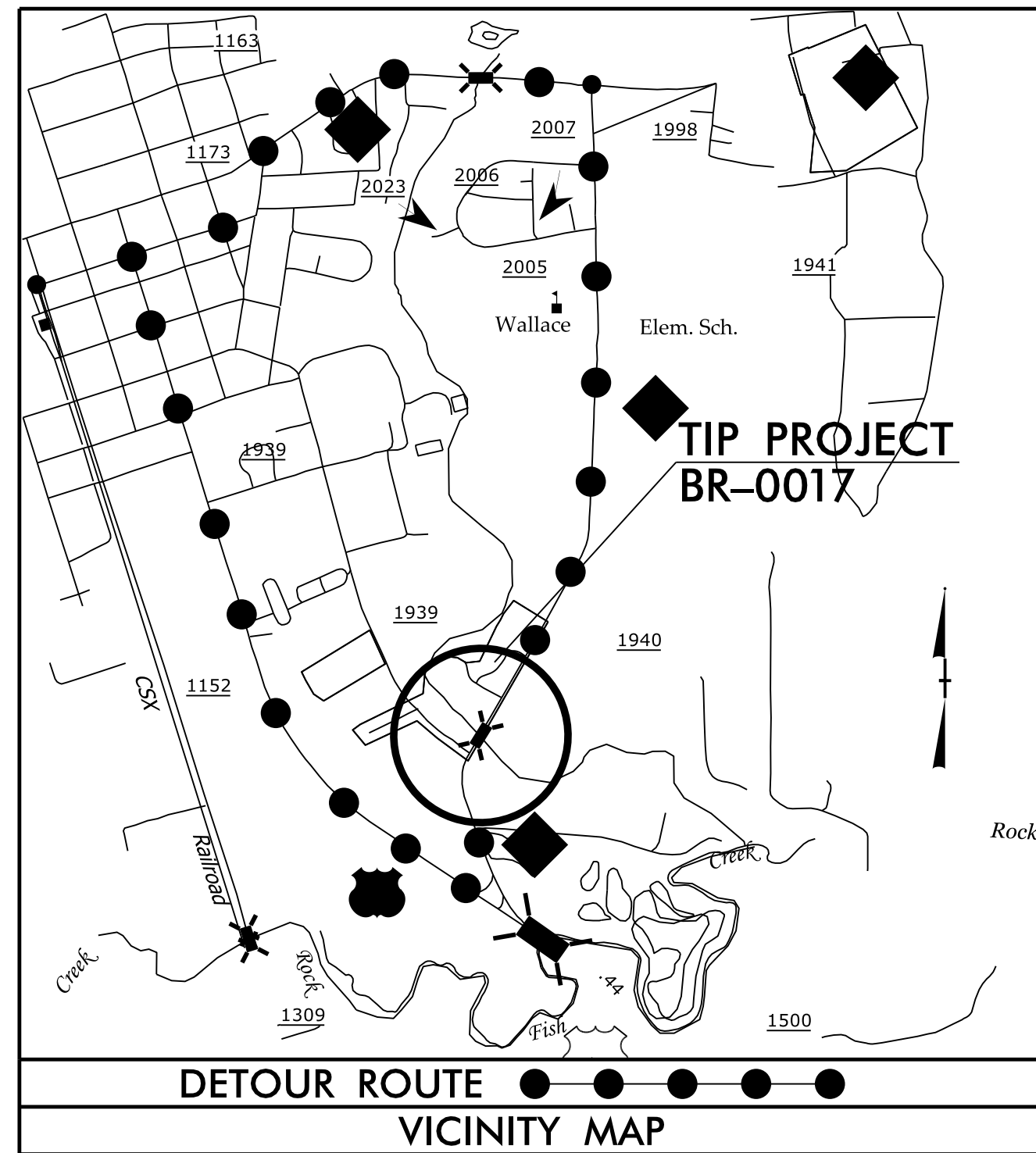


TIP PROJECT: BR-0017

CONTRACT: C204620

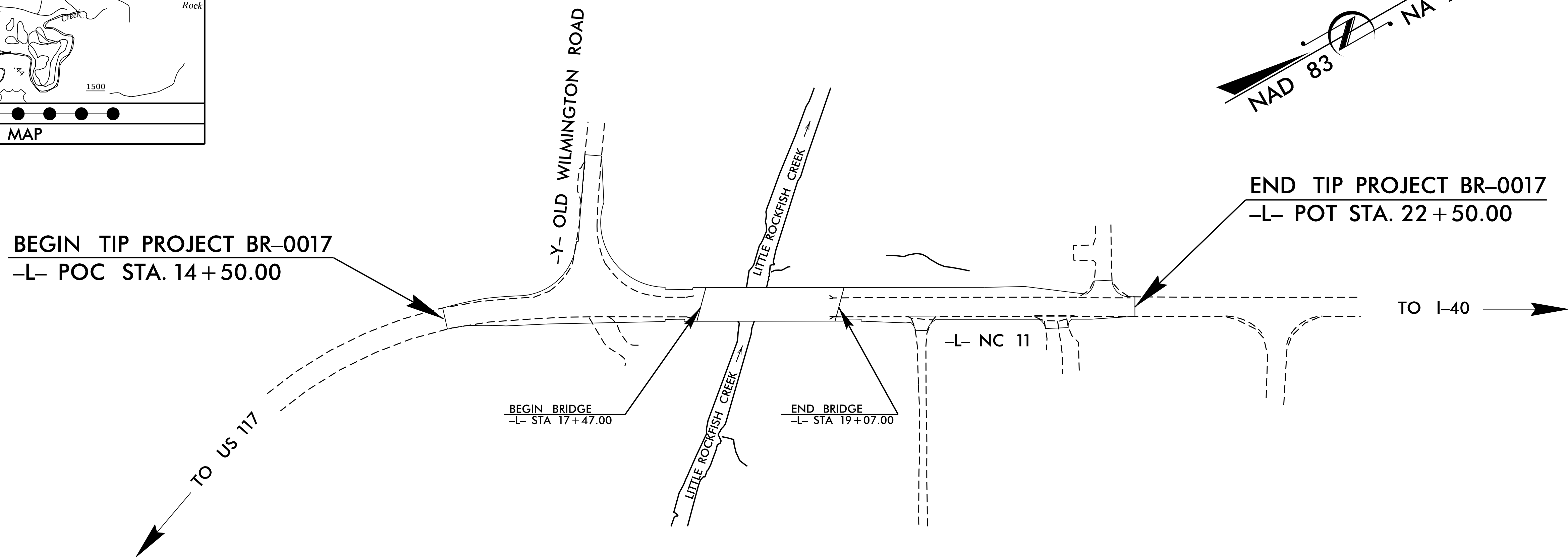


STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
**DUPLIN COUNTY**

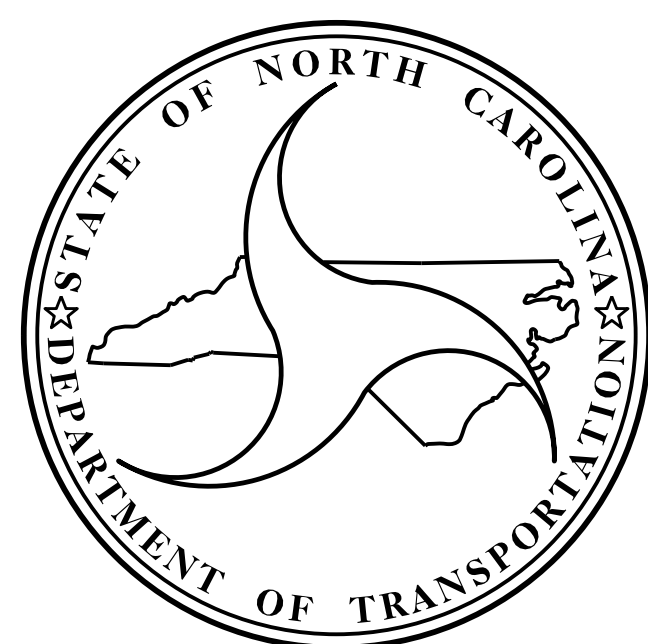
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0017		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
67017.1.1	N/A	P.E.	
67017.2.1	N/A	ROW & UTIL.	
67017.3.1	N/A	CONST.	

**LOCATION: REPLACE BRIDGE #12 ON NC 11  
 OVER LITTLE ROCKFISH CREEK**

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



**STRUCTURE**



**DESIGN DATA**

ADT (2019) = 3,490  
 ADT (2039) = 4,030  
 K = 9 %  
 D = 55 %  
 T = 6 % \*\*  
 \* V = 50 MPH  
 \*\* (TTST 3 %, DUAL 3 %)  
 FUNC CLASS = MAJOR COLLECTOR  
 REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT BR-0017 = 0.122 MILES  
 LENGTH STRUCTURE TIP PROJECT BR-0017 = 0.030 MILES  
 TOTAL LENGTH TIP PROJECT BR-0017 = 0.152 MILES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
 STRUCTURES MANAGEMENT UNIT  
 1000 BIRCH RIDGE DR.  
 RALEIGH, N.C. 27610

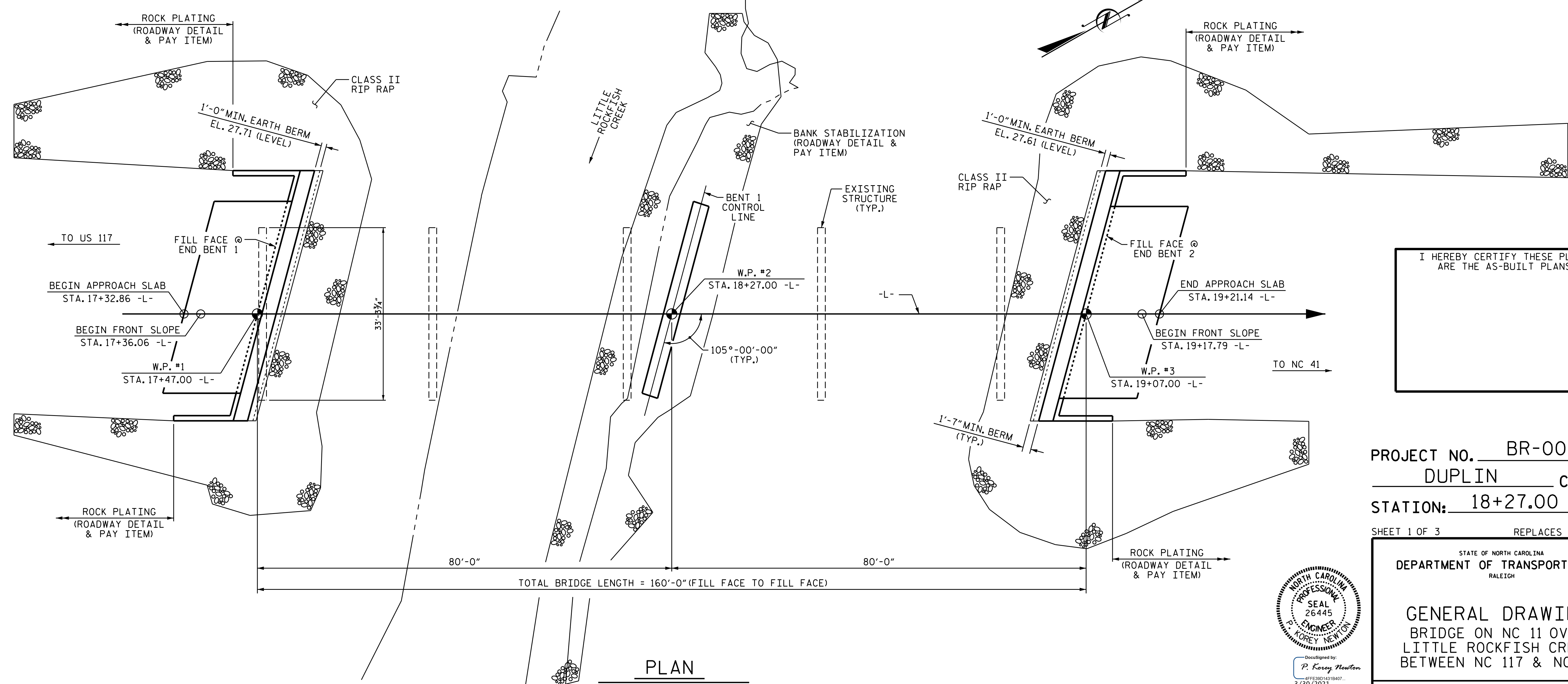
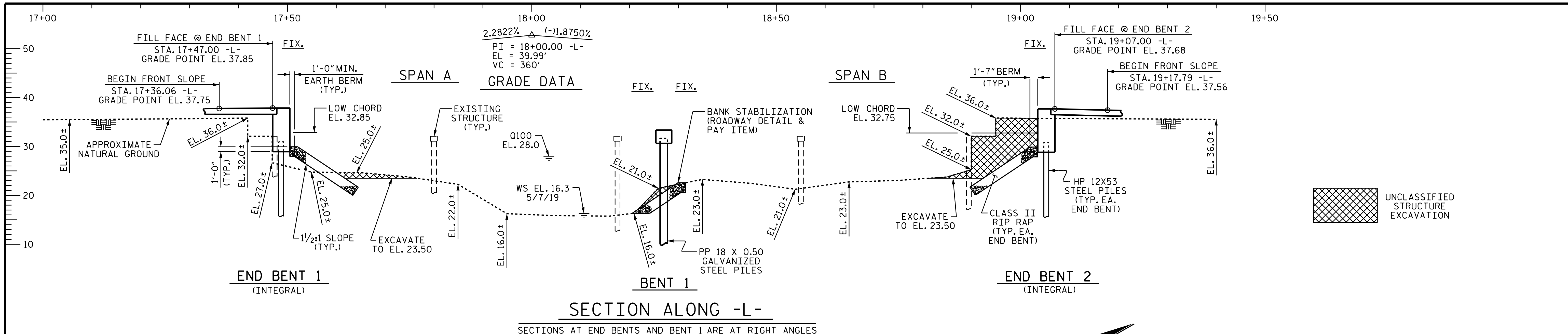
2018 STANDARD SPECIFICATIONS

LETTING DATE :

May 18, 2021

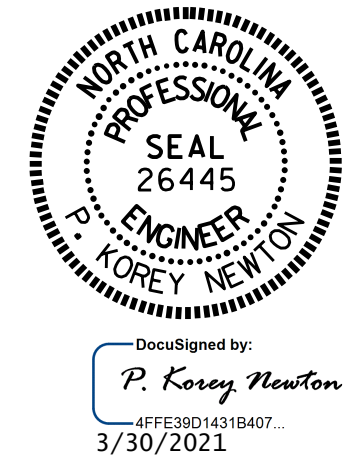
KRISTY L. W. ALFORD, P.E.  
PROJECT ENGINEER

P. KOREY NEWTON, P.E.  
PROJECT DESIGN ENGINEER



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-  
SHEET 1 OF 3 REPLACES BRIDGE #12



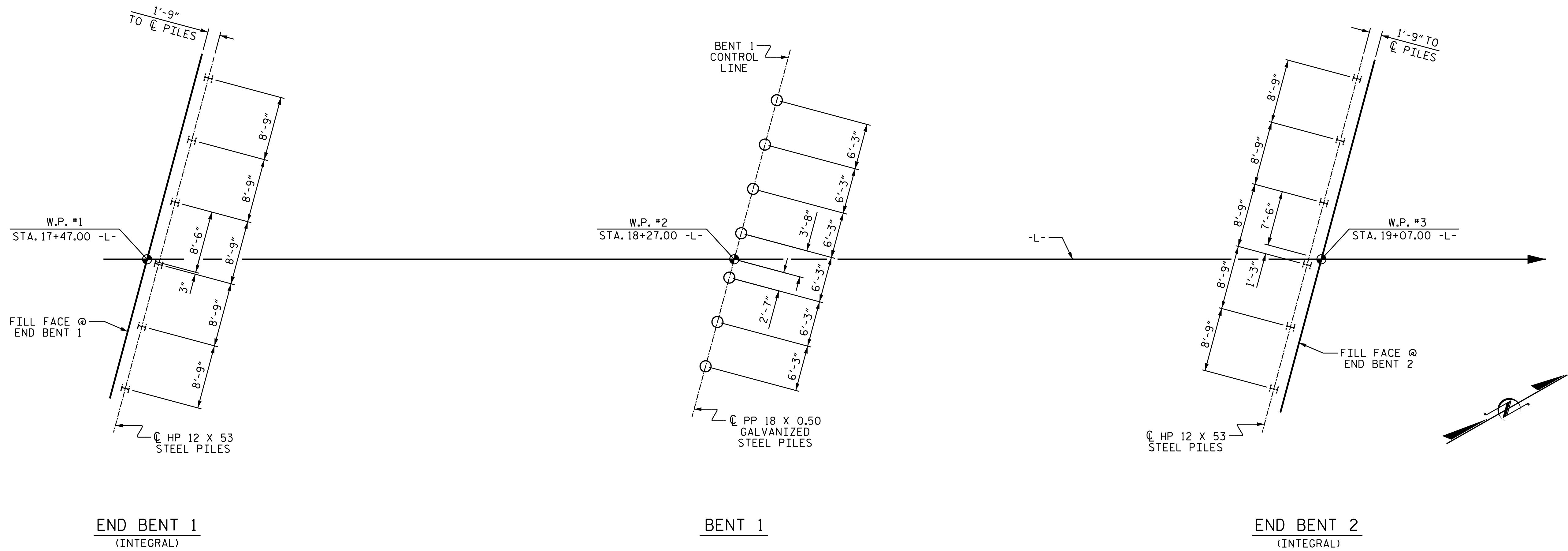
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
BRIDGE ON NC 11 OVER  
LITTLE ROCKFISH CREEK  
BETWEEN NC 117 & NC 41

DRAWN BY: M.K. BEARD DATE: 1/2021  
CHECKED BY: D. R. SHACKELFORD DATE: 2/2021  
DESIGN ENGINEER OF RECORD: P. BRYANT DATE: 3/1/21

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			28



### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ALL PILES ARE VERTICAL.

### NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 & END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT 1 & END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 175 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 300 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN -20 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 8 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 59,700 FT-LBS TO 107,500 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

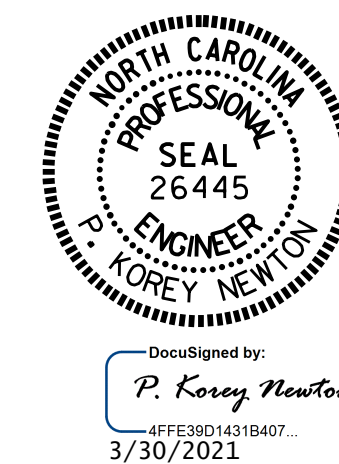
TESTING THE FIRST PRODUCTION PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 OR END BENT 2 & AT BENT 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT BENT 1. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

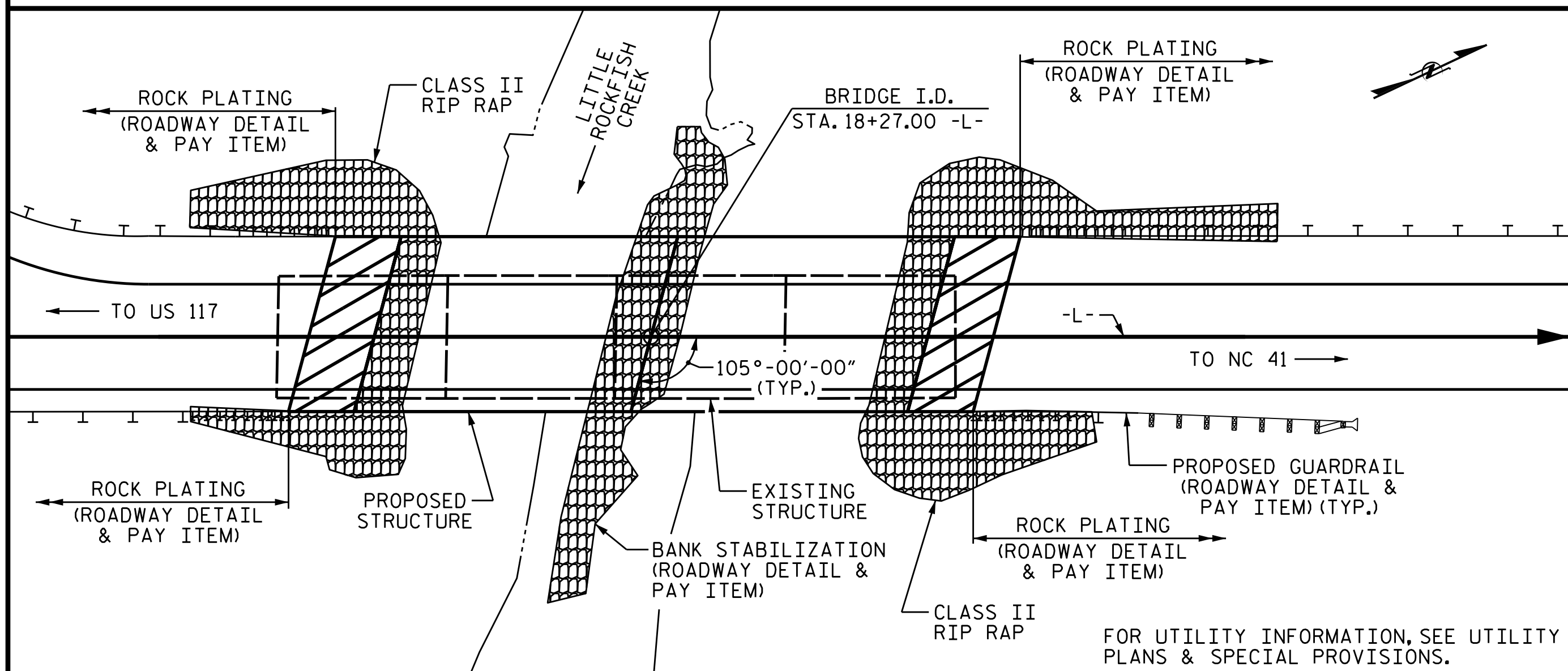
GENERAL DRAWING  
 BRIDGE ON NC 11 OVER  
 LITTLE ROCKFISH CREEK  
 BETWEEN NC 117 & NC 41

DRAWN BY : M.K. BEARD DATE : 1/2021  
 CHECKED BY : D.R. SHACKELFORD DATE : 2/2021  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE : 3/1/21

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			28
2			4			

B.M. #2 R/R SPIKE SET IN 18" RIVER BIRCH TREE, 90.12' LEFT OF STA. 18+85.33 -L-, EL. 32.83



**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 65 FT. LEFT AND 50 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 1, 55 FT. RIGHT OF CENTERLINE ROADWAY AT BENT 1, AND 50 FT. LEFT AND 60 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.  
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+27.00 -L-."

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS: 1 @ 37'-9", 1 @ 37'-3", 1 @ 37'-9" AND 1 @ 37'-6" WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND REINFORCED CONCRETE FLOOR ON STEEL BEAMS AND REINFORCED CONCRETE DECK GIRDERS WITH 5" AWS; ON END BENTS CONSISTING OF REINFORCED CONCRETE ABUTMENTS AND BENTS CONSISTING OF REINFORCED CONCRETE POST AND WEB SHALL BE REMOVED.

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

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES".

FOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 18X0.50 GALVANIZED STEEL PILES	HP 12X53 STEEL PILES	PP 18X0.50 GALVANIZED STEEL PILES	STEEL PILE POINTS	PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS			
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SO.FT.	SO.FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	EACH	EACH	LINE. FT.	TONS	SO. YDS.	LUMP SUM
SUPERSTRUCTURE					6,687	6,703.4				10	786.88							316.55					LUMP SUM	
END BENT 1							39.4		5,526		6		6	450			3			285	315			
BENT 1							13.8		2,696			7		7	525		4							
END BENT 2							38.7		5,251		6		6	450			3			285	315			
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	6,687	6,703.4	91.9	LUMP SUM	13,473	10	786.88	12	7	12	900	7	525	12	7	10	316.55	570	630	LUMP SUM

**HYDRAULIC DATA**

DESIGN DISCHARGE = 1730 CFS  
 FREQUENCY OF DESIGN FLOOD = 50 YRS.  
 DESIGN HIGH WATER ELEVATION = 27.3 FT.  
 DRAINAGE AREA = 9.2 SQ. MI.  
 BASE DISCHARGE (Q100) = 2200 CFS  
 BASE HIGH WATER ELEVATION = 28.0 FT.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 7250 CFS  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION = 31.1 FT.  
 (OVERTOPPING LOCATION @ STA. 10+53.00 -Y-)

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE ON NC 11 OVER  
 LITTLE ROCKFISH CREEK  
 BETWEEN NC 117 & NC 41

DRAWN BY : M.K. BEARD DATE : 1/2021  
 CHECKED BY : D.R. SHACKELFORD DATE : 2/2021  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE : 3/1/21

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			28

## 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	1.029	--	1.75	0.770	1.25	A	EL	38.68	0.915	1.05	A	I	61.88	0.80	0.770	<b>1.03</b>	A	EL	<b>38.68</b>		
	HL-93 (OPERATING)	N/A		1.356	--	1.35	0.770	1.62	A	EL	38.68	0.915	1.36	A	I	61.88	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.283	46.199	1.75	0.770	1.65	A	EL	38.68	0.915	<b>1.28</b>	A	I	<b>58.02</b>	0.80	0.770	1.36	A	EL	38.68		
	HS-20 (OPERATING)	36.000		1.664	59.887	1.35	0.770	2.14	A	EL	38.68	0.915	1.66	A	I	58.02	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		3.110	41.984	1.40	0.770	4.71	A	EL	38.68	0.915	3.76	A	I	58.02	0.80	0.770	3.11	A	EL	38.68		
		SNGARBS2	20.000		2.302	46.045	1.40	0.770	3.48	A	EL	38.68	0.915	2.69	A	I	58.02	0.80	0.770	2.30	A	EL	38.68	
		SNAGRIS2	22.000		2.174	47.826	1.40	0.770	3.28	A	EL	34.81	0.915	2.51	A	I	58.02	0.80	0.770	2.17	A	EL	38.68	
		SNCOTTS3	27.250		1.547	42.160	1.40	0.770	2.34	A	EL	38.68	0.915	1.88	A	I	58.02	0.80	0.770	1.55	A	EL	38.68	
		SNAGGRS4	34.925		1.287	44.950	1.40	0.770	1.95	A	EL	38.68	0.915	1.57	A	I	58.02	0.80	0.770	1.29	A	EL	38.68	
		SNS5A	35.550		1.259	44.757	1.40	0.770	1.91	A	EL	38.68	0.915	1.60	A	I	58.02	0.80	0.770	1.26	A	EL	38.68	
		SNS6A	39.950		1.153	46.050	1.40	0.770	1.74	A	EL	38.68	0.915	1.46	A	I	58.02	0.80	0.770	1.15	A	EL	38.68	
	SNS7B	42.000		1.098	46.100	1.40	0.770	1.66	A	EL	38.68	0.915	1.45	A	I	58.02	0.80	0.770	1.10	A	EL	38.68		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.405	46.362	1.40	0.770	2.13	A	EL	38.68	0.915	1.74	A	I	58.02	0.80	0.770	1.41	A	EL	38.68	
		TNT4A	33.075		1.410	46.650	1.40	0.770	2.13	A	EL	38.68	0.915	1.69	A	I	58.02	0.80	0.770	1.41	A	EL	38.68	
		TNT6A	41.600		1.151	47.877	1.40	0.770	1.74	A	EL	38.68	0.915	1.55	A	I	58.02	0.80	0.770	1.15	A	EL	38.68	
		TNT7A	42.000		1.155	48.526	1.40	0.770	1.75	A	EL	38.68	0.915	1.52	A	I	58.02	0.80	0.770	1.16	A	EL	38.68	
		TNT7B	42.000		1.192	50.072	1.40	0.770	1.80	A	EL	34.81	0.915	1.41	A	I	58.02	0.80	0.770	1.19	A	EL	38.68	
		TNAGRIT4	43.000		1.136	48.866	1.40	0.770	1.72	A	EL	38.68	0.915	1.36	A	I	58.02	0.80	0.770	1.14	A	EL	38.68	
		TNAGT5A	45.000		1.073	48.266	1.40	0.770	1.62	A	EL	38.68	0.915	1.36	A	I	58.02	0.80	0.770	1.07	A	EL	38.68	
TNAGT5B		45.000	③	1.061	47.725	1.40	0.770	1.61	A	EL	38.68	0.915	1.29	A	I	58.02	0.80	0.770	<b>1.06</b>	A	EL	<b>38.68</b>		

LOAD FACTORS:

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

**NOTES:**  
 MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
 ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

**COMMENTS:**  
 1.  
 2.  
 3.  
 4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

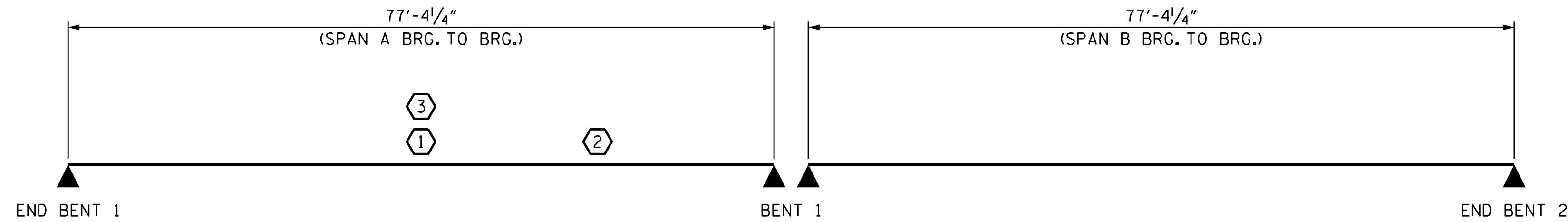
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

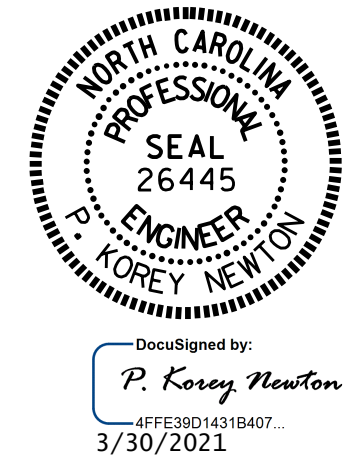
I - INTERIOR GIRDER  
 EL - EXTERIOR LEFT GIRDER  
 ER - EXTERIOR RIGHT GIRDER



PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

### LRFR SUMMARY

DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: <u>3/1/21</u>	
ASSEMBLED BY: P. K. NEWTON DATE: <u>2/1/21</u>	CHECKED BY: M. K. BEARD DATE: <u>2/9/21</u>
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

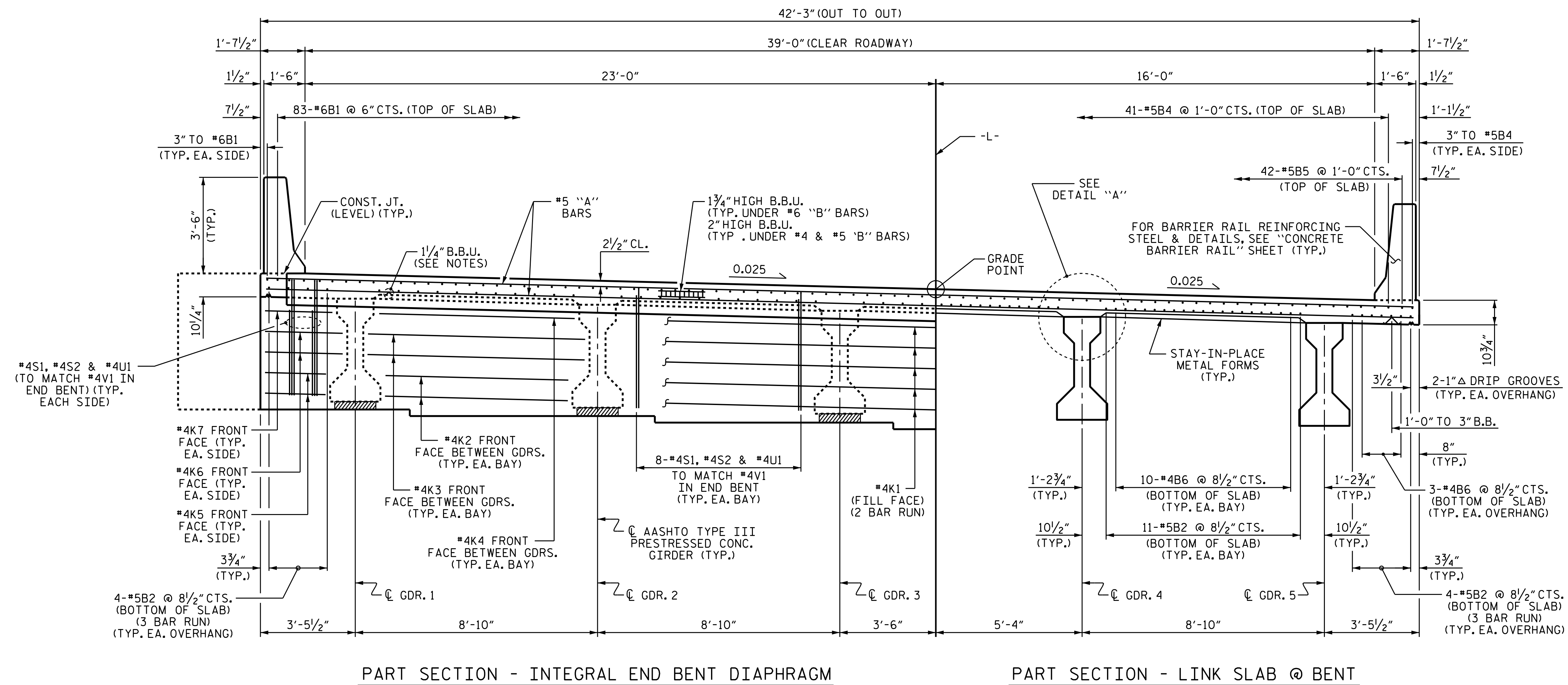


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

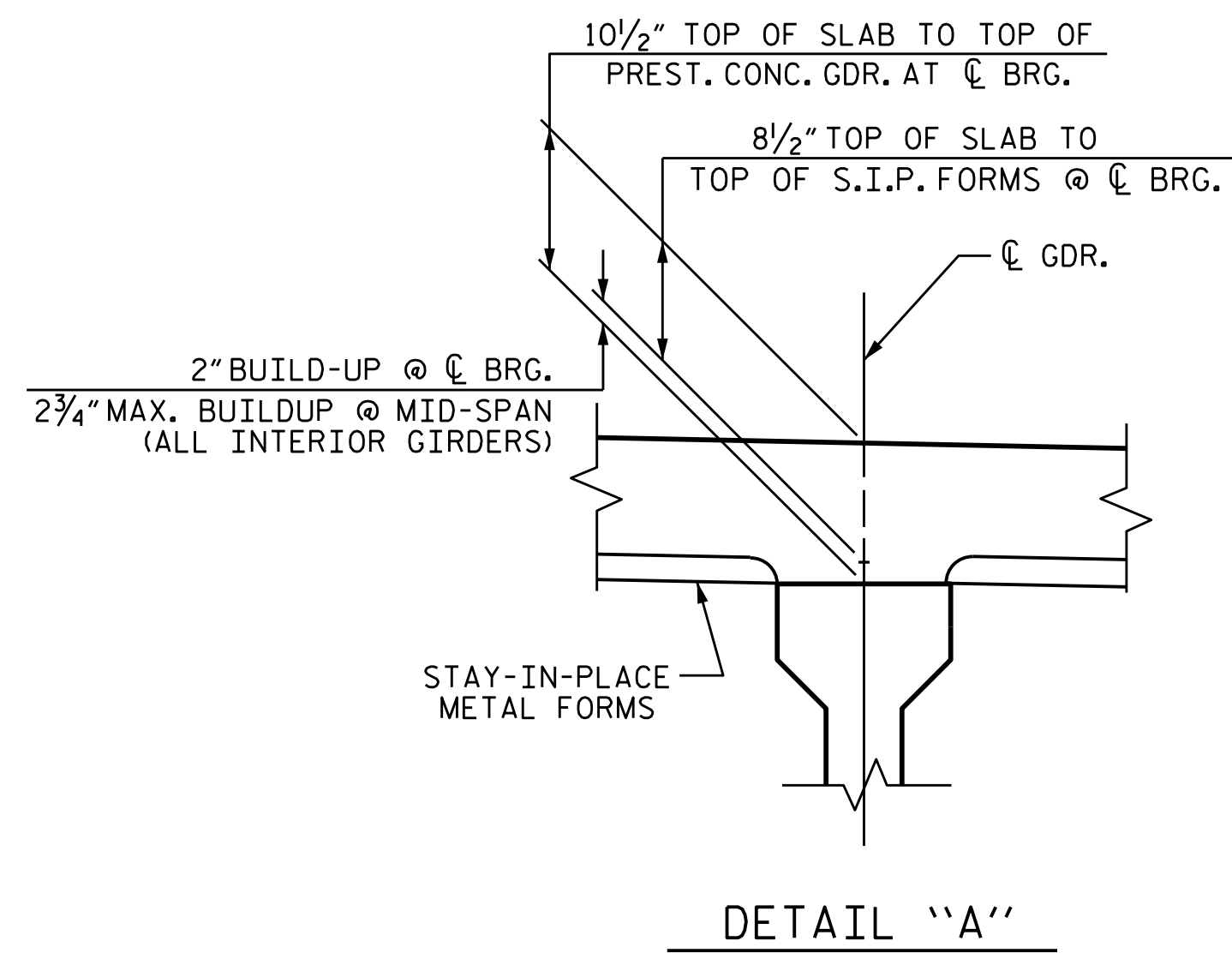
STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			28

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED



**TYPICAL SECTION**



**NOTES**

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

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 1 OF 2

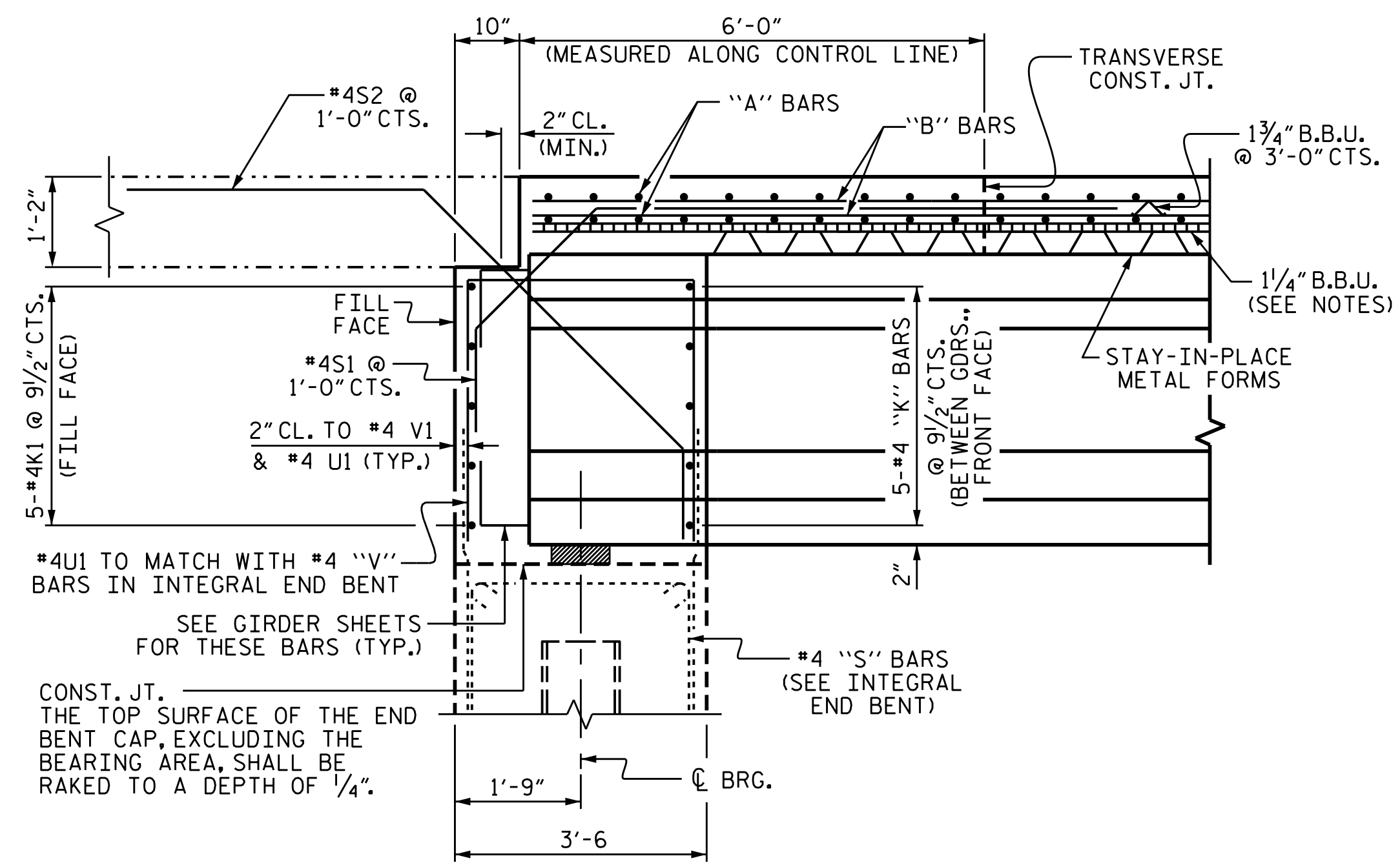


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

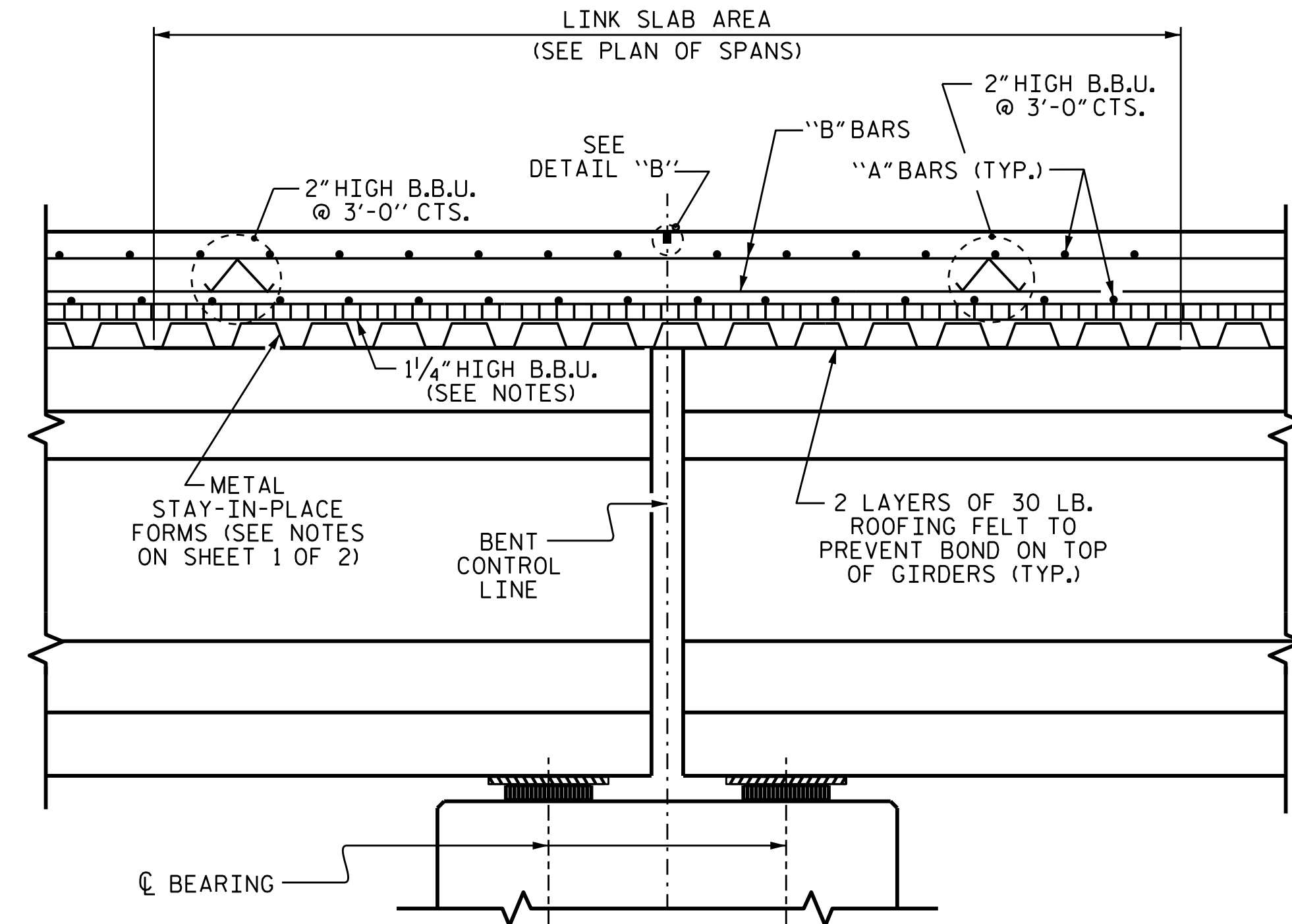
DRAWN BY : M.K. BEARD DATE : 1/2021  
 CHECKED BY : D.R. SHACKELFORD DATE : 2/2021  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE : 3/1/21

DOCUMENT NOT CONSIDERED  
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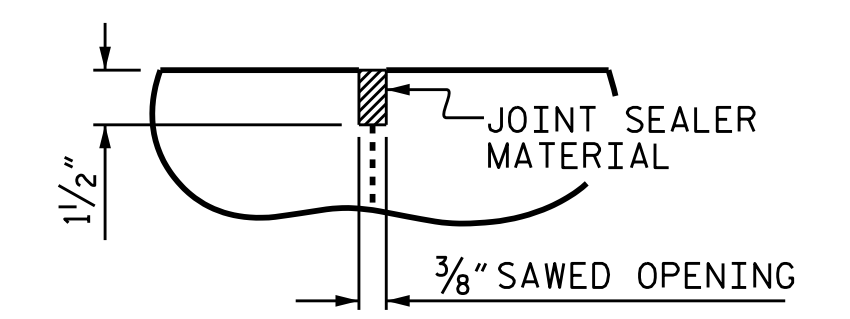
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			28



