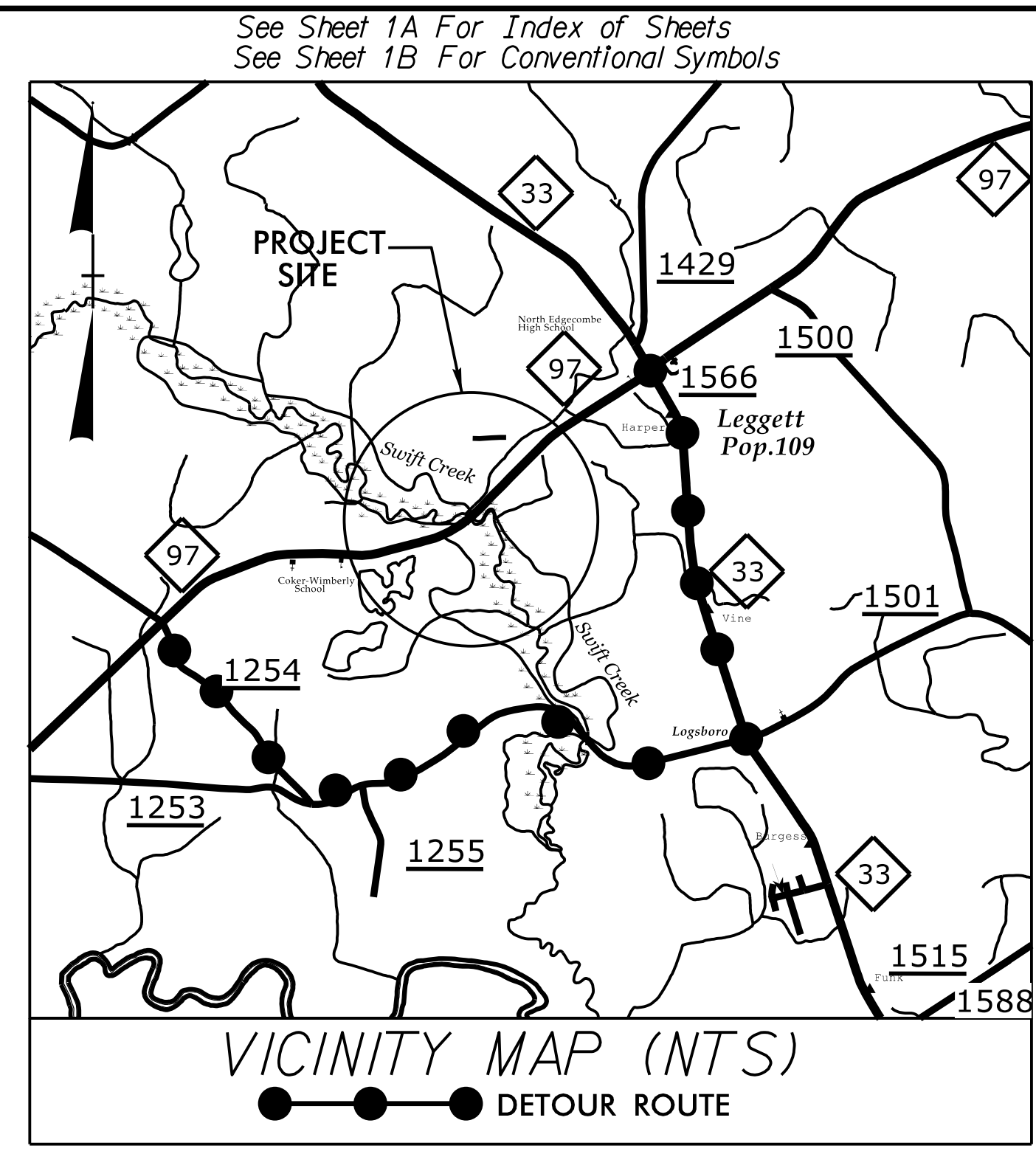


09/08/2019  
 CONTRACT: C204517  
 TIP PROJECT: B-5671  
 \$\$\$SYTIME\$\$\$\$\$  
 \$\$\$DGN\$\$\$\$\$  
 \$\$\$SERNAME\$\$\$\$\$



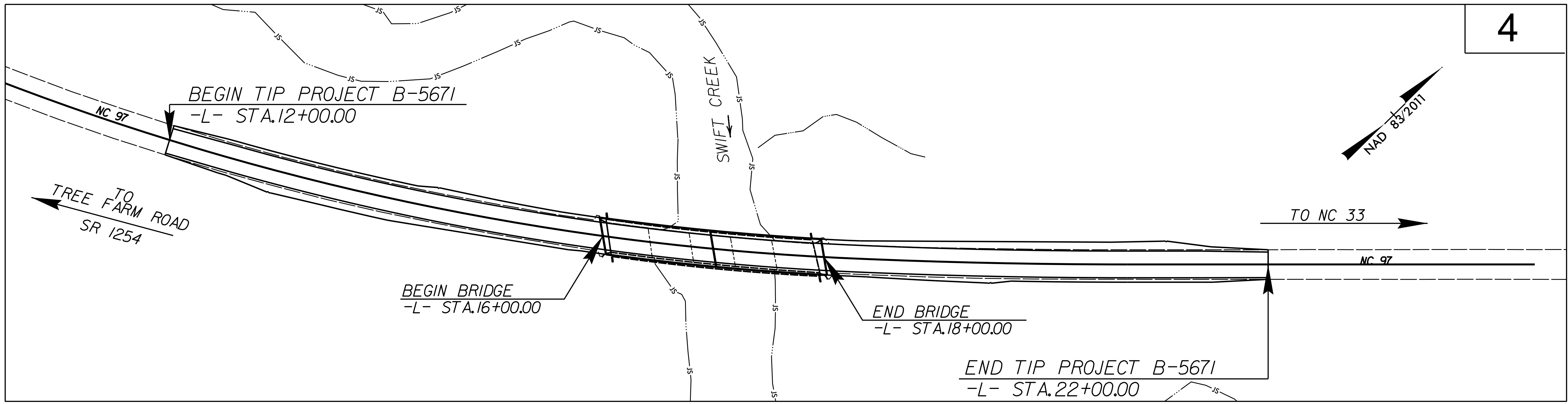
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# EDGECOMBE COUNTY

LOCATION: REPLACE BRIDGE NO. 87 OVER SWIFT CREEK  
ON NC 97

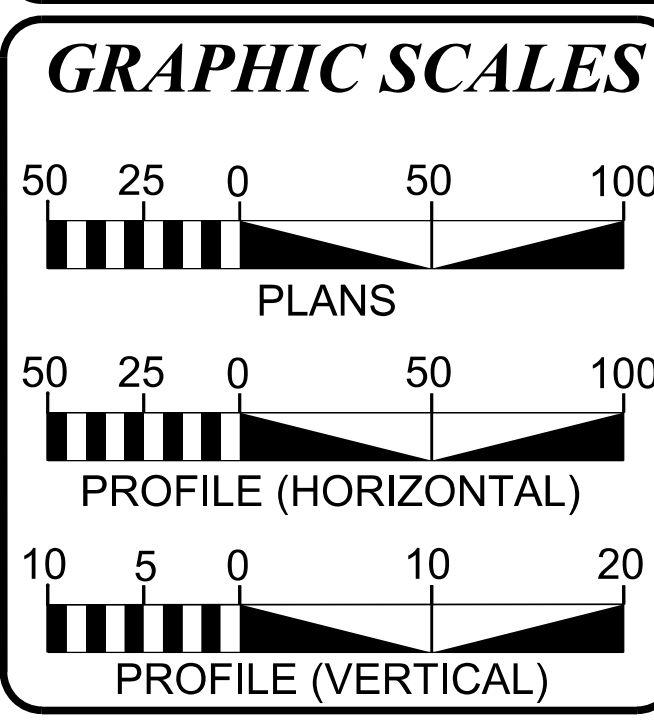
TYPE OF WORK: DRAINAGE, GRADING, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-5671</b>	<b>1</b>	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45626.1.1		P.E.	
45626.2.1		RW & UTIL.	
45626.3.1		CONSTR.	



## STRUCTURE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

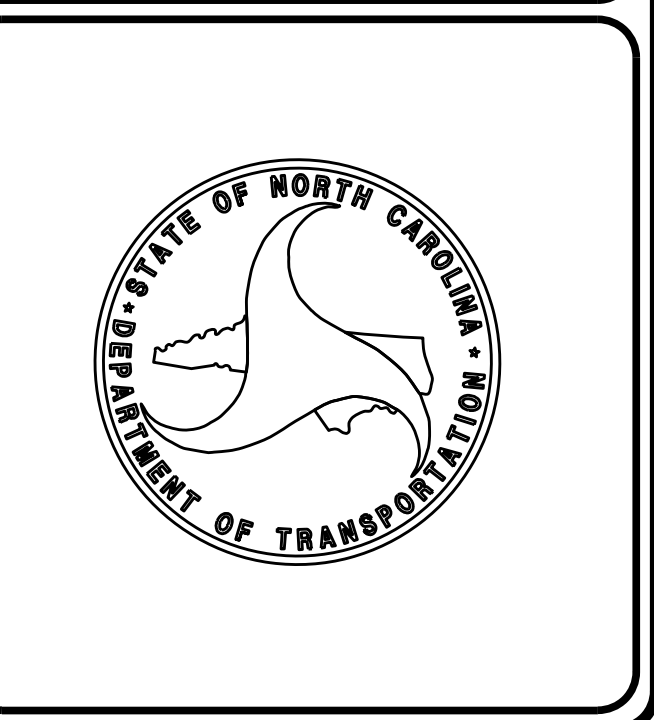
ADT 2020 =	3434
ADT 2040 =	4600
K =	8 %
D =	55 %
T =	13 % *
V =	60 MPH
* TTST = 5% DUAL 8%	
FUNC CLASS = MAJOR COLLECTOR	
REGIONAL TIER	

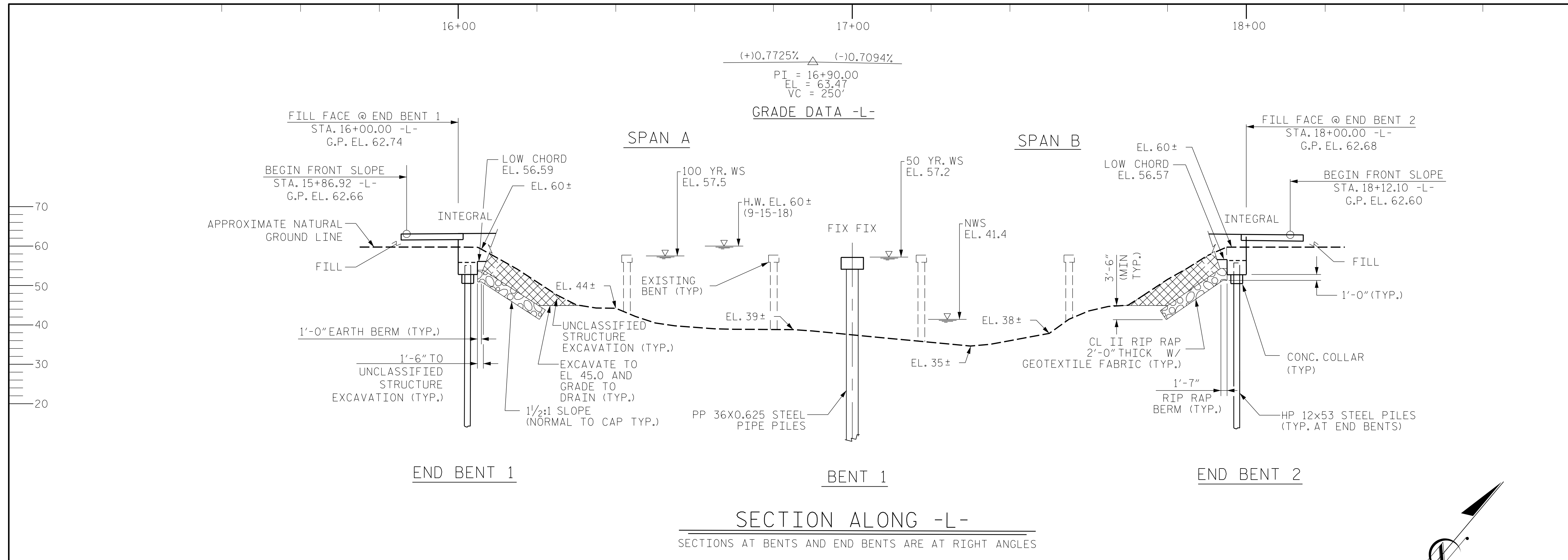
**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-5671	= .151 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5671	= .038 MILES
TOTAL LENGTH OF TIP PROJECT B-5671	= .189 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> NOVEMBER 18, 2019</p> <p><b>LETTING DATE:</b> FEBRUARY 16, 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>DAVID STUTTS, P.E.</b> STRUCTURES MANAGEMENT UNIT</p>
---	--

<p><b>HYDRAULICS ENGINEER</b></p> <p>SIGNATURE: _____</p>	<p><b>STRUCTURE DESIGN ENGINEER</b></p> <p>SIGNATURE: _____</p>
---	---





**HORIZONTAL CURVE DATA -L-**

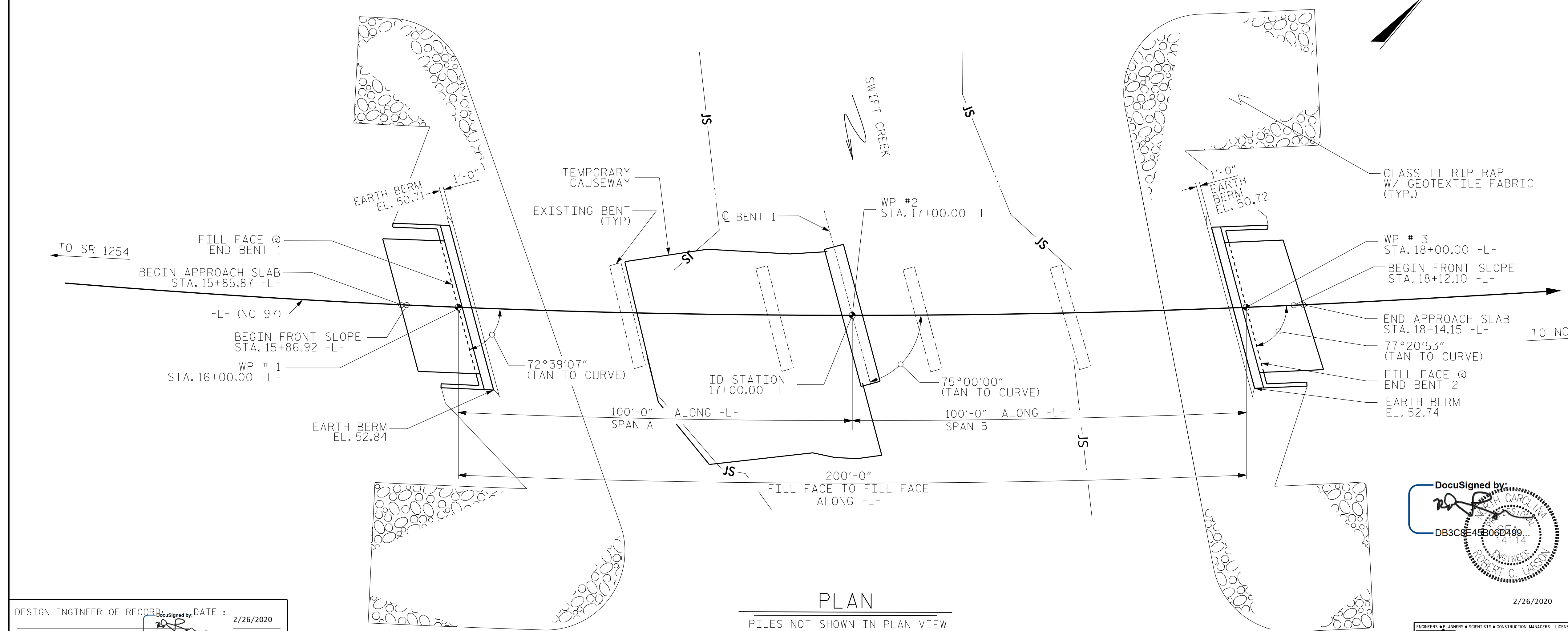
PI Sta 14+16.48  
 $\Delta = 19^\circ 22' 21.2''$  (LT)  
 $D = 2^\circ 20' 53.5''$   
 $L = 825.00'$   
 $T = 416.48'$   
 $R = 2,440.00'$

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 17,639 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 57.2 FT
DRAINAGE AREA	= 268 SQ. MI.
BASE DISCHARGE (Q100)	= 20,684 CFS
BASE HW ELEVATION	= 57.5 FT

OVERTOPPING DATA	
OVERTOPPING DISCHARGE	= 17,300 CFS
OVERTOPPING FREQUENCY	= >50 YRS
OVERTOPPING ELEVATION	= 57.2 * FT

\* SAG @ STA. 32+70 -L-



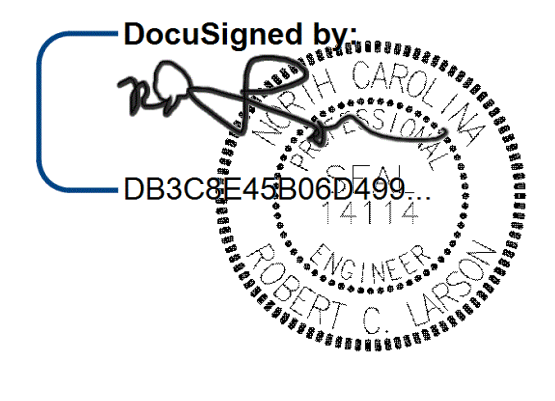
I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 87

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON NC 97 OVER  
 SWIFT CREEK BETWEEN  
 SR 1254 & NC 33



DESIGN ENGINEER OF RECORD:	DATE:	2/26/2020
DRAWN BY: A. SAMBOY	DATE:	04/17/19
CHECKED BY: R. C. LARSON	DATE:	05/14/19

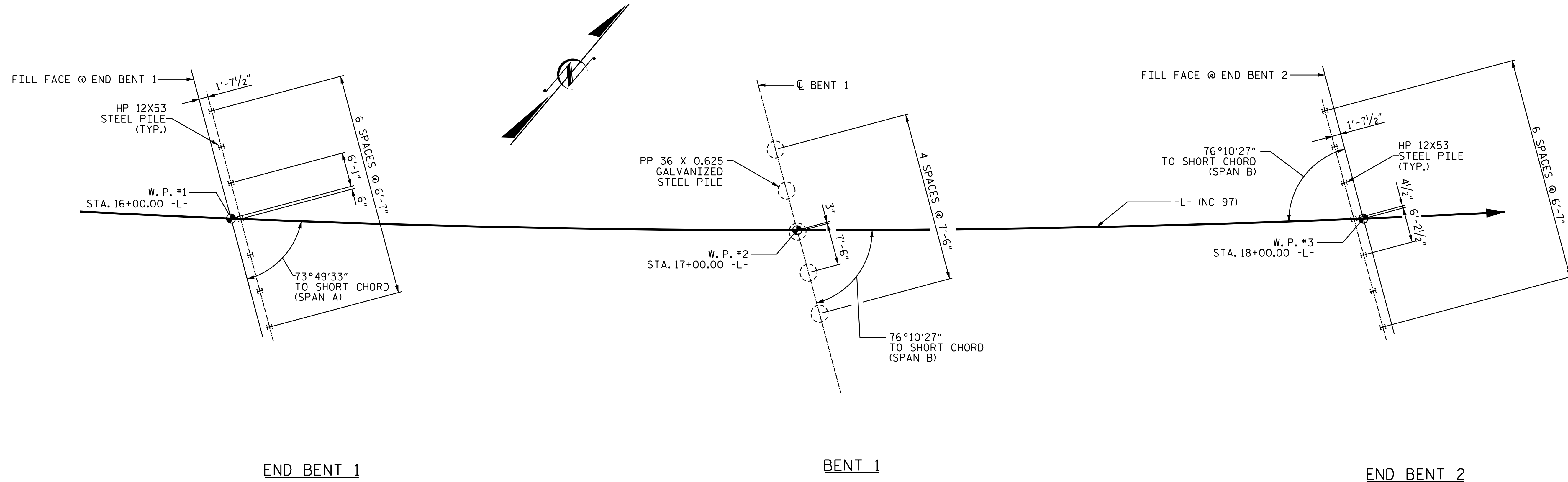
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 2505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-9244

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

SHEET NO. S-1  
 TOTAL SHEETS 29

KCI PROJ. #251801945.24



### 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 110 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 245 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 470 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN -16.0 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 70,000 FT-LBS TO 200,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUB ARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

PIPE PILE PLATES ARE NOT REQUIRED FOR STEEL PIPE PILES AT BENT NO. 1.

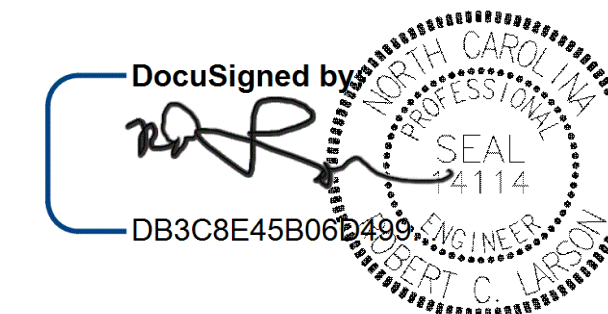
THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 9.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON NC 97 OVER  
 SWIFT CREEK BETWEEN  
 SR 1254 & NC 33



1/24/2020

DESIGN ENGINEER OF RECORD: R.C. LARSON DATE: 1/24/2020  
 DRAWN BY: R.J. FLORY DATE: 08/30/19  
 CHECKED BY: R.C. LARSON DATE: 11/06/19

**DOCUMENT NOT CONSIDERED FINAL  
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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 27609-6270 Phone (919) 785-9241

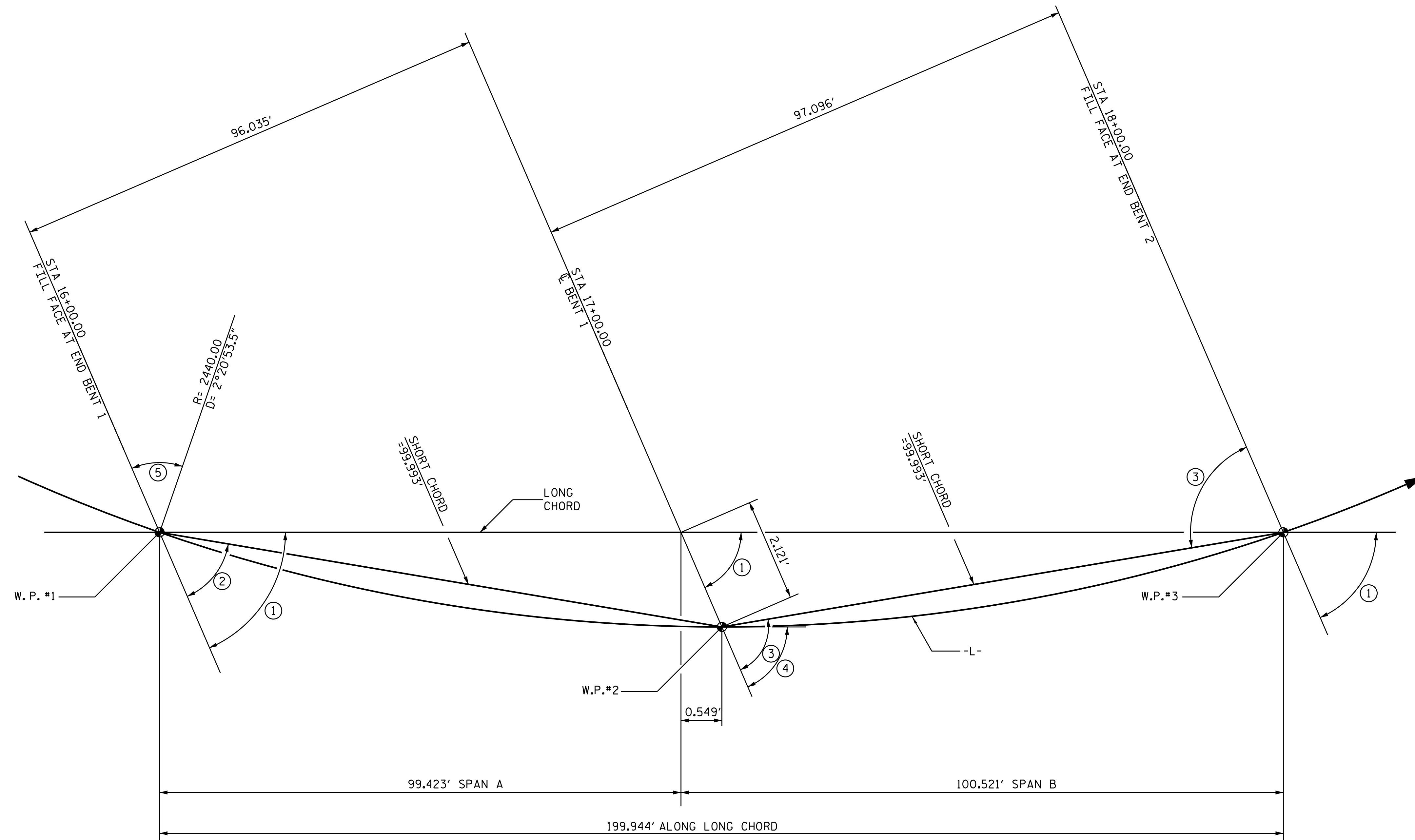
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 29

KCI PROJ. #251801945.24

**ANGLES**

- ① 75°
- ② 73°49'33"
- ③ 76°10'27"
- ④ 75°00'00" (TAN. TO CURVE)
- ⑤ 17°20'53"



**LONG CHORD LAYOUT**

NOTE: BENT AND END BENTS ARE PARALLEL.

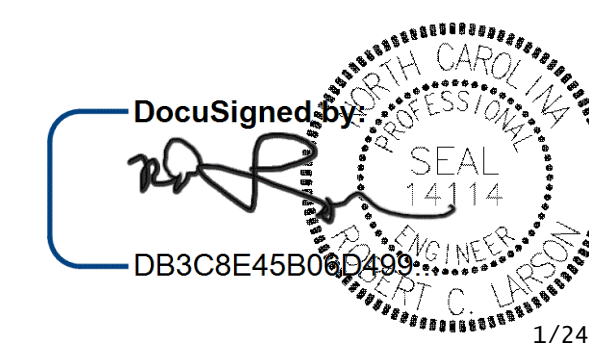
PROJECT NO. B-5671  
 \_\_\_\_\_ EDGECOMBE COUNTY  
 STATION: 17+00.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON NC 97 OVER  
 SWIFT CREEK BETWEEN  
 SR 1254 & NC 33



DESIGN ENGINEER OF RECORD: \_\_\_\_\_ DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 06/05/19  
 CHECKED BY: R. C. LARSON DATE: 06/11/19

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

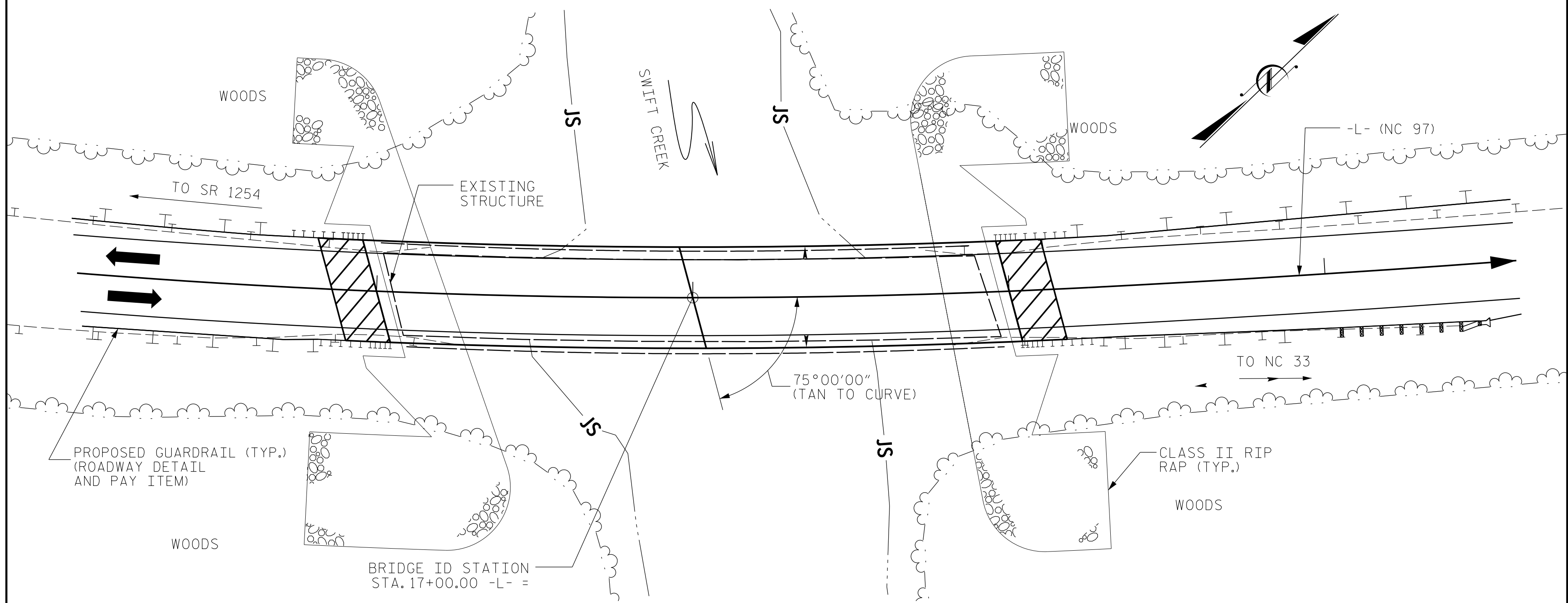
**KCI Associates**  
 of North Carolina, P.A.  
4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-9241

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

TOTAL SHEETS: 29

KCI PROJ. #251801945.24

BENCHMARK: BM#2: RR SPIKE IN BASE OF 15" ASH. -L- STA 16+20.11; OFFSET 49.71' RT EL. 48.88 (NAVD 88)



**LOCATION SKETCH**

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

**NOTES:**

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 17+00.00-L-.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 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.

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS @ STA. 17+00.00 -L-	REMOVAL OF EXISTING STRUCTURE @ STA. 17+00.00 -L-	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 17+00.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP36X0.625 GALV. STEEL PILES	HP 12 X 53 STEEL PILES		PP 36X0.625 GALVANIZED STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	CLASS II RIP RAP (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FIBER OPTIC CONDUIT SYSTEM	
											LUMP SUM	LUMP SUM			LUMP SUM	EACH								LUMP SUM
SUPERSTRUCTURE						6989	6590		LUMP SUM		8	786.67								396.55			LUMP SUM	392.55
END BENT NO.1								32.7		4687			7		7	385			4		555	620		
BENT NO.1								23.4		3799				5			5	550	3					
END BENT NO.2								32.1		4650			7		7	385			4		545	610		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	2	LUMP SUM	6989	6590	88.2	LUMP SUM	13,136	8	786.67	14	5	14	770	5	550	11	396.55	1100	1230	LUMP SUM	392.55

**NOTES (CONT'D):**

THE EXISTING STRUCTURE CONSISTING OF 5 SPANS (1 @ 37'-0", 2 @ 37'-6", 1 @ 37'-8" AND 1 @ 37'-2") REINFORCED CONCRETE DECK GIRDER SPANS WITH 26'-2" CLEAR ROADWAY WIDTH ON CONCRETE CAP AND PILES END BENTS AND BENT AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

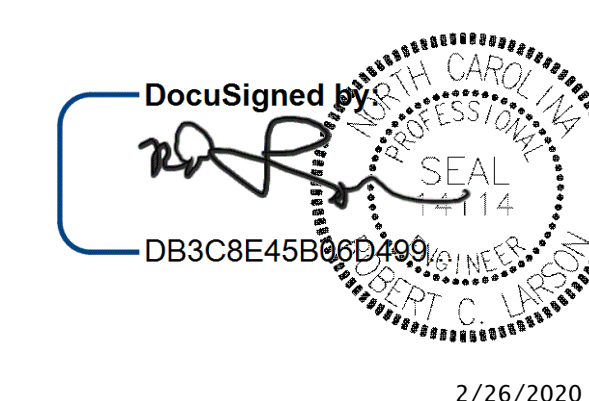
PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON NC 97 OVER  
 SWIFT CREEK BETWEEN  
 SR 1254 & NC 33



2/26/2020

DESIGN ENGINEER OF RECORD		DATE: 2/26/2020
DRAWN BY:	A. SAMBOY	DATE: 4/17/19
CHECKED BY:	R. C. LARSON	DATE: 4/30/19

**DOCUMENT NOT CONSIDERED FINAL  
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ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 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-4
1			3			TOTAL SHEETS
2			4			29

KCI PROJ. #251801945.24

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	1.09		0.815	1.49	A	E	48.5	0.981	1.18	A	I	4.5	0.80	0.744	1.09	A	I	48.5		
	HL-93 (OPERATING)	N/A		1.55		0.815	1.93	A	E	48.5	0.981	1.55	A	I	4.5	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.51		0.815	2.06	A	E	48.5	0.981	1.61	A	I	4.5	0.80	0.744	1.51	A	I	48.5		
	HS-20 (OPERATING)	36.000		2.11		0.815	2.68	A	E	48.5	0.981	2.11	A	I	4.5	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.57	48.19	0.815	6.10	A	E	48.5	0.981	5.15	A	I	4.5	0.80	0.744	3.57	A	I	48.5	
		SNGARBS2	20.000		2.59	51.80	0.815	4.42	A	E	48.5	0.981	3.57	A	I	4.5	0.80	0.744	2.59	A	I	48.5	
		SNAGRIS2	22.000		2.43	53.46	0.815	4.14	A	E	48.5	0.981	3.29	A	I	4.5	0.80	0.744	2.43	A	I	48.5	
		SNCOTTS3	27.250		1.78	48.50	0.815	3.03	A	E	48.5	0.981	2.52	A	I	4.5	0.80	0.744	1.78	A	I	48.5	
		SNAGGRS4	34.925		1.46	50.99	0.815	2.49	A	E	48.5	0.981	2.04	A	I	4.5	0.80	0.744	1.46	A	I	48.5	
		SNS5A	35.550		1.43	50.83	0.815	2.44	A	E	48.5	0.981	2.04	A	I	4.5	0.80	0.744	1.43	A	I	48.5	
		SNS6A	39.950		1.30	51.93	0.815	2.22	A	E	48.5	0.981	1.84	A	I	4.5	0.80	0.744	1.30	A	I	48.5	
		SNS7B	42.000		1.24	52.08	0.815	2.11	A	E	48.5	0.981	1.79	A	I	4.5	0.80	0.744	1.24	A	I	48.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.58	52.14	0.815	2.70	A	E	48.5	0.981	2.22	A	I	4.5	0.80	0.744	1.58	A	I	48.5	
		TNT4A	33.075		1.58	52.25	0.815	2.70	A	E	48.5	0.981	2.18	A	I	4.5	0.80	0.744	1.58	A	I	48.5	
		TNT6A	41.600		1.28	53.24	0.815	2.19	A	E	48.5	0.981	1.87	A	I	4.5	0.80	0.744	1.28	A	I	48.5	
		TNT7A	42.000		1.28	53.76	0.815	2.19	A	E	48.5	0.981	1.84	A	I	4.5	0.80	0.744	1.28	A	I	48.5	
		TNT7B	42.000		1.32	55.44	0.815	2.25	A	E	48.5	0.981	1.76	A	I	4.5	0.80	0.744	1.32	A	I	48.5	
		TNAGRIT4	43.000		1.26	54.18	0.815	2.15	A	E	48.5	0.981	1.70	A	I	4.5	0.80	0.744	1.26	A	I	48.5	
		TNAGT5A	45.000		1.19	53.55	0.815	2.04	A	E	48.5	0.981	1.67	A	I	4.5	0.80	0.744	1.19	A	I	48.5	
TNAGT5B	45.000	③	1.18	53.10	0.815	2.02	A	E	48.5	0.981	1.62	A	I	4.5	0.80	0.744	1.18	A	I	48.5			

**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.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

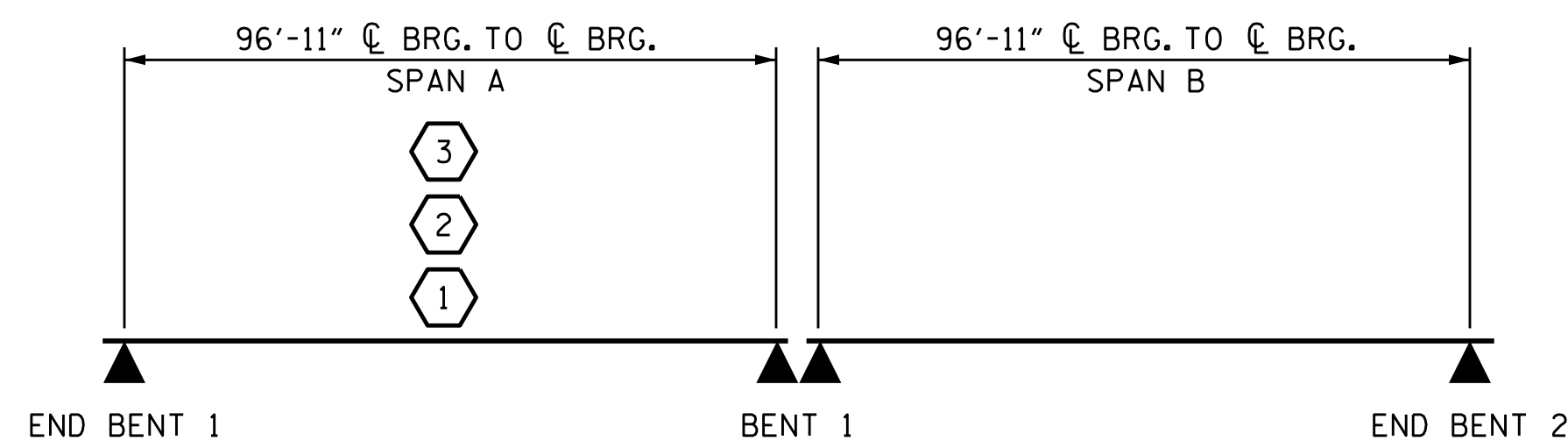
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

I - INTERIOR GIRDER  
E - EXTERIOR



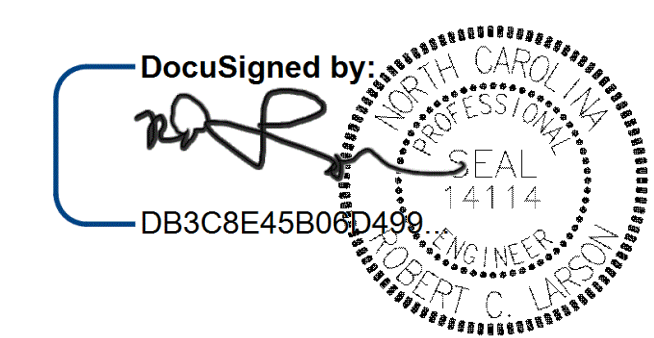
### LRFR SUMMARY

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			29



KCI JOB NO: 251801945.24

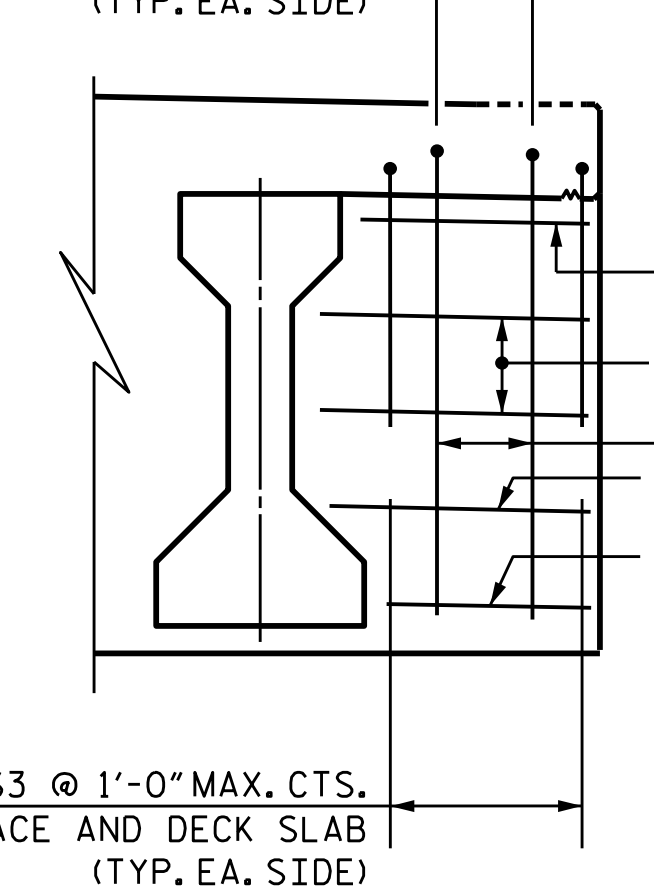
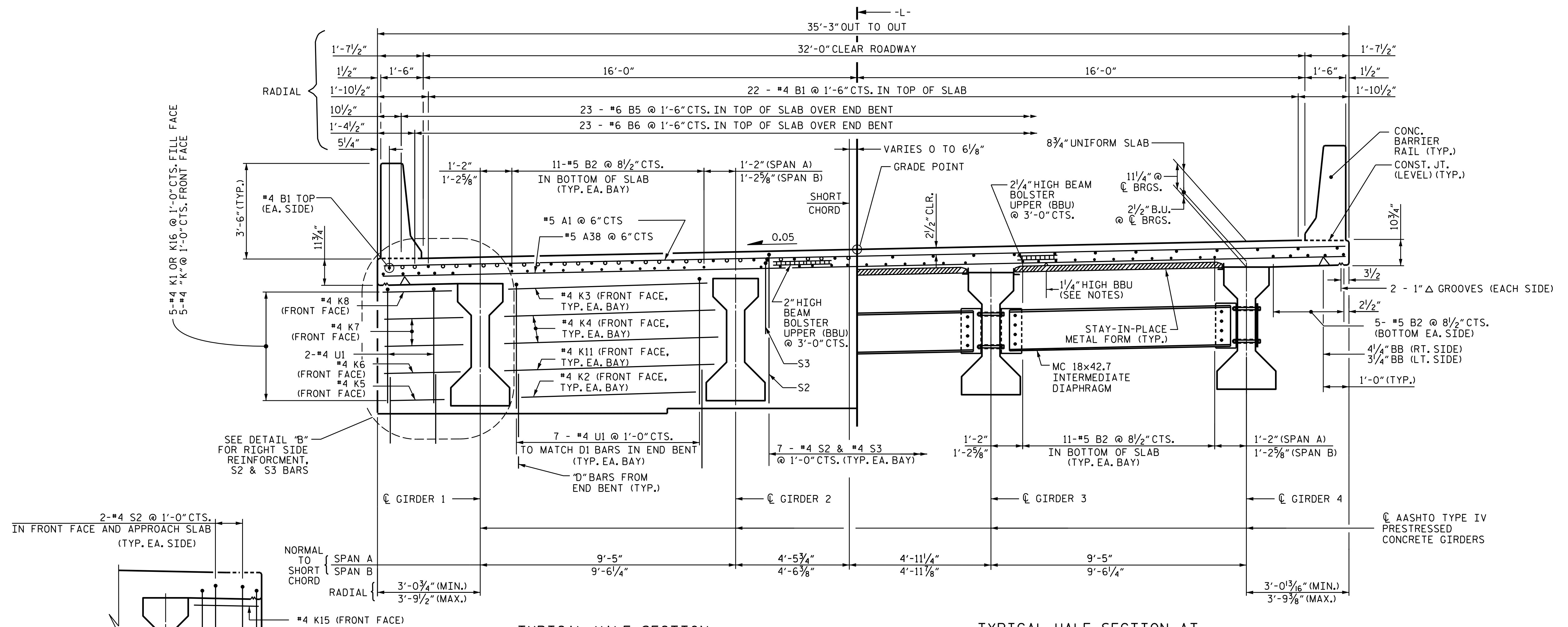
DESIGN ENGINEER OF RECORD: DATE: 1/24/2020

ASSEMBLED BY: C. E. LARSON DATE: 09/05/19  
 CHECKED BY: R. C. LARSON DATE: 09/09/19

DRAWN BY: MAA 1/08 REV. 11/2/08RR MAA/GM  
 CHECKED BY: GM/DI 2/08 REV. 10/1/11 MAA/GM  
 REV. 12/17 MAA/THC

**DOCUMENT NOT CONSIDERED FINAL  
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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 919-783-9241



TYPICAL HALF SECTION AT END BENT DIAPHRAGM

TYPICAL HALF SECTION AT INTERMEDIATE DIAPHRAGM

**TYPICAL SECTION**

- INDICATES CONTINUOUS REINFORCING
- INDICATES ADDITIONAL REINFORCING OVER END BENT

**NOTES**

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (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 CONCRETE BARRIER RAIL DRAWINGS FOR ADDITIONAL REINFORCING STEEL EMBEDDED IN DECK.

FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

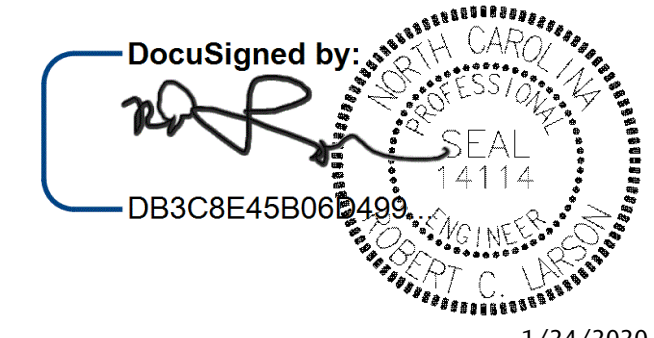
DESIGN ENGINEER OF RECORD:	DATE:
<i>[Signature]</i>	1/24/2020
DRAWN BY: A.K. ALLANKI	DATE: 06/14/19
CHECKED BY: R.C. LARSON	DATE: 06/24/19

PROJECT NO. B-5671  
 \_\_\_\_\_ COUNTY  
 STATION: 17+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



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

TOTAL SHEETS: 29

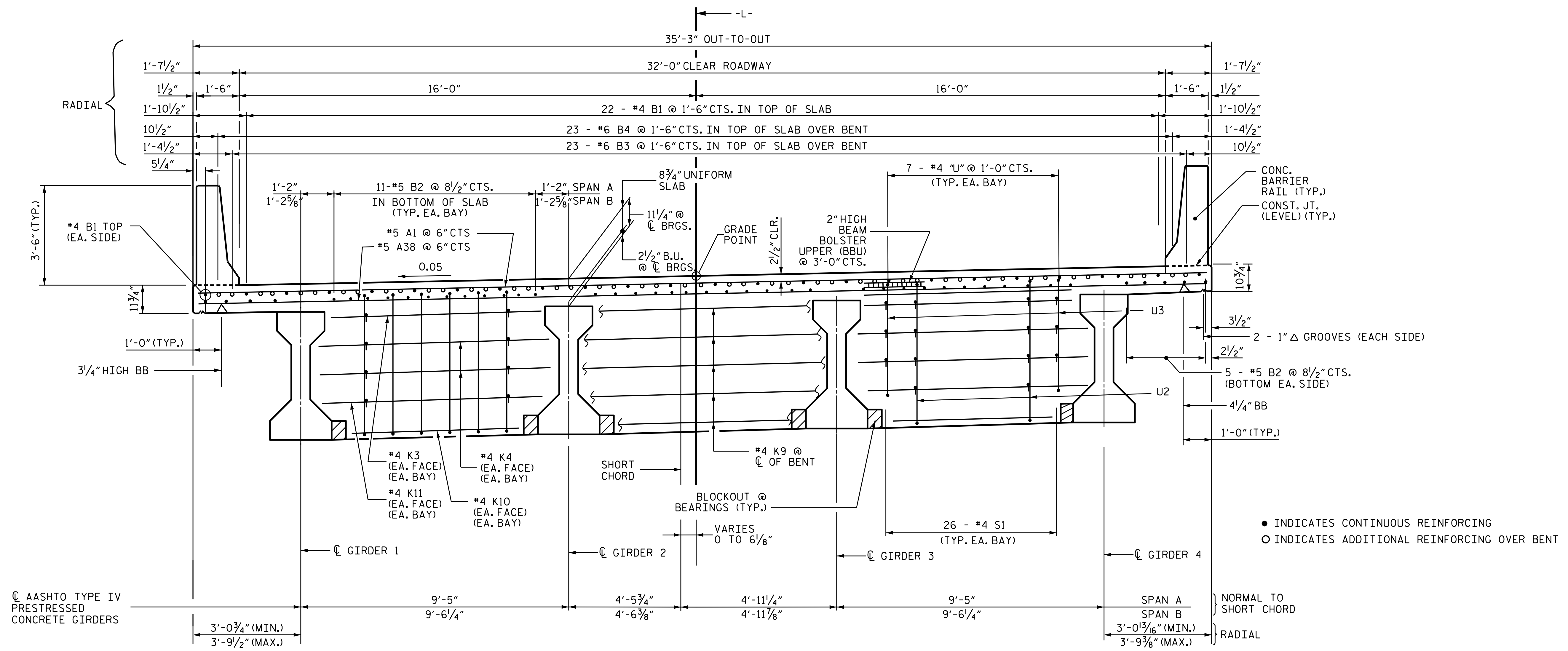
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ENGINEERS, PLANNERS & SCIENTISTS IN CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764

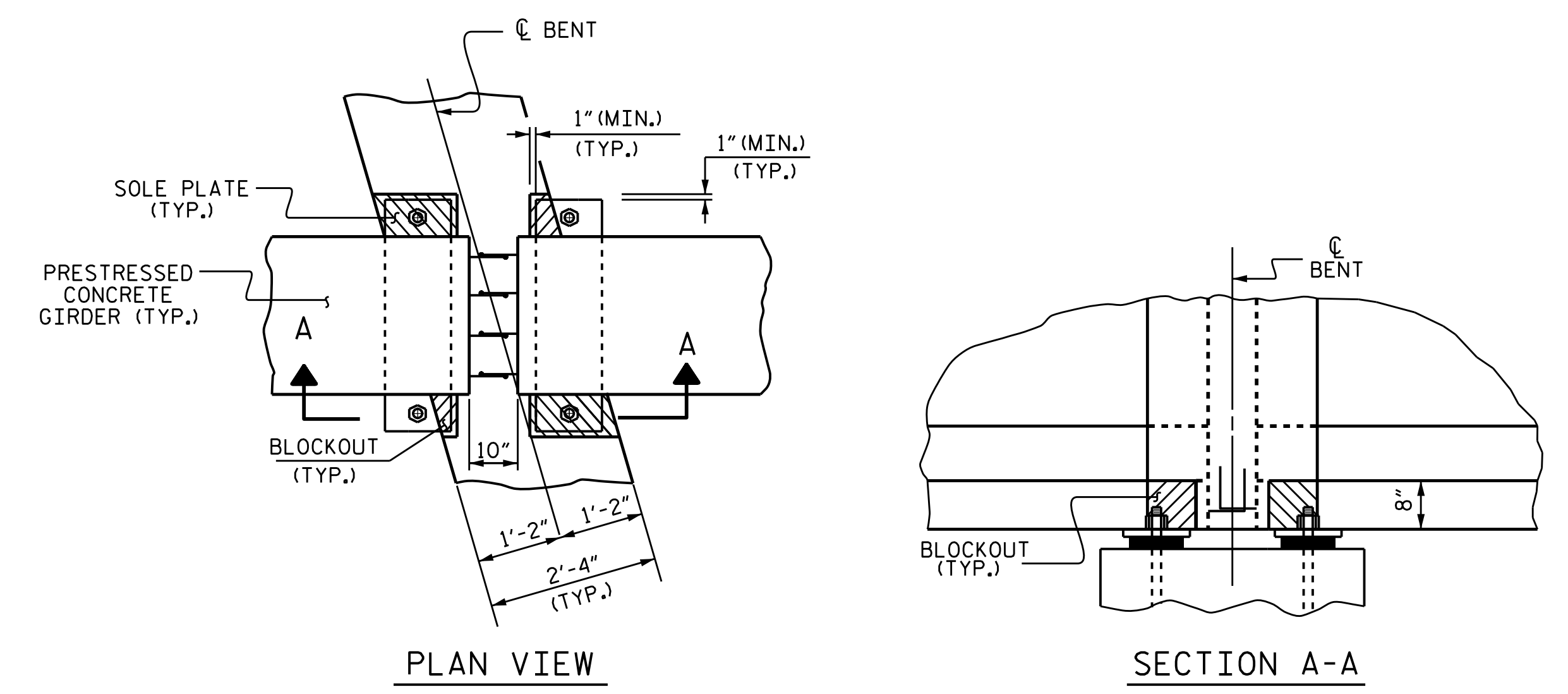
**KCI Associates**  
 of North Carolina, P.A.

400 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: (919) 785-9241

KCI PROJ. #251801945.24



TYPICAL SECTION AT BENT DIAPHRAGM



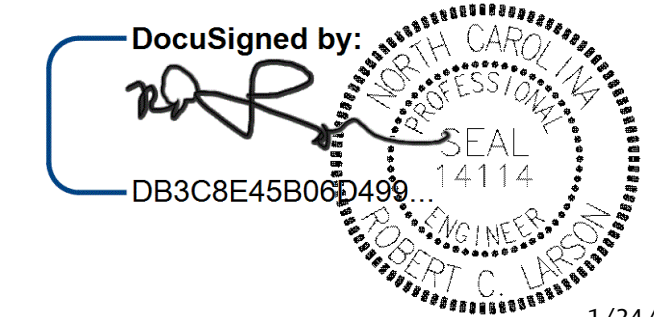
BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



DESIGN ENGINEER OF RECORD:	DATE:
<i>[Signature]</i>	1/24/2020
DRAWN BY:	DATE:
A.K. ALLANKI	06/17/19
CHECKED BY:	DATE:
R.C. LARSON	06/25/19

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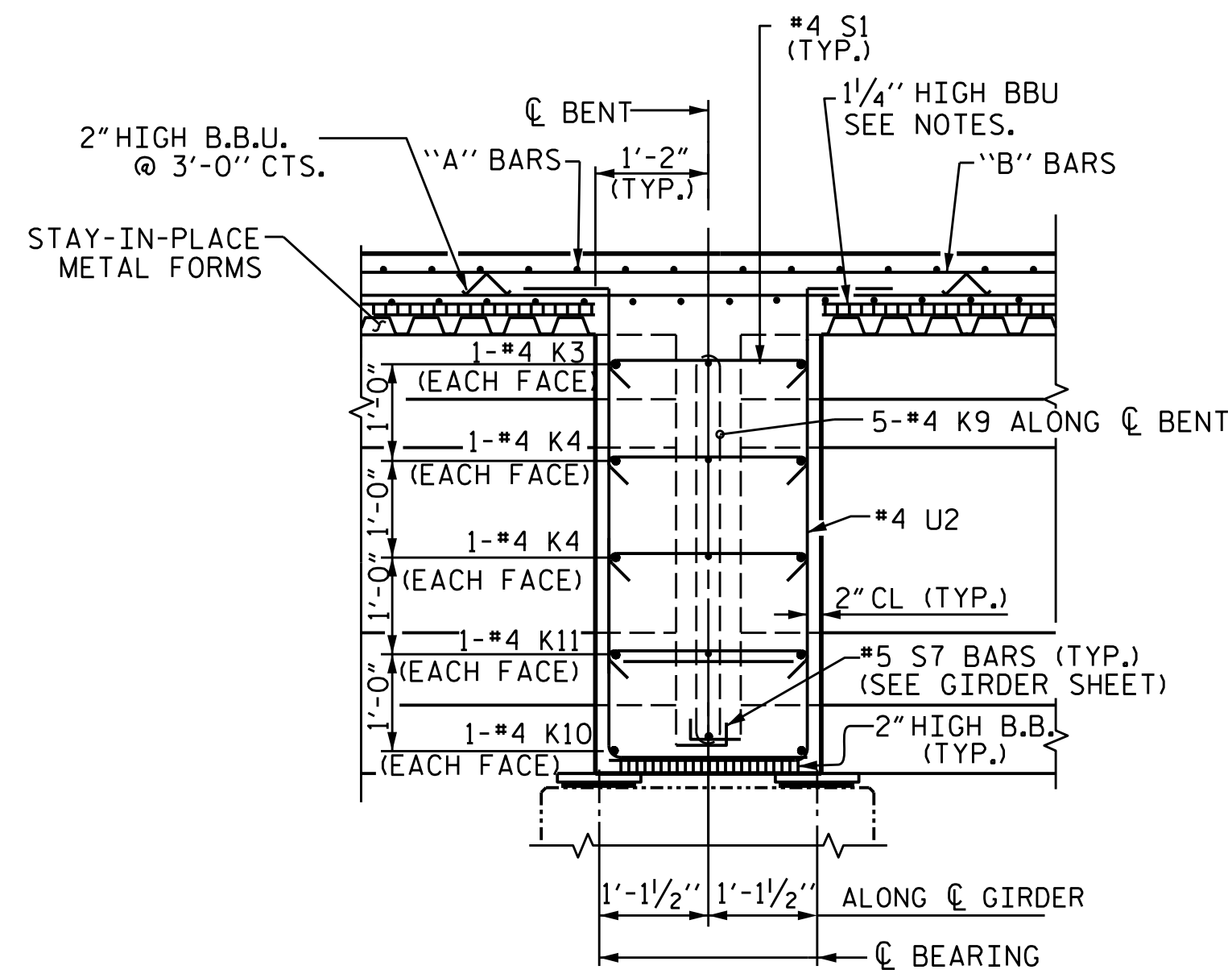
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: 919-785-9241

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

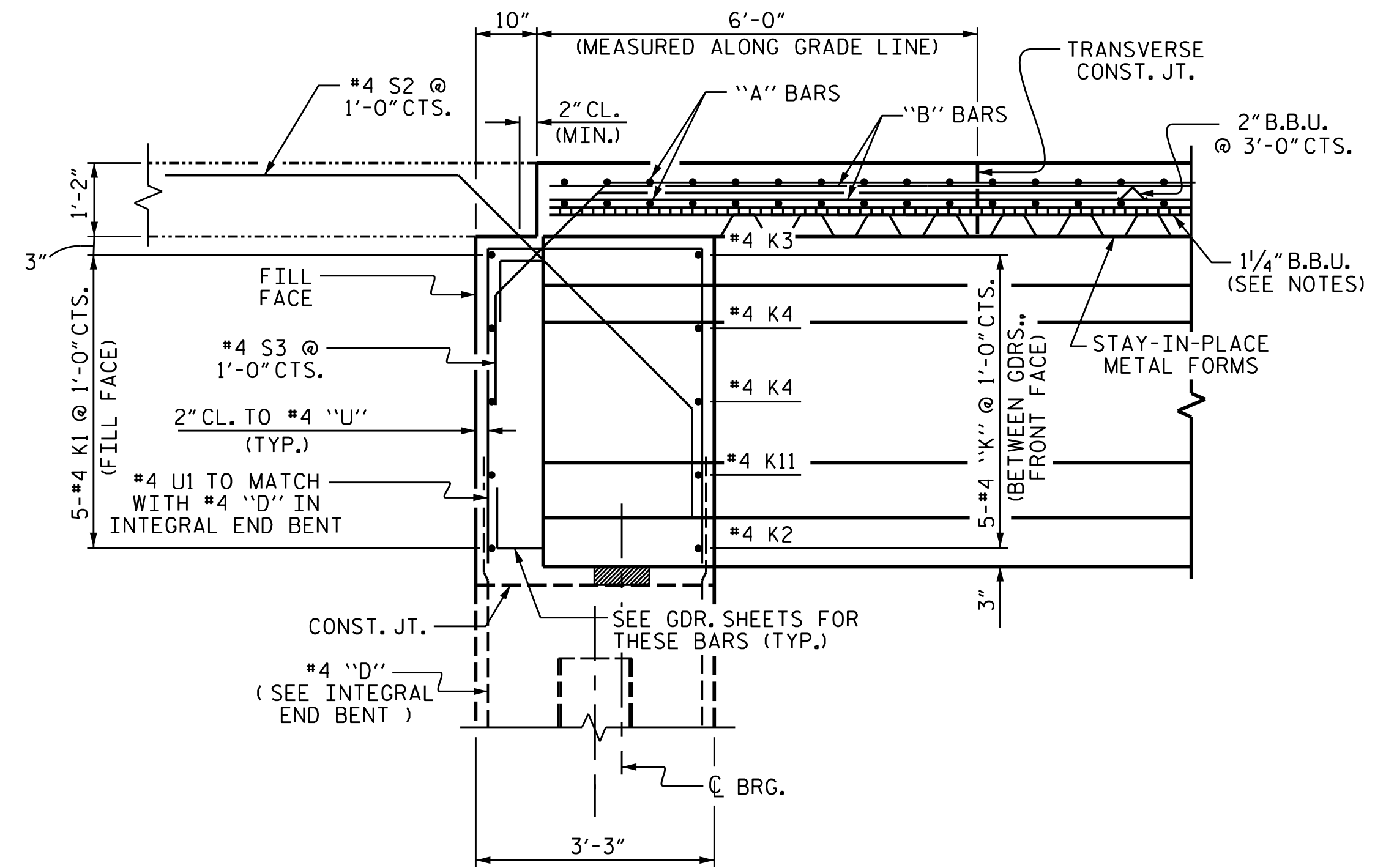
TOTAL SHEETS: 29

KCI PROJ. #251801945.24

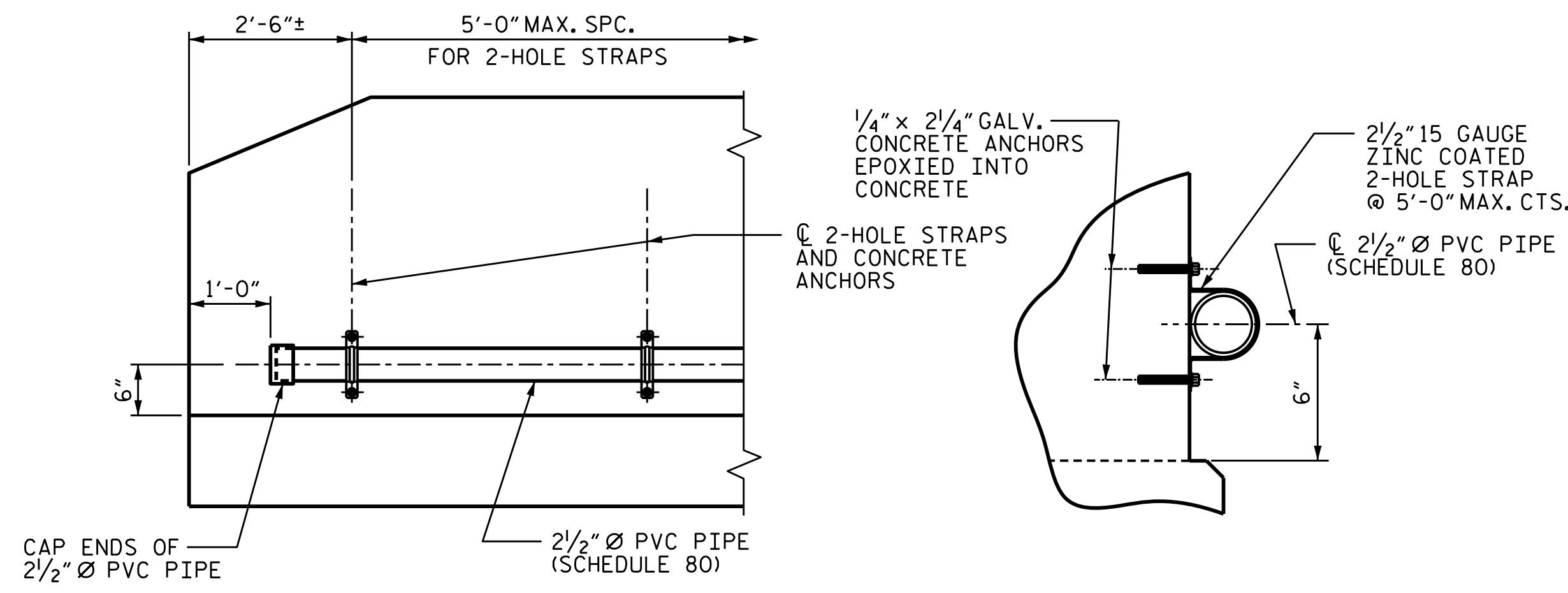




**SECTION THRU BENT DIAPHRAGM**

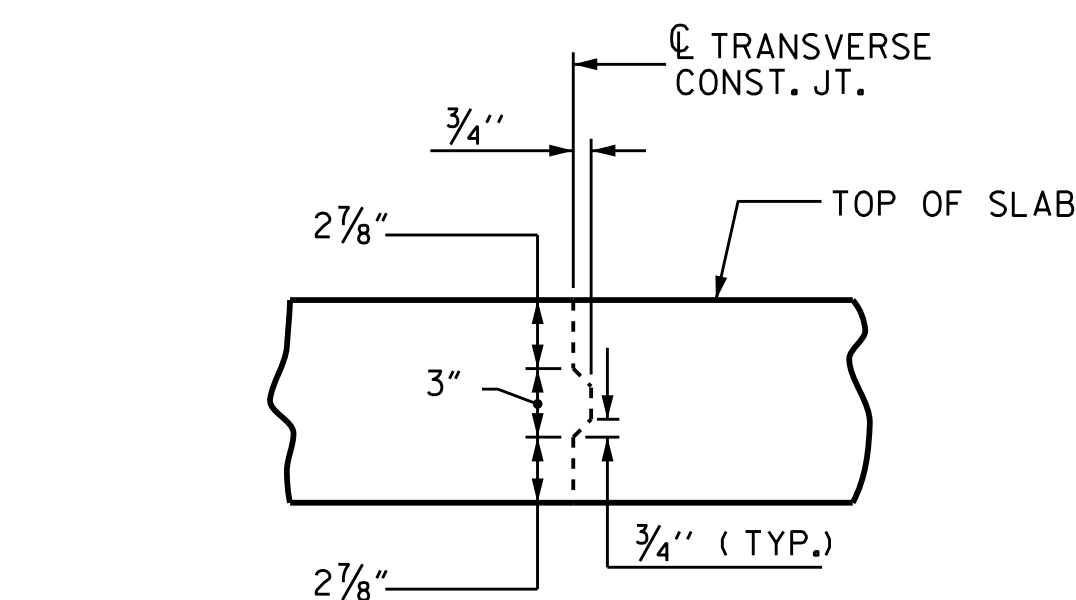


**SECTION THRU INTEGRAL END BENT**



**ELEVATION SECTION**  
**FIBER OPTIC CONDUIT SYSTEM DETAILS**

2 1/2" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

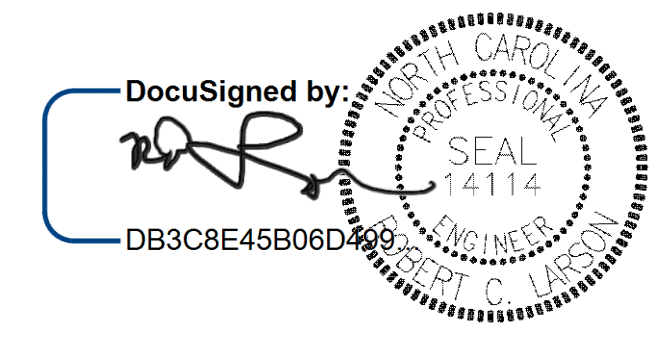
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**



1/24/2020

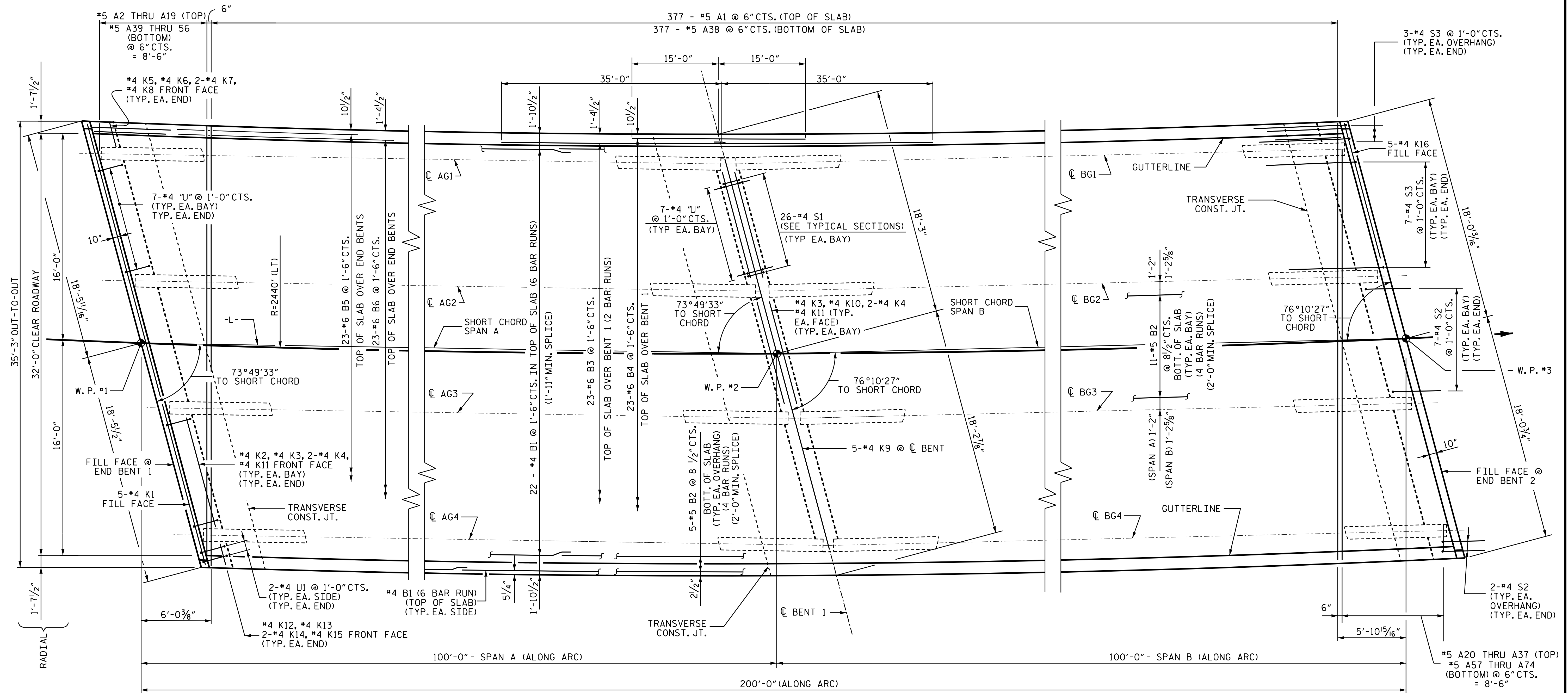
DESIGN ENGINEER OF RECORD:	DATE:
<i>RCL</i>	1/24/2020
DRAWN BY: A. K. ALLANK	DATE: 06/17/19
CHECKED BY: R. C. LARSON	DATE: 06/24/19

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

KCI PROJ. #251801945.24

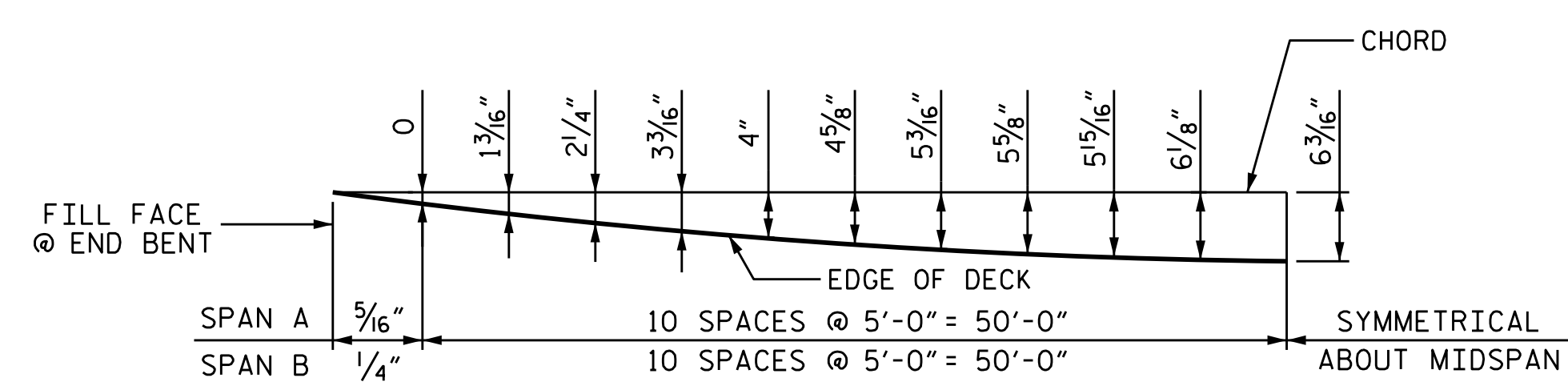


PLAN OF SPAN A

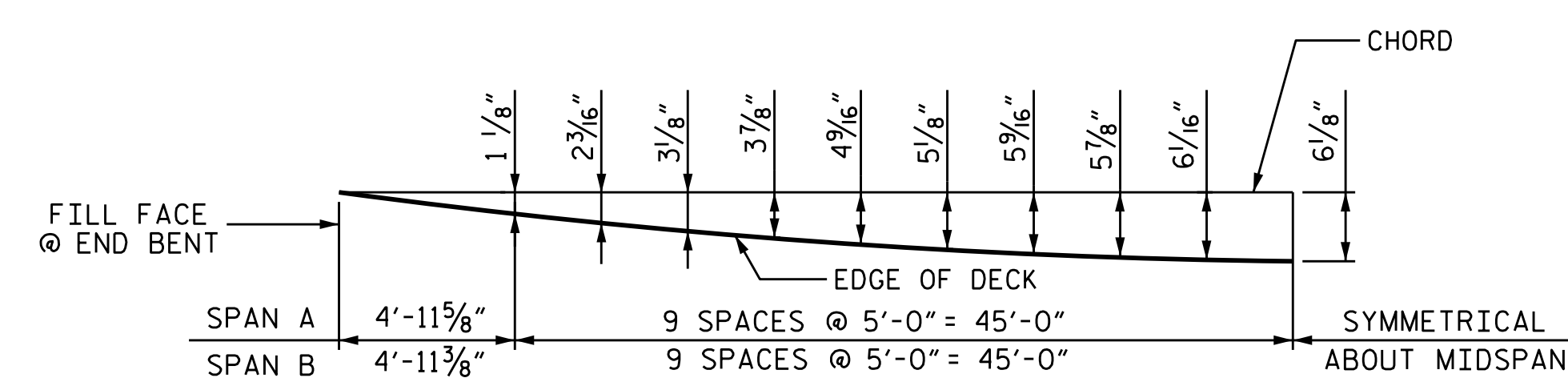
PLAN OF SPAN B

NOTE: SEE SUPERSTRUCTURE BILL OF MATERIAL FOR REINFORCING SPLICE LENGTHS.

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-



ARC OFFSETS (LEFT SIDE)

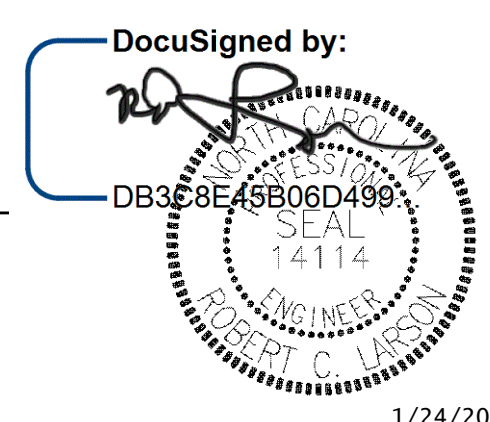


ARC OFFSETS (RIGHT SIDE)

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPANS A & B**

DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 06/21/19  
 CHECKED BY: R. C. LARSON DATE: 06/25/19



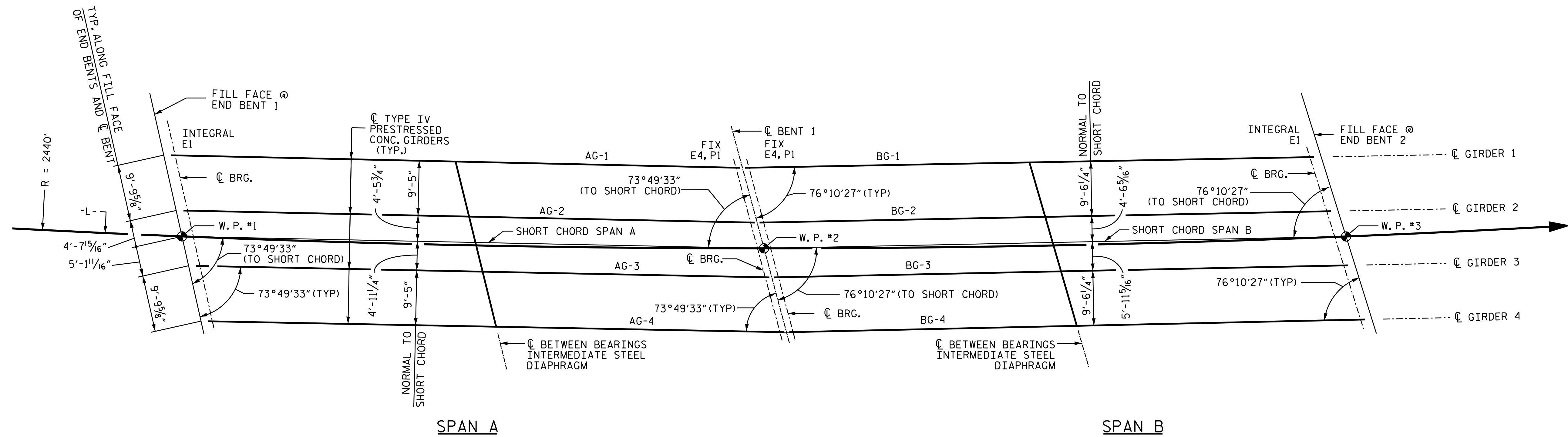
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 29

KCI PROJ. #251801945.24



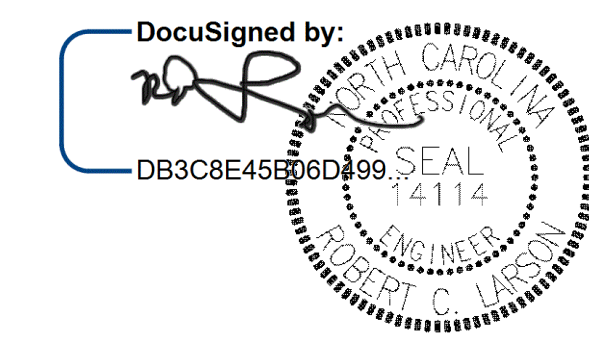
### GIRDER LAYOUT

ALL GIRDERS ARE PARALLEL TO SHORT CHORD  
END BENTS AND BENT ARE PARALLEL

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SUPERSTRUCTURE GIRDER LAYOUT



DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 DRAWN BY: A. SAMBOY DATE: 05/23/19  
 CHECKED BY: R. C. LARSON DATE: 08/26/19

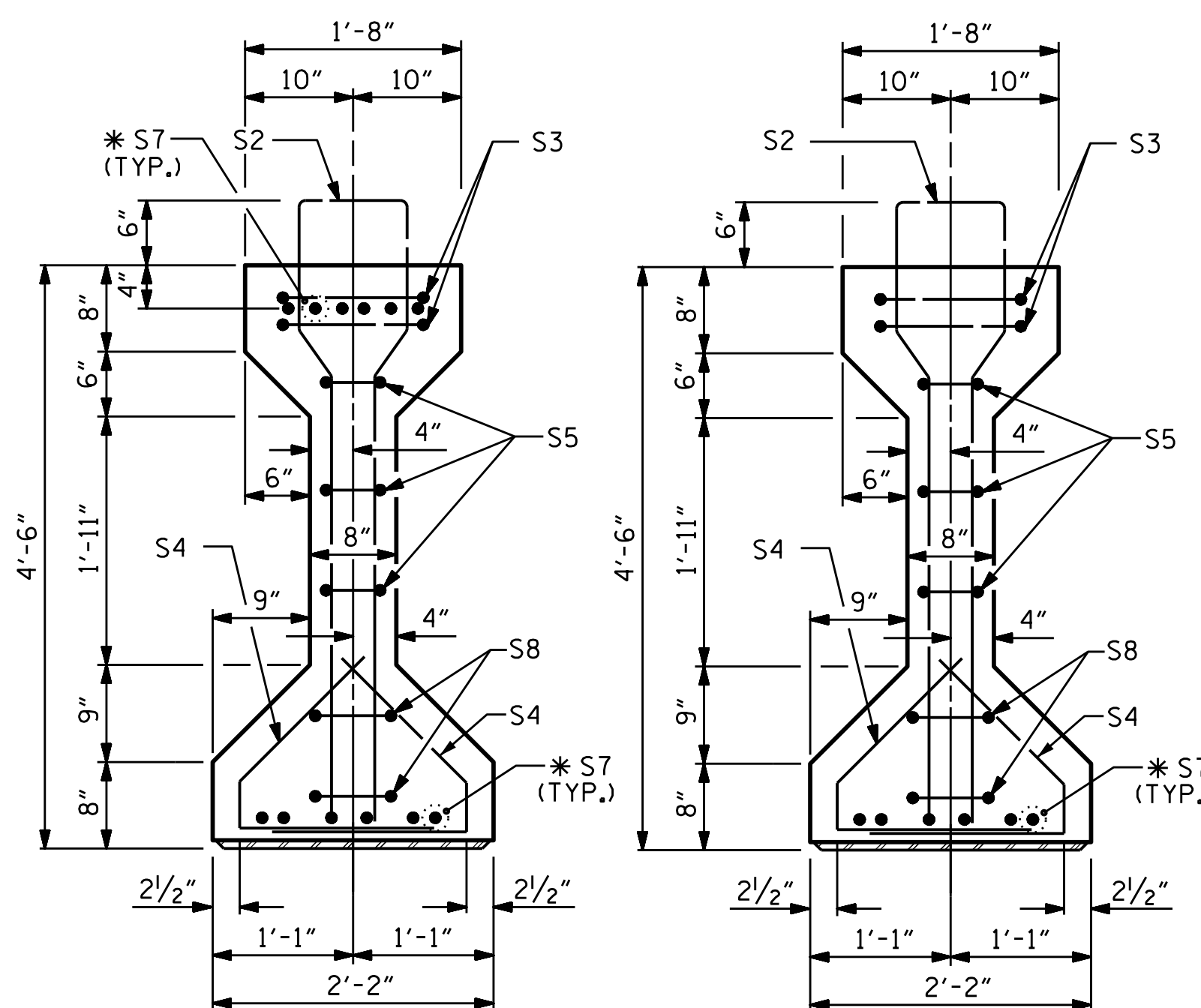
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ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

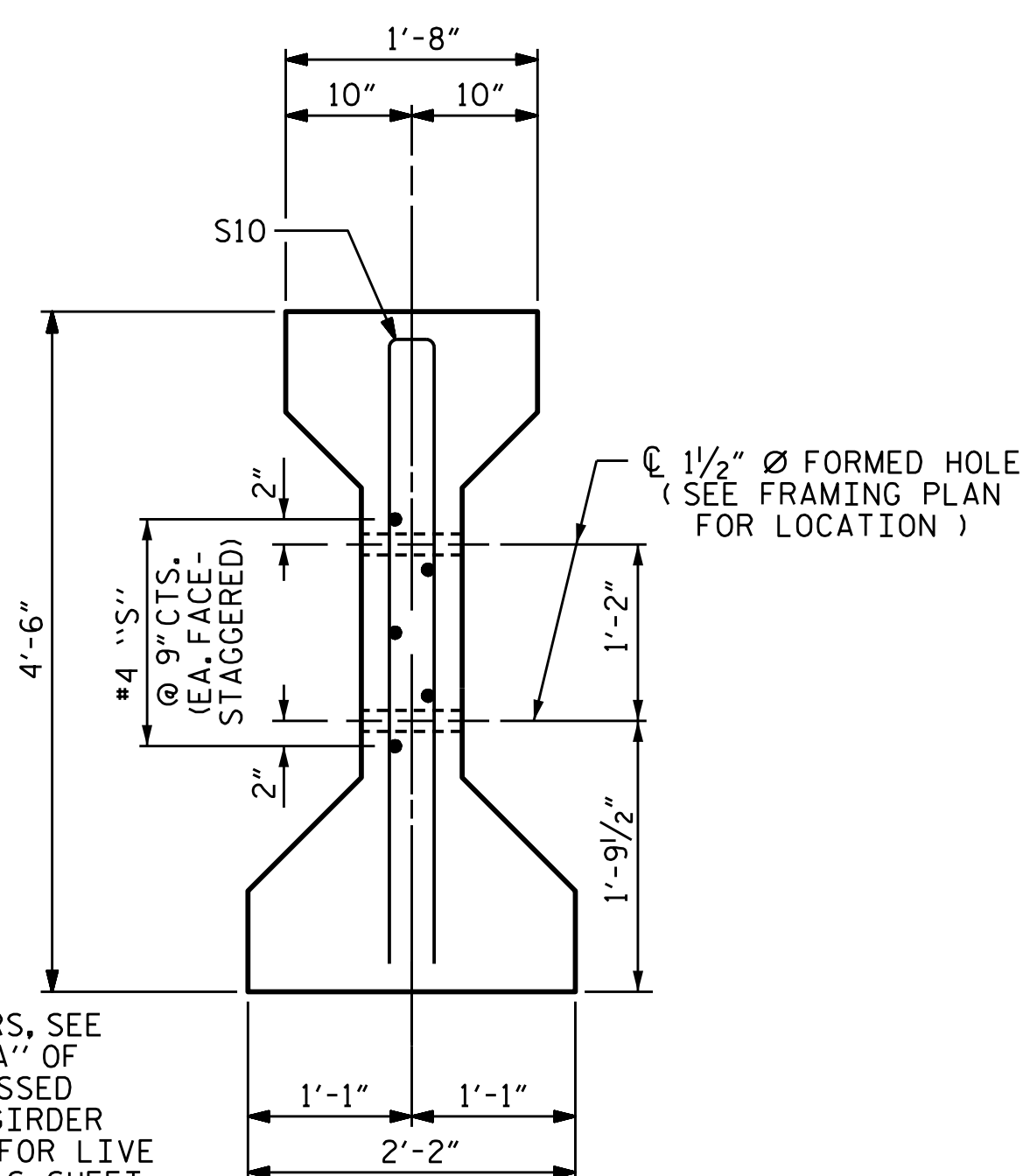
TOTAL SHEETS: 29

KCI PROJ. #251801945.24

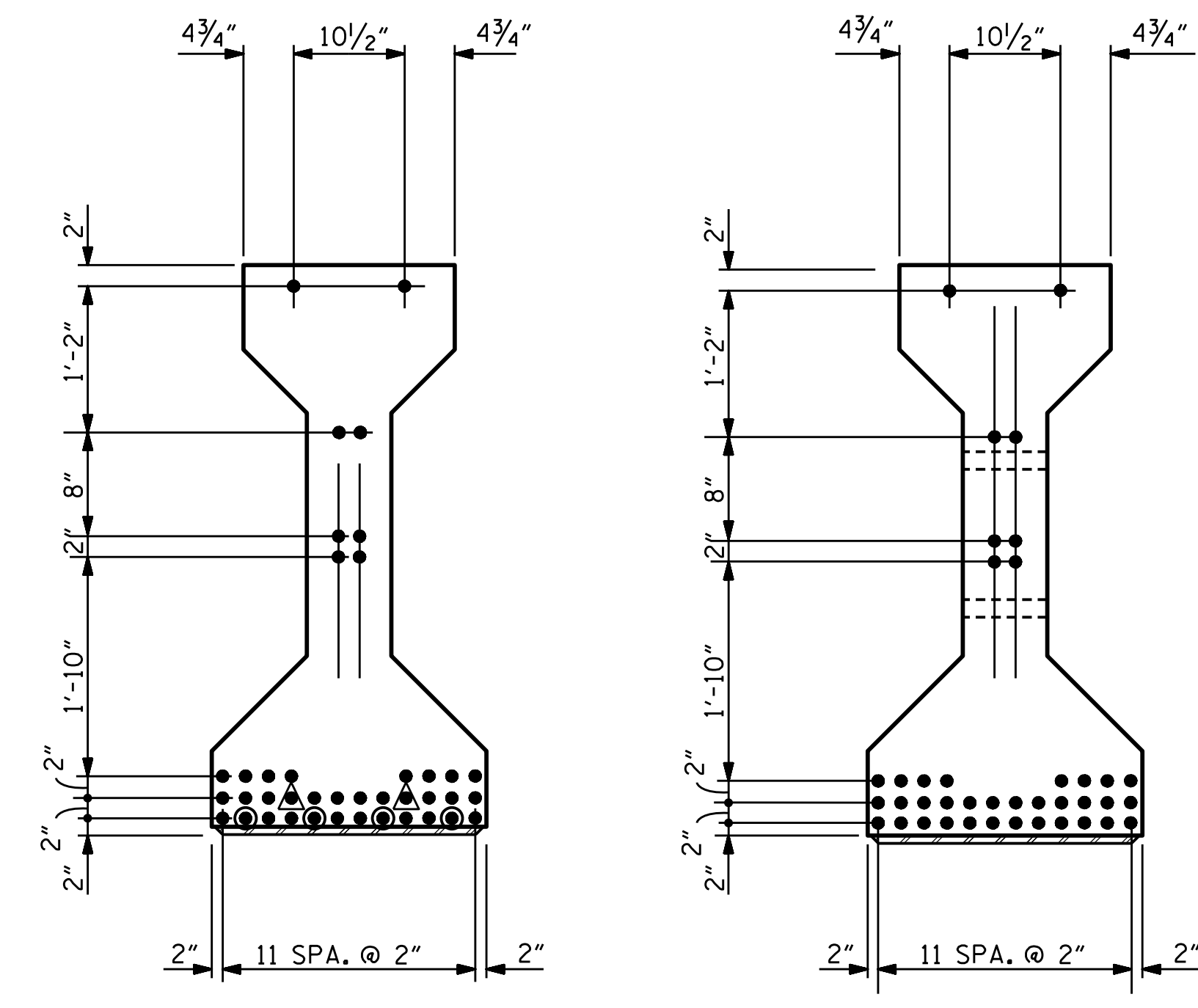


SECTION A-A SECTION B-B

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



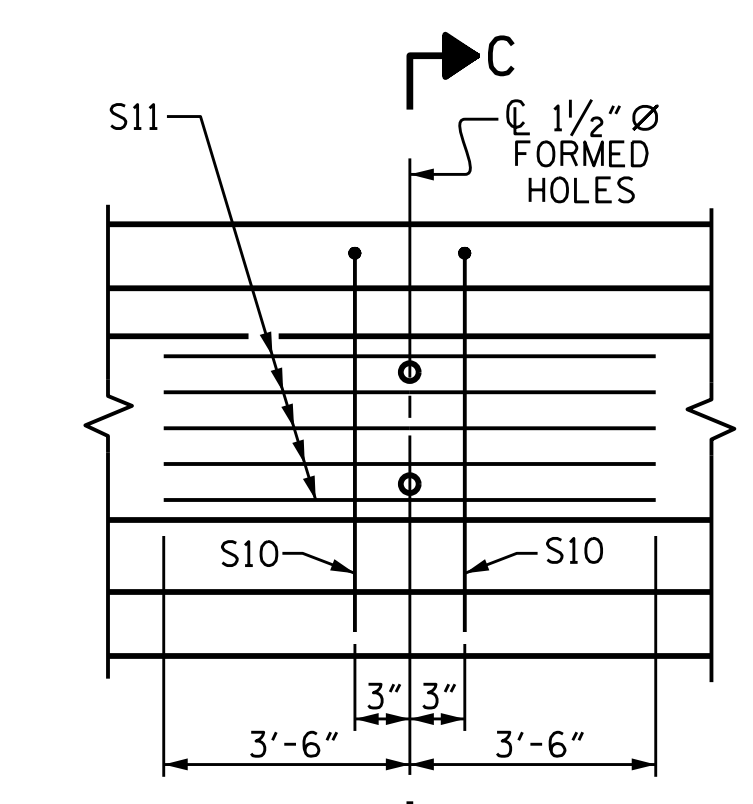
SECTION C-C (S1 BARS NOT SHOWN)



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

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

DEBONDING LEGEND



PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

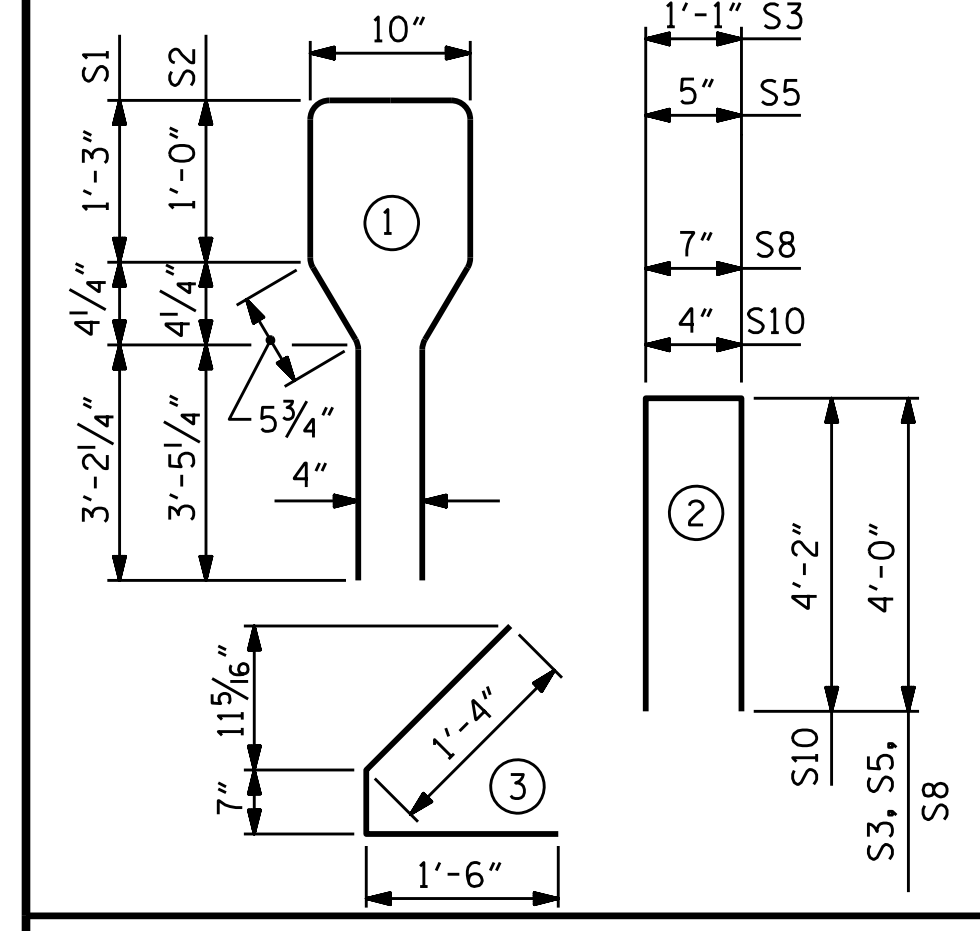
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	72	#4	1	10'-8"	513
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	68	#4	3	3'-5"	155
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



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
1053	20.0	40

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	98'-4"	786'-8"

PROJECT NO. B-5671  
EDGECOMBE COUNTY  
STATION: 17+00.00 -L-

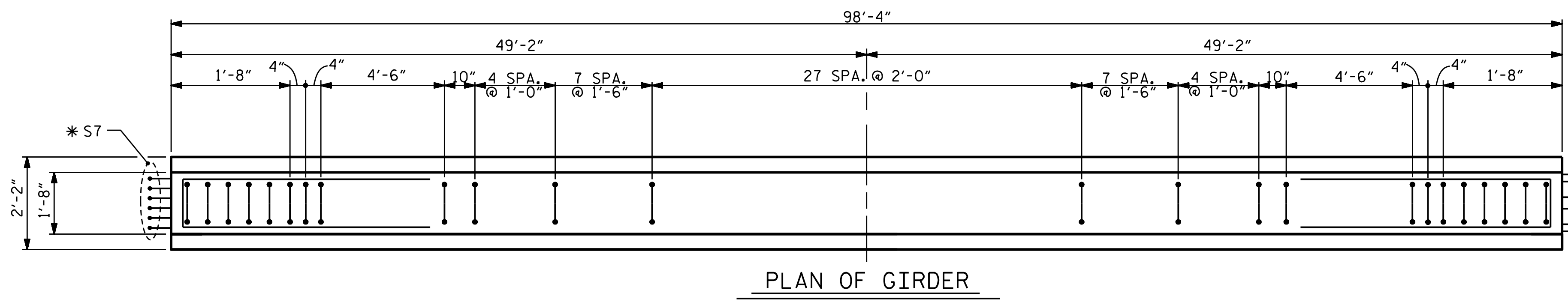
SHEET 1 OF 2  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD

REVISIONS

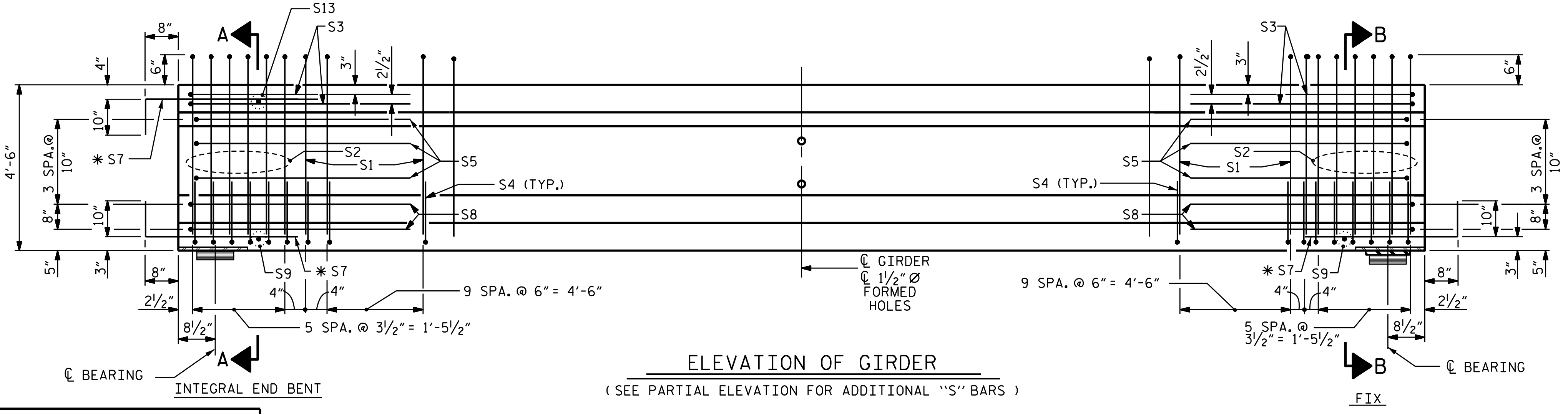
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-11  
TOTAL SHEETS 29

STD. NO. PCG6



PLAN OF GIRDER



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

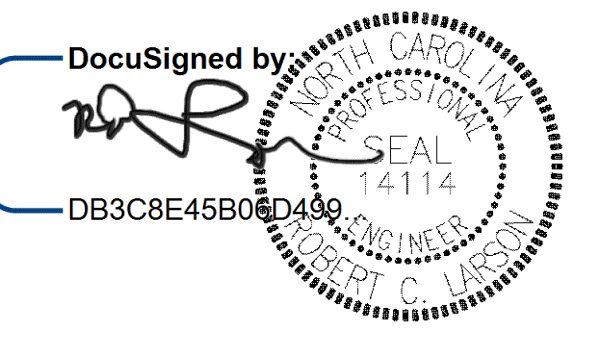
KCI JOB NO: 251801945.24

DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020

ASSEMBLED BY: Z. KADI DATE: 06/03/19  
CHECKED BY: R. C. LARSON DATE: 11/07/19

DRAWN BY: ELR 8/91 MAA/GM  
CHECKED BY: GRP 8/91 REV. 1/15 MAA/TMG  
REV. 12/17 MAA/THC

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DocuSigned by: [Signature]  
KCI Associates of North Carolina, P.A.  
1/24/2020

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.

