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09.08/2011

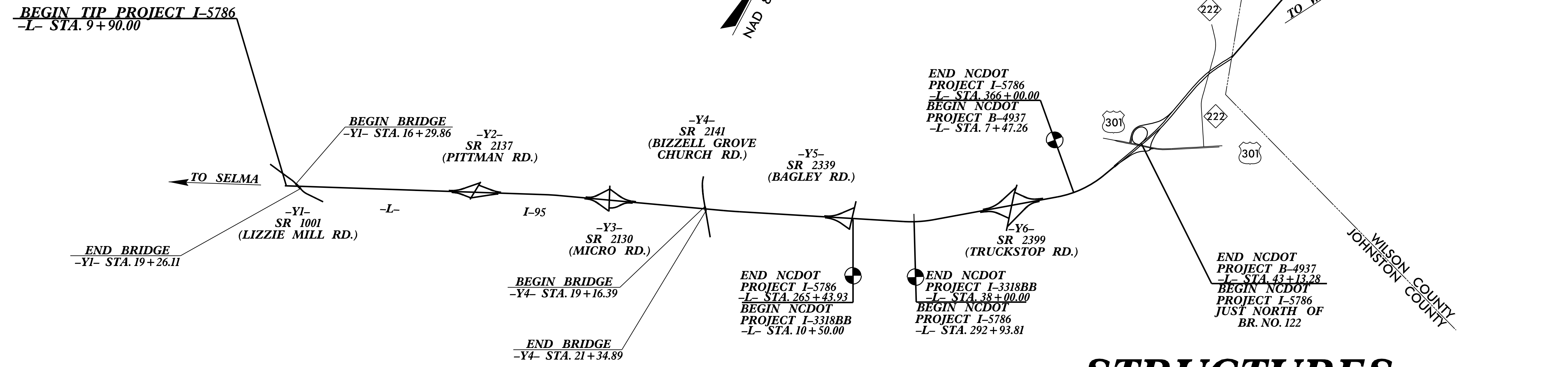
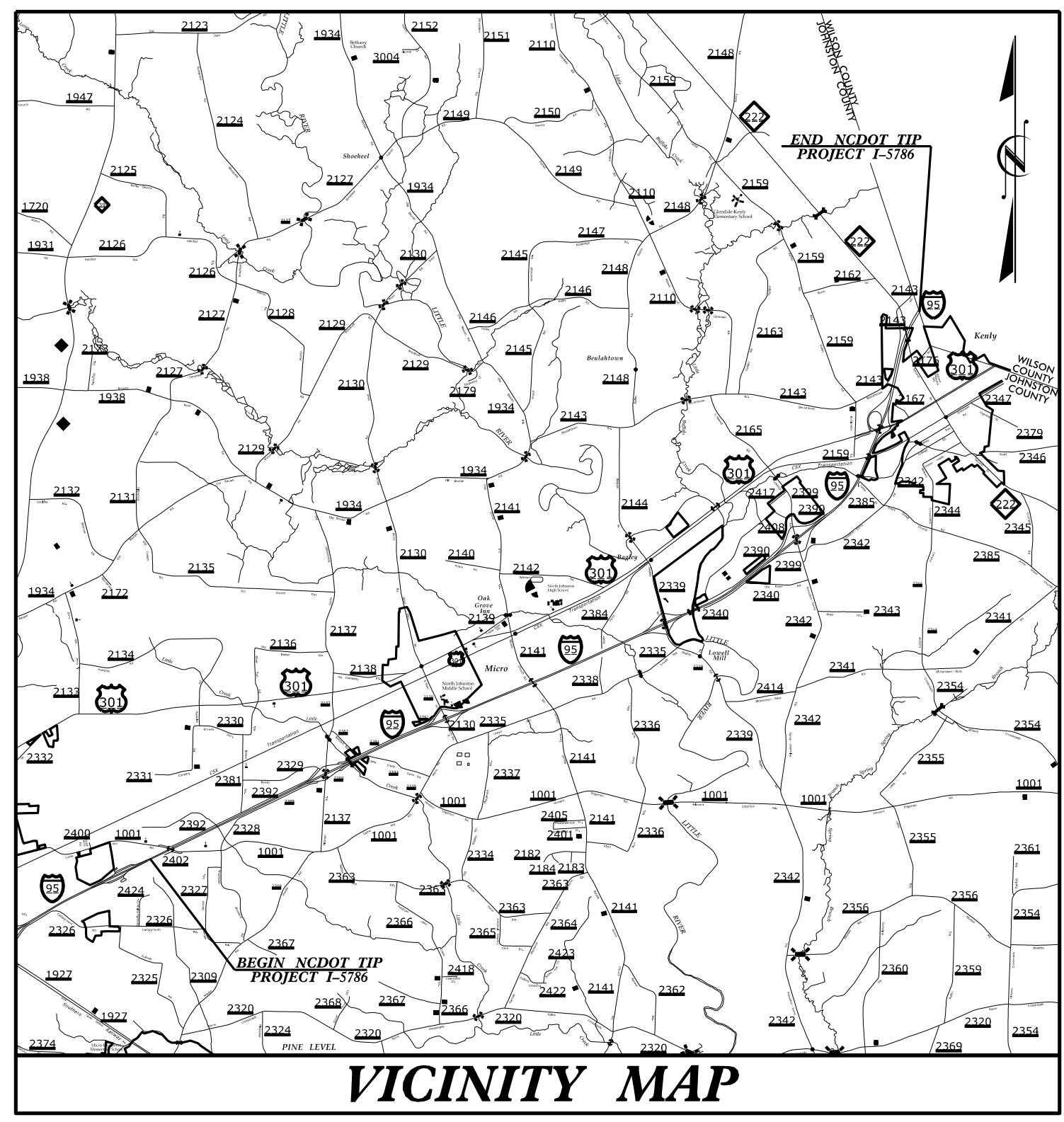
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5786		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
53026.1.FS1	HSIP-0095(031)	PE	
53026.3.1	NHPIM-0095(031)	CONST.	

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

**LOCATION: I-95 FROM JUST SOUTH OF SR 1001 (LIZZIE MILL RD.)  
 TO THE JOHNSTONWILSON COUNTY LINE JUST  
 NORTH OF NC 222**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES**

**TIP PROJECT: I-5786**

**CONTRACT: C204041**



**STRUCTURES**

**DESIGN DATA**

ADT 2017 =	35,590
ADT 2037 =	41,900
K =	12 %
D =	55 %
T =	29 % *
V =	70 MPH
* TTST =	23% DUAL = 6%
FUNC CLASS =	INTERSTATE
STATEWIDE TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT I-5786 =	7.284 MILES
TOTAL LENGTH OF TIP PROJECT I-5786 =	7.284 MILES

Prepared for the North Carolina Department of Transportation in the Office of:

**WETHERILL ENGINEERING**  
 1223 JONES FRANKLIN ROAD  
 Raleigh, N.C. 27606  
 License No. E-0317  
 Fax: 919 851 8077  
 Fax: 919 851 8007

2012 STANDARD SPECIFICATIONS

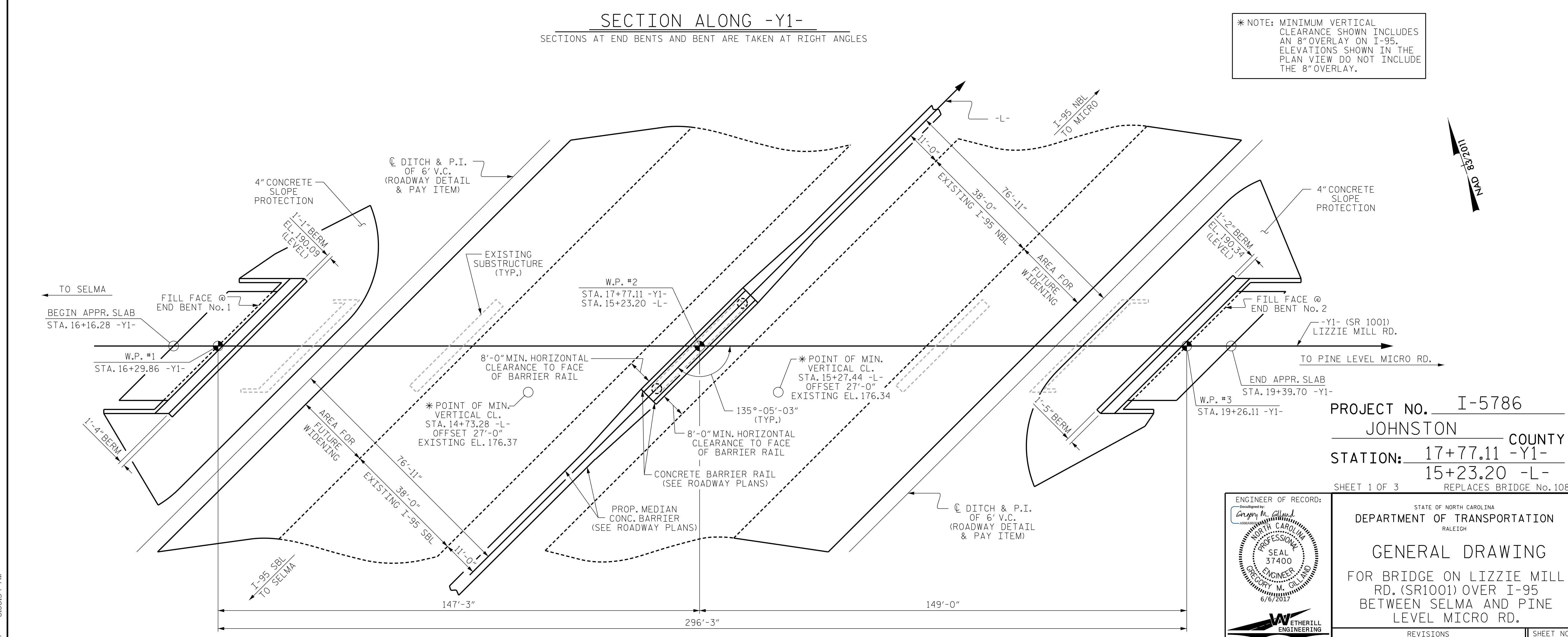
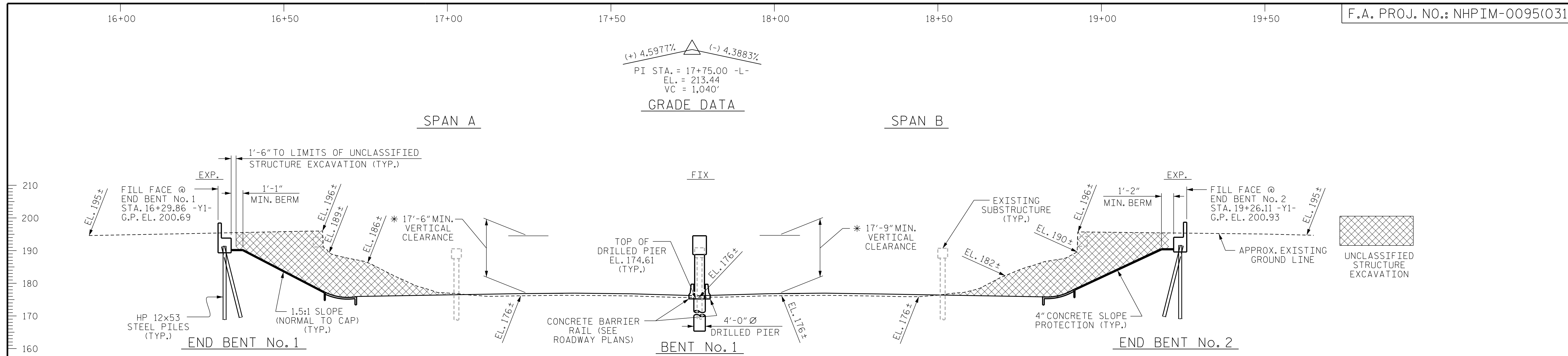
**EDWARD G. WETHERILL, PE**  
 PROJECT ENGINEER

**G.M. GILLAND, P.E.**  
 PROJECT DESIGN ENGINEER

LETTING DATE:  
 JULY 18, 2017

NCDOT CONTACT: **COREY McLAMB, PE**  
 DIVISION 4: PROJECT MANAGER

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DRAWN BY : D. HODGE DATE : 5/17  
 CHECKED BY : B.C. HUNT DATE : 5/17

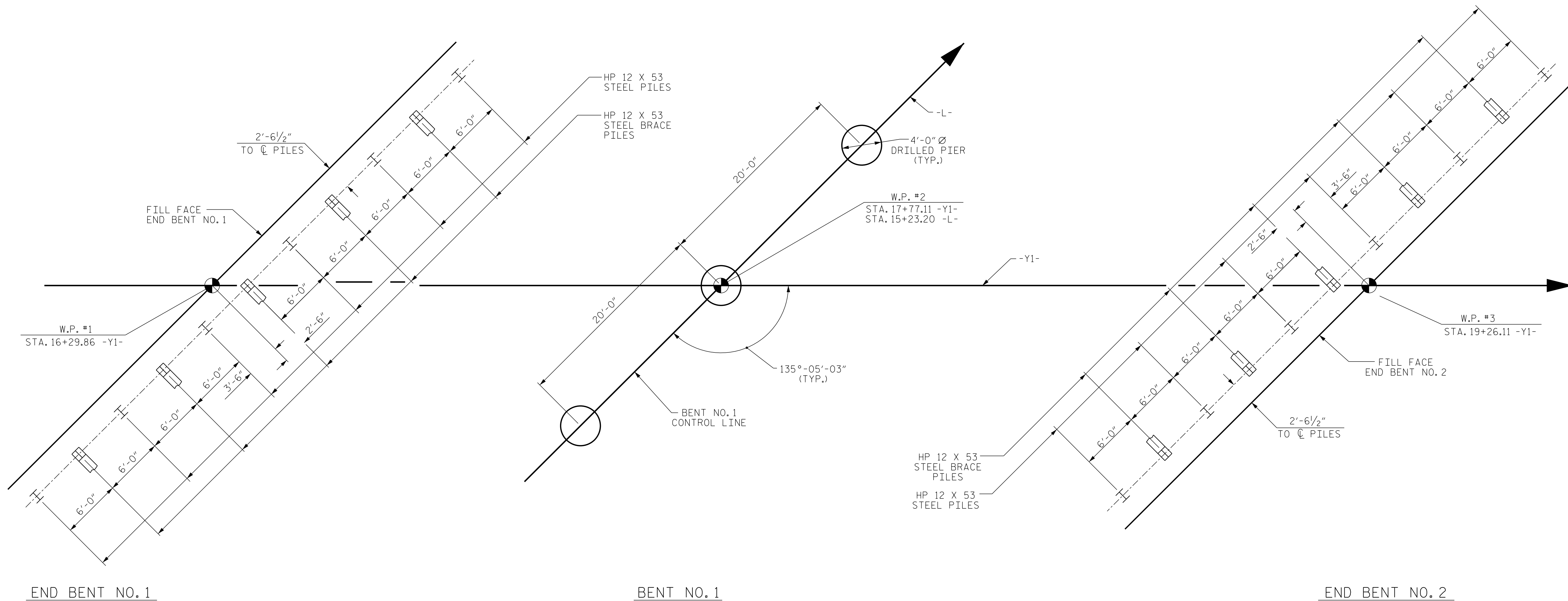
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ENGINEER OF RECORD:  
*Gregory M. Olland*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/6/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON LIZZIE MILL RD. (SR1001) OVER I-95 BETWEEN SELMA AND PINE LEVEL MICRO RD.					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S01-1					TOTAL SHEETS 32

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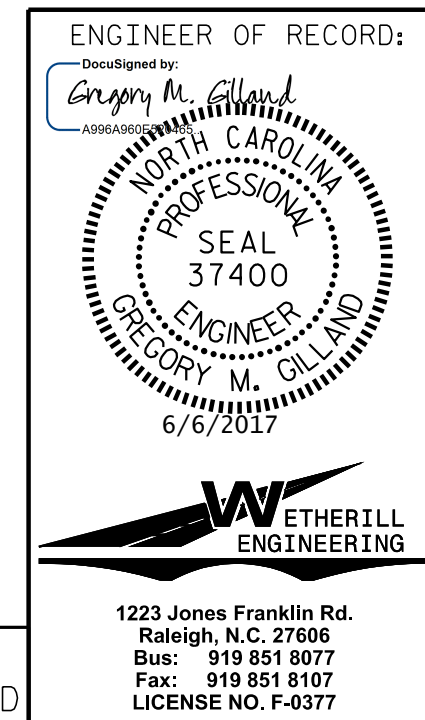


**FOUNDATION LAYOUT**

**NOTES:**

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NOS.1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 690 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 95 TSF.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
- INSTALL DRILLED PIERS AT BENT NO.1, LEFT AND CENTER, TO A TIP ELEVATION NO HIGHER THAN 132.0 WITH THE REQUIRED TIP RESISTANCE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.
- INSTALL DRILLED PIERS AT BENT NO.1, RIGHT, TO A TIP ELEVATION NO HIGHER THAN 134.0 WITH THE REQUIRED TIP RESISTANCE.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 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.
- SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO.1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FEET OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NOS.1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON LIZZIE MILL  
 RD. (SR1001) OVER I-95  
 BETWEEN SELMA AND PINE  
 LEVEL MICRO RD.