**SECTION THRU INTEGRAL END BENT**

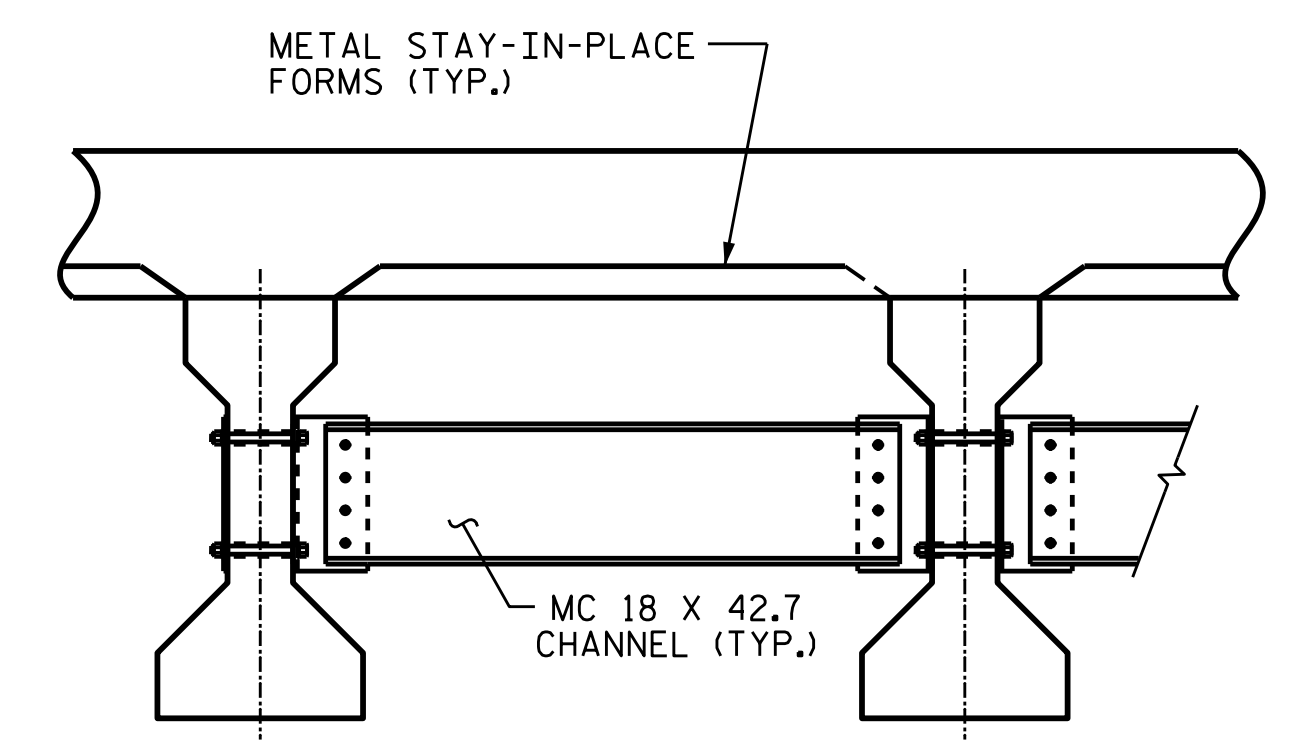


**SECTION @ LINK SLAB**



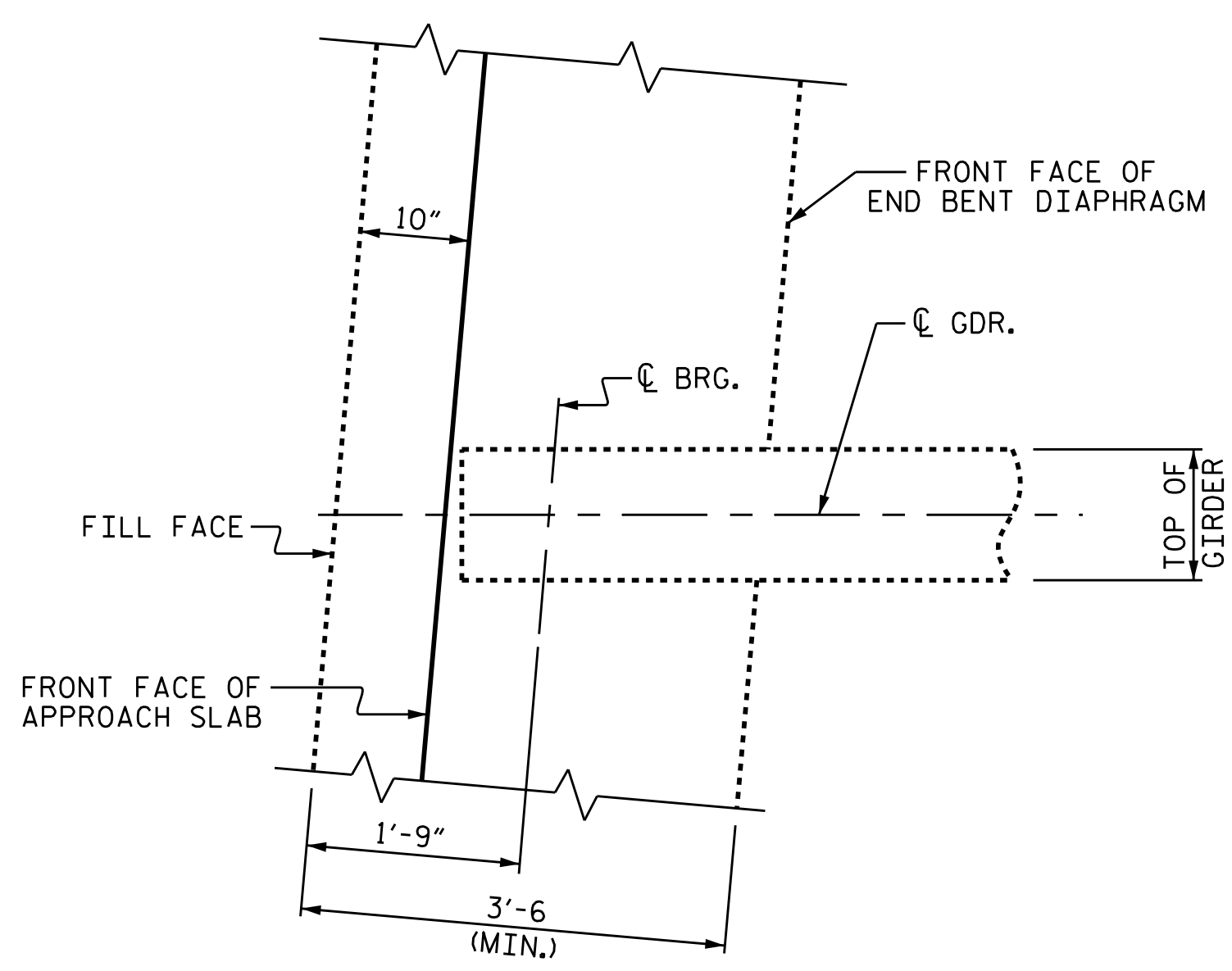
**DETAIL "B"**

A 1/2" DEEP CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWED WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

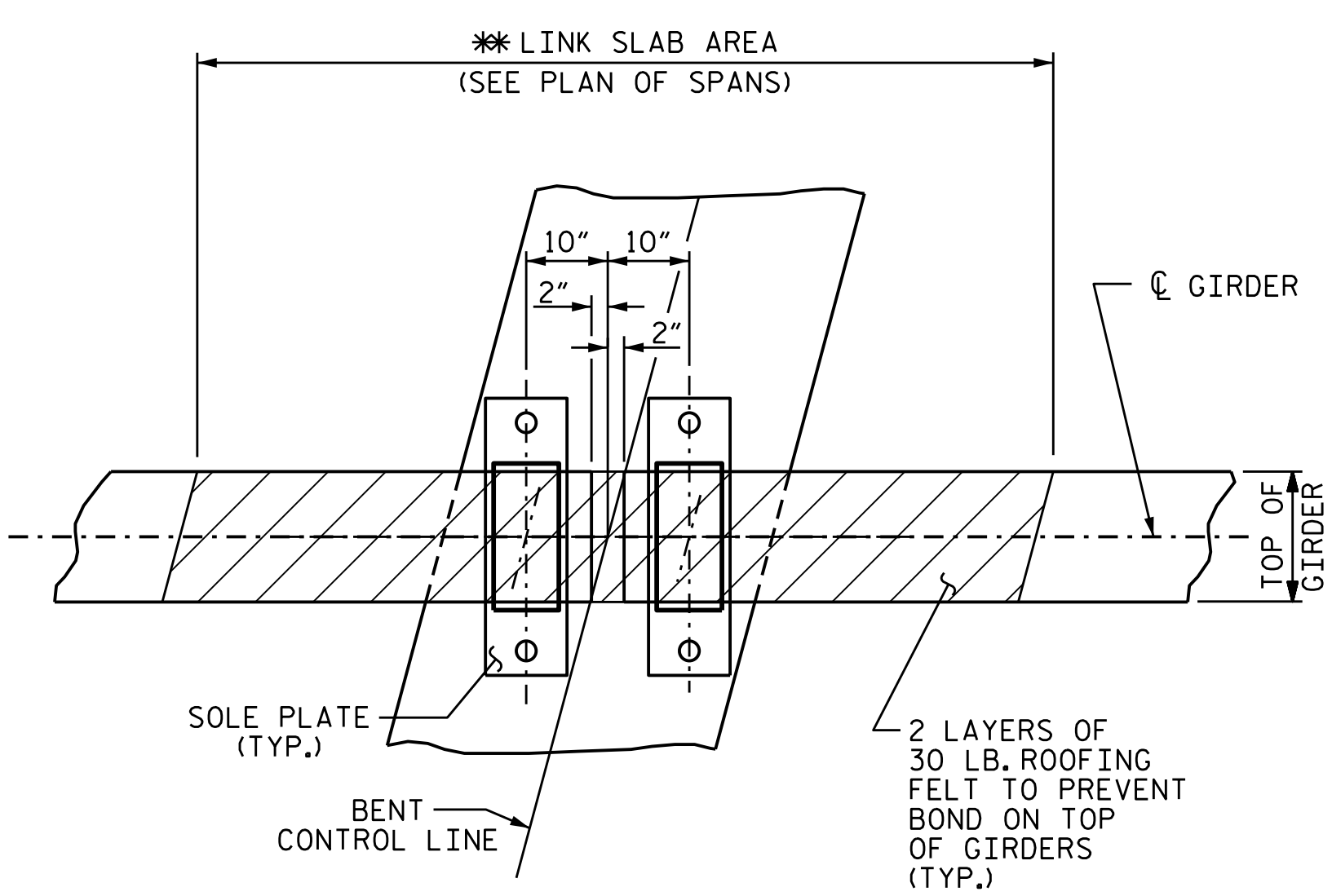


**TYPICAL INTERMEDIATE DIAPHRAGM**

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS.



**PLAN @ INTEGRAL END BENT**



**PLAN @ BENT**

\* THE TOP OF THE GIRDER IN THE AREA OF THE LINK SLAB SHALL BE SMOOTH AND FREE OF STIRRUPS OR ANCHOR STUDS.

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 2 OF 2



DocuSigned by:  
P. Corey Newton  
4FFE39D1431B407  
3/30/2021

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
TYPICAL SECTION

DRAWN BY :	M.K. BEARD	DATE :	1/2021
CHECKED BY :	D. R. SHACKELFORD	DATE :	2/2021
DESIGN ENGINEER OF RECORD:	P. BRYANT	DATE :	3/1/21

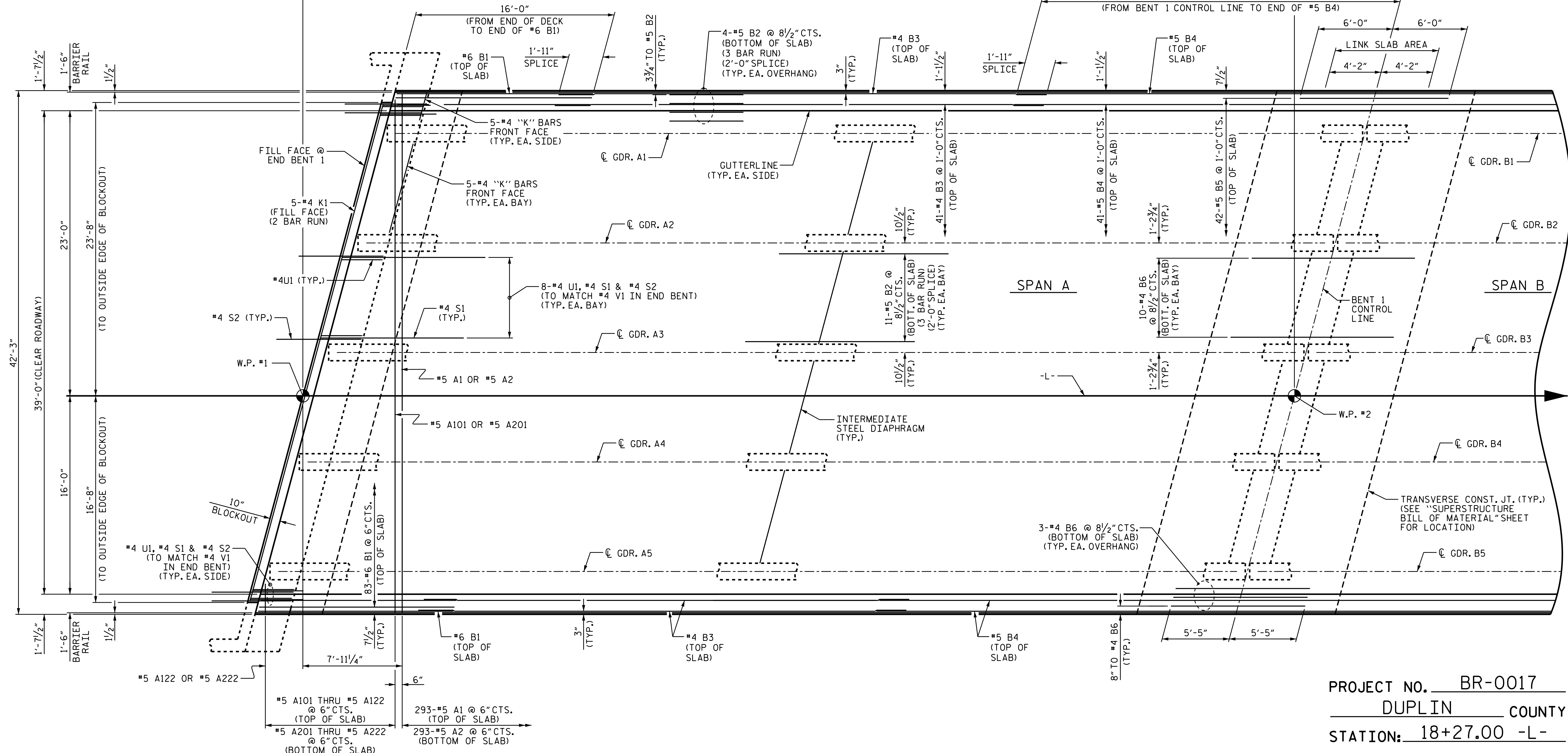
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			28

TOTAL BRIDGE LENGTH = 160'-0" (FILL FACE TO FILL FACE)

80'-0" (W.P. #1 TO W.P. #2)

80'-0" (W.P. #2 TO W.P. 3)



**PLAN OF SPAN A**

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 1 OF 2



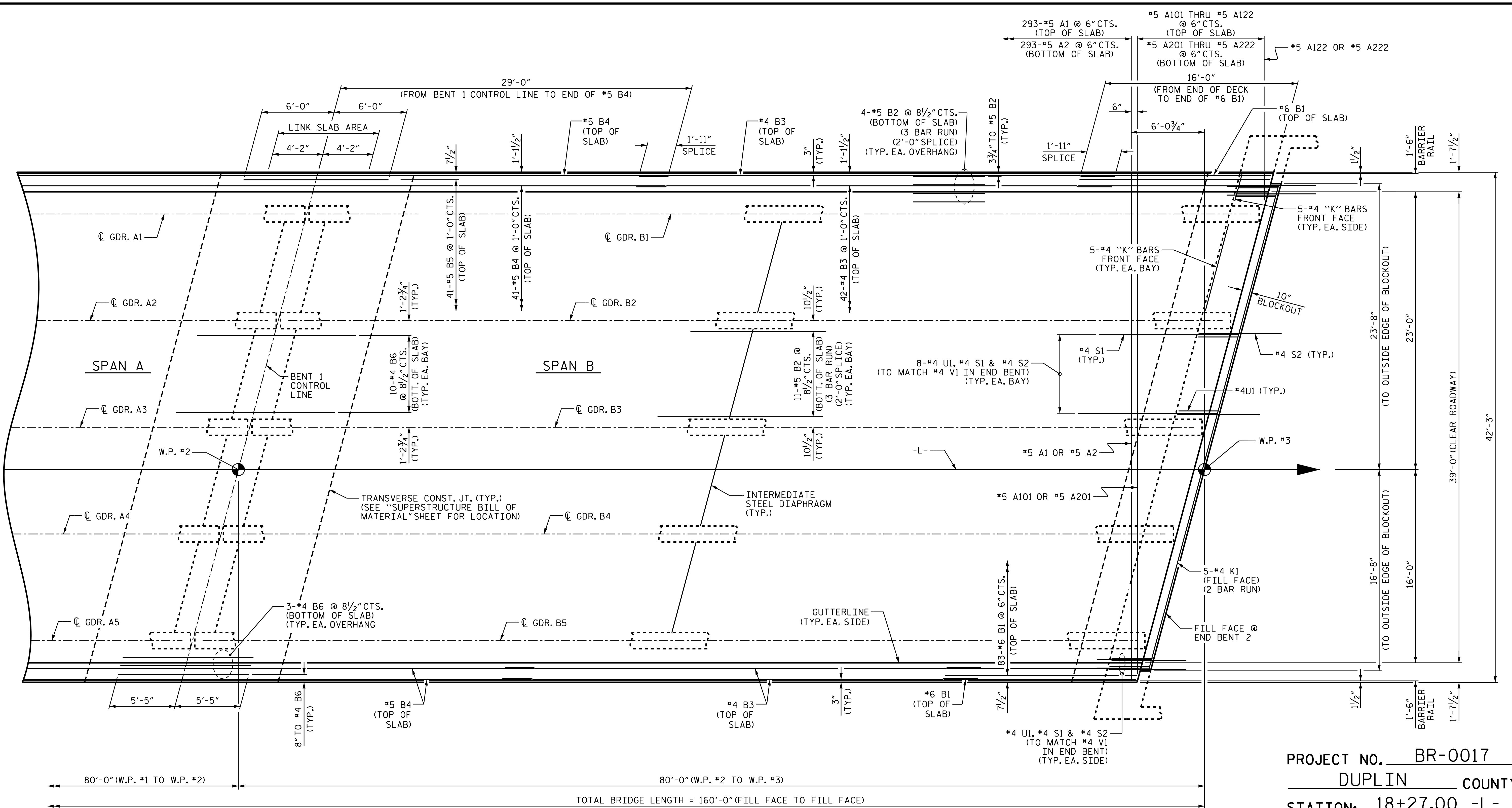
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS

DRAWN BY : O. T. NGUYEN DATE : 1/2021  
 CHECKED BY : M. K. BEARD DATE : 2/2021  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE : 3/1/21

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REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			





**PLAN OF SPAN B**

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

PROJECT NO. BR-0017  
 DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 2 OF 2

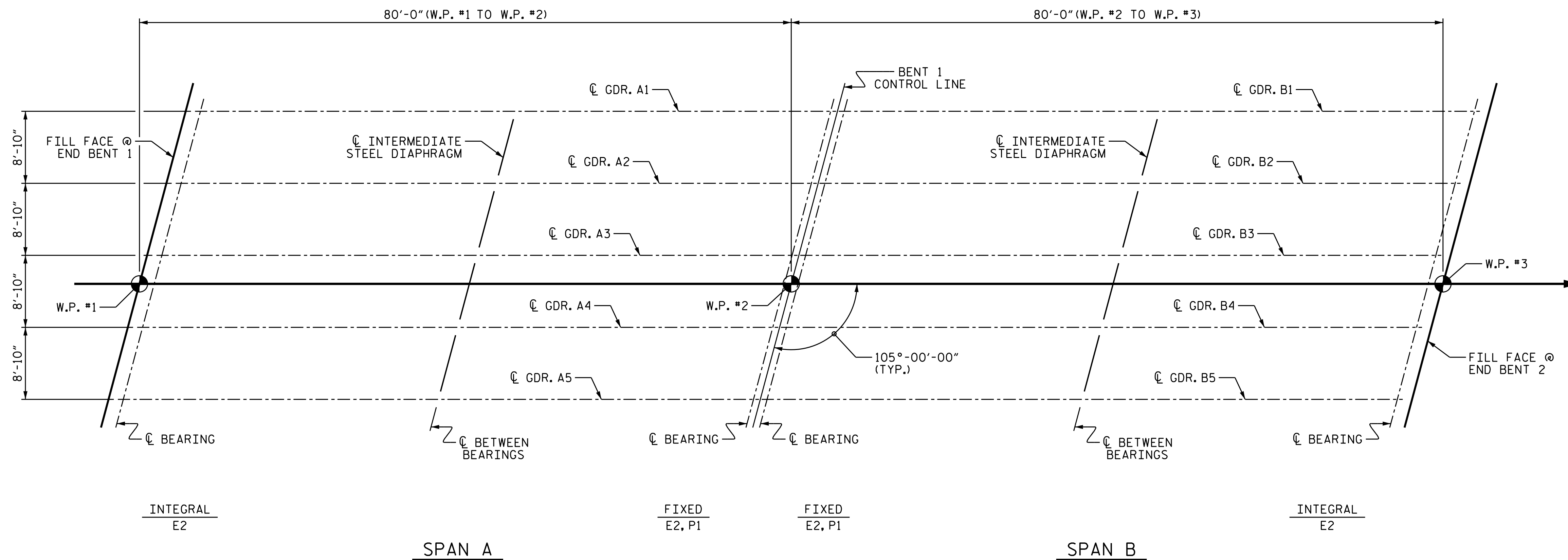


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS

DRAWN BY : O. T. NGUYEN DATE : 1/2021  
 CHECKED BY : M.K. BEARD DATE : 2/2021  
 DESIGN ENGINEER OF RECORD: P. BRYANT DATE : 3/1/21

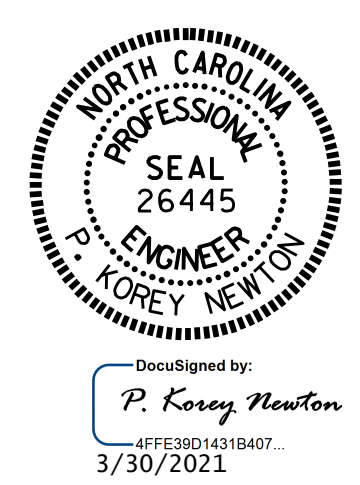
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1			3			TOTAL SHEETS
2			4			28



GIRDER LAYOUT

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-



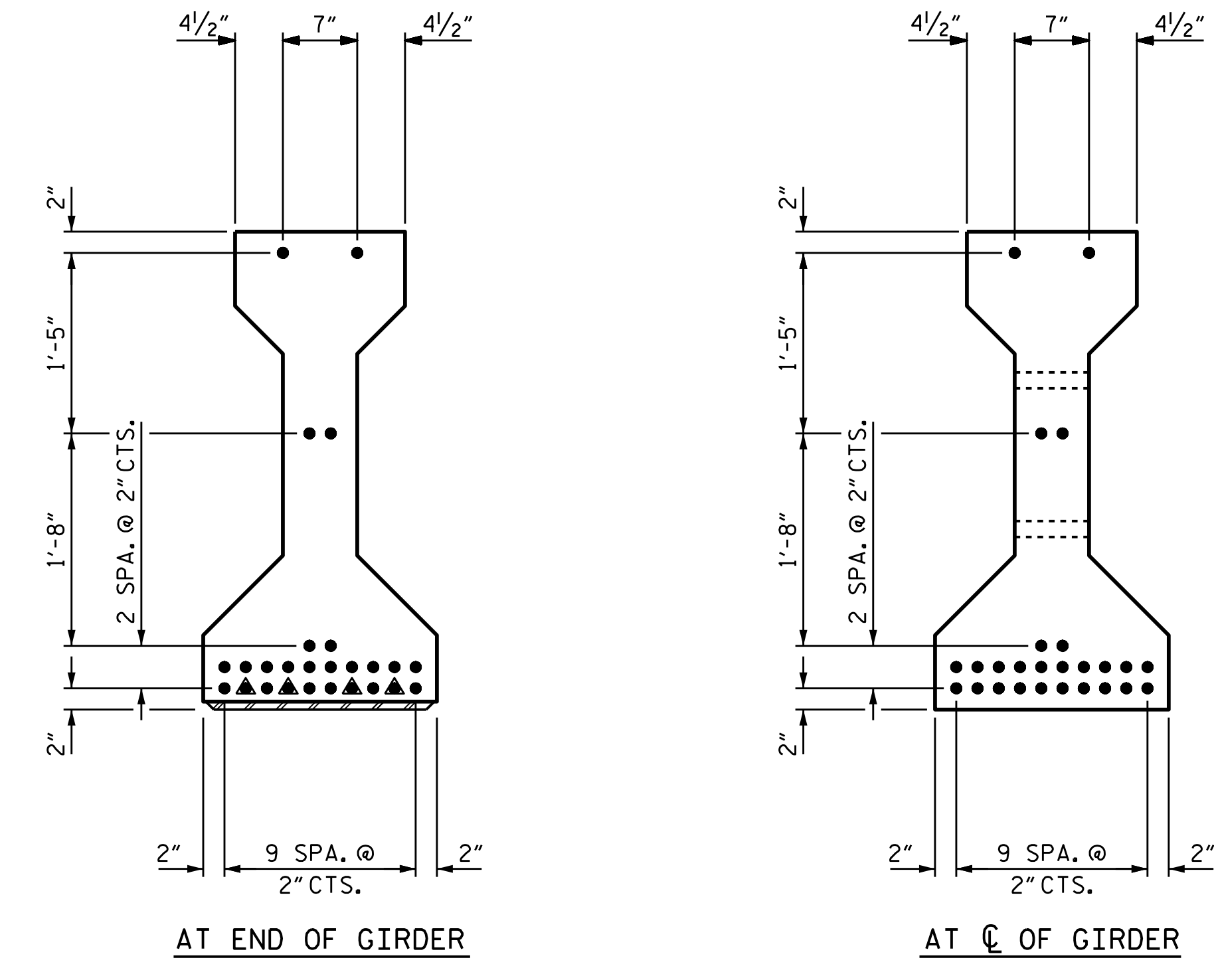
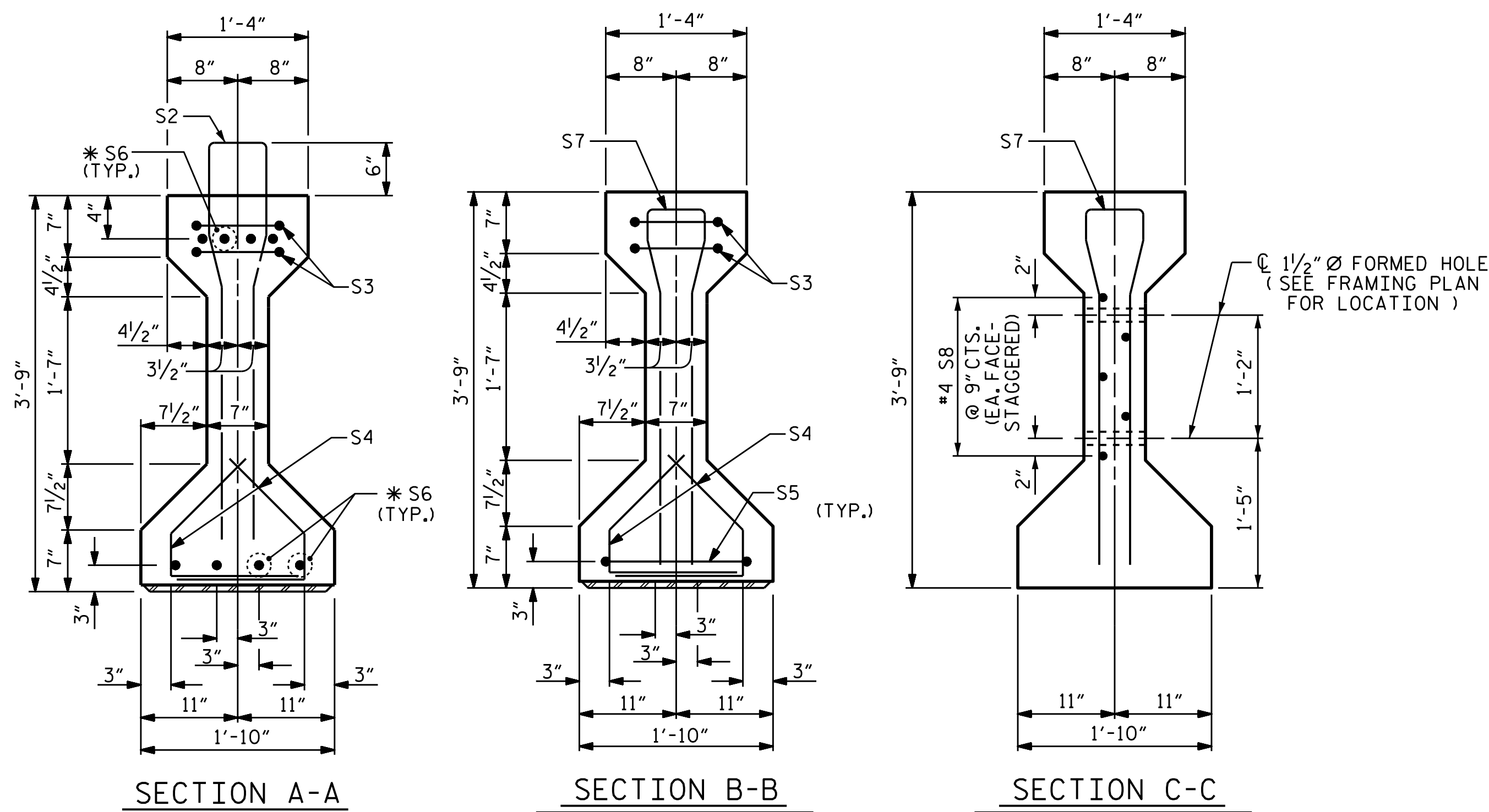
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**FRAMING PLAN**

DRAWN BY : P. K. NEWTON DATE : 1/19/21  
 CHECKED BY : P. D. BRYANT DATE : 1/29/21  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 1/29/21

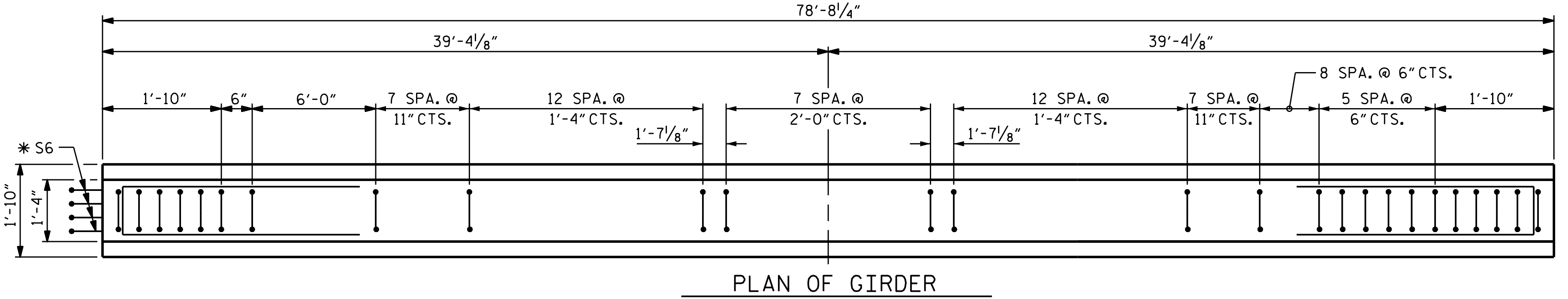
DOCUMENT NOT CONSIDERED  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			28

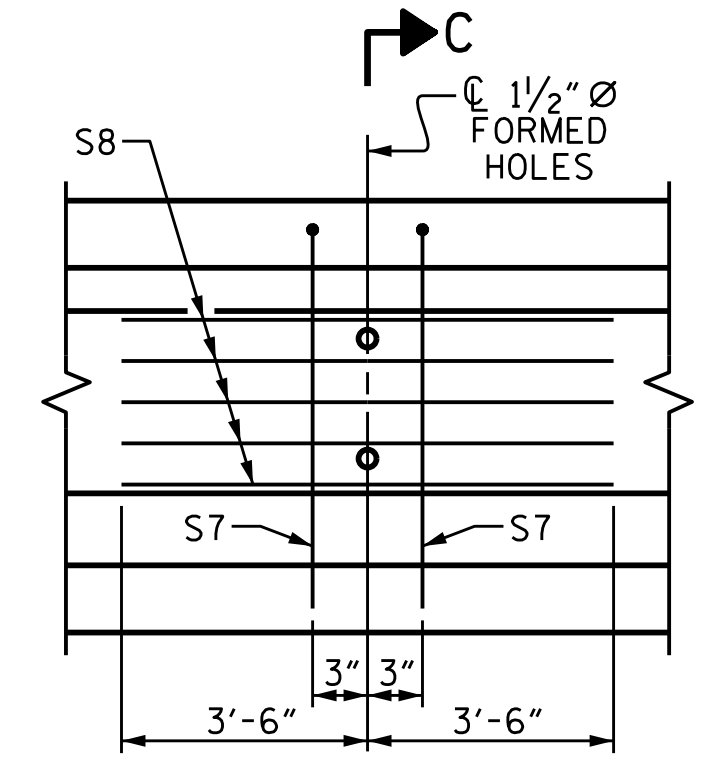


0.6" Ø LOW RELAXATION STRAND LAYOUT

- FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED 12'-0" FROM END OF GIRDER

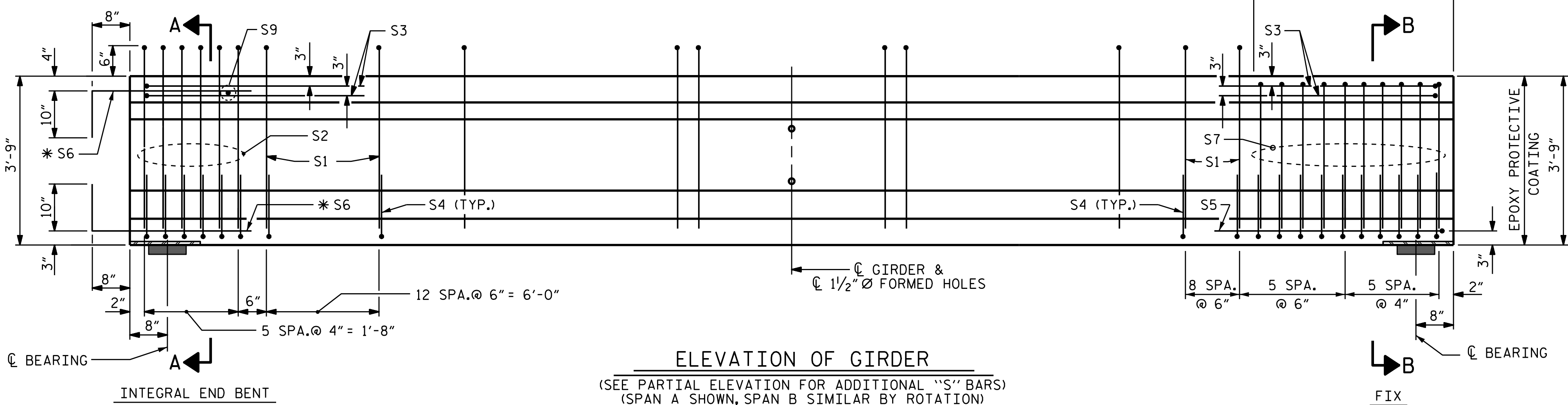


PLAN OF GIRDER



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL

\*\*DO NOT RAKE THE TOP OF THE GIRDER IN THIS AREA



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)  
(SPAN A SHOWN, SPAN B SIMILAR BY ROTATION)

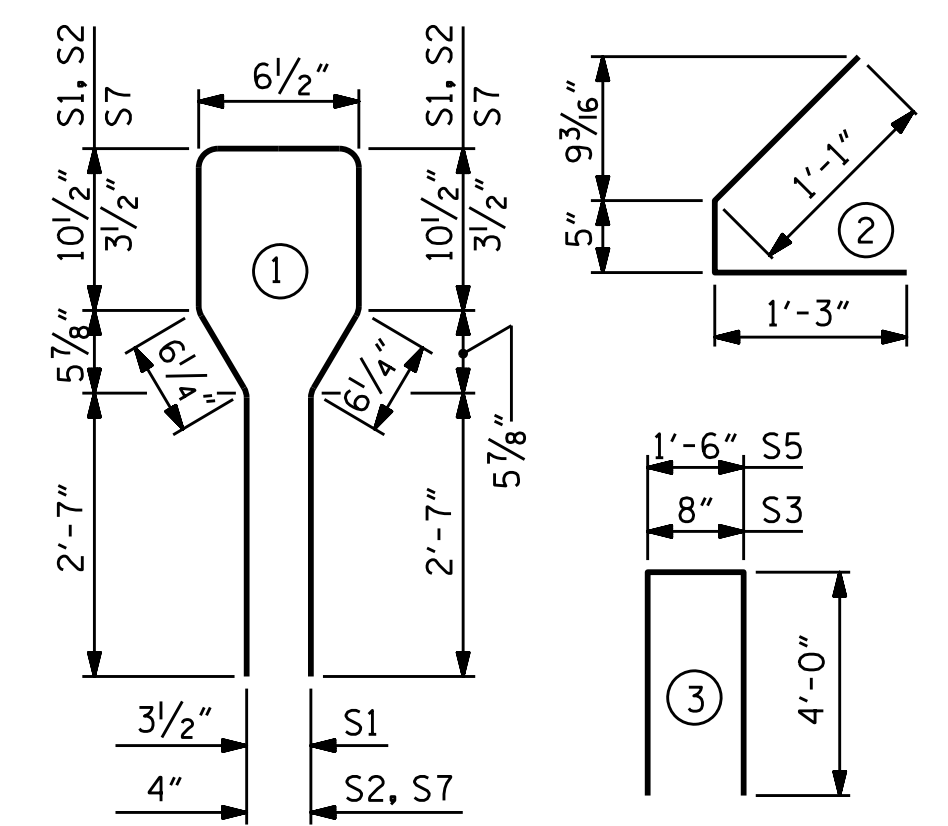
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	68	#4	1	8'-6"	386
S2	6	#6	1	8'-6"	77
S3	4	#4	3	8'-8"	23
S4	76	#4	2	2'-9"	140
S5	1	#4	3	9'-6"	6
*S6	8	#5	STR	3'-8"	31
S7	12	#6	1	7'-4"	132
S8	5	#4	STR	7'-0"	23
S9	1	#4	STR	1'-0"	1

\* 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.	7500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
	819	11.3	26

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	78'-8 1/4"	786.88

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 1 OF 2

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



DESIGN ENGINEER OF RECORD: P. D. BRYANT	DATE: 3/1/21
ASSEMBLED BY: P. K. NEWTON	DATE: 1/15/21
CHECKED BY: M. K. BEARD	DATE: 2/8/21
DRAWN BY: ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY: GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			28

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

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

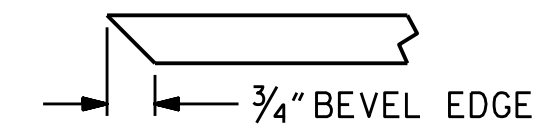
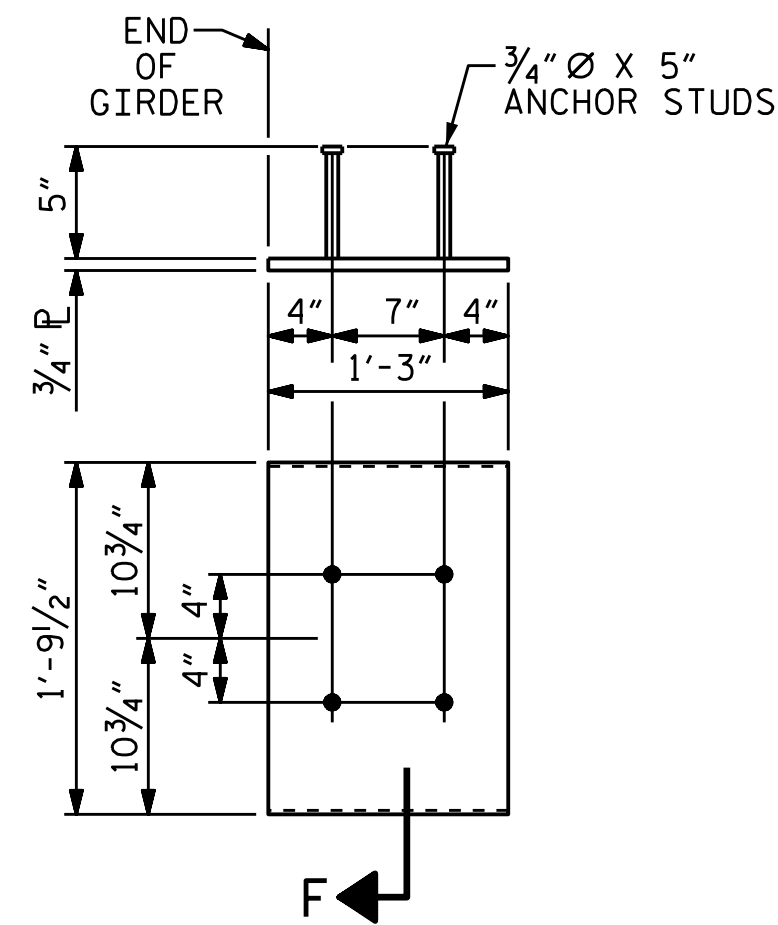
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5700 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)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																									
SPAN A OR B																									
0.6" Ø LOW RELAXATION					GIRDERS 1 & 5																				
TWENTIETH POINTS					0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.027	0.053	0.077	0.100	0.120	0.137	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.137	0.120	0.100	0.077	0.053	0.027	0			
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.019	0.038	0.055	0.071	0.086	0.098	0.107	0.114	0.119	0.120	0.119	0.114	0.107	0.098	0.086	0.071	0.055	0.038	0.019	0			
FINAL CAMBER	↑	0	1/16"	3/16"	1/4"	3/8"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	3/8"	1/4"	3/16"	1/16"	0			
0.6" Ø LOW RELAXATION					GIRDERS 2, 3, & 4																				
TWENTIETH POINTS					0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.027	0.053	0.077	0.100	0.120	0.137	0.150	0.160	0.166	0.168	0.166	0.160	0.150	0.137	0.120	0.100	0.077	0.053	0.027	0			
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.020	0.040	0.059	0.076	0.091	0.104	0.114	0.122	0.126	0.128	0.126	0.122	0.114	0.104	0.091	0.076	0.059	0.040	0.020	0			
FINAL CAMBER	↑	0	1/16"	1/8"	1/4"	5/16"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	5/16"	1/4"	1/8"	1/16"	0			

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

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 2 OF 2



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

DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 3/1/21		
ASSEMBLED BY : P. K. NEWTON	DATE : 1/15/21	
CHECKED BY : M. K. BEARD	DATE : 2/8/21	
DRAWN BY : ELR 11/91	REV. 1/15	MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15	MAA/TMG
	REV. 12/17	MAA/THC

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1			3			TOTAL SHEETS
2			4			28

**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.

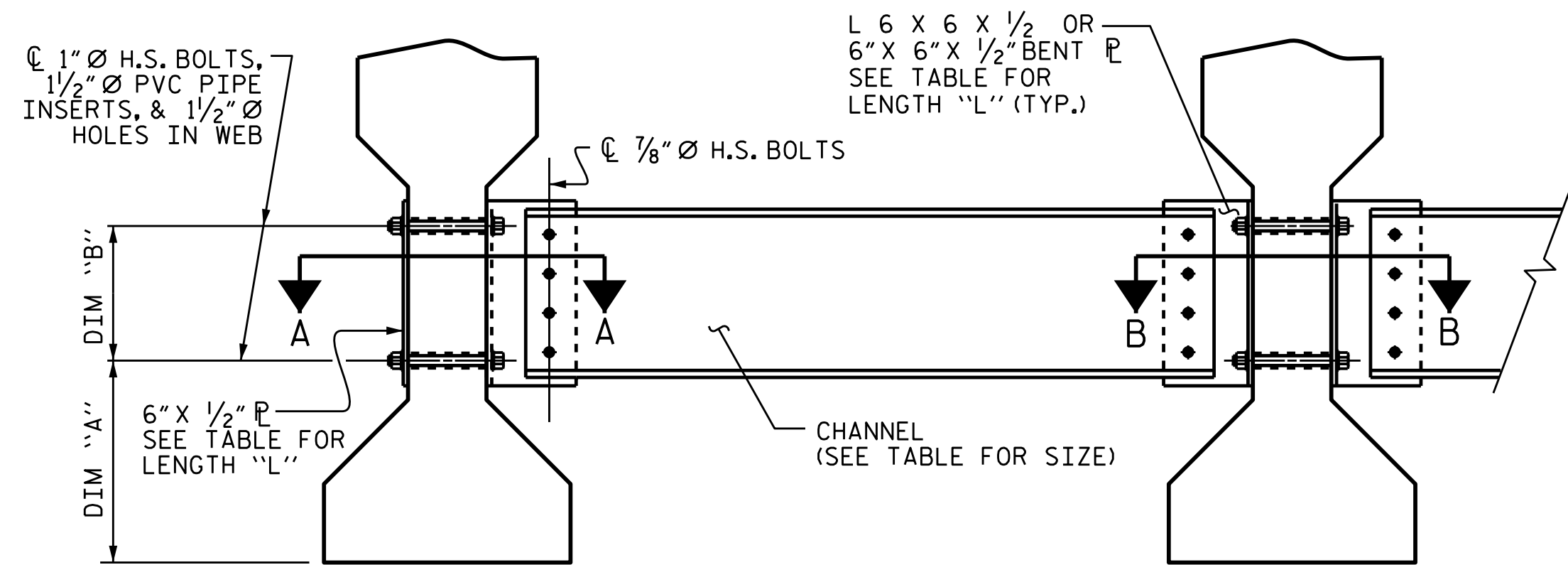
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

