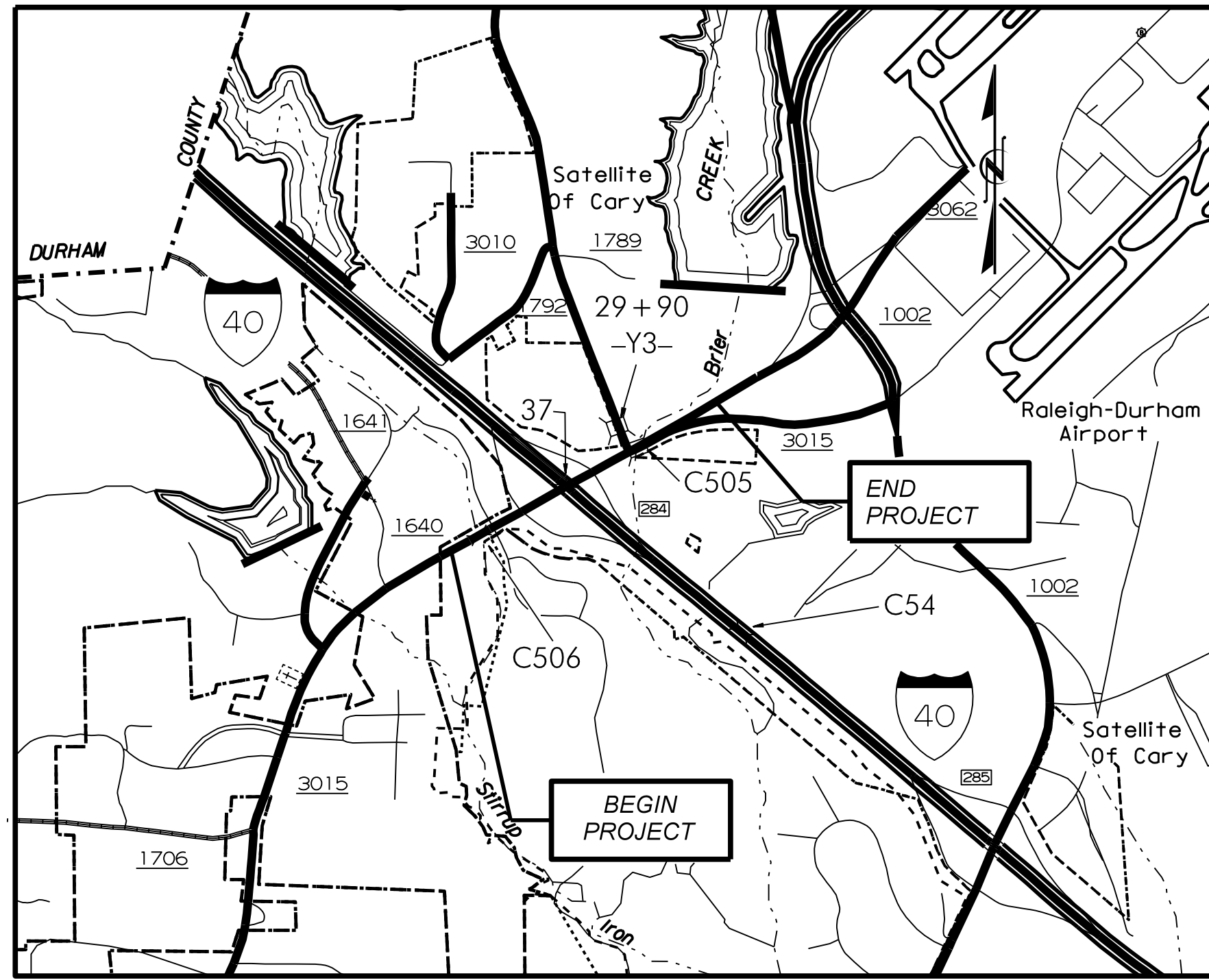


TIP PROJECT: I-5700

CONTRACT: C204351

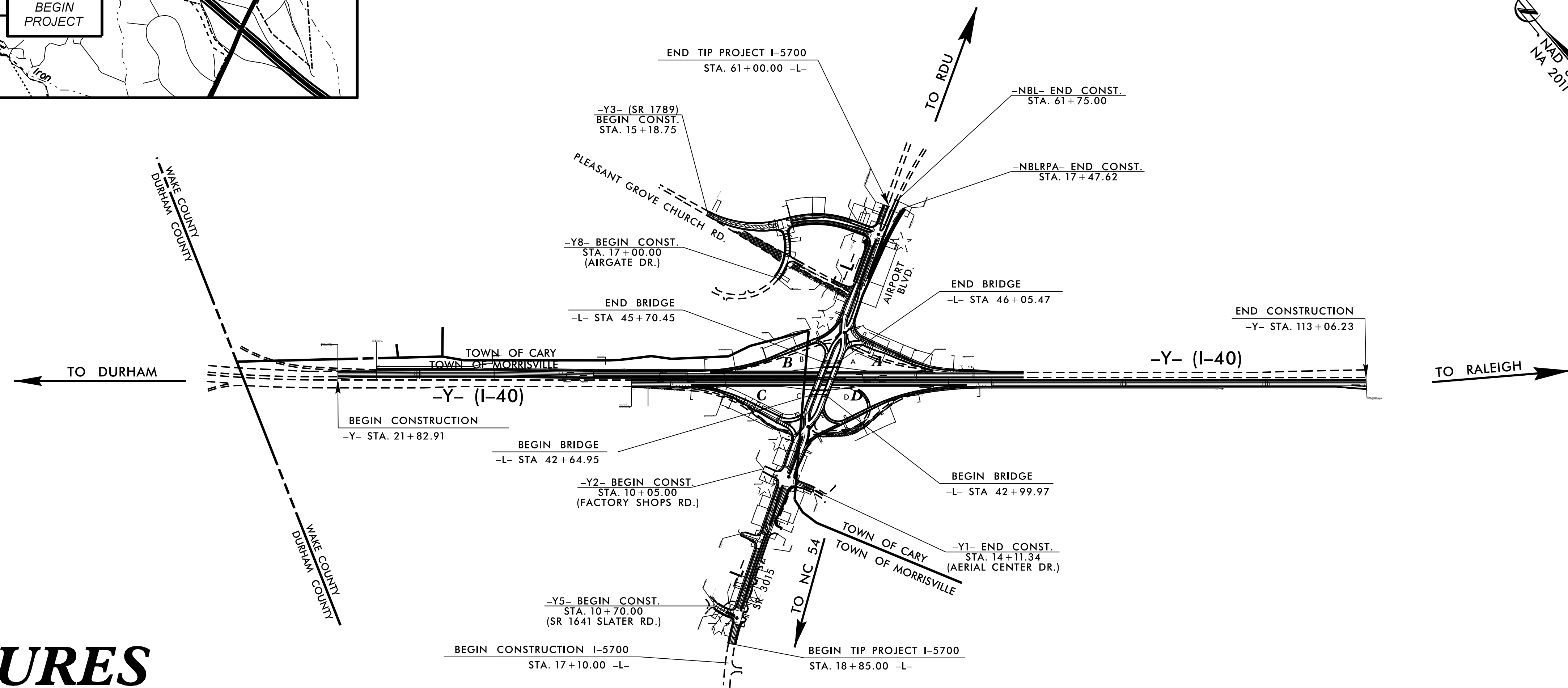


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**WAKE COUNTY**

**LOCATION: I-40 AND SR 3015 (AIRPORT BLVD.), REVISE INTERCHANGE AND CONSTRUCT AUXILIARY LANE ON I-40 WESTBOUND FROM SR 3015 (AIRPORT BLVD.) TO I-540.**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5700	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50118.1.FS1	NHPP-040-1(259)286	P.E.	
50118.2.I	NHPP-040-1(259)286	UTIL., ROW	
50118.3.GV1	NHPP-040-1(259)286	CONST.	



**STRUCTURES**

**DESIGN DATA**

ADT (2019) = 33,660  
 ADT (2040) = 46,500  
 K = 9 %  
 D = 65 %  
 T = 6 % \*  
 V = 50 MPH  
 \* (TTST = 2%, DUAL = 4%)  
 FUNC CLASS = ARTERIAL  
 STATEWIDE TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT I-5700 = 0.740 MILES  
 LENGTH STRUCTURE TIP PROJECT I-5700 = 0.058 MILES  
 TOTAL LENGTH TIP PROJECT I-5700 = 0.798 MILES

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

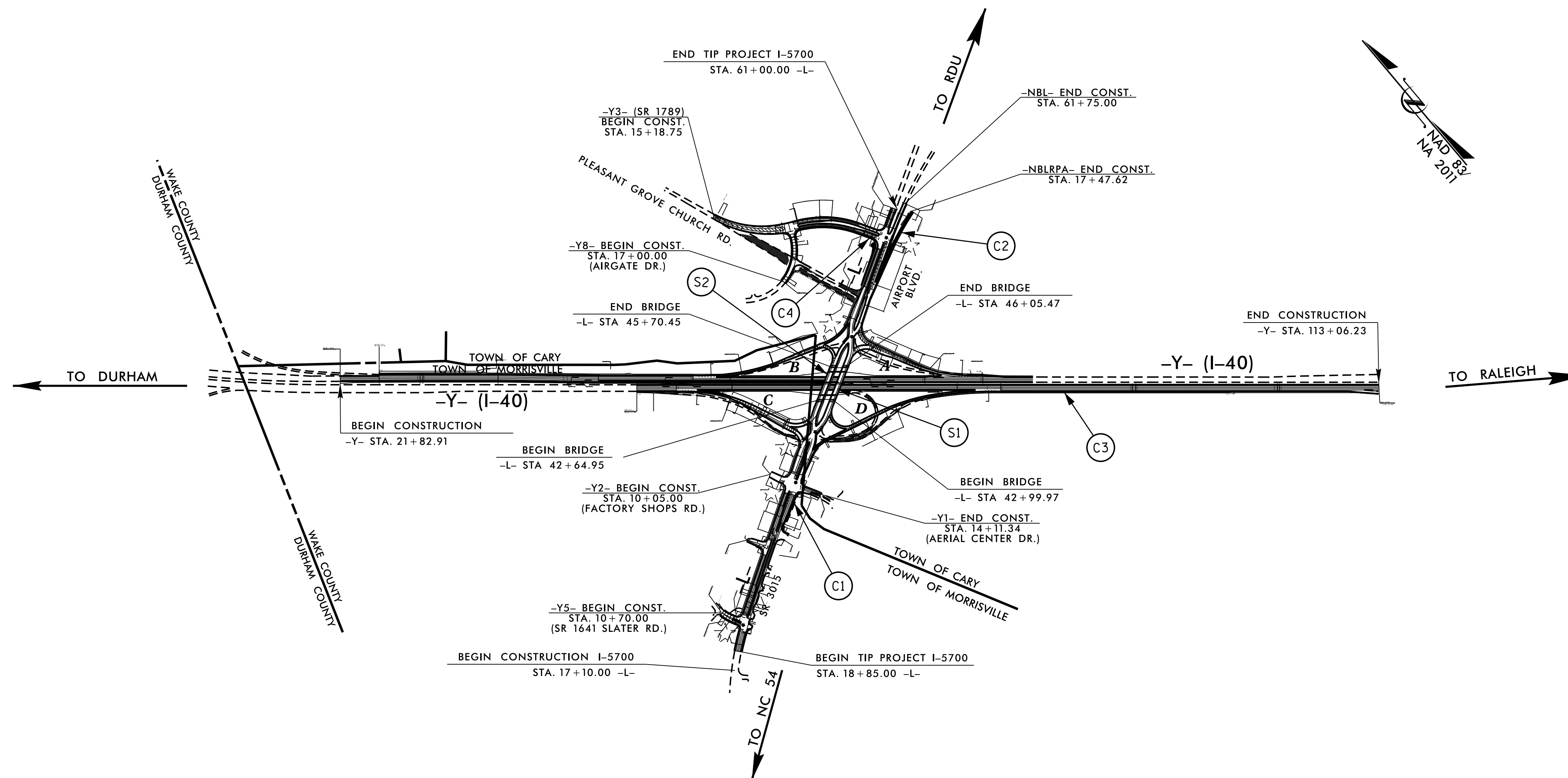
2018 STANDARD SPECIFICATIONS

LETTING DATE :  
 NOVEMBER 19, 2019

KRISTY ALFORD, PE  
 PROJECT ENGINEER

FRANCESCA LEA, PE  
 PROJECT DESIGN ENGINEER

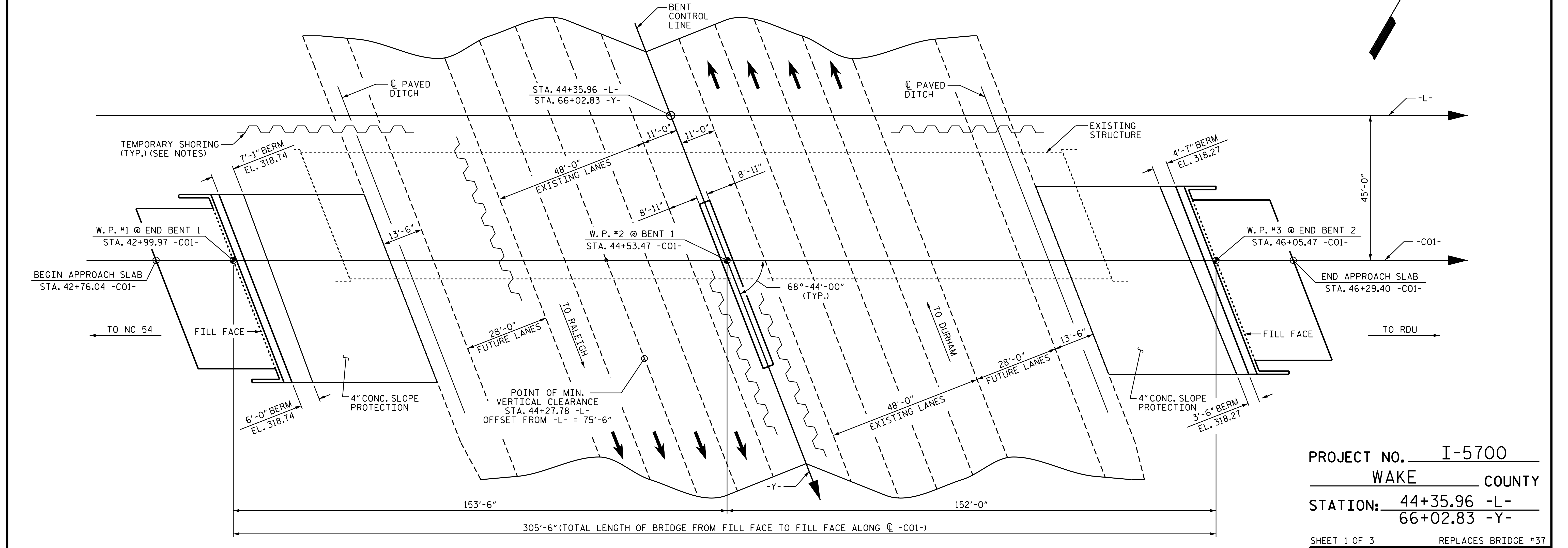
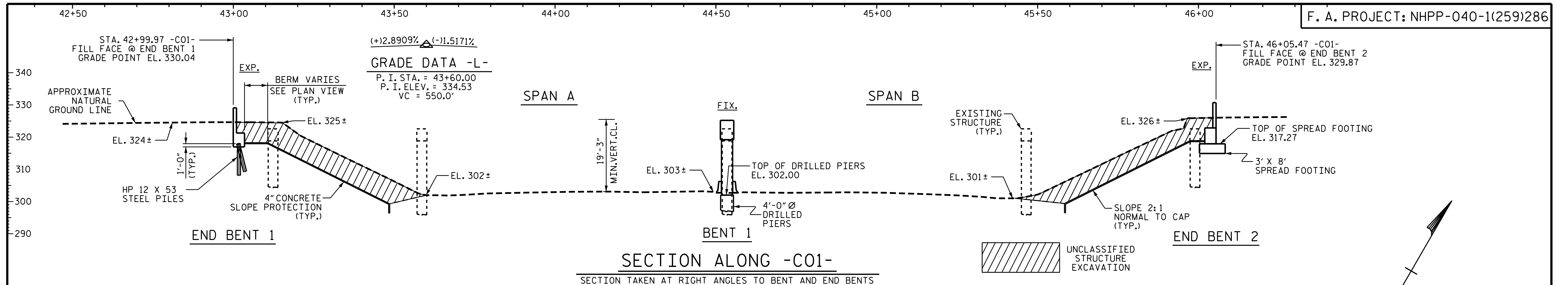
DocuSigned by:  
 Francesca Lea 9/28/2019  
 B79DAD65D5084EF



### INDEX

STR. NO.	STATION	DESCRIPTION	SHEETS
(S1)	STA. 42+99.97 -L-	BRIDGE ON SR 3015 (AIRPORT BLVD.) OVER I-40 (RIGHT LANE)	S1-1 THRU S1-31
(S2)	STA. 42+64.95 -L-	BRIDGE ON SR 3015 (AIRPORT BLVD.) OVER I-40 (LEFT LANE)	S2-1 THRU S2-33
(C1)	STA. 33+31.33 -L-	TRIPLE 10 FT. X 10 FT. CONCRETE BOX CULVERT LEFT EXTENSIONS 90° SKEW	C1-1 THRU C1-4
(C2)	STA. 53+39.00 -L-	TRIPLE 12 FT. X 12 FT. CONCRETE BOX CULVERT LEFT EXTENSIONS 135° SKEW	C2-1 THRU C2-6
(C3)	STA. 86+76.00 -Y-	TRIPLE 9 FT. X 8 FT. CONCRETE BOX CULVERT RIGHT EXTENSIONS 60° SKEW	C3-1 THRU C3-5
(C4)	STA. 29+90.00 -Y3-	SINGLE 12 FT. X 10 FT. CONCRETE BOX CULVERT 90° SKEW	C4-1 THRU C4-4





PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-  
66+02.83 -Y-

SHEET 1 OF 3      REPLACES BRIDGE #37

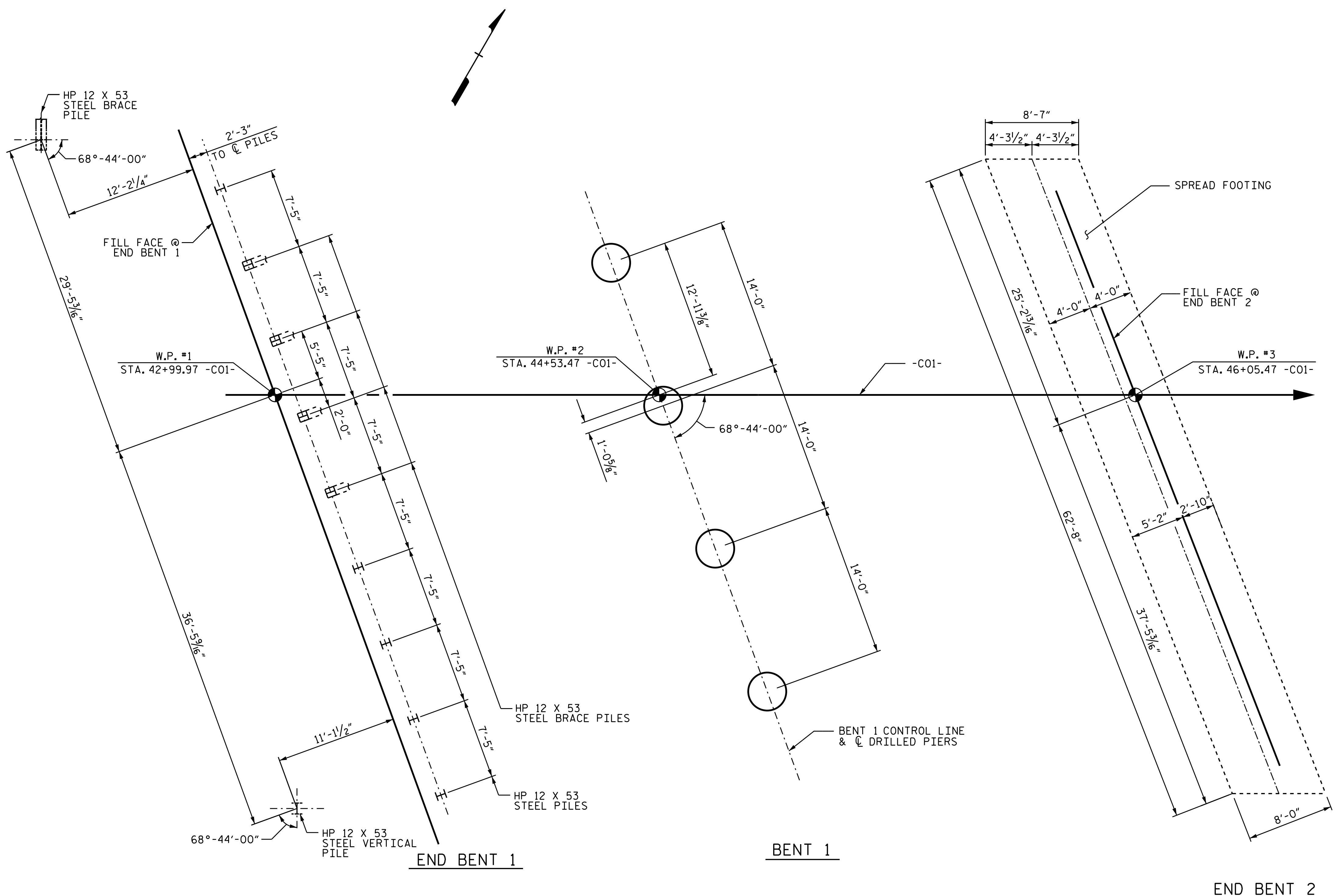
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE OVER I-40 ON  
SR 3015 (AIRPORT BLVD.)  
BETWEEN NC 54 & RDU  
(RIGHT LANE)



DRAWN BY: O. T. NGUYEN/M. WELDON      DATE: 06/2019  
CHECKED BY: F. LEA      DATE: 08/2019  
DESIGN ENGINEER OF RECORD: W.D. REAMS      DATE: 08/2019

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1	
1			3			TOTAL SHEETS	
2			4			31	



**FOUNDATION LAYOUT**

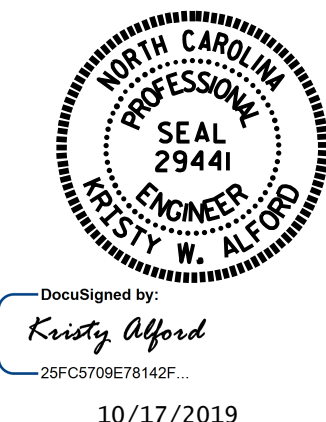
DIMENSIONS LOCATING PILES, DRILLED PIERS AND SPREAD FOOTING ARE SHOWN TO THE CENTERLINES.

**NOTES**

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- INSTALL PILES AT END BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 307.7 FT.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES NO.1 THROUGH NO.5 AND LEFT WING BRACE PILE AT END BENT NO.1.FOR STEEL PILE POINTS,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- DRILLED-IN PILES ARE REQUIRED FOR END BENT NO.1 PILES NO.6 THROUGH NO.9 AND RIGHT WING PILE.USE VERTICAL PILES FOR DRILLED-IN PILES NO.6 THROUGH NO.9 AND RIGHT WING PILE. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 307.7 FT.FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 875 TONS PER PIER.CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 150 TSF.
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 285 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- SPT MAY BE REQUIRED FOR DRILLED PIERS,THE ENGINEER WILL DETERMINE THE NEED FOR SPT.FOR SPT TESTING,SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS,THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.FOR SID INSPECTIONS,SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS,THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING.FOR CSL TESTING,SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIER EXCAVATIONS AT BENT NO.1 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS.CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.
- THE SPREAD FOOTINGS AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 4 TSF.CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE 9 TSF JUST BEFORE PLACING CONCRETE.
- FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES,SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.
- FOOTING EXCAVATIONS AT END BENT NO.2 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS.CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER EXCAVATION IS COMPLETED.
- KEY IN SPREAD FOOTINGS AT END BENT NO.2 AT LEAST 12" INTO WEATHERED ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER I-40 ON  
 SR 3015 (AIRPORT BLVD.)  
 BETWEEN NC 54 & RDU  
 (RIGHT LANE)

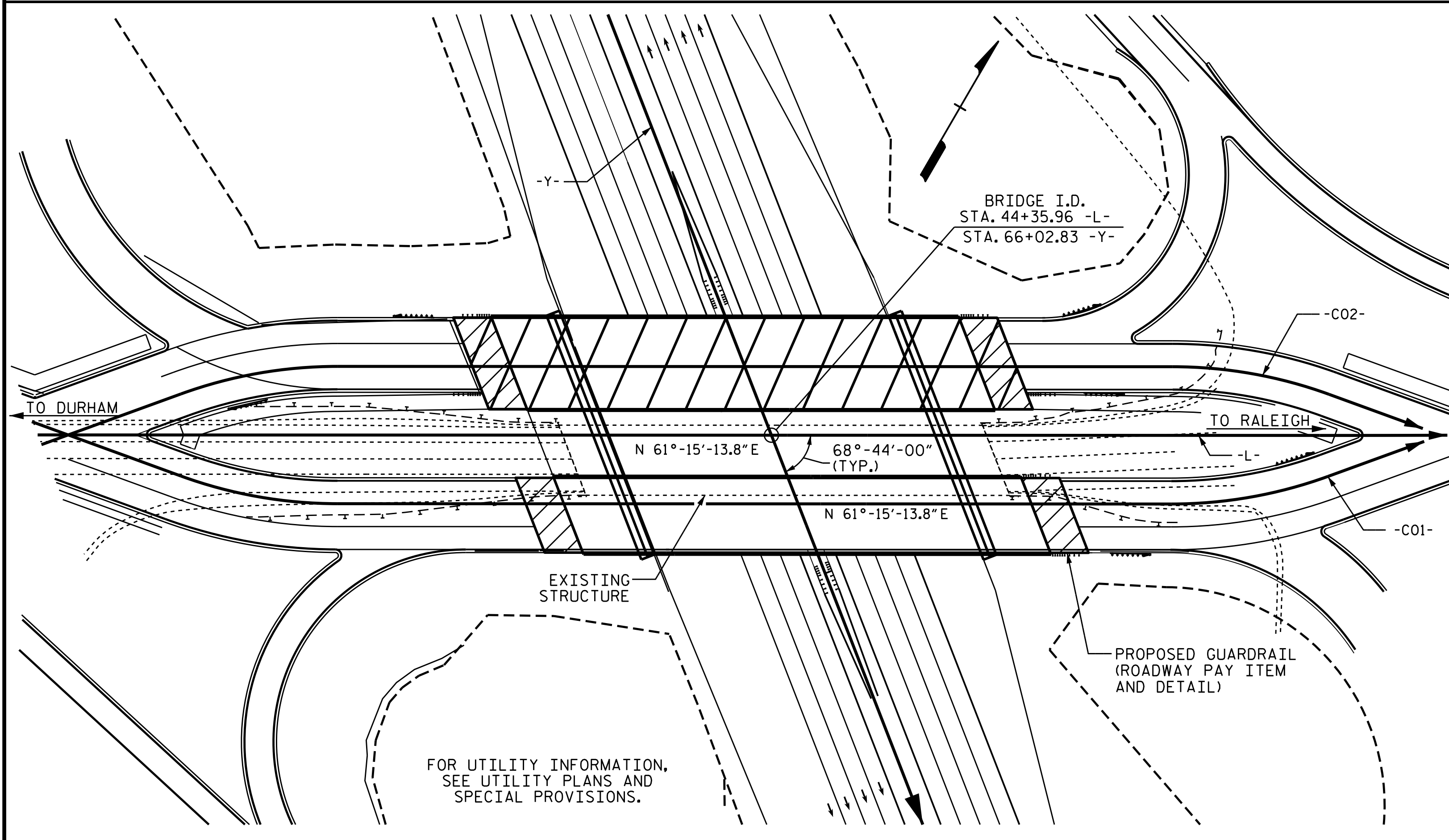
DRAWN BY : O. T. NGUYEN DATE : 06/2019  
 CHECKED BY : F. LEA DATE : 06/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 06/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			31



BM. #3: STA. 40+75.80 -L-, 102.51' RT. NAIL SET IN 20" PINE TREE



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SO. FT.
SUPERSTRUCTURE										LUMP SUM	15839
END BENT 1			41	9							
BENT 1					24	44	1	3	1		
END BENT 2											
TOTAL	LUMP SUM	LUMP SUM	41	9	24	44	1	3	1	LUMP SUM	15839

TOTAL BILL OF MATERIAL

	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 787144 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	
	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EACH	NO.	LIN. FT.	EACH	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	16146		LUMP SUM			LUMP SUM				606.48		LUMP SUM	LUMP SUM	LUMP SUM	
END BENT 1		72.7		10216			6	11	140	6		315			
BENT 1		73.0		18920	3290										
END BENT 2		127.4		19811								300			
TOTAL	16146	273.1	LUMP SUM	48947	3290	LUMP SUM	6	11	140	6	606.48	615	LUMP SUM	LUMP SUM	LUMP SUM

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 CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) 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.

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.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSIST OF 7 LINES 27" I-BEAMS AND CONTINUOUS STEEL PLATE GIRDER @ 7'-6" CENTERS IN 4 SPANS (1 @ 47'-6", 2 @ 96'-0", 1 @ 42'-6") WITH AND OUT TO OUT OF 50'-0" AND C/R OF 47'-6". THE SUBSTRUCTURE CONSIST OF CONCRETE REINFORCED ABUTMENTS WITH H-PILES. INTERIOR BENTS ARE REINFORCED CONCRETE CAPS ON REINFORCED CONCRETE COLUMNS. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURE INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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 44+35.96 -L-.'

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.

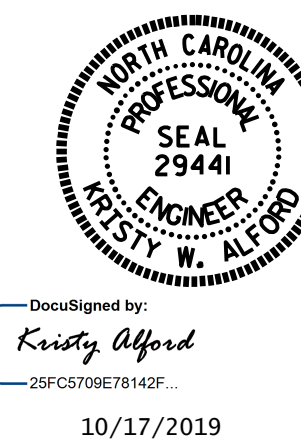
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 1' TO THE LEFT OF -L- TO 64' TO THE RIGHT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

FOR FAA NOTICE OF PROPOSED CONSTRUCTION, SEE SPECIAL PROVISIONS.

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPICE LENGTHS AND  $f_y = 60ksi$ .



PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER I-40 ON  
 SR 3015 (AIRPORT BLVD.)  
 BETWEEN NC 54 & RDU  
 (RIGHT LANE)

DRAWN BY : O. T. NGUYEN DATE : 06/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TOTAL SHEETS 31



LOAD FACTORS:

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

NOTES:

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

LEVEL	VEHICLE	WEIGHT (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II 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	1.04	--	1.75	0.774	1.04	A	I	151.08	1.05	1.10	A	I	0.00	1.30	0.421	1.16	A	I	151.08		
	HL-93 (OPERATING)	N/A		1.34	--	1.35	0.774	1.34	A	I	151.08	1.05	1.42	A	I	0.00	1.00	0.421	1.51	A	I	151.08		
	HS-20 (INVENTORY)	36.00	②	1.62	58.32	1.75	0.870	3.10	A	E	60.43	1.05	1.62	A	I	0.00	1.30	0.696	3.05	A	E	60.43		
	HS-20 (OPERATING)	36.00		2.09	75.24	1.35	0.870	4.02	A	E	60.43	1.05	2.09	A	I	0.00	1.00	0.696	3.97	A	E	60.43		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.06	68.31	1.40	0.870	9.49	A	E	60.43	1.05	5.06	A	I	0.00	1.30	0.696	7.45	A	E	60.43	
		SNGARBS2	20.000		3.51	70.20	1.40	0.870	6.73	A	E	60.43	1.05	3.51	A	I	0.00	1.30	0.696	5.28	A	E	60.43	
		SNAGRIS2	22.000		3.23	71.06	1.40	0.870	6.24	A	E	60.43	1.05	3.23	A	I	0.00	1.30	0.696	4.90	A	E	60.43	
		SNCOTTS3	27.250		2.52	68.67	1.40	0.870	4.73	A	E	60.43	1.05	2.52	A	I	0.00	1.30	0.696	3.71	A	E	60.43	
		SNAGGRS4	34.925		1.90	66.36	1.40	0.870	3.82	A	E	60.43	1.05	1.90	A	I	0.00	1.30	0.696	3.00	A	E	60.43	
		SNS5A	35.550		1.90	67.55	1.40	0.870	3.76	A	E	60.43	1.05	1.90	A	I	0.00	1.30	0.696	2.95	A	E	60.43	
		SNS6A	39.950		1.71	68.31	1.40	0.870	3.39	A	E	60.43	1.05	1.71	A	I	0.00	1.30	0.696	2.66	A	E	60.43	
		SNS7B	42.000		1.65	69.30	1.40	0.870	3.24	A	E	60.43	1.05	1.65	A	I	0.00	1.30	0.696	2.54	A	E	60.43	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.19	72.27	1.40	0.870	4.14	A	E	60.43	1.05	2.19	A	I	0.00	1.30	0.696	3.25	A	E	60.43	
		TNT4A	33.075		2.02	66.81	1.40	0.870	4.11	A	E	60.43	1.05	2.02	A	I	0.00	1.30	0.696	3.23	A	E	60.43	
		TNT6A	41.600		1.72	71.55	1.40	0.870	3.33	A	E	60.43	1.05	1.72	A	I	0.00	1.30	0.696	2.61	A	E	60.43	
		TNT7A	42.000		1.69	70.98	1.40	0.774	3.31	A	I	151.08	1.05	1.69	A	I	0.00	1.30	0.696	2.60	A	E	60.43	
		TNT7B	42.000		1.63	68.46	1.40	0.774	3.32	A	I	151.08	1.05	1.63	A	I	0.00	1.30	0.696	2.63	A	E	60.43	
		TNAGRIT4	43.000		1.59	68.37	1.40	0.774	3.23	A	I	151.08	1.05	1.59	A	I	0.00	1.30	0.696	2.55	A	E	60.43	
		TNAGT5A	45.000		1.55	69.75	1.40	0.774	3.09	A	I	151.08	1.05	1.55	A	I	0.00	1.30	0.696	2.43	A	E	60.43	
TNAGT5B	45.000		③	1.51	67.95	1.40	0.870	3.07	A	E	60.43	1.05	1.51	A	I	0.00	1.30	0.696	2.41	A	E	60.43		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$																						

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) \*\*

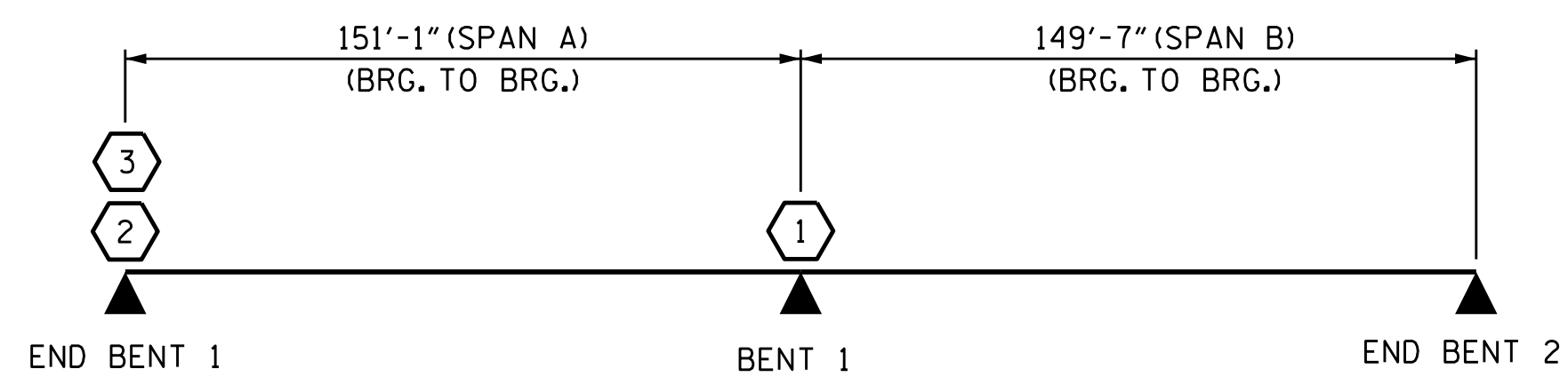
② DESIGN LOAD RATING (HS-20) \*\*

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. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

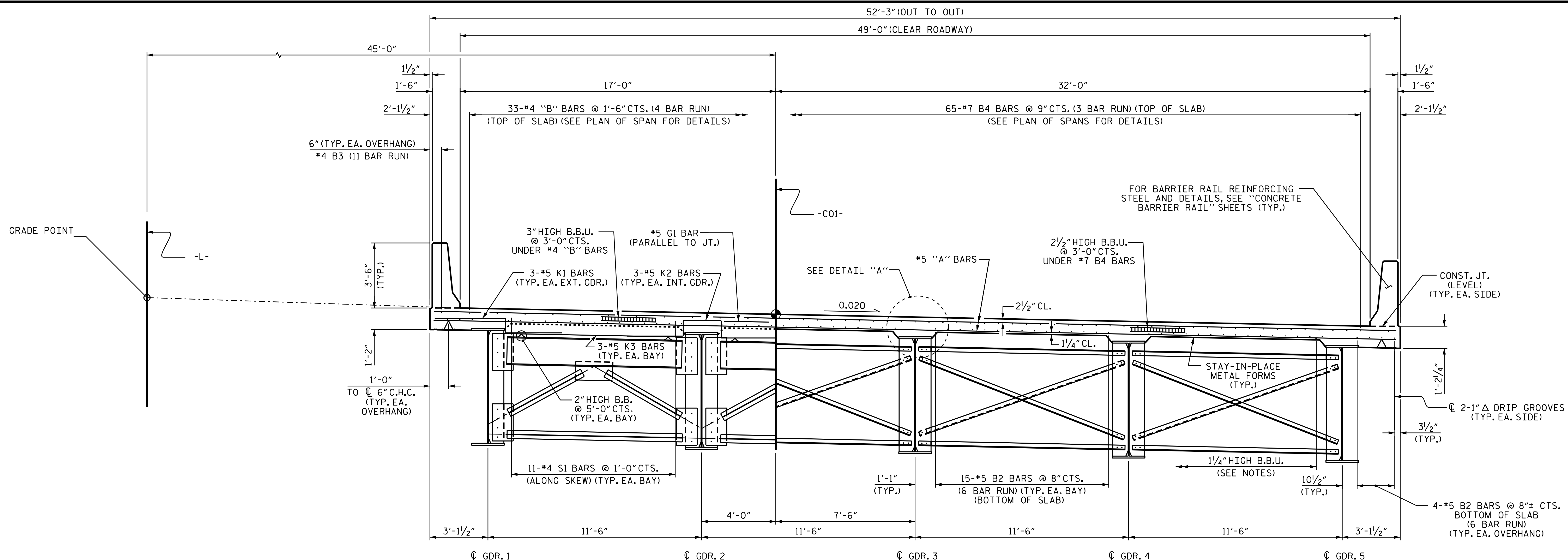


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 STEEL GIRDERS  
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : W. D. REAMS	DATE : 08/2019
CHECKED BY : K. W. ALFORD	DATE : 08/2019
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM

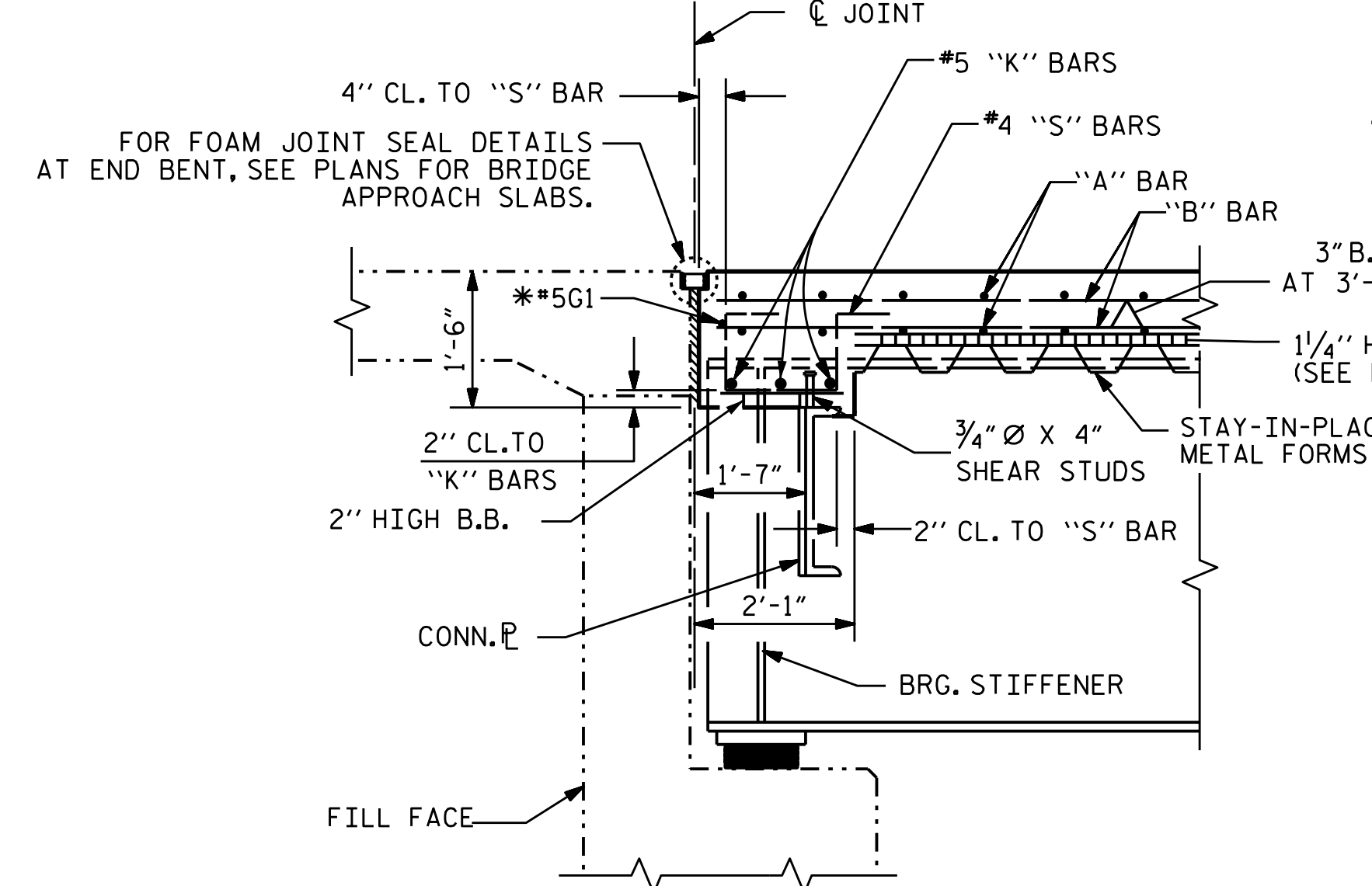
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			31



**PART TYPICAL SECTION**  
(SHOWING END BENT DIAPHRAGM)

**PART TYPICAL SECTION**  
(SHOWING INTERMEDIATE/BENT DIAPHRAGM)

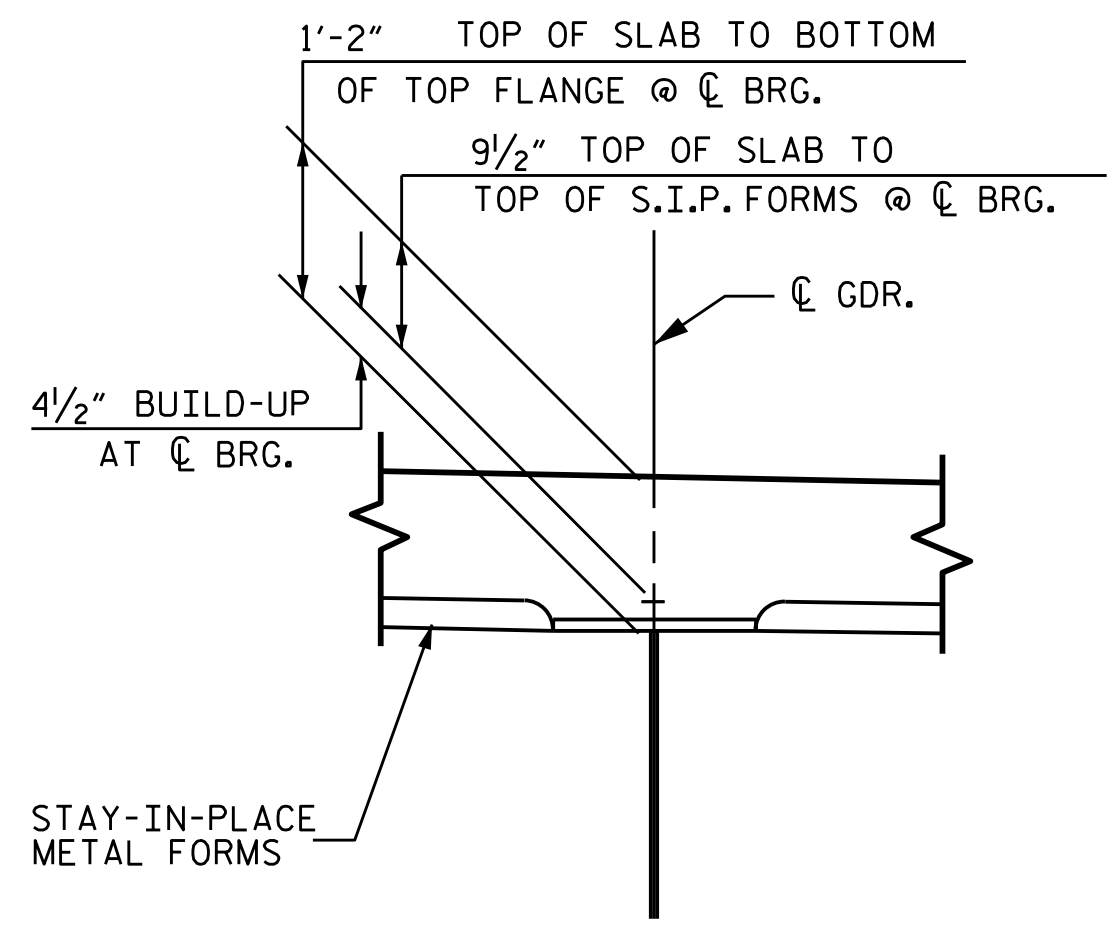


**SECTION @ END BENT**

\* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

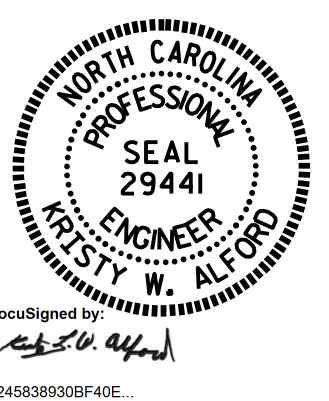
**NOTES:**

- 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.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHAMPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- 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.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.
- THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



**DETAIL "A"**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-



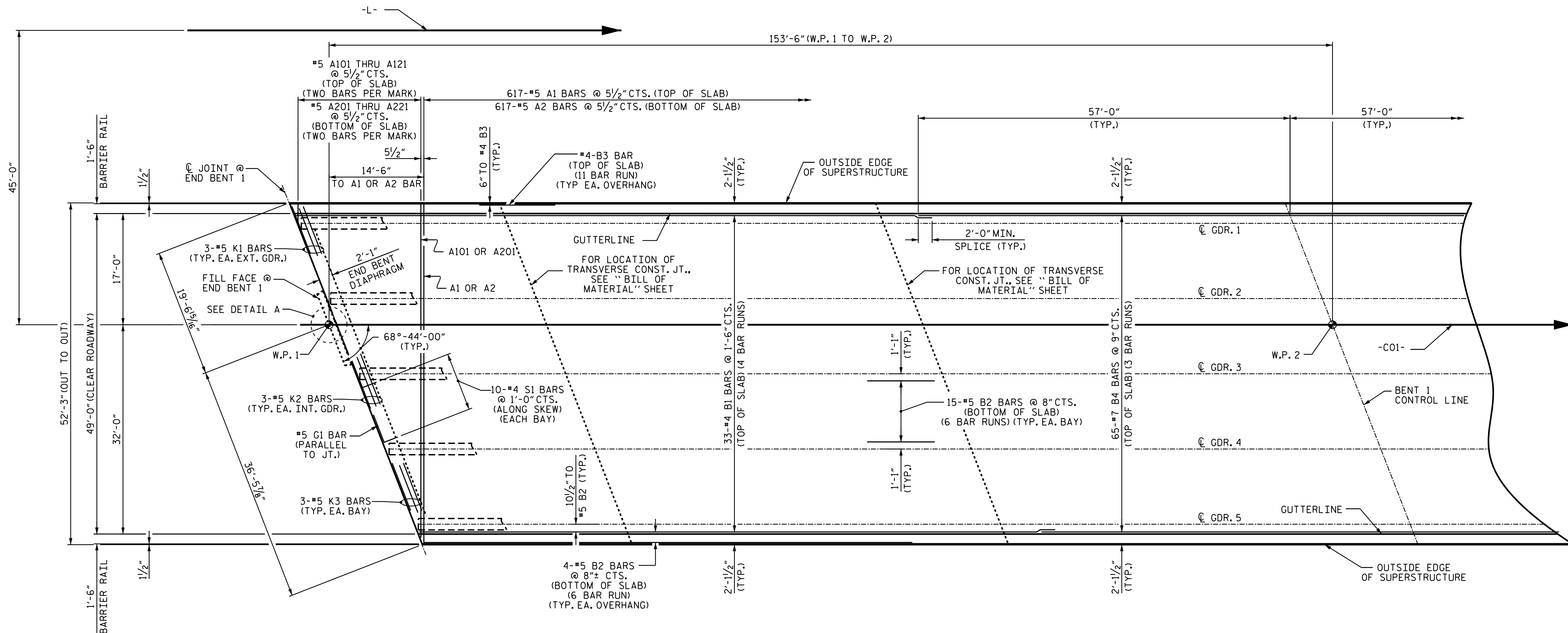
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**TYPICAL SECTION**

DRAWN BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

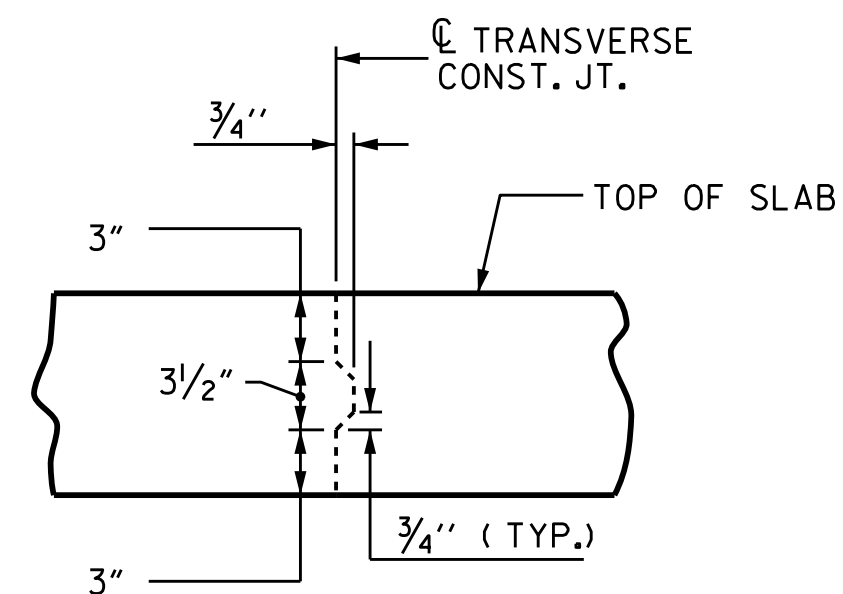
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			31





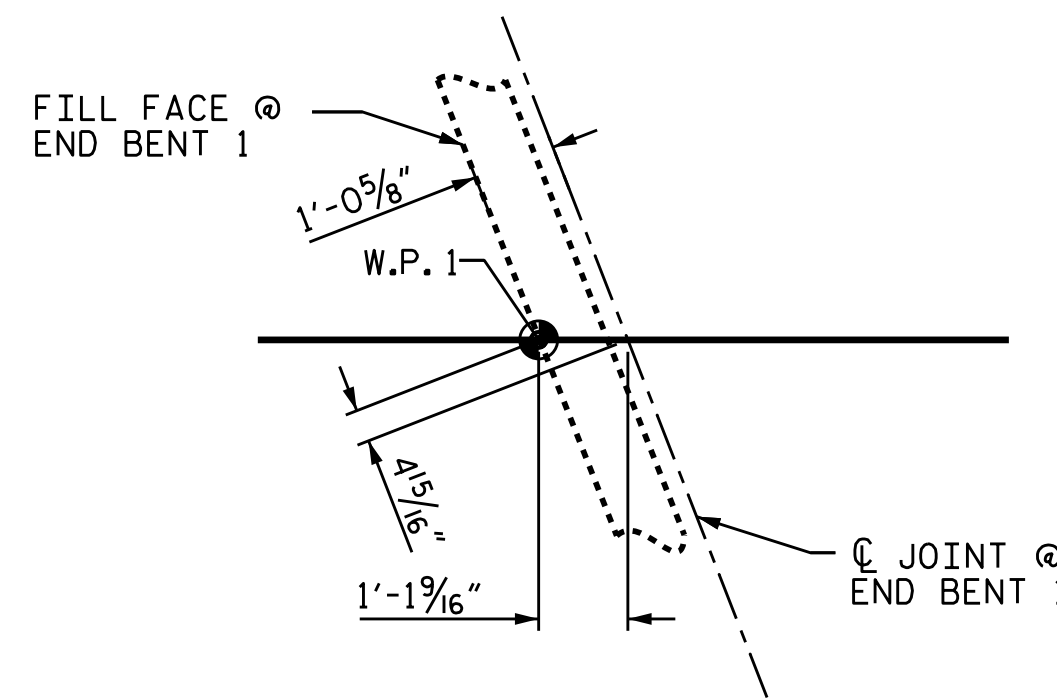
**PLAN OF SPAN A**

FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEETS.



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



**DETAIL A**

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 1 OF 2

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



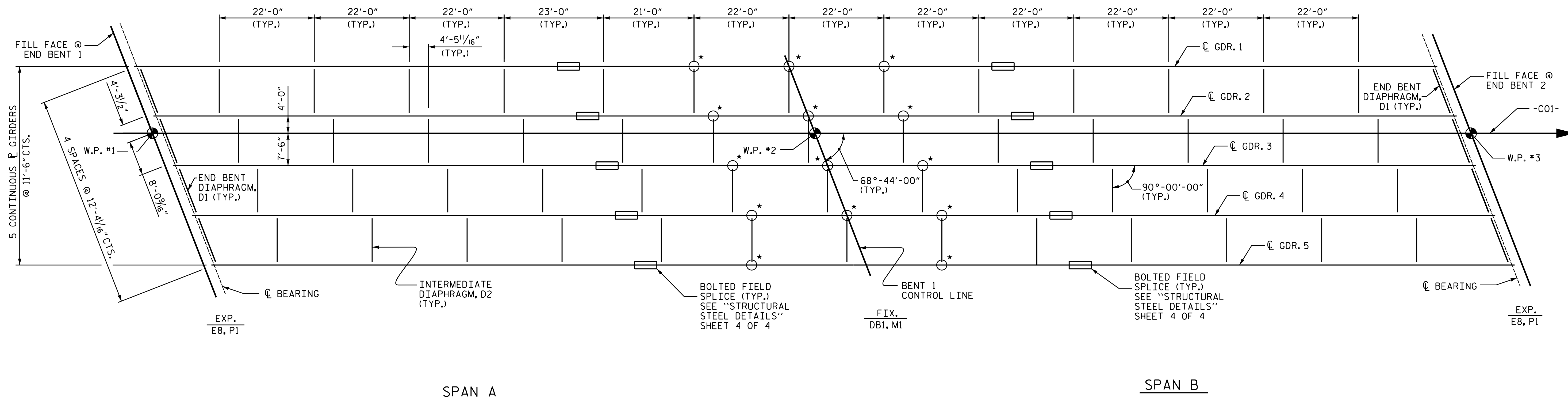
DRAWN BY: K.W. ALFORD DATE: 05/2019  
CHECKED BY: F. LEA DATE: 08/2019  
DESIGN ENGINEER OF RECORD: W.D. REAMS DATE: 04/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			31







SPAN A

SPAN B

### FRAMING PLAN

\*CONNECTOR PLATES SHALL ACT AS TRANSVERSE STIFFENERS AT THESE LOCATIONS

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-



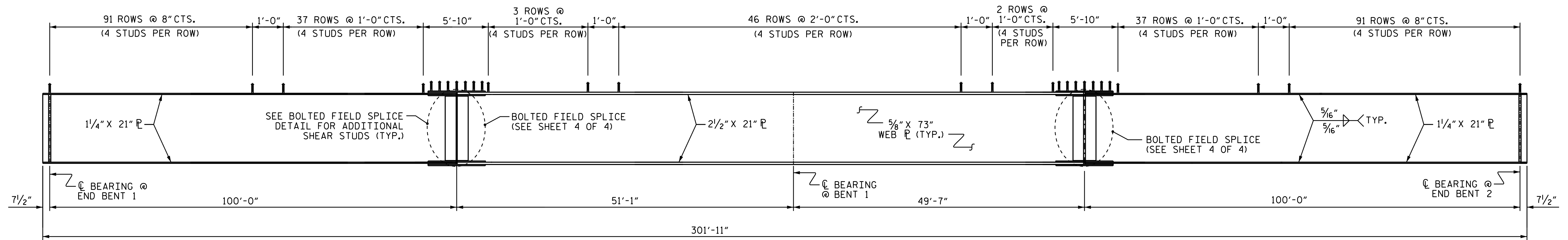
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN

DRAWN BY : O.T. NGUYEN DATE : 08/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

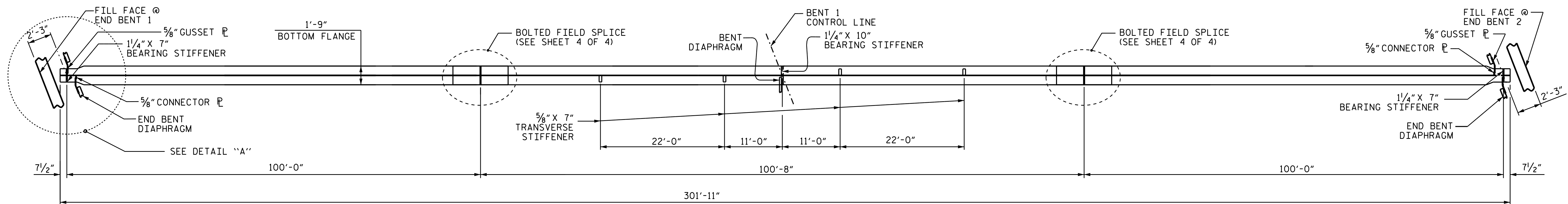
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-8
1			3			TOTAL SHEETS
2			4			31



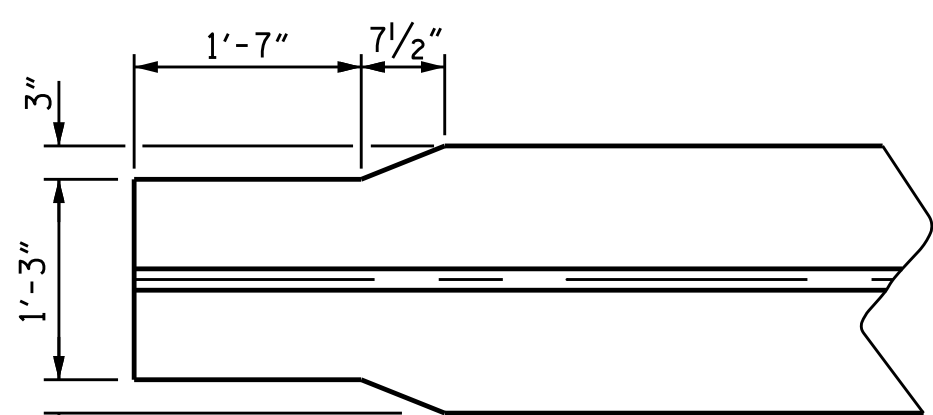


**PLATE GIRDER ELEVATION**

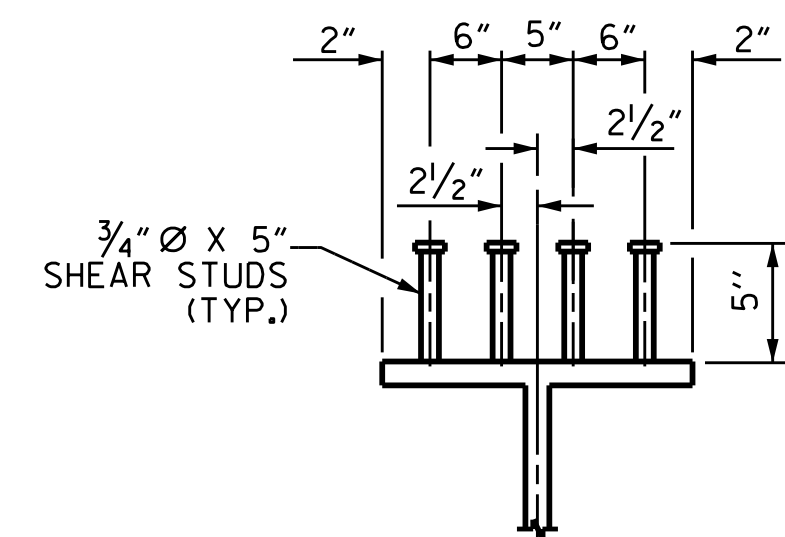
OMIT CONNECTOR PLATES OR TRANSVERSE STIFFENERS ON OUTSIDE OF EXTERIOR GIRDERS. INTERMEDIATE DIAPHRAGMS NOT SHOWN.



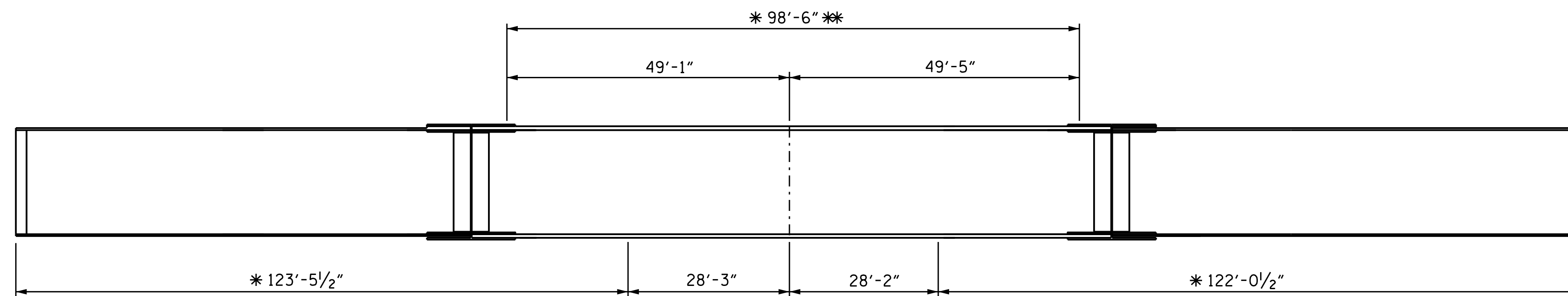
**BOTTOM FLANGE DETAIL**



**END OF GIRDER DETAIL**  
(BOTTOM FLANGE ONLY)



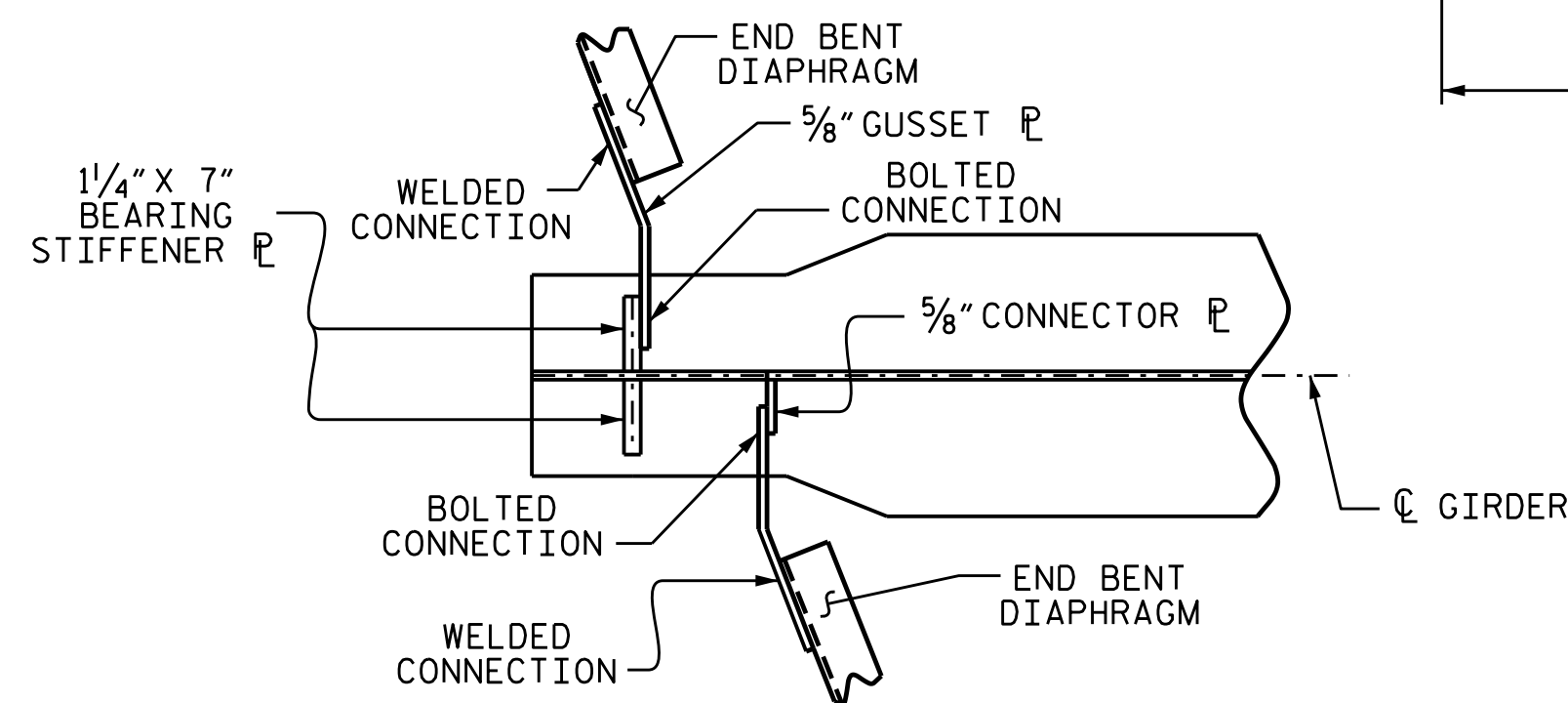
**SHEAR STUD DETAILS**  
(TYP. EA. GIRDER)



**CHARPY V-NOTCH TEST FOR PLATE GIRDER**

\* CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALLS WITHIN THESE LIMITS, INCLUDING ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

\*\* NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



**DETAIL "A"**  
(SIMILAR EACH END)

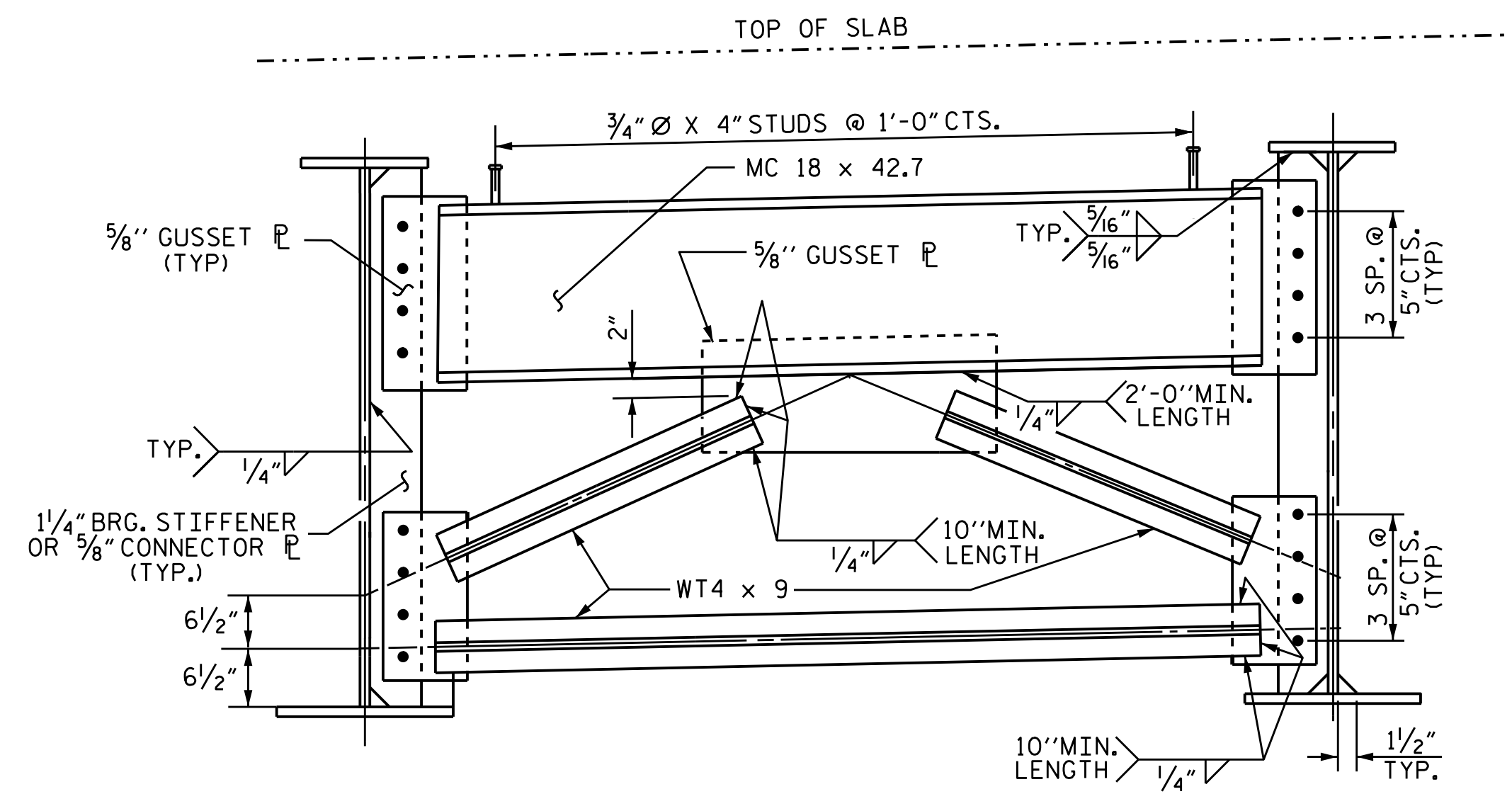
DRAWN BY : O.T. NGUYEN DATE : 08/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

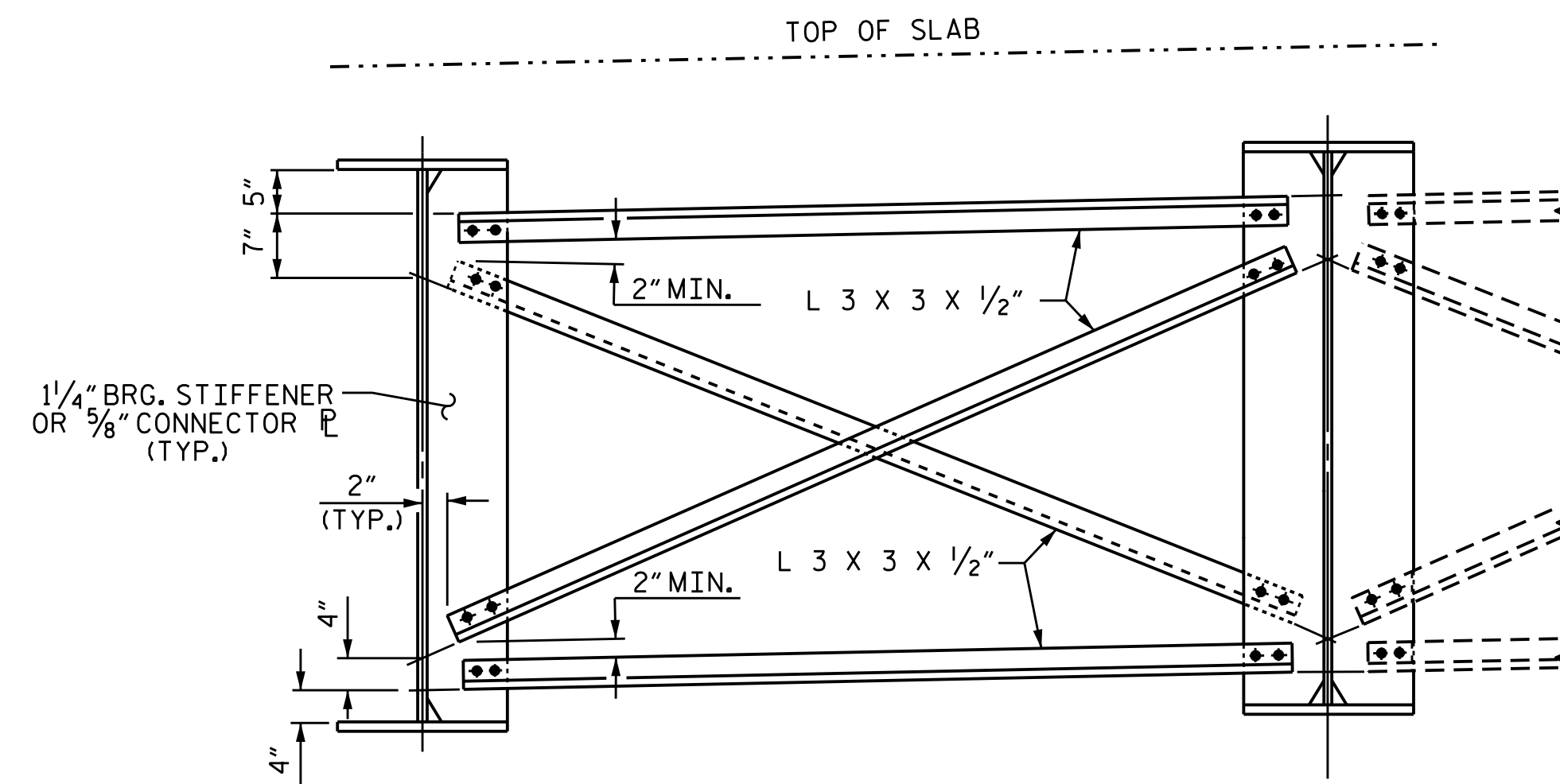
PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S1-9	
SUPERSTRUCTURE						TOTAL SHEETS 31	
STRUCTURAL STEEL DETAILS							
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				



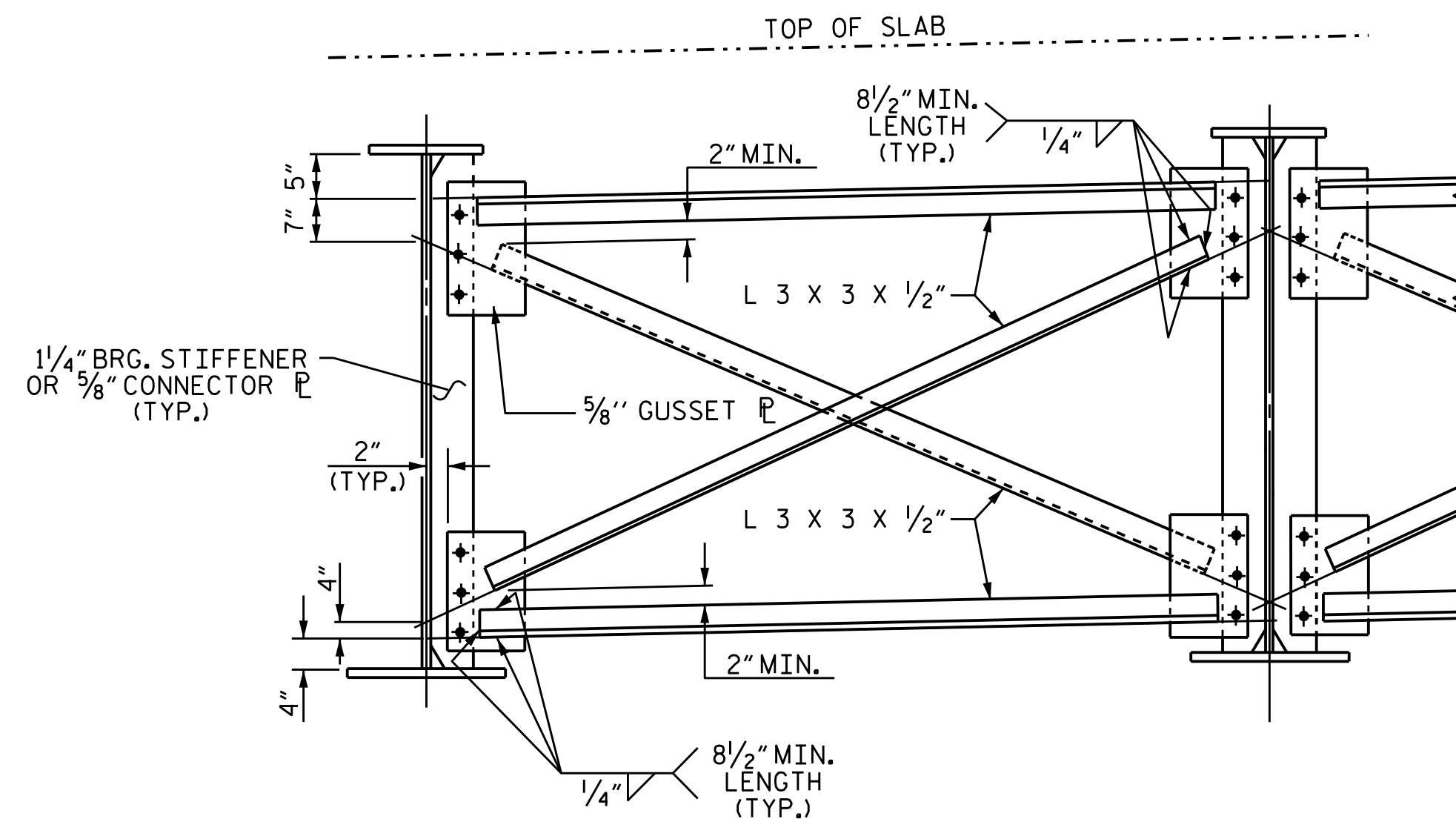
**TYPICAL END BENT DIAPHRAGM (D1)**

FOR WELD SIZE, SEE CONNECTOR PLATE DETAIL OR BEARING STIFFENER @ BENT DETAIL, SHEET 3 OF 4.



**TYPICAL INTERMEDIATE & BENT DIAPHRAGM (D2)**

FOR WELD SIZE, SEE CONNECTOR PLATE DETAIL OR BEARING STIFFENER @ BENT DETAIL, SHEET 3 OF 4.



**OPTIONAL INTERMEDIATE & BENT DIAPHRAGM**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 4



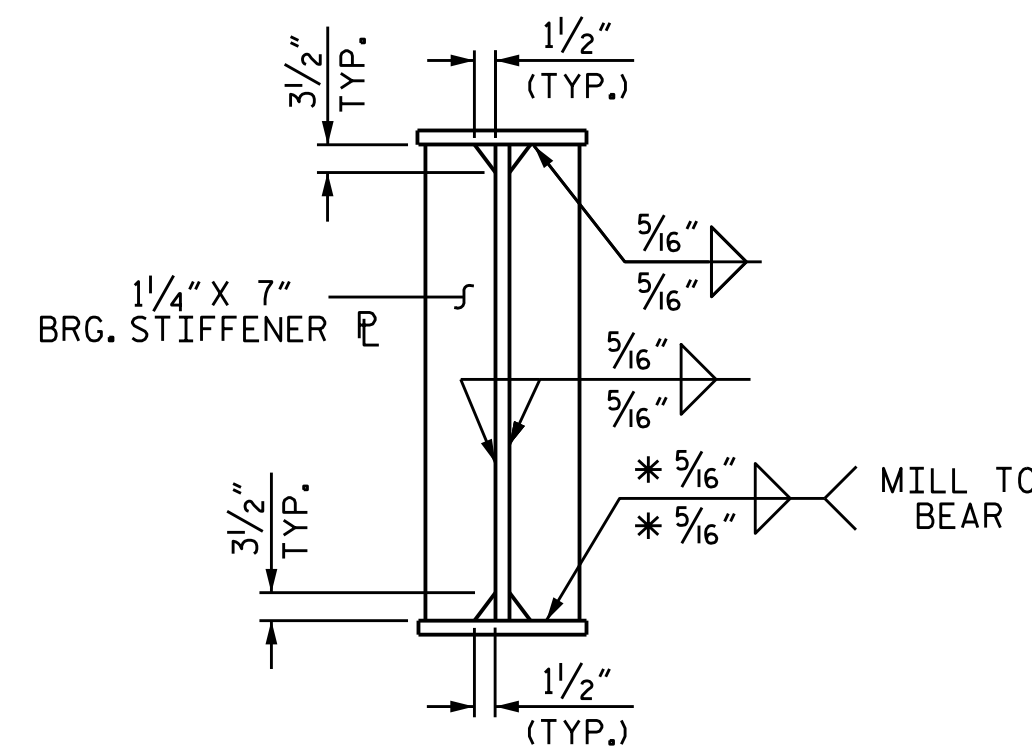
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

DRAWN BY : W.D. REAMS DATE : 08/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

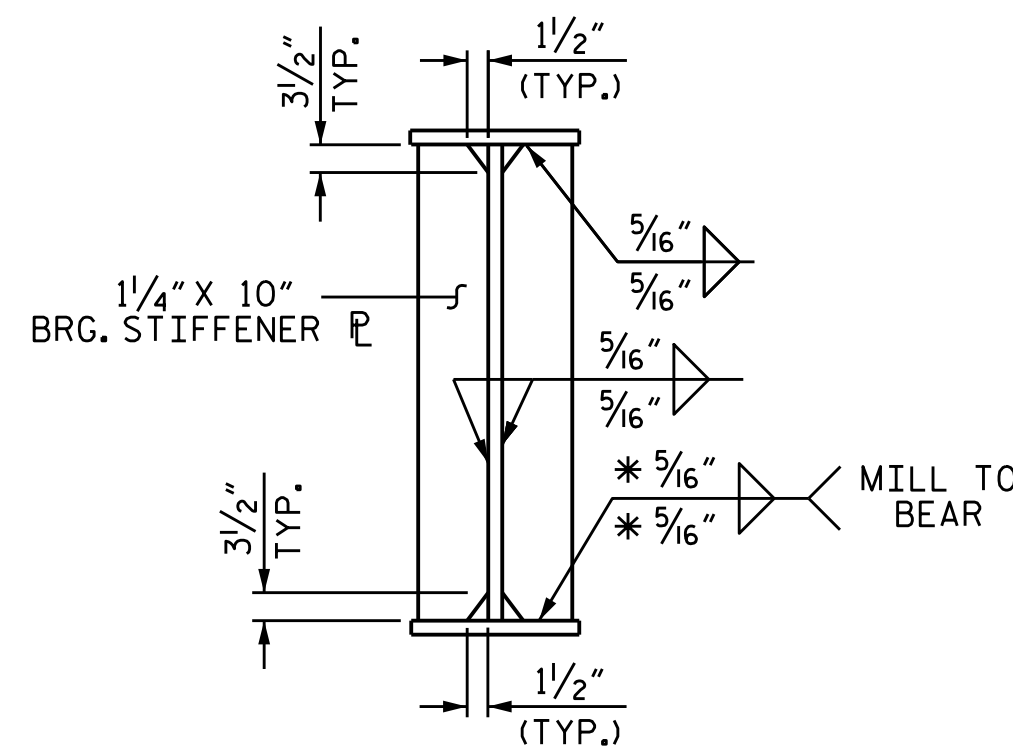
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-10
1			3			TOTAL SHEETS
2			4			31





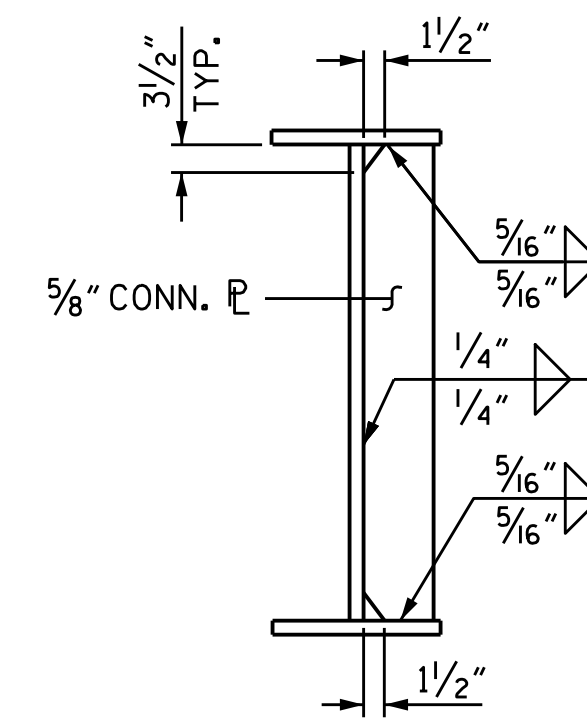
**BEARING STIFFENER @ END BENTS**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE

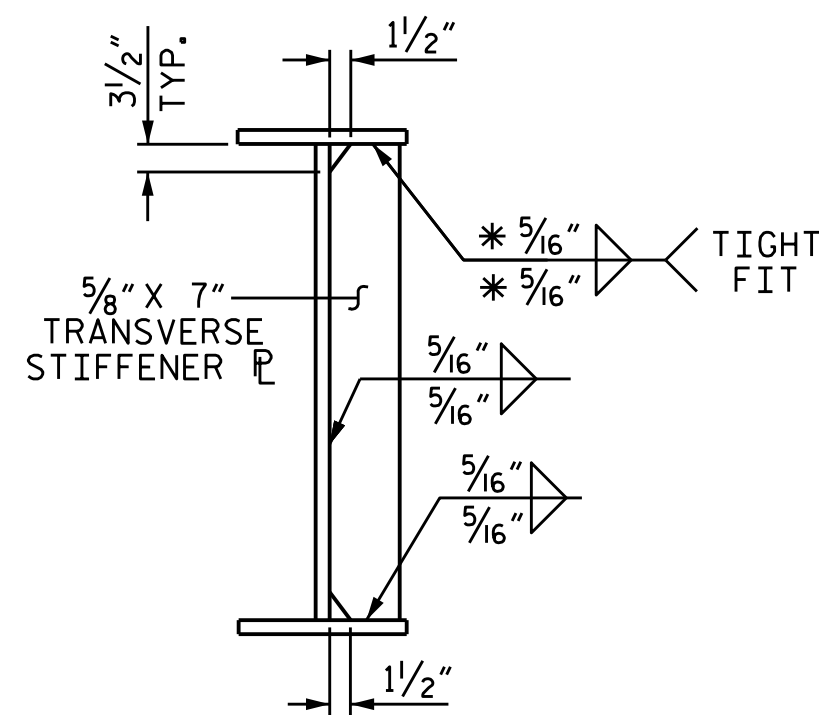


**BEARING STIFFENER @ BENTS**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE

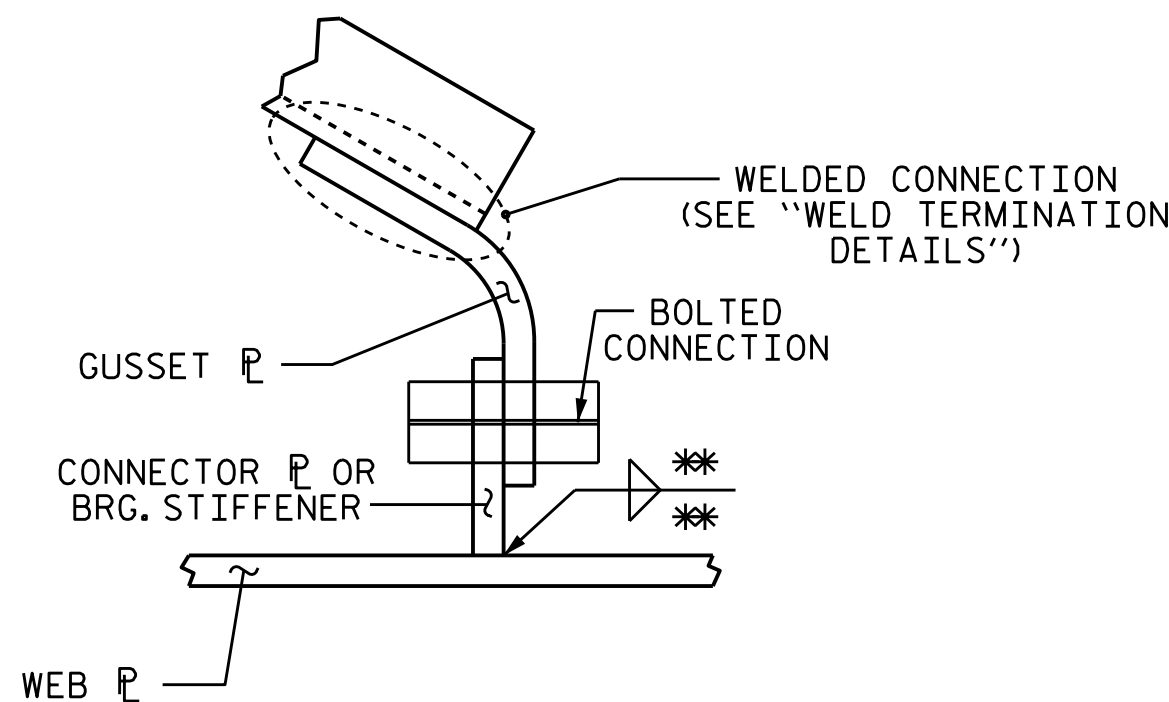


**CONNECTOR PLATE**



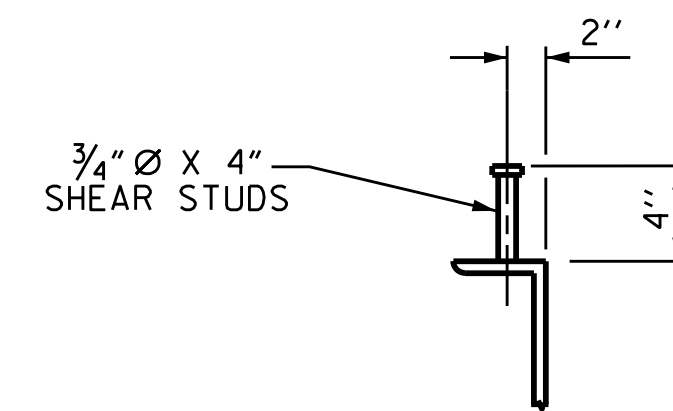
**TRANSVERSE STIFFENER**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE OR BEARING STIFFENER



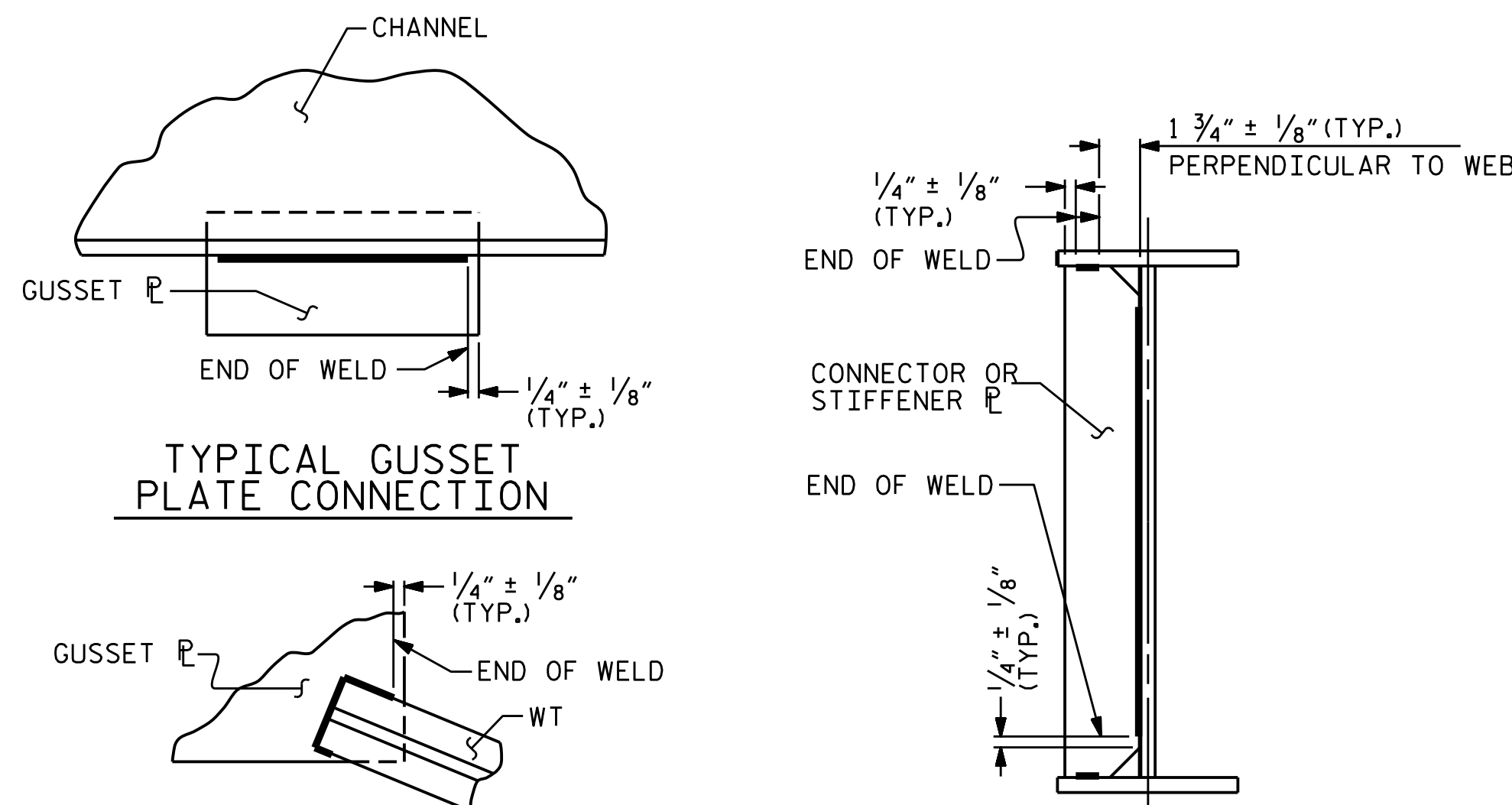
**STIFFENER/CONNECTOR WELD DETAILS**

\*\* WELD SHALL BE 1/4\"/>

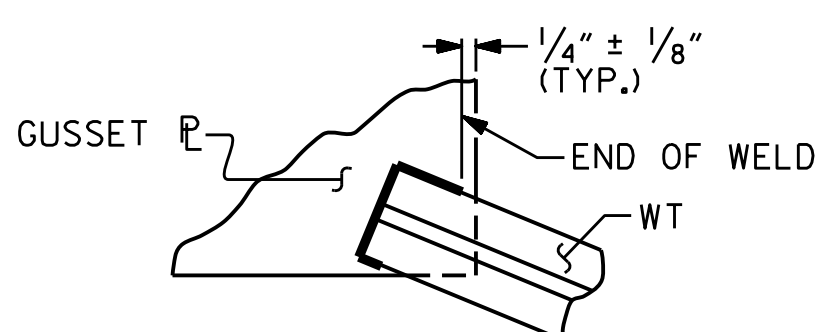


**SHEAR STUD DETAILS**

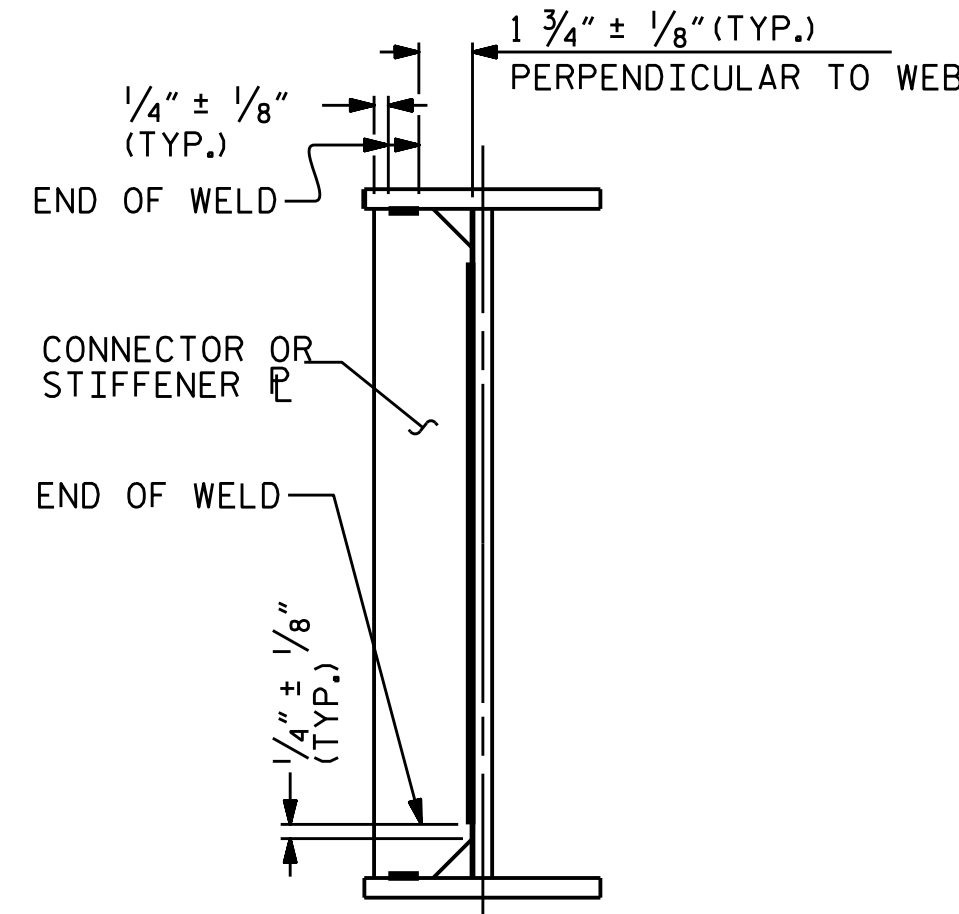
(TYP. EA. END BENT DIAPHRAGM D1)



