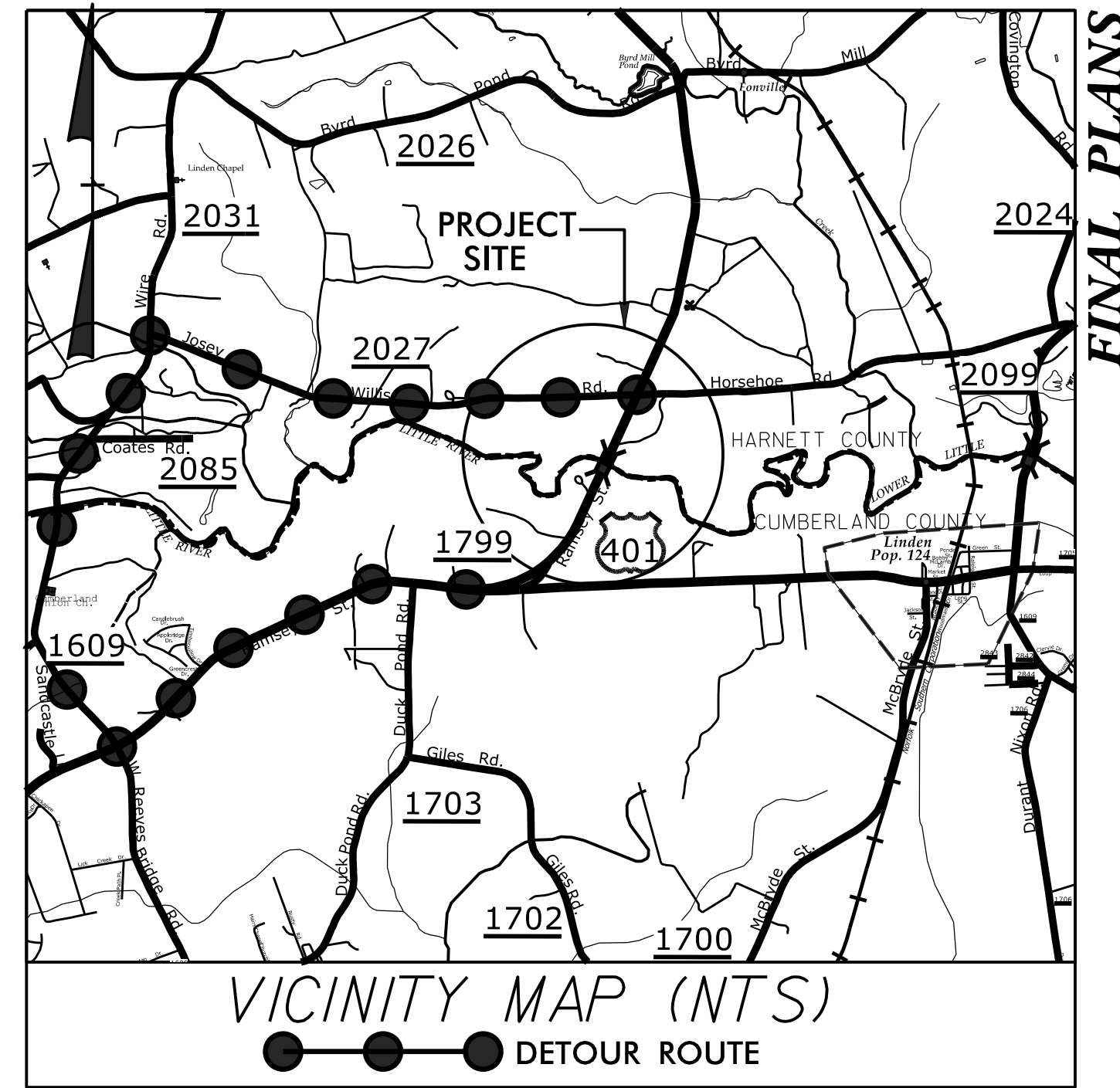


09/08/19  
 CONTRACT: C204430  
 TIP PROJECT: B-5703  
 TIP PROJECT: B-5703  
 CONTRACT: C204430

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



FINAL PLANS

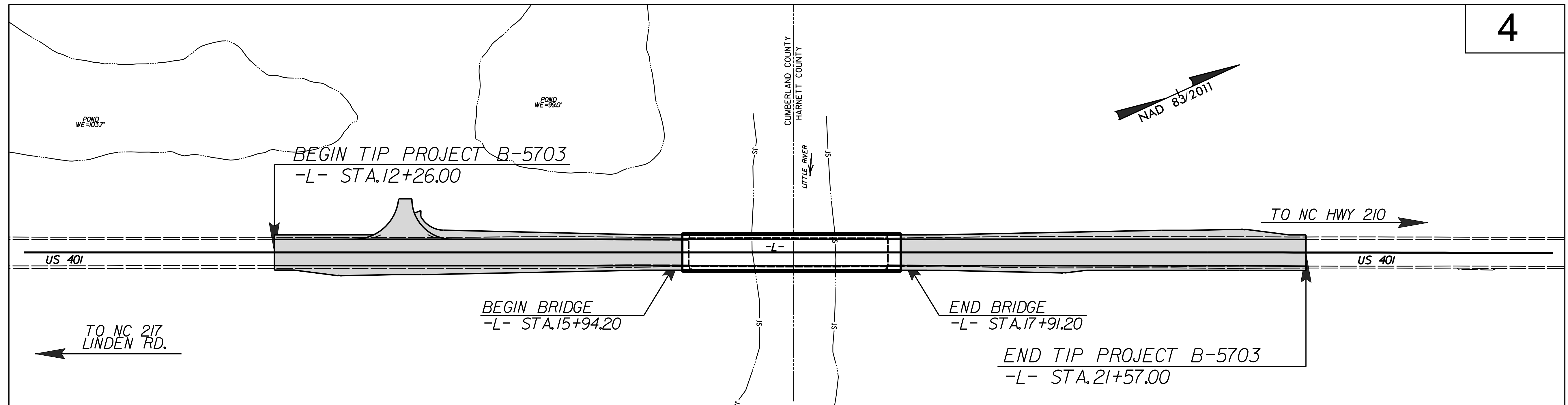
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CUMBERLAND / HARNETT COUNTY

**LOCATION: REPLACE BRIDGE NO. 60 OVER LOWER LITTLE RIVER  
ON US 401**

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

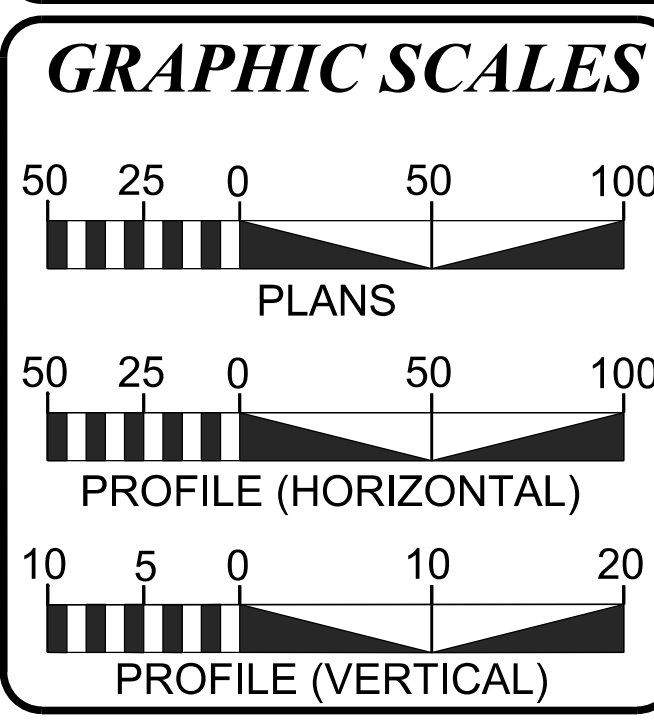
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5703</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45657.1.1		P.E.	
45657.2.1		RW & UTIL.	
45657.3.1		CONST.	



4

## STRUCTURE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2021 =	6409
ADT 2041 =	9242
K =	8 %
D =	55 %
T =	6 % *
V =	60 MPH
* TTST = 4% DUAL 2%	
FUNC CLASS = COLLECTOR	
REGIONAL TIER	

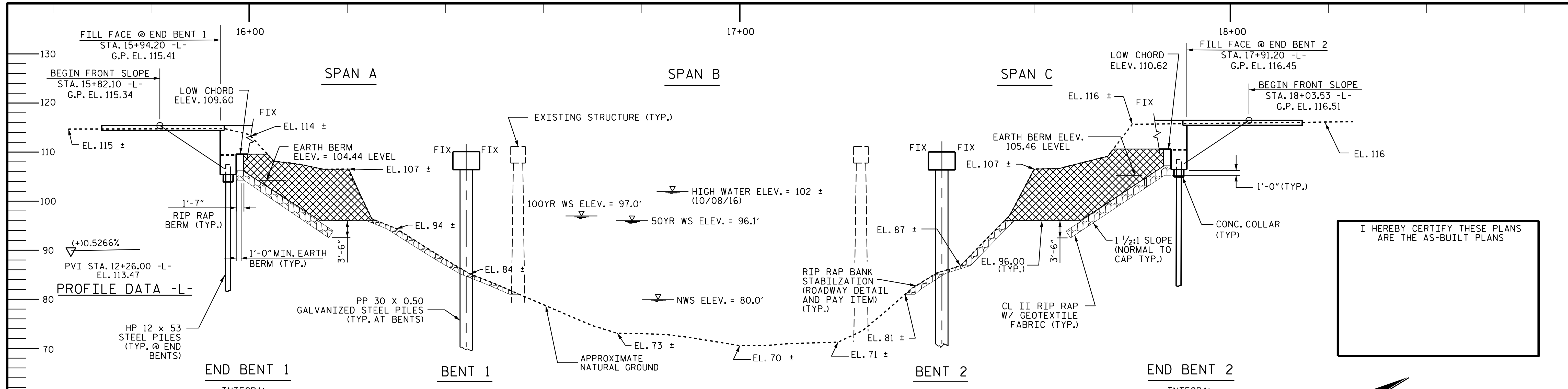
**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-5703	= .139 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5703	= .037 MILES
TOTAL LENGTH OF TIP PROJECT B-5703	= .176 MILES

<p>Prepared in the Office of:</p> <p>KCI Associates of N.C., P.A. 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 Fax (919) 783-9266</p> <p>2018 STANDARD SPECIFICATIONS</p> <p><b>RIGHT OF WAY DATE:</b> JUNE 26, 2019</p> <p><b>LETTING DATE:</b> AUGUST 17, 2021</p> <p><b>NCDOT CONTACT:</b></p>	<p>Plans Prepared For:</p> <p><b>DIVISION OF HIGHWAYS</b> 1000 Birch Ridge Dr. Raleigh NC, 27610</p> <p><b>ELIZABETH R. PHIPPS, P.E.</b> PROJECT ENGINEER</p> <p><b>ROBERT C. LARSON, P.E.</b> PROJECT DESIGN ENGINEER</p> <p><b>KRISTY ALFORD, P.E.</b> STRUCTURES MANAGEMENT UNIT</p>
---	---

<p><b>HYDRAULICS ENGINEER</b></p> <p>_____ SIGNATURE: _____ P.E.</p>	<p><b>ROADWAY DESIGN ENGINEER</b></p> <p>_____ SIGNATURE: _____ P.E.</p>
--	--



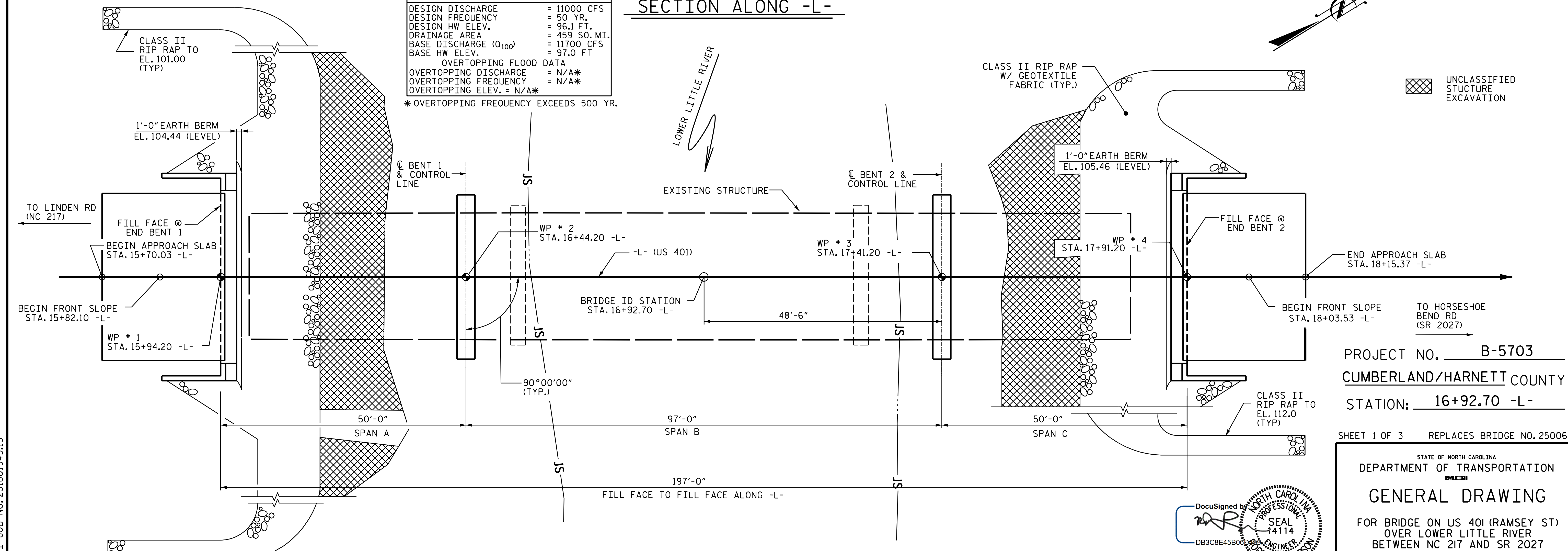


I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 11000 CFS
DESIGN FREQUENCY	= 50 YR.
DESIGN HW ELEV.	= 96.1 FT.
DRAINAGE AREA	= 459 SQ. MI.
BASE DISCHARGE (Q <sub>100</sub> )	= 11700 CFS
BASE HW ELEV.	= 97.0 FT
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= N/A*
OVERTOPPING FREQUENCY	= N/A*
OVERTOPPING ELEV.	= N/A*

\* OVERTOPPING FREQUENCY EXCEEDS 500 YR.



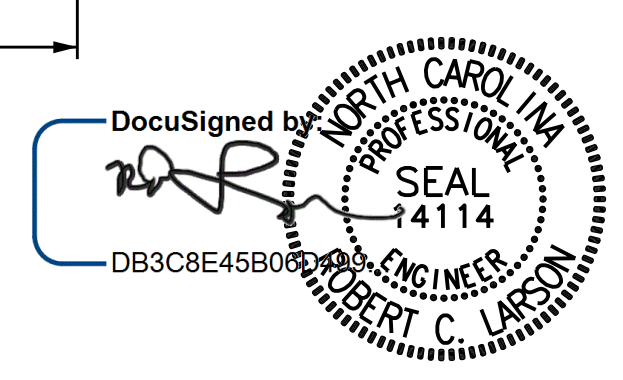
DESIGN ENGINEER OF RECORD: *[Signature]* DATE: 7/1/2021

DRAWN BY: R.J. FLORY DATE: 01/16/19

CHECKED BY: R.C. LARSON DATE: 01/29/19

**PLAN**

PILES NOT SHOWN IN PLAN VIEW



PROJECT NO. B-5703

CUMBERLAND/HARNETT COUNTY

STATION: 16+92.70 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 250060

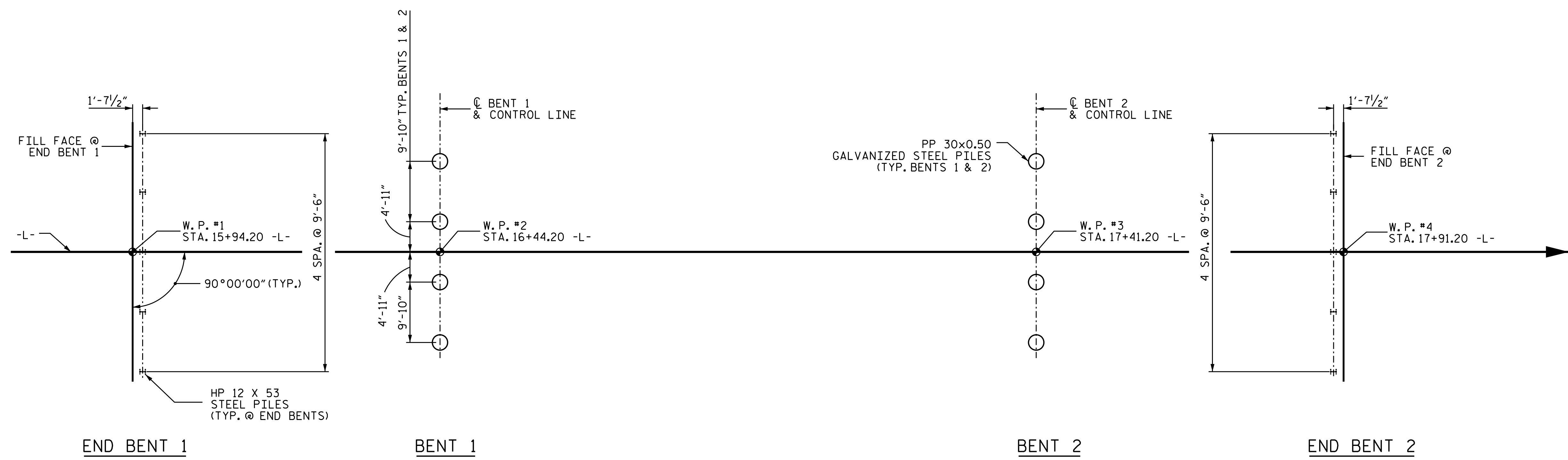
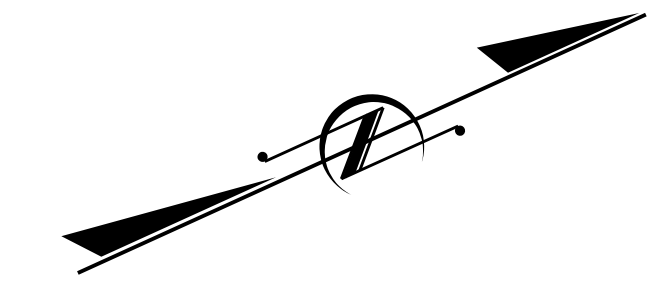
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
**GENERAL DRAWING**  
 FOR BRIDGE ON US 40I (RAMSEY ST)  
 OVER LOWER LITTLE RIVER  
 BETWEEN NC 217 AND SR 2027

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

SHEET NO. S-1  
TOTAL SHEETS 29

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

KCI JOB NO: 251801945.13



**FOUNDATION LAYOUT**

(NOTE: ALL PILES ARE VERTICAL)

**FOUNDATION 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 105 TONS PER PILE.

PILES AT BENT 1 AND BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 250 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

DRIVE PILES AT BENT 1 AND BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 425 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 56.0 FT (LT) AND 53.0 FT (RT).

INSTALL PILES AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 54.0 FT (LT) AND 51.0 FT (RT).

THE SCOUR CRITICAL ELEVATION FOR BENT 1 AND BENT 2 IS ELEVATION 77.0 FT. SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 80-170 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 AND BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

**FOUNDATION RECOMMENDATION COMMENTS**

1.5:1 (H:V) SLOPE AT THE END BENTS ARE OK WITH SLOPE PROTECTION.

INTEGRAL END BENT WILL BE USED AT END BENT 1 AND END BENT 2.

USE ONLY TYPE A BRIDGE APPROACH FILL DETAILS AT END BENT 1 TO AID SLOPE STABILITY.

USE TYPE I OR TYPE A BRIDGE APPROACH FILL DETAILS AT END BENT 2.

THE DESIGN SCOUR ELEVATIONS FOR BENT 1 AND BENT 2 ARE 79.3 FT. AND 79.9 FT.

NO WAITING PERIOD IS REQUIRED BEFORE BEGINNING OF END BENT CONSTRUCTION.

USE A SINGLE ROW OF PLUMB PILES AT EACH END BENT.

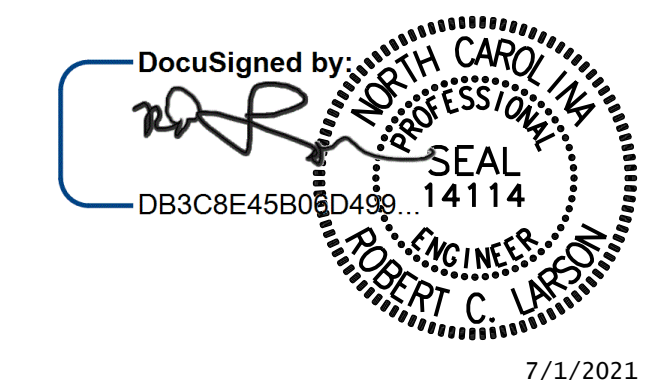
PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON US 40 (RAMSEY ST)  
 OVER LOWER LITTLE RIVER  
 BETWEEN NC 217 AND SR 2027



DESIGN ENGINEER OF RECORD:	DATE:
A. SAMBOY	7/1/2021
DRAWN BY:	DATE:
R.C. LARSON	03/11/19
CHECKED BY:	DATE:
R.C. LARSON	09/10/20

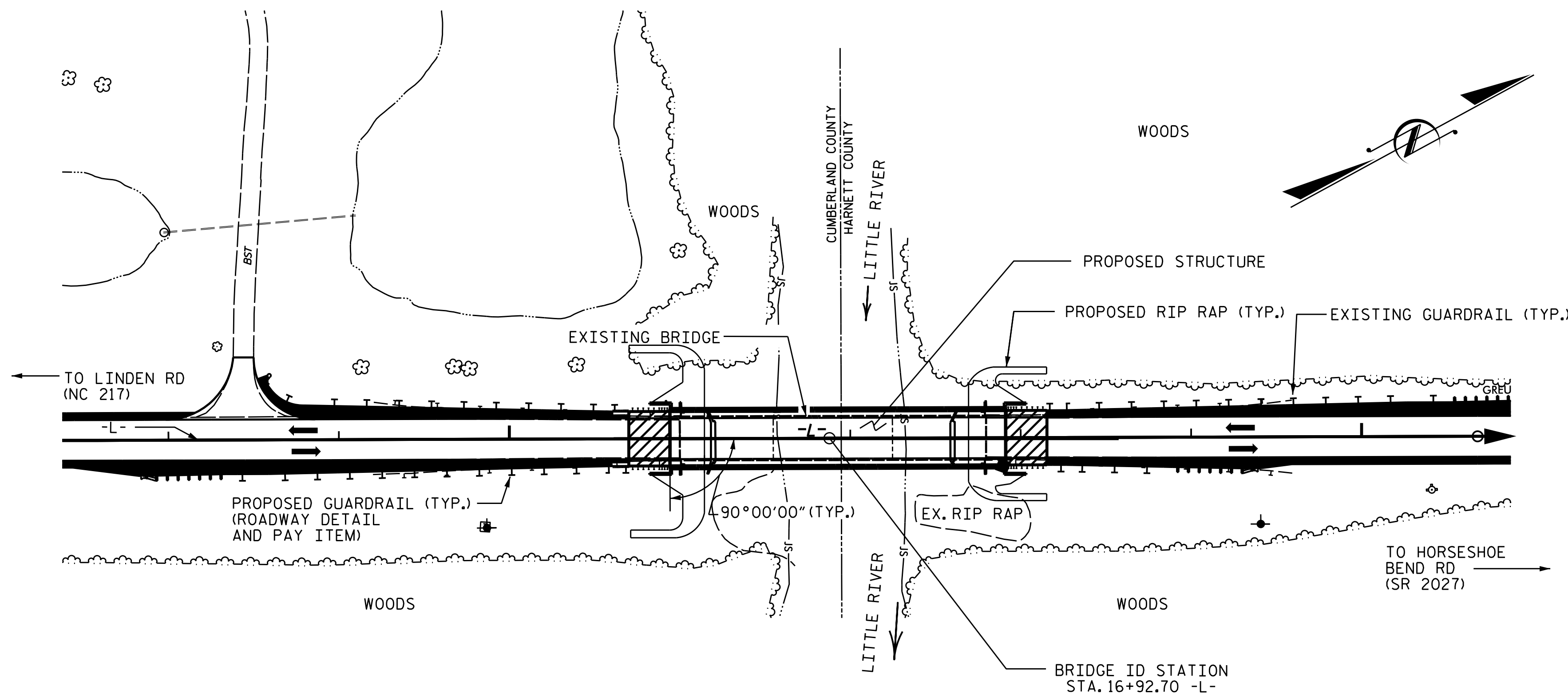
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

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

TOTAL SHEETS	S-2
	29

KCI JOB NO: 251801945.13

BENCHMARK: BM #1 - RR SPIKE IN BASE OF 23" GUM STA. 16+13.70 -L- , 159.64' LT EL. 102.92 NAVD 88



**NOTES:**

- ASSUMED LOADING = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC PERFORMANCE 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.
- 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 16+ 92.70 -L-"
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF 1 @ 54.9', 1 @ 69.8', 1 @ 54.9' CONTINUOUS STEEL BEAMS; 25'-10" CLEAR ROADWAY WIDTH RC FLOOR ON CONCRETE POST-AND-BEAM BENTS/CONCRETE END BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

**LOCATION SKETCH**

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE @ STA. 16+92.70 -L-	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 16+92.70 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS AT STA. 16+92.70 -L-	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 30X0.5 GALVANIZED STEEL PILES	HP 12X53 STEEL PILES	PP30 X 0.50 GALVANIZED STEEL PILES	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.Y	LUMP SUM	LBS.	NO.	LIN.FT.	EACH	EACH	NO.	LIN.FT.	NO.	LIN.FT.	EACH	LIN.FT.	TON	SO.YDS.	LUMP SUM		
SUPERSTRUCTURE	LUMP SUM	LUMP SUM			6885	7086		LUMP SUM		12	774.00									390.67		LUMP SUM		
END BENT 1							31.1		4381			5		5	275				3		550	610		
BENT 1							15.6		2861				4			4	230		2					
BENT 2							15.6		2861				4			4	260		2					
END BENT 2							31.1		4381			5		5	275				3		305	340		
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	6885	7086	93.4	LUMP SUM	14,484	12	774.00	10		8		10	550	8	490	10	390.67	855	950	LUMP SUM

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

**NOTES (CONT'D):**

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 INTERIOR BENTS 1 AND 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED PILES.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

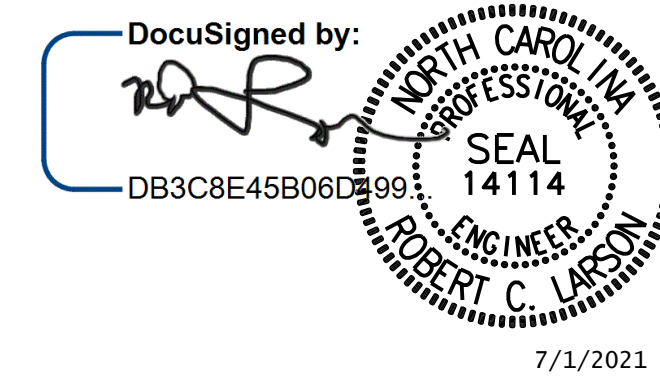
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION

**GENERAL DRAWING**

FOR BRIDGE ON US 40 (RAMSEY ST)  
 OVER LOWER LITTLE RIVER  
 BETWEEN NC 217 AND SR 2027



DESIGN ENGINEER OF RECORD	DATE: 7/1/2021
DRAWN BY: A.K. ALLANK	DATE: 03/13/19
CHECKED BY: R.C. LARSON	DATE: 03/13/19

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

KCI Associates  
 of North Carolina, P.A.  
 4005 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-5244

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

KCI JOB NO: 251801945.13

LOAD FACTORS:

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

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 ( $\gamma_{LL}$ )	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 ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)				
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.32	--	1.75	0.810	1.65	B	E	47.38	0.940	1.34	B	I	8.91	0.80	0.760	1.32	B	I	47.38				
	HL-93 (OPERATING)	N/A		1.77	--	1.35	0.810	2.14	B	E	47.38	0.940	1.77	B	I	8.91	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.81	65.160	1.75	0.810	2.28	B	E	47.38	0.940	1.81	B	I	8.91	0.80	0.760	1.81	B	I	47.38				
	HS-20 (OPERATING)	36.000		2.37	85.320	1.35	0.810	2.95	B	E	47.38	0.940	2.37	B	I	8.91	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.28	57.780	1.40	0.900	6.66	A	I	23.62	0.940	5.70	A	I	9.02	0.80	0.760	4.28	B	I	47.38			
		SNGARBS2	20.000		3.11	62.000	1.40	0.810	4.88	B	E	47.38	0.940	4.01	B	I	8.91	0.80	0.760	3.11	B	I	47.38			
		SNAGRIS2	22.000		2.91	64.020	1.40	0.810	4.57	B	E	47.38	0.940	3.69	B	I	8.91	0.80	0.760	2.91	B	I	47.38			
		SNCOTTS3	27.250		2.13	58.043	1.40	0.900	3.32	A	I	23.62	0.940	2.81	B	I	8.91	0.80	0.760	2.13	B	I	47.38			
		SNAGGRS4	34.925		1.75	61.119	1.40	0.810	2.74	B	E	47.38	0.940	2.28	B	I	8.91	0.80	0.760	1.75	B	I	47.38			
		SNS5A	35.550		1.71	60.791	1.40	0.810	2.68	B	E	47.38	0.940	2.29	B	I	8.91	0.80	0.760	1.71	B	I	47.38			
		SNS6A	39.950		1.56	62.322	1.40	0.810	2.44	B	E	47.38	0.940	2.07	B	I	8.91	0.80	0.760	1.56	B	I	47.38			
		SNS7B	42.000		1.48	62.160	1.40	0.810	2.33	B	E	47.38	0.940	2.01	B	I	8.91	0.80	0.760	1.48	B	I	47.38			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.89	62.370	1.40	0.810	2.97	B	E	47.38	0.940	2.49	B	I	8.91	0.80	0.760	1.89	B	I	47.38			
		TNT4A	33.075		1.90	62.843	1.40	0.810	2.98	B	E	47.38	0.940	2.44	B	I	8.91	0.80	0.760	1.90	B	I	47.38			
		TNT6A	41.600		1.54	64.064	1.40	0.810	2.42	B	E	47.38	0.940	2.11	B	I	8.91	0.80	0.760	1.54	B	I	47.38			
		TNT7A	42.000		1.54	64.680	1.40	0.810	2.42	B	E	47.38	0.940	2.08	B	I	8.91	0.80	0.760	1.54	B	I	47.38			
		TNT7B	42.000		1.58	66.360	1.40	0.810	2.48	B	E	47.38	0.940	1.97	B	I	8.91	0.80	0.760	1.58	B	I	47.38			
		TNAGRIT4	43.000		1.51	64.930	1.40	0.810	2.38	B	E	47.38	0.940	1.91	B	I	8.91	0.80	0.760	1.51	B	I	47.38			
TNAGT5A	45.000		1.43	64.350	1.40	0.810	2.25	B	E	47.38	0.940	1.88	B	I	8.91	0.80	0.760	1.43	B	I	47.38					
TNAGT5B	45.000		③	1.42	63.900	1.40	0.810	2.23	B	E	47.38	0.940	1.81	B	I	8.91	0.80	0.760	1.42	B	E	47.38				

NOTES:

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

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

COMMENTS:

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

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

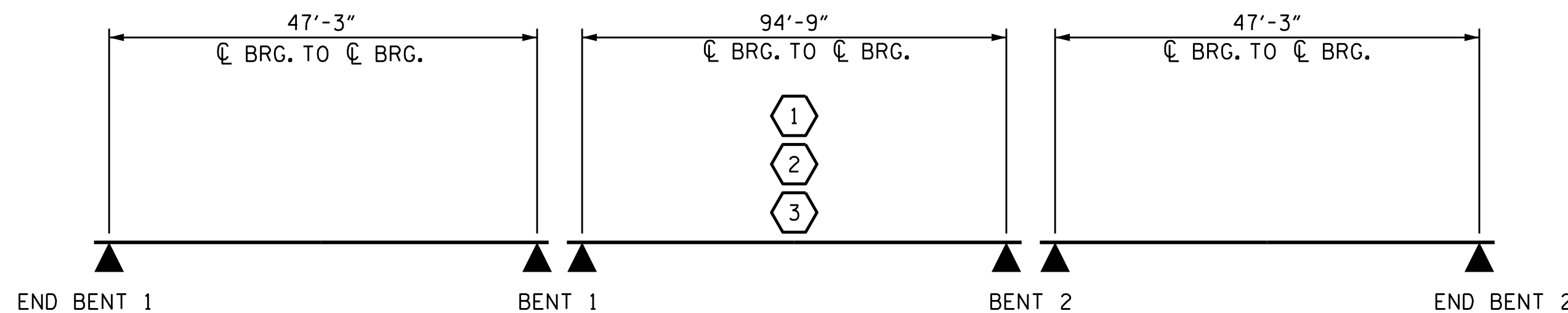
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

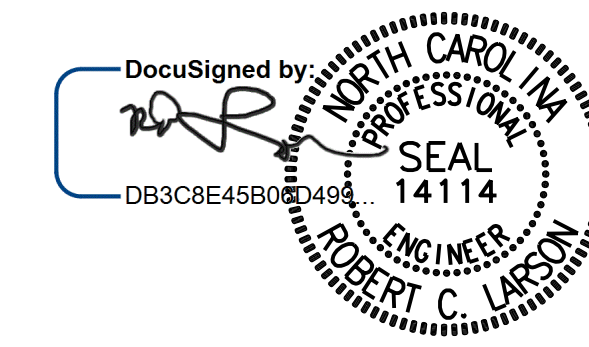
GIRDER LOCATION

I - INTERIOR GIRDER  
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-



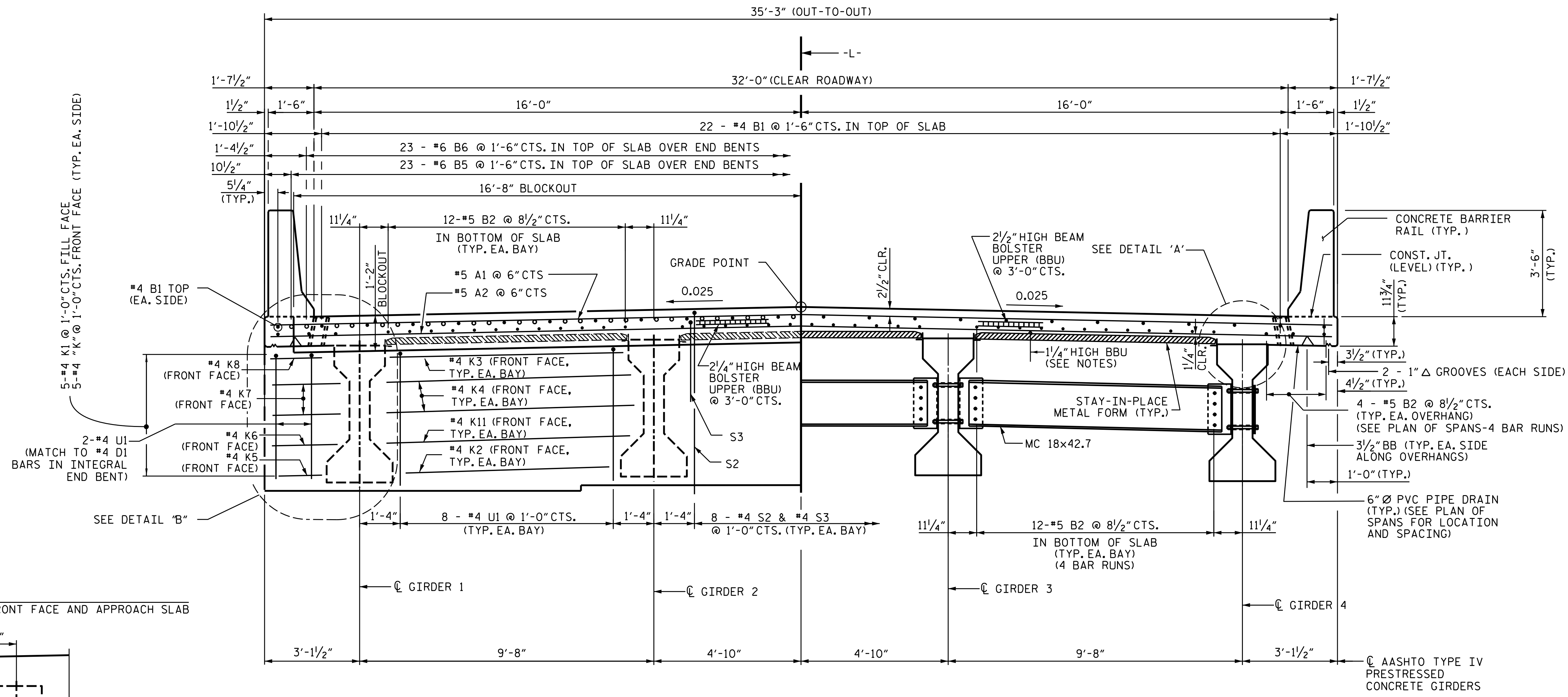
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
PRESTRESSED  
CONCRETE GIRDERS  
(NON-INTERSTATE TRAFFIC)

DESIGN ENGINEER OF RECORD	DATE: 7/1/2021
ASSEMBLED BY: A.K. ALLANKR	DATE: 03/05/18
CHECKED BY: R.C. LARSON	DATE: 03/05/18
DRAWN BY: MAA	REV. 11/12/08RR
CHECKED BY: GM/DI 2/08	REV. 10/1/11
	REV. 12/17

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KCI Associates  
of North Carolina, P.A.  
4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9241

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

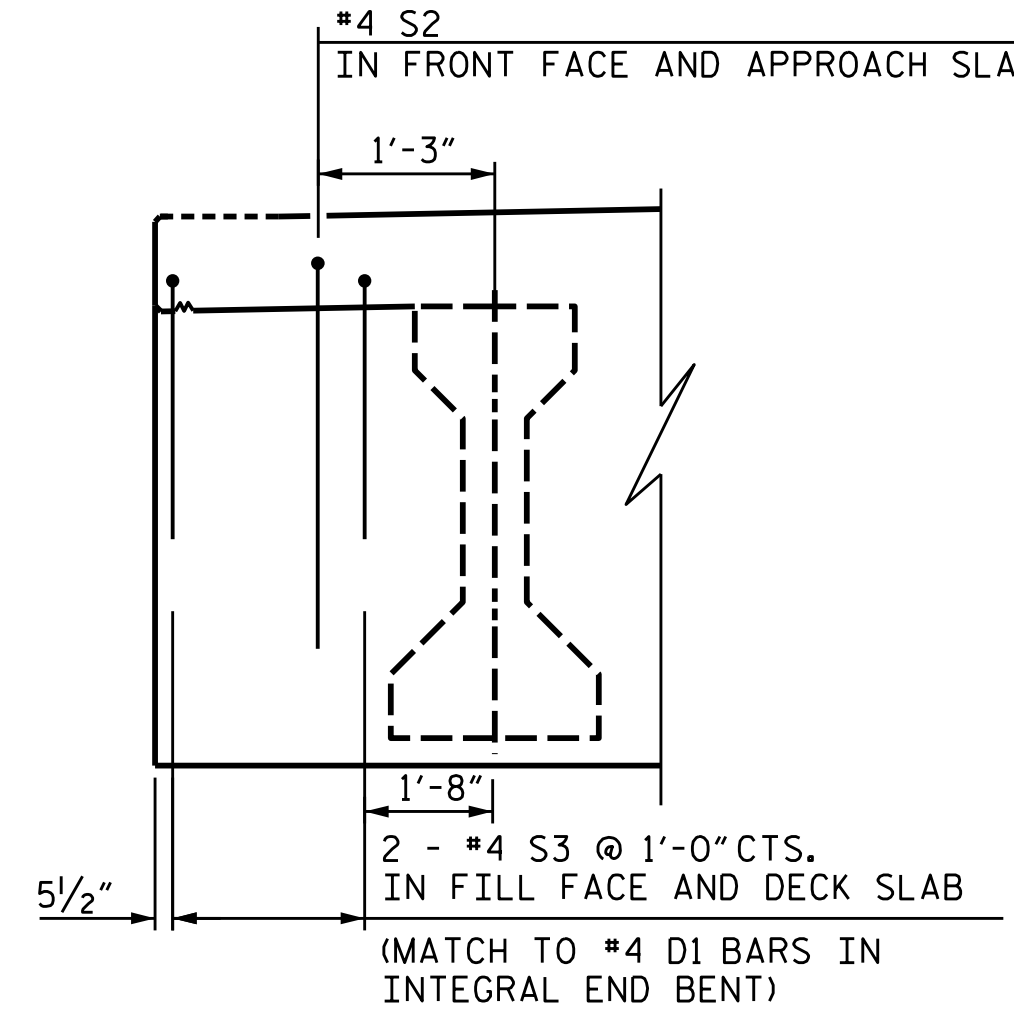


TYPICAL HALF SECTION  
INTEGRAL END BENT

TYPICAL HALF SECTION AT  
MIDSPAN

TYPICAL SECTION

● INDICATES CONTINUOUS REINFORCING  
○ INDICATES ADDITIONAL REINFORCING OVER END BENT



DETAIL B  
(TYP. EA. SIDE  
@ END BENTS)

NOTES

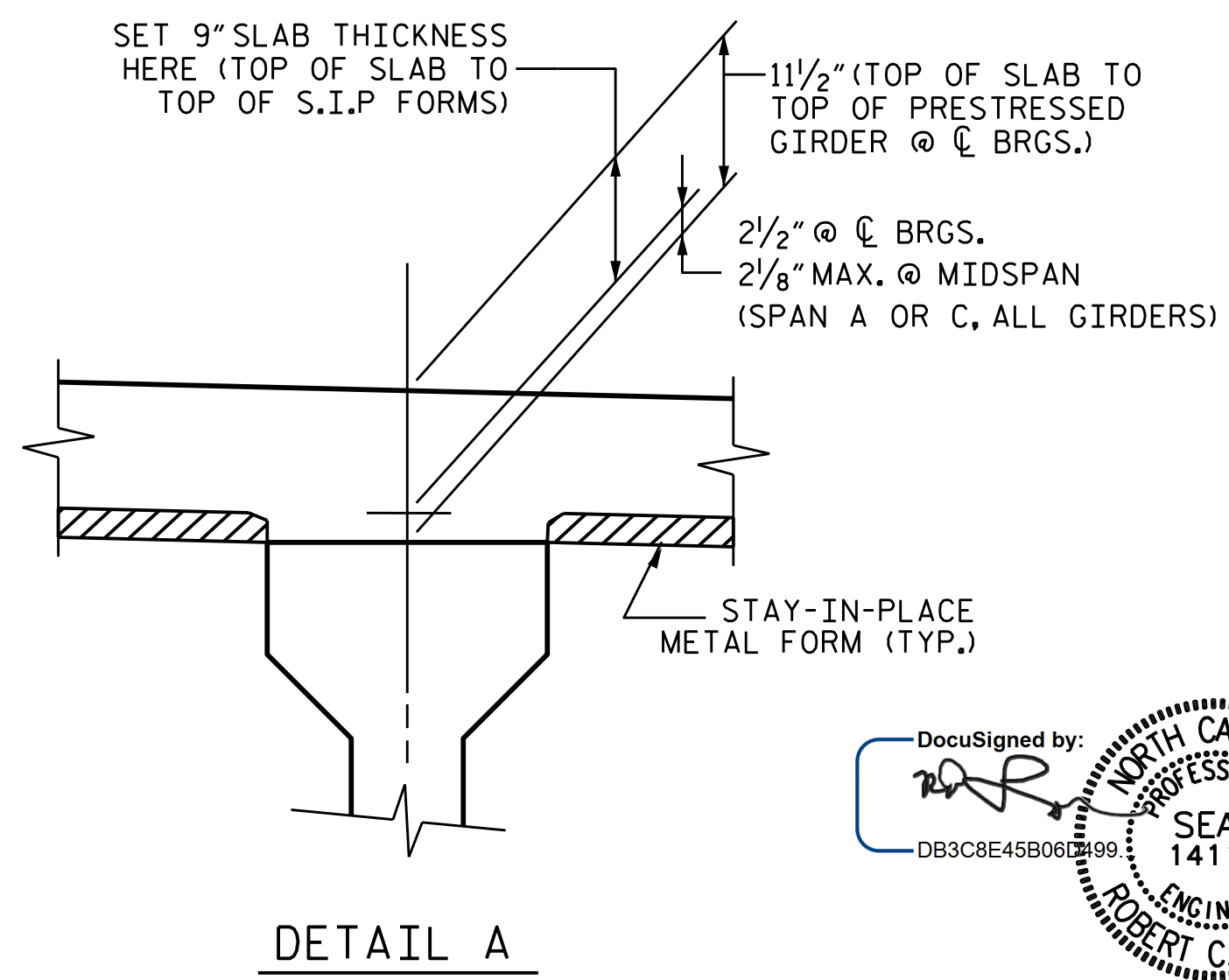
PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" 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 SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE CONTINUOUS UNIT.

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

SEE CONC. BARRIER RAIL DRAWINGS FOR ADDITIONAL REINFORCING STEEL EMBEDDED IN DECK.



