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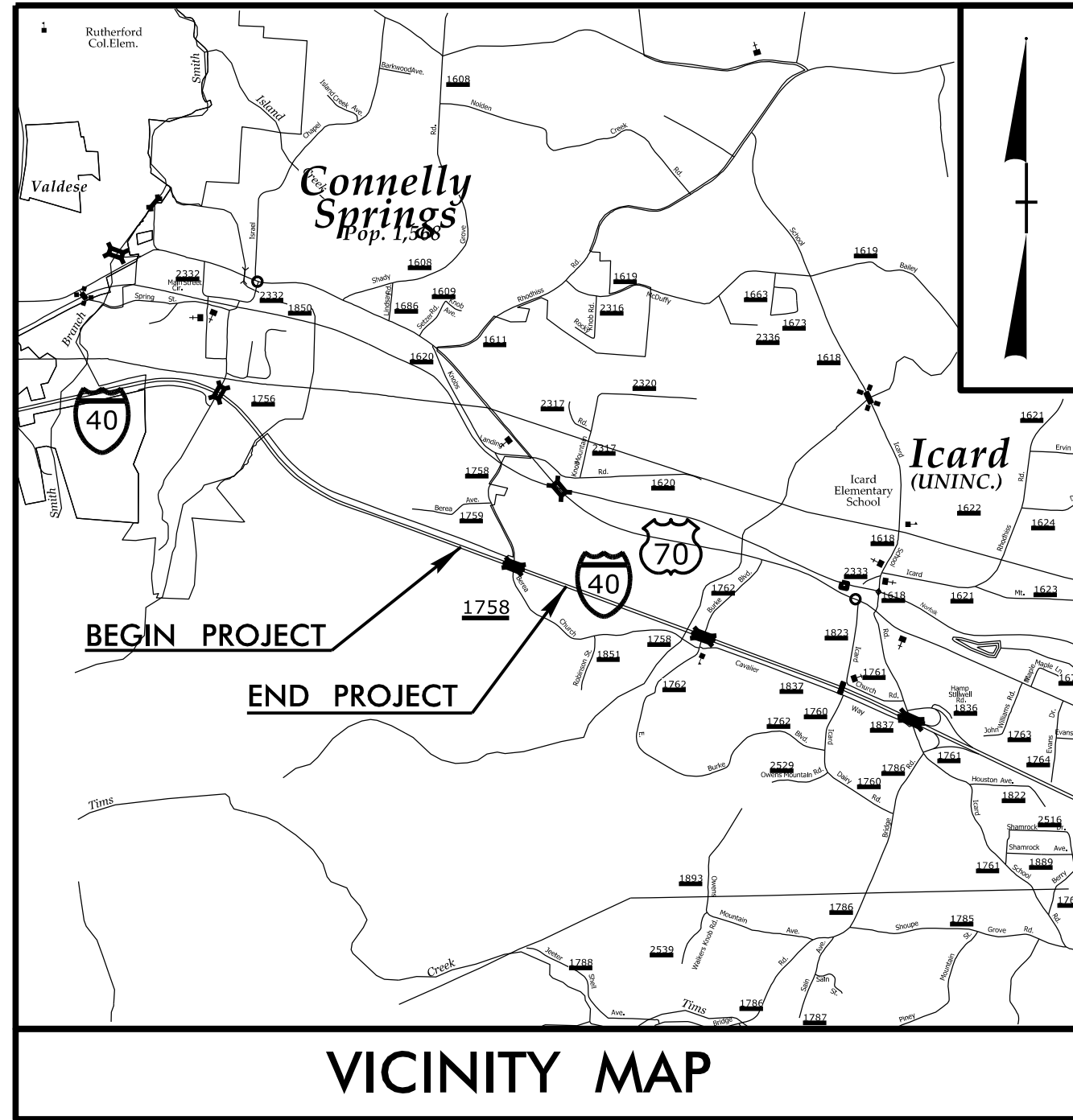
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 \$\$\$DCN\$\$\$\$\$  
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**TIP PROJECT: B-4447**

**CONTRACT: C203935**



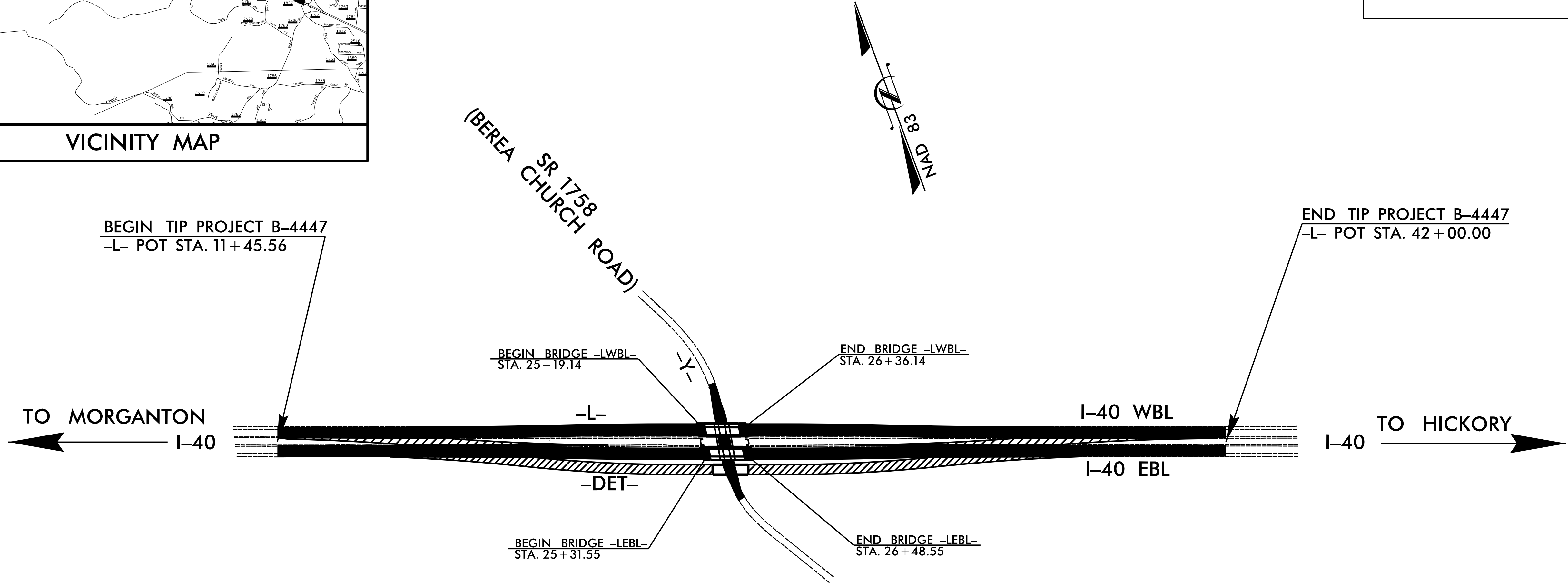
STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**BURKE COUNTY**

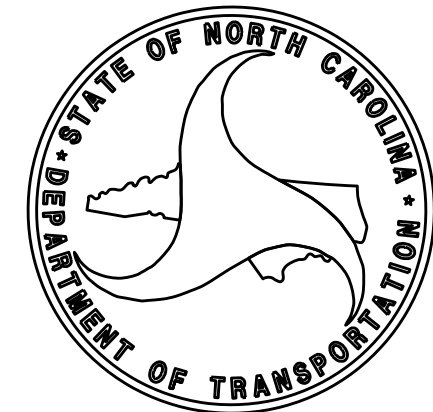
**LOCATION: BRIDGES 160 & 162 ON I-40 OVER SR 1758  
 (BEREA CHURCH ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4447		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38371.1.1	BRNHS-40-1(159)115	PE	
38371.2.1		R/W	
38371.2.2		UTILITIES	



**STRUCTURE**



**DESIGN DATA**

ADT 2017 =	47,075
ADT 2040 =	57,600
K =	55 %
D =	9 %
T =	15 % *
V =	70 MPH
* 10% TTST =	5% DUAL
FUNC CLASS =	INTERSTATE
	STATEWIDE TIER

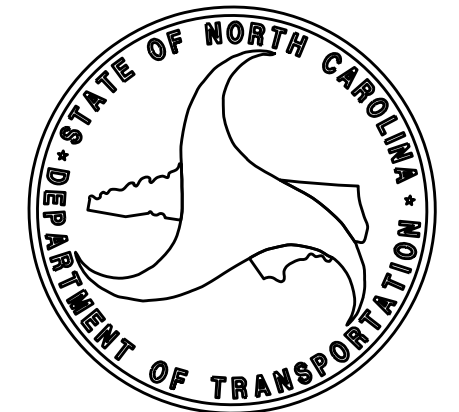
**PROJECT LENGTH**

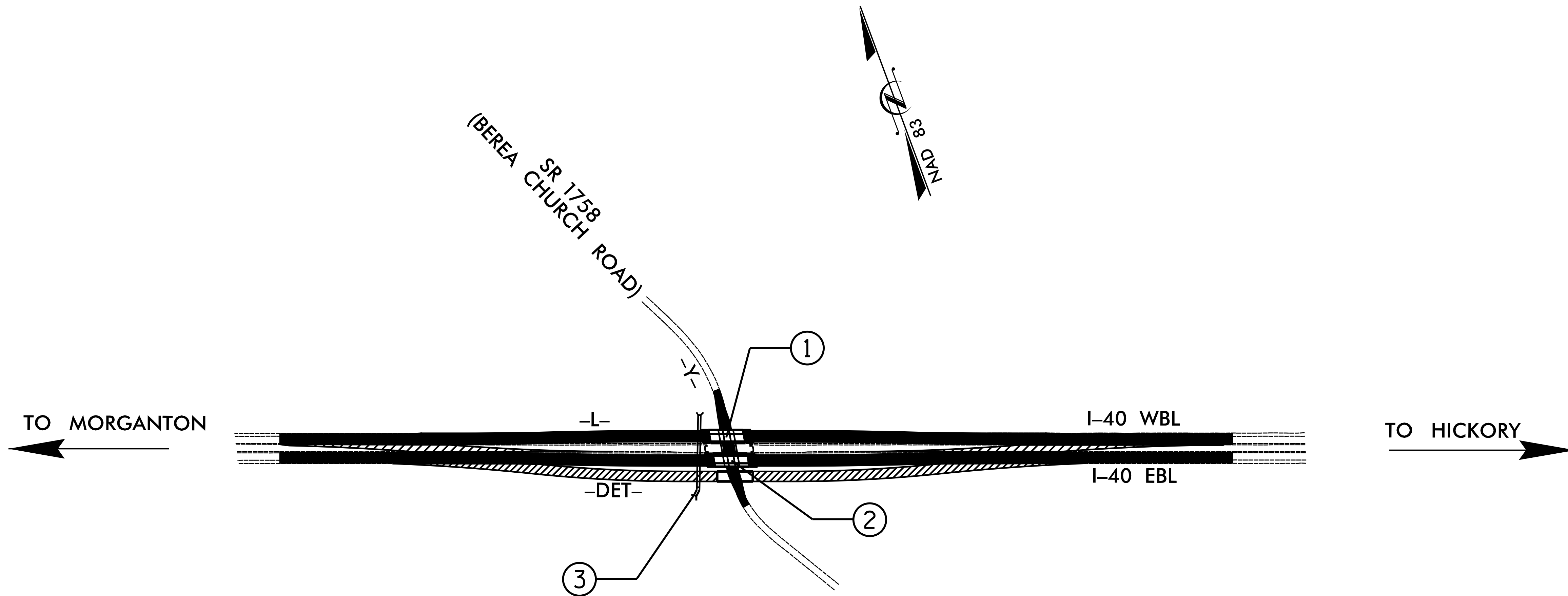
LENGTH OF ROADWAY TIP PROJECT B-4447 =	0.556 MILE
LENGTH OF STRUCTURE TIP PROJECT B-4447 =	0.022 MILE
TOTAL LENGTH OF TIP PROJECT B-4447 =	0.578 MILE

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Dr., Raleigh NC, 27610  
 2012 STANDARD SPECIFICATIONS

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LETTING DATE:  
 JUNE 20, 2017





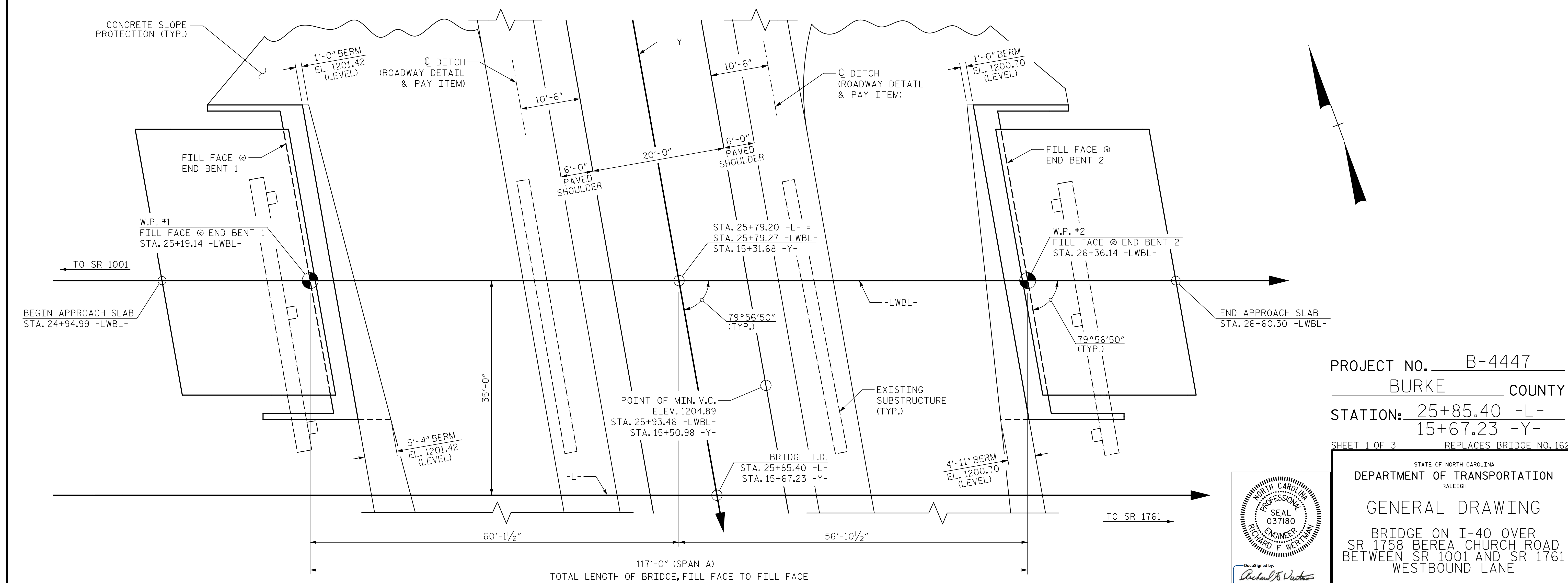
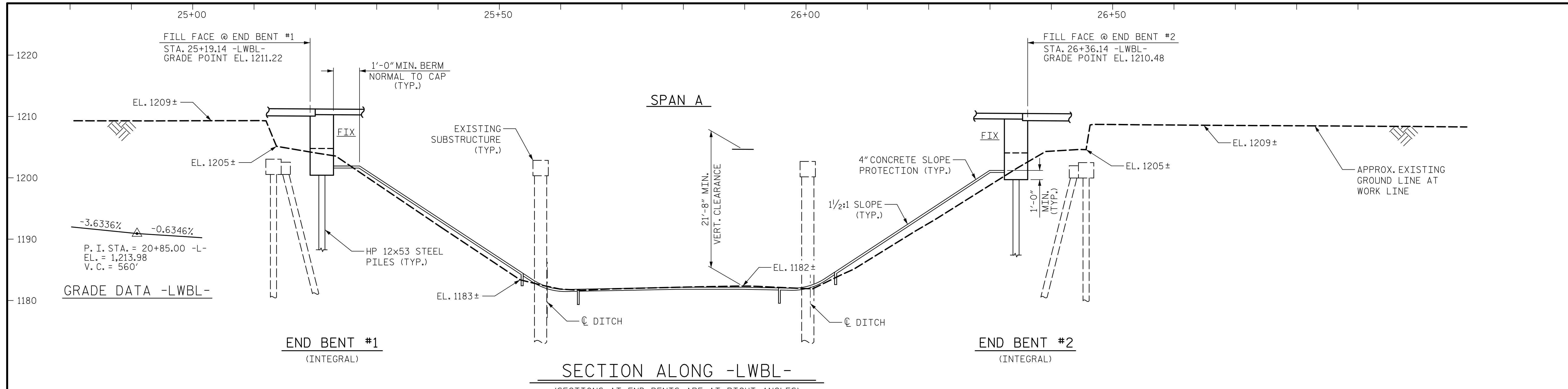
INDEX			
STR.	STATION	DESCRIPTION	SHEETS
1	25+85.40 -L-	BRIDGE ON I-40 OVER SR 1758 (WESTBOUND LANE)	S01-1 THRU S01-28
2	25+85.40 -L-	BRIDGE ON I-40 OVER SR 1758 (EASTBOUND LANE)	S02-1 THRU S02-28
3	24+88.00 -L-	SINGLE 6' x 6' CULVERT EXTENSION	C-1 THRU C-6

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: \_\_\_\_\_

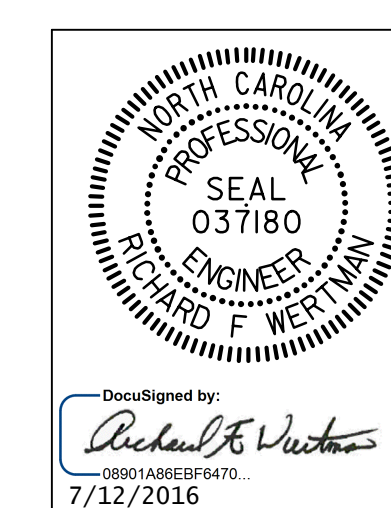
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

INDEX

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



PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 162



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON I-40 OVER  
 SR 1758 BEREA CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 WESTBOUND LANE

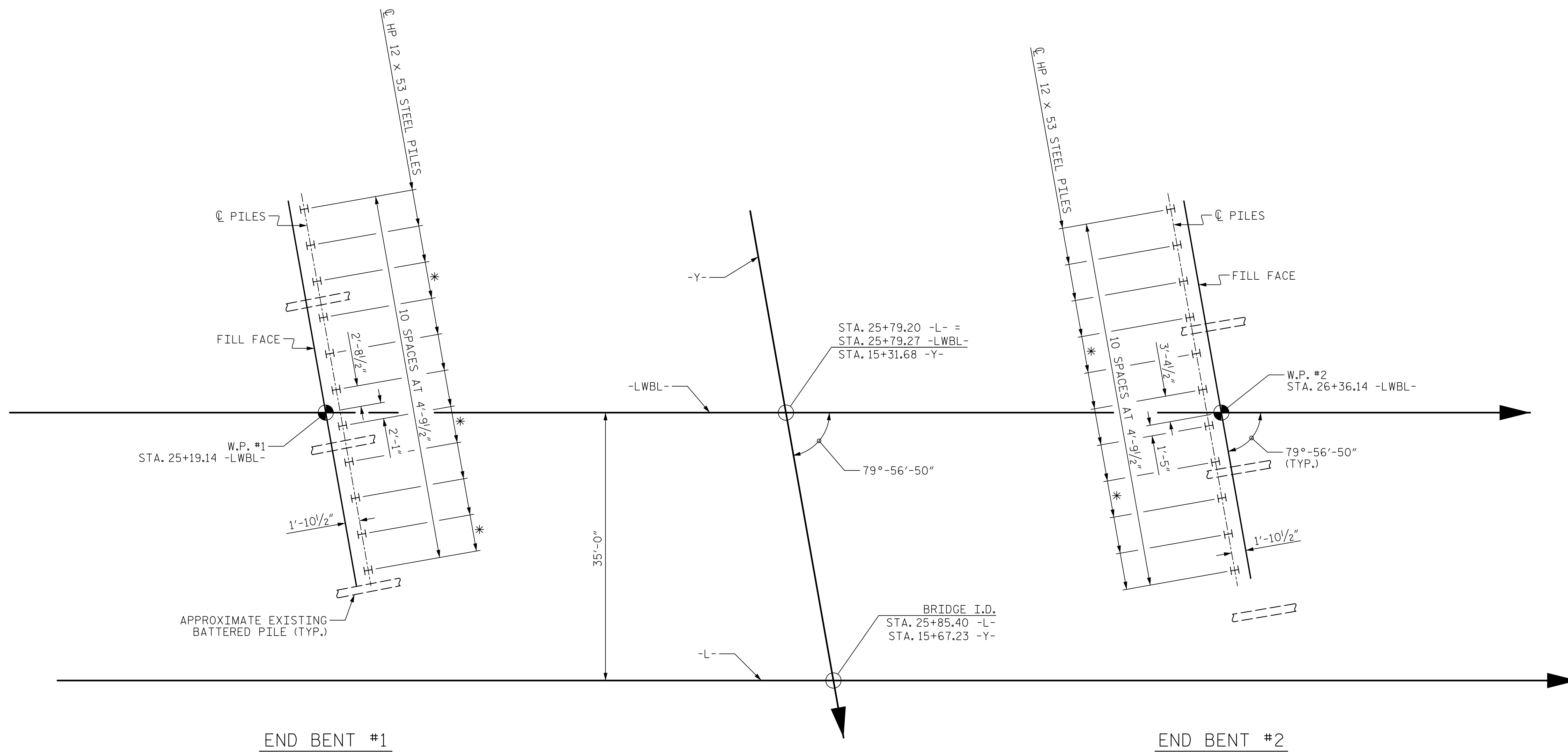
DRAWN BY : T.J. KIRSCHBAUM DATE : 9/21/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/29/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
 NC Lic. No. F-0270

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-1
1			3			TOTAL SHEETS
2			4			28





**FOUNDATION LAYOUT**

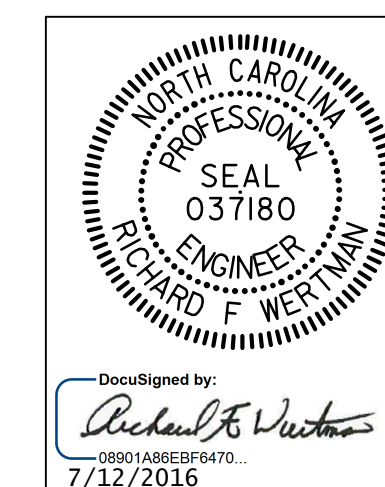
DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

**NOTES:**

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
- \* PILES LOCATED NEAR THE EXISTING BATTERED PILES CAN BE SHIFTED UP TO 1'-6" TO AVOID INTERFERENCE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING BATTERED PILES BEFORE DRIVING NEW PILES.

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON I-40 OVER  
 SR 1758 BEREA CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 WESTBOUND LANE

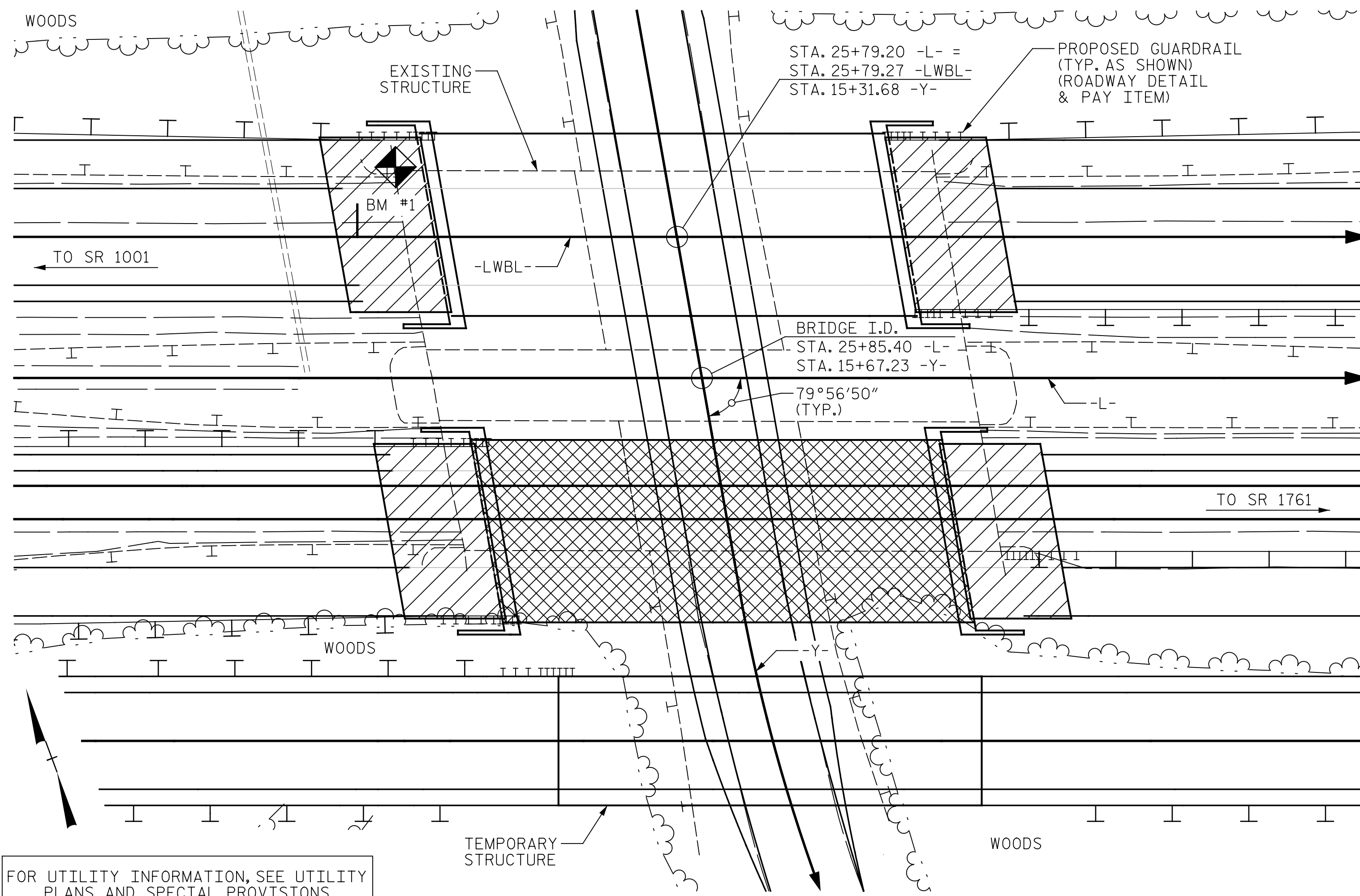
DRAWN BY : T.J. KIRSCHBAUM DATE : 9/21/15  
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BENCH MARK #1: 2" SQUARE ETCH ON NORTH WINGWALL AT WEST ABUTMENT ON WESTBOUND I-40 OVER SR 1758, -L- STA. 25+09.42, 52.315' LEFT, EL. 1209.55



LOCATION SKETCH

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.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 25+85.40 -L-".

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-5 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS @ 45'-0" FT. WITH A CLEAR ROADWAY OF 40' AND REINFORCED CONCRETE DECK ON STEEL GIRDERS ON END BENTS WITH REINFORCED CONCRETE CAPS ON STEEL PILES & INTERIOR BENTS WITH REINFORCED CONCRETE POSTS AND BEAMS LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED.

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.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STA. 26+05.17 -DETB- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

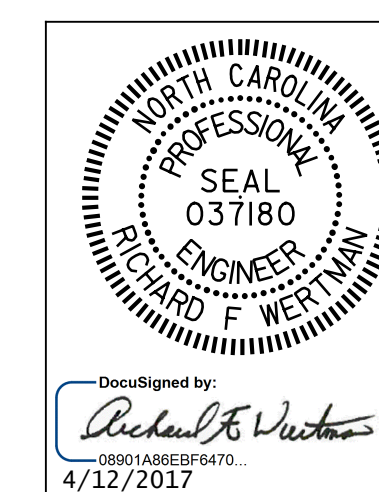
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE AT STA. 25+85.40 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT		
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	EACH	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			5218	6447		LUMP SUM		5	573.04			230.6		LUMP SUM	LUMP SUM	
END BENT NO. 1					48.7		6084			11	11	580		375		
END BENT NO. 2					48.4		6043			11	11	390		330		
TOTAL	LUMP SUM	LUMP SUM	5218	6447	97.1	LUMP SUM	12127	5	573.04	22	22	970	230.6	705	LUMP SUM	LUMP SUM

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING

BRIDGE ON I-40 OVER  
 SR 1758 BERE A CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 WESTBOUND LANE

REVISIONS

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

SHEET NO.  
 S01-3  
 TOTAL SHEETS  
 28

DRAWN BY : T.J. KIRSCHBAUM DATE : 12/14/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/29/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

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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			
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT					SHEAR					LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	0.821	1.25	A	E	56.6	0.956	1.27	A	I	33.7	0.80	0.821	1.09	A	E	56.6	1	
	HL-93 (OPERATING)	N/A	--	1.62	--	1.35	0.821	1.62	A	E	56.6	0.956	1.78	A	I	22.2	N/A	--	--	--	--	--	1	
	HS-20 (INVENTORY)	36.000	②	1.56	56.160	1.75	0.821	1.80	A	E	56.6	0.956	1.85	A	I	22.2	0.80	0.821	1.56	A	E	56.6	1	
	HS-20 (OPERATING)	36.000	--	2.33	83.880	1.35	0.821	2.33	A	E	56.6	0.956	2.44	A	I	22.2	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500	--	4.09	51.125	1.40	0.821	5.87	A	E	56.6	0.956	6.57	A	I	22.2	0.80	0.821	4.09	A	E	56.6	1
		S3C	21.500	--	2.39	51.385	1.40	0.821	3.43	A	E	56.6	0.956	3.77	A	I	22.2	0.80	0.821	2.39	A	E	56.6	1
		S3A	22.750	--	2.26	51.415	1.40	0.821	3.25	A	E	56.6	0.956	3.57	A	I	22.2	0.80	0.821	2.26	A	E	56.6	1
		S4A	26.750	--	1.97	52.698	1.40	0.821	2.83	A	E	56.6	0.956	3.08	A	I	22.2	0.80	0.821	1.97	A	E	56.6	1
		S5A	30.500	--	1.74	53.070	1.40	0.821	2.50	A	E	56.6	0.956	2.78	A	I	22.2	0.80	0.821	1.74	A	E	56.6	1
		S6A	34.500	--	1.57	54.165	1.40	0.821	2.25	A	E	56.6	0.956	2.48	A	I	22.2	0.80	0.821	1.57	A	E	56.6	1
		S7B	38.500	--	1.42	54.670	1.40	0.821	2.04	A	E	56.6	0.956	2.29	A	I	22.2	0.80	0.821	1.42	A	E	56.6	1
		S7A	40.000	③	1.39	55.600	1.40	0.821	2.00	A	E	56.6	0.956	2.31	A	I	22.2	0.80	0.821	1.39	A	E	56.6	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250	--	1.93	54.523	1.40	0.821	2.76	A	E	56.6	0.956	2.97	A	I	22.2	0.80	0.821	1.93	A	E	56.6	1
		T5B	32.000	--	1.69	54.080	1.40	0.821	2.43	A	E	56.6	0.956	2.77	A	I	22.2	0.80	0.821	1.69	A	E	56.6	1
		T6A	36.000	--	1.54	55.440	1.40	0.821	2.21	A	E	56.6	0.956	2.51	A	I	22.2	0.80	0.821	1.54	A	E	56.6	1
		T7A	40.000	--	1.42	56.800	1.40	0.821	2.03	A	E	56.6	0.956	2.31	A	I	22.2	0.80	0.821	1.42	A	E	56.6	1
		T7B	40.000	--	1.48	59.200	1.40	0.821	2.13	A	E	56.6	0.956	2.19	A	I	22.2	0.80	0.821	1.48	A	E	56.6	1

**NOTES:**

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

**COMMENTS:**

1. THE REDUCTION OF LOAD DISTRIBUTION FACTOR FOR MOMENT IN LONGITUDINAL BEAMS ON SKEWED SUPPORTS (AASHTO TABLE 4.6.2.2E-1) WAS NOT APPLIED.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

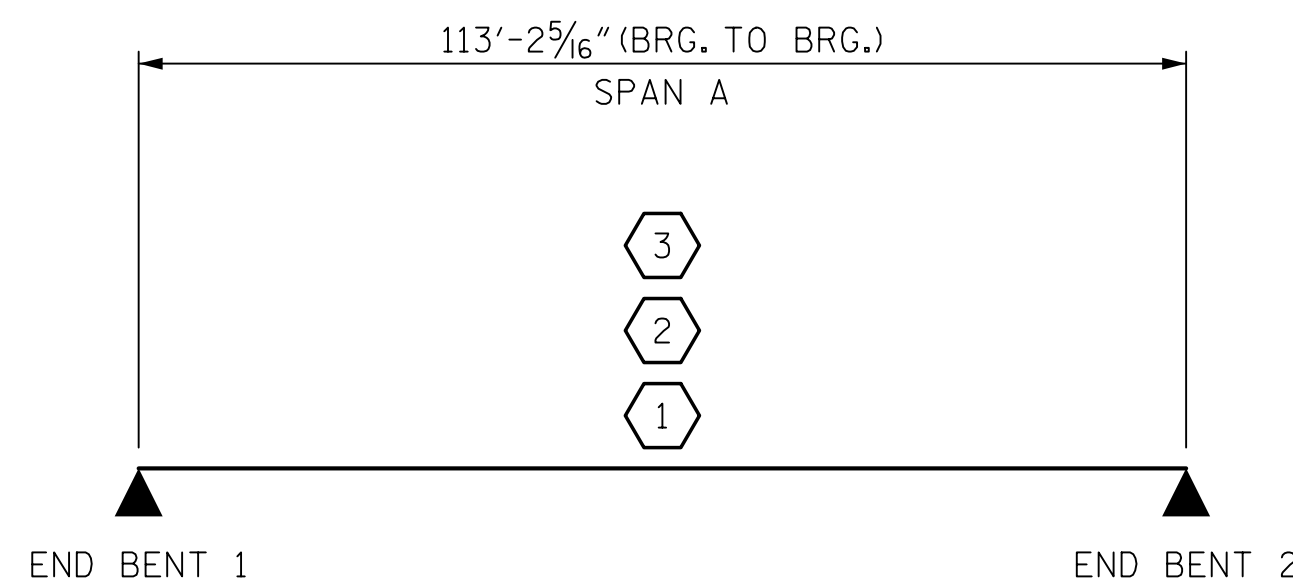
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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



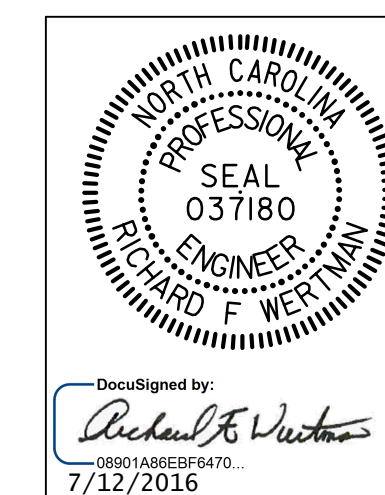
### LRFR SUMMARY

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 11/16/15  
 CHECKED BY : A.J. FORFA DATE : 12/2/15  
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM  
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered *As Promised* NC Lic. No. F-0270  
 2610 Wycliff Road Suite 102 Raleigh NC 27607-3073 (919) 420-7660

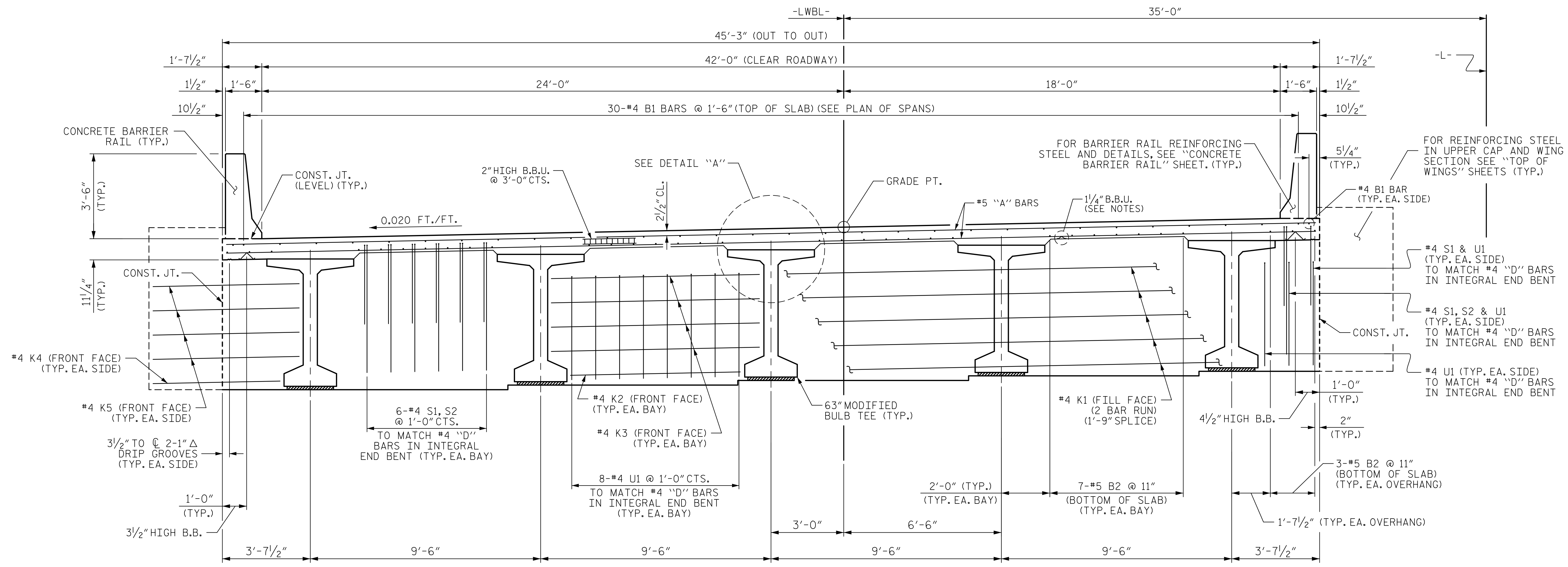
THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.



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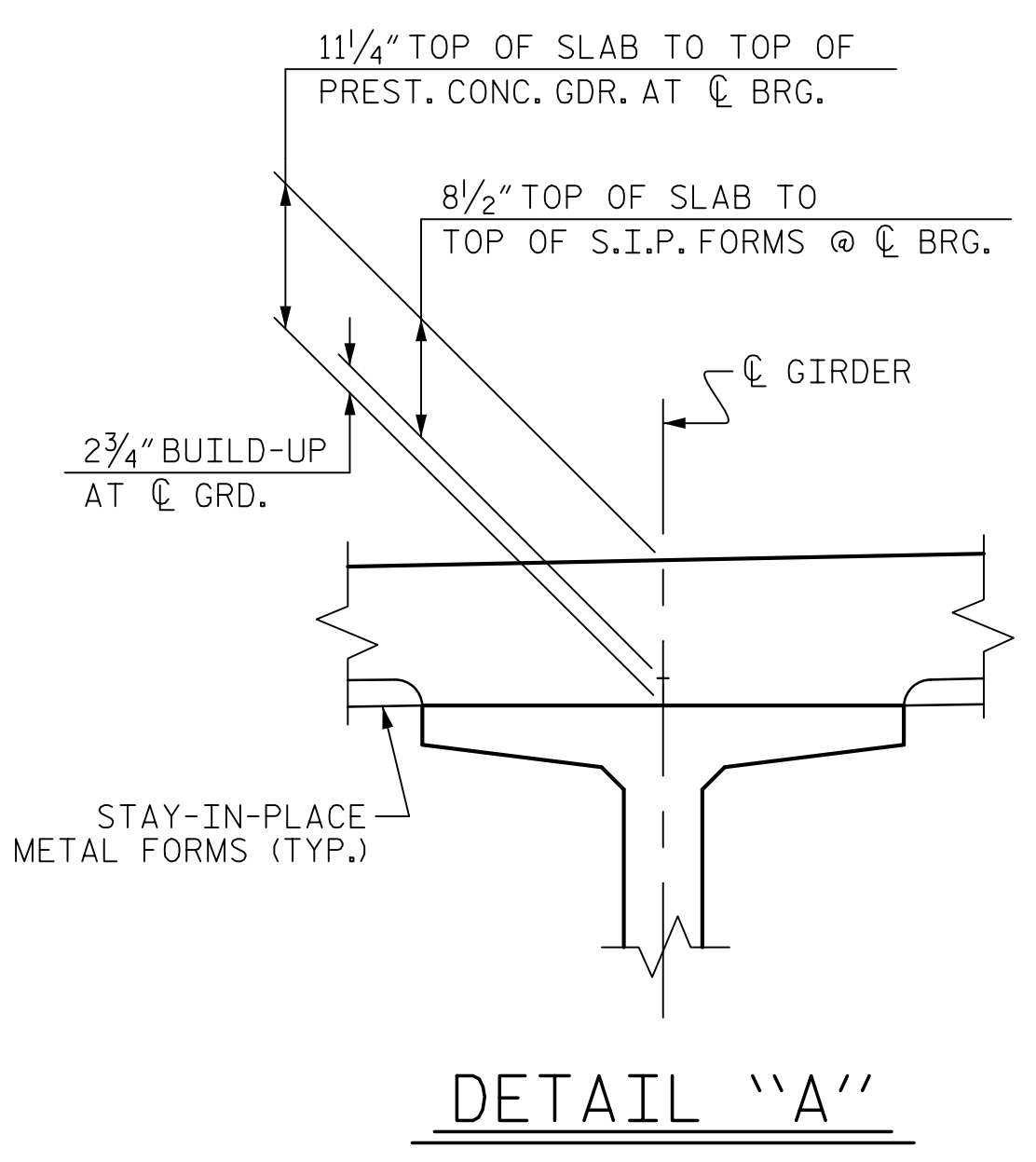
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (INTERSTATE TRAFFIC)  
 WESTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-4
1			3			TOTAL SHEETS
2			4			28



**TYPICAL SECTION AT INTEGRAL END BENT**  
 FOR WING WALLS OF INTEGRAL END BENTS, SEE "TOP OF WINGS" SHEETS

**NOTES:**  
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.  
 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 (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

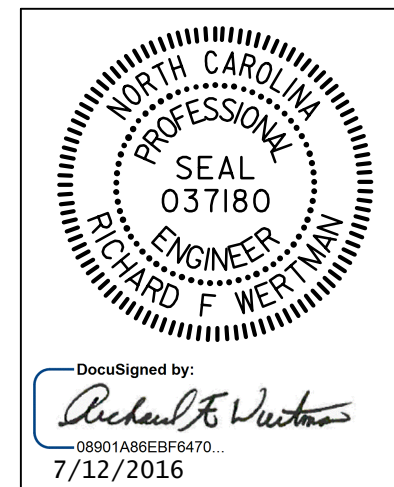


PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION  
 WESTBOUND LANE



DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

PLANS PREPARED BY:

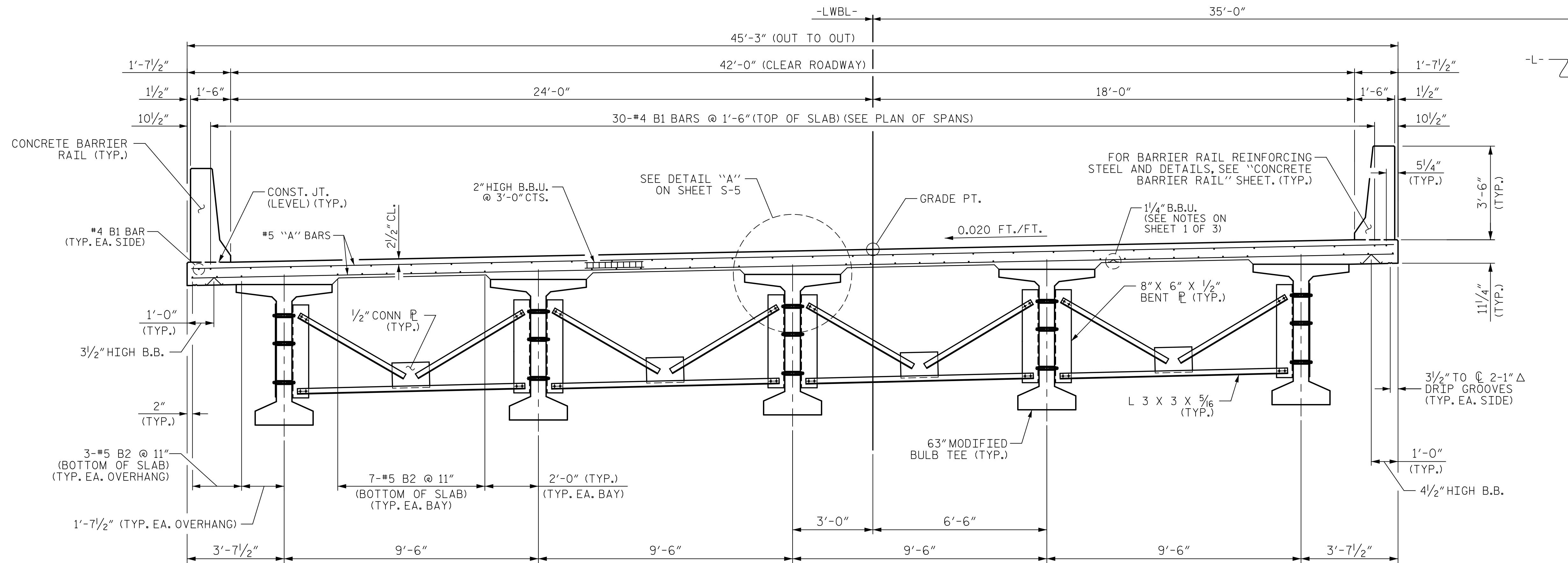
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-5
1			3			TOTAL SHEETS
2			4			28

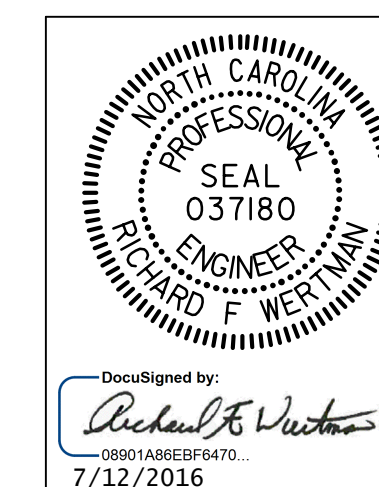




**TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM**  
 FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE SHEET S-12

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 3



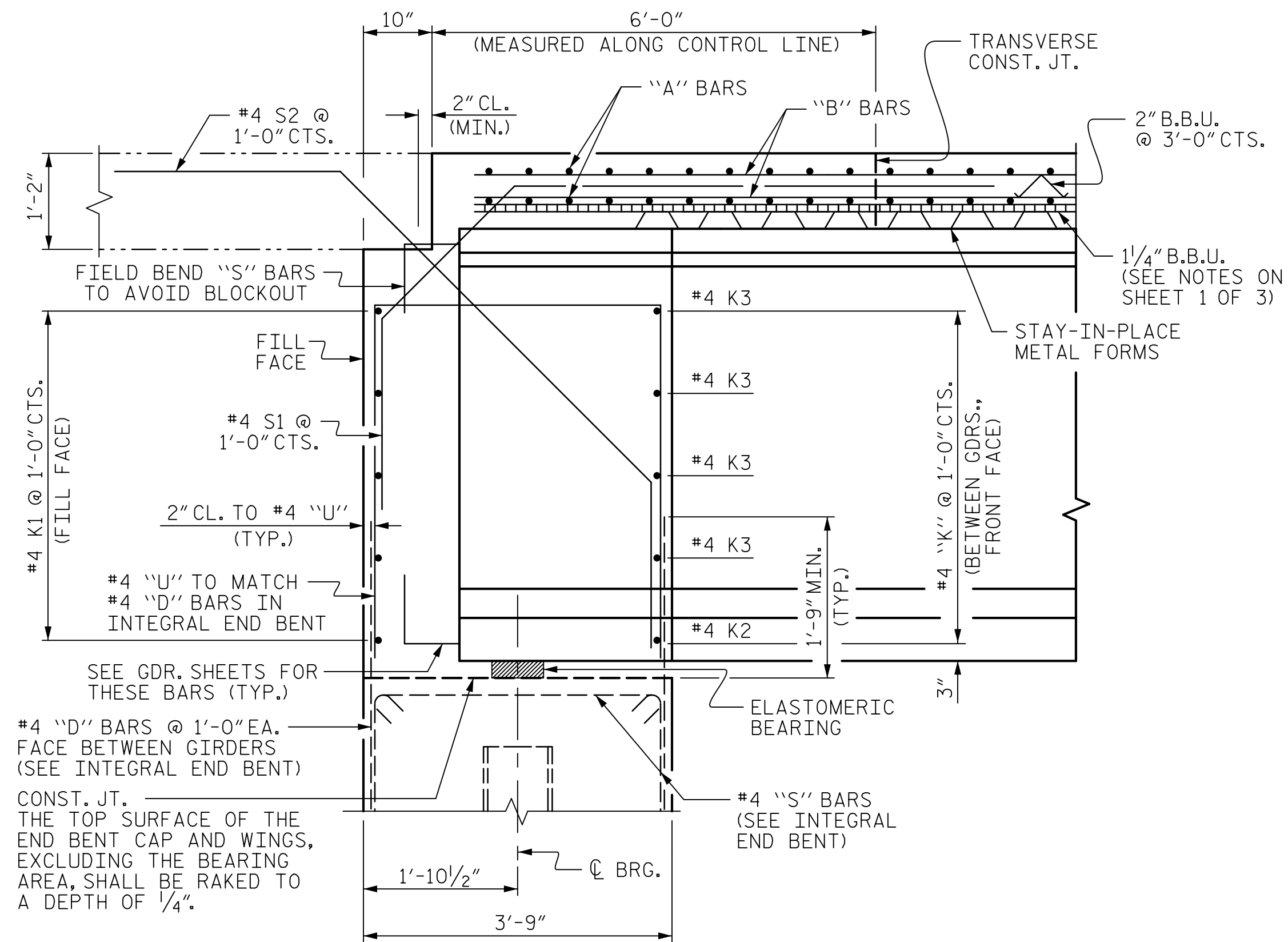
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

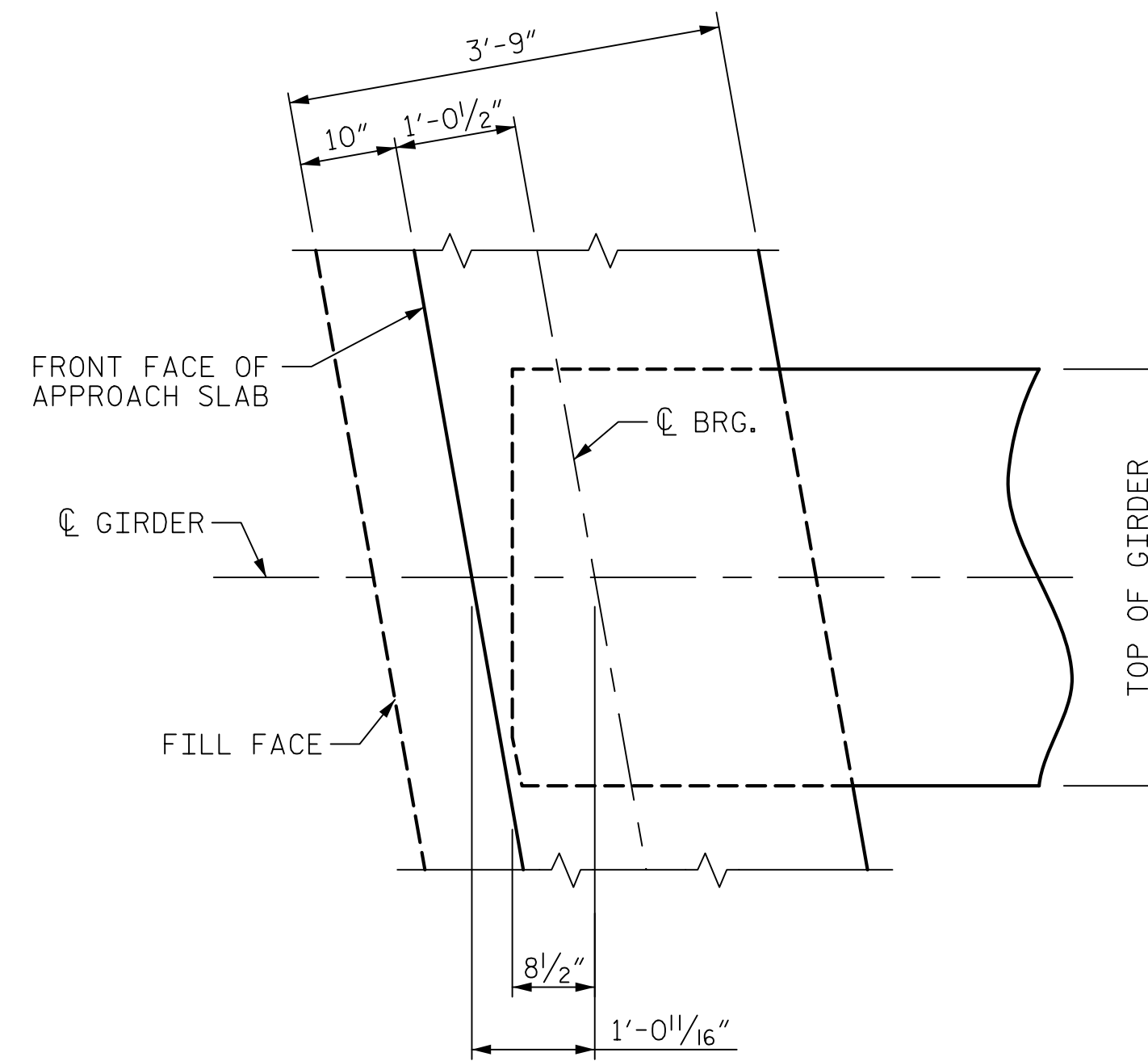
PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
 NC Lic. No. F-0270

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REVISIONS						SHEET NO. S01-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			



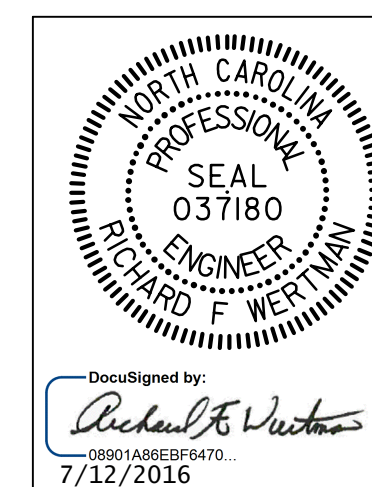
SECTION AT INTEGRAL END BENT



END BENT DIAPHRAGM

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 3 OF 3



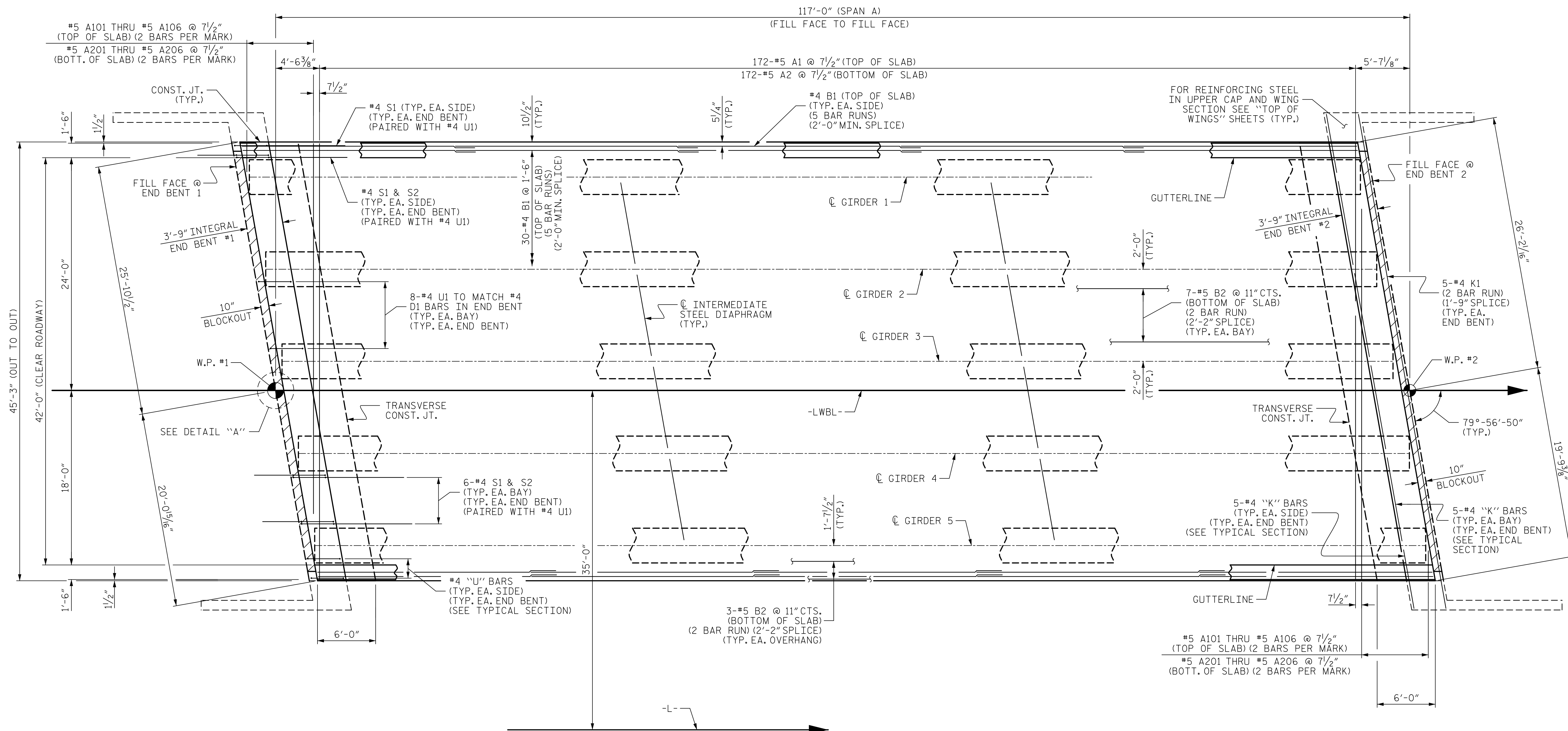
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS  
 WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

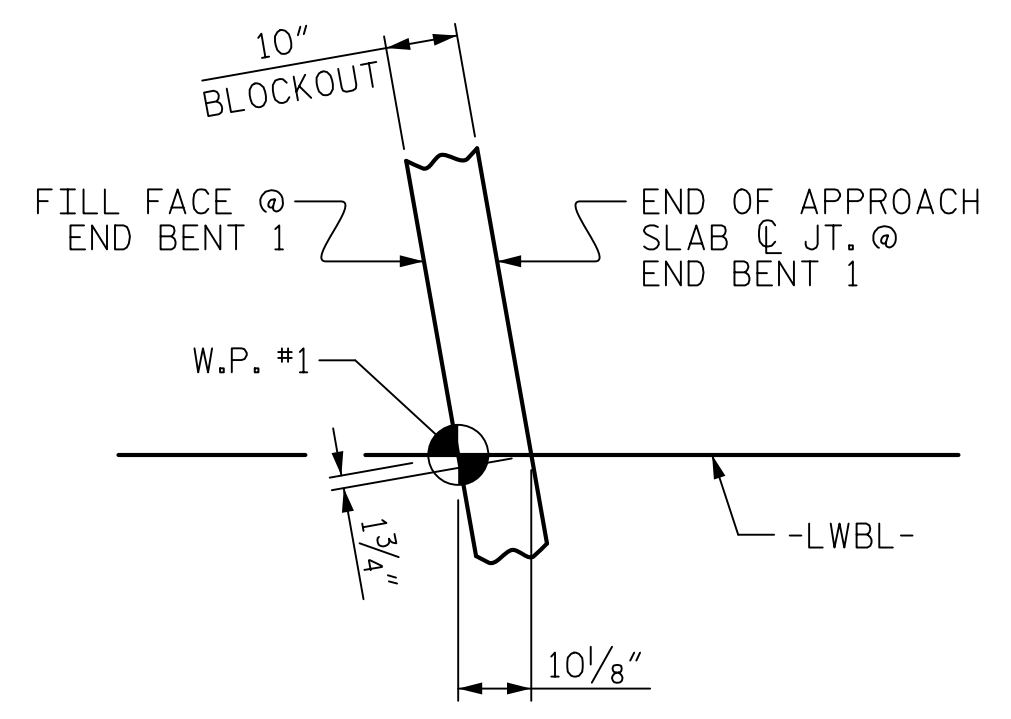
PLANS PREPARED BY:  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-7
1			3			TOTAL SHEETS
2			4			28

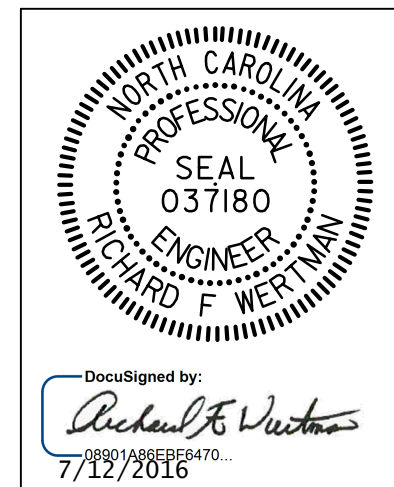


PLAN OF SPAN A



DETAIL "A"

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPAN A  
WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 10/9/15  
CHECKED BY : A.J. FORFA DATE : 12/15/15  
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

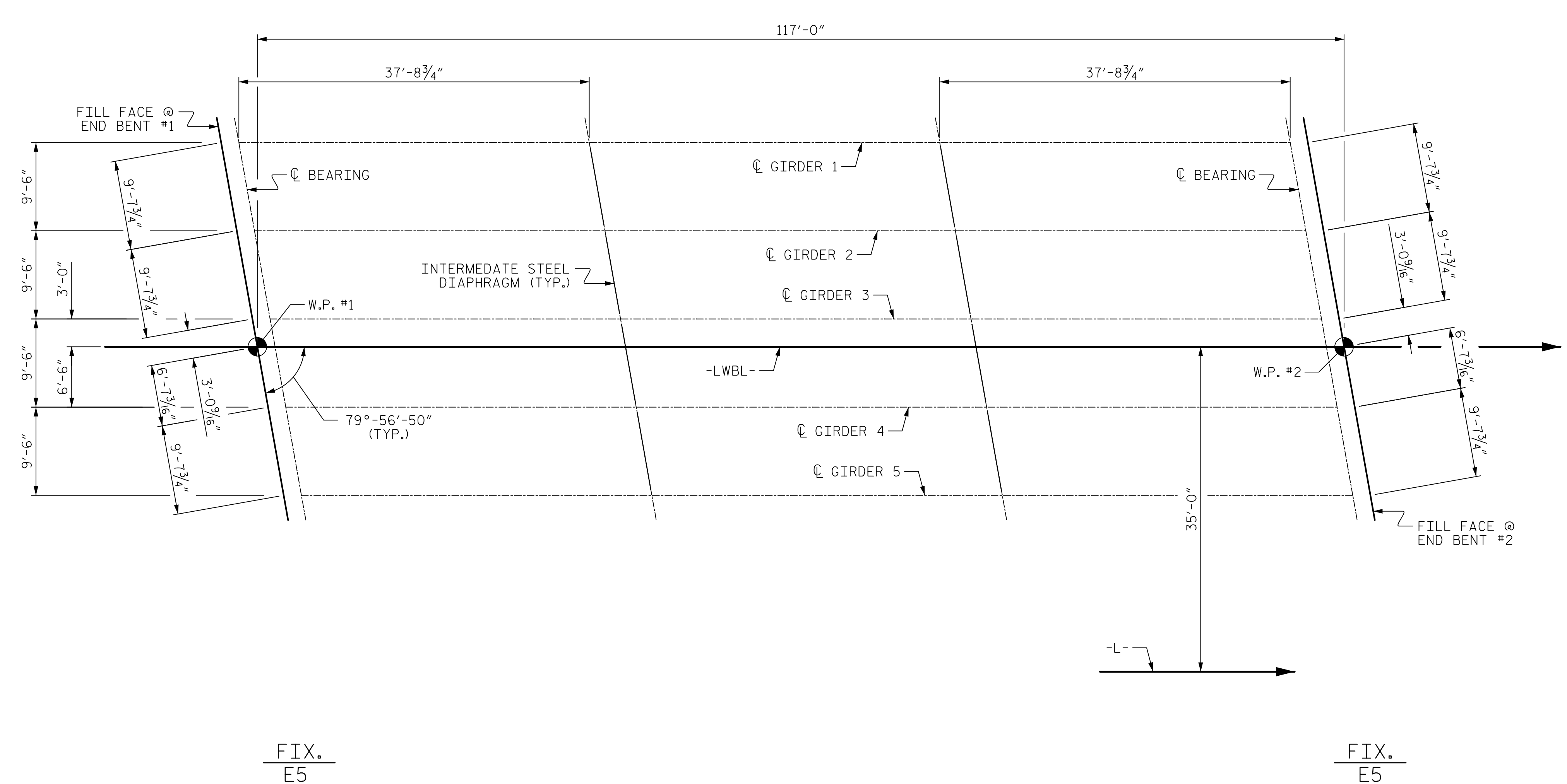
PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered As Promised

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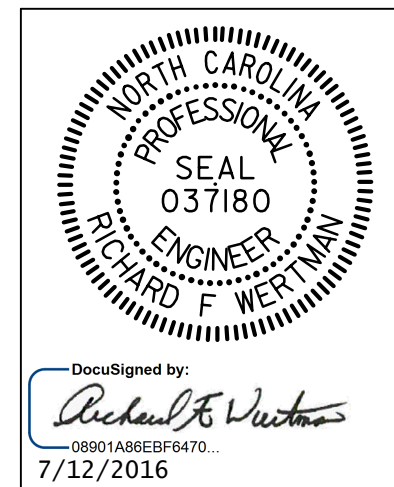


FIX.  
E5

FIX.  
E5

SPAN A  
FRAMING PLAN

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



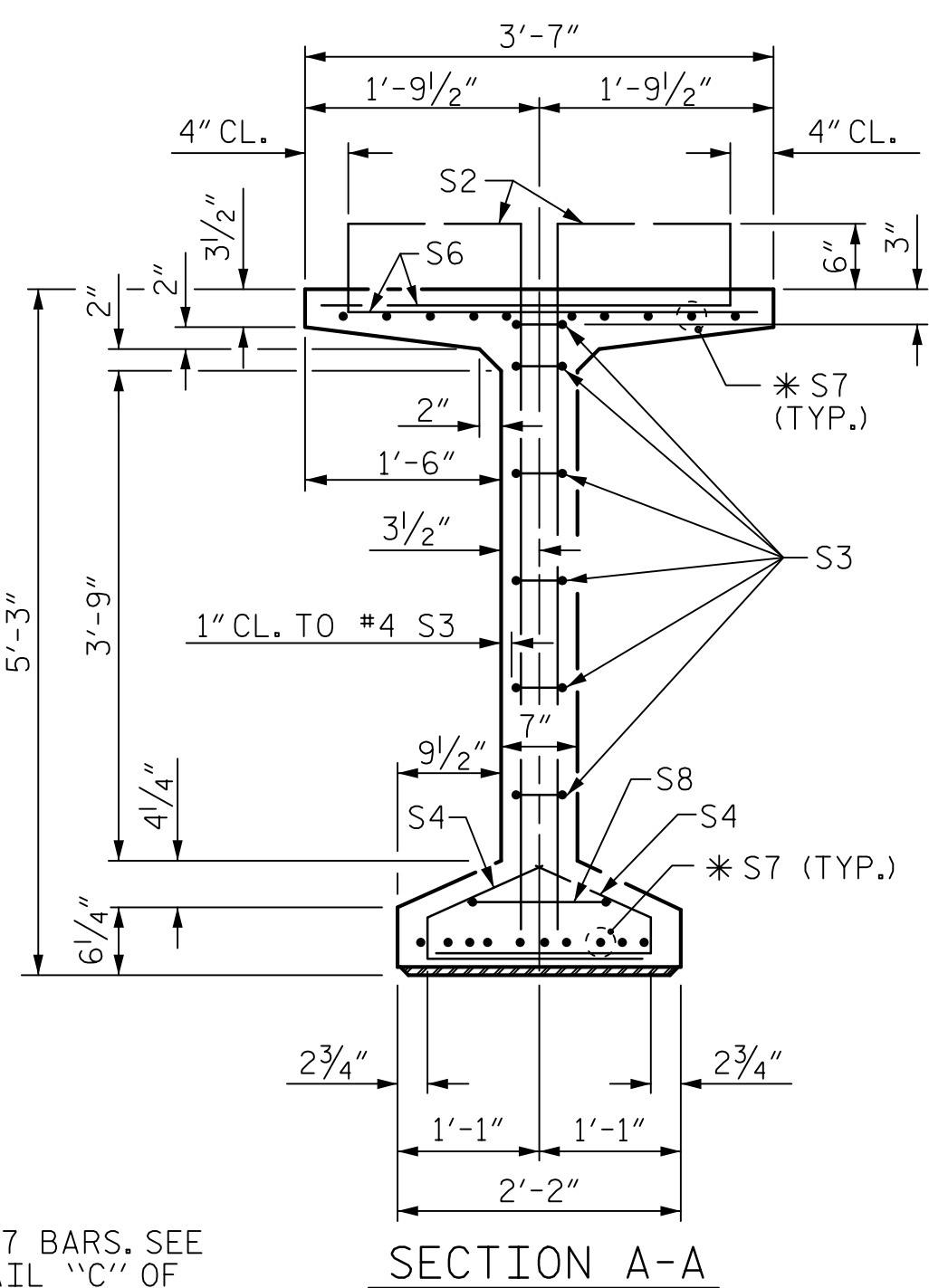
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 10/29/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/29/16

PLANS PREPARED BY:  
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 2610 Wycliff Road  
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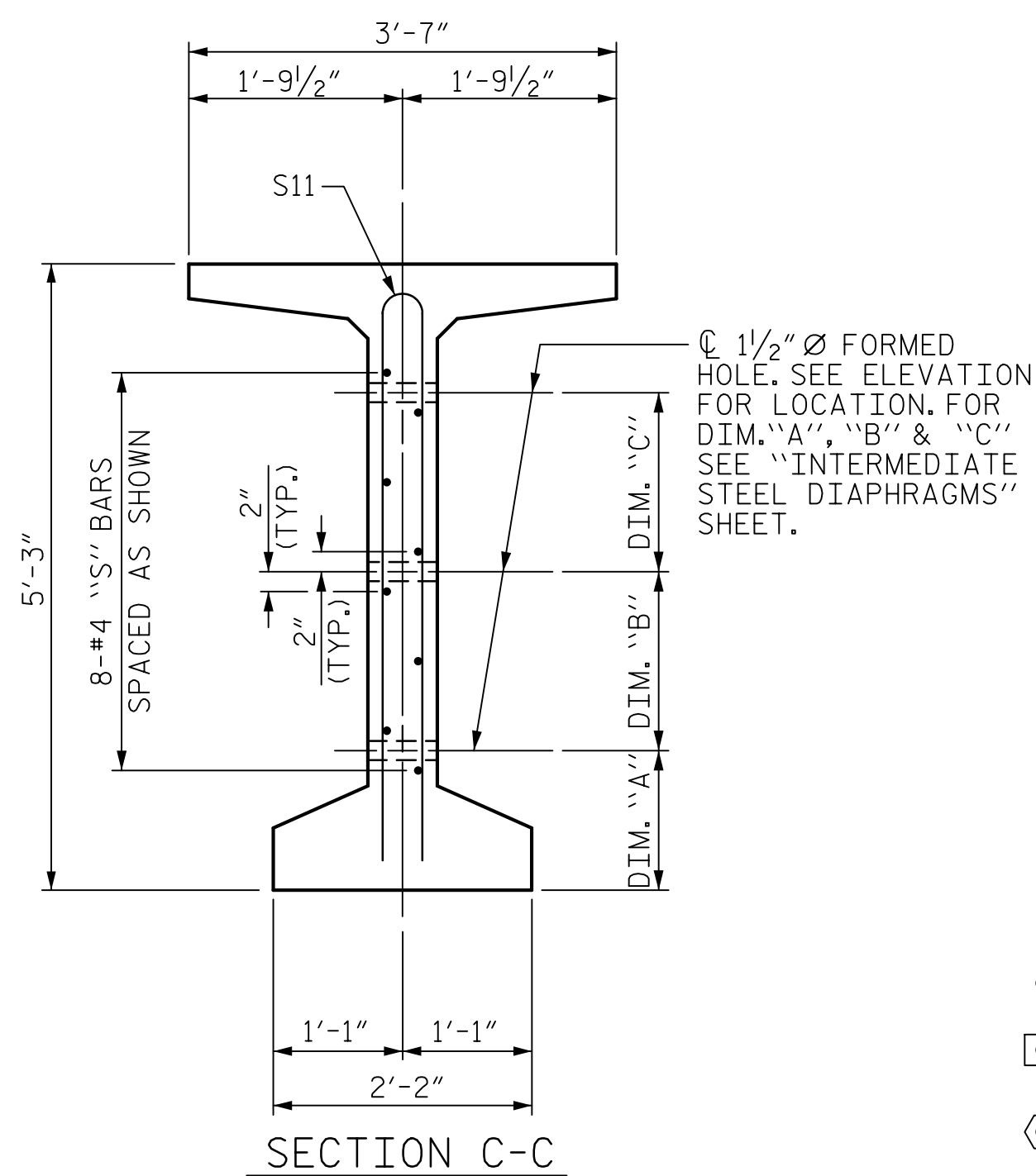
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-9
1			3			TOTAL SHEETS
2			4			28



SECTION A-A

\*FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET

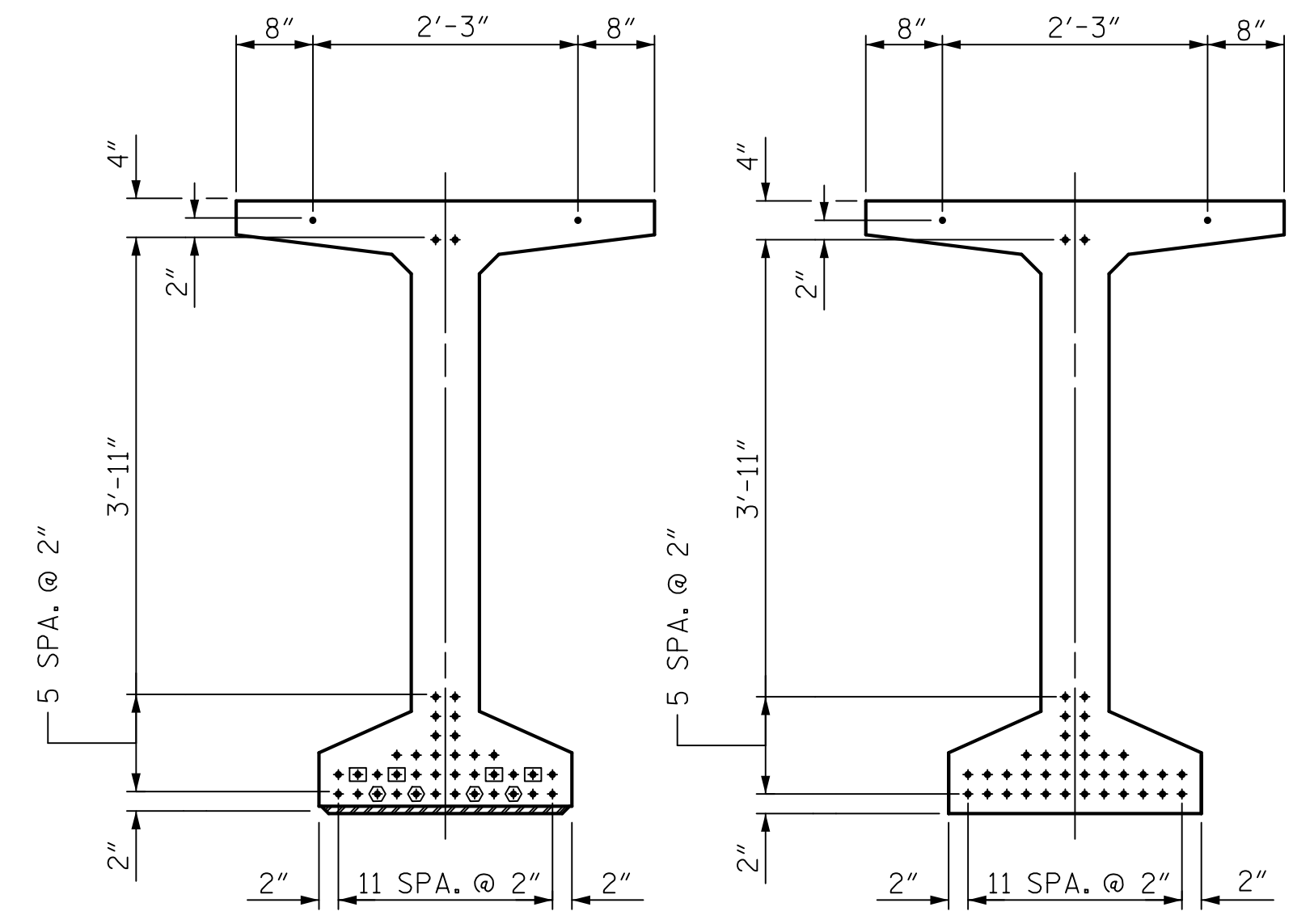


SECTION C-C

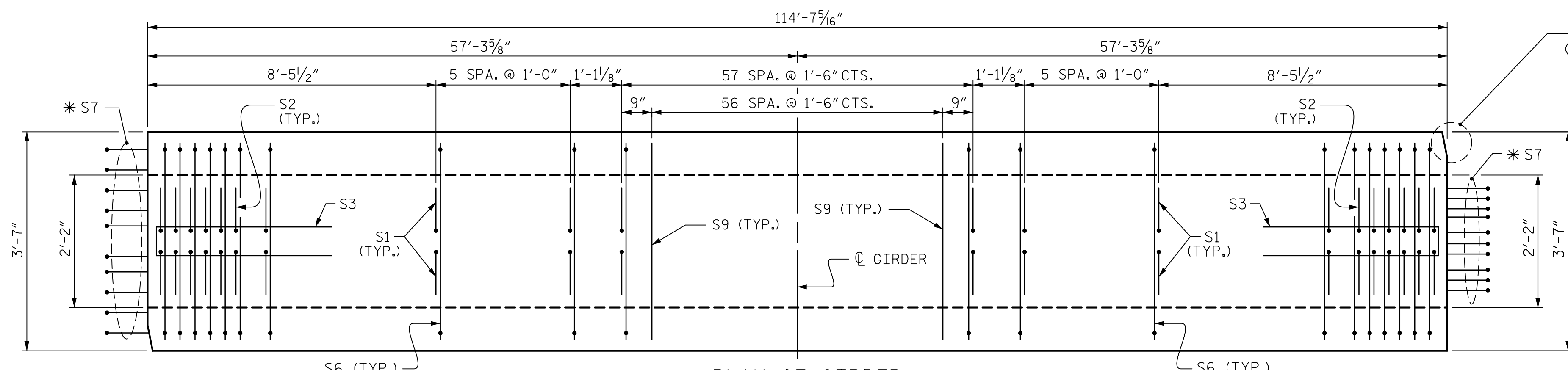
(S1, S6 AND S9 BARS NOT SHOWN)

1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.

- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◐ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER

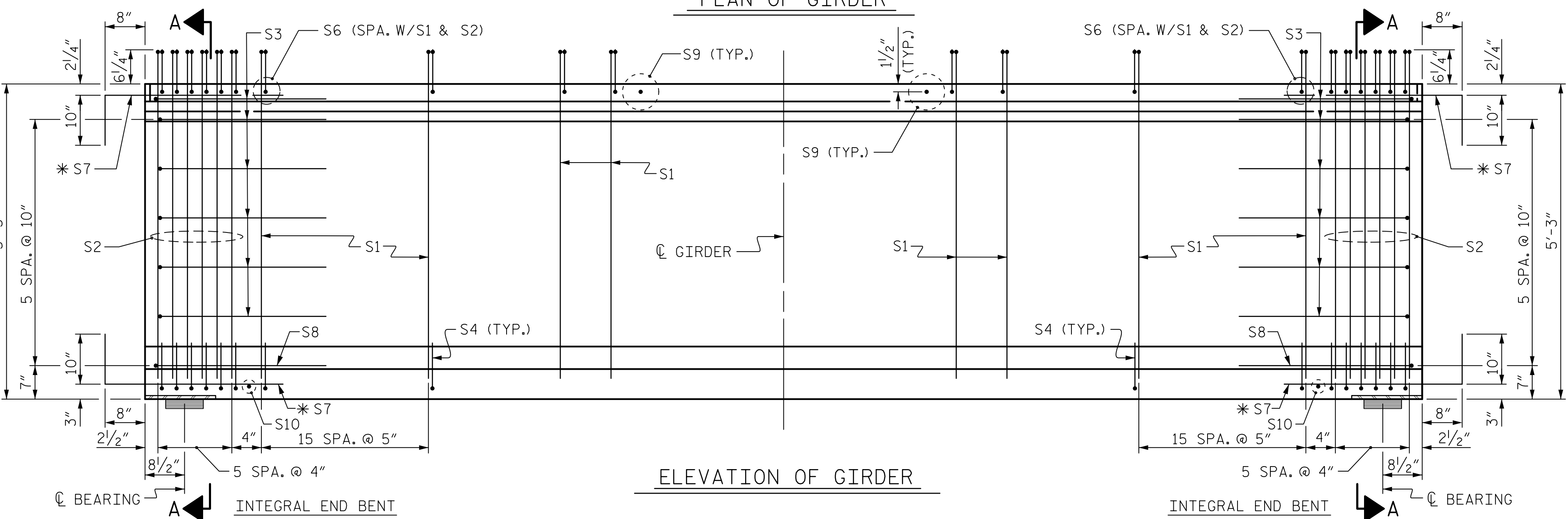


AT END OF GIRDER AT C. OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT

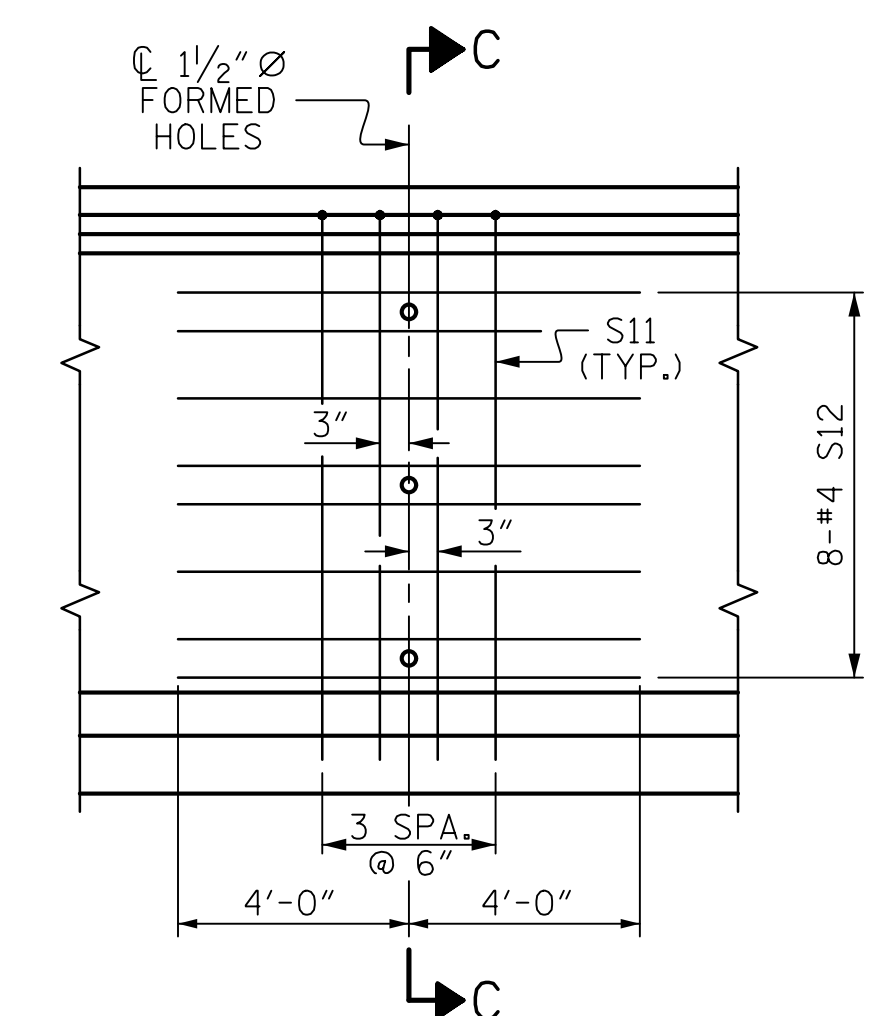


PLAN OF GIRDER

CLIP IN TOP FLANGE (TYP. EA. END) SEE DETAIL "D" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET



ELEVATION OF GIRDER

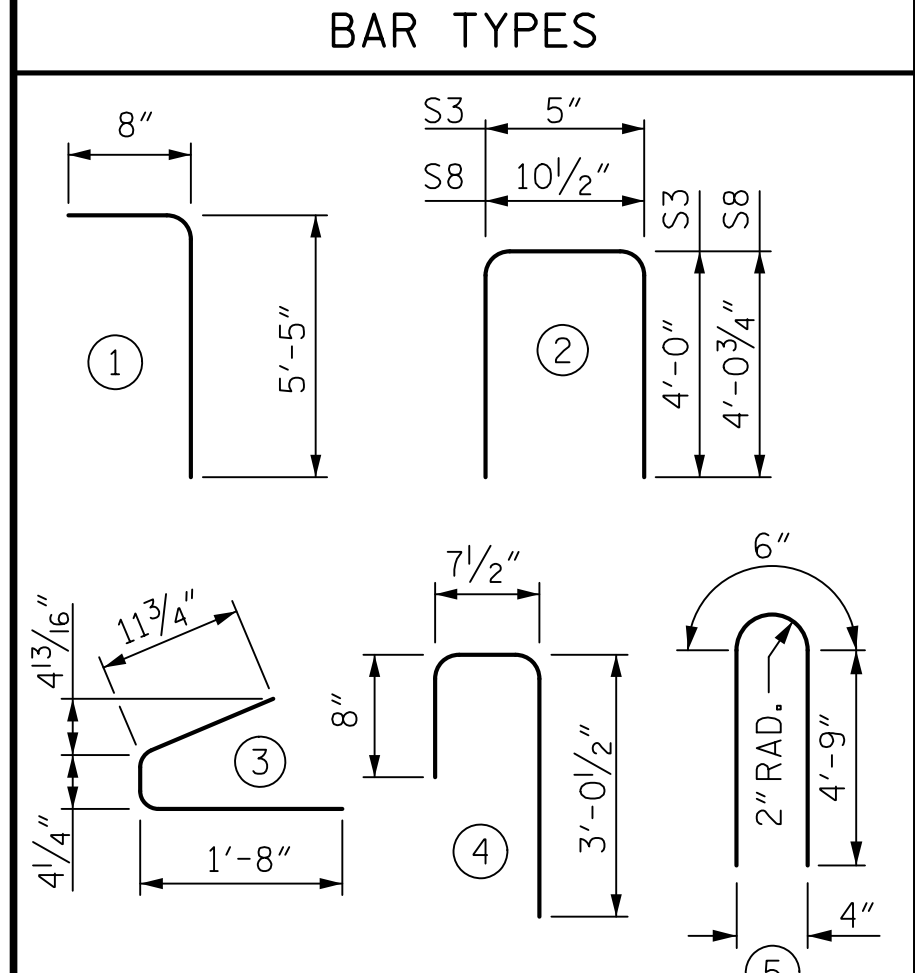


PARTIAL ELEVATION  
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-5

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	200	#4	1	6'-1"	813
S2	24	#6	1	6'-1"	219
S3	12	#4	2	8'-5"	67
S4	88	#4	3	3'-0"	176
S6	224	#5	4	4'-4"	1012
*S7	40	#5	STR	3'-8"	153
S8	2	#5	2	9'-0"	19
S9	57	#5	STR	3'-3"	193
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

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



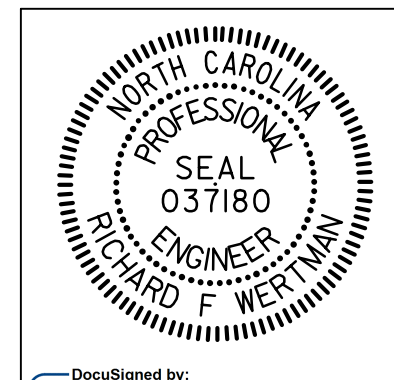
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2822	22.7	40
INTERIOR GIRDER	2822	22.7	40

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	114'-7 5/8"	573'-0 1/2"

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
63" PRESTRESSED CONCRETE  
MODIFIED BULB TEE  
SPAN A  
WESTBOUND LANE

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

SHEET NO. S01-10  
TOTAL SHEETS 28

ASSEMBLED BY: T.J. KIRSCHBAUM	DATE: 10/9/15
CHECKED BY: A.J. FORFA	DATE: 12/15/15
DRAWN BY: EEM 2/6/97	REV. 10/1/11 MAA/GM
CHECKED BY: VAP 2/6/97	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

PLANS PREPARED BY:  
**Gannett Fleming**  
2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

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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.