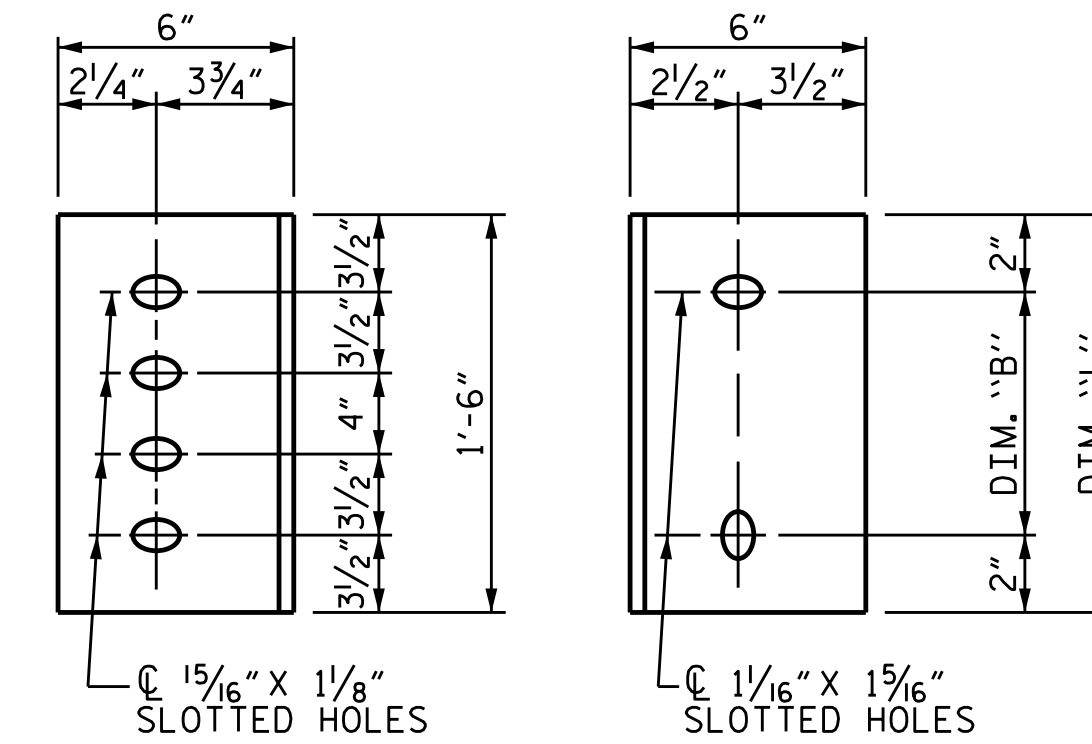
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

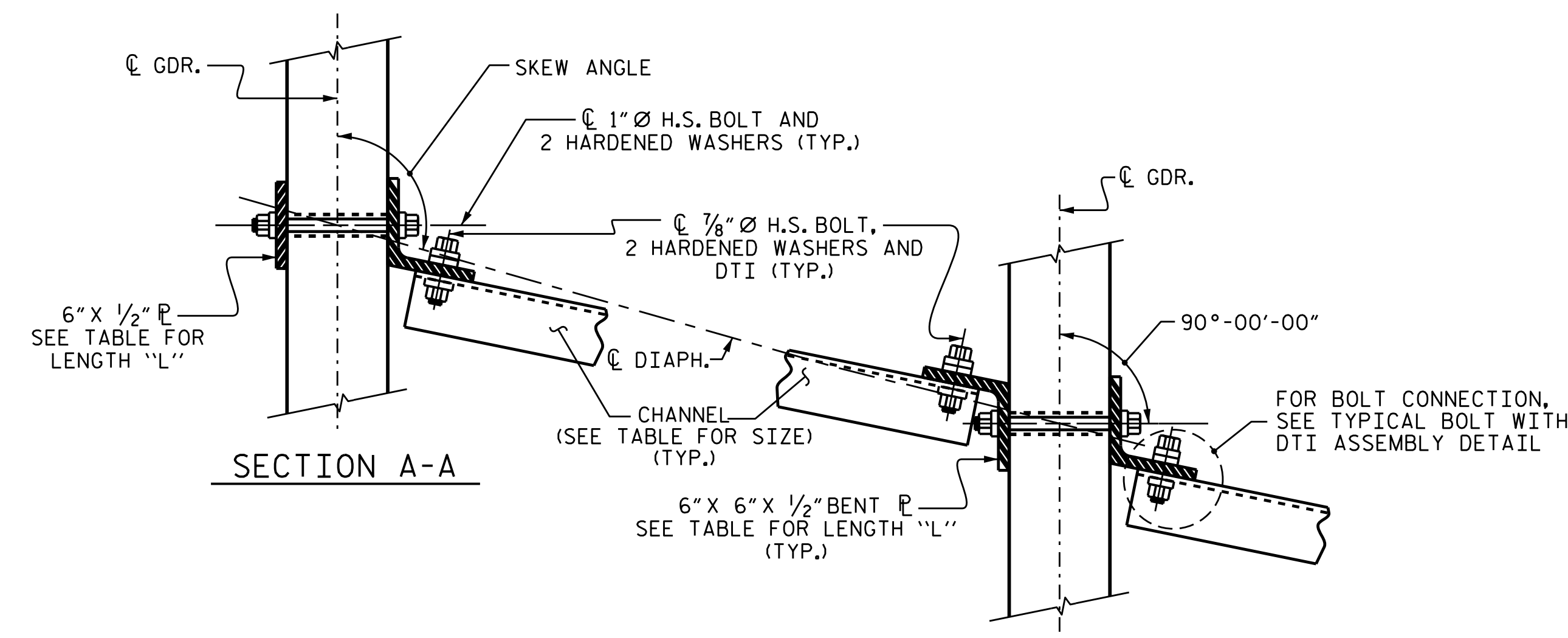


**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
 (TYPE III OR TYPE IV GIRDER SHOWN)

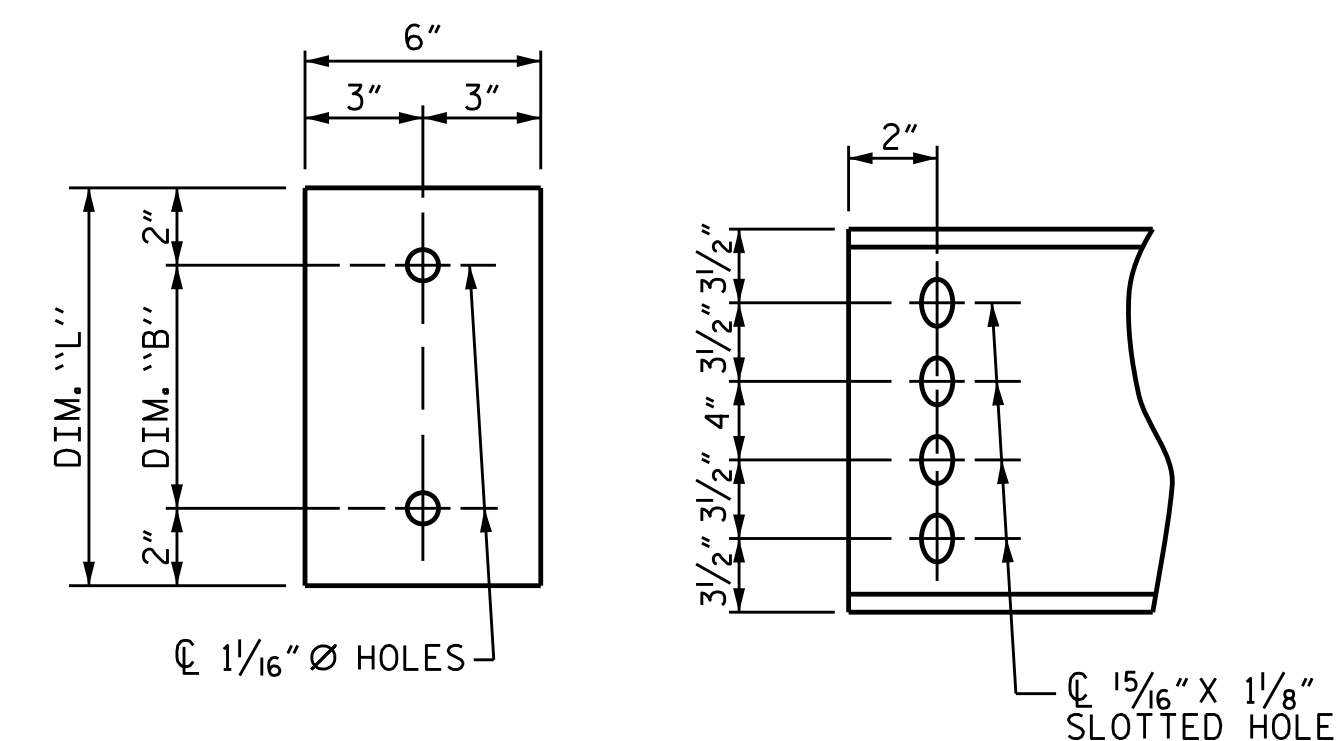


**DIAPHRAGM FACE**      **WEB FACE**  
 (TYPE III GIRDER)

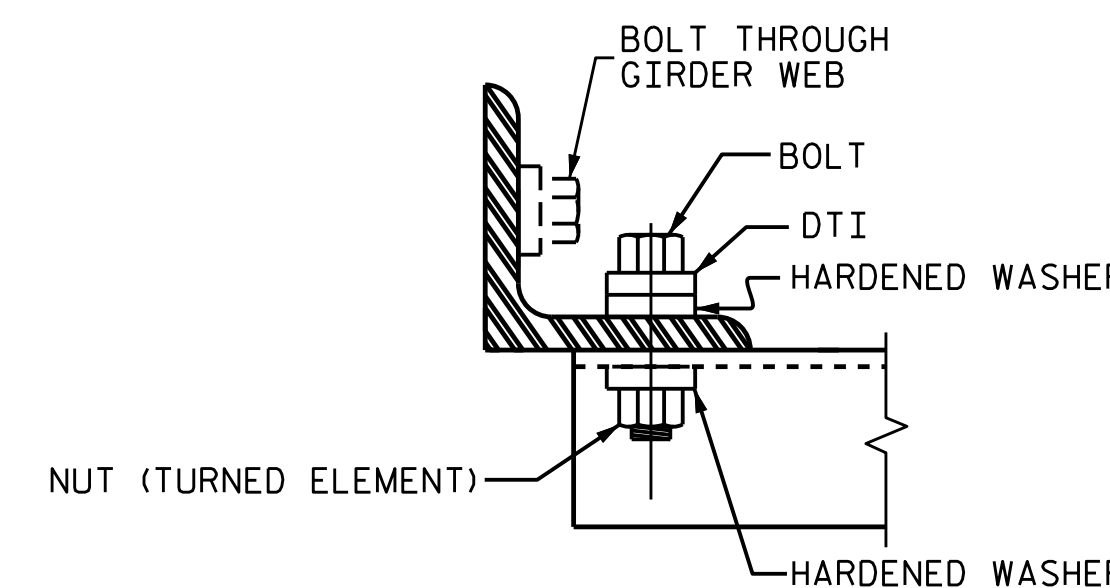
**CONNECTOR PLATE DETAILS**



**SECTION A-A**      **SECTION B-B**  
**CONNECTION DETAILS**



**PLATE DETAILS**      **CHANNEL END**  
 (TYPE III GIRDER)

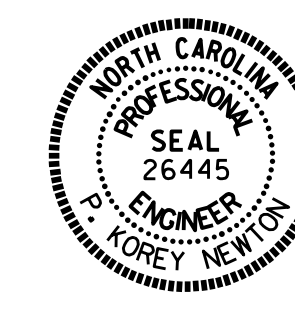


**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

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

PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-



DocuSigned by:  
 P. Kerry Newton  
 4FF89D1431B407  
 3/30/2021

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

DESIGN ENGINEER OF RECORD: P. D. BRYANT	DATE: 3/1/21
ASSEMBLED BY: P. K. NEWTON	DATE: 1/15/21
CHECKED BY: M. K. BEARD	DATE: 2/8/21
DRAWN BY: TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY: VC 6/05	REV. 10/1/18 MAA/GM
	REV. 12/17 MAA/THC

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			28
2			4			

**NOTES**

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

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

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

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

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

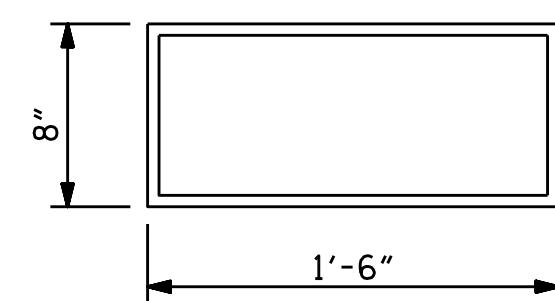
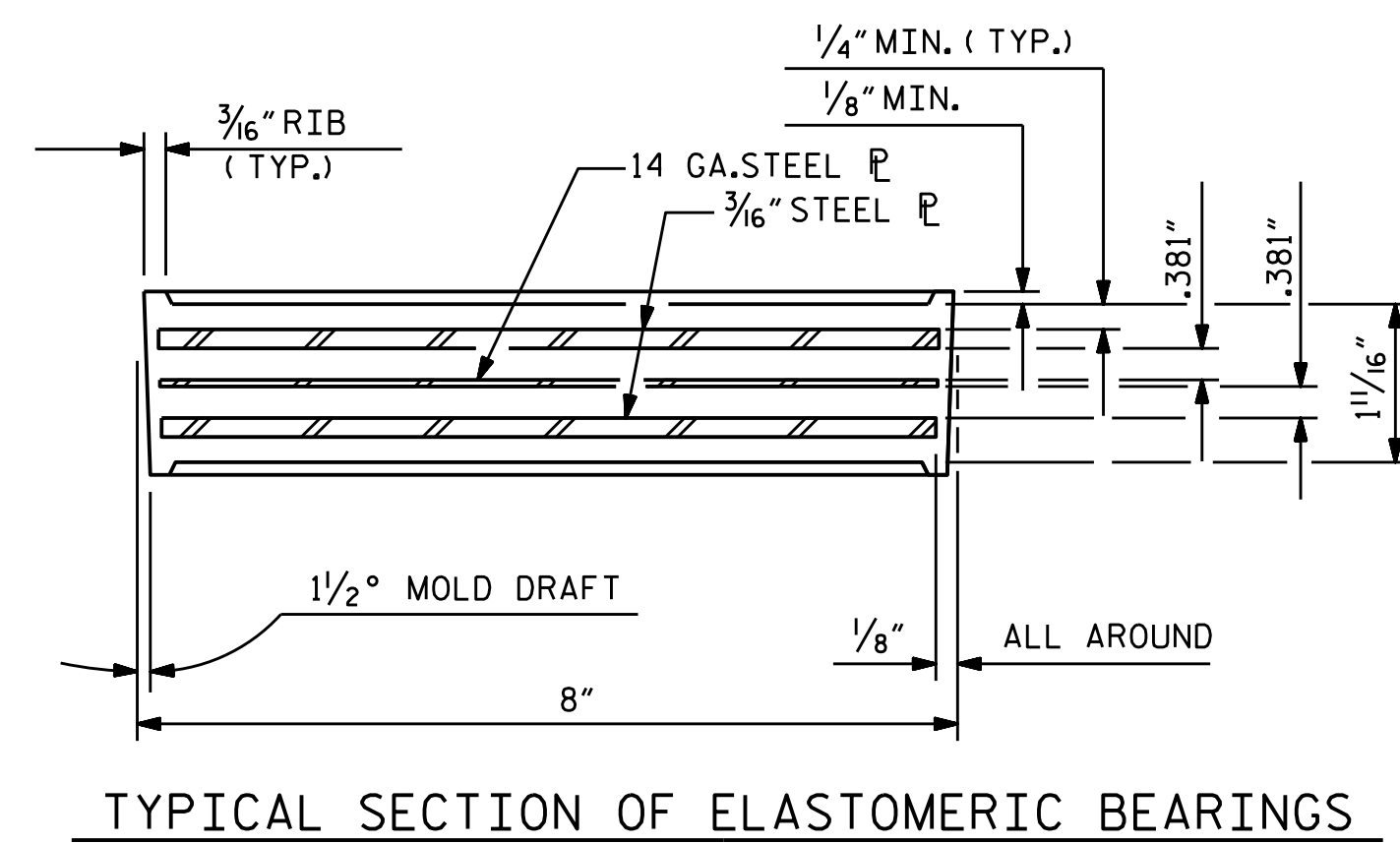
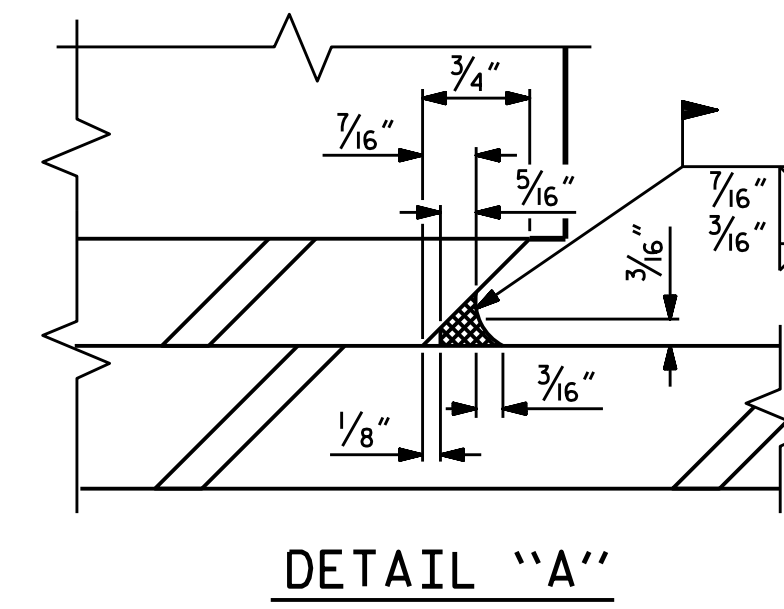
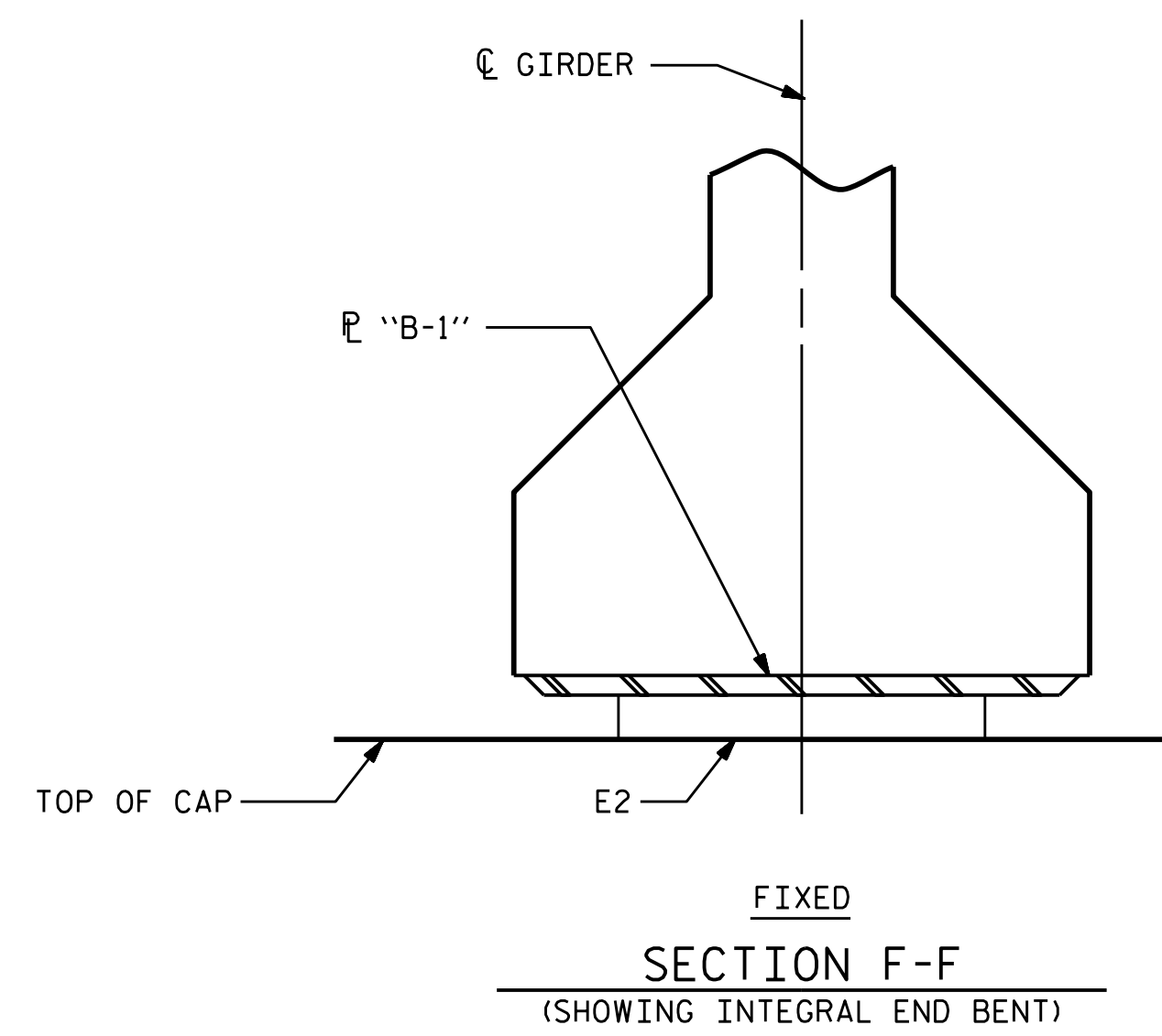
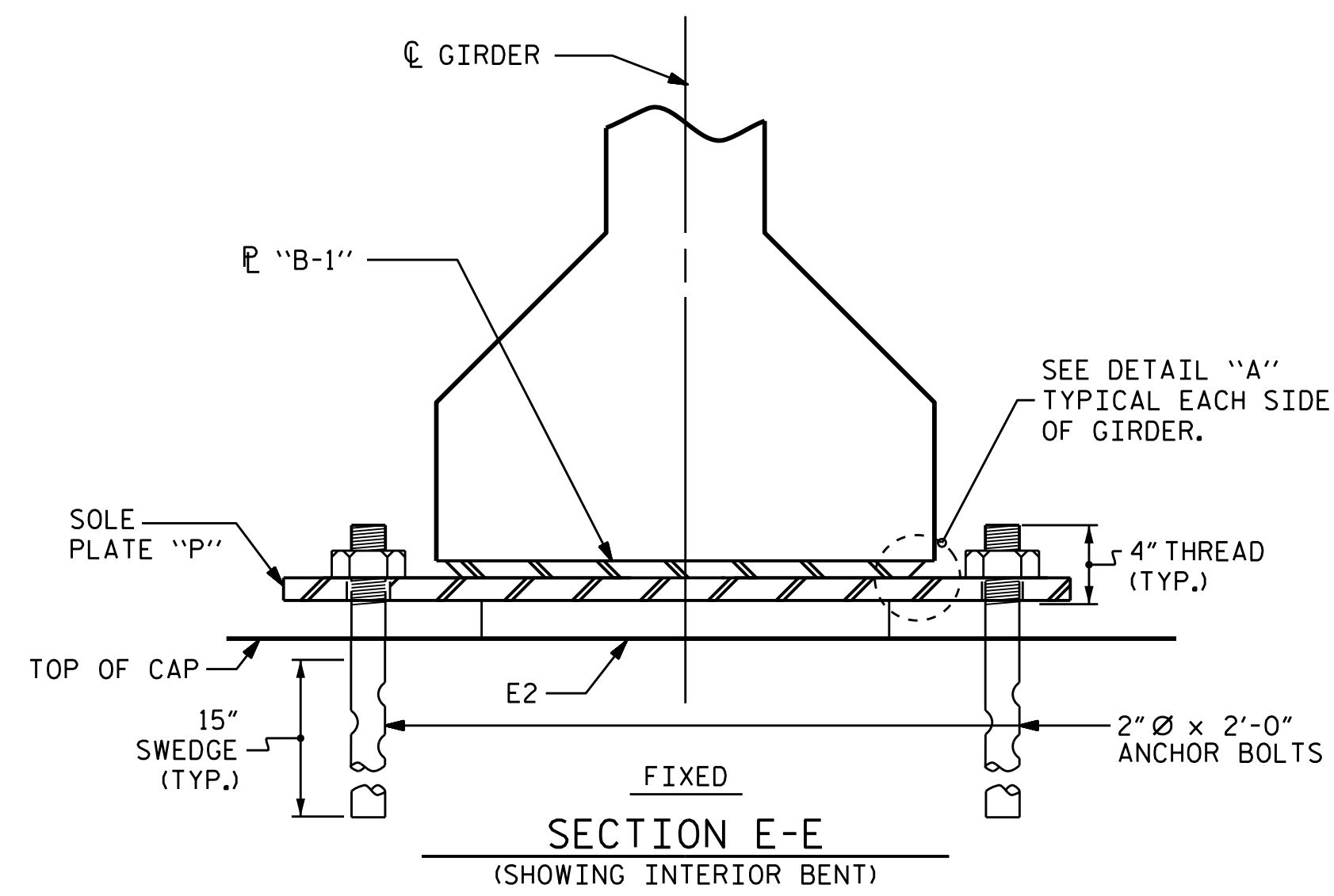
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

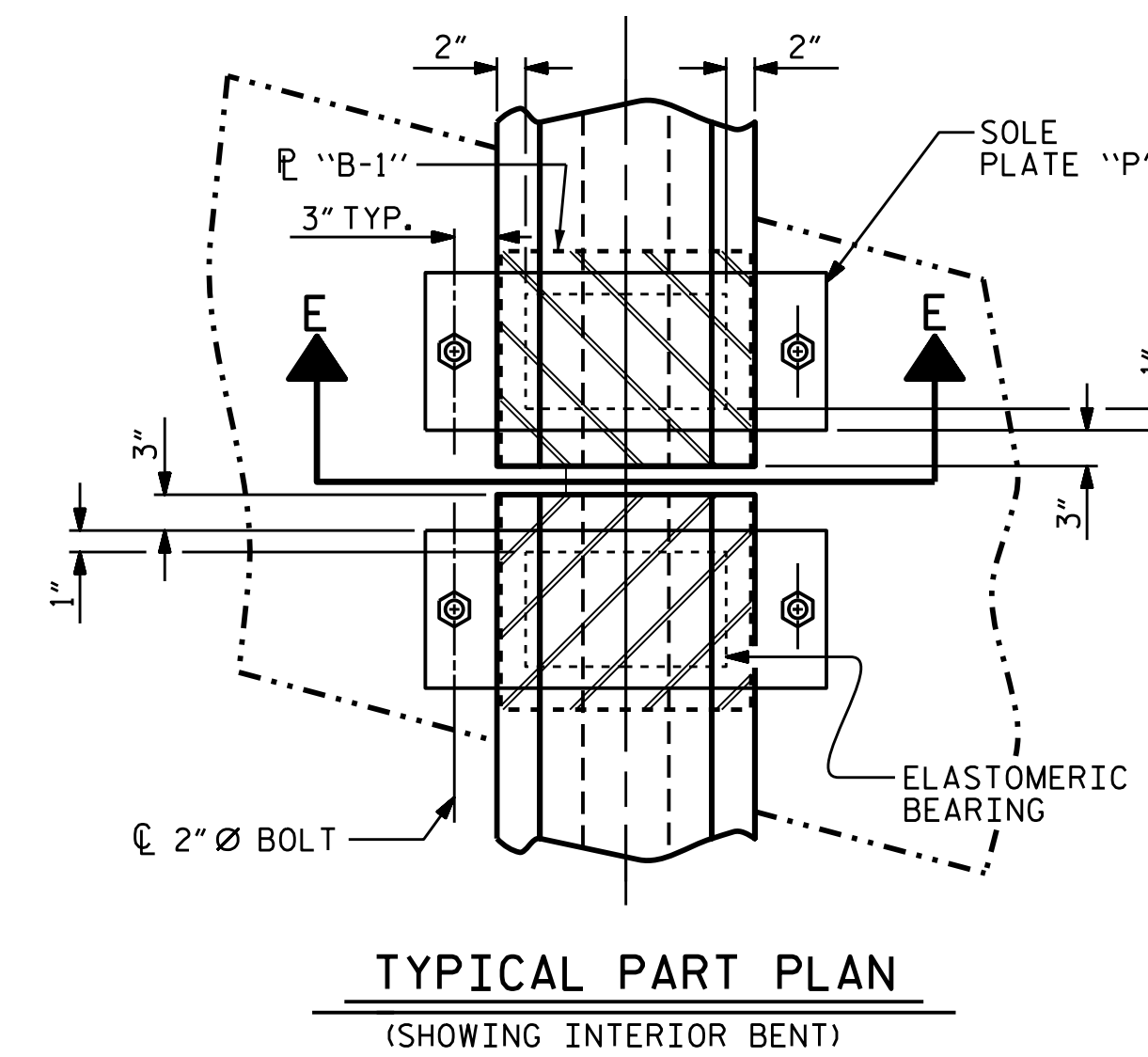
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

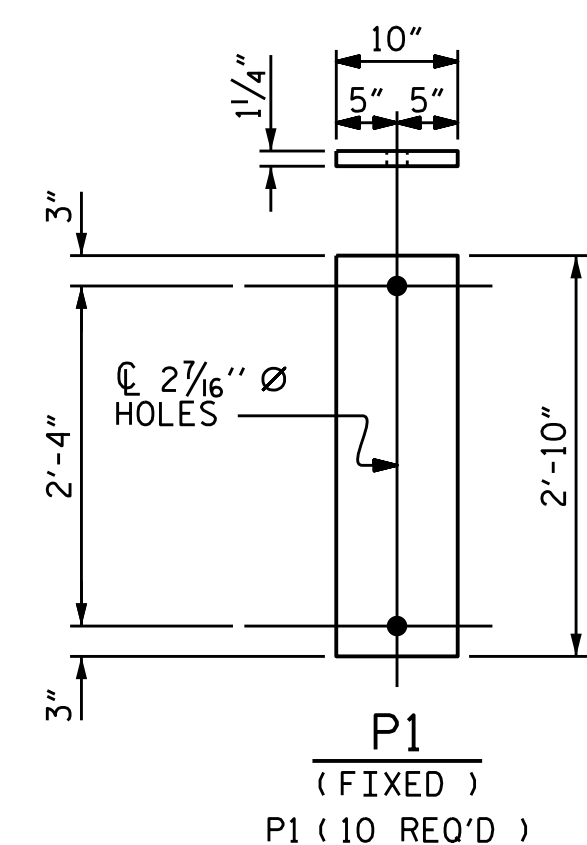
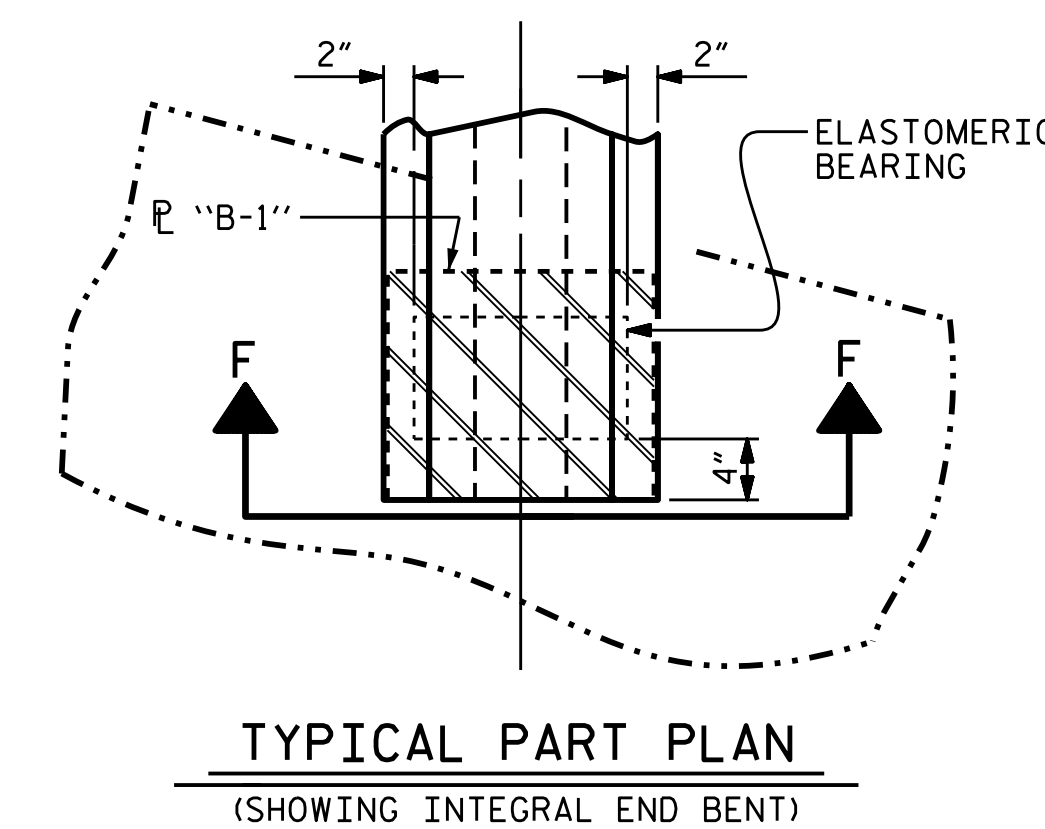
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



E2 (20 REQ'D)  
TYPE III



MAXIMUM ALLOWABLE SERVICE LOAD	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k



DESIGN ENGINEER OF RECORD:		P. D. BRYANT		DATE: 1/29/21	
ASSEMBLED BY:		P. K. NEWTON		DATE: 1/19/21	
CHECKED BY:		P. D. BRYANT		DATE: 1/29/21	
DRAWN BY:	WJH 8/89	REV. 6/13	AAC/MAA	REV. 1/15	MAA/TMG
CHECKED BY:	CRK 8/89	REV. 12/17	MAA/THC		

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			28
2			4			

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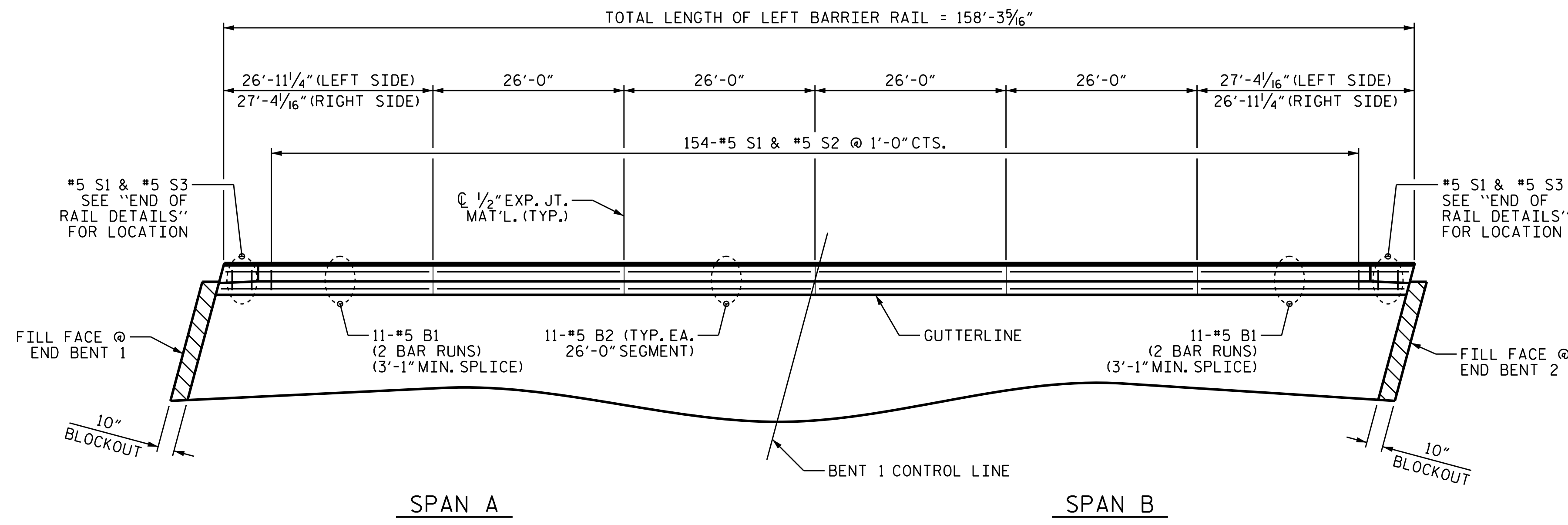
**NOTES**

THE BARRIER RAIL 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.

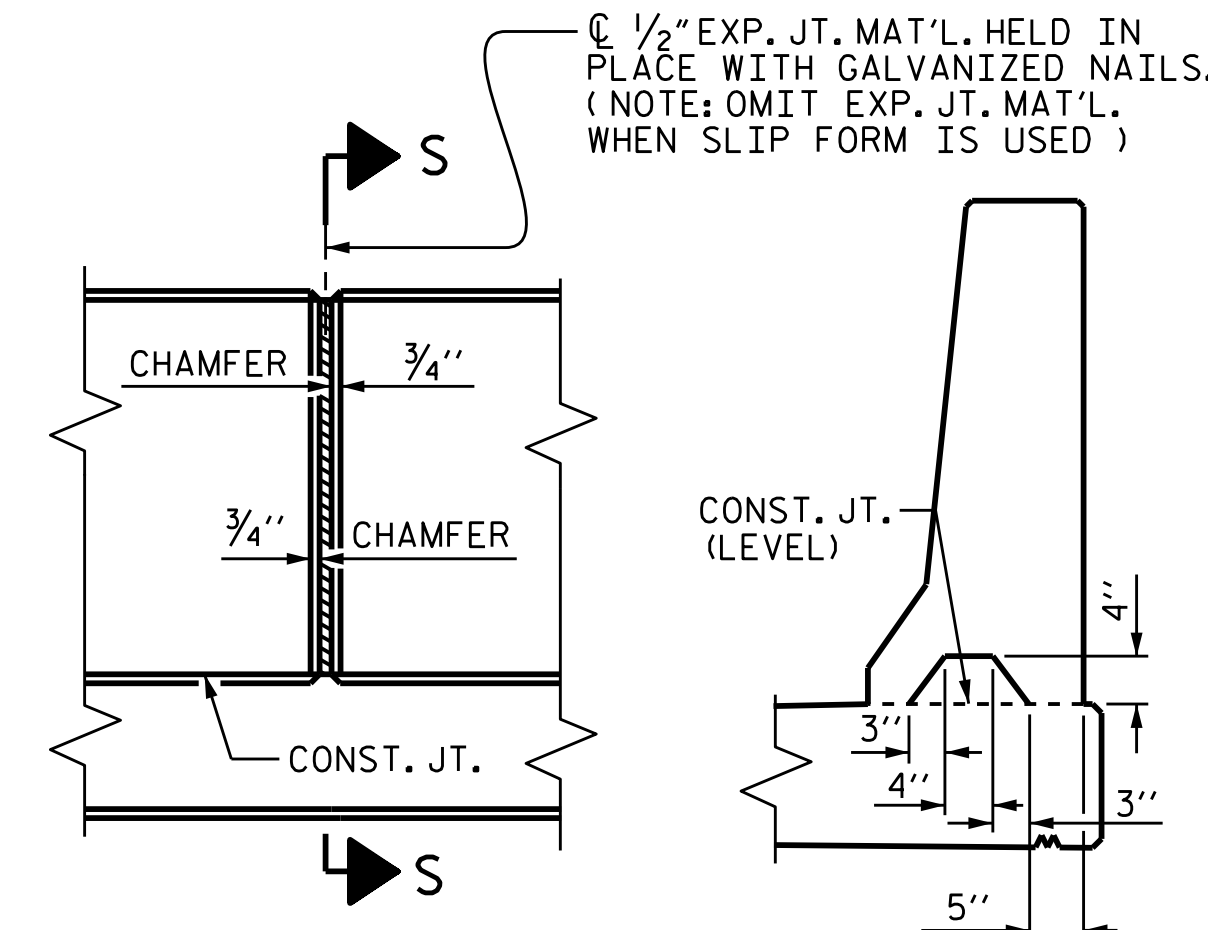
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					
BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR	15'-0"	1377
* B2	88	#5	STR	25'-7"	2348
* S1	316	#5	1	4'-8"	1538
* S2	308	#5	2	7'-0"	2249
* S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL					7558 LBS.
CLASS AA CONCRETE				43.0 CU. YDS.	
CONCRETE BARRIER RAIL				316.55 LIN. FT.	

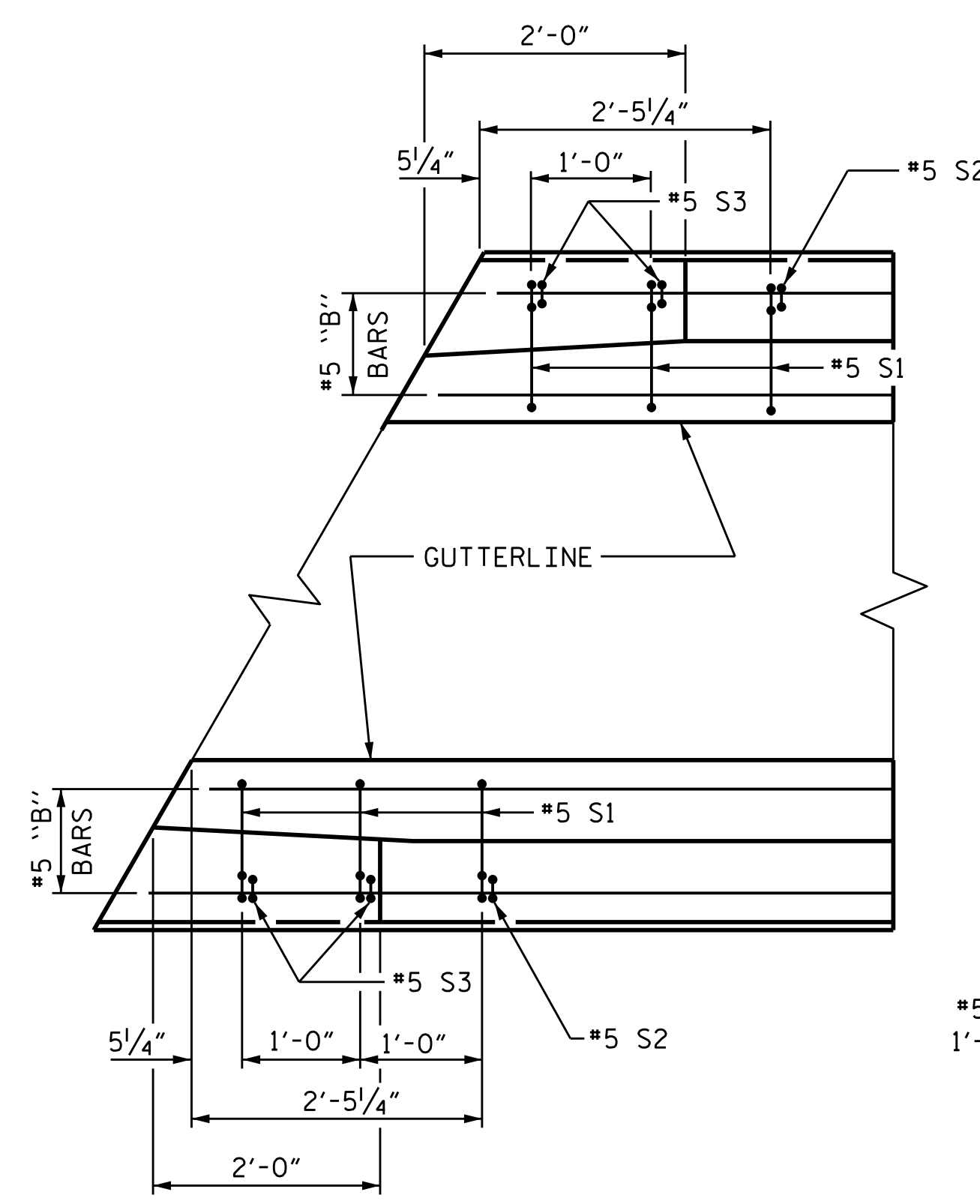


**PART PLAN**  
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR BY ROTATION. RAIL DIMENSIONS ARE MEASURED ALONG THE OUTSIDE FACE.