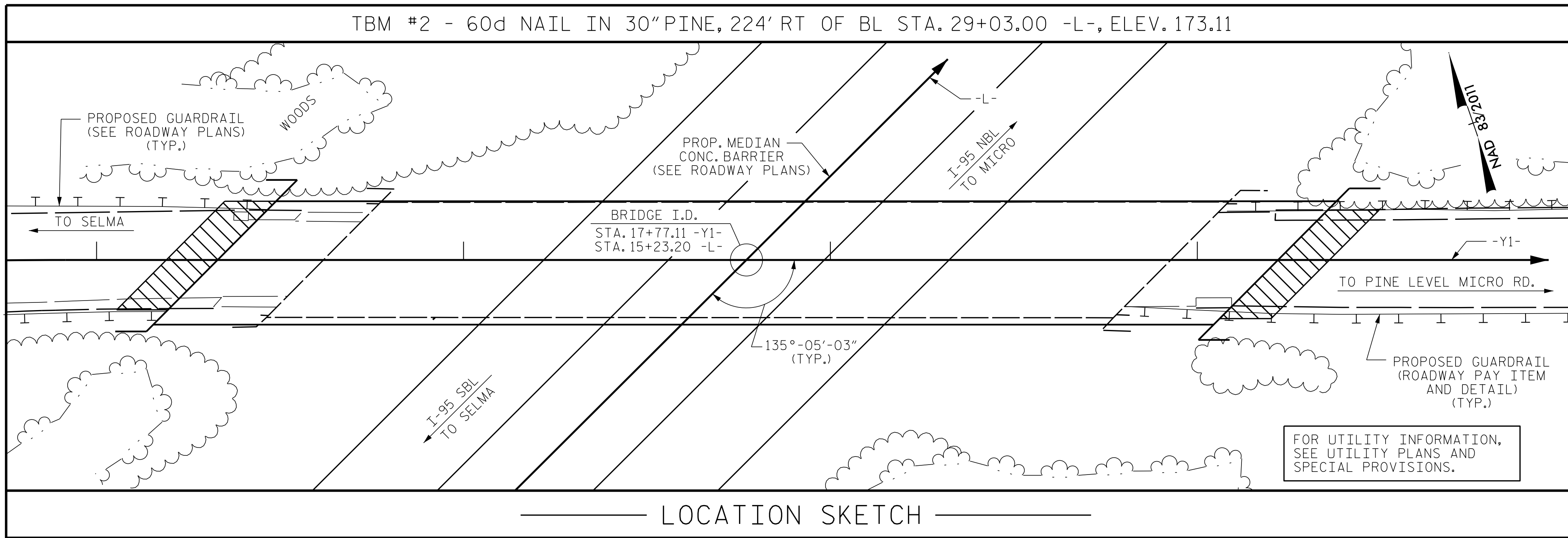
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-2
1			3			TOTAL SHEETS
2			4			32

1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

DRAWN BY : B.C. HUNT DATE : 5-17  
 CHECKED BY : T.V. ROUNTREE DATE : 5-17

DOCUMENT NOT CONSIDERED FINAL  
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**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 440,900 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	FOAM JOINT SEAL	ASBESTOS ASSESSMENT	
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EA.	No.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM								11,512	10,502		LUMP SUM			LUMP SUM					586.60		LUMP SUM	LUMP SUM	LUMP SUM	
END BENT 1											70.3		10,575			11	11	605	6		330				
BENT 1		105.00	21.00		1	1	1				55.0		15,349	4,291											
END BENT 2											70.3		10,575			11	11	575	6		395				
TOTAL	LUMP SUM	105.00	21.00	1	1	1	1	LUMP SUM	11,512	10,502	195.6	LUMP SUM	36,499	4,291	LUMP SUM	22	22	1,180	12	586.60	725	LUMP SUM	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 FALSEWORK AND FORMWORK, 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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS, 1 @ 45', 2 @ 70' AND 1 @ 45' WITH A REINFORCED CONCRETE DECK ON 4 LINES OF I-BEAMS AND A CLEAR ROADWAY WIDTH OF 26'-2" ON REINFORCED CONCRETE POST & BEAM BENTS AND REINFORCED CONCRETE END BENTS ON TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE FOUNDATIONS OF THE EXISTING POST AND BEAM BENTS IS UNKNOWN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

THE CONTRACTOR SHALL SUBMIT A GIRDER ERECTION SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL.

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 17+77.11 -Y1-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE ON LIZZIE MILL RD. (SR1001) OVER I-95 BETWEEN SELMA AND PINE LEVEL MICRO RD.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-3
1			3			TOTAL SHEETS
2			4			32

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LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS																								
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	1.09	--	1.75	0.816	1.09	A	E	143.48	1.196	1.10	A	I	0.00	1.30	0.816	1.50	A	E	87.14		
	HL-93 (OPERATING)	N/A		1.42	--	1.35	0.816	1.42	A	E	143.48	1.196	1.43	A	I	0.00	1.00	0.816	1.95	A	E	87.14		
	HS-20 (INVENTORY)	36.00	②	1.60	57.60	1.75	0.816	2.32	A	E	87.14	1.196	1.60	A	I	0.00	1.30	0.816	2.26	A	E	87.14		
	HS-20 (OPERATING)	36.00		2.07	74.52	1.35	0.816	3.00	A	E	87.14	1.196	2.07	A	I	0.00	1.00	0.816	2.94	A	E	87.14		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.99	67.37	1.40	0.816	7.05	A	E	87.14	1.196	4.99	A	I	0.00	1.30	0.816	5.50	A	E	87.14	
		SNGARBS2	20.000		3.46	69.20	1.40	0.816	5.01	A	E	87.14	1.196	3.46	A	I	0.00	1.30	0.816	3.91	A	E	87.14	
		SNAGRIS2	22.000		3.19	70.18	1.40	0.816	4.65	A	E	87.14	1.196	3.19	A	I	0.00	1.30	0.816	3.63	A	E	87.14	
		SNCOTTS3	27.250		2.48	67.58	1.40	0.816	3.51	A	E	87.14	1.196	2.48	A	I	0.00	1.30	0.816	2.74	A	E	87.14	
		SNAGGRS4	34.925		1.68	58.67	1.40	0.816	2.84	A	E	87.14	1.196	1.68	A	I	0.00	1.30	0.816	2.22	A	E	87.14	
		SNS5A	35.550		1.68	59.72	1.40	0.816	2.80	A	E	87.14	1.196	1.68	A	I	0.00	1.30	0.816	2.18	A	E	87.14	
		SNS6A	39.950		1.51	60.32	1.40	0.816	2.53	A	E	87.14	1.196	1.51	A	I	0.00	1.30	0.816	1.97	A	E	87.14	
		SNS7B	42.000		1.47	61.74	1.40	0.816	2.41	A	E	87.14	1.196	1.47	A	I	0.00	1.30	0.816	1.88	A	E	87.14	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.16	71.28	1.40	0.816	3.08	A	E	87.14	1.196	2.16	A	I	0.00	1.30	0.816	2.40	A	E	87.14	
		TNT4A	33.075		1.78	58.87	1.40	0.816	3.06	A	E	87.14	1.196	1.78	A	I	0.00	1.30	0.816	2.39	A	E	87.14	
		TNT6A	41.600		1.52	63.23	1.40	0.816	2.48	A	E	87.14	1.196	1.52	A	I	0.00	1.30	0.816	1.94	A	E	87.14	
		TNT7A	42.000		1.50	63.00	1.40	0.816	2.48	A	E	87.14	1.196	1.50	A	I	0.00	1.30	0.816	1.93	A	E	87.14	
		TNT7B	42.000		1.45	60.90	1.40	0.816	2.50	A	E	87.14	1.196	1.45	A	I	0.00	1.30	0.816	1.95	A	E	87.14	
		TNAGRIT4	43.000		1.40	60.20	1.40	0.816	2.42	A	E	87.14	1.196	1.40	A	I	0.00	1.30	0.816	1.89	A	E	87.14	
TNAGT5A	45.000		1.37	61.56	1.40	0.816	2.31	A	E	87.14	1.196	1.37	A	I	0.00	1.30	0.816	1.80	A	E	87.14			
TNAGT5B	45.000		③	1.34	60.30	1.40	0.816	2.28	A	E	87.14	1.196	1.34	A	I	0.00	1.30	0.816	1.78	A	E	87.14		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$																						

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.

COMMENTS:  
1.  
2.  
3.  
4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) \*\*

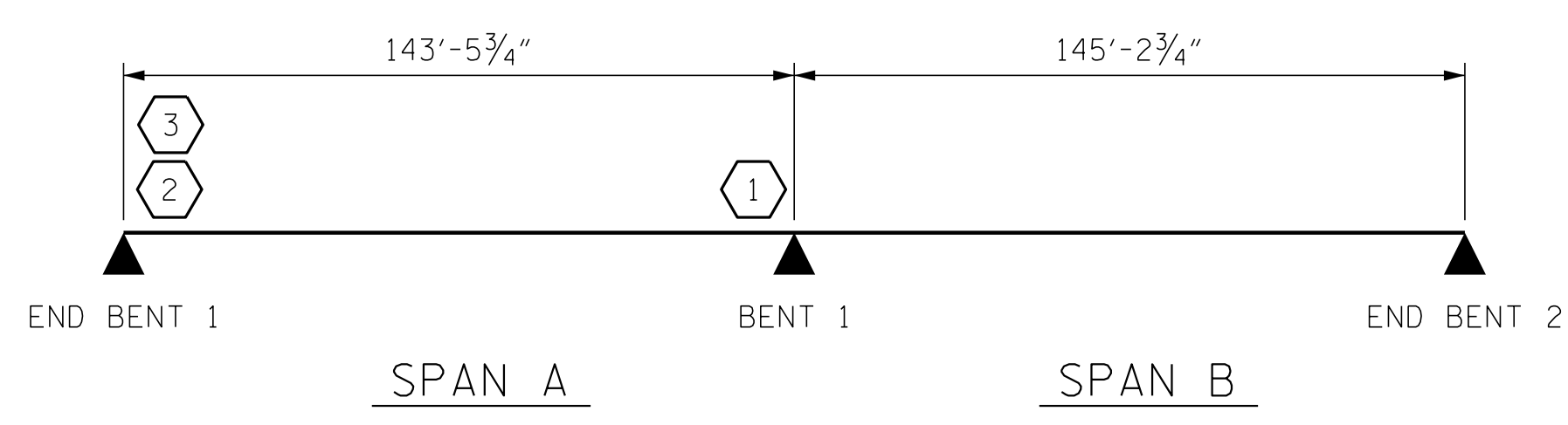
② DESIGN LOAD RATING (HS-20) \*\*

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER  
E - EXTERIOR GIRDER



PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-

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ASSEMBLED BY : D. HODGE DATE : 5/17  
CHECKED BY : B.C. HUNT DATE : 5/17  
DRAWN BY : MAA 1/08 REV. 11/2/08RR MAA/GM  
CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

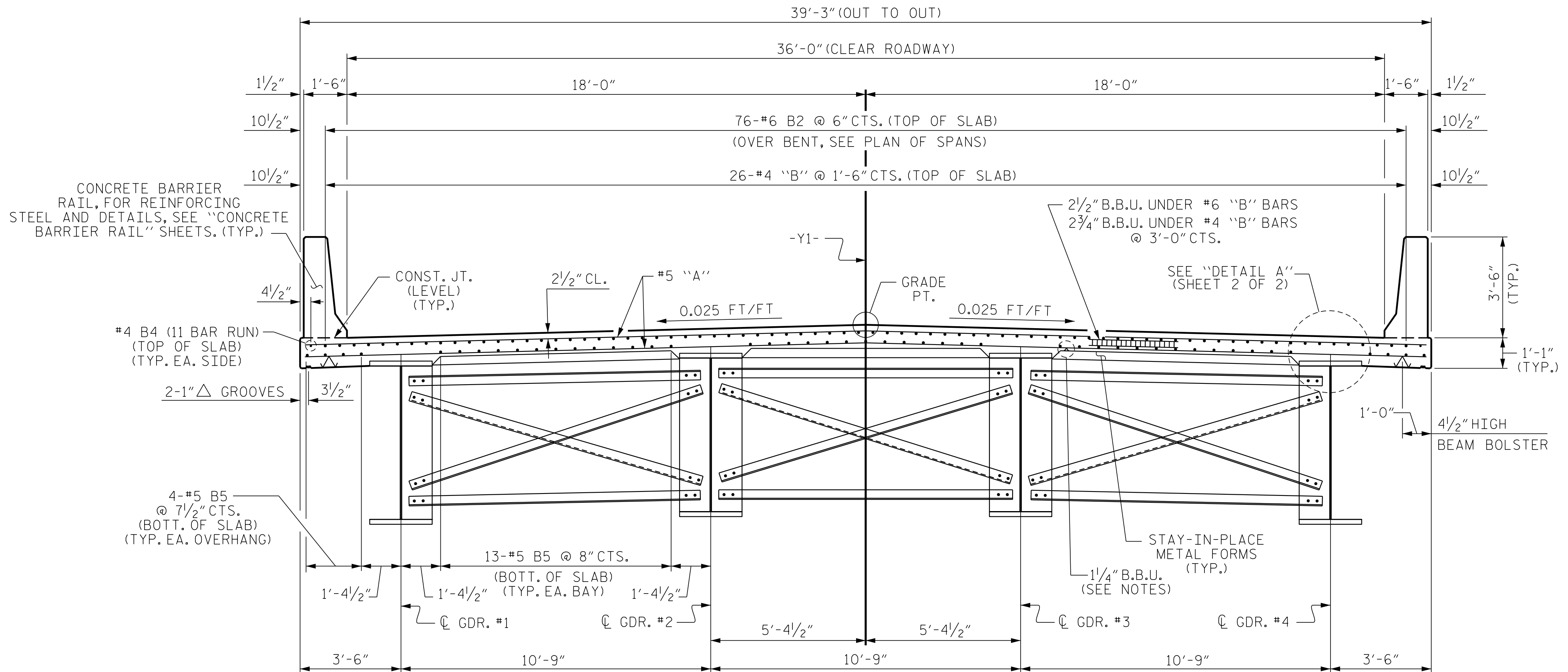
ENGINEER OF RECORD:  
Gregory M. Olland  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 37400  
GREGORY M. OLLAND  
6/6/2017  
ETHERILL ENGINEERING  
1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

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

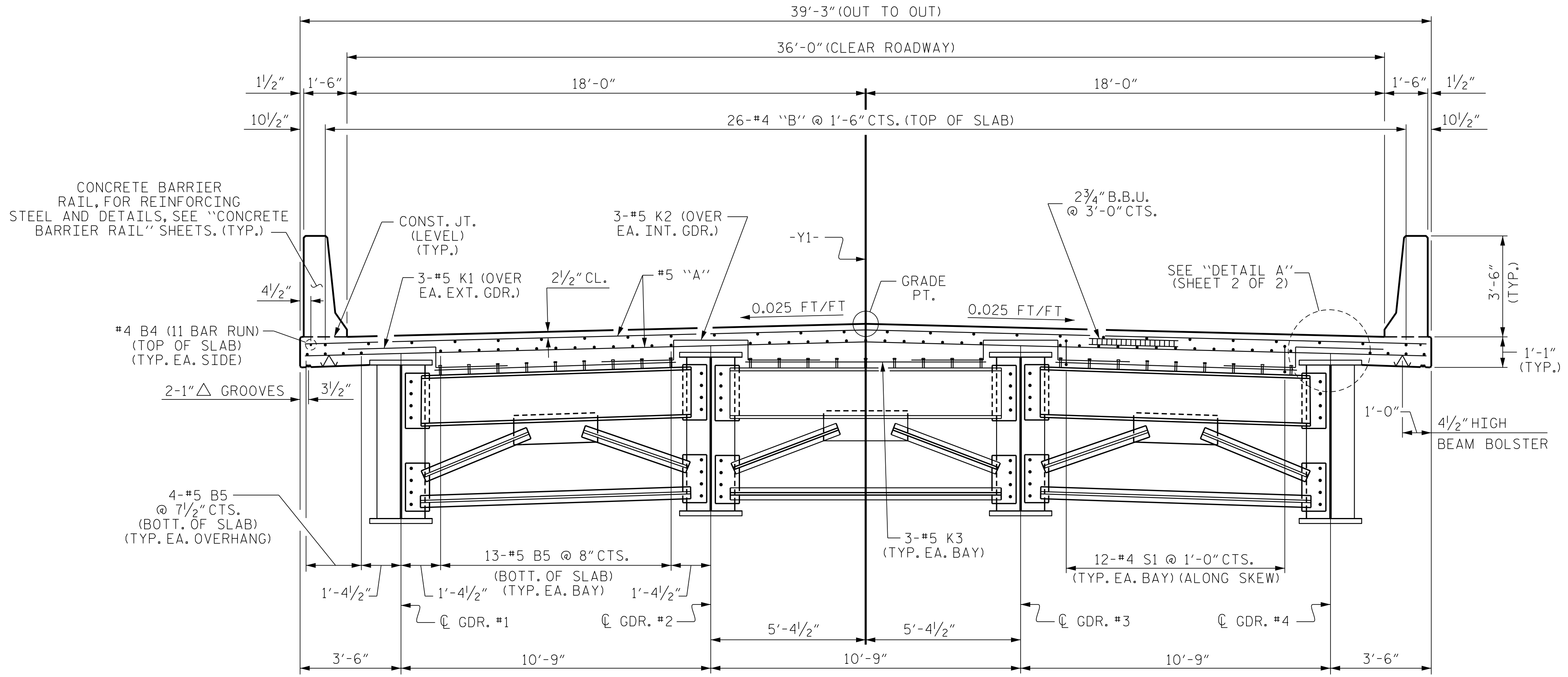
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S01-4  
TOTAL SHEETS 32

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**TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS)



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

**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 CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

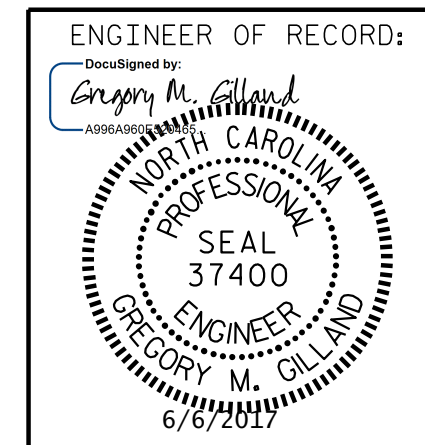
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND 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.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-  
SHEET 1 OF 2



