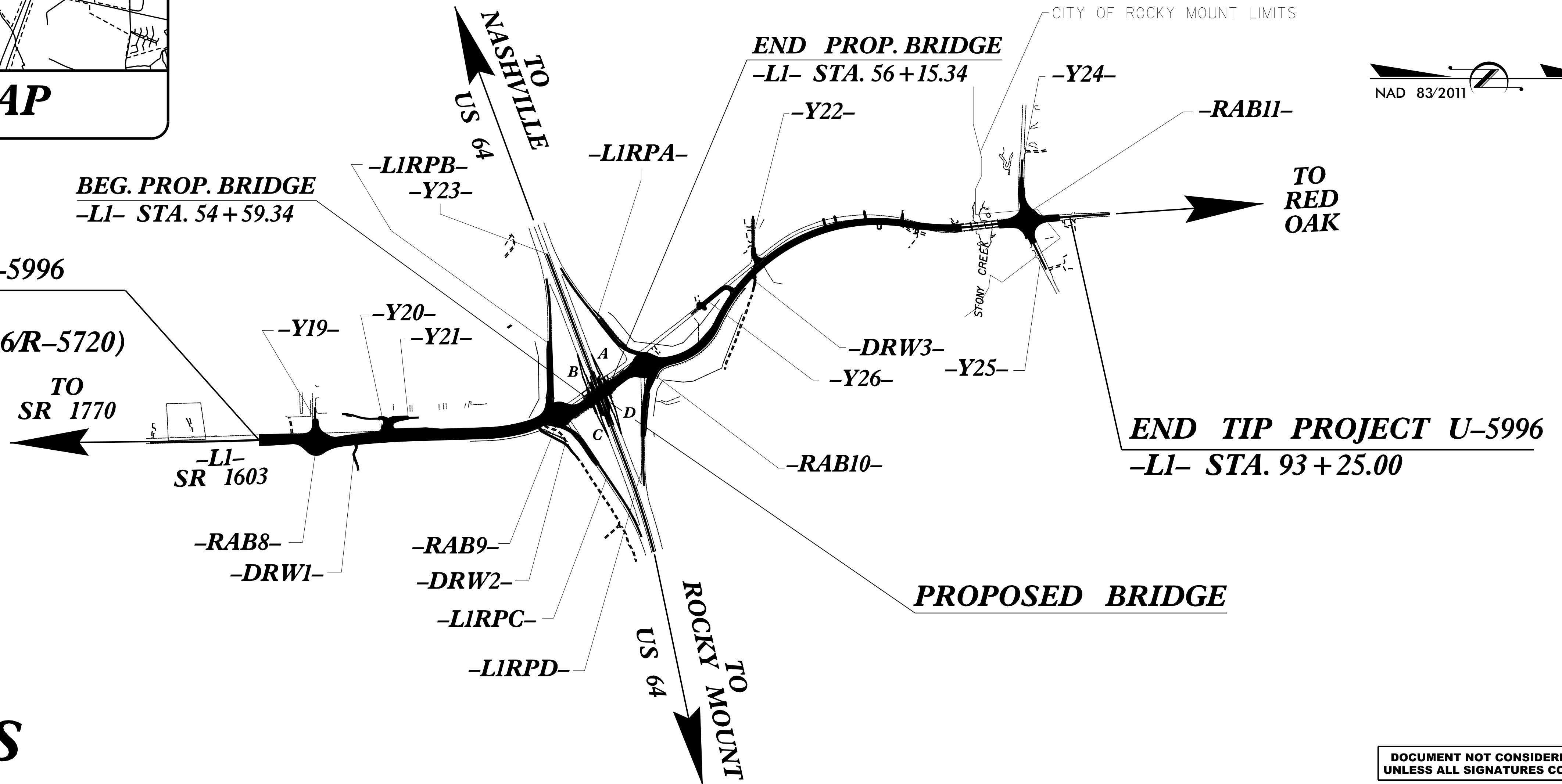
**-LI- STA. 30 + 70.01 =  
-LI- STA. 30 + 70.00 (U-5026/R-5720)**

**BEG. PROP. BRIDGE  
-LI- STA. 54 + 59.34**

**END PROP. BRIDGE  
-LI- STA. 56 + 15.34**

**END TIP PROJECT U-5996  
-LI- STA. 93 + 25.00**

**STRUCTURES**



**DESIGN DATA**

ADT 2020 =	13,322
ADT 2040 =	18,800
K =	9 %
D =	55 %
T =	4 % *
V =	50 MPH**

\* TTST = 1% DUAL 3%  
\*\* V = 40 MPH B/W RAMP  
FUNC CLASS = ARTERIAL

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-5996	=	1.155 MI.
LENGTH STRUCTURE TIP PROJECT U-5996	=	0.030 MI.
TOTAL LENGTH OF TIP PROJECT U-5996	=	1.185 MI.

NCDOT CONTACT: \_\_\_\_\_ RUSSELL BROADWELL, PE

Prepared In the Office of:

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER : P-0671

2018 STANDARD SPECIFICATIONS

December 13, 2019  
RIGHT OF WAY DATE:

January 18, 2022  
LETTING DATE:

MORRIS ISRAELNAIM, PE  
PROJECT ENGINEER

ALLYSON K. ORR, PE  
PROJECT DESIGN ENGINEER

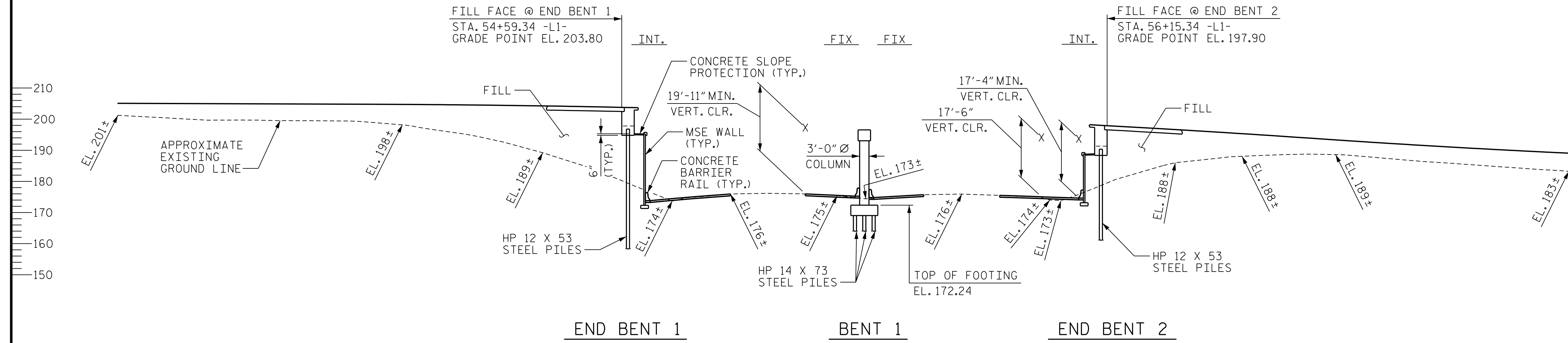
11/8/2021

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UNLESS ALL SIGNATURES COMPLETED

53+00 54+00 55+00 56+00 57+00

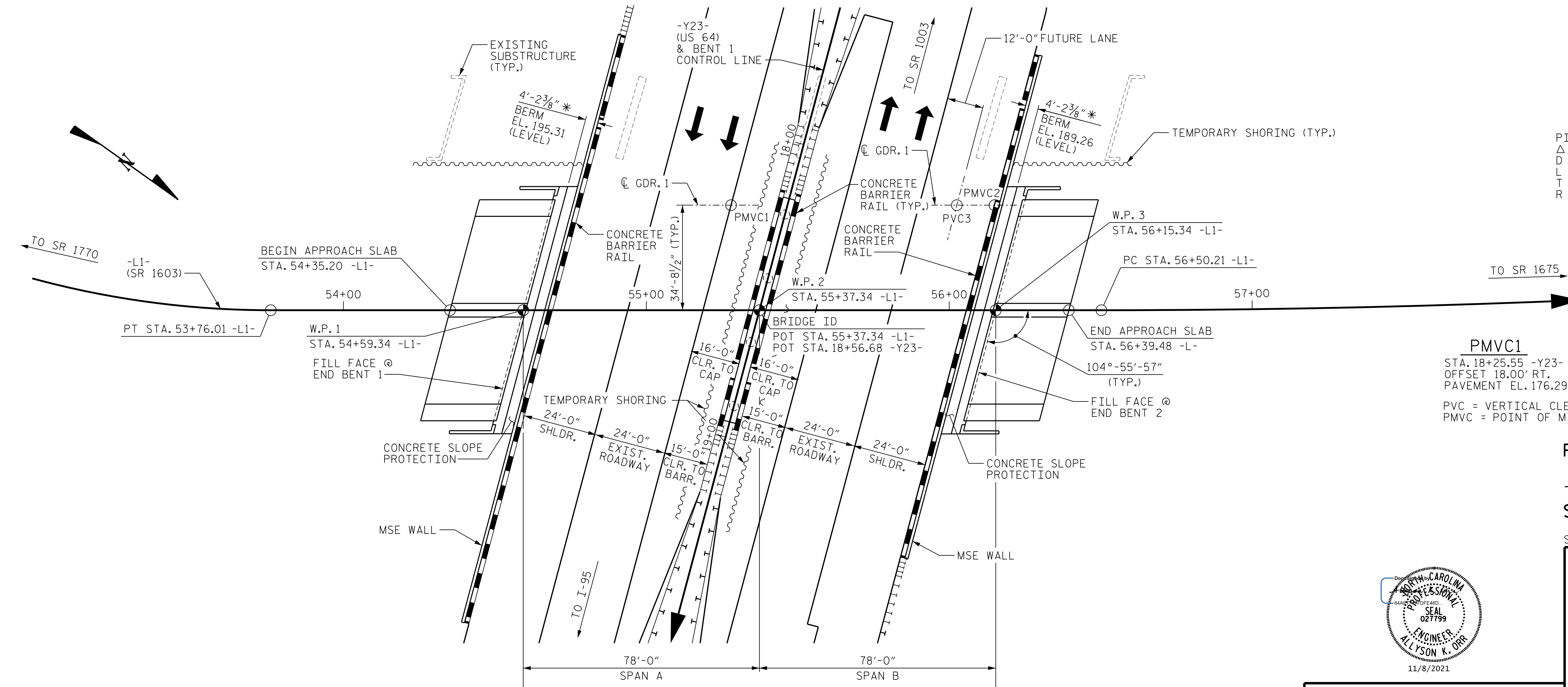
SPAN A SPAN B

-0.3867%  $\Delta$  -6.8489%  
 PVI = 55+30.00 -L1-  
 EL. = 204.20  
 V.C. = 300.00'  
 -6.8489%  $\Delta$  -2.9996%  
 PVI = 57+55.00 -L1-  
 EL. = 188.79  
 V.C. = 144.00'  
 GRADE DATA -L1-



SECTION ALONG -L1-

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)



HORIZ. CURVE DATA -L1-  
 PI STA. 53+04.42 -L1- PI STA. 57+29.51 -L1-  
 $\Delta = 27^\circ-54'-37"$  (LT.)  $\Delta = 2^\circ-25'-22"$  (LT.)  
 D = 19'-05'-55" D = 1'-31'-40"  
 L = 146.14' L = 158.57'  
 T = 74.55' T = 79.30'  
 R = 300.00' R = 3,750.00'

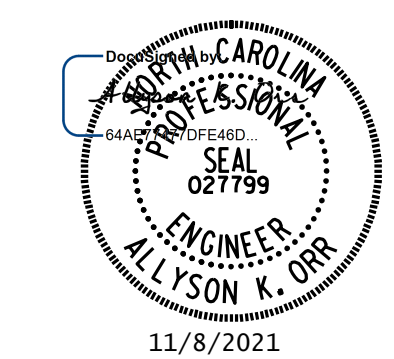
PMVC1 STA. 18+25.55 -Y23-  
 OFFSET 18.00' RT.  
 PAVEMENT EL. 176.29

PMVC2 STA. 18+03.15 -Y23-  
 OFFSET 66.00' LT.  
 PAVEMENT EL. 175.01

PVC3 STA. 18+06.35 -Y23-  
 OFFSET 54.00' LT.  
 PAVEMENT EL. 175.48

PVC = VERTICAL CLEARANCE POINT  
 PMVC = POINT OF MINIMUM VERTICAL CLEARANCE

PROJECT NO. U-5996  
 NASH COUNTY  
 STATION: 55+37.34 -L1-  
 18+56.68 -Y23-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 630154



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 UNLESS ALL SIGNATURES COMPLETED

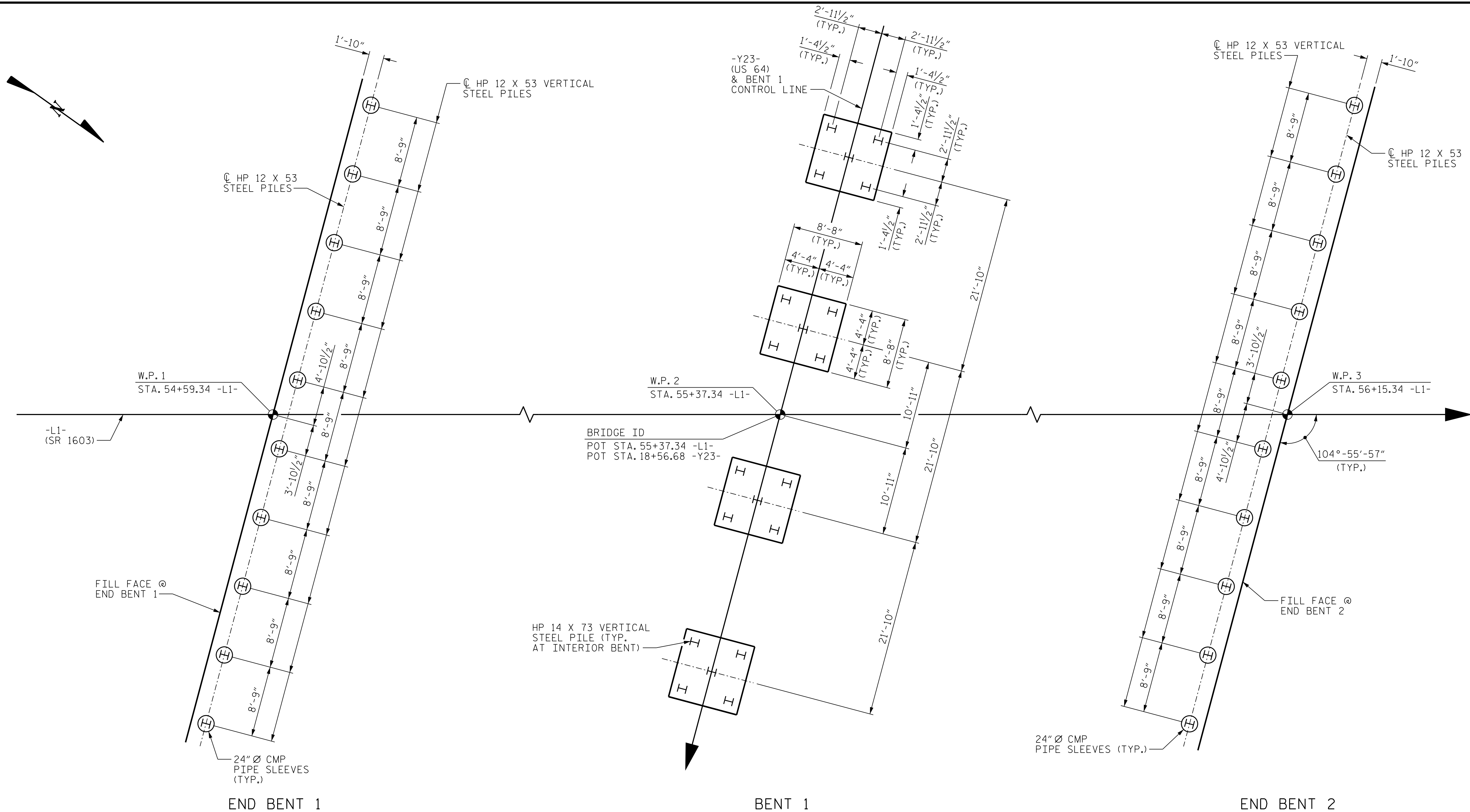
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

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

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DRAWN BY : B.E. LANNING DATE : 02/20  
 CHECKED BY : A.K. ORR DATE : 02/20  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

11/8/2021 3:05:24 PM User: blanning  
 Filename: N:\NC Bridges\W17034 - U-5996 (VHBA\Final\U-5996)\Structures\Site2\402.003.U5996.SMU.GD02.630154.dgn



**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP OR FOOTING.

**NOTES**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 117 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 155 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BOTH END BENT 1 AND 2 AND BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 138.0 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40-45 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2 AND BENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE AT AN END BENT AND BENT 1 WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT. OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING DRIVING PILES THROUGH CANS AND END BENT CONSTRUCTION AT END BENT 1 AND 2.

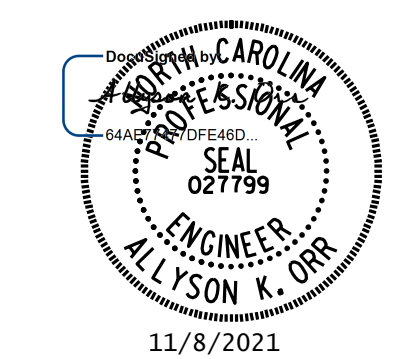
OBSERVE AN ADDITIONAL TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE END BENT CAP AND REINFORCED APPROACH FILLS OVERLAIN WITH SURCHARGE WALL TO MINIMUM HEIGHT OF 2 FT. ABOVE THE FINISHED GRADE ELEVATION AT END BENT 1 AND 2 APPROACH. FOR WAITING PERIODS STAGE DETAILS, SEE THE ROADWAY PLANS. FOR BRIDGE WAITING PERIODS, SEE SECTION 235 OF THE STANDARD SPECIFICATIONS.

REQUIRED DRIVING RESISTANCES ARE COMPUTED USING A 0.75 RESISTANCE FACTOR.

FOR ADDITIONAL NOTES, SEE "MSE WALL NOTES" SHEET.

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 3



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

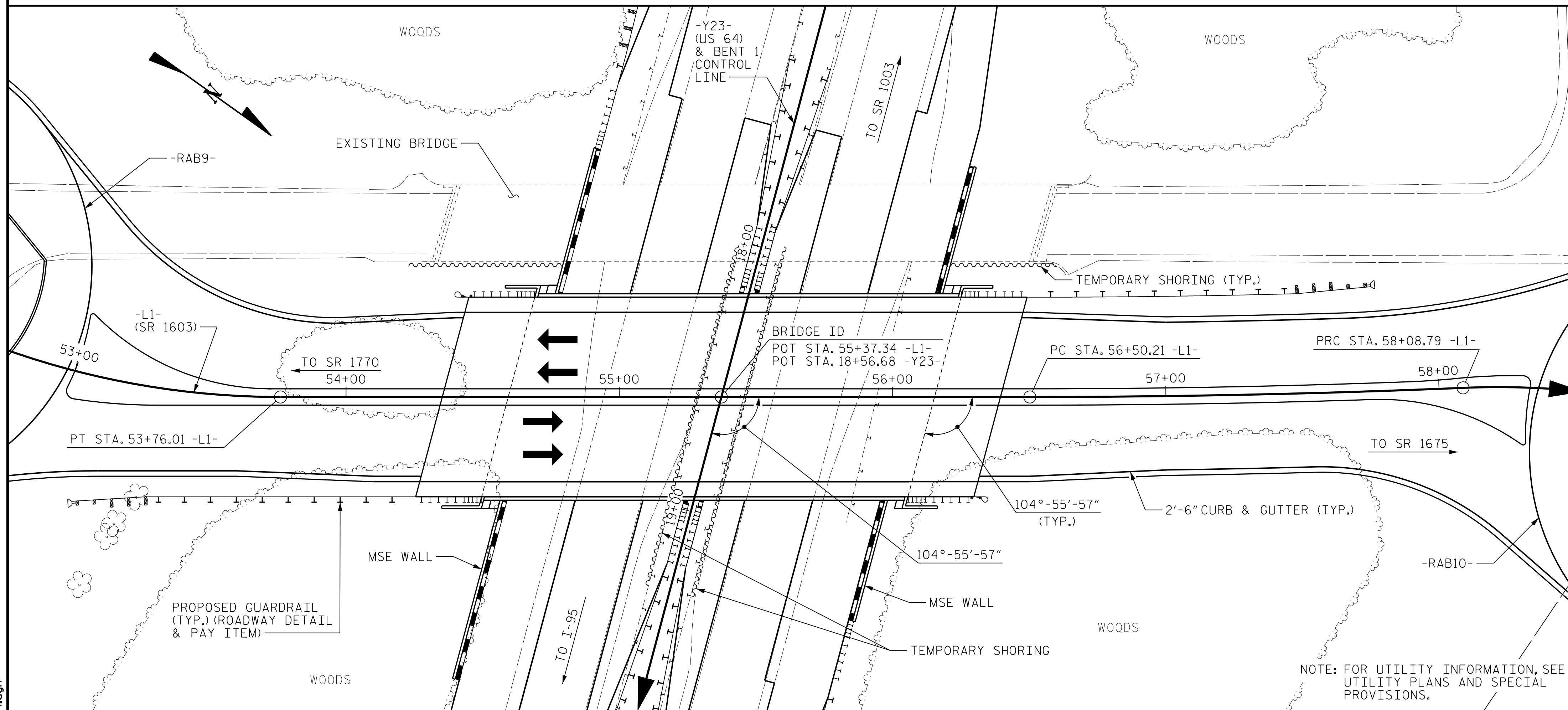
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON SR 1603  
 OVER US 64 BETWEEN  
 SR 1770 AND SR 1675

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

B.M. #1: BENCHTIE NAIL SET IN 24" PINE; 153.77' LEFT OF STA. 58+02.37 -L1-, EL. 183.04



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF THE METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE SKEWED END CONDITIONS AT THE BENT AND END BENTS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 55+37.34 -L-."
- FOR MSE RETAINING WALLS, SEE GEOTECHNICAL SPECIAL PROVISIONS.
- FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 42'-6", 3 @ 59'-6") OF REINFORCED CONCRETE DECK WITH A CLEAR ROADWAY OF 28'-1" ON STEEL I-BEAMS ON REINFORCED CONCRETE END BENTS AND REINFORCED CONCRETE ON PRESTRESSED CONCRETE PILE INTERIOR BENTS AND LOCATED 60 FT. WEST OF THE SITE OF 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 THE CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 55+37.34 -L1-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION AT BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM				11,791	10,450					1222.56
END BENT 1							50.0	LUMP SUM	8066		
BENT 1			LUMP SUM				122.5	LUMP SUM	19,049	1675	
END BENT 2							52.2	LUMP SUM	7775		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	11,791	10,450	224.7	LUMP SUM	34,890	1675	1222.56

TOTAL BILL OF MATERIAL

	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	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 3'-3" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	
	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	SO. YDS.	LUMP SUM
SUPERSTRUCTURE								292.92	308.55	LUMP SUM
END BENT 1	10		10	650					35	
BENT 1		20			20	800	20			
END BENT 2	10		10	750					35	
TOTAL	20	20	20	1400	20	800	40	292.92	308.55	70

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.

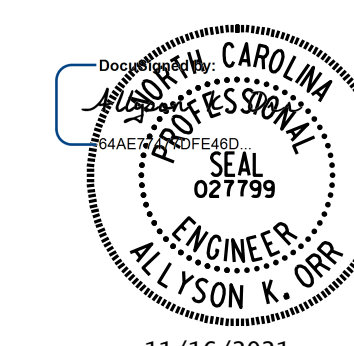
TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW. SEE ROADWAY PLANS AND TRAFFIC CONTROL PLANS FOR MORE INFORMATION.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

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

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 3 OF 3



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1603  
 OVER US 64 BETWEEN  
 SR 1770 AND SR 1675

REVISIONS

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

SHEET NO.  
S-3  
 TOTAL SHEETS  
39

DRAWN BY: B.E. LANNING DATE: 02/20  
 CHECKED BY: A.K. ORR DATE: 02/20  
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/20

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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 x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.45	--	1.75	0.812	1.95	A	E	30.0	1.009	<b>1.45</b>	A	I	71.0	0.80	0.768	1.59	A	I	37.5		
	HL-93 (OPERATING)	N/A		1.91	--	1.35	0.812	2.53	A	E	30.0	1.009	1.91	A	I	71.0	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	2.04	73.44	1.75	0.812	2.55	A	E	30.0	1.009	<b>2.04</b>	B	I	22.5	0.80	0.768	2.08	A	I	37.5		
	HS-20 (OPERATING)	36.000		2.69	96.84	1.35	0.812	3.30	A	E	30.0	1.009	2.69	B	I	22.5	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.67	63.05	1.40	0.812	7.14	A	E	30.0	1.009	6.35	B	I	22.5	0.80	0.768	4.67	A	I	37.5	
		SNGARBS2	20.000		3.47	69.40	1.40	0.812	5.30	A	E	30.0	1.009	4.47	B	I	22.5	0.80	0.768	3.47	A	I	37.5	
		SNAGRIS2	22.000		3.29	72.38	1.40	0.812	5.01	A	E	30.0	1.009	4.14	B	I	22.5	0.80	0.768	3.29	A	I	37.5	
		SNCOTTS3	27.250		2.33	63.49	1.40	0.812	3.58	A	E	30.0	1.009	3.07	B	I	22.5	0.80	0.768	2.33	A	I	37.5	
		SNAGGRS4	34.925		1.95	68.10	1.40	0.812	2.99	A	E	30.0	1.009	2.53	B	I	22.5	0.80	0.768	1.95	A	I	37.5	
		SNS5A	35.550		1.92	68.26	1.40	0.812	2.95	A	E	30.0	1.009	2.57	B	I	22.5	0.80	0.768	1.92	A	I	37.5	
		SNS6A	39.950		1.76	70.31	1.40	0.812	2.70	A	E	30.0	1.009	2.30	B	I	4.0	0.80	0.768	1.76	A	I	37.5	
	SNS7B	42.000		1.68	70.56	1.40	0.812	2.58	A	E	30.0	1.009	2.20	A	I	71.0	0.80	0.768	1.68	A	I	37.5		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.16	71.28	1.40	0.812	3.32	A	E	30.0	1.009	2.81	B	I	4.0	0.80	0.768	2.16	A	I	37.5	
		TNT4A	33.075		2.15	71.11	1.40	0.812	3.28	A	E	30.0	1.009	2.73	B	I	22.5	0.80	0.768	2.15	A	I	37.5	
		TNT6A	41.600		1.76	73.22	1.40	0.812	2.71	A	E	30.0	1.009	2.29	A	I	71.0	0.80	0.768	1.76	A	I	37.5	
		TNT7A	42.000		1.77	74.34	1.40	0.812	2.72	A	E	30.0	1.009	2.28	A	I	71.0	0.80	0.768	1.77	A	I	37.5	
		TNT7B	42.000		1.81	76.02	1.40	0.812	2.76	A	E	30.0	1.009	2.18	B	I	4.0	0.80	0.768	1.81	A	I	37.5	
		TNAGRIT4	43.000		1.74	74.82	1.40	0.812	2.66	A	E	30.0	1.009	2.17	B	I	22.5	0.80	0.768	1.74	A	I	37.5	
TNAGT5A		45.000		1.65	74.25	1.40	0.812	2.54	A	E	30.0	1.009	2.05	B	I	4.0	0.80	0.768	1.65	A	I	37.5		
TNAGT5B	45.000		③	1.62	72.90	1.40	0.812	2.49	A	E	30.0	1.009	2.01	B	I	4.0	0.80	0.768	<b>1.62</b>	A	I	37.5		

### 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

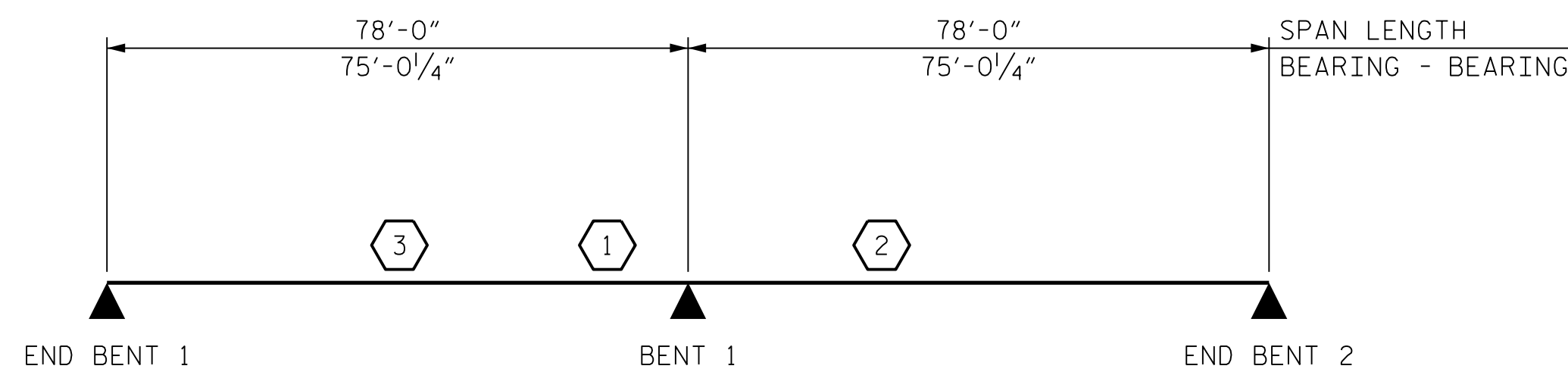
### NOTES:

- 1. MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
- 2. ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

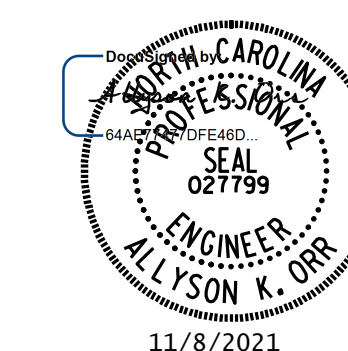
### COMMENTS:

1. BARRIER LOADS DISTRIBUTED ACCORDING TO NCDOT DESIGN MANUAL SECTION 2.1.2.1.
2. GIRDERS ASSUMED TO ACT CONTINUOUSLY UNDER COMPOSITE AND LIVE LOADING.
3. RATING INCLUDES PEDESTRIAN LOAD APPLIED TO SIDEWALKS.

#	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 E - EXTERIOR GIRDER



PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-



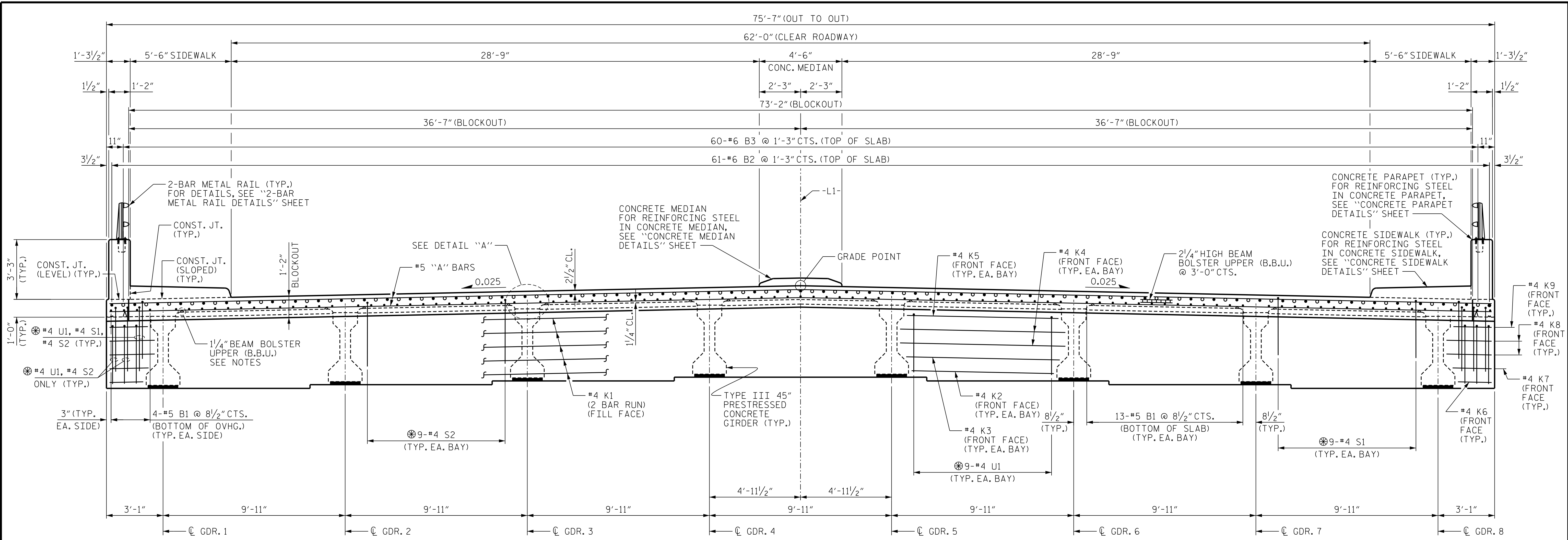
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)					
SHEET NO. <b>S-4</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS <b>39</b>

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ASSEMBLED BY: B.E. LANNING	DATE: 02/20
CHECKED BY: A.K. ORR	DATE: 02/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
DRAWN BY: MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY: GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

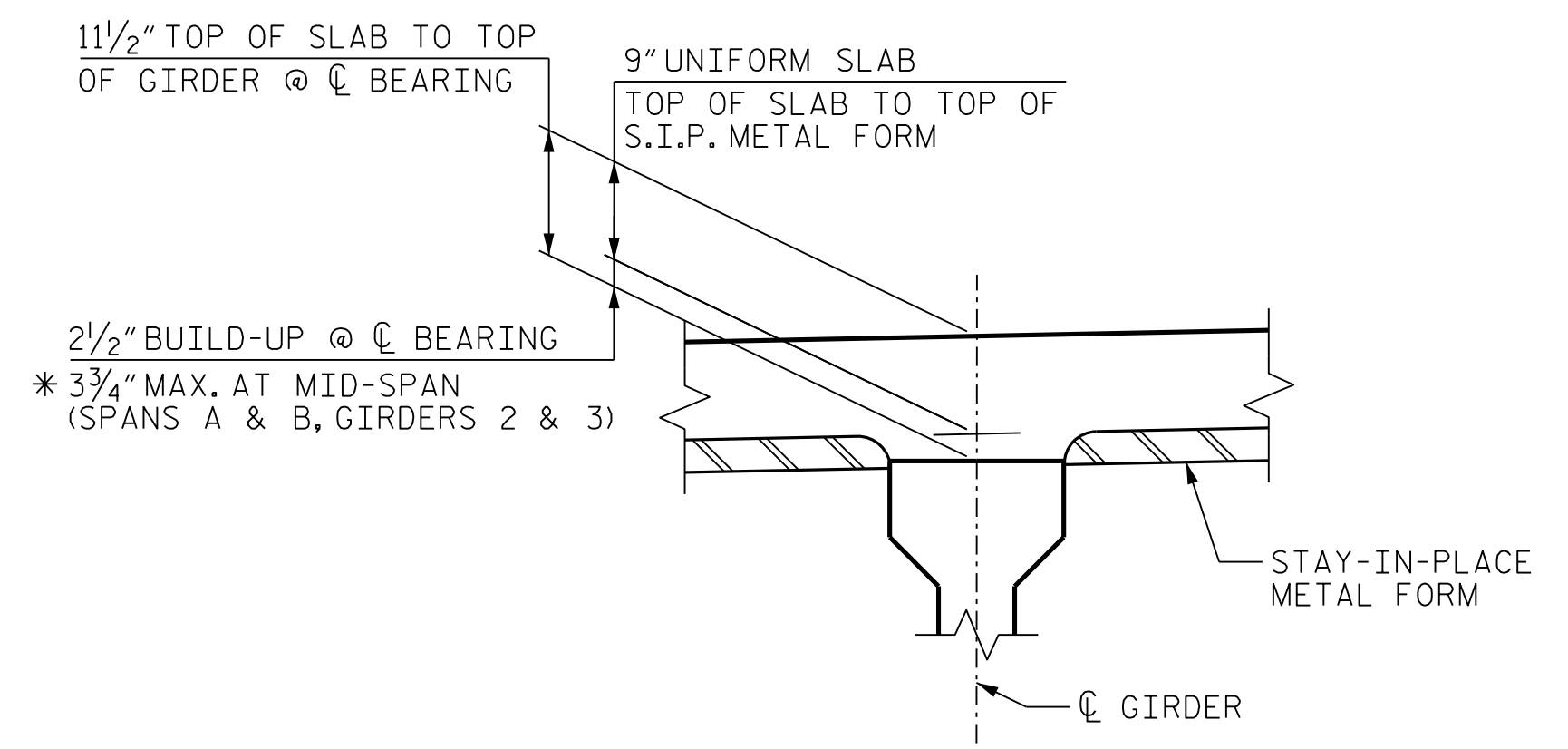


TYPICAL SECTION AT INTEGRAL END BENT

#4 S1, #4 S2 AND #4 U1 BARS TO MATCH WITH #4 'V' BARS IN INTEGRAL END BENT CAP.

NOTES:

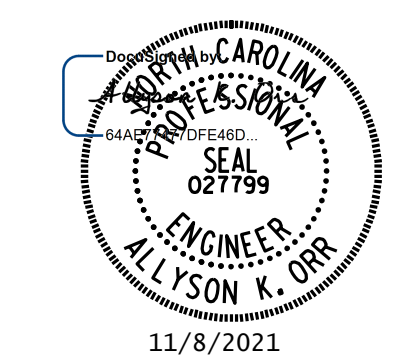
- PROVIDE 1/4" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE METAL FORMS TO SUPPORT THE BOTTOM MAT "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF 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 PARAPET, SIDEWALK, AND CONCRETE MEDIAN IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.



DETAIL "A"  
\* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

PROJECT NO. U-5996  
NASH COUNTY  
STATION: 55+37.34 -L1-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION  
AT INTEGRAL END BENT

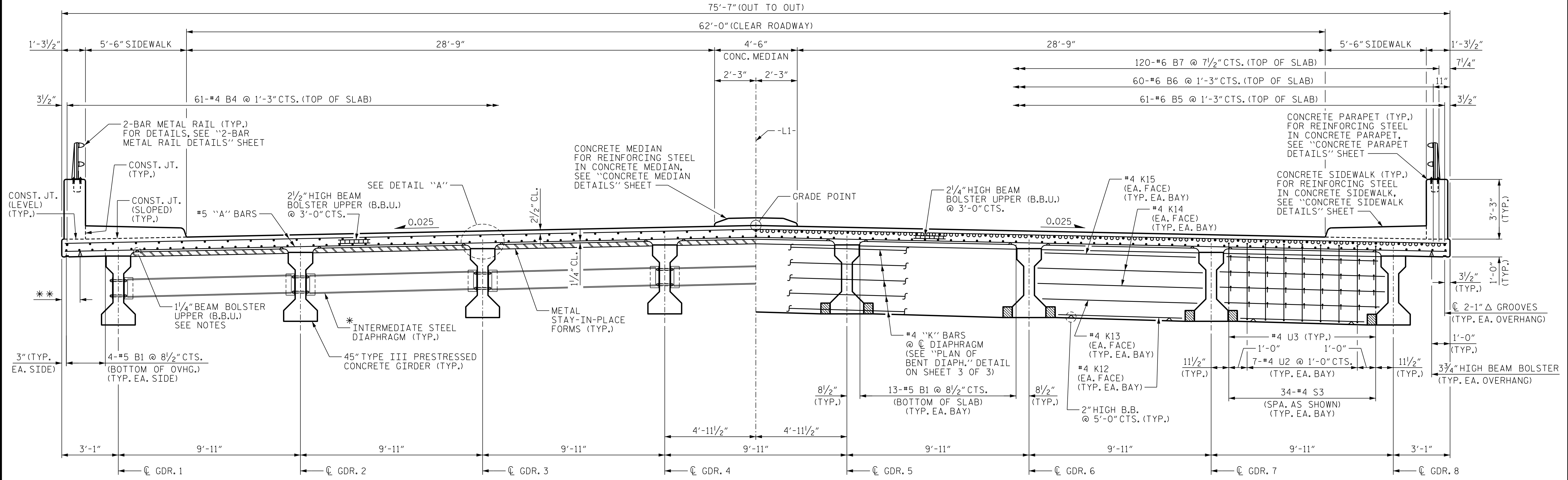
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : B.E. LANNING	DATE : 12/19
CHECKED BY : A.K. ORR	DATE : 01/20
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/20

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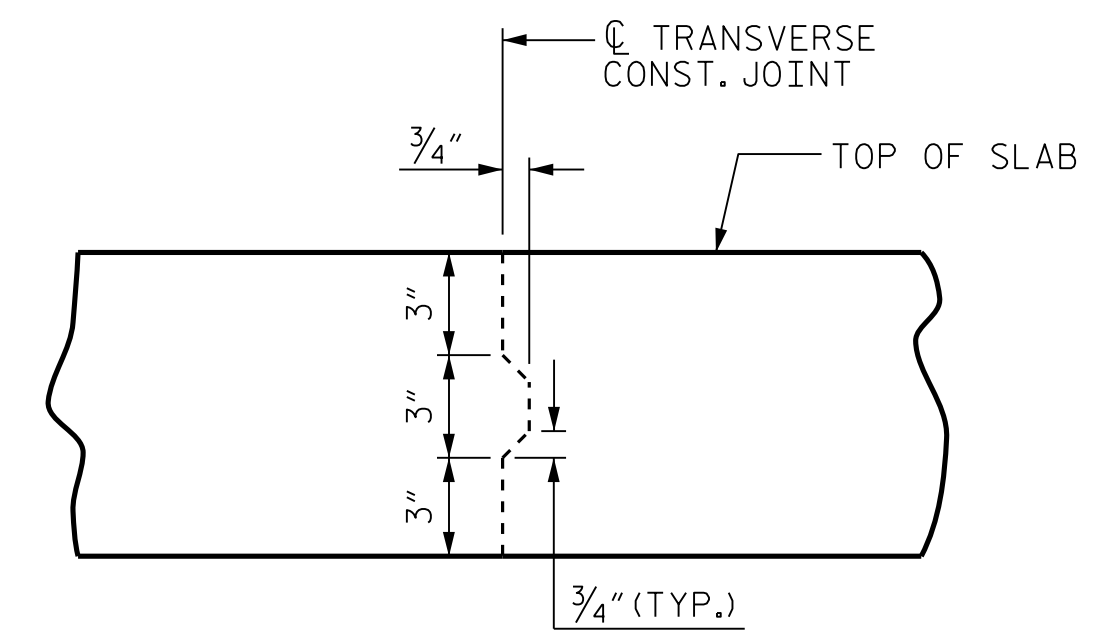


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION AT BENT DIAPHRAGM

**NOTES:**

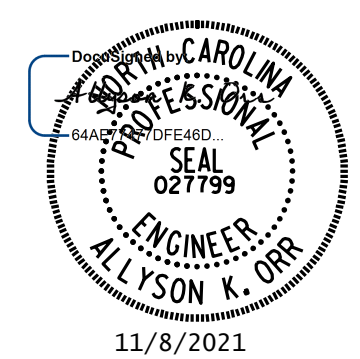
- FOR DETAIL "A", SEE SHEET 1 OF 3.
- FOR ADDITIONAL NOTES, SEE SHEET 1 OF 3.
- \* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 45" TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.
- \*\* ADJUST LOCATION OF MID-SPAN BEAM BOLSTERS AS NEEDED TO MAINTAIN BAR CLEARANCES.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-  
 SHEET 2 OF 3



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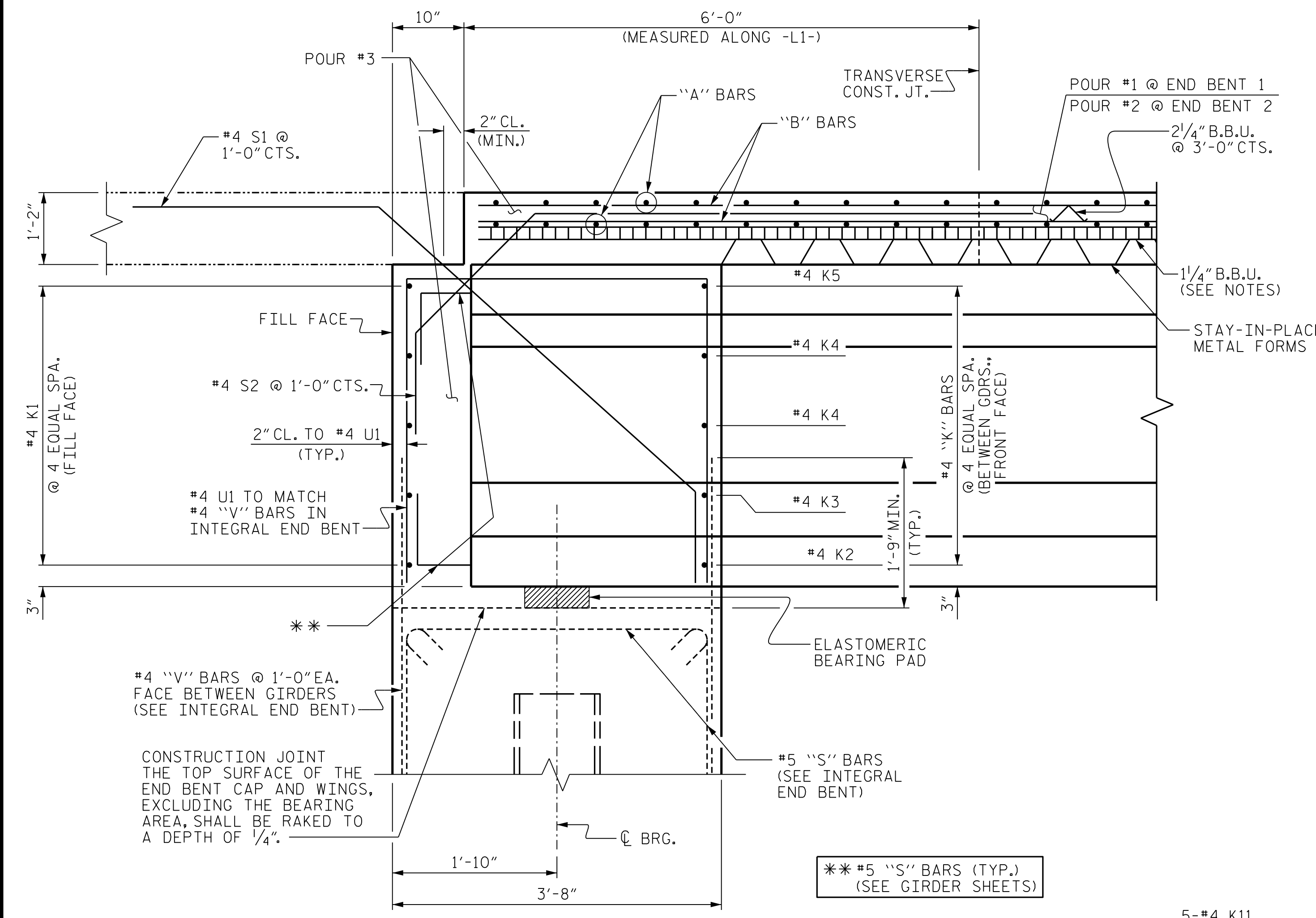
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM AND BENT DIAPHRAGM					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-6
TOTAL SHEETS					39