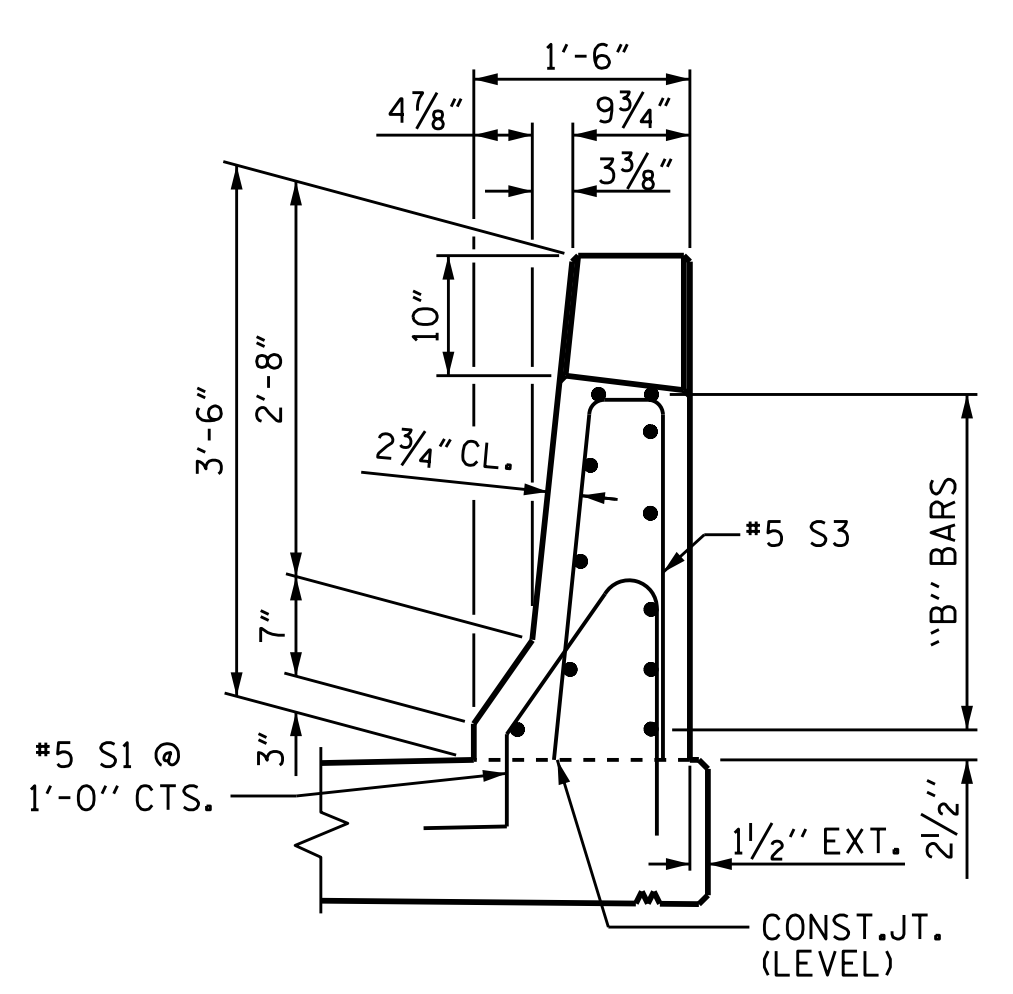


**SECTION S-S**  
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

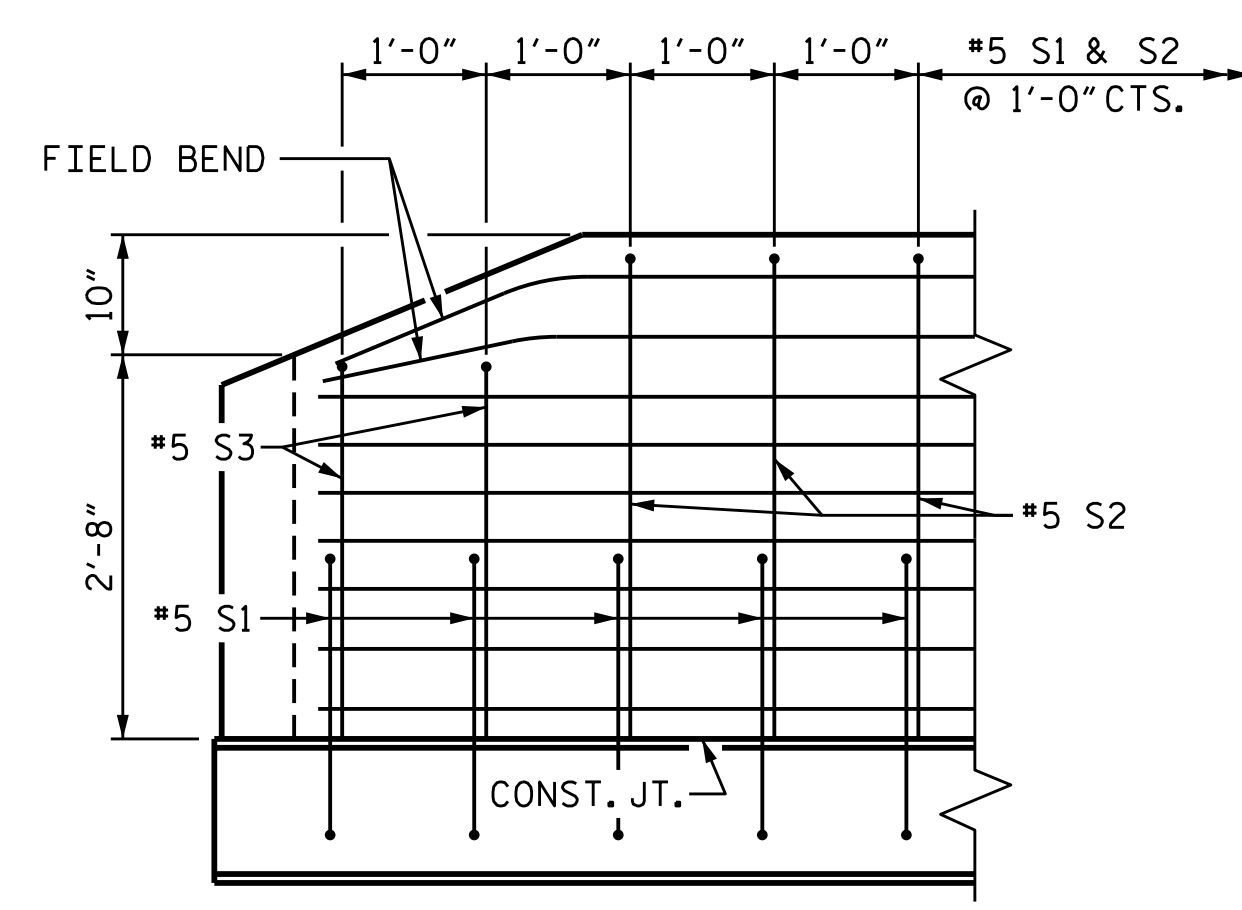
**ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS**



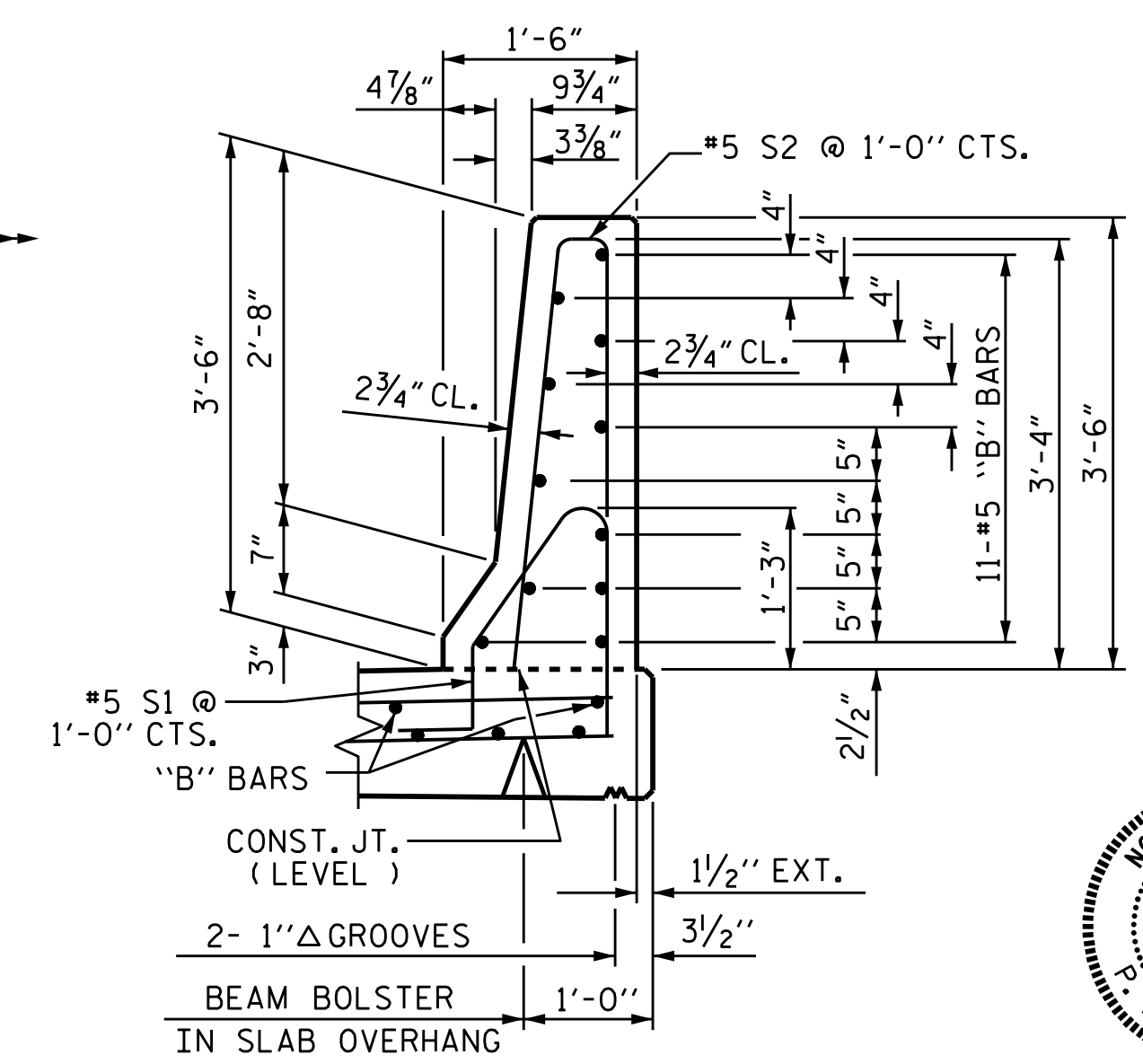
**PLAN**



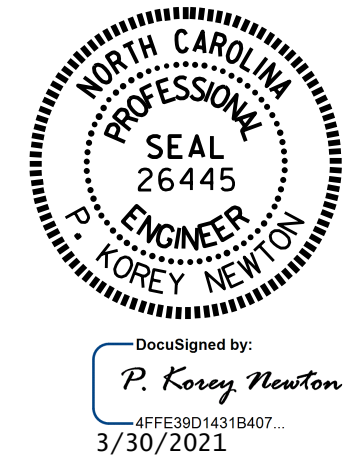
**END VIEW**



**SIDE VIEW**



**SECTION THRU RAIL**



PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
CONCRETE  
BARRIER RAIL

DRAWN BY: P. K. NEWTON DATE: 2/10/21  
CHECKED BY: M. K. BEARD DATE: 2/10/21  
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/12/21

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REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			

NOTES

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

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

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

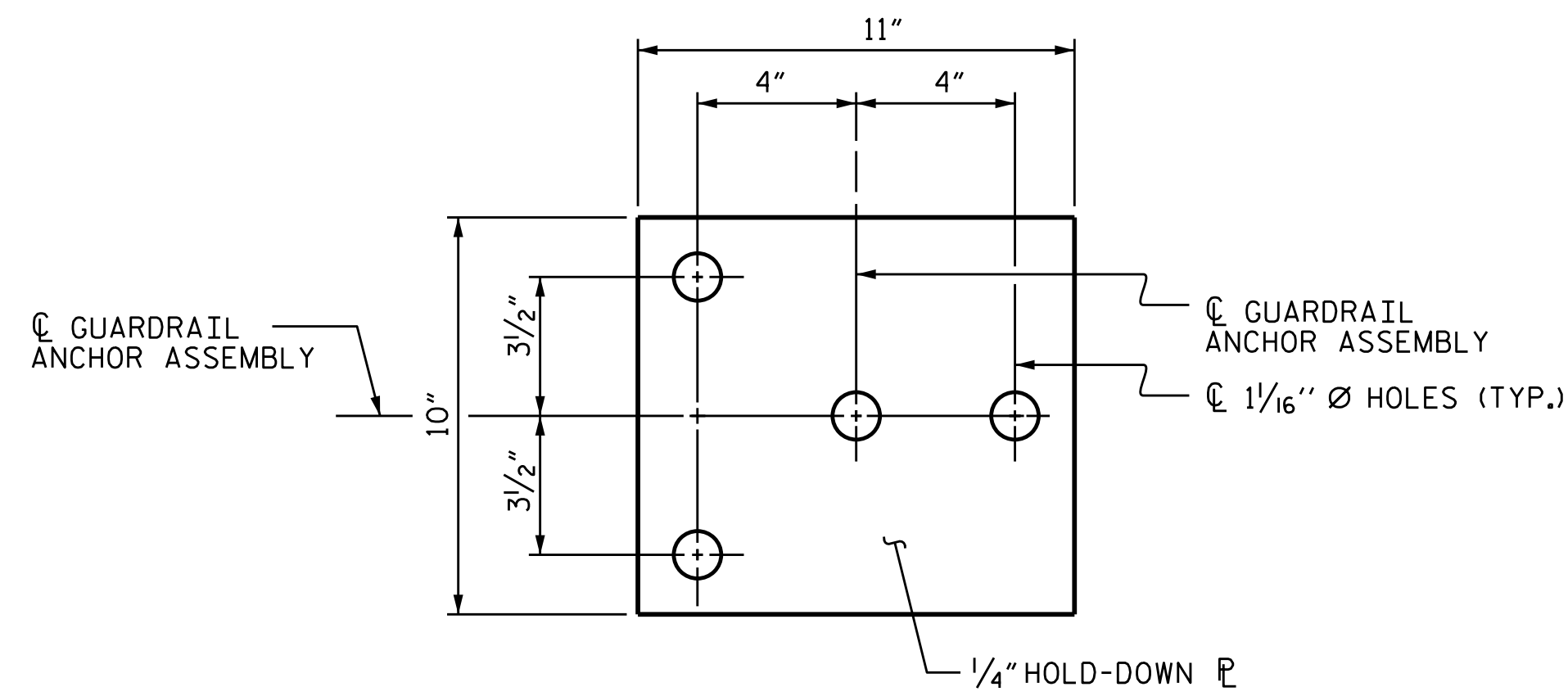
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

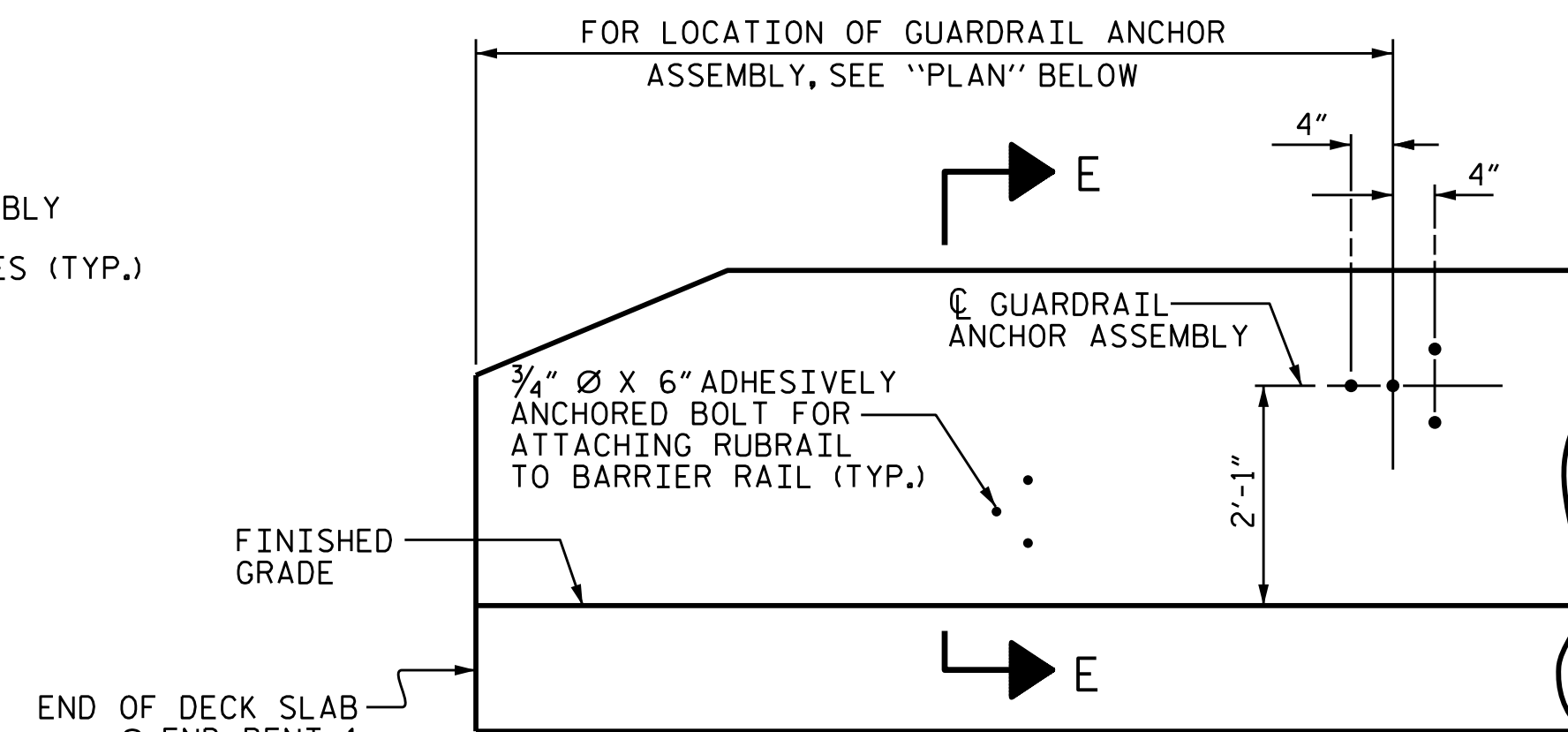
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

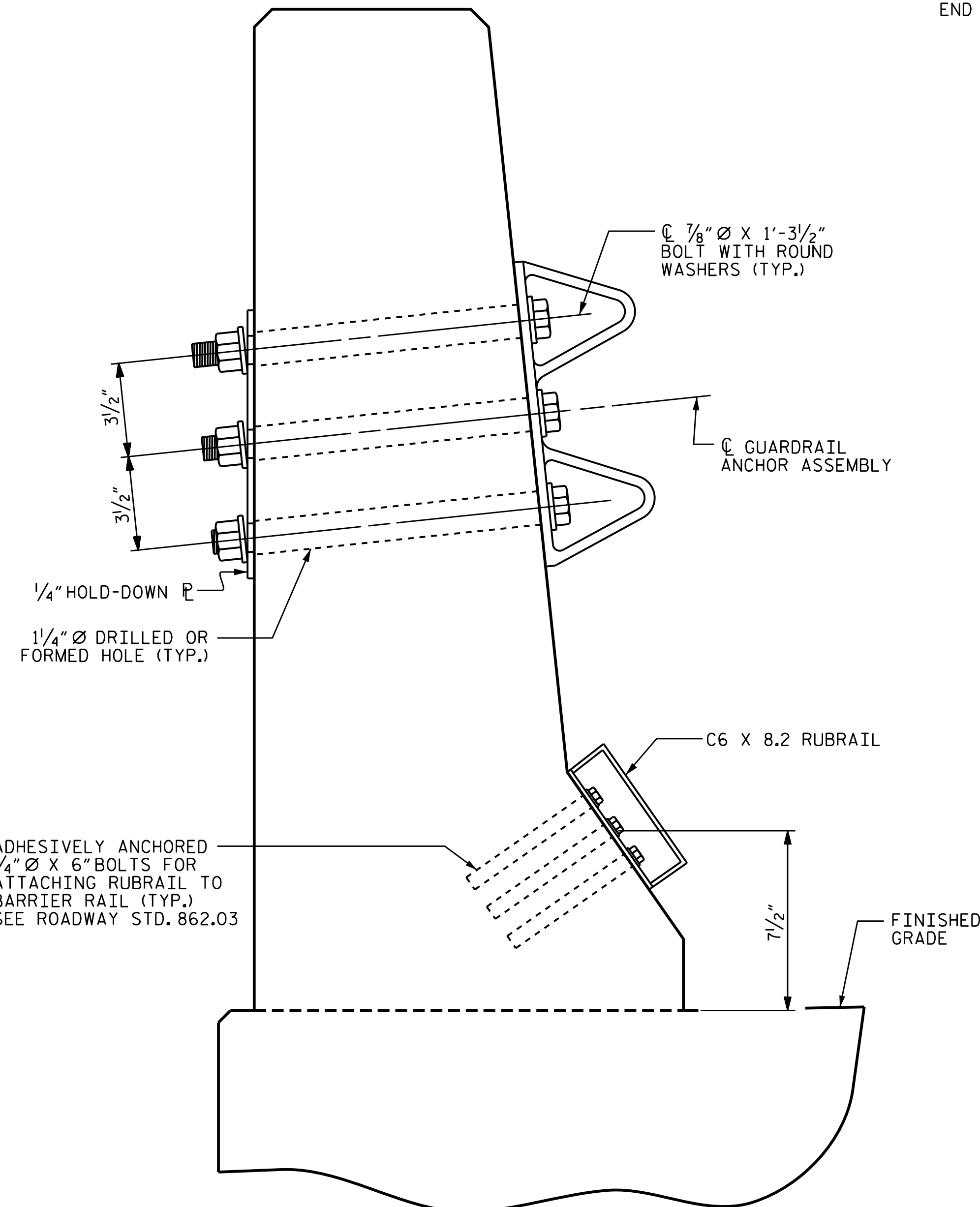
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



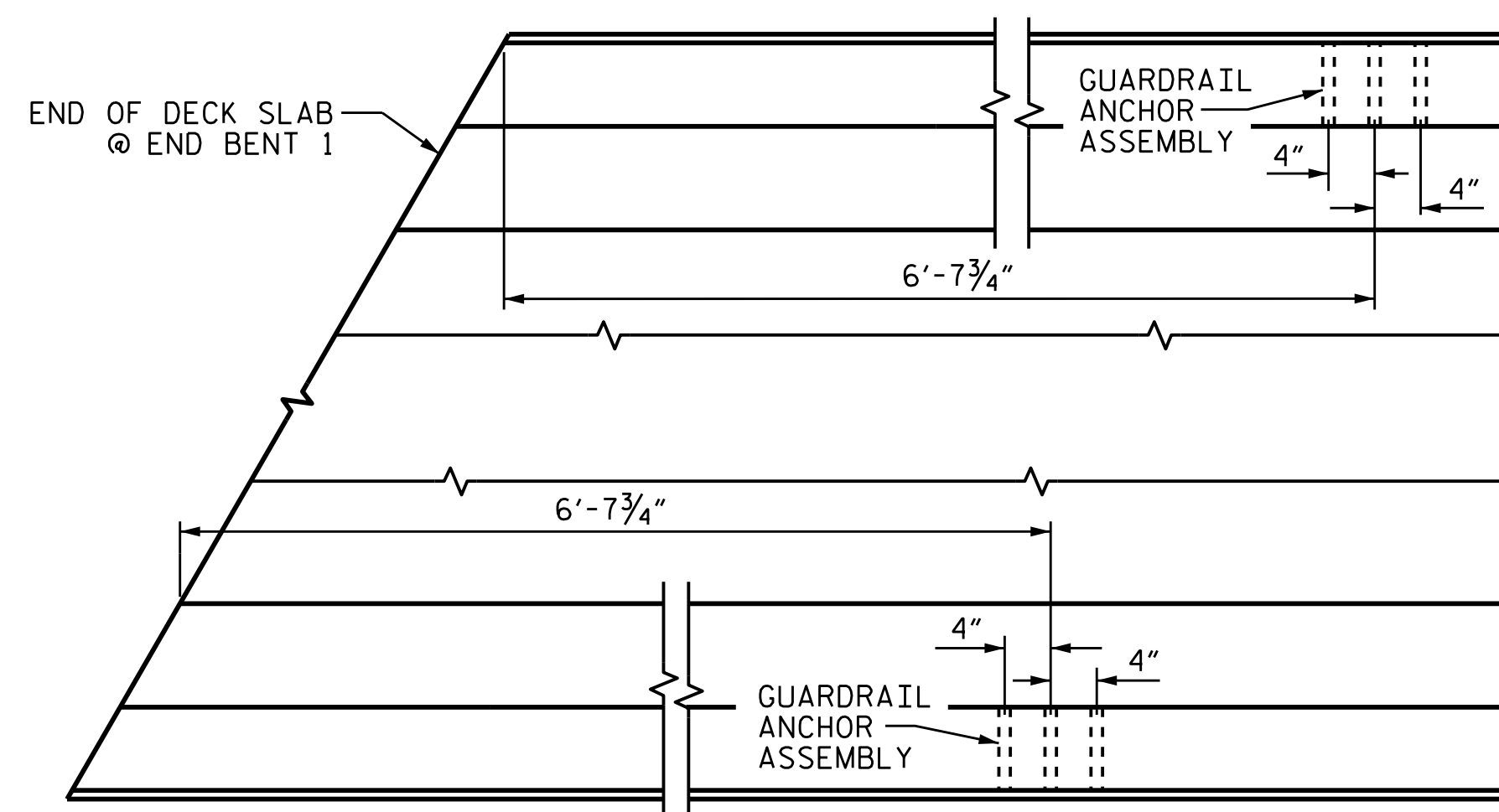
PLAN



ELEVATION



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-



DocuSigned by:  
P. Corey Newton  
4FF639D1431B407  
3/30/2021

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

ASSEMBLED BY : P. K. NEWTON	DATE : 2/9/21
CHECKED BY : M. K. BEARD	DATE : 2/10/21
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

30-MAR-2021 18:10  
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pknewton

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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			28

(SHT 1b) STD. NO. GRA2



**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"

**— SUPERSTRUCTURE BILL OF MATERIAL —**

	CLASS AA CONCRETE ( CU.YDS.)	REINFORCING STEEL ( LBS.)	EPOXY COATED REINFORCING STEEL ( LBS.)
POUR #1	154.8	---	---
POUR #2	74.8	---	---
<b>TOTALS**</b>	229.6	23,908	24,204

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

**GROOVING BRIDGE FLOORS**

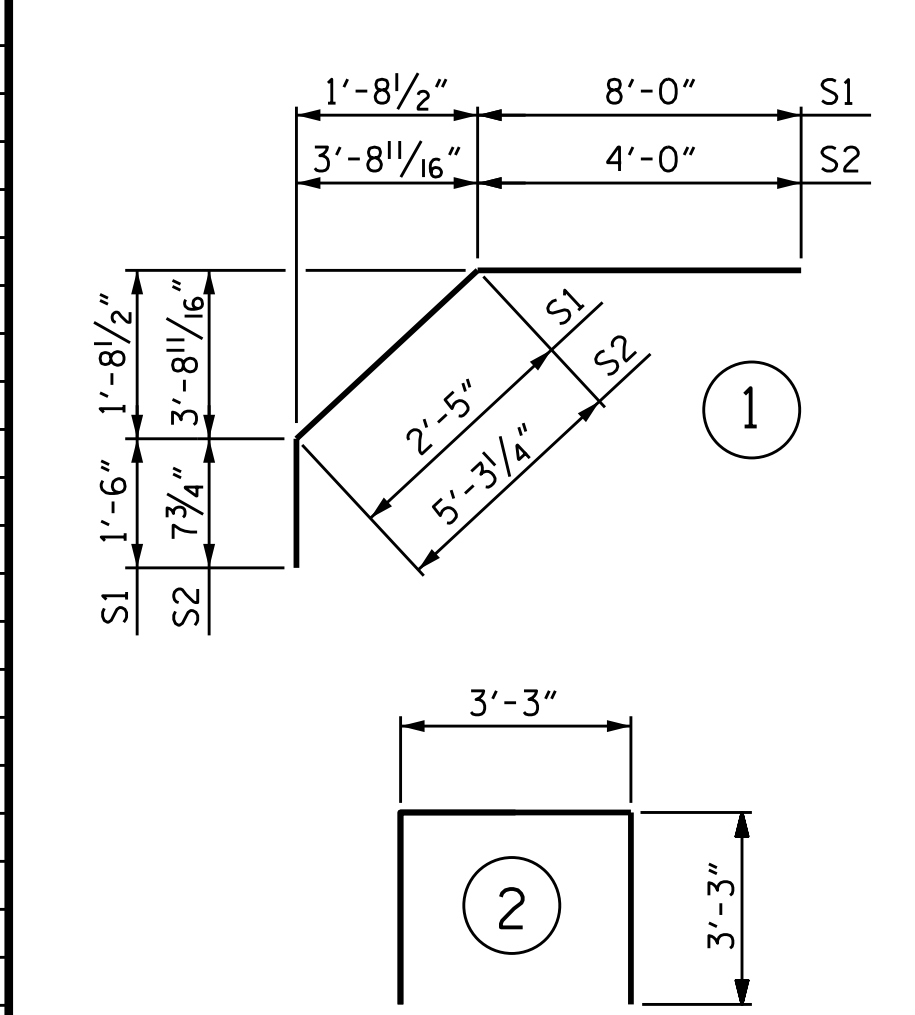
APPROACH SLABS	1017.9 SQ.FT.
BRIDGE DECK	5685.5 SQ.FT.
<b>TOTAL</b>	<b>6703.4 SQ.FT.</b>

**BILL OF MATERIAL**

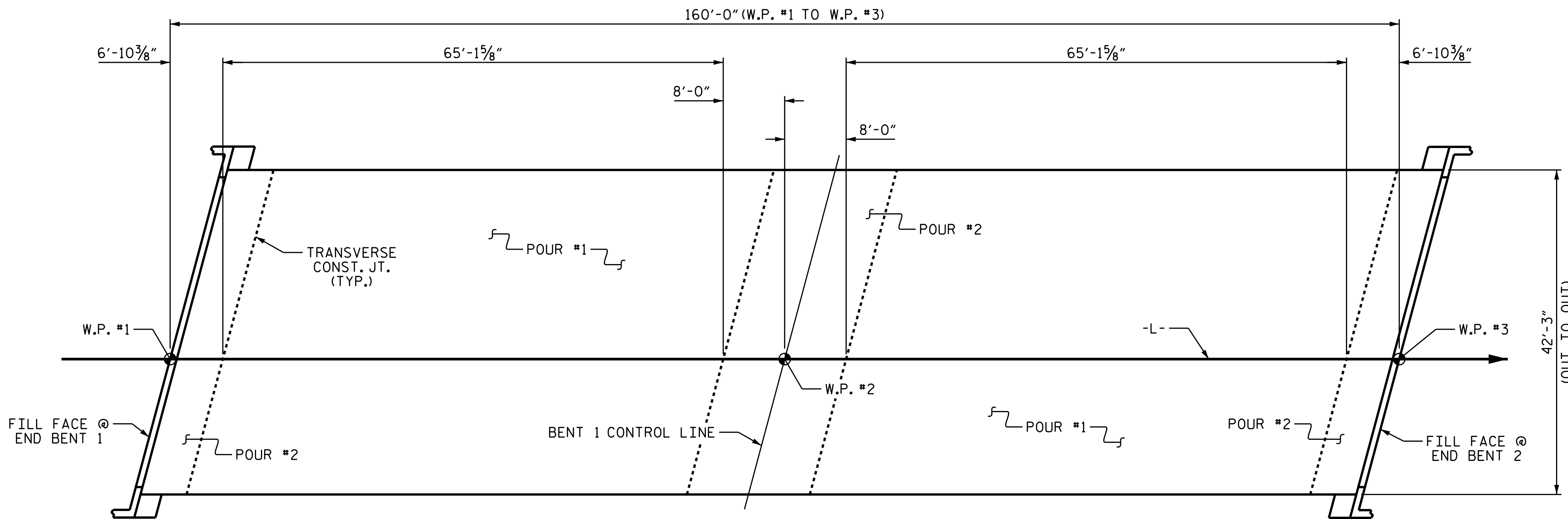
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	293	#5	STR	41'-11"	12810	* B1	170	#6	STR	15'-10"	4043
A2	293	#5	STR	41'-11"	12810	B2	156	#5	STR	54'-0"	8786
* A101	2	#5	STR	41'-2"	86	* B3	86	#4	STR	38'-0"	2183
* A102	2	#5	STR	39'-4"	82	* B4	43	#5	STR	58'-0"	2601
* A103	2	#5	STR	37'-5"	78	* B5	42	#5	STR	12'-0"	526
* A104	2	#5	STR	35'-7"	74	B6	46	#4	STR	10'-10"	333
* A105	2	#5	STR	33'-9"	70	K1	20	#4	STR	21'-6"	287
* A106	2	#5	STR	31'-10"	66	K2	16	#4	STR	6'-10"	73
* A107	2	#5	STR	30'-0"	63	K3	16	#4	STR	8'-1"	86
* A108	2	#5	STR	28'-2"	59	K4	8	#4	STR	7'-4"	39
* A109	2	#5	STR	26'-3"	55	K5	8	#4	STR	2'-3"	12
* A110	2	#5	STR	24'-5"	51	K6	8	#4	STR	2'-10"	15
* A111	2	#5	STR	22'-7"	47	K7	4	#4	STR	2'-6"	7
* A112	2	#5	STR	20'-8"	43						
* A113	2	#5	STR	18'-10"	39	* S1	72	#4	1	11'-11"	573
* A114	2	#5	STR	16'-11"	35	* S2	72	#4	1	9'-11"	477
* A115	2	#5	STR	15'-1"	31						
* A116	2	#5	STR	13'-3"	28	U1	72	#4	2	9'-9"	469
* A117	2	#5	STR	11'-4"	24						
* A118	2	#5	STR	9'-6"	20						
* A119	2	#5	STR	7'-7"	16						
* A120	2	#5	STR	5'-9"	12						
* A121	2	#5	STR	3'-11"	8						
* A122	2	#5	STR	2'-0"	4						

REINFORCING STEEL 23,908 LBS.  
\* EPOXY COATED REINF. STEEL 24,204 LBS.

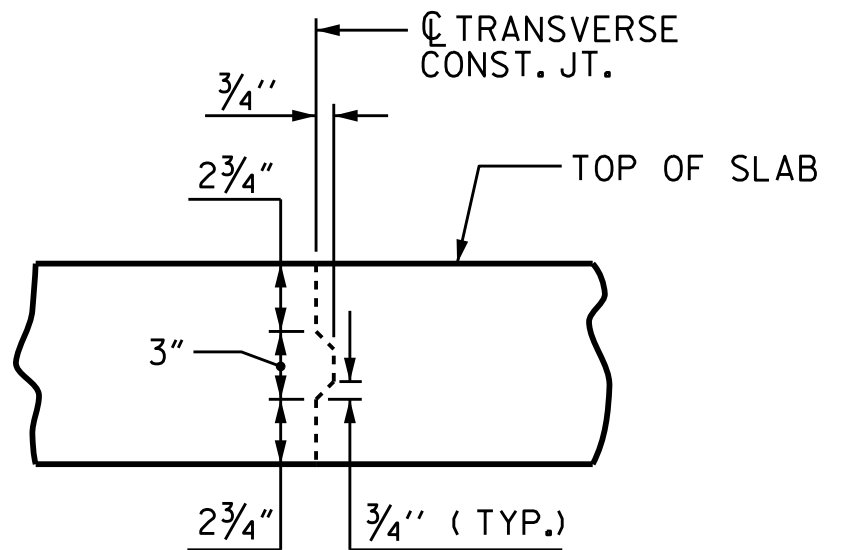
**— BAR TYPES —**



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
( SQ. FT. = 6687 )



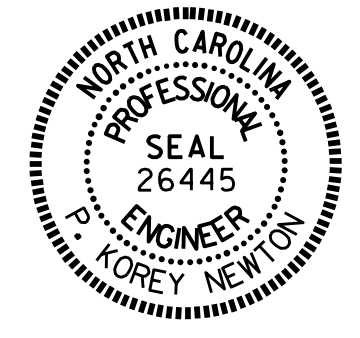
**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

DRAWN BY :	P. K. NEWTON	DATE :	2/9/21
CHECKED BY :	M. K. BEARD	DATE :	2/10/21
DESIGN ENGINEER OF RECORD:	P. D. BRYANT	DATE :	3/1/21

30-MAR-2021 18:10  
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pknewton

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

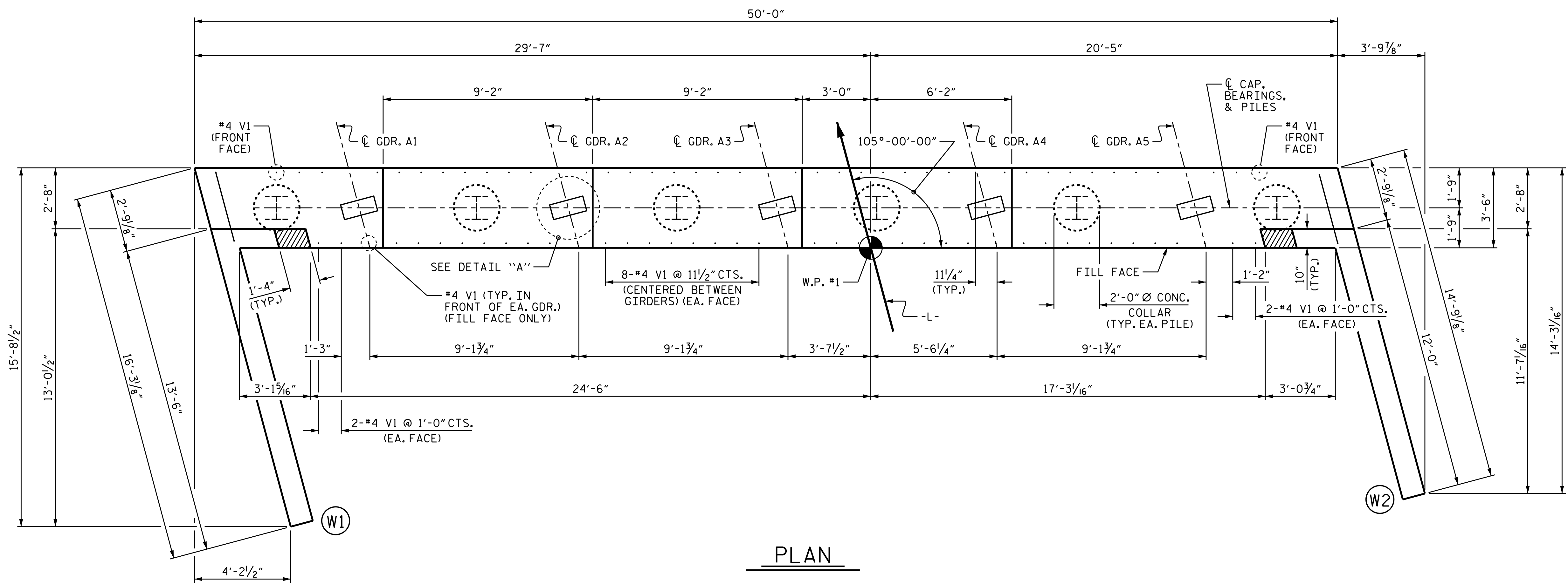


DocuSigned by:  
P. Corey Newton  
#FFE3D451B407  
3/30/2021

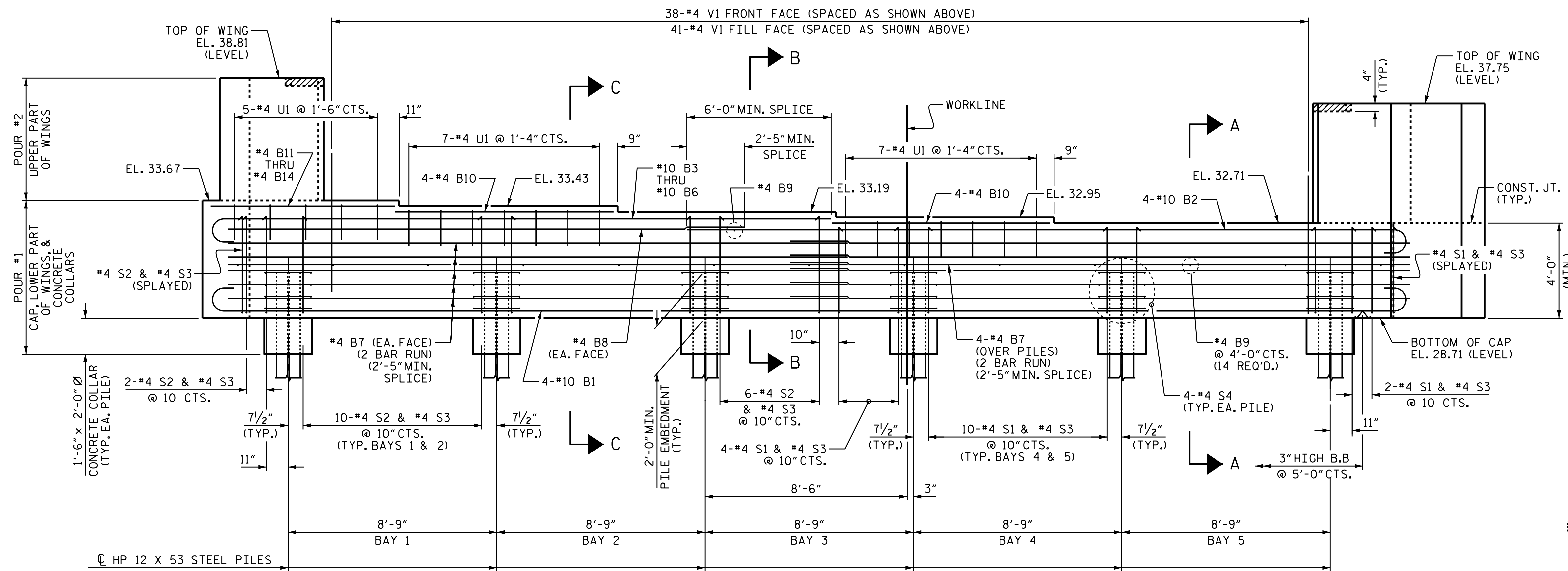
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			28

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FINAL UNLESS ALL  
SIGNATURES COMPLETED



PLAN



ELEVATION

LEFT WING NOT SHOWN FOR CLARITY. FOR SECTION A-A, B-B, AND C-C, SEE SHEET 3 OF 3.

NOTES

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

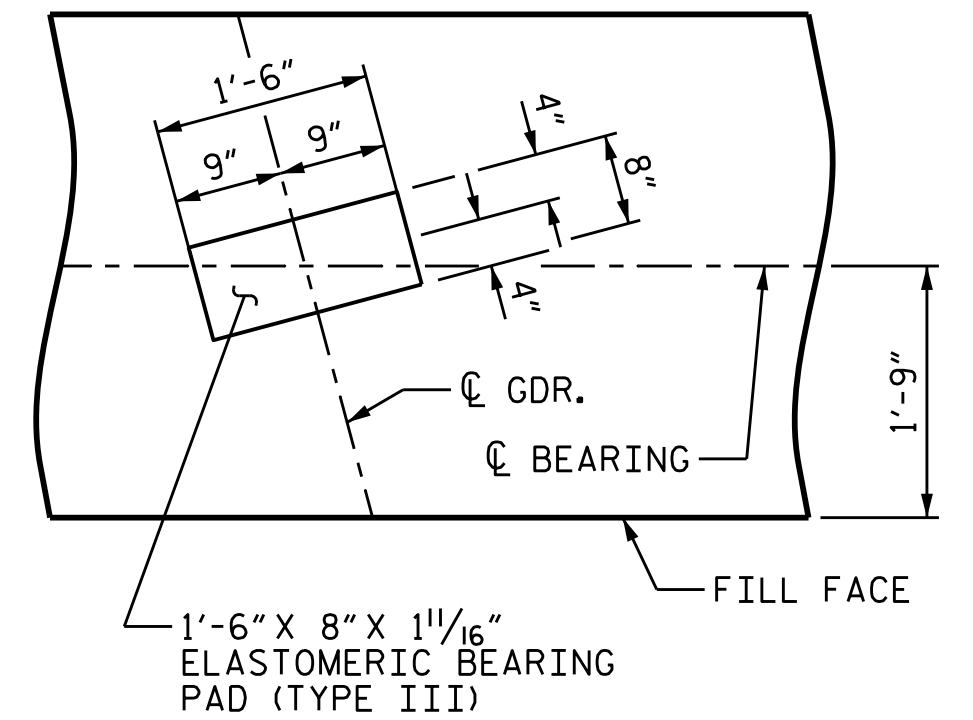
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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

THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

FOR WING DETAILS, SEE SHEET 2 OF 3.

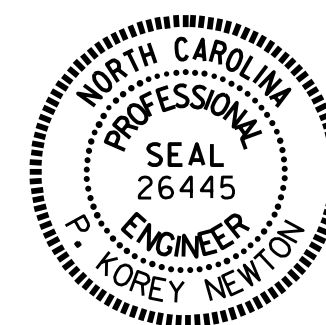
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.



DETAIL "A" (TYP. EA. GDR.)