1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

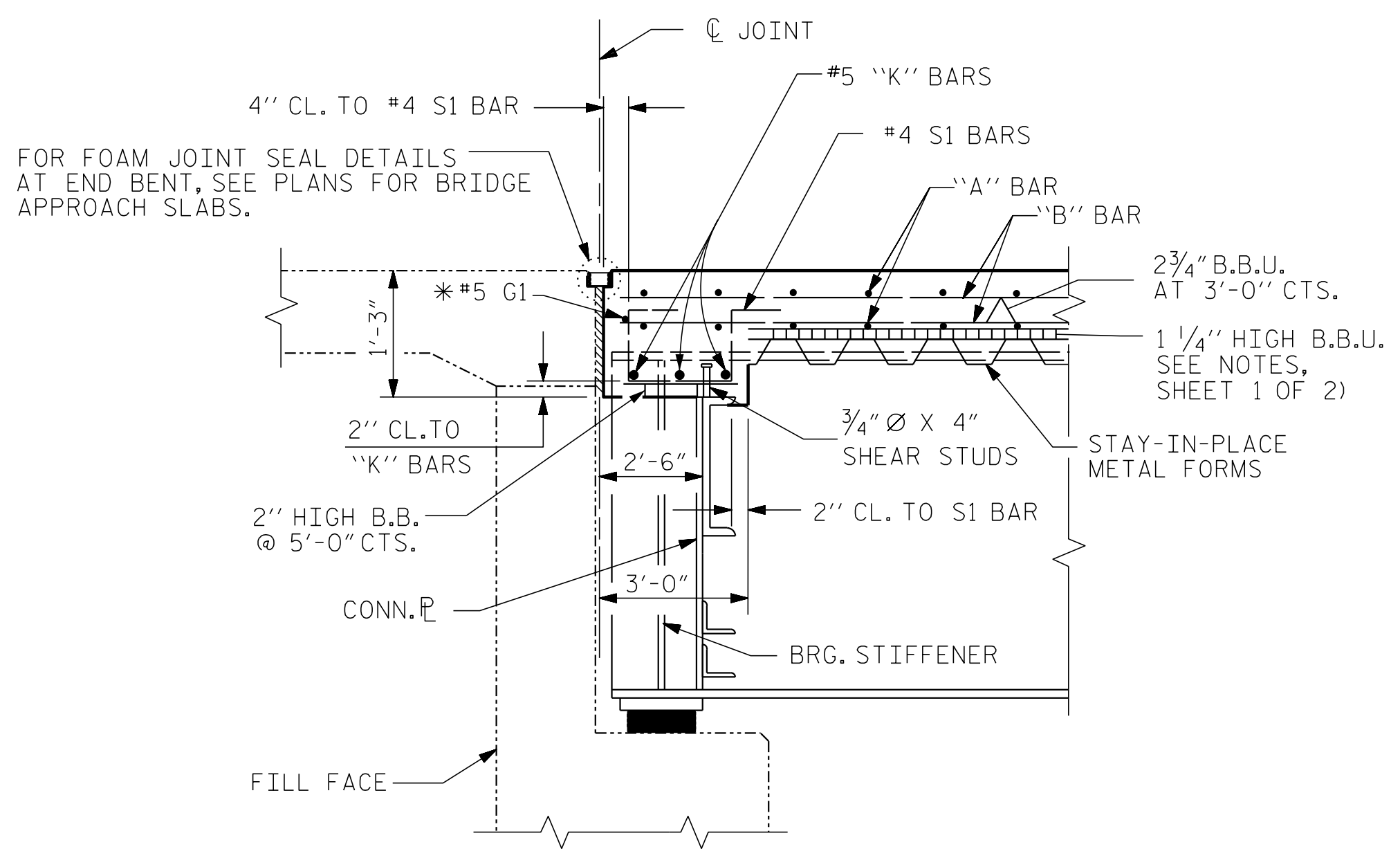
SUPERSTRUCTURE  
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-5
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 5/17

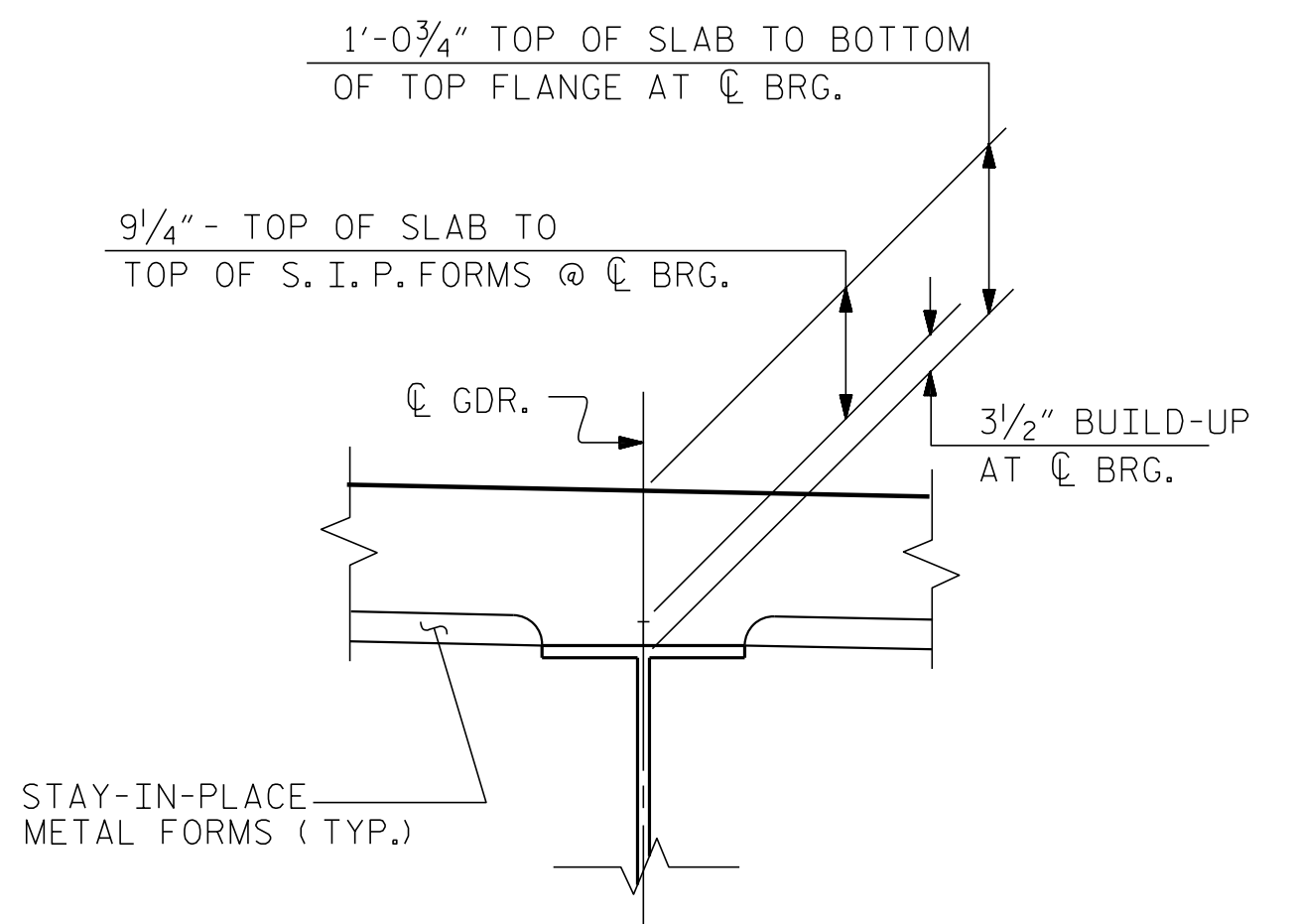
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UNLESS ALL SIGNATURES COMPLETED

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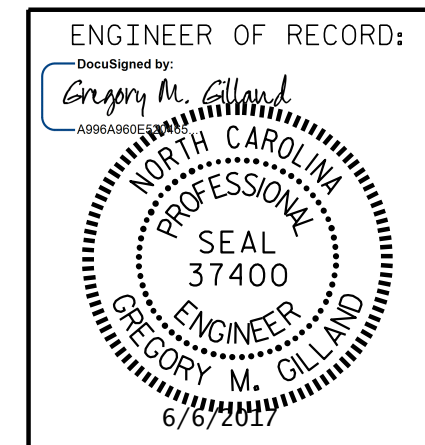
**SECTION THRU END BENT**

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



**DETAIL "A"**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 2



1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 TYPICAL SECTION**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-6
1			3			TOTAL SHEETS
2			4			32

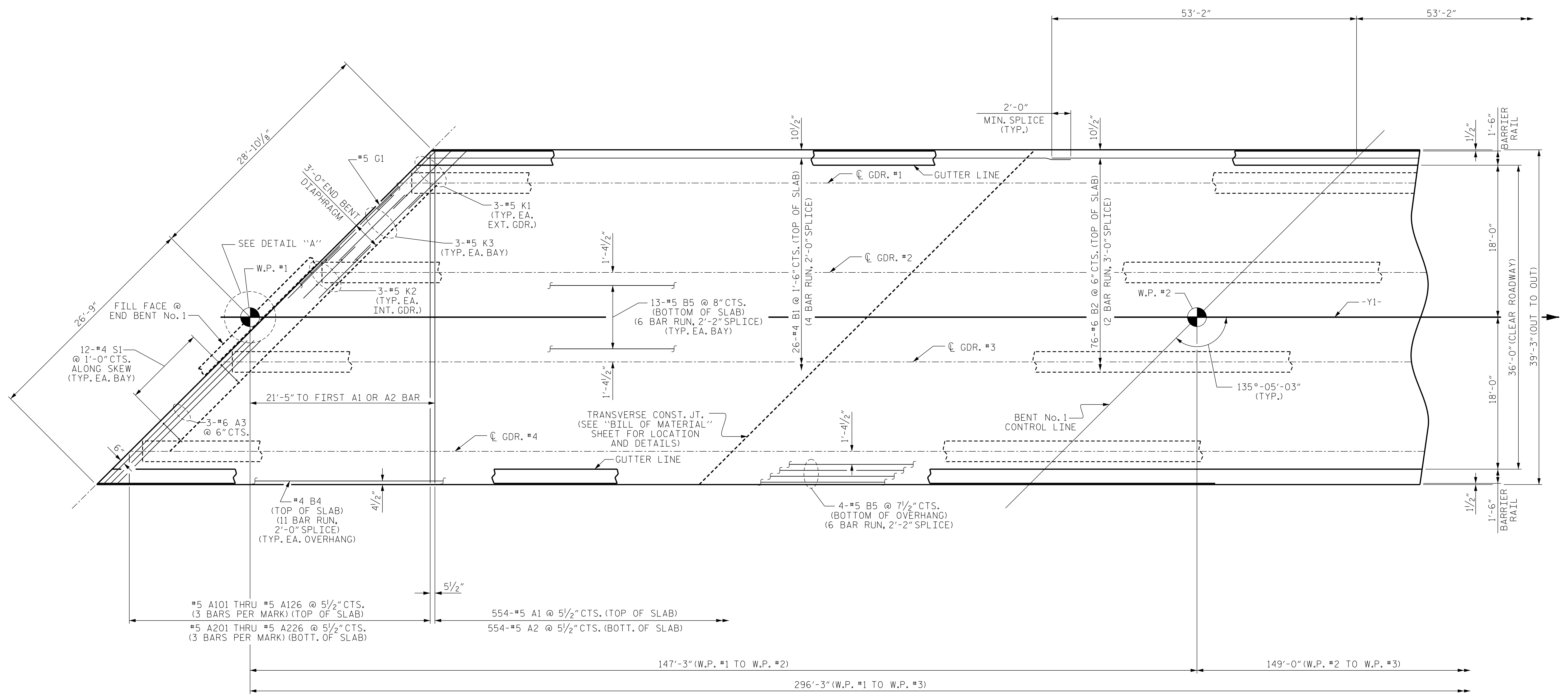
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 UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : D. HODGE DATE : 4/17  
 CHECKED BY : B.C. HUNT DATE : 5/17

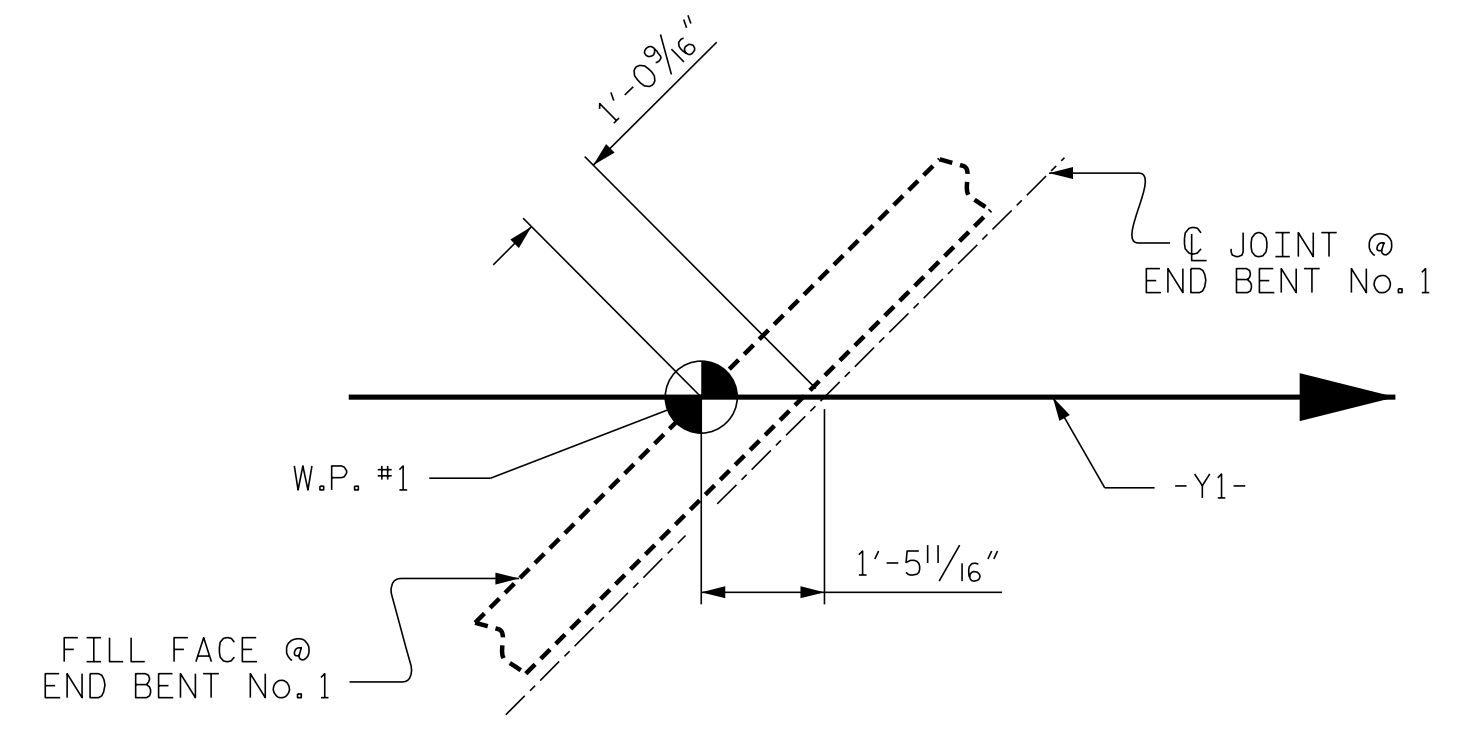
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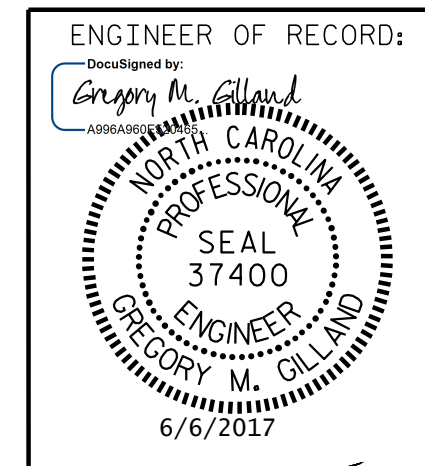


### PLAN OF SPAN A



#### DETAIL A

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 1 OF 2



**ETHERILL ENGINEERING**  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

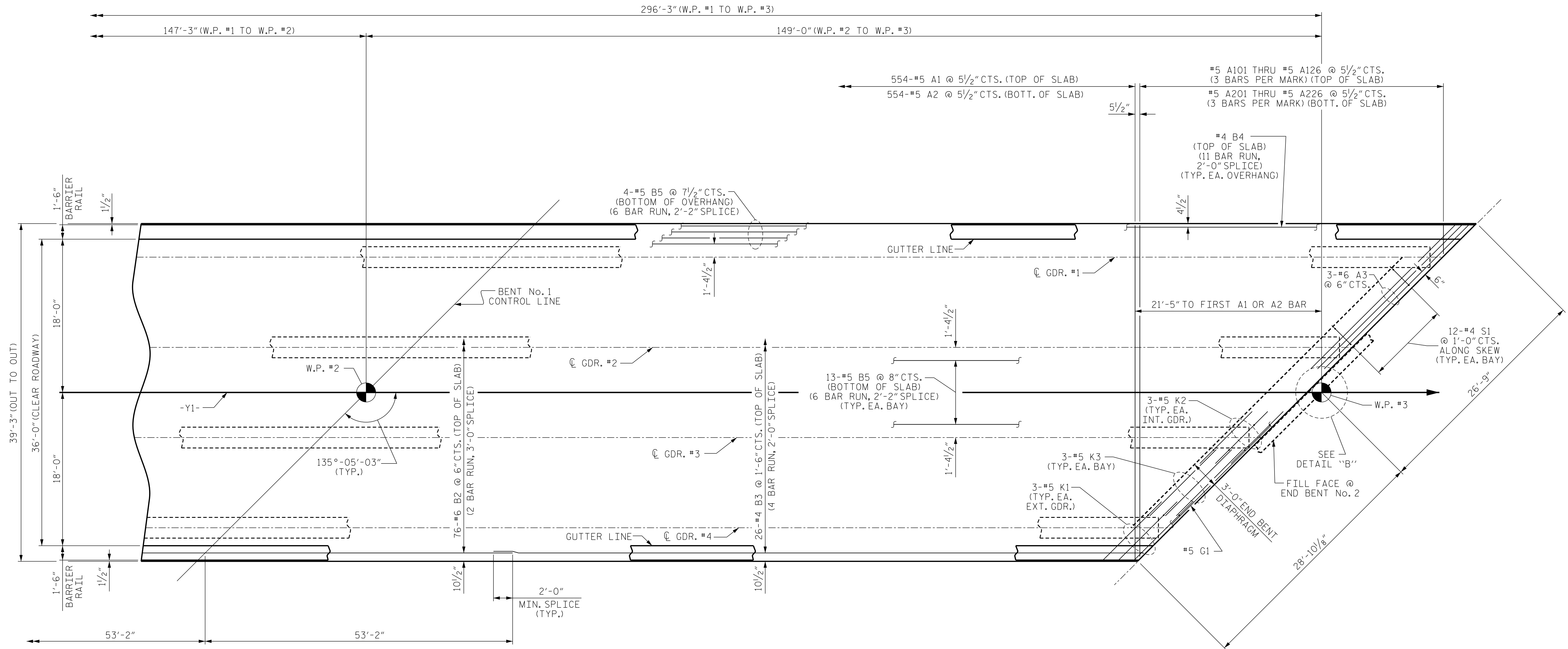
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### SUPERSTRUCTURE PLAN OF SPANS