**TYPICAL GUSSET PLATE CONNECTION**

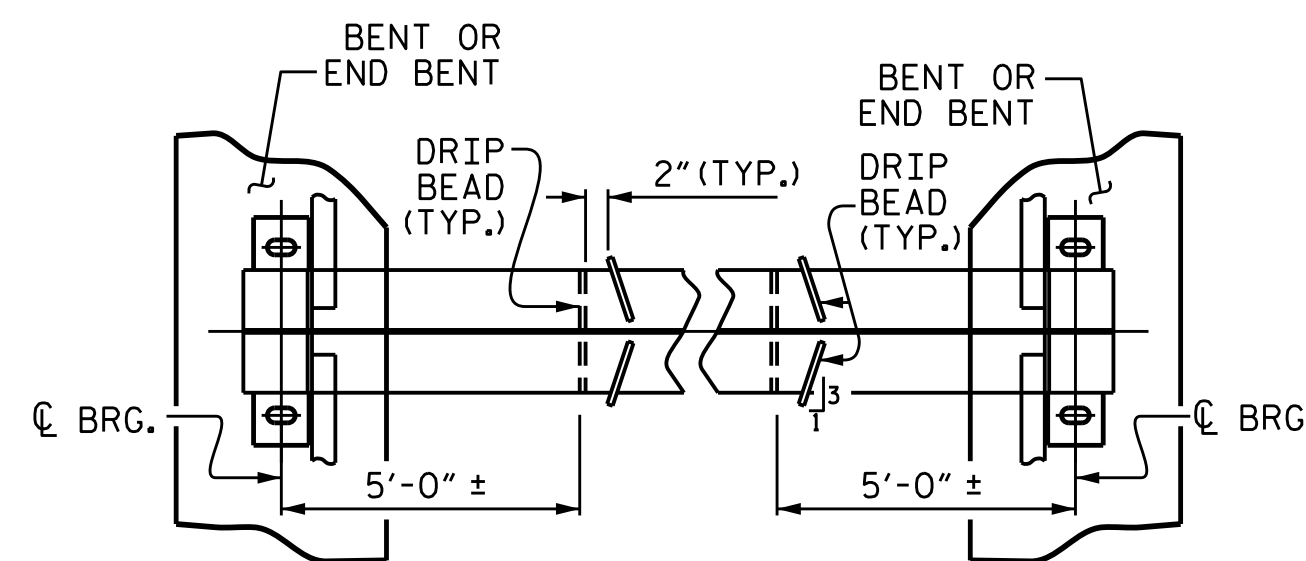


**TYPICAL \"TEE\" TO GUSSET PLATE CONNECTION**

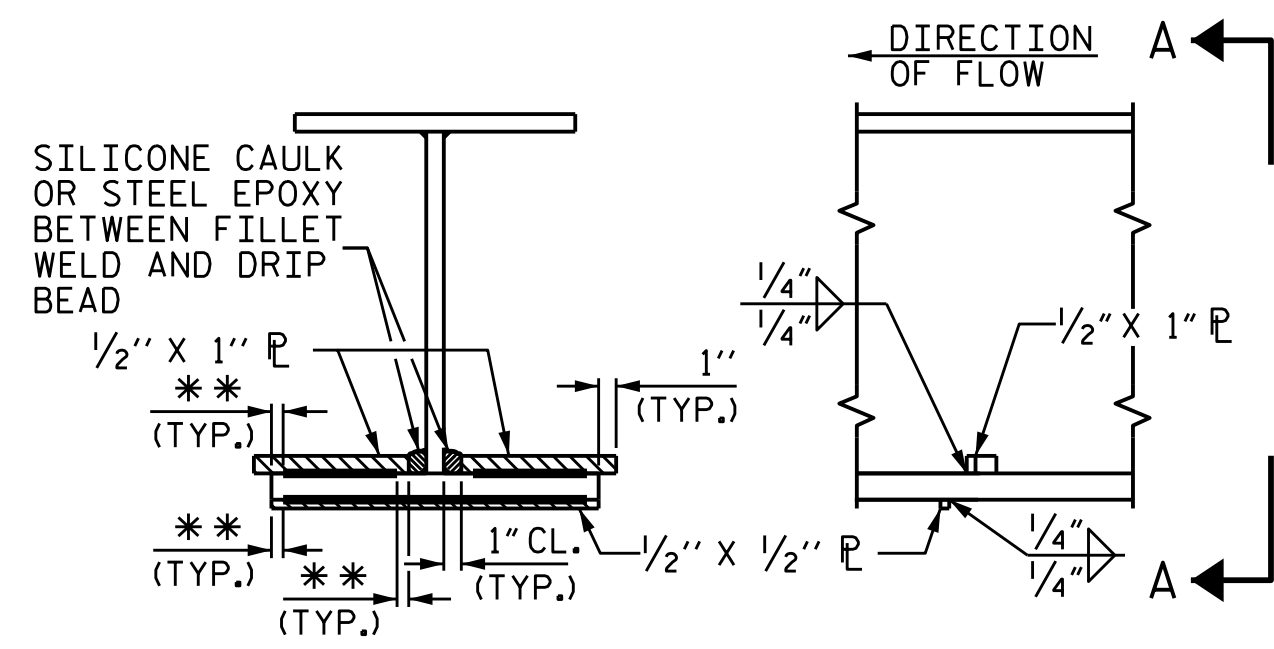


**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**

**WELD TERMINATION DETAILS**



**PART PLAN - BOTTOM FLANGE**

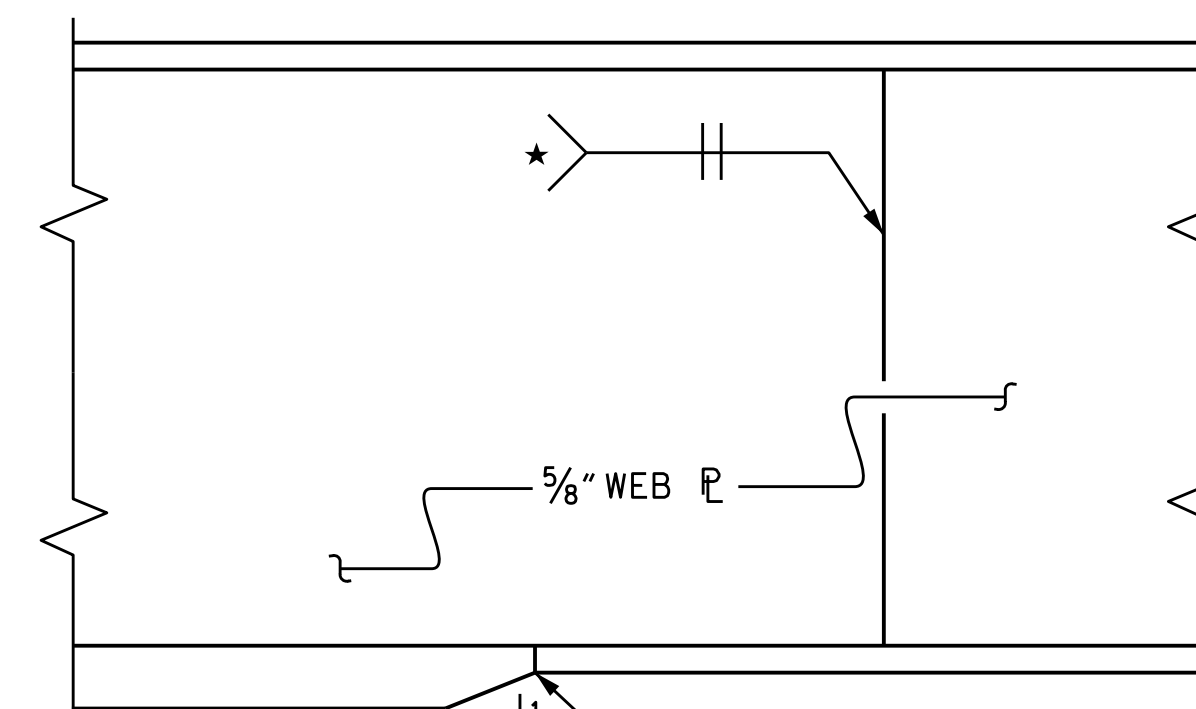


**VIEW A-A**

**SECTION**

\*\* SEE \"WELD TERMINATION DETAILS\"

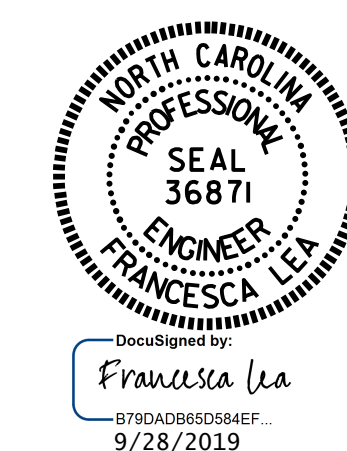
**DRIP BEAD DETAILS**



**ELEVATION**

**TYPICAL FLANGE AND WEB BUTT JOINT**

\* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS / GIRDERS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

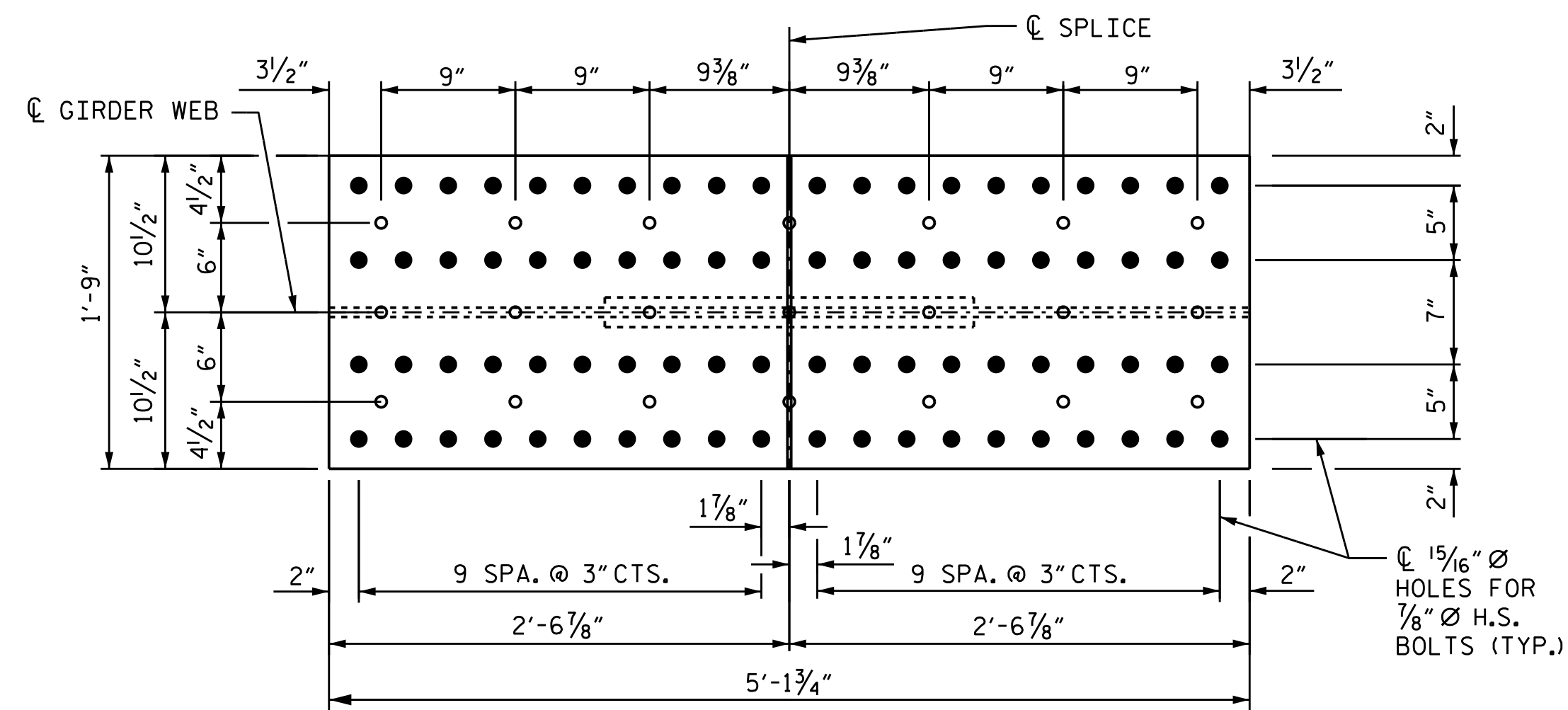
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11	
1			3			TOTAL SHEETS	
2			4			31	

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

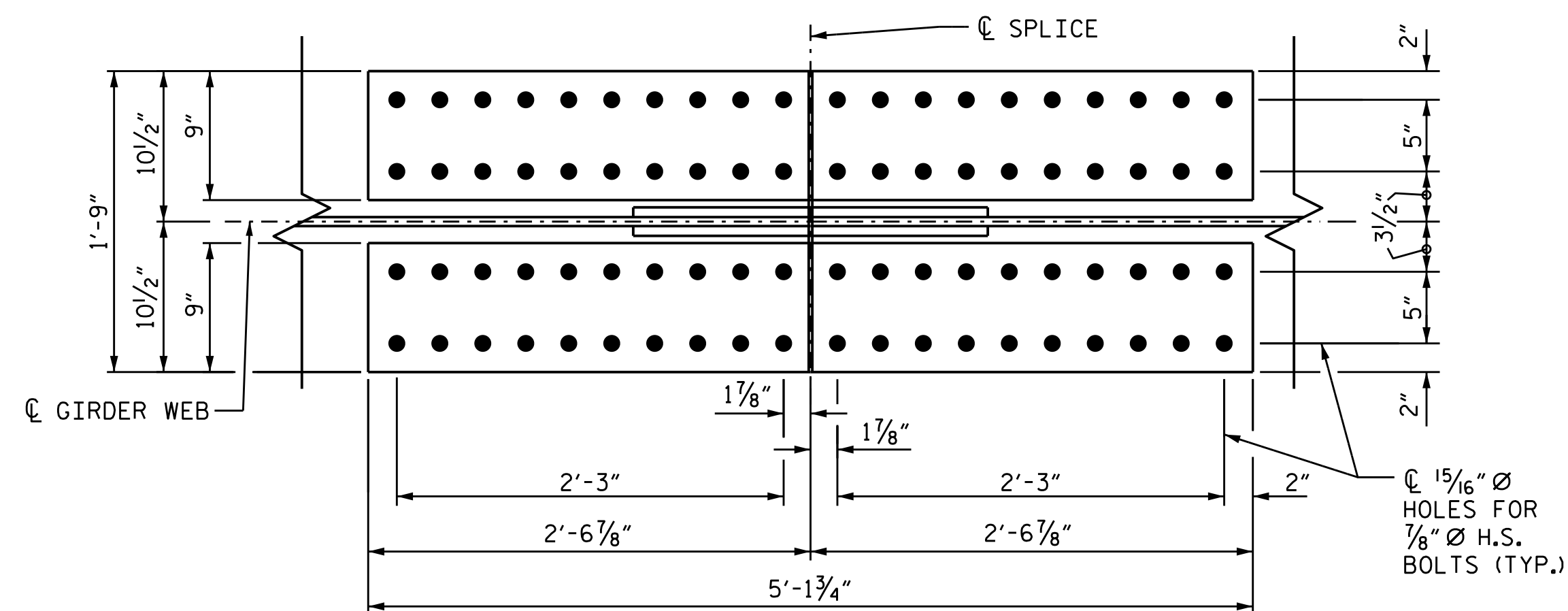
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

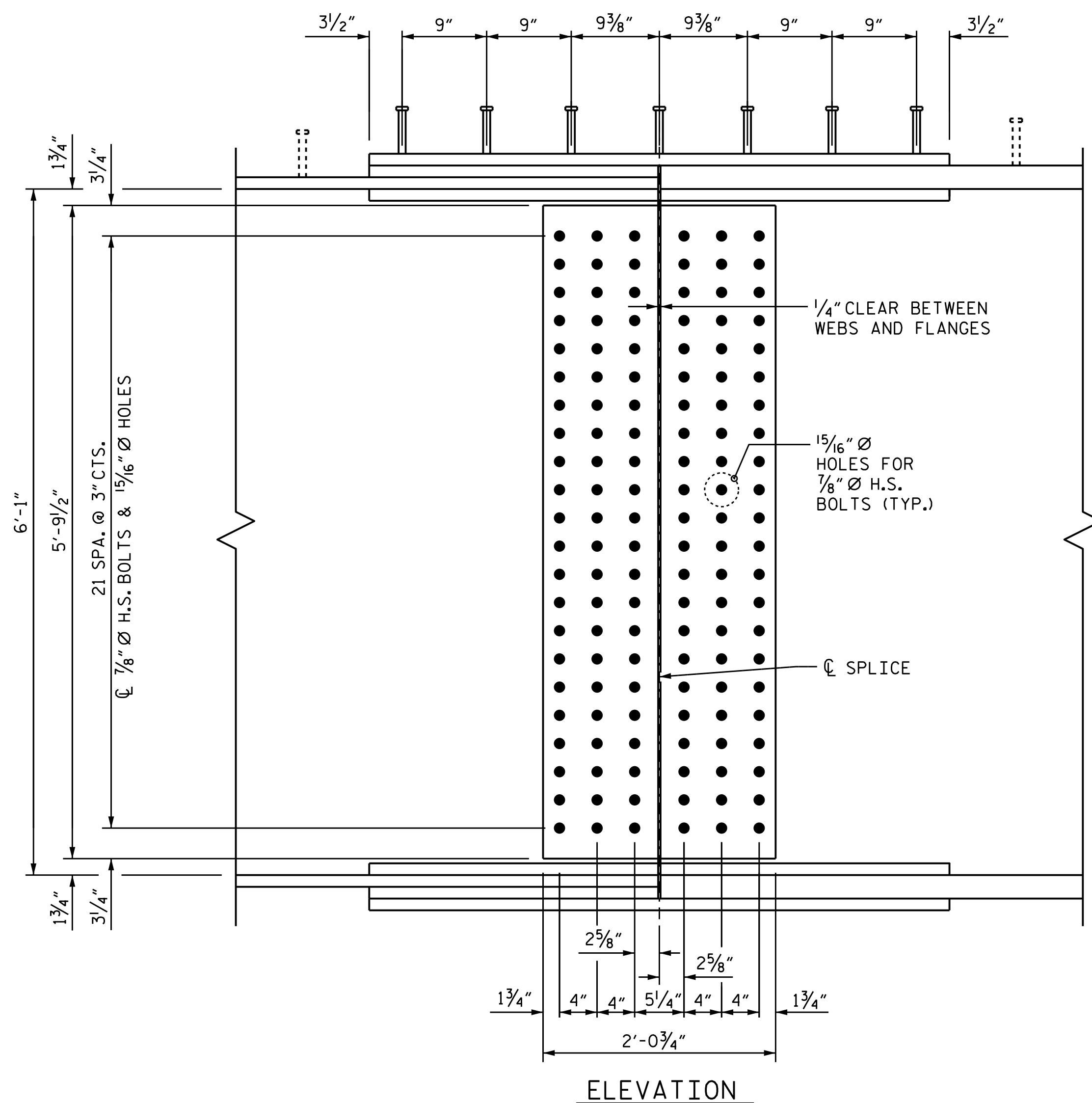
DRAWN BY : W.D. REAMS DATE : 08/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019



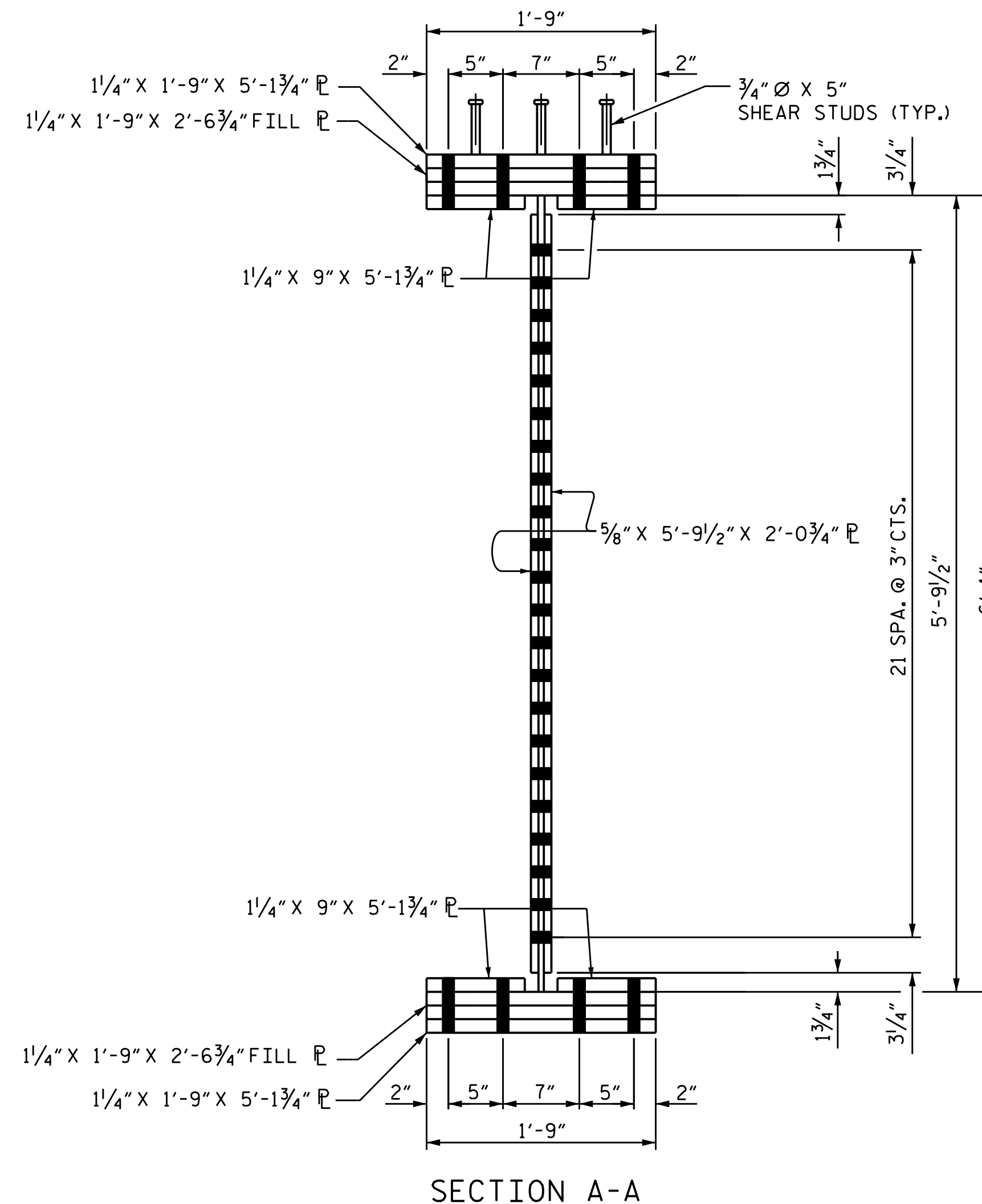
PLAN (TOP OF TOP FLANGE)



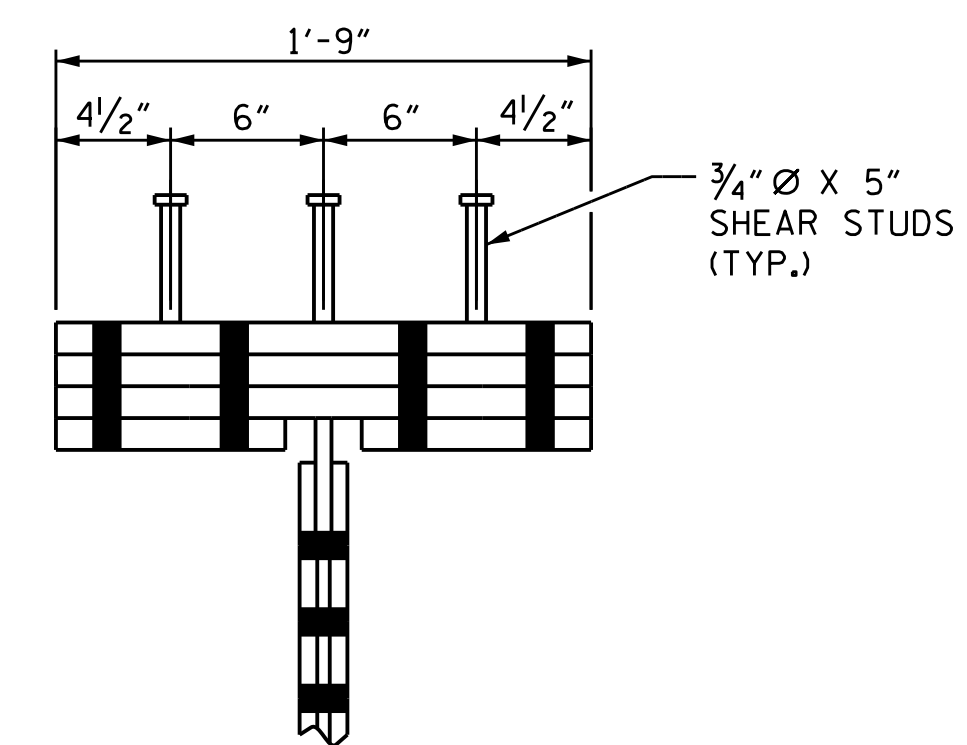
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

BOLTED FIELD SPLICE DETAIL

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

DRAWN BY : W.D. REAMS/O.T. NGUYEN DATE : 07/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

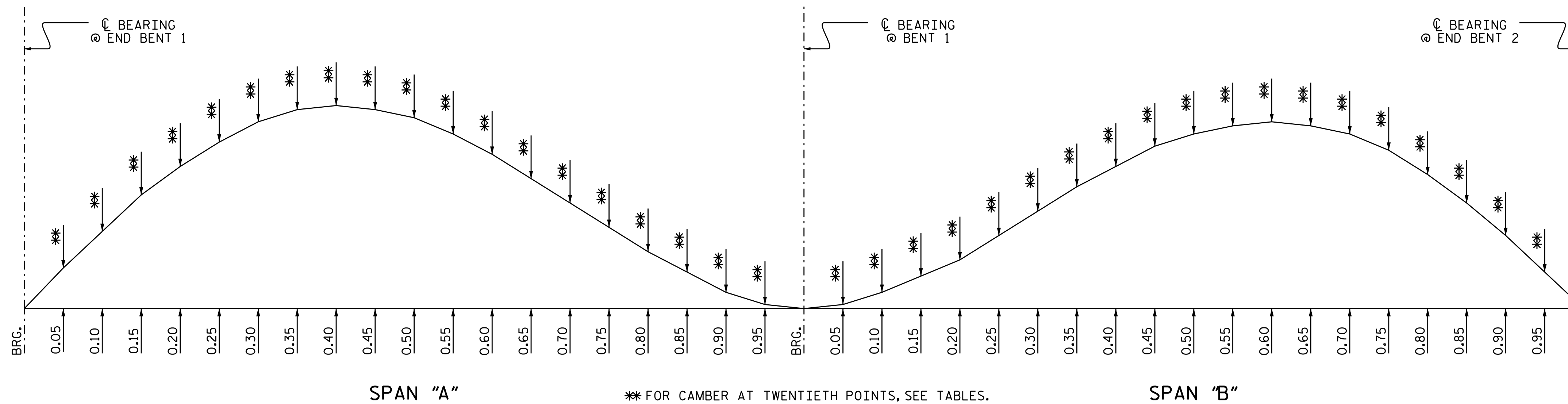
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			31



## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

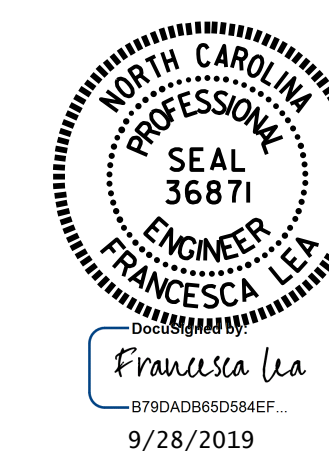
SPAN A																						
GIRDERS #1 & #5																						
TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.011	0.021	0.030	0.038	0.045	0.050	0.053	0.054	0.053	0.050	0.046	0.041	0.035	0.028	0.022	0.015	0.009	0.005	0.001	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.034	0.067	0.097	0.123	0.144	0.160	0.169	0.173	0.170	0.162	0.150	0.133	0.113	0.091	0.069	0.049	0.030	0.015	0.004	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.003	0.007	0.010	0.012	0.014	0.016	0.017	0.017	0.017	0.016	0.015	0.014	0.012	0.009	0.007	0.005	0.003	0.002	0.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.048	0.095	0.137	0.173	0.203	0.226	0.239	0.244	0.240	0.228	0.211	0.188	0.160	0.128	0.098	0.069	0.042	0.022	0.005	0
VERTICAL CURVE ORDINATE	↓	0	0.043	0.082	0.117	0.146	0.172	0.192	0.208	0.220	0.226	0.229	0.226	0.220	0.208	0.192	0.172	0.146	0.117	0.082	0.043	0
REQUIRED CAMBER	↑	0	1/8"	2/8"	3/16"	3 3/16"	4 1/2"	5"	5 3/8"	5 9/16"	5 5/8"	5 1/2"	5 1/4"	4 7/8"	4 7/16"	3 3/16"	3/4"	2 5/16"	1 7/8"	1 1/4"	9/16"	0
GIRDERS #2 - #4																						
TWENTIETH POINTS	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	BRG.	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.011	0.021	0.030	0.038	0.045	0.050	0.053	0.054	0.053	0.050	0.046	0.041	0.035	0.028	0.022	0.015	0.009	0.005	0.001	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.034	0.067	0.097	0.123	0.144	0.160	0.169	0.173	0.170	0.162	0.150	0.133	0.113	0.091	0.069	0.049	0.030	0.015	0.004	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.003	0.006	0.009	0.011	0.013	0.015	0.016	0.016	0.016	0.015	0.014	0.013	0.011	0.009	0.007	0.005	0.003	0.002	0.000	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.048	0.094	0.136	0.172	0.202	0.225	0.238	0.243	0.239	0.227	0.210	0.187	0.159	0.128	0.098	0.069	0.042	0.022	0.005	0
VERTICAL CURVE ORDINATE	↓	0	0.043	0.082	0.117	0.146	0.172	0.192	0.208	0.220	0.226	0.229	0.226	0.220	0.208	0.192	0.172	0.146	0.117	0.082	0.043	0
REQUIRED CAMBER	↑	0	1/8"	2/8"	3/16"	3 3/16"	4 1/2"	5"	5 3/8"	5 9/16"	5 5/8"	5 1/2"	5 1/4"	4 7/8"	4 7/16"	3 3/16"	3/4"	2 5/16"	1 7/8"	1 1/4"	9/16"	0
SPAN B																						
GIRDERS #1 & #5																						
TWENTIETH POINTS	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	BRG.	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.001	0.004	0.008	0.013	0.019	0.025	0.032	0.038	0.043	0.046	0.049	0.050	0.049	0.046	0.042	0.036	0.028	0.019	0.010	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.003	0.012	0.026	0.043	0.062	0.083	0.103	0.122	0.138	0.150	0.158	0.161	0.158	0.149	0.135	0.115	0.091	0.063	0.032	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.000	0.001	0.003	0.005	0.007	0.009	0.011	0.013	0.014	0.015	0.016	0.016	0.015	0.013	0.011	0.009	0.006	0.003	0.003	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.004	0.017	0.037	0.061	0.088	0.117	0.146	0.173	0.195	0.211	0.223	0.227	0.223	0.210	0.190	0.162	0.128	0.088	0.045	0
VERTICAL CURVE ORDINATE	↓	0	0.043	0.081	0.114	0.144	0.168	0.188	0.204	0.215	0.222	0.224	0.222	0.215	0.204	0.188	0.168	0.144	0.114	0.081	0.043	0
REQUIRED CAMBER	↑	0	9/16"	1 3/16"	1 13/16"	2 7/16"	3 1/16"	3 11/16"	4 3/16"	4 5/8"	5"	5 1/4"	5 5/16"	5 5/16"	5 1/8"	4 3/4"	4 5/16"	3 11/16"	2 5/16"	2"	1 1/16"	0
GIRDERS #2 - #4																						
TWENTIETH POINTS	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	BRG.	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.001	0.004	0.008	0.013	0.019	0.025	0.032	0.038	0.043	0.046	0.049	0.050	0.049	0.046	0.042	0.036	0.028	0.019	0.010	0
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.003	0.012	0.026	0.043	0.062	0.083	0.103	0.122	0.138	0.150	0.158	0.161	0.158	0.149	0.135	0.115	0.091	0.063	0.032	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.000	0.001	0.003	0.004	0.006	0.008	0.010	0.012	0.013	0.014	0.015	0.015	0.014	0.013	0.011	0.008	0.006	0.003	0.003	0
TOTAL DEAD LOAD DEFLECTION	↓	0	0.004	0.017	0.037	0.060	0.087	0.116	0.145	0.172	0.194	0.210	0.222	0.226	0.222	0.209	0.190	0.162	0.127	0.088	0.045	0
VERTICAL CURVE ORDINATE	↓	0	0.043	0.081	0.114	0.144	0.168	0.188	0.204	0.215	0.222	0.224	0.222	0.215	0.204	0.188	0.168	0.144	0.114	0.081	0.043	0
REQUIRED CAMBER	↑	0	9/16"	1 3/16"	1 13/16"	2 7/16"	3 1/16"	3 5/8"	4 3/16"	4 5/8"	5"	5 3/16"	5 5/16"	5 5/16"	5 1/8"	4 3/4"	4 5/16"	3 11/16"	2 7/8"	2"	1 1/16"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).  
 DEFLECTIONS ARE TAKEN AT TWENTIETH POINTS BETWEEN BEARINGS.



SCHEMATIC CAMBER ORDINATES

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-



STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUPERSTRUCTURE					
DEAD LOAD DEFLECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S1-13 TOTAL SHEETS 31

DRAWN BY: W. D. REAMS DATE: 08/2019  
 CHECKED BY: F. LEA DATE: 08/2019  
 DESIGN ENGINEER OF RECORD: W. D. REAMS DATE: 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

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.

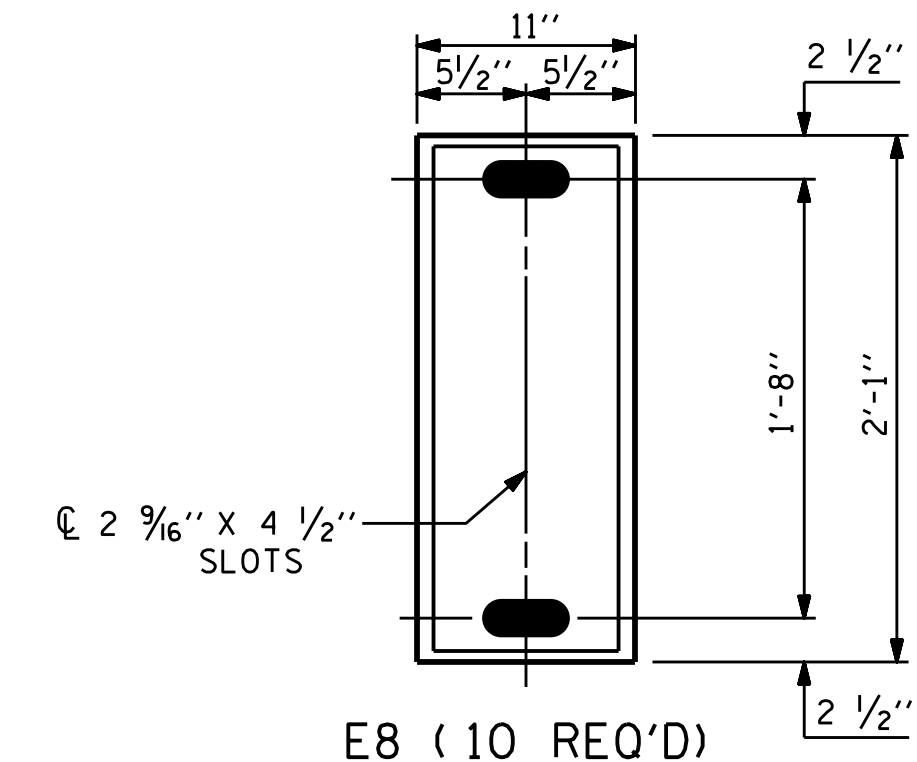
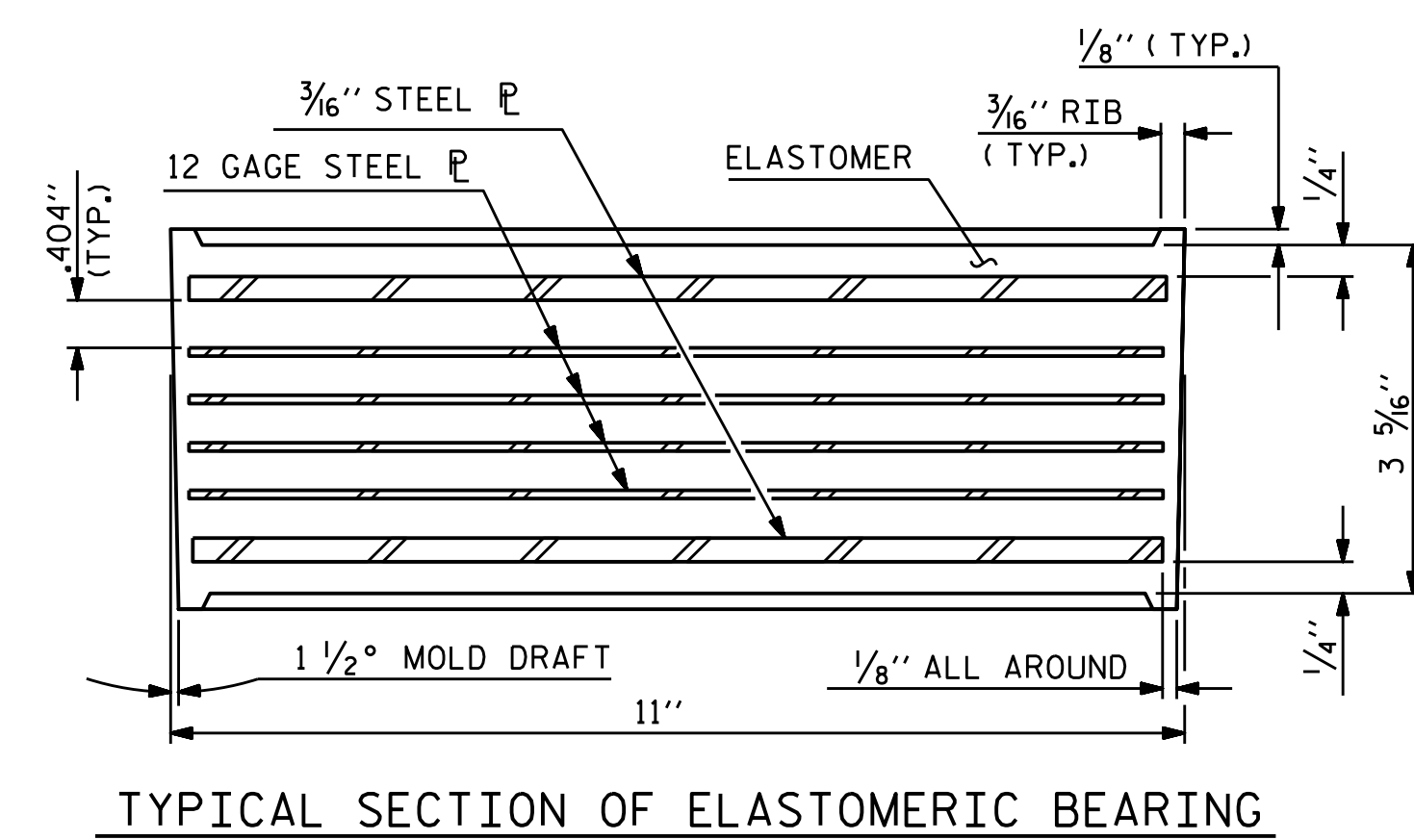
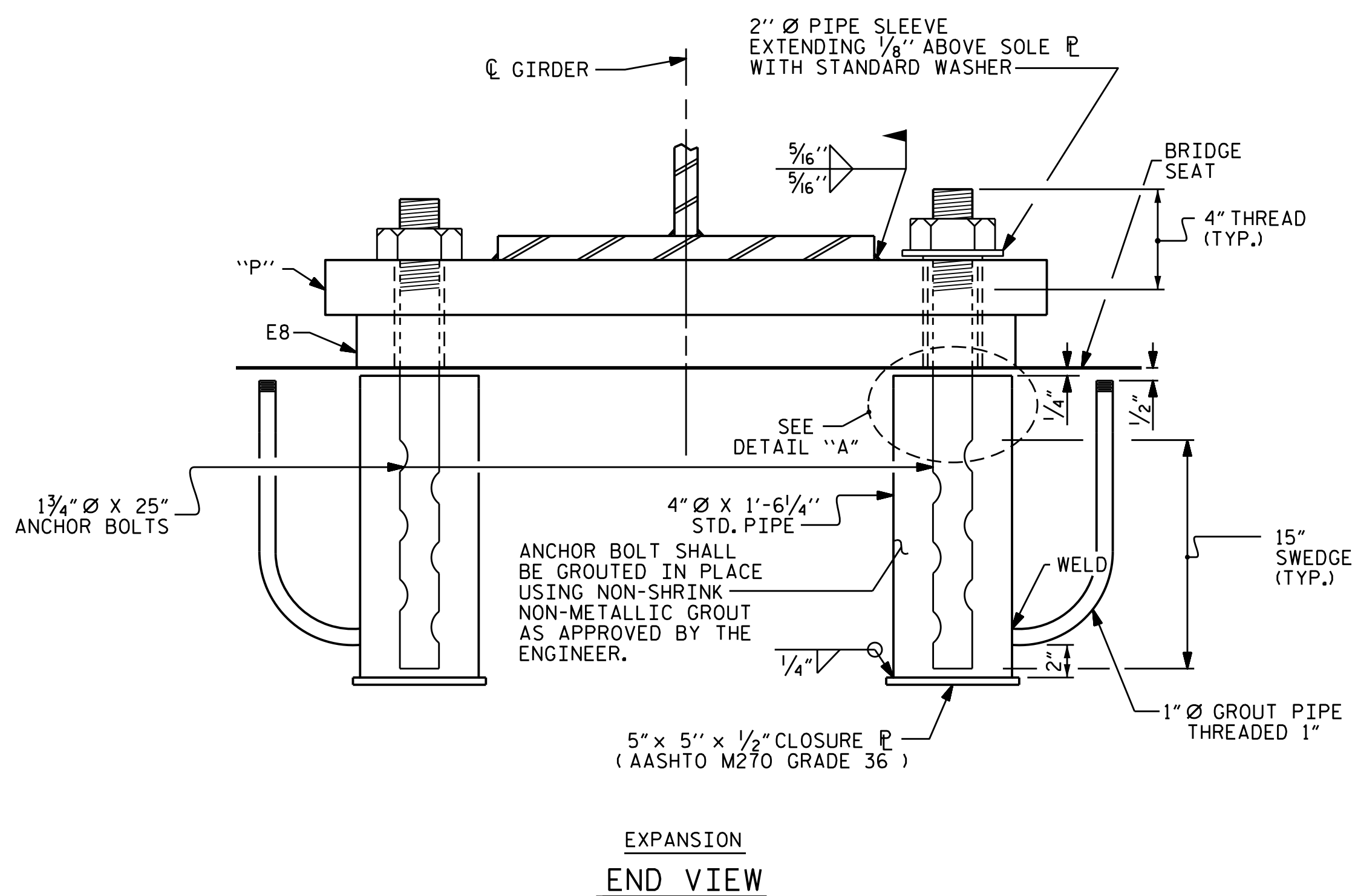
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

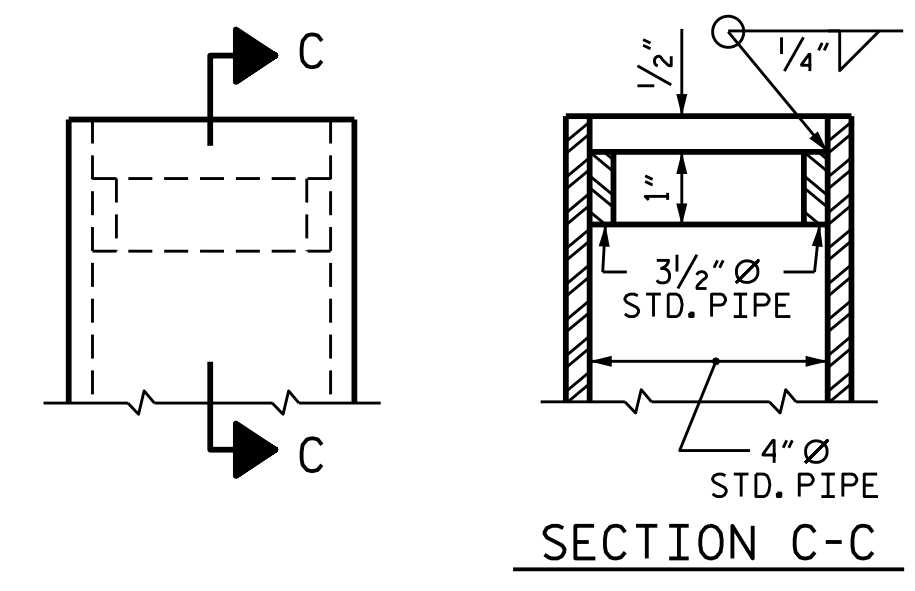
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60°F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

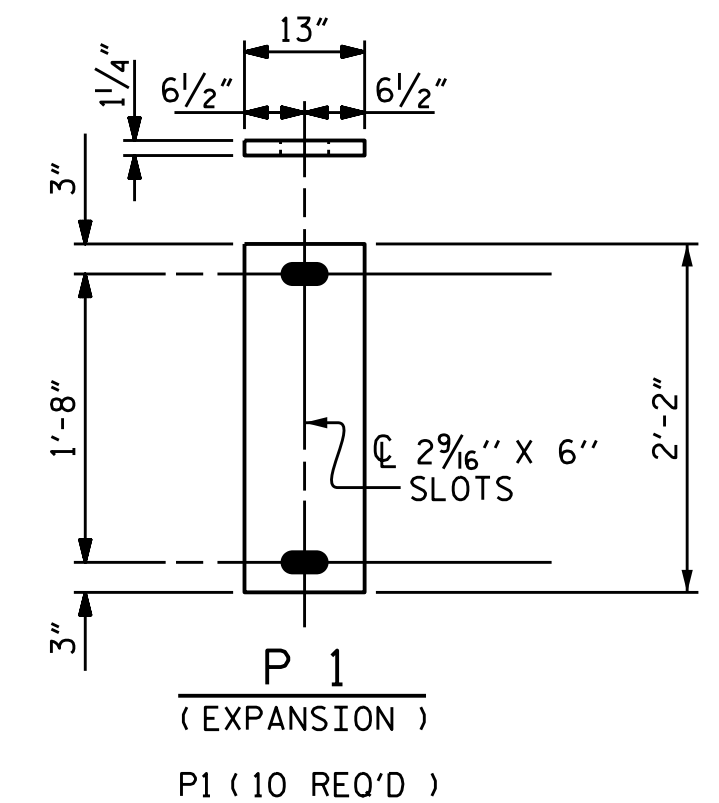
THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



PLAN VIEW OF ELASTOMERIC BEARING  
TYPE IV



DETAIL "A"



SOLE PLATE DETAILS ("P")

<b>MAXIMUM ALLOWABLE SERVICE LOADS</b>	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
(STEEL SUPERSTRUCTURE)

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : EEM 10/95	REV. 10/1/11 MAA/GM
CHECKED BY : PEK 10/95	REV. 6/13 AAC/MAA
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14	
1			3			TOTAL SHEETS	
2			4			31	



**NOTES**

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

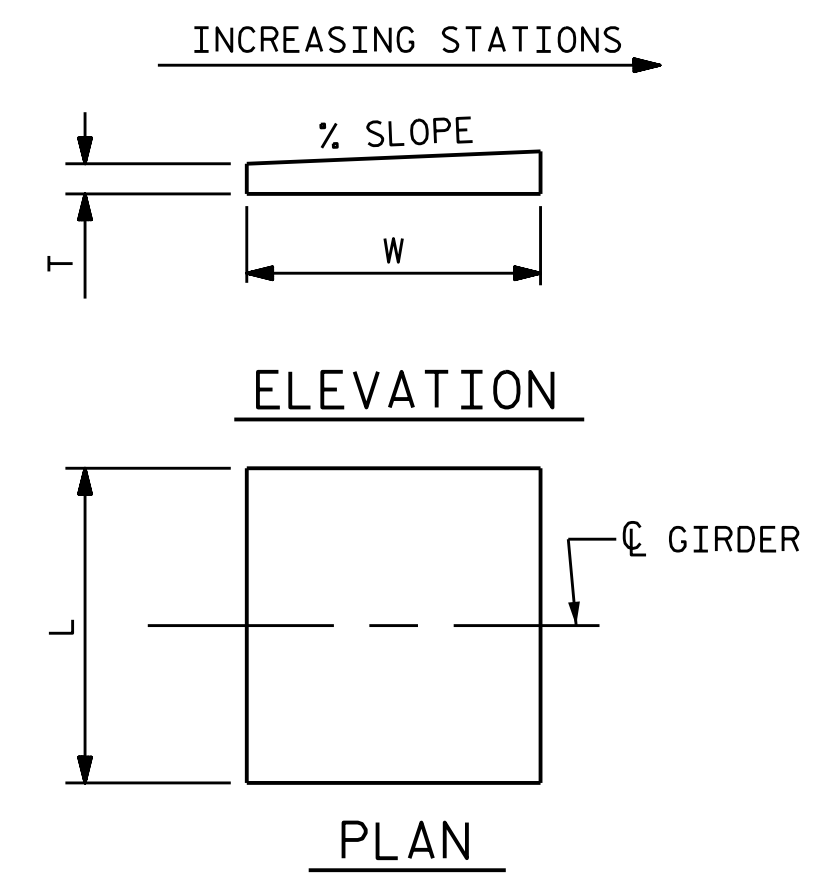
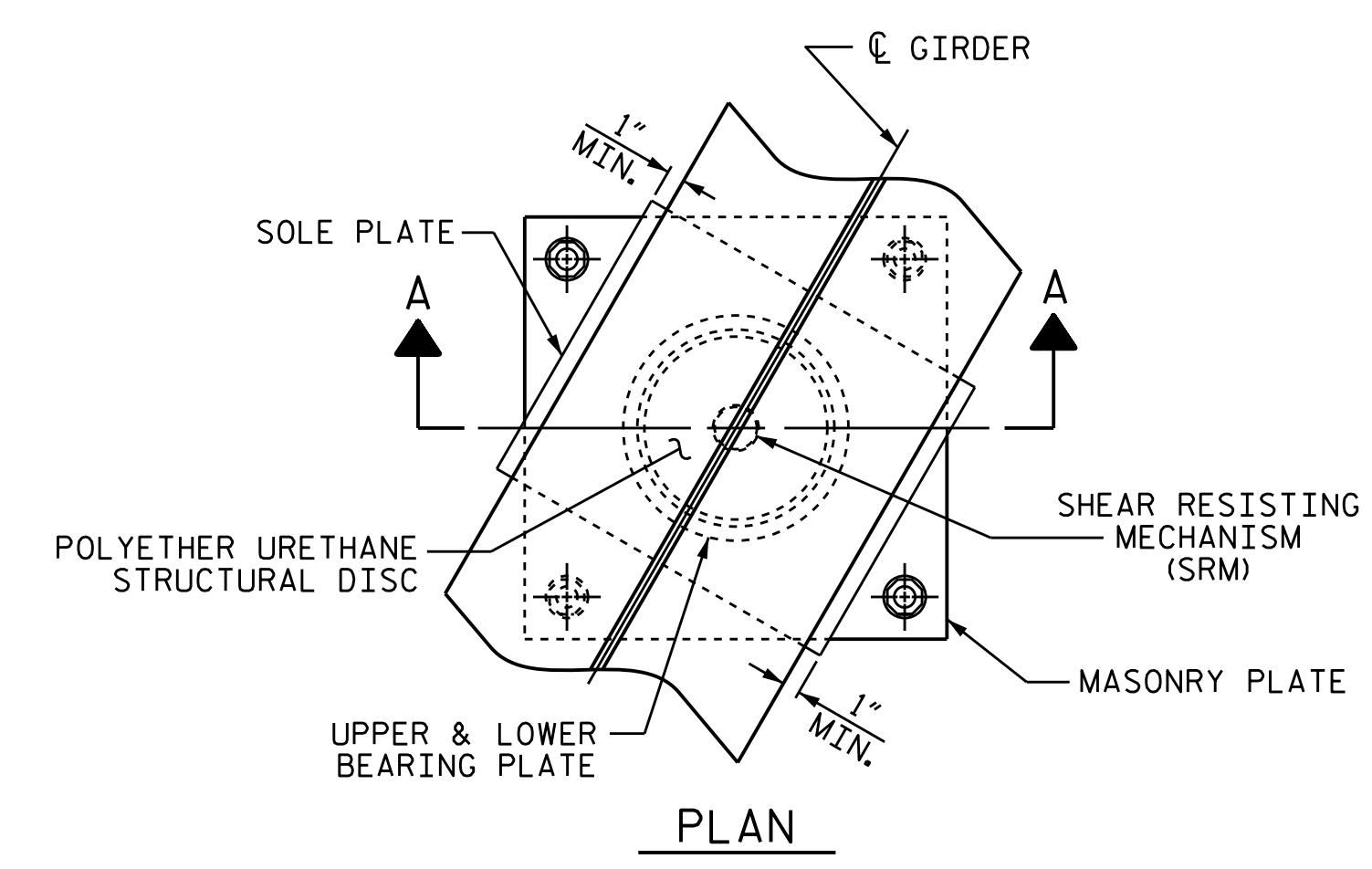
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

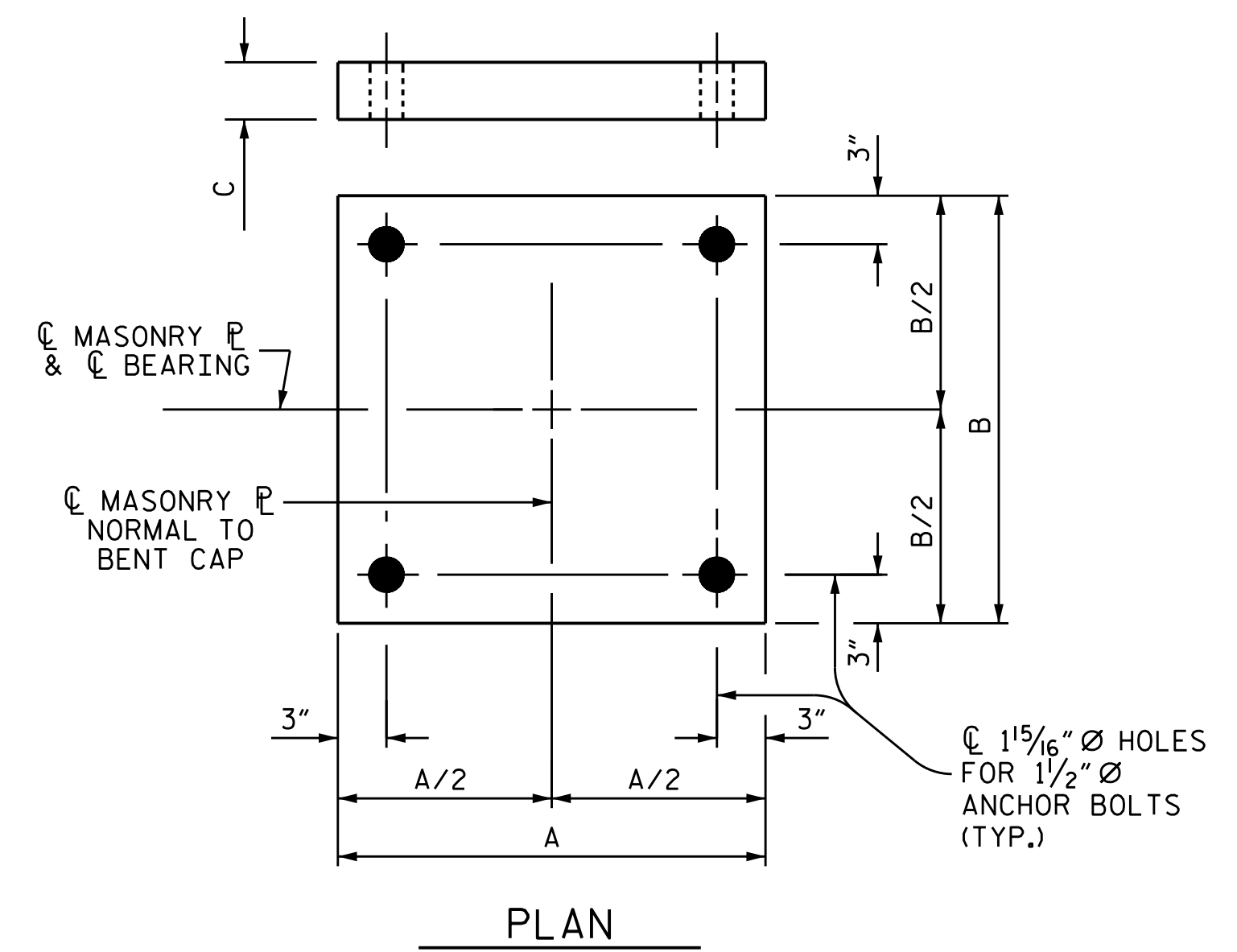
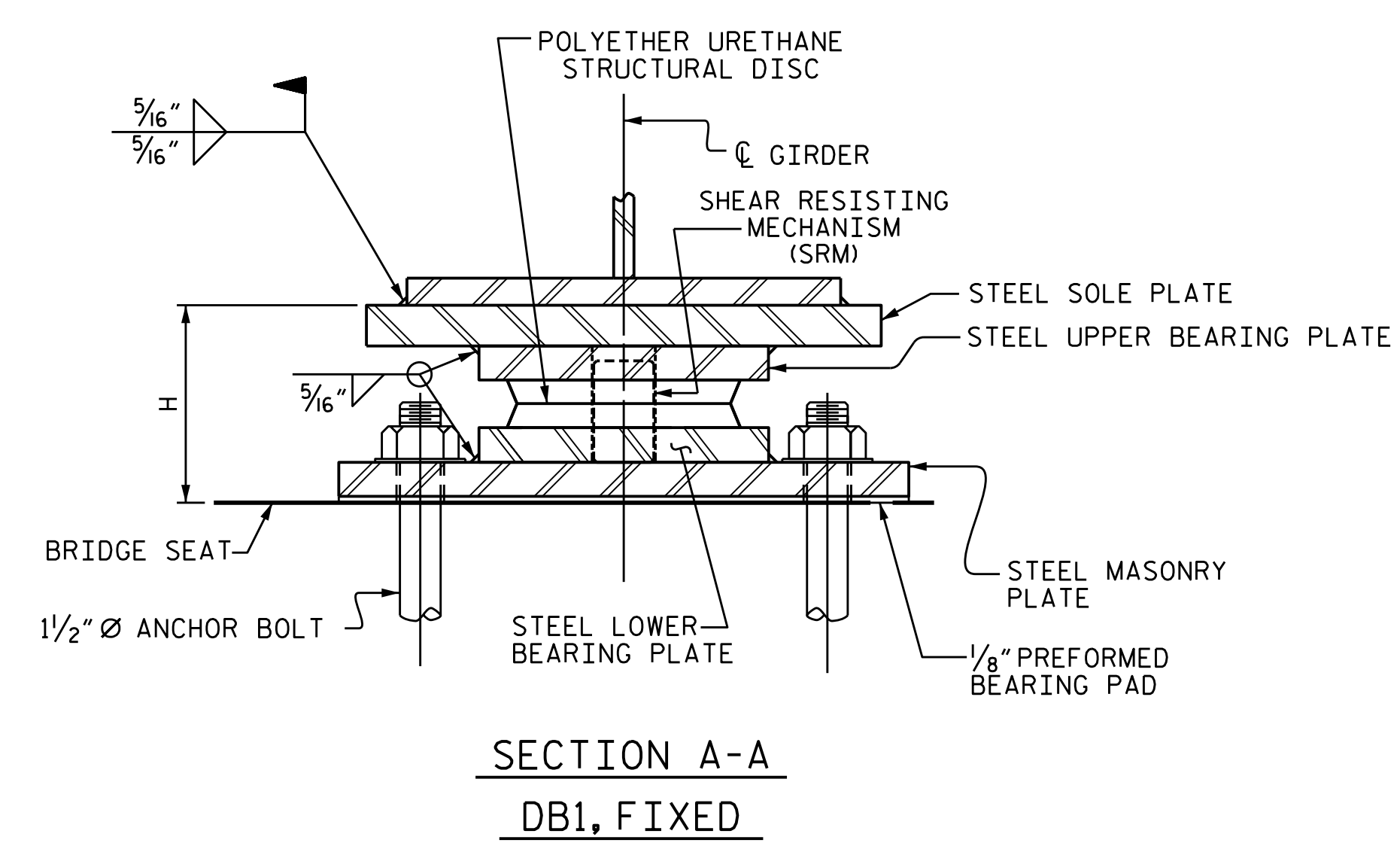
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.



NOTE:  
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

**SOLE PLATE DETAILS**

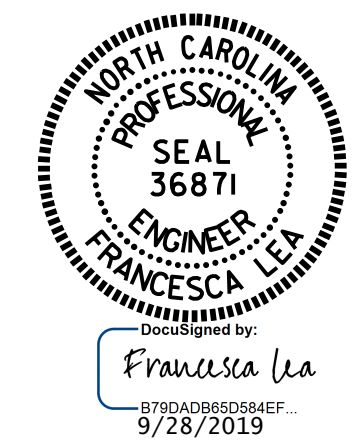


**MASONRY PLATE (M1) DETAILS**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT						
				BEARING H (IN.)	MASONRY PLATE (A, B (IN.))		SOLE PLATE C (IN.)	TOP SLOPE (%)	L (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)	
DB1 (FIXED)	M1	BENT 1	5	7 1/2"	30"	30"	1"	0	23"	459.1	56.0	301.2	166.4	0

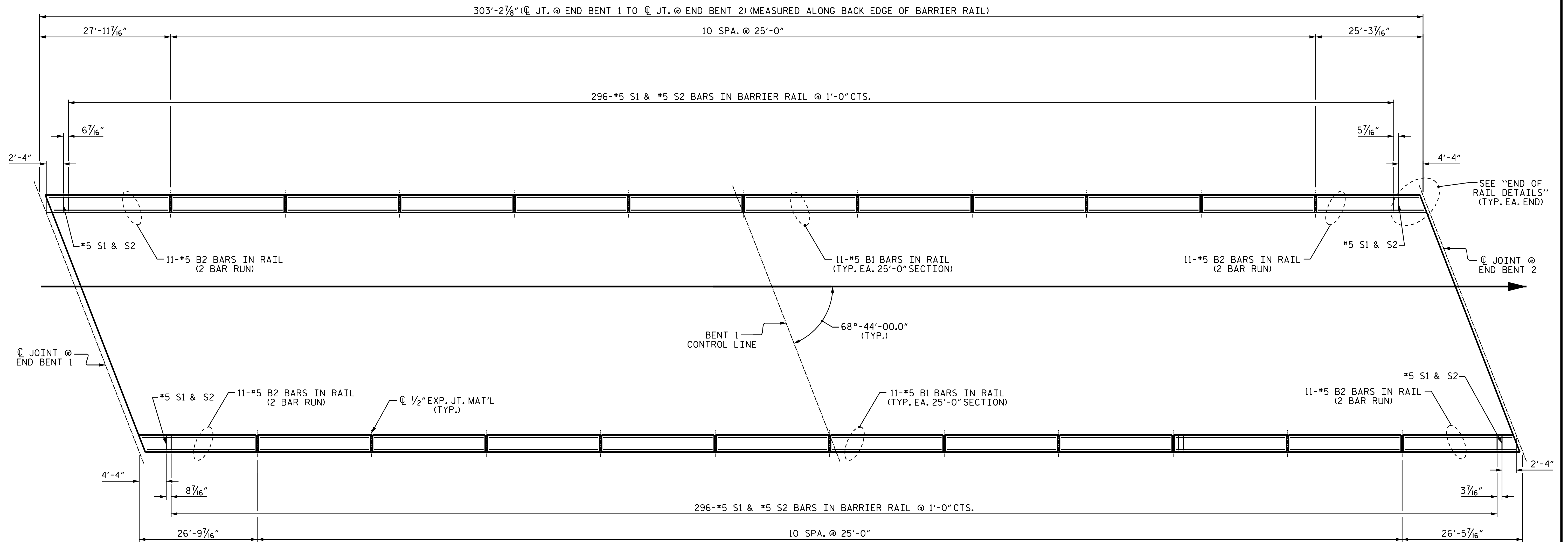
ASSEMBLED BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DRAWN BY : TMG 08/13 REV. 12/17 MAA/THC  
 CHECKED BY : EKP 10/13



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 DISC BEARING  
 DETAILS

NO.	REVISIONS		NO.	REVISIONS		SHEET NO.
	BY:	DATE:		BY:	DATE:	
1			3			S1-15
2			4			TOTAL SHEETS 31



PLAN OF BARRIER RAIL

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 1 OF 2



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

DRAWN BY: K.W. ALFORD DATE: 05/2019  
 CHECKED BY: F. LEA DATE: 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE: 03/2019

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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			31



NOTES

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

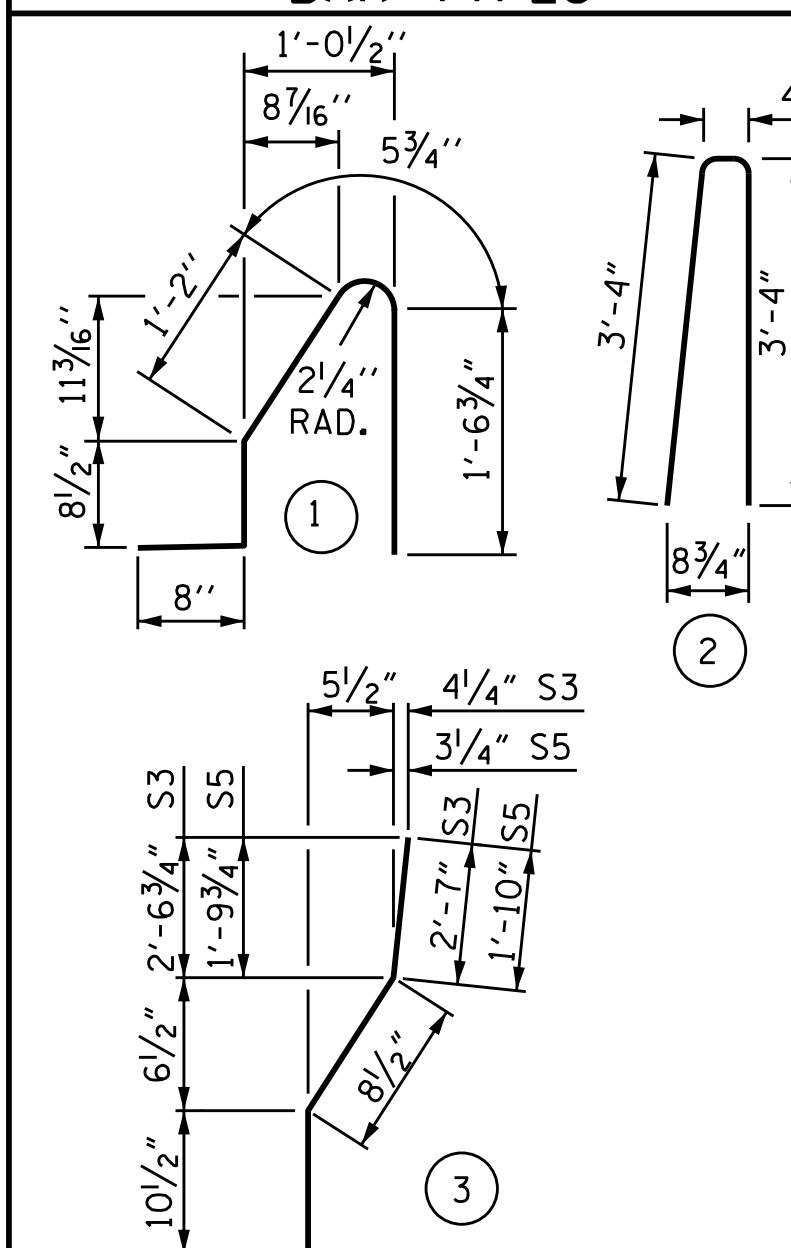
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

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.

BAR TYPES

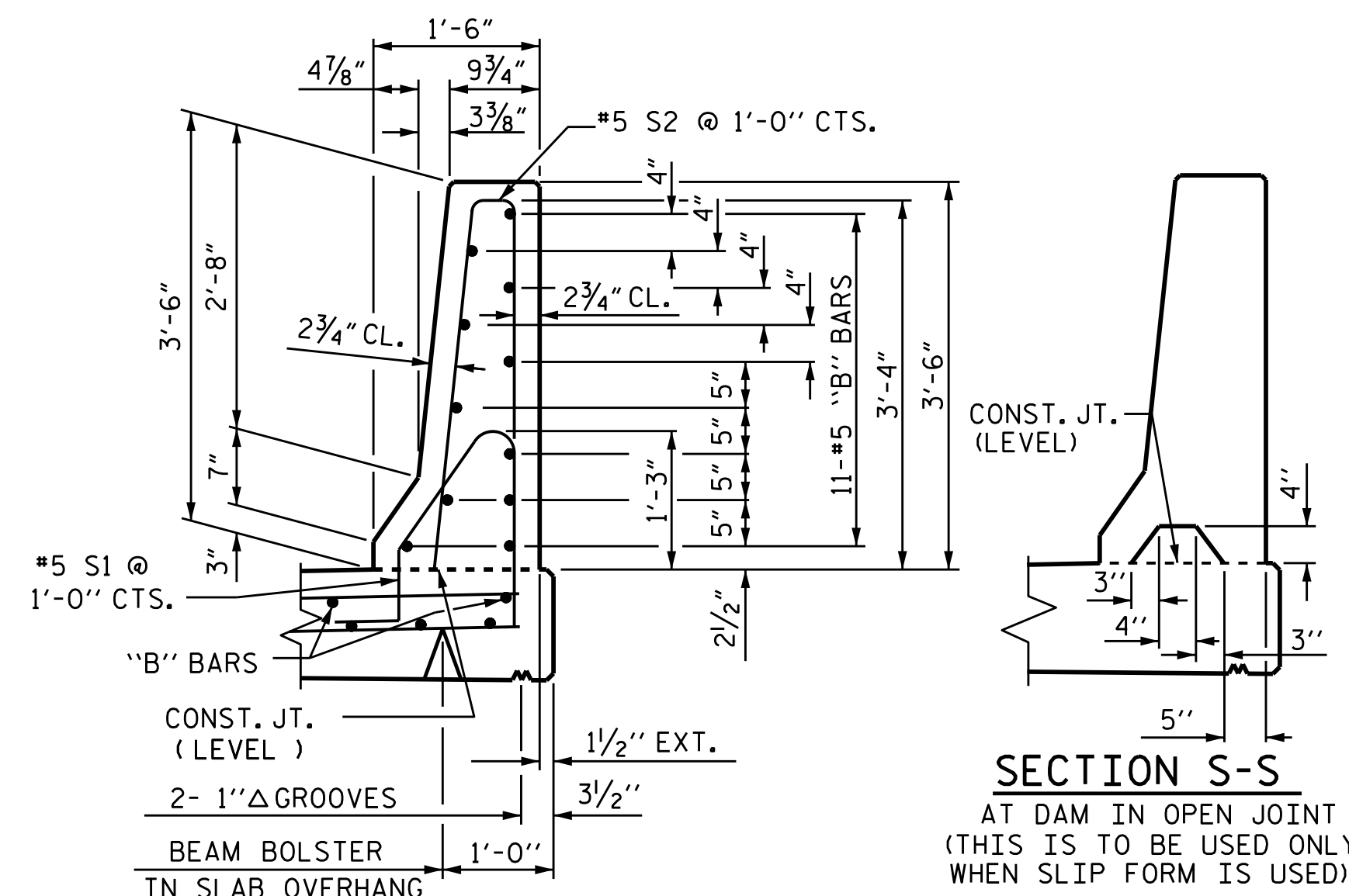


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

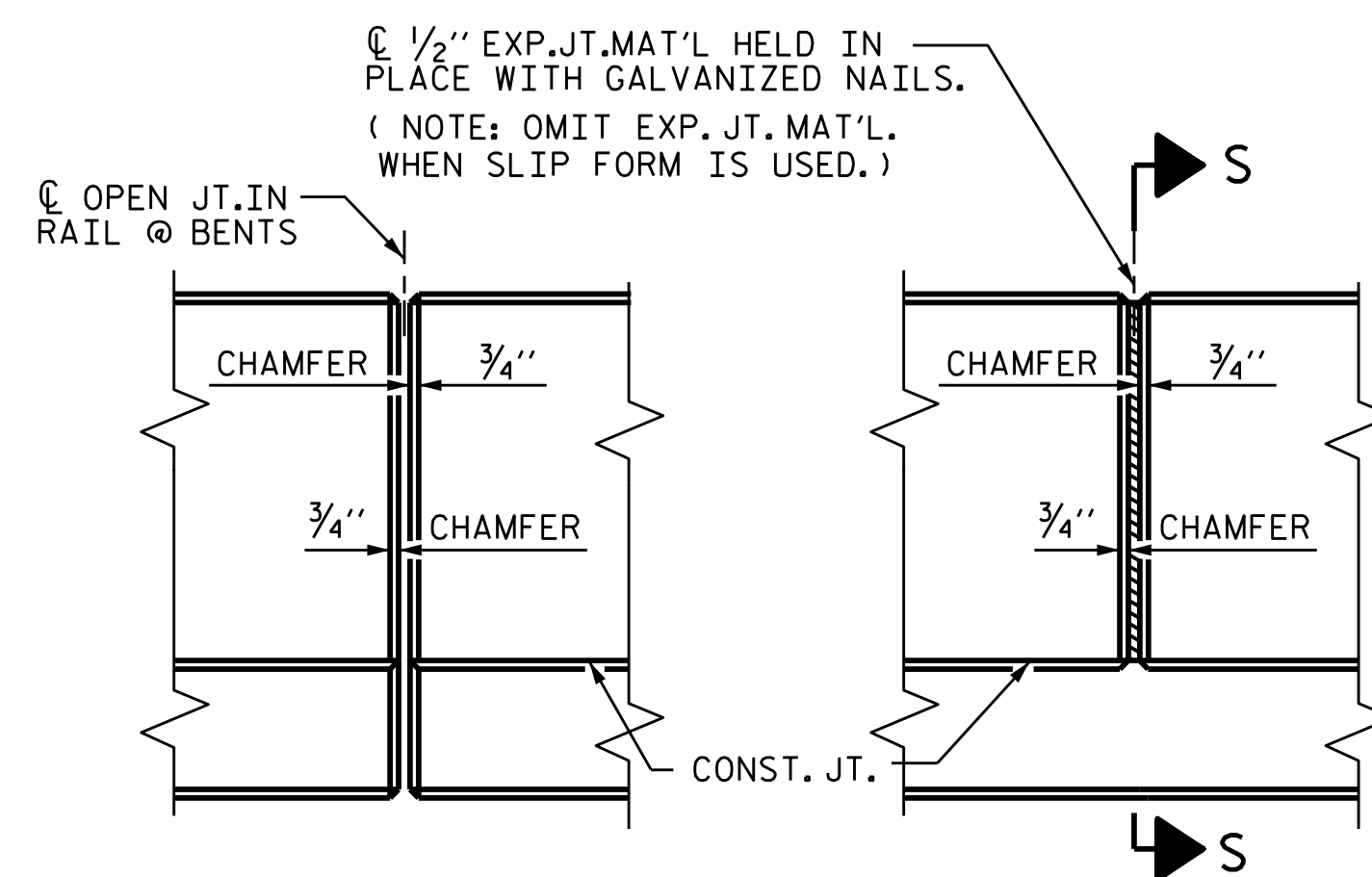
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	220	#5	STR	24'-7"	5641
* B2	88	#5	STR	15'-6"	1423
* S1	596	#5	1	4'-7"	2849
* S2	596	#5	2	7'-0"	4351
* 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					14354 LBS.
CLASS AA CONCRETE					82.5 CU. YDS.
CONCRETE BARRIER RAIL					606.48 LIN. FT.

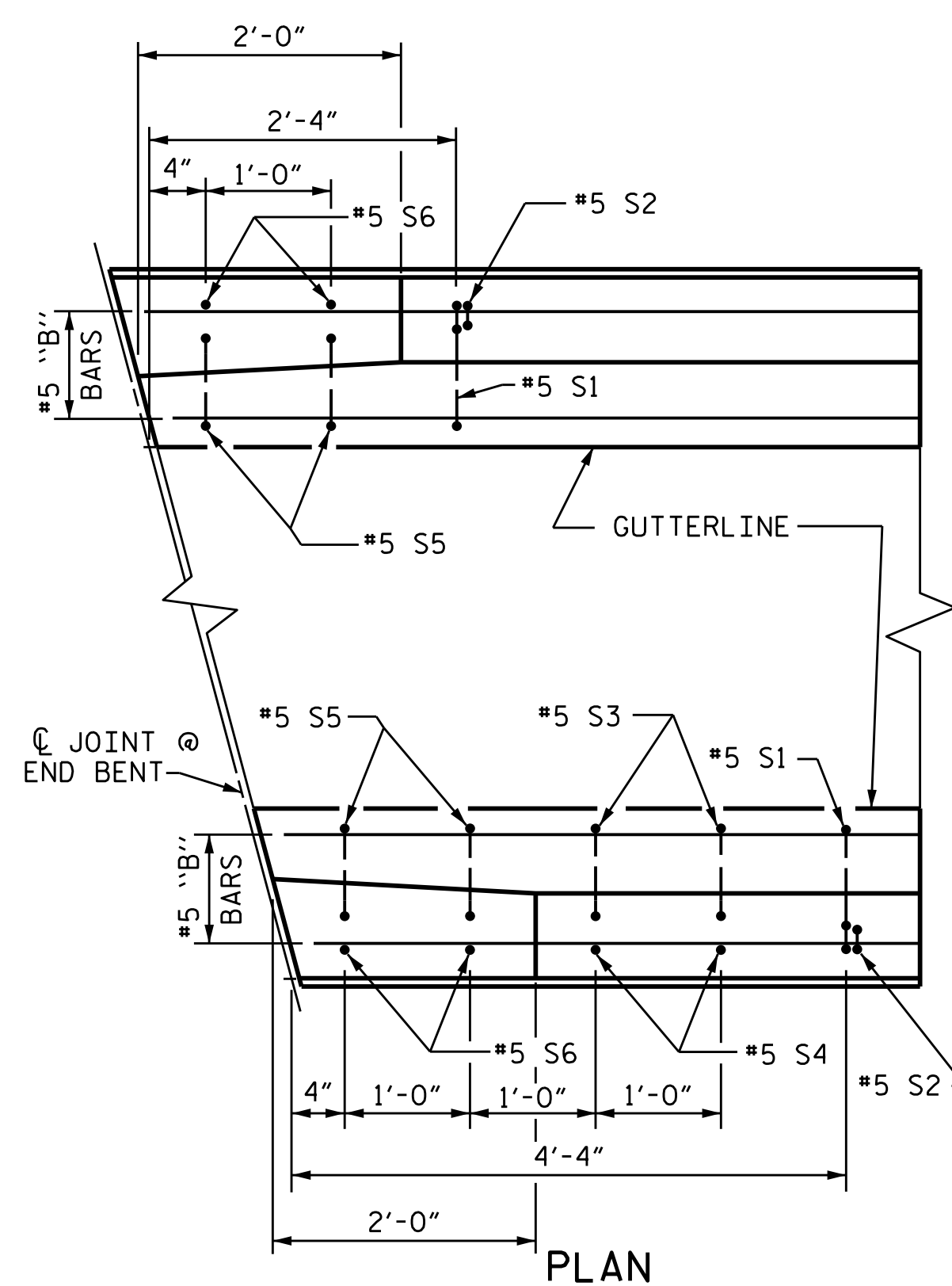


SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

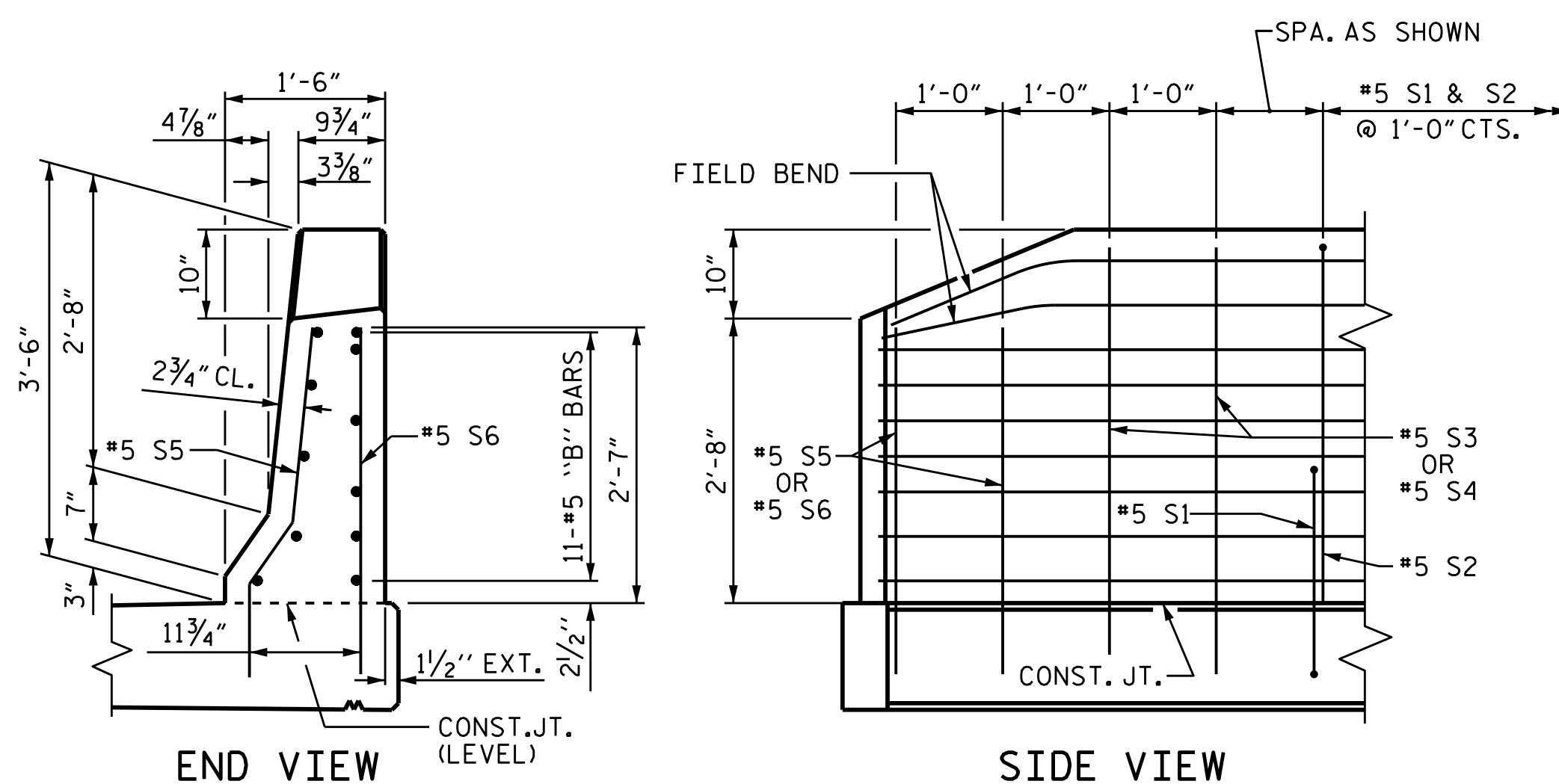
SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



PLAN



END OF RAIL DETAILS  
FOR ADHESIVE ANCHORING AT SAWED JOINTS

ASSEMBLED BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DRAWN BY : ARB 5/87 REV. 7/12 MAA/GM  
 CHECKED BY : SJD 9/87 REV. 6/13 MAA/GM  
 REV. 12/17 MAA/THC



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS 31
2			4			

NOTES

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

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

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

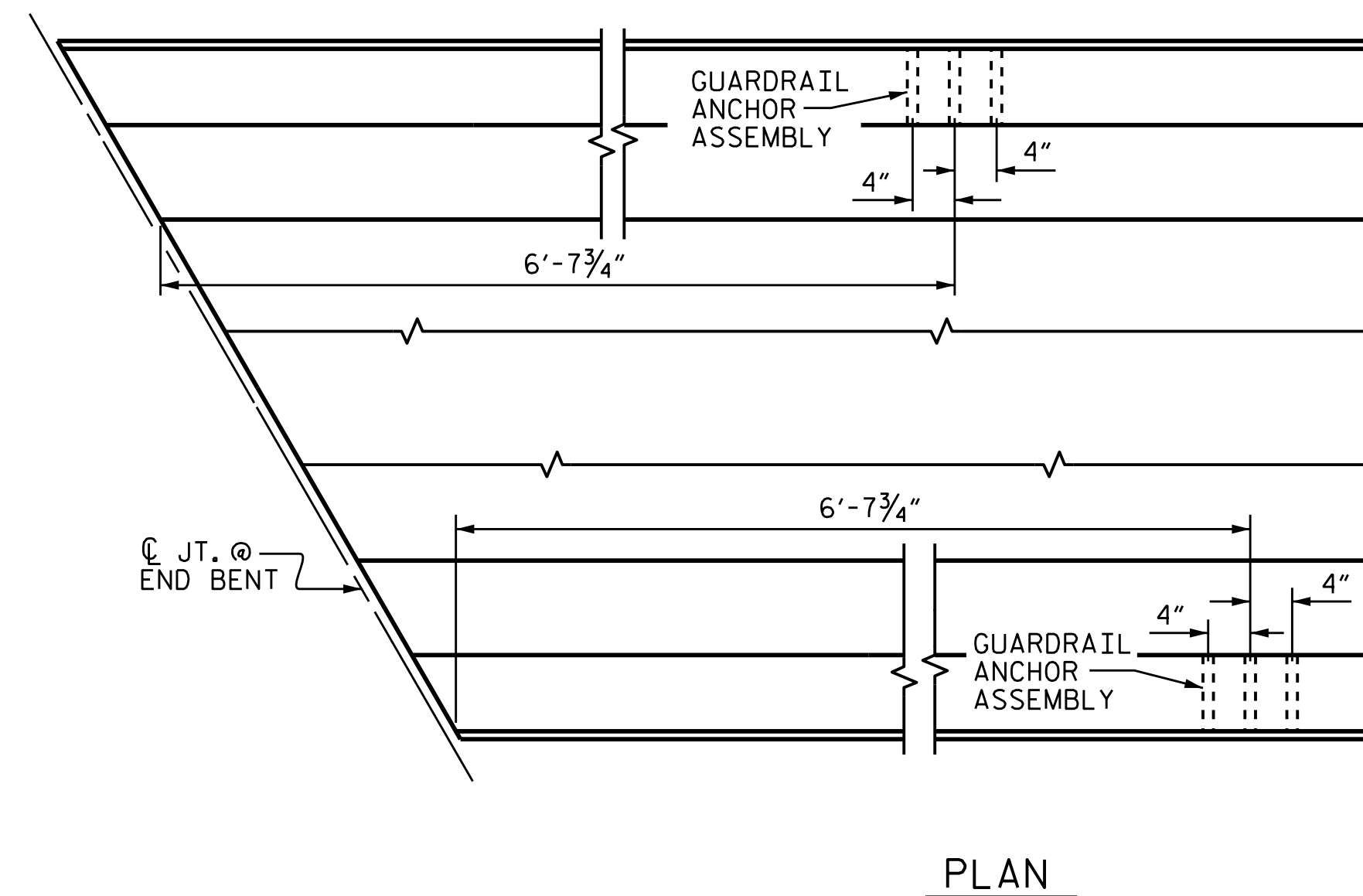
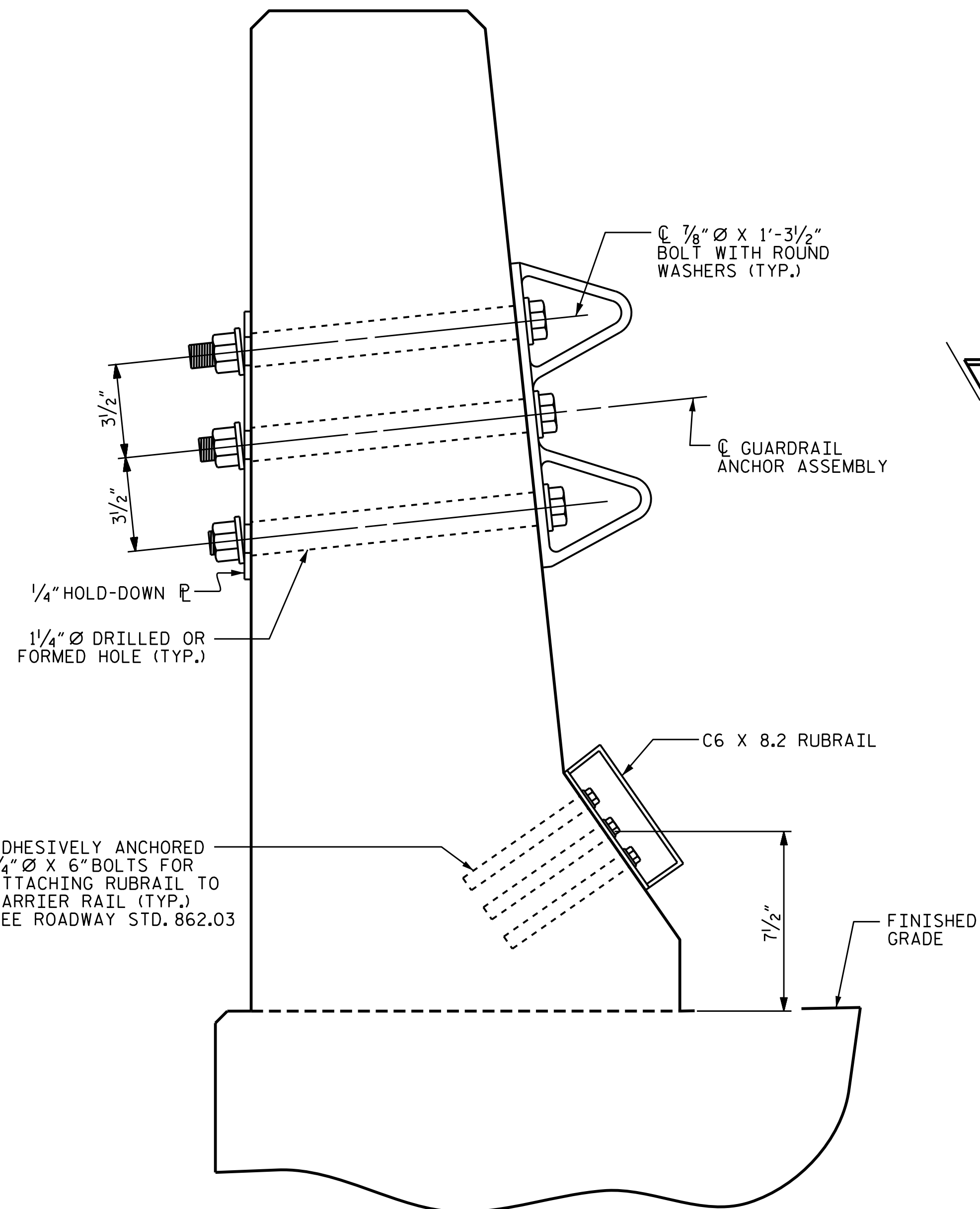
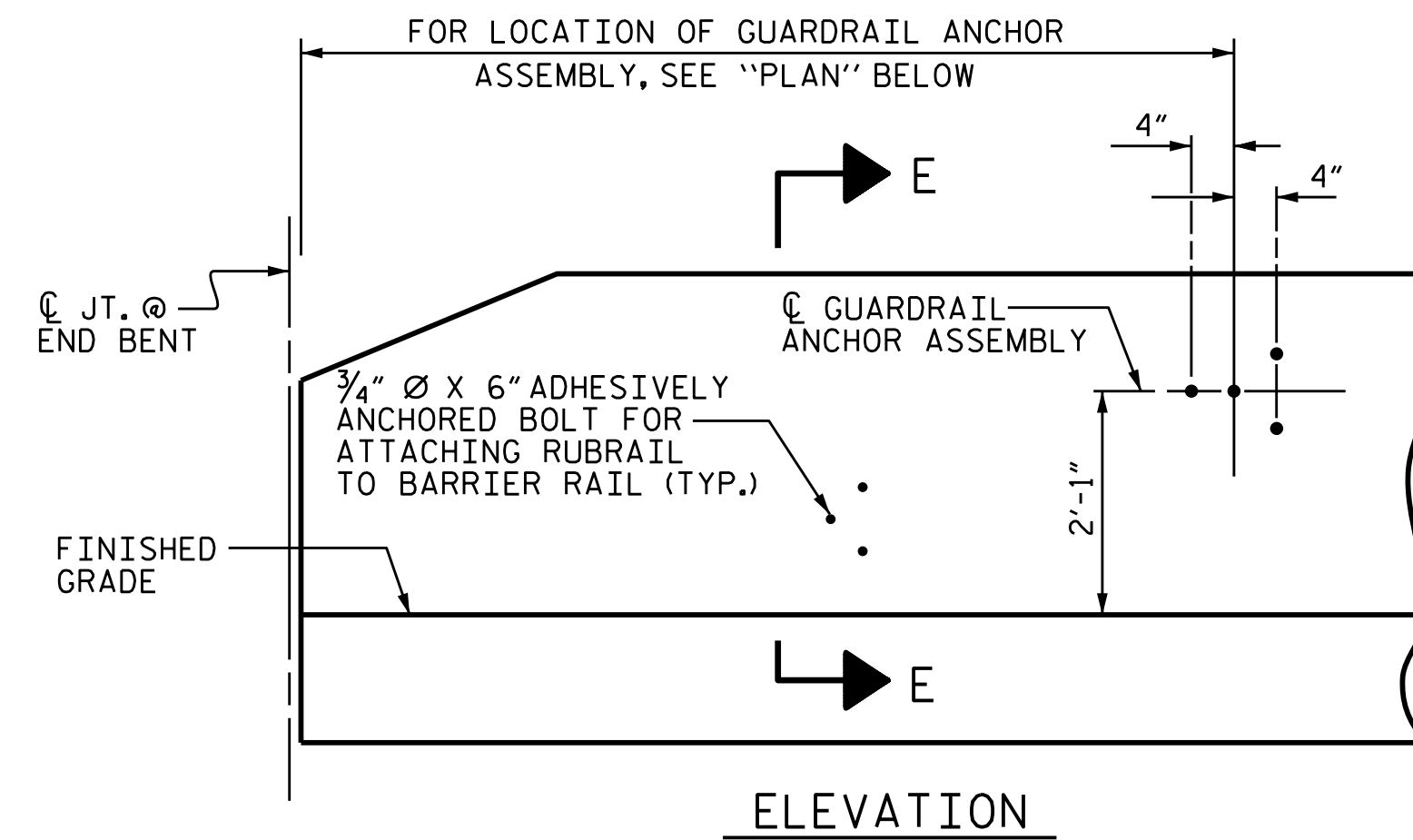
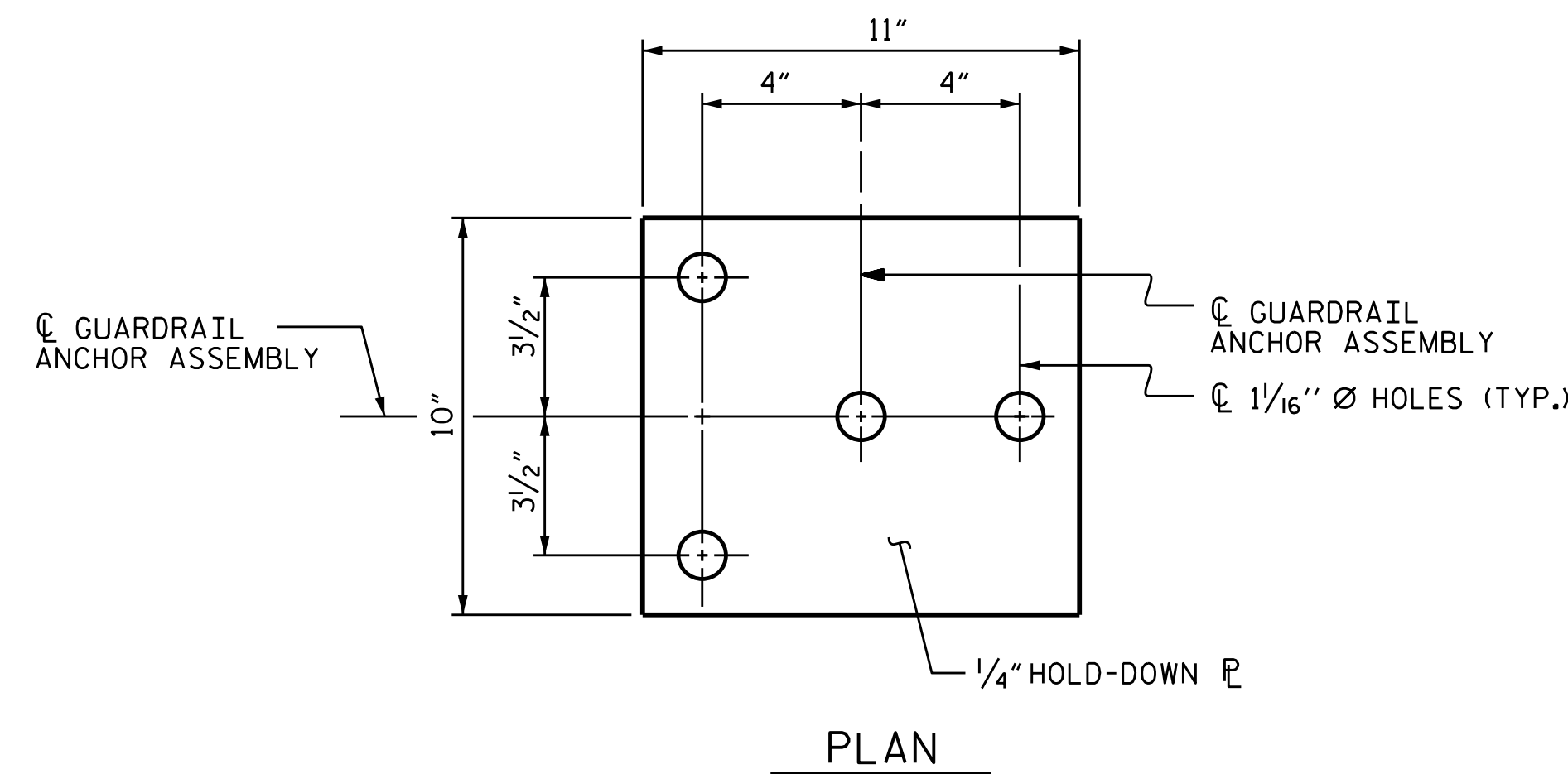
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

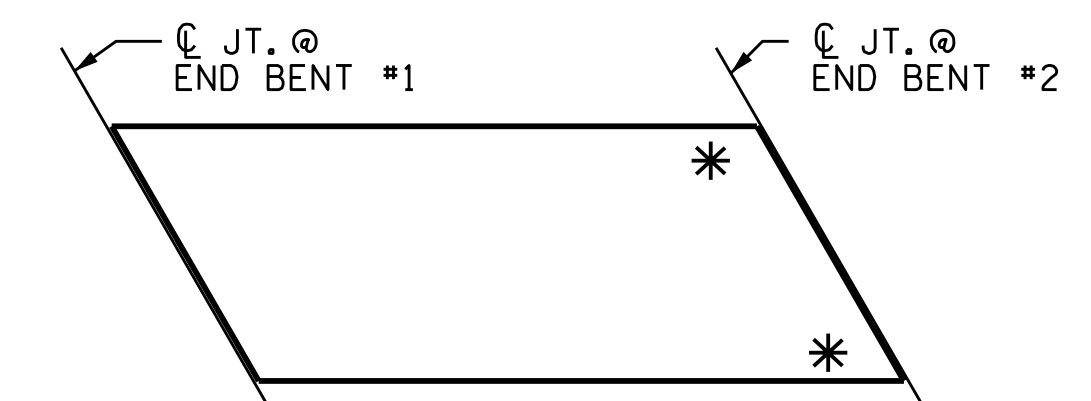
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-



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

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			31



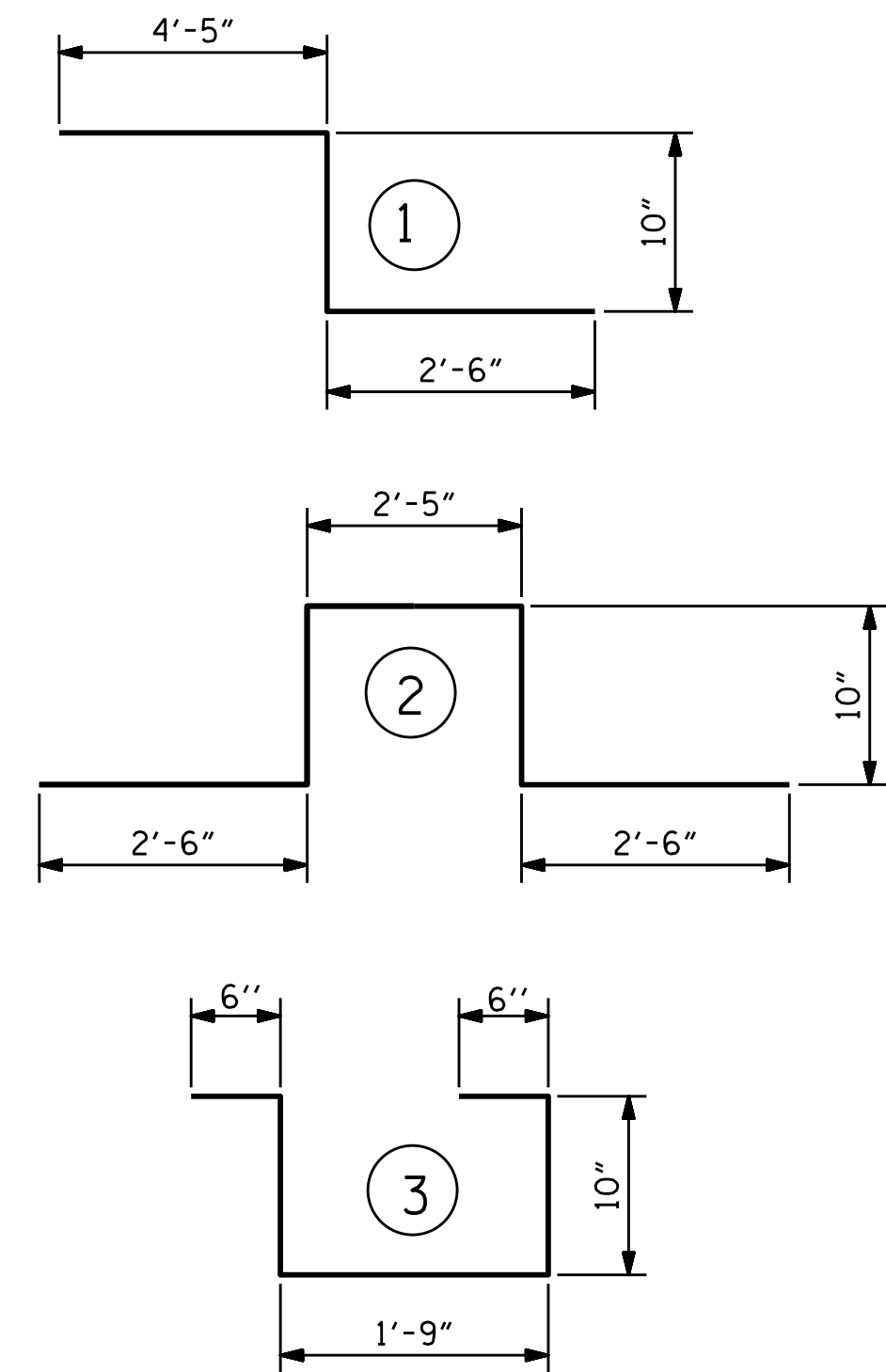
REINFORCING BAR SCHEDULE													
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A1	617	#5	STR	51'-10"	33356	A208	4	#5	STR	33'-4"	139		
A2	617	#5	STR	51'-10"	33356	A209	4	#5	STR	31'-0"	129		
						A210	4	#5	STR	28'-7"	119		
* A101	4	#5	STR	49'-10"	208	A211	4	#5	STR	26'-3"	110		
* A102	4	#5	STR	47'-6"	198	A212	4	#5	STR	23'-11"	100		
* A103	4	#5	STR	45'-1"	188	A213	4	#5	STR	21'-7"	90		
* A104	4	#5	STR	42'-9"	178	A214	4	#5	STR	19'-2"	80		
* A105	4	#5	STR	40'-5"	169	A215	4	#5	STR	16'-10"	70		
* A106	4	#5	STR	38'-1"	159	A216	4	#5	STR	14'-6"	60		
* A107	4	#5	STR	35'-8"	149	A217	4	#5	STR	12'-2"	51		
* A108	4	#5	STR	33'-4"	139	A218	4	#5	STR	9'-9"	41		
* A109	4	#5	STR	31'-0"	129	A219	4	#5	STR	7'-5"	31		
* A110	4	#5	STR	28'-7"	119	A220	4	#5	STR	5'-1"	21		
* A111	4	#5	STR	26'-3"	110	A221	4	#5	STR	2'-9"	11		
* A112	4	#5	STR	23'-11"	100								
* A113	4	#5	STR	21'-7"	90	* B1	132	#4	STR	25'-10"	2278		
* A114	4	#5	STR	19'-2"	80	B2	408	#5	STR	52'-4"	22270		
* A115	4	#5	STR	16'-10"	70	* B3	22	#4	STR	29'-5"	432		
* A116	4	#5	STR	14'-6"	60	* B4	195	#7	STR	40'-10"	16275		
* A117	4	#5	STR	12'-2"	51	* B5	132	#4	STR	25'-5"	2241		
* A118	4	#5	STR	9'-9"	41								
* A119	4	#5	STR	7'-5"	31	* G1	2	#5	STR	55'-8"	116		
* A120	4	#5	STR	5'-1"	21								
* A121	4	#5	STR	2'-9"	11	* K1	12	#5	1	7'-9"	97		
						* K2	18	#5	2	9'-1"	171		
A201	4	#5	STR	49'-10"	208	* K3	24	#5	STR	10'-3"	257		
A202	4	#5	STR	47'-6"	198								
A203	4	#5	STR	45'-1"	188	* S1	80	#5	3	4'-5"	369		
A204	4	#5	STR	42'-9"	178								
A205	4	#5	STR	40'-5"	169								
A206	4	#5	STR	38'-1"	159								
A207	4	#5	STR	35'-8"	149								
										REINFORCING STEEL	57,927	LBS.	
										* EPOXY COATED REINFORCING STEEL	57,893	LBS.	