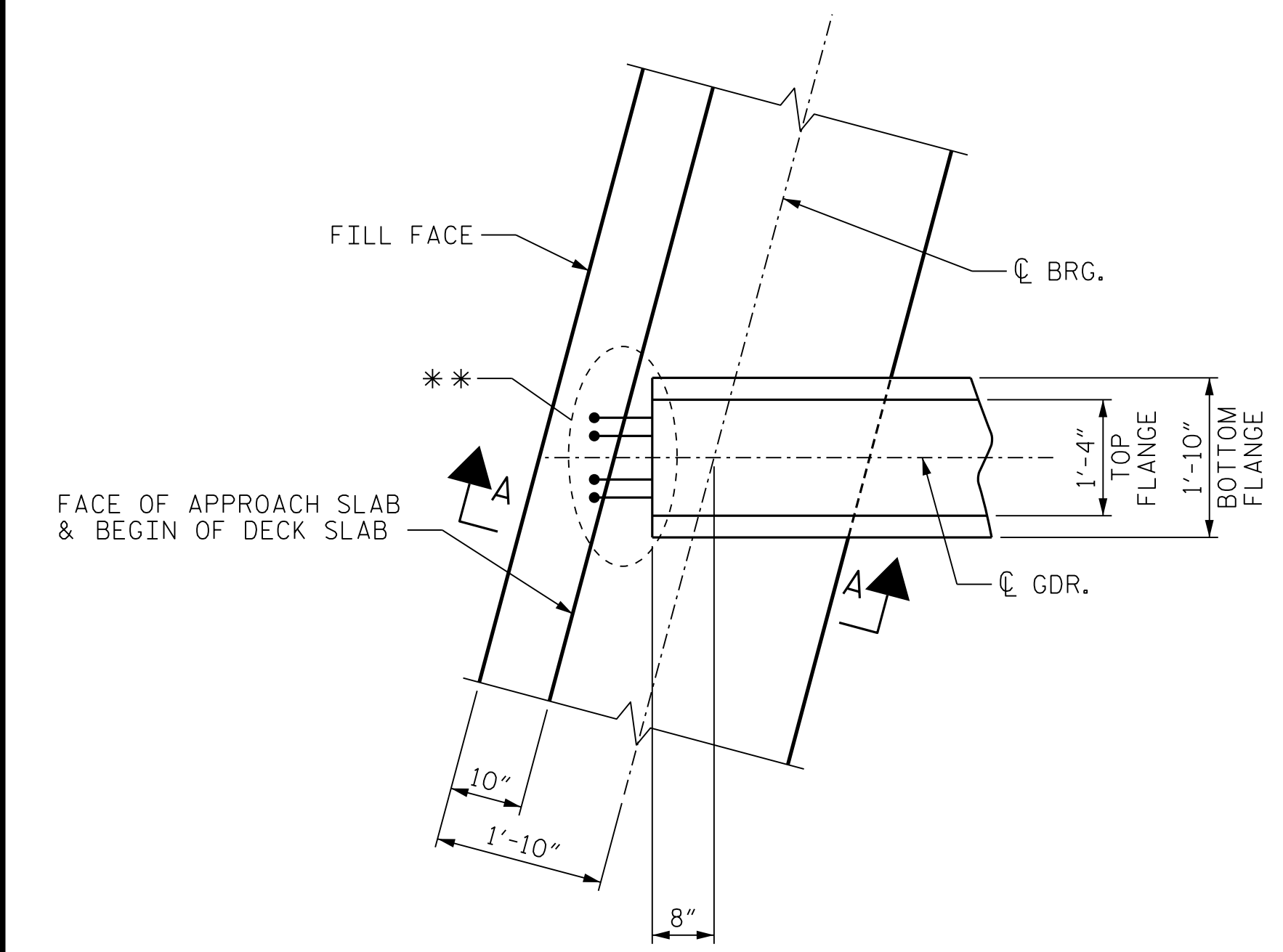
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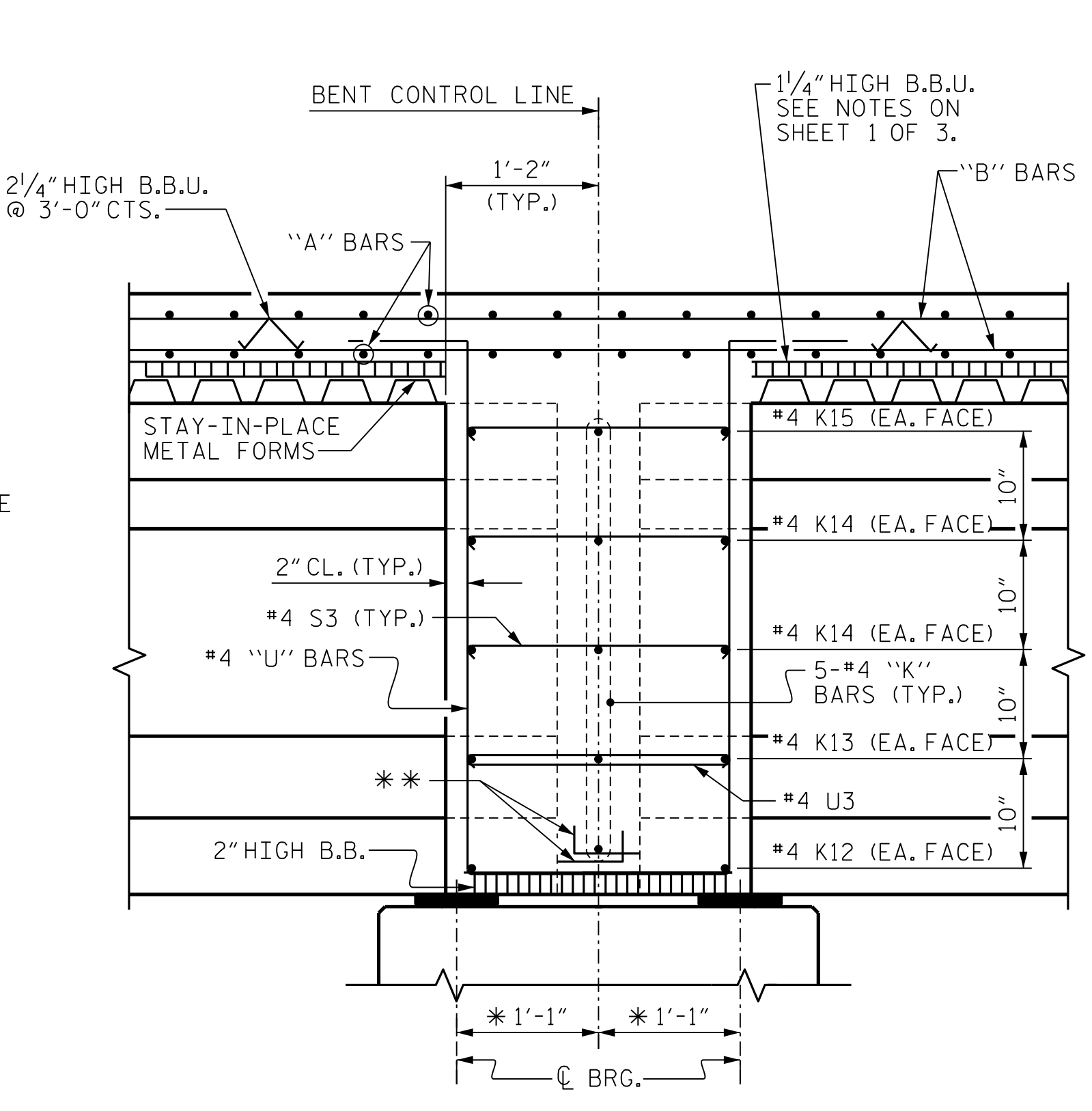
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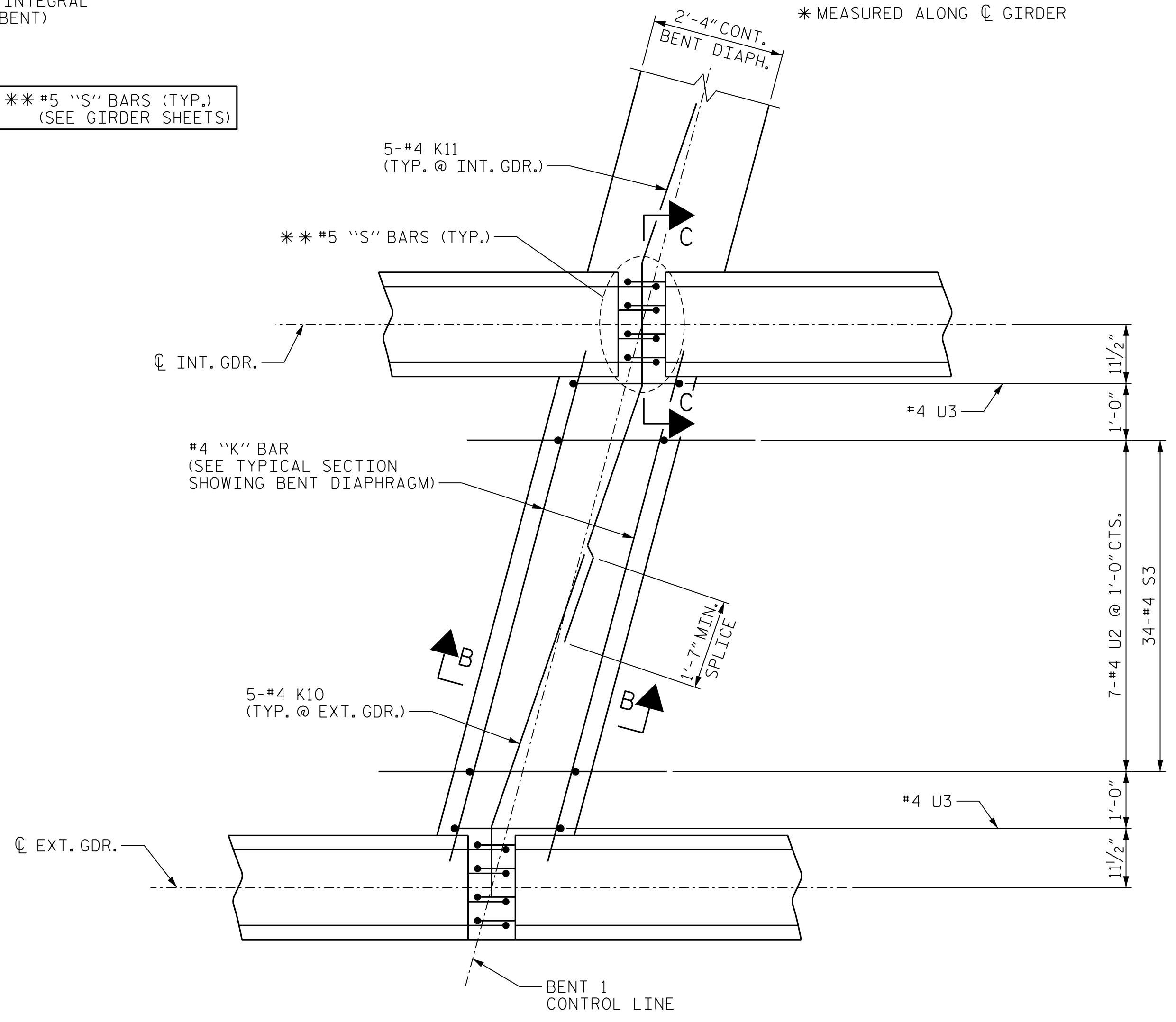
SECTION A-A



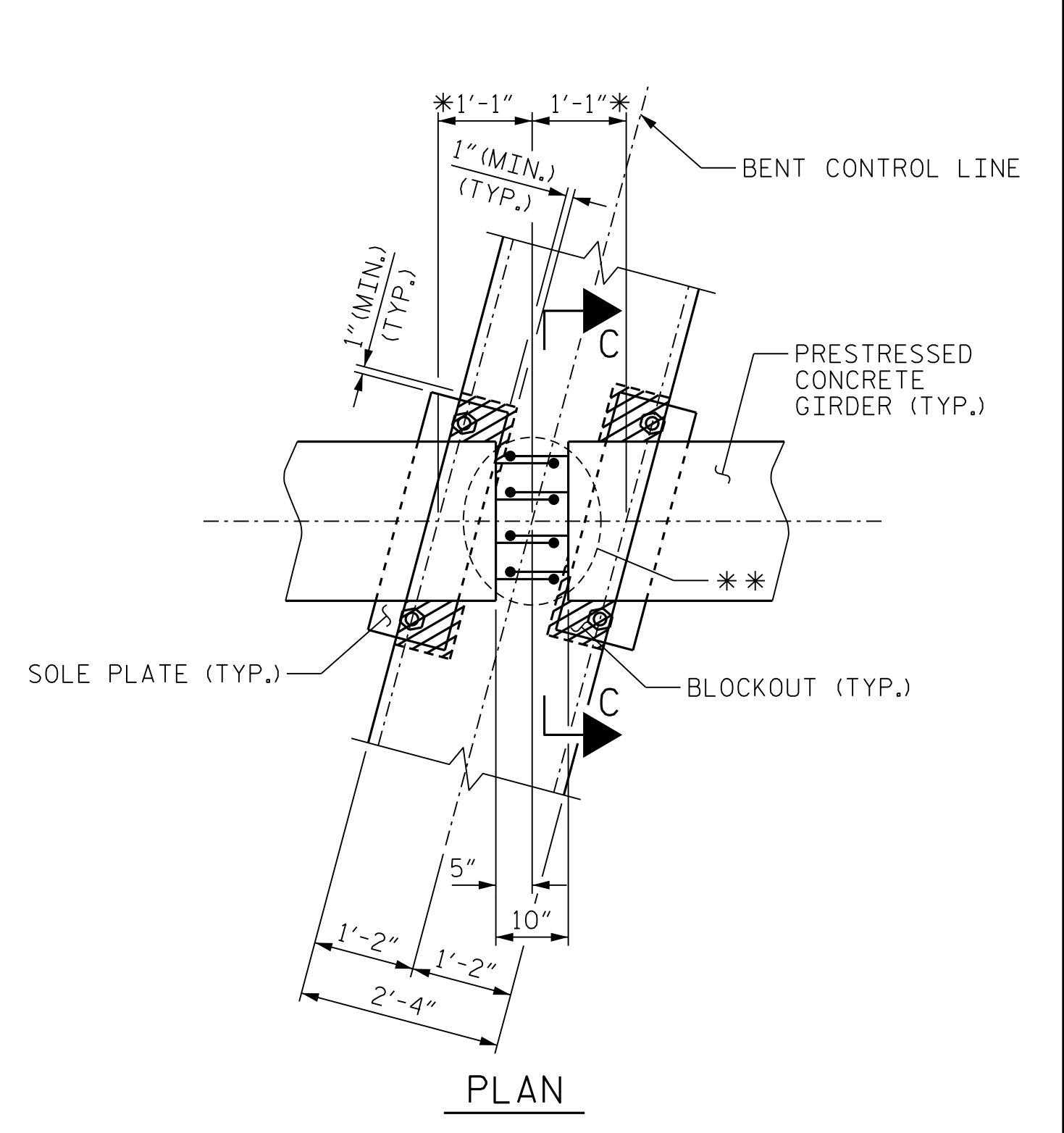
PLAN OF GIRDER AT INTEGRAL END BENT  
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)



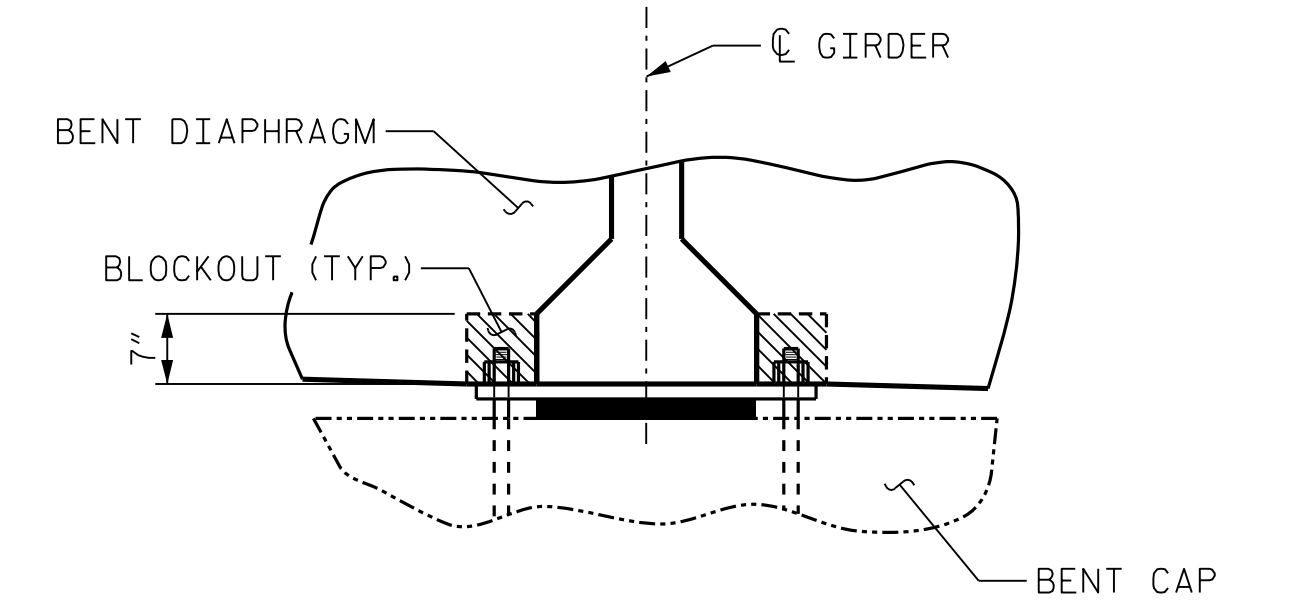
SECTION B-B  
 \* MEASURED ALONG CL GIRDER



PLAN OF BENT DIAPHRAGM

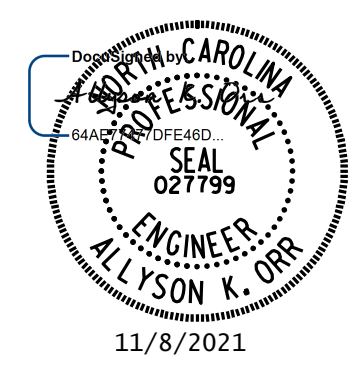


PLAN



SECTION C-C  
 BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-  
 SHEET 3 OF 3



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

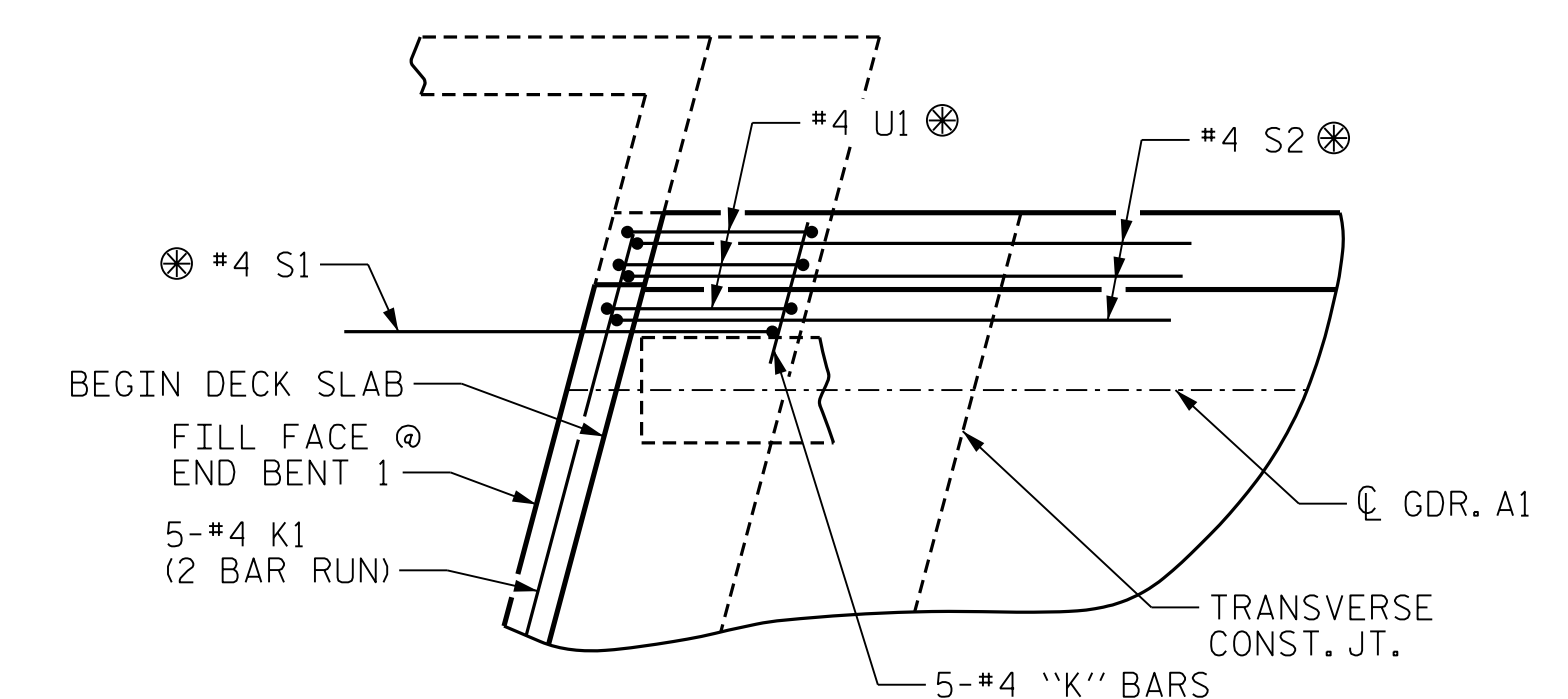
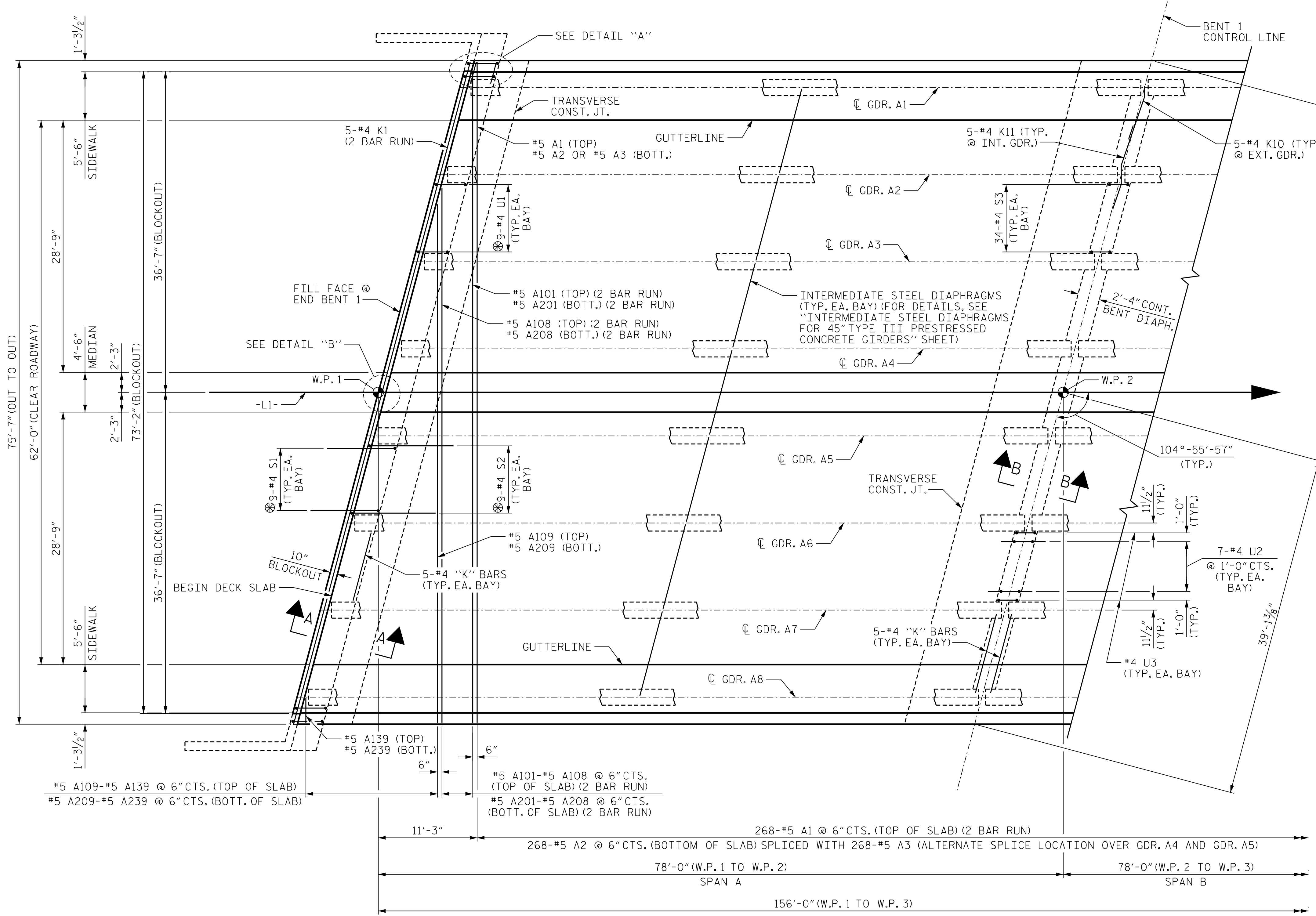
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-7					TOTAL SHEETS 39

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CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20

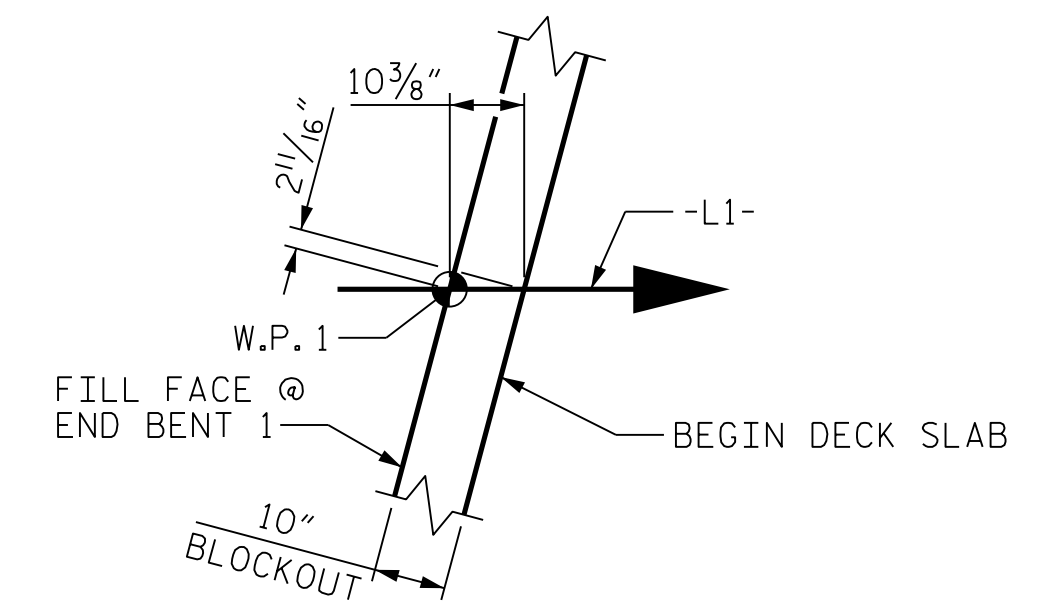


**NOTES**

- FOR REINFORCING STEEL IN CONCRETE PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
- FOR REINFORCING STEEL IN SIDEWALK AND MEDIAN, SEE "SIDEWALK AND CONCRETE MEDIAN DETAILS" SHEET.
- FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.
- #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 3 OF 3.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.



**DETAIL "A"**  
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

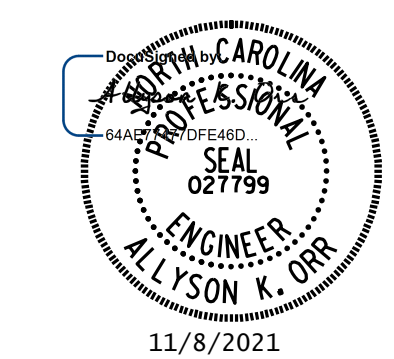


**DETAIL "B"**

**PLAN OF SPAN A**

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 3



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

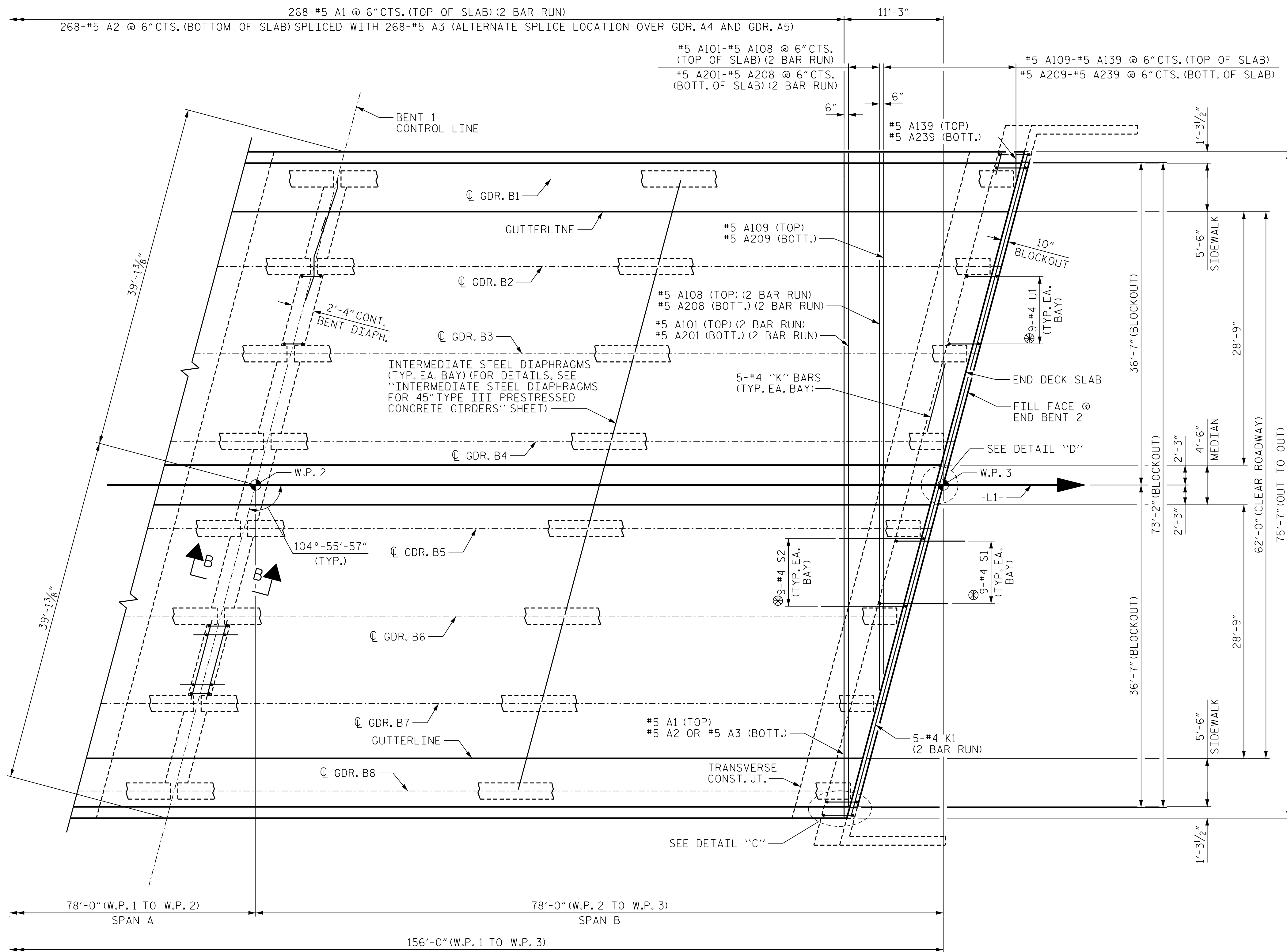
**DOCUMENT NOT CONSIDERED FINAL  
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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

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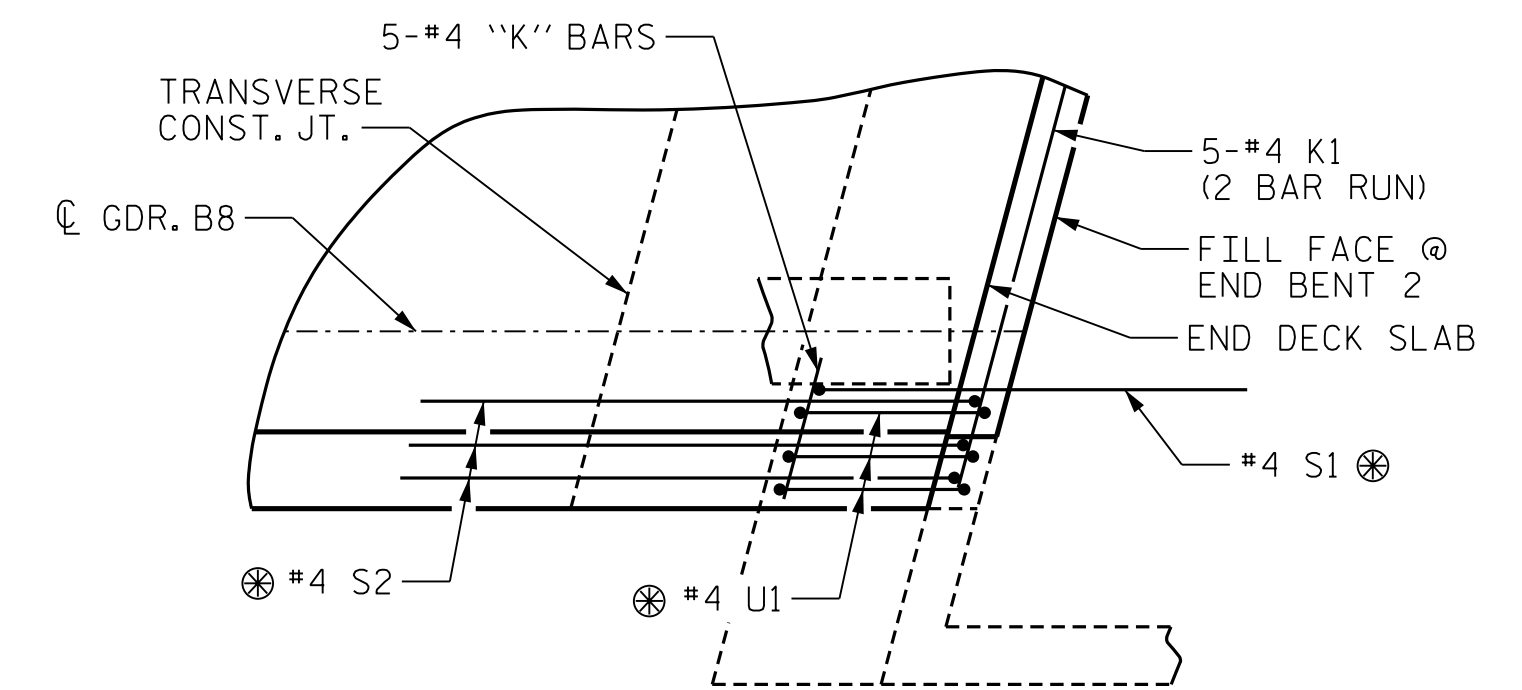
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 CHECKED BY: A.K. ORR DATE: 01/20  
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/20



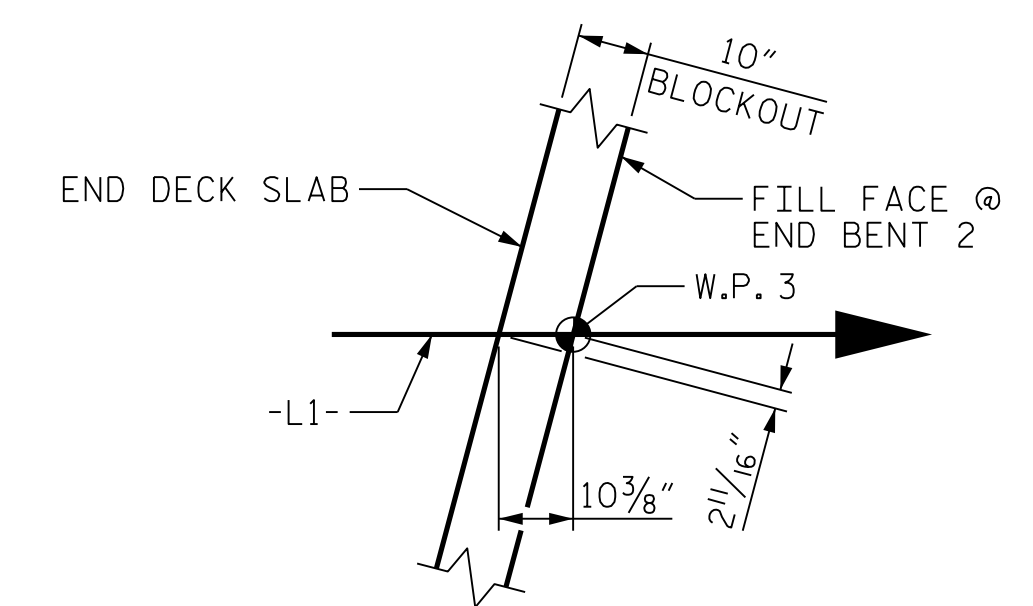
PLAN OF SPAN B

NOTES

- FOR REINFORCING STEEL IN CONCRETE PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.
- FOR REINFORCING STEEL IN SIDEWALK AND MEDIAN, SEE "SIDEWALK AND CONCRETE MEDIAN DETAILS" SHEET.
- FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEETS.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- FOR TOP AND BOTTOM "B" BARS NOT SHOWN, SEE SHEET 3 OF 3.
- ⊗ #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION AND DETAILS" SHEET 3 OF 3.
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "POURING SEQUENCE" ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEETS.



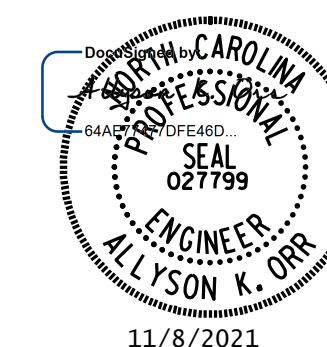
DETAIL "C"  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



DETAIL "D"

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 3



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
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 (919) 851-6606  
 FIRM PE NUMBER: P-0671

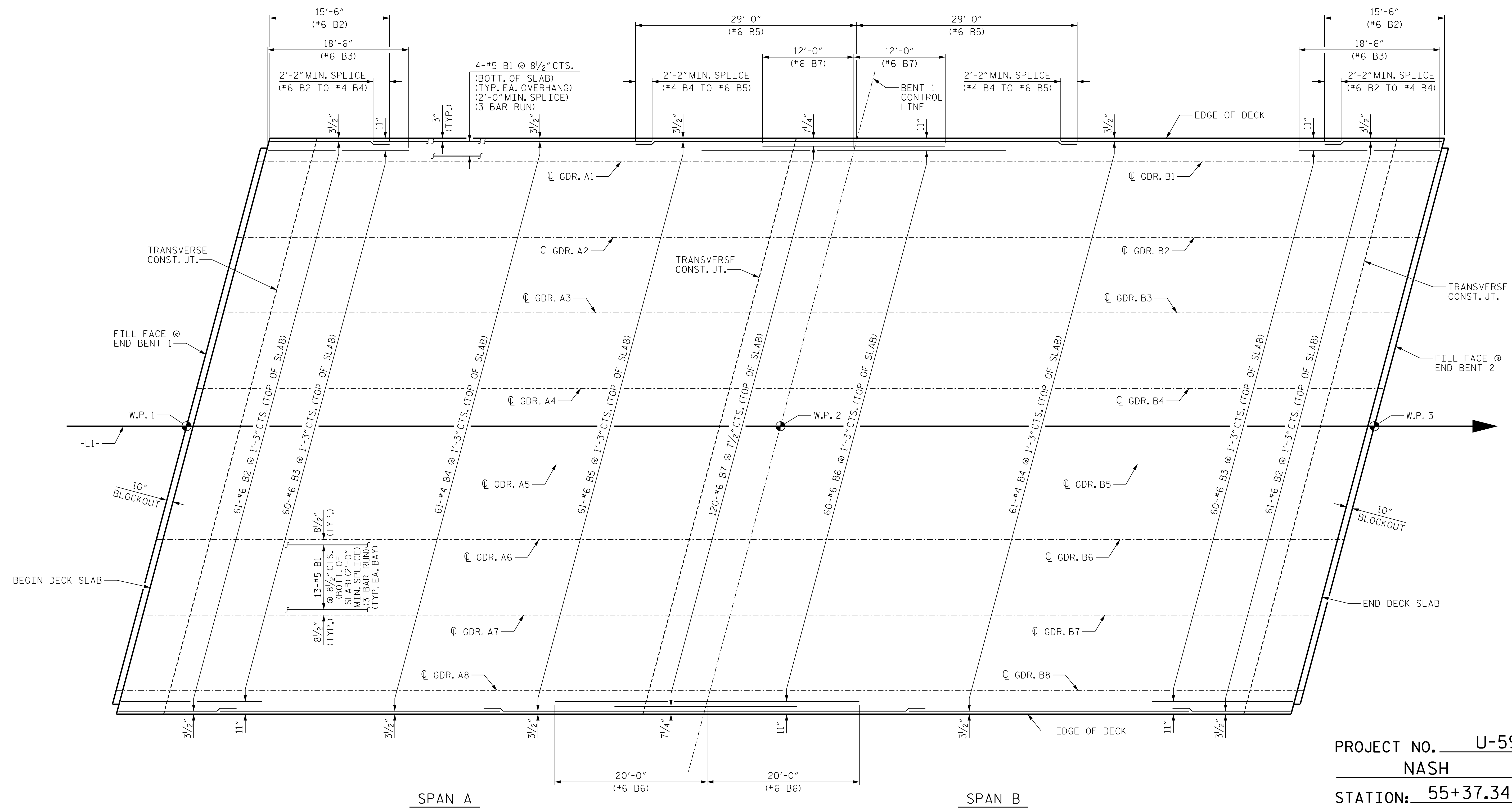
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPAN B

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

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 CHECKED BY : A.K. ORR DATE : 01/20  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

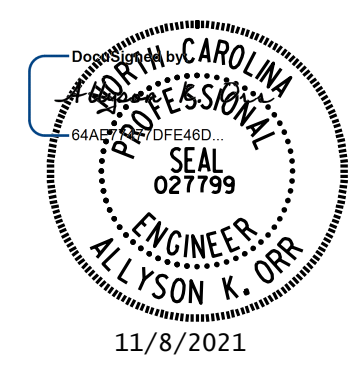
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PLAN - "B" BAR LAYOUT  
 (GUTTERLINE NOT SHOWN FOR CLARITY)

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-  
 SHEET 3 OF 3



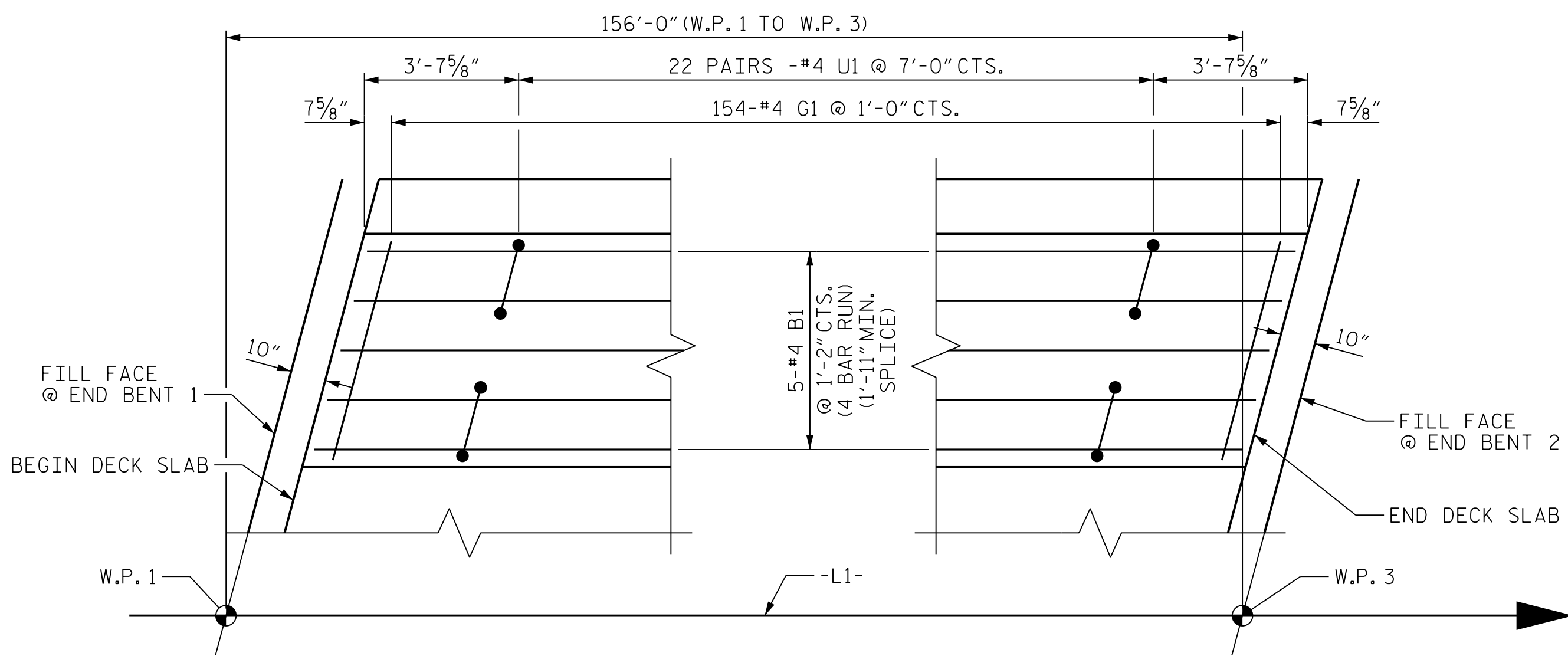
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
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 PLAN OF SPANS  
 "B" BAR LAYOUT

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 CHECKED BY : A.K. ORR DATE : 01/20  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

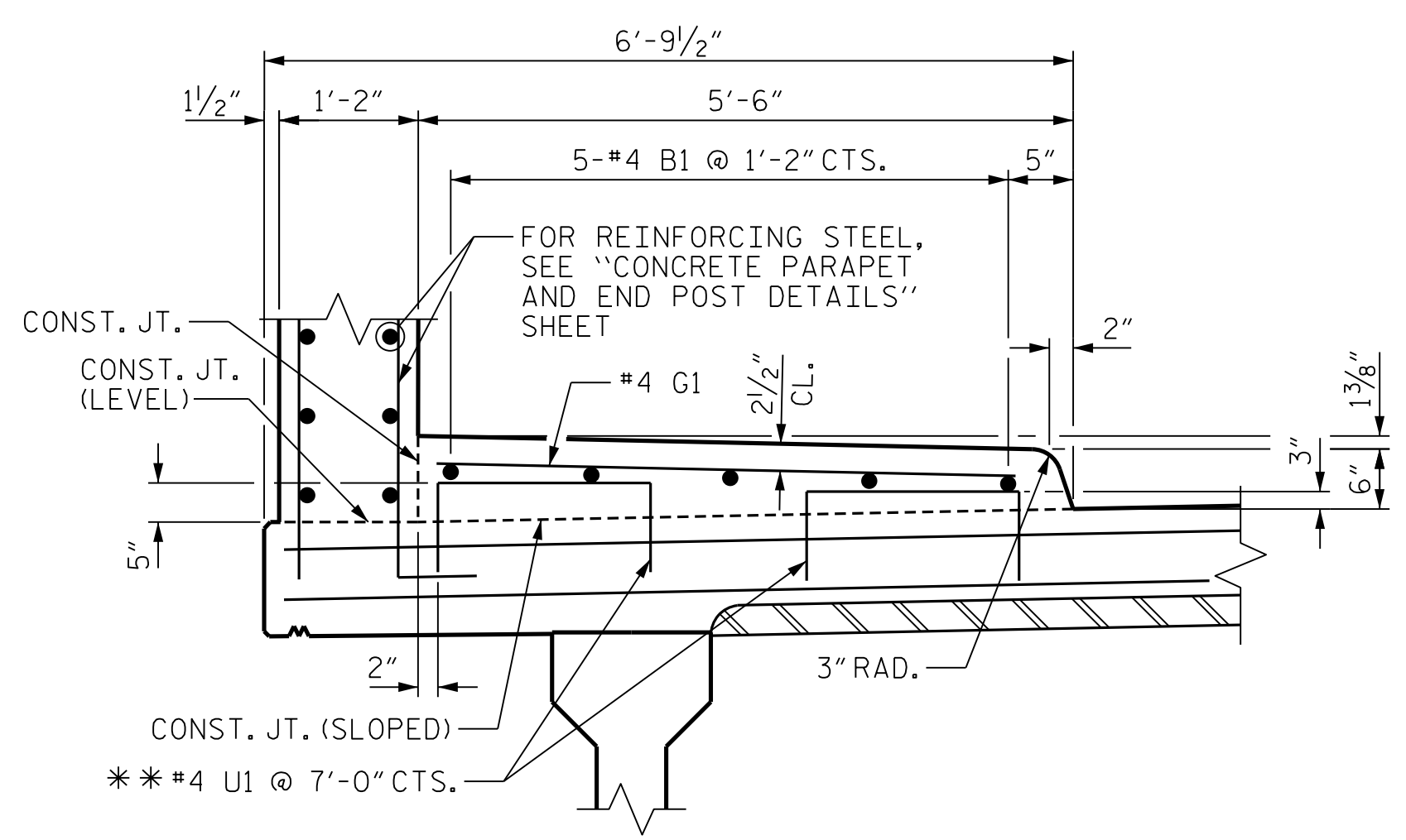
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	
2			4			39	



**PLAN OF SIDEWALK**

(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)



**SECTION THRU SIDEWALK**

\*\* #4 U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

**NOTES**

FOR CONCRETE PARAPET RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET" SHEETS.

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

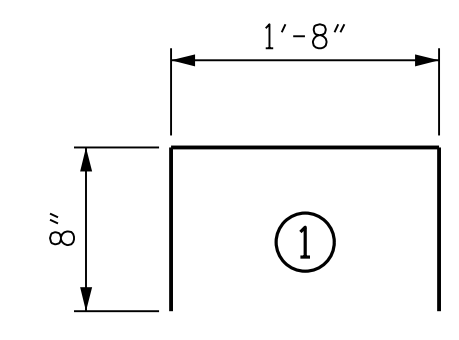
THE SIDEWALK AND CONCRETE MEDIAN IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

SIDEWALK ON THE BRIDGE IS PAID FOR AS PART OF THE REINFORCED CONCRETE DECK SLAB PAY ITEM.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE BID FOR THE REINFORCED CONCRETE DECK SLAB.

ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE MEDIAN SHALL BE EPOXY COATED.