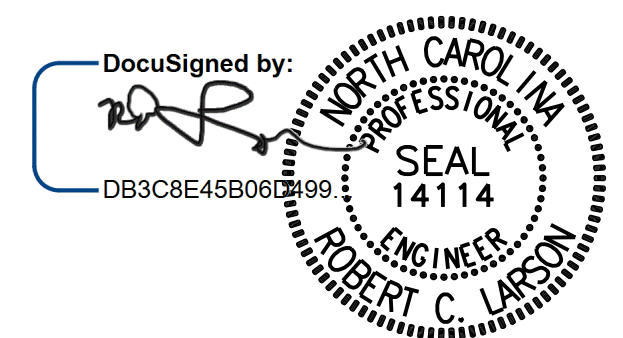
DETAIL A

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



DESIGN ENGINEER OF RECORD	DATE: 7/1/2021
DRAWN BY: R.J. FLORY	DATE: 03/19/19
CHECKED BY: R.C. LARSON	DATE: 03/20/19

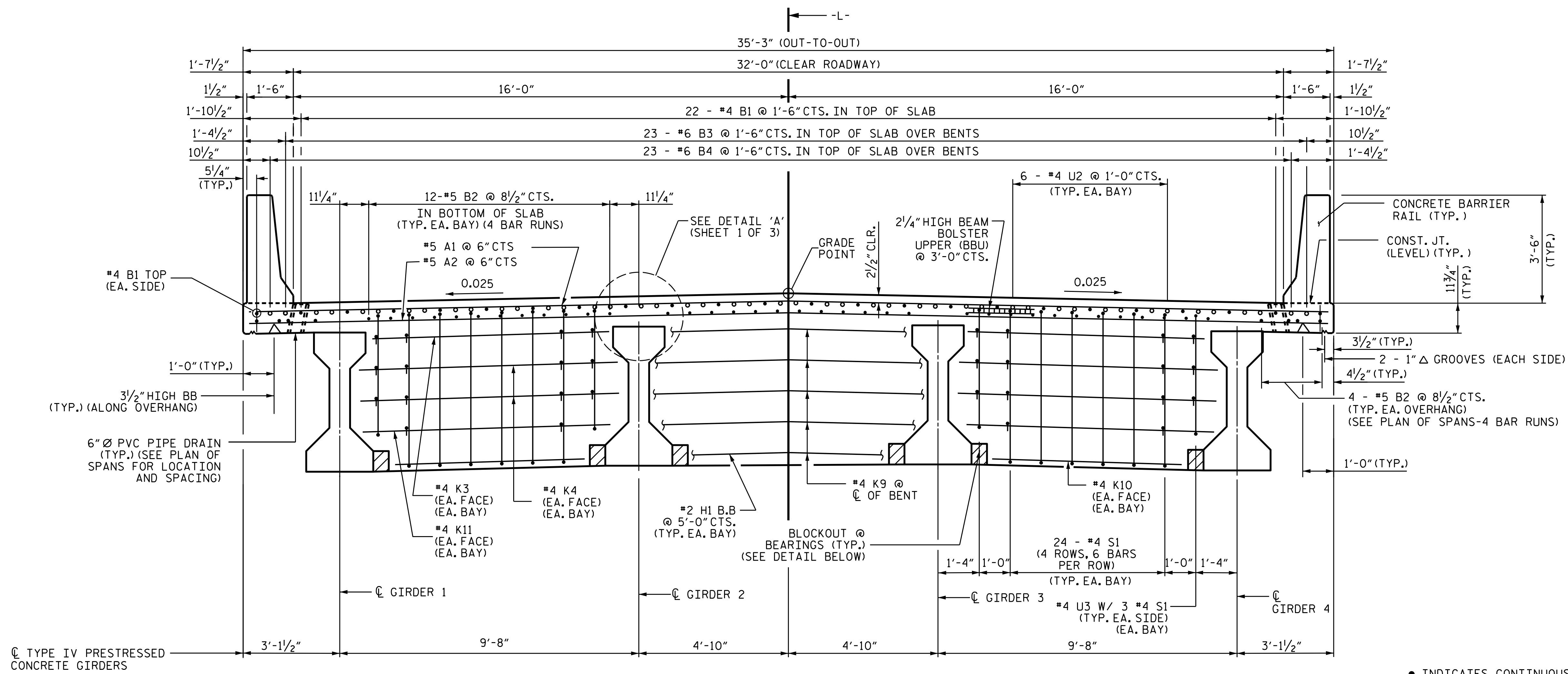
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	

DOCUMENT NOT CONSIDERED FINAL  
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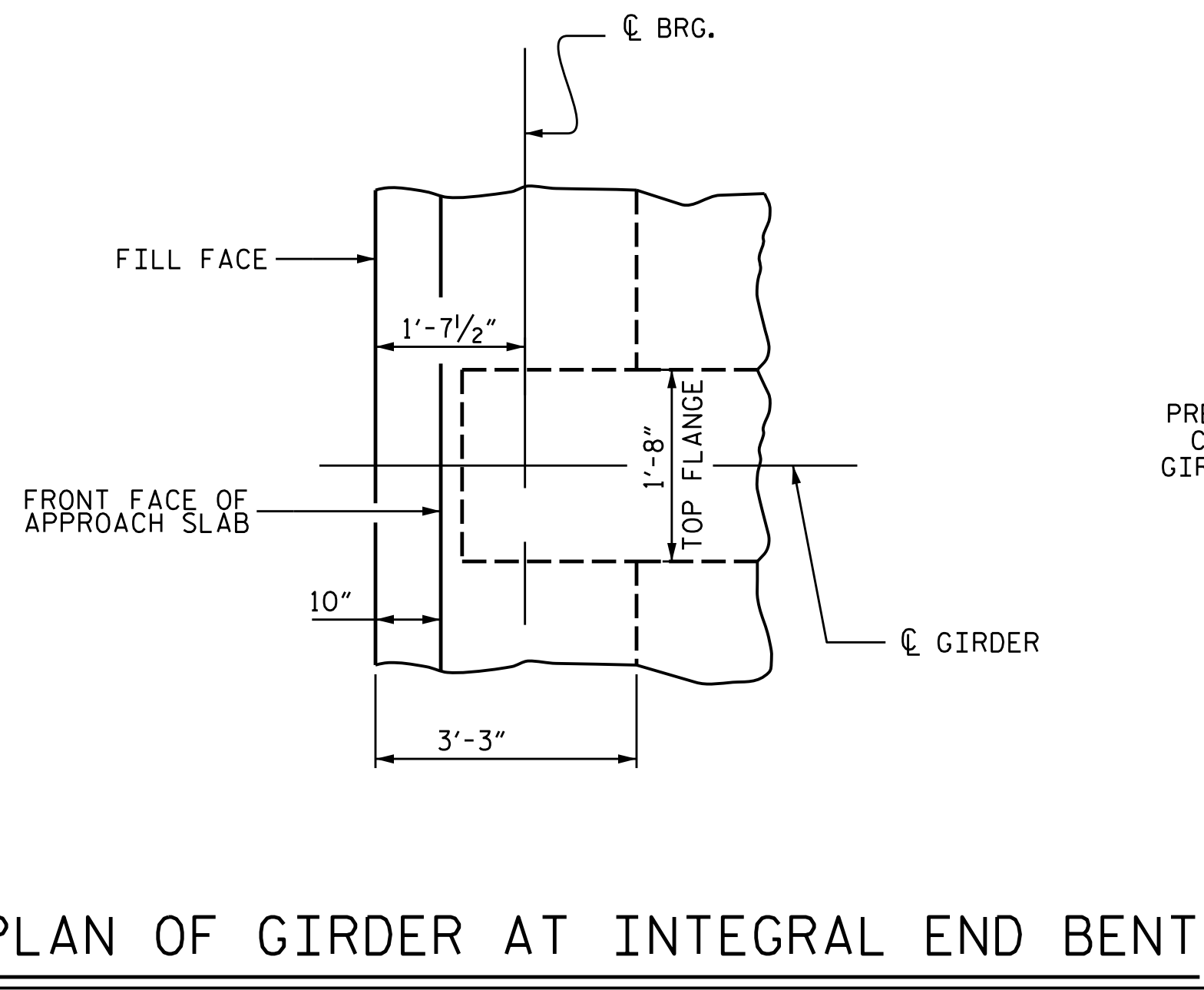
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KCI JOB NO: 251801945.13

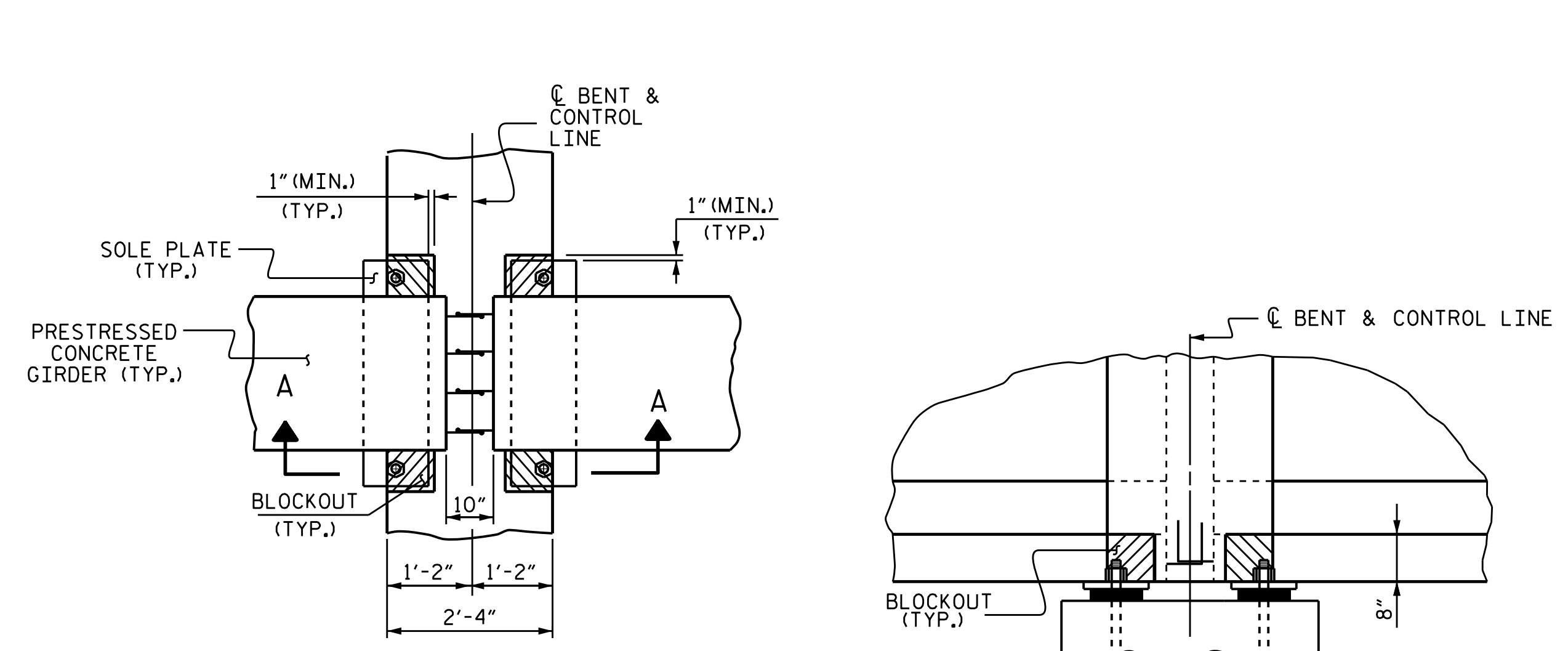


● INDICATES CONTINUOUS REINFORCING  
○ INDICATES ADDITIONAL REINFORCING OVER BENT

**TYPICAL SECTION AT CONTINUOUS BENT DIAPHRAGM**  
(BENTS 1 & 2)



**PLAN OF GIRDER AT INTEGRAL END BENT**



**PLAN VIEW**

**SECTION A-A**

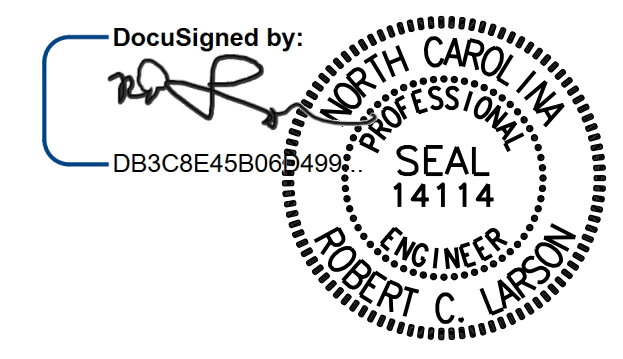
**BENT DIAPHRAGM BLOCKOUT DETAIL**

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



KCI JOB NO: 251801945.13

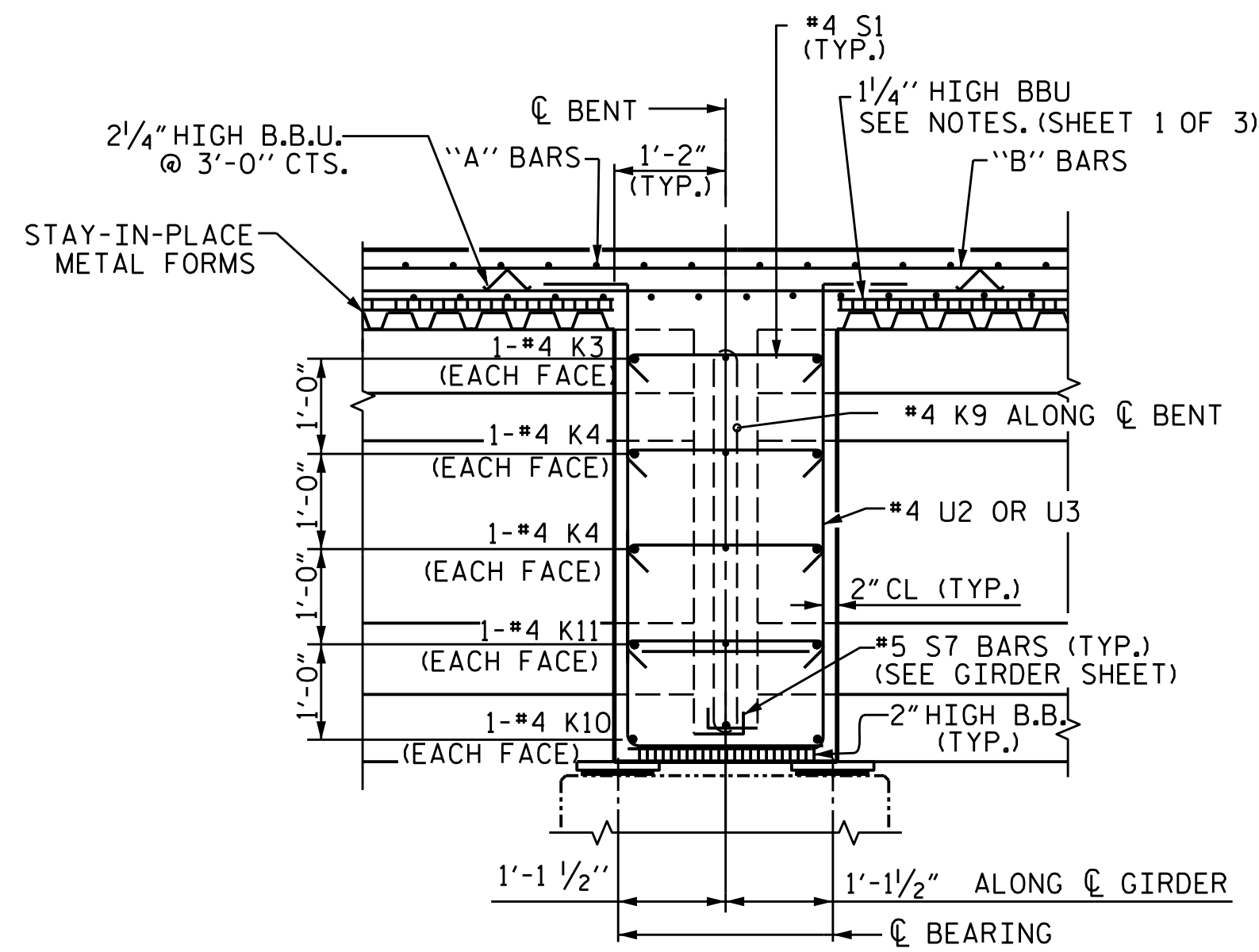
DESIGN ENGINEER OF RECORD:	DATE:
<i>[Signature]</i>	7/1/2021
DRAWN BY: A.K. ALLANKI	DATE: 03/18/19
CHECKED BY: R.C. LARSON	DATE: 03/20/19

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

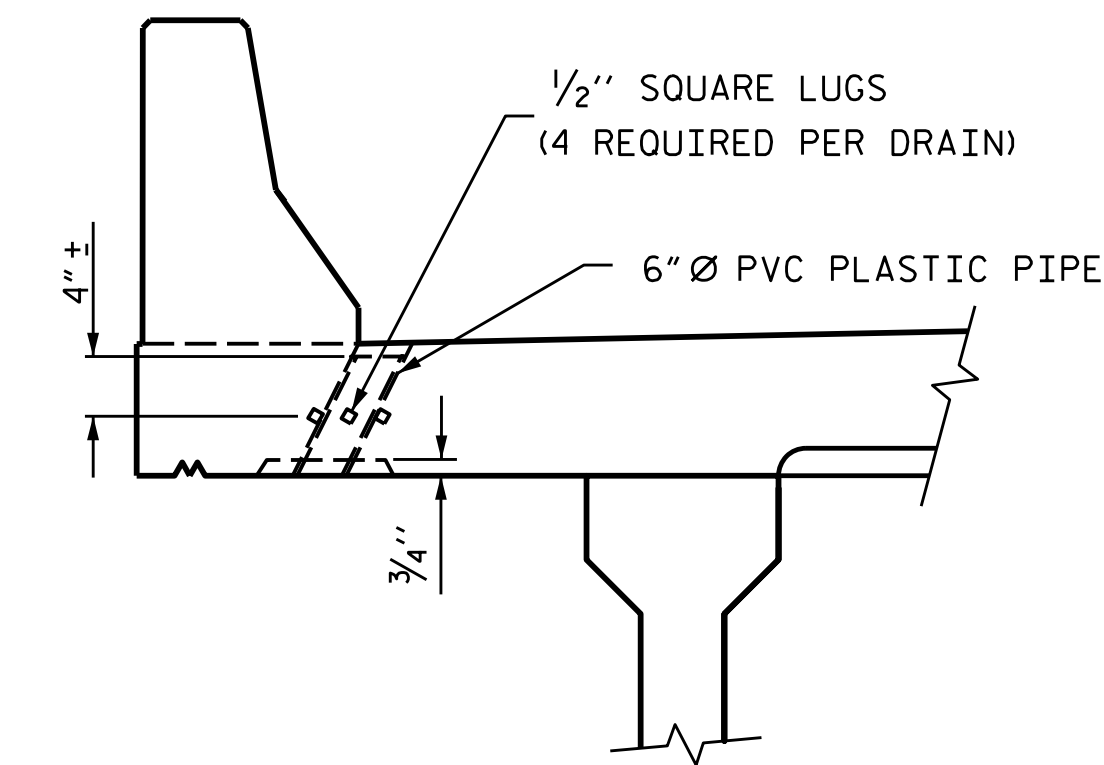
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: (919) 785-5241

REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
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2		4	

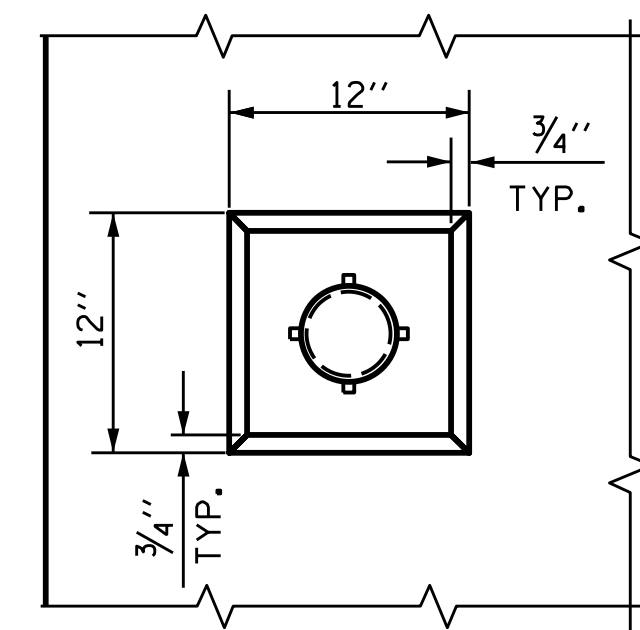
TOTAL SHEETS: 29



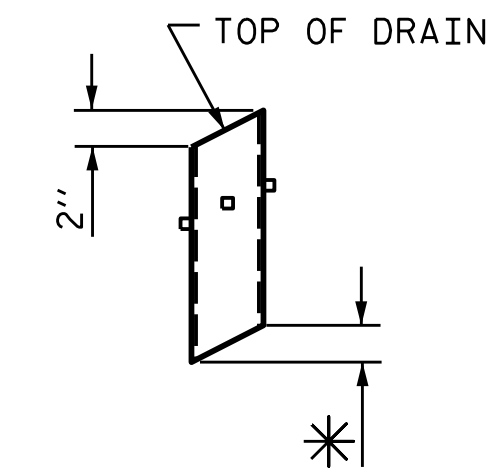
**SECTION THRU BENT DIAPHRAGM**



**ELEVATION**



**PLAN OF RECESS**

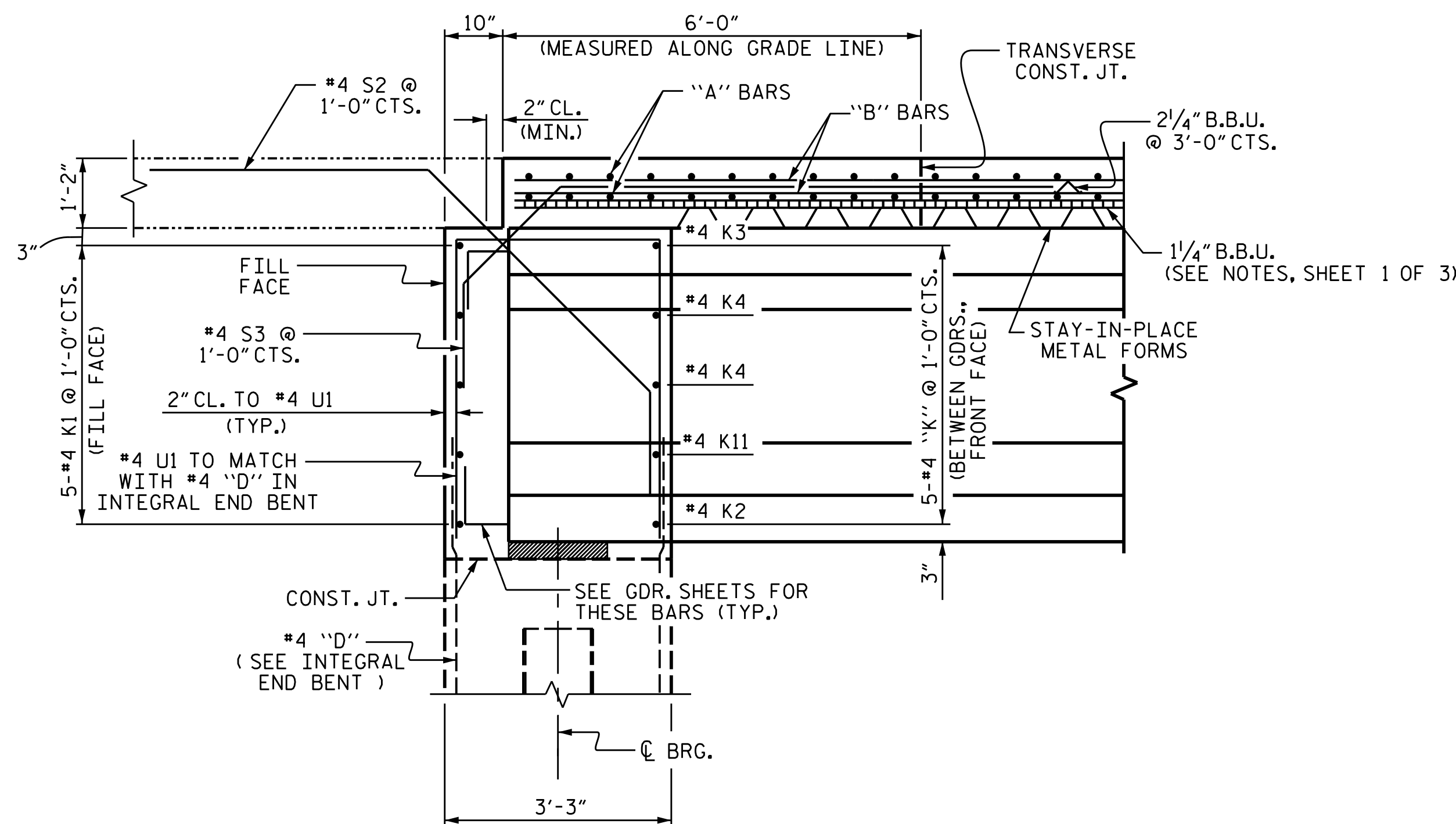


\* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (24 DRAINS REQUIRED)

**PIPE DETAIL**

TOP OF FLOOR DRAINS TO BE SET  $\frac{3}{8}$ " BELOW SURFACE OF SLAB.  
 4 -  $\frac{1}{2}$ " SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.  
 THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

**DRAIN DETAILS**



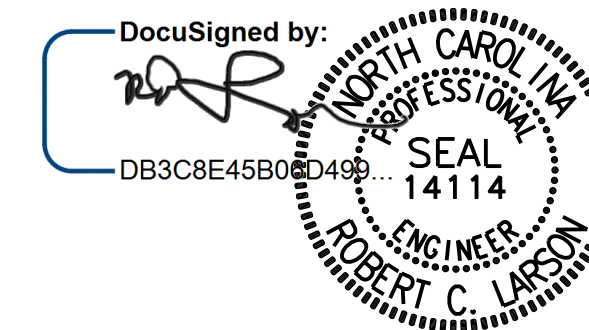
**SECTION THRU INTEGRAL END BENT**

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



7/1/2021

DESIGN ENGINEER OF RECORD: A. K. ALLANK DATE: 7/1/2021  
 DRAWN BY: A. K. ALLANK DATE: 06/17/19  
 CHECKED BY: R. C. LARSON DATE: 06/24/19

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

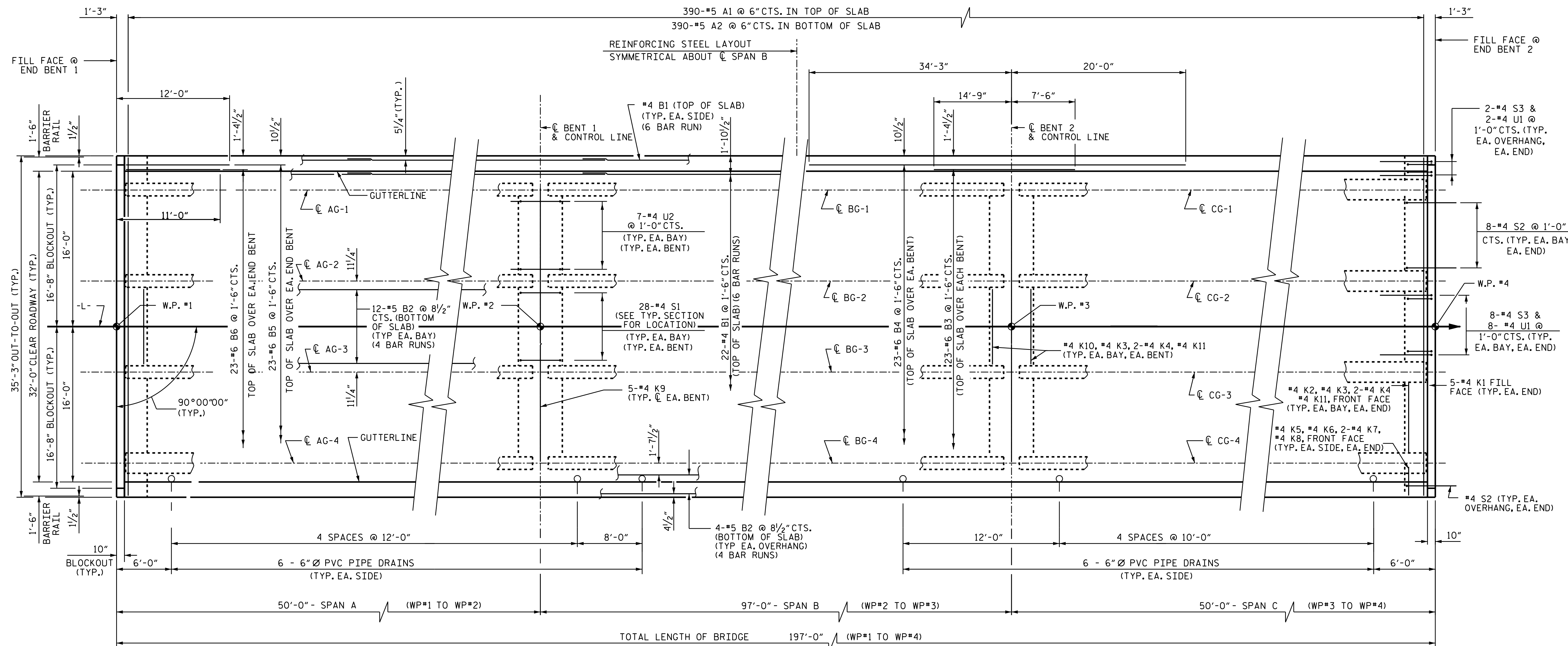
ENGINEERS, PLANNERS & SCIENTISTS IN CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: (919) 785-9244

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

TOTAL SHEETS: 29

KCI JOB NO: 251801945.13





PLAN - SPANS A-C

SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET FOR REINFORCING STEEL SPLICE LENGTHS.

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV GIRDERS" SHEET

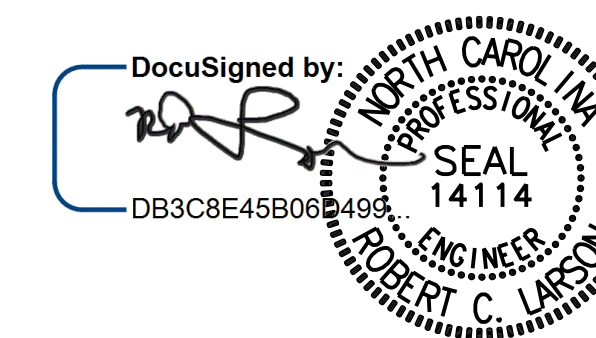
FOR INTERMEDIATE STEEL DIAPHRAGM LOCATIONS SEE "SUPERSTRUCTURE GIRDER LAYOUT"

FOR TRANSVERSE CONSTRUCTION JOINT LOCATIONS, SEE DECK POURING SEQUENCE ON "SUPERSTRUCTURE BILL OF MATERIALS" SHEET

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPANS A - C



7/1/2021

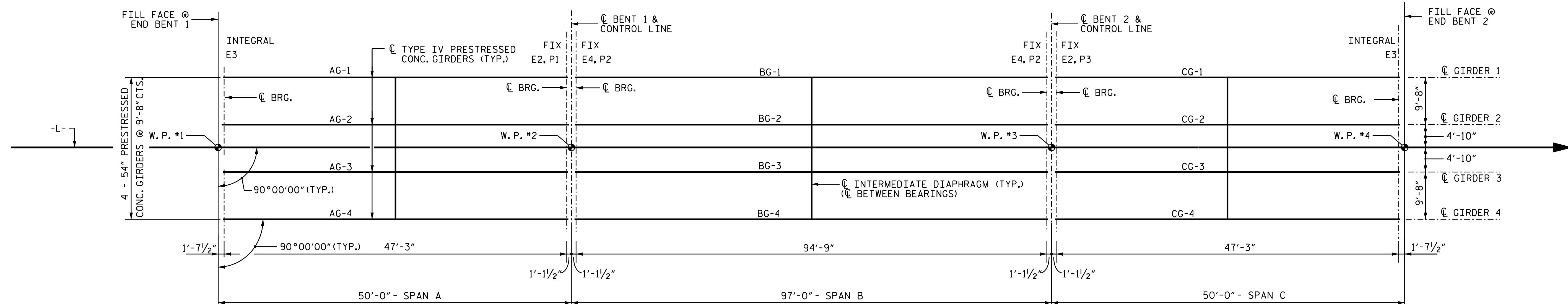
DESIGN ENGINEER OF RECORD	DATE : 7/1/2021
DRAWN BY : R. J. FLORY	DATE : 09/10/20
CHECKED BY : R. C. LARSON	DATE : 09/11/20

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2505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-9244

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS 29
2			4			

KCI JOB NO: 251801945.13



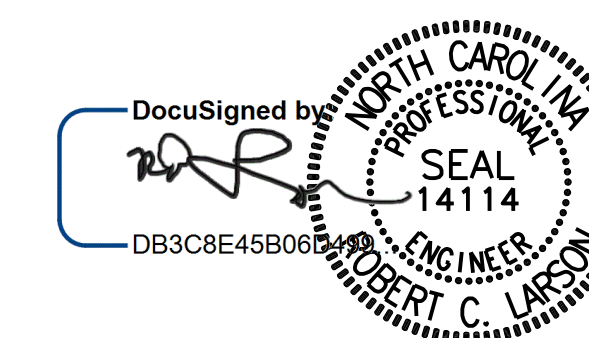
### GIRDER LAYOUT - SPANS A, B, & C

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS SEE  
"INTERMEDIATE STEEL DIAPHRAGM FOR TYPE IV GIRDERS"

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SUPERSTRUCTURE GIRDER LAYOUT



7/1/2021

DESIGN ENGINEER OF RECORD: [Signature] DATE: 7/1/2021  
 DRAWN BY: A. SAMBOY DATE: 03/11/19  
 CHECKED BY: R. C. LARSON DATE: 09/11/20

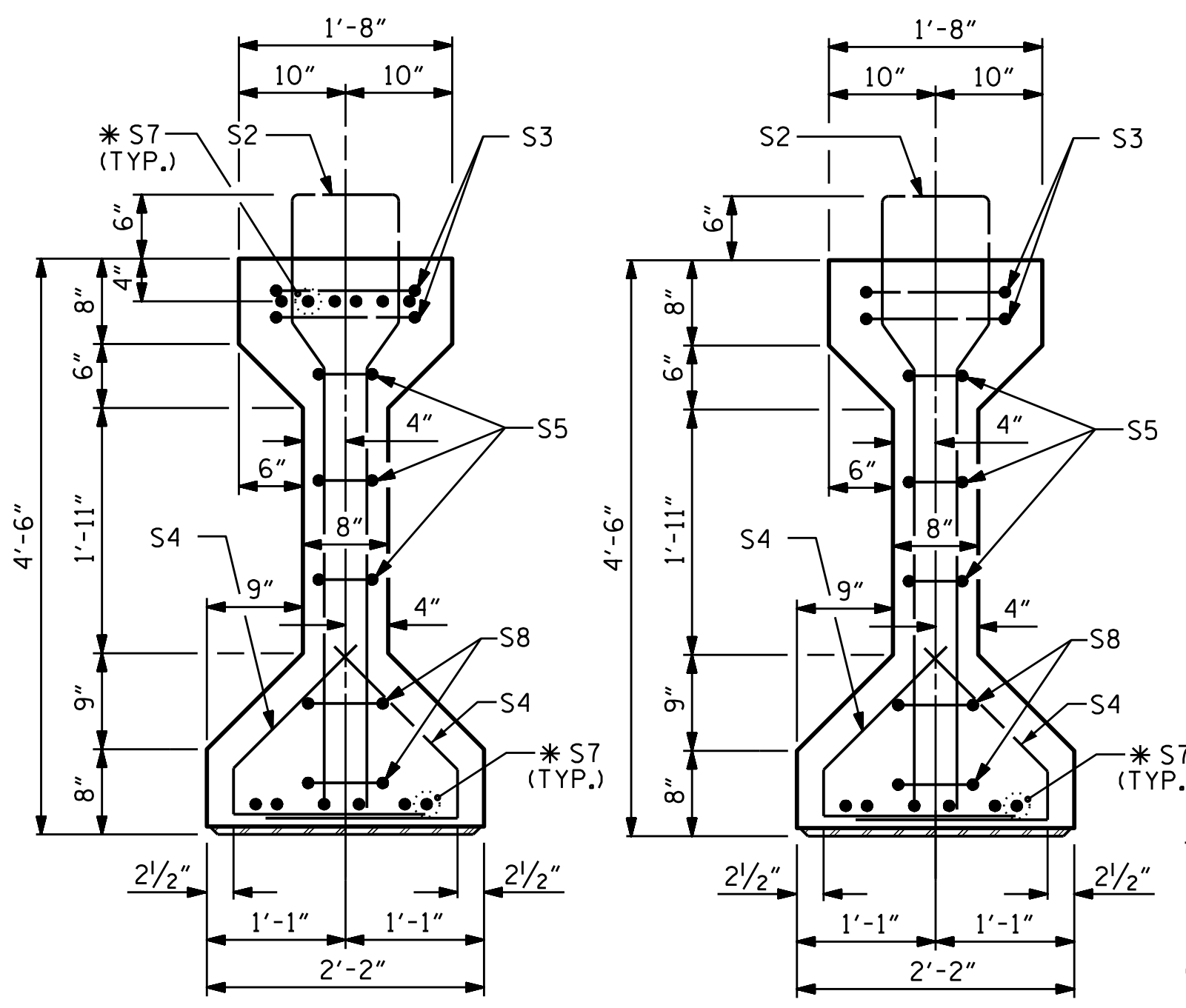
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-4270 Phone (919) 785-5241

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

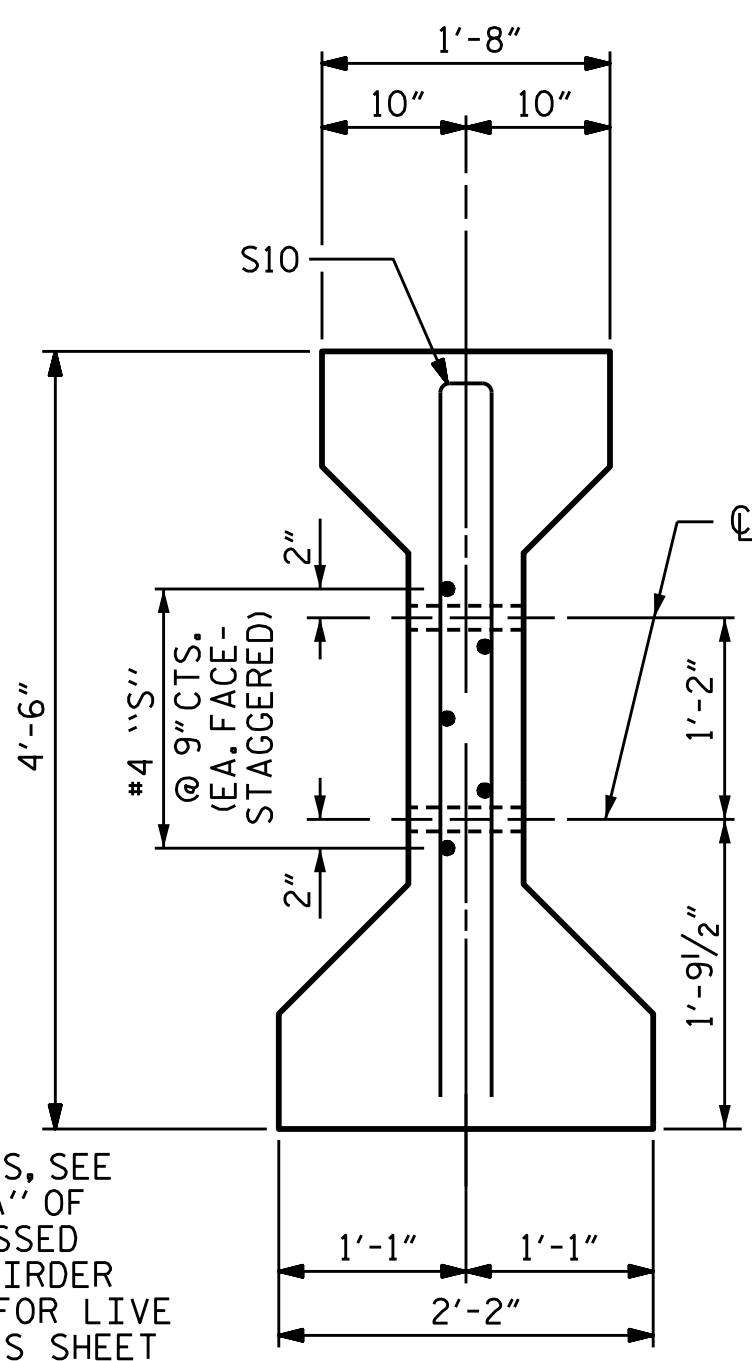
TOTAL SHEETS: 29

KCI JOB NO: 251801945.13

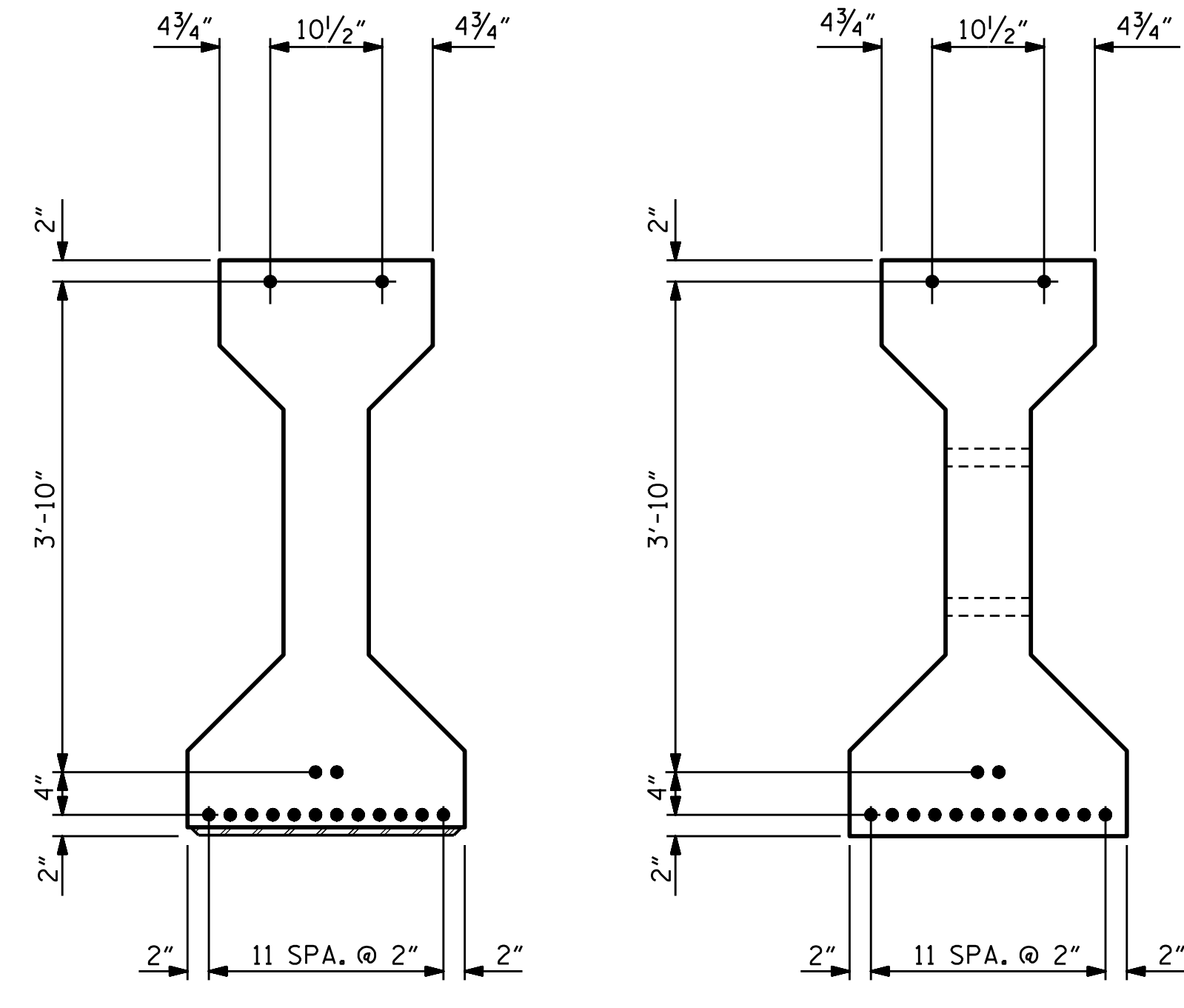


SECTION A-A

SECTION B-B



SECTION C-C  
(S1 BARS NOT SHOWN)

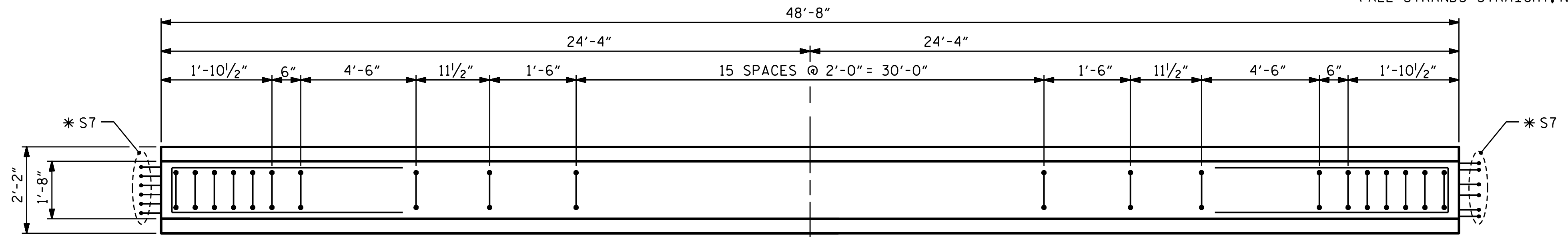


AT END OF GIRDER

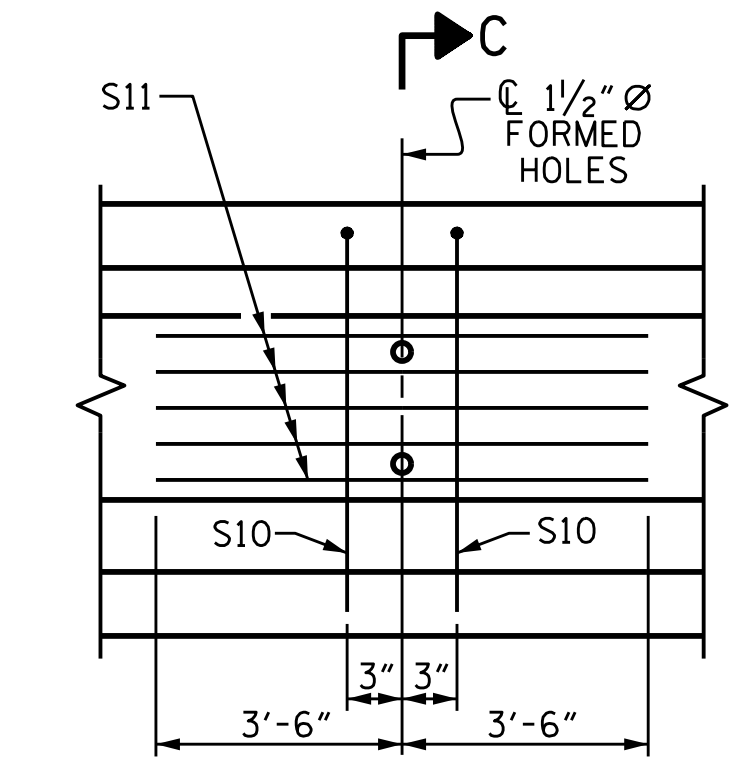
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

( ALL STRANDS STRAIGHT; NO DEBONDING REQUIRED )

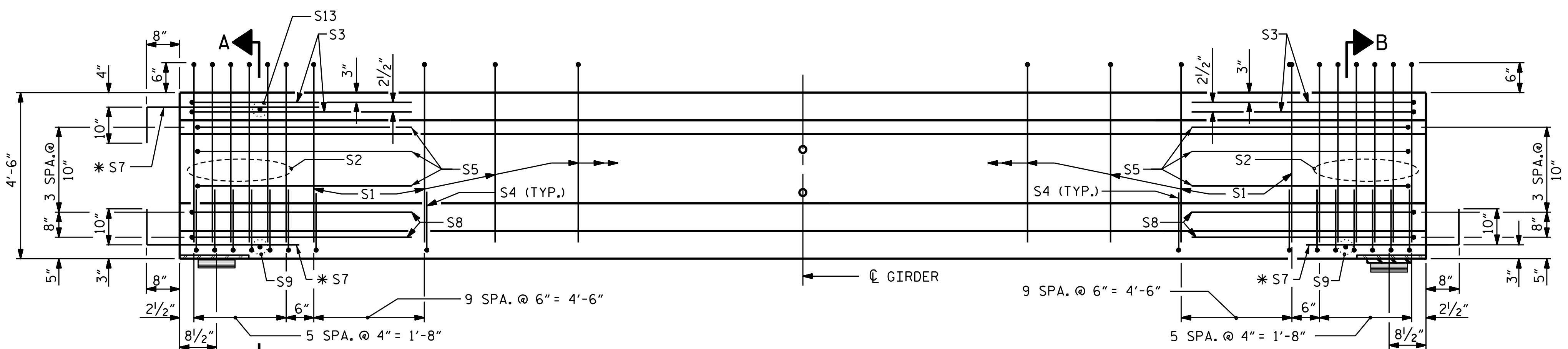


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER

( SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS )  
( SPAN A SHOWN; SPAN C SIMILAR BY REFLECTION ABOUT C GIRDER )

0.6" Ø L. R. GRADE 270 STRANDS

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

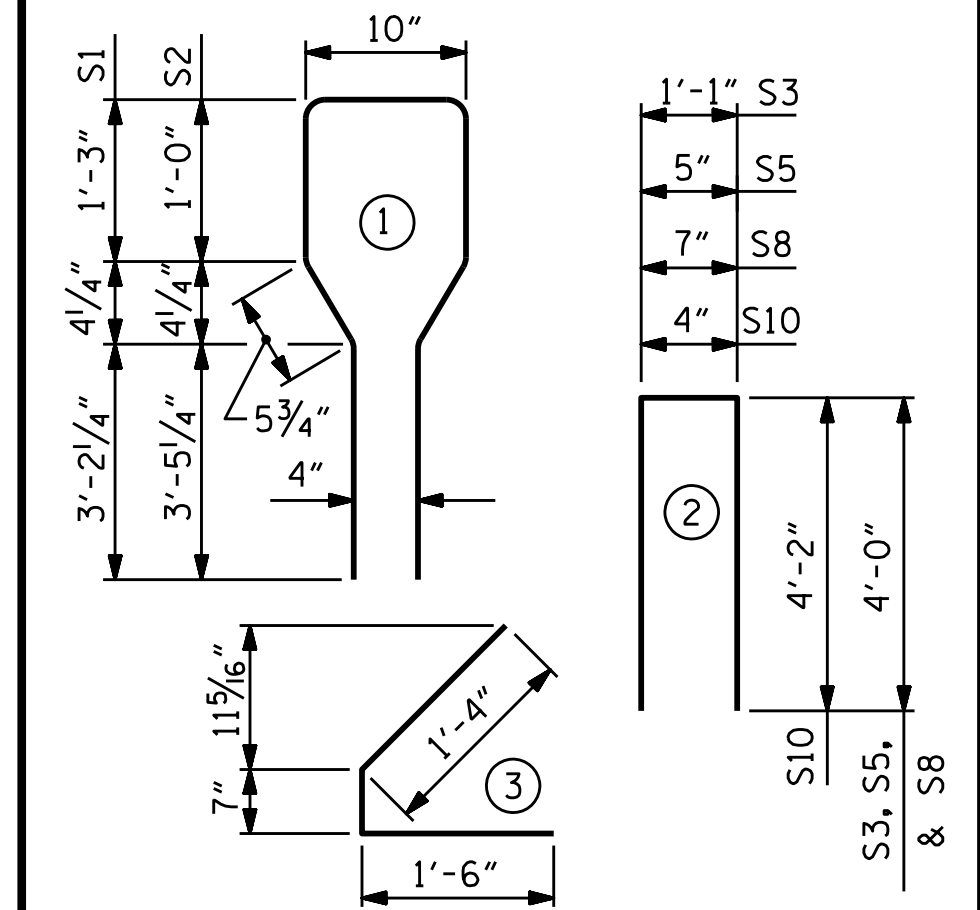
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	38	#4	1	10'-8"	271
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
*S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
802	9.9	16

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	48'-8"	389'-4"

PROJECT NO. B-5703

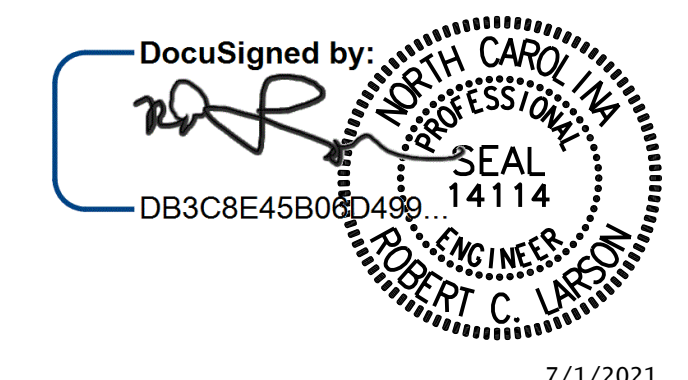
CUMBERLAND/HARNETT COUNTY

STATION: 16+92.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN A OR C



KCI JOB NO: 251801945.13

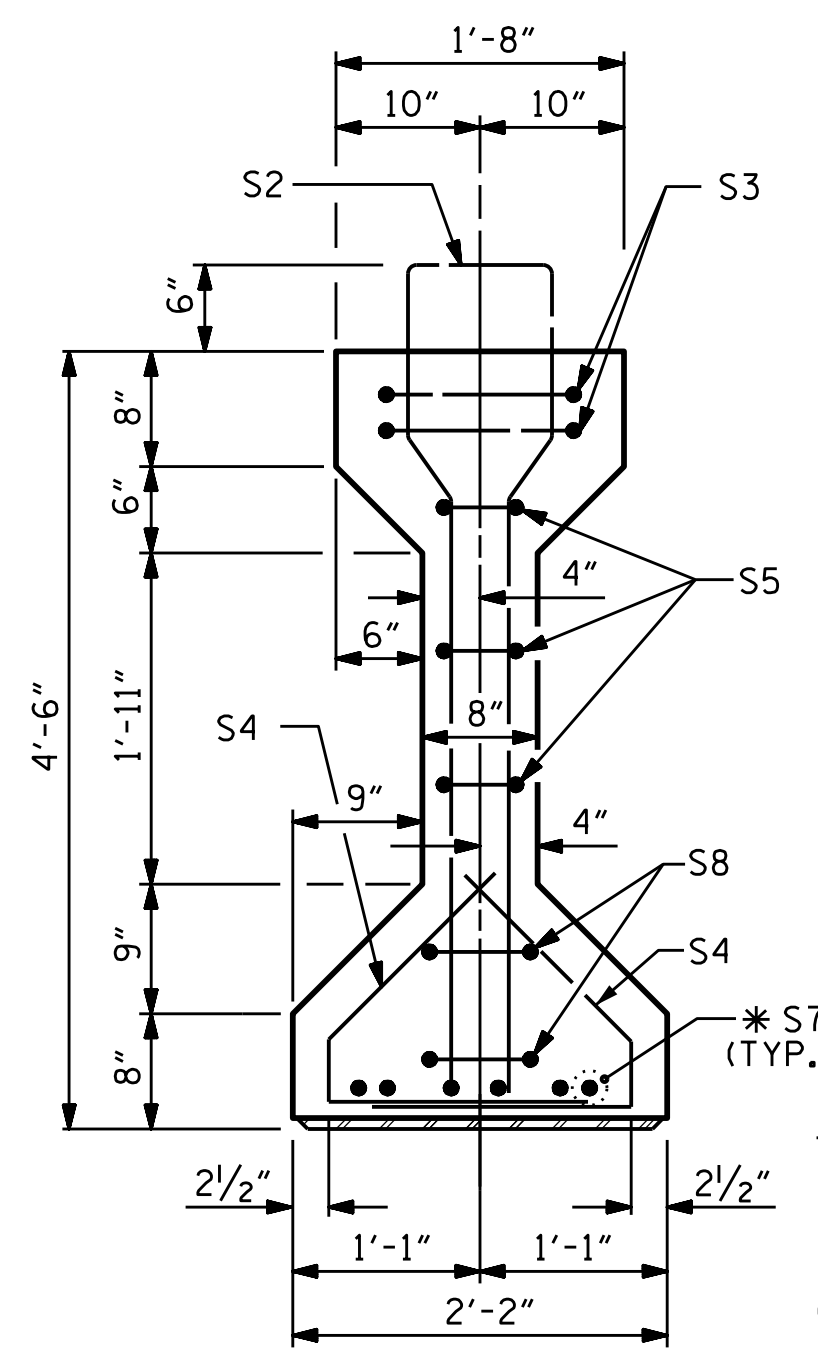
DESIGN ENGINEER OF RECORD	DATE: 7/1/2021
ASSEMBLED BY: A. K. ALLANK	DATE: 02/14/19
CHECKED BY: R. C. LARSON	DATE: 02/15/19
DRAWN BY: ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY: GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