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	2,218	SO.FT.
BRIDGE DECK	13,928	SO.FT.
TOTAL	16,146	SO.FT.

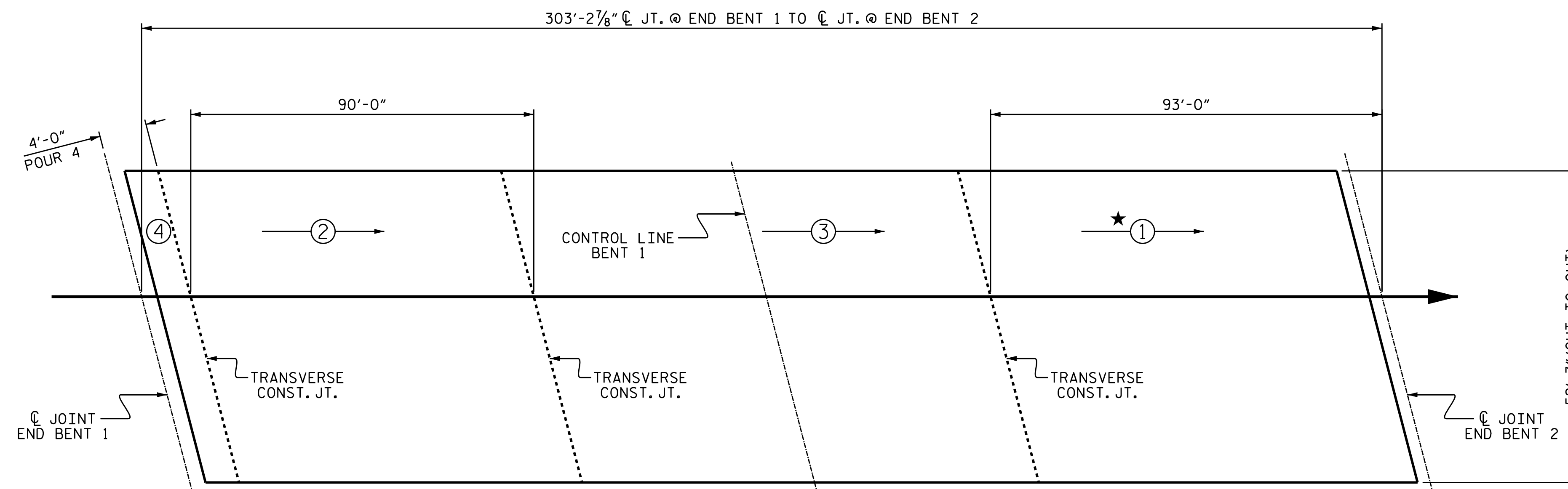


ALL BAR DIMENSIONS ARE OUT TO OUT

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE ( CU.YDS.)	REINFORCING STEEL ( LBS.)	EPOXY COATED REINFORCING STEEL ( LBS.)
ALL SPANS		57,297	57,893
POUR 1	169.9		
POUR 2	162.3		
POUR 3	209.1		
POUR 4	9.9		
TOTALS**	551.2	57,297	57,893

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



\* IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR 1, A TRANSVERSE CONSTRUCTION JOINT WILL BE REQUIRED 4'-0" FROM THE JOINT.

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB ( SQ. FT. = 15,839 )

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-



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

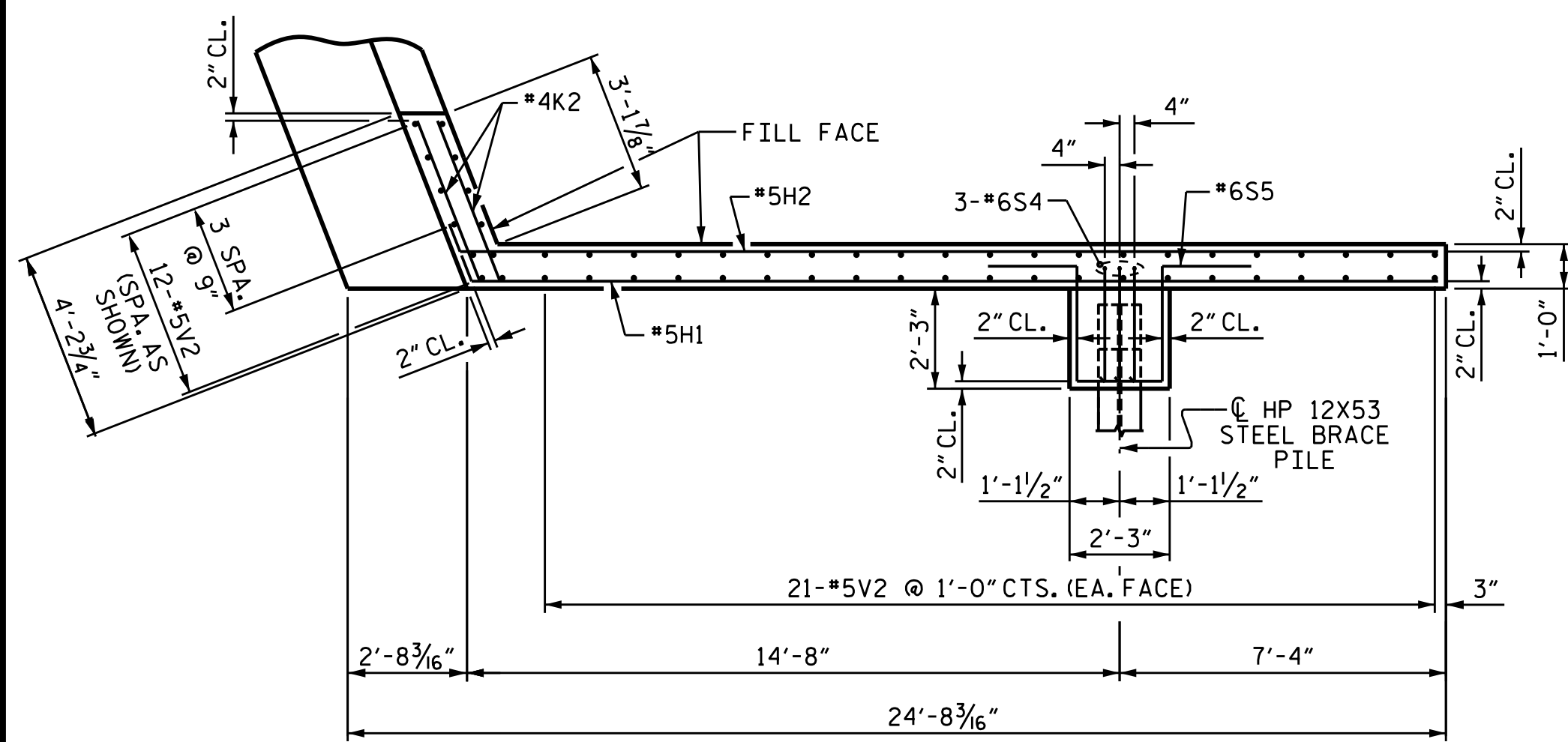
ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : JMB 5/87	REV. 10/1/11 MAA/GM
CHECKED BY : SJD 9/87	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

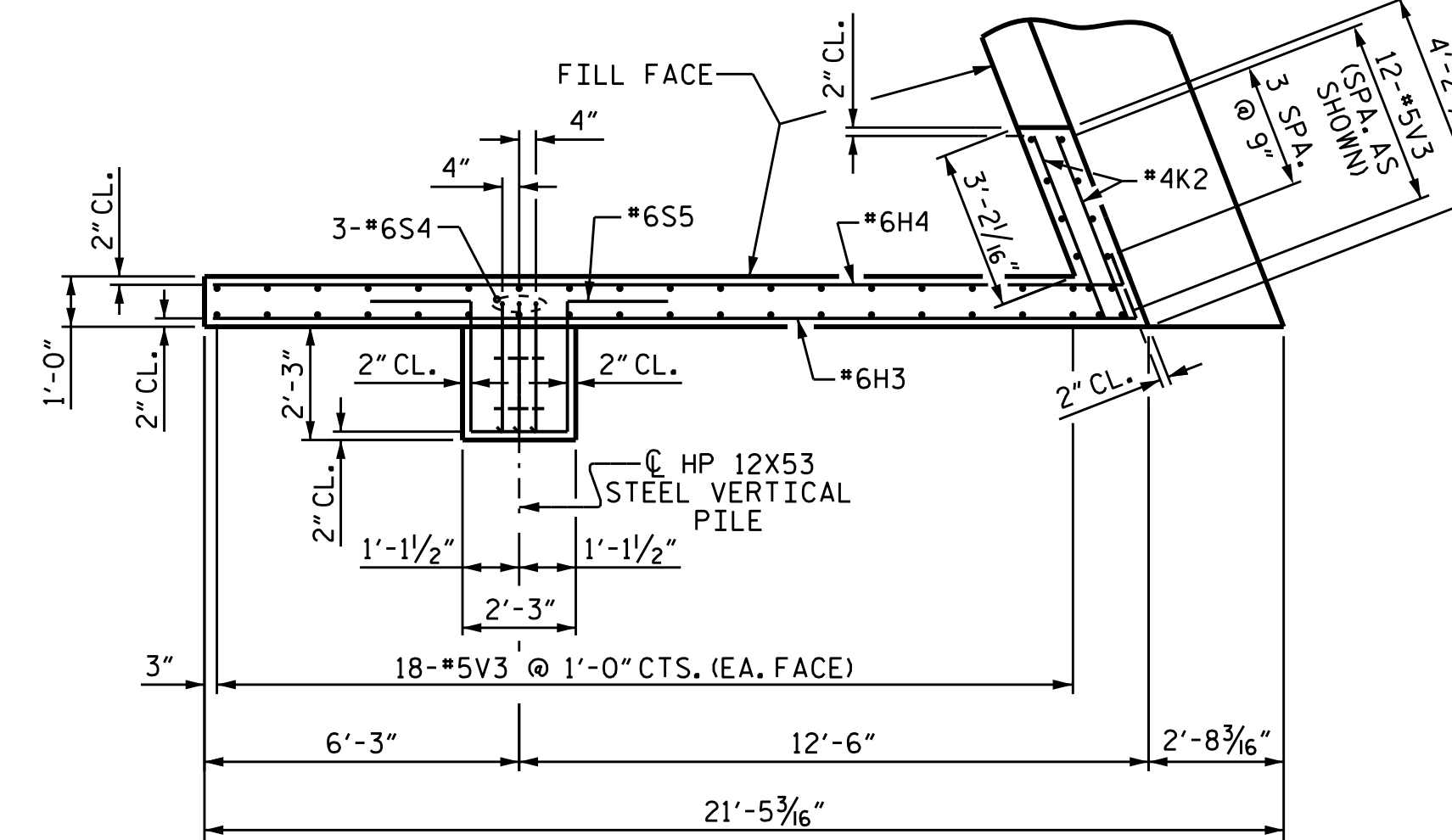
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
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2			4			



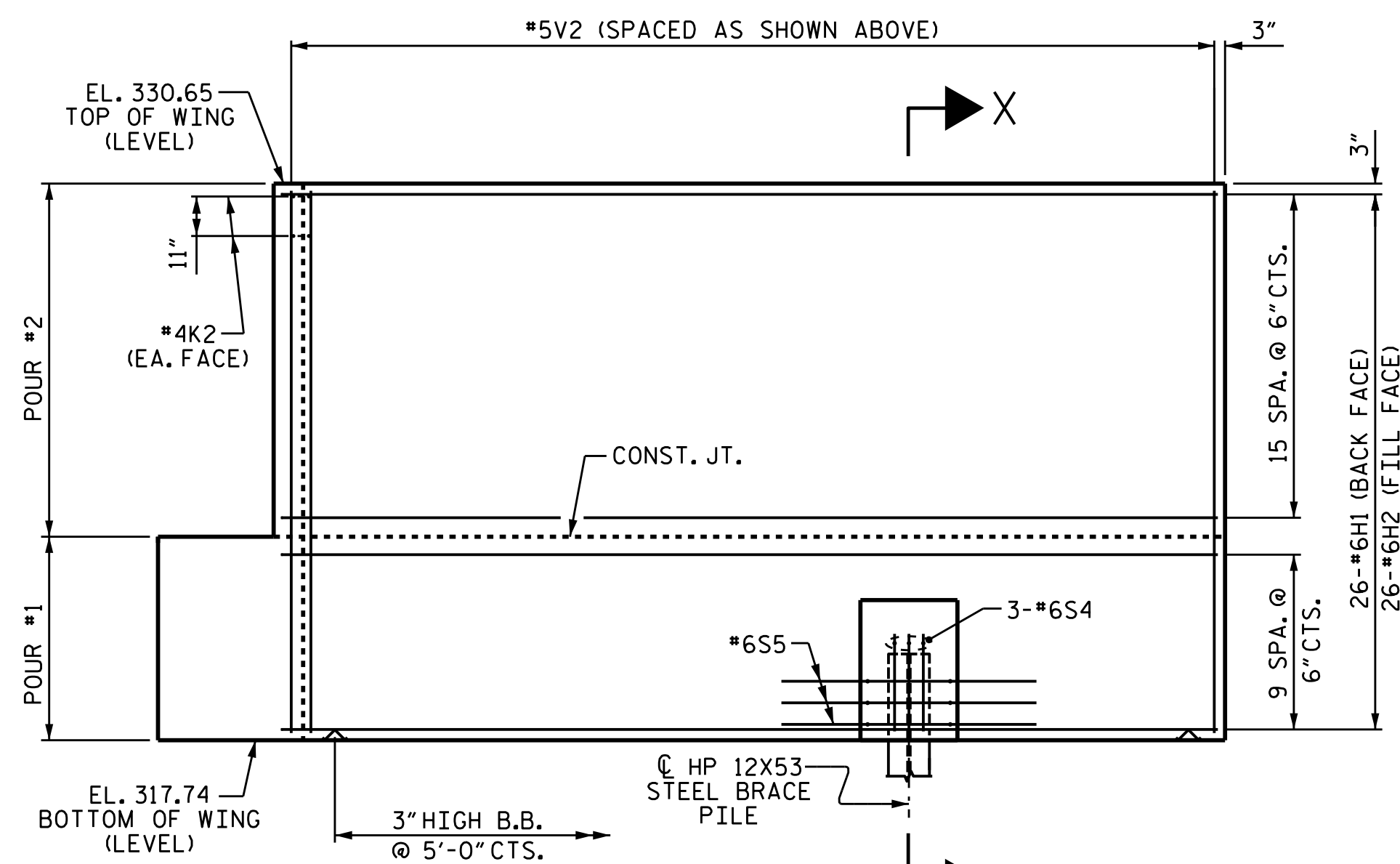




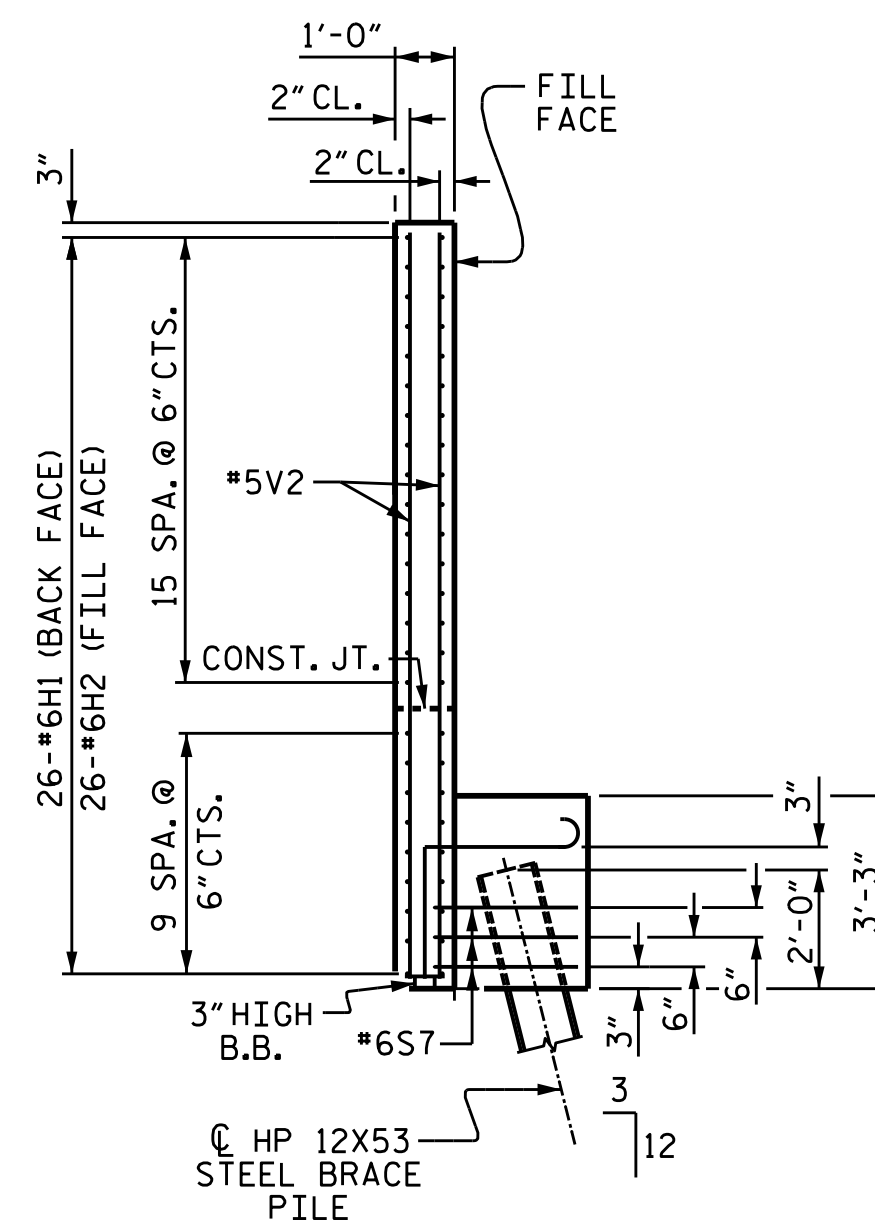
PLAN OF WING (W1)



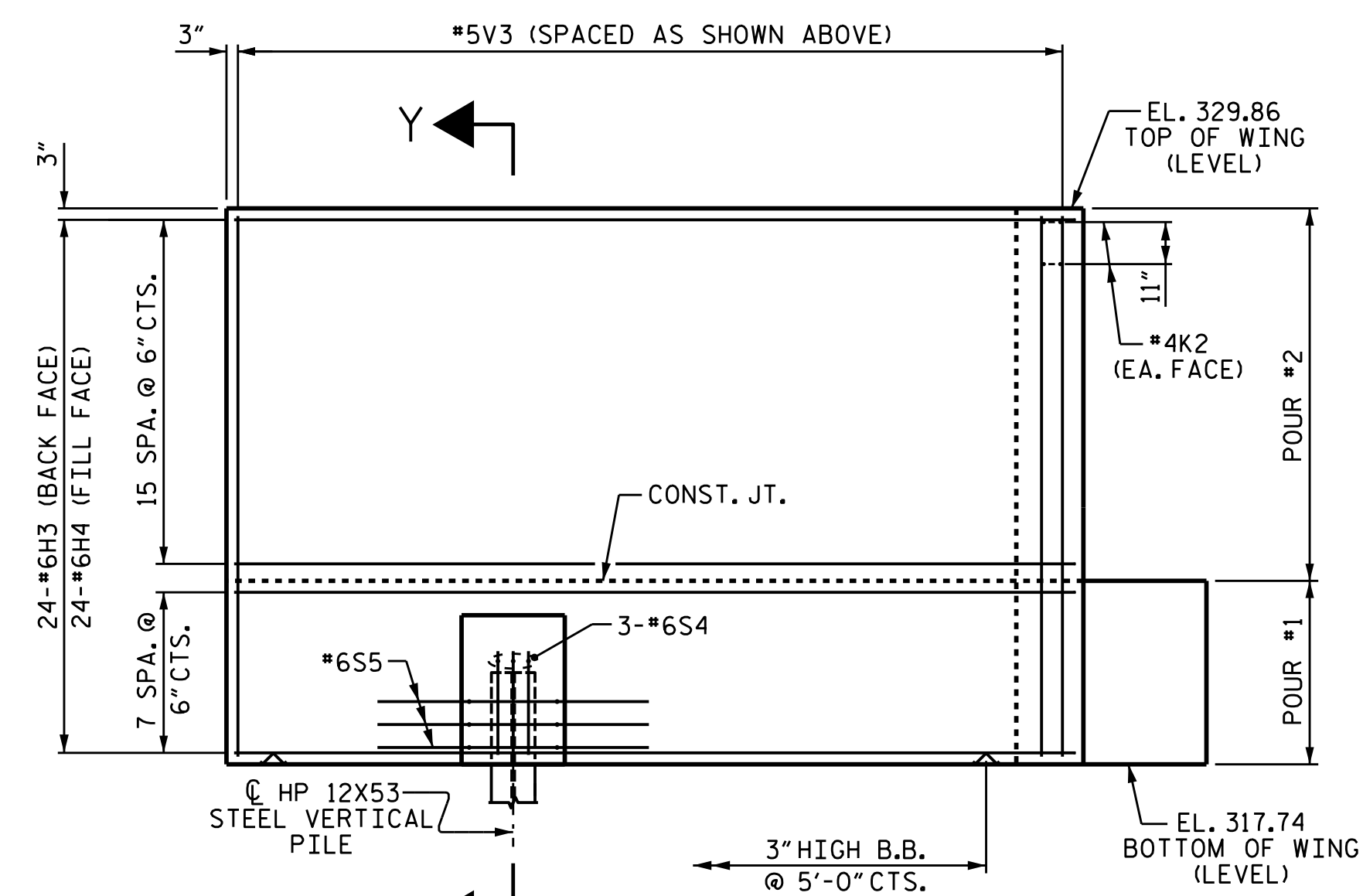
PLAN OF WING (W2)



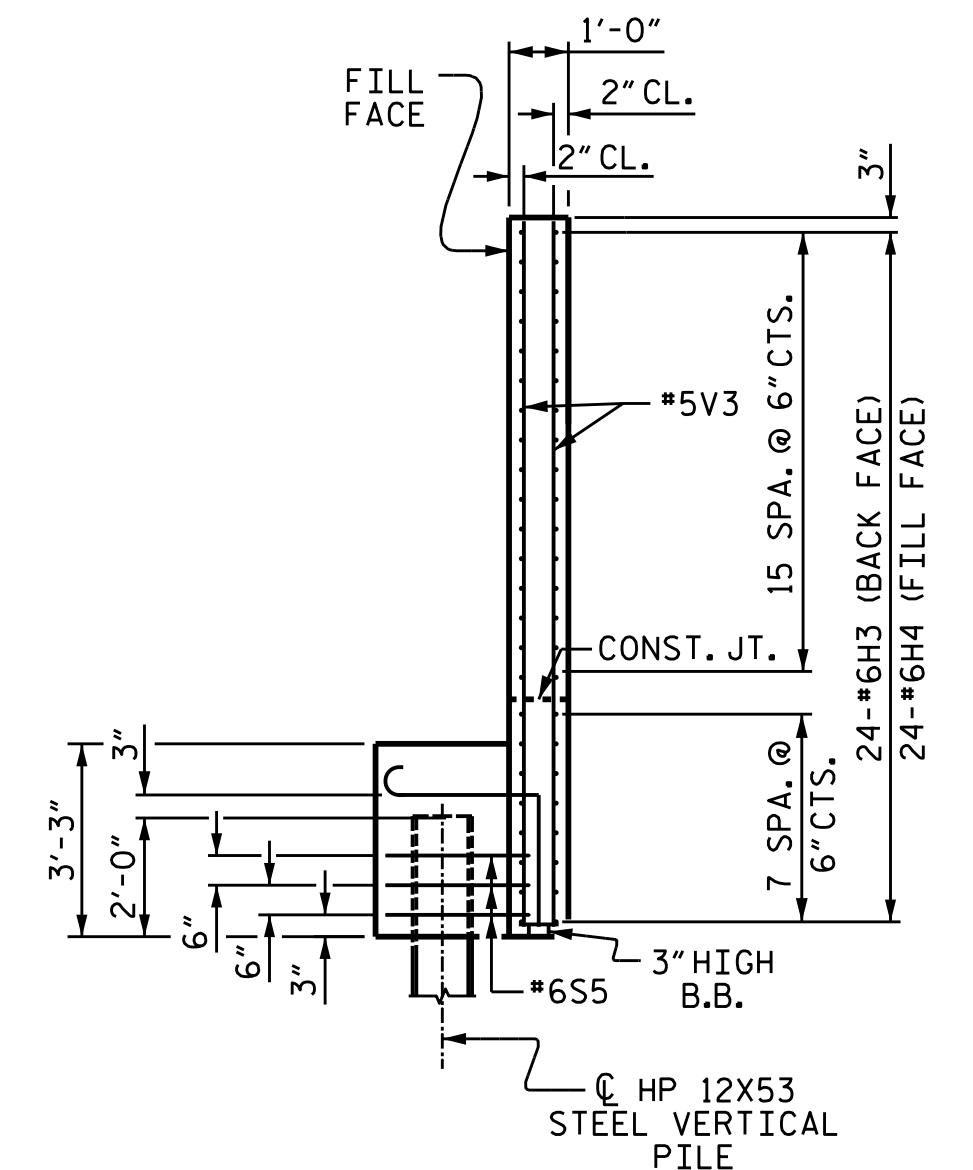
ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)

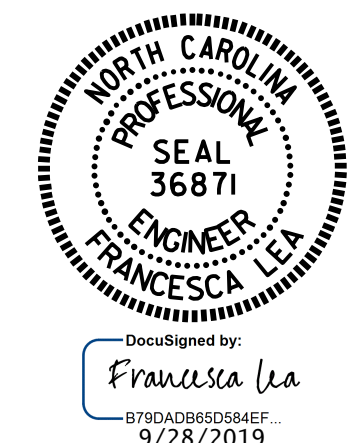


SECTION Y-Y

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 3

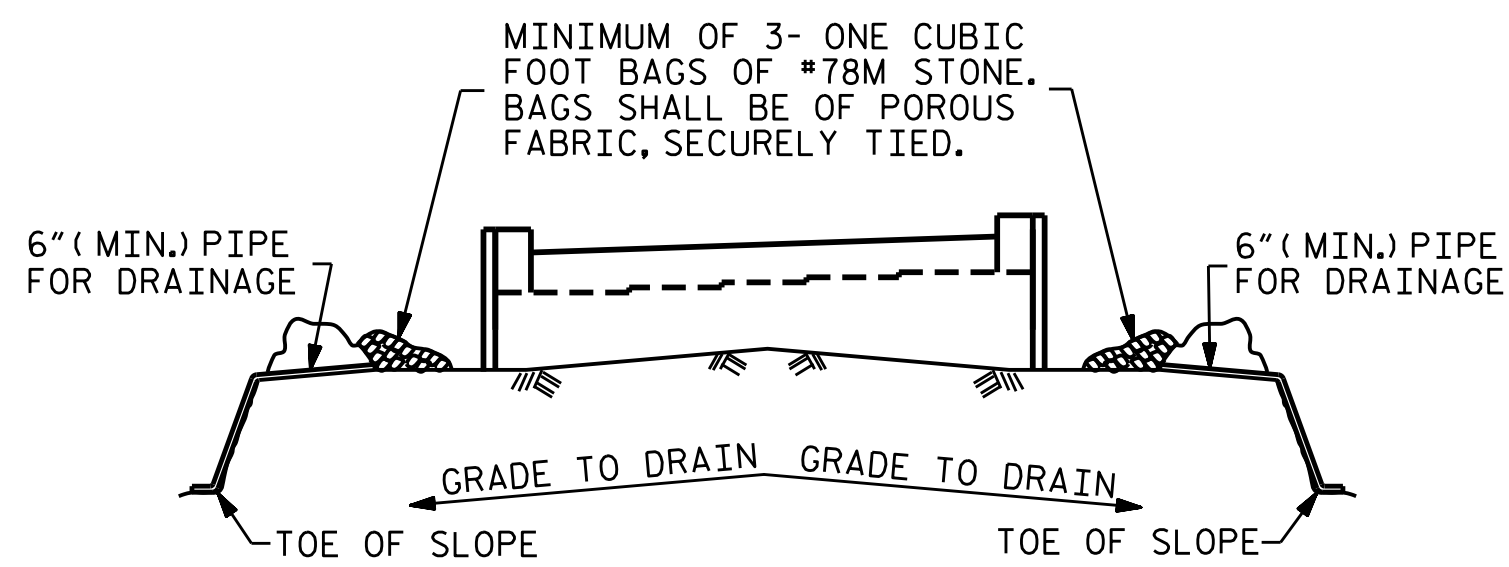
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1



DRAWN BY: M.K. BEARD DATE: 8/9/19  
 CHECKED BY: D. SHACKELFORD DATE: 09/2/19  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE: 08/2019

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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
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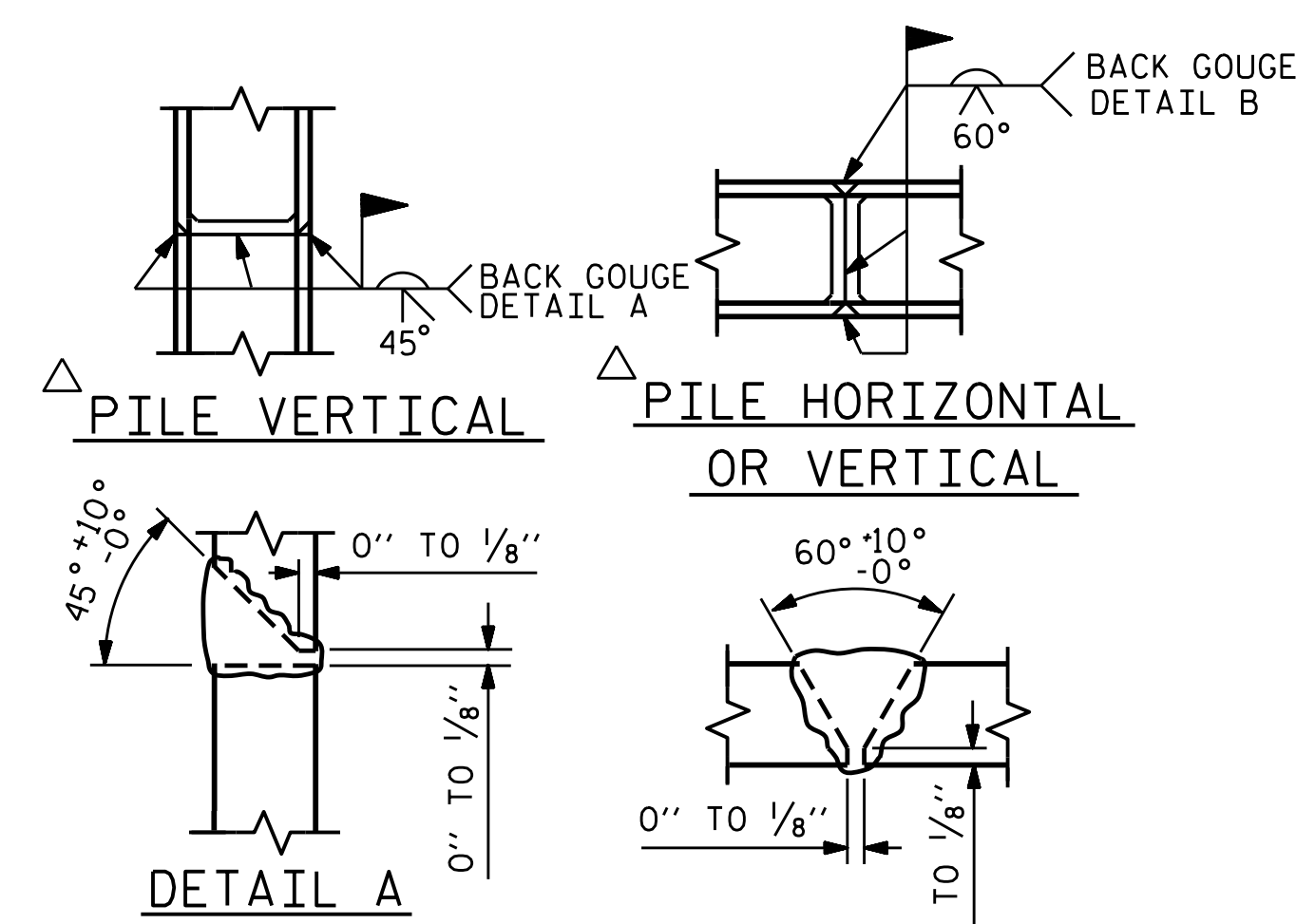


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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**



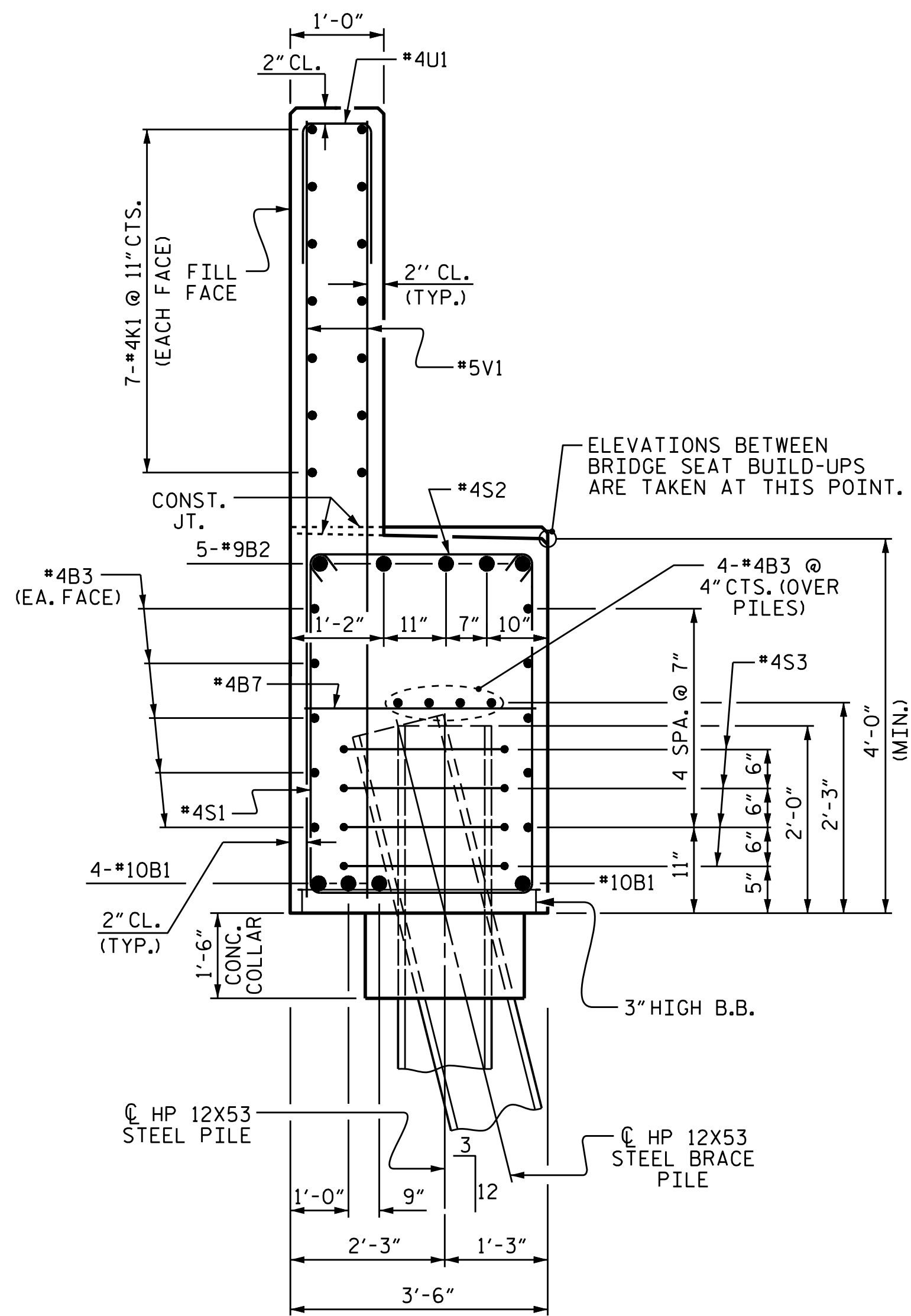
POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**

**BAR TYPES**

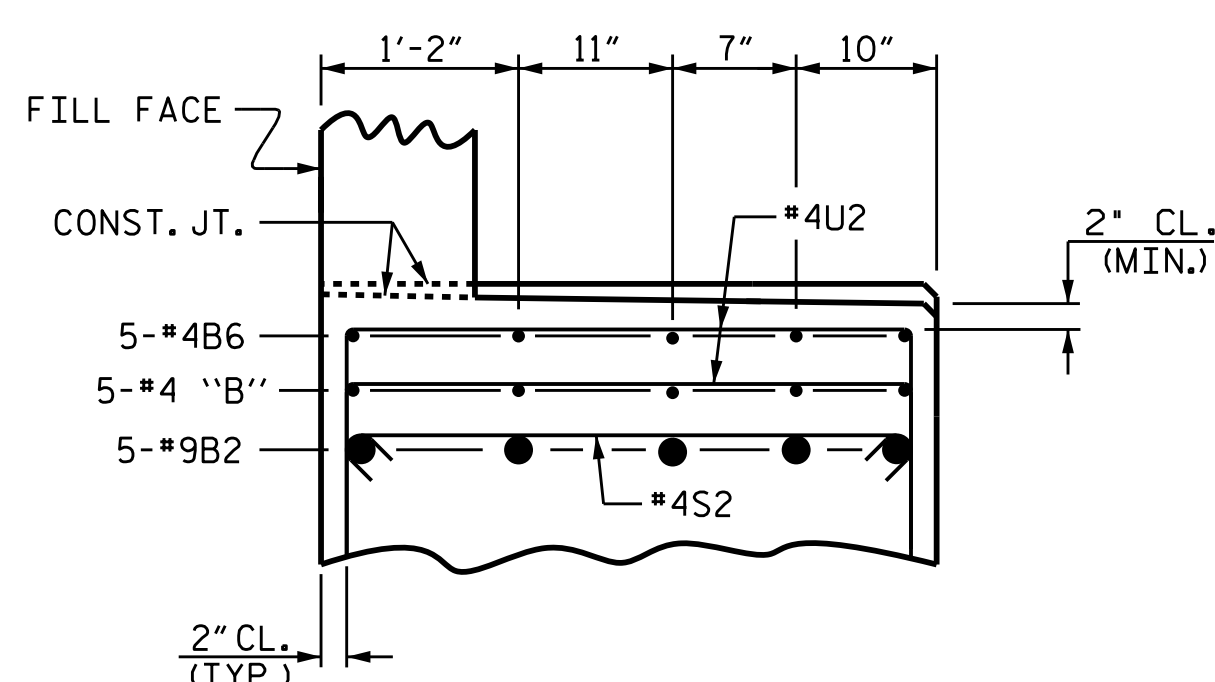
**BILL OF MATERIAL**

END BENT 1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	35'-1"	1208
B2	10	#9	1	35'-3"	1199
B3	28	#4	STR	32'-5"	606
B4	5	#4	STR	20'-11"	70
B5	5	#4	STR	12'-2"	41
B6	10	#4	STR	2'-8"	18
B7	15	#4	STR	3'-2"	32
H1	26	#6	2	22'-4"	872
H2	26	#6	2	22'-7"	882
H3	24	#6	3	18'-8"	673
H4	24	#6	3	19'-0"	685
K1	42	#4	STR	27'-7"	774
K2	8	#4	STR	3'-10"	20
S1	70	#4	4	11'-2"	522
S2	70	#4	5	3'-11"	183
S3	36	#4	6	6'-6"	156
S4	6	#6	8	5'-3"	47
S5	6	#6	9	11'-1"	100
U1	55	#4	7	3'-8"	135
U2	31	#4	7	5'-11"	123
V1	55	#5	STR	10'-1"	578
V2	54	#5	STR	12'-6"	704
V3	48	#5	STR	11'-9"	588
REINFORCING STEEL					10,216 LBS.
CLASS A CONCRETE					
POUR #1 (CAP, LOWER WINGS & COLLARS)					45.4 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)					27.3 C.Y.
TOTAL =					72.7 C.Y.
HP 12X53 STEEL PILES					
No. 11					140 LIN. FT.
STEEL PILE POINTS					6 EA.
PILE DRIVING EQUIPMENT SETUP					6 EA.
PILE EXCAVATION					
PILE NOT IN SOIL					9 LIN. FT.
PILE IN SOIL					41 LIN. FT.

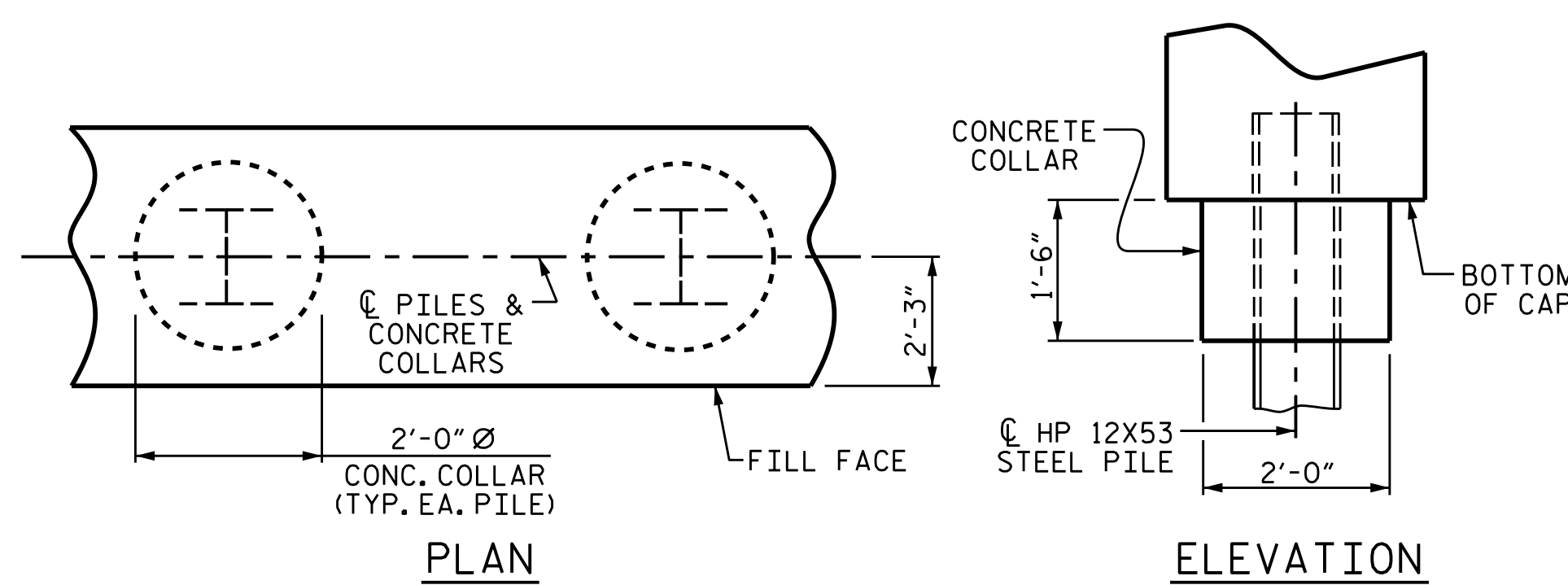
ALL BAR DIMENSIONS ARE OUT TO OUT.



**SECTION A-A**



**PARTIAL SECTION B-B**



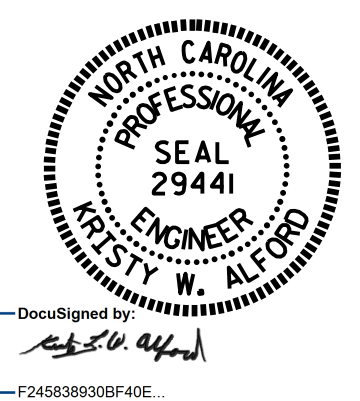
**CORROSION PROTECTION FOR STEEL PILES DETAIL**

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

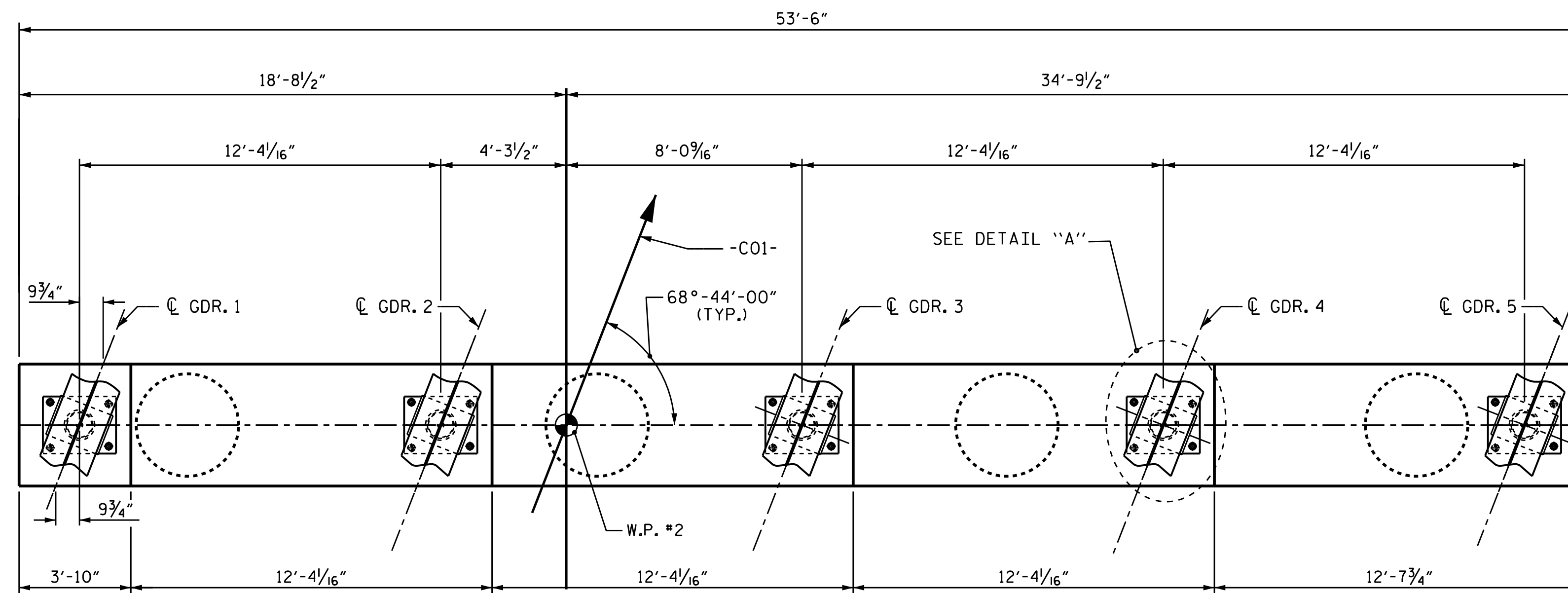
**SUBSTRUCTURE**  
**END BENT 1**

DRAWN BY : M.K. BEARD DATE : 8/9/19  
CHECKED BY : D. SHACKELFORD DATE : 8/18/19  
DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 6/2019

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1			3			TOTAL SHEETS 31
2			4			





PLAN

SPAN B

SPAN A

**NOTES**

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

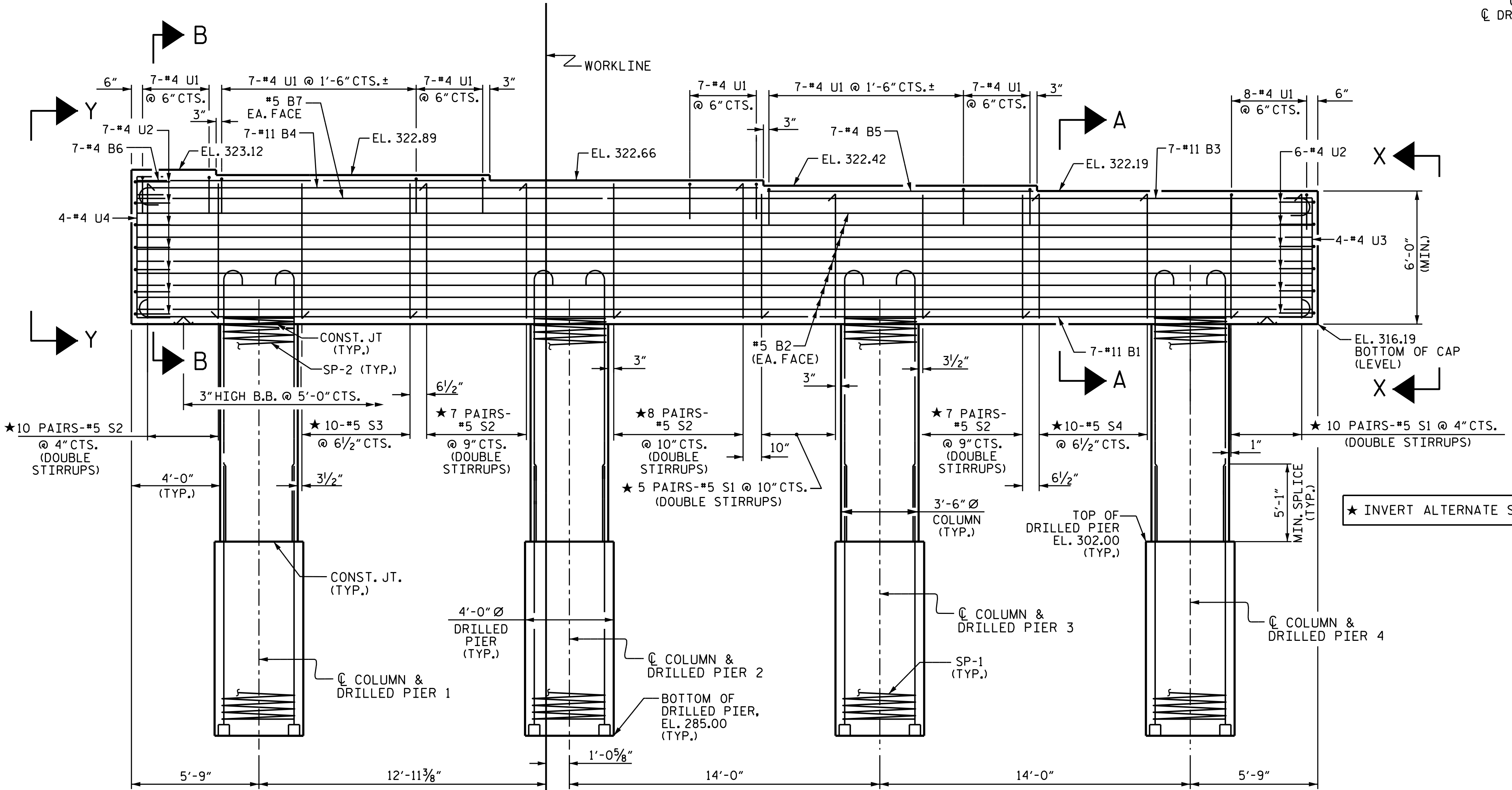
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCEMENT STEEL.

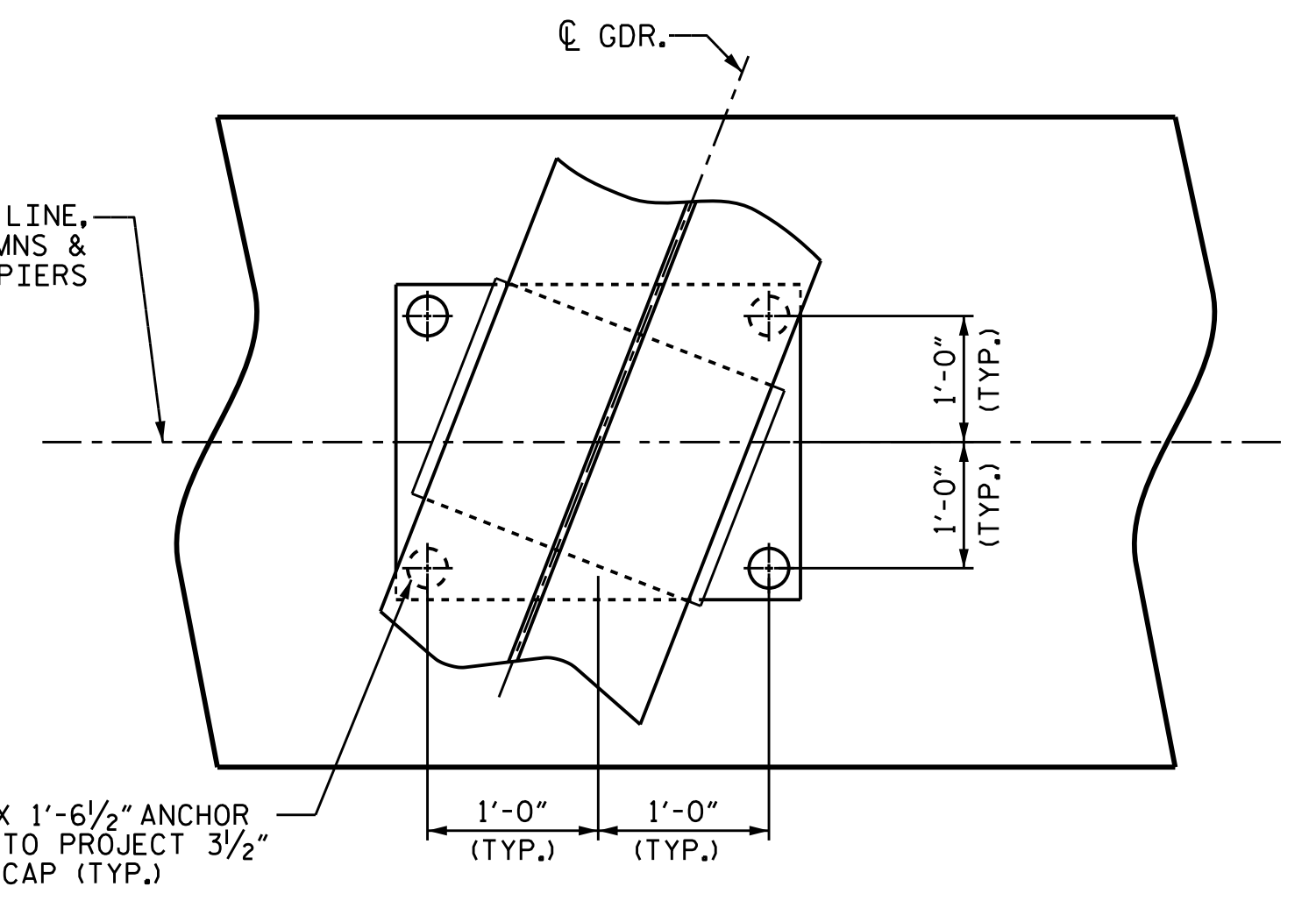
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.



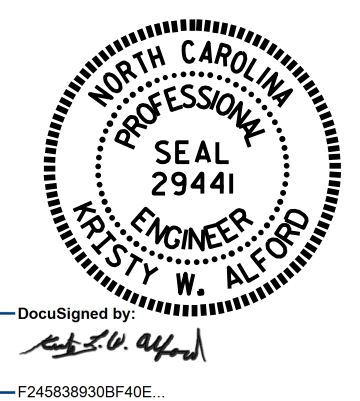
ELEVATION



DETAIL "A"  
(TYP. EA. GIRDER)

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 1 OF 2

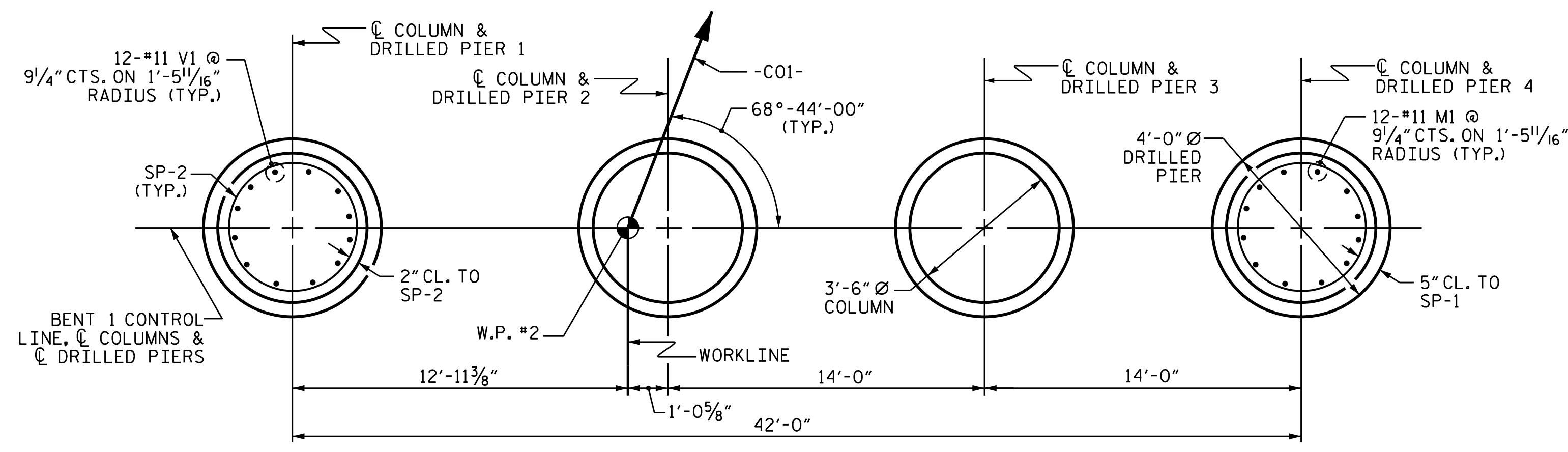


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1

DRAWN BY : S. N. MEGAHED / O. T. NGUYEN DATE : 8/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/19  
 DESIGN ENGINEER OF RECORD : S. N. MEGAHED DATE : 7/19

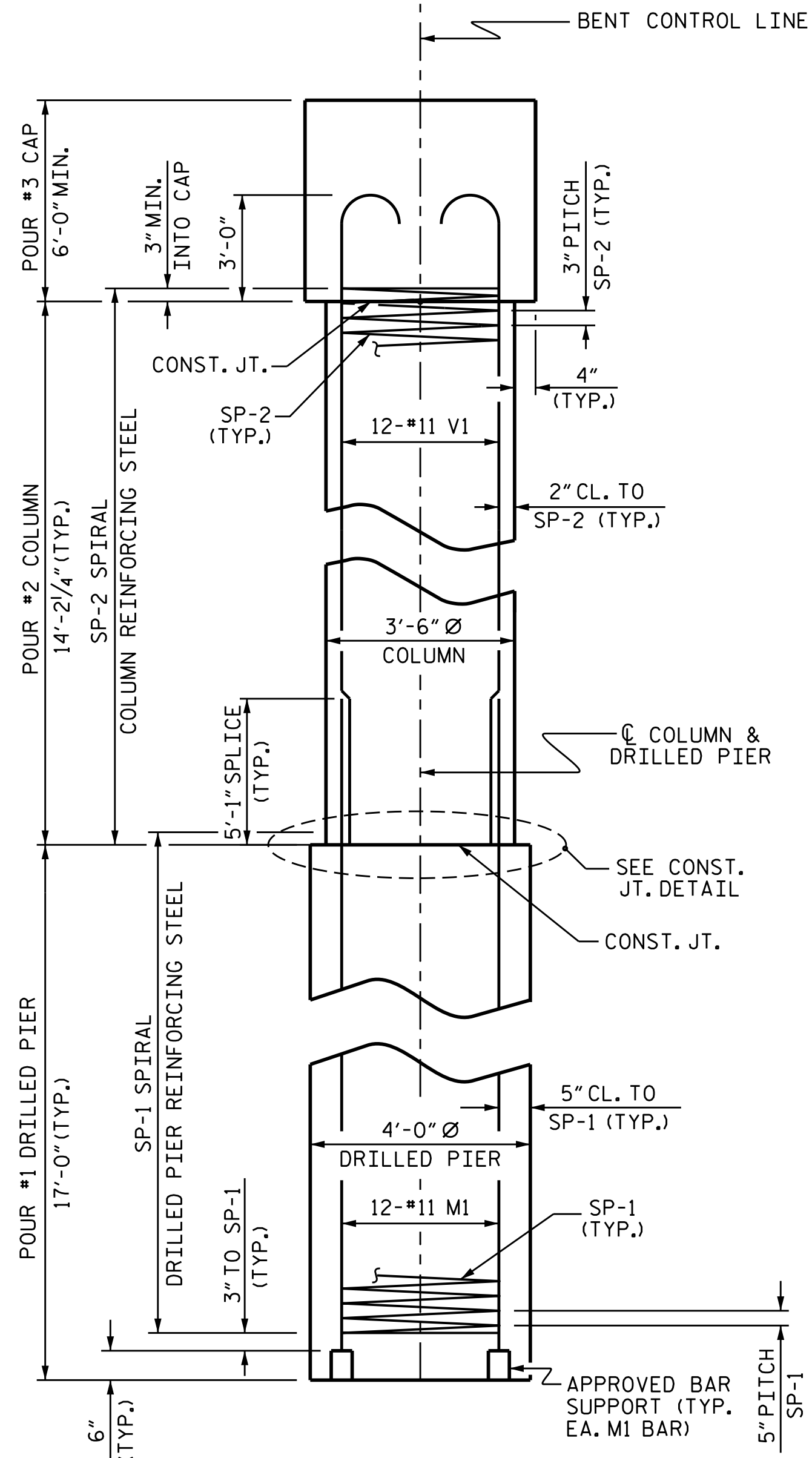
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			31

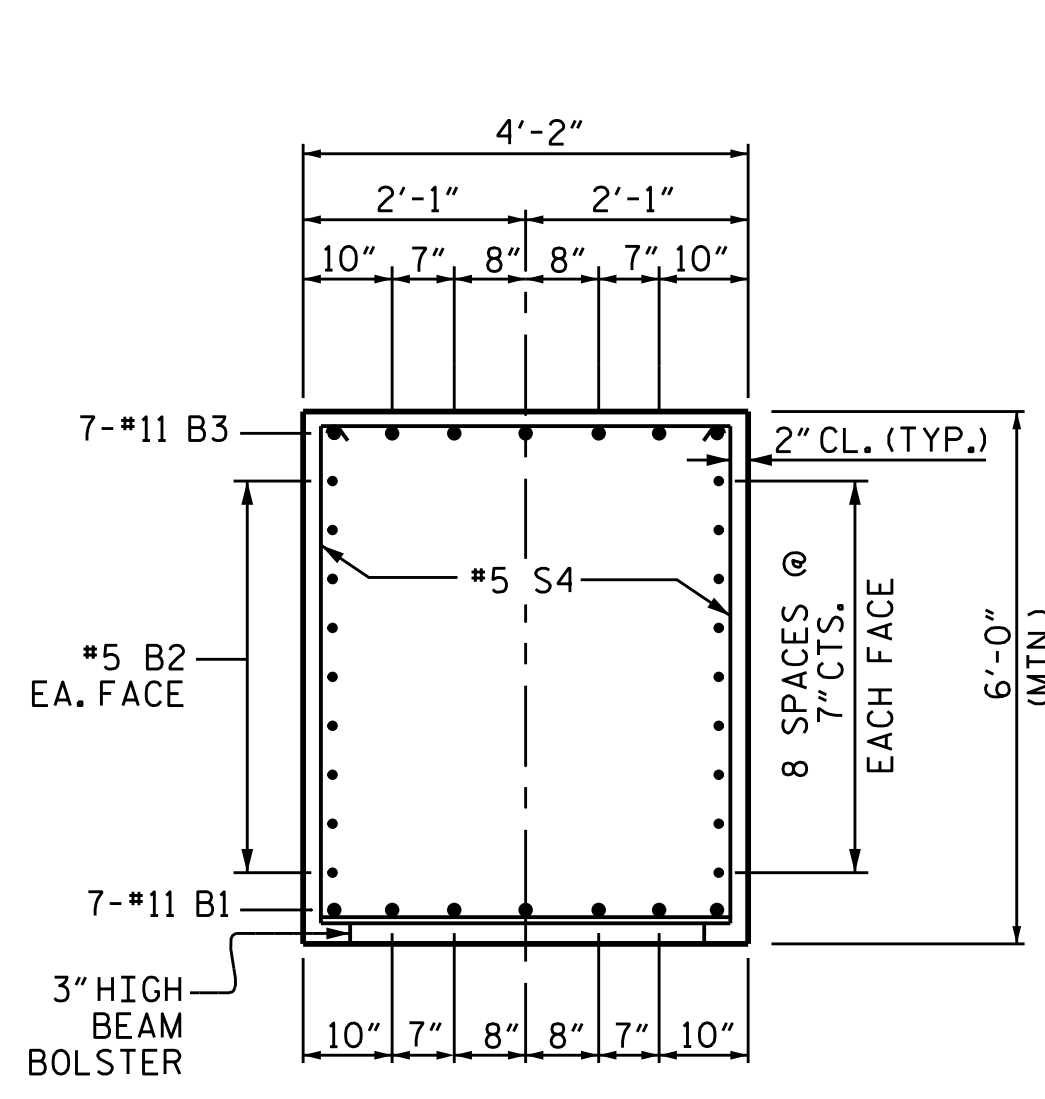


**PLAN OF DRILLED PIERS & COLUMNS**

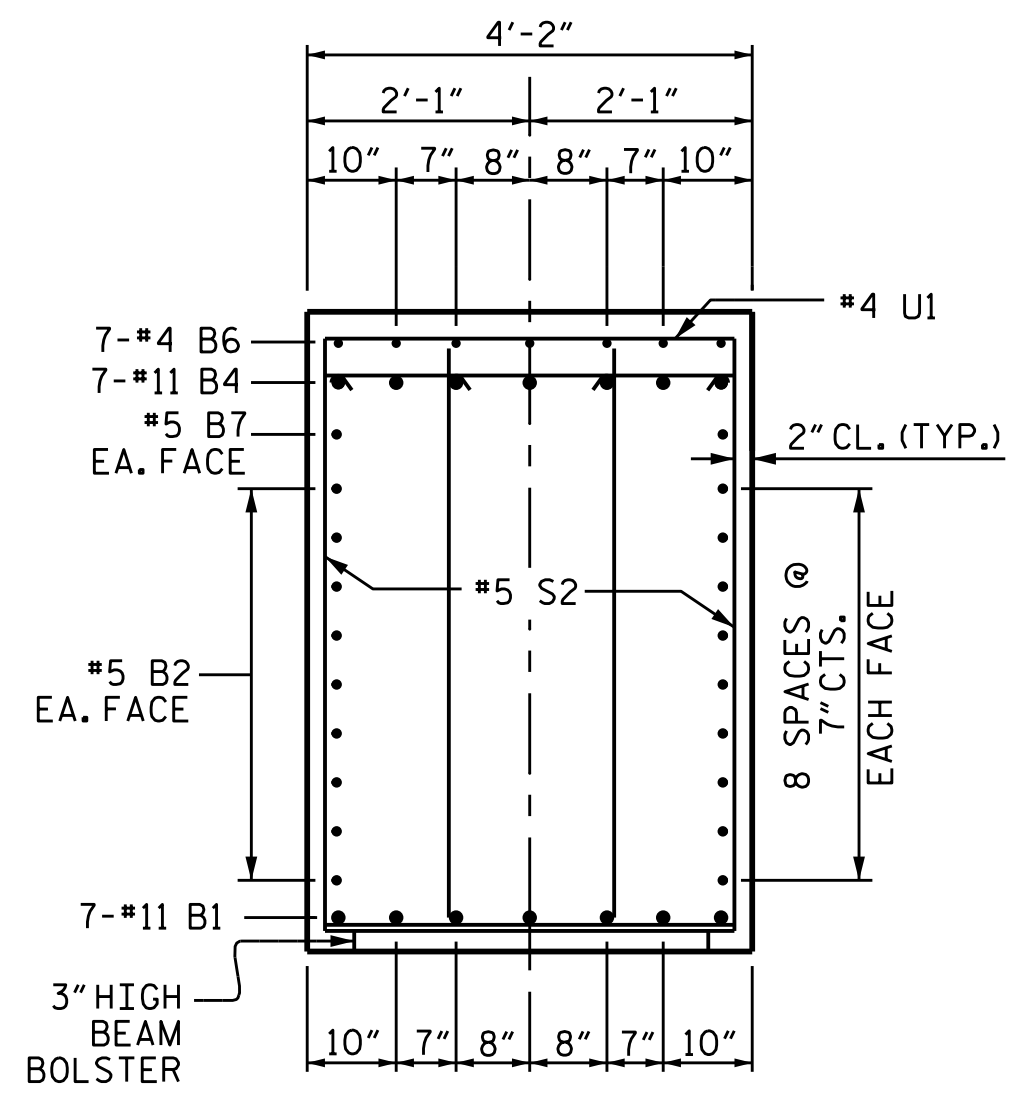
(DIMENSIONS AND REINFORCING STEEL SHOWN ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



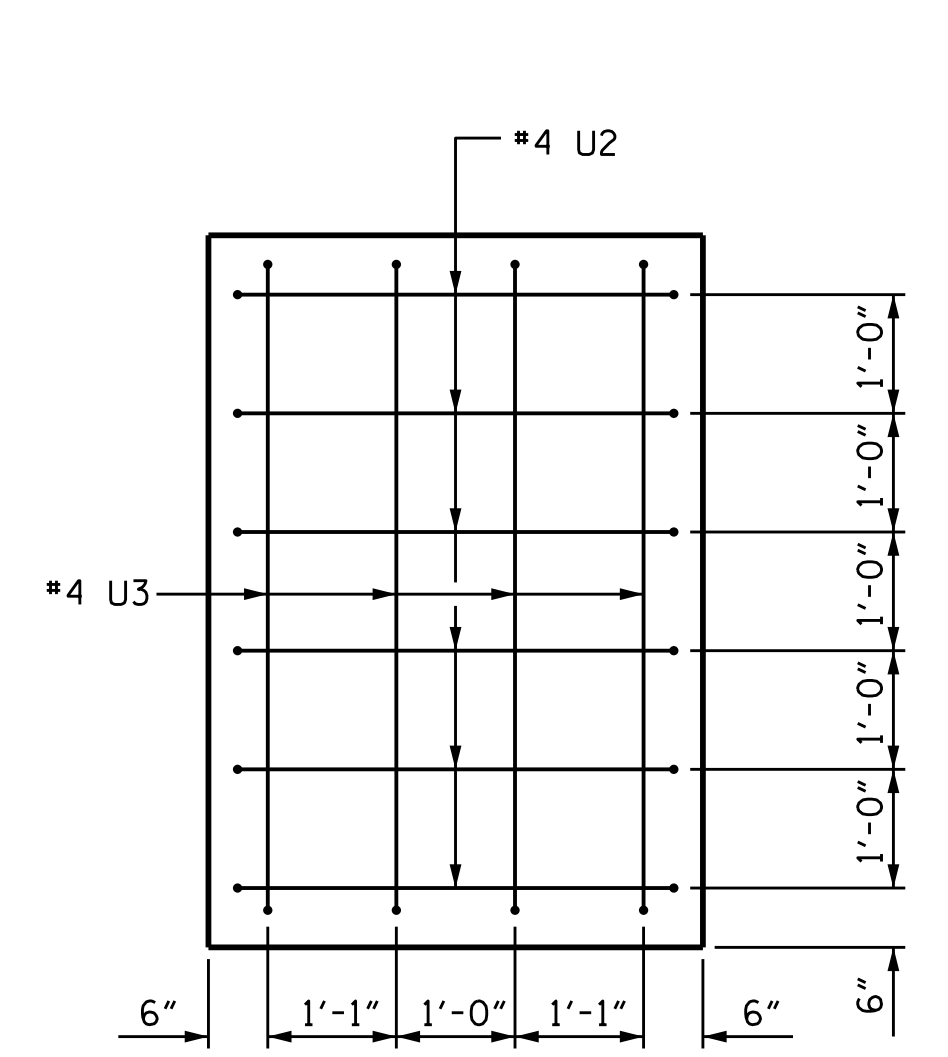
**END ELEVATION**



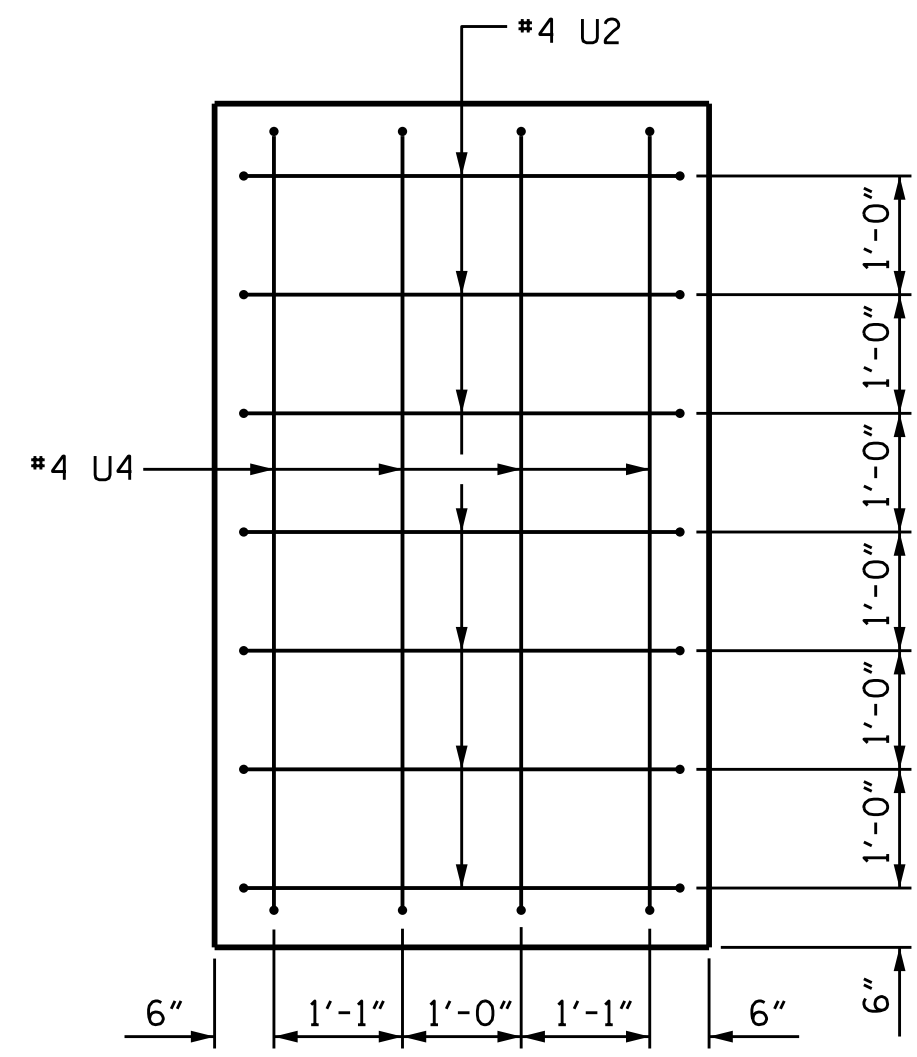
**SECTION A-A**



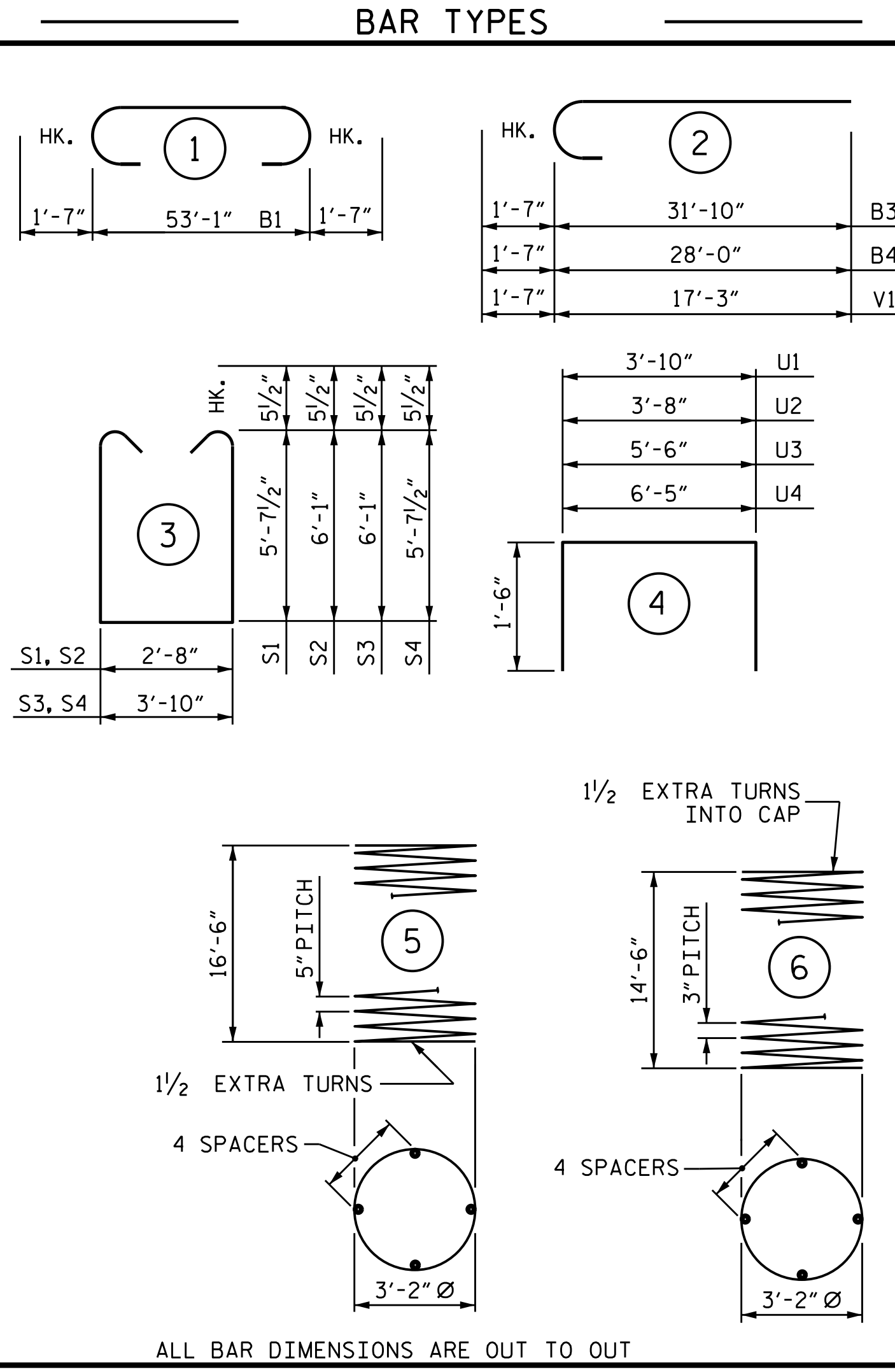
**SECTION B-B**



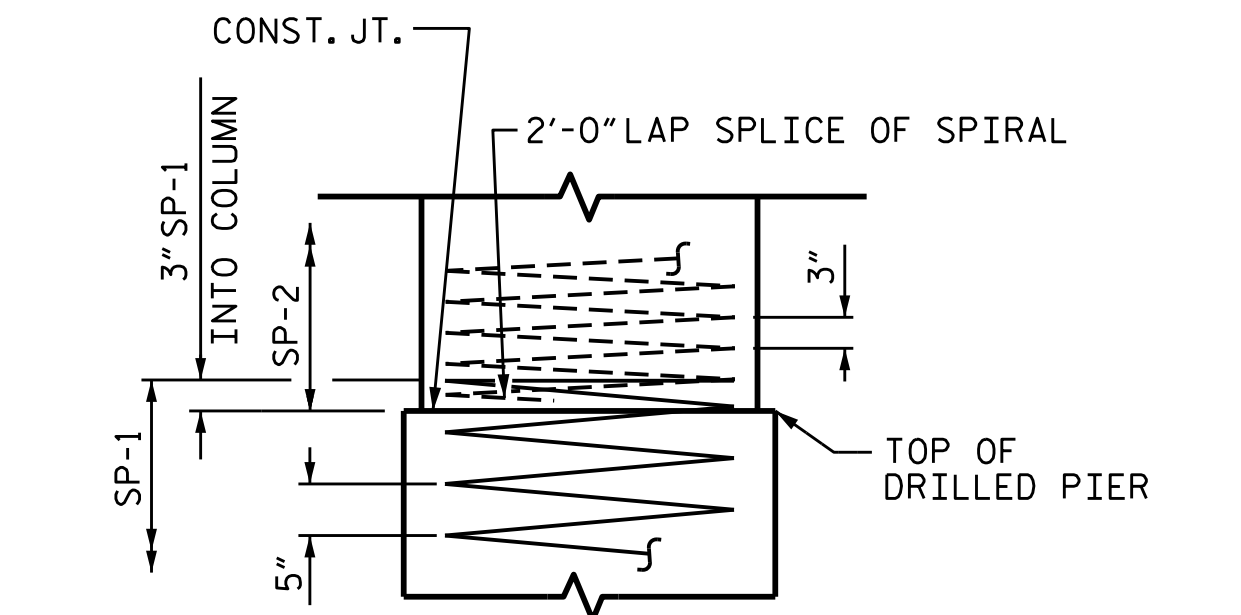
**VIEW X-X**



**VIEW Y-Y**



ALL BAR DIMENSIONS ARE OUT TO OUT



**CONSTRUCTION JOINT DETAIL**

BILL OF MATERIAL						
BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#11	1	56'-3"	2092	
B2	18	#5	STR	53'-1"	997	
B3	7	#11	2	33'-5"	1243	
B4	7	#11	2	29'-7"	1100	
B5	7	#4	STR	12'-0"	56	
B6	7	#4	STR	15'-8"	73	
B7	2	#5	STR	21'-3"	44	
M1	48	#11	STR	24'-10"	6333	
V1	48	#11	2	18'-10"	4803	
S1	44	#5	3	14'-10"	681	
S2	50	#5	3	15'-9"	821	
S3	10	#5	3	16'-11"	176	
S4	10	#5	3	16'-0"	167	
U1	50	#4	4	6'-10"	228	
U2	13	#4	4	6'-8"	58	
U3	4	#4	4	8'-6"	23	
U4	4	#4	4	9'-5"	25	

REINFORCING STEEL 18,920 LBS.

SP-1	4	*	5	411'-4"	1716
SP-2	4	**	6	589'-3"	1574

SPIRAL COLUMN REINFORCING STEEL 3,290 LBS.

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	20.2 C.Y.
POUR #3 (CAP)	52.8 C.Y.

TOTAL CLASS A CONCRETE 73.0 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	31.6 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	44 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	24 LIN. FT.
CSL TUBES	296 LIN. FT.