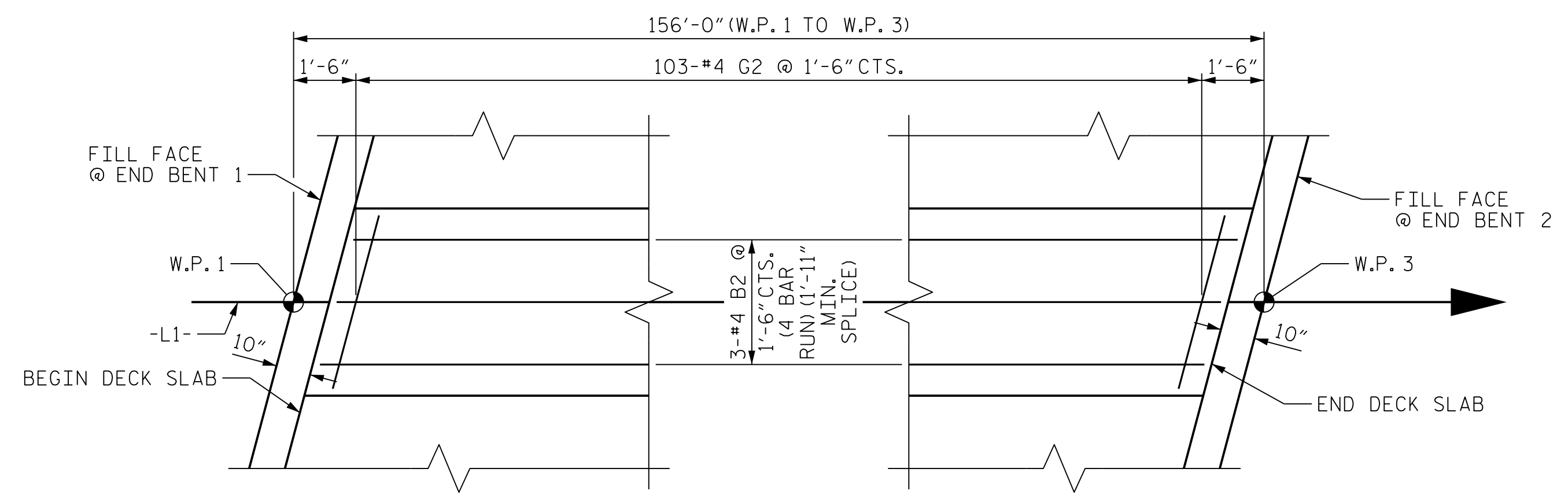
**BAR TYPES**



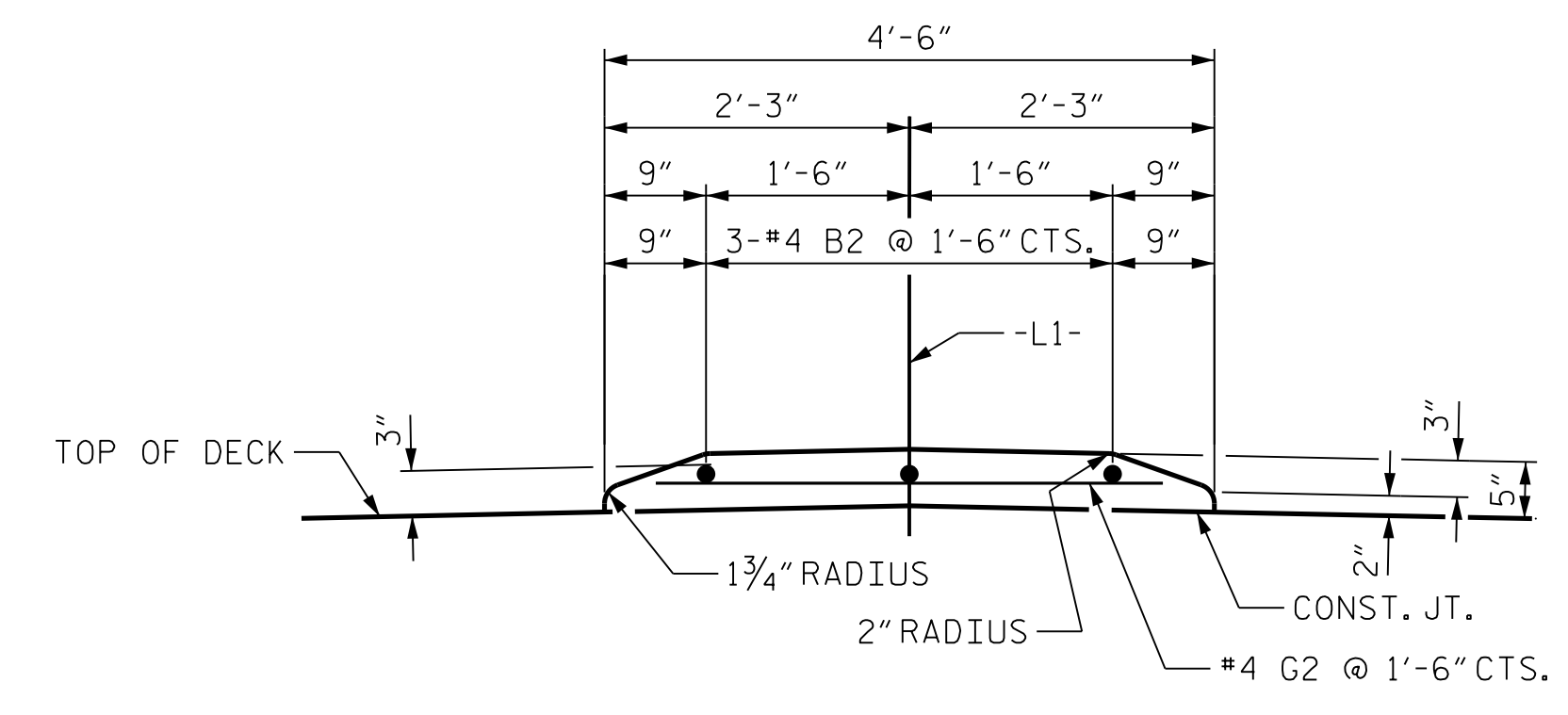
ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	40	#4	STR	39'-11"	1067
*G1	308	#4	STR	5'-1"	1046
*U1	88	#4	1	3'-0"	176
* EPOXY COATED REINFORCING STEEL					2289 LBS.
CLASS AA CONCRETE					39.3 C.Y.
CONCRETE MEDIAN					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	12	#4	STR	39'-11"	320
*G2	103	#4	STR	3'-3"	224
* EPOXY COATED REINFORCING STEEL					544 LBS.
CLASS AA CONCRETE					9.7 C.Y.

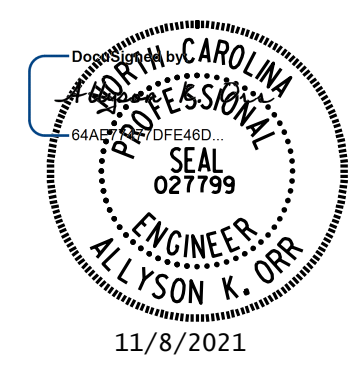


**PLAN OF CONCRETE MEDIAN**



**SECTION THRU CONCRETE MEDIAN**

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 SIDEWALK AND  
 CONCRETE MEDIAN  
 DETAILS

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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

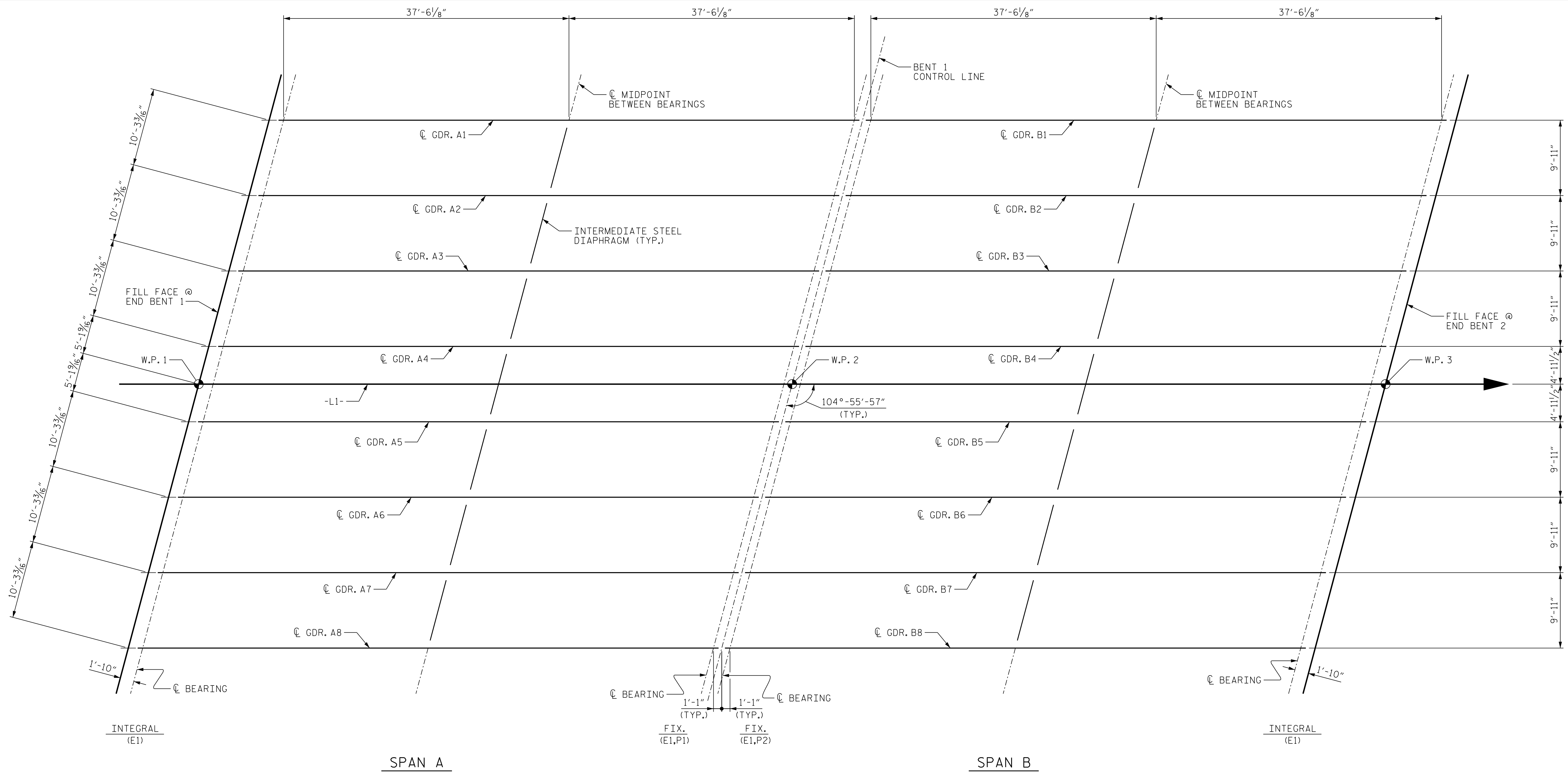
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NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

SHEET NO.  
**S-11**  
 TOTAL SHEETS  
**39**

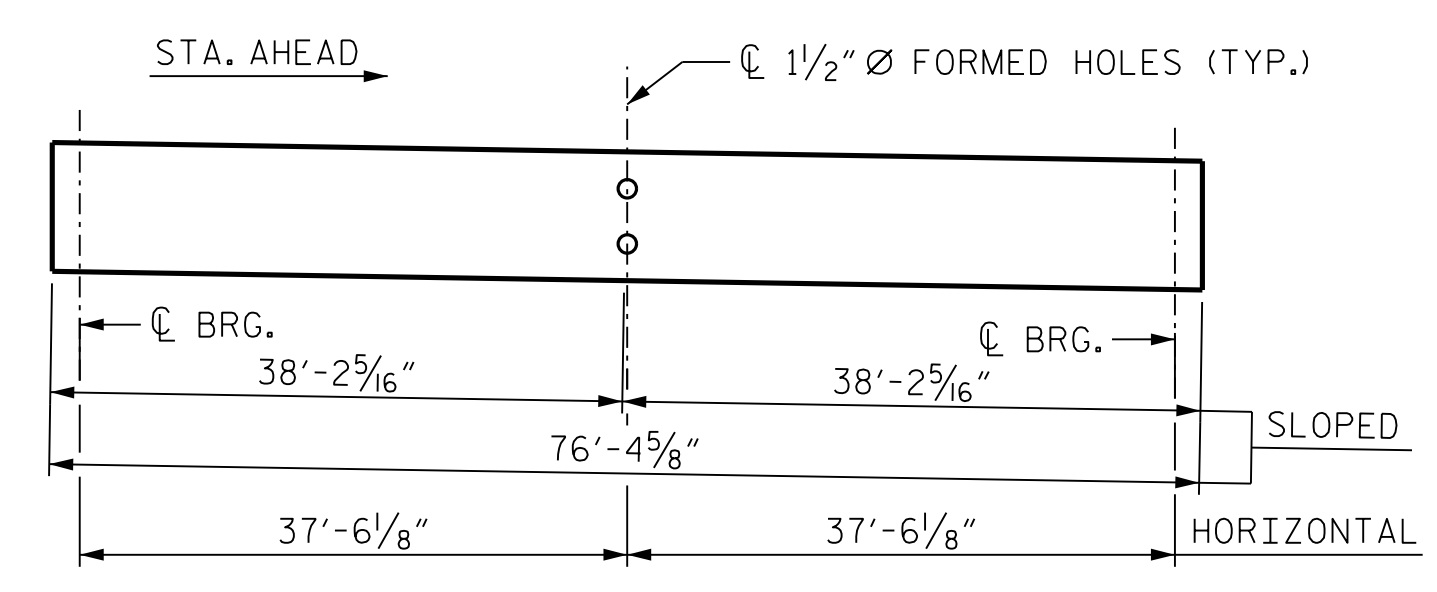
DRAWN BY : B.E. LANNING DATE : 12/19  
 CHECKED BY : A.K. ORR DATE : 12/19  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

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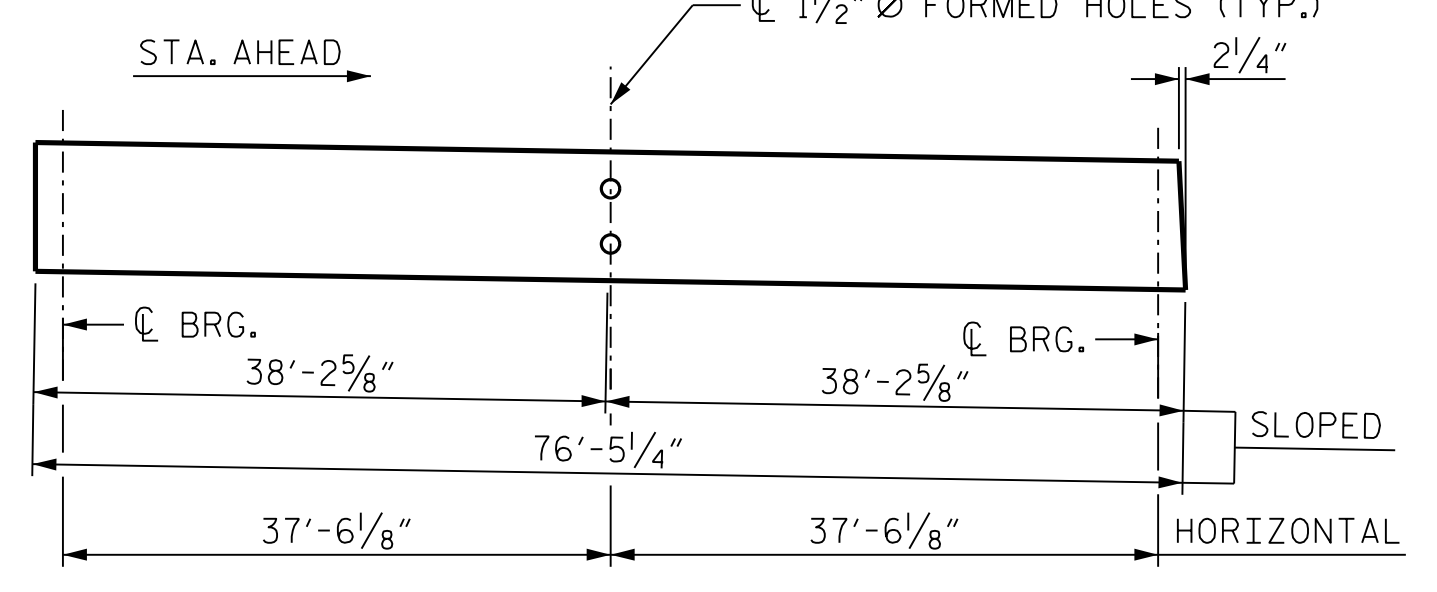
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**FRAMING PLAN**  
 ALL DIMENSIONS HORIZONTAL U.O.N.

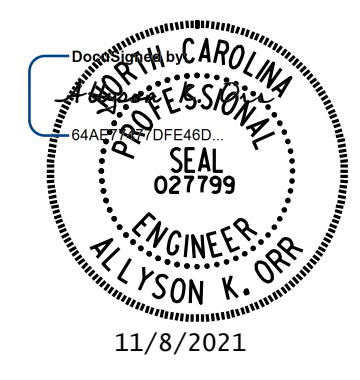


**GIRDER ELEVATION - SPAN A**  
 MEASUREMENTS GIVEN ALONG BOTTOM OF GIRDER



**GIRDER ELEVATION - SPAN B**  
 MEASUREMENTS GIVEN ALONG BOTTOM OF GIRDER

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

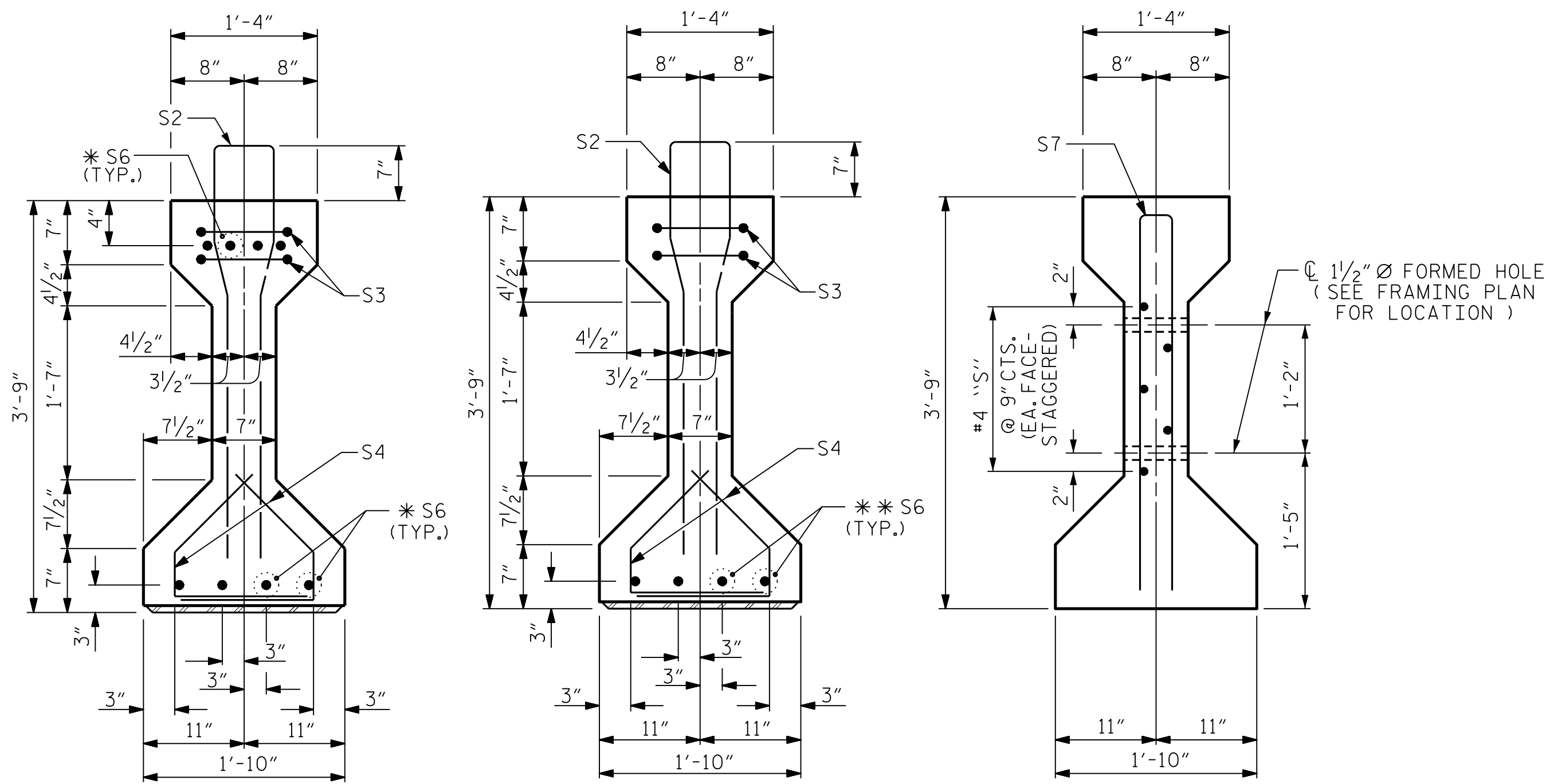


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE  
 FRAMING PLAN**

DRAWN BY : B.E. LANNING DATE : 01/20  
 CHECKED BY : A.K. ORR DATE : 01/20  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**  
 MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

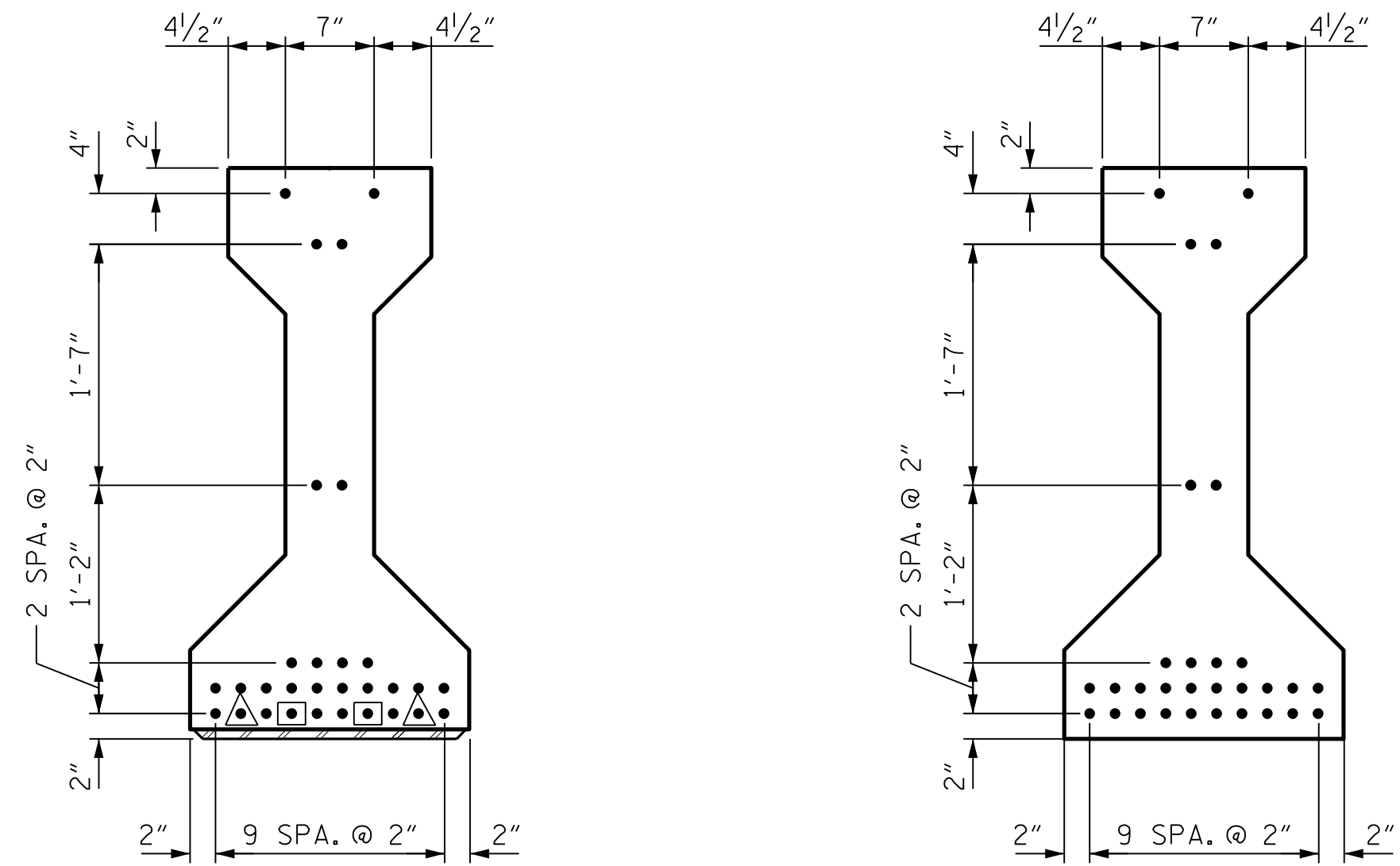
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-12
2			4			
						TOTAL SHEETS
						39



SECTION A-A  
\* FOR S6 BARS, SEE  
DETAIL "A" SHEET 3 OF 5

SECTION B-B  
\*\* FOR S6 BARS, SEE  
DETAIL "B" SHEET 3 OF 5

SECTION C-C  
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

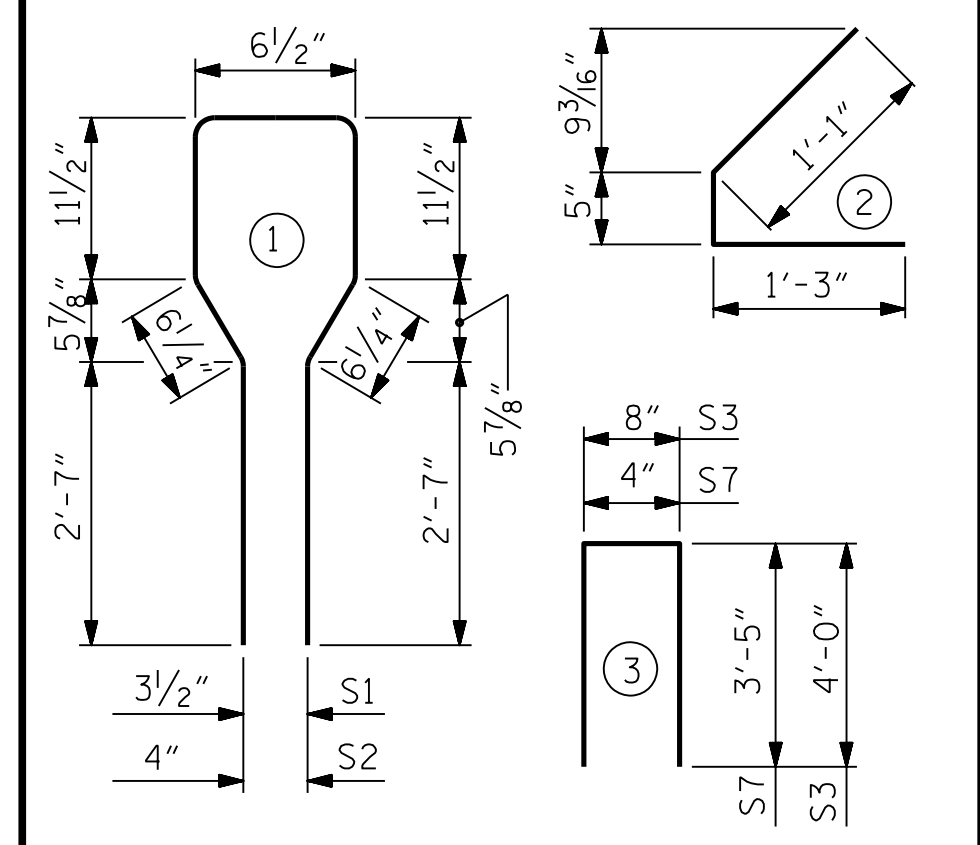
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	105	#4	1	8'-8"	608
S2	18	#6	1	8'-8"	234
S3	4	#4	3	8'-8"	23
S4	180	#4	2	2'-9"	331
S5	1	#3	STR	1'-0"	1
S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

NOTE: S6 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 LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GDR. A1 - GDR. A8	1281	11.0	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	76.38'	611.04'

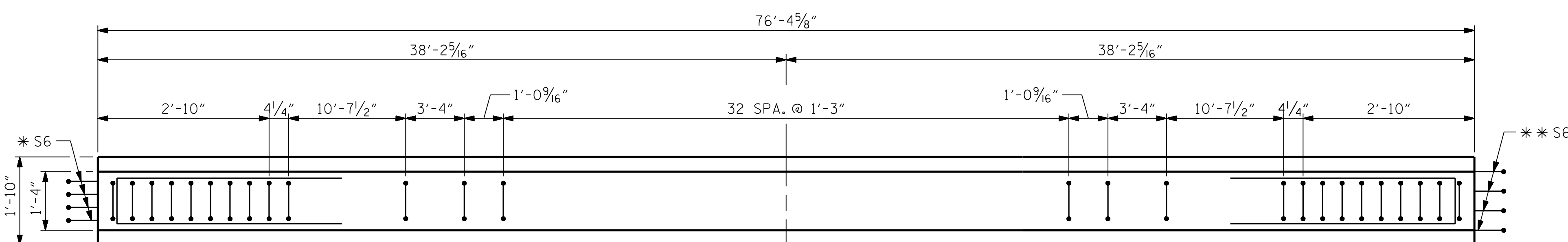
PROJECT NO. U-5996  
NASH COUNTY  
STATION: 55+37.34 -L1-

SHEET 1 OF 5

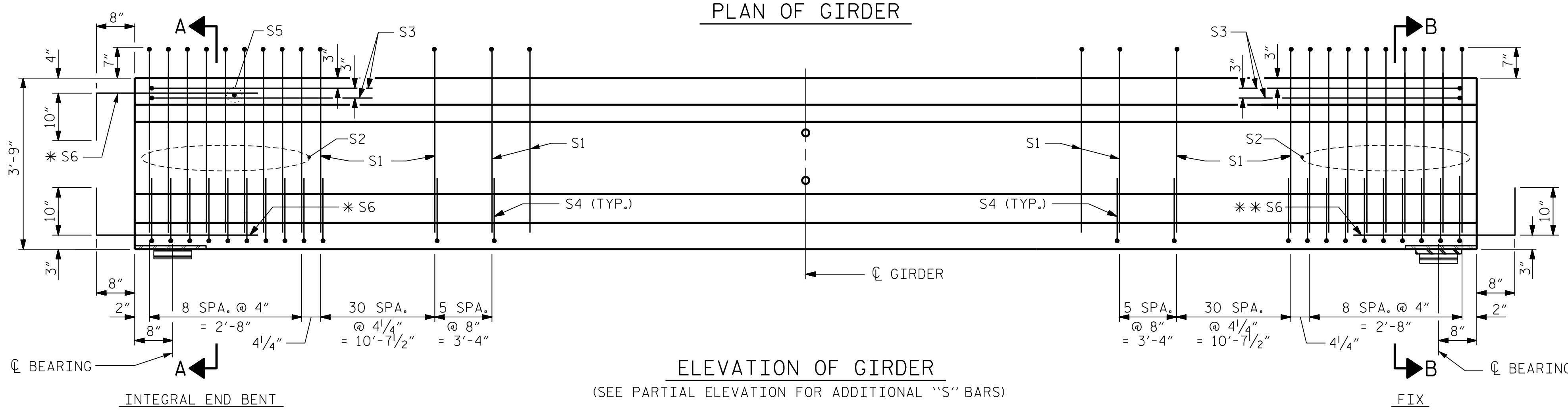
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE III  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN A

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

STD. NO. PCC5 (Sht. 2)

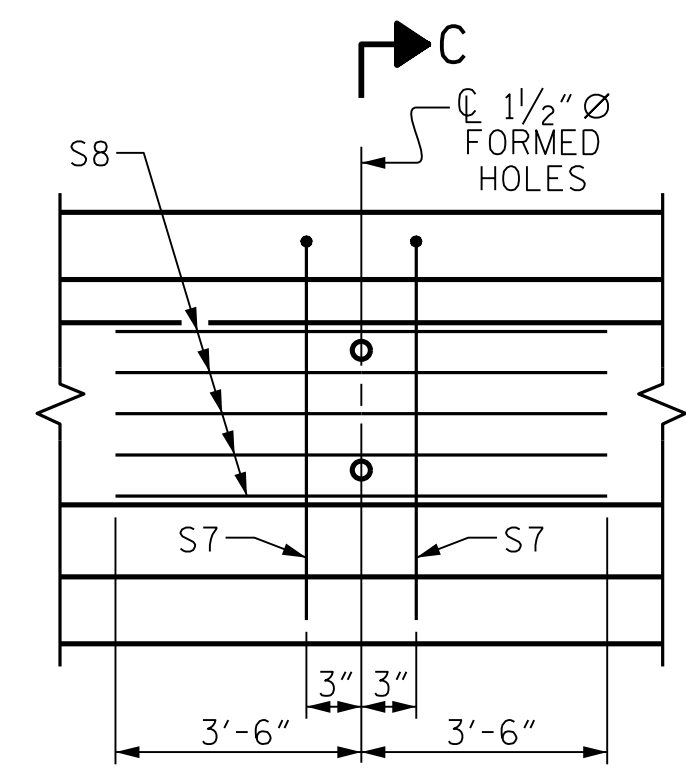


PLAN OF GIRDER



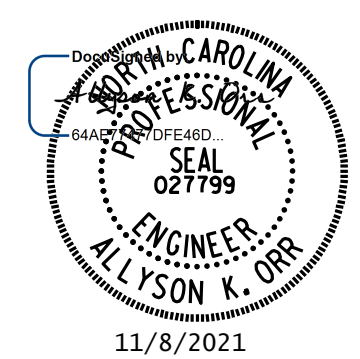
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GDR. A1 - GDR. A8



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER: P-0671

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ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
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



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.

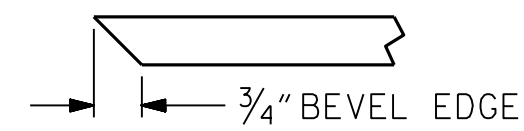
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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.

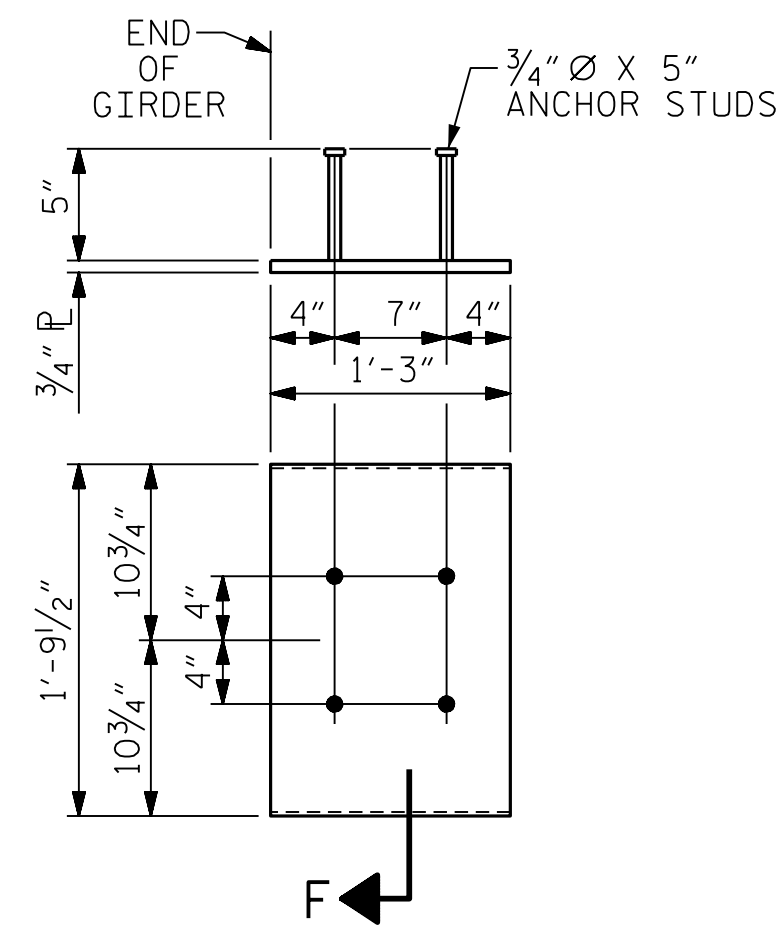
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

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

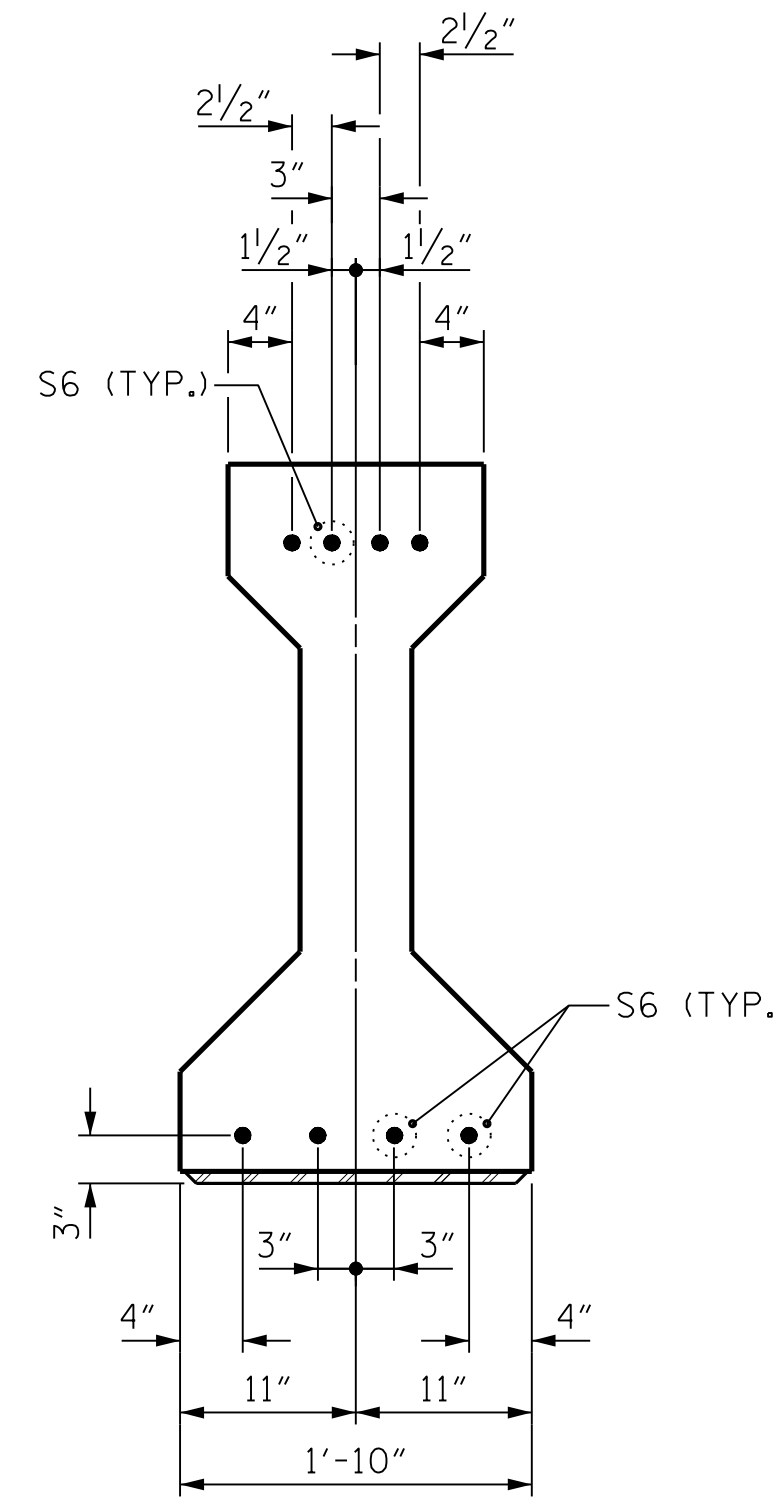
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".



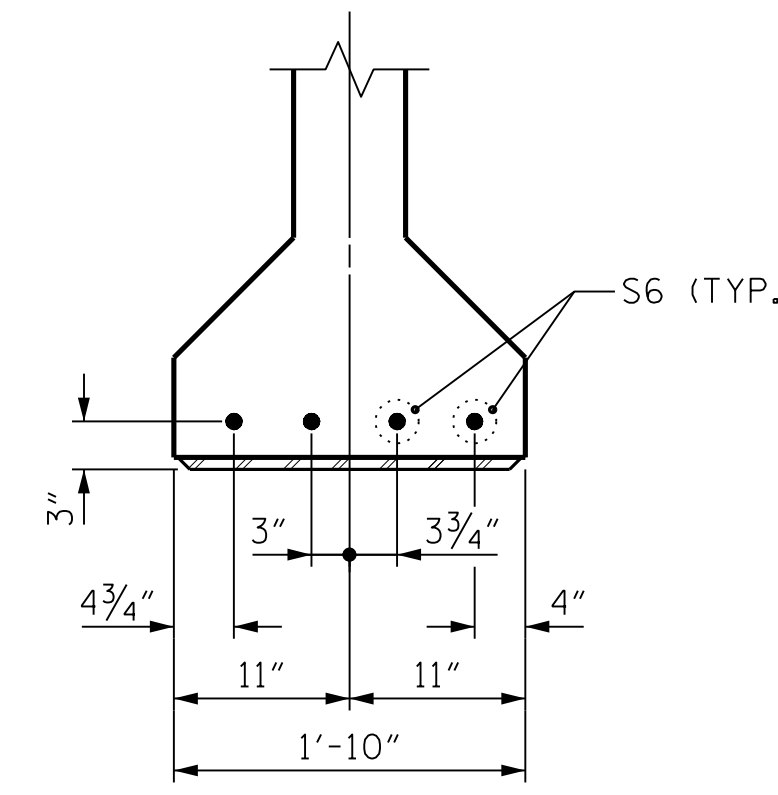
SECTION "F"  
(SEE NOTES)



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



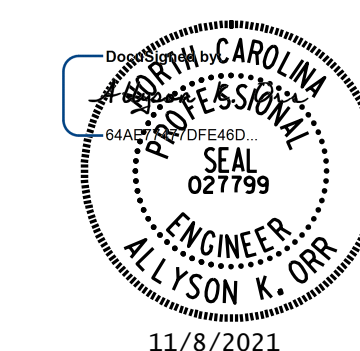
DETAIL "A"



DETAIL "B"

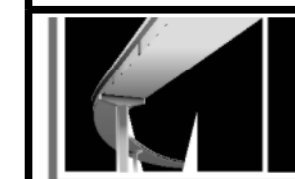
PROJECT NO. U-5996  
NASH COUNTY  
STATION: 55+37.34 -L1-

SHEET 3 OF 5



11/8/2021

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UNLESS ALL SIGNATURES COMPLETED**



MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER : P-0671

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

ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
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2			4			39

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.60" Ø LOW RELAXATION STRANDS	GIRDERS 1 & 8																																									
	SPAN A																	SPAN B																								
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.017	0.033	0.049	0.065	0.077	0.089	0.097	0.105	0.107	0.109	0.106	0.103	0.095	0.086	0.074	0.061	0.046	0.030	0.015	0	0	0.015	0.030	0.046	0.061	0.074	0.086	0.095	0.103	0.106	0.109	0.107	0.105	0.097	0.089	0.077	0.065	0.049	0.033	0.017	0
FINAL CAMBER ↑	0	1/8"	1/4"	5/16"	7/16"	1/2"	9/16"	5/8"	5/8"	11/16"	11/16"	11/16"	11/16"	5/8"	9/16"	9/16"	7/16"	3/8"	1/4"	1/8"	0	0	1/8"	1/4"	3/8"	7/16"	9/16"	9/16"	5/8"	11/16"	11/16"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	5/16"	1/4"	1/8"	0

0.60" Ø LOW RELAXATION STRANDS	GIRDERS 2 & 7																																									
	SPAN A																	SPAN B																								
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.019	0.037	0.055	0.073	0.086	0.100	0.109	0.118	0.120	0.123	0.120	0.116	0.107	0.098	0.084	0.070	0.052	0.035	0.017	0	0	0.017	0.035	0.052	0.070	0.084	0.098	0.107	0.116	0.120	0.123	0.120	0.118	0.109	0.100	0.086	0.073	0.055	0.037	0.019	0
FINAL CAMBER ↑	0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	9/16"	1/2"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	3/16"	1/8"	0	0	1/8"	3/16"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	1/2"	9/16"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0

0.60" Ø LOW RELAXATION STRANDS	GIRDERS 3 & 6																																									
	SPAN A																	SPAN B																								
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.018	0.037	0.054	0.072	0.086	0.099	0.108	0.117	0.120	0.122	0.119	0.116	0.107	0.097	0.083	0.070	0.052	0.035	0.017	0	0	0.017	0.035	0.052	0.070	0.083	0.097	0.107	0.116	0.119	0.122	0.120	0.117	0.108	0.099	0.086	0.072	0.054	0.037	0.018	0
FINAL CAMBER ↑	0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	3/16"	1/8"	0	0	1/8"	3/16"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0

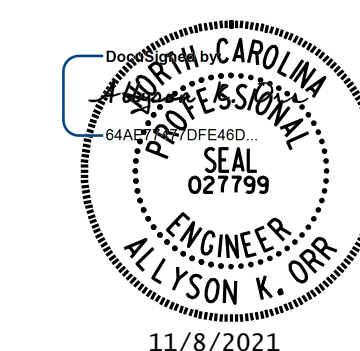
0.60" Ø LOW RELAXATION STRANDS	GIRDERS 4 & 5																																									
	SPAN A																	SPAN B																								
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0	0	0.027	0.052	0.077	0.099	0.119	0.136	0.149	0.159	0.165	0.167	0.165	0.159	0.149	0.136	0.119	0.099	0.077	0.052	0.027	0
** DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.018	0.036	0.053	0.070	0.084	0.097	0.106	0.114	0.117	0.120	0.117	0.113	0.105	0.096	0.082	0.069	0.052	0.034	0.017	0	0	0.017	0.034	0.052	0.069	0.082	0.096	0.105	0.113	0.117	0.120	0.117	0.114	0.106	0.097	0.084	0.070	0.053	0.036	0.018	0
FINAL CAMBER ↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	7/16"	1/2"	9/16"	9/16"	9/16"	9/16"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0	0	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	9/16"	9/16"	9/16"	9/16"	1/2"	7/16"	7/16"	3/8"	5/16"	3/16"	1/8"	0		

\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 4 OF 5



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

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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

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

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ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
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.