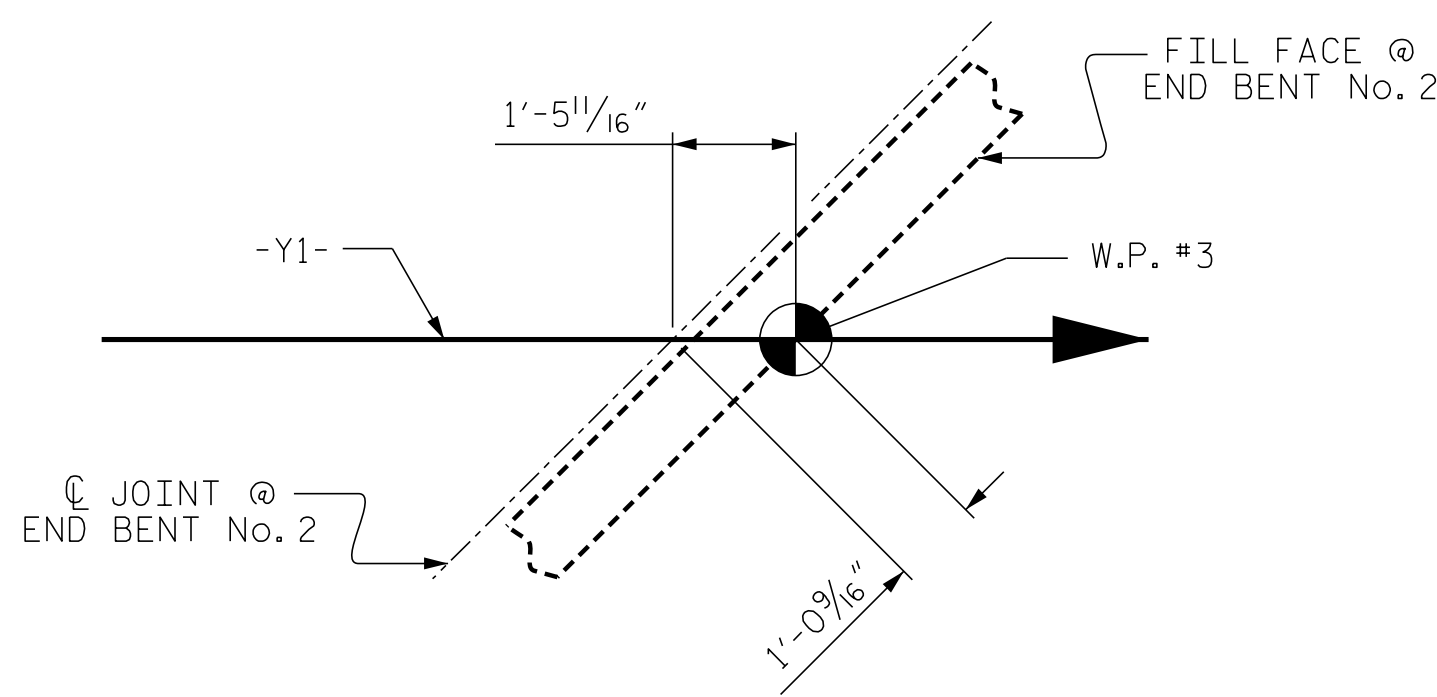
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-7
1			3			TOTAL SHEETS
2			4			32

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 CHECKED BY: B.C. HUNT DATE: 5/17

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PLAN OF SPAN B



DETAIL B

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 2

ENGINEER OF RECORD:  
 Designed by  
*Gregory M. Olland*  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 37400  
 ENGINEER  
 GREGORY M. OLLAND  
 6/6/2017  
 WETHERILL  
 ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

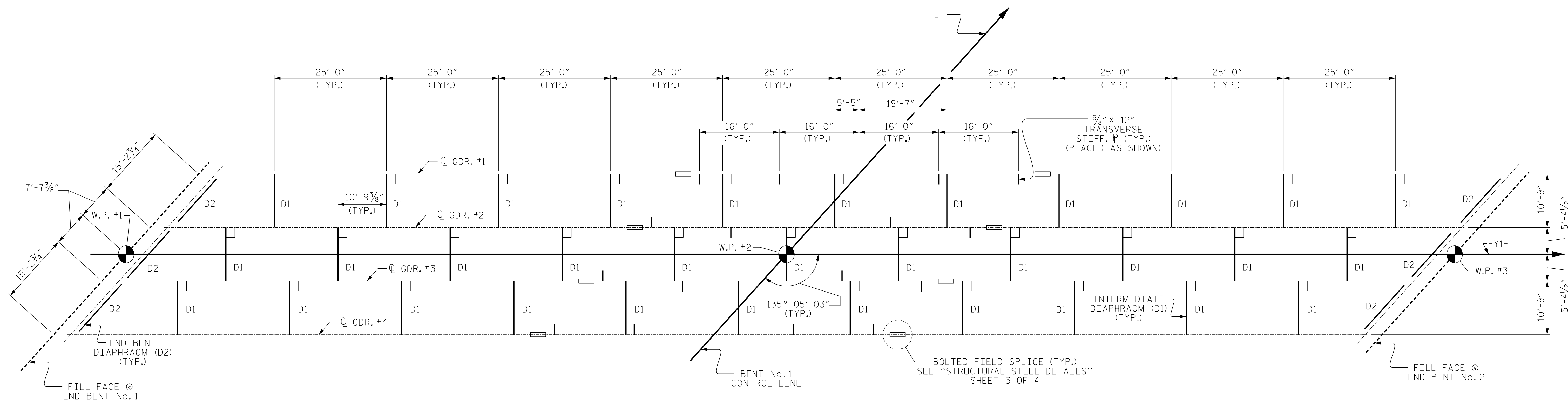
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S01-8					TOTAL SHEETS 32

DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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EXP.  
E1, P1

FIXED  
DB1, M1

EXP.  
E1, P2

SPAN A

SPAN B

FRAMING PLAN

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

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 CHECKED BY : B.C. HUNT DATE : 5/17

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ENGINEER OF RECORD:  
 Gregory M. Olland  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 37400  
 ENGINEER  
 GREGORY M. OLLAND  
 6/6/2017

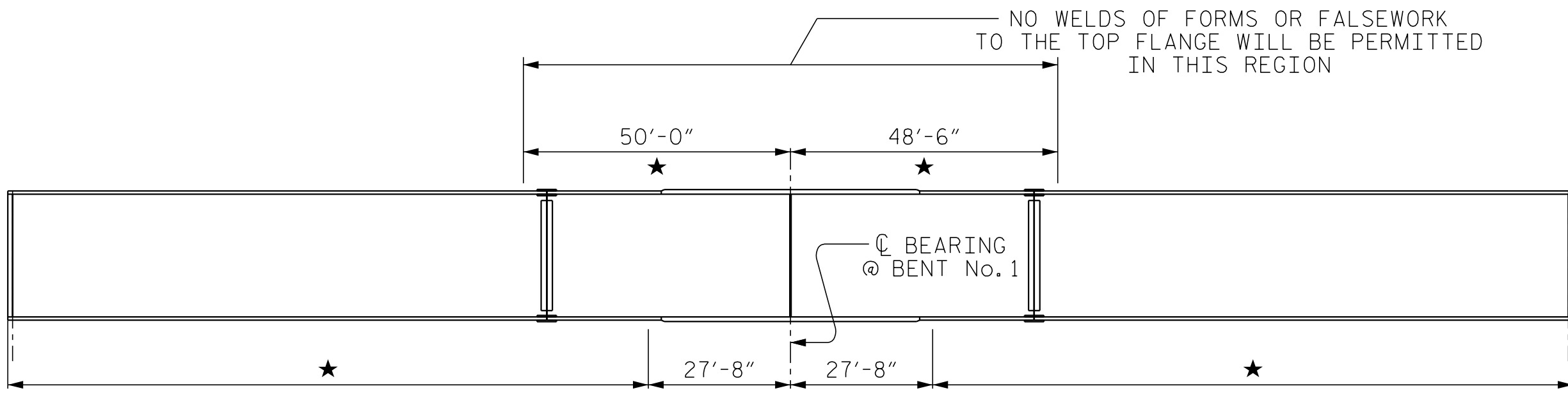
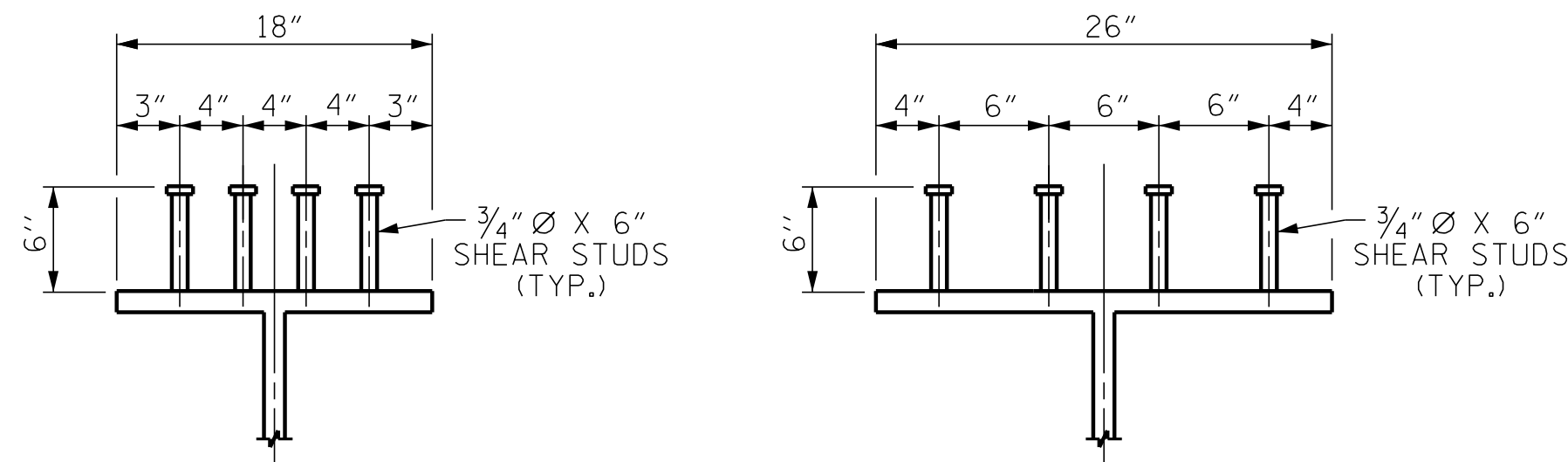
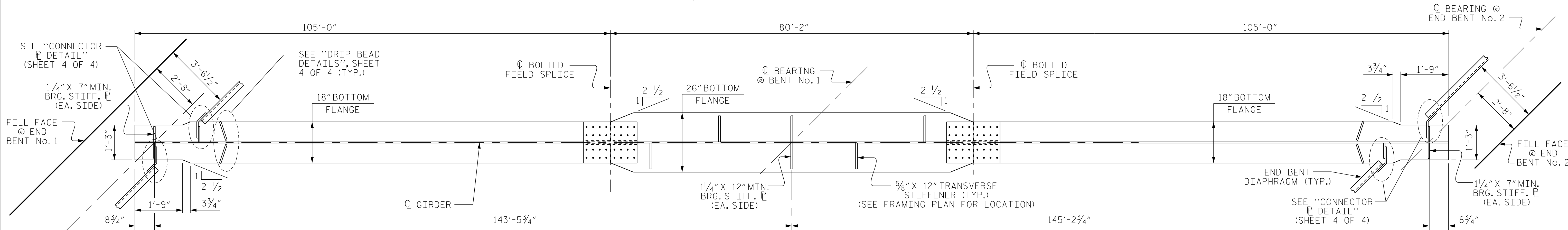
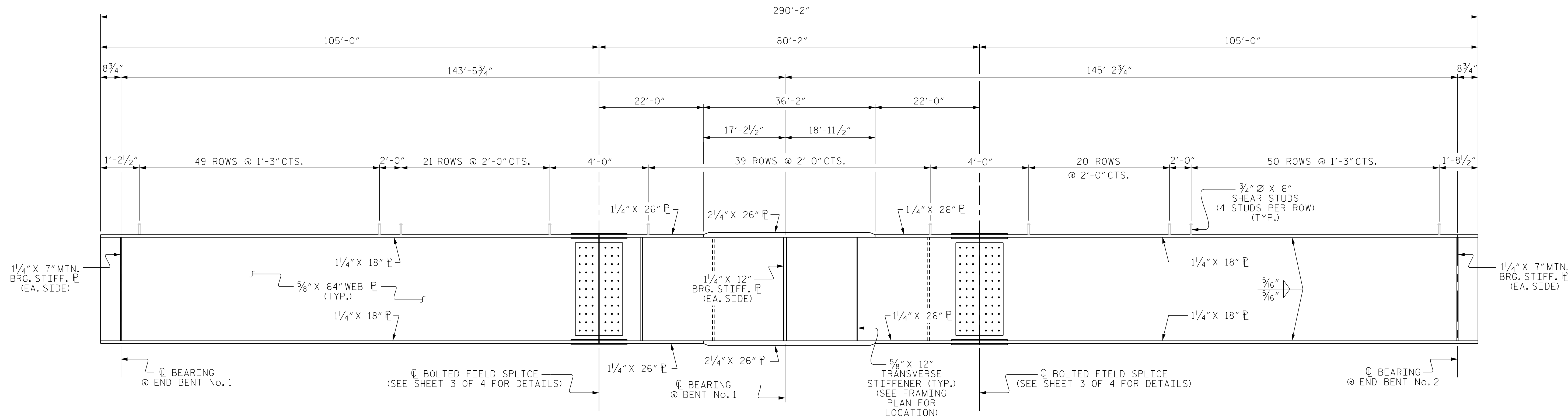
ETHERILL  
 ENGINEERING

1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-9
1			3			TOTAL SHEETS
2			4			32



\* CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS. CHARPY V-NOTCH TEST ARE REQUIRED FOR 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 FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 1 OF 4

ENGINEER OF RECORD:  
 Greg M. Gillard  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/6/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL DETAILS