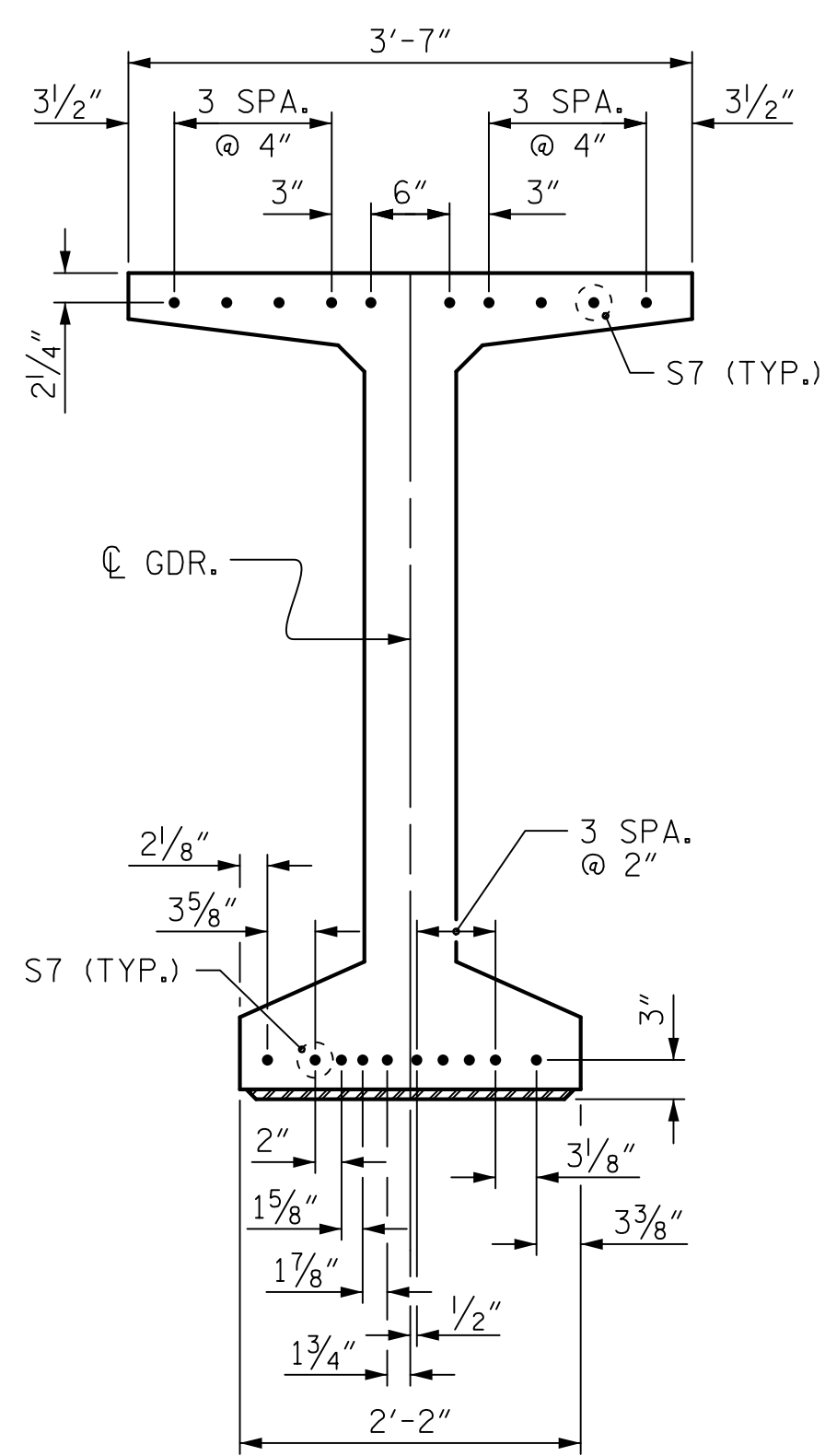
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6400 PSI. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

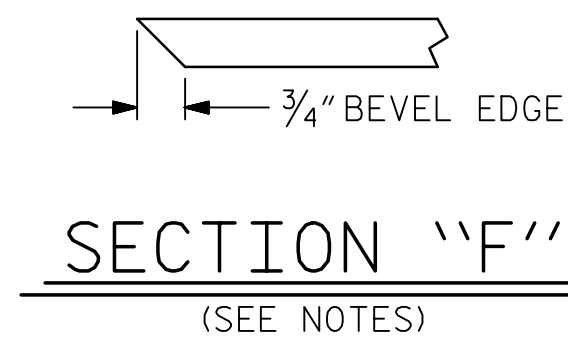
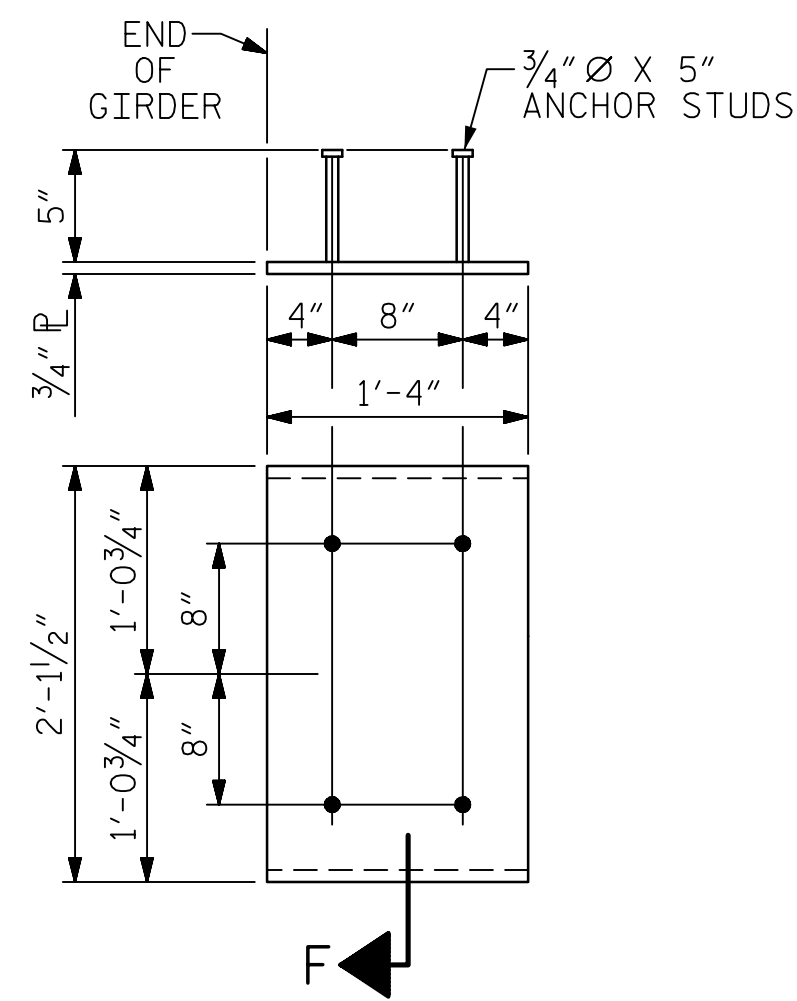
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES.

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

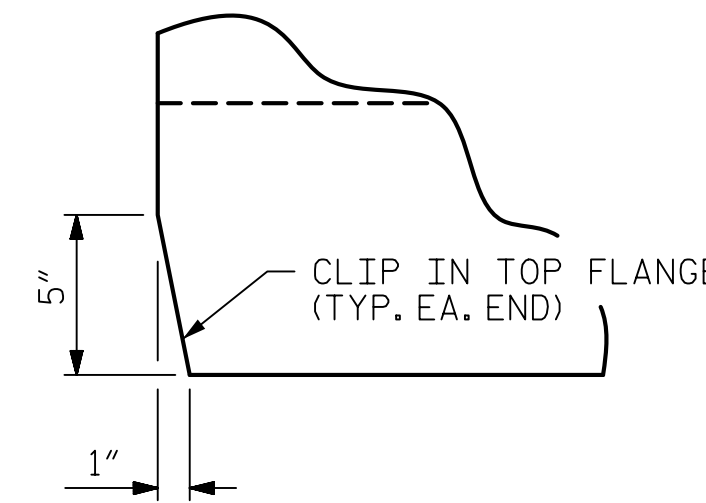
FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



DETAIL "C"



EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES (2 REQ'D PER GIRDER)

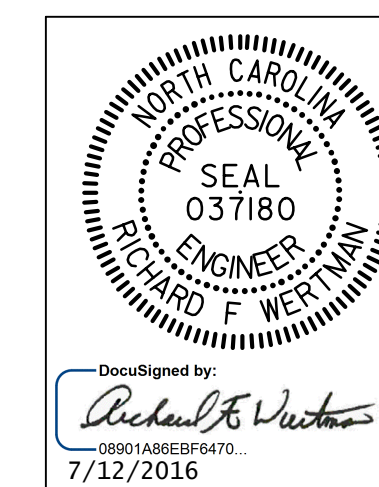


DETAIL "D"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION		SPAN A																					
		GIRDERS 1 & 5																					
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
CAMBER ( GIRDER ALONE IN PLACE )		↑	0	0.046	0.091	0.134	0.173	0.207	0.237	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.237	0.207	0.173	0.134	0.091	0.046	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	0.028	0.056	0.084	0.109	0.132	0.151	0.166	0.177	0.184	0.186	0.184	0.177	0.166	0.151	0.132	0.109	0.084	0.056	0.028	0
FINAL CAMBER		↑	0	3/16"	7/16"	5/8"	3/4"	7/8"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1 1/16"	7/8"	3/4"	5/8"	7/16"	3/16"	0
0.6" Ø LOW RELAXATION		SPAN A																					
		GIRDERS 2, 3 & 4																					
TWENTIETH POINTS		0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
CAMBER ( GIRDER ALONE IN PLACE )		↑	0	0.046	0.091	0.134	0.173	0.207	0.237	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.237	0.207	0.173	0.134	0.091	0.046	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.		↓	0	0.029	0.060	0.090	0.118	0.143	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.143	0.118	0.090	0.060	0.029	0
FINAL CAMBER		↑	0	3/16"	3/8"	1/2"	1 1/16"	3/4"	7/8"	1 5/16"	1"	1 1/16"	1 1/16"	1 1/16"	1"	1 5/16"	7/8"	3/4"	1 1/16"	1/2"	3/8"	3/16"	0

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

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 DETAILS  
 WESTBOUND LANE

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 10/9/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DRAWN BY : ELR 11/91 REV. 10/1/11 MAA/GM  
 CHECKED BY : GRP 11/91 REV. 1/15 MAA/TMG  
 REV. 2/15 MAA/TMG

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			28



**STRUCTURAL STEEL NOTES**

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE 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, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE 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.

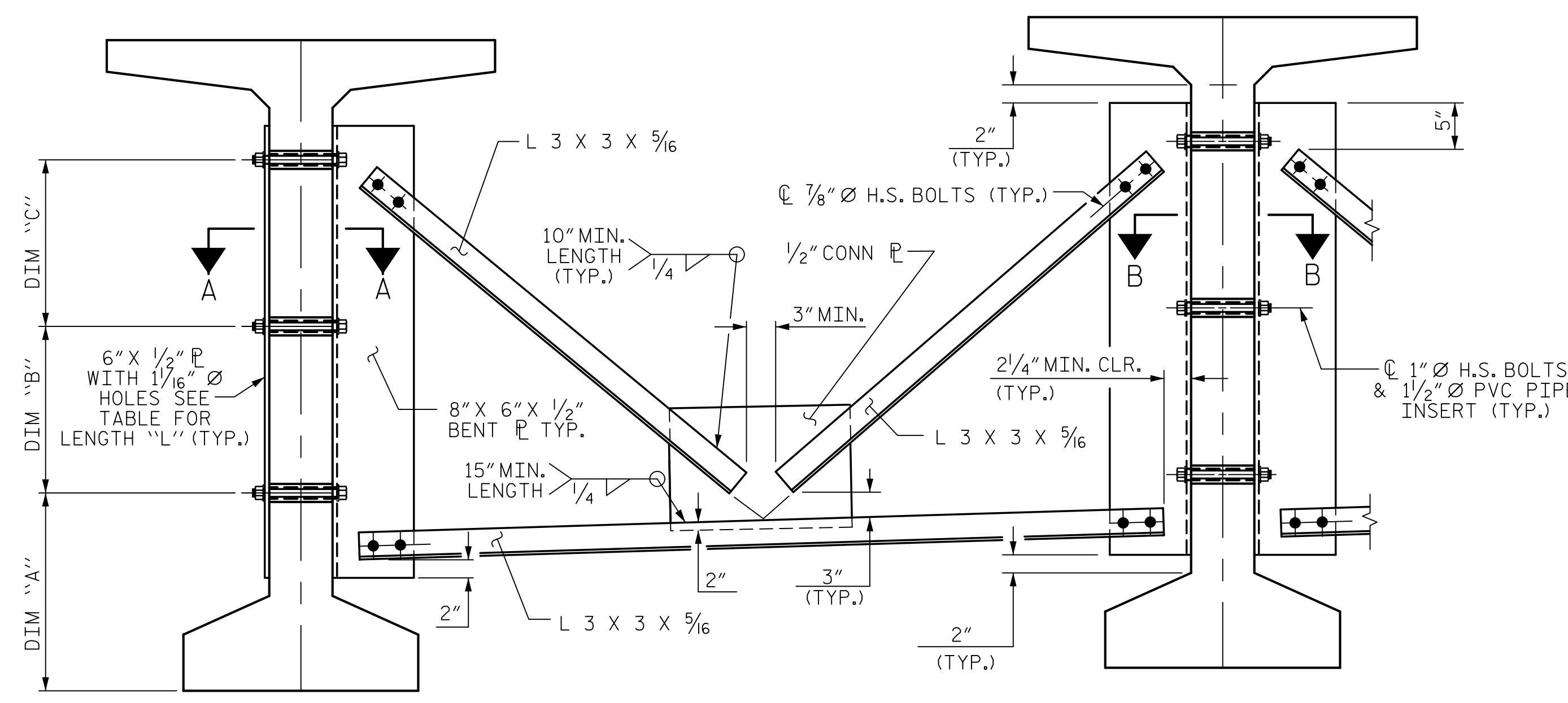
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

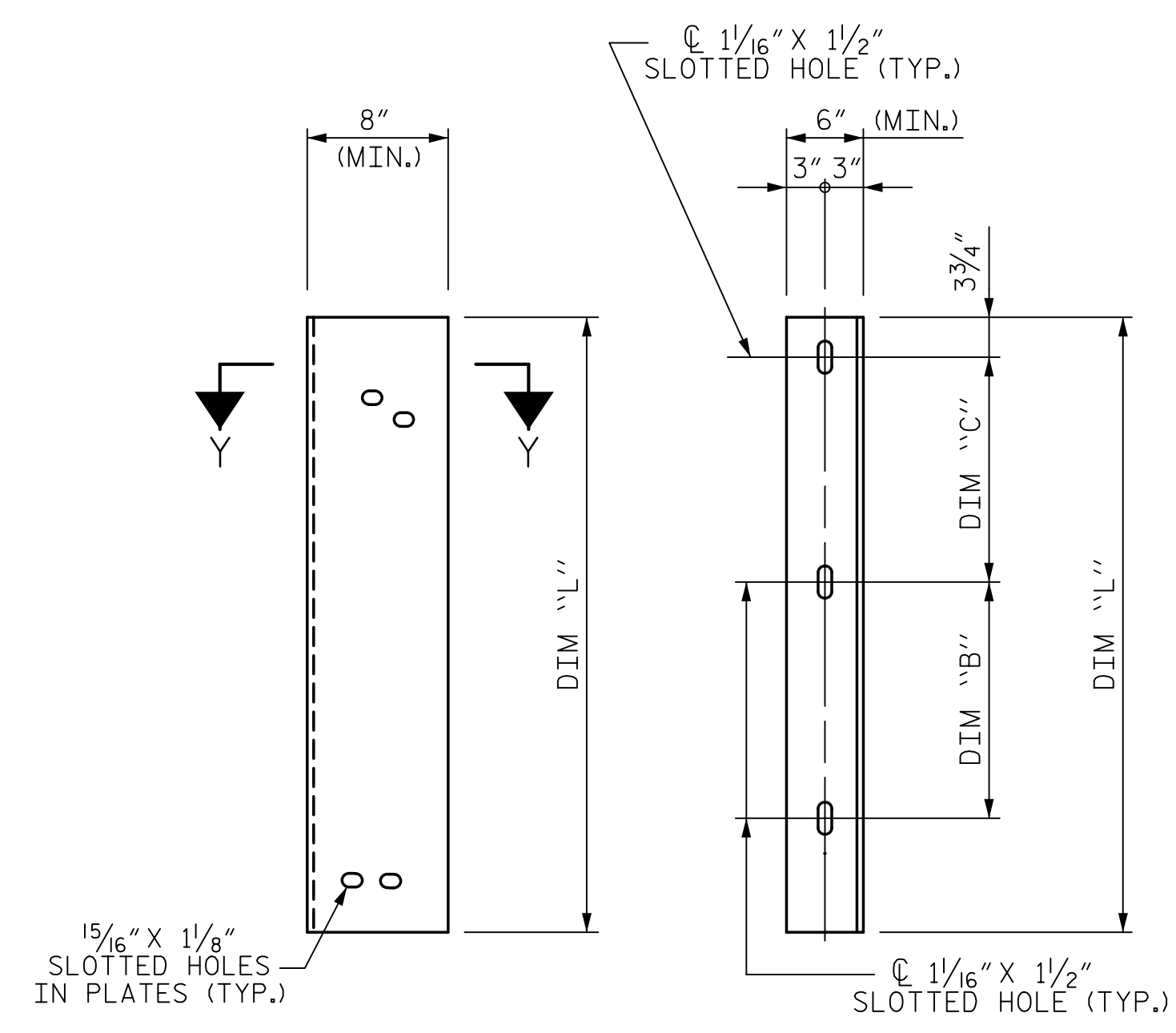
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

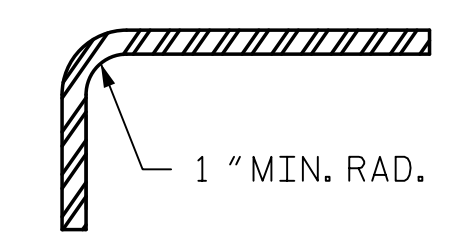
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



**PART SECTION AT INTERMEDIATE DIAPHRAGM**



**DIAPHRAGM FACE WEB FACE**

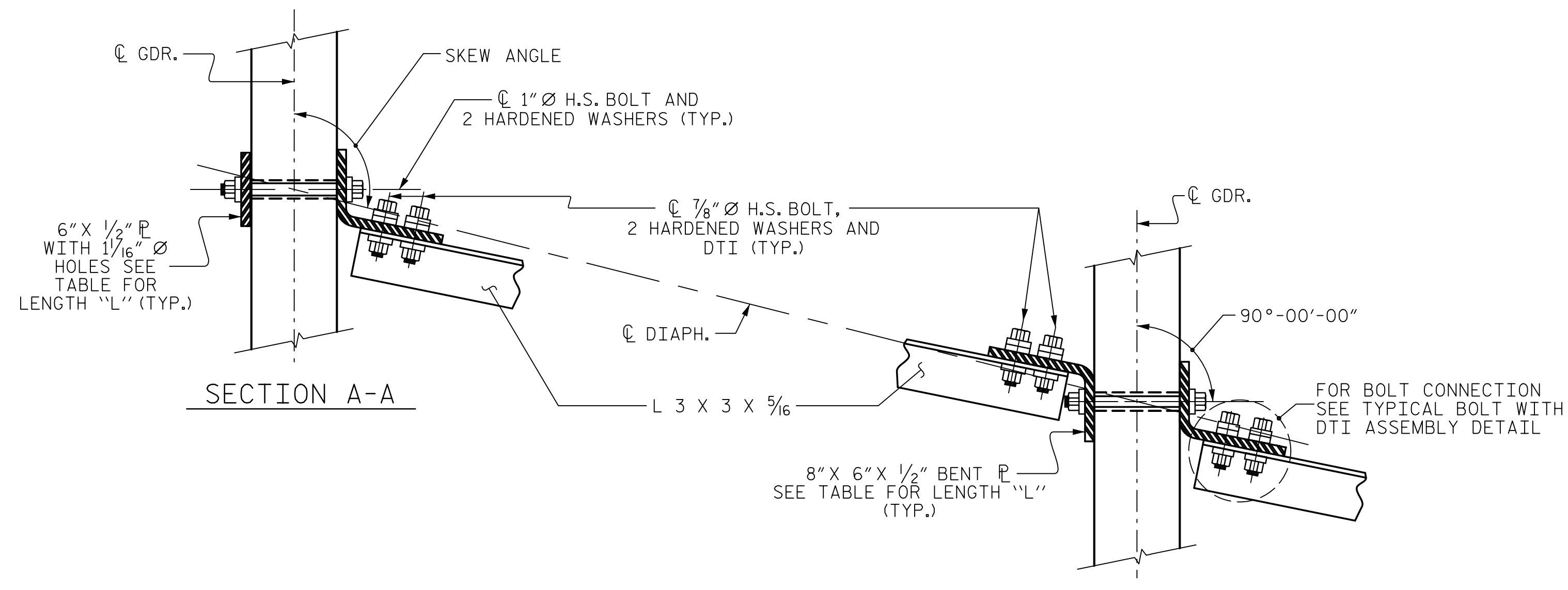


**SECTION Y-Y**

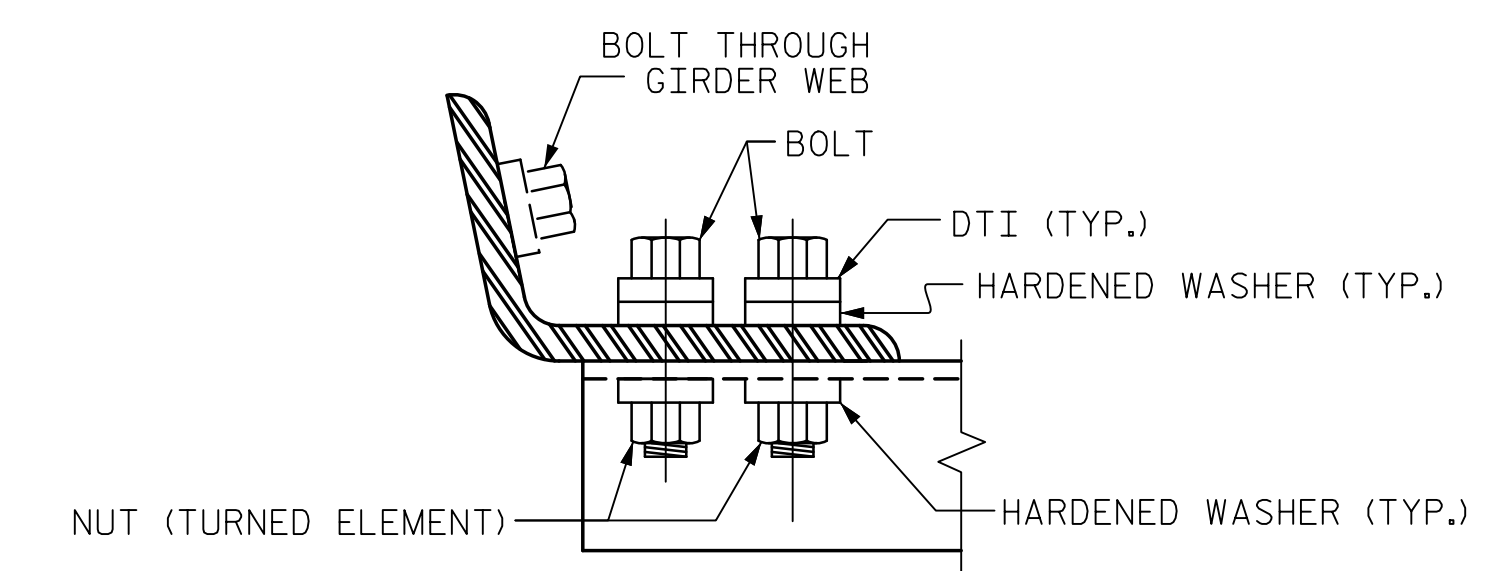
**CONNECTOR PLATE DETAIL**

**TABLE**

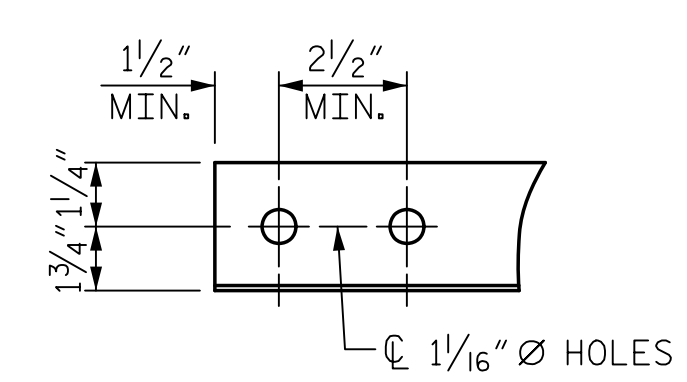
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 3/4"	1'-3"	1'-3"	3'-5"



**CONNECTION DETAILS**

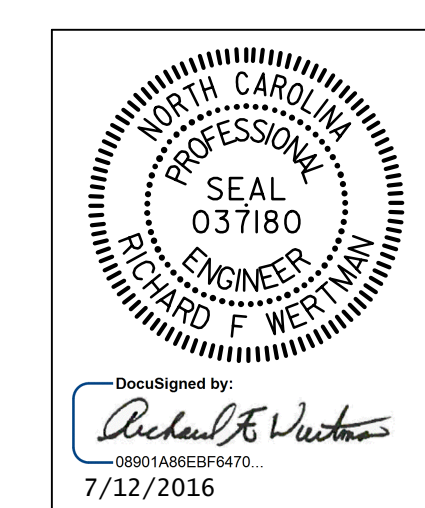


**BOLT WITH DTI ASSEMBLY DETAIL**



**ANGLE END (L 3 X 3 X 5/16)**

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE STEEL  
 DIAPHRAGMS FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS  
 WESTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-12
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 10/9/15  
 CHECKED BY : A.J. FORFA DATE : 12/15/15  
 DRAWN BY : RWW 11/09  
 CHECKED BY : GM 11/09  
 ADDED 11/23/09R  
 REV. 10/1/11 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh NC 27607-3073  
 (919) 420-7660  
 INC Lic. No. F-02710

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

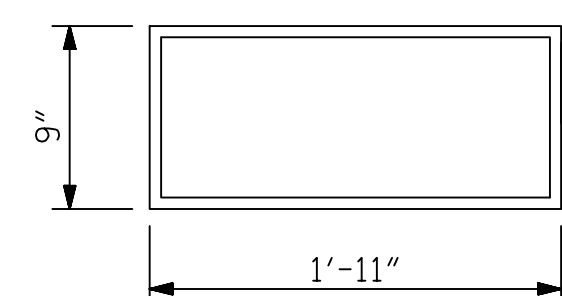
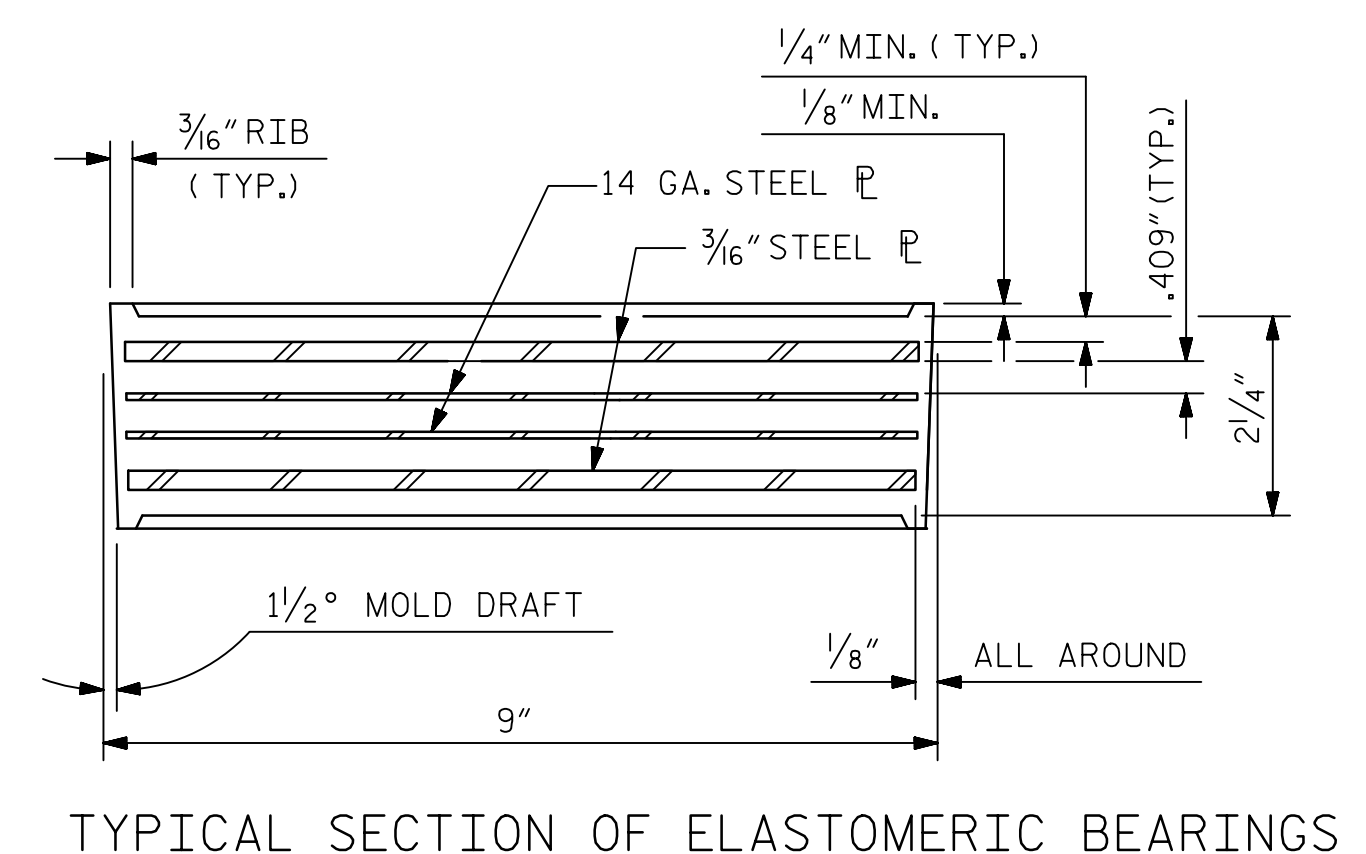
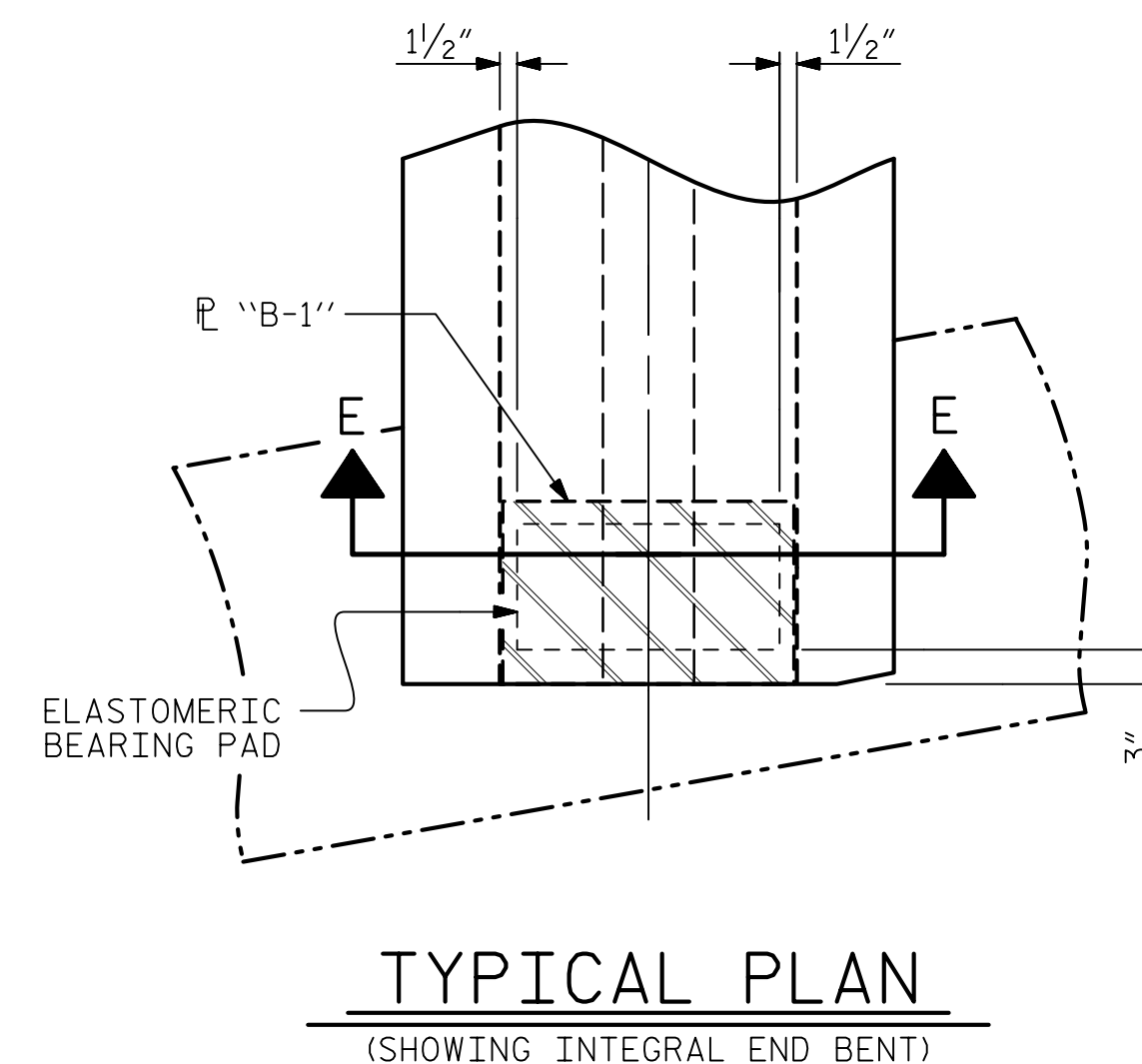
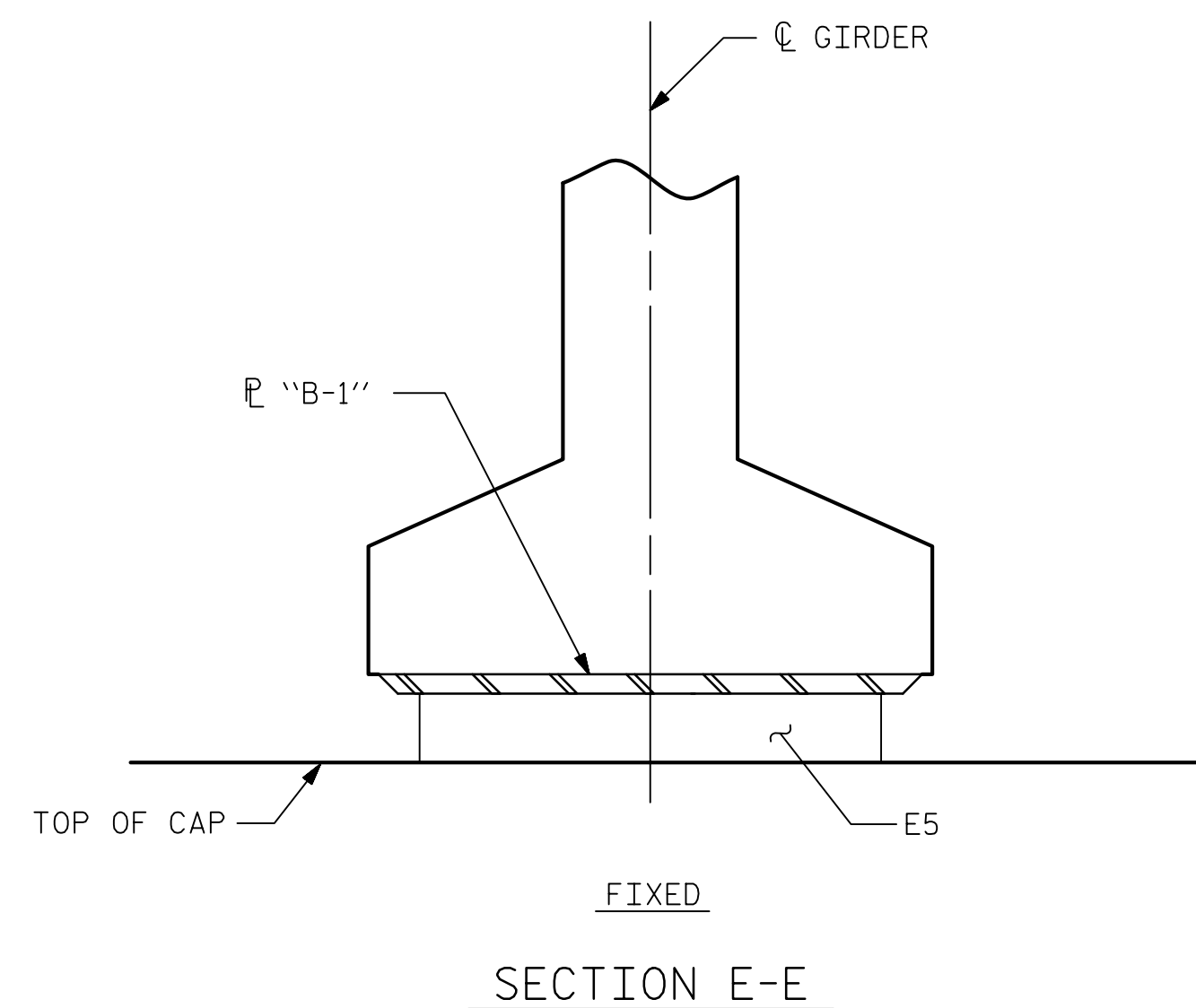
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

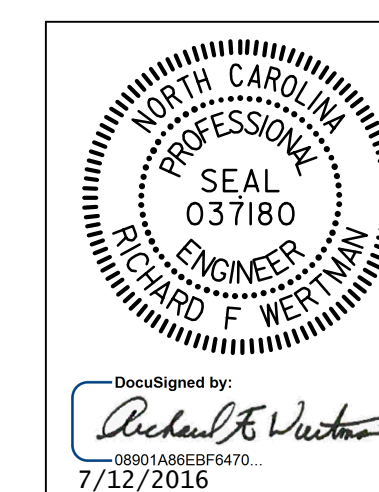
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



E5 ( 10 REQ'D )  
 PLAN VIEW OF ELASTOMERIC BEARING  
 TYPE V

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



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

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 10/9/15
CHECKED BY : A.J. FORFA	DATE : 12/15/15
DRAWN BY : EEM 2/97	REV. 10/1/11
CHECKED BY : VAP 2/97	REV. 6/13
	REV. 1/15
MAA/GM	MAA/TMG
AAC/MAA	

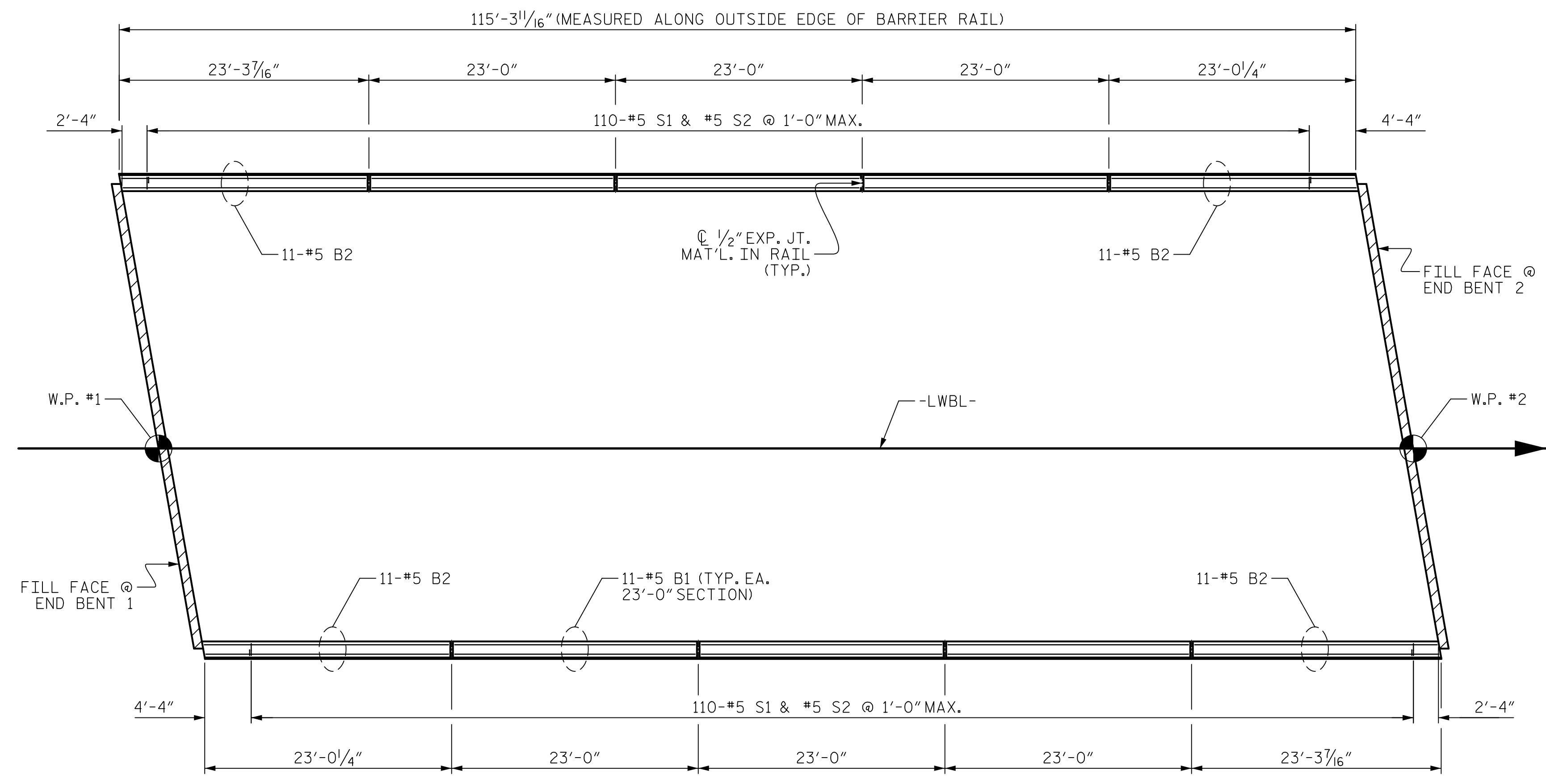
PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered *As Promised*  
 2610 Wycliff Road  
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 Raleigh, NC 27607-3073  
 (919) 420-7660  
 INC Lic. No. F-0270

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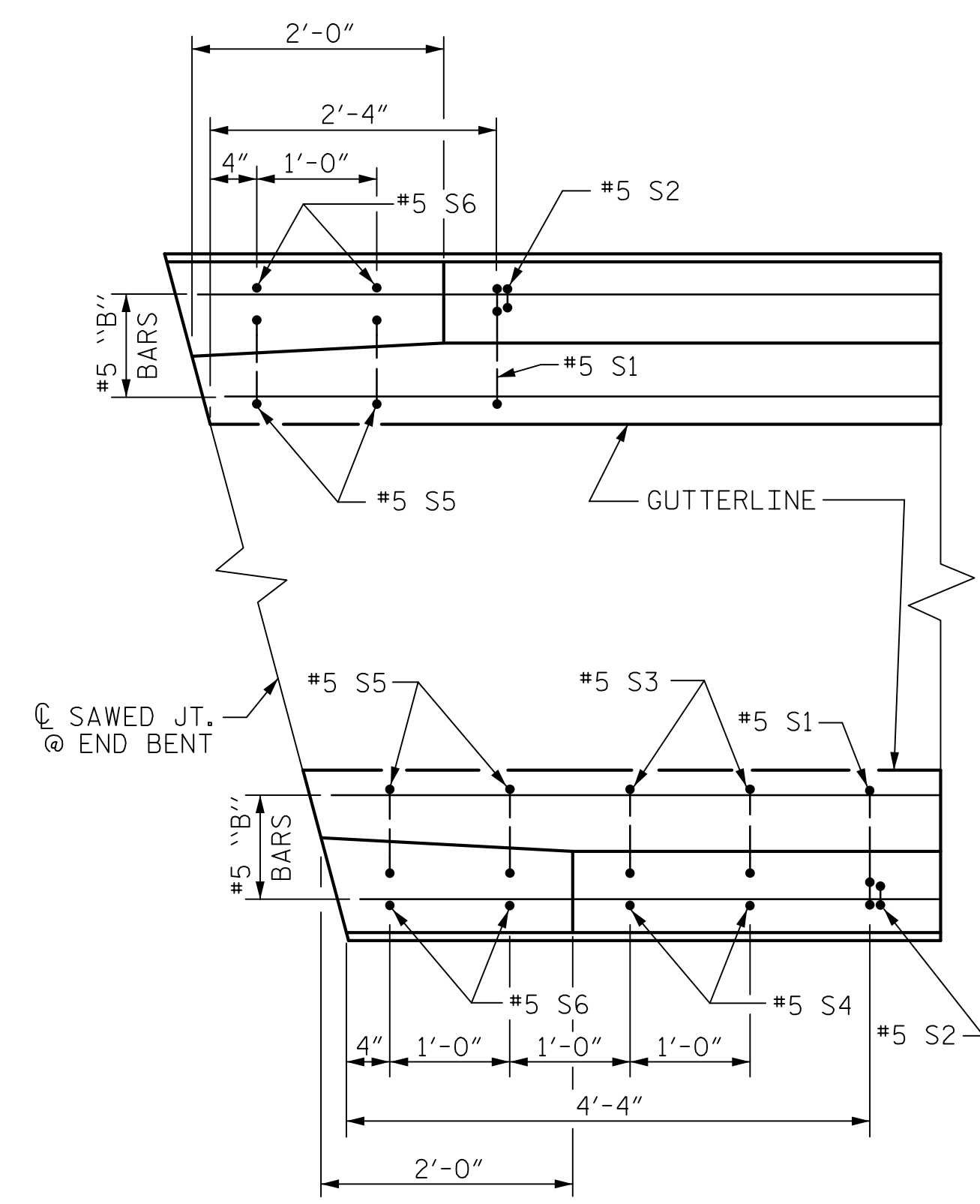
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			28

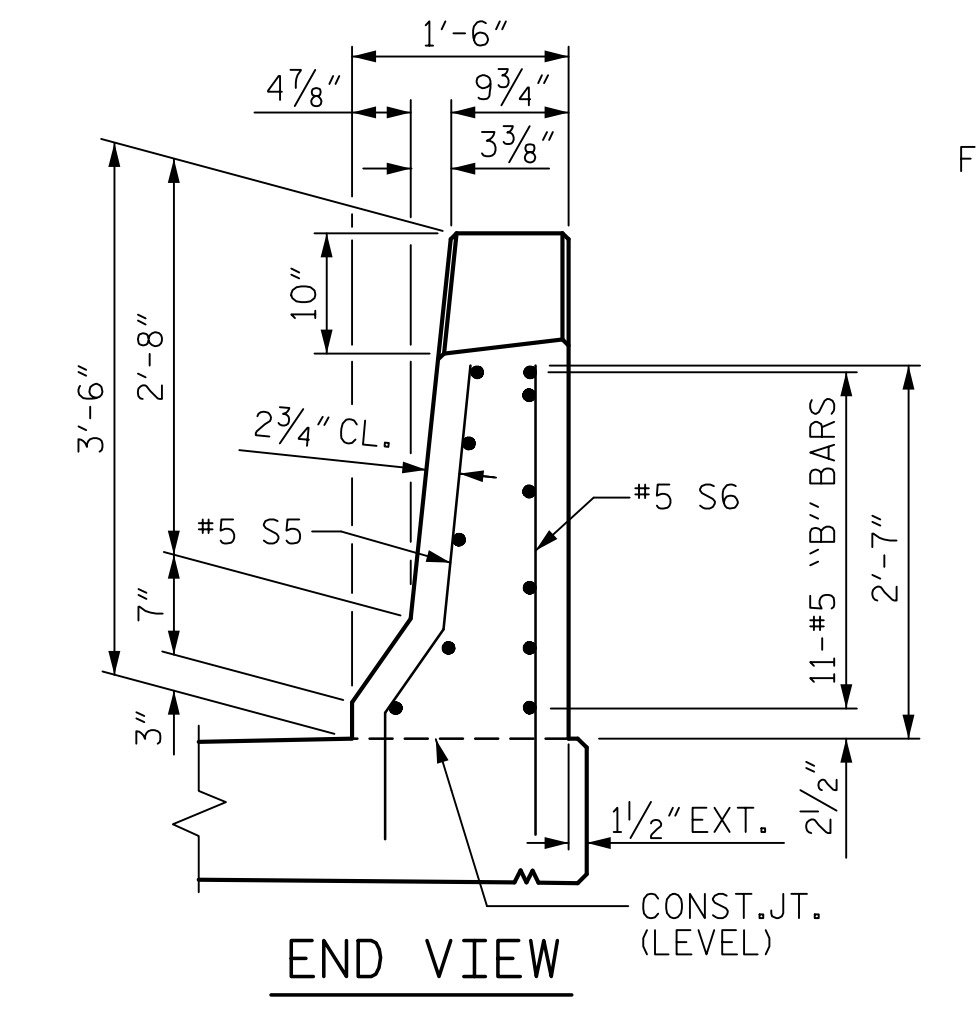




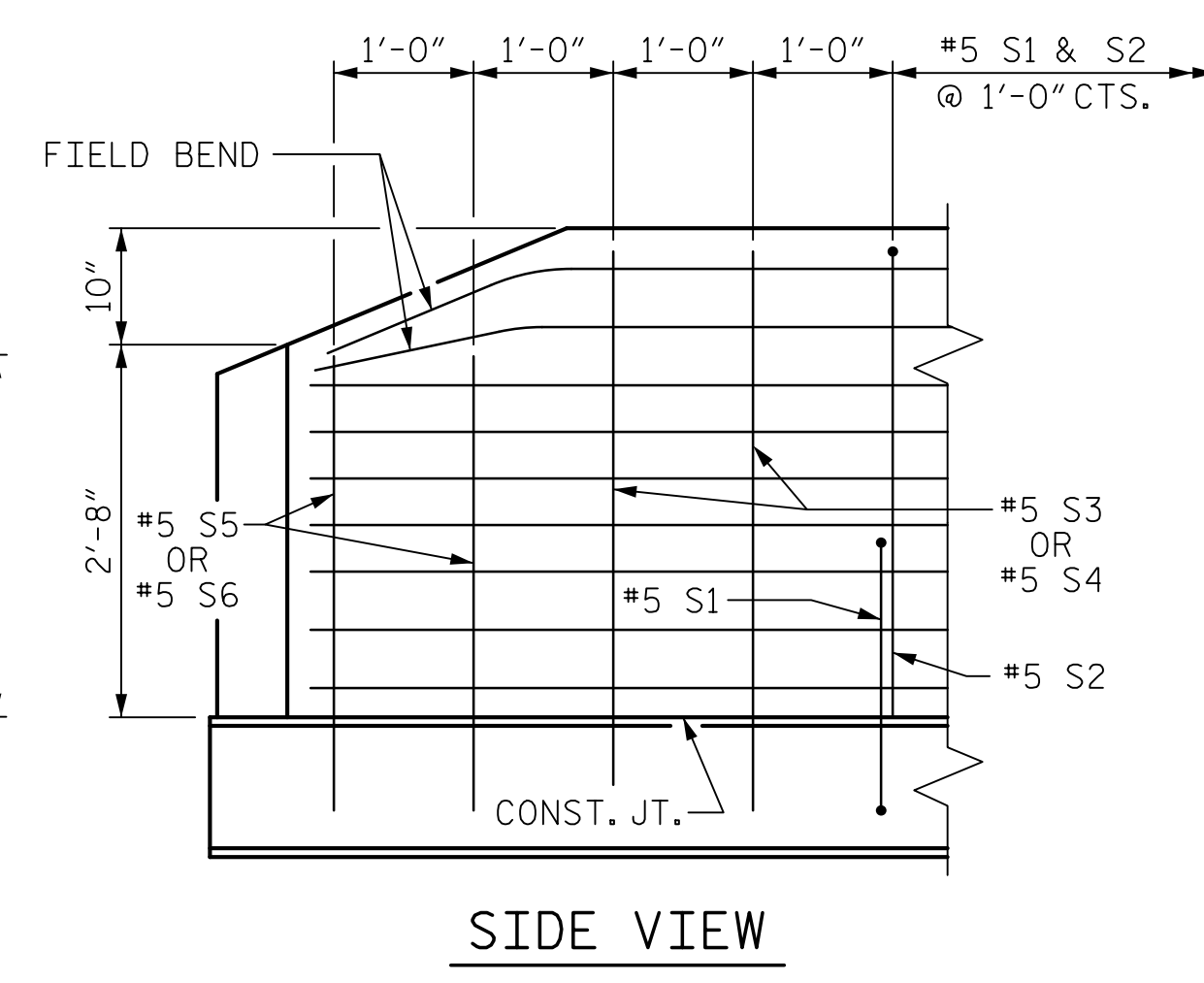
PLAN



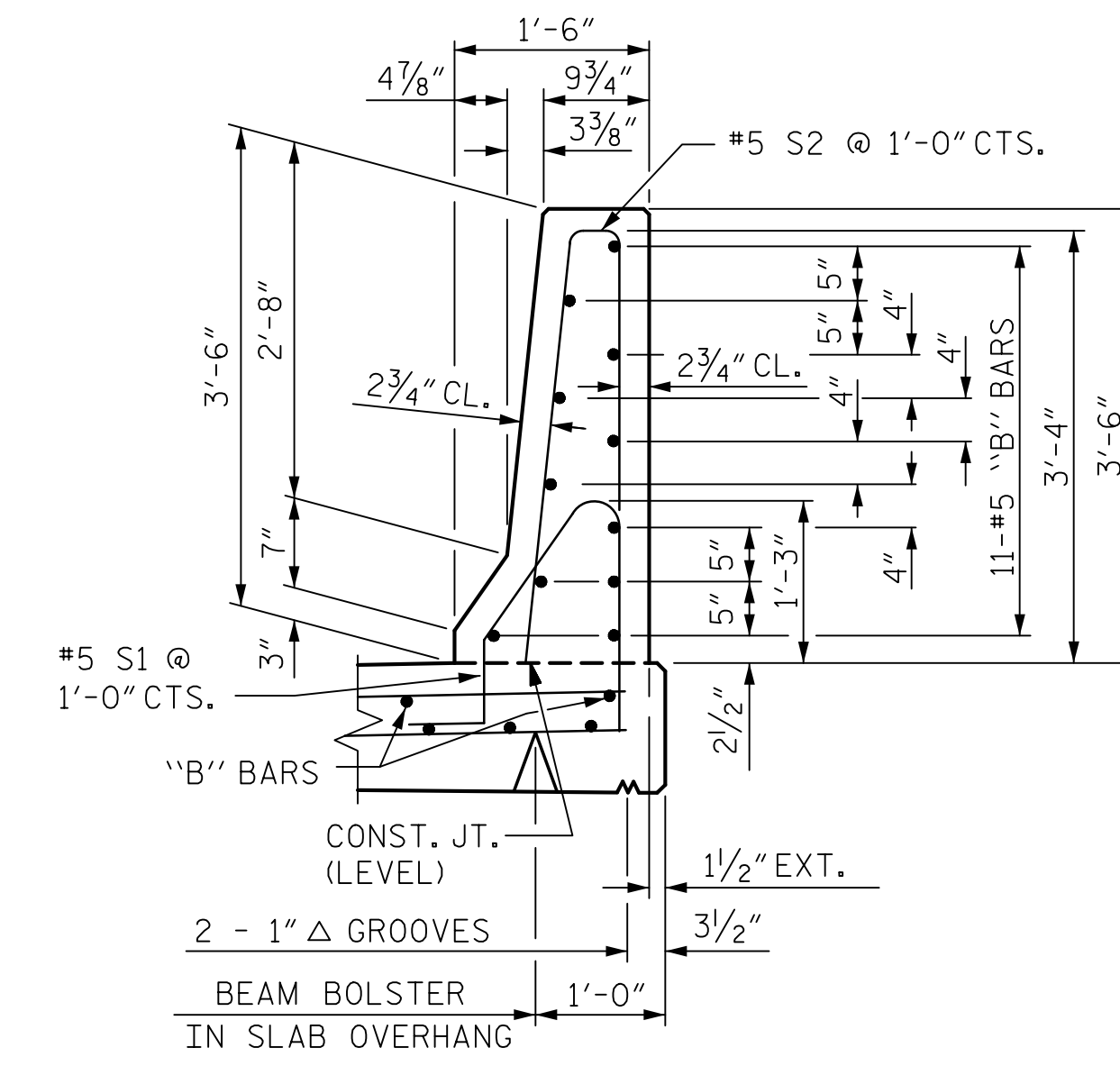
PLAN



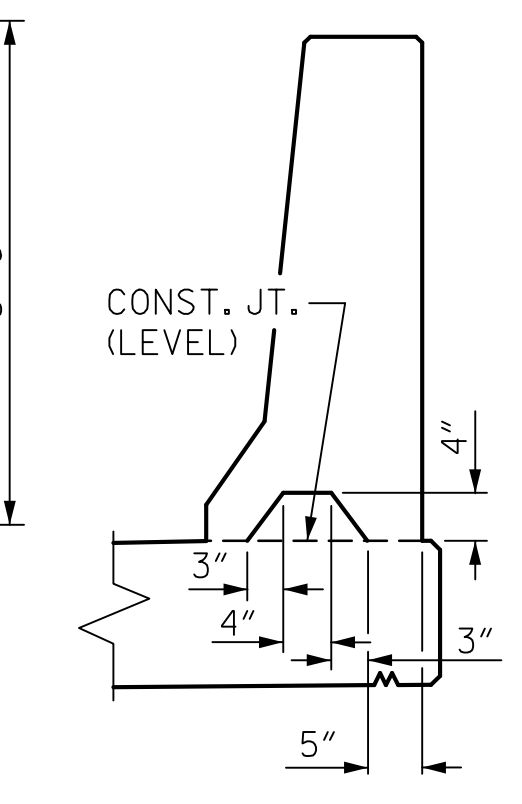
END OF RAIL DETAILS  
FOR ADHESIVE ANCHORING AT SAWED JOINTS



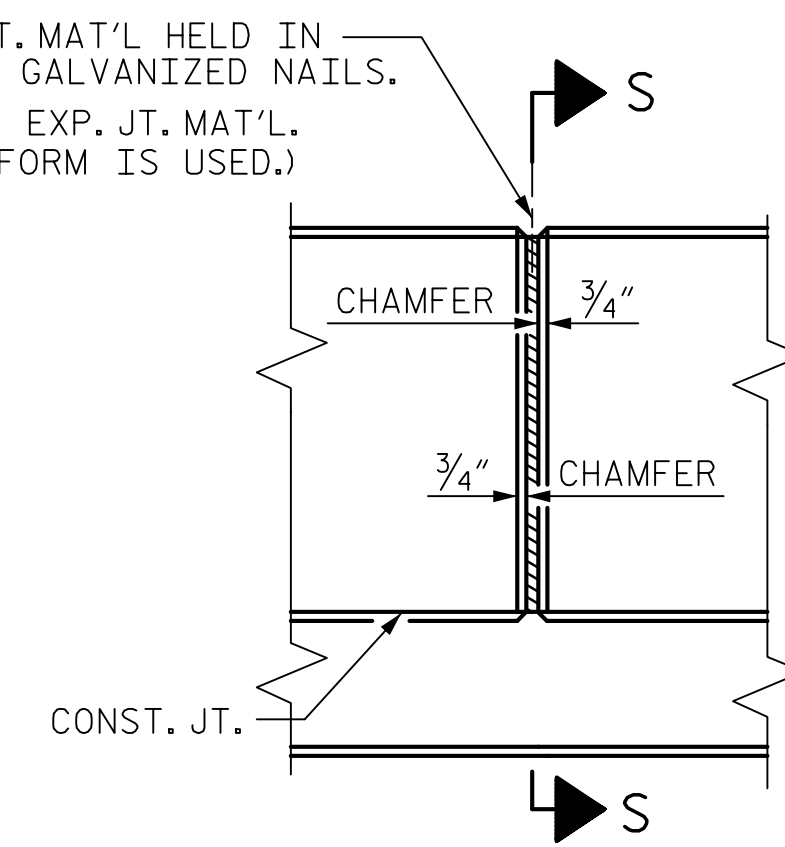
SIDE VIEW



SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS

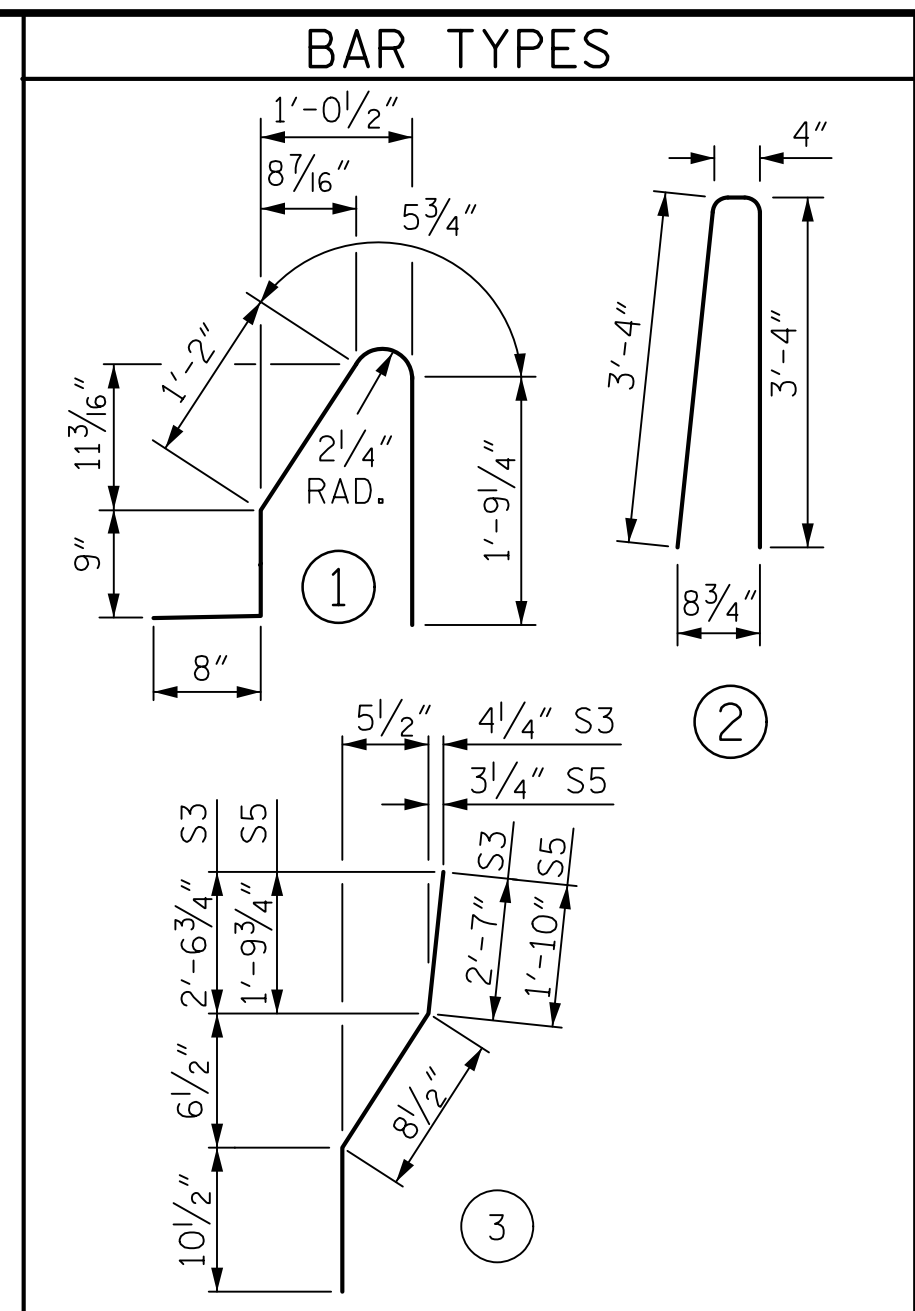
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

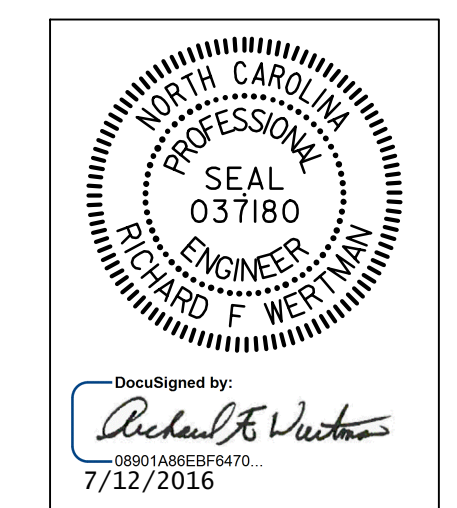
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	66	#5	STR	22'-7"	1555
* B2	44	#5	STR	22'-8"	1040
* S1	220	#5	1	4'-10"	1109
* S2	220	#5	2	7'-0"	1606
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27

\*EPOXY COATED REINFORCING STEEL 5,400 LBS.  
CLASS AA CONCRETE 31.2 CU. YDS.  
CONCRETE BARRIER RAIL 230.6 LIN. FT.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

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

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

SHEET NO. S01-14  
TOTAL SHEETS 28

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 11/10/15  
CHECKED BY : A.J. FORFA DATE : 12/15/15  
DRAWN BY : ARB 5/87 REV. 10/1/11 MAA/GM  
CHECKED BY : SJD 9/87 REV. 7/12 MAA/GM  
REV. 6/13 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered As Promised  
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NC Lic. No. F-0270

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NOTES

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

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

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

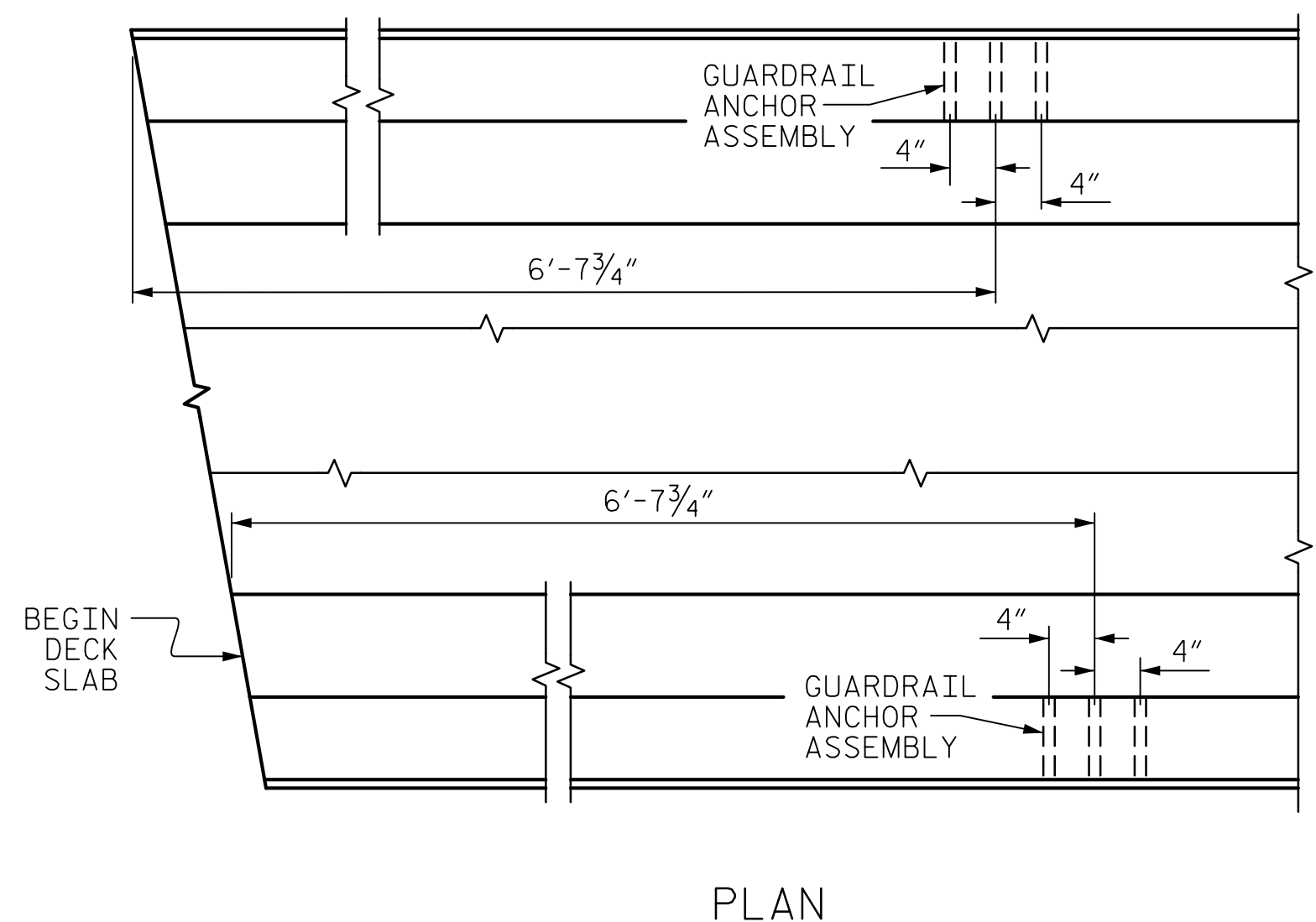
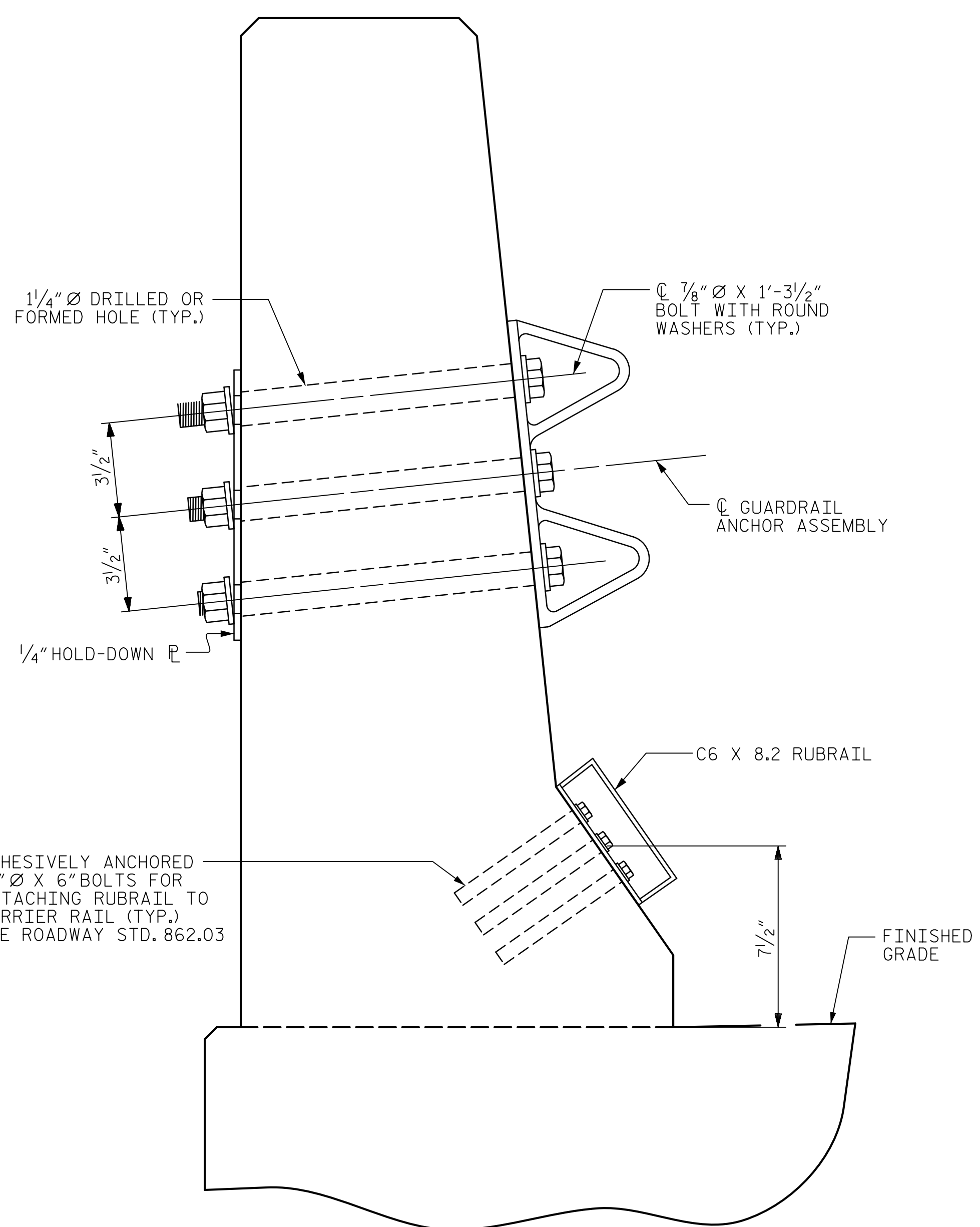
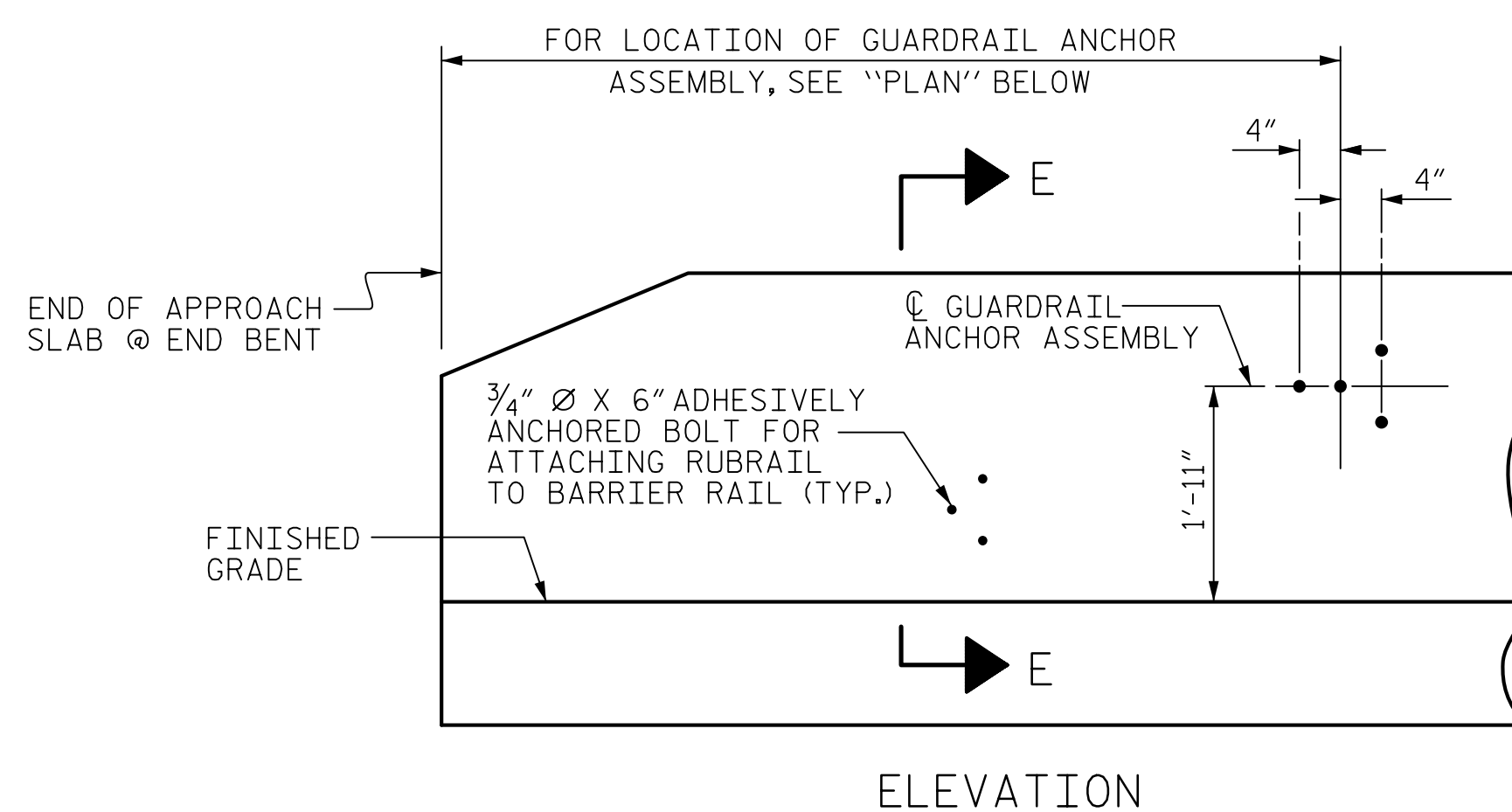
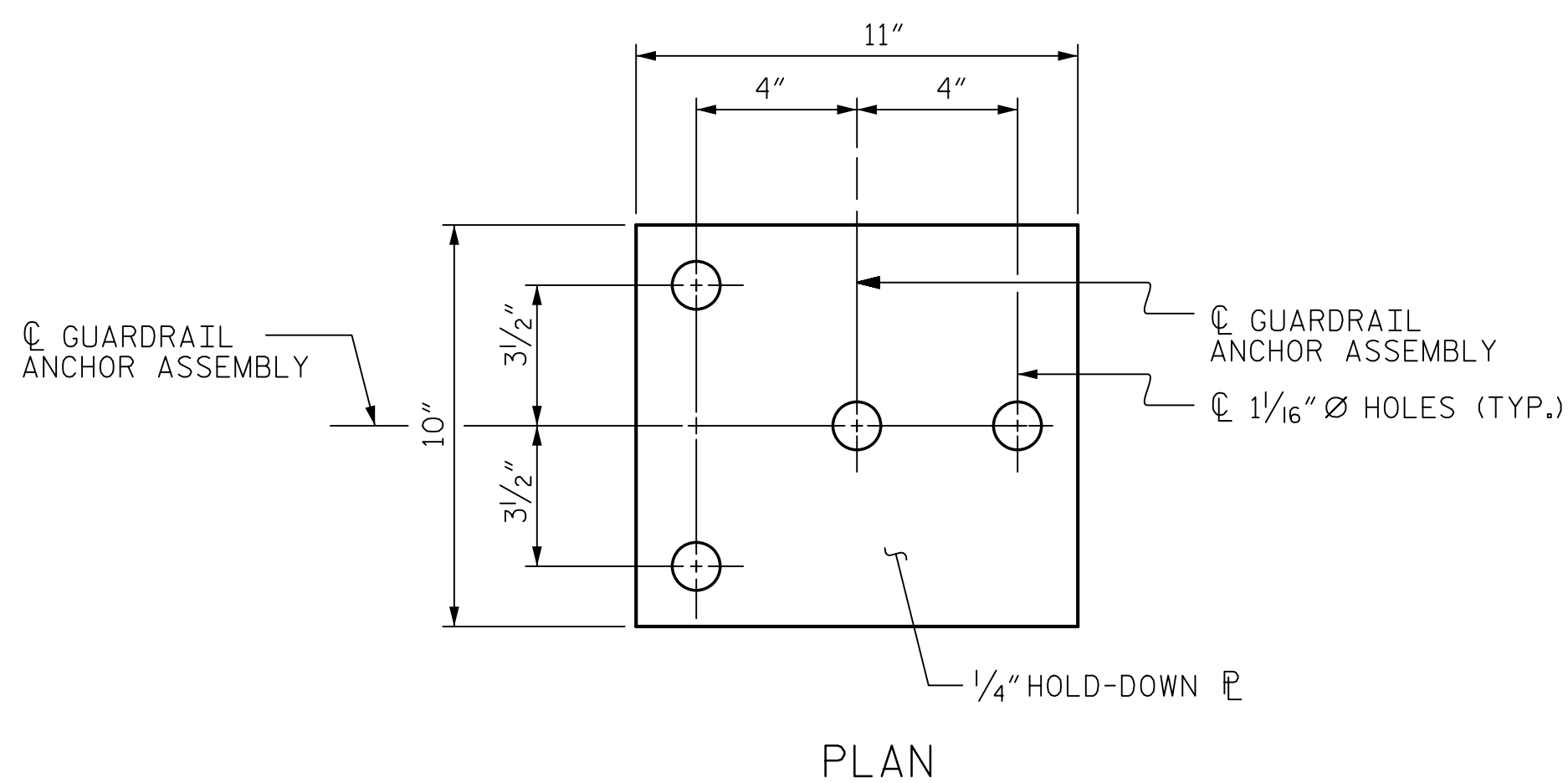
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

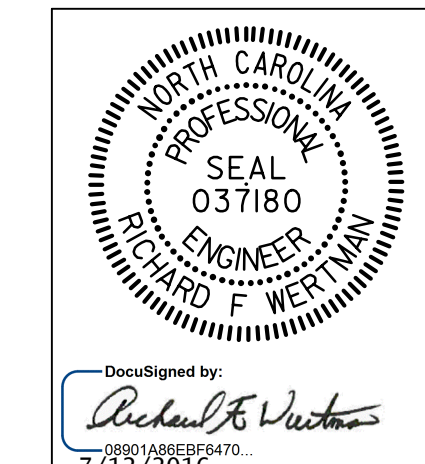
SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15
CHECKED BY : A.J. FORFA	DATE : 12/15/15
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

PLANS PREPARED BY:

2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

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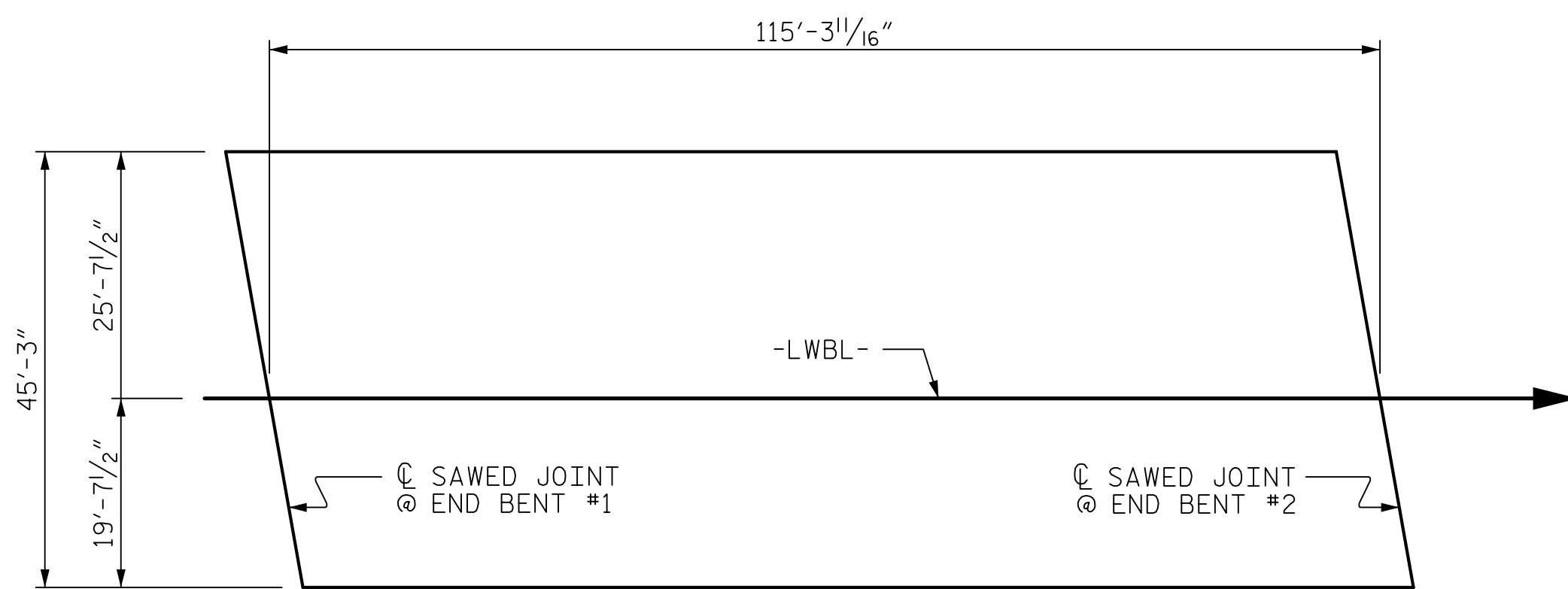
PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

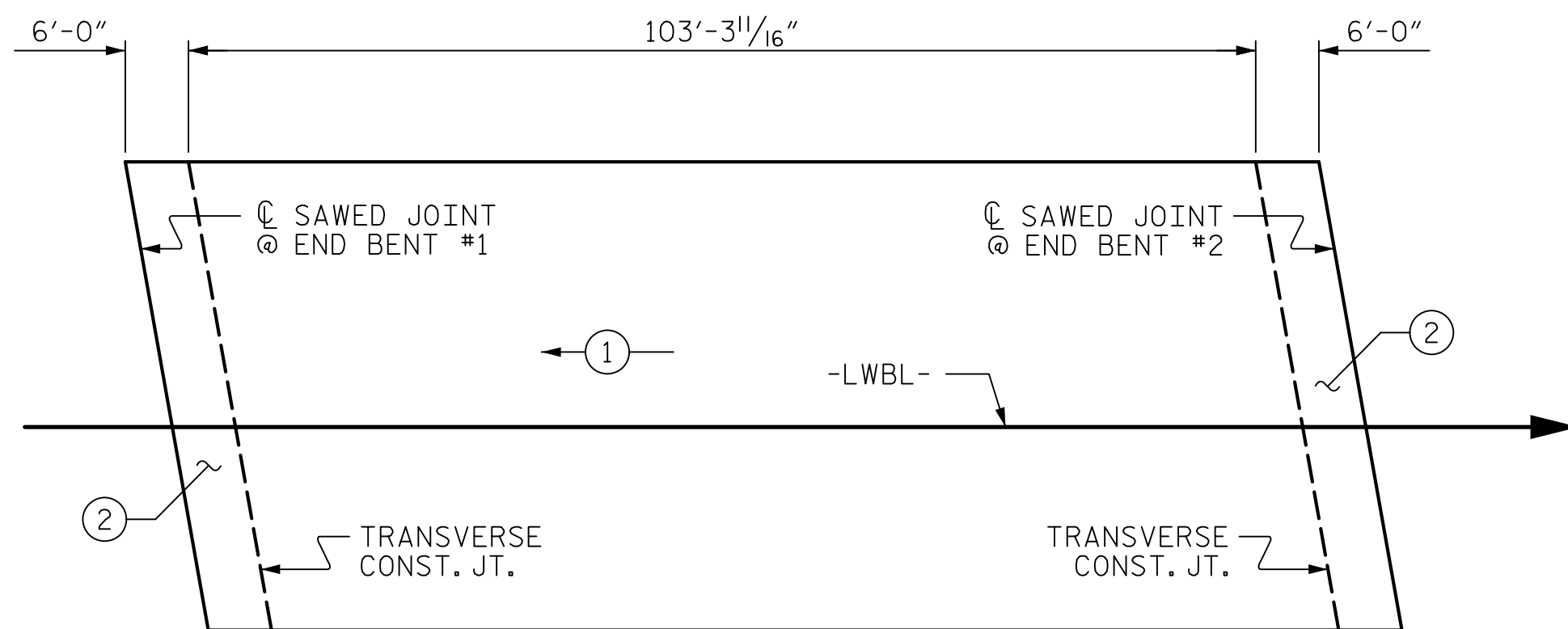
STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL  
WESTBOUND LANE

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

TOTAL SHEETS 28



LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 5218)



POURING SEQUENCE

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

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

GROOVING BRIDGE FLOORS

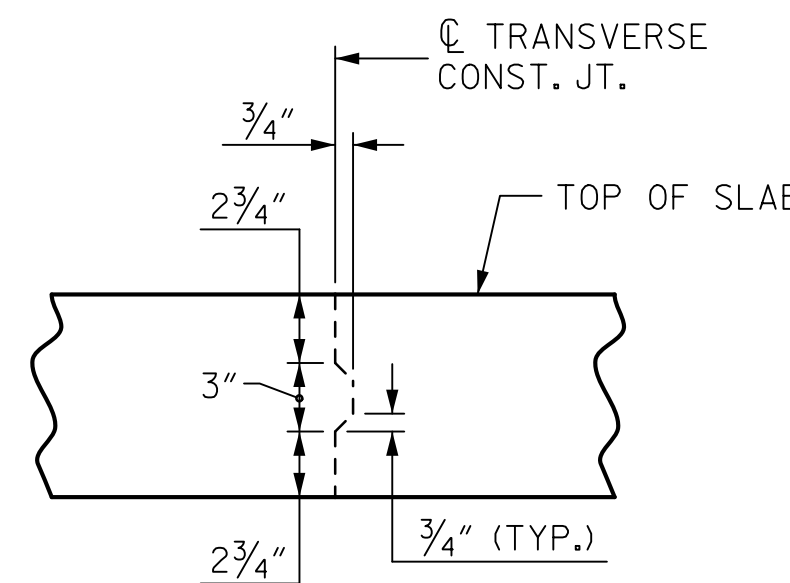
APPROACH SLABS	1950	SQ.FT.
BRIDGE DECK	4497	SQ.FT.
TOTAL	6447	SQ.FT.