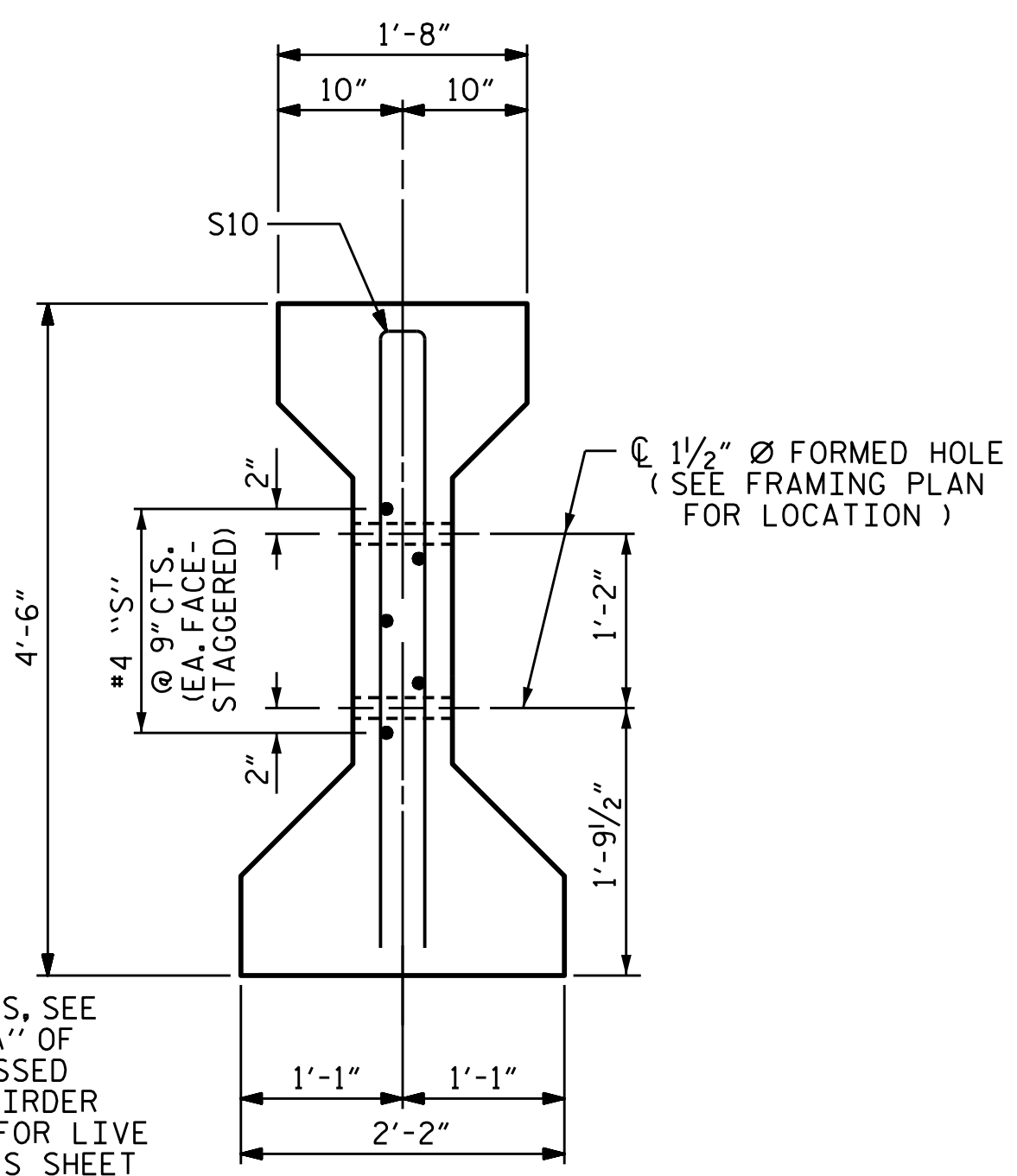
KCI Associates  
of North Carolina, P.A.  
2505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9241

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

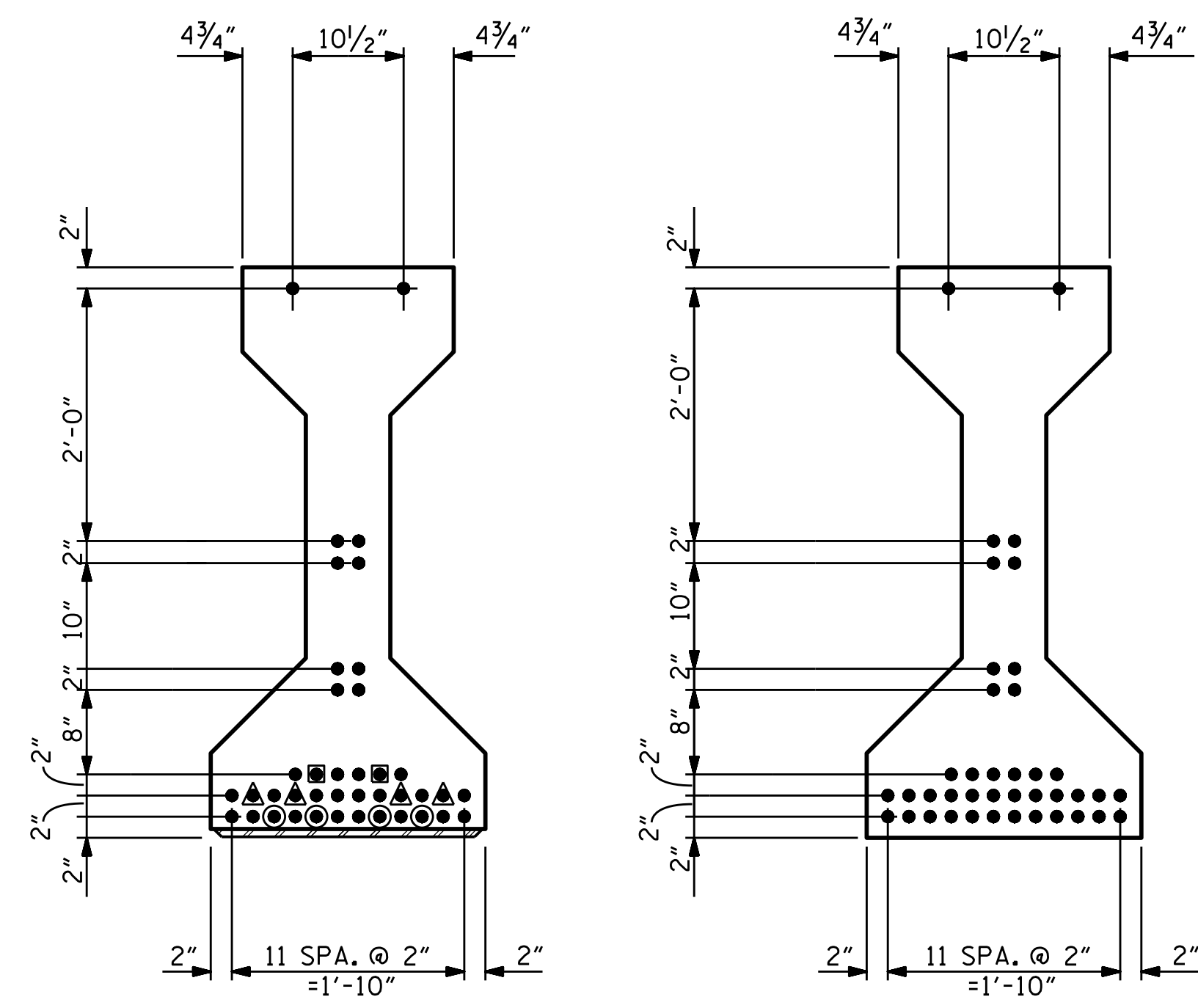
SHEET NO. S-10  
TOTAL SHEETS 29



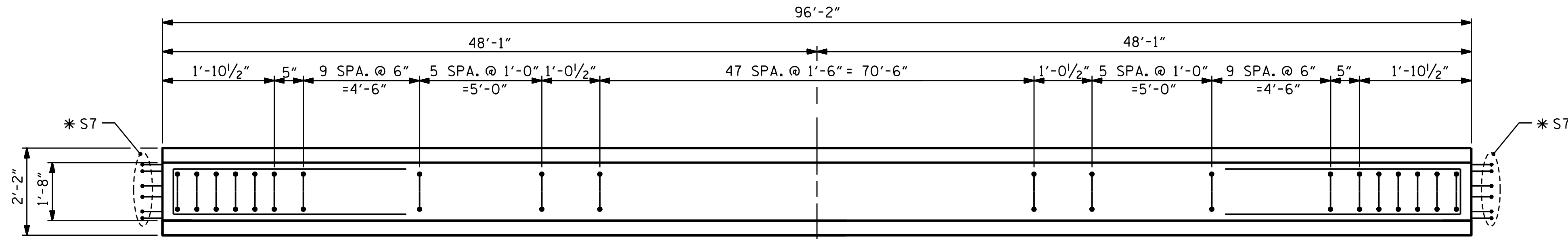
SECTION B-B



SECTION C-C  
(S1 BARS NOT SHOWN)



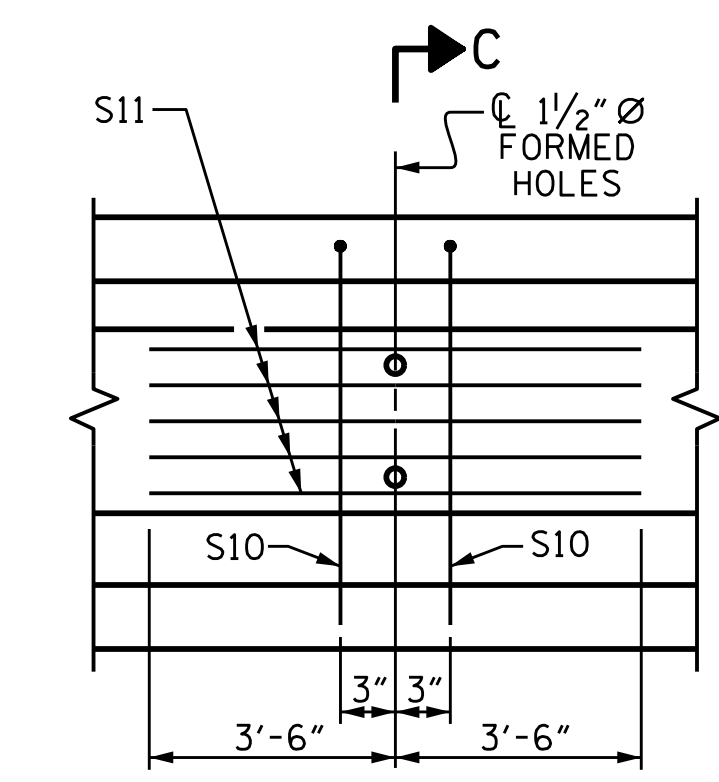
AT END OF GIRDER  
AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT



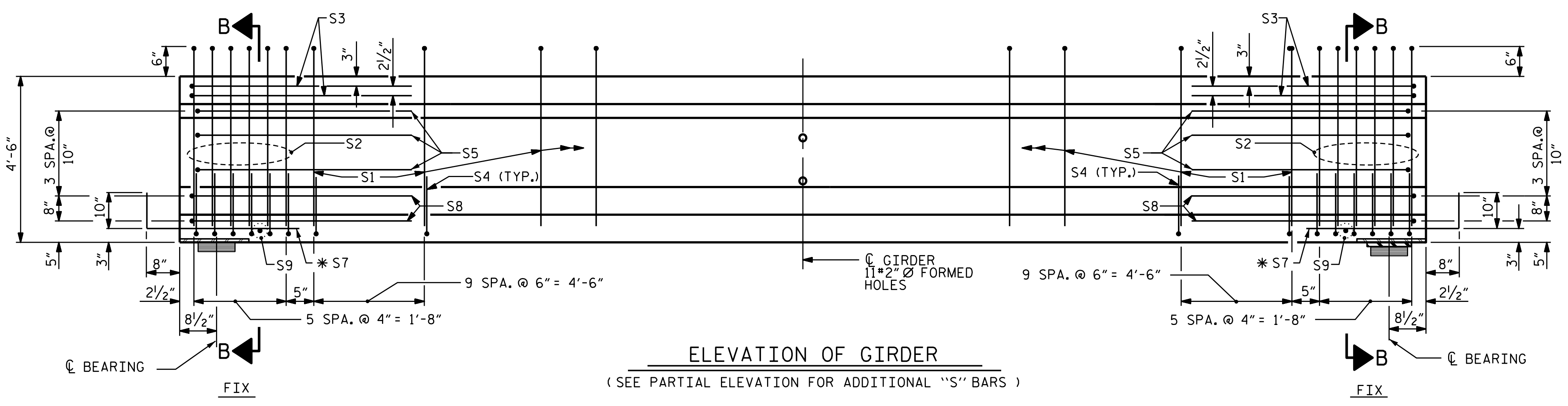
PLAN OF GIRDER

- ⊙ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF GIRDER. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ⊠ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF GIRDER. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ⊠ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 10'-0" FROM END OF GIRDER. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



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

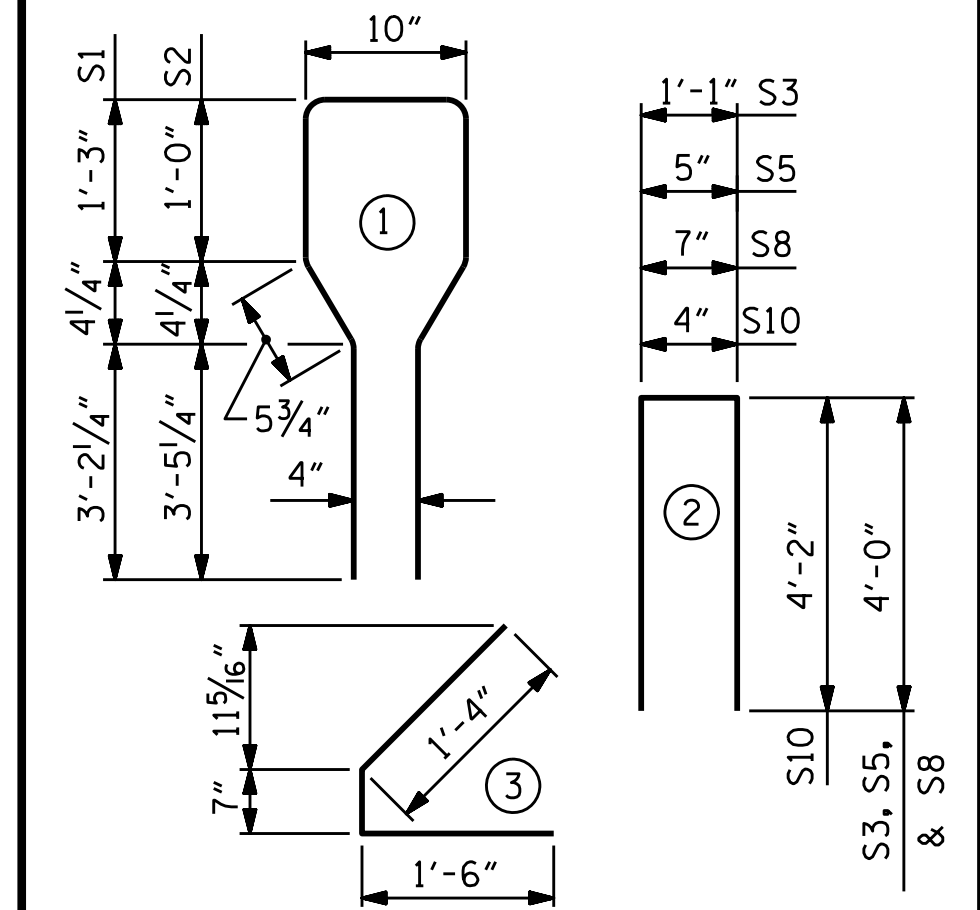
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	78	#4	1	10'-8"	556
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS	
LB.	C.Y.	No.	
1063	19.5	40	

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	96'-2"	384'-8"

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-

SHEET 2 OF 3

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

REVISIONS

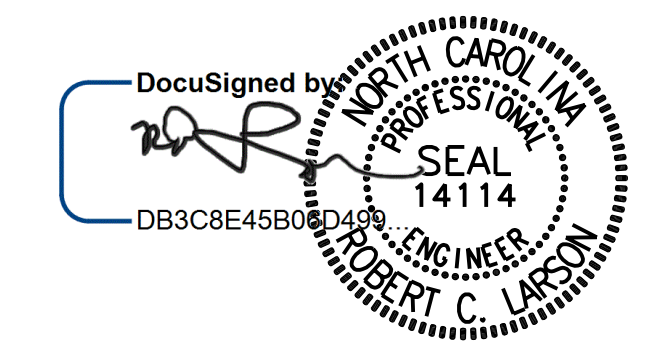
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	
S-11	TOTAL SHEETS 29

KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD	DATE: 7/3/2021
ASSEMBLED BY: A. K. ALLANKR	DATE: 03/01/19
CHECKED BY: R. C. LARSON	DATE: 03/01/19
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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2505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9241

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

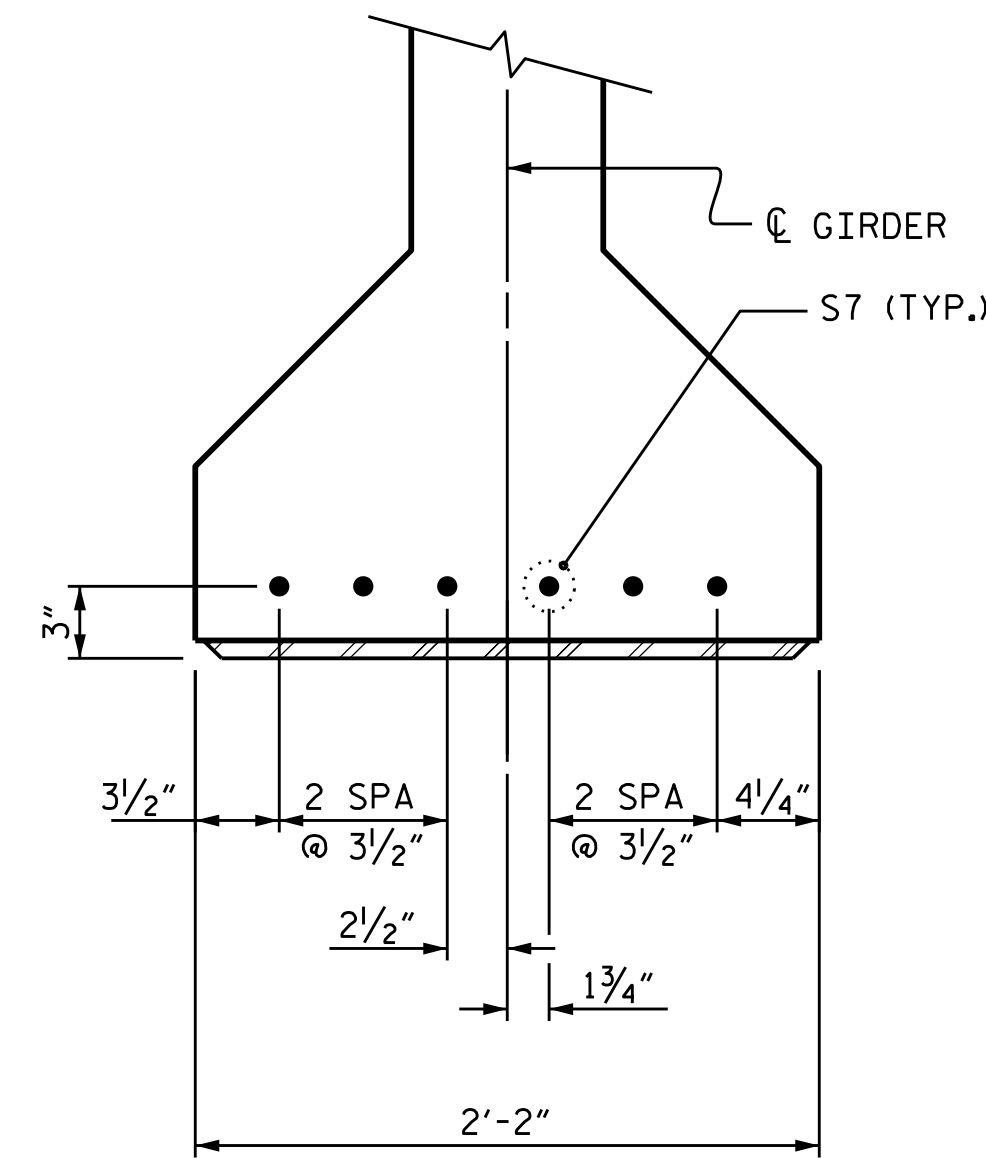
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI FOR SPANS A AND C OR 6000 PSI FOR SPAN B.

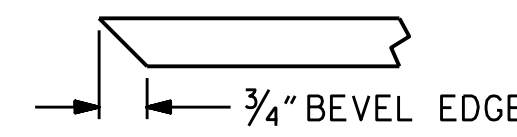
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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



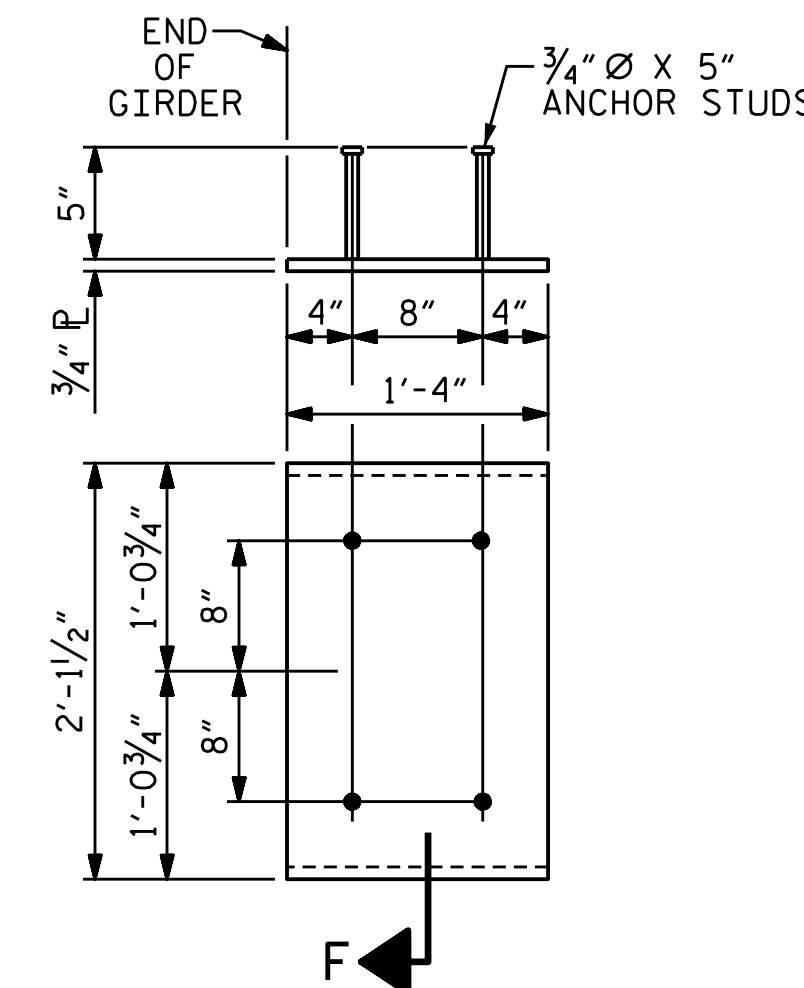
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)



SECTION "F"

(SEE NOTES)



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

(2 REQ'D PER GIRDER)

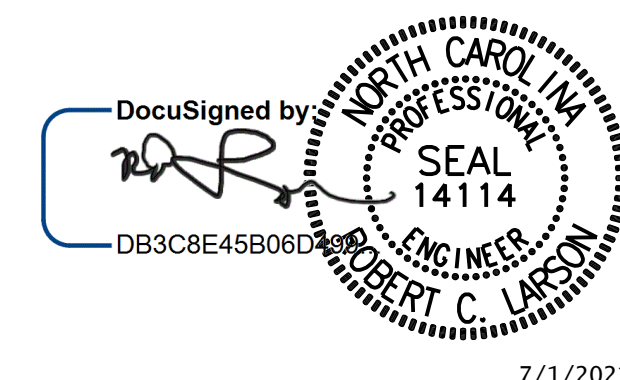
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION		SPAN A OR C (INTERIOR OR EXTERIOR)																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.000	0.007	0.013	0.019	0.024	0.029	0.034	0.037	0.039	0.041	0.041	0.041	0.039	0.037	0.034	0.029	0.024	0.019	0.013	0.007	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.002	0.003	0.005	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.011	0.011	0.010	0.009	0.008	0.007	0.005	0.003	0.002	0
FINAL CAMBER	↑	0	1/16"	1/8"	3/16"	3/16"	1/4"	5/16"	5/16"	5/16"	3/8"	3/8"	3/8"	5/16"	5/16"	5/16"	1/4"	3/16"	3/16"	1/8"	1/16"	0
0.6" Ø LOW RELAXATION		SPAN B (INTERIOR)																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.000	0.034	0.067	0.097	0.126	0.151	0.172	0.189	0.202	0.209	0.212	0.209	0.202	0.189	0.172	0.151	0.126	0.097	0.067	0.034	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.025	0.047	0.073	0.093	0.114	0.129	0.143	0.152	0.158	0.160	0.158	0.152	0.143	0.129	0.114	0.093	0.073	0.047	0.025	0
FINAL CAMBER	↑	0	1/8"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	1/4"	1/8"	0
0.6" Ø LOW RELAXATION		SPAN B (EXTERIOR)																				
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.000	0.034	0.067	0.097	0.126	0.151	0.172	0.189	0.202	0.209	0.212	0.209	0.202	0.189	0.172	0.151	0.126	0.097	0.067	0.034	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.022	0.041	0.064	0.081	0.100	0.113	0.125	0.133	0.138	0.140	0.138	0.133	0.125	0.113	0.100	0.081	0.064	0.041	0.022	0
FINAL CAMBER	↑	0	1/8"	5/16"	3/8"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	7/8"	7/8"	13/16"	3/4"	11/16"	5/8"	9/16"	3/8"	5/16"	1/8"	0

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

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-

SHEET 3 OF 3



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

KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD	DATE :	7/1/2021
ASSEMBLED BY : R. C. LARSON	DATE :	02/13/19
CHECKED BY : A. SAMBOY	DATE :	03/04/19
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

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

KCI Associates  
of North Carolina, P.A.  
2505 Falls of Hope Road, Suite 400 Raleigh, NC 27629-5270 Phone (919) 783-9241

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			29

STD. NO. PCG9 (Sht. 3)

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

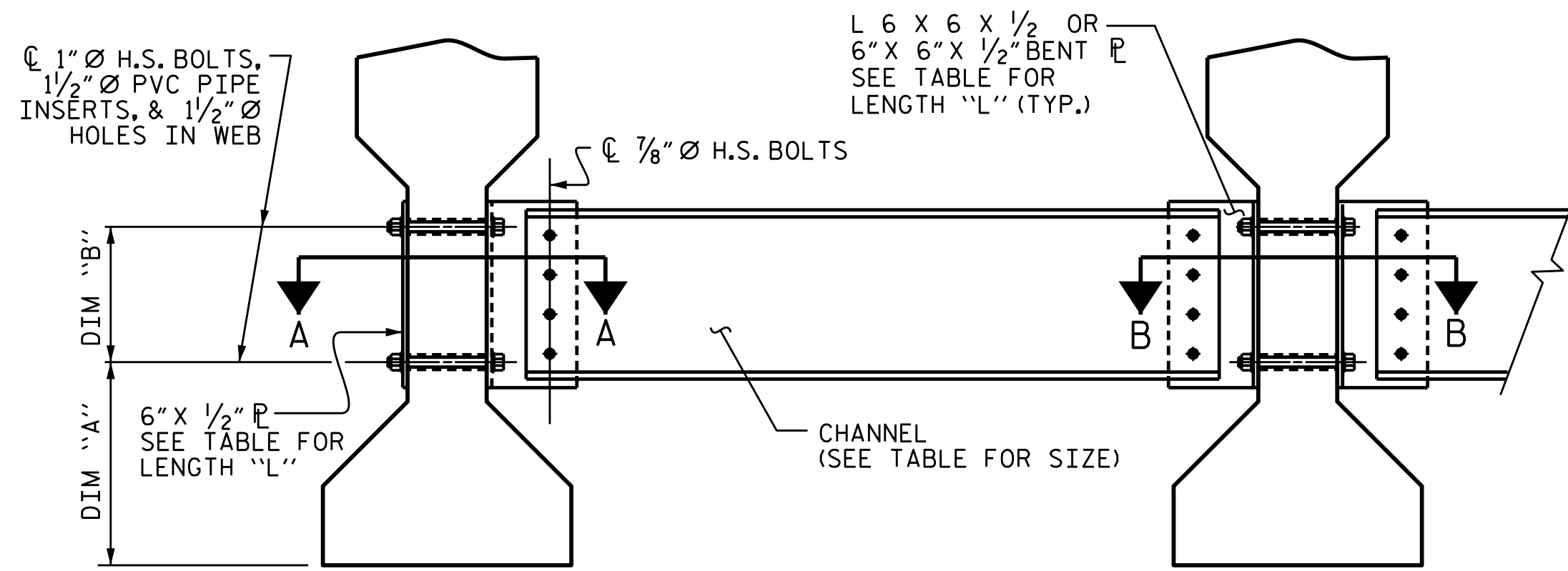
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

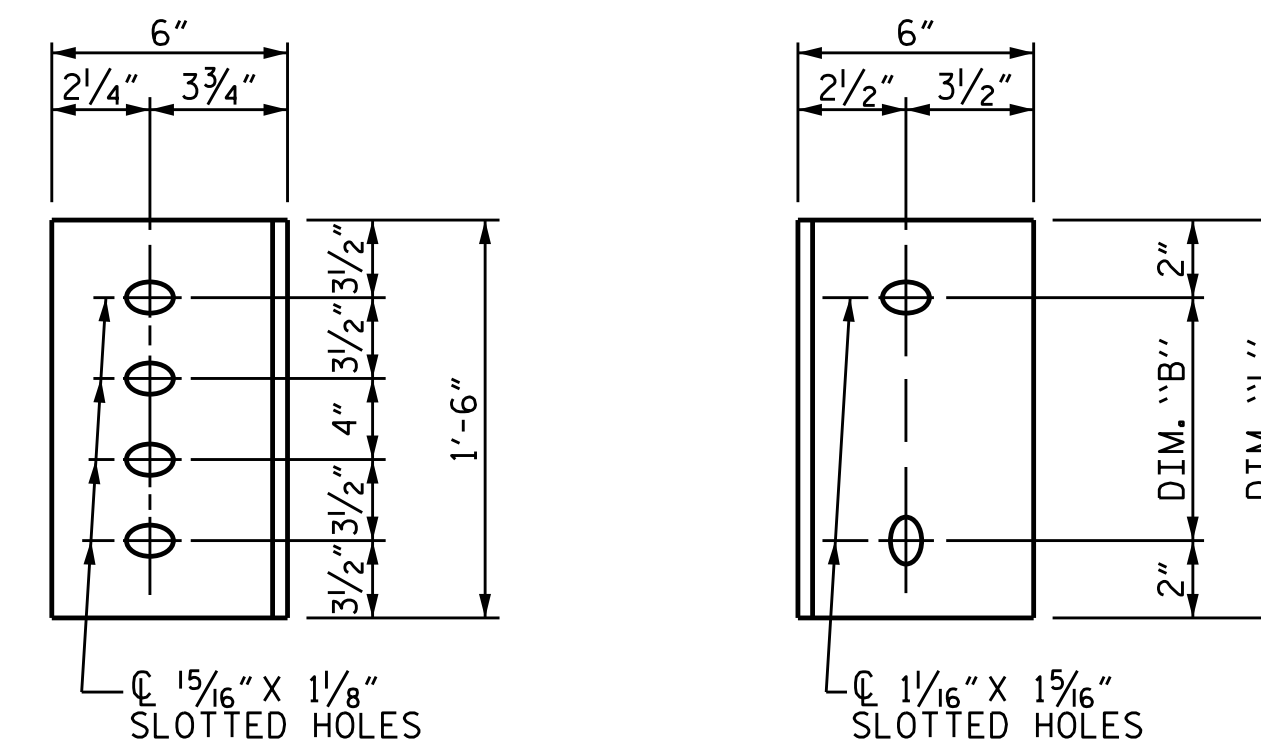
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS

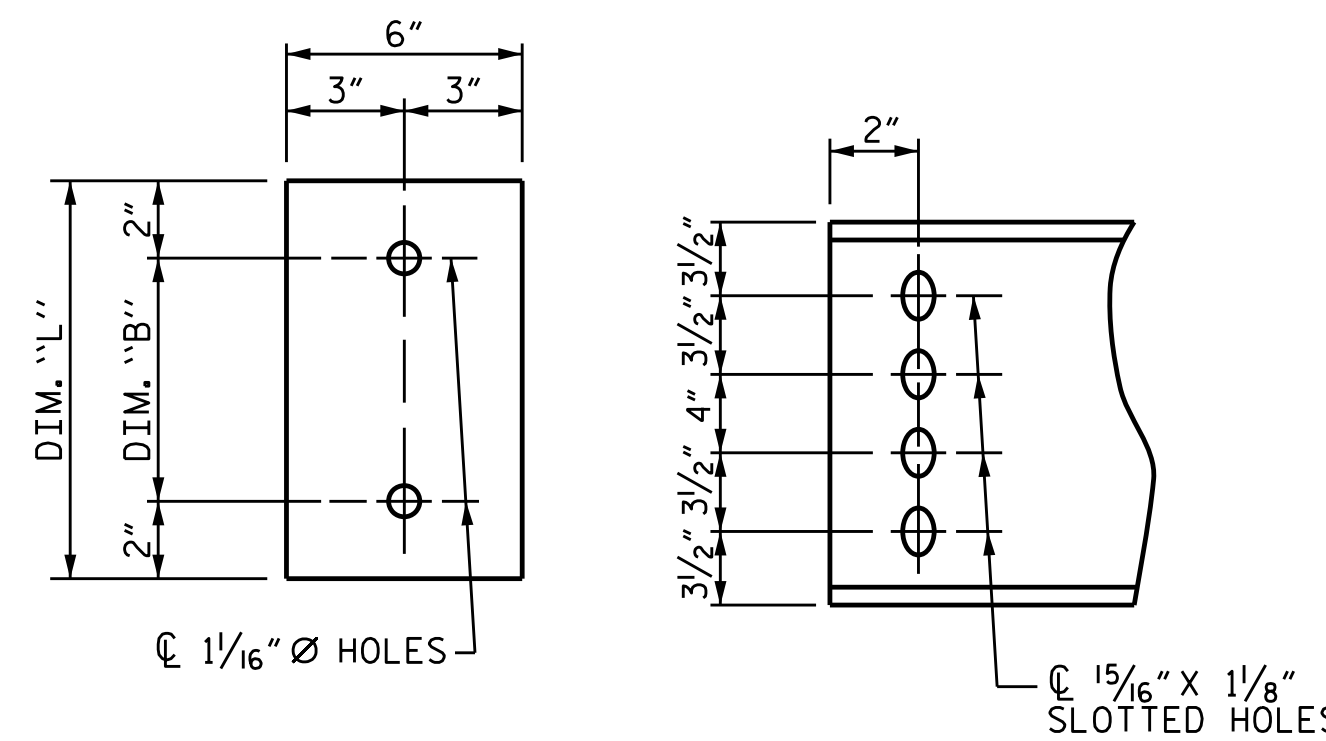
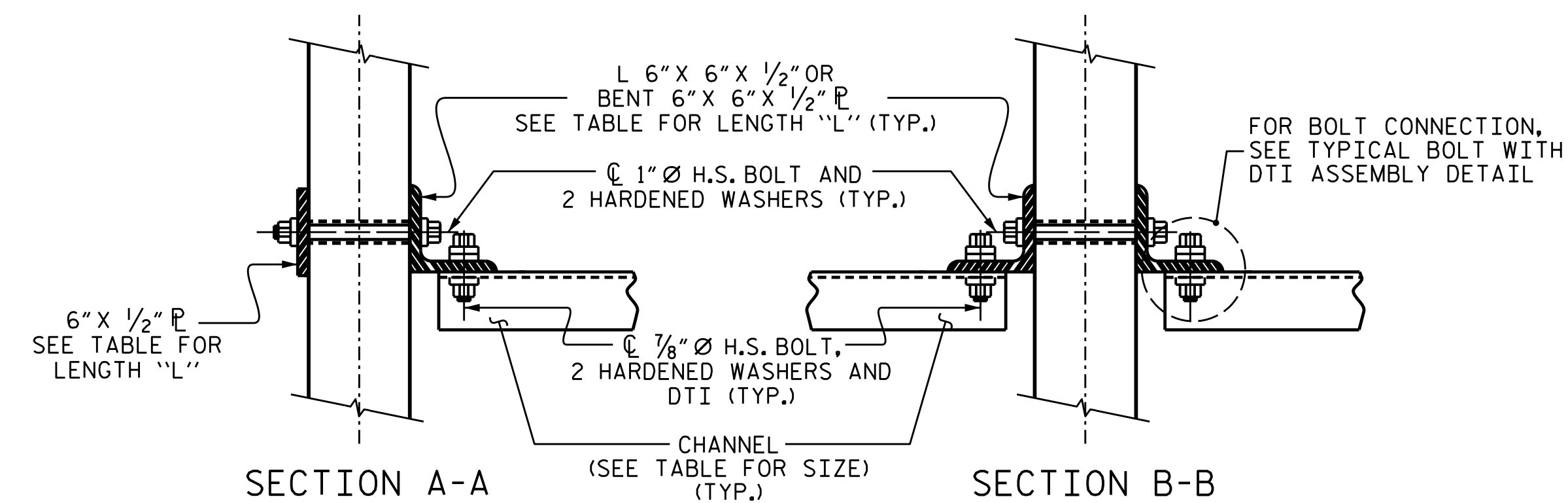
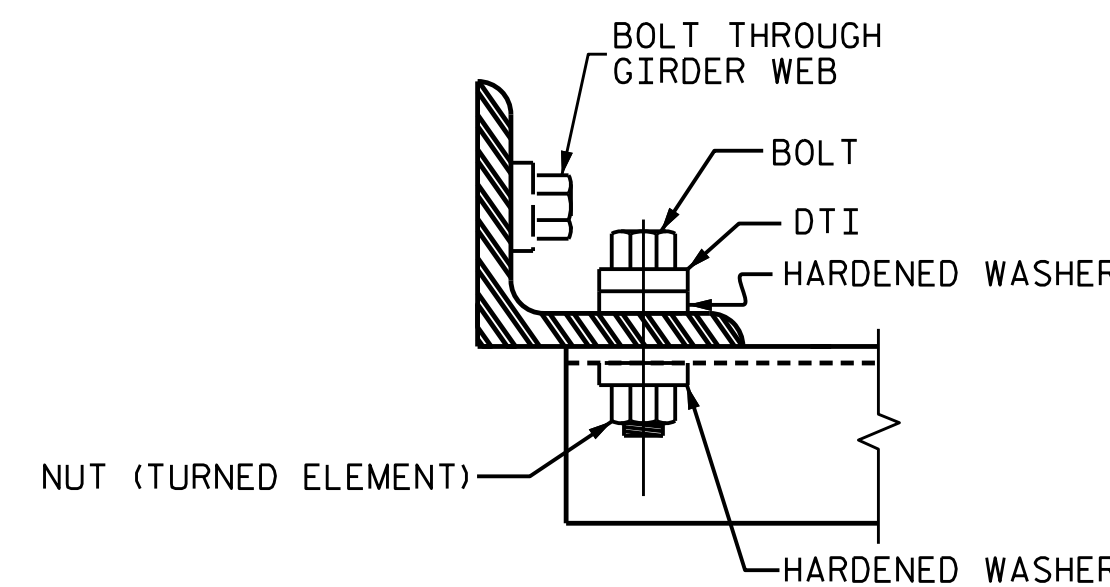


PLATE DETAILS CHANNEL END



SECTION A-A SECTION B-B

CONNECTION DETAILS



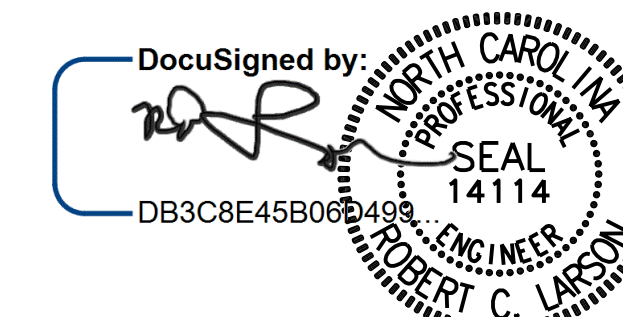
BOLT WITH DTI ASSEMBLY DETAIL

TABLE

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

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

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

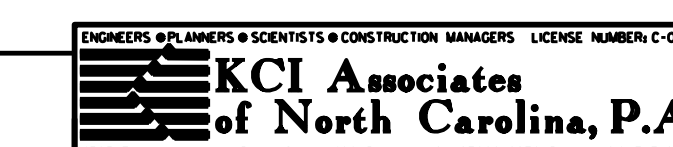


REVISIONS

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

SHEET NO. S-13  
 TOTAL SHEETS 29

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD	DATE: 7/1/2021
ASSEMBLED BY: R. C. LARSON	DATE: 02/14/19
CHECKED BY: A. K. ALLANKI	DATE: 10/27/20
DRAWN BY: TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY: VC 6/05	REV. 10/11/11 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 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.