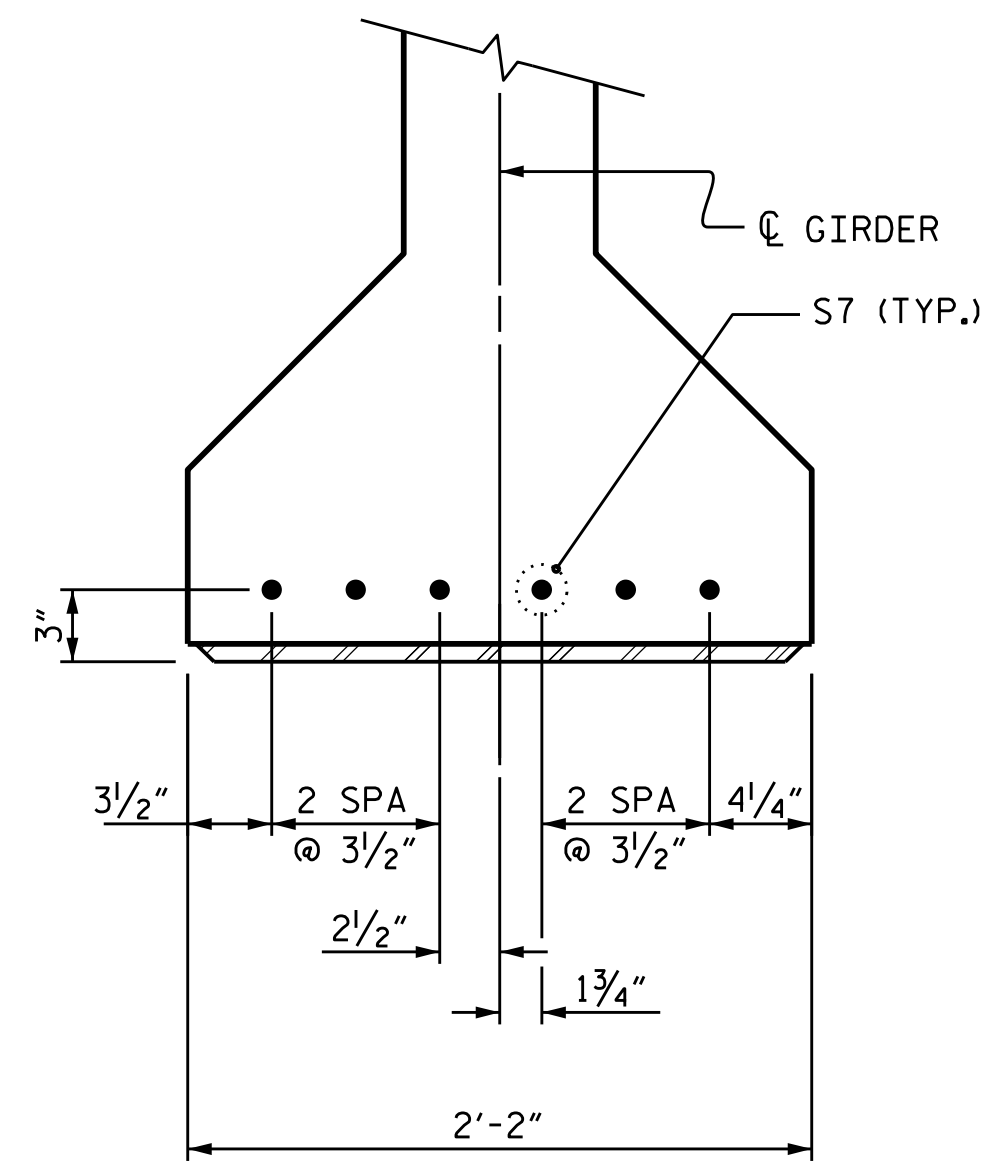
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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.

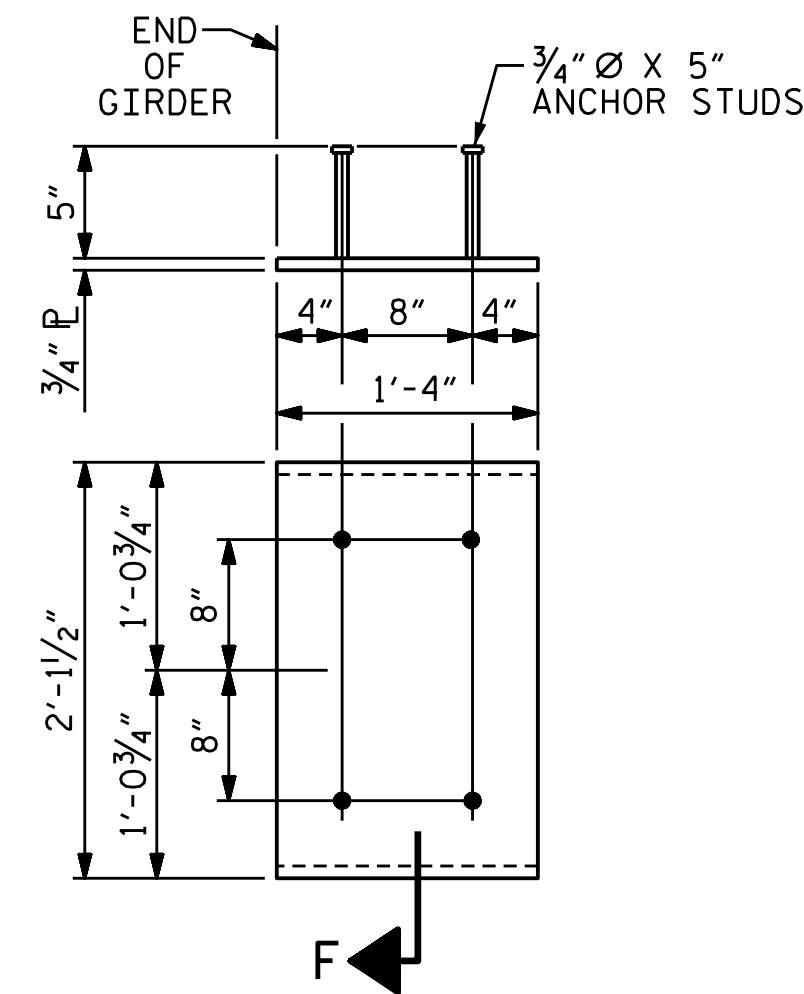
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 PSI.

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

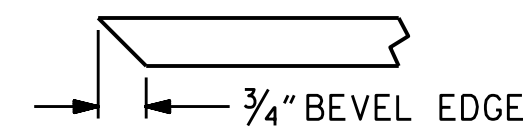
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".



**DETAIL "A"**  
(FOR AASHTO TYPE IV GIRDERS)



**EMBEDDED PLATE "B-1" DETAILS**  
**FOR AASHTO TYPE IV GIRDER AND**  
(2 REQ'D PER GIRDER)



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

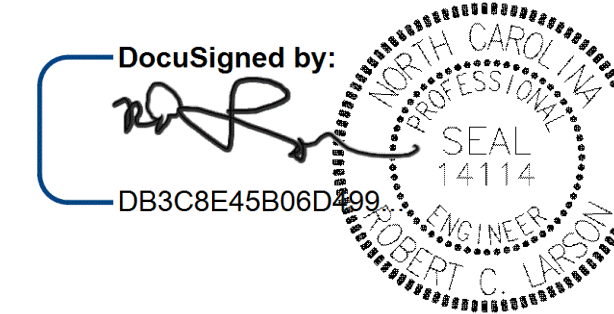
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	EXTERIOR GIRDER											INTERIOR GIRDER											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.000	0.065	0.124	0.169	0.198	0.208	0.198	0.169	0.124	0.065	0.000	0.000	0.065	0.124	0.169	0.198	0.208	0.198	0.169	0.124	0.065	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.047	0.092	0.128	0.151	0.159	0.151	0.128	0.092	0.047	0.000	0.000	0.052	0.103	0.143	0.168	0.177	0.168	0.143	0.103	0.052	0.000
FINAL CAMBER	↑	0	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	0	0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	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-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-

SHEET 2 OF 2

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



DESIGN ENGINEER OF RECORD:	DATE:	1/24/2020
ASSEMBLED BY: Z. KADI	DATE:	08/26/19
CHECKED BY: R. C. LARSON	DATE:	08/26/19
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

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

**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.

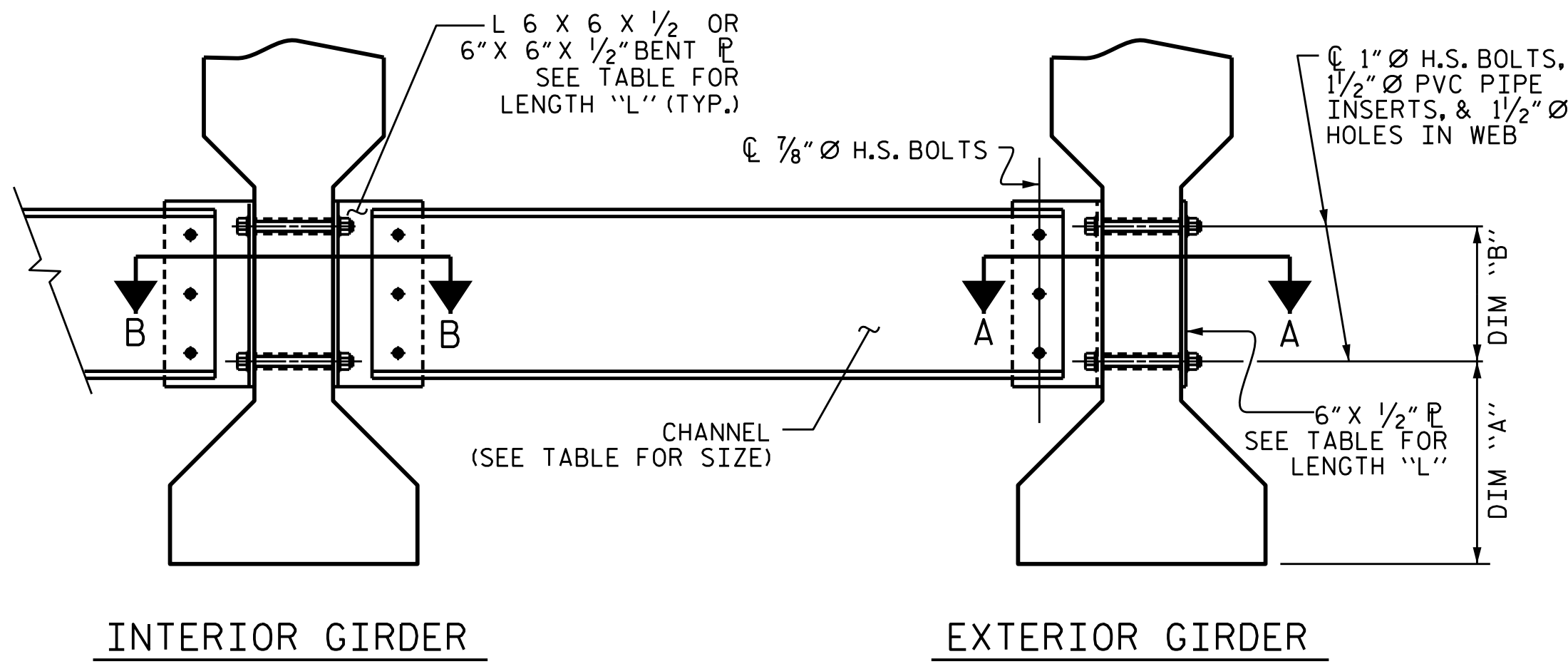
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

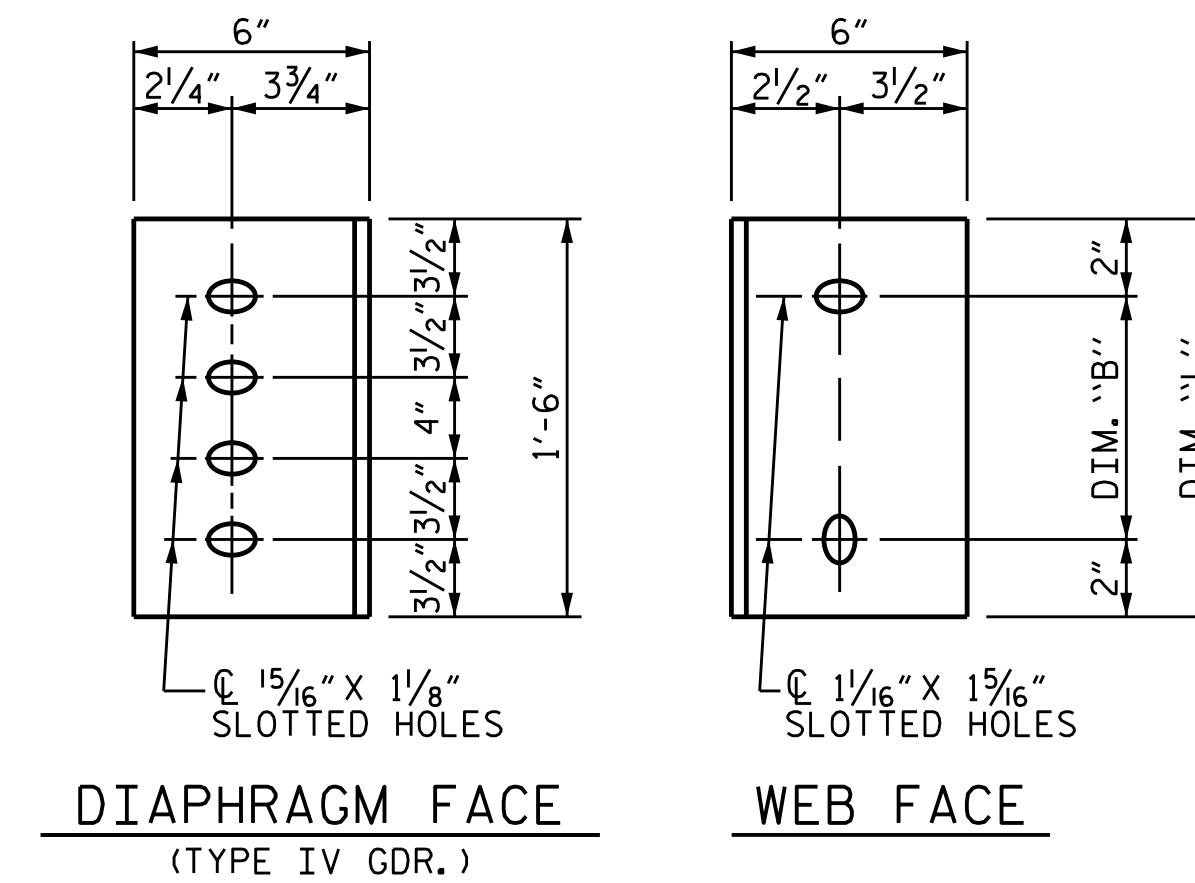
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

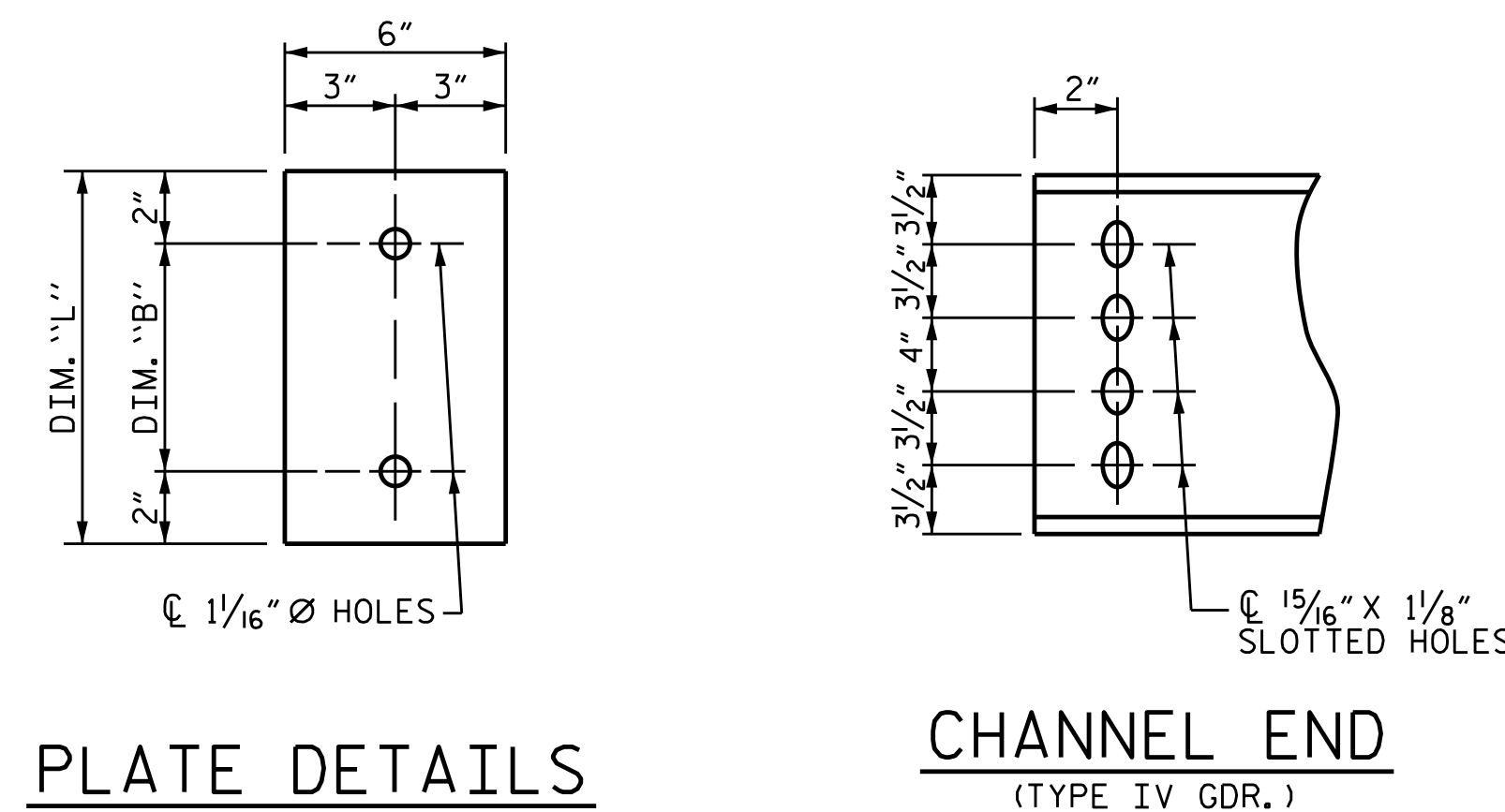


**PART SECTION AT INTERMEDIATE DIAPHRAGM**

(TYPE IV GIRDER SHOWN)

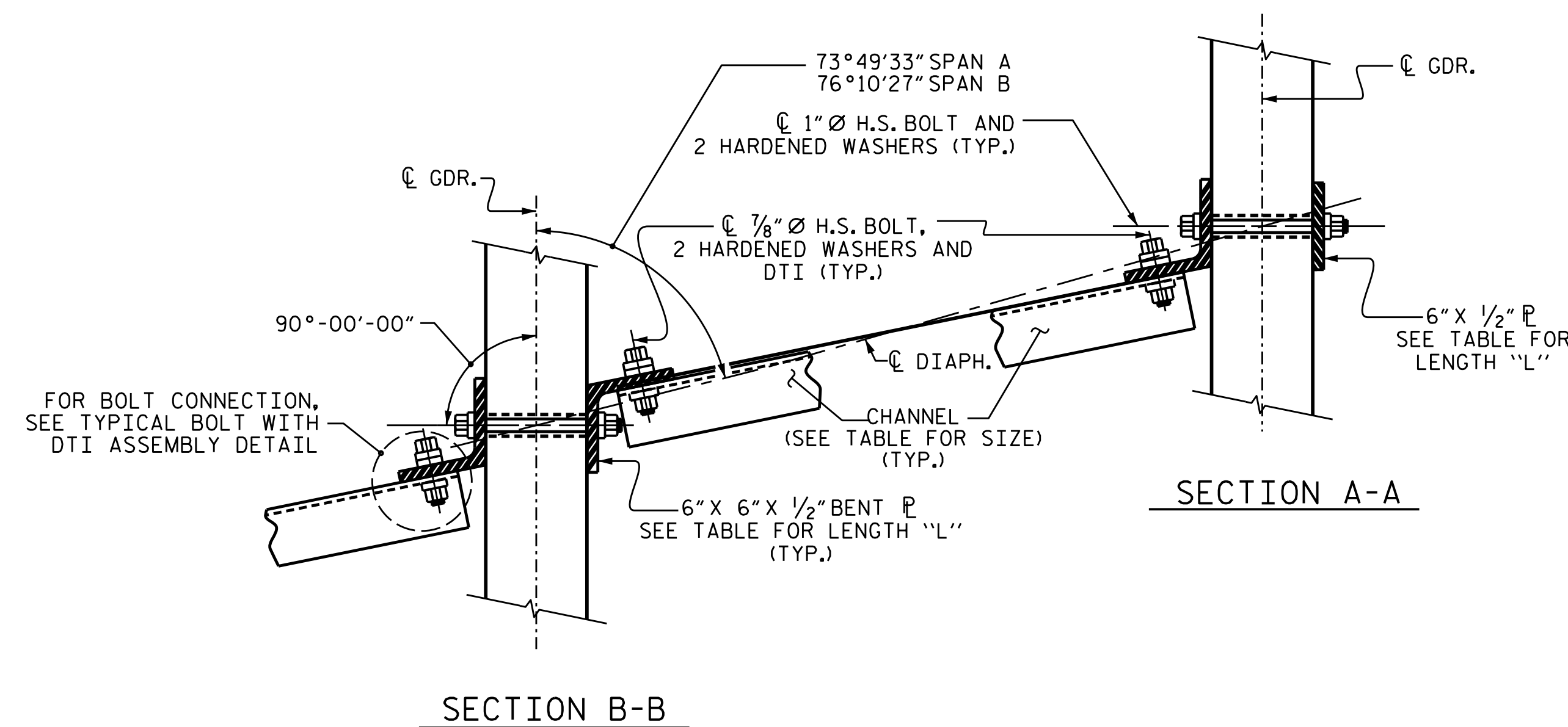


**CONNECTOR PLATE DETAILS**

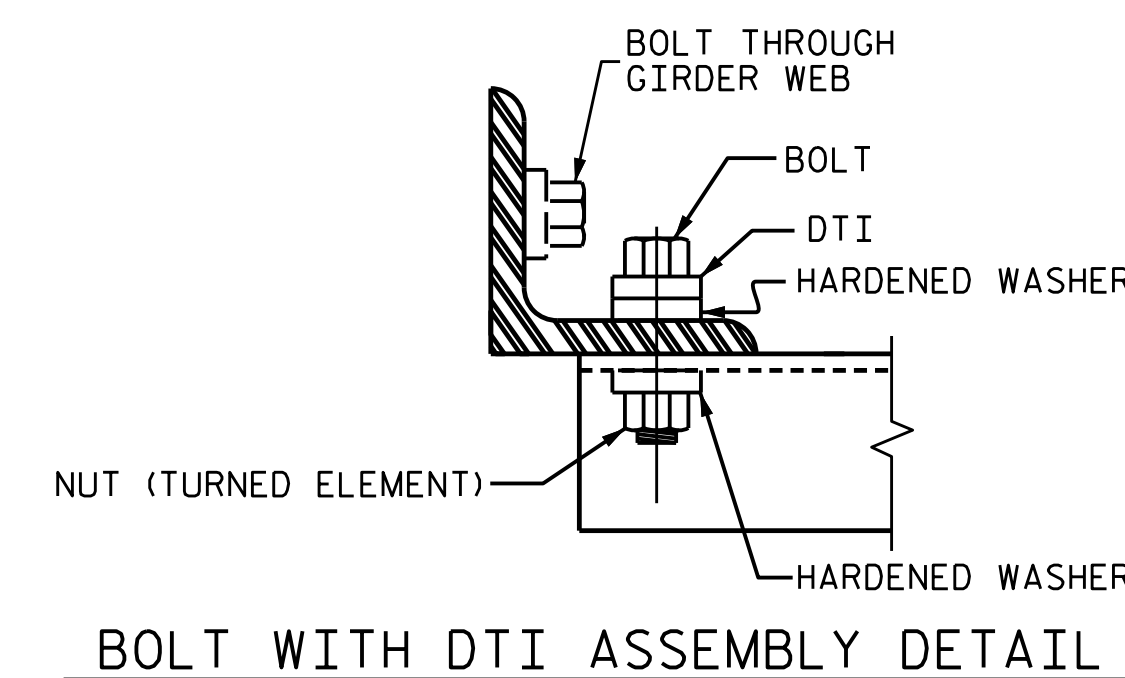


**TABLE**

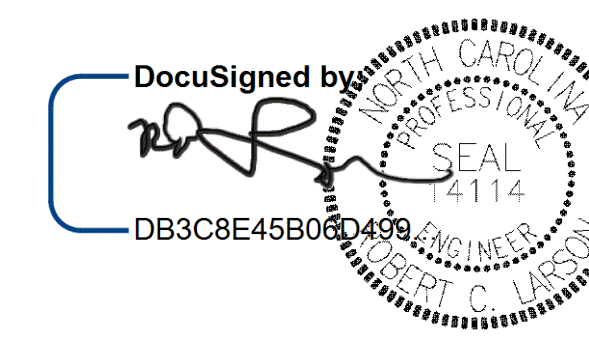
GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"



**CONNECTION DETAILS**



PROJECT NO. B-5671  
 \_\_\_\_\_ COUNTY  
 STATION: 17+00.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS**

DESIGN ENGINEER OF RECORD: _____ DATE: 1/24/2020
ASSEMBLED BY: A. K. ALLANKAR DATE: 06/03/19
CHECKED BY: R. C. LARSON DATE: 08/26/19
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

**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 199-785-9241

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

TOTAL SHEETS: 29

**NOTES**

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

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

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

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

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

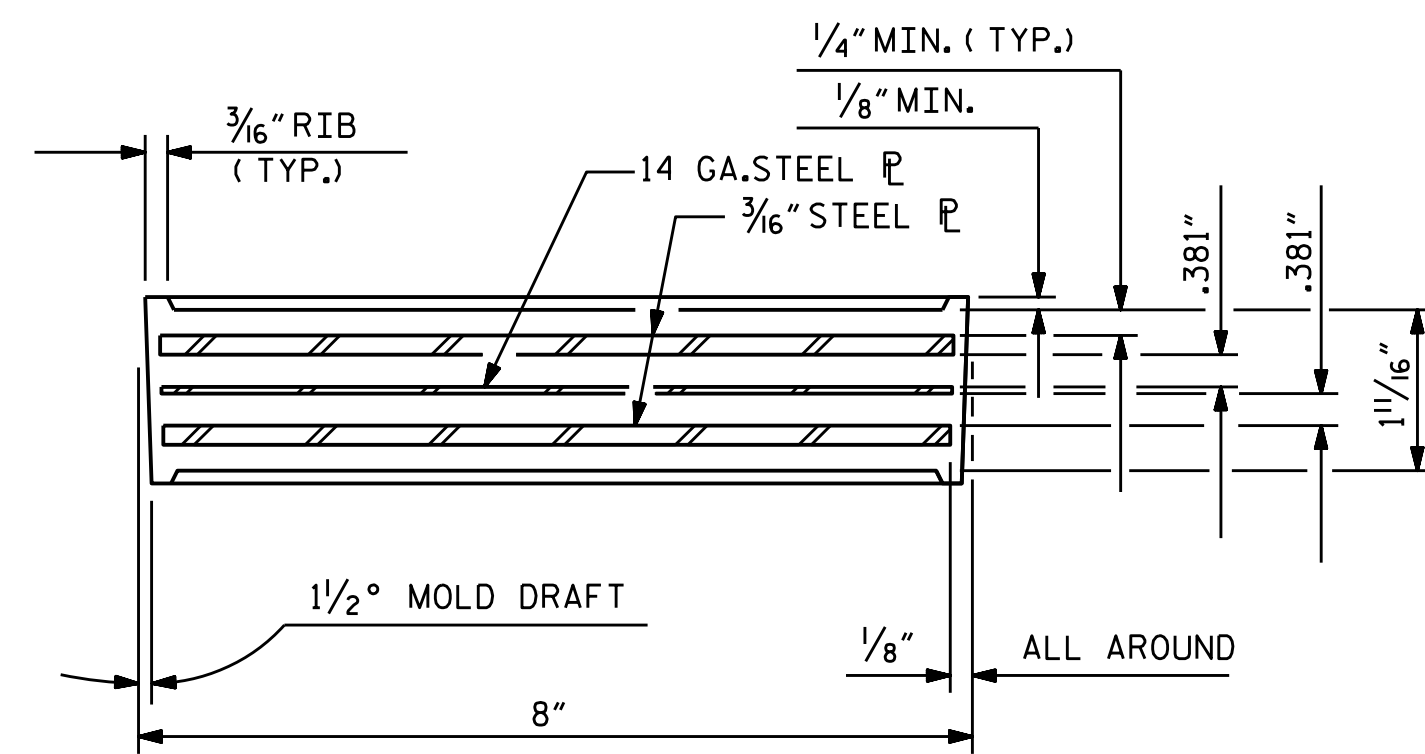
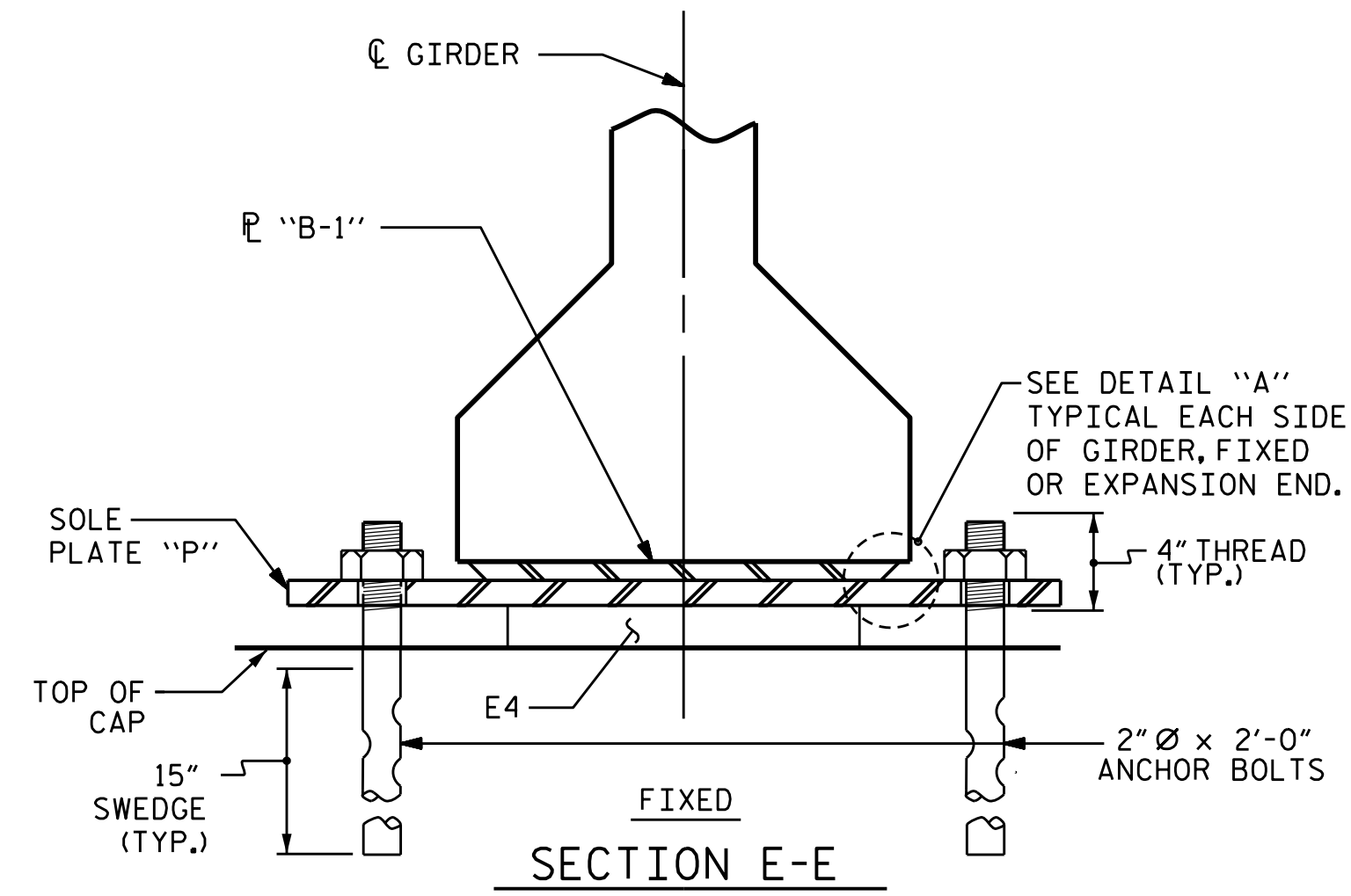
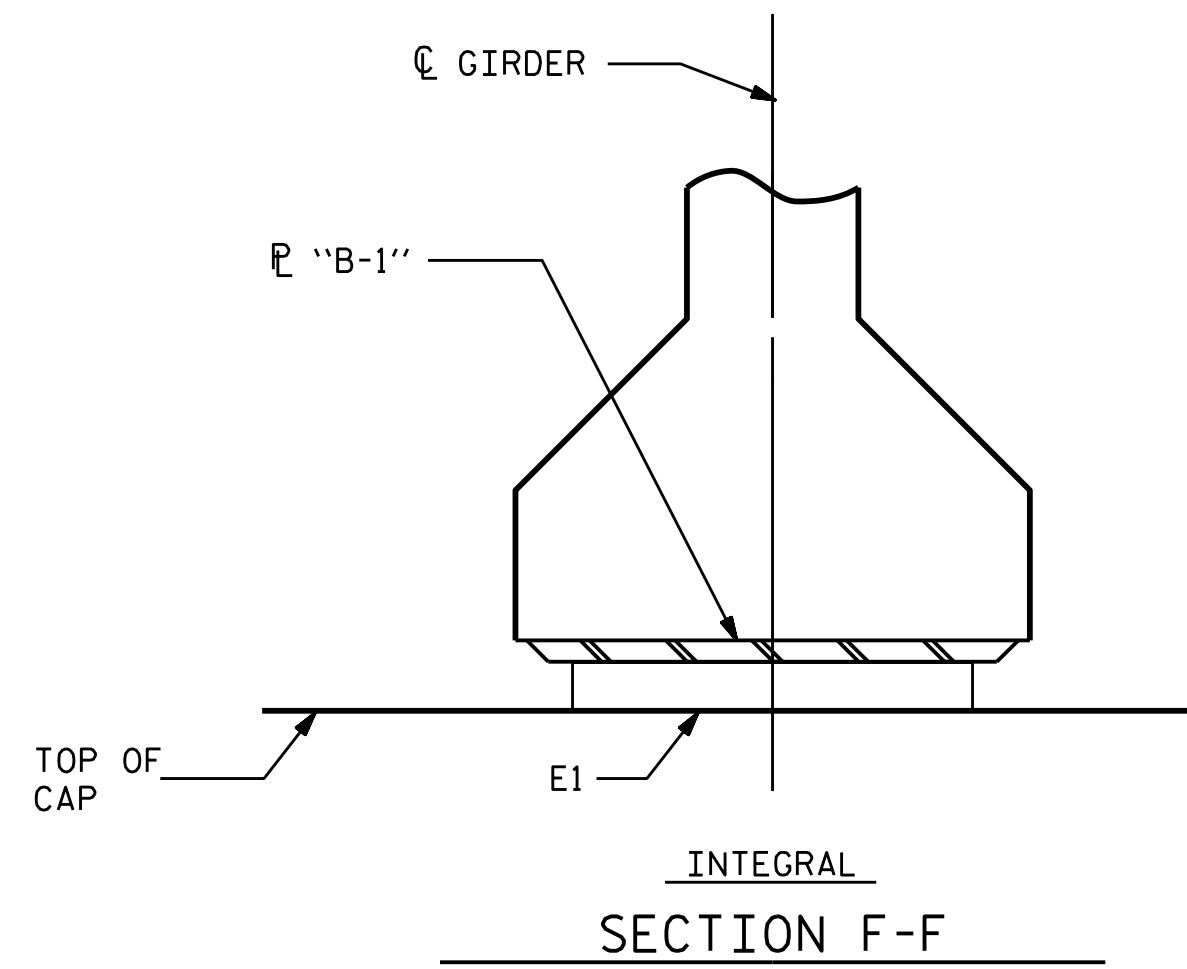
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

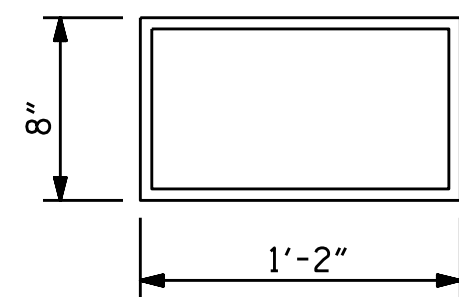
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



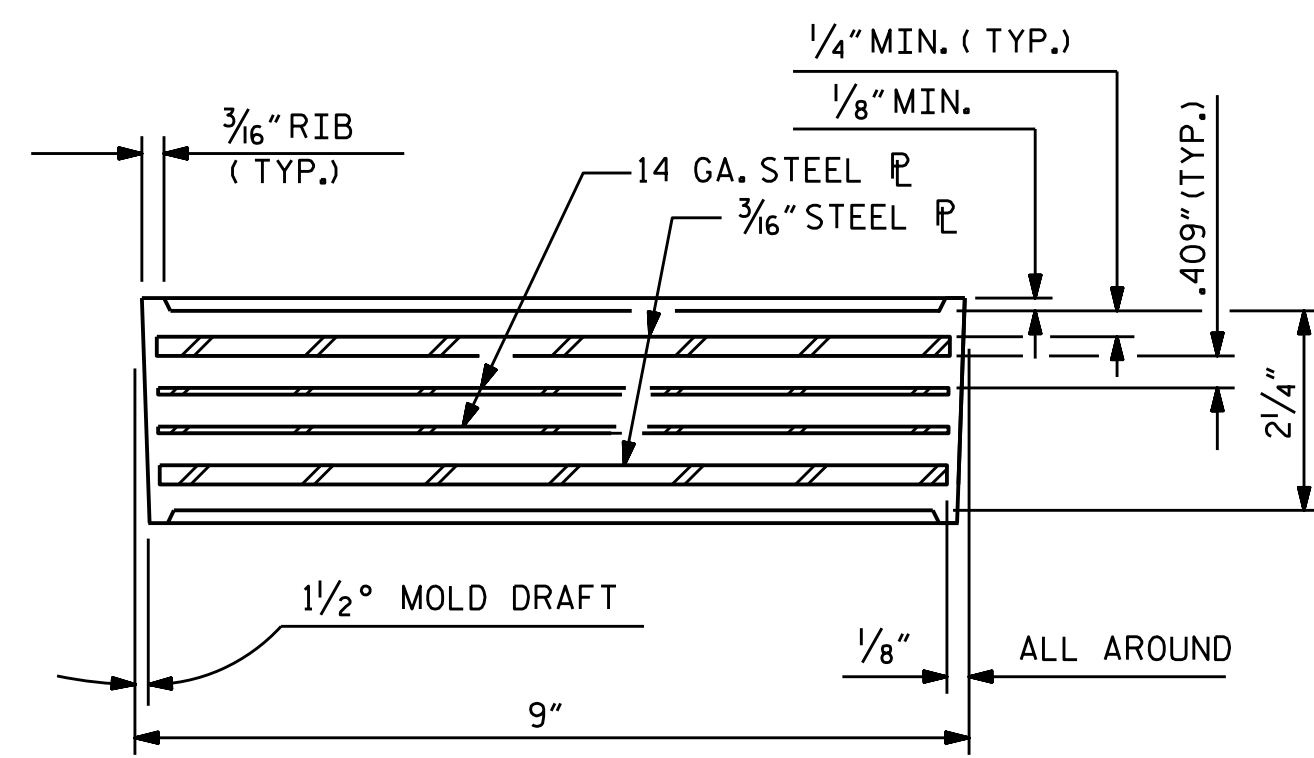
TYPICAL SECTION OF ELASTOMERIC BEARINGS



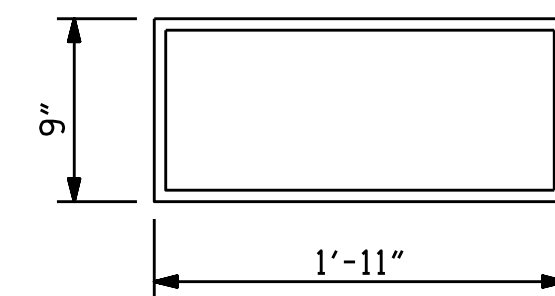
E1 ( 8 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