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

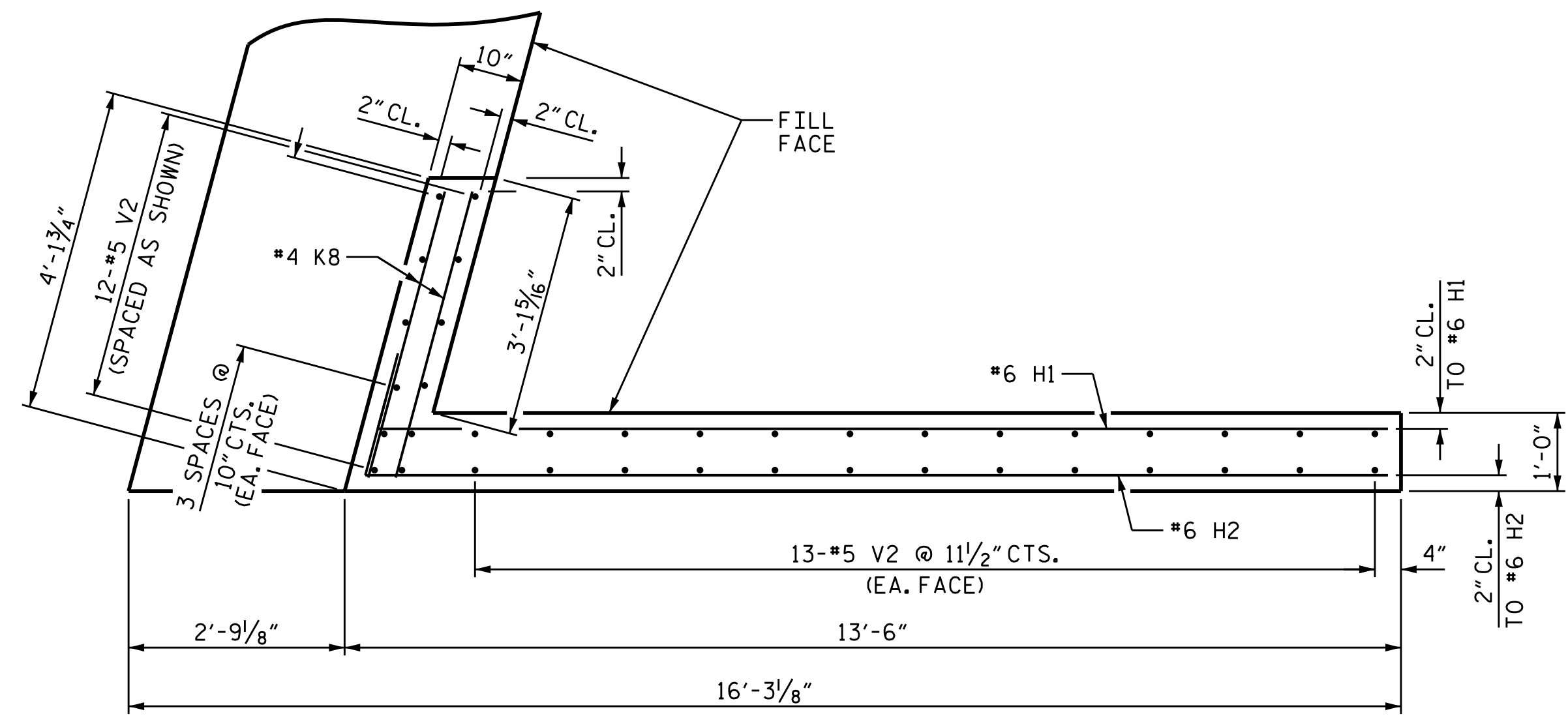
INTEGRAL  
END BENT 1

DRAWN BY: P. K. NEWTON DATE: 2/24/21  
CHECKED BY: P. D. BRYANT DATE: 3/1/21  
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21

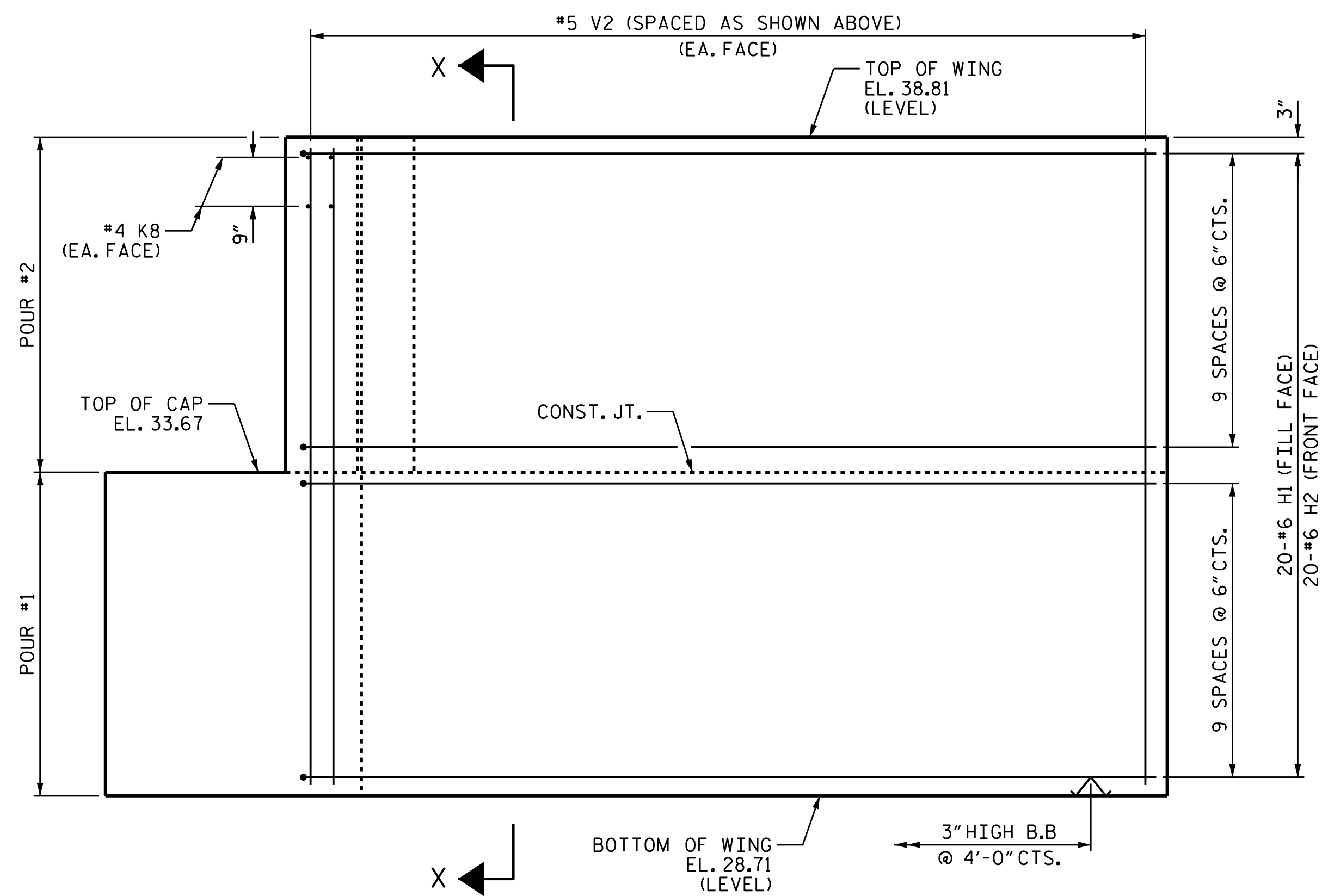
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pknewton

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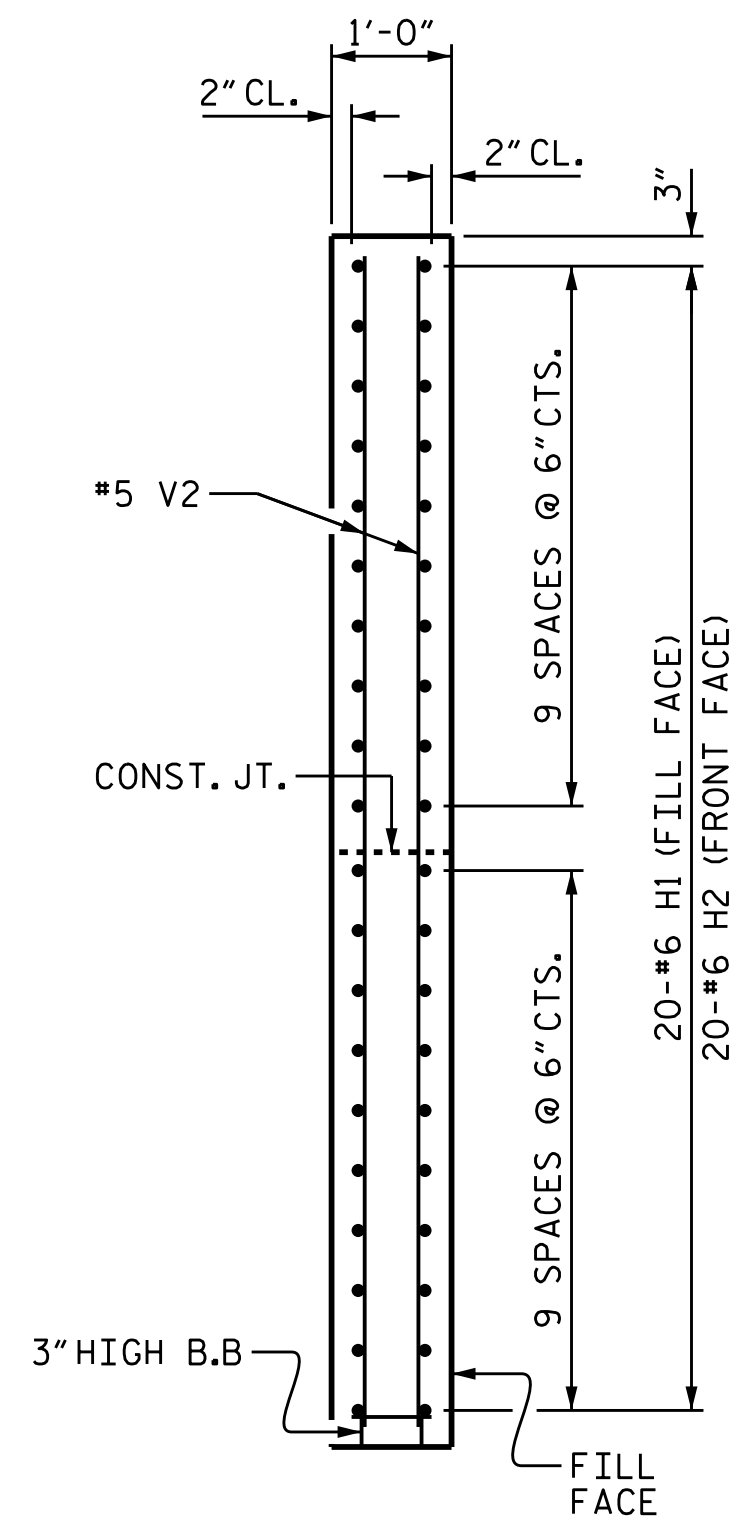
REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			



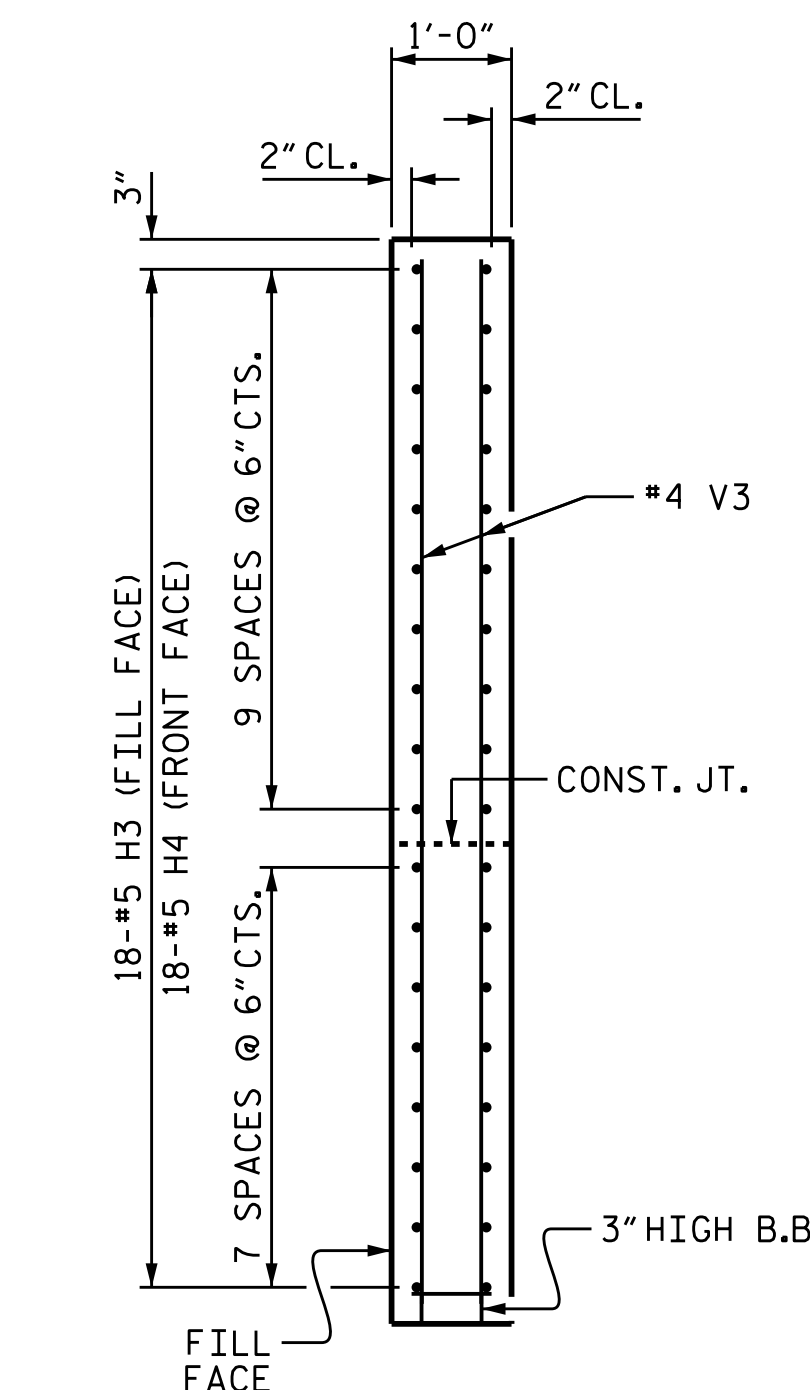
PLAN OF WING W1



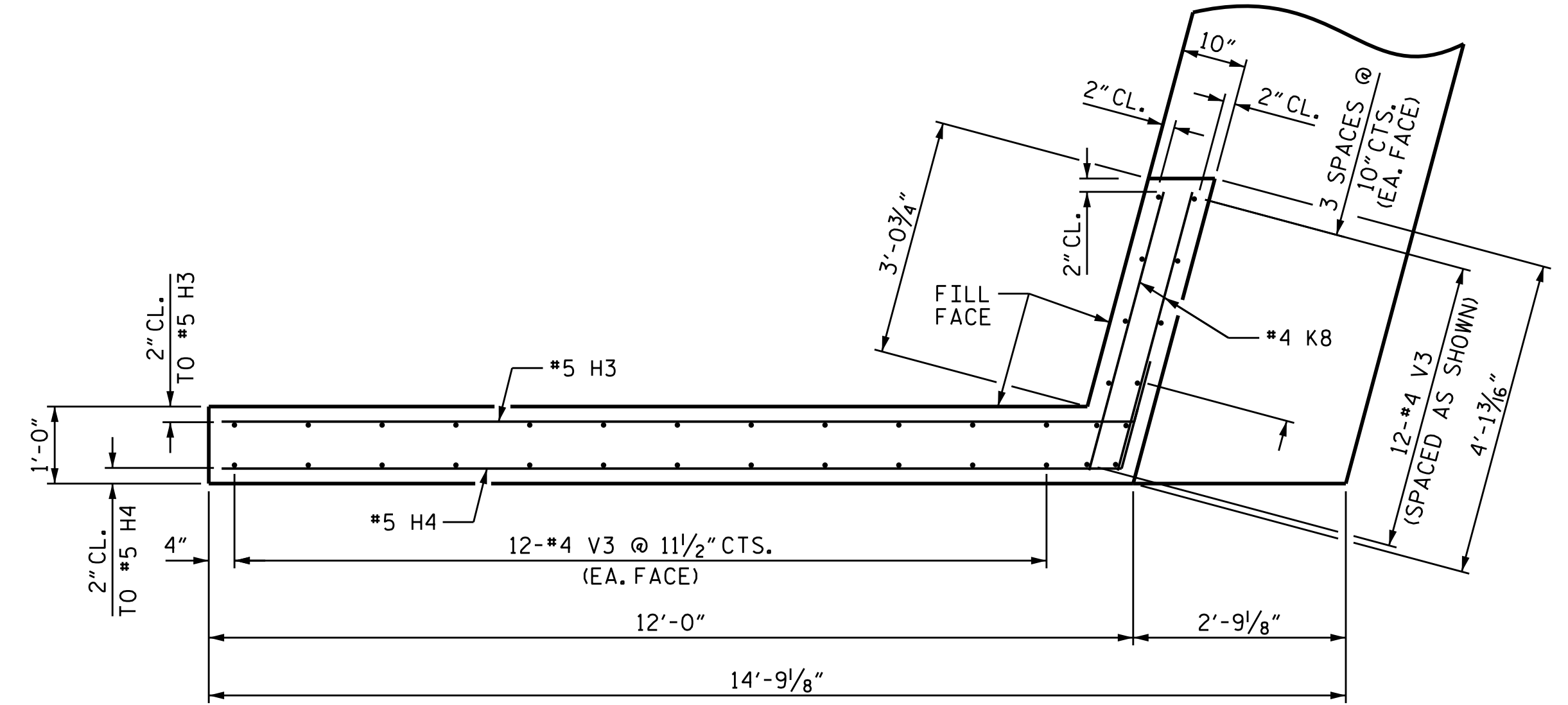
ELEVATION OF WING W1



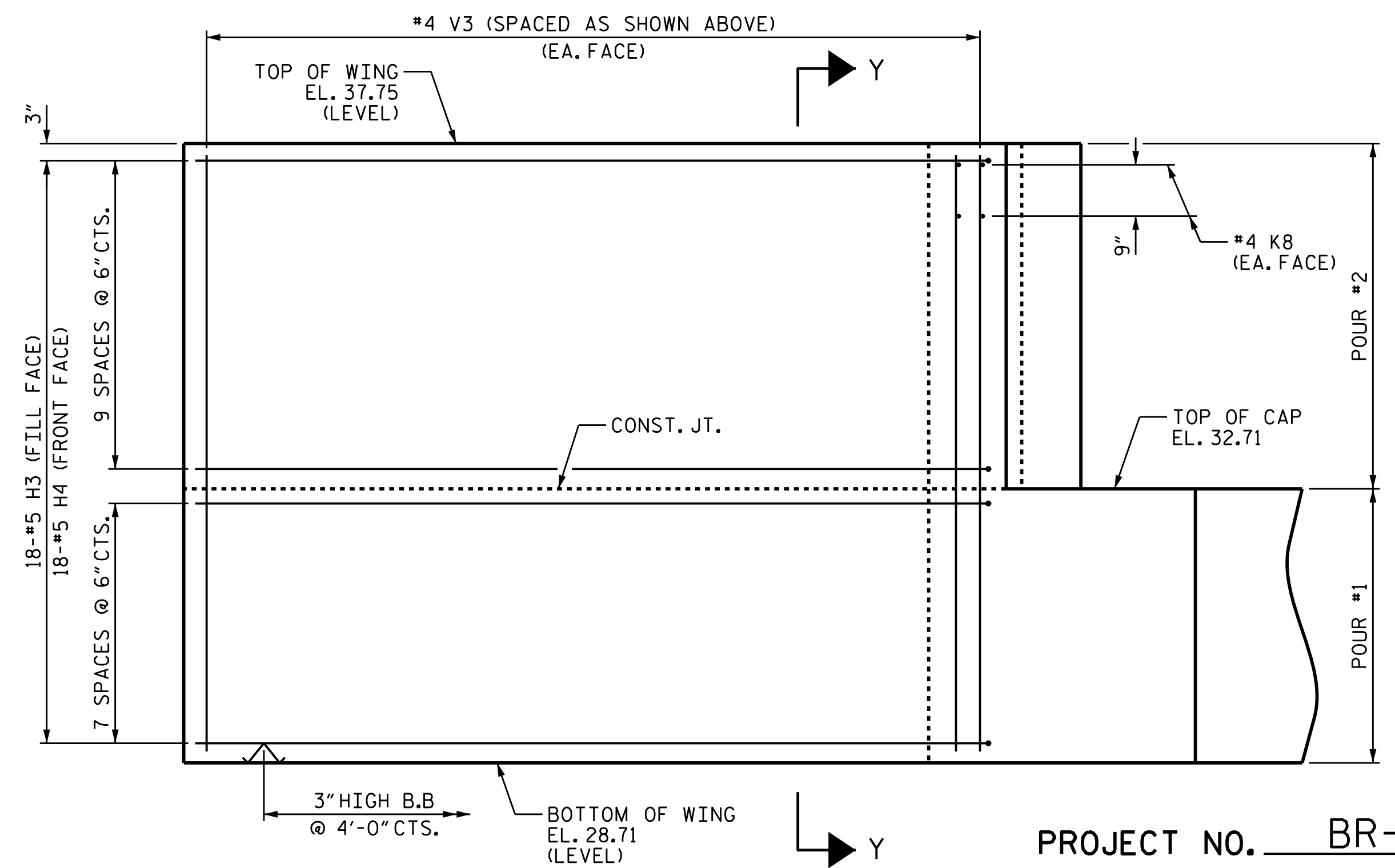
SECTION X-X



SECTION Y-Y



PLAN OF WING W2



ELEVATION OF WING W2

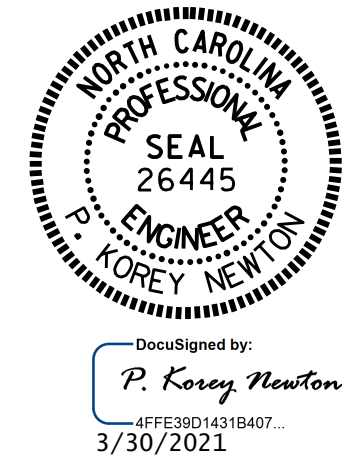
PROJECT NO. BR-0017  
 DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

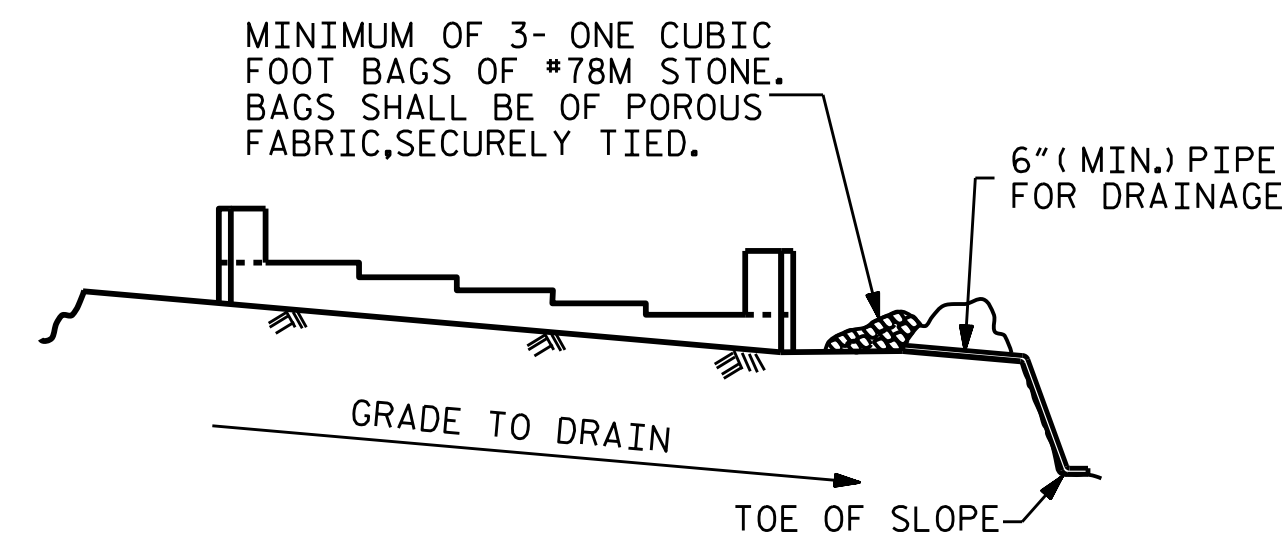
INTEGRAL  
 END BENT 1



DRAWN BY: P. K. NEWTON DATE: 2/24/21  
 CHECKED BY: P. D. BRYANT DATE: 3/1/21  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			28

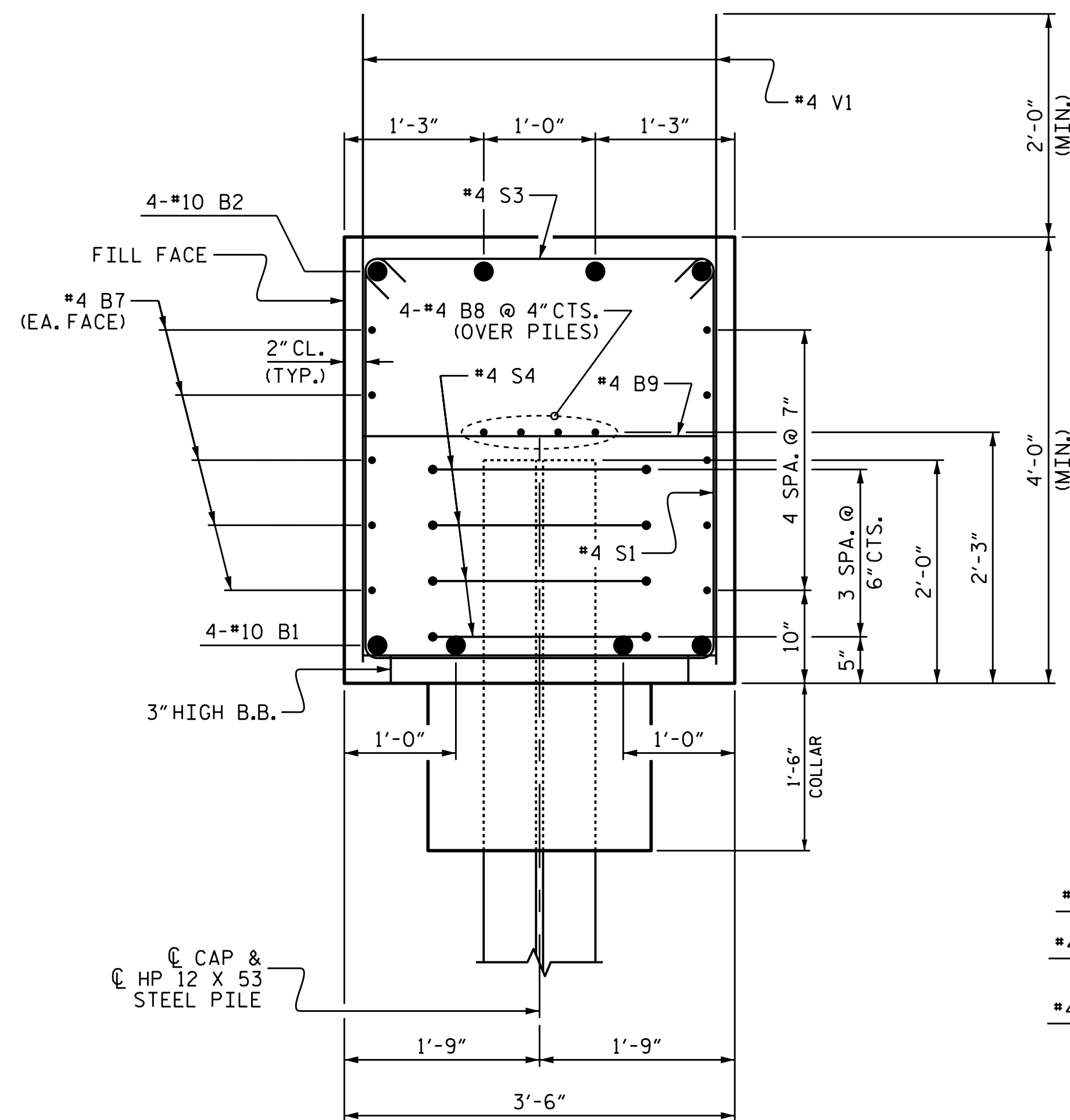


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

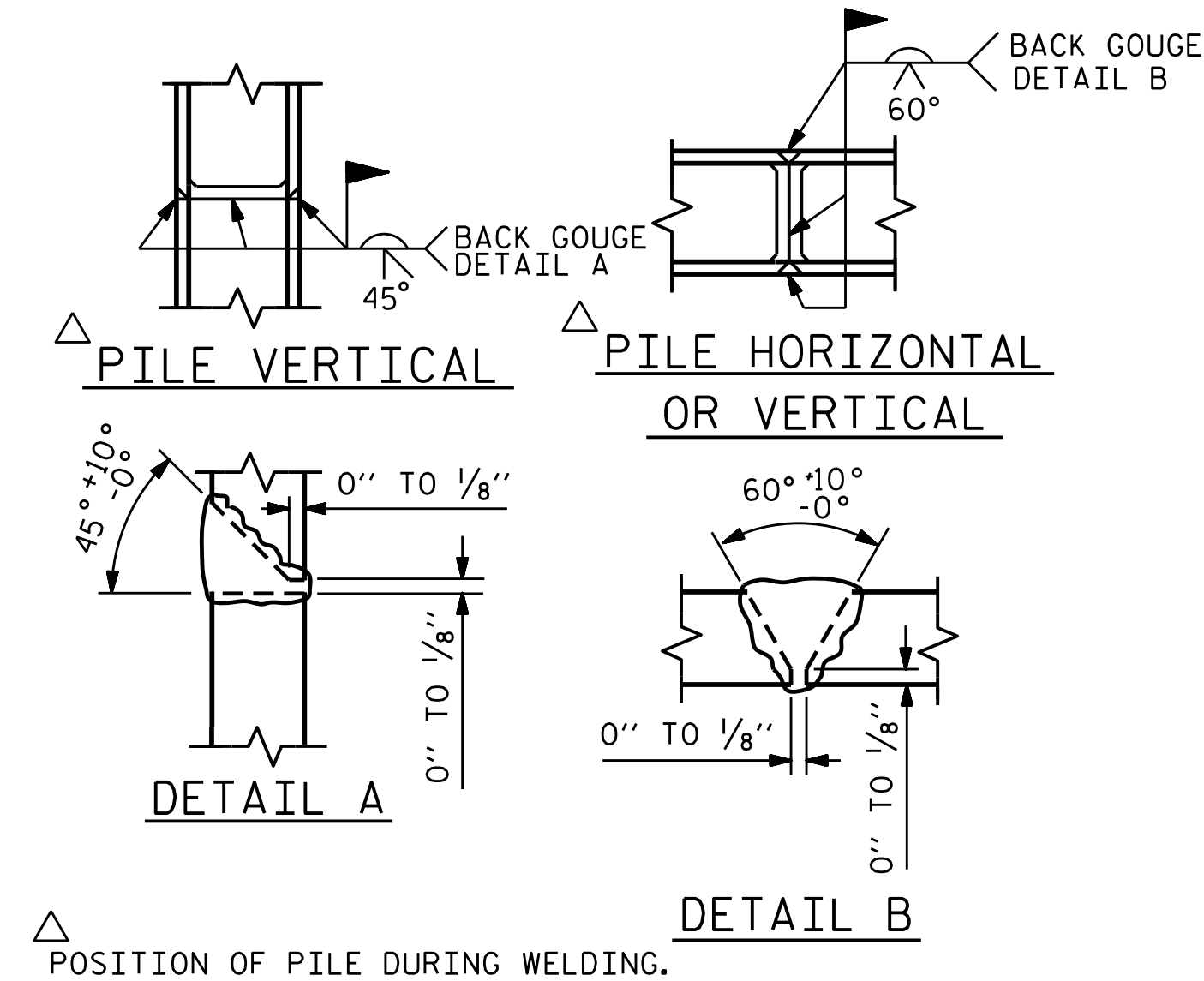
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

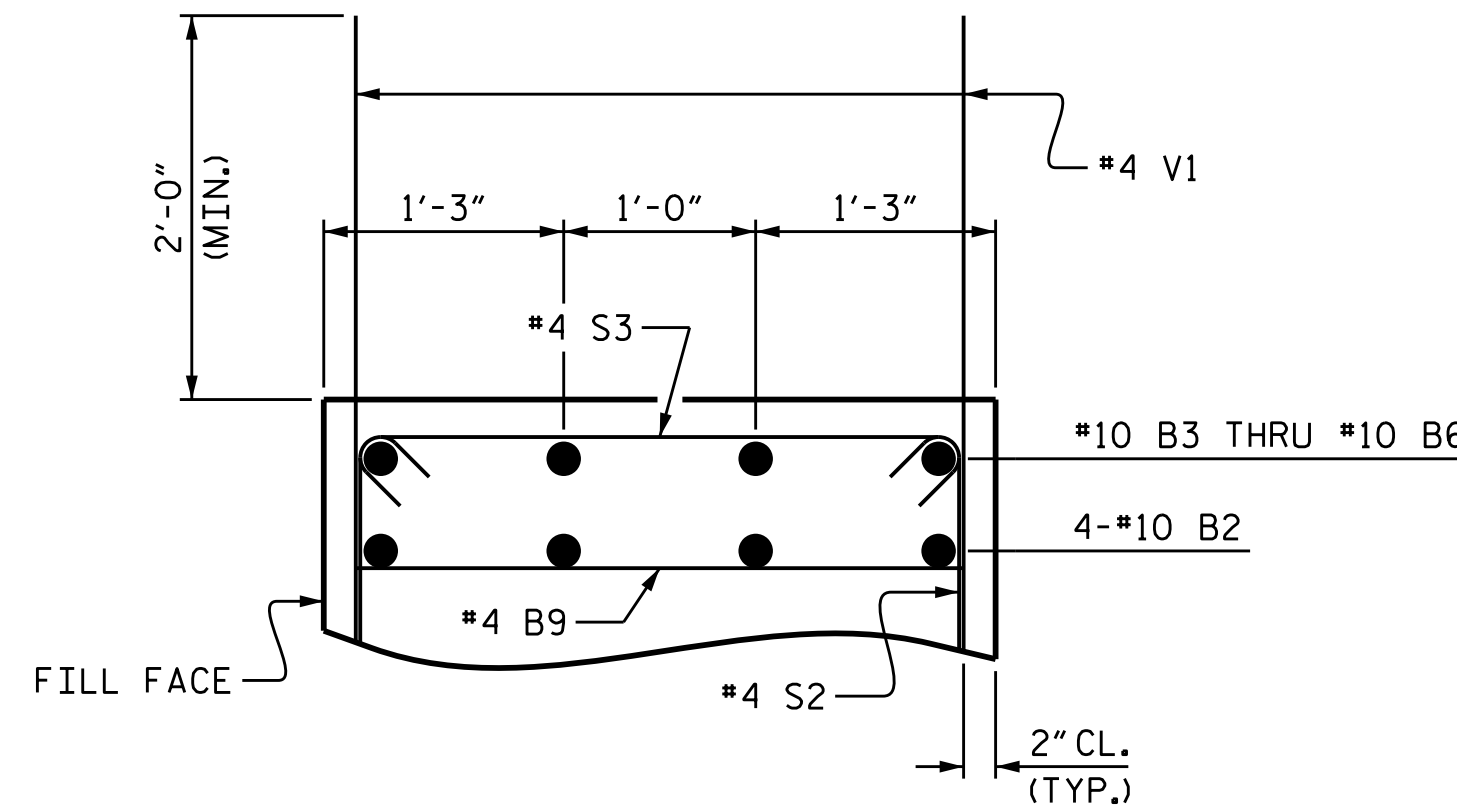
### TEMPORARY DRAINAGE AT END BENT



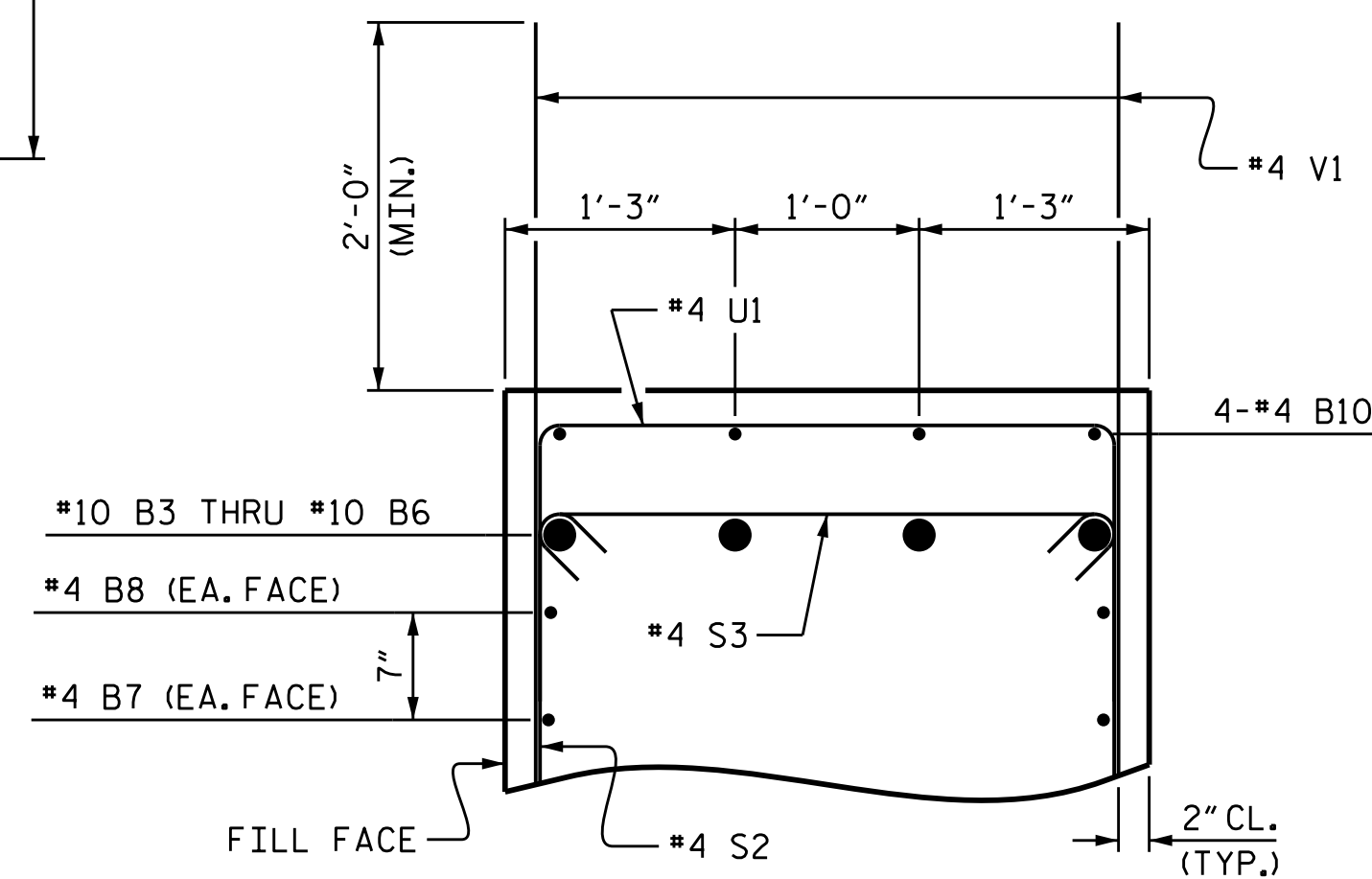
SECTION A-A



### PILE SPLICE DETAILS

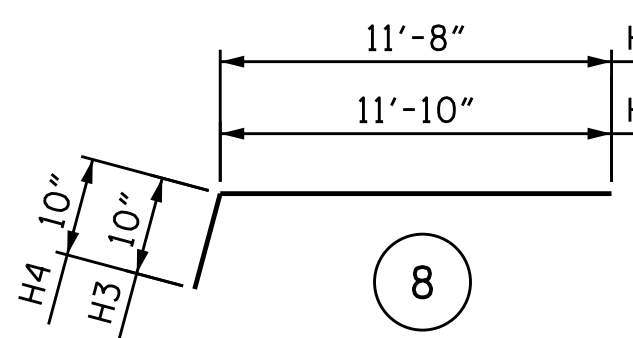
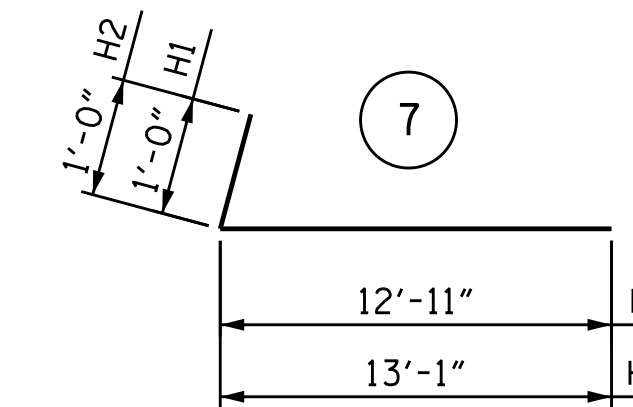
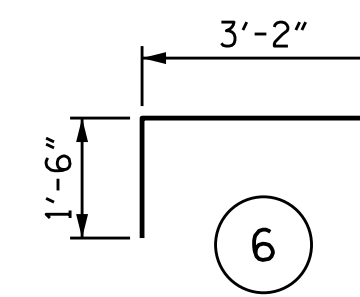
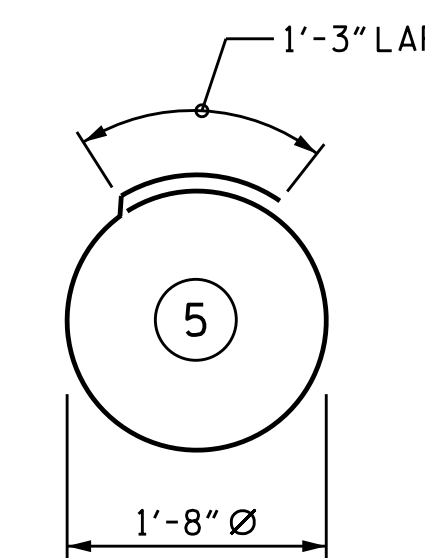
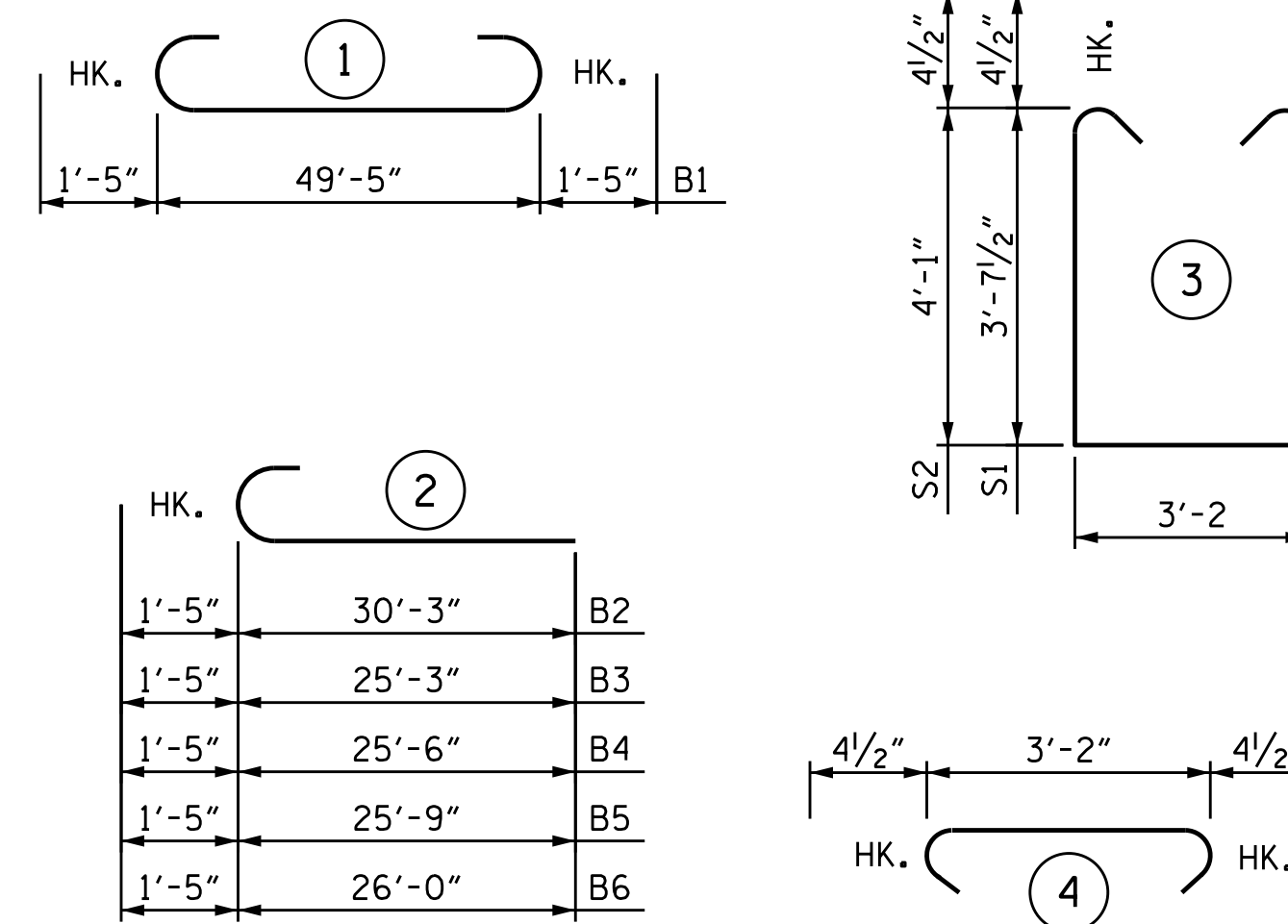


PART SECTION B-B



PART SECTION C-C

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	52'-3"	899
B2	4	#10	2	31'-8"	545
B3	1	#10	2	26'-8"	115
B4	1	#10	2	26'-11"	116
B5	1	#10	2	27'-2"	117
B6	1	#10	2	27'-5"	118
B7	28	#4	STR	26'-1"	488
B8	2	#4	STR	21'-9"	29
B9	14	#4	STR	3'-2"	30
B10	8	#4	STR	9'-2"	49
B11	1	#4	STR	7'-0"	5
B12	1	#4	STR	7'-3"	5
B13	1	#4	STR	7'-6"	5
B14	1	#4	STR	7'-9"	5
H1	20	#6	7	13'-11"	418
H2	20	#6	7	14'-1"	423
H3	18	#5	8	12'-6"	235
H4	18	#5	8	12'-8"	238
K8	8	#4	STR	3'-9"	20
S1	27	#4	3	11'-2"	1
S2	29	#4	3	12'-1"	234
S3	56	#4	4	3'-11"	147
S4	24	#4	5	6'-6"	104
U1	19	#4	6	6'-2"	78
V1	79	#4	STR	5'-10"	308
V2	38	#5	STR	9'-9"	386
V3	36	#4	STR	8'-8"	208

REINFORCING STEEL 5,526 LBS.