BAR TYPES				BILL OF MATERIAL			
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A1	172	#5	STR	44'-11"	8058		
A2	172	#5	STR	44'-11"	8058		
* A101	4	#5	STR	38'-2"	159		
* A102	4	#5	STR	31'-2"	130		
* A103	4	#5	STR	24'-1"	101		
* A104	4	#5	STR	17'-0"	71		
* A105	4	#5	STR	10'-0"	42		
* A106	4	#5	STR	2'-11"	12		
A201	4	#5	STR	38'-2"	159		
A202	4	#5	STR	31'-2"	130		
A203	4	#5	STR	24'-1"	101		
A204	4	#5	STR	17'-0"	71		
A205	4	#5	STR	10'-0"	42		
A206	4	#5	STR	2'-11"	12		
* B1	160	#4	STR	24'-8"	2636		
B2	68	#5	STR	58'-7"	4155		
K1	20	#4	STR	26'-10"	359		
K2	8	#4	STR	7'-1"	38		
K3	32	#4	STR	8'-8"	185		
K4	4	#4	STR	5'-3"	14		
K5	16	#4	STR	6'-1"	65		
* S1	56	#4	1	11'-11"	446		
* S2	52	#4	1	10'-10"	376		
U1	76	#4	2	11'-11"	605		
REINFORCING STEEL					=	13,994	
* EPOXY COATED REINF. STEEL					=	12,031	

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE ( CU. YDS. )	REINFORCING STEEL ( LBS. )	EPOXY COATED REINFORCING STEEL ( LBS. )
POUR #1	141.6		
POUR #2	82.2		
TOTALS **	223.8	13,994	12,031

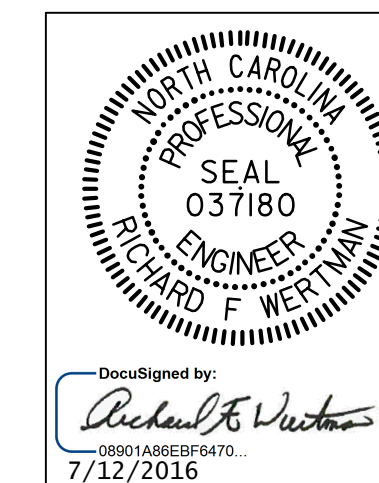
\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BILL OF MATERIAL  
WESTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-16
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15
CHECKED BY : A.J. FORFA	DATE : 12/15/15
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

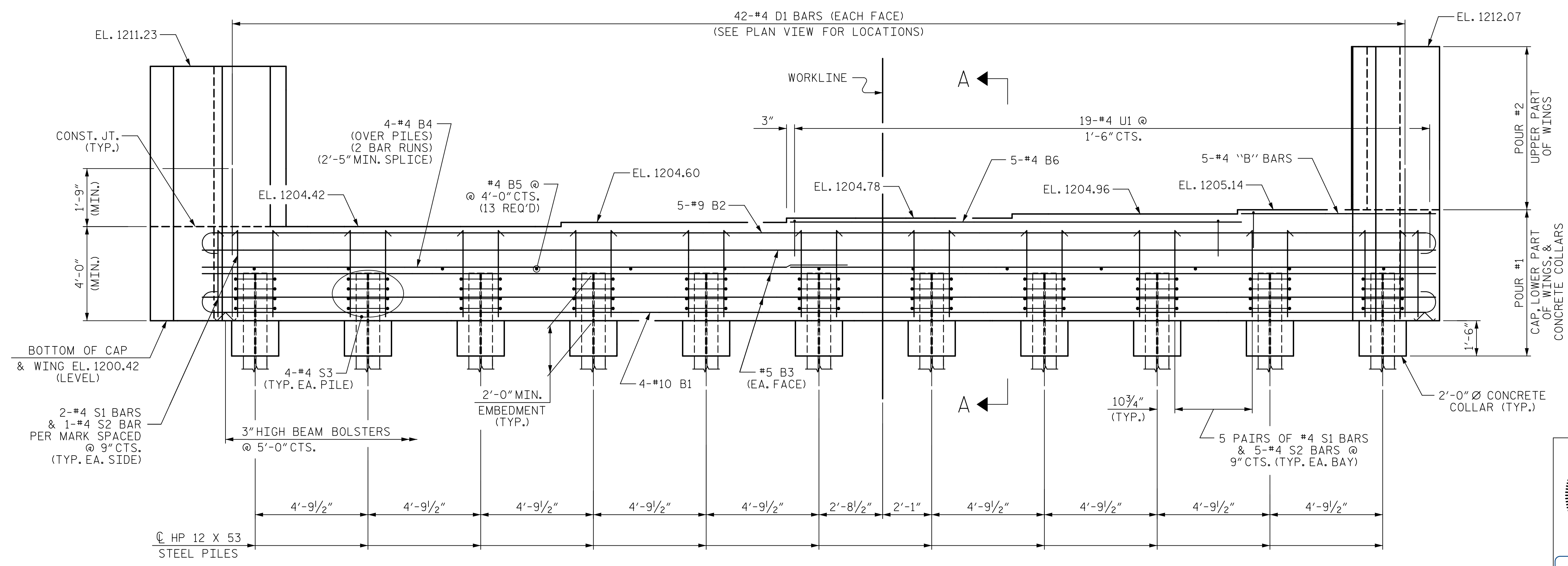
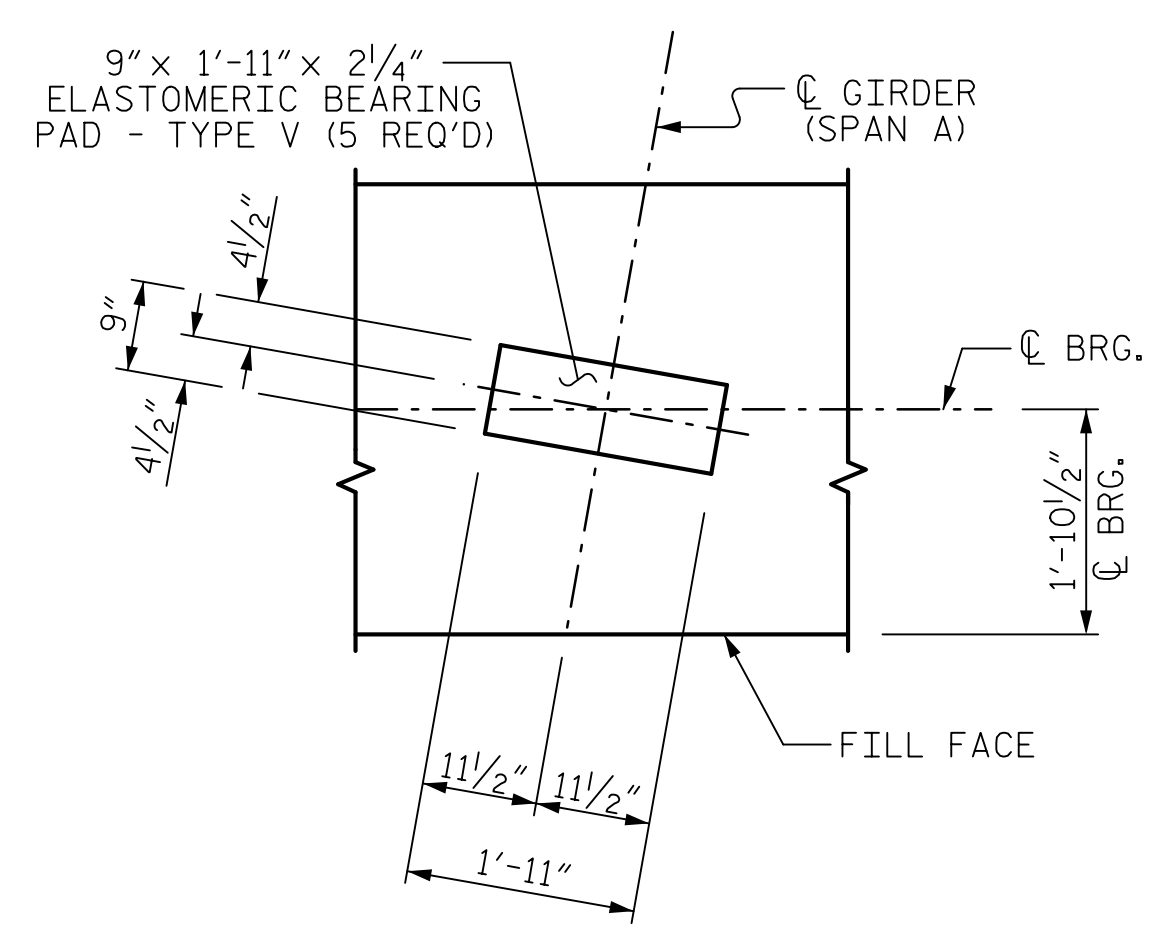
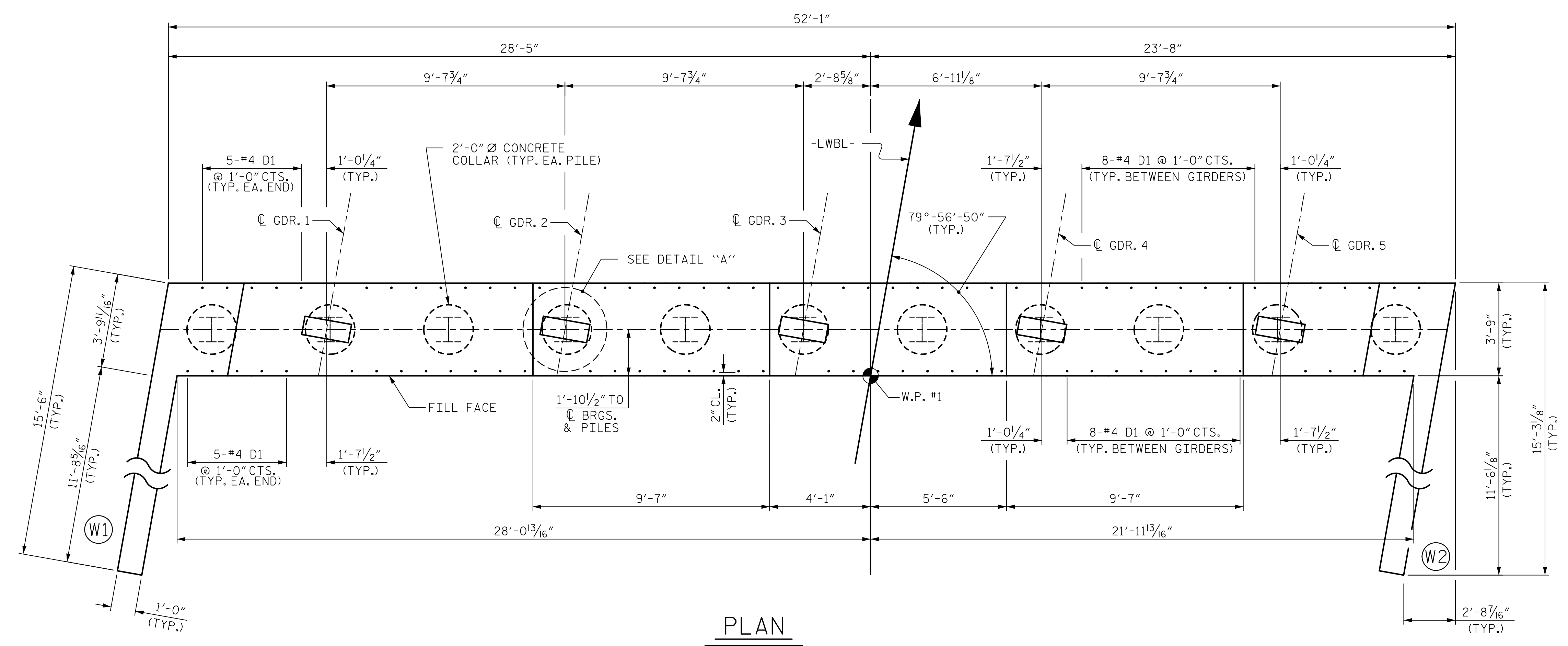
PLANS PREPARED BY:  
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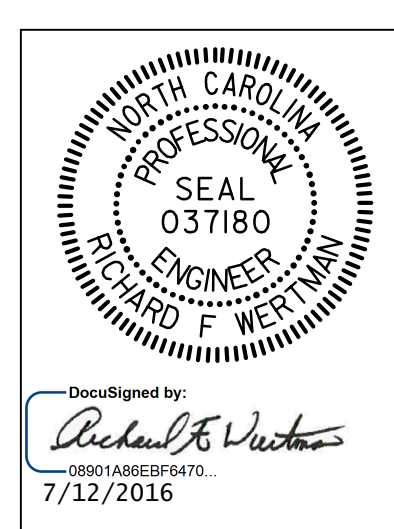
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**NOTES:**  
 INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 #4 D1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.  
 THE UPPER PART OF THE WINGS (POUR #2) SHALL BE POURED AFTER THE SUPERSTRUCTURE.



PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 1 OF 4



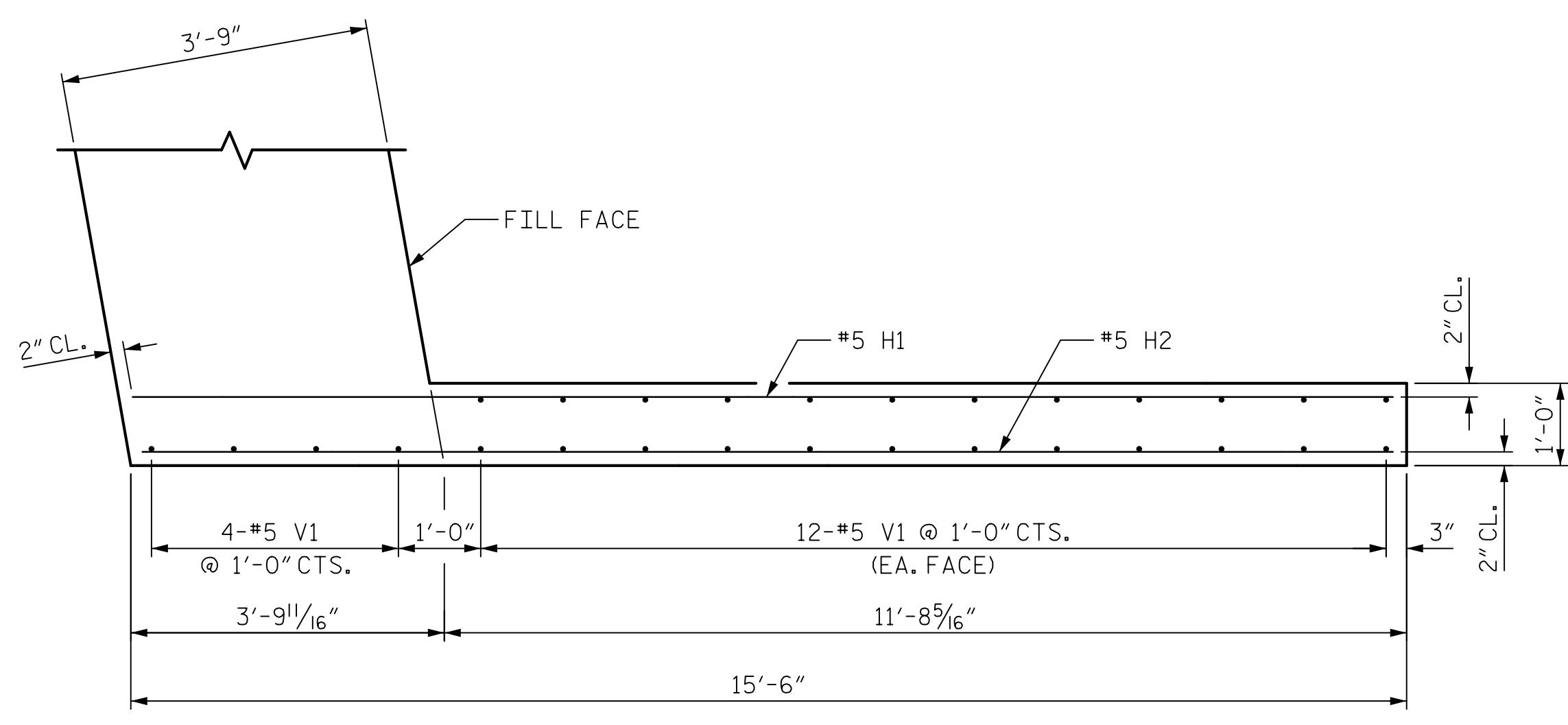
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL  
 END BENT #1  
 WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 2/2/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

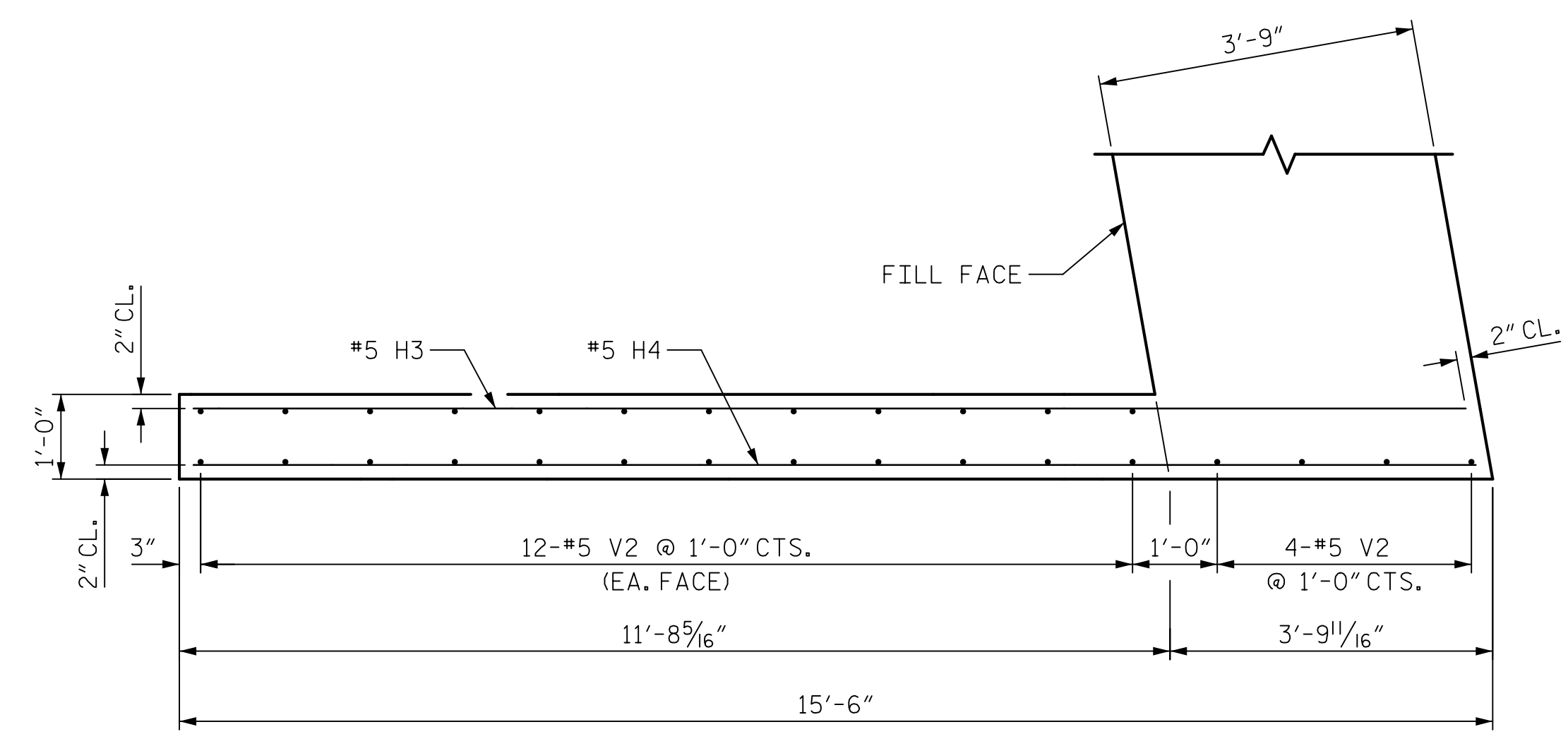
PLANS PREPARED BY:  
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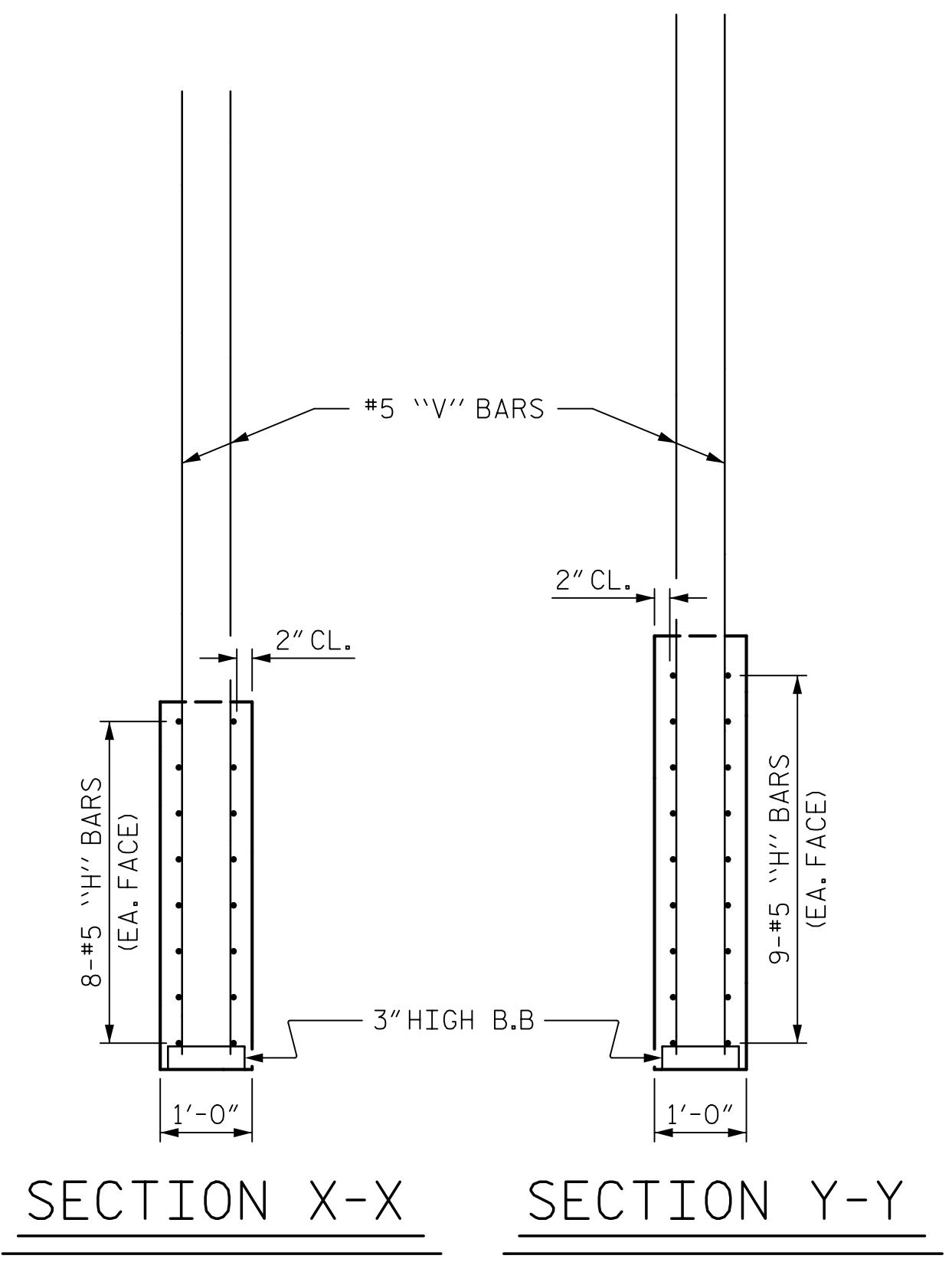
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-17
1			3			TOTAL SHEETS
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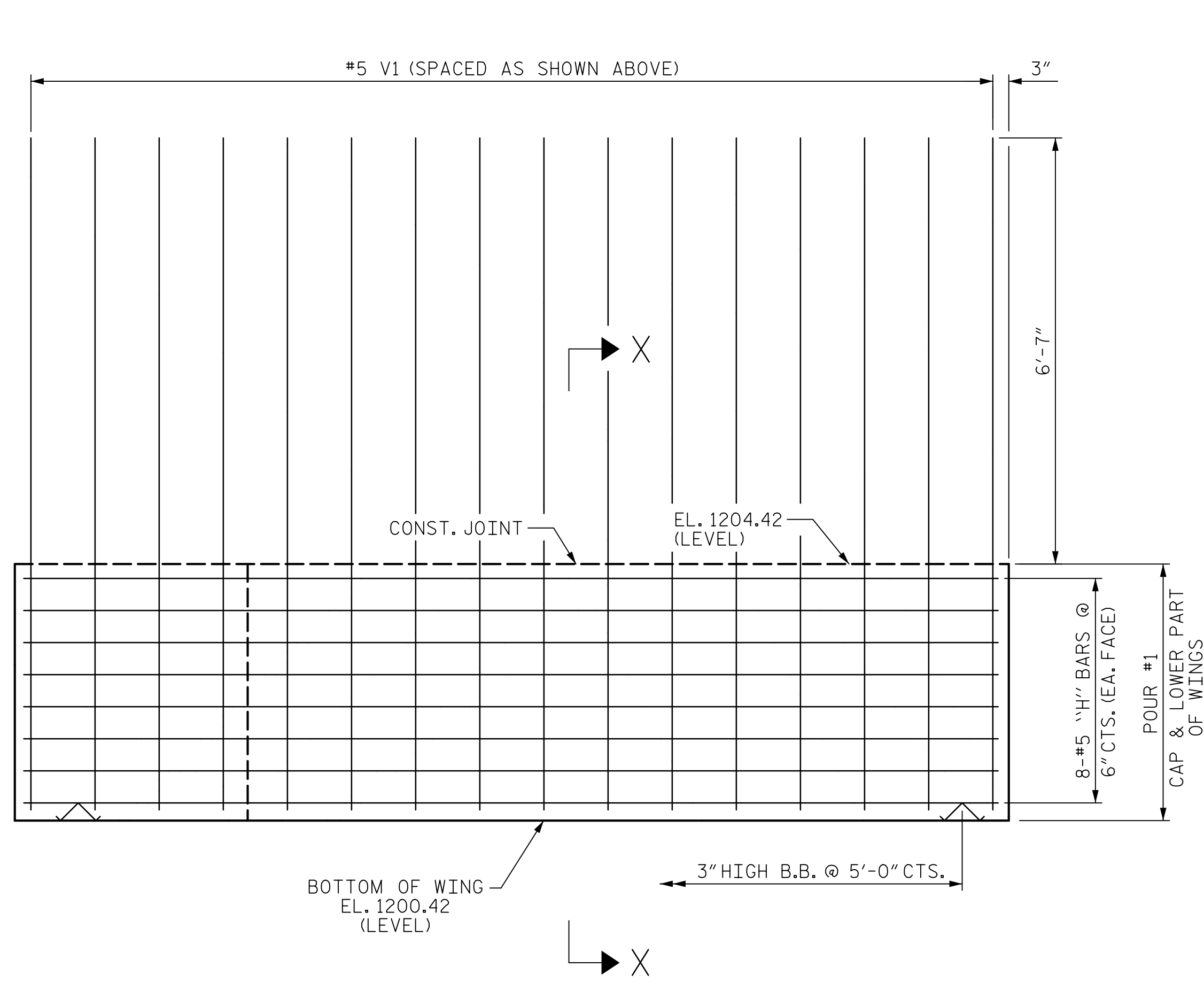
PLAN - BOTTOM OF WING (W1)



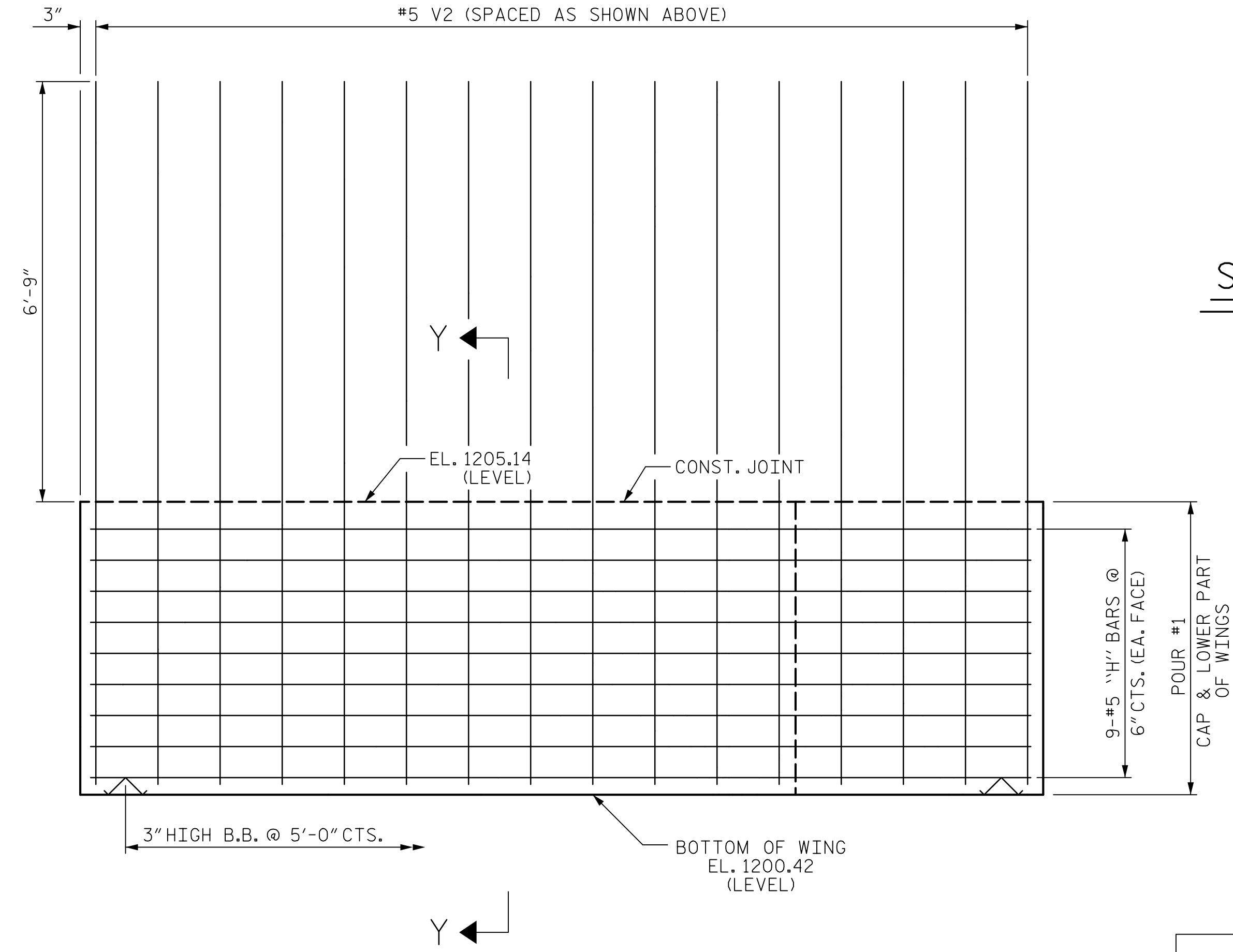
PLAN - BOTTOM OF WING (W2)



SECTION X-X SECTION Y-Y

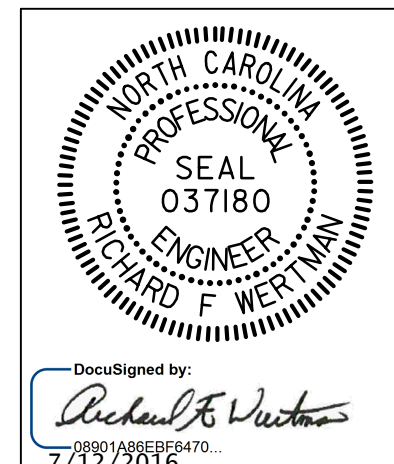


ELEVATION - BOTTOM OF WING (W1)



ELEVATION - BOTTOM OF WING (W2)

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 4



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

DRAWN BY: T.J. KIRSCHBAUM DATE: 2/2/16  
 CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
 DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

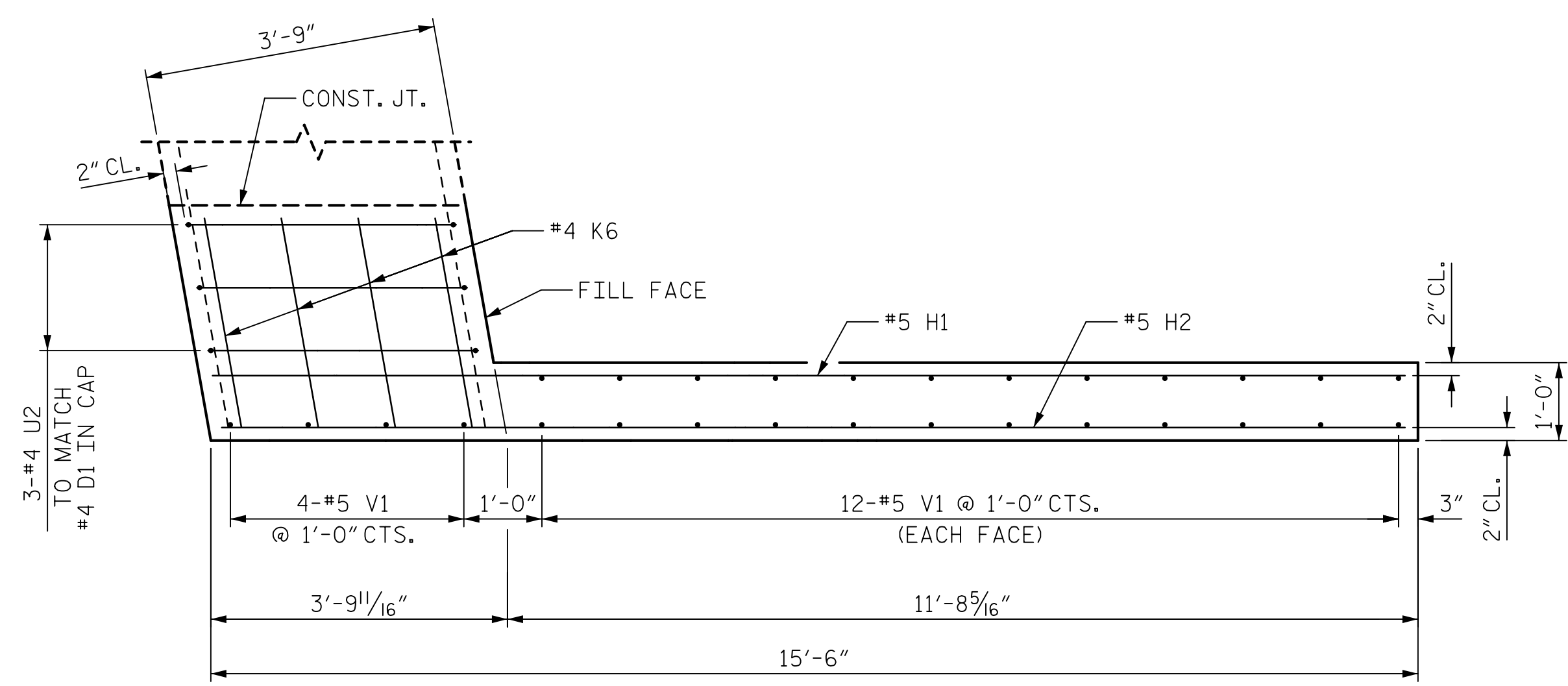
PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
 NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

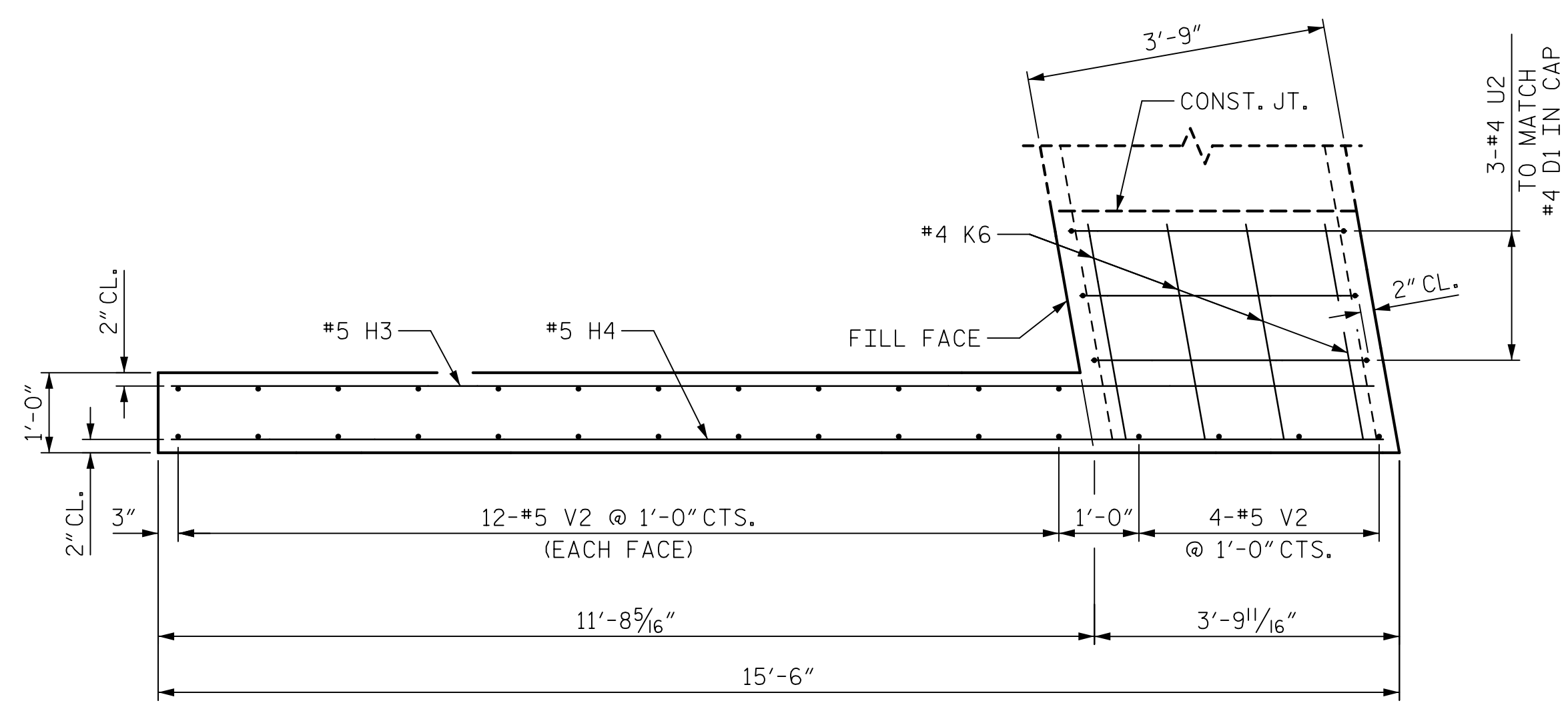
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 28

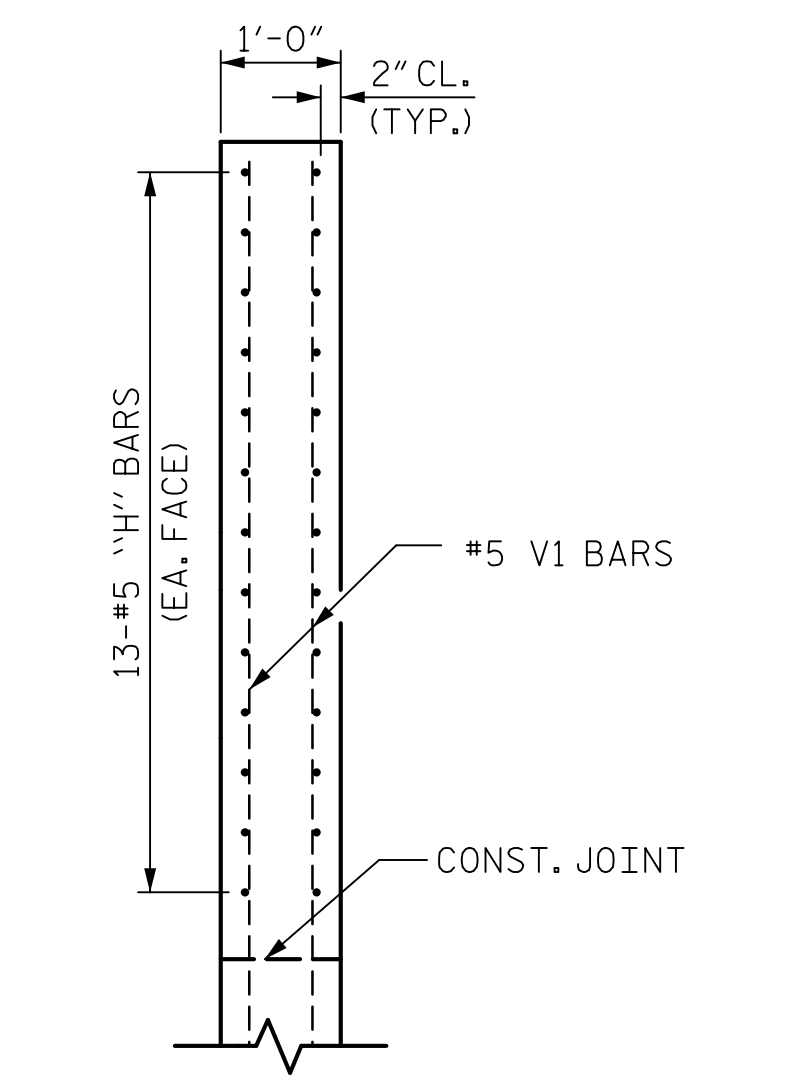




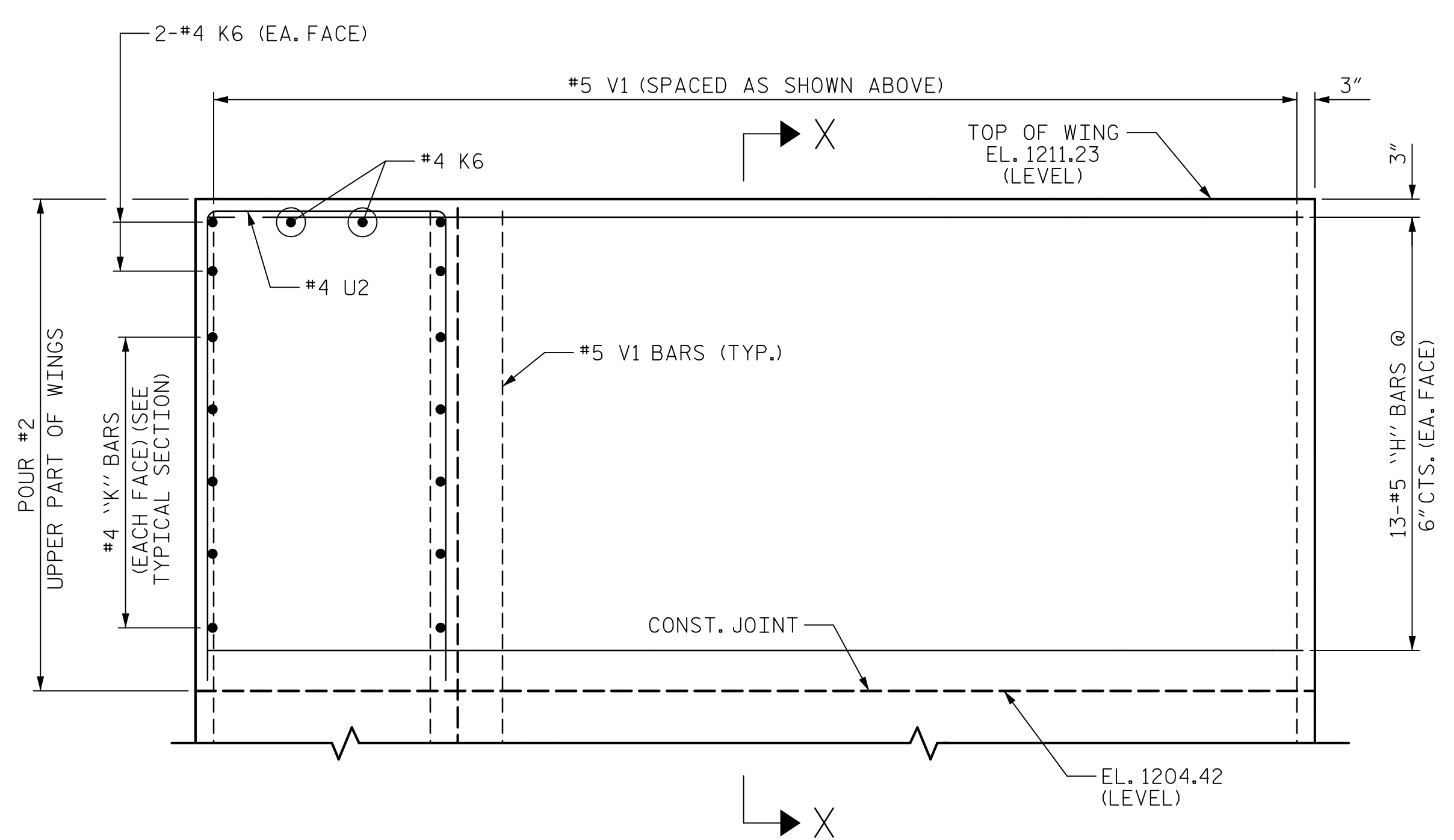
PLAN - TOP OF WING (W1)



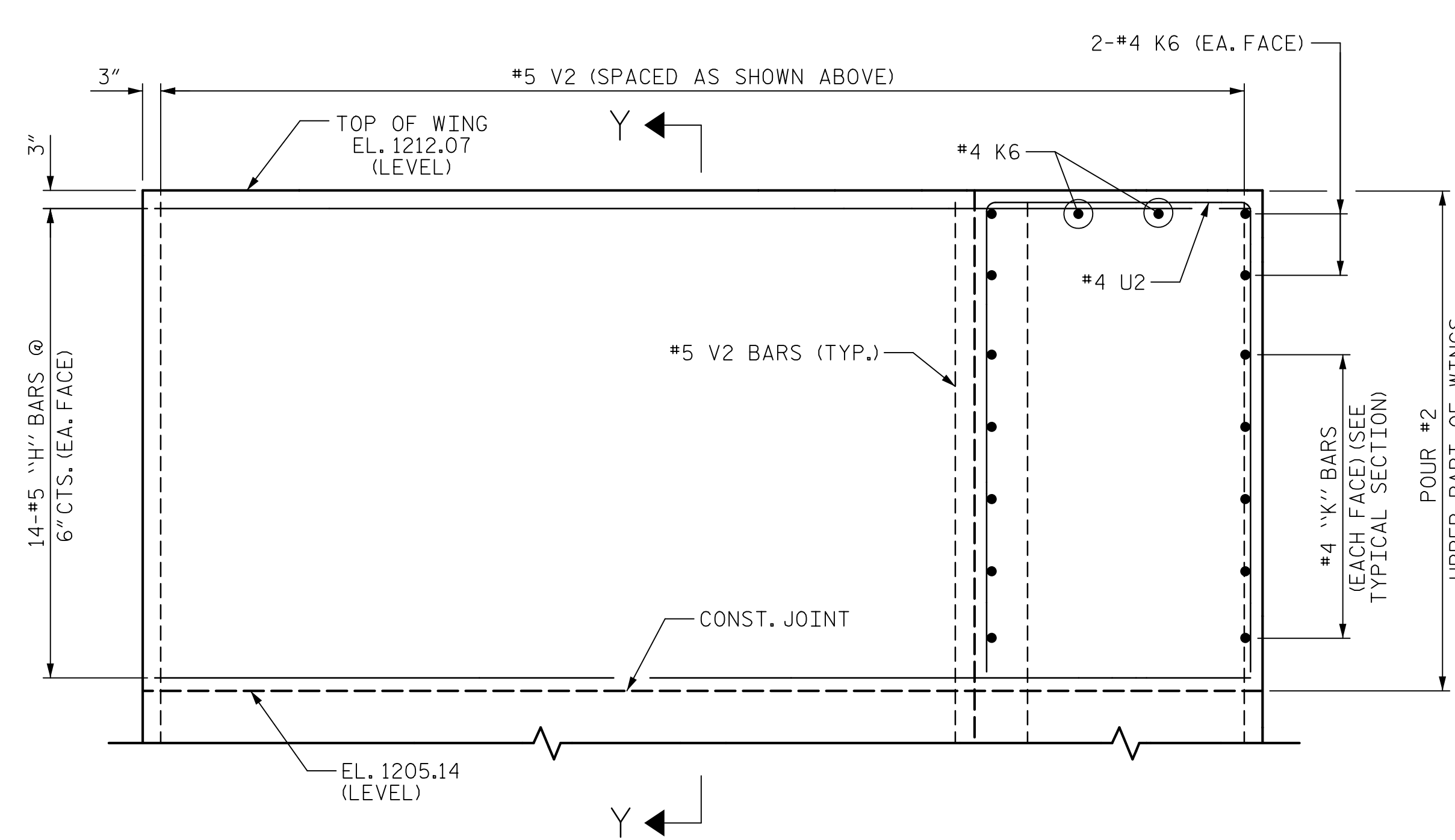
PLAN - TOP OF WING (W2)



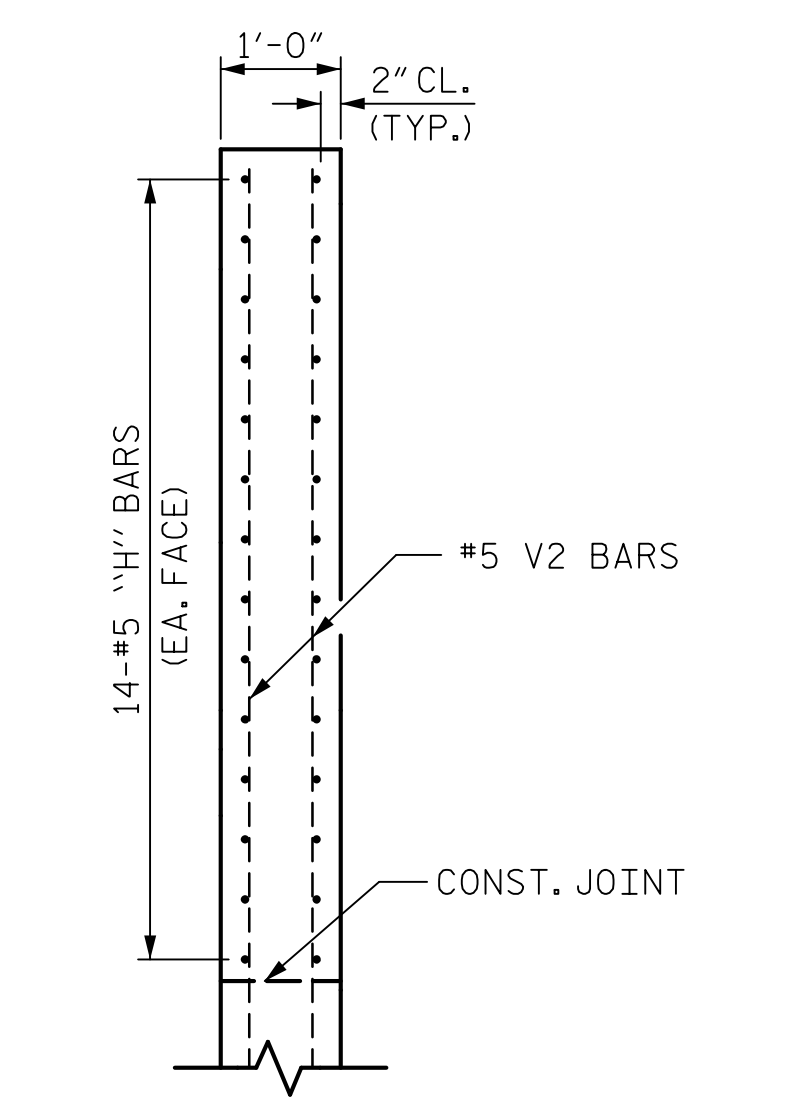
SECTION X-X



ELEVATION - TOP OF WING (W1)



ELEVATION - TOP OF WING (W2)



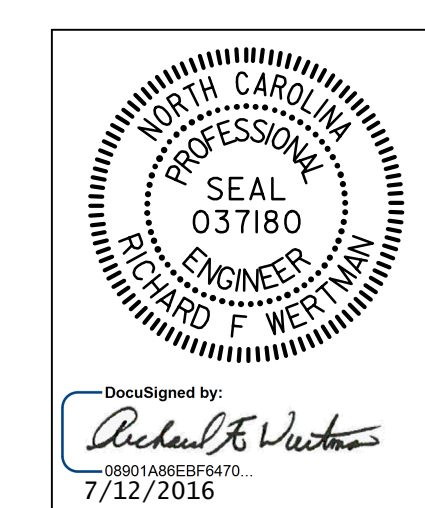
SECTION Y-Y

NOTES:  
THE UPPER PART OF THE WINGS (POUR #2)  
SHALL BE POURED AFTER THE SUPERSTRUCTURE.

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-  
SHEET 3 OF 4

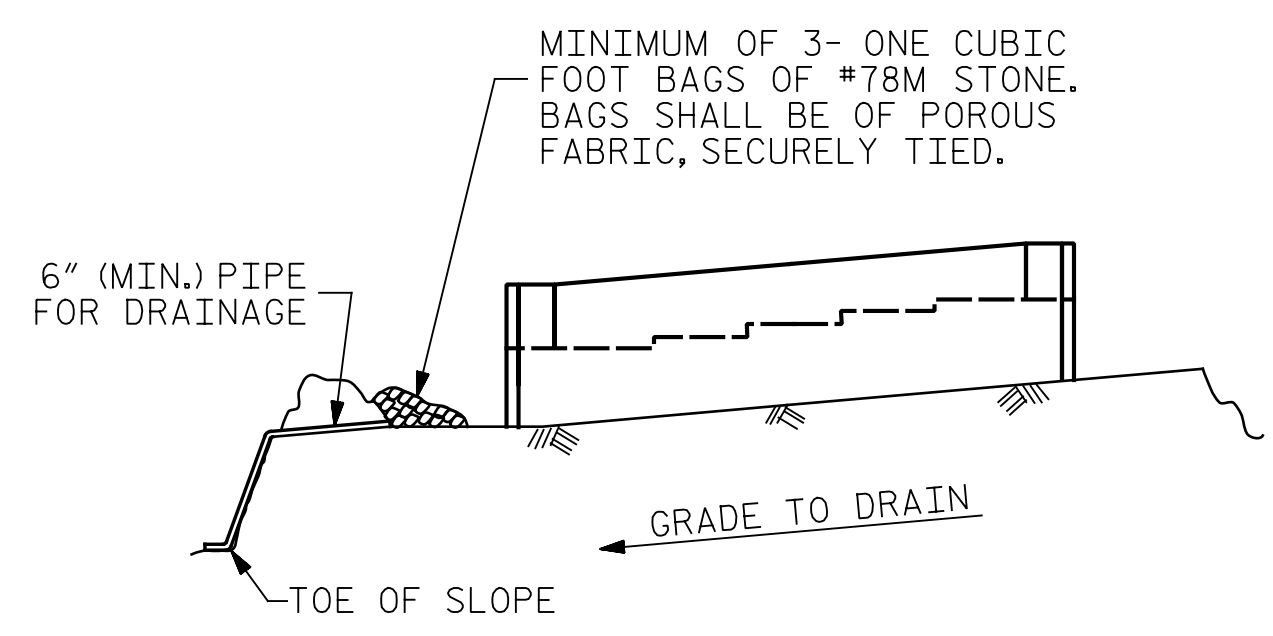
DRAWN BY: T.J. KIRSCHBAUM DATE: 2/2/16  
CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

PLANS PREPARED BY:  
**Gannett Fleming**  
2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
NC Lic. No. F-0270



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT #1 WESTBOUND LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S01-19					TOTAL SHEETS 28

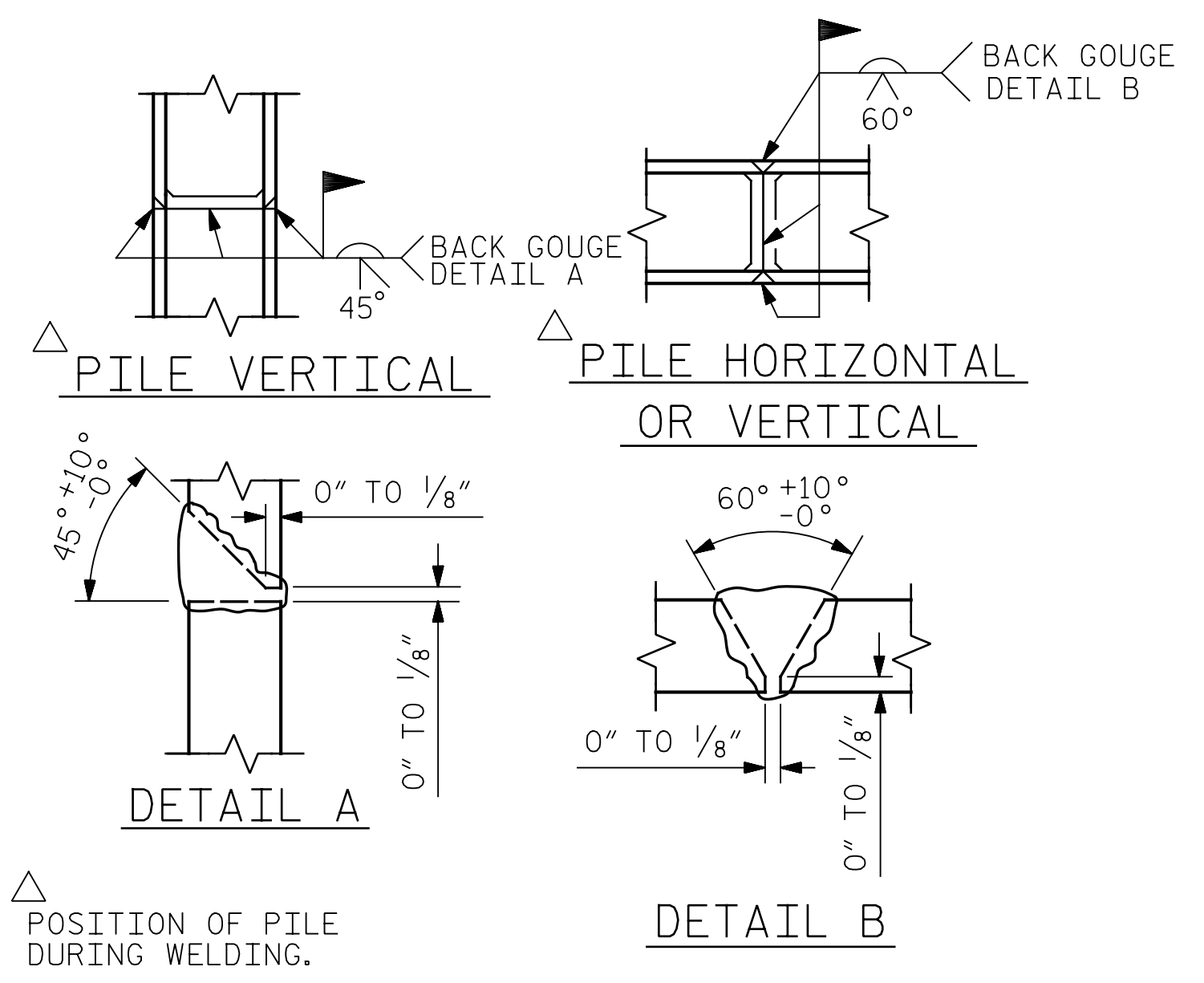


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

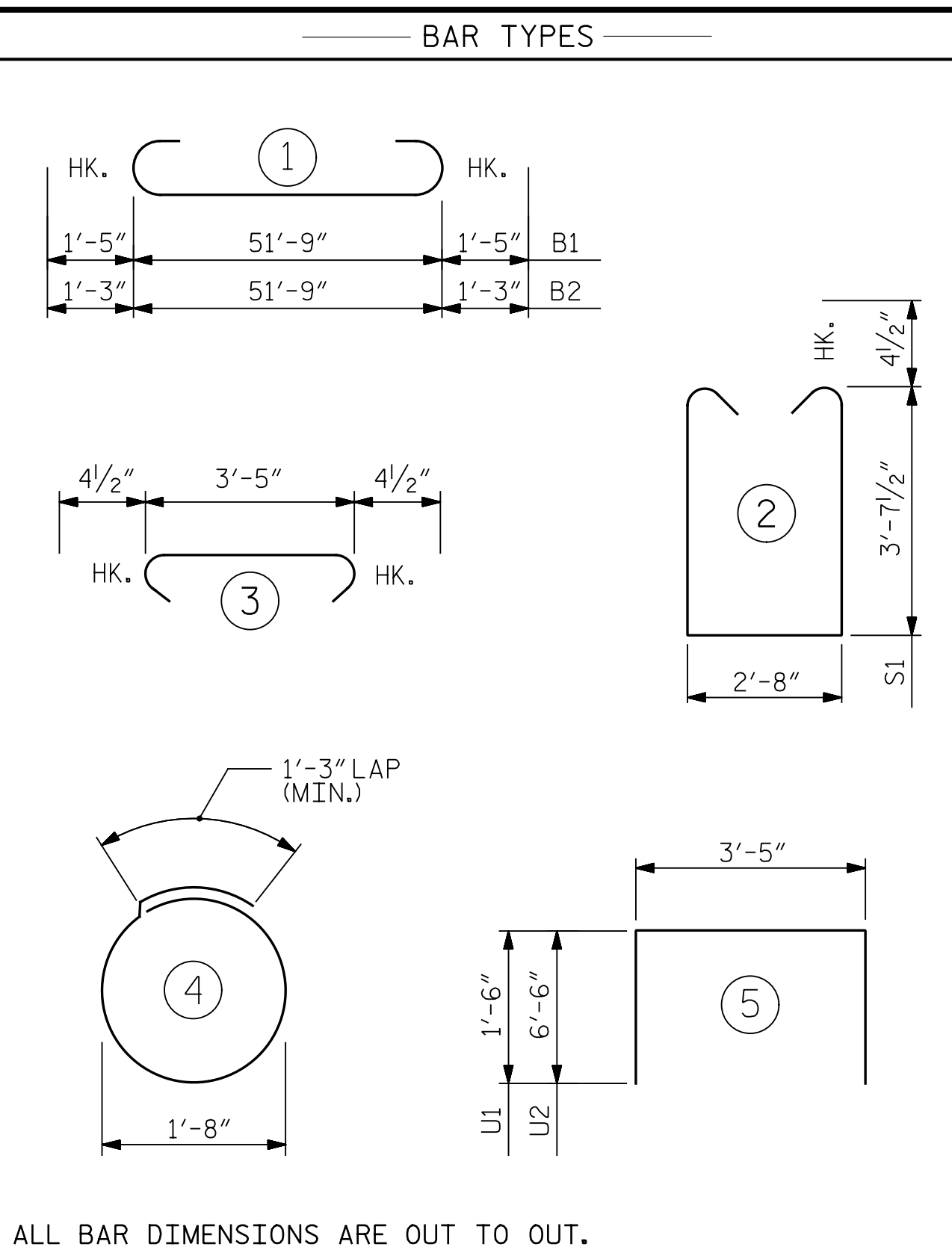
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

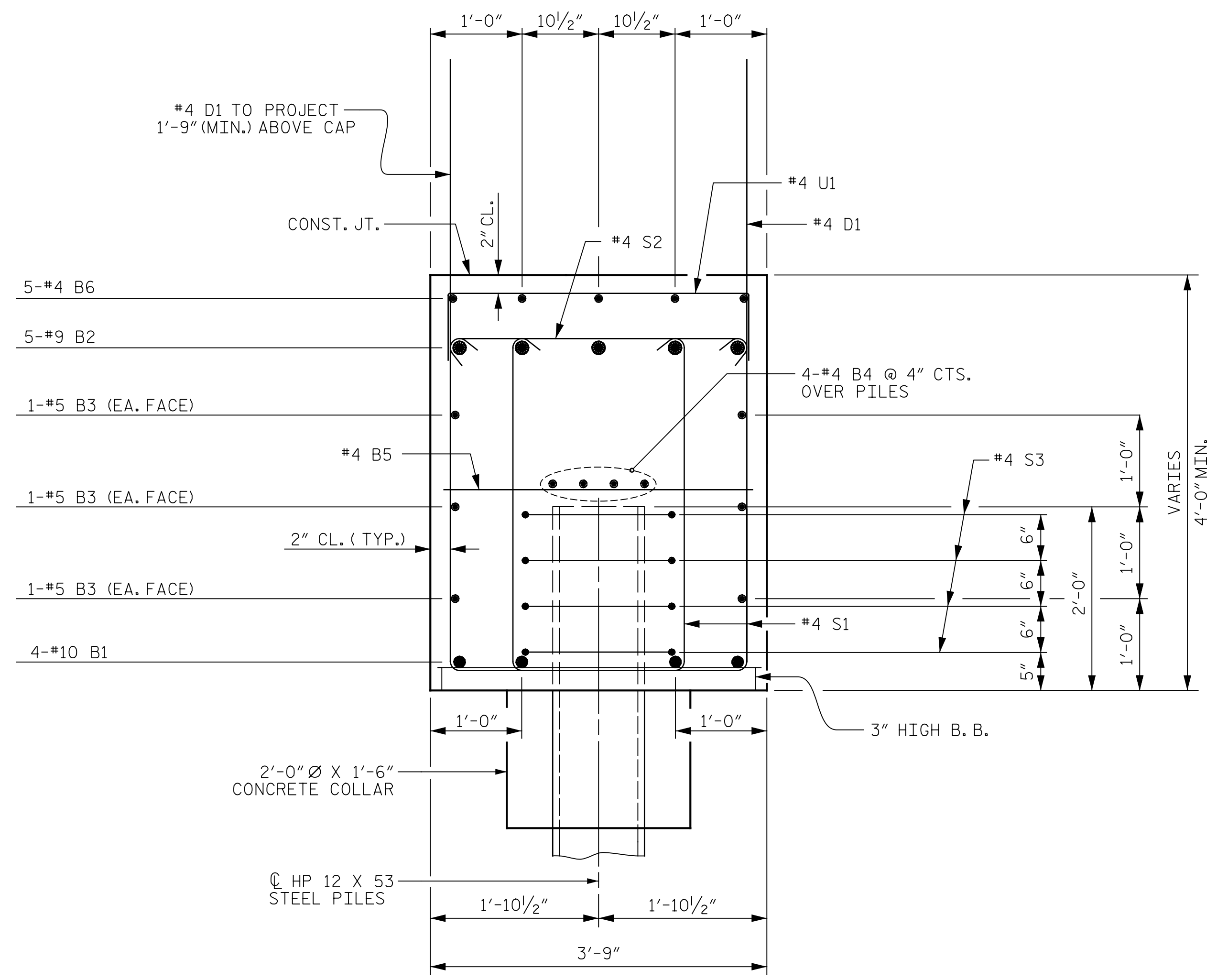
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPLICE DETAILS**



BILL OF MATERIAL					
END BENT #1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-7"	940
B2	5	#9	1	54'-3"	922
B3	6	#5	STR	51'-9"	324
B4	8	#4	STR	27'-1"	145
B5	13	#4	STR	3'-5"	30
B6	5	#4	STR	19'-0"	63
B7	1	#4	STR	7'-7"	5
B8	1	#4	STR	7'-9"	5
B9	1	#4	STR	7'-11"	5
B10	1	#4	STR	8'-0"	5
B11	1	#4	STR	8'-2"	5
D1	84	#4	STR	6'-5"	360
H1	21	#5	STR	15'-3"	334
H2	21	#5	STR	15'-2"	332
H3	23	#5	STR	15'-0"	360
H4	23	#5	STR	15'-1"	362
K6	12	#4	STR	2'-8"	21
S1	108	#4	2	10'-8"	770
S2	54	#4	3	4'-2"	150
S3	44	#4	4	6'-6"	191
U1	13	#4	5	6'-5"	56
U2	6	#4	5	16'-5"	66
V1	28	#5	STR	10'-5"	304
V2	28	#5	STR	11'-3"	329



**SECTION A-A**

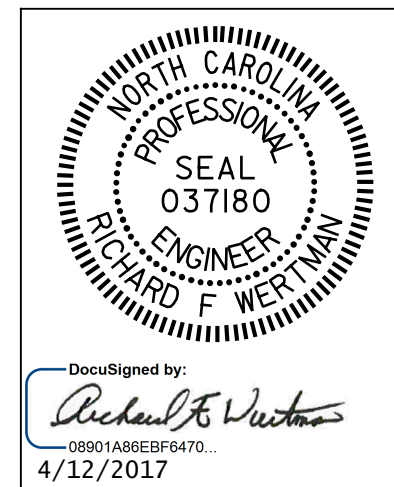
PROJECT NO. B-4447

BURKE COUNTY

STATION: 25+85.40 -L-

15+67.23 -Y-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1

WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 2/2/16

CHECKED BY : R.F. WERTMAN DATE : 4/6/16

DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

PLANS PREPARED BY:

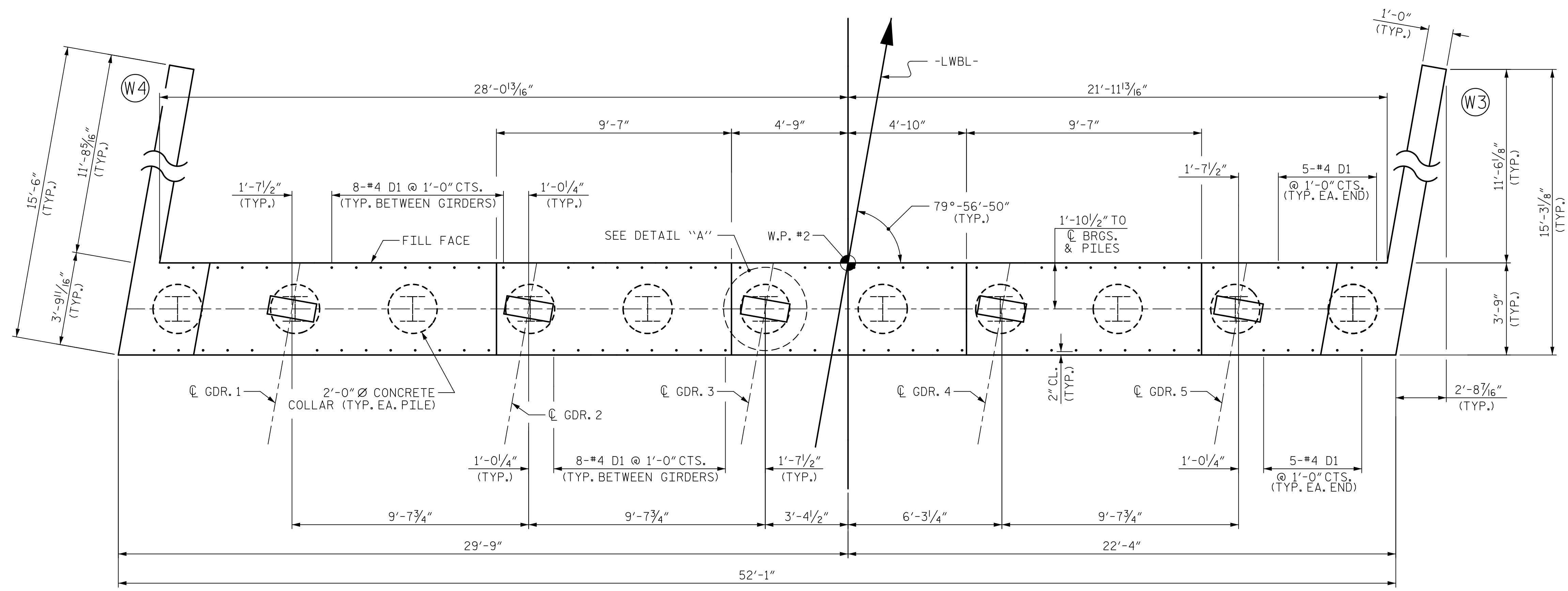
**Gannett Fleming**

2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
NC Lic. No. F-0270

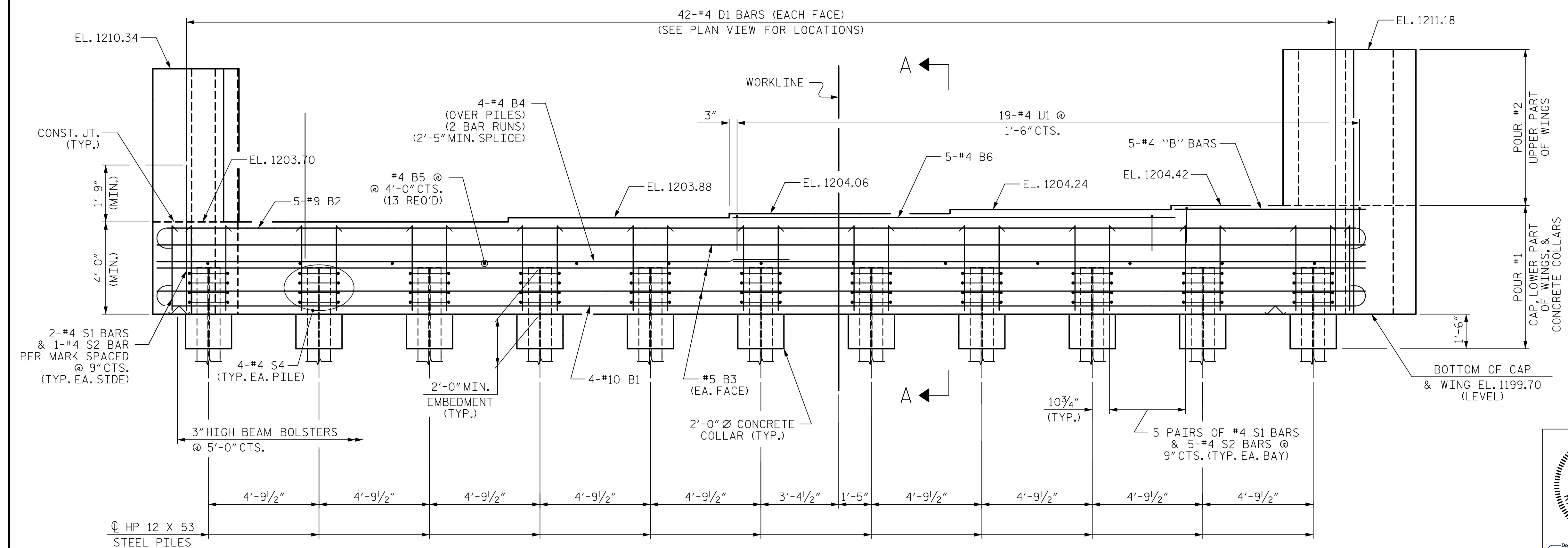
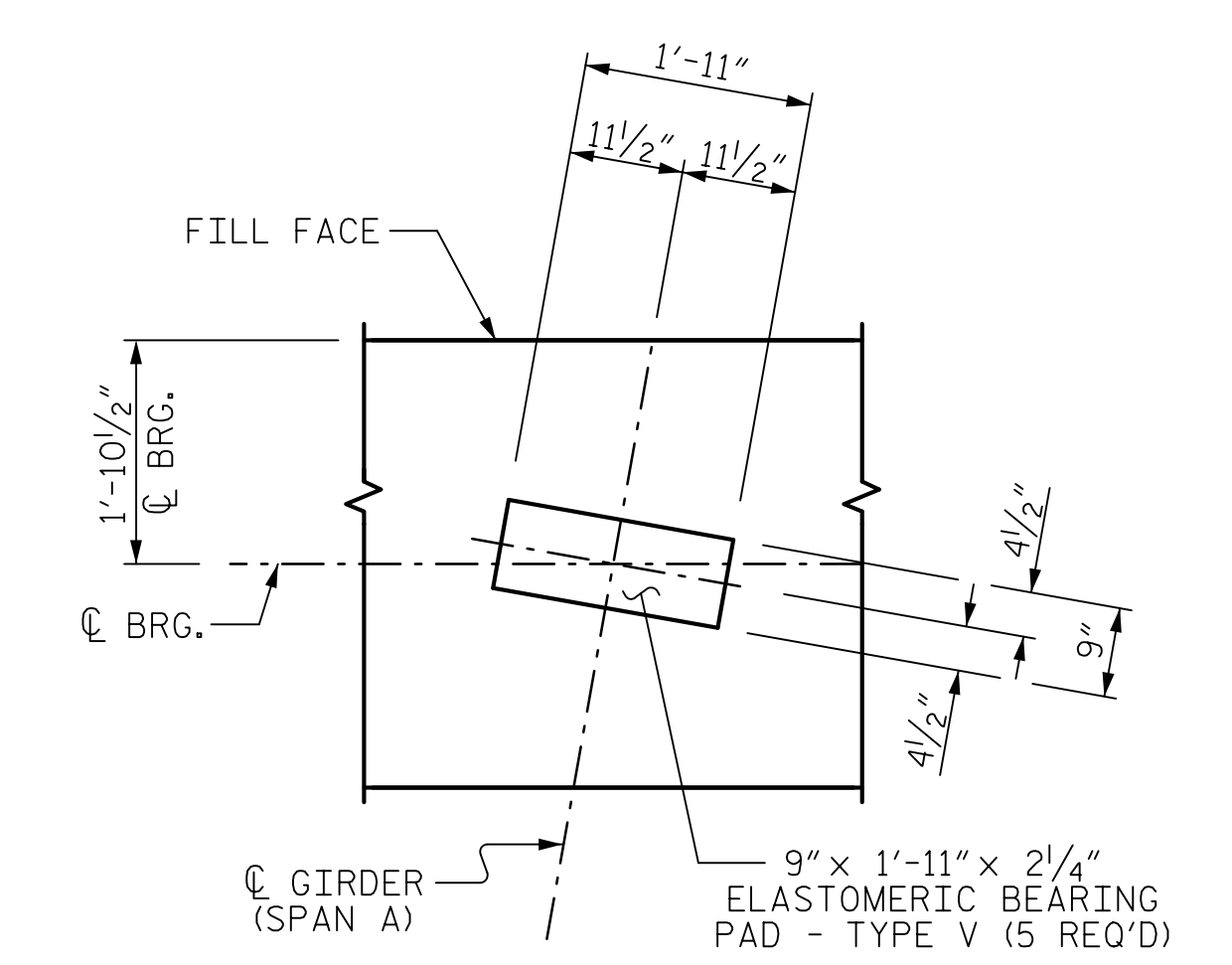
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-20
1			3			TOTAL SHEETS
2			4			28

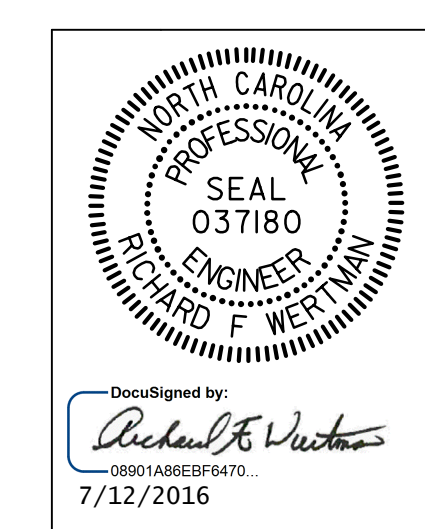




**NOTES:**  
 INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 #4 D1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.  
 THE UPPER PART OF THE WINGS (POUR #2) SHALL BE POURED AFTER THE SUPERSTRUCTURE.



PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 1 OF 4



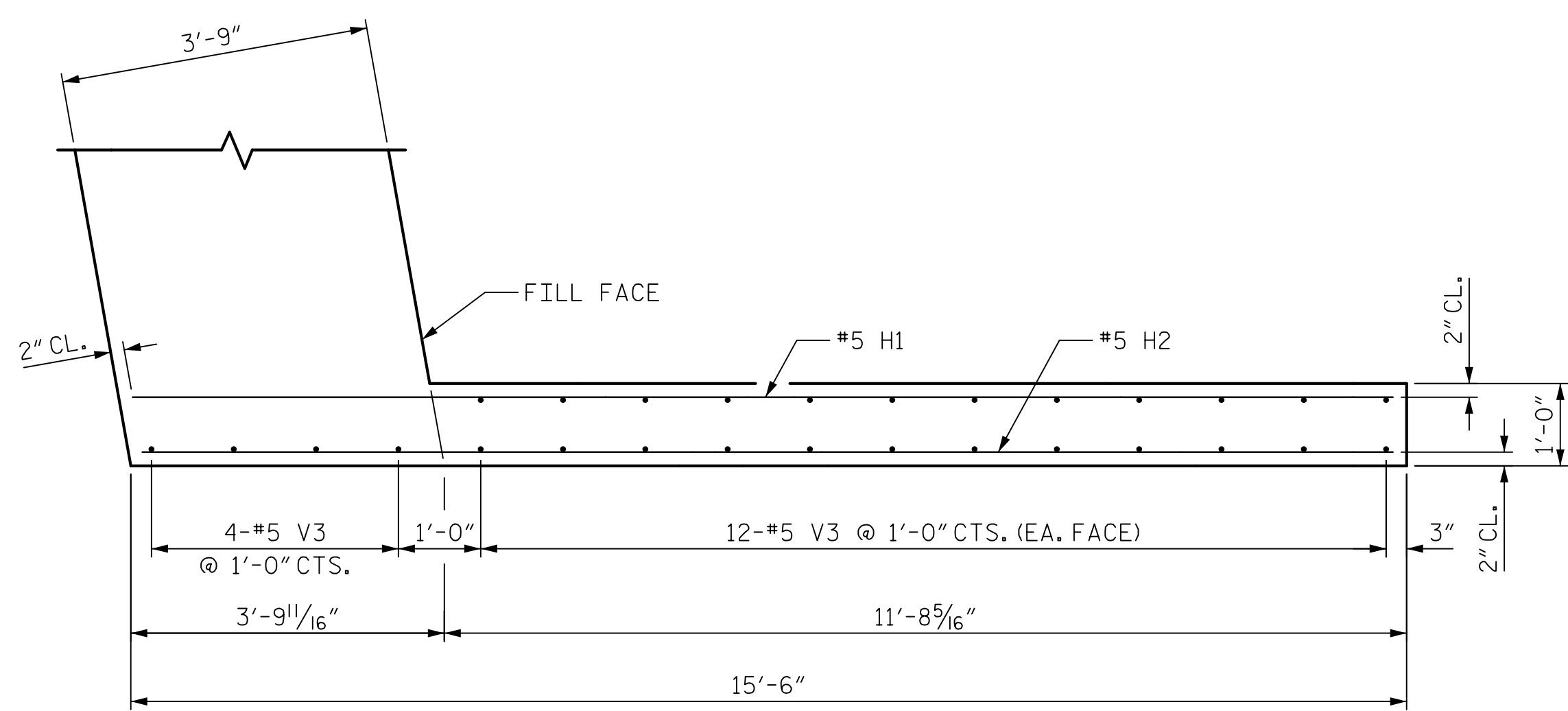
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL  
 END BENT #2  
 WESTBOUND LANE

DRAWN BY: T.J. KIRSCHBAUM DATE: 2/2/16  
 CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
 DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

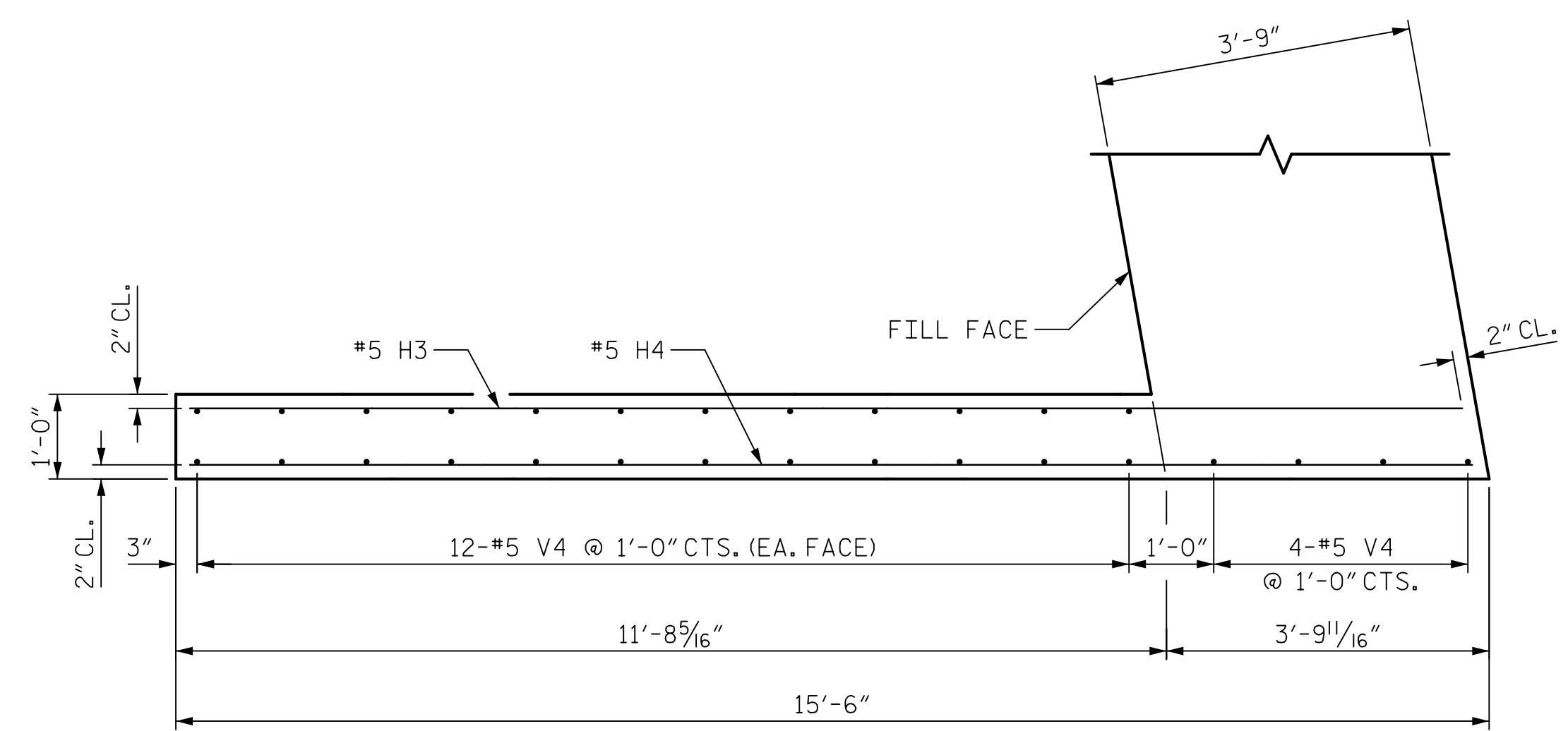
PLANS PREPARED BY:  
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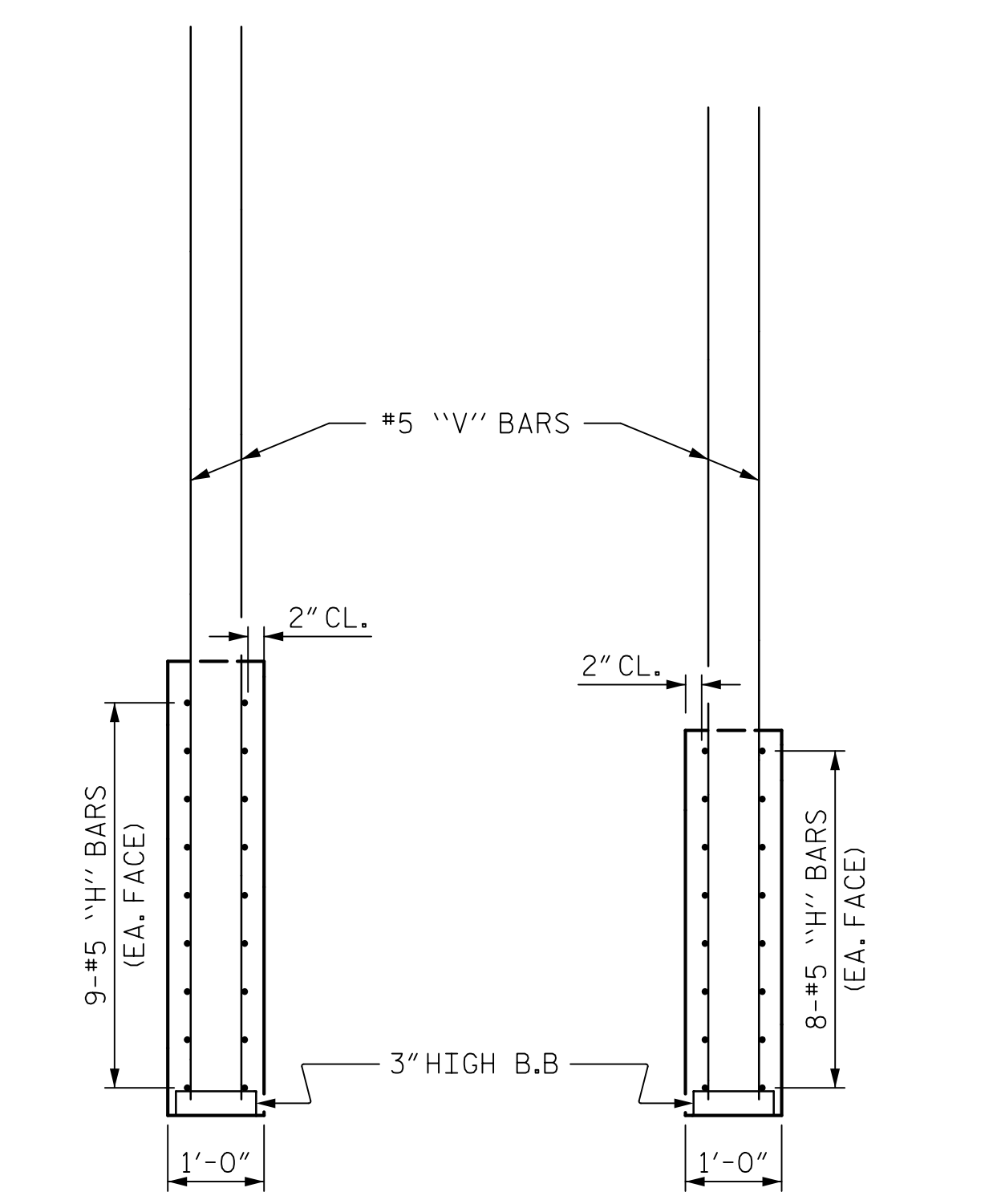
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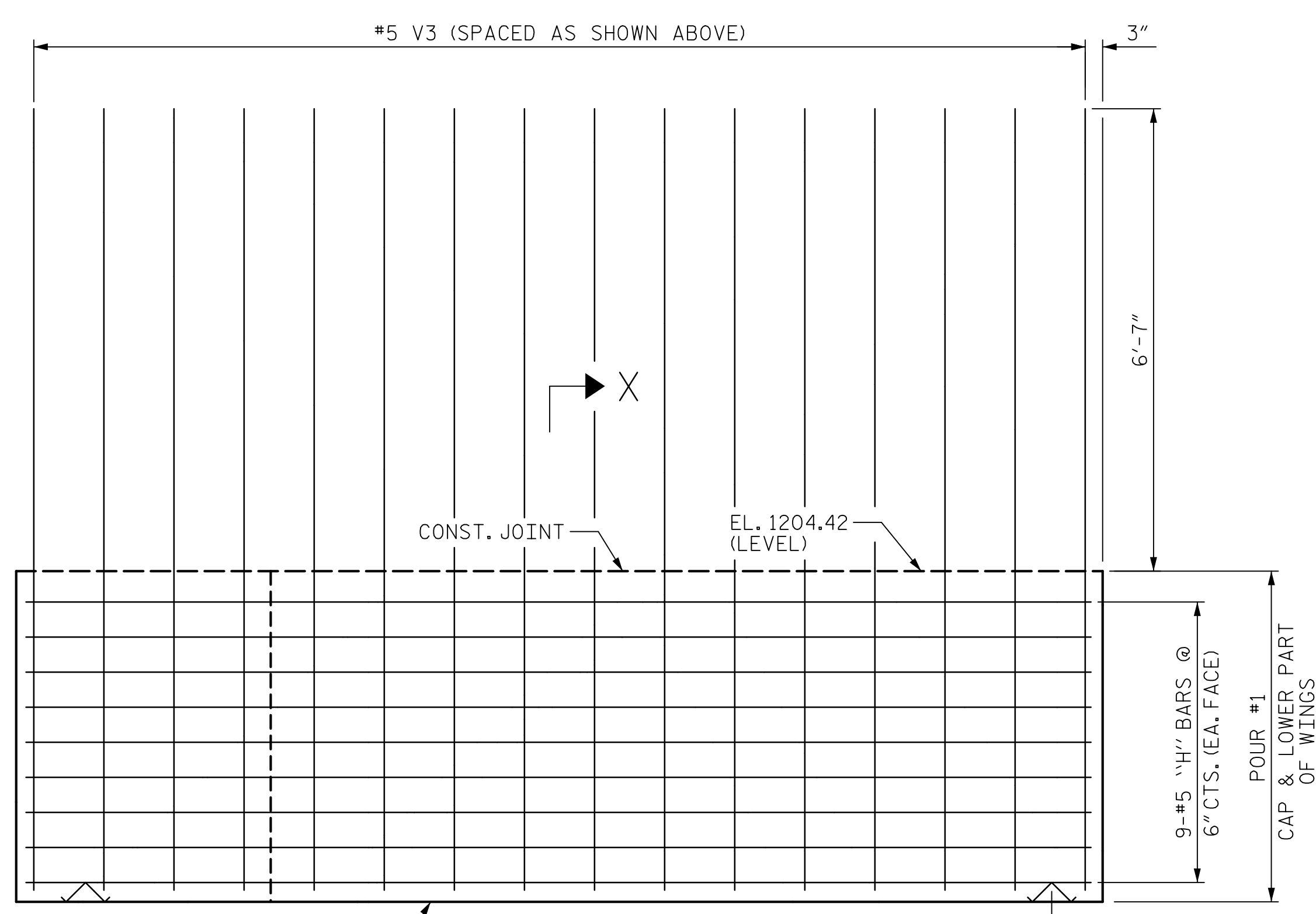
PLAN - BOTTOM OF WING (W3)



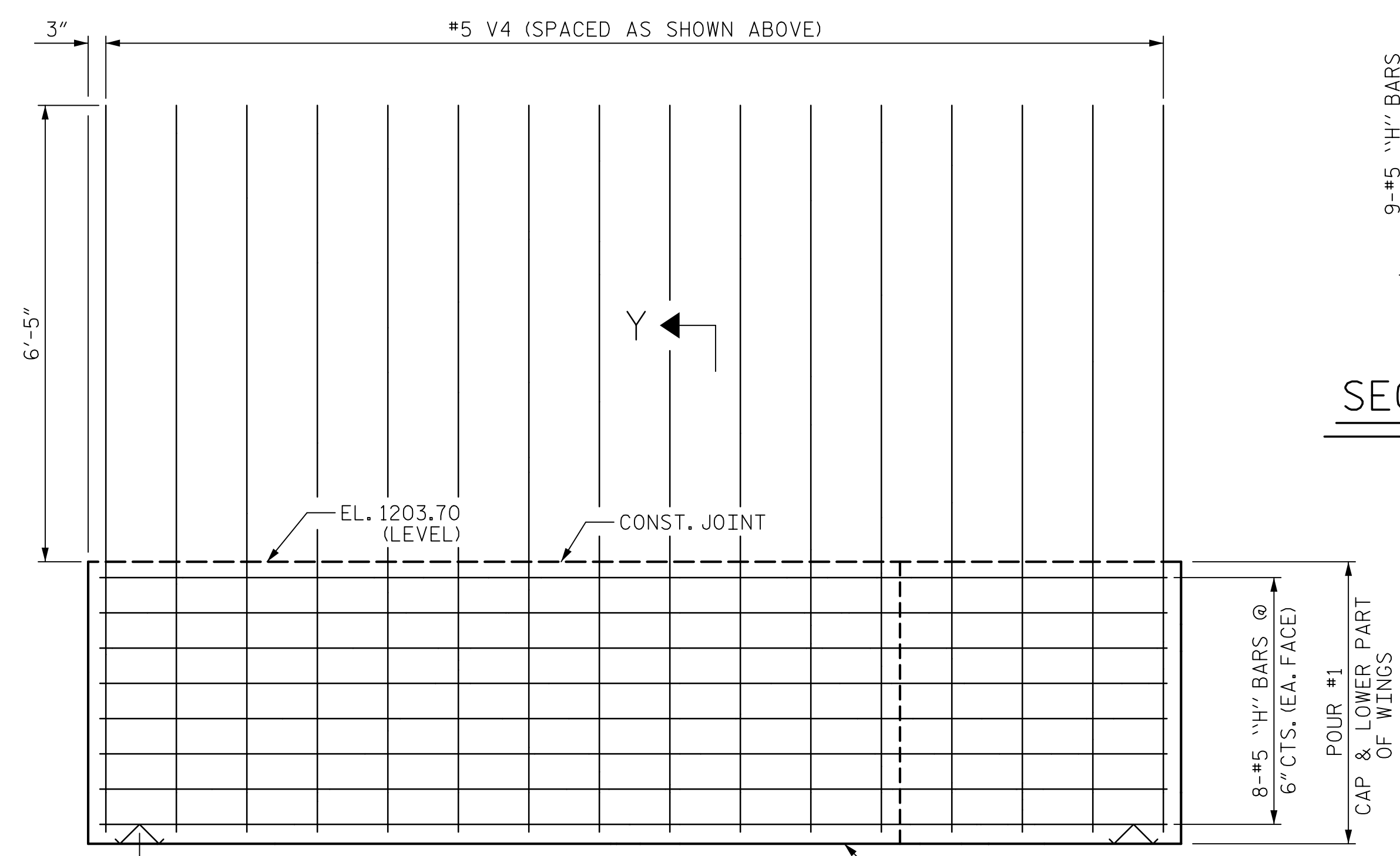
PLAN - BOTTOM OF WING (W4)



SECTION X-X SECTION Y-Y

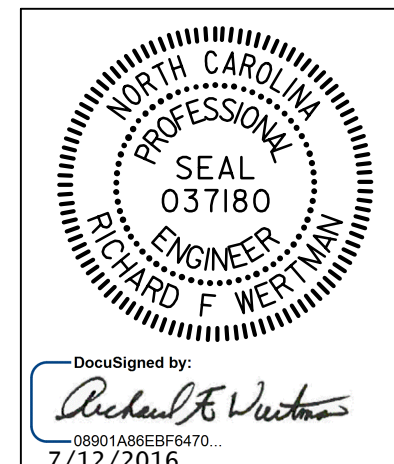


ELEVATION - BOTTOM OF WING (W3)



ELEVATION - BOTTOM OF WING (W4)

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 4



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

DRAWN BY : T.J. KIRSCHBAUM DATE : 2/2/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

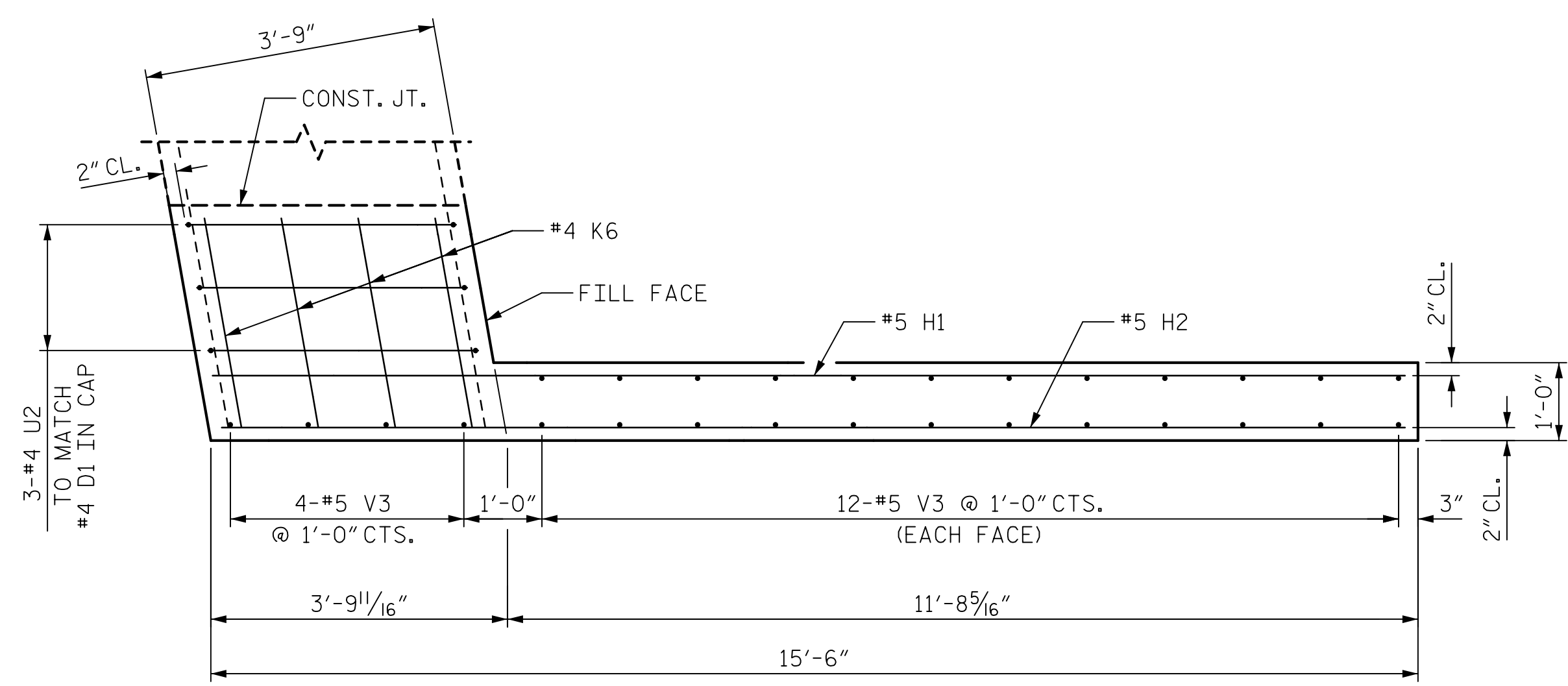
PLANS PREPARED BY:  
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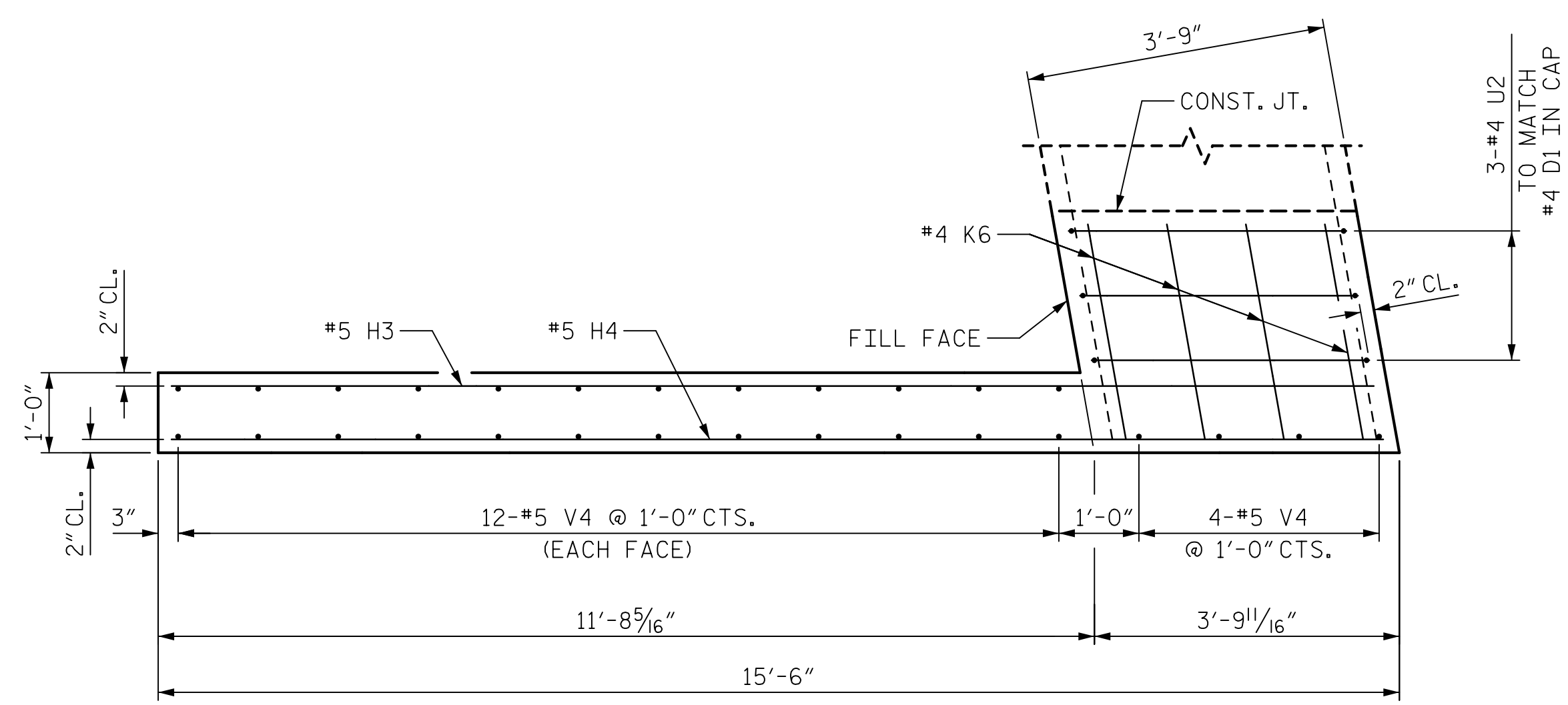
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TOTAL SHEETS 28

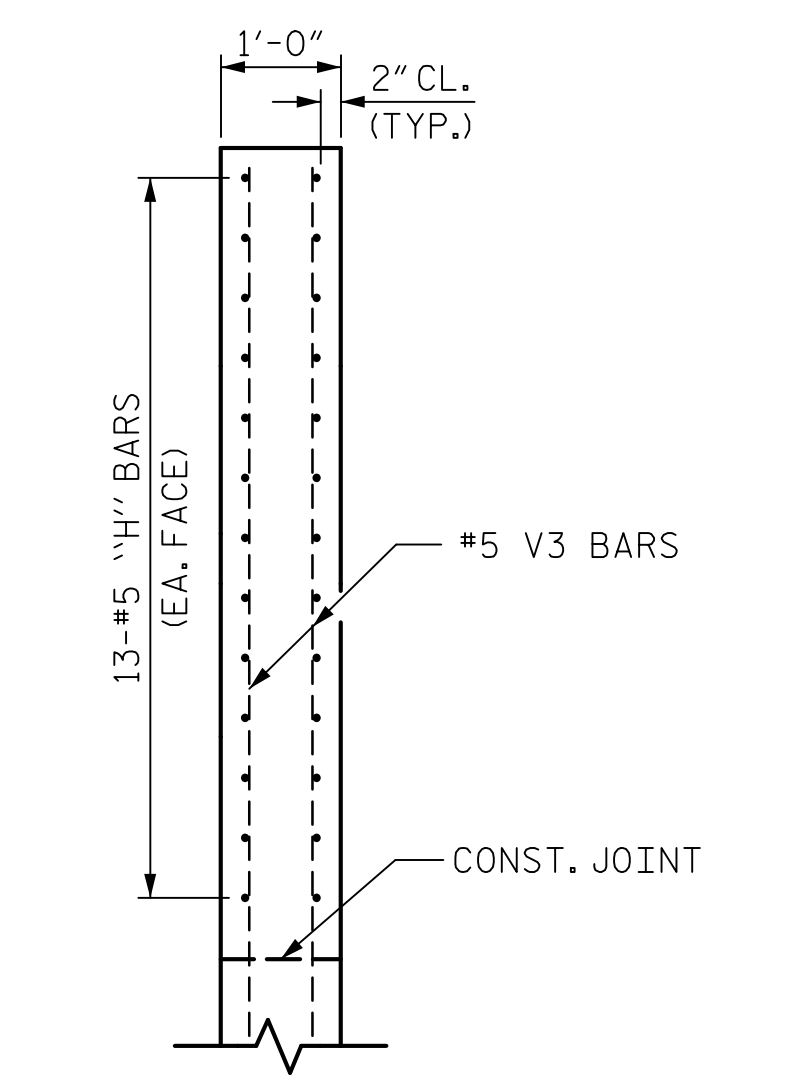




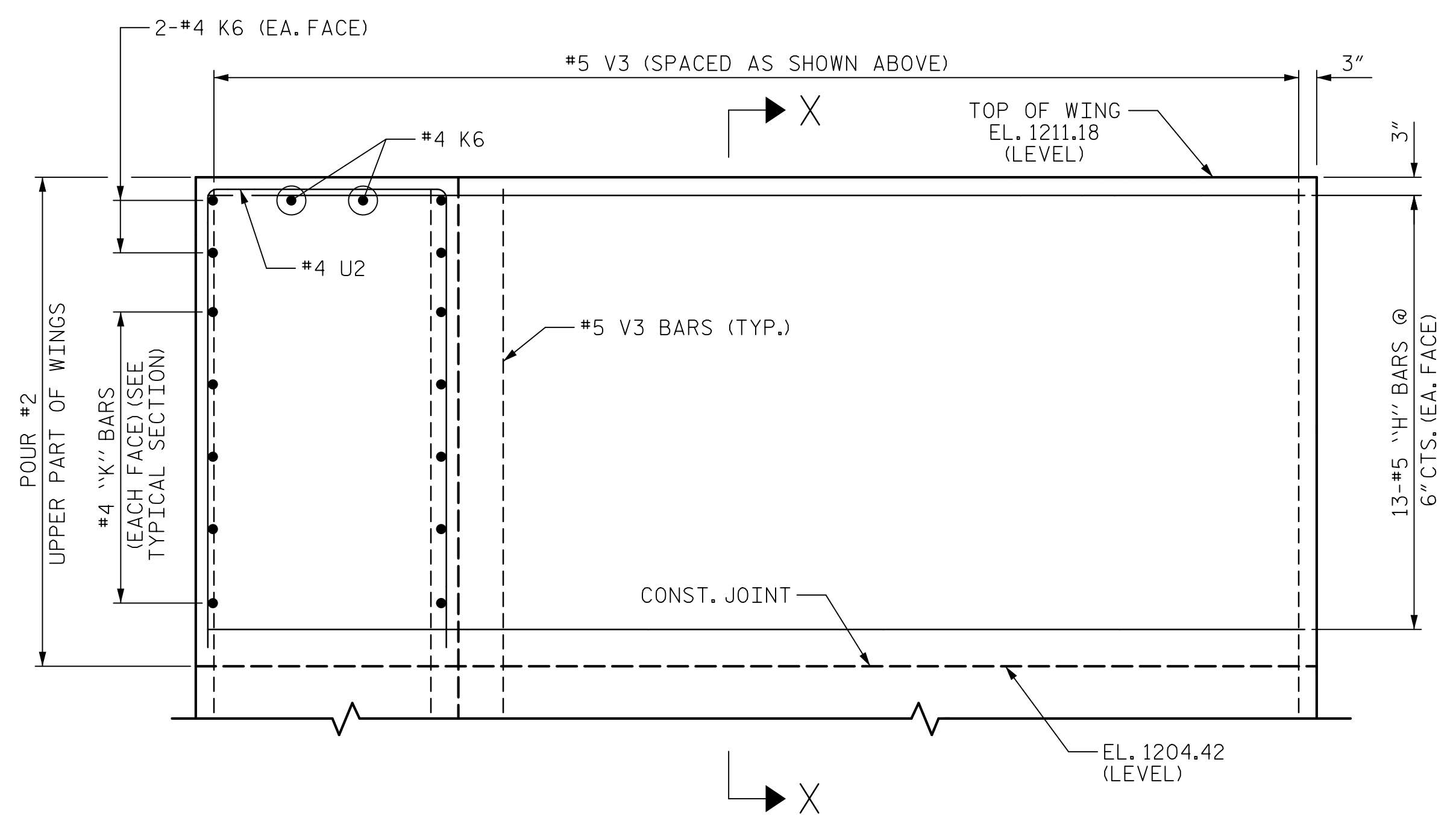
PLAN - TOP OF WING (W3)



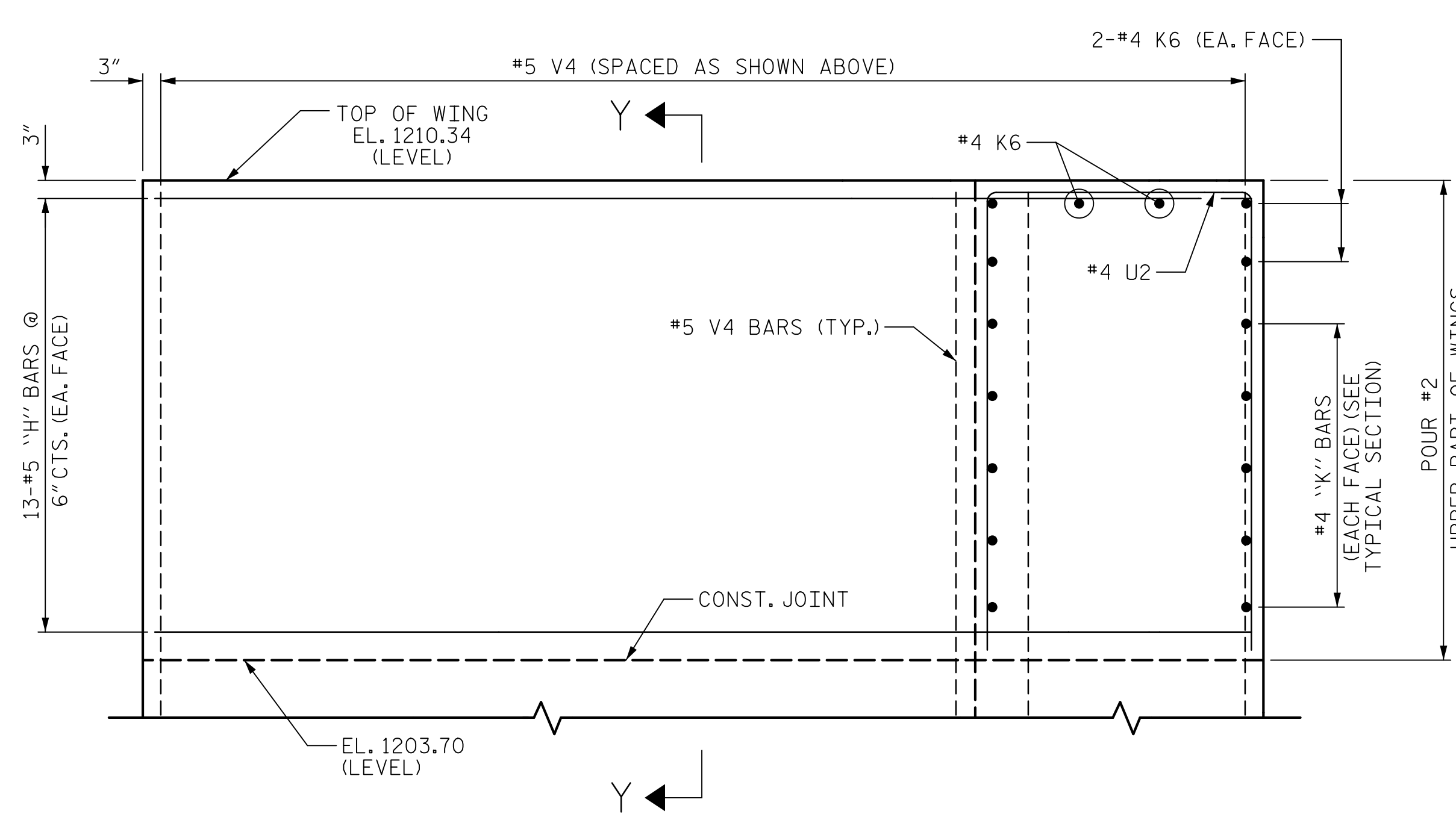
PLAN - TOP OF WING (W4)



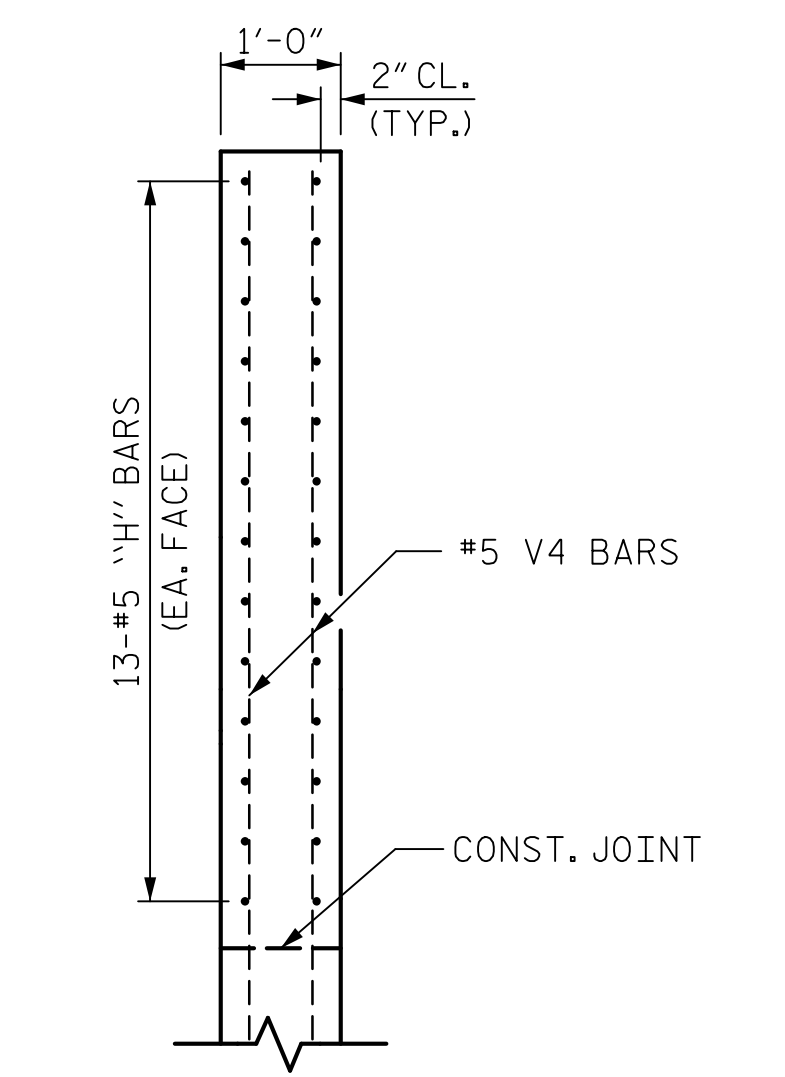
SECTION X-X



ELEVATION - TOP OF WING (W3)



ELEVATION - TOP OF WING (W4)



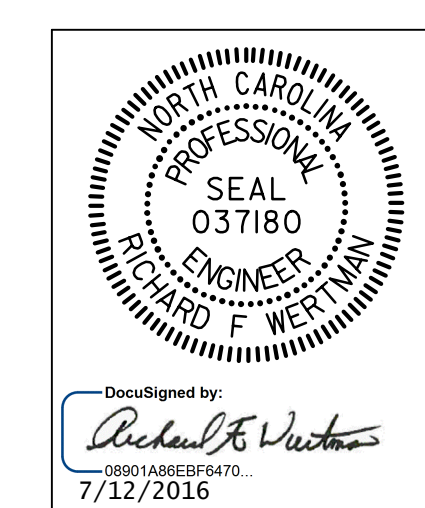
SECTION Y-Y

NOTES:  
THE UPPER PART OF THE WINGS (POUR #2)  
SHALL BE POURED AFTER THE SUPERSTRUCTURE.

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-  
SHEET 3 OF 4

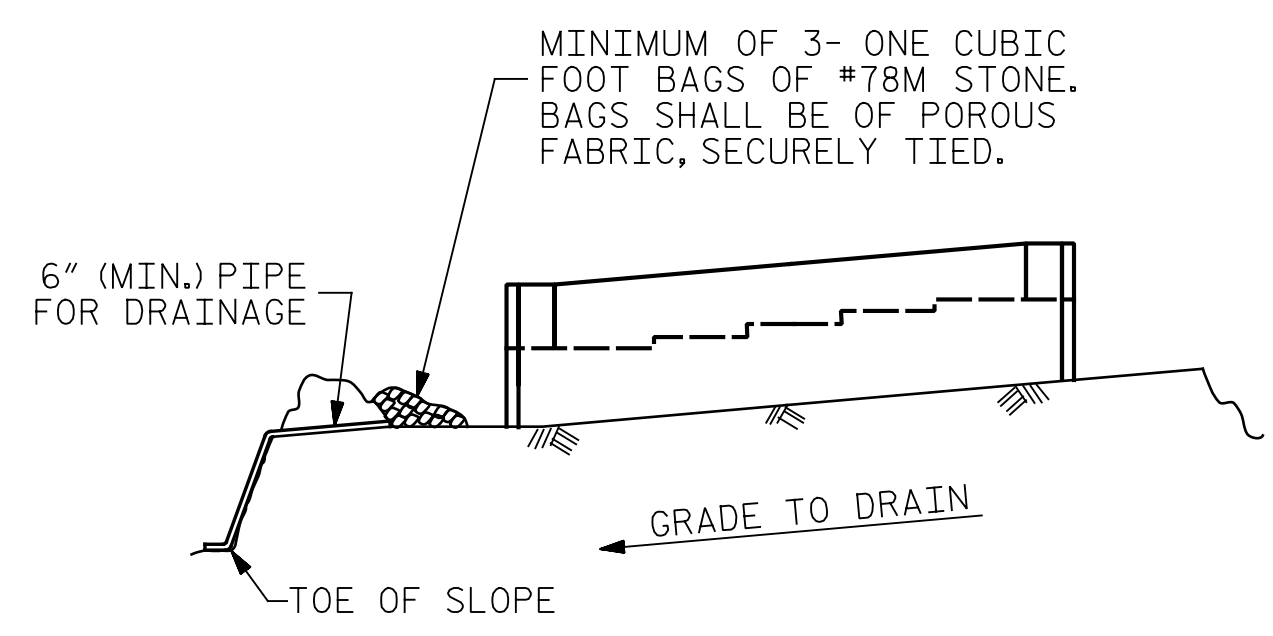
DRAWN BY: T.J. KIRSCHBAUM DATE: 2/2/16  
CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

PLANS PREPARED BY:  
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Raleigh, NC 27607-3073  
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NC Lic. No. F-0270



DOCUMENT NOT CONSIDERED  
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SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT #2 WESTBOUND LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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SHEET NO. S01-23					TOTAL SHEETS 28

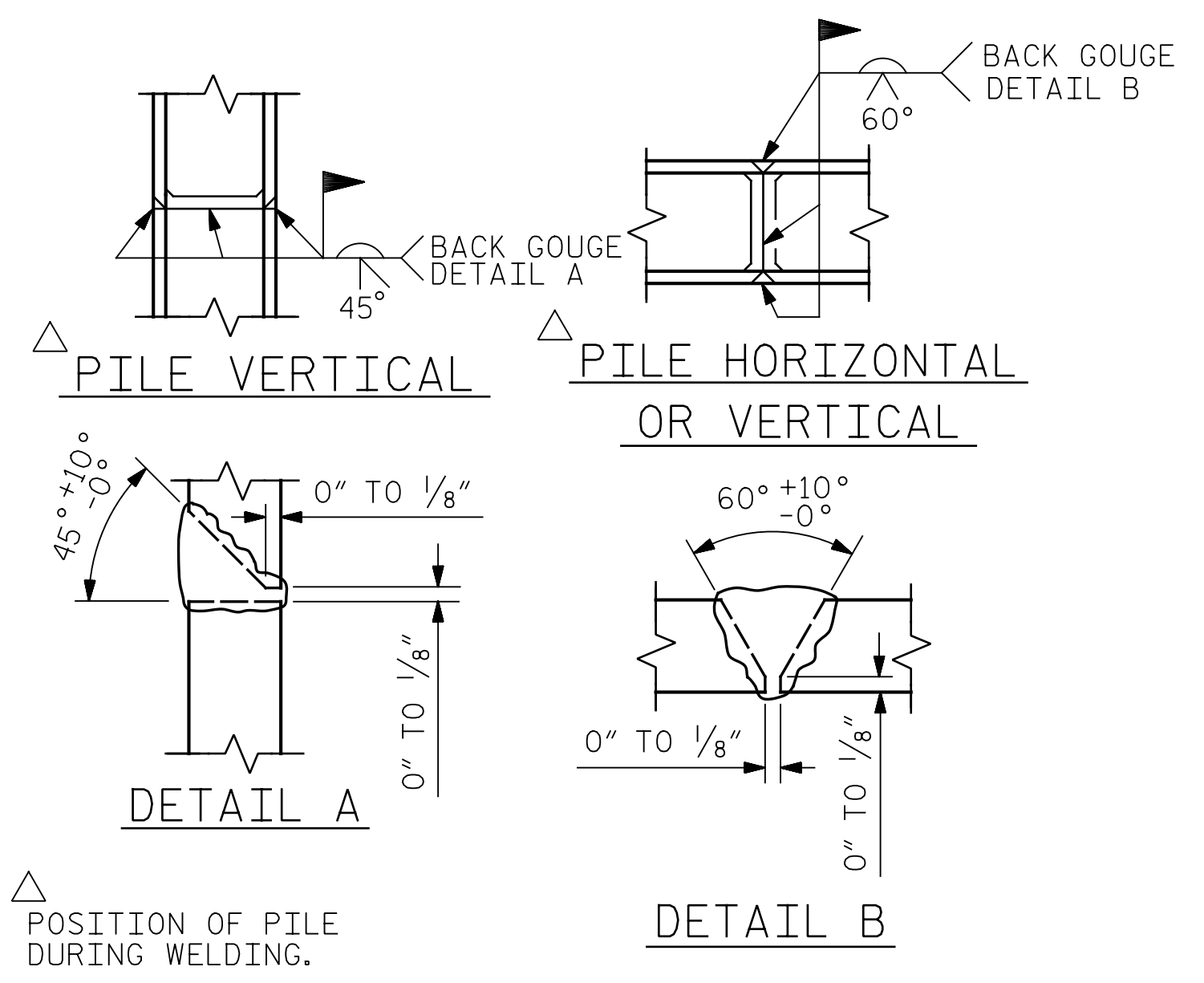


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

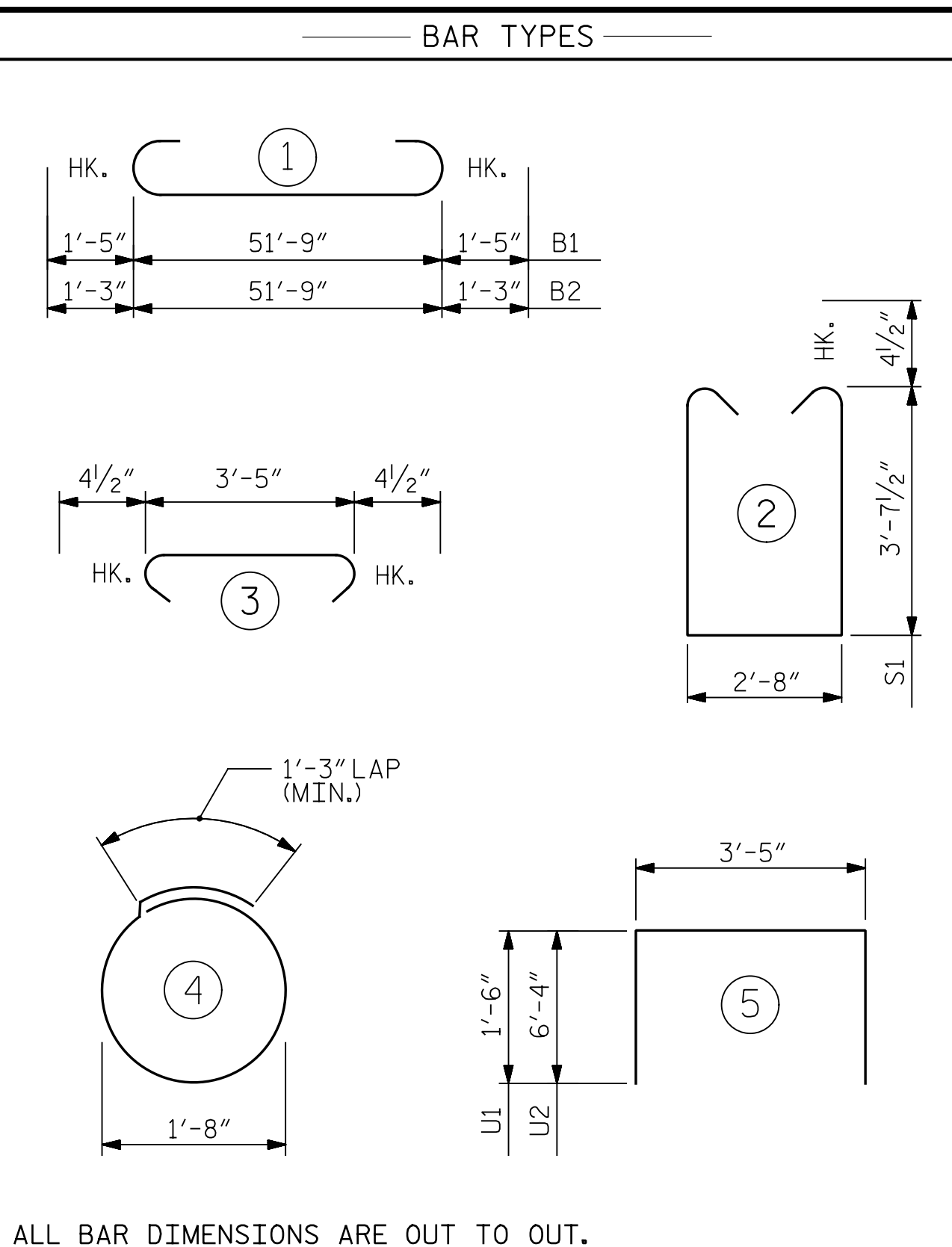
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NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**

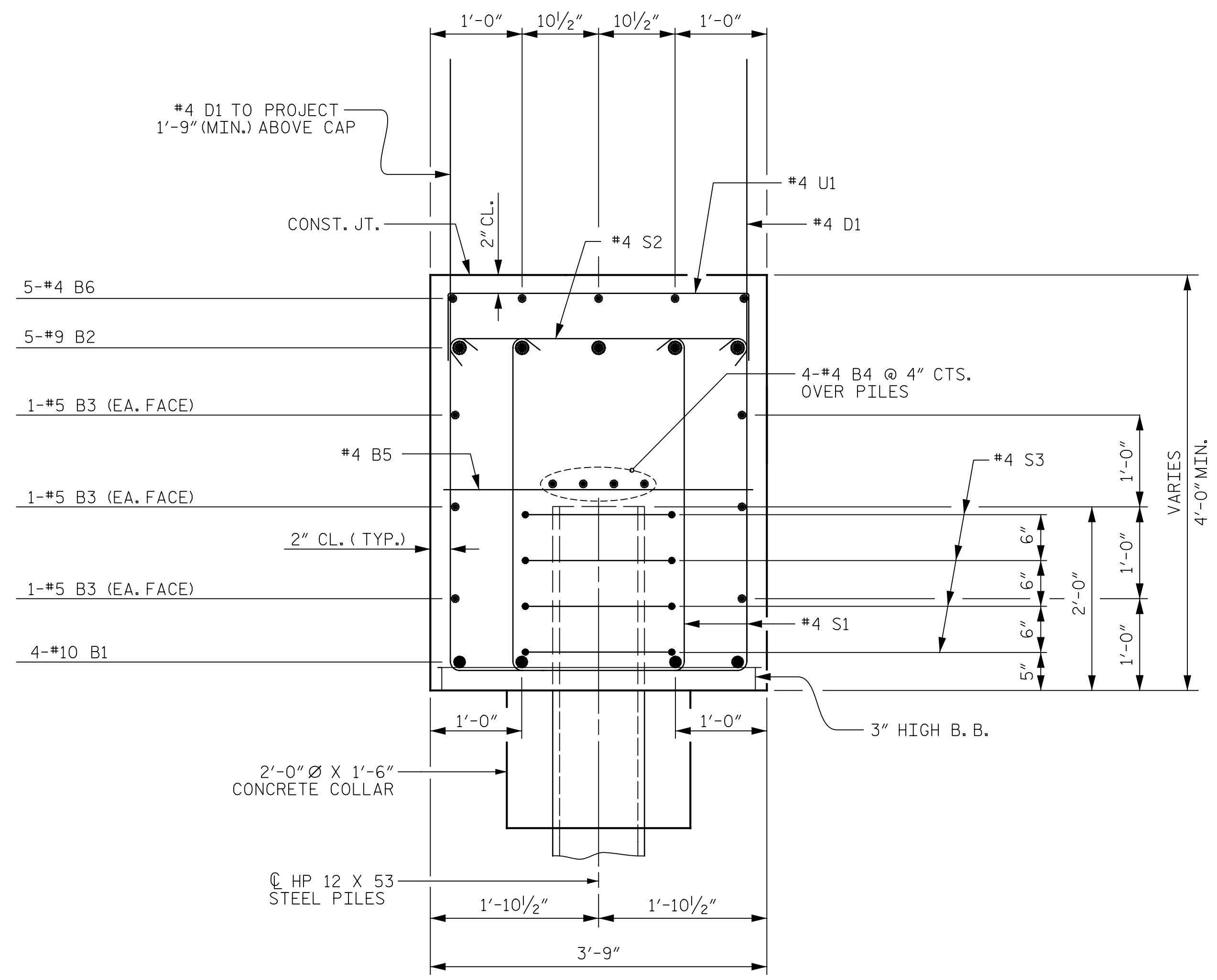


**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT #2					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-7"	940
B2	5	#9	1	54'-3"	922
B3	6	#5	STR	51'-9"	324
B4	8	#4	STR	27'-1"	145
B5	13	#4	STR	3'-5"	30
B6	5	#4	STR	19'-0"	63
B7	1	#4	STR	7'-7"	5
B8	1	#4	STR	7'-9"	5
B9	1	#4	STR	7'-11"	5
B10	1	#4	STR	8'-0"	5
B11	1	#4	STR	8'-2"	5
D1	84	#4	STR	6'-5"	360
H1	22	#5	STR	15'-3"	350
H2	22	#5	STR	15'-2"	348
H3	21	#5	STR	15'-0"	329
H4	21	#5	STR	15'-1"	330
K6	12	#4	STR	2'-8"	21
S1	108	#4	2	10'-8"	770
S2	54	#4	3	4'-2"	150
S3	44	#4	4	6'-6"	191
U1	13	#4	5	6'-5"	56
U2	6	#4	5	16'-1"	65
V3	28	#5	STR	11'-1"	324
V4	28	#5	STR	10'-3"	300



**SECTION A-A**

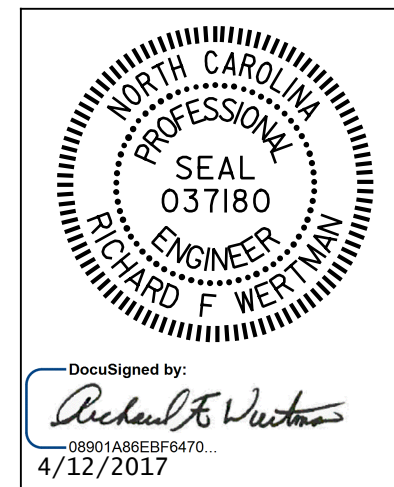
REINFORCING STEEL	6,043 LBS.
CLASS A CONCRETE	
POUR #1 (CAP, LOWER WINGS & COLLARS)	36.9 C.Y.
POUR #2 (UPPER WINGS)	11.5 C.Y.
TOTAL	48.4 C.Y.
HP 12 X 53 STEEL PILES	
No. = 11	390 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	11 EACH

PROJECT NO. B-4447

BURKE COUNTY

STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
INTEGRAL  
END BENT #2  
WESTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM	DATE : 2/2/16
CHECKED BY : R.F. WERTMAN	DATE : 4/6/16
DESIGN ENGINEER OF RECORD : R.F. WERTMAN	DATE : 4/6/16

PLANS PREPARED BY:

**Gannett Fleming**  
Excellence Delivered As Promised

2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
NC Lic. No. F-0270

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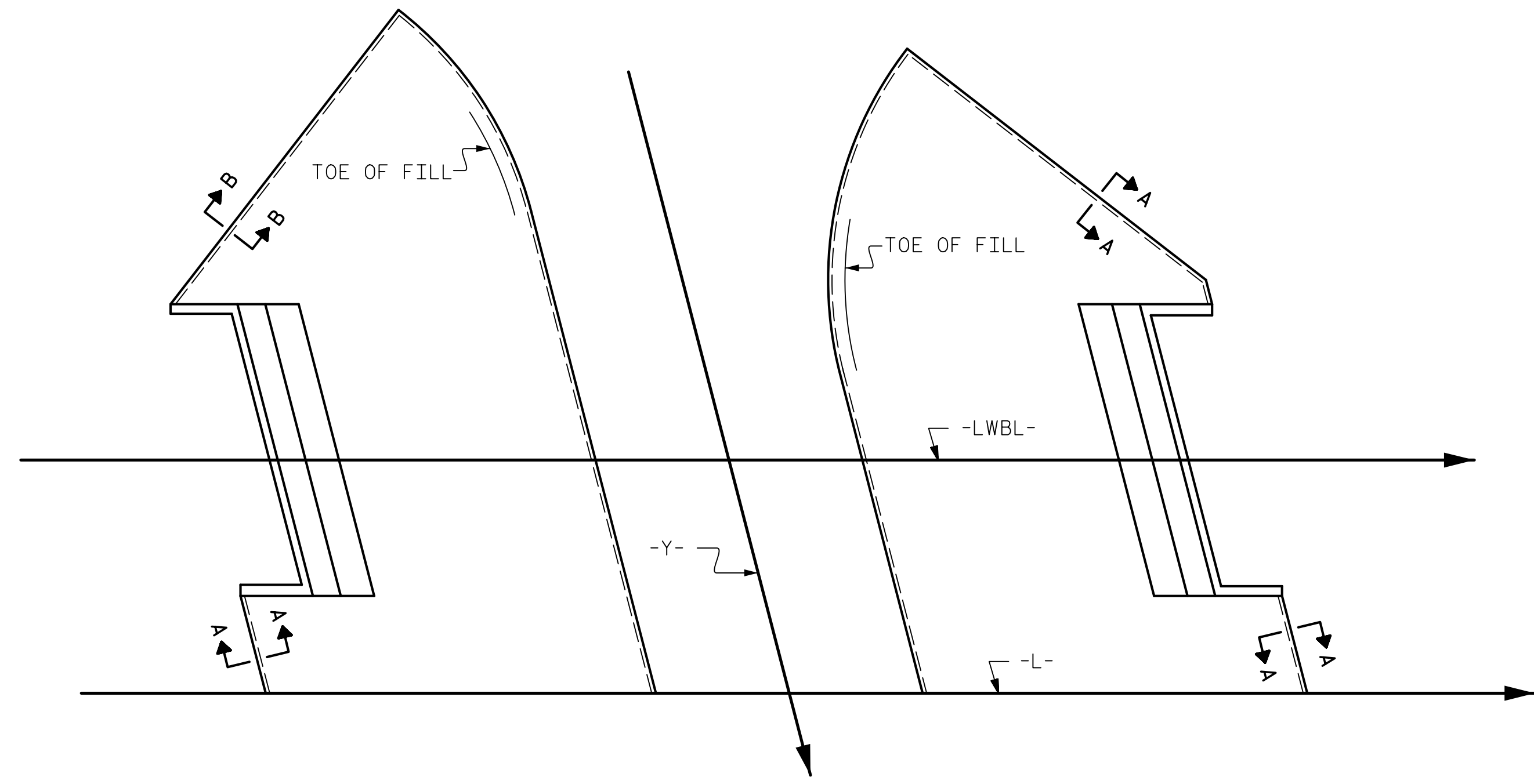
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NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

TOTAL SHEETS: 28



**GENERAL NOTES**

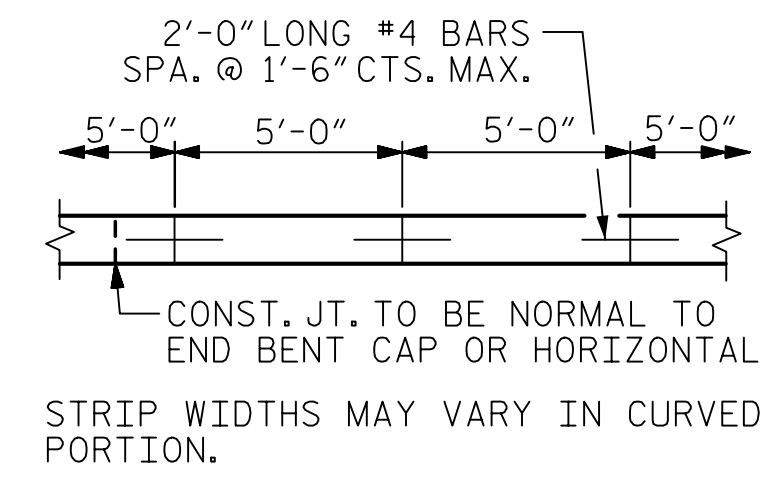
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



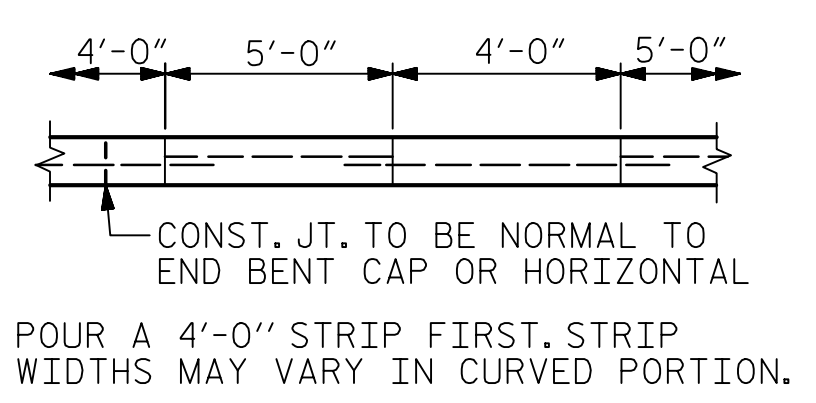
**PLAN**

BRIDGE @ STA. 25+85.40 -L- STA. 15+67.23 -Y-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	375	830
END BENT 2	330	825

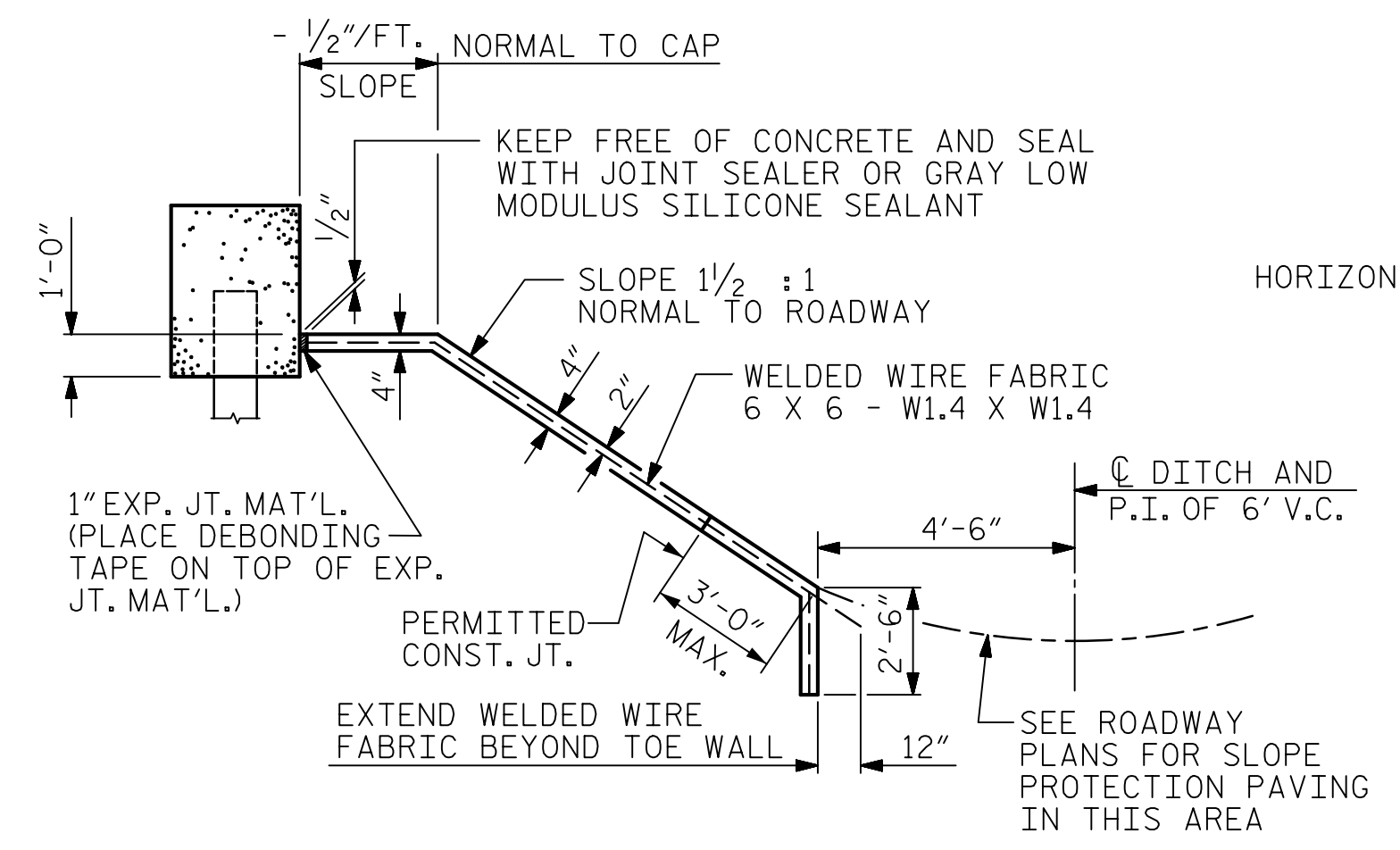
\* QUANTITY SHOWN IS BASED ON 5' POURS.



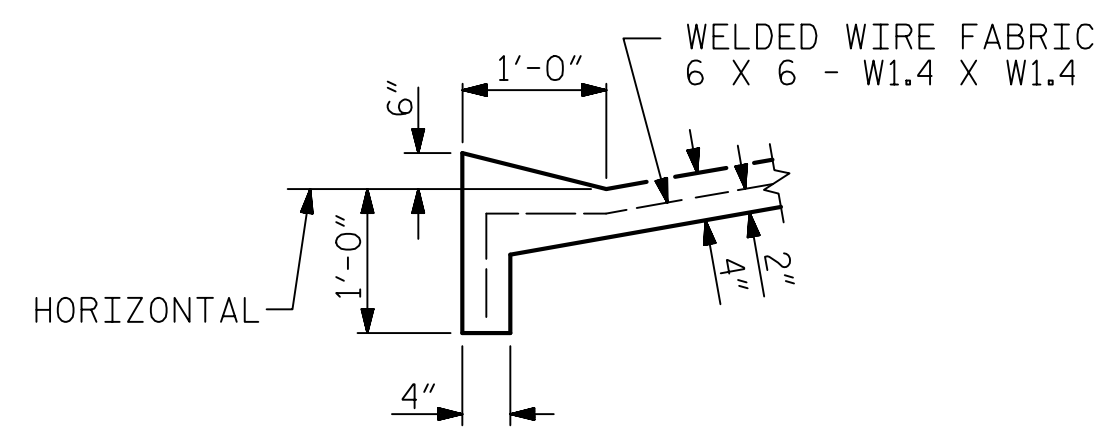
**POURING DETAIL**



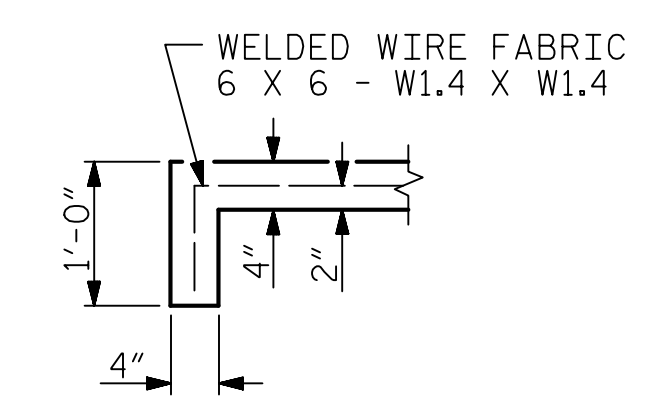
**OPTIONAL POURING DETAIL**



**SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH**



**SECTION B-B**



**SECTION A-A**

**DETAILS FOR SLOPE PROTECTION**

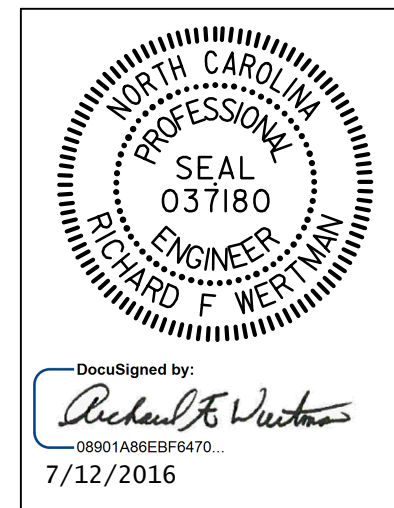
PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
SLOPE PROTECTION  
DETAILS

WESTBOUND LANE



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 4/13/16
CHECKED BY : R.F. WERTMAN	DATE : 4/27/16
DRAWN BY : ELR 5/92	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 12/21/11 MAA/GM
	REV. 1/16 MAA/TMG

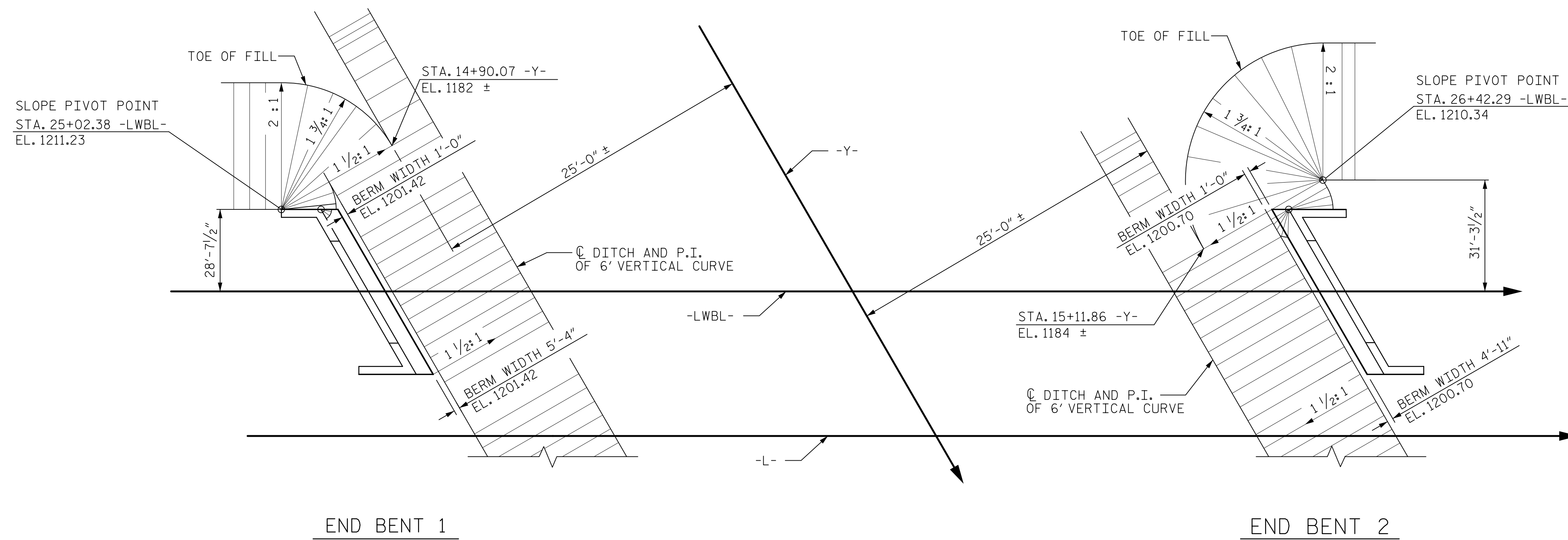
PLANS PREPARED BY:

**Gannett Fleming**  
Excellence Delivered As Promised

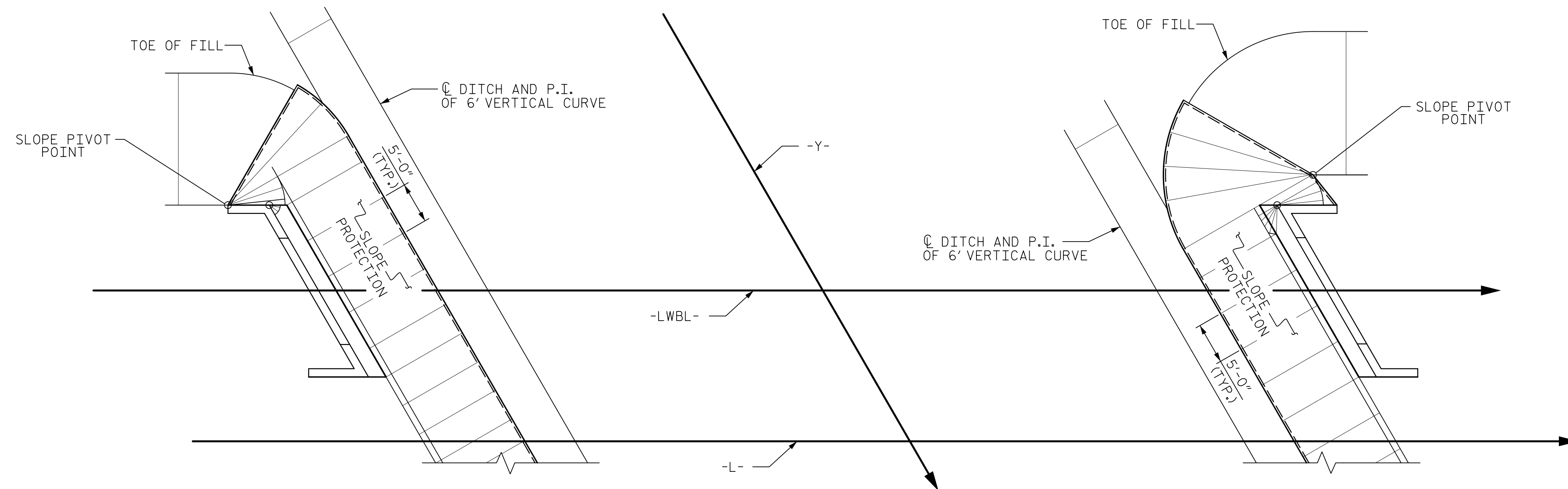
2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-25
1			3			TOTAL SHEETS
2			4			28

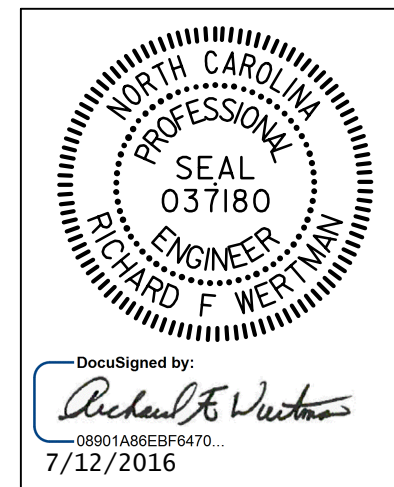


PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SLOPE PROTECTION  
 DETAILS  
 WESTBOUND LANE

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 4/13/16
CHECKED BY : R.F. WERTMAN	DATE : 4/27/16
DRAWN BY : WJH 10/88	REV. 5/1/06 TLA/GM
CHECKED BY : FCJ 10/88	REV. 10/1/11 MAA/GM
	REV. 1/16 MAA/TMG

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 Excellence Delivered *As Promised*  
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			28



### NOTES:

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

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

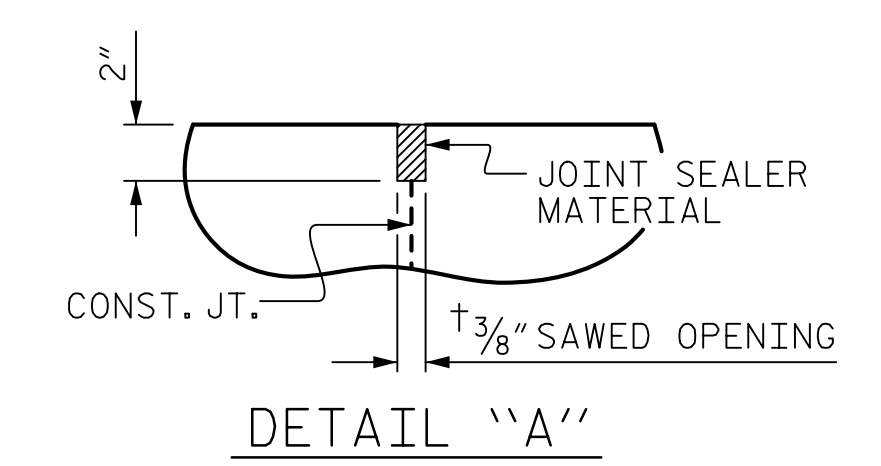
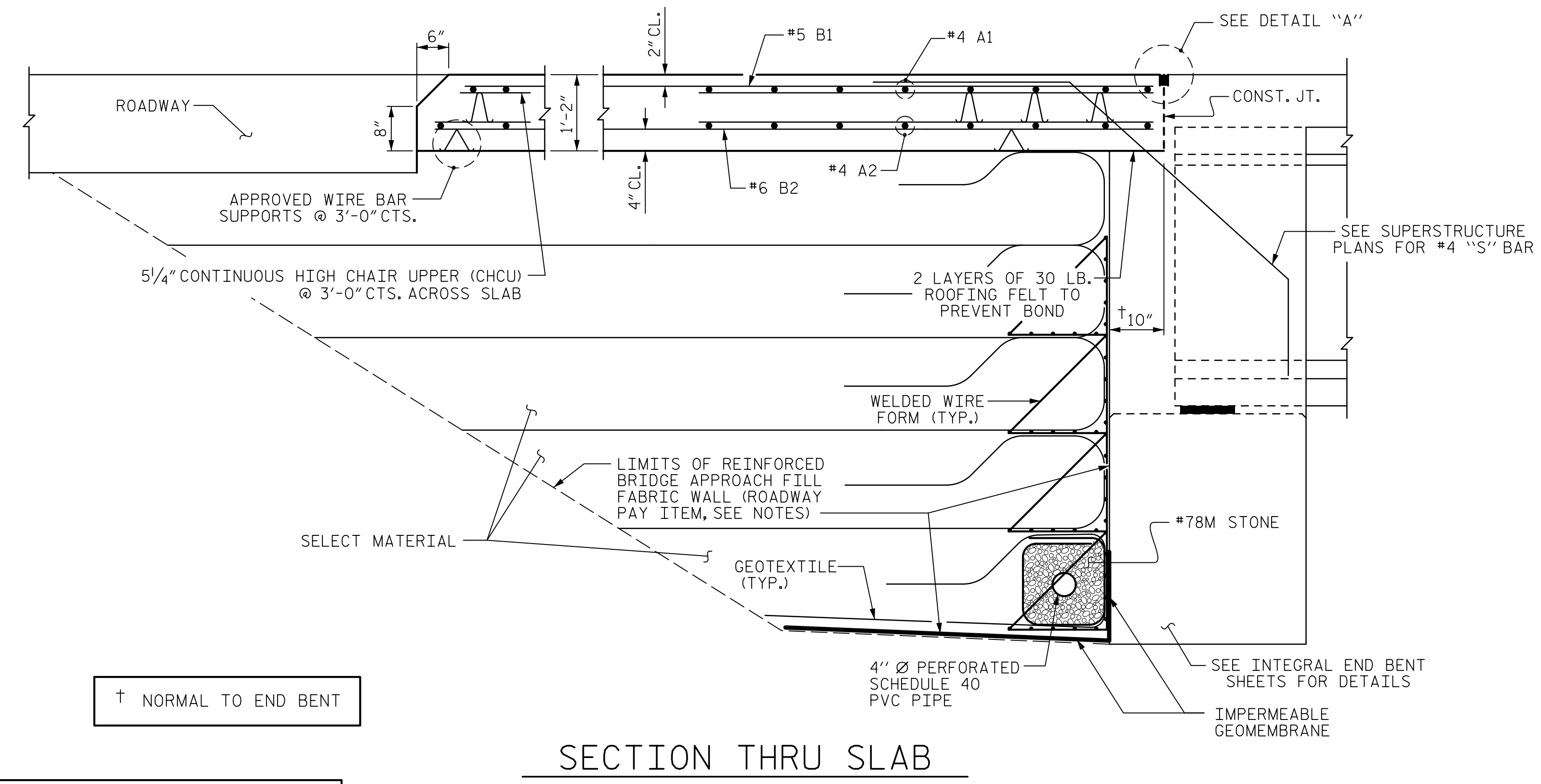
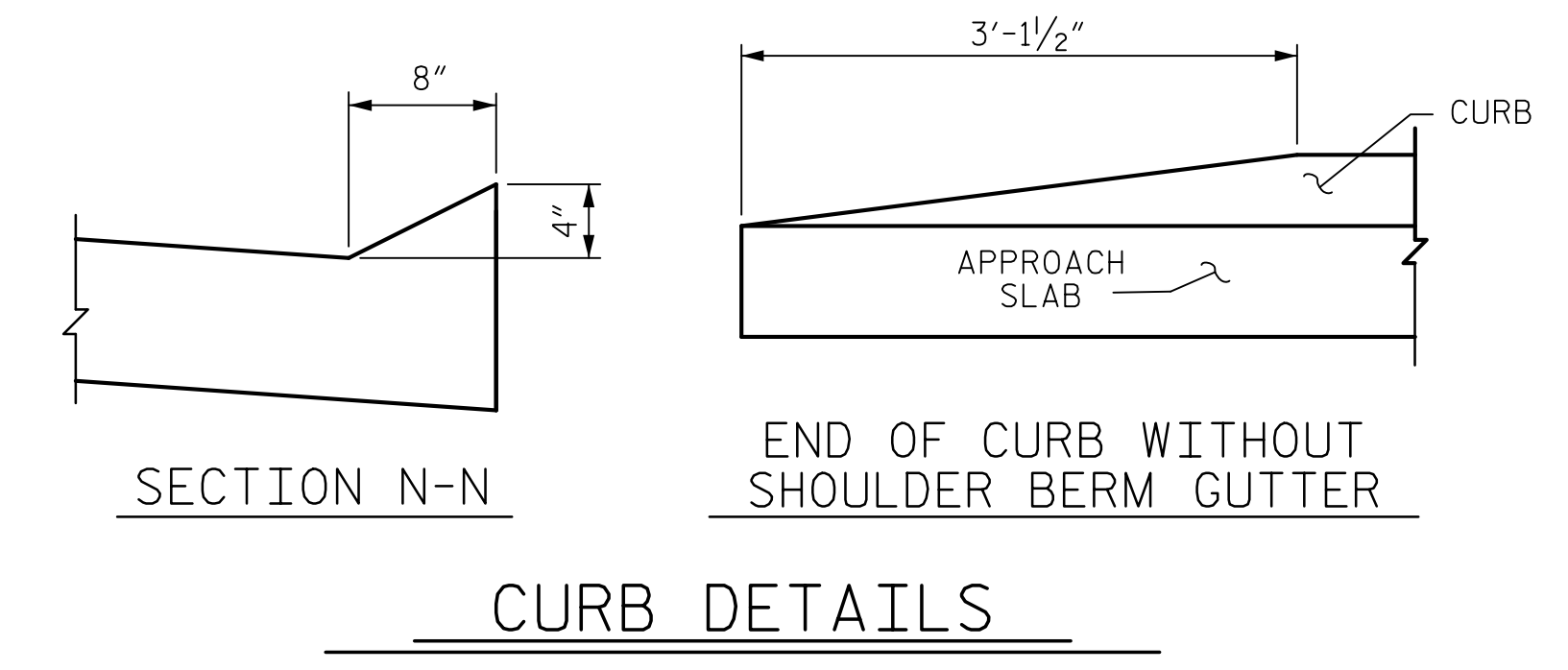
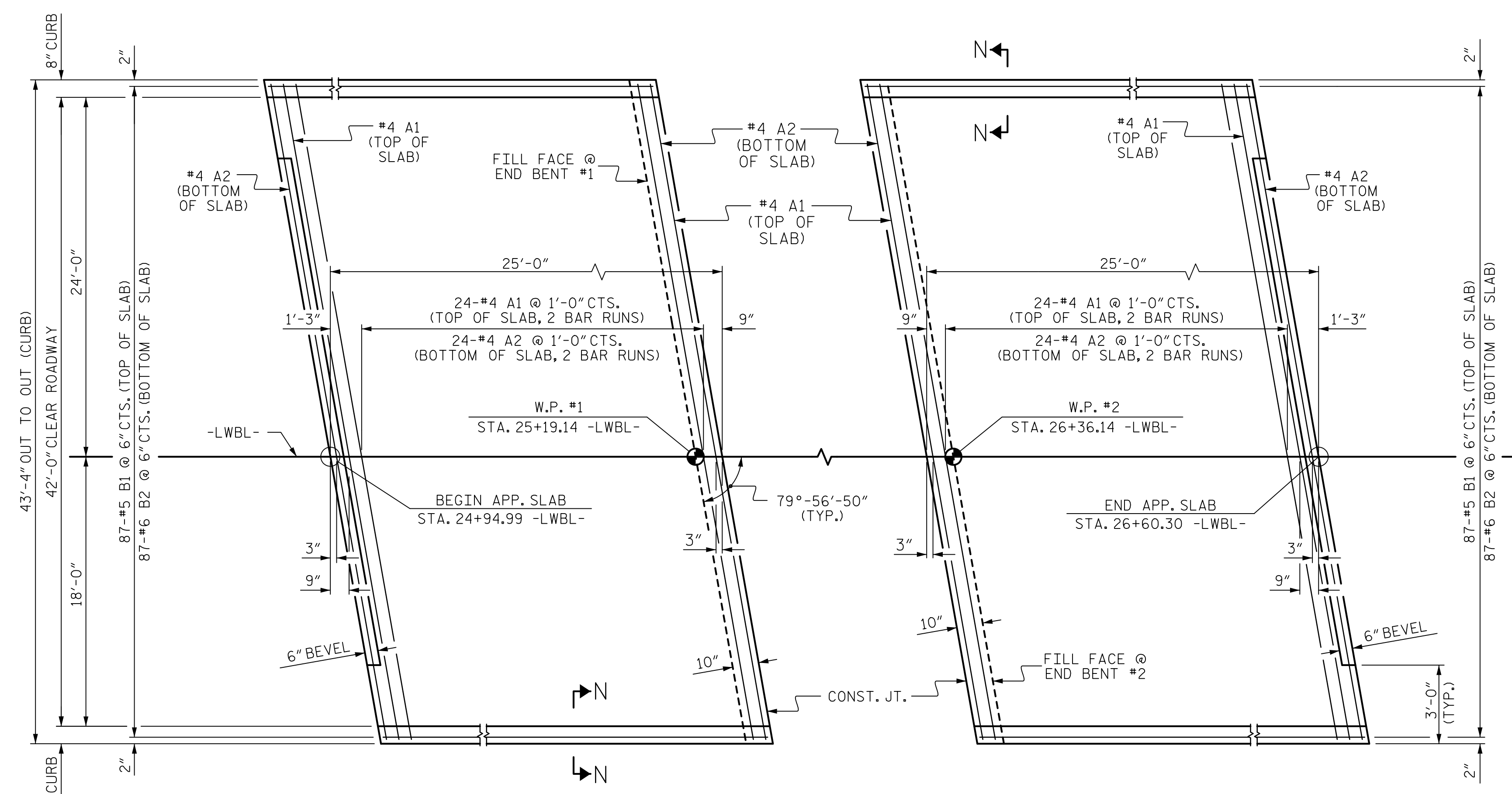
### BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQUIRED)

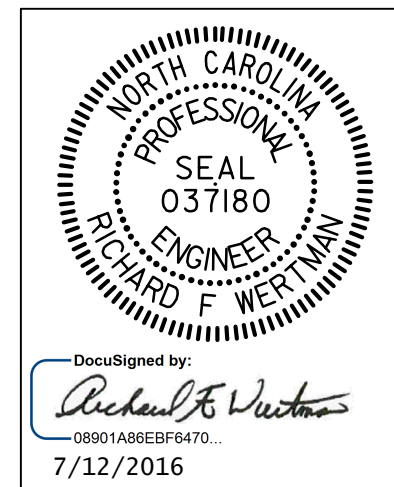
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	22'-11"	796
A2	52	#4	STR	22'-9"	790
*B1	87	#5	STR	24'-2"	2193
B2	87	#6	STR	24'-8"	3223
REINFORCING STEEL				LBS.	4013
*EPOXY COATED REINFORCING STEEL				LBS.	2989
CLASS AA CONCRETE				C. Y.	46.9

### SPLICE LENGTHS CHART

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



PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH  
 SLAB FOR  
 INTEGRAL ABUTMENT  
 WESTBOUND LANE

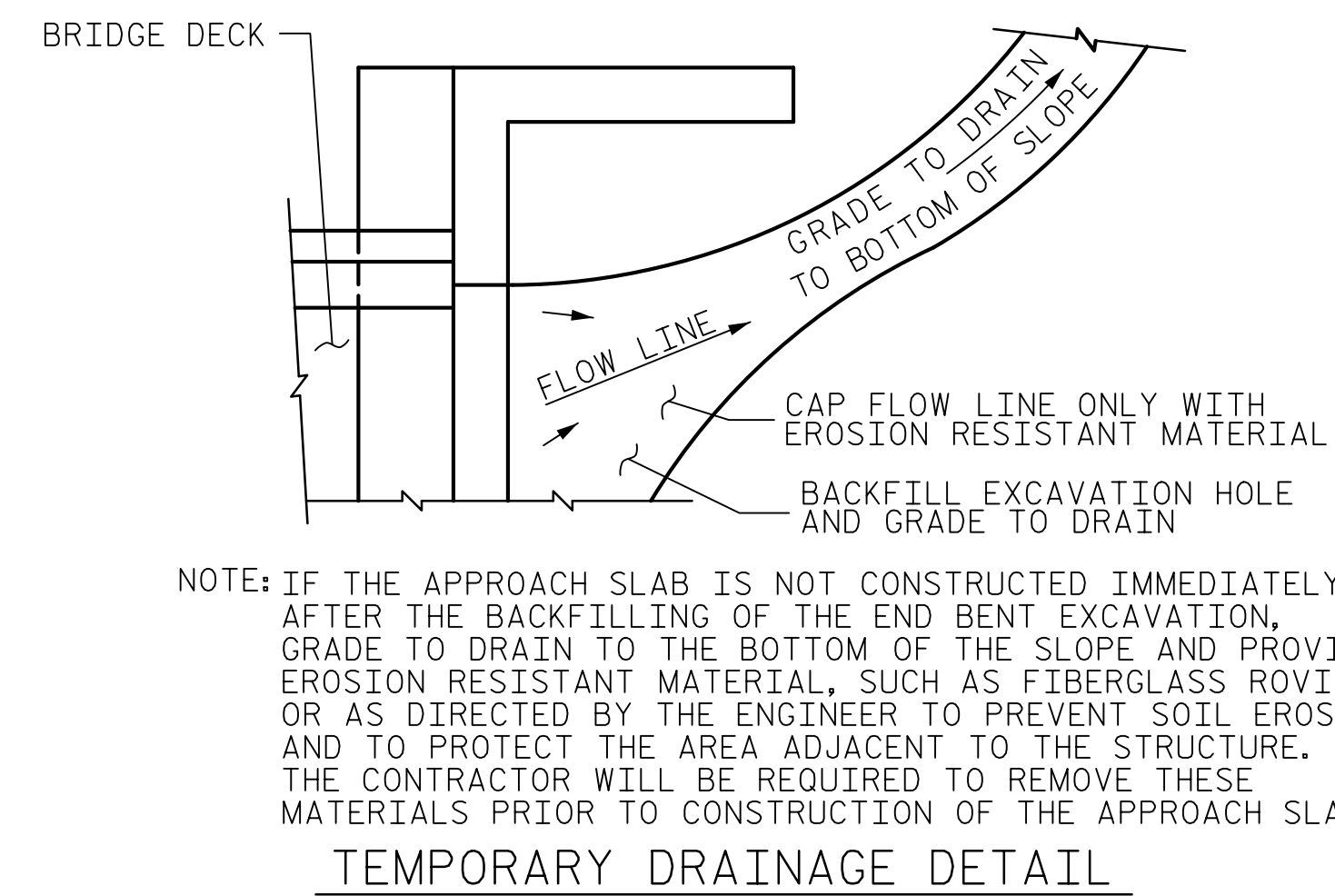
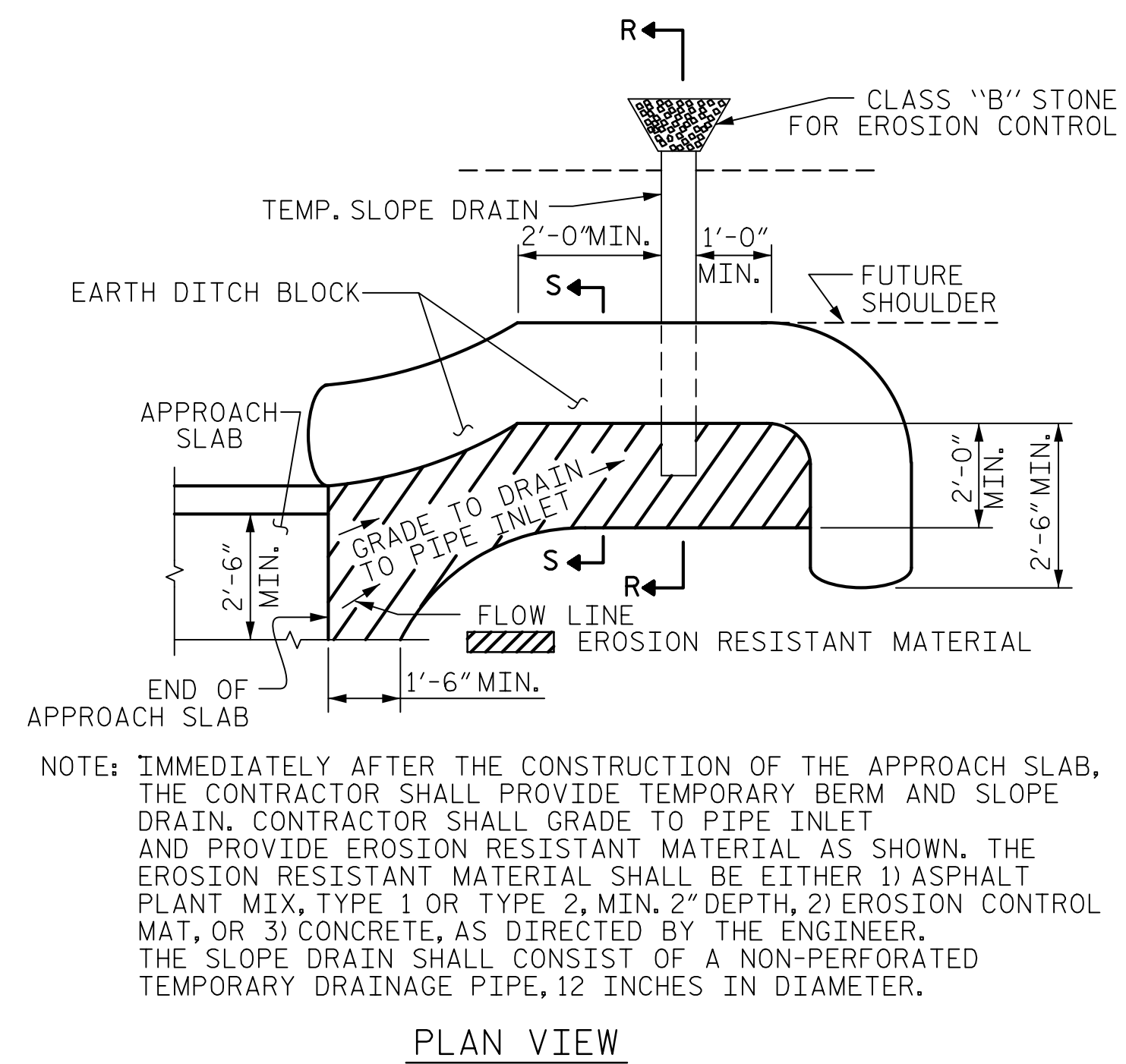
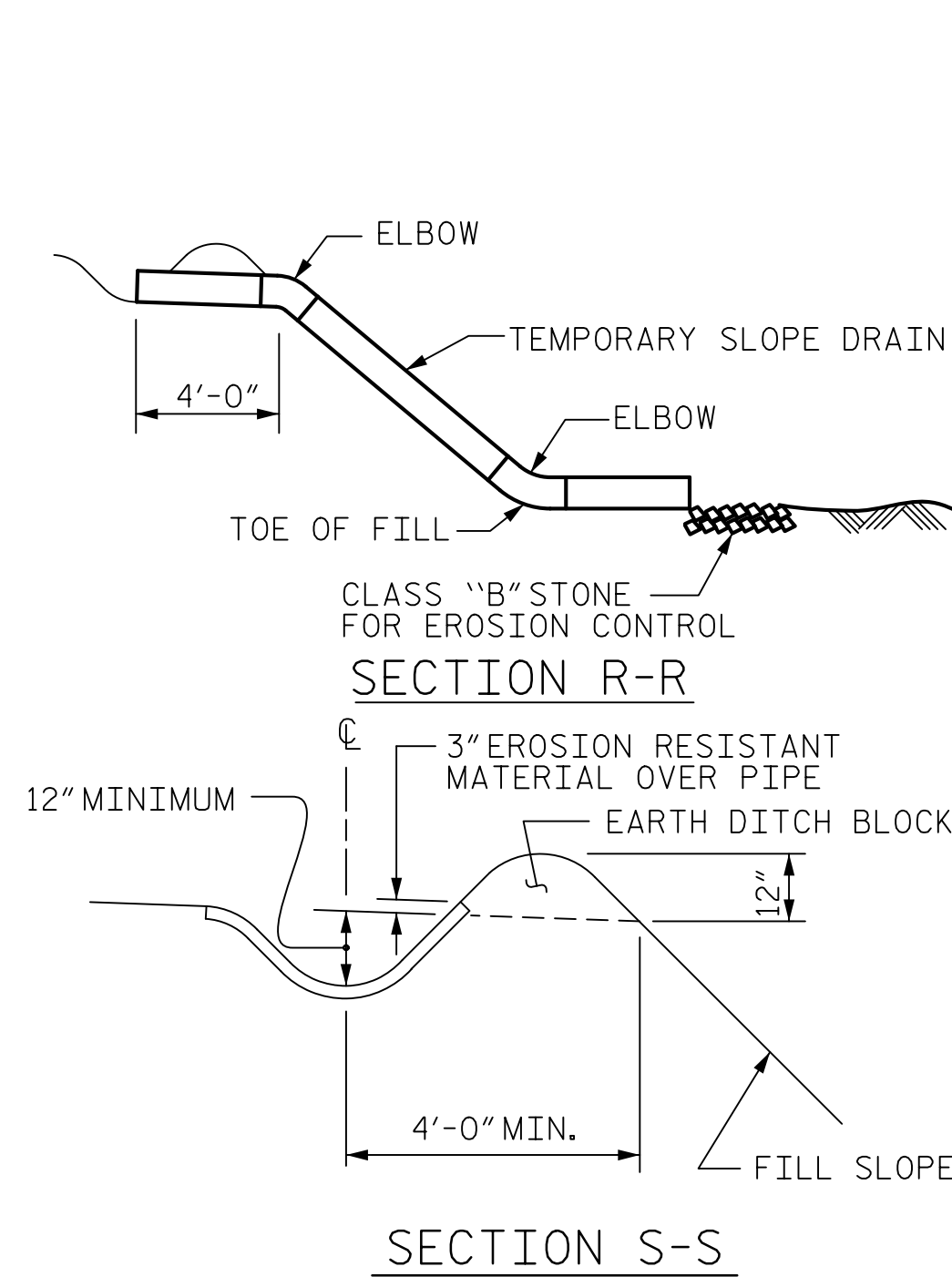
ASSEMBLED BY: T.J. KIRSCHBAUM	DATE: 11/10/15
CHECKED BY: A.J. FORFA	DATE: 12/15/15
DRAWN BY: TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY: GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
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 INC Lic. No. F-0270