**TYPE II**



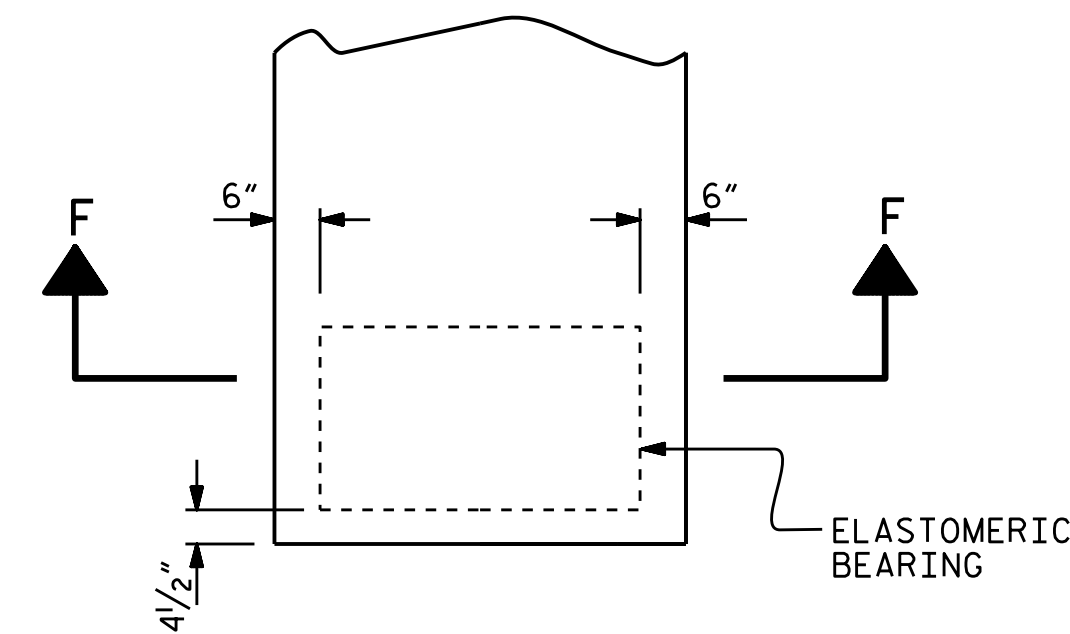
TYPICAL SECTION OF ELASTOMERIC BEARINGS



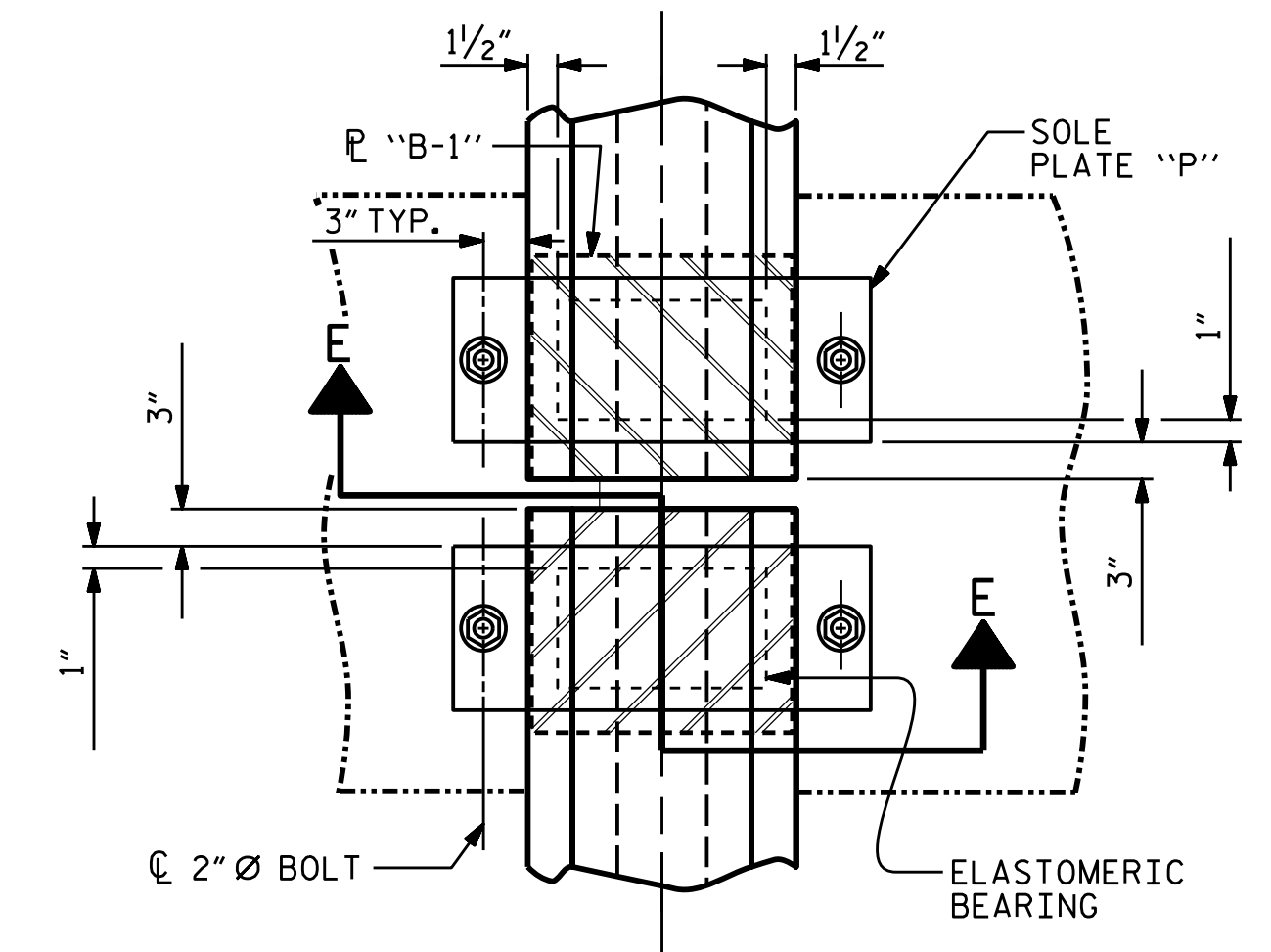
E4 ( 8 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

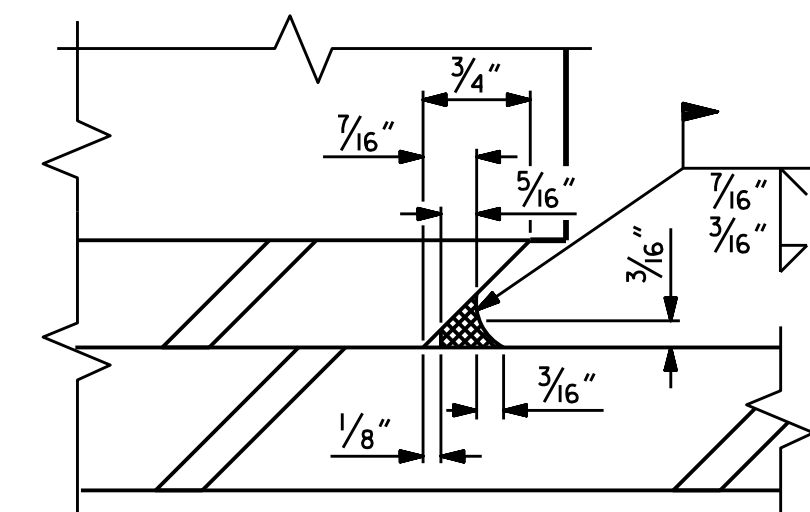
**TYPE V**



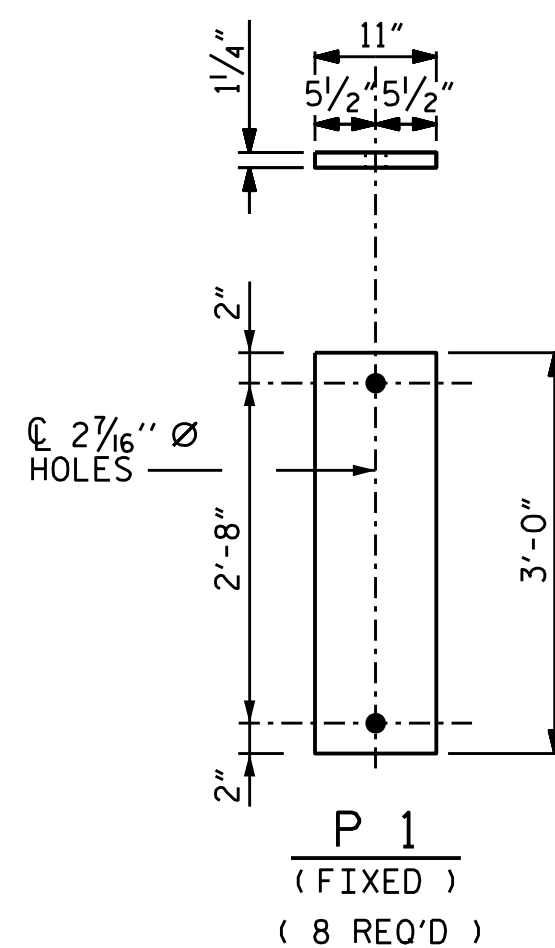
TYPICAL PLAN AT END BENT



TYPICAL PLAN AT BENT  
(SHOWING CONTINUOUS BENT)

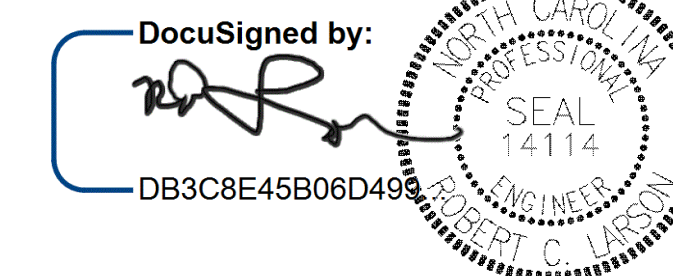


DETAIL "A"



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k
TYPE V	365 k



PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

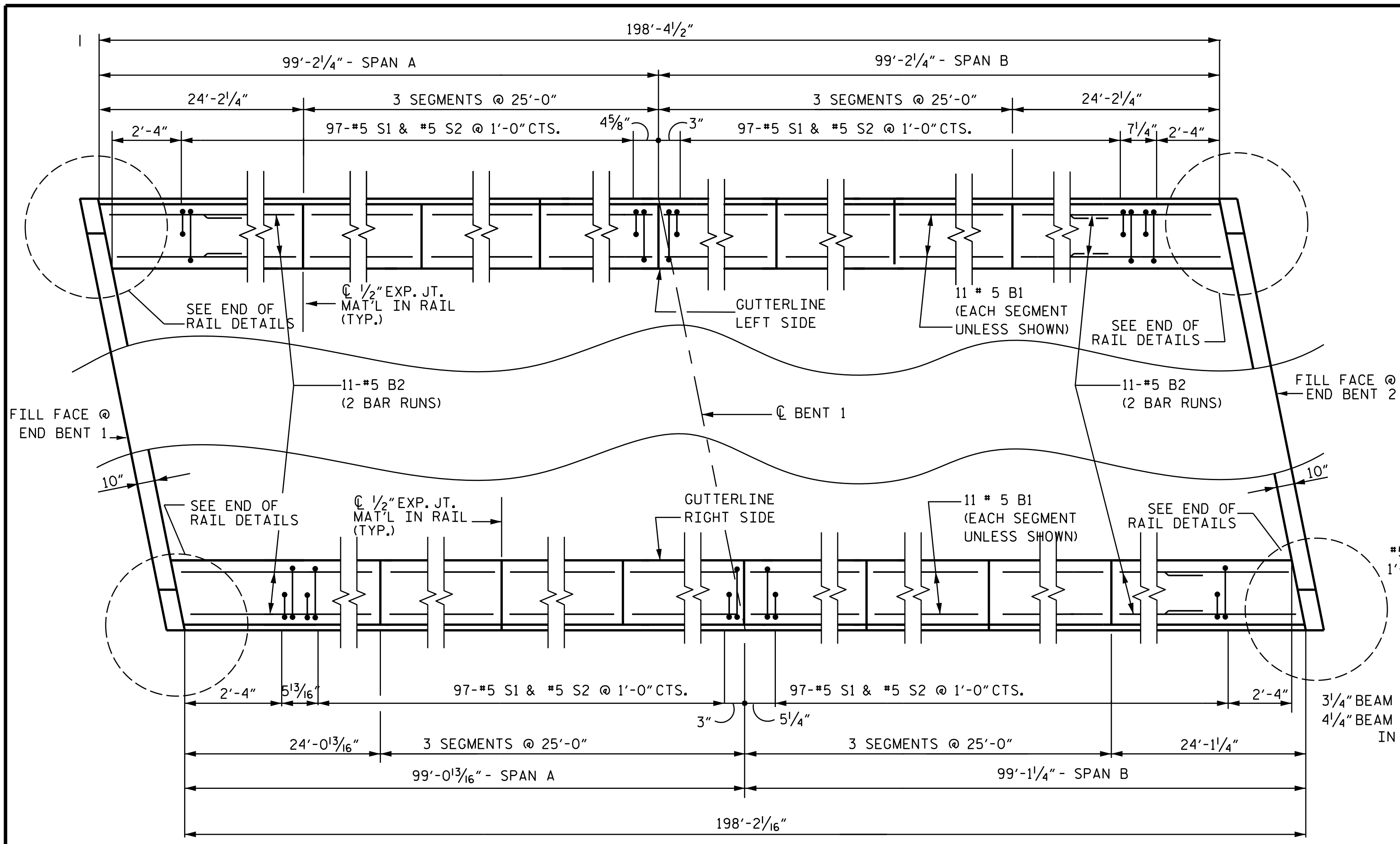
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**ELASTOMERIC BEARING**  
**DETAILS**  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE

DESIGN ENGINEER OF RECORD: <i>[Signature]</i>	DocuSigned by: <i>[Signature]</i>	DATE: 1/24/2020
ASSEMBLED BY: K. ZADI	DATE: 06/18/19	
CHECKED BY: R. C. LARSON	DATE: 08/26/19	
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	

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

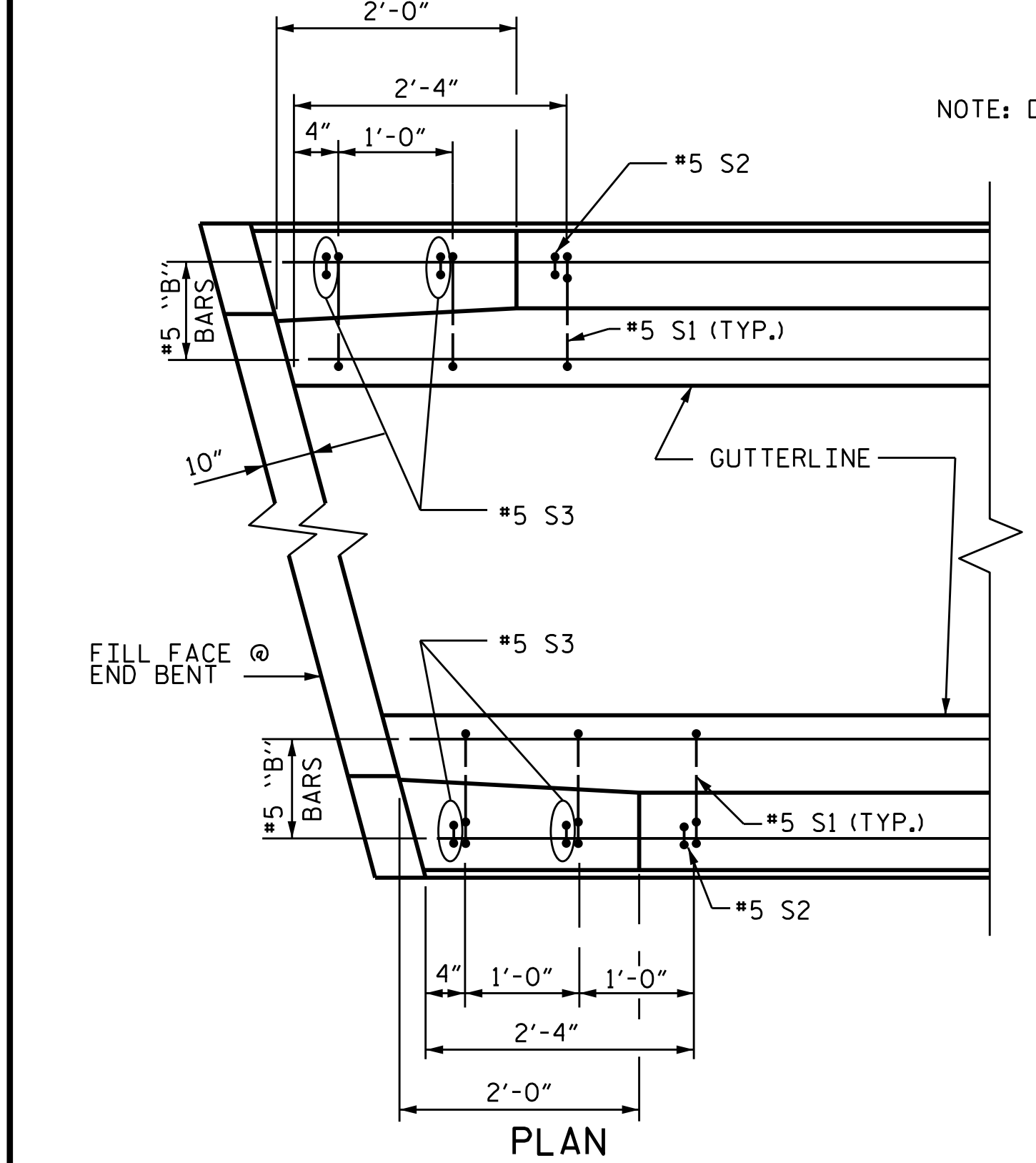
ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764  
**KCI Associates**  
 of North Carolina, P.A.  
 400 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-0270 Phone 919-783-9201

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

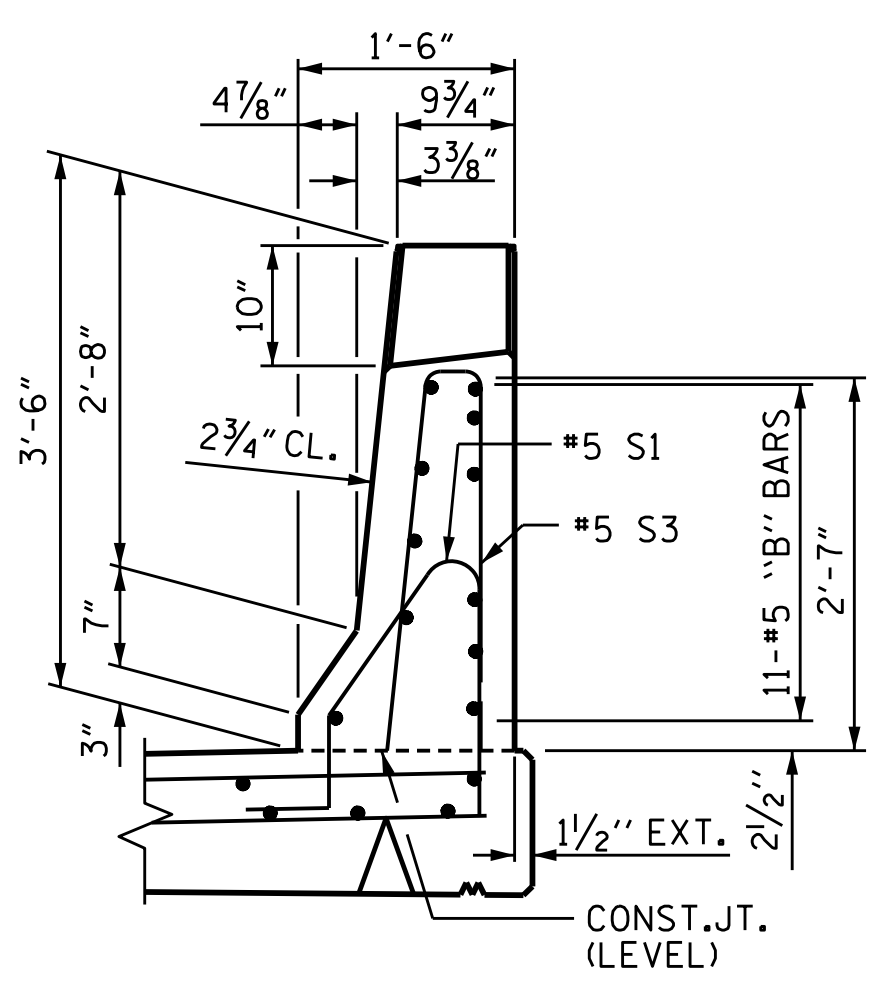


**PLAN**

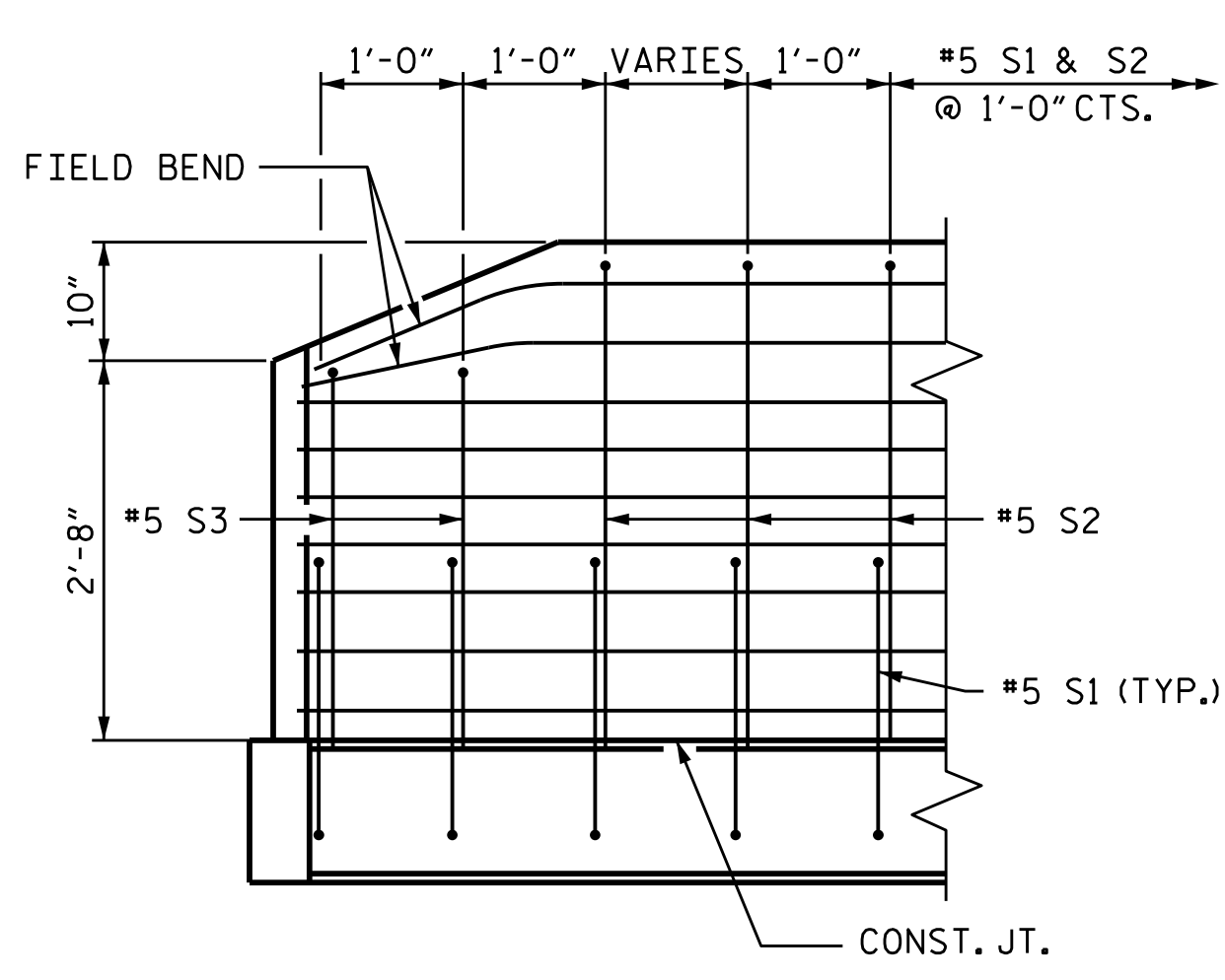
NOTE: DIMENSIONS SHOWN ARE ALONG OUTSIDE OF RAIL



**PLAN**



**END VIEW**



**SIDE VIEW**

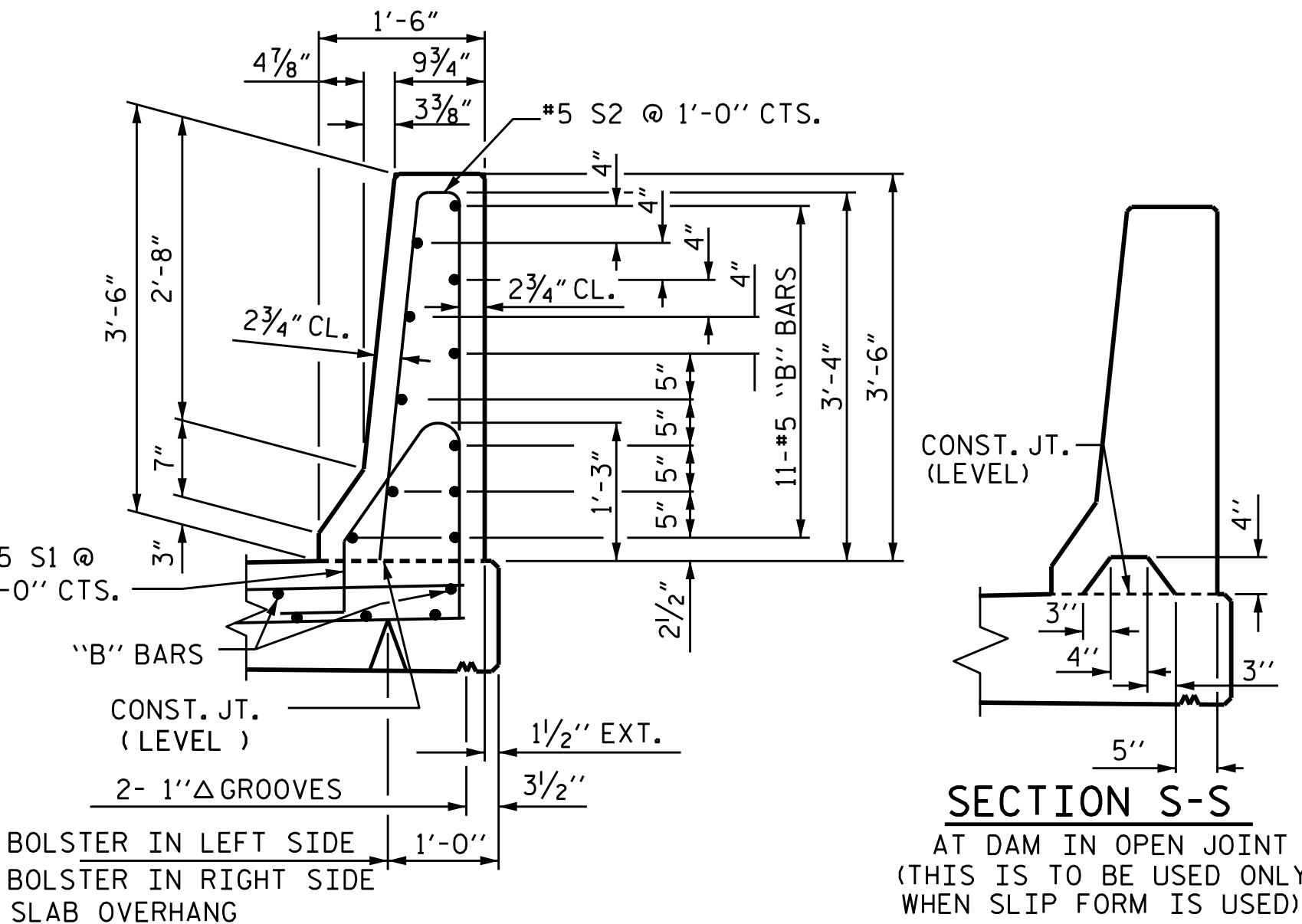
**END OF RAIL DETAILS**

**NOTES**

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

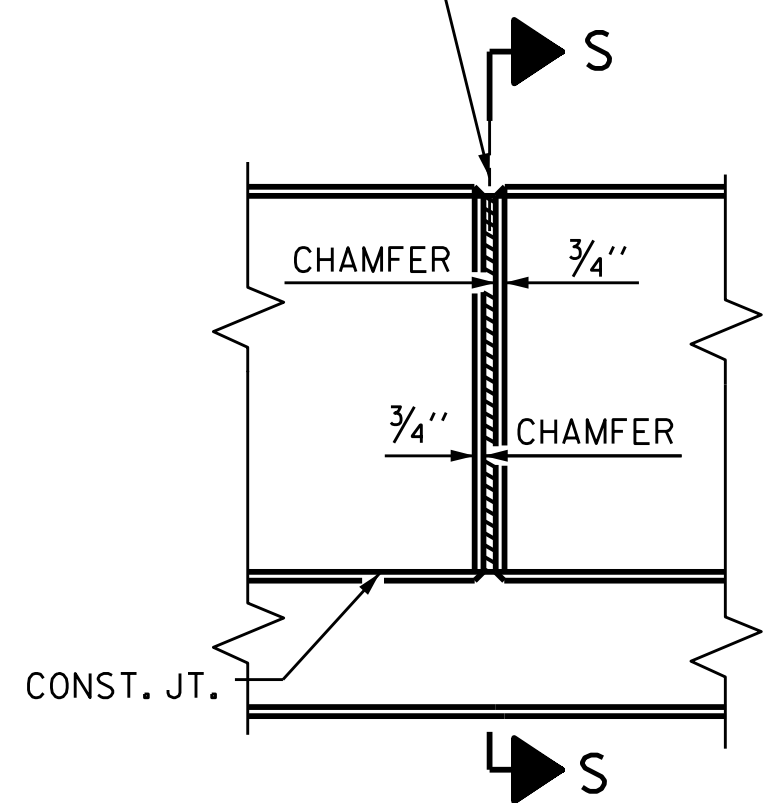
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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



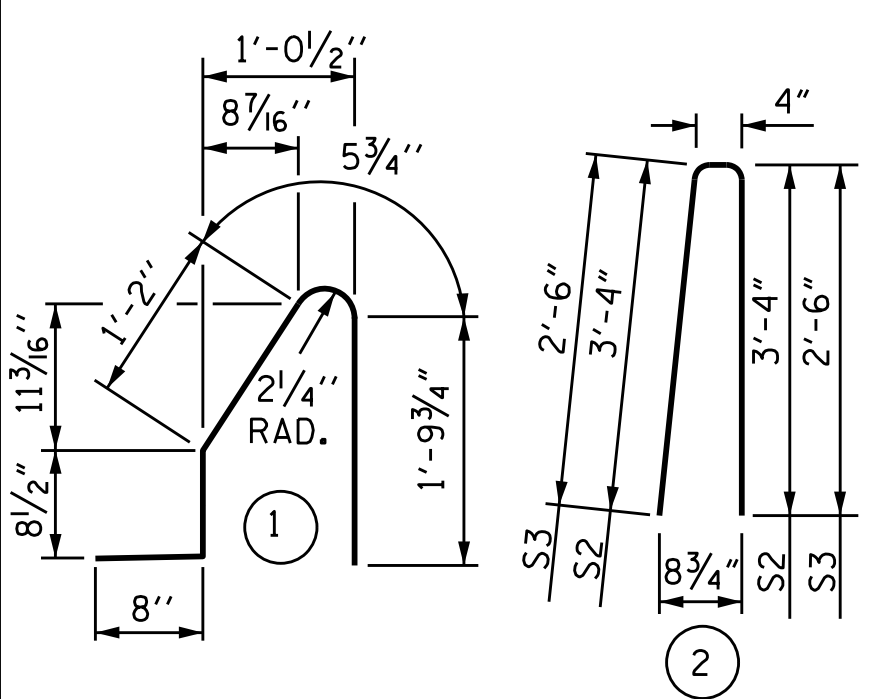
**SECTION THRU RAIL**

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



**ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS**

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

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

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	398	#5	1	4'-10"	2006
* S2	390	#5	2	7'-0"	2847
* S3	8	#5	2	5'-4"	45
* B1	132	#5	STR	24'-8"	3396
* B2	88	#5	STR	13'-9"	1262

\* EPOXY COATED REINFORCING STEEL 9556 LBS.  
CLASS AA CONCRETE 53.9 CU. YDS.  
CONCRETE BARRIER RAIL 396.55 LIN. FT.

PROJECT NO. B-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-

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

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

STD. NO. CBR1 (SHT 1)

KCI JOB NO: 251801945.24

DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 ASSEMBLED BY: Z. KADI DATE: 6/19/2019  
 CHECKED BY: R. C. LARSON DATE: 6/19/2019  
 DRAWN BY: ARB 5/87 REV. 7/12 MAA/GM  
 CHECKED BY: SJD 9/87 REV. 6/13 MAA/GM  
 REV. 12/17 MAA/THC

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



DocuSigned by:  
[Signature]  
DB3C8E45B06E499  
1/24/2020

1/24/2020

ENGINEERS & ARCHITECTS IN CONSTRUCTION MANAGERS LICENSE NUMBER: C-076  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-783-9241



NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" 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 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

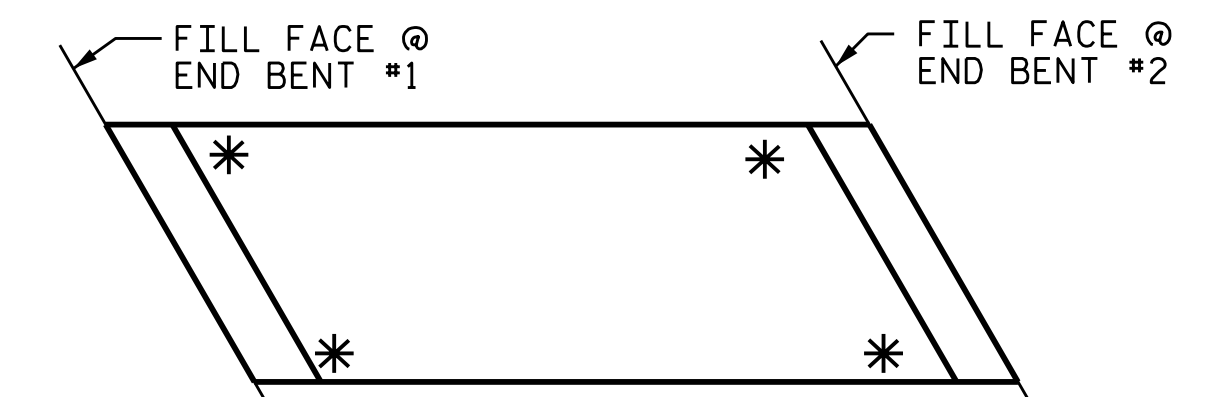
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

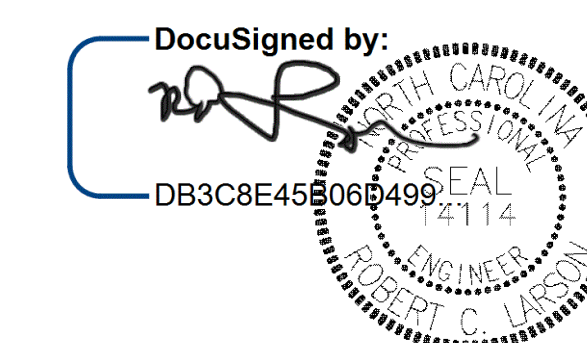


SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5671  
 EDGECOMBE COUNTY  
 STATION: 17+00.00 -L-

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



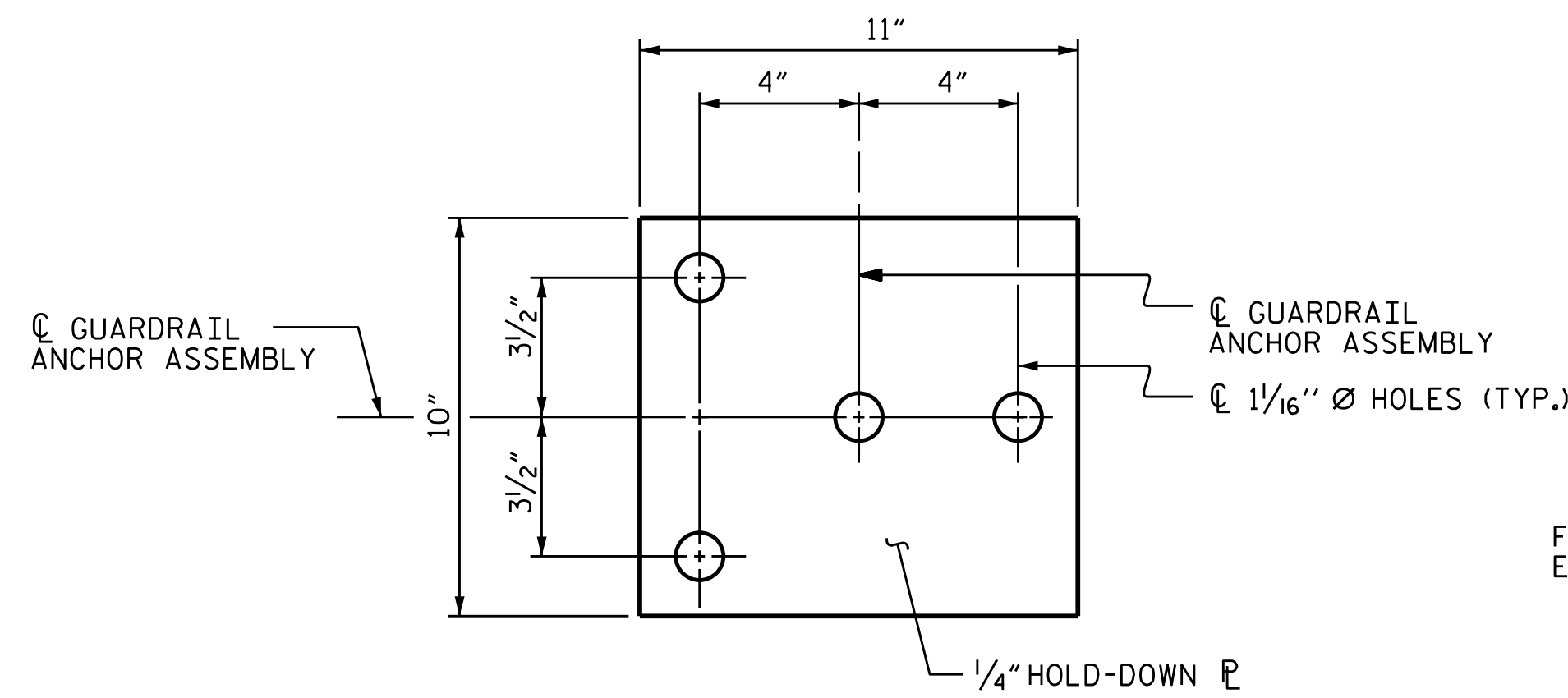
1/24/2020

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	29
2			4				

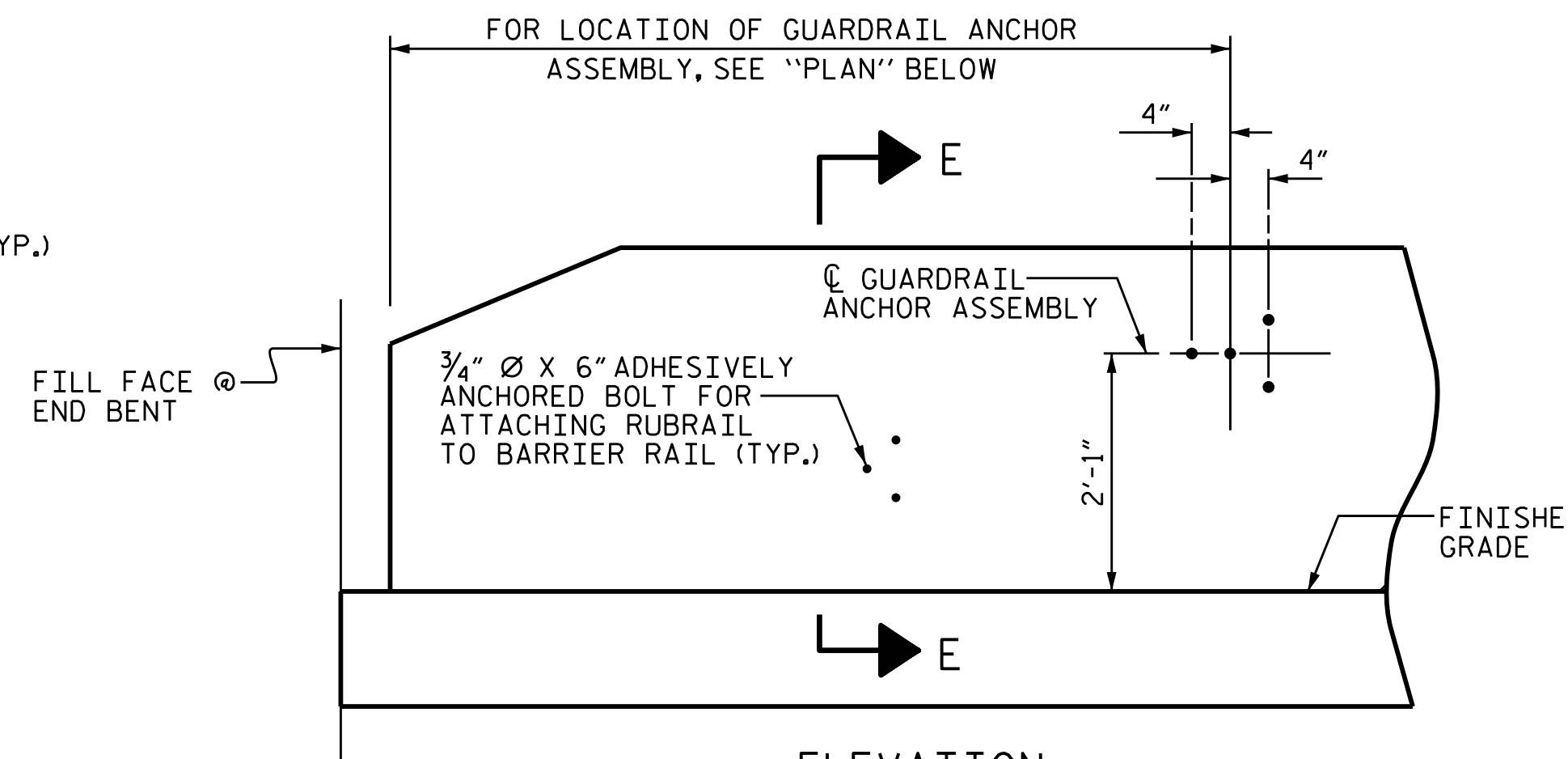
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 400 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-0270 Phone: 919-783-9201