CLASS A CONCRETE  
POUR #1 (CAP, COLLARS, & LOWER PART OF WINGS) 33.6 C.Y.  
POUR #2 (UPPER PART OF WINGS) 5.8 C.Y.  
TOTAL 39.4 C.Y.

HP 12 X 53 STEEL PILES  
No. 6 LIN FT. 450

PILE REDRIVES NO. 3

STEEL PILE POINTS NO. 6

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO. 6

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 3 OF 3



DocuSigned by:  
P. Corey Newton  
4FFE39D1431B407  
3/30/2021

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

### REVISIONS

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

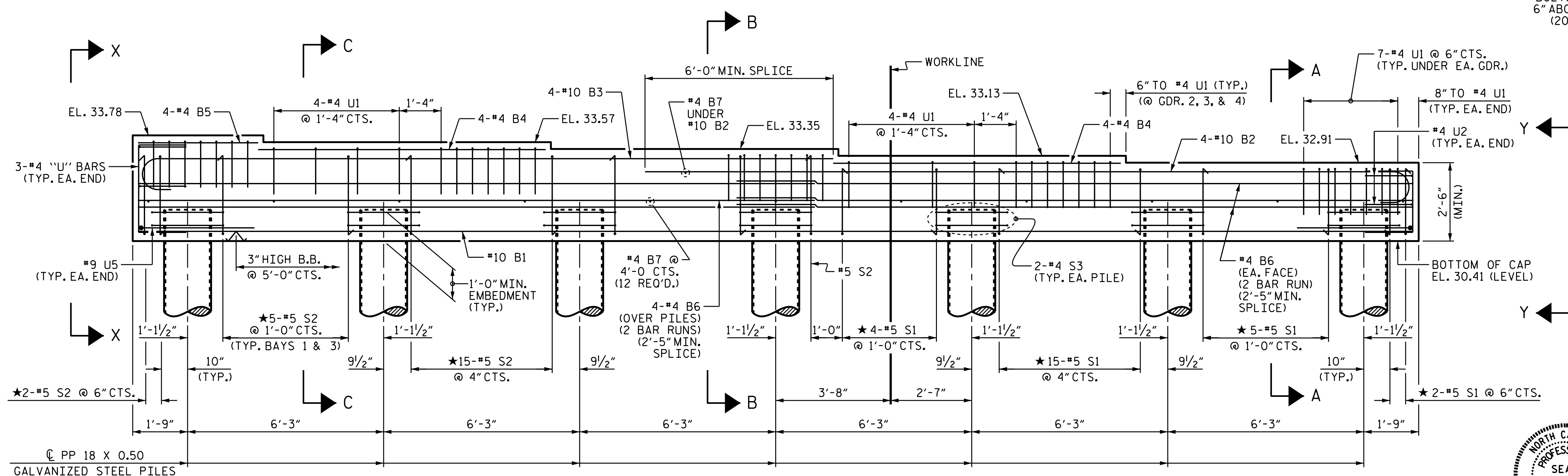
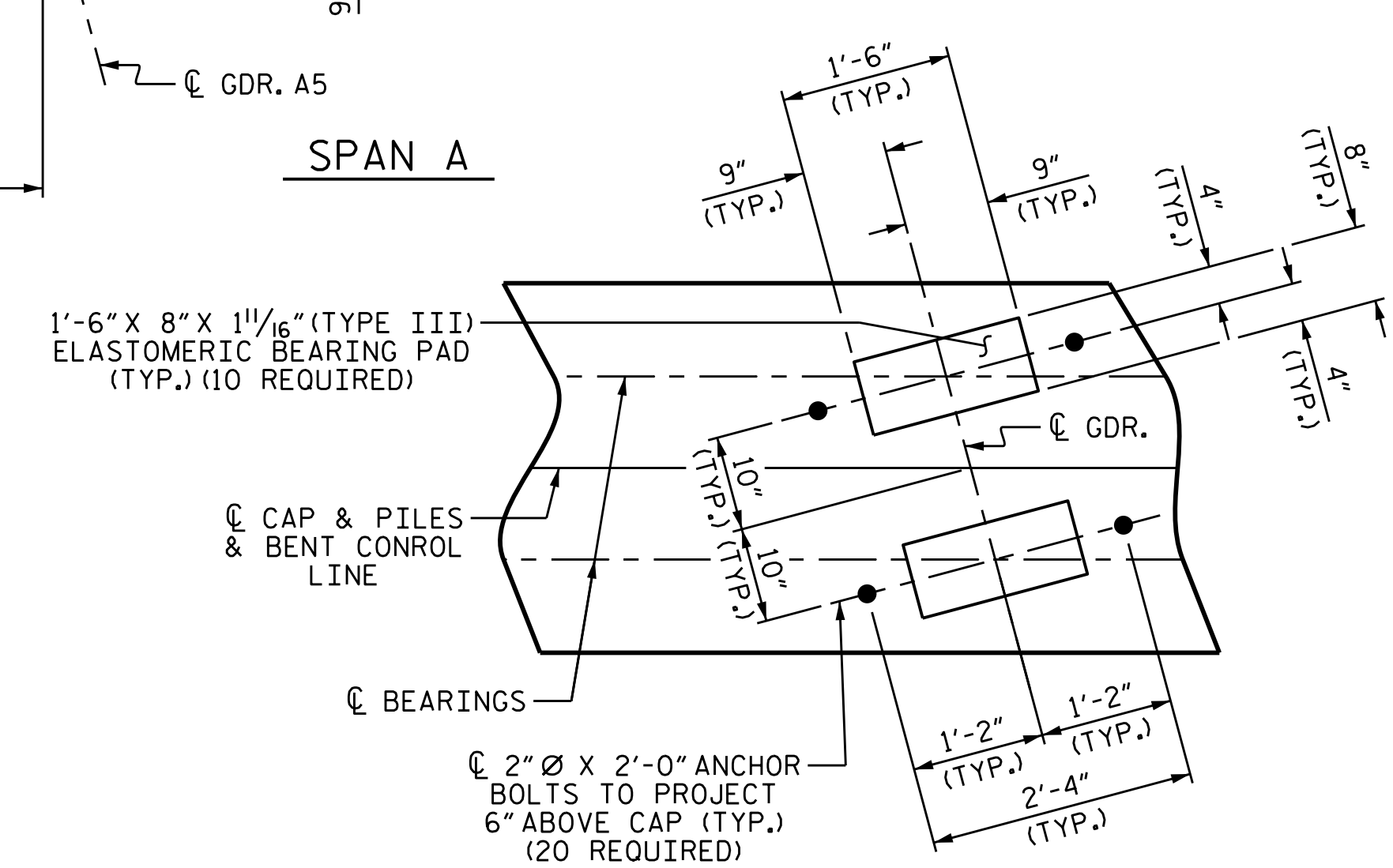
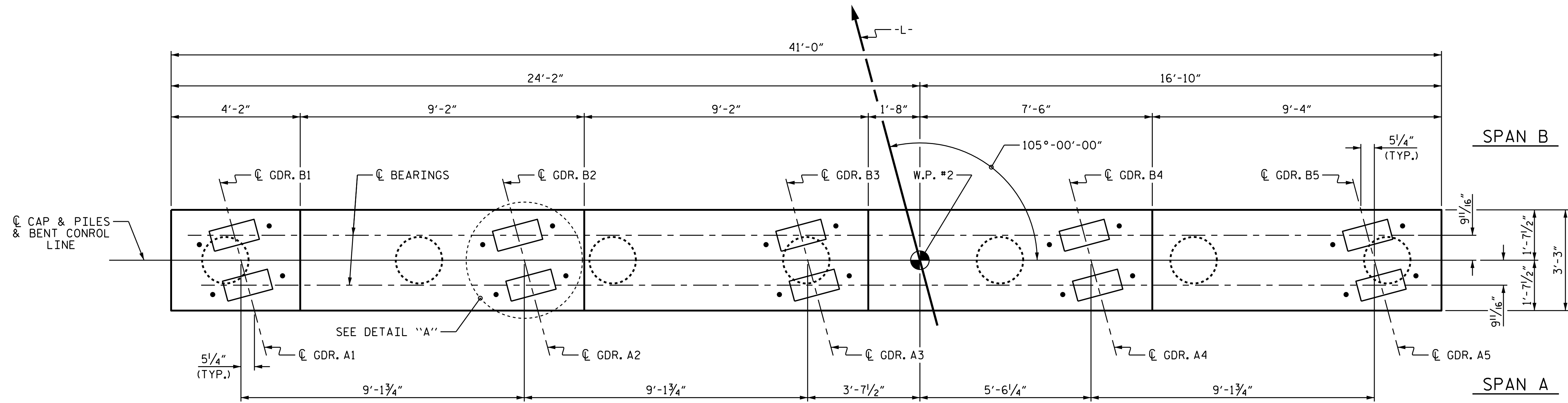
SHEET NO.  
S-19  
TOTAL SHEETS  
28

DRAWN BY: P. K. NEWTON DATE: 2/25/21  
CHECKED BY: P. D. BRYANT DATE: 3/1/21  
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- ★ INVERT ALTERNATE STIRRUPS.
- FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE SHEET 3 OF 3.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 49 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

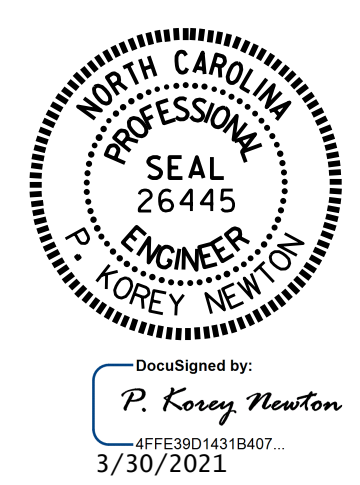


PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

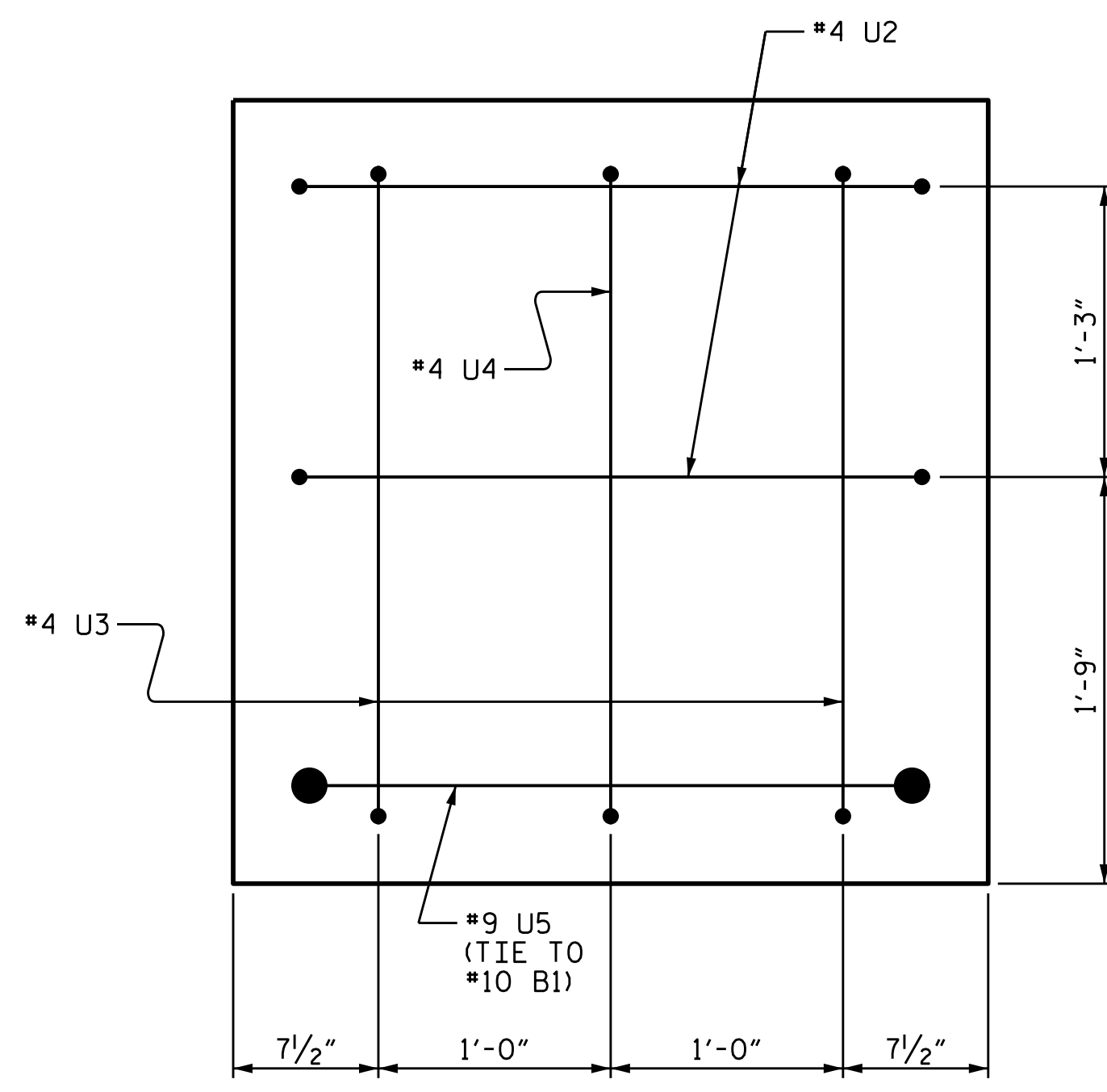
SUBSTRUCTURE  
BENT 1



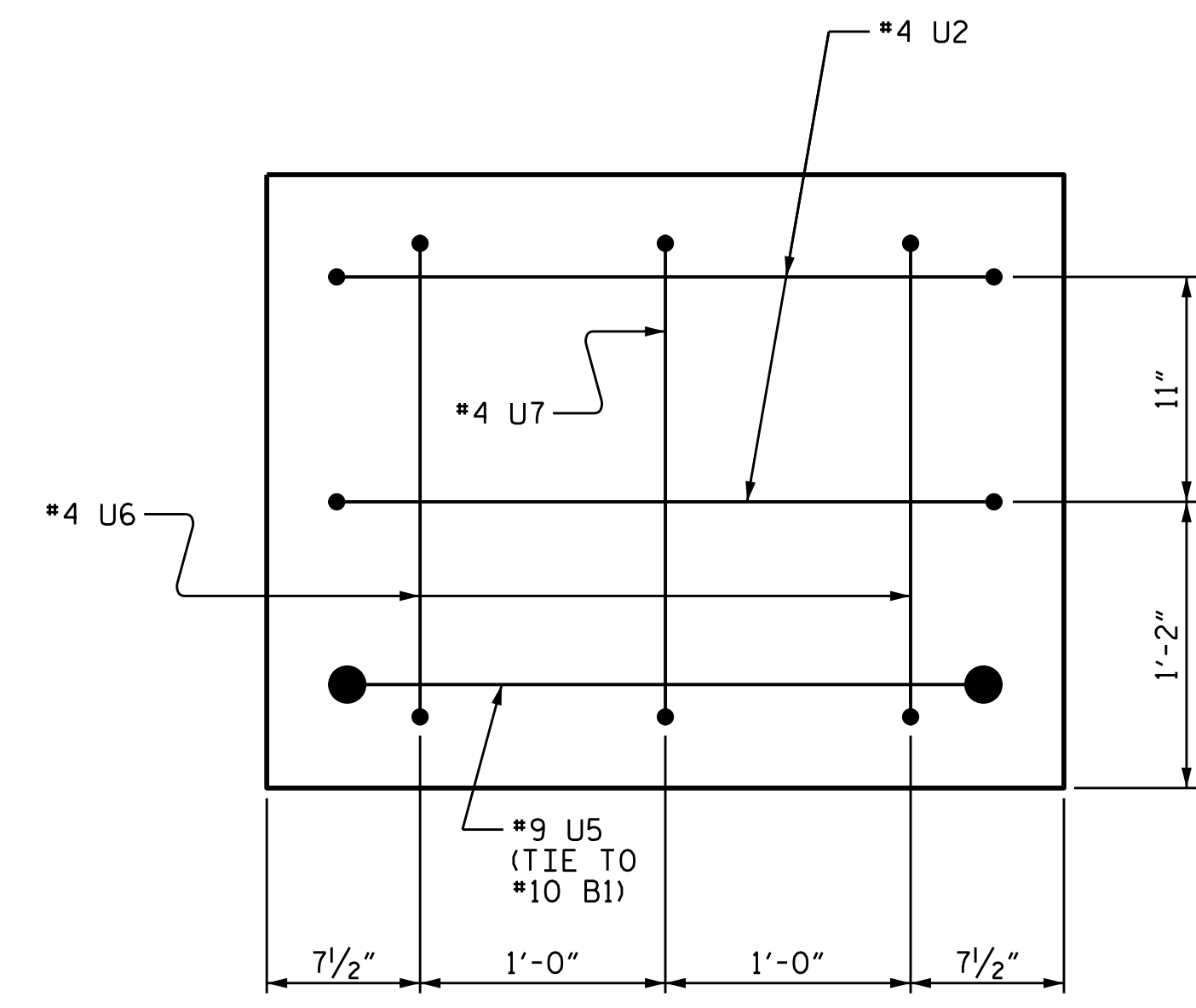
DRAWN BY: P. K. NEWTON DATE: 2/15/21  
CHECKED BY: D. R. SHACKELFORD DATE: 2/15/21  
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			28

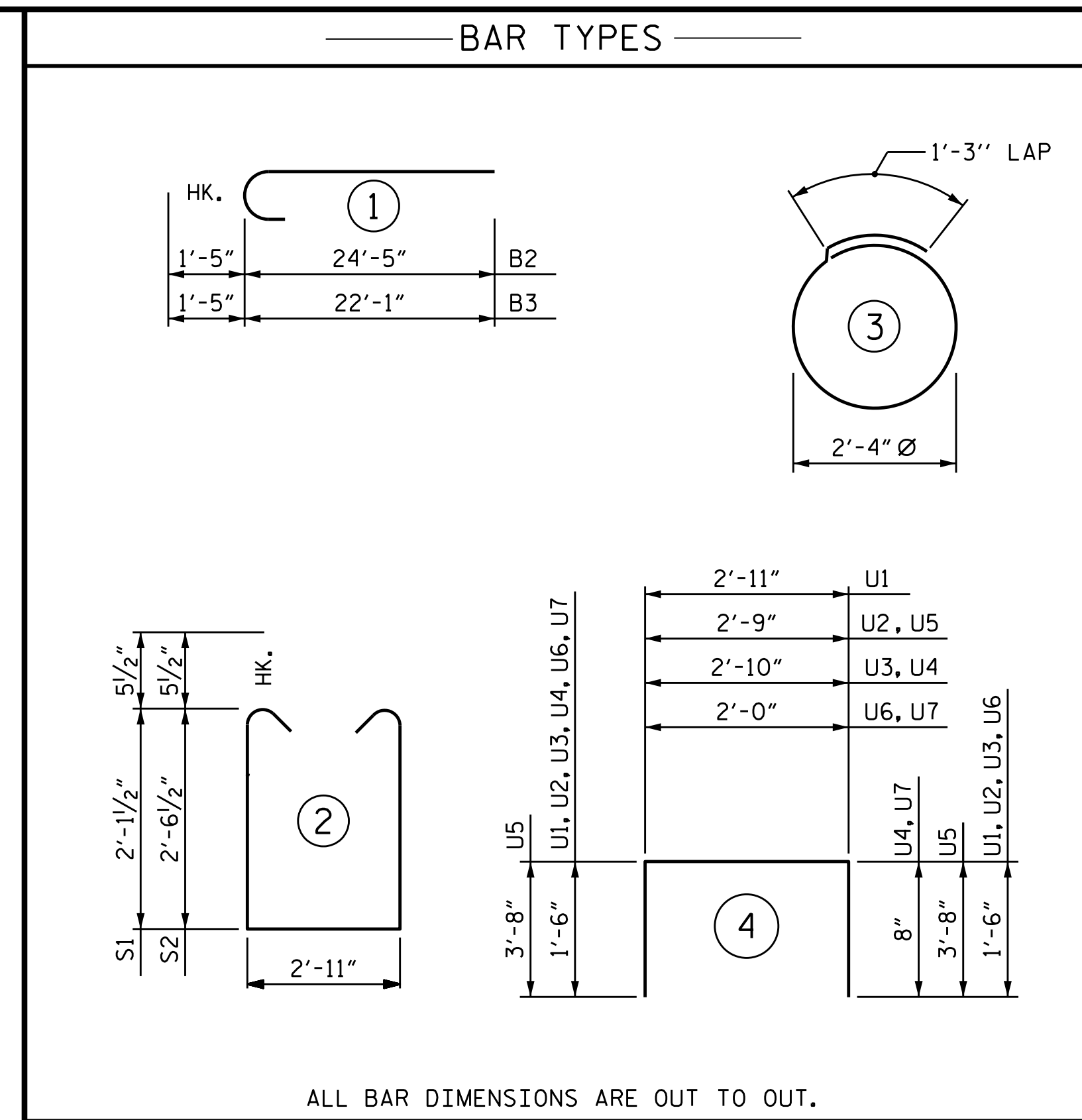
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



VIEW X-X



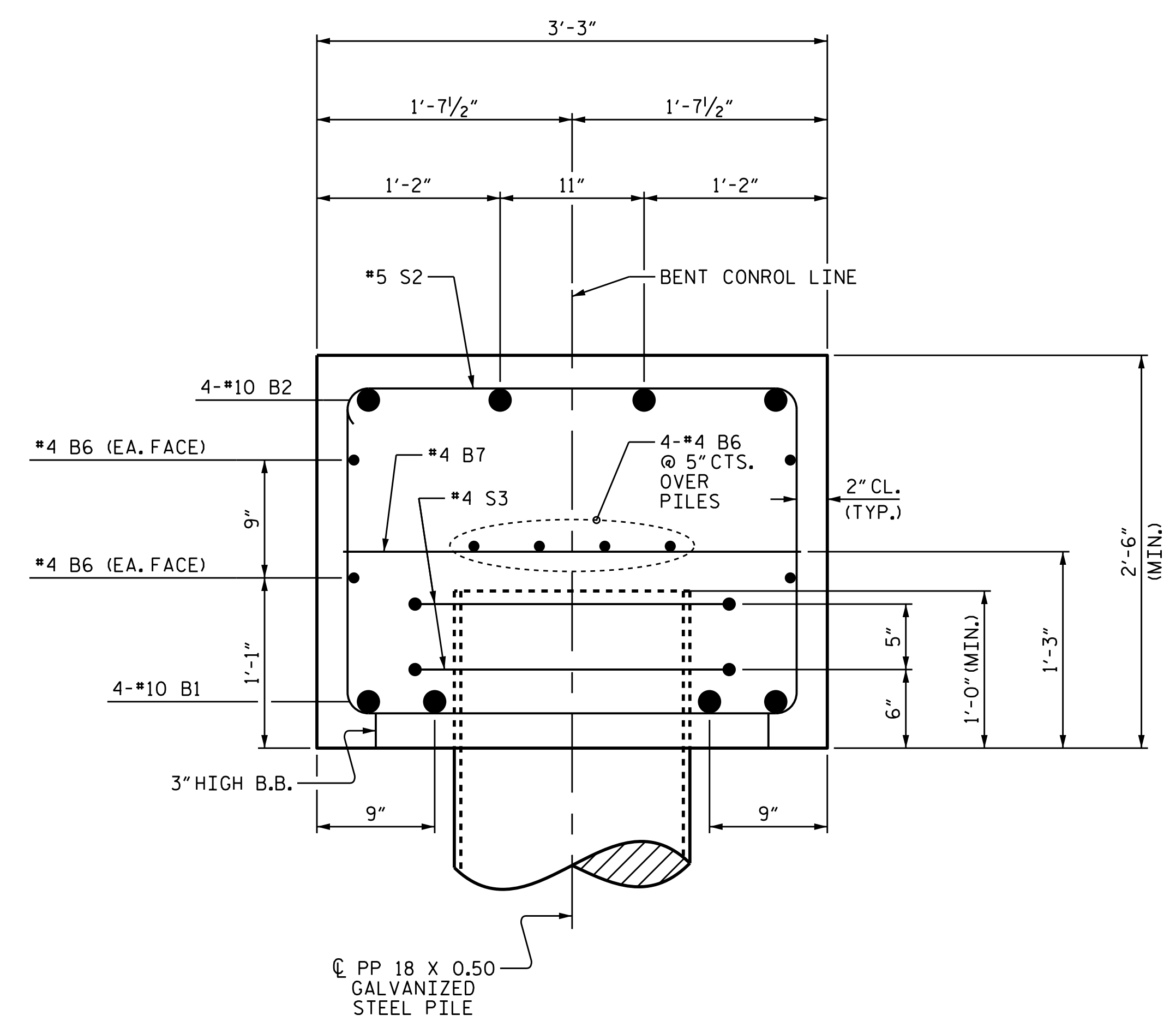
VIEW Y-Y



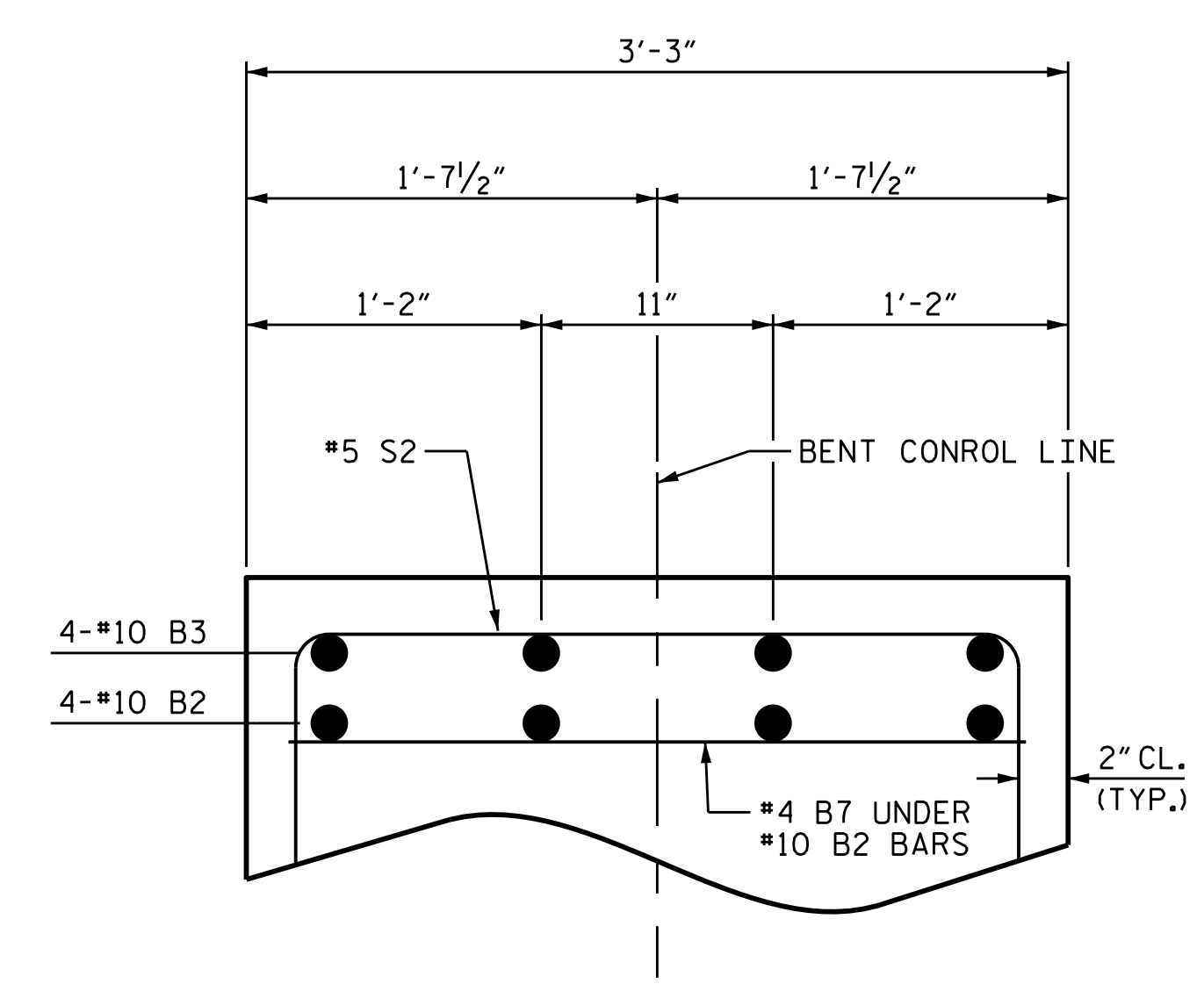
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	STR	40'-8"	700
B2	4	#10	1	25'-10"	445
B3	4	#10	1	23'-6"	404
B4	8	#4	STR	9'-2	49
B5	4	#4	STR	3'-10	10
B6	16	#4	STR	21'-7"	231
B7	12	#4	STR	2'-11"	23
S1	26	#5	2	8'-1"	219
S2	28	#5	2	8'-11"	260
S3	13	#4	3	8'-7"	80
U1	43	#4	4	5'-11"	170
U2	4	#4	4	5'-9"	15
U3	2	#4	4	5'-10"	8
U4	1	#4	4	5'-0"	3
U5	2	#9	4	10'-1"	69
U6	2	#4	4	5'-0"	7
U7	1	#4	4	4'-2	3
REINFORCING STEEL					2,696 LBS.
CLASS A CONCRETE BREAKDOWN					
TOTAL CLASS A CONCRETE					▲ 13.8 C.Y.
PP 18 x 0.50 GALVANIZED STEEL PILES					
No. 7					LIN. FT. 525.0
PIPE PILE PLATES					NO. 7
PILE DRIVING EQUIPMENT SETUP FOR PP 18 x 0.50 GALVANIZED STEEL PILES					NO. 7
PILE REDRIVES					NO. 4

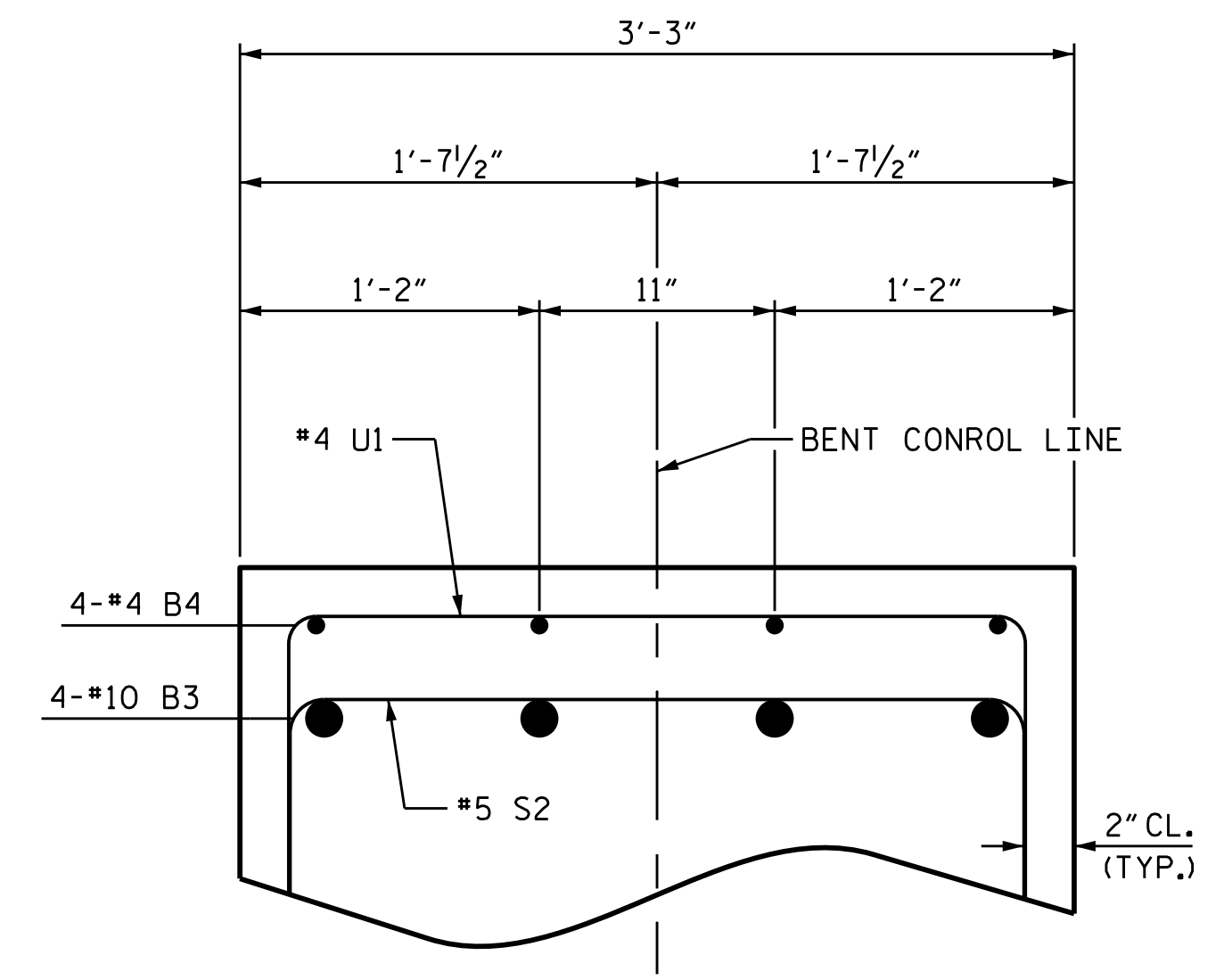
▲ CONCRETE DISPLACED BY THE PP 18 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



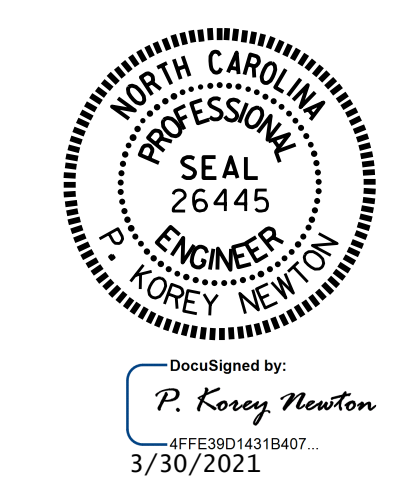
SECTION A-A



PART SECTION B-B



PART SECTION C-C



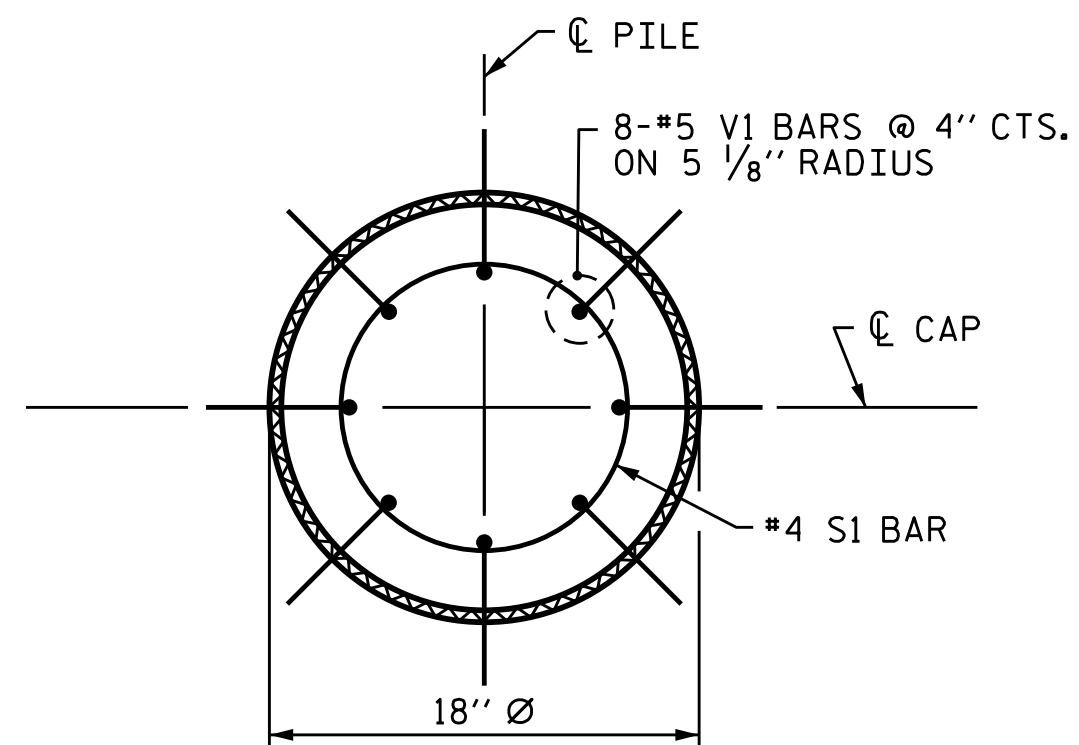
PROJECT NO. BR-0017  
 DUPLIN COUNTY  
 STATION: 18+27.00 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1

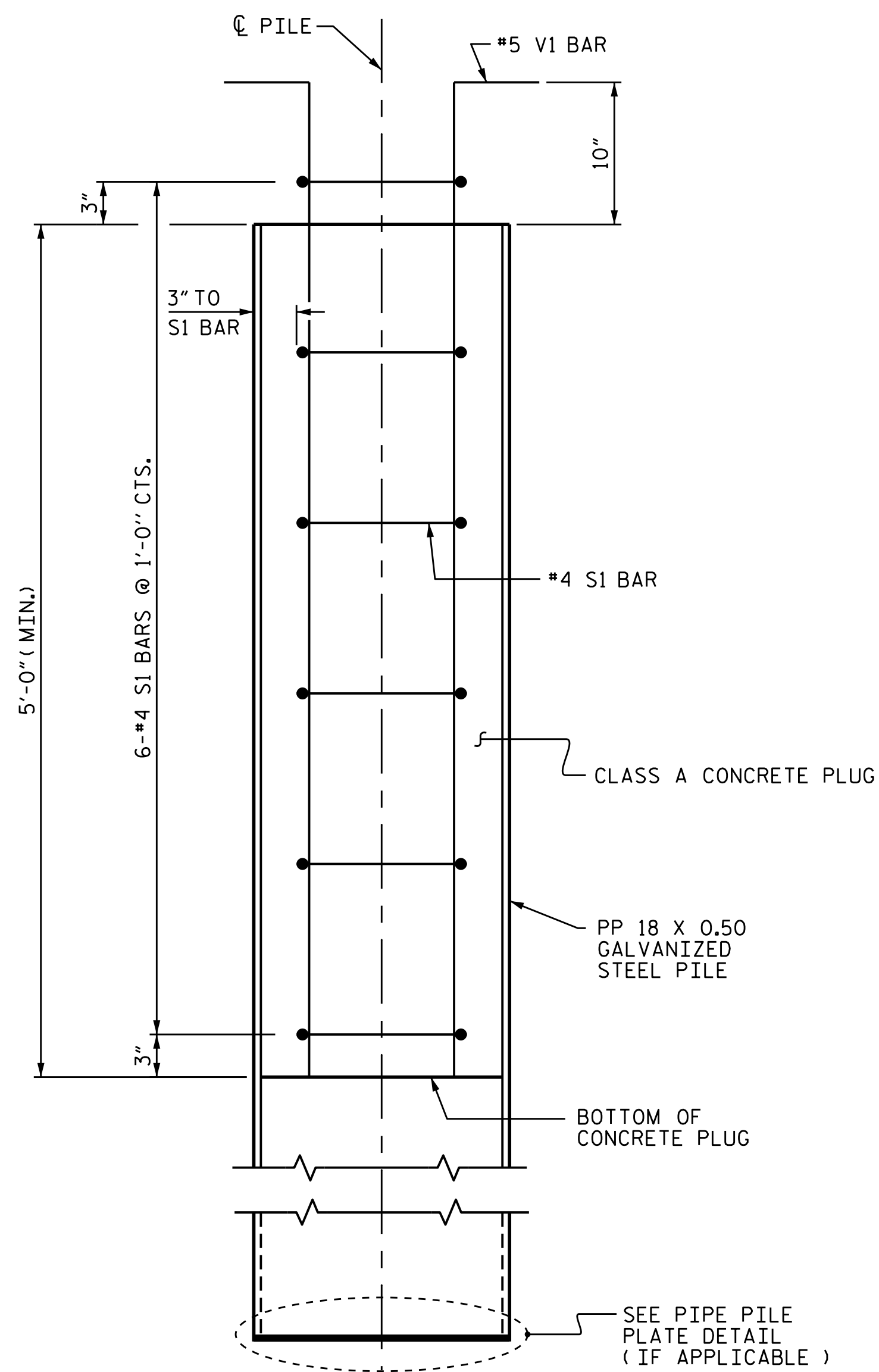
DRAWN BY : P. K. NEWTON DATE : 2/15/21  
 CHECKED BY : D. R. SHACKELFORD DATE : 2/15/21  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 3/1/21

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			28

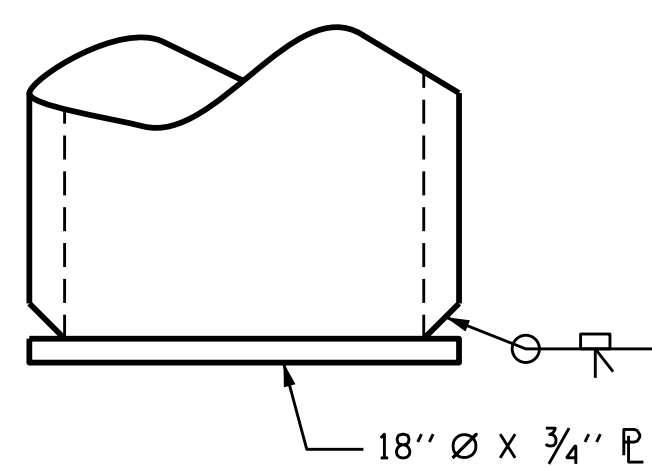


PLAN

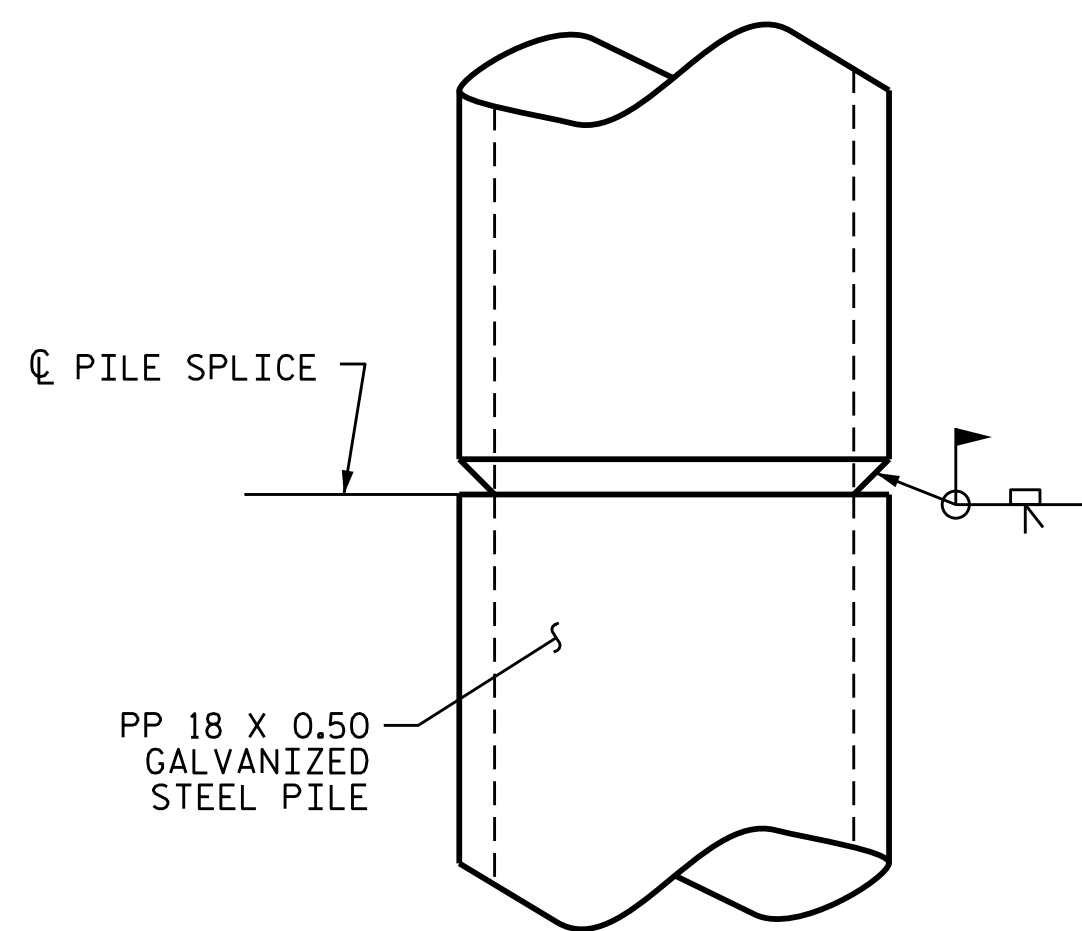


ELEVATION

PP 18 X 0.50 GALVANIZED STEEL PILE  
(OPEN OR CLOSED END)



PIPE PILE PLATE DETAIL  
(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

NOTES

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

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

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

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

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

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

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

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

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

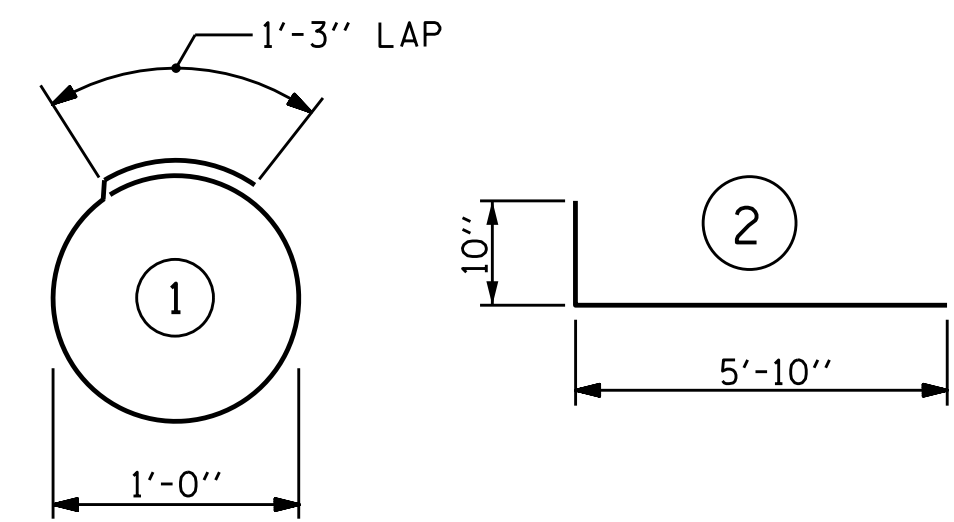
BILL OF MATERIAL FOR ONE  
PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56

REINFORCING STEEL = 74 LBS.