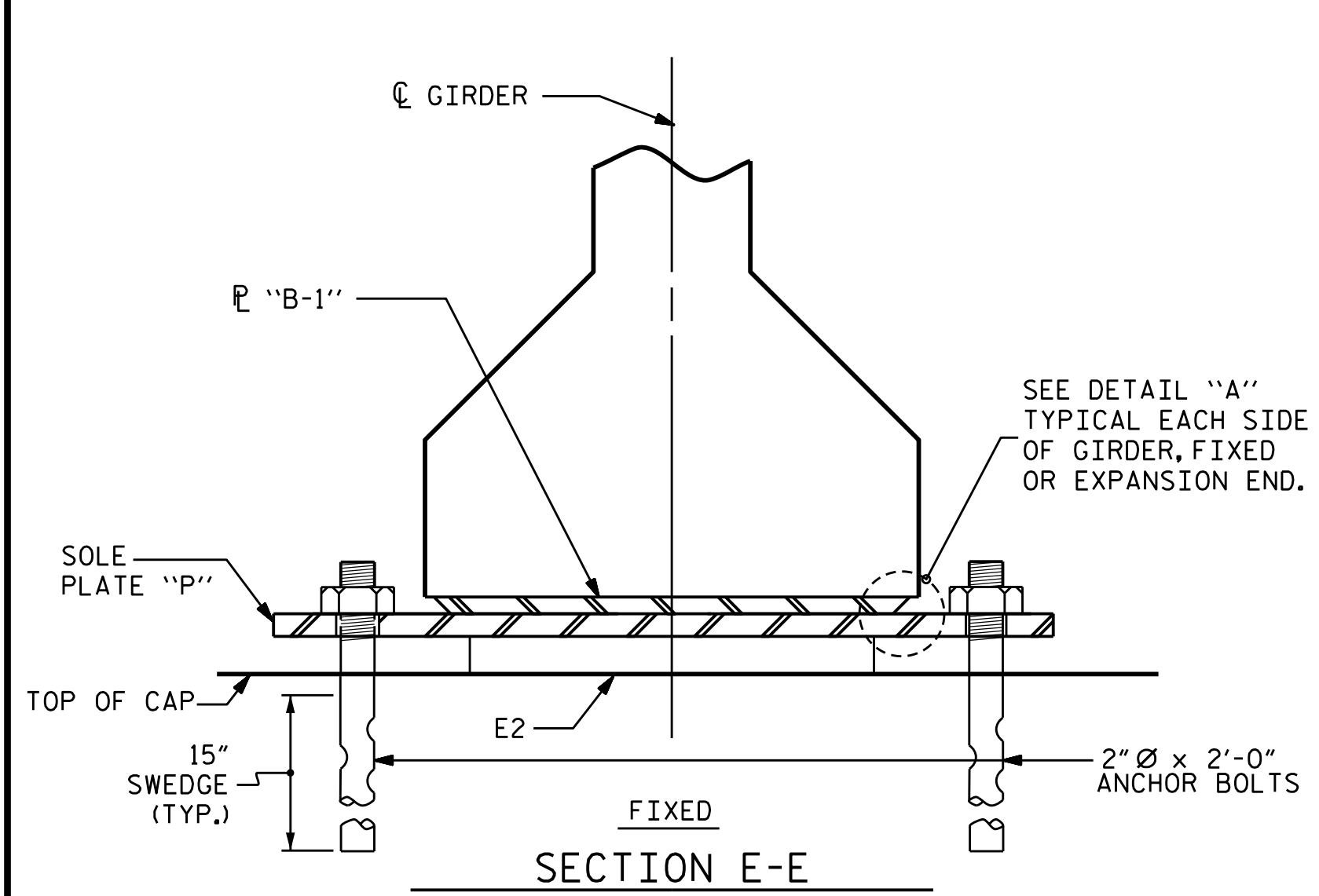
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

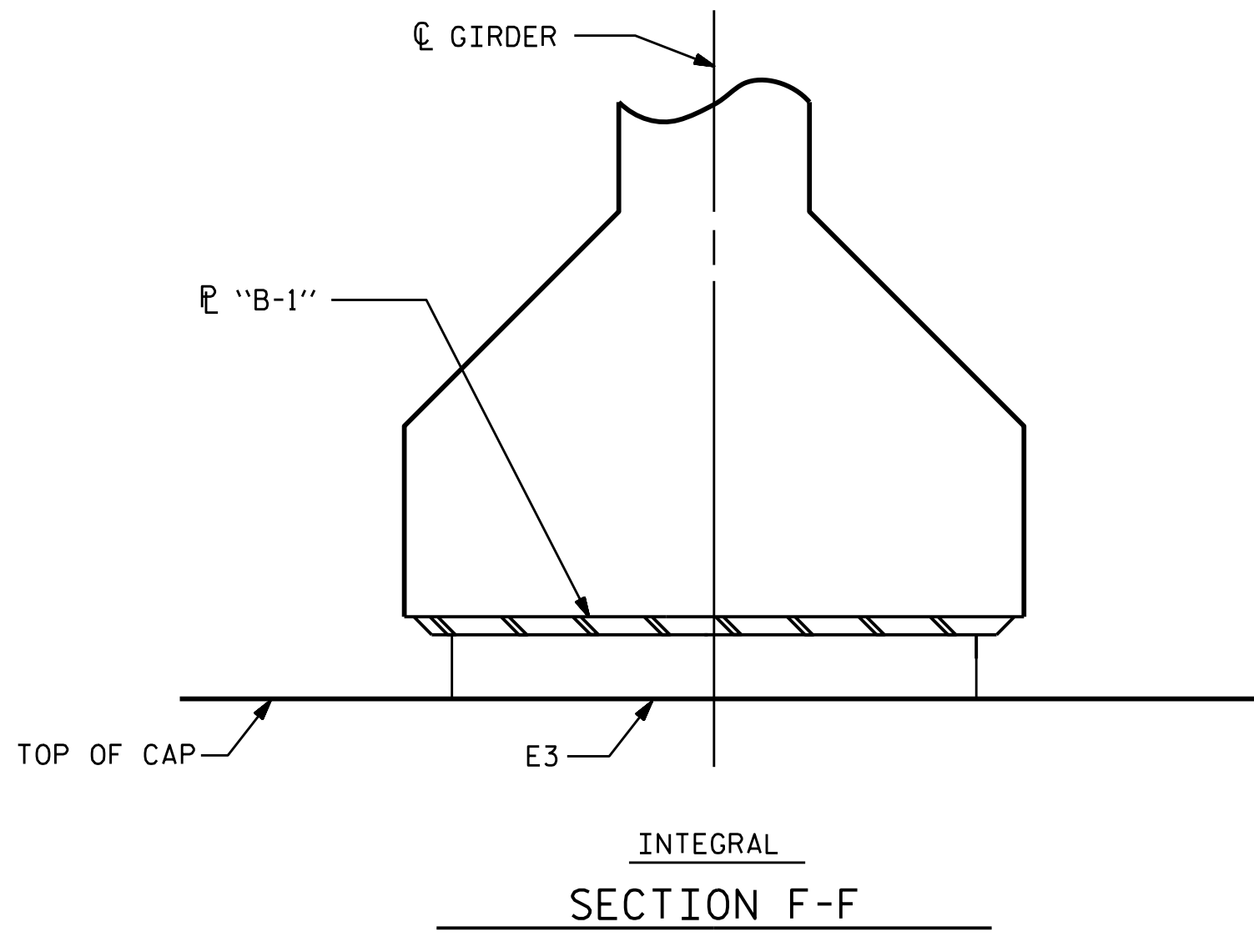
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

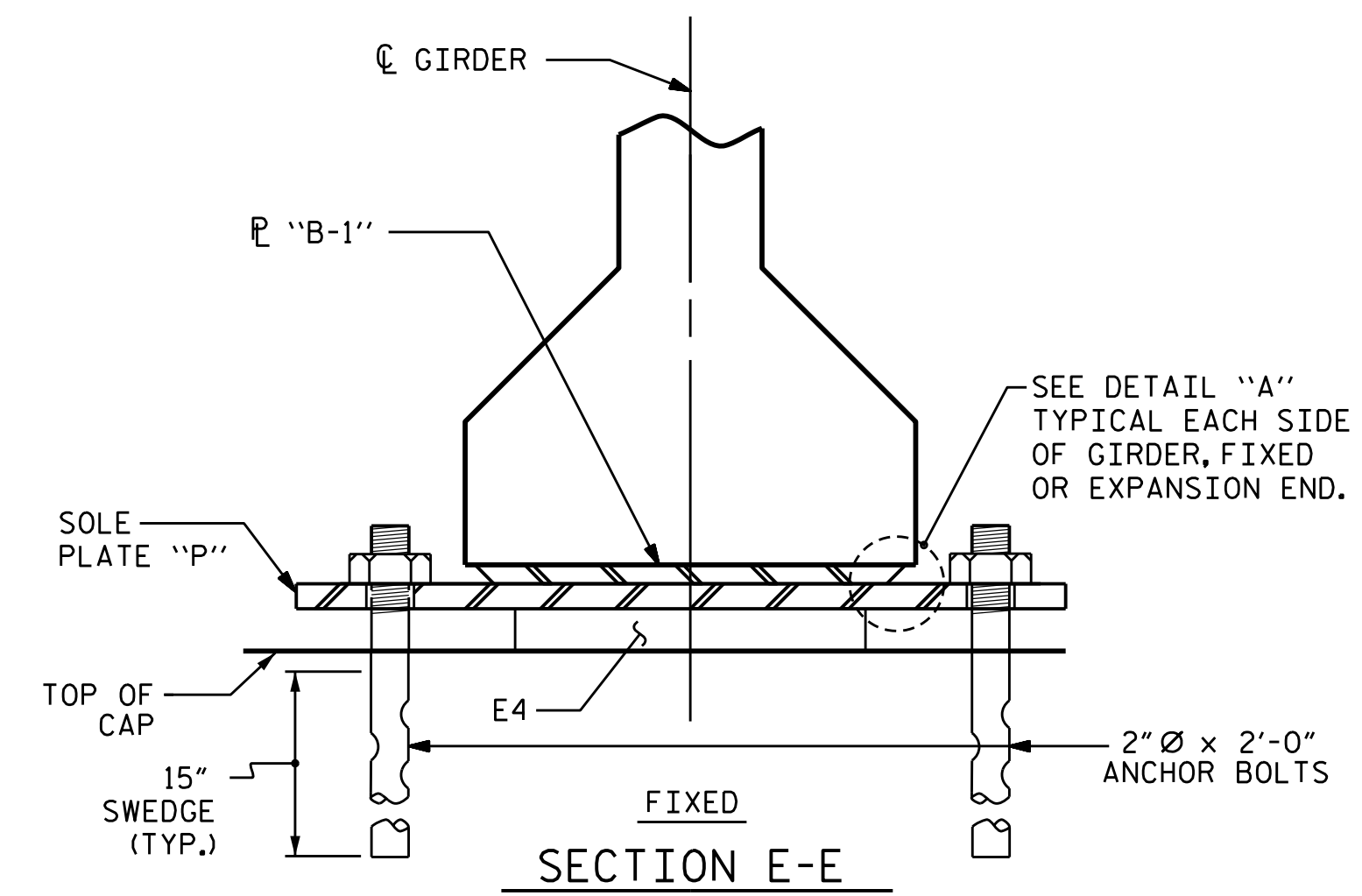
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



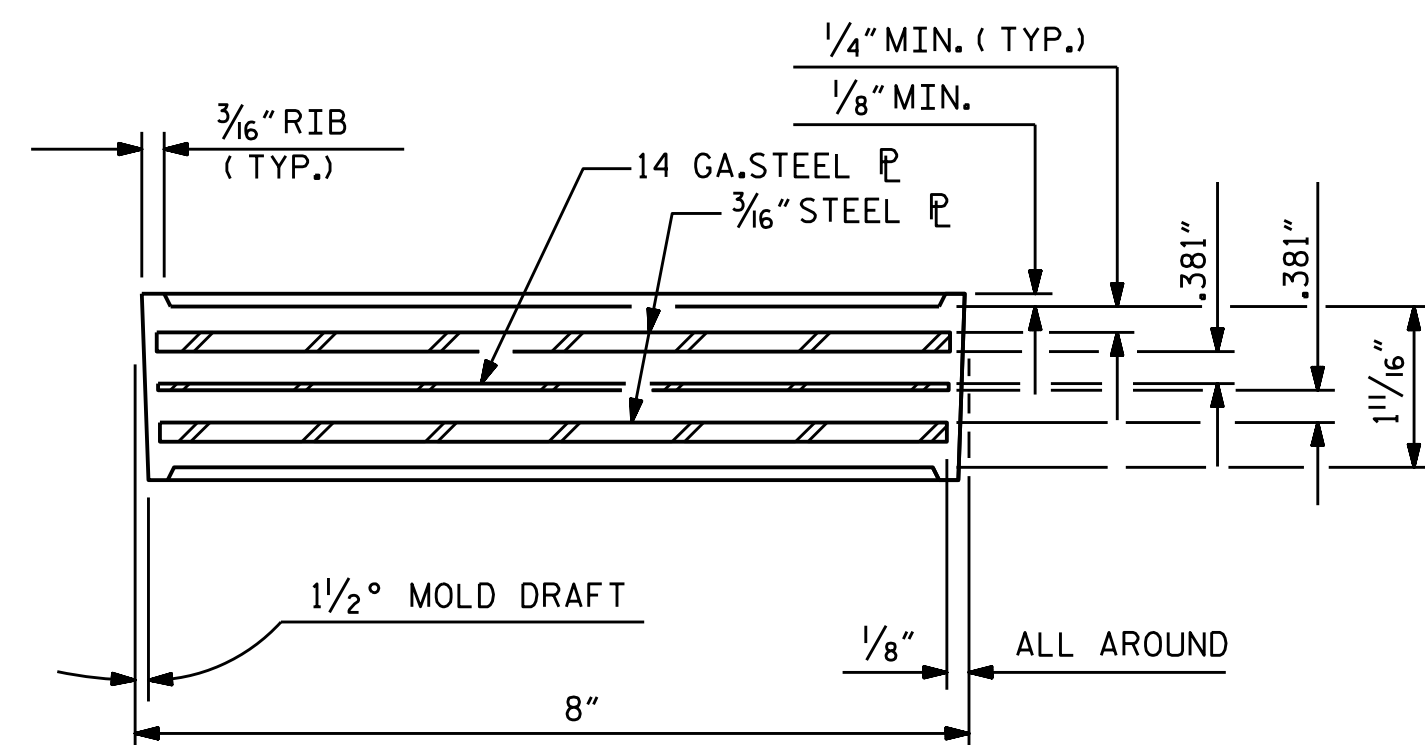
SECTION E-E



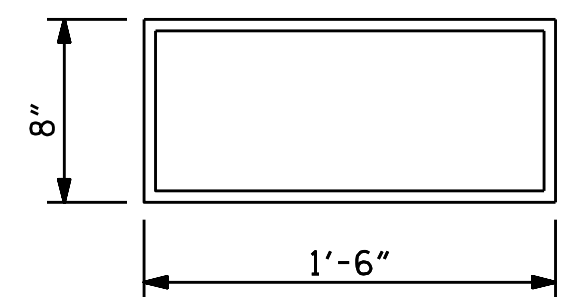
SECTION F-F



SECTION E-E



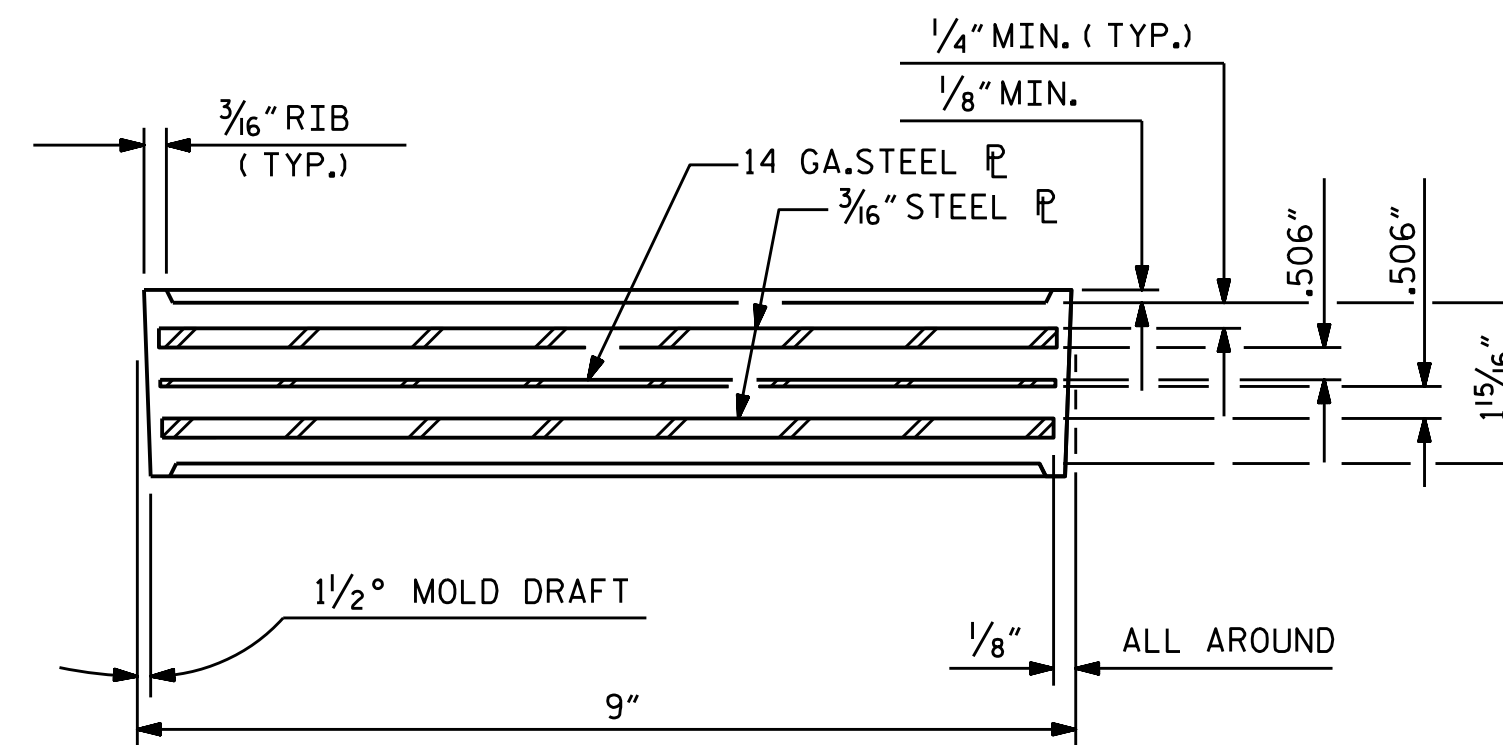
TYPICAL SECTION OF ELASTOMERIC BEARINGS



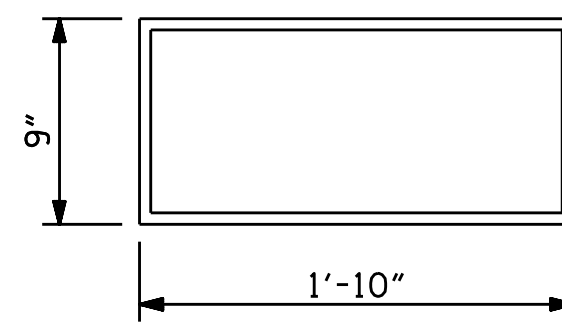
E2 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



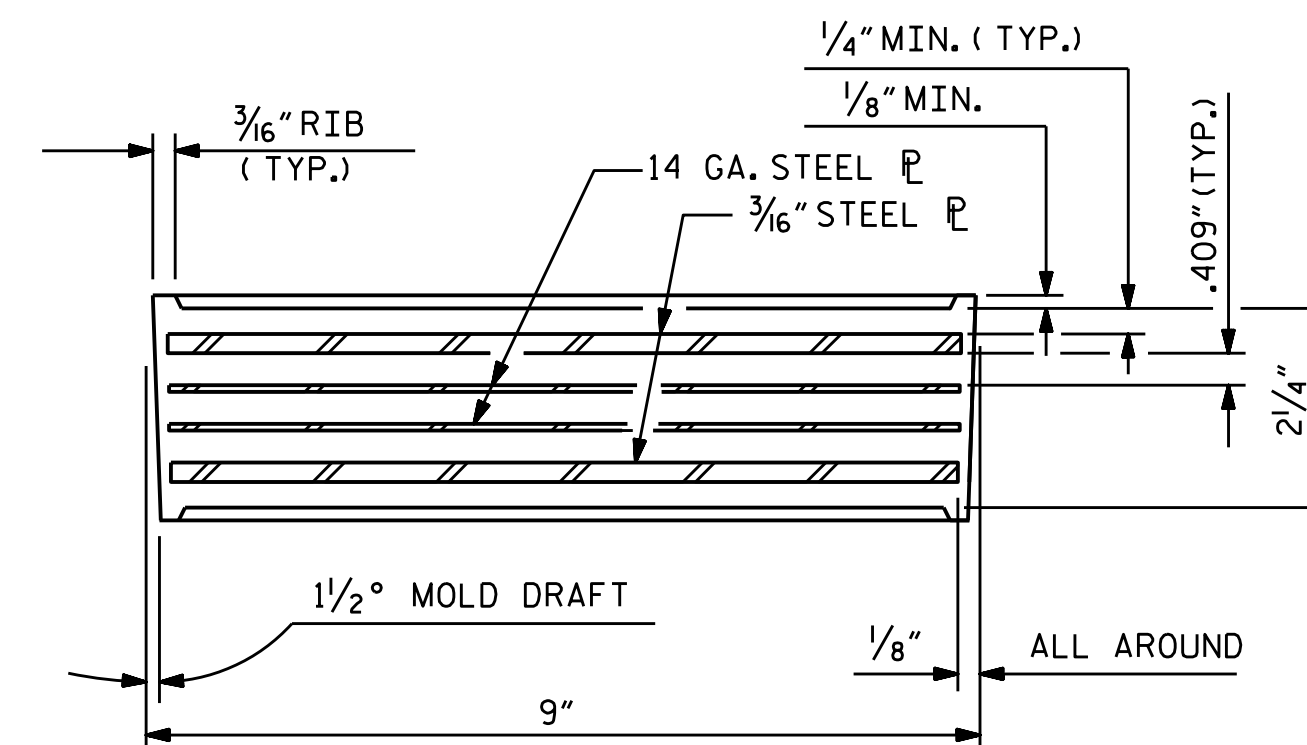
TYPICAL SECTION OF ELASTOMERIC BEARINGS



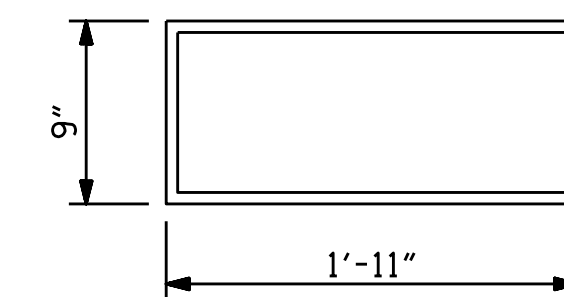
E3 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



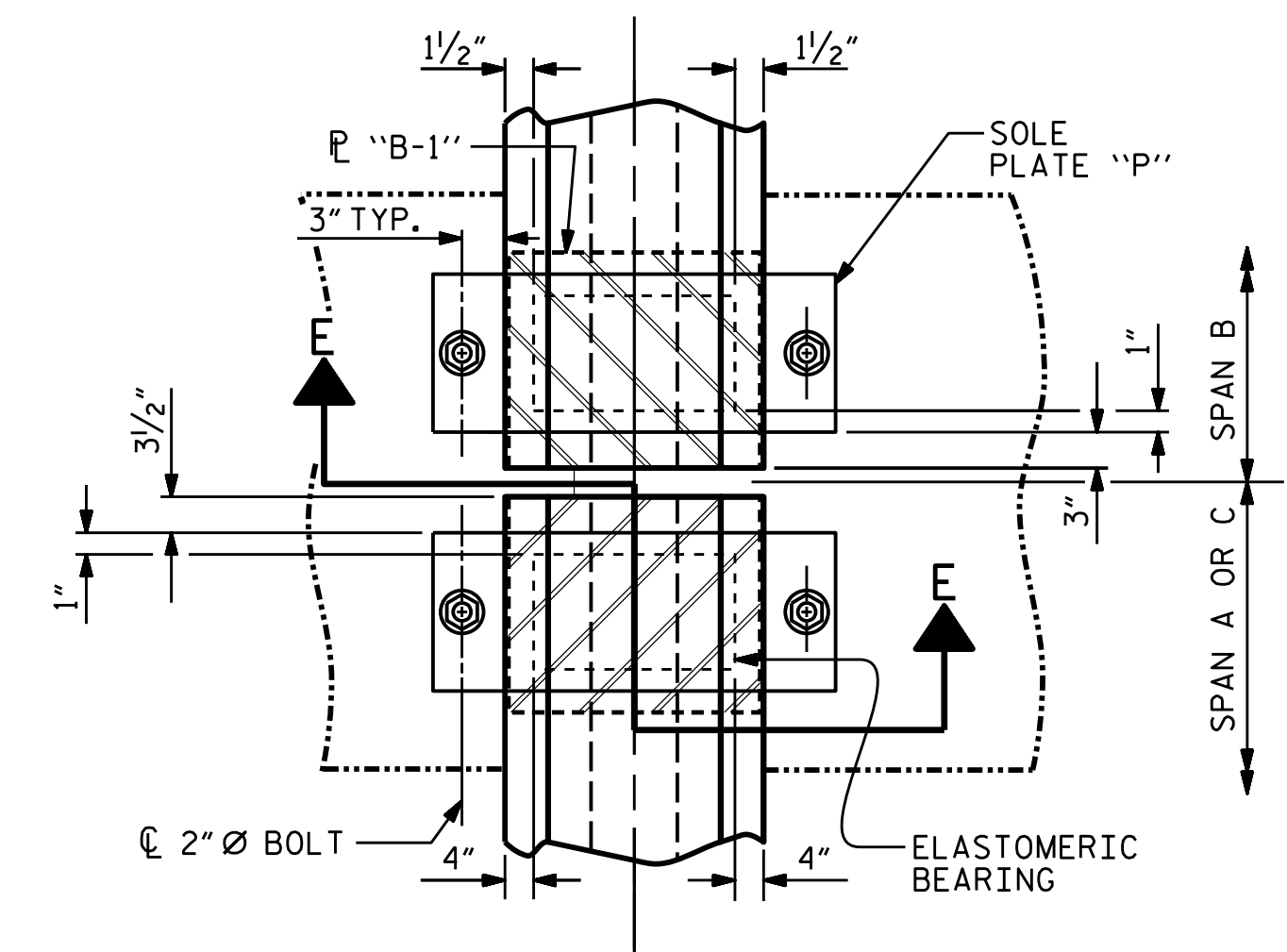
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

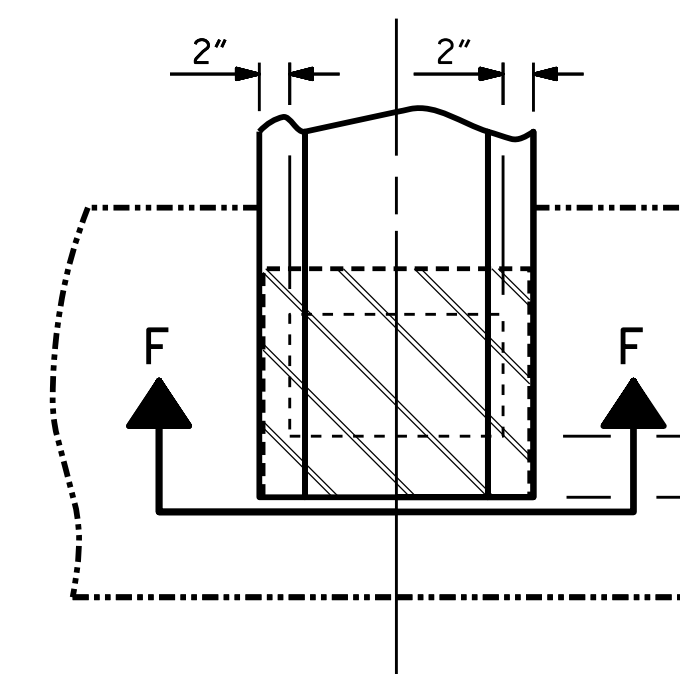


TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

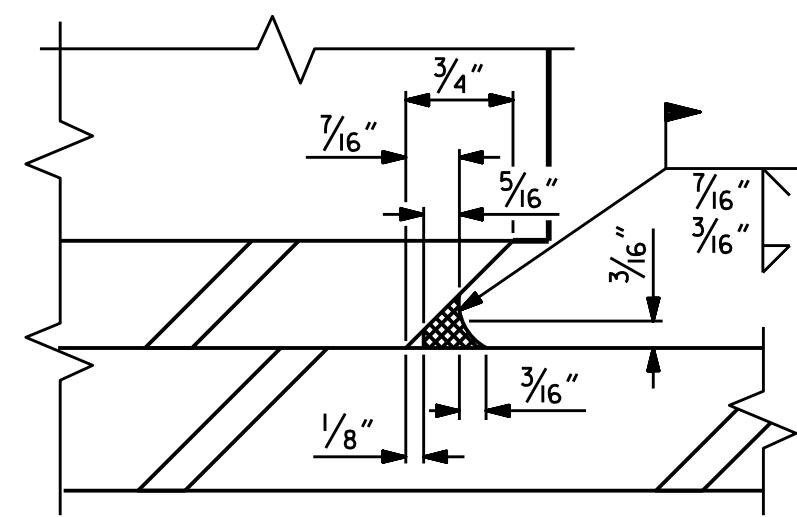
PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k
TYPE IV	225 k
TYPE V	365 k

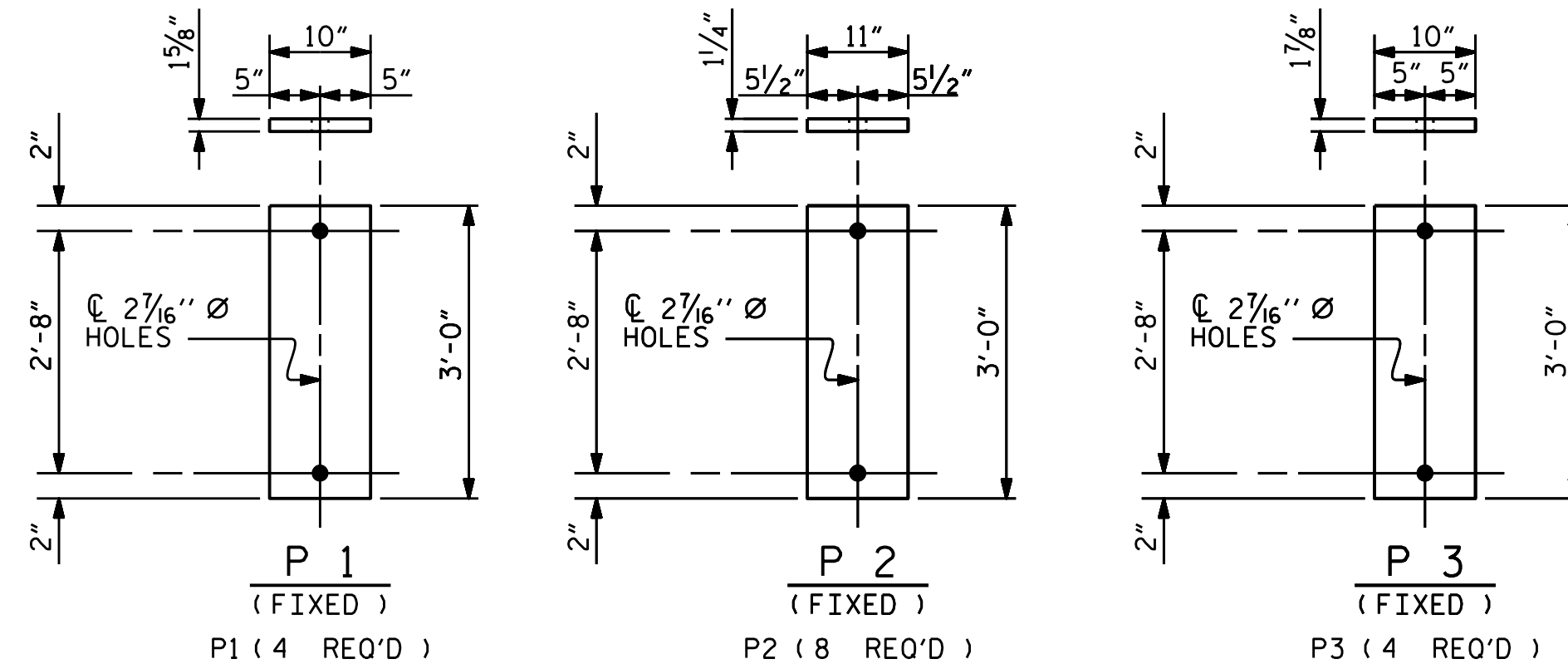


TYPICAL PLAN

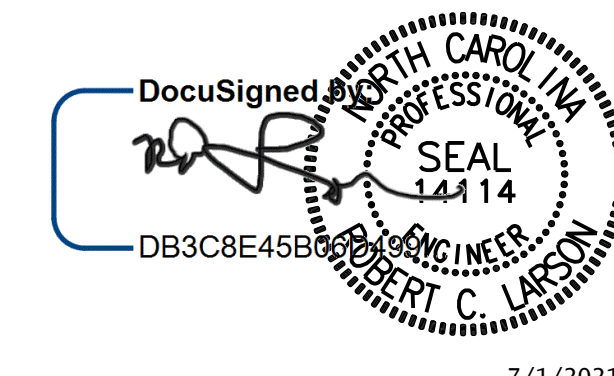
(SHOWING INTEGRAL END BENT)



DETAIL "A"



SOLE PLATE DETAILS ("P")



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

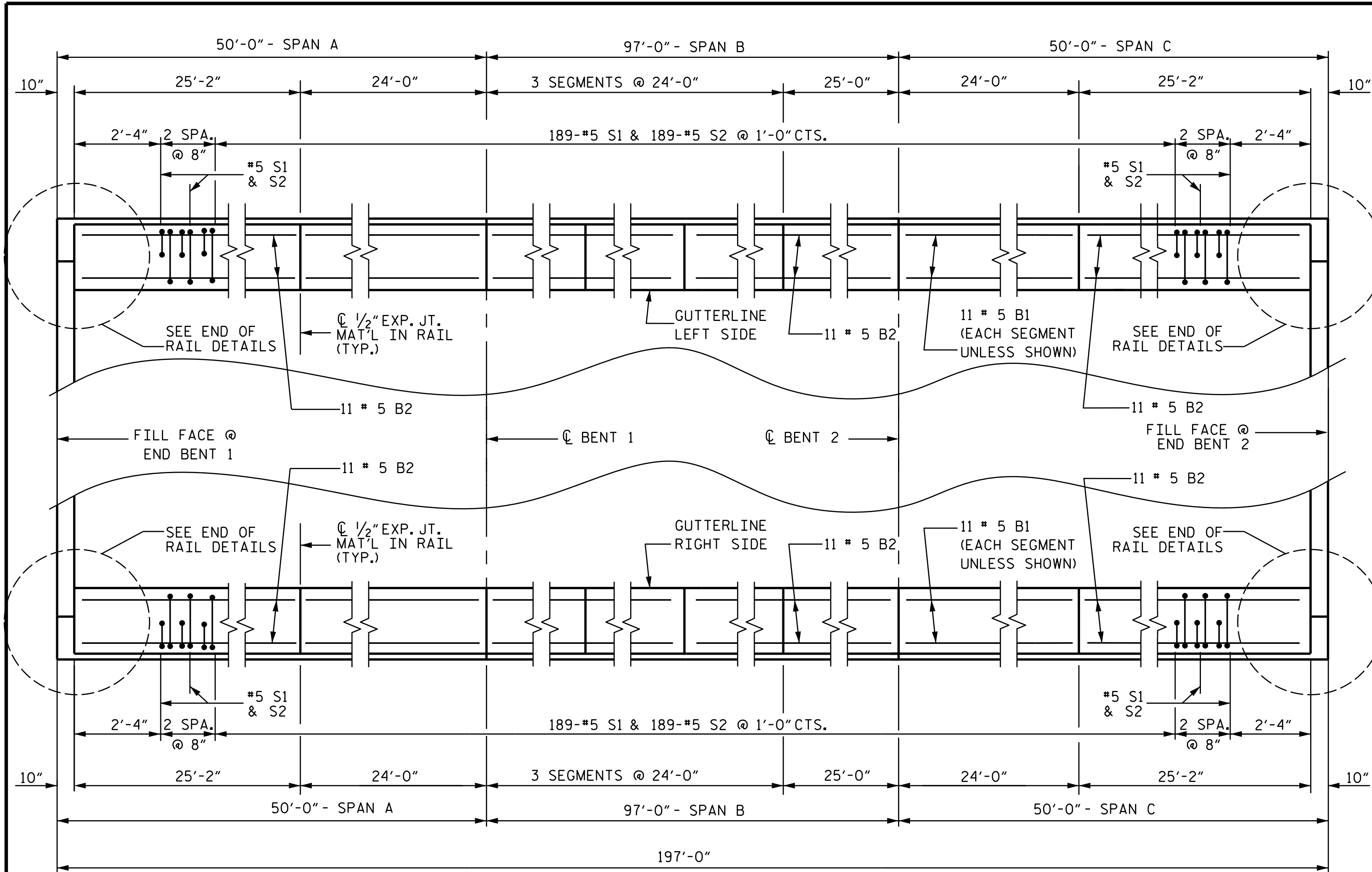
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			29

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UNLESS ALL SIGNATURES COMPLETED

KCI Associates  
of North Carolina, P.A.  
405 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9241

KCI JOB NO: 251801945.13

DESIGNED BY: R. C. LARSON	DATE: 7/1/2021
ASSEMBLED BY: A. K. ALLANK	DATE: 09/28/20
CHECKED BY: R. C. LARSON	DATE: 09/30/20
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

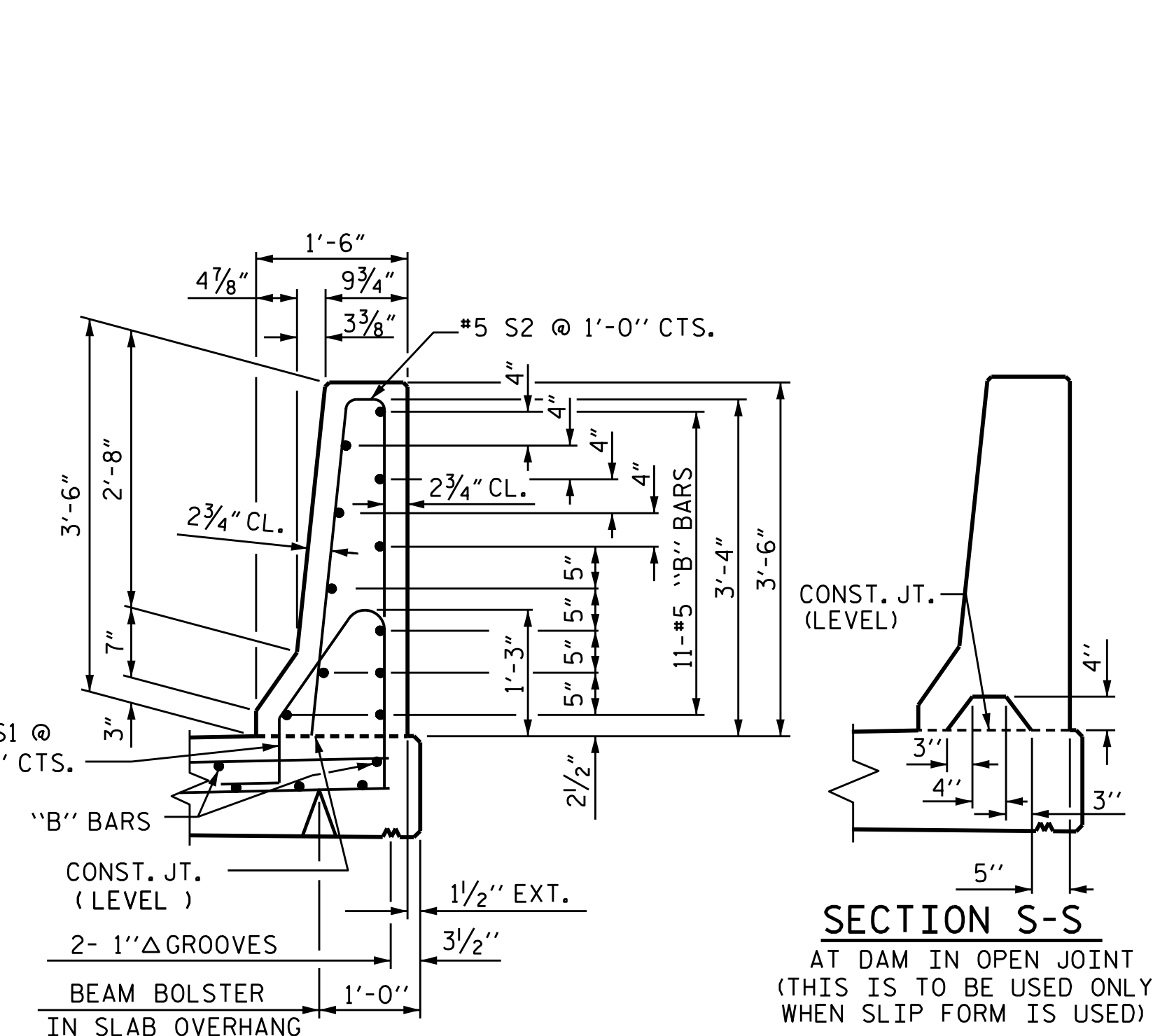
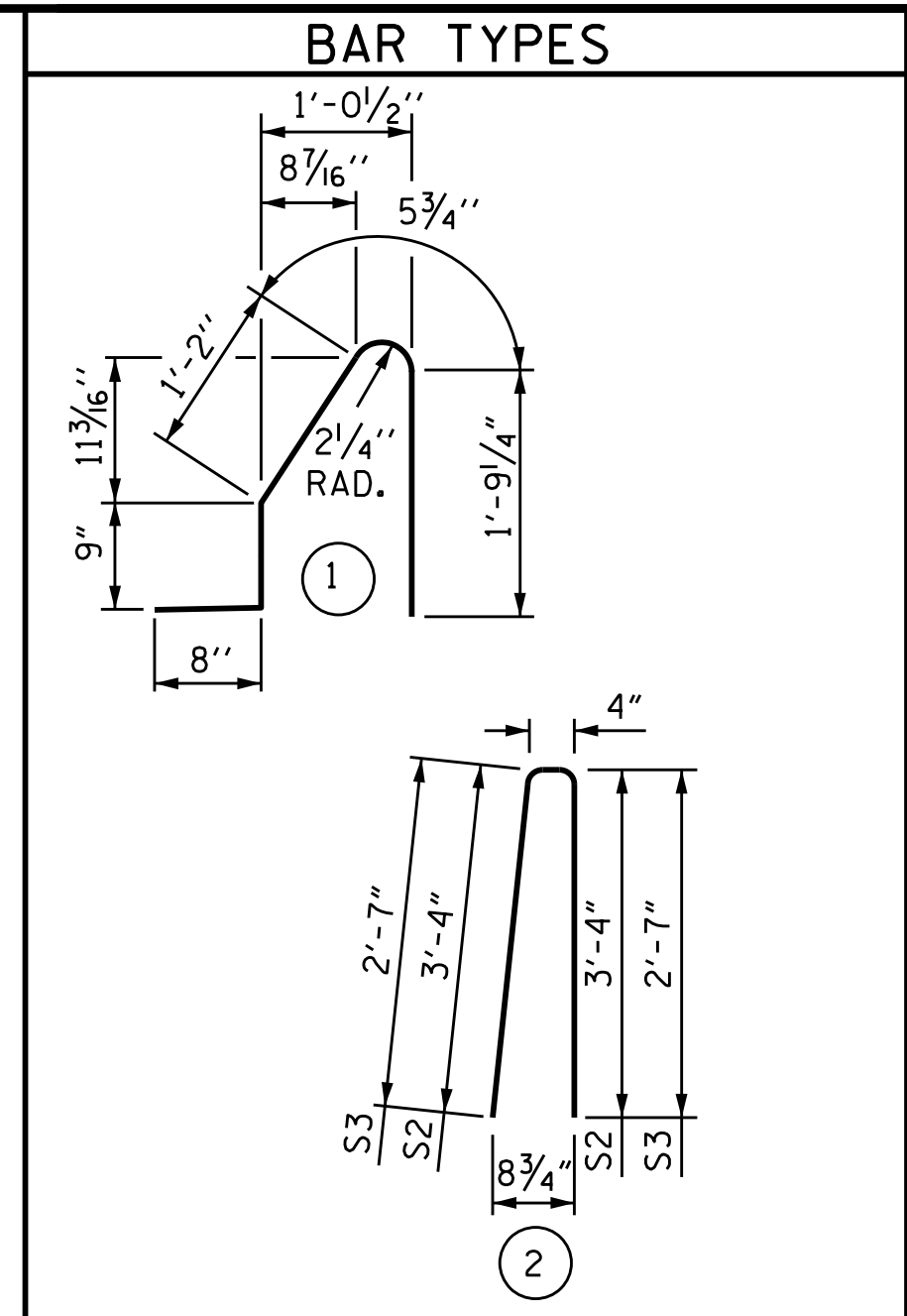


**NOTES**

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



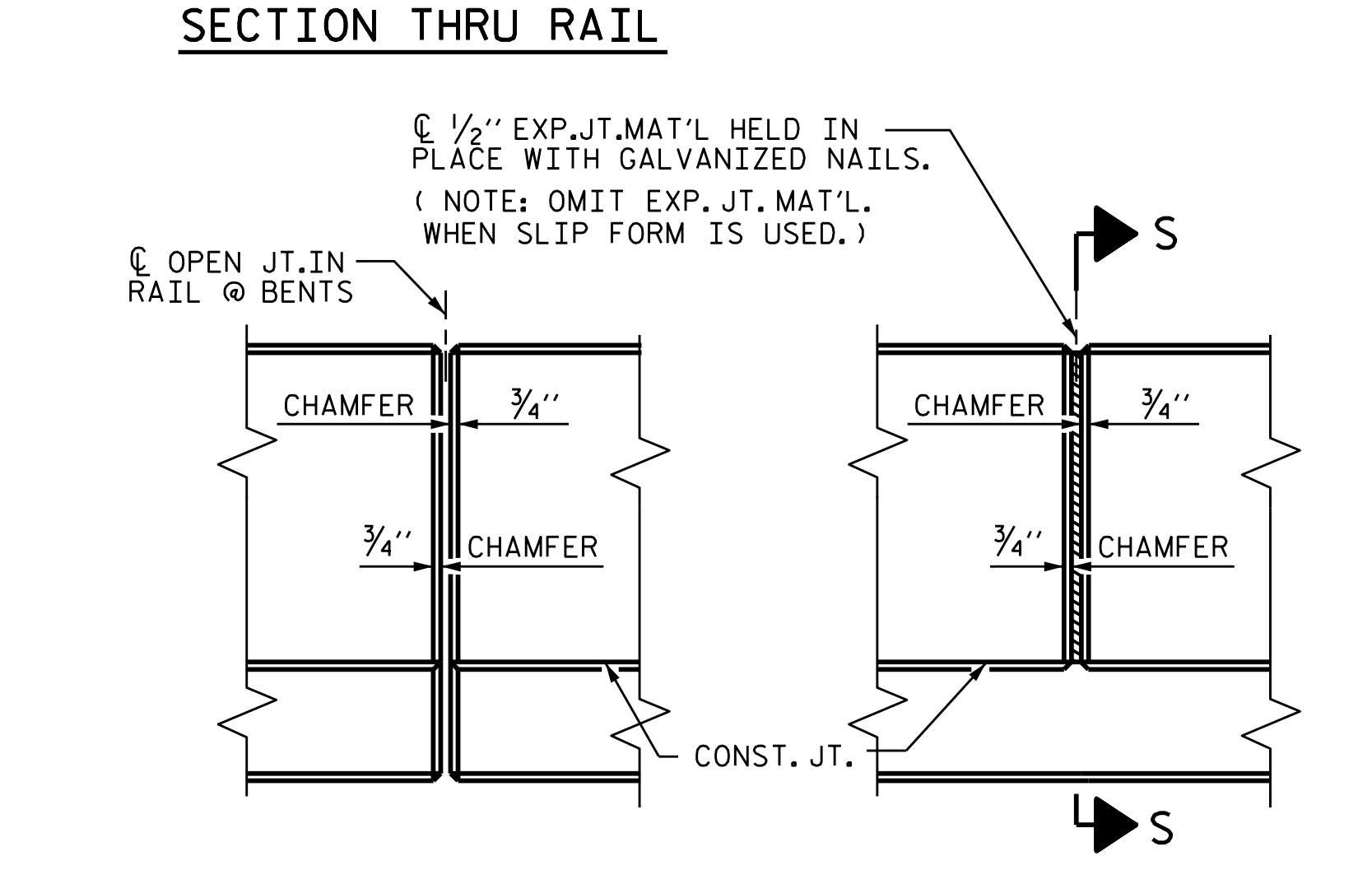
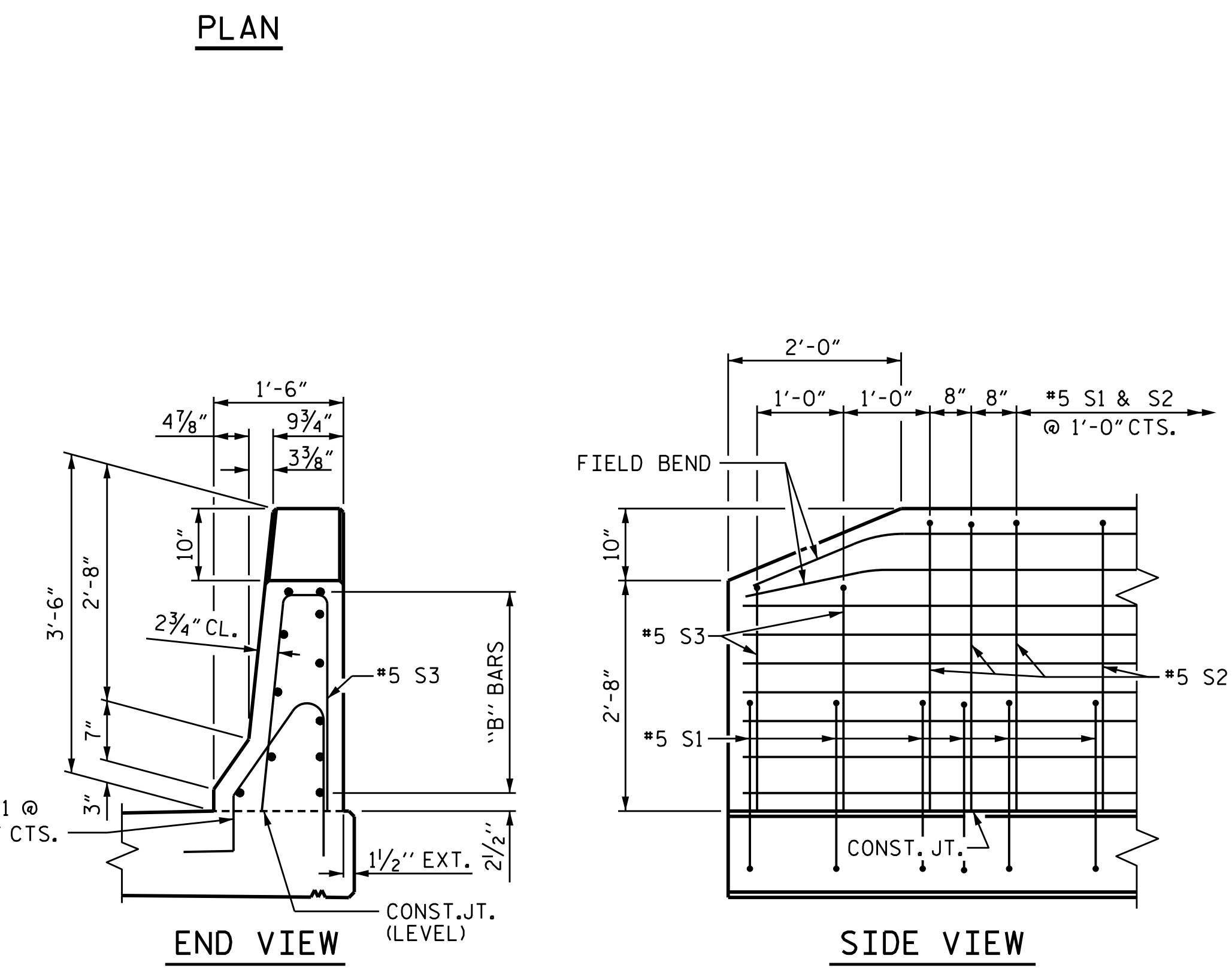
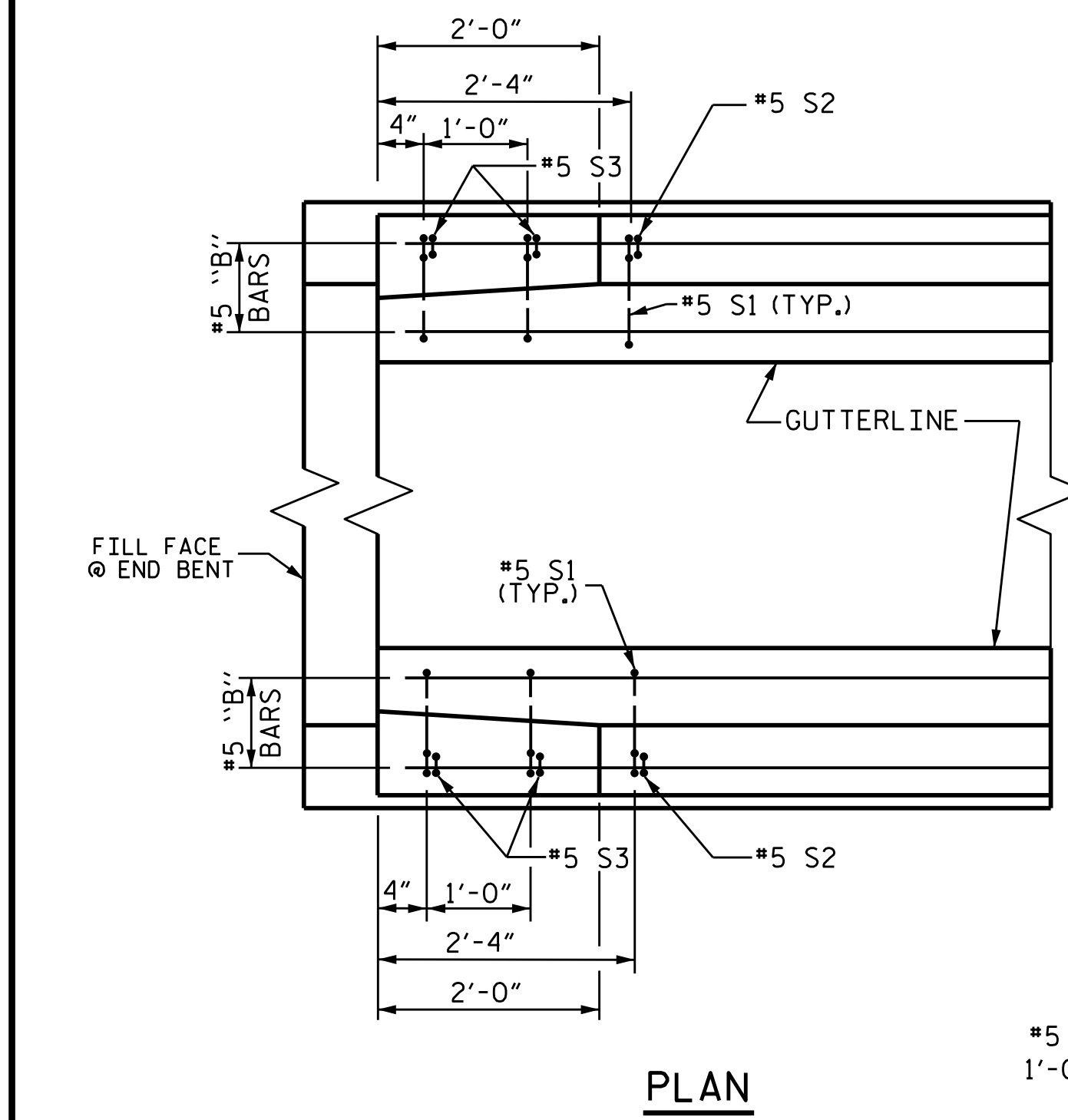
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**  
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	394	#5	1	4'-10"	1986
* S2	386	#5	2	7'-0"	2818
* S3	8	#5	2	5'-6"	46
* B1	110	#5	STR	23'-8"	2715
* B2	66	#5	STR	24'-8"	1698

* EPOXY COATED REINFORCING STEEL	9263 LBS.
CLASS AA CONCRETE	53.1 CU. YDS.
CONCRETE BARRIER RAIL	390.67 LIN. FT.



KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD: *DocuSigned by: R.C. Larson* DATE: 7/1/2021

ASSEMBLED BY: R. C. LARSON DATE: 09/15/20  
 CHECKED BY: A. K. ALLANKI DATE: 10/20/20

DRAWN BY: ARB 5/87 REV. 7/12 MAA/GM  
 CHECKED BY: SJD 9/87 REV. 6/13 MAA/GM  
 REV. 12/17 MAA/THC

**END OF RAIL DETAILS**

**ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS**

DocuSigned by:  
*DocuSigned by: R.C. Larson*  
 DB3C8E45B06D489...  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 14114  
 ROBERT C. LARSON  
 7/1/2021

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

ENGINEERS PLANNERS SCIENTISTS CONSTRUCTION MANAGERS LICENSE NUMBER C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9241

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD  
CONCRETE  
BARRIER RAIL**

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	S-15
1			3	TOTAL SHEETS 29
2			4	



NOTES

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

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

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

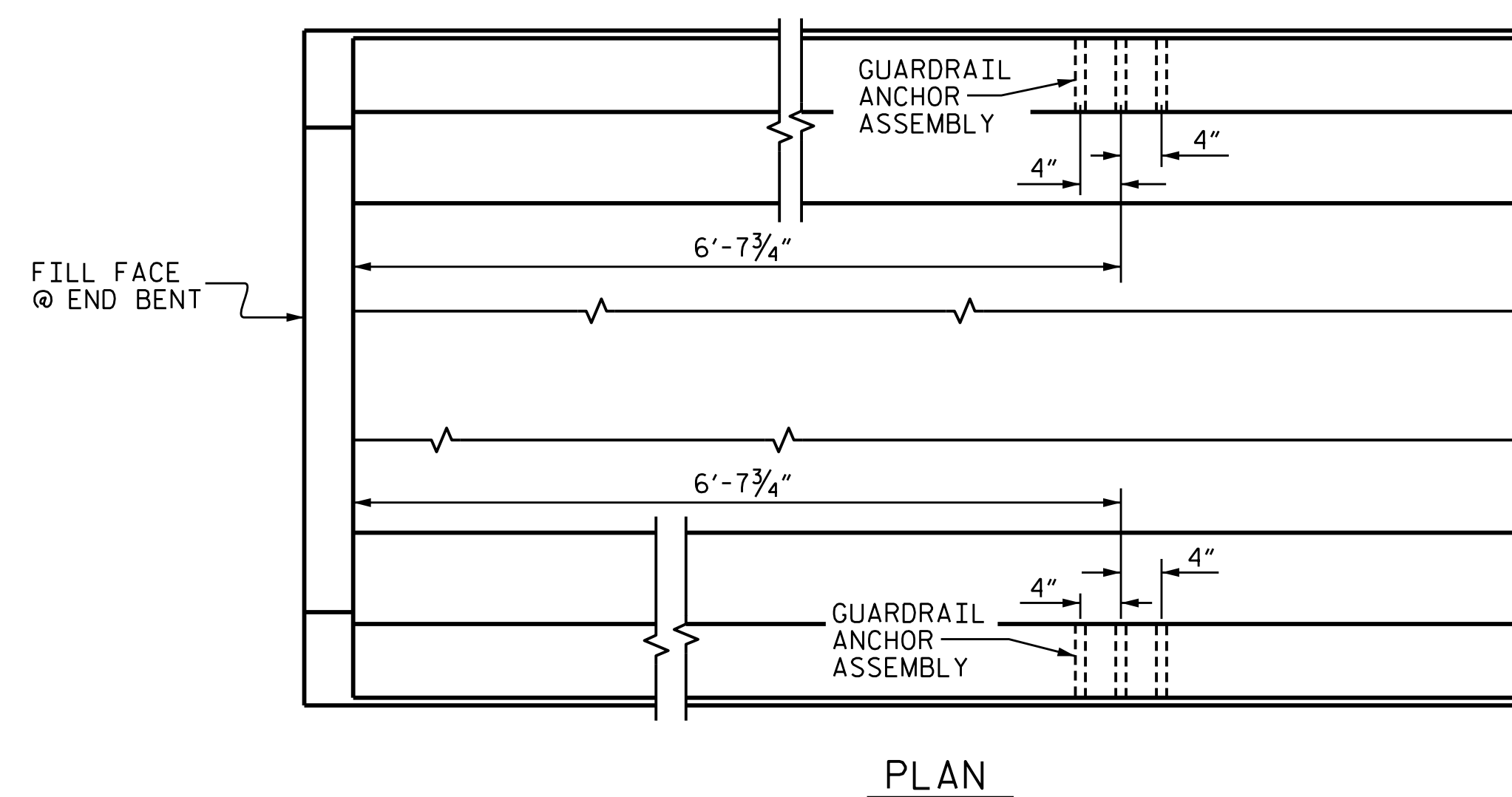
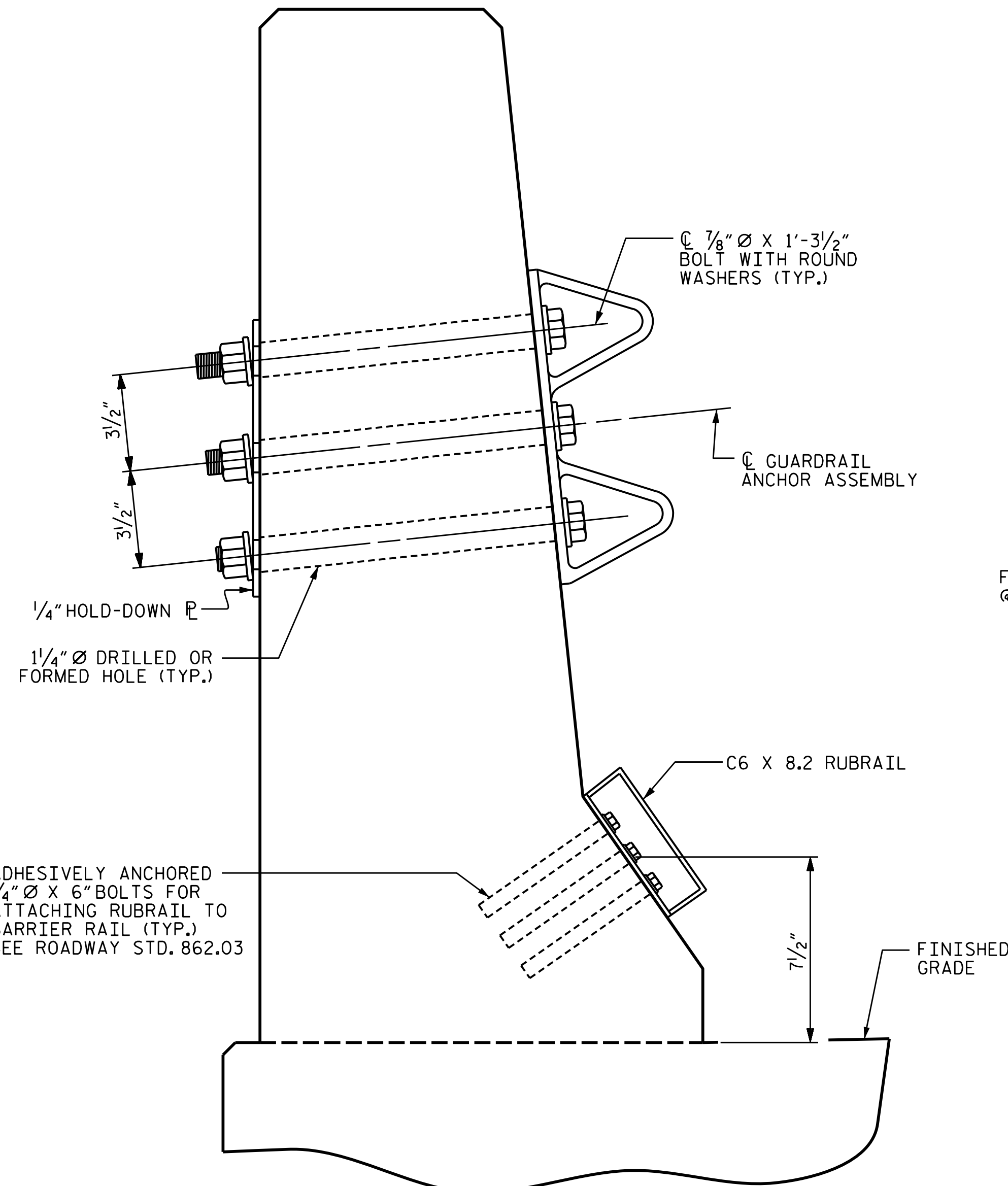
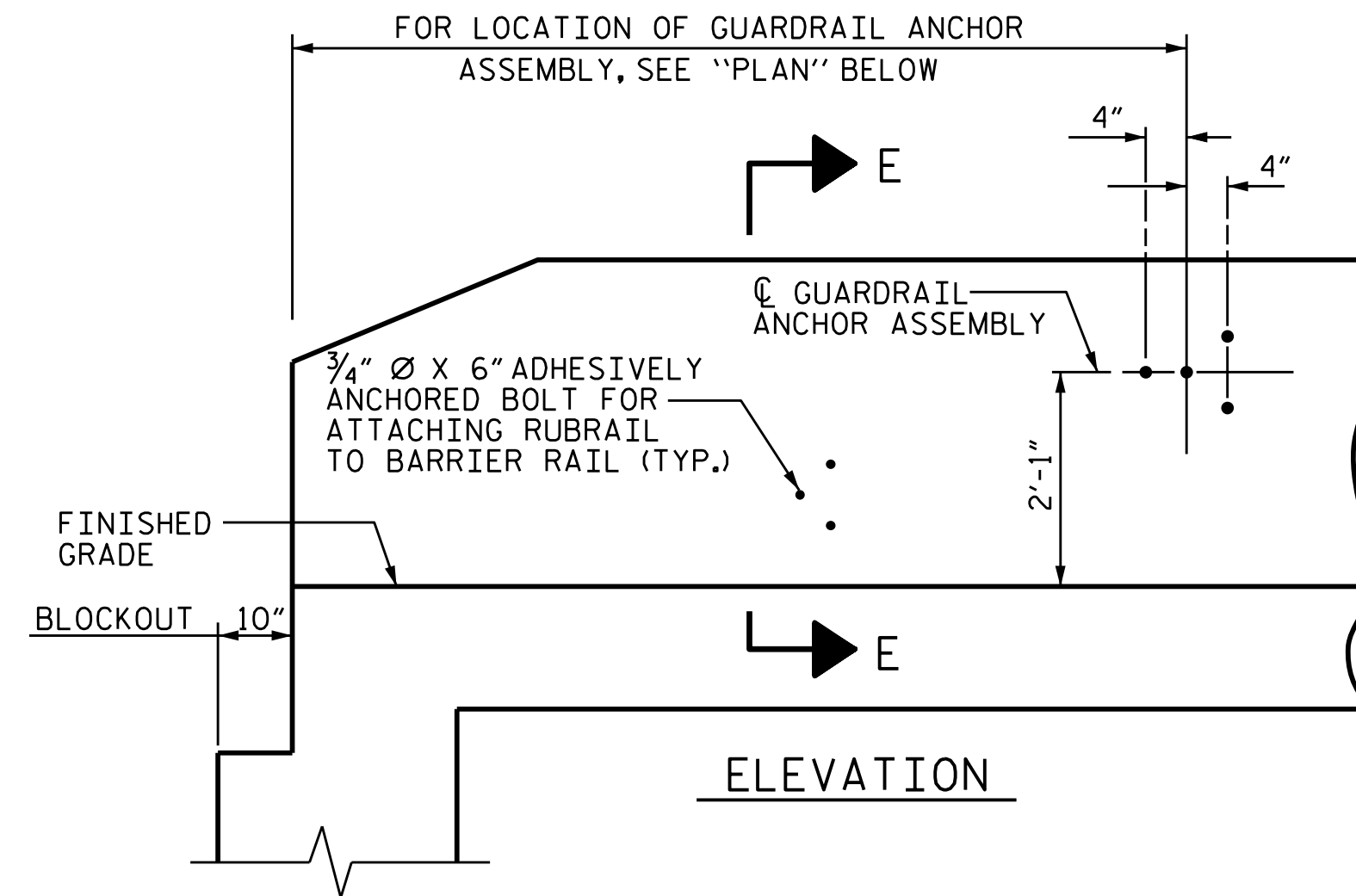
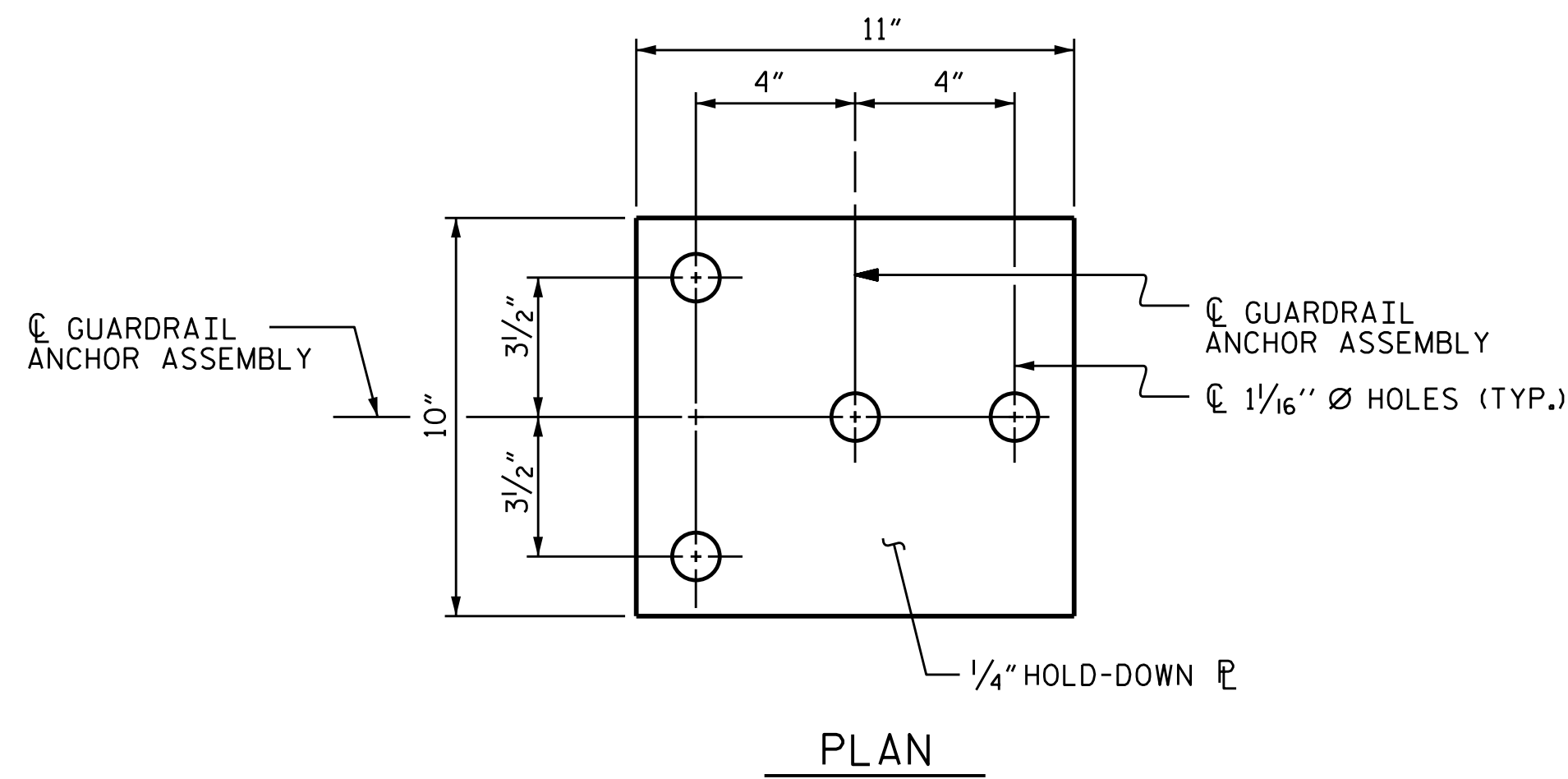
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

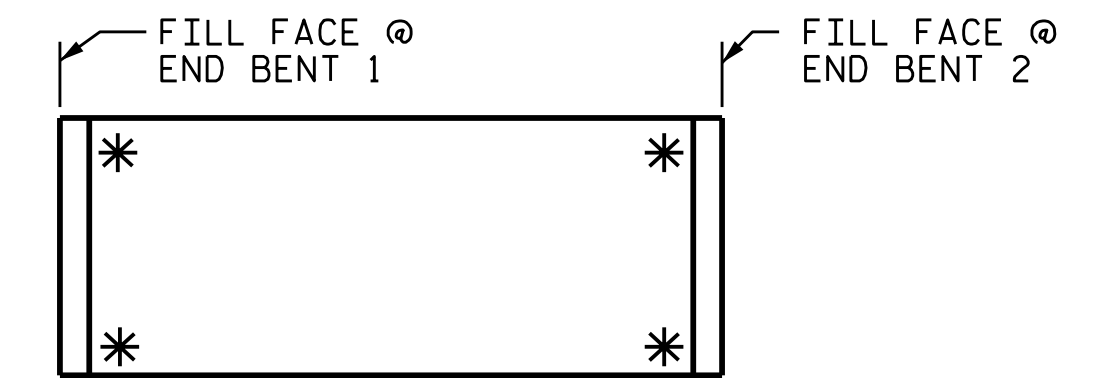
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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



LOCATION OF ANCHORS FOR GUARDRAIL

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

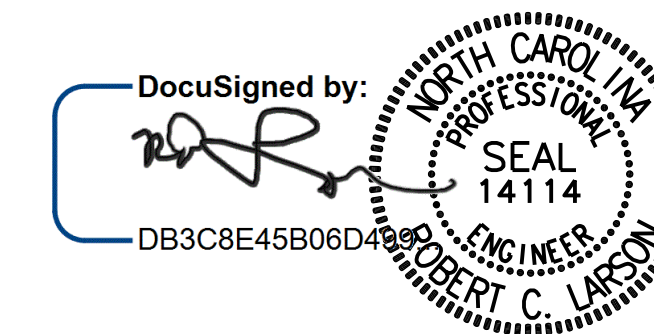


SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

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



7/1/2021

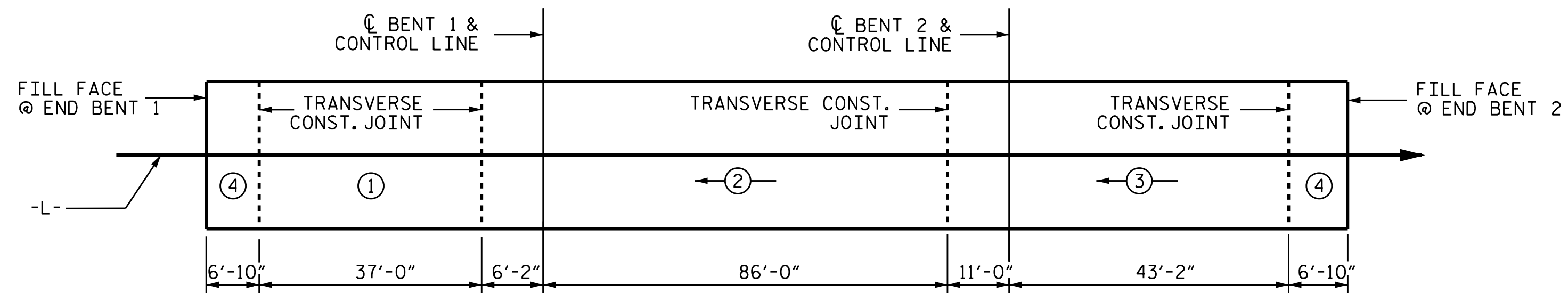
DESIGN ENGINEER OF RECORD	DATE :	7/1/2021
ASSEMBLED BY : R. C. LARSON	DATE :	11/12/20
CHECKED BY : R. F. DECOLA	DATE :	11/12/20
DRAWN BY : TLA 5/06	REV. 7/12	MAA/GM
CHECKED BY : GM 5/06	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
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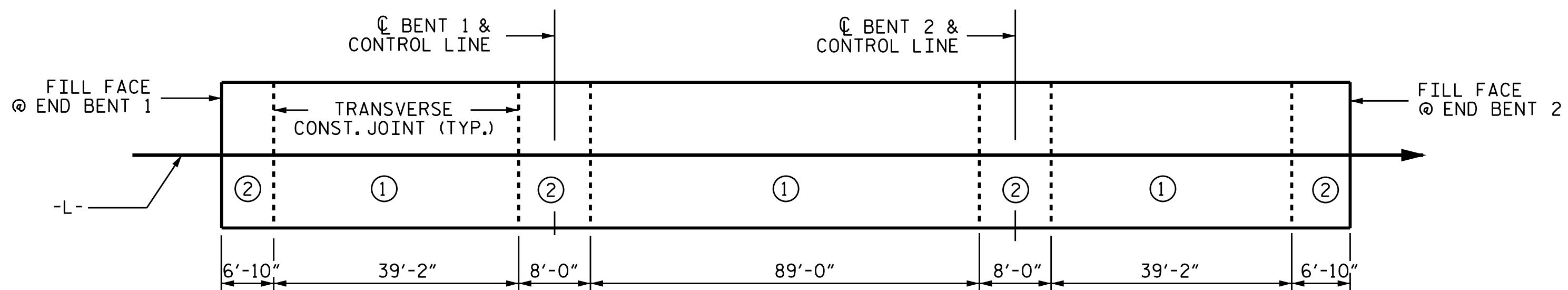
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S- 16
1			3			TOTAL SHEETS 29
2			4			

KCI JOB NO: 251801945.13



**DECK POURING SEQUENCE**

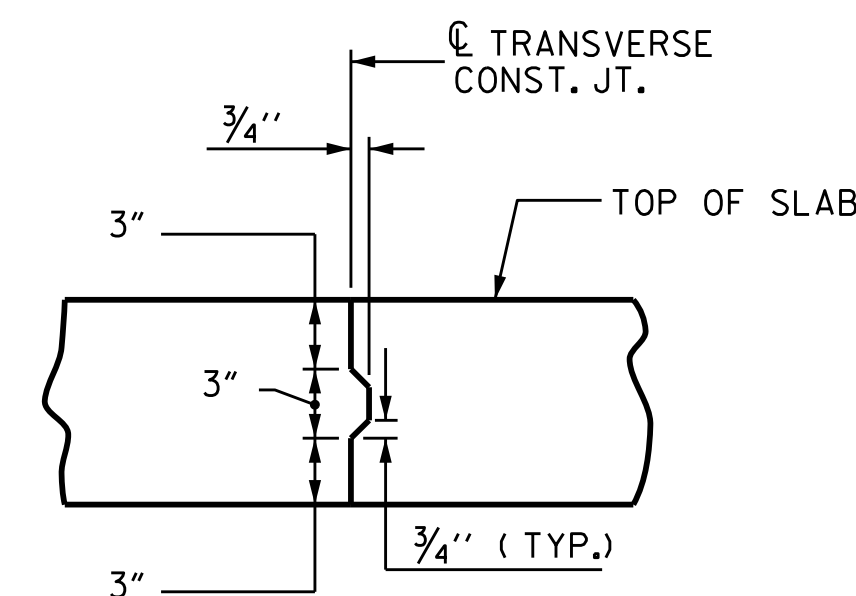
② → INDICATES POUR SEQUENCE AND DIRECTION



**OPTIONAL DECK POURING SEQUENCE**

② → INDICATES POUR SEQUENCE AND DIRECTION

NO POUR 2 MAY BE STARTED UNTIL BOTH ADJACENT POURS 1 HAVE REACHED A MINIMUM STRENGTH OF 3000 PSI.

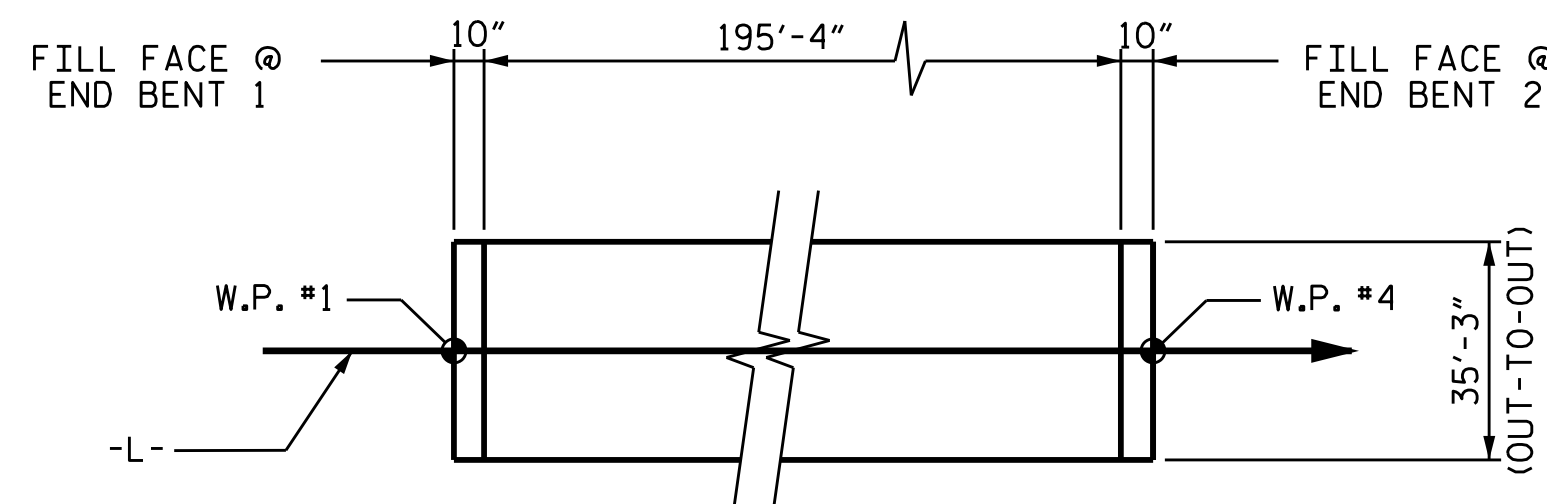


**TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB**

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

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

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



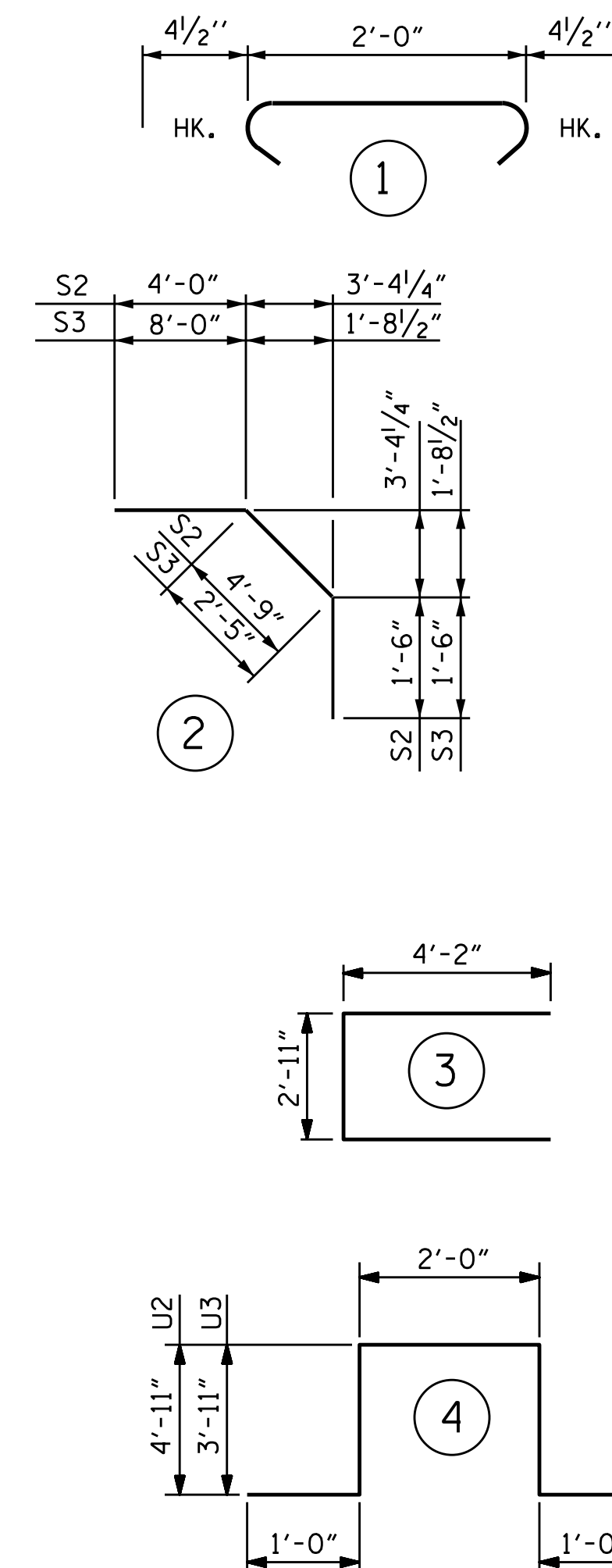
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6885)

**BILL OF MATERIAL**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	390	5	STR.	34'-11"	14203
A2	390	5	STR.	34'-11"	14203
*B1	144	4	STR.	34'-2"	3287
B2	176	5	STR.	50'-5"	9255
*B3	46	6	STR.	22'-3"	1537
*B4	46	6	STR.	54'-3"	3748
*B5	46	6	STR.	11'-0"	760
*B6	46	6	STR.	10'-0"	691
K1	10	4	STR.	34'-11"	233
K2	6	4	STR.	7'-2"	29
K3	18	4	STR.	7'-8"	92
K4	36	4	STR.	8'-8"	208
K5	4	4	STR.	1'-8"	4
K6	4	4	STR.	2'-1"	6
K7	8	4	STR.	2'-5"	13
K8	4	4	STR.	1'-11"	5
K9	10	4	STR.	29'-4"	196
K10	12	4	STR.	6'-2"	49
K11	18	4	STR.	7'-11"	95
S1	180	4	1	2'-9"	331
*S2	52	4	2	10'-3"	356
*S3	56	4	2	11'-11"	446
U1	56	4	3	11'-3"	421
U2	36	4	4	13'-10"	333
U3	12	4	4	11'-10"	95
REINFORCING STEEL					25,568
EPOXY COATED REINFORCING STEEL					25,028

\* EPOXY COATED REINFORCING STEEL

**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.)
SPAN A-C			
POUR 1	42.1		
POUR 2	115.6		
POUR 3	72.3		
POUR 4	49.6		
TOTALS**	279.6	25,568	25,028

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	1421	SQ.FT.
BRIDGE DECK	5665	SQ.FT.
TOTAL	7086	SQ.FT.

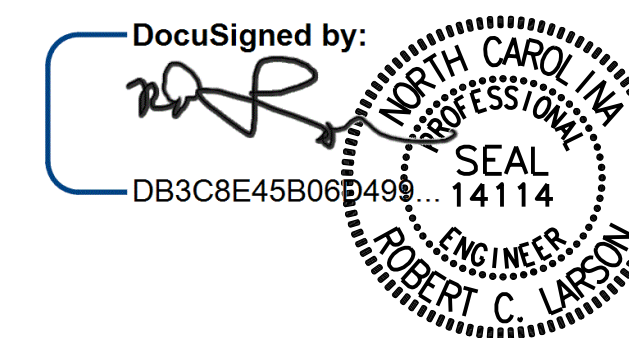
PROJECT NO. B-5703

CUMBERLAND/HARNETT COUNTY

STATION: 16+92.70 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL



7/1/2021

**REVISIONS**

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

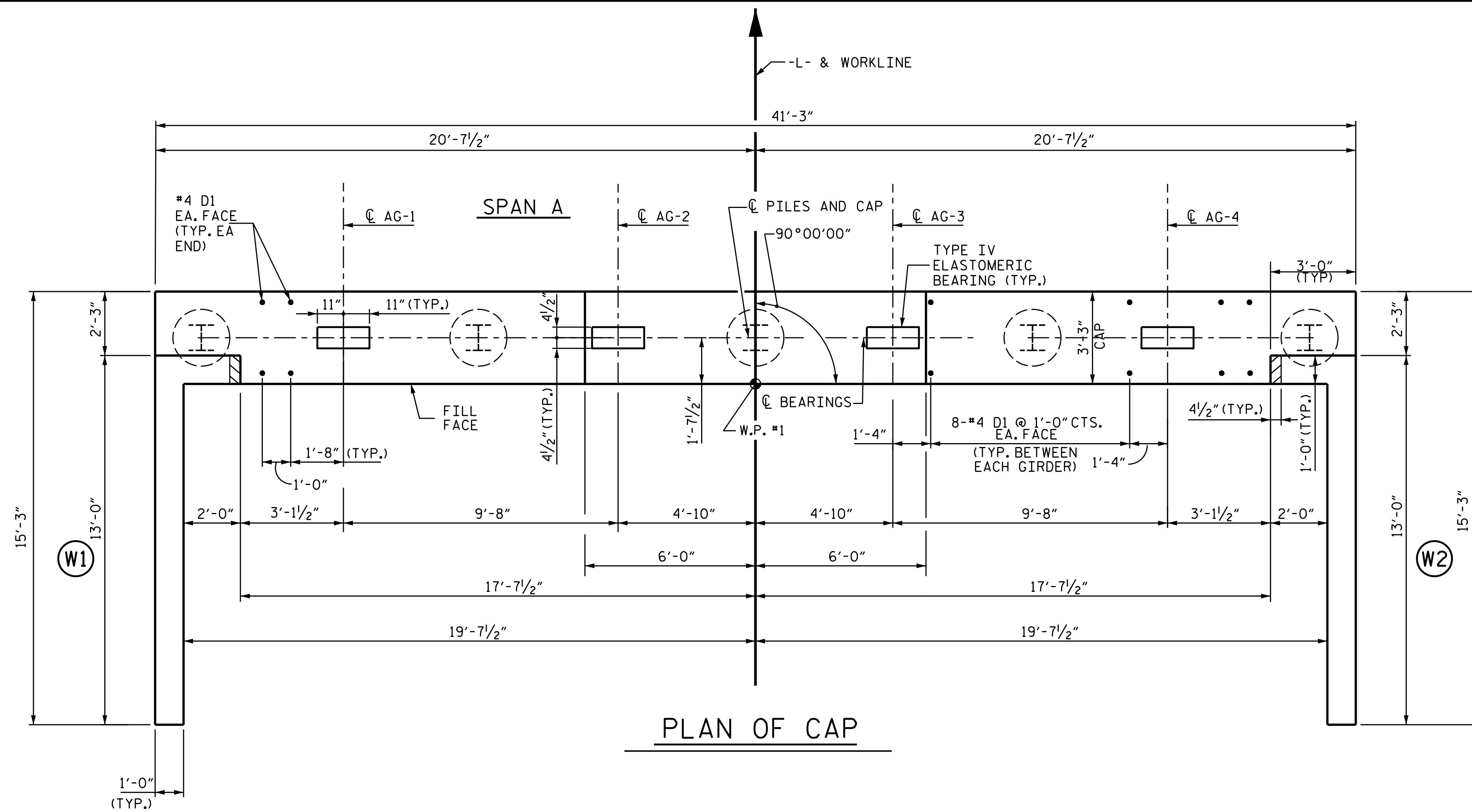
SHEET NO.  
S-17  
TOTAL SHEETS  
29

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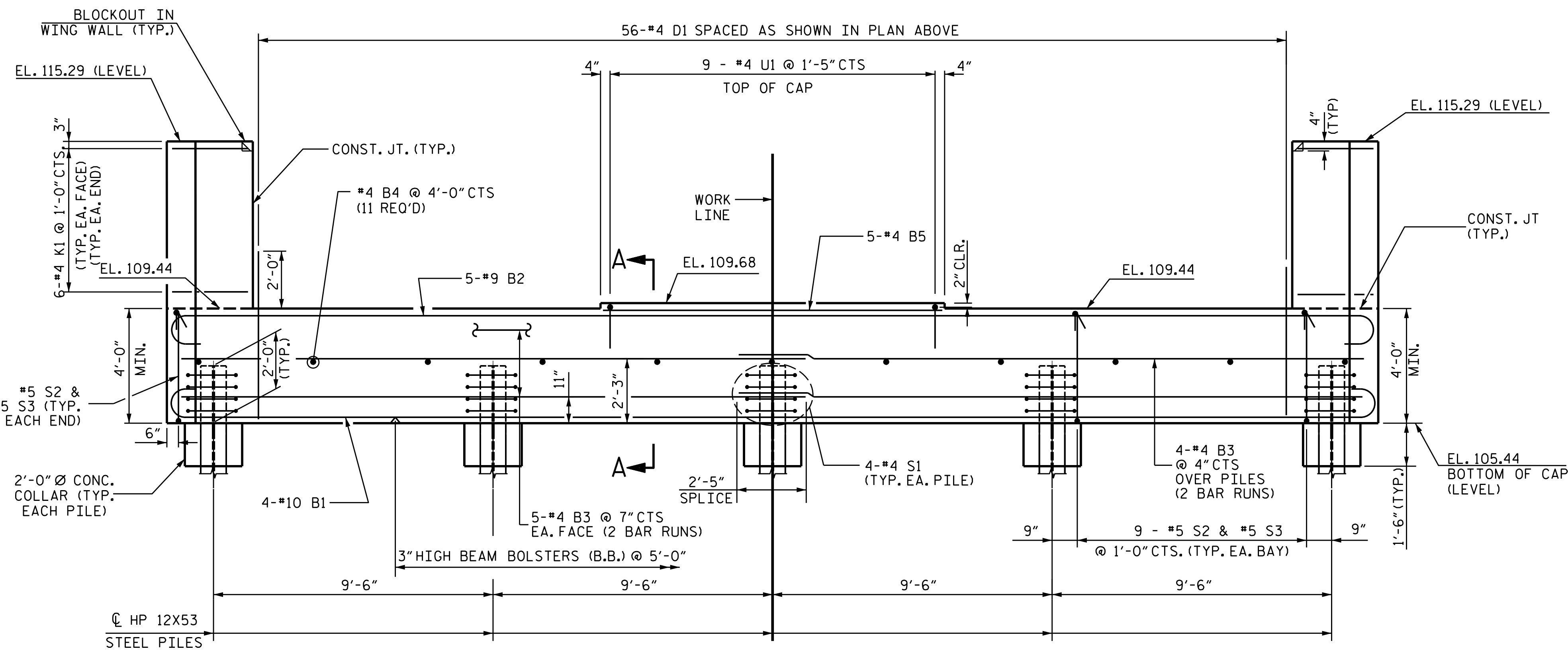
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS  
**KCI Associates**  
of North Carolina, P.A.  
4025 Falls of Hudson Road, Suite 400, Raleigh, NC 27609-4270 Phone 199-181-1024

STD. NO. BOM2

ASSEMBLED BY:	DocuSigned by:	DATE:	7/1/2021
ASSEMBLED BY:	A. K. ALLEN	DATE:	03/26/19
CHECKED BY:	R. C. LARSON	DATE:	09/11/20
DRAWN BY:	JMB 5/87	REV. 5/1/06	TLA/GM
CHECKED BY:	SJD 9/87	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC



PLAN OF CAP



ELEVATION

NOTES

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

FOR "TEMPORARY DRAINAGE AT END BENT", SEE END BENT 2.

FOR SECTION A-A SEE SHEET 3 OF 3.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 D1 BARS.

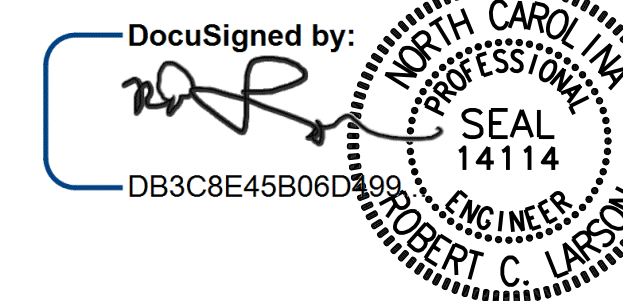
THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1  
 (INTEGRAL)



7/1/2021

DESIGN ENGINEER OF RECORD: DATE : 7/1/2021  
 DRAWN BY : F. A. BARHAM DATE : 02/28/19  
 CHECKED BY : R. C. LARSON DATE : 09/20/20

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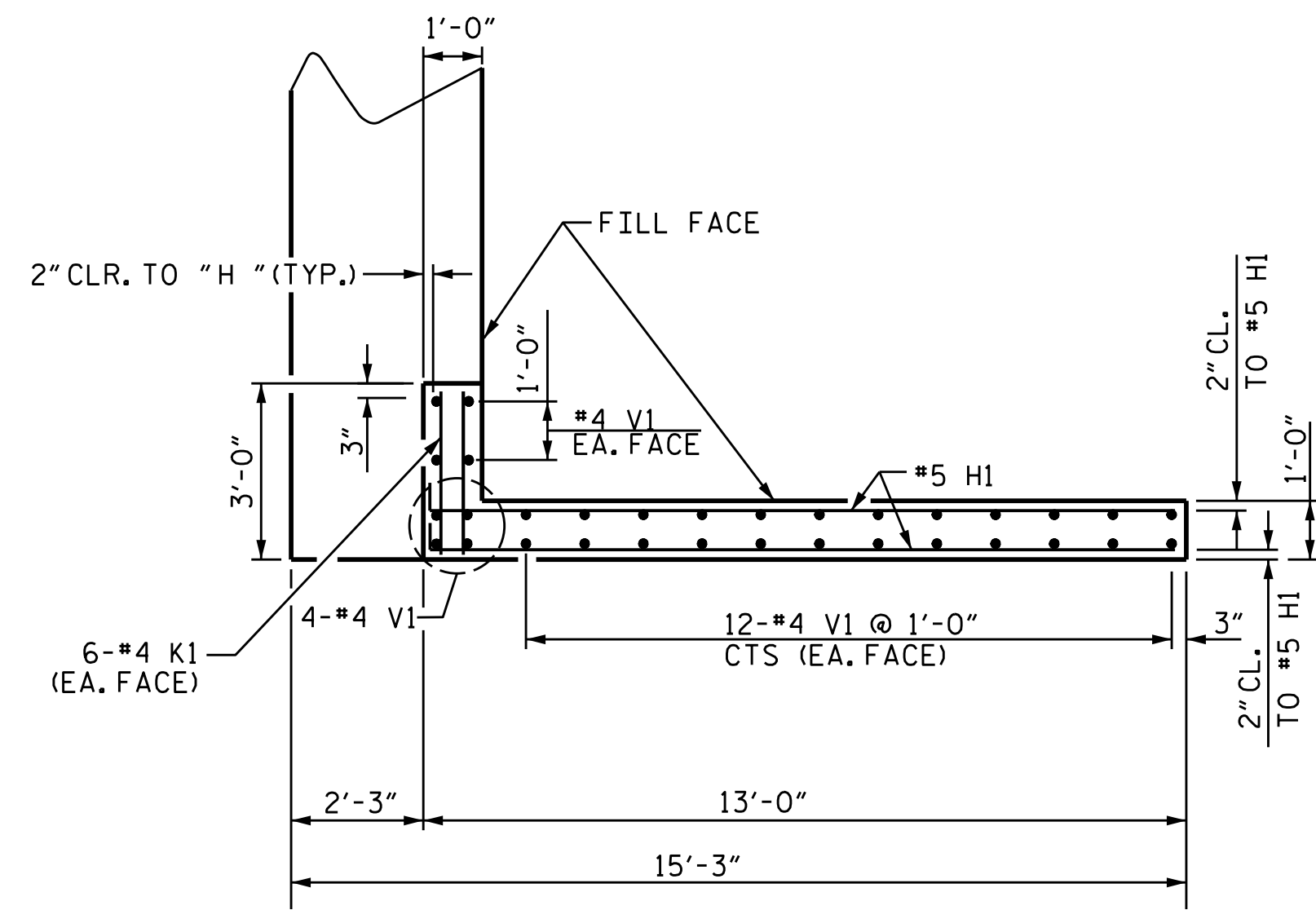


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NO.	DATE	NO.	DATE
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2		4	

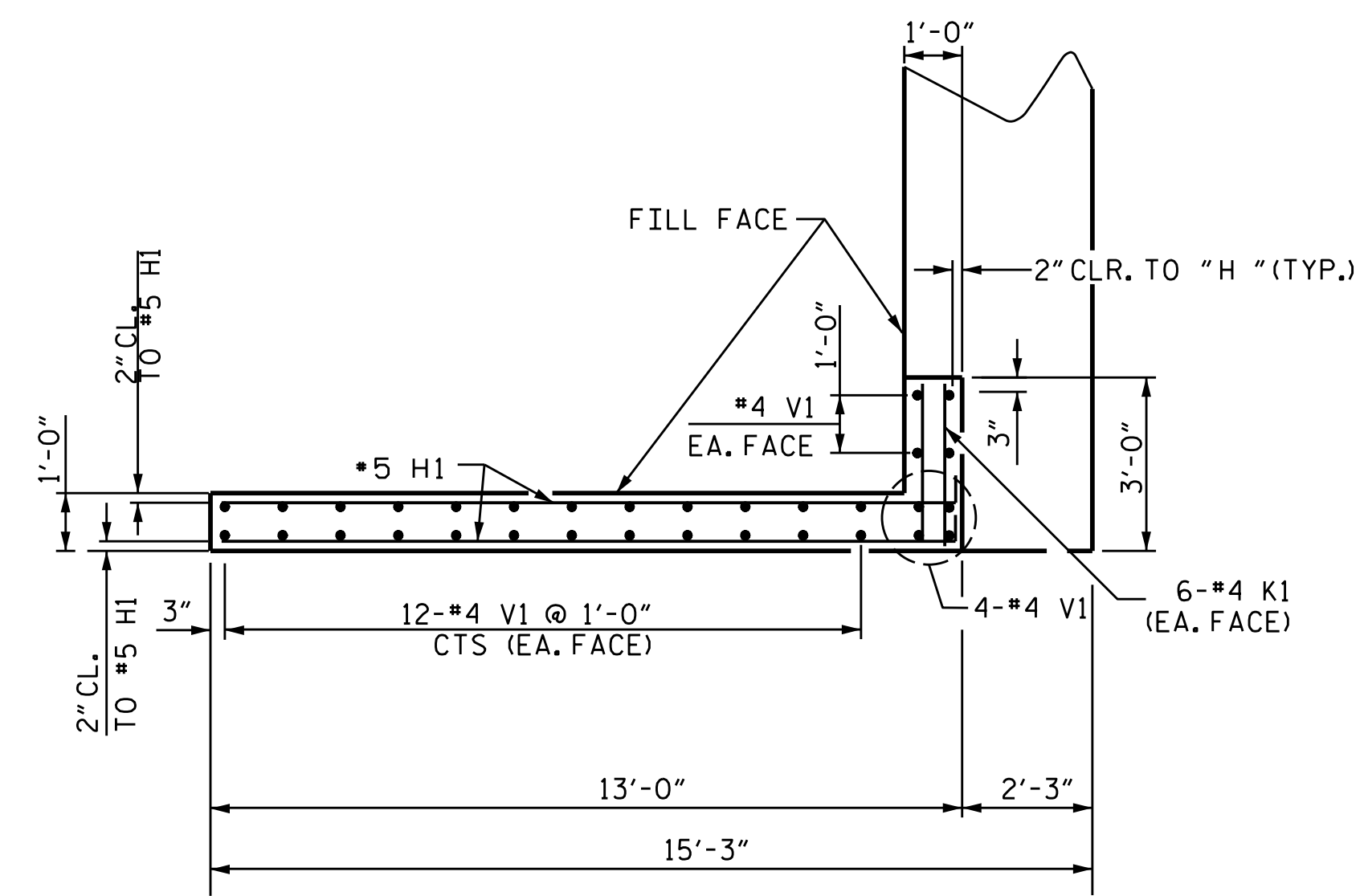
TOTAL SHEETS: 29

KCI JOB NO: 251801945.13

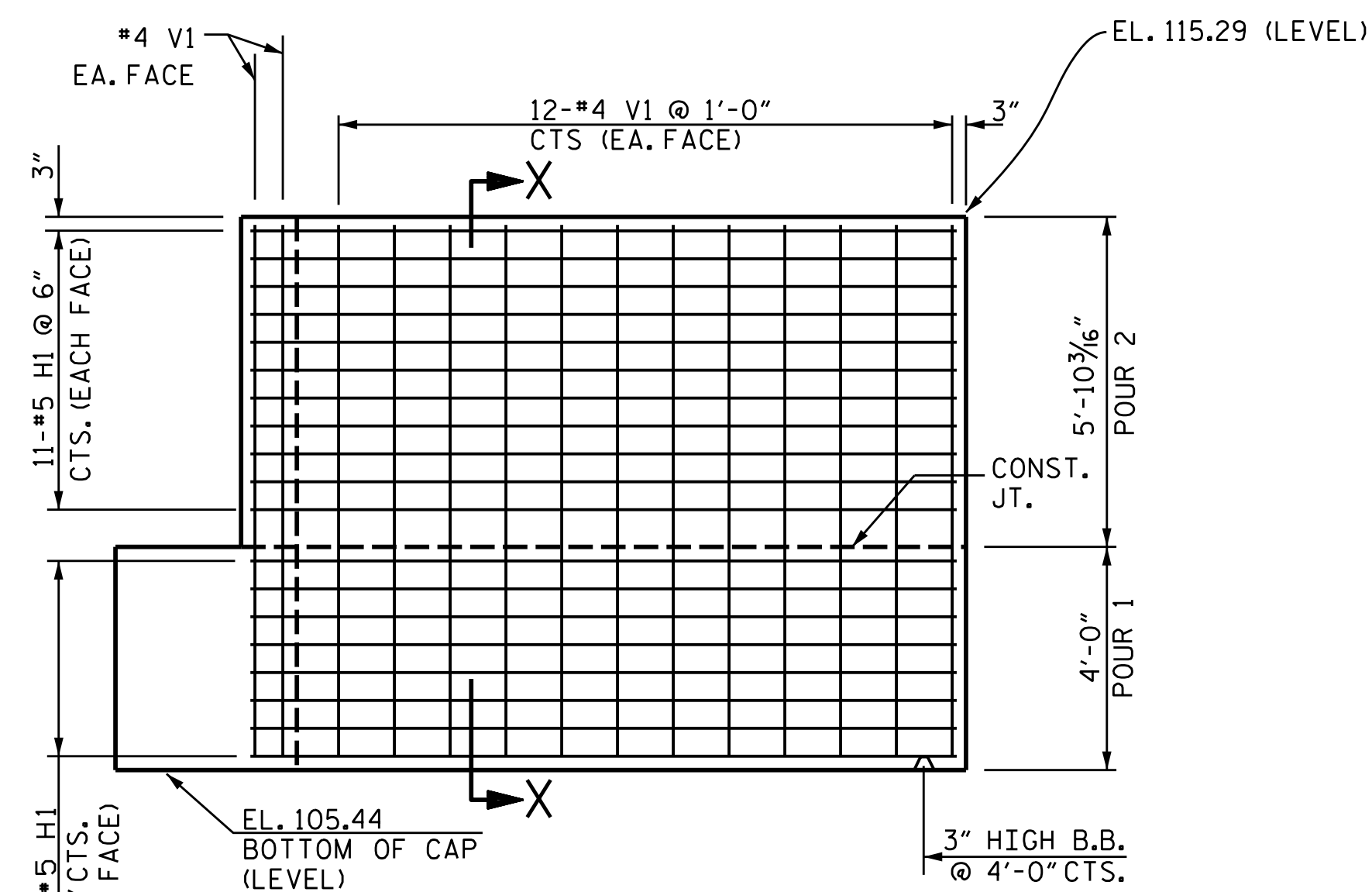
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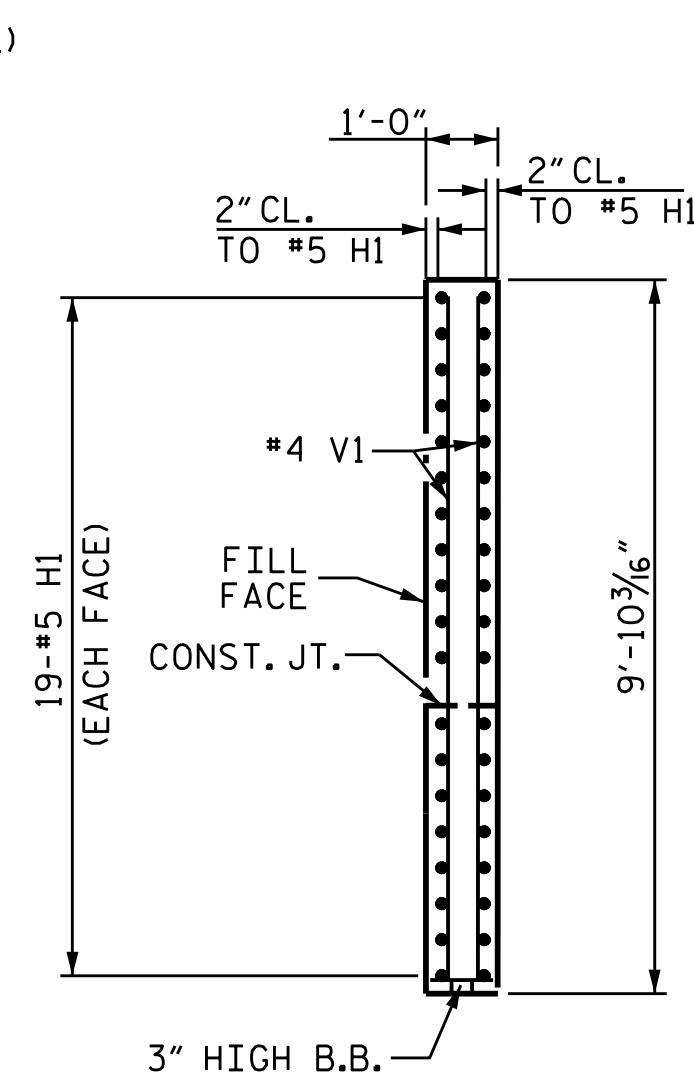
PLAN W1