(SHT 2a) STD. NO. GRA2

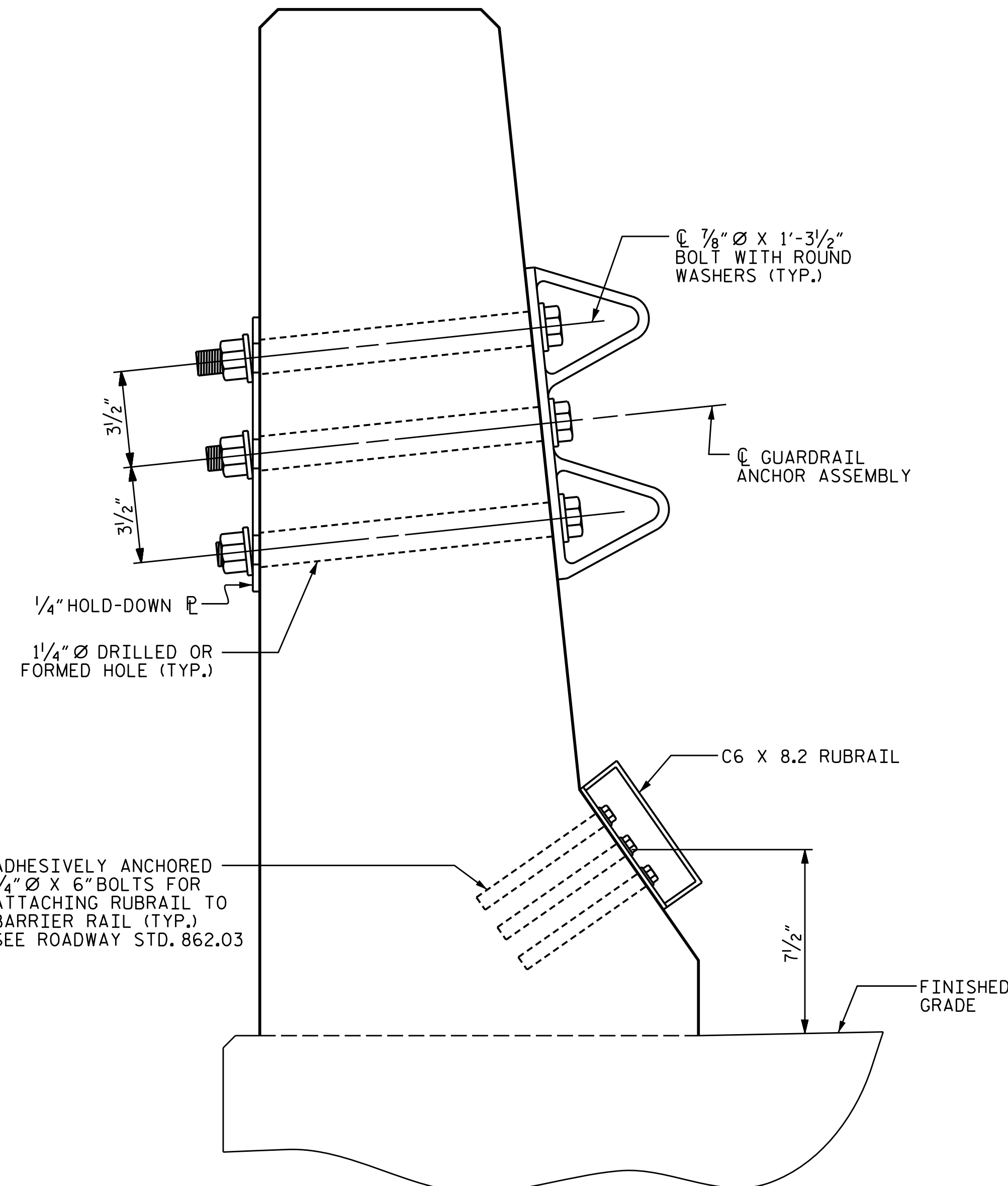


PLAN



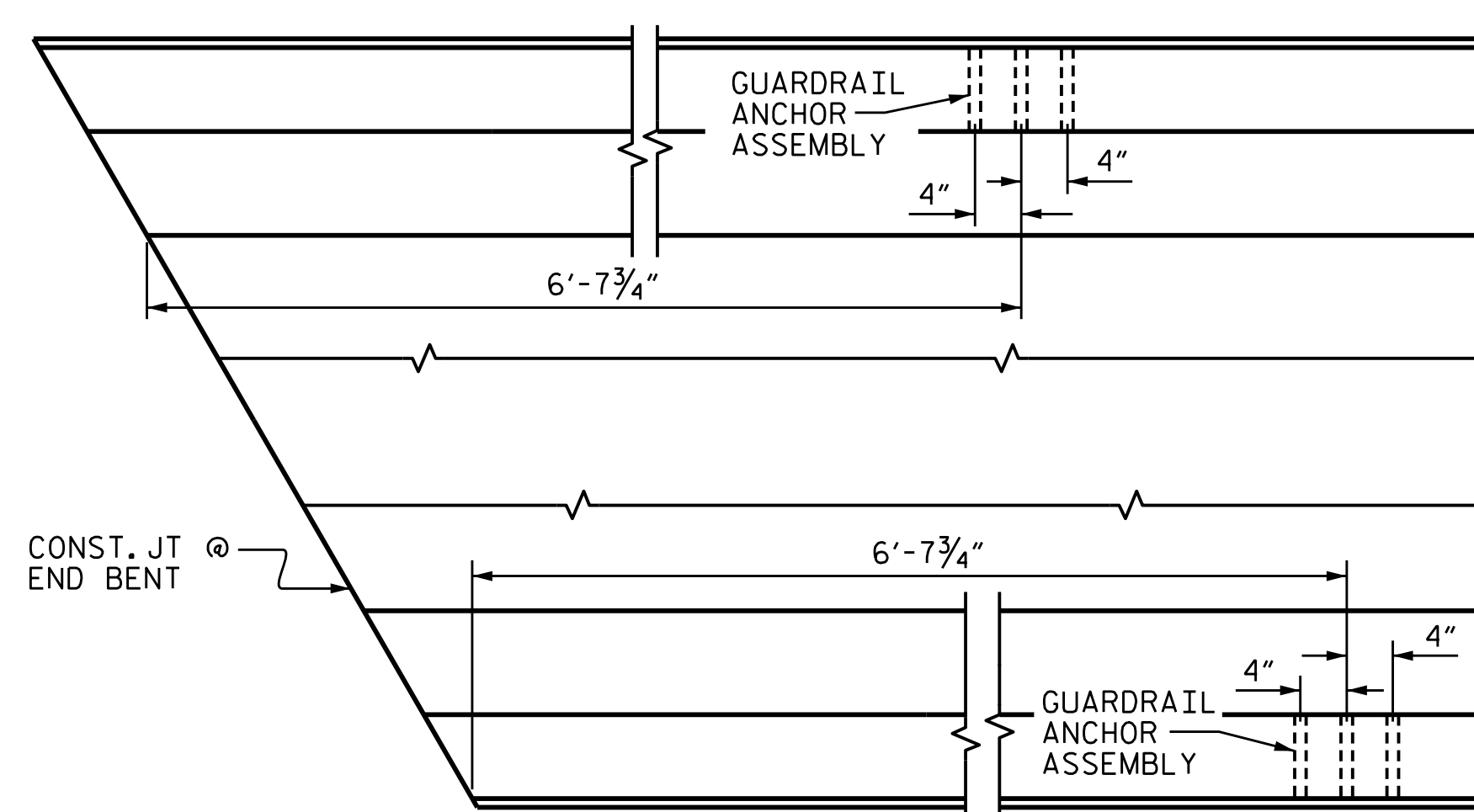
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

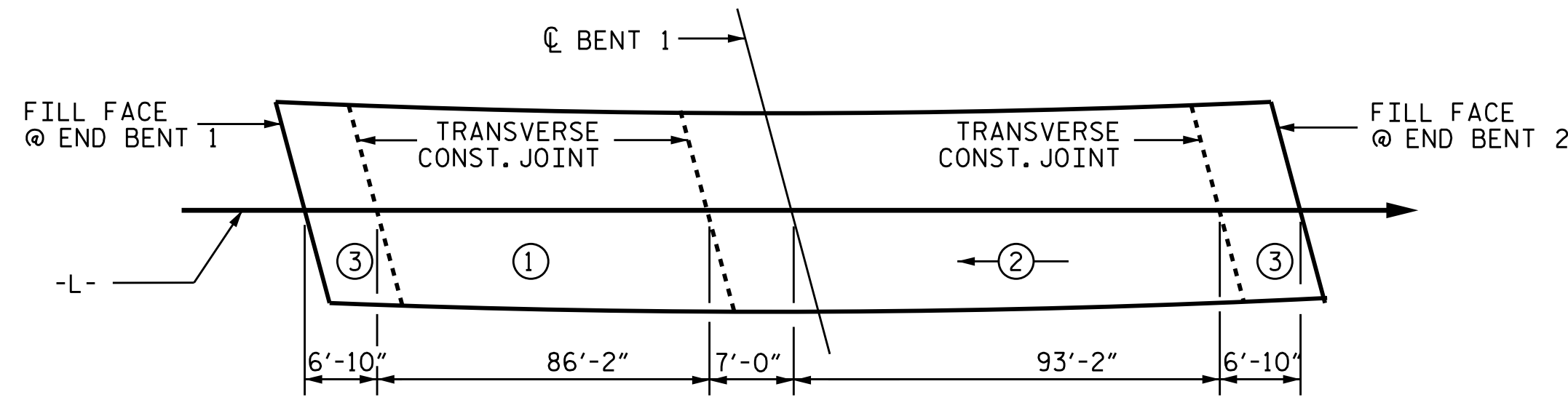


PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

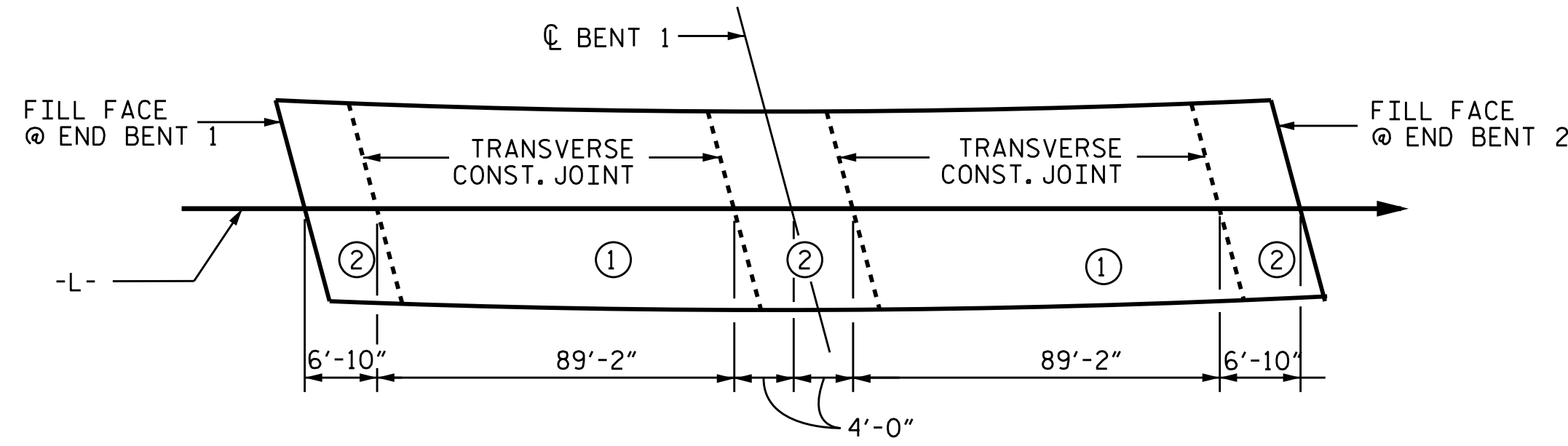
END BENT #1 SHOWN, END BENT #2 SIMILAR.

DESIGN ENGINEER OF RECORD:	DATE: 1/24/2020
ASSEMBLED BY: R. C. LARSON	DATE: 08/27/19
CHECKED BY: A. K. ALLANKI	DATE: 12/13/19
DRAWN BY: TLA 5/06	REV. 7/12
CHECKED BY: GM 5/06	REV. 6/13
	REV. 12/17
	MAA/GM
	MAA/OM
	MAA/THC



**DECK POURING SEQUENCE**

② → INDICATES POUR SEQUENCE AND DIRECTION



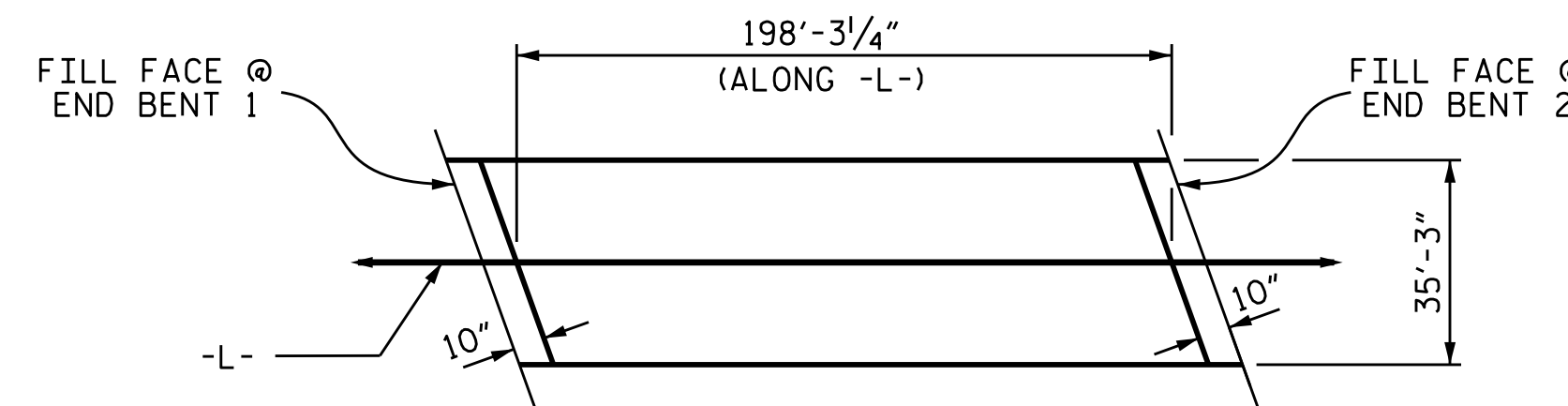
**OPTIONAL DECK POURING SEQUENCE**

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.

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

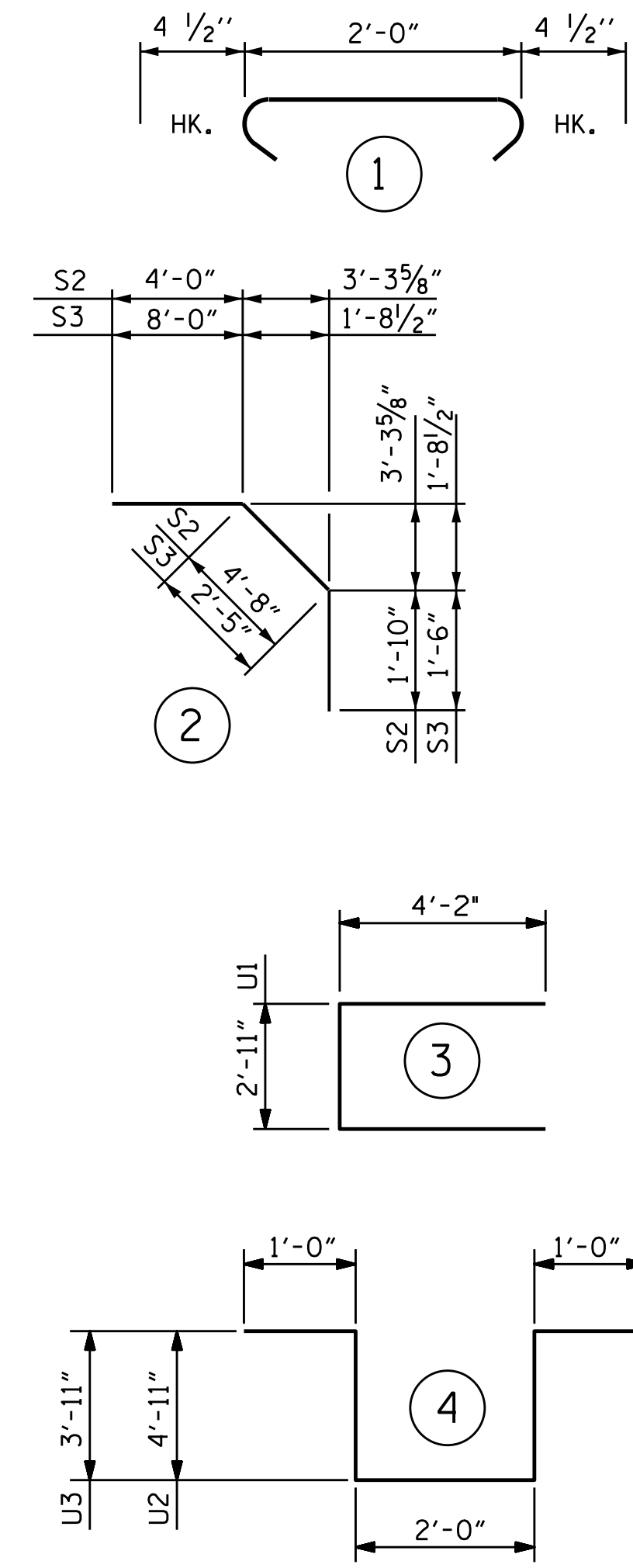
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6989)

BILL OF MATERIAL											
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A1	377	5	STR.	34'-11"	13730	A54	1	5	STR.	30'-4"	32
* A2	1	5	STR.	2'-7"	3	A55	1	5	STR.	32'-2"	34
* A3	1	5	STR.	4'-6"	5	A56	1	5	STR.	34'-0"	35
* A4	1	5	STR.	6'-4"	7	A57	1	5	STR.	34'-0"	35
* A5	1	5	STR.	8'-2"	9	A58	1	5	STR.	32'-1"	33
* A6	1	5	STR.	10'-0"	10	A59	1	5	STR.	30'-3"	32
* A7	1	5	STR.	11'-10"	12	A60	1	5	STR.	28'-4"	30
* A8	1	5	STR.	13'-8"	14	A61	1	5	STR.	26'-5"	28
* A9	1	5	STR.	15'-6"	16	A62	1	5	STR.	24'-7"	26
* A10	1	5	STR.	17'-5"	18	A63	1	5	STR.	22'-8"	24
* A11	1	5	STR.	19'-3"	20	A64	1	5	STR.	20'-9"	22
* A12	1	5	STR.	21'-1"	22	A65	1	5	STR.	18'-11"	20
* A13	1	5	STR.	22'-11"	24	A66	1	5	STR.	17'-0"	18
* A14	1	5	STR.	24'-9"	26	A67	1	5	STR.	15'-1"	16
* A15	1	5	STR.	26'-7"	28	A68	1	5	STR.	13'-3"	14
* A16	1	5	STR.	28'-5"	30	A69	1	5	STR.	11'-4"	12
* A17	1	5	STR.	30'-4"	32	A70	1	5	STR.	9'-6"	10
* A18	1	5	STR.	32'-2"	34	A71	1	5	STR.	7'-7"	8
* A19	1	5	STR.	34'-0"	35	A72	1	5	STR.	5'-8"	6
* A20	1	5	STR.	34'-0"	35	A73	1	5	STR.	3'-10"	4
* A21	1	5	STR.	32'-1"	33	A74	1	5	STR.	2'-0"	2
* A22	1	5	STR.	30'-3"	32						
* A23	1	5	STR.	28'-4"	30	* B1	144	4	STR.	34'-8"	3335
* A24	1	5	STR.	26'-5"	28	B2	172	5	STR.	51'-4"	9209
* A25	1	5	STR.	24'-7"	26	* B3	46	6	STR.	36'-6"	2522
* A26	1	5	STR.	22'-8"	24	* B4	23	6	STR.	30'-0"	1036
* A27	1	5	STR.	20'-9"	22	* B5	46	6	STR.	21'-0"	1451
* A28	1	5	STR.	18'-11"	20	* B6	46	6	STR.	20'-0"	1382
* A29	1	5	STR.	17'-0"	18						
* A30	1	5	STR.	15'-1"	16	K1	5	4	STR.	36'-6"	122
* A31	1	5	STR.	13'-3"	14	K2	6	4	STR.	7'-2"	29
* A32	1	5	STR.	11'-4"	12	K3	12	4	STR.	7'-8"	61
* A33	1	5	STR.	9'-6"	10	K4	24	4	STR.	8'-9"	140
* A34	1	5	STR.	7'-7"	8	K5	2	4	STR.	2'-1"	3
* A35	1	5	STR.	5'-8"	6	K6	2	4	STR.	2'-6"	3
* A36	1	5	STR.	3'-10"	4	K7	4	4	STR.	2'-10"	8
* A37	1	5	STR.	2'-0"	2	K8	2	4	STR.	2'-4"	3
A38	377	5	STR.	34'-11"	13730	K9	5	4	STR.	29'-9"	99
A39	1	5	STR.	2'-7"	3	K10	6	4	STR.	6'-2"	25
A40	1	5	STR.	4'-6"	5	K11	12	4	STR.	9'-1"	73
A41	1	5	STR.	6'-4"	7	K12	2	4	STR.	1'-9"	2
A42	1	5	STR.	8'-2"	9	K13	2	4	STR.	2'-2"	3
A43	1	5	STR.	10'-0"	10	K14	4	4	STR.	2'-6"	7
A44	1	5	STR.	11'-10"	12	K15	2	4	STR.	2'-0"	3
A45	1	5	STR.	13'-8"	14	K16	5	4	STR.	35'-10"	120
A46	1	5	STR.	15'-6"	16						
A47	1	5	STR.	17'-5"	18	S1	78	4	1	2'-9"	143
A48	1	5	STR.	19'-3"	20	* S2	50	4	2	10'-6"	351
A49	1	5	STR.	21'-1"	22	* S3	54	4	2	11'-11"	430
A50	1	5	STR.	22'-11"	24						
A51	1	5	STR.	24'-9"	26	U1	50	4	3	11'-3"	376
A52	1	5	STR.	26'-7"	28	U2	15	4	4	13'-10"	139
A53	1	5	STR.	28'-5"	30	U3	6	4	4	11'-10"	47

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	96.2		
POUR 2	122.7		
POUR 3	56.0		
TOTALS**	274.9	24,983	24,922

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	840	SQ.FT.
BRIDGE DECK	5750	SQ.FT.
TOTAL	6590	SQ.FT.

PROJECT NO. B-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-

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

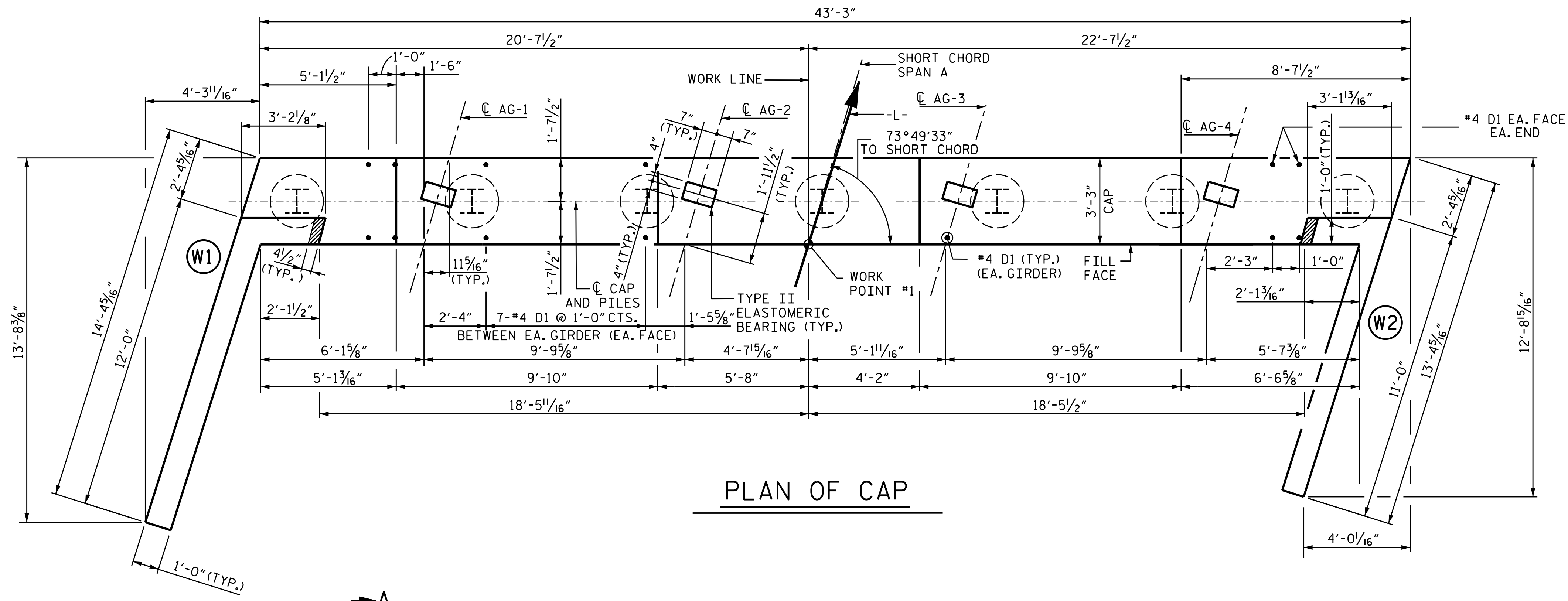
DESIGN ENGINEER OF RECORD:	DATE:	1/24/2020
ASSEMBLED BY: A. K. ALLANKAR	DATE:	07/11/19
CHECKED BY: R. C. LARSON	DATE:	09/06/19
DRAWN BY: JMB	5/87	MAA/GM
CHECKED BY: SJD	9/87	MAA/THC
	REV. 10/1/11	BNB/THC
	REV. 12/17	
	REV. 06/19	

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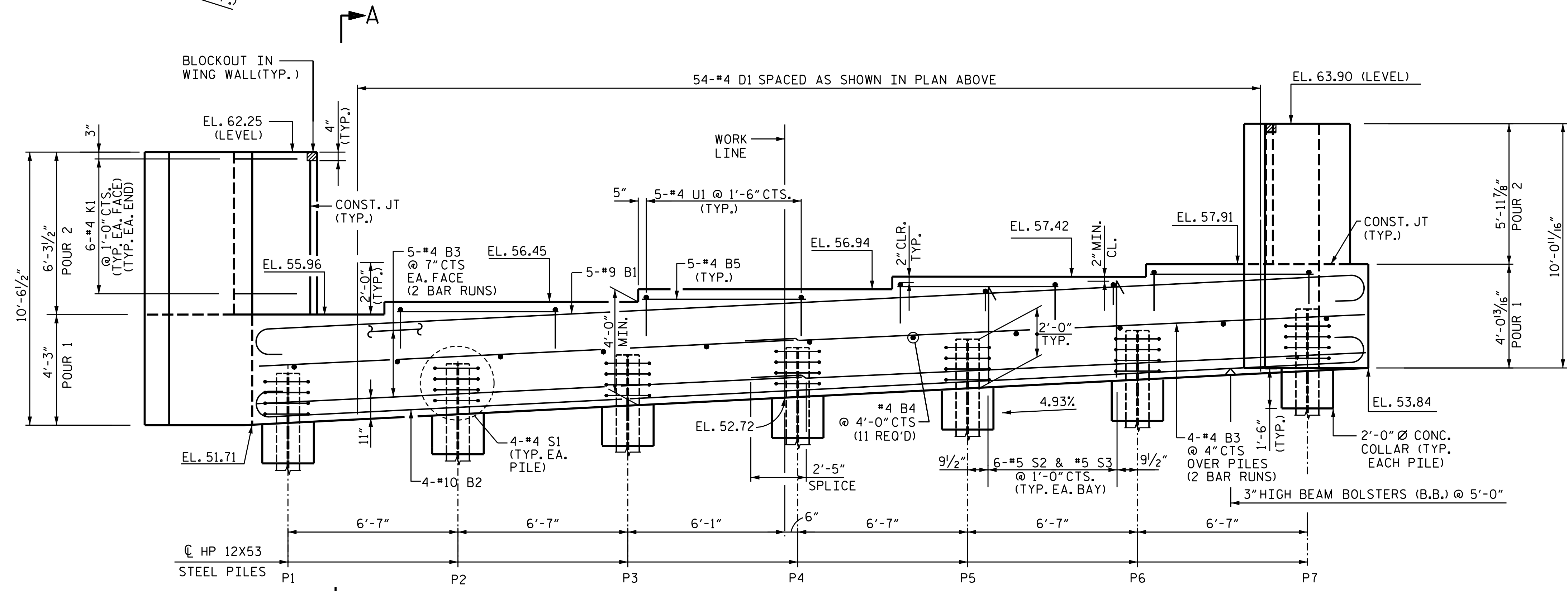
DocuSigned by: DB3C8E45B6D499...4114  
1/24/2020

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-17
2			4			TOTAL SHEETS 29

STD. NO. BOM2



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 "TEMPORARY DRAINAGE AT END BENT", SEE END BENT 2.
- FOR SECTION A-A SEE SHEET 3 OF 3.

TOP OF PILE ELEVATIONS	
P1	53.80
P2	54.12
P3	54.44
P4	54.77
P5	55.09
P6	55.42
P7	55.74

PROJECT NO. B-5671  
EDGECOMBE COUNTY  
 STATION: 17+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1**



DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 08/29/19  
 CHECKED BY: R. C. LARSON DATE: 08/30/19

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

DocuSigned by:  
[Signature]  
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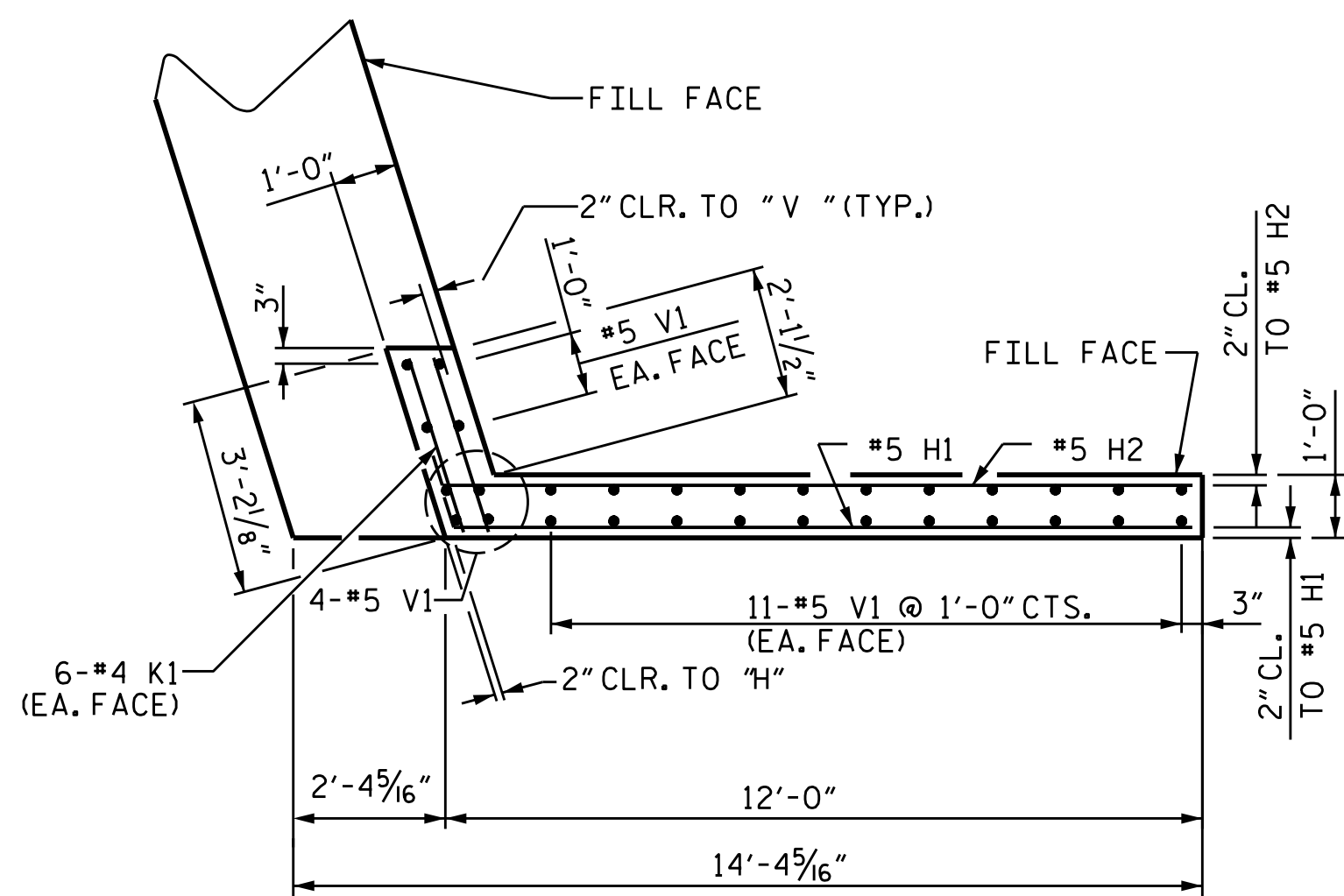
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	

TOTAL SHEETS: 29

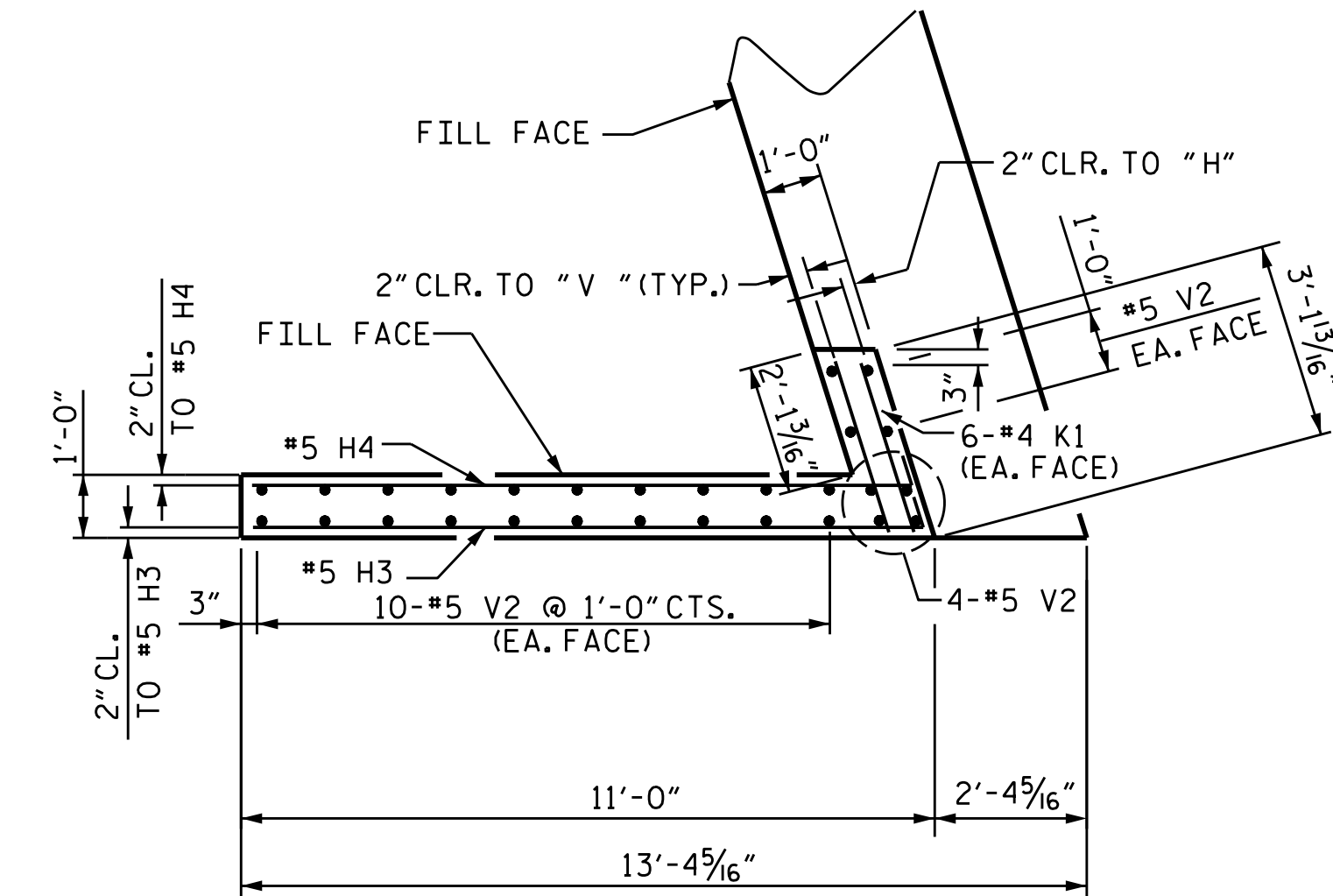
KCI PROJ. #251801945.24

1/24/2020

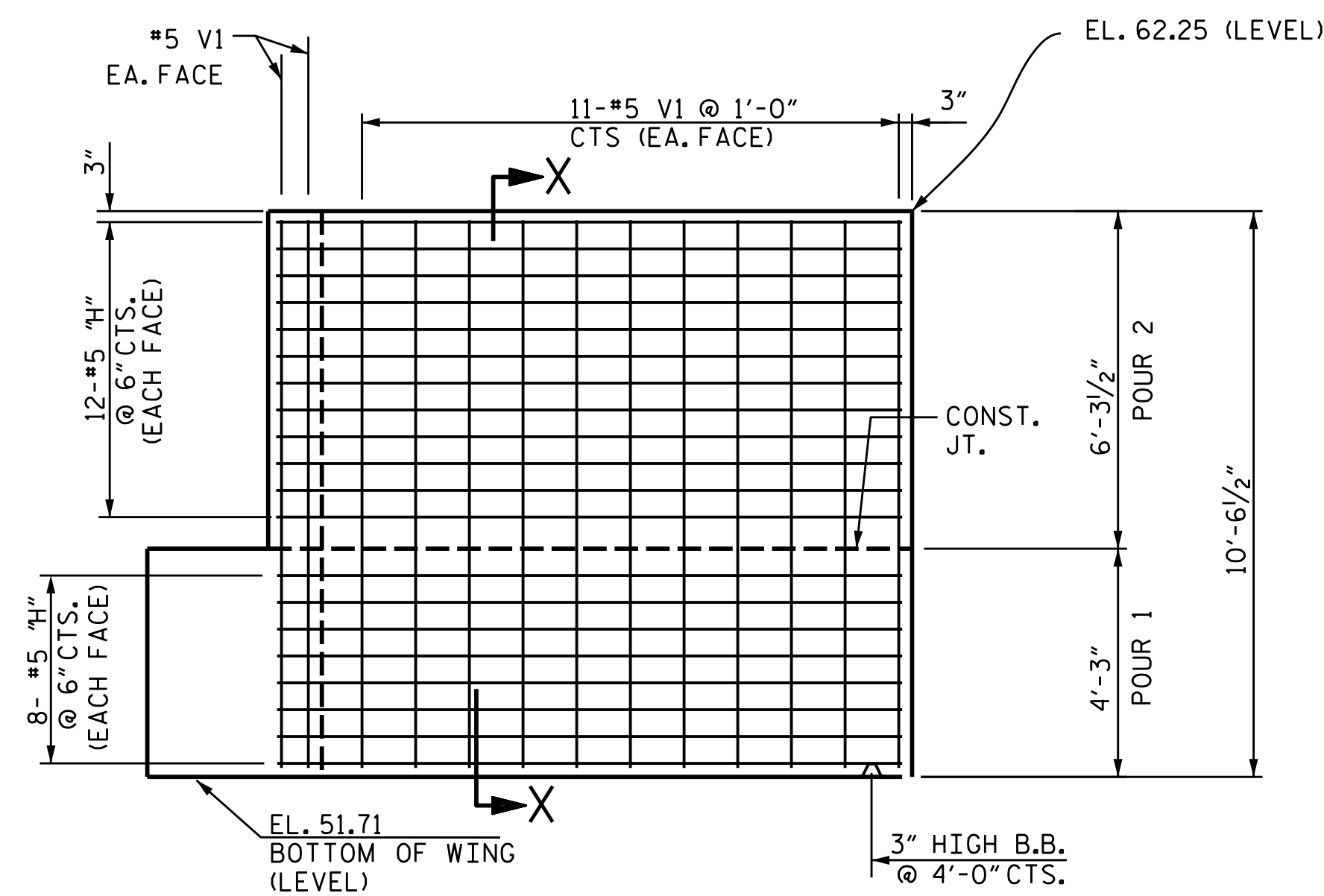
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone: 919-785-5241



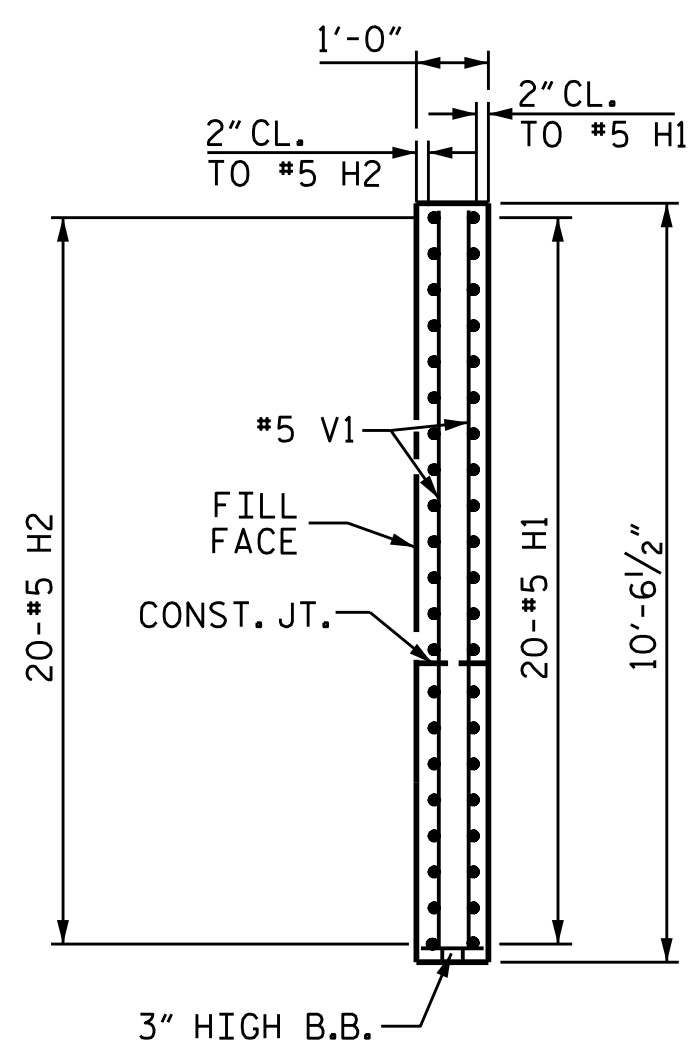
PLAN W1



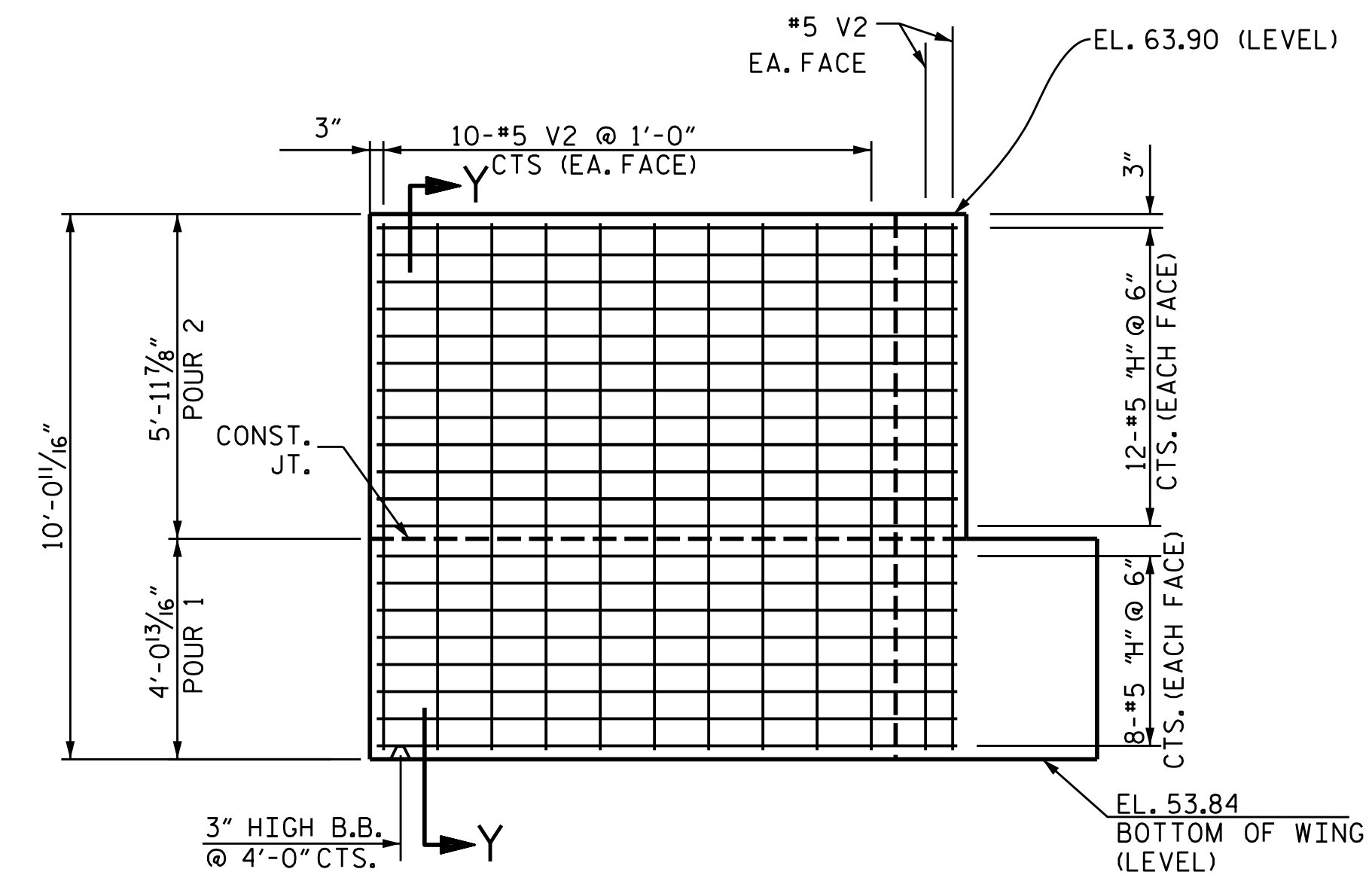
PLAN W2



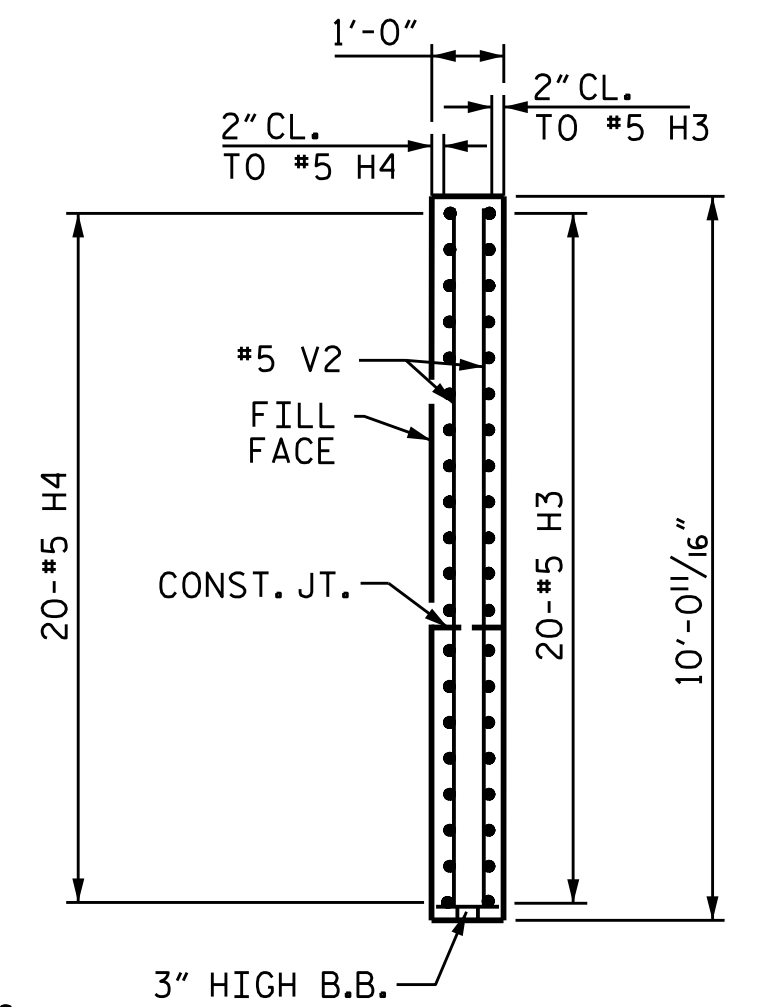
ELEVATION W1



SECTION X-X



ELEVATION W2



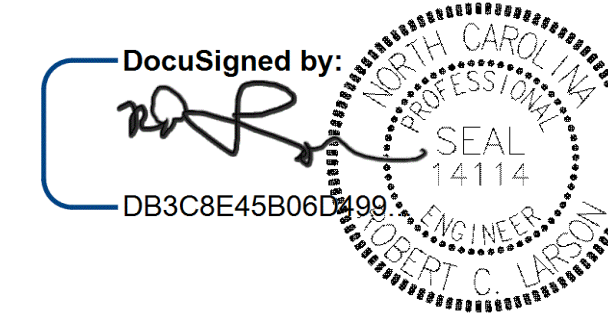
SECTION Y-Y

PROJECT NO. B-5671  
 EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1



DESIGN ENGINEER OF RECORD: *[Signature]* DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 08/30/19  
 CHECKED BY: R. C. LARSON DATE: 08/30/19