PROJECT NO. I-5700

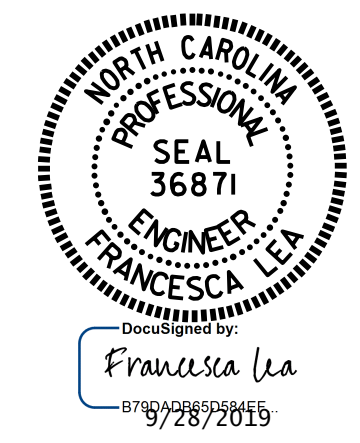
WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT 1



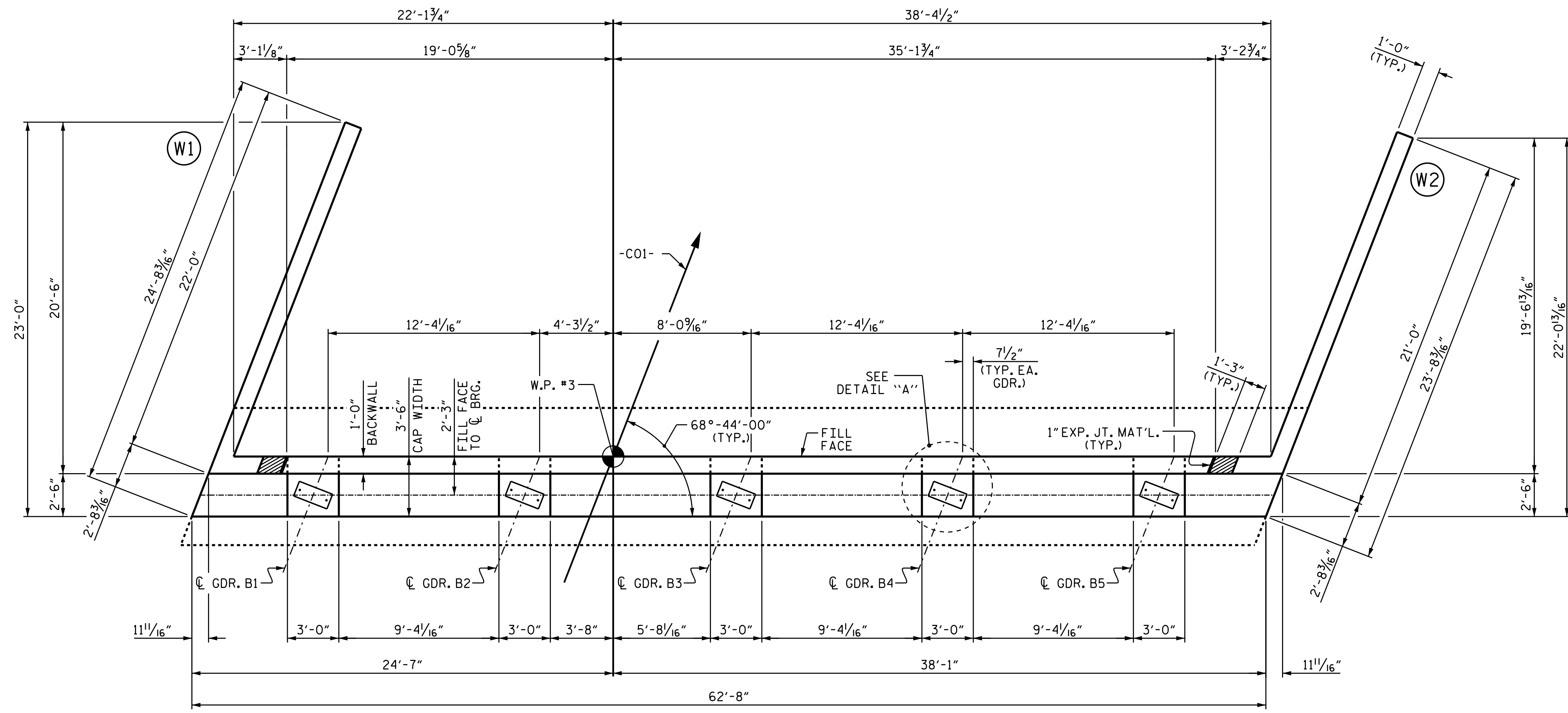
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CHECKED BY: D. SHACKELFORD DATE: 8/19  
DESIGN ENGINEER OF RECORD: S. N. MEGAHED DATE: 7/19

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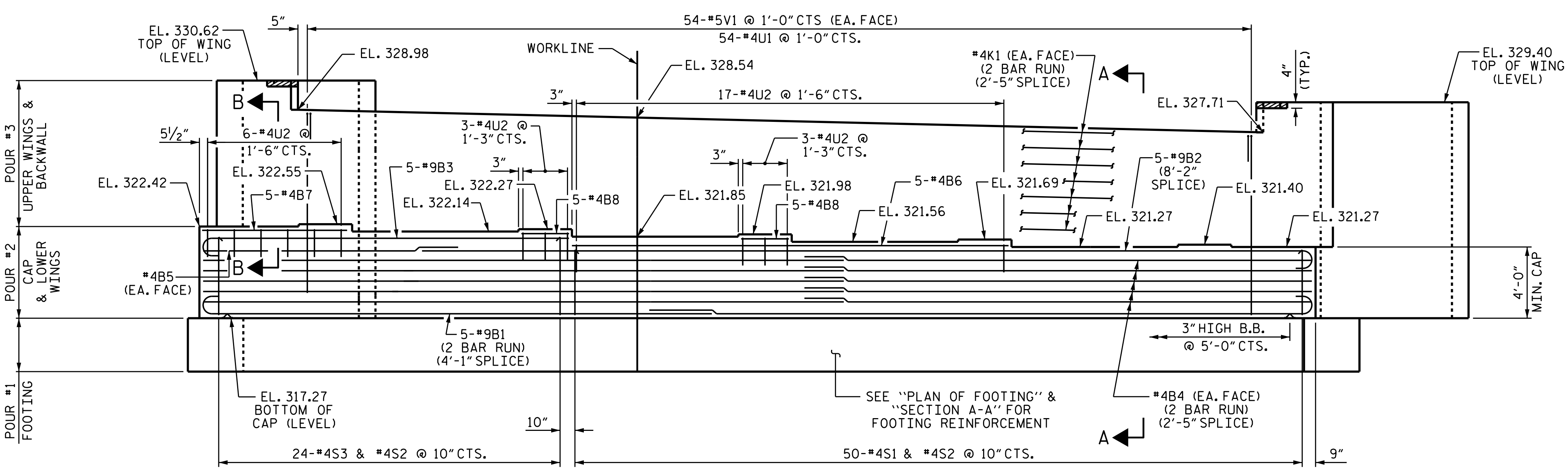
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S1-24  
TOTAL SHEETS  
31

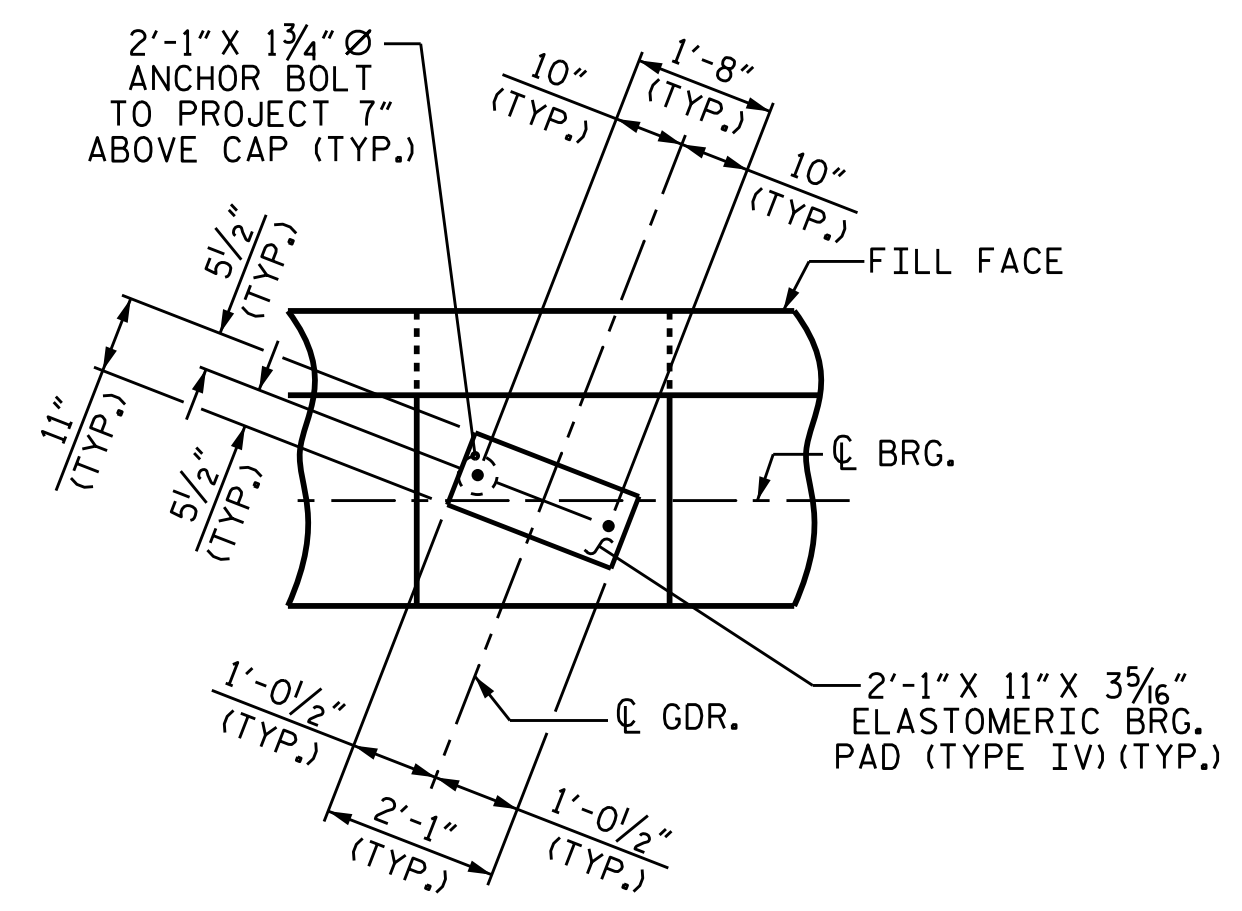




PLAN



ELEVATION



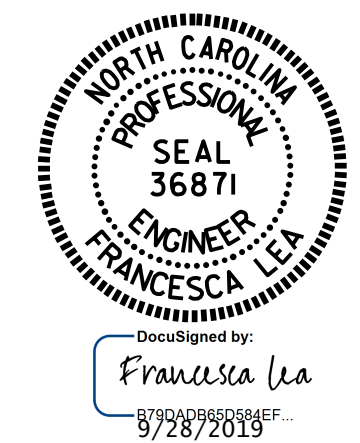
DETAIL "A"

NOTES

- STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE #5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 1 OF 4

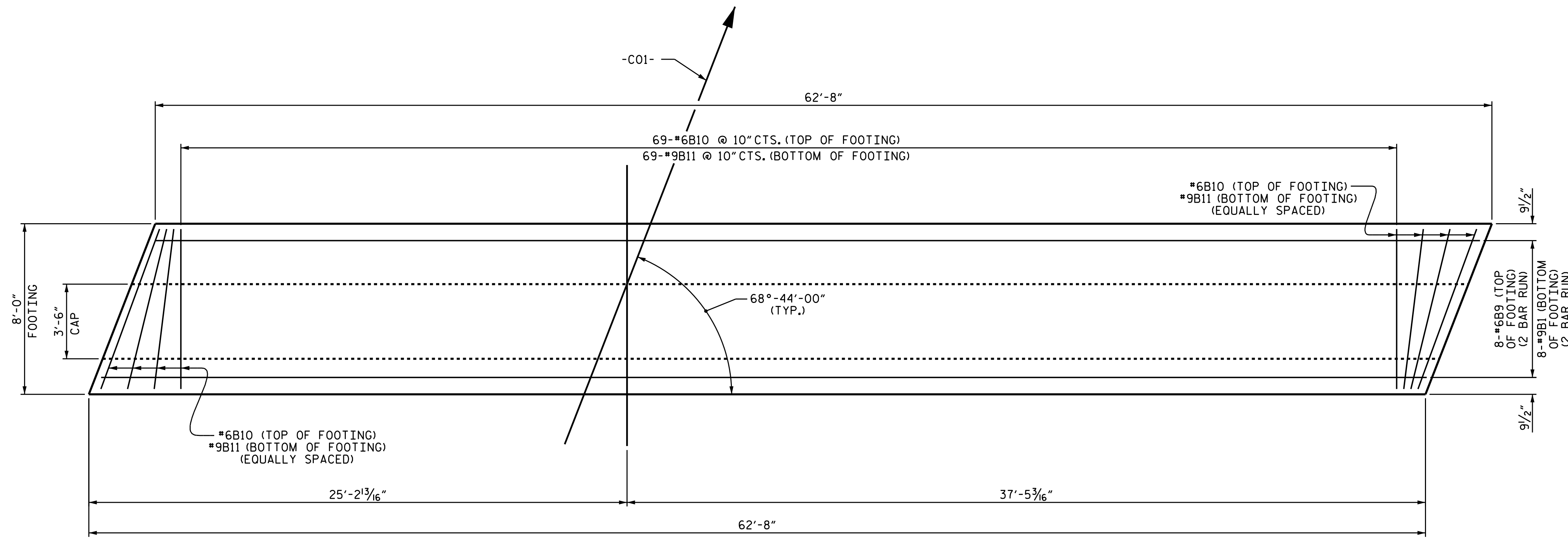


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2

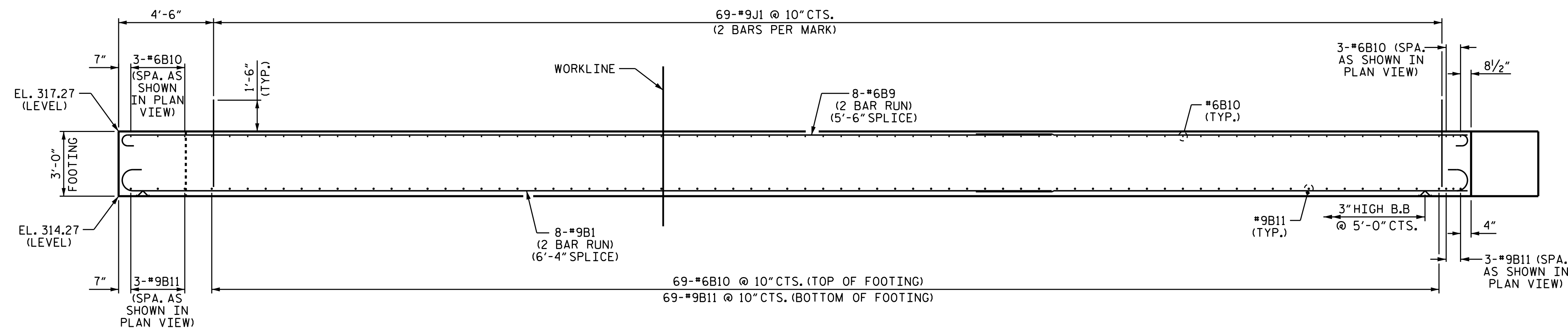
DRAWN BY: M.K. BEARD DATE: 8/12/19  
 CHECKED BY: D. SHACKELFORD DATE: 8/26/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE: 06/2019

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2			4			31



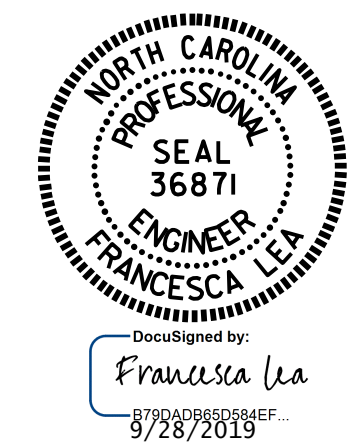
PLAN



ELEVATION

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 4



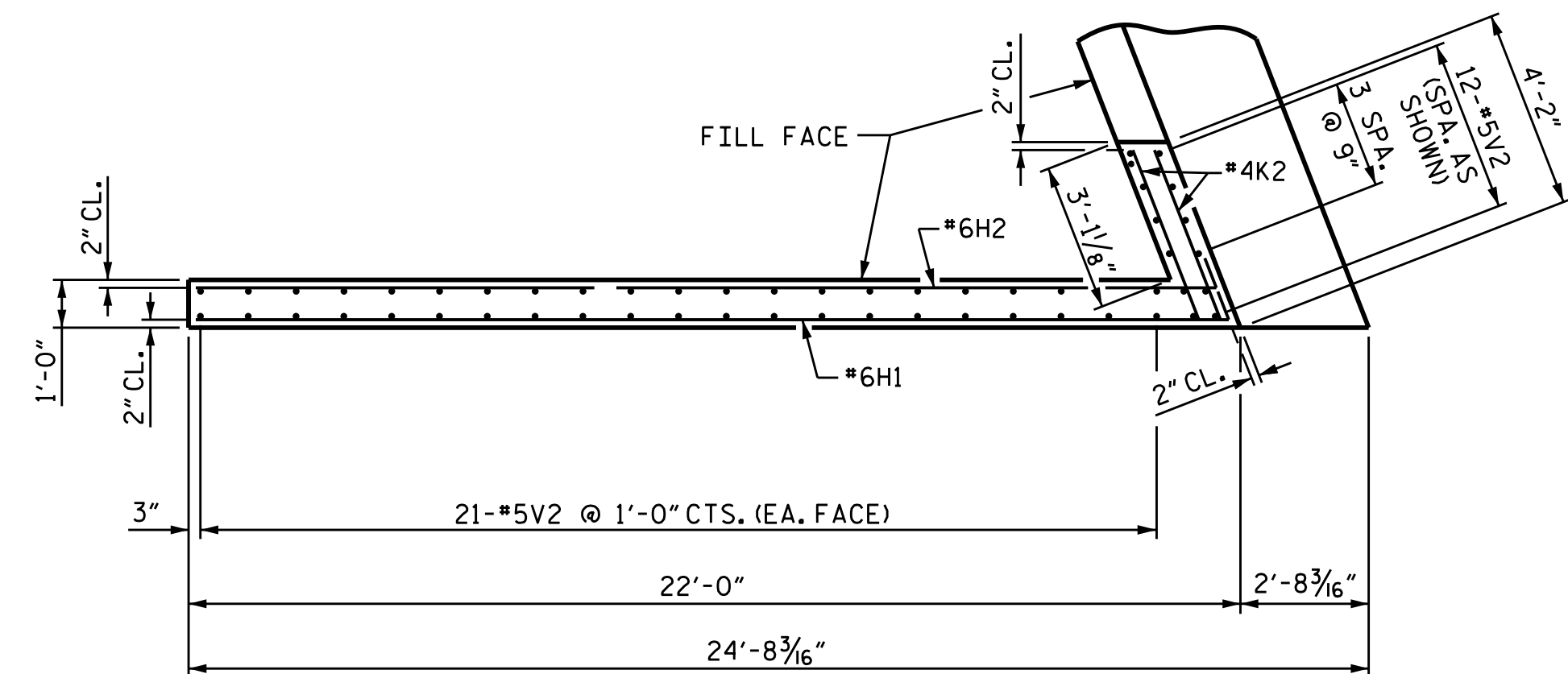
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2

DRAWN BY : M.K. BEARD DATE : 9/12/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/26/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 06/2019

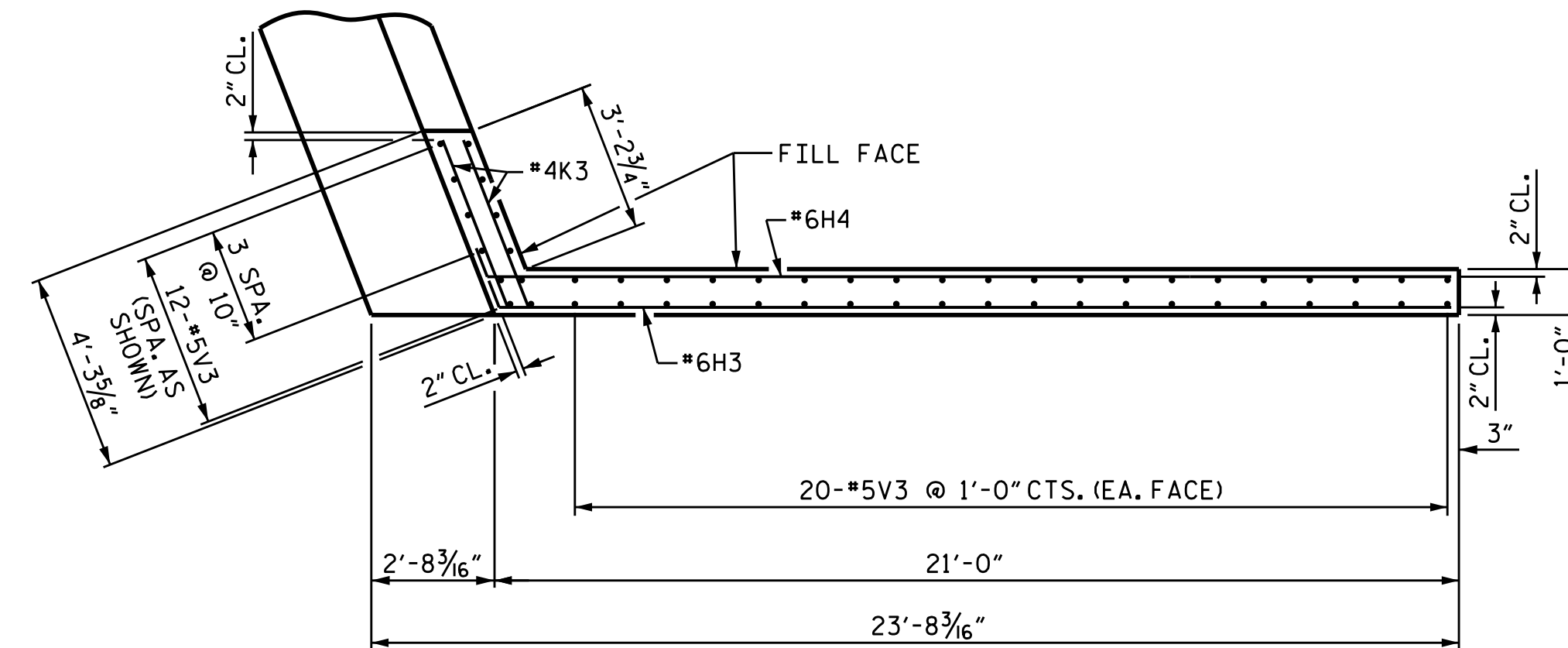
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-26
1			3			TOTAL SHEETS
2			4			31

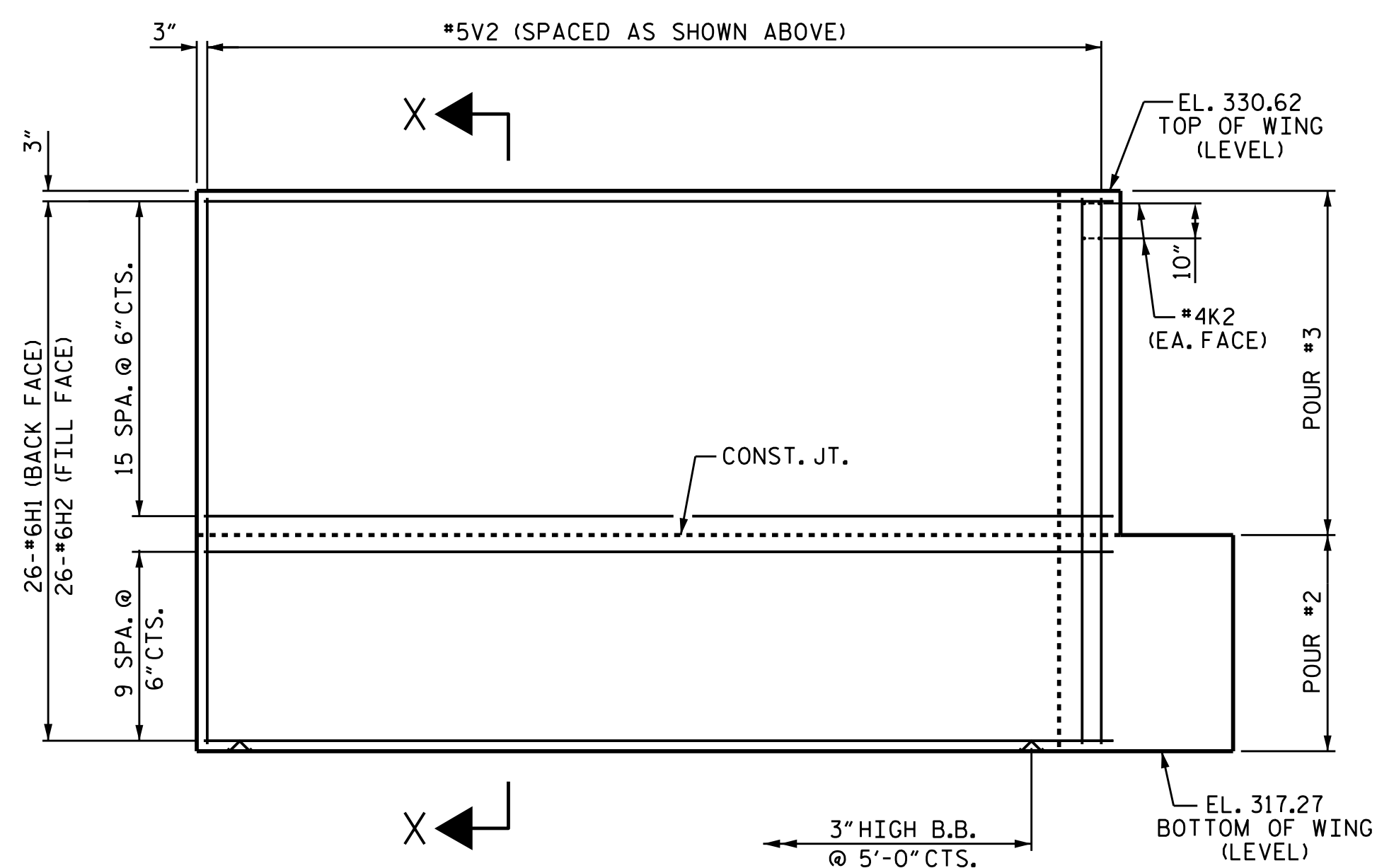




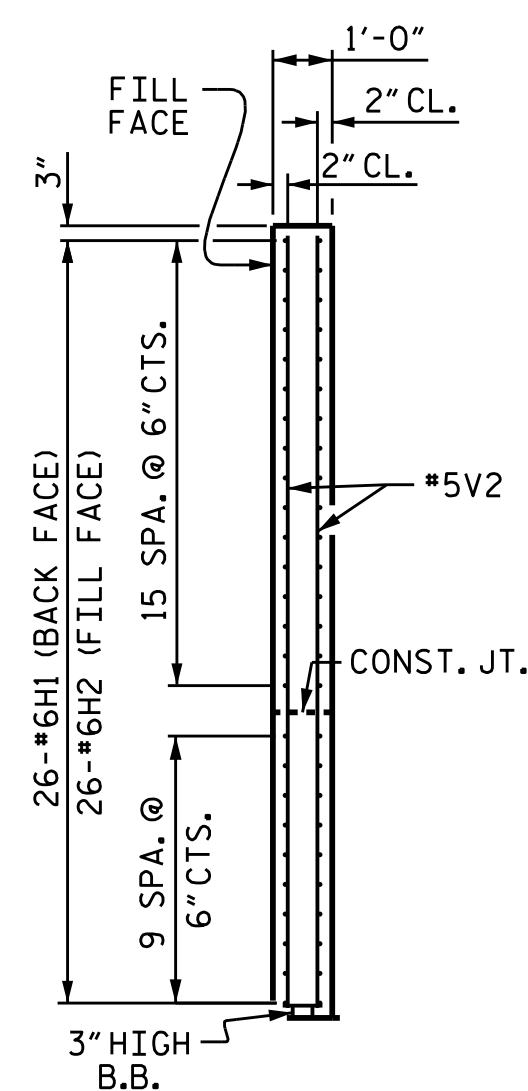
PLAN OF WING (W1)



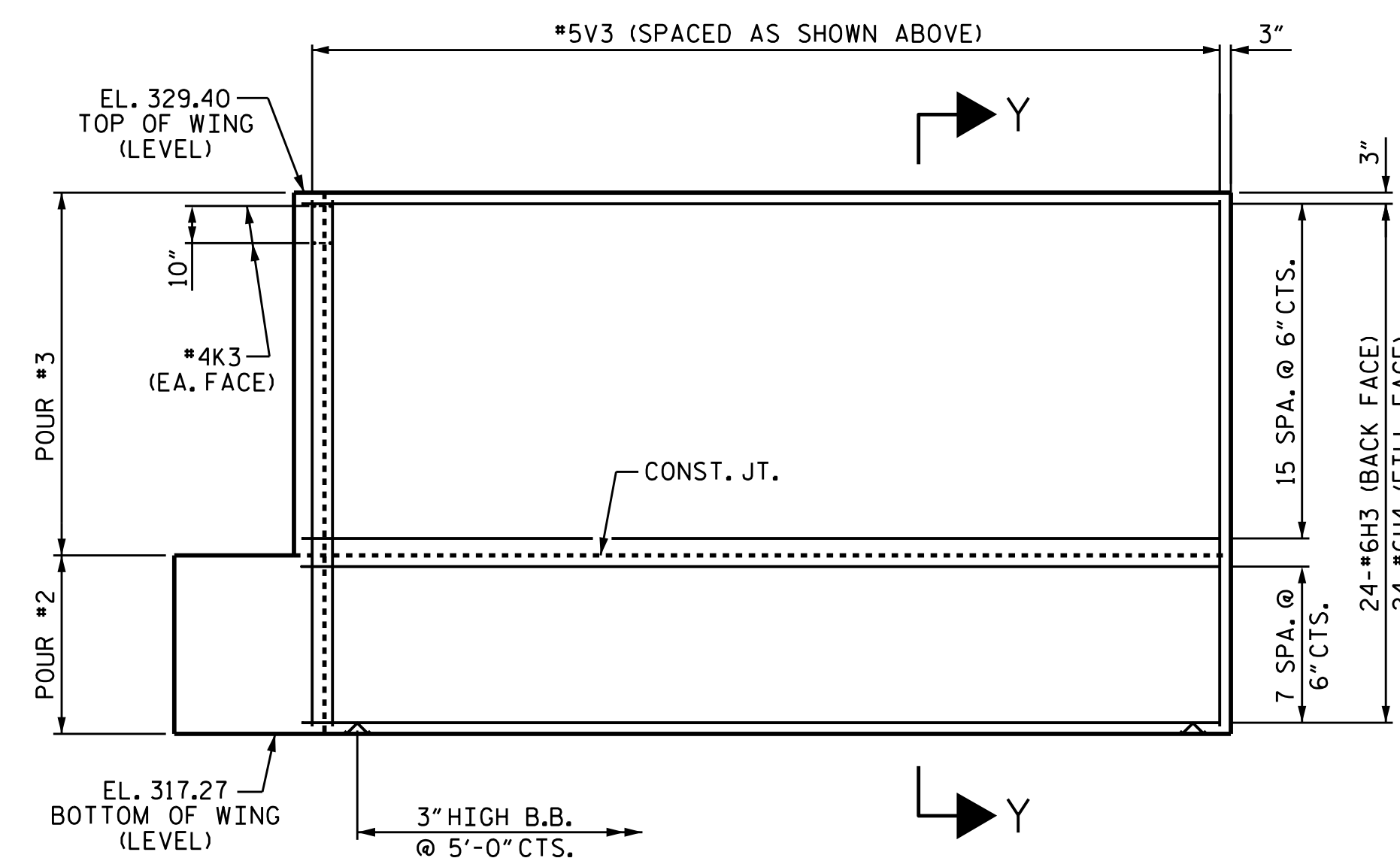
PLAN OF WING (W2)



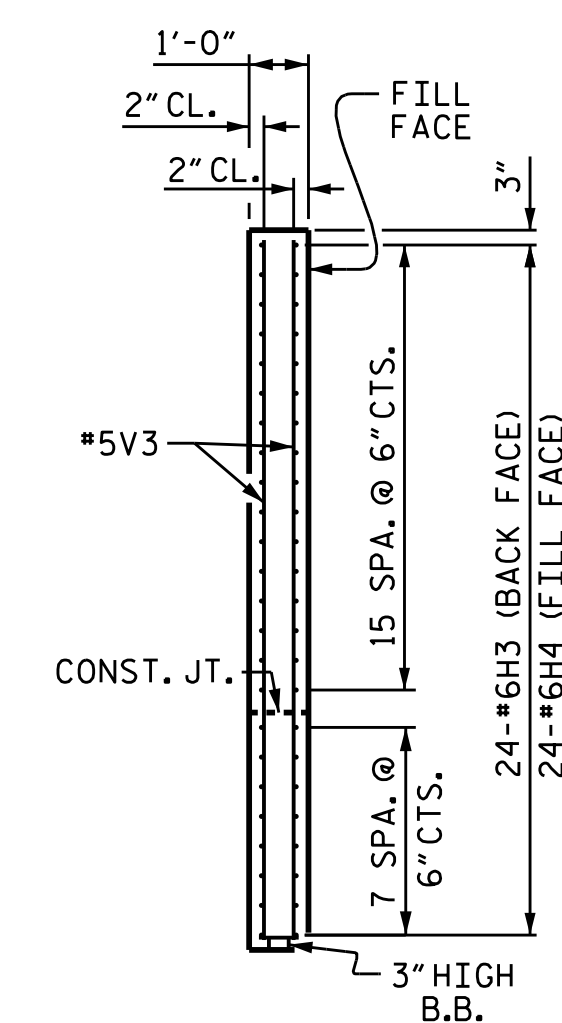
ELEVATION OF WING (W1)



SECTION X-X



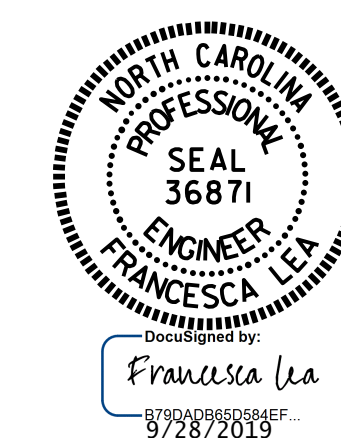
ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 3 OF 4

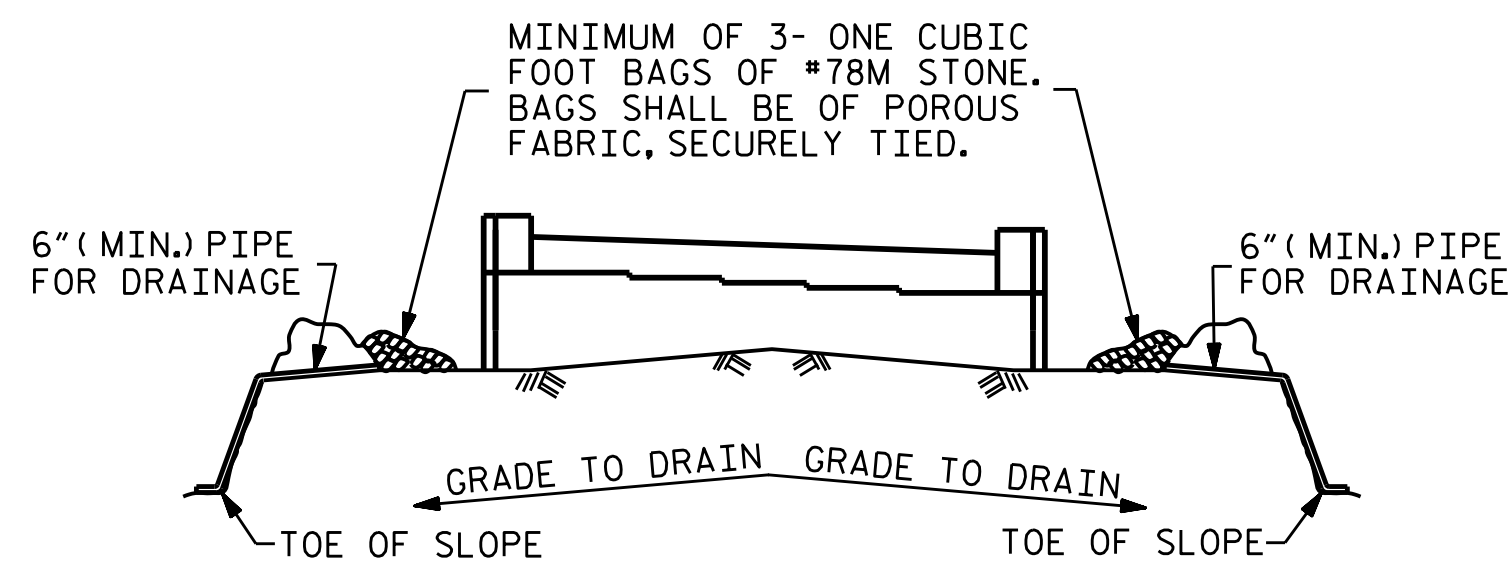


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2

DRAWN BY : M.K. BEARD DATE : 8/9/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/26/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 06/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			31

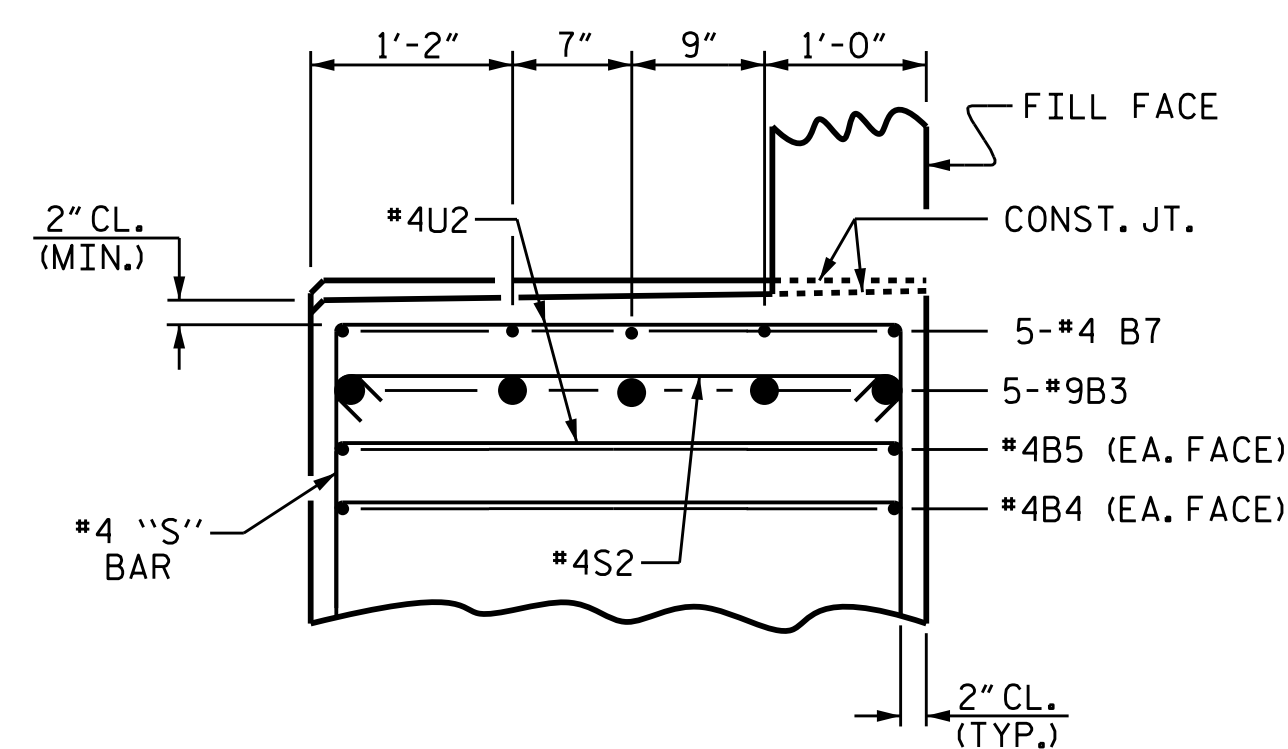


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

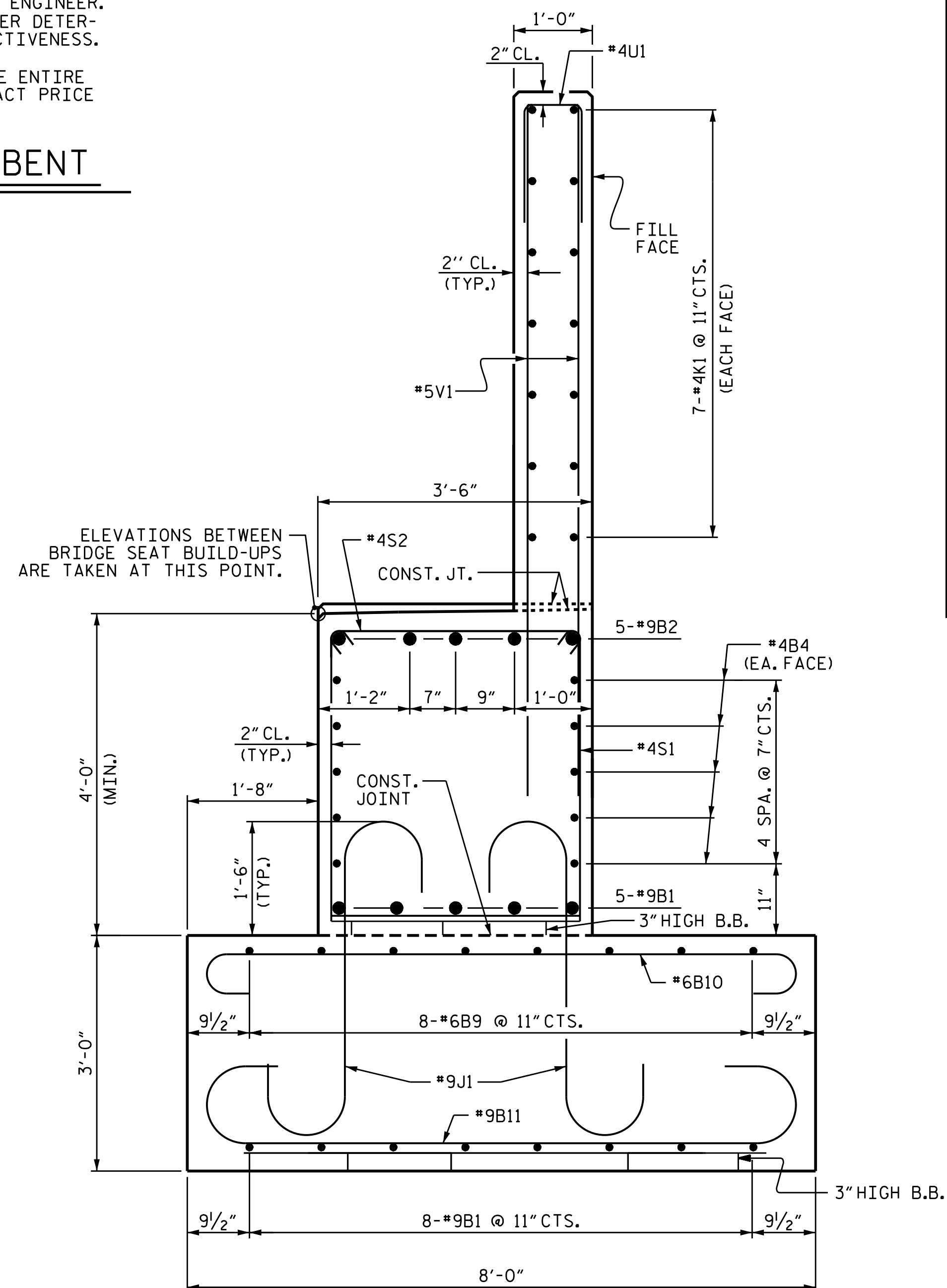
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

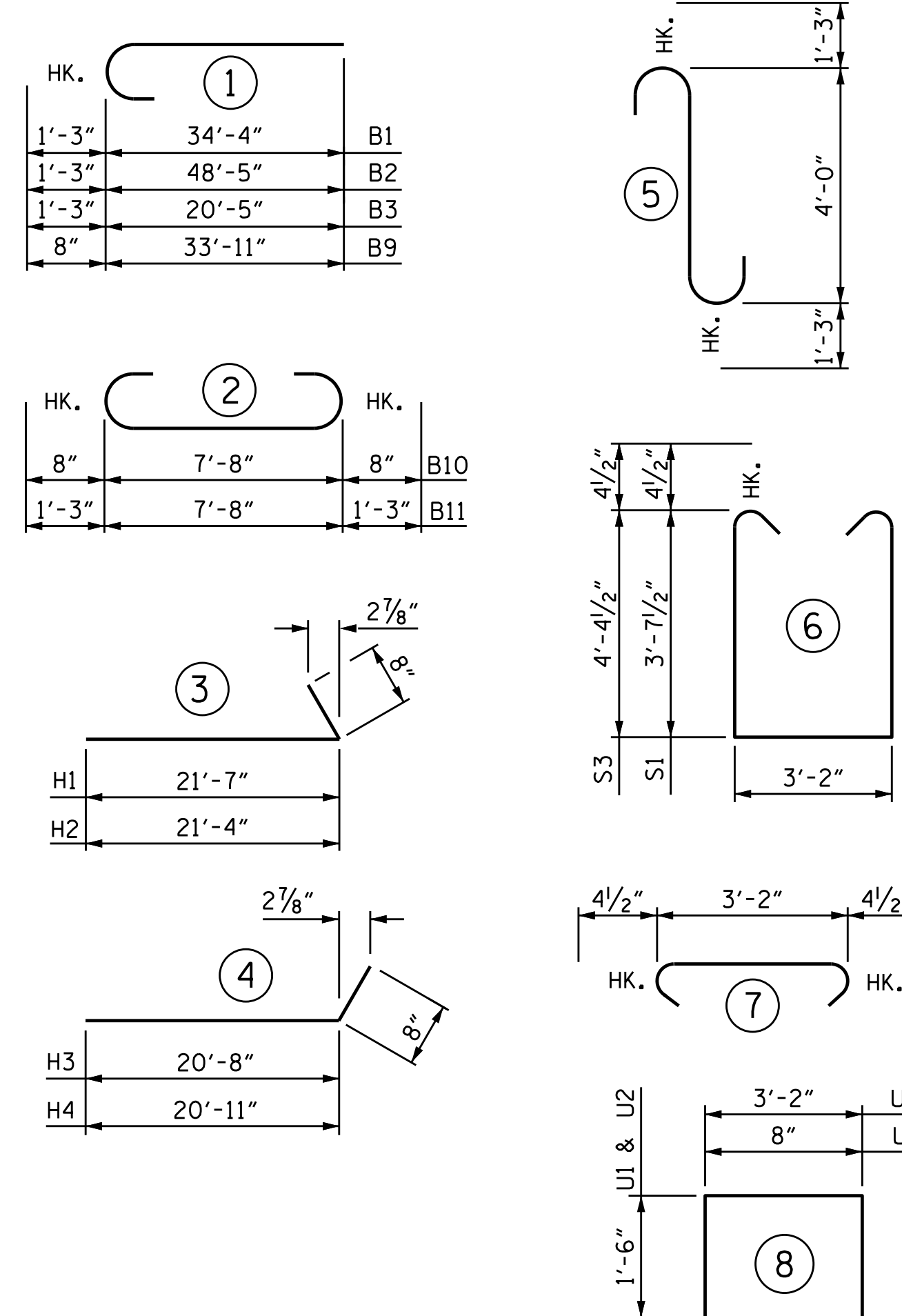


### PARTIAL SECTION B-B



### SECTION A-A

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

#### END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	26	#9	1	35'-7"	3146
B2	5	#9	1	51'-3"	871
B3	5	#9	1	21'-8"	368
B4	20	#4	STR	32'-4"	432
B5	2	#4	STR	14'-4"	19
B6	5	#4	STR	24'-8"	82
B7	5	#4	STR	8'-0"	27
B8	10	#4	STR	2'-8"	18
B9	16	#6	1	34'-7"	831
B10	75	#6	2	9'-0"	1014
B11	75	#9	2	10'-2"	2593
H1	26	#6	3	22'-3"	869
H2	26	#6	3	22'-0"	859
H3	24	#6	4	21'-4"	769
H4	24	#6	4	21'-7"	778
J1	138	#9	5	6'-6"	3050
K1	28	#4	STR	32'-7"	609
K2	4	#4	STR	3'-9"	10
K3	4	#4	STR	3'-11"	10
S1	50	#4	6	11'-2"	373
S2	74	#4	7	3'-11"	194
S3	24	#4	6	12'-8"	203
U1	54	#4	8	3'-8"	132
U2	12	#4	8	6'-2"	49
V1	108	#5	STR	10'-1"	1136
V2	54	#5	STR	13'-0"	732
V3	52	#5	STR	11'-9"	637

REINFORCING STEEL	19,811 LBS.
CLASS A CONCRETE	
POUR #1 (FOOTNG)	55.7 C.Y.
POUR #2 (CAP & LOWER WINGS)	43.6 C.Y.
POUR #3 (UPPER WINGS & BACKWALL)	28.1 C.Y.
TOTAL	127.4 C.Y.

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2

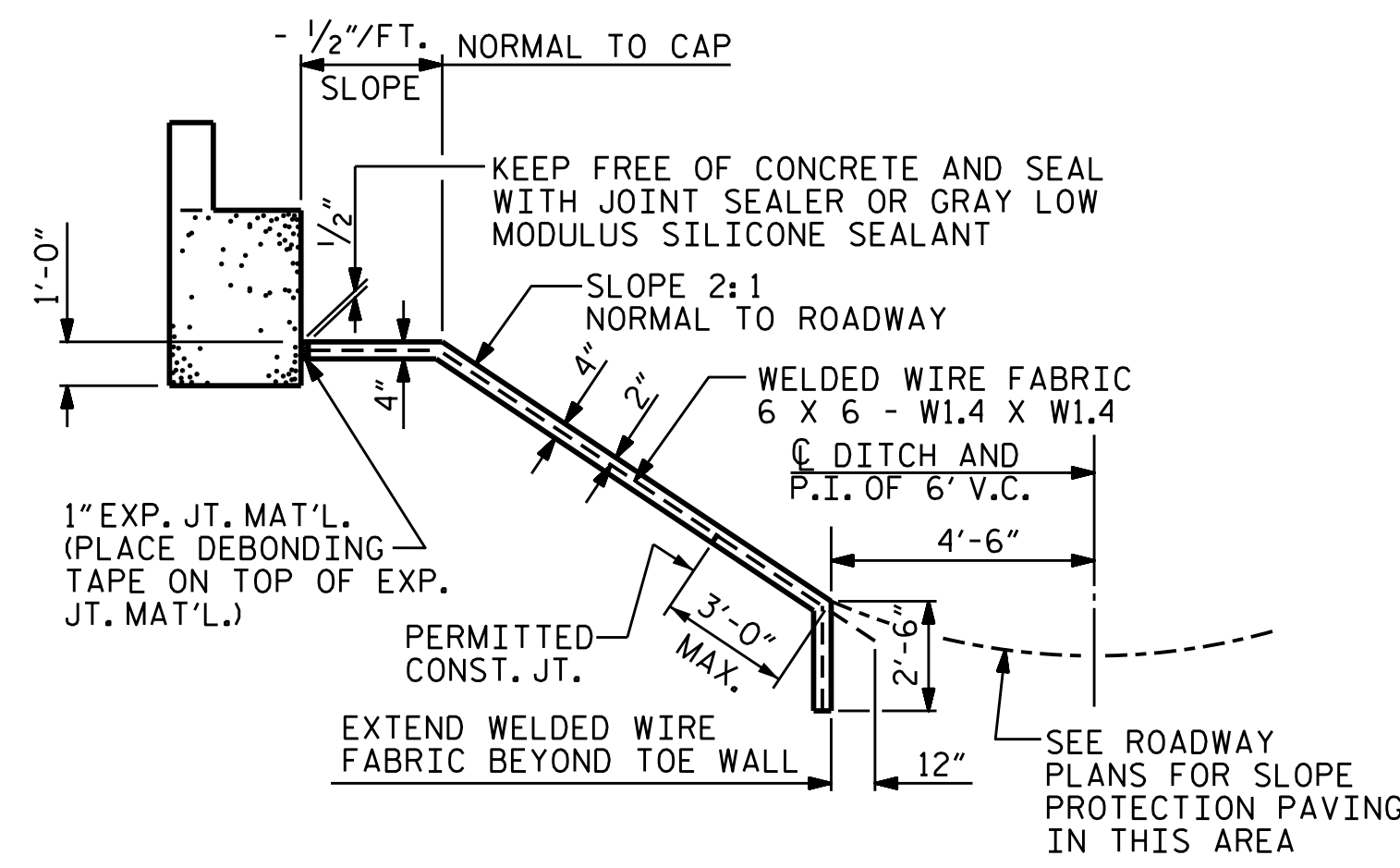


DRAWN BY : M.K. BEARD DATE : 8/12/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/26/19  
 DESIGN ENGINEER OF RECORD : R.L. CHESSON DATE : 06/2019

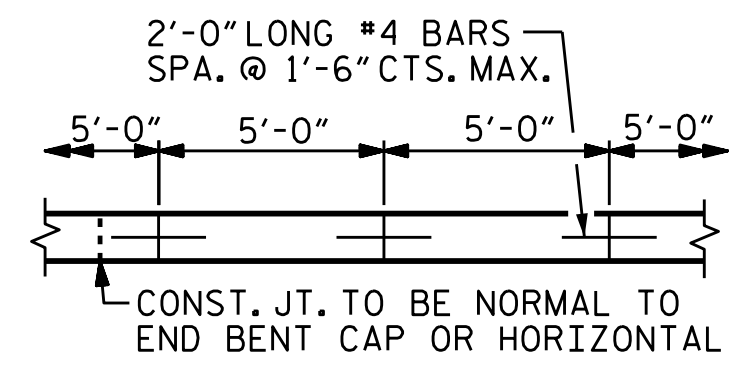
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1			3			TOTAL SHEETS
2			4			31

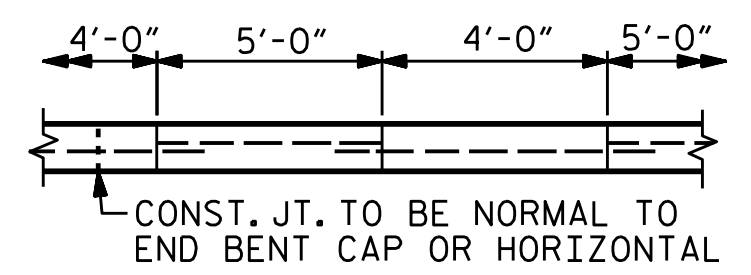




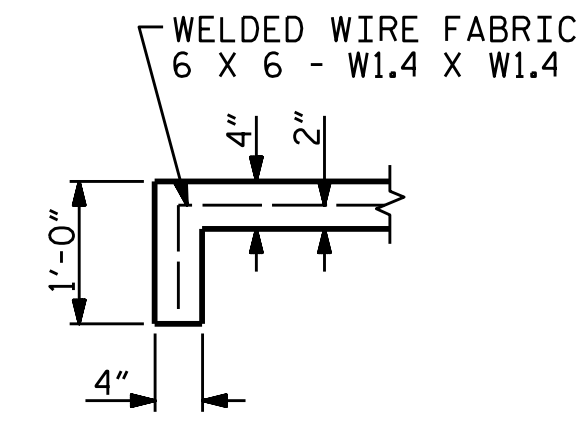
SECTION NORMAL TO CAP AT END BENT 1  
(END BENT 2 SIMILAR)



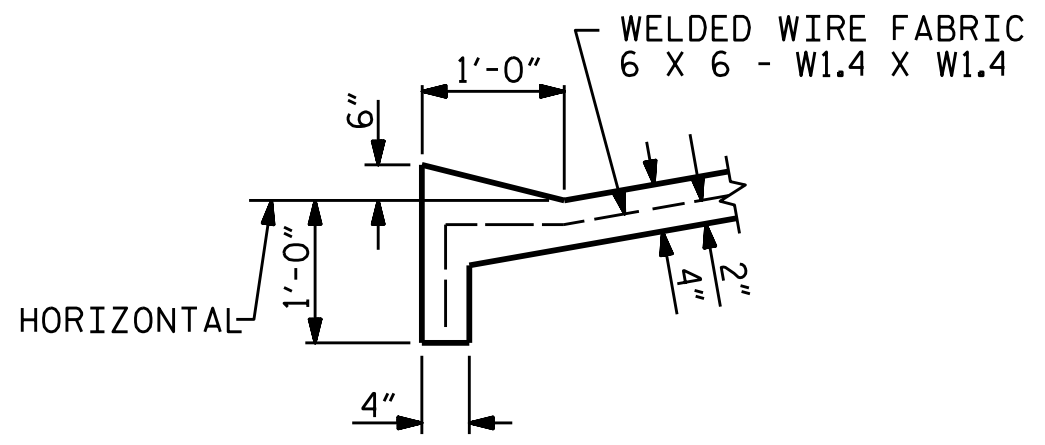
POURING DETAIL



OPTIONAL POURING DETAIL



SECTION A-A



SECTION B-B

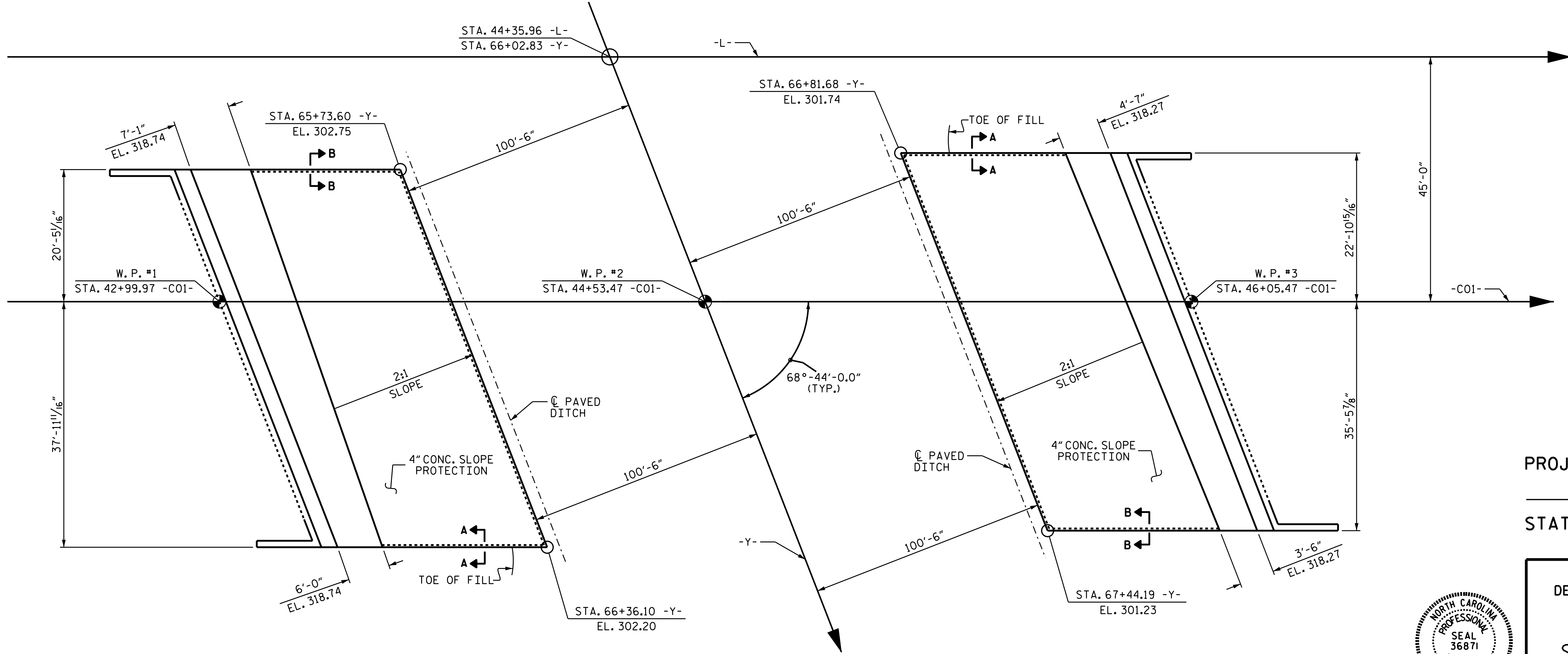
**GENERAL NOTES**

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.

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 SPACINGS. 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.

BRIDGE @ STA. 44+53.47 -C01-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	315	560
END BENT 2	300	535

\* QUANTITY SHOWN IS BASED ON 5' POURS.



PLAN

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

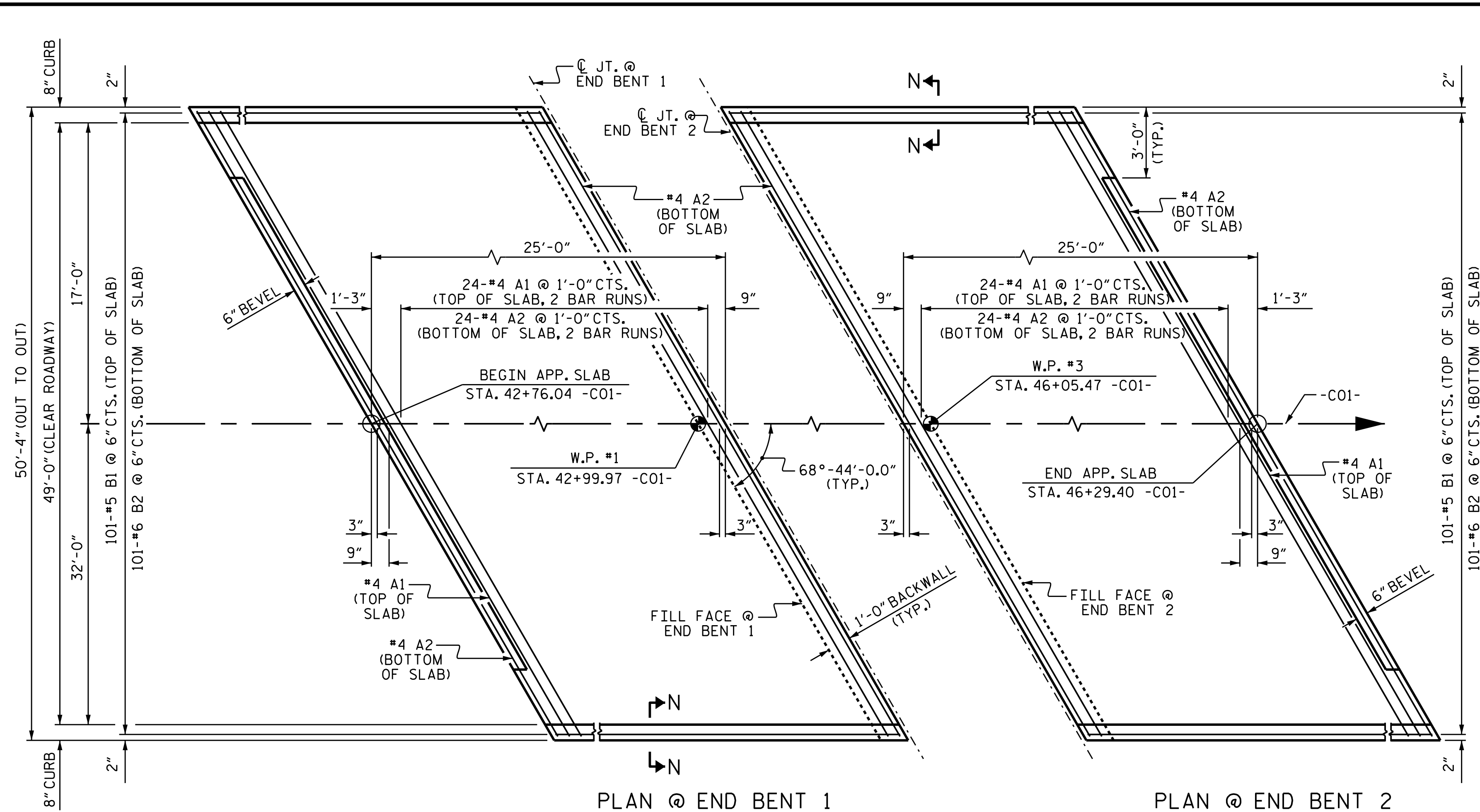


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SLOPE PROTECTION  
 DETAILS

ASSEMBLED BY : W.D. REAMS	DATE : 08/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

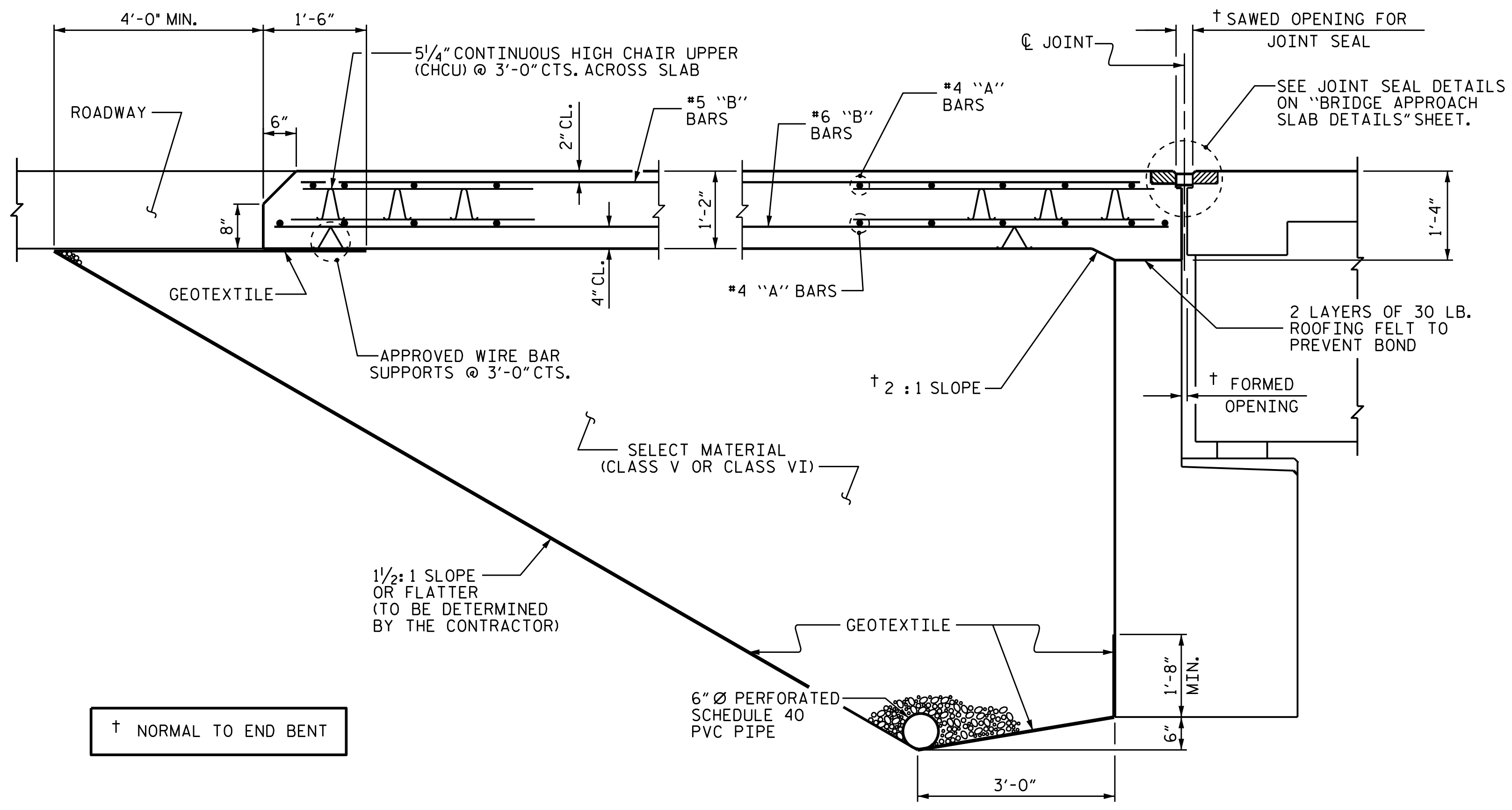
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29
1			3			TOTAL SHEETS 31
2			4			



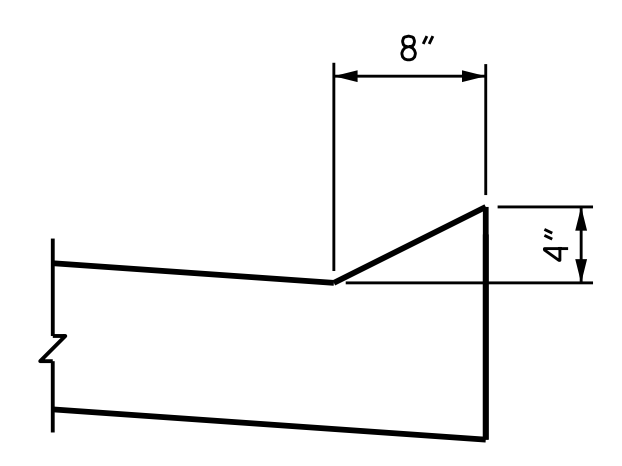
PLAN @ END BENT 1                      PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)



SECTION N-N

CURB DETAILS

NOTES

- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- WITH FOAM JOINT SEAL
- FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	27'-10"	930
A2	52	#4	STR	27'-8"	961
*B1	101	#5	STR	23'-9"	2502
B2	101	#6	STR	24'-8"	3742
REINFORCING STEEL					LBS. 4703
* EPOXY COATED REINFORCING STEEL					LBS. 3432
CLASS AA CONCRETE					C. Y. 58

APPROACH SLAB AT BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	27'-10"	930
A2	52	#4	STR	27'-8"	961
*B1	101	#5	STR	23'-9"	2502
B2	101	#6	STR	24'-8"	3742
REINFORCING STEEL					LBS. 4703
* EPOXY COATED REINFORCING STEEL					LBS. 3432
CLASS AA CONCRETE					C. Y. 58

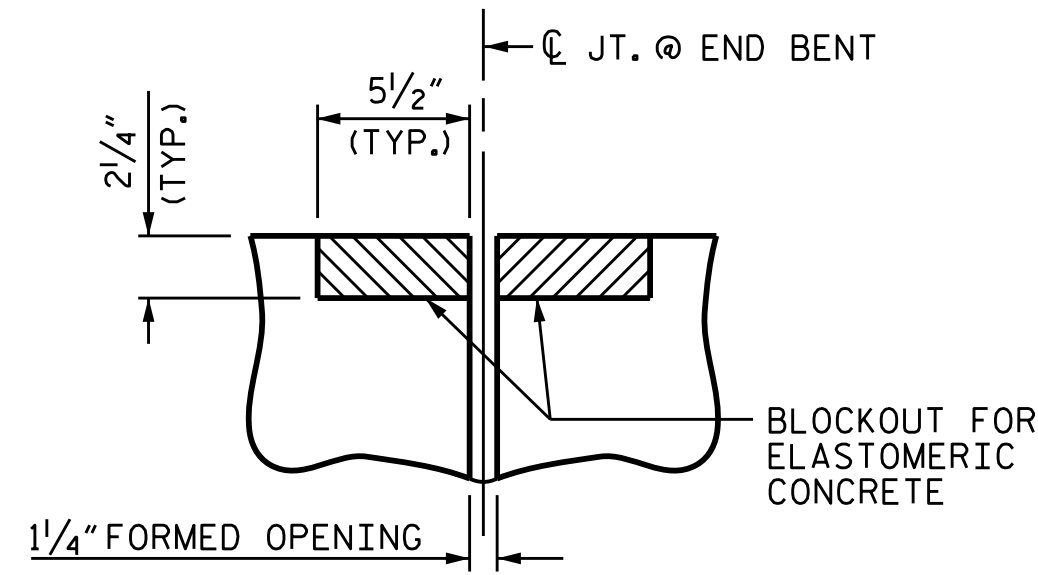
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

ASSEMBLED BY :	W.D. REAMS	DATE :	08/2019
CHECKED BY :	F. LEA	DATE :	09/2019
DRAWN BY :	EEM	3/95	REV. 6/13
CHECKED BY :	VAP	3/95	REV. 12/17
			REV. 06/19
			MAA/GM
			MAA/THC
			BNB/THC

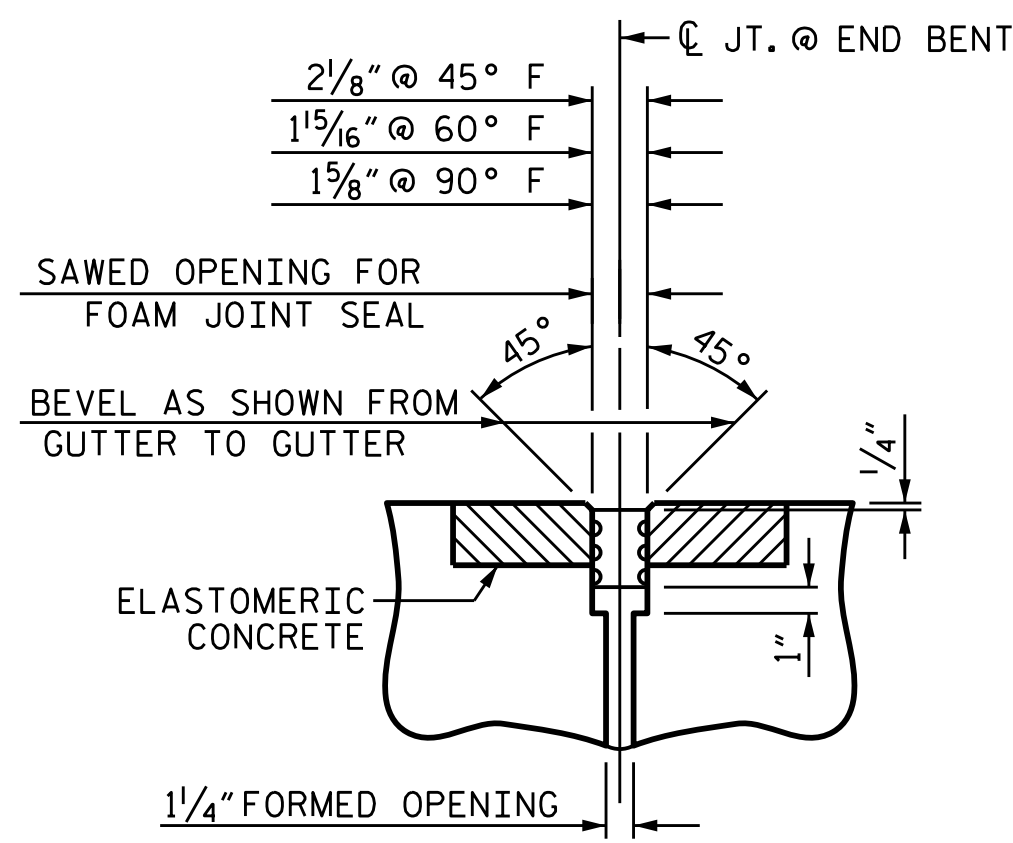
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS 31
2			4			





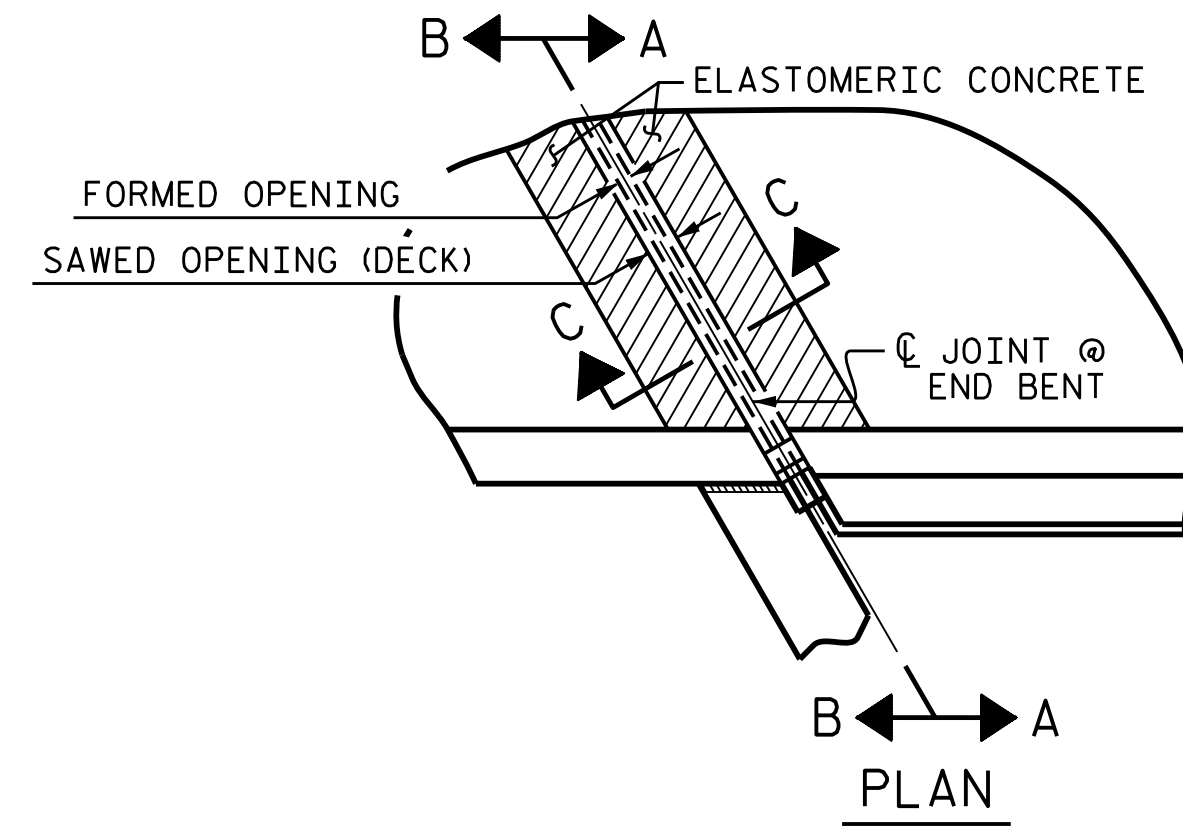
**SECTION C-C**  
FOAM JOINT SEAL  
(PRE-SAWED ELASTOMERIC  
CONCRETE DIMENSIONS)



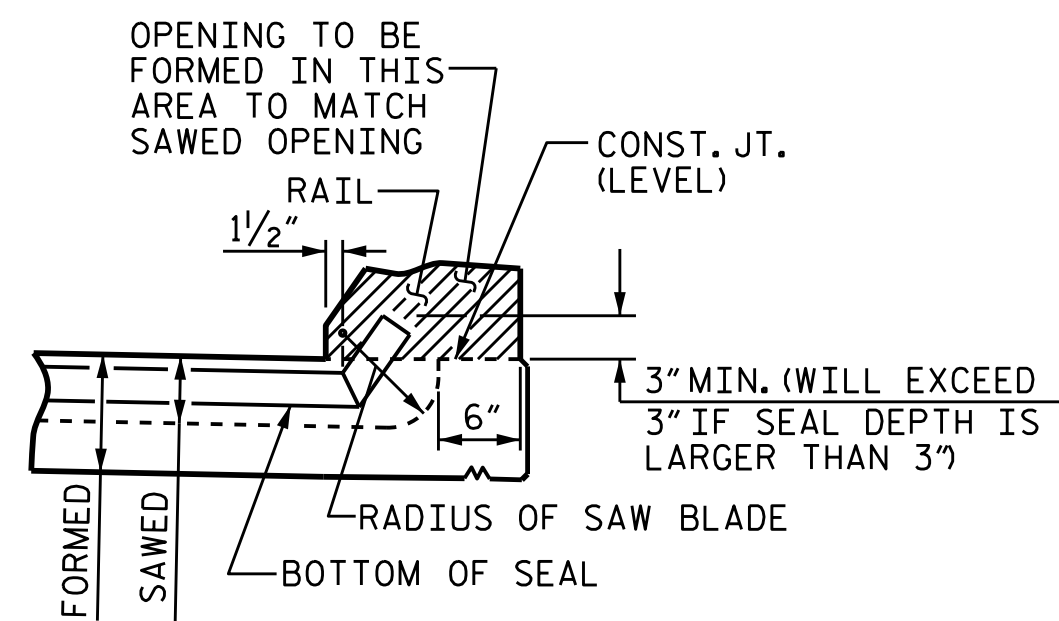
**SECTION C-C**  
FOAM JOINT SEAL  
(EXPANSION)

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	10
2	10
TOTAL	20

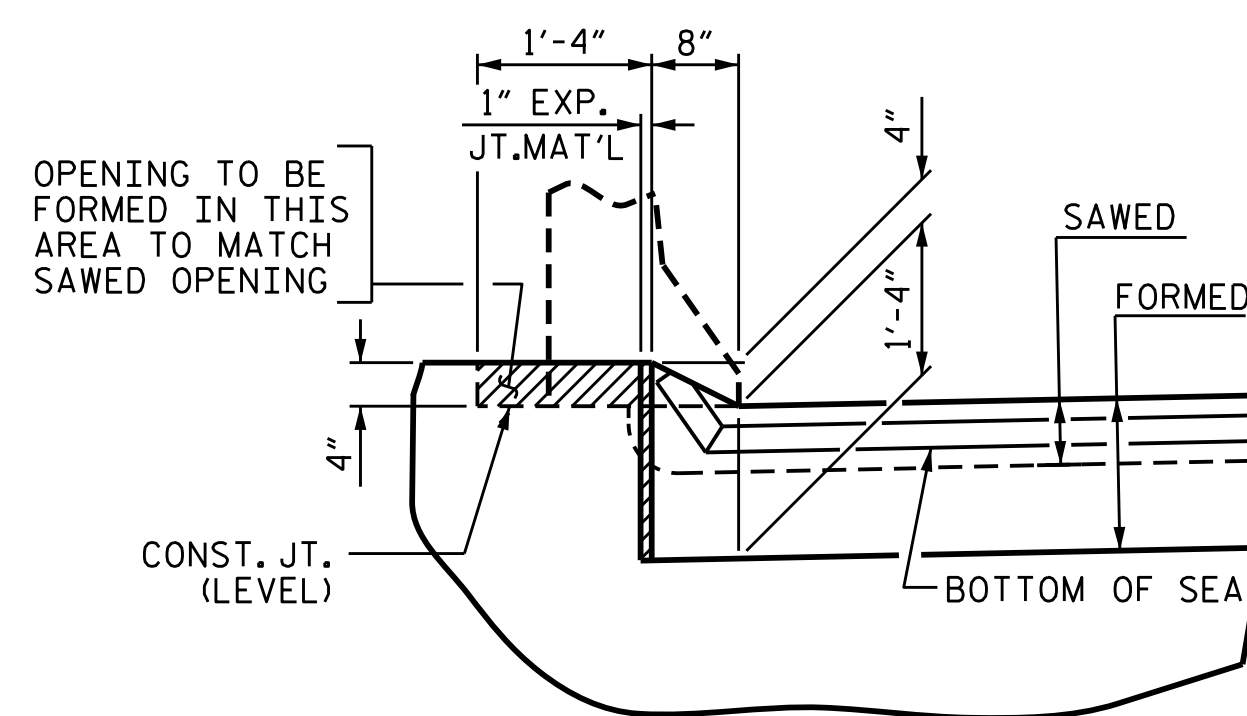
\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



**PLAN**



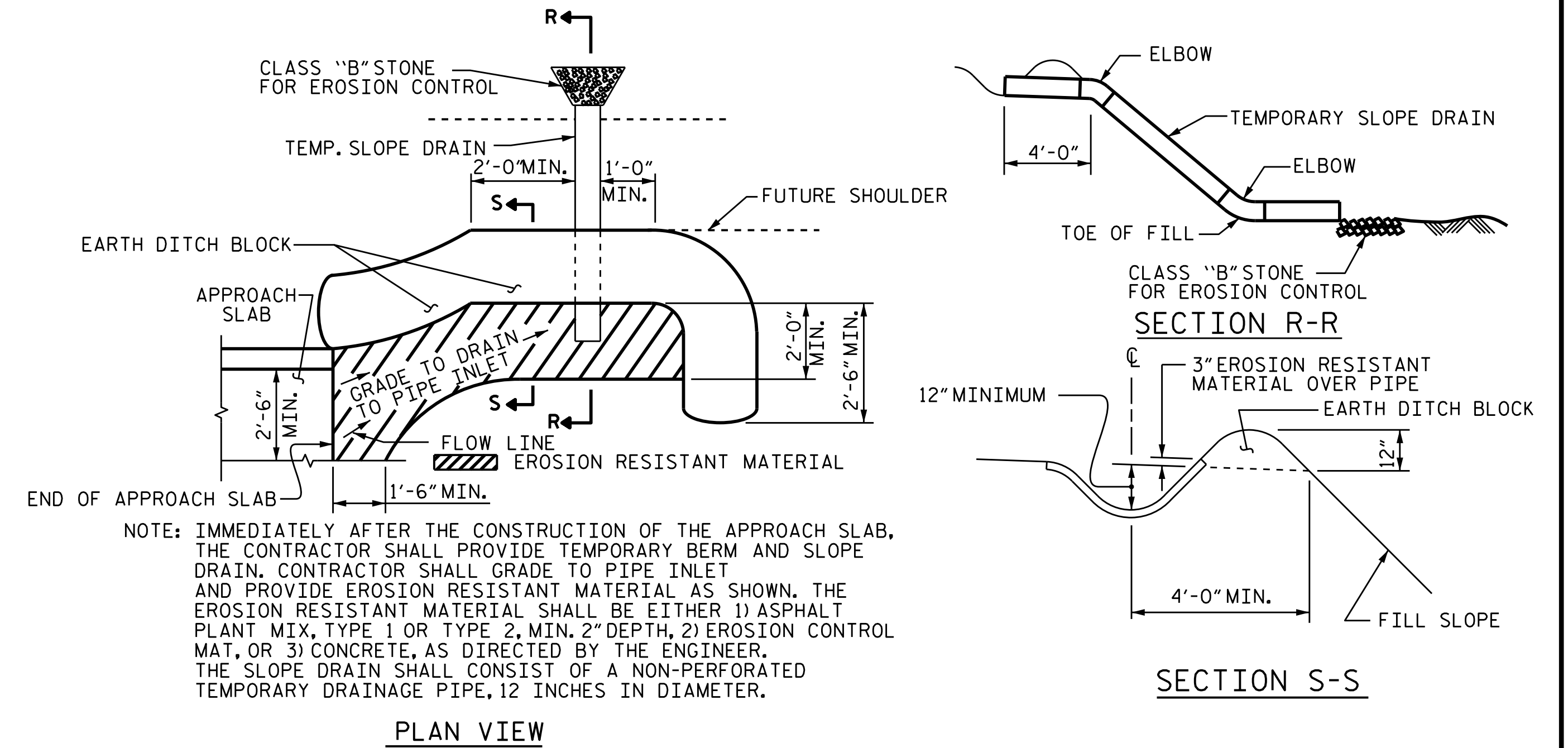
**SECTION A-A**



**SECTION B-B**

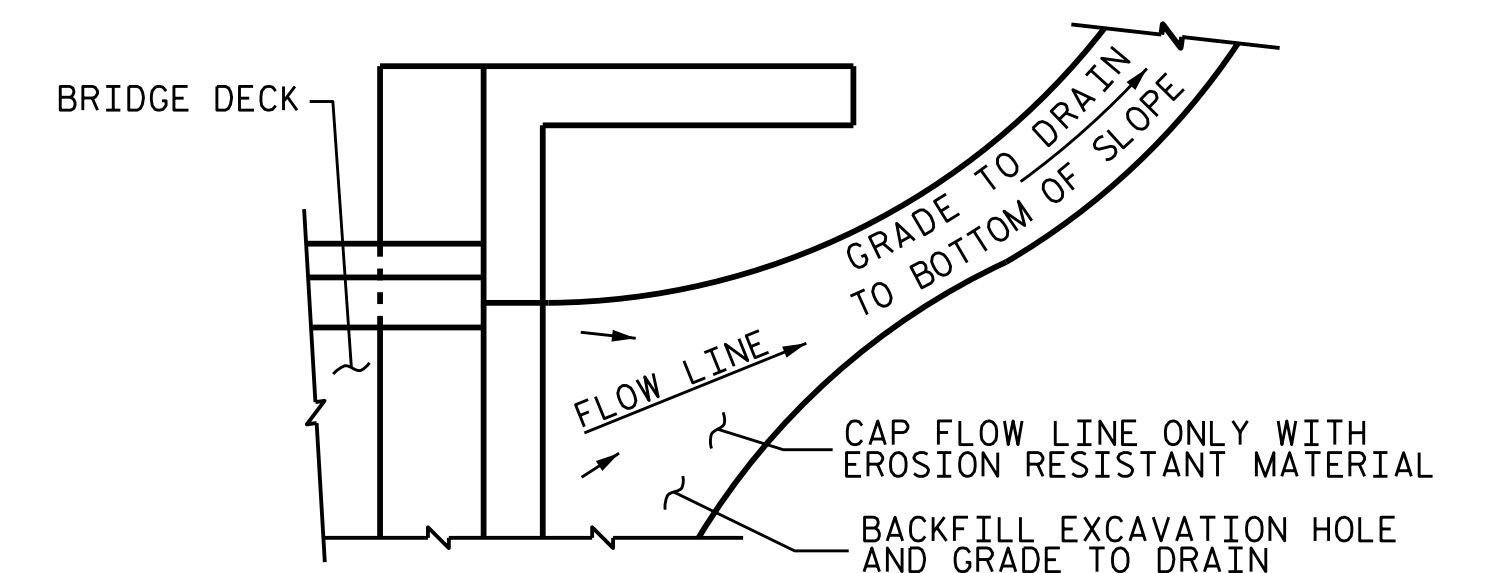
**JOINT SEAL DETAILS @ END BENT**

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.  
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

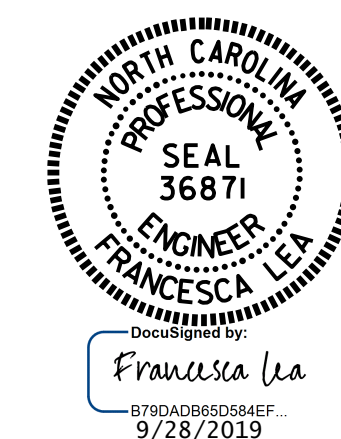


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-

SHEET 2 OF 2

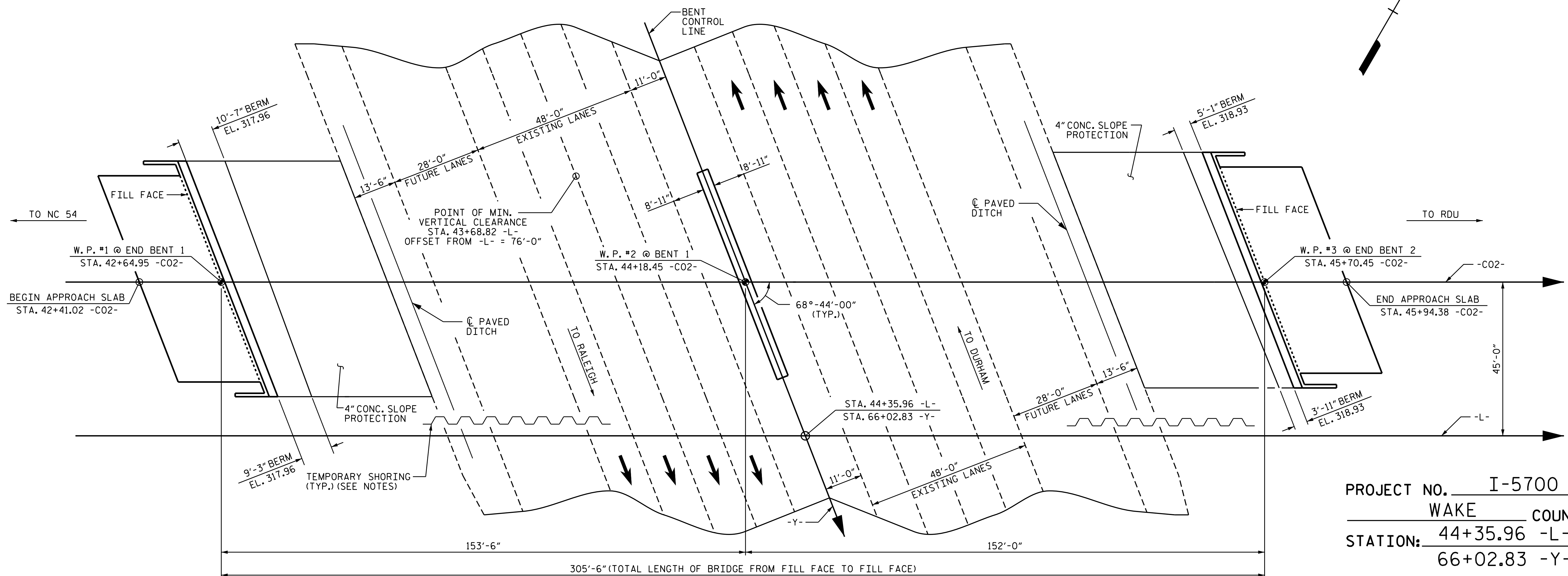
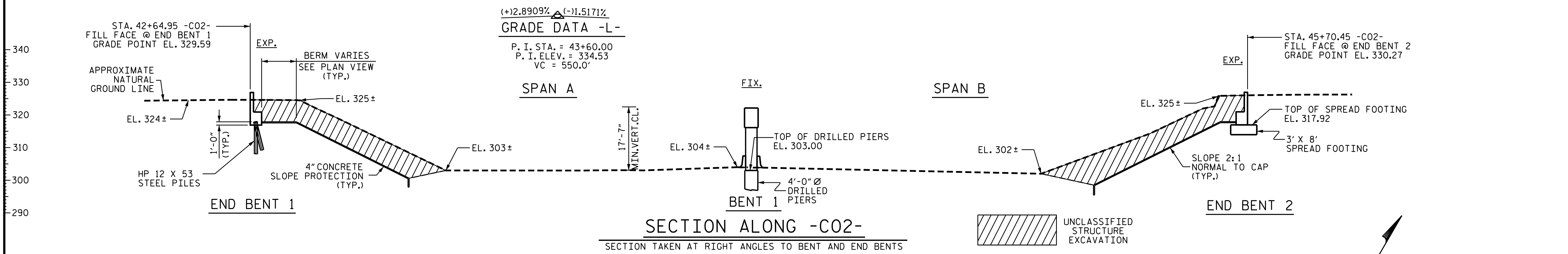


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH  
SLAB DETAILS

ASSEMBLED BY :	W.D. REAMS	DATE :	08/2019
CHECKED BY :	F. LEA	DATE :	09/2019
DRAWN BY :	FCJ	11/88	REV. 6/13 MAA/GM
CHECKED BY :	ARB	11/88	REV. 12/17 MAA/THC
			REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-31
1			3			TOTAL SHEETS 31
2			4			



PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-  
66+02.83 -Y-

SHEET 1 OF 3 BRIDGE #1499



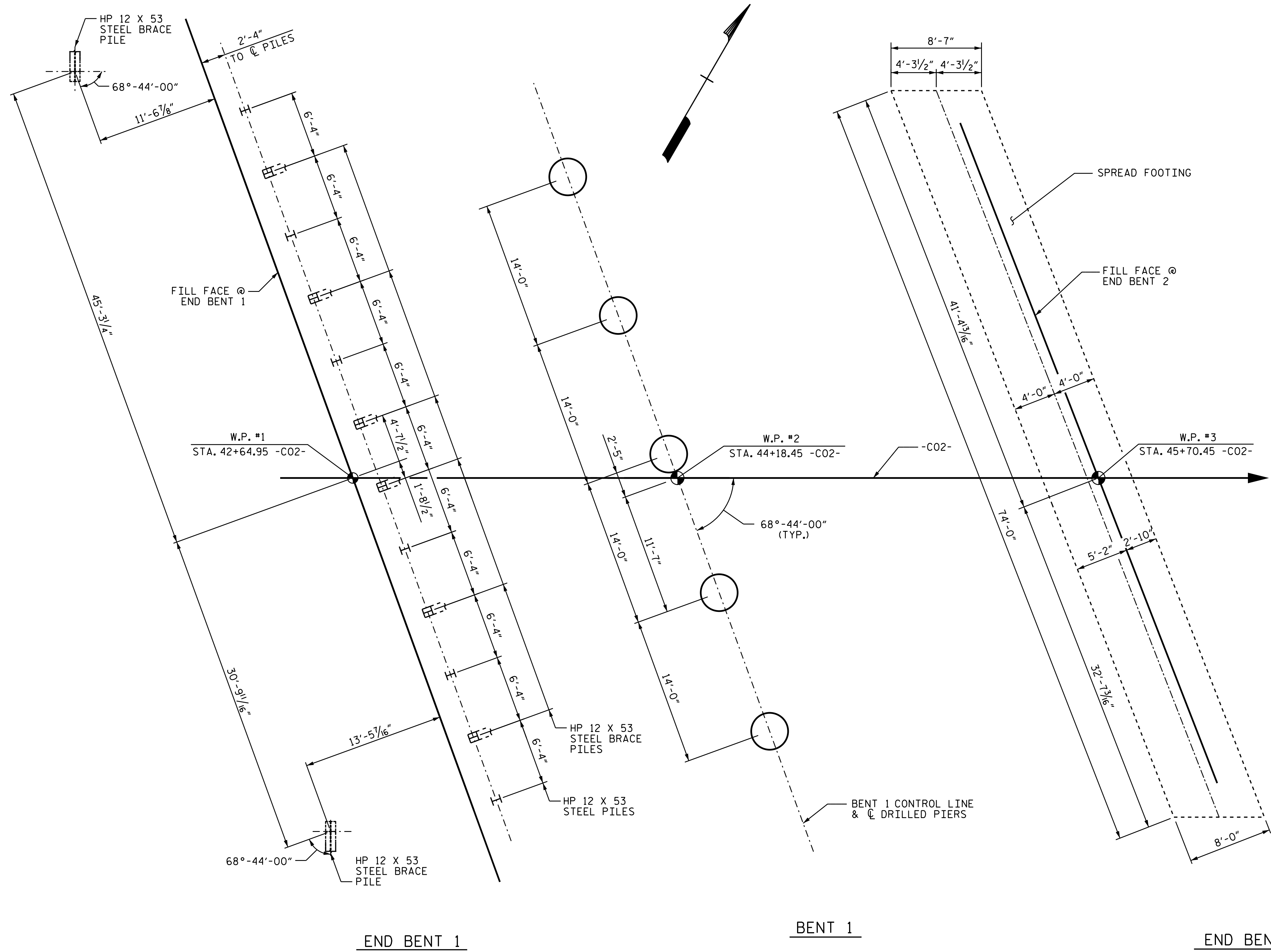
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER I-40 ON  
 SR 3015 (AIRPORT BLVD.)  
 BETWEEN NC 54 & RDU  
 (LEFT LANE)

DRAWN BY : O. T. NGUYEN/M. WELDON DATE : 06/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-1
2			4			33





**NOTES**

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 800 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 150 TSF.
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 283 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- SPT MAY BE REQUIRED FOR DRILLED PIERS, THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIER EXCAVATIONS AT BENT NO.1 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.
- THE SPREAD FOOTINGS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 4 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE 9 TSF JUST BEFORE PLACING CONCRETE.
- FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.
- FOOTING EXCAVATIONS AT END BENT NO.2 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER EXCAVATION IS COMPLETED.
- KEY IN SPREAD FOOTINGS AT END BENT NO.2 AT LEAST 12" INTO WEATHERED ROCK WITH MINIMUM THICKNESS AS SHOWN ON THE PLANS.

END BENT 1

BENT 1

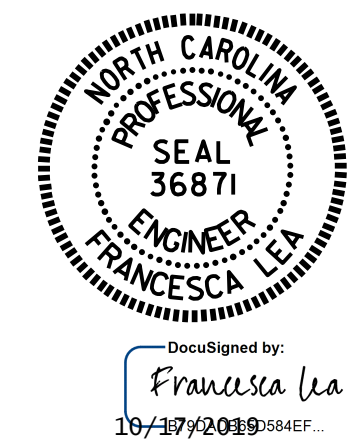
END BENT 2

**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES, DRILLED PIERS AND SPREAD FOOTING ARE SHOWN TO THE CENTERLINES.