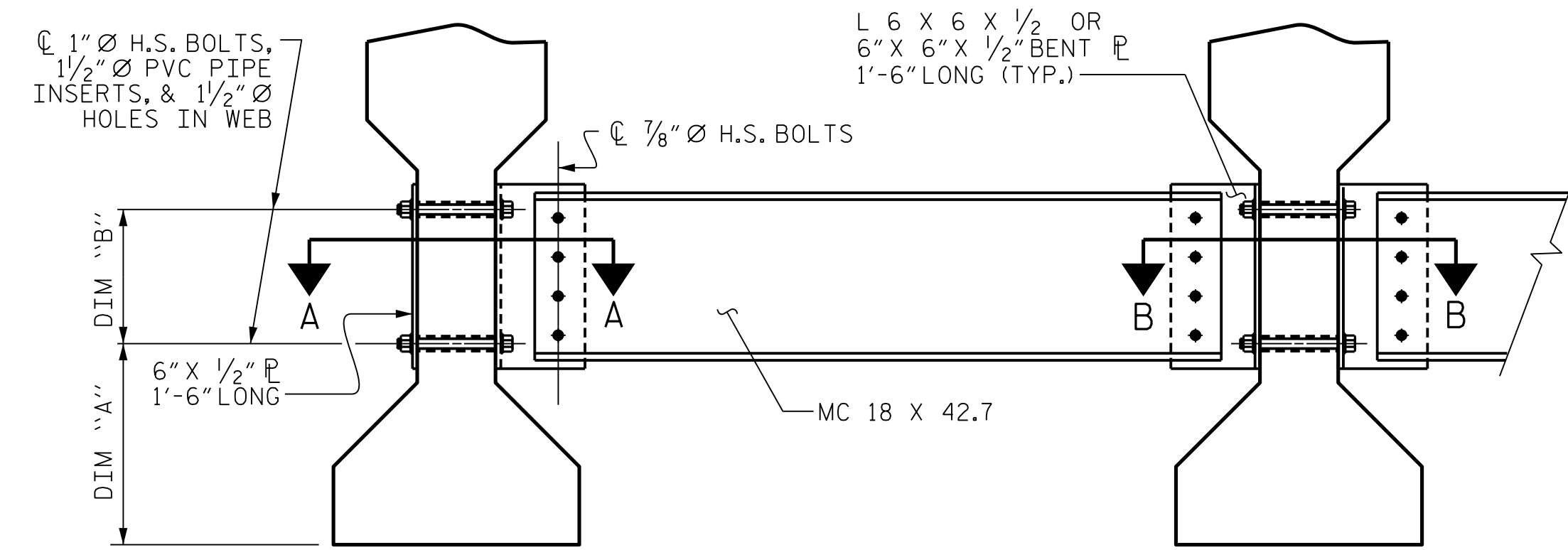
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

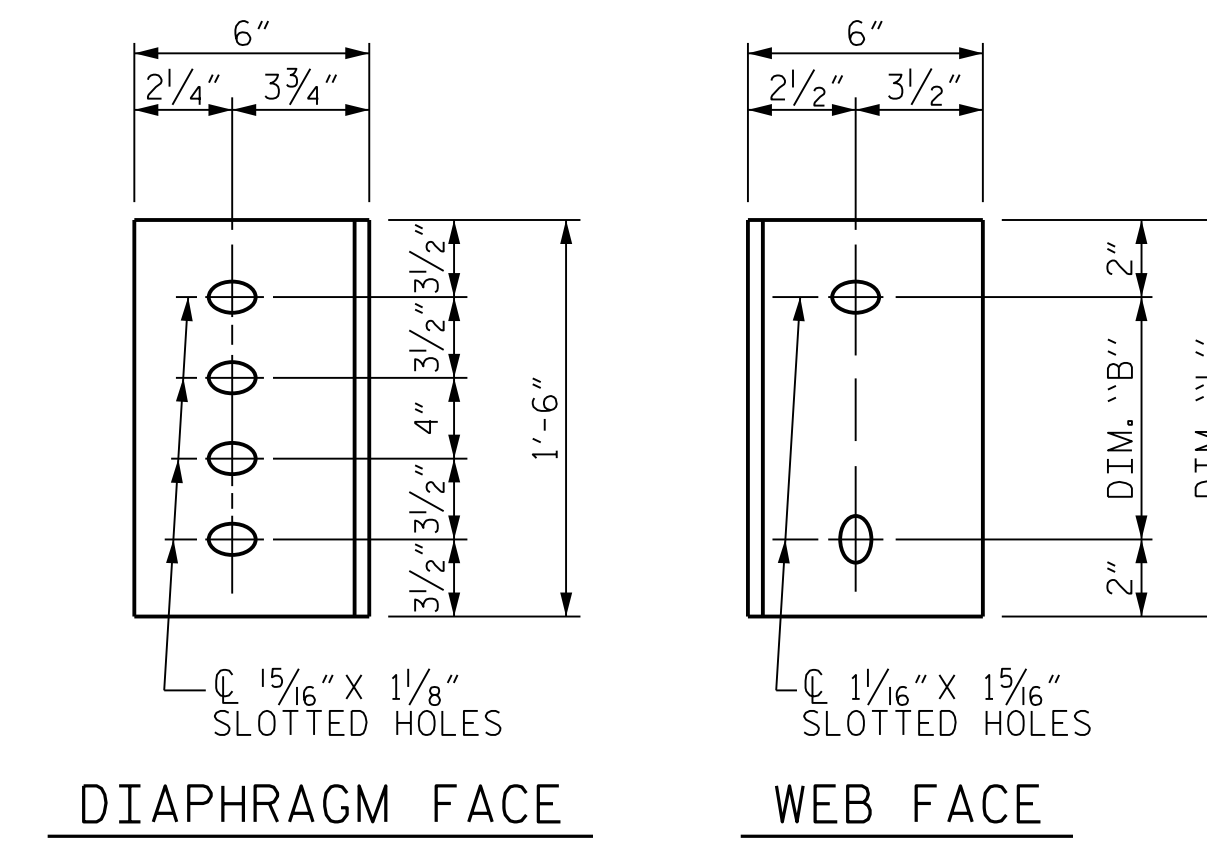
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



CONNECTOR PLATE DETAILS

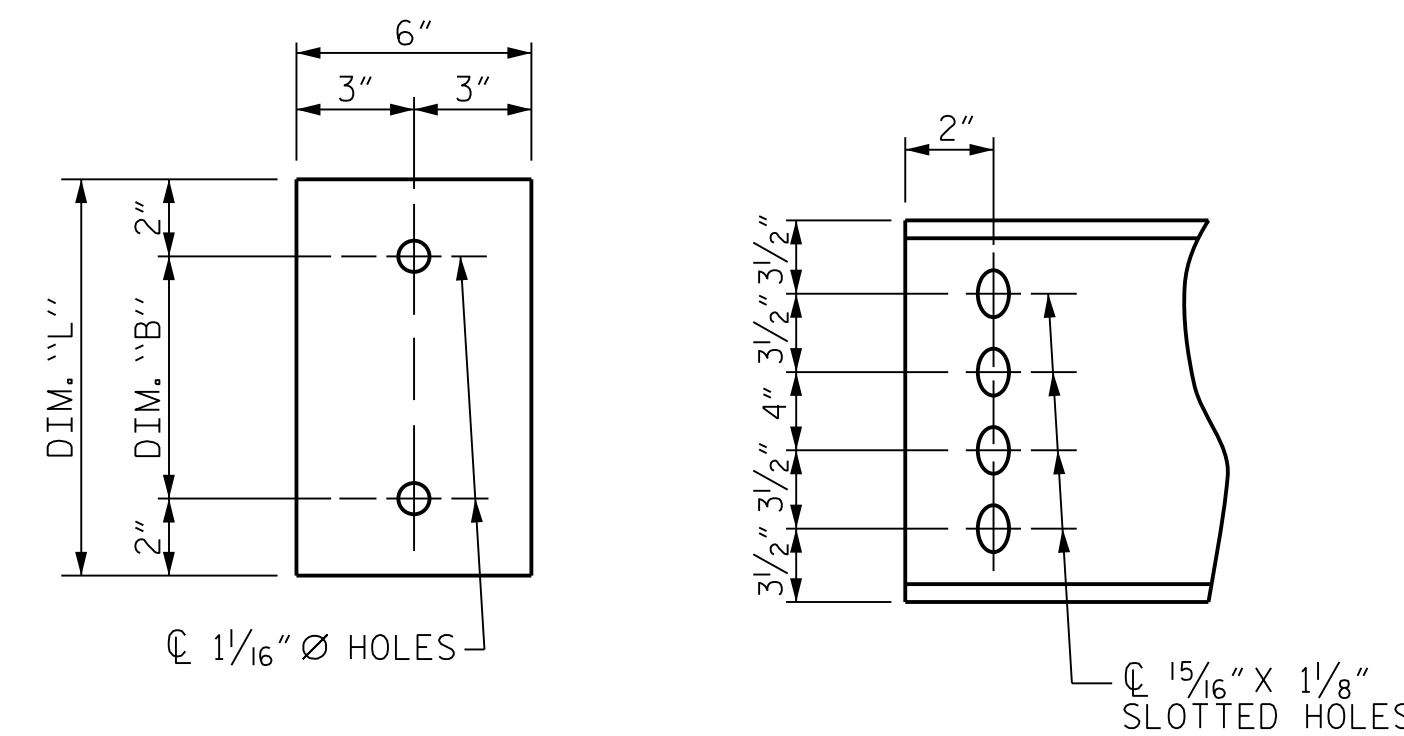
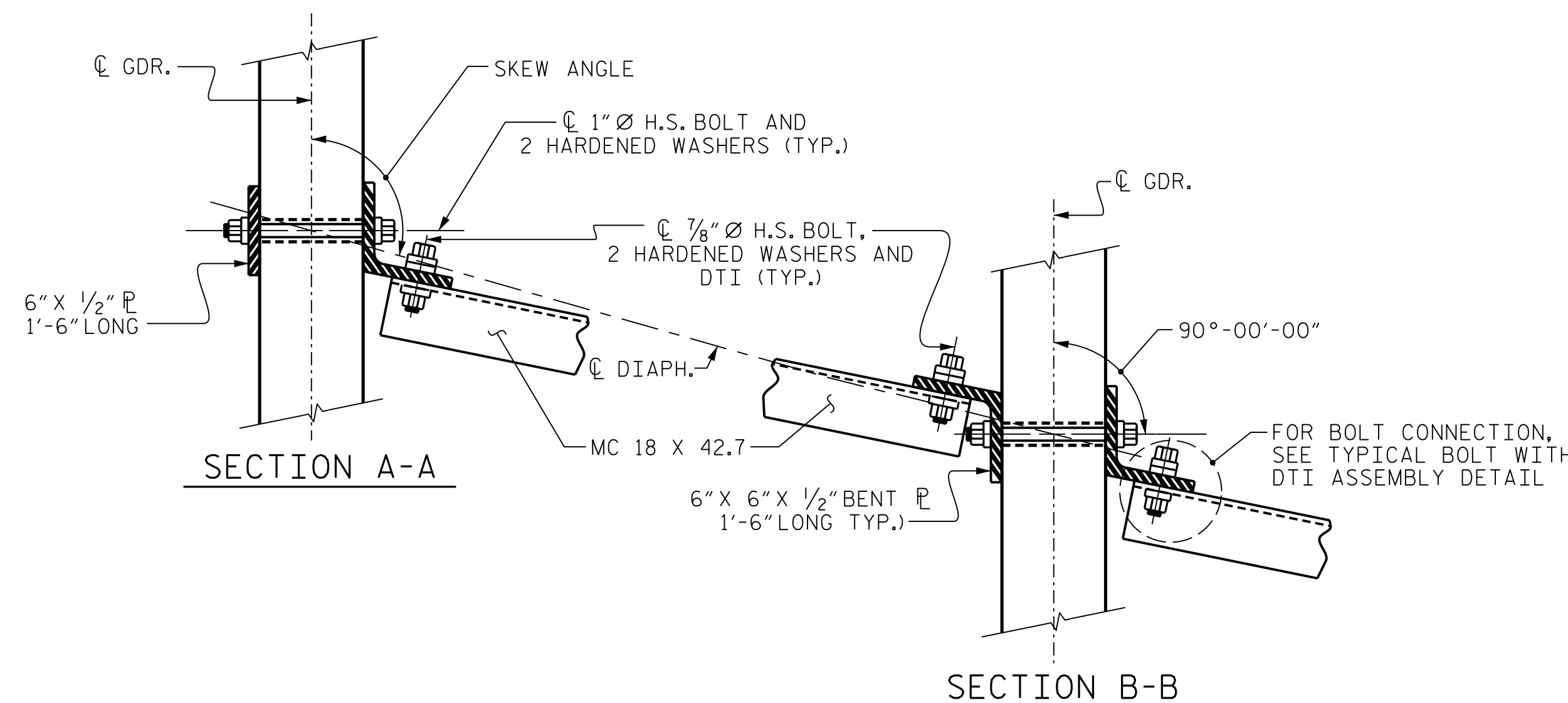


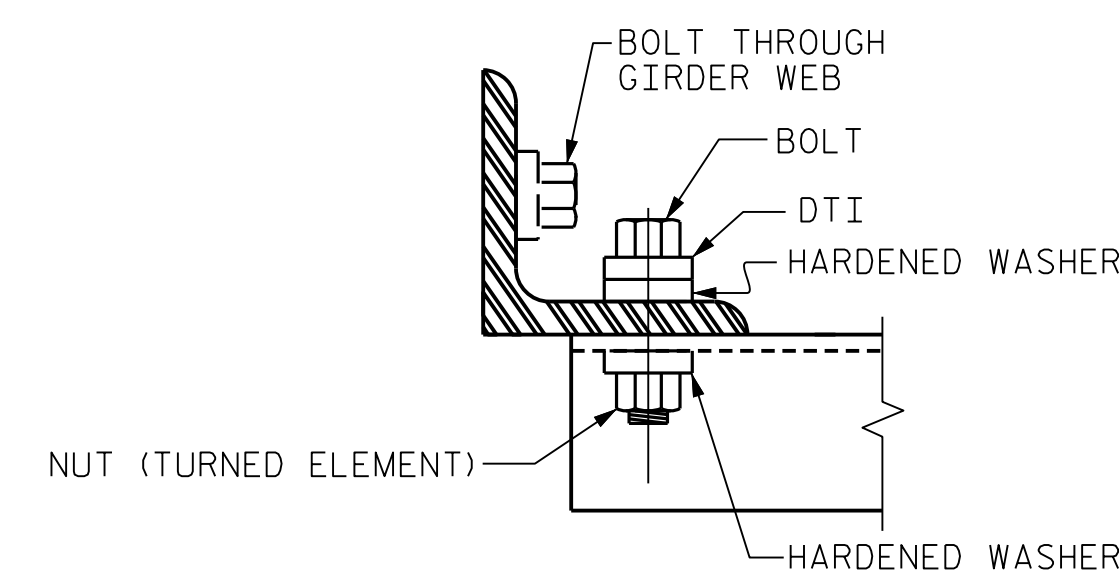
PLATE DETAILS CHANNEL END

TABLE

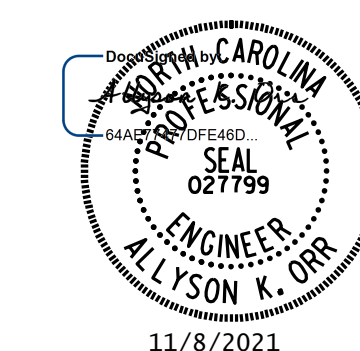
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL



PROJECT NO. U-5996  
 NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 5 OF 5

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 39
2			4			

STD. NO. PCG10 (SHT 4)

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ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
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

**NOTES**

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

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

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

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

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

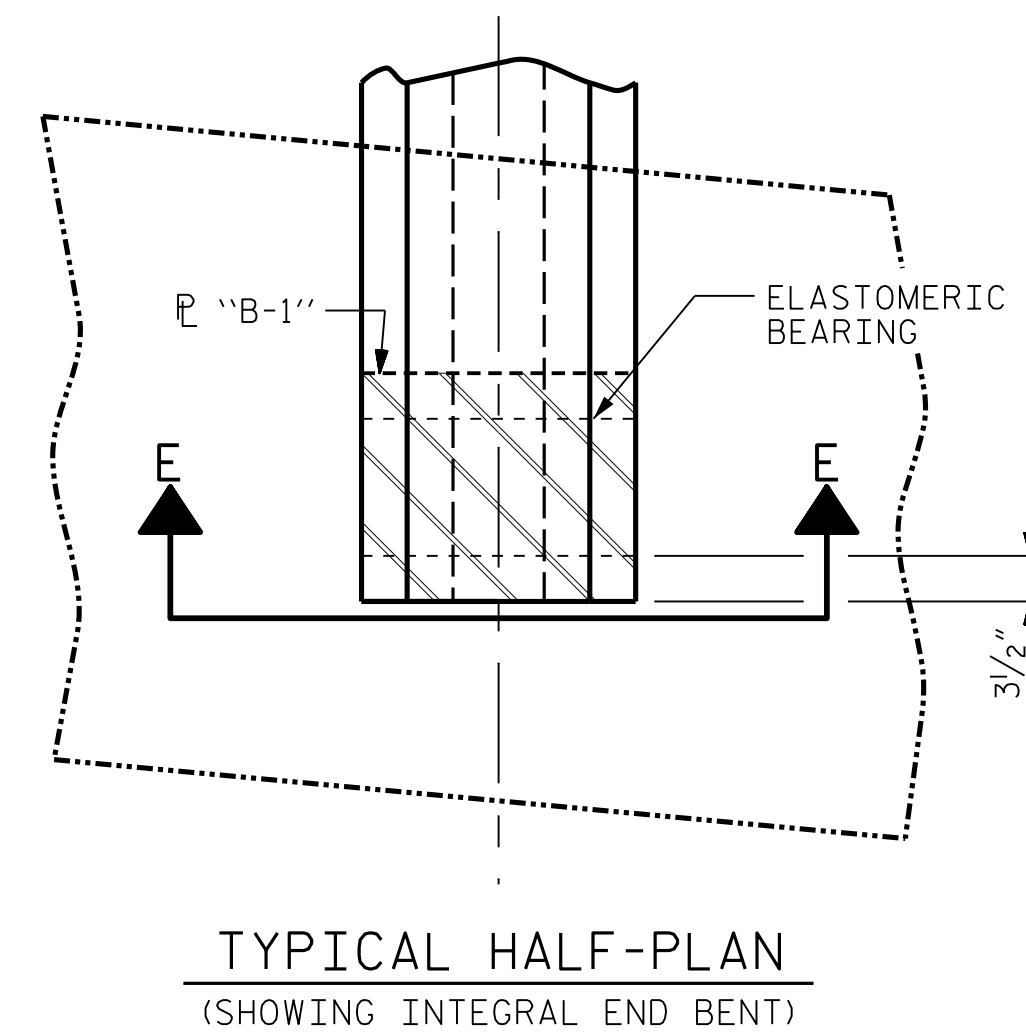
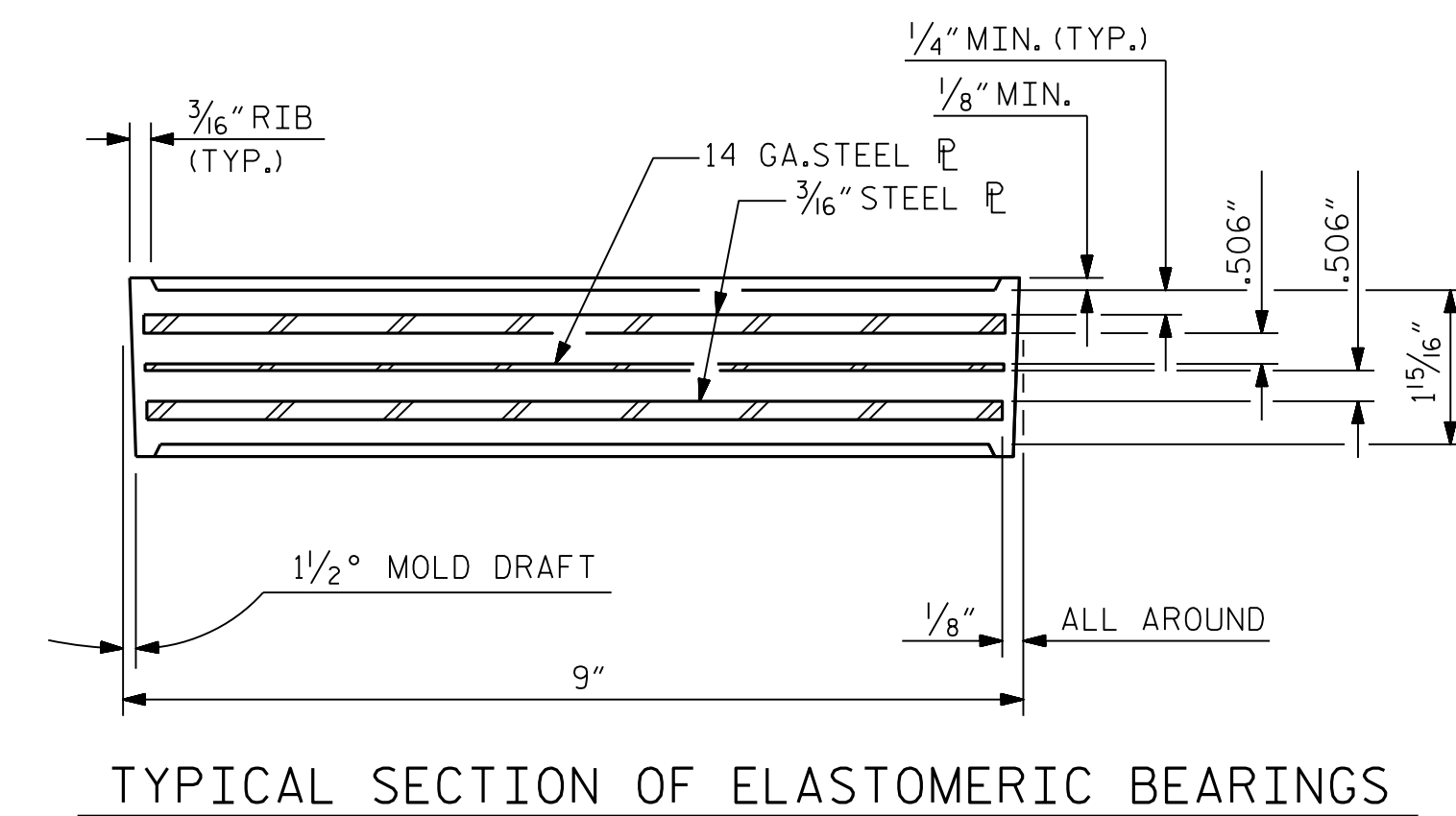
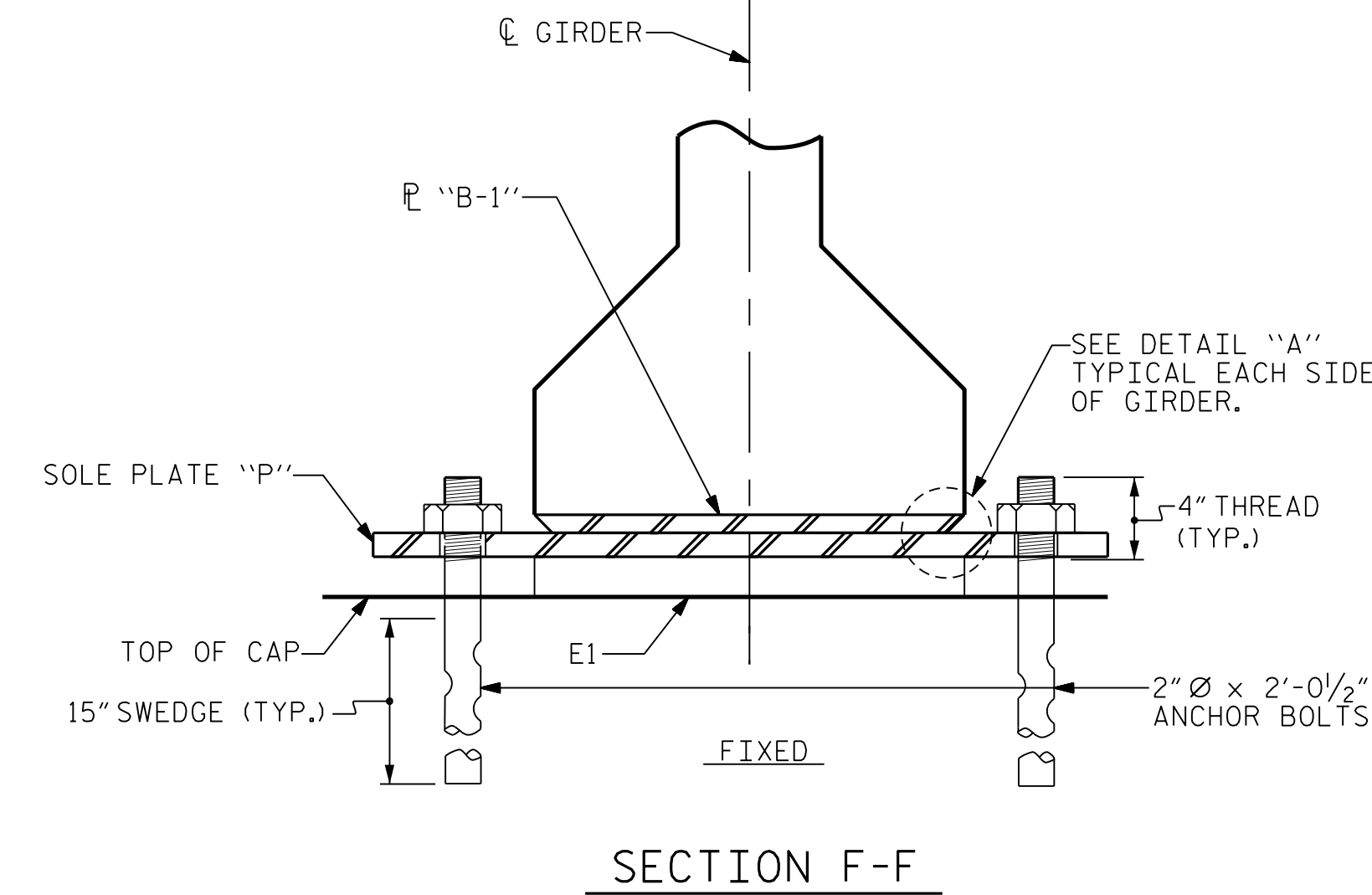
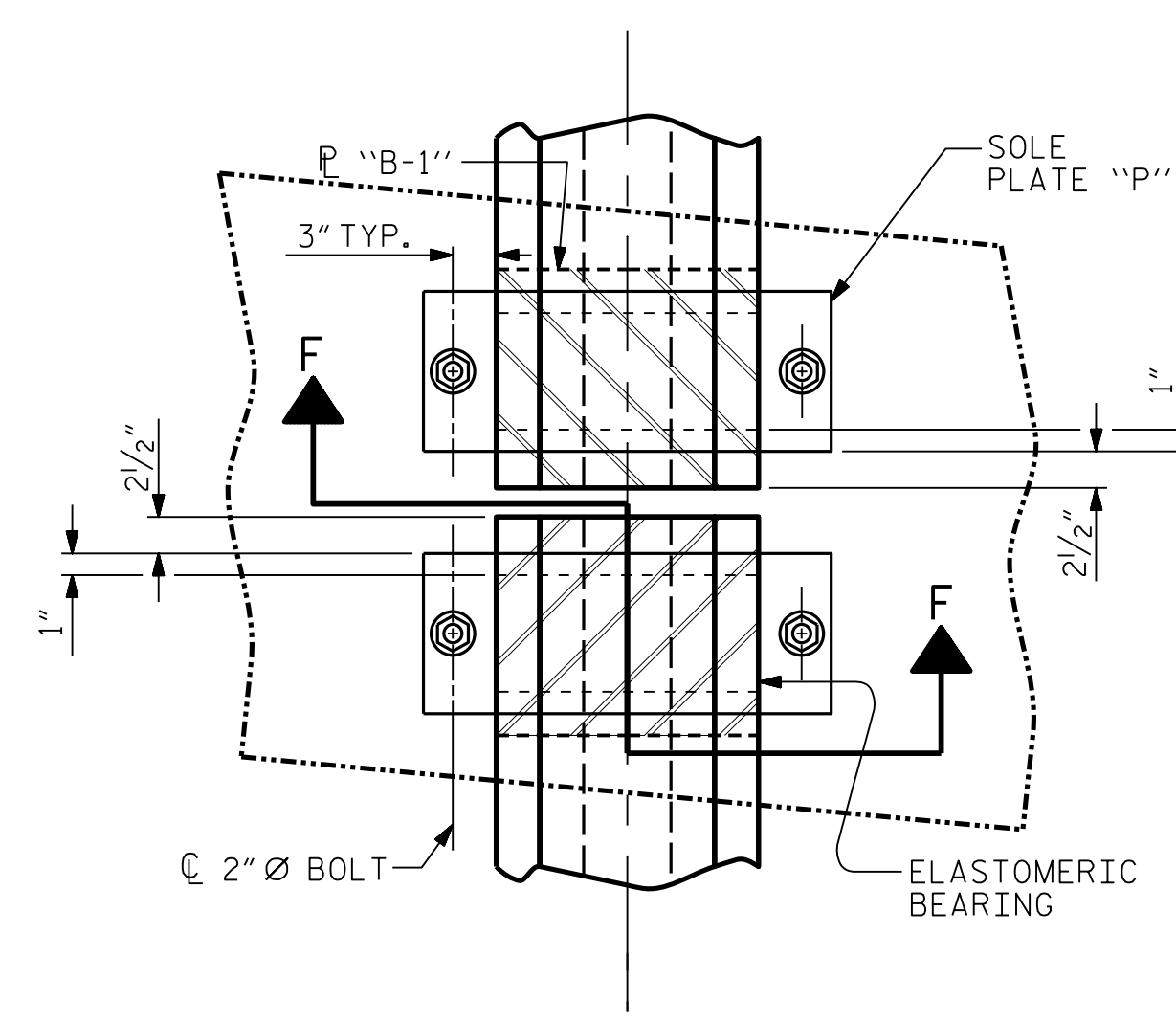
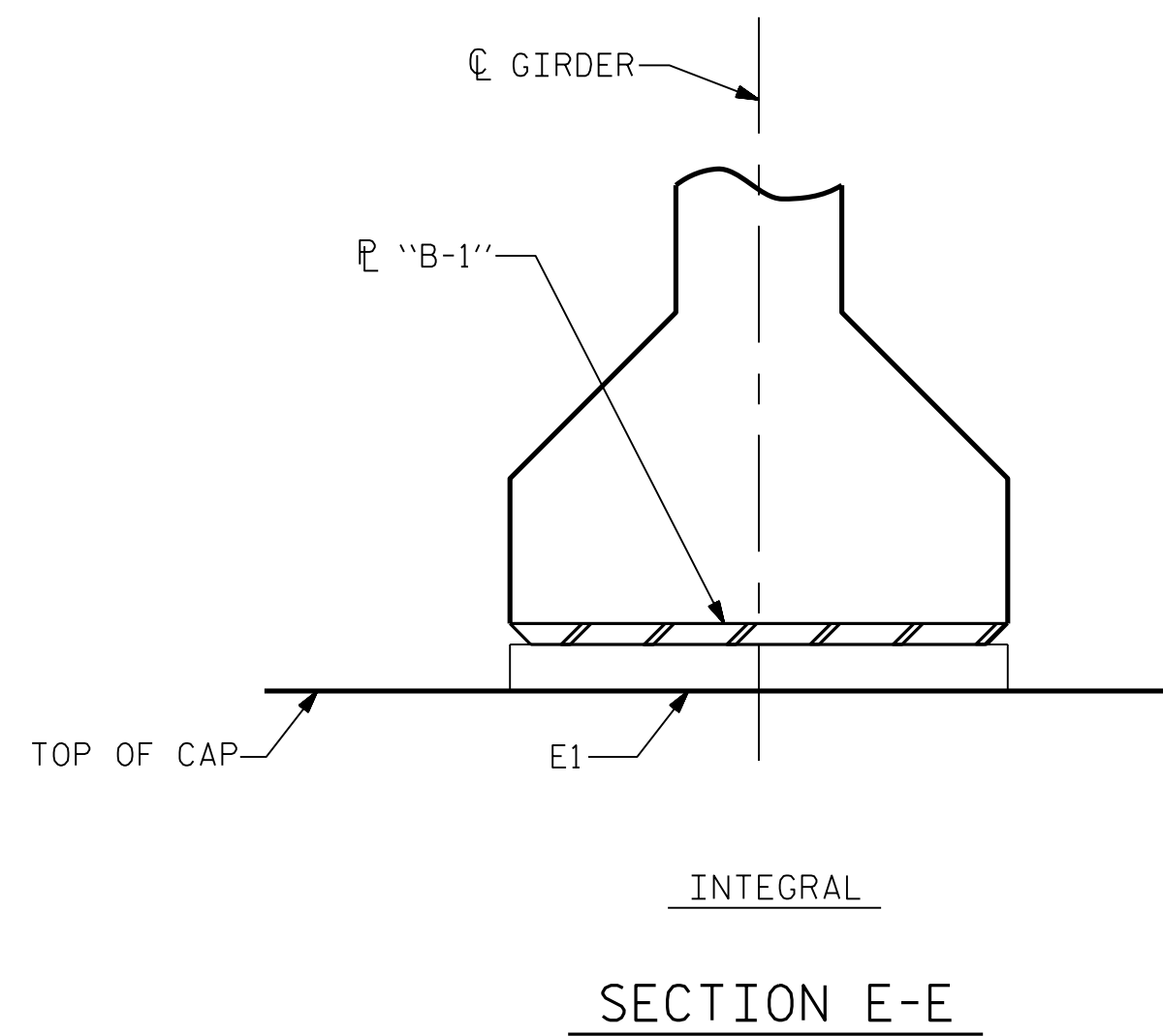
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

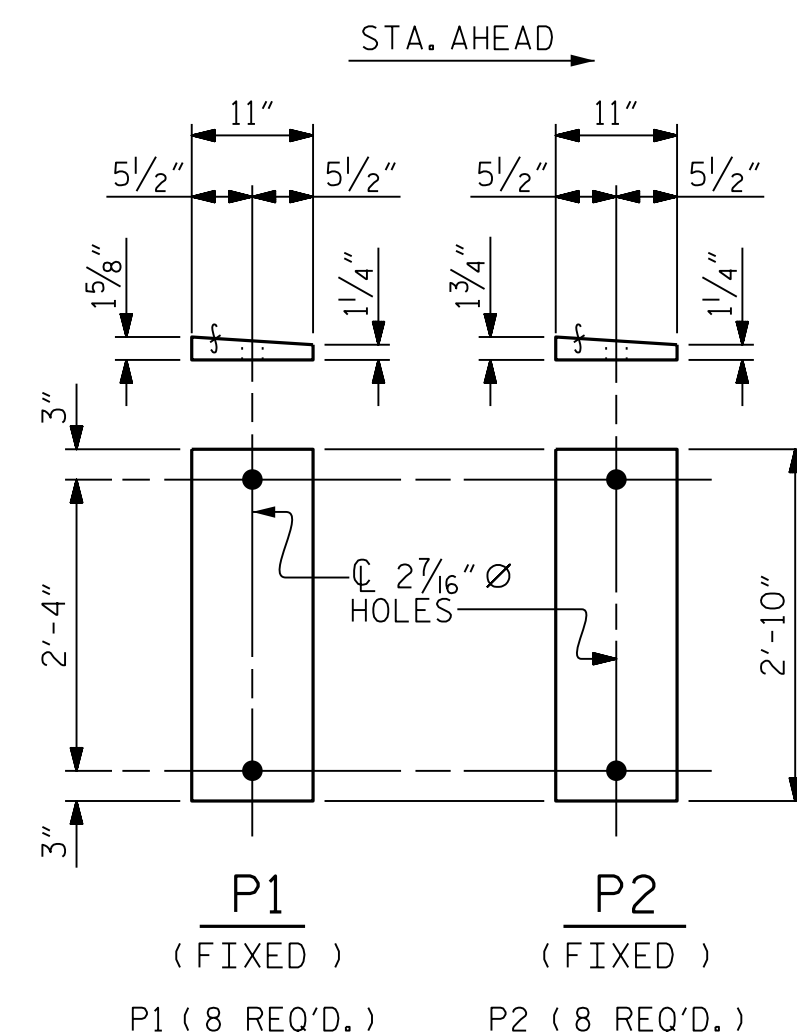
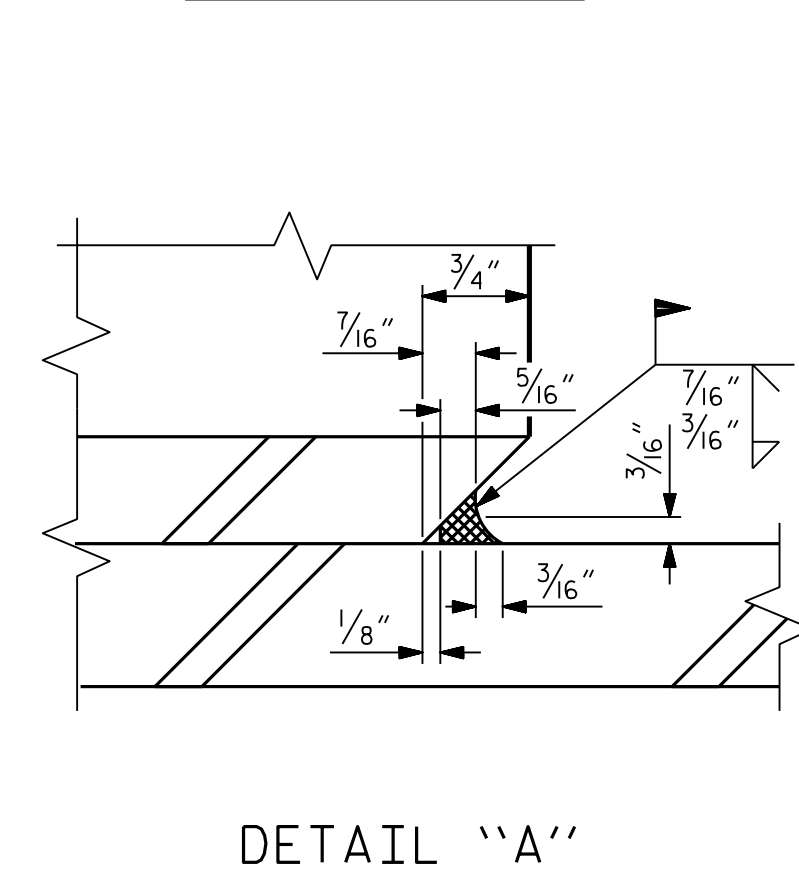
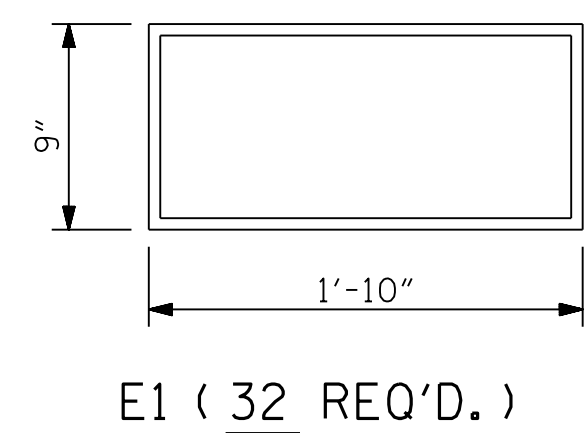
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

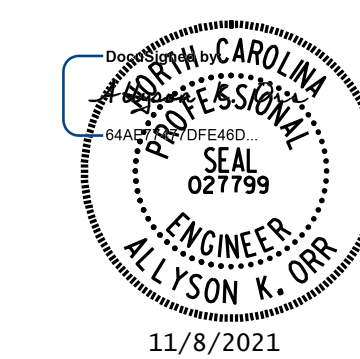
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



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



PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-



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

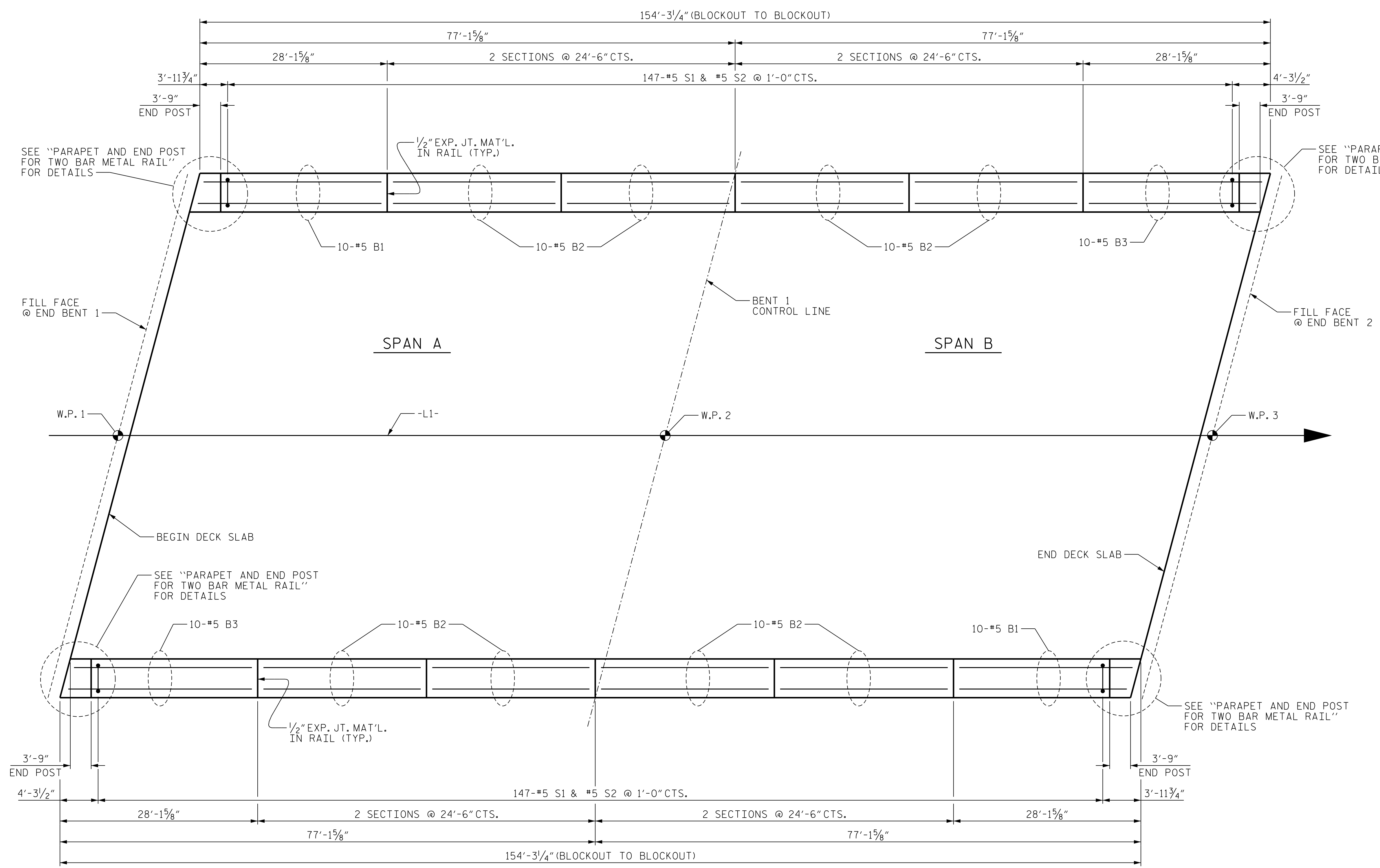
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD ELASTOMERIC BEARING DETAILS PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-18
TOTAL SHEETS					39

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ASSEMBLED BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20
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

11/8/2021 3:05:49 PM User: blanning  
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**PLAN OF CONCRETE PARAPET**

FOR DETAILS OF CONCRETE PARAPET, NOTES, AND ADDITIONAL REINFORCEMENT, SEE SHEET 2 OF 2

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 2



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

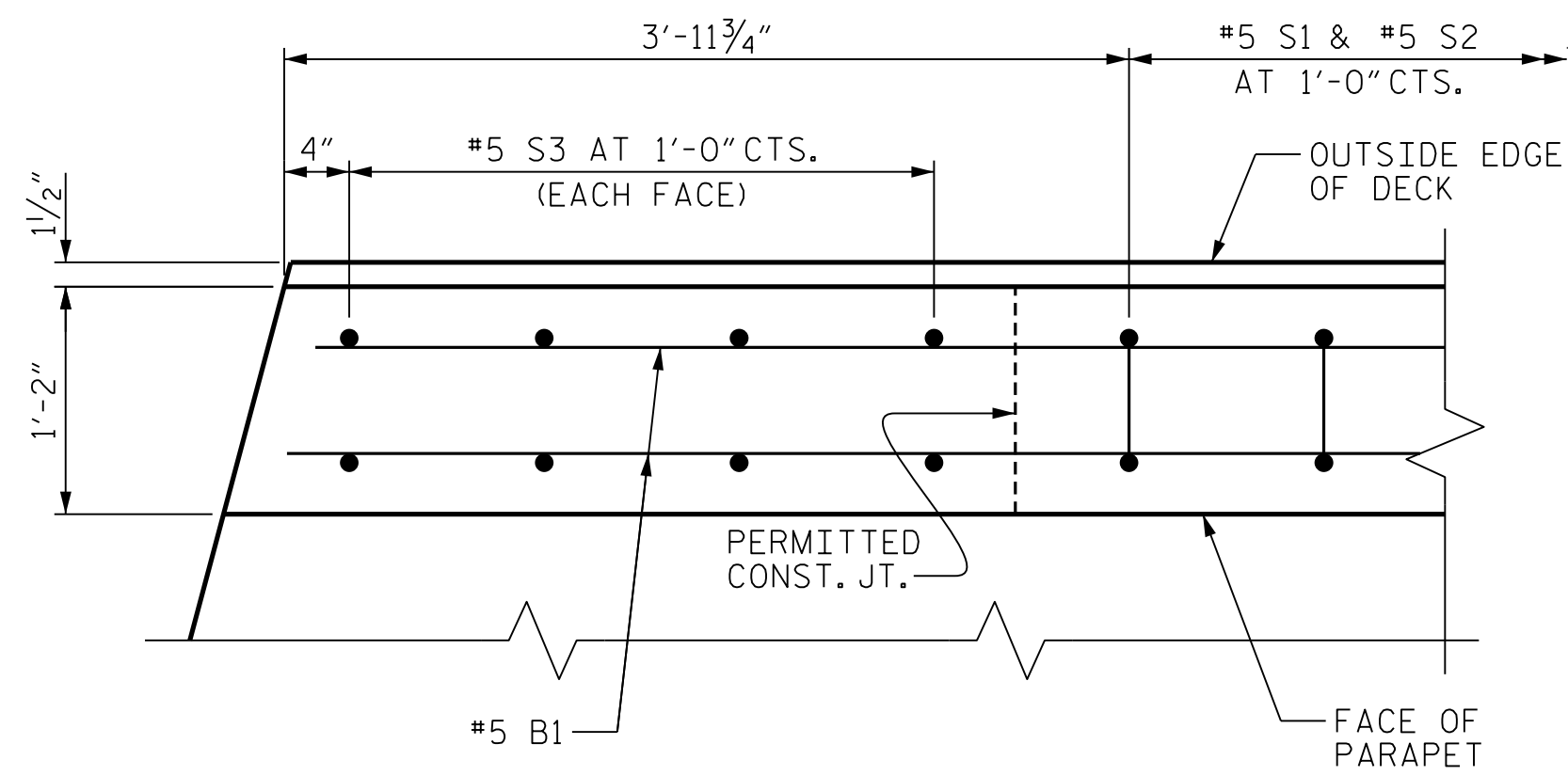
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 FOR  
 2 BAR METAL RAIL

DRAWN BY : B.E. LANNING	DATE : 12/19
CHECKED BY : A.K. ORR	DATE : 12/19
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/20

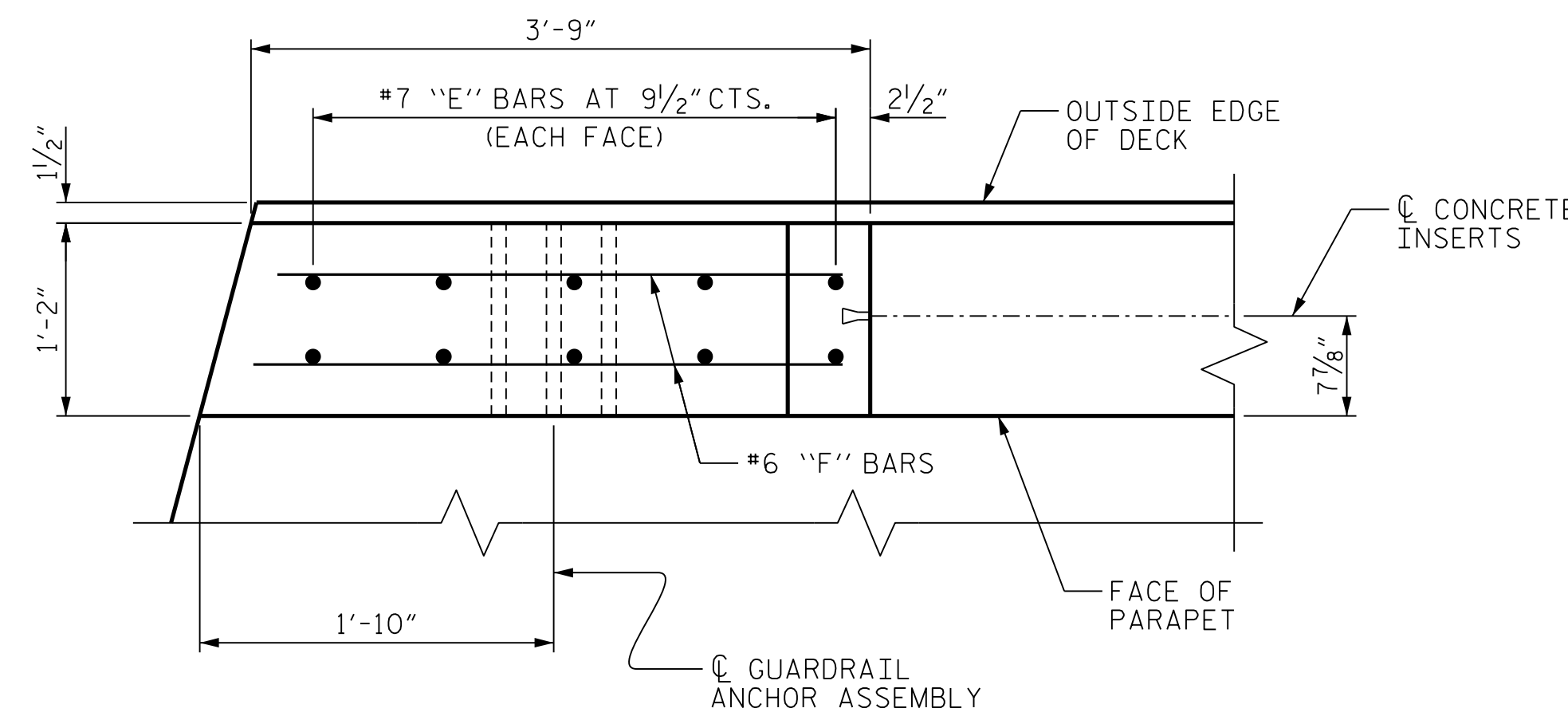
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			

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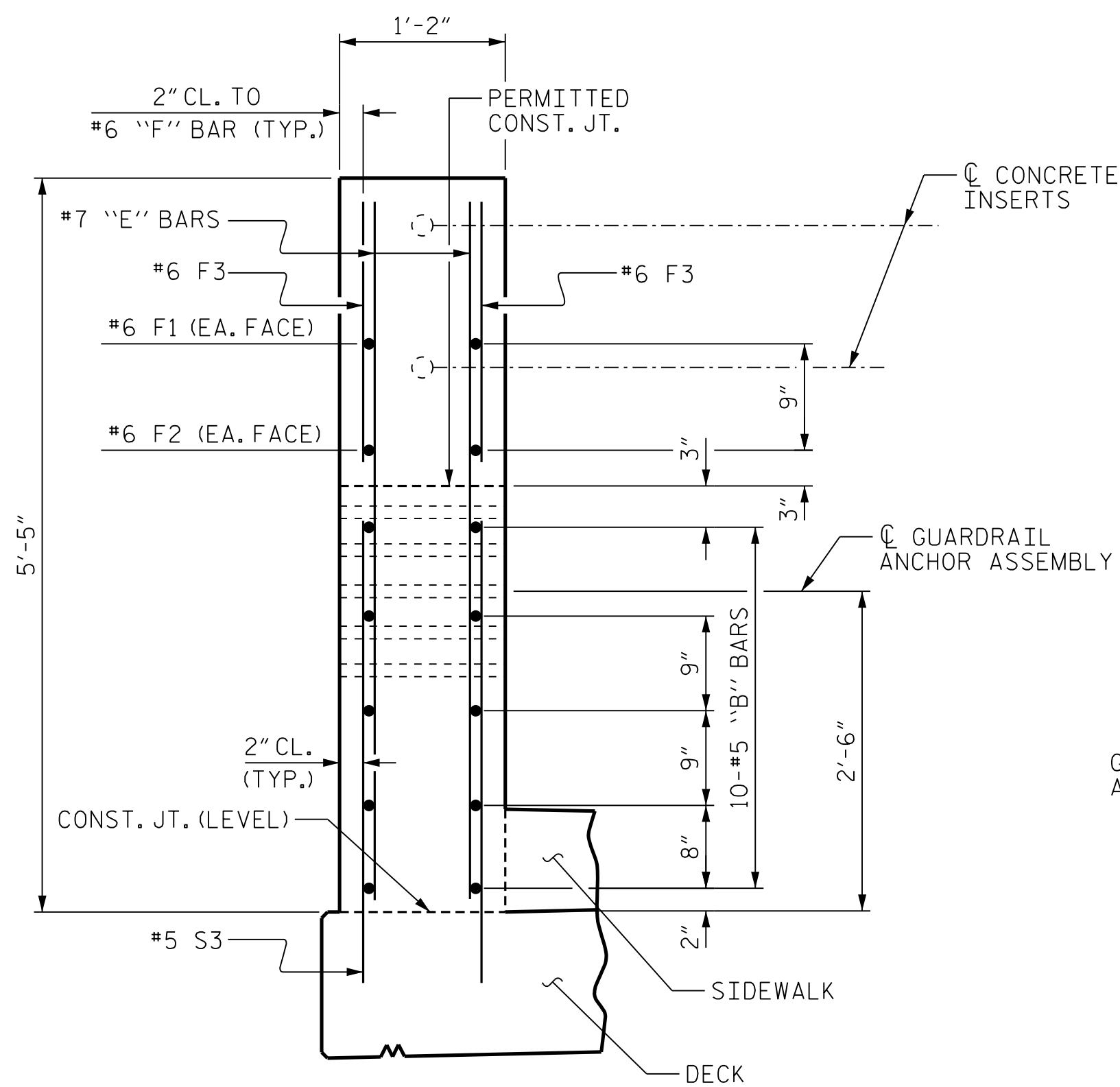