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

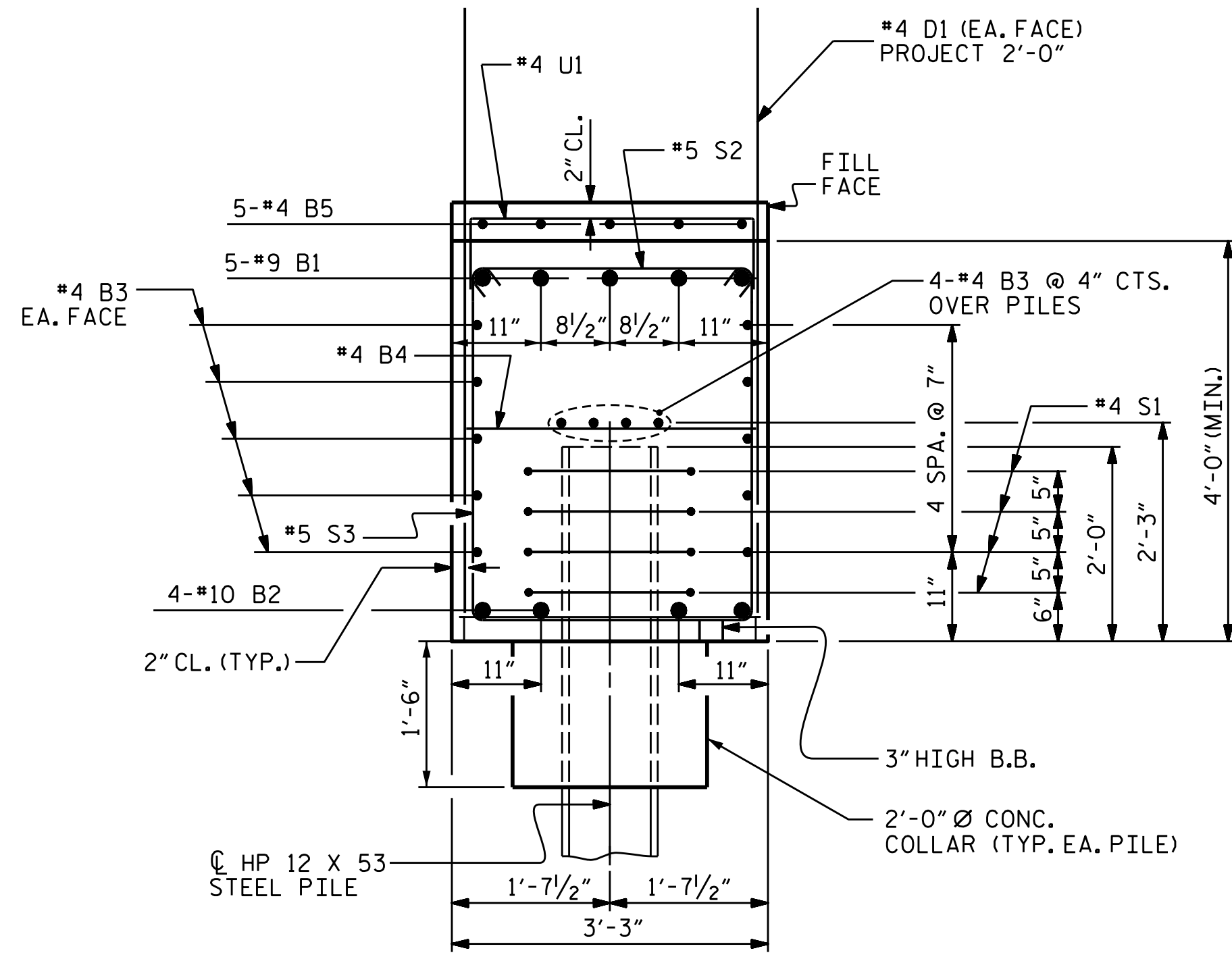
KCI Associates  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6370 Phone (919) 785-5241

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

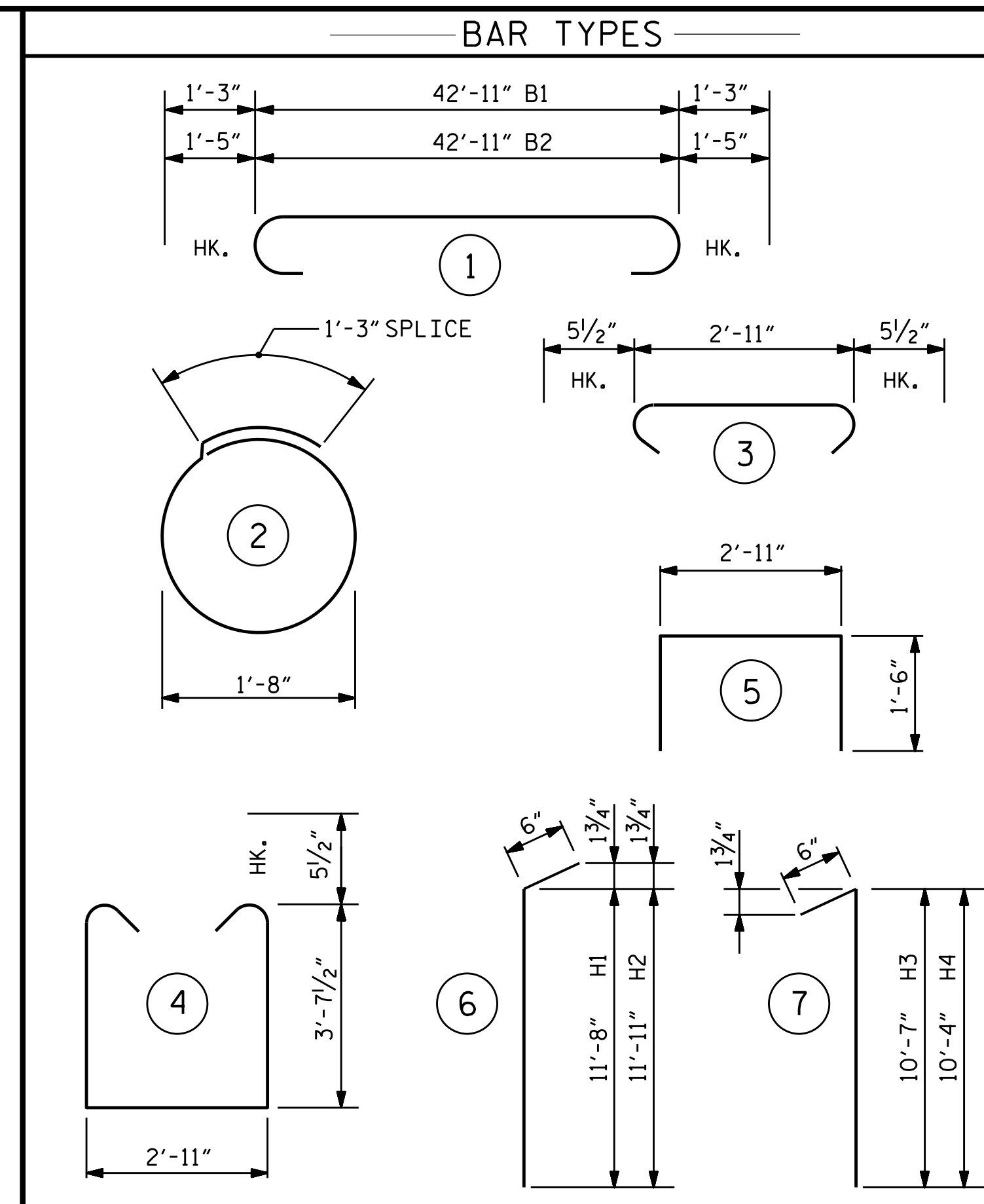
TOTAL SHEETS: 29

KCI PROJ. #251801945.24

1/24/2020



SECTION A-A



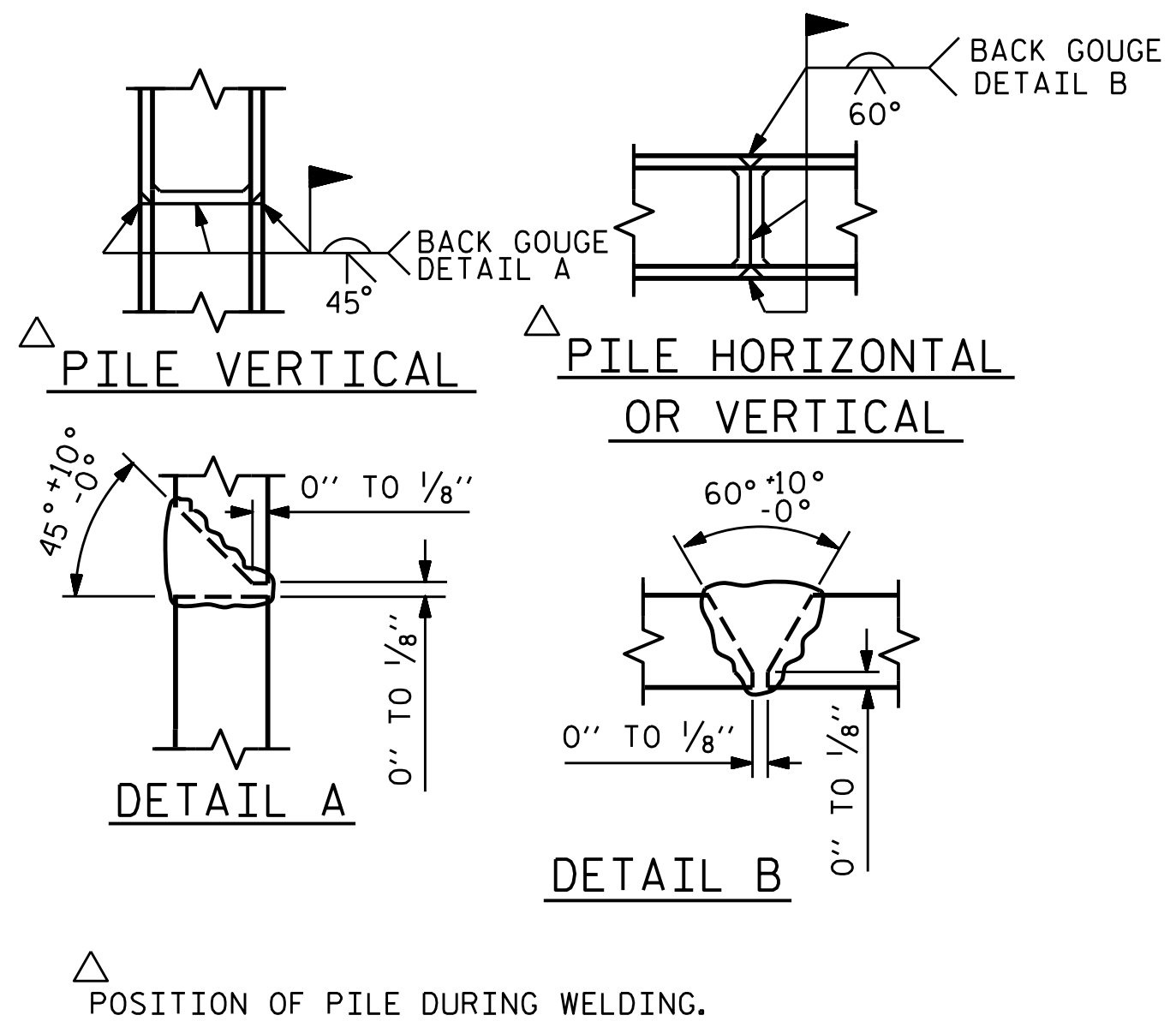
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	45'-5"	772
B2	4	10	1	45'-9"	787
B3	28	4	STR.	22'-8"	424
B4	11	4	STR.	2'-11"	21
B5	20	4	STR.	7'-3"	97
D1	54	4	STR.	5'-10"	210
H1	20	5	6	12'-2"	254
H2	20	5	6	12'-5"	259
H3	20	5	7	11'-1"	231
H4	20	5	7	10'-10"	226
K1	24	4	STR.	2'-10"	45
S1	28	4	2	6'-6"	122
S2	36	5	3	3'-10"	144
S3	36	5	4	11'-1"	416
U1	20	4	5	5'-11"	79
V1	30	5	STR.	10'-2"	318
V2	28	5	STR.	9'-8"	282

REINFORCING STEEL, LBS.		4687
CLASS A CONCRETE, CY	POUR 1	26.5
	POUR 2	6.2
TOTAL		32.7
HP 12X53 STEEL PILES	NO.	7
	L.F.	385
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.		7
PILE REDRIVES, EA.		4



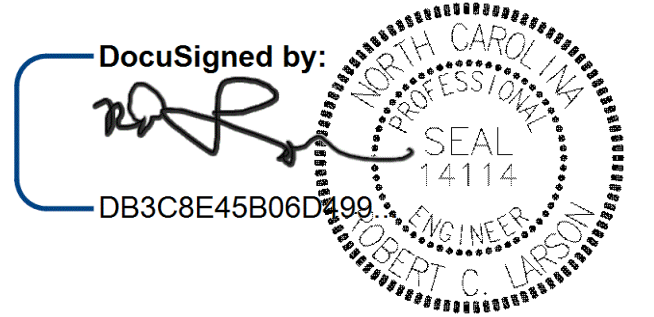
PILE SPLICE DETAILS

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 1**



DESIGN ENGINEER OF RECORD	DATE
<i>[Signature]</i>	1/24/2020
DRAWN BY : R. J. FLORY	DATE : 08/30/19
CHECKED BY : R. C. LARSON	DATE : 09/05/19

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

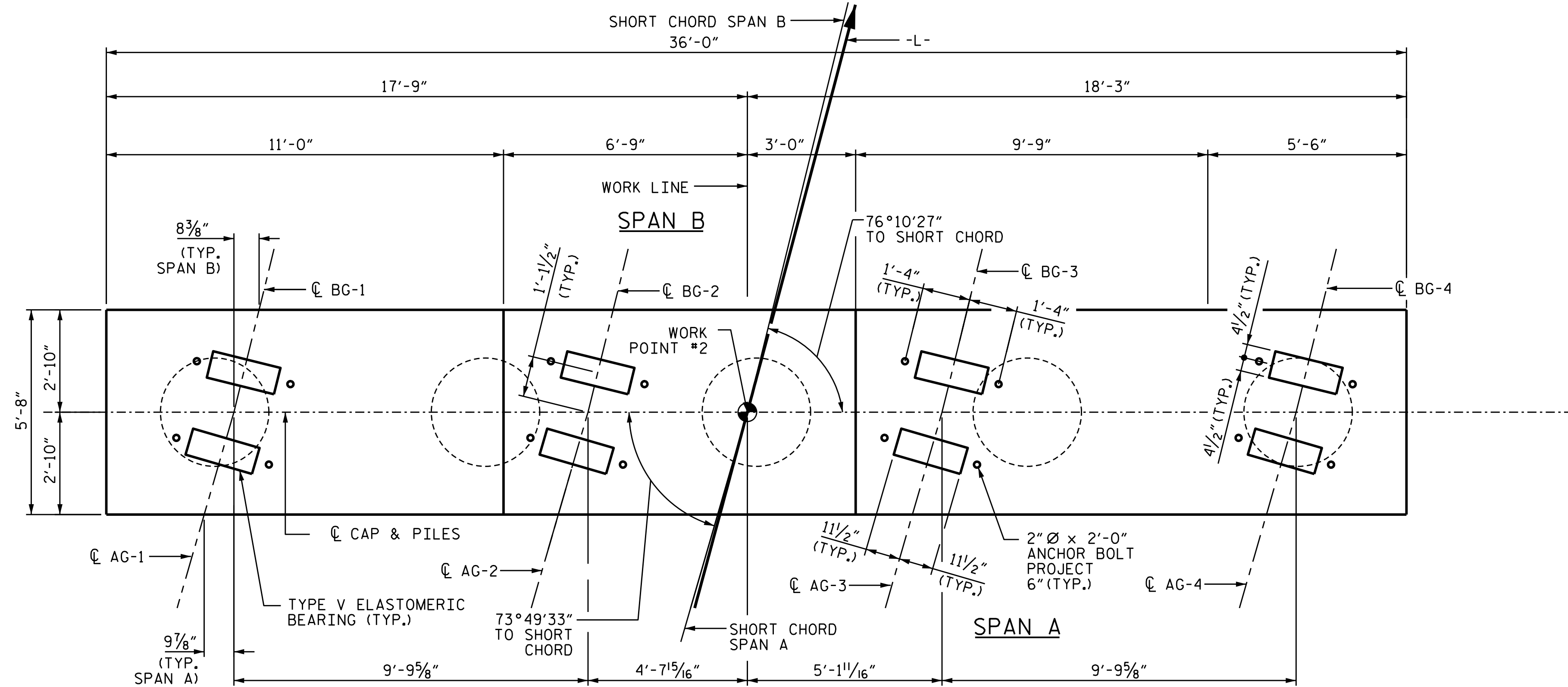
1/24/2020

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 27609-6370 Phone (919) 785-9241

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KCI PROJ. #251801945.24



**NOTES**

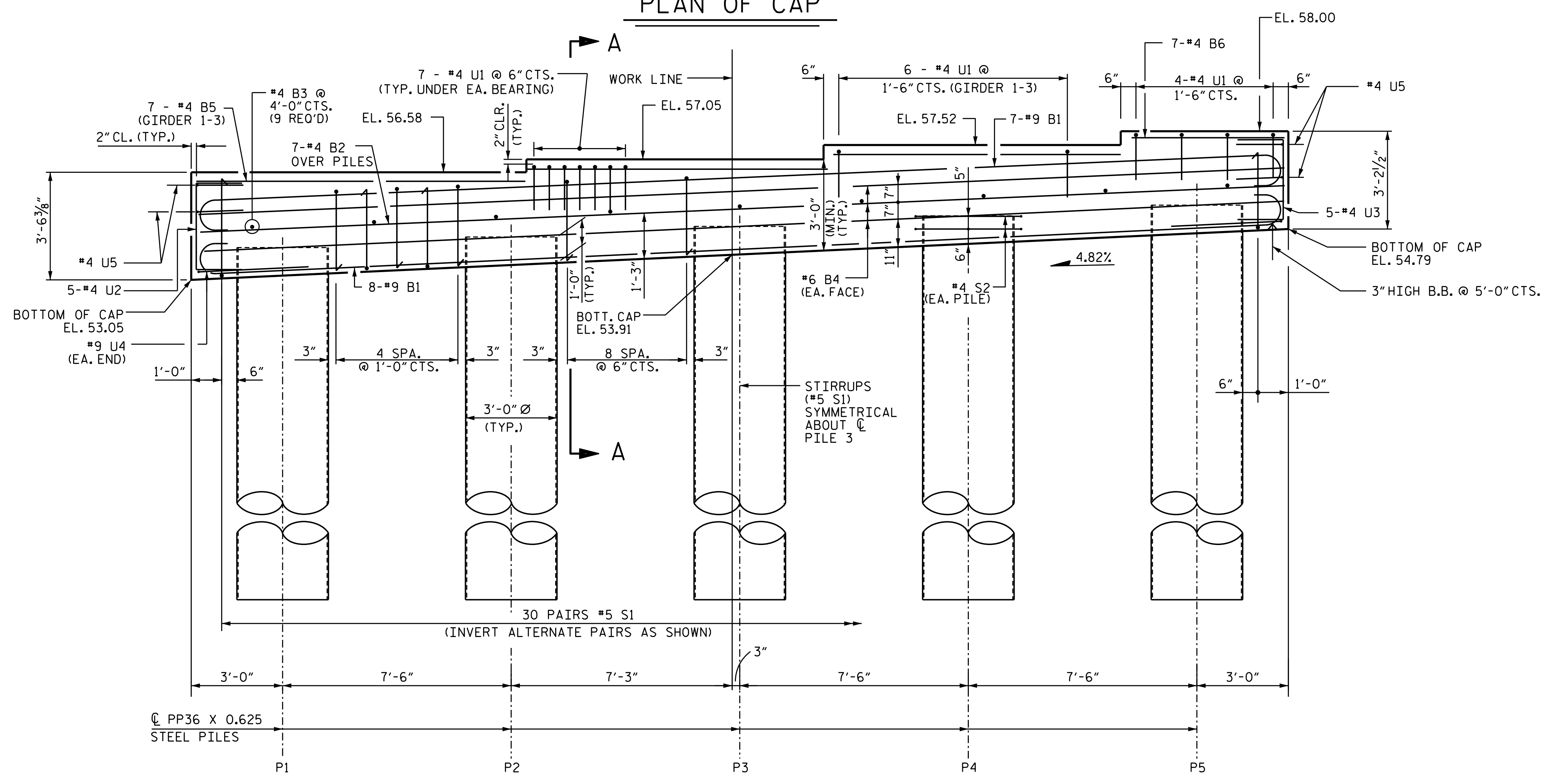
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 70'. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR CONCRETE PLUG AND REINFORCING IN PILES SEE "36" STEEL PIPE PILE" SHEET.

FOR SECTION A-A SEE SHEET 2 OF 2

TOP OF PILE ELEVATIONS	
P1	54.27
P2	54.63
P3	54.99
P4	55.35
P5	55.71



PROJECT NO. B-5671

EDGEcombe COUNTY

STATION: 17+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE BENT 1**

DocuSigned by:  
KCI Associates, Inc.  
DB3C8E45B06D498

PROFESSIONAL SEAL  
14114  
ENGINEER  
ROBERT C. LARSON

1/24/2020

DESIGN ENGINEER OF RECORD: R.J. FLORY DATE: 1/24/2020

DRAWN BY: R.J. FLORY DATE: 10/24/19

CHECKED BY: R.C. LARSON DATE: 10/30/19

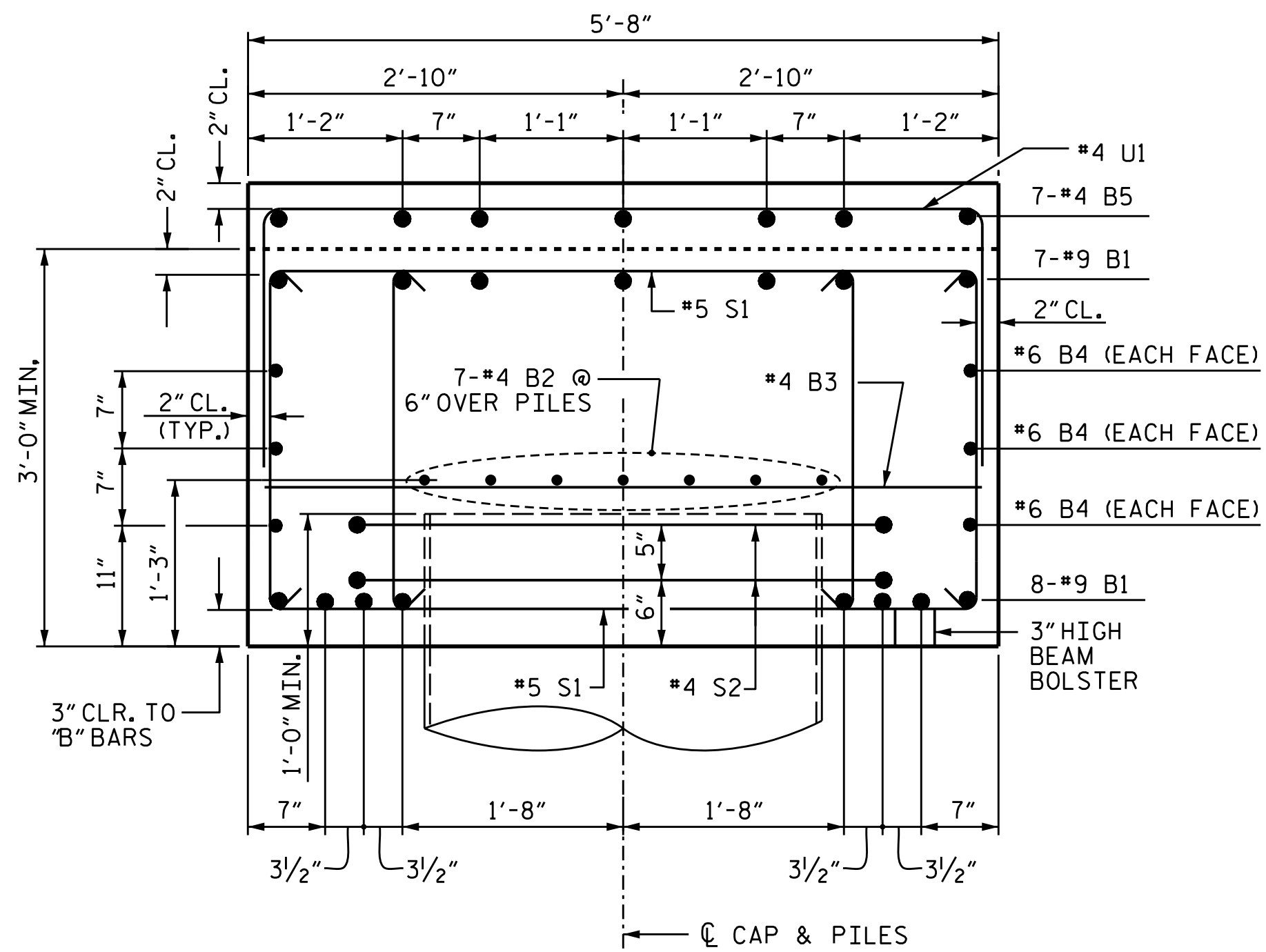
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS	
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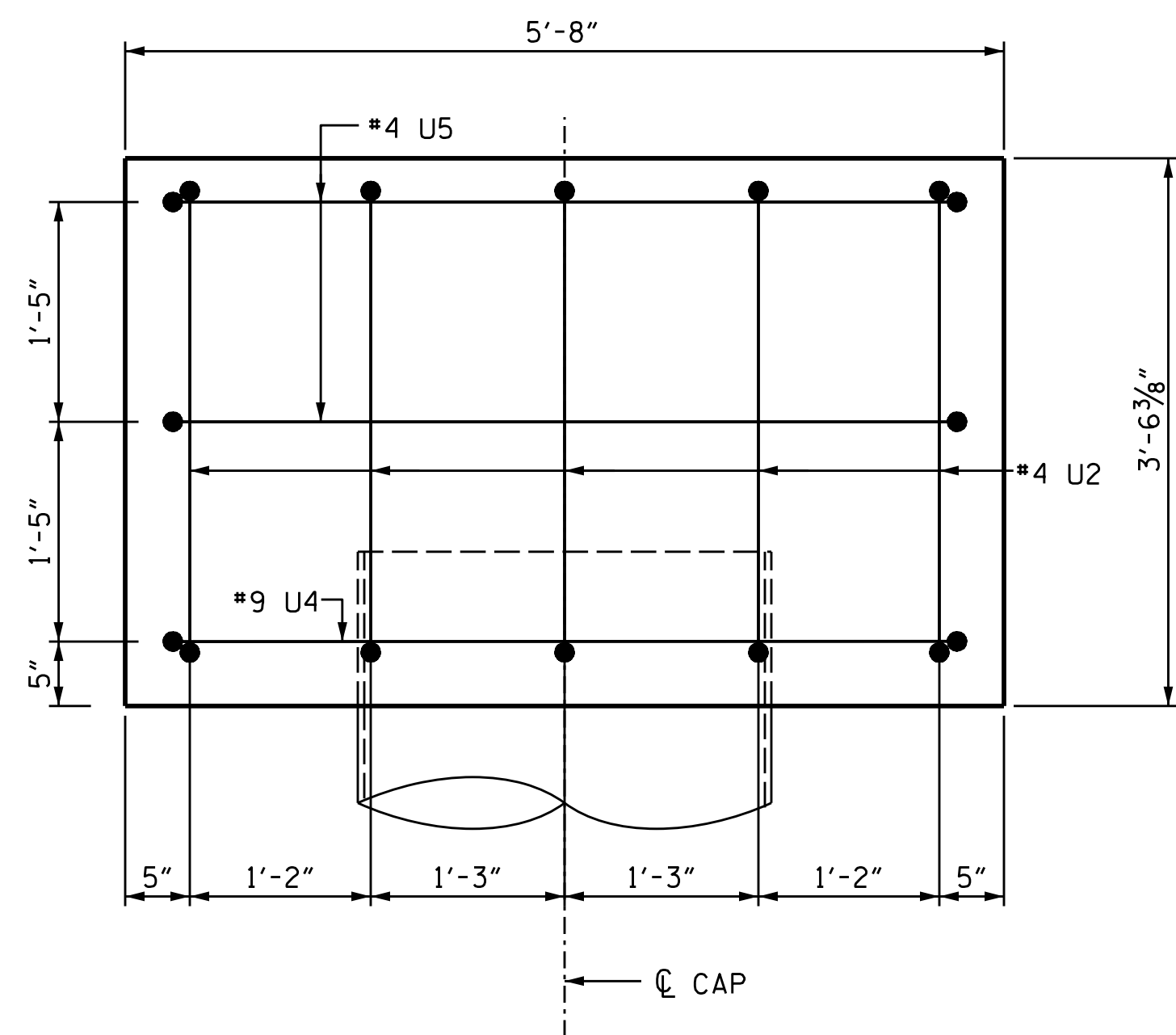
SHEET NO. S-21

TOTAL SHEETS 29

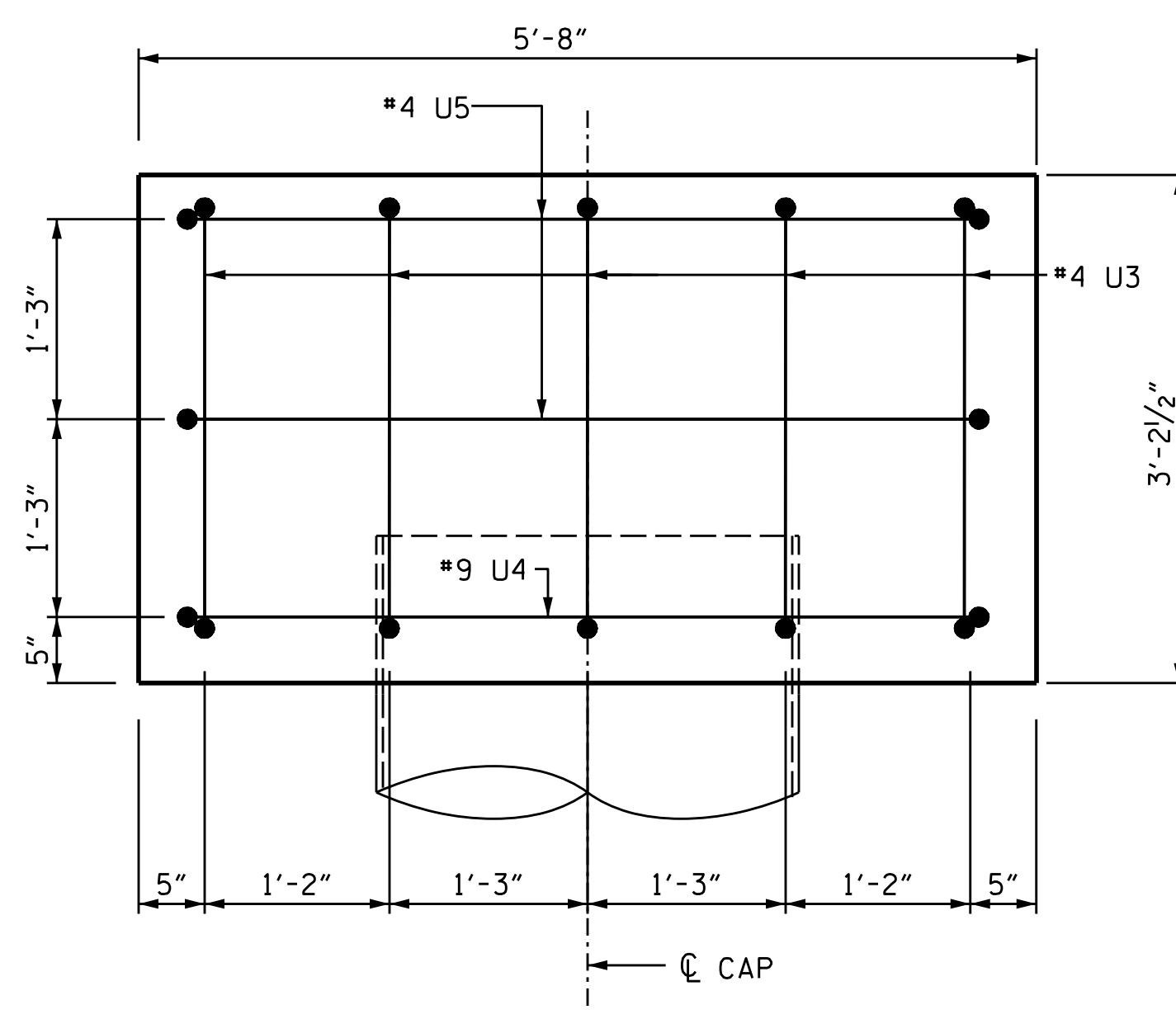
KCI Associates, P.A.  
2505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-5241



SECTION A-A

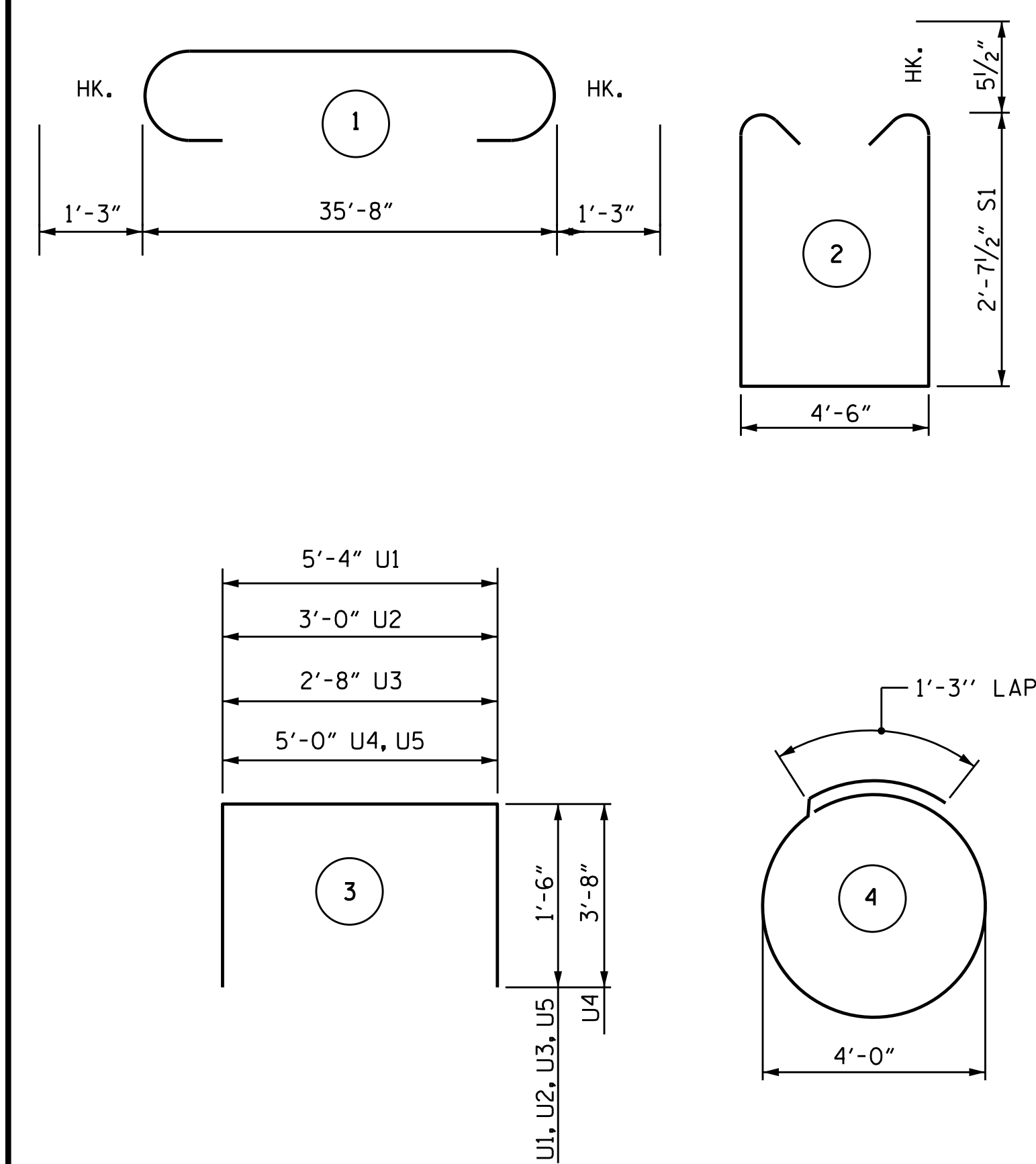


LEFT END OF CAP VIEW



RIGHT END OF CAP VIEW

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	15	9		38'-2"	1947
B2	7	4	STR.	35'-8"	167
B3	9	4	STR.	5'-4"	32
B4	6	6	STR.	35'-8"	321
B5	21	4	STR.	9'-0"	126
B6	7	4	STR.	5'-2"	24
S1	60	5		10'-8"	668
S2	10	4		13'-10"	92
U1	50	4		8'-4"	278
U2	5	4		6'-0"	20
U3	5	4		5'-8"	19
U4	2	9		12'-4"	84
U5	4	4		8'-0"	21

REINFORCING STEEL, LBS. 3799

CLASS A CONCRETE, CU. YD. 23.4

PP 36 X 0.625 GALVANIZED STEEL PILES  
 NO. 5  
 LIN. FT. 550

PILE DRIVING EQUIPMENT SETUP FOR  
 PP 36 X 0.625 GALVANIZED STEEL PILES, EA. 5

PILE REDRIVES, EA. 3

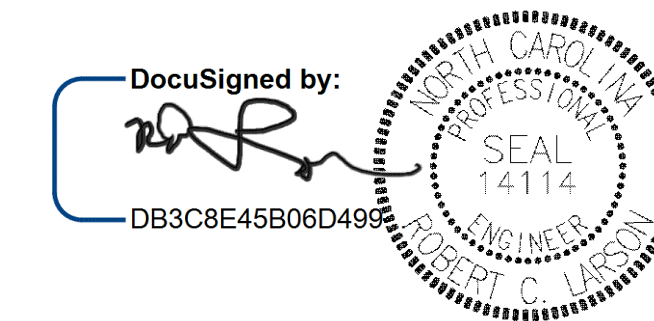
(NOTE: PILE HEADS HAVE BEEN DEDUCTED FROM CLASS A CONCRETE)

PROJECT NO. B-5671  
 EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT 1



1/24/2020

REVISIONS

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

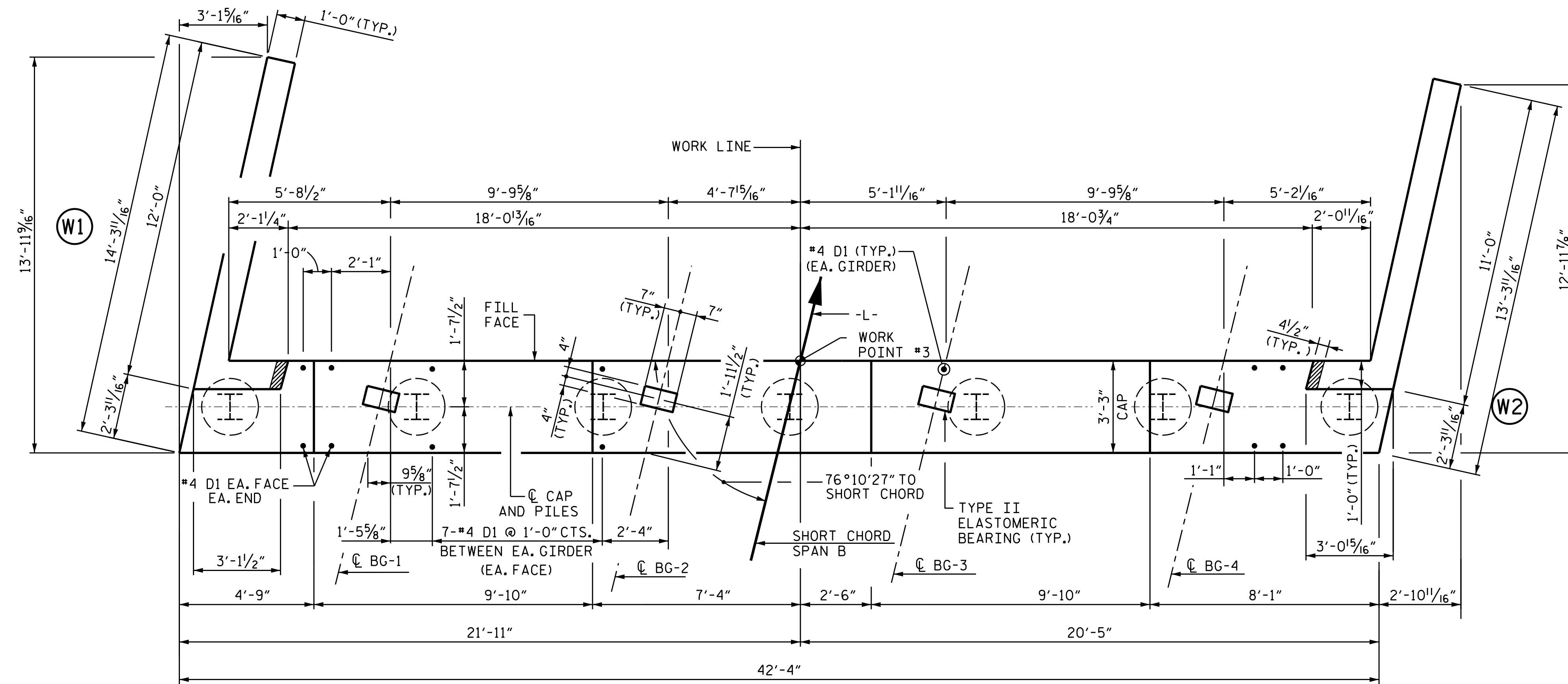
SHEET NO. S- 22  
 TOTAL SHEETS 29

DESIGN ENGINEER OF RECORD: R. J. FLORY DATE: 1/24/2020  
 DRAWN BY: R. J. FLORY DATE: 10/24/19  
 CHECKED BY: R. C. LARSON DATE: 10/30/19

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KCI PROJ. #251801945.24



PLAN OF CAP

NOTES

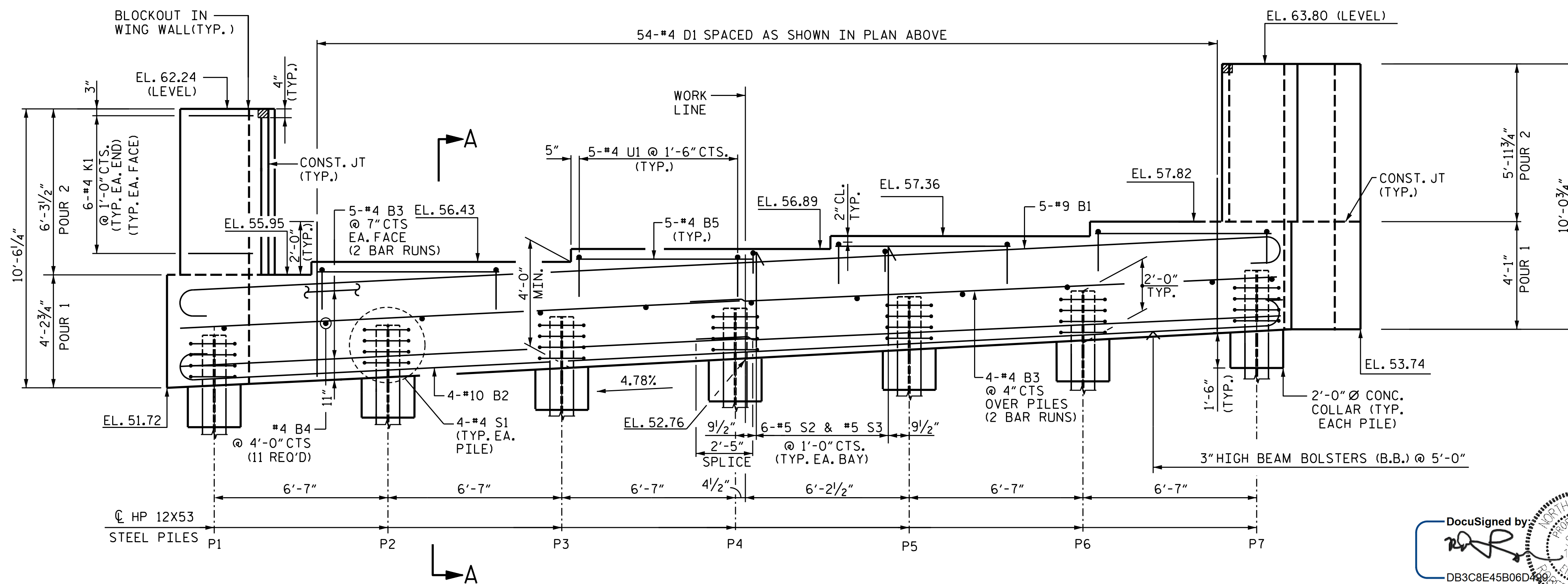
THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1) EXCEPT THE BEARING AREAS AND THE AREA OUTSIDE OF THE SUPERSTRUCTURE SHALL BE RAKED TO A DEPTH OF 1/4"

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 SECTION A-A SEE SHEET 3 OF 3.