CLASS A CONCRETE  
5'-0" MINIMUM PLUG 0.3 CY

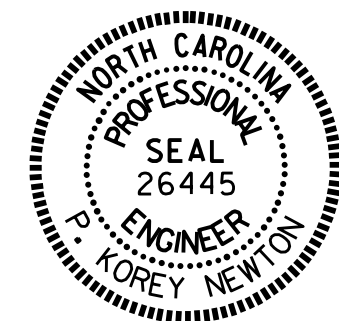
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00

SHEET 3 OF 3

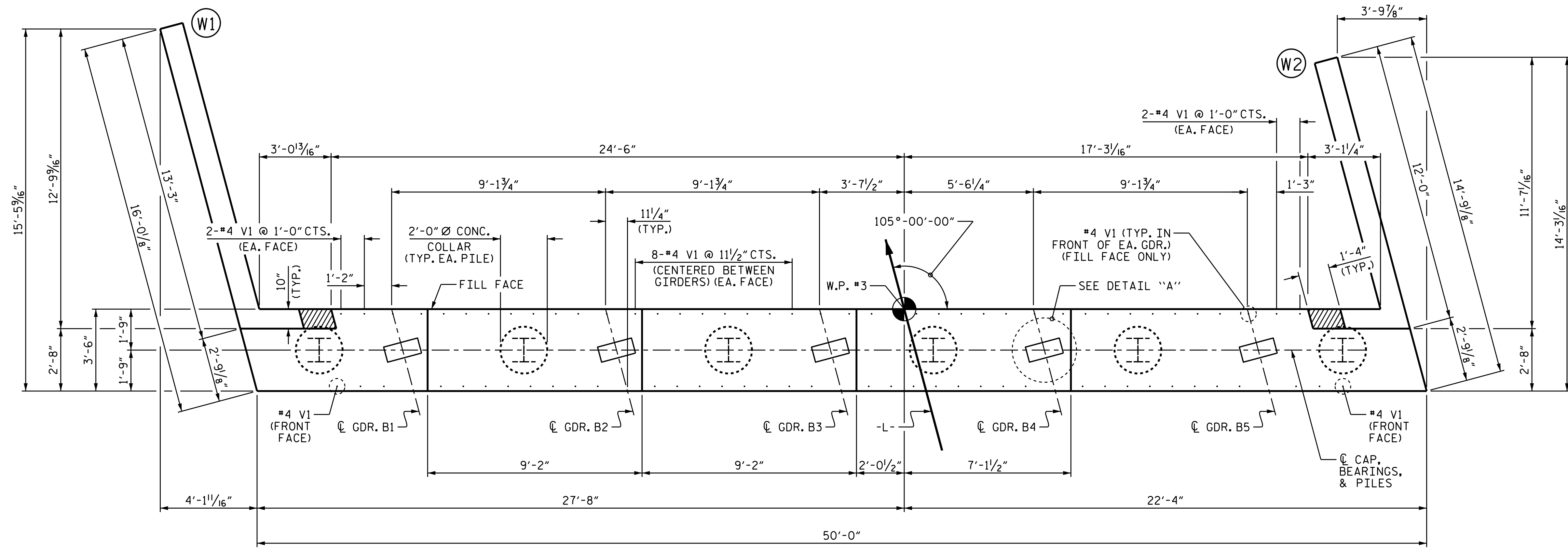


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
18" STEEL PIPE PILE

ASSEMBLED BY : P, D. BRYANT	DATE : 2/9/21
CHECKED BY : D. R. SHACKELFORD	DATE : 2/9/21
DRAWN BY : RWW 1/01	REV. 5/1/06R MAA/KMM
CHECKED BY : LES 1/01	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

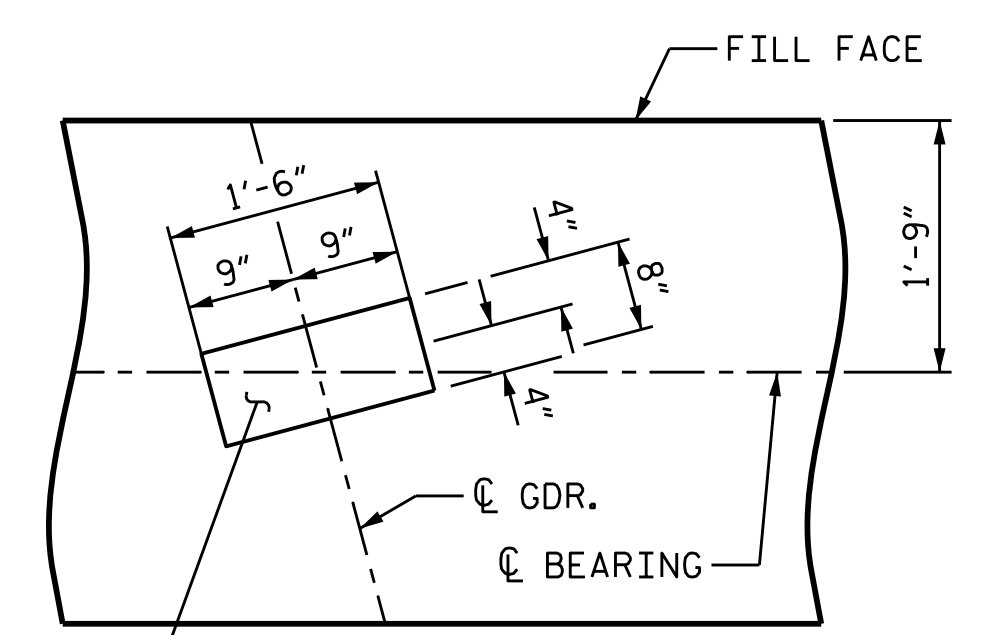
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			28



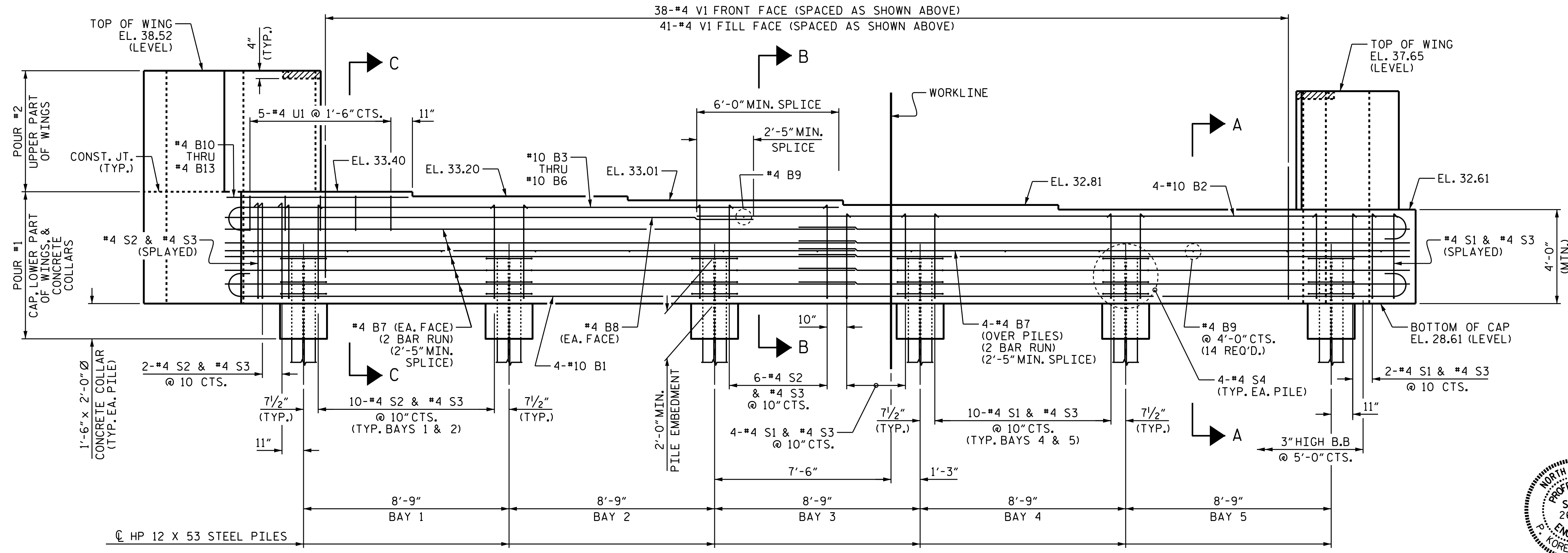
PLAN

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA SHALL BE RAKED TO A DEPTH OF 1/4".
- THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.



DETAIL "A"  
(TYP. EA. GDR.)

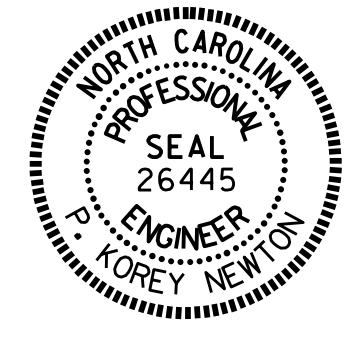


ELEVATION

LEFT WING NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, B-B, AND C-C, SEE SHEET 3 OF 3.

PROJECT NO. BR-0017  
DUPLIN COUNTY  
STATION: 18+27.00 -L-

SHEET 1 OF 3



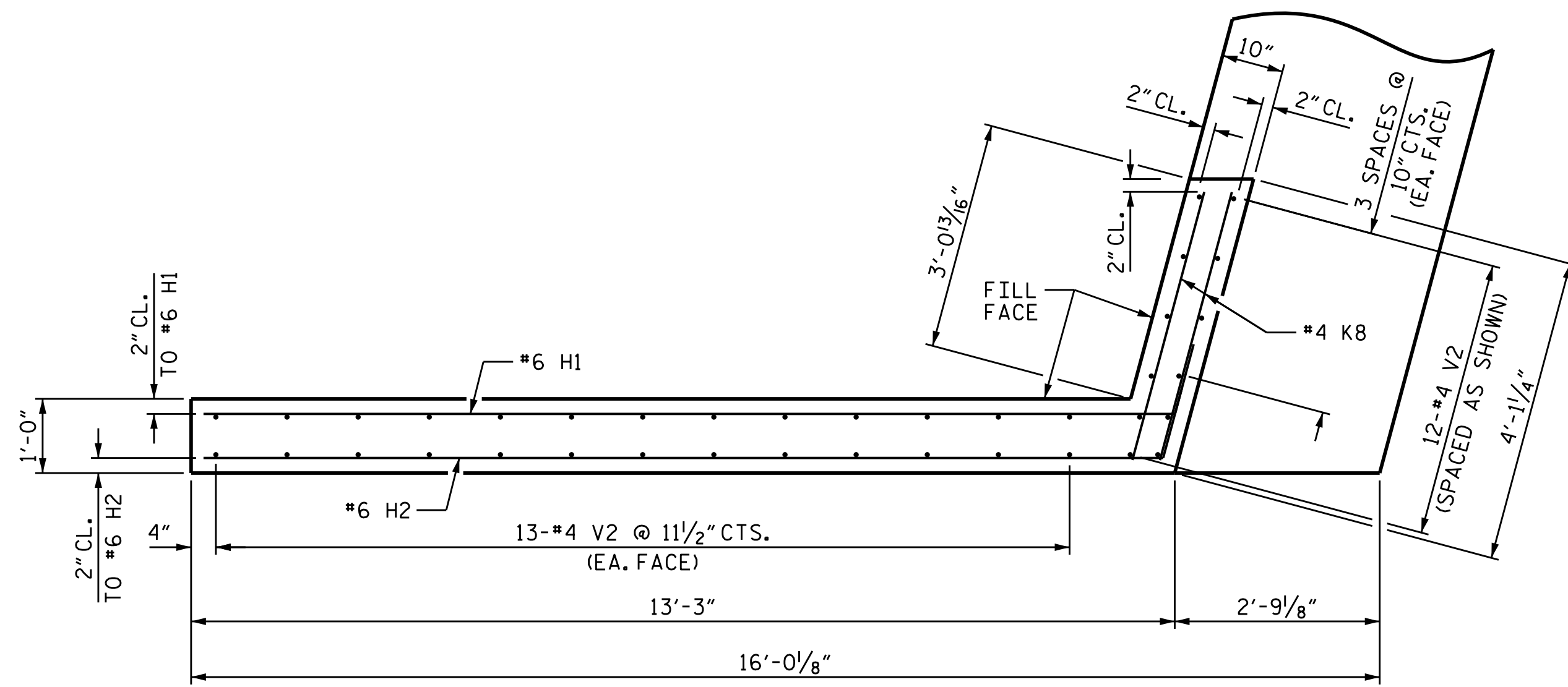
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
INTEGRAL  
END BENT 2

DRAWN BY: P. K. NEWTON DATE: 2/25/21  
CHECKED BY: P. D. BRYANT DATE: 3/1/21  
DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21

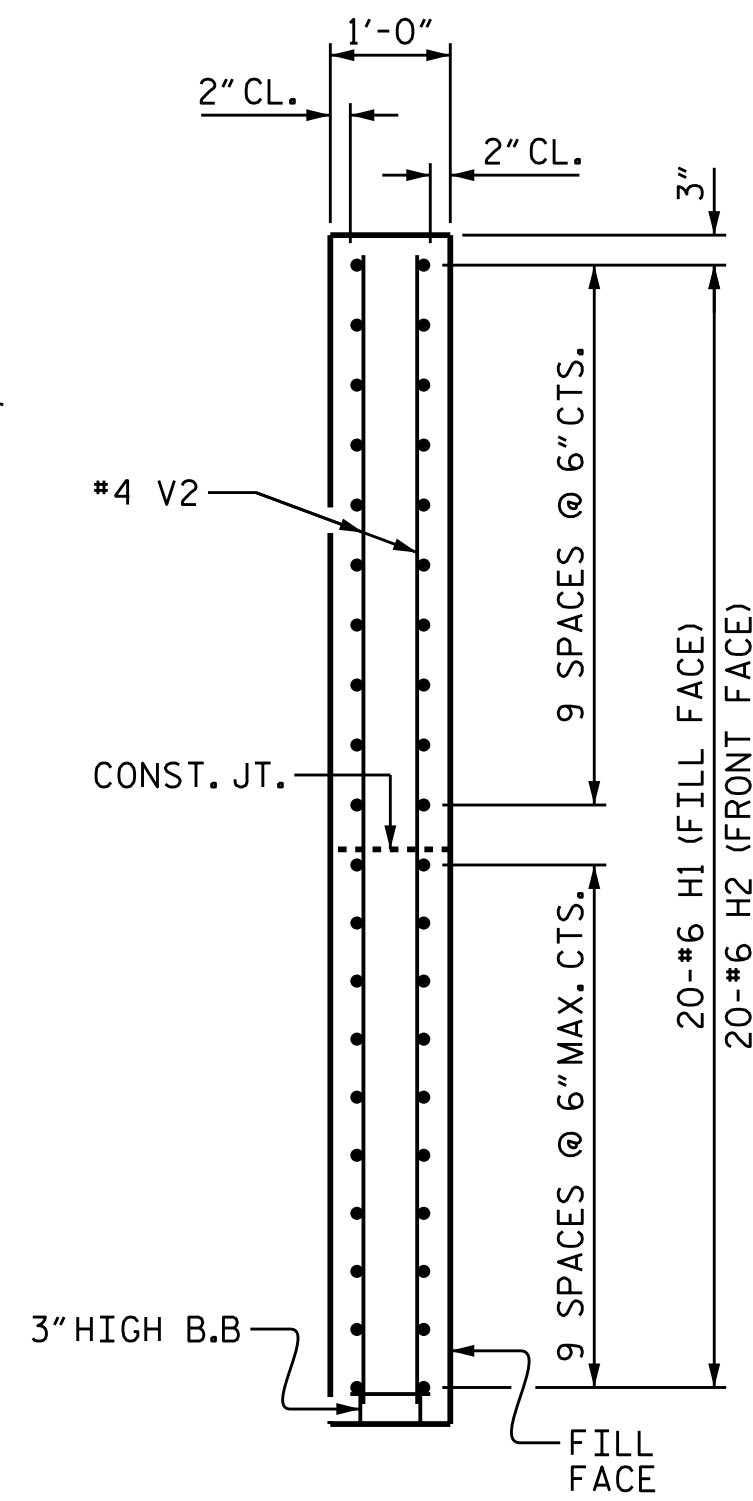
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			28

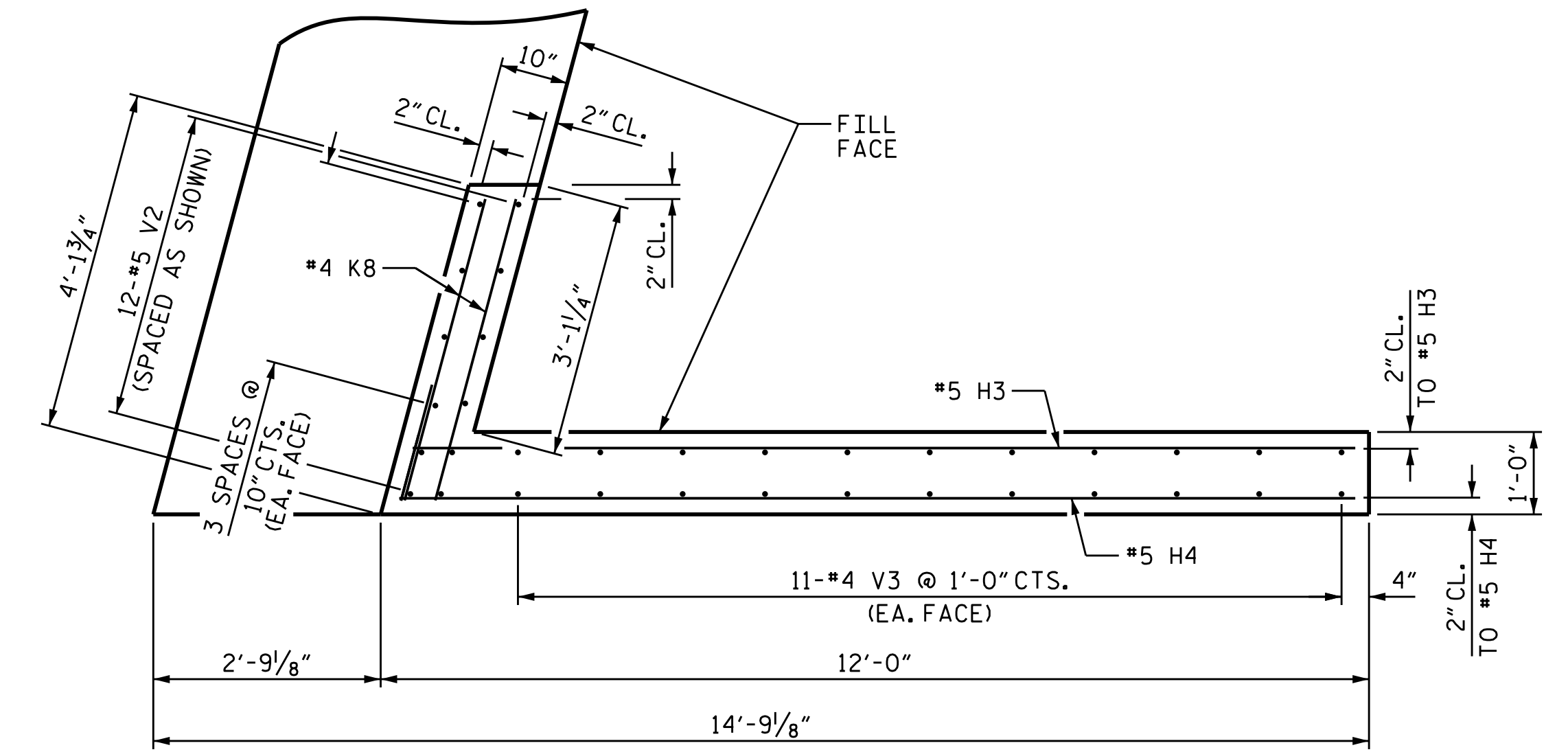




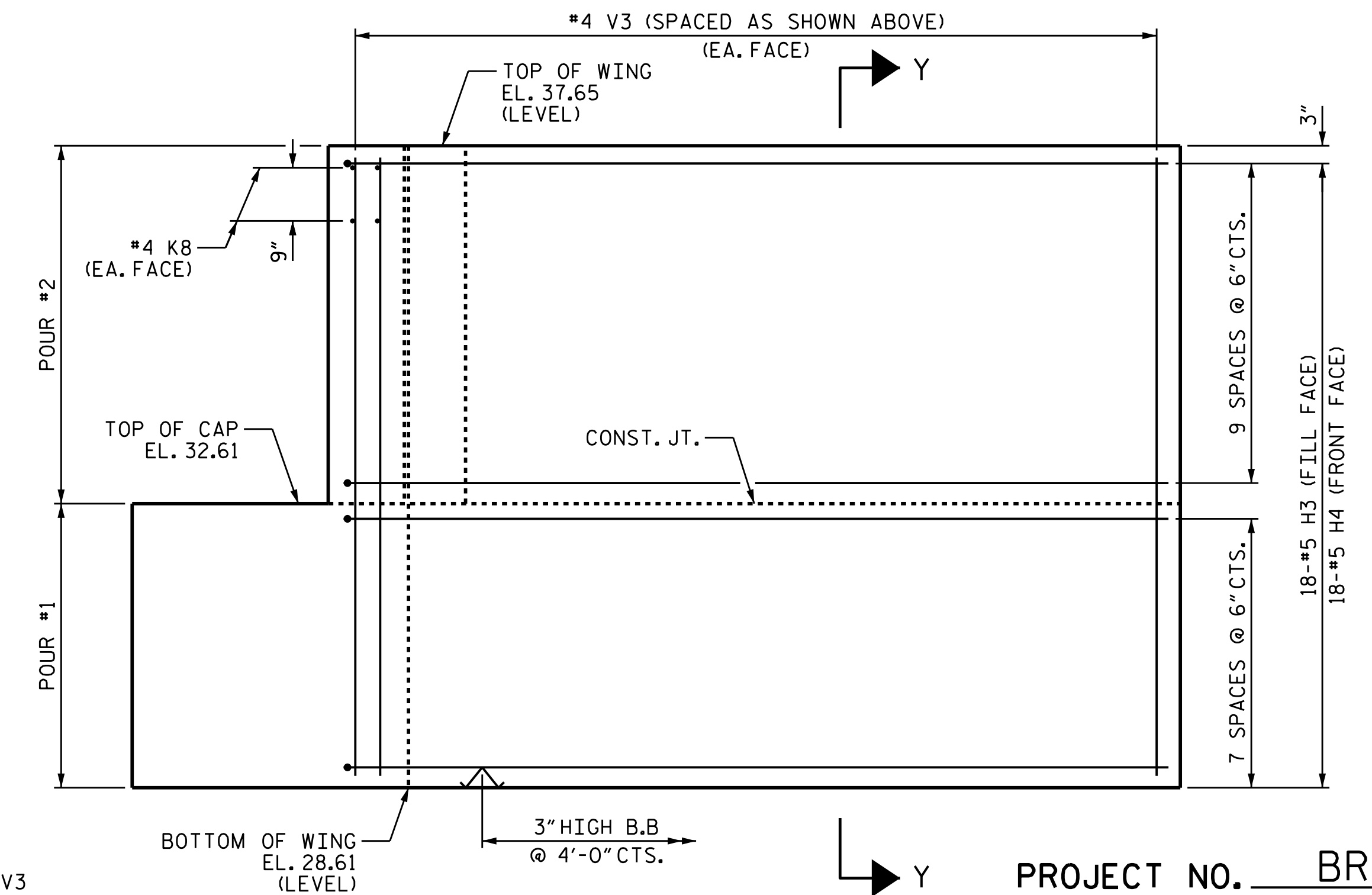
PLAN OF WING W1



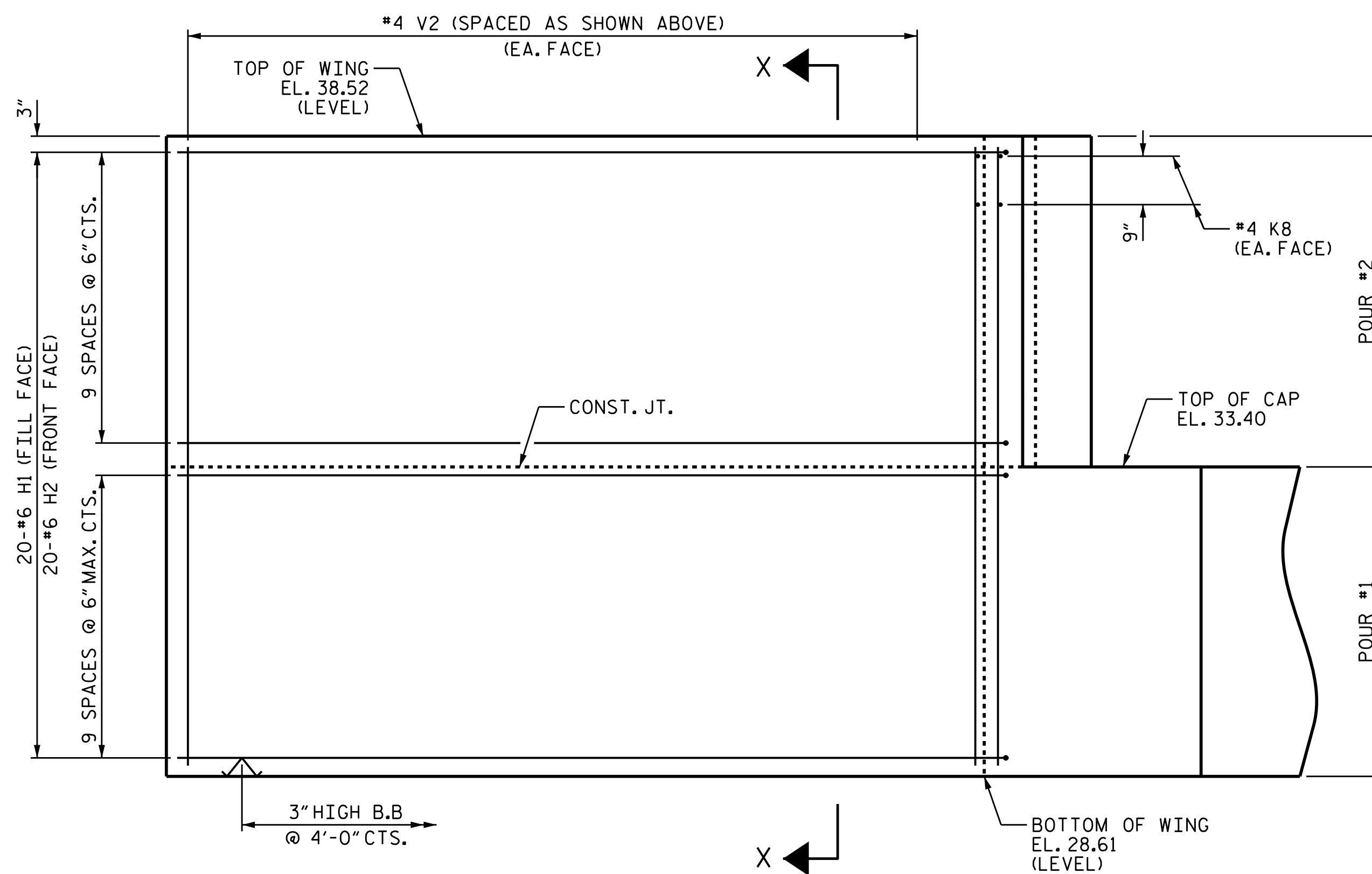
SECTION X-X



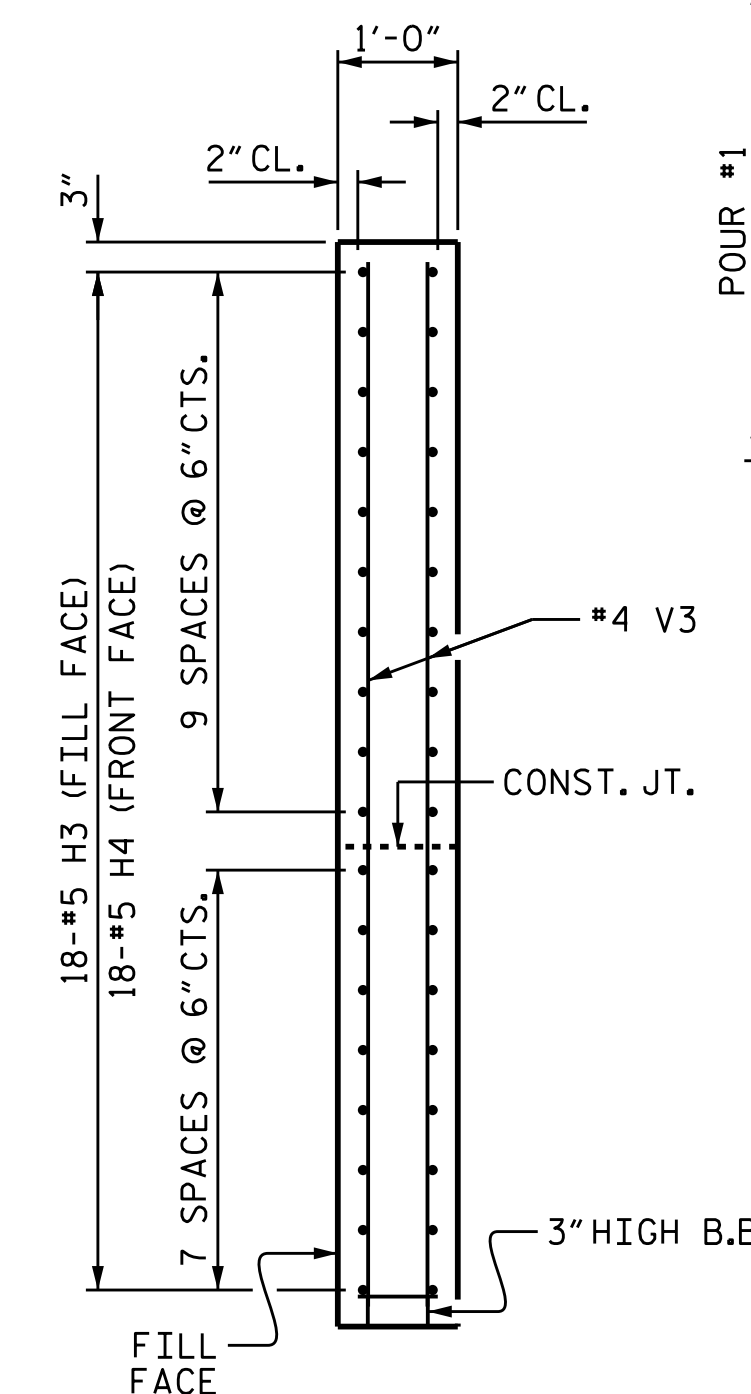
PLAN OF WING W2



ELEVATION OF WING W2



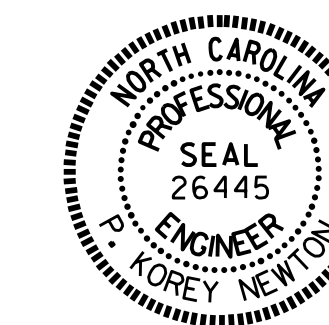
ELEVATION OF WING W1



SECTION Y-Y

PROJECT NO. BR-0017  
 DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 2 OF 3



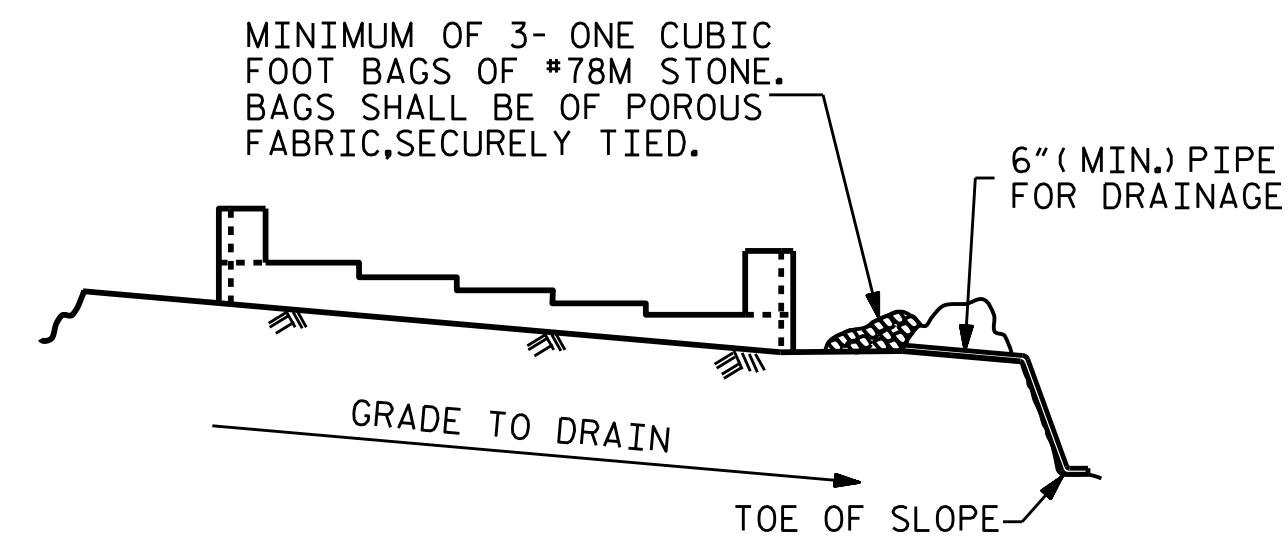
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL  
 END BENT 2

DRAWN BY : P. K. NEWTON DATE : 2/27/21  
 CHECKED BY : P. D. BRYANT DATE : 3/1/21  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE : 3/1/21

30-MAR-2021 18:10  
 pknewton

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			28

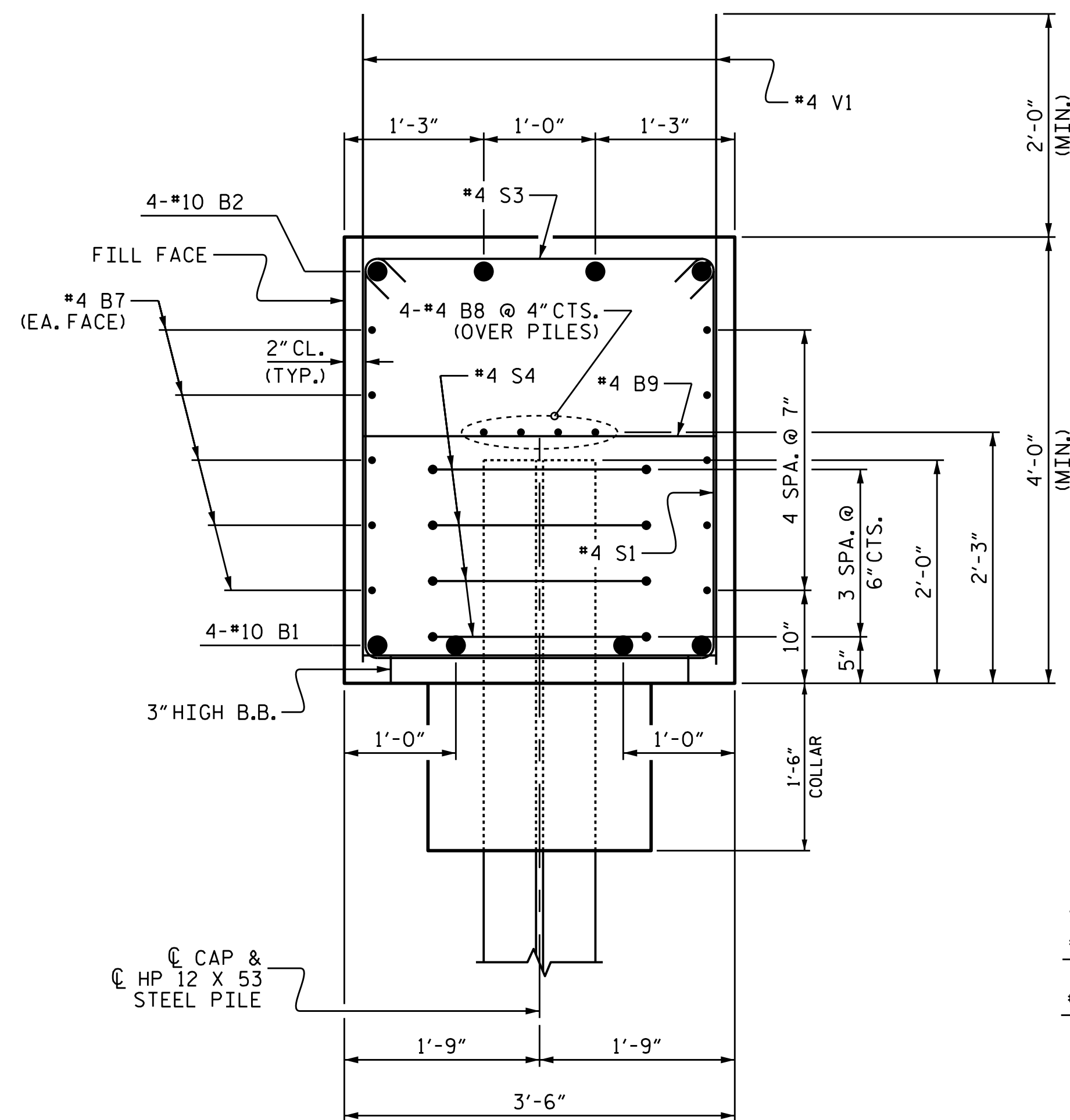


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

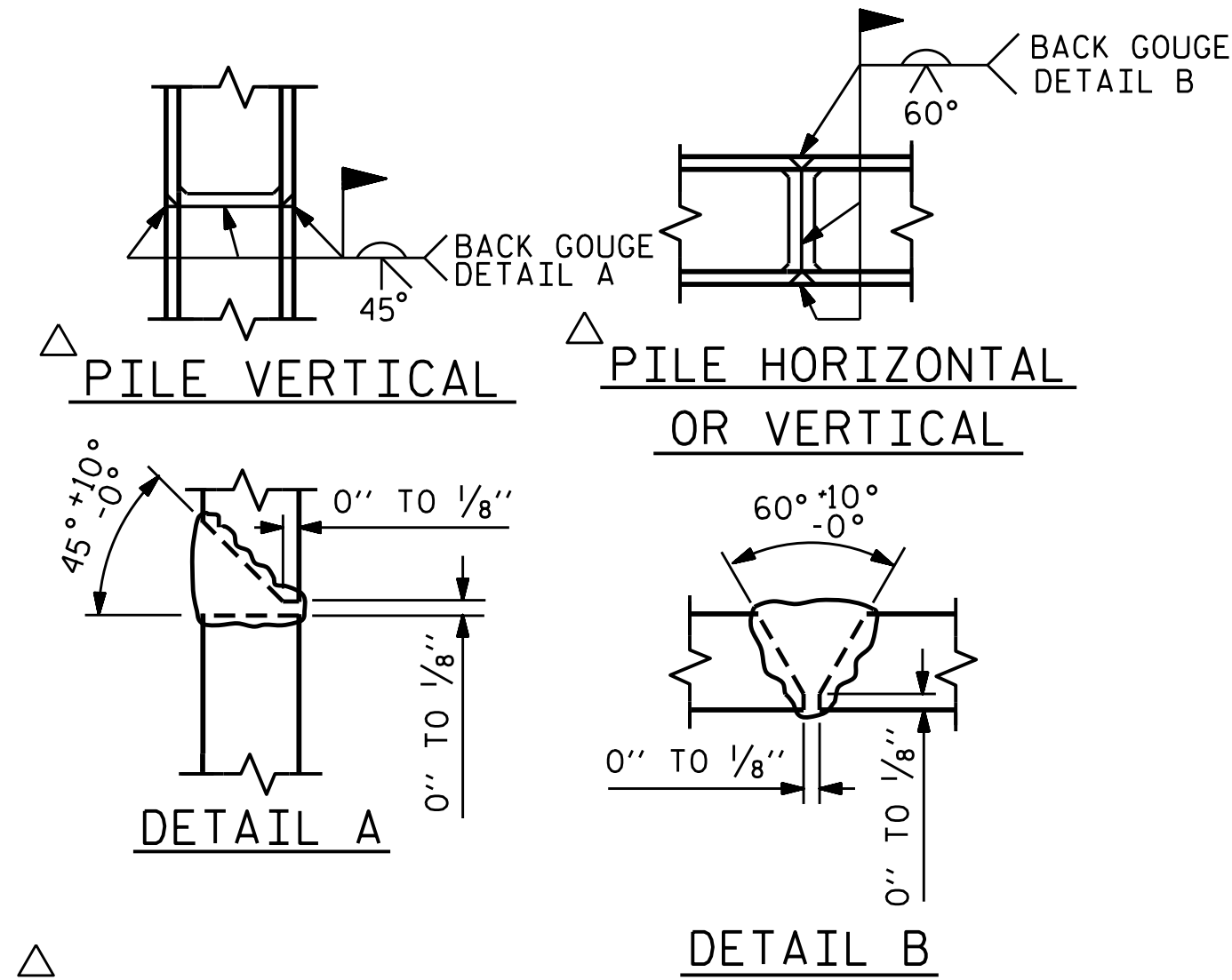
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

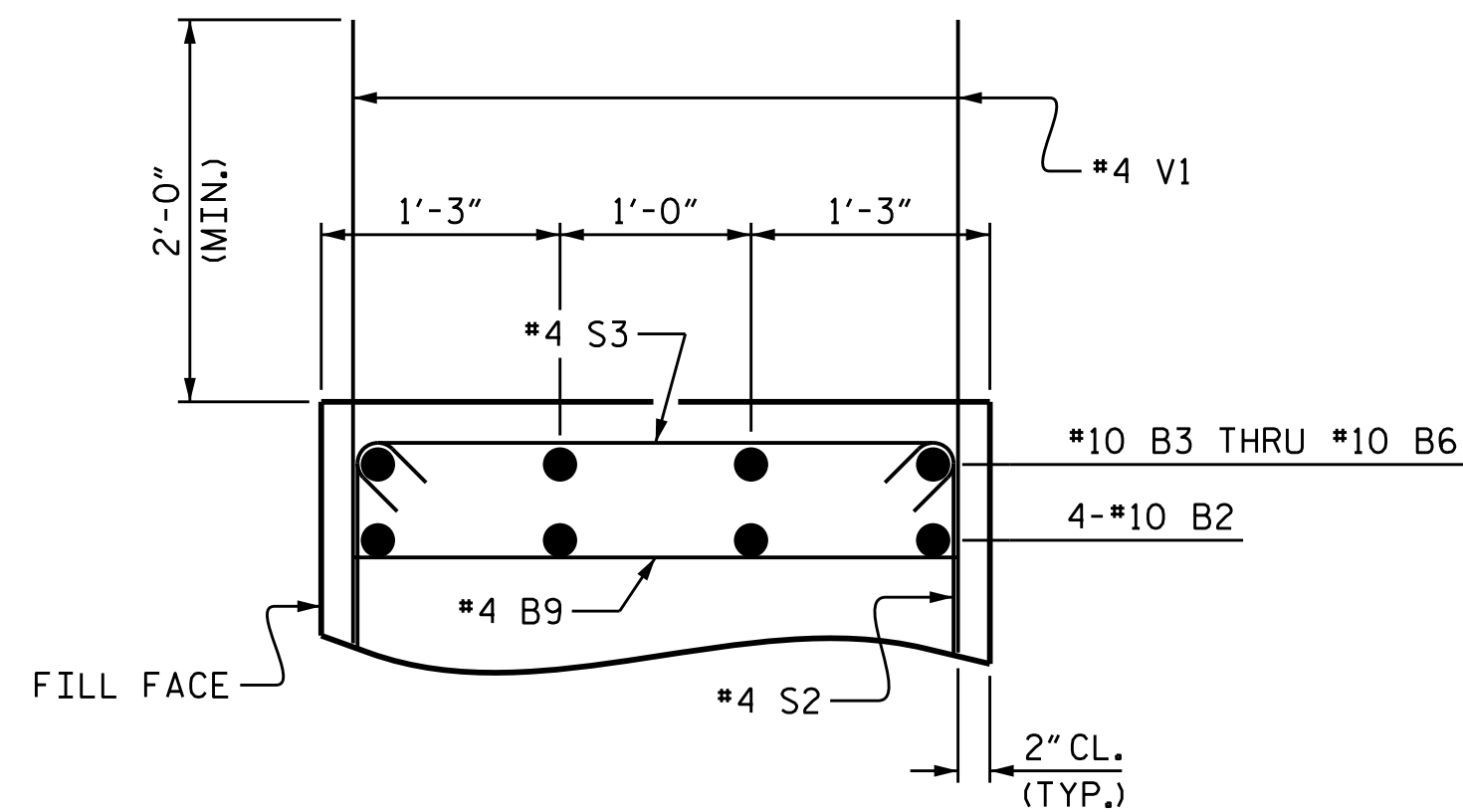


SECTION A-A

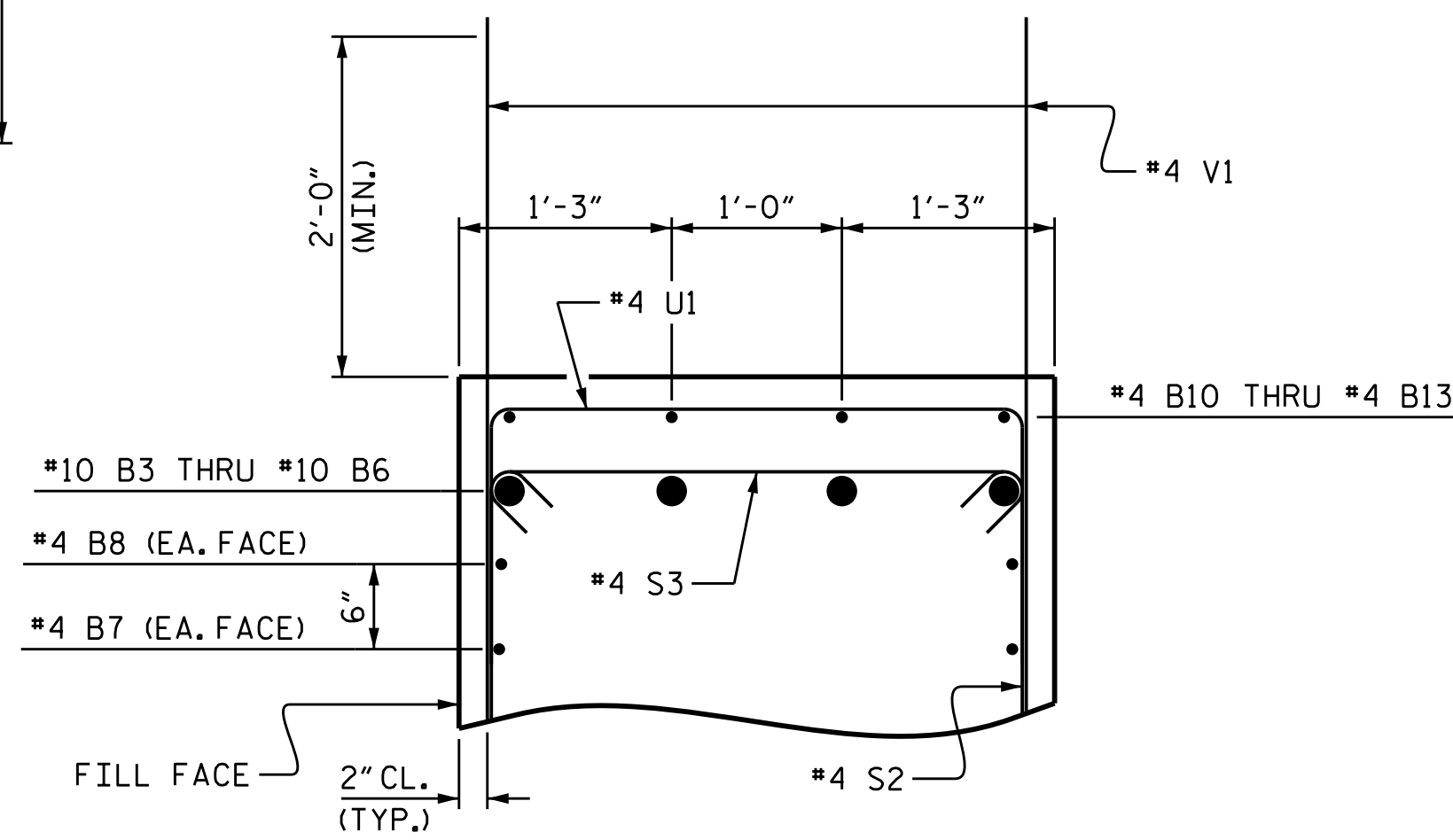


POSITION OF PILE DURING WELDING.