PLAN OF PARAPET

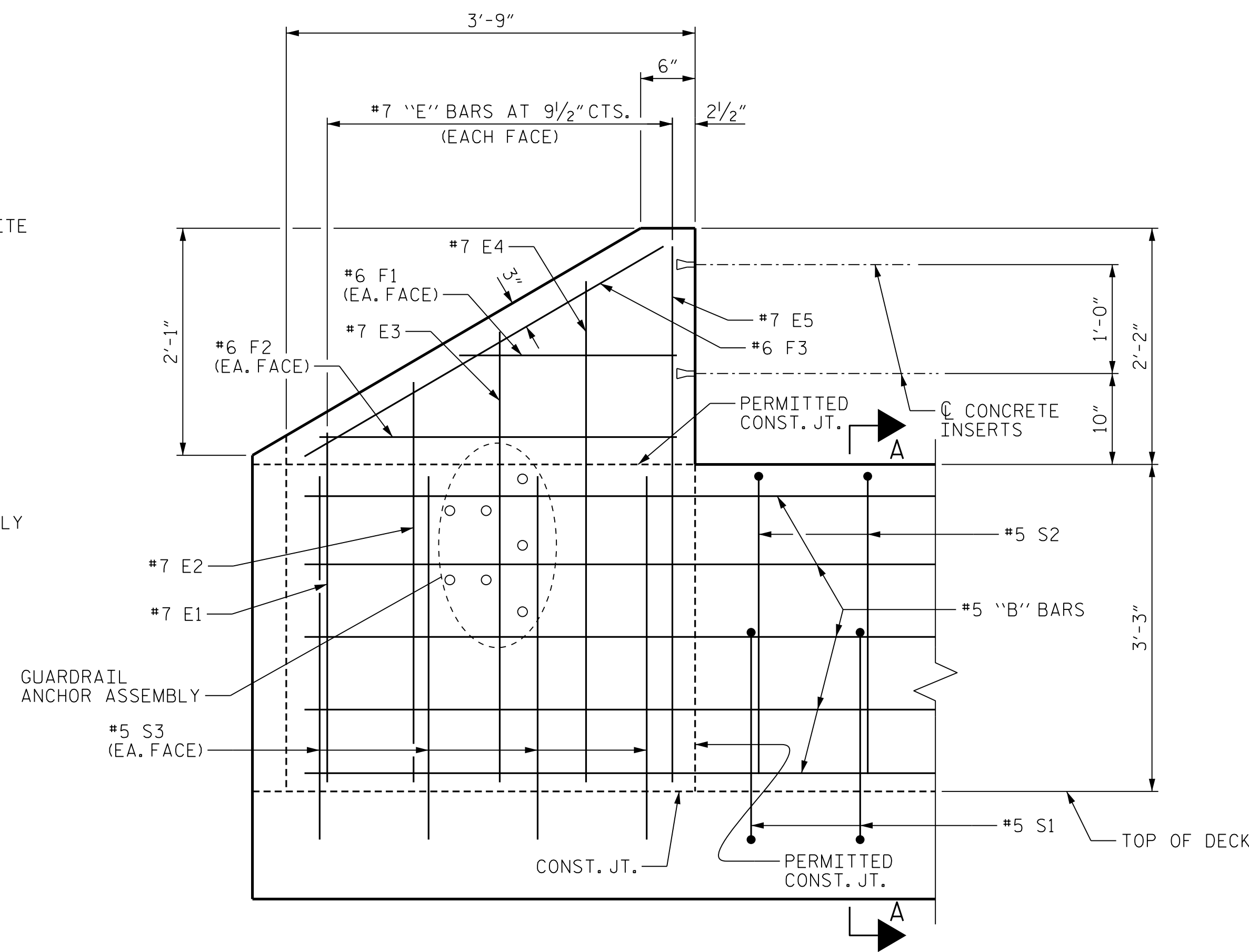
(LEFT SIDE END BENT 1 SHOWN, OTHERS SIMILAR)



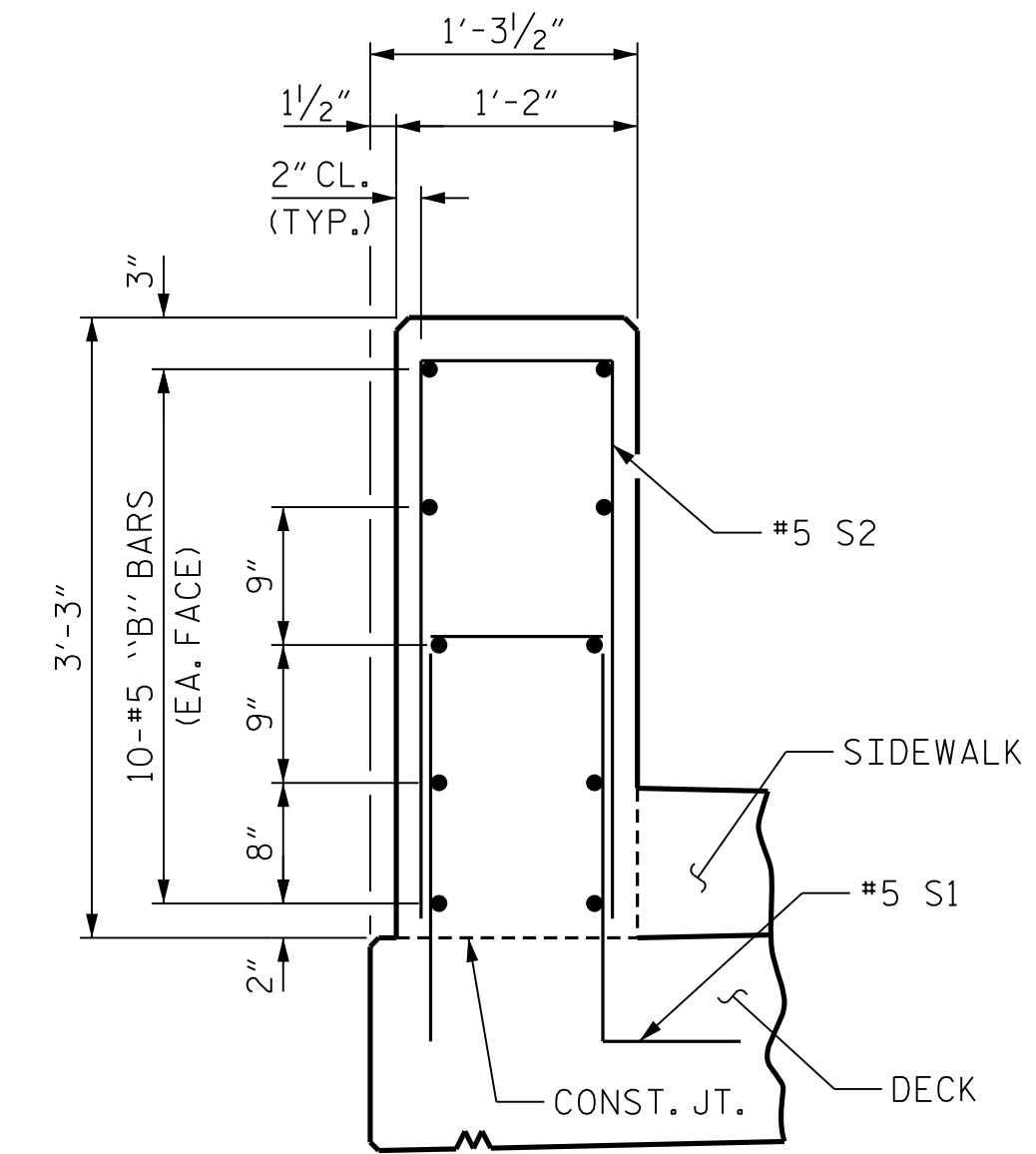
PLAN OF END POST



END VIEW



ELEVATION



SECTION A-A

NOTES

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

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

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

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

BILL OF MATERIAL

PARAPET AND END POSTS

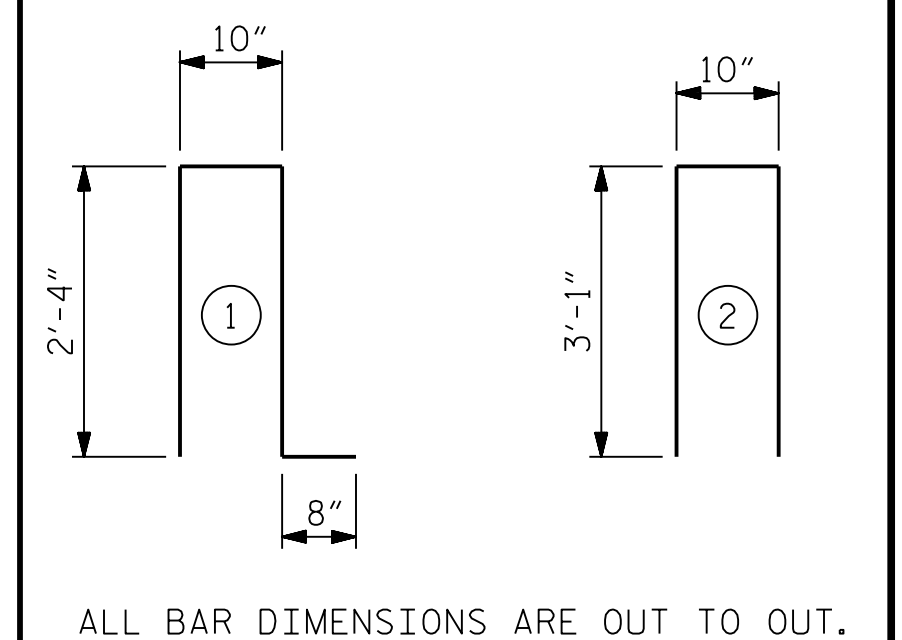
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#5	STR	27'-9"	579
B2	80	#5	STR	24'-1"	2010
B3	20	#5	STR	27'-4"	570
E1	8	#7	STR	3'-3"	53
E2	8	#7	STR	3'-9"	61
E3	8	#7	STR	4'-3"	69
E4	8	#7	STR	4'-9"	78
E5	8	#7	STR	5'-0"	82
F1	8	#6	STR	1'-11"	23
F2	8	#6	STR	3'-3"	39
F3	8	#6	STR	3'-9"	45
S1	294	#5	1	6'-2"	1891
S2	294	#5	2	7'-0"	2146
S3	32	#5	STR	3'-9"	125

EPOXY COATED REINFORCING STEEL 7771 LBS.

CLASS AA CONCRETE 44.2 C. Y.

1'-2" x 3'-3" CONCRETE PARAPET 308.55 LIN. FT.

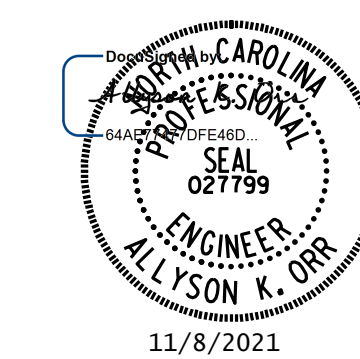
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 2



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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 DETAILS AND  
 BILL OF MATERIAL

DRAWN BY : B.E. LANNING	DATE : 12/19
CHECKED BY : A.K. ORR	DATE : 12/19
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			39

**NOTES**

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

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

**ALUMINUM RAILS**

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

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

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

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

**GENERAL NOTES**

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

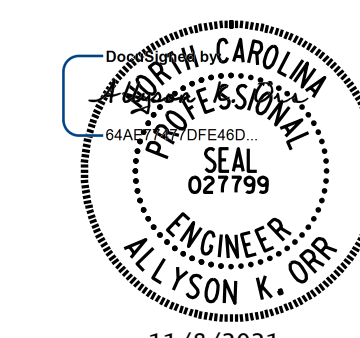
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT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

PAY LENGTH = 292.92 LIN. FT.

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

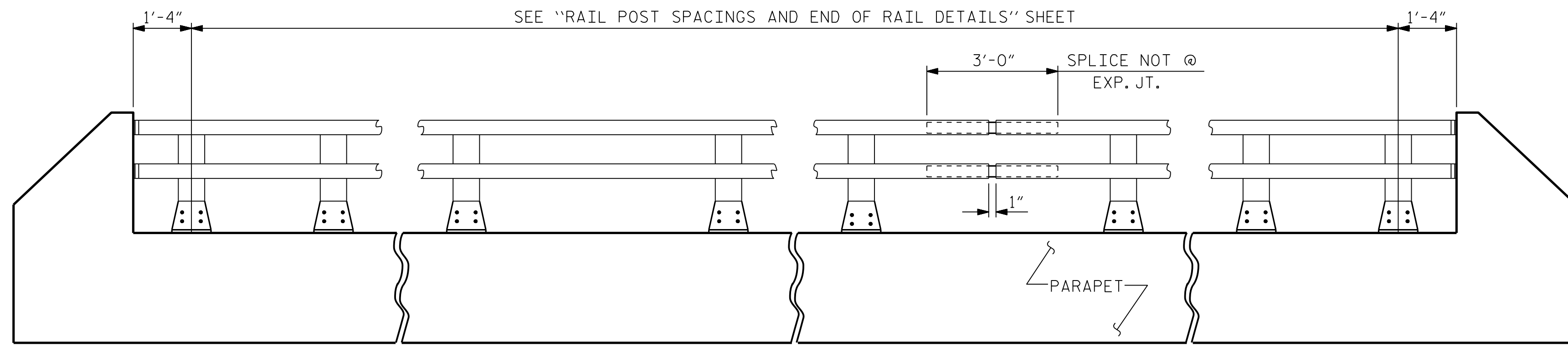


**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

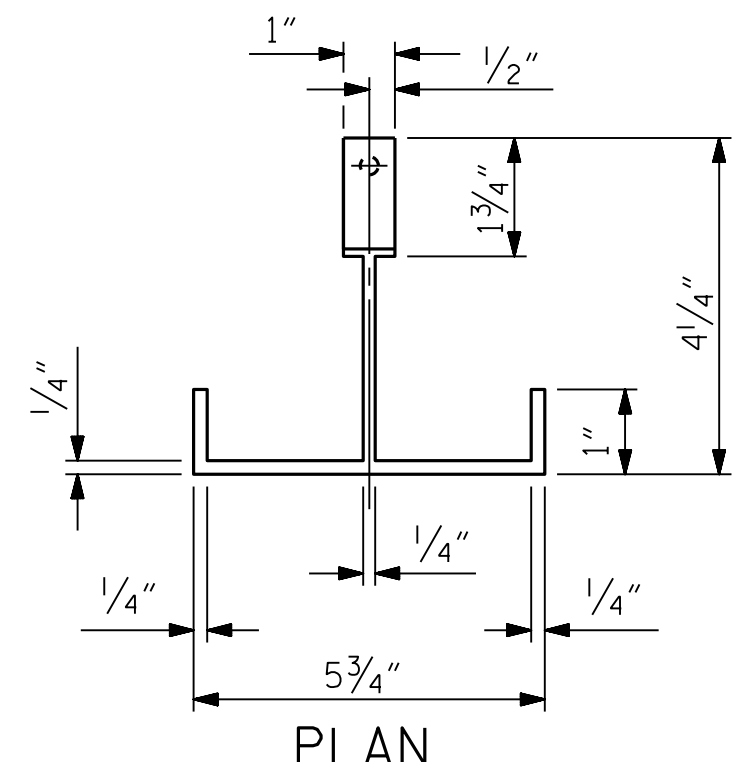
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			

STD. NO. BMR3 (SHT 1)

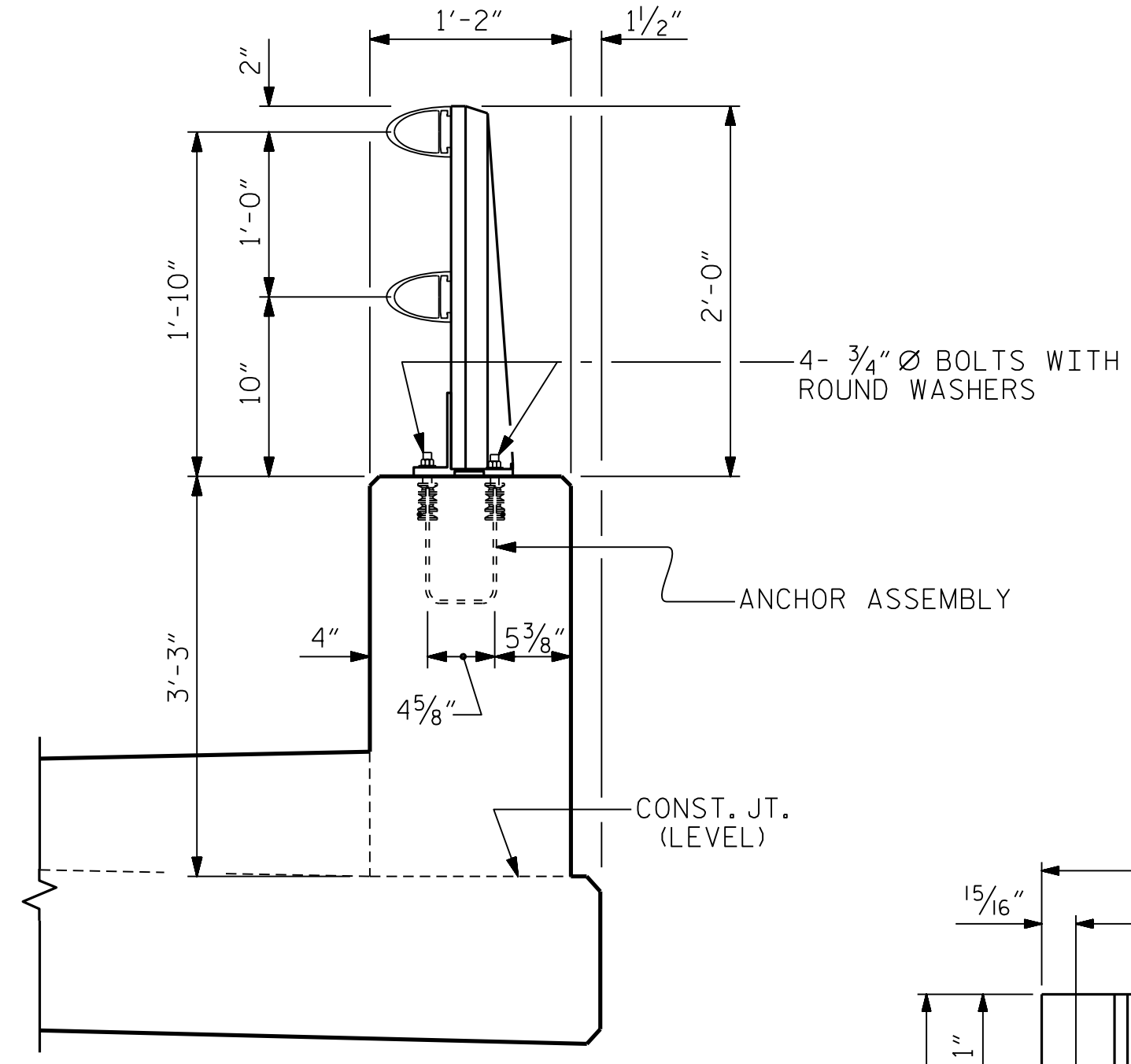


**ELEVATION**

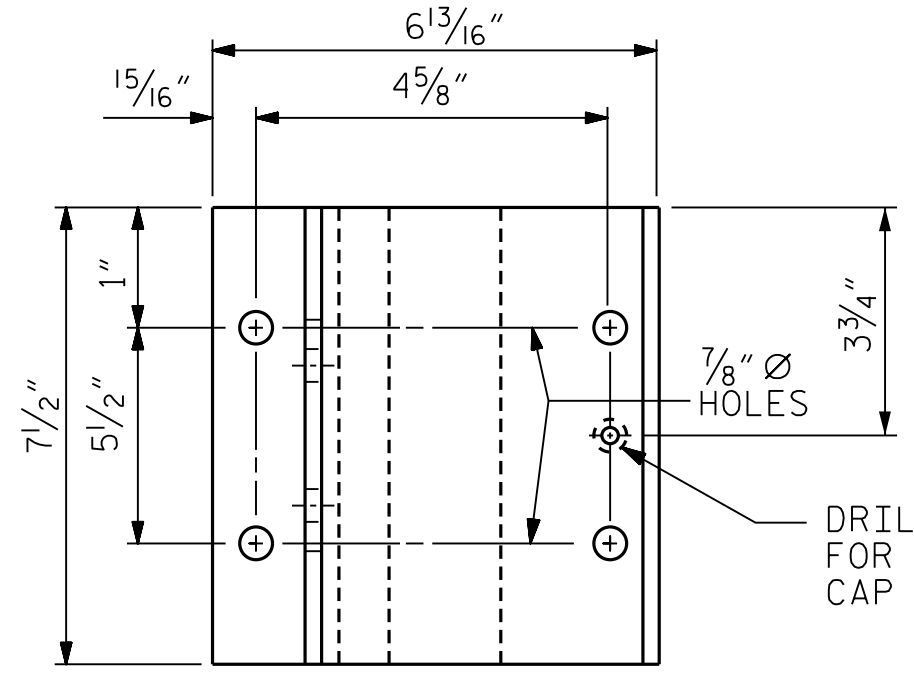
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 2 OF 2.



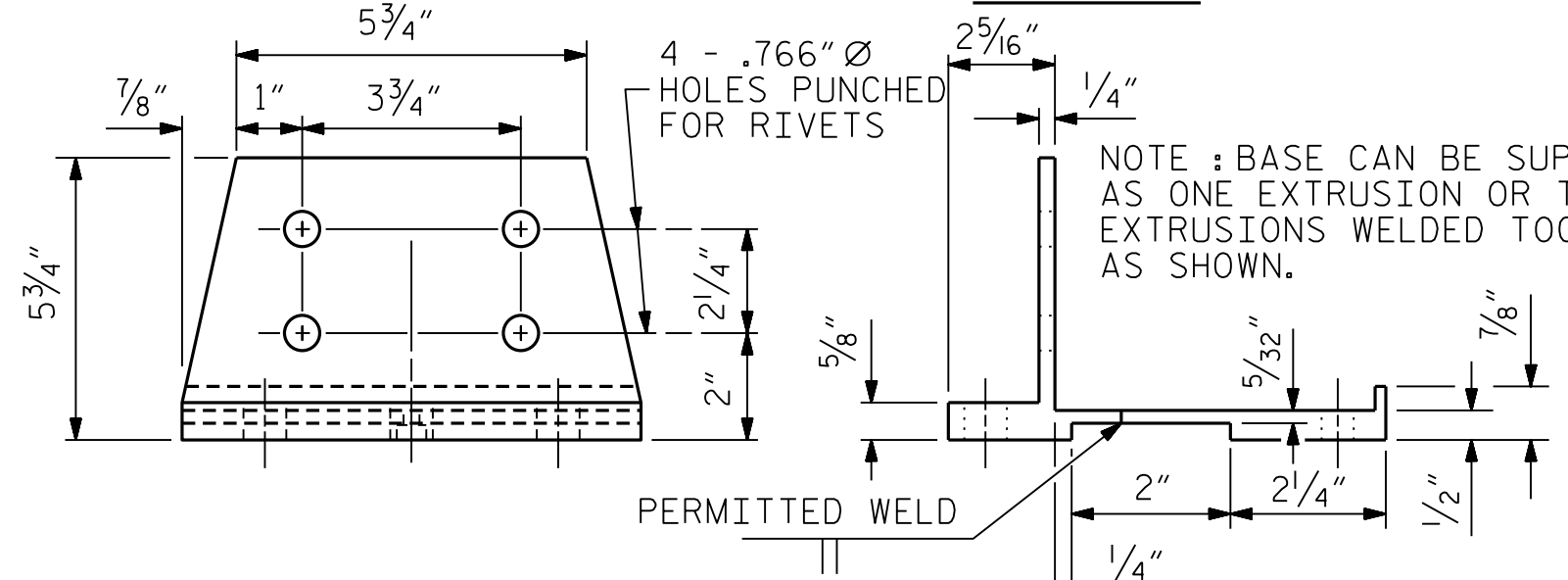
**PLAN**



**SECTION THRU PARAPET AND RAIL**



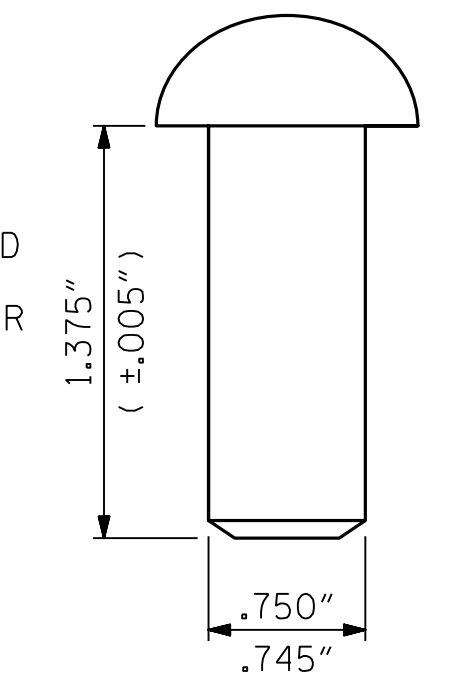
**PLAN**



**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**

11/8/2021 3:05:52 PM User: blanning  
 File: \\B:\Final\U-5996\Structures\Steel\02-041-U5996-SMU-BMRL-630154.dgn

ASSEMBLED BY: B.E. LANNING	DATE: 12/19
CHECKED BY: A.K. ORR	DATE: 12/19
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 02/20
DRAWN BY: EEM 6/94	REV. 10/1/11 MAA/GM
CHECKED BY: RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NOTES

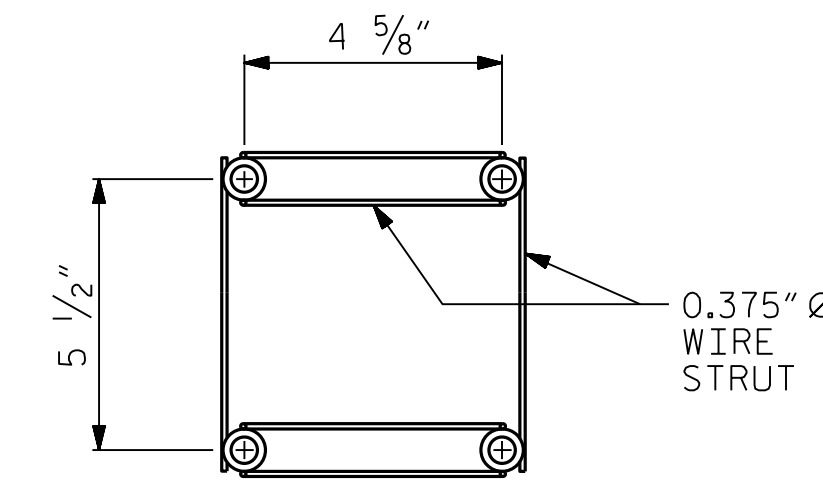
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

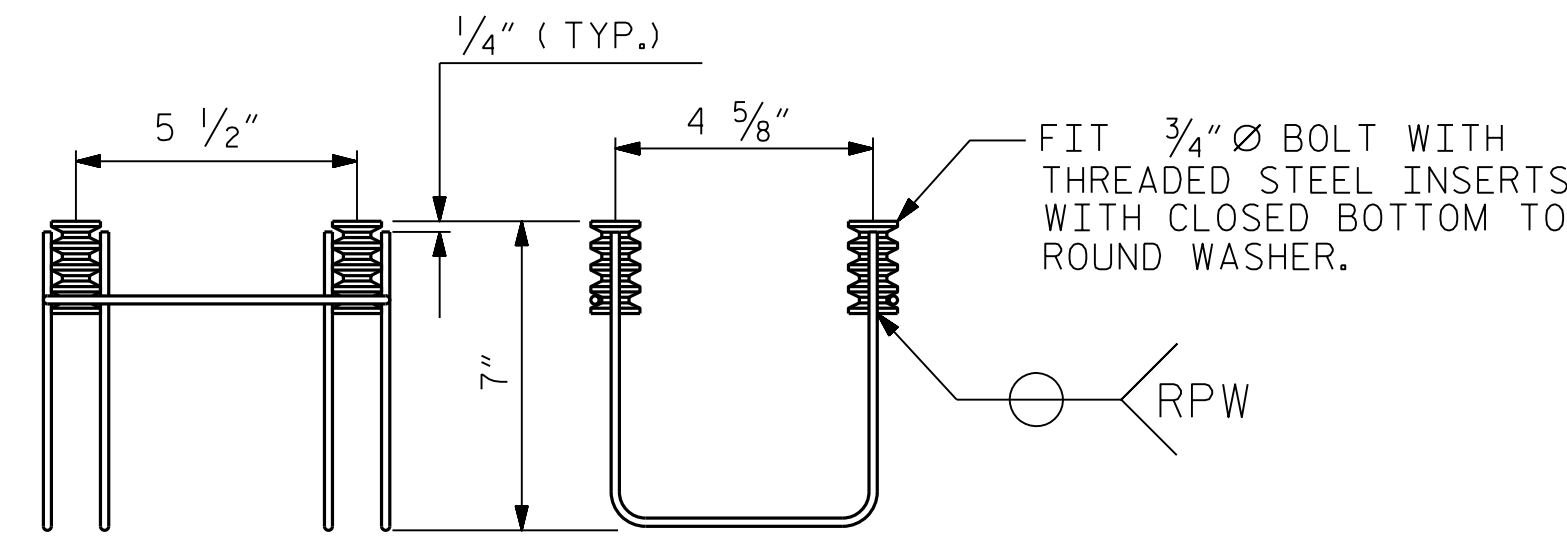
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN

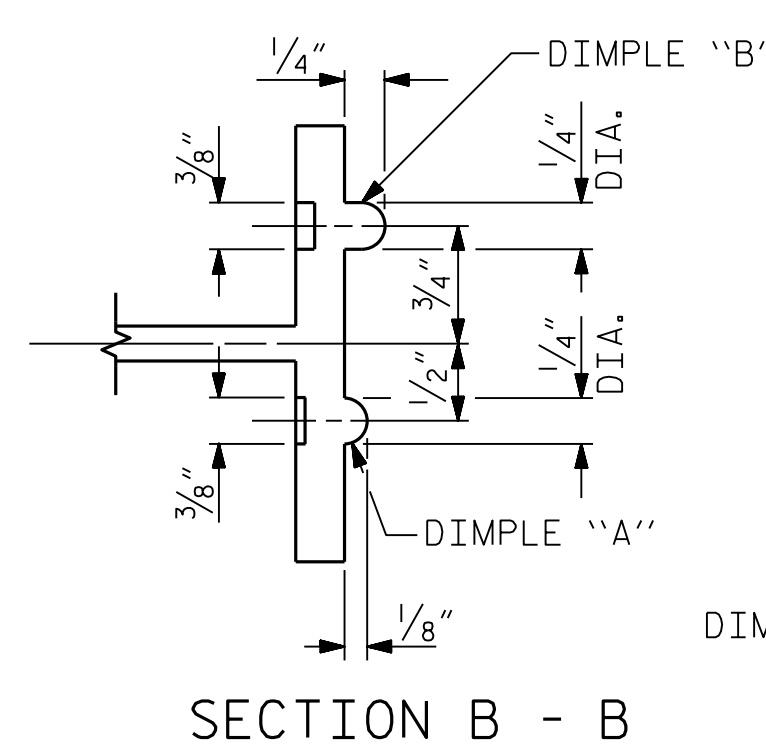


SIDE VIEW

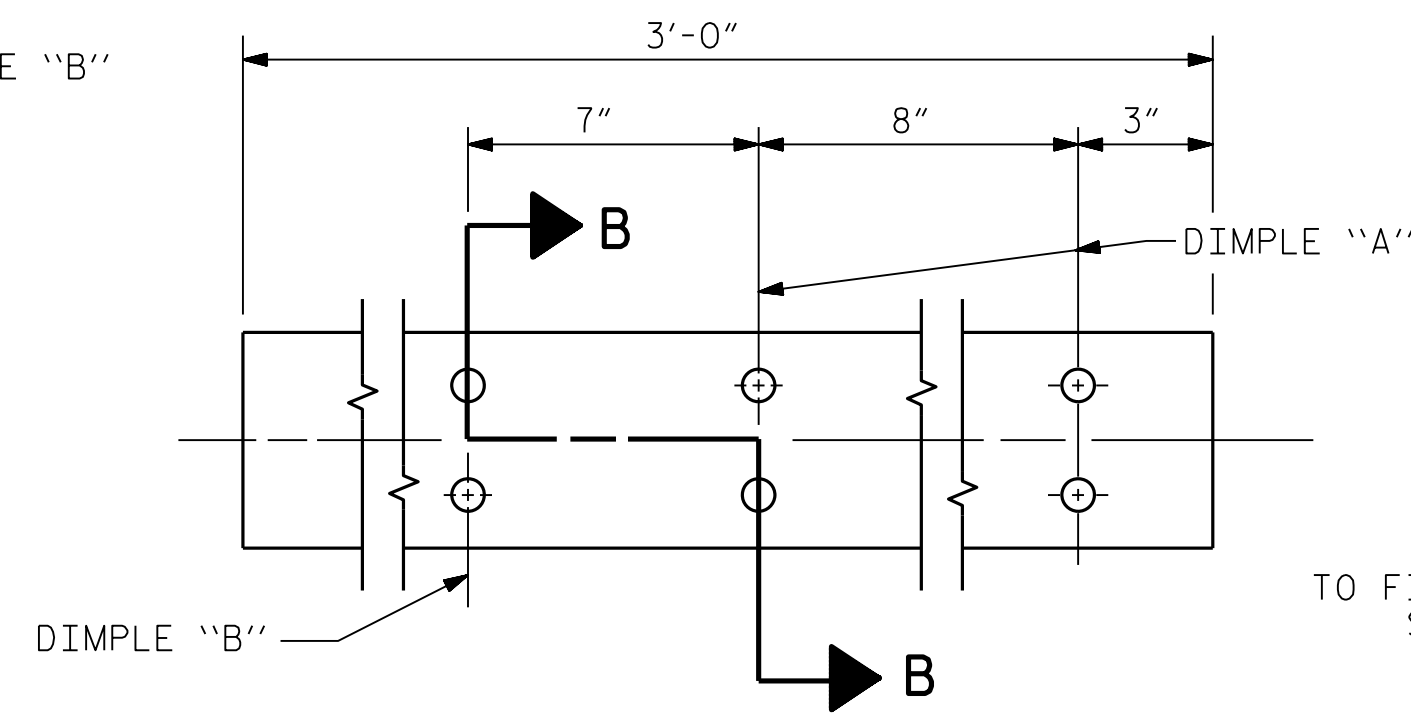
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

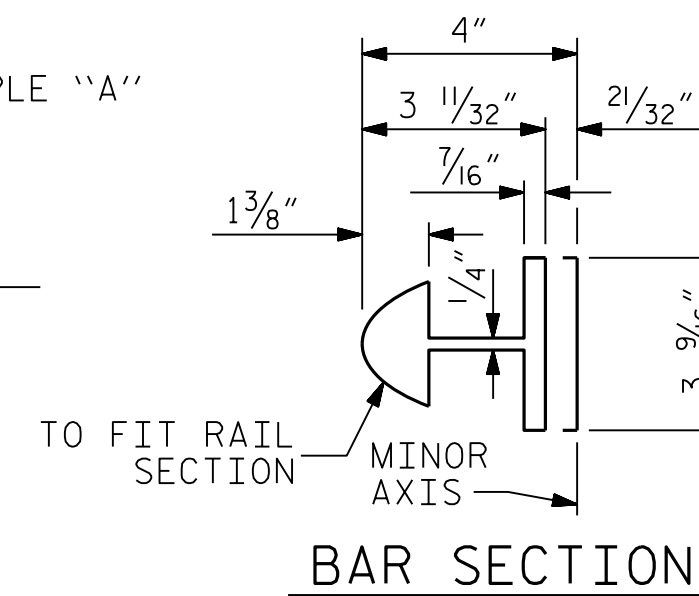
( 54 ASSEMBLIES REQUIRED )



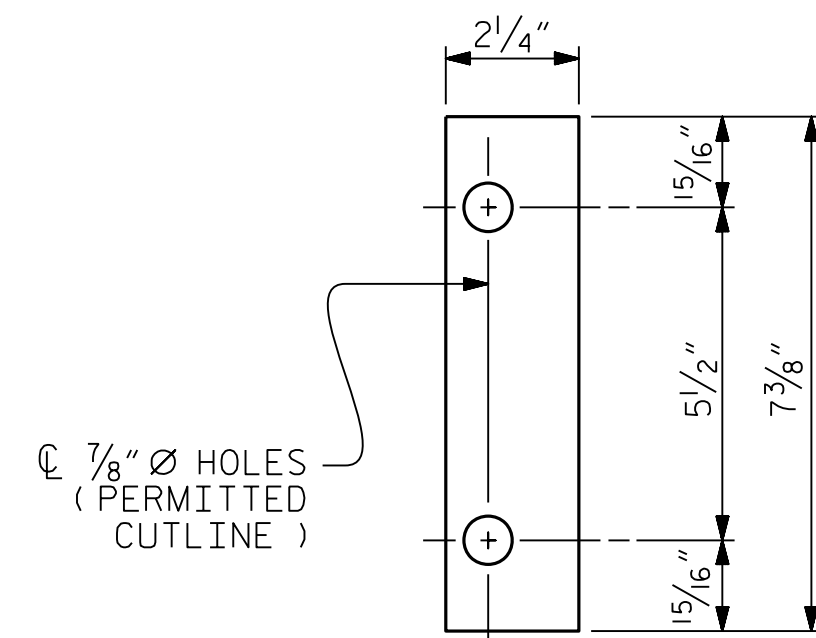
SECTION B - B



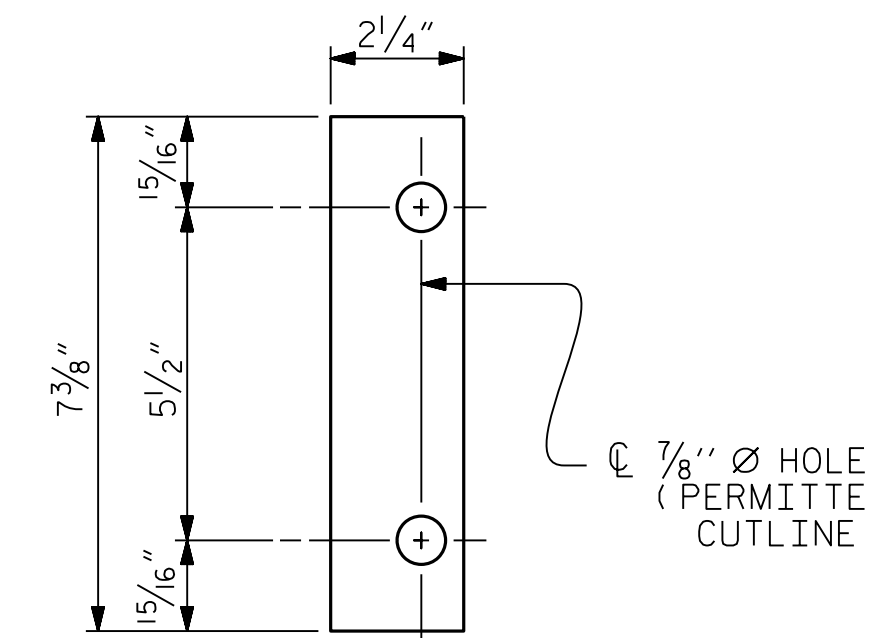
EXPANSION BAR DETAILS



BAR SECTION



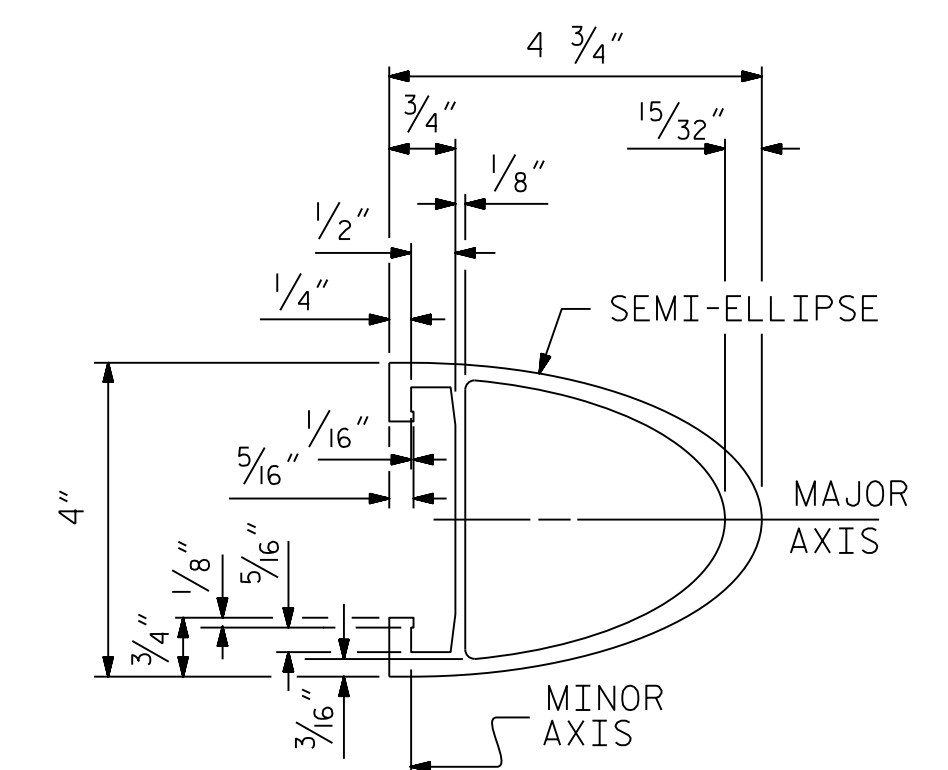
FRONT PLATE



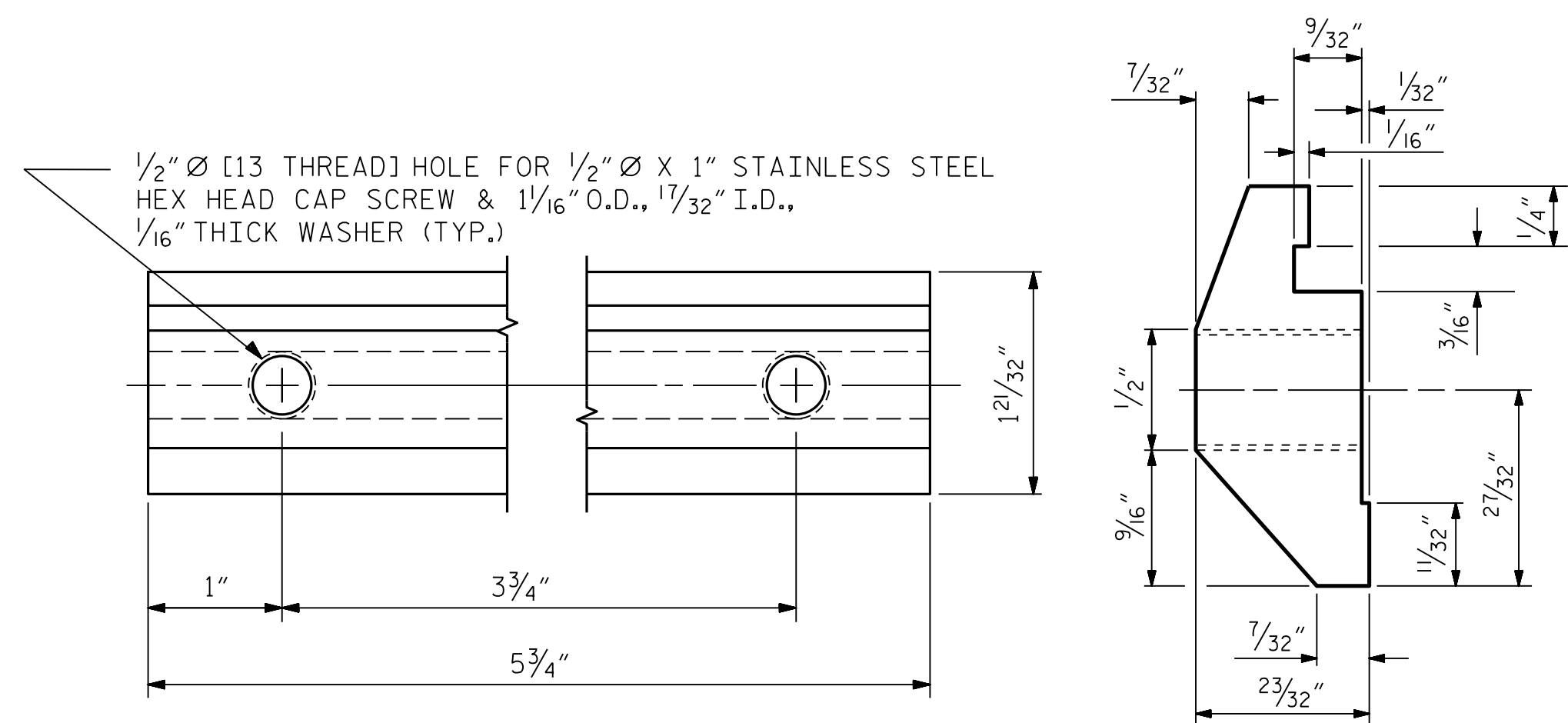
REAR PLATE

SHIM DETAILS

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

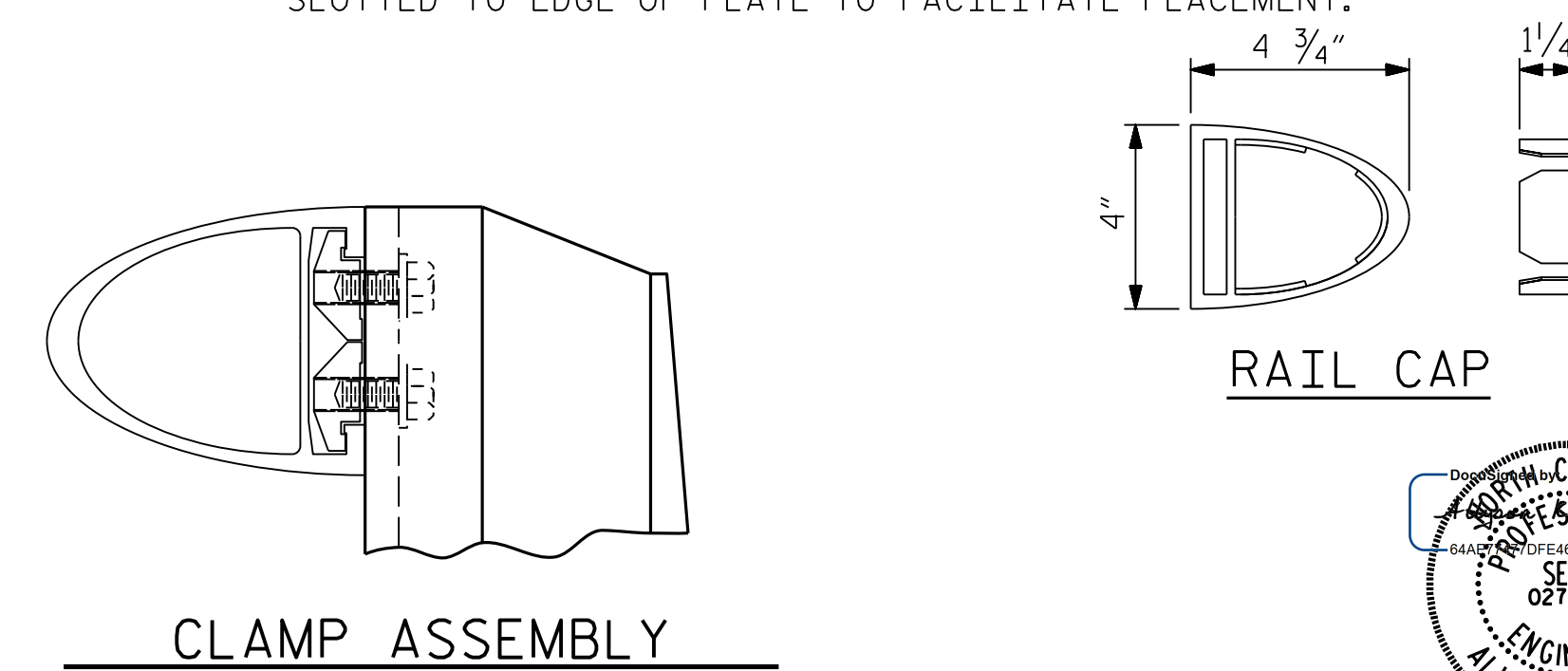


RAIL SECTION



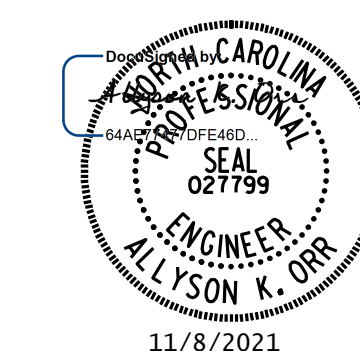
CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

RAIL CAP



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
1011 SCHAUB DRIVE, SUITE 100  
RALEIGH, NC 27606  
(919) 851-6606  
FIRM PE NUMBER : P-0671

PROJECT NO. U-5996  
NASH COUNTY  
STATION: 55+37.34 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-22
TOTAL SHEETS					39

STD. NO. BMR4

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ASSEMBLED BY: B.E. LANNING	DATE: 12/19
CHECKED BY: A.K. ORR	DATE: 12/19
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 02/20
DRAWN BY: EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY: RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC





NOTES

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

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

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

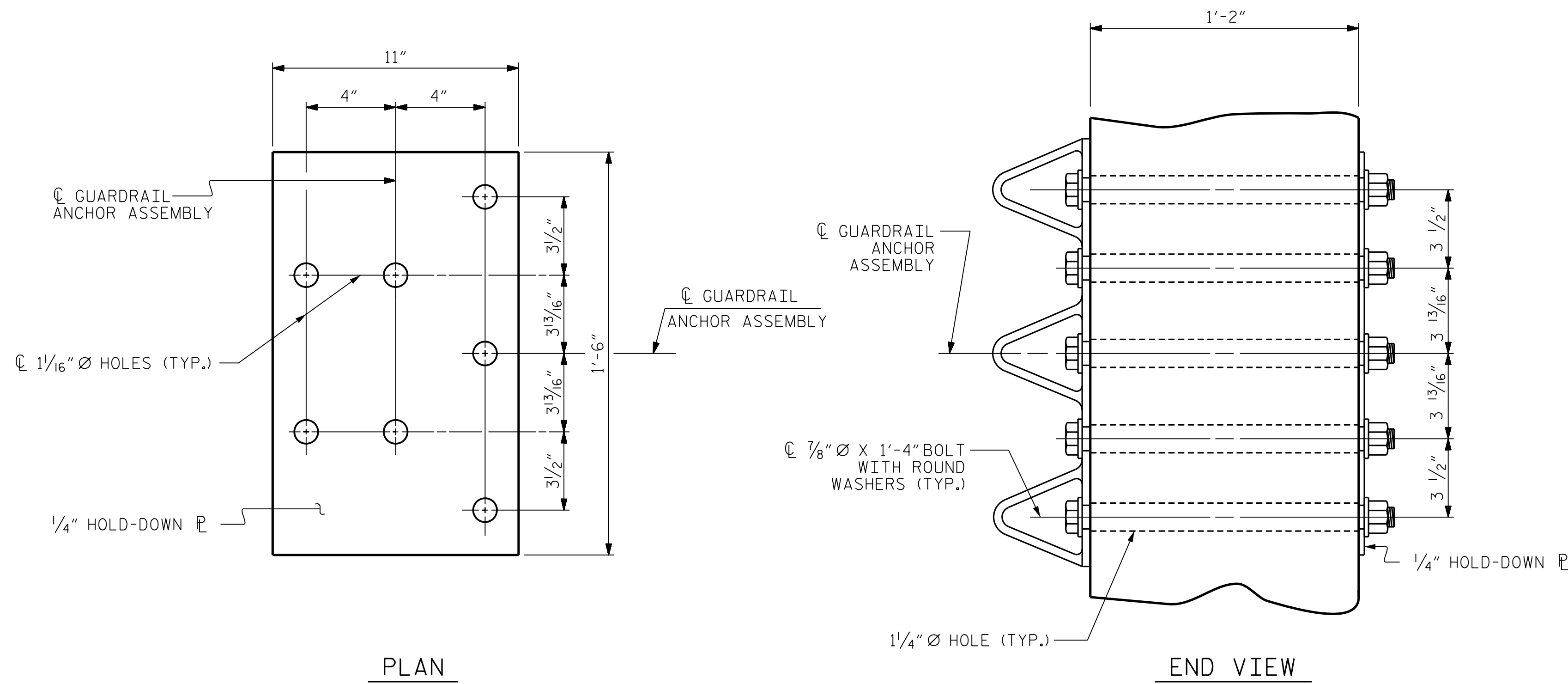
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

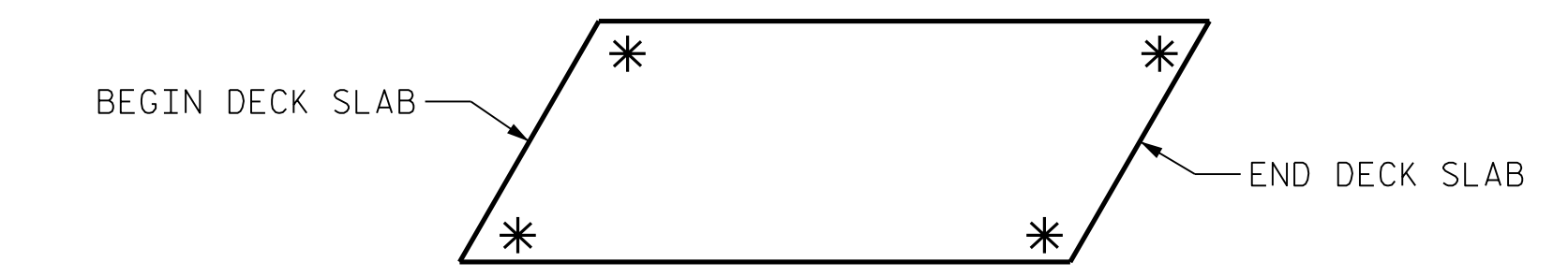
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

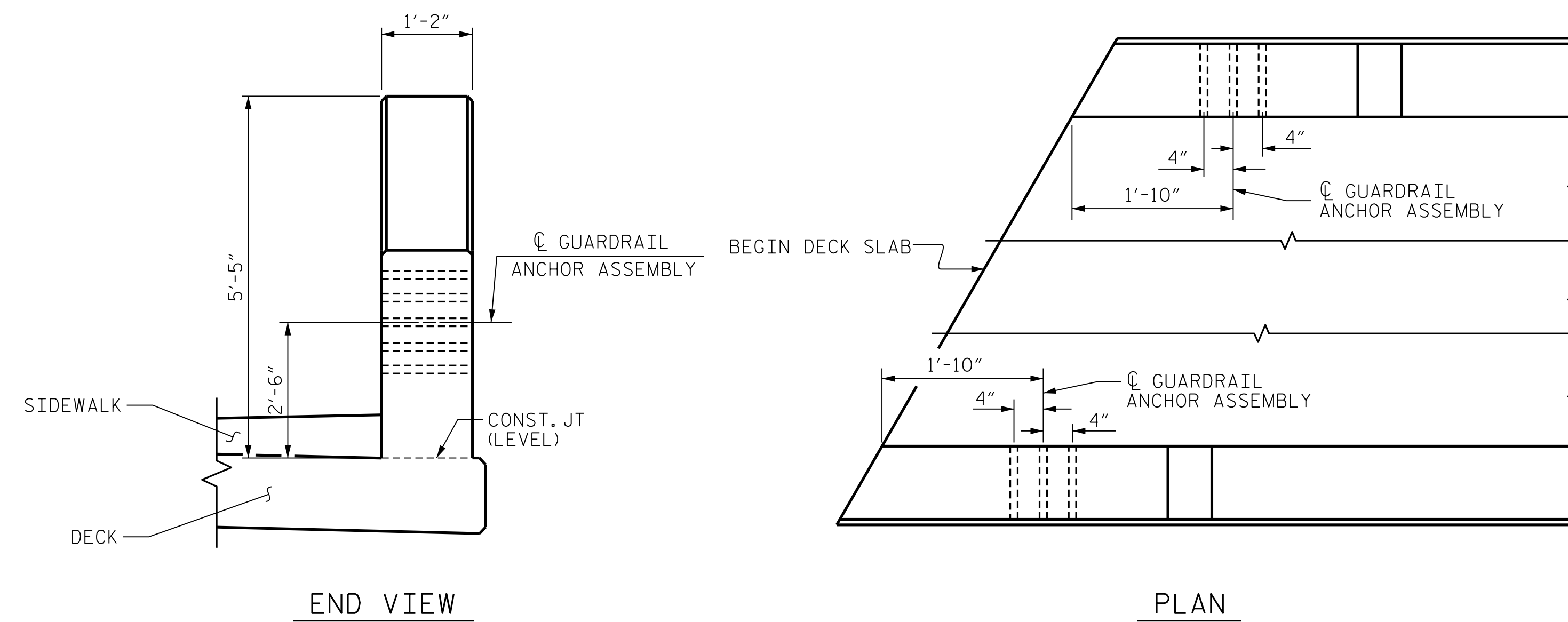


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

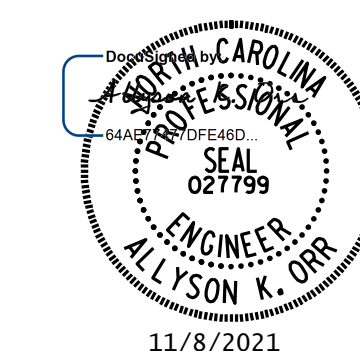
\* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-



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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

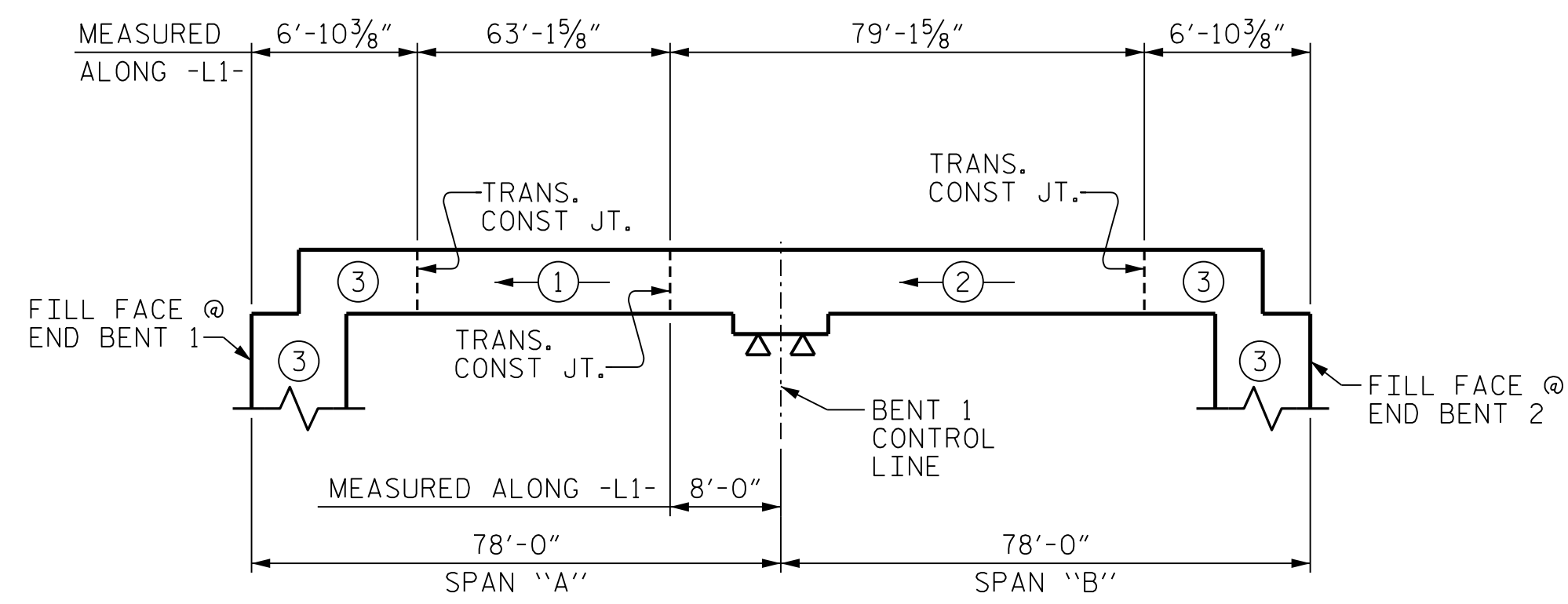
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			39

(SHT 2A) STD. NO. GRA3

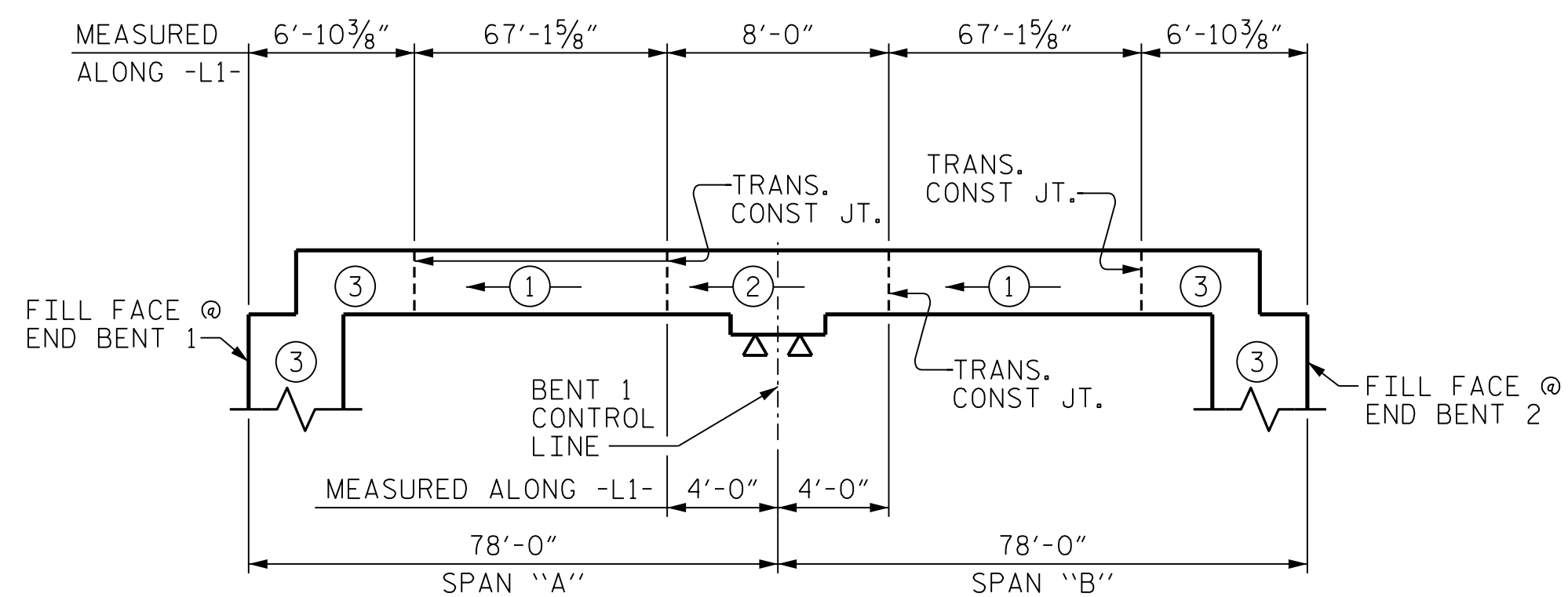
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ASSEMBLED BY: B.E. LANNING	DATE: 12/19
CHECKED BY: A.K. ORR	DATE: 12/19
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 02/20
DRAWN BY: MAA 5/10	REV. 6/13 MAA/GM
CHECKED BY: GM 5/10	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC



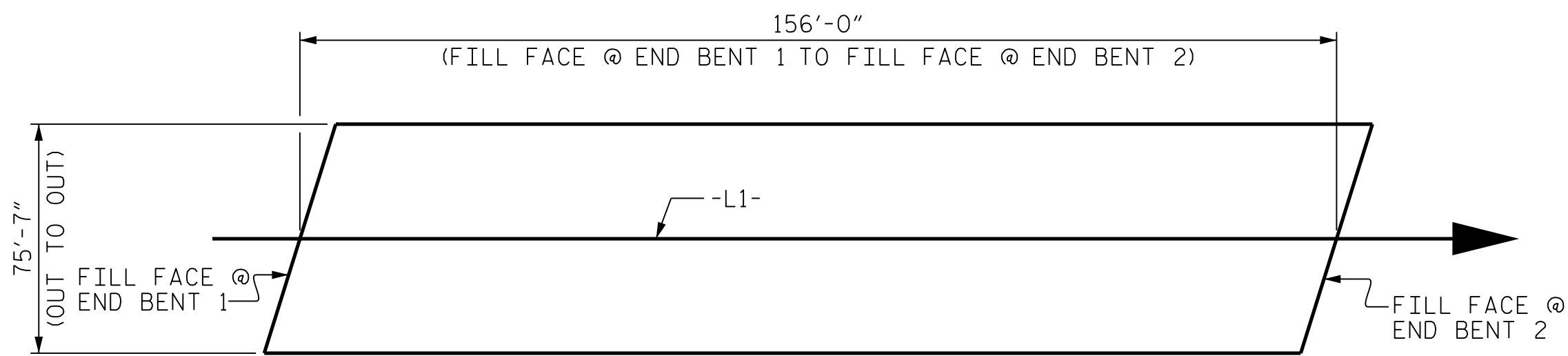
**POURING SEQUENCE**

① → INDICATES POUR NUMBER AND DIRECTION OF POUR



**OPTIONAL POURING SEQUENCE**

POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI.

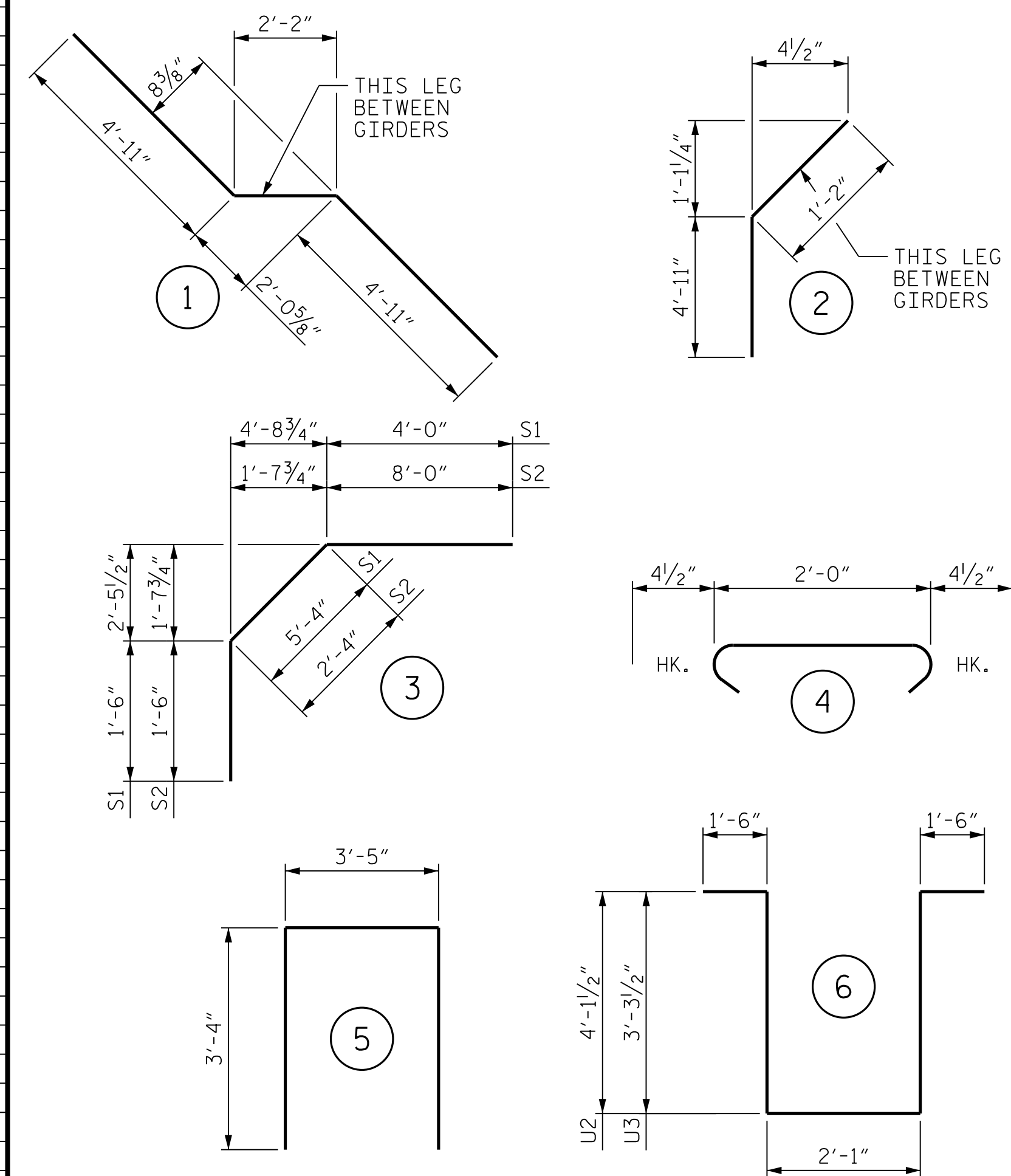


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 11,791)

**REINFORCING BAR SCHEDULE**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	536	#5	STR	38'-10"	21,710	A216	2	#5	STR	45'-9"	95
A2	268	#5	STR	43'-7"	12,183	A217	2	#5	STR	43'-11"	92
*A3	268	#5	STR	33'-8"	9,411	A218	2	#5	STR	42'-0"	88
						A219	2	#5	STR	40'-2"	84
*A101	4	#5	STR	38'-3"	160	A220	2	#5	STR	38'-3"	80
*A102	4	#5	STR	37'-3"	155	A221	2	#5	STR	36'-5"	76
*A103	4	#5	STR	36'-4"	152	A222	2	#5	STR	34'-6"	72
*A104	4	#5	STR	35'-5"	148	A223	2	#5	STR	32'-8"	68
*A105	4	#5	STR	34'-6"	144	A224	2	#5	STR	30'-9"	64
*A106	4	#5	STR	33'-6"	140	A225	2	#5	STR	28'-11"	60
*A107	4	#5	STR	32'-7"	136	A226	2	#5	STR	27'-0"	56
*A108	4	#5	STR	31'-8"	132	A227	2	#5	STR	25'-2"	52
*A109	2	#5	STR	58'-11"	123	A228	2	#5	STR	23'-3"	48
*A110	2	#5	STR	57'-0"	119	A229	2	#5	STR	21'-5"	45
*A111	2	#5	STR	55'-2"	115	A230	2	#5	STR	19'-6"	41
*A112	2	#5	STR	53'-3"	111	A231	2	#5	STR	17'-8"	37
*A113	2	#5	STR	51'-5"	107	A232	2	#5	STR	15'-9"	33
*A114	2	#5	STR	49'-6"	103	A233	2	#5	STR	13'-11"	29
*A115	2	#5	STR	47'-8"	99	A234	2	#5	STR	12'-0"	25
*A116	2	#5	STR	45'-9"	95	A235	2	#5	STR	10'-2"	21
*A117	2	#5	STR	43'-11"	92	A236	2	#5	STR	8'-3"	17
*A118	2	#5	STR	42'-0"	88	A237	2	#5	STR	6'-5"	13
*A119	2	#5	STR	40'-2"	84	A238	2	#5	STR	4'-6"	9
*A120	2	#5	STR	38'-3"	80	A239	2	#5	STR	2'-8"	6
*A121	2	#5	STR	36'-5"	76						
*A122	2	#5	STR	34'-6"	72	B1	297	#5	STR	52'-8"	16,315
*A123	2	#5	STR	32'-8"	68	*B2	122	#6	STR	15'-4"	2810
*A124	2	#5	STR	30'-9"	64	*B3	120	#6	STR	18'-4"	3304
*A125	2	#5	STR	28'-11"	60	*B4	122	#4	STR	37'-0"	3015
*A126	2	#5	STR	27'-0"	56	*B5	61	#6	STR	58'-0"	5314
*A127	2	#5	STR	25'-2"	52	*B6	60	#6	STR	40'-0"	3605
*A128	2	#5	STR	23'-3"	48	*B7	120	#6	STR	24'-0"	4326
*A129	2	#5	STR	21'-5"	45						
*A130	2	#5	STR	19'-6"	41	K1	20	#4	STR	39'-9"	531
*A131	2	#5	STR	17'-8"	37	K2	14	#4	STR	8'-0"	75
*A132	2	#5	STR	15'-9"	33	K3	14	#4	STR	8'-7"	80
*A133	2	#5	STR	13'-11"	29	K4	28	#4	STR	9'-3"	173
*A134	2	#5	STR	12'-0"	25	K5	14	#4	STR	8'-6"	79
*A135	2	#5	STR	10'-2"	21	K6	4	#4	STR	1'-10"	5
*A136	2	#5	STR	8'-3"	17	K7	4	#4	STR	2'-2"	6
*A137	2	#5	STR	6'-5"	13	K8	8	#4	STR	2'-6"	13
*A138	2	#5	STR	4'-6"	9	K9	4	#4	STR	2'-1"	6
*A139	2	#5	STR	2'-8"	6	K10	10	#4	2	6'-1"	41
						K11	30	#4	1	12'-0"	240
A201	4	#5	STR	38'-0"	159	K12	14	#4	STR	6'-9"	63
A202	4	#5	STR	37'-1"	155	K13	14	#4	STR	8'-7"	80
A203	4	#5	STR	36'-2"	151	K14	28	#4	STR	9'-3"	173
A204	4	#5	STR	35'-2"	147	K15	14	#4	STR	8'-6"	79
A205	4	#5	STR	34'-3"	143						
A206	4	#5	STR	33'-4"	139	*S1	130	#4	3	10'-10"	941
A207	4	#5	STR	32'-5"	135	*S2	138	#4	3	11'-10"	1091
A208	4	#5	STR	31'-5"	131	S3	238	#4	4	2'-9"	437
A209	2	#5	STR	58'-11"	123						
A210	2	#5	STR	57'-0"	119	U1	138	#4	5	10'-1"	930
A211	2	#5	STR	55'-2"	115	U2	49	#4	6	13'-4"	436
A212	2	#5	STR	53'-3"	111	U3	14	#4	6	11'-8"	109
A213	2	#5	STR	51'-5"	107						
A214	2	#5	STR	49'-6"	103						
A215	2	#5	STR	47'-8"	99						

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**— SUPERSTRUCTURE BILL OF MATERIAL —**

	CLASS AA CONCRETE ( CU. YDS. )	REINFORCING STEEL ( LBS. )	EPOXY COATED REINFORCING STEEL ( LBS. )
POUR #1	153.2	-	-
POUR #2	214.4	-	-
POUR #3	107.1	-	-
TOTALS**	474.7	35,202	58,682

\*\* QUANTITIES FOR PARAPET, SIDEWALK AND MEDIAN ARE NOT INCLUDED

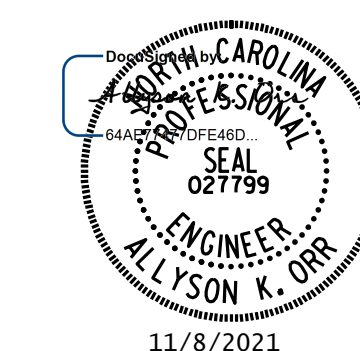
**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2504 SQ.FT.
BRIDGE DECK	7946 SQ.FT.
TOTAL	10,450 SQ.FT.

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

**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"			



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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

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

REVISIONS						SHEET NO. S-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

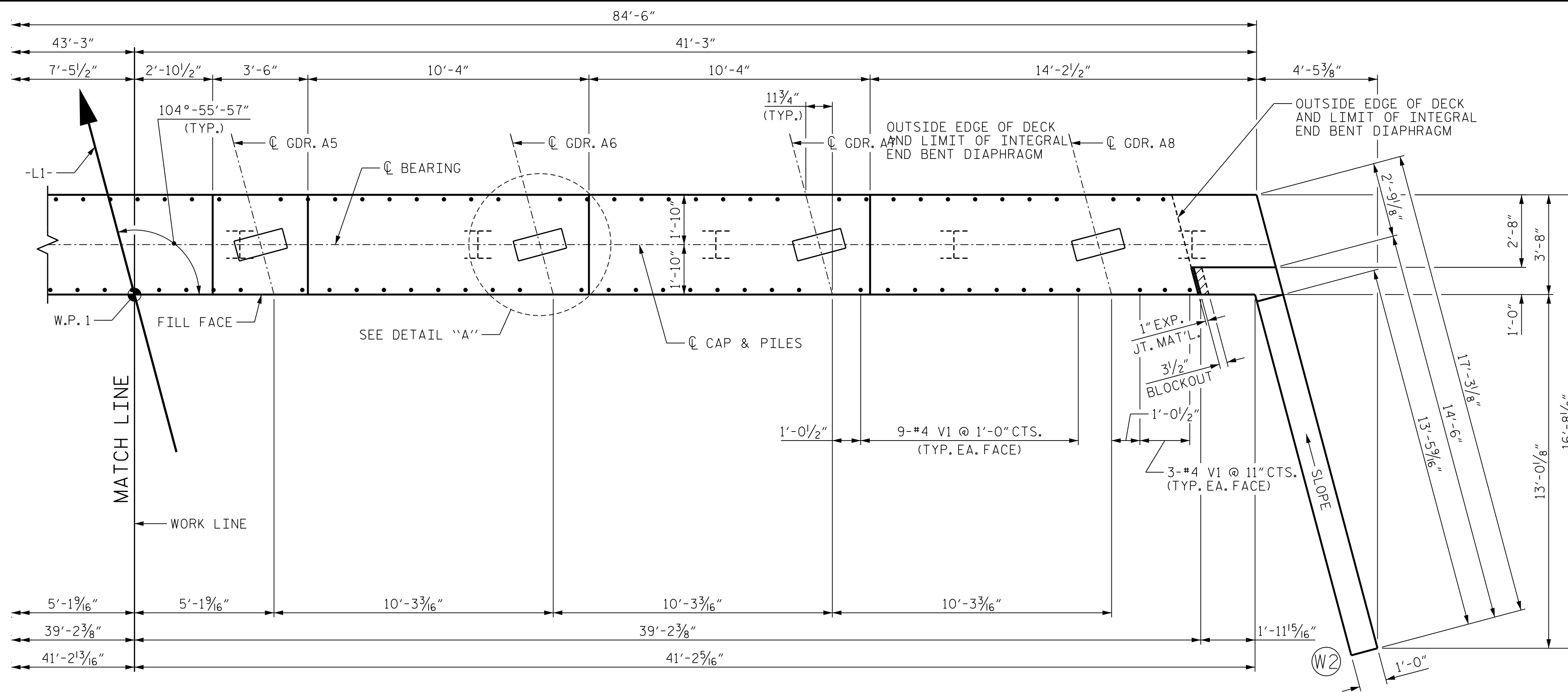
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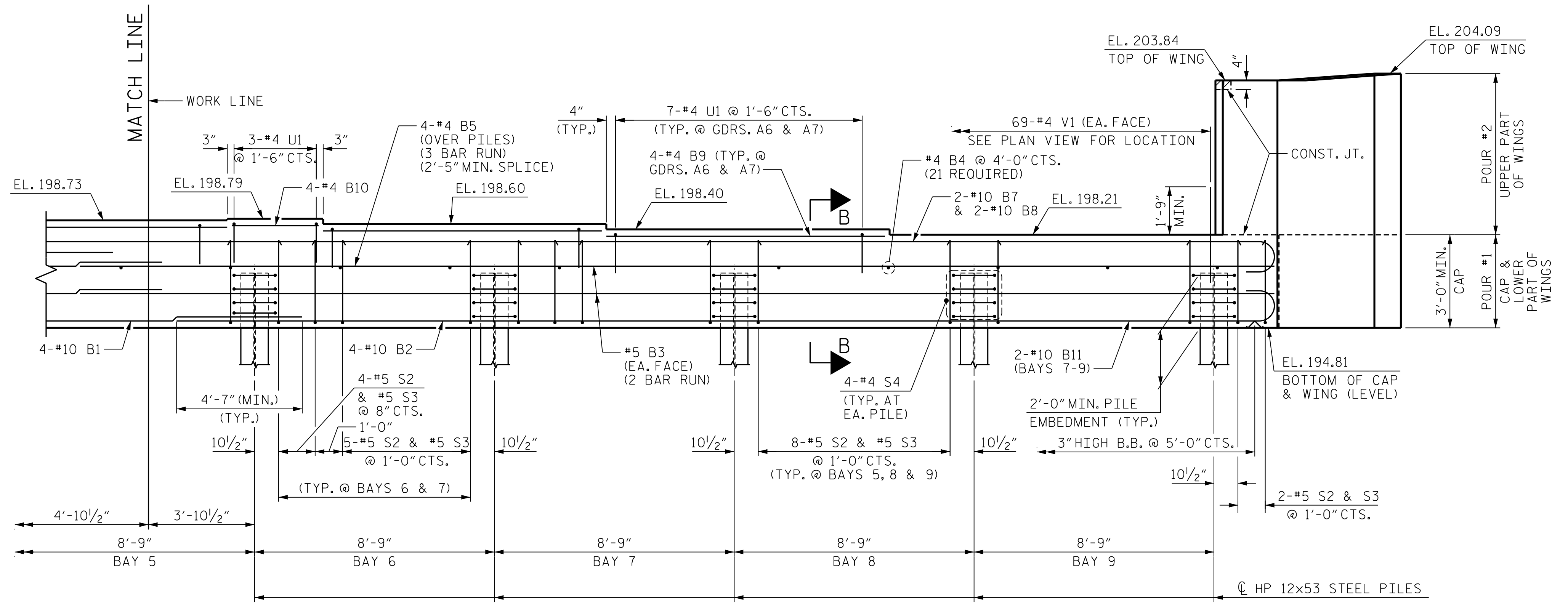
ASSEMBLED BY: B.E. LANNING	DATE: 02/20
CHECKED BY: A.K. ORR	DATE: 02/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 02/20
DRAWN BY: JMB 5/87	REV. 10/1/11 MAA/GM
CHECKED BY: SJD 9/87	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC



**NOTES**  
 FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.  
 FOR DETAIL "A", SEE SHEET 1 OF 4.  
 FOR SECTION B-B, SEE SHEET 4 OF 4.



**PLAN**

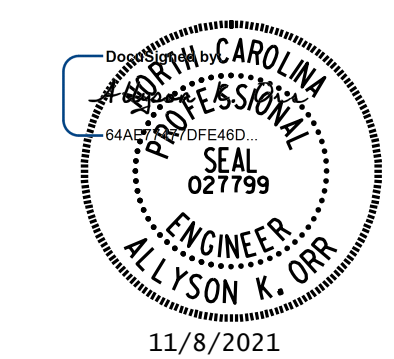


**ELEVATION**

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 PLAN AND ELEVATION



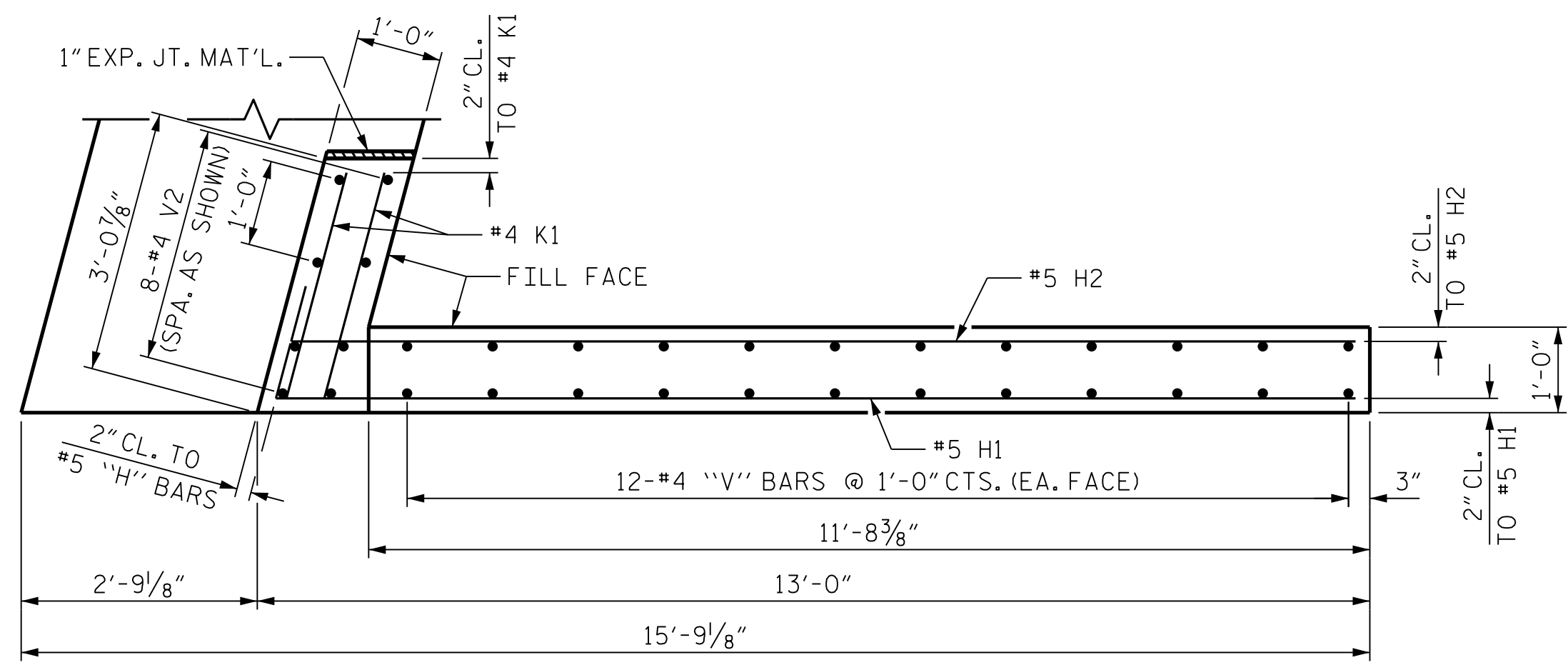
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

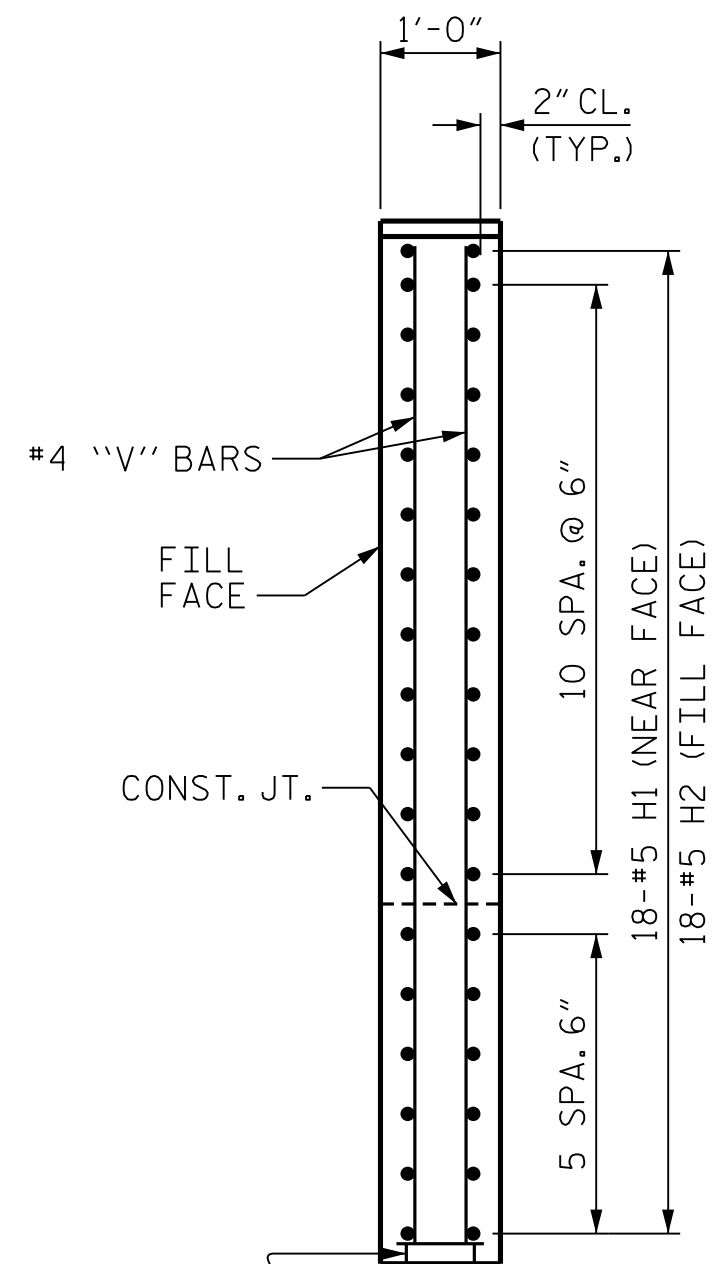
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 39

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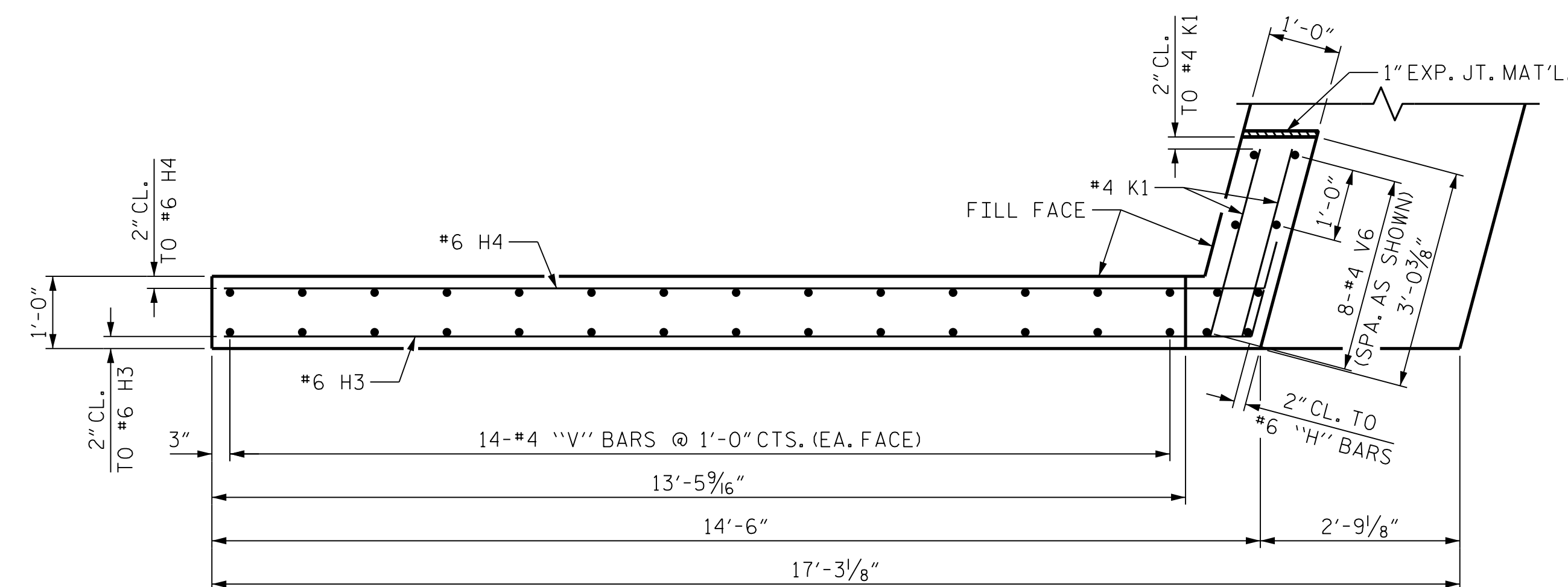
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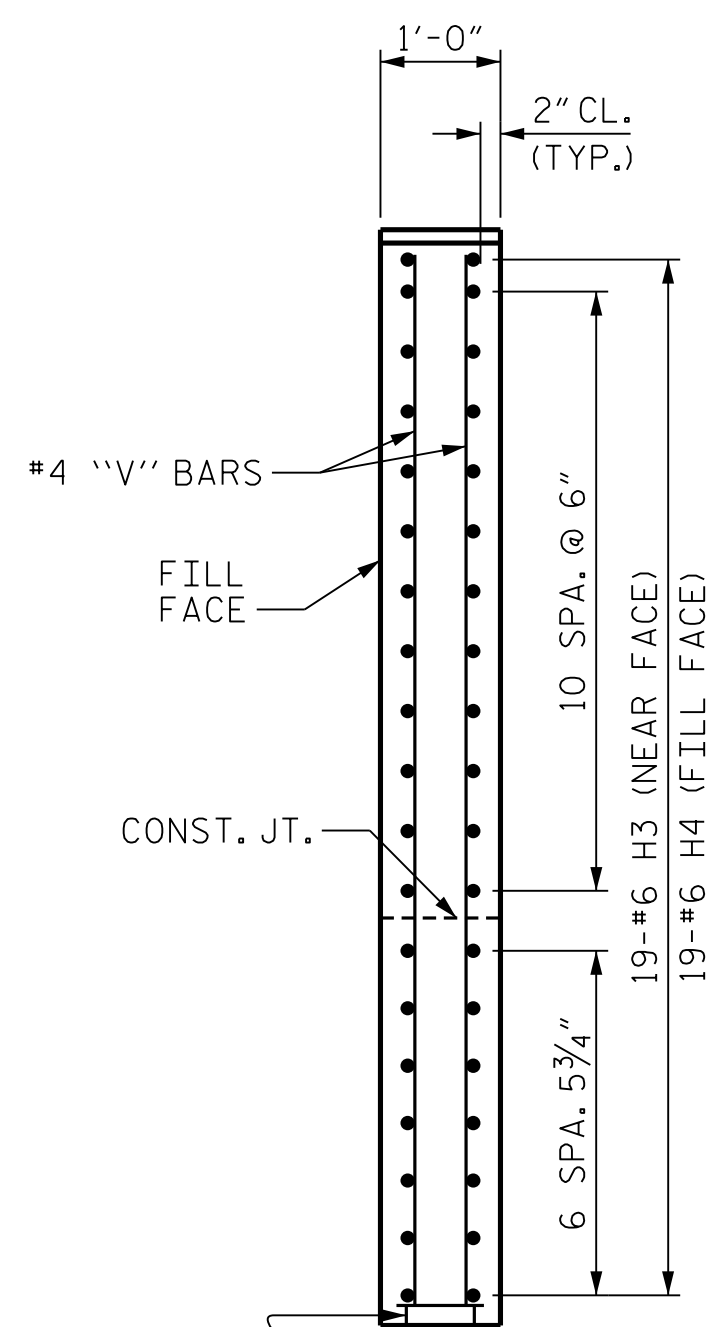
PLAN OF WING (W1)



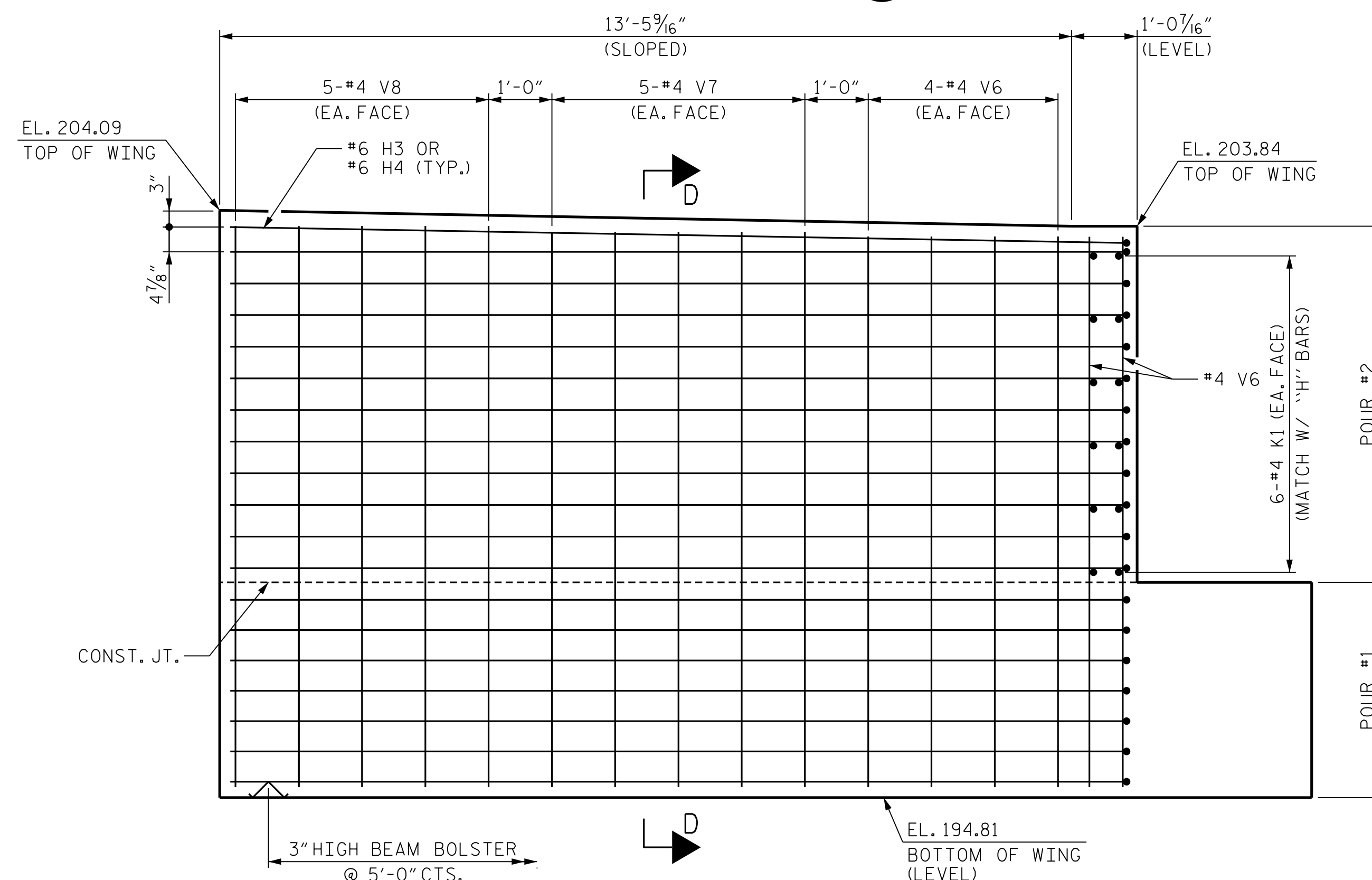
SECTION C-C



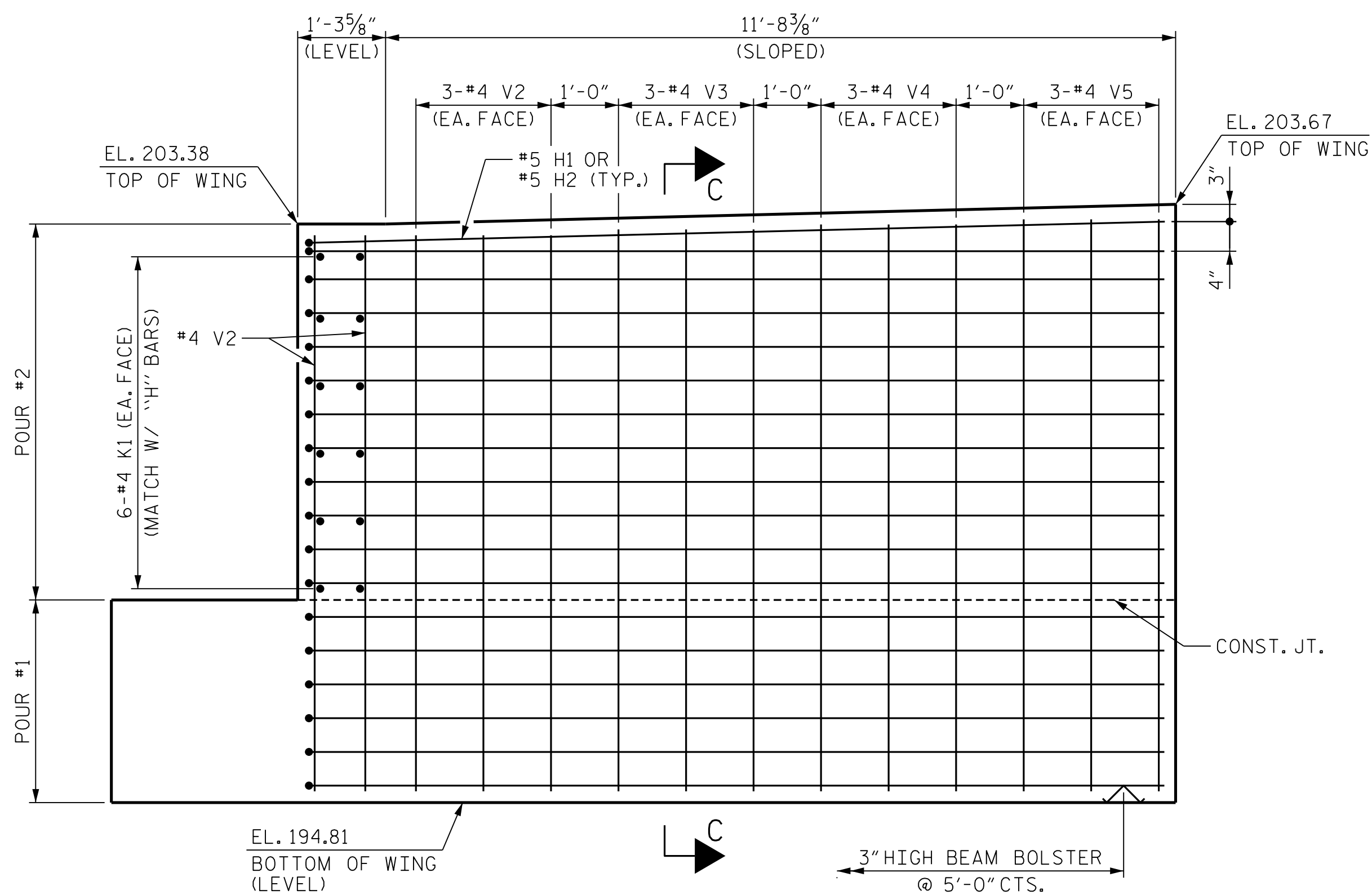
PLAN OF WING (W2)