TOP OF PILE ELEVATIONS	
P1	53.82
P2	54.14
P3	54.45
P4	54.77
P5	55.08
P6	55.40
P7	55.71



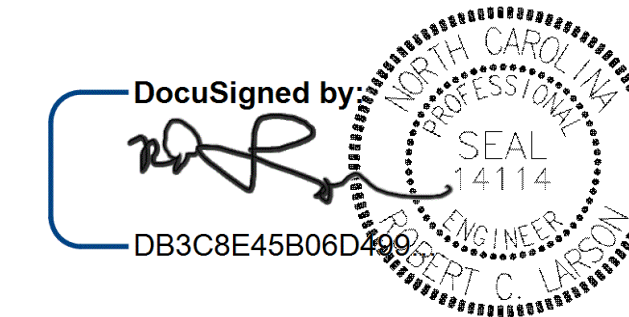
ELEVATION

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2



1/24/2020

DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 09/10/19  
 CHECKED BY: R. C. LARSON DATE: 10/28/19

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 UNLESS ALL SIGNATURES COMPLETED

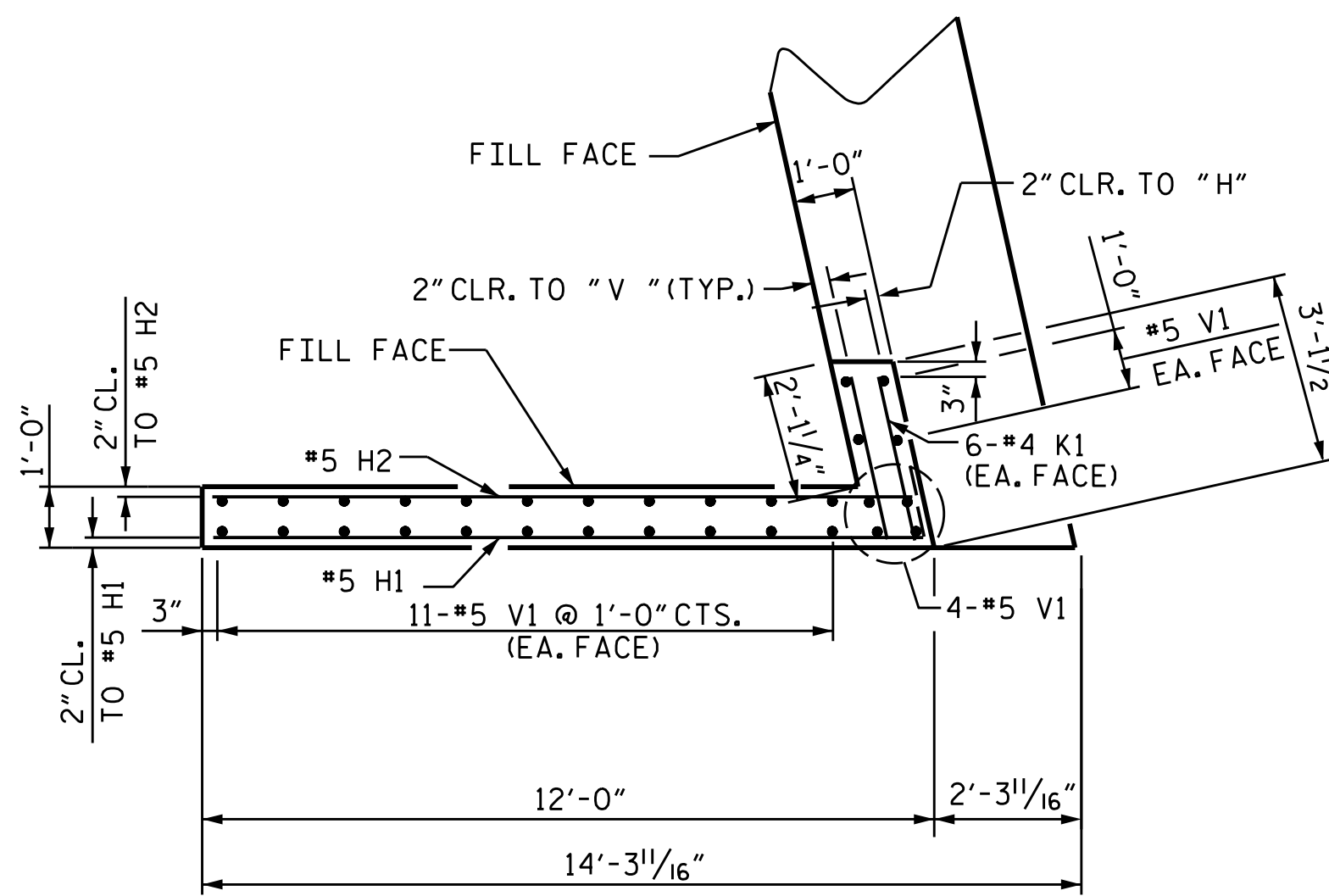
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-9241

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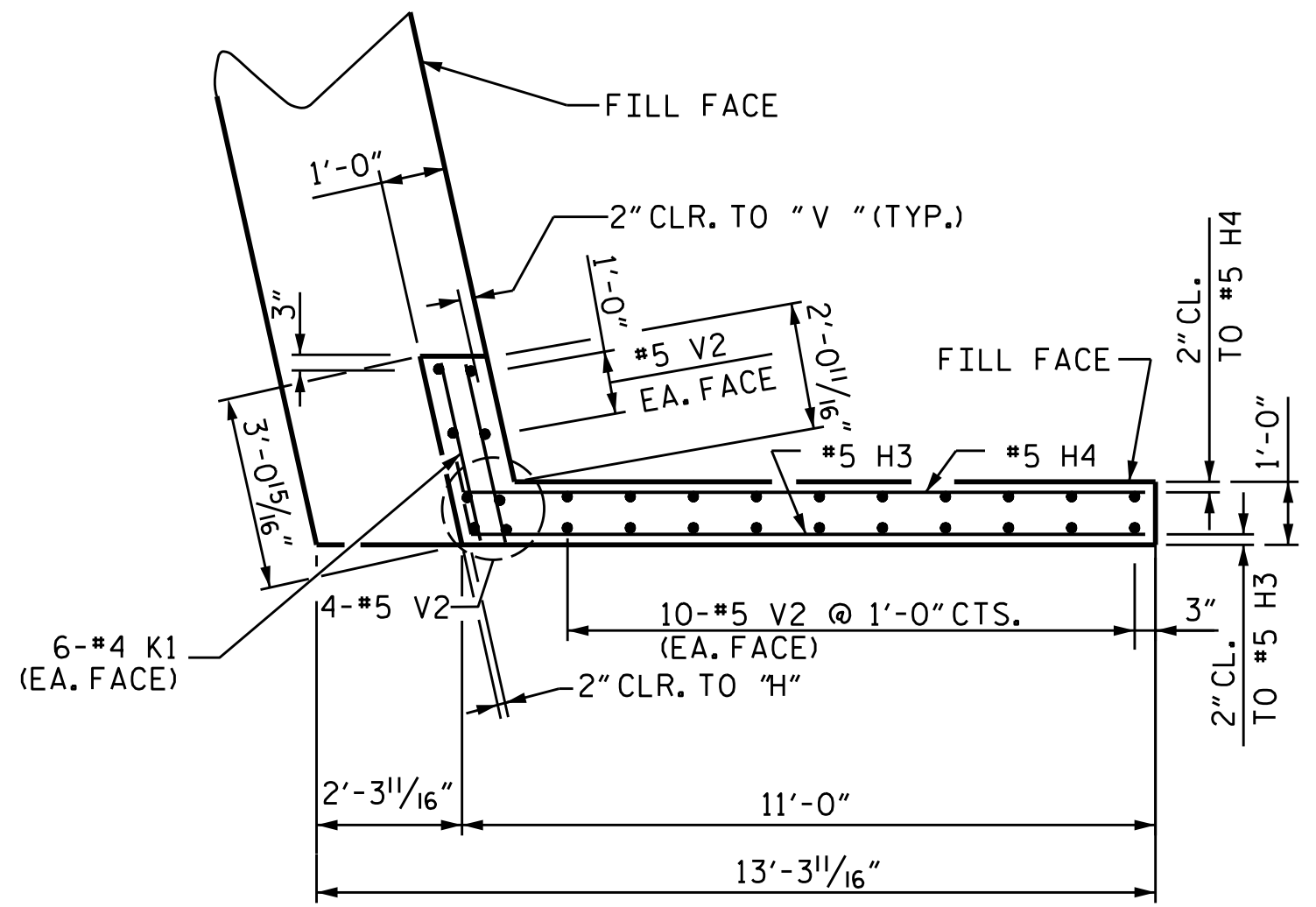
TOTAL SHEETS: 29

KCI PROJ. #251801945.24

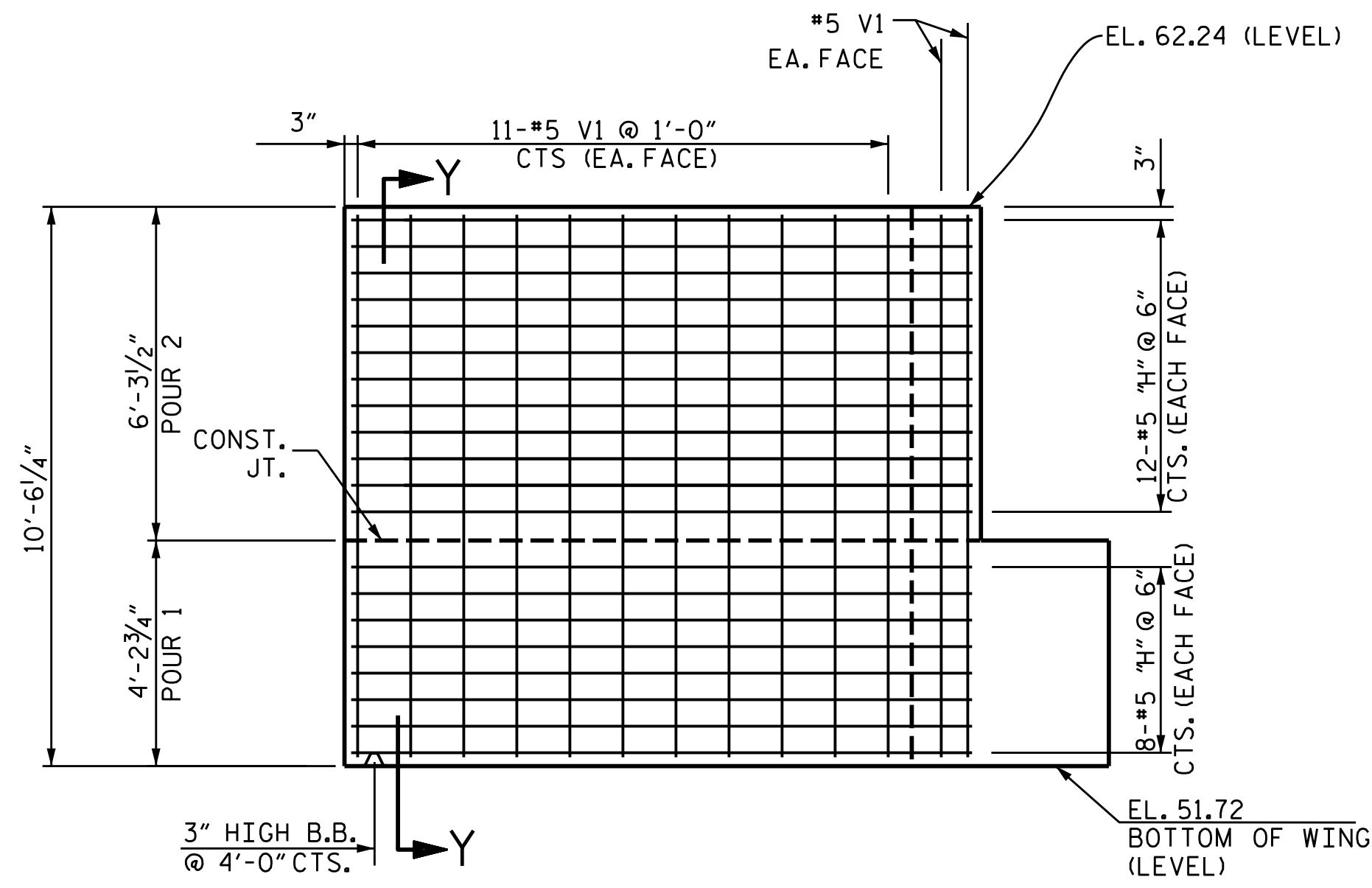




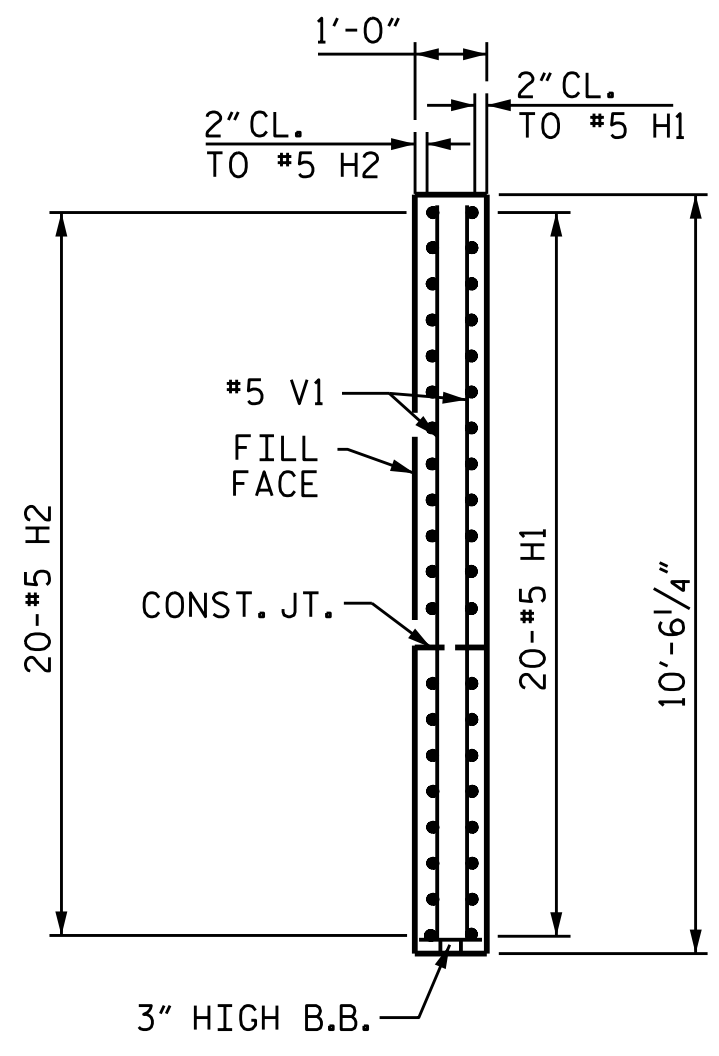
PLAN W1



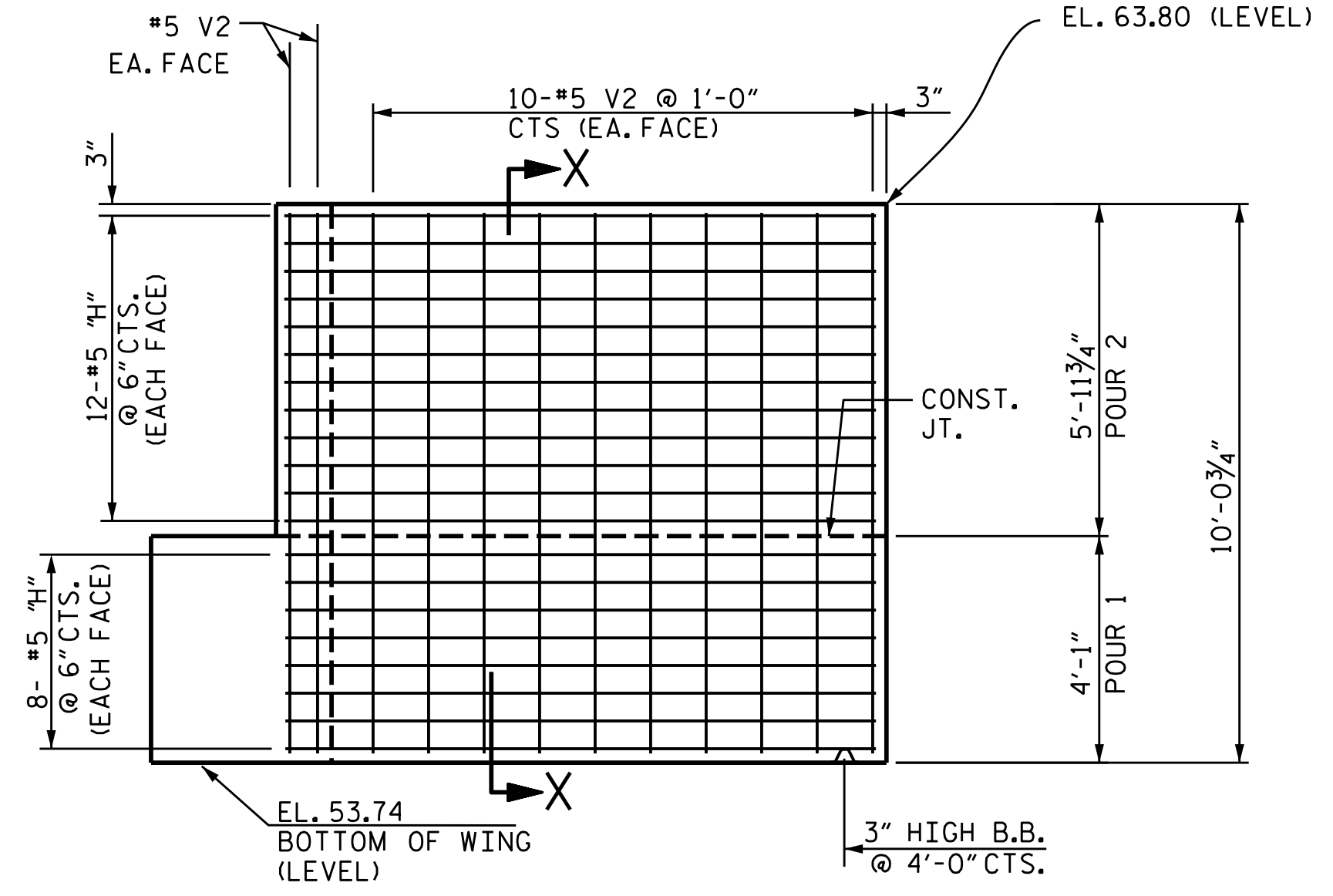
PLAN W2



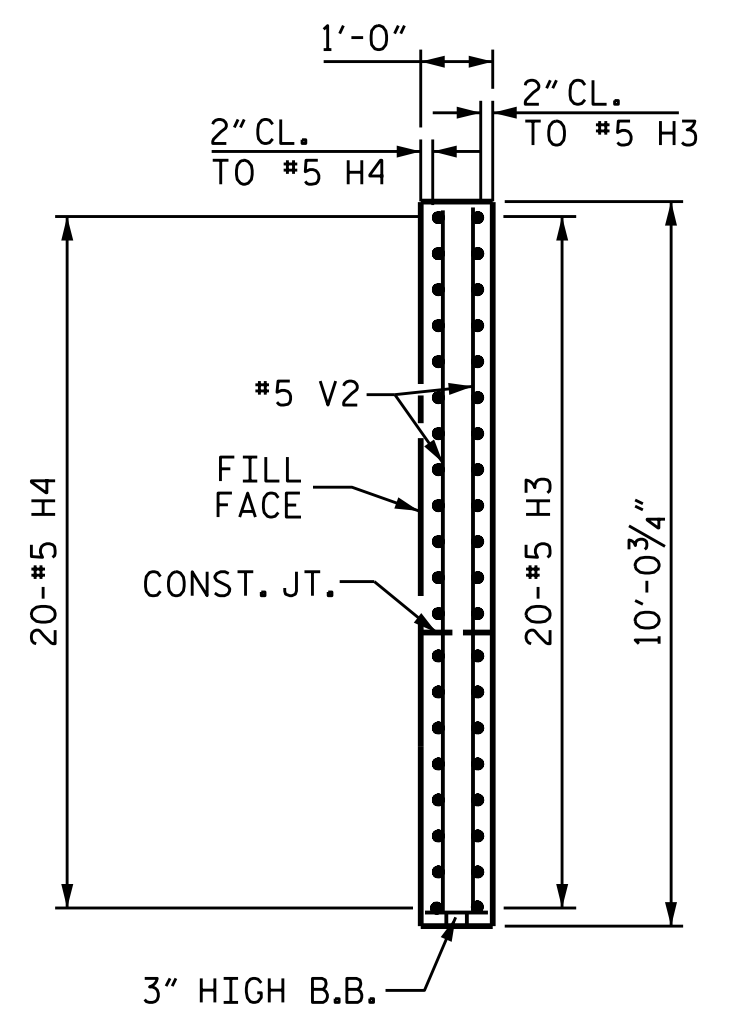
ELEVATION W1



SECTION Y-Y



ELEVATION W2



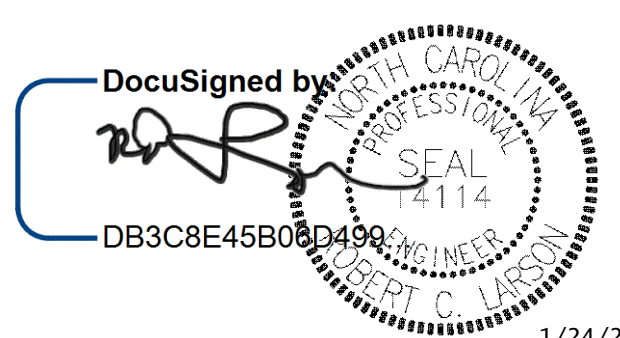
SECTION X-X

PROJECT NO. B-5671  
EDGEcombe COUNTY  
 STATION: 17+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2**



DESIGN ENGINEER OF RECORD: [Signature] DATE: 1/24/2020  
 DRAWN BY: A. K. ALLANKI DATE: 09/09/19  
 CHECKED BY: R. C. LARSON DATE: 10/30/19

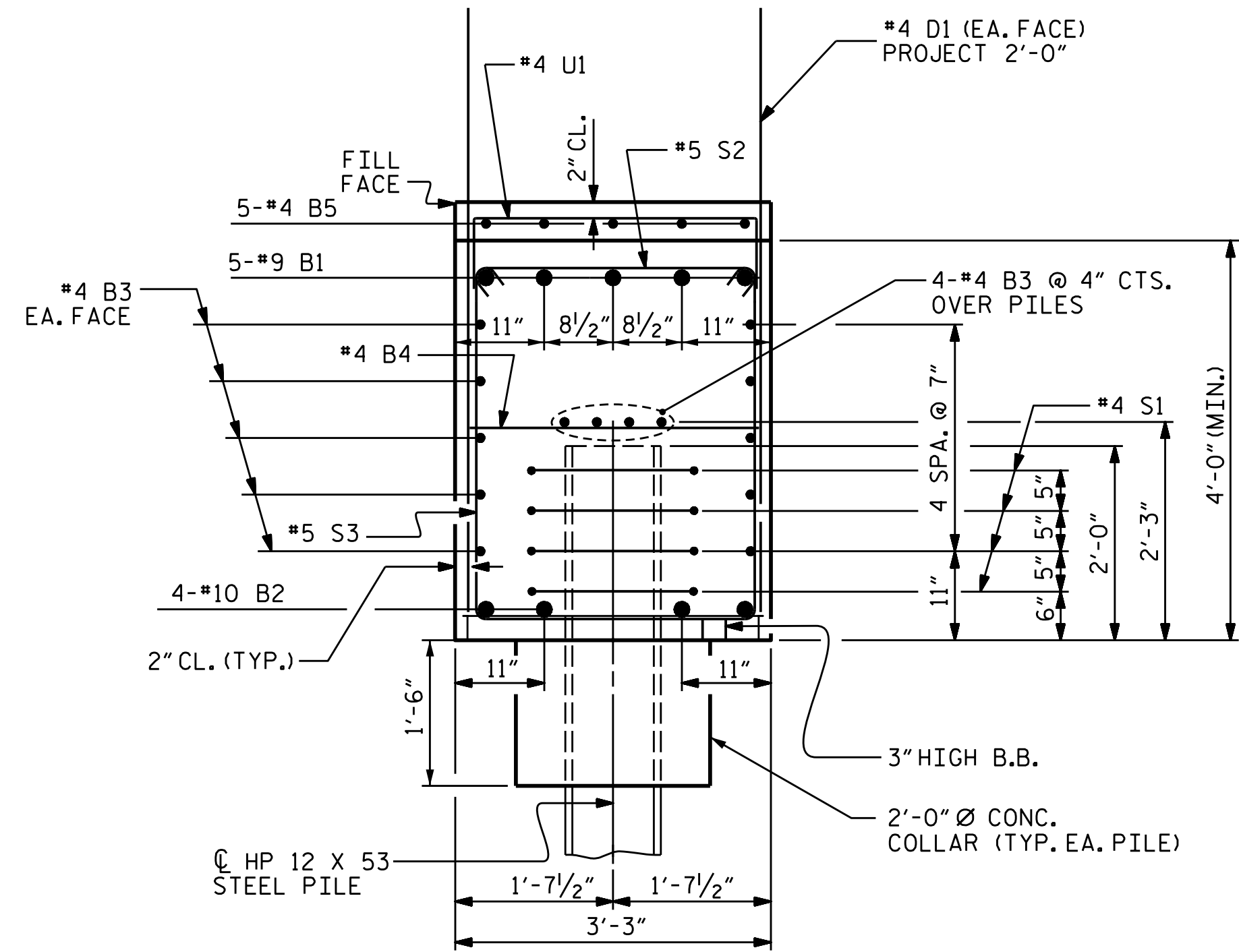
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ENGINEERS, PLANNERS & SCIENTISTS IN CONSTRUCTION MANAGERS LICENSE NUMBER: C-0784  
**KCI Associates**  
 of North Carolina, P.A.  
 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone: 919-785-5241

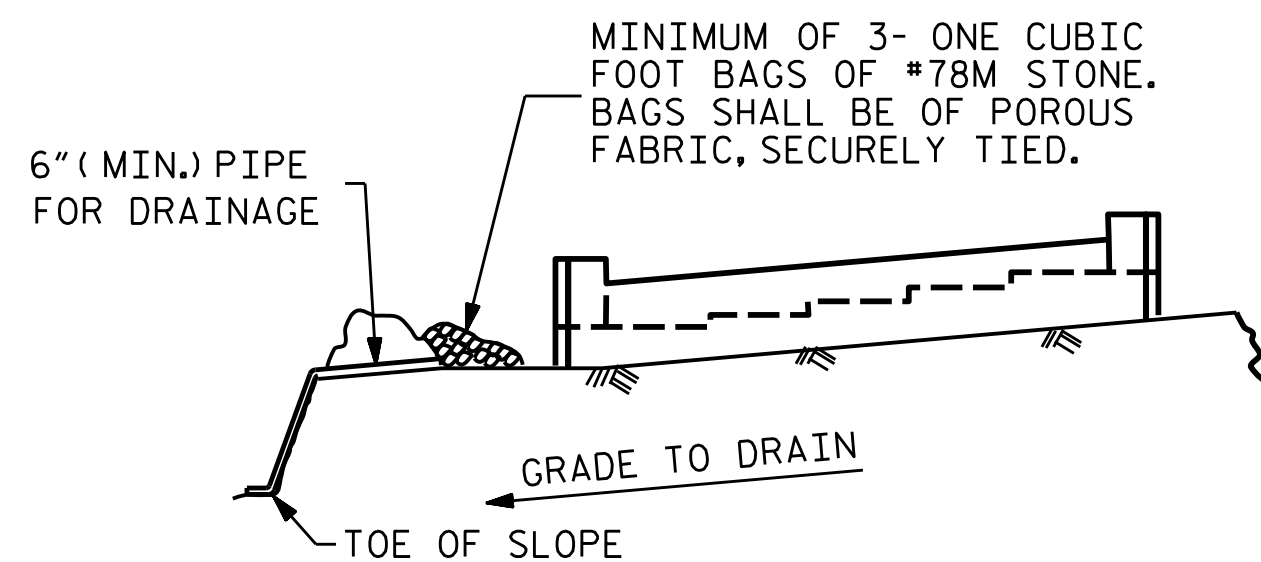
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
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2		4	

TOTAL SHEETS: 29

KCI PROJ. #251801945.24



SECTION A-A



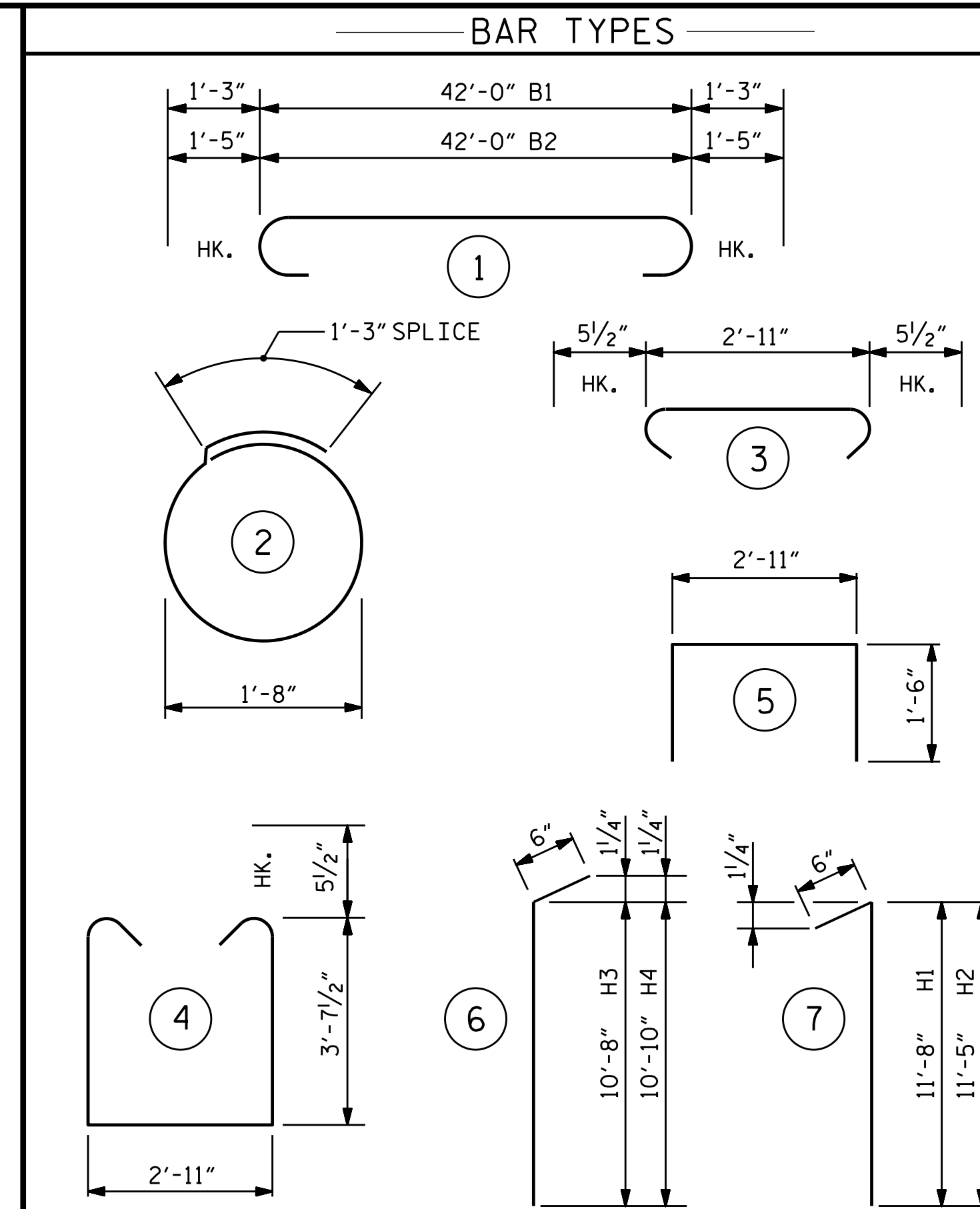
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

1/24/2020

**TEMPORARY DRAINAGE AT END BENT**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

**END BENT 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	44'-6"	757
B2	4	10	1	44'-10"	772
B3	28	4	STR.	22'-3"	416
B4	11	4	STR.	2'-11"	21
B5	20	4	STR.	7'-3"	97
D1	54	4	STR.	5'-10"	210
H1	20	5	7	12'-2"	254
H2	20	5	7	11'-11"	249
H3	20	5	6	11'-2"	233
H4	20	5	6	11'-4"	236
K1	24	4	STR.	2'-9"	44
S1	28	4	2	6'-6"	122
S2	36	5	3	3'-10"	144
S3	36	5	4	11'-1"	416
U1	20	4	5	5'-11"	79
V1	30	5	STR.	10'-2"	318
V2	28	5	STR.	9'-8"	282

REINFORCING STEEL, LBS. 4650

CLASS A CONCRETE, CY POUR 1 26.0  
POUR 2 6.1

TOTAL 32.1

HP 12X53 STEEL PILES NO. 7  
L.F. 385

PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA. 7

PILE REDRIVES, EA. 4

PROJECT NO. B-5671

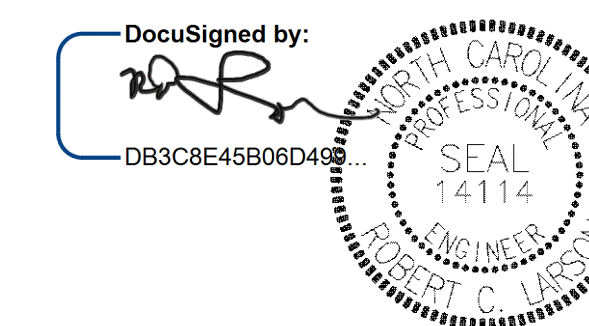
EDGEcombe COUNTY

STATION: 17+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE  
END BENT 2**



1/24/2020

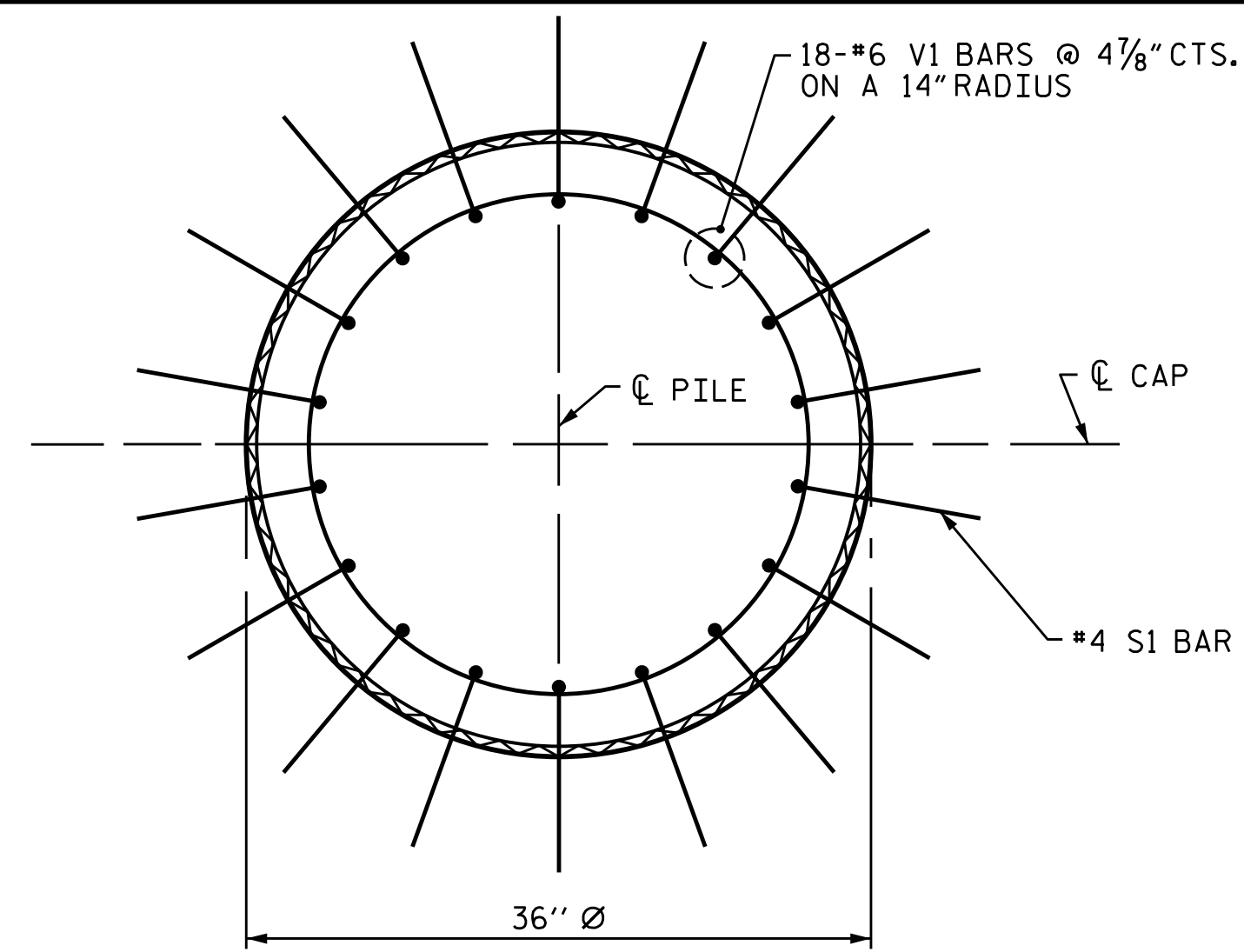
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DRAWN BY:	A. K. ALLANKI	DATE:	09/10/19
CHECKED BY:	R. C. LARSON	DATE:	10/30/19

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-25
2			4			TOTAL SHEETS 29

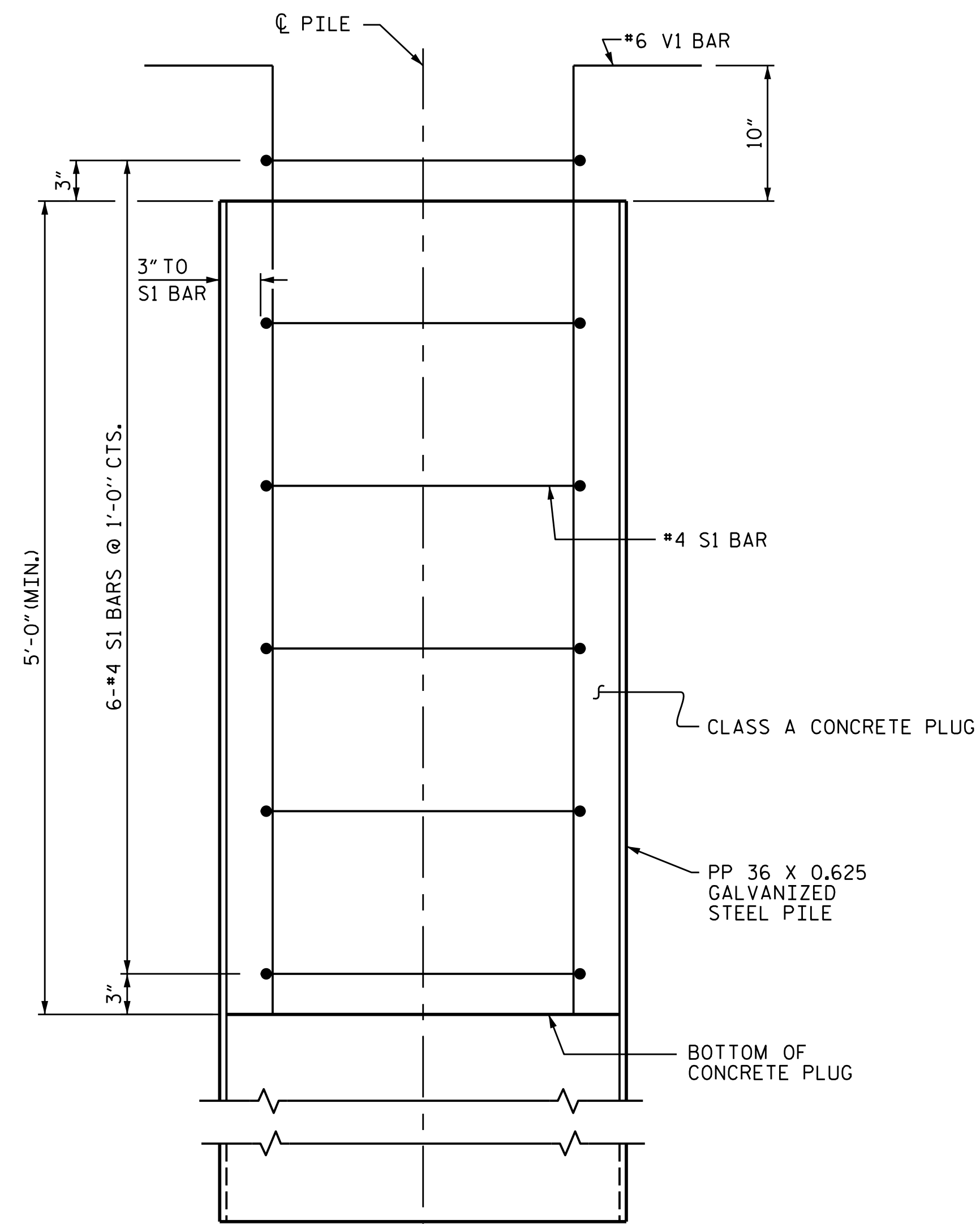
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



KCI PROJ. #251801945.24

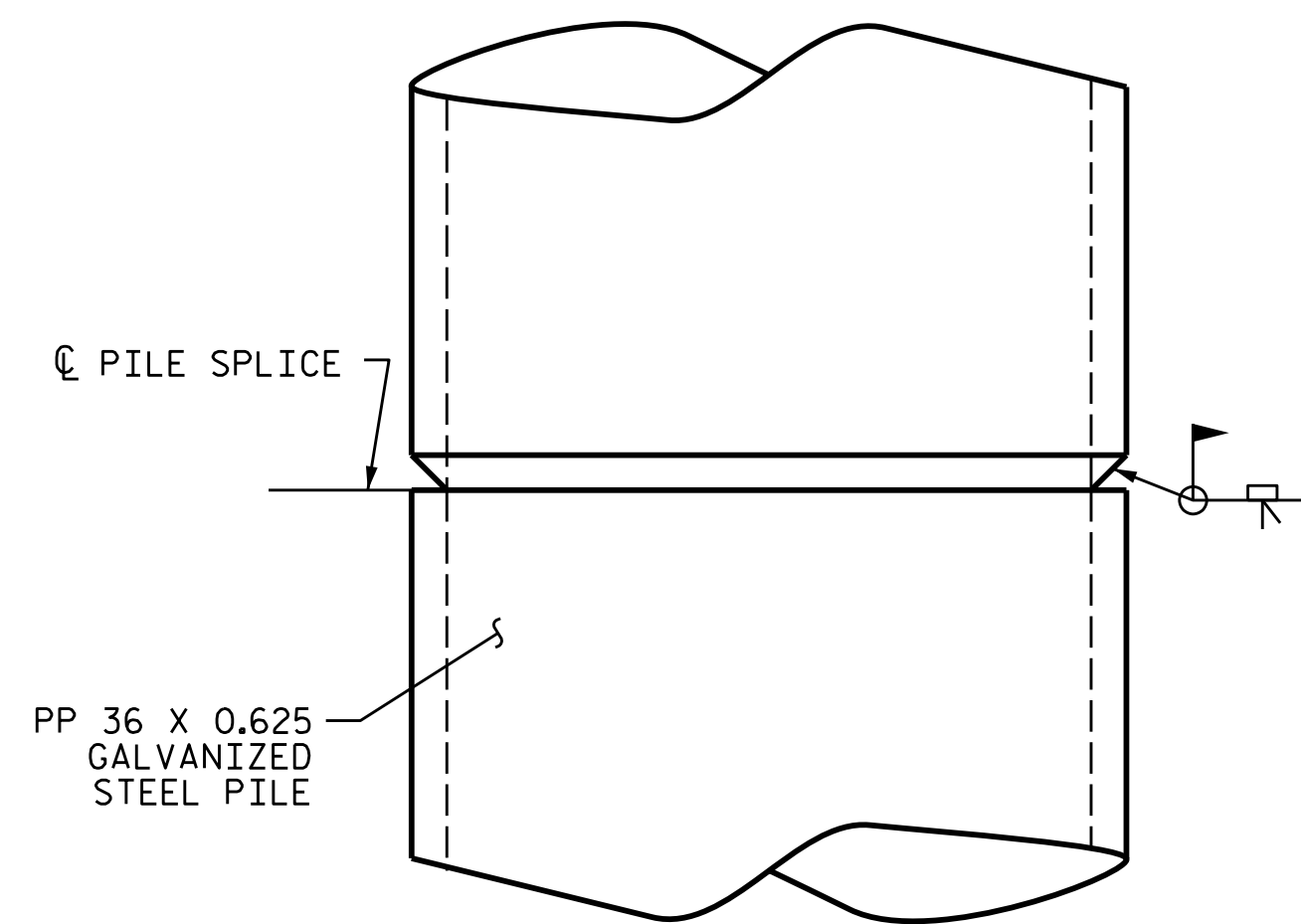


PLAN



ELEVATION

PP 36 X 0.625 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 36 X 0.625 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE  
PP 36 X 0.625 GALVANIZED STEEL PILE

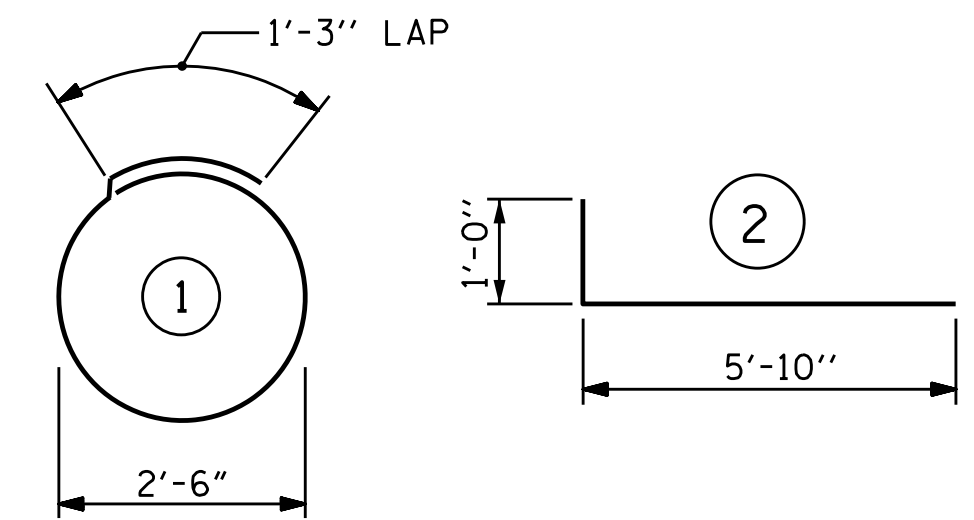
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	9'-2"	37
V1	18	#6	2	6'-10"	185
REINFORCING STEEL =					222 LBS.