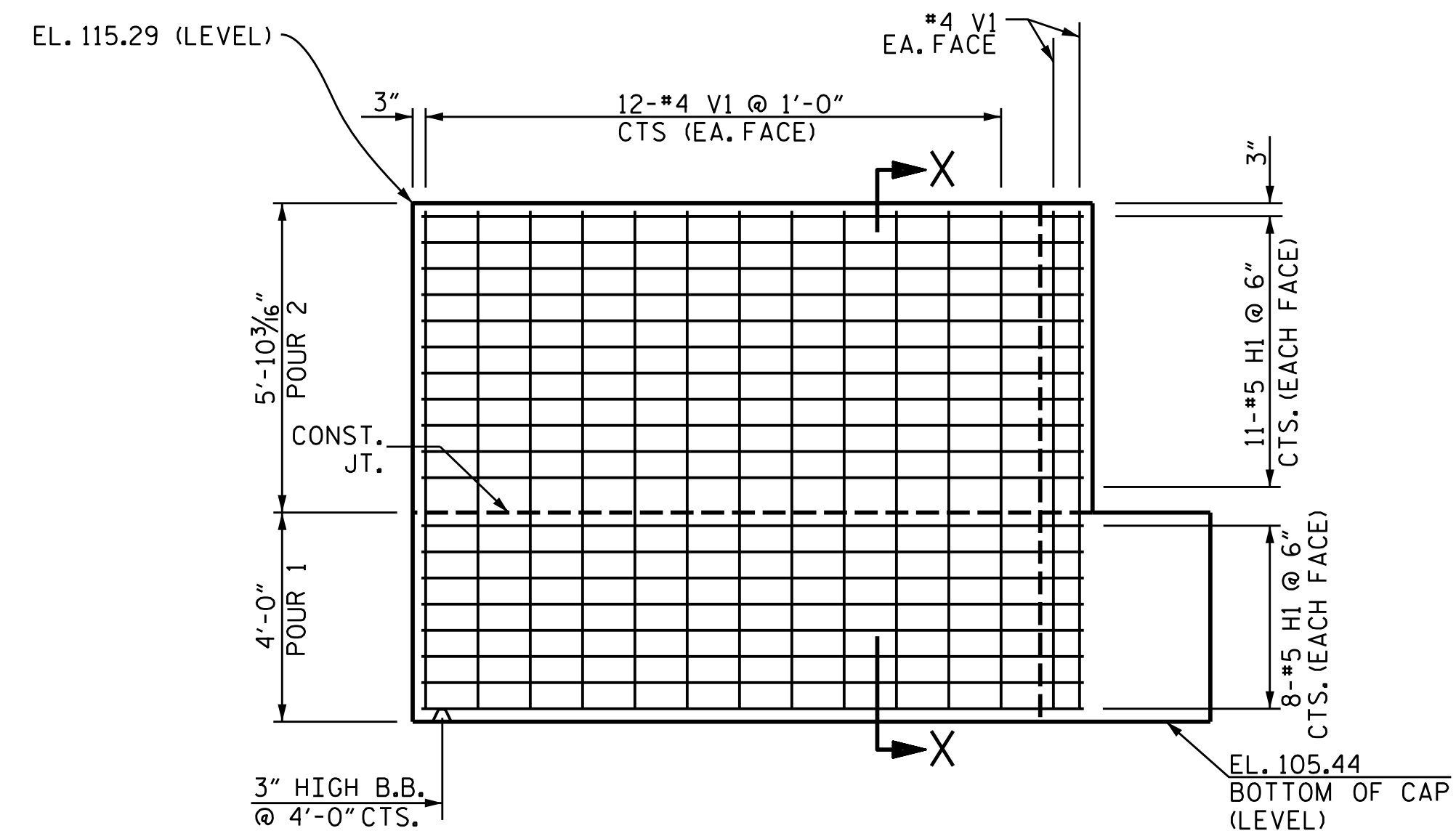
PLAN W2



ELEVATION W1



SECTION X-X



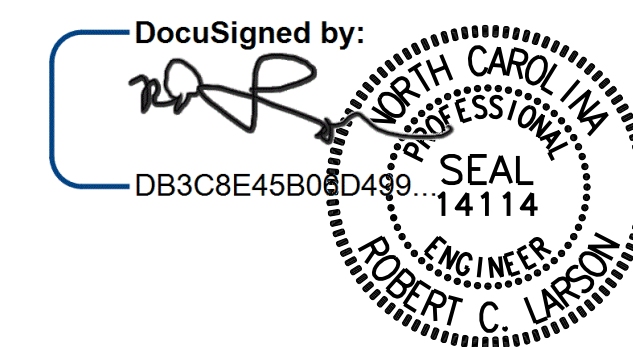
ELEVATION W2

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1



7/1/2021

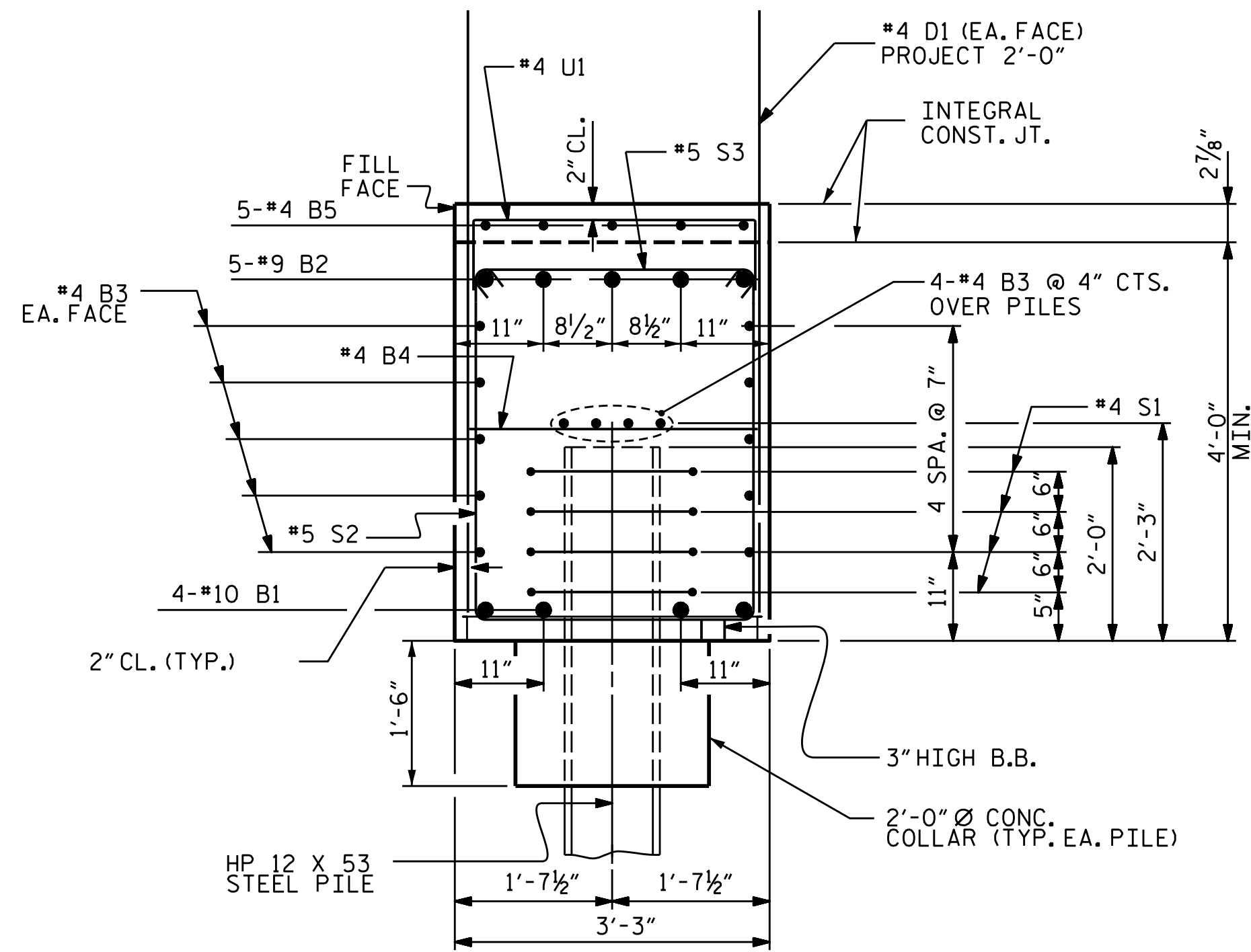
DESIGN ENGINEER OF RECORD: [Signature] DATE: 7/1/2021  
 DRAWN BY: F. A. BARHAM DATE: 03/12/19  
 CHECKED BY: R. C. LARSON DATE: 09/21/20

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 UNLESS ALL SIGNATURES COMPLETED

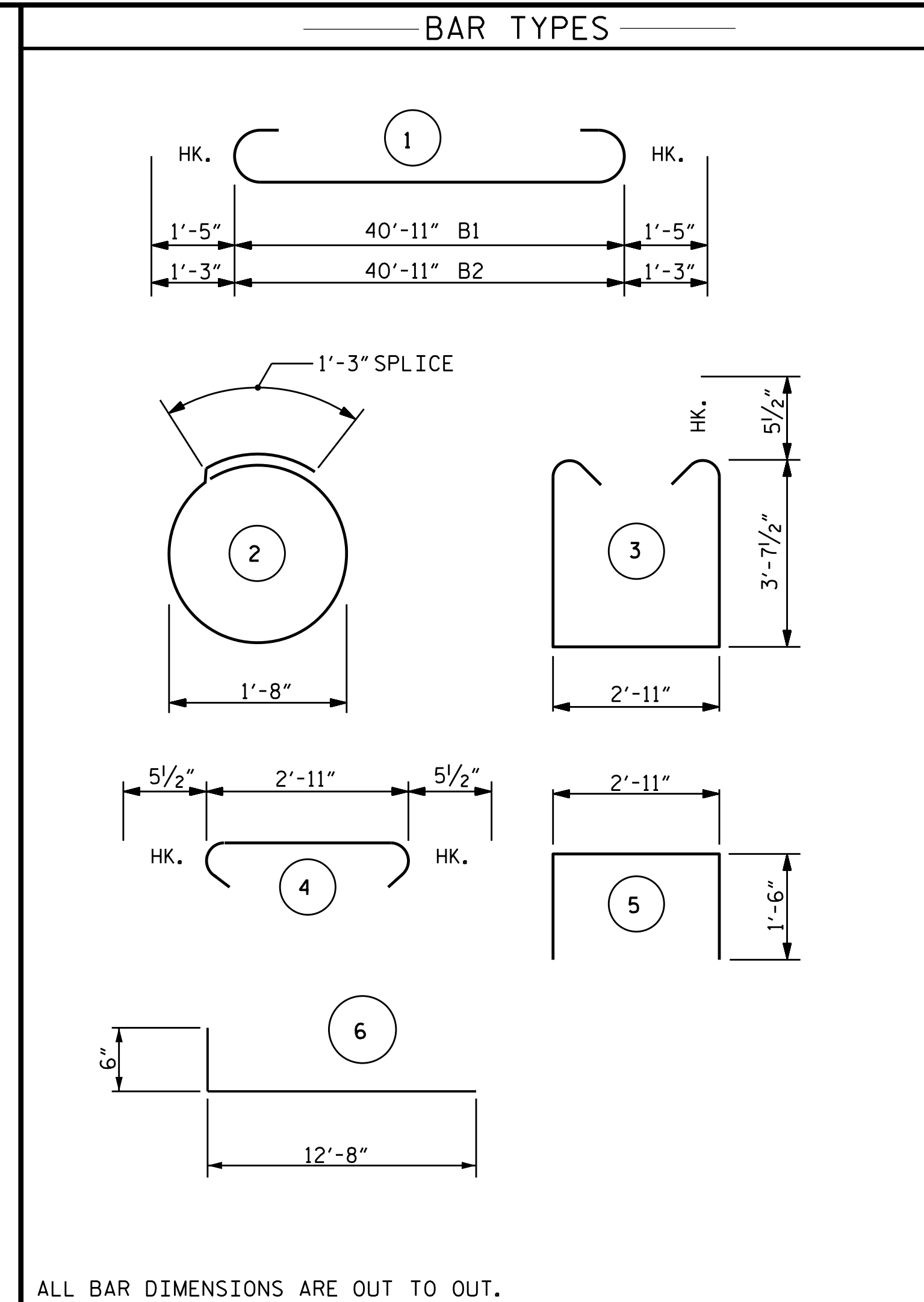
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: (919) 785-9241

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

TOTAL SHEETS: 29

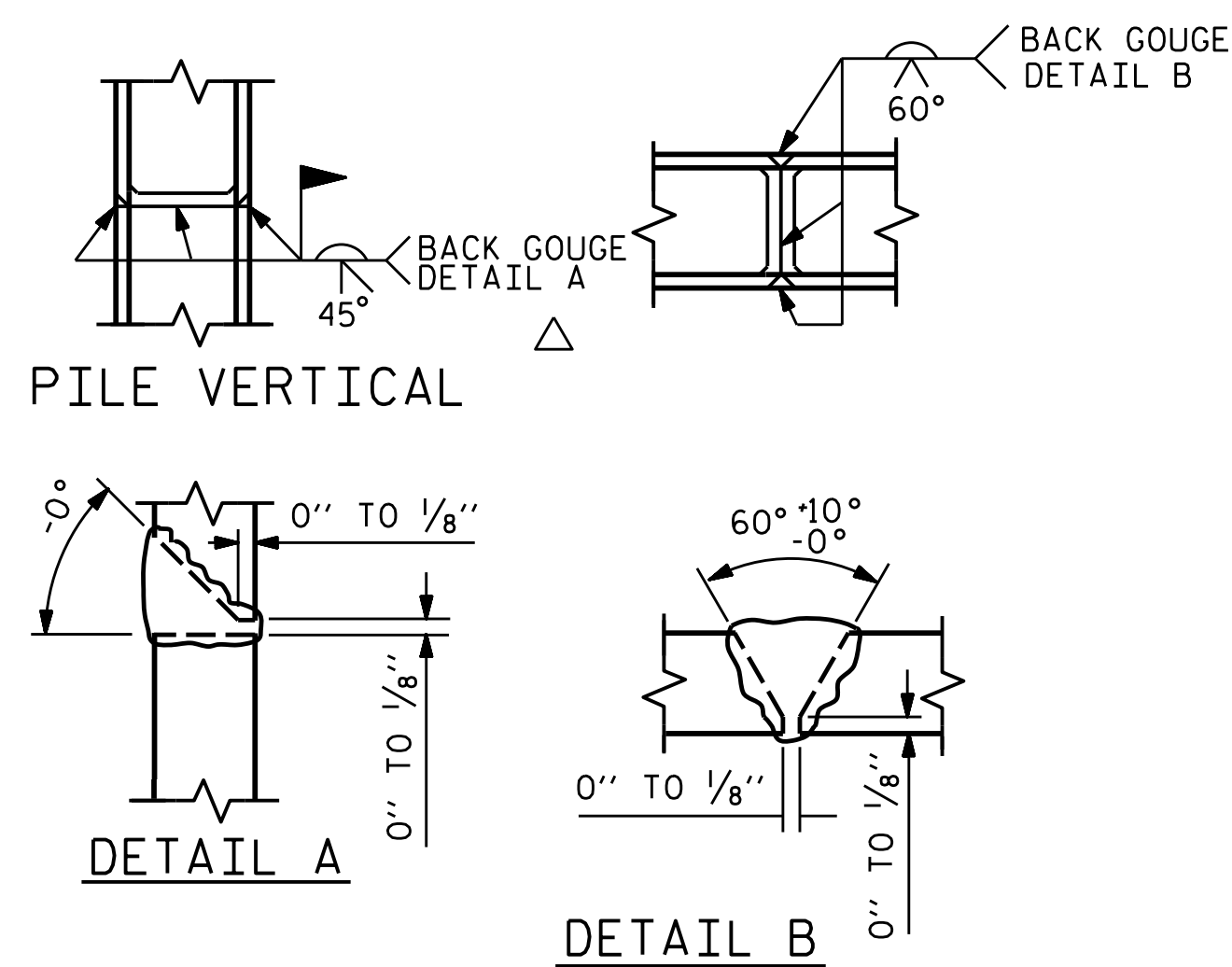


**SECTION A-A**

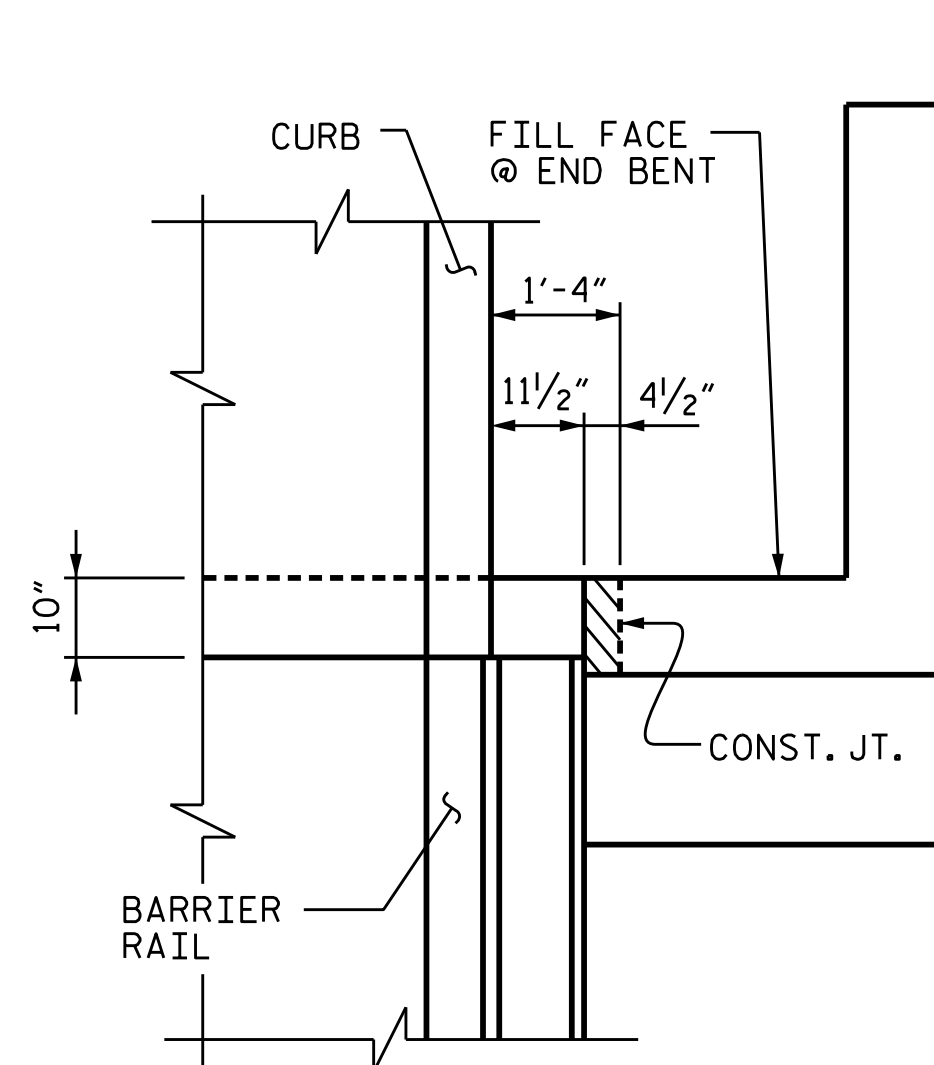


ALL BAR DIMENSIONS ARE OUT TO OUT.

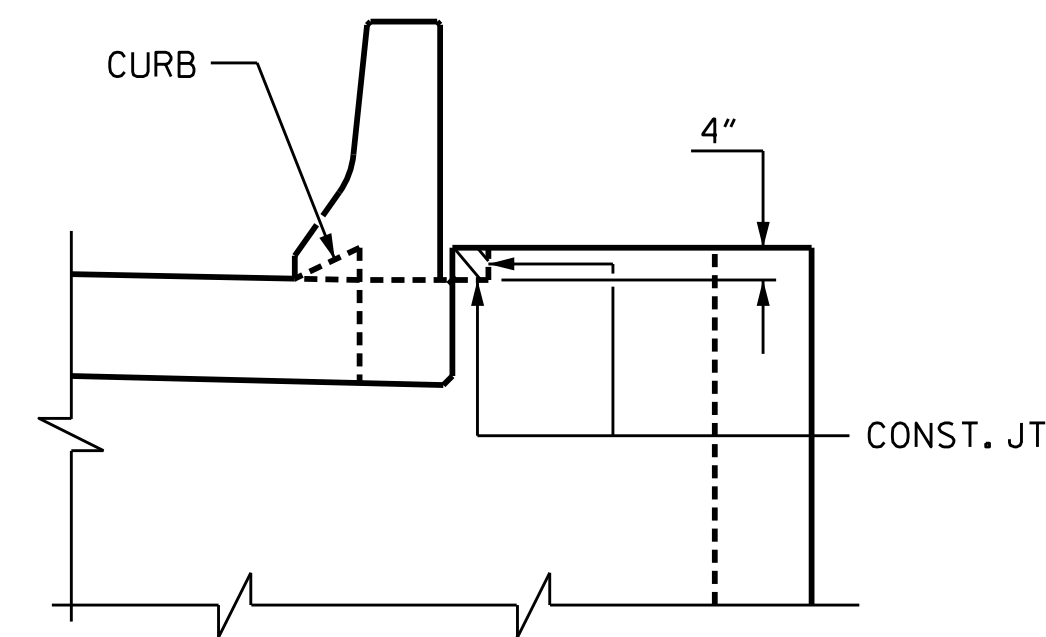
BILL OF MATERIAL					
END BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	10	1	43'-9"	753
B2	5	9	1	43'-5"	738
B3	28	4	STR.	21'-8"	405
B4	11	4	STR.	2'-11"	21
B5	5	4	STR.	11'-8"	39
D1	56	4	STR.	5'-10"	218
H1	76	5	6	13'-2"	1044
K1	24	4	STR.	2'-8"	43
S1	20	4	2	6'-6"	87
S2	38	5	3	11'-1"	439
S3	38	5	4	3'-10"	152
U1	9	4	5	5'-11"	36
V1	64	4	STR.	9'-6"	406
REINFORCING STEEL, LB					4381
CLASS A CONCRETE, CY				POUR 1	24.6
				POUR 2	6.5
TOTAL					31.1
HP 12X53 STEEL PILES				NO.	5
				LF	275
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.					5
PILE REDRIVES, EA.					3



**PILE SPLICE DETAILS**



**PLAN**



**ELEVATION**

**BLOCKOUT IN WING WALL**

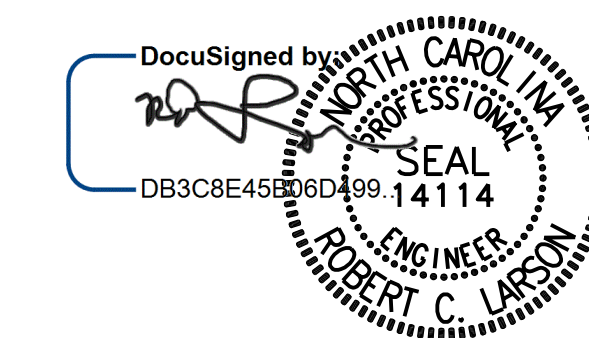
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
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SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1**



7/1/2021

DESIGN ENGINEER OF RECORD:	DATE:
<i>[Signature]</i>	7/1/2021
DRAWN BY: F. A. BARHAM	DATE: 03/12/19
CHECKED BY: R. C. LARSON	DATE: 09/21/20

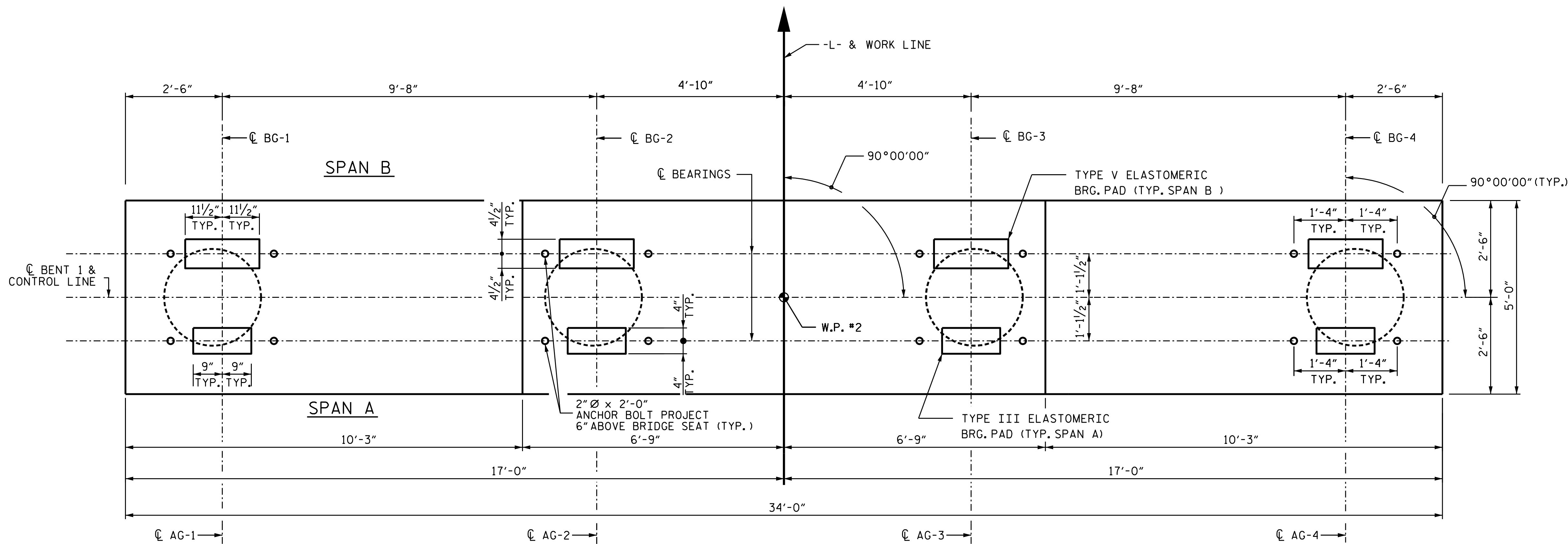
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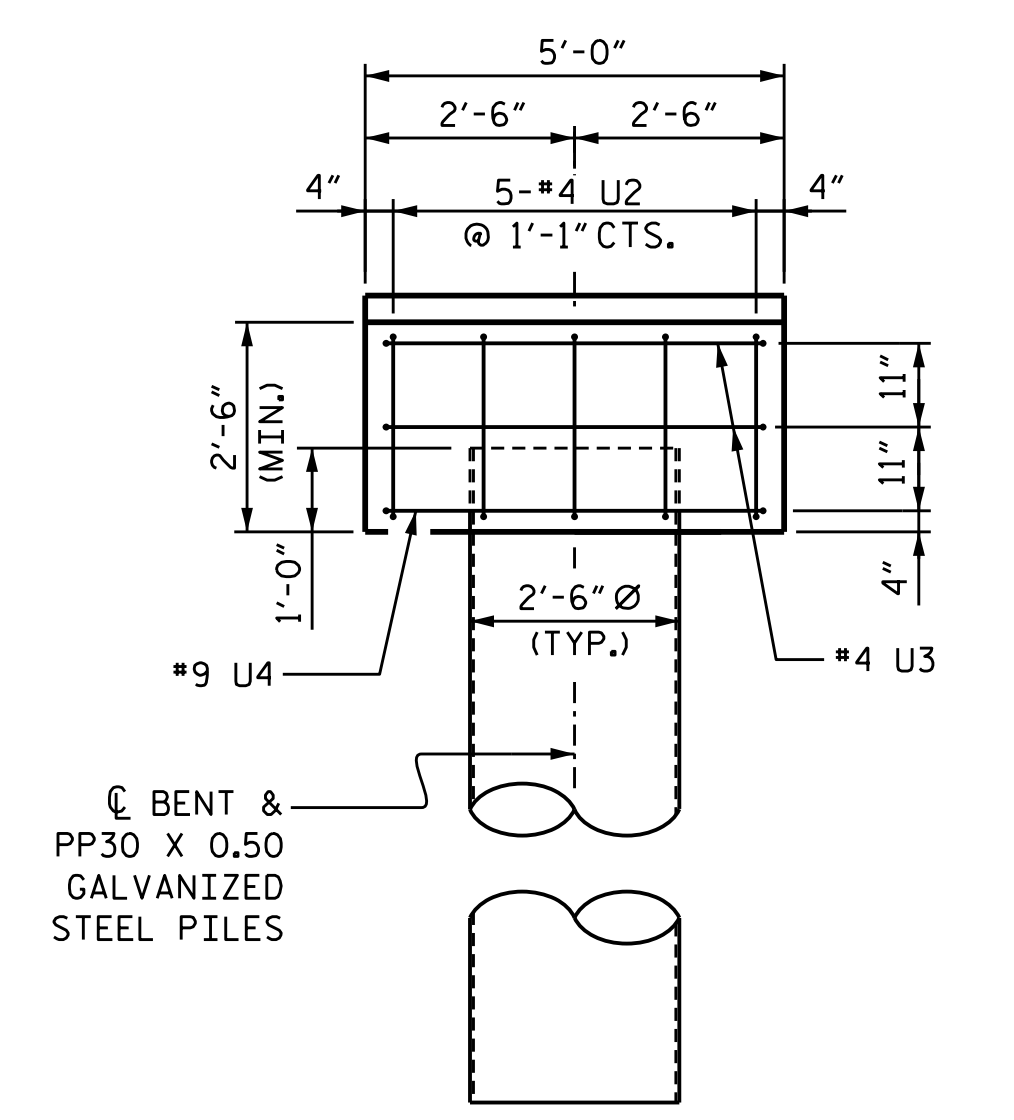
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-20
TOTAL SHEETS	29

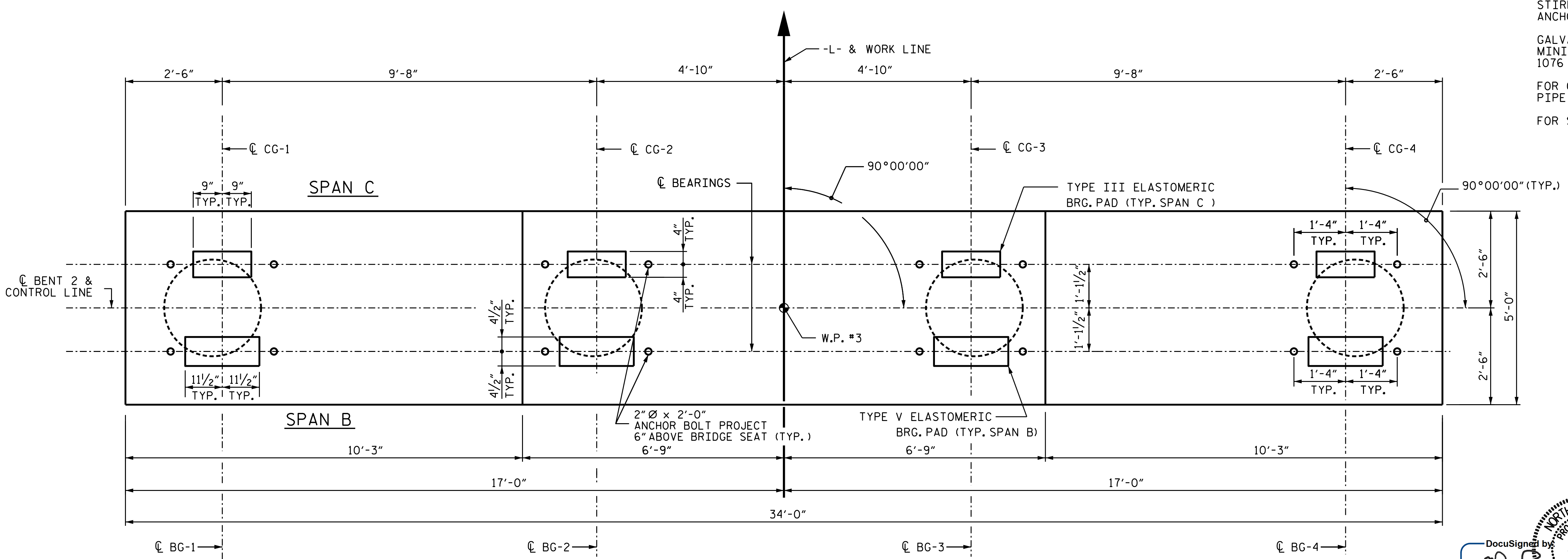
KCI JOB NO: 251801945.13



PLAN OF CAP - BENT 1



TYPICAL END ELEVATION



PLAN OF CAP - BENT 2

NOTES

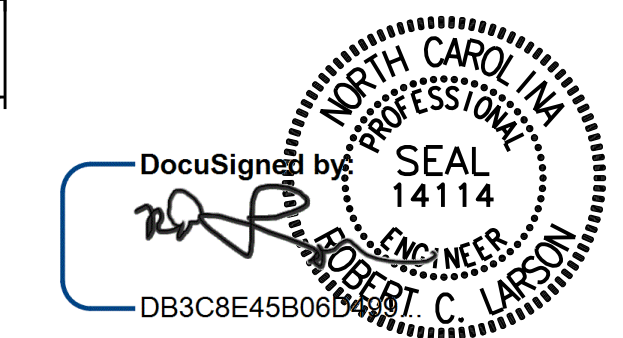
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 45'. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
- FOR CONCRETE PLUG AND REINFORCING IN PILES SEE "30" STEEL PIPE PILE" SHEET.
- FOR SECTION THRU BENT CAP SEE SHEET 2 OF 2

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 BENT 1 OR 2**



KCI JOB NO: 251801945.13

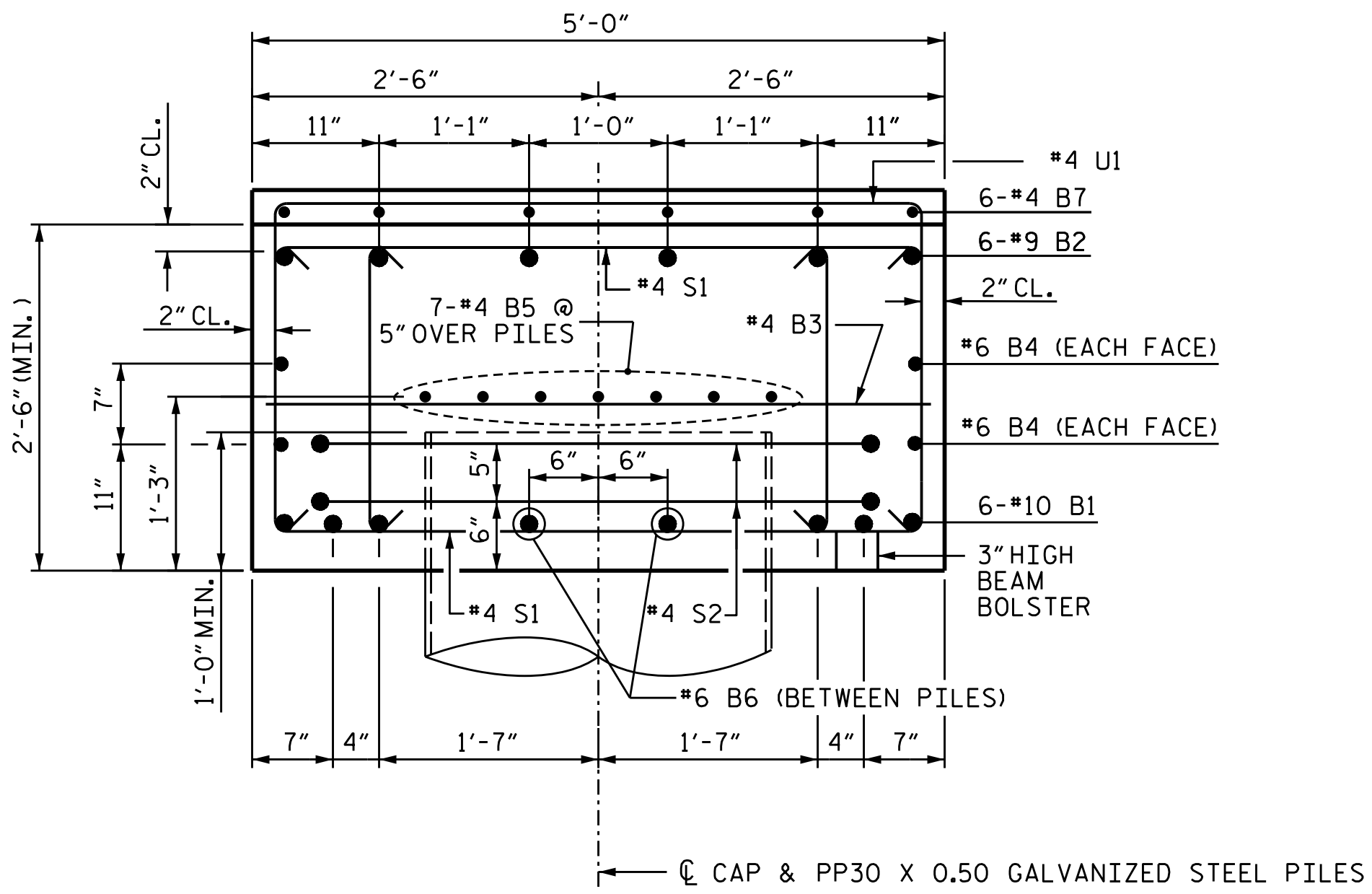
DESIGN ENGINEER OF RECORD: [Signature] DATE: 7/1/2021  
 DRAWN BY: A. K. ALLANKER DATE: 09/23/20  
 CHECKED BY: R. C. LARSON DATE: 09/27/20

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

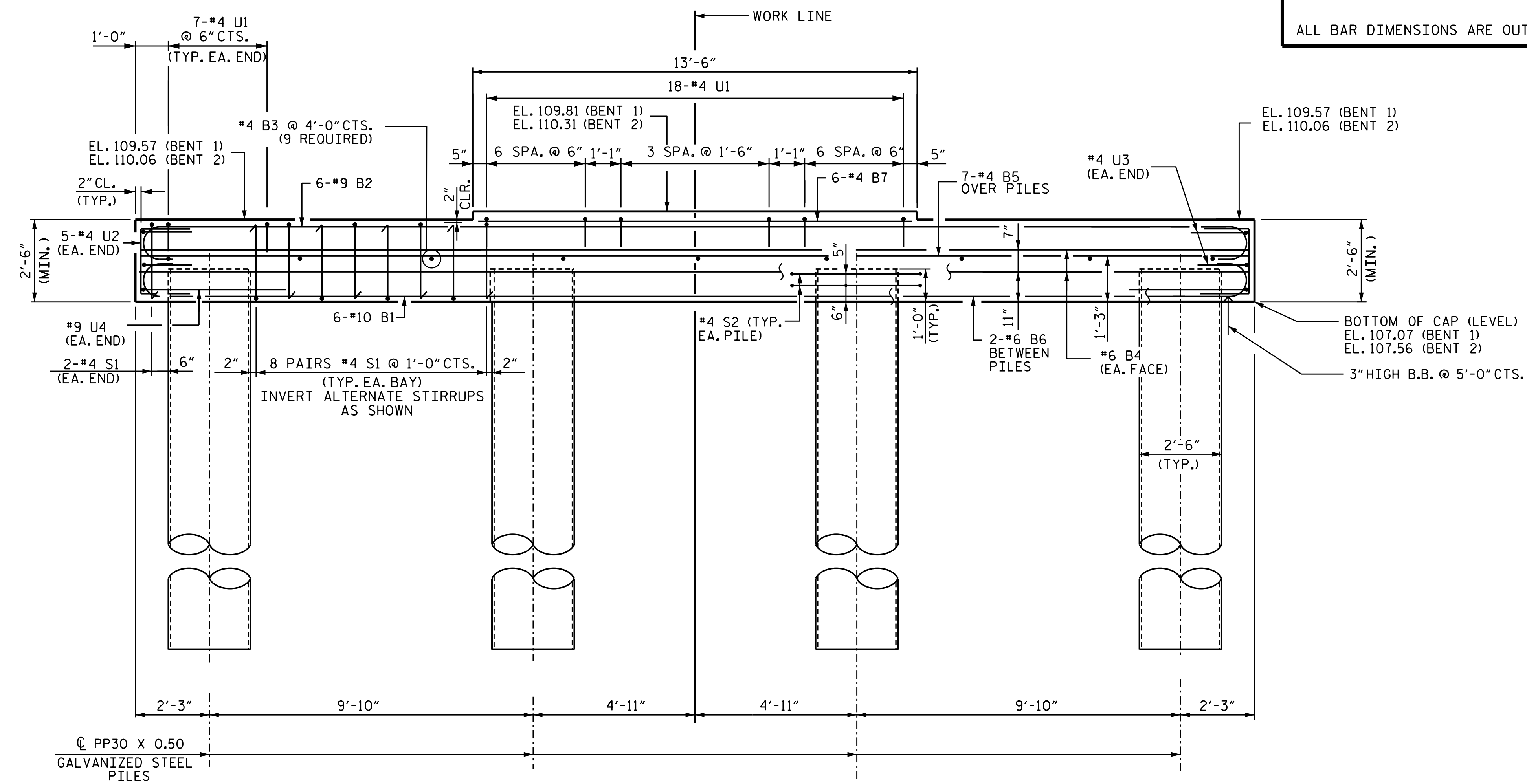
KCI Associates  
 of North Carolina, P.A.  
 4005 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone 199-785-9244

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

TOTAL SHEETS: 29

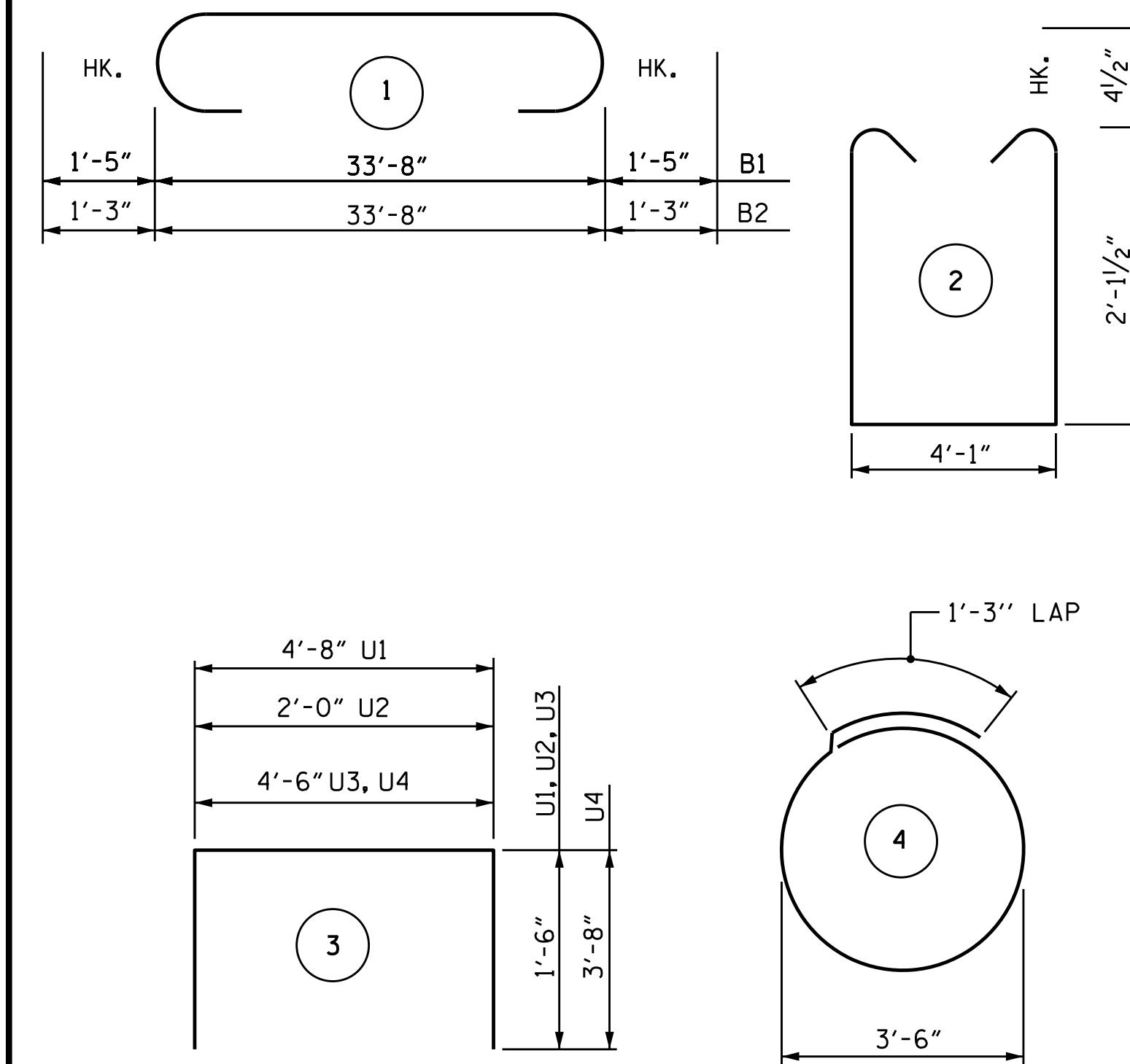


SECTION THRU BENT CAP



ELEVATION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR BENT 1 OR 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	1	36'-6"	942
B2	6	9	1	36'-2"	738
B3	9	4	STR.	4'-8"	28
B4	4	6	STR.	33'-8"	202
B5	7	4	STR.	33'-8"	157
B6	6	6	STR.	7'-0"	63
B7	6	4	STR.	13'-2"	53
S1	52	4	2	9'-1"	316
S2	8	4	4	12'-3"	65
U1	32	4	3	7'-8"	164
U2	10	4	3	5'-0"	33
U3	4	4	3	7'-6"	20
U4	2	9	3	11'-10"	80

REINFORCING STEEL, LBS. 2861

CLASS A CONCRETE, CU. YD. 15.6

PP 30 X 0.50 GALVANIZED STEEL PILES

NO. 4

LIN. FT. 230 - BENT 1

LIN. FT. 260 - BENT 2

PILE DRIVING EQUIPMENT SETUP FOR

PP 30 X 0.50 GALVANIZED STEEL PILES, EA. 4

PILE REDRIVES, EA. 2

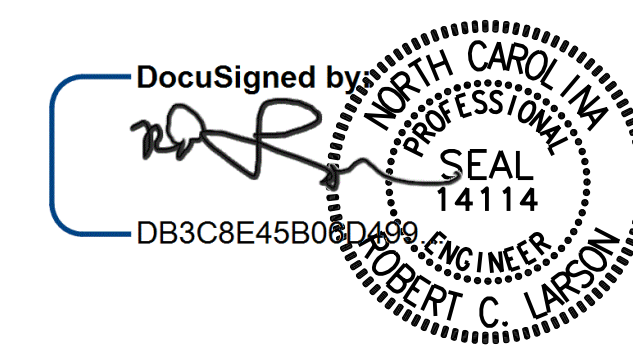
(NOTE: PILE HEADS HAVE BEEN DEDUCTED FROM CLASS A CONCRETE)

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1 OR 2



7/1/2021

REVISIONS

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

DESIGN ENGINEER OF RECORD: [Signature] DATE: 7/1/2021

DRAWN BY: A. K. ALLANKI DATE: 09/23/20

CHECKED BY: R. C. LARSON DATE: 09/27/20

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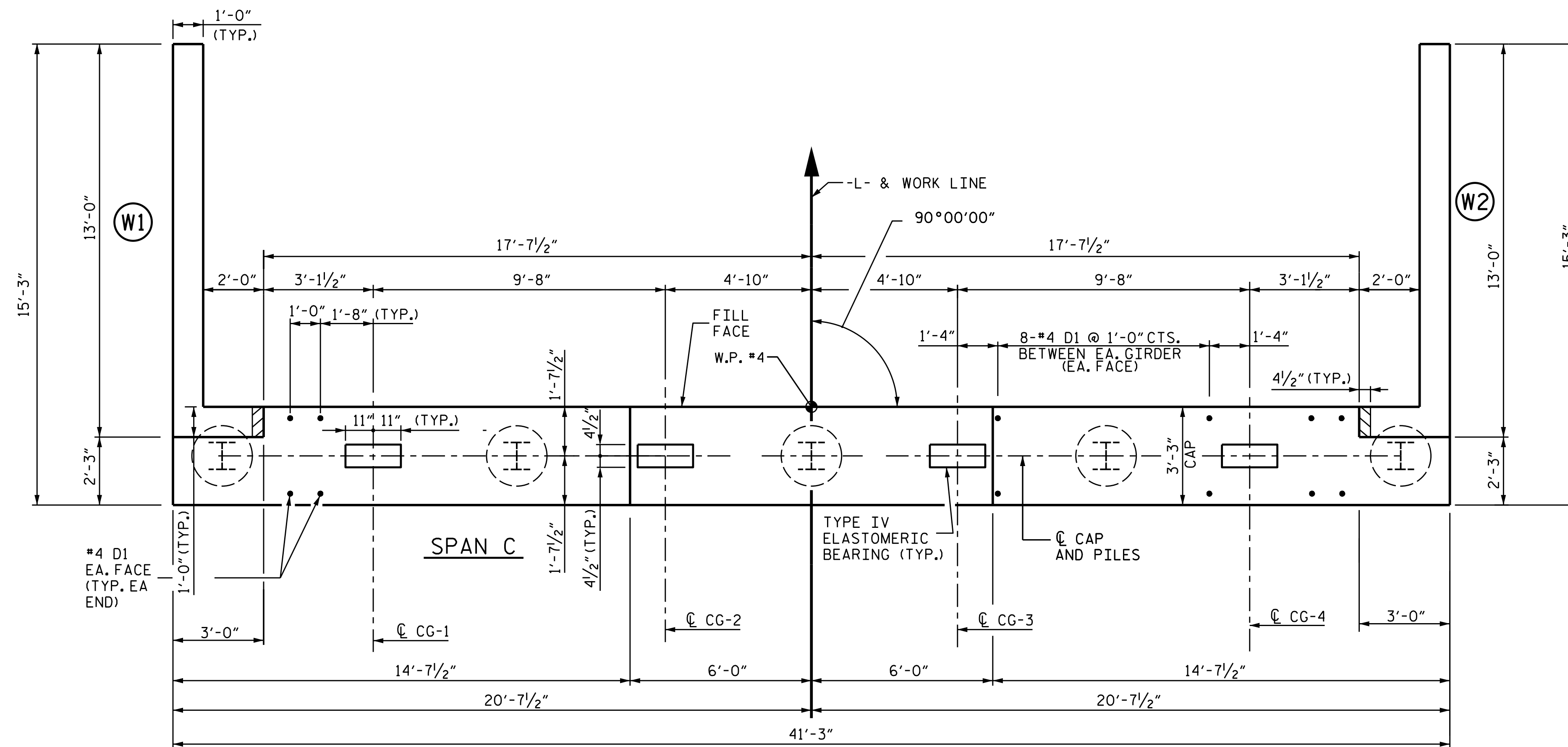
SHEET NO.