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

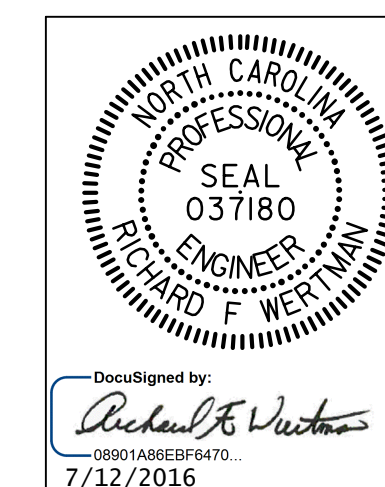


## TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 2



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

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15
CHECKED BY : A.J. FORFA	DATE : 12/15/15
DRAWN BY : FCJ 11/88	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

PLANS PREPARED BY:  
  
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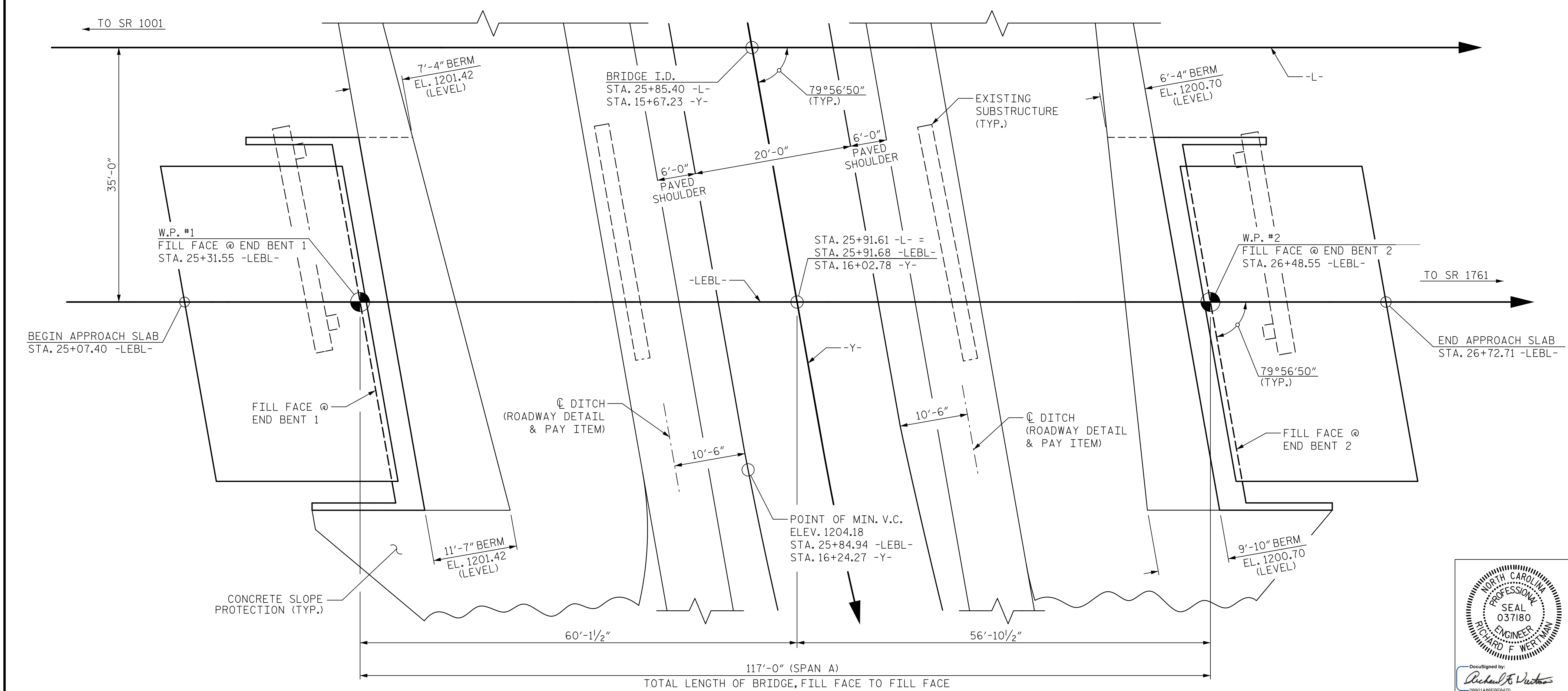
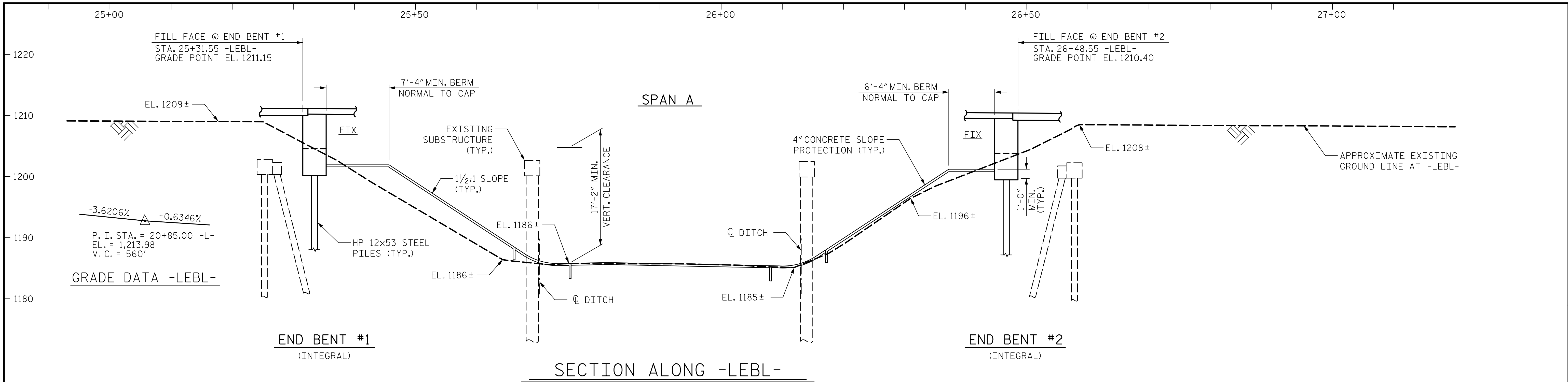
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-28
1			3			TOTAL SHEETS
2			4			28

STR. NO. 1

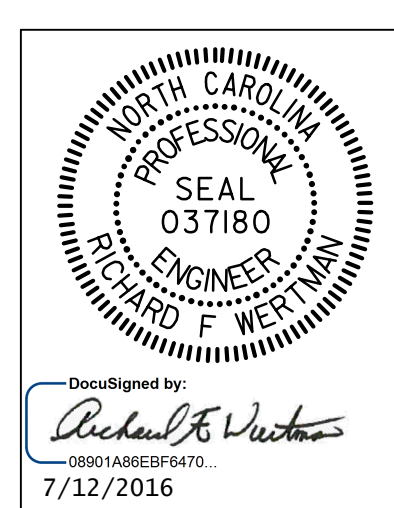
STD. NO. BAS4





DRAWN BY : T.J. KIRSCHBAUM DATE : 9/21/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/9/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/9/16

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L- / 15+67.23 -Y-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 160

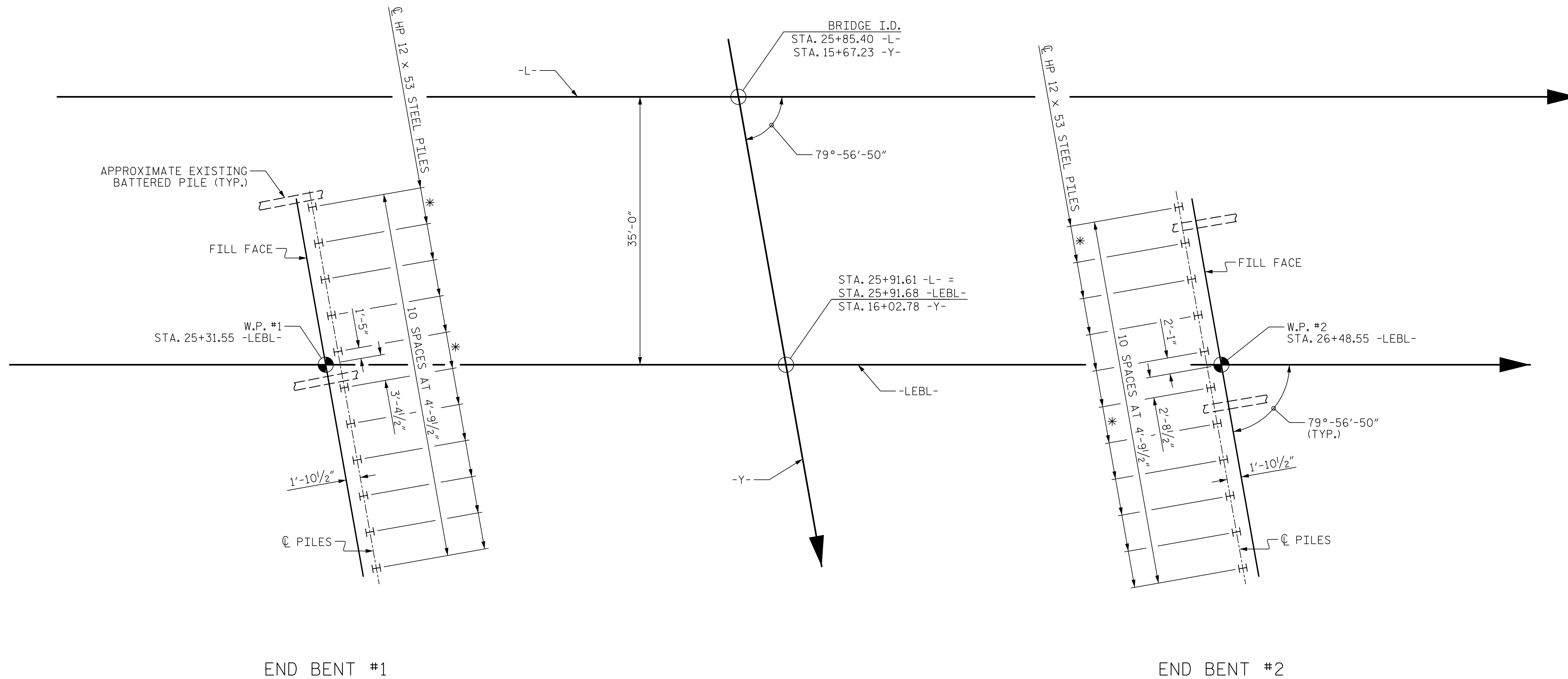


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON I-40 OVER  
 SR 1758 BEREJA CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 EASTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-1
1			3			TOTAL SHEETS 28
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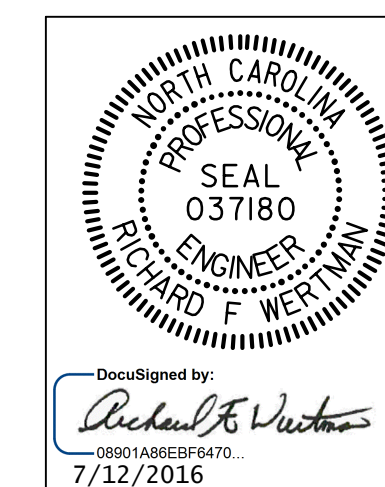
**FOUNDATION LAYOUT**  
DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

**NOTES:**

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
- \* PILES LOCATED NEAR THE EXISTING BATTERED PILES CAN BE SHIFTED UP TO 1'-6" TO AVOID INTERFERENCE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING BATTERED PILES BEFORE DRIVING NEW PILES.

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE ON I-40 OVER  
 SR 1758 BEREA CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 EASTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 9/21/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/21/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/21/16

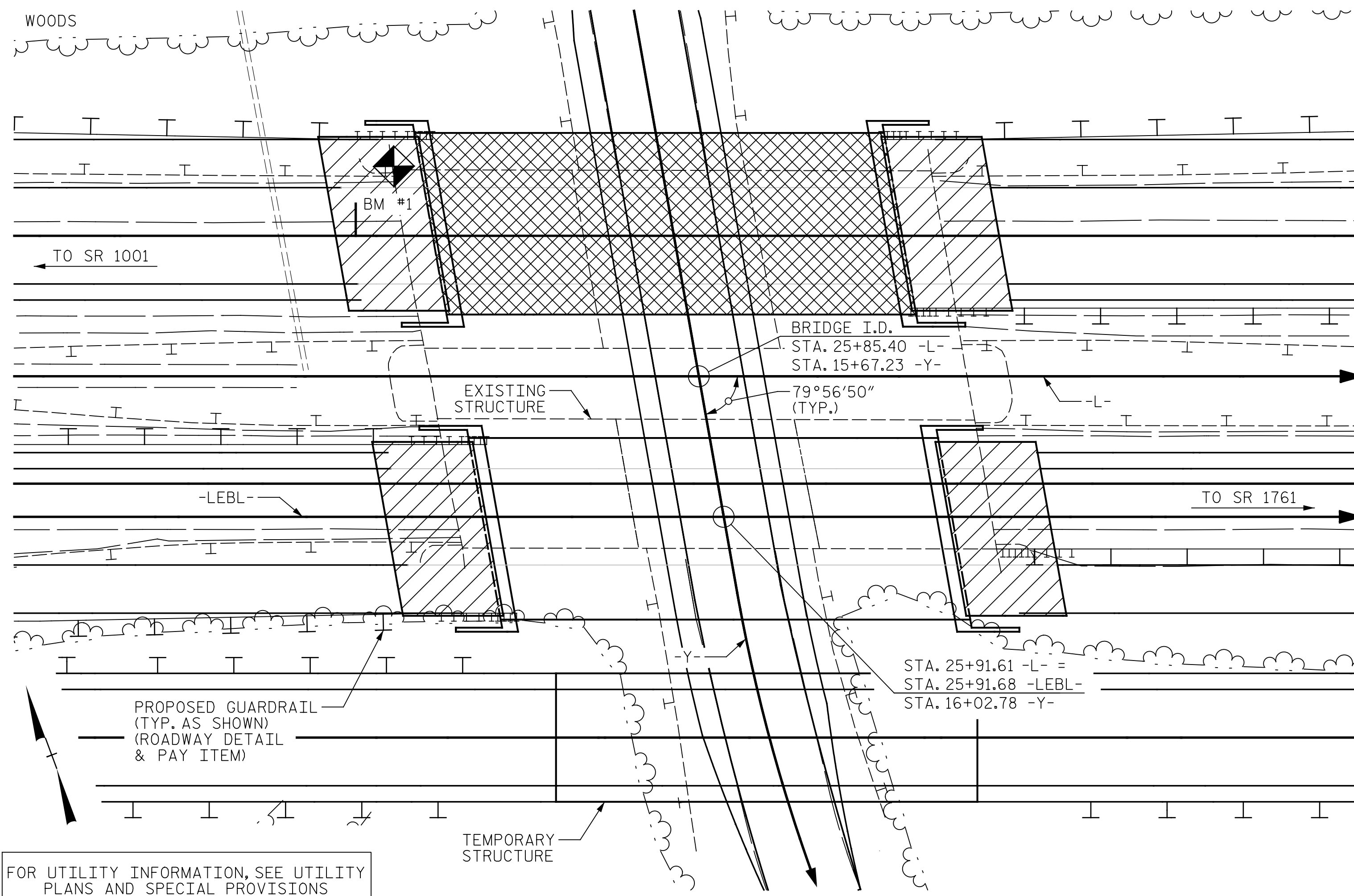
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BENCH MARK #1: 2" SQUARE ETCH ON NORTH WINGWALL AT WEST ABUTMENT ON WESTBOUND I-40 OVER SR 1758, -L- STA. 25+09.42, 52.315' LEFT, EL. 1209.55



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 25+85.40 -L-".

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-5 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS @ 45'-0" FT. WITH A CLEAR ROADWAY OF 28' AND REINFORCED CONCRETE DECK ON STEEL GIRDERS ON END BENTS WITH REINFORCED CONCRETE CAPS ON STEEL PILES & INTERIOR BENTS WITH REINFORCED CONCRETE POSTS AND BEAMS LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED.

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.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STA. 26+05.17 -DETB- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

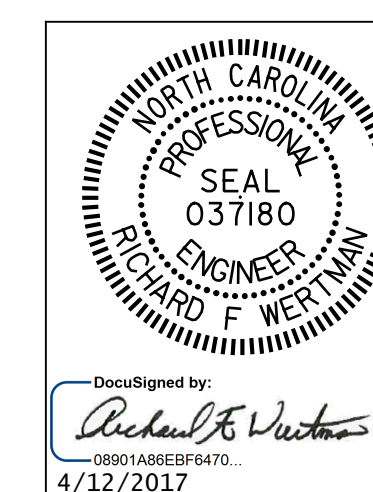
FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 25+85.40 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO. LIN.FT.	EACH	NO. LIN.FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		5218	6447		LUMP SUM		5 573.04			230.6		LUMP SUM	LUMP SUM
END BENT NO. 1				49.0		6119		11	11 580		360		
END BENT NO. 2				48.7		6044		11	11 445		330		
TOTAL	LUMP SUM	5218	6447	97.7	LUMP SUM	12163	5 573.04	22	22 1025	230.6	690	LUMP SUM	LUMP SUM

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE ON I-40 OVER  
 SR 1758 BEREA CHURCH ROAD  
 BETWEEN SR 1001 AND SR 1761  
 EASTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM DATE : 9/23/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/21/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/21/16

PLANS PREPARED BY:  
  
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1			3			TOTAL SHEETS 28
2			4			

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	0.821	1.25	A	E	56.6	0.956	1.27	A	I	33.7	0.80	0.821	1.09	A	E	56.6	1	
	HL-93 (OPERATING)	N/A	--	1.62	--	1.35	0.821	1.62	A	E	56.6	0.956	1.78	A	I	22.2	N/A	--	--	--	--	--	1	
	HS-20 (INVENTORY)	36.000	②	1.56	56.160	1.75	0.821	1.80	A	E	56.6	0.956	1.85	A	I	22.2	0.80	0.821	1.56	A	E	56.6	1	
	HS-20 (OPERATING)	36.000	--	2.33	83.880	1.35	0.821	2.33	A	E	56.6	0.956	2.44	A	I	22.2	N/A	--	--	--	--	--	1	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500	--	4.09	51.125	1.40	0.821	5.87	A	E	56.6	0.956	6.57	A	I	22.2	0.80	0.821	4.09	A	E	56.6	1
		S3C	21.500	--	2.39	51.385	1.40	0.821	3.43	A	E	56.6	0.956	3.77	A	I	22.2	0.80	0.821	2.39	A	E	56.6	1
		S3A	22.750	--	2.26	51.415	1.40	0.821	3.25	A	E	56.6	0.956	3.57	A	I	22.2	0.80	0.821	2.26	A	E	56.6	1
		S4A	26.750	--	1.97	52.698	1.40	0.821	2.83	A	E	56.6	0.956	3.08	A	I	22.2	0.80	0.821	1.97	A	E	56.6	1
		S5A	30.500	--	1.74	53.070	1.40	0.821	2.50	A	E	56.6	0.956	2.78	A	I	22.2	0.80	0.821	1.74	A	E	56.6	1
		S6A	34.500	--	1.57	54.165	1.40	0.821	2.25	A	E	56.6	0.956	2.48	A	I	22.2	0.80	0.821	1.57	A	E	56.6	1
		S7B	38.500	--	1.42	54.670	1.40	0.821	2.04	A	E	56.6	0.956	2.29	A	I	22.2	0.80	0.821	1.42	A	E	56.6	1
		S7A	40.000	③	1.39	55.600	1.40	0.821	2.00	A	E	56.6	0.956	2.31	A	I	22.2	0.80	0.821	1.39	A	E	56.6	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250	--	1.93	54.523	1.40	0.821	2.76	A	E	56.6	0.956	2.97	A	I	22.2	0.80	0.821	1.93	A	E	56.6	1
		T5B	32.000	--	1.69	54.080	1.40	0.821	2.43	A	E	56.6	0.956	2.77	A	I	22.2	0.80	0.821	1.69	A	E	56.6	1
		T6A	36.000	--	1.54	55.440	1.40	0.821	2.21	A	E	56.6	0.956	2.51	A	I	22.2	0.80	0.821	1.54	A	E	56.6	1
		T7A	40.000	--	1.42	56.800	1.40	0.821	2.03	A	E	56.6	0.956	2.31	A	I	22.2	0.80	0.821	1.42	A	E	56.6	1
		T7B	40.000	--	1.48	59.200	1.40	0.821	2.13	A	E	56.6	0.956	2.19	A	I	22.2	0.80	0.821	1.48	A	E	56.6	1

**LOAD FACTORS:**

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

**NOTES:**

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

**COMMENTS:**

1. THE REDUCTION OF LOAD DISTRIBUTION FACTOR FOR MOMENT IN LONGITUDINAL BEAMS ON SKEWED SUPPORTS (AASHTO TABLE 4.6.2.2E-1) WAS NOT APPLIED.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

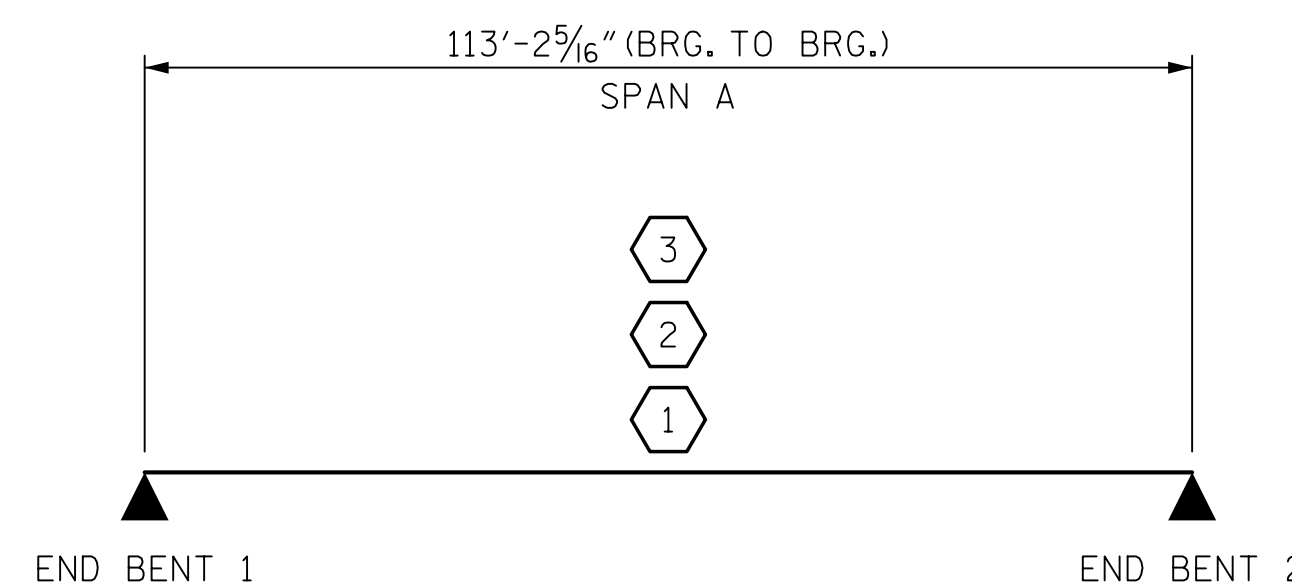
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

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



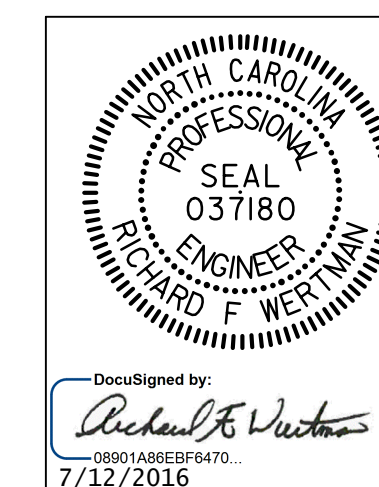
LRFR SUMMARY

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

ASSEMBLED BY : T.J. KIRSCHBAUM    DATE : 11/16/15  
 CHECKED BY : A.J. FORFA    DATE : 12/2/15  
 DRAWN BY : MAA 1/08    REV. 11/12/08RR    MAA/GM  
 CHECKED BY : GM/DI 2/08    REV. 10/1/11    MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered *As Promised*    NC Lic. No. F-0270  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

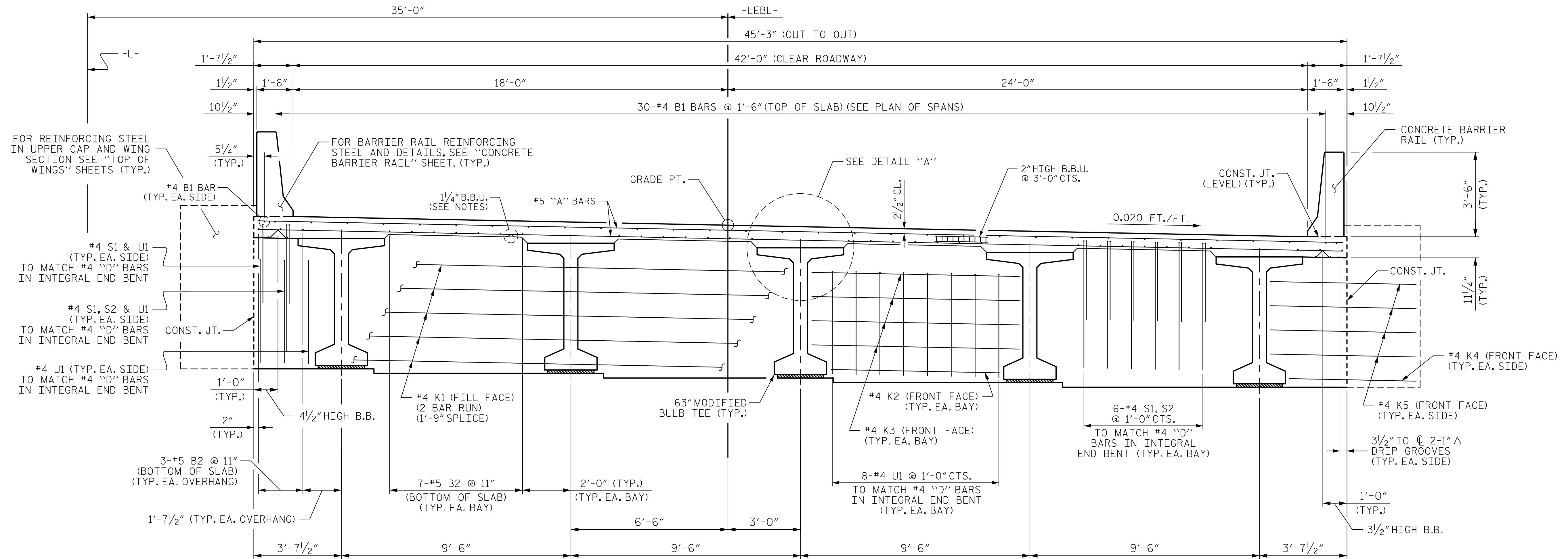


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-4
1			3			TOTAL SHEETS
2			4			28





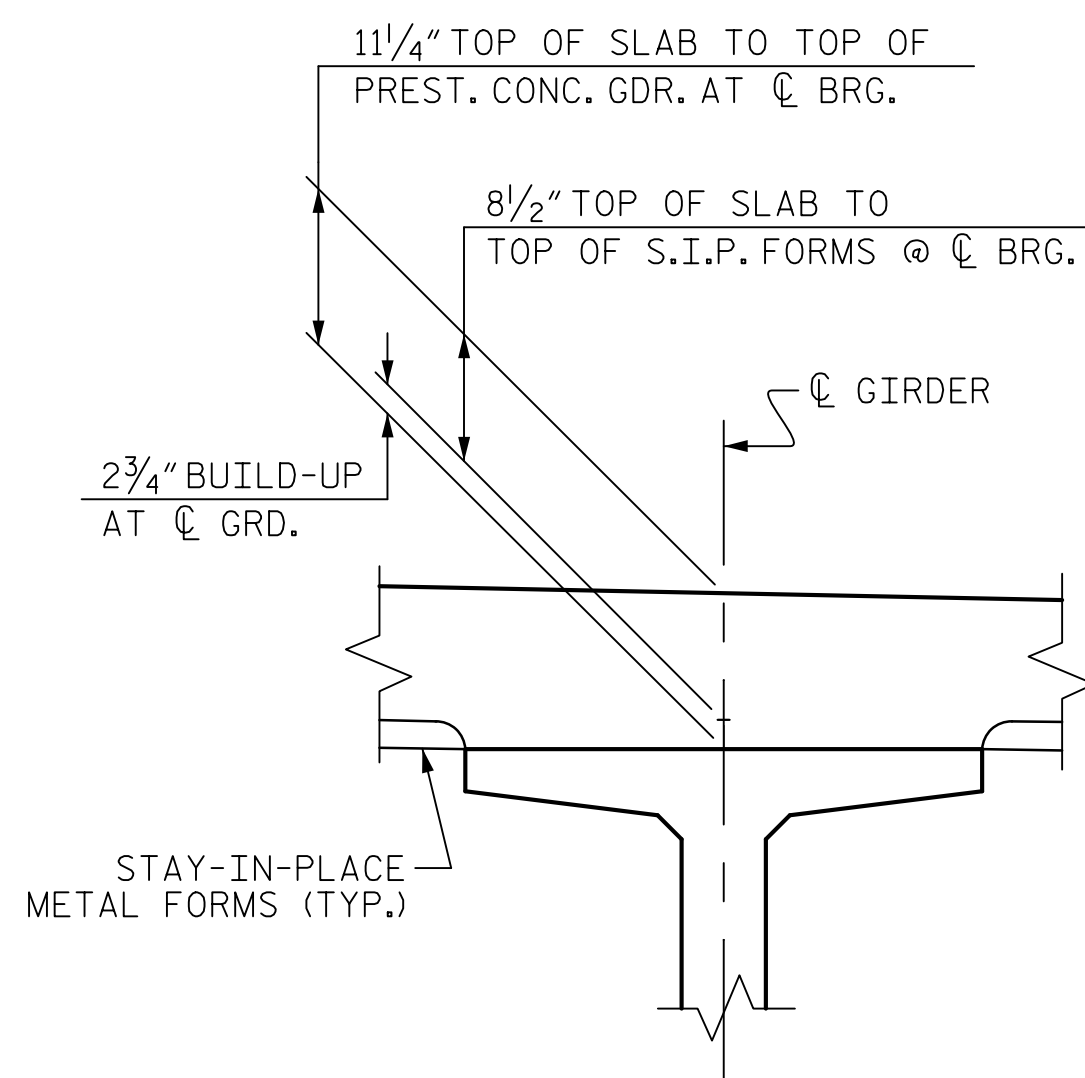
**TYPICAL SECTION AT INTEGRAL END BENT**

FOR WING WALLS OF INTEGRAL END BENTS, SEE "TOP OF WINGS" SHEETS

**NOTES:**

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

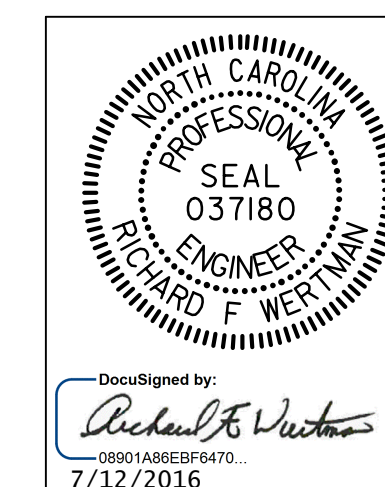
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2"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



**DETAIL "A"**

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

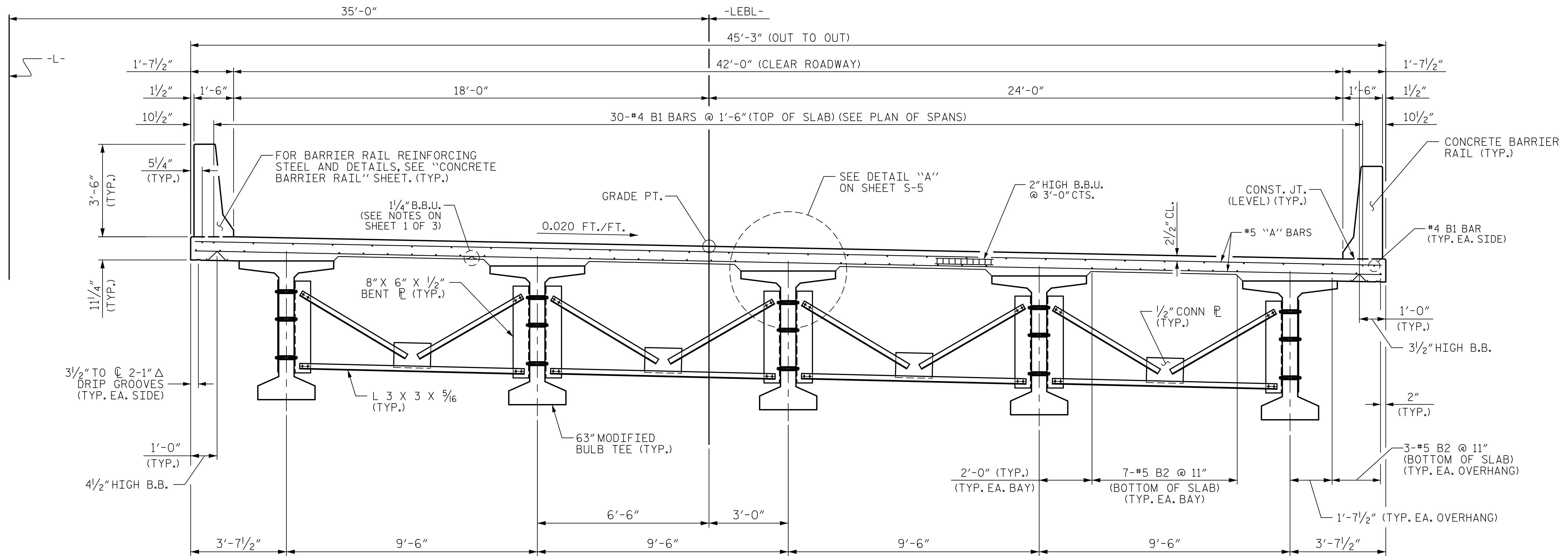
SUPERSTRUCTURE  
 TYPICAL SECTION  
 EASTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-5
1			3			TOTAL SHEETS
2			4			28

DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/21/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/21/16

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
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 NC Lic. No. F-0270

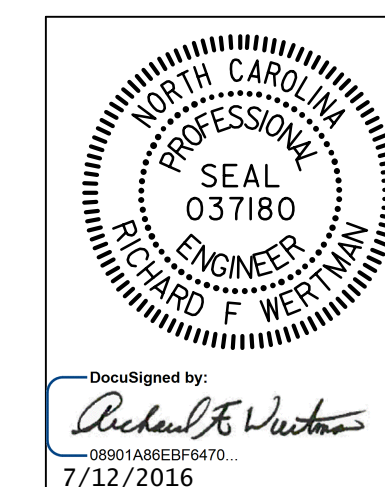
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM**  
 FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE SHEET S-12

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 EASTBOUND LANE

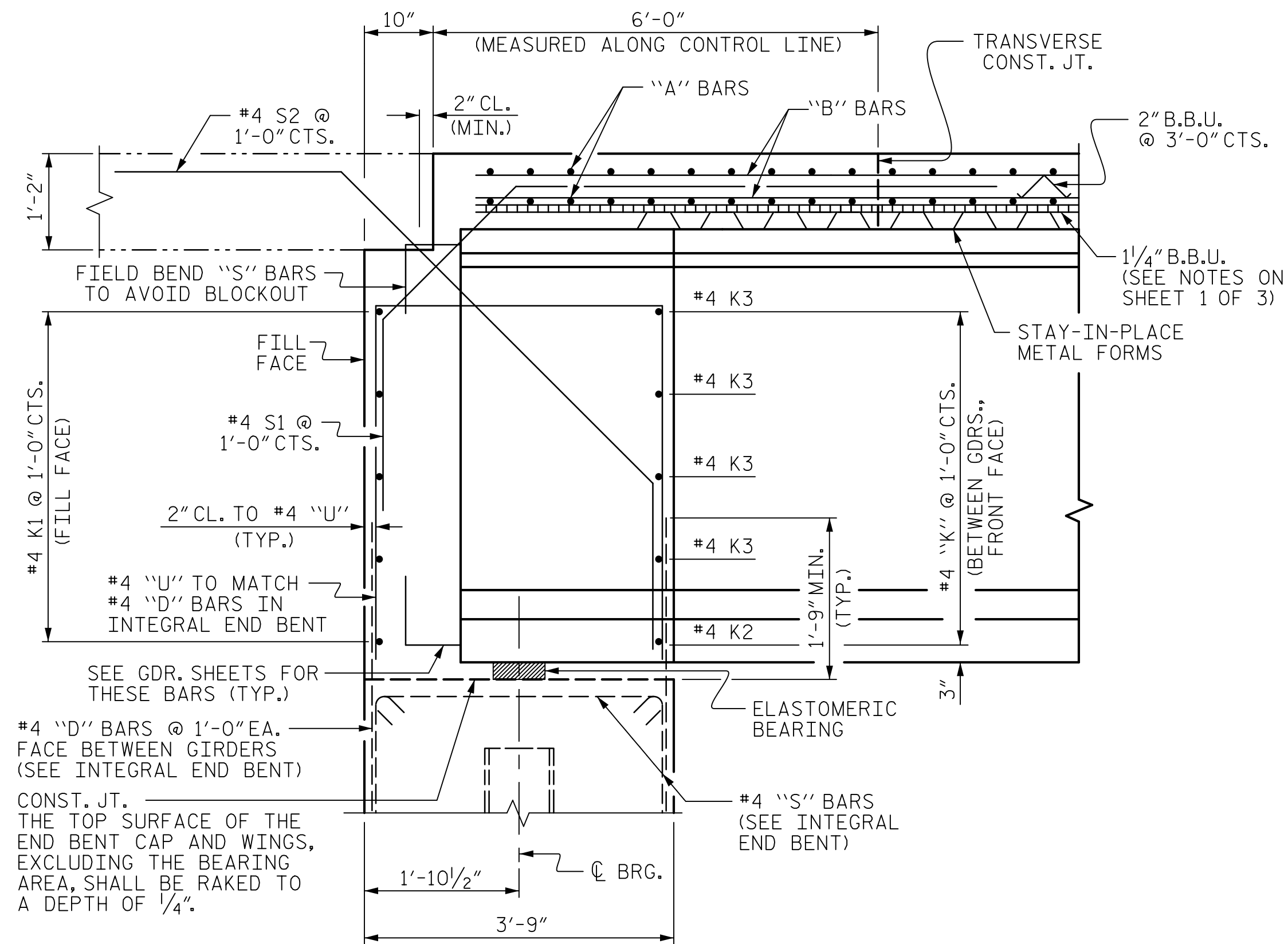
DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/21/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/21/16

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 2610 Wycliff Road  
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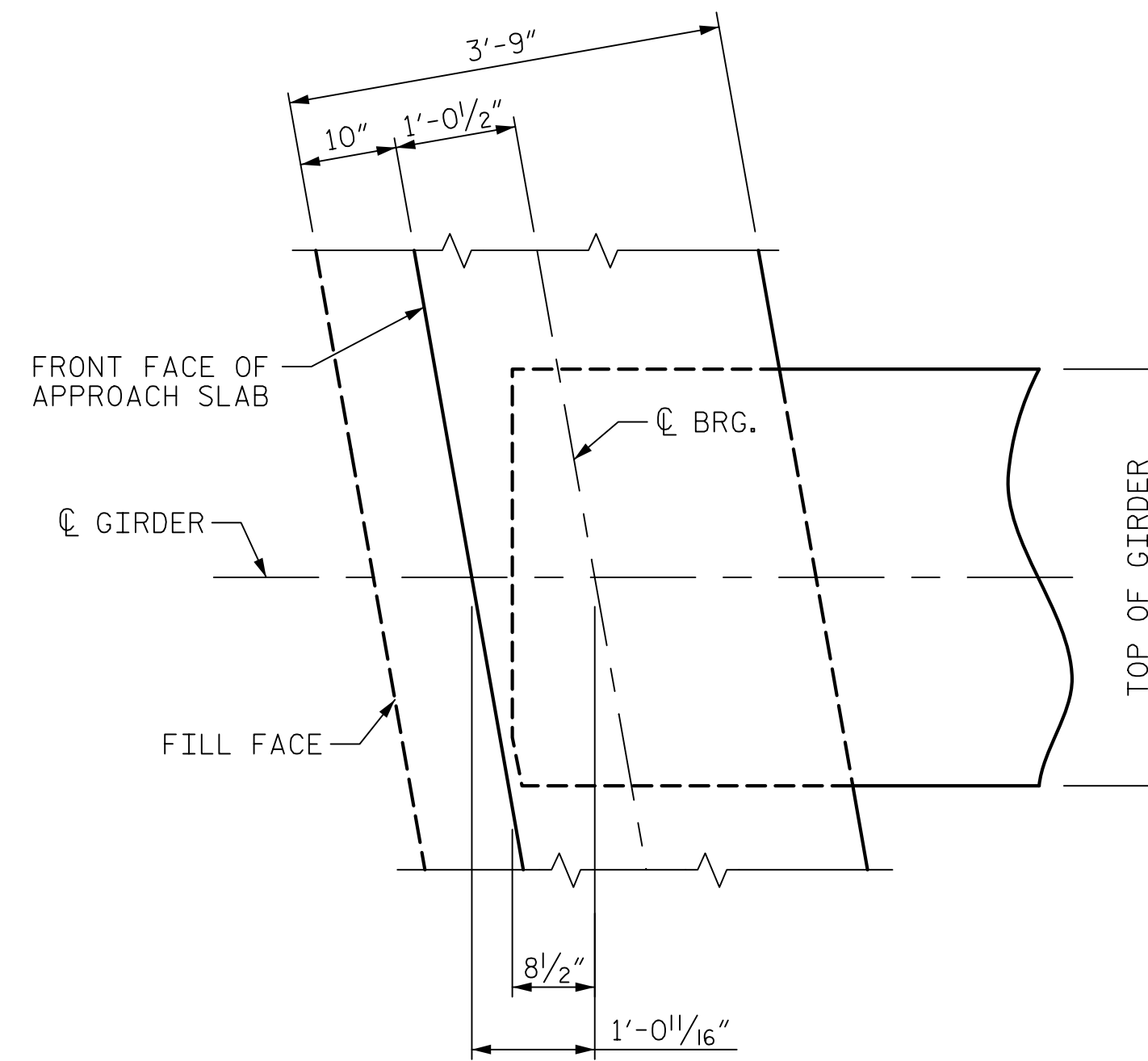
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-6
1			3			TOTAL SHEETS
2			4			28





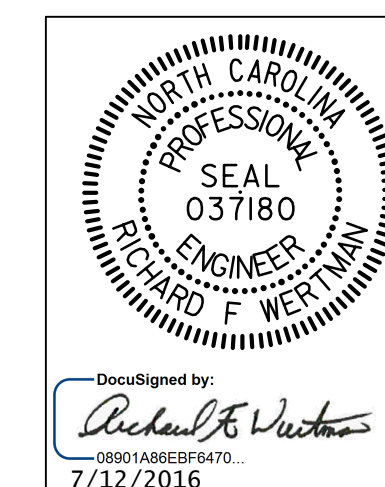
SECTION AT INTEGRAL END BENT



END BENT DIAPHRAGM

DRAWN BY : T.J. KIRSCHBAUM DATE : 11/10/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/22/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/22/16

PLANS PREPARED BY:  
**Gannett Fleming**  
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 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
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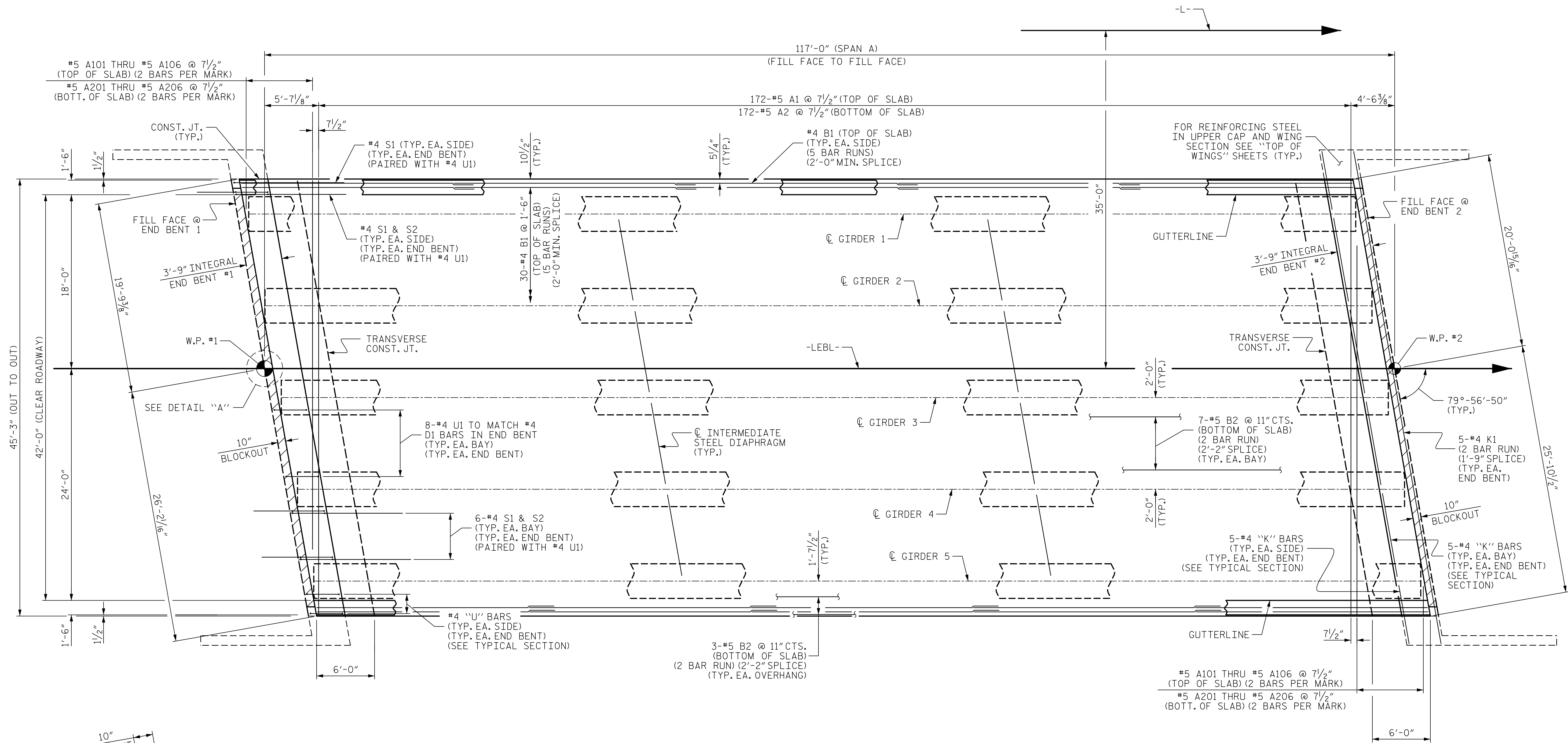
PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 3 OF 3

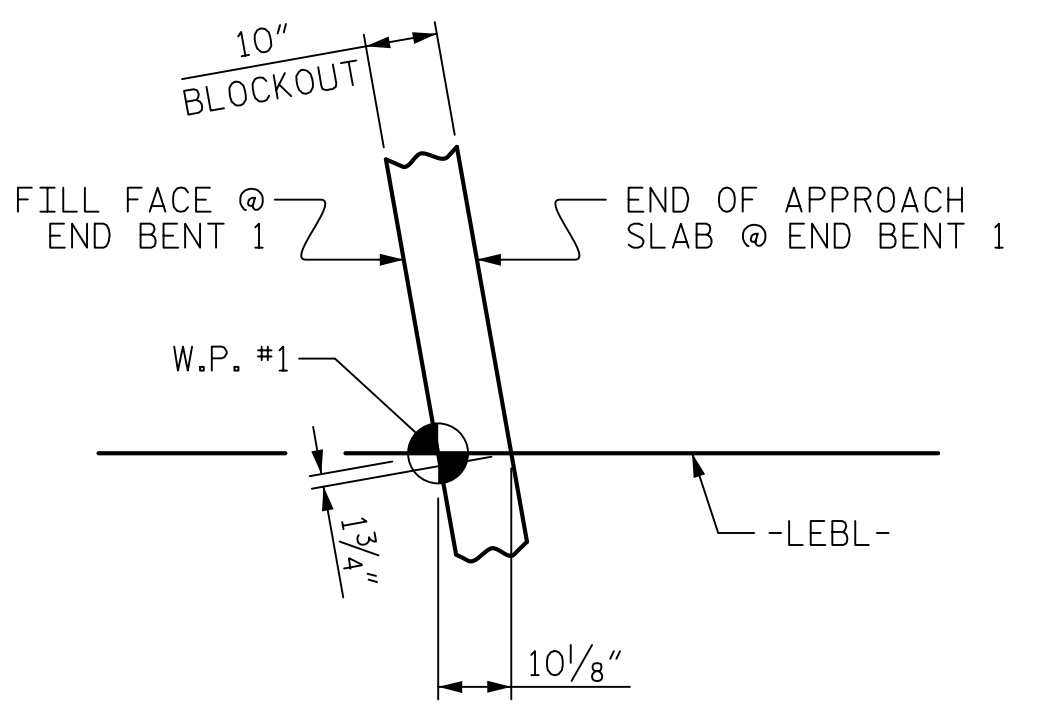
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS  
 EASTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-7
1			3			TOTAL SHEETS
2			4			28

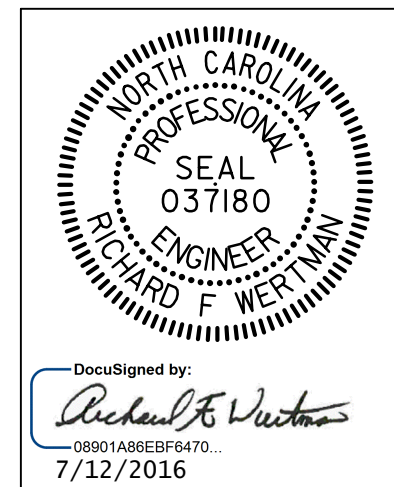


PLAN OF SPAN A



DETAIL "A"

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN A  
 EASTBOUND LANE

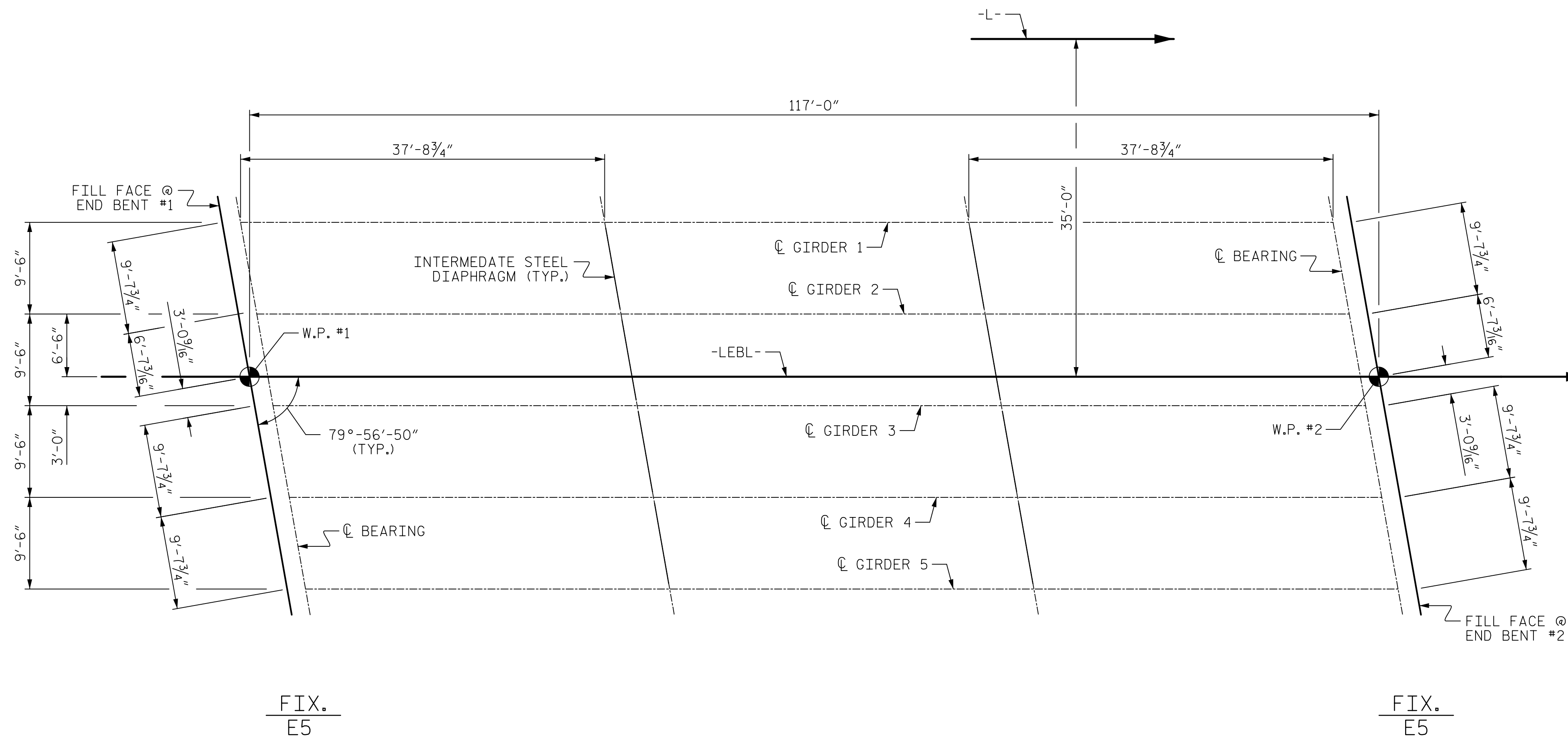
DRAWN BY : T.J. KIRSCHBAUM DATE : 10/9/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/22/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 3/22/16

PLANS PREPARED BY:  
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 Raleigh, NC 27607-3073  
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 NC Lic. No. F-0270

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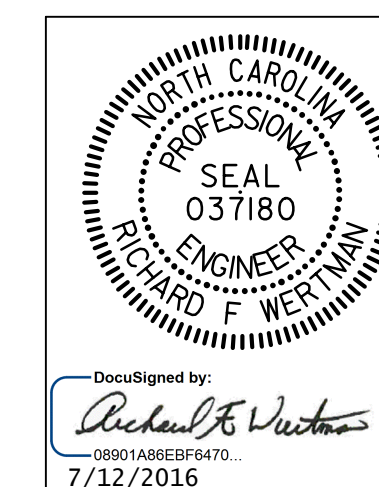
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	
1			3			S02-8	
2			4			TOTAL SHEETS 28	





SPAN A  
FRAMING PLAN

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



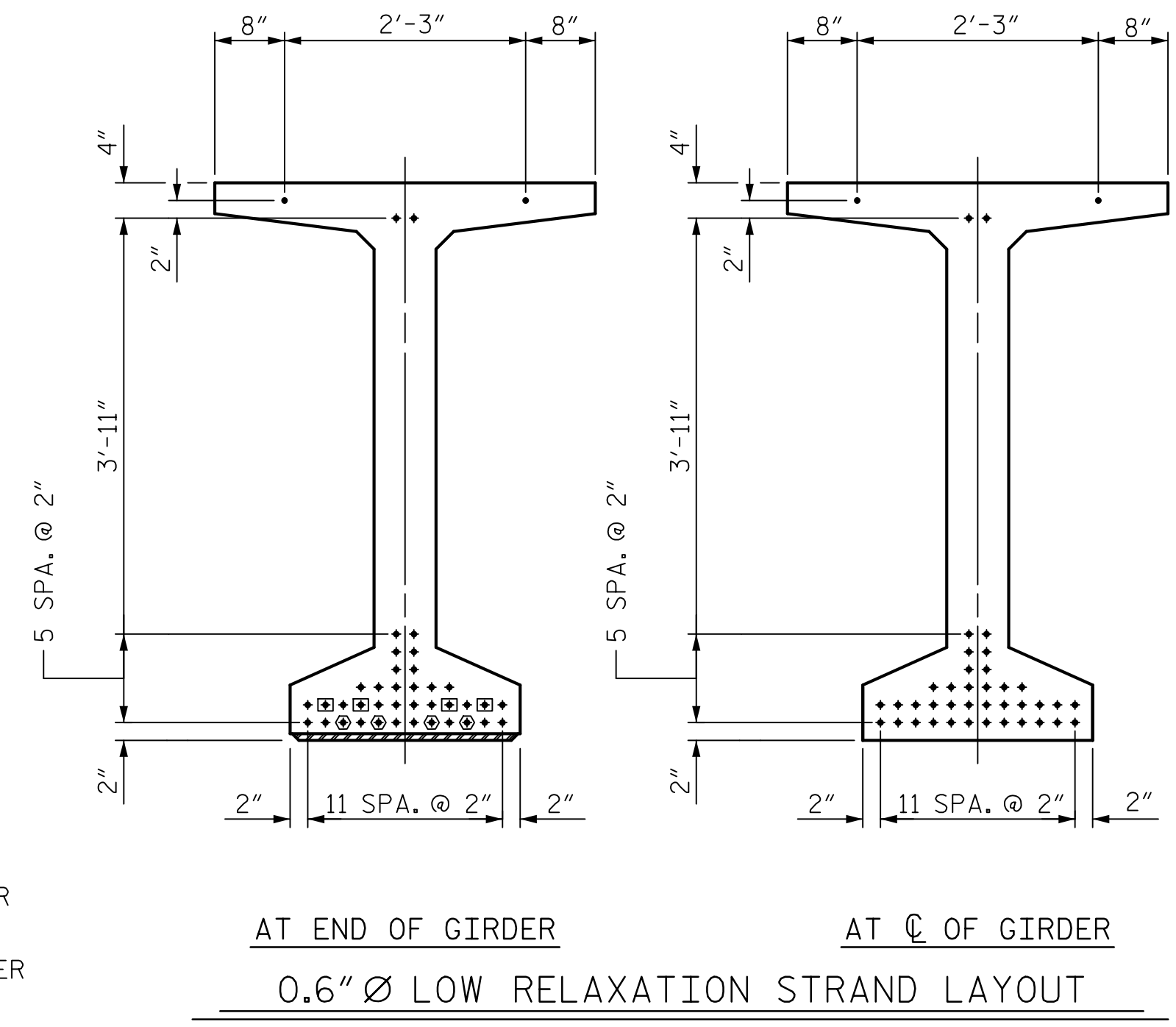
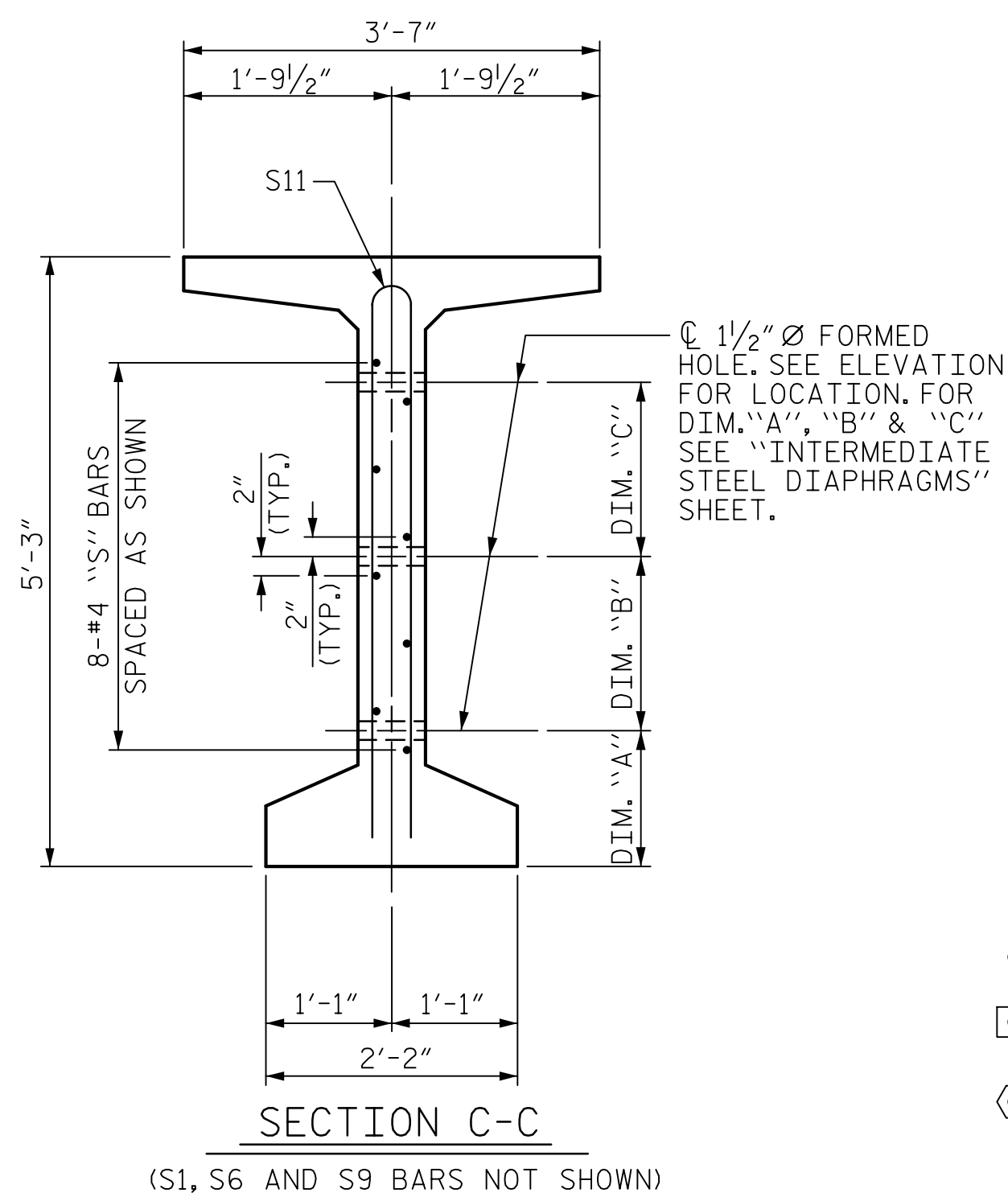
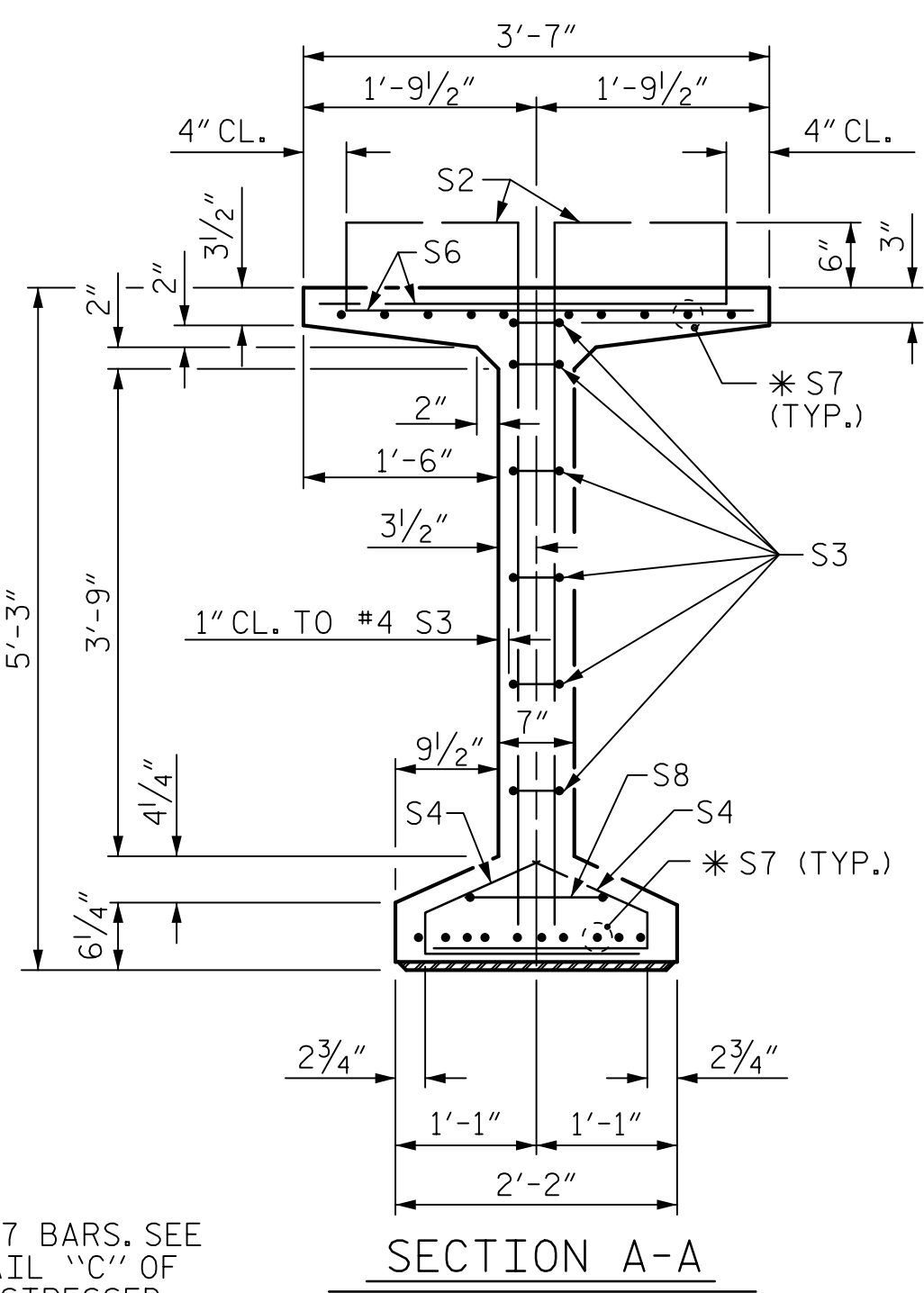
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 EASTBOUND LANE

DRAWN BY : T.J. KIRSCHBAUM      DATE : 10/29/15  
 CHECKED BY : R.F. WERTMAN      DATE : 3/23/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN      DATE : 3/23/16

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered *As Promised*  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
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 NC Lic. No. F-0270

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-9
1			3			TOTAL SHEETS
2			4			28



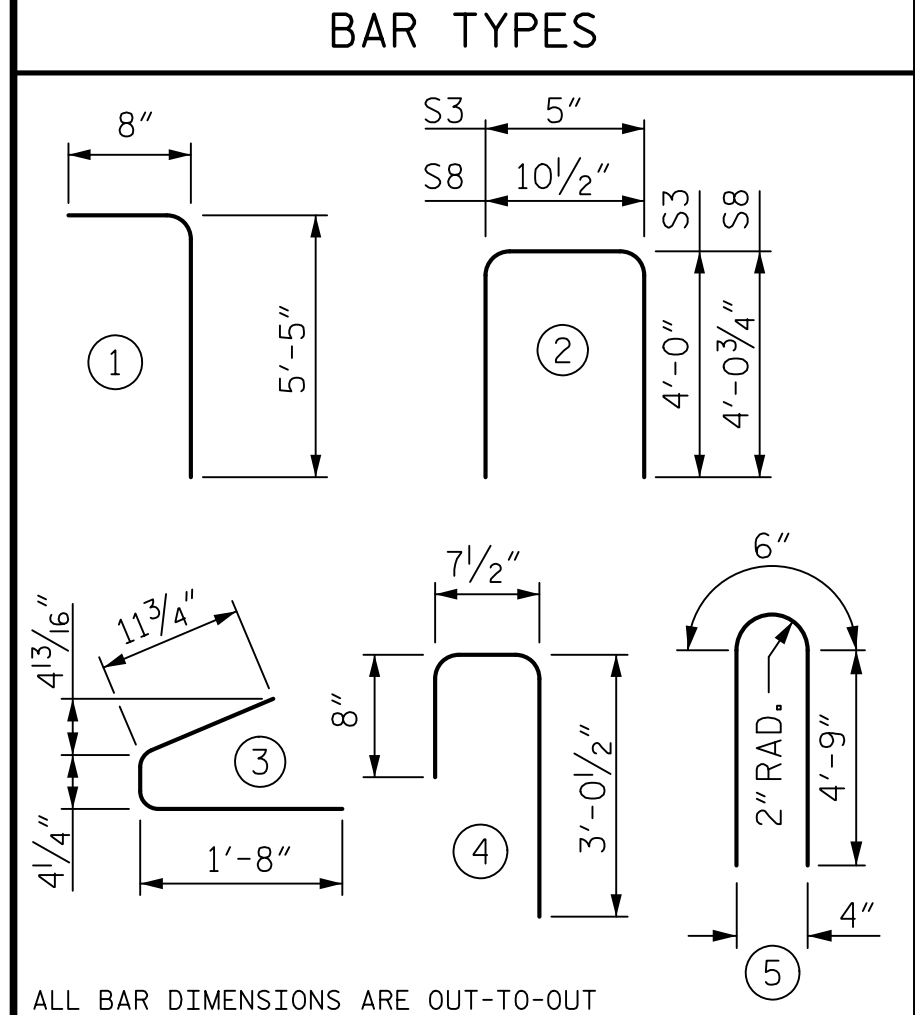
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◐ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER

\*FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET

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

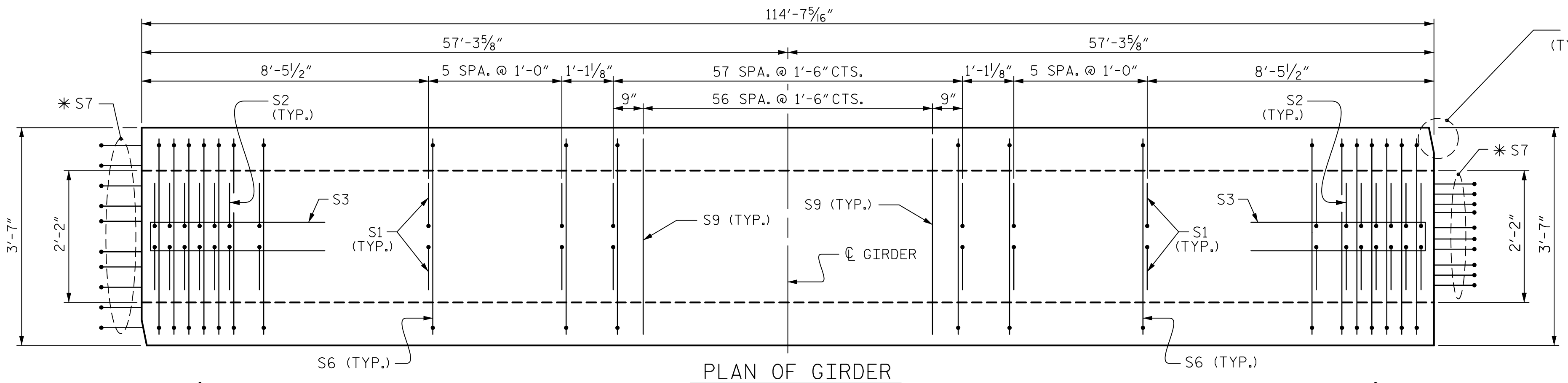
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	200	#4	1	6'-1"	813
S2	24	#6	1	6'-1"	219
S3	12	#4	2	8'-5"	67
S4	88	#4	3	3'-0"	176
S6	224	#5	4	4'-4"	1012
*S7	40	#5	STR	3'-8"	153
S8	2	#5	2	9'-0"	19
S9	57	#5	STR	3'-3"	193
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

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

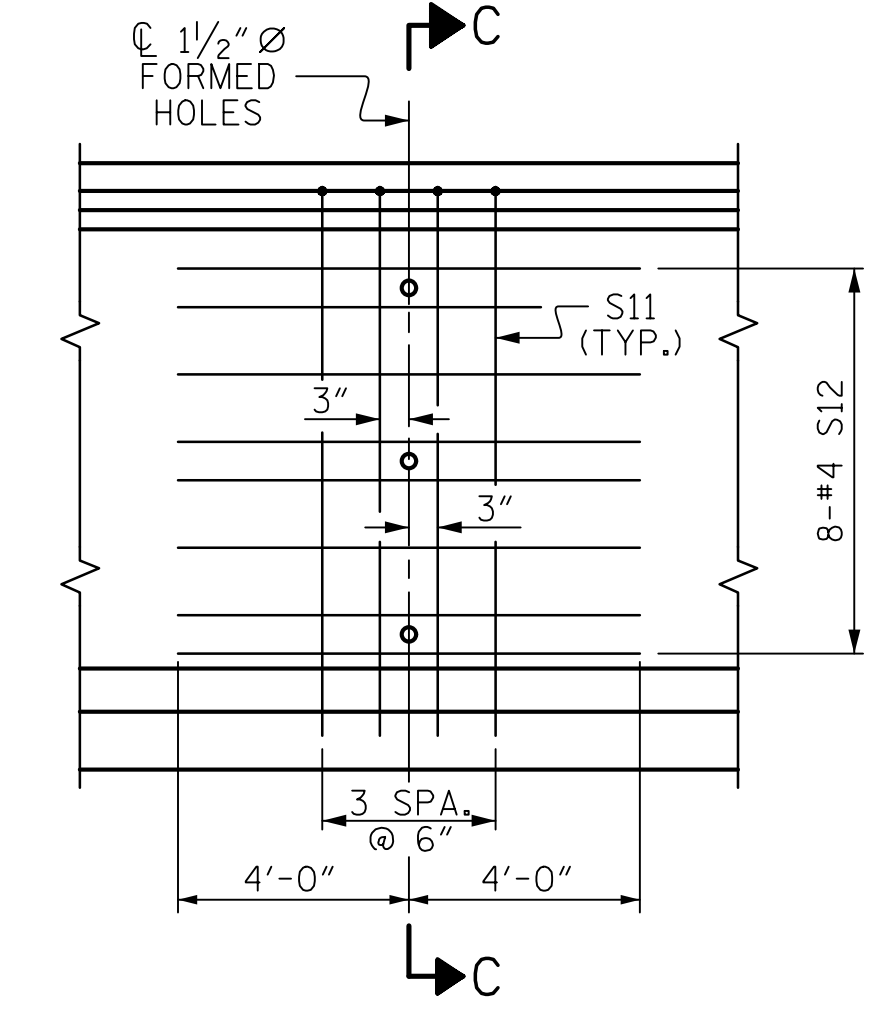


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2822	22.7	40
INTERIOR GIRDER	2822	22.7	40

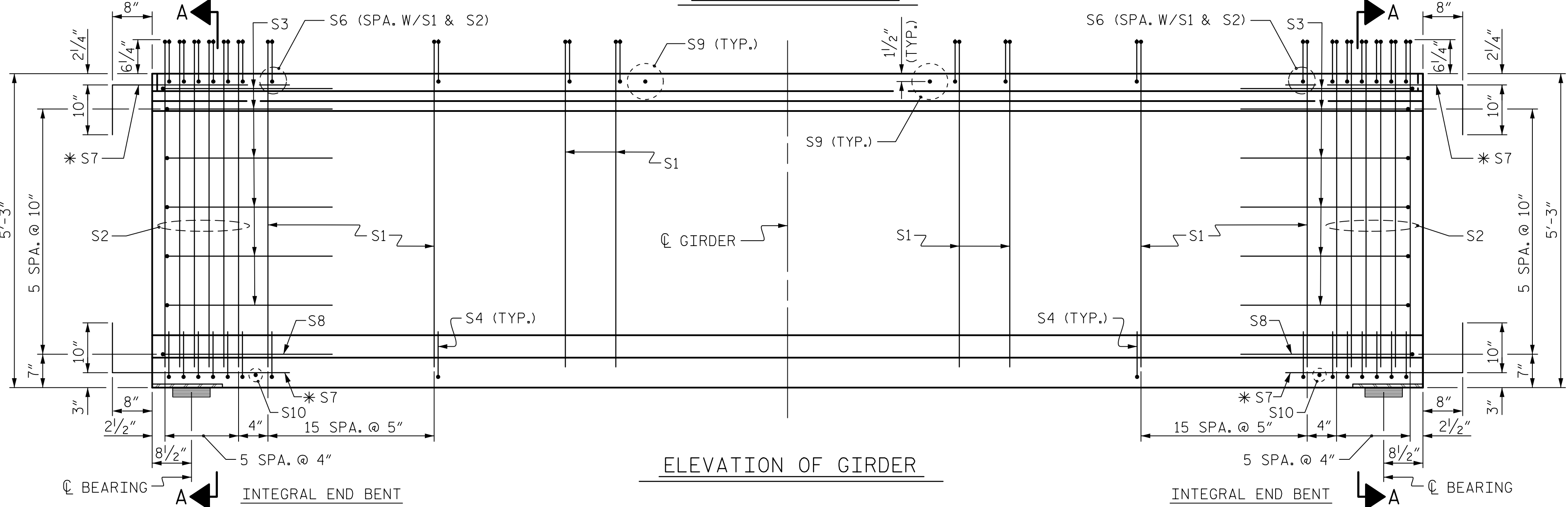
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	114'-7 5/8"	573'-0 1/2"



CLIP IN TOP FLANGE (TYP. EA. END) SEE DETAIL "D" OF PRESTRESSED CONCRETE GIRDER DETAILS SHEET



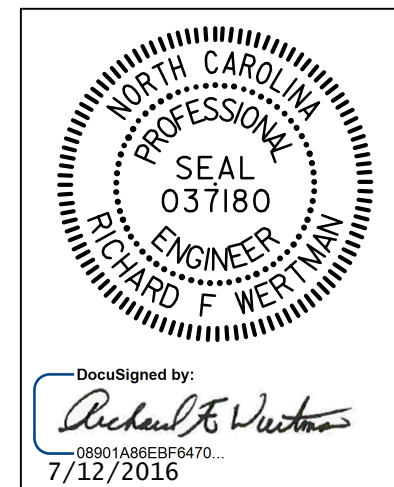
**PARTIAL ELEVATION**  
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-5



ASSEMBLED BY: T.J. KIRSCHBAUM DATE: 10/9/15  
 CHECKED BY: R.F. WERTMAN DATE: 3/23/16  
 DRAWN BY: EEM 2/6/97 REV. 10/1/11 MAA/GM  
 CHECKED BY: VAP 2/6/97 REV. 6/13 MAA/GM  
 REV. 1/15 MAA/TMG

PLANS PREPARED BY:  
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 Excellence Delivered As Promised  
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 INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 SPAN A  
 EASTBOUND LANE

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



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.

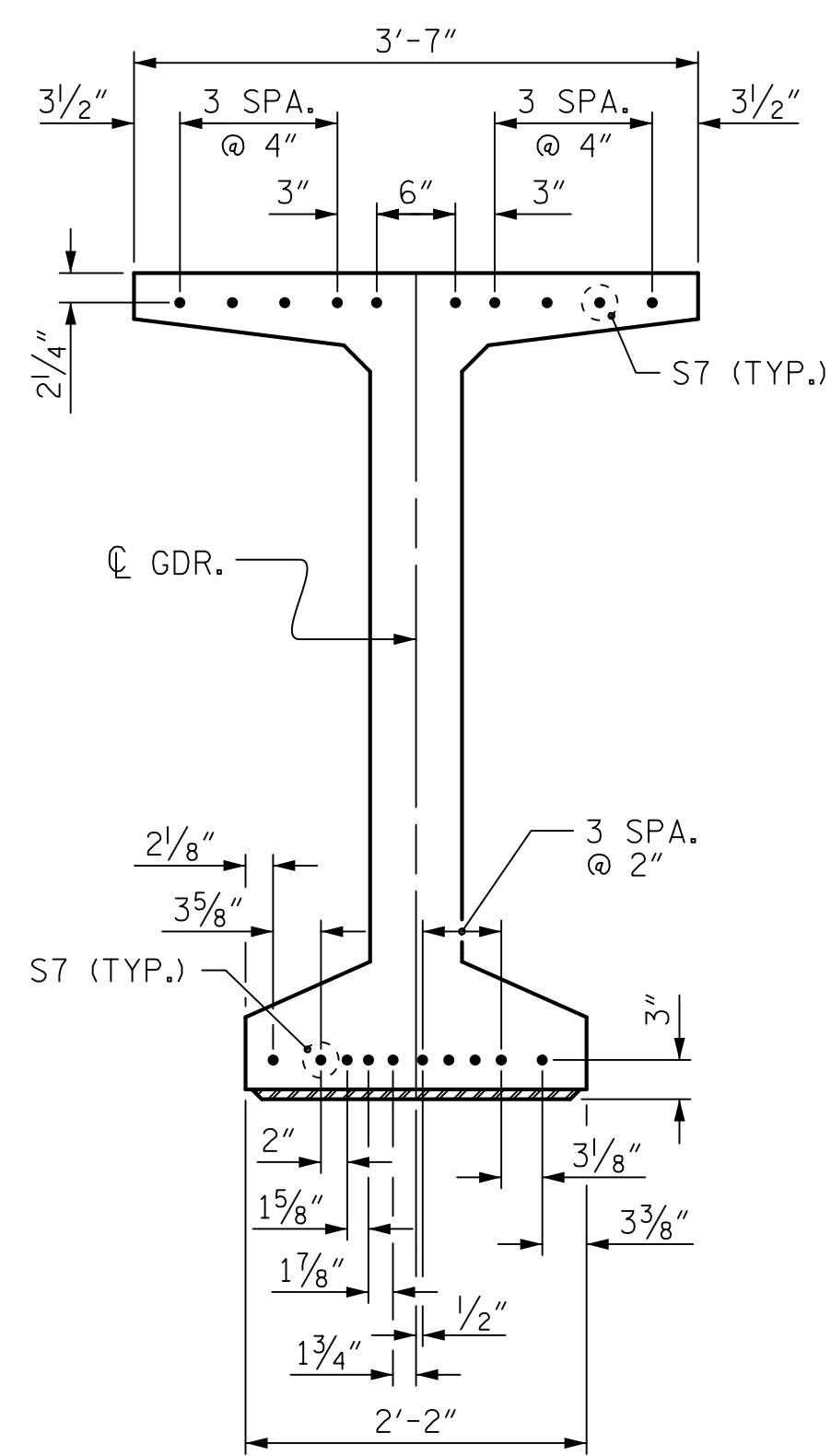
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6400 PSI. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

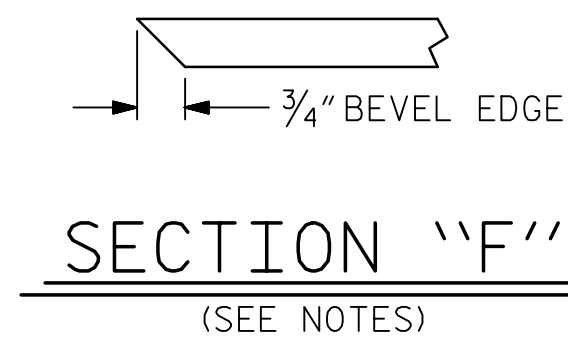
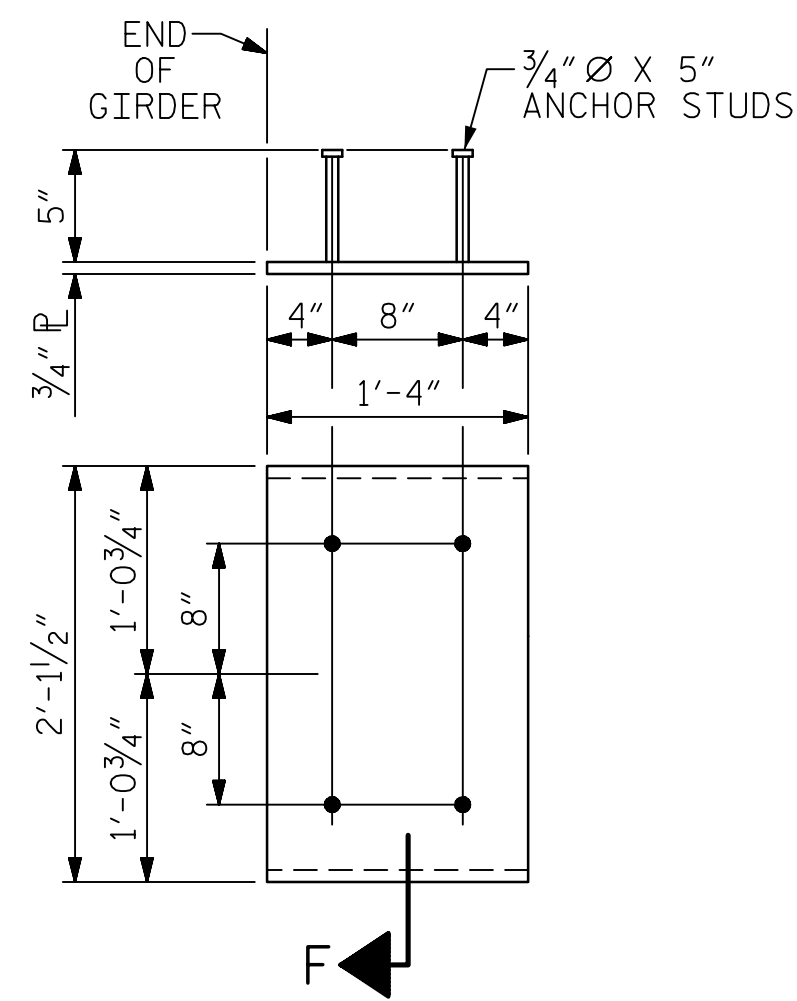
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES.

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

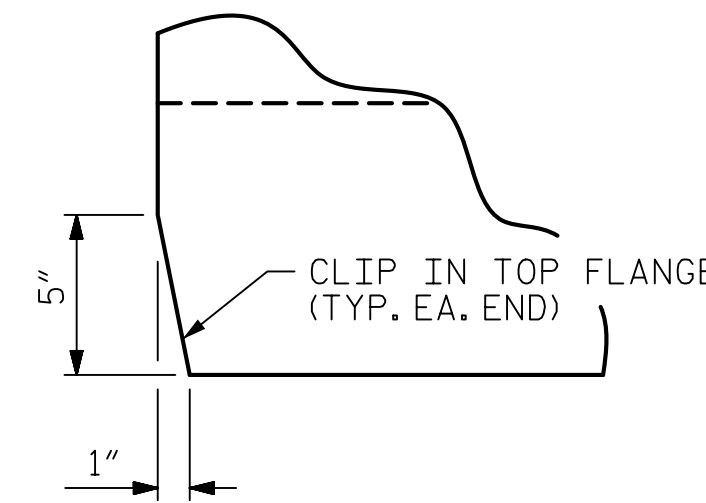
FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.



DETAIL "C"



EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES (2 REQ'D PER GIRDER)

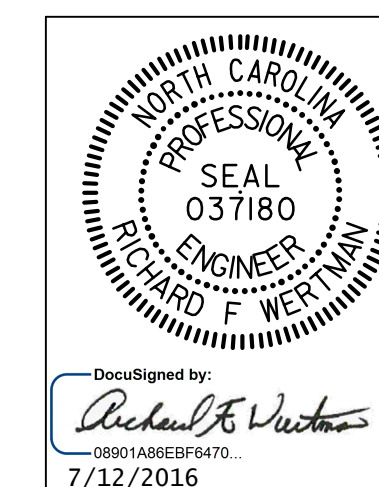


DETAIL "D"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDERS 1 & 5																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.046	0.091	0.134	0.173	0.207	0.237	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.237	0.207	0.173	0.134	0.091	0.046	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.028	0.056	0.084	0.109	0.132	0.151	0.166	0.177	0.184	0.186	0.184	0.177	0.166	0.151	0.132	0.109	0.084	0.056	0.028	0
FINAL CAMBER	↑	0	3/16"	7/16"	5/8"	3/4"	7/8"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1 1/16"	7/8"	3/4"	5/8"	7/16"	3/16"	0
0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDERS 2, 3 & 4																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	0.046	0.091	0.134	0.173	0.207	0.237	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.237	0.207	0.173	0.134	0.091	0.046	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.029	0.060	0.090	0.118	0.143	0.164	0.180	0.192	0.199	0.202	0.199	0.192	0.180	0.164	0.143	0.118	0.090	0.060	0.029	0
FINAL CAMBER	↑	0	3/16"	3/8"	1/2"	11/16"	3/4"	7/8"	1 5/16"	1"	1 1/16"	1 1/16"	1 1/16"	1"	1 5/16"	7/8"	3/4"	1 1/16"	1/2"	3/8"	3/16"	0

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

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 DETAILS  
 EASTBOUND LANE

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 10/9/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/24/16  
 DRAWN BY : ELR 11/91 REV. 10/1/11 MAA/GM  
 CHECKED BY : GRP 11/91 REV. 1/15 MAA/TMG  
 REV. 2/15 MAA/TMG

PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
 INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE 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, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE 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.

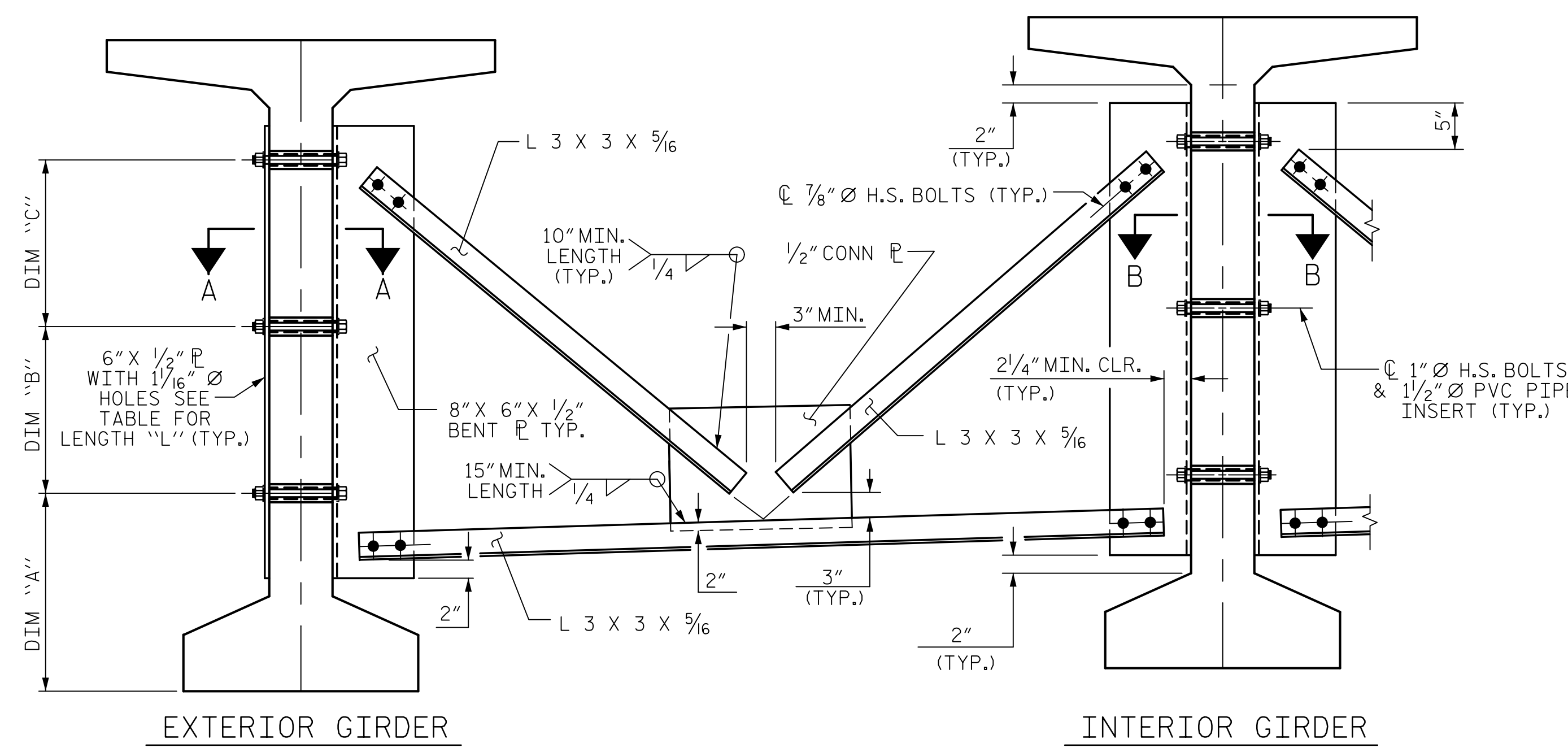
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

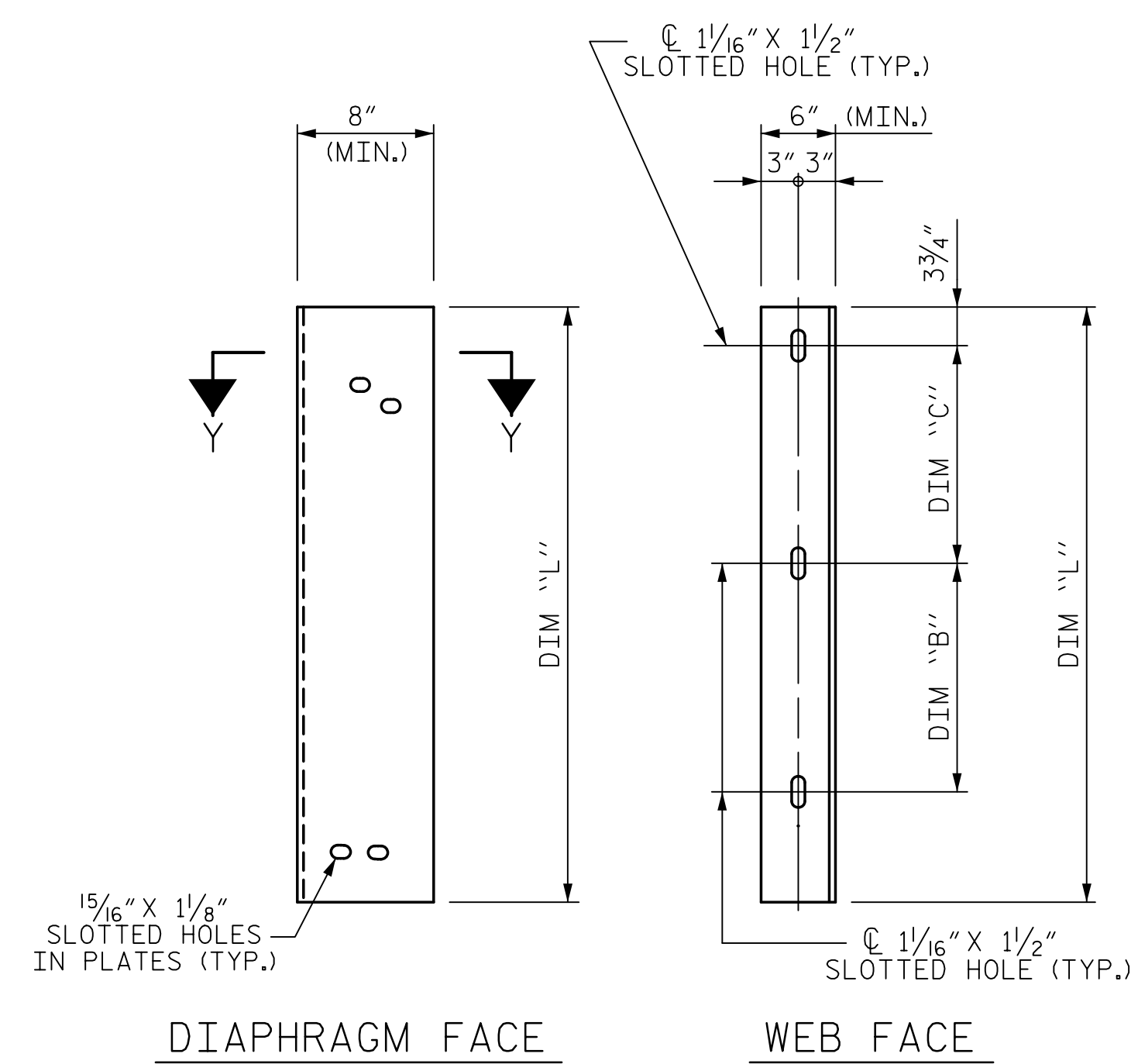
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

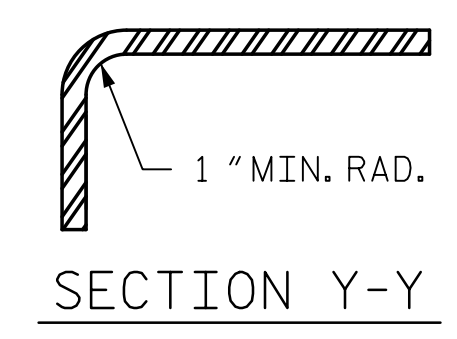
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PART SECTION AT INTERMEDIATE DIAPHRAGM



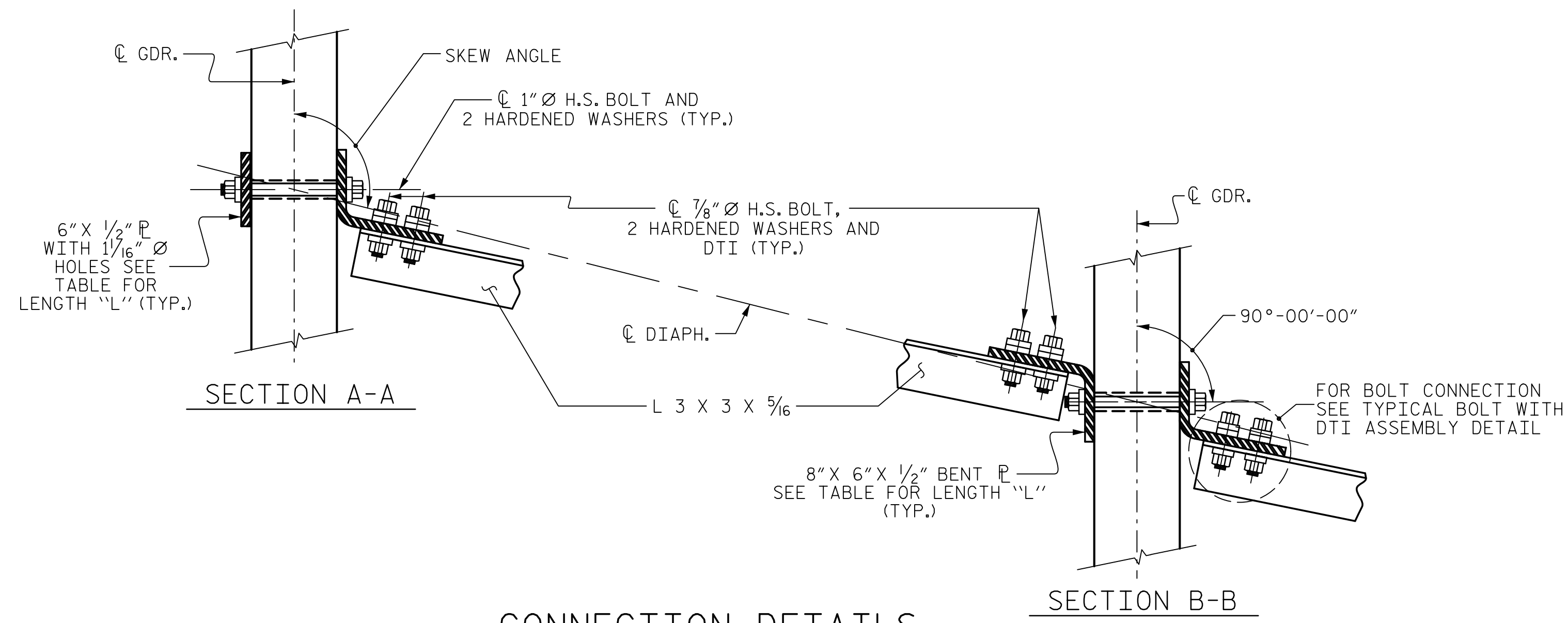
DIAPHRAGM FACE WEB FACE



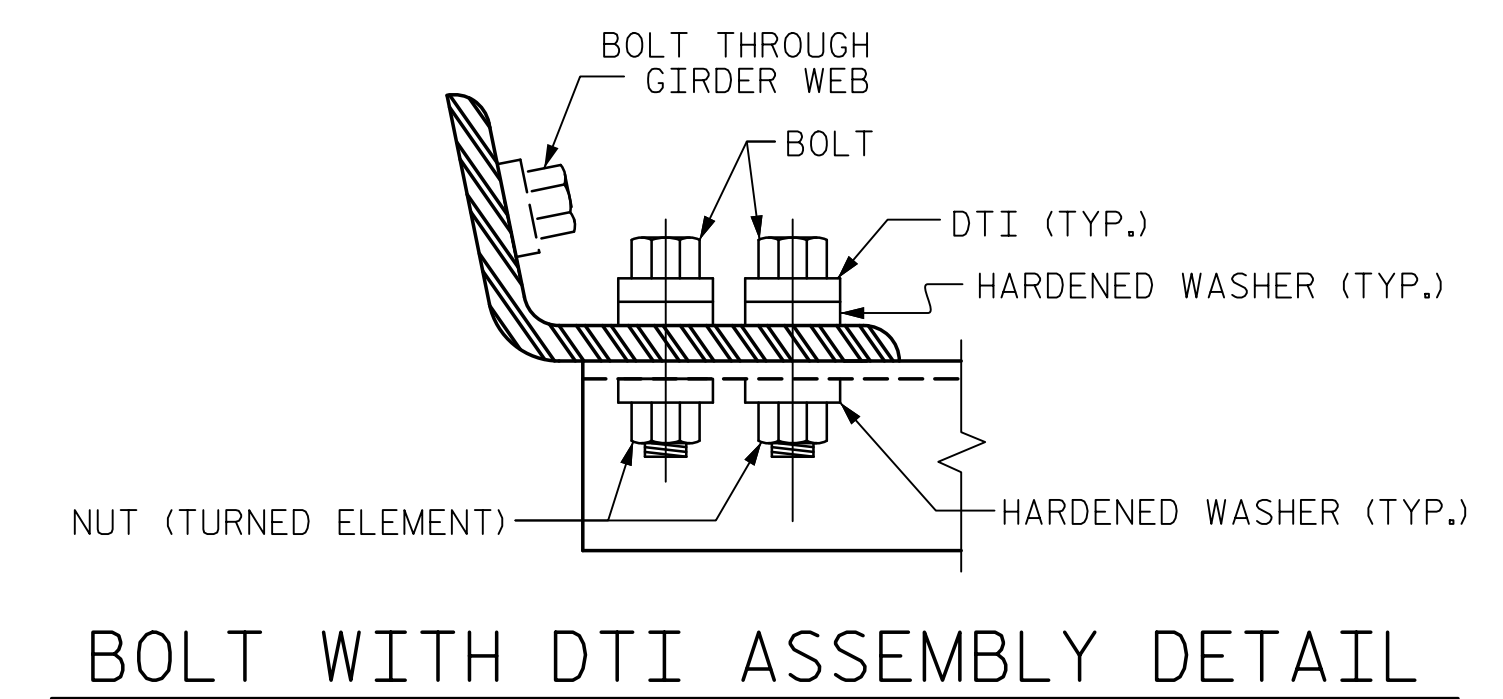
CONNECTOR PLATE DETAIL

TABLE

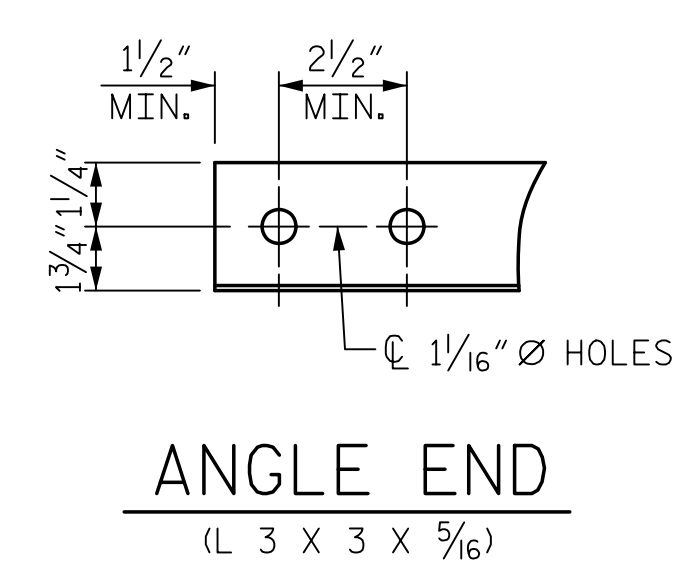
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 3/4"	1'-3"	1'-3"	3'-5"



CONNECTION DETAILS

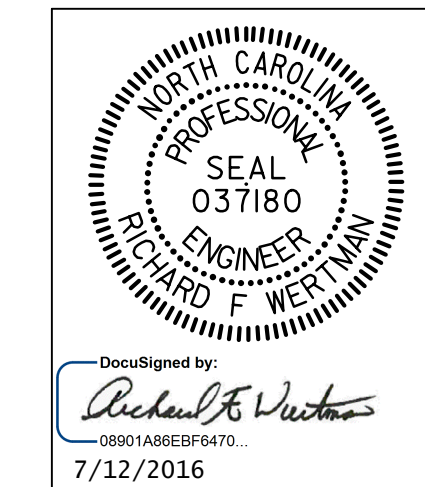


BOLT WITH DTI ASSEMBLY DETAIL



ANGLE END (L 3 x 3 x 5/16)

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE STEEL  
 DIAPHRAGMS FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS  
 EASTBOUND LANE

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

ASSEMBLED BY : T.J. KIRSCHBAUM DATE : 10/9/15  
 CHECKED BY : R.F. WERTMAN DATE : 3/24/16  
 DRAWN BY : RWW 11/09  
 CHECKED BY : GM 11/09  
 ADDED 11/23/09R  
 REV. 10/11/11 MAA/GM

PLANS PREPARED BY:  
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 INC Lic. No. F-02710

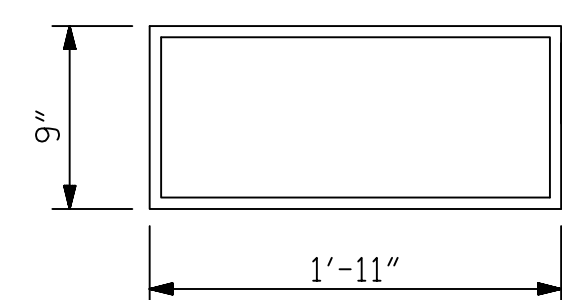
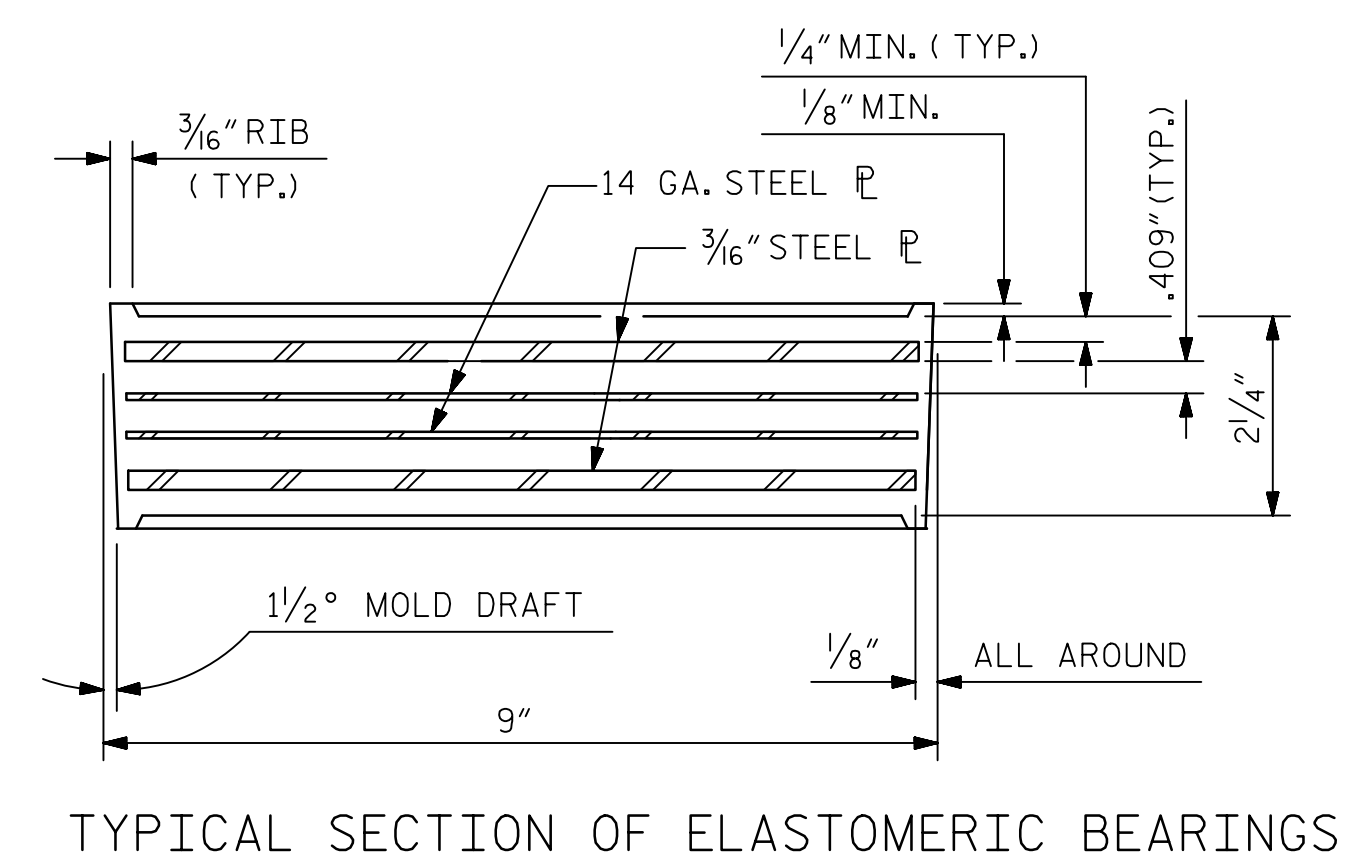
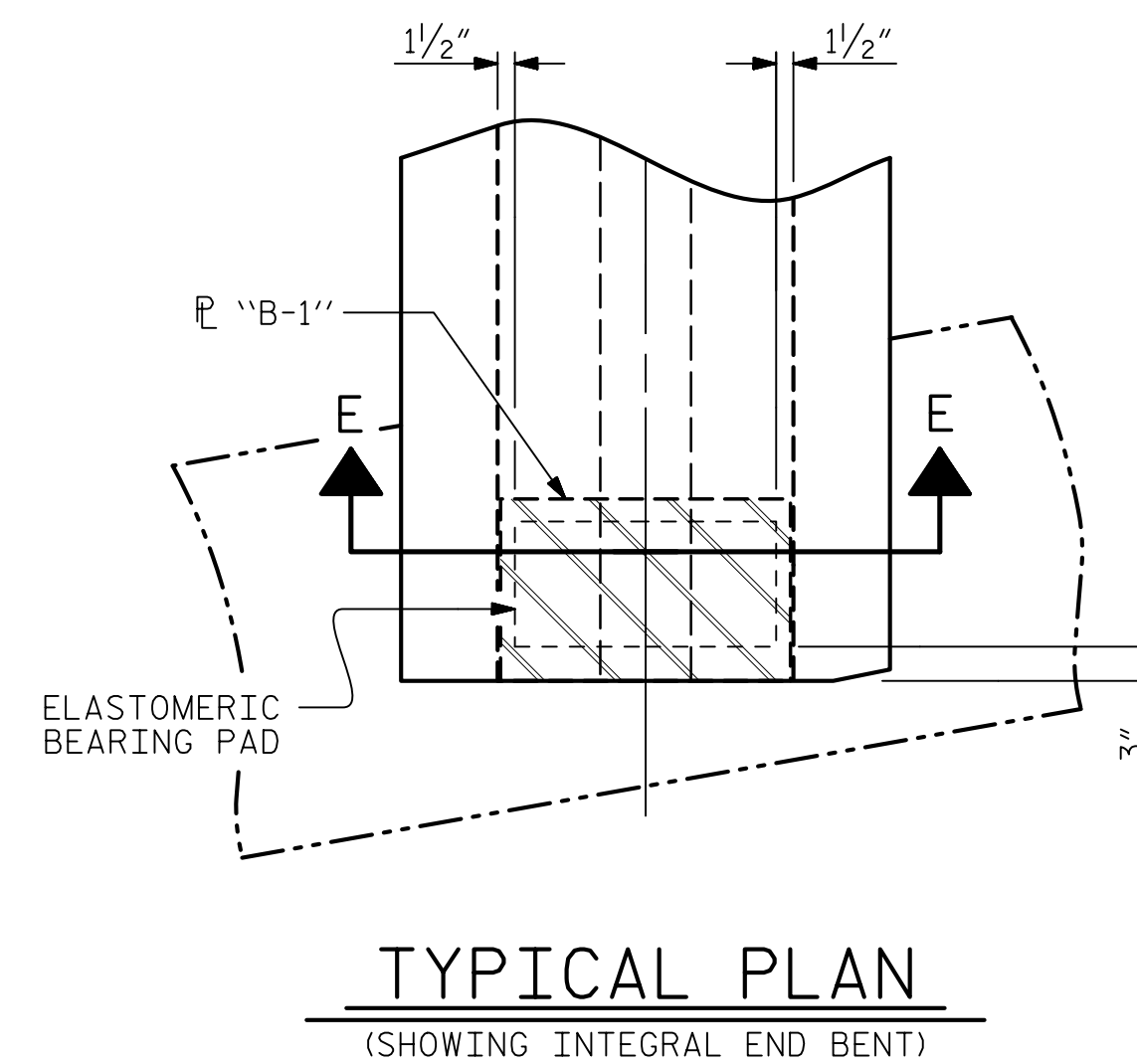
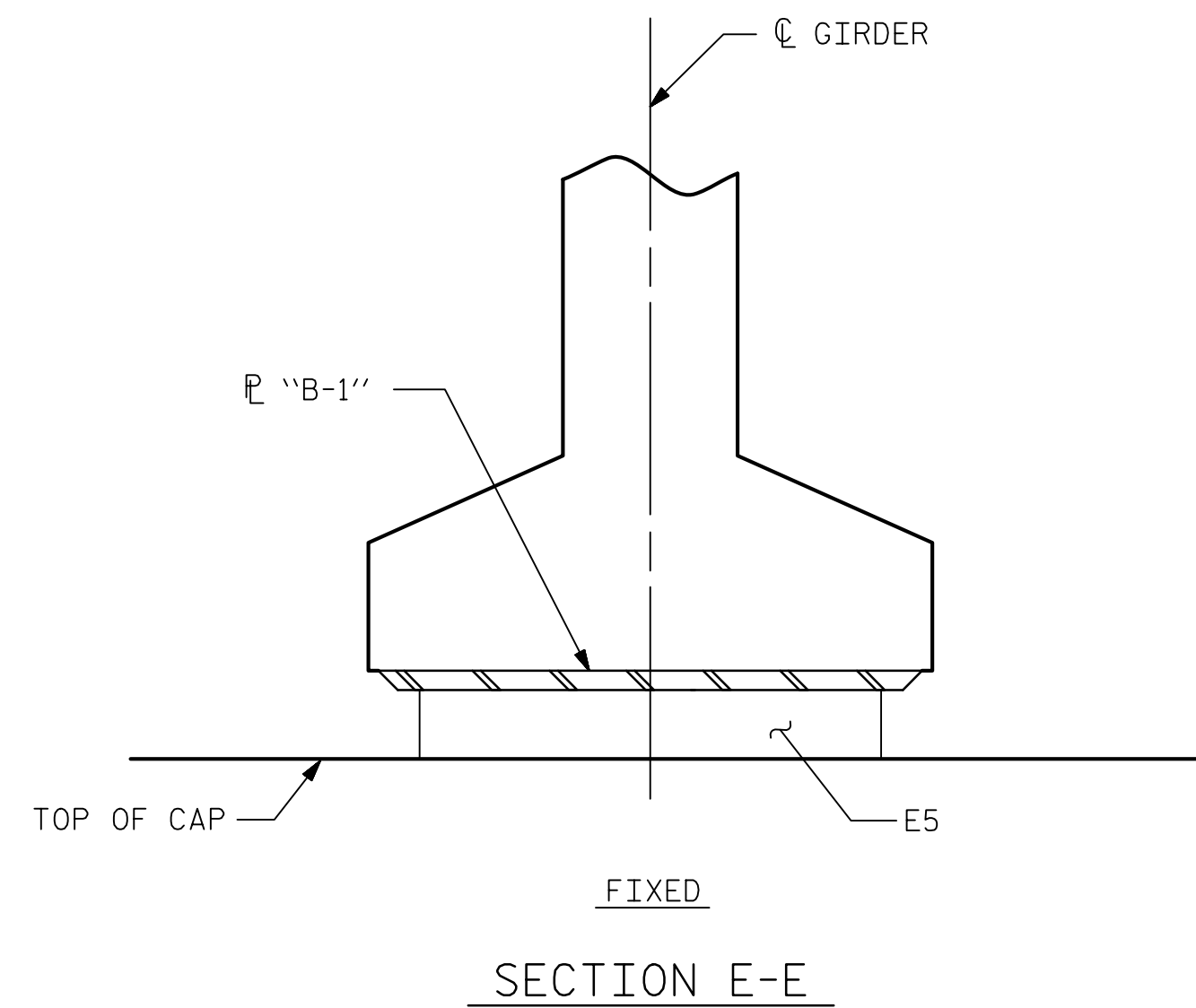
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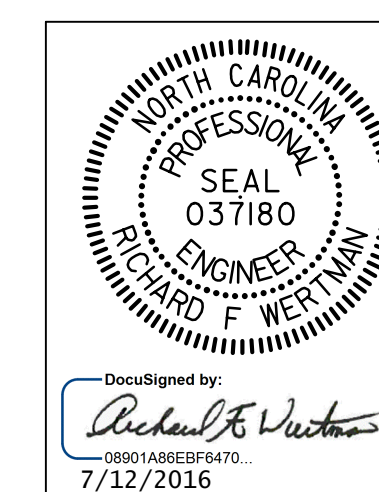
NOTES

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.



E5 ( 10 REQ'D )  
 PLAN VIEW OF ELASTOMERIC BEARING  
 TYPE V

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



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

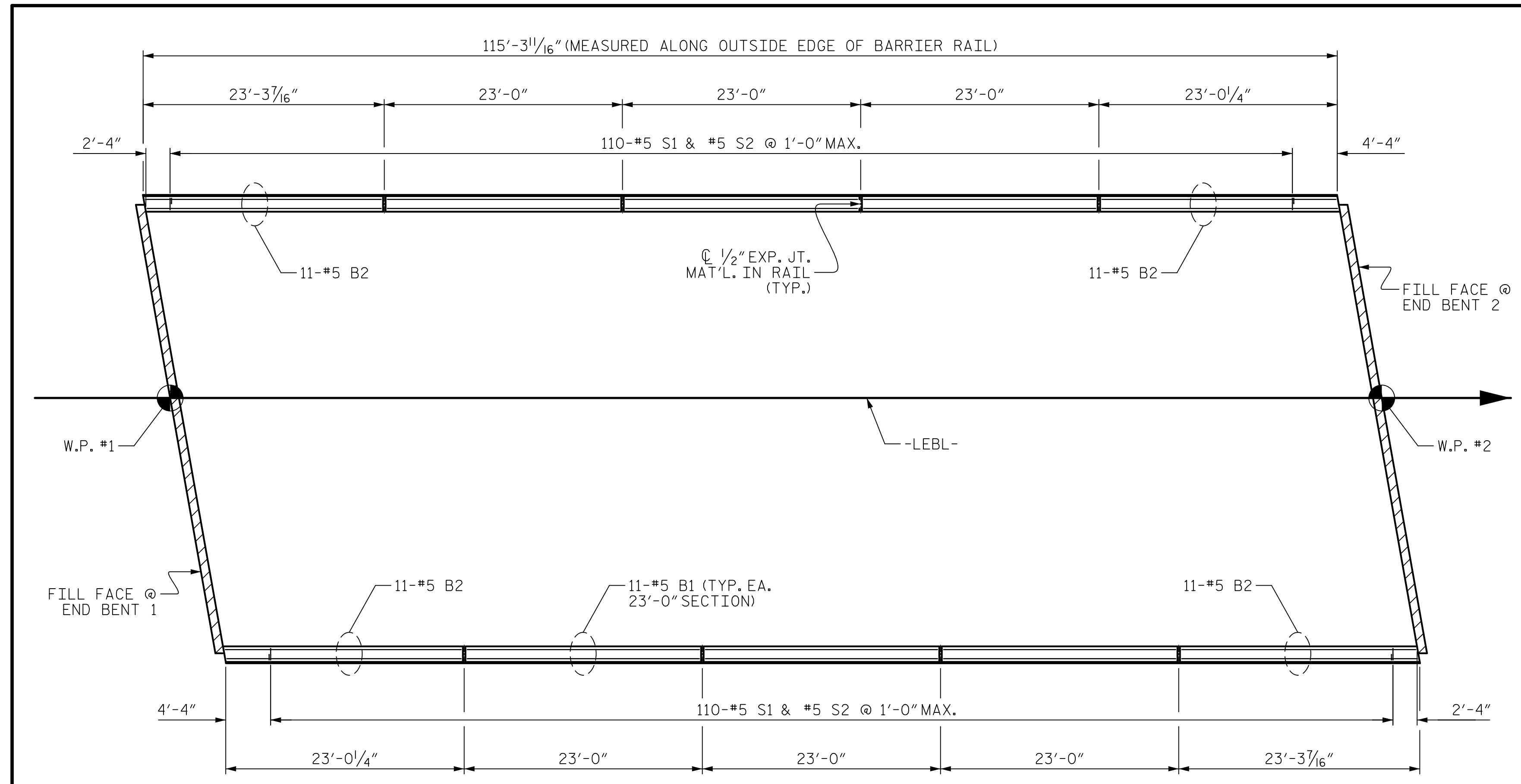
ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 10/9/15
CHECKED BY : R.F. WERTMAN	DATE : 3/24/16
DRAWN BY : EEM 2/97	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 2/97	REV. 6/13 AAC/MAA
	REV. 1/15 MAA/TMG

PLANS PREPARED BY:  
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 2610 Wycliff Road  
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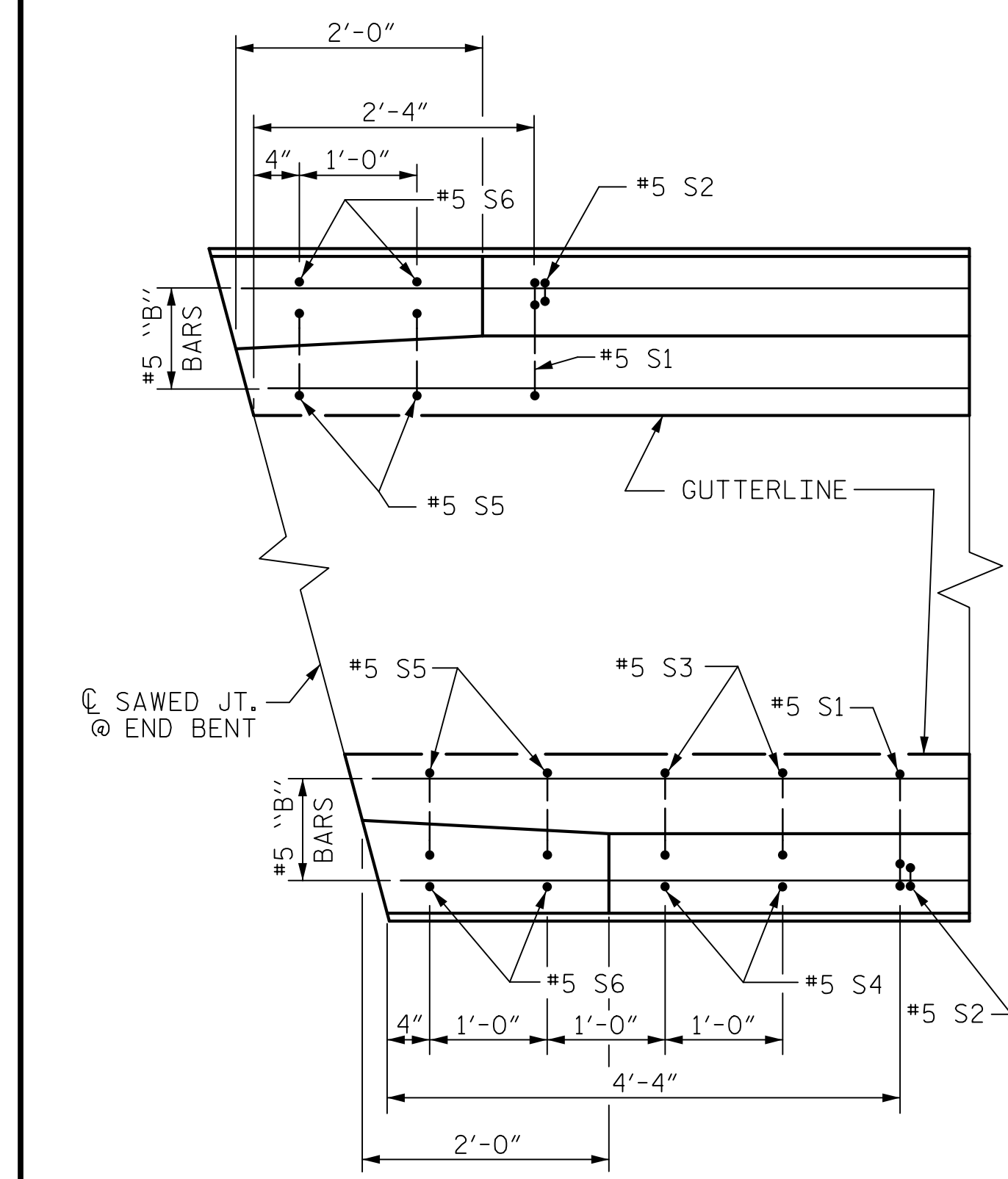
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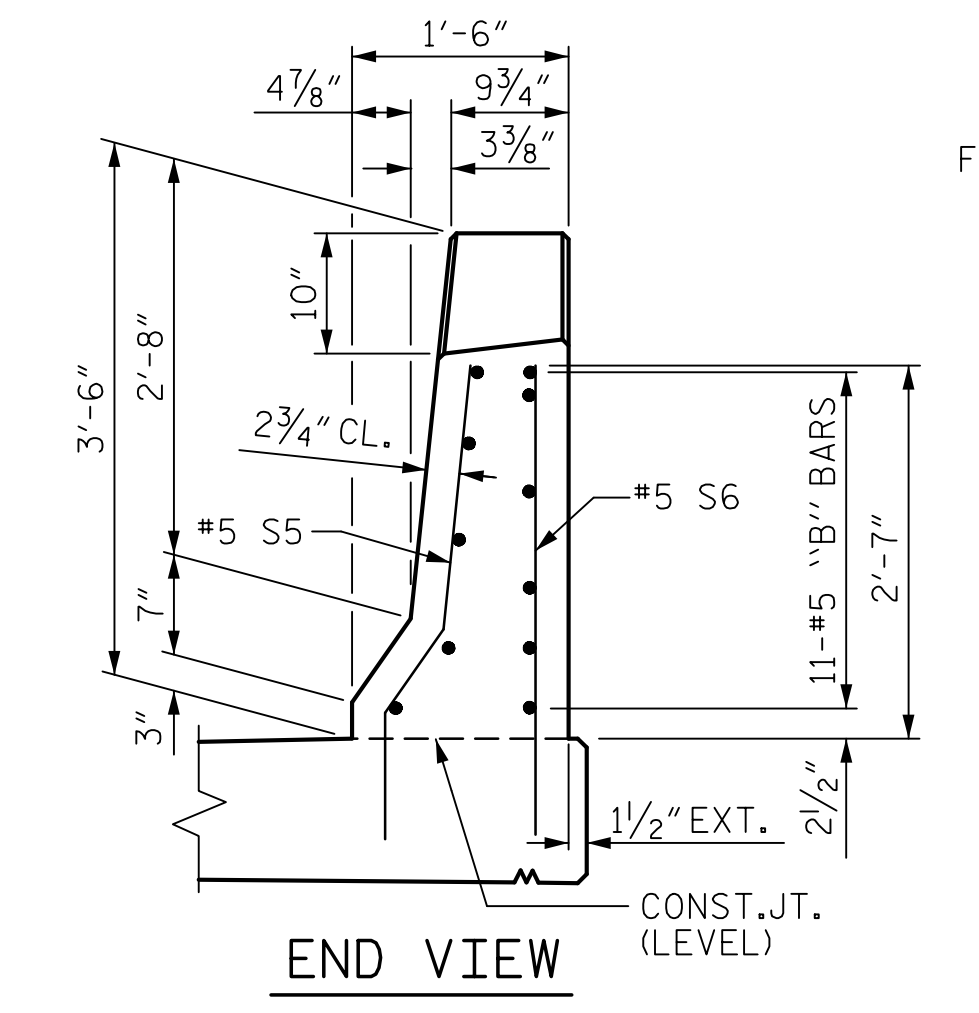
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-13
1			3			TOTAL SHEETS
2			4			28



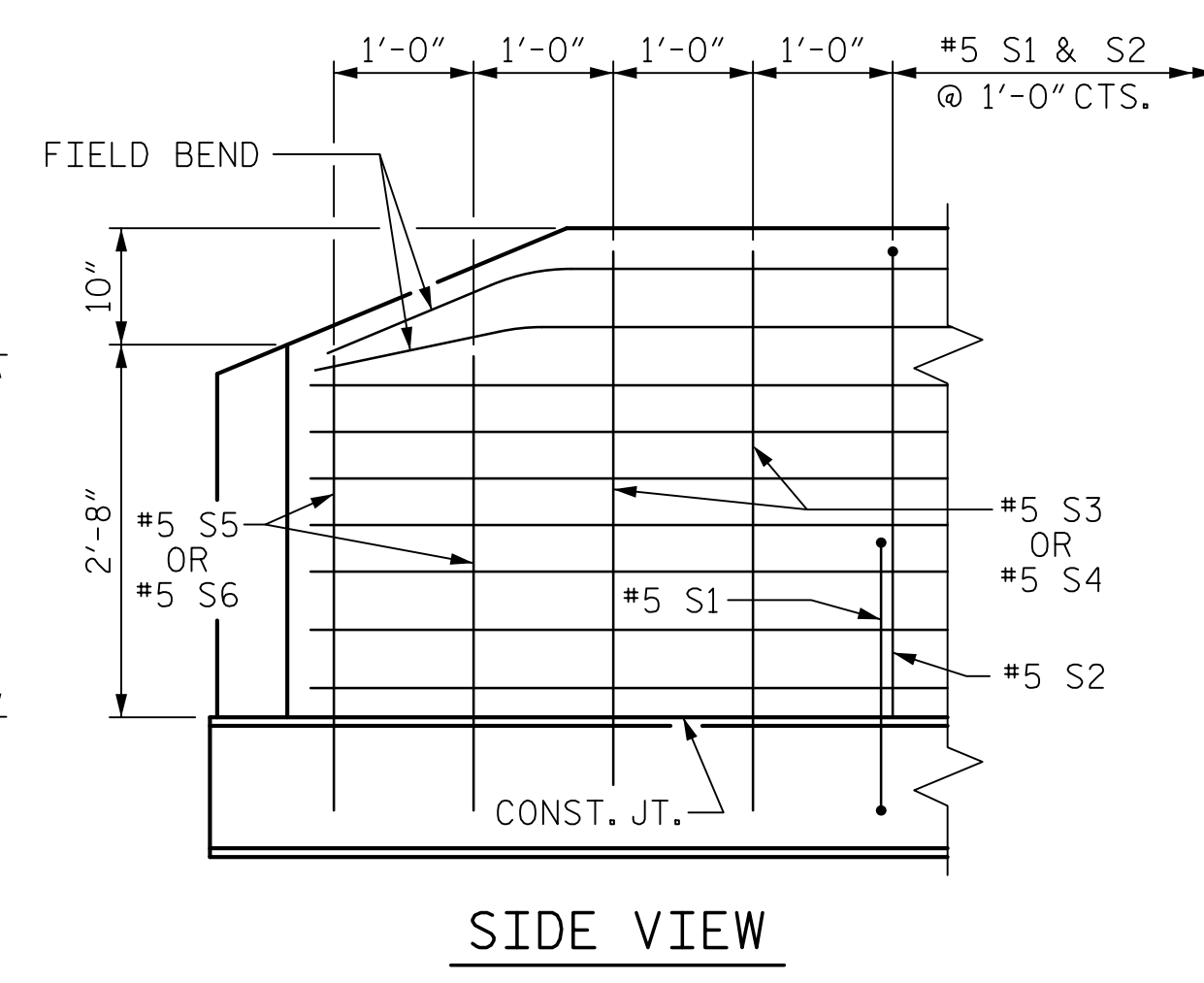
PLAN



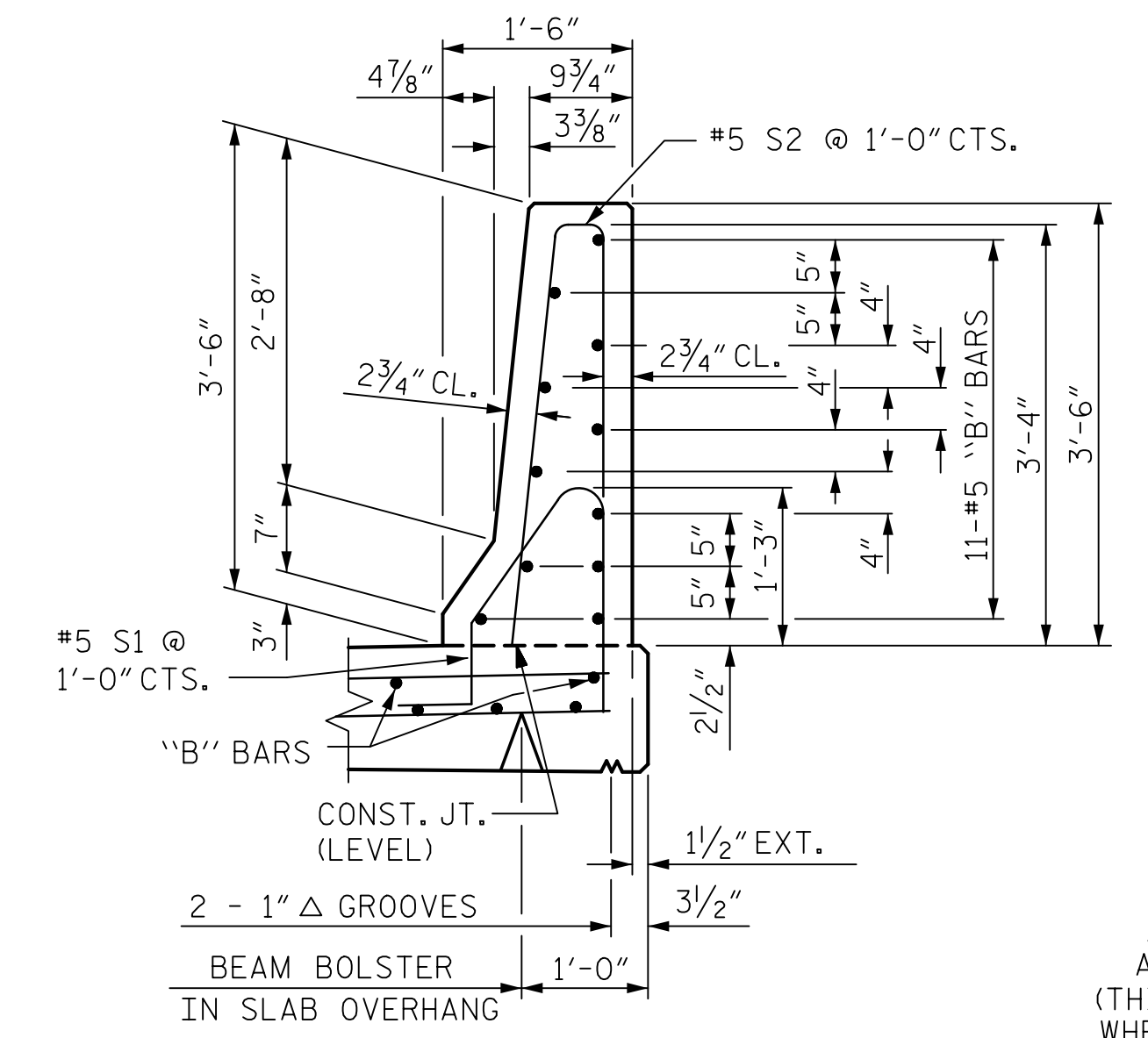
PLAN



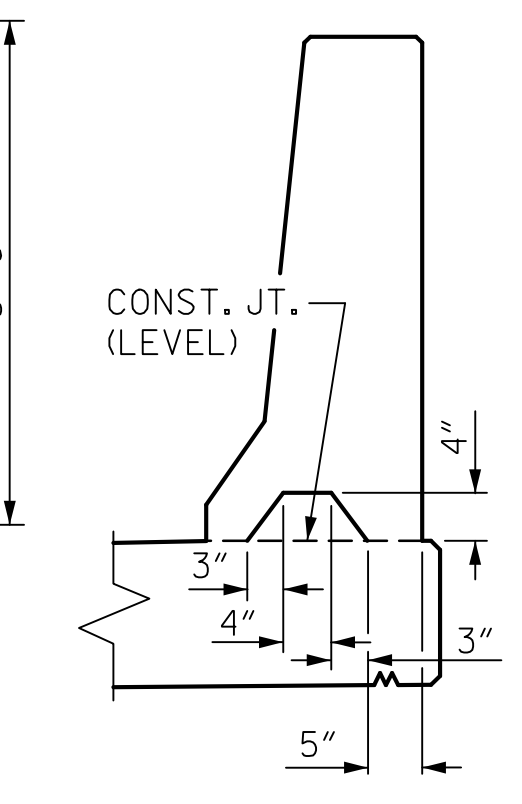
END OF RAIL DETAILS  
FOR ADHESIVE ANCHORING AT SAWED JOINTS



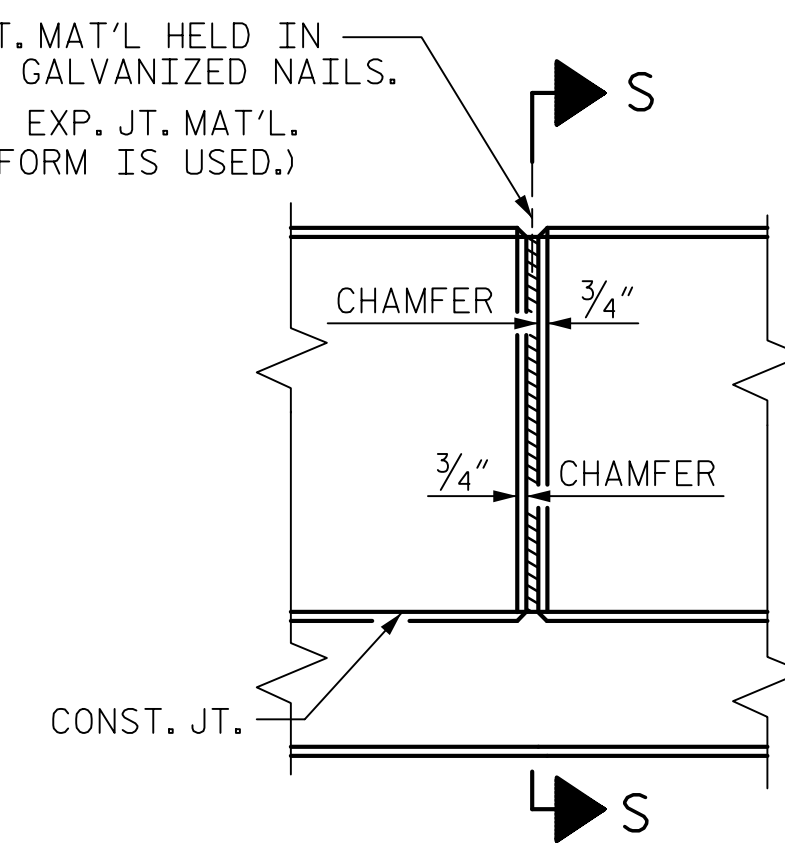
SIDE VIEW



SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS

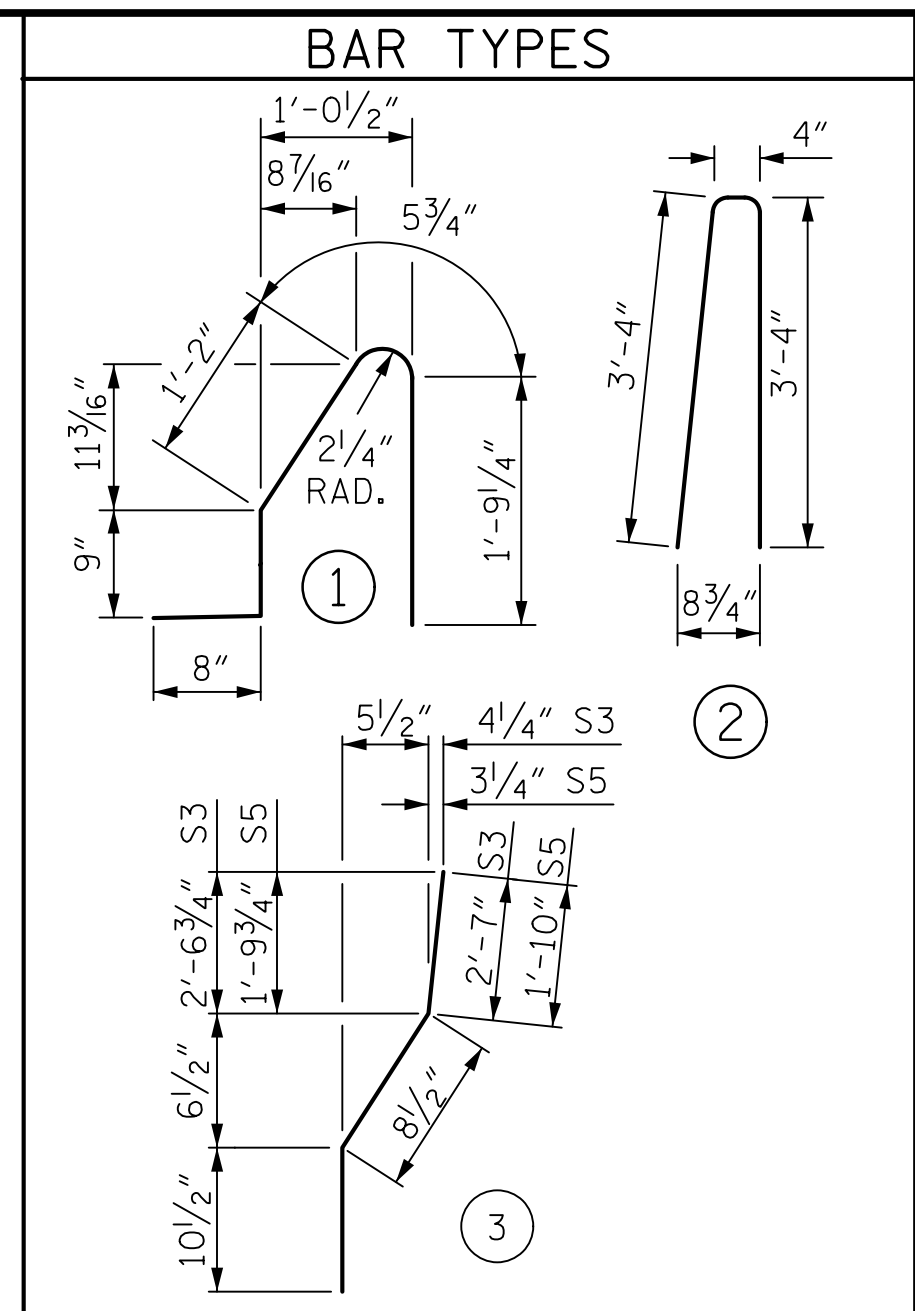
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	66	#5	STR	22'-7"	1555
* B2	44	#5	STR	22'-8"	1040
* S1	220	#5	1	4'-10"	1109
* S2	220	#5	2	7'-0"	1606
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27

*EPOXY COATED REINFORCING STEEL	5,400 LBS.
CLASS AA CONCRETE	31.2 CU. YDS.
CONCRETE BARRIER RAIL	230.6 LIN. FT.



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PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

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

REVISIONS						SHEET NO. S02-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15	
CHECKED BY : R.F. WERTMAN	DATE : 3/25/16	
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered As Promised

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NOTES

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

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

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

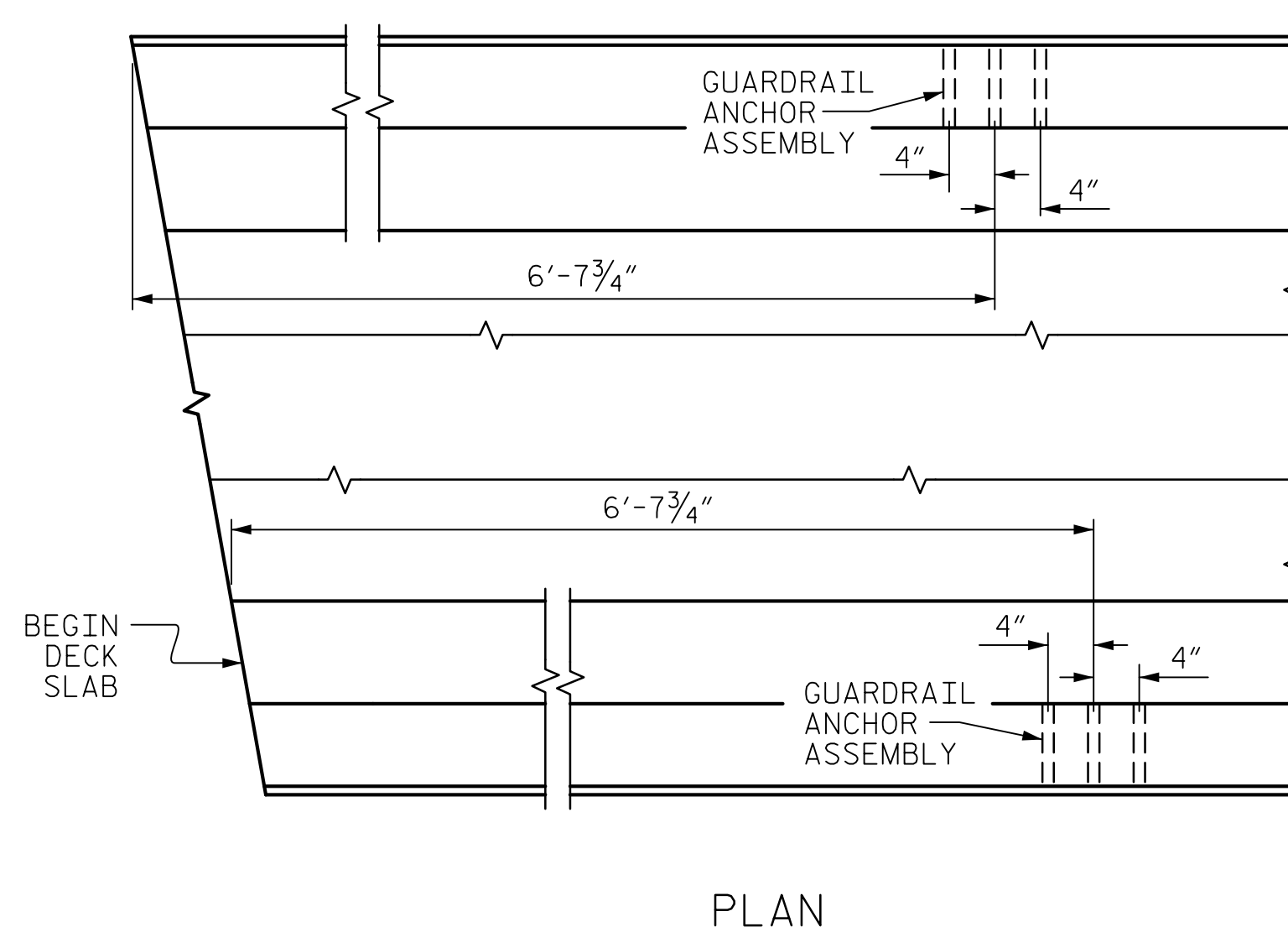
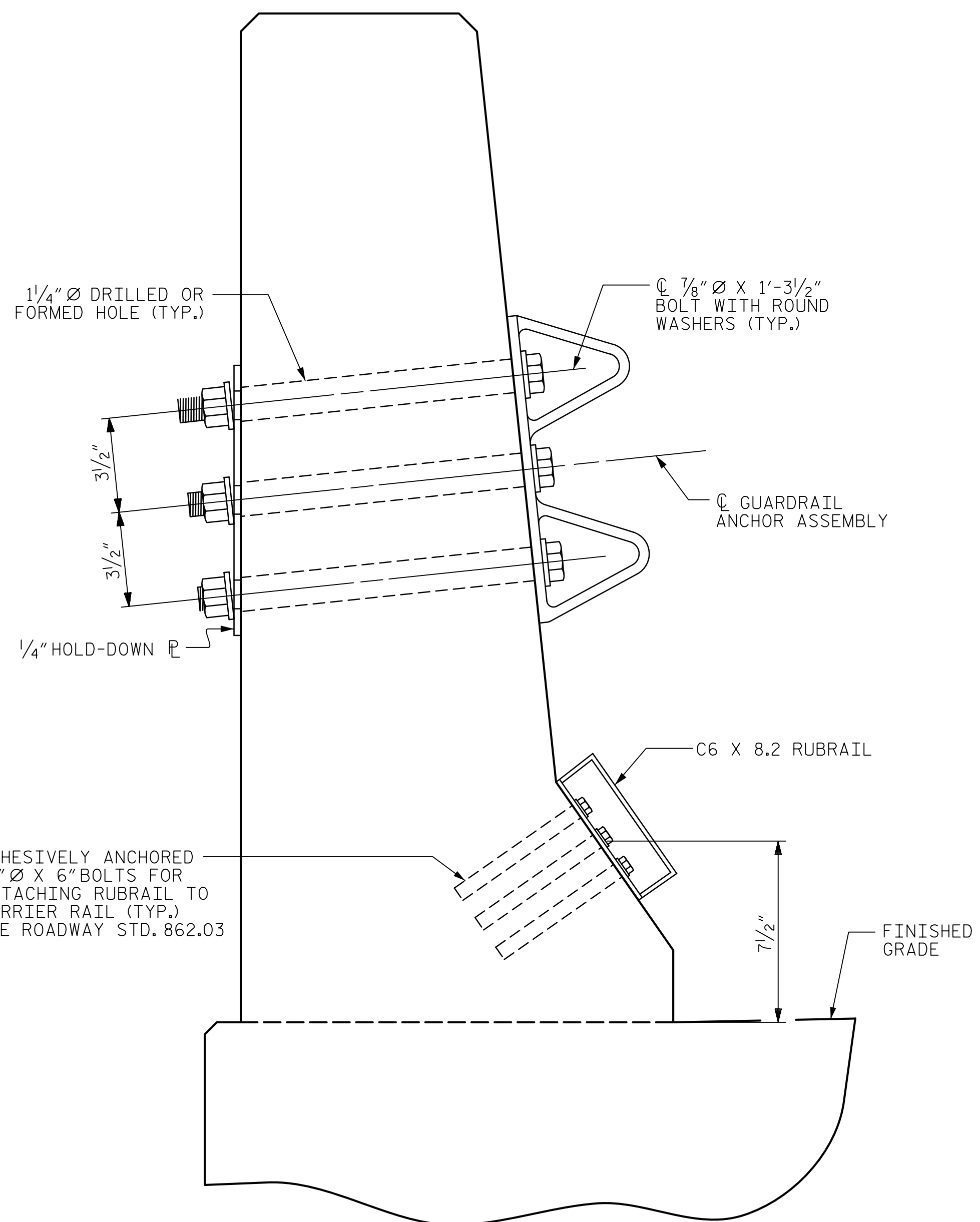
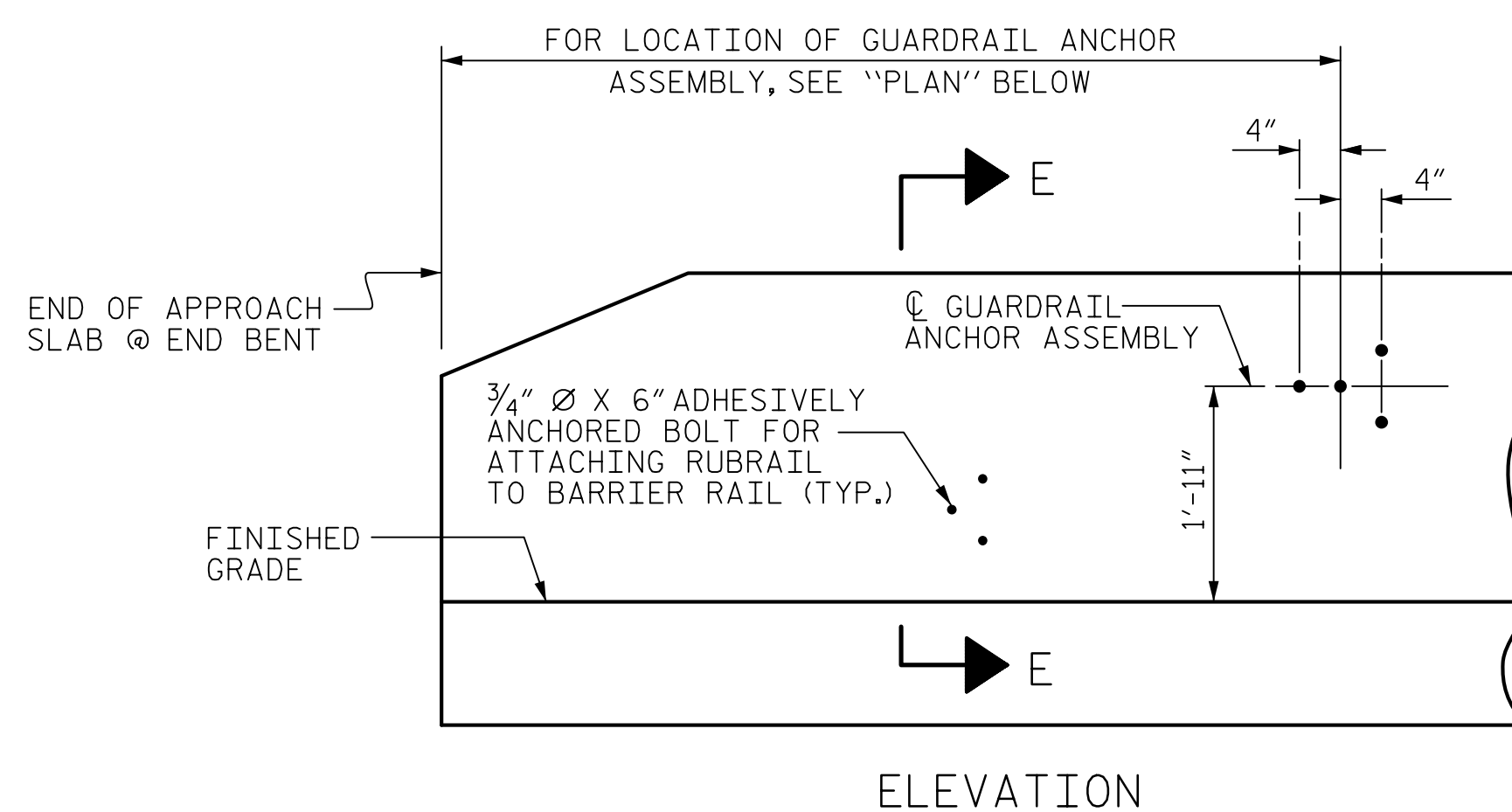
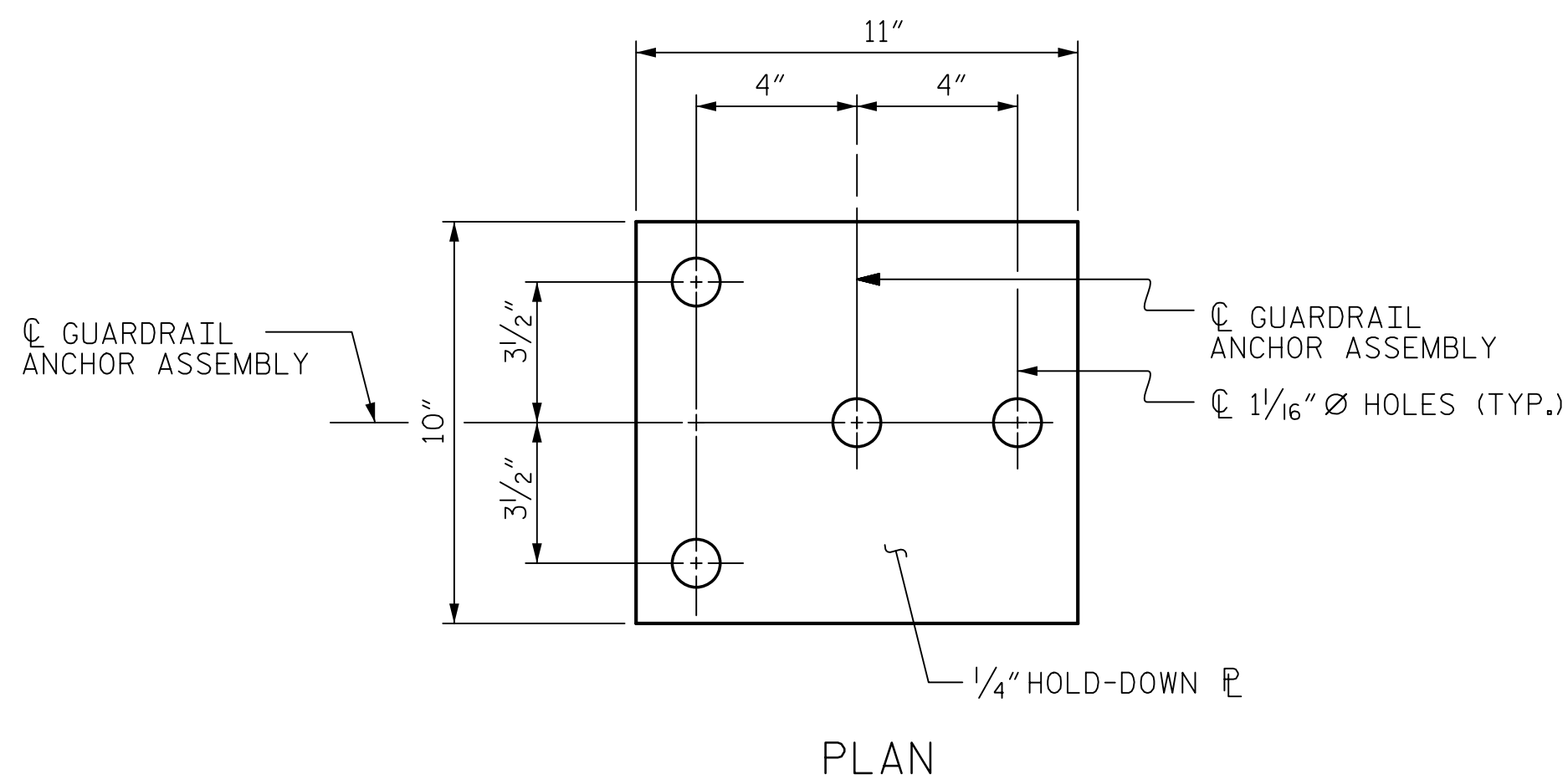
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



LOCATION OF ANCHORS FOR GUARDRAIL

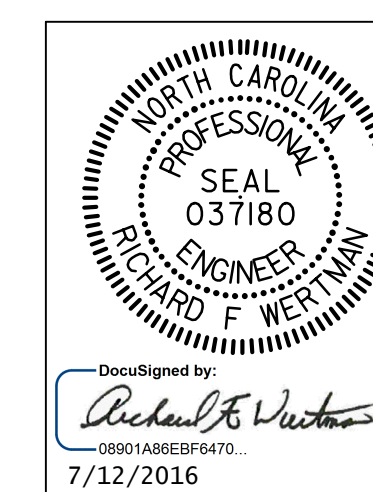
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-15
1			3			TOTAL SHEETS
2			4			28

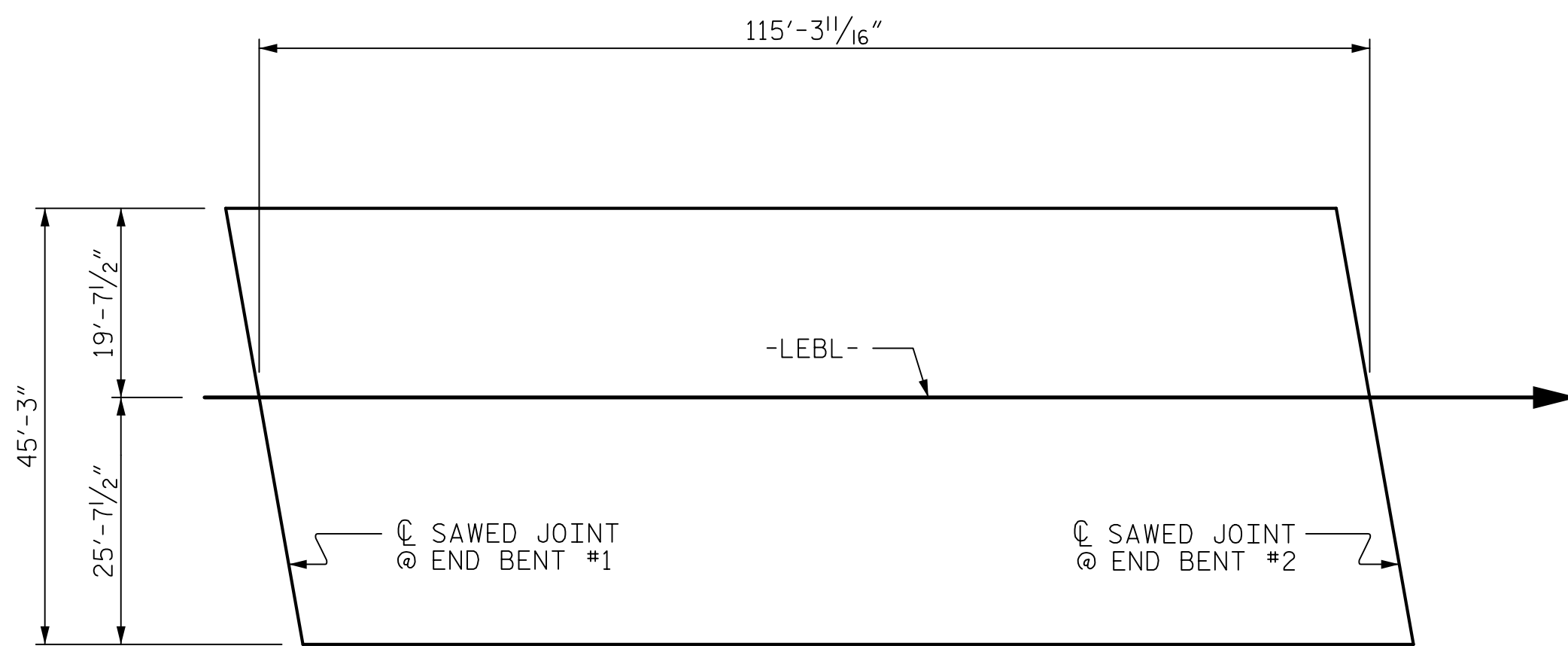
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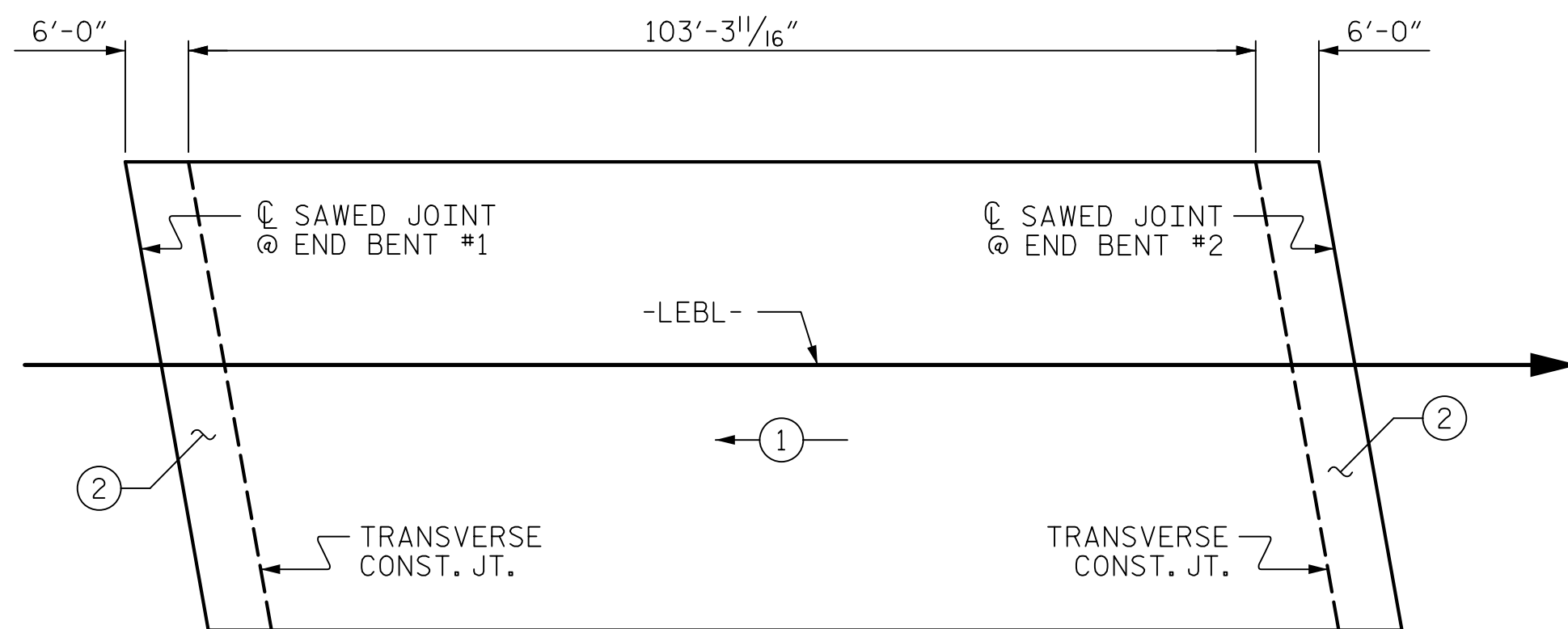
PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
 Suite 102  
 Raleigh, NC 27607-3073  
 (919) 420-7660  
 INC Lic. No. F-0270

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15
CHECKED BY : R.F. WERTMAN	DATE : 3/25/16
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

SECTION E-E  
 GUARDRAIL ANCHOR ASSEMBLY DETAILS



LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 5218)



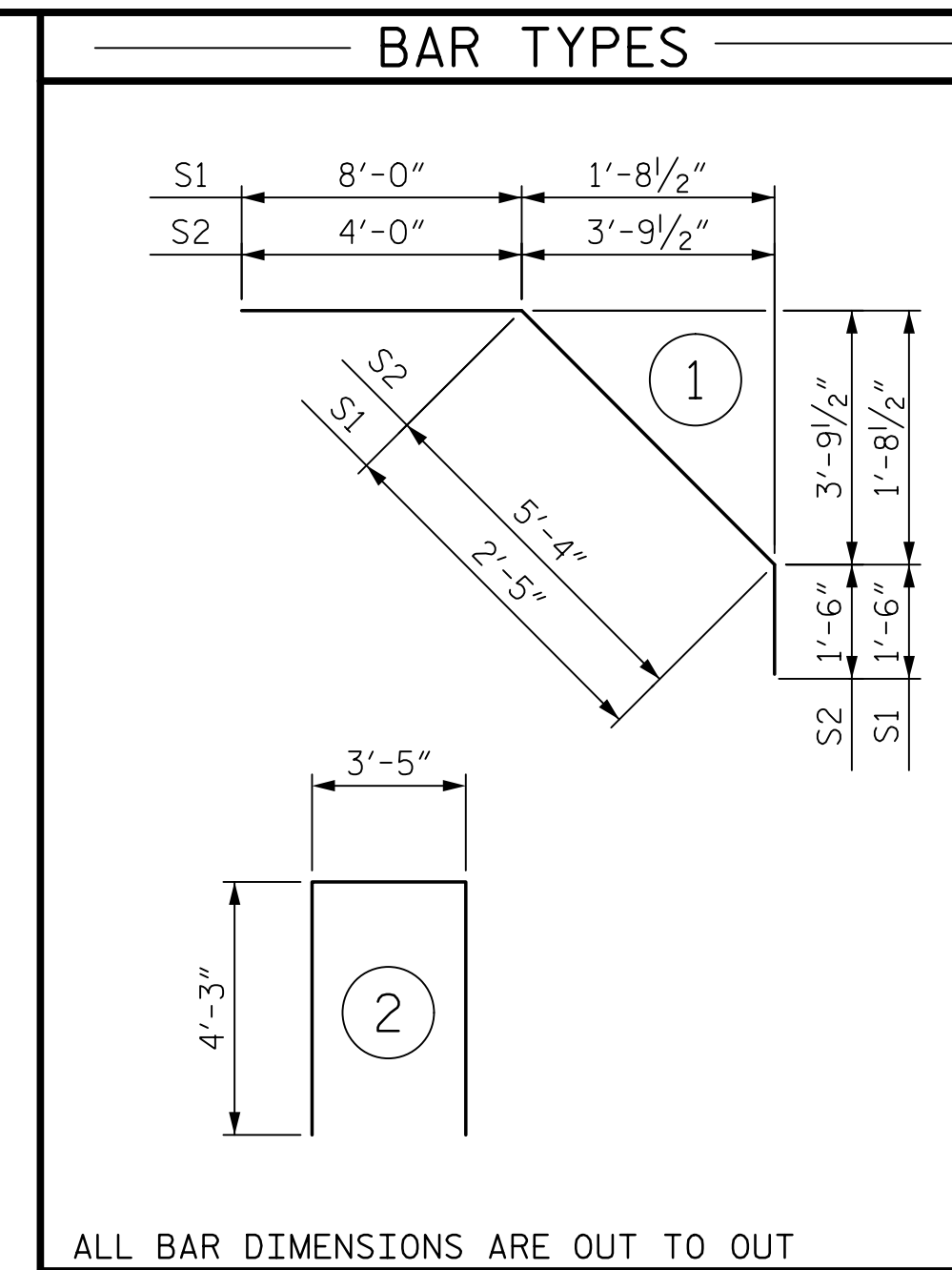
POURING SEQUENCE

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1950	SQ.FT.
BRIDGE DECK	4497	SQ.FT.
TOTAL	6447	SQ.FT.



ALL BAR DIMENSIONS ARE OUT TO OUT

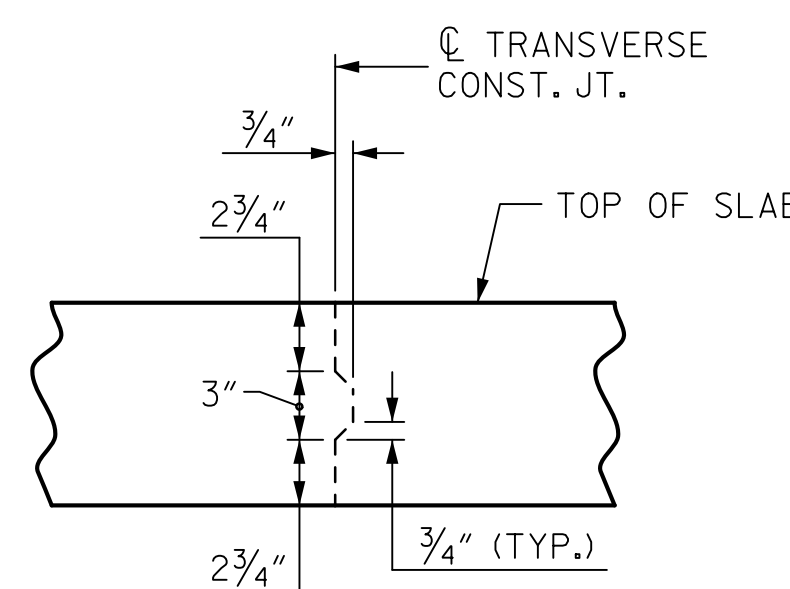
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	172	#5	STR	44'-11"	8058
A2	172	#5	STR	44'-11"	8058
* A101	4	#5	STR	38'-2"	159
* A102	4	#5	STR	31'-2"	130
* A103	4	#5	STR	24'-1"	101
* A104	4	#5	STR	17'-0"	71
* A105	4	#5	STR	10'-0"	42
* A106	4	#5	STR	2'-11"	12
A201	4	#5	STR	38'-2"	159
A202	4	#5	STR	31'-2"	130
A203	4	#5	STR	24'-1"	101
A204	4	#5	STR	17'-0"	71
A205	4	#5	STR	10'-0"	42
A206	4	#5	STR	2'-11"	12
* B1	160	#4	STR	24'-8"	2636
B2	68	#5	STR	58'-7"	4155
K1	20	#4	STR	26'-10"	359
K2	8	#4	STR	7'-1"	38
K3	32	#4	STR	8'-8"	185
K4	4	#4	STR	5'-3"	14
K5	16	#4	STR	6'-1"	65
* S1	56	#4	1	11'-11"	446
* S2	52	#4	1	10'-10"	376
U1	76	#4	2	11'-11"	605
REINFORCING STEEL					= 13,994
* EPOXY COATED REINF. STEEL					= 12,031

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	141.6		
POUR #2	82.2		
TOTALS **	223.8	13,994	12,031

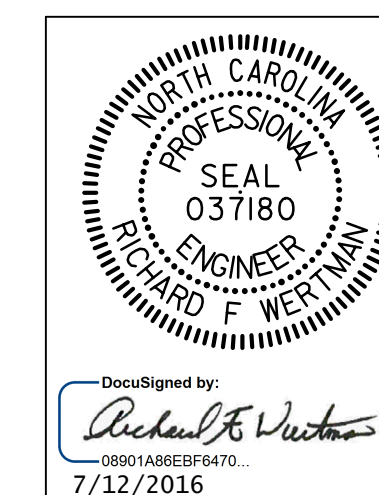
\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BILL OF MATERIAL  
EASTBOUND LANE

REVISIONS

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

SHEET NO. S02-16  
TOTAL SHEETS 28

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15
CHECKED BY : R.F. WERTMAN	DATE : 3/28/16
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered As Promised  
2610 Wycliff Road  
Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

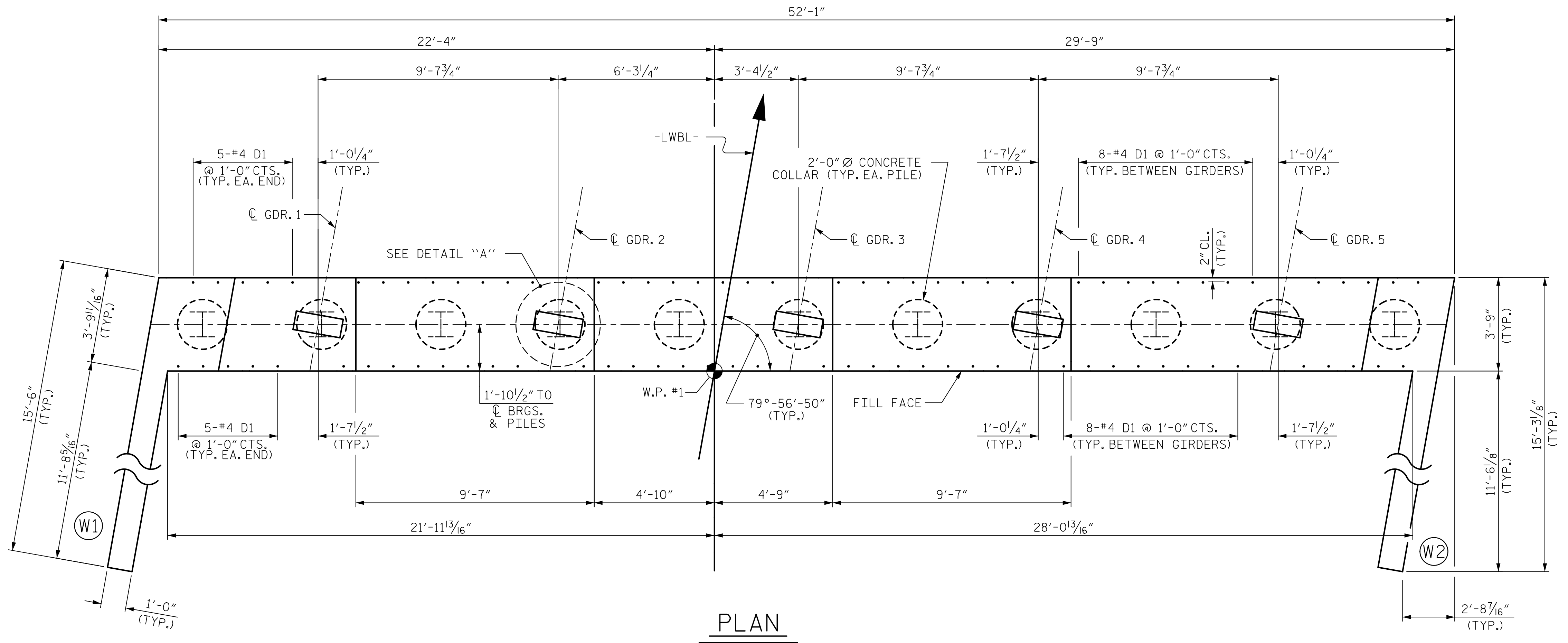
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 2

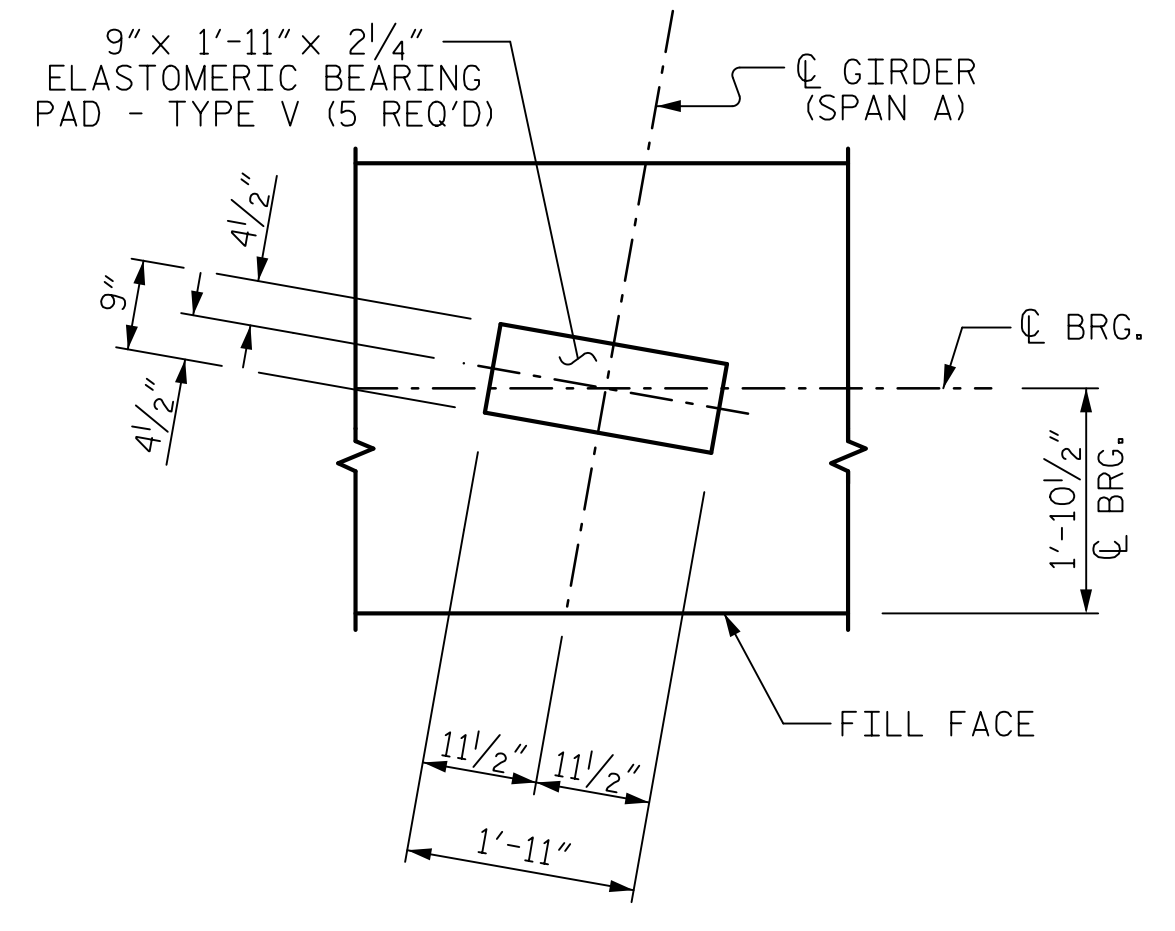
STD. NO. BOM2



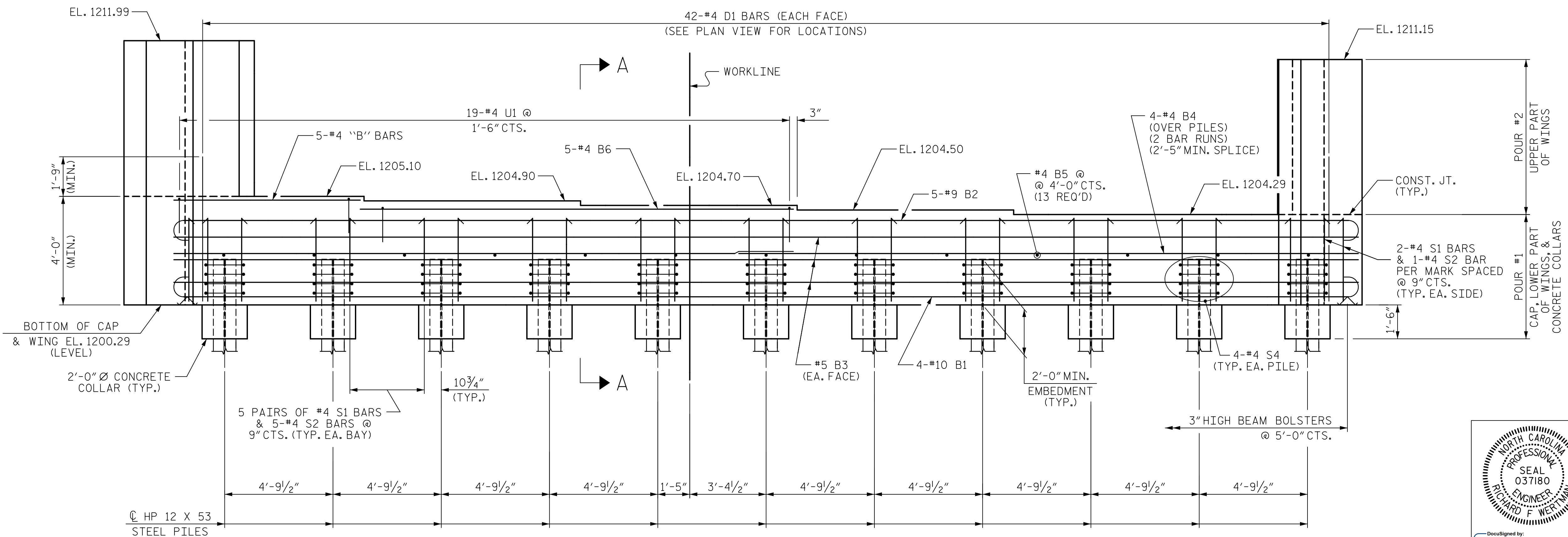
**NOTES:**  
 INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 #4 D1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.  
 THE UPPER PART OF THE WINGS (POUR #2) SHALL BE POURED AFTER THE SUPERSTRUCTURE.



**PLAN**

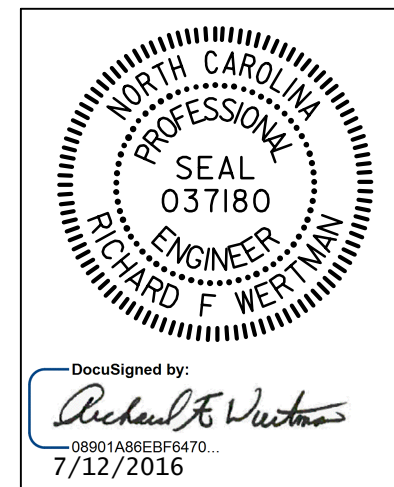


**DETAIL "A"**  
(TYP. EA. GIRDER)



**ELEVATION**

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 1 OF 4



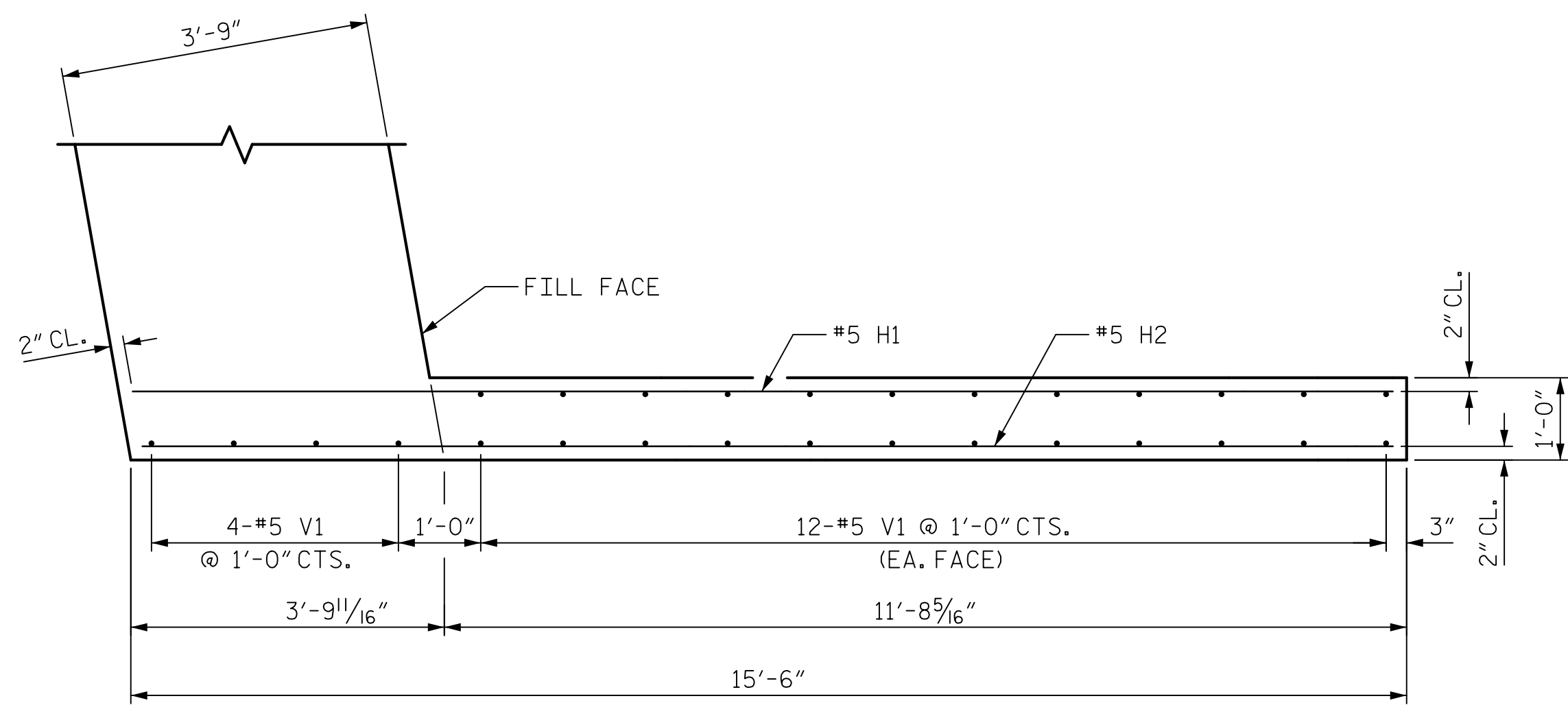
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL  
 END BENT #1  
 EASTBOUND LANE

DRAWN BY: T.J. KIRSCHBAUM DATE: 1/6/16  
 CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
 DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

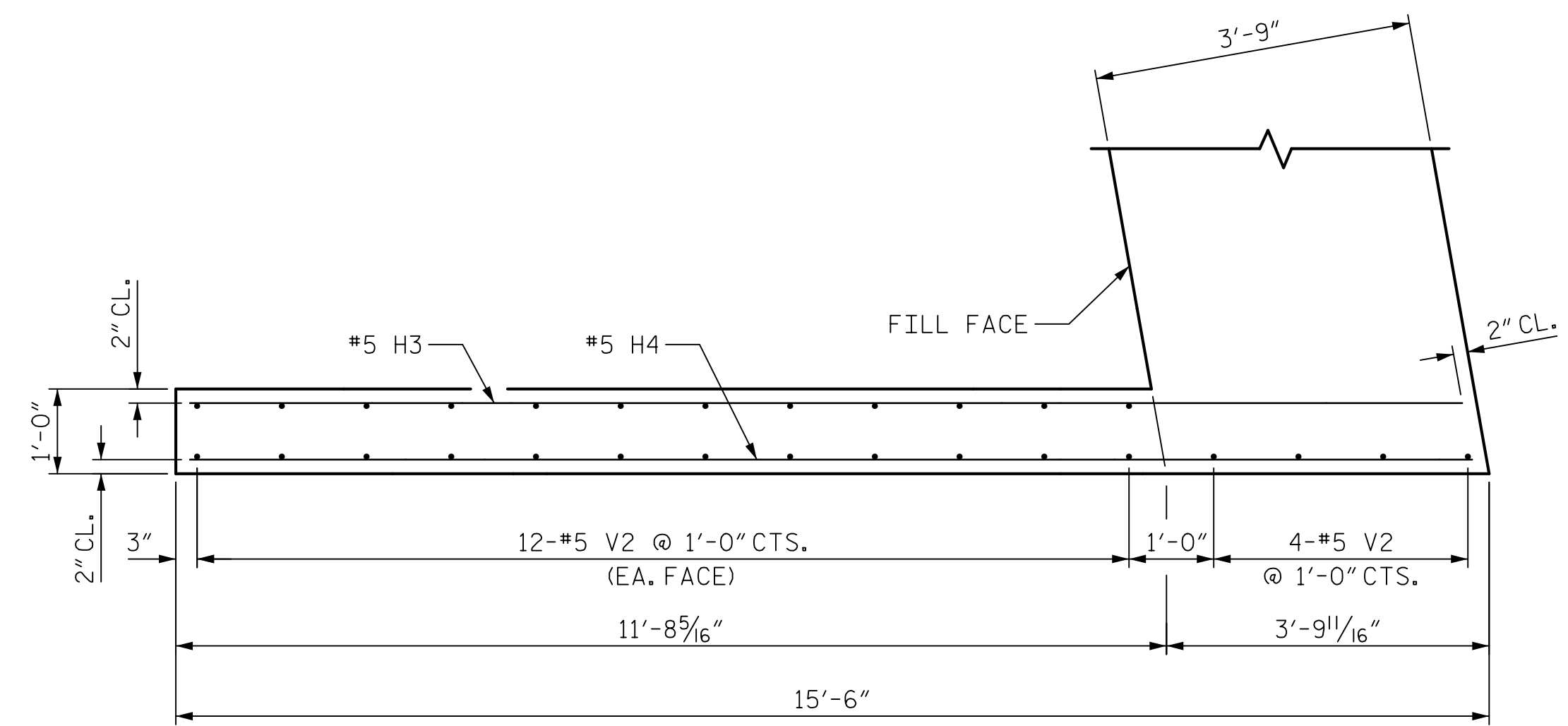
PLANS PREPARED BY:  
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 NC Lic. No. F-0270

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

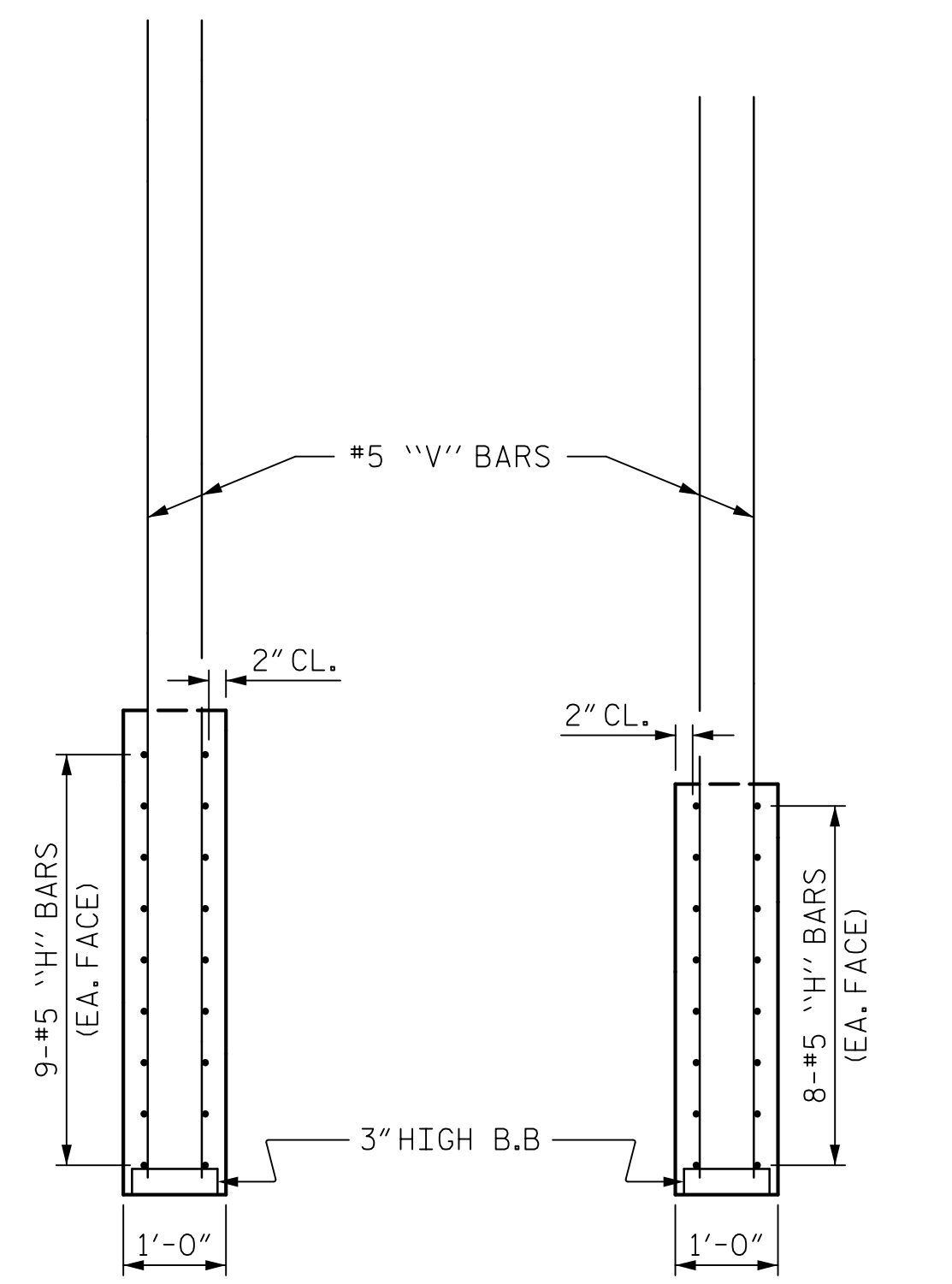
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-17
1			3			TOTAL SHEETS
2			4			28



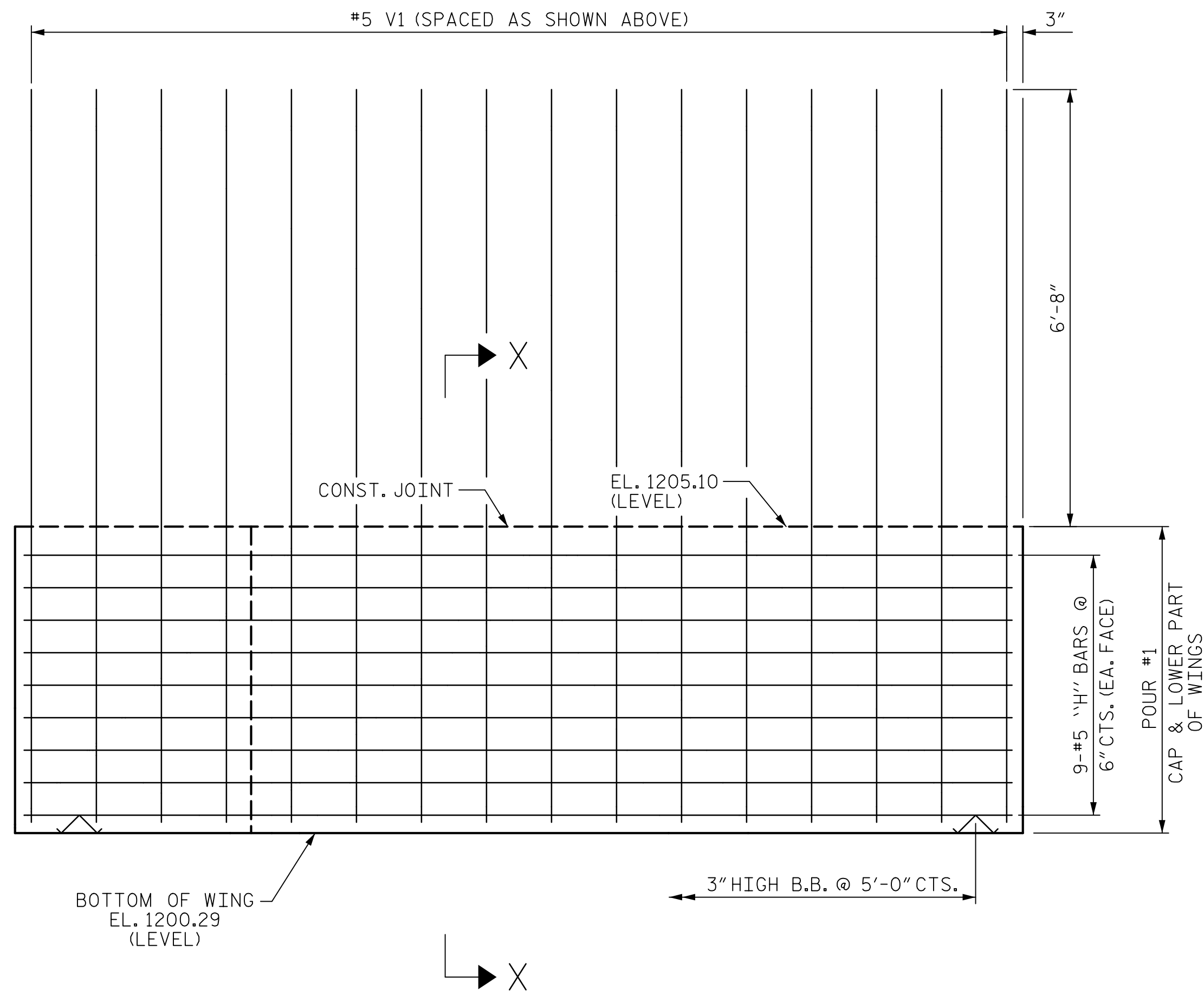
PLAN - BOTTOM OF WING (W1)



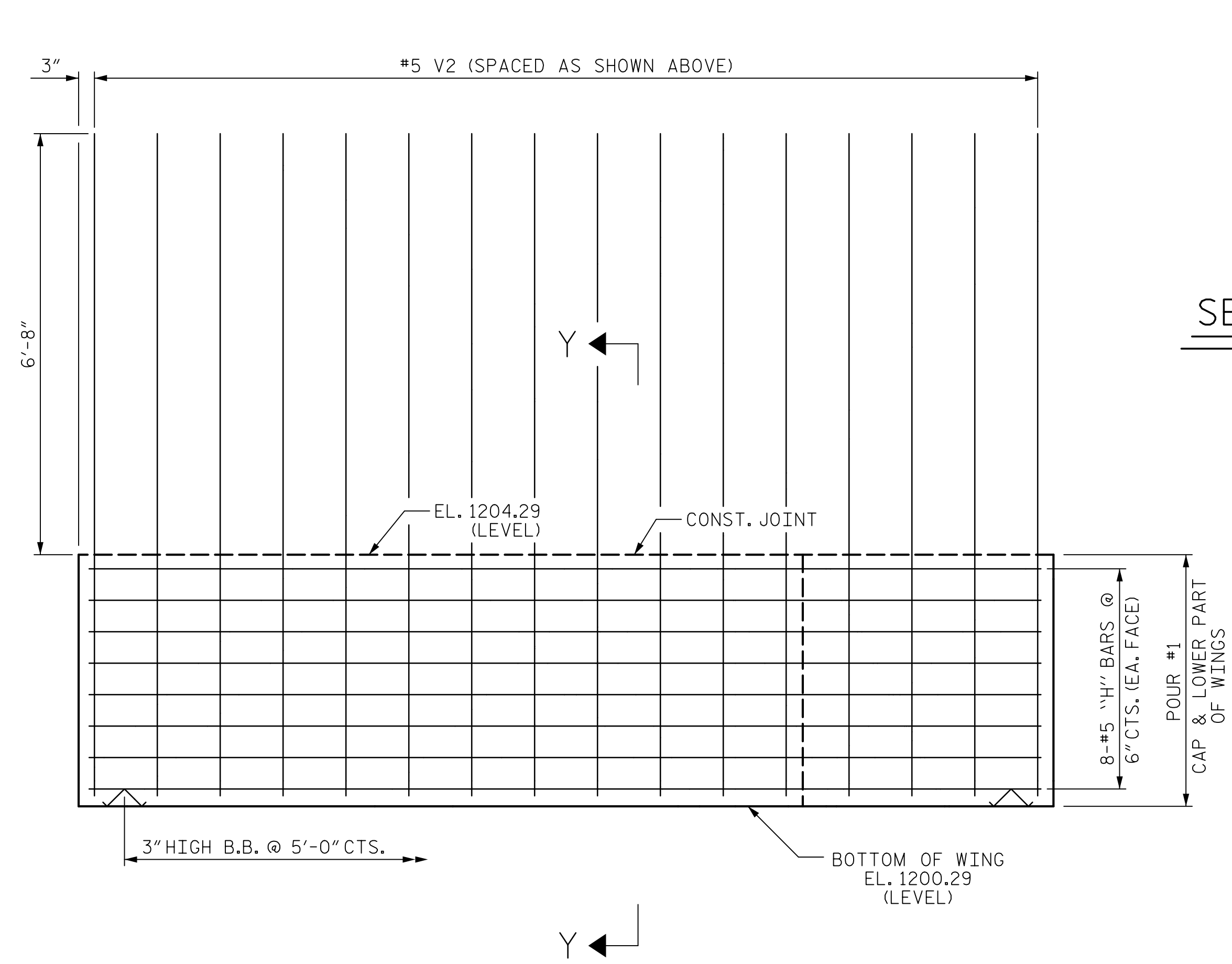
PLAN - BOTTOM OF WING (W2)



SECTION X-X SECTION Y-Y

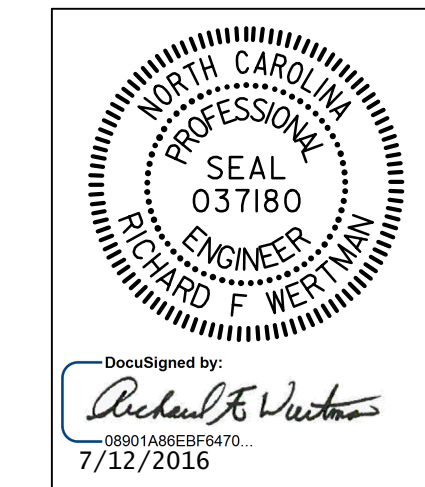


ELEVATION - BOTTOM OF WING (W1)



ELEVATION - BOTTOM OF WING (W2)

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 4



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

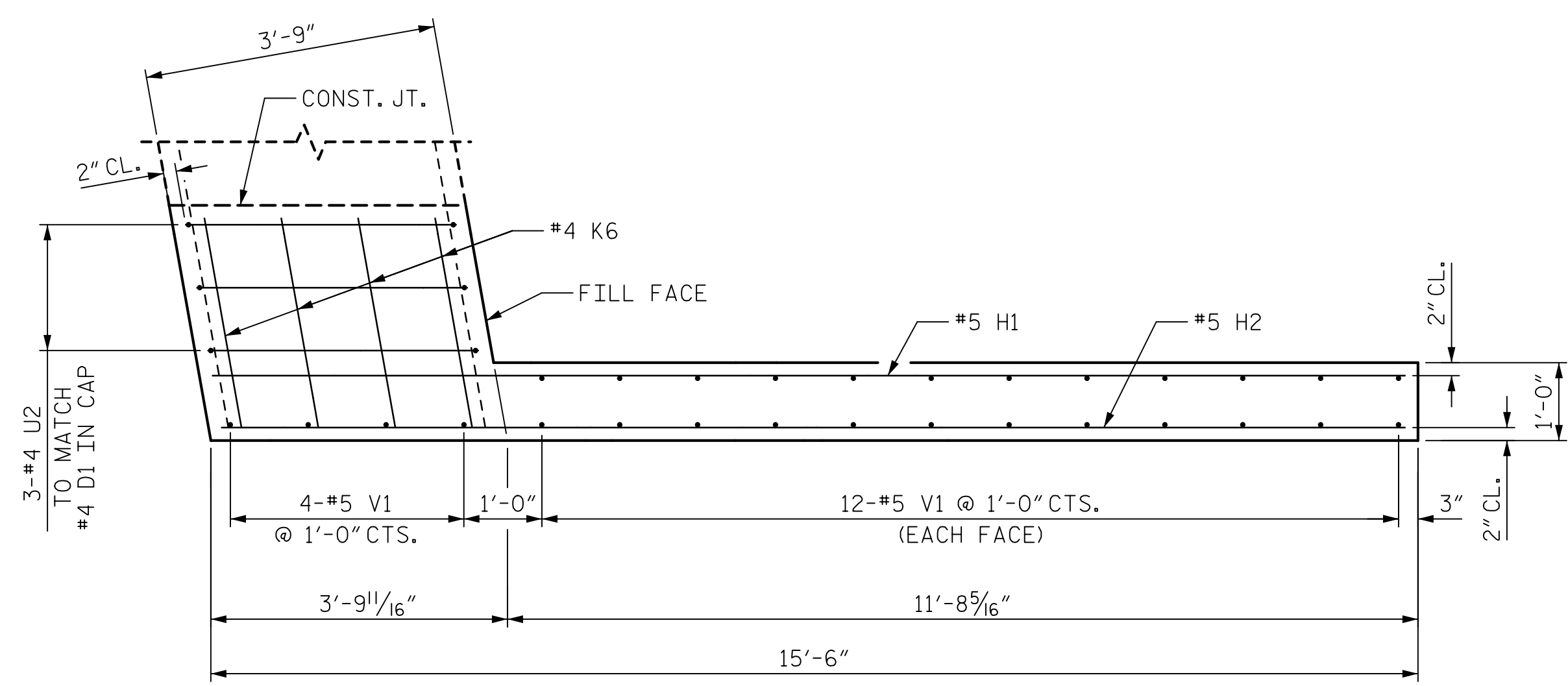
DRAWN BY : T.J. KIRSCHBAUM DATE : 1/6/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

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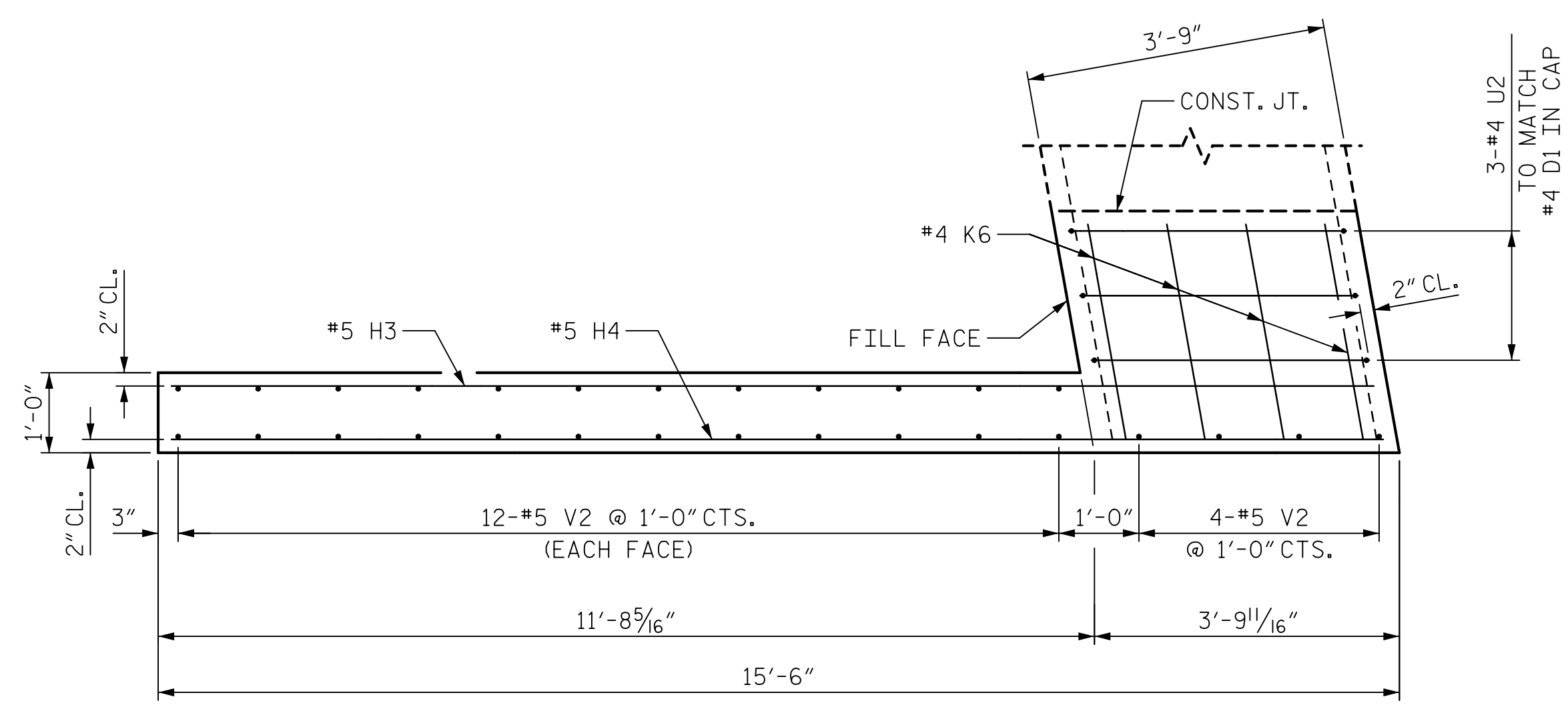
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

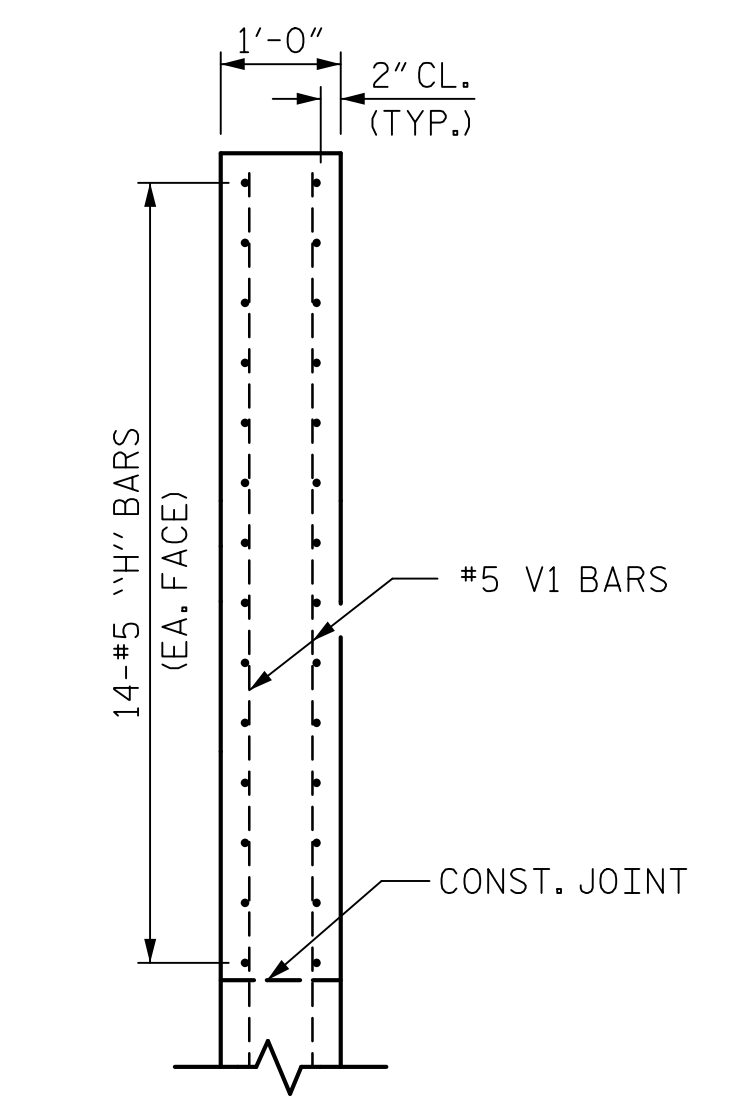




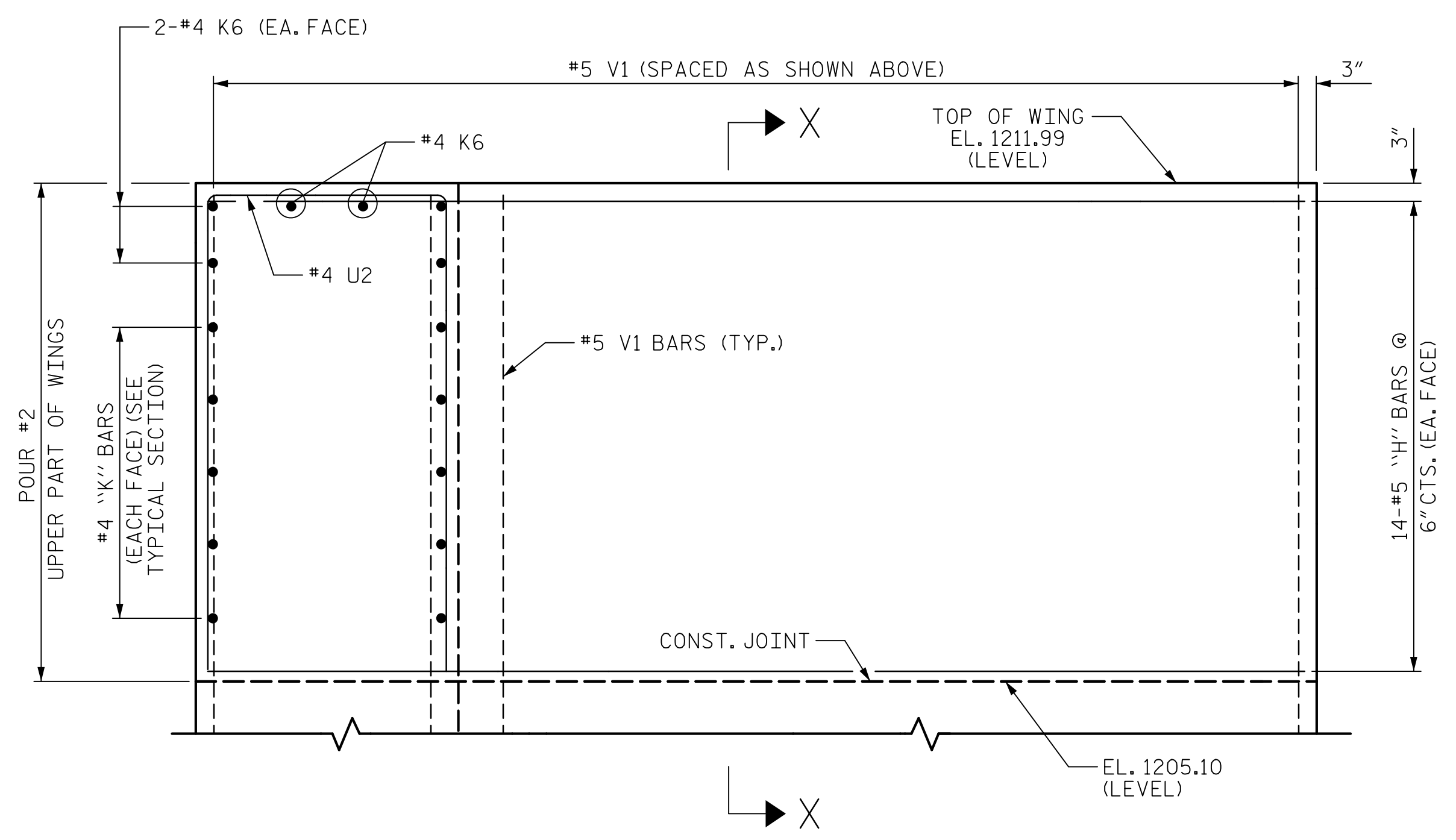
PLAN - TOP OF WING (W1)



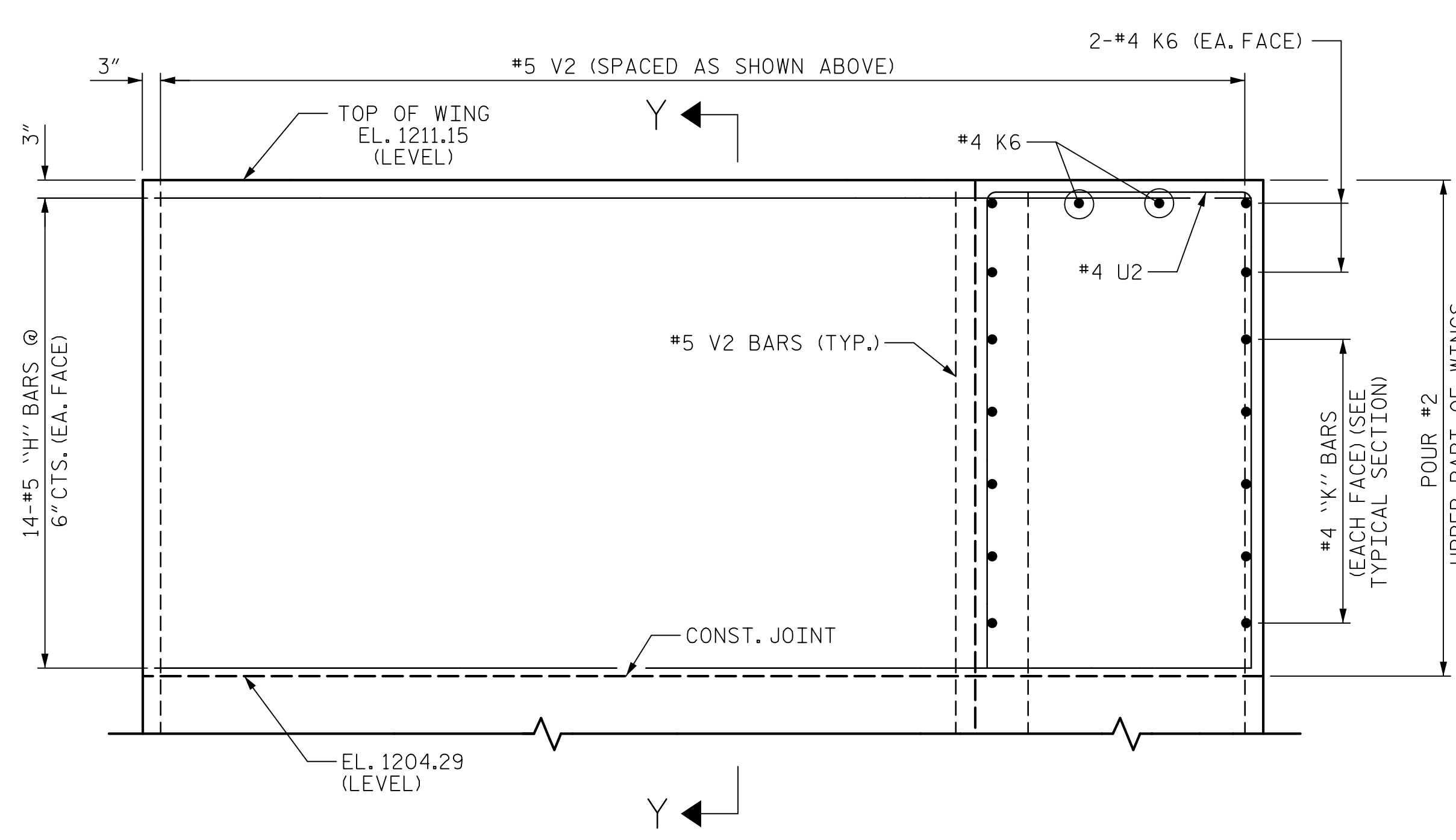
PLAN - TOP OF WING (W2)



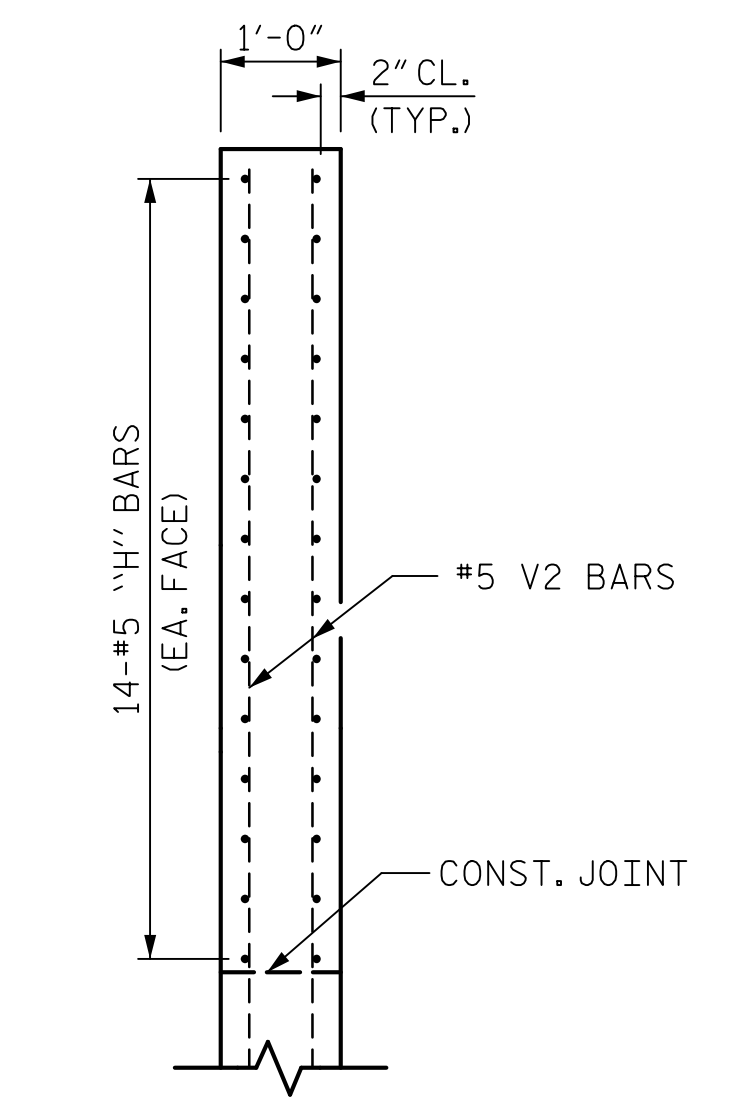
SECTION X-X



ELEVATION - TOP OF WING (W1)



ELEVATION - TOP OF WING (W2)



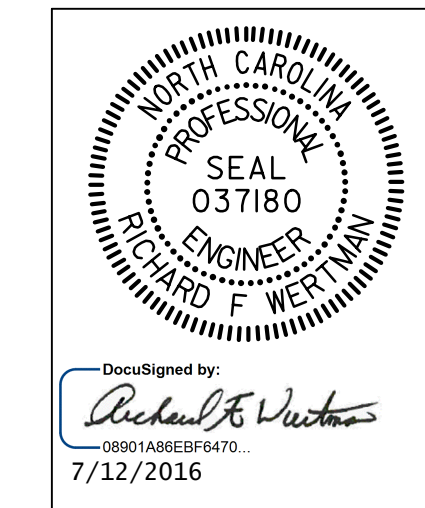
SECTION Y-Y

NOTES:  
THE UPPER PART OF THE WINGS (POUR #2)  
SHALL BE POURED AFTER THE SUPERSTRUCTURE.

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-  
SHEET 3 OF 4

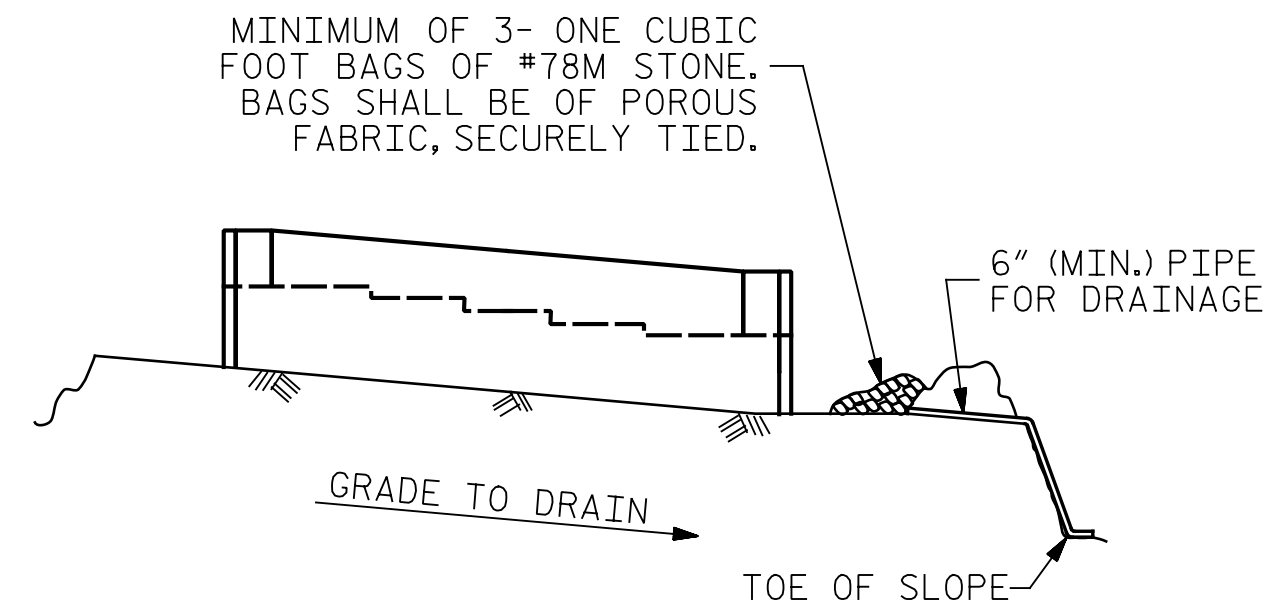
DRAWN BY : T.J. KIRSCHBAUM DATE : 1/6/16  
CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

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DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT #1 EASTBOUND LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-19					TOTAL SHEETS 28

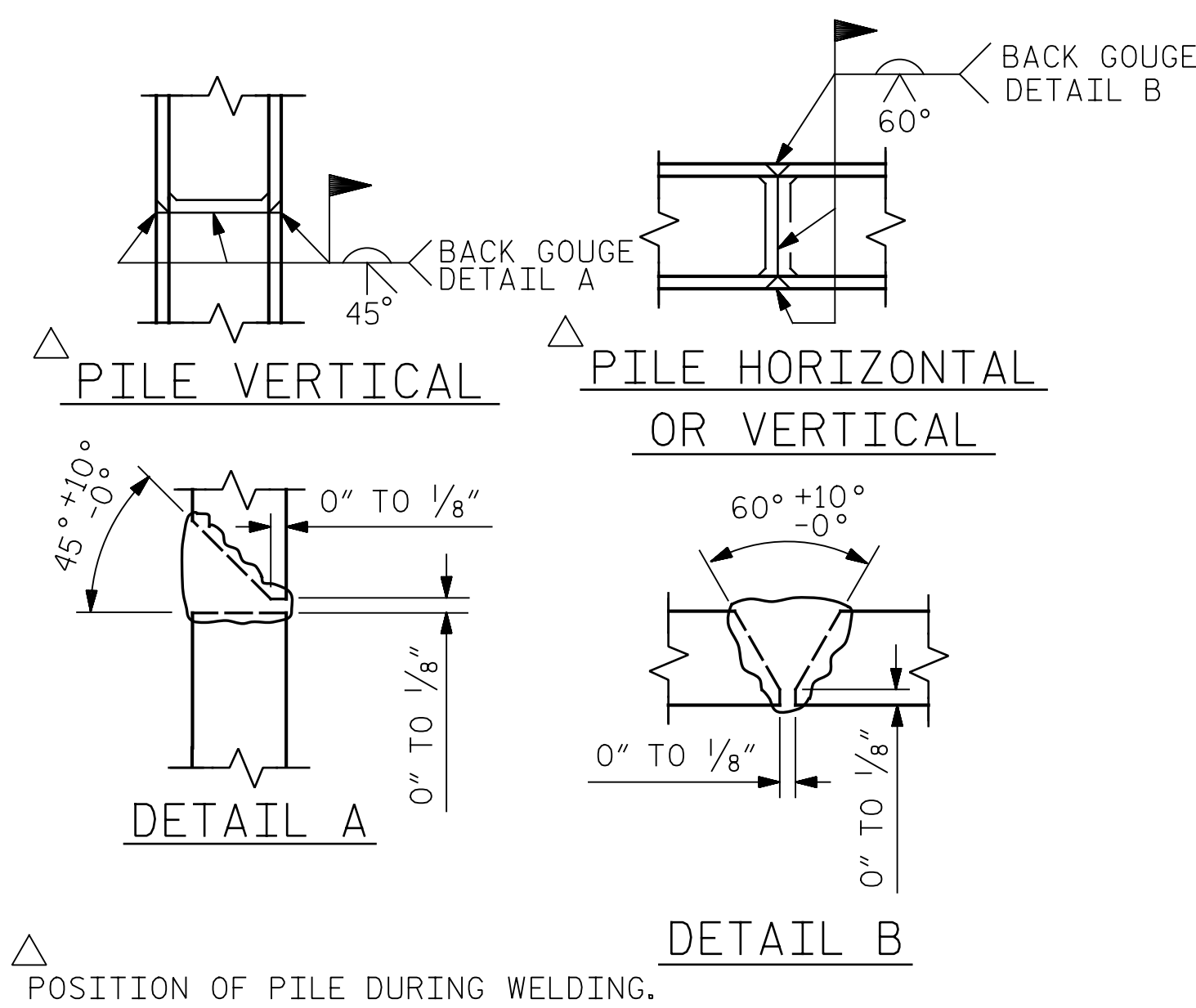


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

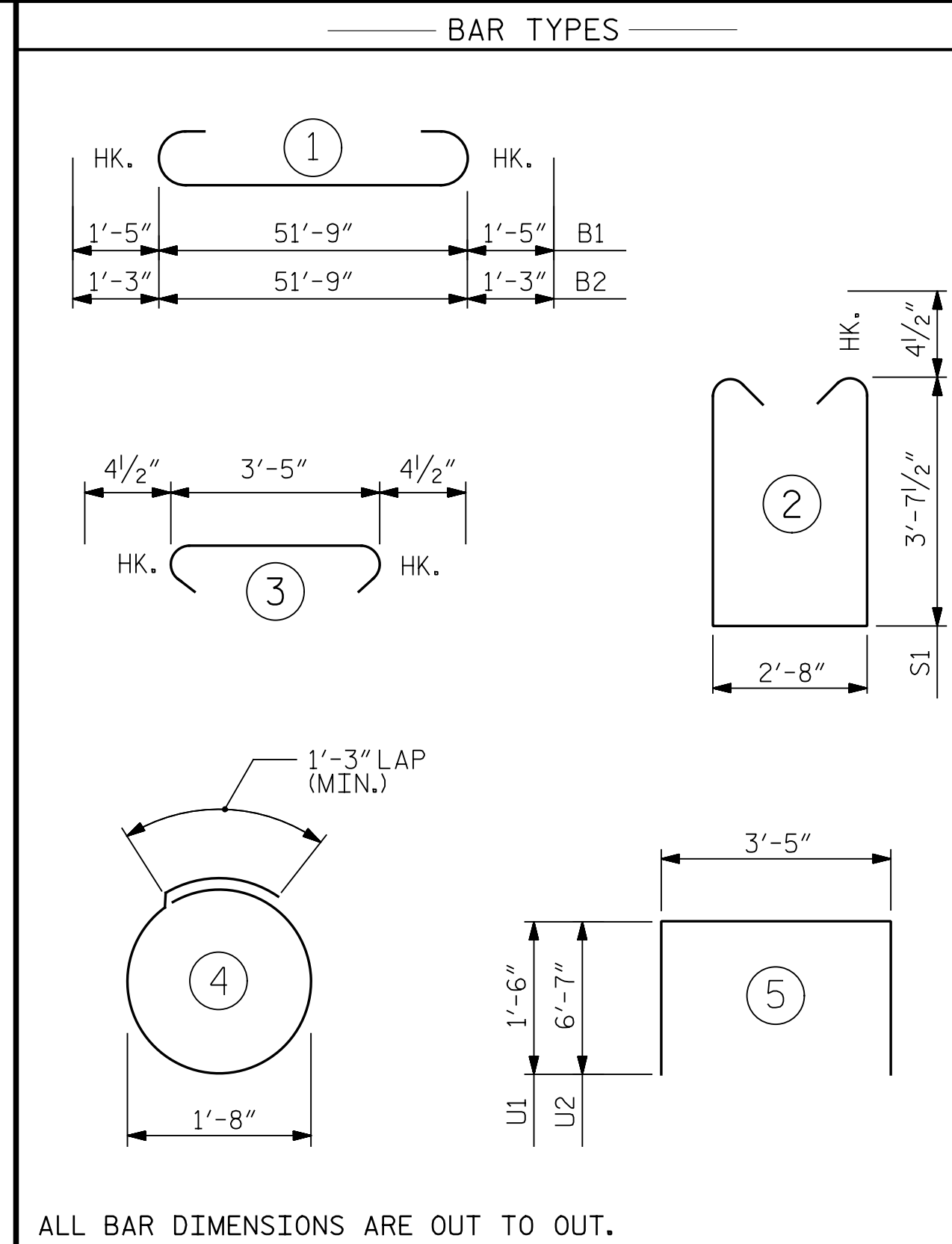
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

**TEMPORARY DRAINAGE AT END BENT**

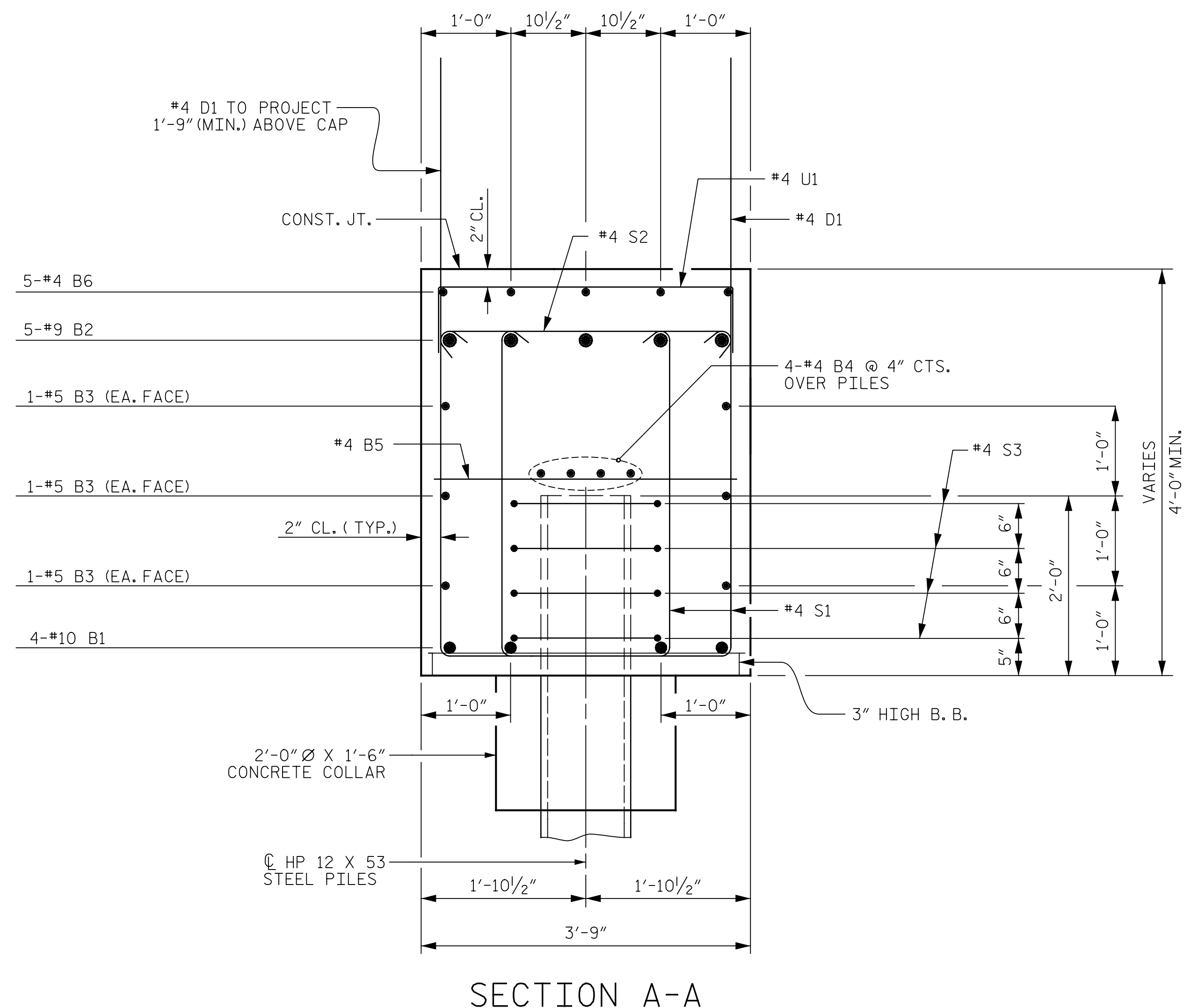


**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

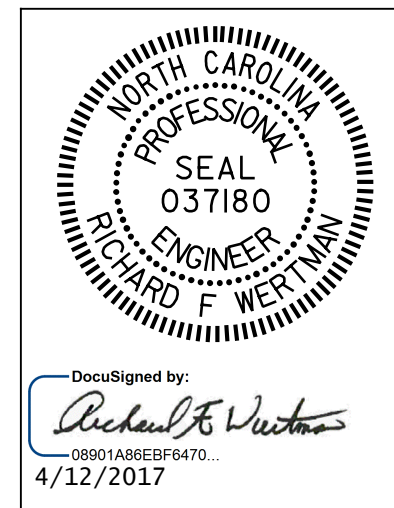
BILL OF MATERIAL					
END BENT #1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-7"	940
B2	5	#9	1	54'-3"	922
B3	6	#5	STR	51'-9"	324
B4	8	#4	STR	27'-1"	145
B5	13	#4	STR	3'-5"	30
B6	5	#4	STR	19'-0"	63
B7	1	#4	STR	7'-7"	5
B8	1	#4	STR	7'-9"	5
B9	1	#4	STR	7'-11"	5
B10	1	#4	STR	8'-0"	5
B11	1	#4	STR	8'-2"	5
D1	84	#4	STR	6'-5"	360
H1	23	#5	STR	15'-3"	366
H2	23	#5	STR	15'-2"	364
H3	22	#5	STR	15'-0"	344
H4	22	#5	STR	15'-1"	346
K6	12	#4	STR	2'-8"	21
S1	108	#4	2	10'-8"	770
S2	54	#4	3	4'-2"	150
S3	44	#4	4	6'-6"	191
U1	13	#4	5	6'-5"	56
U2	6	#4	5	16'-7"	66
V1	28	#5	STR	11'-3"	329
V2	28	#5	STR	10'-6"	307



**SECTION A-A**

REINFORCING STEEL	6,119 LBS.
CLASS A CONCRETE	
POUR #1 (CAP, LOWER WINGS & COLLARS)	37.2 C.Y.
POUR #2 (UPPER WINGS)	11.8 C.Y.
<b>TOTAL</b>	<b>49.0 C.Y.</b>
HP 12 X 53 STEEL PILES	
No. = 11	580 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	
	11 EACH

PROJECT NO. B-4447  
 COUNTY BURKE  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 4 OF 4



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

DRAWN BY : T.J. KIRSCHBAUM DATE : 1/6/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

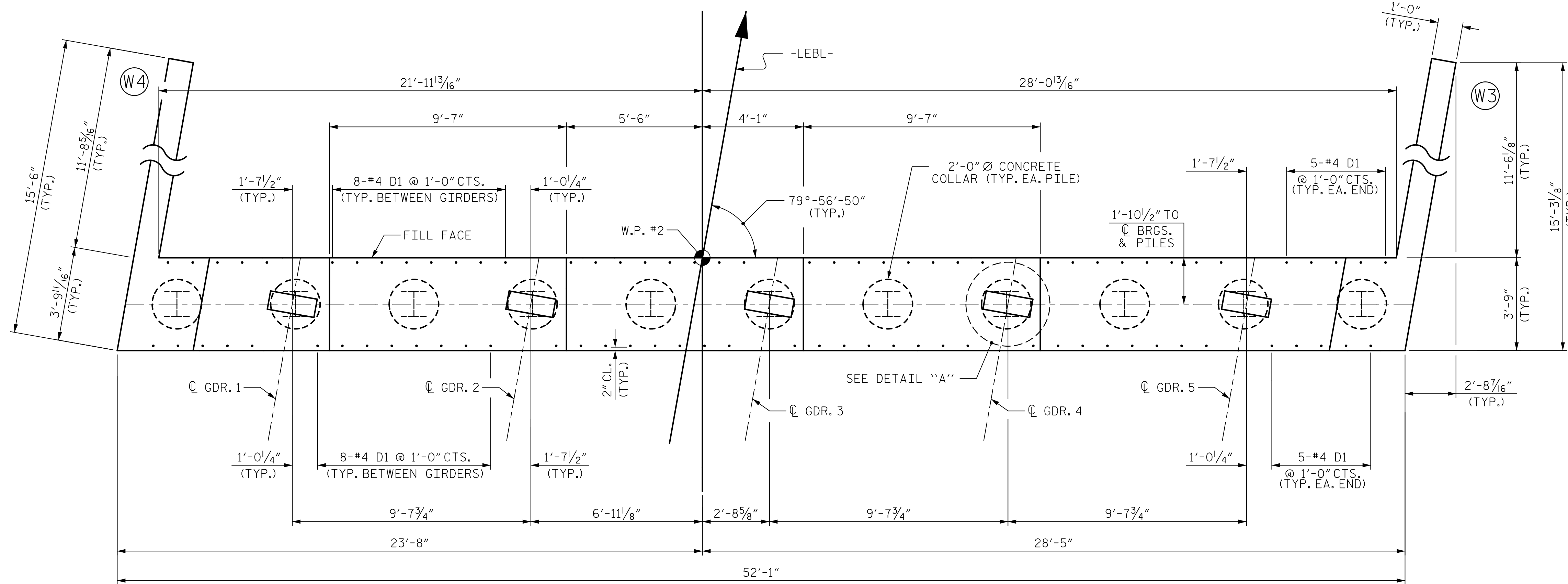
PLANS PREPARED BY:  
**Gannett Fleming**  
 Excellence Delivered As Promised  
 2610 Wycliff Road  
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 Raleigh, NC 27607-3073  
 (919) 420-7660  
 NC Lic. No. F-0270

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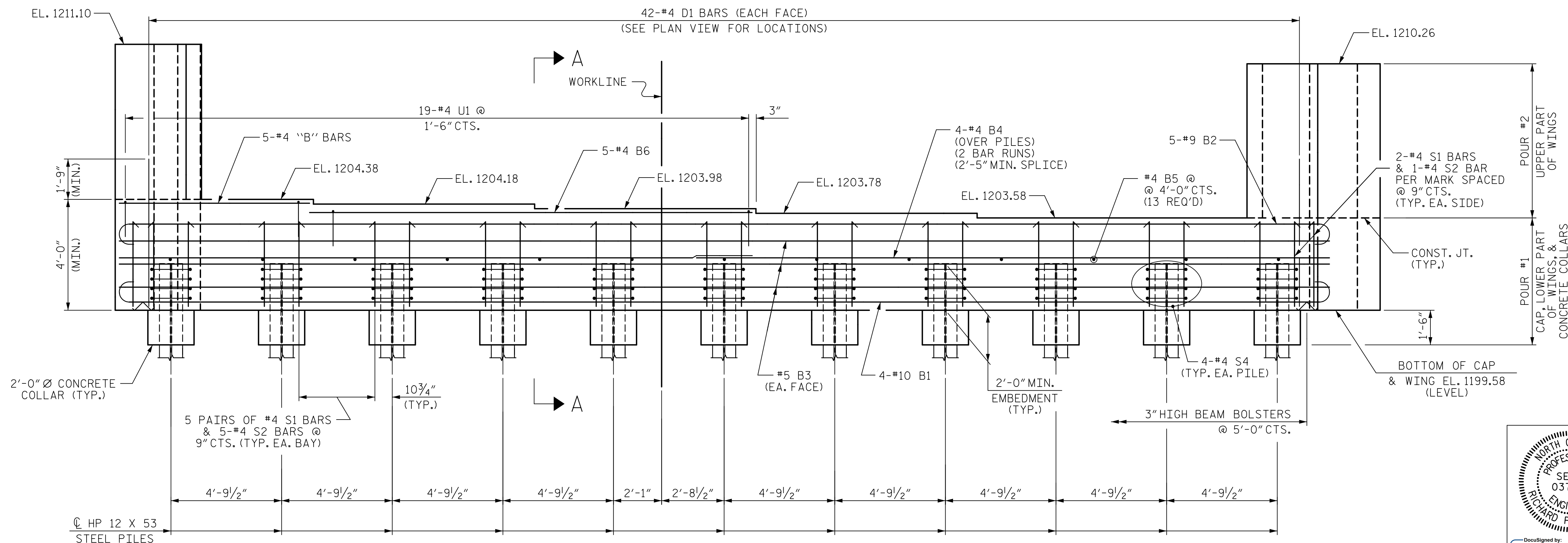
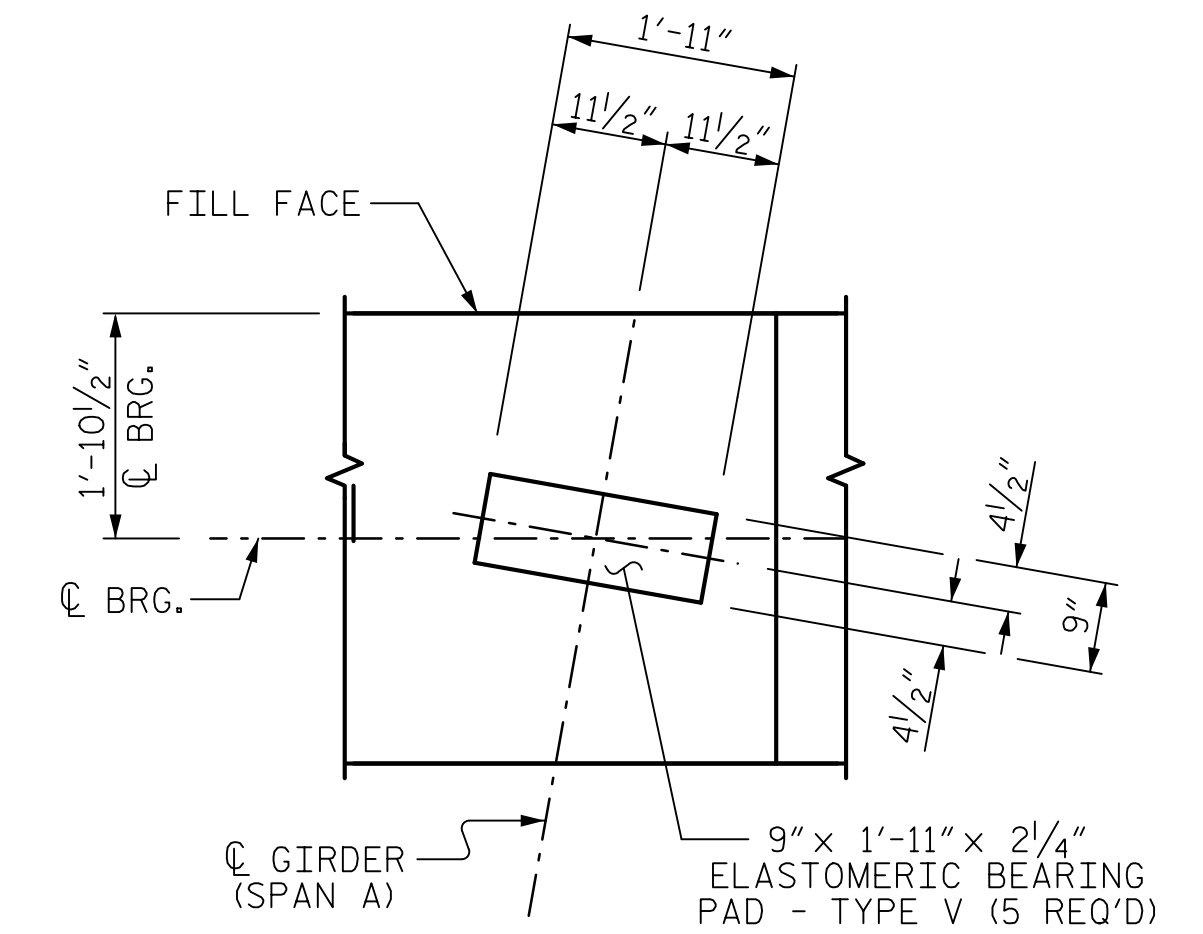
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1			3		
2			4		

SHEET NO. S02-20  
 TOTAL SHEETS 28

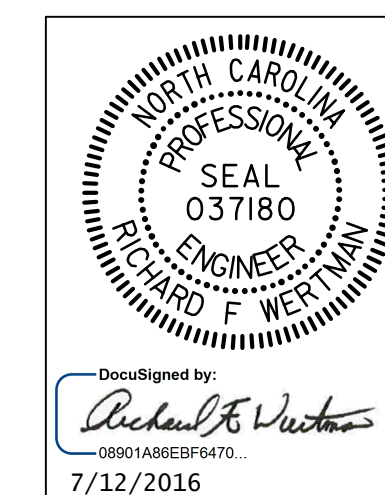




**NOTES:**  
 INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.  
 #4 D1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.  
 THE UPPER PART OF THE WINGS (POUR #2) SHALL BE POURED AFTER THE SUPERSTRUCTURE.



PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 1 OF 4



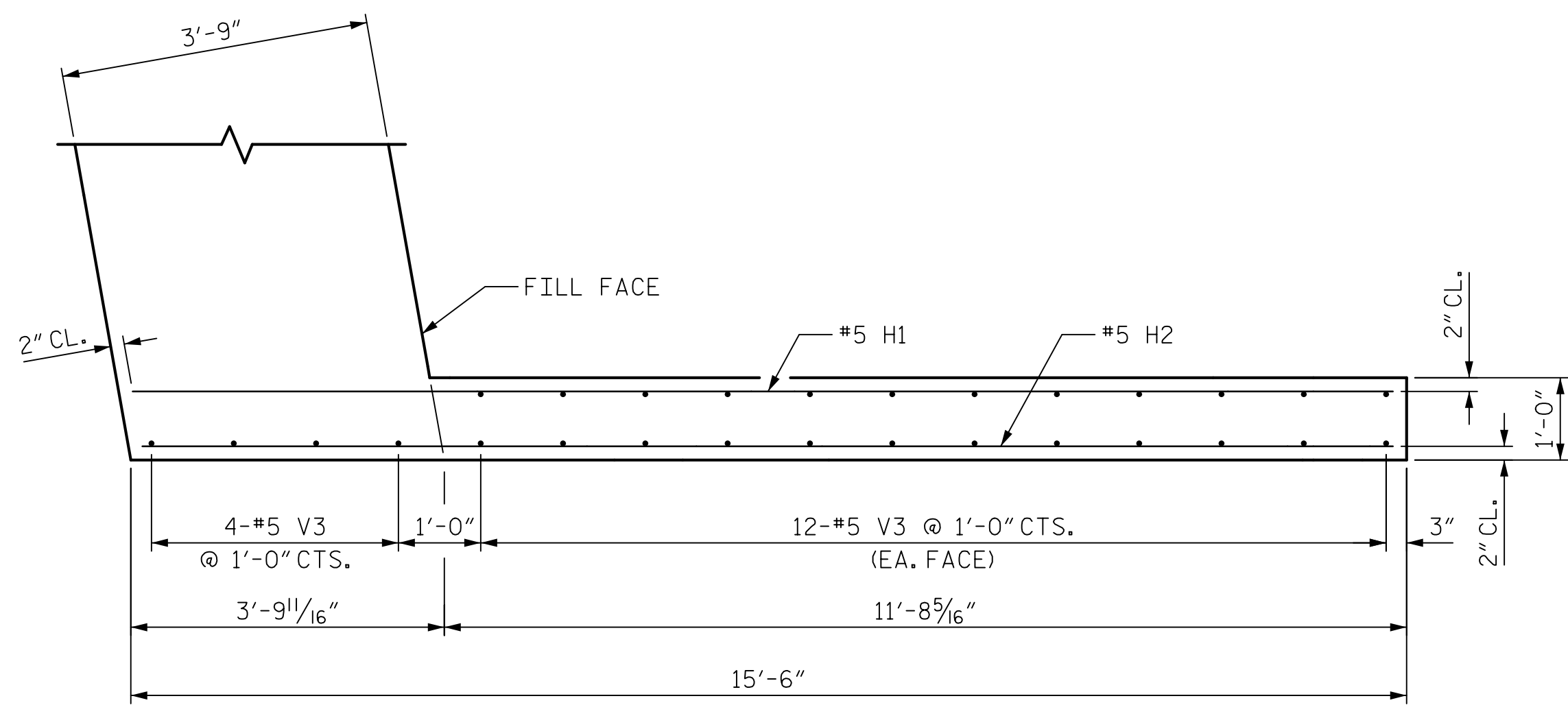
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL  
 END BENT #2  
 EASTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-21
1			3			TOTAL SHEETS
2			4			28

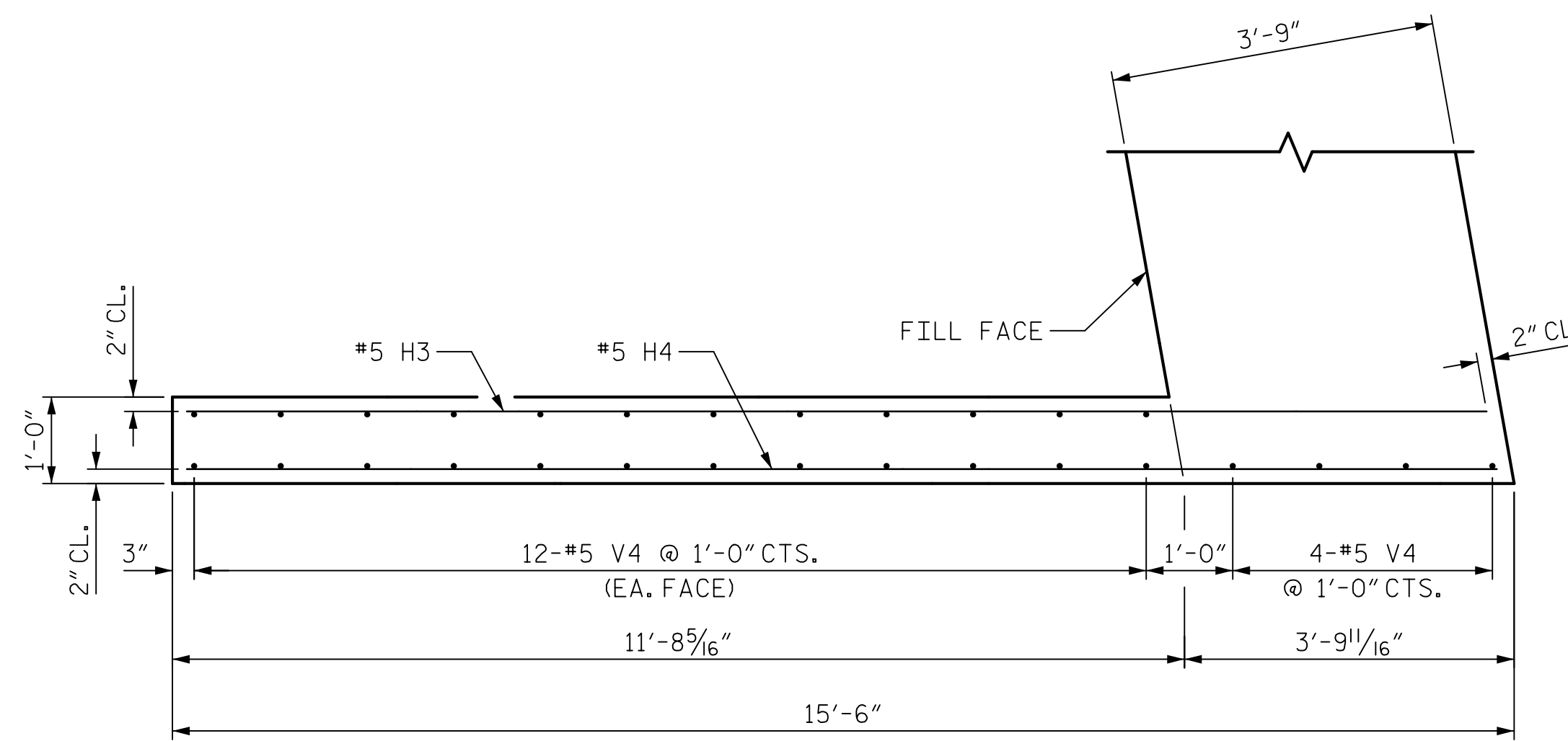
DRAWN BY: T.J. KIRSCHBAUM DATE: 1/6/16  
 CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
 DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

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 Suite 102  
 Raleigh, NC 27607-3073  
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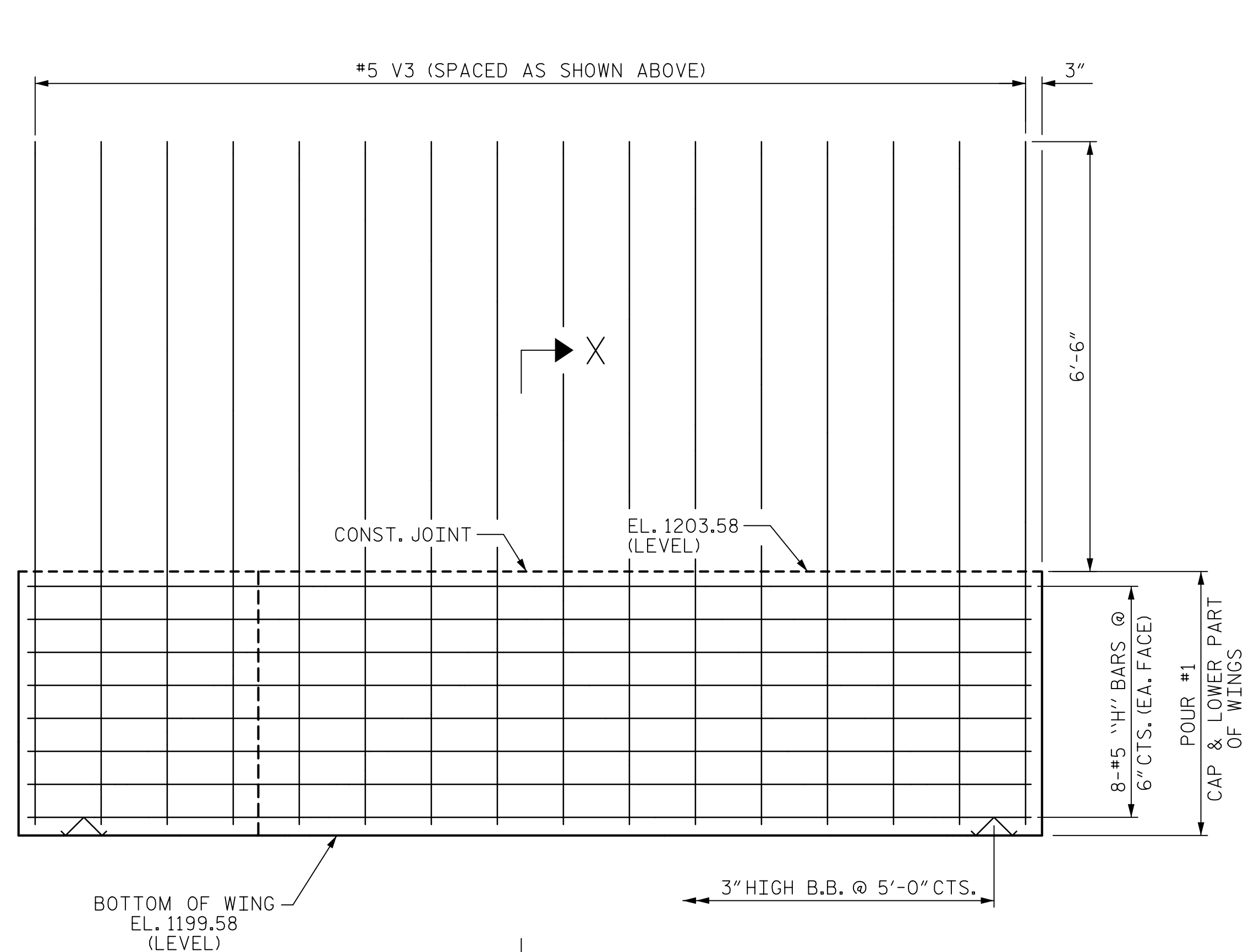
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



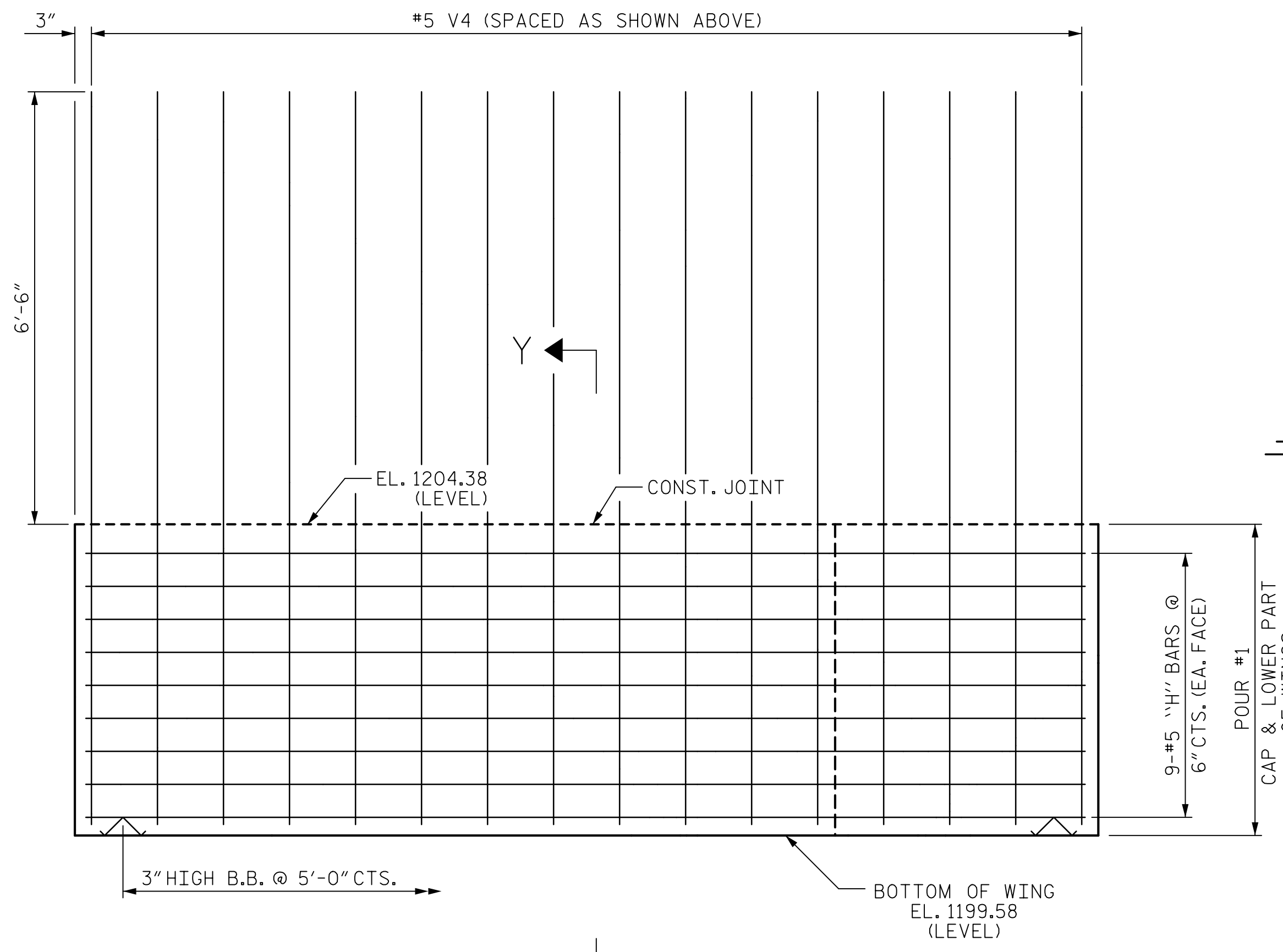
PLAN - BOTTOM OF WING (W3)



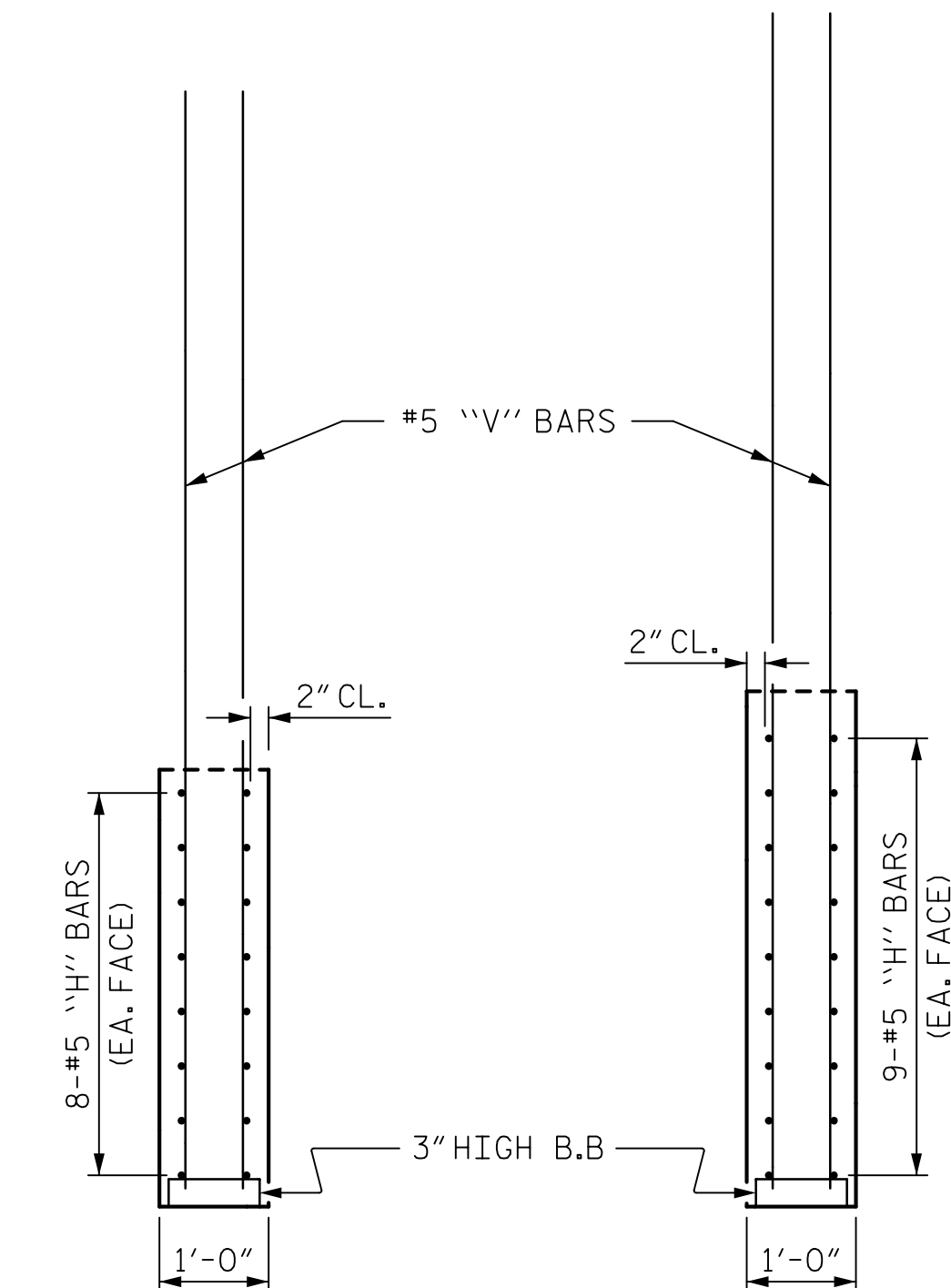
PLAN - BOTTOM OF WING (W4)



ELEVATION - BOTTOM OF WING (W3)



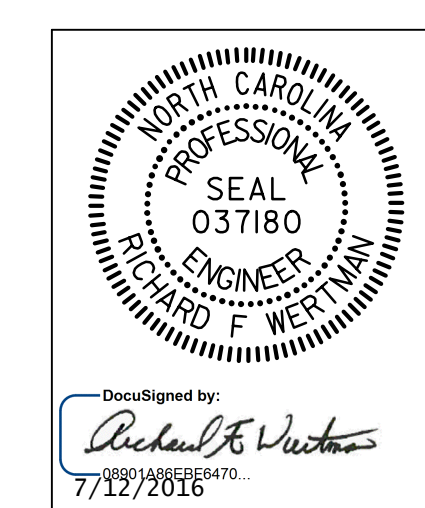
ELEVATION - BOTTOM OF WING (W4)



SECTION X-X

SECTION Y-Y

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 2 OF 4



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

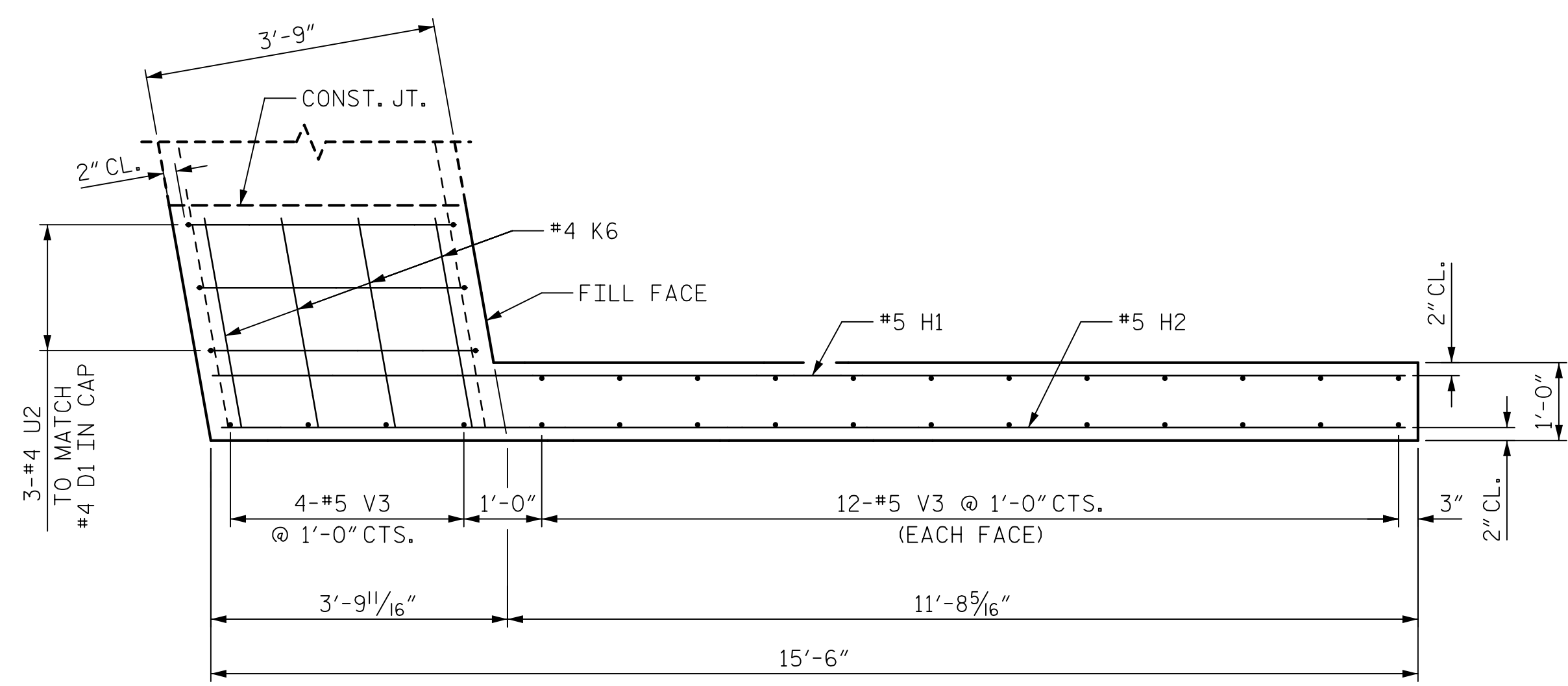
DRAWN BY : T.J. KIRSCHBAUM DATE : 1/6/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

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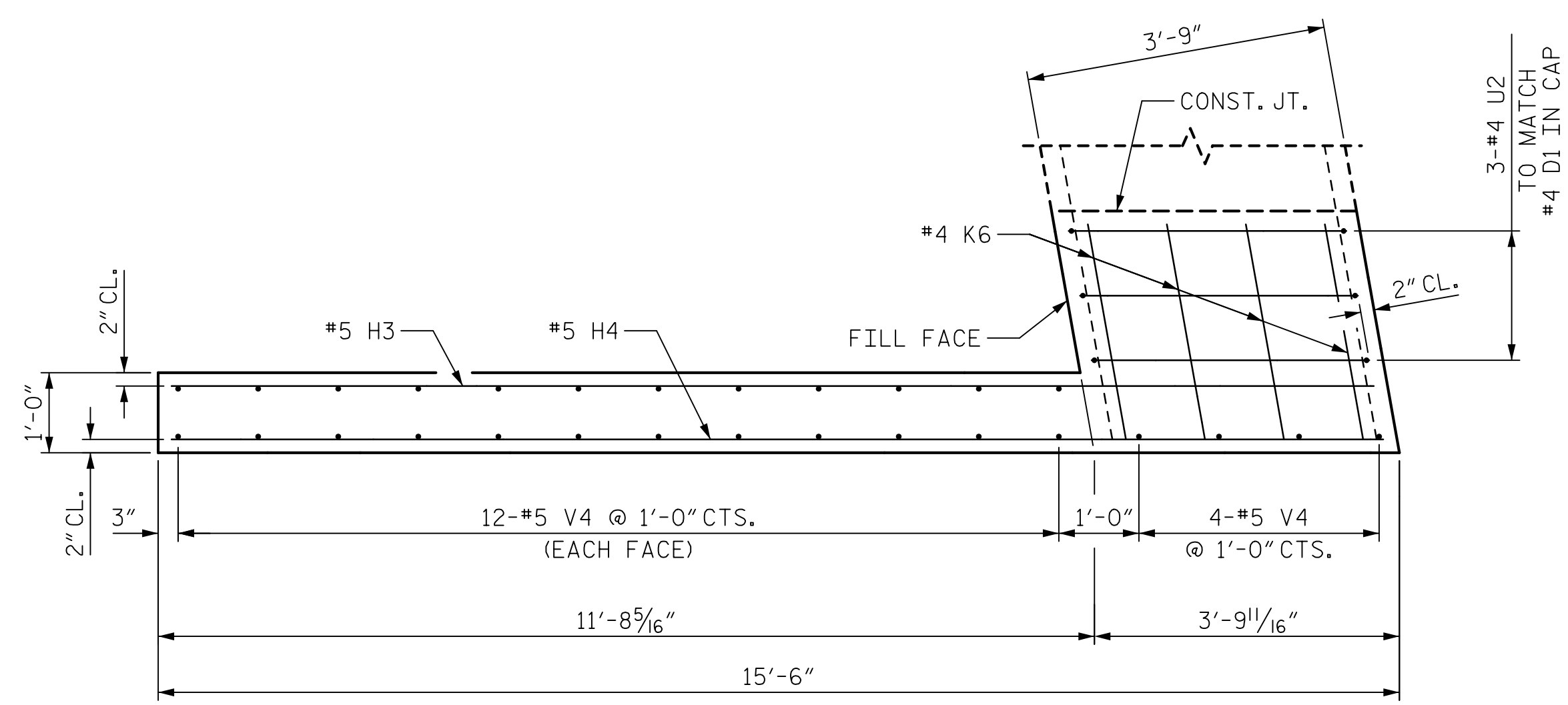
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-22
1			3			TOTAL SHEETS 28
2			4			

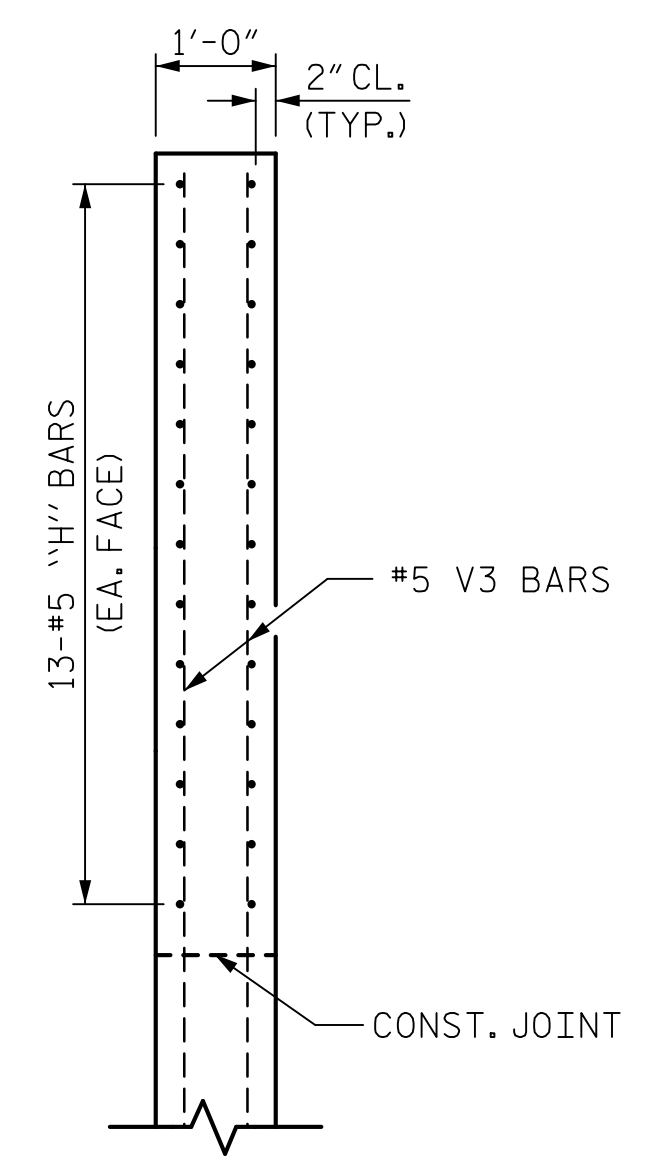




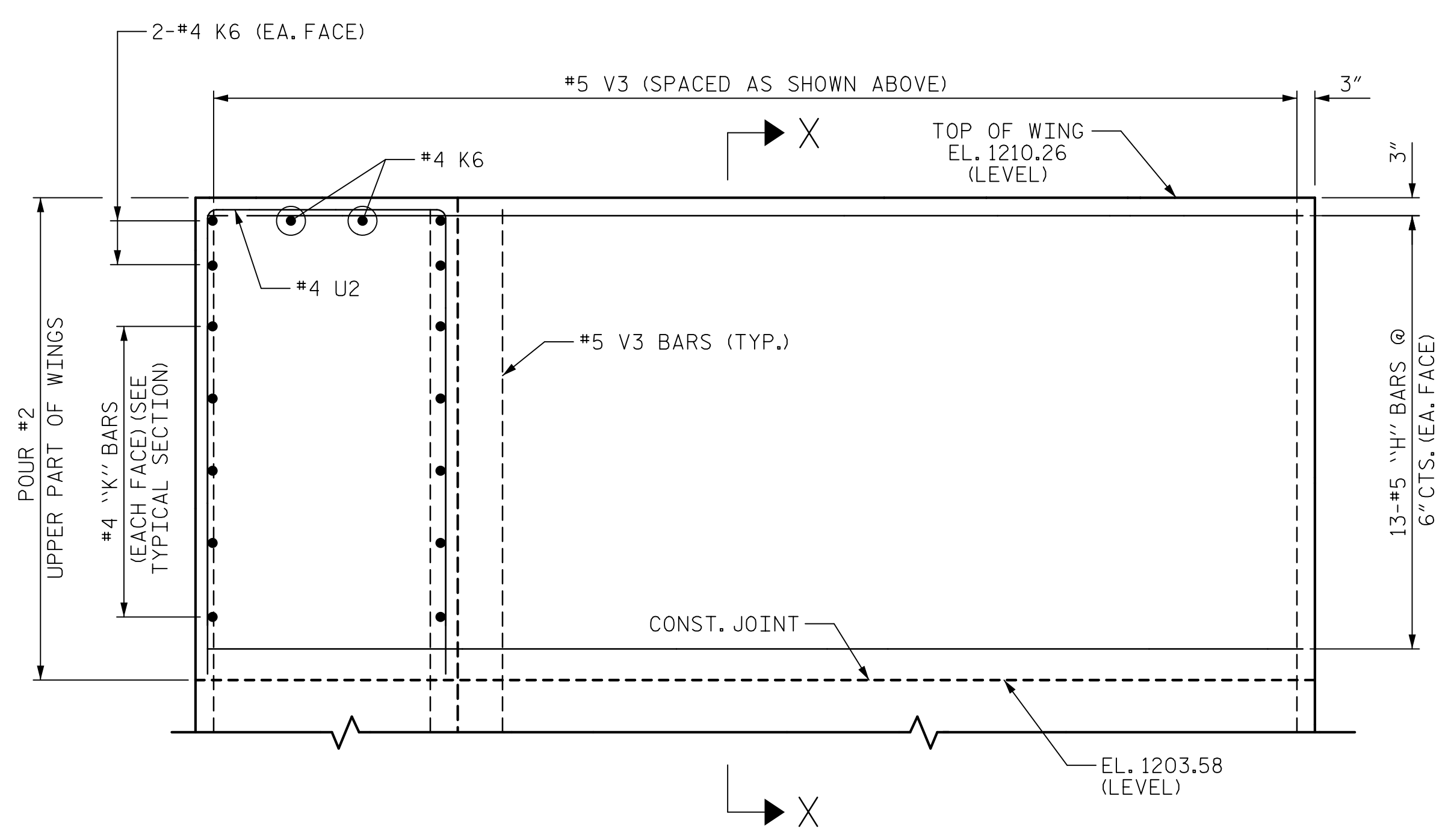
PLAN - TOP OF WING (W3)



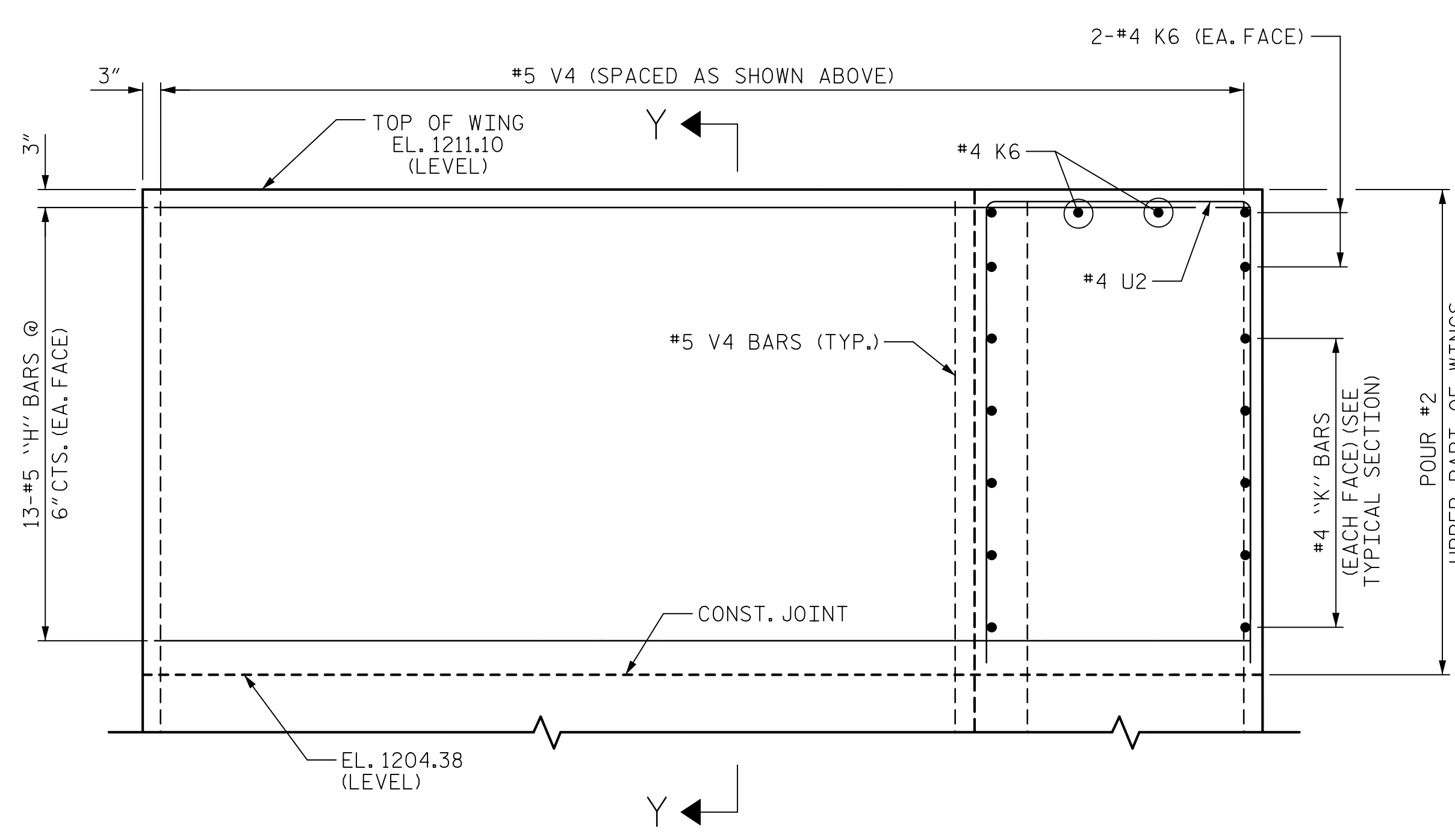
PLAN - TOP OF WING (W4)



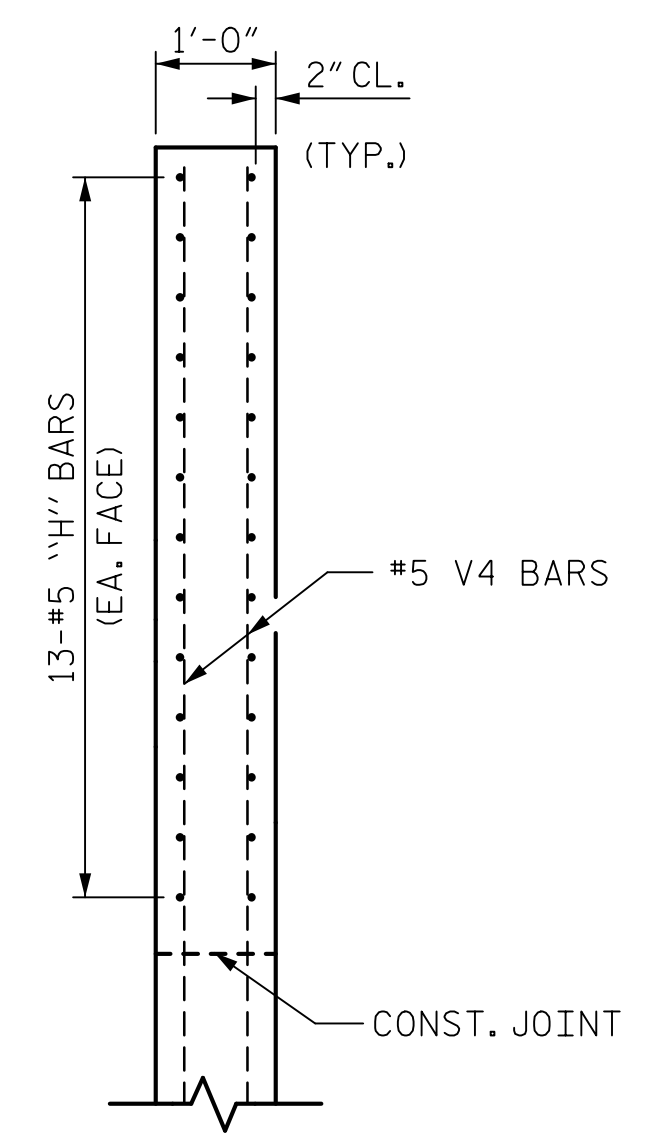
SECTION X-X



ELEVATION - TOP OF WING (W3)



ELEVATION - TOP OF WING (W4)



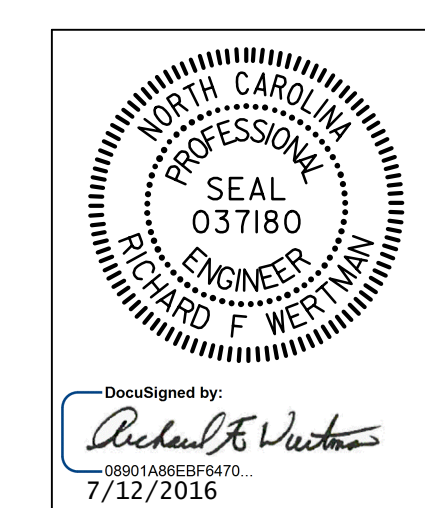
SECTION Y-Y

NOTES:  
 THE UPPER PART OF THE WINGS (POUR #2)  
 SHALL BE POURED AFTER THE SUPERSTRUCTURE.

PROJECT NO. B-4447  
 BURKE COUNTY  
 STATION: 25+85.40 -L-  
 15+67.23 -Y-  
 SHEET 3 OF 4

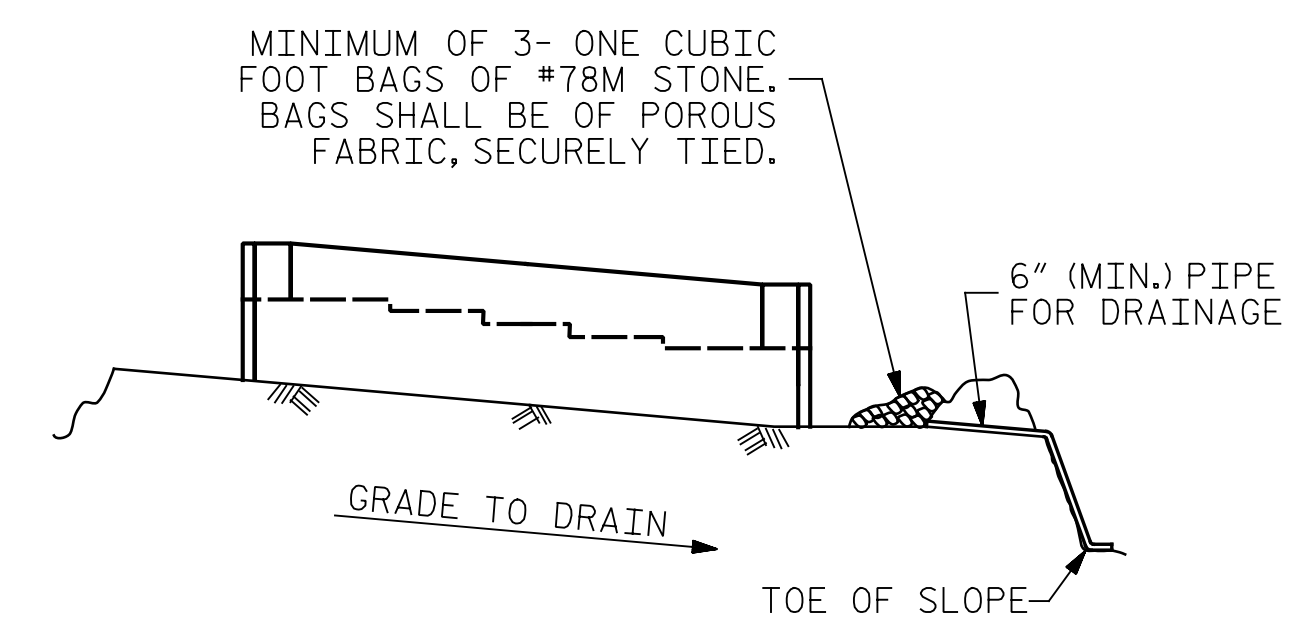
DRAWN BY: T.J. KIRSCHBAUM DATE: 2/2/16  
 CHECKED BY: R.F. WERTMAN DATE: 4/6/16  
 DESIGN ENGINEER OF RECORD: R.F. WERTMAN DATE: 4/6/16

PLANS PREPARED BY:  
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 Excellence Delivered As Promised  
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 Suite 102  
 Raleigh, NC 27607-3073  
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DOCUMENT NOT CONSIDERED  
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT #2 EASTBOUND LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-23					TOTAL SHEETS 28

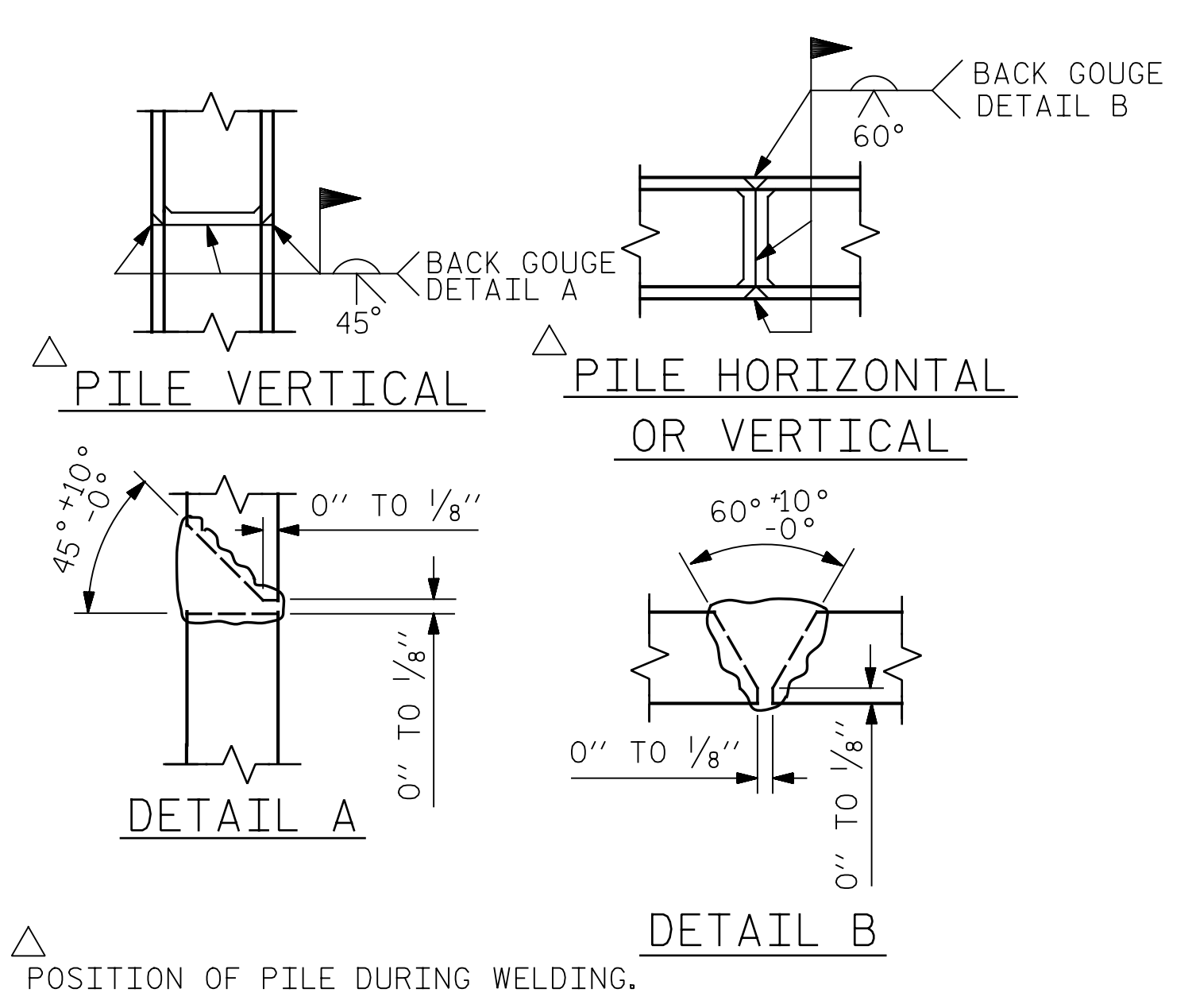


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

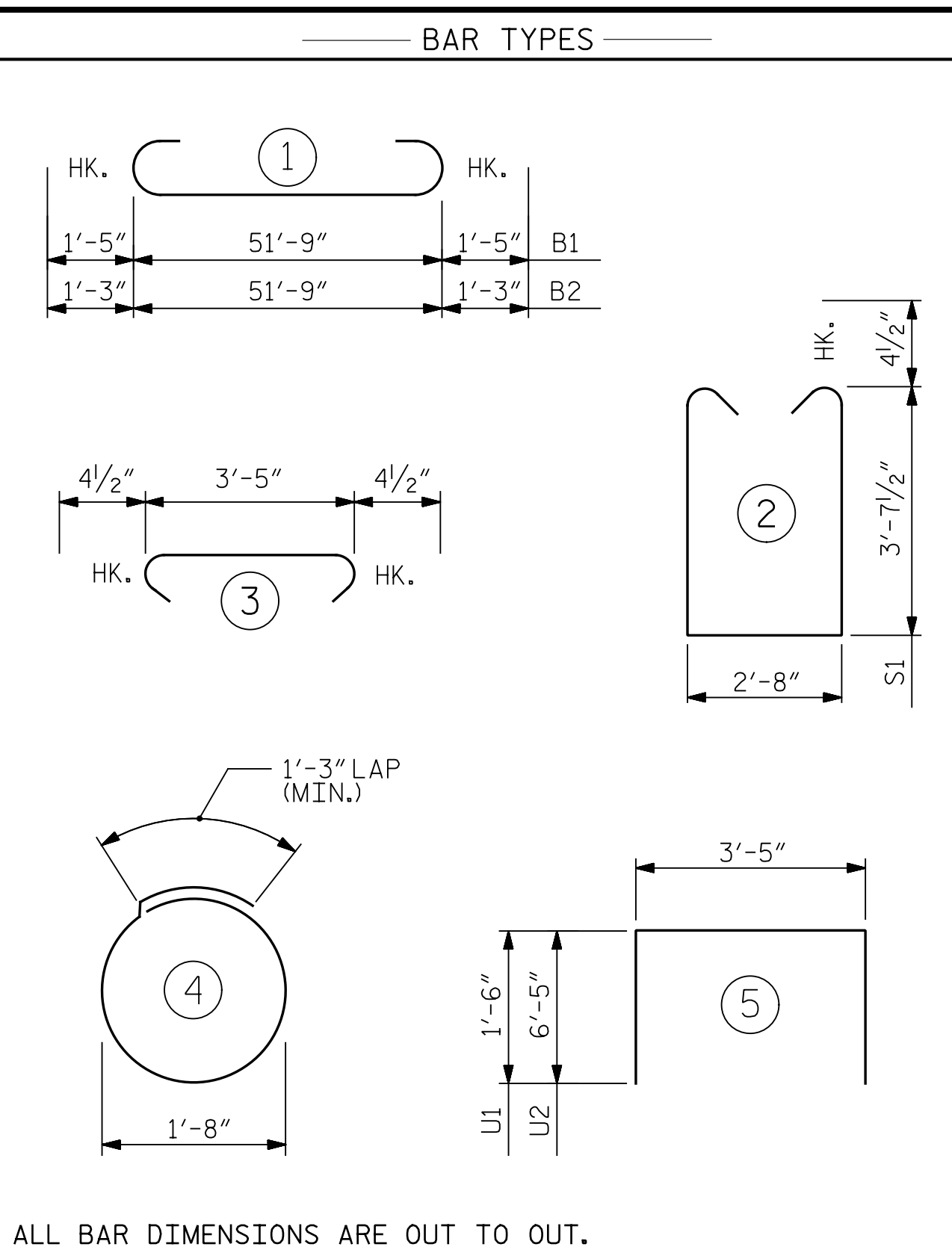
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

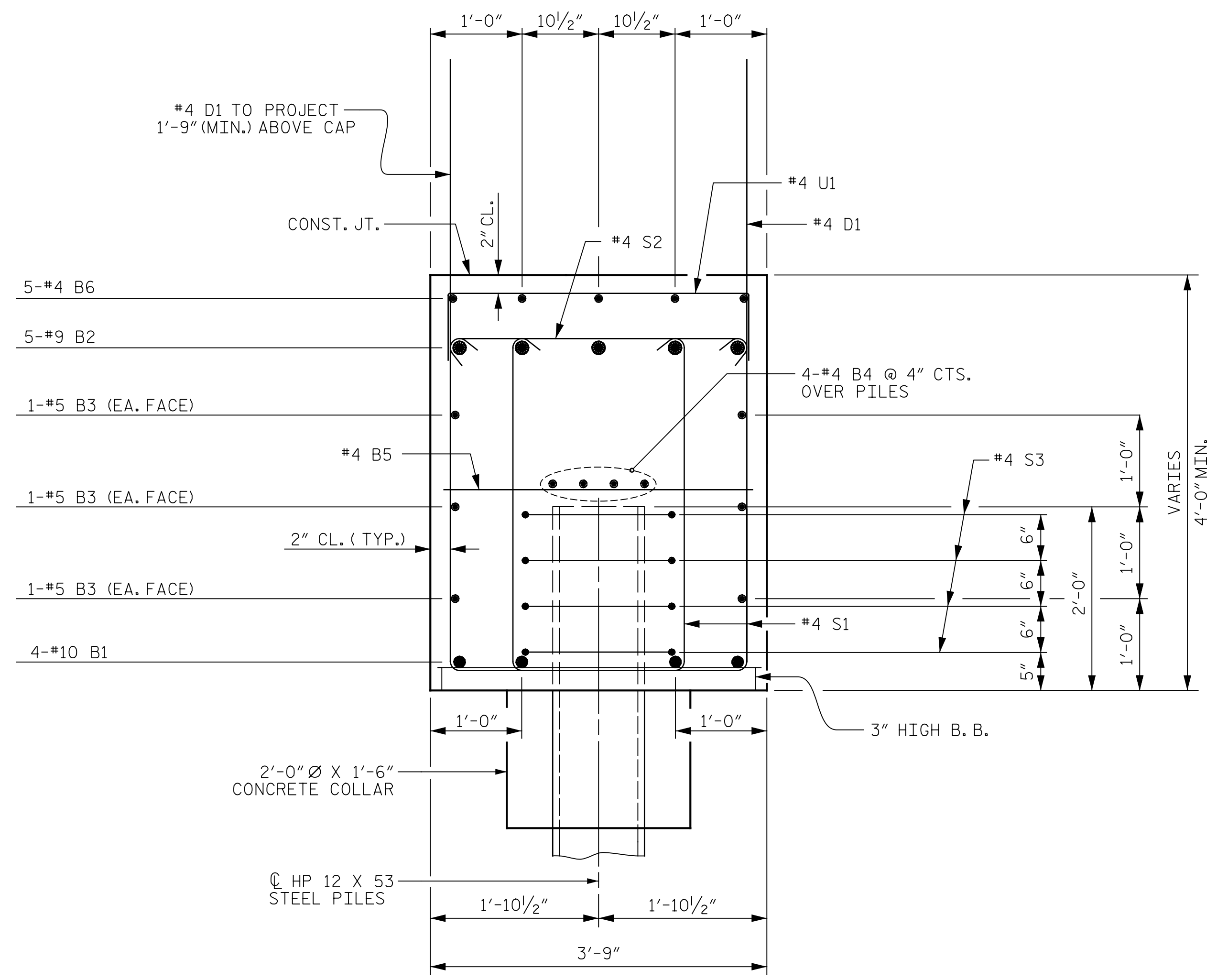
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPLICE DETAILS**



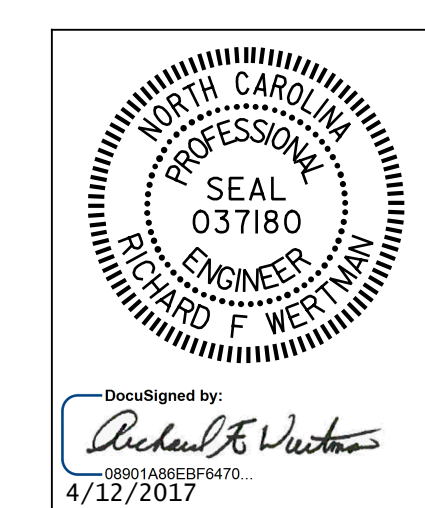
BILL OF MATERIAL					
END BENT #2					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	54'-7"	940
B2	5	#9	1	54'-3"	922
B3	6	#5	STR	51'-9"	324
B4	8	#4	STR	27'-1"	145
B5	13	#4	STR	3'-5"	30
B6	5	#4	STR	19'-0"	63
B7	1	#4	STR	7'-7"	5
B8	1	#4	STR	7'-9"	5
B9	1	#4	STR	7'-11"	5
B10	1	#4	STR	8'-0"	5
B11	1	#4	STR	8'-2"	5
D1	84	#4	STR	6'-5"	360
H1	21	#5	STR	15'-3"	334
H2	21	#5	STR	15'-2"	332
H3	22	#5	STR	15'-0"	344
H4	22	#5	STR	15'-1"	346
K6	12	#4	STR	2'-8"	21
S1	108	#4	2	10'-8"	770
S2	54	#4	3	4'-2"	150
S3	44	#4	4	6'-6"	191
U1	13	#4	5	6'-5"	56
U2	6	#4	5	16'-3"	65
V3	28	#5	STR	10'-4"	302
V4	28	#5	STR	11'-1"	324



**SECTION A-A**

DRAWN BY : T.J. KIRSCHBAUM DATE : 1/6/16  
 CHECKED BY : R.F. WERTMAN DATE : 4/6/16  
 DESIGN ENGINEER OF RECORD : R.F. WERTMAN DATE : 4/6/16

PLANS PREPARED BY: **Gannett Fleming**  
 2610 Wycliff Road, Suite 102, Raleigh, NC 27607-3073  
 (919) 420-7660  
 Excellence Delivered As Promised NC Lic. No. F-0270



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 4 OF 4

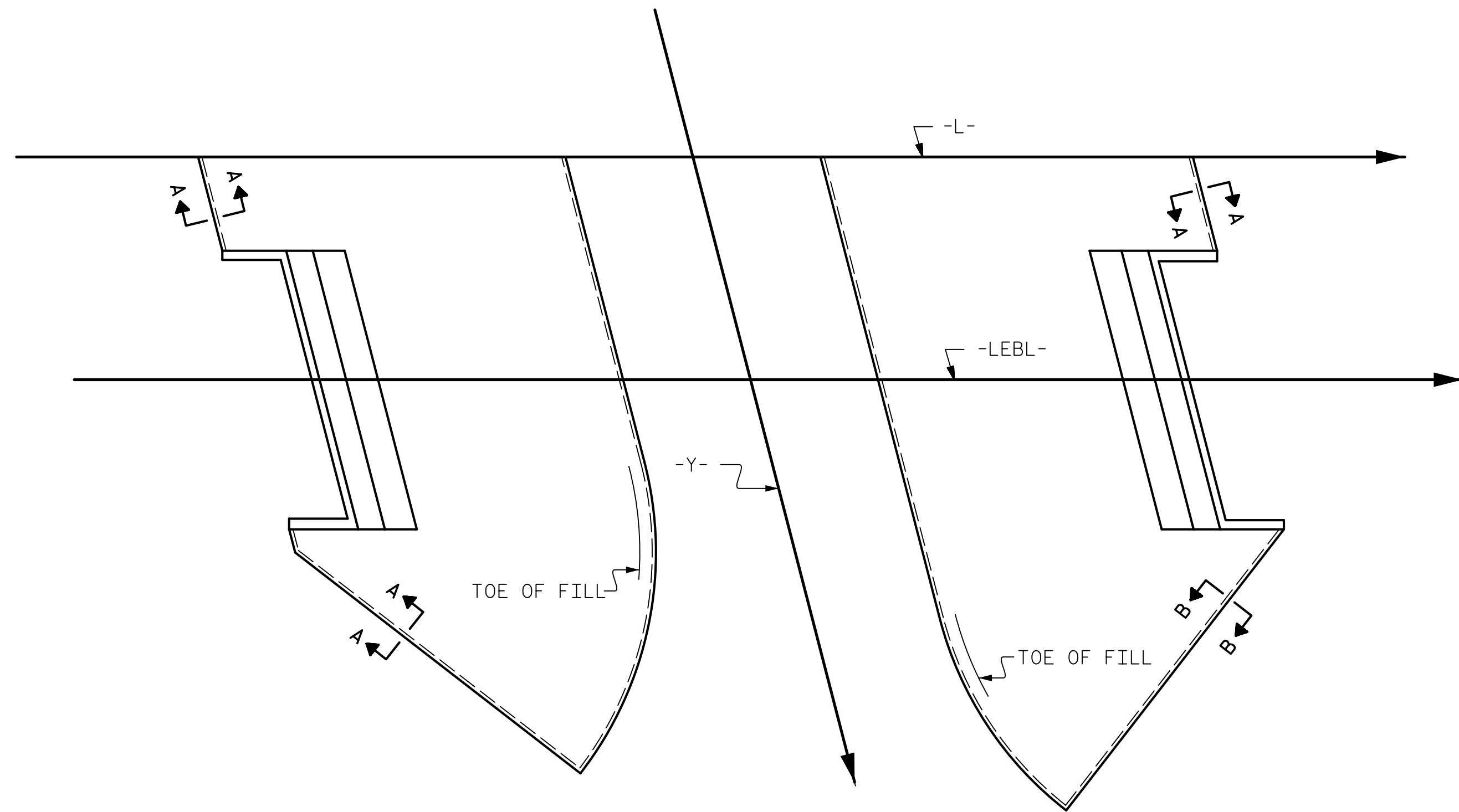
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
INTEGRAL END BENT #2					
EASTBOUND LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S02-24				
TOTAL SHEETS 28				



**GENERAL NOTES**

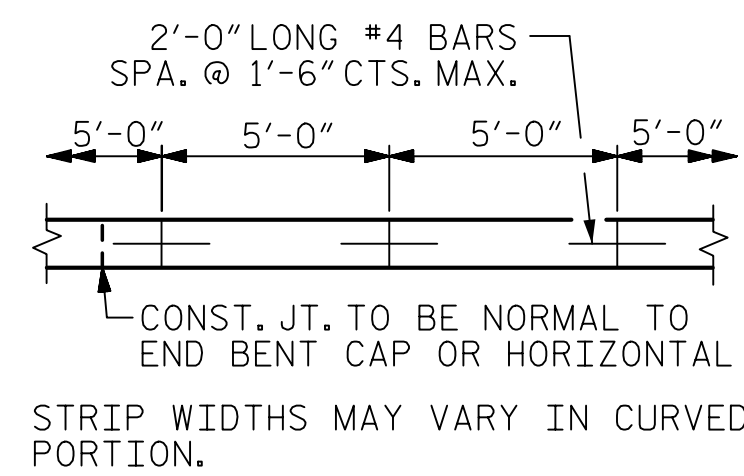
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



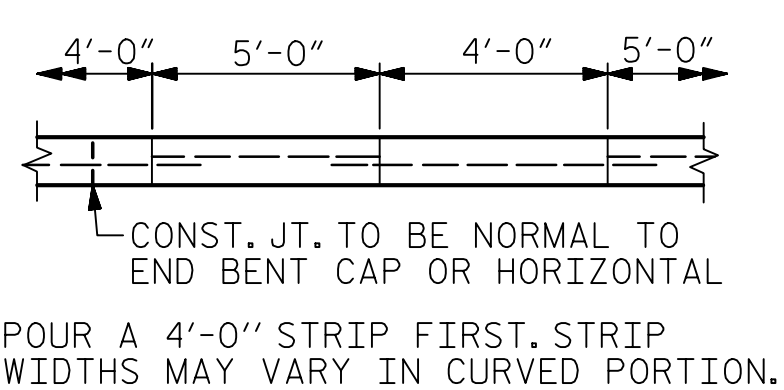
**PLAN**

BRIDGE @ STA. 25+85.40 -L- STA. 15+67.23 -Y-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	360	900
END BENT 2	330	760

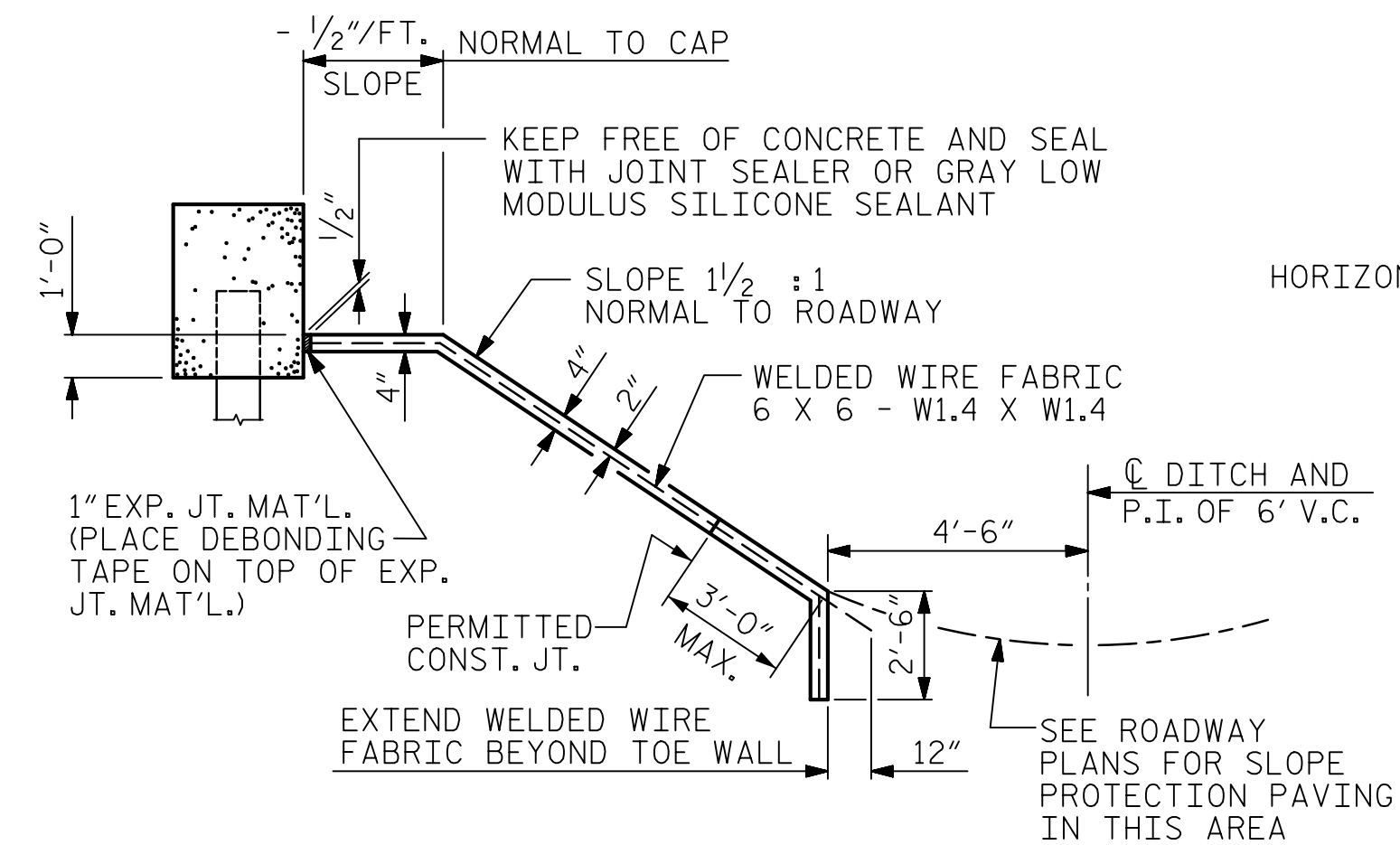
\* QUANTITY SHOWN IS BASED ON 5' POURS.



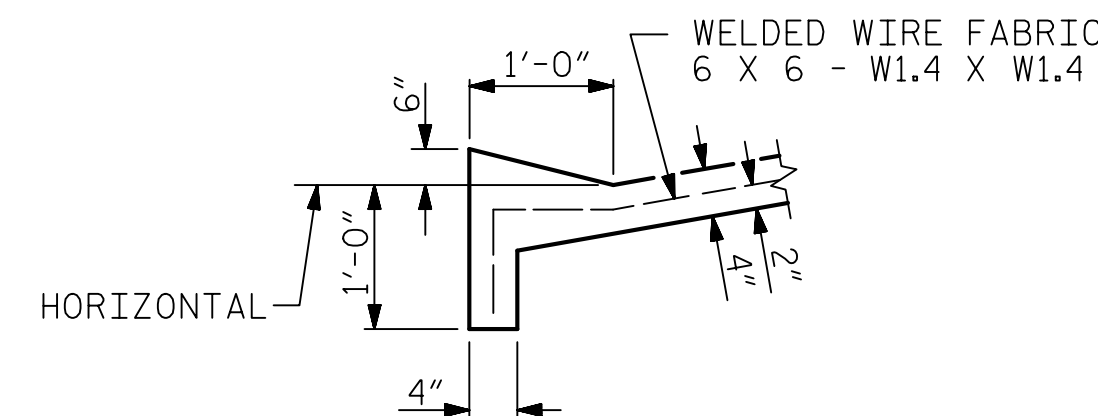
**POURING DETAIL**



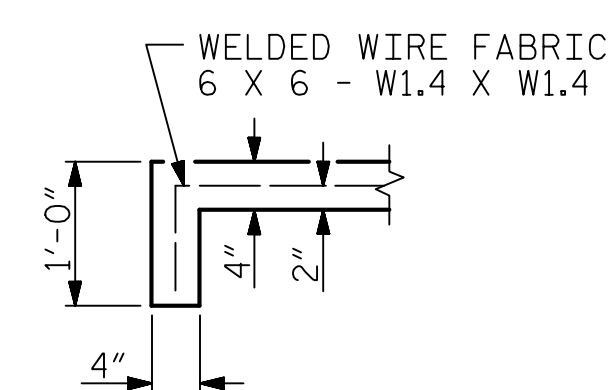
**OPTIONAL POURING DETAIL**



**SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH**



**SECTION B-B**

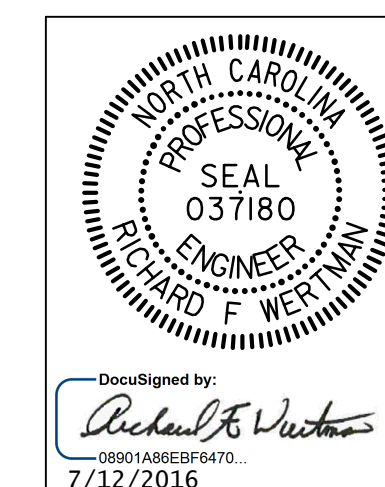


**SECTION A-A**

**DETAILS FOR SLOPE PROTECTION**

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SLOPE PROTECTION  
DETAILS  
EASTBOUND LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-25
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 4/13/16
CHECKED BY : R.F. WERTMAN	DATE : 4/27/16
DRAWN BY : ELR 5/92	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 12/21/11 MAA/GM
	REV. 1/16 MAA/TMG

PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered *As Promised* INC Lic. No. F-0270

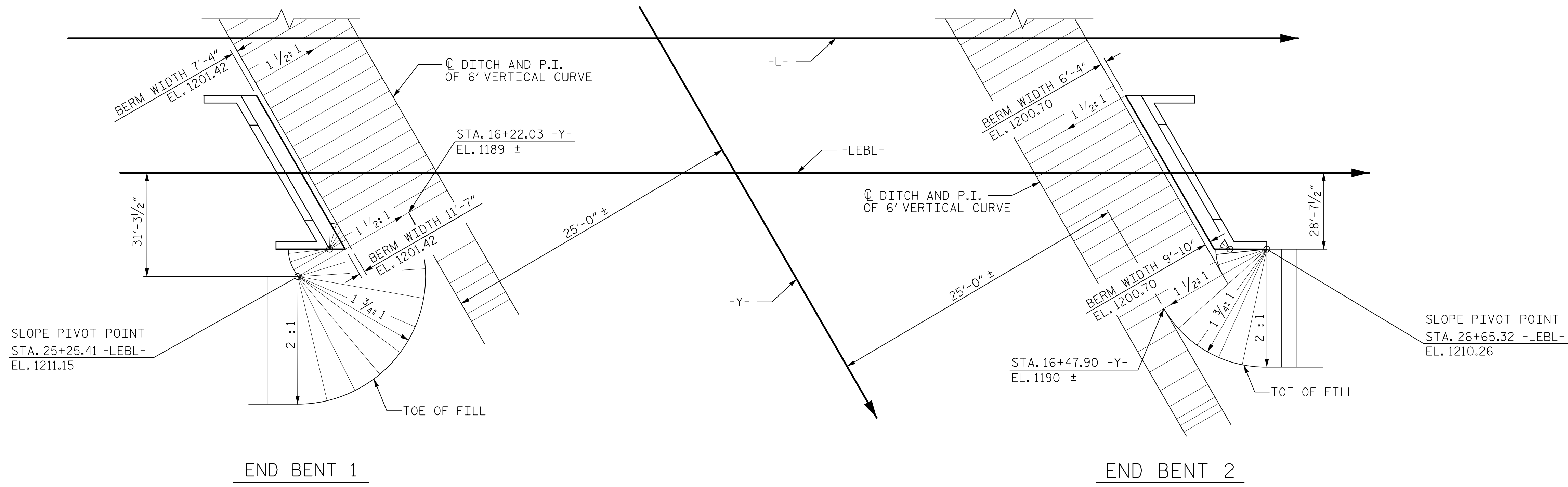
2610 Wycliff Road  
Suite 102  
Raleigh NC 27607-3073  
(919) 420-7660

THESE PLANS HAVE BEEN PROPERLY EXAMINED BY THE UNDERSIGNED. I HAVE DETERMINED THAT THEY COMPLY WITH EXISTING NORTH CAROLINA CODES, AND HAVE BEEN PROPERLY ADAPTED FOR USE IN THIS AREA.

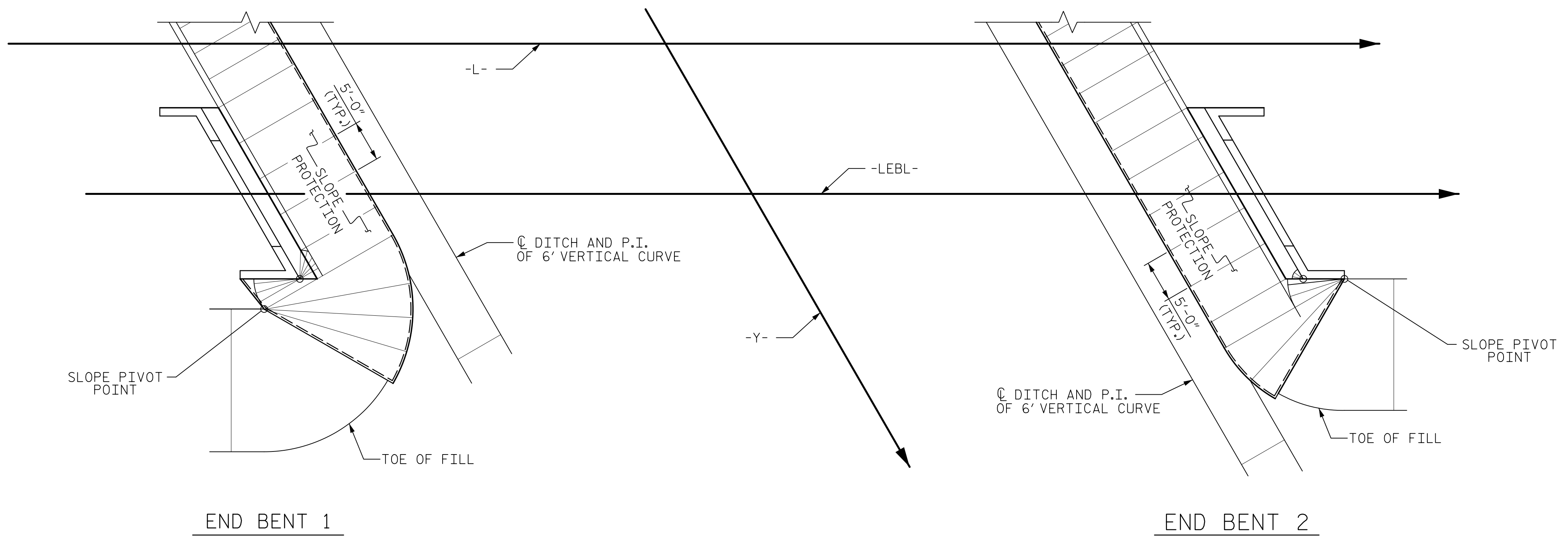
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STR. NO. 2

STD. NO. SP1

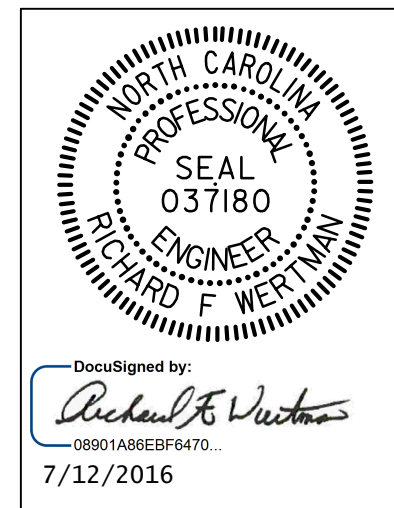


PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SLOPE PROTECTION  
 DETAILS  
 EASTBOUND LANE

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 4/13/16
CHECKED BY : R.F. WERTMAN	DATE : 4/27/16
DRAWN BY : WJH 10/88	REV. 5/1/06 TLA/GM
CHECKED BY : FCJ 10/88	REV. 10/1/11 MAA/GM
	REV. 1/16 MAA/TMG

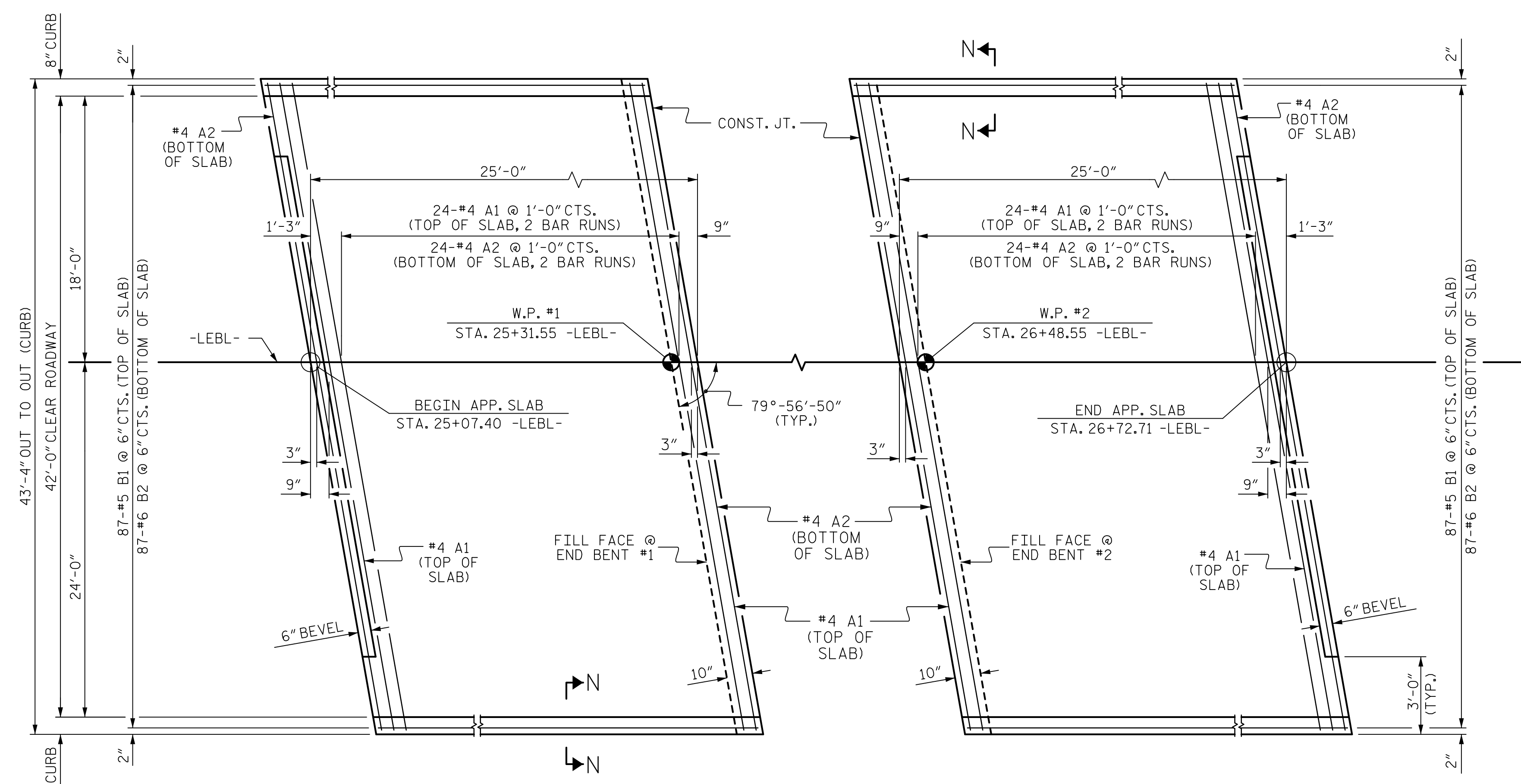
PLANS PREPARED BY:  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-26
1			3			TOTAL SHEETS
2			4			28





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

**NOTES:**

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

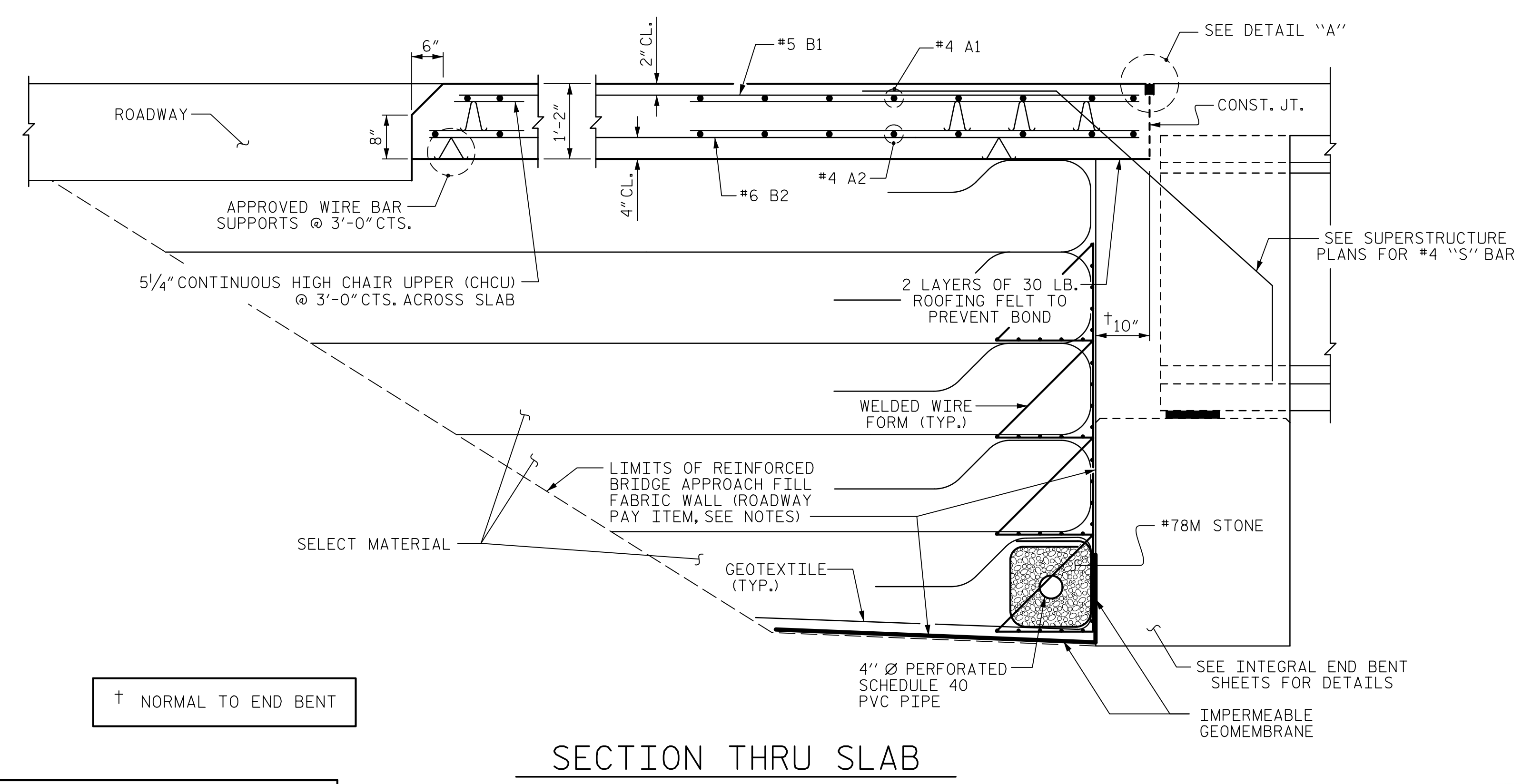
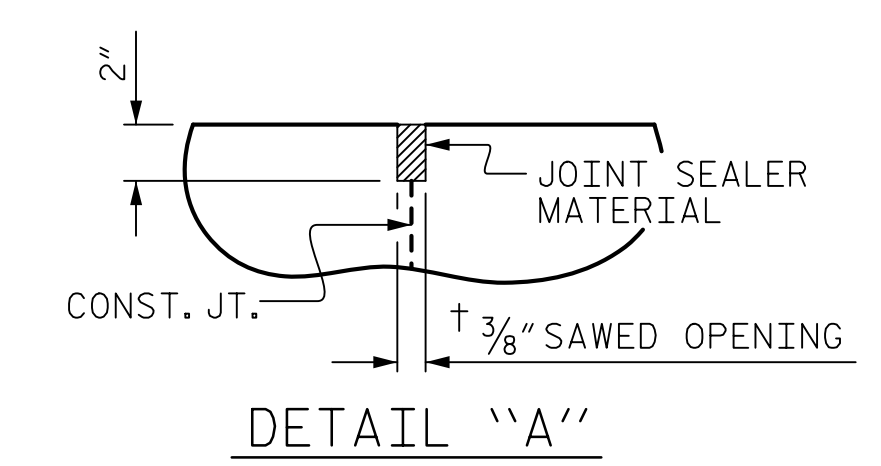
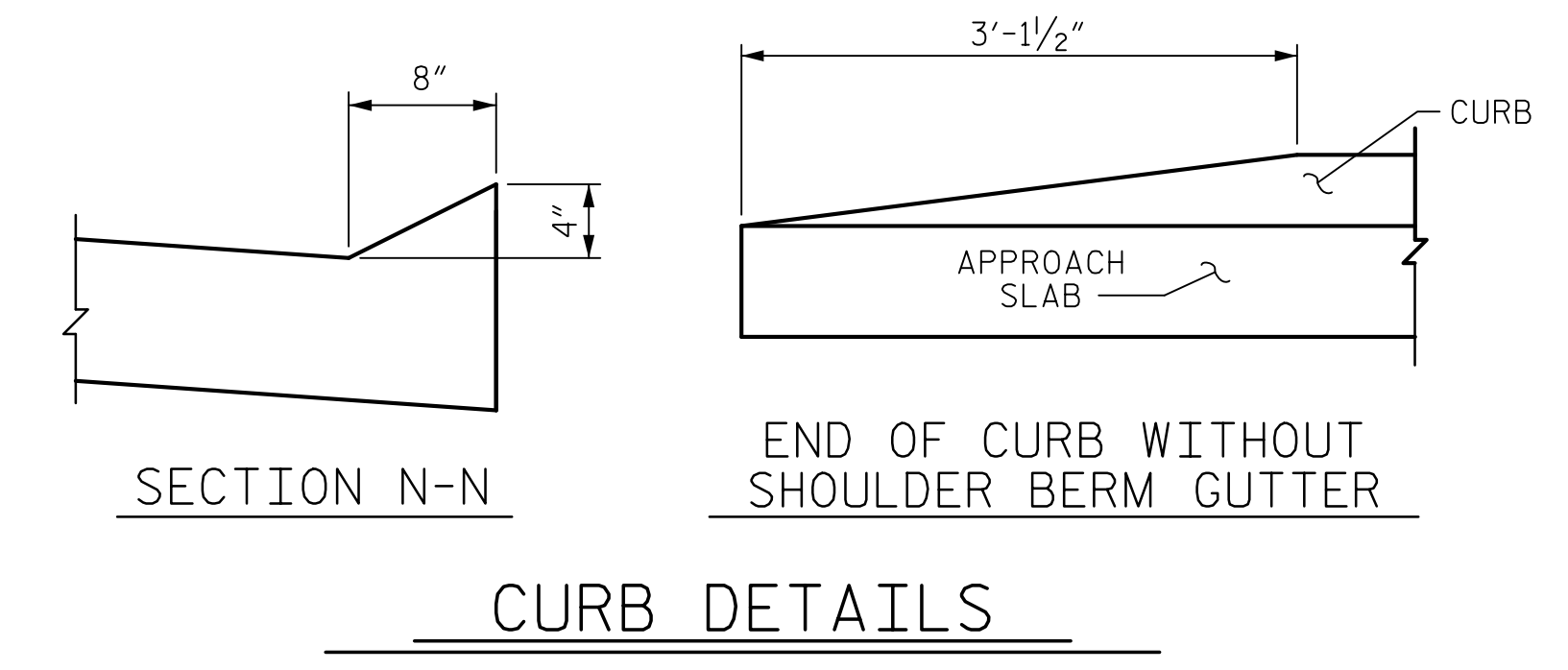
FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

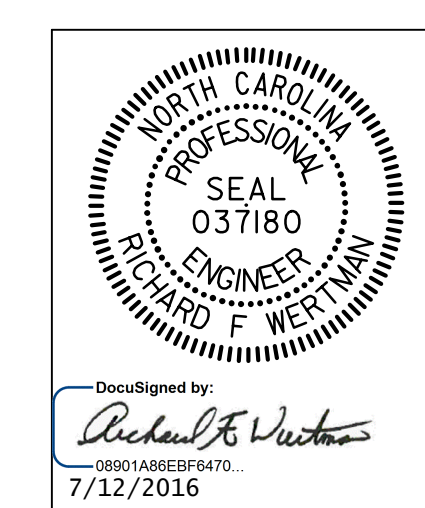
BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQUIRED)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	22'-11"	796
A2	52	#4	STR	22'-9"	790
*B1	87	#5	STR	24'-2"	2193
B2	87	#6	STR	24'-8"	3223
REINFORCING STEEL				LBS.	4013
*EPOXY COATED REINFORCING STEEL				LBS.	2989
CLASS AA CONCRETE				C. Y.	46.9

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



SECTION THRU SLAB

PROJECT NO. B-4447  
BURKE COUNTY  
STATION: 25+85.40 -L-  
15+67.23 -Y-  
SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH  
SLAB FOR  
INTEGRAL ABUTMENT  
EASTBOUND LANE

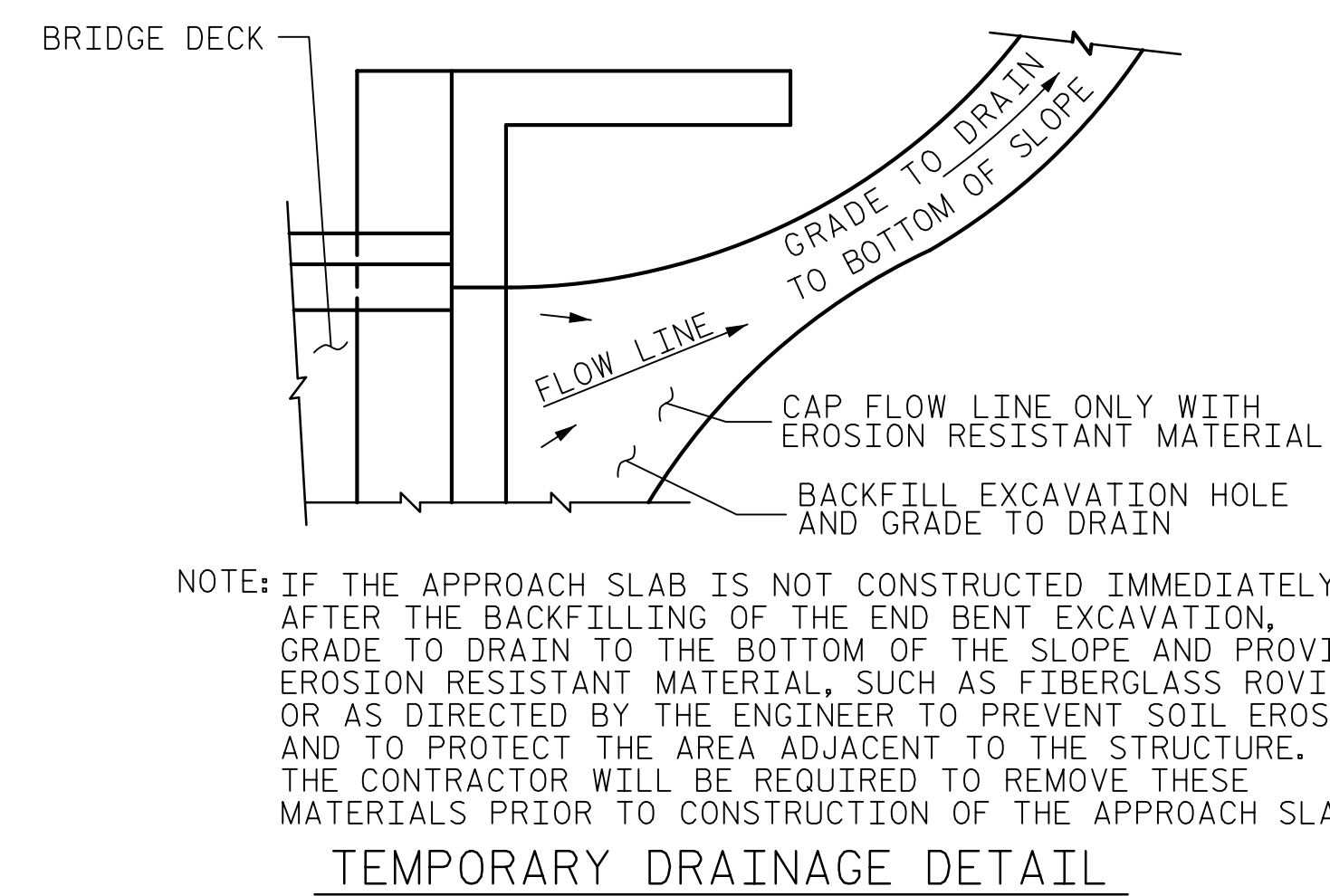
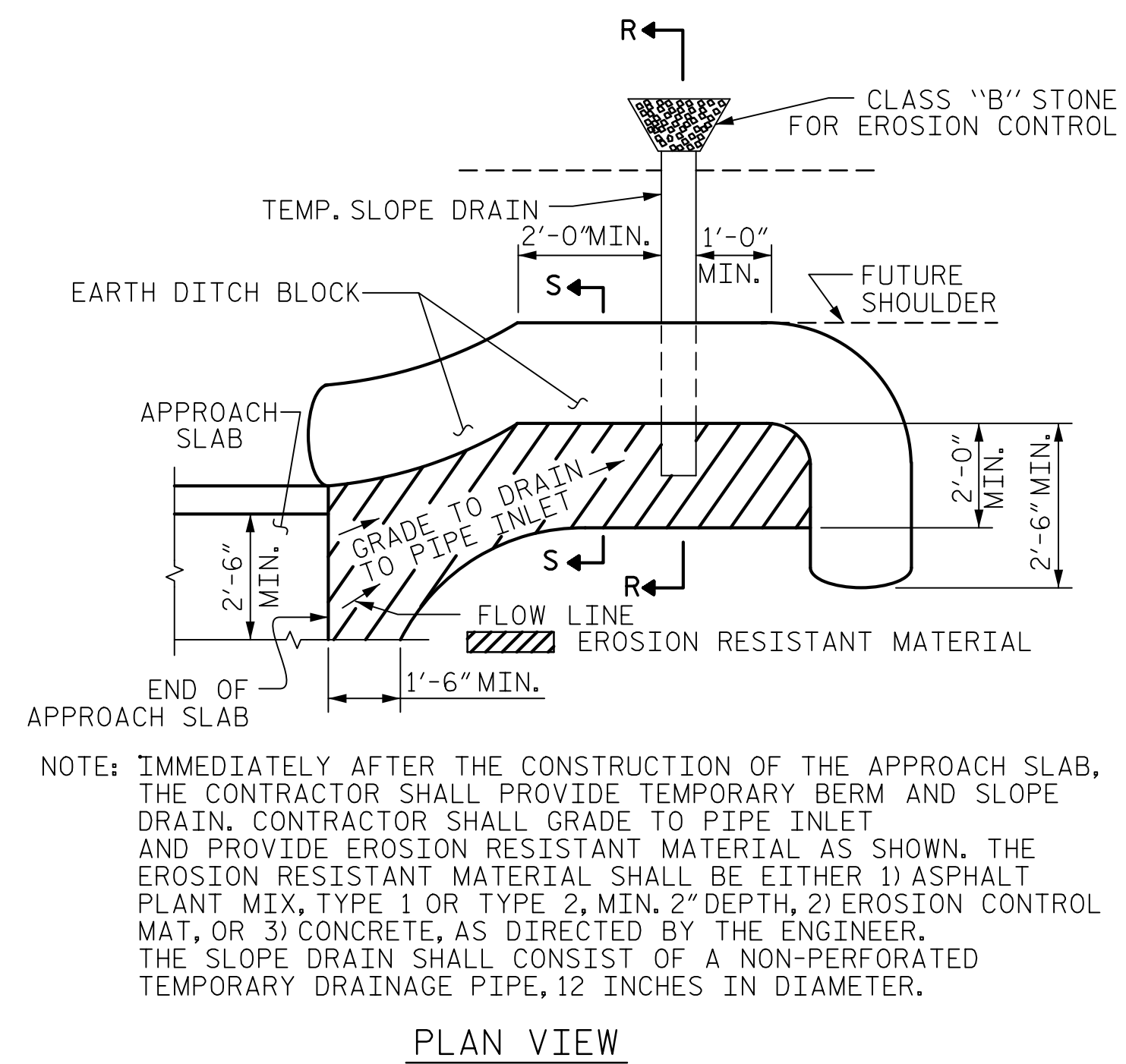
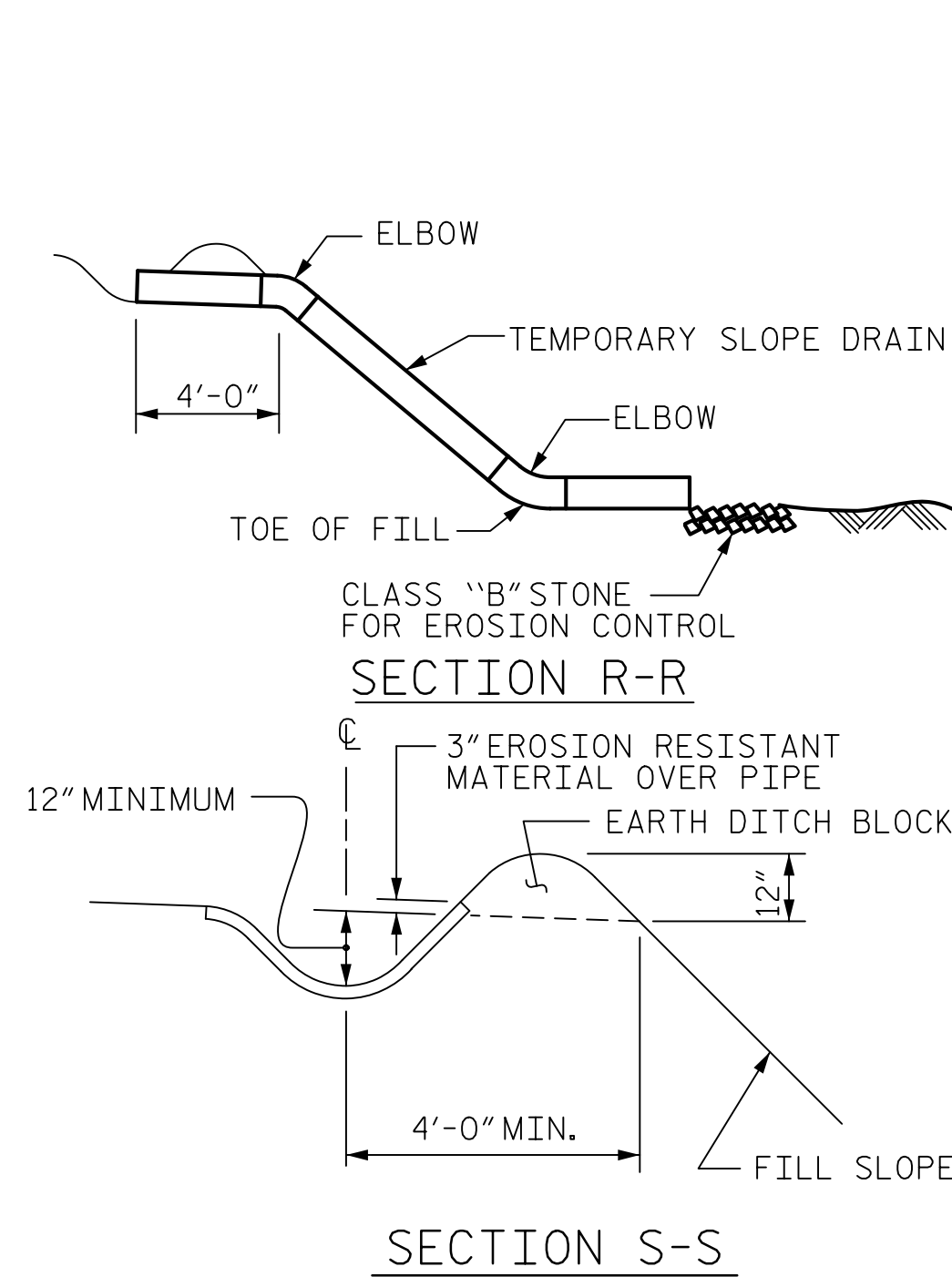
ASSEMBLED BY: T.J. KIRSCHBAUM	DATE: 11/10/15
CHECKED BY: R.F. WERTMAN	DATE: 3/29/16
DRAWN BY: TLA 10/05	REV. 10/1/11 MAA/GM
CHECKED BY: GM 5/06	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

PLANS PREPARED BY:  
**Gannett Fleming**  
Excellence Delivered As Promised  
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Suite 102  
Raleigh, NC 27607-3073  
(919) 420-7660  
INC Lic. No. F-0270

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

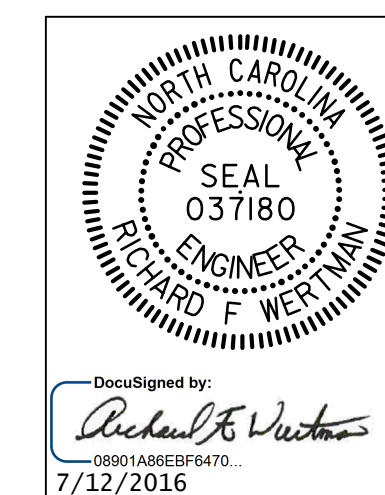


## TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4447  
BURKE COUNTY  
 STATION: 25+85.40 -L-  
15+67.23 -Y-

SHEET 2 OF 2



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

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

ASSEMBLED BY : T.J. KIRSCHBAUM	DATE : 11/10/15	
CHECKED BY : R.F. WERTMAN	DATE : 3/29/16	
DRAWN BY : FCJ 11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

PLANS PREPARED BY:  
  
 Excellence Delivered *As Promised* INC Lic. No. F-0270

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STR. NO. 2

STD. NO. BAS4



## 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 2012 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 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 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø 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 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.  
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.  
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

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