SECTION D-D



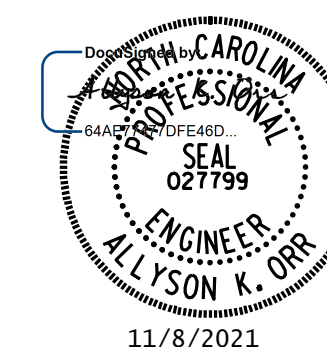
ELEVATION OF WING (W2)



ELEVATION OF WING (W1)

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 3 OF 4



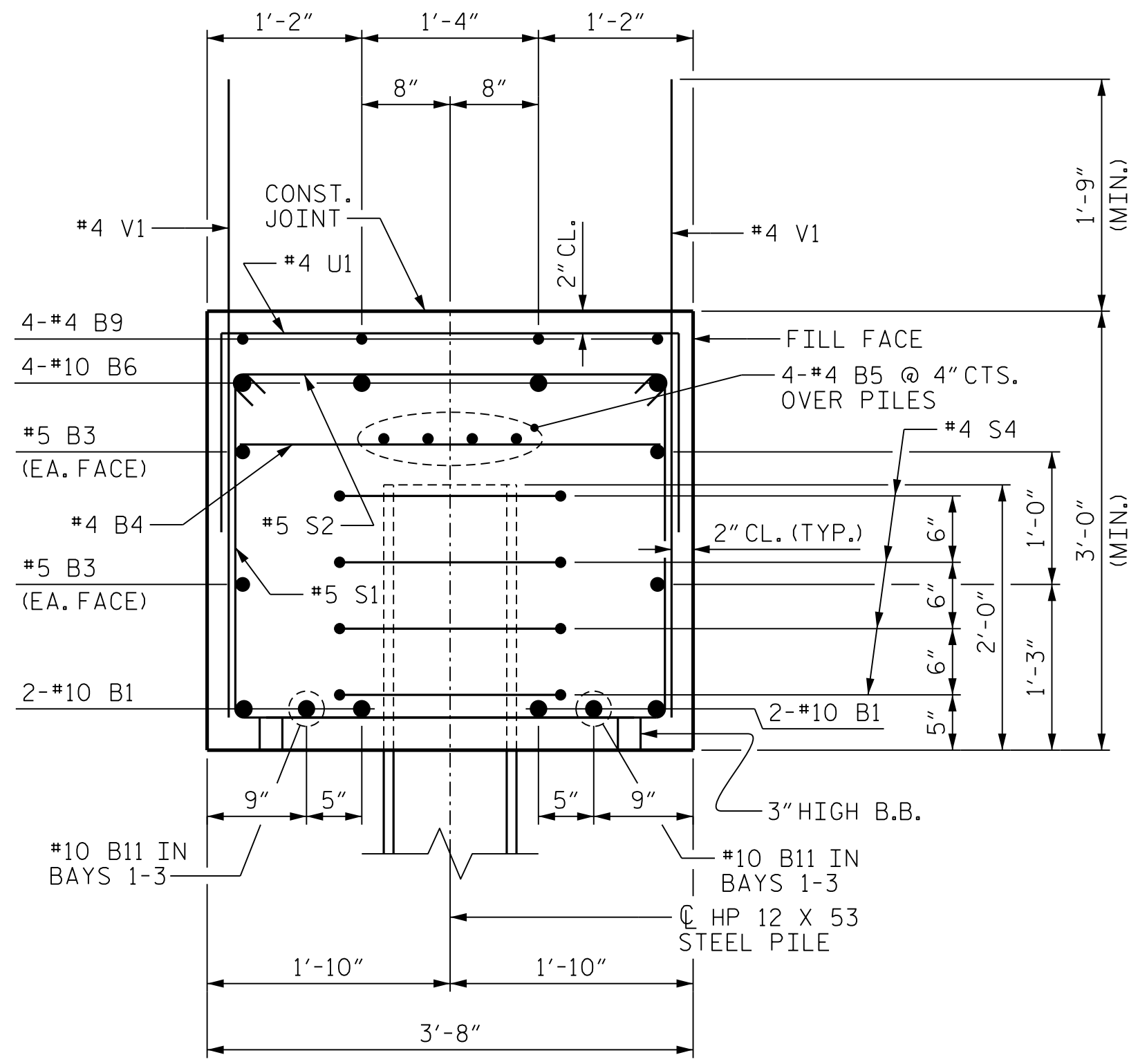
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 UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

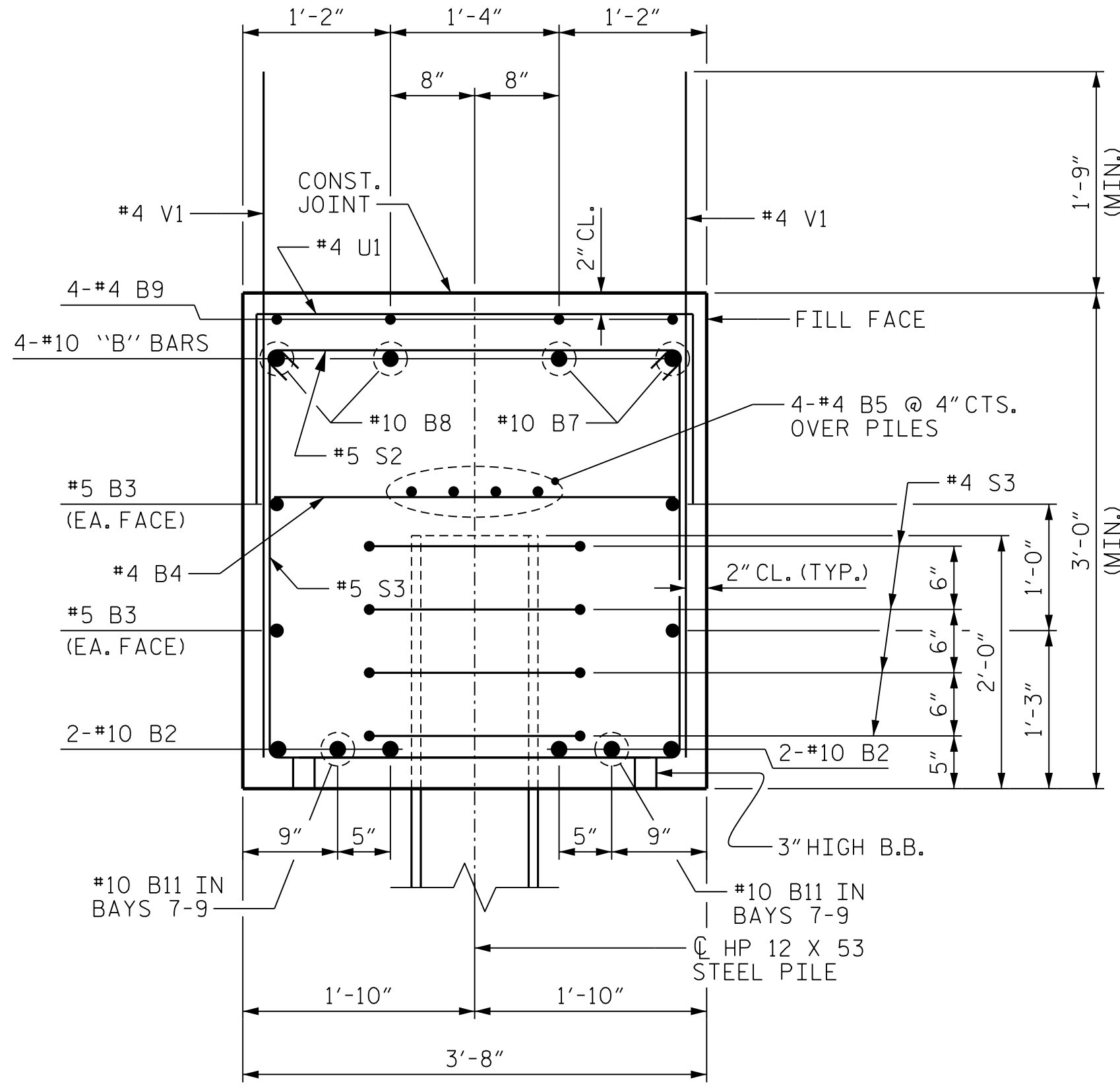
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SUBSTRUCTURE END BENT 1 WINGWALL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-28
TOTAL SHEETS					39

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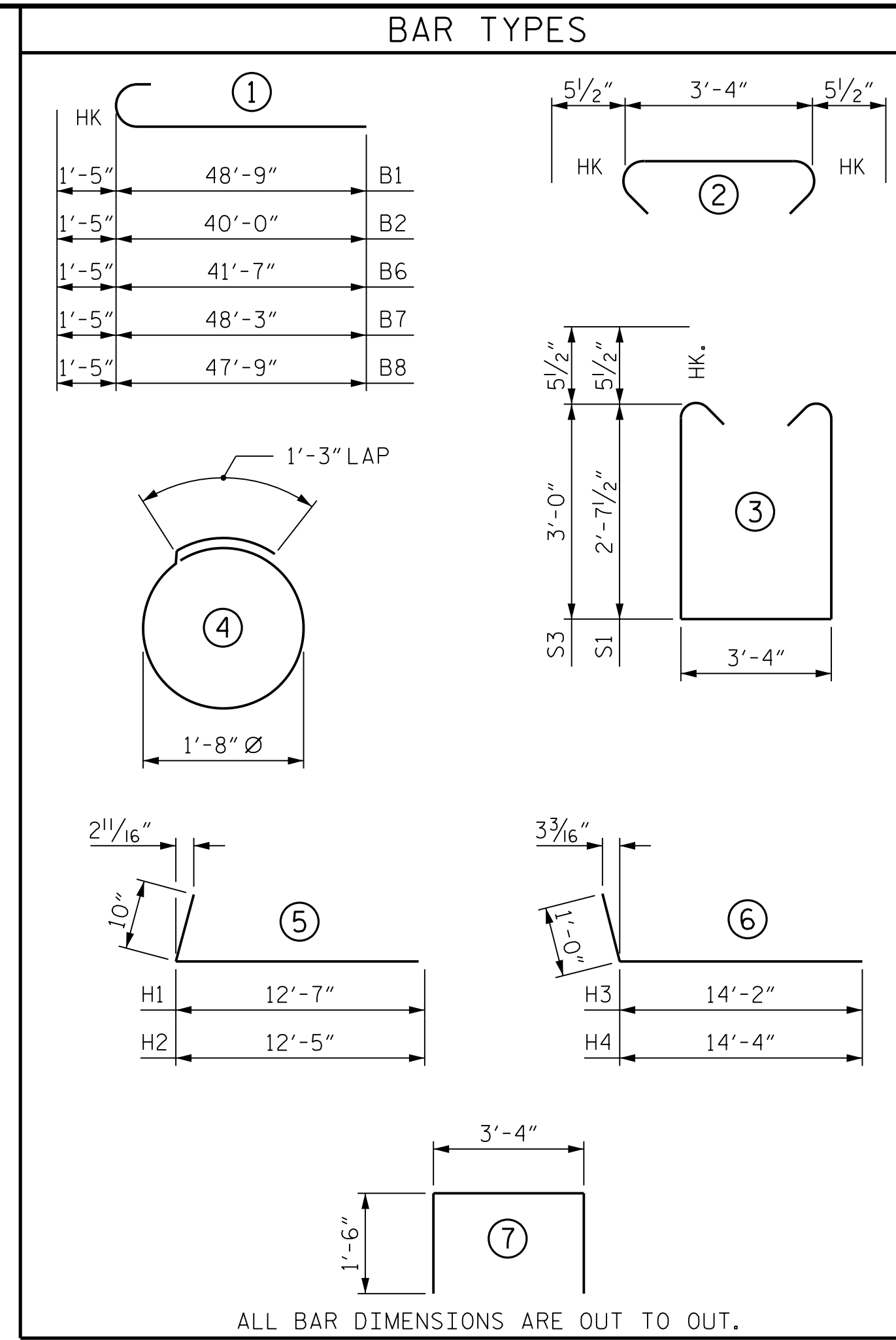
DRAWN BY: B.E. LANNING	DATE: 01/20
CHECKED BY: A.K. ORR	DATE: 01/20
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 03/20



SECTION A-A

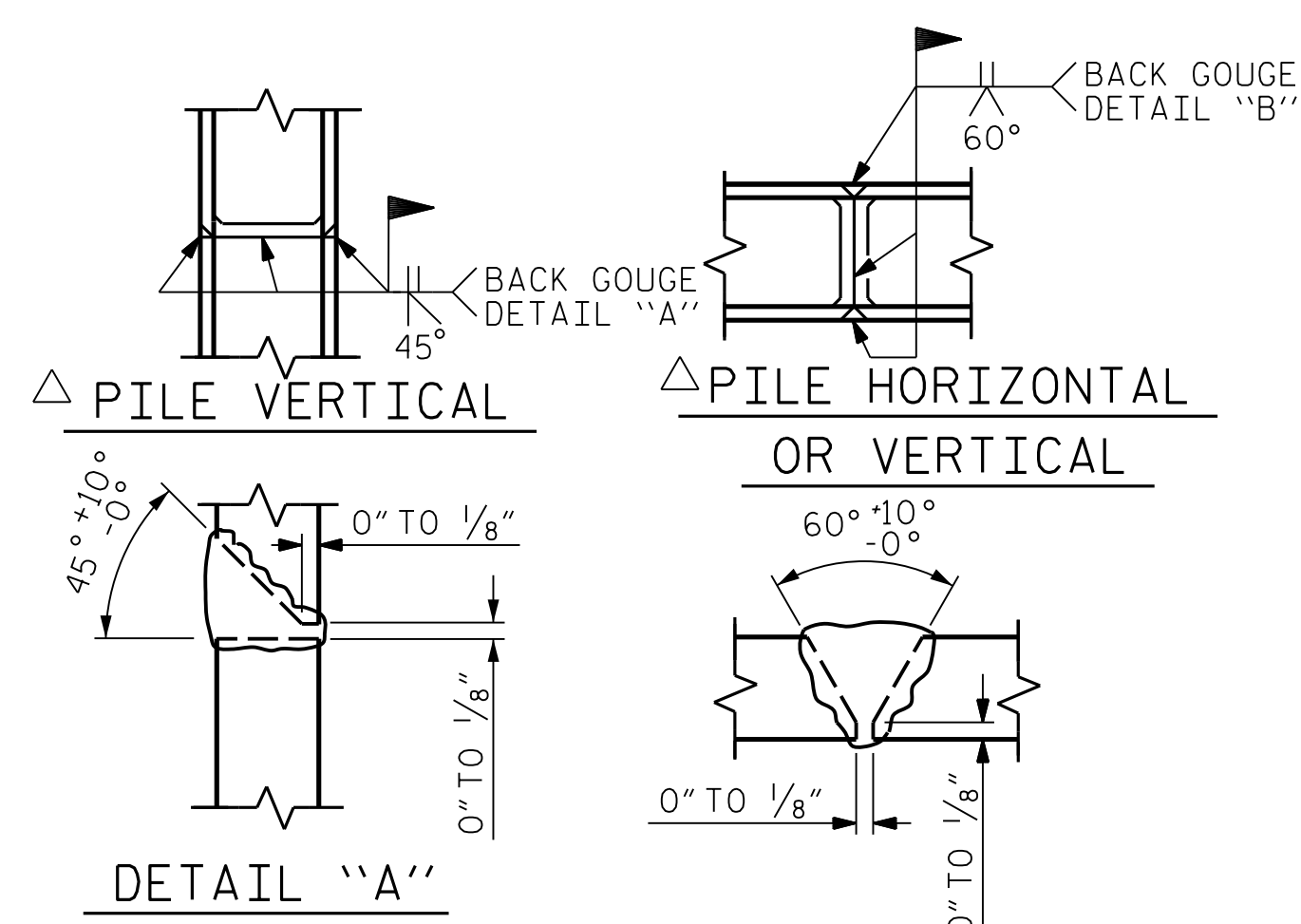


SECTION B-B

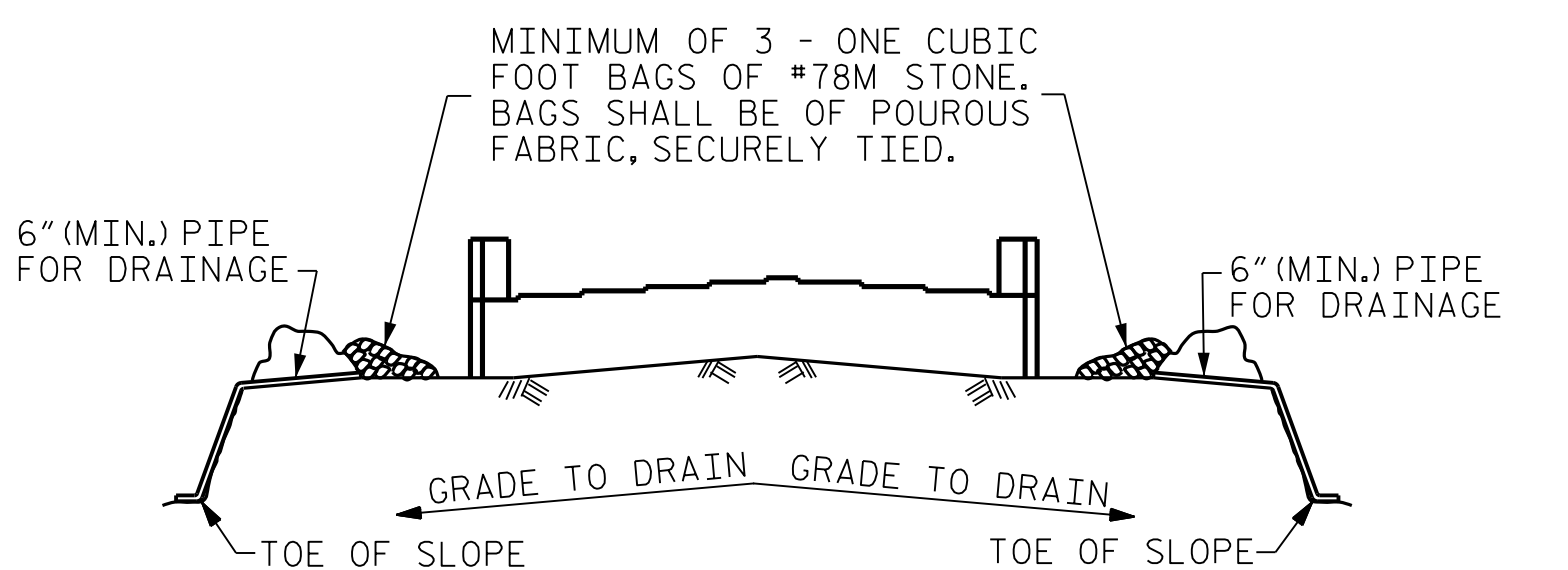


BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	50'-2"	863
B2	4	#10	1	41'-5"	713
B3	8	#5	STR	44'-1"	368
B4	21	#4	STR	3'-4"	47
B5	12	#4	STR	30'-0"	240
B6	4	#10	1	43'-0"	740
B7	2	#10	1	49'-8"	427
B8	2	#10	1	49'-2"	423
B9	20	#4	STR	10'-2"	136
B10	4	#4	STR	3'-2"	8
B11	4	#10	STR	32'-0"	551
H1	18	#5	5	13'-5"	252
H2	18	#5	5	13'-3"	249
H3	19	#6	6	15'-2"	433
H4	19	#6	6	15'-4"	438
K1	24	#4	STR	2'-8"	43
S1	33	#5	3	9'-6"	327
S2	80	#5	2	4'-3"	355
S3	47	#5	3	10'-3"	402
S4	40	#4	4	6'-6"	174
U1	38	#4	7	6'-4"	161
V1	138	#4	STR	5'-6"	507
V2	14	#4	STR	8'-1"	76
V3	6	#4	STR	8'-2"	33
V4	6	#4	STR	8'-3"	33
V5	6	#4	STR	8'-4"	33
V6	16	#4	STR	8'-7"	92
V7	10	#4	STR	8'-8"	58
V8	10	#4	STR	8'-9"	58

REINFORCING STEEL	8066 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP & LOWER PART OF WINGS)	43.3 C.Y.
POUR #2 (UPPER PART OF WINGS)	6.7 C.Y.
TOTAL	50.0 C.Y.
HP 12 X 53 STEEL PILES	NO.: 10 650 LIN. FT.
STEEL PILE POINTS	NO.: 10
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	EA.: 10



PILE SPLICE DETAILS



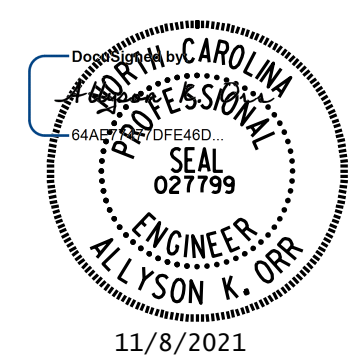
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-  
 SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 DETAILS AND  
 BILL OF MATERIAL

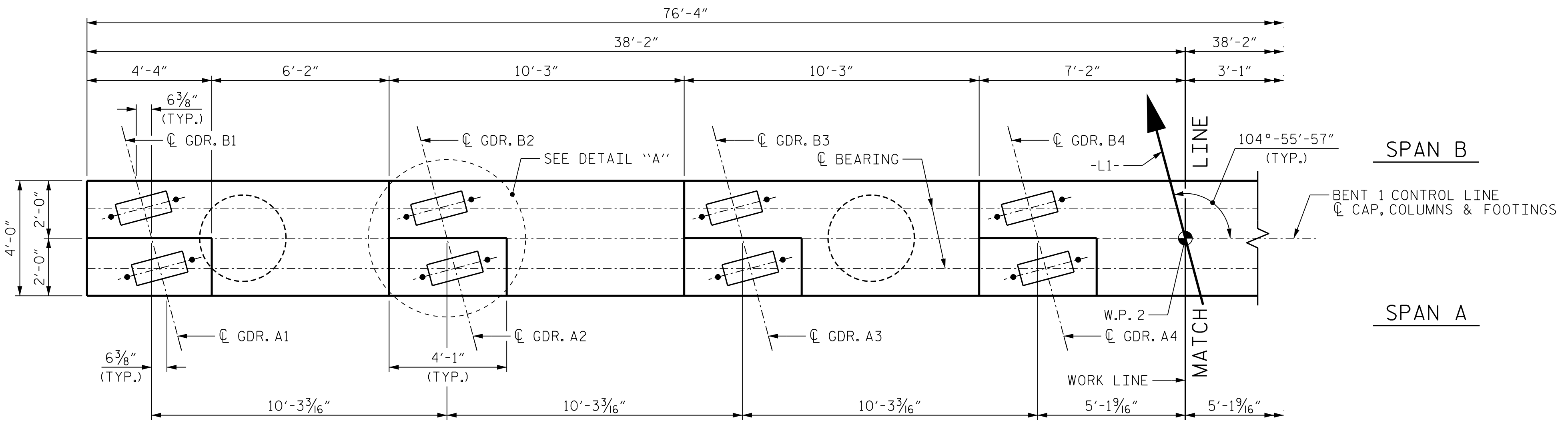
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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-29 TOTAL SHEETS 39
2			4			

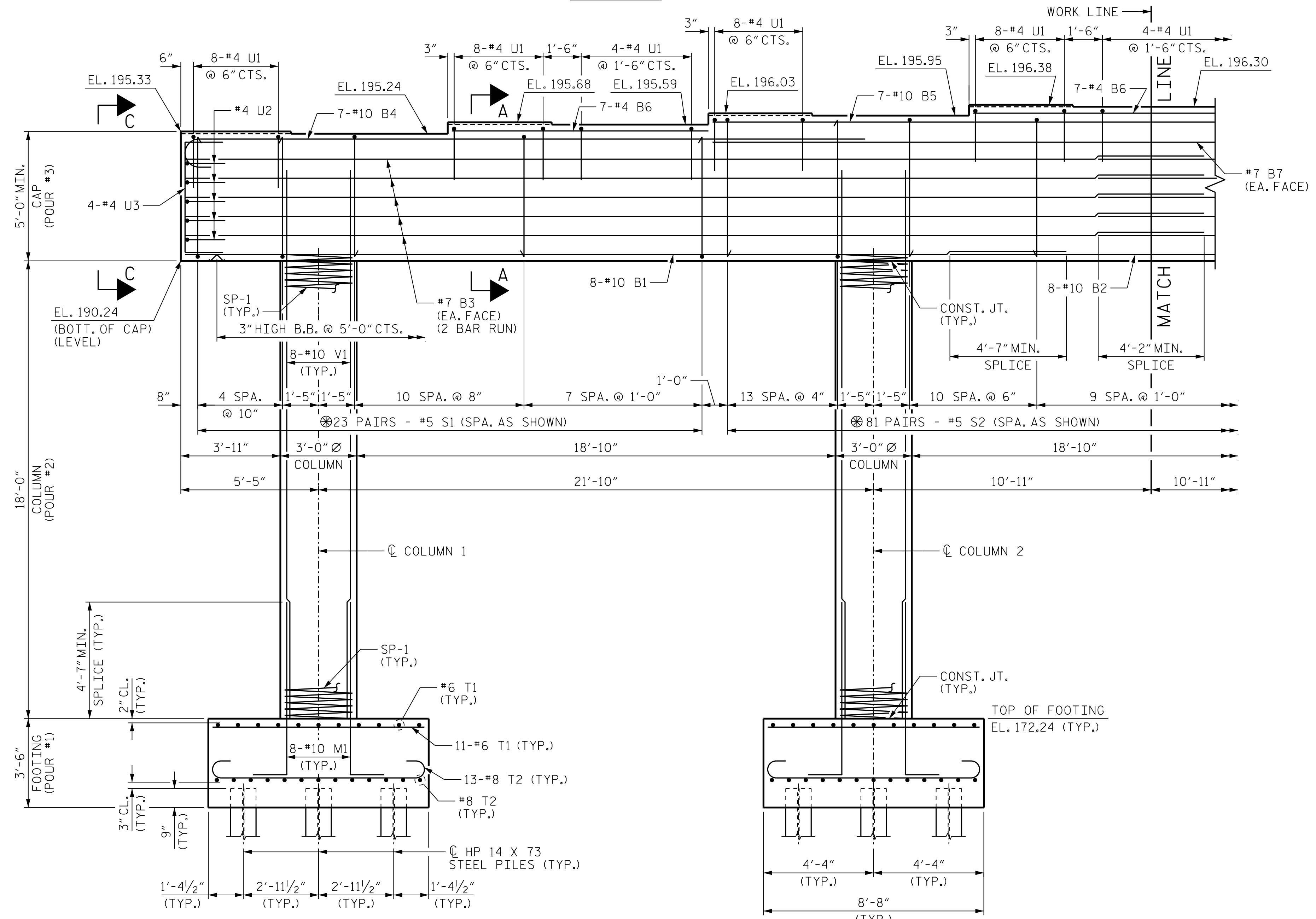
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CHECKED BY : A.K. ORR	DATE : 01/20
DESIGN ENGINEER OF RECORD : A.K. ORR	DATE : 03/20

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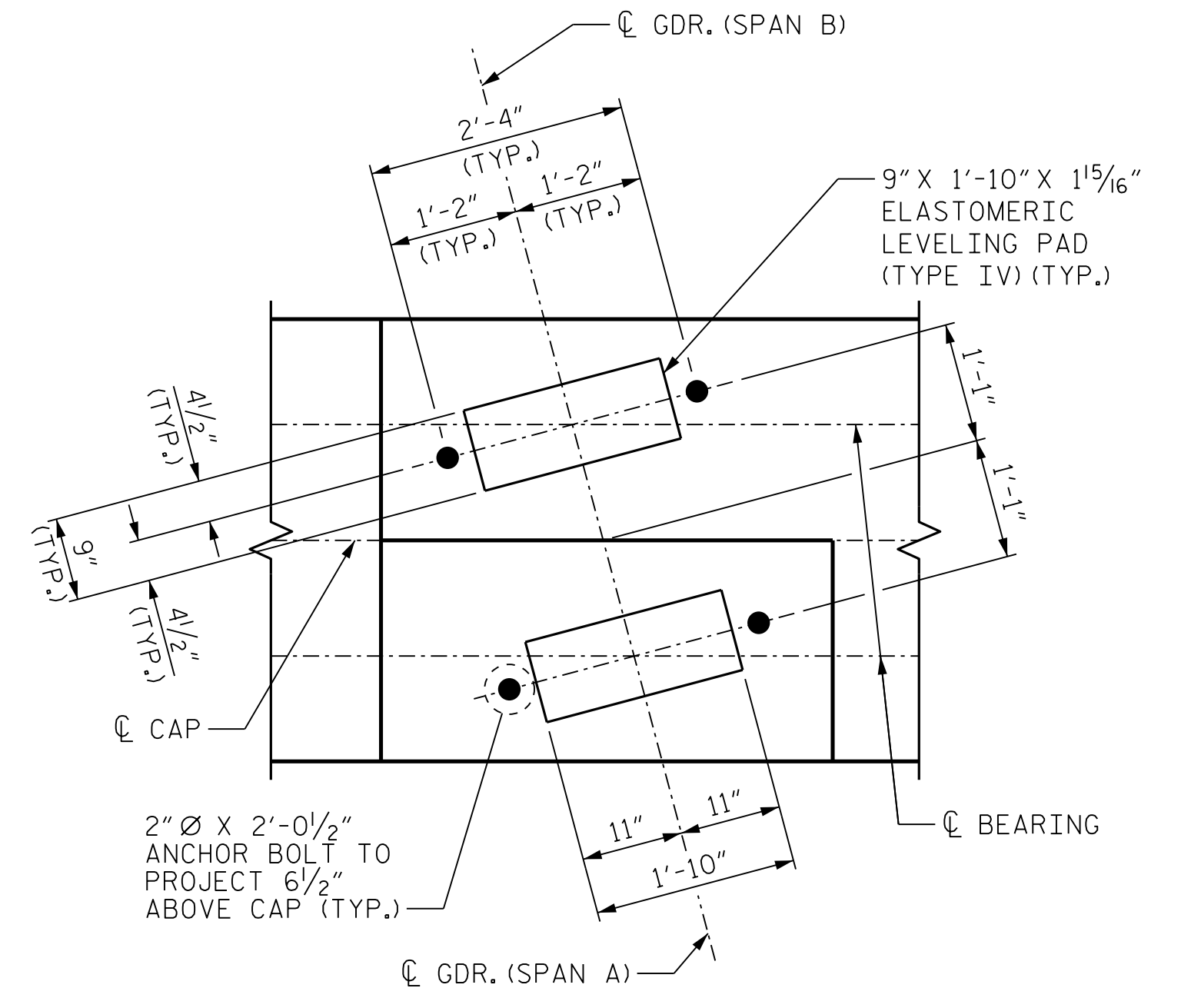


PLAN

**NOTES**  
 STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR END ELEVATION, SEE SHEET 2 OF 3.  
 FOR SECTION A-A AND VIEW C-C, SEE SHEET 3 OF 3.  
 ⊗ INVERT ALTERNATE PAIRS OF STIRRUPS.  
 FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 4 OF 4.



ELEVATION

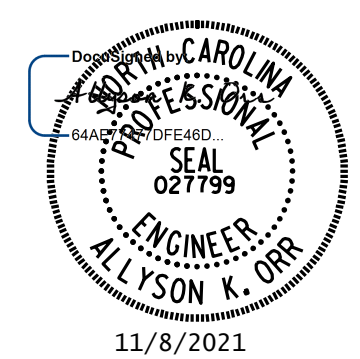


DETAIL "A"

REINFORCING STEEL, DIMENSIONS, AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS NOTED OTHERWISE.

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 PLAN AND ELEVATION

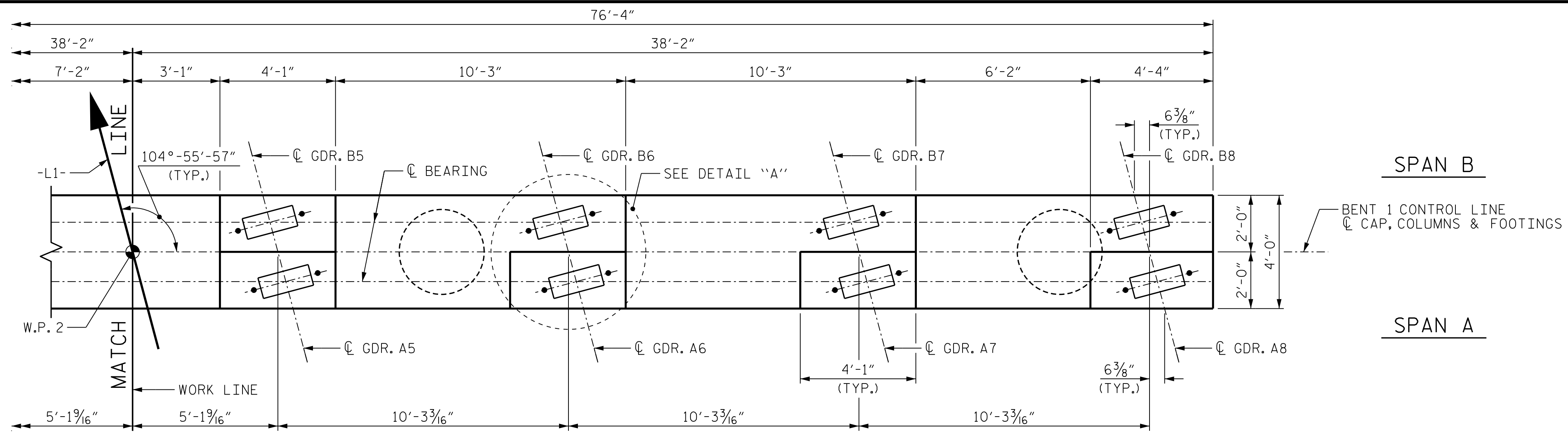
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

MI ENGINEERING  
 1011 SCHAUH DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

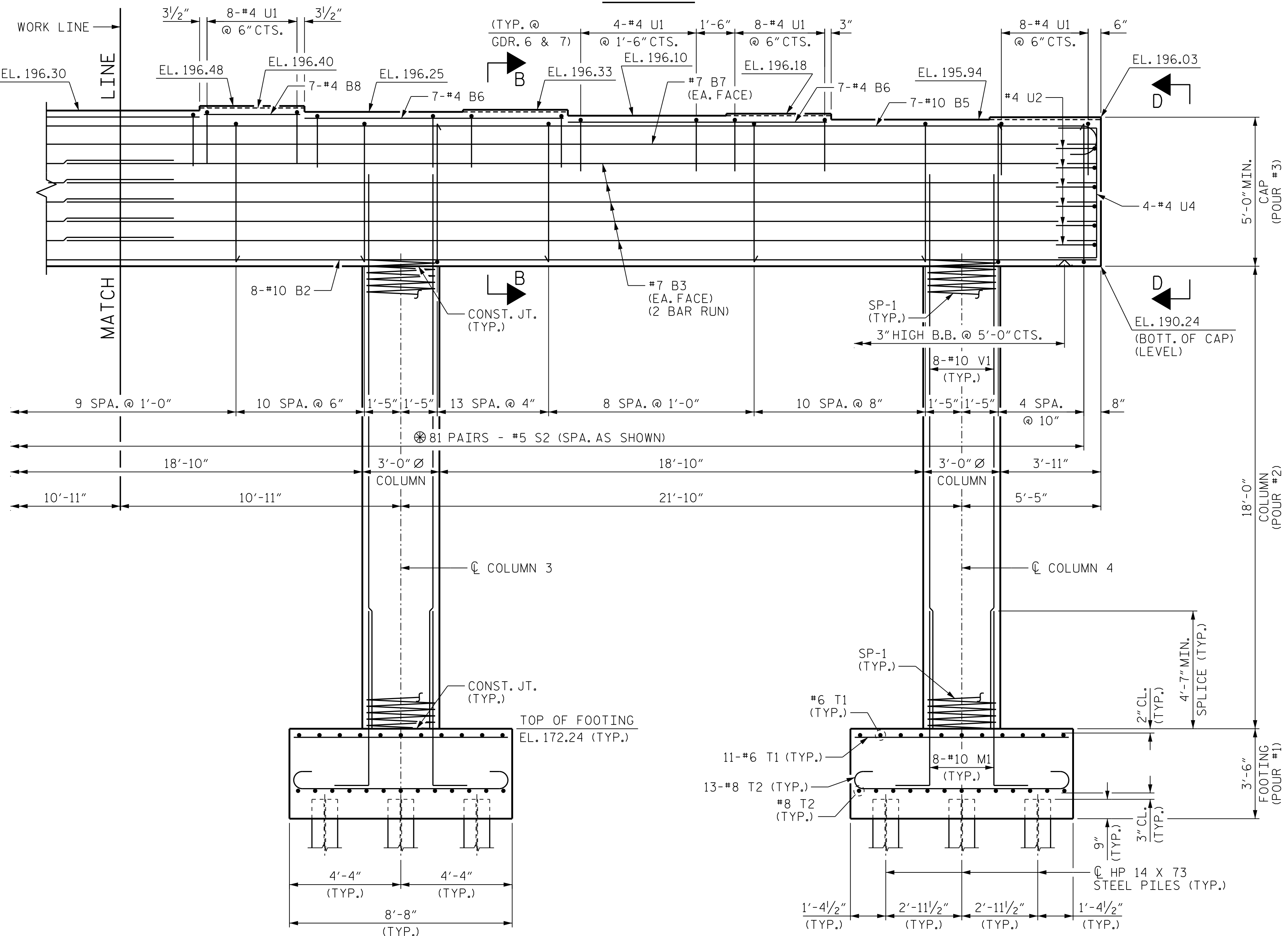
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
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2			4			39	

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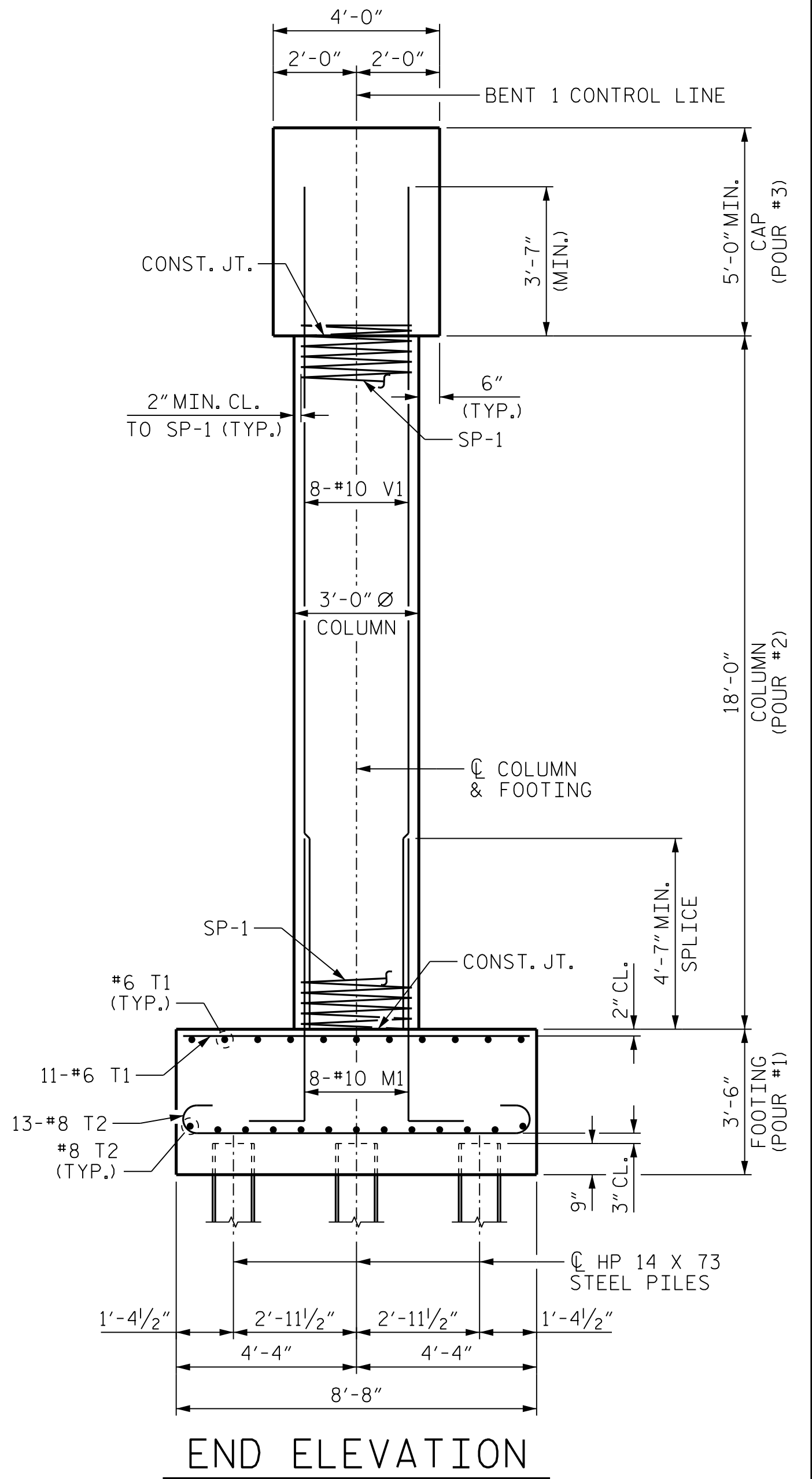
PLAN



ELEVATION

REINFORCING STEEL, DIMENSIONS, AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS NOTED OTHERWISE.

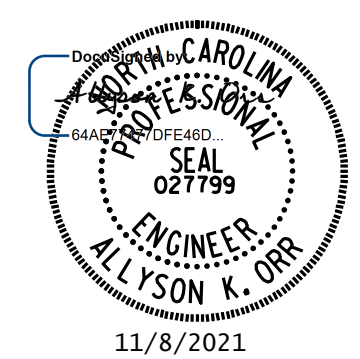
- NOTES**
- FOR ADDITIONAL NOTES, SEE SHEET 1 OF 3.
  - ⊗ INVERT ALTERNATE PAIRS OF STIRRUPS.
  - FOR DETAIL "A", SEE SHEET 1 OF 3.
  - FOR SECTION B-B AND VIEW D-D, SEE SHEET 3 OF 3.



END ELEVATION

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 3



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MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 PLAN AND ELEVATION

REVISIONS						SHEET NO. <b>S-31</b>
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS <b>39</b>
2			4			

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 CHECKED BY: A.K. ORR DATE: 02/20  
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 03/20





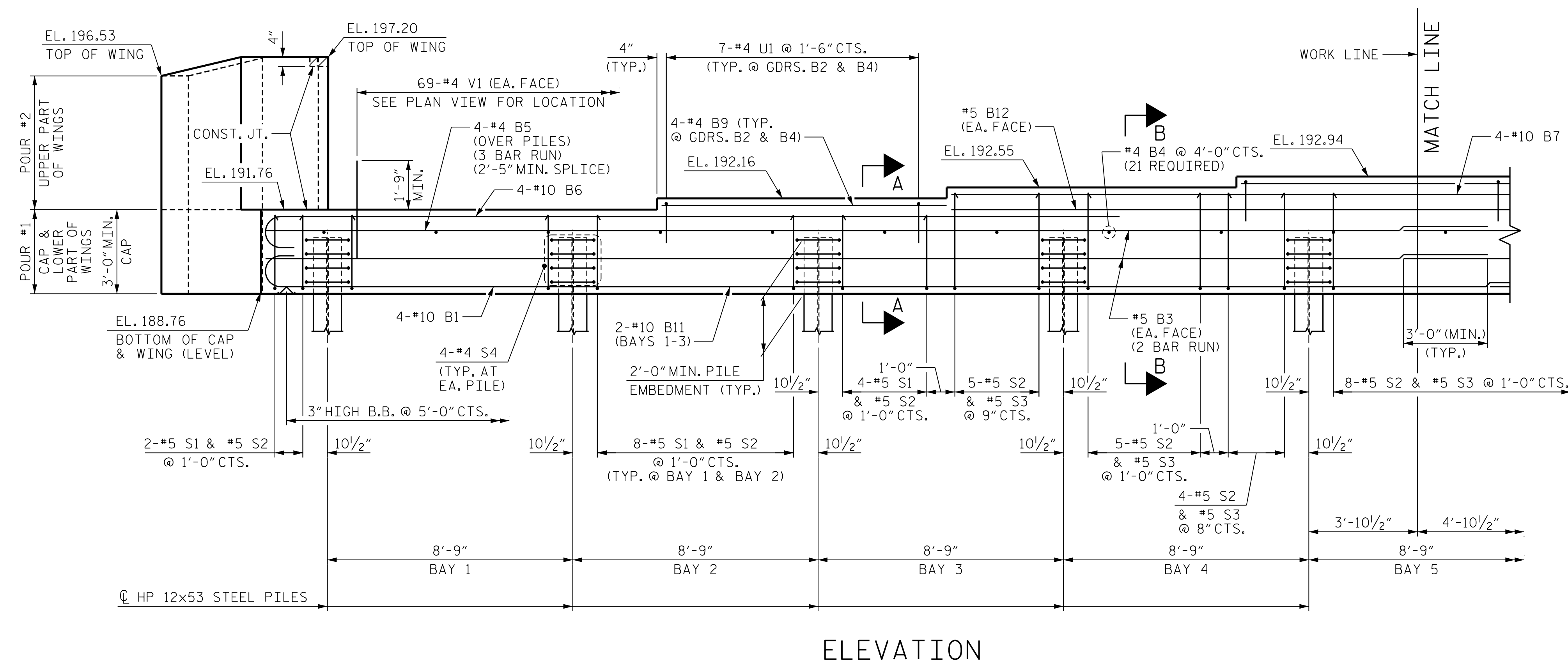
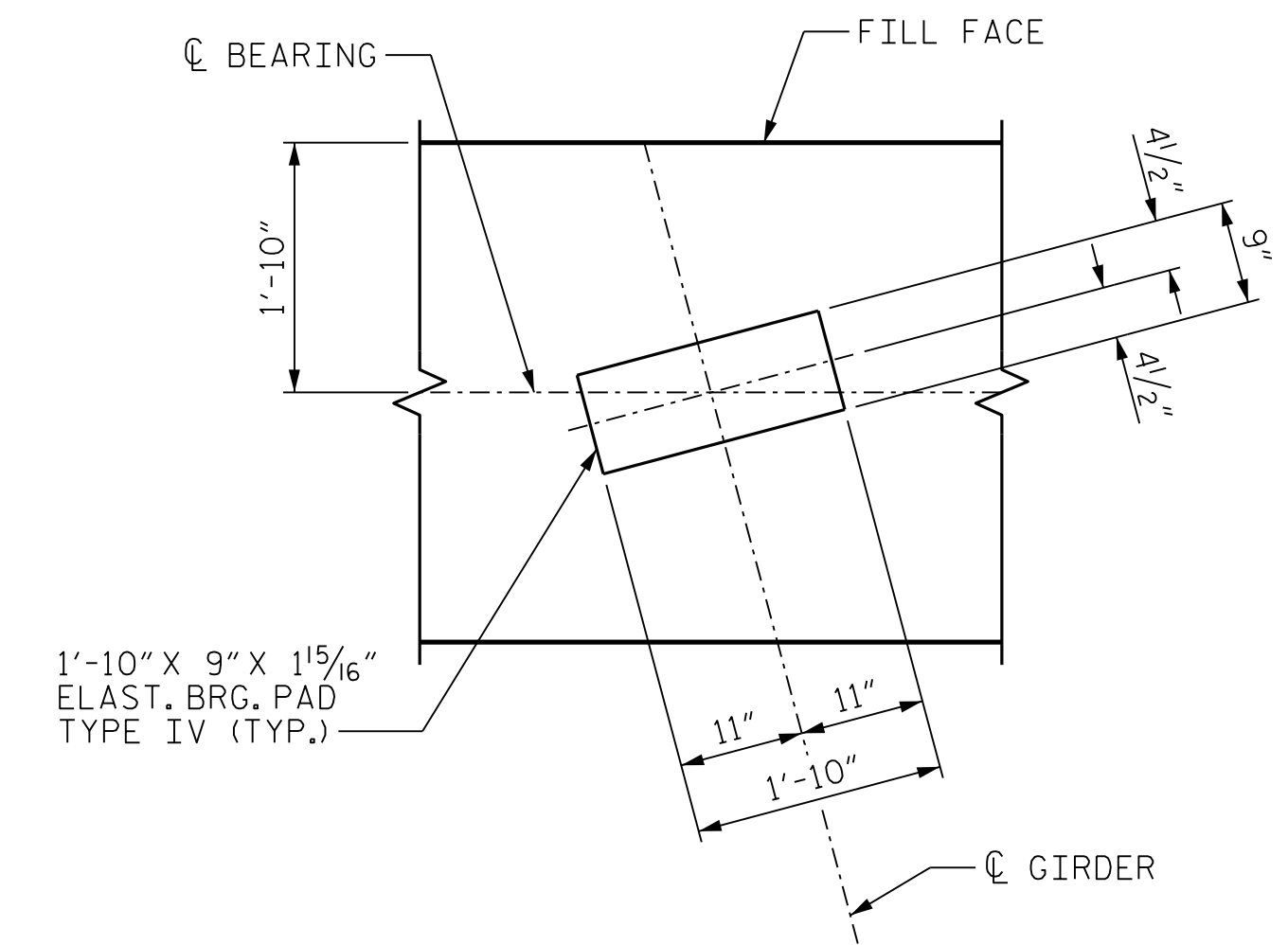
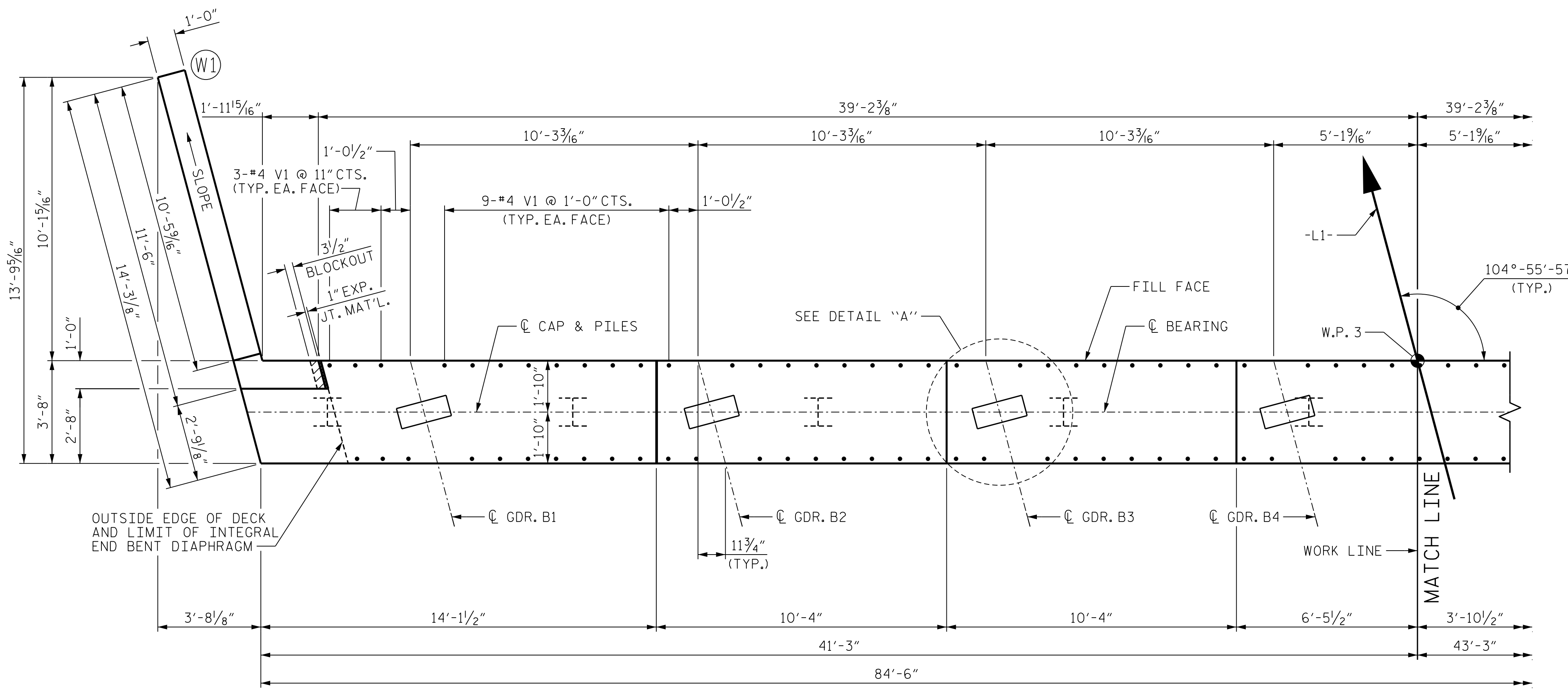
**NOTES**

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

FOR SECTION A-A, PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 4 OF 4.