S- 22

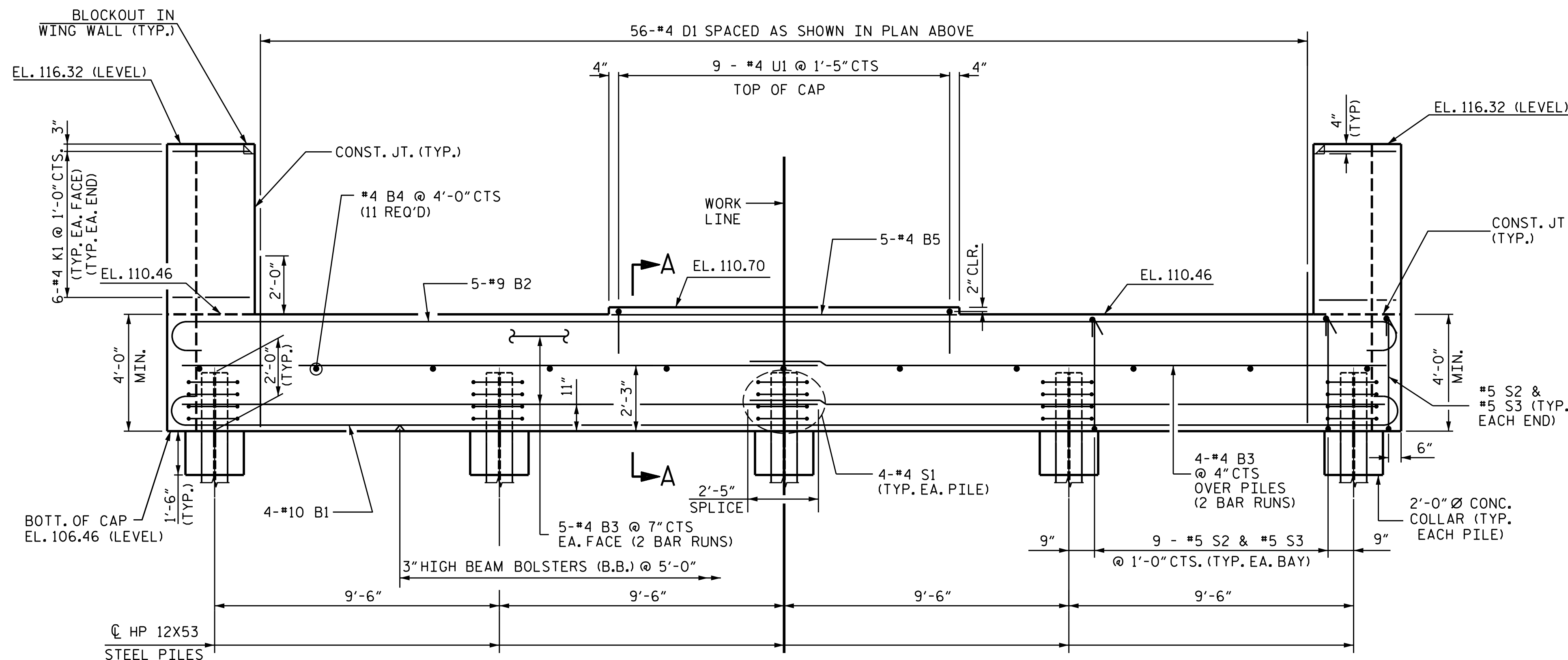
TOTAL SHEETS

29

KCI JOB NO: 251801945.13



**PLAN OF CAP**



**ELEVATION**

**NOTES**

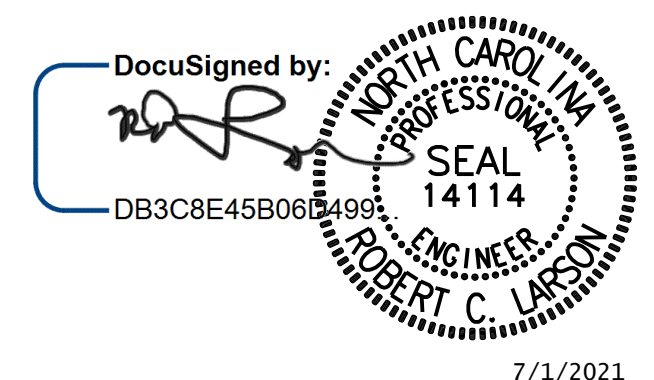
- THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1) EXCEPT THE BEARING AREAS AND THE AREA OUTSIDE OF THE SUPERSTRUCTURE SHALL BE RAKED TO A DEPTH OF 1/4".
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIPFORMING IS USED.
- FOR "PILE SPLICE DETAILS", SEE END BENT 1.
- FOR "BLOCKOUT IN WING WALL", SEE END BENT 1.
- FOR SECTION A-A SEE SHEET 3 OF 3.
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 D1 BARS.
- THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2  
 (INTEGRAL)**



7/1/2021

DESIGN ENGINEER OF RECORD	DATE:
<i>[Signature]</i>	7/1/2021
DRAWN BY: A. K. ALLANKI	DATE: 10/01/20
CHECKED BY: R. C. LARSON	DATE: 10/07/20

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

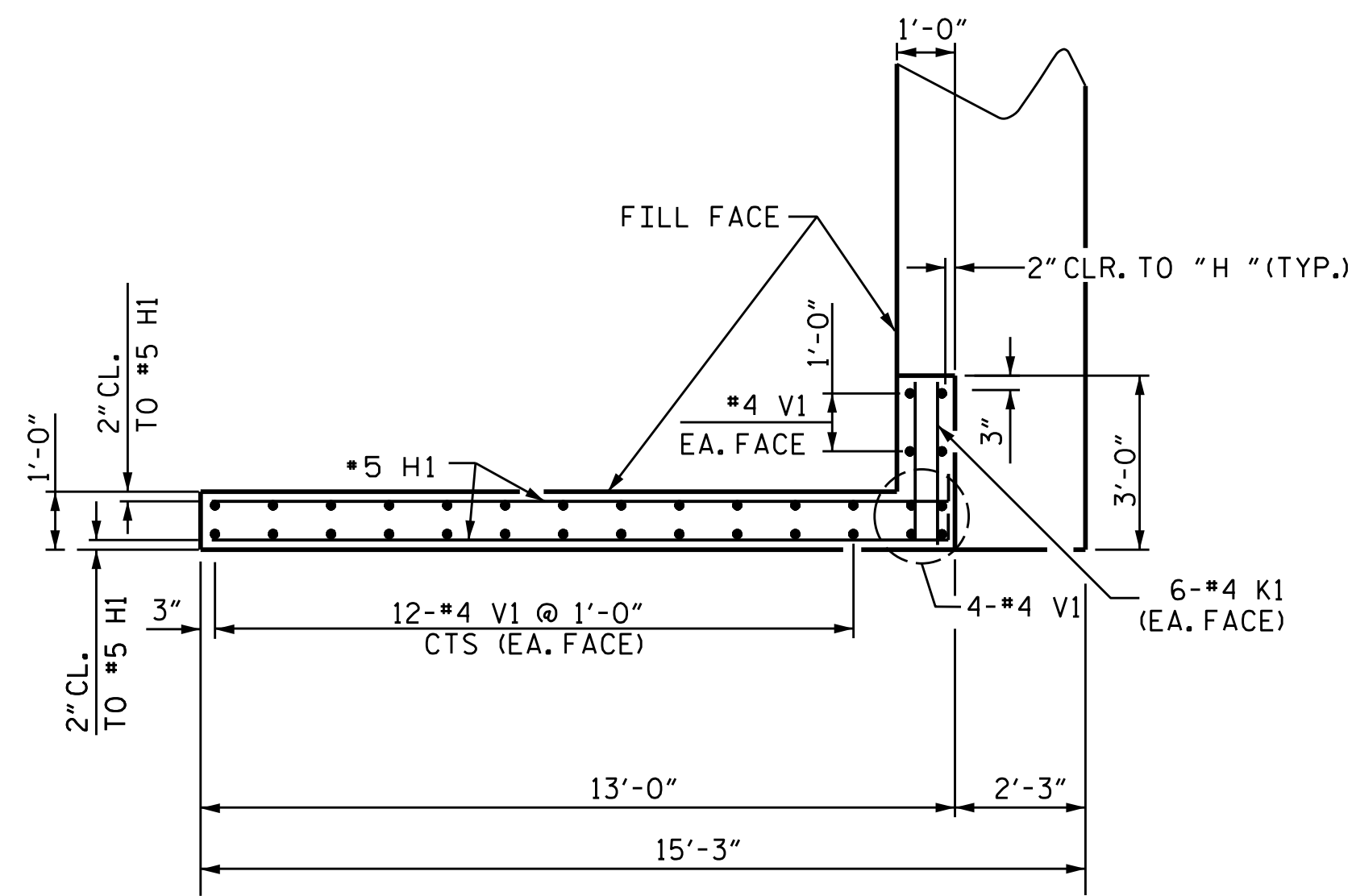


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

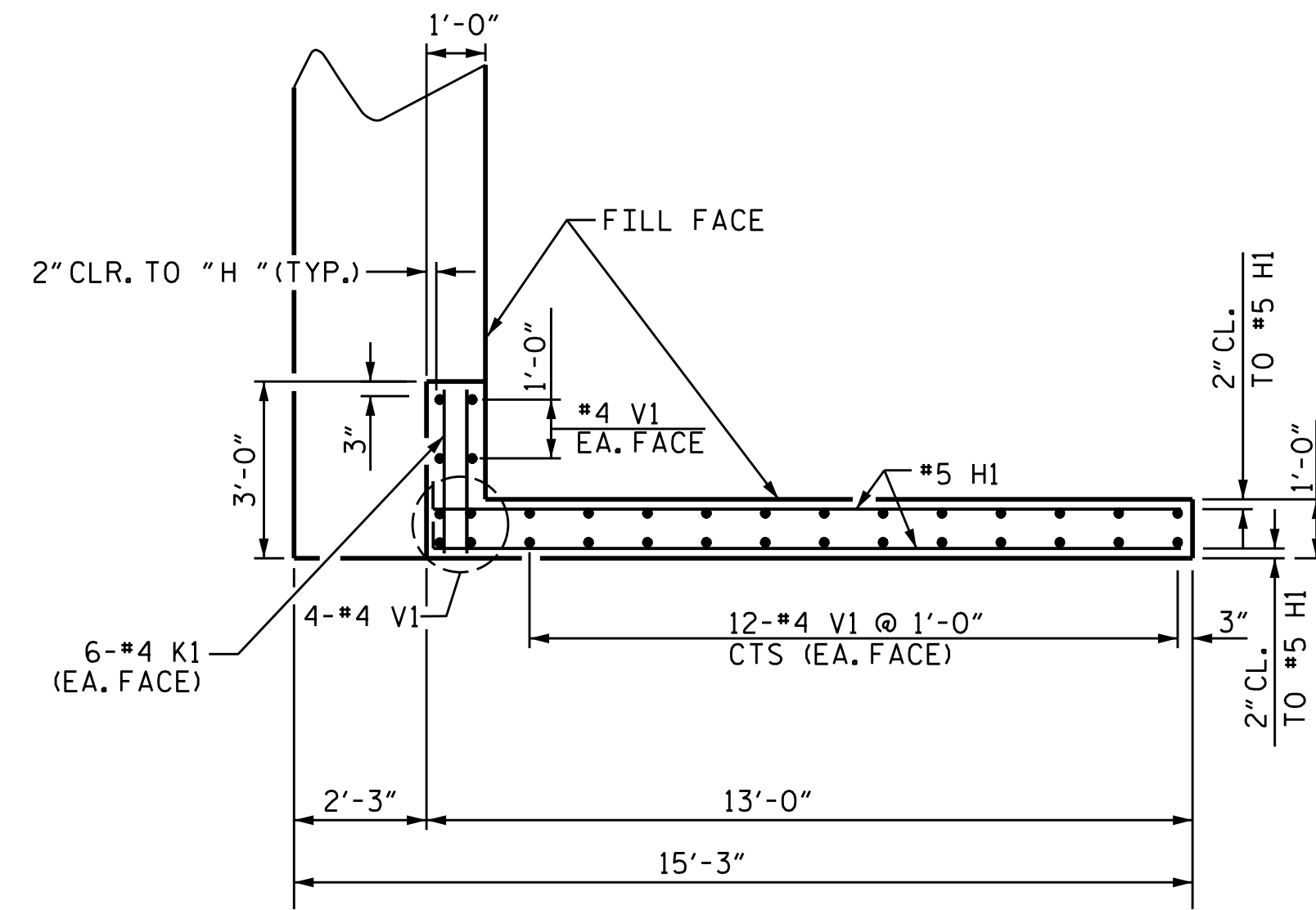
TOTAL SHEETS: 29

KCI JOB NO: 251801945.13

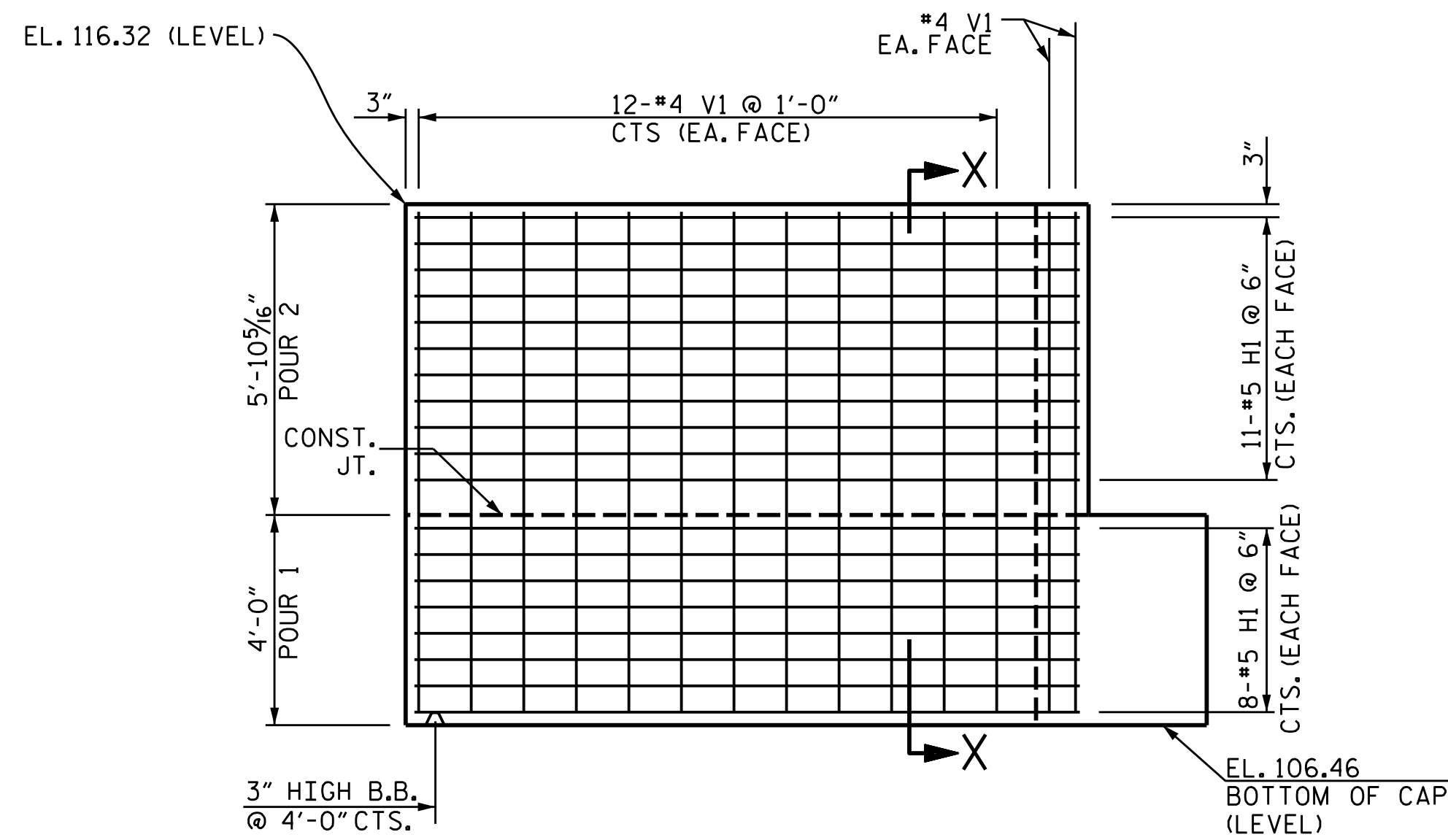




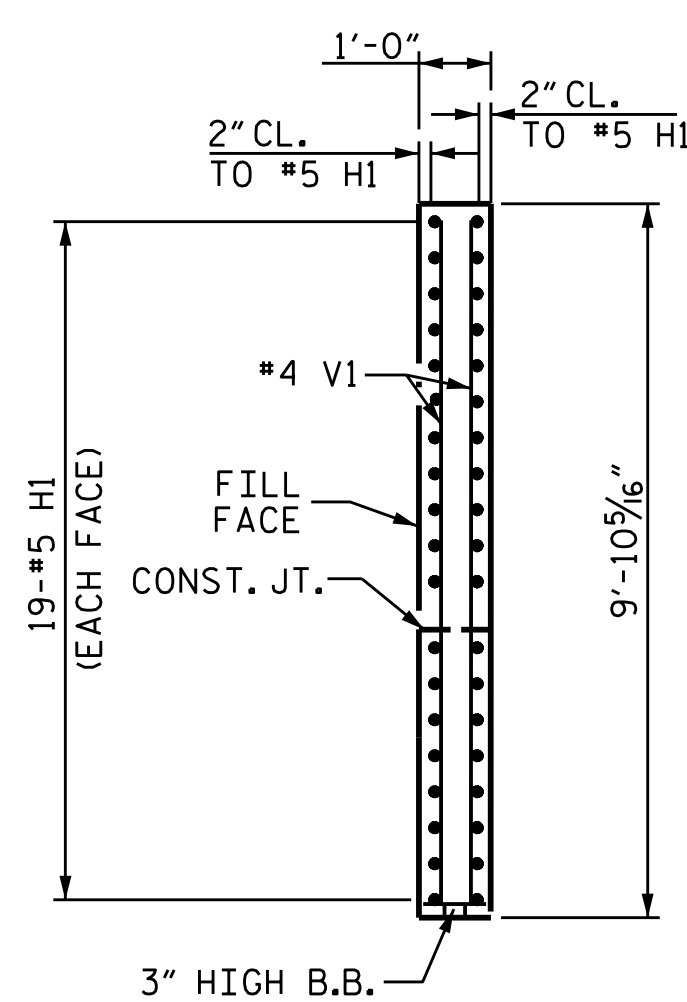
PLAN W1



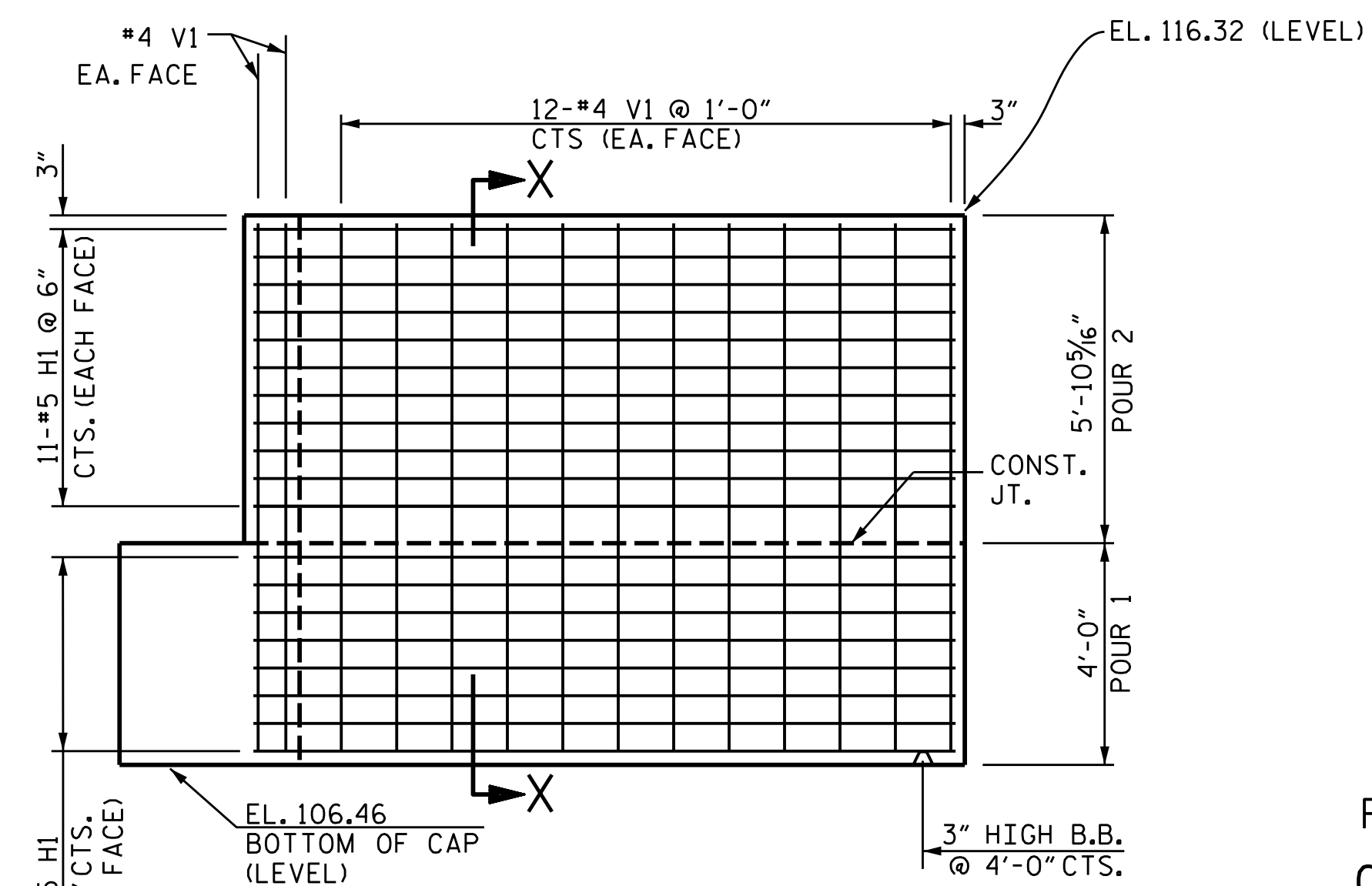
PLAN W2



ELEVATION W1



SECTION X-X



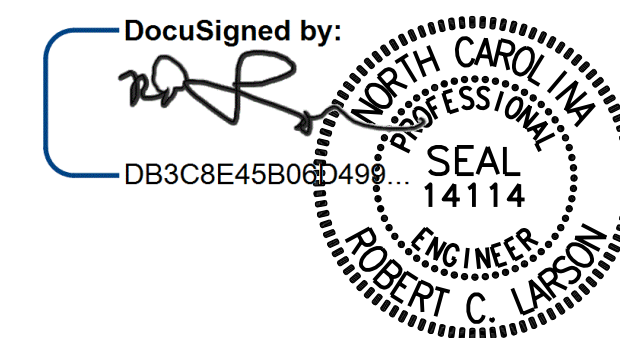
ELEVATION W2

PROJECT NO. B-5703  
 CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2



7/1/2021

DESIGN ENGINEER OF RECORD: [Signature] DATE: 7/1/2021  
 DRAWN BY: A. K. ALLANKI DATE: 10/02/20  
 CHECKED BY: R. C. LARSON DATE: 10/07/20

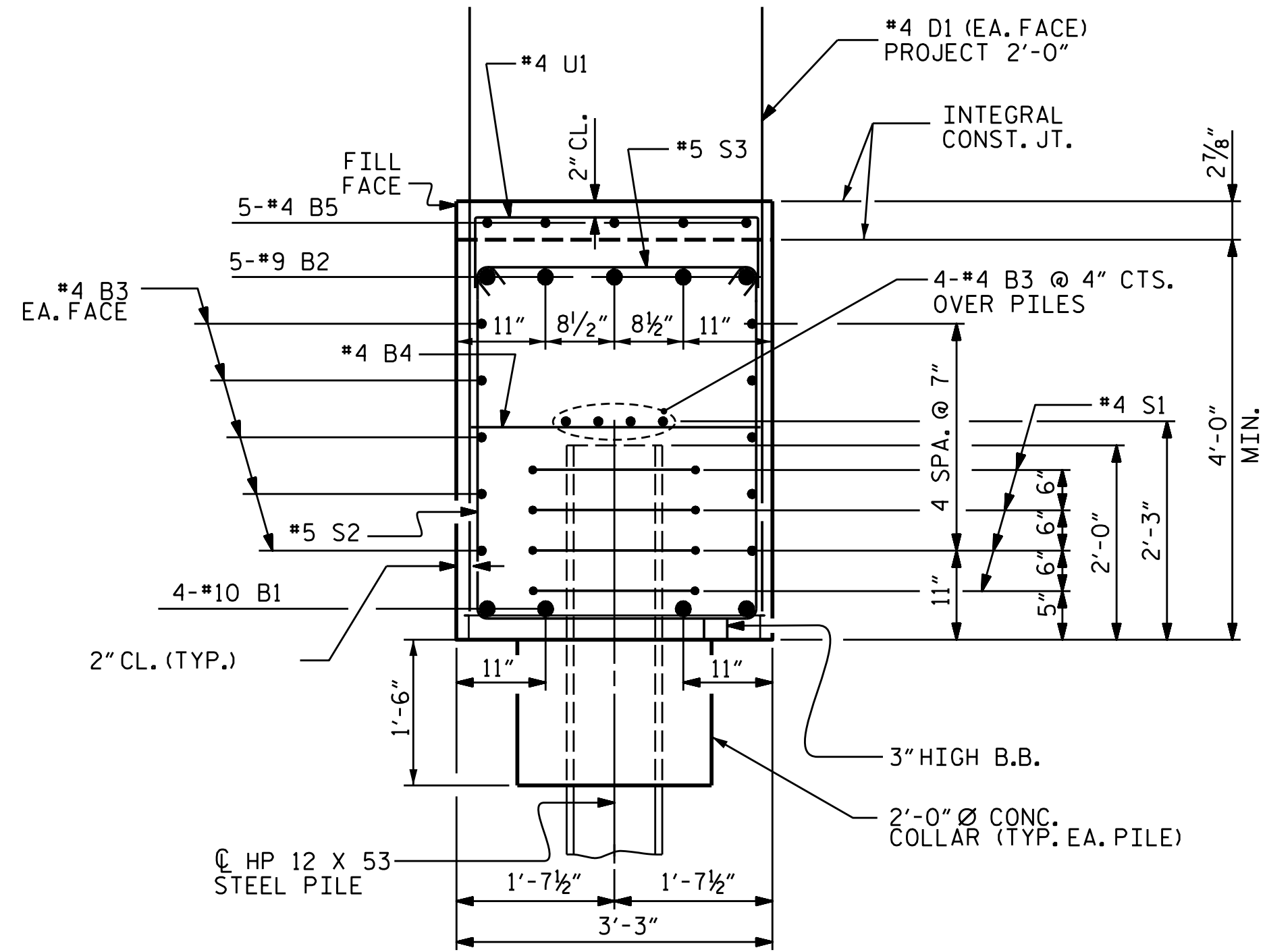
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 UNLESS ALL SIGNATURES COMPLETED

ENGINEERS, PLANNERS & SCIENTISTS IN CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9241

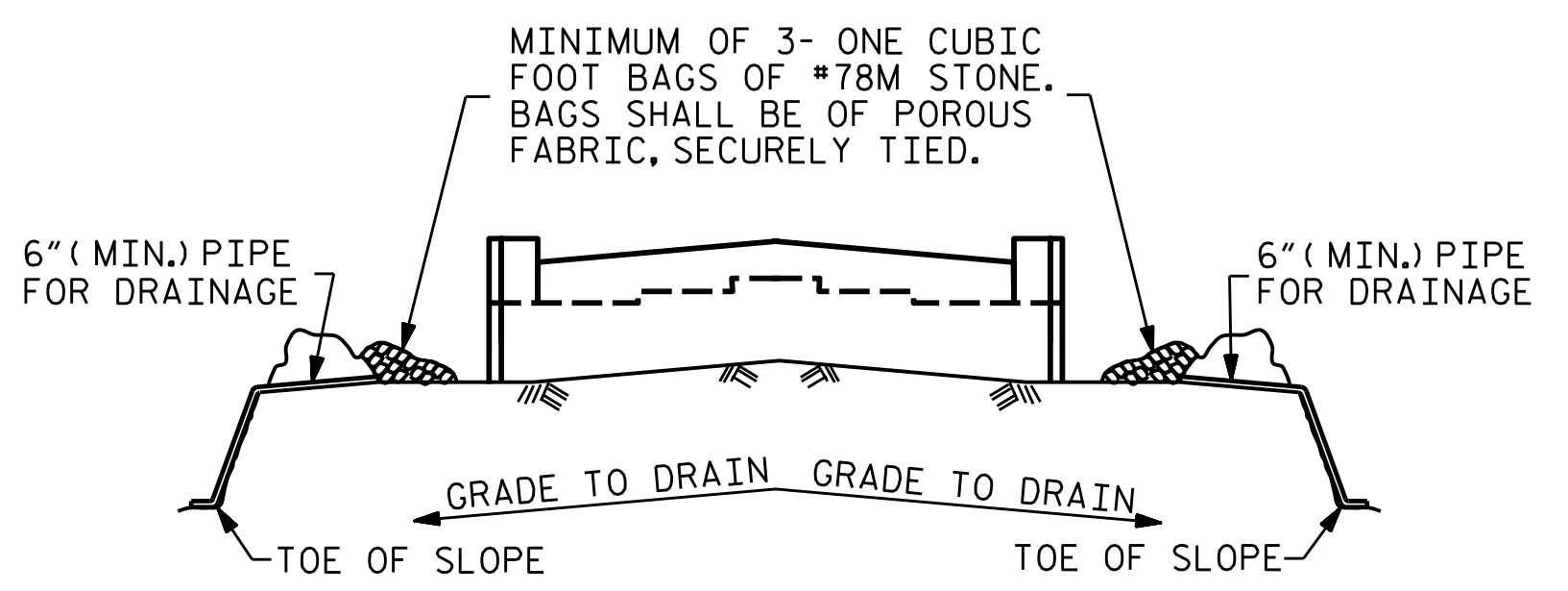
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
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2		4	

TOTAL SHEETS: 29

KCI JOB NO: 251801945.13



**SECTION A-A**

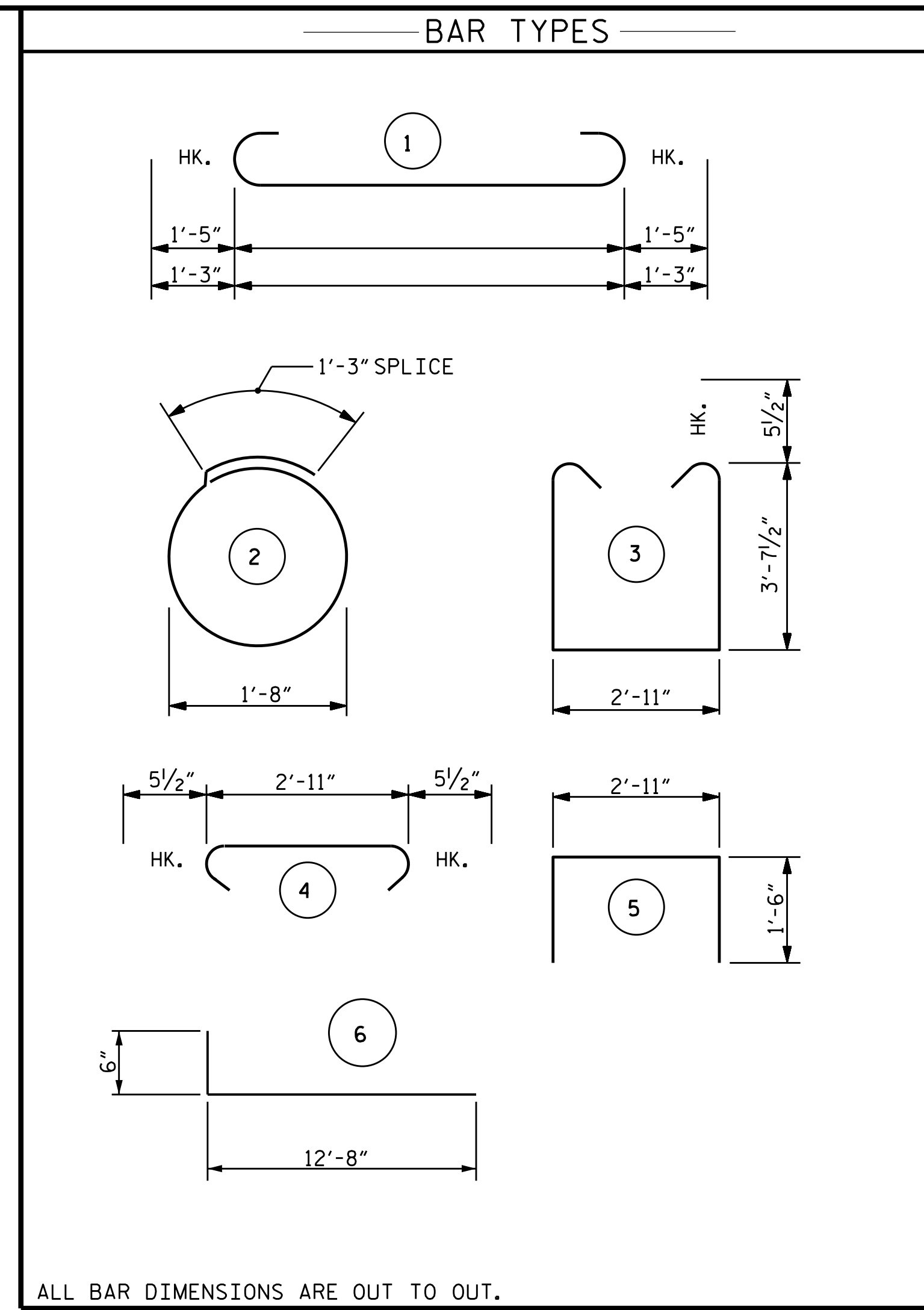


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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**



ALL BAR DIMENSIONS ARE OUT TO OUT.

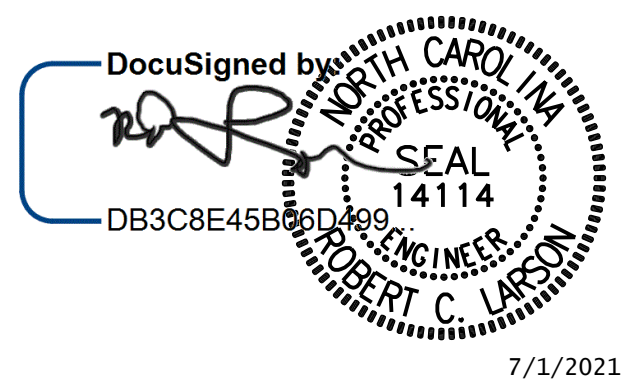
BILL OF MATERIAL					
END BENT 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	10	1	43'-9"	753
B2	5	9	1	43'-5"	738
B3	28	4	STR.	21'-8"	405
B4	11	4	STR.	2'-11"	21
B5	5	4	STR.	11'-8"	39
D1	56	4	STR.	5'-10"	218
H1	76	5	6	13'-2"	1044
K1	24	4	STR.	2'-8"	43
S1	20	4	2	6'-6"	87
S2	38	5	3	11'-1"	439
S3	38	5	4	3'-10"	152
U1	9	4	5	5'-11"	36
V1	64	4	STR.	9'-6"	406
REINFORCING STEEL, LB					4381
CLASS A CONCRETE, CY				POUR 1	24.6
				POUR 2	6.5
TOTAL					31.1
HP 12X53 STEEL PILES				NO.	5
				LF	275
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.					
5					
PILE REDRIVES, EA.					
3					

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2**



DESIGN ENGINEER OF RECORD:	DATE:
	7/1/2021
DRAWN BY:	DATE:
A. K. ALLANKI	10/02/20
CHECKED BY:	DATE:
R. C. LARSON	10/07/20

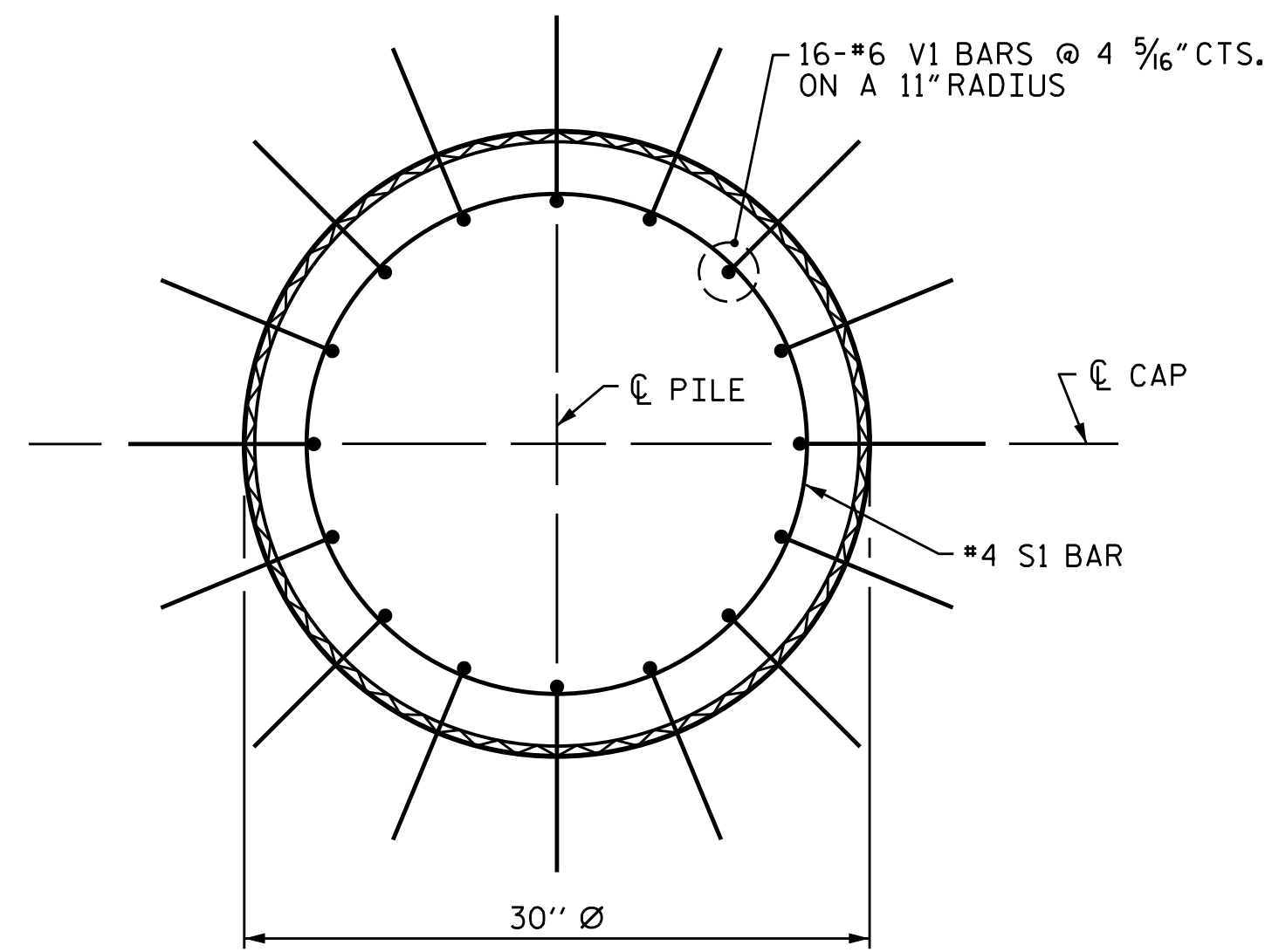
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**



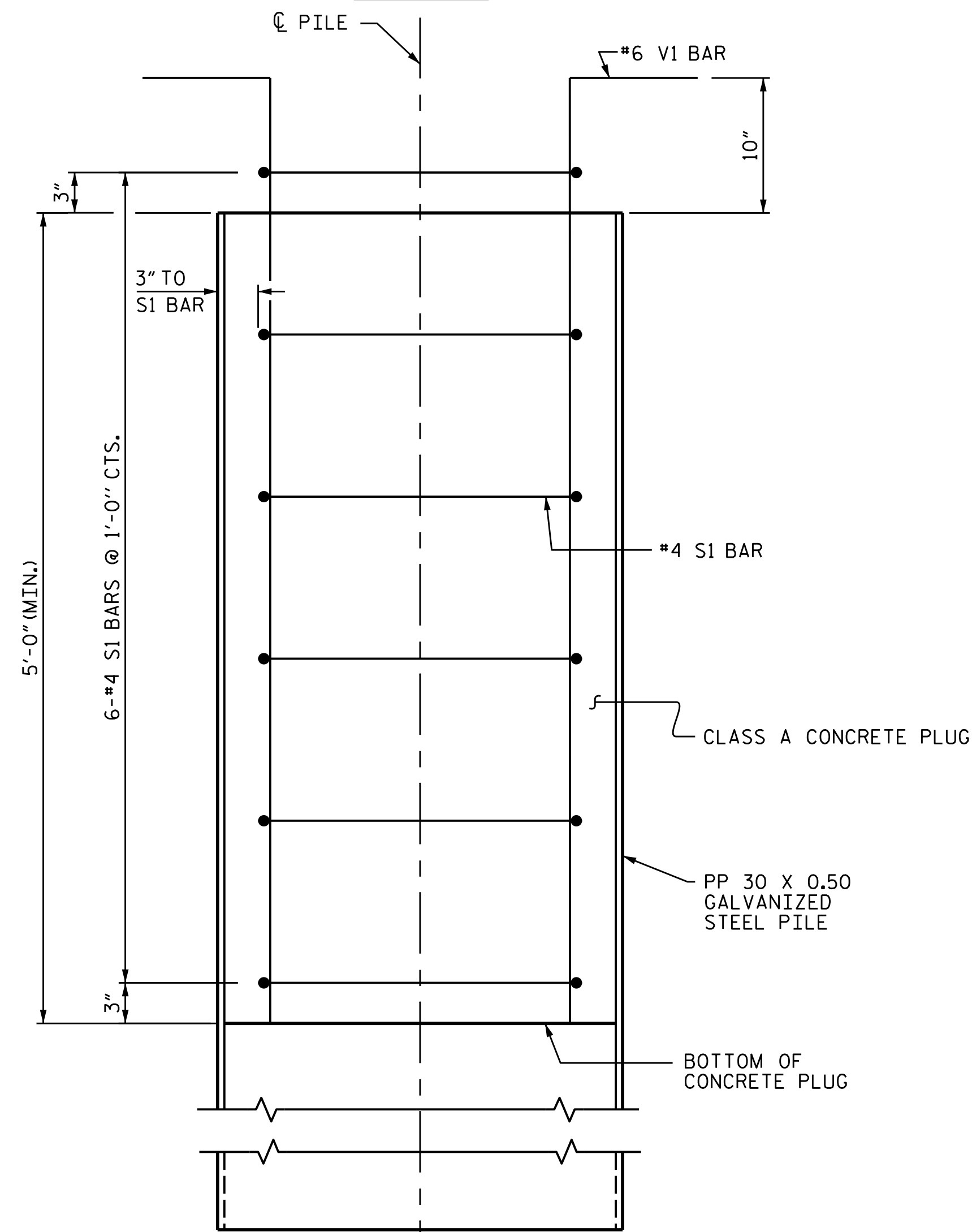
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.	S-25
TOTAL SHEETS	29

KCI JOB NO: 251801945.13

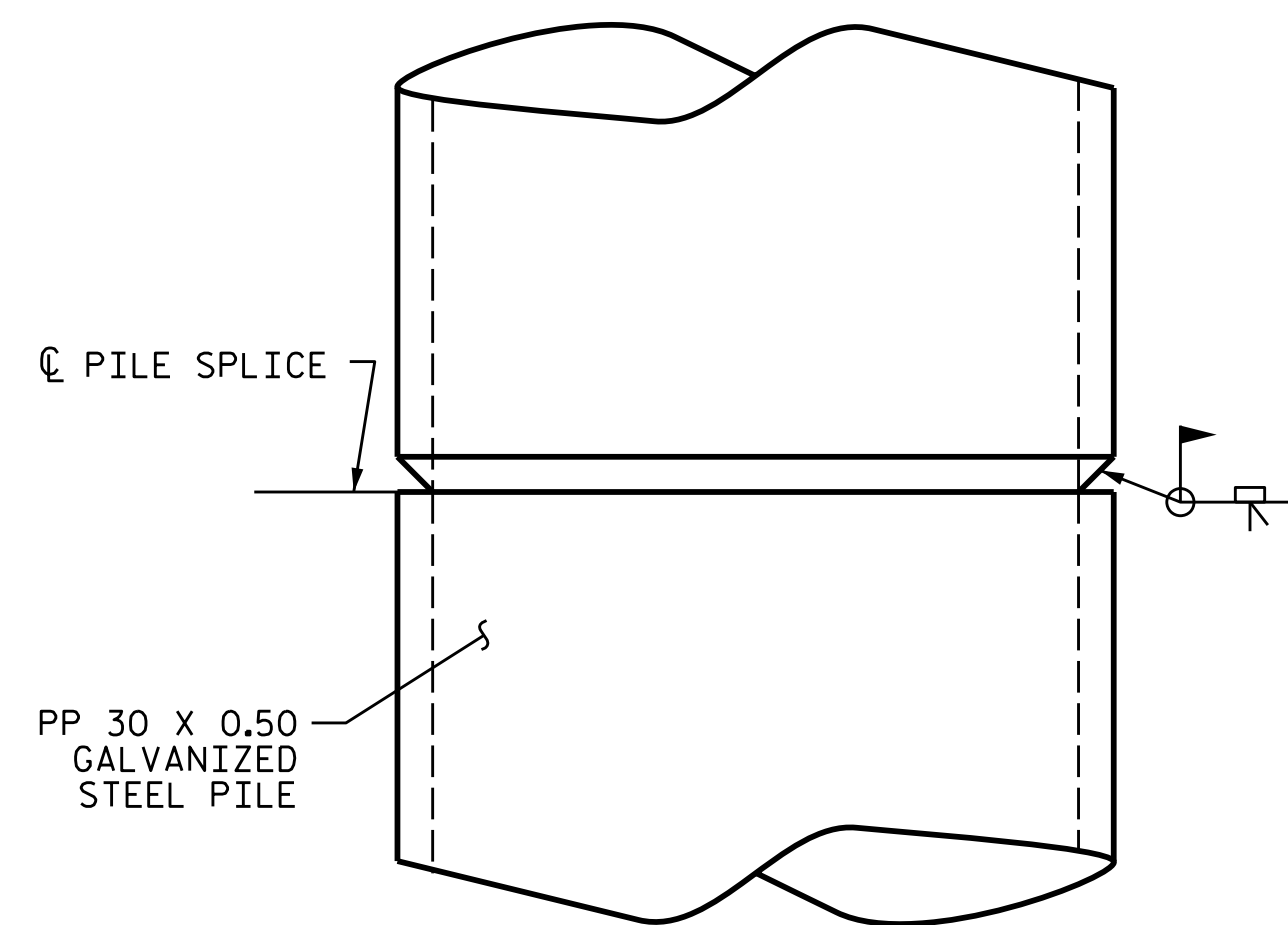


PLAN



ELEVATION

PP 30 X 0.50 GALVANIZED STEEL PILE  
(OPEN END)



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.