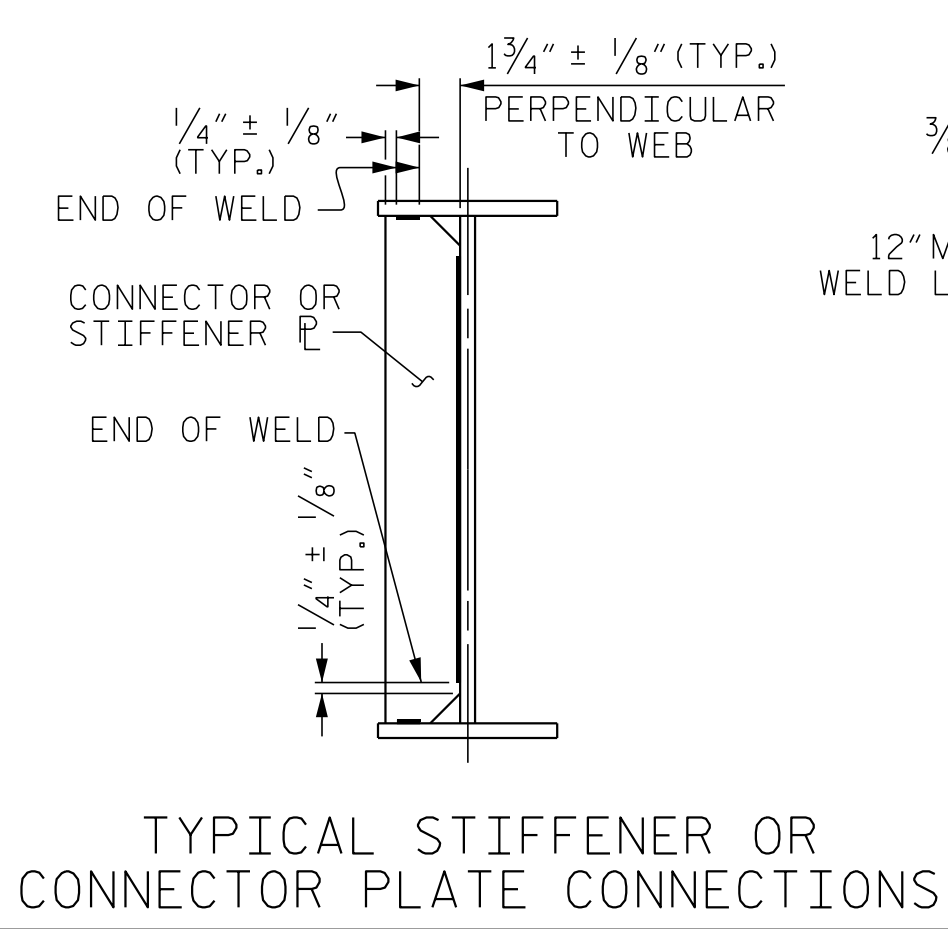
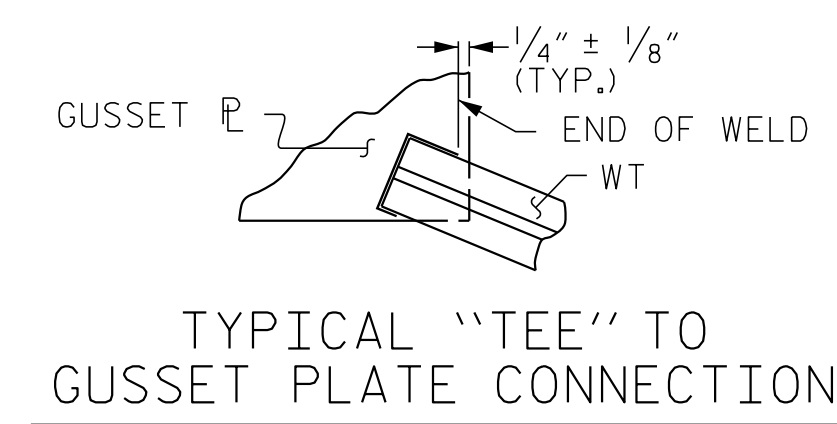
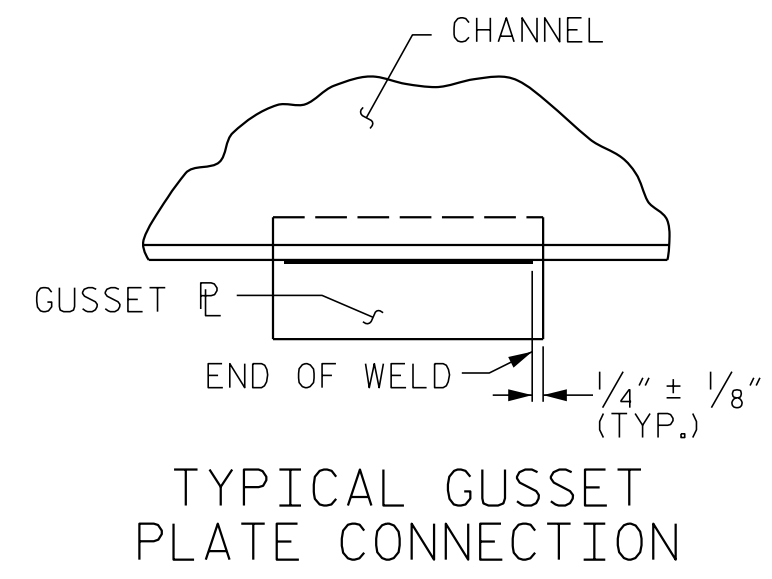
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DRAWN BY: D. HODGE DATE: 4/17  
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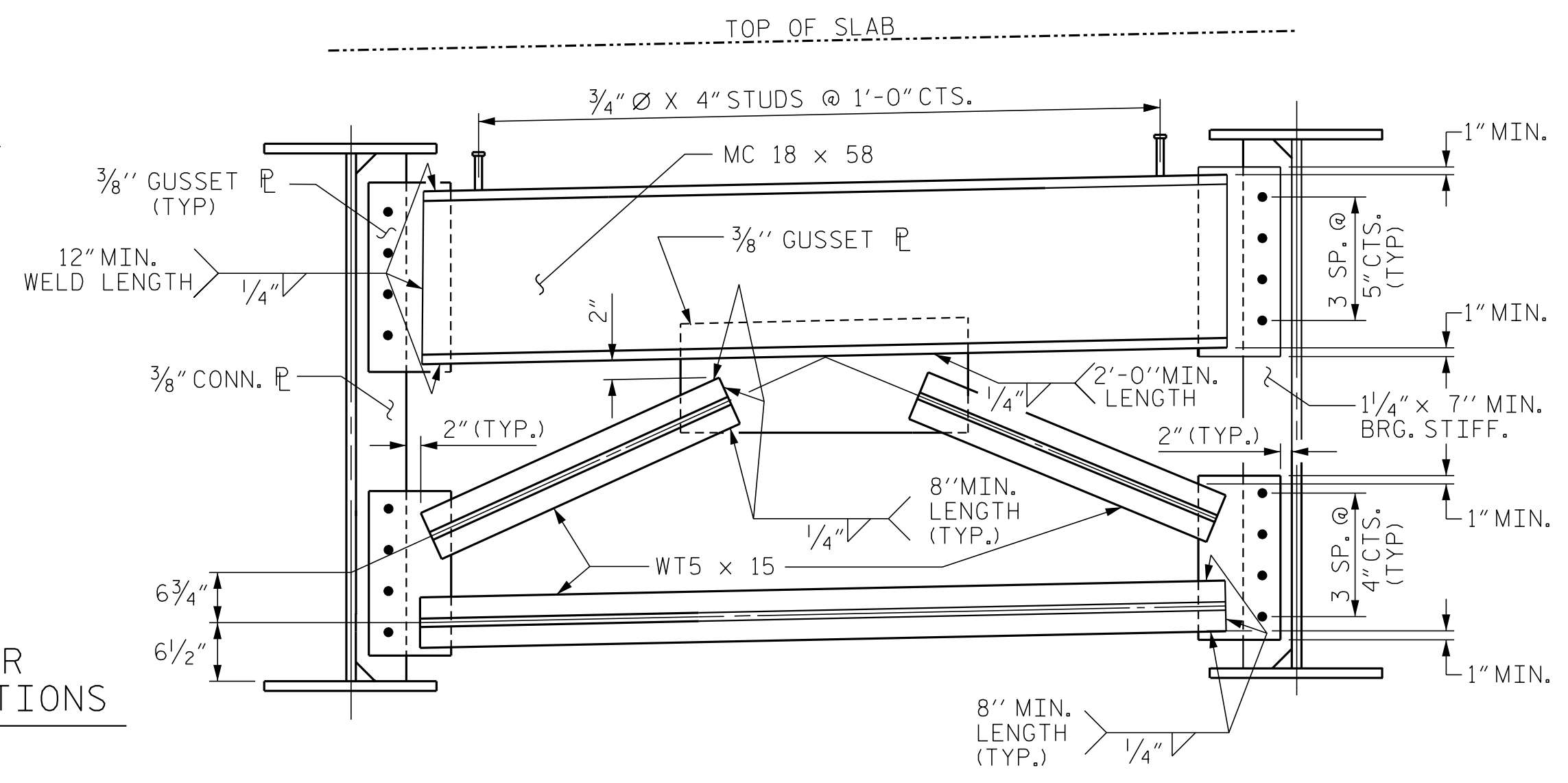
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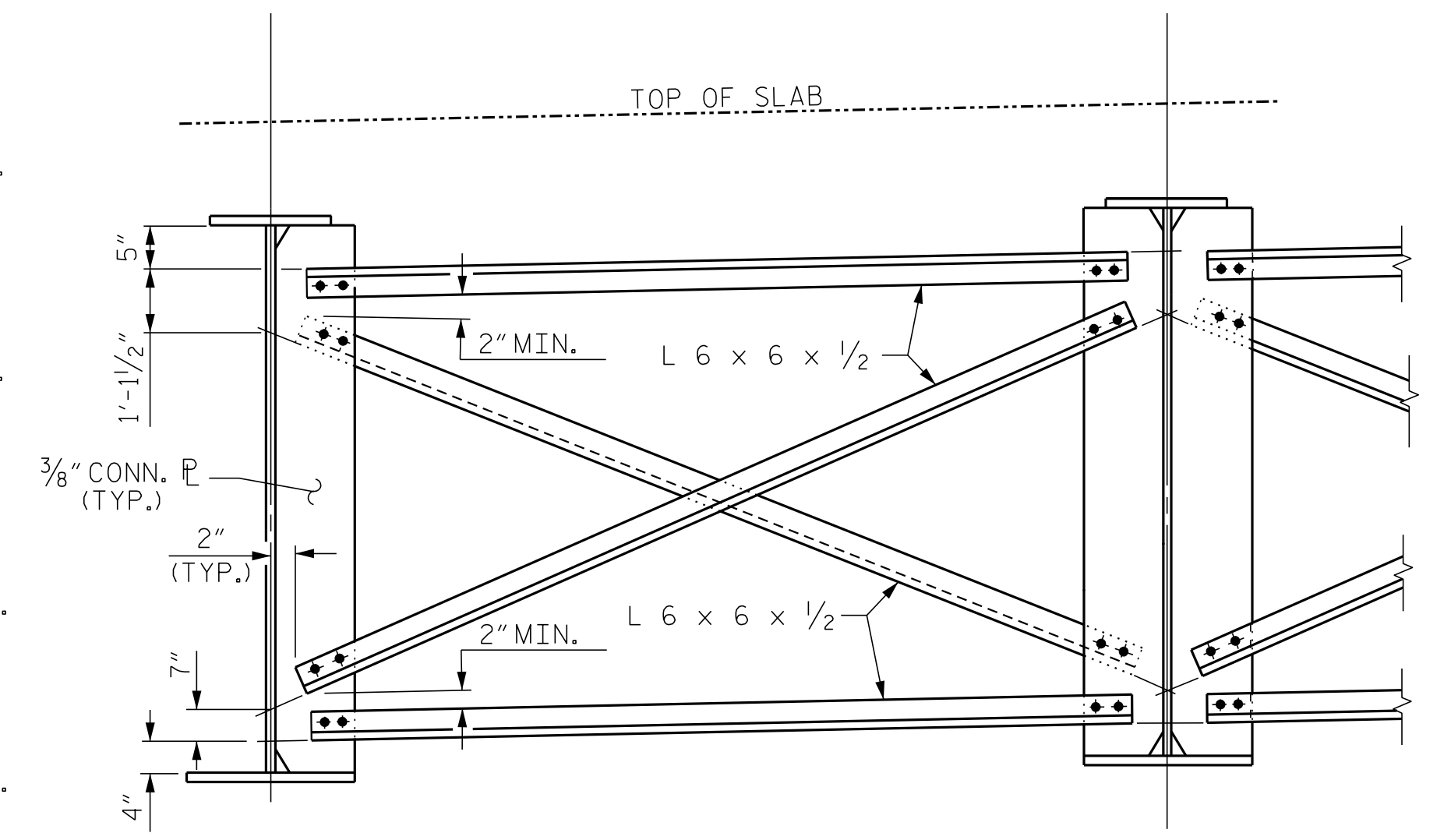




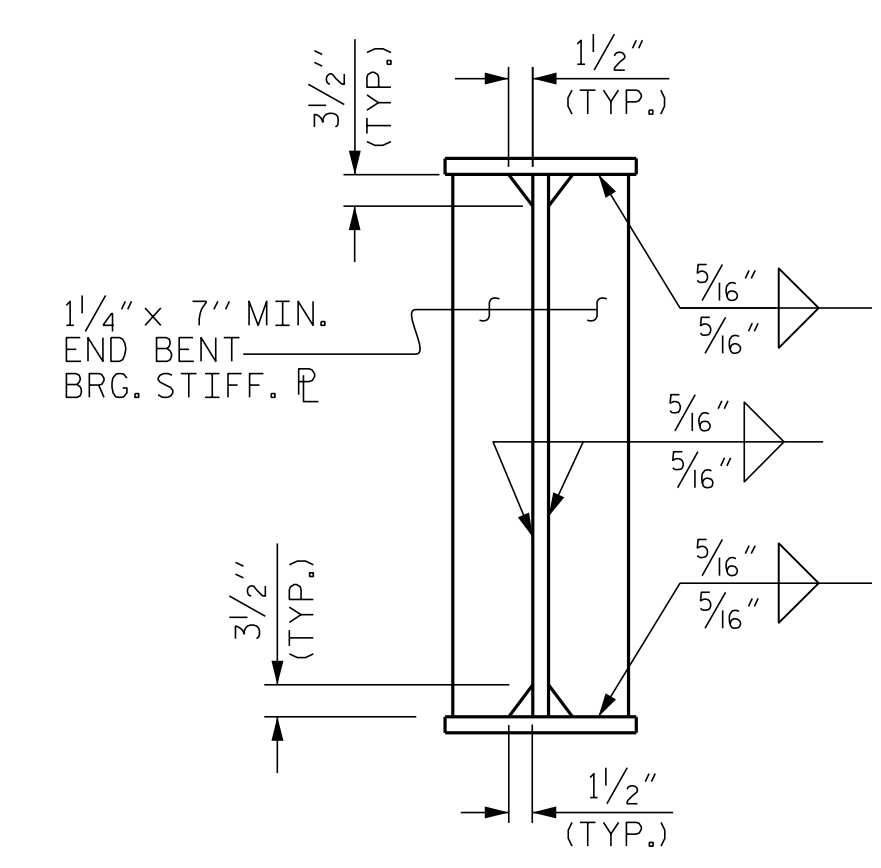
WELD TERMINATION DETAILS



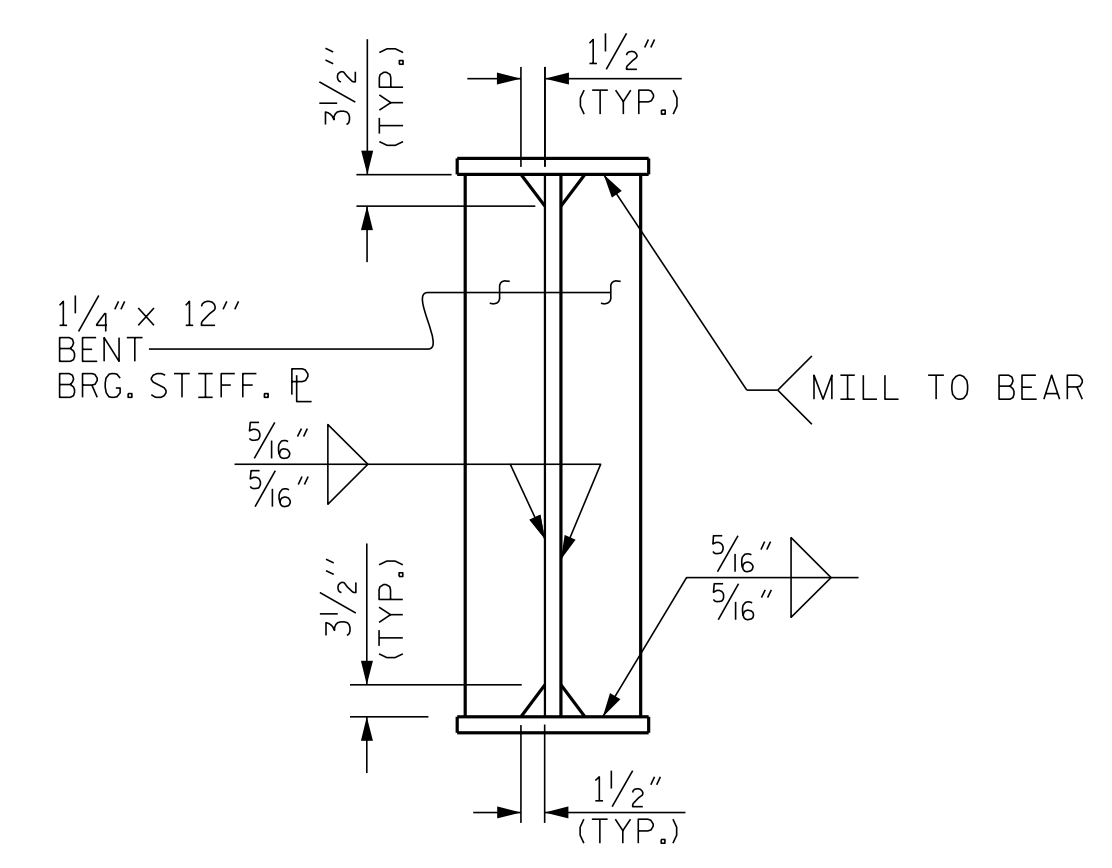
TYPICAL END BENT DIAPHRAGM (D2)



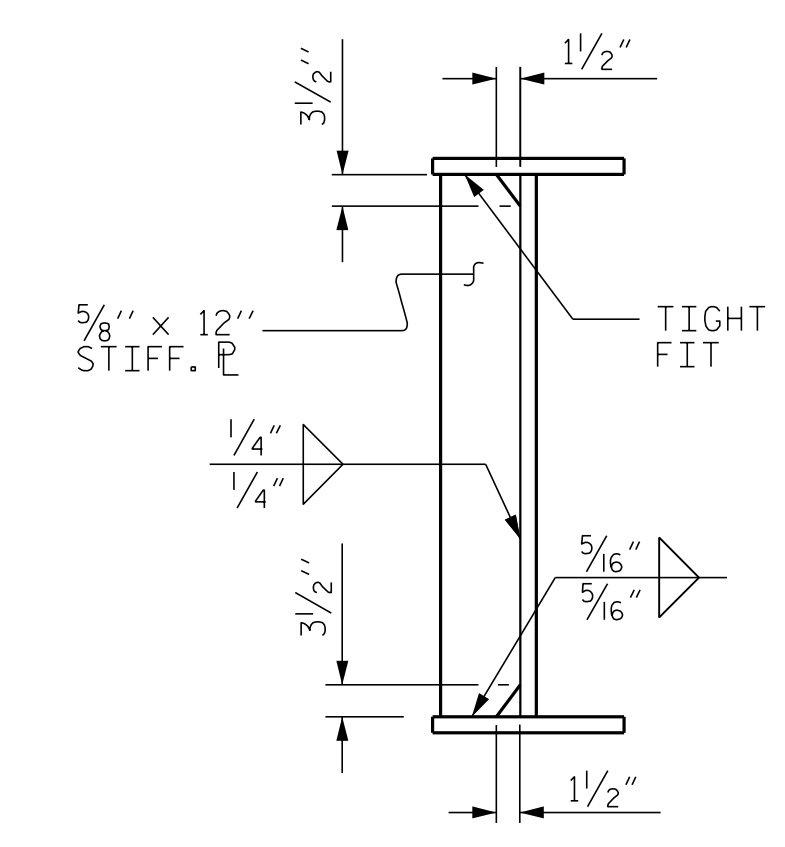
TYPICAL INTERMEDIATE DIAPHRAGM (D1)



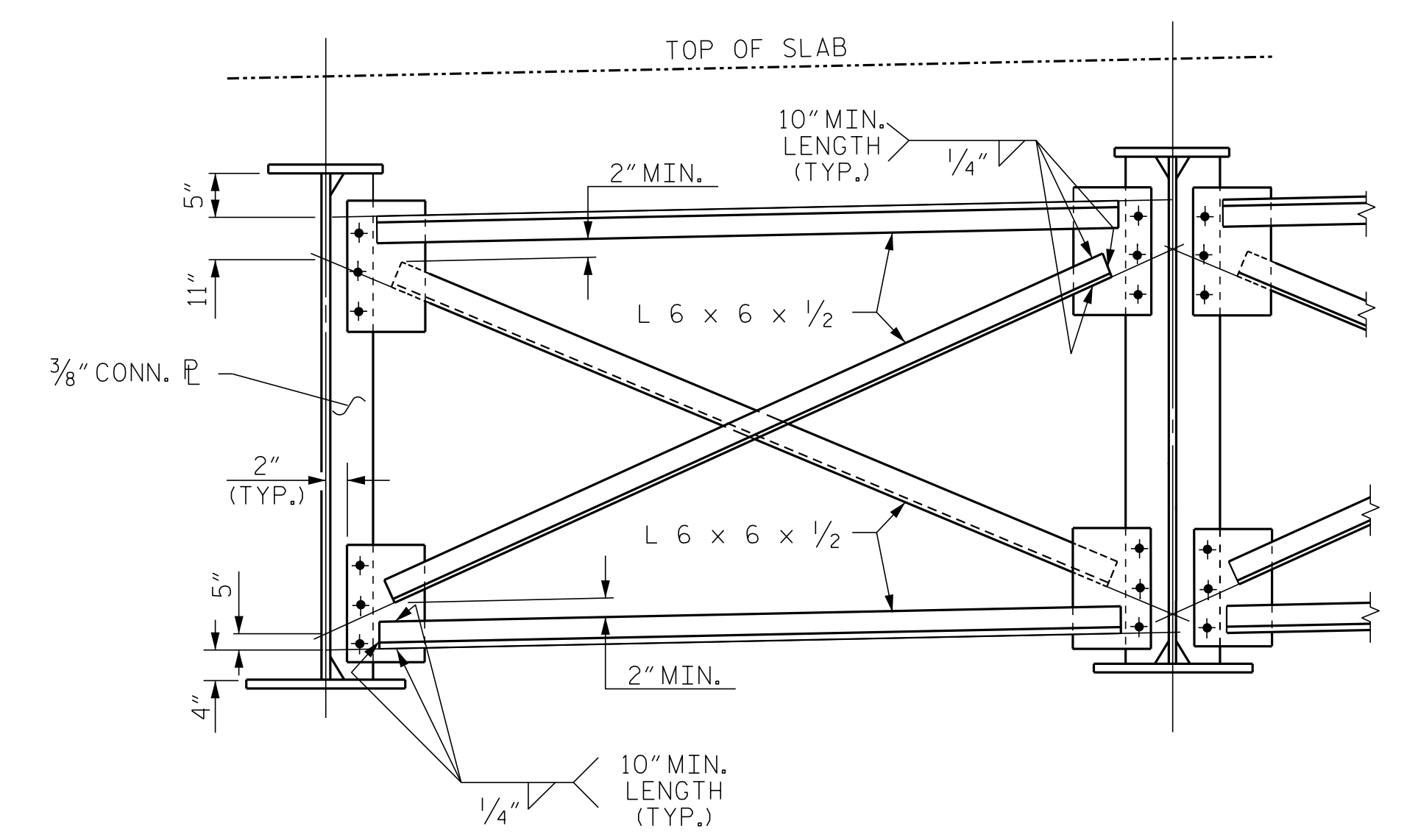
BEARING STIFFENER (AT END BENTS)



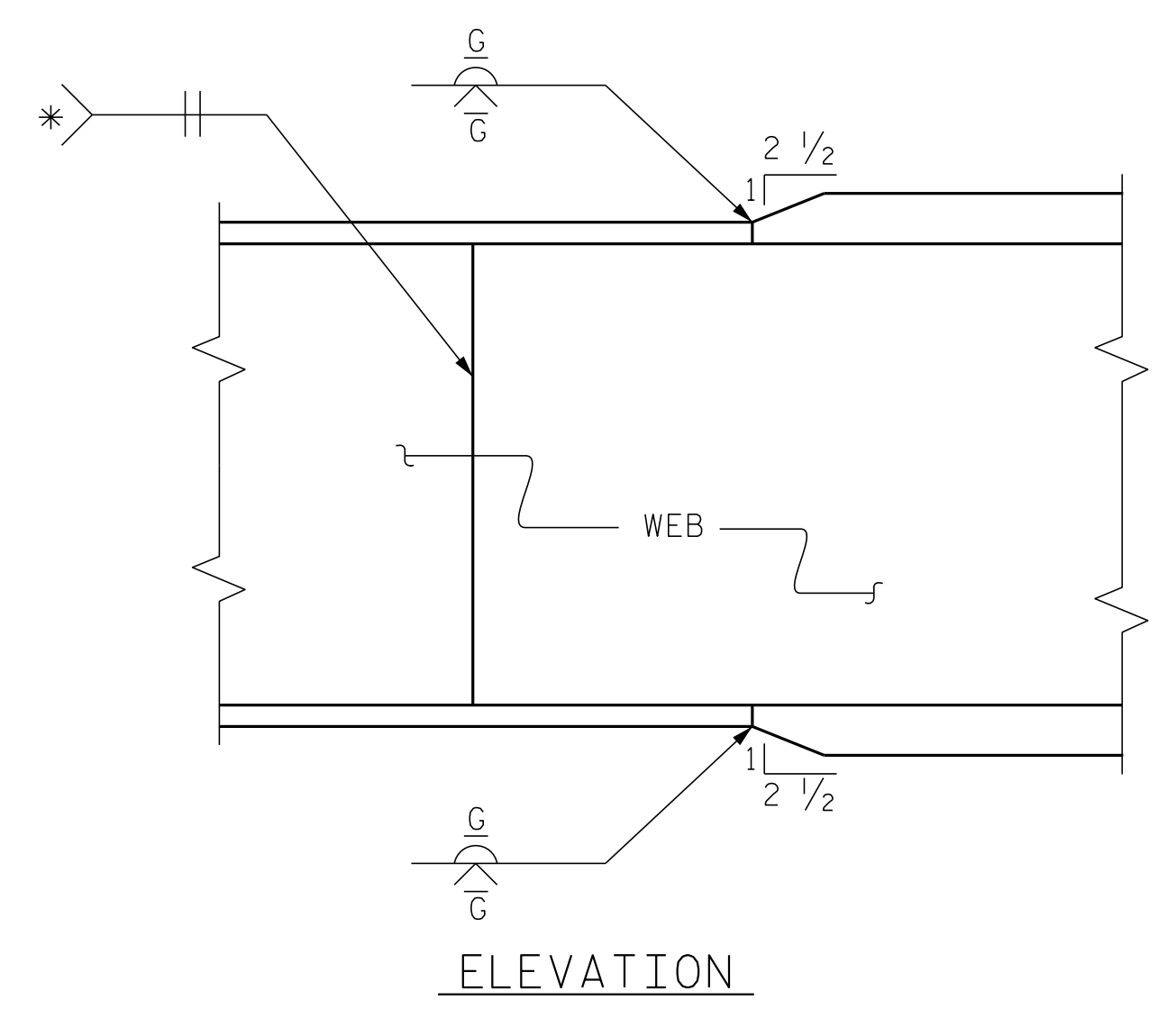
BEARING STIFFENER (AT INTERIOR BENT)



TRANSVERSE STIFFENER

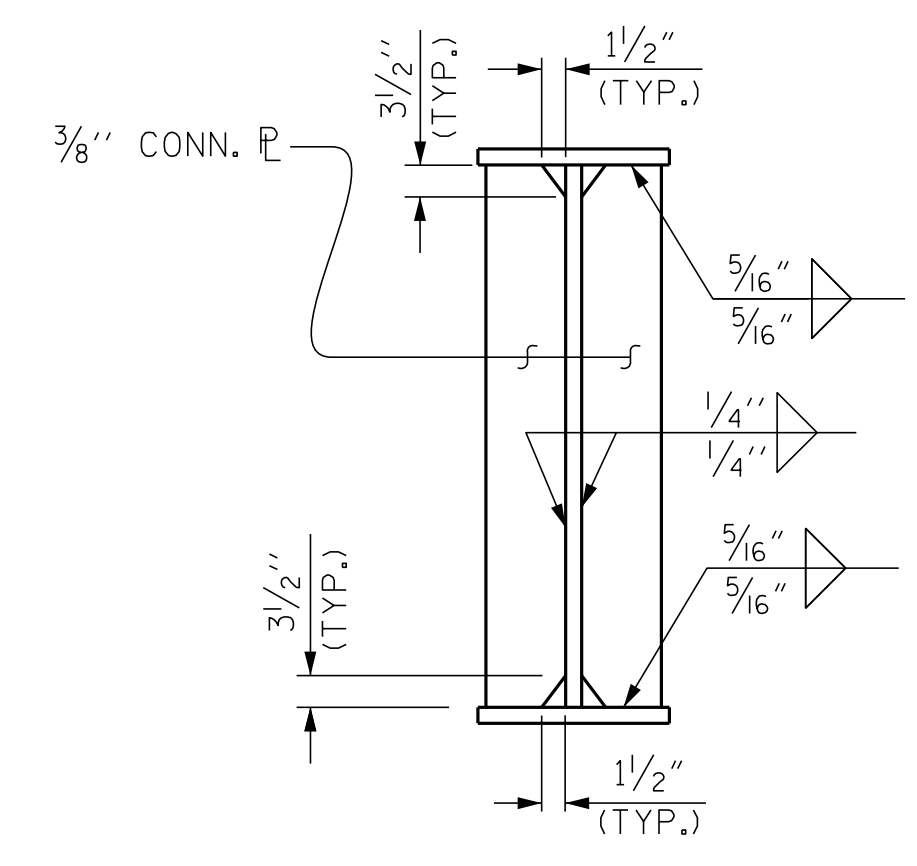


TYPICAL OPTIONAL INTERMEDIATE DIAPHRAGM (D1)