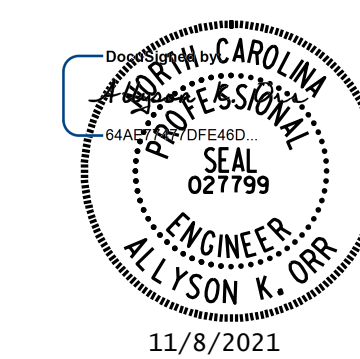
THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.



PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 PLAN AND ELEVATION

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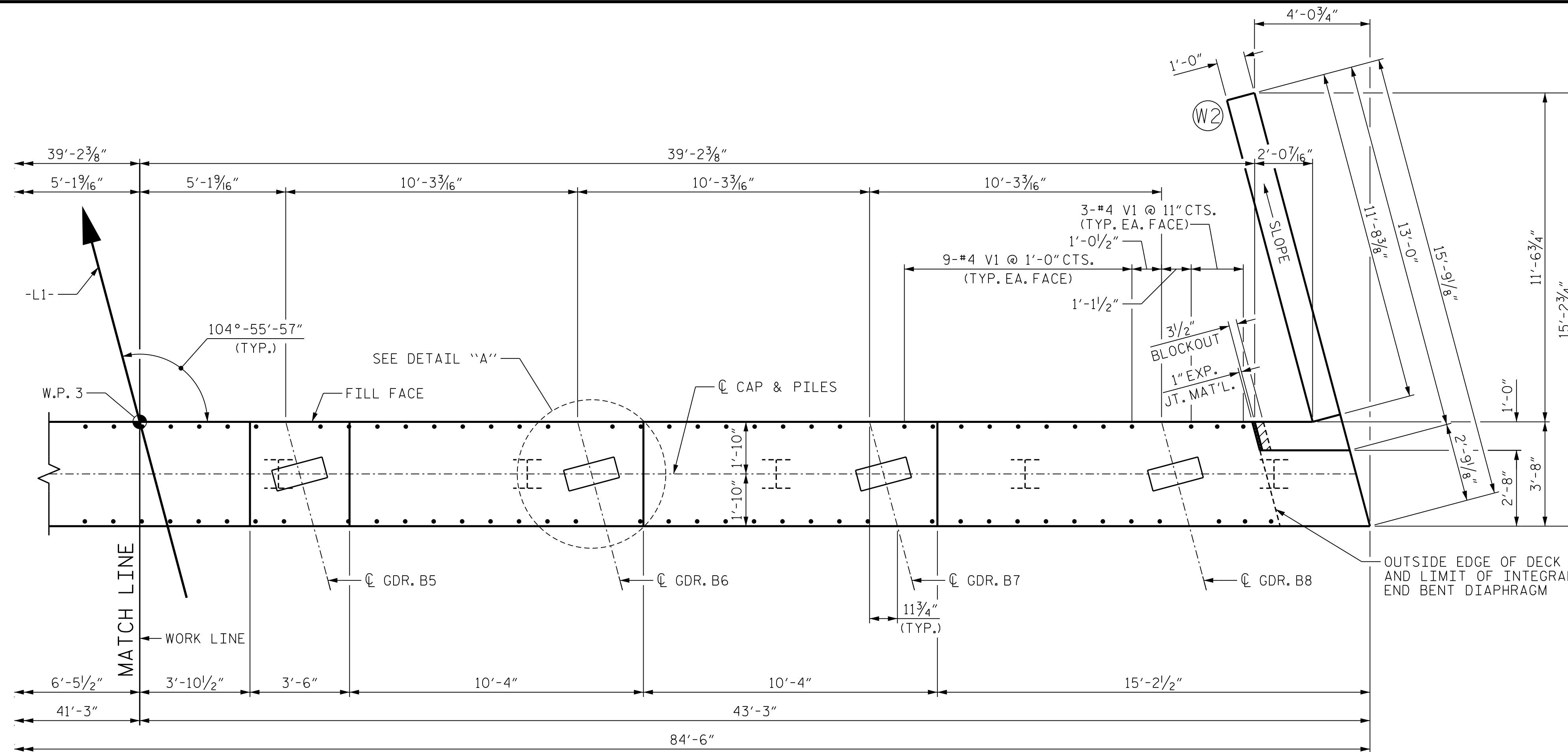
MI ENGINEERING  
 1011 SCHAUH DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-33 TOTAL SHEETS 39
2			4			

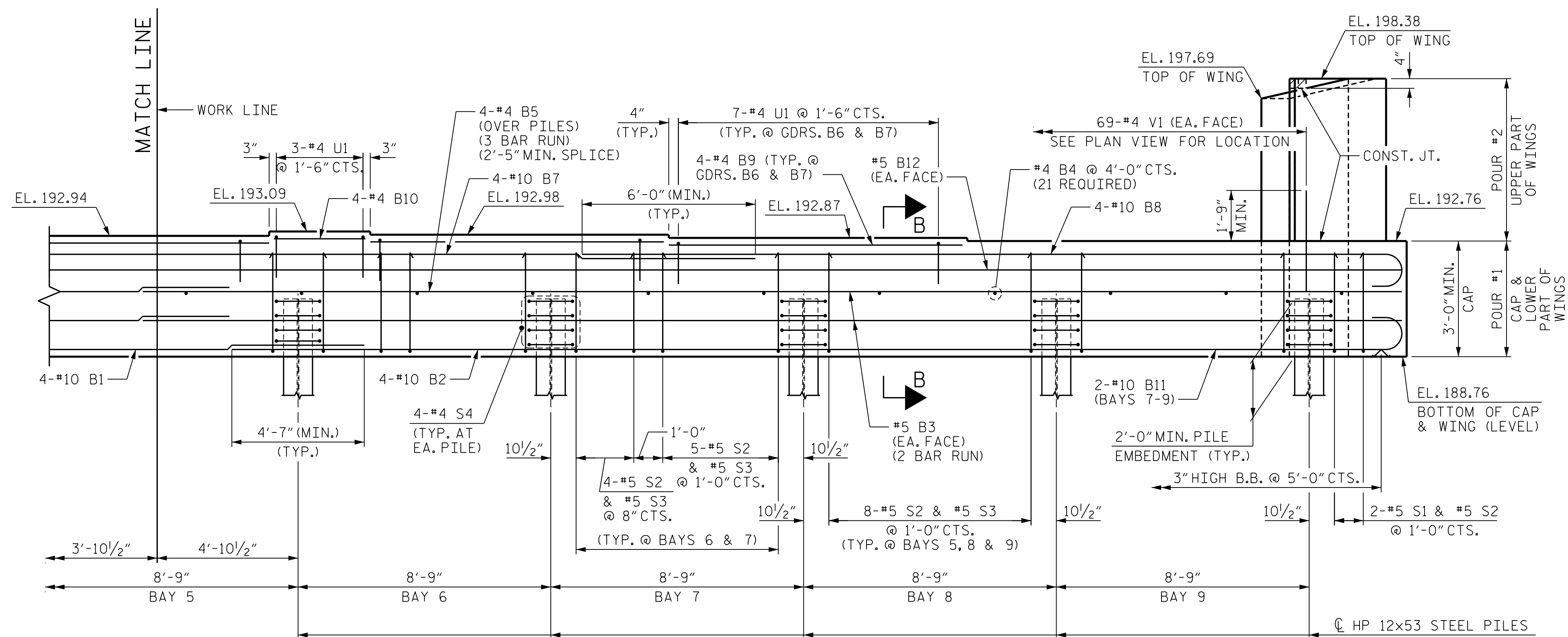
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NOTES  
 FOR ADDITIONAL NOTES, SEE SHEET 1 OF 4.  
 FOR DETAIL "A", SEE SHEET 1 OF 4.  
 FOR SECTION B-B, SEE SHEET 4 OF 4.



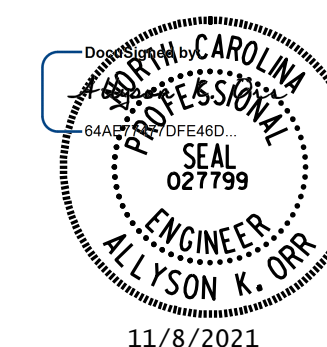
PLAN



ELEVATION

PROJECT NO. U-5996  
 NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 4



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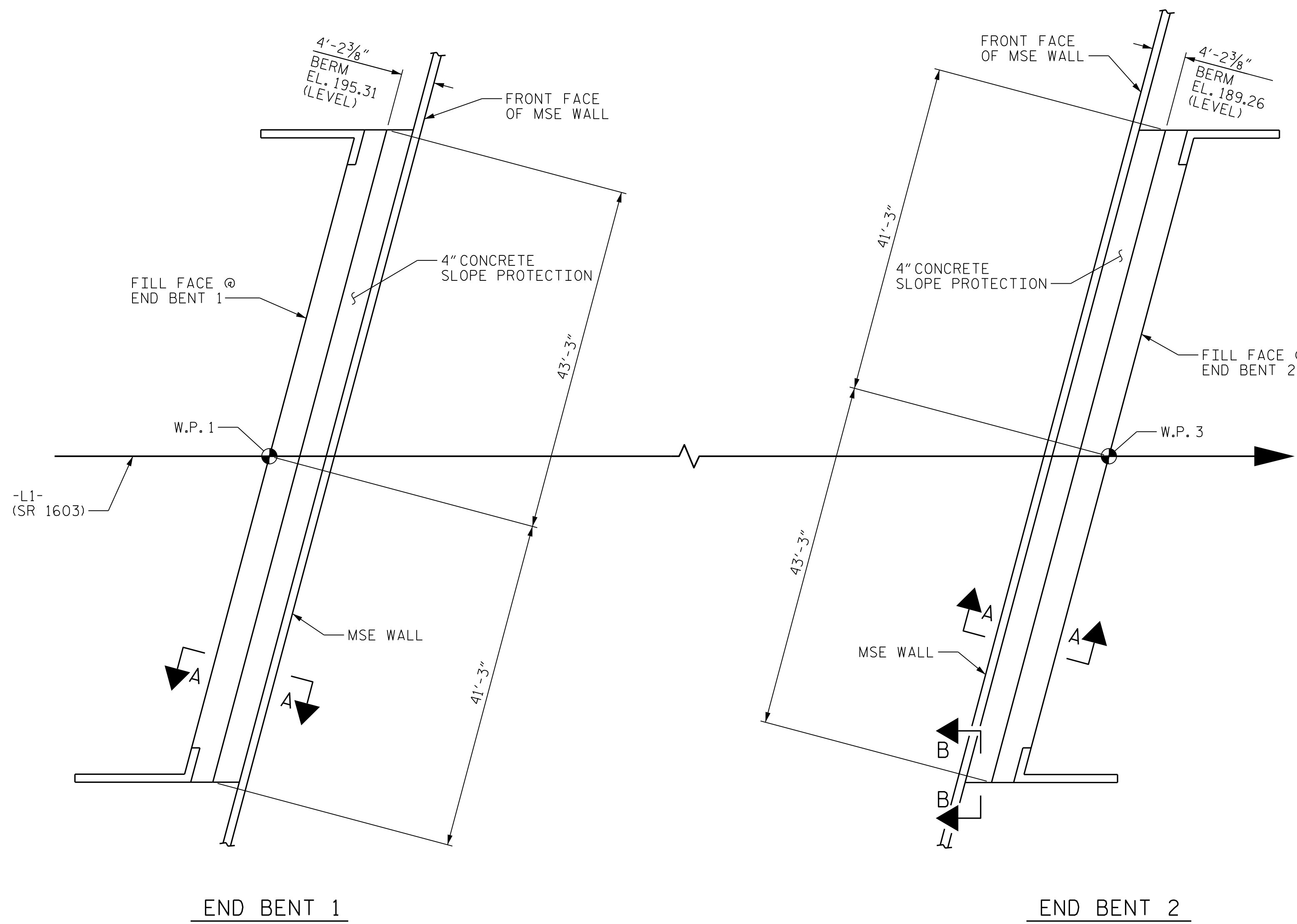
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2 PLAN AND ELEVATION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-34					TOTAL SHEETS 39

DRAWN BY : B.E. LANNING DATE : 01/20  
 CHECKED BY : A.K. ORR DATE : 02/20  
 DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 03/20

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END BENT 1

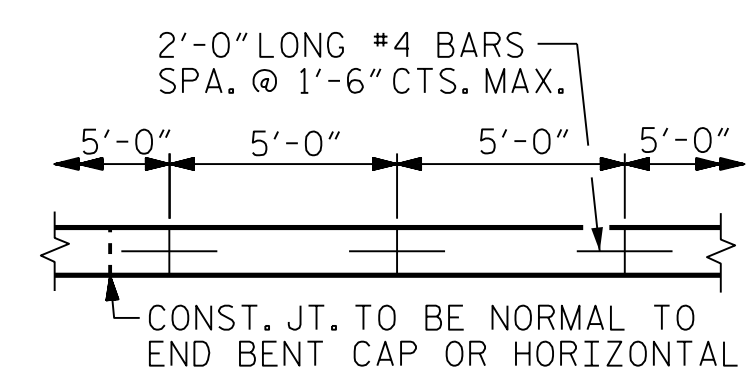
END BENT 2

PLAN

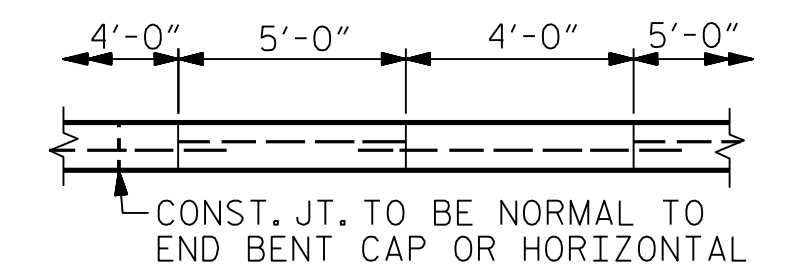
**NOTES**

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

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



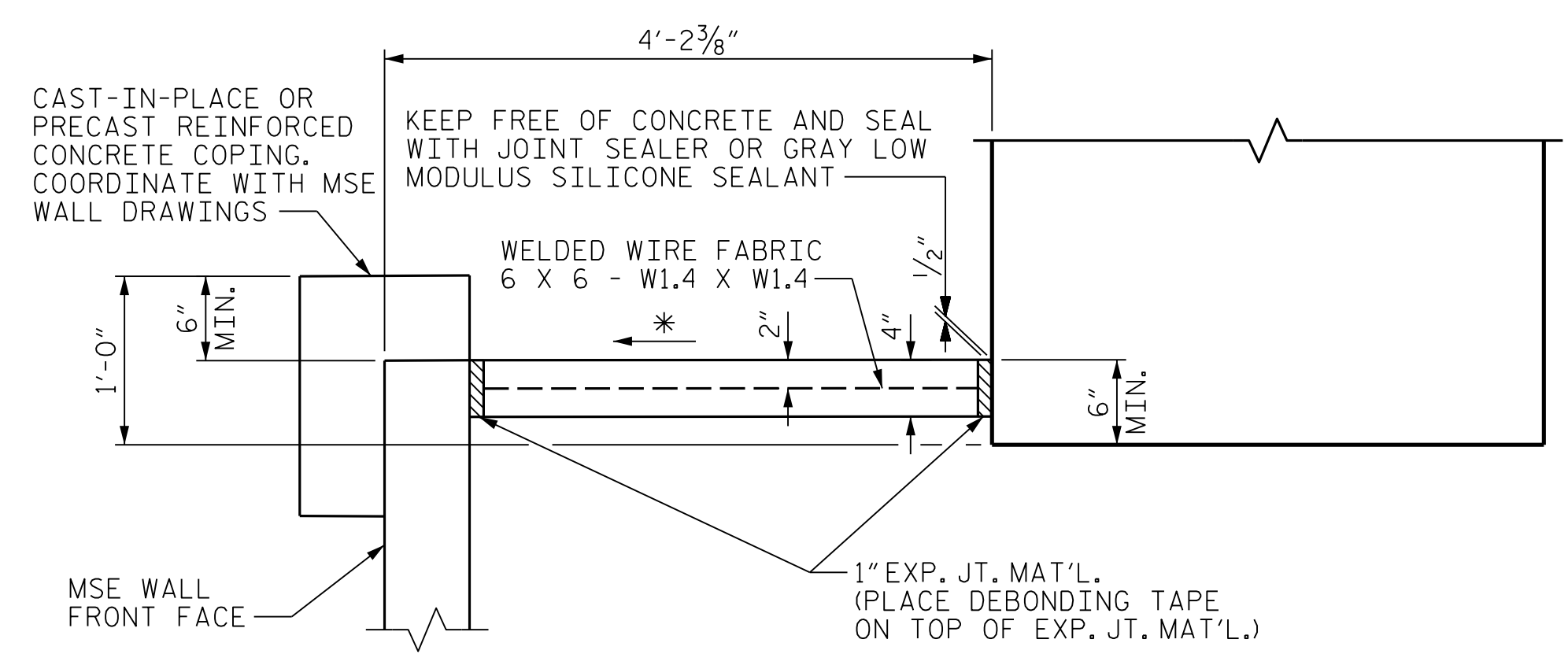
POURING DETAIL



OPTIONAL POURING DETAIL

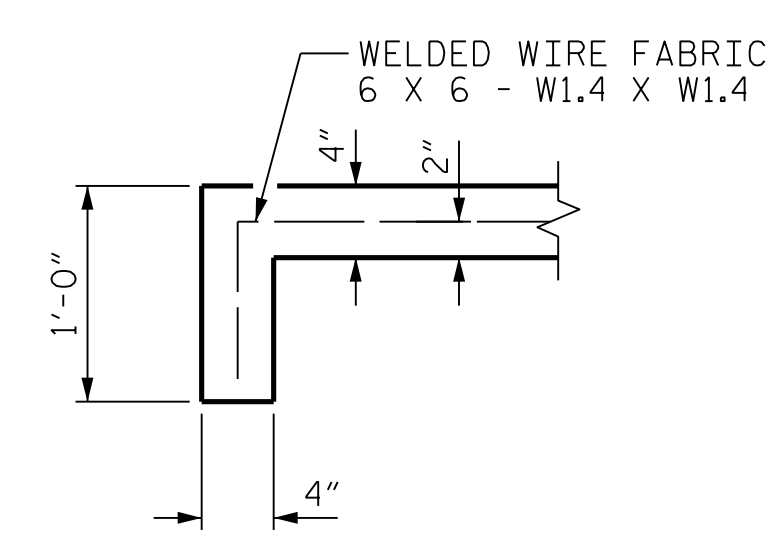
BRIDGE @ STA. 55+37.34 -L1-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	35	70
END BENT 2	35	70

\* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION A-A

\* 2% SLOPE (NORMAL TO CAP)



SECTION B-B



PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SLOPE PROTECTION**

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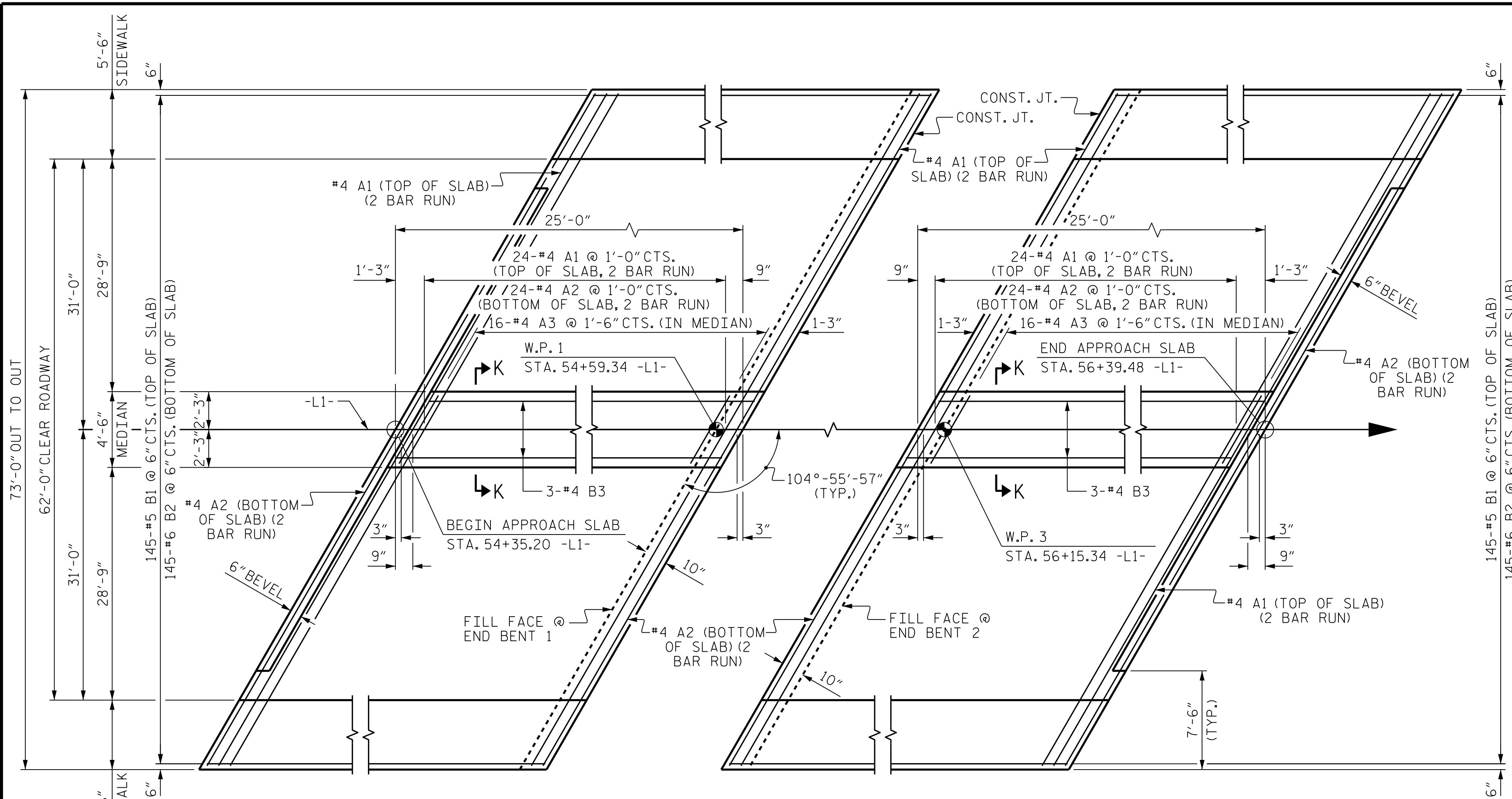
MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER : P-0671

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

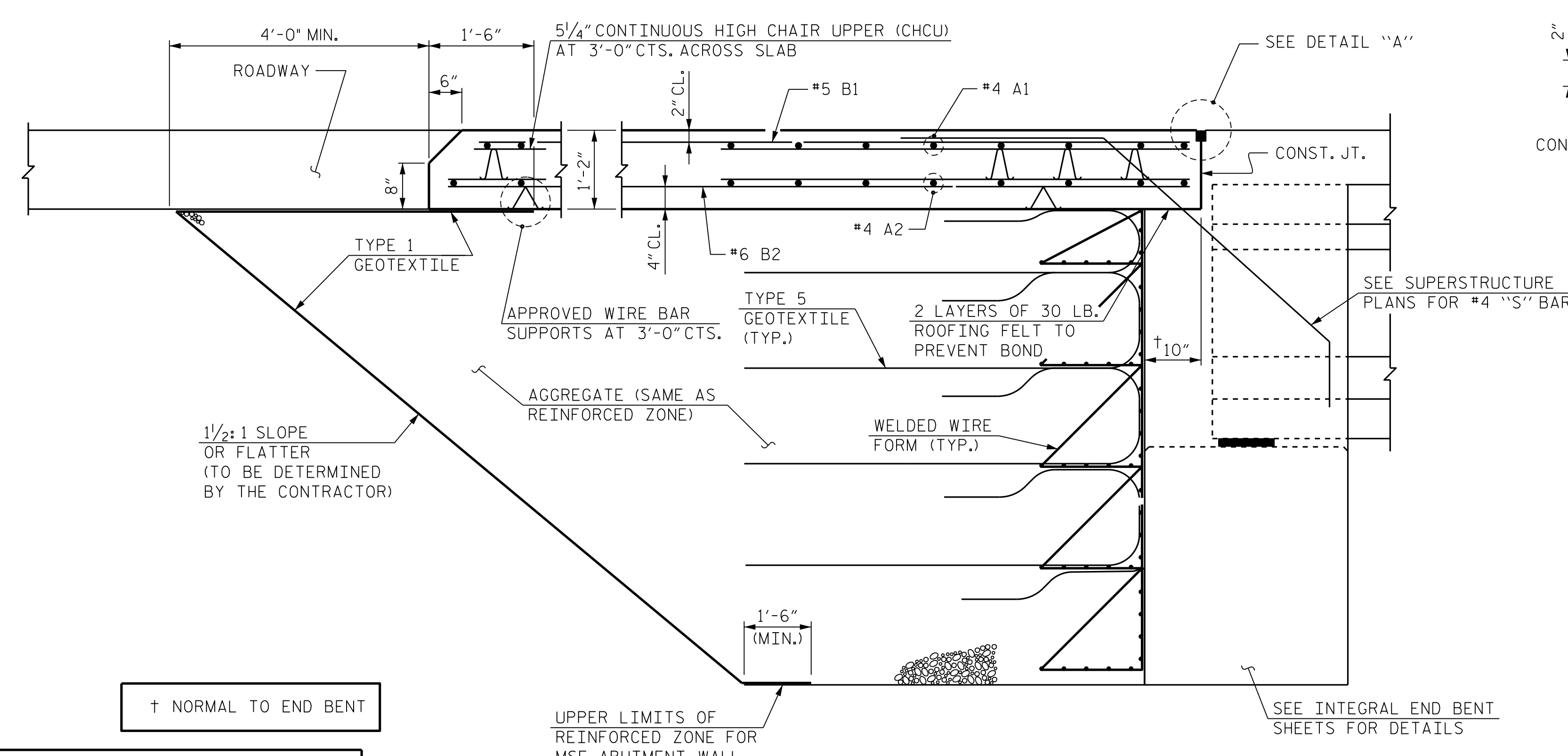
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**S-37**  
 TOTAL SHEETS  
**39**

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



SECTION THRU SLAB  
 (TYPE A - ALTERNATE APPROACH FILL)

NOTES

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

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

FOR SELECT MATERIAL BACKFILL SEE MSE WALL NOTES.

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

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.

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

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN AND SIDEWALK. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE FOR APPROACH SLABS.

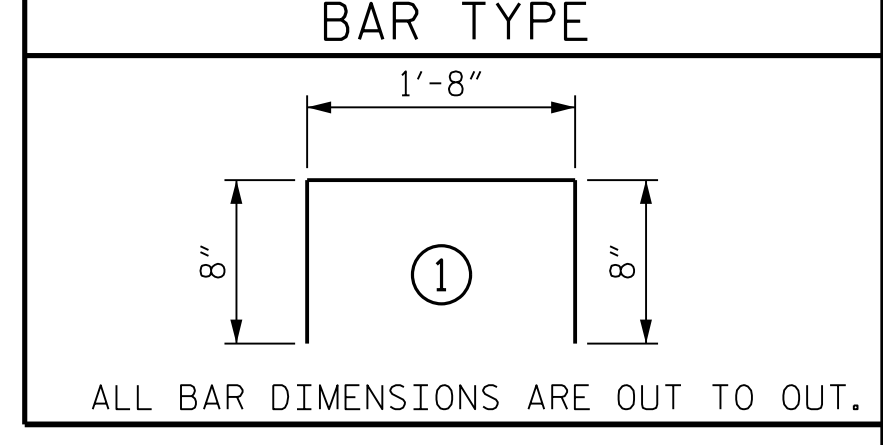
ALL REINFORCING STEEL IN SIDEWALK AND CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR SECTION K-K AND SIDEWALK DETAILS, SEE SHEET 2 OF 2.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	38'-7"	1340
A2	52	#4	STR	38'-5"	1334
*A3	16	#4	STR	3'-3"	35
*B1	145	#5	STR	24'-1"	3642
B2	145	#6	STR	24'-7"	5354
*B3	3	#4	STR	24'-1"	48
*B4	10	#4	STR	24'-7"	164
*G1	50	#4	STR	5'-1"	170
*U1	20	#4	1	3'-0"	40
REINFORCING STEEL					6688 LBS.
* EPOXY COATED REINFORCING STEEL					5439 LBS.
CLASS AA CONCRETE BREAKDOWN					
POUR #1 (SLAB)					78.6 C.Y.
POUR #2 (SIDEWALK & MEDIAN)					8.0 C.Y.
TOTAL					86.6 C.Y.



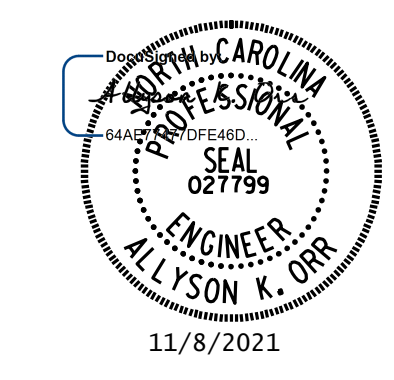
SPLICE LENGTHS

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

PROJECT NO. U-5996  
 NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 1 OF 2

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



DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

REVISIONS

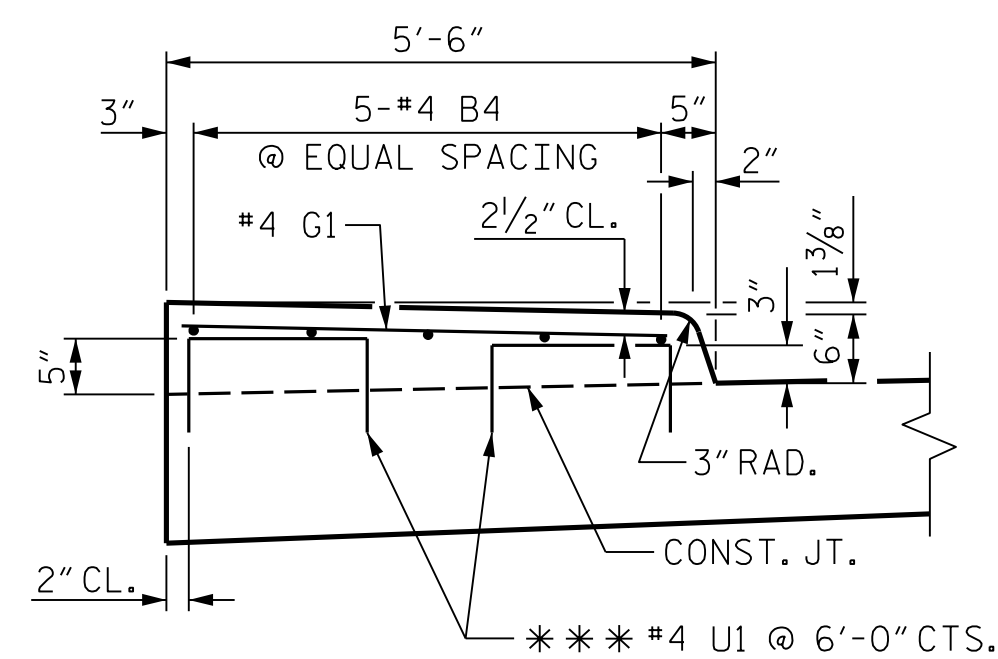
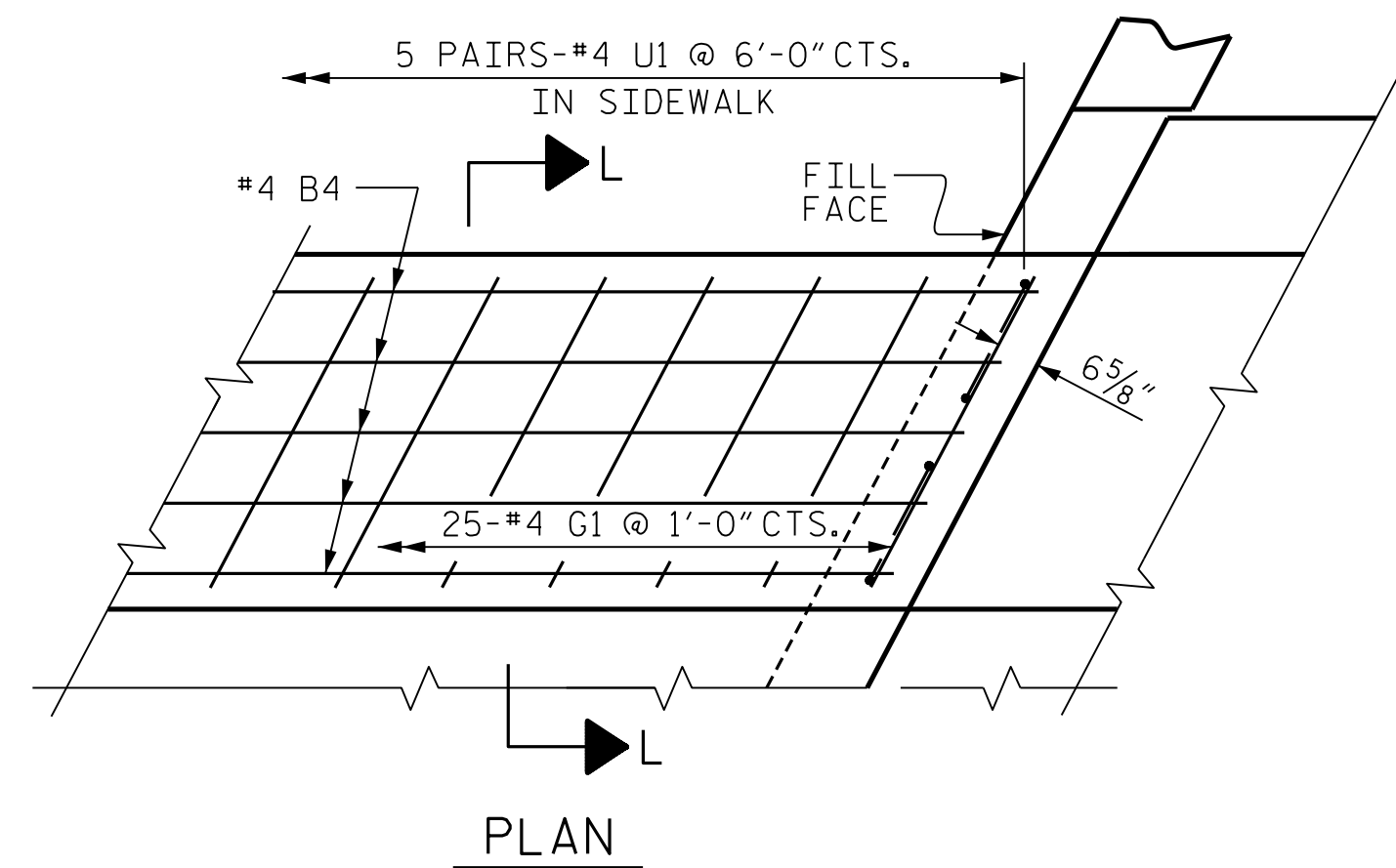
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-38  
 TOTAL SHEETS 39

11/8/2021 3:06:18 PM User: blanning  
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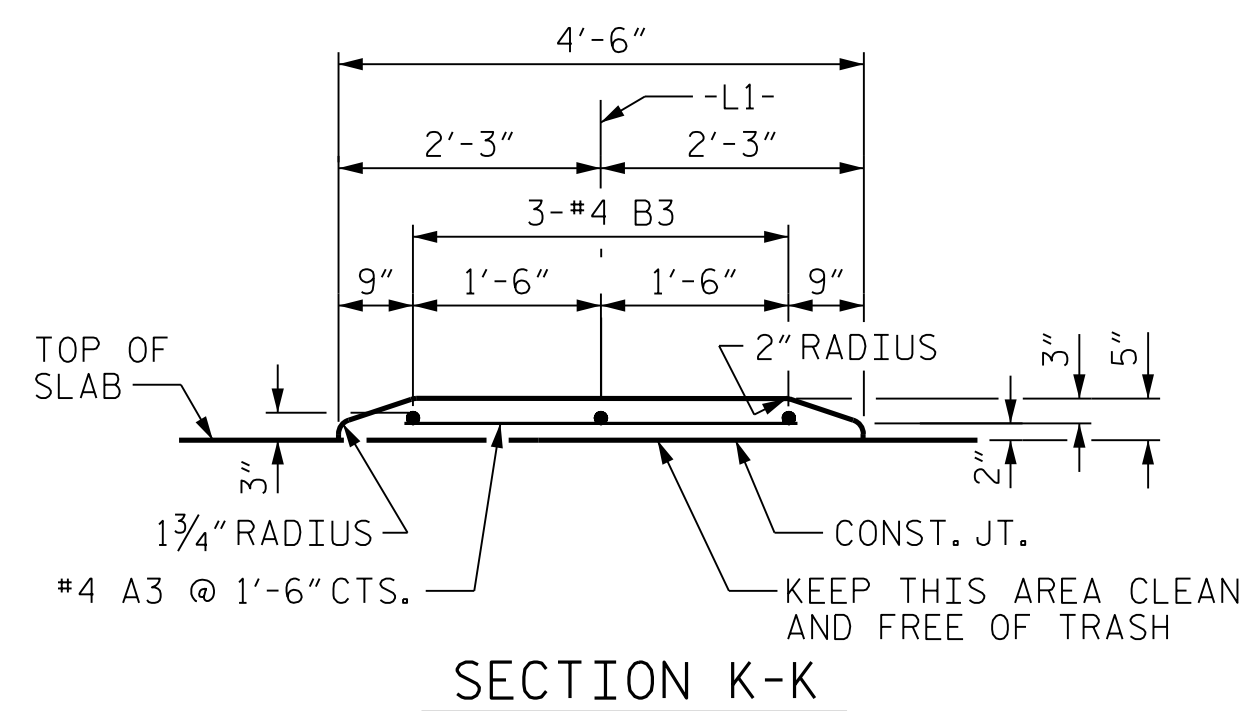
ASSEMBLED BY: B.E. LANNING DATE: 12/19  
 CHECKED BY: A.K. ORR DATE: 12/19  
 DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 02/20

DRAWN BY: TLA 10/05 REV. 6/13 MAA/GM  
 CHECKED BY: GM 5/06 REV. 12/17 MAA/THC  
 REV. 06/19 BNB/THC

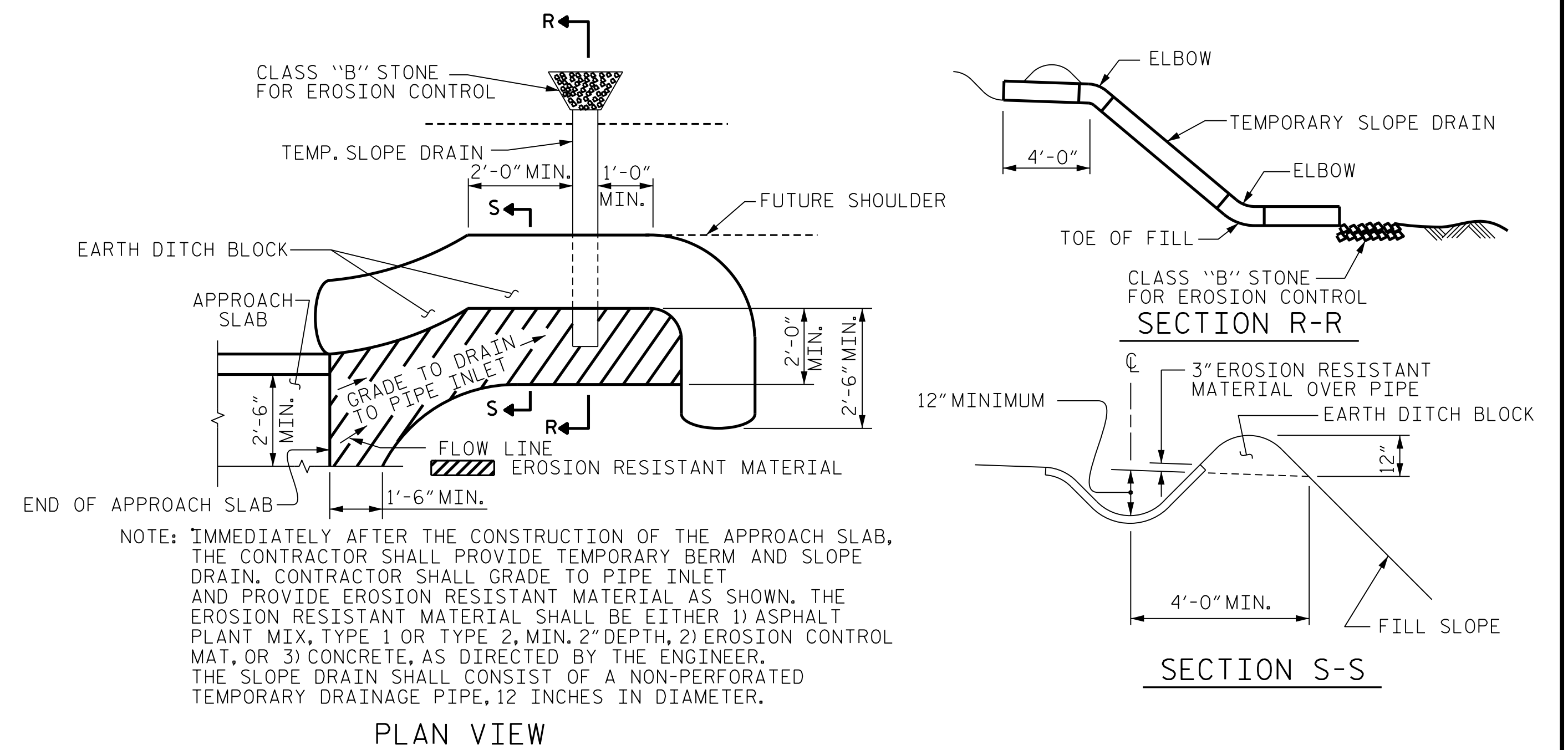


SECTION L-L  
DETAILS OF SIDEWALK  
ON APPROACH SLAB

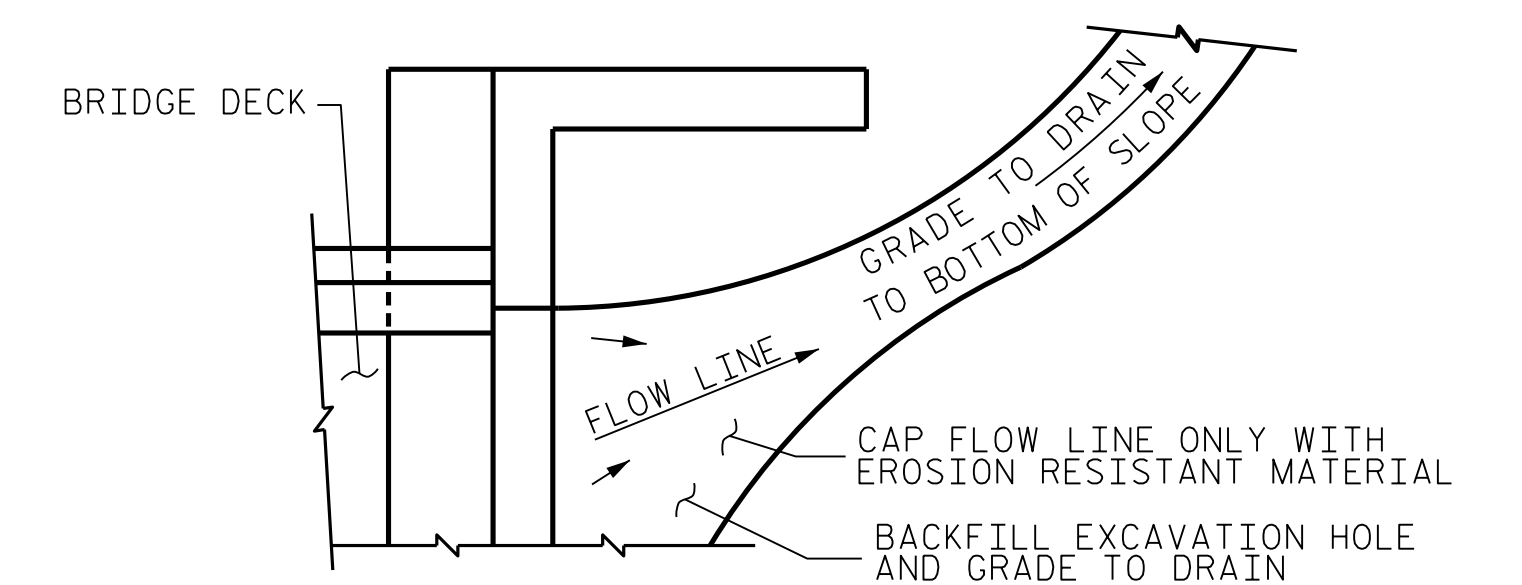
\*\*\* #4 U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDED OFF.



SECTION K-K



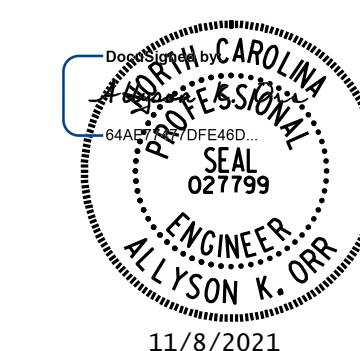
TEMPORARY BERM AND SLOPE DRAIN DETAILS  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-5996  
NASH COUNTY  
 STATION: 55+37.34 -L1-

SHEET 2 OF 2



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

MI ENGINEERING  
 1011 SCHAUB DRIVE, SUITE 100  
 RALEIGH, NC 27606  
 (919) 851-6606  
 FIRM PE NUMBER: P-0671

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. <b>S-39</b>					TOTAL SHEETS <b>39</b>

STD. NO. BAS5 (SHT 1B)

ASSEMBLED BY: B.E. LANNING	DATE: 12/19
CHECKED BY: A.K. ORR	DATE: 12/19
DESIGN ENGINEER OF RECORD: A.K. ORR	DATE: 02/20
DRAWN BY: TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY: GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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