CLASS A CONCRETE

5'-0" MINIMUM PLUG

1.3 CY

BAR TYPES

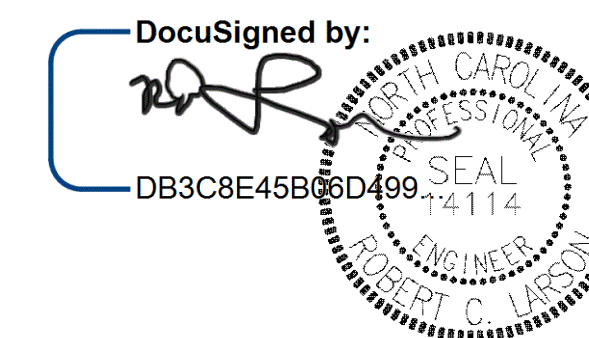


ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5671  
EDGECOMBE COUNTY  
 STATION: 17+00.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

36" STEEL PIPE PILE



1/24/2020

REVISIONS

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

SHEET NO.  
S-26  
TOTAL SHEETS  
29

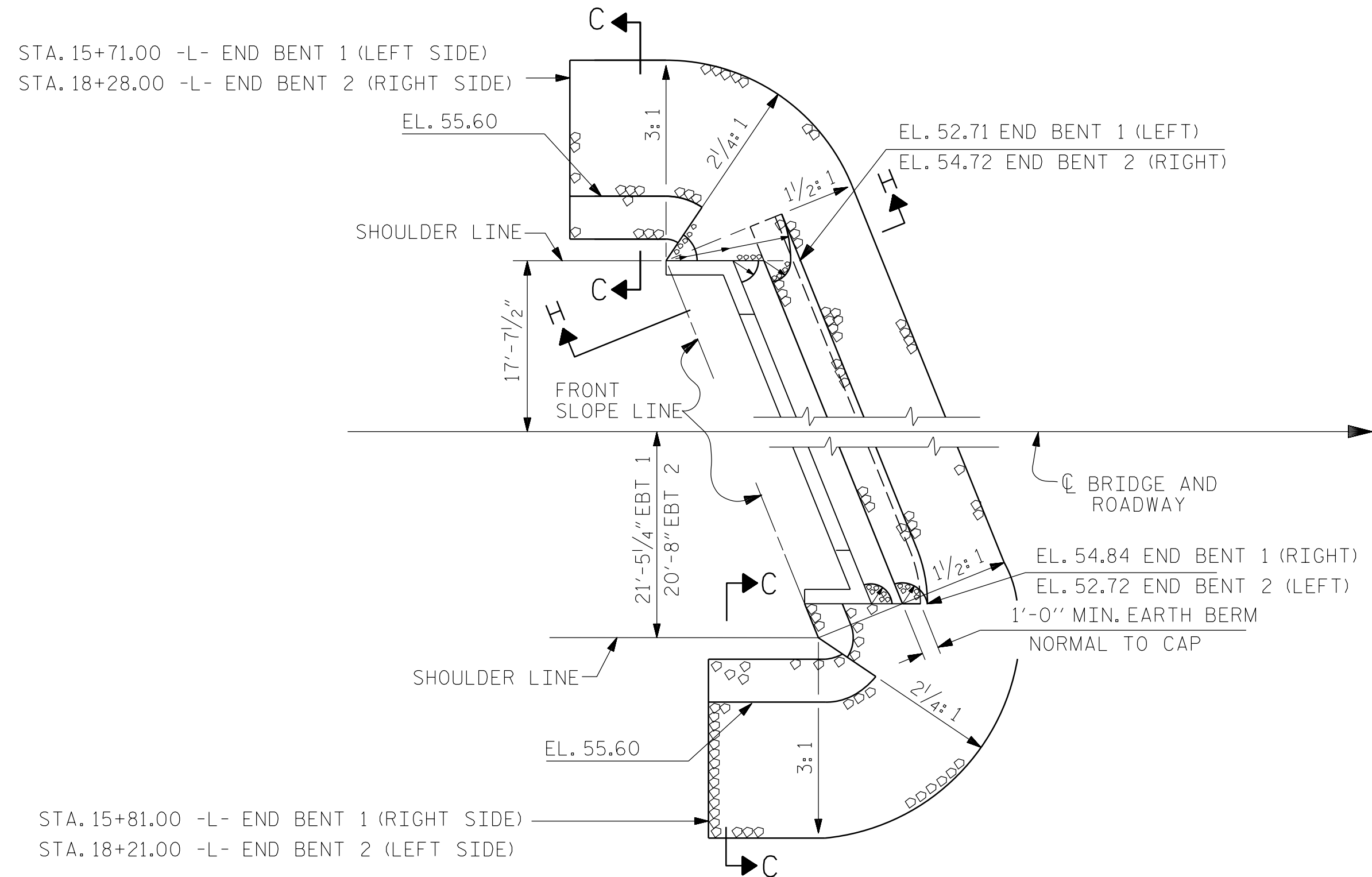
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



DESIGN ENGINEER OF RECORD:	<i>RGL</i>	DATE:	1/24/2020
DRAWN BY:	R. C. LARSON	DATE:	10/23/19
CHECKED BY:	A. K. ALLANKI	DATE:	12/13/19

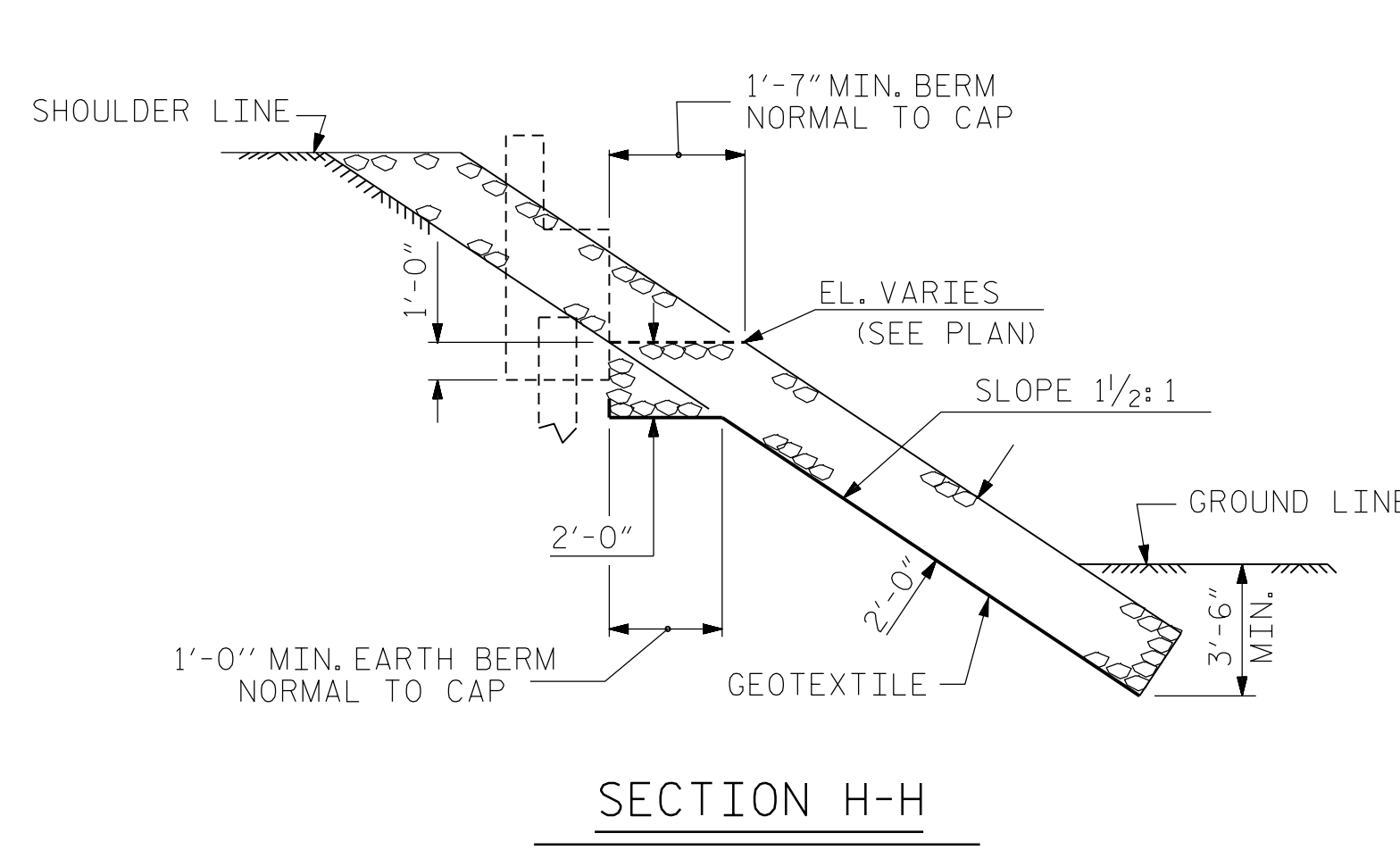
KCI PROJ. #251801945.24

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

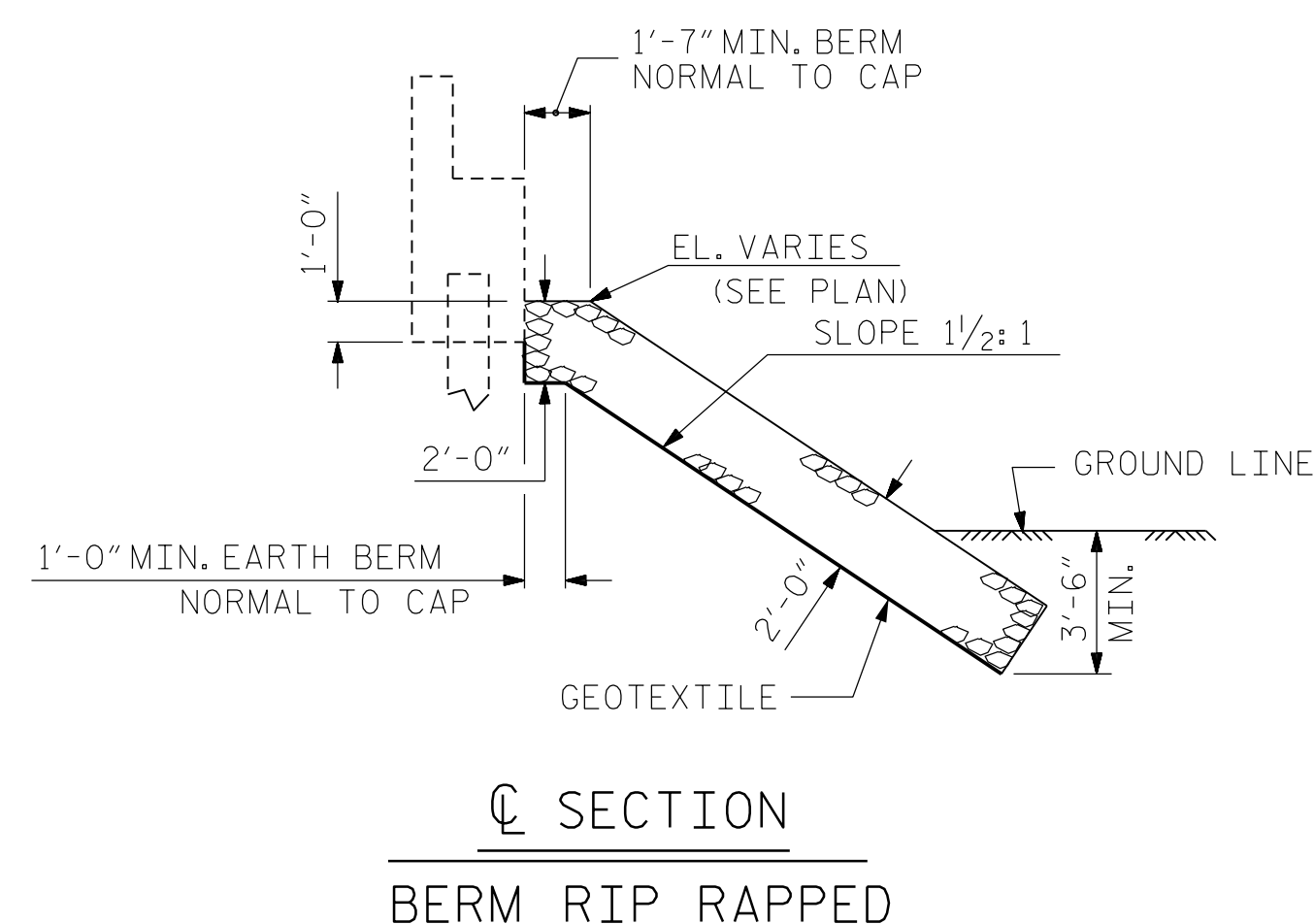


SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP

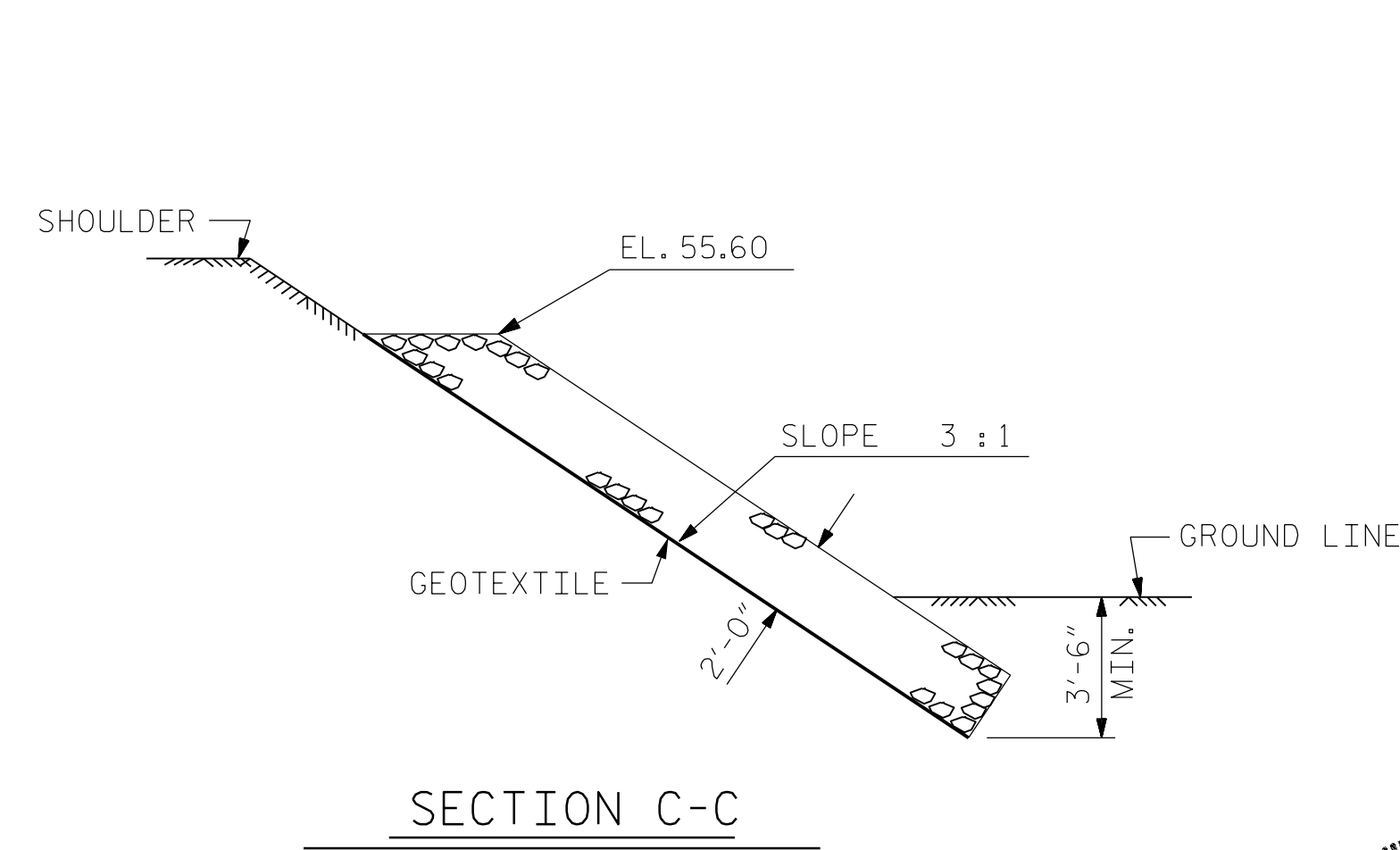
ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+00.00	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	555	620
END BENT 2	545	610



SECTION H-H

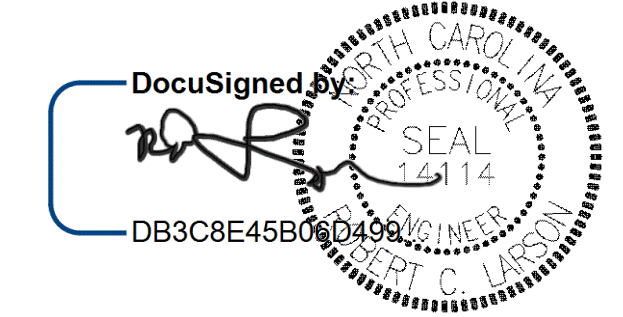


SECTION C-C  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-



2/26/2020

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

DESIGN ENGINEER OF RECORD	DocuSigned by: [Signature]	DATE : 2/26/2020
ASSEMBLED BY : A. SAMBO	DATE : 6/25/19	
CHECKED BY : R. C. LARSON	DATE : 11/11/19	
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

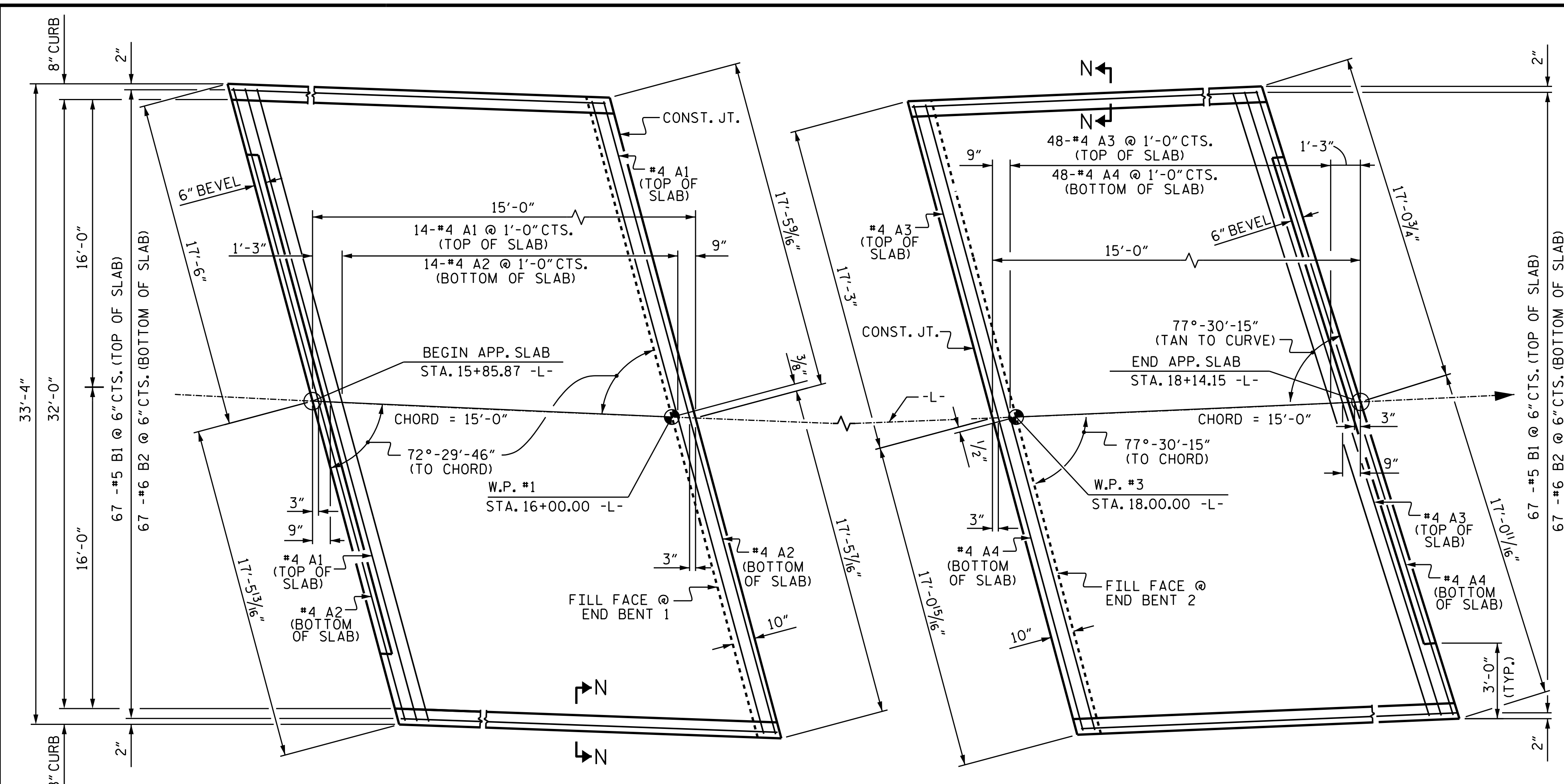
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UNLESS ALL SIGNATURES COMPLETED**

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS LICENSE NUMBER: C-0744  
**KCI Associates**  
of North Carolina, P.A.  
400 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-6270 Phone: (919) 783-9201

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

STD. NO. RR1

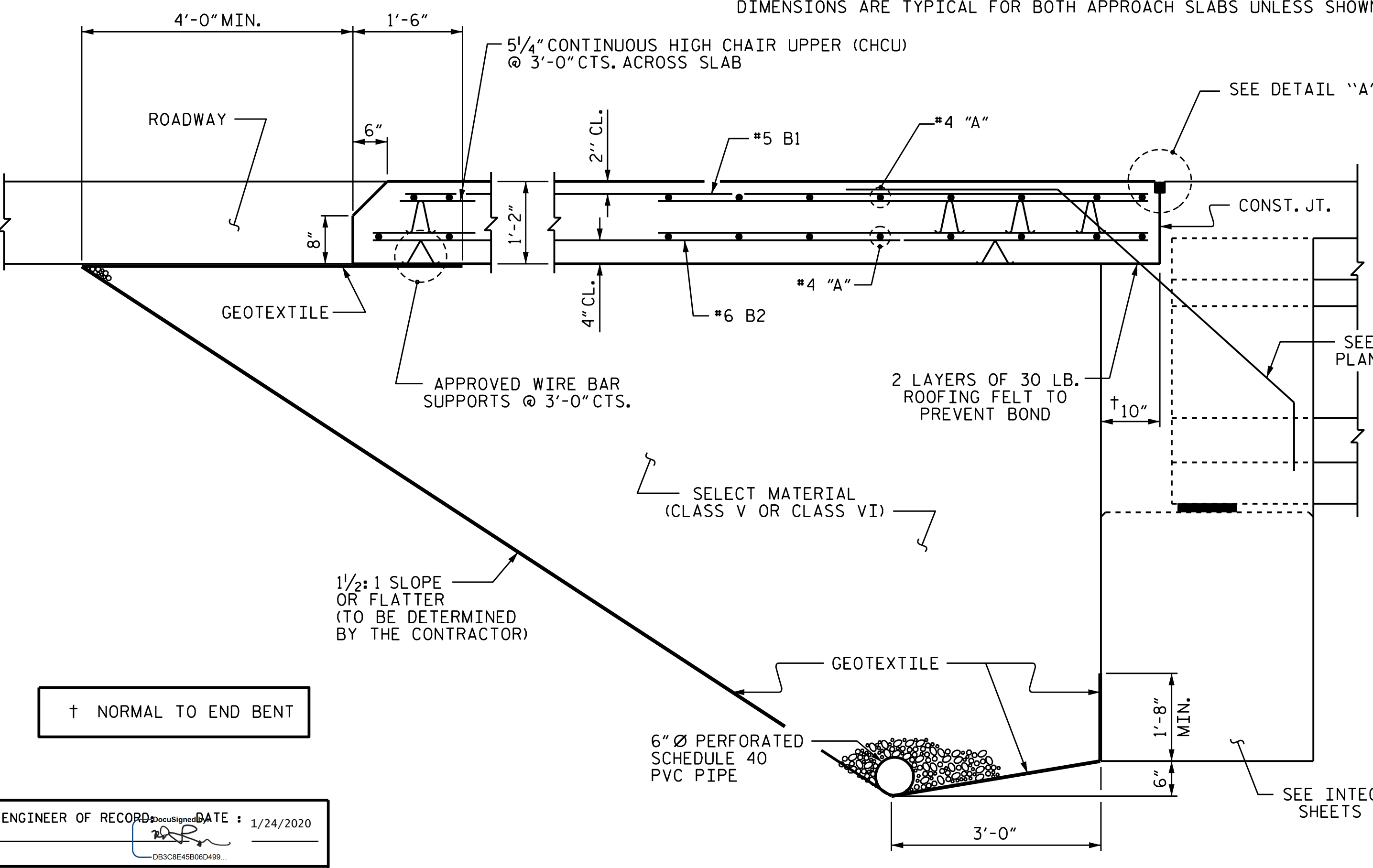
KCI JOB NO: 251801945.24



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS ARE TYPICAL FOR BOTH APPROACH SLABS UNLESS SHOWN



SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

NOTES

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

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

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

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

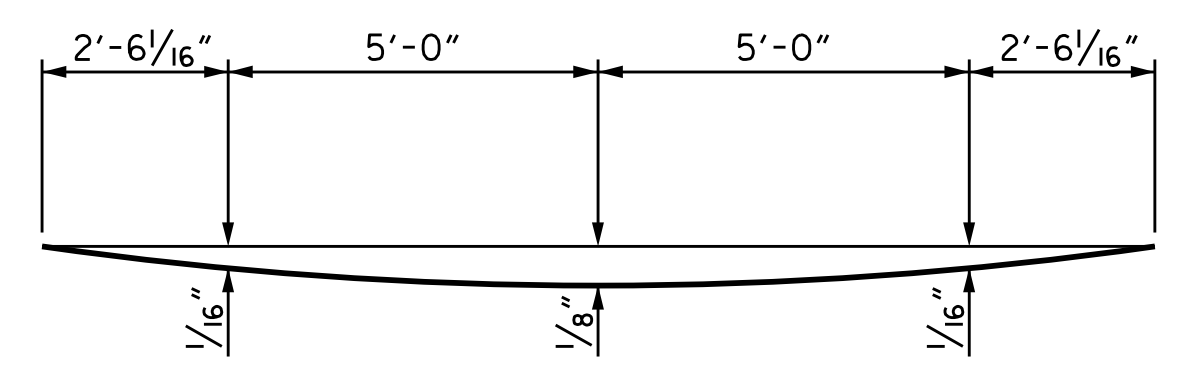
SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

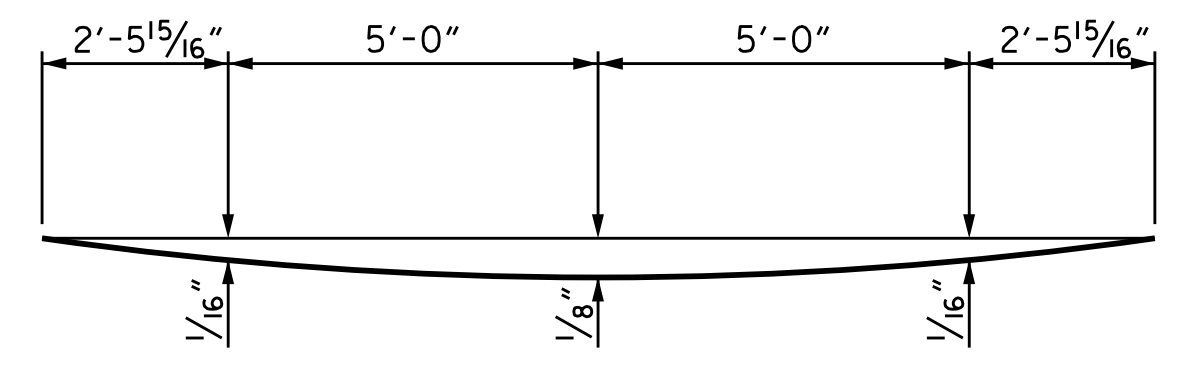
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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

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

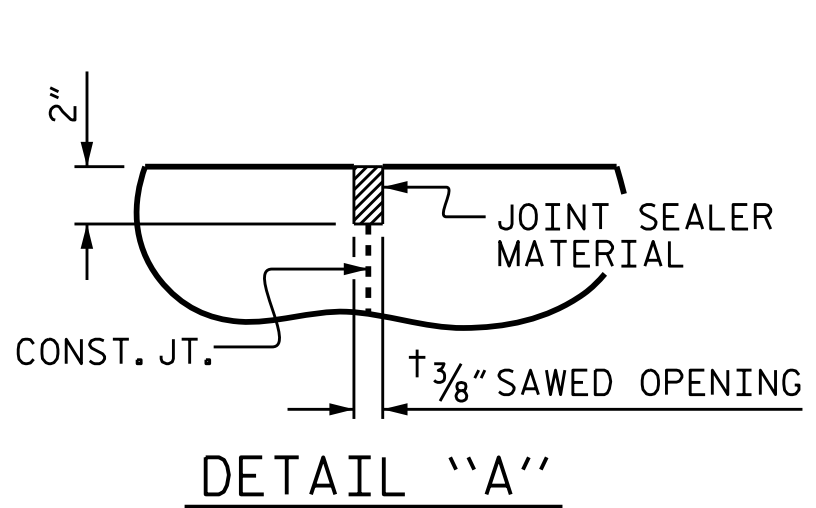


LEFT EDGE

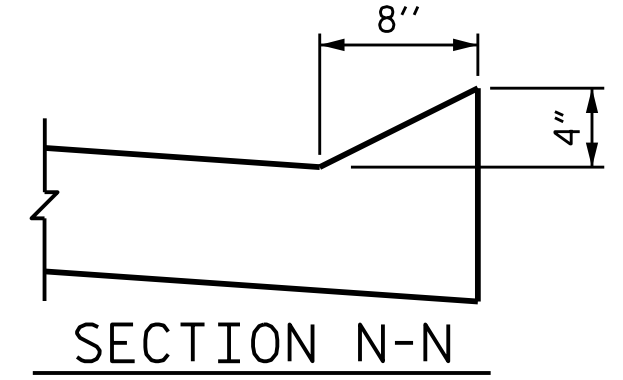
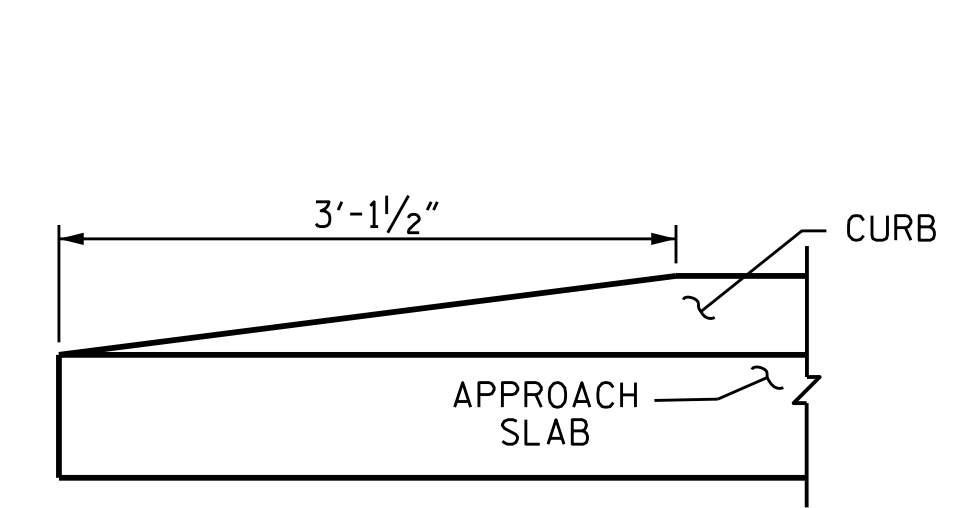


RIGHT EDGE

ARC OFFSETS  
APPROACH SLAB AT END BENT 1 OR 2



DETAIL "A"



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

BILL OF MATERIAL					
FOR APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	16	#4	STR	34'-7"	370
A2	16	#4	STR	34'-7"	370
* B1	67	#5	STR	14'-1"	984
B2	67	#6	STR	14'-7"	1468
REINFORCING STEEL				LBS.	1838
* EPOXY COATED REINFORCING STEEL				LBS.	1354
CLASS AA CONCRETE				C. Y.	21.6
FOR APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	16	#4	STR	33'-9"	361
A4	16	#4	STR	33'-9"	361
* B1	67	#5	STR	14'-1"	984
B2	67	#6	STR	14'-7"	1468
REINFORCING STEEL				LBS.	1829
* EPOXY COATED REINFORCING STEEL				LBS.	1345
CLASS AA CONCRETE				C. Y.	21.6

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

PROJECT NO. B-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
BRIDGE APPROACH SLAB  
FOR INTEGRAL ABUTMENT  
WITH FLEXIBLE PAVEMENT

DESIGN ENGINEER OF RECORD: DATE: 1/24/2020

ASSEMBLED BY: A. SAMBOY DATE: 06/21/19  
CHECKED BY: R.C. LARSON DATE: 06/27/19

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

DocuSigned by:  
KCI Associates, P.A.  
Professional Engineer  
Robert C. Larson  
1/24/2020

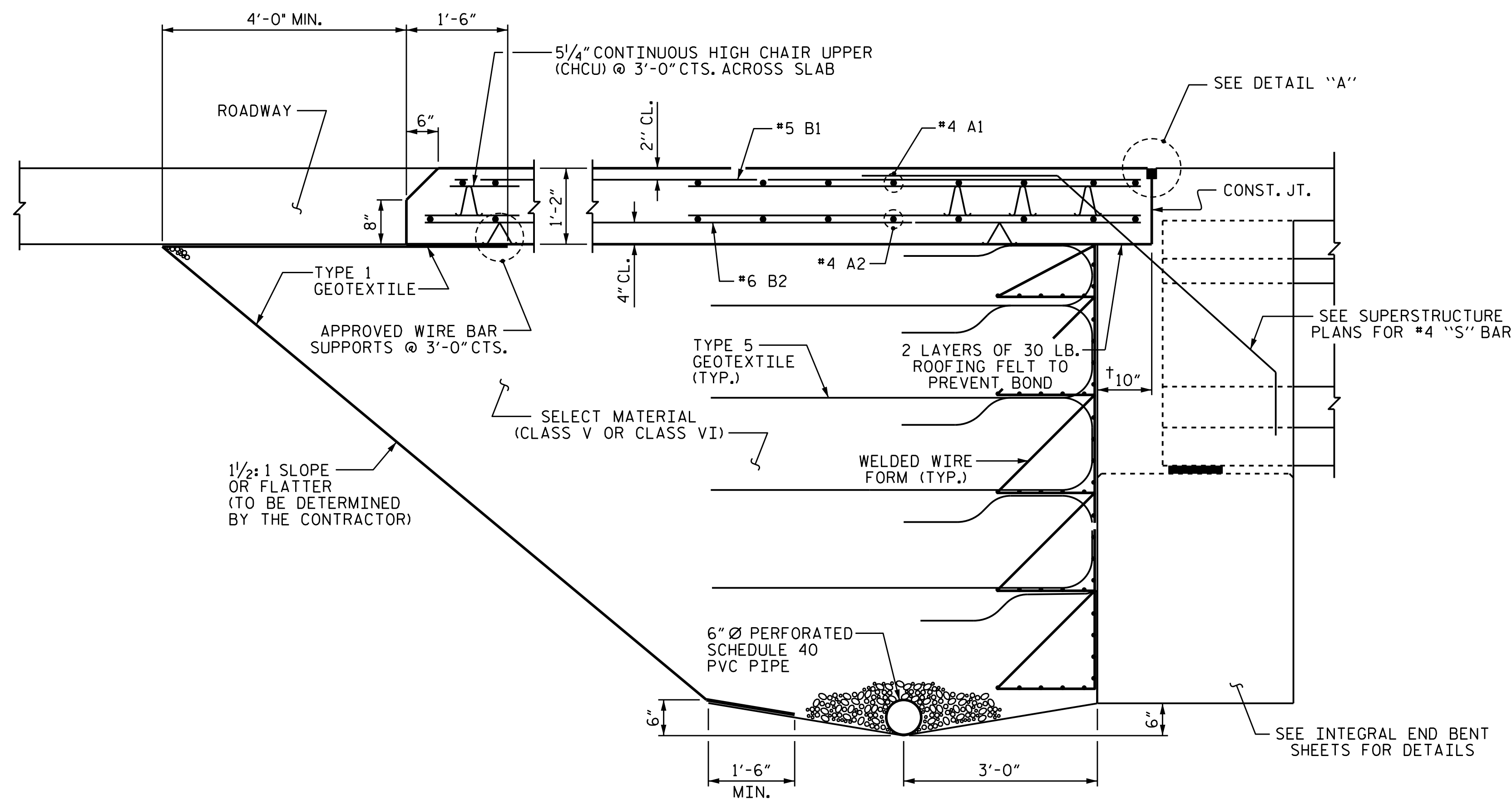
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KCI Associates  
of North Carolina, P.A.  
2505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone 919-785-5241

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

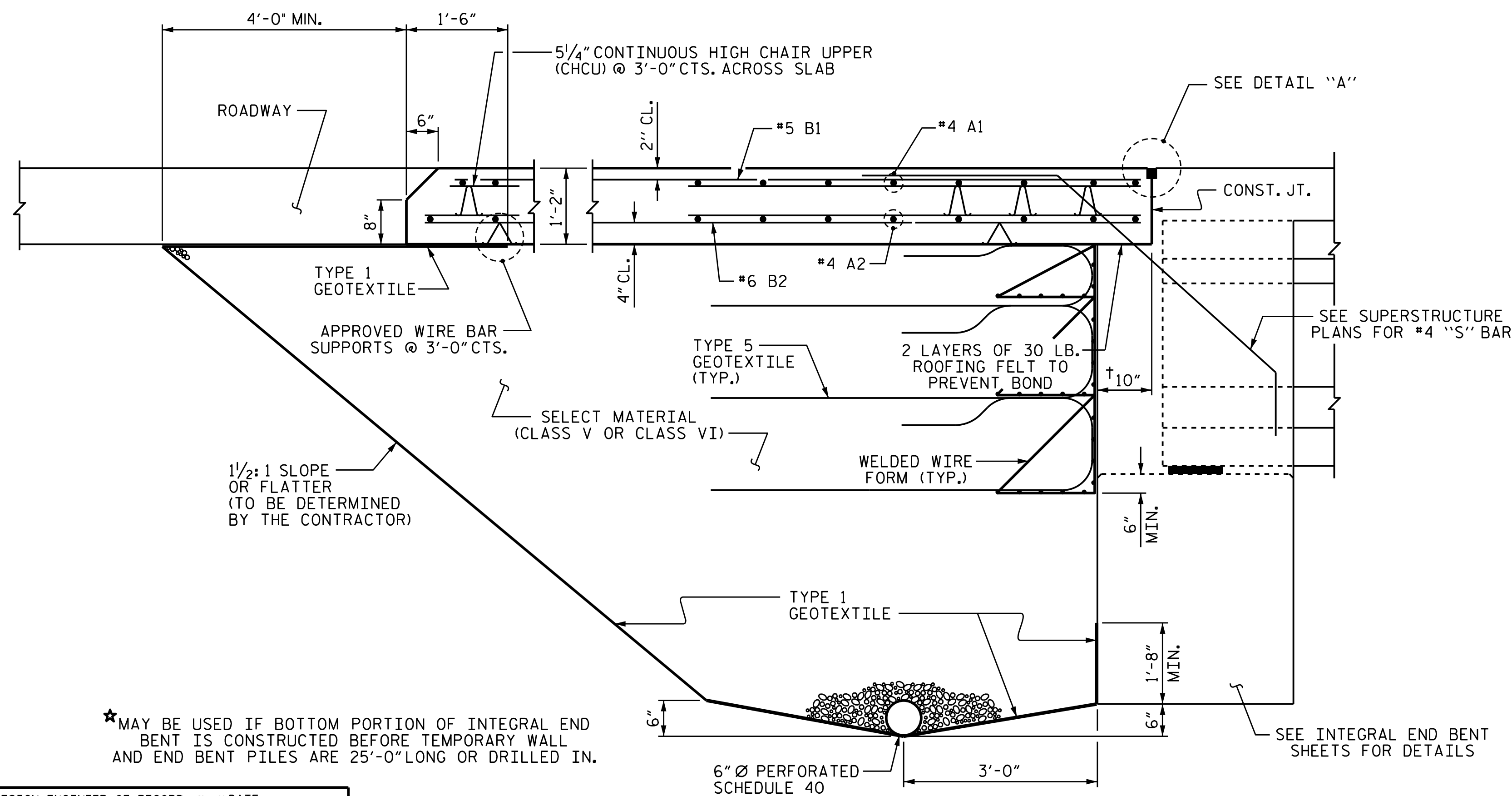
SHEET NO. S-28  
TOTAL SHEETS 29

STD. NO. BAS5



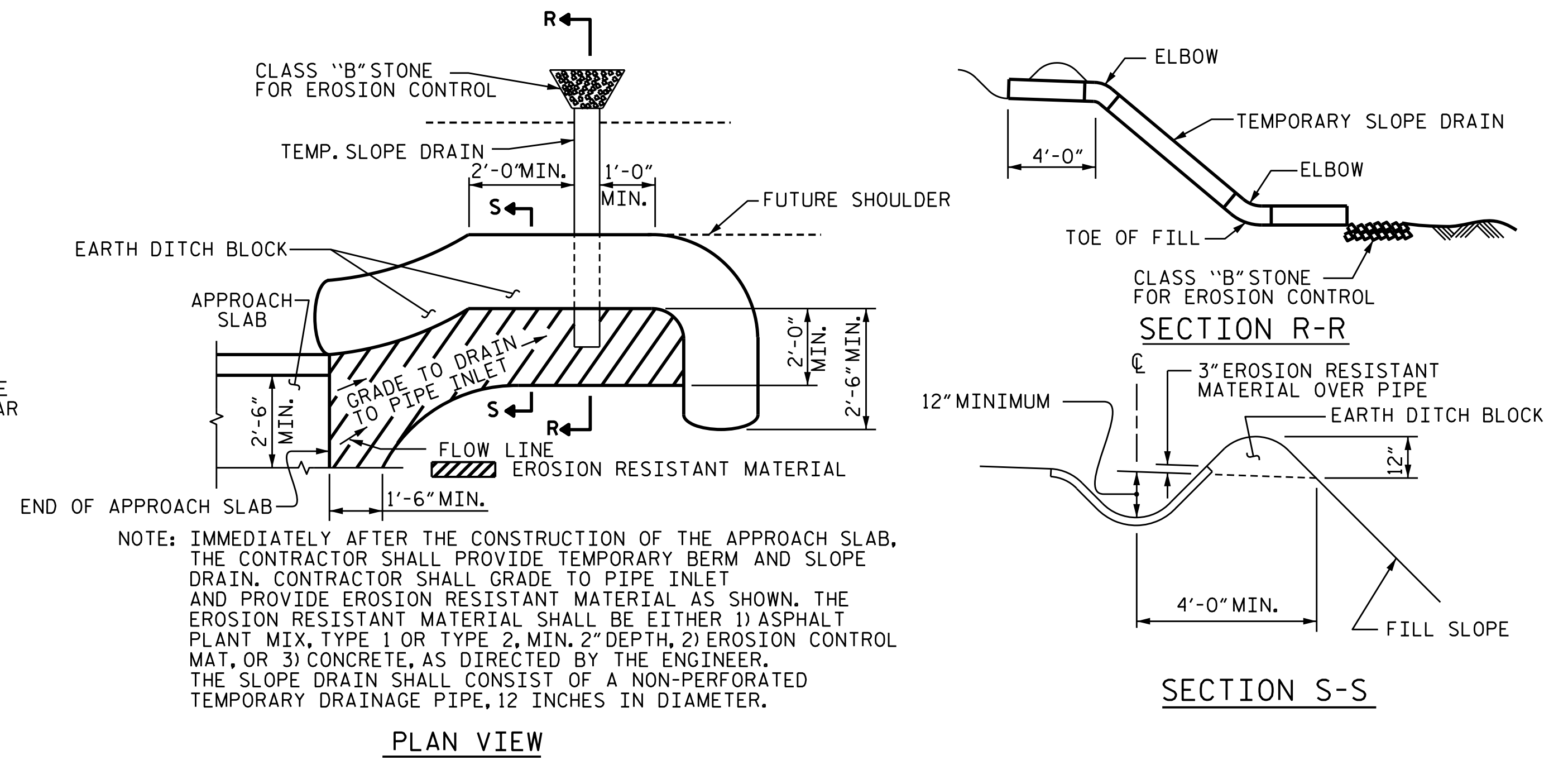
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



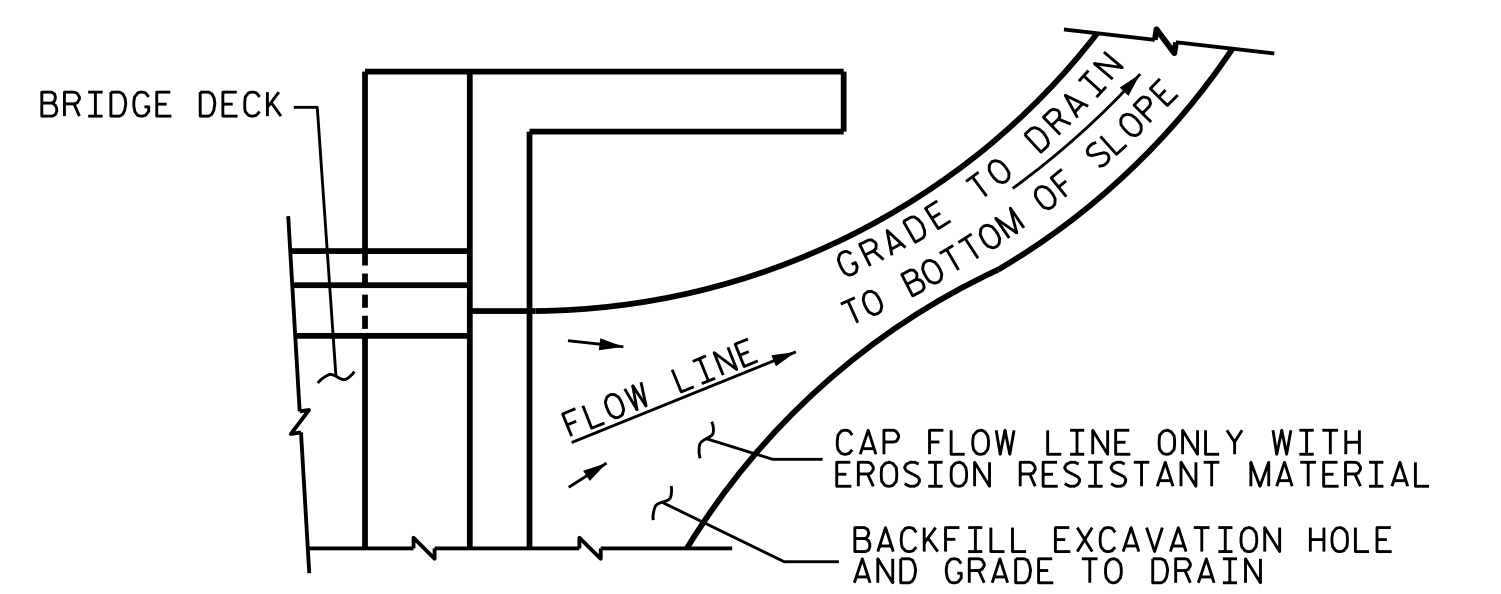
**SECTION THRU SLAB**

(TYPE A - ALTERNATE APPROACH FILL)



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

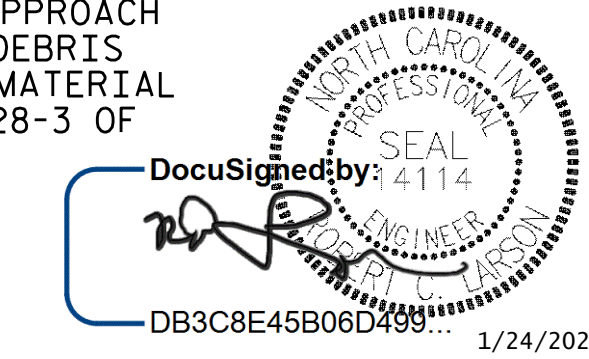
**TEMPORARY DRAINAGE DETAIL**

**NOTES**

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

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

DESIGN ENGINEER OF RECORD	DATE	1/24/2020
ASSEMBLED BY : A. SAMBUTY	DATE	06/21/19
CHECKED BY : R. C. LARSON	DATE	06/27/19
DRAWN BY : TLA	10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM	5/06	REV. 6/13 MAA/GM
		REV. 12/17 MAA/THC



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**KCI Associates**  
of North Carolina, P.A.  
400 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-3270 Phone 919-783-9201

PROJECT NO. B-5671  
EDGEcombe COUNTY  
STATION: 17+00.00 -L-

SHEET 2 OF 2

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

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

STD. NO. BASS

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE  $\frac{1}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{1}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{1}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{1}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST  $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

**ENGLISH**

JANUARY, 1990

STD. NO. SN