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER I-40 ON  
 SR 3015 (AIRPORT BLVD.)  
 BETWEEN NC 54 & RDU  
 (LEFT LANE)

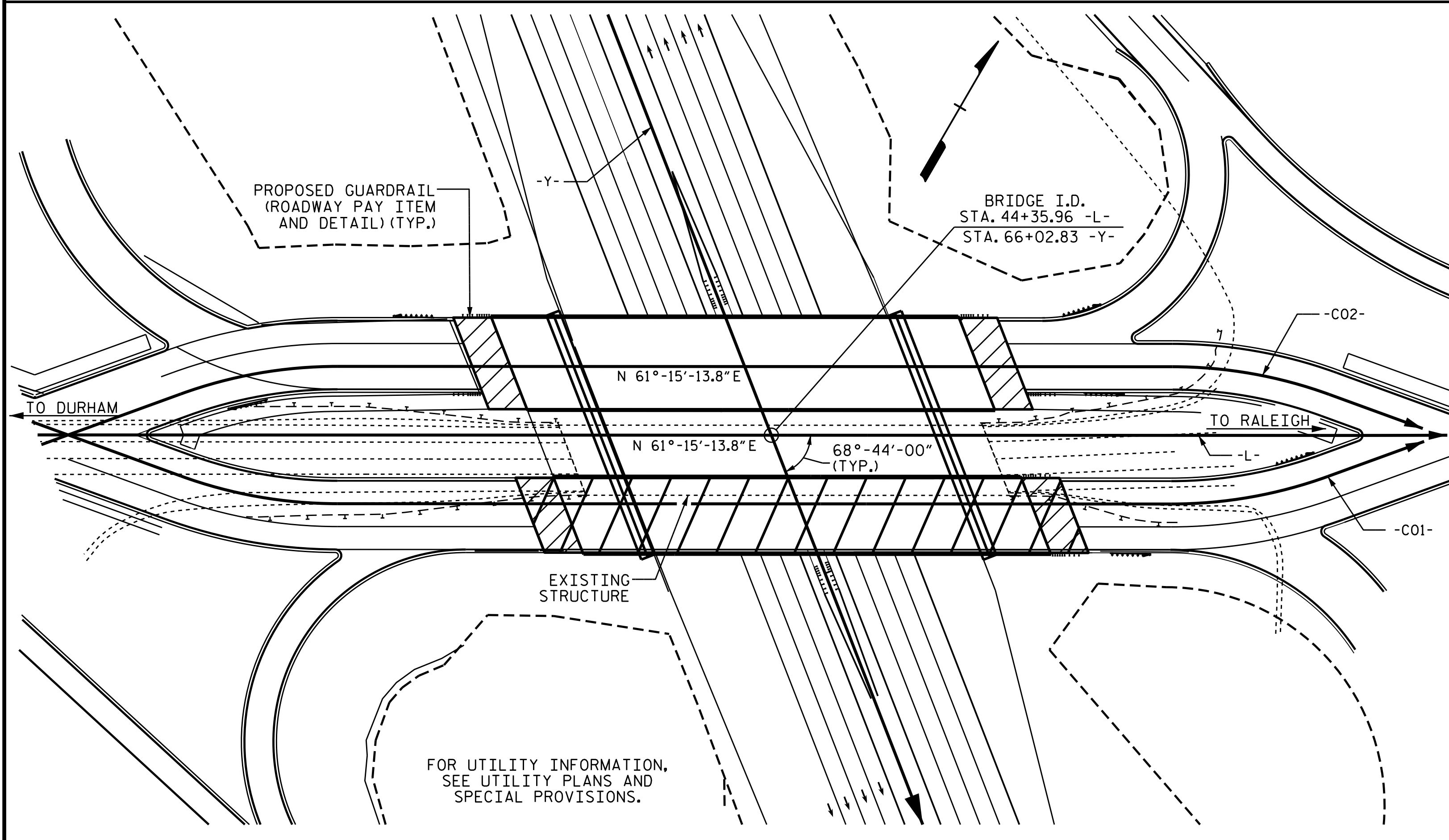
DRAWN BY :	O. T. NGUYEN	DATE :	06/2019
CHECKED BY :	F. LEA	DATE :	08/2019
DESIGN ENGINEER OF RECORD:	W.D. REAMS	DATE :	08/2019

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			33



BM. #3 -L- STA. 40+75.80, 102.51' RT. NAIL SET IN 20" PINE TREE



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE						LUMP SUM	19021	20006		LUMP SUM	
END BENT 1									87.1		11396
BENT 1	54	46	1	3	1				89.5		24123
END BENT 2									146.4		21575
TOTAL	54	46	1	3	1	LUMP SUM	19021	20006	323.0	LUMP SUM	57094

TOTAL BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	APPROX. 947076 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LBS.	LUMP SUM	EACH	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		LUMP SUM				303.24	706.7		LUMP SUM	LUMP SUM	LUMP SUM
END BENT 1			14	14	177.8	14		370			
BENT 1	4307										
END BENT 2								365			
TOTAL	4307	LUMP SUM	14	14	177.8	14	303.24	706.7	735	LUMP SUM	LUMP SUM

DRAWN BY : O. T. NGUYEN/M.WELDON DATE : 06/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

17-OCT-2019 09:43  
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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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE, PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) 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.

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.

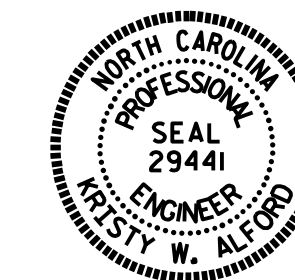
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

DocuSigned by:  
Kirsty Alford

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:  
 SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_y = 60\text{ksi}$ .



DocuSigned by:  
Kirsty Alford

10/17/2019

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file

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 15' TO THE LEFT OF -L- TO 1' TO THE LEFT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

FOR FAA NOTICE OF PROPOSED CONSTRUCTION, SEE SPECIAL PROVISIONS.

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER I-40 OM  
 SR 3015 (AIRPORT BLVD.)  
 BETWEEN NC 54 & RDU  
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			33

STR. 2



LOAD FACTORS:

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

NOTES:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II 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	1.01	--	1.75	0.780	1.01	A	I	151.08	1.05	1.08	A	I	0.00	1.30	0.424	1.13	A	I	151.08		
	HL-93 (OPERATING)	N/A		1.31	--	1.35	0.780	1.31	A	I	151.08	1.05	1.41	A	I	0.00	1.00	0.424	1.47	A	I	151.08		
	HS-20 (INVENTORY)	36.00	②	1.59	57.24	1.75	0.780	3.10	A	I	151.08	1.05	1.59	A	I	0.00	1.30	0.652	3.21	A	E	60.43		
	HS-20 (OPERATING)	36.00		2.06	74.16	1.35	0.780	4.02	A	I	151.08	1.05	2.06	A	I	0.00	1.00	0.652	4.17	A	E	60.43		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.01	67.64	1.40	0.780	9.99	A	E	0.00	1.05	5.01	A	I	0.00	1.30	0.424	7.84	A	I	60.43	
		SNGARBS2	20.000		3.48	69.60	1.40	0.780	6.96	A	I	151.08	1.05	3.48	A	I	0.00	1.30	0.424	5.56	A	I	60.43	
		SNAGRIS2	22.000		3.20	70.40	1.40	0.780	6.39	A	I	151.08	1.05	3.20	A	I	0.00	1.30	0.424	5.15	A	I	60.43	
		SNCOTTS3	27.250		2.49	67.85	1.40	0.780	4.95	A	I	151.08	1.05	2.49	A	I	0.00	1.30	0.652	3.91	A	E	60.43	
		SNAGGRS4	34.925		1.88	65.66	1.40	0.780	3.82	A	I	151.08	1.05	1.88	A	I	0.00	1.30	0.652	3.16	A	E	60.43	
		SNS5A	35.550		1.88	66.83	1.40	0.780	3.75	A	I	151.08	1.05	1.88	A	I	0.00	1.30	0.424	3.10	A	I	60.43	
		SNS6A	39.950		1.69	67.52	1.40	0.780	3.35	A	I	151.08	1.05	1.69	A	I	0.00	1.30	0.424	2.80	A	I	60.43	
		SNS7B	42.000		1.64	68.88	1.40	0.780	3.19	A	I	151.08	1.05	1.64	A	I	0.00	1.30	0.424	2.67	A	I	60.43	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		2.17	71.61	1.40	0.780	4.11	A	I	151.08	1.05	2.17	A	I	0.00	1.30	0.652	3.42	A	E	60.43	
		TNT4A	33.075		2.00	66.15	1.40	0.780	4.05	A	I	151.08	1.05	2.00	A	I	0.00	1.30	0.424	3.40	A	I	60.43	
		TNT6A	41.600		1.70	70.72	1.40	0.780	3.24	A	I	151.08	1.05	1.70	A	I	0.00	1.30	0.424	2.75	A	I	60.43	
		TNT7A	42.000		1.67	70.14	1.40	0.780	3.21	A	I	151.08	1.05	1.67	A	I	0.00	1.30	0.424	2.74	A	I	60.43	
		TNT7B	42.000		1.62	68.04	1.40	0.780	3.22	A	I	151.08	1.05	1.62	A	I	0.00	1.30	0.652	2.77	A	E	60.43	
		TNAGRIT4	43.000		1.57	67.51	1.40	0.780	3.12	A	I	151.08	1.05	1.57	A	I	0.00	1.30	0.424	2.68	A	I	60.43	
		TNAGT5A	45.000		1.53	68.85	1.40	0.780	2.99	A	I	151.08	1.05	1.53	A	I	0.00	1.30	0.652	2.56	A	E	60.43	
TNAGT5B	45.000		③	1.50	67.50	1.40	0.780	2.98	A	I	151.08	1.05	1.50	A	I	0.00	1.30	0.424	2.53	A	I	60.43		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$																						

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) \*\*

② DESIGN LOAD RATING (HS-20) \*\*

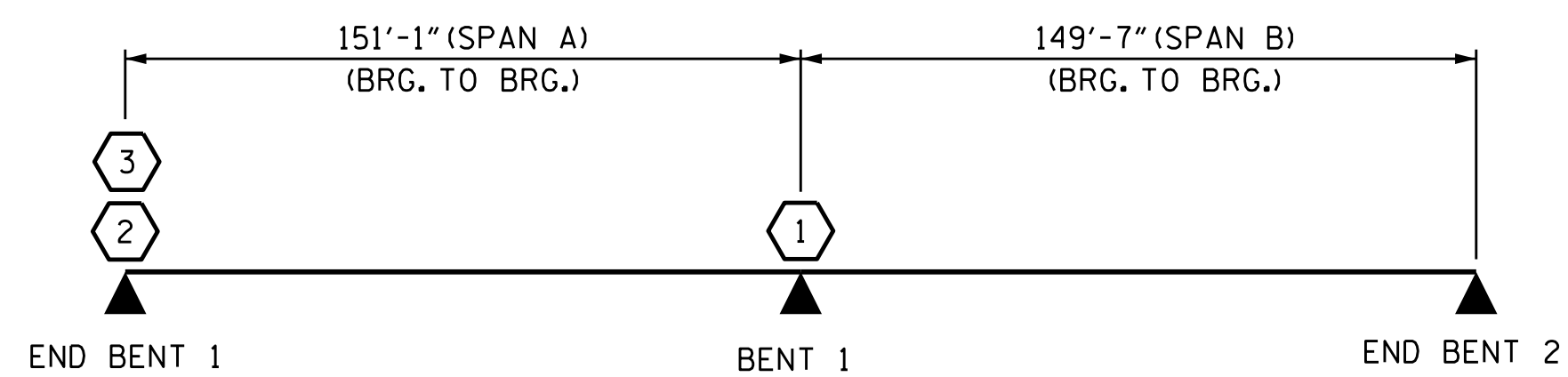
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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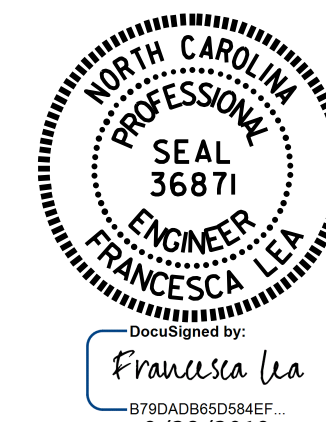
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

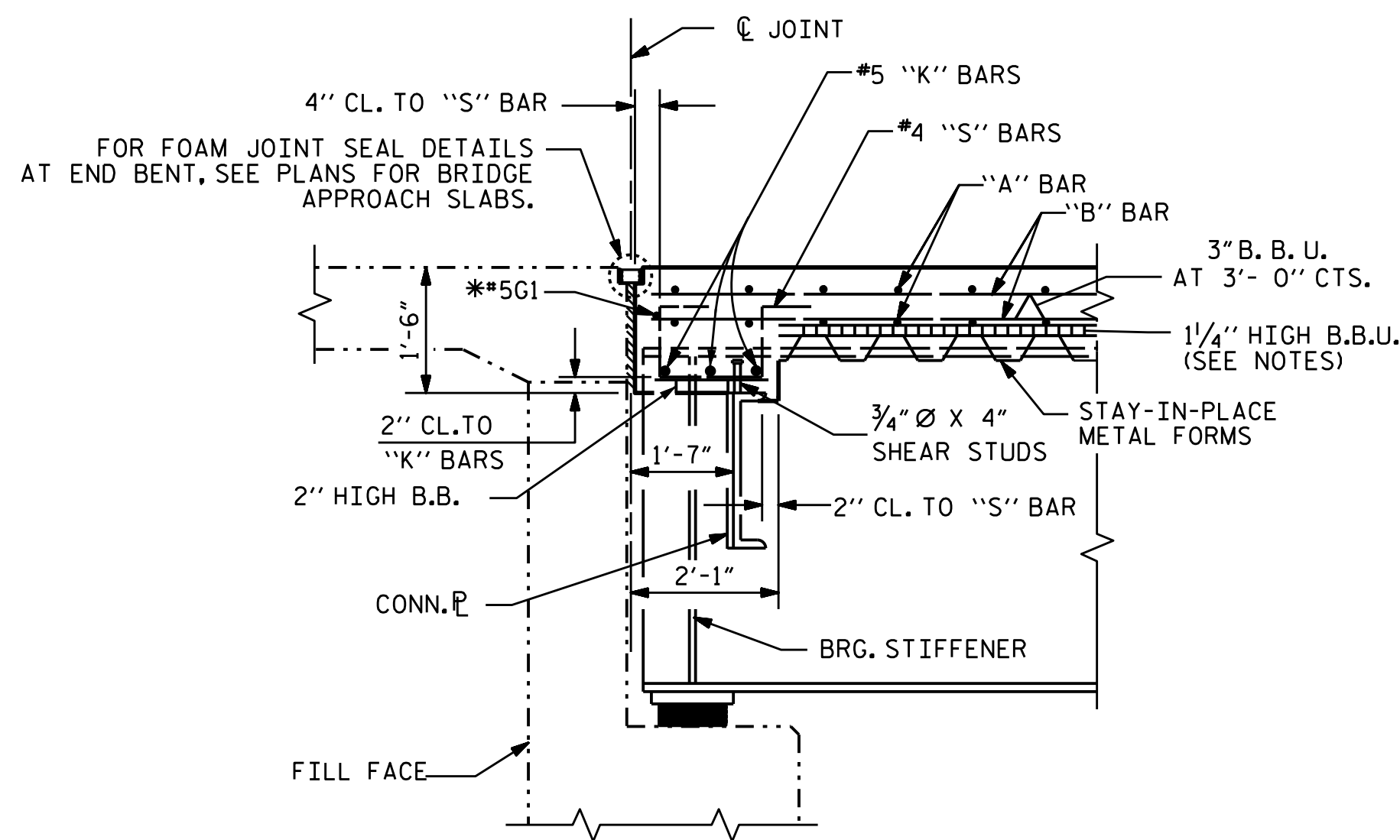
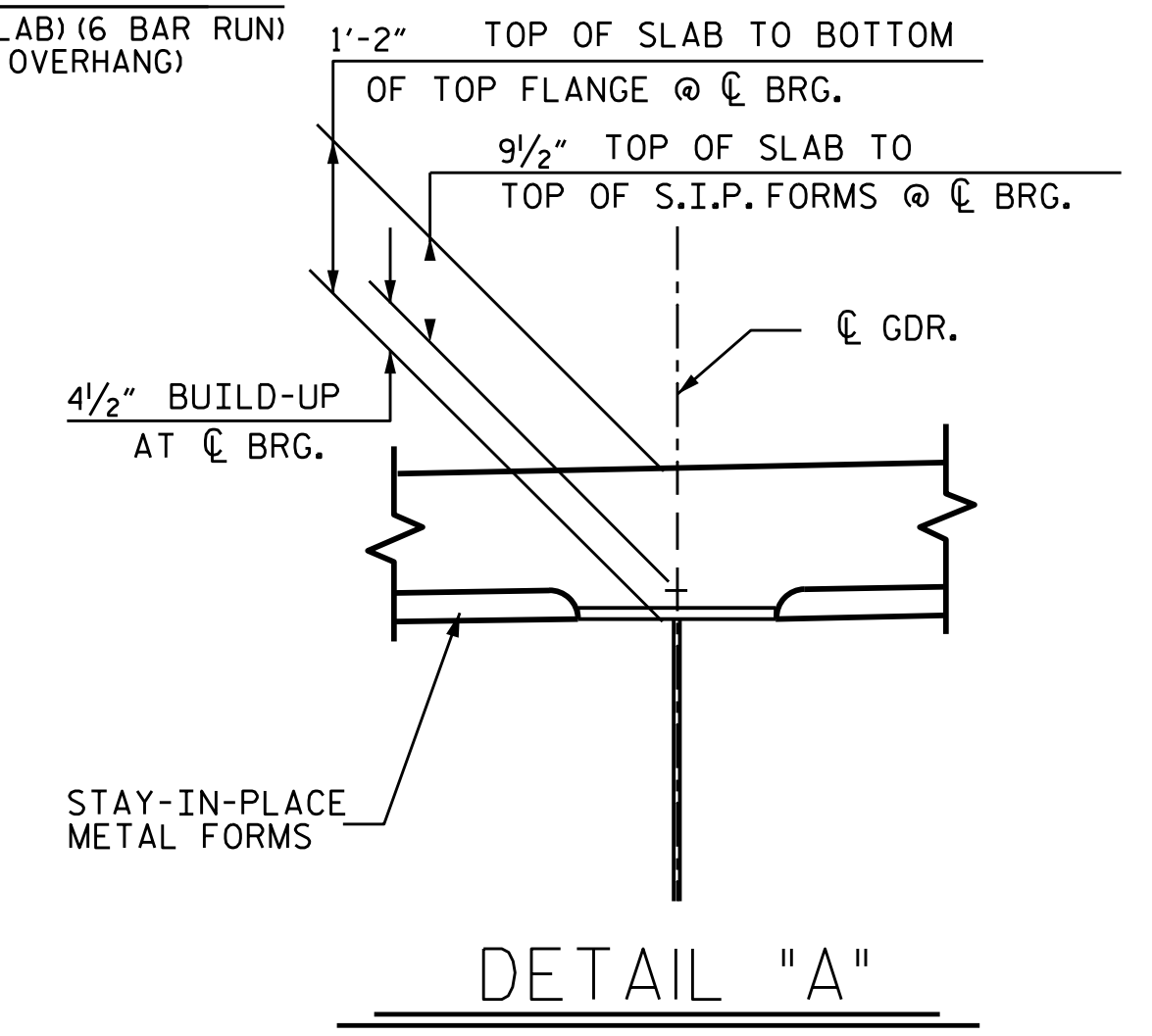
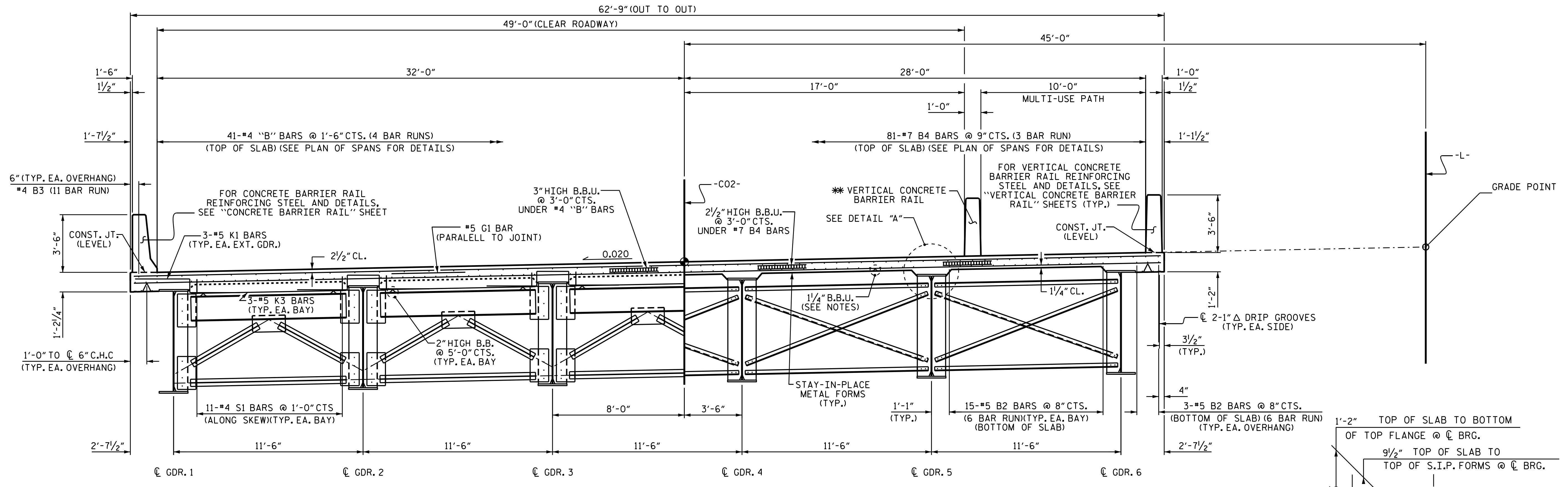


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 STEEL GIRDERS  
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : W. D. REAMS	DATE : 08/2019
CHECKED BY : K. W. ALFORD	DATE : 08/2019
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM

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2			4			33



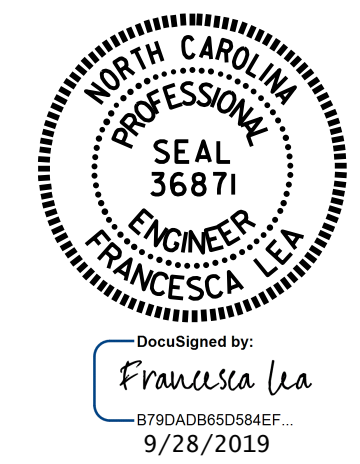
**NOTES:**

- PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- 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.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.
- THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- \* VERTICAL CONCRETE BARRIER RAIL SEPARATING THE MULTI-USE PATH FROM THE TRAVEL LANES SHALL BE PLACED DURING STAGE II CONSTRUCTION.

**SECTION @ END BENT**

\* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-



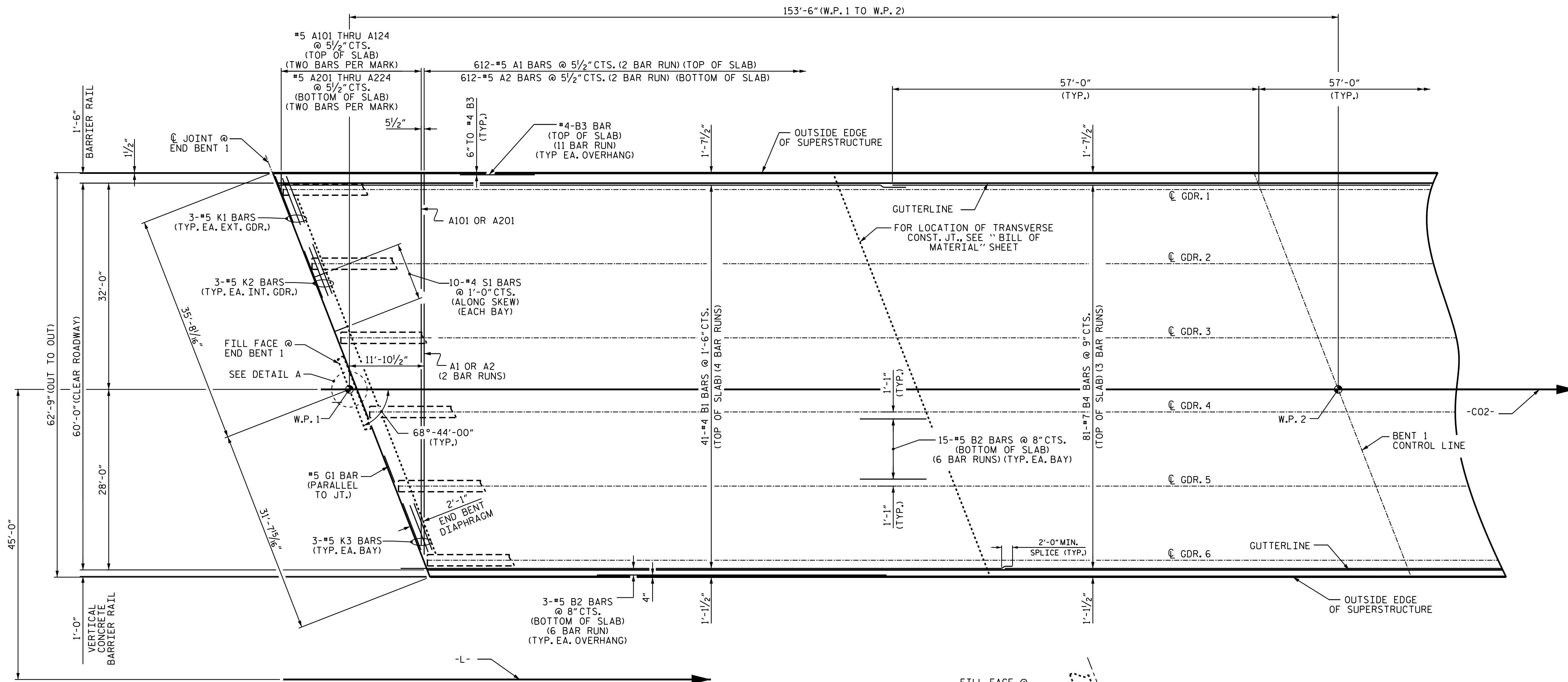
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

DRAWN BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

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2			4			33



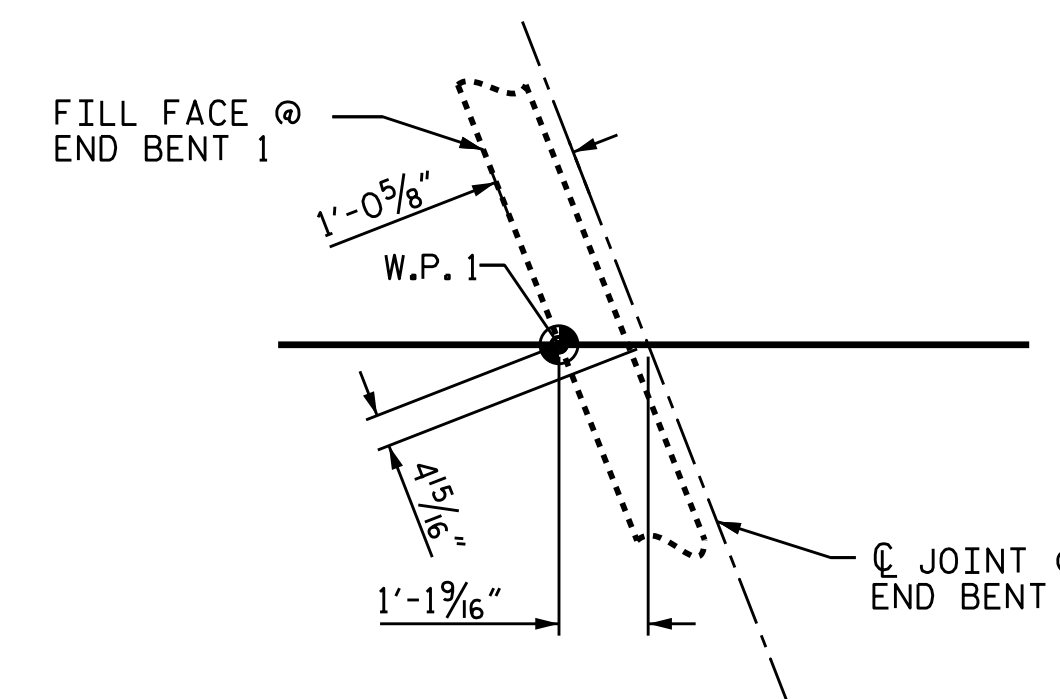


**PLAN OF SPAN A**

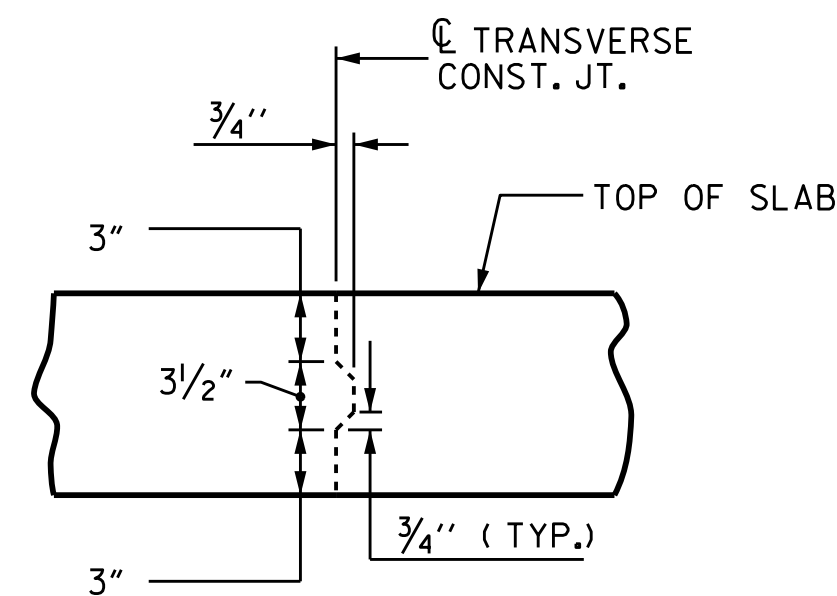
FOR CLARITY, STAGE II VERTICAL BARRIER RAIL NOT SHOWN.

FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR VERTICAL CONCRETE BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "VERTICAL CONCRETE BARRIER RAIL" SHEETS.



**DETAIL A**



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 1 OF 2

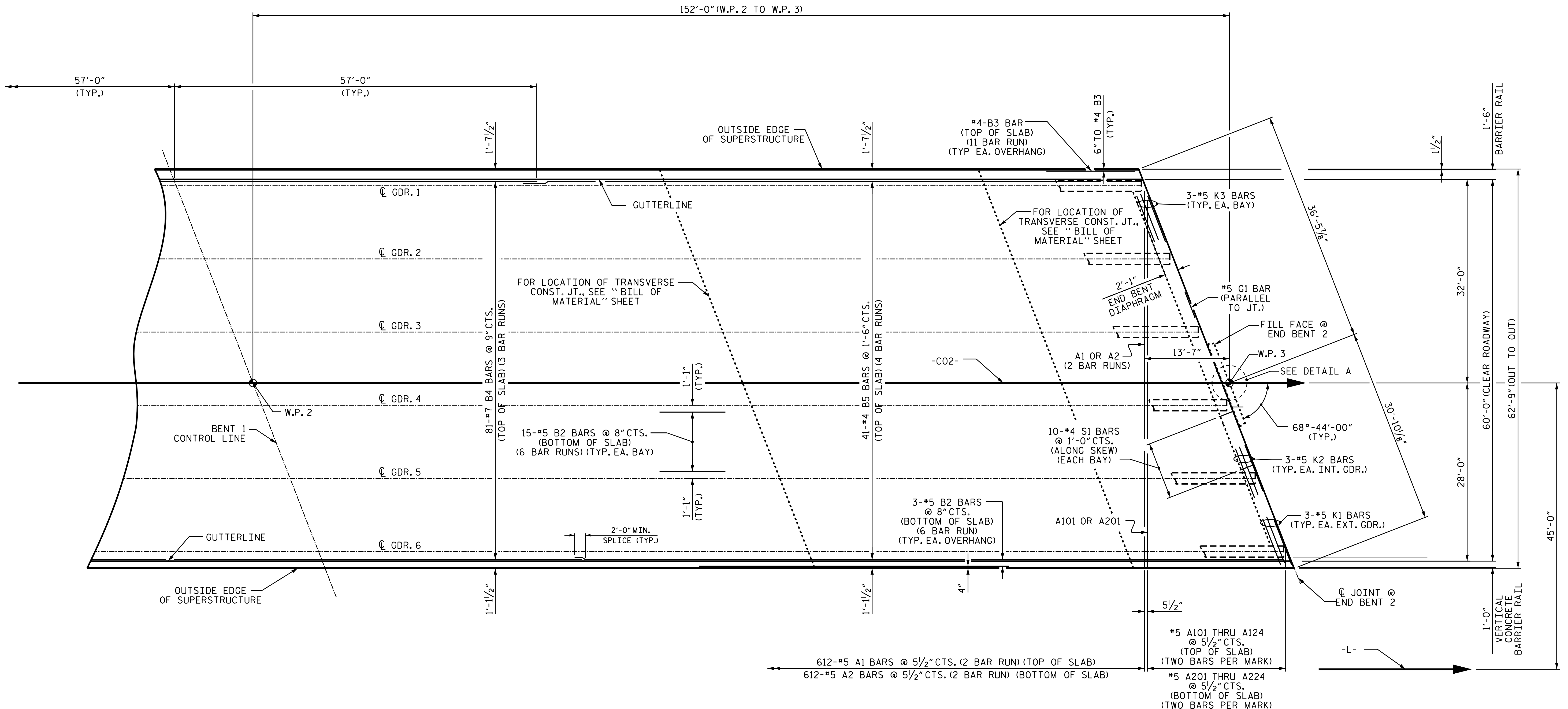


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPAN A

DRAWN BY : K.W. ALFORD DATE : 05/2019  
CHECKED BY : F. LEA DATE : 08/2019  
DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 05/2019

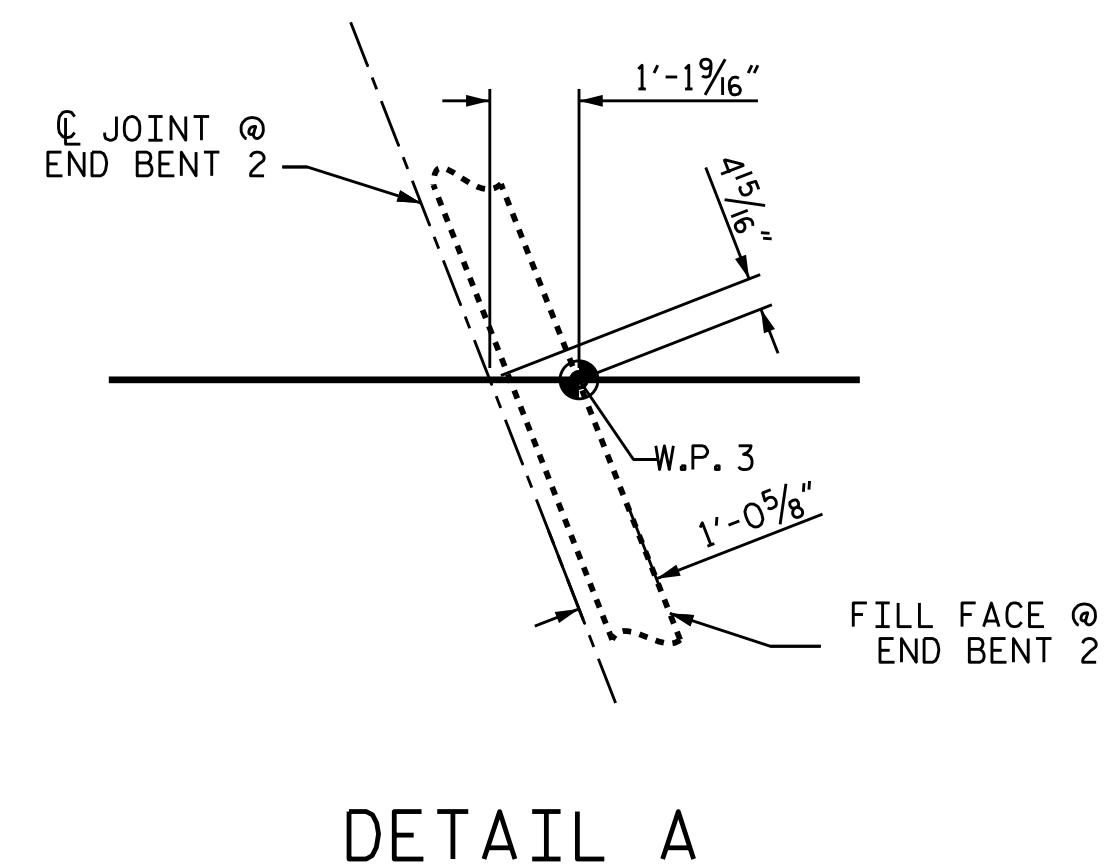
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-6
1			3			TOTAL SHEETS
2			4			33



**PLAN OF SPAN B**

FOR CLARITY, STAGE II VERTICAL BARRIER RAIL NOT SHOWN.  
 FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.  
 FOR VERTICAL CONCRETE BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "VERTICAL CONCRETE BARRIER RAIL" SHEETS.



**DETAIL A**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 2 OF 2



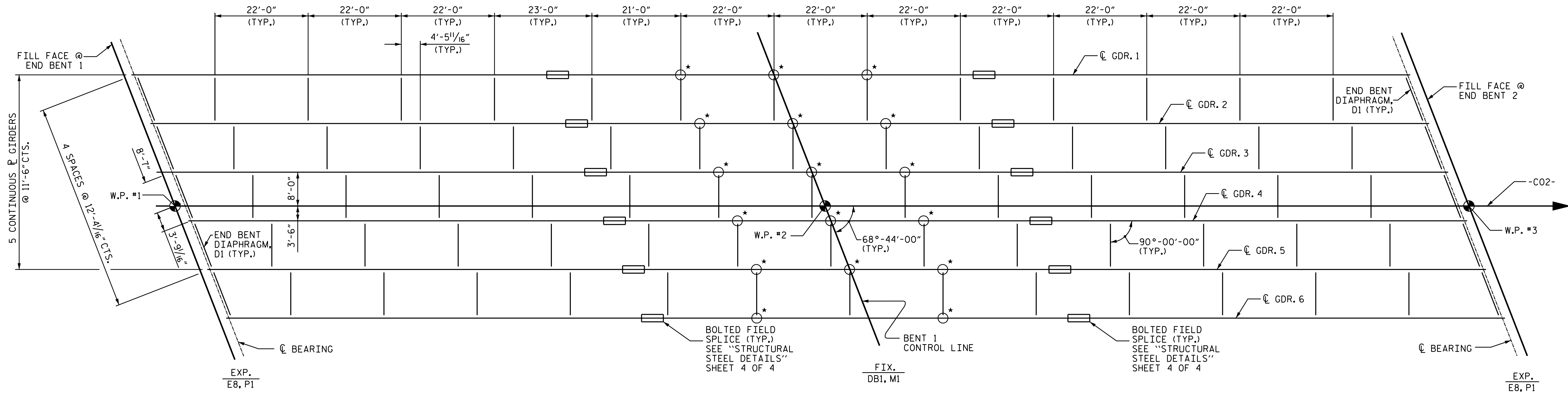
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN B

DRAWN BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : F. LEA DATE : 09/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 05/2019

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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7	
1			3			TOTAL SHEETS	
2			4			33	





SPAN A

FRAMING PLAN

SPAN B

\*CONNECTOR PLATES SHALL ACT AS TRANSVERSE STIFFENERS AT THESE LOCATIONS

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

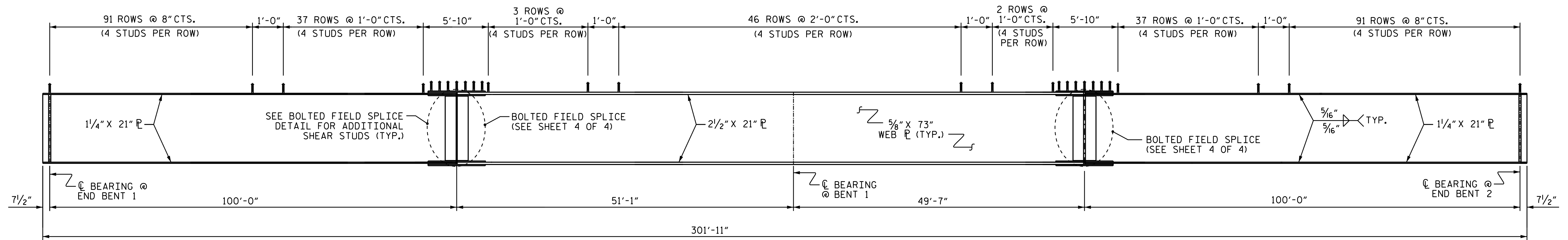


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN

DRAWN BY : O.T. NGUYEN DATE : 08/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

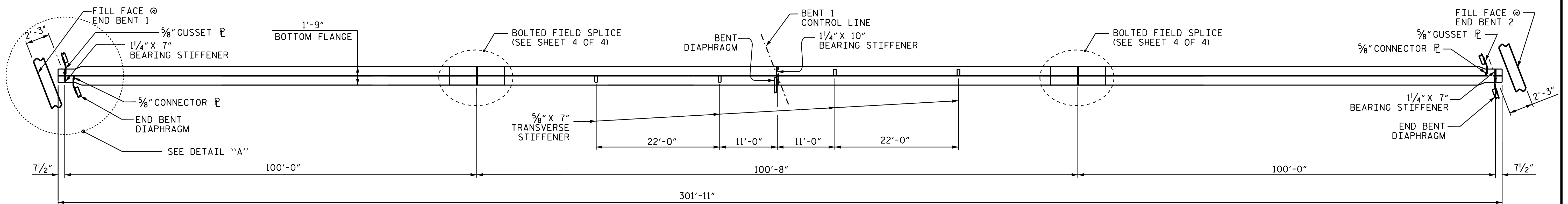
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
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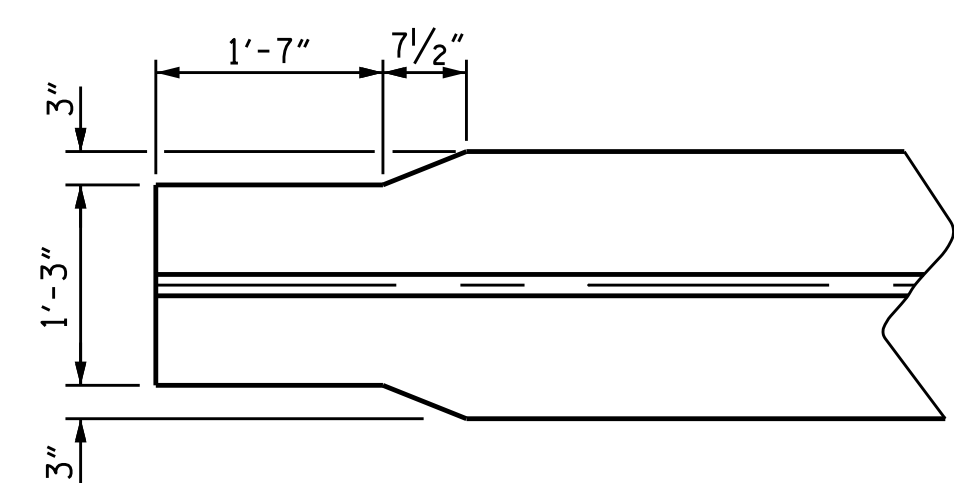


**PLATE GIRDER ELEVATION**

OMIT CONNECTION PLATES ON OUTSIDE OF INTERIOR GIRDERS.  
INTERMEDIATE DIAPHRAGMS NOT SHOWN.

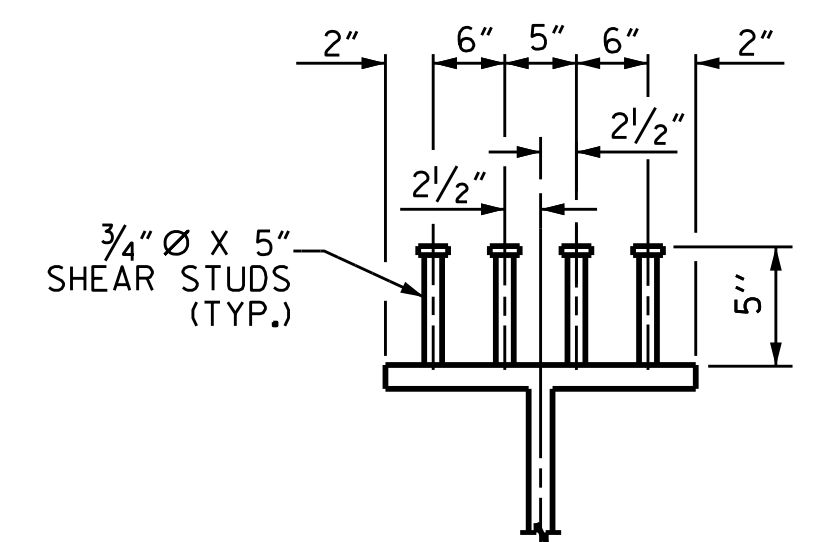


**BOTTOM FLANGE DETAIL**



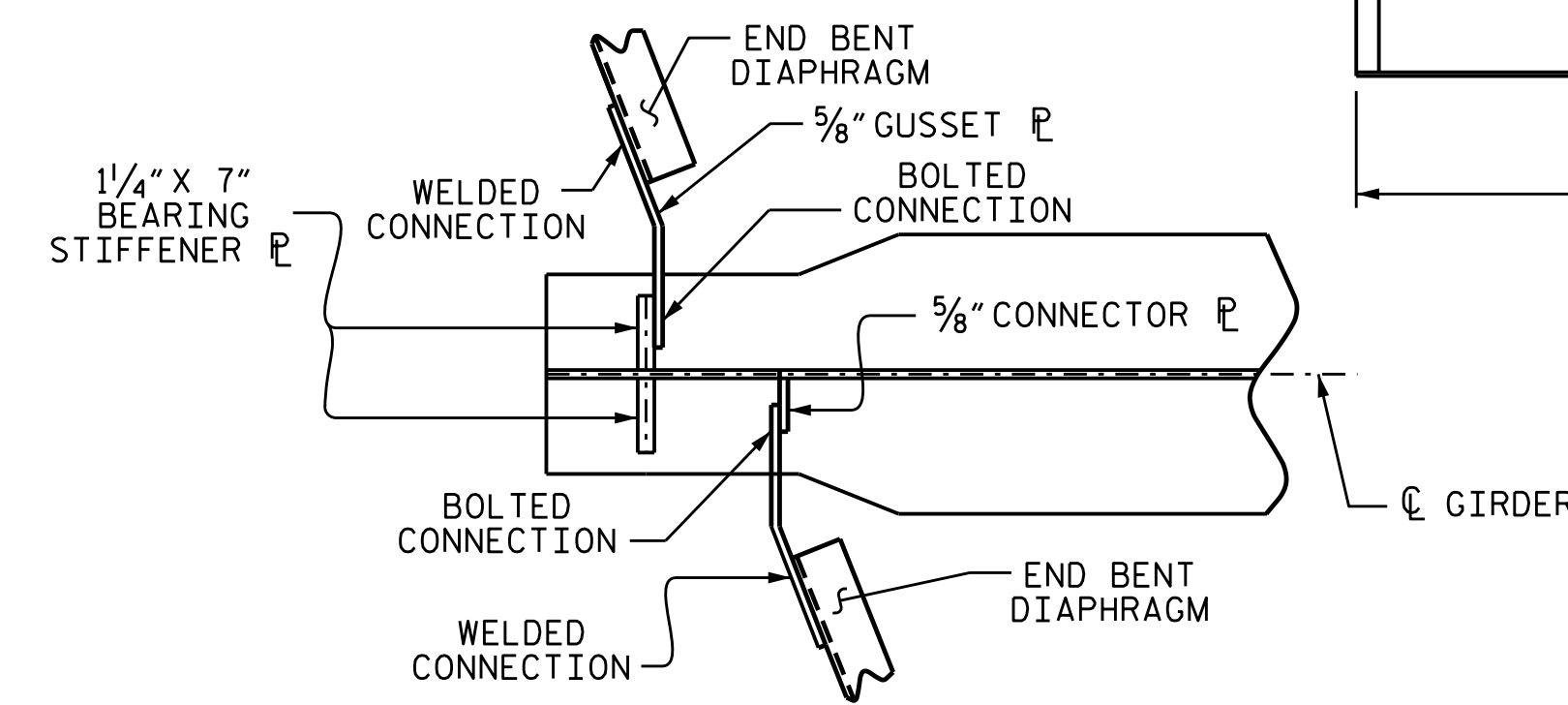
**END OF GIRDER DETAIL**

(BOTTOM FLANGE ONLY)



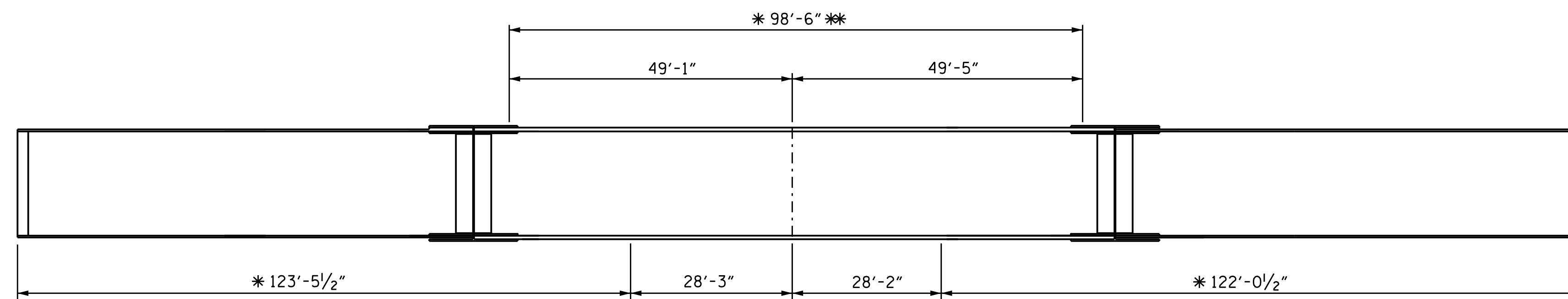
**SHEAR STUD DETAILS**

(TYP. EA. GIRDER)



**DETAIL "A"**

(SIMILAR EACH END)



**CHARPY V-NOTCH TEST FOR PLATE GIRDER**

\* CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALLS WITHIN THESE LIMITS, INCLUDING ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

\*\* NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 1 OF 4

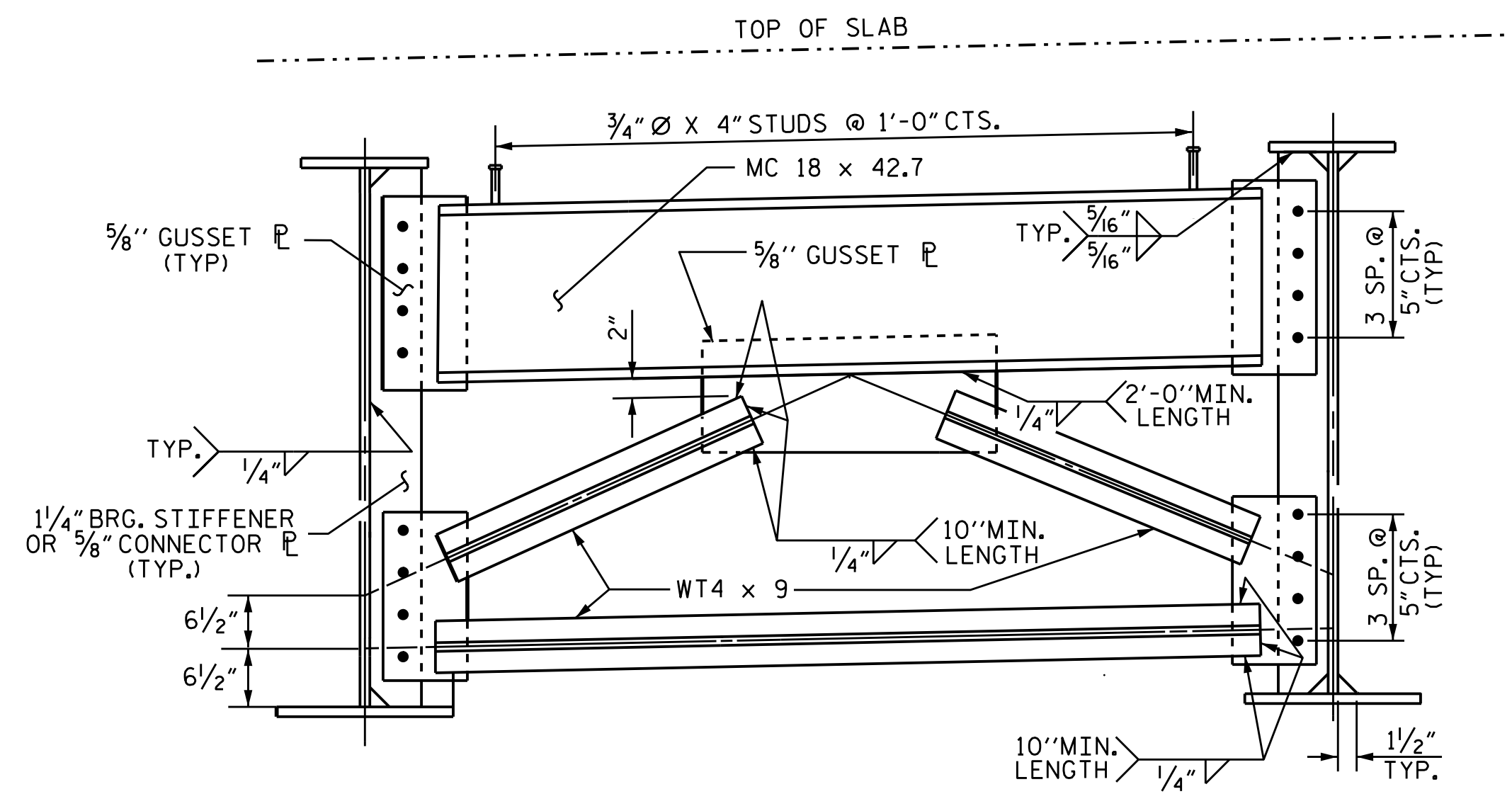
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

DRAWN BY : O.T. NGUYEN DATE : 08/2019  
 CHECKED BY : W.D. REAMS DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

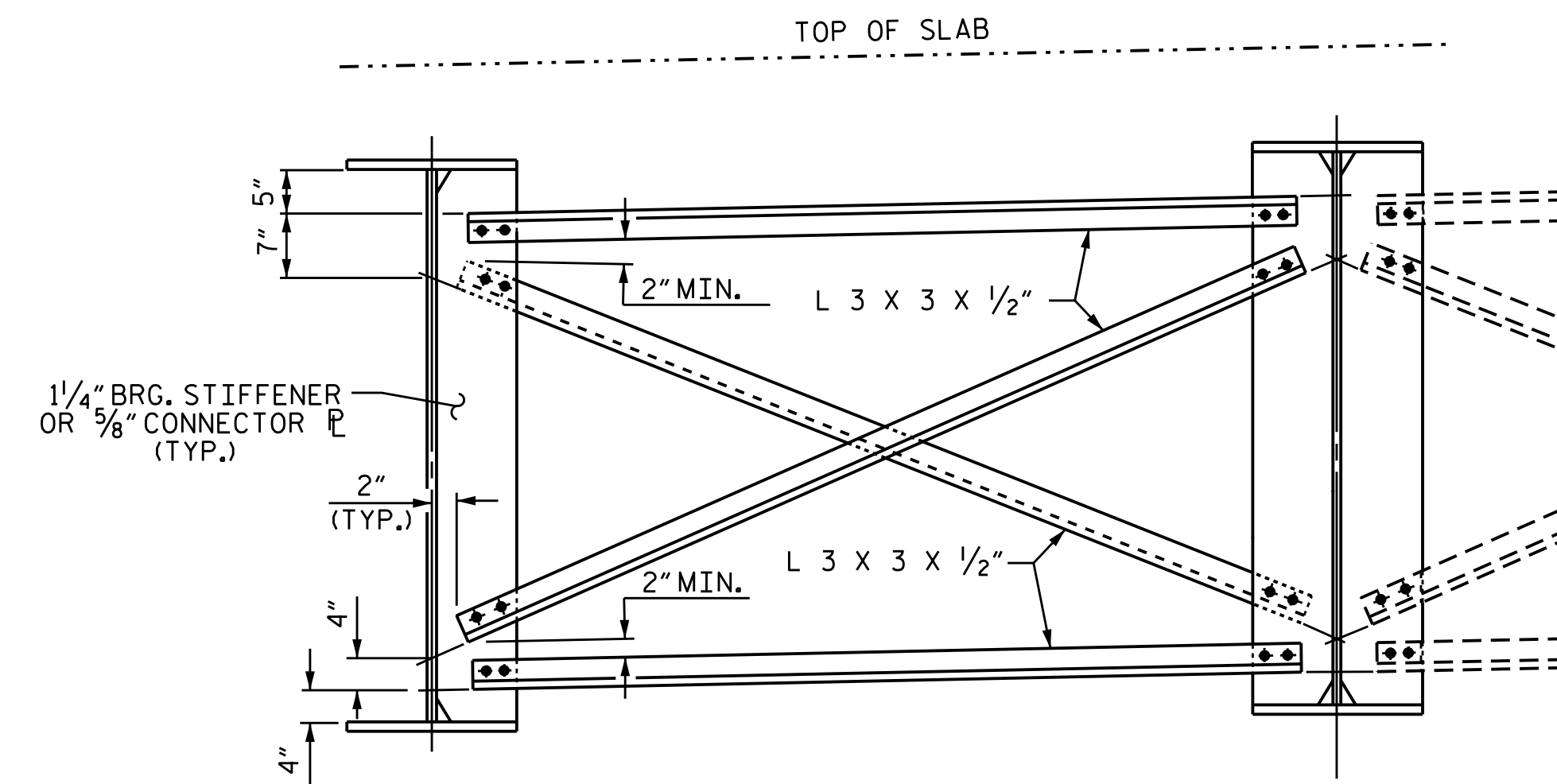
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-9
2			4			33





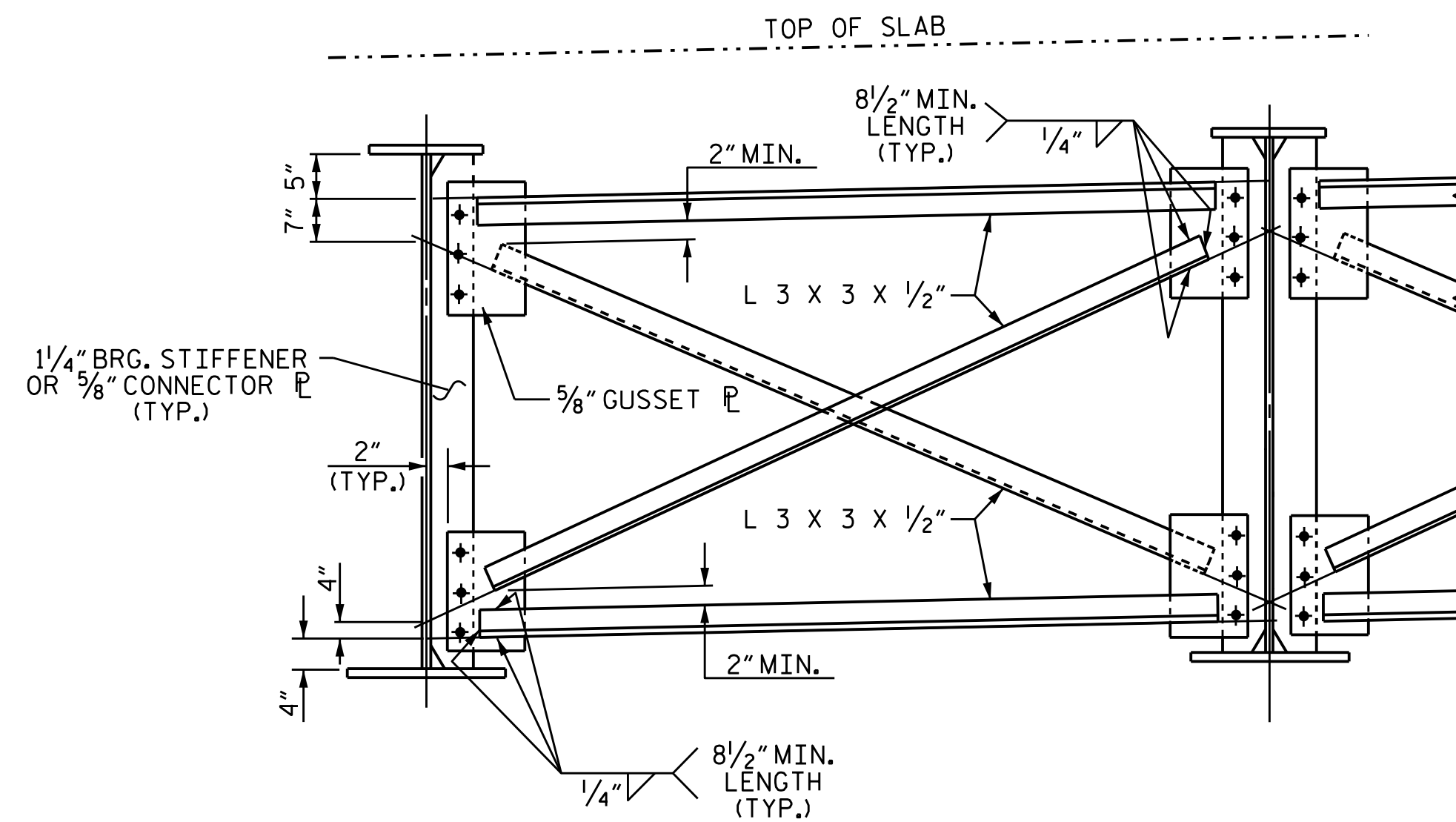
**TYPICAL END BENT DIAPHRAGM (D1)**

FOR WELD SIZE, SEE CONNECTOR PLATE DETAIL OR BEARING STIFFENER @ BENT DETAIL, SHEET 3 OF 4.



**TYPICAL INTERMEDIATE & BENT DIAPHRAGM (D2)**

FOR WELD SIZE, SEE CONNECTOR PLATE DETAIL OR BEARING STIFFENER @ BENT DETAIL, SHEET 3 OF 4.



**OPTIONAL INTERMEDIATE & BENT DIAPHRAGM**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 4

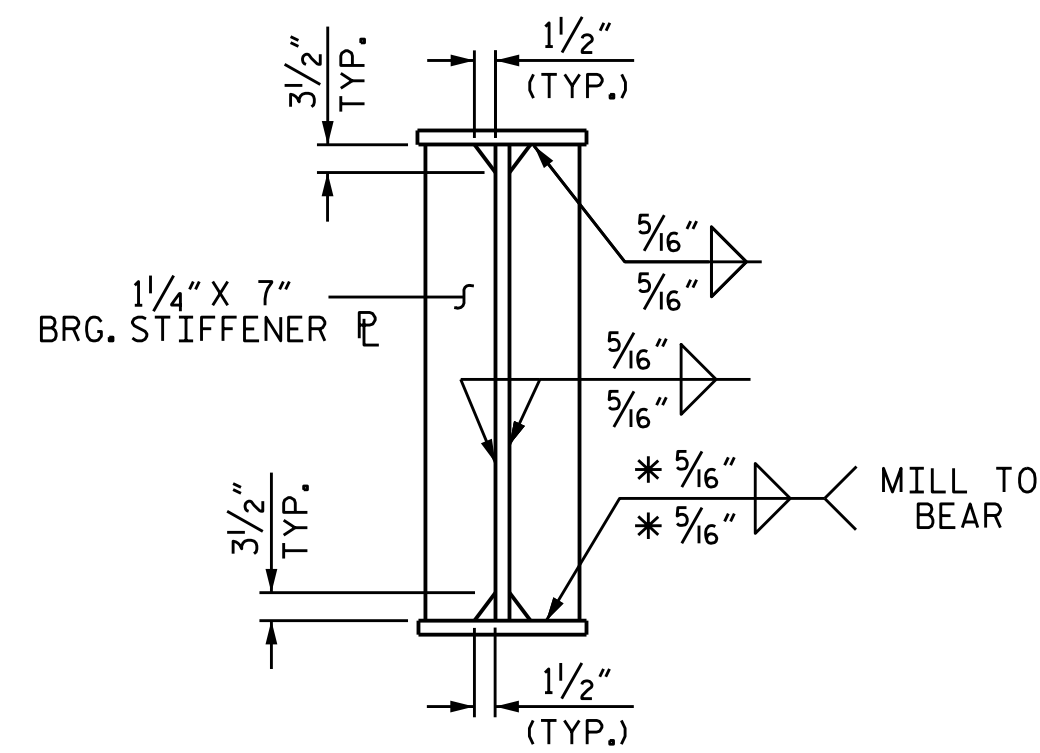


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

DRAWN BY : W.D. REAMS DATE : 08/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

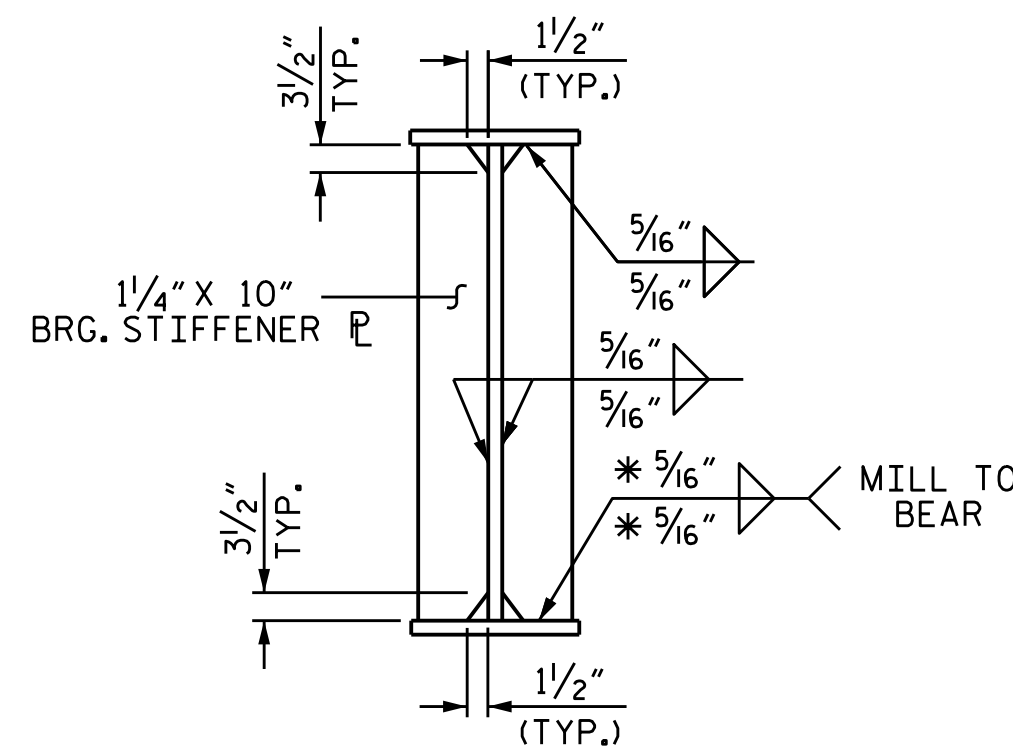
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
2			4			33



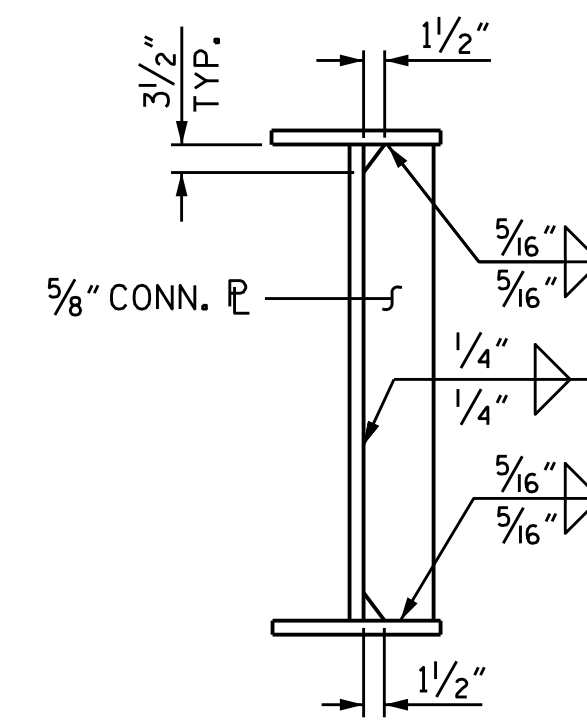
**BEARING STIFFENER @ END BENTS**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE

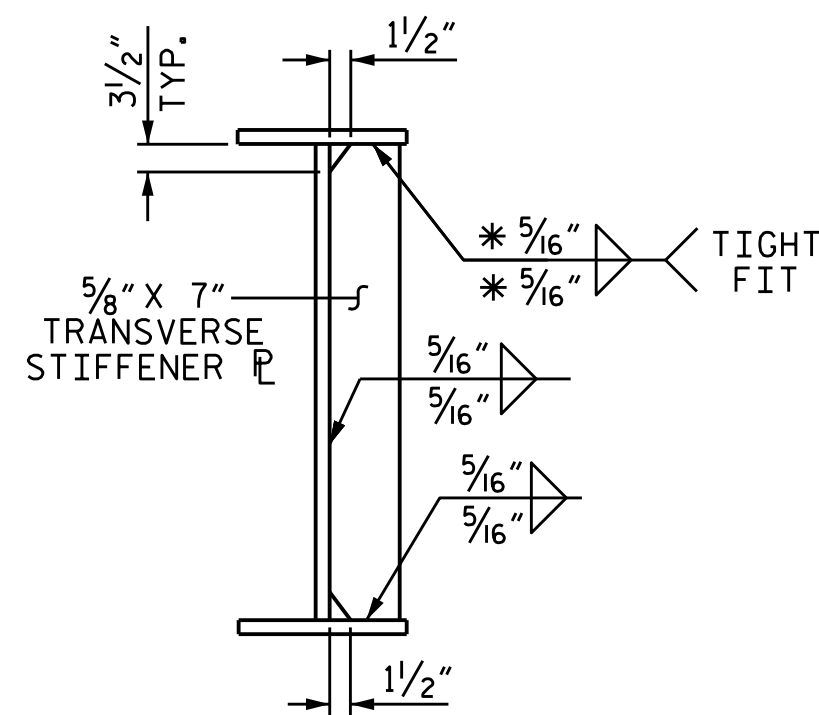


**BEARING STIFFENER @ BENTS**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE

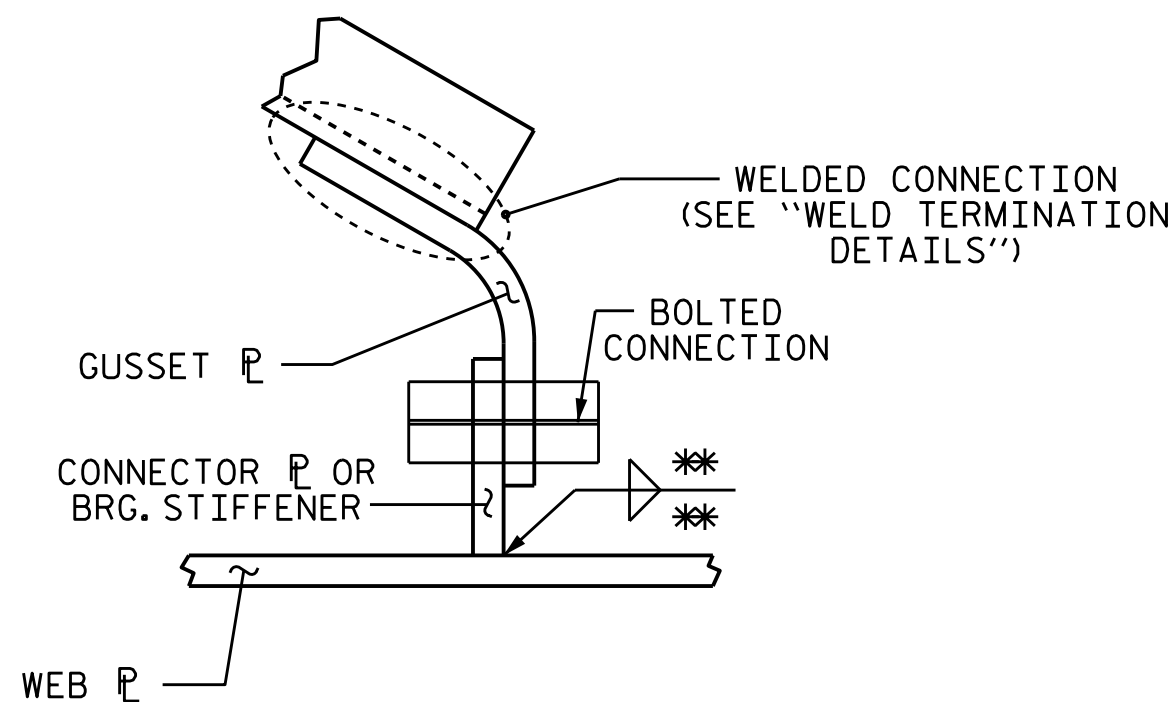


**CONNECTOR PLATE**



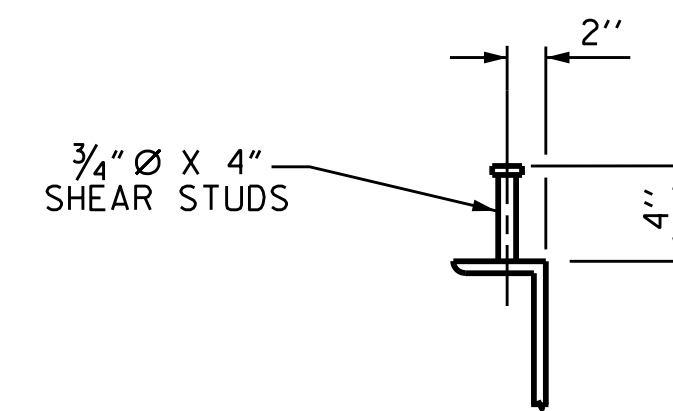
**TRANSVERSE STIFFENER**

\* WELD ONLY WHEN USED AS CONNECTOR PLATE OR BEARING STIFFENER



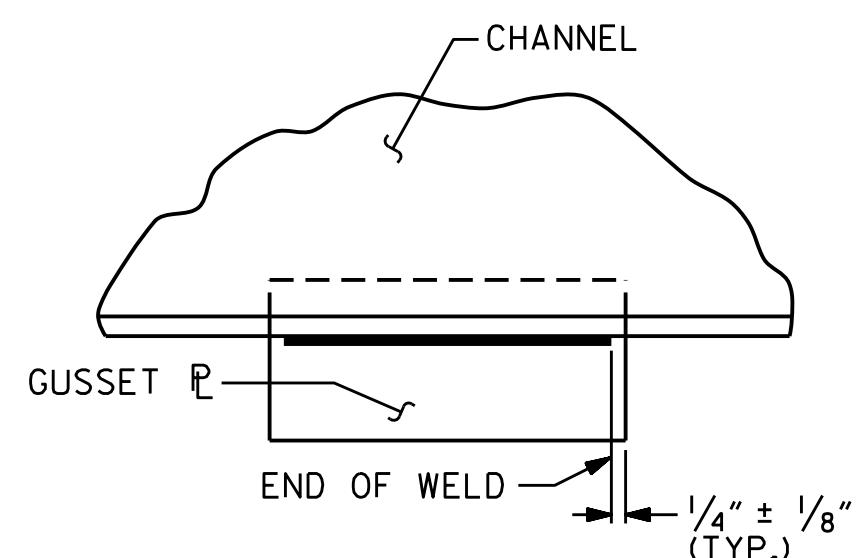
**STIFFENER/CONNECTOR WELD DETAILS**

\*\* WELD SHALL BE 1/4\"/>

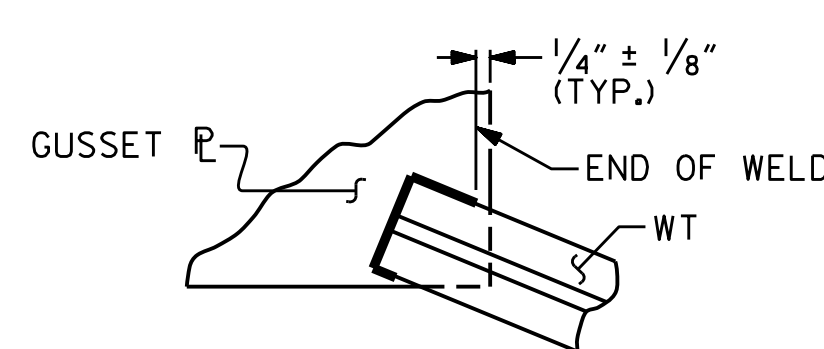


**SHEAR STUD DETAILS**

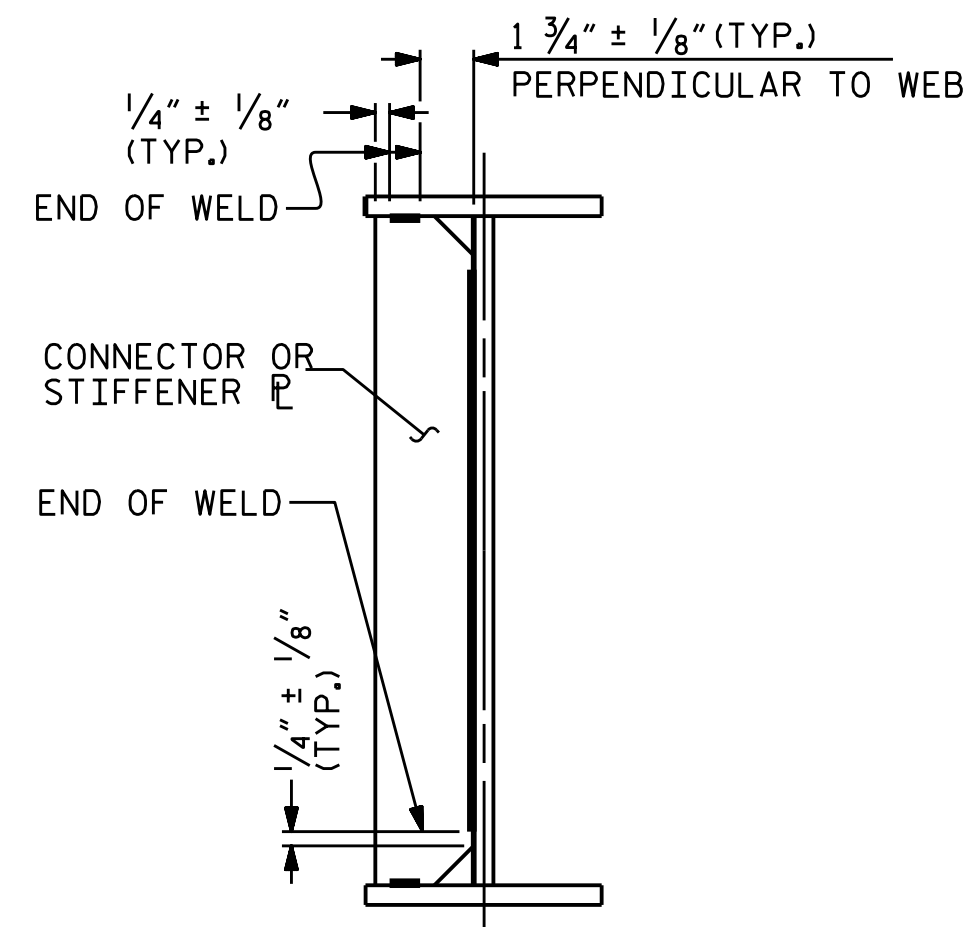
(TYP. EA. END BENT DIAPHRAGM D1)



**TYPICAL GUSSET PLATE CONNECTION**

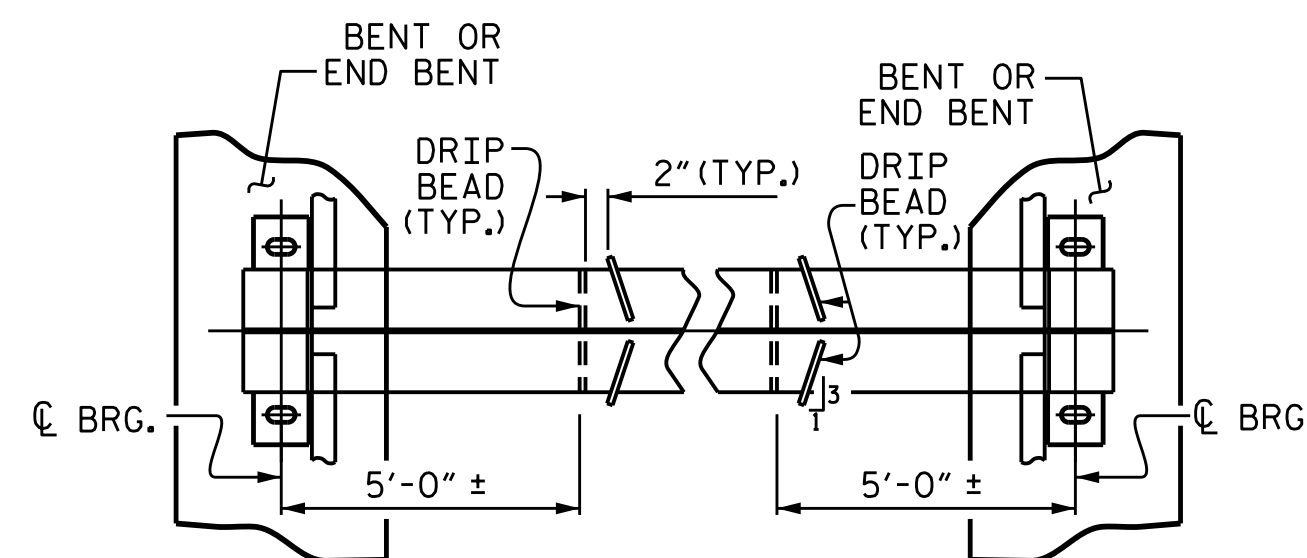


**TYPICAL \"TEE\" TO GUSSET PLATE CONNECTION**

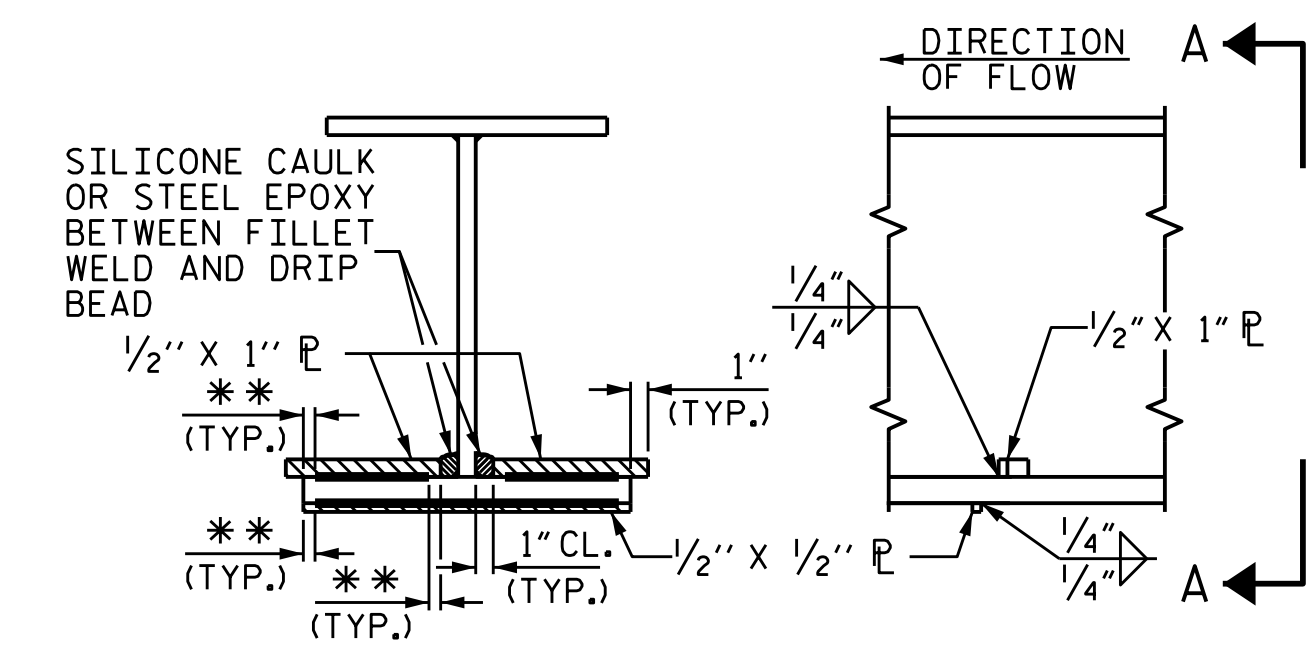


**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**

**WELD TERMINATION DETAILS**



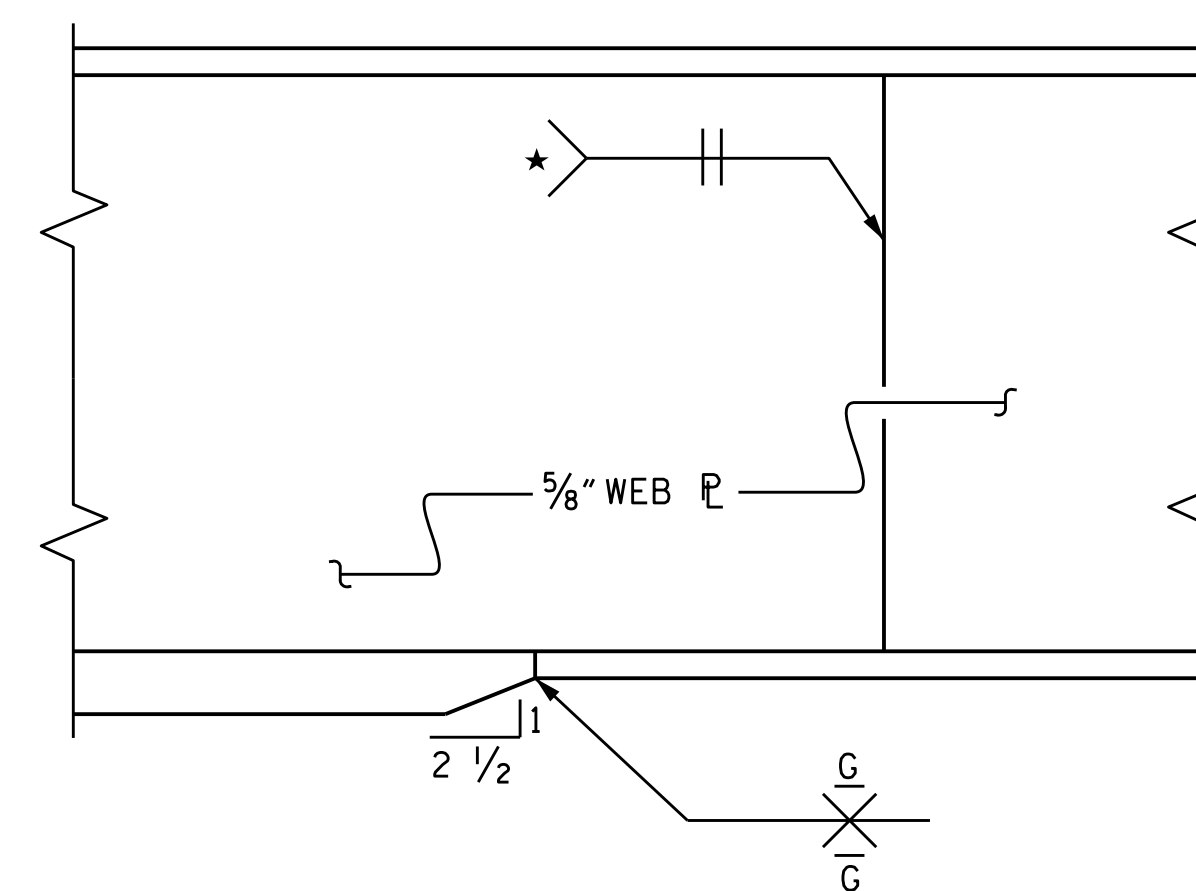
**PART PLAN - BOTTOM FLANGE**



**VIEW A-A SECTION**

\*\* SEE \"WELD TERMINATION DETAILS\"

**DRIP BEAD DETAILS**



**ELEVATION**

**TYPICAL FLANGE AND WEB BUTT JOINT**

\* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS / GIRDERS



PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 3 OF 4

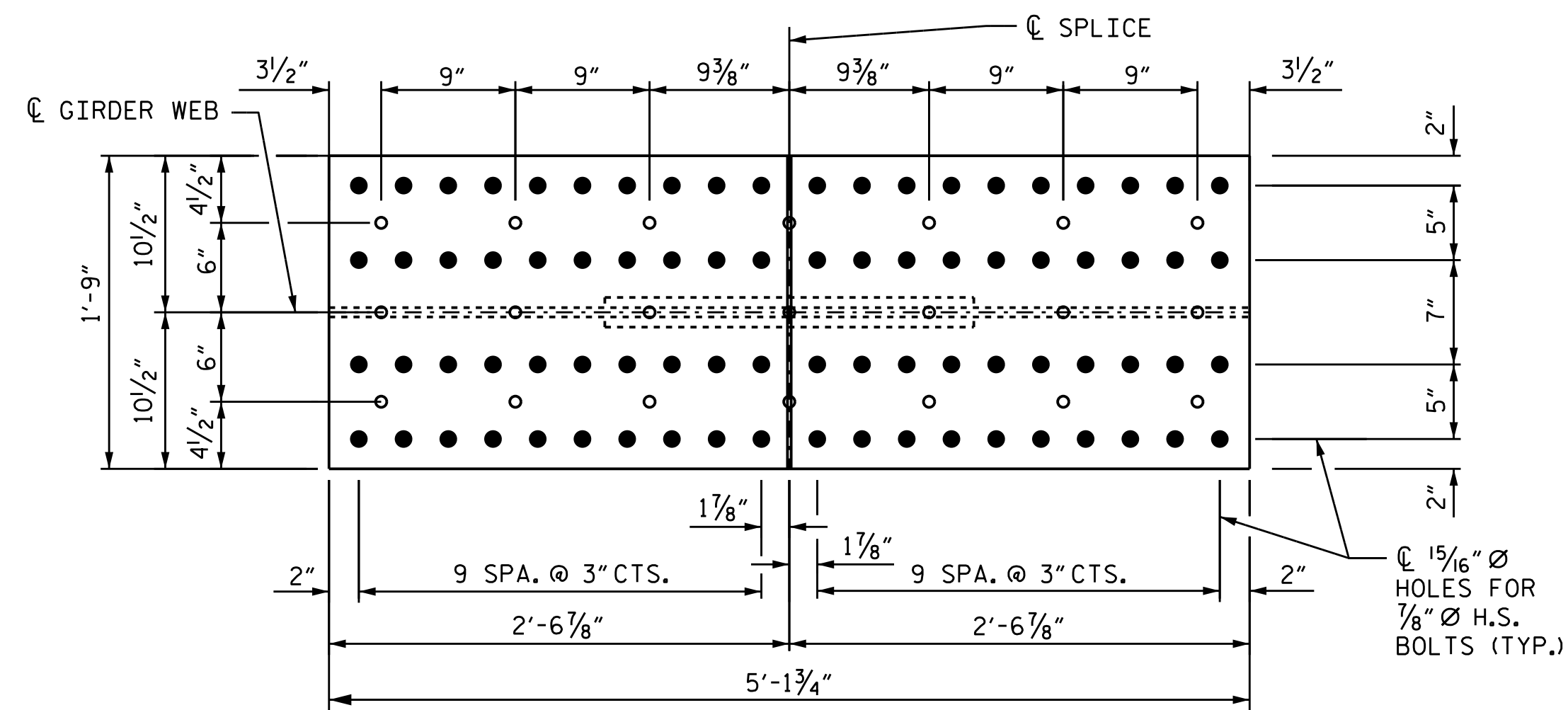
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11	
1			3			TOTAL SHEETS	
2			4			33	

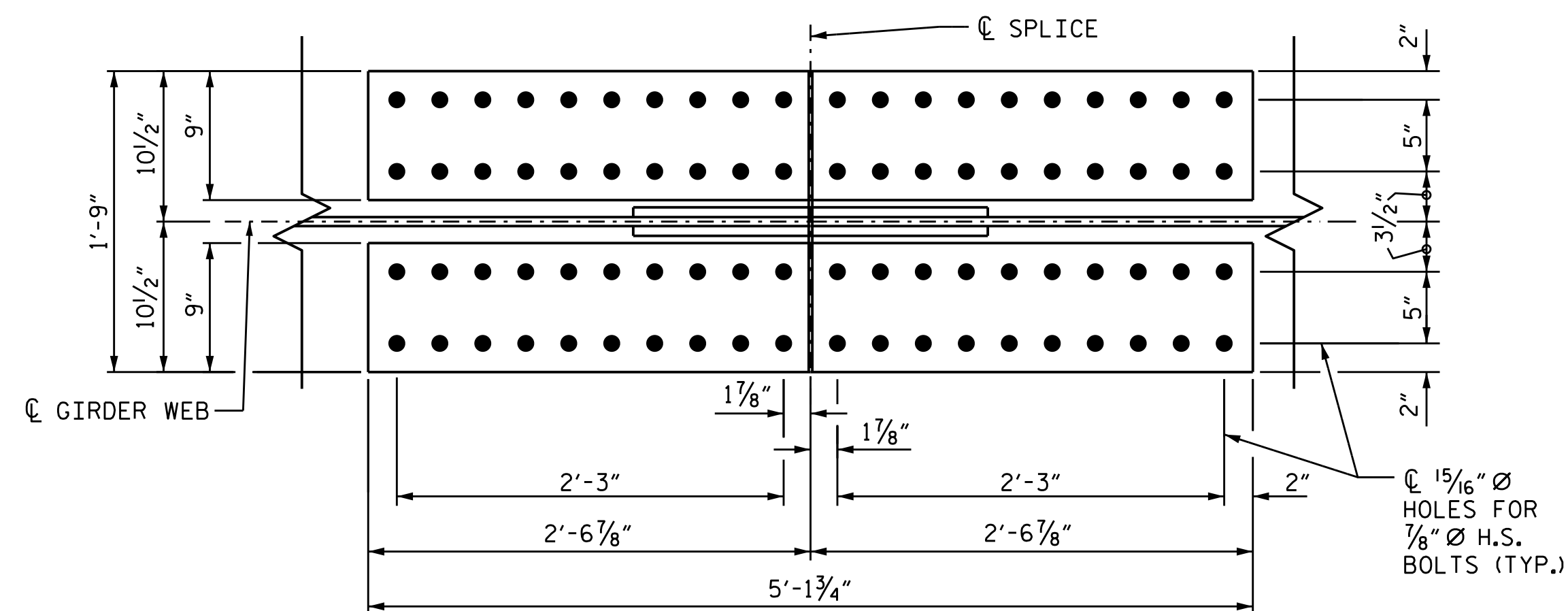
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : W.D. REAMS DATE : 08/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD : W.D. REAMS DATE : 08/2019