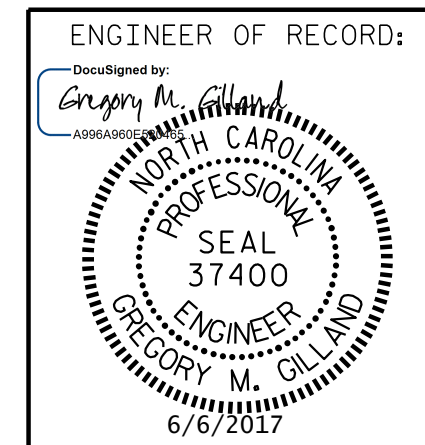
TYPICAL FLANGE AND WEB BUTT JOINT

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



CONNECTOR PL

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-  
SHEET 2 OF 4



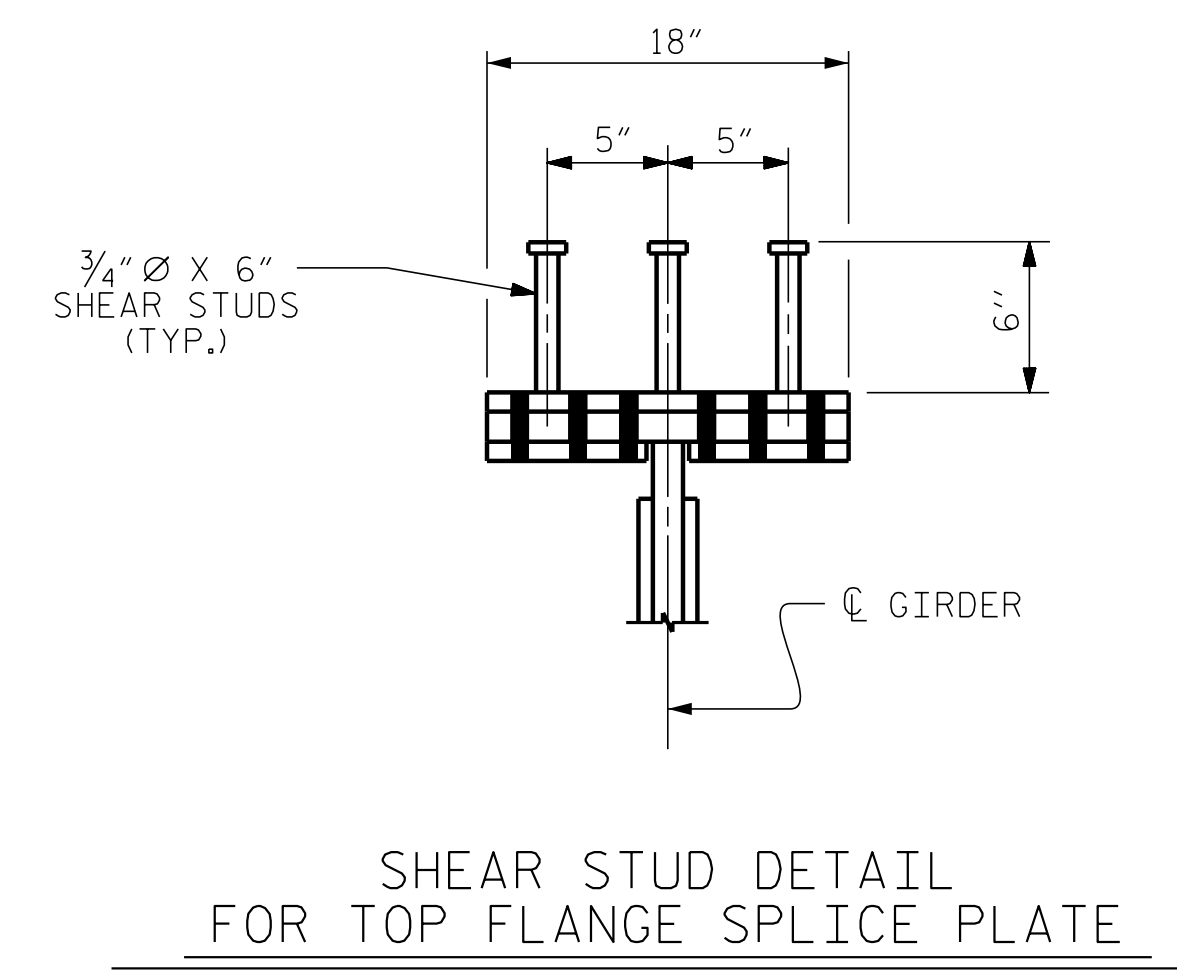
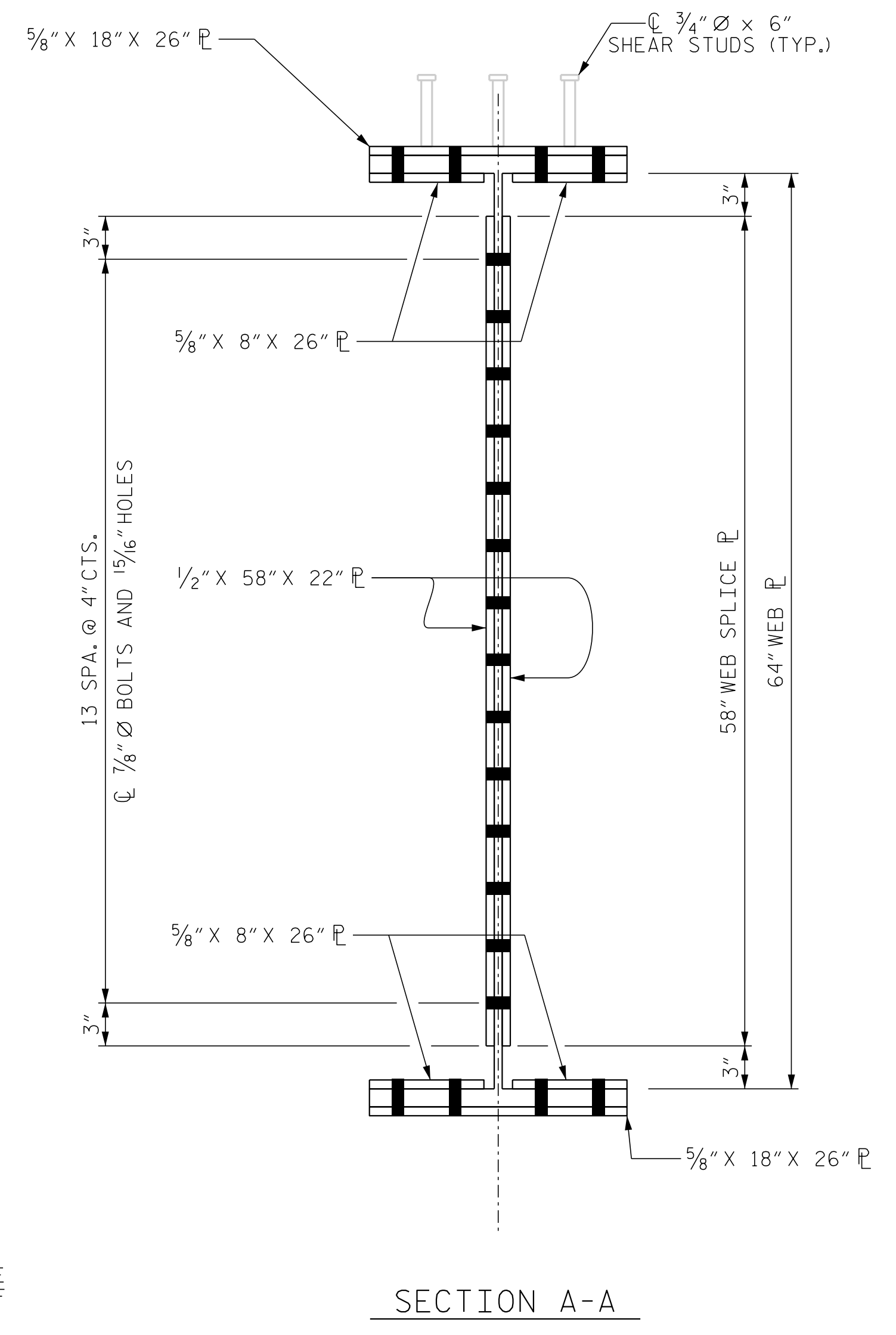
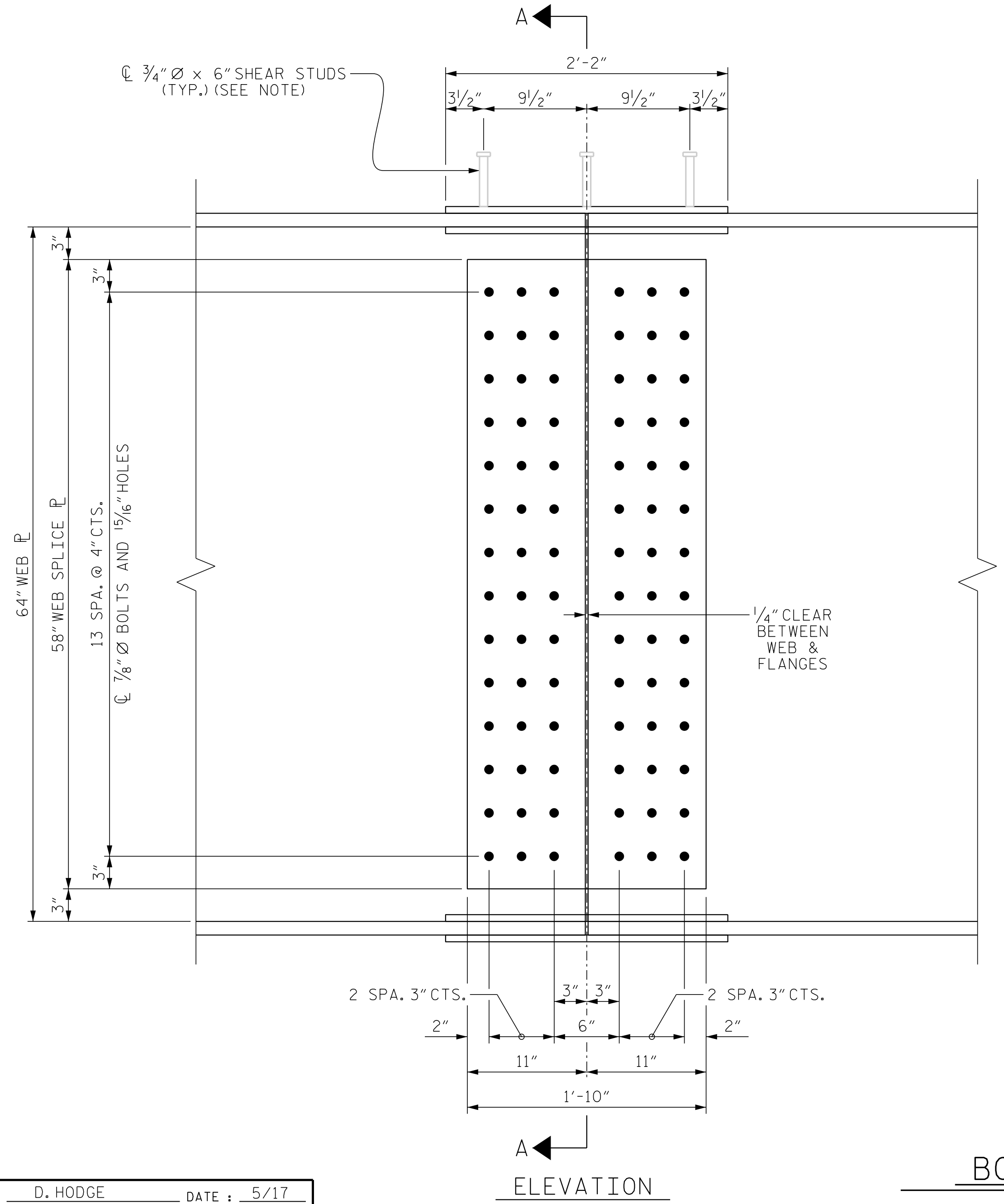
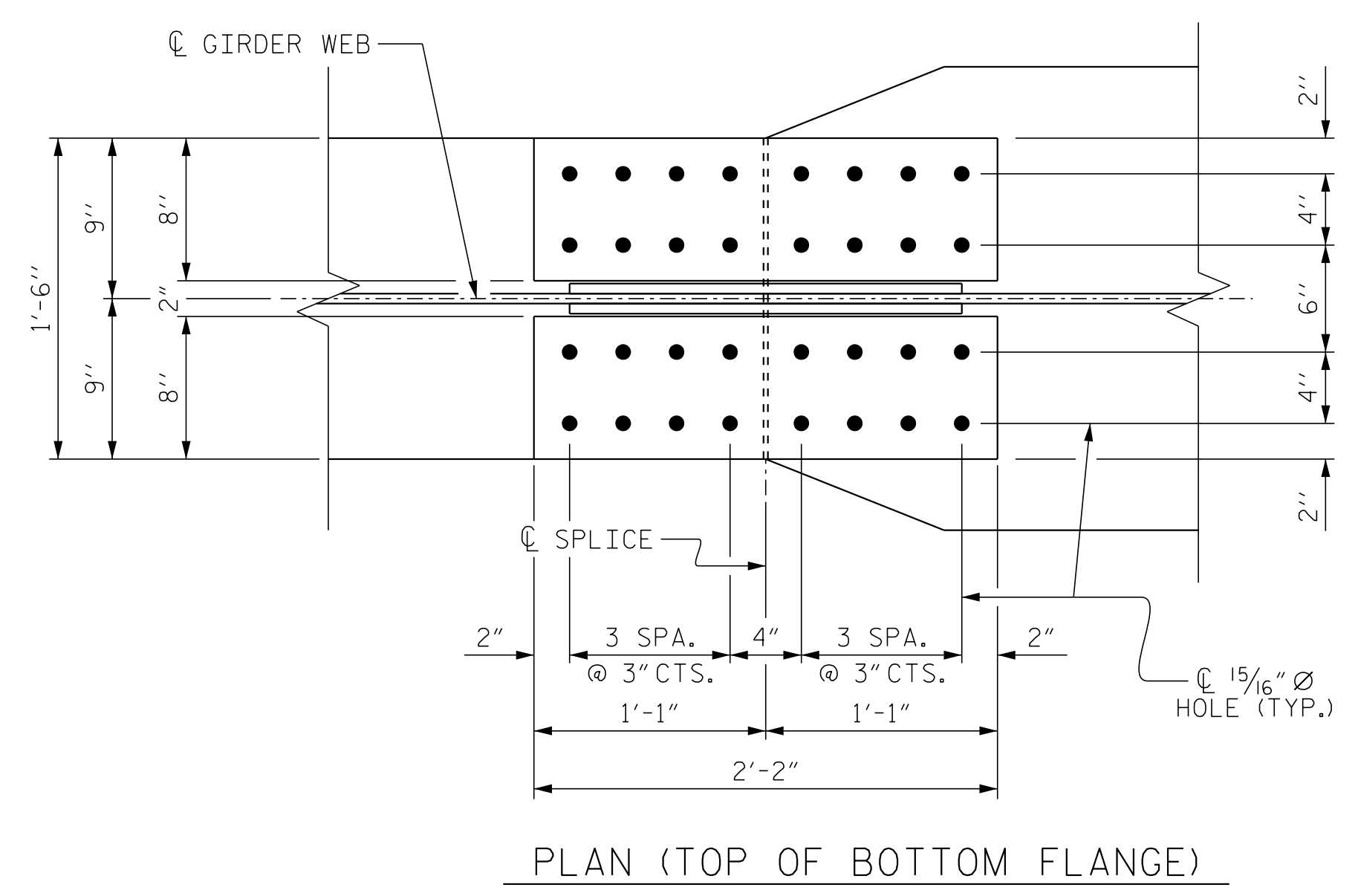
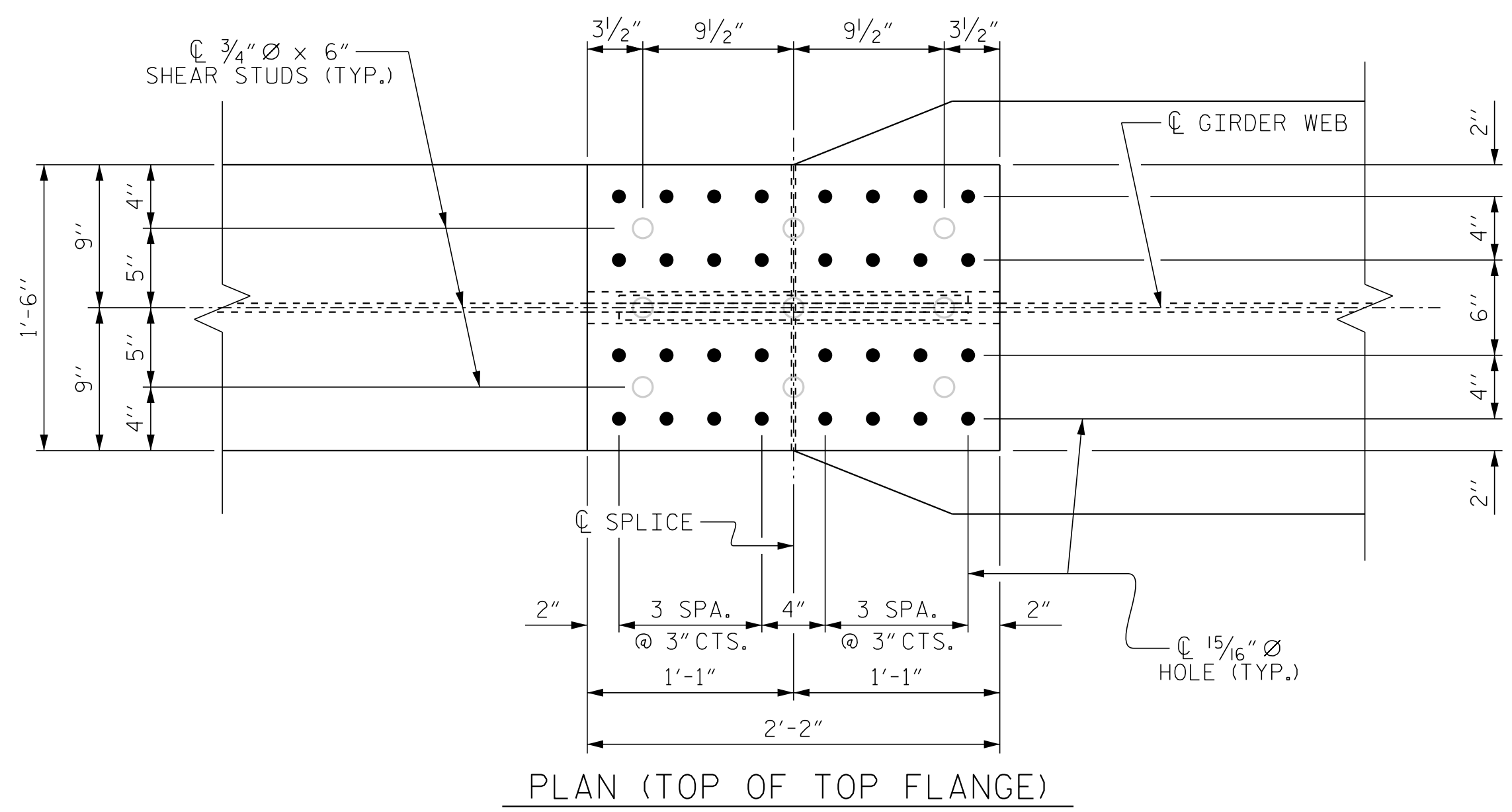
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
STRUCTURAL STEEL  
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			32

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 6/6/2017 8:04:22 AM



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

**BOLTED FIELD SPLICE**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 3 OF 4

ENGINEER OF RECORD:  
*Gregory M. Olland*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/6/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S01-12
TOTAL SHEETS					32

DRAWN BY: D. HODGE DATE: 5/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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**STRUCTURAL STEEL NOTES :**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

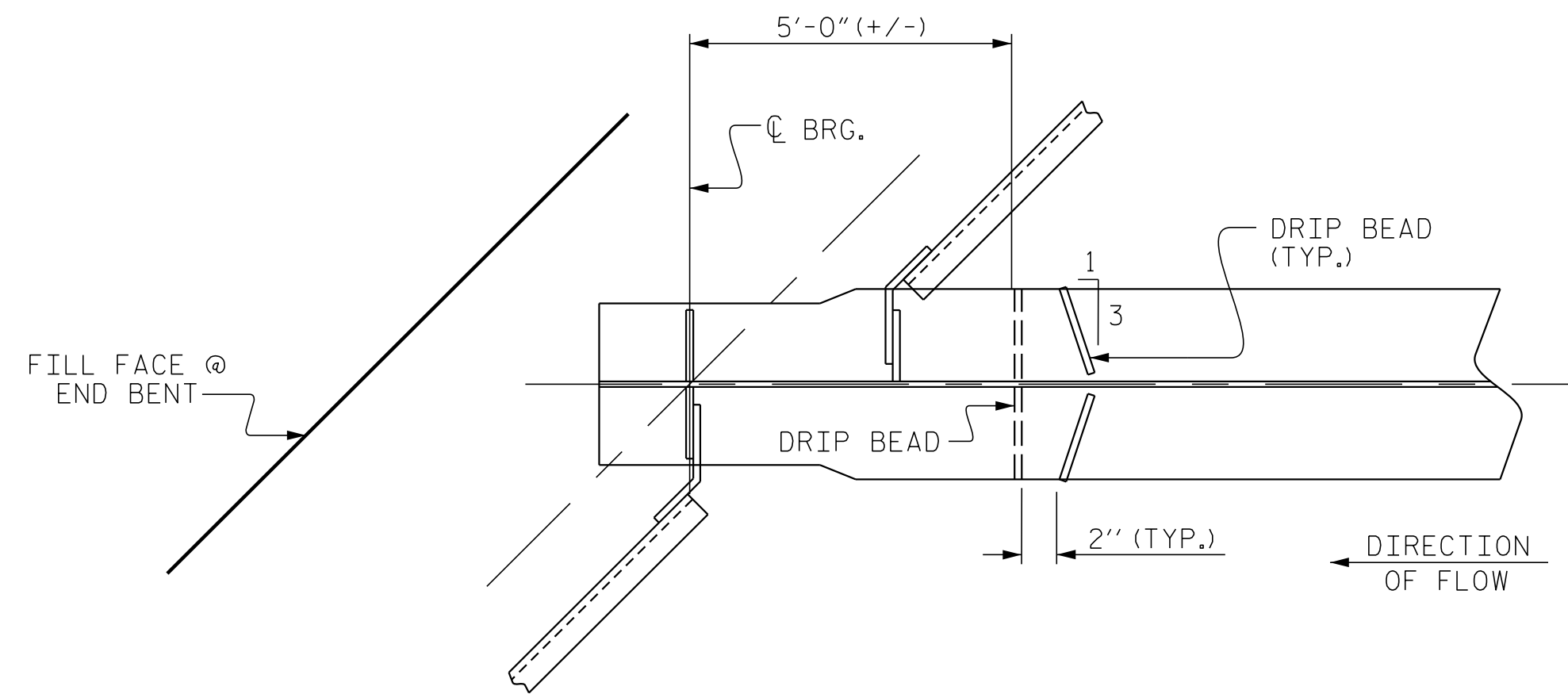
AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

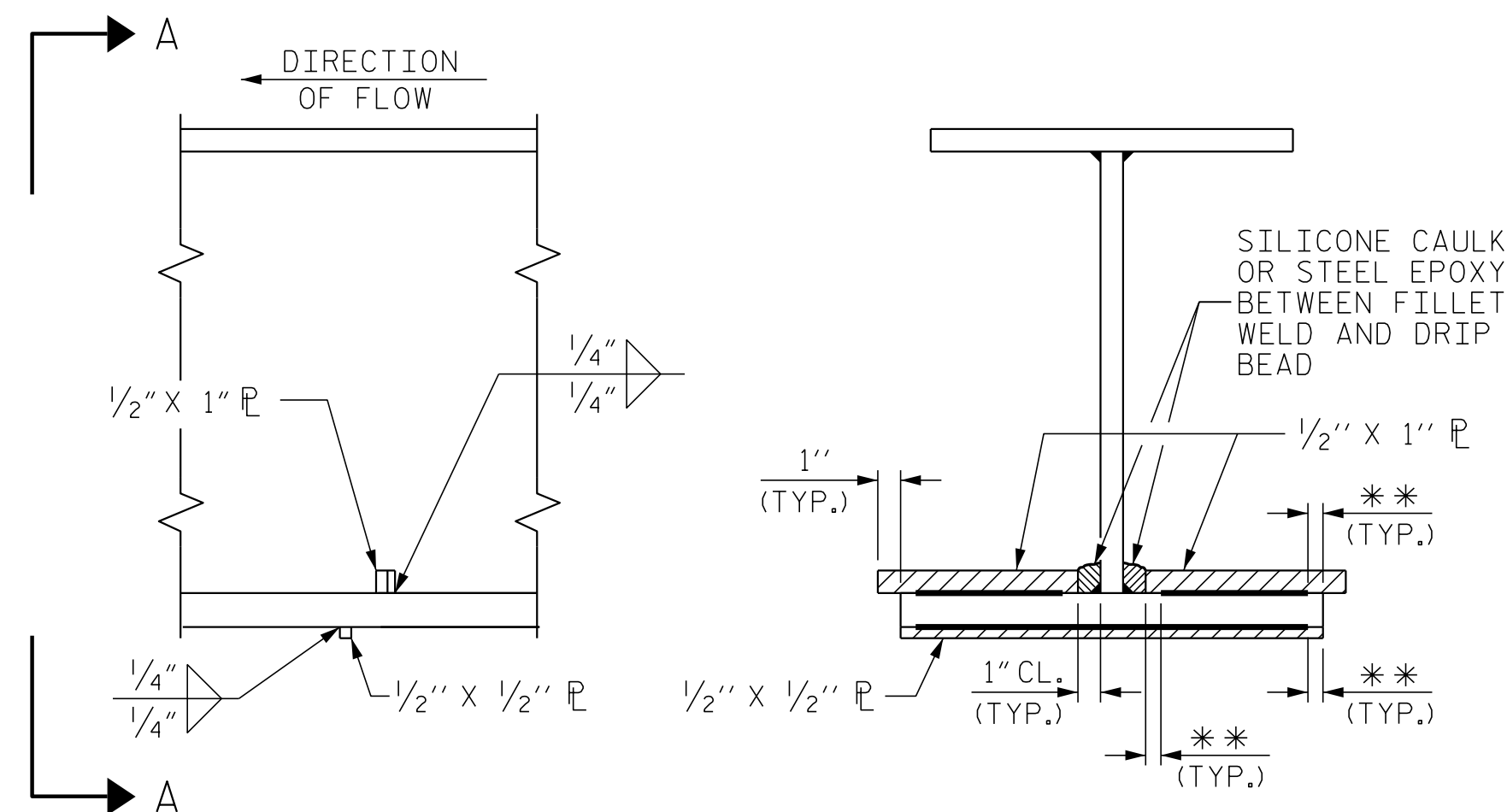
STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

END OF GIRDERS SHALL BE PLUMB.