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 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 30 X 0.50 GALVANIZED STEEL PILES.

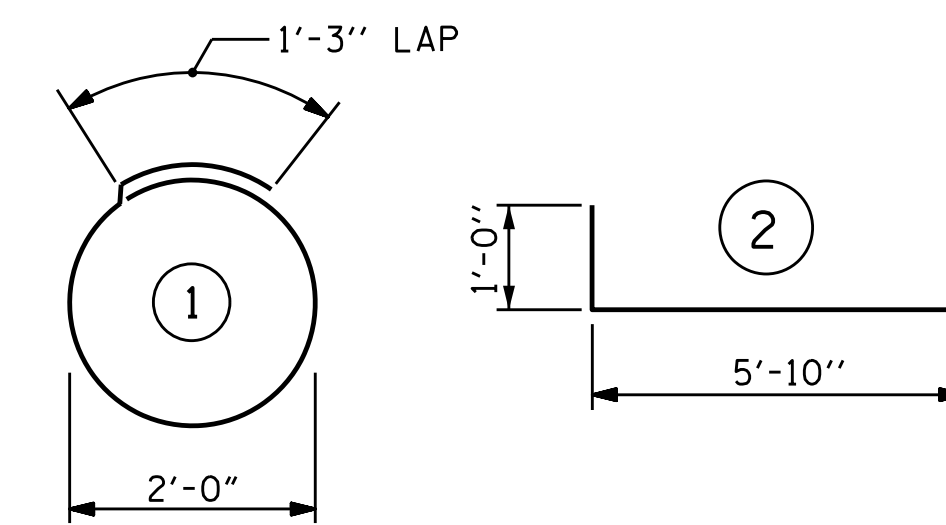
BILL OF MATERIAL FOR ONE  
PP 30 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	7'-7"	30
V1	16	#6	2	6'-10"	164
REINFORCING STEEL =				194	lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG 0.8 CY

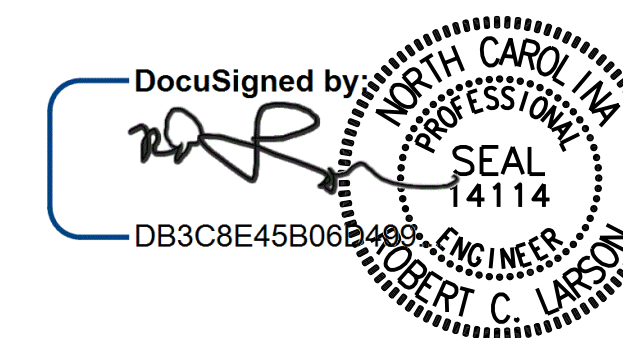
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
STATION: 16+92.70 -L-

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



7/1/2021

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-26
2			4			TOTAL SHEETS 29

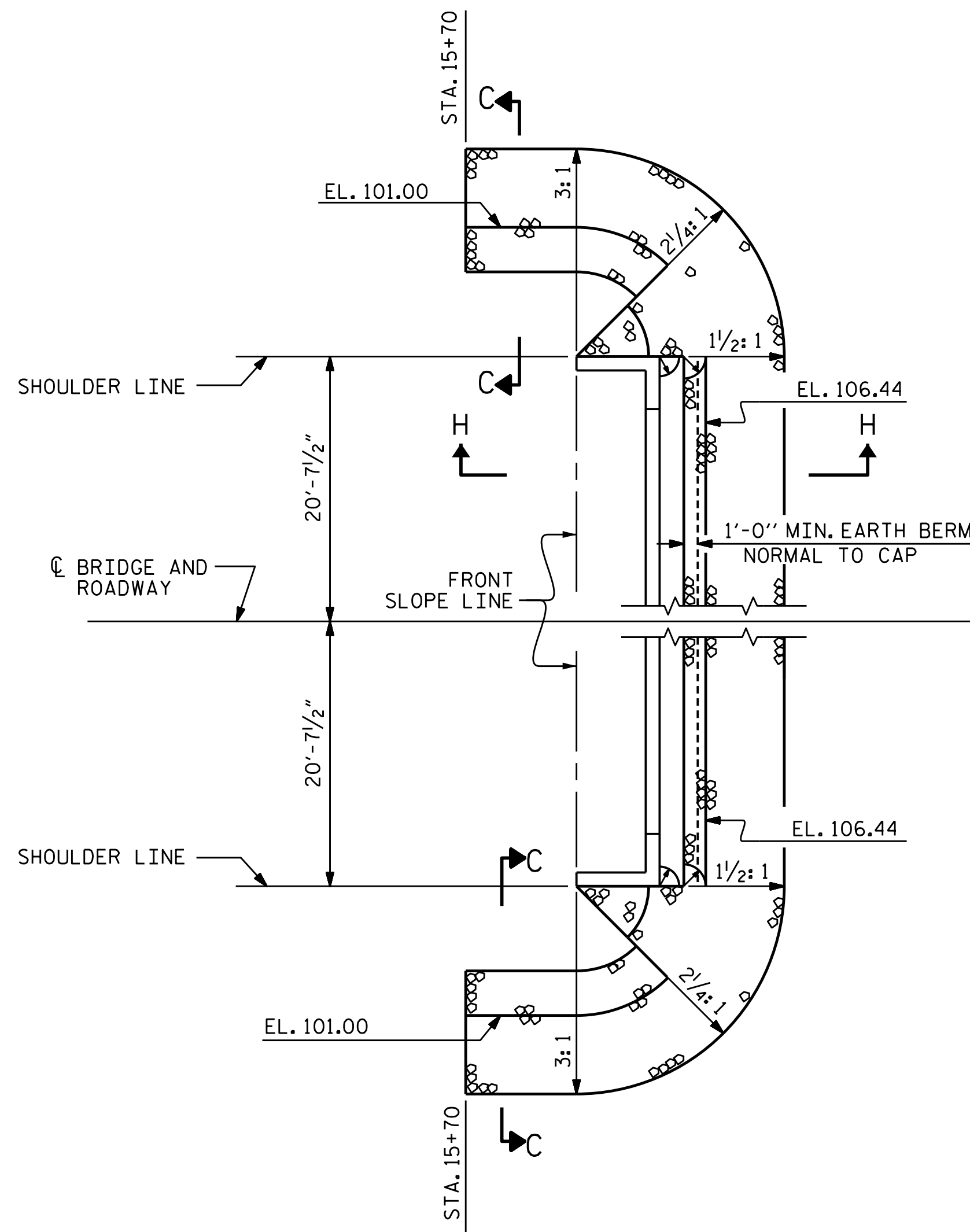
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



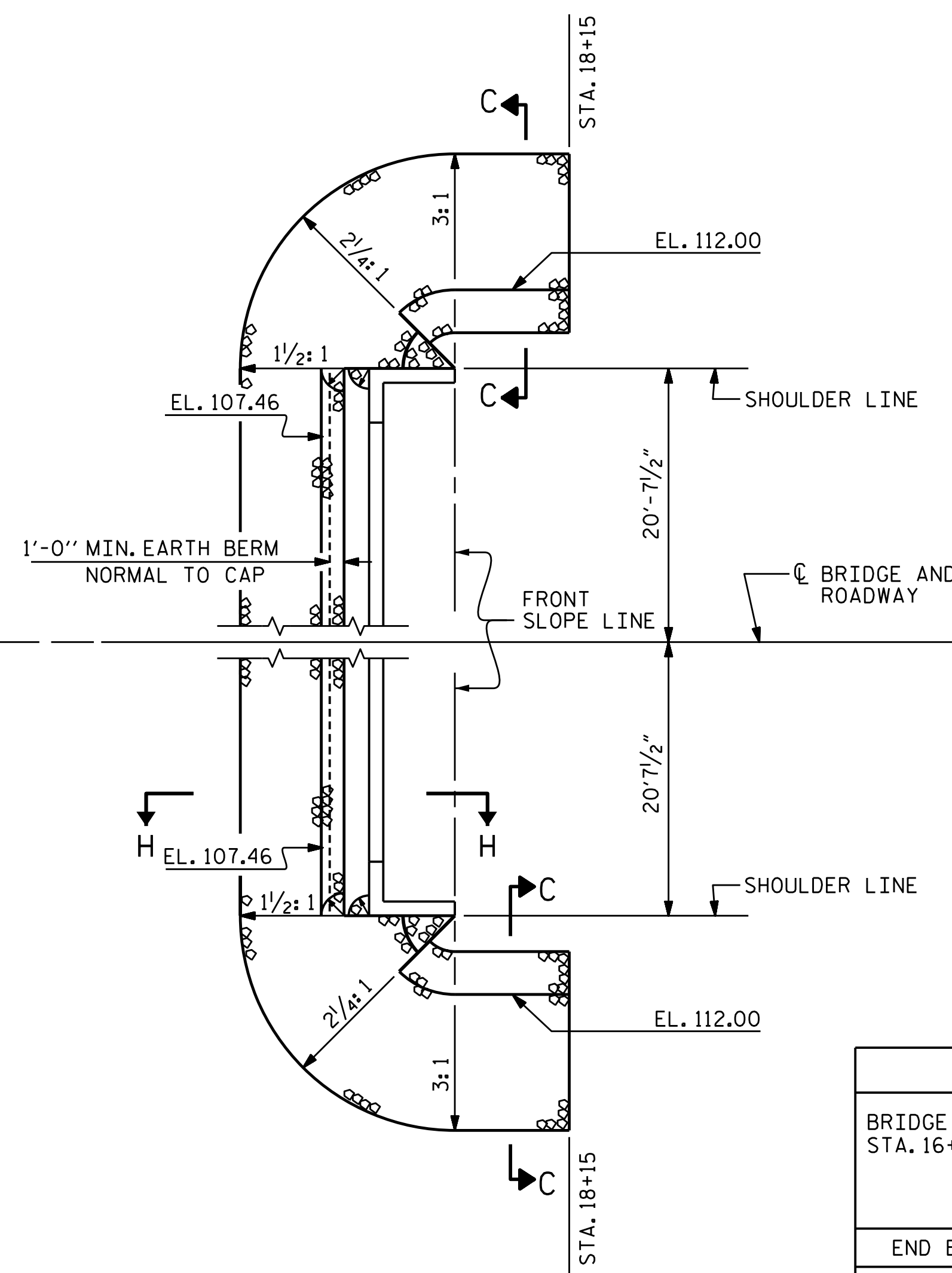
STD. NO. SPP5

KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD	DocuSigned by	DATE :
ASSEMBLED BY : R. C. LARSON	DATE : 11/30/20	
CHECKED BY : K. SU	DATE : 12/01/20	
DRAWN BY : TLA 8/05	REV. 5/1/06R	MAA/KMM
CHECKED BY : GM 9/05	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC

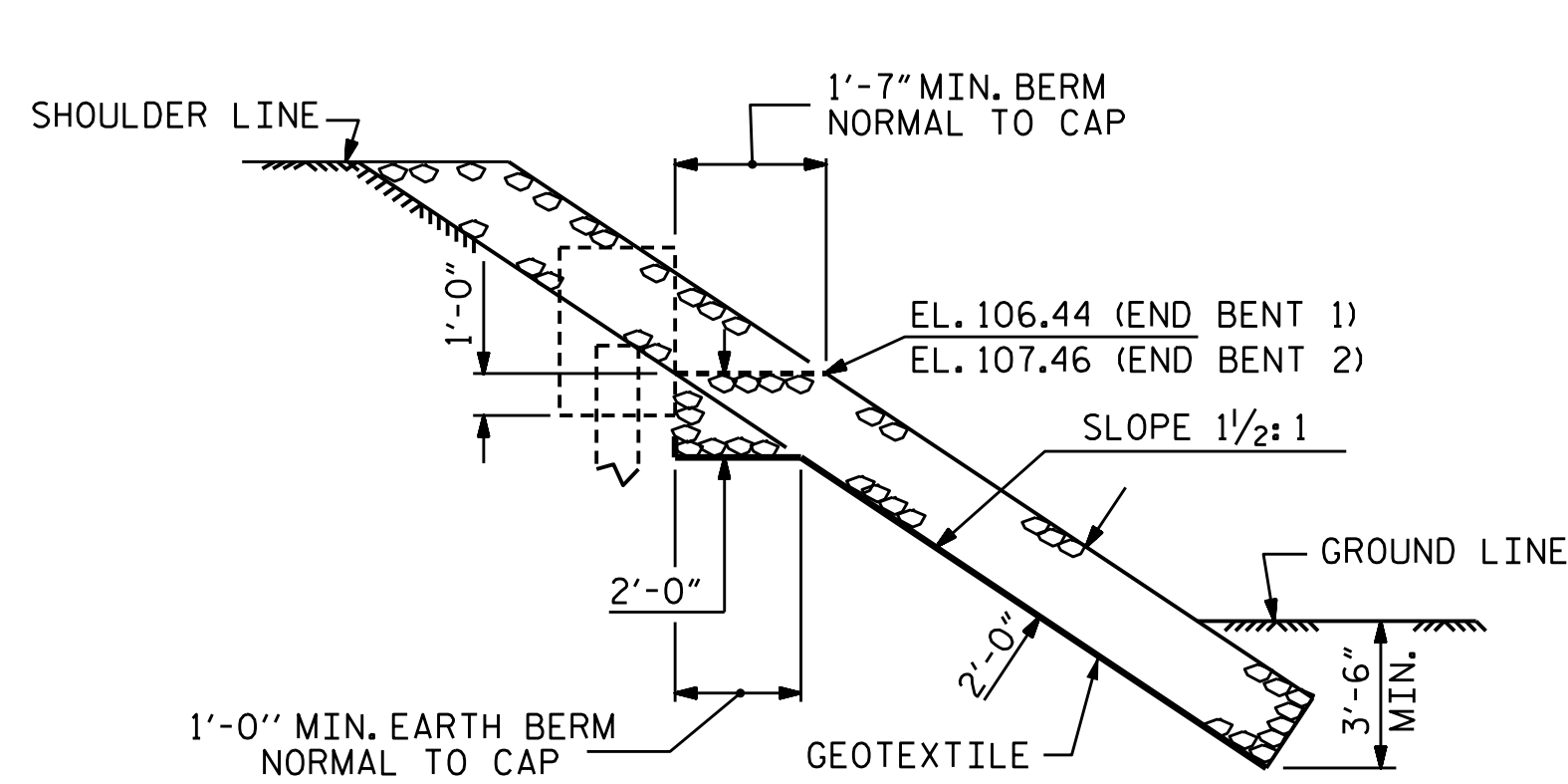


**BERM RIP RAPPED**  
(END BENT 1)

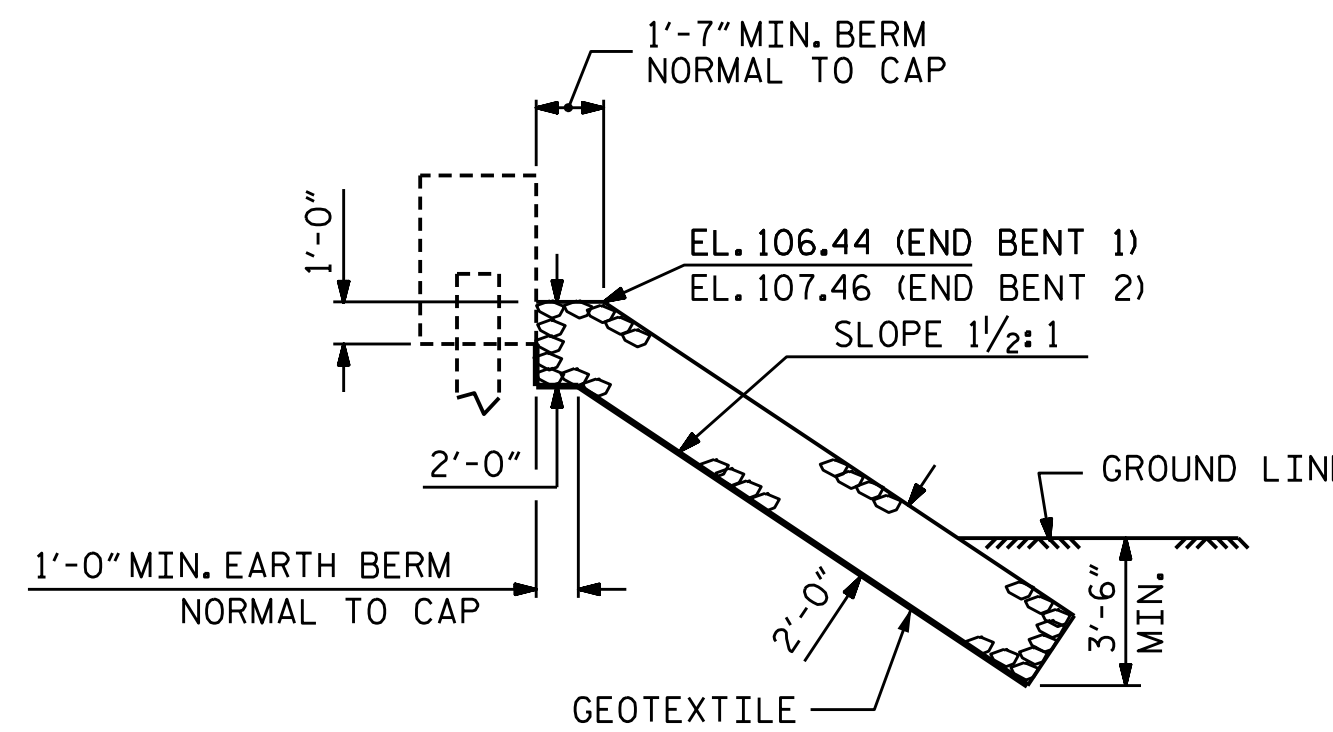


**SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP**  
(END BENT 2)

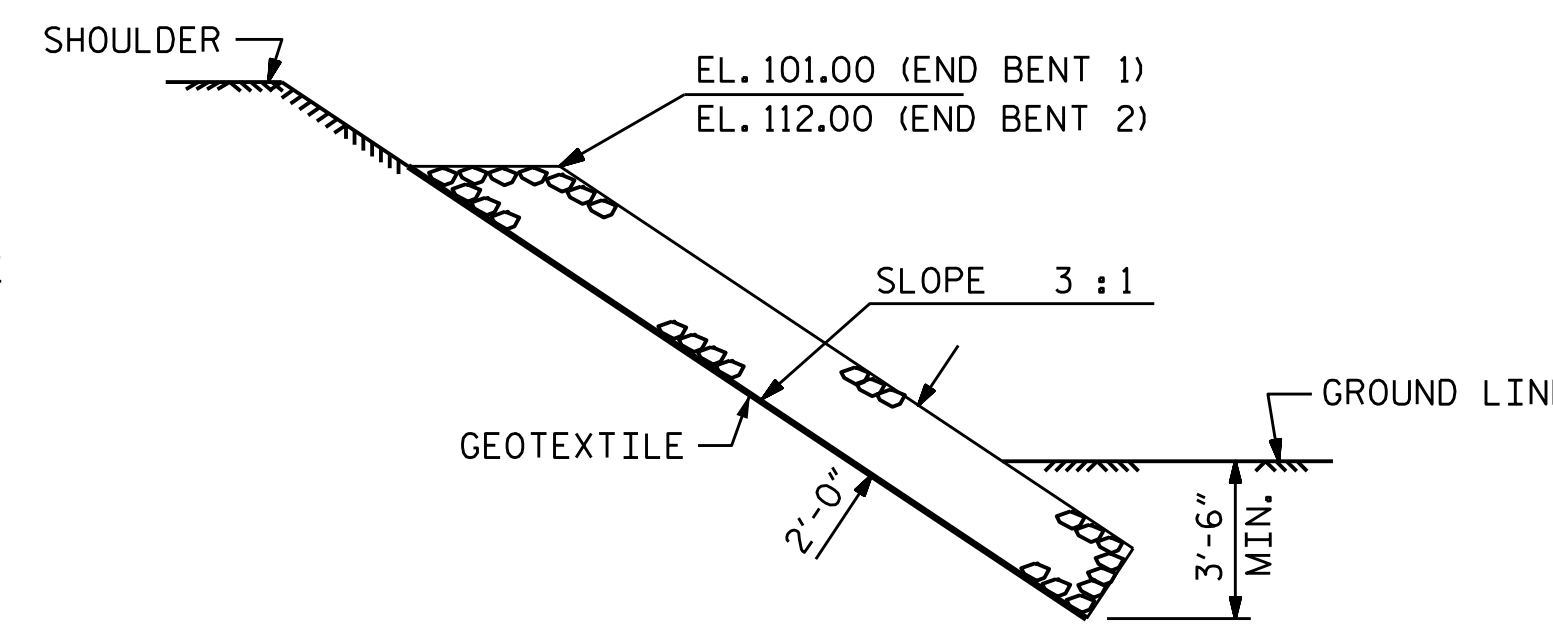
ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+92.70 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	550	610
END BENT 2	305	340



**SECTION H-H**



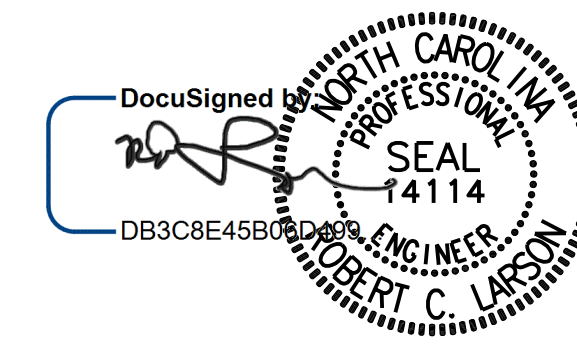
**SECTION C-C**  
BERM RIP RAPPED



**SECTION C-C**

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

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



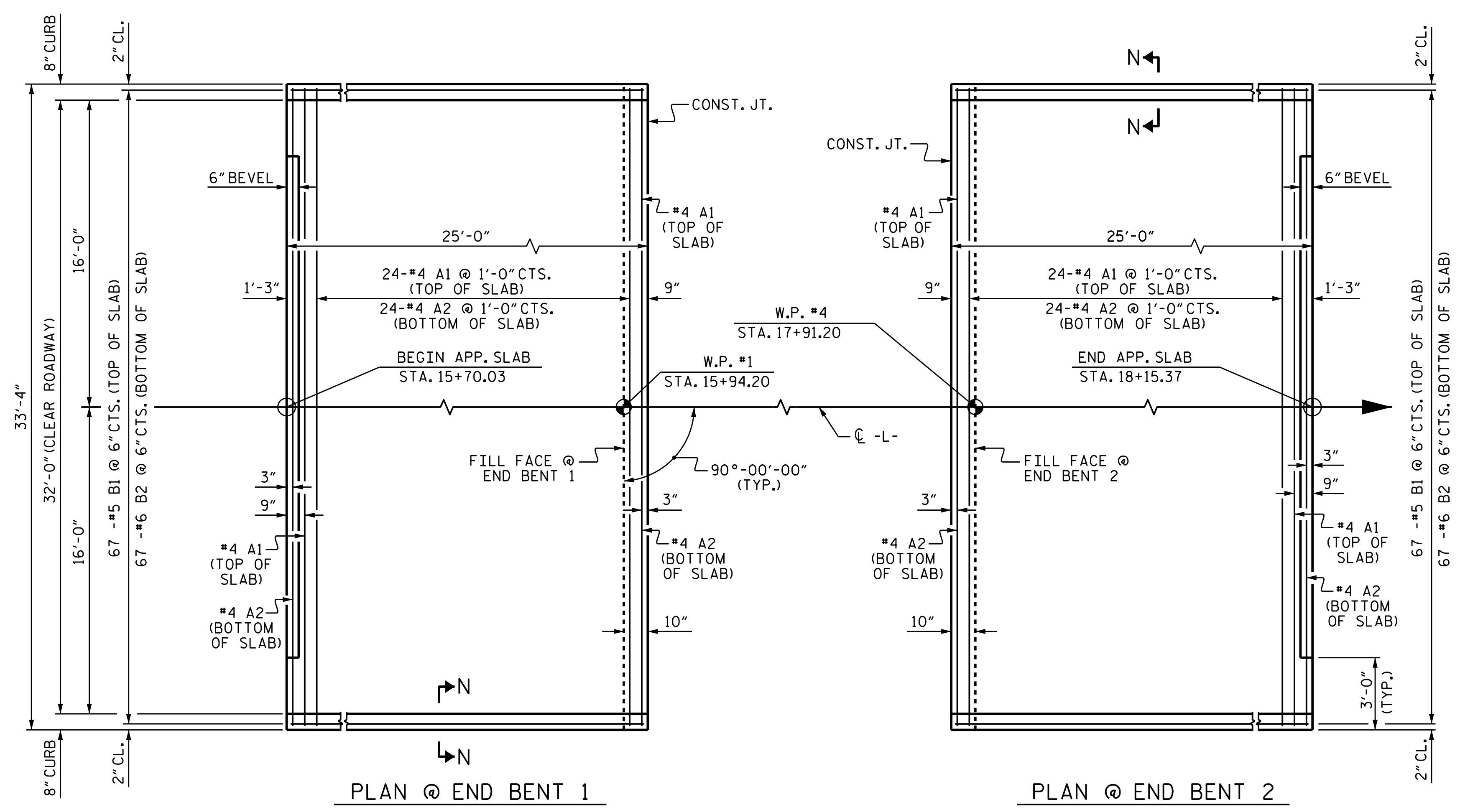
DESIGN ENGINEER OF RECORD	DocuSigned by:	DATE: 7/1/2021
ASSEMBLED BY: A. SAMBOY	DATE: 03/11/19	
CHECKED BY: R. C. LARSON	DATE: 09/22/20	
DRAWN BY: REK 1/84	REV. 10/1/11	MAA/GM
CHECKED BY: RDU 1/84	REV. 12/21/11	MAA/GM
	REV. 12/17	MAA/THC

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 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-6270 Phone: (919) 785-9241

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS 29
2			4			

KCI JOB NO: 251801945.13



**NOTES**

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

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

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

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

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

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

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

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

"TYPE A - ALTERNATE APPROACH FILL" SHALL BE CONSTRUCTED AT END BENT 1. "TYPE I - STANDARD APPROACH FILL" NOT ALLOWED AT END BENT 1. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

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 AT BENT 2 ONLY. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

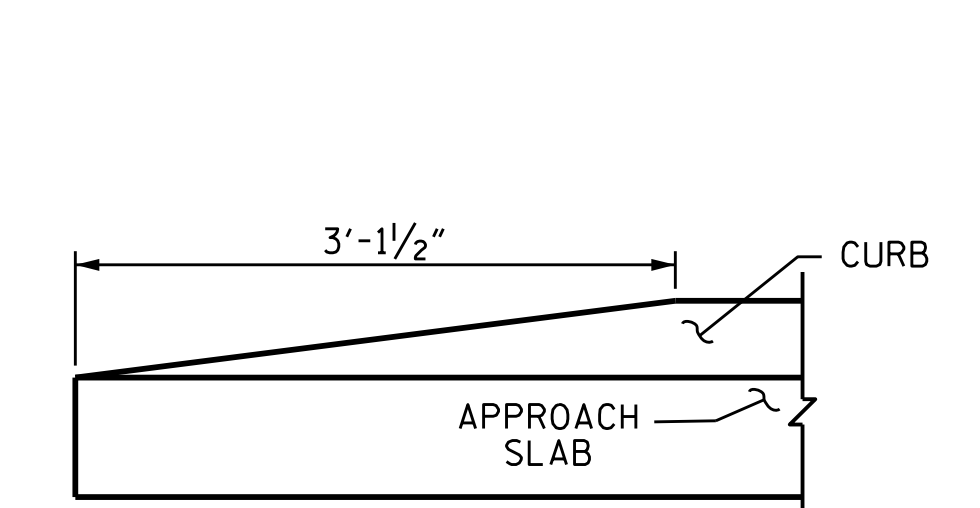
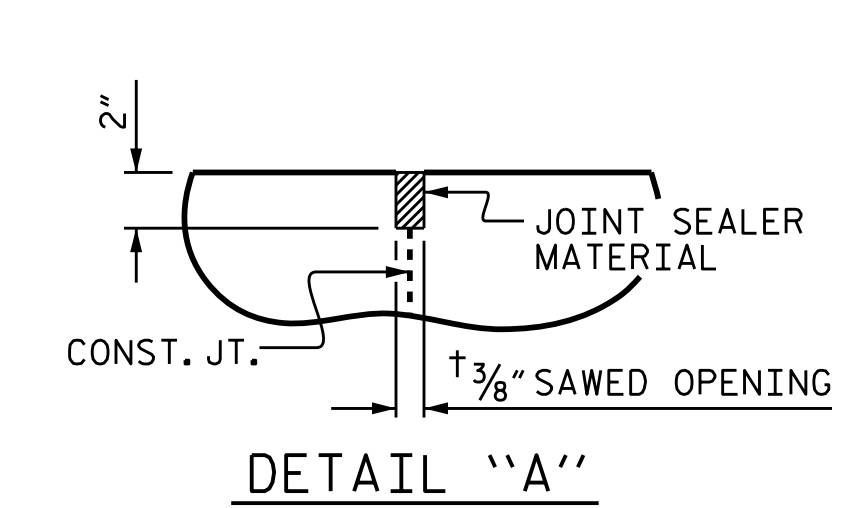
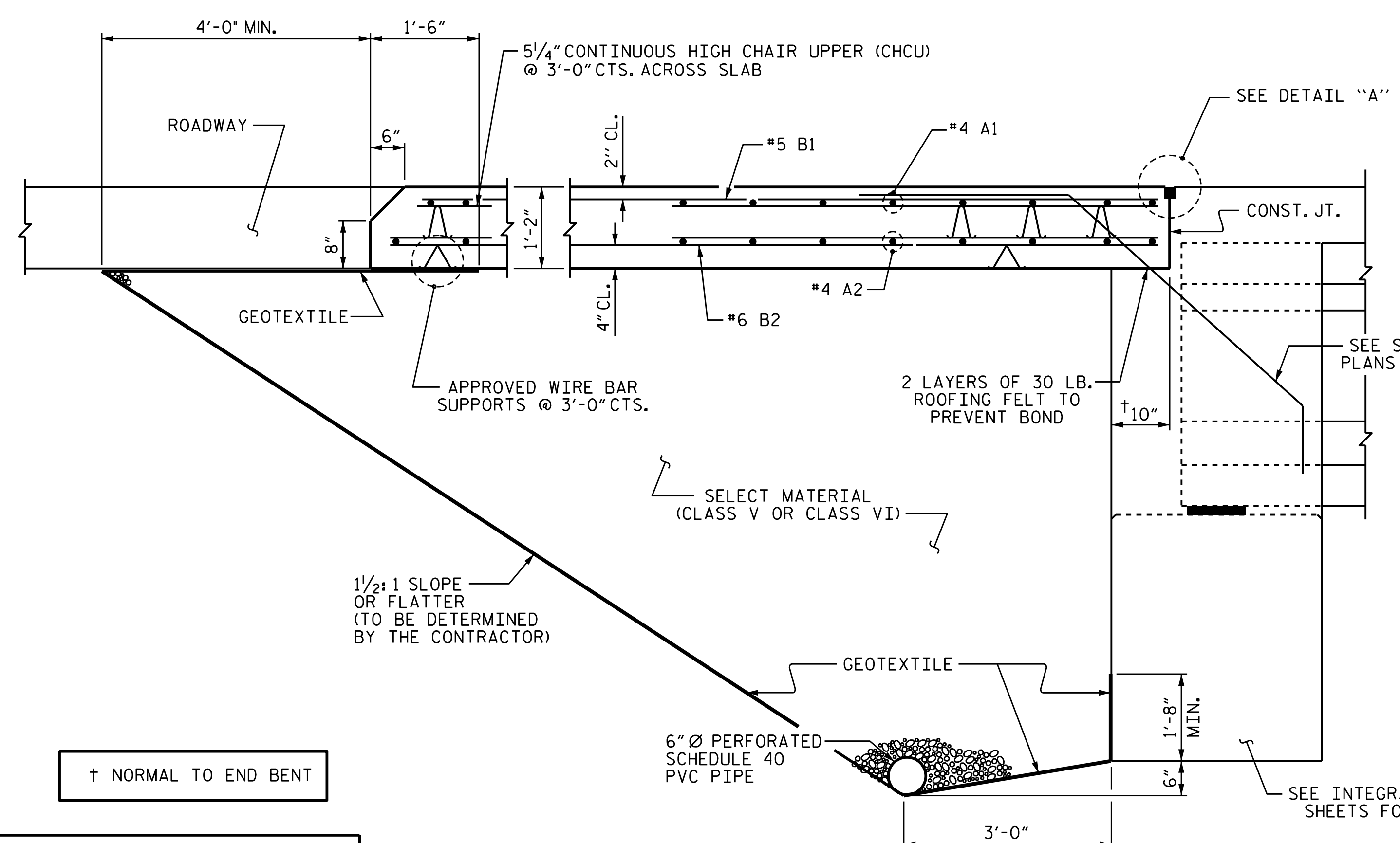
**BILL OF MATERIAL**

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	33'-0"	573
A2	26	#4	STR	33'-0"	573
* B1	67	#5	STR	24'-8"	1724
B2	67	#6	STR	24'-8"	2482
REINFORCING STEEL				LBS.	3055
* EPOXY COATED REINFORCING STEEL				LBS.	2297
CLASS AA CONCRETE				C. Y.	36.0

**SPLICE LENGTHS**

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



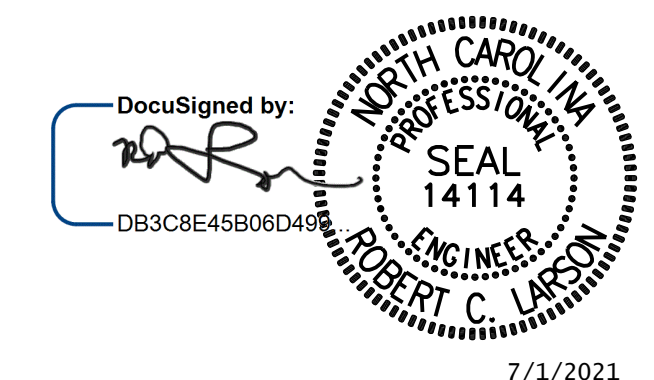
END OF CURB WITHOUT SHOULDER BERM GUTTER (@ END BENT 2)

PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

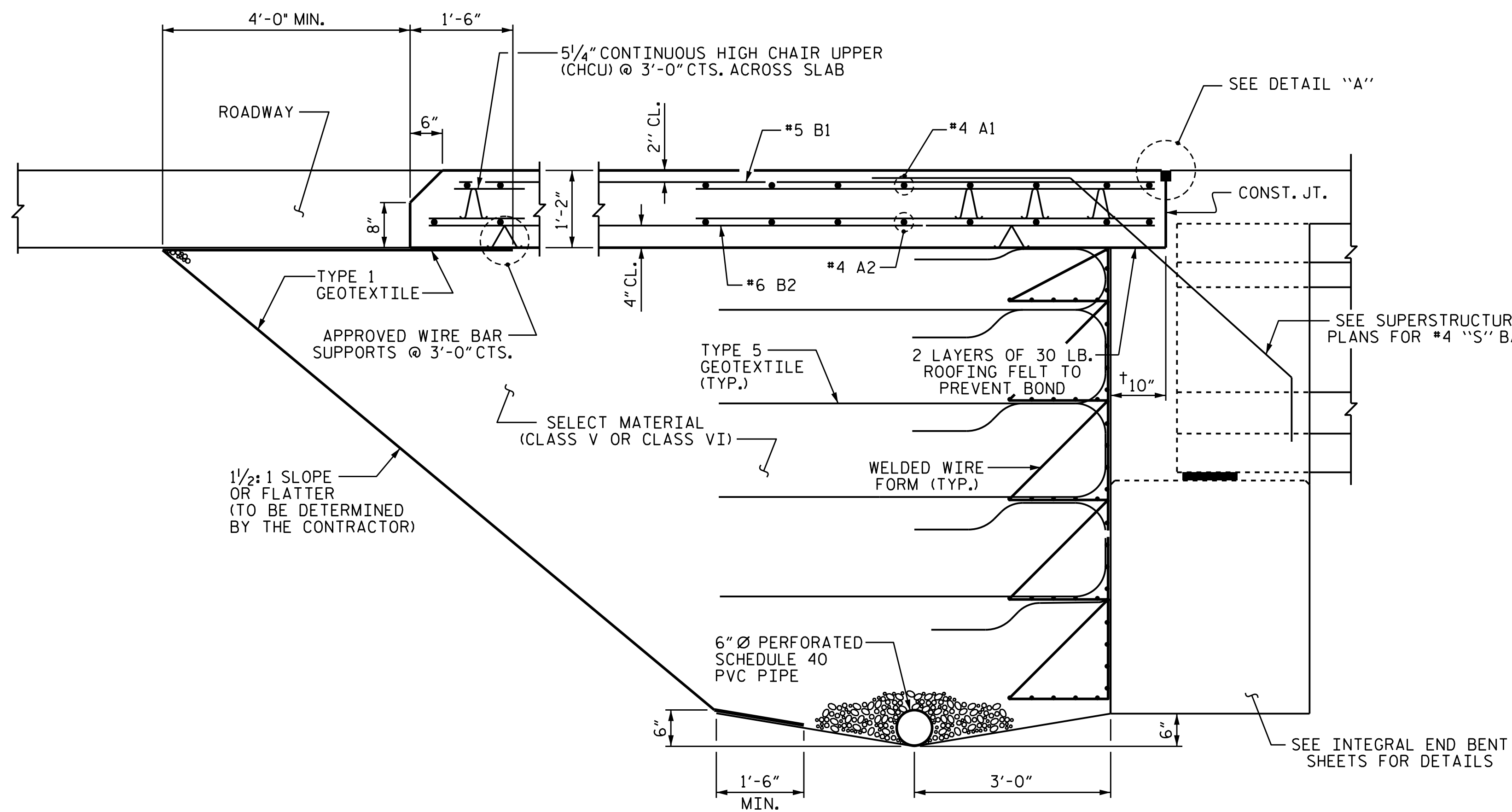


KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD: DATE: 7/1/2021  
 DRAWN BY: A. SAMBOY DATE: 09/30/20  
 CHECKED BY: R.C. LARSON DATE: 10/12/20

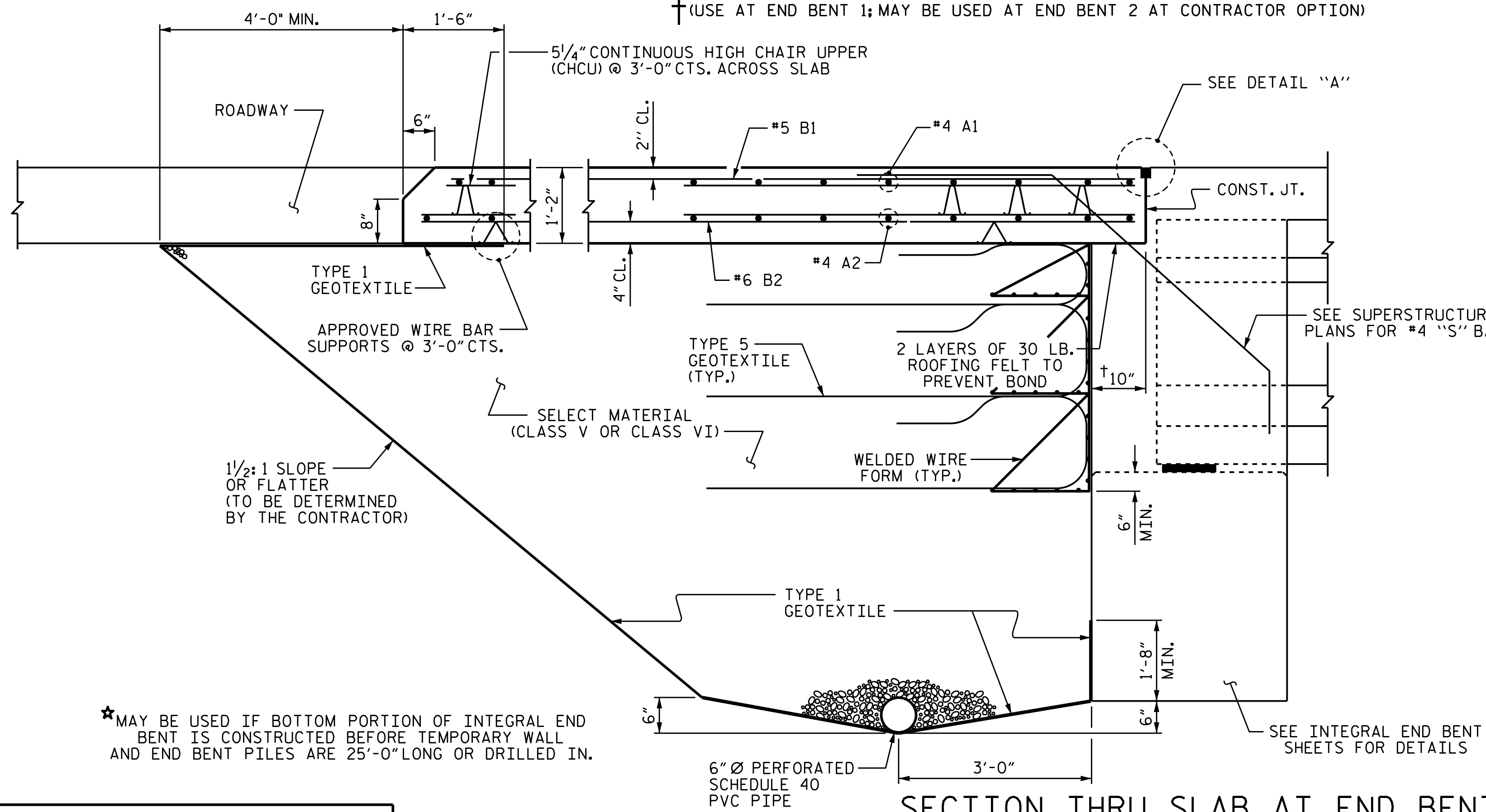
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NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-28
2			4			TOTAL SHEETS 29



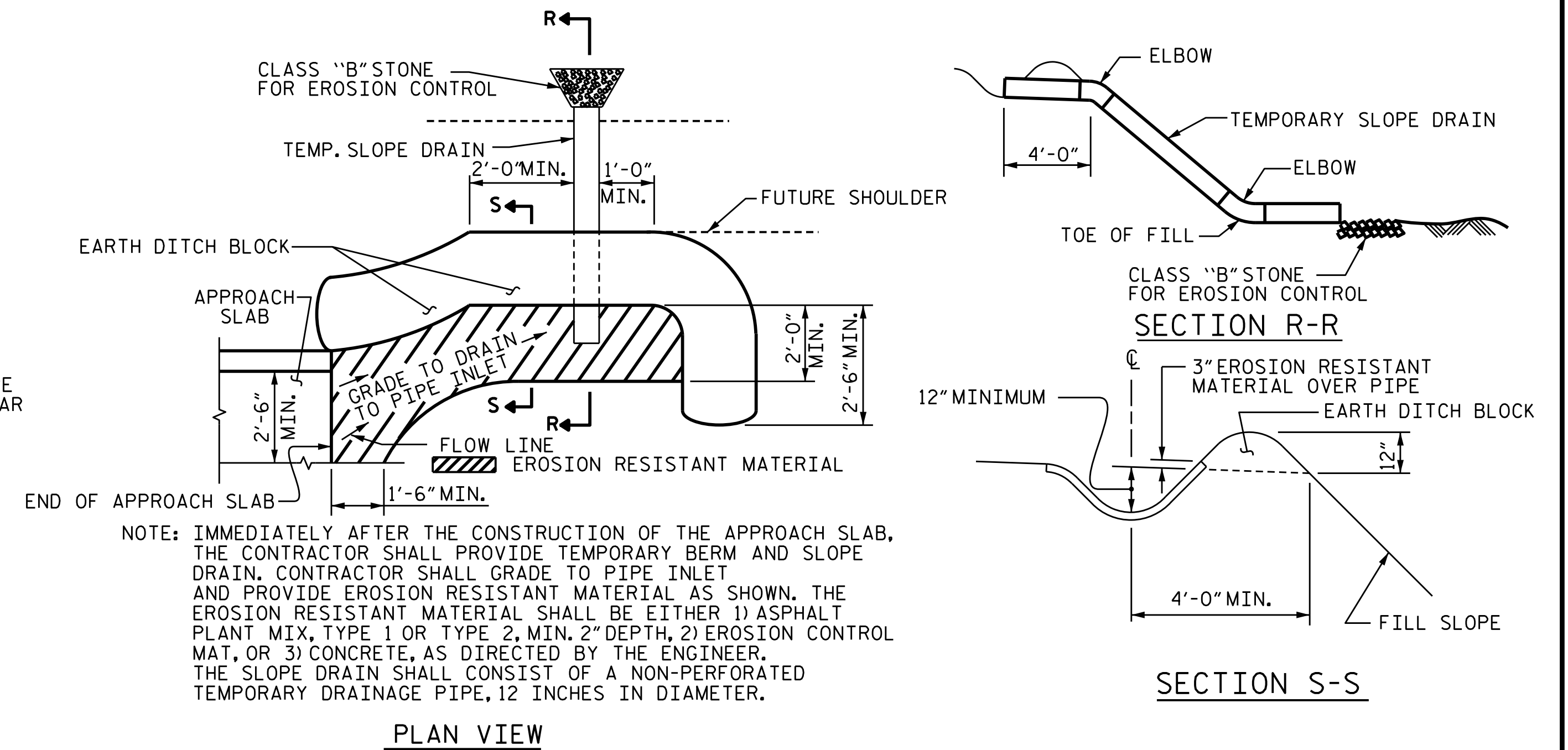
**SECTION THRU SLAB AT END BENT 1<sup>†</sup>**

(TYPE A - ALTERNATE APPROACH FILL)  
<sup>†</sup>(USE AT END BENT 1; MAY BE USED AT END BENT 2 AT CONTRACTOR OPTION)



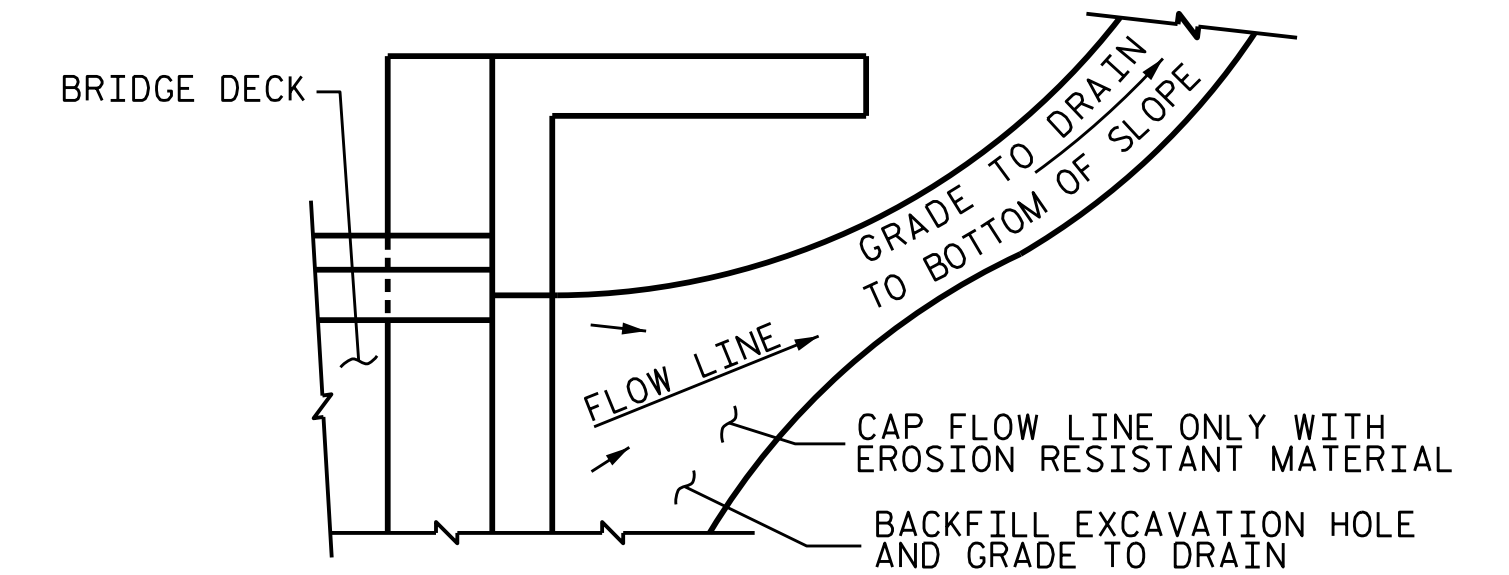
**SECTION THRU SLAB AT END BENT 1<sup>†</sup>**

(TYPE A - ALTERNATE APPROACH FILL)  
<sup>†</sup>(USE AT END BENT 1; MAY BE USED AT END BENT 2 AT CONTRACTOR OPTION)



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

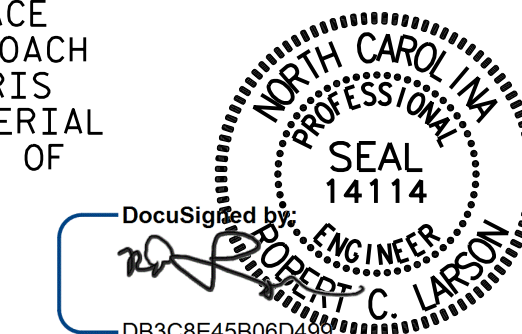


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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



PROJECT NO. B-5703  
CUMBERLAND/HARNETT COUNTY  
 STATION: 16+92.70 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**BRIDGE APPROACH  
 SLAB DETAILS**

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

TOTAL SHEETS: 29

KCI JOB NO: 251801945.13

DESIGN ENGINEER OF RECORD: *[Signature]* DATE: 7/1/2021  
 DRAWN BY: A. K. ALLANKI DATE: 09/30/20  
 CHECKED BY: R. C. LARSON DATE: 10/12/20

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**KCI Associates**  
 of North Carolina, P.A.  
 4205 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-9244