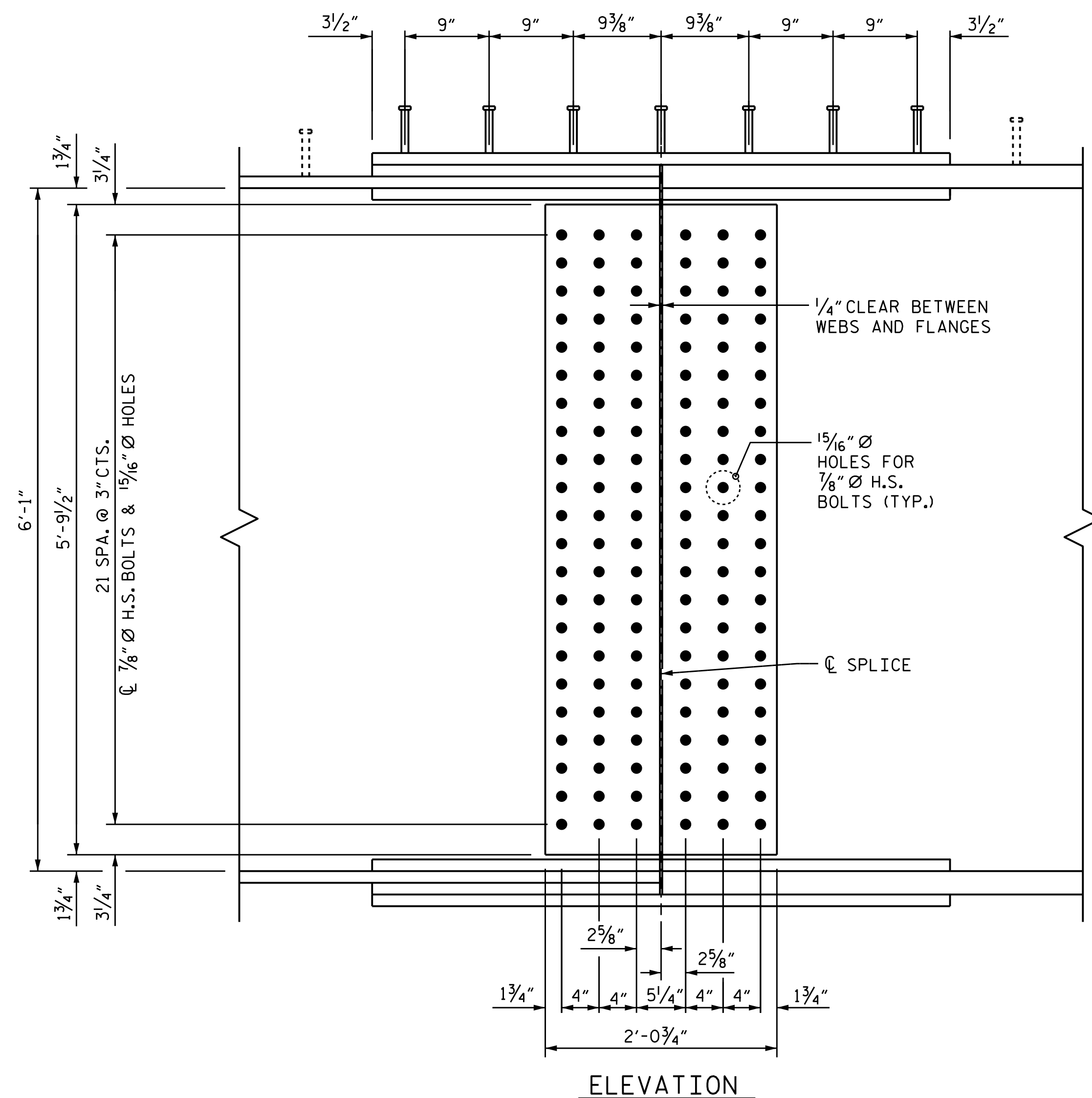




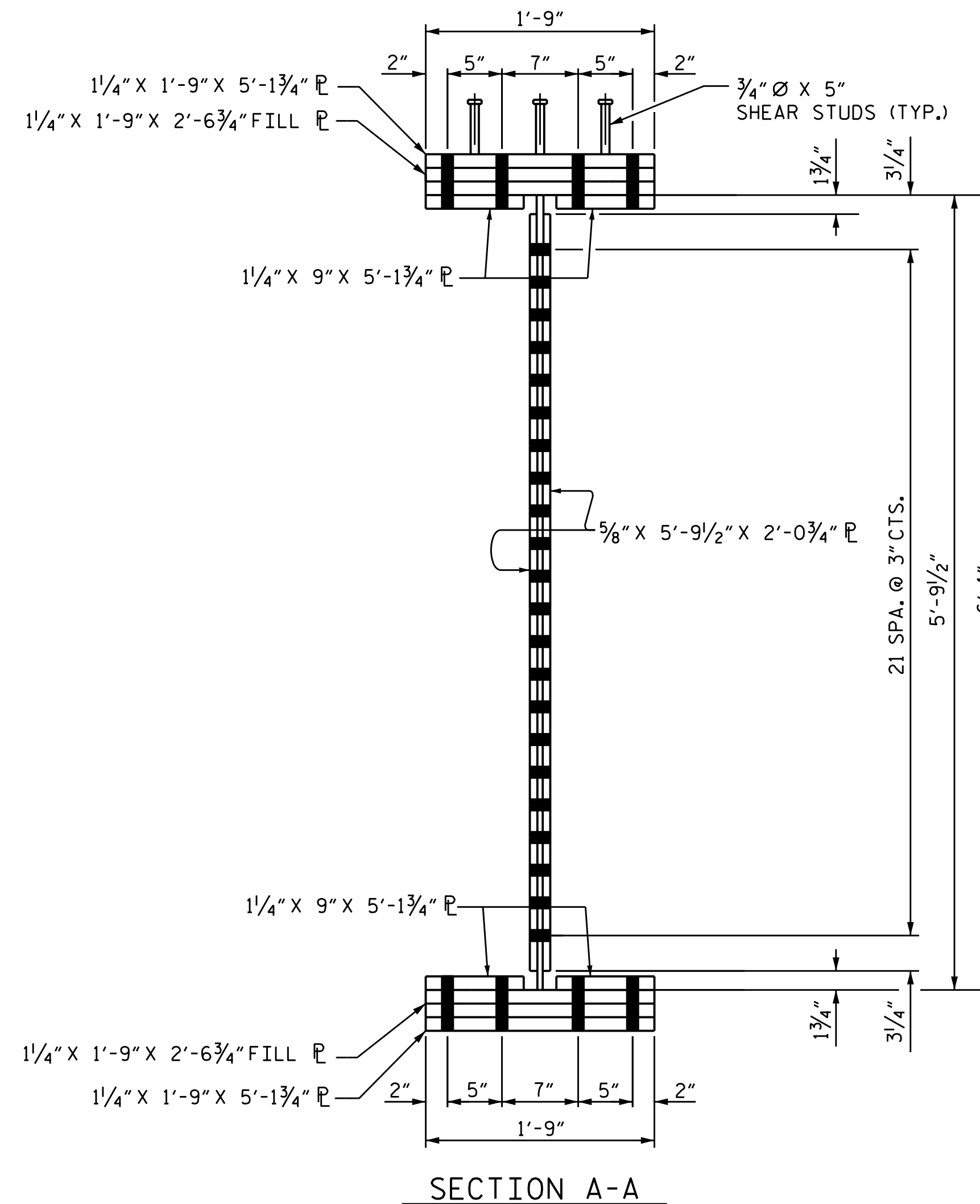
PLAN (TOP OF TOP FLANGE)



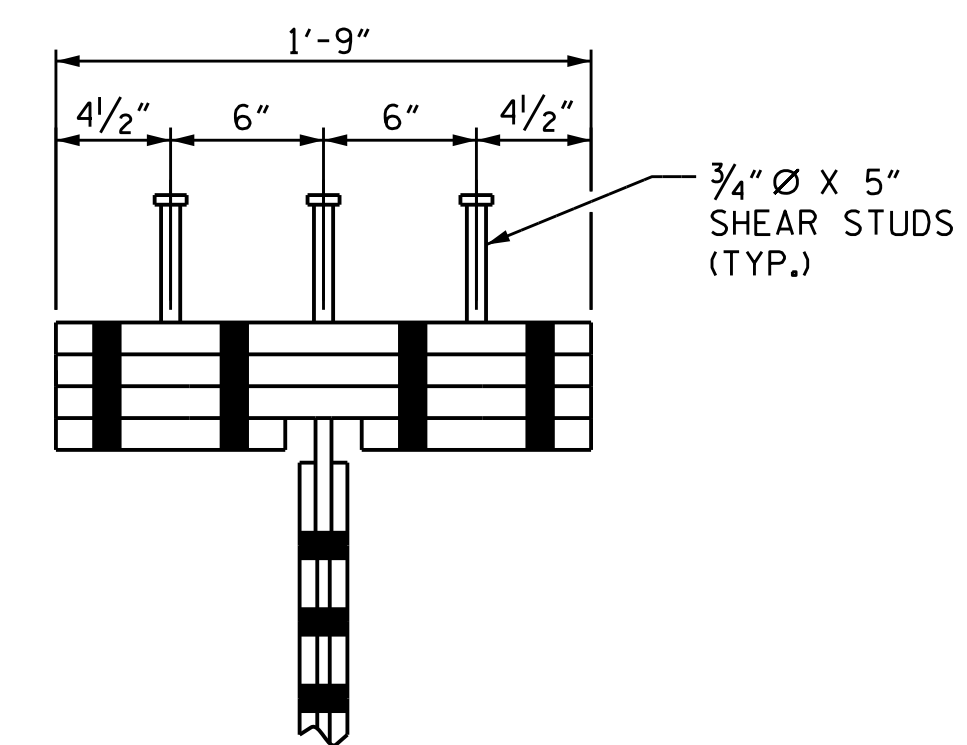
PLAN (TOP OF BOTTOM FLANGE)



ELEVATION



SECTION A-A



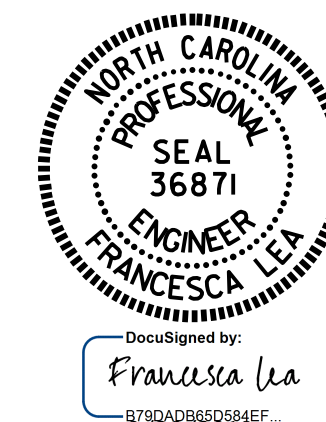
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE  
SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

**BOLTED FIELD SPLICE DETAIL**

DRAWN BY : W.D. REAMS/O.T. NGUYEN DATE : 07/2019  
 CHECKED BY : K.W. ALFORD DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE : 08/2019

28-SEP-2019 16:10  
 V:\Structures\Plans\Final Plans\402.023.I5700.S54.S12.911499.dgn  
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



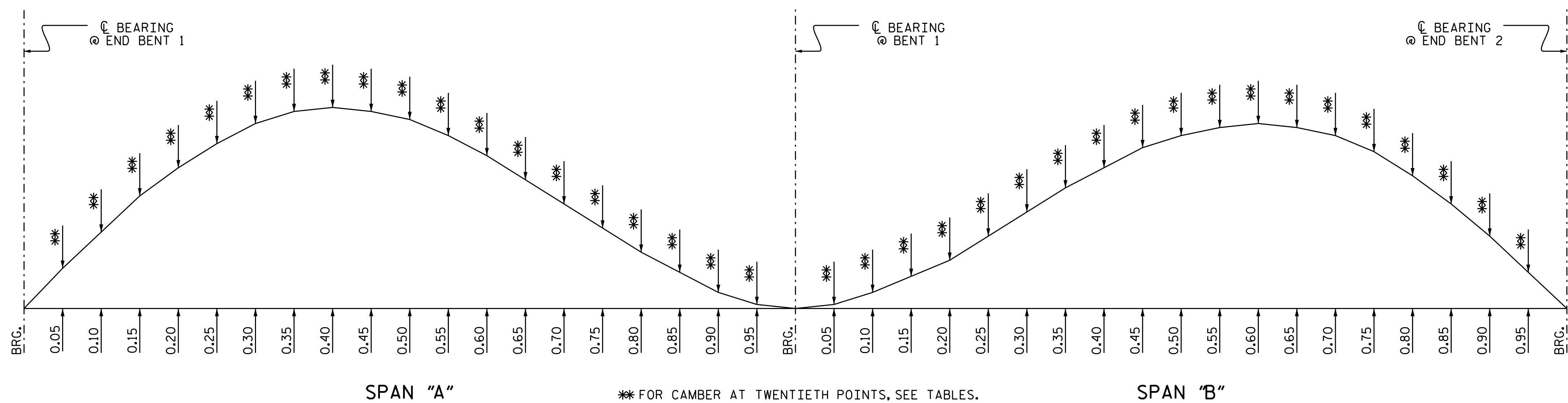
PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-12
2			4			33

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
SPAN A																							
GIRDERS #1 & #6																							
TWENTIETH POINTS	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	BRG.		
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.011	0.021	0.030	0.038	0.045	0.050	0.053	0.054	0.053	0.050	0.046	0.041	0.035	0.028	0.022	0.015	0.009	0.005	0.001	0	
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.032	0.063	0.090	0.114	0.134	0.148	0.157	0.160	0.158	0.151	0.139	0.123	0.105	0.085	0.064	0.045	0.028	0.014	0.004	0	
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.004	0.008	0.011	0.014	0.017	0.018	0.020	0.020	0.020	0.019	0.018	0.016	0.013	0.011	0.008	0.006	0.004	0.002	0.001	0	
TOTAL DEAD LOAD DEFLECTION	↓	0	0.047	0.092	0.131	0.166	0.196	0.216	0.230	0.234	0.231	0.220	0.203	0.180	0.153	0.124	0.094	0.066	0.041	0.021	0.006	0	
VERTICAL CURVE ORDINATE	↑	0	0.043	0.082	0.117	0.146	0.172	0.192	0.208	0.220	0.226	0.229	0.226	0.220	0.208	0.192	0.172	0.146	0.117	0.082	0.043	0	
REQUIRED CAMBER	↑	0	1/16"	2/16"	3"	3 3/4"	4 1/8"	4 7/8"	5 1/4"	5 7/8"	5 1/2"	5 3/8"	5 1/8"	4 3/16"	4 5/16"	3 3/16"	3 3/16"	2 5/16"	1 7/8"	1 1/4"	9/16"	0	
GIRDERS #2 - #5																							
TWENTIETH POINTS	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	BRG.		
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.011	0.021	0.030	0.038	0.045	0.050	0.053	0.054	0.053	0.050	0.046	0.041	0.035	0.028	0.022	0.015	0.009	0.005	0.001	0	
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.032	0.063	0.090	0.114	0.134	0.148	0.157	0.160	0.158	0.151	0.139	0.123	0.105	0.085	0.064	0.045	0.028	0.014	0.004	0	
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.004	0.007	0.010	0.013	0.015	0.017	0.018	0.018	0.018	0.017	0.016	0.014	0.012	0.010	0.008	0.005	0.003	0.002	0.001	0	
TOTAL DEAD LOAD DEFLECTION	↓	0	0.047	0.091	0.130	0.165	0.194	0.215	0.228	0.232	0.229	0.229	0.220	0.201	0.178	0.152	0.123	0.094	0.065	0.040	0.021	0.006	0
VERTICAL CURVE ORDINATE	↑	0	0.043	0.082	0.117	0.146	0.172	0.192	0.208	0.220	0.226	0.229	0.226	0.220	0.208	0.192	0.172	0.146	0.117	0.082	0.043	0	
REQUIRED CAMBER	↑	0	1/16"	2/16"	2 5/16"	3 3/4"	4 3/8"	4 7/8"	5 1/4"	5 7/8"	5 1/8"	5 3/16"	4 3/4"	4 5/16"	3 3/4"	3 3/16"	2 5/16"	1 7/8"	1 1/4"	9/16"	0	0	
SPAN B																							
GIRDERS #1 & #6																							
TWENTIETH POINTS	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	BRG.		
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.001	0.004	0.008	0.013	0.019	0.025	0.032	0.038	0.043	0.046	0.049	0.050	0.049	0.046	0.042	0.036	0.028	0.019	0.010	0	
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.003	0.011	0.024	0.040	0.058	0.077	0.096	0.113	0.128	0.140	0.147	0.149	0.146	0.138	0.125	0.107	0.085	0.059	0.030	0	
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.000	0.002	0.003	0.005	0.007	0.009	0.011	0.013	0.015	0.016	0.017	0.017	0.017	0.016	0.014	0.012	0.010	0.007	0.003	0	
TOTAL DEAD LOAD DEFLECTION	↓	0	0.004	0.017	0.035	0.058	0.085	0.112	0.140	0.165	0.187	0.204	0.214	0.218	0.213	0.201	0.183	0.156	0.123	0.085	0.044	0	
VERTICAL CURVE ORDINATE	↑	0	0.043	0.081	0.114	0.144	0.168	0.188	0.204	0.215	0.222	0.224	0.222	0.215	0.204	0.188	0.168	0.144	0.114	0.081	0.043	0	
REQUIRED CAMBER	↑	0	9/16"	1 3/16"	1 13/16"	2 7/16"	3 1/16"	3 5/8"	4 1/8"	4 9/16"	4 15/16"	5 1/8"	5 1/4"	5 3/16"	5"	4 11/16"	4 3/16"	3 5/16"	2 13/16"	2"	1 1/16"	0	
GIRDERS #2 - #5																							
TWENTIETH POINTS	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	BRG.		
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0	0.001	0.004	0.008	0.013	0.019	0.025	0.032	0.038	0.043	0.046	0.049	0.050	0.049	0.046	0.042	0.036	0.028	0.019	0.010	0	
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0	0.003	0.011	0.024	0.040	0.058	0.077	0.096	0.113	0.128	0.140	0.147	0.149	0.146	0.138	0.125	0.107	0.085	0.059	0.030	0	
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0	0.000	0.001	0.003	0.005	0.007	0.009	0.011	0.013	0.015	0.016	0.017	0.017	0.017	0.016	0.014	0.012	0.010	0.007	0.003	0	
TOTAL DEAD LOAD DEFLECTION	↓	0	0.004	0.016	0.035	0.058	0.084	0.111	0.139	0.164	0.186	0.202	0.213	0.216	0.212	0.200	0.181	0.155	0.123	0.085	0.043	0	
VERTICAL CURVE ORDINATE	↑	0	0.043	0.081	0.114	0.144	0.168	0.188	0.204	0.215	0.222	0.224	0.222	0.215	0.204	0.188	0.168	0.144	0.114	0.081	0.043	0	
REQUIRED CAMBER	↑	0	9/16"	1 3/16"	1 13/16"	2 7/16"	3"	3 3/16"	4 1/8"	4 9/16"	4 7/8"	5 1/8"	5 3/16"	5 3/16"	5"	4 11/16"	4 3/16"	3 5/16"	2 13/16"	2"	1"	0	

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).  
 DEFLECTIONS ARE TAKEN AT TWENTIETH POINTS BETWEEN BEARINGS.



SCHEMATIC CAMBER ORDINATES

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-



DocuSigned by:  
 Kristy W. Alford  
 F245838020P-40E...  
 9/30/2019

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
DEAD LOAD DEFLECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S2-13 TOTAL SHEETS 33

DRAWN BY : W. D. REAMS DATE : 08/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DESIGN ENGINEER OF RECORD: W. D. REAMS DATE : 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED



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.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

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.

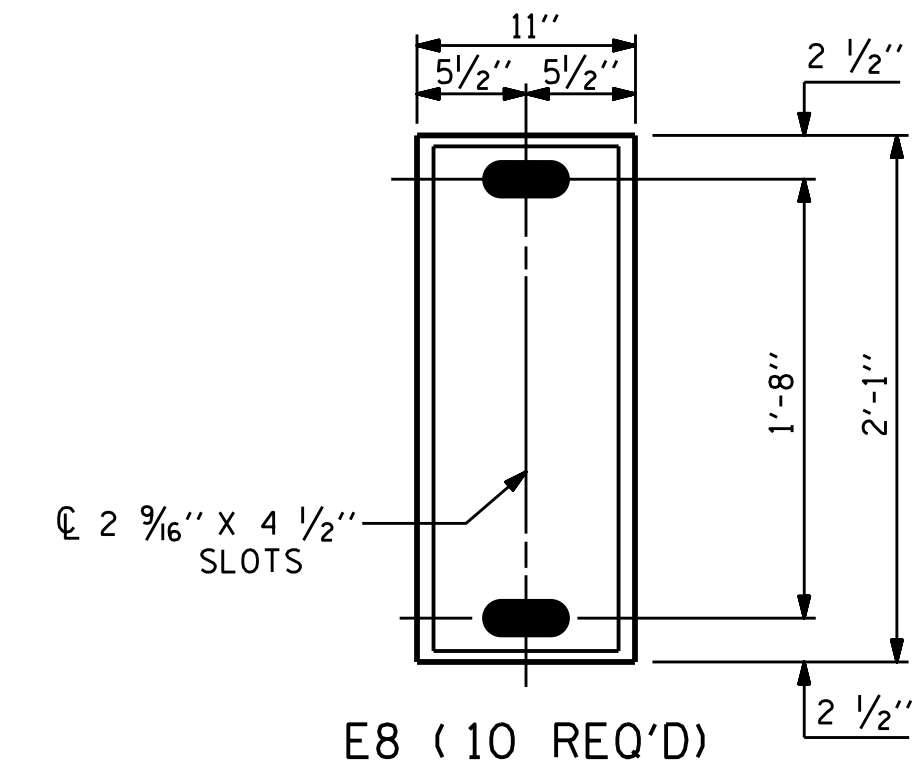
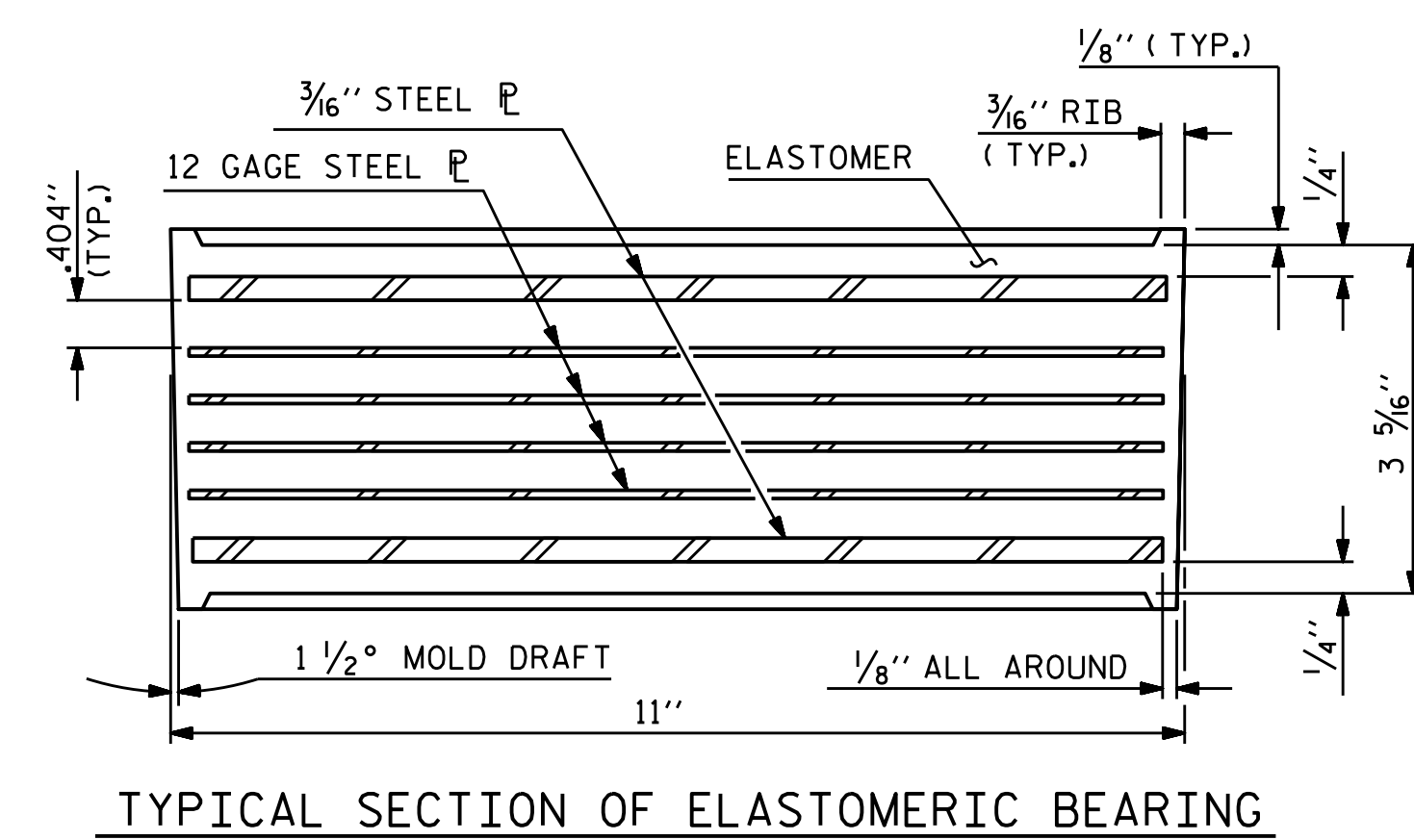
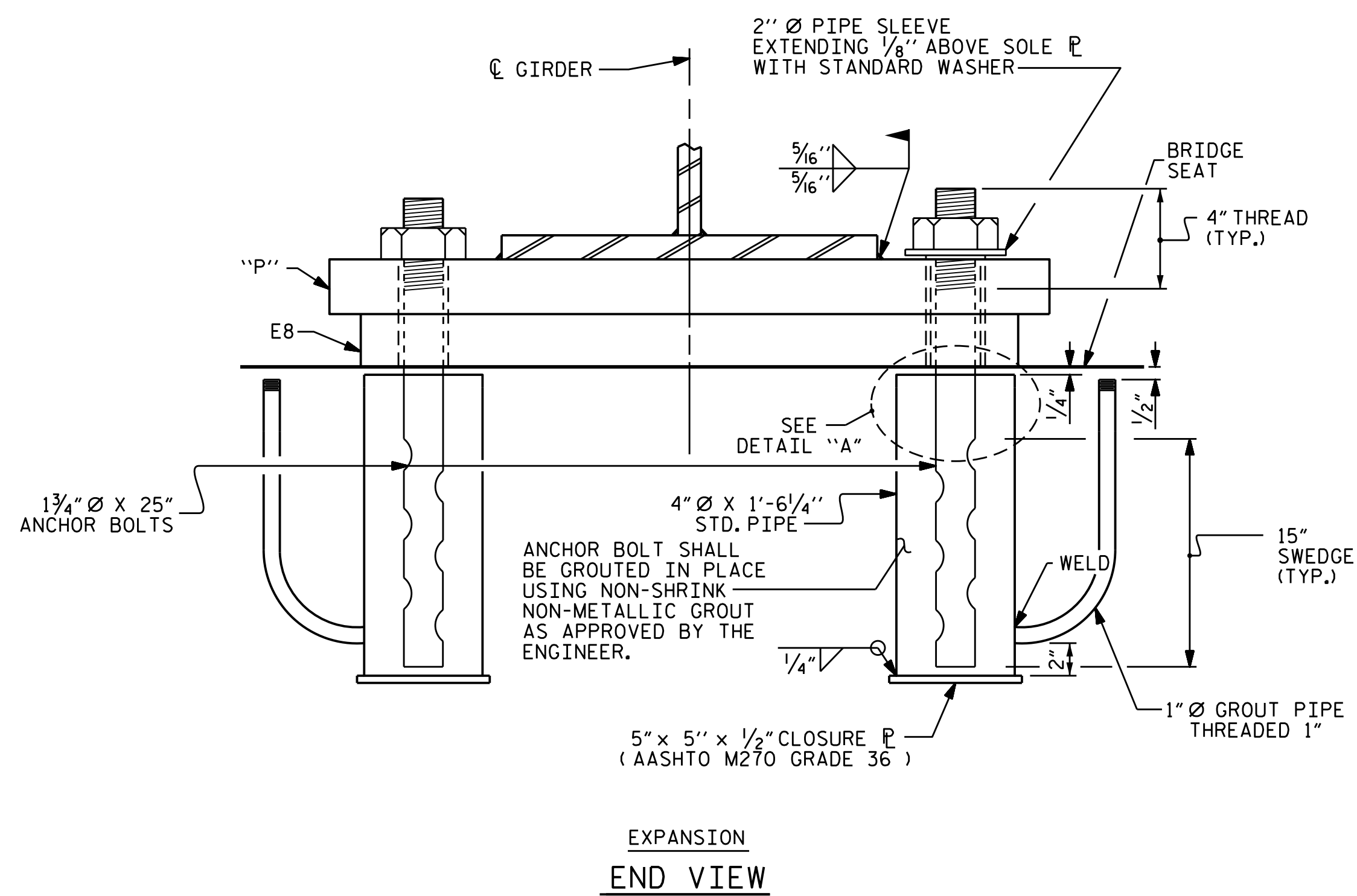
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

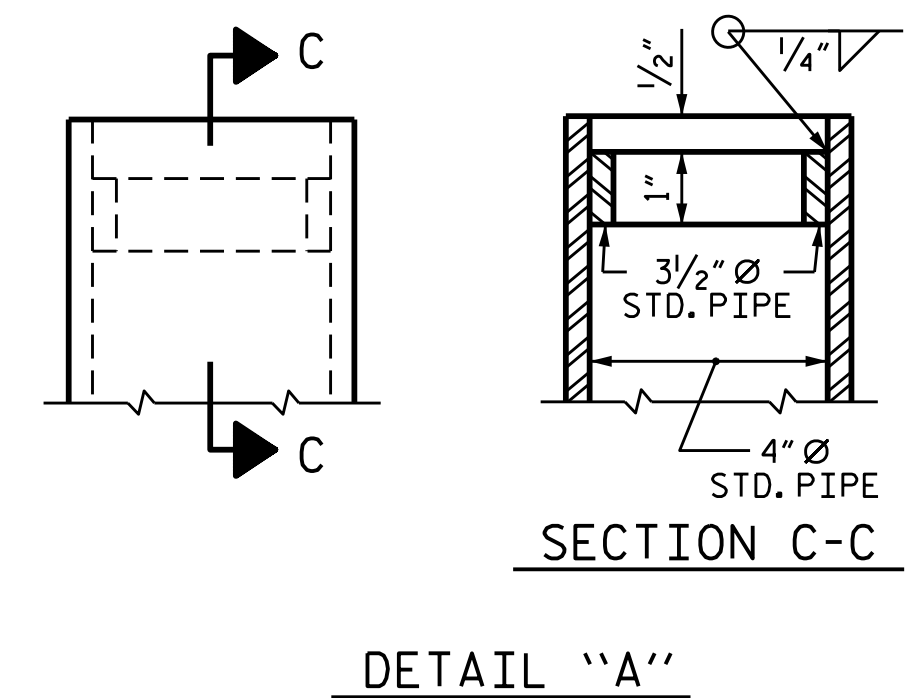
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60°F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

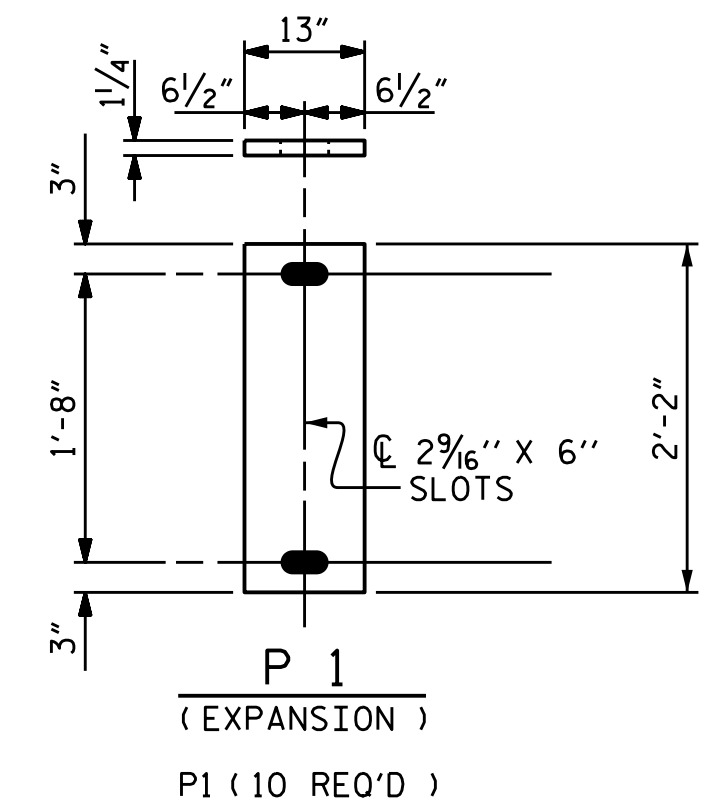
THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



PLAN VIEW OF ELASTOMERIC BEARING TYPE IV



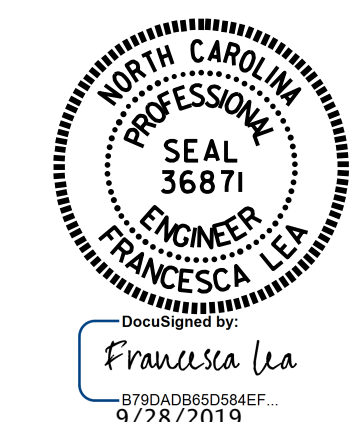
DETAIL "A"



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 (STEEL SUPERSTRUCTURE)

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : EEM 10/95	REV. 10/1/11 MAA/GM
CHECKED BY : PEK 10/95	REV. 6/13 AAC/MAA
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14	TOTAL SHEETS
1			3				33
2			4				

**NOTES**

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

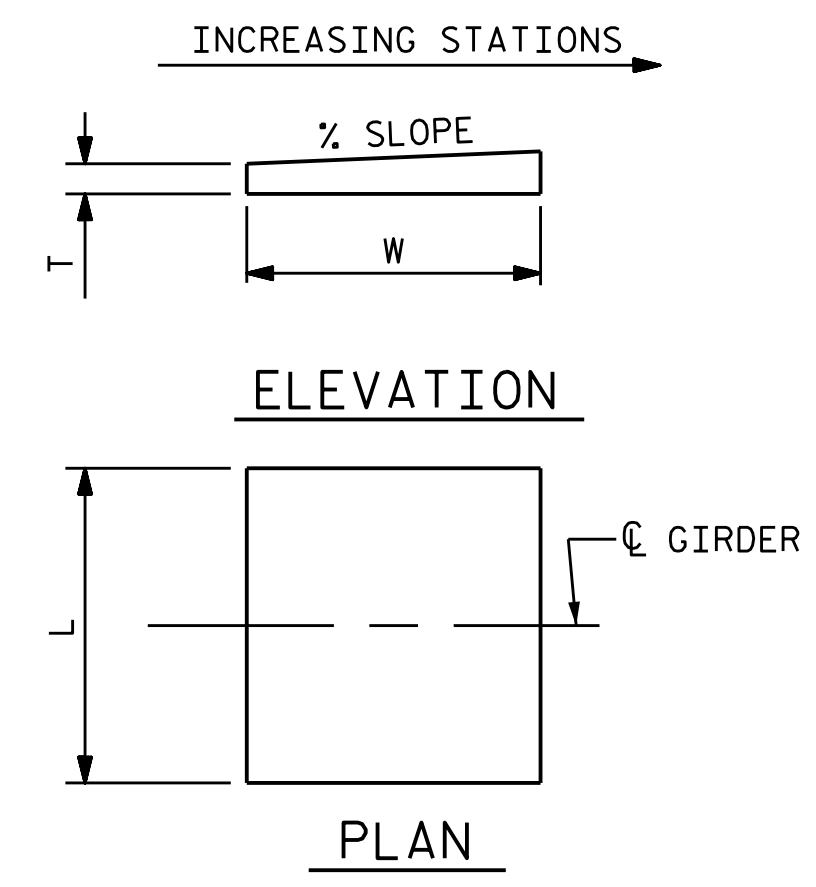
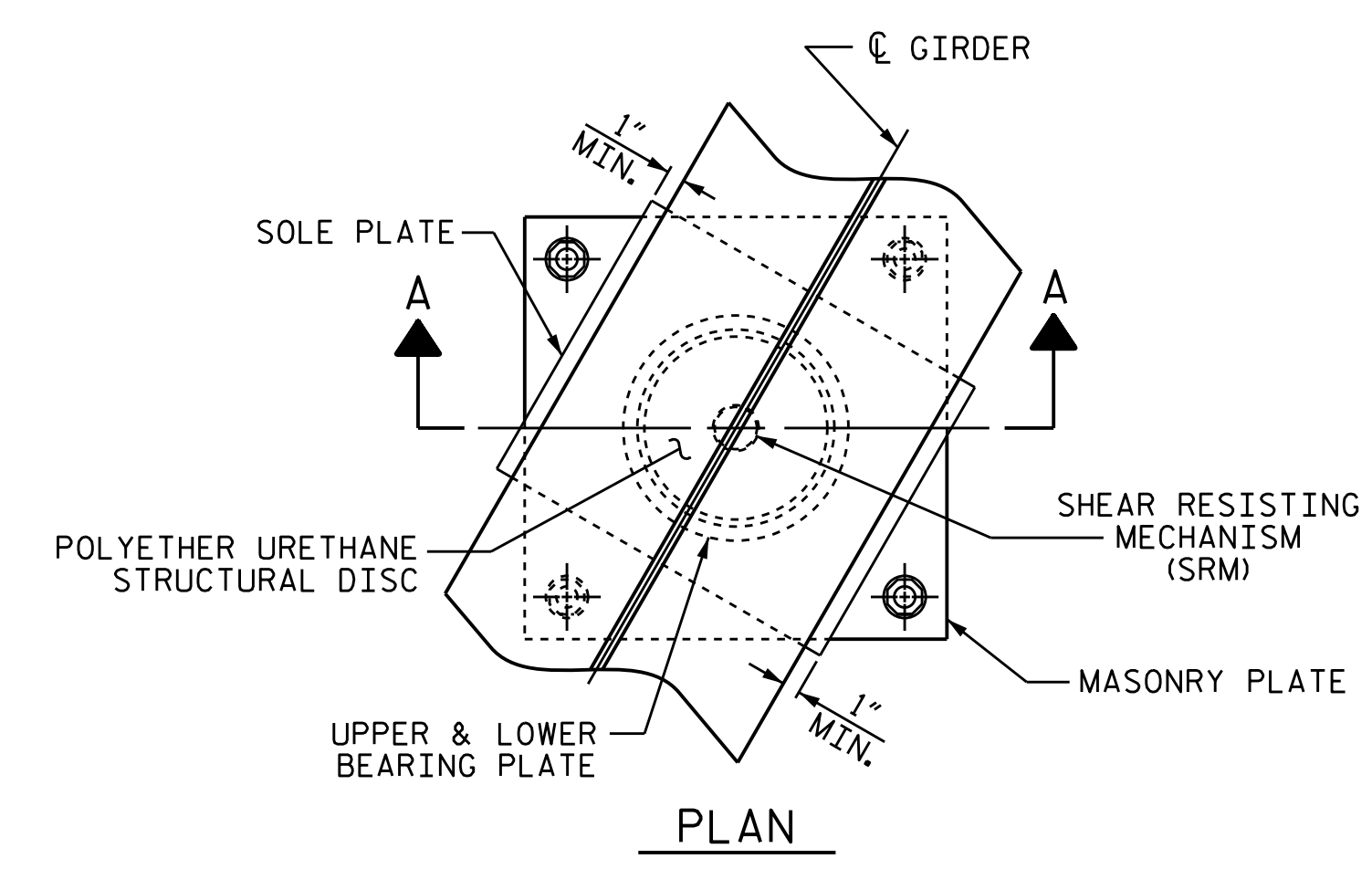
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

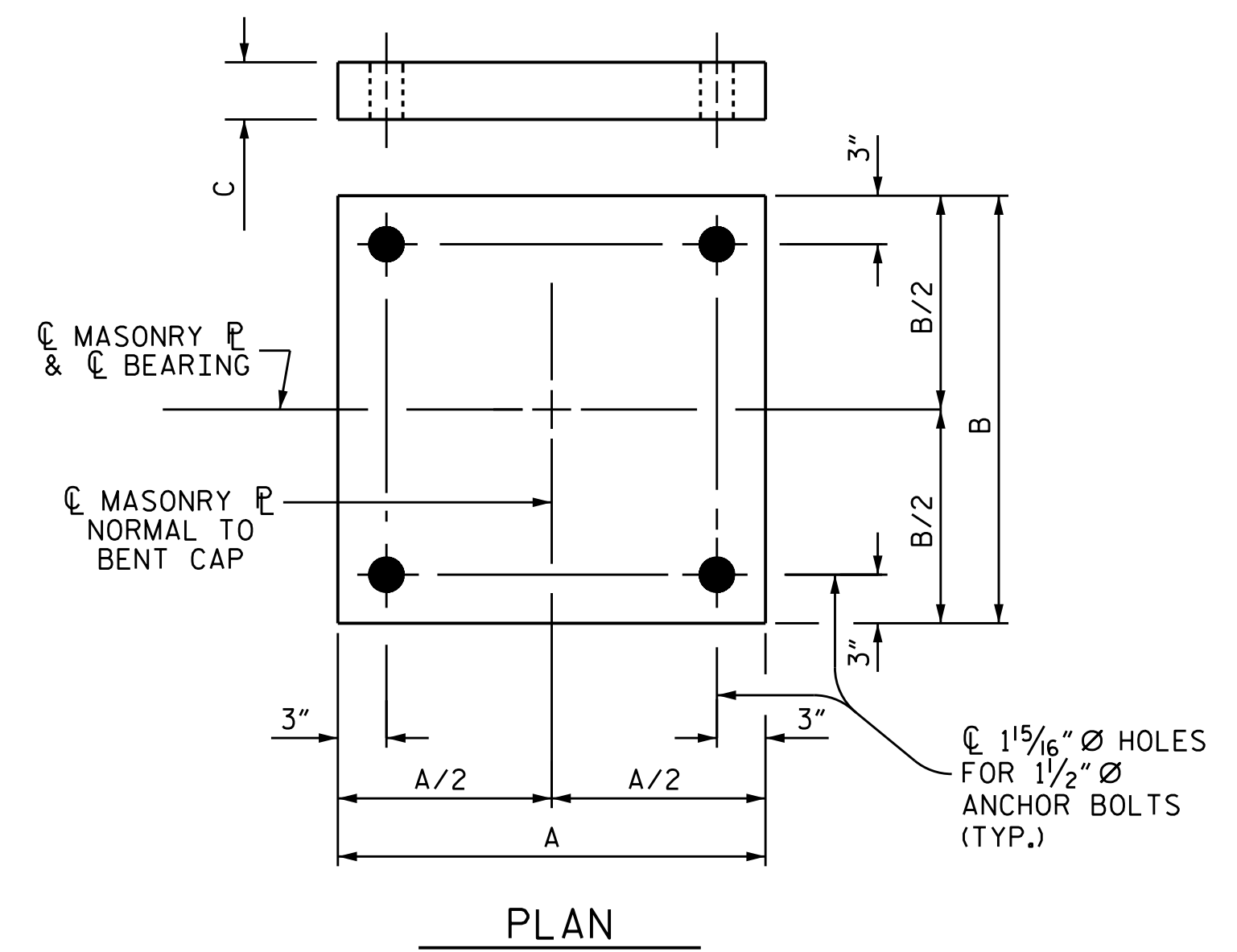
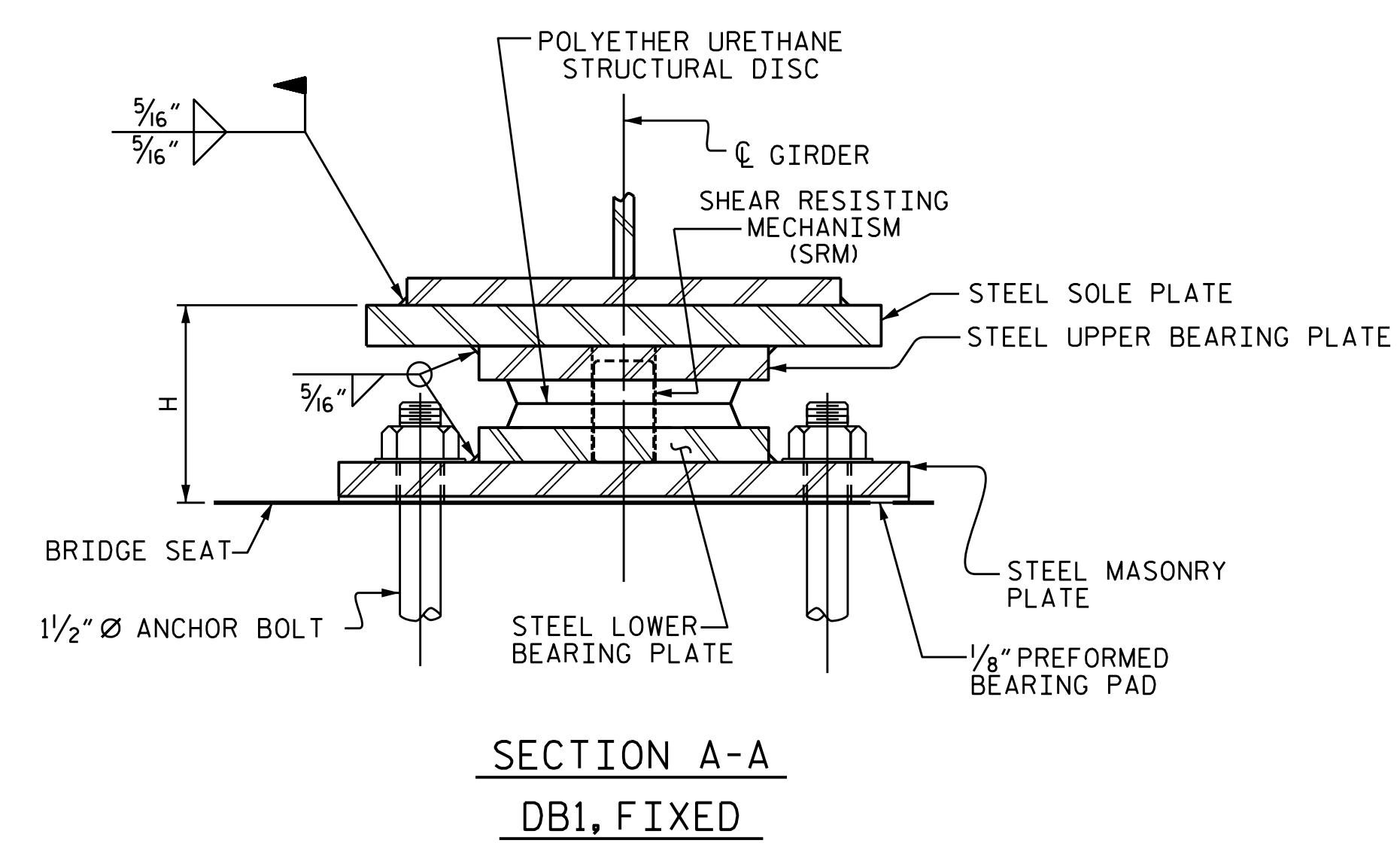
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.



NOTE:  
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

**SOLE PLATE DETAILS**



**MASONRY PLATE (M1) DETAILS**

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT						
				BEARING H (IN.)	MASONRY PLATE (A, B (IN.))		SOLE PLATE C (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)			
BEARINGS	MASONRY P						TOP SLOPE (%)	L (IN.)	DEAD			LIVE		
DB1 (FIXED)	M1	BENT 1	5	7 1/2"	30"	30"	1"	0	23"	465.0	57.9	301.2	168.4	0



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

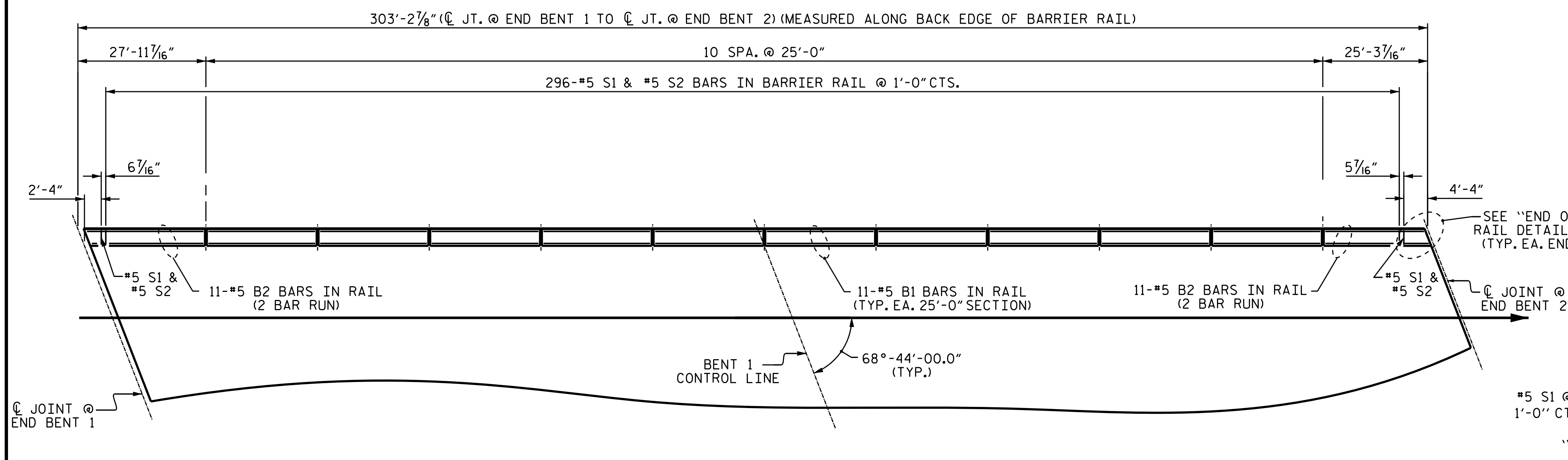
**STANDARD DISC BEARING DETAILS**

ASSEMBLED BY : K.W. ALFORD DATE : 05/2019  
 CHECKED BY : F. LEA DATE : 08/2019  
 DRAWN BY : TMG 08/13 REV. 12/17 MAA/THC  
 CHECKED BY : EKP 10/13

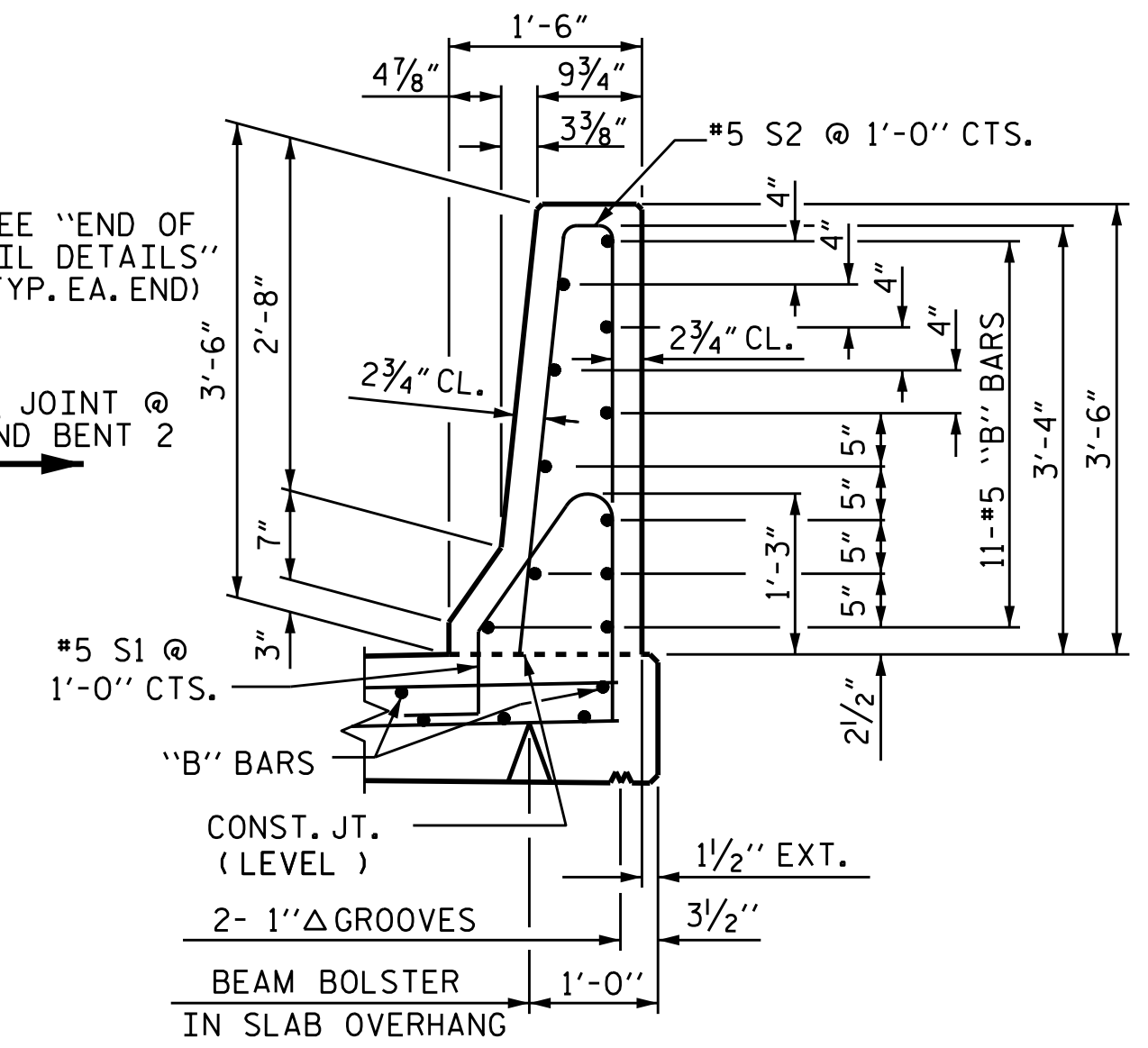
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-15
2			4			33

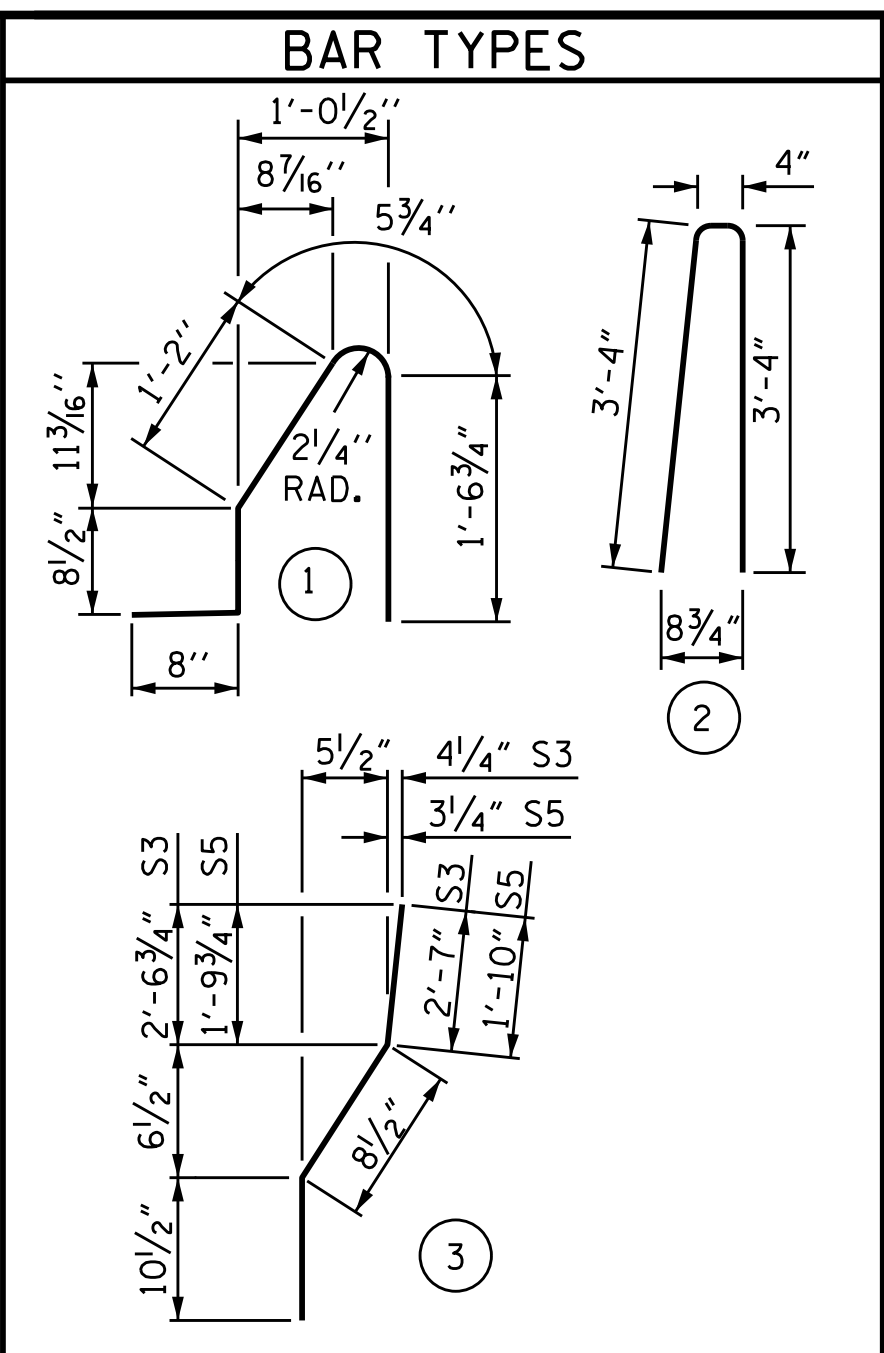




PLAN OF BARRIER RAIL



SECTION THRU RAIL



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	110	#5	STR	24'-7"	2820
* B2	44	#5	STR	15'-6"	711
* S1	298	#5	1	4'-7"	1425
* S2	298	#5	2	7'-0"	2176
* S3	2	#5	3	4'-2"	9
* S4	2	#5	STR	4'-0"	8
* S5	4	#5	3	3'-5"	14
* S6	4	#5	STR	3'-3"	14
* EPOXY COATED REINFORCING STEEL					7177 LBS.
CLASS AA CONCRETE					41.3 CU. YDS.
CONCRETE BARRIER RAIL					303.24 LIN. FT.

NOTES

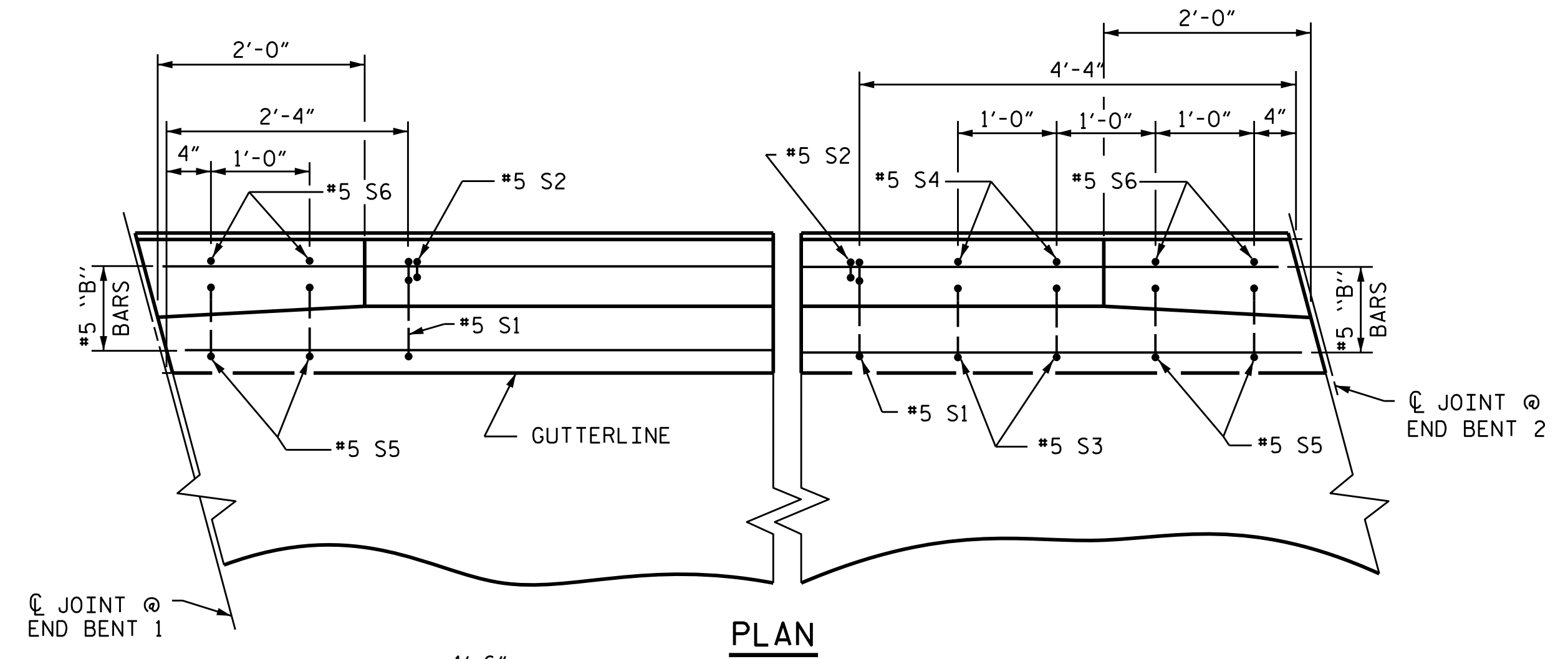
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWS PRIOR TO THE CASTING OF BARRIER RAIL.

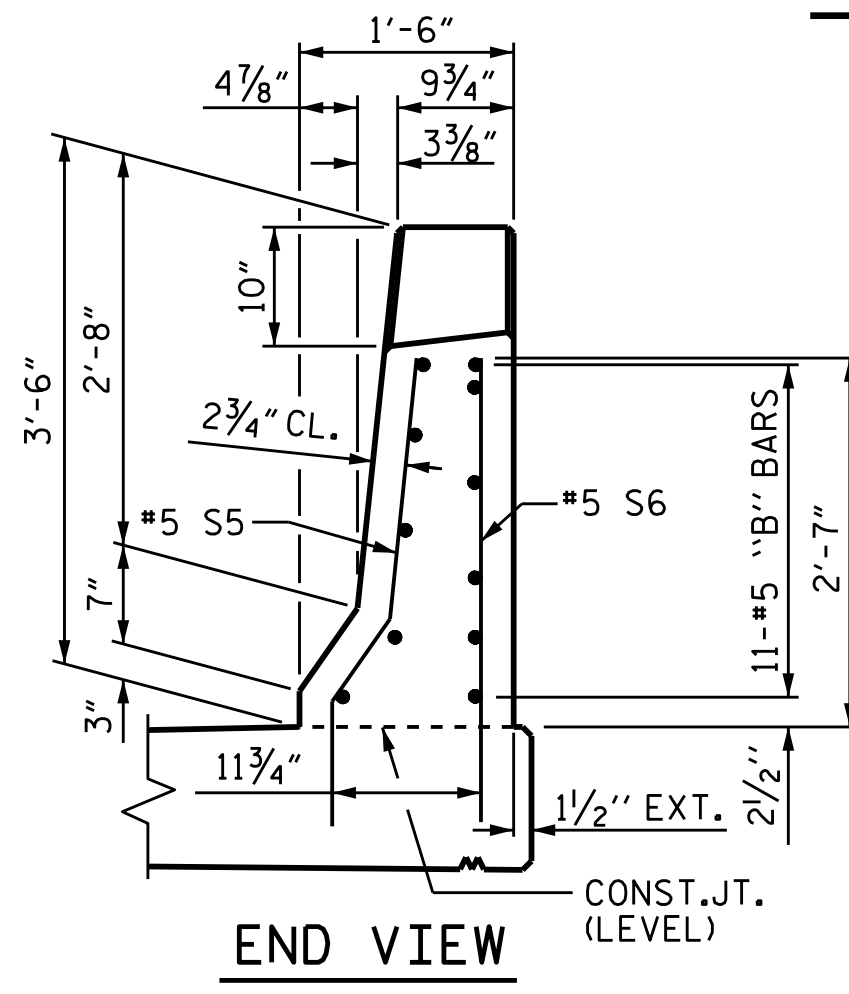
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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.

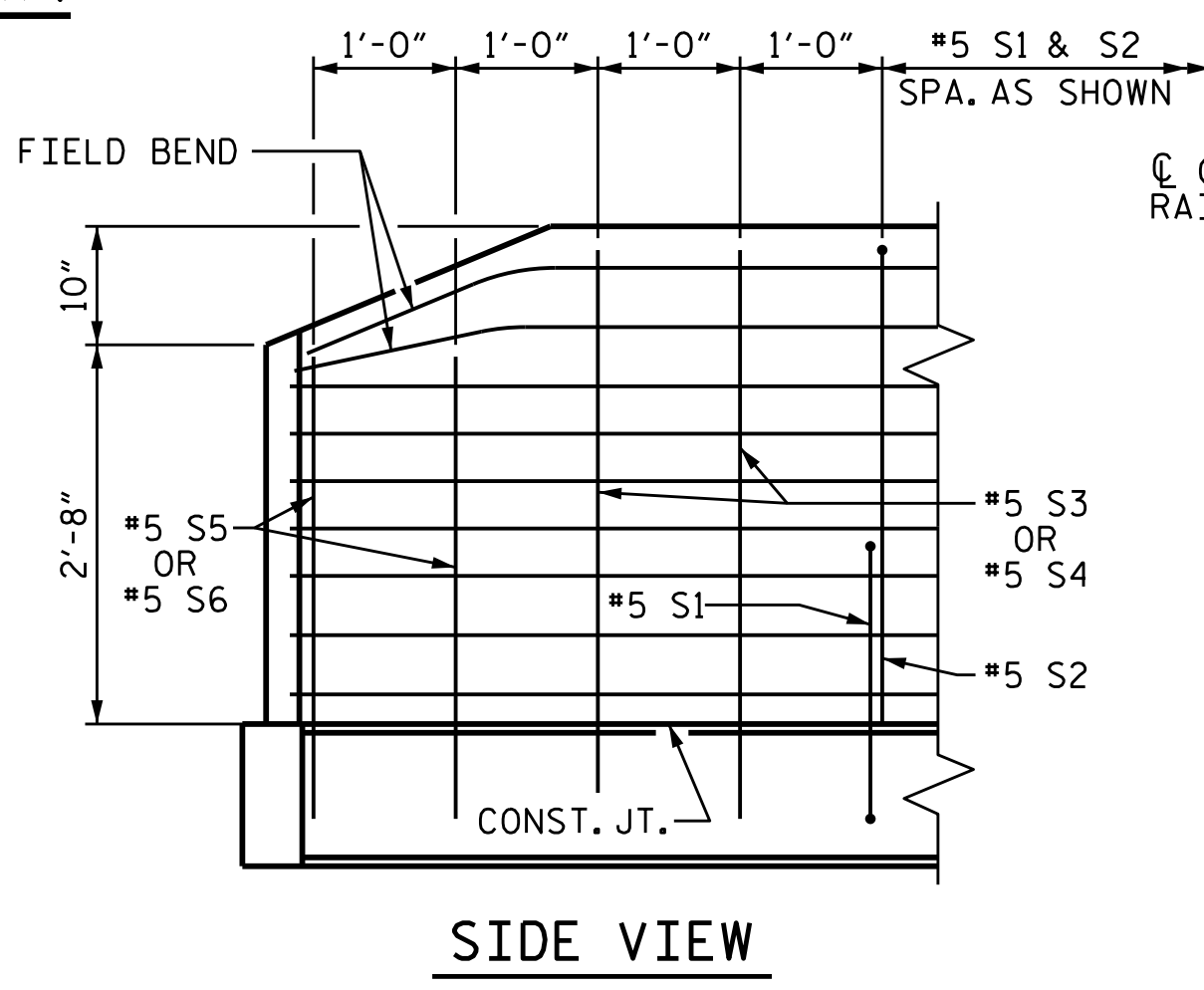
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS 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.



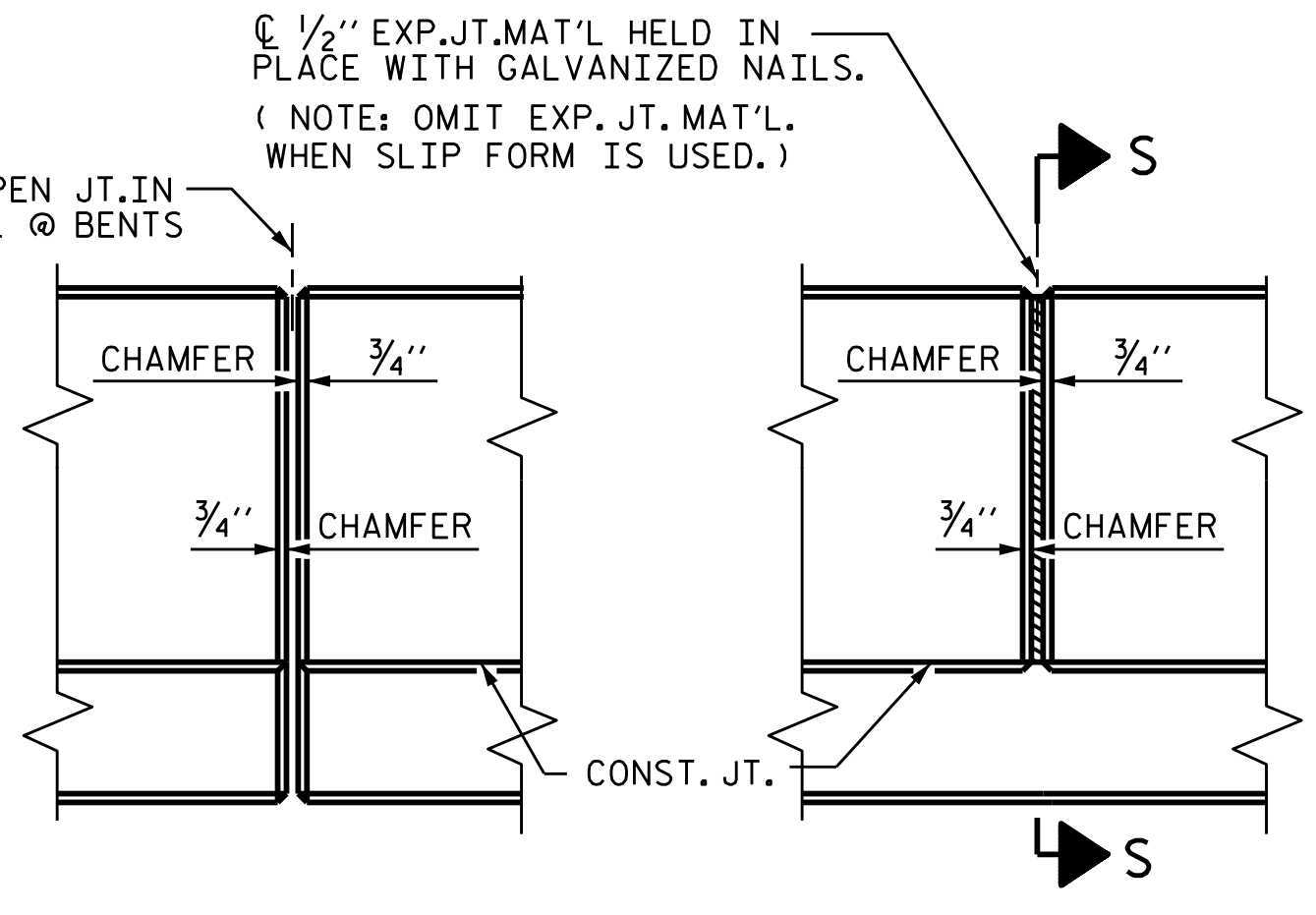
PLAN



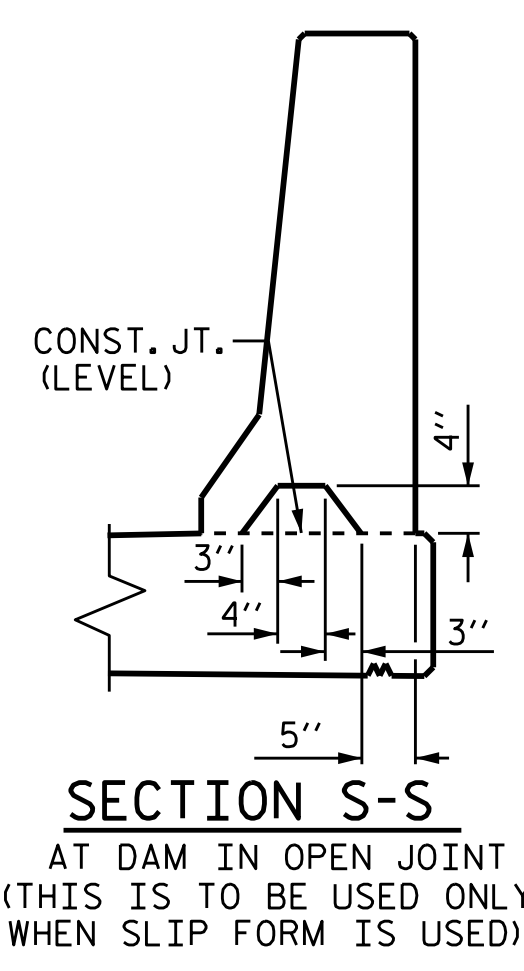
END VIEW



SIDE VIEW



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



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



PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-

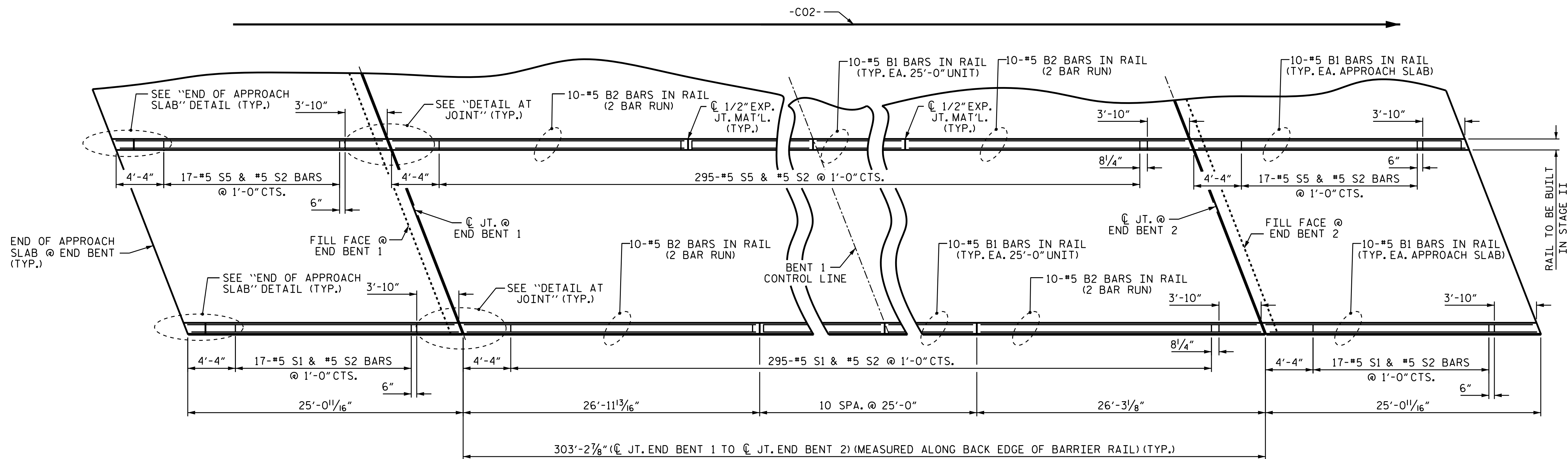
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
CONCRETE  
BARRIER RAIL

ASSEMBLED BY : K.W. ALFORD	DATE :05/2019
CHECKED BY : W.D. REAMS	DATE :08/2019
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

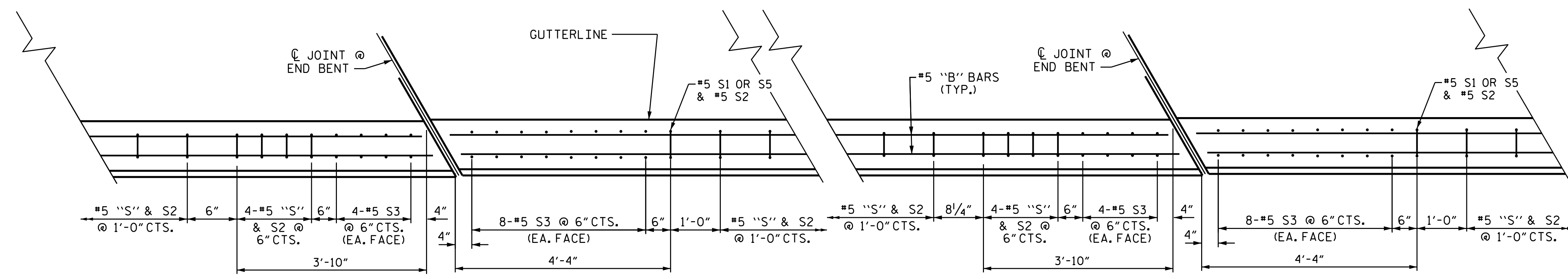
END OF RAIL DETAILS  
FOR ADHESIVE ANCHORING AT SAWS JOINTS

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

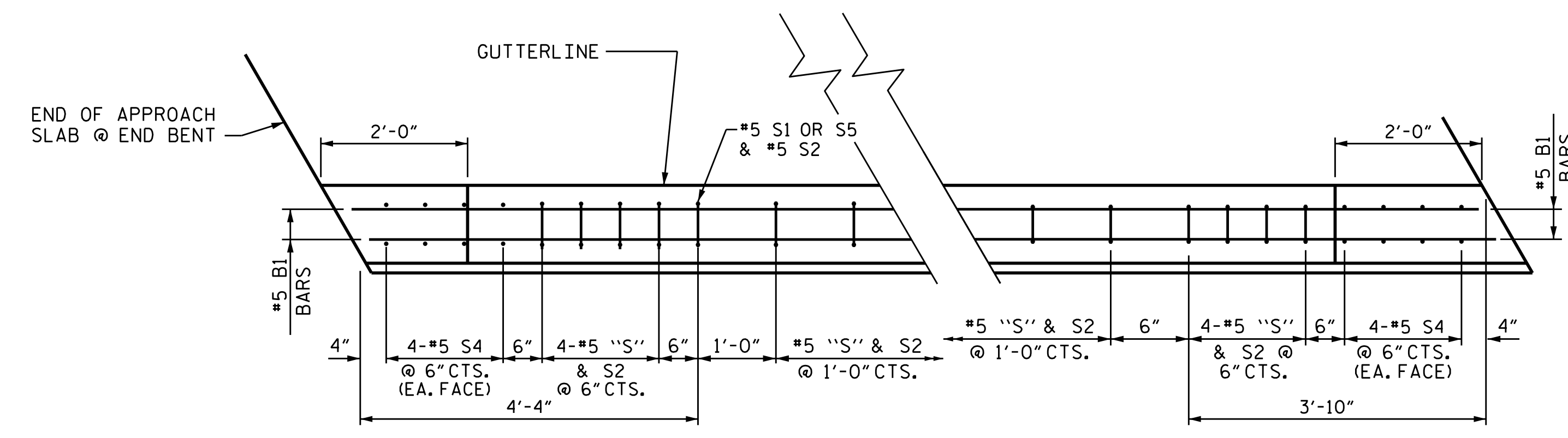
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS 33
2			4			



PLAN OF BARRIER RAIL



DETAIL AT JOINT



END OF APPROACH SLAB

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**VERTICAL CONCRETE  
 BARRIER RAIL**

DRAWN BY: K.W. ALFORD DATE: 05/2019  
 CHECKED BY: W.D. REAMS DATE: 08/2019  
 DESIGN ENGINEER OF RECORD: W.D. REAMS DATE: 08/2019

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-17
2			4			33



## NOTES

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

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

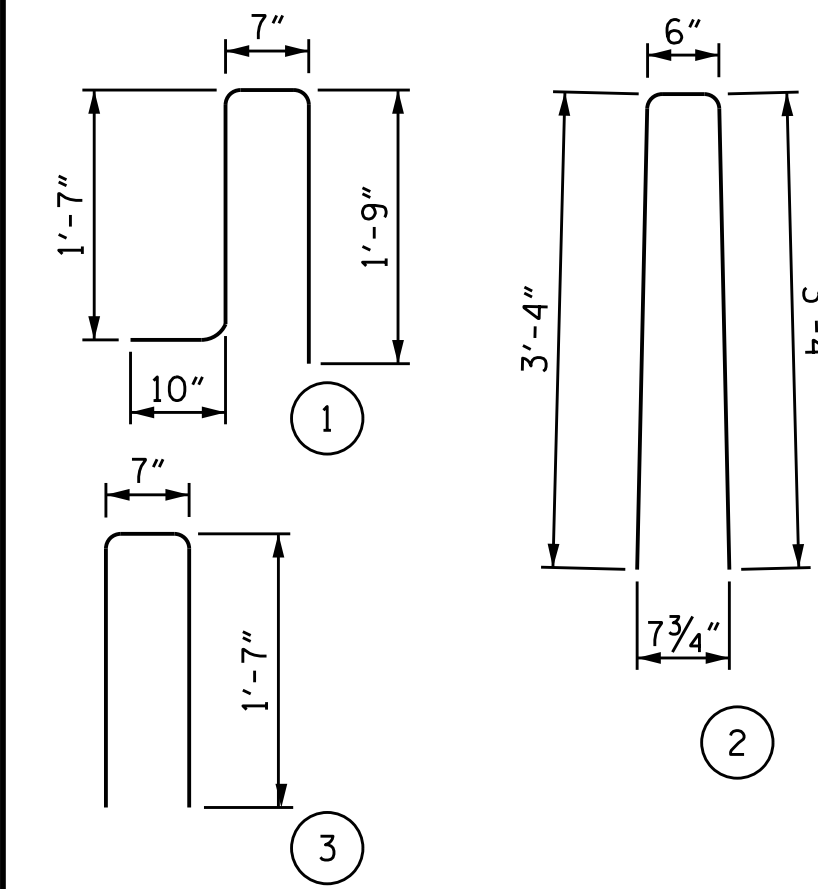
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5 S5 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AS PART OF STAGE II CONSTRUCTION. THE YIELD LOAD FOR THE #5 S5 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.

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL

#### STAGE I

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	120	#5	STR	24'-7"	3077
* B2	20	#5	STR	15'-2"	316
* S1	345	#5	1	4'-9"	1709
* S2	345	#5	2	7'-2"	2579
* S3	48	#5	STR	4'-0"	200
* S4	16	#5	STR	3'-6"	58

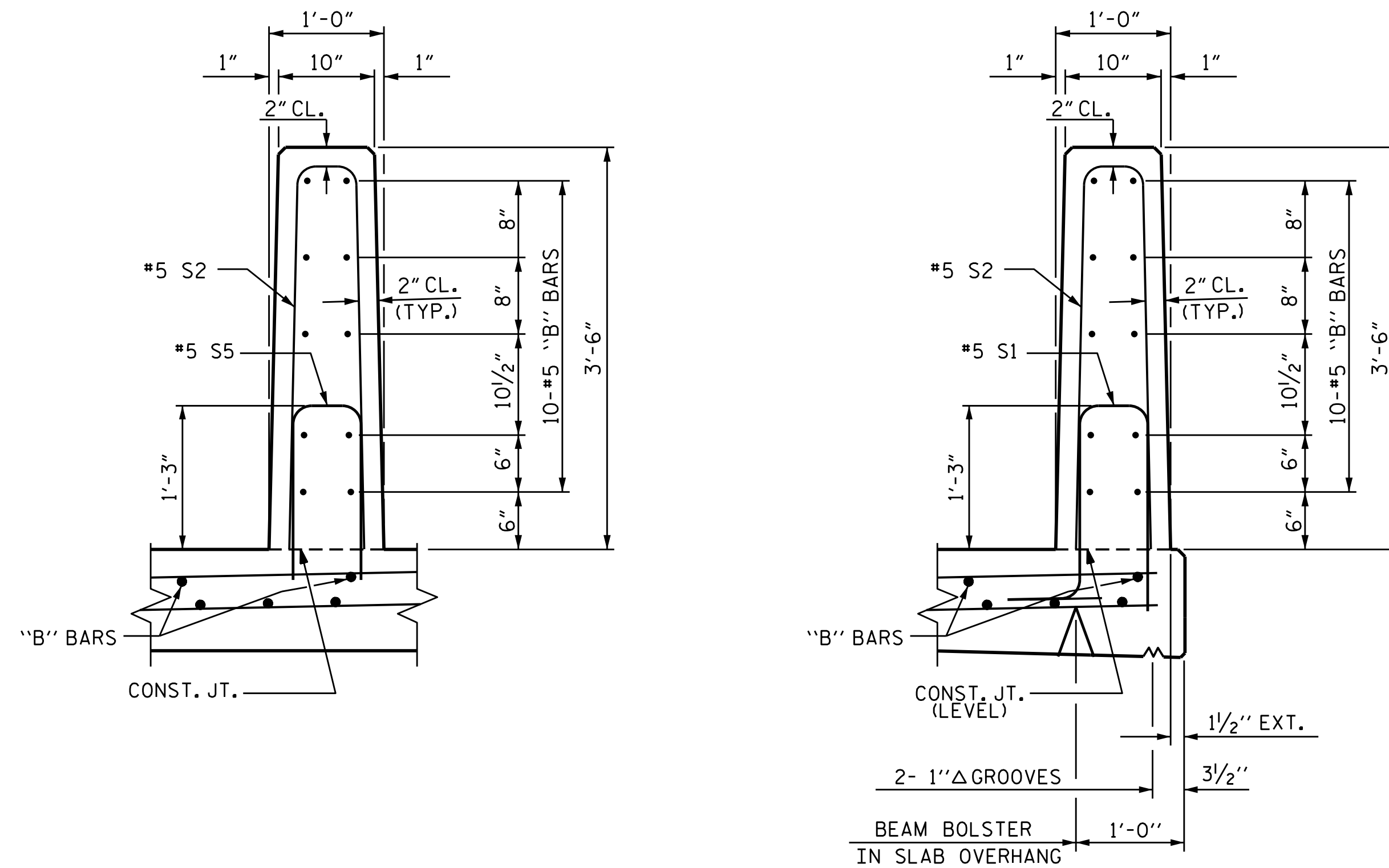
* EPOXY COATED REINFORCING STEEL	7939 LBS.
CLASS AA CONCRETE	42.0 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	353.35 LIN. FT.

#### STAGE II

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

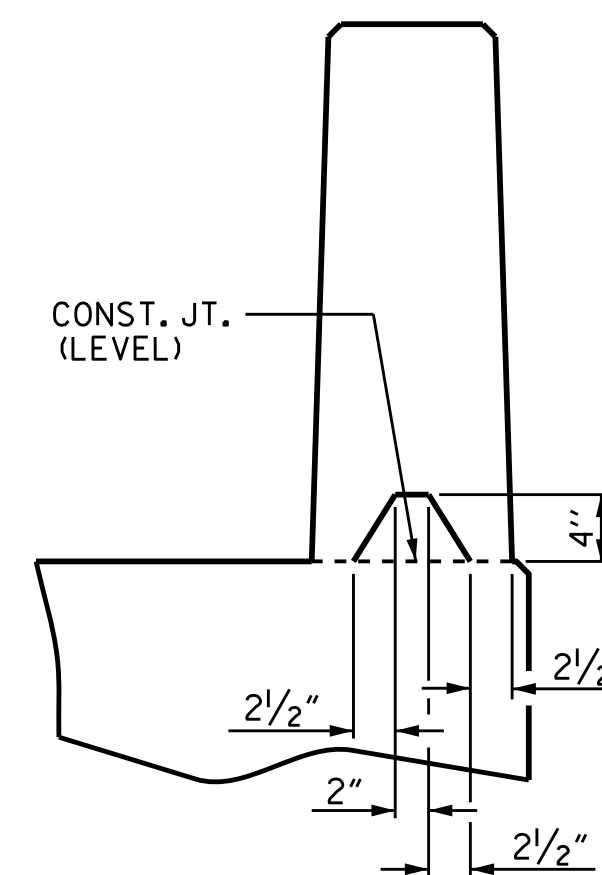
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	120	#5	STR	24'-7"	3077
* B2	20	#5	STR	15'-2"	316
* S2	345	#5	2	7'-2"	2579
* S3	48	#5	STR	4'-0"	200
* S4	16	#5	STR	3'-6"	58
* S5	345	#5	3	3'-9"	1349

* EPOXY COATED REINFORCING STEEL	7579 LBS.
CLASS AA CONCRETE	42.0 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	353.35 LIN. FT.