### PILE SPLICE DETAILS



PART SECTION B-B



PART SECTION C-C

BAR TYPES				BILL OF MATERIAL		
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	#10	1	52'-3"	899	
B2	4	#10	2	31'-8"	545	
B3	1	#10	2	26'-8"	115	
B4	1	#10	2	26'-11"	116	
B5	1	#10	2	27'-2"	117	
B6	1	#10	2	27'-5"	118	
B7	28	#4	STR	26'-1"	488	
B8	2	#4	STR	21'-9"	29	
B9	14	#4	STR	3'-2"	30	
B10	1	#4	STR	7'-0"	5	
B11	1	#4	STR	7'-3"	5	
B12	1	#4	STR	7'-6"	5	
B13	1	#4	STR	7'-9"	5	
H1	20	#6	7	14'-1"	423	
H2	20	#6	7	13'-11"	418	
H3	18	#5	8	12'-3"	230	
H4	18	#5	8	12'-5"	233	
K8	2	#4	STR	3'-9"	5	
S1	27	#4	3	11'-2"	201	
S2	29	#4	3	11'-11"	231	
S3	56	#4	4	3'-11"	147	
S4	24	#4	5	6'-6"	104	
U1	5	#4	6	6'-2"	21	
V1	79	#4	STR	5'-10"	308	
V2	38	#4	STR	9'-9"	241	
V3	34	#4	STR	8'-8"	197	
REINFORCING STEEL					5,251	LBS.
CLASS A CONCRETE						
POUR #1 (CAP, COLLARS, & LOWER PART OF WINGS)					33.0	C.Y.
POUR #2 (UPPER PART OF WINGS)					5.7	C.Y.
TOTAL					38.7	C.Y.
HP 12 X 53 STEEL PILES						
No. 6					450	LIN FT.
PILE REDRIVES						NO. 3
STEEL PILE POINTS						NO. 6
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES						NO. 6

ALL BAR DIMENSIONS ARE OUT TO OUT.

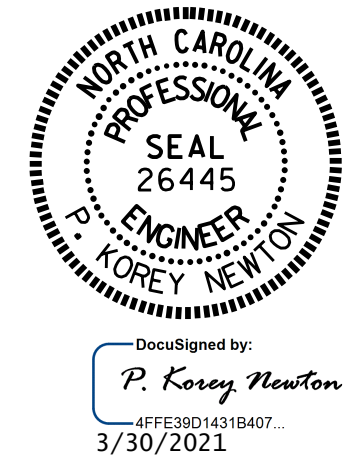
PROJECT NO. BR-0017  
DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

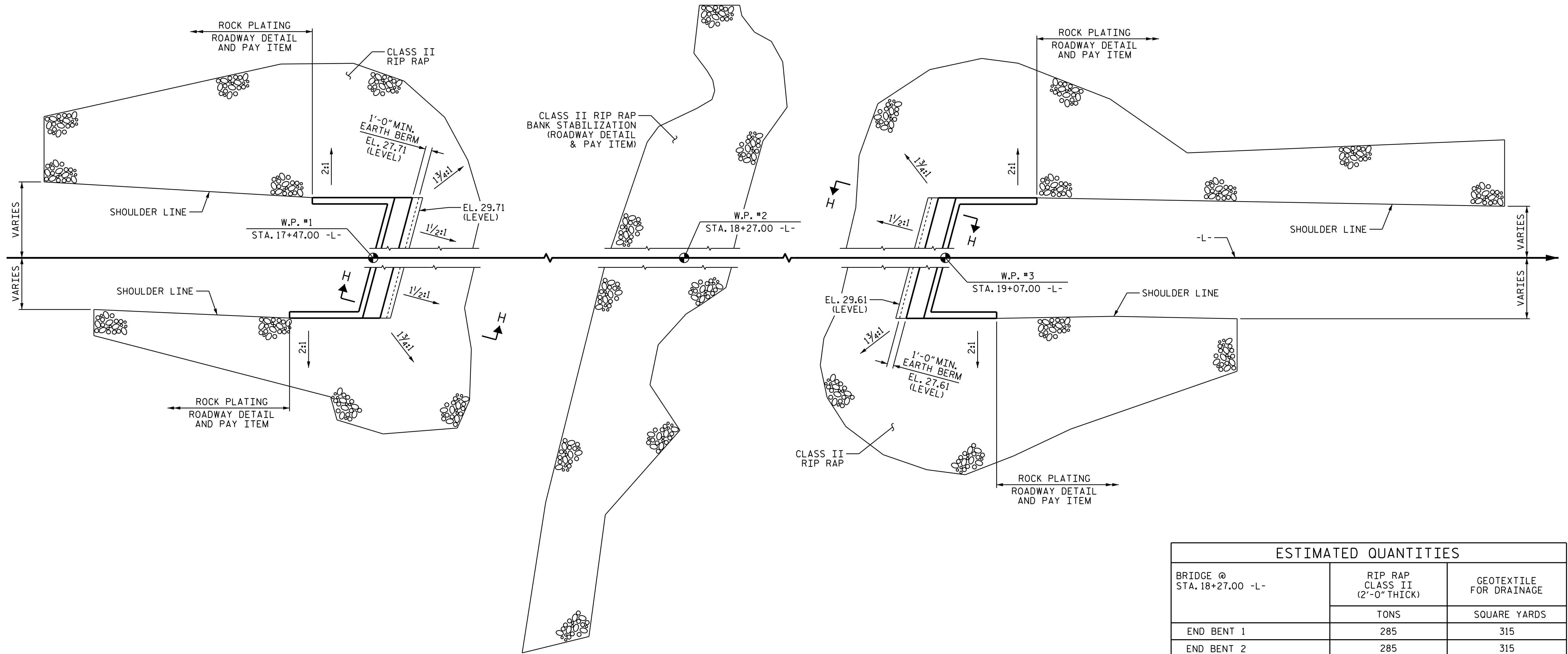
INTEGRAL  
 END BENT 2



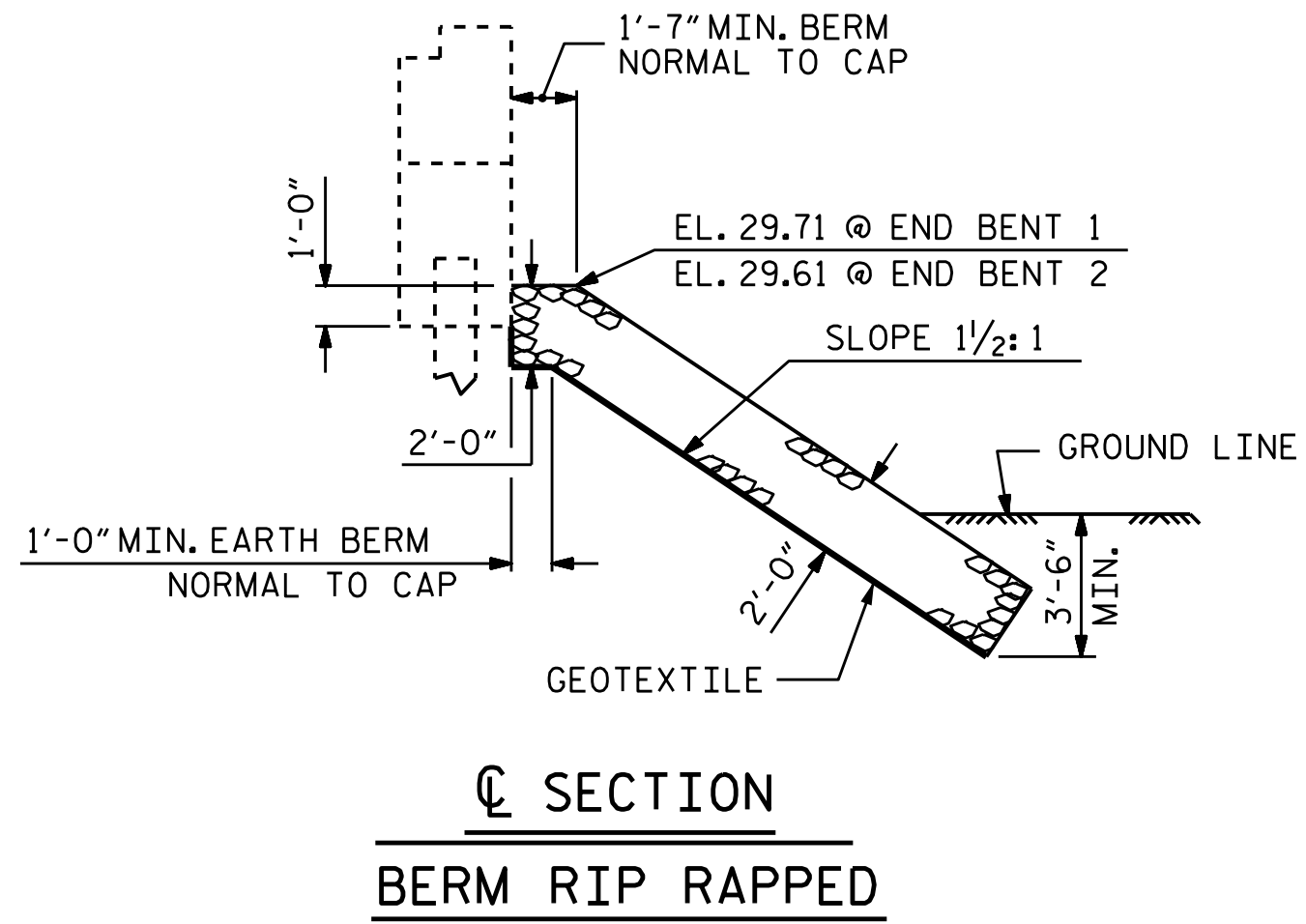
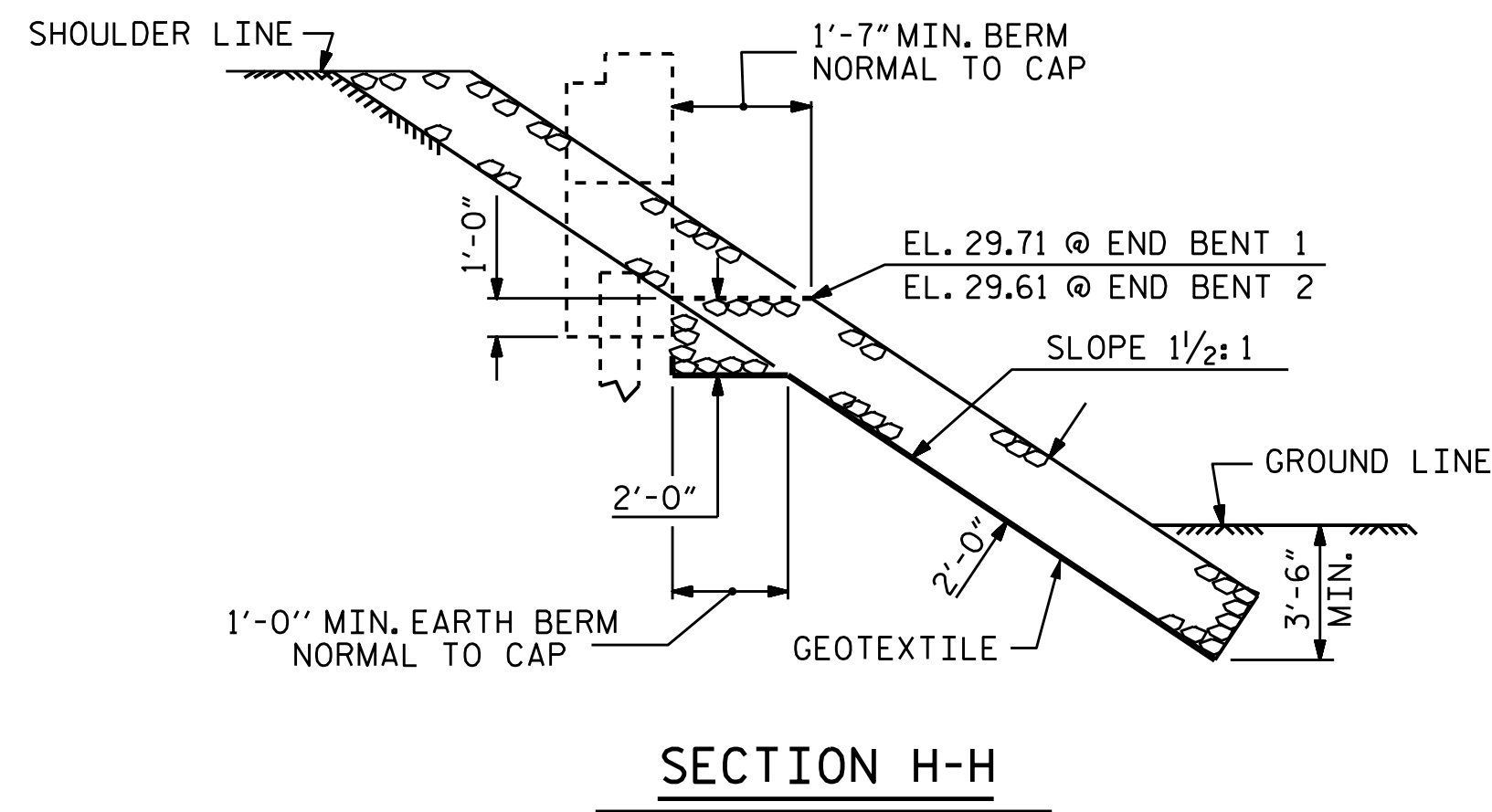
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			28

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: P. K. NEWTON DATE: 2/25/21  
 CHECKED BY: P. D. BRYANT DATE: 3/1/21  
 DESIGN ENGINEER OF RECORD: P. D. BRYANT DATE: 3/1/21



ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+27.00 -L-	RIp RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	285	315
END BENT 2	285	315



PROJECT NO. BR-0017  
DUPLIN COUNTY  
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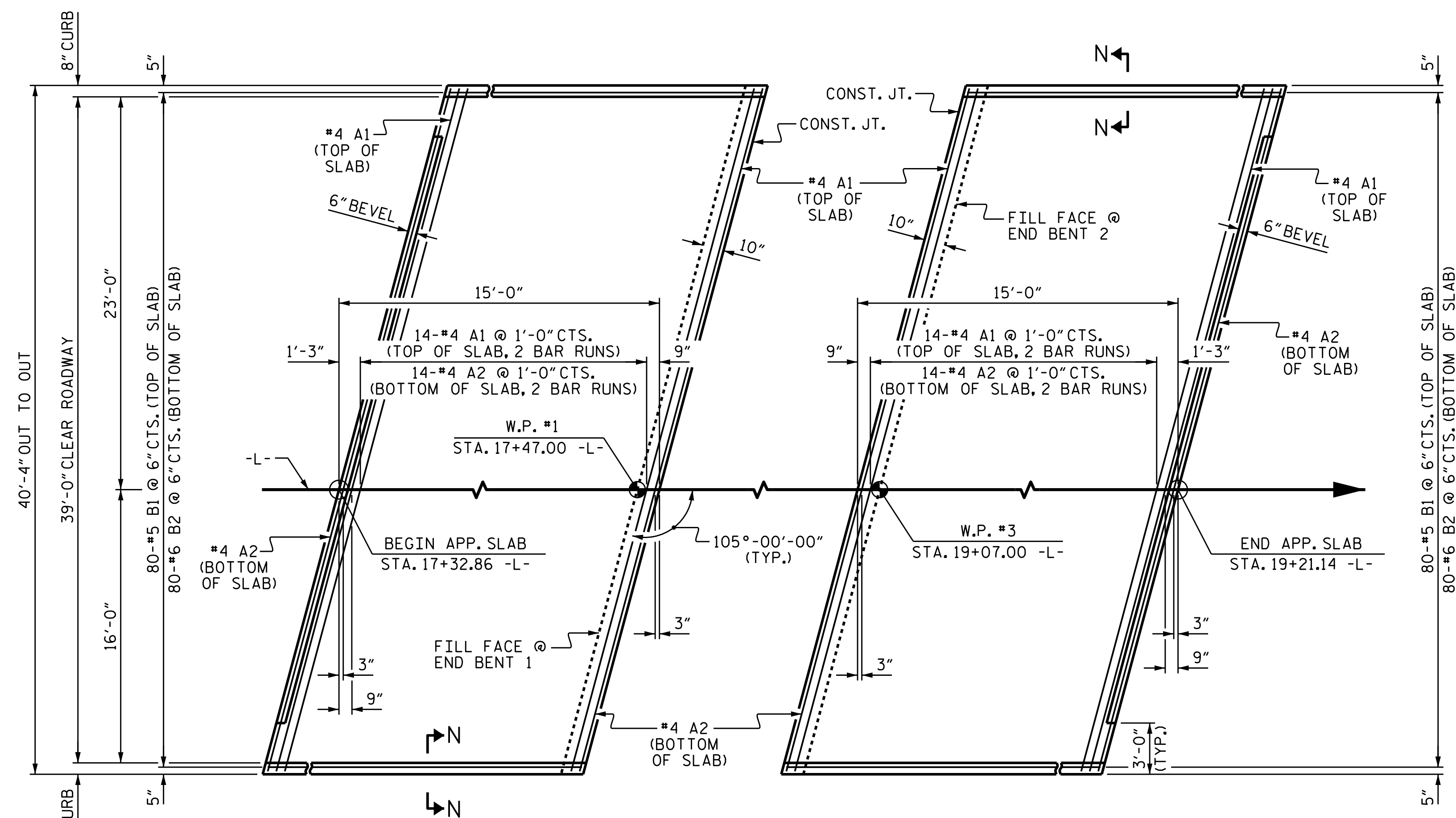


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS

ASSEMBLED BY : P. K. NEWTON DATE : 1/26/21  
 CHECKED BY : D. R. SHACKELFORD DATE : 2/5/21  
 DRAWN BY : REK 1/84 REV. 10/1/11 MAA/GM  
 CHECKED BY : RDU 1/84 REV. 12/21/11 MAA/GM  
 REV. 12/17 MAA/THC

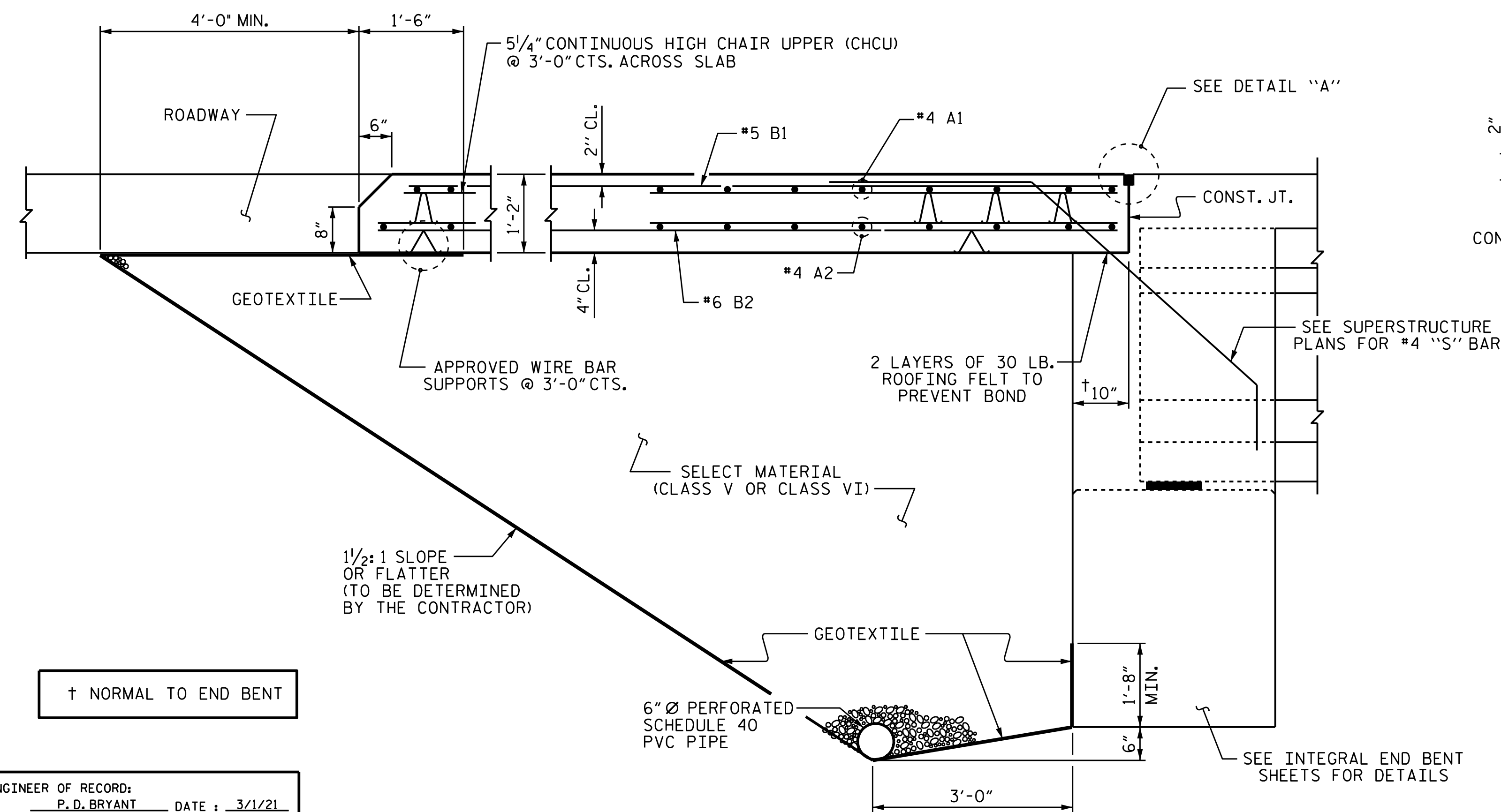
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			28



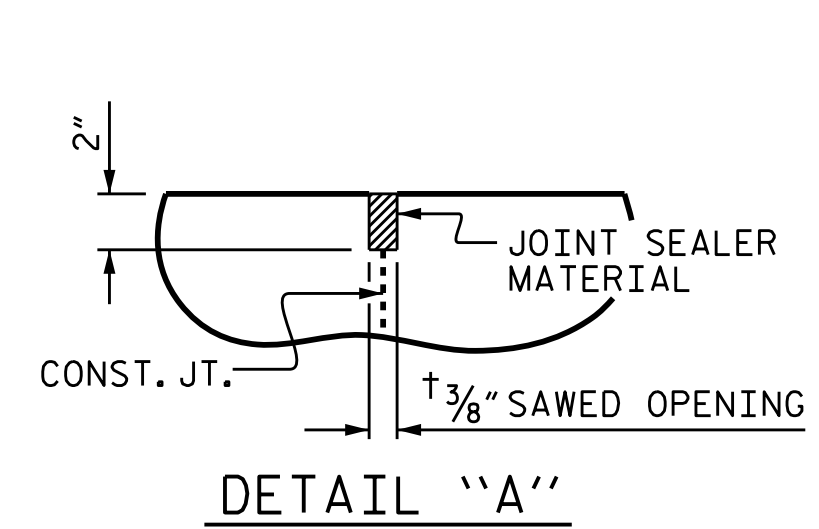
PLAN @ END BENT 1      PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

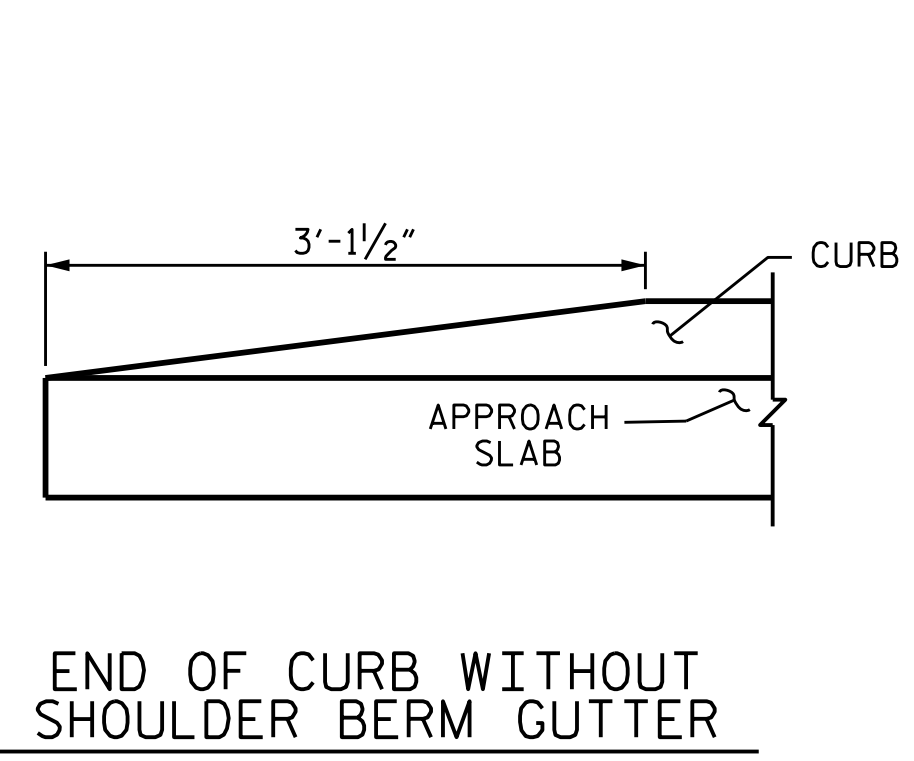


SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

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

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

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

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

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

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

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

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

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

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	16	#4	STR	21'-8"	232
A2	16	#4	STR	21'-8"	232
* B1	80	#5	STR	14'-7"	1217
B2	80	#6	STR	14'-7"	1752
REINFORCING STEEL				LBS.	1984
* EPOXY COATED REINFORCING STEEL				LBS.	1449
CLASS AA CONCRETE				C. Y.	26.1

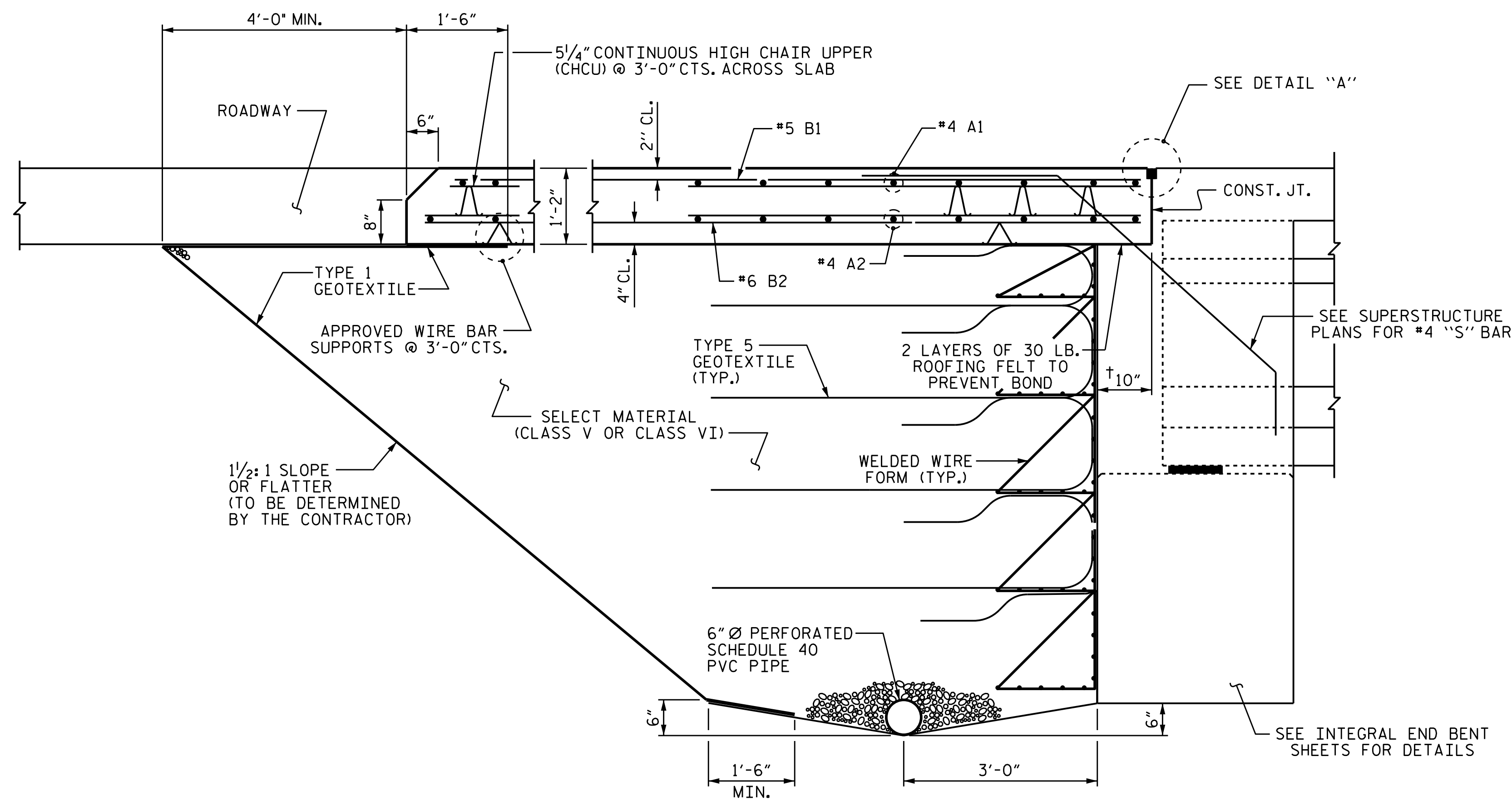
SPLICE LENGTHS

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

DESIGN ENGINEER OF RECORD:	
P. D. BRYANT	DATE: 3/1/21
ASSEMBLED BY: P. K. NEWTON DATE: 1/22/21	
CHECKED BY: D. R. SHACKELFORD DATE: 2/9/21	
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

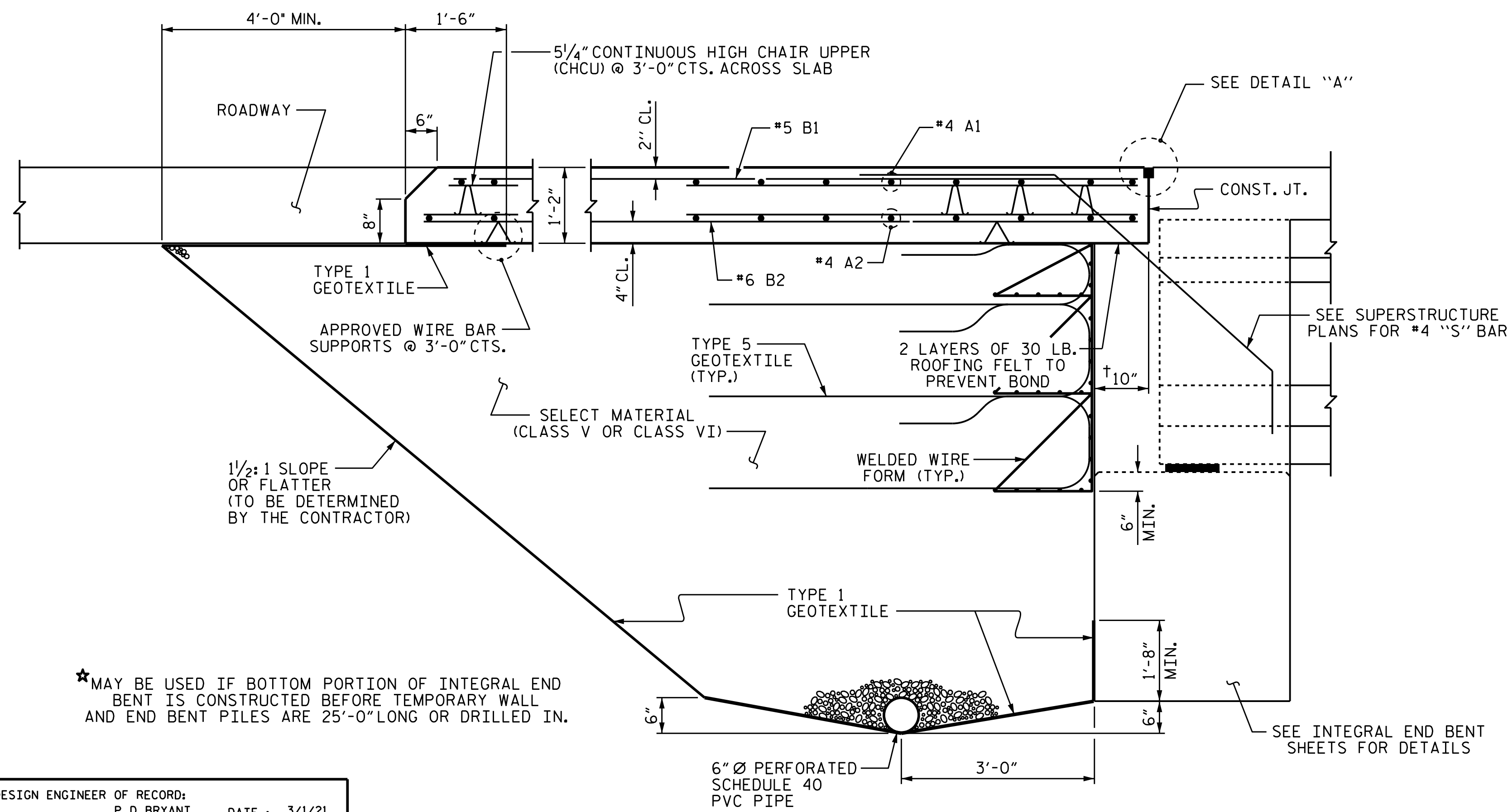
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			28



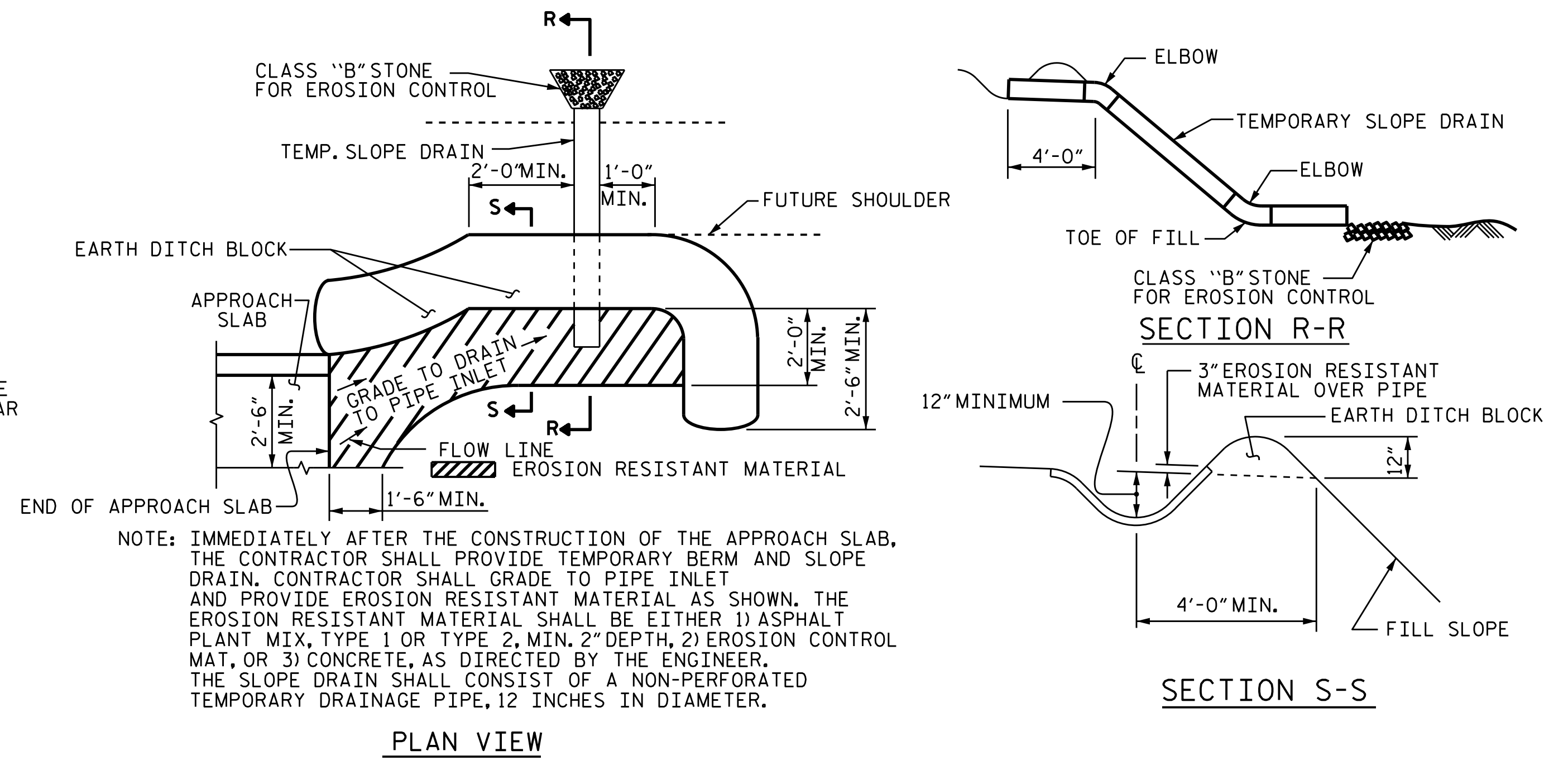
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



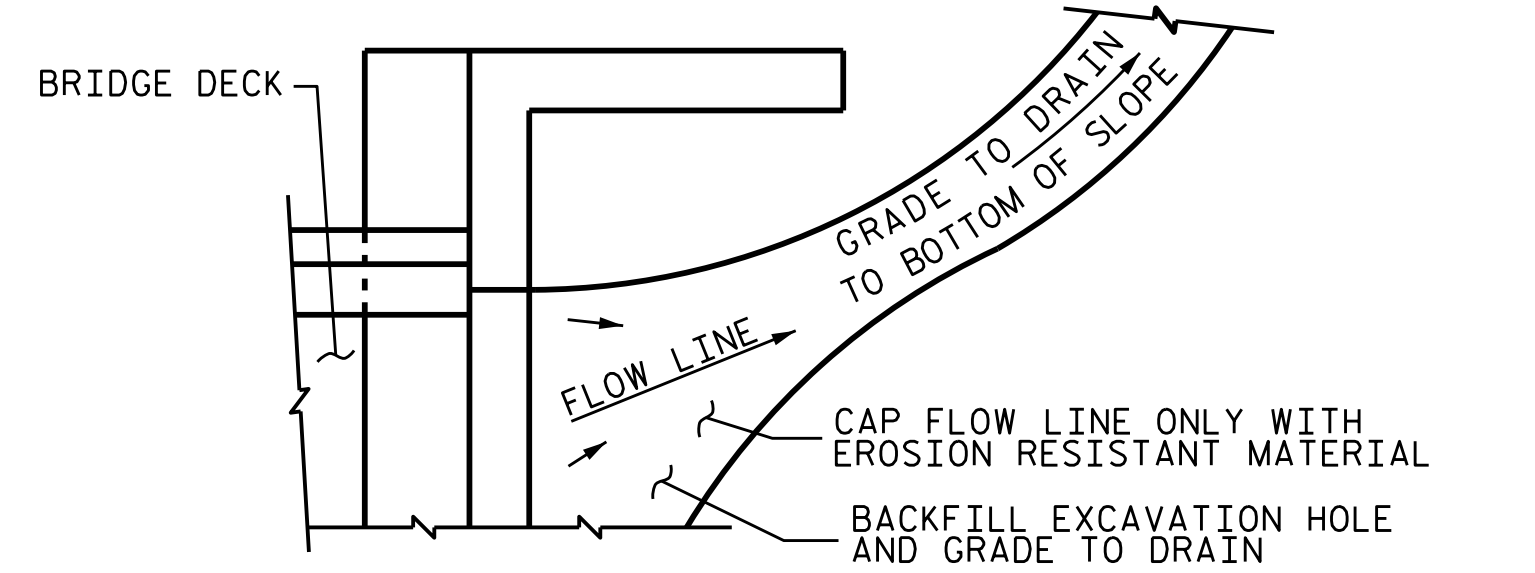
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



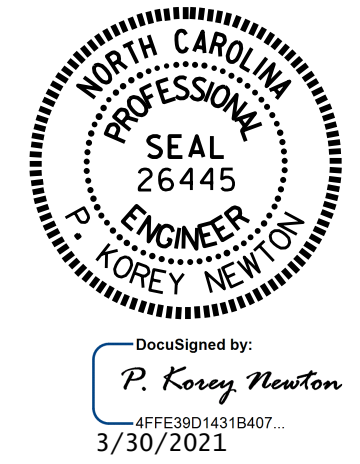
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

**NOTES**

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

DESIGN ENGINEER OF RECORD:		P. D. BRYANT		DATE:	3/1/21
ASSEMBLED BY:	P. K. NEWTON	DATE:	1/22/21	MAA/GM	
CHECKED BY:	D. R. SHACKELFORD	DATE:	2/9/21	MAA/GM	
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	



PROJECT NO. BR-0017  
 DUPLIN COUNTY  
 STATION: 18+27.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS		NO.		SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				TOTAL SHEETS 28	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN