

**This electronic collection of documents is provided  
for the convenience of the user  
and is Not a Certified Document –**

**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

**This file or an individual page  
shall not be considered a certified document.**

**TIP PROJECT: U-2524BC**

**CONTRACT: C203290**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GUILFORD COUNTY**

**LOCATION: GREENSBORO WESTERN LOOP (I-73 CONNECTOR) FROM I-73 / I-840  
TO SR 2085 (JOSEPH BRYAN BLVD.) INTERCHANGE**

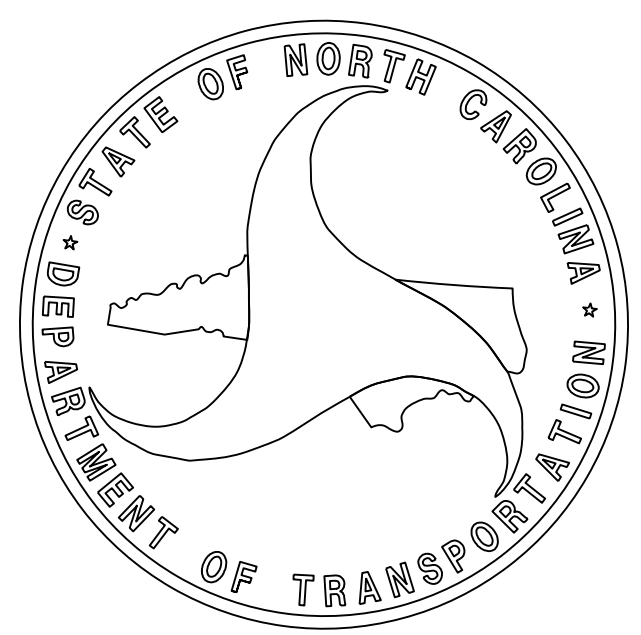
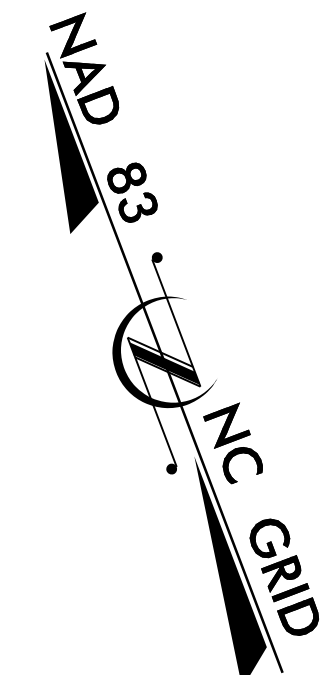
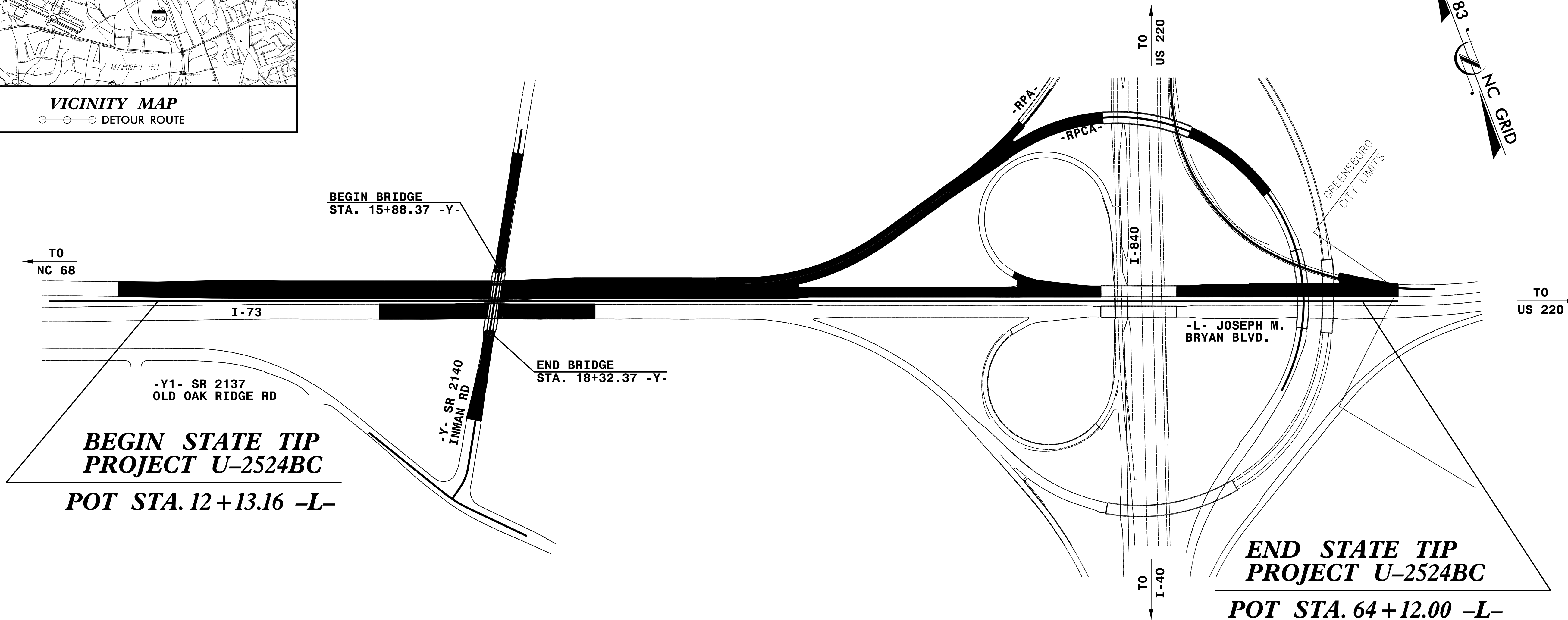
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, ITS, AND STRUCTURES**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524BC		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34820.1.13	STP-NHF-124-1(1)	P.E.	
34820.3.FS29	NHF-0708(62)	CONST.	



**VICINITY MAP**  
○ ○ ○ DETOUR ROUTE

**STRUCTURES**



**DESIGN DATA**

ADT 2014 = 28,300  
 ADT 2034 = 65,500  
 K = 11 %  
 D = 55 %  
 T = 14 % \*  
 V = 70 MPH

CLASSIFICATION: FREEWAY  
 \* (8% TTST DUAL 6%)  
 INTERSTATE TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-2524BC = 0.985 MILES  
 TOTAL LENGTH OF TIP PROJECT U-2524BC = 0.985 MILES

PLANS PREPARED BY:  
**PARSONS**  
 5540 Centerview Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

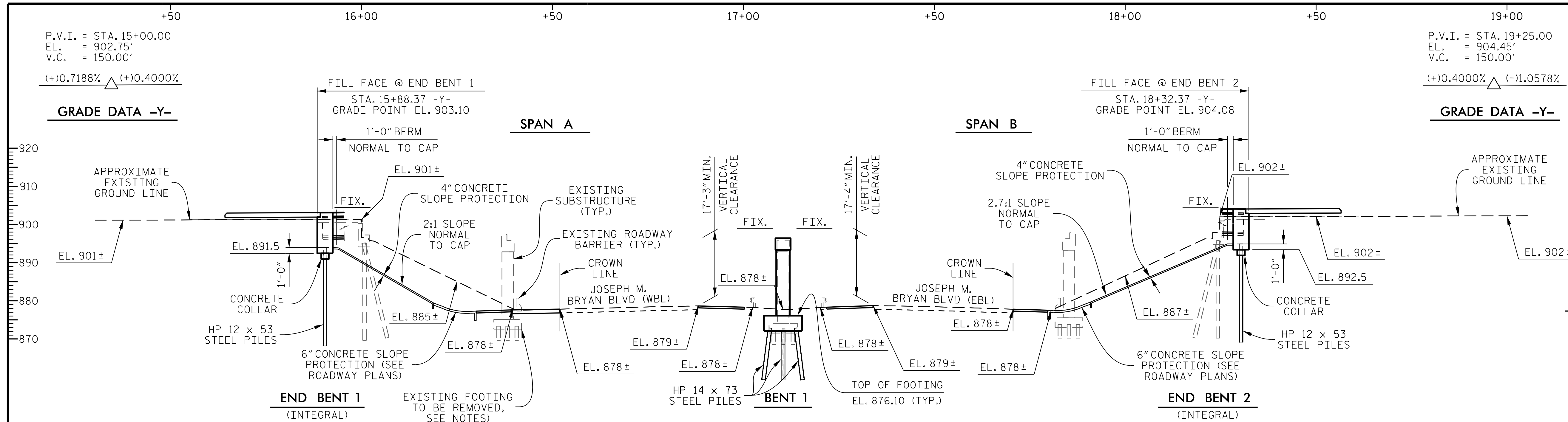
LETTING DATE:  
 JUNE 16, 2015

TOM M. HARRIS, P.E.  
 PROJECT ENGINEER

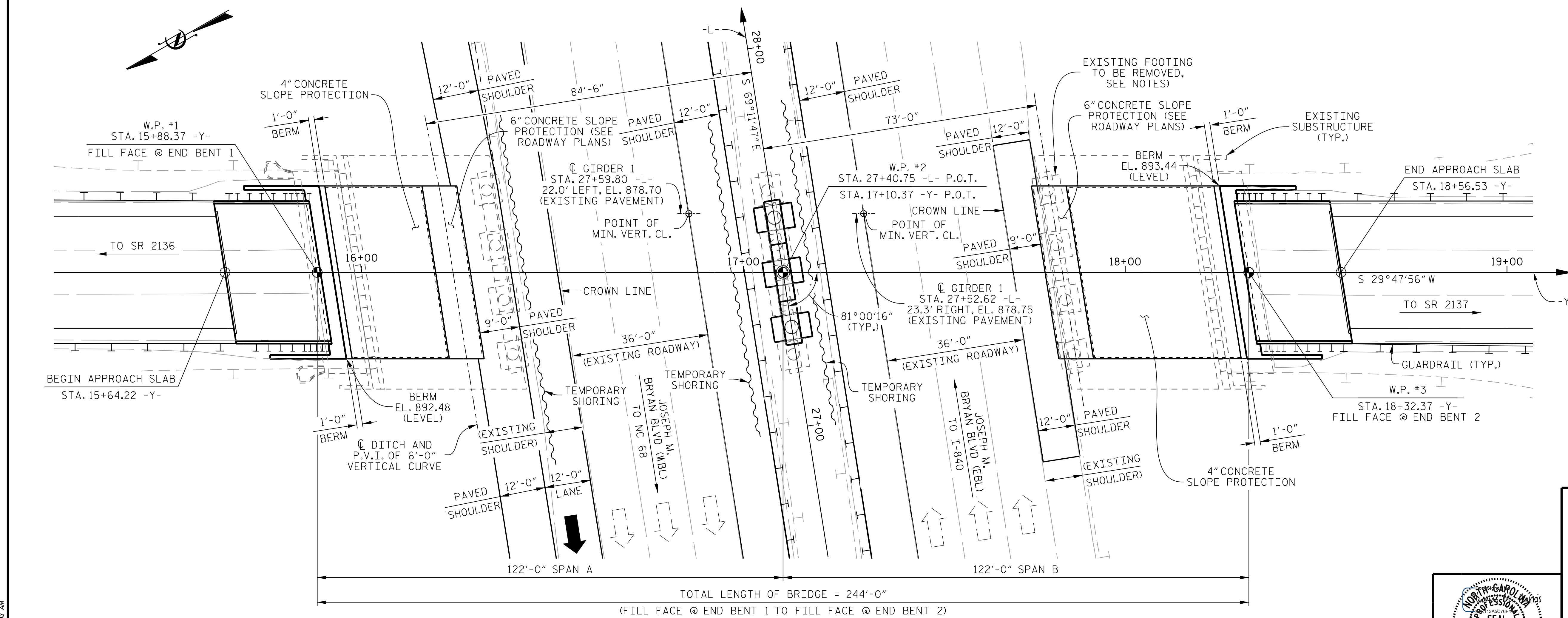
ANUPAM D. SHAH, P.E.  
 PROJECT DESIGN ENGINEER

**END STATE TIP PROJECT U-2524BC**  
 POT STA. 64+12.00 -L-

3/6/2015

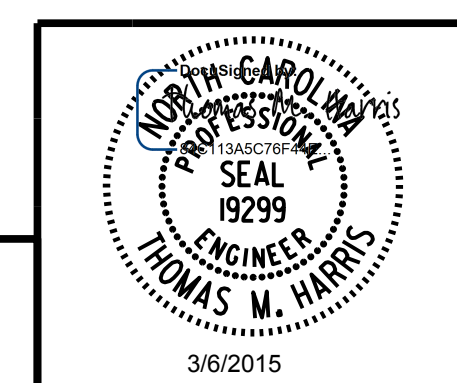


**NOTE**  
FOR GENERAL NOTES, SEE SHEET 3 OF 3.



PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27+40.75 -L-**  
**17+10.37 -Y-**  
 SHEET 1 OF 3 REPLACES BRIDGE No. 743

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PRELIMINARY GENERAL DRAWING  
**BRIDGE OVER SR 2085 (-L-) ON SR 2140 (-Y-) BETWEEN SR 2136 AND SR 2137**

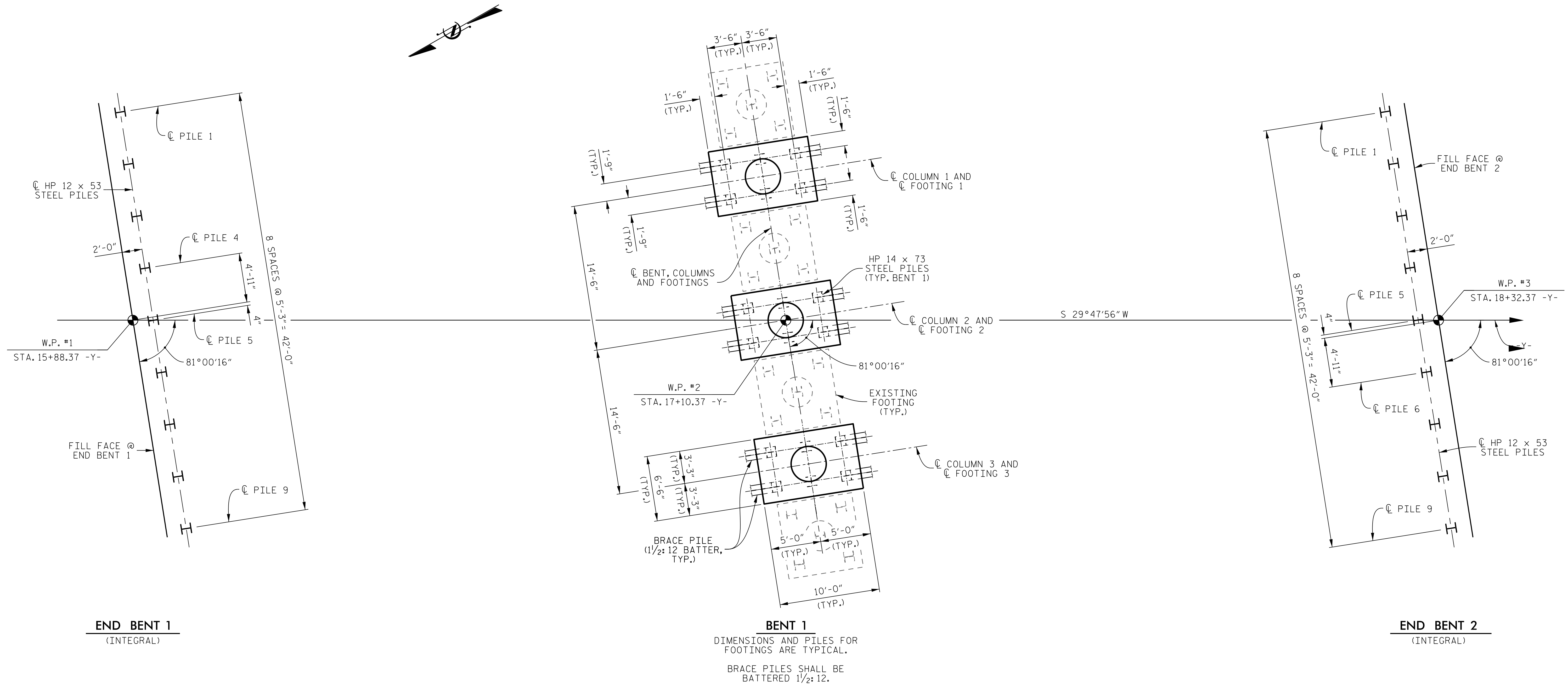


PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 1-15  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15

REVISIONS						SHEET No. S01-1
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

FILE: J:\U-2524BC\Structures\Plans\Final\U2524BC\_S01.dgn  
 DATE: 3/6/2015 10:30:03 AM



**FOUNDATION LAYOUT**

**NOTES**

ALL DIMENSIONS LOCATING PILES ARE TO PILE CENTERLINE AT THE BOTTOM OF THE END BENT CAP OR BENT FOOTING.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 230 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40 TO 55 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1, BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

PROJECT NO. U-2524BC

GUILFORD COUNTY

STATION: 27 + 40.75 -L-

SHEET 2 OF 3

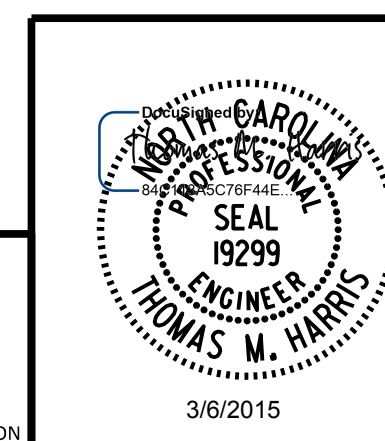
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
BRIDGE OVER SR 2085 (-L-) ON SR 2140 (-Y-) BETWEEN SR 2136 AND SR 2137

FILE: I:\2524BC\Drawings\General\102524BC\_S01.dwg  
DATE: 3/2/15 9:15:47 AM

DRAWN BY : K. E. LOFTON DATE : 12-14  
CHECKED BY : T. M. HARRIS DATE : 1-15  
DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

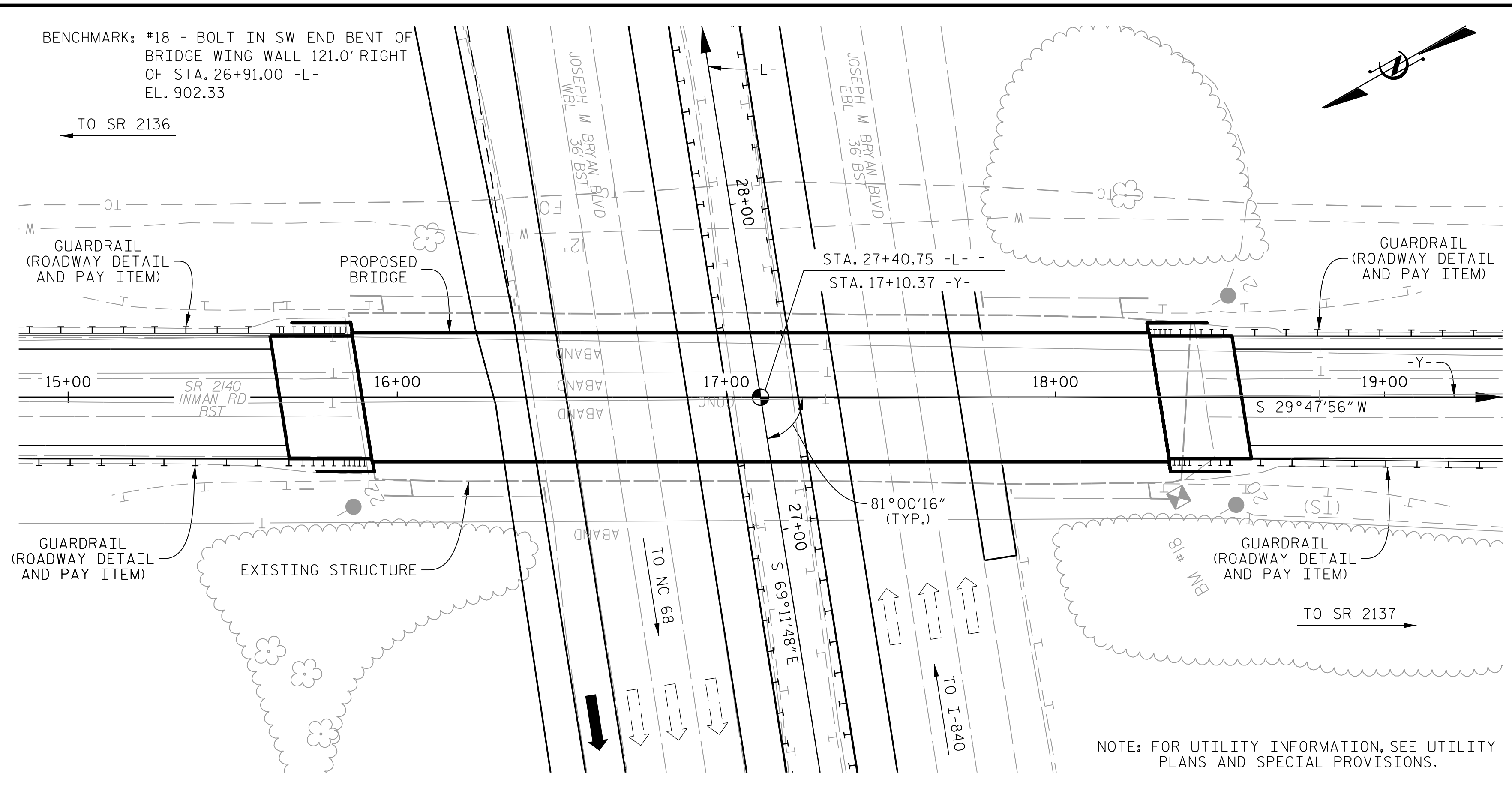
PLANS PREPARED BY :  
**PARSONS**  
5540 CenterView Drive, Suite 217  
Raleigh, NC 27606-3386  
NC LICENSE No. F-0246  
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



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

SHEET No. S01-2  
TOTAL SHEETS 27

STR. #1



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 PERFORMANCE ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- 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 1024-6 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 CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- 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.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- 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.
- EXISTING FOOTING UNDER BRYAN BLVD. (WBL) SHALL BE REMOVED. PAYMENT FOR EXCAVATION SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR FOUNDATION EXCAVATION. PAYMENT FOR FOOTING REMOVAL SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR "REMOVAL OF EXISTING STRUCTURE".
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- WORK SHALL NOT BE STARTED ON END BENT 1 OR END BENT 2 UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- THE EXISTING STRUCTURE CONSISTING OF 1 SPAN @ 40'-6", 2 SPANS @ 73'-6" AND 1 SPAN @ 39'-0" EACH CONSISTING OF REINFORCED CONCRETE DECK WITH PRECAST DECK PANELS ON PRESTRESSED CONCRETE GIRDERS WITH 52'-0" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE POST AND BEAM INTERIOR BENTS WITH STEEL PILE SUPPORTED FOOTINGS AND REINFORCED CONCRETE END BENT CAPS ON STEEL PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STA. 27+40.75 -L-	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	EACH	SO. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE				9,577	9,578		LUMP SUM	
END BENT 1						33.8		6,762
BENT 1		LUMP SUM				72.1		12,447
END BENT 2						33.8		6,762
TOTAL	LUMP SUM	LUMP SUM	1	9,577	9,578	139.7	LUMP SUM	25,971

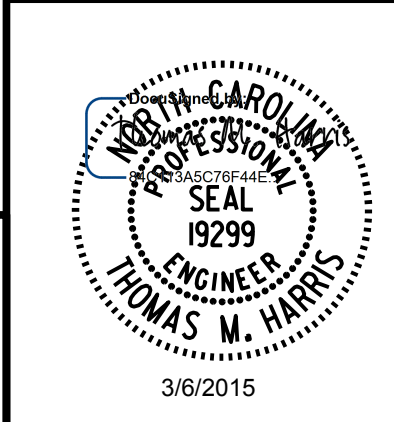
  

	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	HP 12 x 53 STEEL PILES	HP 14 x 73 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LBS.	No., LIN. FT.	No., LIN. FT.	No., LIN. FT.	EACH	LIN. FT.	SQ. YD.	LUMP SUM
SUPERSTRUCTURE		8 962.16				484.63		LUMP SUM
END BENT 1			9 640.0		9		170	
BENT 1	1,279			18 855.0	18			
END BENT 2			9 480.0		9		225	
TOTAL	1,279	8 962.16	18 1,120.0	18 855.0	36	484.63	395	LUMP SUM

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27+40.75 -L-**

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
**BRIDGE OVER SR 2085 (-L-) ON SR 2140 (-Y-) BETWEEN SR 2136 AND SR 2137**



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 1-15  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S01-3
1			3			TOTAL SHEETS
2			4			27

**LOAD FACTORS**

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	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**

- SPAN "A" AND SPAN "B" ARE IDENTICAL.
- LEFT AND RIGHT EXTERIOR GIRDER ARE IDENTICAL.

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	SPANS	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	SPANS		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.19	--	1.75	0.910	1.35	A	EL	59.4	1.005	1.64	A	I	11.3	0.80	0.910	1.19	A	EL	59.4	--	
	HL-93 (OPERATING)	N/A		1.75	--	1.35	0.910	1.75	A	EL	59.4	1.005	2.16	A	I	11.3	N/A	--	--	--	--	--	--	
	HS-20 (INVENTORY)	36.000	2	1.87	67.32	1.75	0.910	1.97	A	EL	59.4	1.005	2.32	A	I	11.3	0.80	0.910	1.87	A	EL	59.4	--	
	HS-20 (OPERATING)	36.000		2.55	91.80	1.35	0.910	2.55	A	EL	59.4	1.005	3.05	A	I	11.3	N/A	--	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.19	56.57	1.40	0.910	5.96	A	EL	59.4	1.005	7.50	A	I	11.3	0.80	0.910	4.19	A	EL	59.4	--
		SNGARBS2	20.000		2.99	59.80	1.40	0.910	4.26	A	EL	59.4	1.005	5.19	A	I	11.3	0.80	0.910	2.99	A	EL	59.4	--
		SNAGRIS2	22.000		2.79	61.38	1.40	0.910	3.97	A	EL	59.4	1.005	4.76	A	I	11.3	0.80	0.910	2.79	A	EL	59.4	--
		SNCOTTS3	27.250		1.51	41.15	1.40	0.910	2.96	A	EL	59.4	1.005	3.67	A	I	11.3	0.80	0.910	1.51	A	EL	59.4	--
		SNAGGRS4	34.925		1.69	59.02	1.40	0.910	2.41	A	EL	59.4	1.005	2.95	A	I	11.3	0.80	0.910	1.69	A	EL	59.4	--
		SNS5A	35.550		1.66	59.01	1.40	0.910	2.36	A	EL	59.4	1.005	2.95	A	I	11.3	0.80	0.910	1.66	A	EL	59.4	--
		SNS6A	39.950		1.50	59.93	1.40	0.910	2.13	A	EL	59.4	1.005	2.65	A	I	11.3	0.80	0.910	1.50	A	EL	59.4	--
	SNS7B	42.000		1.43	60.06	1.40	0.910	2.03	A	EL	59.4	1.005	2.56	A	I	11.3	0.80	0.910	1.43	A	EL	59.4	--	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.82	60.06	1.40	0.910	2.59	A	EL	59.4	1.005	3.20	A	I	11.3	0.80	0.910	1.82	A	EL	59.4	--
		TNT4A	33.075		1.83	60.53	1.40	0.910	2.60	A	EL	59.4	1.005	3.15	A	I	11.3	0.80	0.910	1.83	A	EL	59.4	--
		TNT6A	41.600		1.47	61.15	1.40	0.910	2.10	A	EL	59.4	1.005	2.67	A	I	11.3	0.80	0.910	1.47	A	EL	59.4	--
		TNT7A	42.000		1.47	61.74	1.40	0.910	2.10	A	EL	59.4	1.005	2.63	A	I	11.3	0.80	0.910	1.47	A	EL	59.4	--
		TNT7B	42.000		1.50	63.00	1.40	0.910	2.14	A	EL	59.4	1.005	2.53	A	I	11.3	0.80	0.910	1.50	A	EL	59.4	--
		TNAGRIT4	43.000		1.44	61.92	1.40	0.910	2.06	A	EL	59.4	1.005	2.45	A	I	11.3	0.80	0.910	1.44	A	EL	59.4	--
TNAGT5A		45.000		1.37	61.65	1.40	0.910	1.95	A	EL	59.4	1.005	2.40	A	I	11.3	0.80	0.910	1.37	A	EL	59.4	--	
TNAGT5B	45.000	3	1.36	61.20	1.40	0.910	1.94	A	EL	59.4	1.005	2.33	A	I	11.3	0.80	0.910	1.36	A	EL	59.4	--		

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

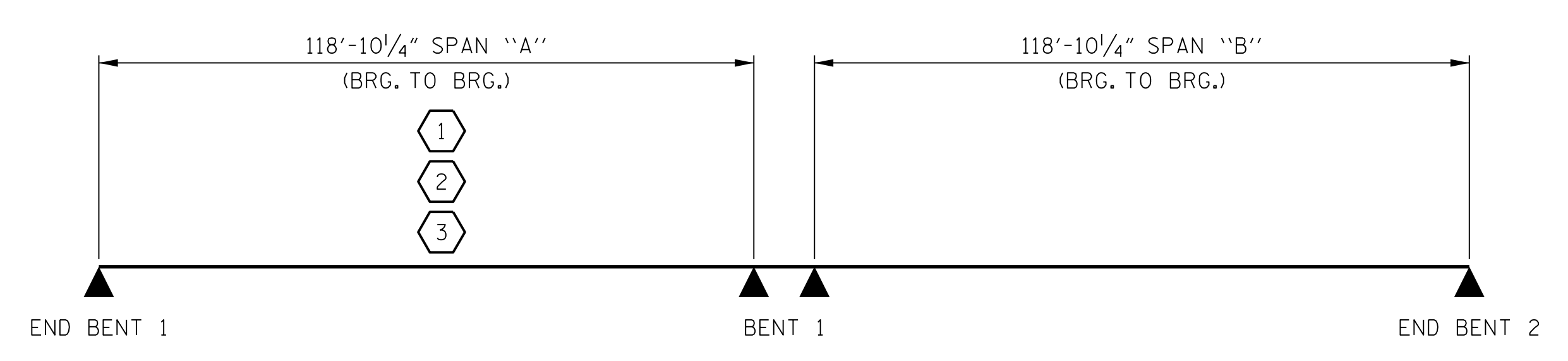
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

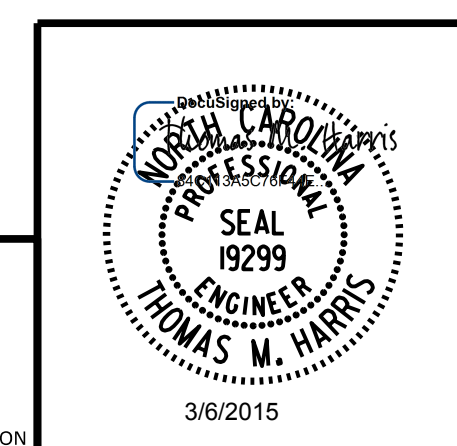
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



**LRFR SUMMARY**

PROJECT NO. U-2524BC  
GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-

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

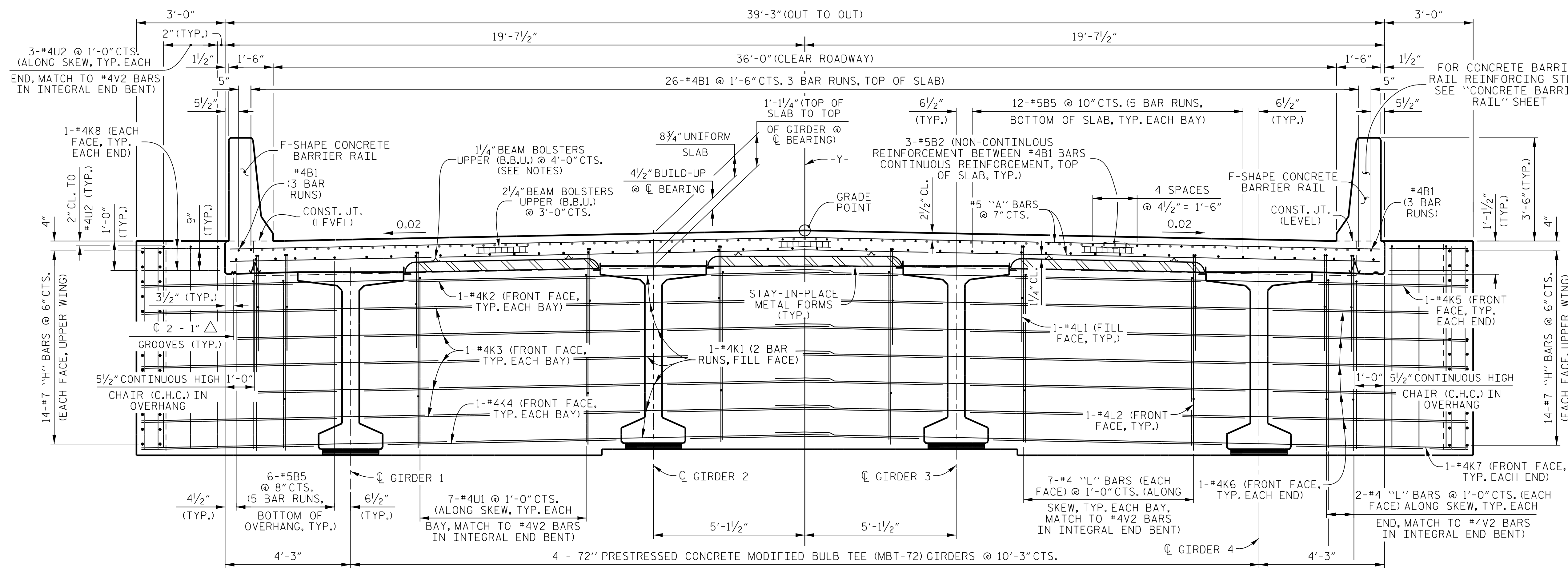


PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 12-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			27
2			4			

ASSEMBLED BY : K. E. LOFTON DATE : 12-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DRAWN BY : MAA 1/08 REV. 11/2/08RR MAA/GM  
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM



**TYPICAL SECTION AT INTEGRAL END BENT 1 AND END BENT 2**

**NOTES**

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

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

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

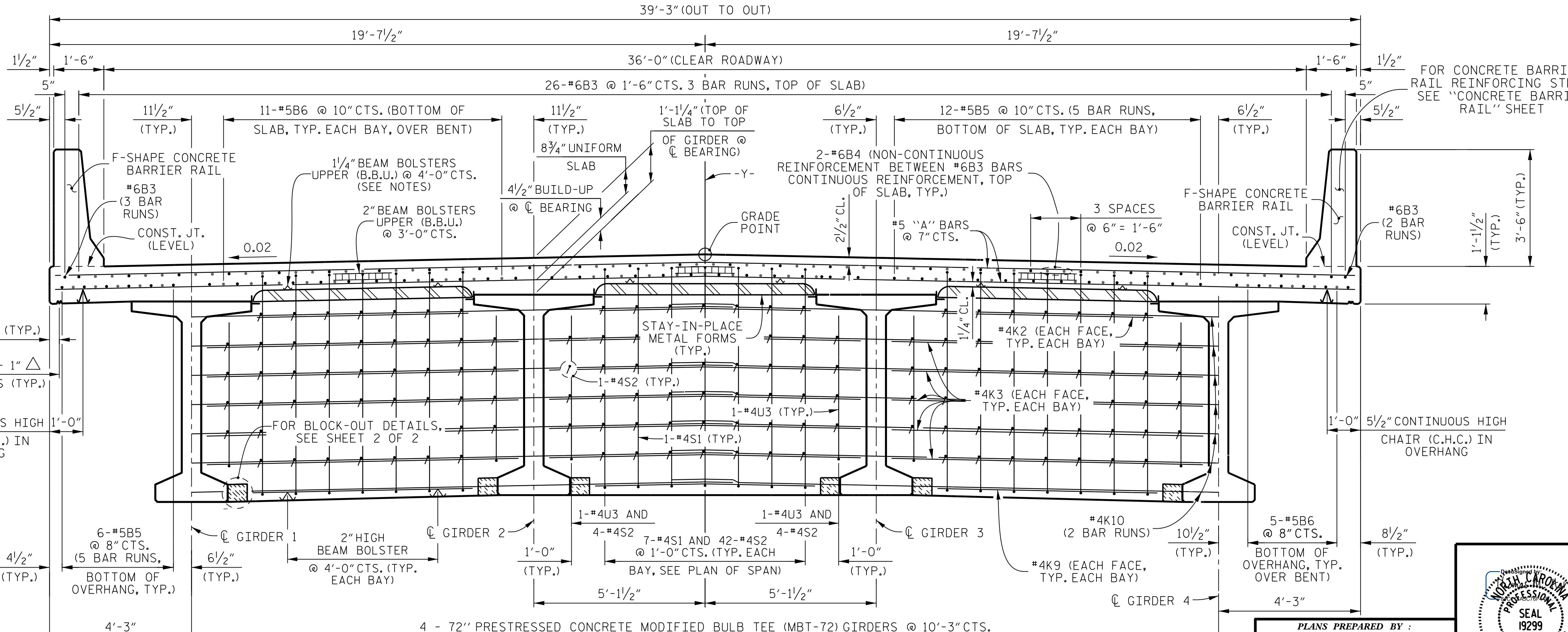
BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR STEEL INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR 72" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDER" SHEET. FOR LOCATIONS SEE "FRAMING PLAN" SHEET.

FOR F-SHAPE CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

FOR PARTIAL TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM, SEE "FRAMING PLAN" SHEET.



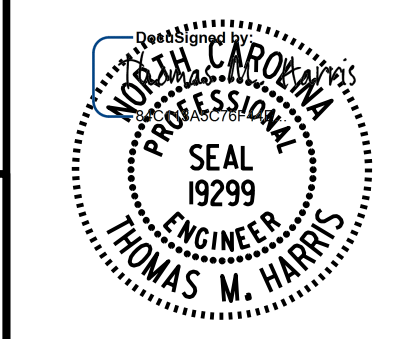
**TYPICAL SECTION AT BENT 1**

PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27 + 40.75 -L-**  
 SHEET 1 OF 2

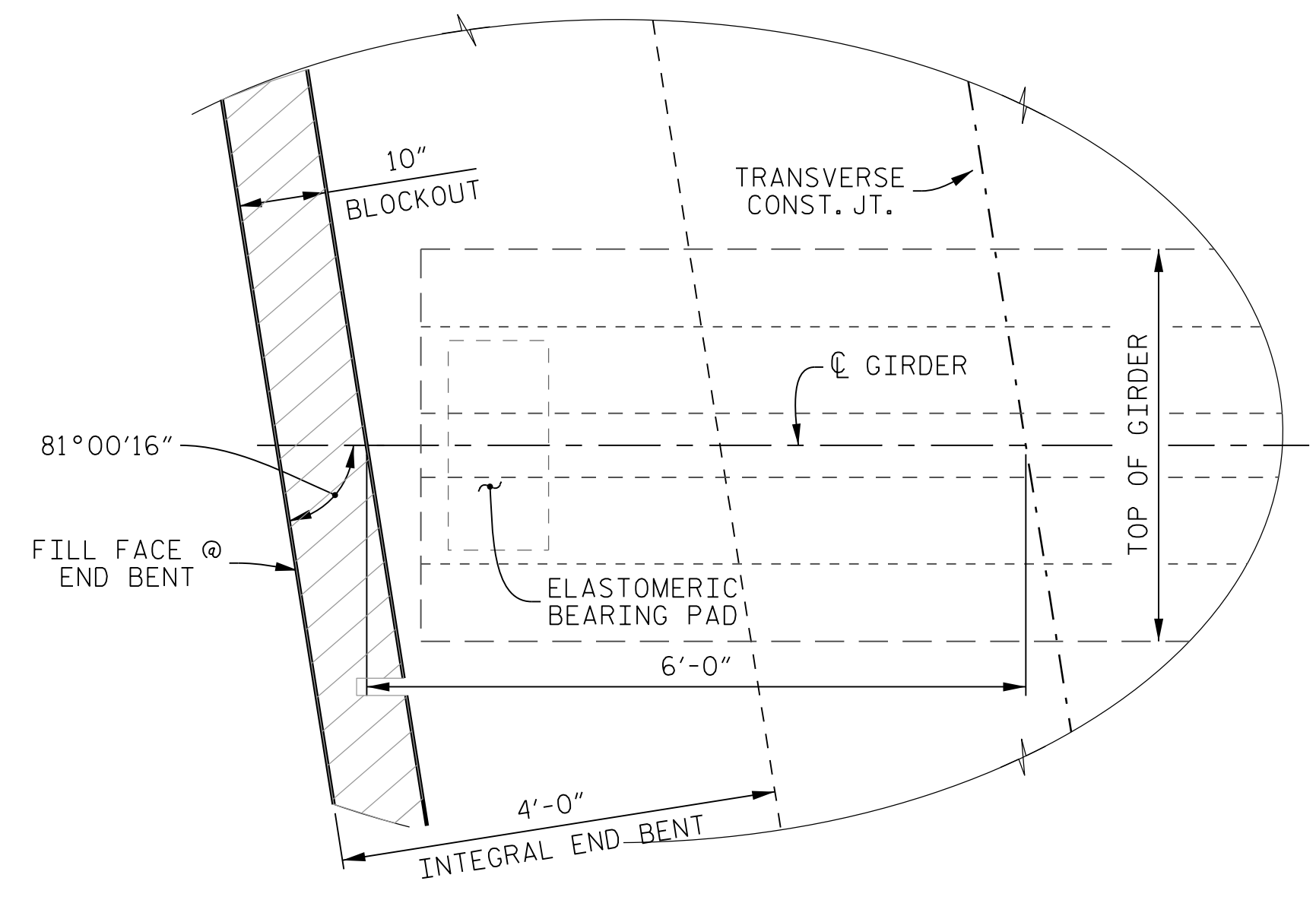
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
**TYPICAL SECTION**

DRAWN BY : K. E. LOFTON DATE : 12-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

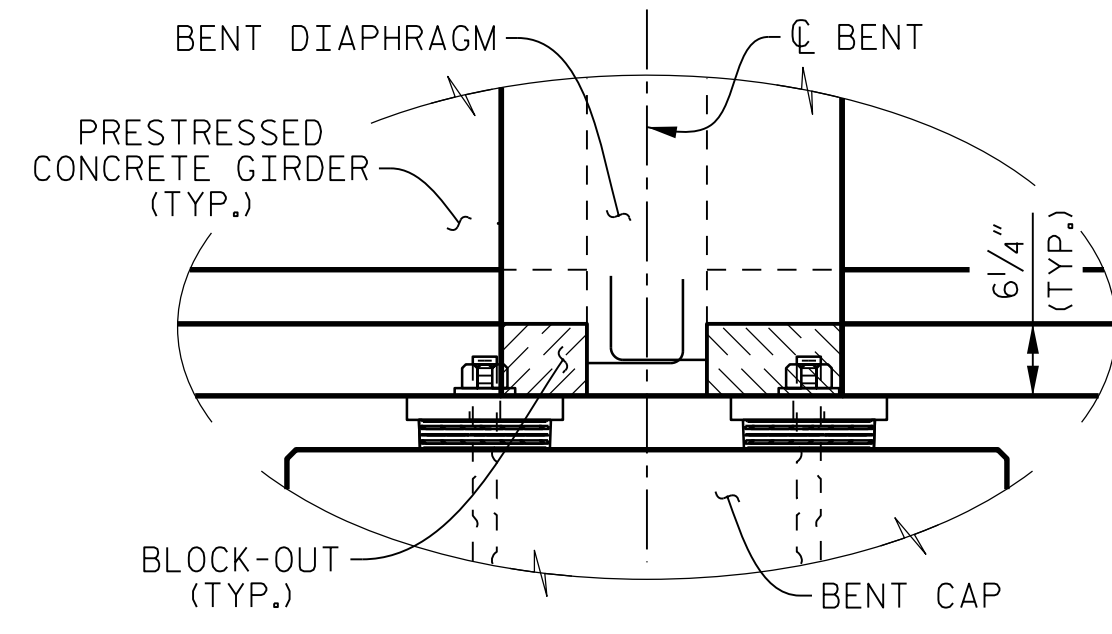
PLANS PREPARED BY :  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



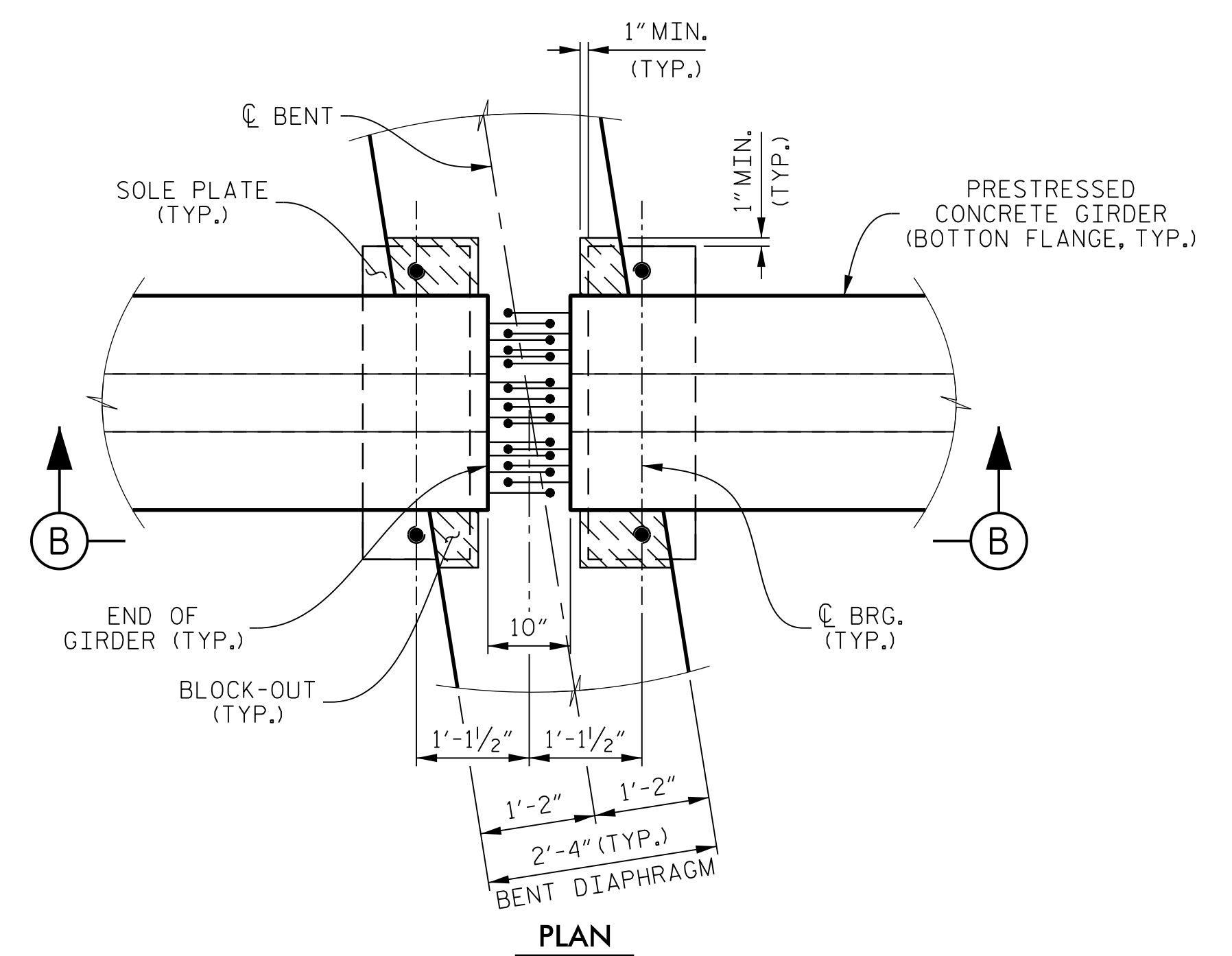
REVISIONS						SHEET No. S01-5
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			STR. #1



**PLAN OF GIRDER - INTEGRAL END BENT**



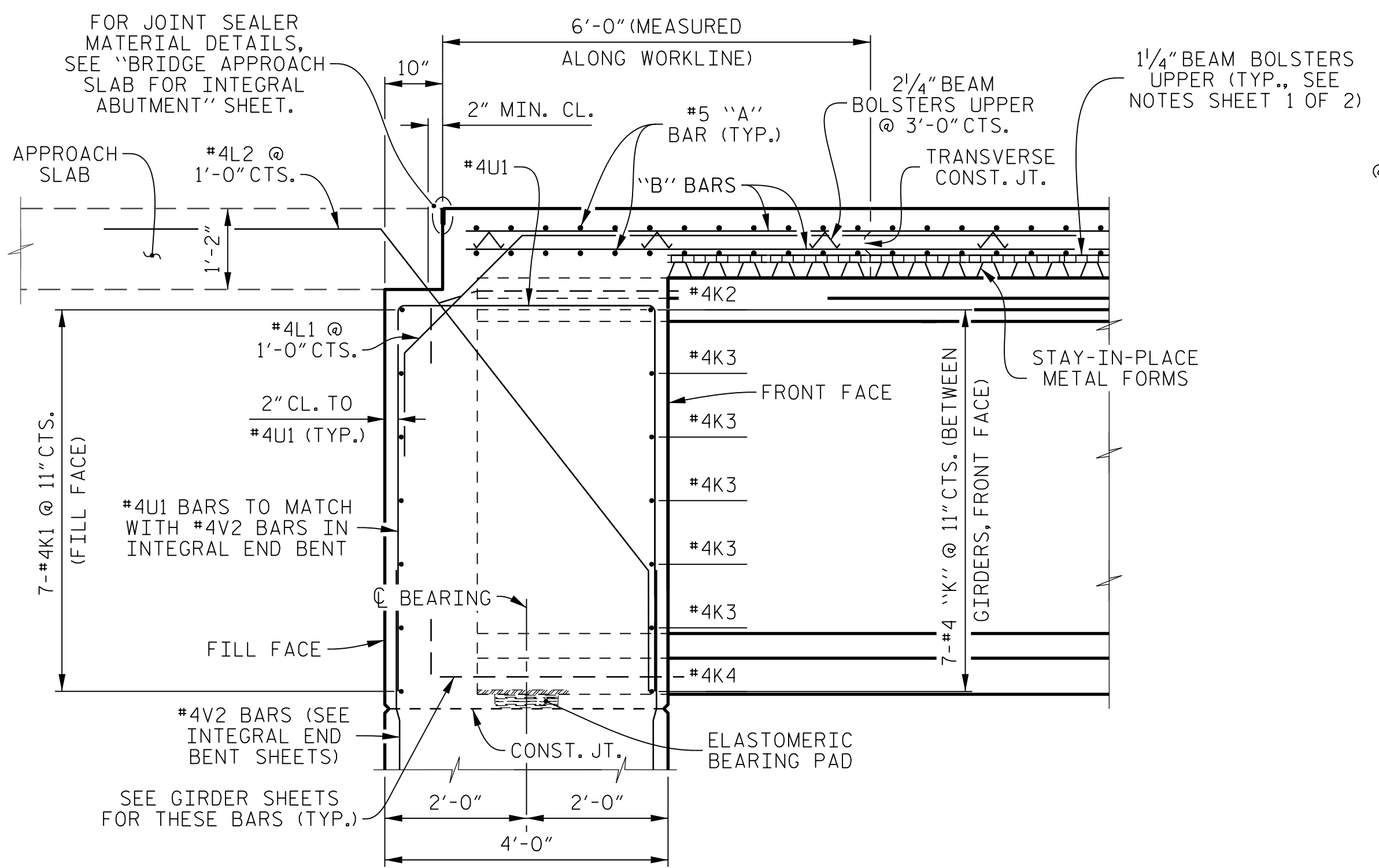
**SECTION B-B**



**PLAN**

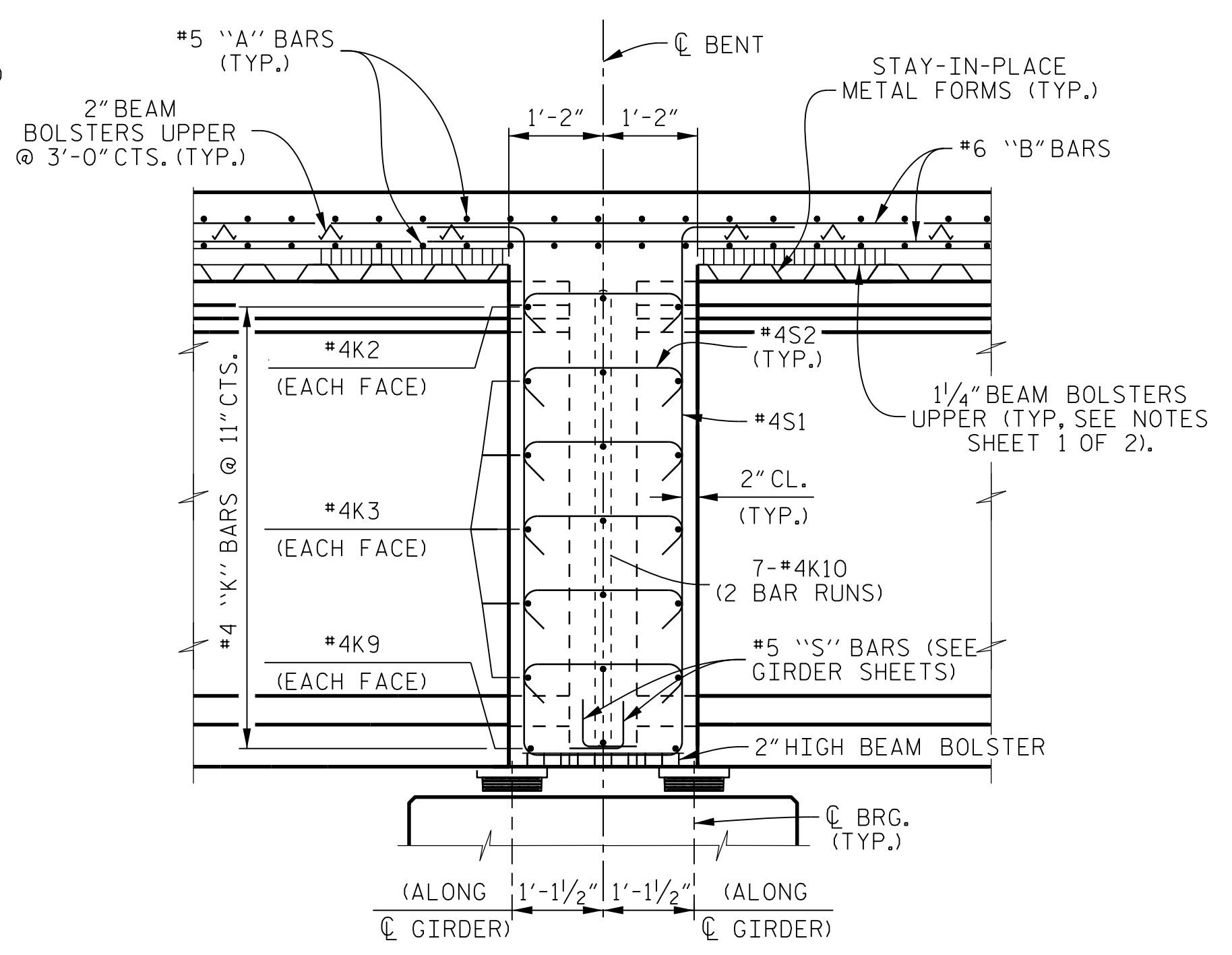
**BENT DIAPHRAGM BLOCK-OUT DETAIL**

(TYPICAL BENT 1)

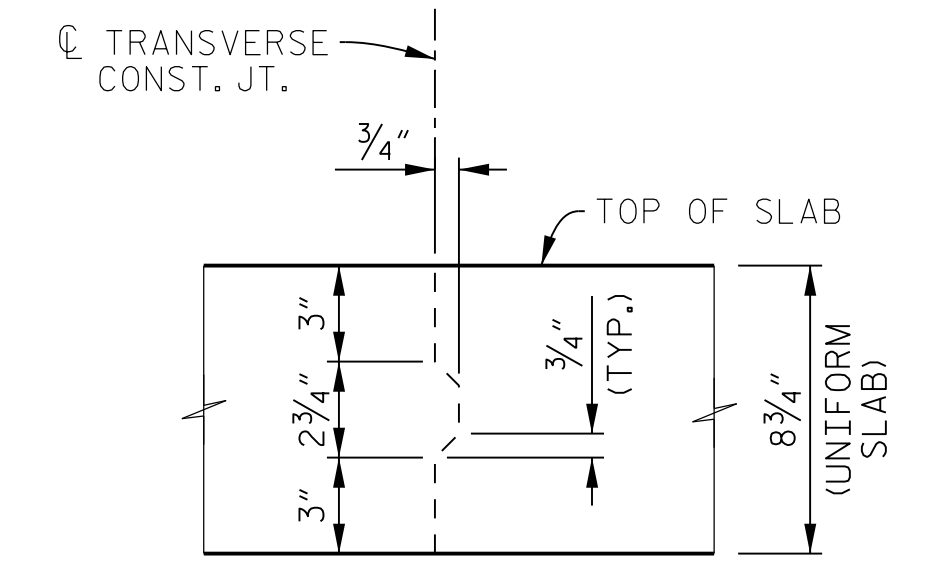


**SECTION THRU INTEGRAL END BENT**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



**SECTION THRU BENT DIAPHRAGM**



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

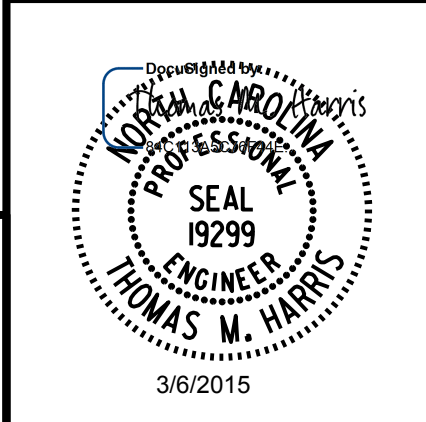
PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27 + 40.75 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**

**TYPICAL SECTION DETAILS**

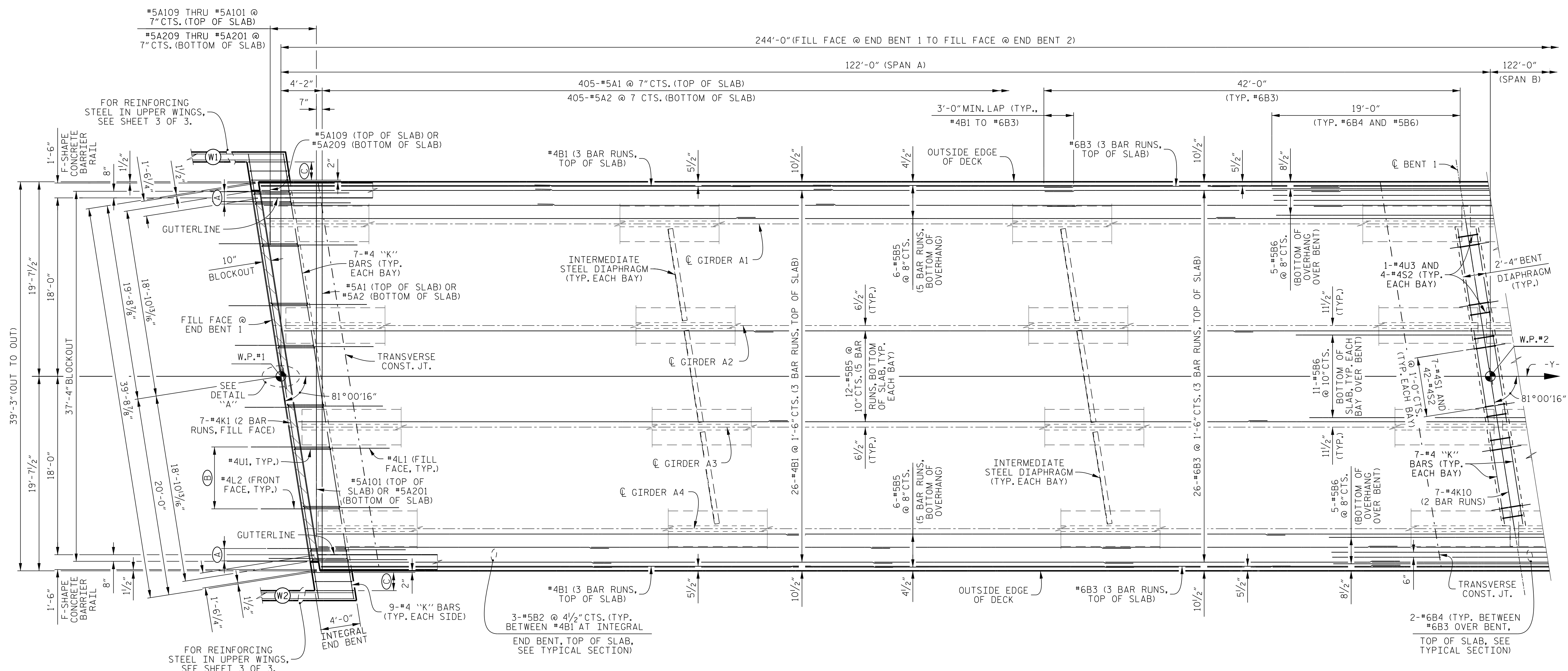


PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 12-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

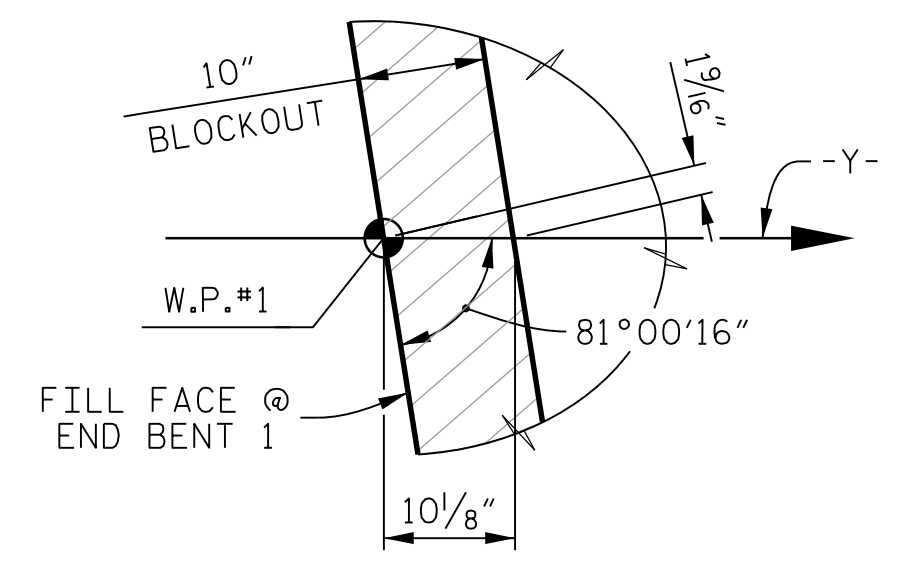
REVISIONS						SHEET No. S01-6
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			STR. #1





**PLAN OF SPAN A**

- A 2-#4 "L" BARS (EACH FACE) AND 2-#4U1 @ 1'-0" (TYP. EACH END, MATCH TO #4V2 BARS IN INTEGRAL END BENT)
- B 7-#4 "L" BARS (EACH FACE) AND 7-#4U1 @ 1'-0" CTS. (TYP. EACH BAY, MATCH TO #4V2 BARS IN INTEGRAL END BENT)
- C 3-#4U2 @ 1'-0" CTS.



**DETAIL A**

**NOTES**

FOR "PLAN OF SPAN "B", SEE SHEET 2 OF 3.  
FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.  
FOR SLAB POURING SEQUENCE AND SPLICE CHART, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27 + 40.75 -L-**  
 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**  
**PLAN OF SPAN A**

DRAWN BY : K. E. LOFTON DATE : 12-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

PLANS PREPARED BY :

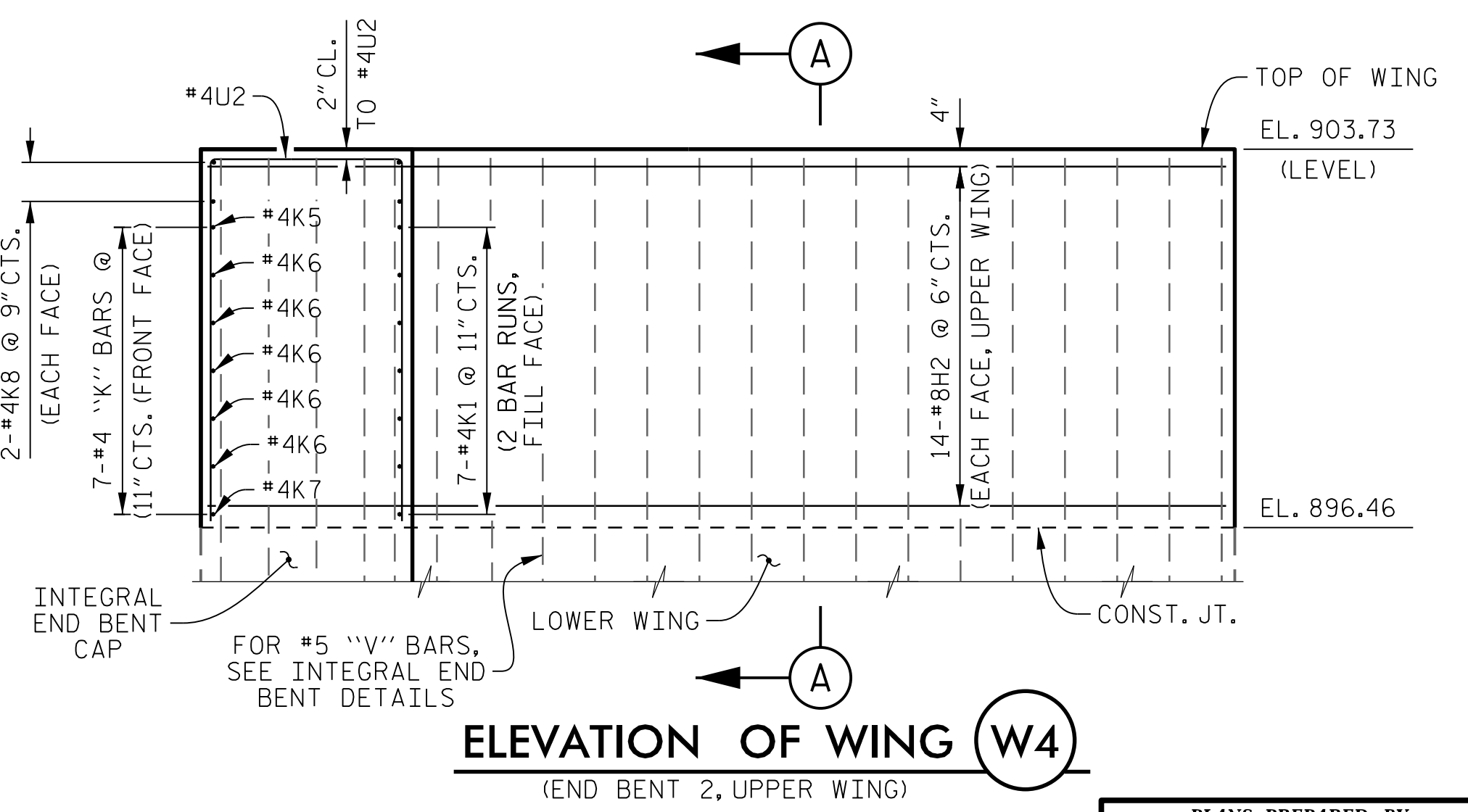
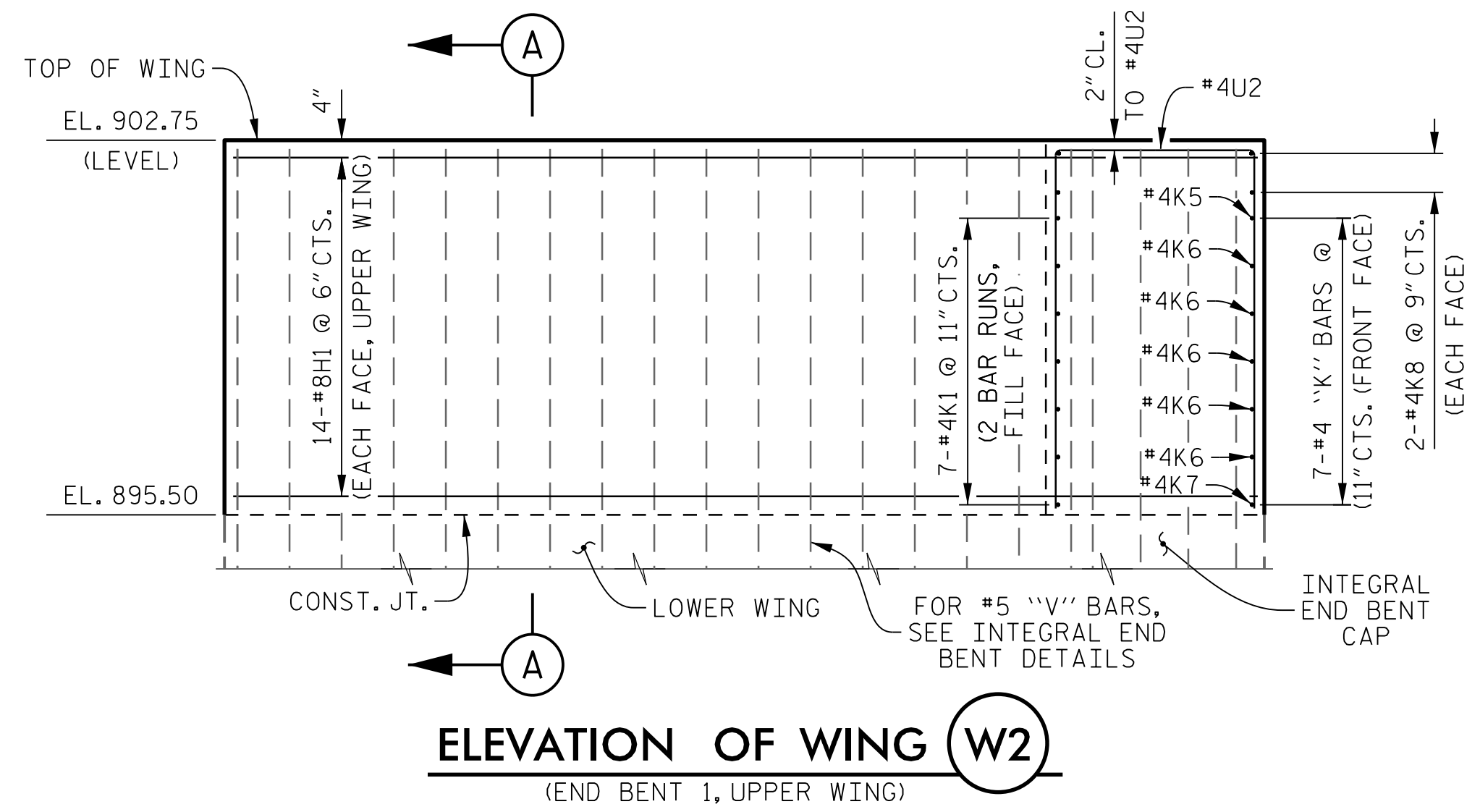
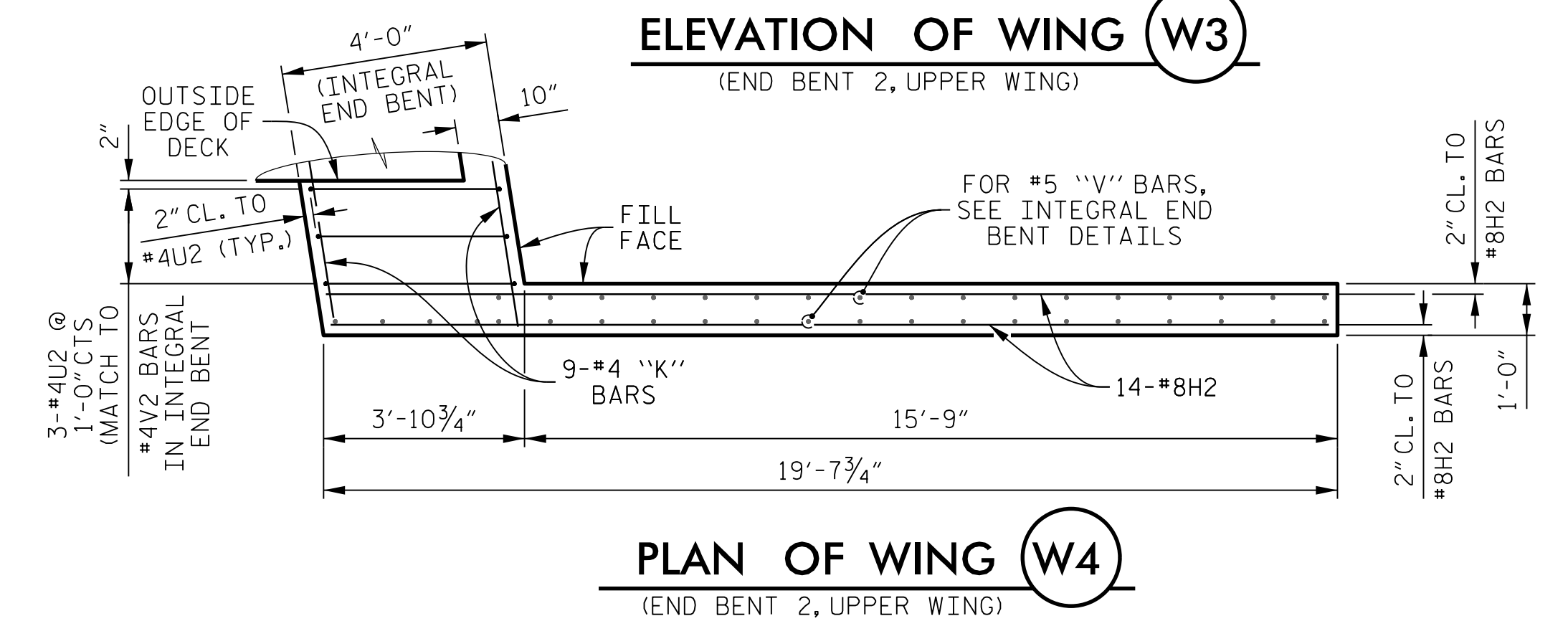
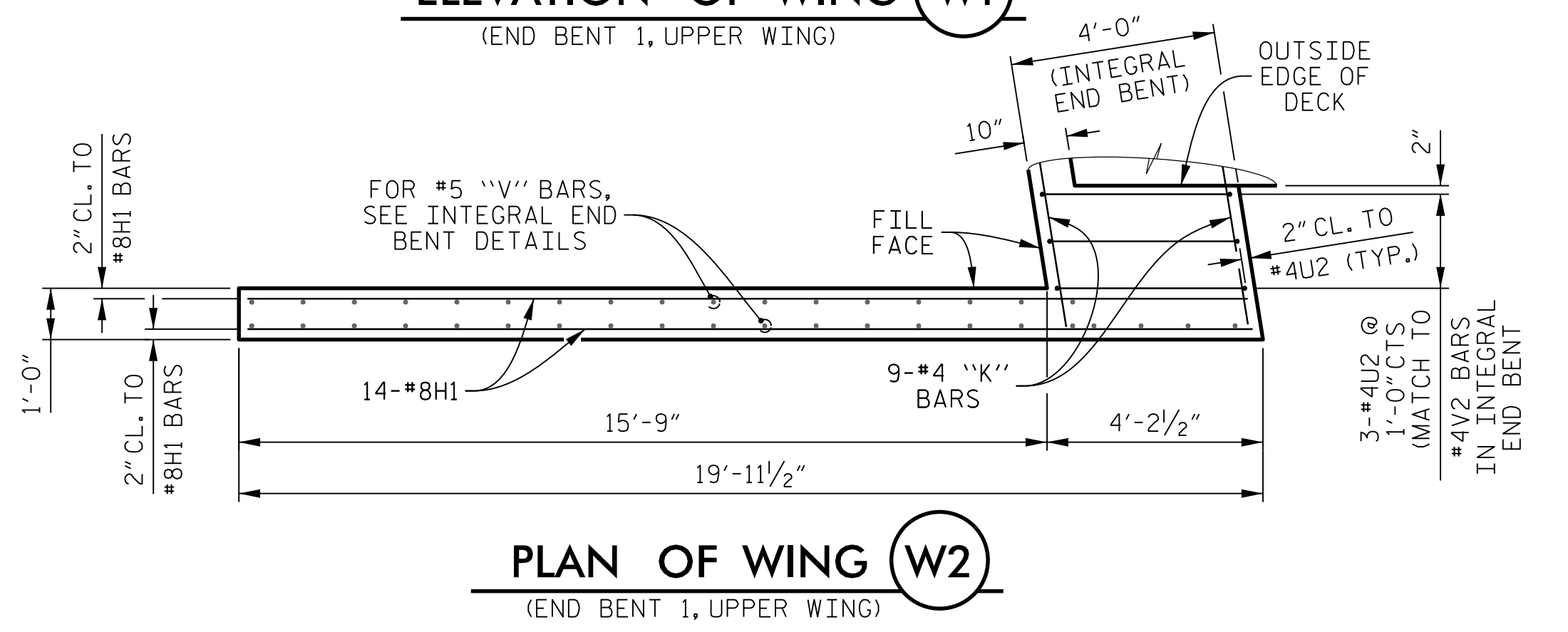
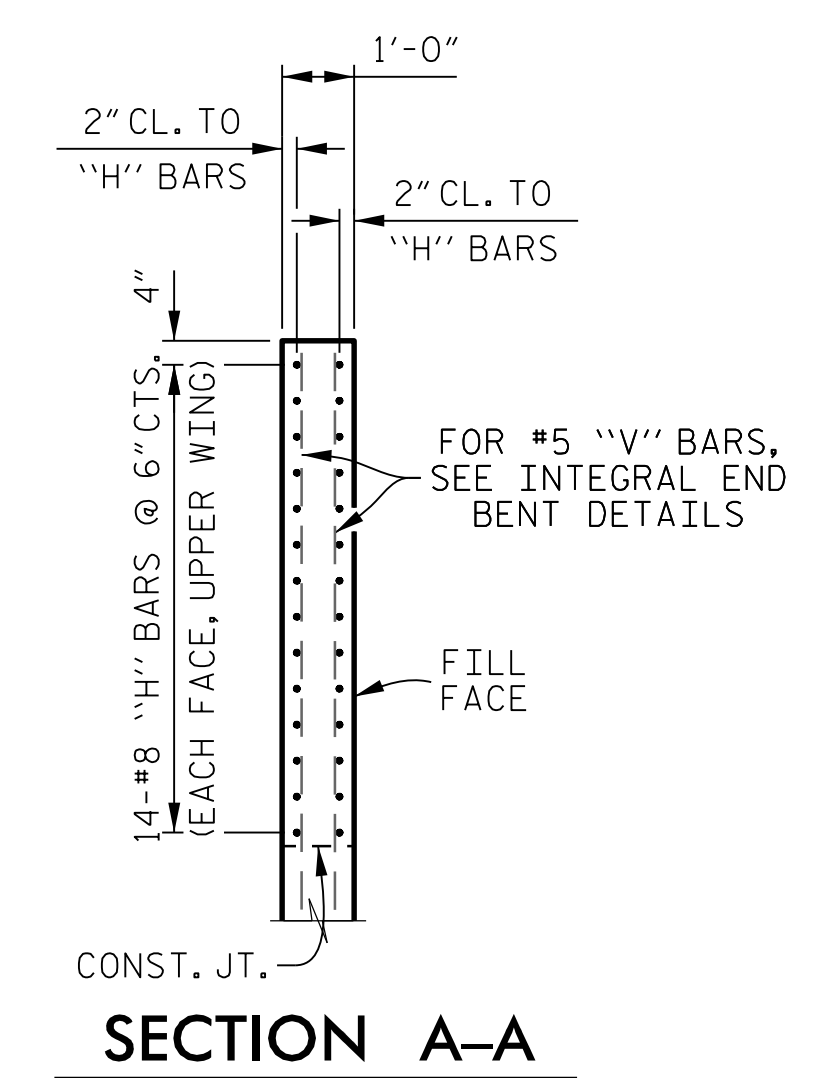
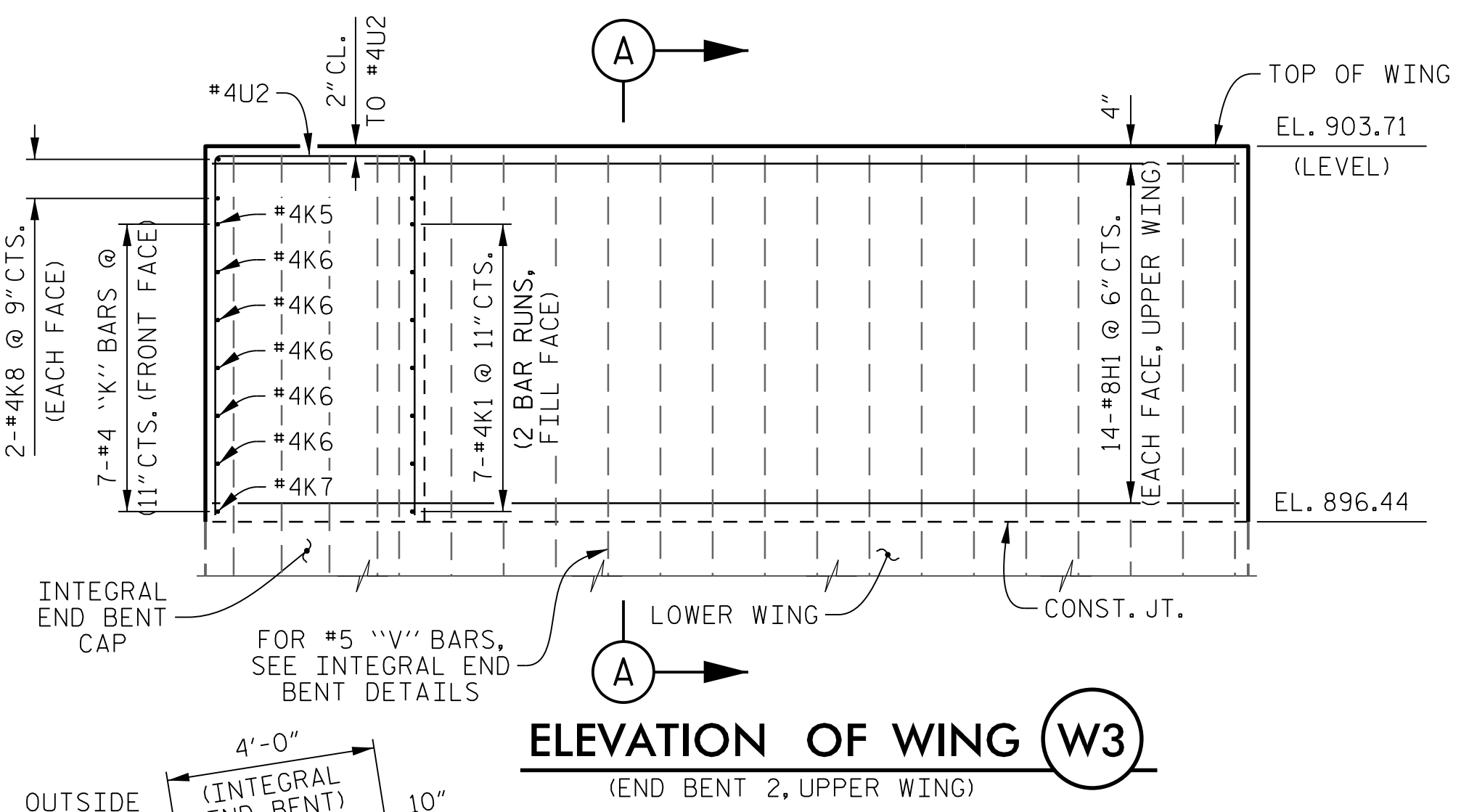
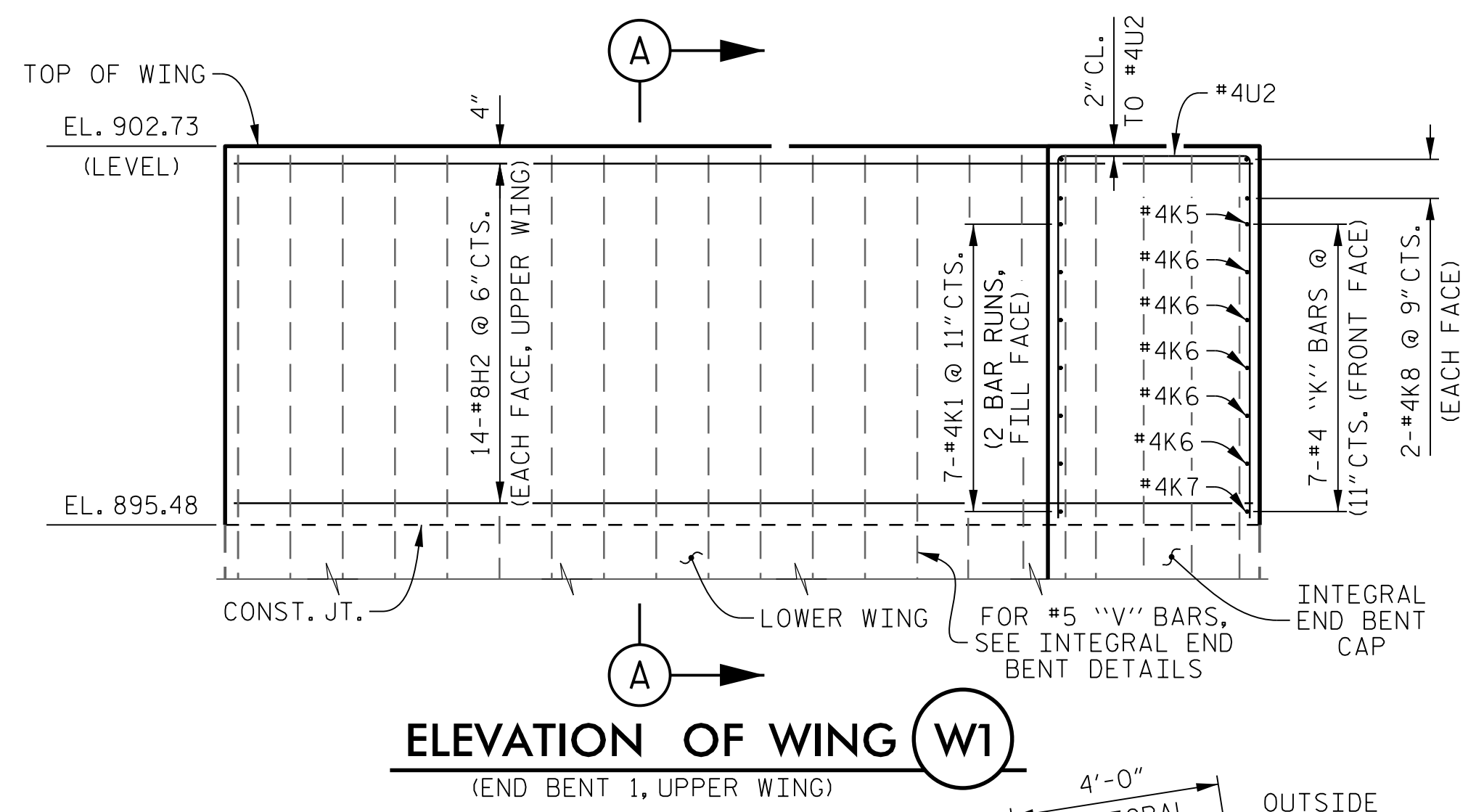
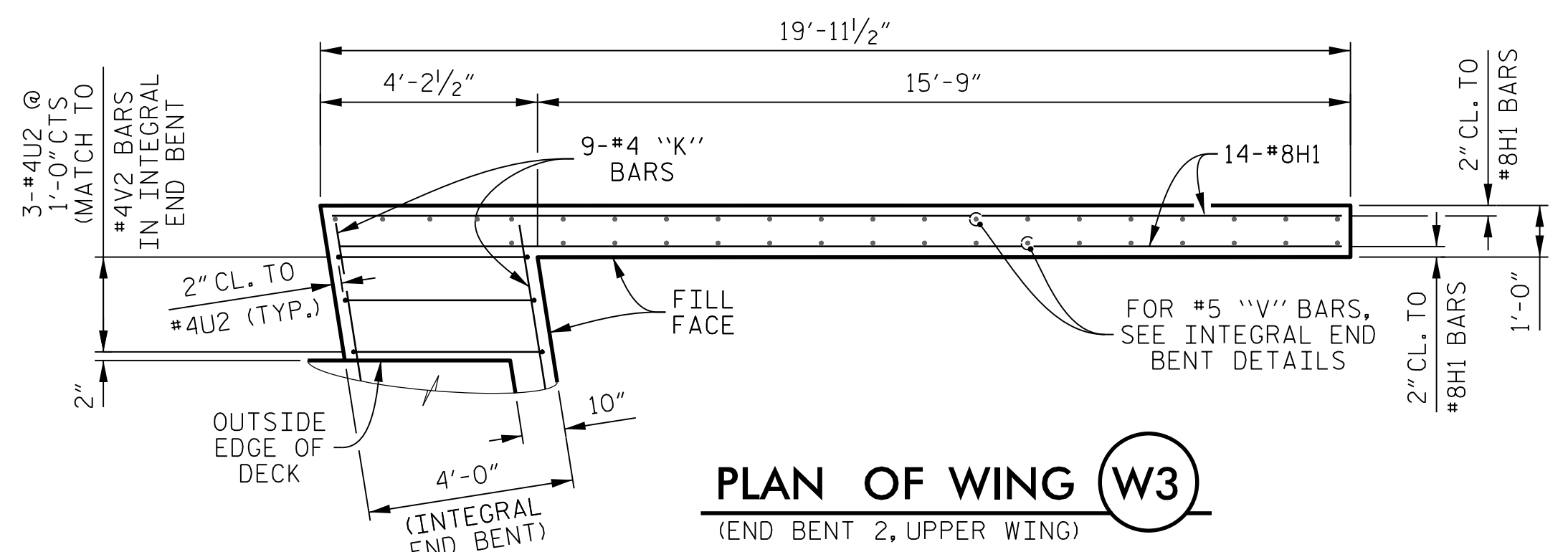
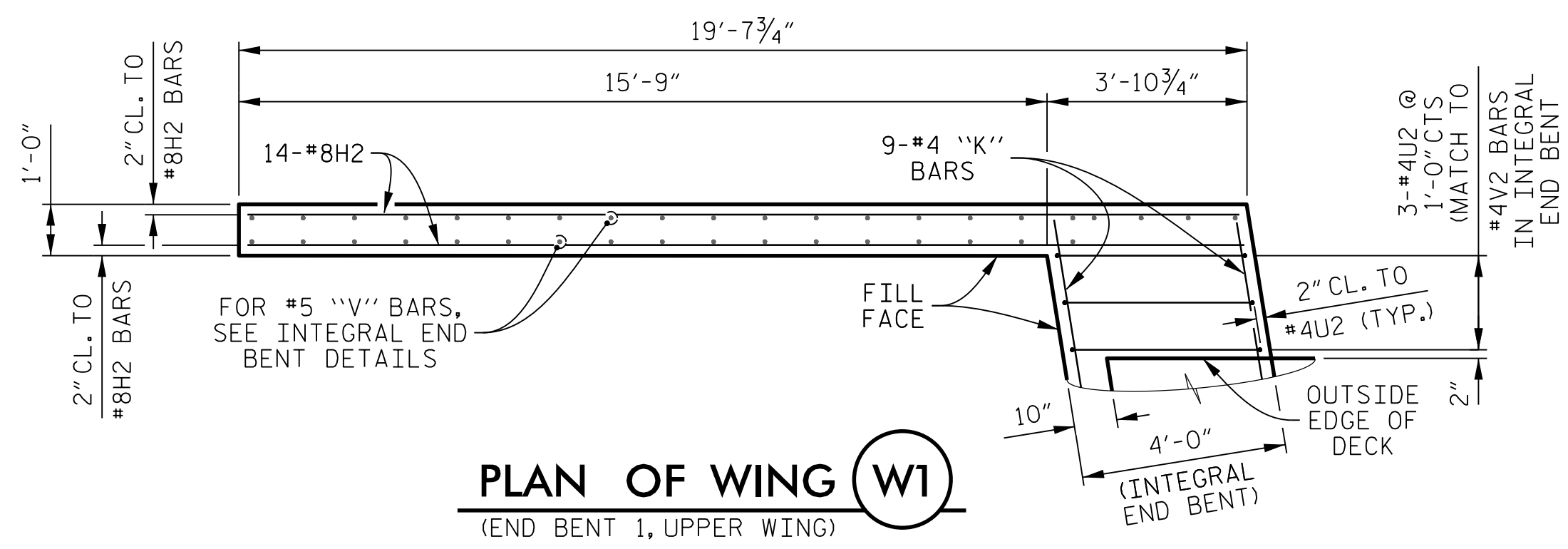
5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE NO. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

THOMAS M. HARRIS  
 PROFESSIONAL ENGINEER  
 SEAL 19299  
 3/6/2015

REVISIONS		SHEET No.	
No.	DATE	No.	SHEETS
1		3	27
2		4	

FILE: i:\p22424\doc\plans\final\U2524BC\_S01.ppt.dgn  
 DATE: 3/8/2015 9:24:11 AM

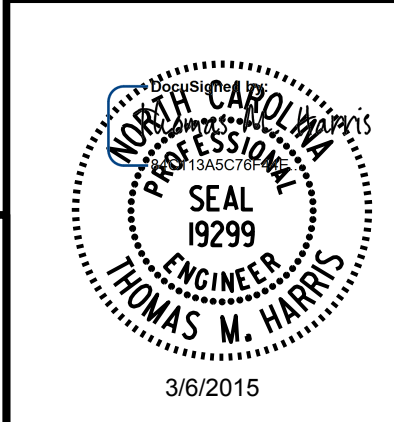




PROJECT NO. U-2524BC  
 GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

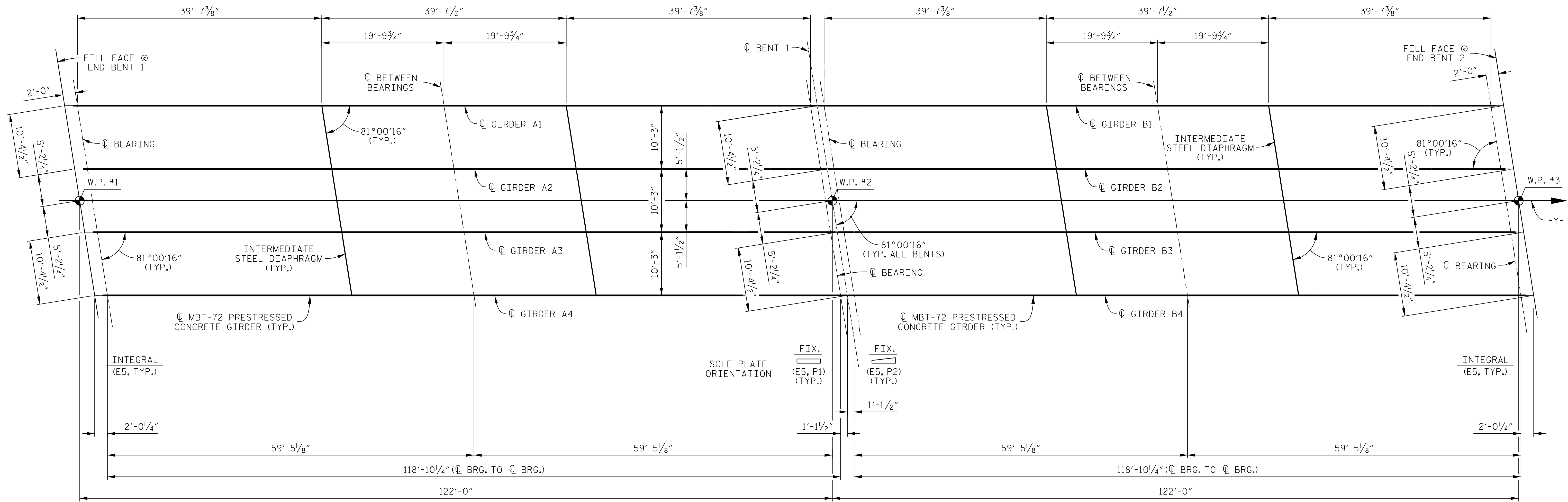
**SUPERSTRUCTURE  
 PLAN OF SPAN  
 DETAILS**



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 12-14  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15

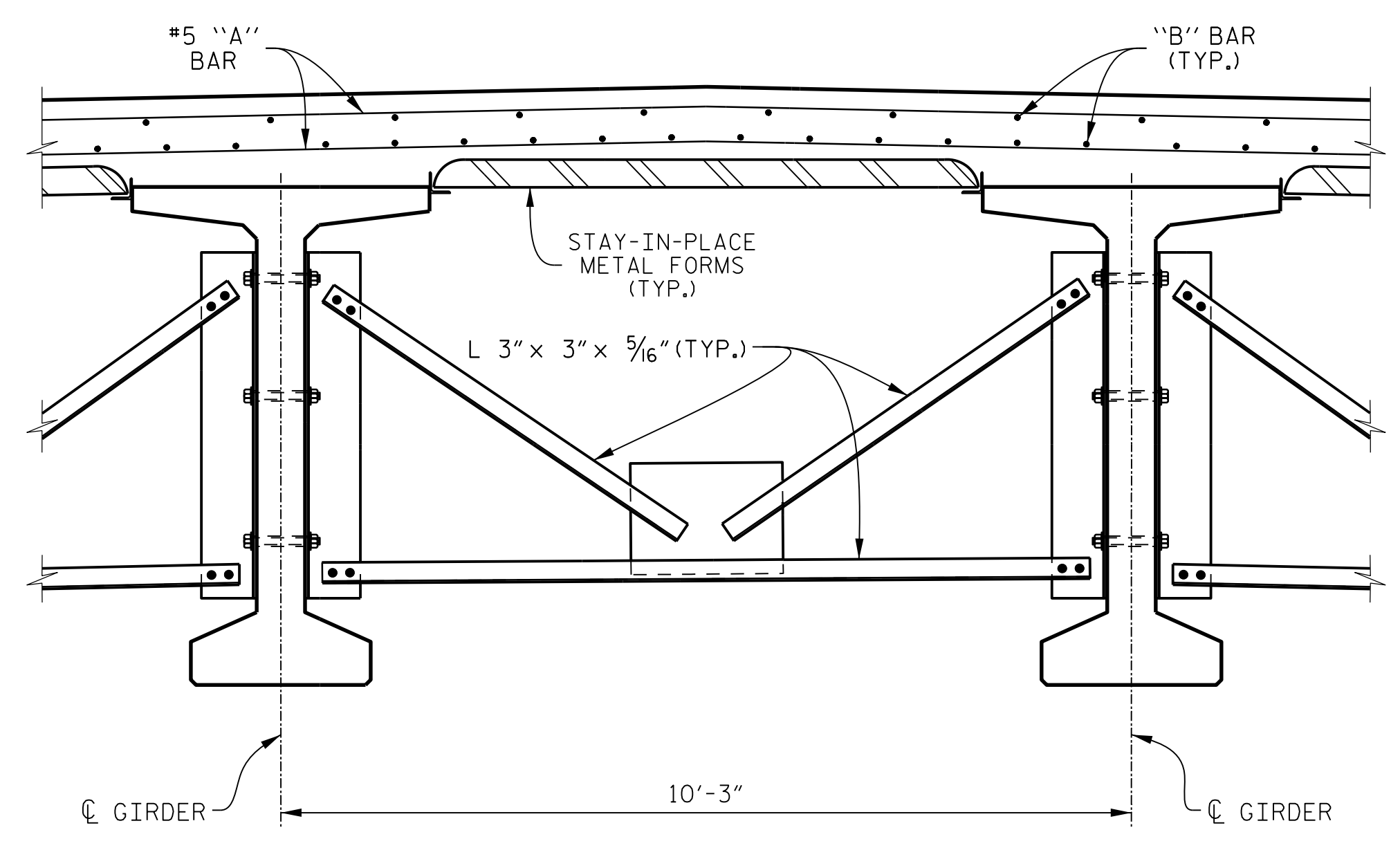
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			27
2			4			



SPAN A

FRAMING PLAN

SPAN B



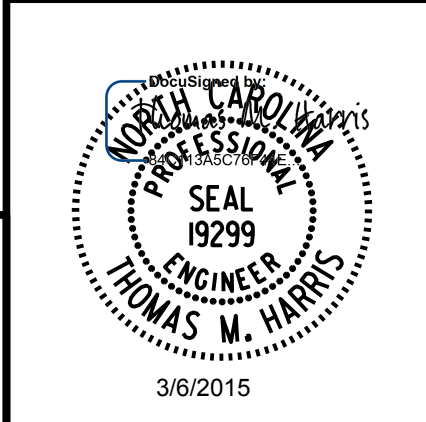
PARTIAL TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

**NOTES**

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.  
 FOR ELASTOMERIC BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE" SHEET.

PROJECT NO. U-2524BC  
 GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	11-14
CHECKED BY :	T. M. HARRIS	DATE :	1-15
DESIGN ENGINEER :	T. M. HARRIS	DATE :	2-15

REVISIONS				SHEET No.	
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					27

FILE: I:\\_2524BC\Drawings\Struct\U2524BC\_SD\_f1.dgn  
 DATE: 3/2/15 9:28:16 AM



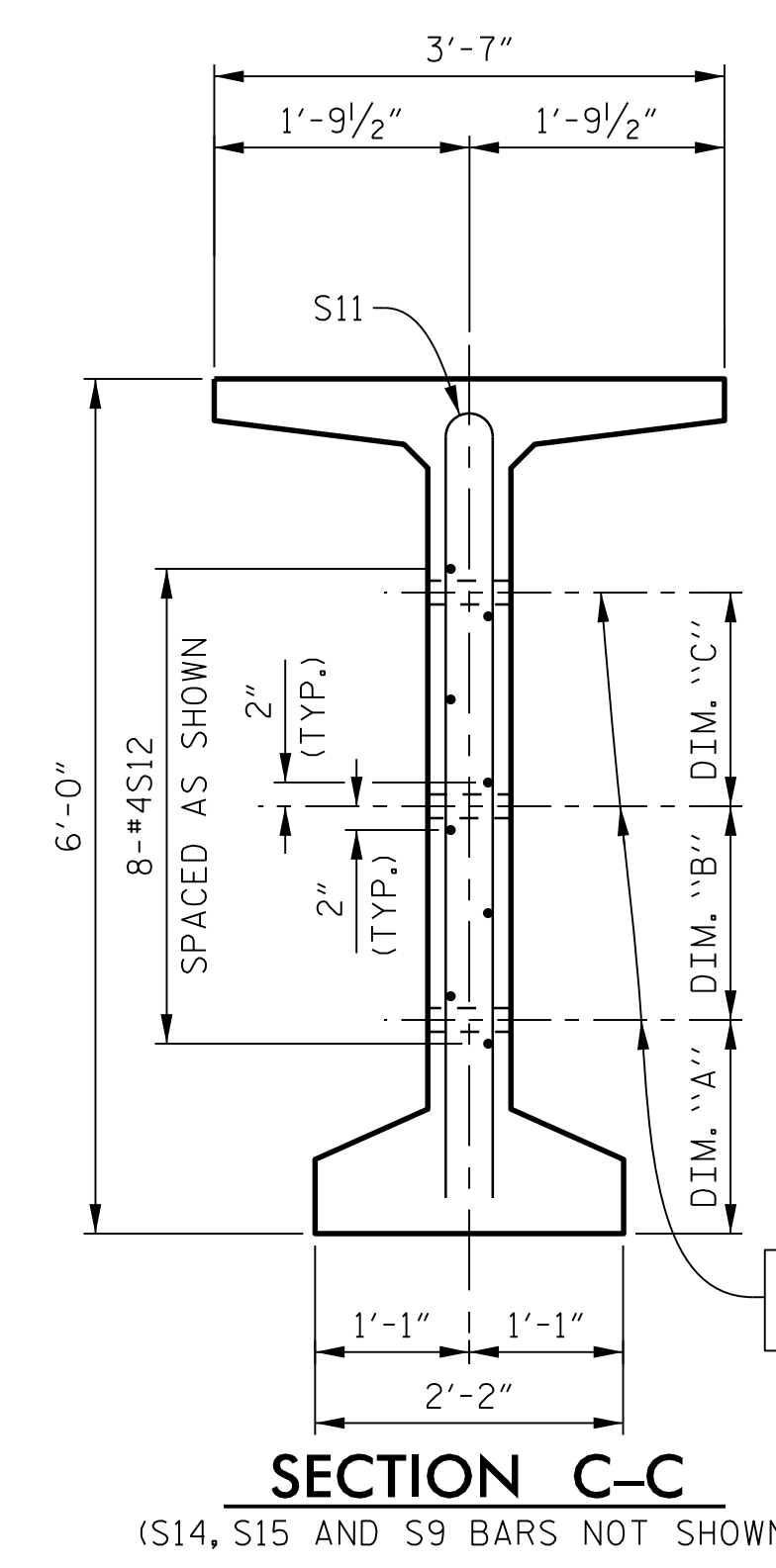
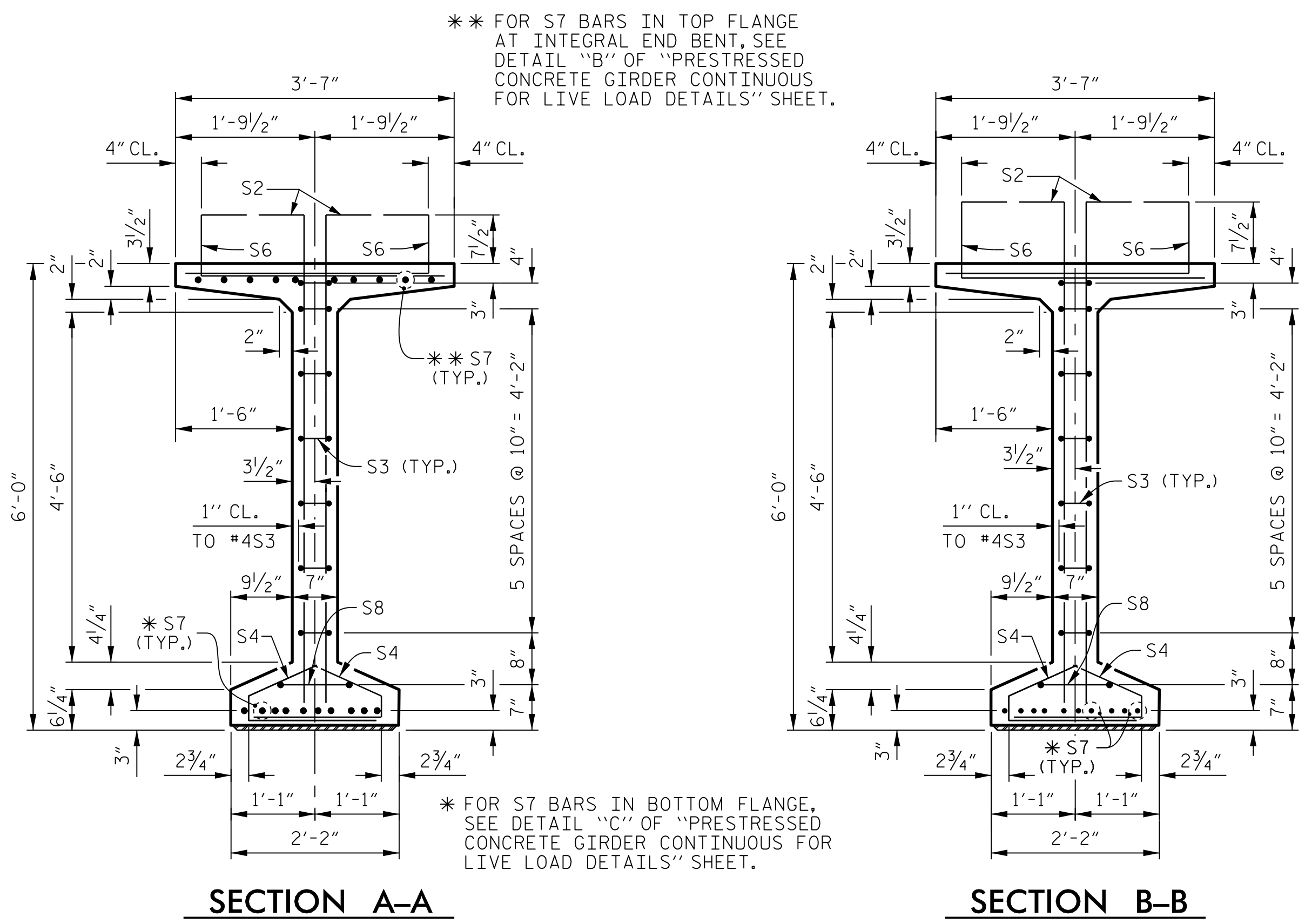
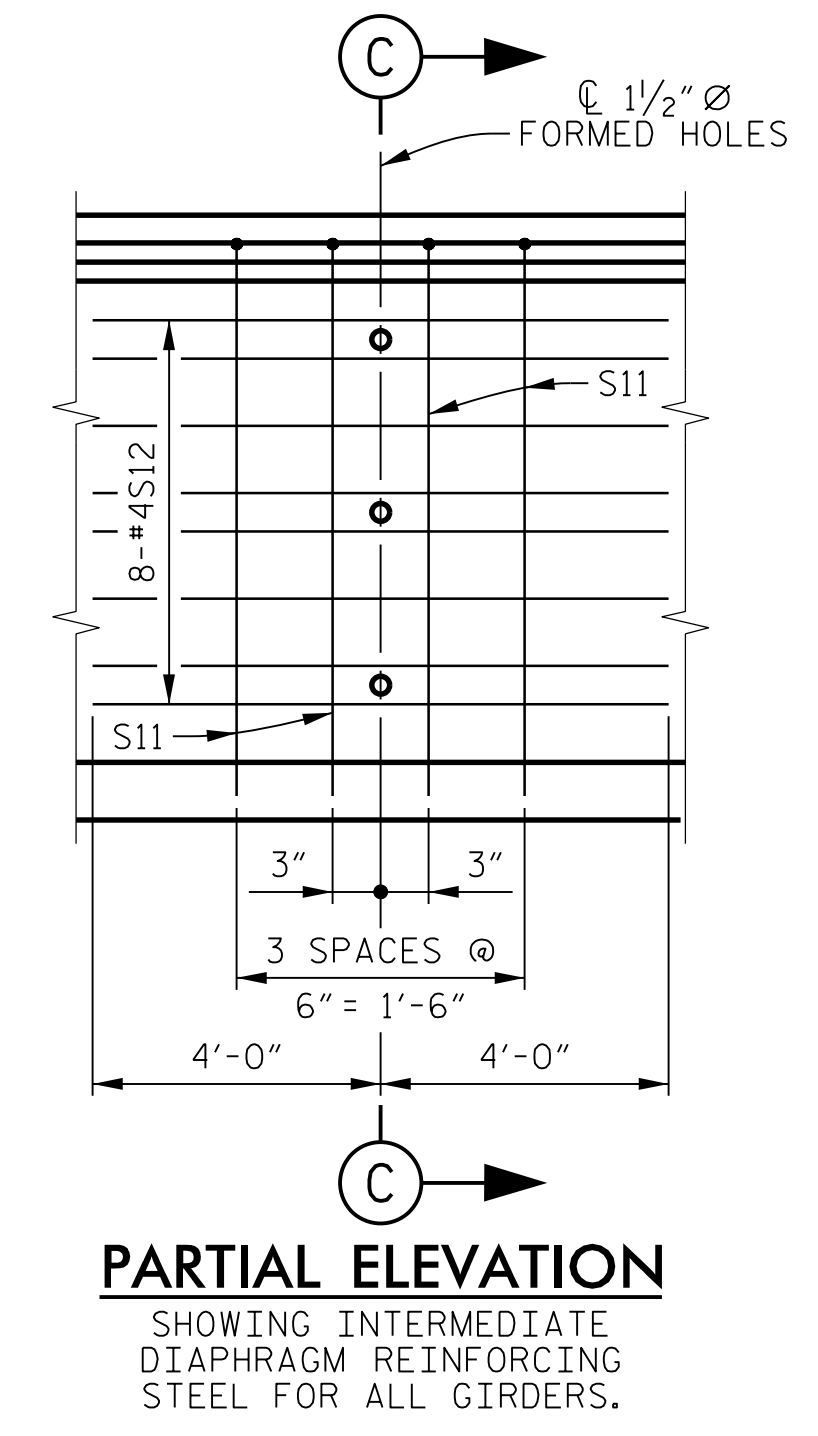
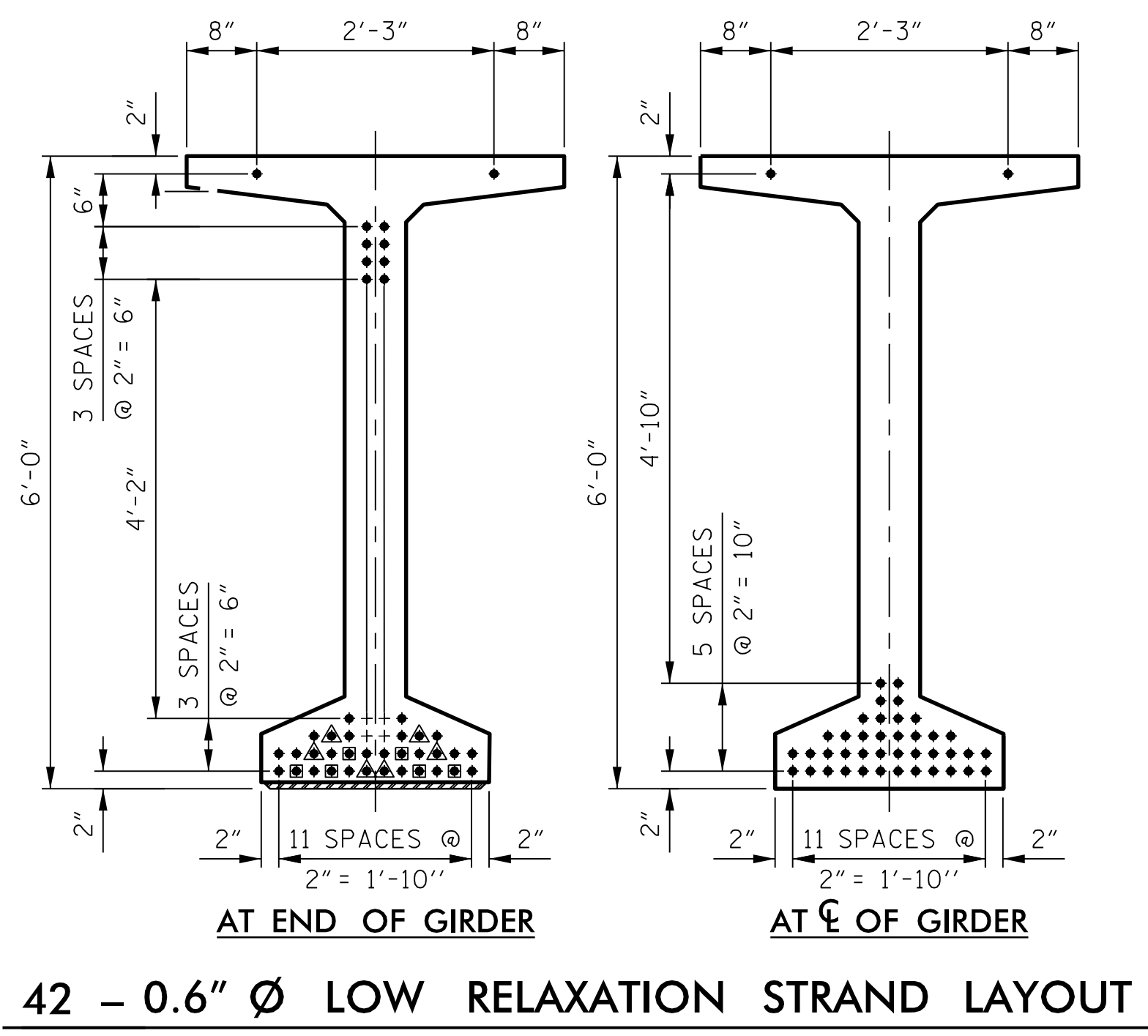


TABLE			
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"
72" BULB TEE	1'-9"	1'-9"	1'-4 3/4"

**DEBONDING LEGEND**

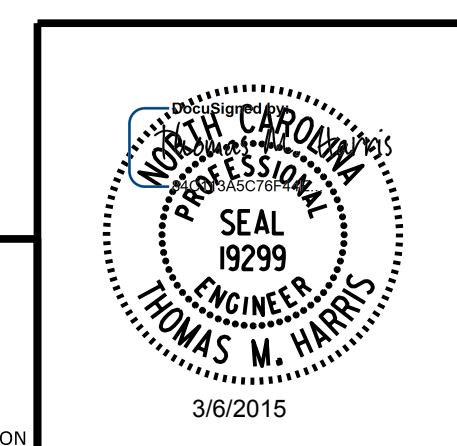
- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ◼ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



PROJECT NO. U-2524BC  
 GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 72" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE CONTINUOUS  
 FOR LIVE LOAD

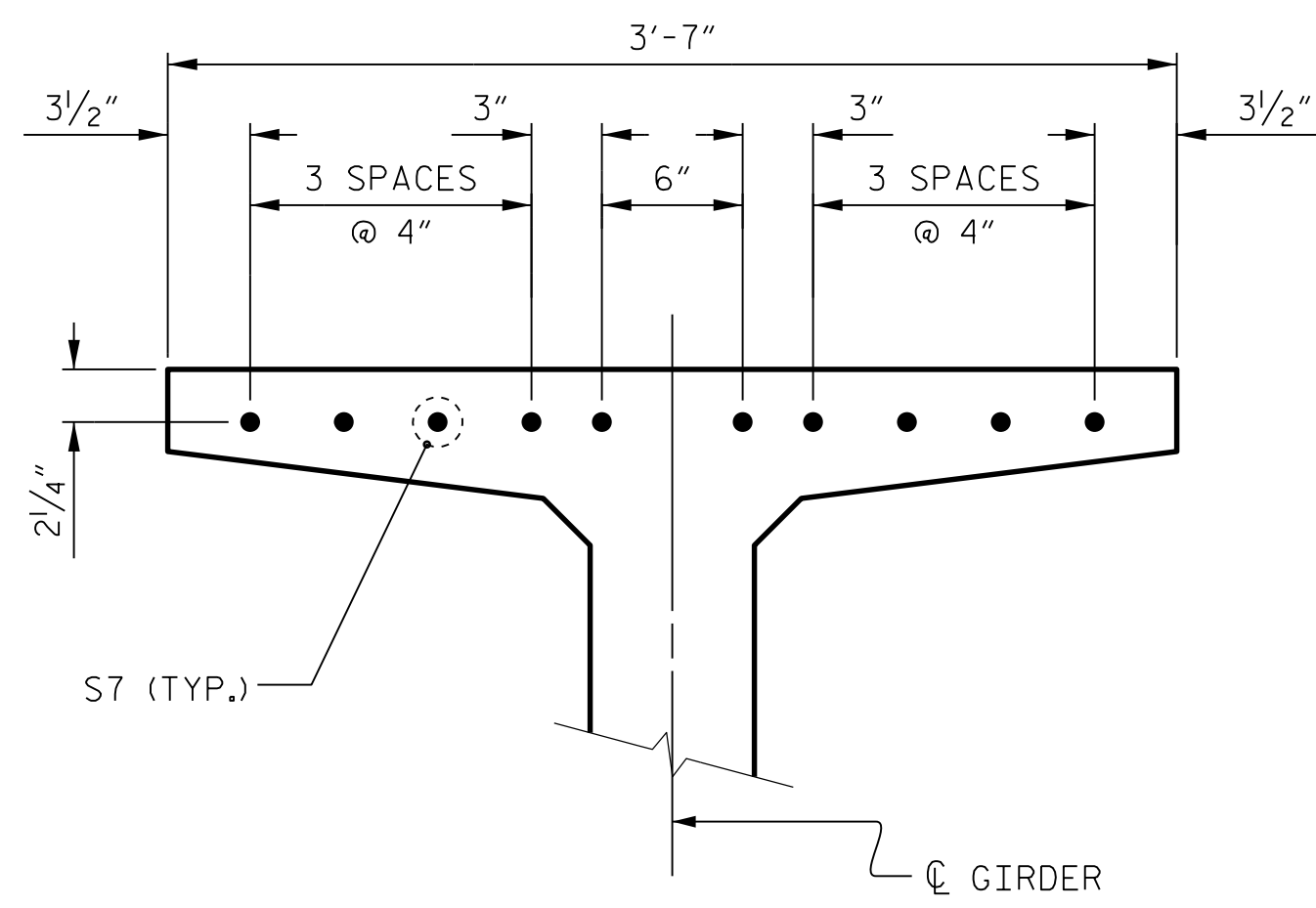
REVISIONS						SHEET No.
No.	BY	DATE	No.	BY	DATE	TOTAL SHEETS
1			3			27
2			4			



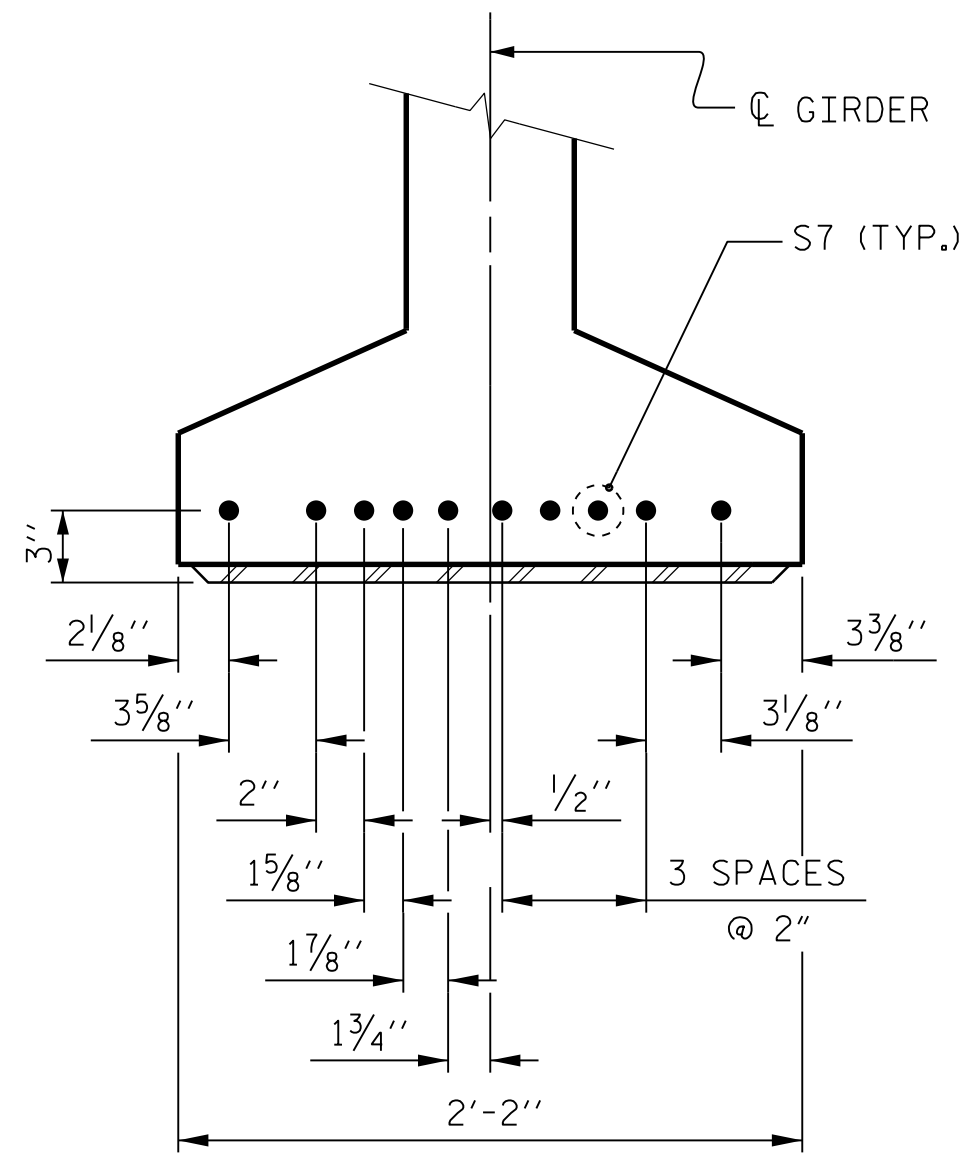
PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

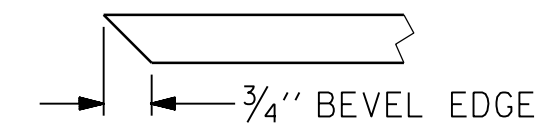
ASSEMBLED BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DRAWN BY : EEM 2/6/97 REV. 10/1/11 MAA/GM  
 CHECKED BY : VAP 2/6/97 REV. 6/13 MAA/GM  
 DATE : 3/2/05 REV. 1/15 MAA/TMG



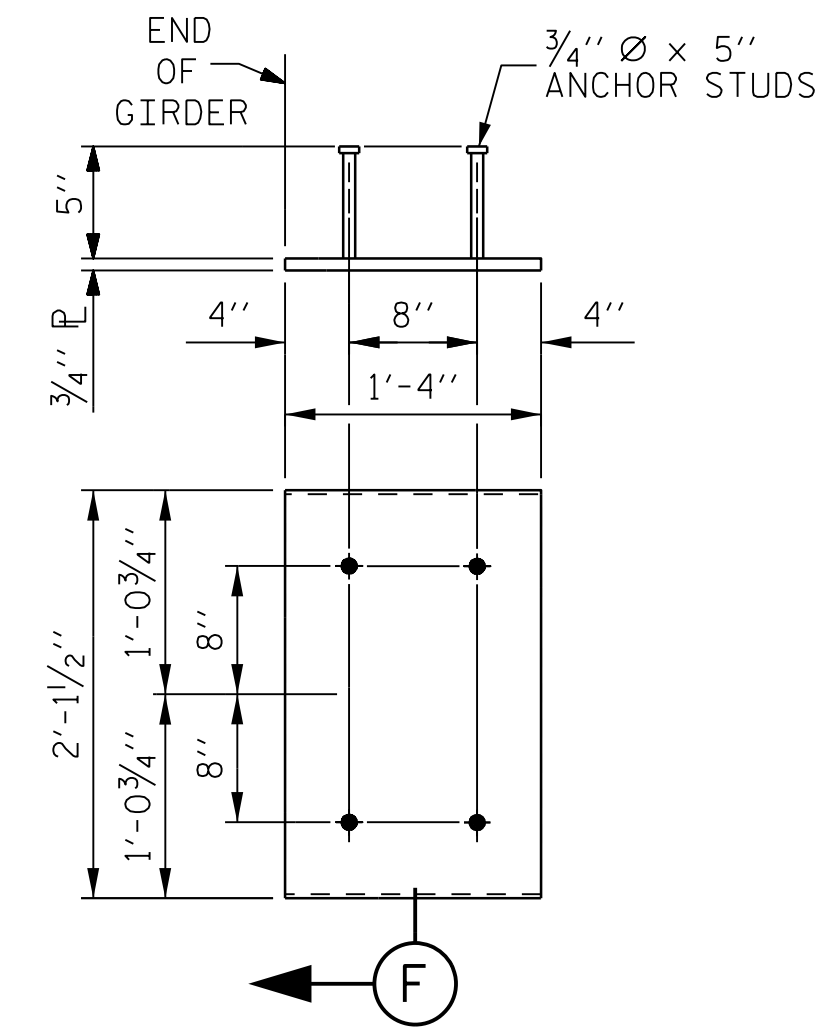
**DETAIL "B"**  
(FOR INTEGRAL END BENT)



**DETAIL "C"**  
(FOR 72" MODIFIED BULB TEES)



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



**EMBEDDED PLATE "B-1" DETAILS**  
**FOR 72" MODIFIED BULB TEES**  
(2 REQUIRED PER GIRDER)

**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 6,800 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 72" 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 4,500 LBS.

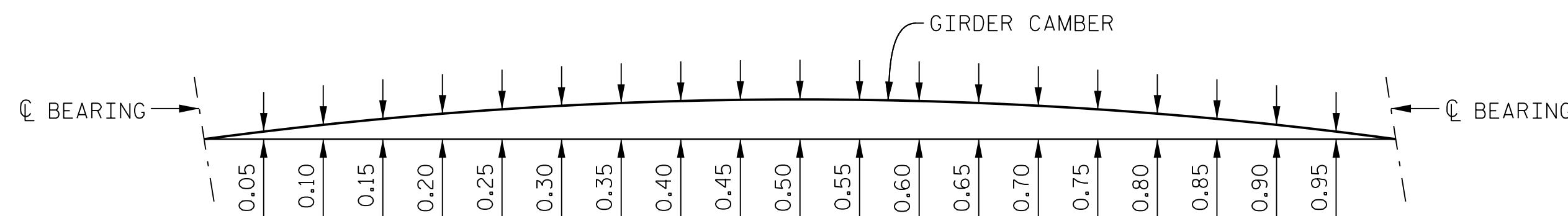
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

**CAMBER AND DEAD LOAD DEFLECTIONS**

GIRDERS 1 THRU 4	SPAN A AND SPAN B																				
	CL BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	CL BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.048	0.095	0.138	0.181	0.214	0.247	0.268	0.289	0.297	0.304	0.297	0.289	0.268	0.247	0.214	0.181	0.138	0.095	0.048	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓ 0.000	0.028	0.057	0.084	0.111	0.132	0.153	0.167	0.180	0.185	0.189	0.185	0.180	0.167	0.153	0.132	0.111	0.084	0.057	0.028	0.000
FINAL CAMBER	↑ 0	1/4"	7/16"	5/8"	13/16"	1"	1 1/8"	1 1/4"	1 5/16"	1 5/16"	1 3/8"	1 5/16"	1 5/16"	1 1/4"	1 1/8"	1"	13/16"	5/8"	7/16"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE

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

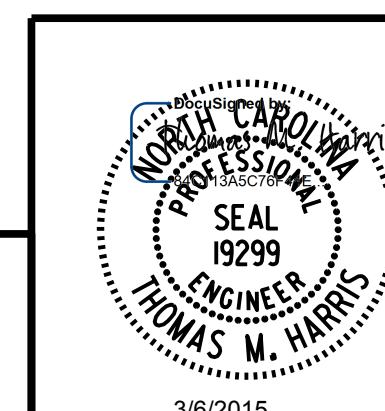


**GIRDER CAMBER AND DEFLECTIONS**

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
STATION: **27 + 40.75 -L-**

SHEET 3 OF 3

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



PLANS PREPARED BY:  
**PARSONS**  
5540 CenterView Drive, Suite 217  
Raleigh, NC 27606-3386  
NC LICENSE No. F-0246  
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: **K. E. LOFTON** DATE: **12-14**  
CHECKED BY: **T. M. HARRIS** DATE: **1-15**  
DESIGN ENGINEER: **T. M. HARRIS** DATE: **2-15**

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			27
2			4			27

ASSEMBLED BY: **K. E. LOFTON** DATE: **12-14**  
CHECKED BY: **T. M. HARRIS** DATE: **1-15**  
DRAWN BY: **ELR** 11/91  
CHECKED BY: **GRP** 11/91  
REV. 10/1/11 MAA/GM  
REV. 1/15 MAA/TMG  
REV. 2/15 MAA/TMG

**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.

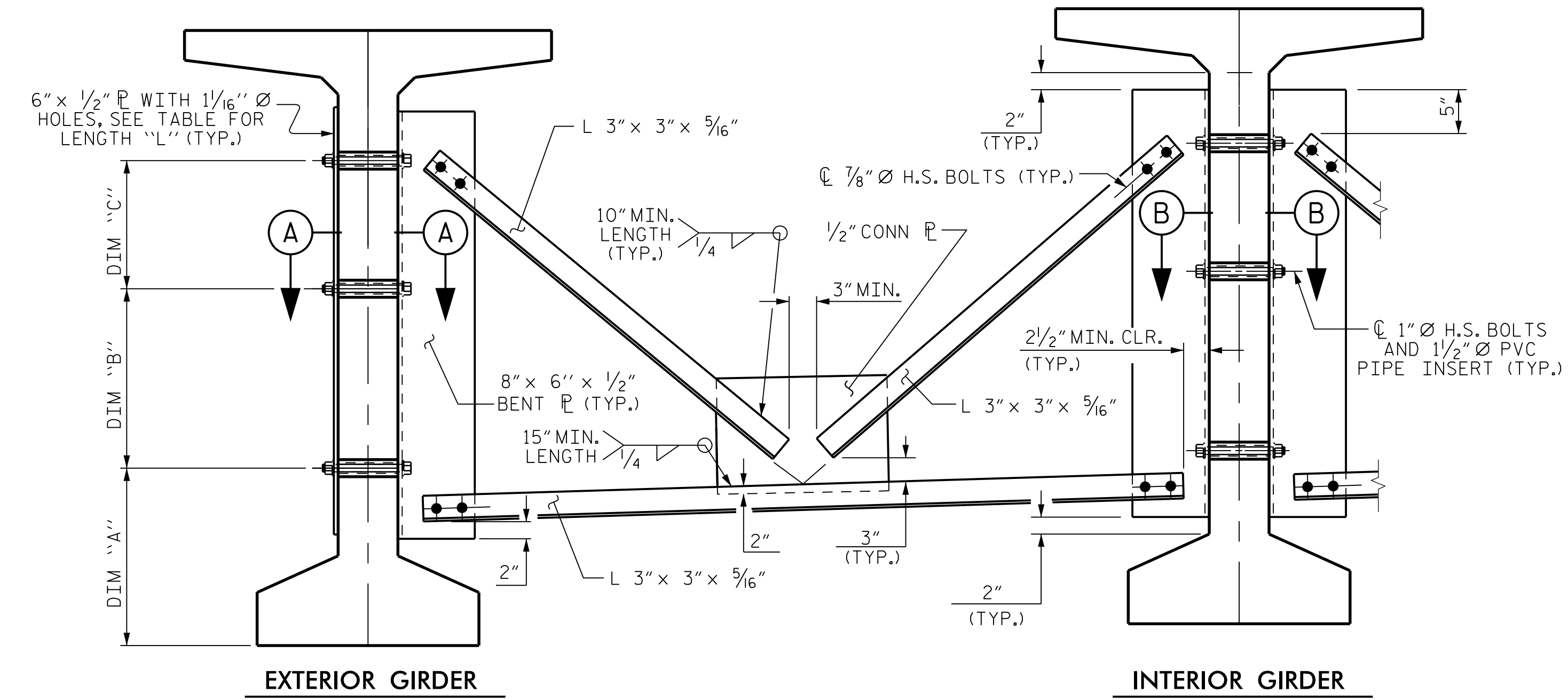
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

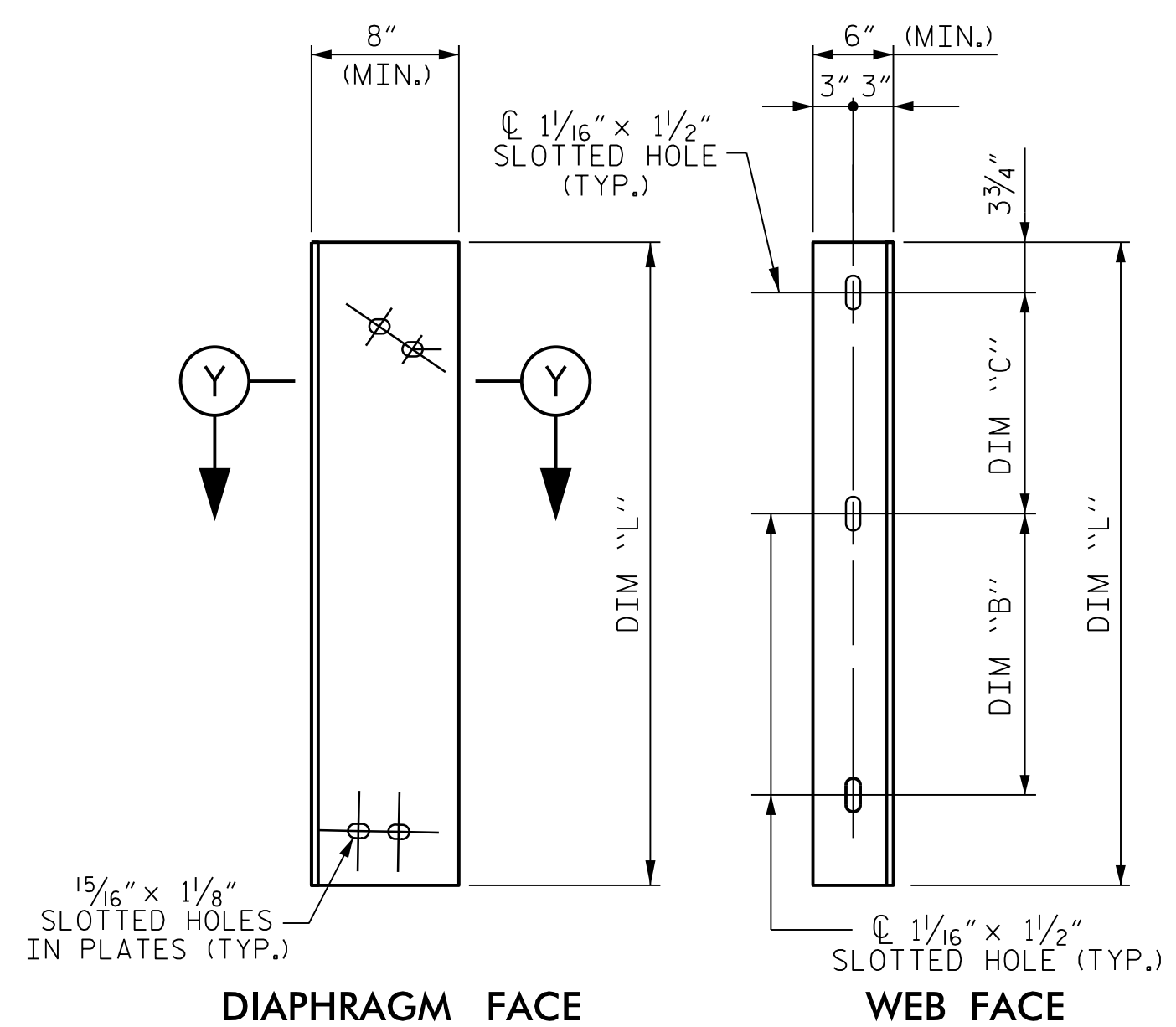
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

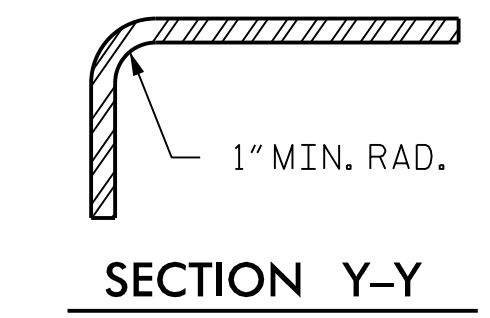
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



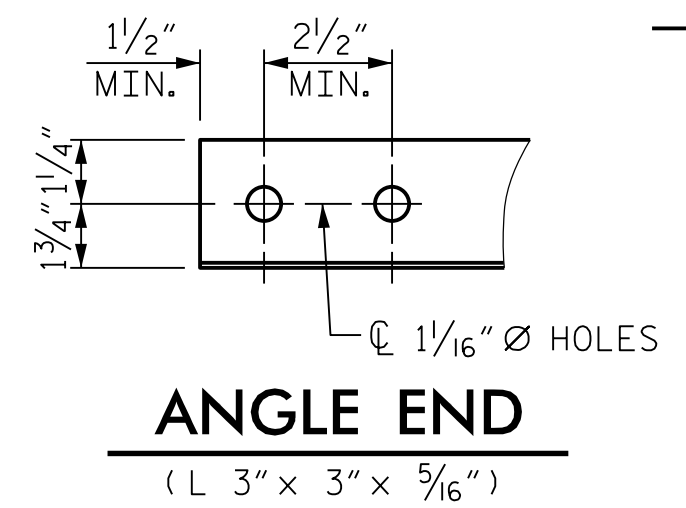
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
(72" BULB TEE)



**DIAPHRAGM FACE**      **WEB FACE**



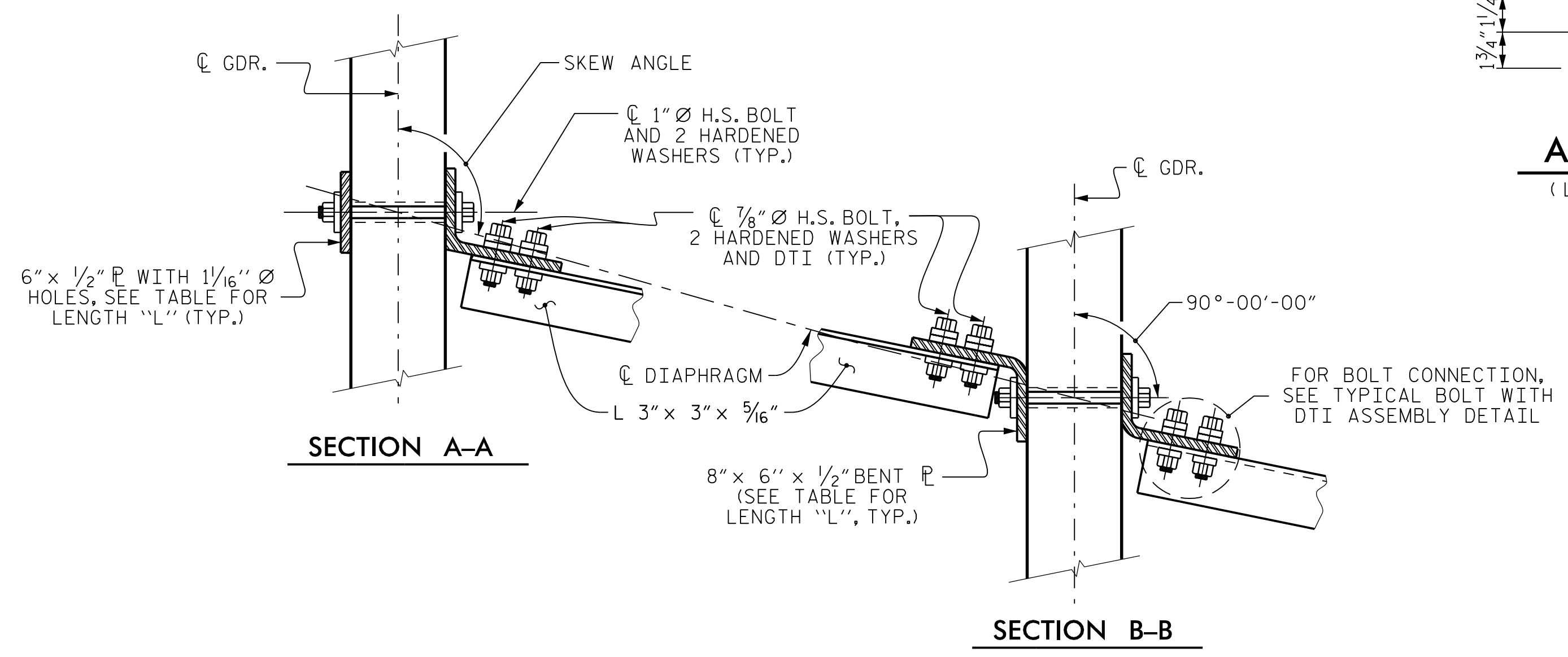
**SECTION Y-Y**



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

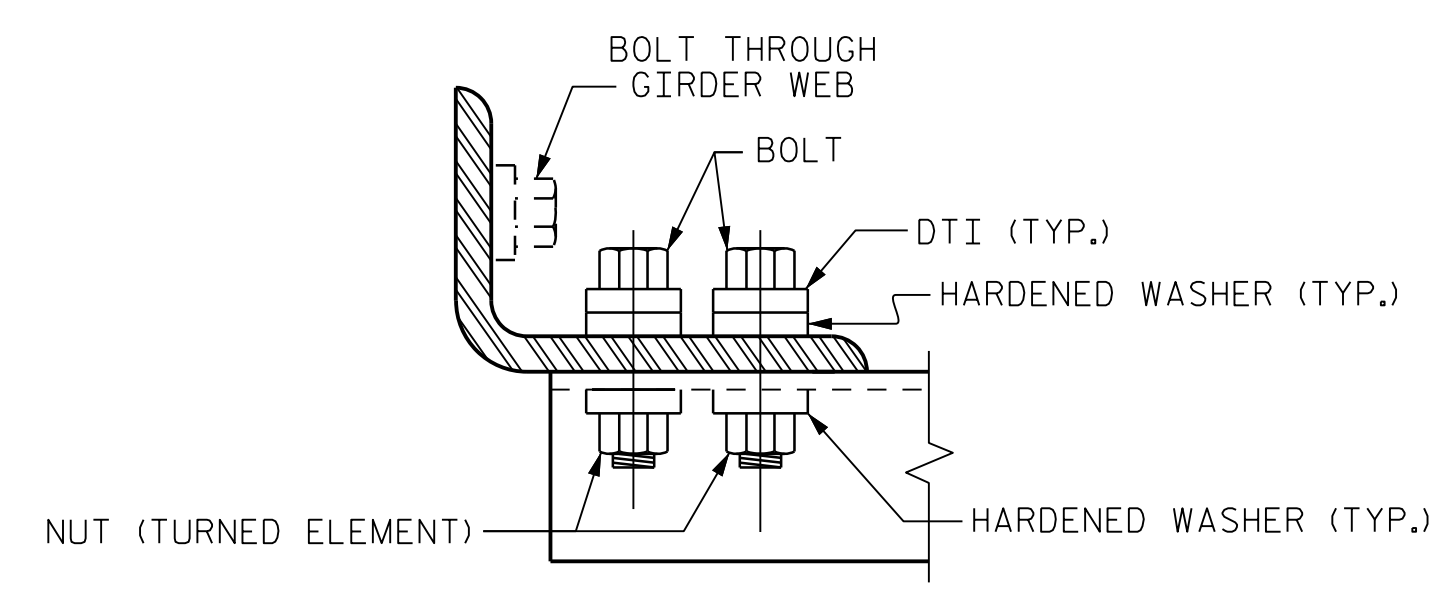
**CONNECTOR PLATE DETAILS**

TABLE				
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-9"	1'-9"	1'-4 3/4"	4'-2"



**CONNECTION DETAILS**

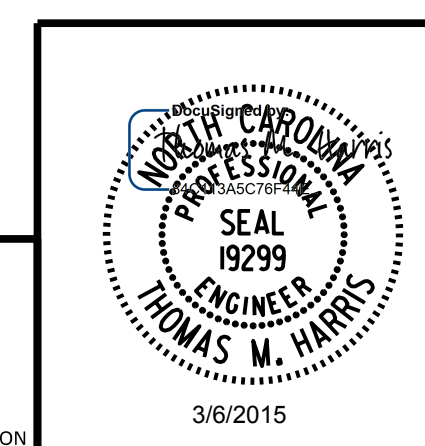
( FOR 70° ≤ SKEW < 90° OR 90° < SKEW ≤ 110° )



**BOLT WITH DTI ASSEMBLY DETAIL**

PROJECT NO. U-2524BC  
GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**INTERMEDIATE STEEL DIAPHRAGMS  
 FOR 72" MODIFIED BULB TEE  
 PRESTRESSED CONCRETE GIRDERS**



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

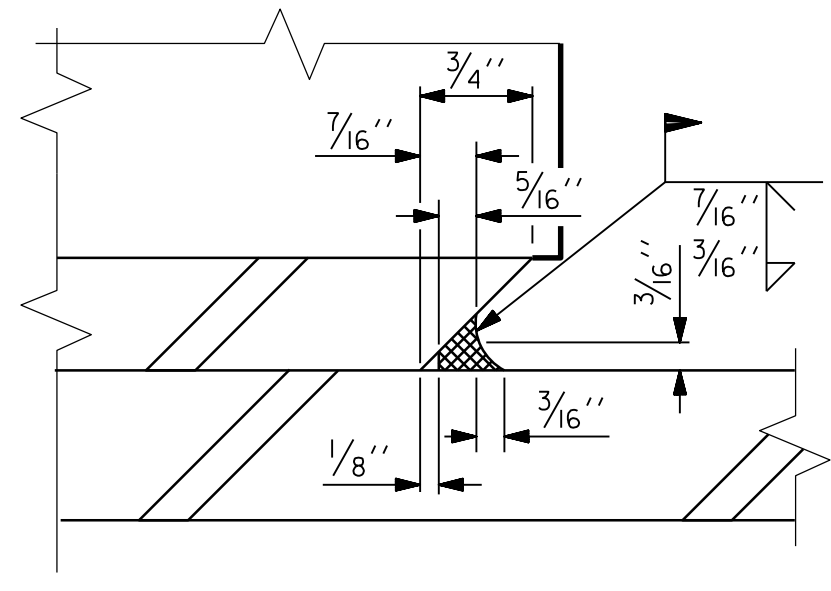
DRAWN BY :	K. E. LOFTON	DATE :	11-14
CHECKED BY :	T. M. HARRIS	DATE :	1-15
DESIGN ENGINEER :	T. M. HARRIS	DATE :	2-15

REVISIONS				SHEET No.			
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS	
1			3			27	
2			4				

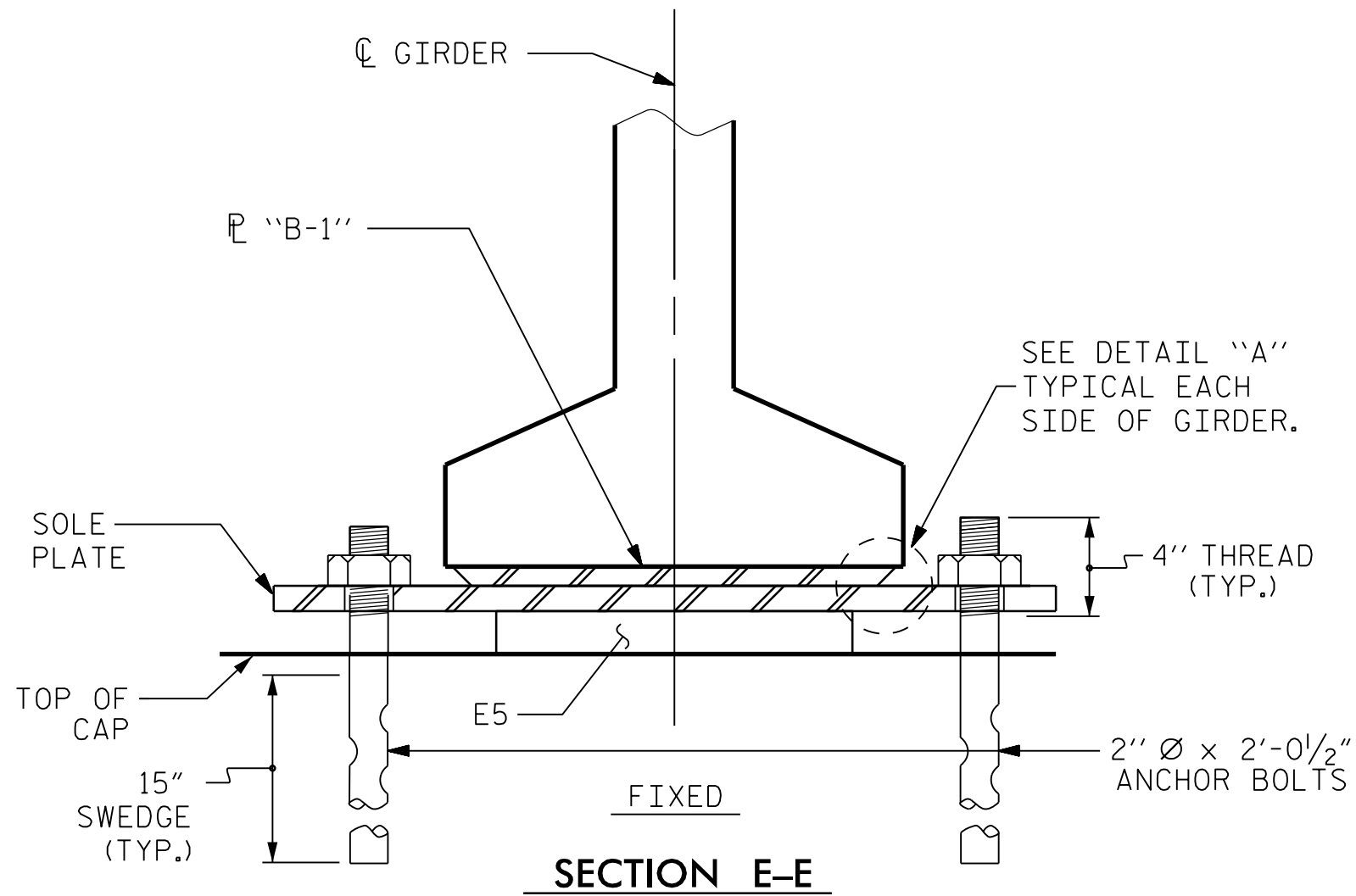
FILE: J:\2524BC\1414\work\plans\final\U2524BC\_SD\_dfl.dgn  
 DATE: 3/2/15 9:30:25 AM

ASSEMBLED BY :	K. E. LOFTON	DATE :	11-14
CHECKED BY :	T. M. HARRIS	DATE :	1-15
DRAWN BY :	RWW 11/09	ADDED :	11/23/09R
CHECKED BY :	GM 11/09	REV. :	10/1/11
		MAA/GM	

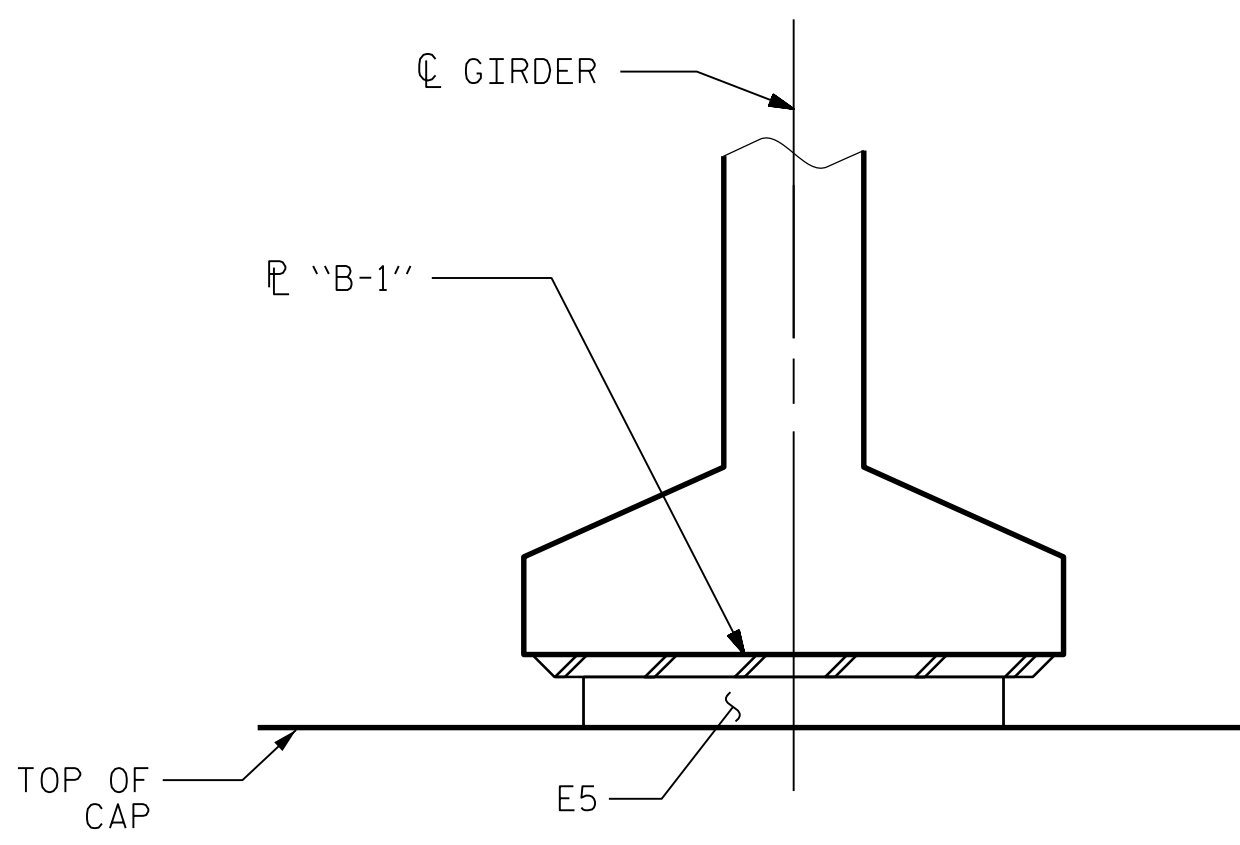




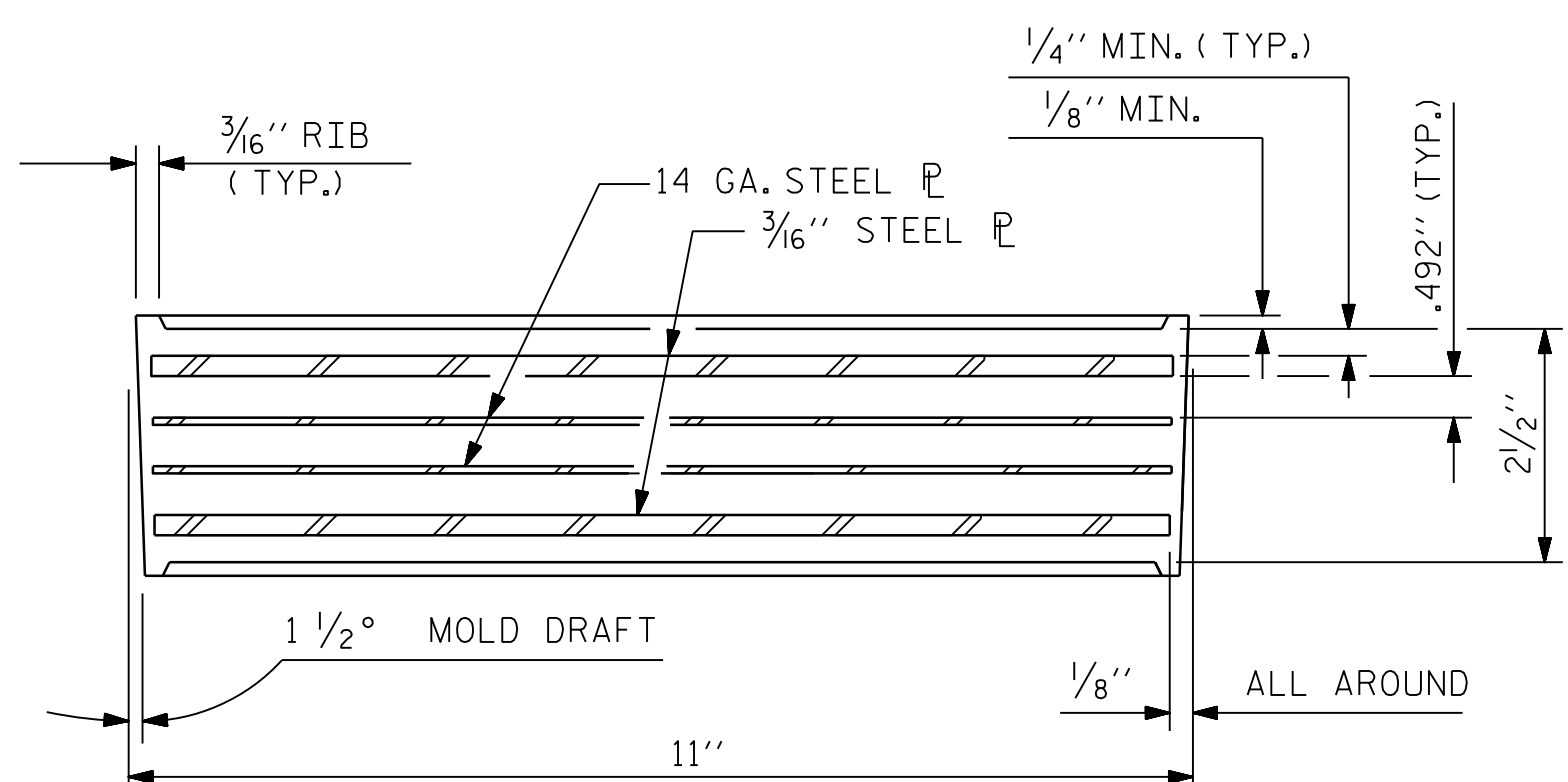
**DETAIL "A"**



**SECTION E-E**

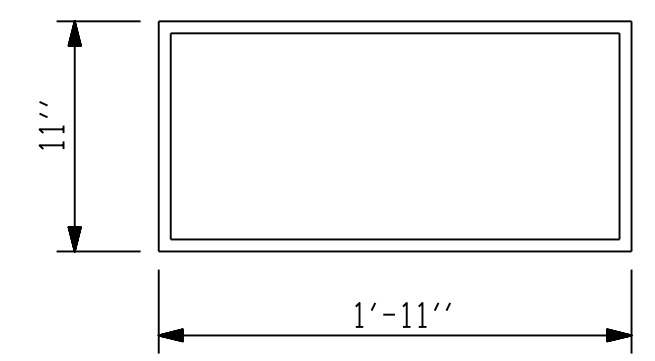


**SECTION F-F**

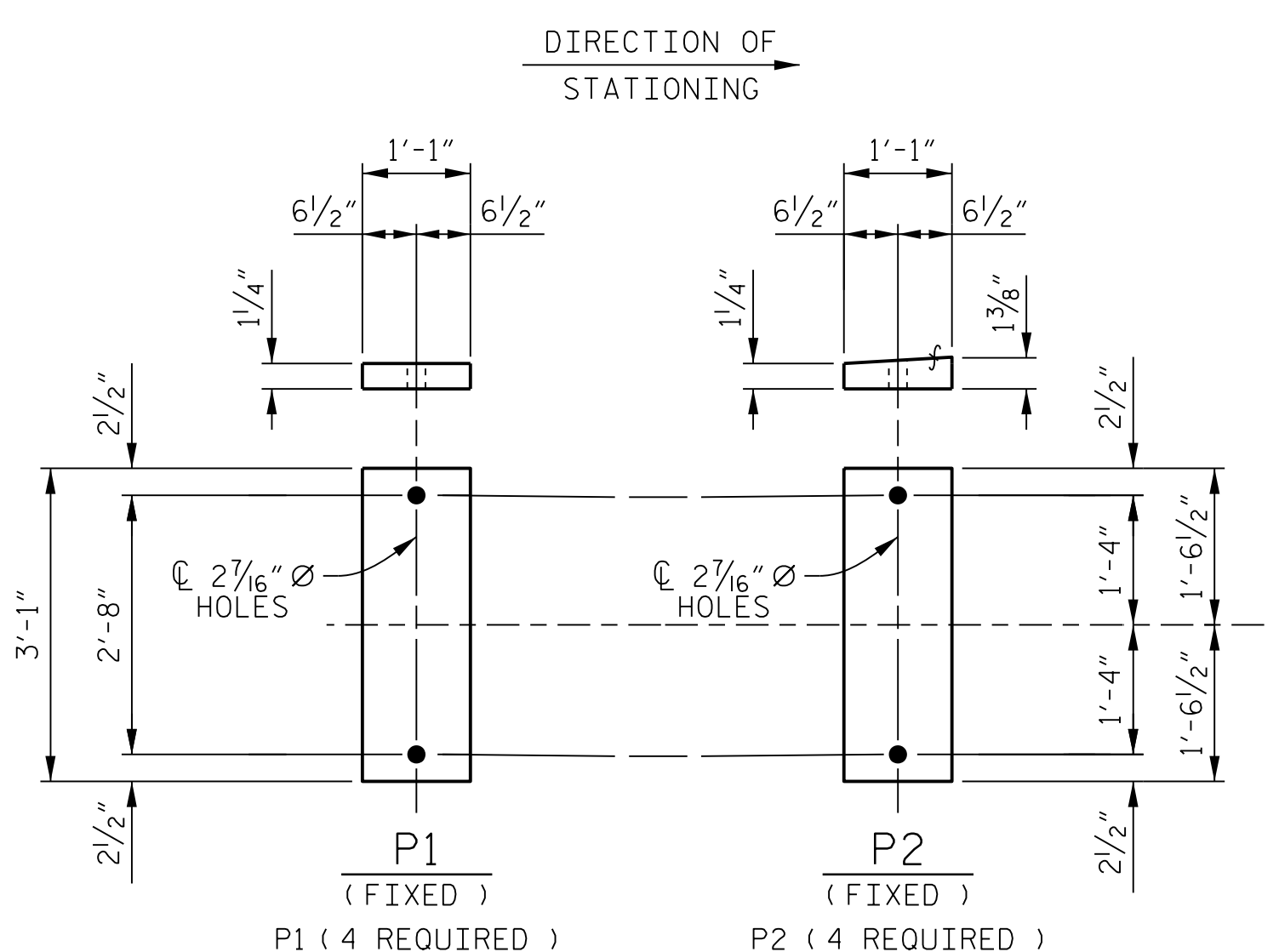


**TYPICAL SECTION OF ELASTOMERIC BEARINGS**

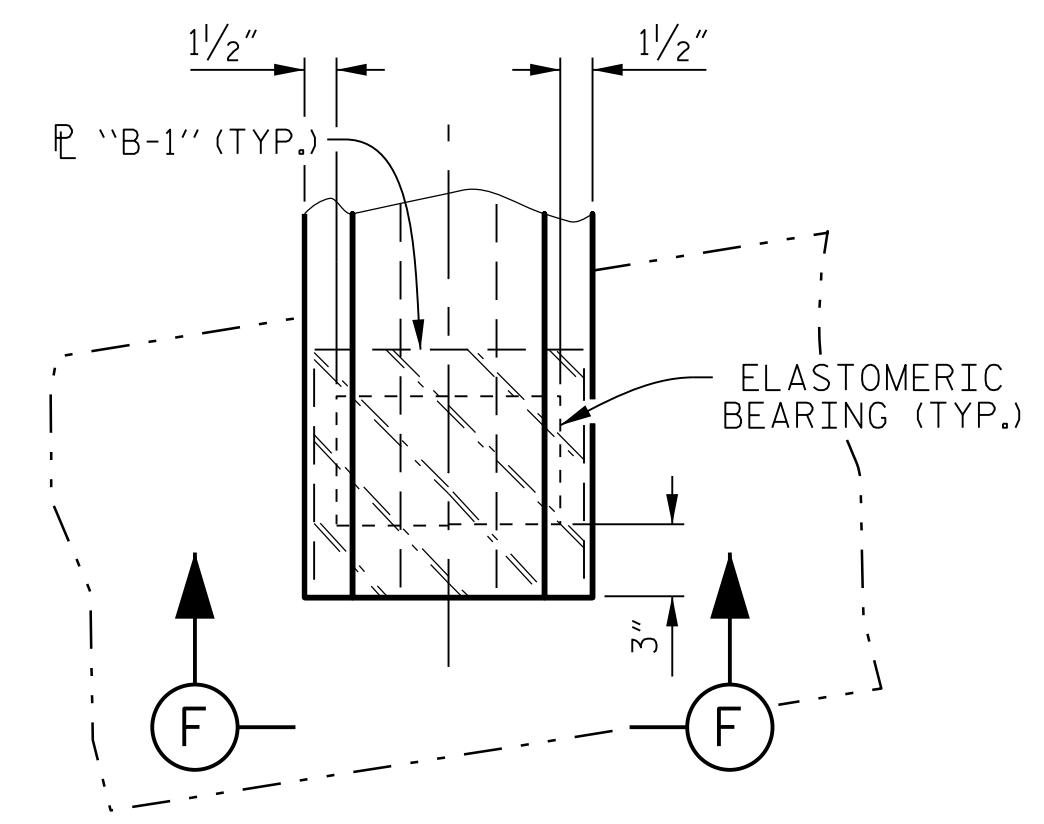
**TYPE VI**



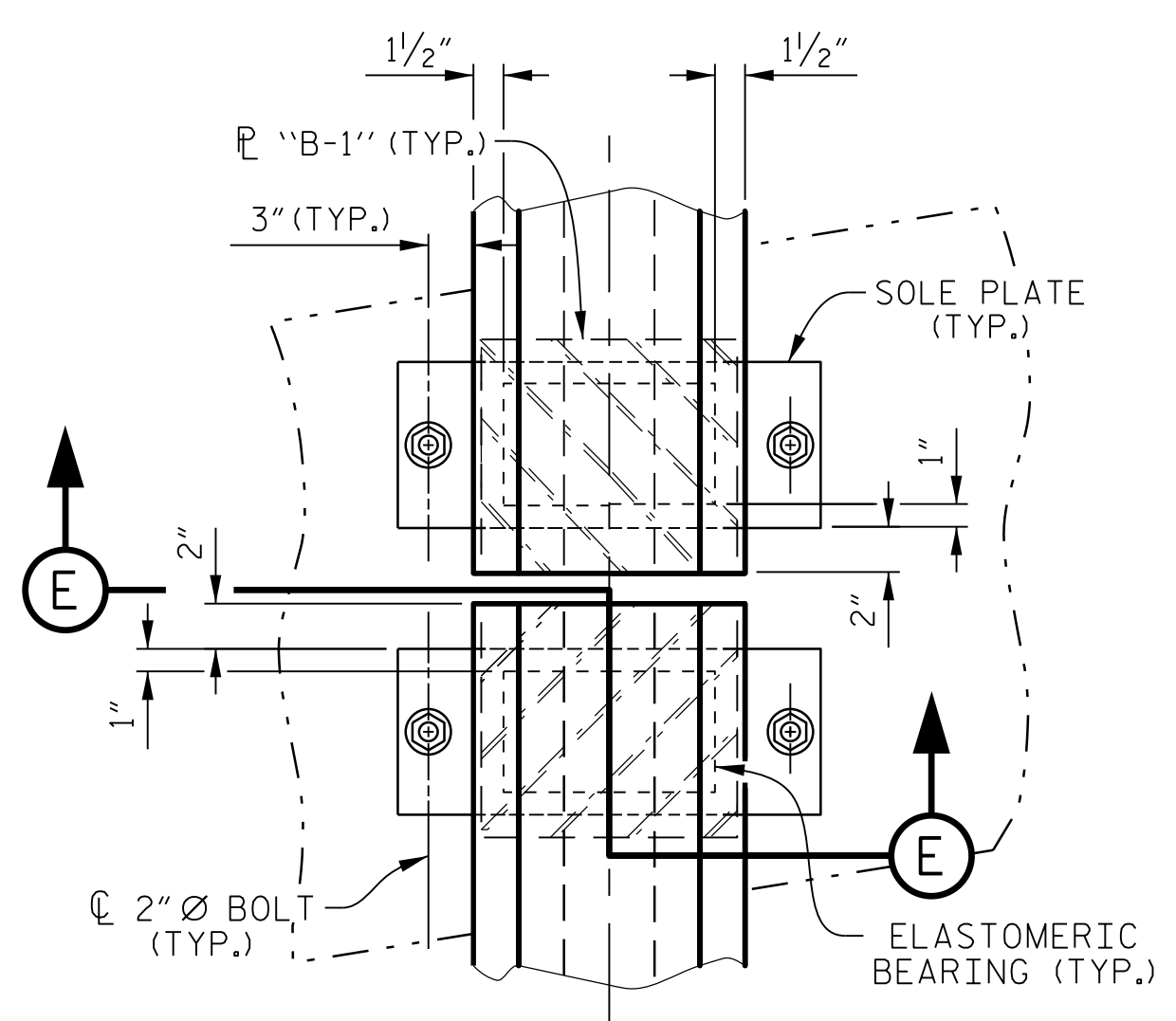
**PLAN VIEW OF ELASTOMERIC BEARING**



**SOLE PLATE DETAIL**



**PARTIAL PLAN - INTEGRAL END BENT**



**PARTIAL PLAN - BENT**

**NOTES**

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

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

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

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

SOLE PLATES, BOLTS, NUTS AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOAD	
	D.L. + L.L. (NO IMPACT)
TYPE VI	420 K

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27 + 40.75 -L-**

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



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

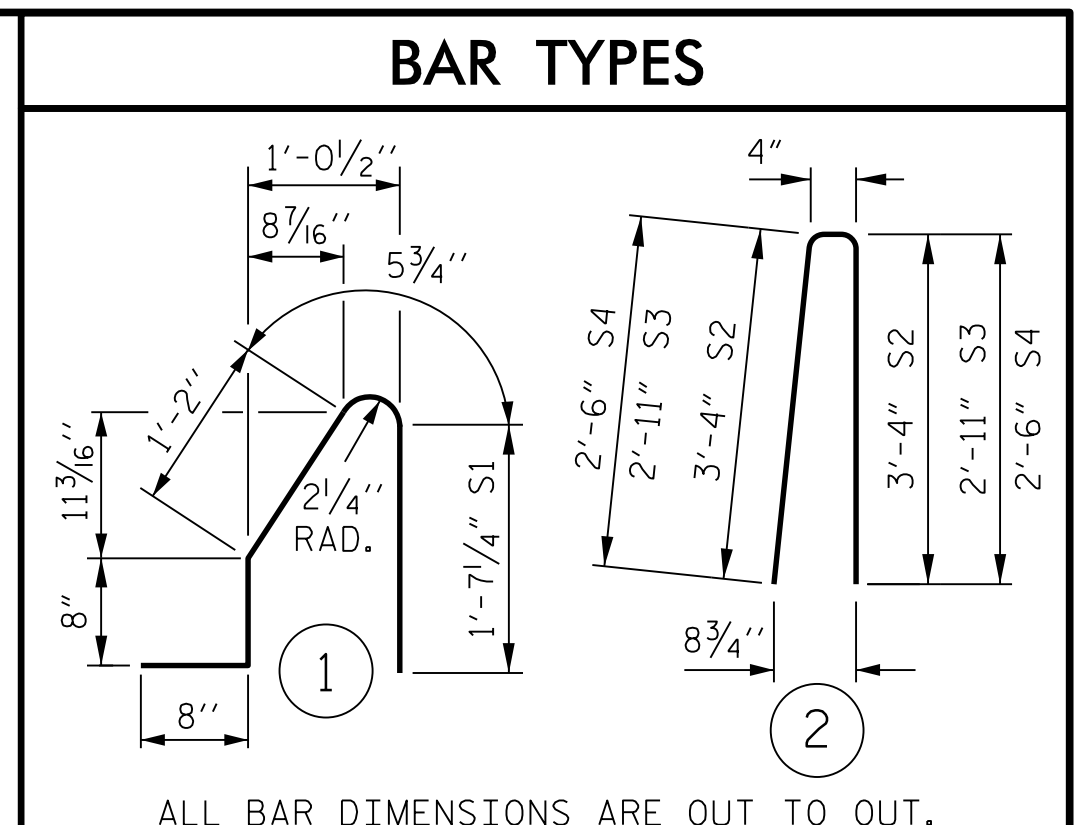
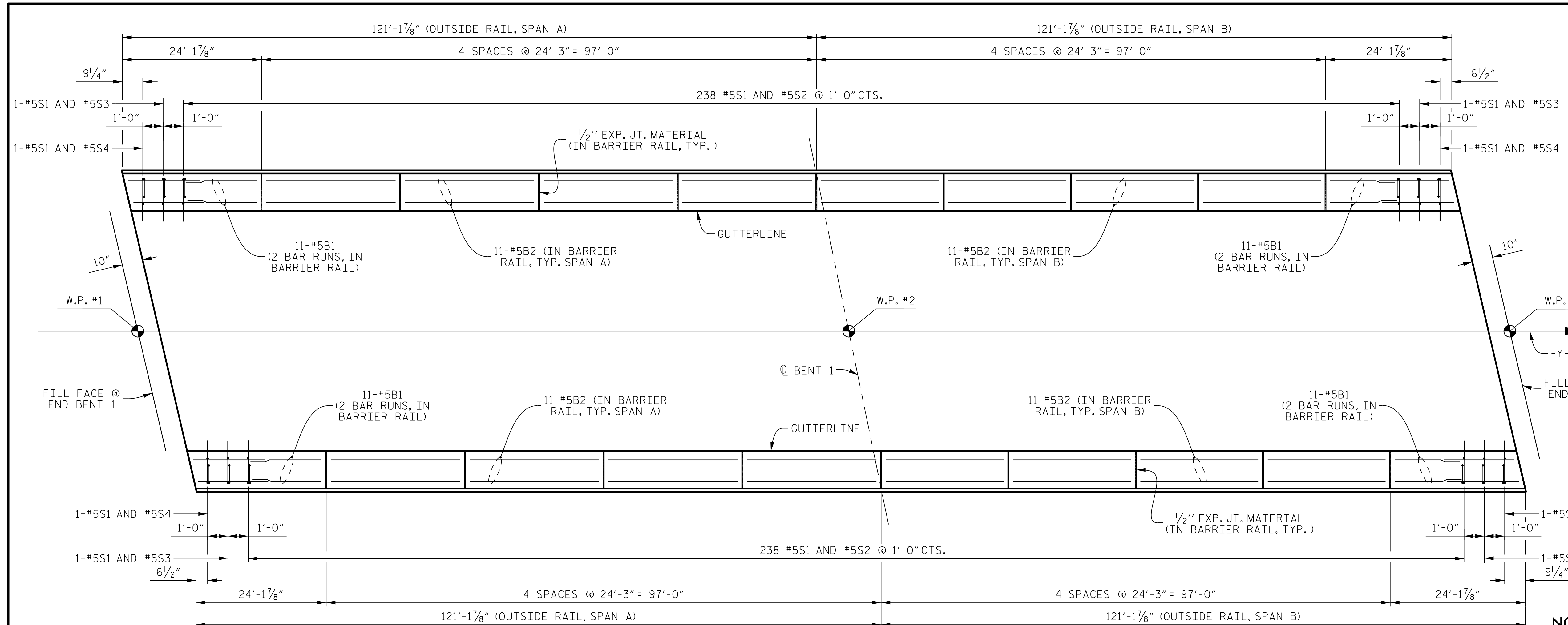
DRAWN BY: K. E. LOFTON DATE: 11-14  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15

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

TOTAL SHEETS: 27

FILE: I:\2524BC\1\Drawings\Plans\Final\U2524BC\_SD\_eb1.dgn  
 DATE: 3/6/2015 9:30:44 AM

ASSEMBLED BY: K. E. LOFTON DATE: 11-14  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DRAWN BY: EEM 2/97 REV. 10/1/11 MAA/GM  
 CHECKED BY: VAP 2/97 REV. 6/13 AAC/MAA  
 REV. 1/15 MMA/TMG



**BILL OF MATERIAL**

**FOR CONCRETE BARRIER RAIL ONLY**

BAR No.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR 13'-8"	1,254
* B2	176	#5	STR 23'-10"	4,375
* S1	484	#5	1 4'-7"	2,314
* S2	476	#5	2 7'-0"	3,475
* S3	4	#5	2 6'-2"	26
* S4	4	#5	2 5'-4"	22

\*EPOXY COATED REINFORCING STEEL 11,466 LBS.

CLASS "AA" CONCRETE 65.8 CU. YDS.

CONCRETE BARRIER RAIL 484.63 LIN. FT.

**SPLICE LENGTH**

BAR	SIZE	LENGTH
B1	#5	3'-5"

**PLAN OF BARRIER RAIL**

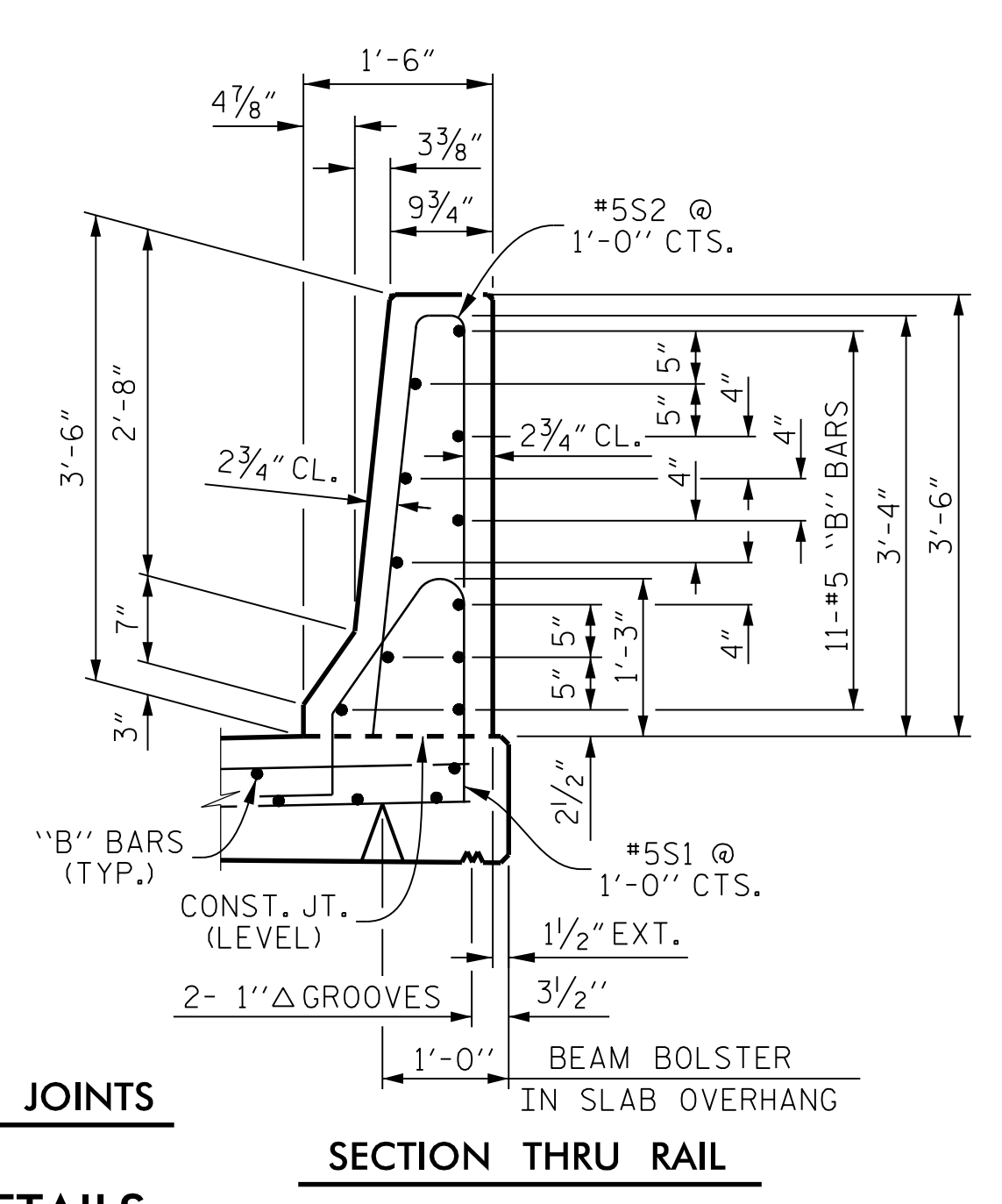
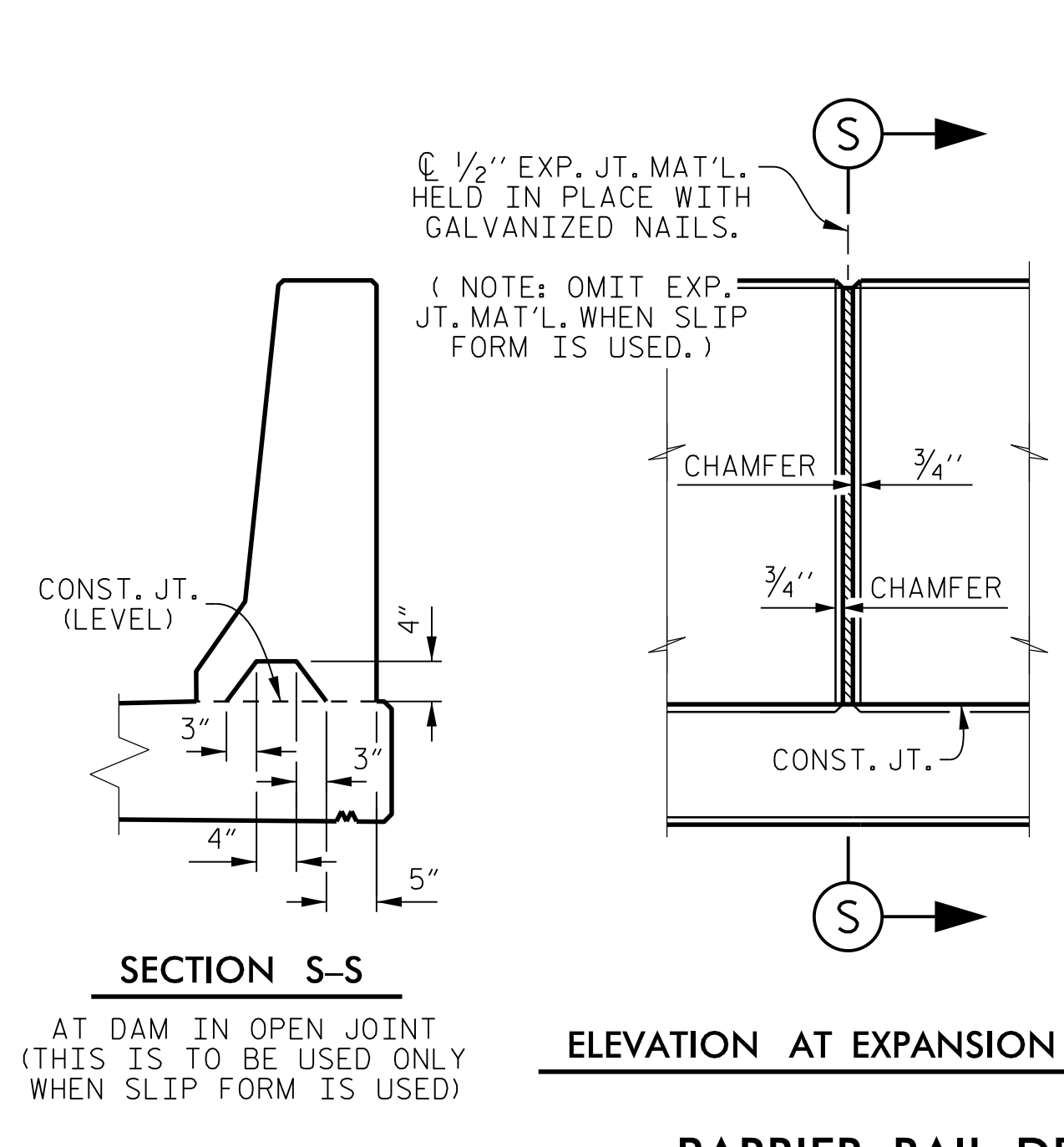
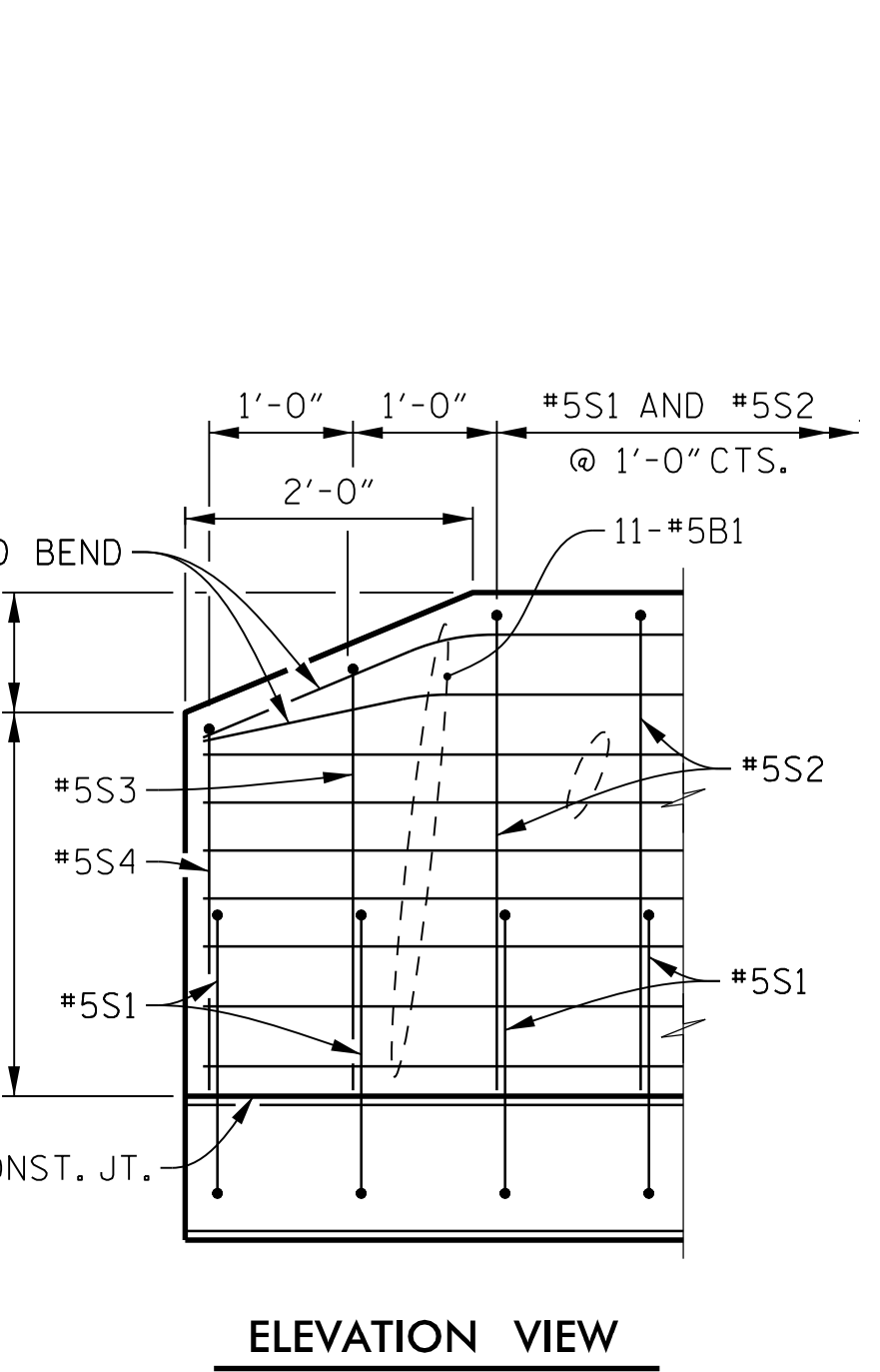
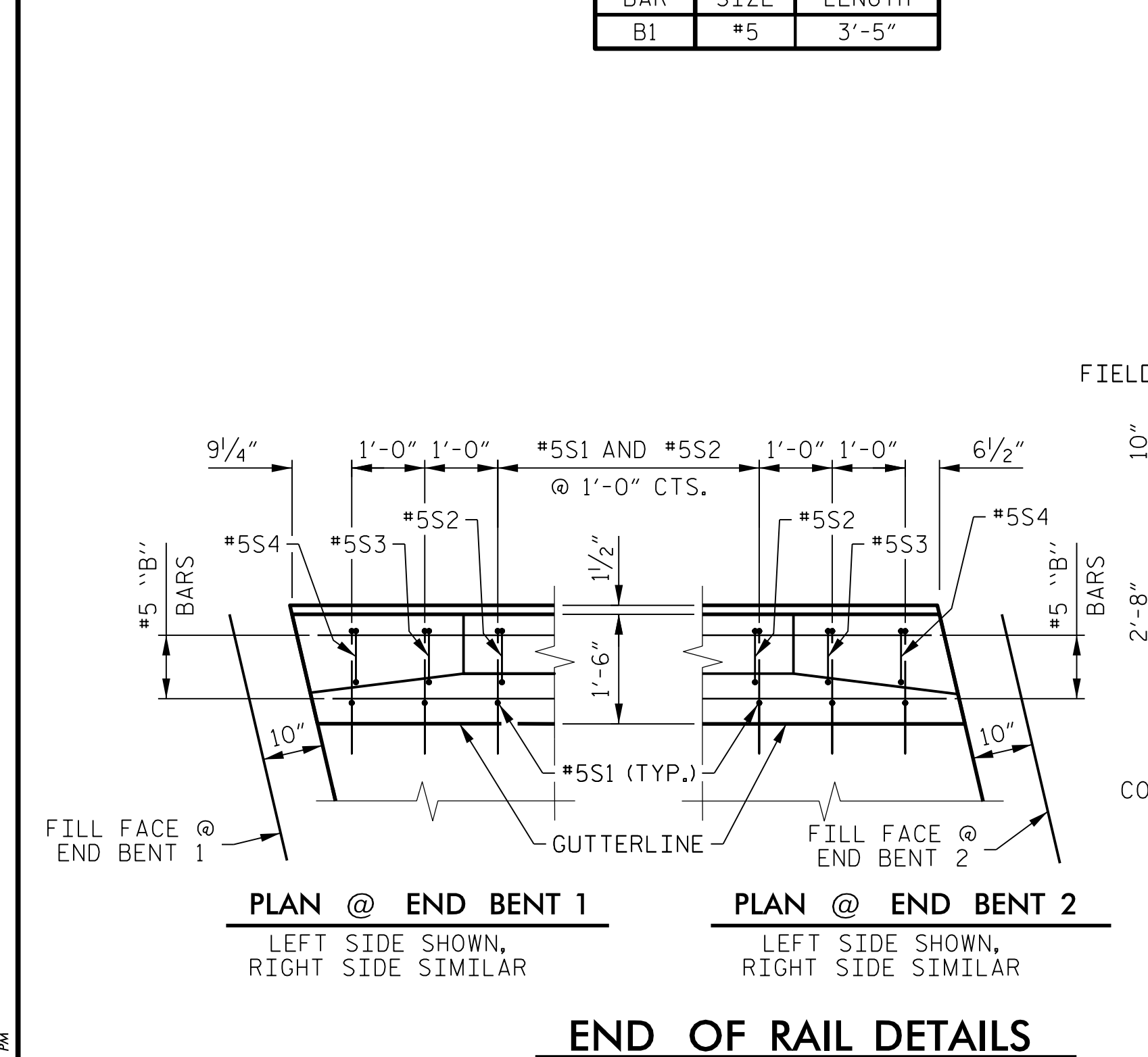
**NOTES**

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5S1 AND #5S2 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAIL.



PROJECT NO. **U-2524BC**

**GUILFORD COUNTY**

STATION: **27 + 40.75 -L-**

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**STANDARD CONCRETE BARRIER RAIL**

ASSEMBLED BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15

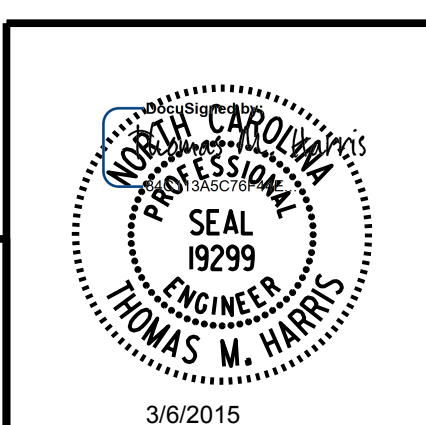
DRAWN BY : ARB 5/87 REV. 10/1/11 MAA/GM  
 CHECKED BY : SJD 9/87 REV. 7/12 MAA/GM  
 DATE: 3/2015 REV. 6/13 MAA/GM

DRAWN BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

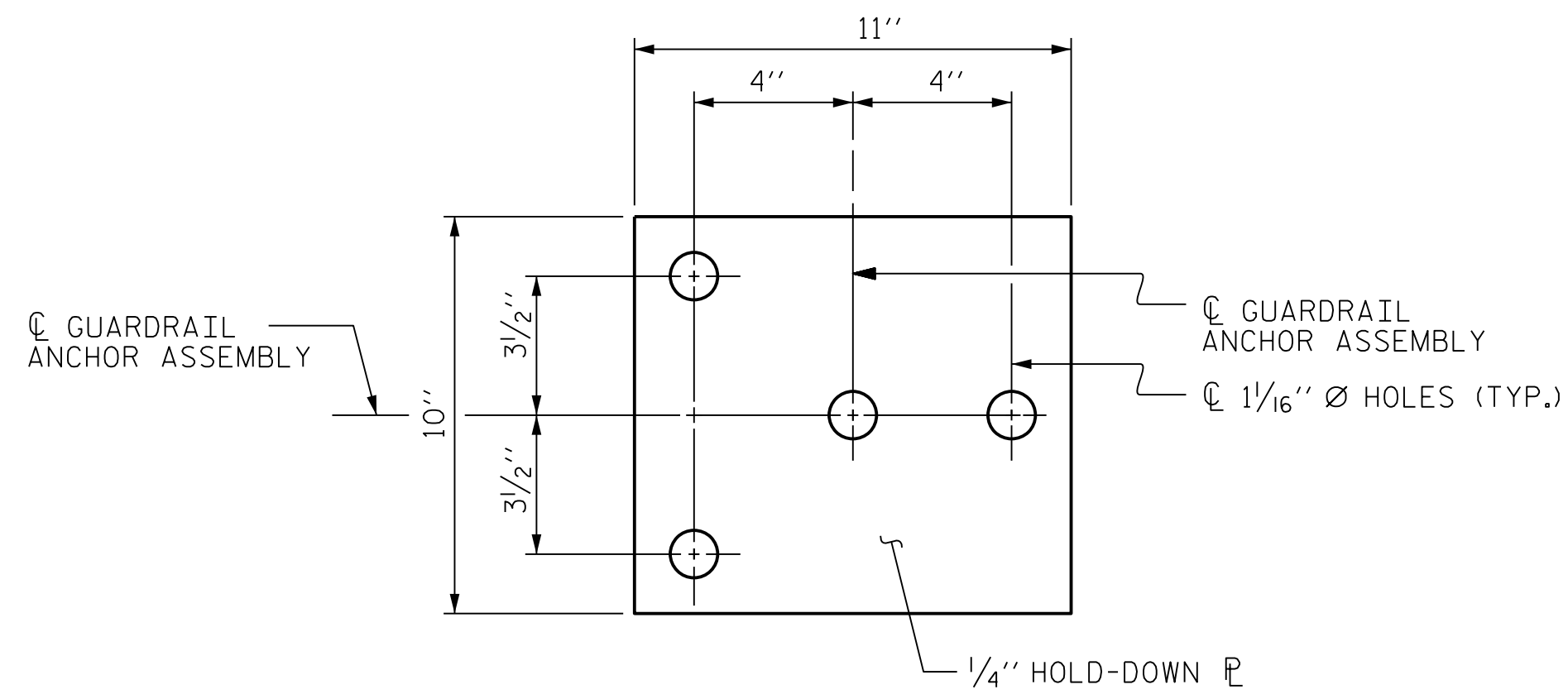
PLANS PREPARED BY :

**PARSONS**

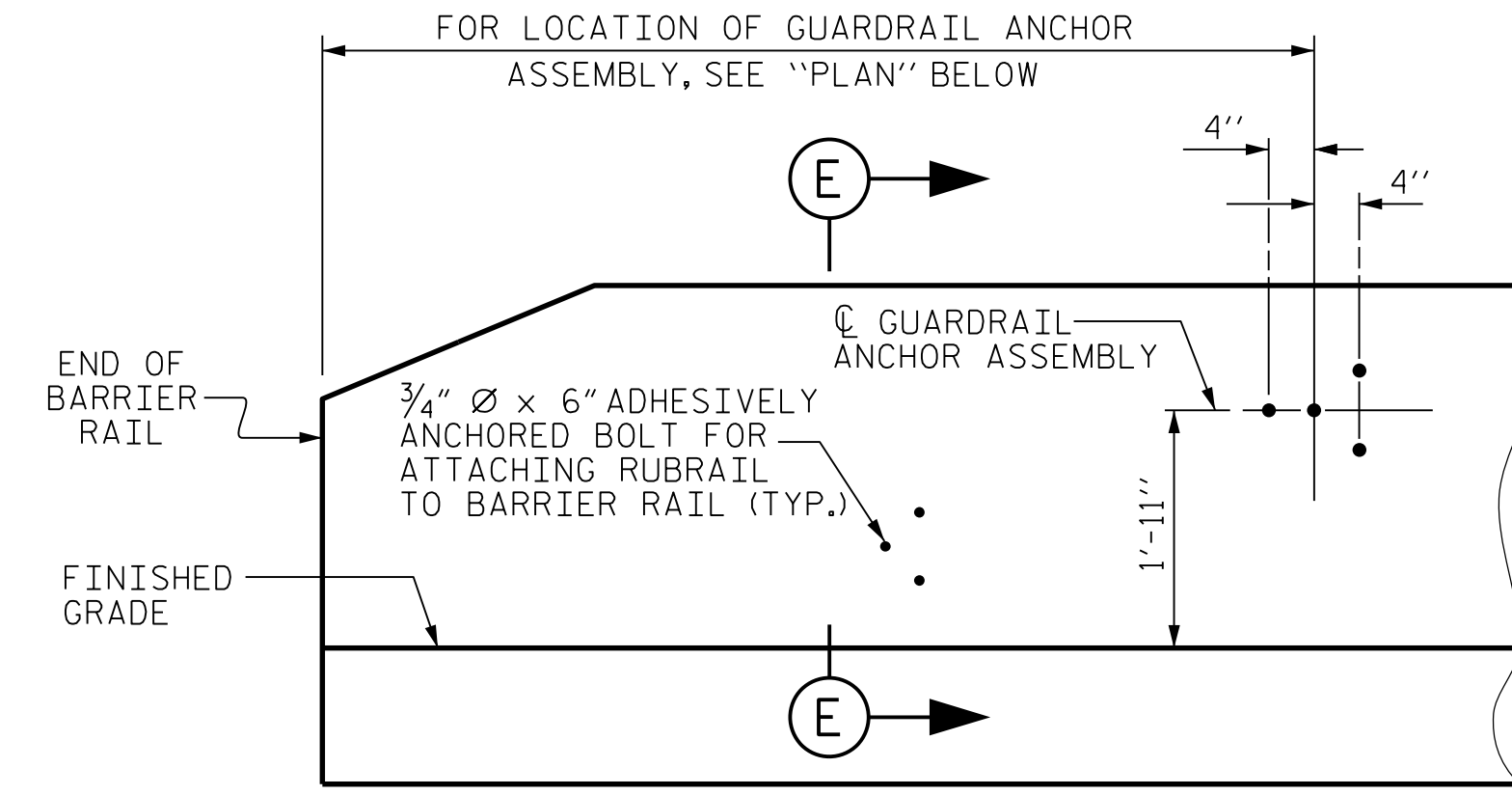
5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246



REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			27
2			4			27



**PLAN**



**ELEVATION**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

**NOTES**

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

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

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

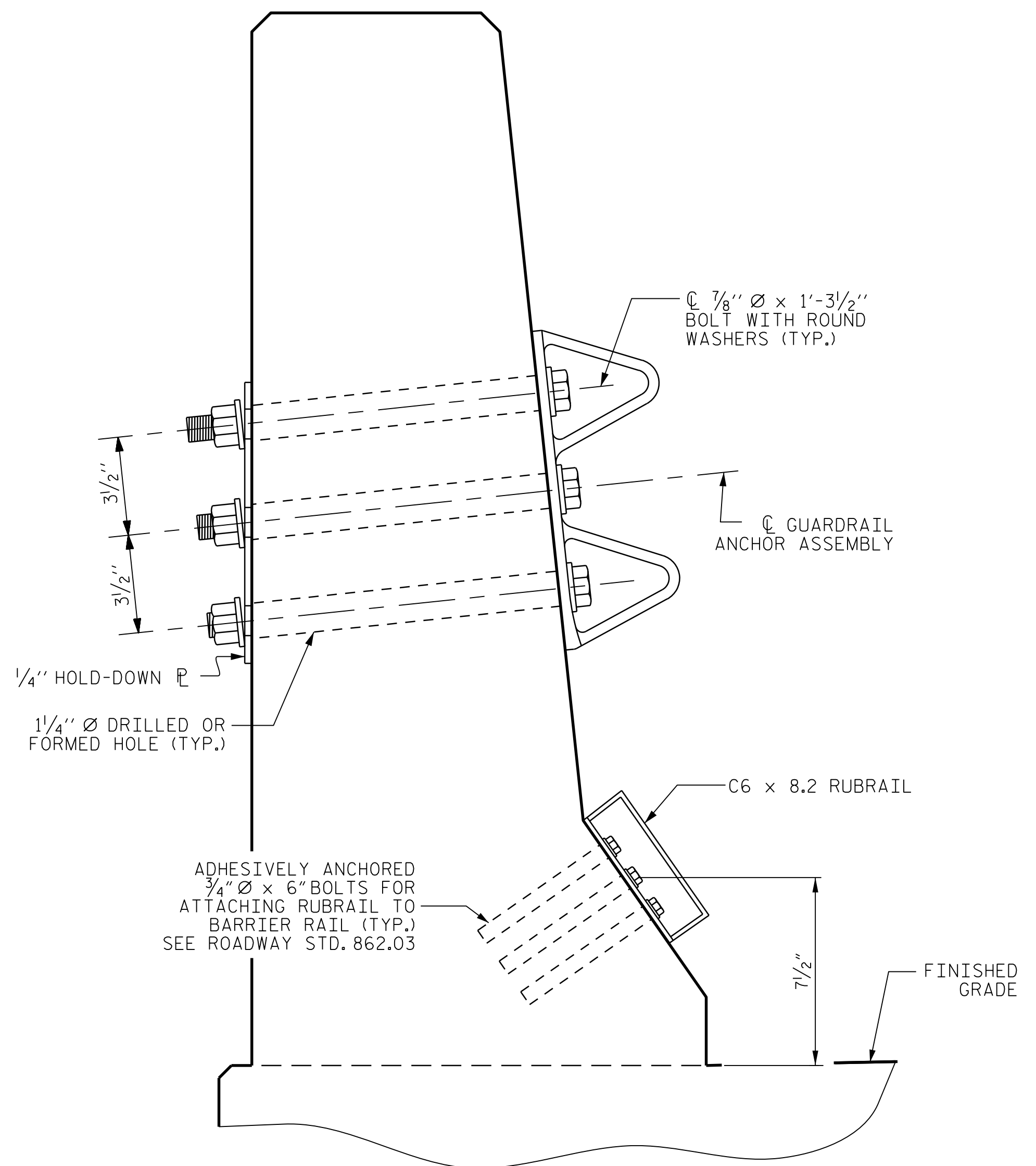
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

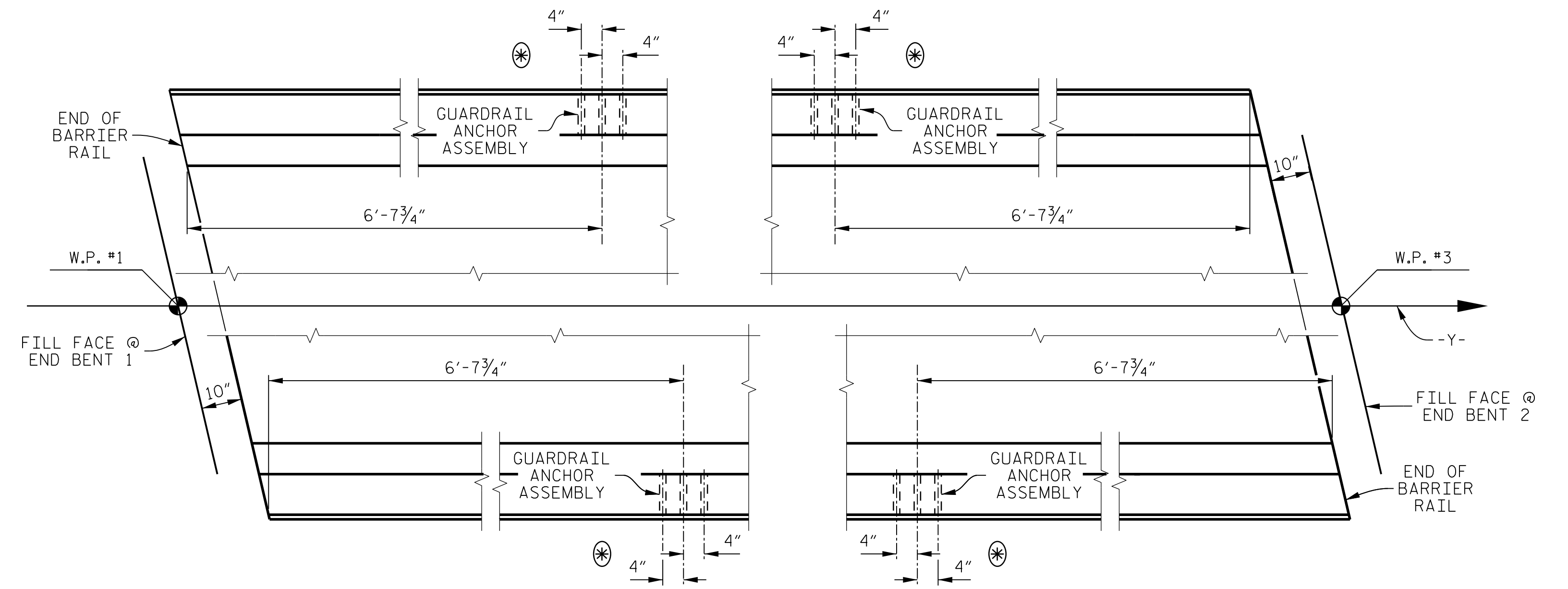
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.



**SECTION E-E**

**GUARDRAIL ANCHOR ASSEMBLY DETAILS**



**PLAN**

**LOCATION OF ANCHORS FOR GUARDRAIL**

⊗ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27 + 40.75 -L-**

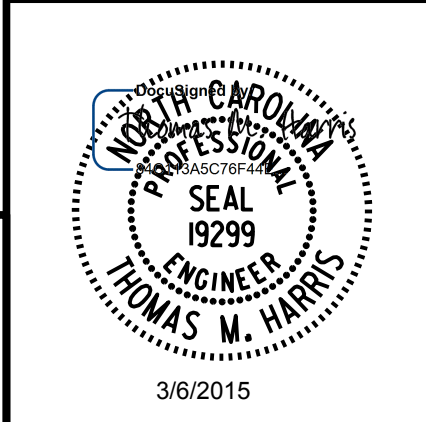
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL**

FILE: I:\2524BC\Drawings\Drawings\Final\U2524BC\_SD.grd  
 DATE: 3/2/05 9:22:10 AM

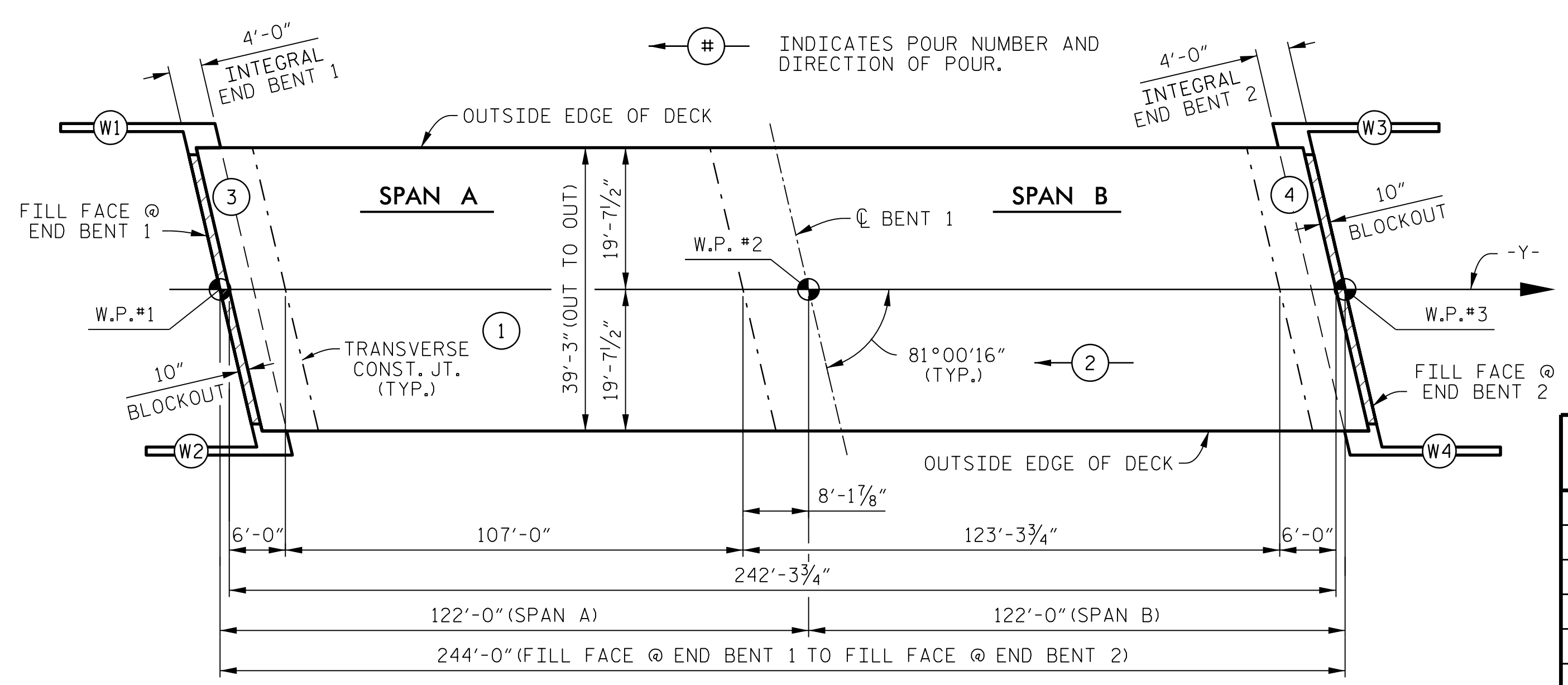
ASSEMBLED BY : K. E. LOFTON	DATE : 11-14
CHECKED BY : T. M. HARRIS	DATE : 1-15
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DRAWN BY : K. E. LOFTON	DATE : 11-14
CHECKED BY : T. M. HARRIS	DATE : 1-15
DESIGN ENGINEER : T. M. HARRIS	DATE : 2-15

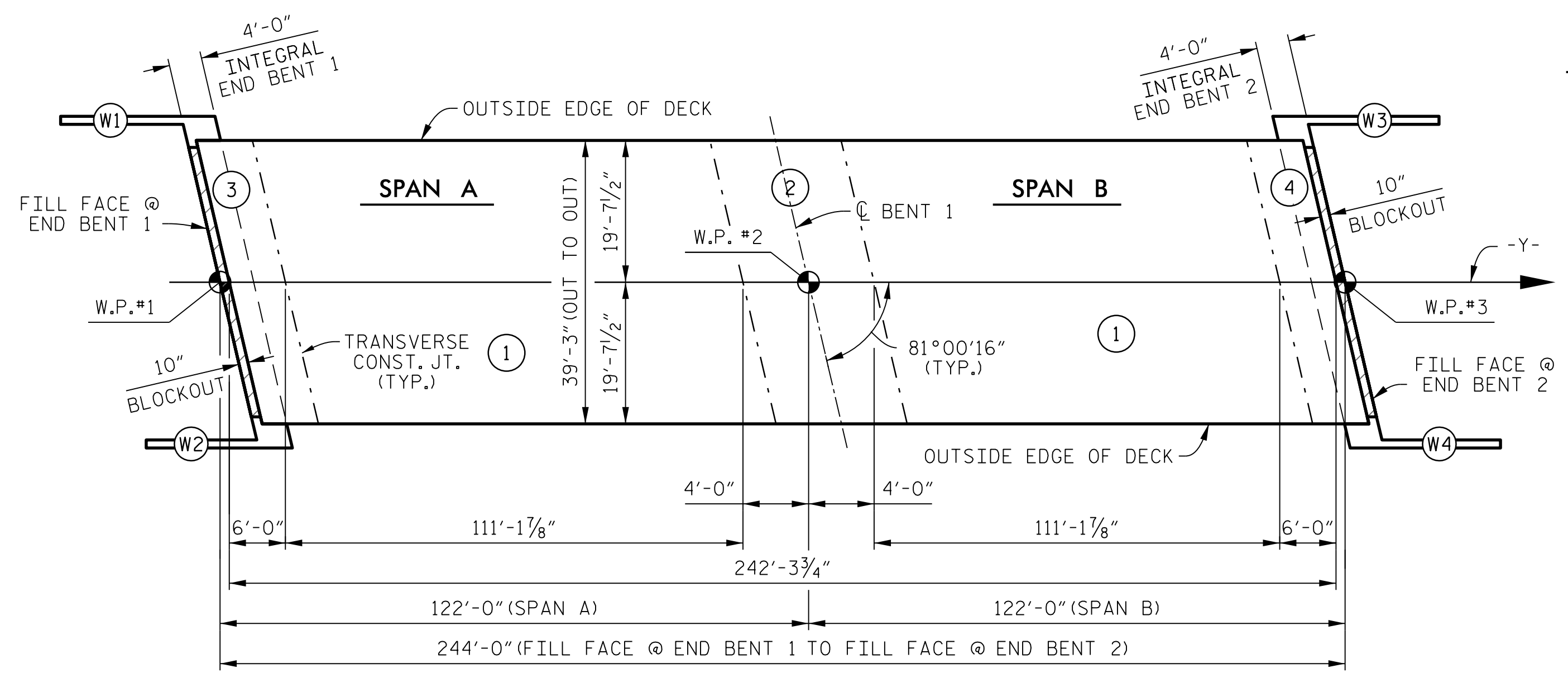
PLANS PREPARED BY :  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



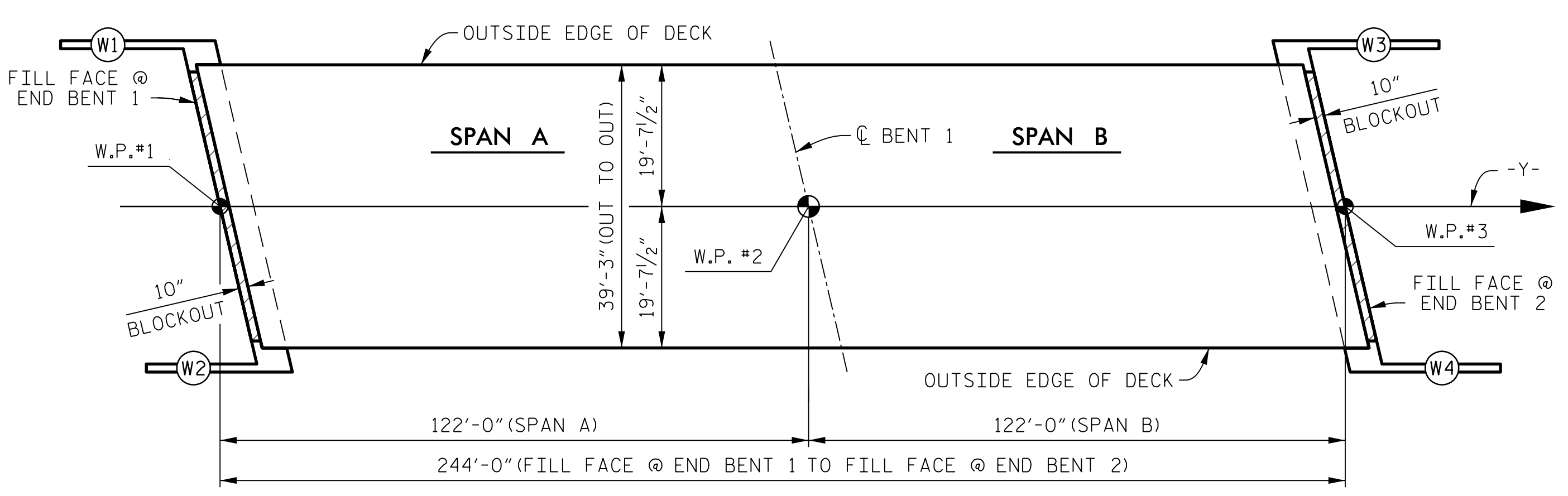
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			27
2			4			



**POURING SEQUENCE**



**OPTIONAL POURING SEQUENCE**



**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**

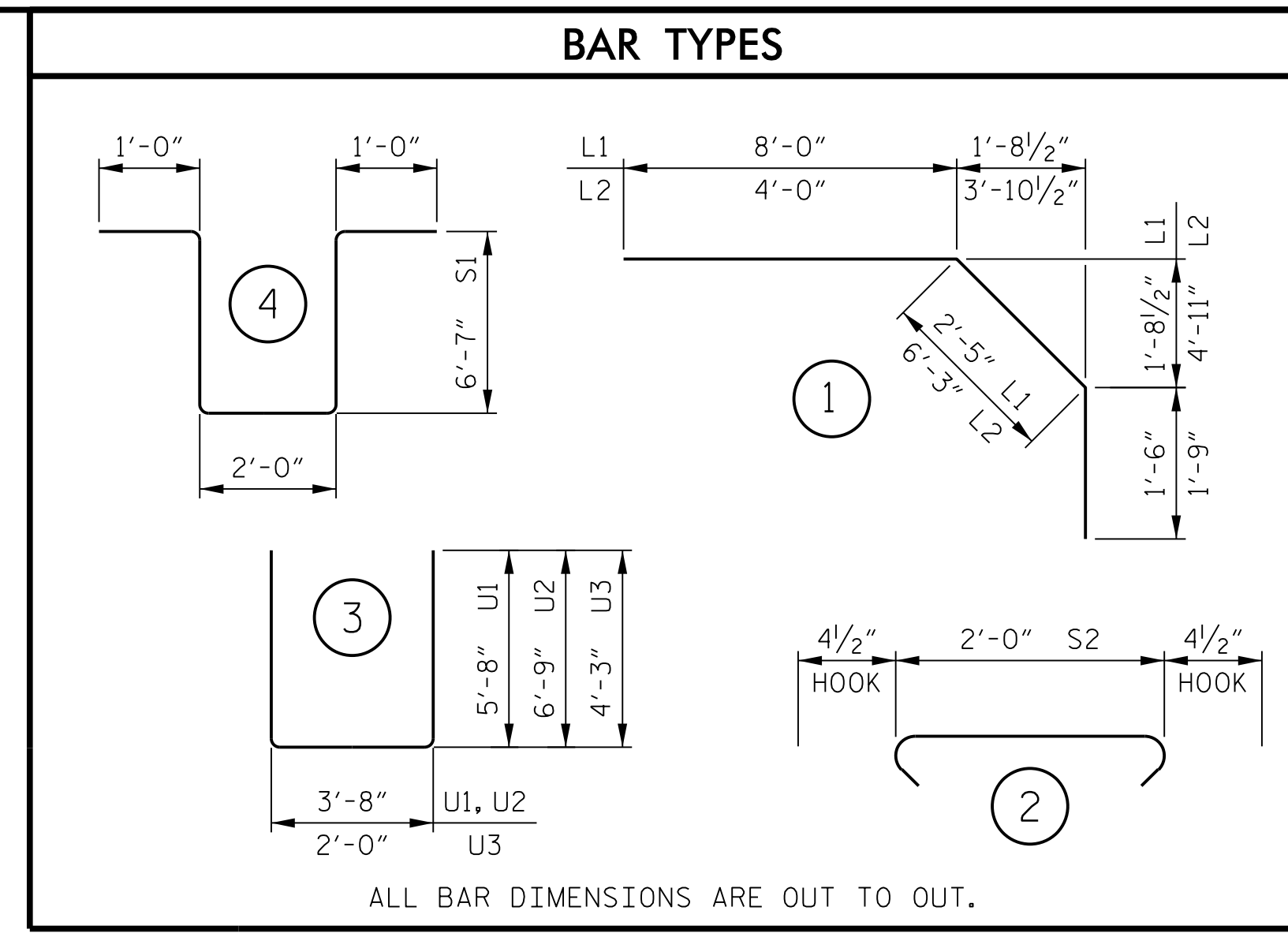
(9,577 SQ. FT.)

CLASS AA CONCRETE BREAKDOWN	
POUR 1	149.3 CU. YDS.
POUR 2	189.1 CU. YDS.
POUR 3	58.6 CU. YDS.
POUR 4	58.6 CU. YDS.
TOTAL	455.6 CU. YDS.

**NOTES**

REINFORCING STEEL AND CONCRETE FOR THE UPPER WINGS IS INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB".

POUR 3 AND POUR 4 MAY BE COMBINED.



ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL SUPERSTRUCTURE QUANTITIES			
	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	CLASS "AA" CONCRETE
	LBS.	LBS.	CU. YDS.
SPAN A AND SPAN B	35,923	31,817	455.6
<b>** TOTAL</b>	<b>35,923</b>	<b>31,817</b>	<b>455.6</b>

\*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED. SEE "CONCRETE BARRIER RAIL" SHEET FOR DETAILS.

GROOVING BRIDGE FLOORS		
APPROACH SLAB AT END BENT 1	797 SQ. FT.	
BRIDGE DECK	7,984 SQ. FT.	
APPROACH SLAB AT END BENT 2	797 SQ. FT.	
TOTAL	9,578 SQ. FT.	

BAR SIZE	SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS				PARAPET AND BARRIER RAIL
	EXCEPT APPROACH SLABS, PARAPET AND BARRIER RAIL		APPROACH SLABS		
	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"			

BILL OF MATERIAL SPAN A AND SPAN B					
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	405	#5	STR	38'-11"	16,439
* A101	2	#5	STR	35'-8"	74
* A102	2	#5	STR	32'-0"	67
* A103	2	#5	STR	28'-4"	59
* A104	2	#5	STR	24'-8"	51
* A105	2	#5	STR	21'-0"	44
* A106	2	#5	STR	17'-3"	36
* A107	2	#5	STR	13'-7"	28
* A108	2	#5	STR	9'-11"	21
* A109	2	#5	STR	6'-3"	13
A2	405	#5	STR	38'-11"	16,439
A201	2	#5	STR	35'-8"	74
A202	2	#5	STR	32'-0"	67
A203	2	#5	STR	28'-4"	59
A204	2	#5	STR	24'-8"	51
A205	2	#5	STR	21'-0"	44
A206	2	#5	STR	17'-3"	36
A207	2	#5	STR	13'-7"	28
A208	2	#5	STR	9'-11"	21
A209	2	#5	STR	6'-3"	13
* B1	168	#4	STR	28'-9"	3,226
* B2	150	#5	STR	24'-5"	3,820
* B3	84	#6	STR	30'-0"	3,785
* B4	50	#6	STR	38'-0"	2,854
B5	240	#5	STR	50'-2"	12,558
B6	43	#5	STR	38'-0"	1,704
H1	28	#8	STR	19'-6"	1,458
H2	28	#8	STR	19'-4"	1,445
K1	28	#4	STR	23'-7"	441
K2	12	#4	STR	6'-5"	51
K3	60	#4	STR	9'-5"	377
K4	6	#4	STR	7'-10"	31
K5	4	#4	STR	5'-4"	14
K6	20	#4	STR	6'-8"	89
K7	4	#4	STR	5'-11"	16
K8	16	#4	STR	2'-8"	29
K9	6	#4	STR	6'-8"	27
K10	14	#4	STR	16'-6"	154
* L1	50	#4	1	11'-11"	398
* L2	50	#4	1	12'-0"	401
S1	21	#4	4	17'-2"	241
S2	150	#4	2	2'-9"	276
* U1	50	#4	3	15'-0"	501
U2	12	#4	3	17'-2"	138
U3	6	#4	3	10'-6"	42
REINFORCING STEEL	35,923 LBS.				
EPOXY COATED REINFORCING STEEL	31,817 LBS.				

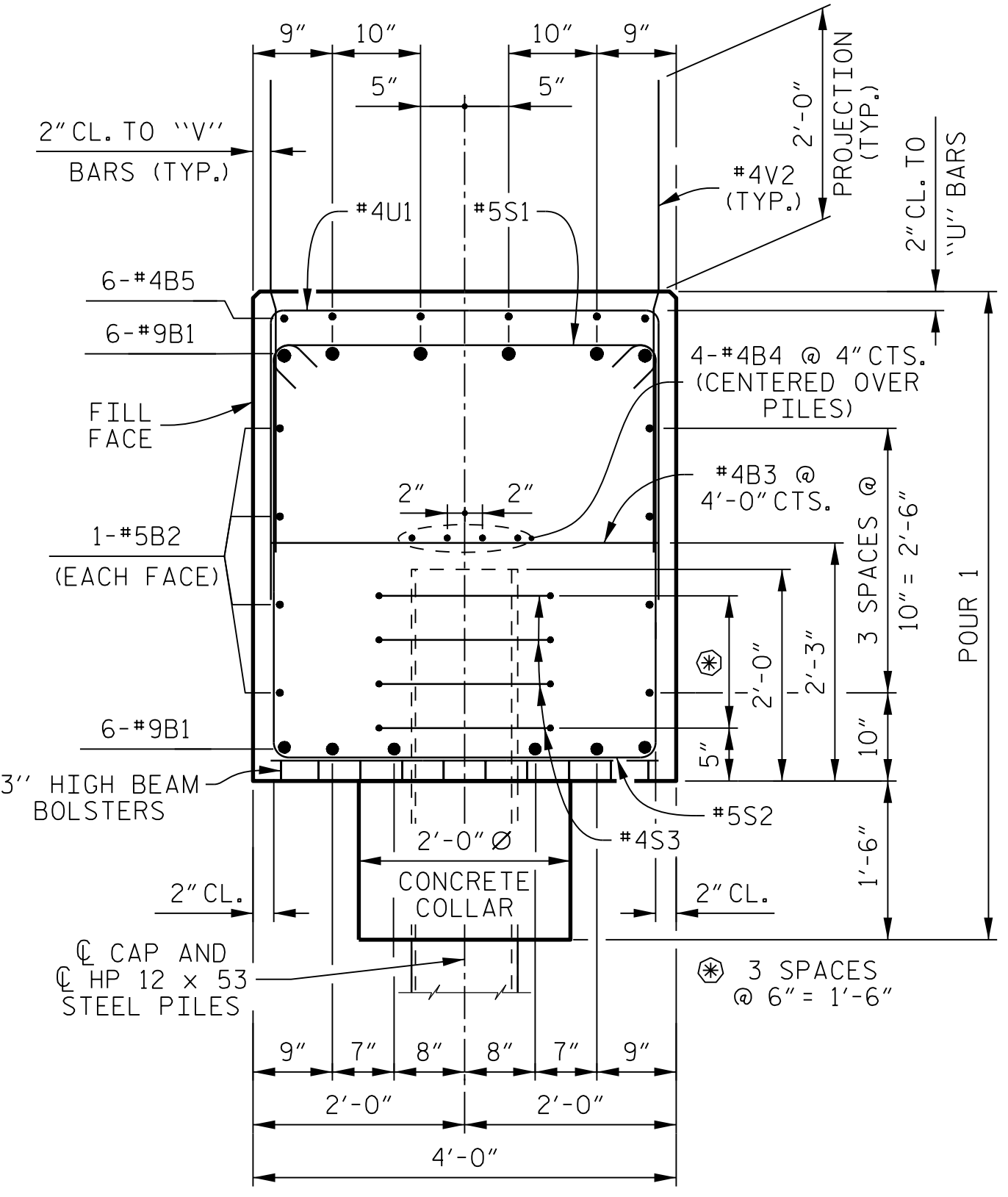
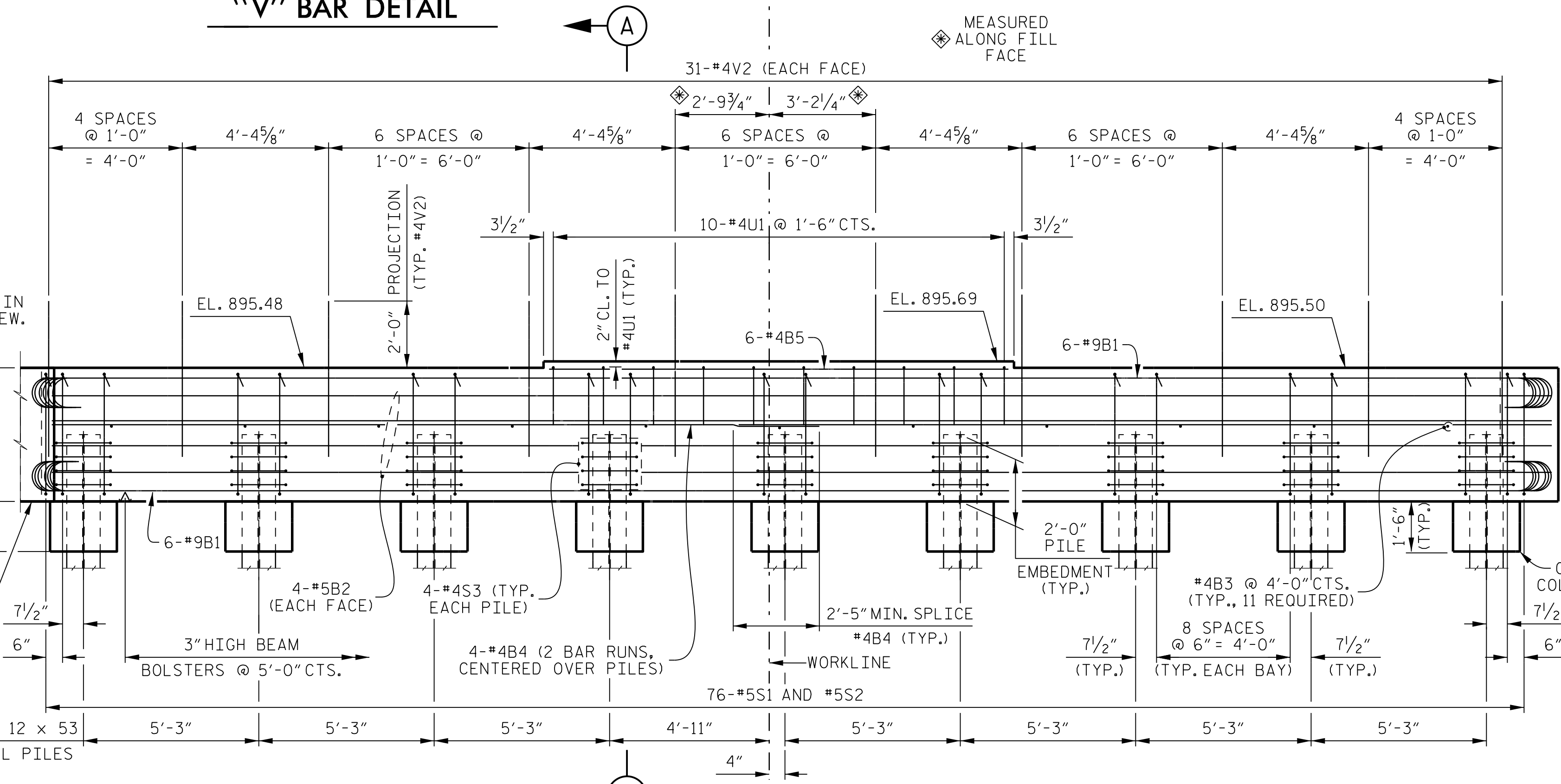
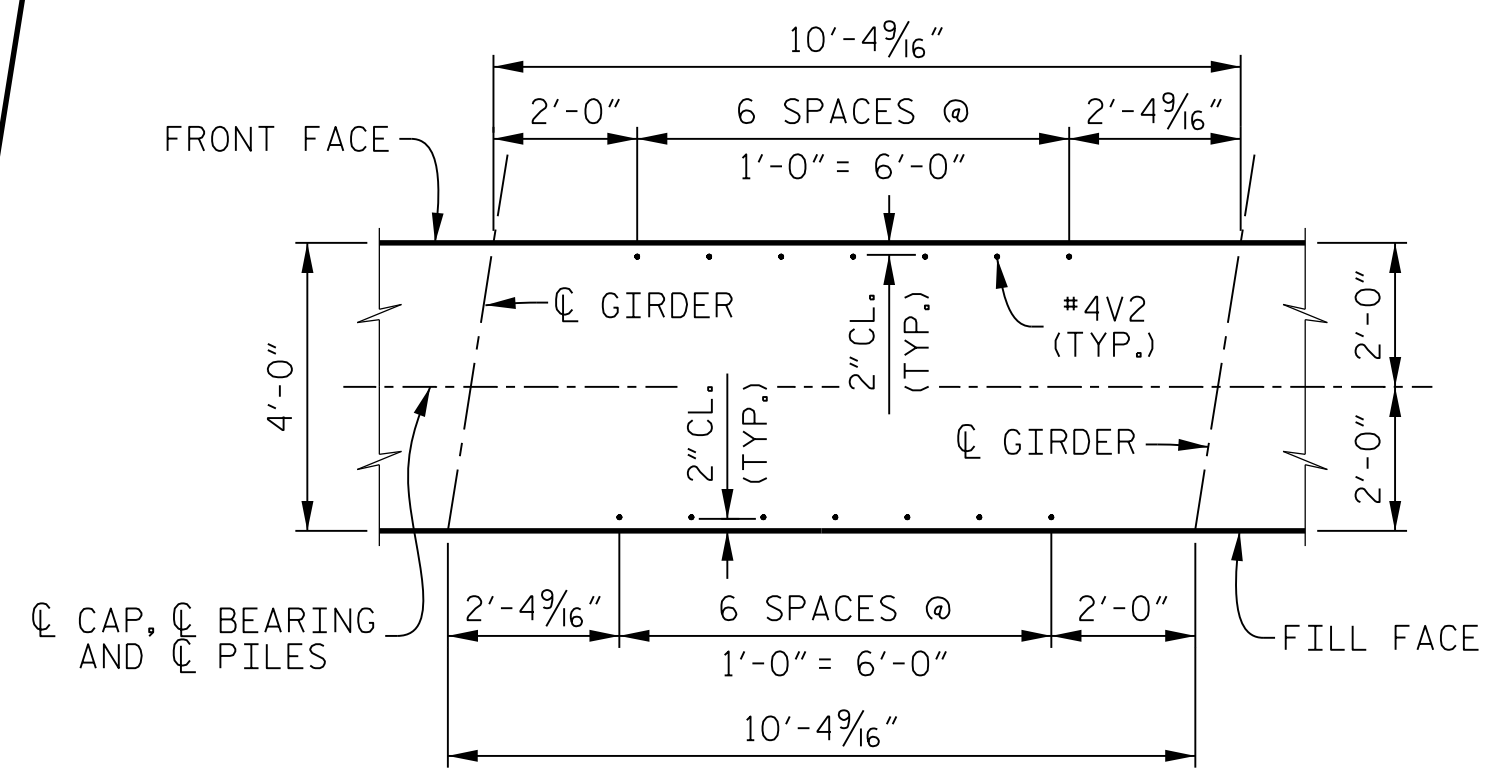
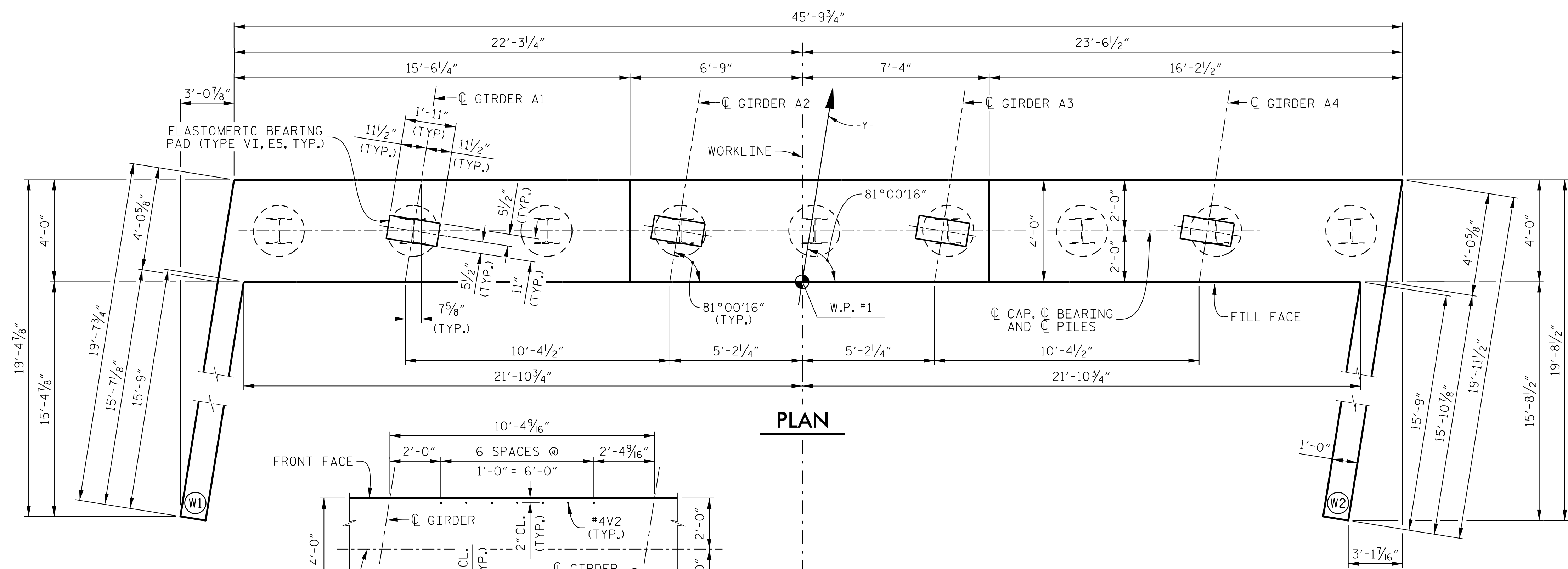
PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27 + 40.75 -L-**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
BILL OF MATERIAL					
REVISIONS					SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					27

PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

3/6/2015

DRAWN BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15



**NOTES**

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

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4V2 BARS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 2 OF 2.

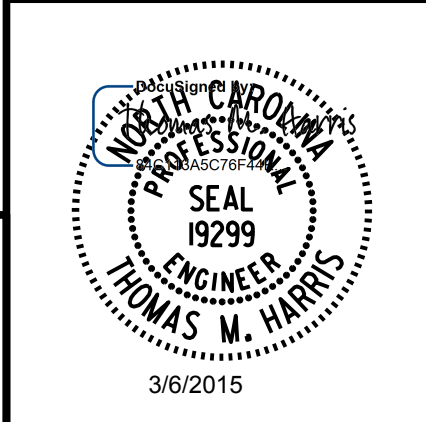
NOTE:  
WINGS NOT SHOWN IN THE ELEVATION VIEW.

PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27 + 40.75 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**  
**END BENT 1**

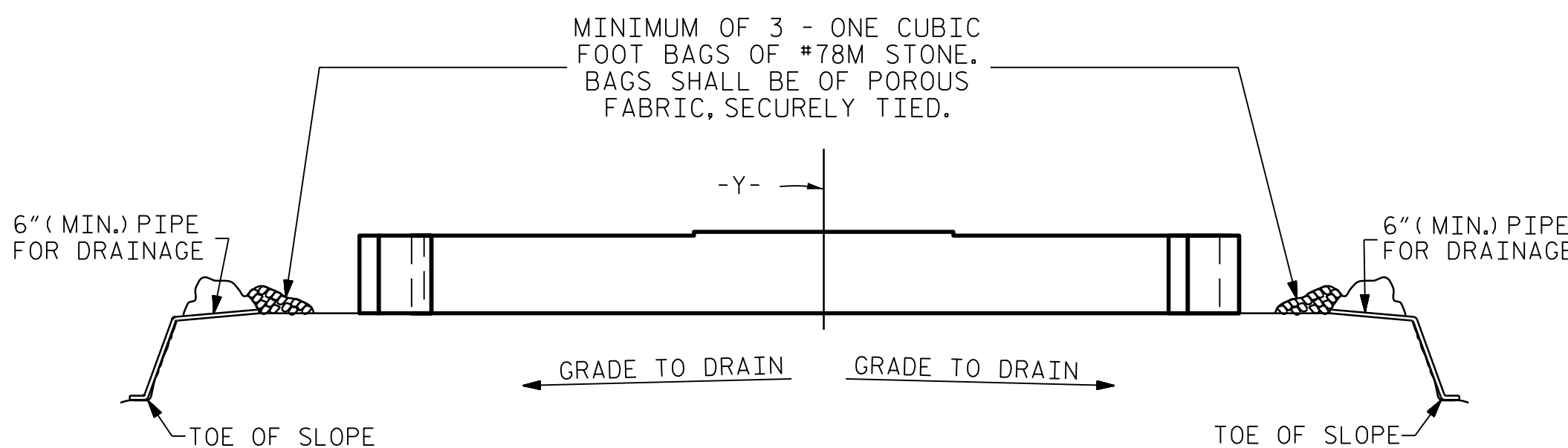


PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY : K. E. LOFTON DATE : 11-14  
 CHECKED BY : T. M. HARRIS DATE : 1-15  
 DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

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

TOTAL SHEETS: 27

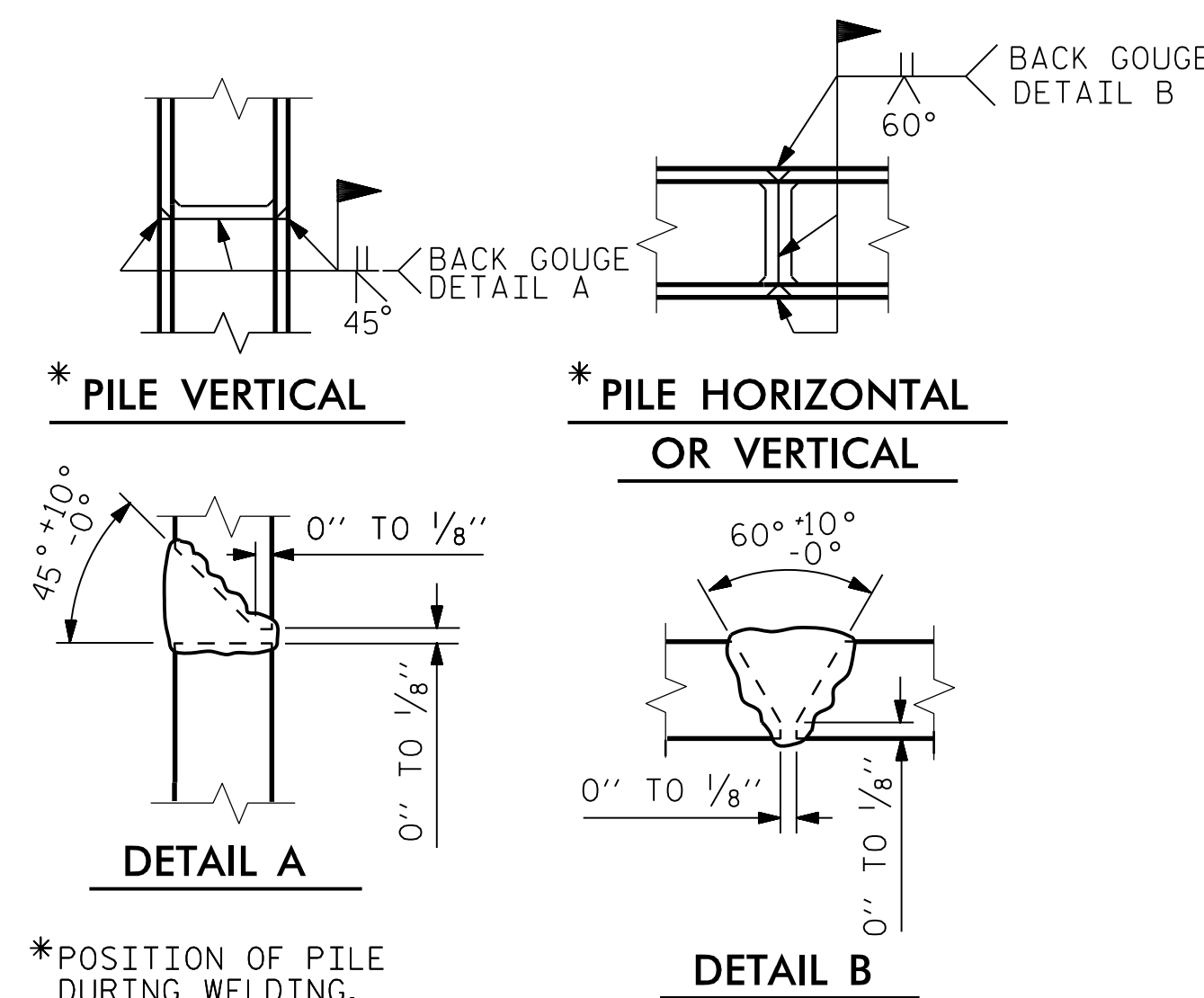


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

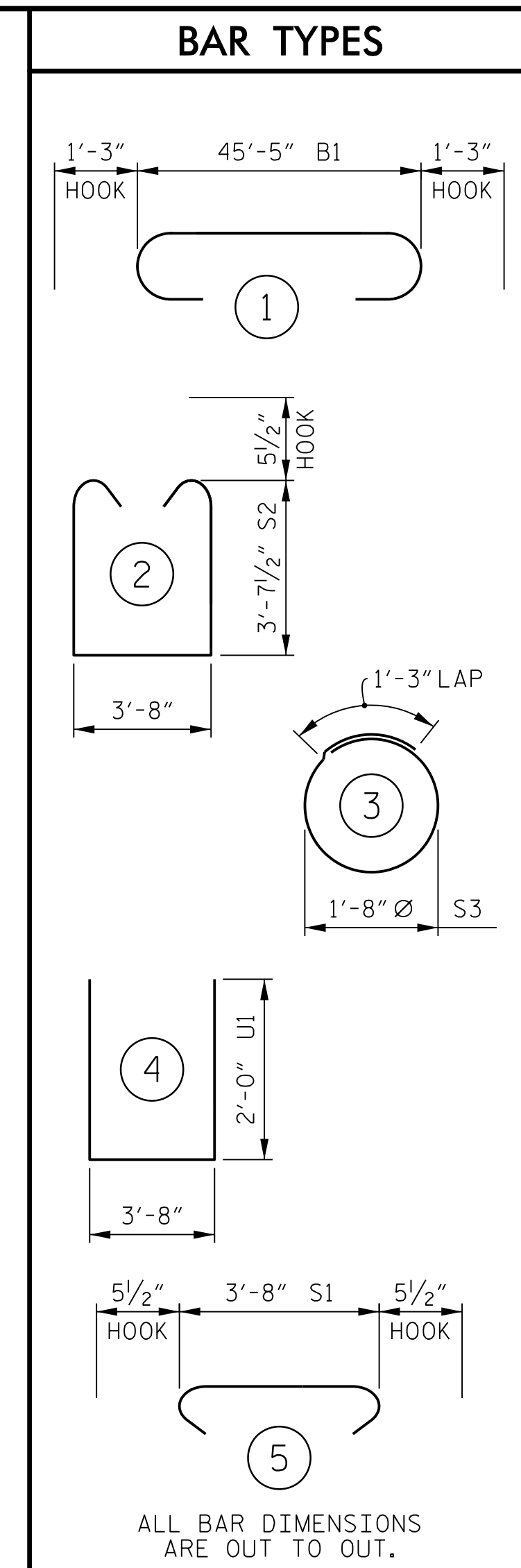
NO SEPARATE PAYMENT SHALL BE MADE FOR THIS WORK AND ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

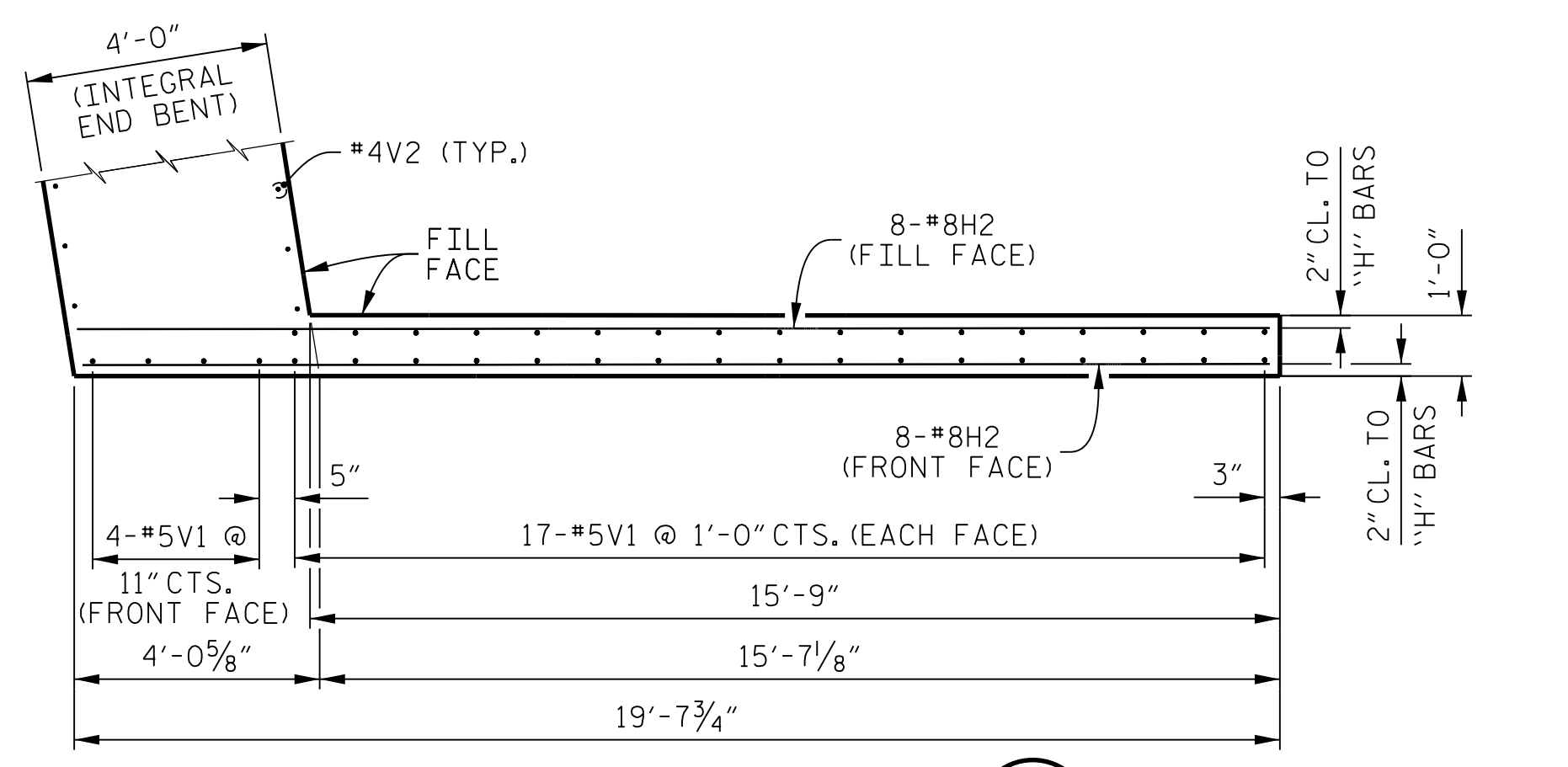


\* POSITION OF PILE DURING WELDING.

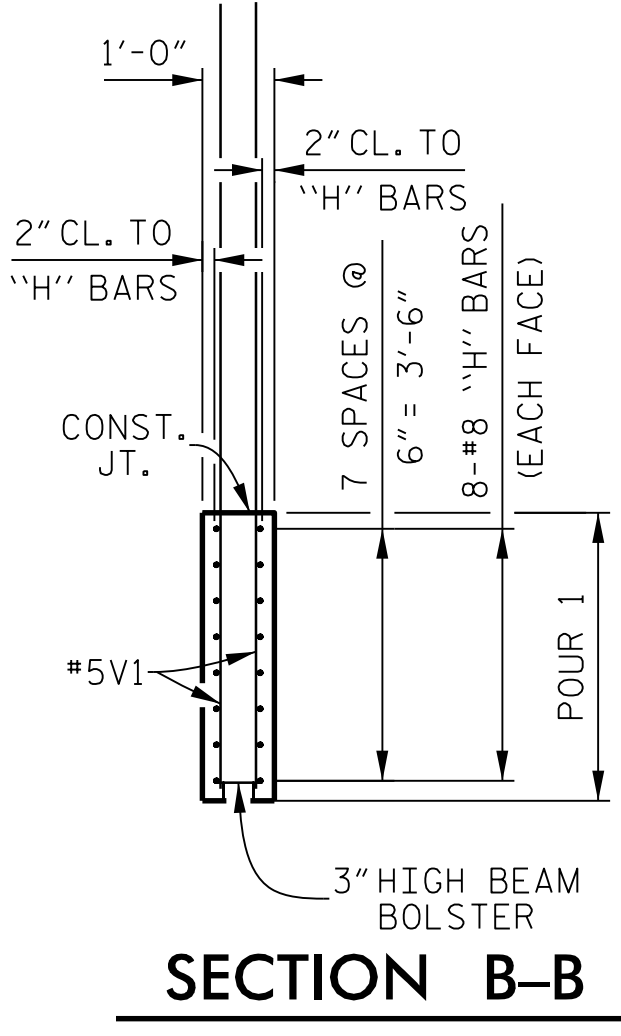
PILE SPICE DETAILS



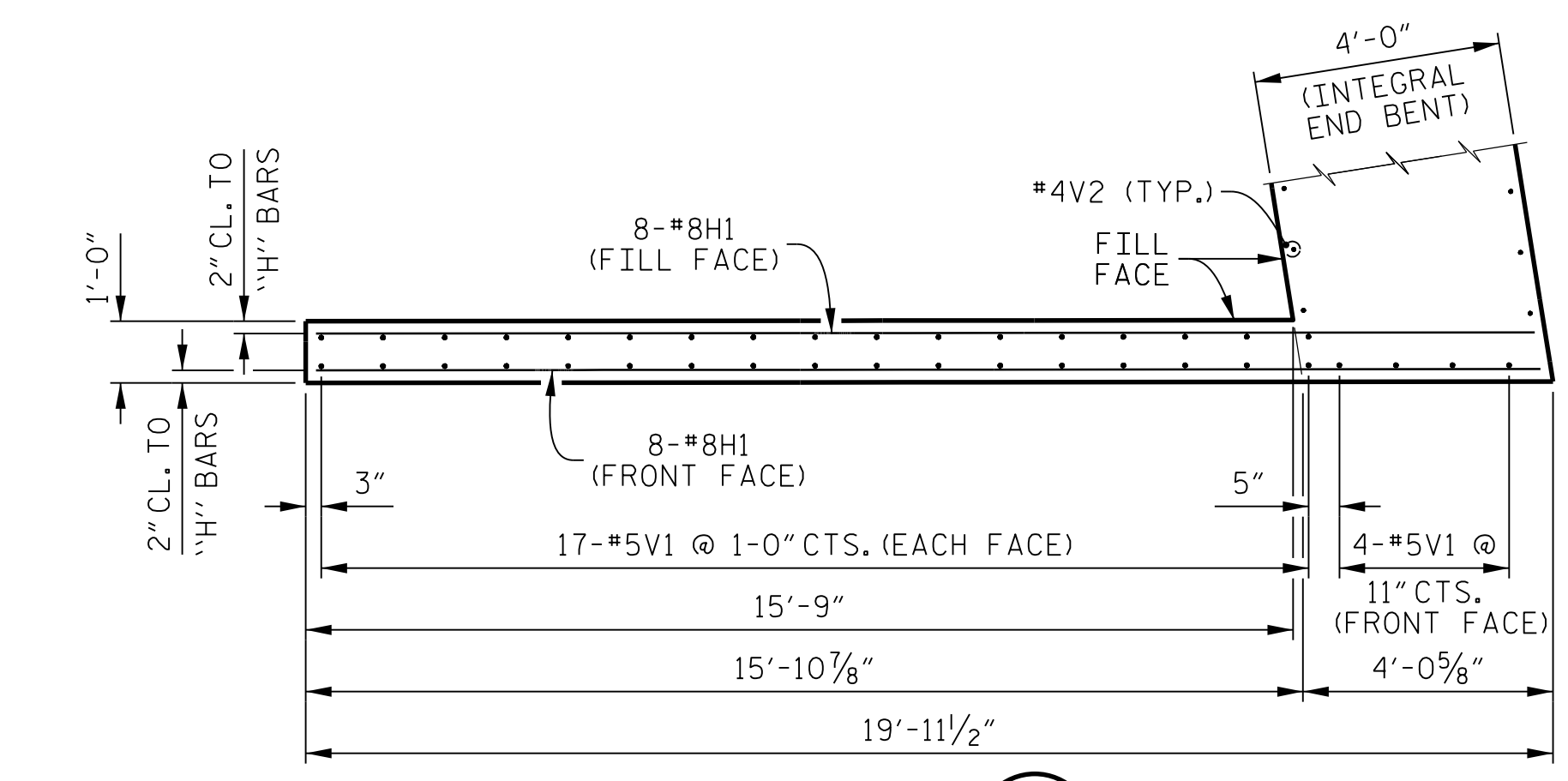
BILL OF MATERIAL table with columns for BAR No., SIZE, TYPE, LENGTH, WEIGHT, and REINFORCING STEEL (6,762 LBS.).



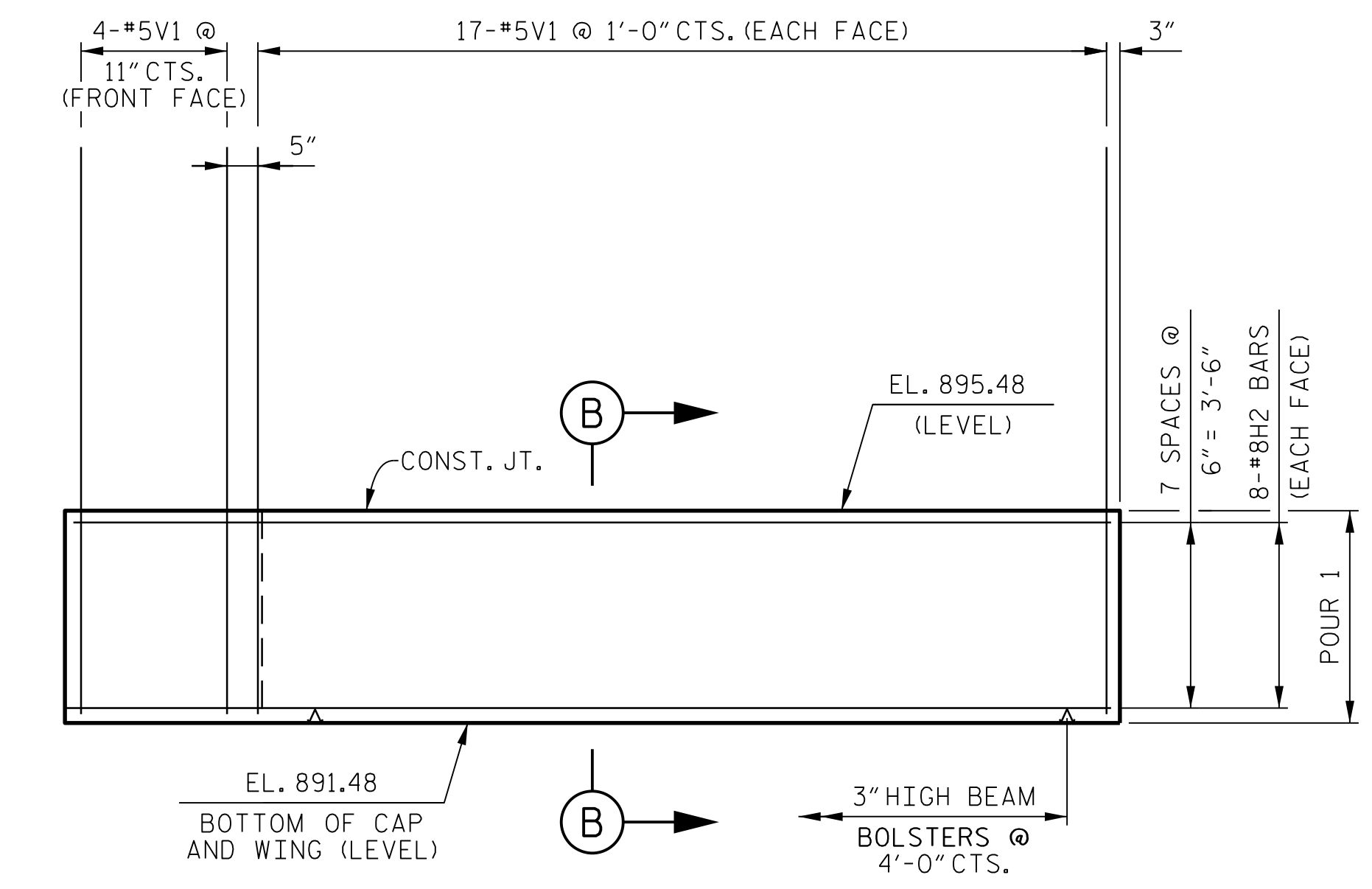
PLAN OF WING W1



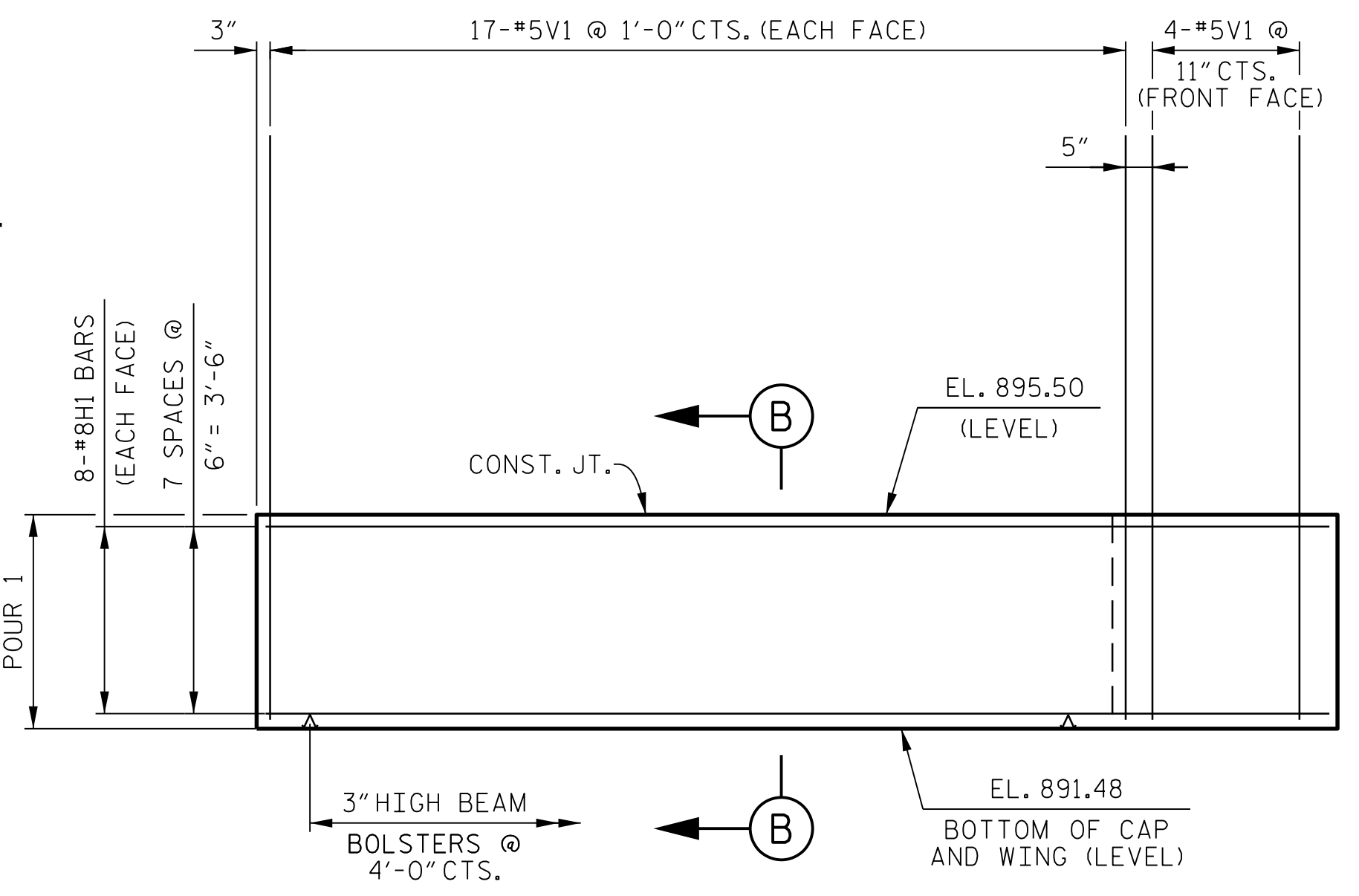
SECTION B-B



PLAN OF WING W2



ELEVATION OF WING W1



ELEVATION OF WING W2

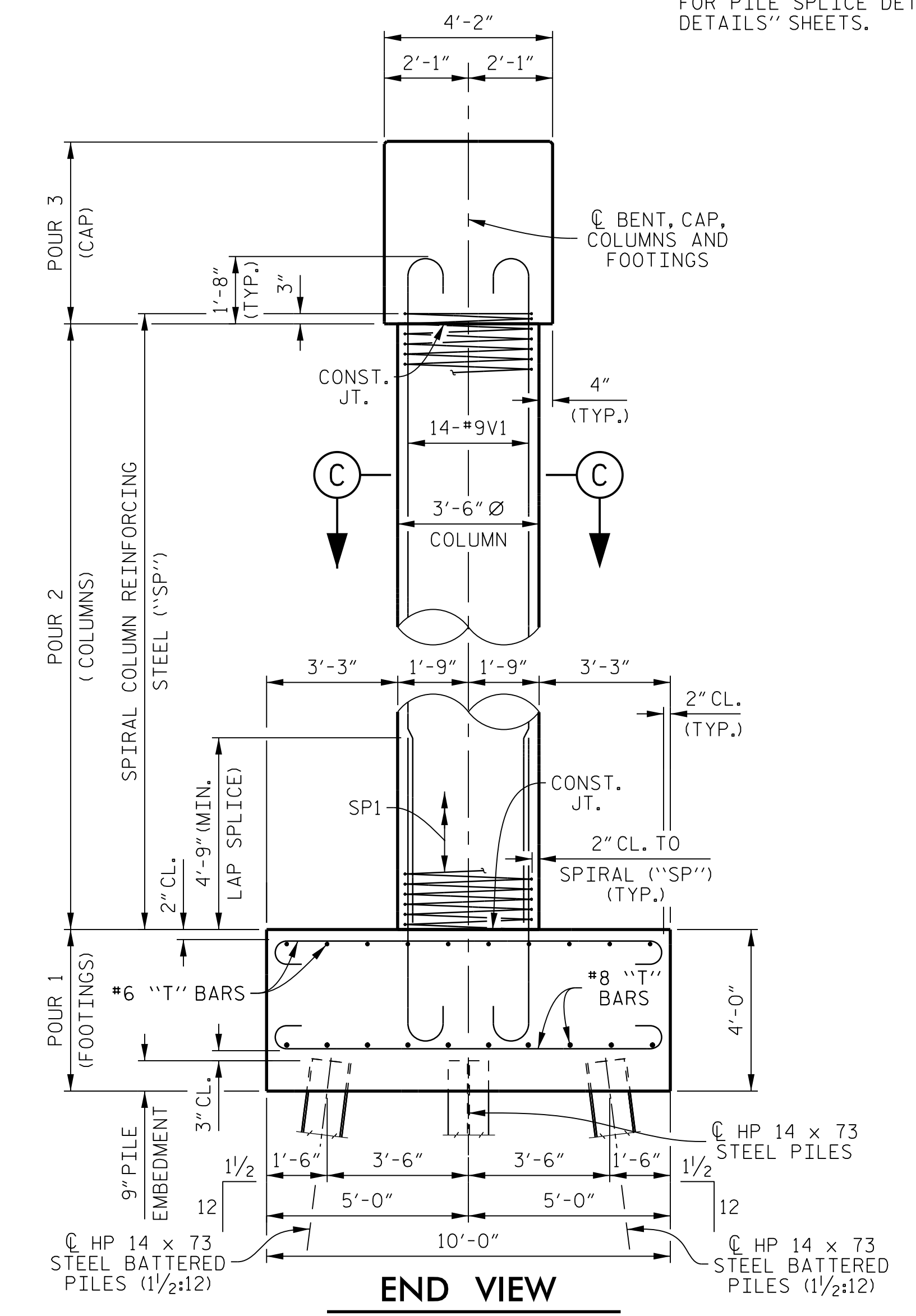
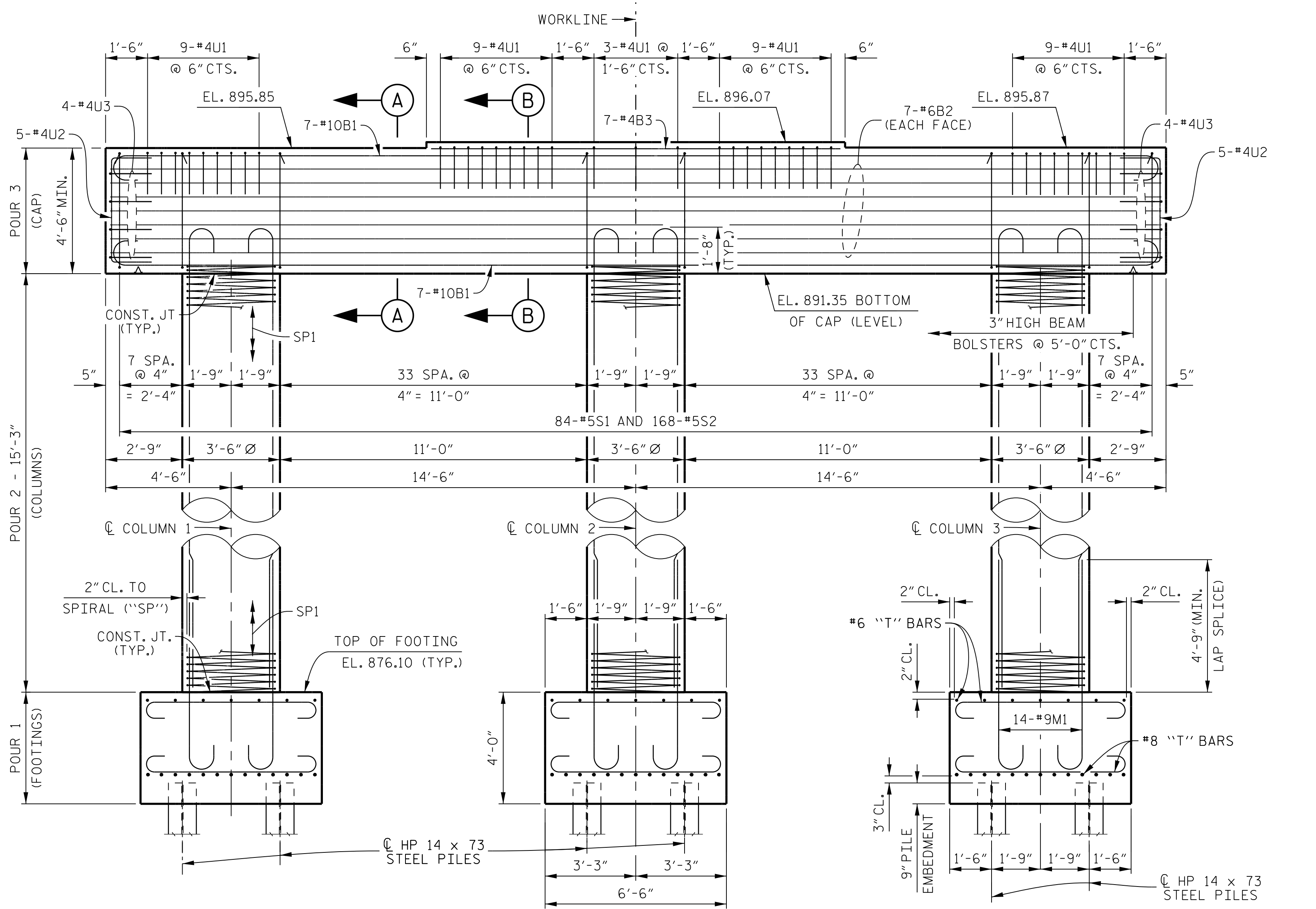
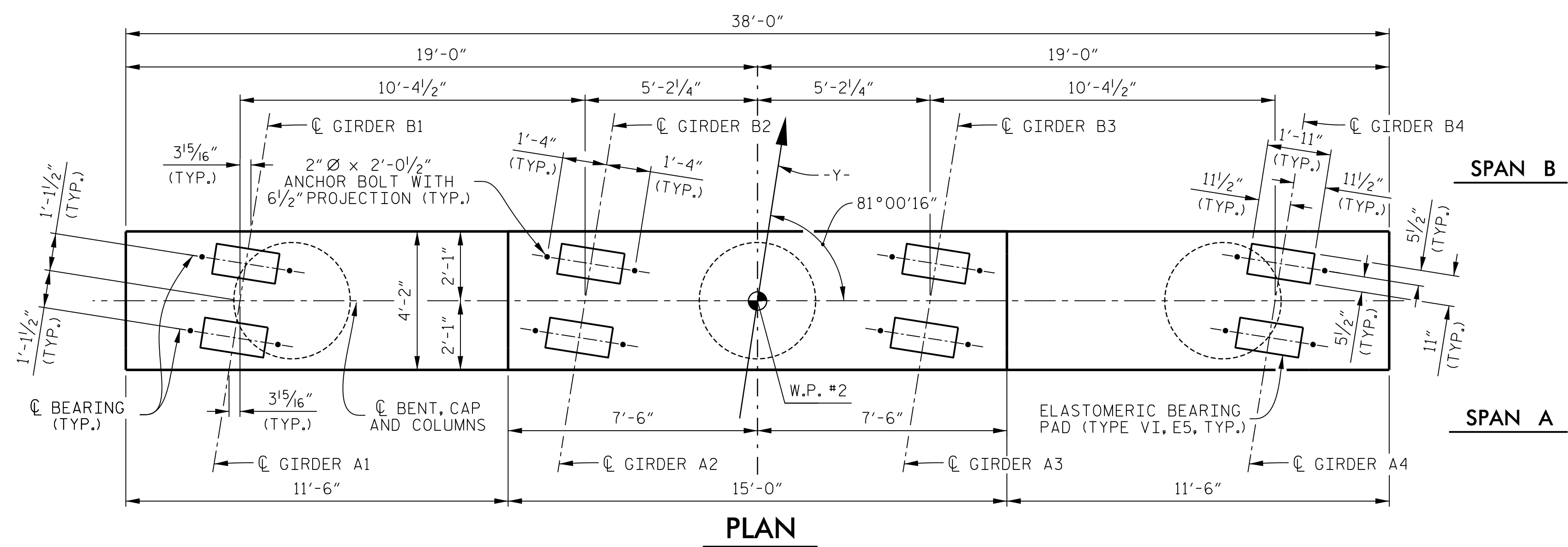
PROJECT NO. U-2524BC, GUILFORD COUNTY, STATION: 27 + 40.75 -L-

DEPARTMENT OF TRANSPORTATION SUBSTRUCTURE END BENT 1 table with REVISIONS and SHEET No. S01-20.

PARSONS logo and contact information for K. E. LOFTON, T. M. HARRIS, and design details.

Professional Engineer Seal for Thomas M. Harris, No. 19299, State of North Carolina.

Vertical text on the left margin: FILE: I:\... DATE: 3/6/2015



**NOTES**

- STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR SECTION VIEWS, SEE SHEET 2 OF 2.
- FOR END OF CAP DETAIL, SEE SHEET 2 OF 2.
- FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS" SHEETS.

DIMENSIONS, PILES AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND FOOTINGS.

PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27 + 40.75 -L-**  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

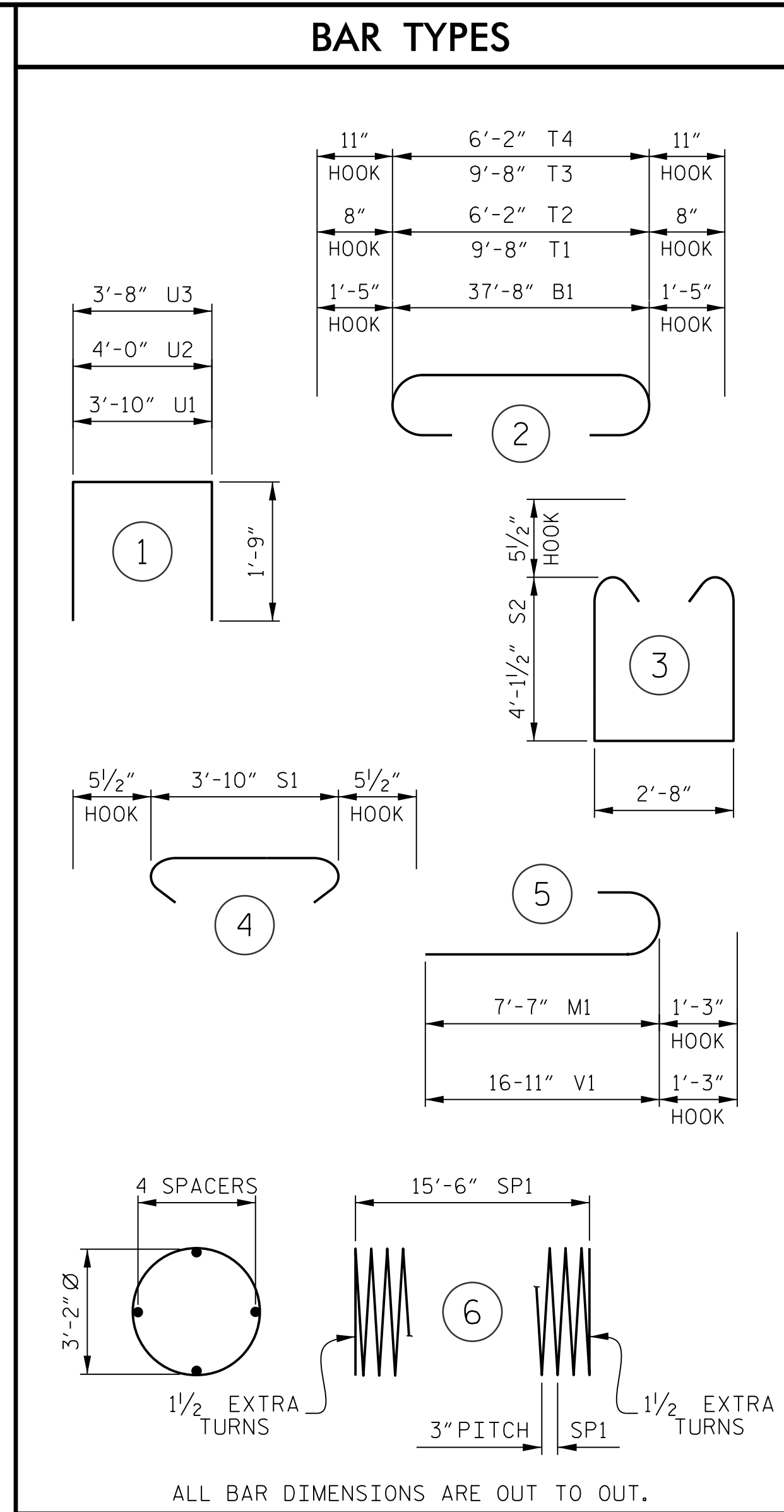
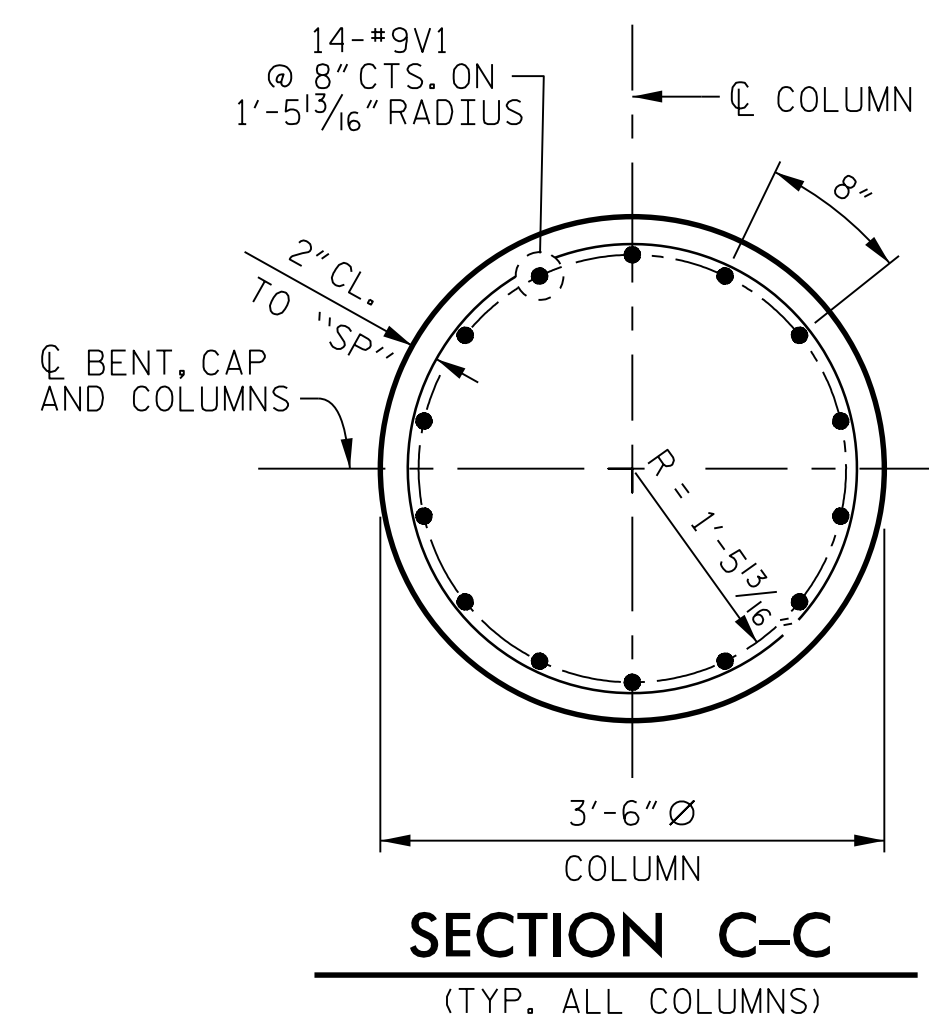
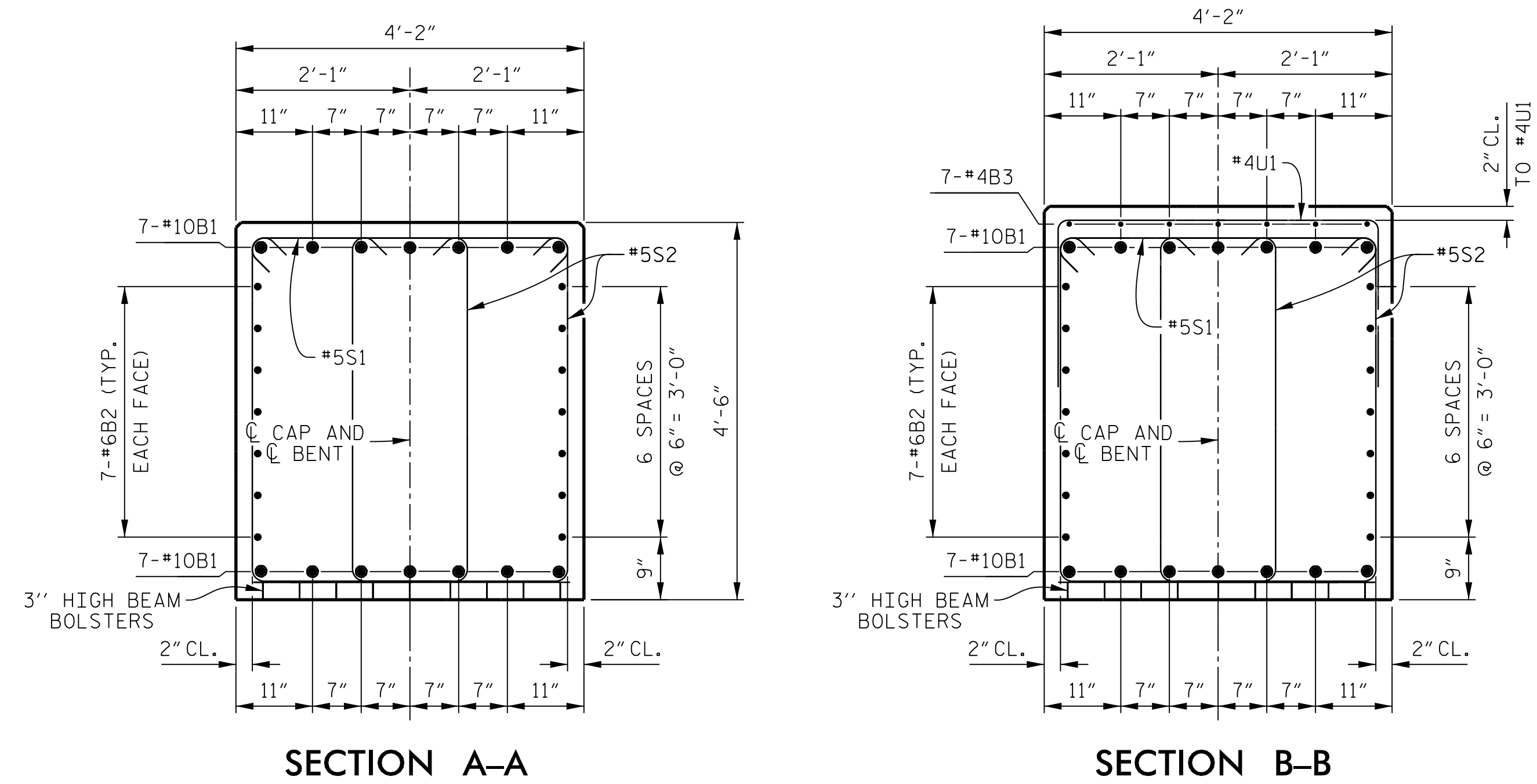
**BENT 1**



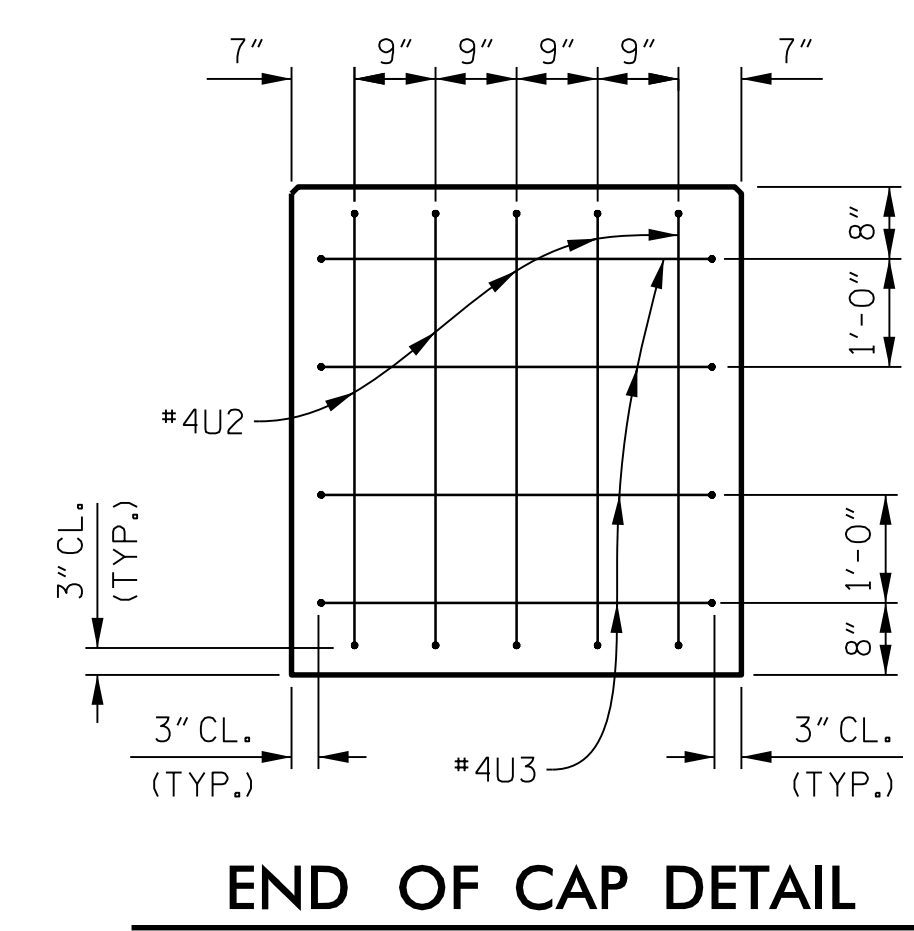
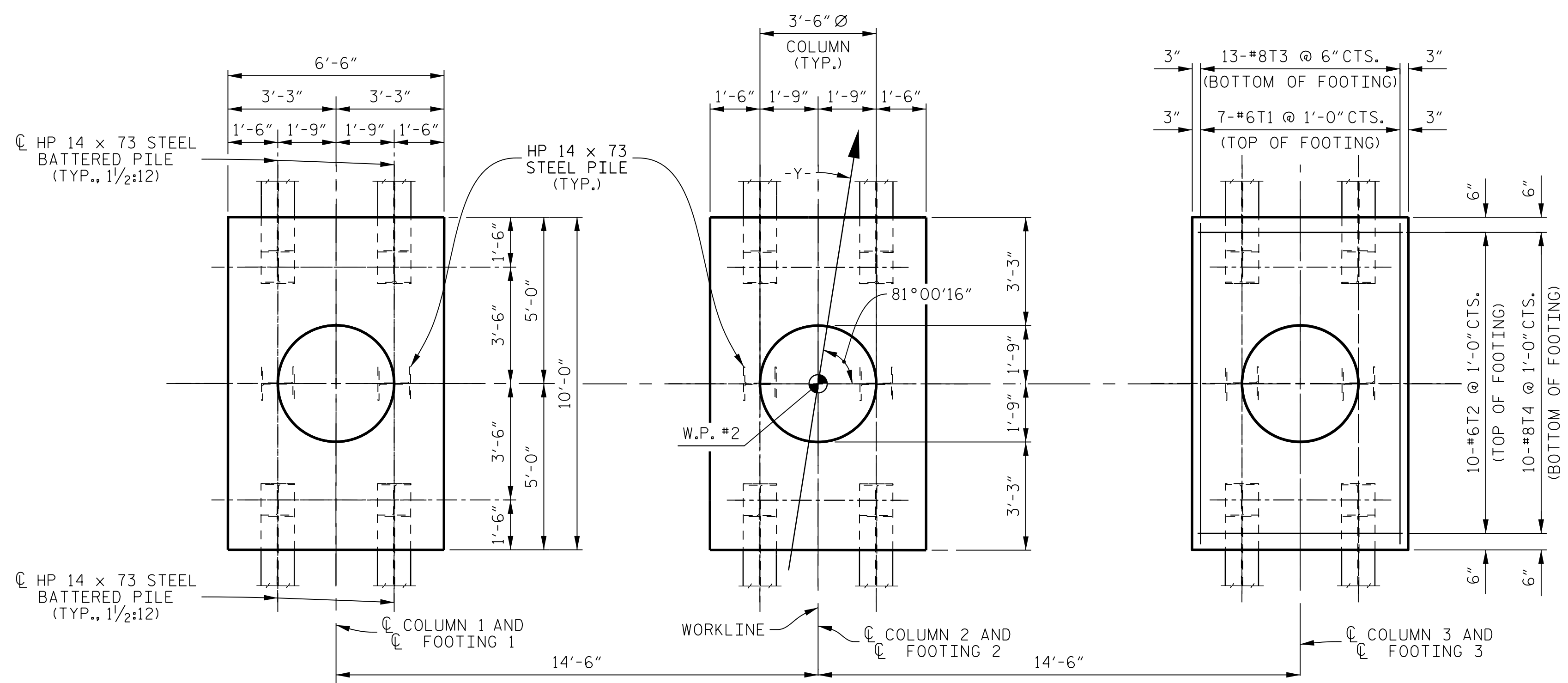
PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246

DRAWN BY: **K. E. LOFTON** DATE: **11-14**  
 CHECKED BY: **T. M. HARRIS** DATE: **1-15**  
 DESIGN ENGINEER: **T. M. HARRIS** DATE: **2-15**

REVISIONS						SHEET No. S01-21
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			



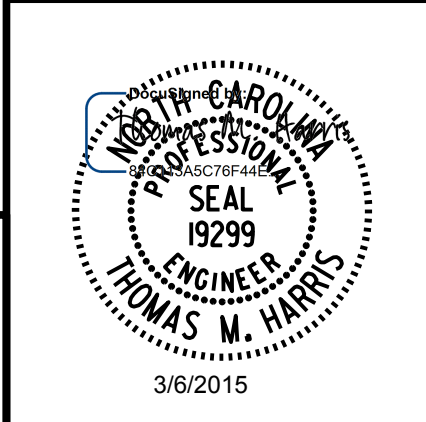
BILL OF MATERIAL					
BENT 1					
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
B1	14	#10	2	40'-6"	2,440
B2	14	#6	STR	37'-8"	792
B3	7	#4	STR	14'-8"	69
M1	42	#9	5	8'-10"	1,261
S1	84	#5	4	4'-9"	416
S2	168	#5	3	11'-10"	2,073
U1	39	#4	1	7'-4"	191
U2	10	#4	1	7'-6"	50
U3	8	#4	1	7'-2"	38
T1	21	#6	2	11'-0"	347
T2	30	#6	2	7'-6"	338
T3	39	#8	2	11'-6"	1,197
T4	30	#8	2	8'-0"	641
V1	42	#9	5	18'-2"	2,594
REINFORCING STEEL				12,447	LBS.
SP1	3	**	6	638'-5"	1,279
SPIRAL COLUMN REINFORCING STEEL				1,279	LBS.
CLASS "A" CONCRETE					
POUR 3	CAP			26.9	CU. YDS.
POUR 2	COLUMNS			16.3	CU. YDS.
POUR 1	FOOTINGS			28.9	CU. YDS.
TOTAL				72.1	CU. YDS.
HP 14 x 73 STEEL PILES				18	REQUIRED
				855.0	LIN. FT.
FOUNDATION EXCAVATION					LUMP SUM



**PLAN OF FOOTINGS**  
DIMENSIONS, PILES AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND FOOTINGS.

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27 + 40.75 -L-**  
 SHEET 2 OF 2

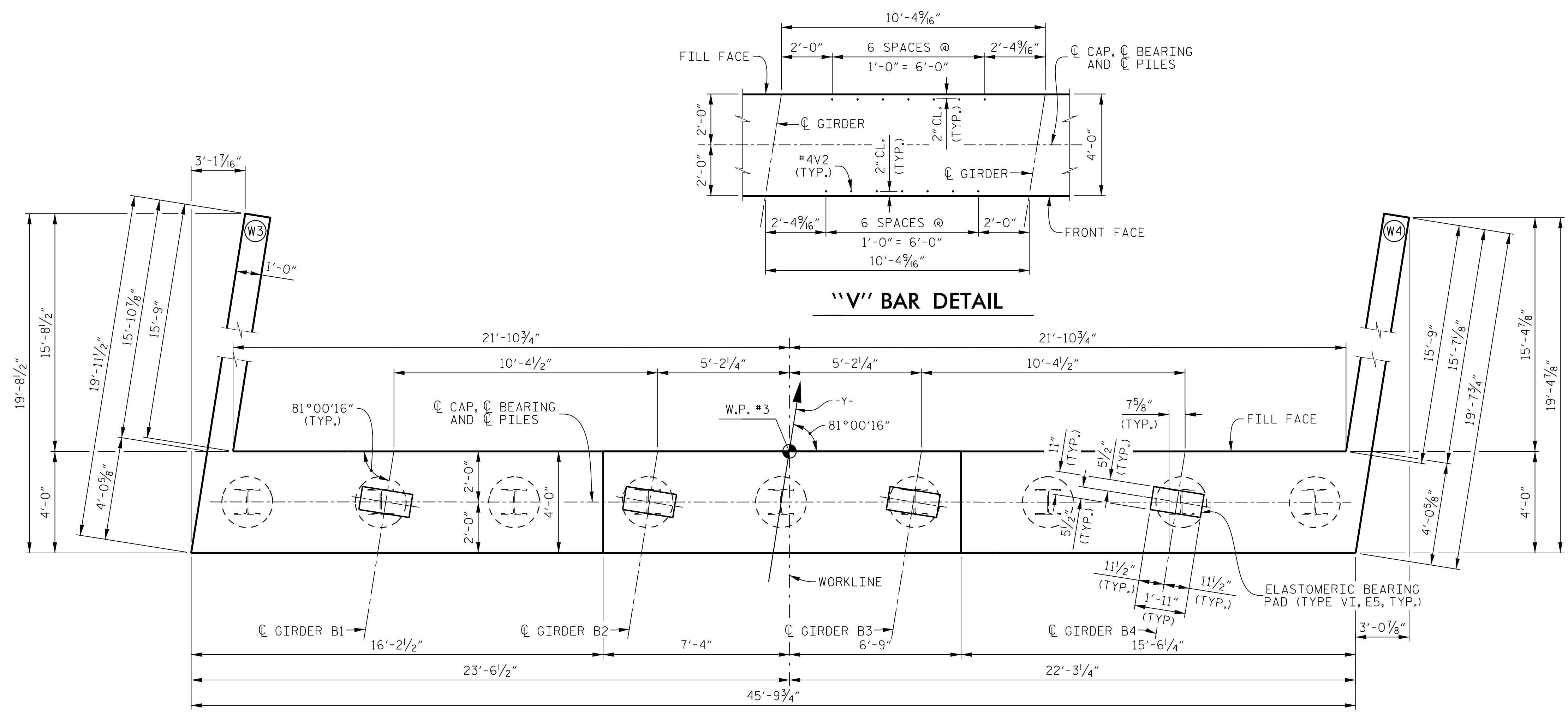
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
REVISIONS					
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 11-14  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15





**NOTES**

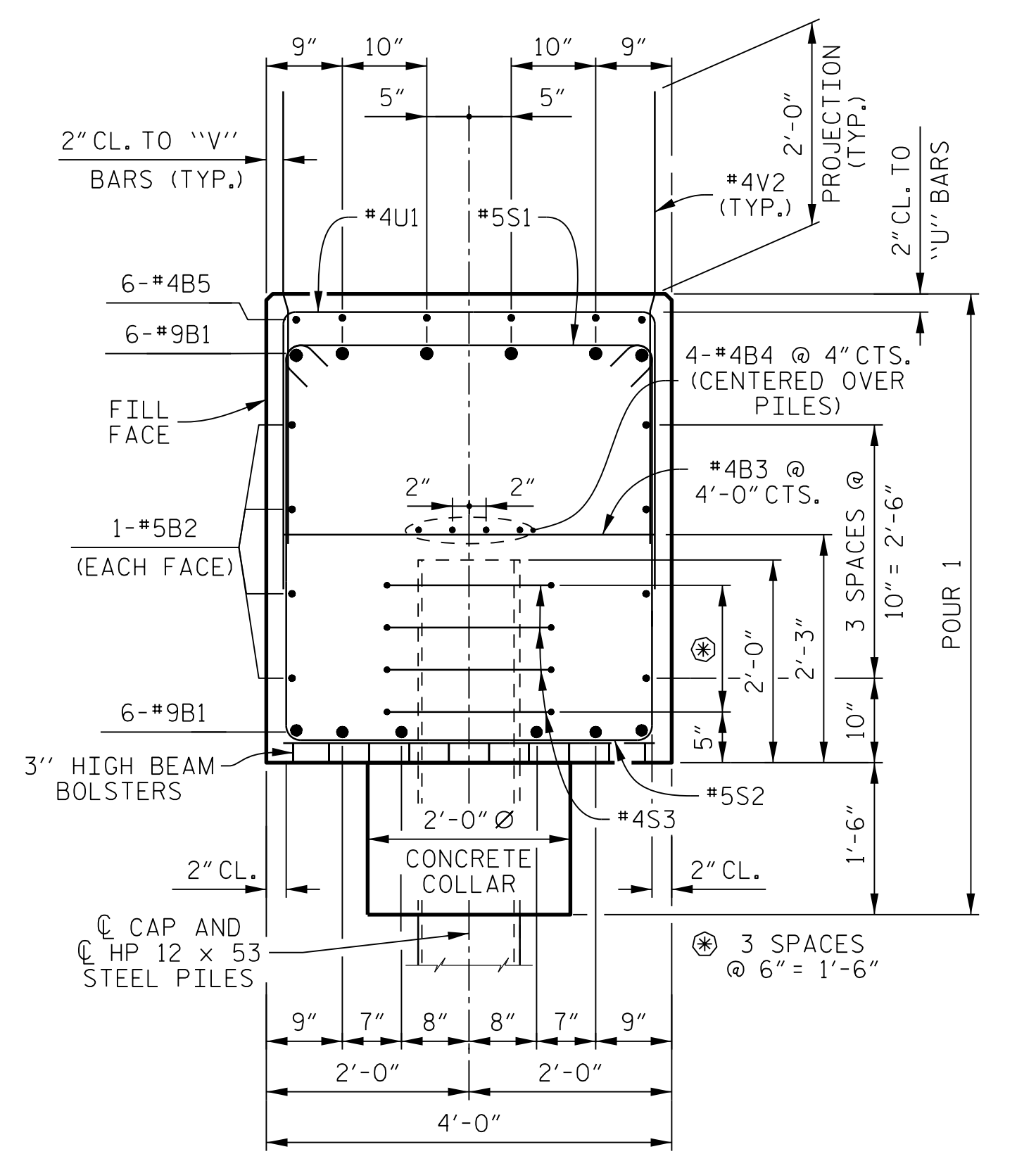
THE UPPER PORTION OF THE INTEGRAL END BENT CAP AND THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4V2 BARS.

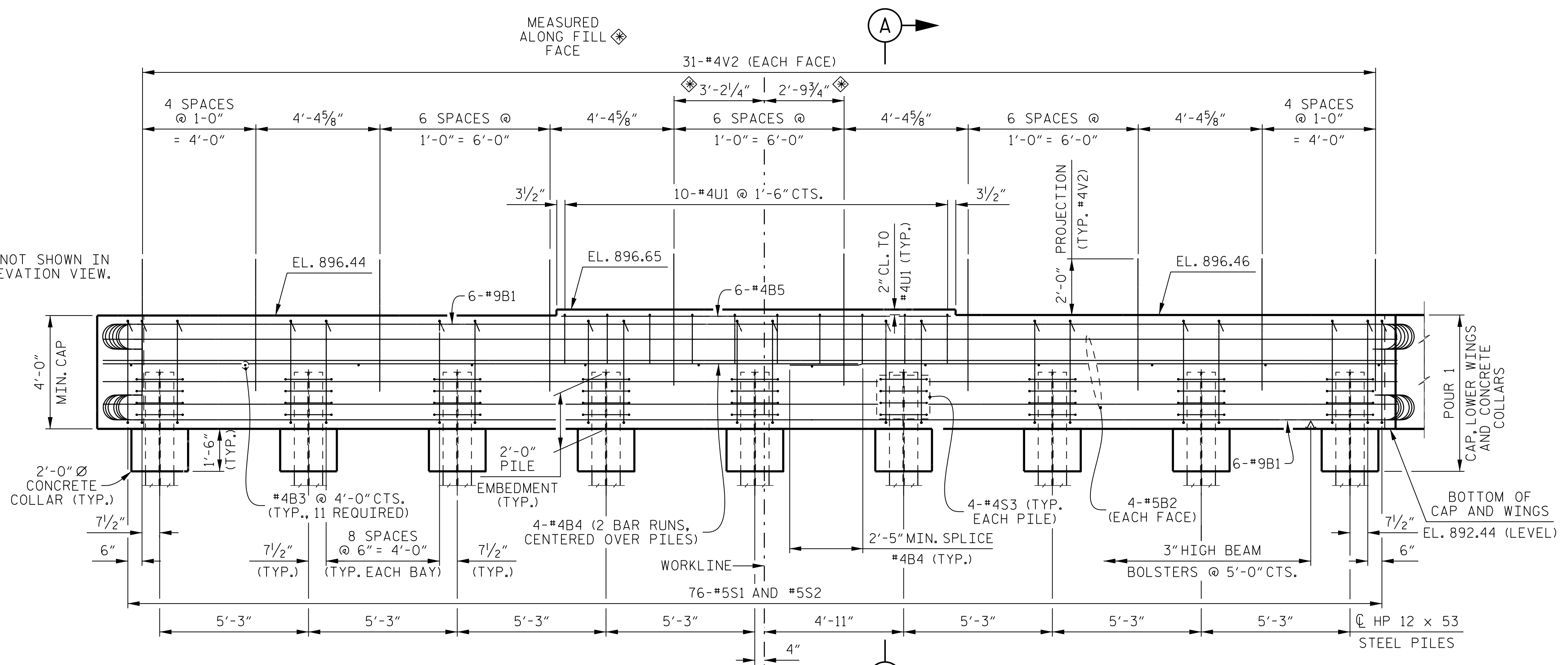
THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE SHEET 2 OF 2.

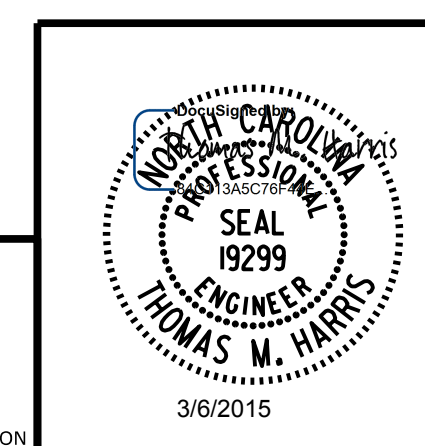


NOTE:  
WINGS NOT SHOWN IN THE ELEVATION VIEW.



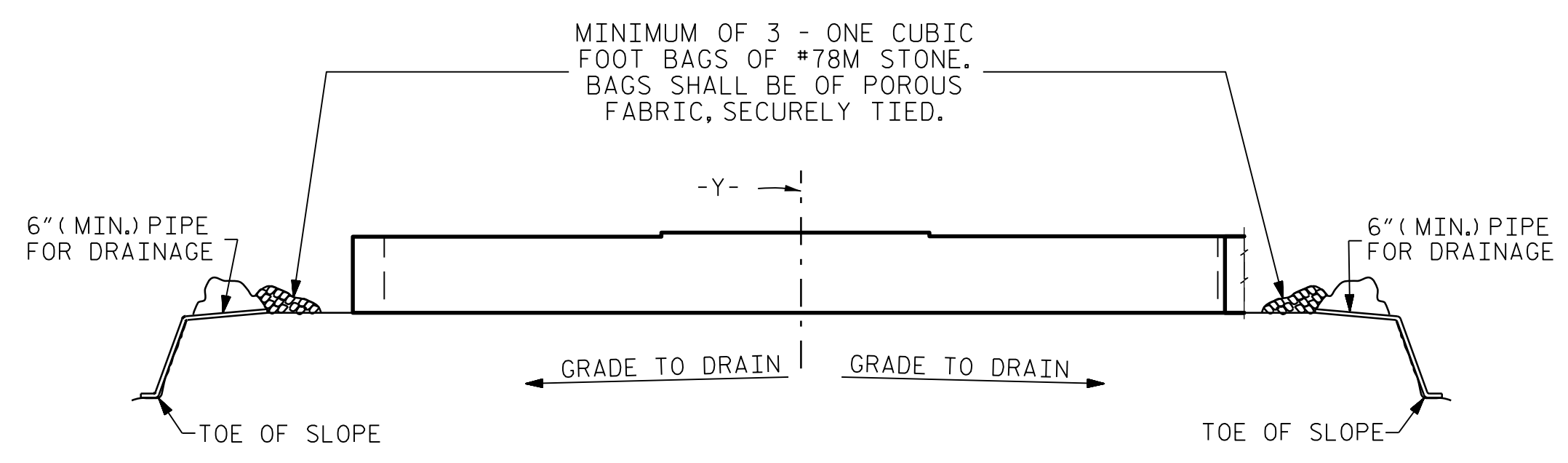
PROJECT NO. **U-2524BC**  
**GUILFORD COUNTY**  
 STATION: **27+40.75 -L-**  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>SUBSTRUCTURE</b>					
<b>END BENT 2</b>					
REVISIONS					
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
					SHEET No. <b>S01-23</b>
					TOTAL SHEETS <b>27</b>



PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 1-15  
 CHECKED BY: T. M. HARRIS DATE: 1-15  
 DESIGN ENGINEER: T. M. HARRIS DATE: 2-15

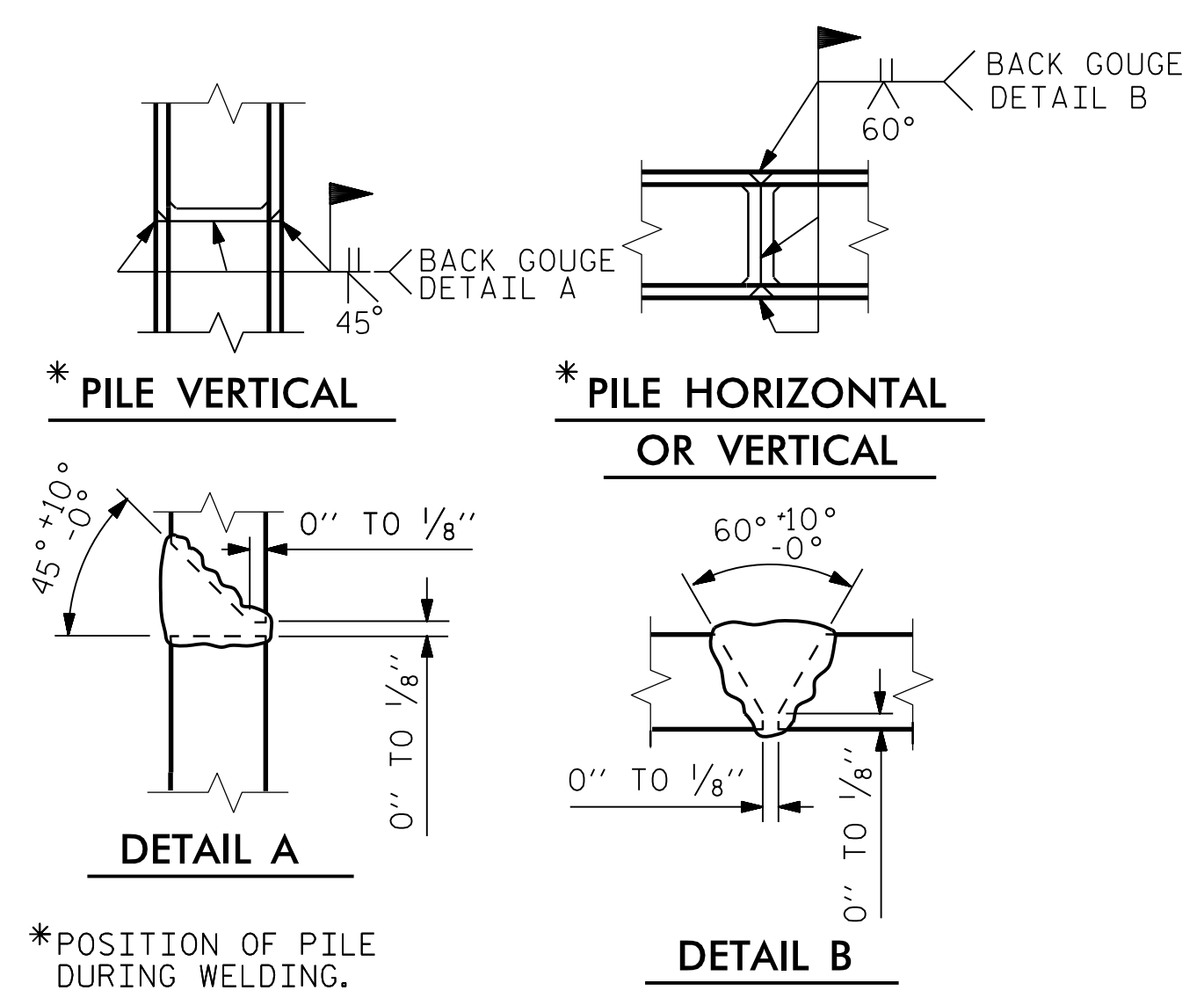


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

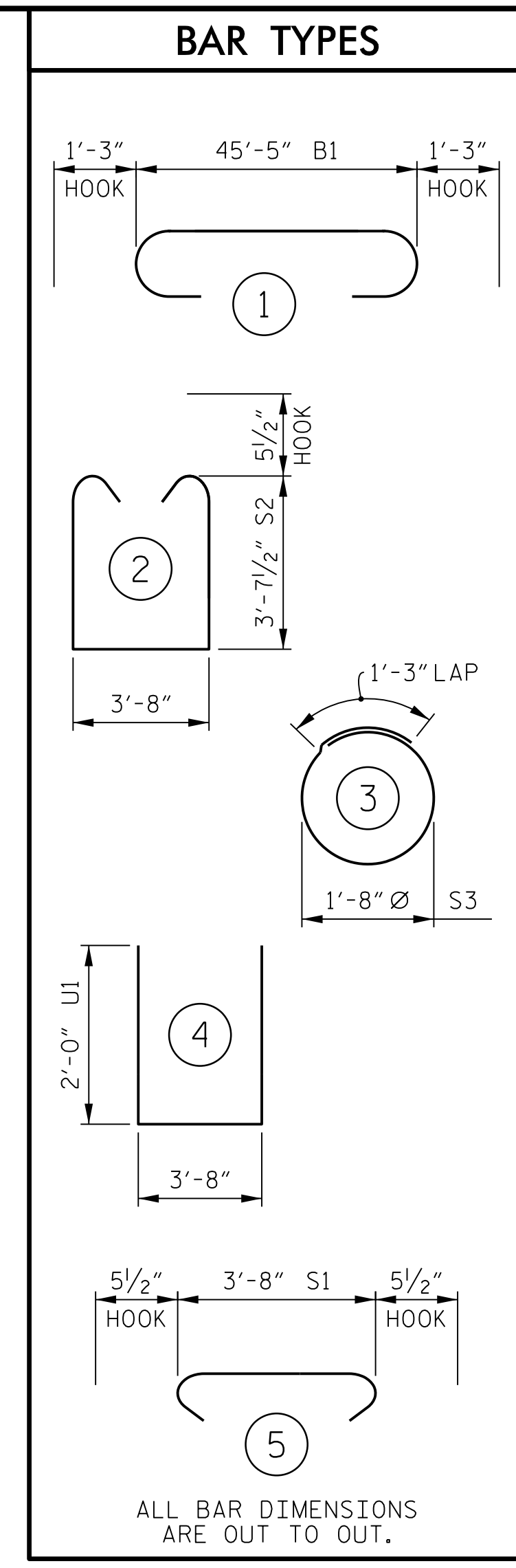
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

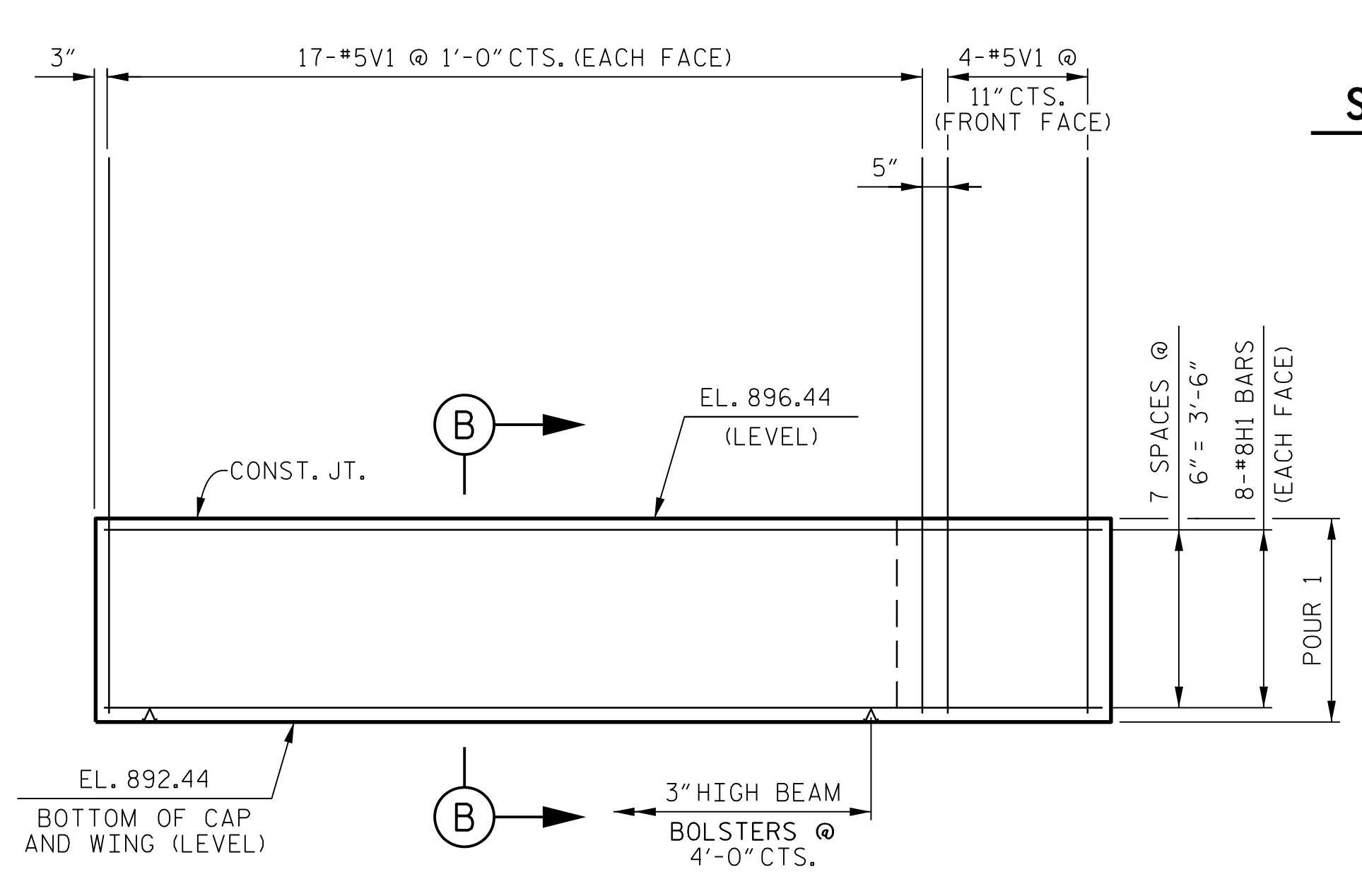
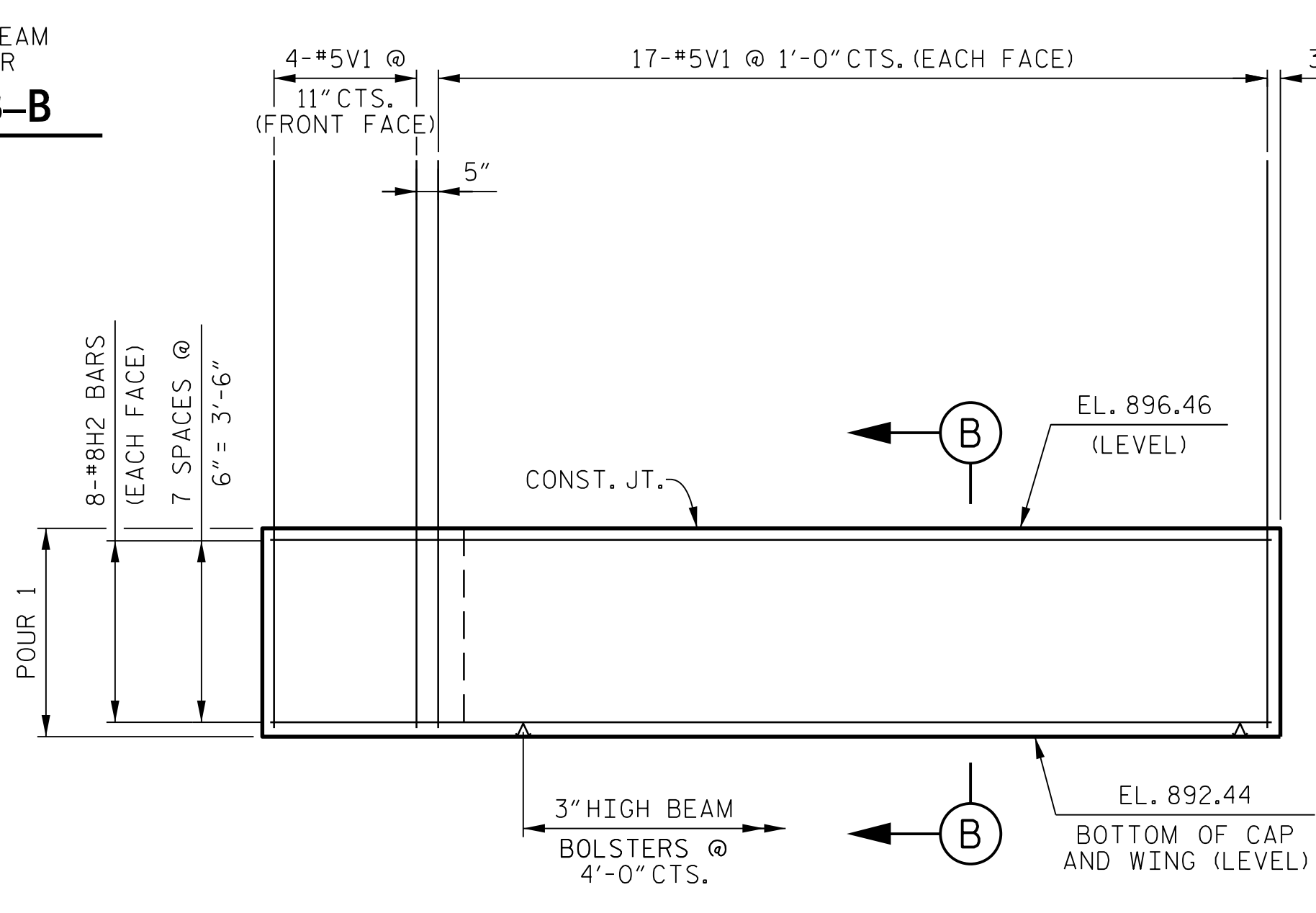
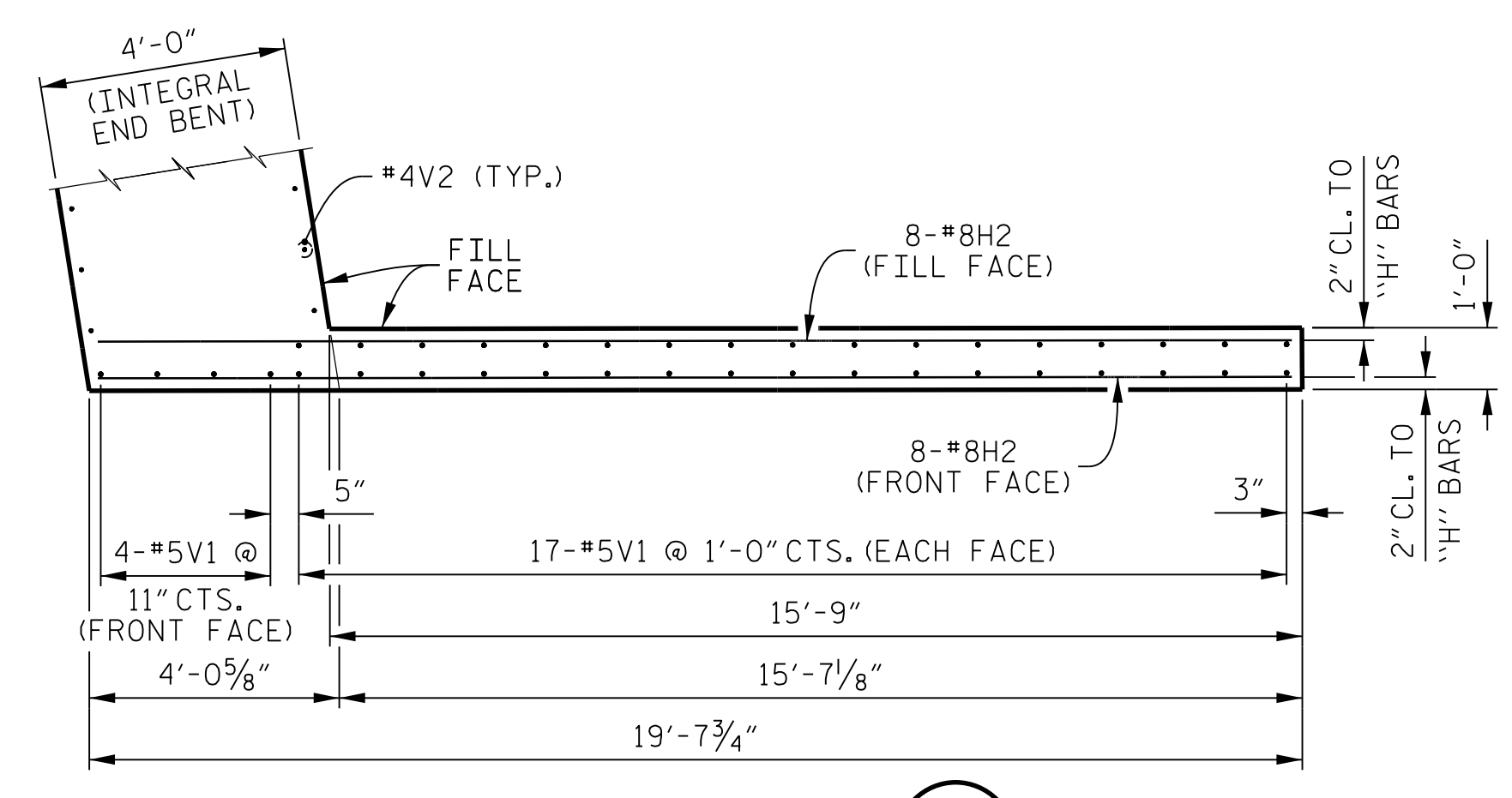
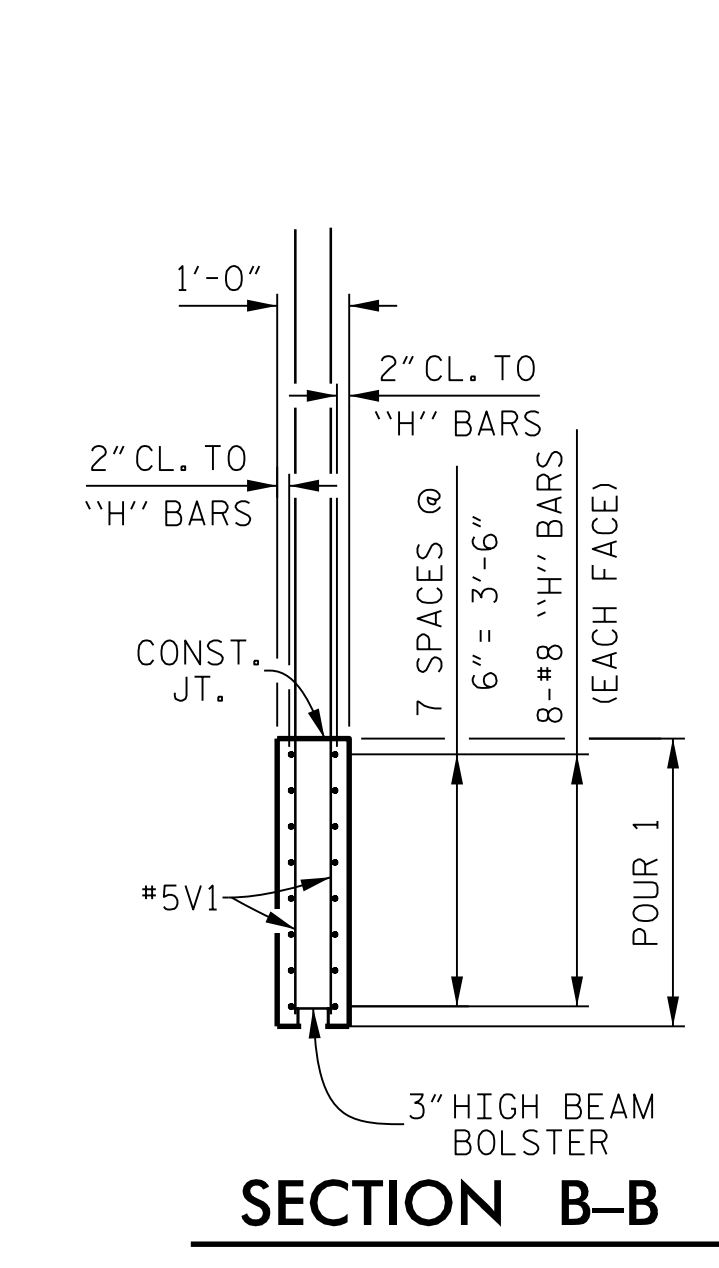
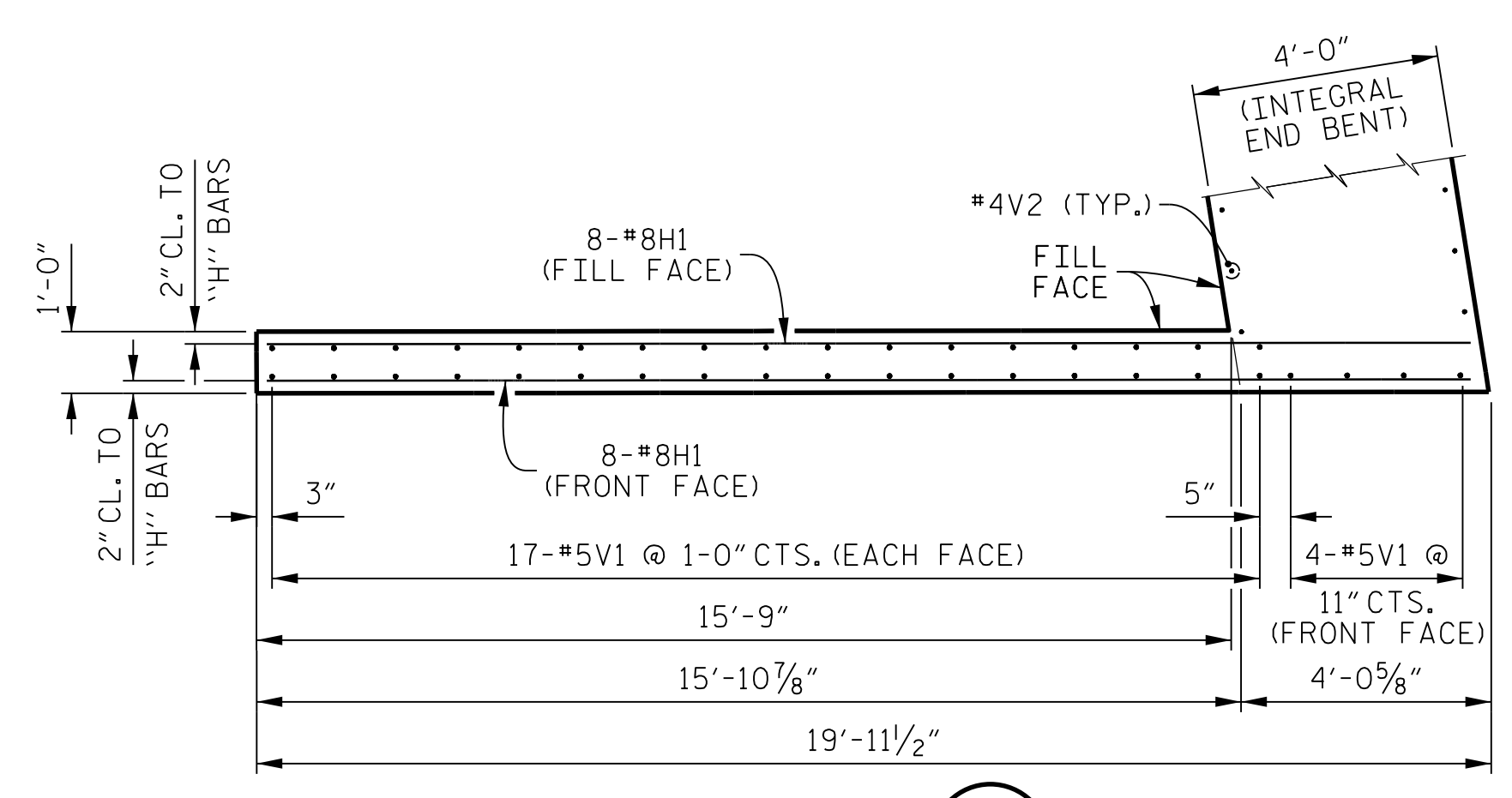
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPLICE DETAILS**



BILL OF MATERIAL		END BENT 2			
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#9	1	47'-11"	1,955	
B2	#5	STR	45'-5"	379	
B3	#4	STR	3'-8"	27	
B4	#4	STR	23'-11"	128	
B5	#4	STR	13'-9"	55	
H1	#8	STR	19'-6"	833	
H2	#8	STR	19'-4"	826	
S1	#5	5	4'-7"	363	
S2	#5	2	11'-10"	938	
S3	#4	3	6'-6"	156	
U1	#4	4	7'-8"	51	
V1	#5	STR	10'-11"	865	
V2	#4	STR	4'-6"	186	
REINFORCING STEEL				6,762 LBS.	
CLASS "A" CONCRETE					
POUR 1 COLLARS, CAP AND LOWER WINGS				33.8 CU. YDS.	
HP 12 x 53 STEEL PILES					
9 REQUIRED				480.0 LIN. FT.	



PROJECT NO. U-2524BC

GUILFORD COUNTY

STATION: 27 + 40.75 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		

DRAWN BY : K. E. LOFTON DATE : 1-15

CHECKED BY : T. M. HARRIS DATE : 1-15

DESIGN ENGINEER : T. M. HARRIS DATE : 2-15

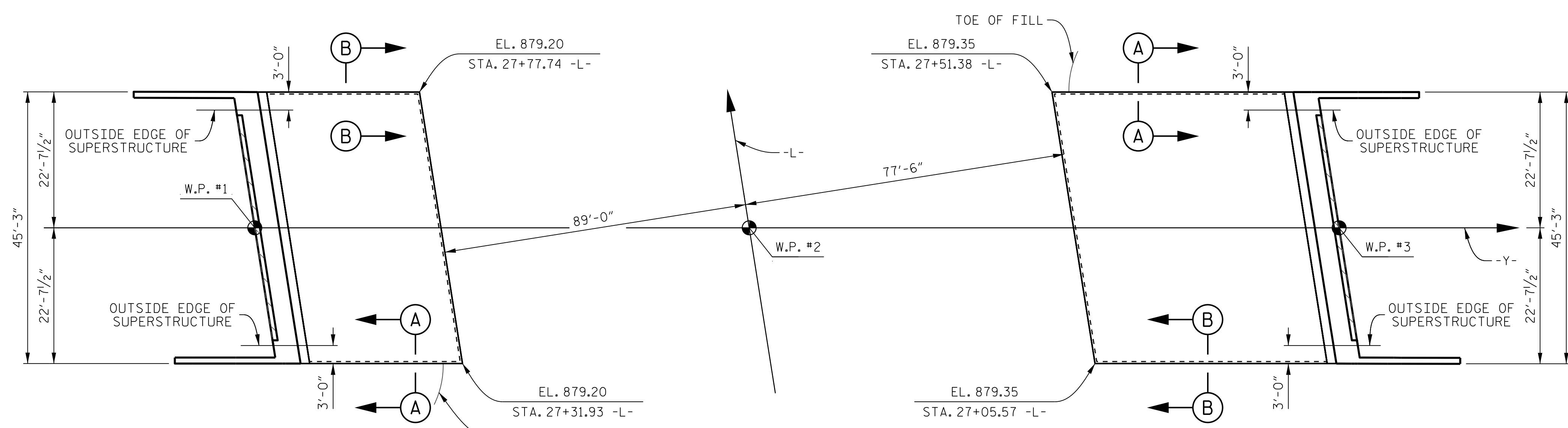
PLANS PREPARED BY :

**PARSONS**

5540 CenterView Drive, Suite 217  
Raleigh, NC 27606-3386  
NC LICENSE No. F-0246

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

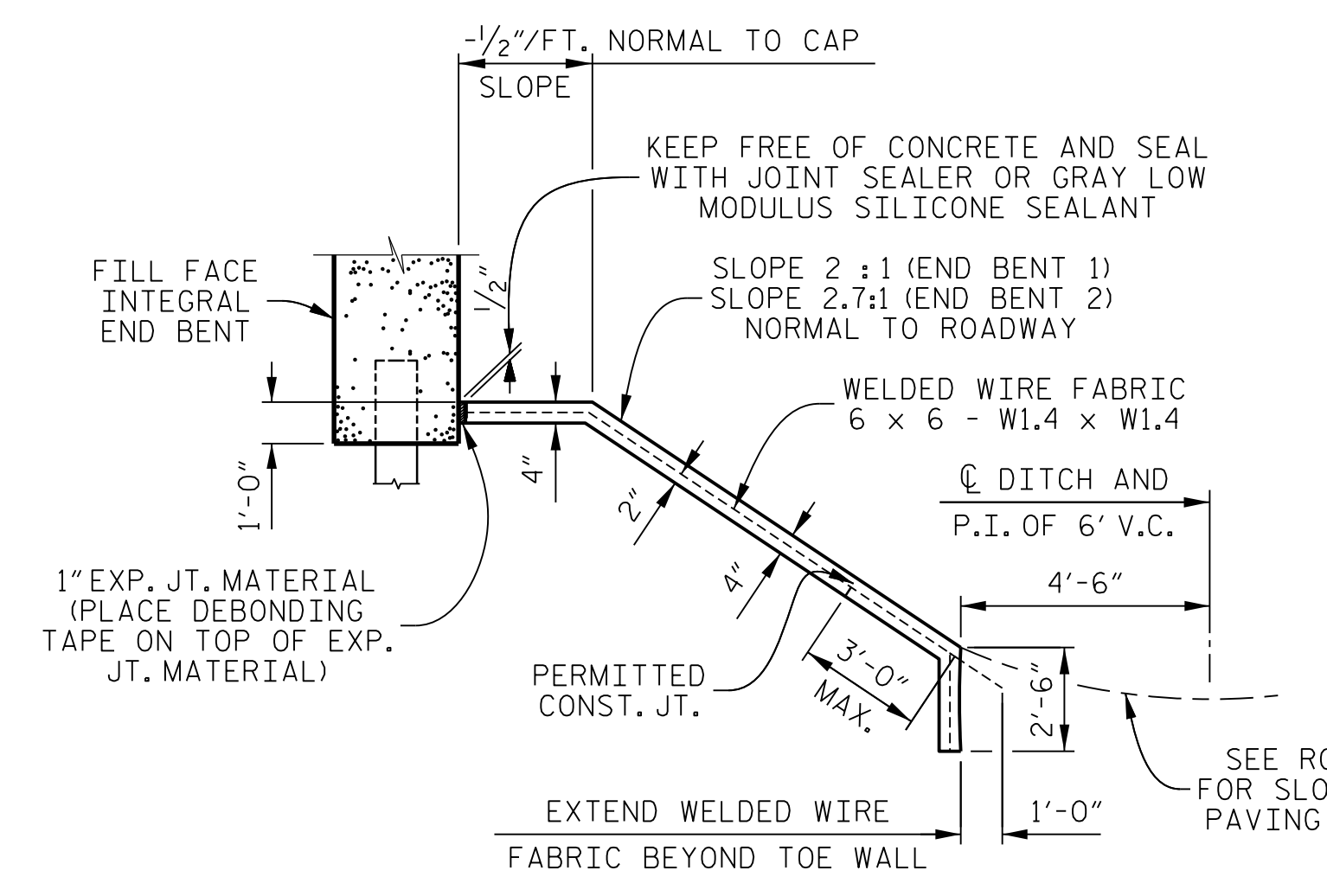




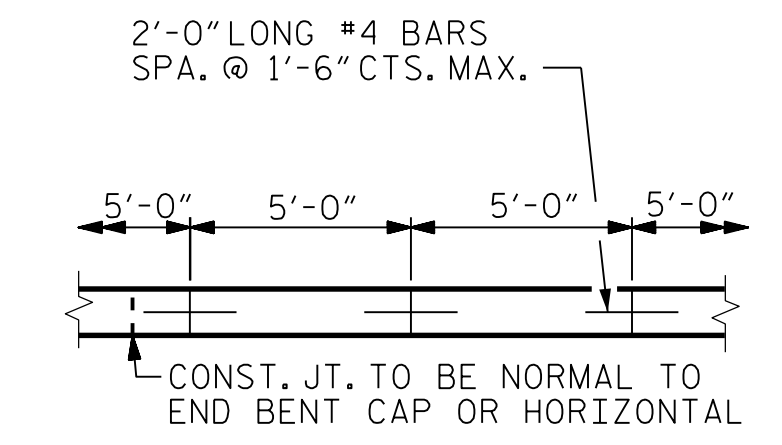
**PLAN**  
CONCRETE DITCHES NOT SHOWN

**GENERAL NOTES**  
 SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. 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.

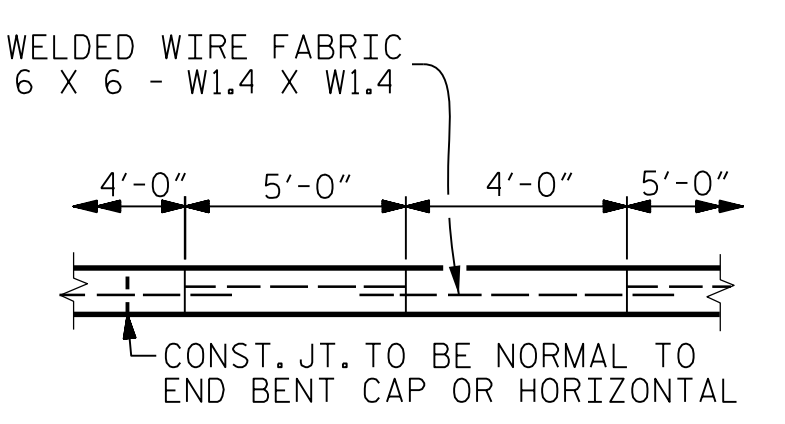
**ALTERNATE "A"**  
 ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B", THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE 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 "A" 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.



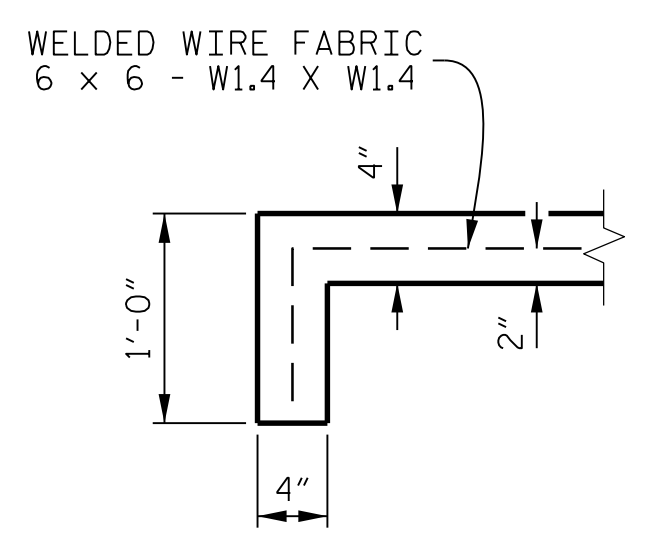
SECTION ALONG ROADWAY WHEN FILL CATCHES IN DITCH



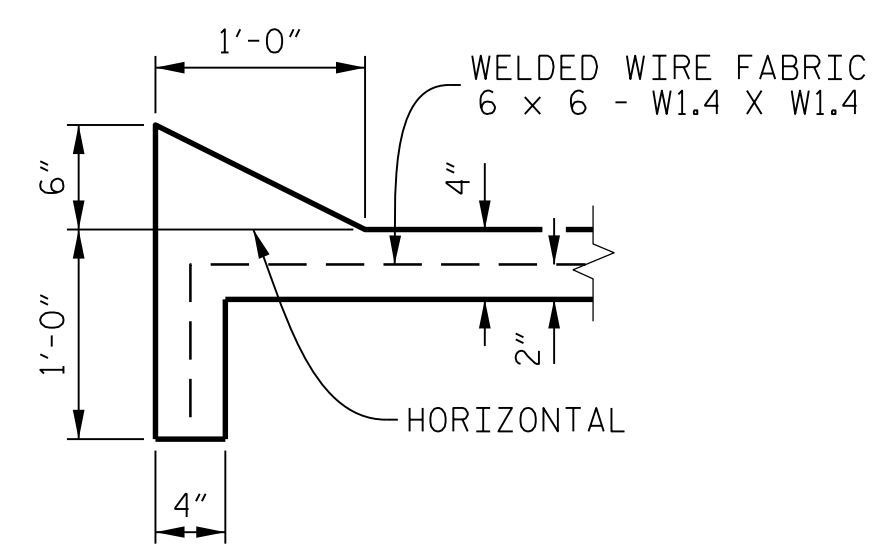
POURING DETAIL



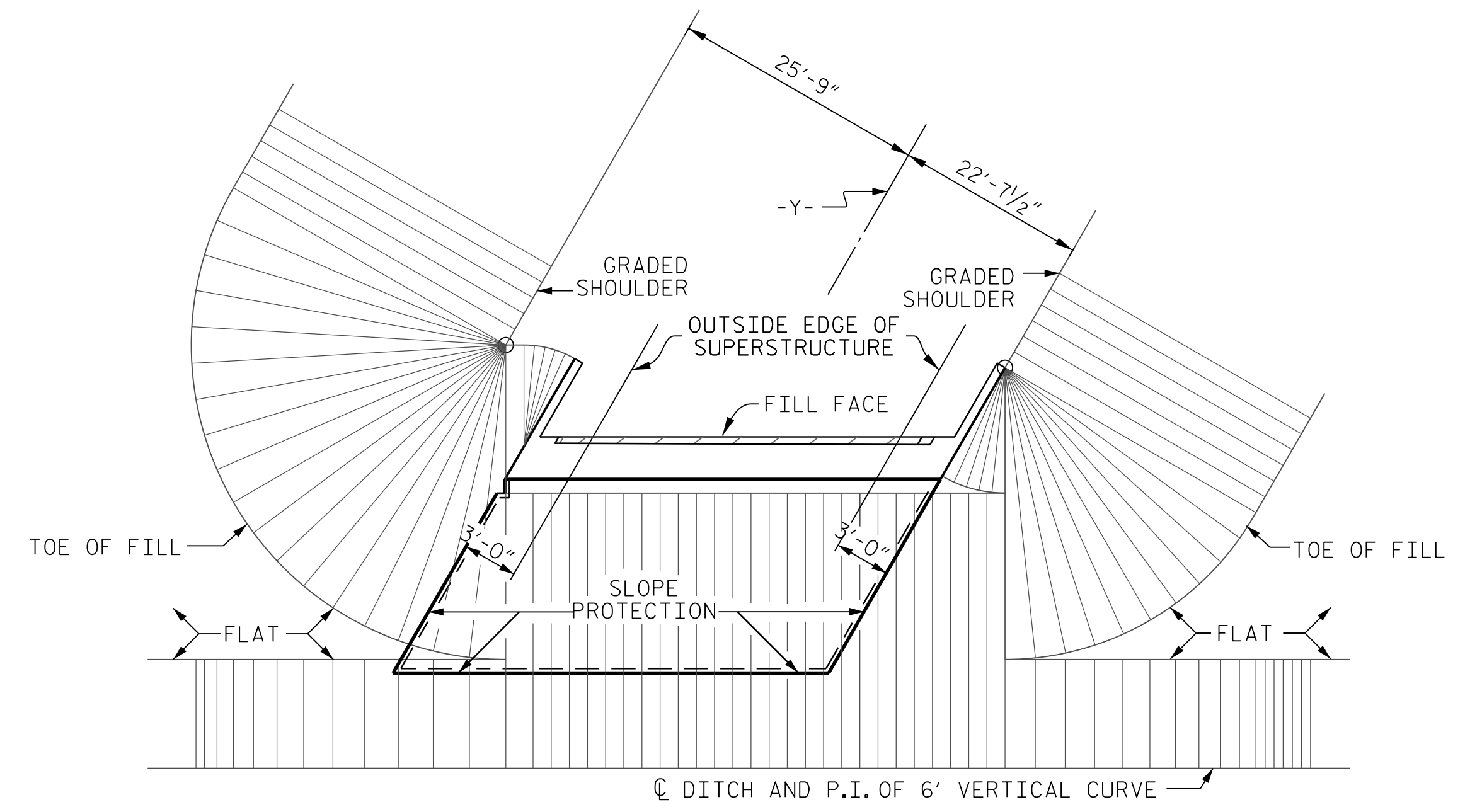
OPTIONAL POURING DETAIL



SECTION A-A



SECTION B-B



PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED  
(2:1 SLOPE, END BENT 1 SHOWN, END BENT 2 SIMILAR)

**DETAILS FOR ALTERNATE "A"**

PROJECT NO. U-2524BC  
GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-

BRIDGE AT STA. 27 + 40.75 -L-	4" SLOPE PROTECTION SQUARE YARDS	* WELDED WIRE FABRIC 60 INCHES WIDE APPROX. LINEAR FEET
END BENT 1	170	305
END BENT 2	225	405

\* QUANTITY SHOWN IS BASED ON 5' POURS.

PLANS PREPARED BY:  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE NO. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROFESSIONAL ENGINEER  
 SEAL 19299  
 THOMAS M. HARRIS  
 3/6/2015

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

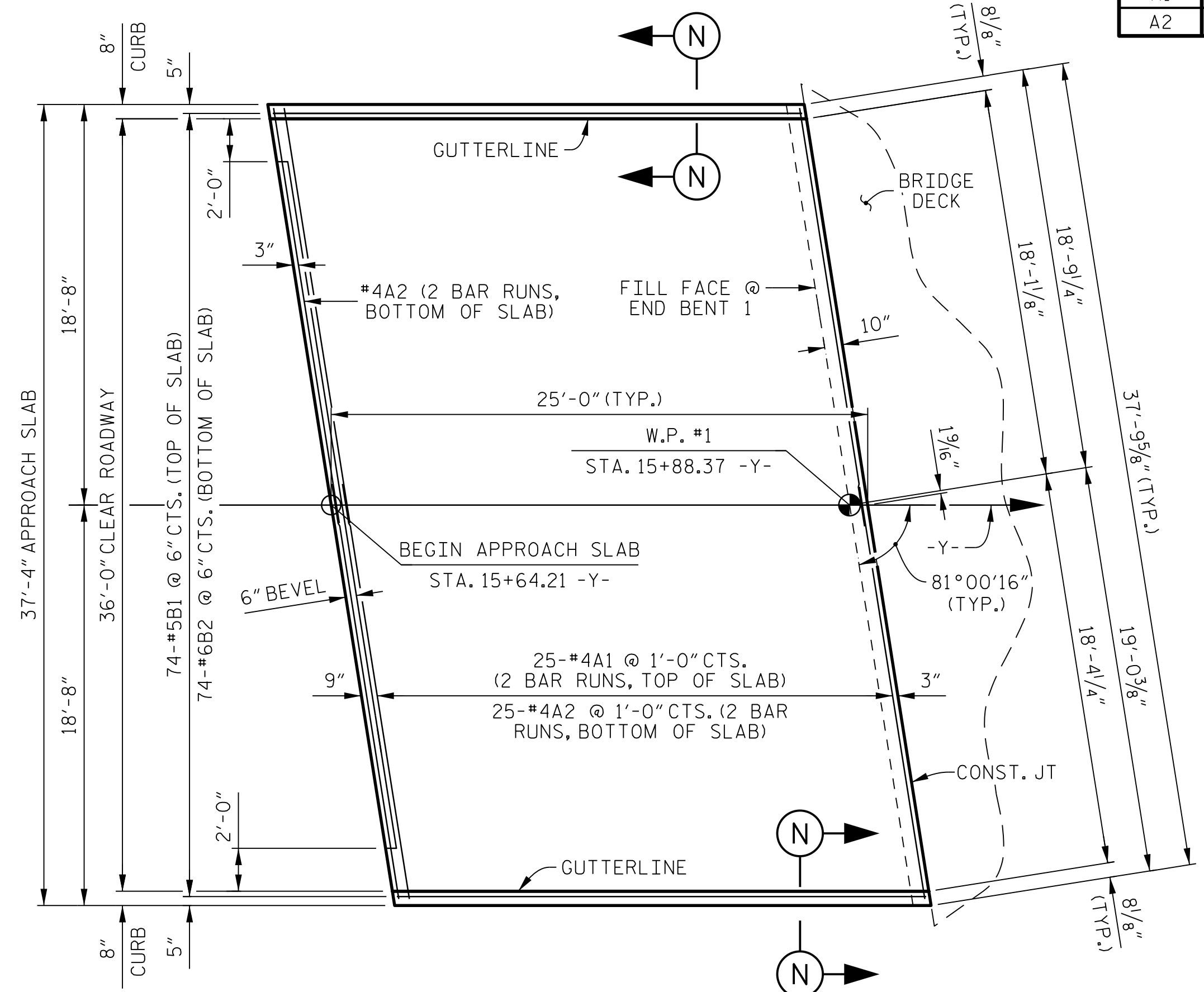
**SLOPE PROTECTION DETAILS**

REVISIONS		SHEET No.
No.	DATE	S01-25
1	3	TOTAL SHEETS 27
2	4	

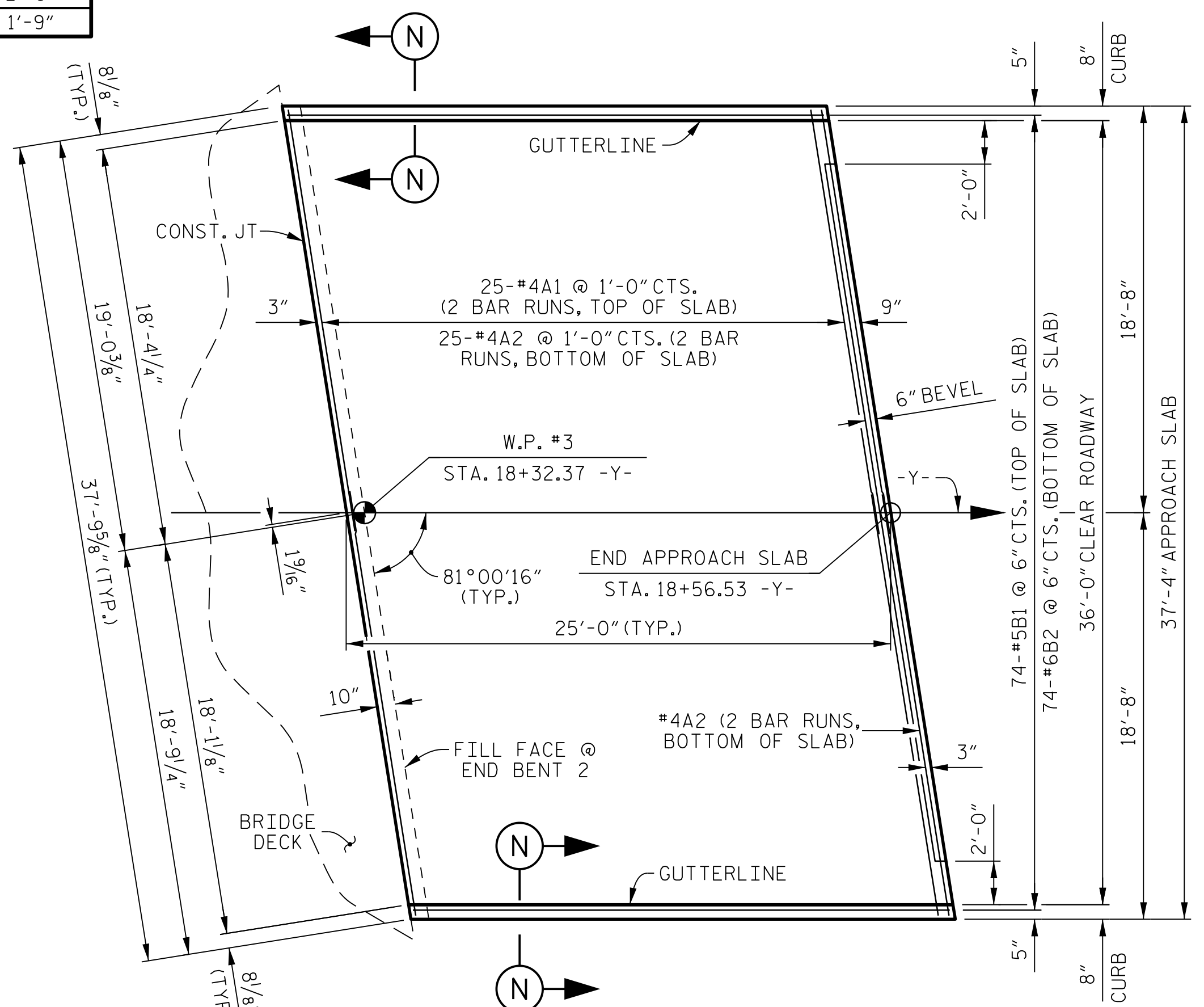
FILE: \\p013210\p01\m\c\harris\p\plans\102524BC\_SD.sp1.dgn  
 DATE: 3/2/15 9:42:00 AM

SPlice LENGTHS		
BAR	SIZE	LENGTH
A1	#4	2'-0"
A2	#4	1'-9"

BILL OF MATERIAL					
APPROACH SLAB AT END BENT 1 OR END BENT 2					
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR	19'-9"	660
A2	52	#4	STR	19'-8"	683
*B1	74	#5	STR	24'-2"	1,865
B2	74	#6	STR	24'-8"	2,742
REINFORCING STEEL					3,425 LBS.
*EPOXY COATED REINFORCING STEEL					2,525 LBS.
CLASS "AA" CONCRETE					40.4 CU. YDS.



PLAN OF APPROACH SLAB AT END BENT 1



PLAN OF APPROACH SLAB AT END BENT 2

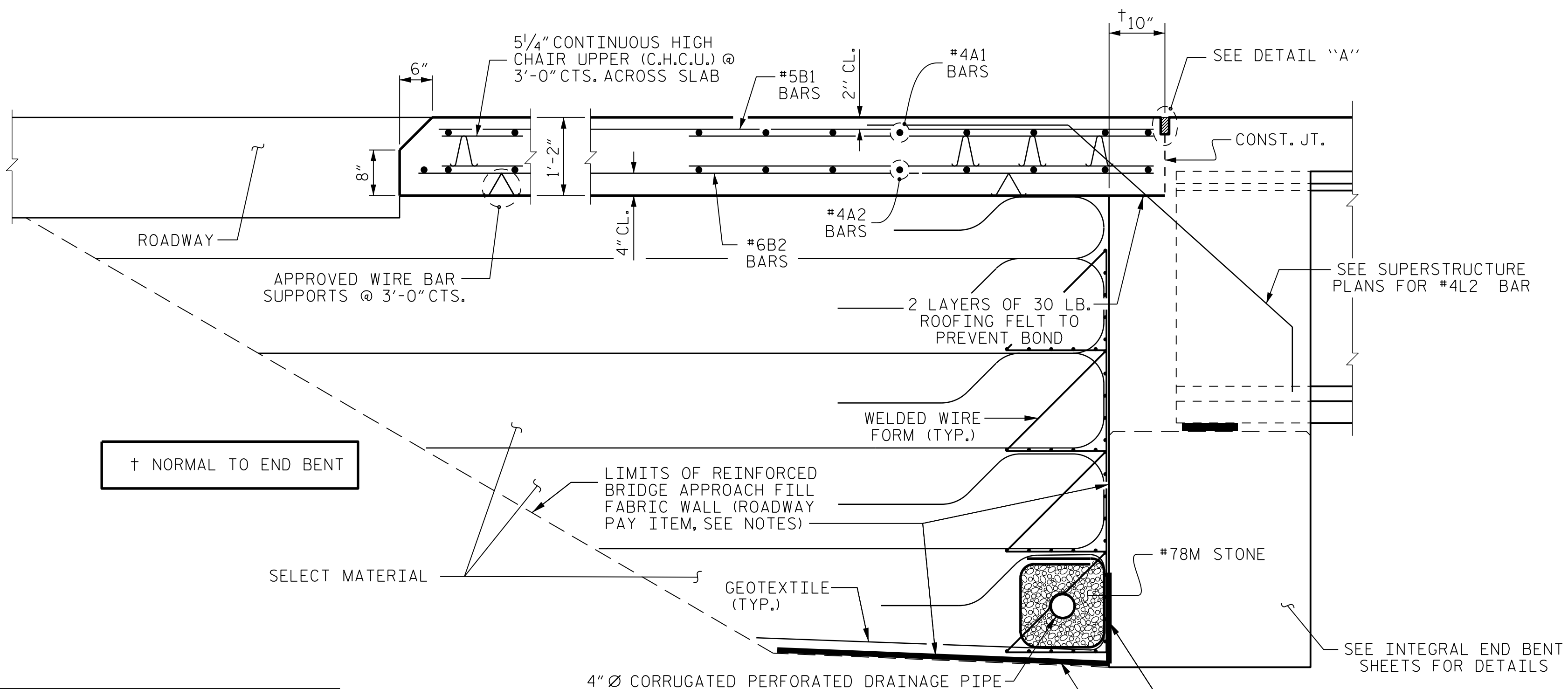
NOTES

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

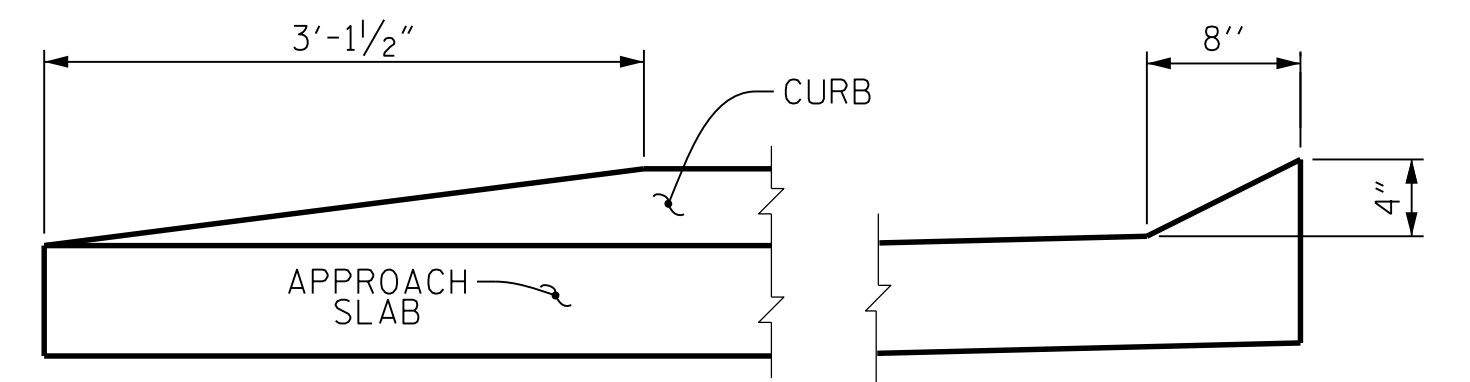
FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

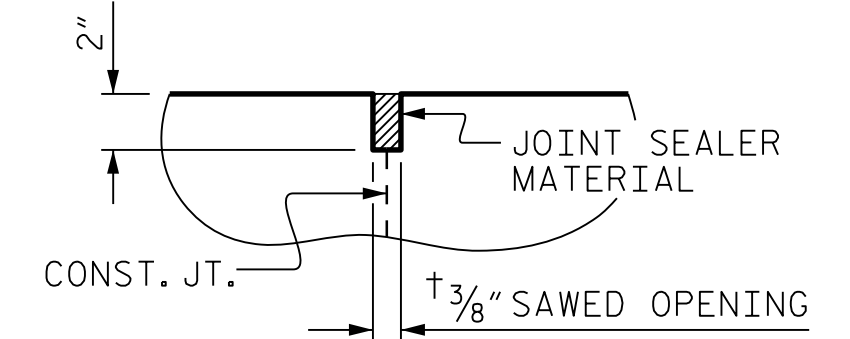


SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER SECTION N-N

CURB DETAILS



DETAIL "A"

PROJECT NO. **U-2524BC**  
**GUILFORD** COUNTY  
 STATION: **27 + 40.75 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

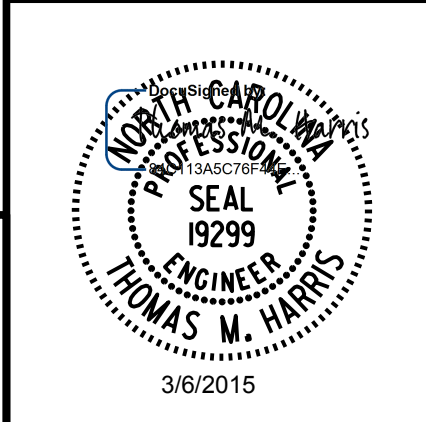
**BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT**

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

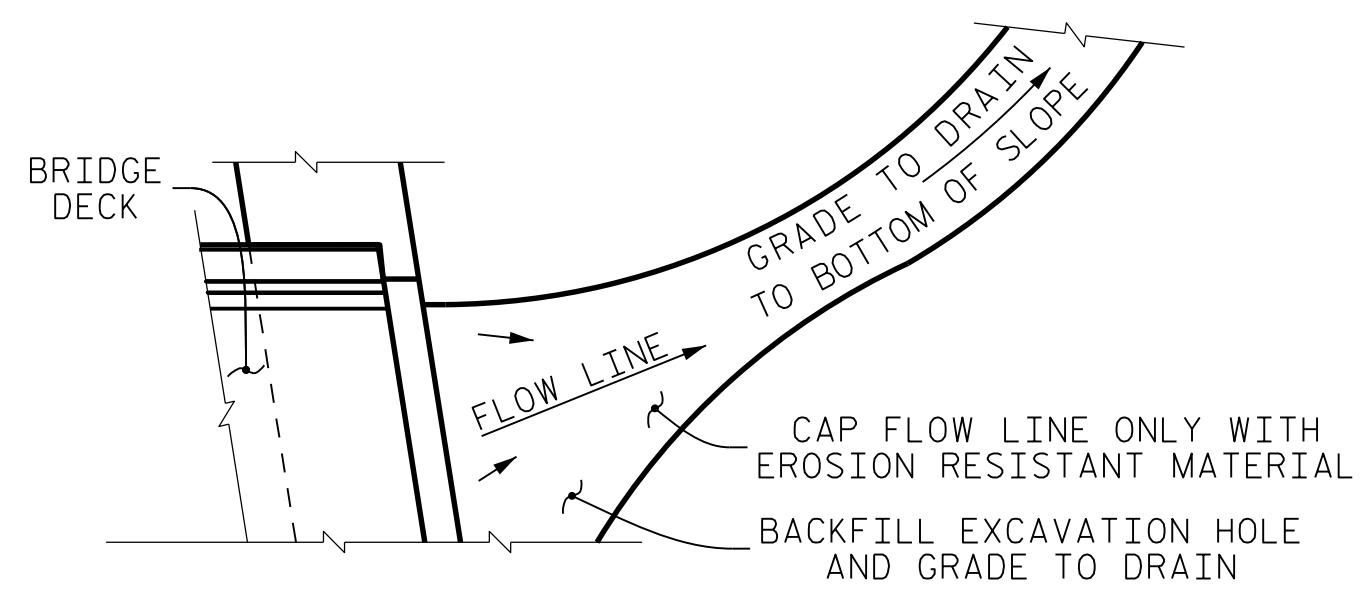
ASSEMBLED BY : K. E. LOFTON	DATE : 11-14
CHECKED BY : T. M. HARRIS	DATE : 1-15
DRAWN BY : TLA	10/05
CHECKED BY : GM	5/06
REV. 10/1/11	MAA/GM
REV. 12/12/11	MAA/GM
REV. 6/13	MAA/GM

DRAWN BY : K. E. LOFTON	DATE : 11-14
CHECKED BY : T. M. HARRIS	DATE : 1-15
DESIGN ENGINEER : T. M. HARRIS	DATE : 2-15

PLANS PREPARED BY :  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

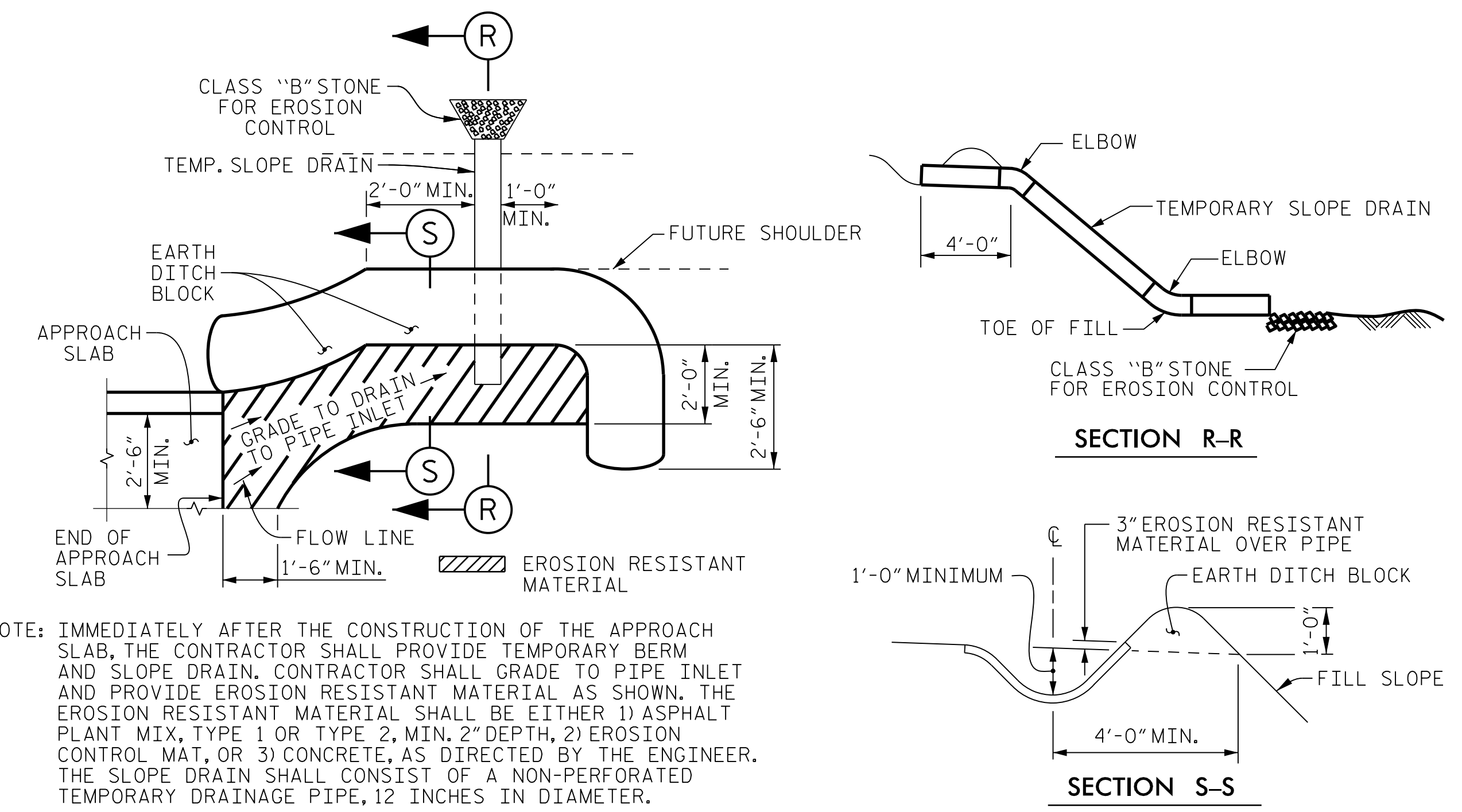


FILE: I:\2524BC\Drawings\Drawings\102524BC\_S01.dgn  
 DATE: 3/2/2015 9:42:59 AM



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

**TEMPORARY DRAINAGE DETAIL**



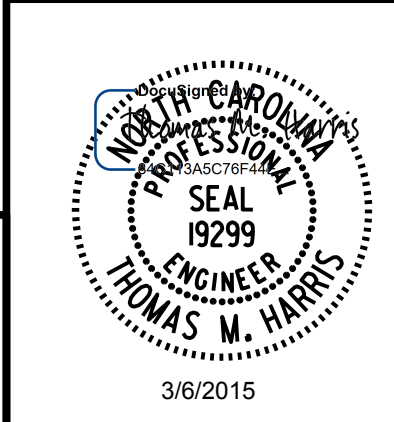
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

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

PROJECT NO. U-2524BC  
GUILFORD COUNTY  
 STATION: 27 + 40.75 -L-

SHEET 2 OF 2

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



PLANS PREPARED BY :  
**PARSONS**  
 5540 CenterView Drive, Suite 217  
 Raleigh, NC 27606-3386  
 NC LICENSE No. F-0246  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	11-14
CHECKED BY :	T. M. HARRIS	DATE :	1-15
DESIGN ENGINEER :	T. M. HARRIS	DATE :	2-15

REVISIONS				SHEET No.	
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
				TOTAL SHEETS	
				27	

FILE: I:\2015\10\14\101015\101015.dwg (101015.dwg) DATE: 10/14/2015 9:48:47 AM

ASSEMBLED BY :	K. E. LOFTON	DATE :	11-14	
CHECKED BY :	T. M. HARRIS	DATE :	1-15	
DRAWN BY :	FCJ	11/88	REV. 10/1/11	MAA/GM
CHECKED BY :	ABR	11/88	REV. 7/12	MAA/GM
			REV. 6/13	MAA/GM

## 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.

FILE: i:\u-232\dc\structures\shen\final\U232-ABC\_SD\_enl.dgn  
DATE: 3/27/05 9:43:56 PM

# ENGLISH

JANUARY, 1990

STD. NO. SN