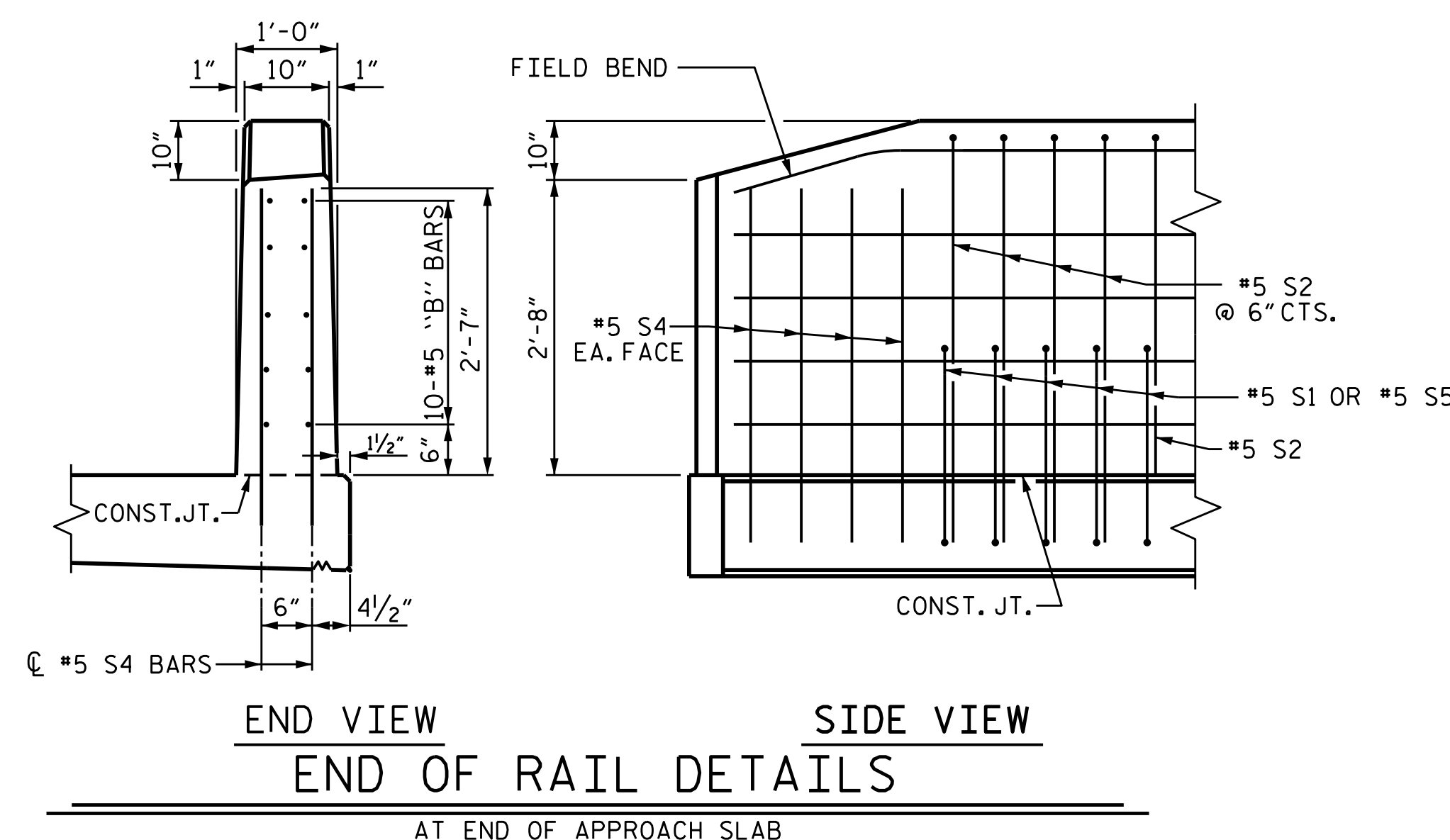


**SECTION THRU RAIL**  
STAGE II

**SECTION THRU RAIL**  
STAGE I



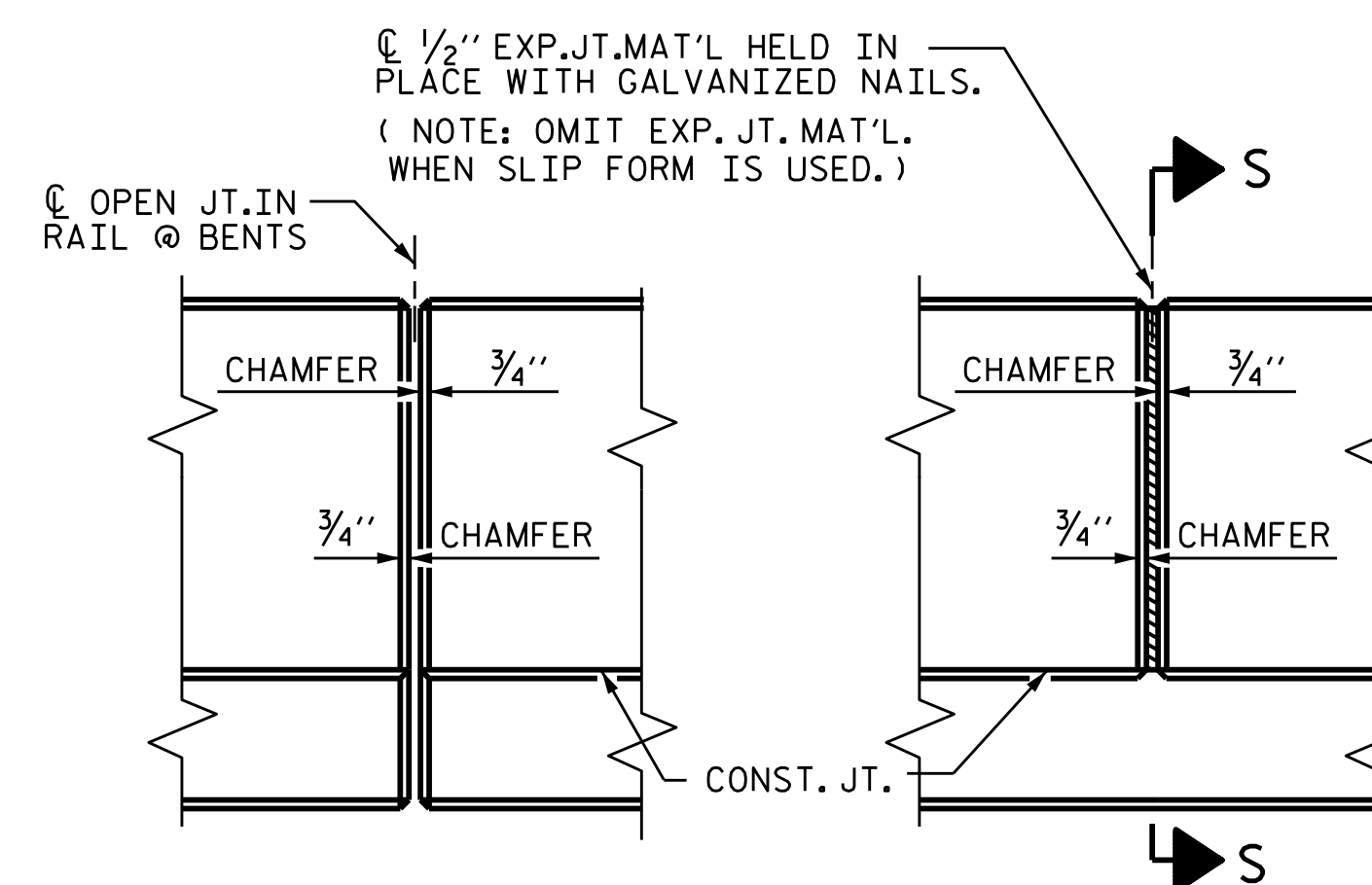
**SECTION S-S**  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



**END VIEW**  
**END OF RAIL DETAILS**

**SIDE VIEW**

AT END OF APPROACH SLAB



**ELEVATION AT EXPANSION JOINTS**  
**BARRIER RAIL DETAILS**



PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**VERTICAL CONCRETE BARRIER RAIL**

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : W.D. REAMS	DATE : 08/2019
DRAWN BY : MAA 5/10	REV. 6/13 MAA/GM
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS 33
2			4			

NOTES

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

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

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

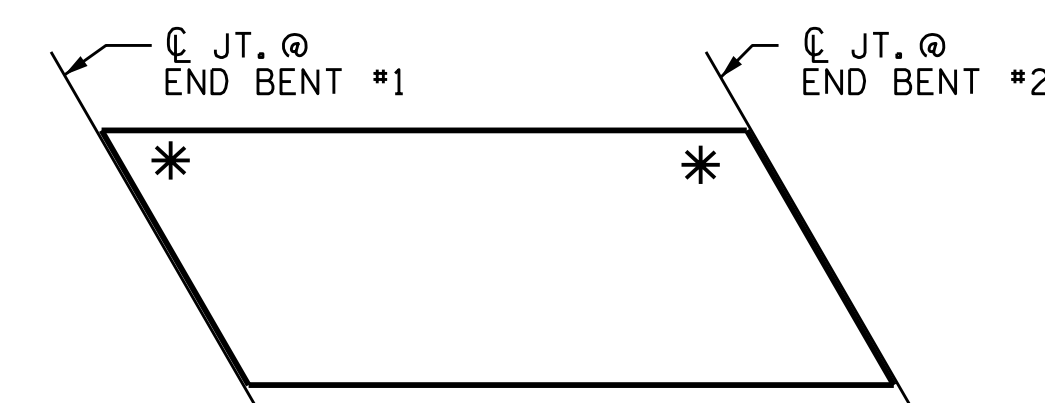
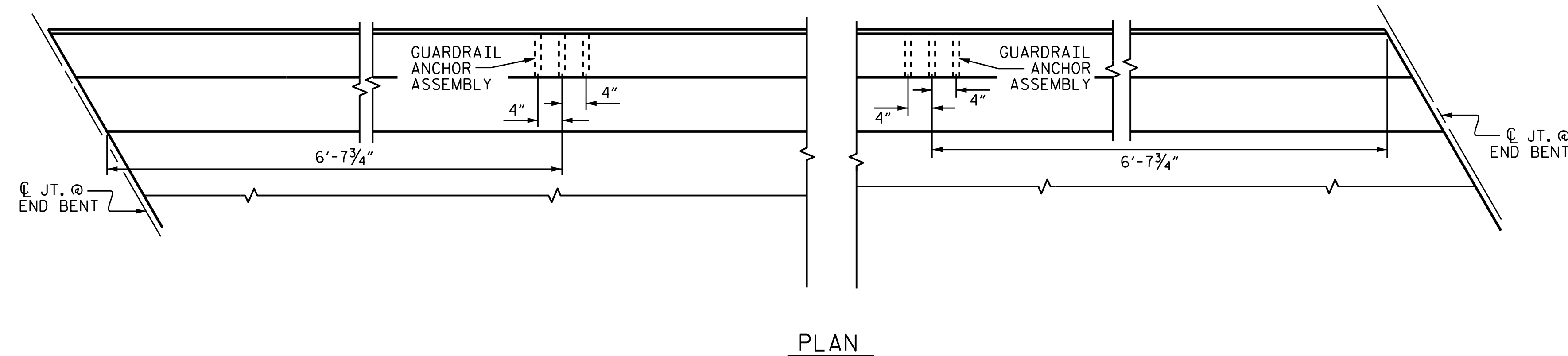
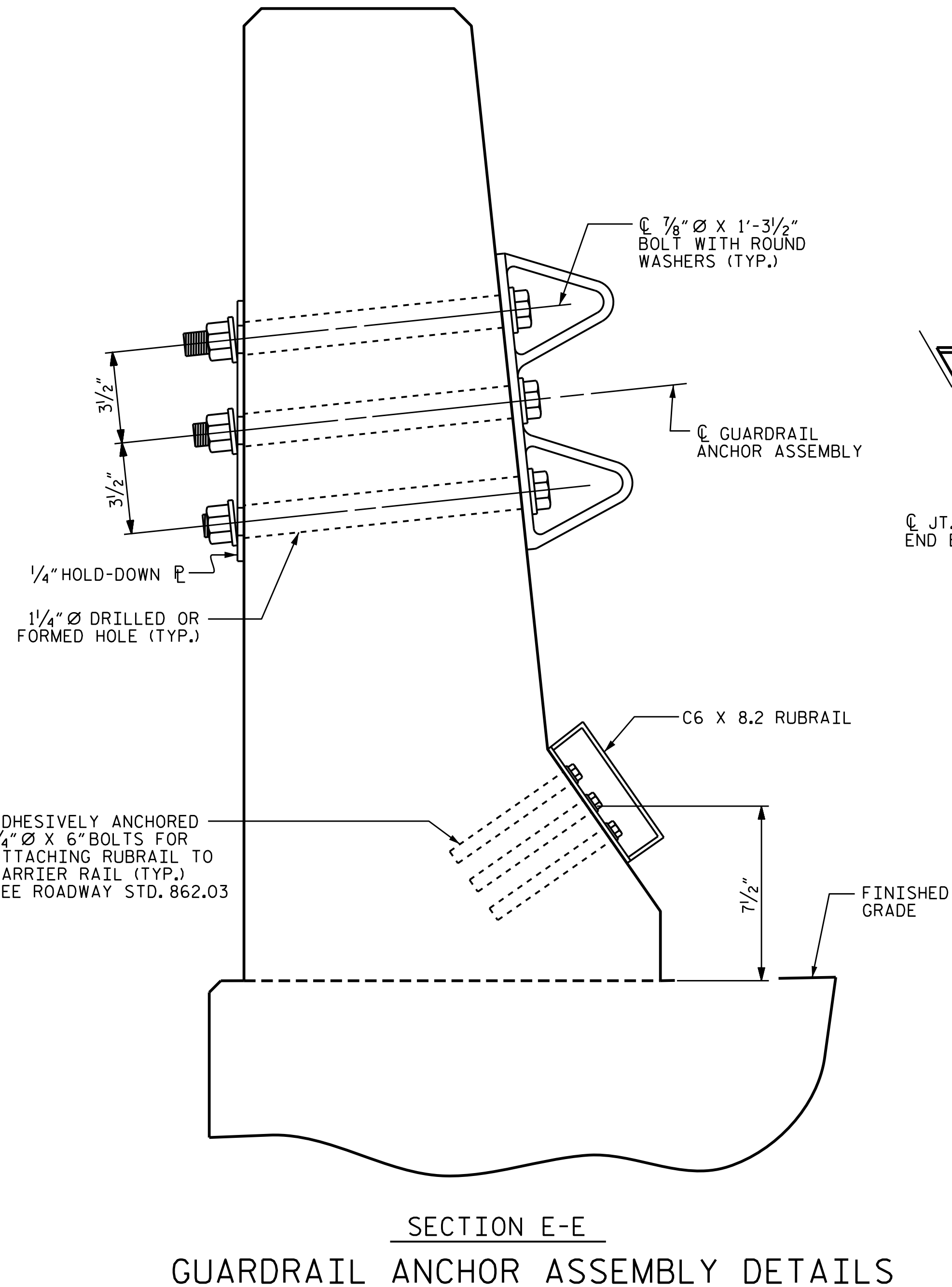
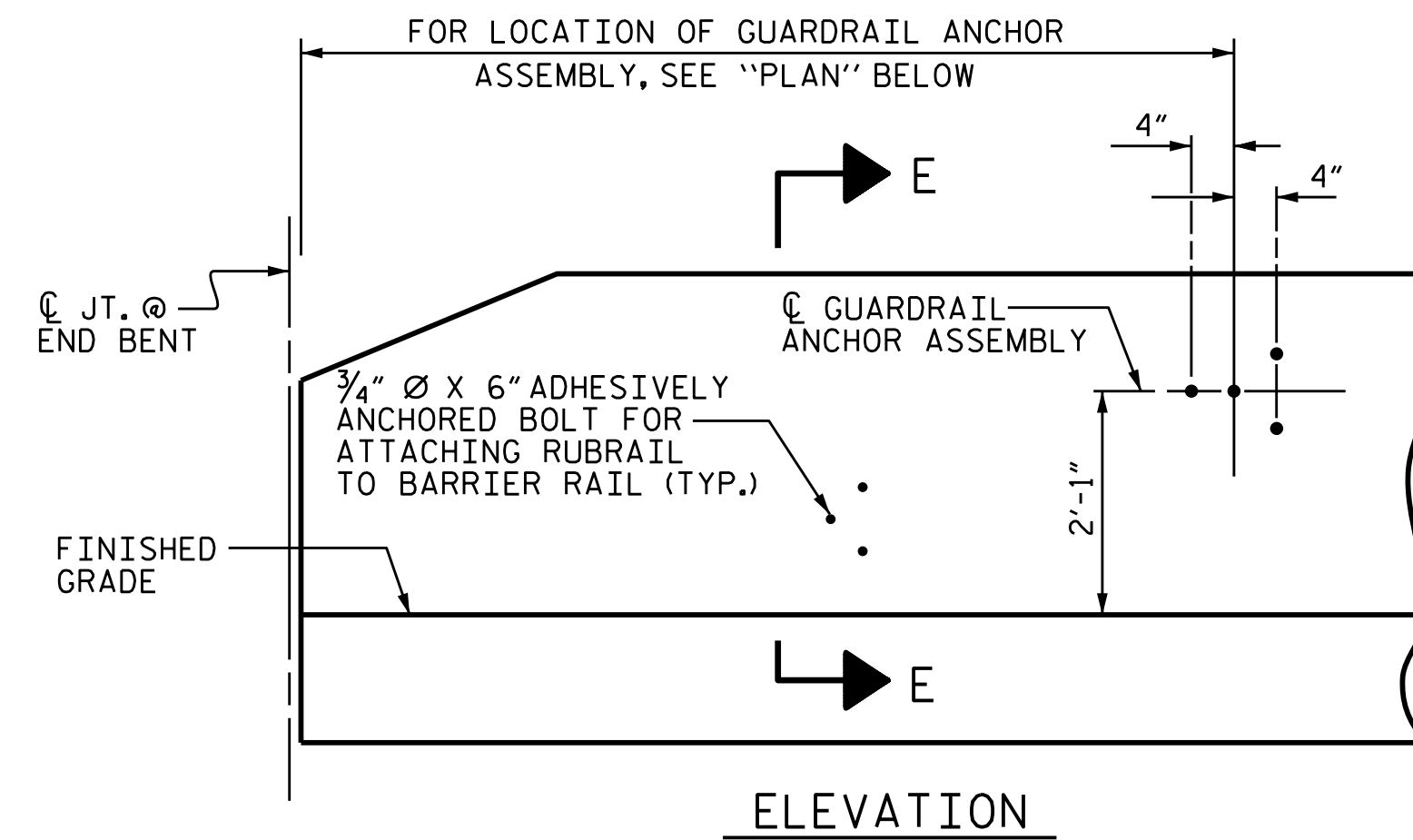
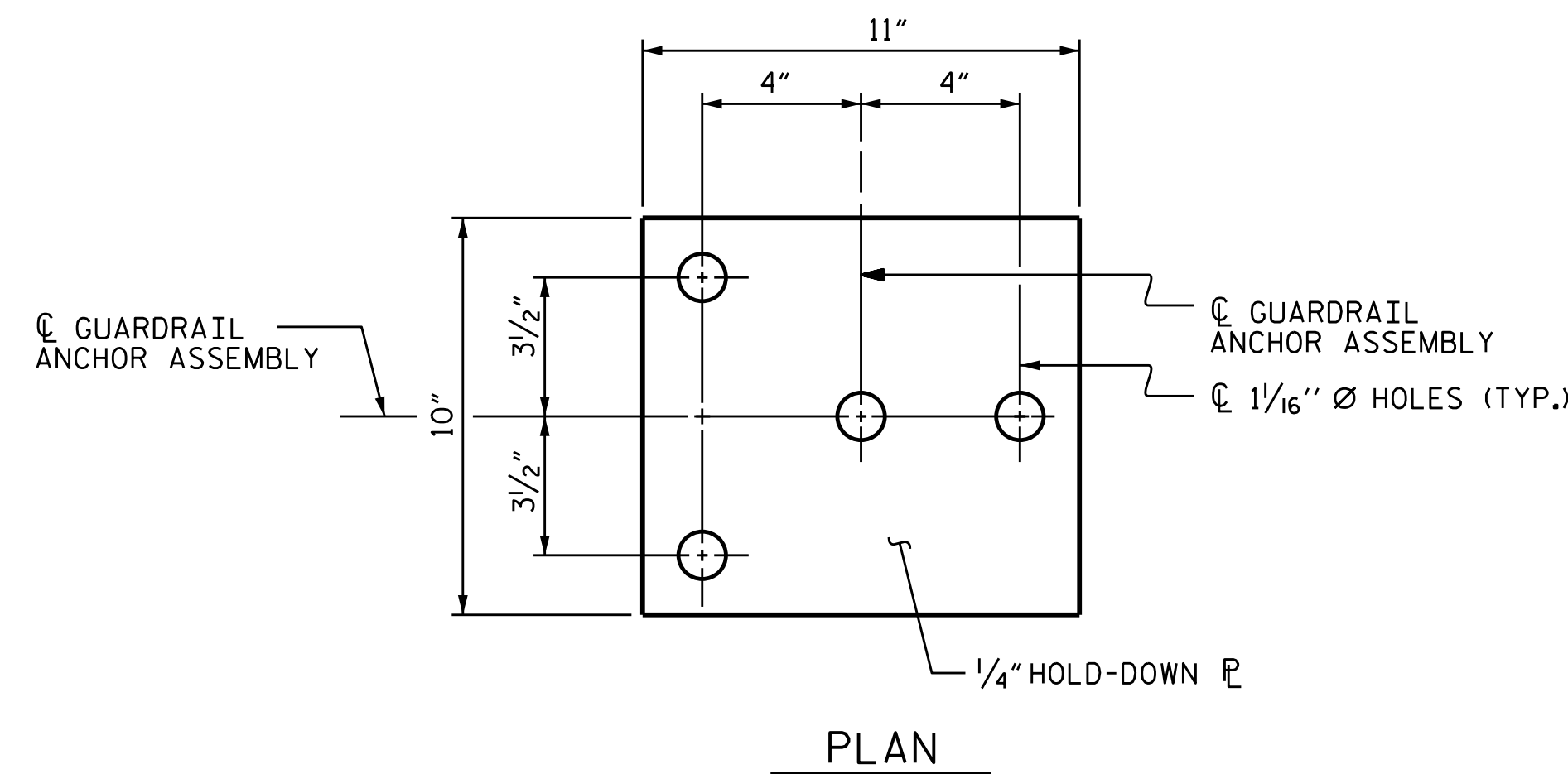
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

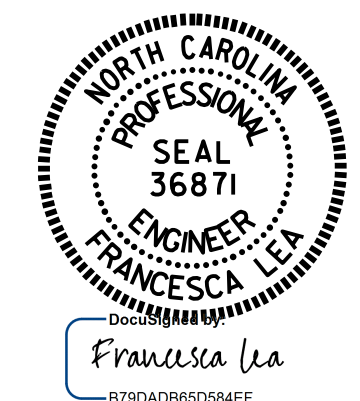
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



SKETCH SHOWING POINTS OF ATTACHMENTS  
\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 1 OF 2



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

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : W.D. REAMS	DATE : 08/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-19
2			4			33



NOTES

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

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.)

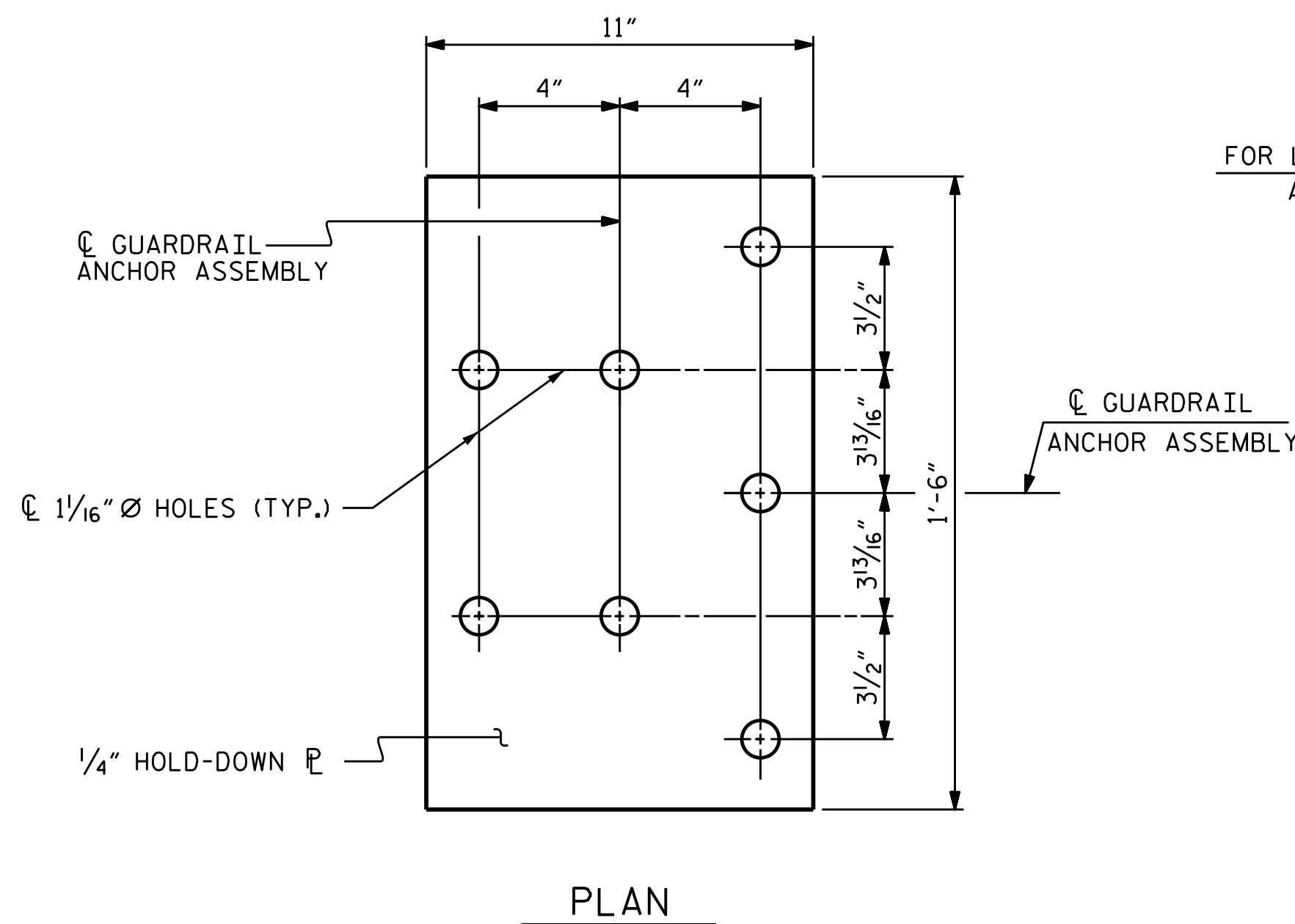
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

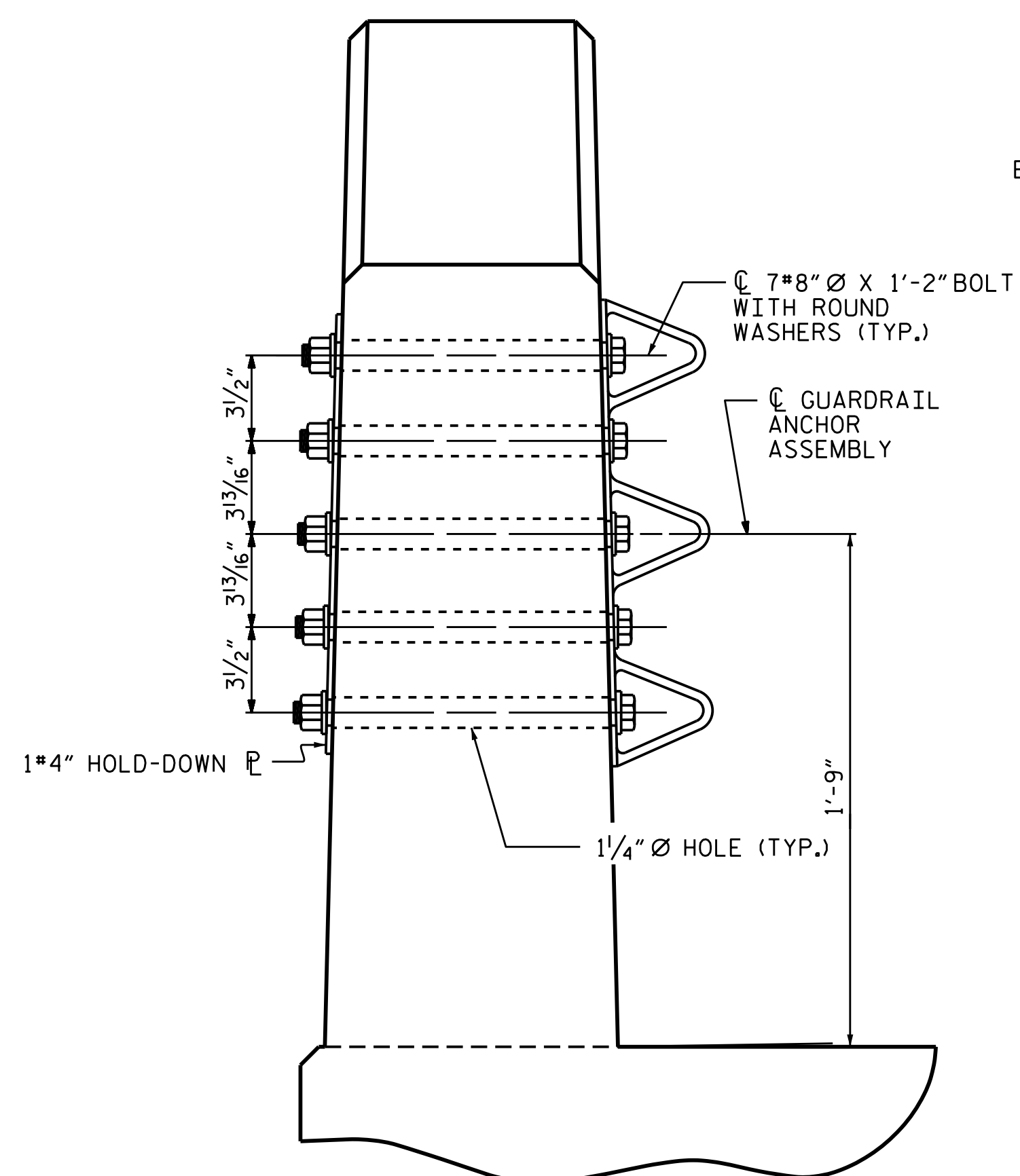
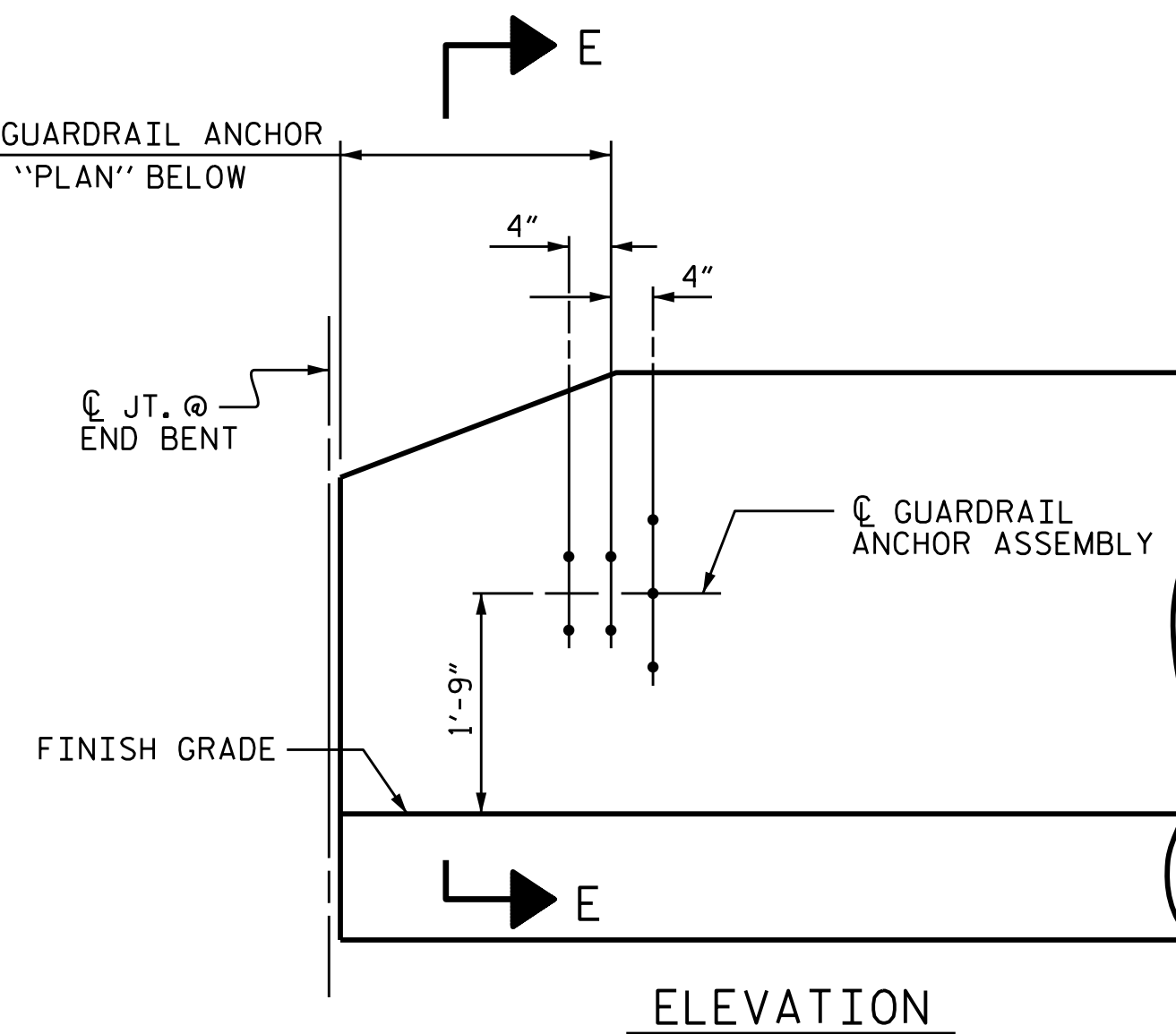
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

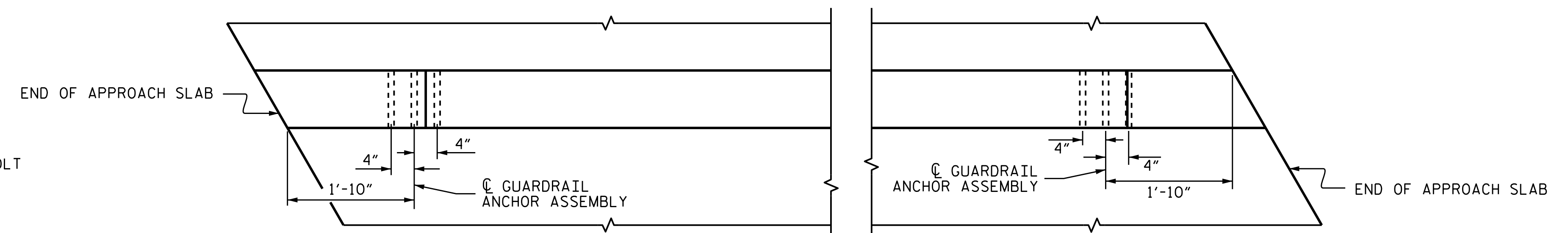
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

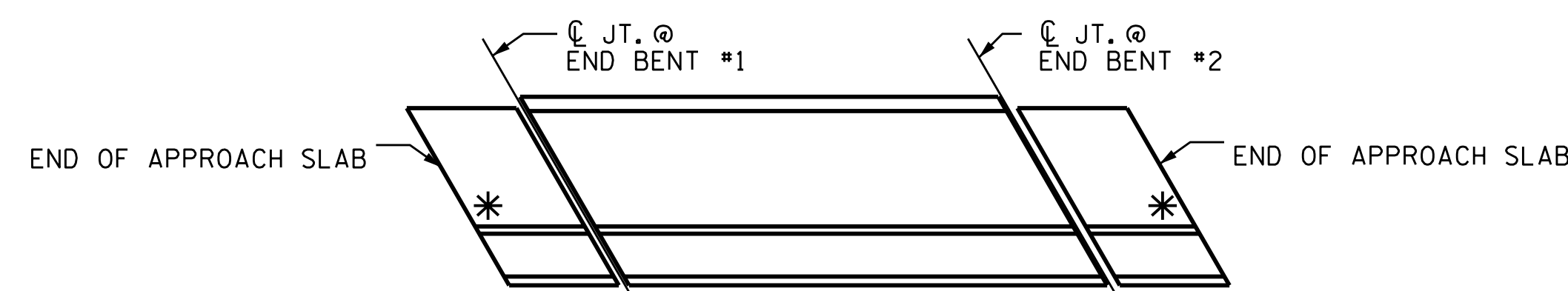


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



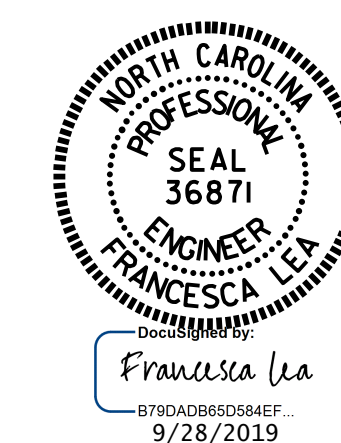
LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY



PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 2

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

ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : W.D. REAMS	DATE : 08/2019
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-20
2			4			33

REINFORCING BAR SCHEDULE													
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
* A1	1224	#5	STR	32'-6"	41491	A208	4	#5	STR	41'-7"	173		
A2	1224	#5	STR	32'-4"	41278	A209	4	#5	STR	39'-3"	164		
						A210	4	#5	STR	36'-11"	154		
* A101	4	#5	STR	58'-1"	242	A211	4	#5	STR	34'-6"	144		
* A102	4	#5	STR	55'-9"	233	A212	4	#5	STR	32'-2"	134		
* A103	4	#5	STR	53'-4"	223	A213	4	#5	STR	29'-10"	124		
* A104	4	#5	STR	51'-0"	213	A214	4	#5	STR	27'-6"	115		
* A105	4	#5	STR	48'-8"	203	A215	4	#5	STR	25'-1"	105		
* A106	4	#5	STR	46'-4"	193	A216	4	#5	STR	22'-9"	95		
* A107	4	#5	STR	43'-11"	183	A217	4	#5	STR	20'-5"	85		
* A108	4	#5	STR	41'-7"	173	A218	4	#5	STR	18'-1"	75		
* A109	4	#5	STR	39'-3"	164	A219	4	#5	STR	15'-8"	65		
* A110	4	#5	STR	36'-11"	154	A220	4	#5	STR	13'-4"	56		
* A111	4	#5	STR	34'-6"	144	A221	4	#5	STR	11'-0"	46		
* A112	4	#5	STR	32'-2"	134	A222	4	#5	STR	8'-8"	36		
* A113	4	#5	STR	29'-10"	124	A223	4	#5	STR	6'-3"	26		
* A114	4	#5	STR	27'-6"	115	A224	4	#5	STR	3'-11"	16		
* A115	4	#5	STR	25'-1"	105								
* A116	4	#5	STR	22'-9"	95	* B1	164	#4	STR	25'-10"	2830		
* A117	4	#5	STR	20'-5"	85	B2	486	#5	STR	52'-4"	26528		
* A118	4	#5	STR	18'-1"	75	* B3	22	#4	STR	29'-5"	432		
* A119	4	#5	STR	15'-8"	65	* B4	243	#7	STR	40'-10"	20282		
* A120	4	#5	STR	13'-4"	56	* B5	164	#4	STR	25'-5"	2784		
* A121	4	#5	STR	11'-0"	46								
* A122	4	#5	STR	8'-8"	36	* G1	4	#5	STR	34'-10"	145		
* A123	4	#5	STR	6'-3"	26	* K2	24	#5	2	9'-1"	227		
* A124	4	#5	STR	3'-11"	16	* K3	30	#5	STR	10'-3"	321		
A201	4	#5	STR	58'-1"	242								
A202	4	#5	STR	55'-9"	233								
A203	4	#5	STR	53'-4"	223	* S1	100	#5	3	4'-5"	461		
A204	4	#5	STR	51'-0"	213								
A205	4	#5	STR	48'-8"	203								
A206	4	#5	STR	46'-4"	193								
A207	4	#5	STR	43'-11"	183								
										REINFORCING STEEL	70,909	LBS.	
										* EPOXY COATED			
										REINFORCING STEEL	72,166	LBS.	

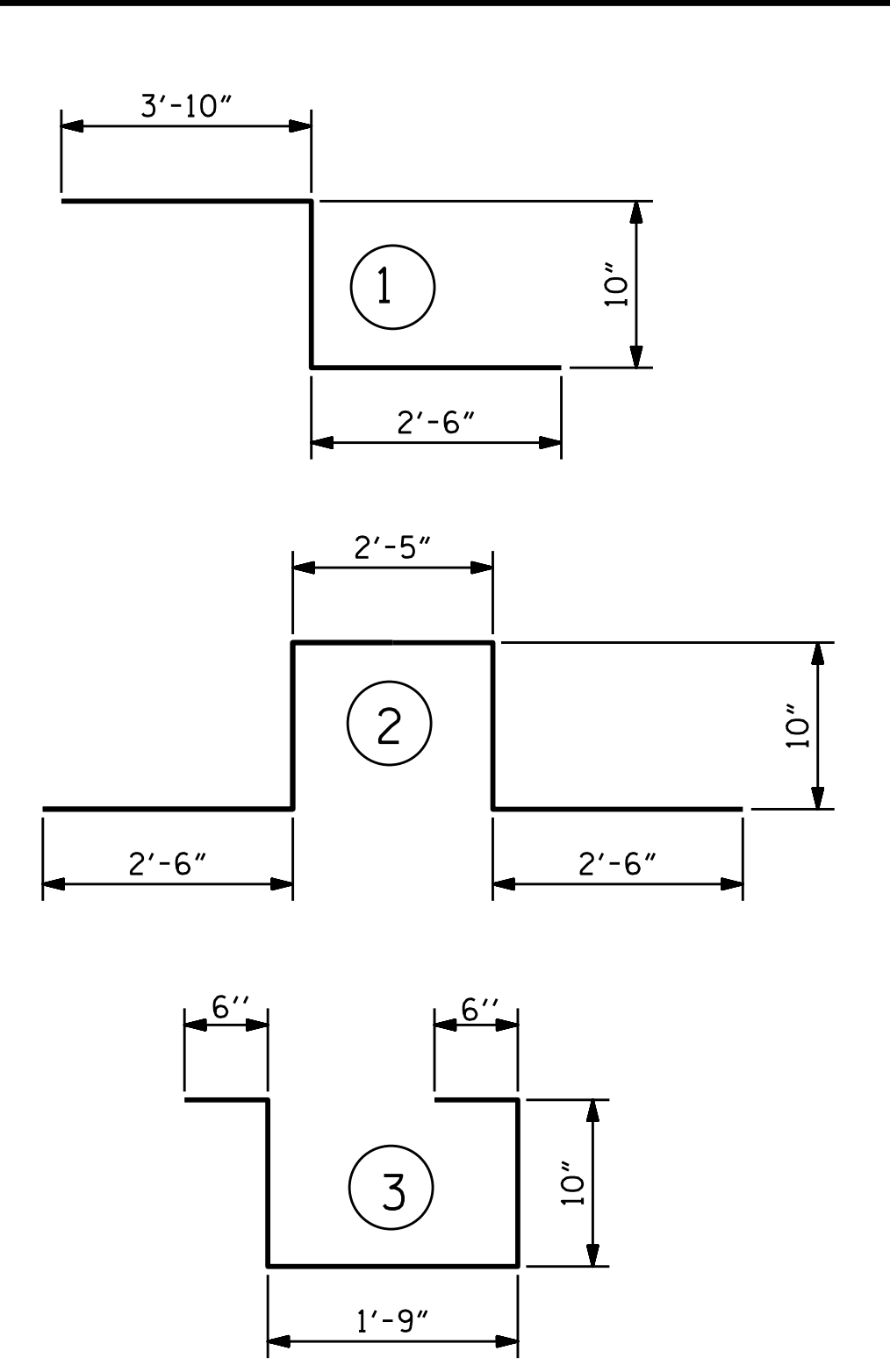
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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	2,748	SO.FT.
BRIDGE DECK	17,258	SO.FT.
TOTAL	20,006	SO.FT.

BAR TYPES

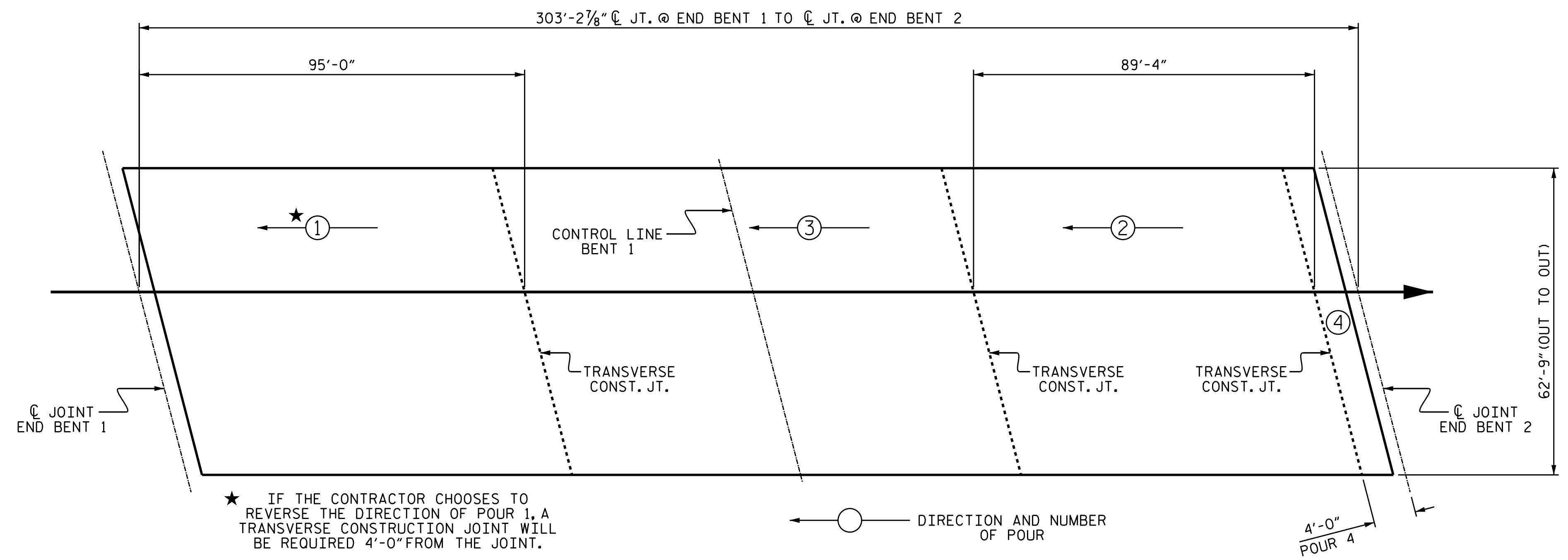


ALL BAR DIMENSIONS ARE OUT TO OUT

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE ( CU.YDS.)	REINFORCING STEEL ( LBS.)	EPOXY COATED REINFORCING STEEL ( LBS.)
ALL SPANS		70,909	72,166
POUR 1	209.8		
POUR 2	194.8		
POUR 3	250.0		
POUR 4	12.0		
TOTALS**	666.6	70,909	72,166

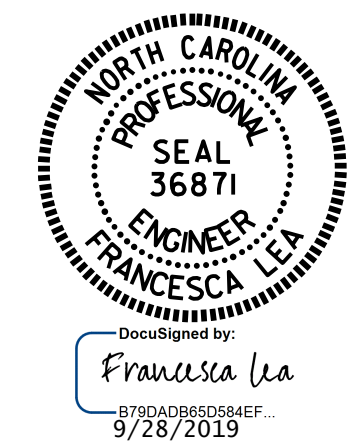
\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



\* IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR 1, A TRANSVERSE CONSTRUCTION JOINT WILL BE REQUIRED 4'-0" FROM THE JOINT.

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB ( SQ. FT. = 19,021 )

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-



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

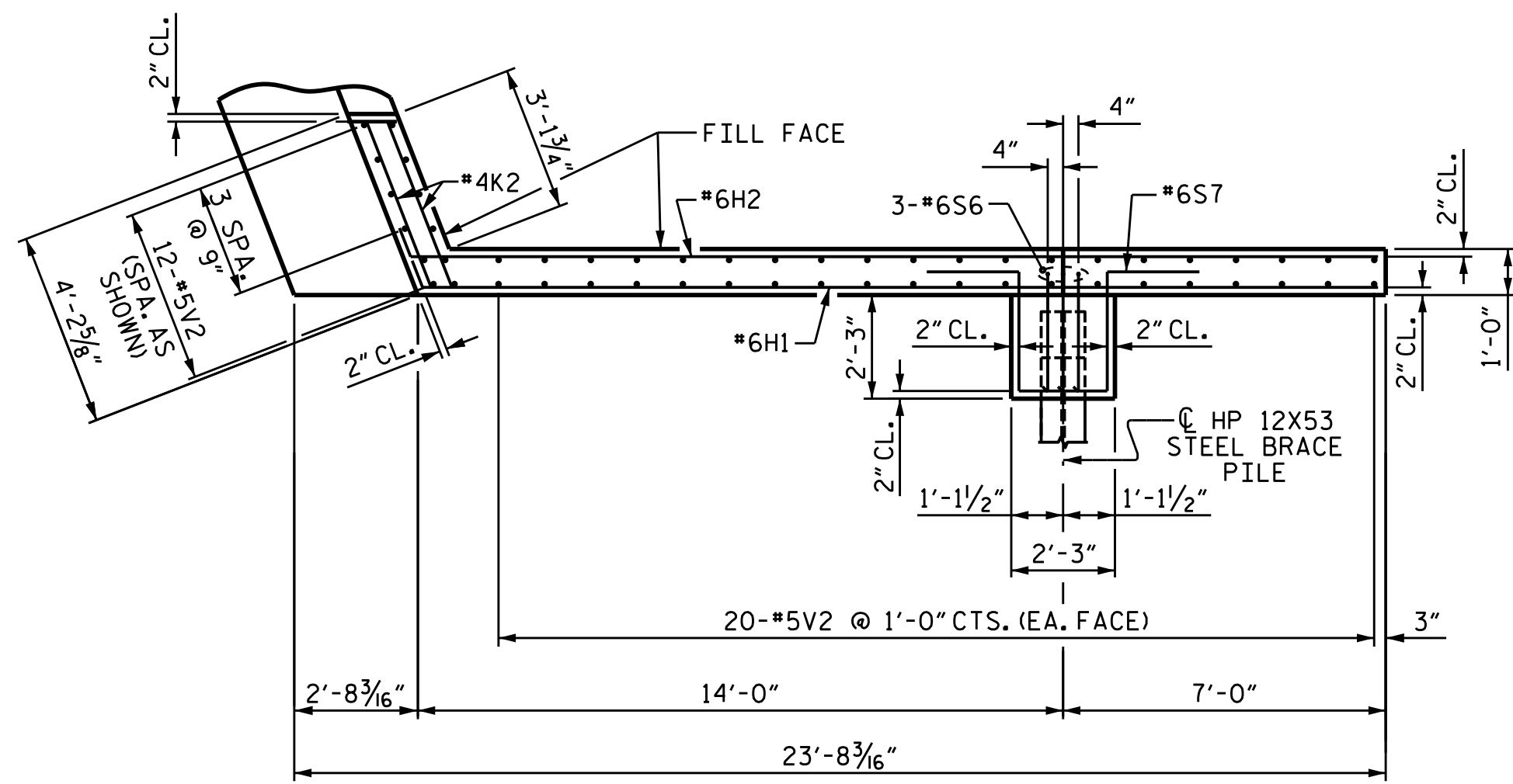
ASSEMBLED BY : K.W. ALFORD	DATE : 05/2019
CHECKED BY : F. LEA	DATE : 08/2019
DRAWN BY : JMB 5/87	REV. 10/1/11 MAA/GM
CHECKED BY : SJD 9/87	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

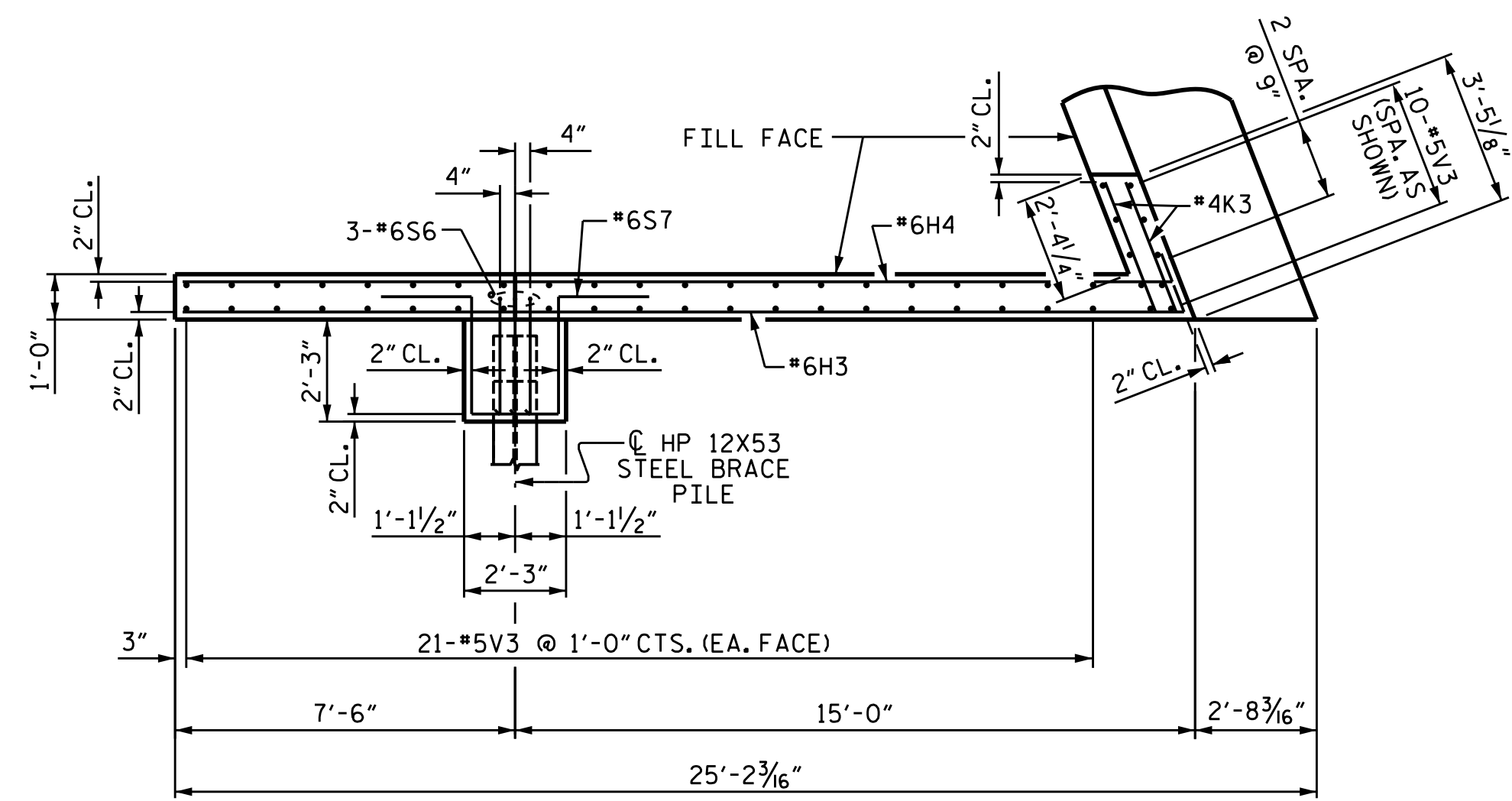
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S2-21
2			4			33



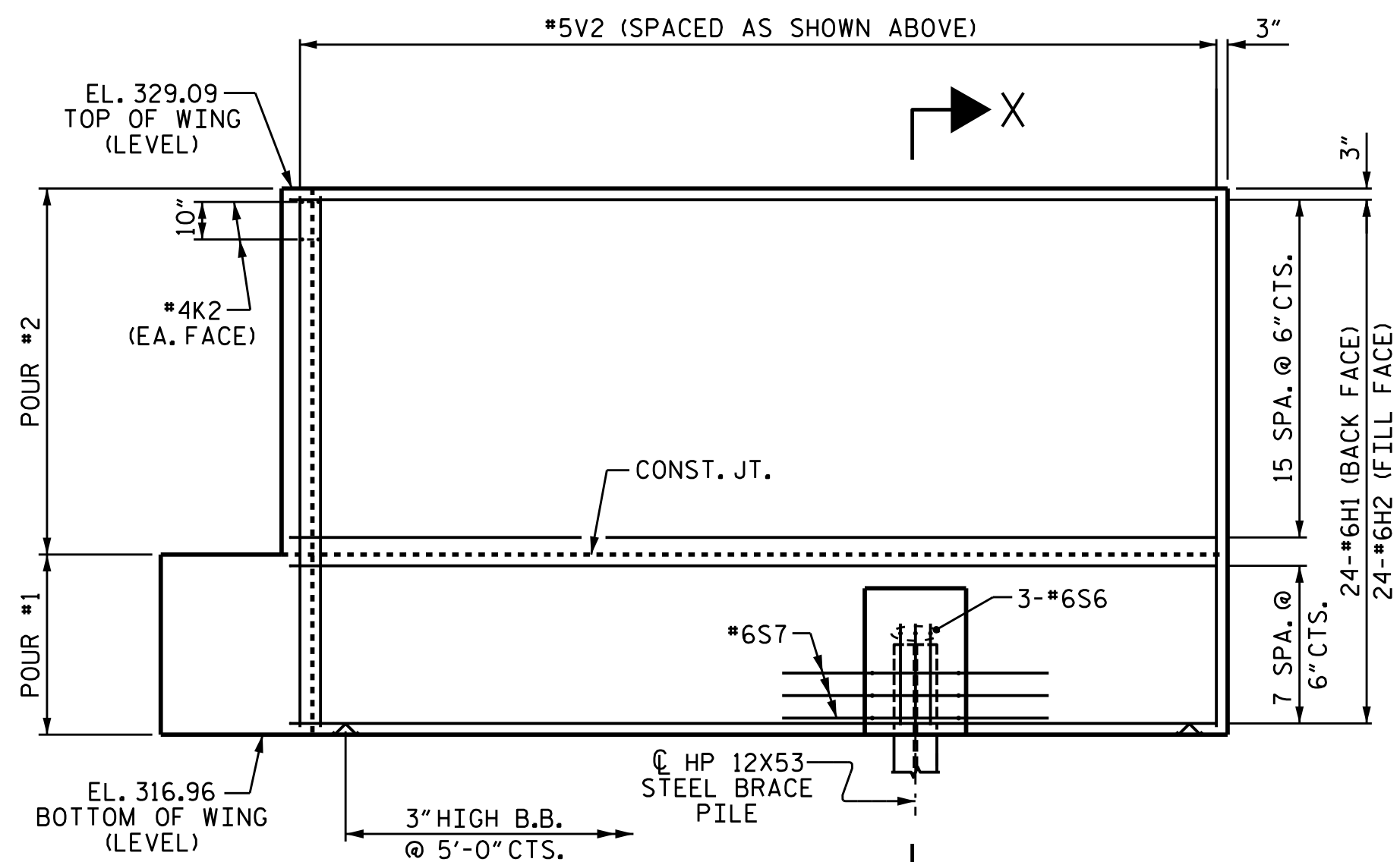




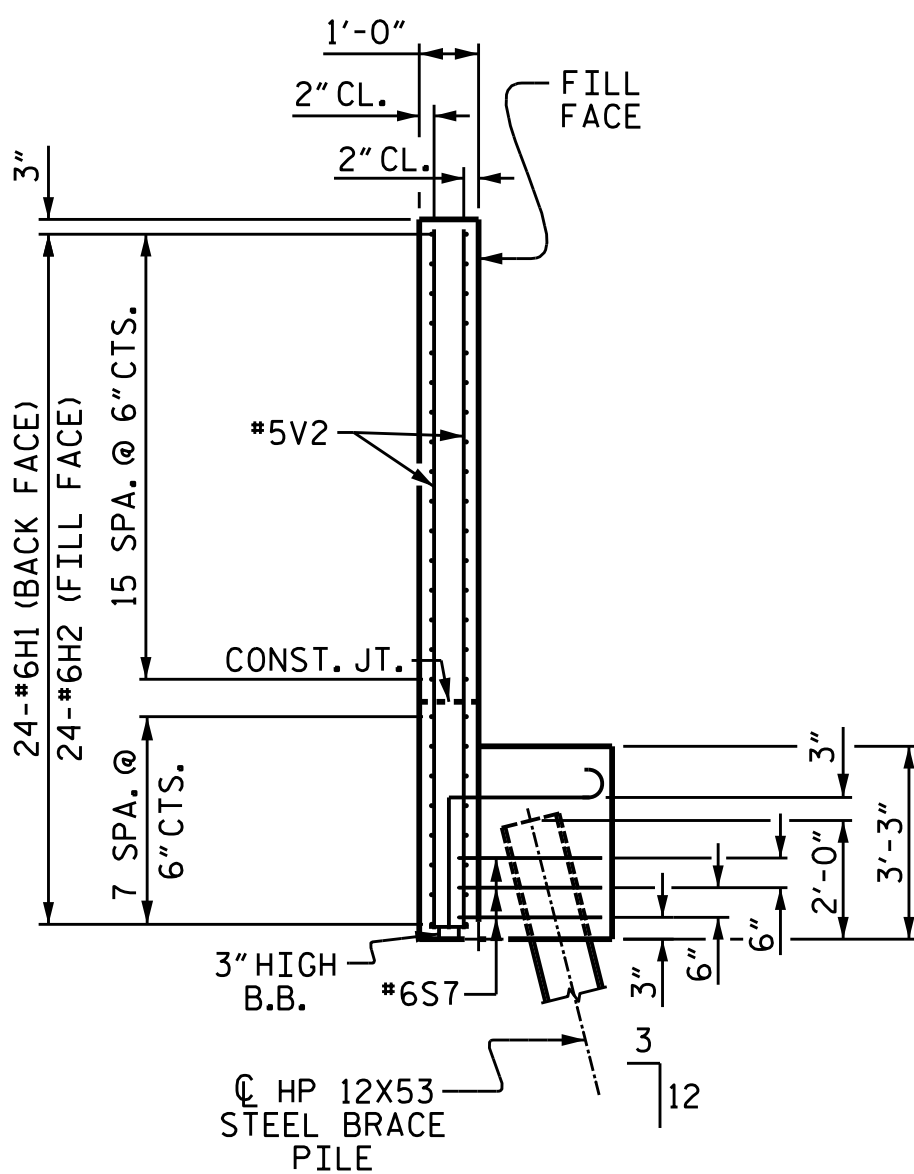
PLAN OF WING (W1)



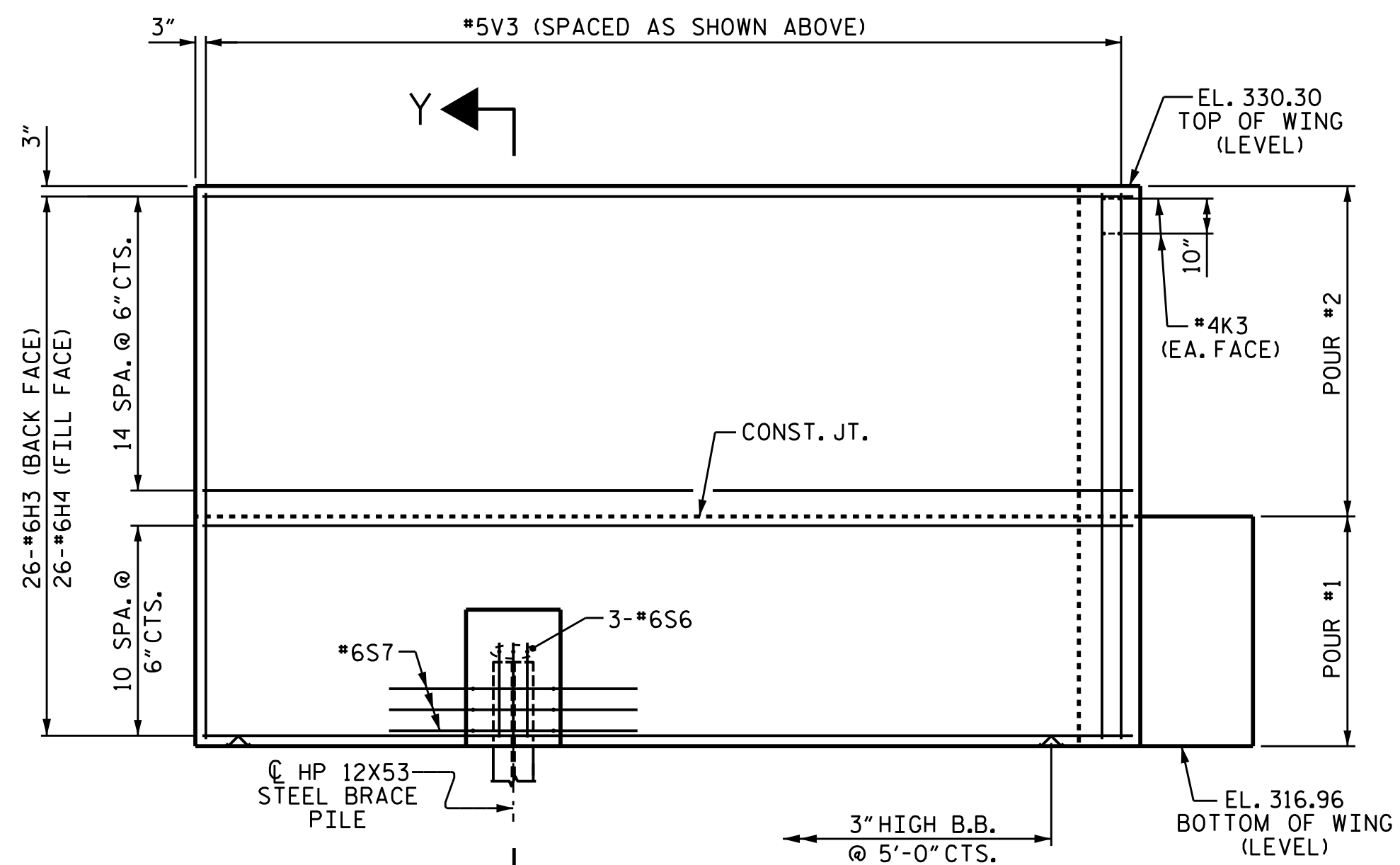
PLAN OF WING (W2)



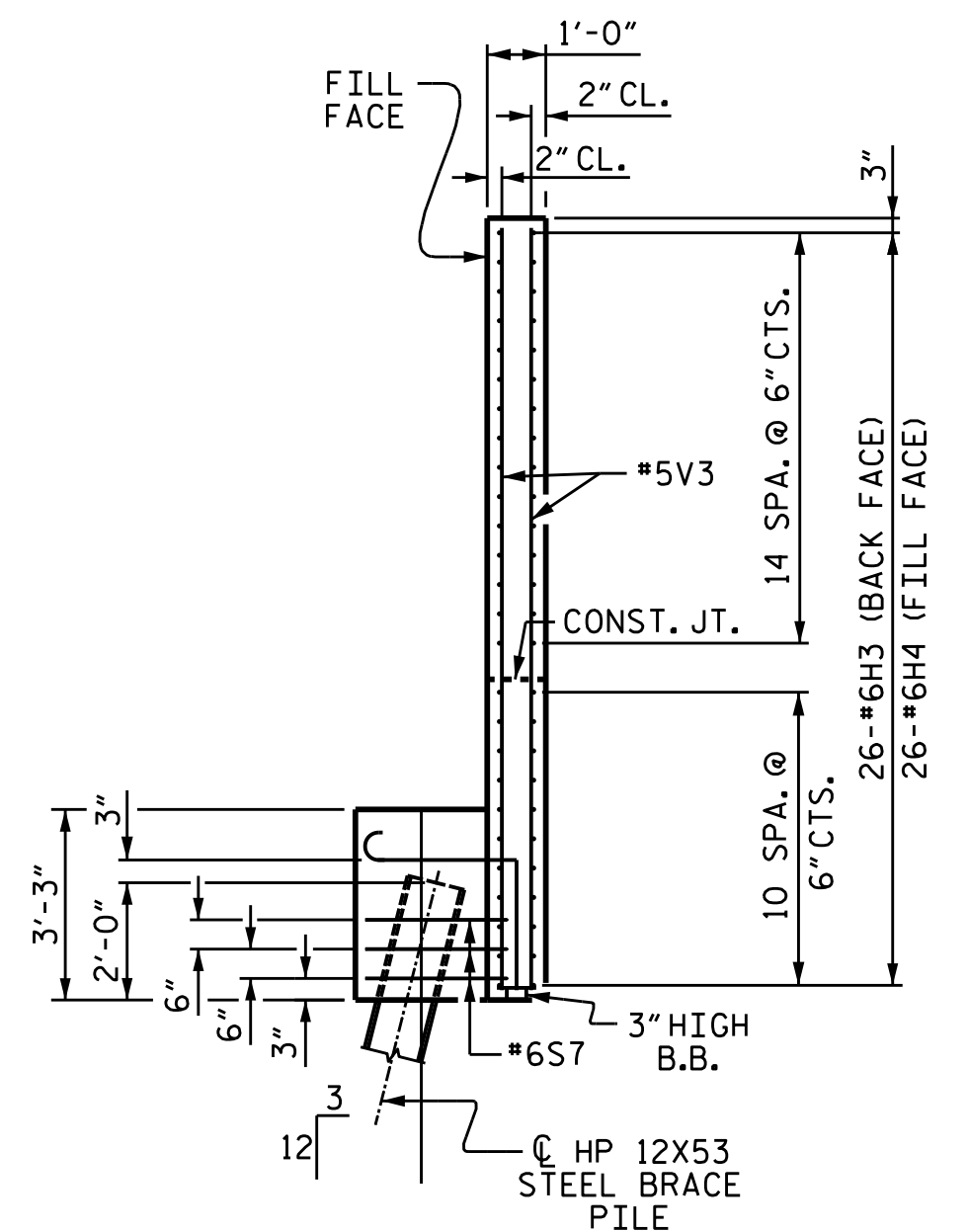
ELEVATION OF WING (W1)



SECTION X-X



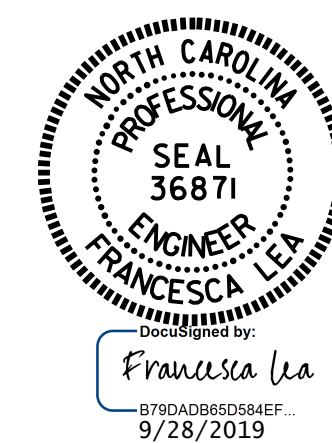
ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 2 OF 3



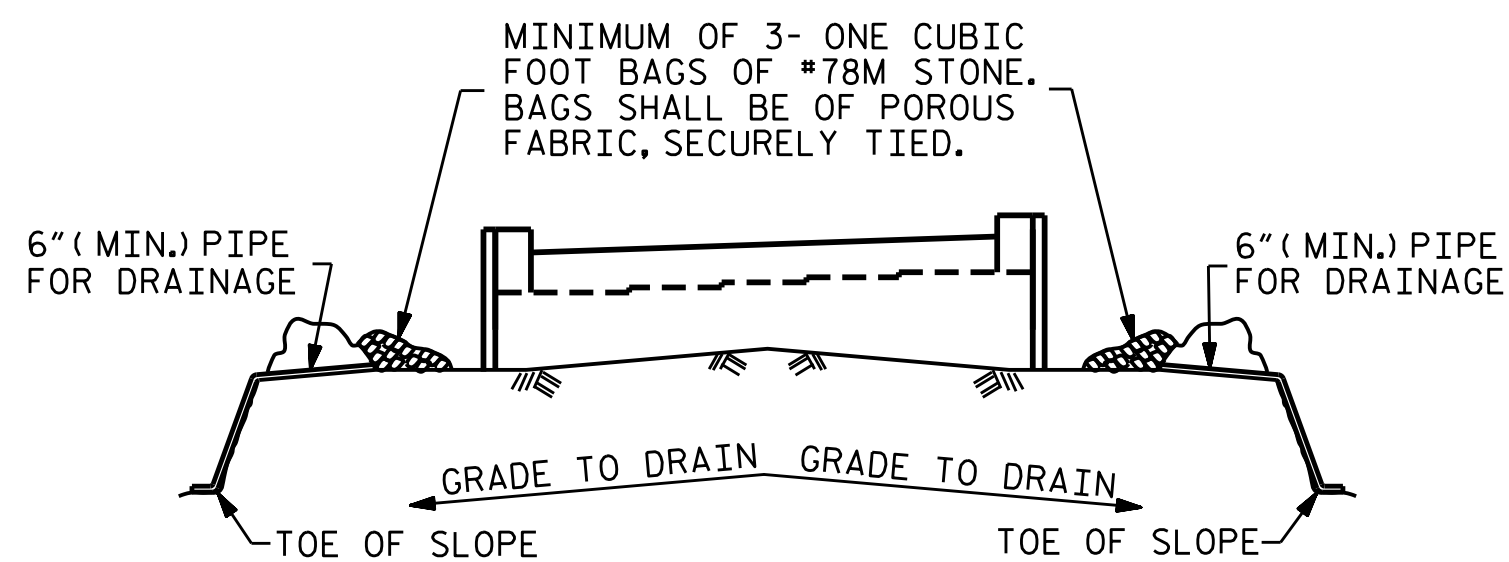
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1

DRAWN BY: M.K. BEARD DATE: 7/31/19  
 CHECKED BY: D. SHACKELFORD DATE: 8/5/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE: 7/22/19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-23
1			3			TOTAL SHEETS
2			4			33



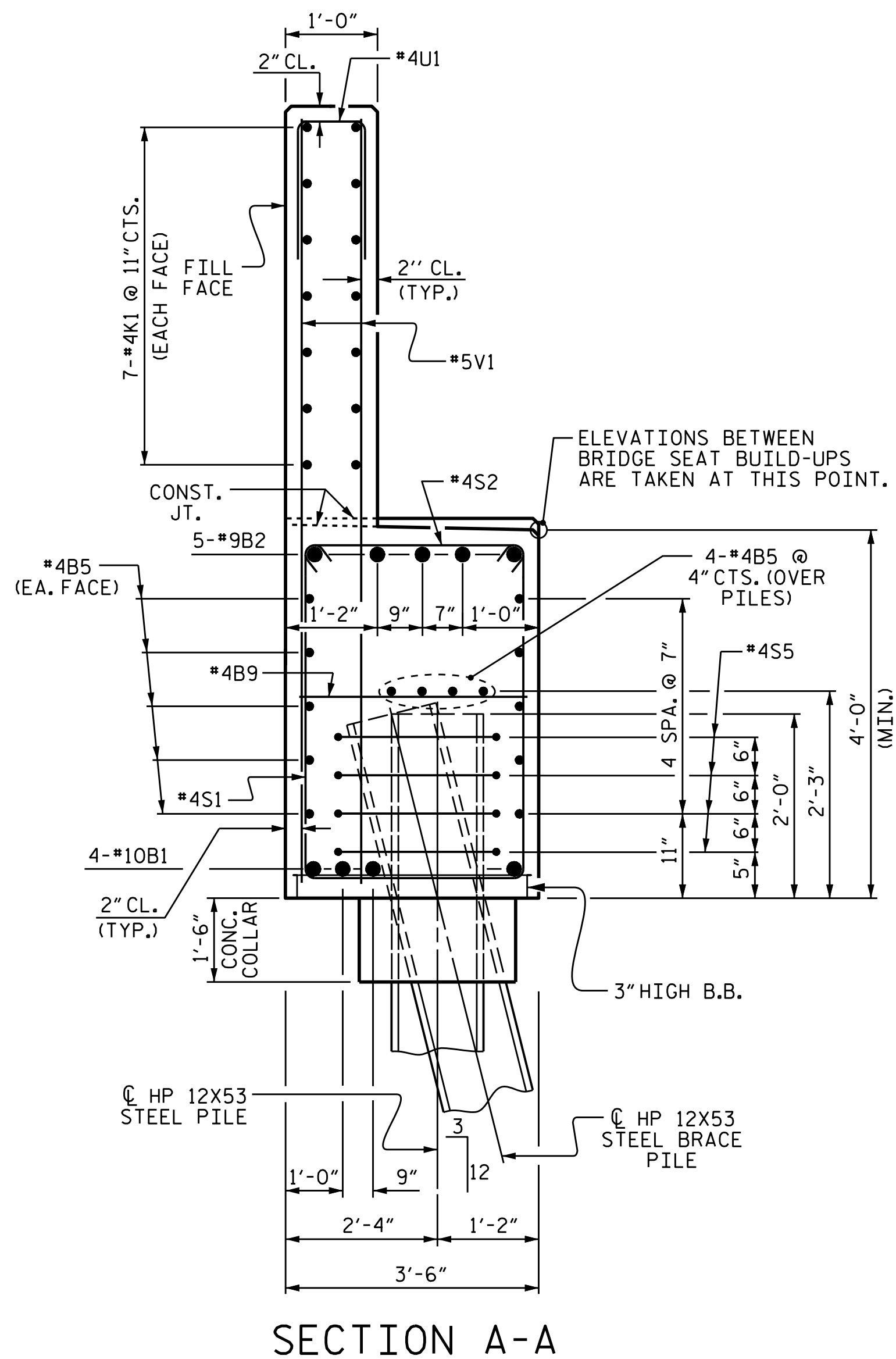


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

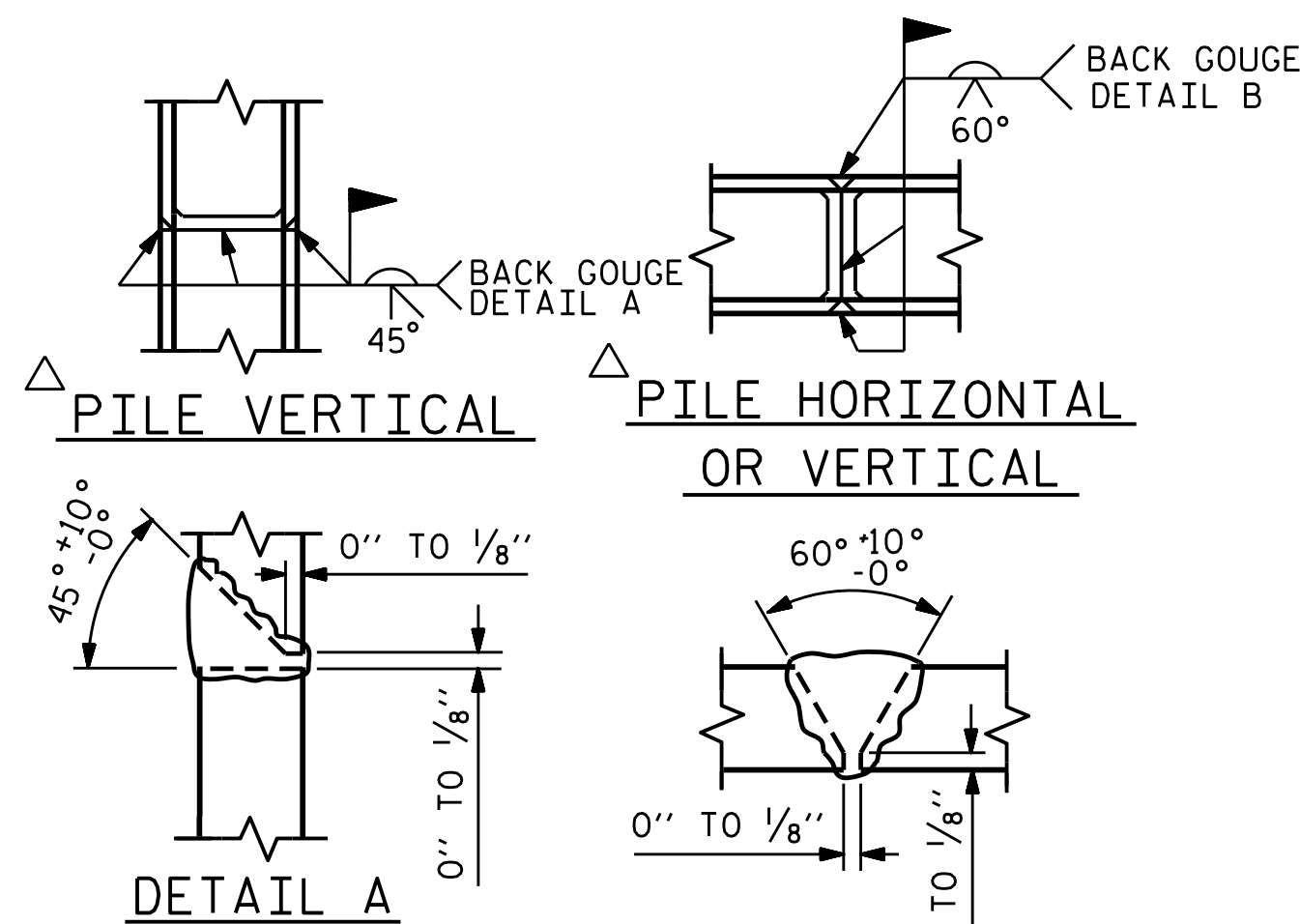
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**



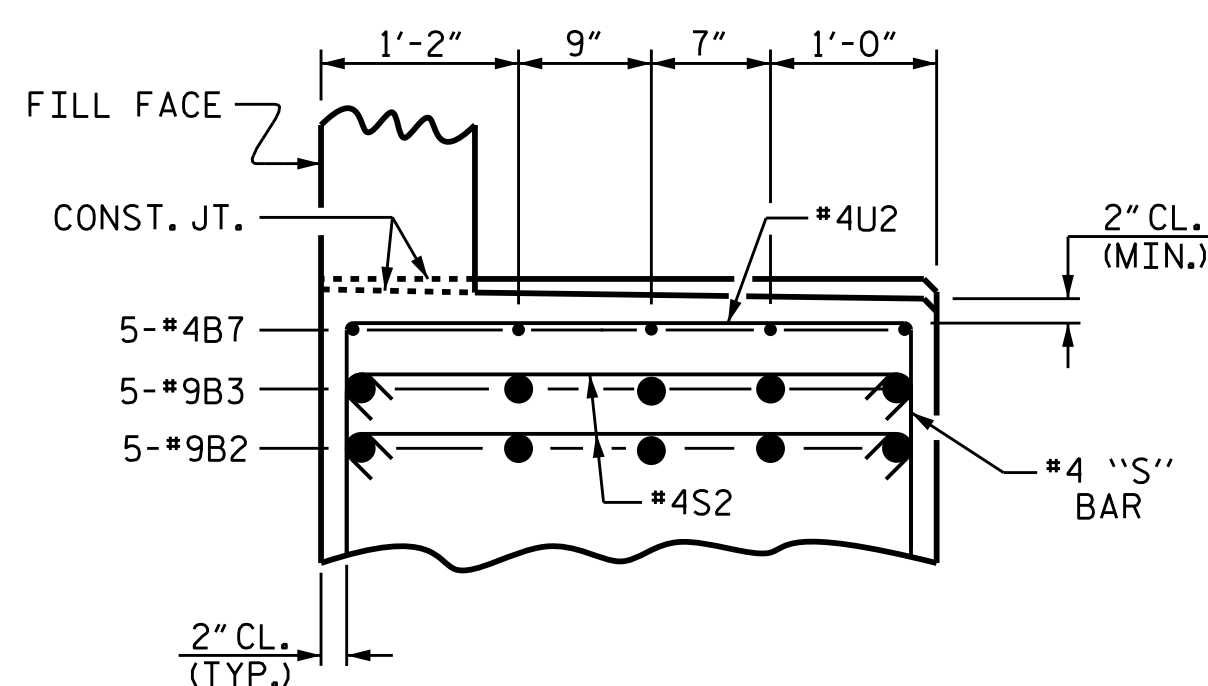
**SECTION A-A**

DRAWN BY : M.K. BEARD DATE : 7/31/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/5/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 7/22/19

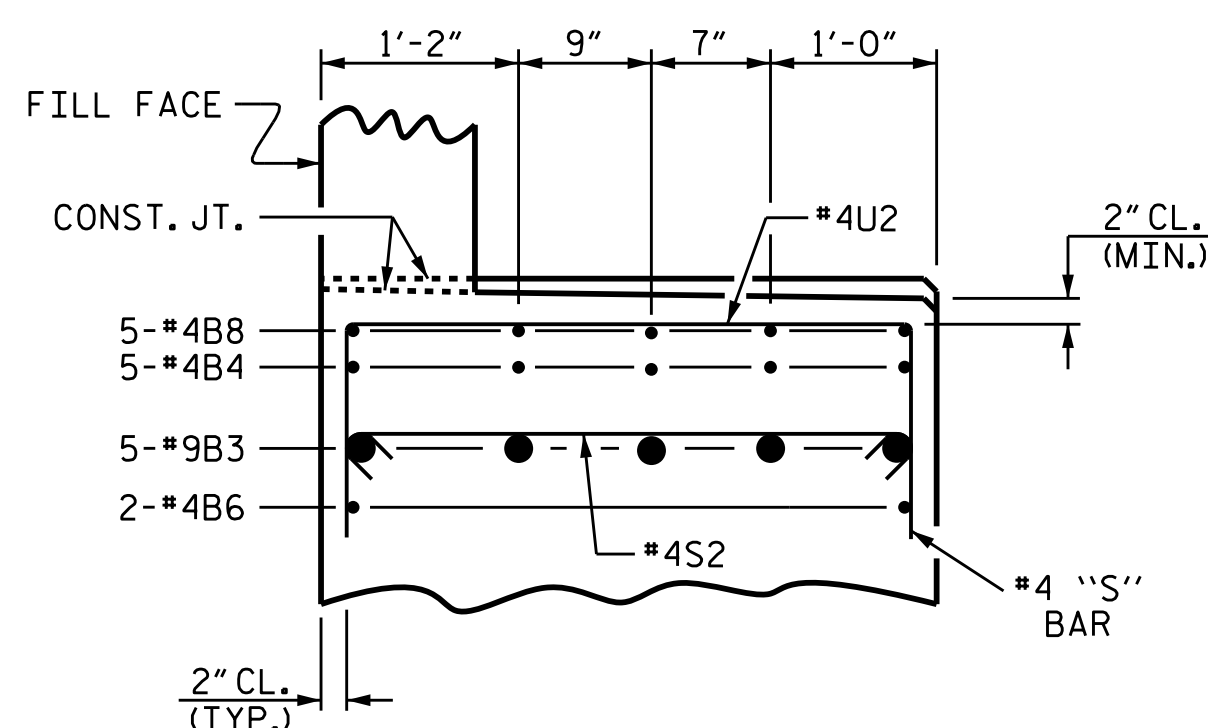


POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**

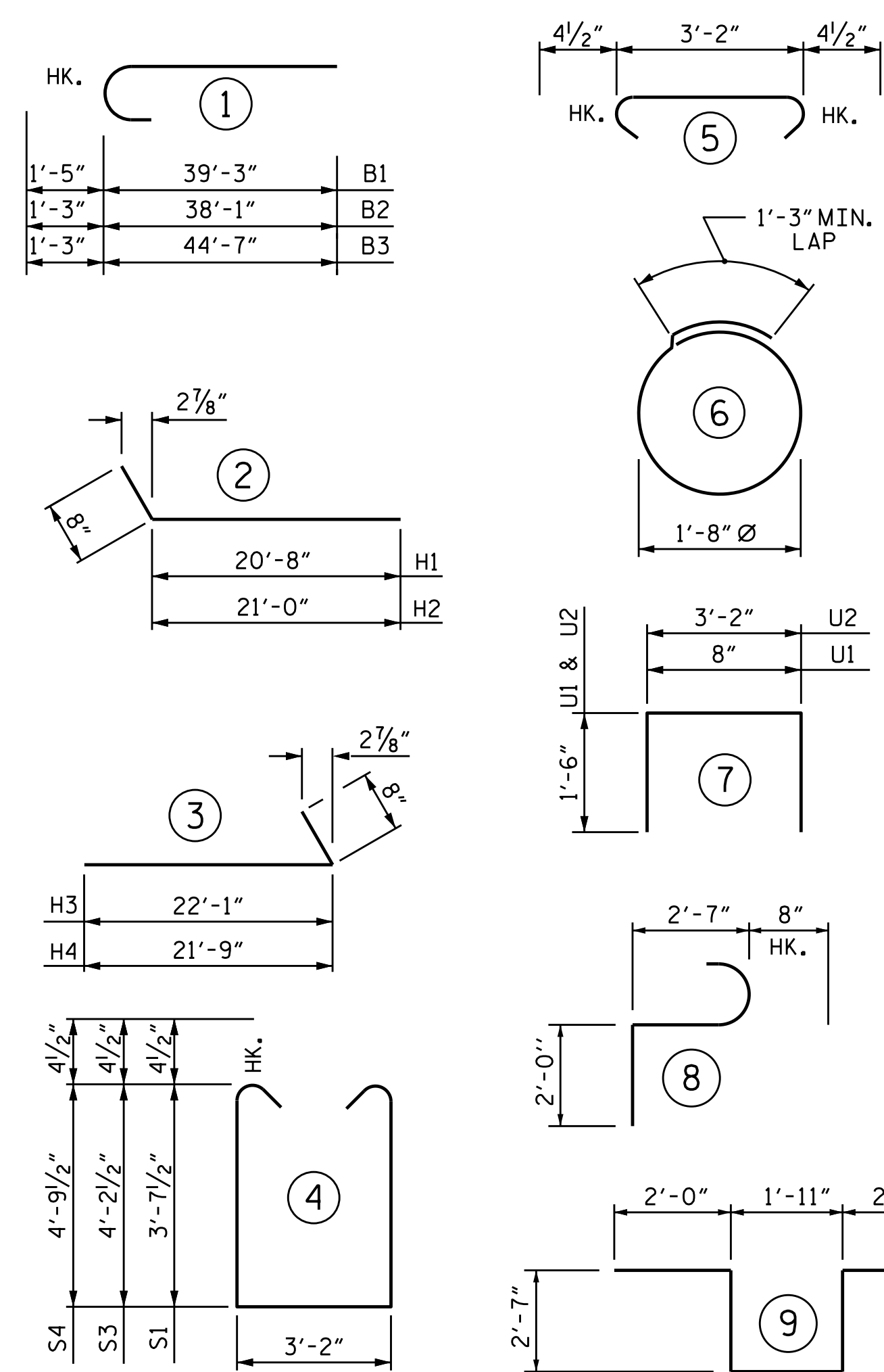


**PARTIAL SECTION B-B**

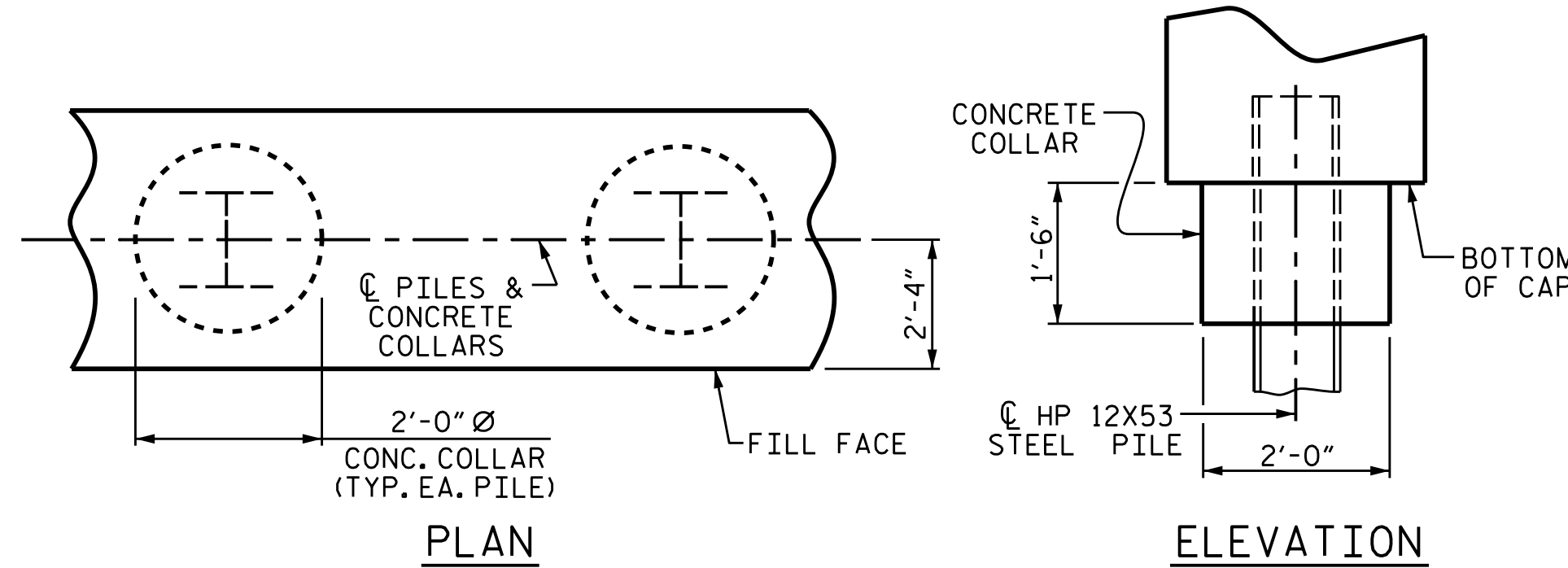


**PARTIAL SECTION C-C**

**BAR TYPES**



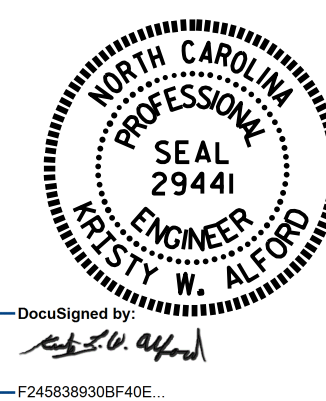
ALL BAR DIMENSIONS ARE OUT TO OUT.



**CORROSION PROTECTION FOR STEEL PILES DETAIL**

BILL OF MATERIAL					
END BENT 1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	40'-8"	1400
B2	5	#9	1	39'-4"	669
B3	5	#9	1	45'-10"	779
B4	5	#4	STR	19'-11"	66
B5	28	#4	STR	38'-1"	711
B6	2	#4	STR	38'-10"	52
B7	10	#4	STR	12'-2"	81
B8	5	#4	STR	7'-7"	26
B9	18	#4	STR	3'-2"	38
H1	24	#6	2	21'-4"	769
H2	24	#6	2	21'-8"	781
H3	26	#6	3	22'-9"	888
H4	26	#6	3	22'-5"	875
K1	28	#4	STR	38'-6"	720
K2	4	#4	STR	3'-10"	10
K3	4	#4	STR	3'-0"	8
S1	32	#4	4	11'-2"	239
S2	81	#4	5	3'-11"	212
S3	27	#4	4	12'-4"	222
S4	22	#4	4	13'-6"	198
S5	48	#4	6	6'-6"	208
S6	6	#6	9	5'-3"	47
S7	6	#6	10	11'-1"	100
U1	66	#4	7	3'-8"	162
U2	24	#4	7	6'-2"	99
V1	66	#5	STR	10'-1"	694
V2	52	#5	STR	11'-9"	637
V3	52	#5	STR	13'-0"	705
REINFORCING STEEL				11,396 LBS.	
CLASS A CONCRETE					
POUR #1 (CAP, LOWER WINGS & COLLARS)				56.1 C.Y.	
POUR #2 (UPPER WINGS & BACKWALL)				31 C.Y.	
TOTAL =				87.1 C.Y.	
HP 12X53 STEEL PILES					
No. = 14				177.8 LIN. FT.	
STEEL PILE POINTS				14 EA.	
PILE DRIVING EQUIPMENT SETUP				14 EA.	

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 3 OF 3

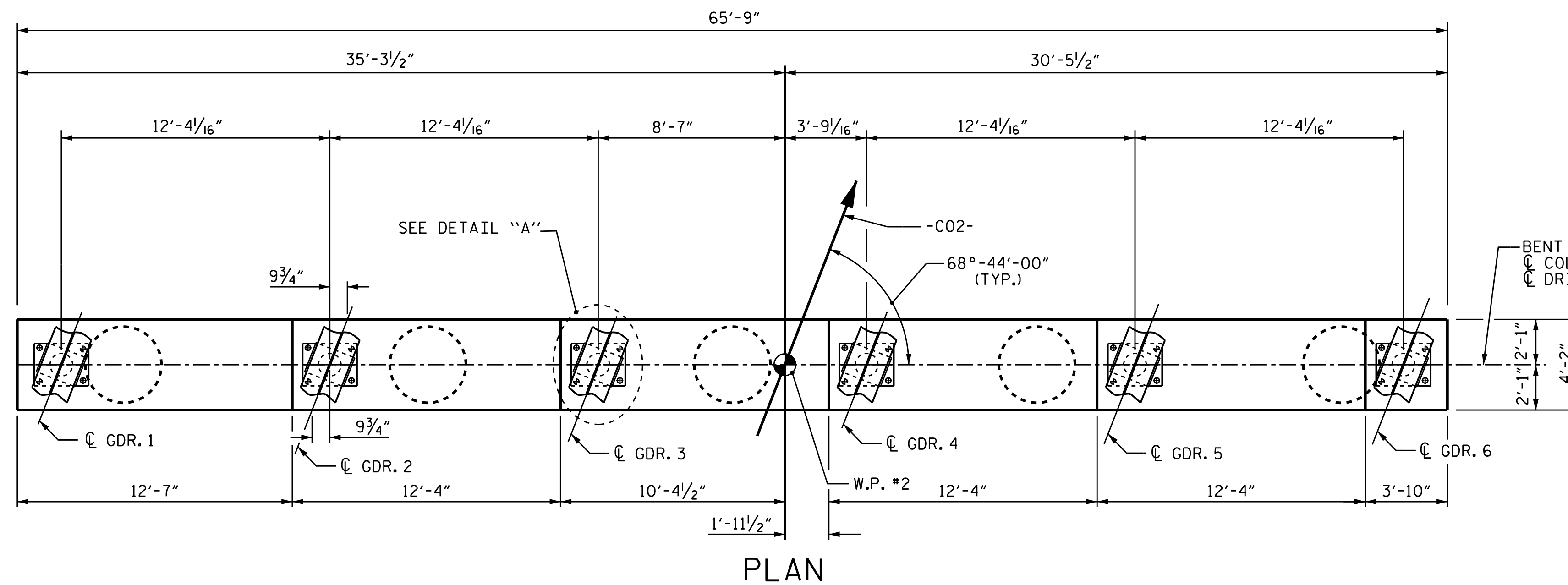


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			52-24
2			4			33

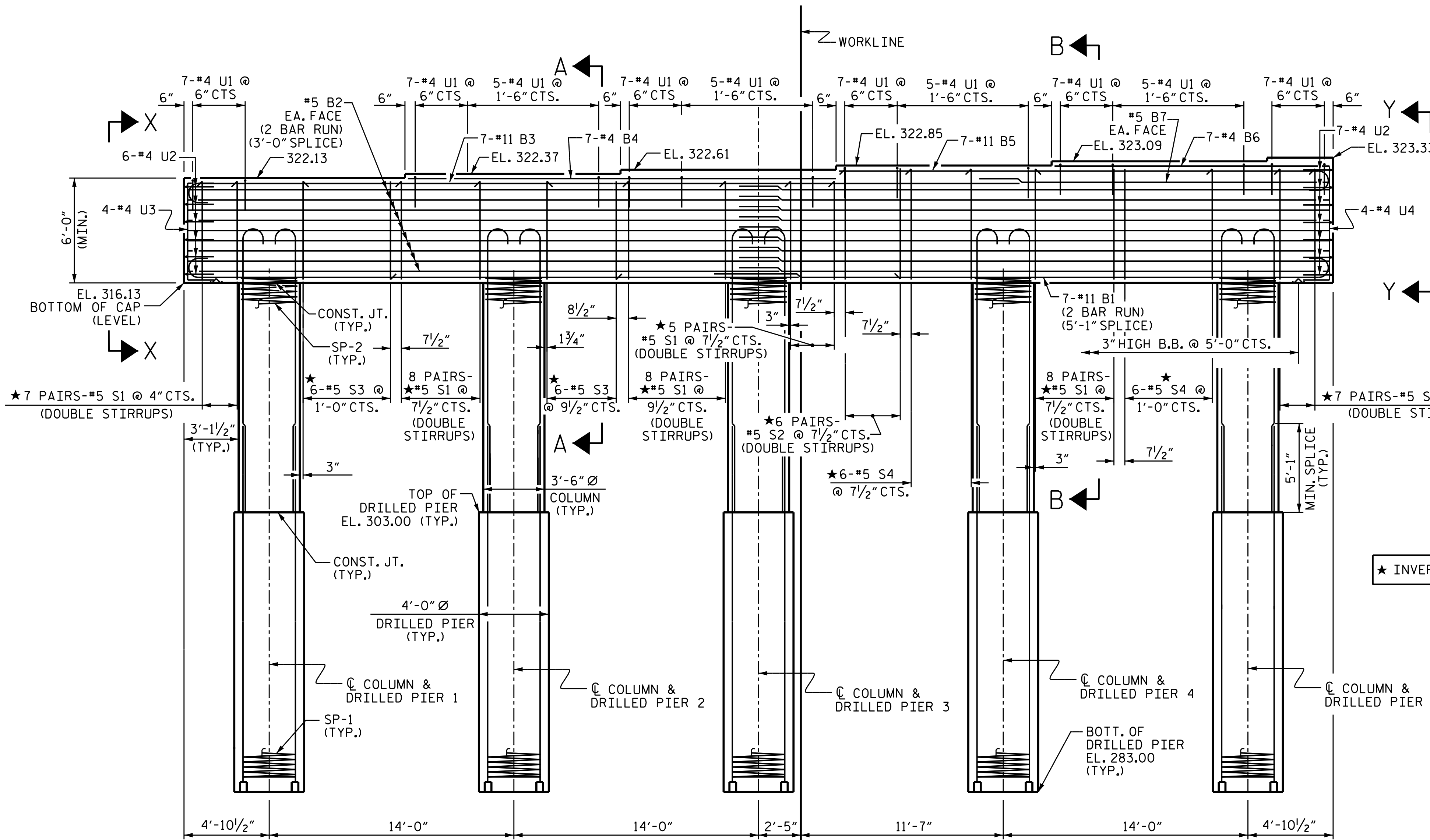
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN

SPAN B

SPAN A



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

**NOTES**

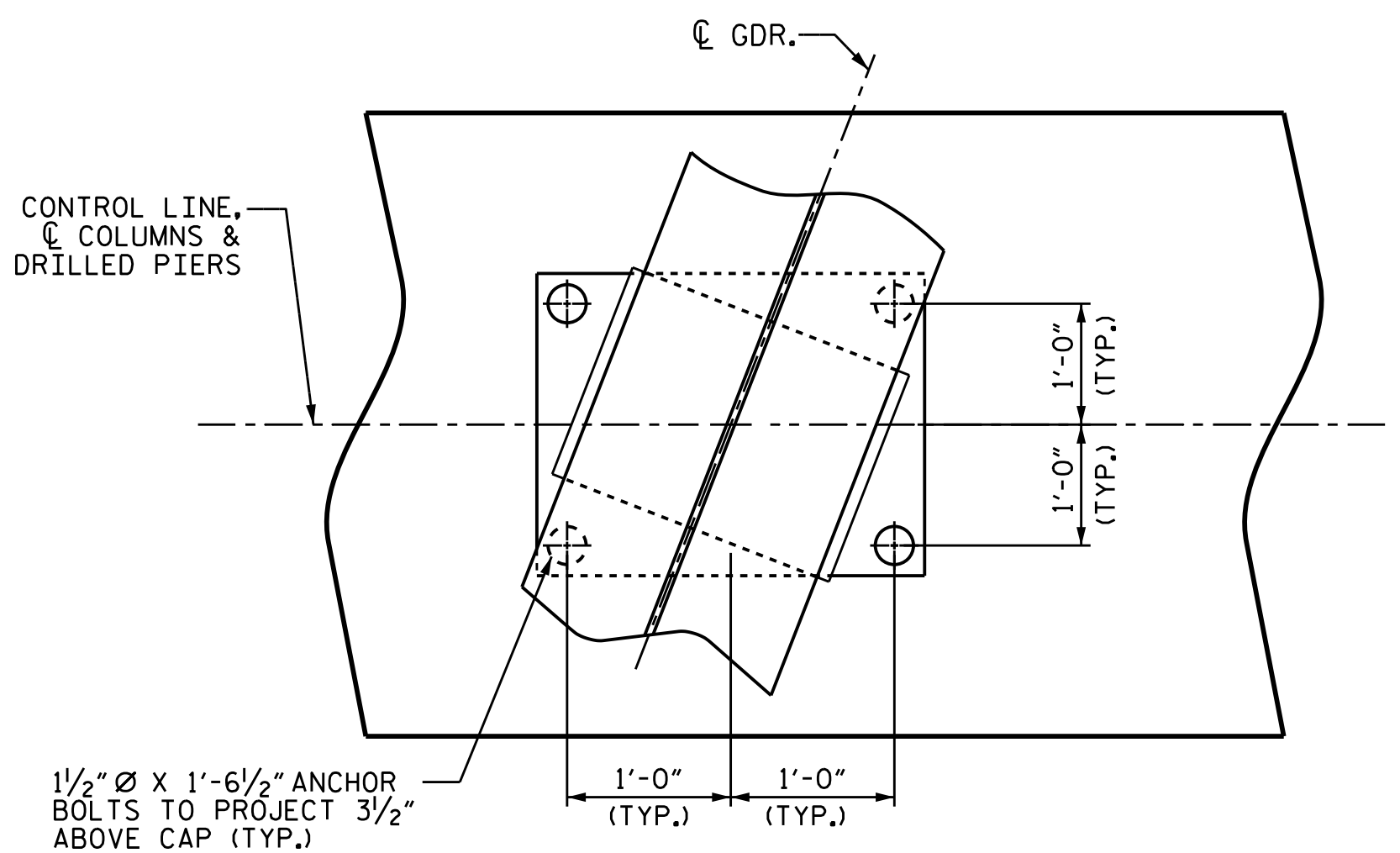
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCEMENT STEEL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

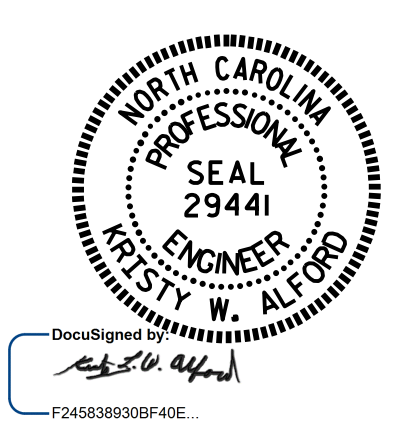
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



DETAIL "A"  
(TYP. EA. GIRDER)

★ INVERT ALTERNATE STIRRUPS.

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 1 OF 2



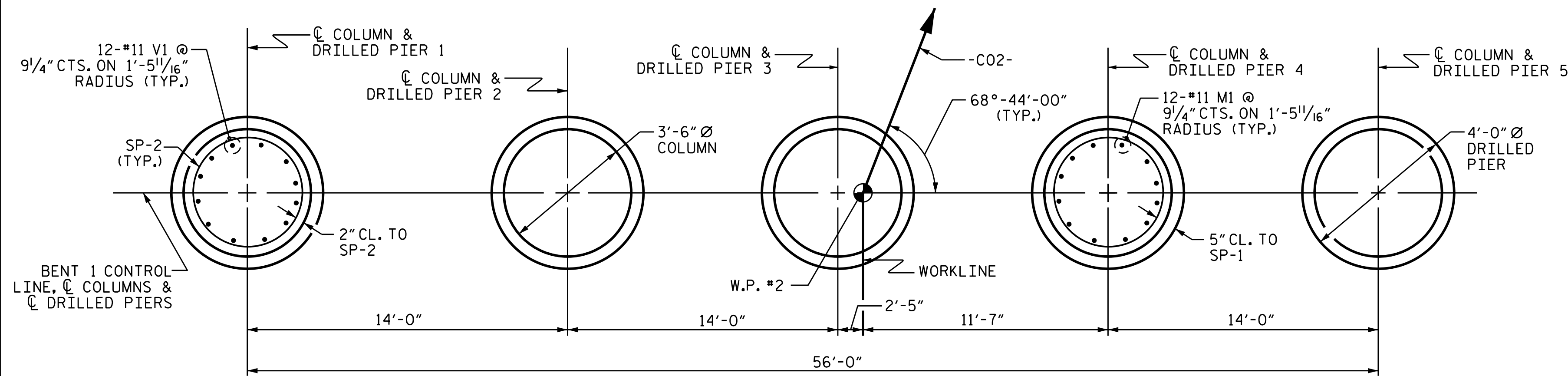
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1

DRAWN BY : O. T. NGUYEN DATE : 8/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/19  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 7/19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

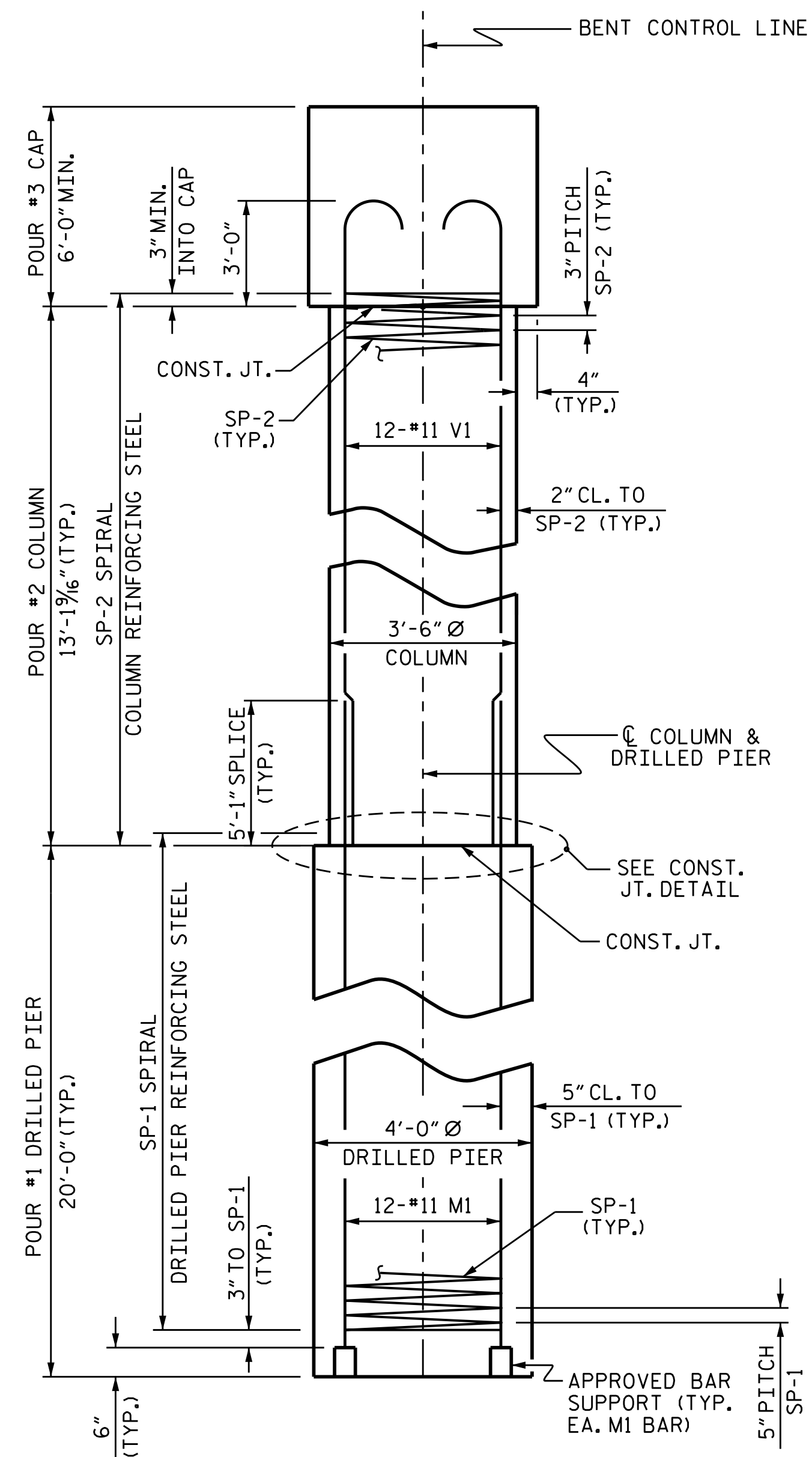
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			33



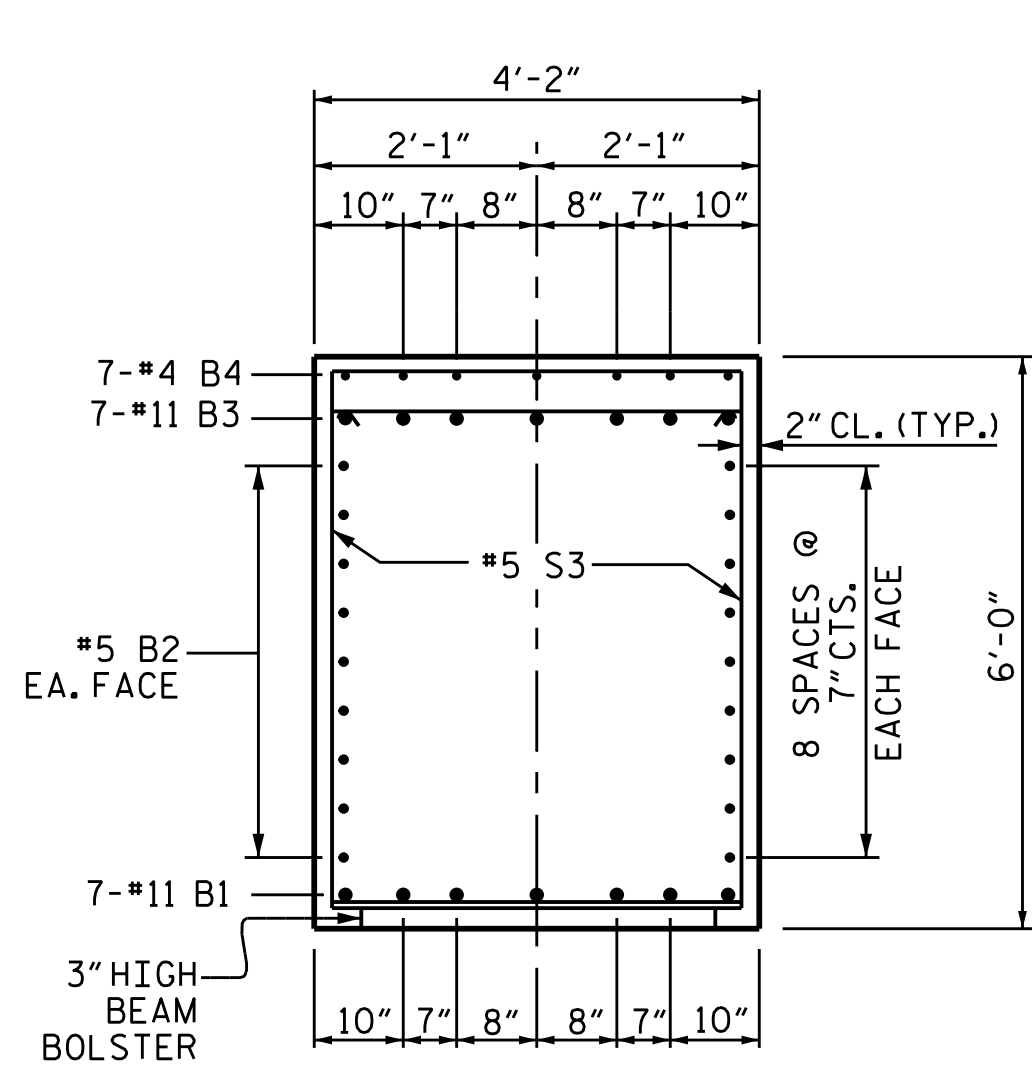


**PLAN OF DRILLED PIERS & COLUMNS**

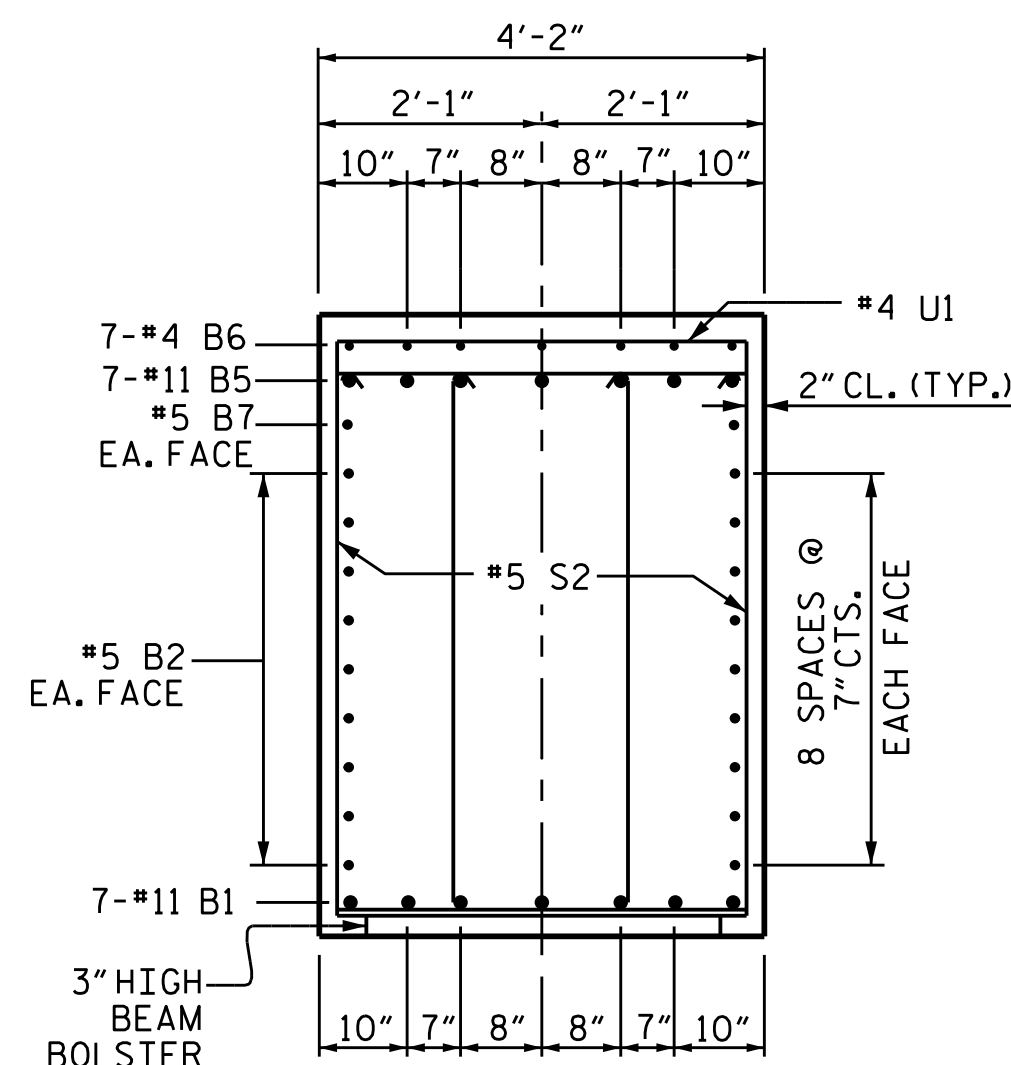
(DIMENSIONS AND REINFORCING STEEL SHOWN ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



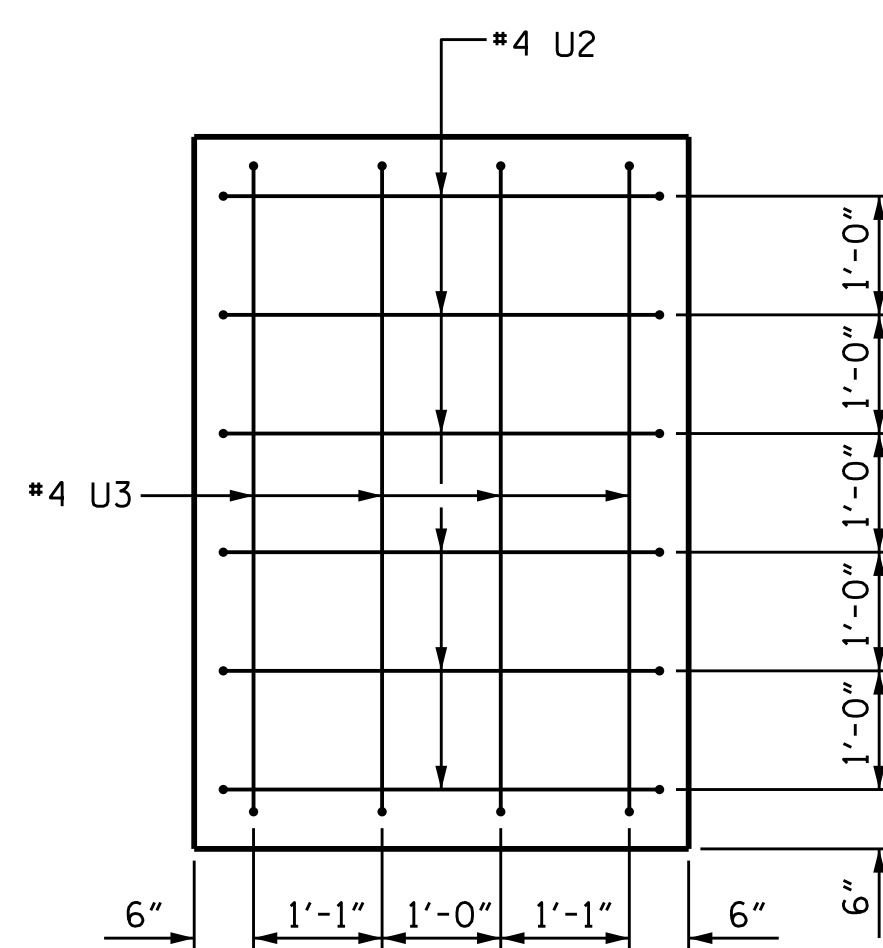
**END ELEVATION**



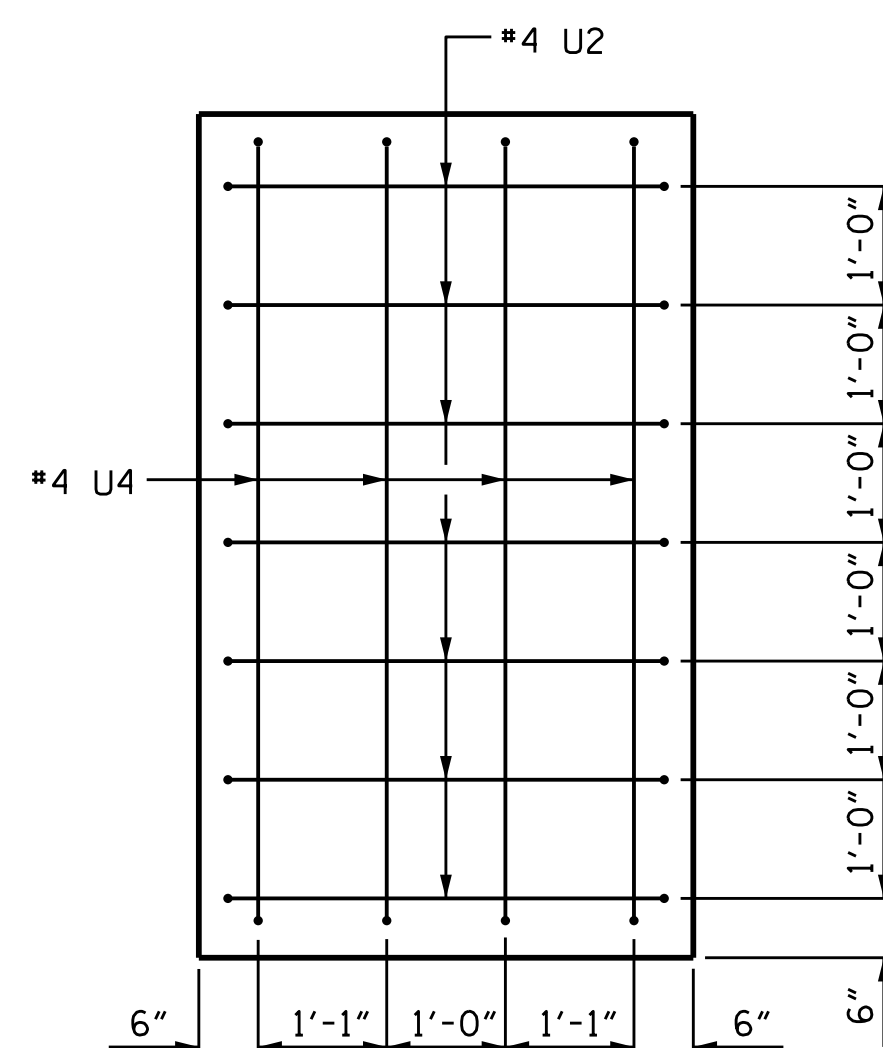
**SECTION A-A**



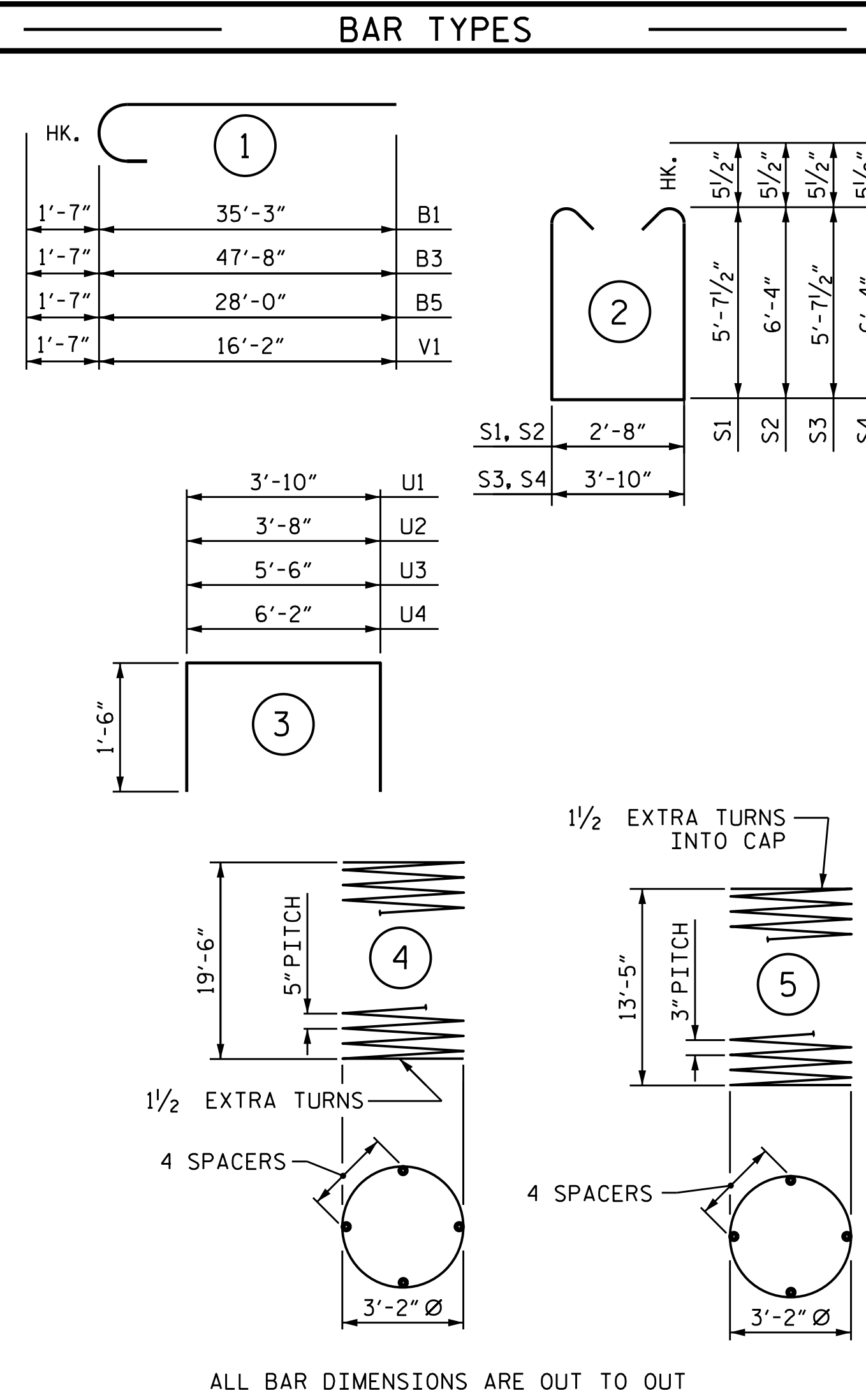
**SECTION B-B**



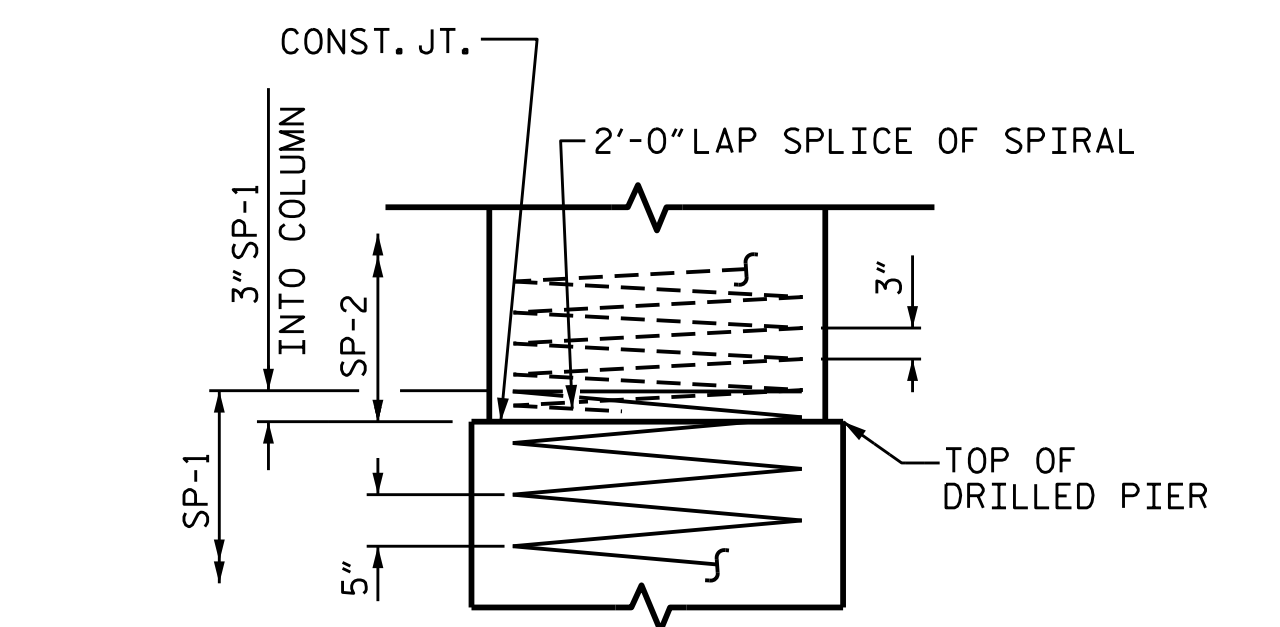
**VIEW X-X**



**VIEW Y-Y**



ALL BAR DIMENSIONS ARE OUT TO OUT



**CONSTRUCTION JOINT DETAIL**

BILL OF MATERIAL					
BENT 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	14	#11	1	36'-10"	2740
B2	36	#5	STR	34'-2"	1283
B3	7	#11	1	49'-3"	1832
B4	7	#4	STR	24'-5"	114
B5	7	#11	1	29'-7"	1100
B6	7	#4	STR	15'-7"	73
B7	2	#5	STR	23'-1"	48
M1	60	#11	STR	27'-10"	8873
V1	60	#11	1	17'-9"	5658
S1	56	#5	2	14'-10"	866
S2	42	#5	2	16'-3"	712
S3	12	#5	2	16'-0"	200
S4	12	#5	2	17'-5"	218
U1	62	#4	3	6'-10"	283
U2	13	#4	3	6'-8"	58
U3	4	#4	3	8'-6"	23
U4	4	#4	3	9'-2"	25

REINFORCING STEEL 24,123 LBS.

SP-1	5	*	4	479'-11"	2503
SP-2	5	**	5	540'-2"	1804

SPIRAL COLUMN REINFORCING STEEL 4,307 LBS.

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

**CLASS A CONCRETE BREAKDOWN**

POUR #2 (COLUMNS)	23.4 C.Y.
POUR #3 (CAP)	66.1 C.Y.

TOTAL CLASS A CONCRETE 89.5 C.Y.

**DRILLED PIERS:**

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	46.5 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	46 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	54 LIN. FT.
CSL TUBES	430 LIN. FT.

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 2 OF 2

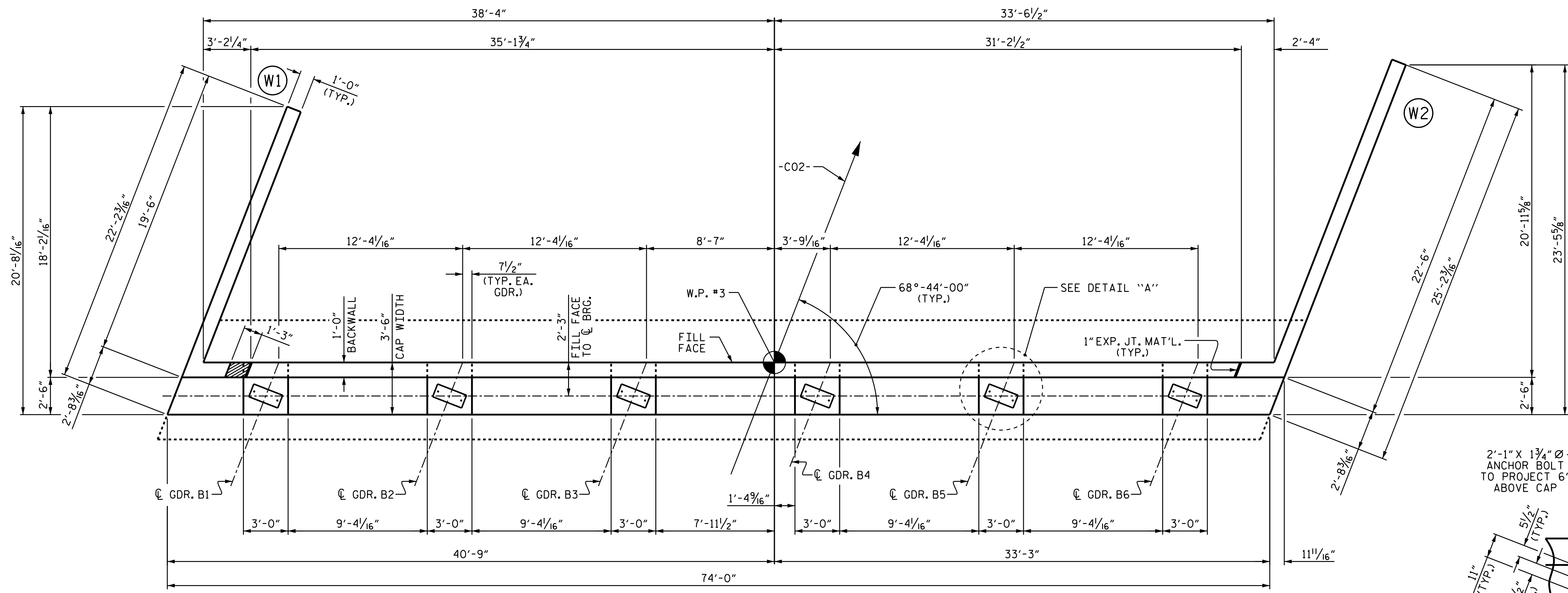
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1



DRAWN BY: O. T. NGUYEN DATE: 8/19  
 CHECKED BY: D. SHACKELFORD DATE: 8/19  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 7/19

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-26
1			3			TOTAL SHEETS 33
2			4			



PLAN

**NOTES**

STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

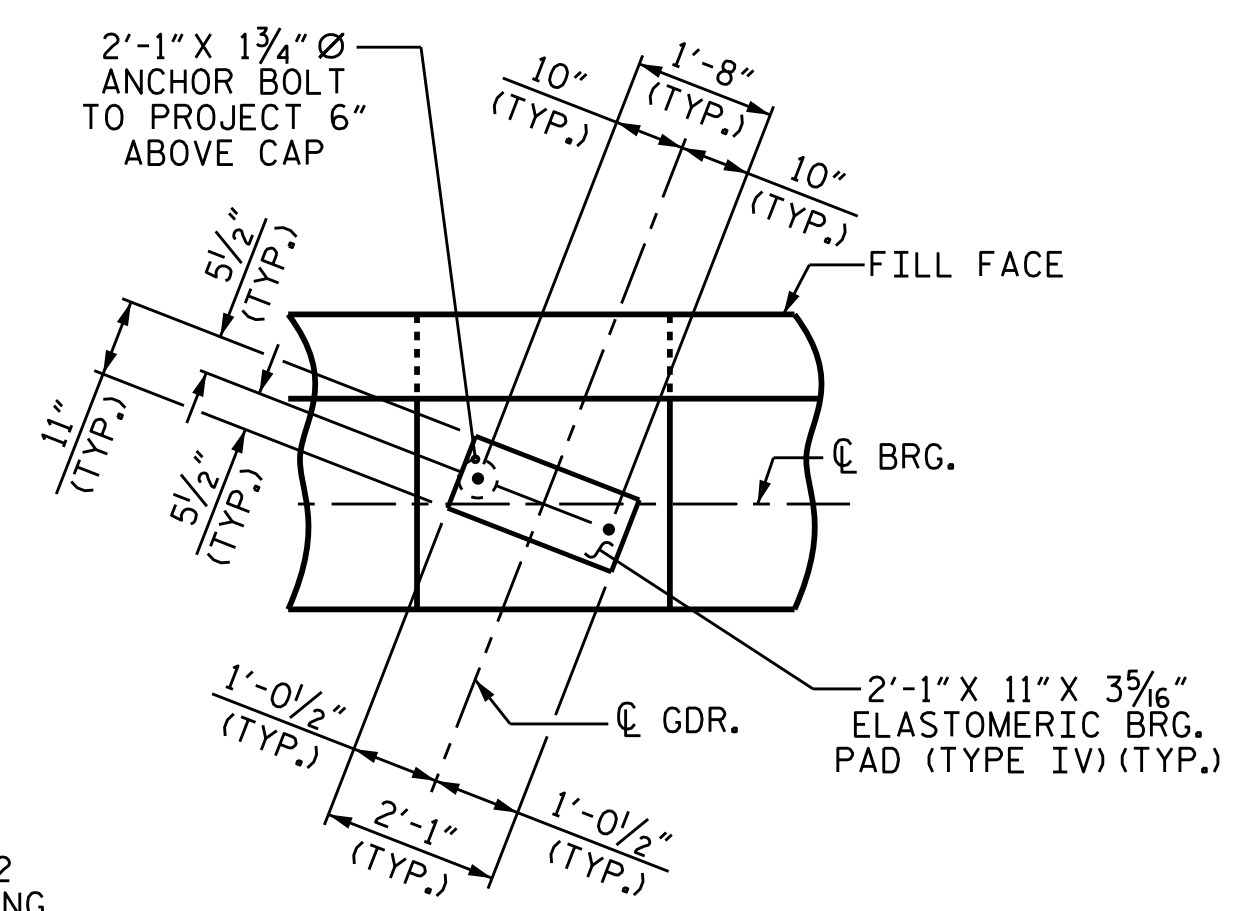
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE #5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM THE TOP OF BACKWALL.

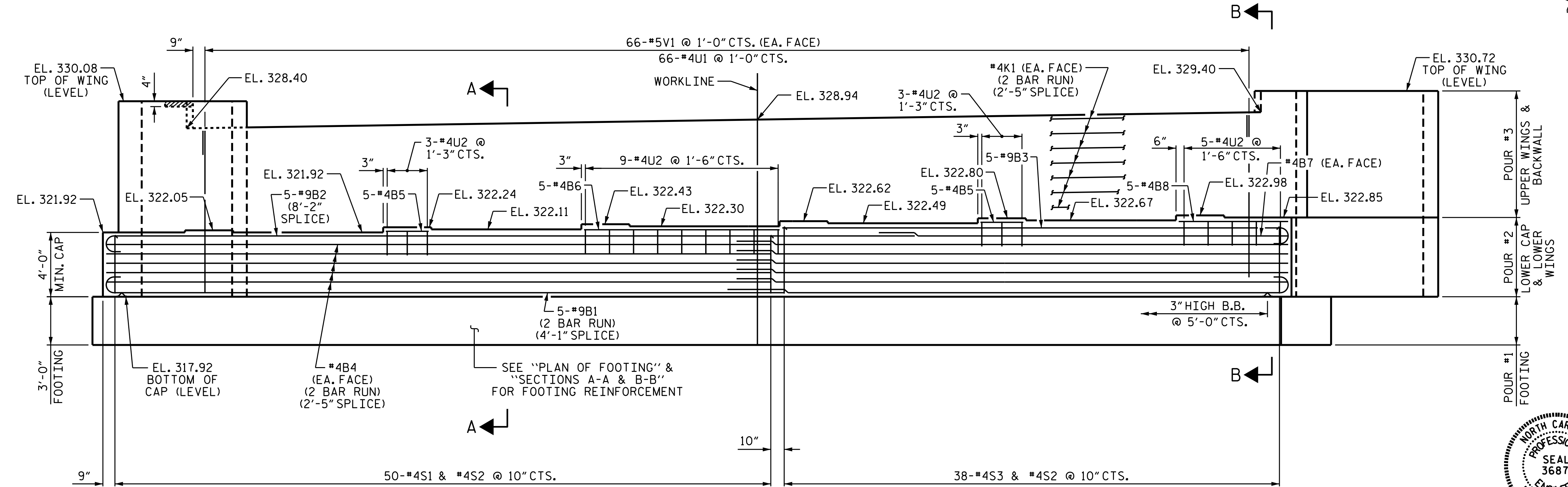
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.



DETAIL "A"  
(TYP. EA. GIRDER)



ELEVATION

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-  
SHEET 1 OF 4



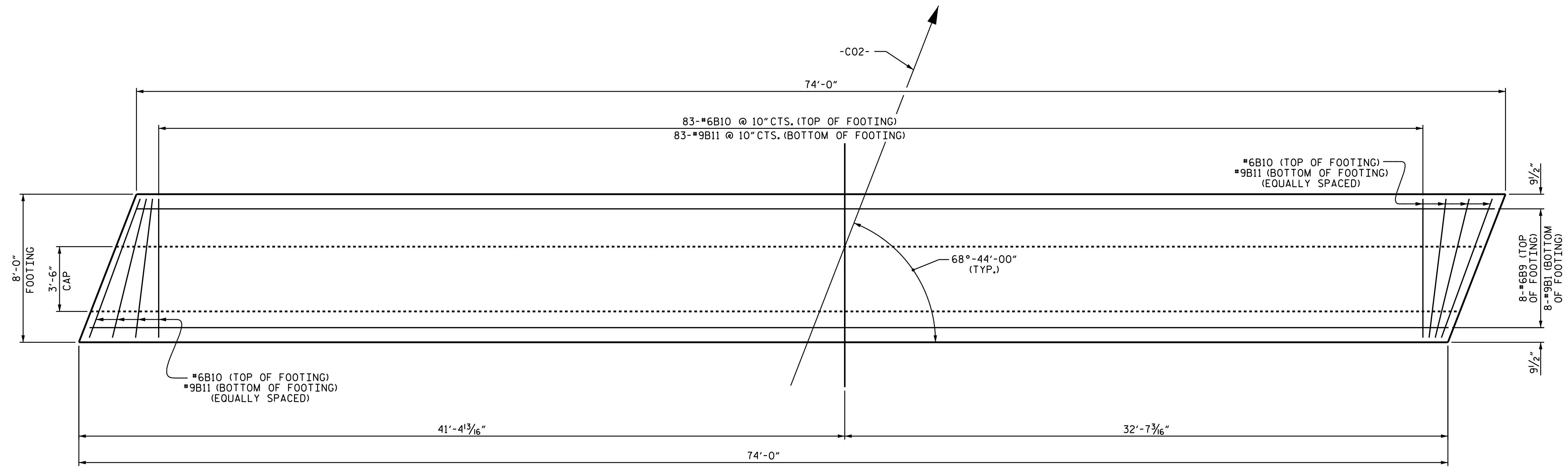
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2

DRAWN BY: M.K. BEARD DATE: 7/29/19  
CHECKED BY: D. SHACKELFORD DATE: 8/12/19  
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE: 06/2019

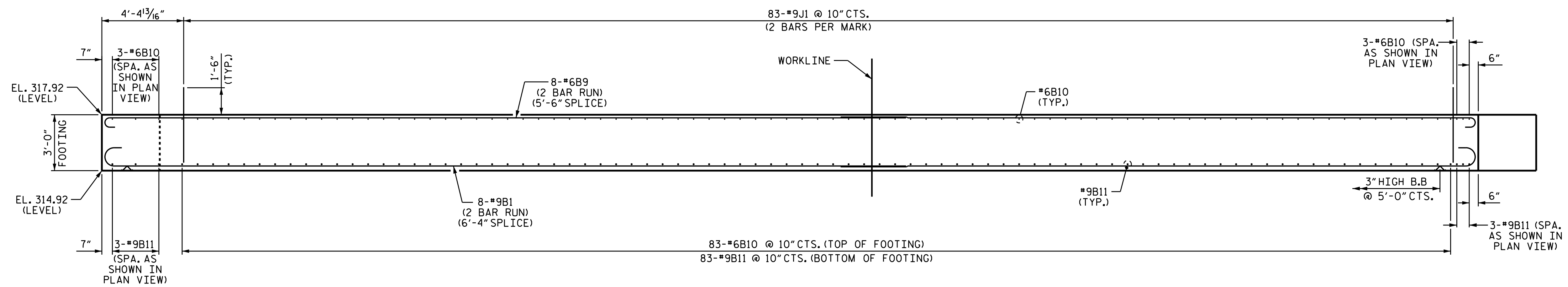
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			33





PLAN



ELEVATION

PROJECT NO. I-5700

WAKE COUNTY

STATION: 44+35.96 -L-

SHEET 2 OF 4

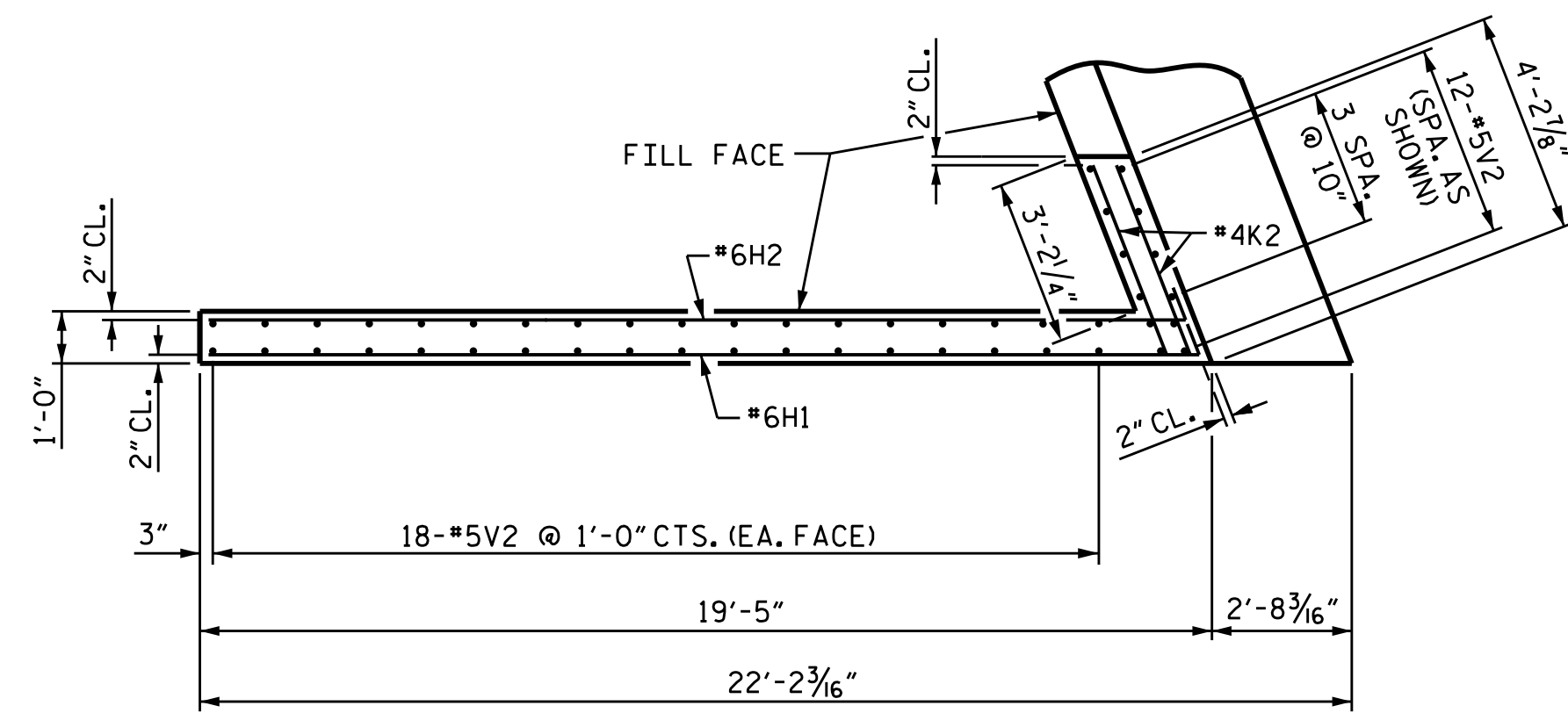


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2

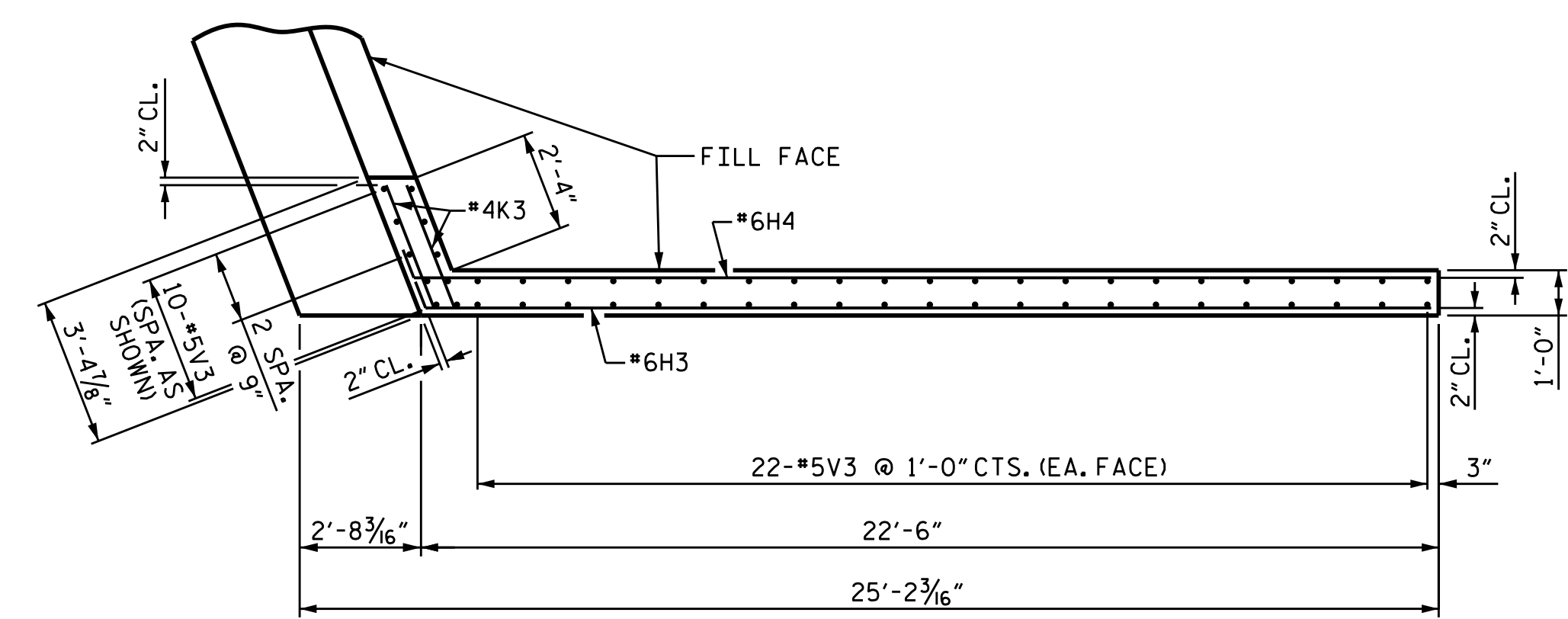
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CHECKED BY : D. SHACKELFORD DATE : 8/12/19  
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 6/2019

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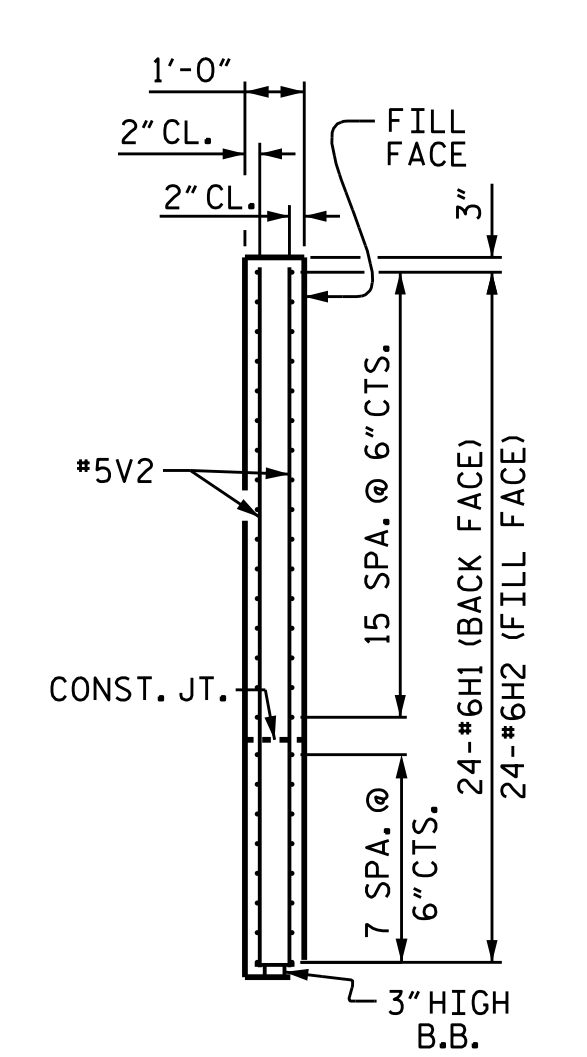
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1			3			S2-26
2			4			33



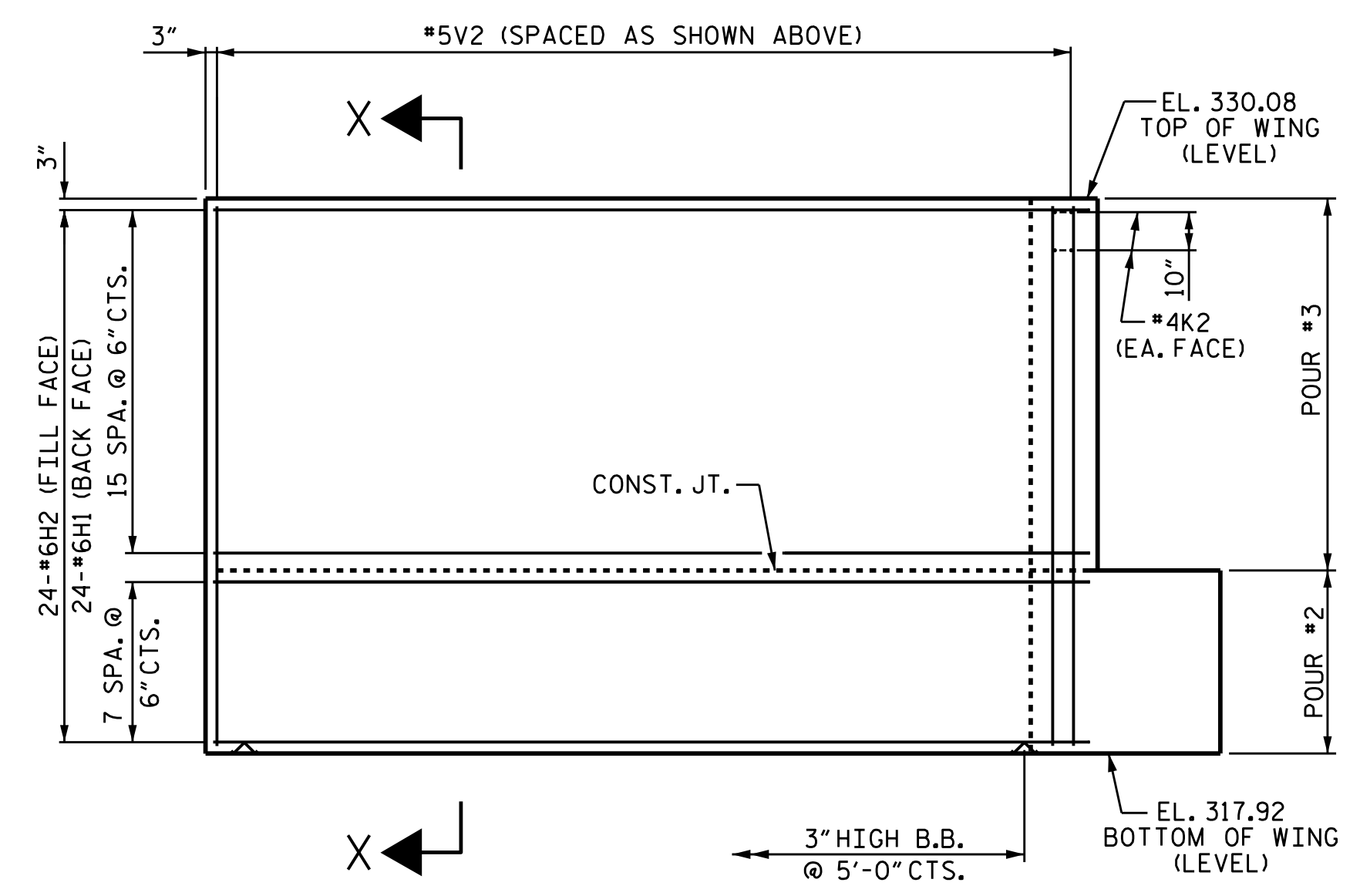
PLAN OF WING (W1)



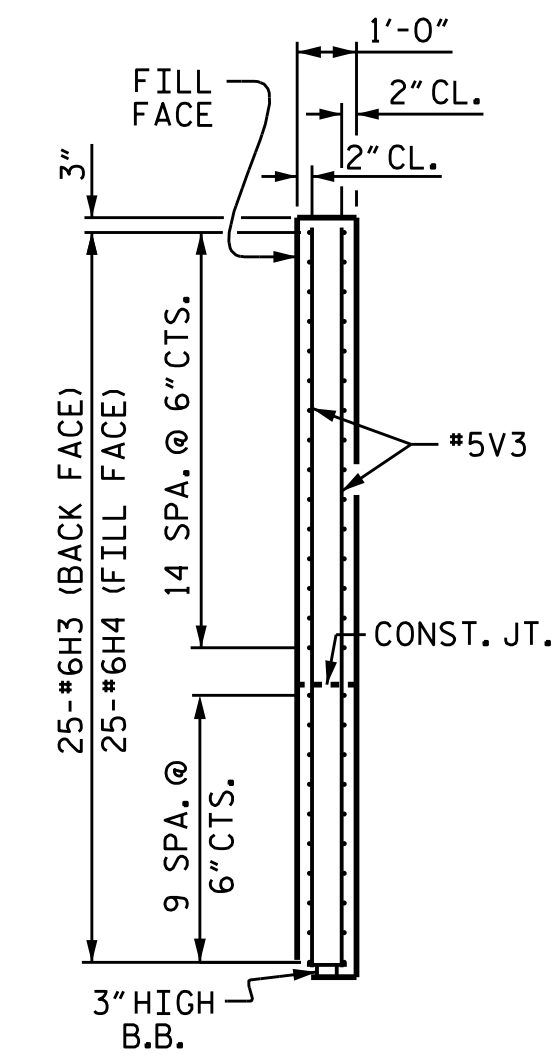
PLAN OF WING (W2)



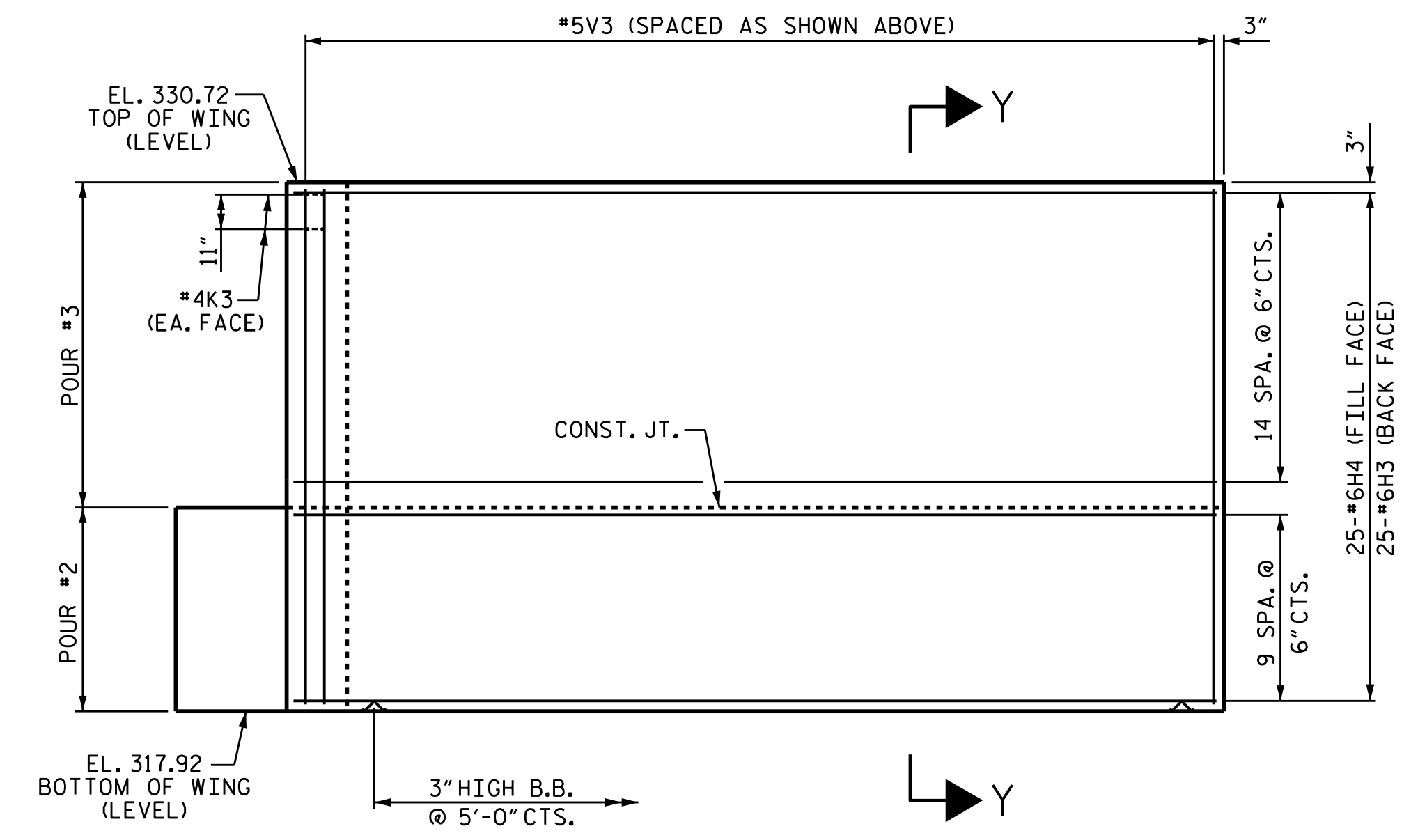
SECTION X-X



ELEVATION OF WING (W1)



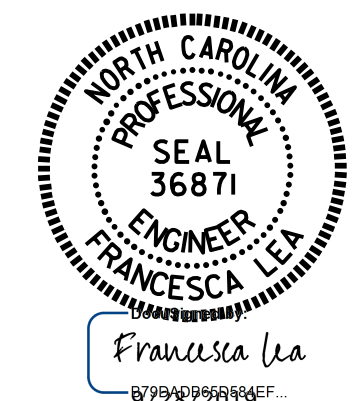
SECTION Y-Y



ELEVATION OF WING (W2)

PROJECT NO. I-5700  
 WAKE COUNTY  
 STATION: 44+35.96 -L-

SHEET 3 OF 4



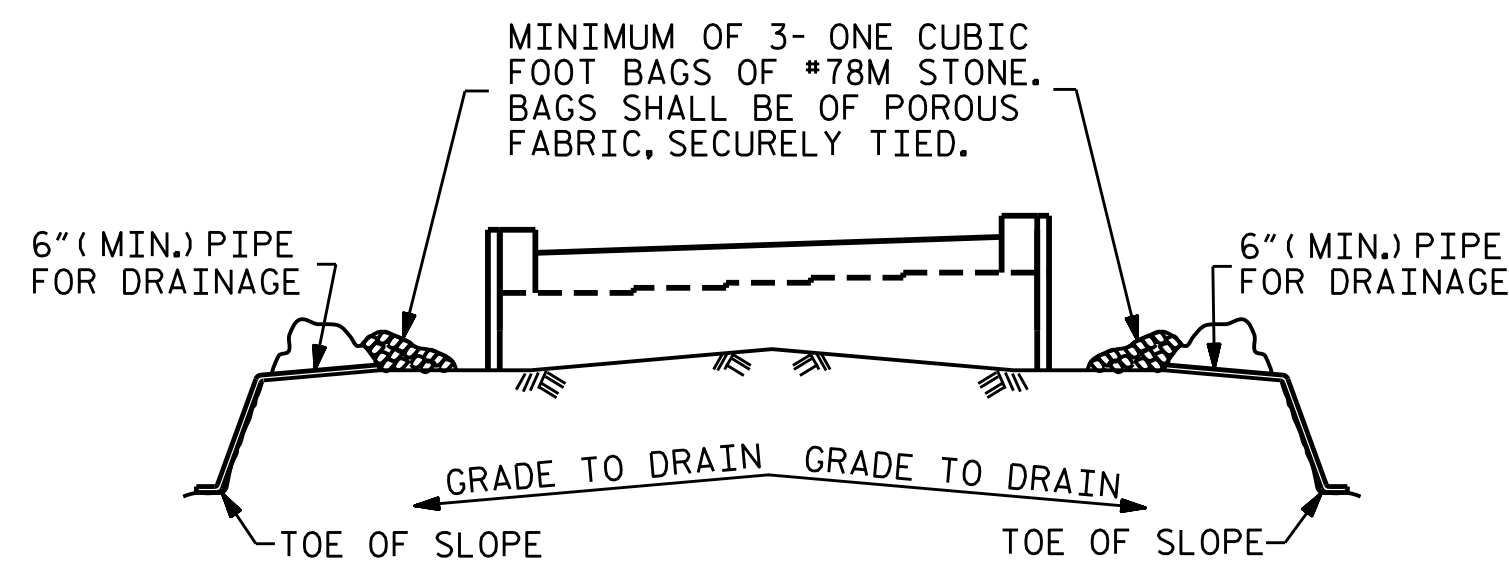
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2

DRAWN BY : M.K. BEARD DATE : 8/5/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/12/19  
 DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 06/2019

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			33



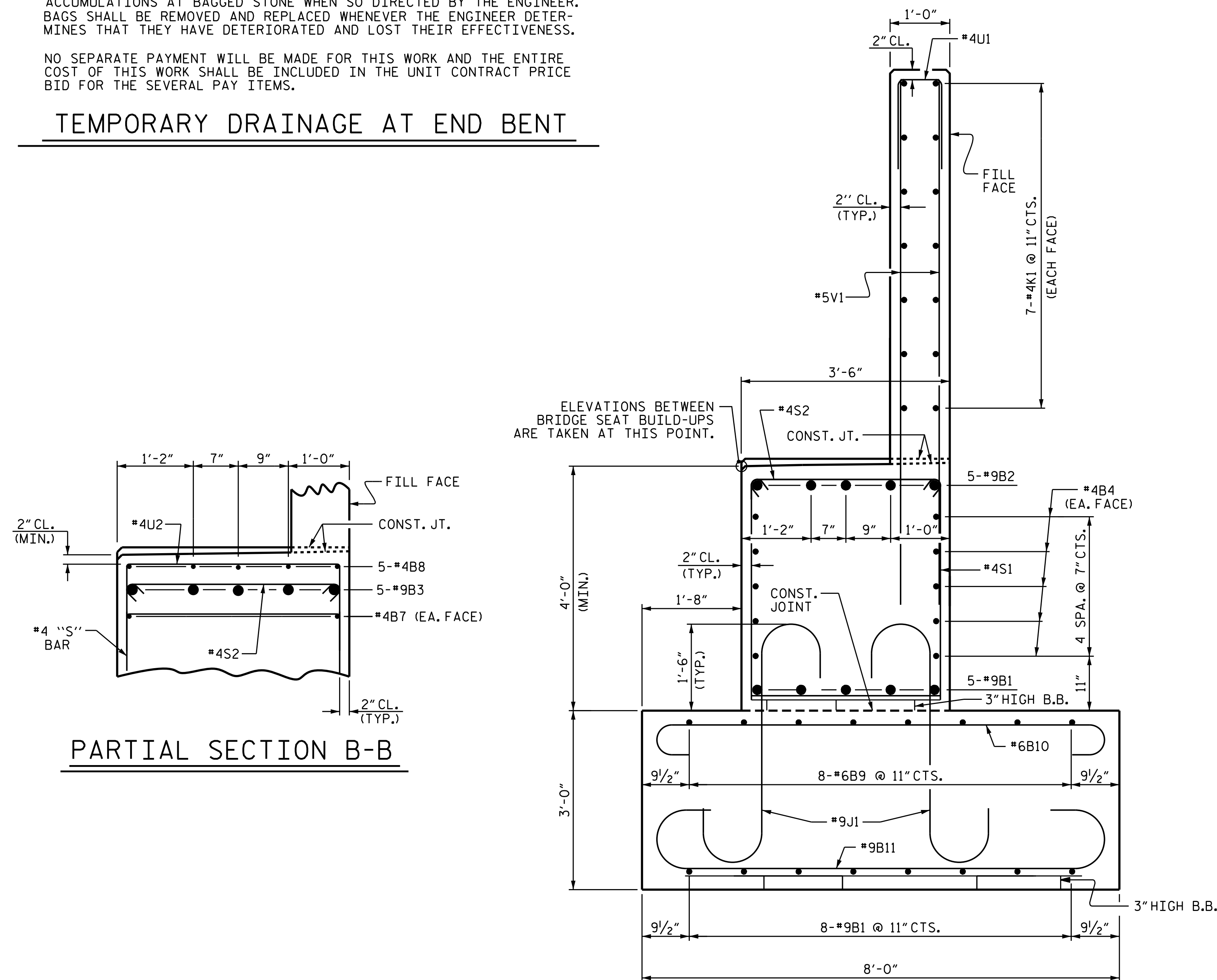


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

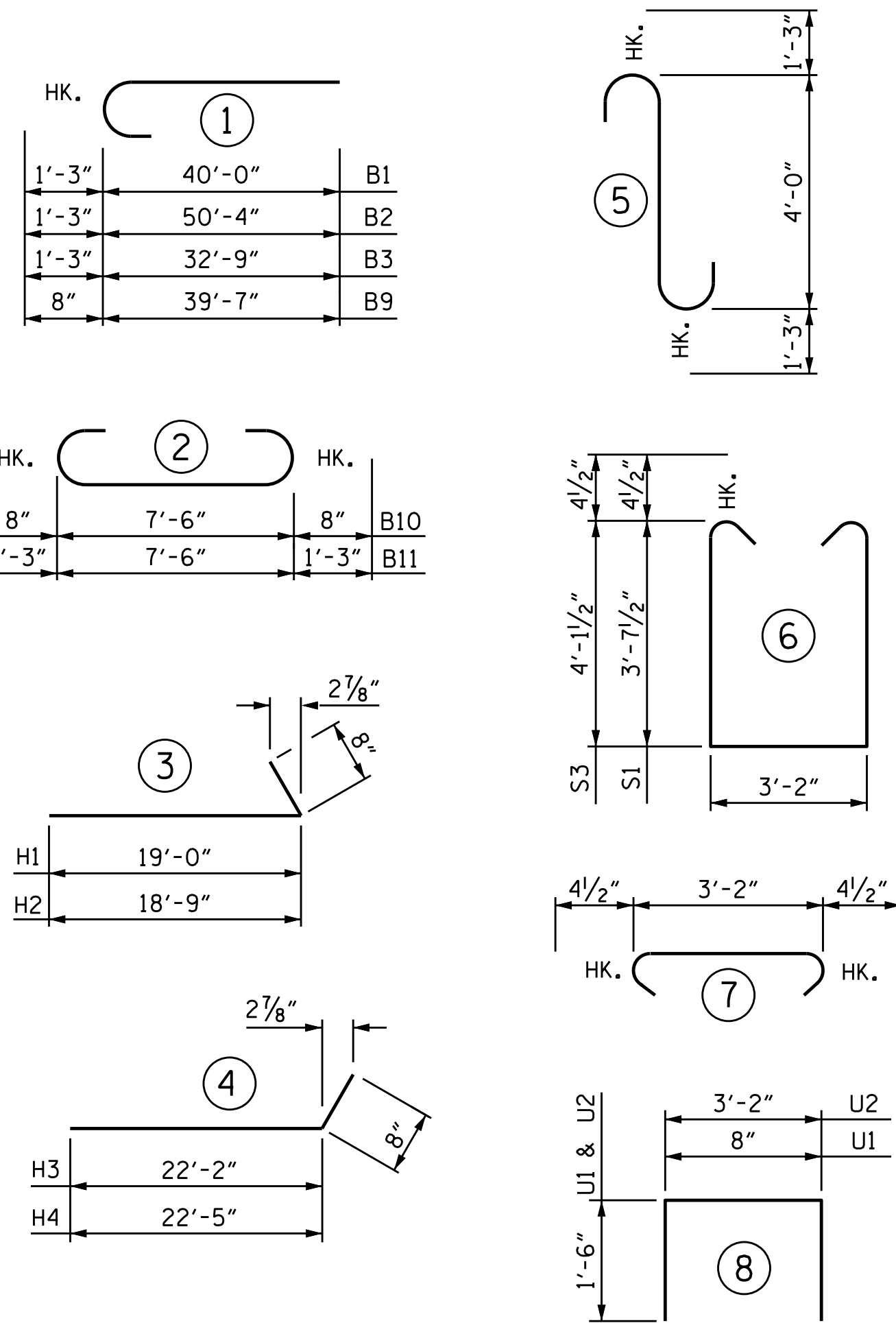
### TEMPORARY DRAINAGE AT END BENT



### PARTIAL SECTION B-B

### SECTION A-A

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

#### END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	26	#9	1	41'-3"	3647
B2	5	#9	1	51'-7"	877
B3	5	#9	1	34'-0"	578
B4	20	#4	STR	38'-2"	510
B5	10	#4	STR	2'-8"	18
B6	5	#4	STR	12'-2"	41
B7	2	#4	STR	25'-6"	34
B8	5	#4	STR	8'-1"	27
B9	16	#6	1	40'-3"	967
B10	89	#6	2	8'-10"	1181
B11	89	#9	2	10'-0"	3026
H1	24	#6	3	19'-8"	709
H2	24	#6	3	19'-5"	700
H3	25	#6	4	22'-10"	857
H4	25	#6	4	23'-1"	867
J1	166	#9	5	6'-6"	3669
K1	28	#4	STR	38'-1"	712
K2	4	#4	STR	3'-10"	10
K3	4	#4	STR	3'-0"	8
S1	50	#4	6	11'-2"	373
S2	88	#4	7	3'-11"	230
S3	38	#4	6	12'-2"	309
U1	66	#4	8	3'-8"	162
U2	20	#4	8	6'-2"	82
V1	66	#5	STR	10'-1"	694
V2	48	#5	STR	11'-9"	588
V3	54	#5	STR	12'-5"	699

REINFORCING STEEL		21,575 LBS.
CLASS A CONCRETE		
POUR #1 (FOOTNG)		65.8 C.Y.
POUR #2 (CAP & LOWER WINGS)		49.4 C.Y.
POUR #3 (UPPER WINGS & BACKWALL)		30.2 C.Y.
<b>TOTAL</b>		<b>146.4 C.Y.</b>

PROJECT NO. I-5700  
WAKE COUNTY  
 STATION: 44+35.96 -L-  
 SHEET 4 OF 4



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

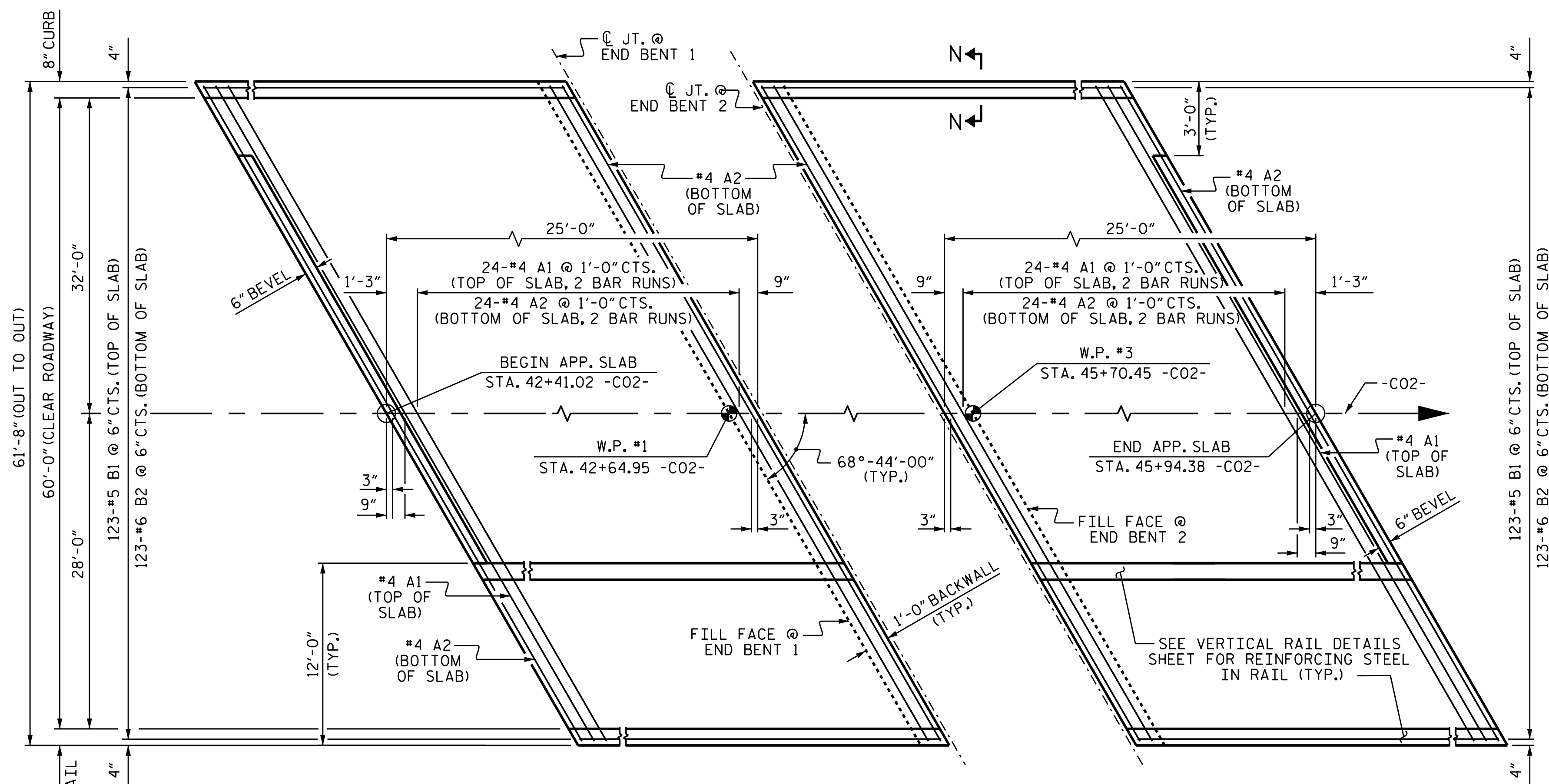
DRAWN BY : M.K. BEARD DATE : 8/5/19  
 CHECKED BY : D. SHACKELFORD DATE : 8/18/19  
 DESIGN ENGINEER OF RECORD : R.L. CHESSON DATE : 6/2019

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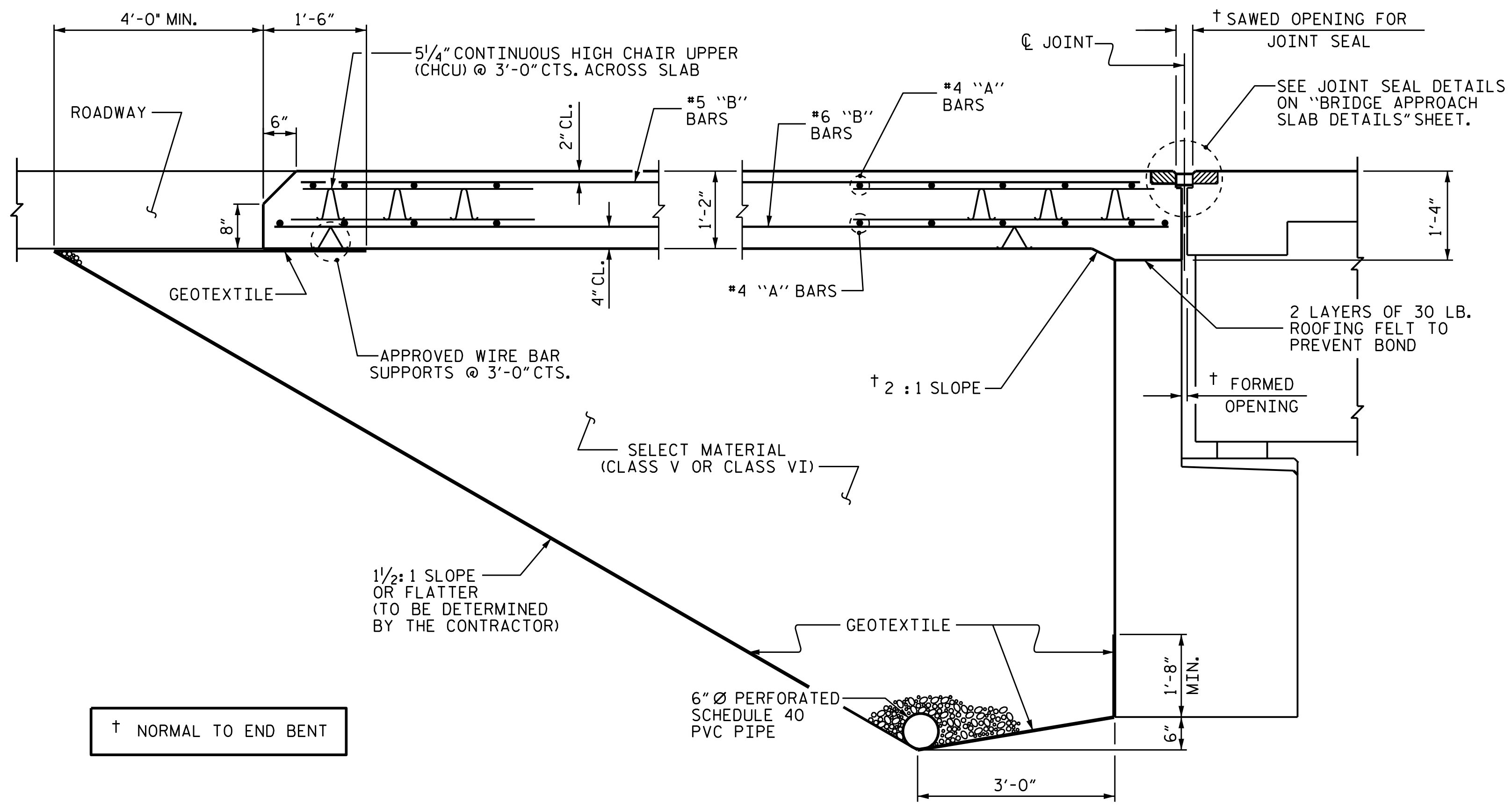
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-28
1			3			TOTAL SHEETS
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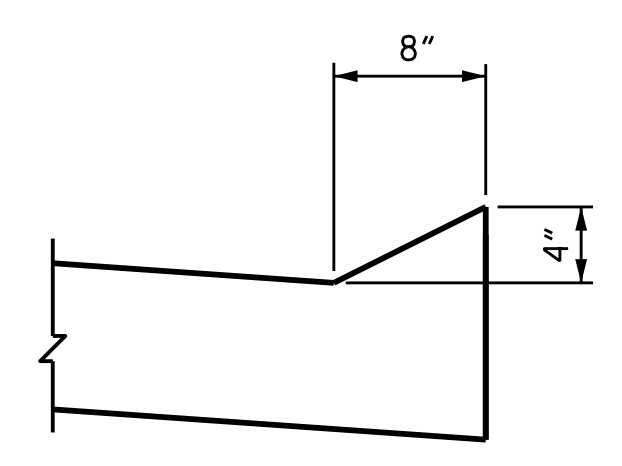




PLAN @ END BENT 1 PLAN @ END BENT 2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB  
(TYPE I - STANDARD APPROACH FILL)



SECTION N-N

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.  
 GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
 SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
 SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.  
 FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 WITH FOAM JOINT SEAL  
 FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.  
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2".  
 FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	33'-11"	1133
A2	52	#4	STR	33'-9"	1172
*B1	123	#5	STR	23'-9"	3047
B2	123	#6	STR	24'-8"	4557

REINFORCING STEEL	LBS.	5729
* EPOXY COATED REINFORCING STEEL	LBS.	4180

CLASS AA CONCRETE	C. Y.	72
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APPROACH SLAB AT BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	33'-11"	1133
A2	52	#4	STR	33'-9"	1172
*B1	123	#5	STR	23'-9"	3047
B2	123	#6	STR	24'-8"	4557

REINFORCING STEEL	LBS.	5729
* EPOXY COATED REINFORCING STEEL	LBS.	4180

CLASS AA CONCRETE	C. Y.	72
-------------------	-------	----

SPLICE LENGTHS

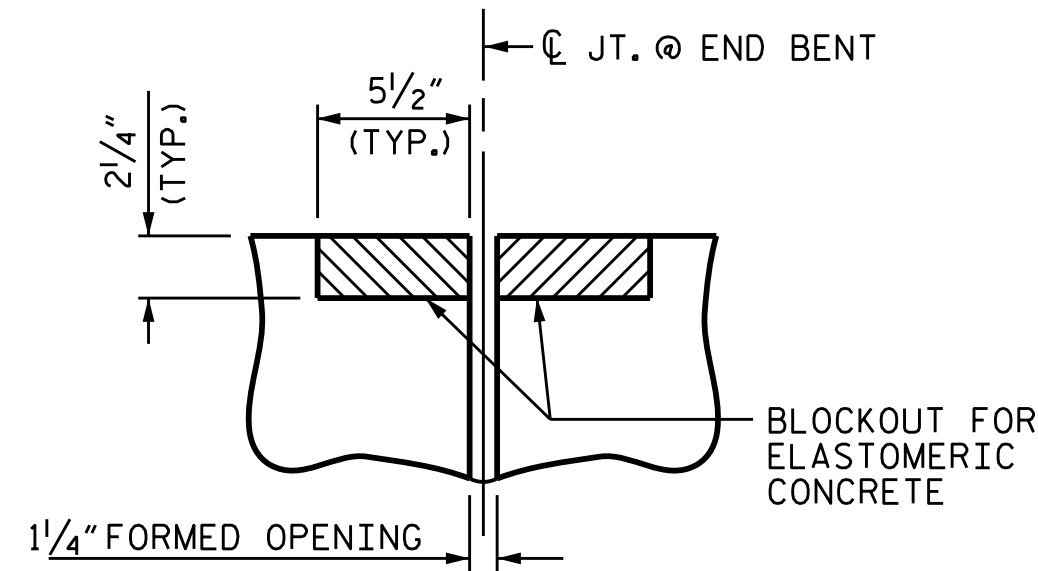
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

ASSEMBLED BY :	W.D. REAMS	DATE :	08/2019
CHECKED BY :	F. LEA	DATE :	09/2019
DRAWN BY :	EEM	REV. 6/13	MAA/GM
CHECKED BY :	VAP	REV. 12/17	MAA/THC
		REV. 06/19	BNB/THC

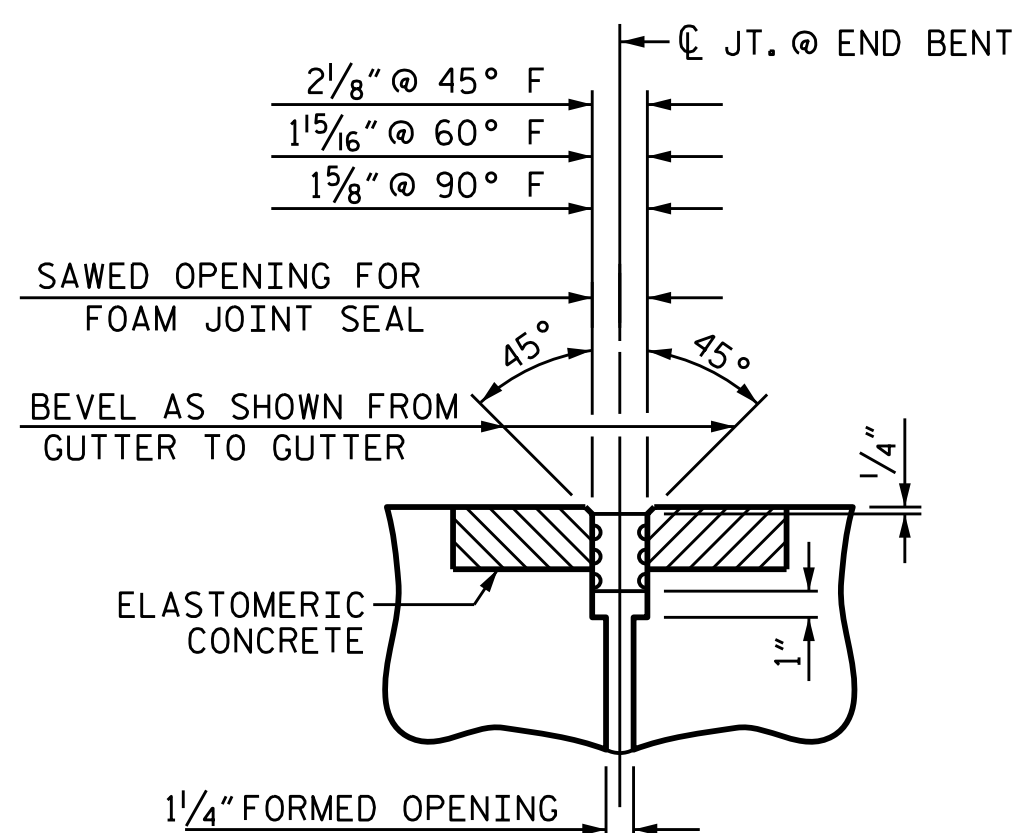
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-32	TOTAL SHEETS
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2			4				





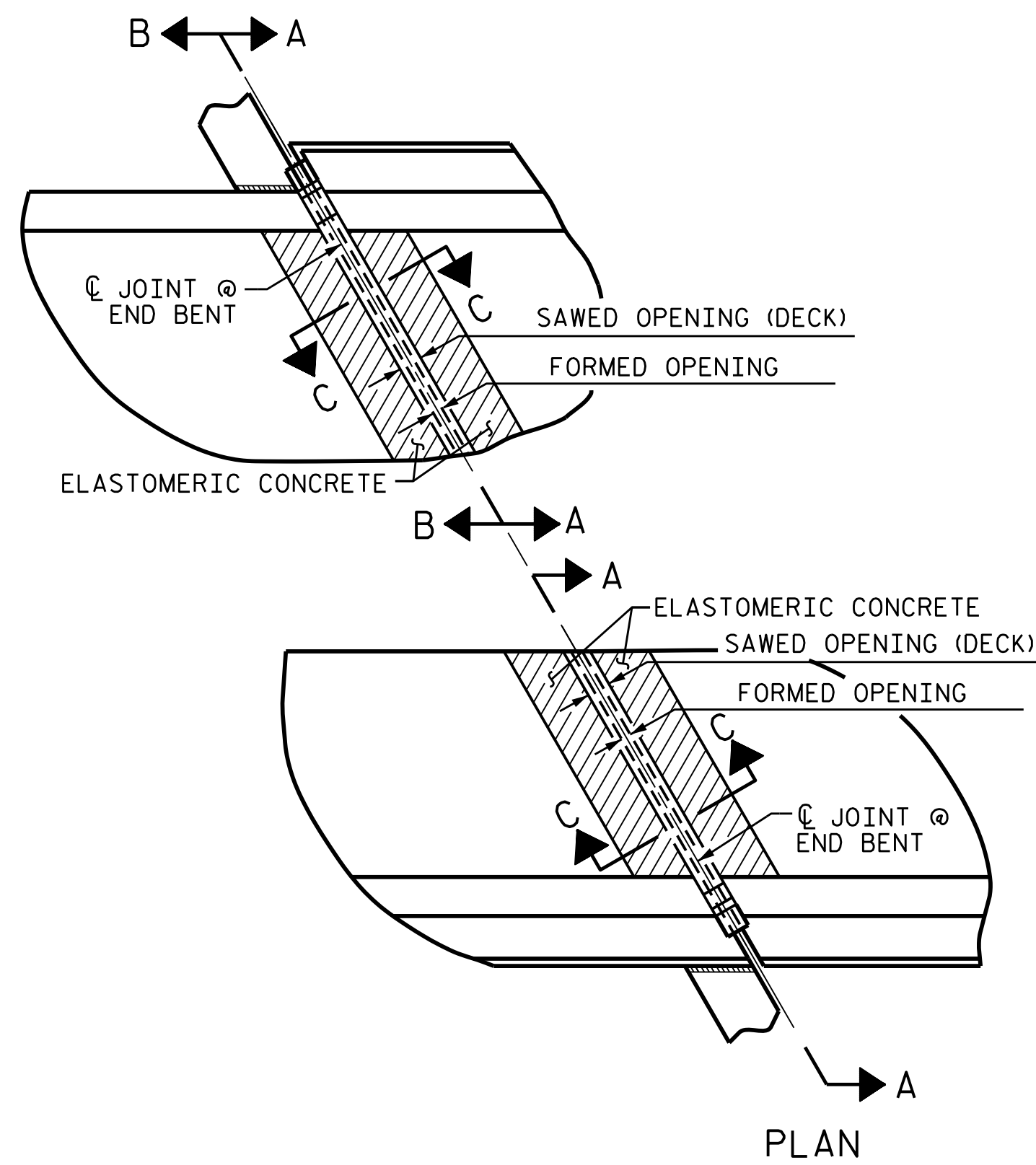
**SECTION C-C**  
FOAM JOINT SEAL  
(PRE-SAWED ELASTOMERIC  
CONCRETE DIMENSIONS)



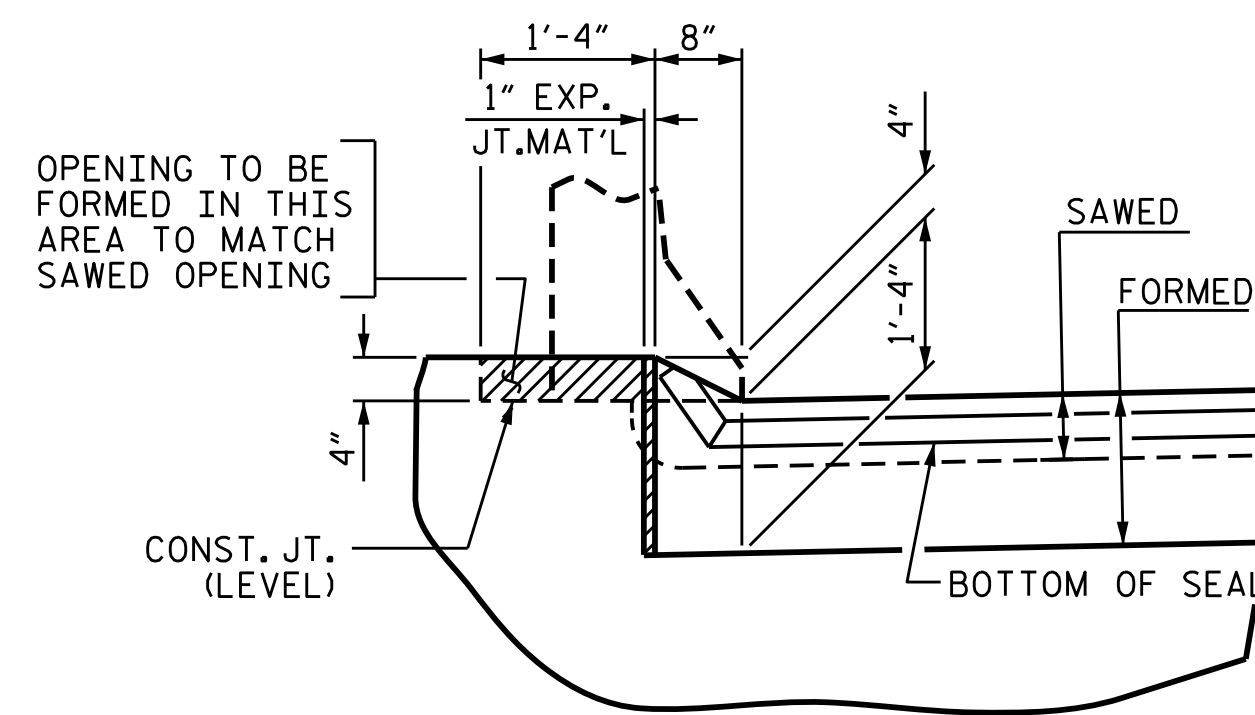
**SECTION C-C**  
FOAM JOINT SEAL  
(EXPANSION)

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	12
2	12
TOTAL	24

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



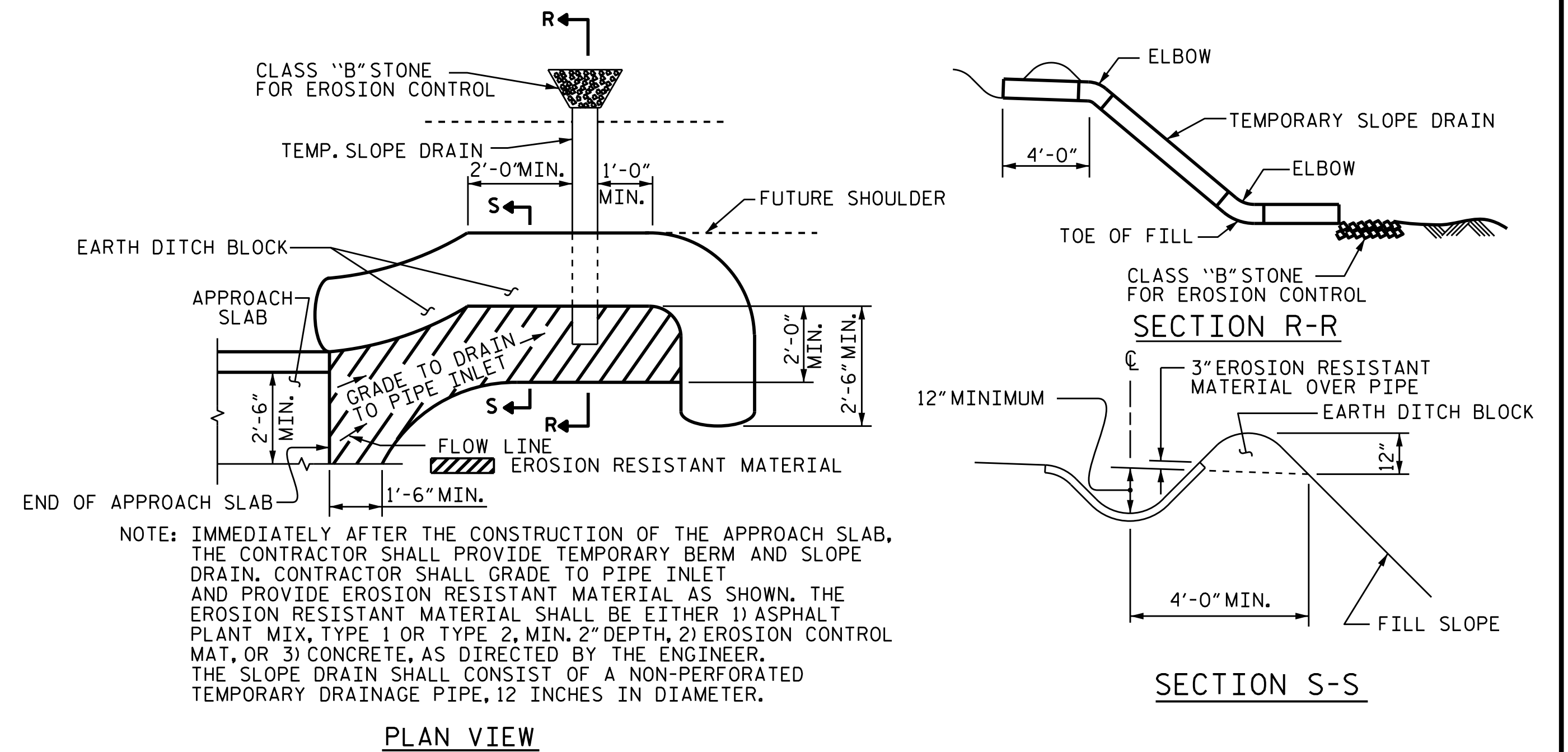
**SECTION A-A**



**SECTION B-B**

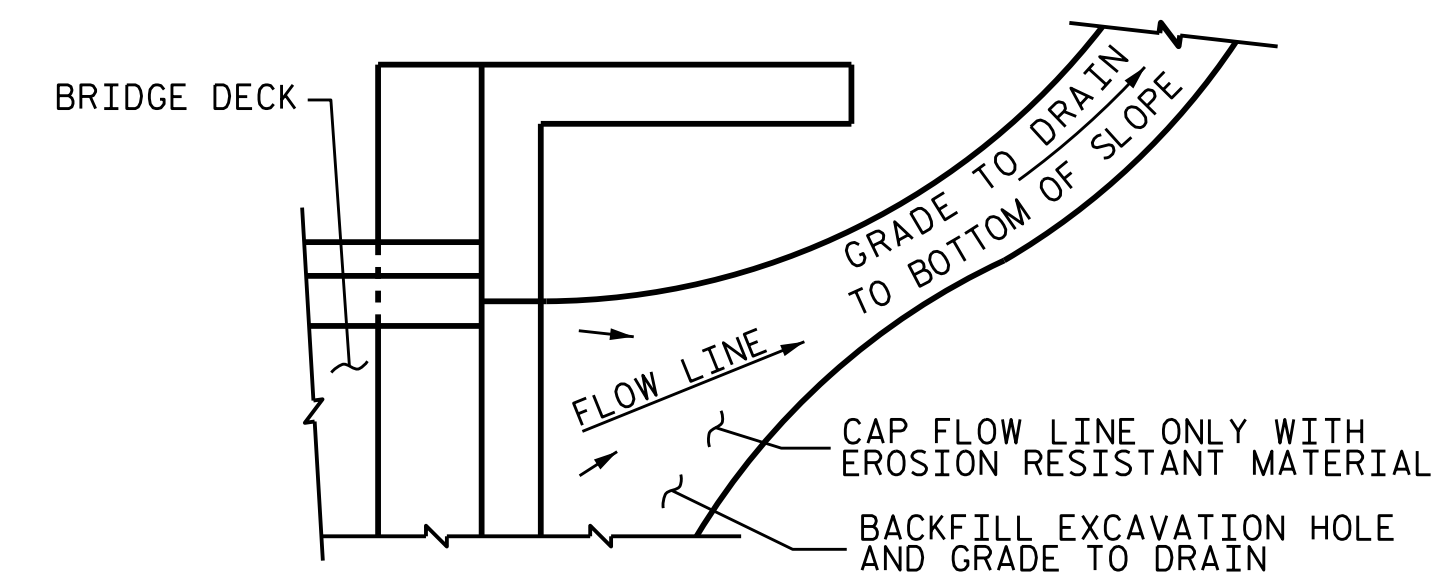
**JOINT SEAL DETAILS @ END BENT**

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.  
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. I-5700  
WAKE COUNTY  
STATION: 44+35.96 -L-

SHEET 2 OF 2



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

ASSEMBLED BY :	W.D. REAMS	DATE :	08/2019
CHECKED BY :	F. LEA	DATE :	09/2019
DRAWN BY :	FCJ	REV. 6/13	MAA/GM
CHECKED BY :	ARB	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-33	
1			3			TOTAL SHEETS 33	
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