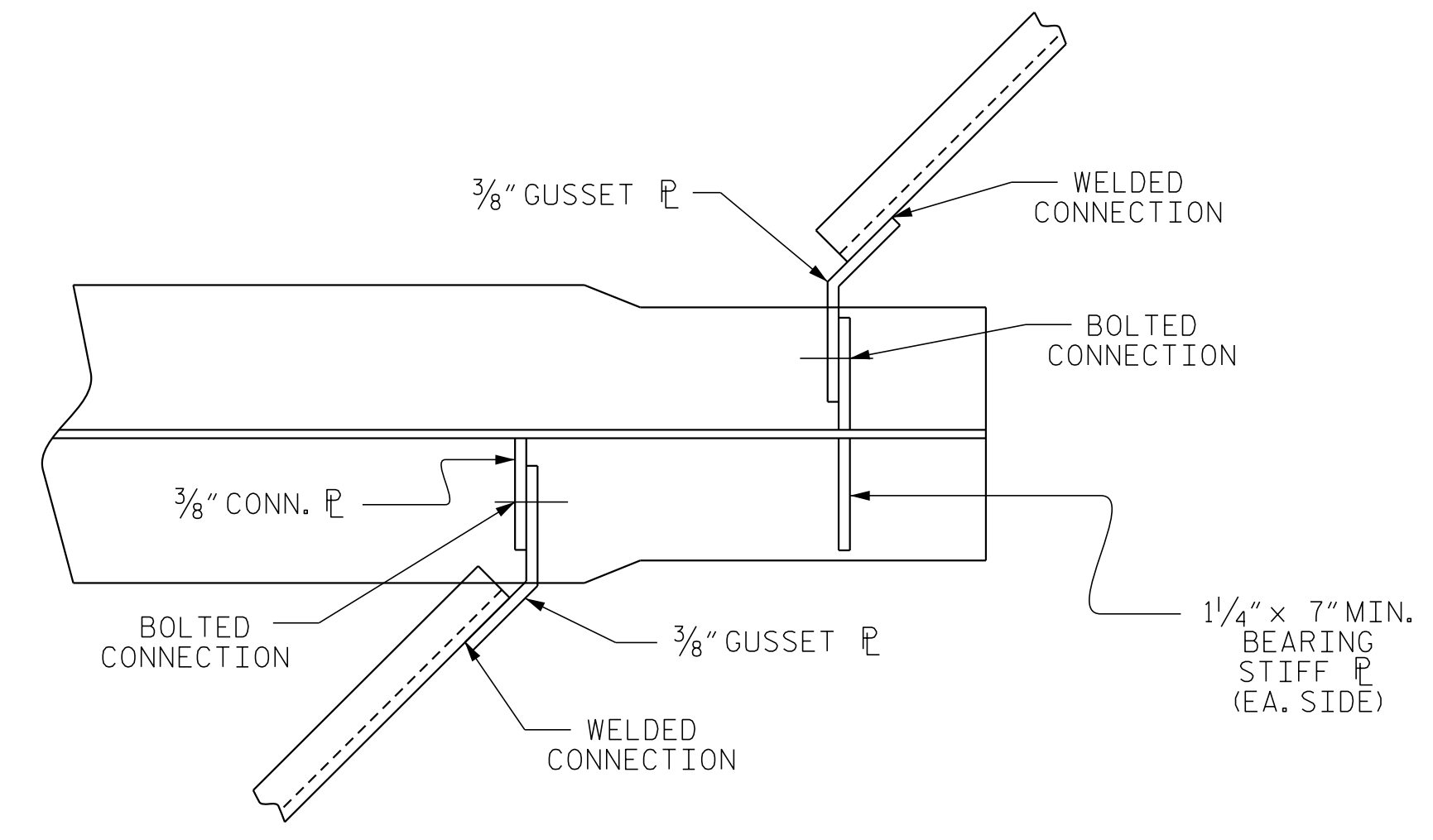
WHEN BEARING STIFFENERS ARE USED AS CONNECTOR PLATES THE FABRICATOR MAY ADJUST THE WIDTH AS NECESSARY, 7" MINIMUM, BEARING STIFFENERS MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.



**PART PLAN - BOTTOM FLANGE**  
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR)



**SECTION**  
**VIEW A-A**  
\*\* SEE "WELD TERMINATION DETAILS" SHEET 2 OF 4  
**DRIP BEAD DETAILS**



**CONNECTOR PLATE DETAIL**  
(EACH END SIMILAR)

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-  
SHEET 4 OF 4

ENGINEER OF RECORD:  
DocuSigned by:  
*Gregory M. Olland*  
NORTH CAROLINA  
PROFESSIONAL  
SEAL  
37400  
ENGINEER  
GREGORY M. OLLAND  
6/6/2017  
ETHERILL  
ENGINEERING  
1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
STRUCTURAL STEEL  
DETAILS  
REVISIONS  
NO. BY: DATE: NO. BY: DATE:  
1 3  
2 4  
SHEET NO.  
S01-13  
TOTAL SHEETS  
32

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 5/17

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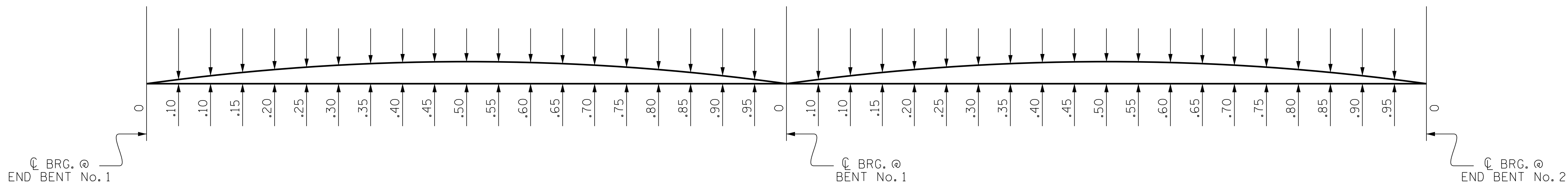
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6/6/2017 8:07:38 AM

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPAN A - GIRDERS 1 THRU 4																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.010	0.020	0.029	0.036	0.043	0.047	0.049	0.050	0.049	0.046	0.042	0.037	0.031	0.024	0.017	0.011	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.037	0.073	0.105	0.133	0.155	0.171	0.180	0.183	0.179	0.170	0.154	0.135	0.112	0.088	0.064	0.042	0.023	0.010	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.005	0.010	0.015	0.019	0.022	0.024	0.025	0.026	0.025	0.024	0.022	0.020	0.016	0.013	0.010	0.006	0.004	0.002	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.052	0.103	0.149	0.188	0.220	0.242	0.254	0.259	0.253	0.240	0.218	0.192	0.159	0.125	0.091	0.059	0.033	0.015	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.042	0.080	0.113	0.142	0.167	0.187	0.202	0.213	0.220	0.222	0.220	0.213	0.202	0.187	0.167	0.142	0.113	0.080	0.042	0.000
REQUIRED CAMBER	↑	0	1/8"	23/16"	3/8"	315/16"	45/8"	5/8"	51/2"	511/16"	511/16"	59/16"	5/4"	47/8"	45/16"	33/4"	3/16"	27/16"	13/4"	1/8"	9/16"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPAN B - GIRDERS 1 THRU 4																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.005	0.009	0.015	0.022	0.029	0.036	0.043	0.049	0.053	0.056	0.057	0.056	0.052	0.047	0.041	0.032	0.022	0.011	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.005	0.016	0.032	0.052	0.077	0.103	0.129	0.153	0.173	0.189	0.199	0.202	0.198	0.187	0.169	0.145	0.115	0.079	0.041	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.001	0.002	0.005	0.008	0.011	0.015	0.019	0.022	0.025	0.027	0.028	0.028	0.028	0.026	0.024	0.020	0.016	0.011	0.006	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.007	0.023	0.046	0.075	0.110	0.147	0.184	0.218	0.247	0.269	0.283	0.287	0.282	0.265	0.240	0.206	0.163	0.112	0.058	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.043	0.082	0.116	0.146	0.171	0.191	0.207	0.219	0.226	0.228	0.226	0.219	0.207	0.191	0.171	0.146	0.116	0.082	0.043	0.000
REQUIRED CAMBER	↑	0	5/8"	11/4"	115/16"	25/8"	33/8"	41/16"	411/16"	5/4"	511/16"	515/16"	6/8"	61/16"	57/8"	51/2"	415/16"	43/16"	33/8"	25/16"	13/16"	0

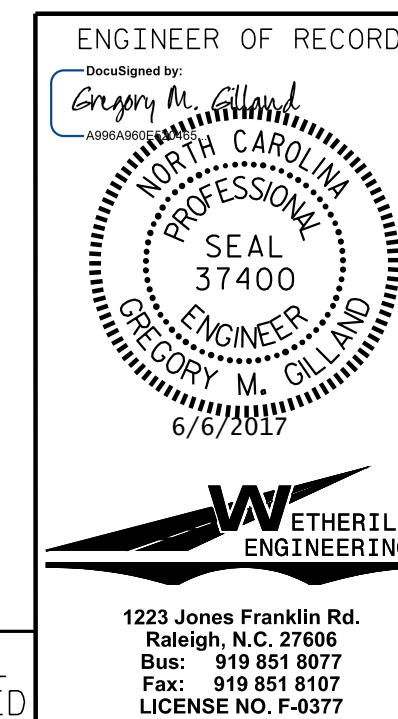
\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



### SCHMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
DEAD LOAD  
DEFLECTION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-14
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: D. HODGE DATE: 5/17  
CHECKED BY: B.C. HUNT DATE: 5/17

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NOTES

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 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.

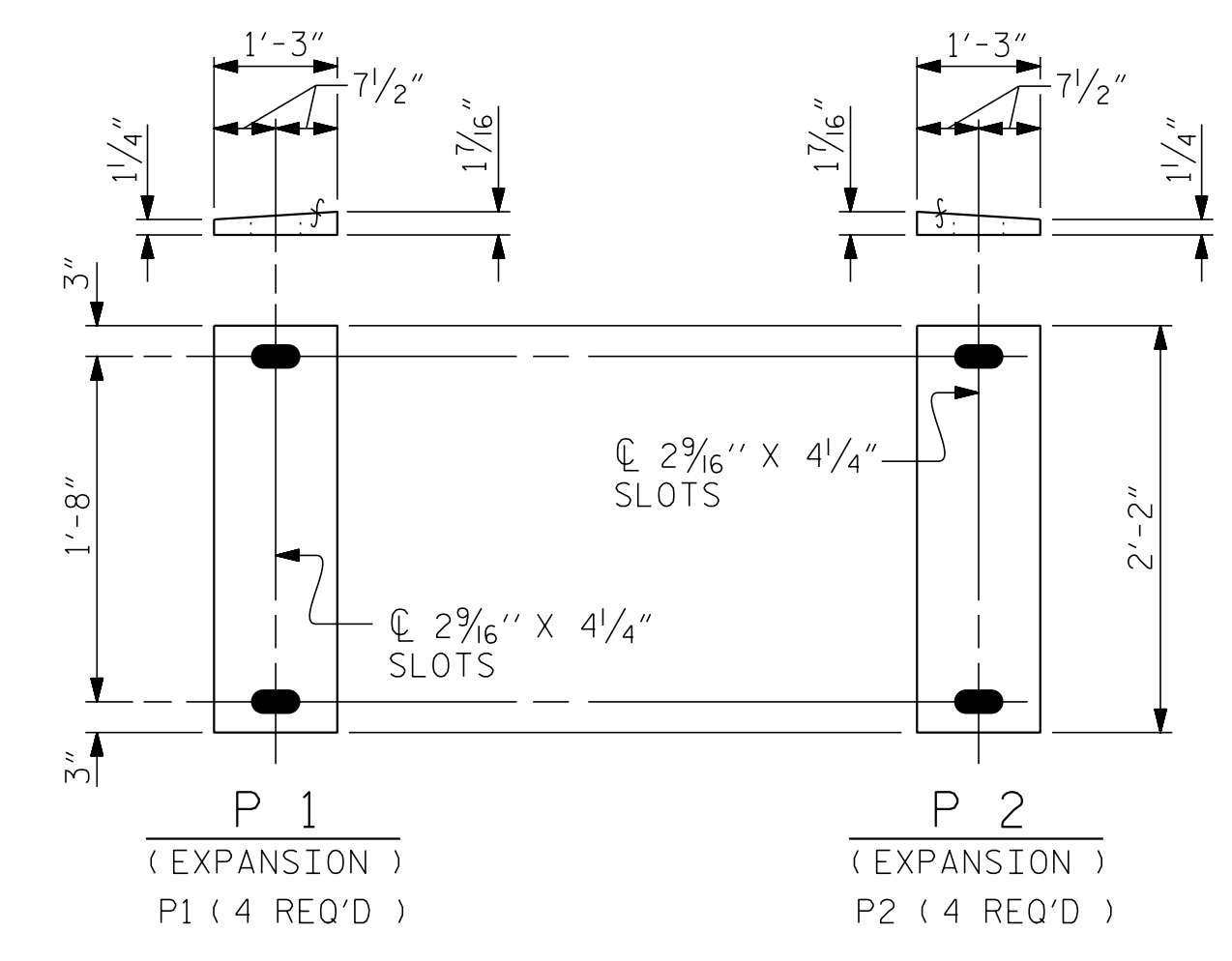
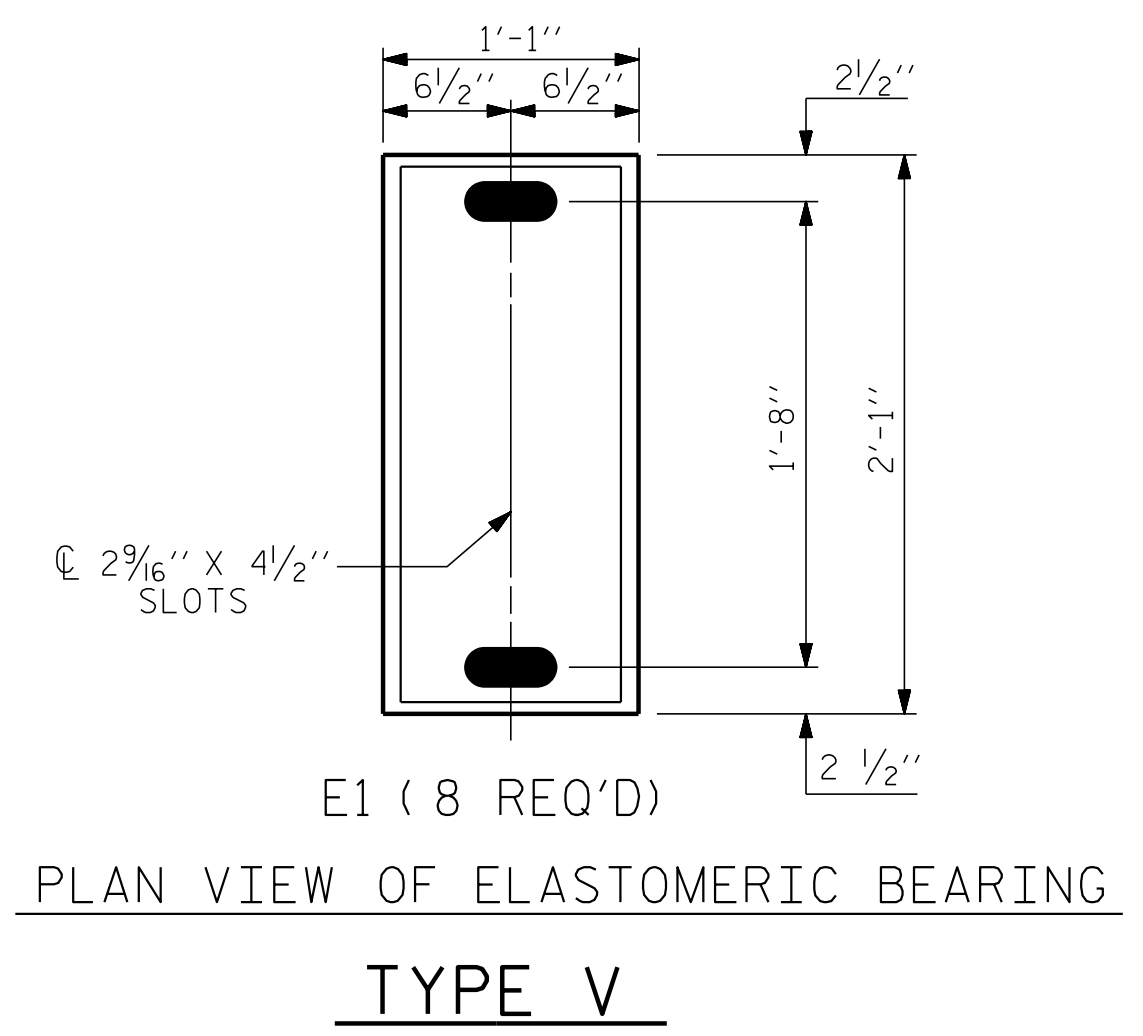
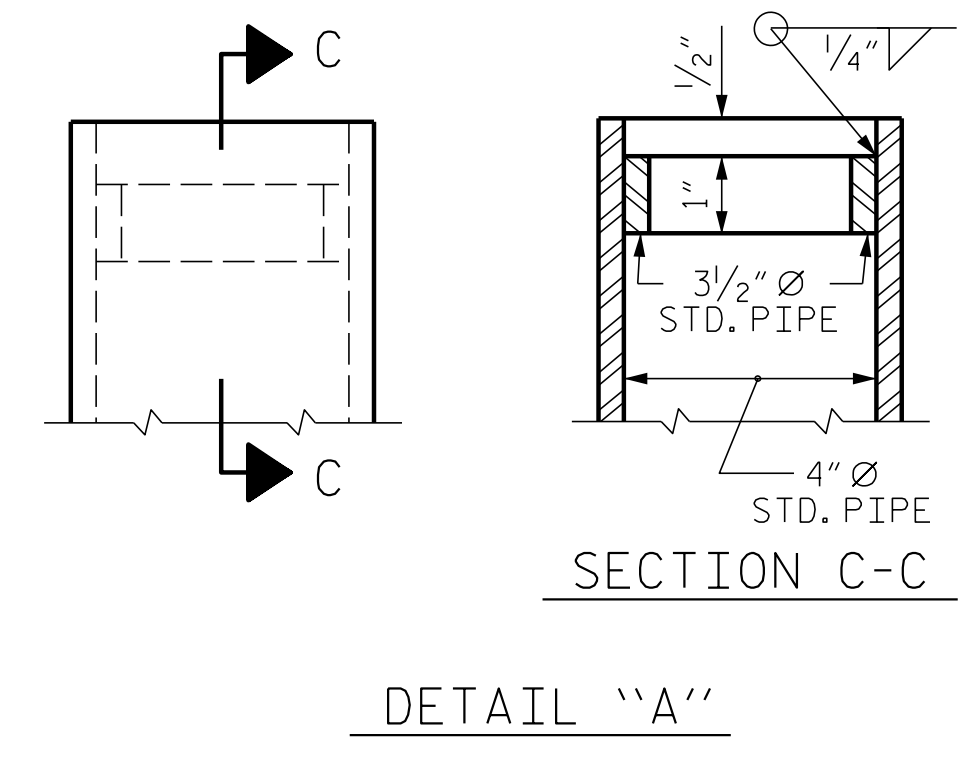
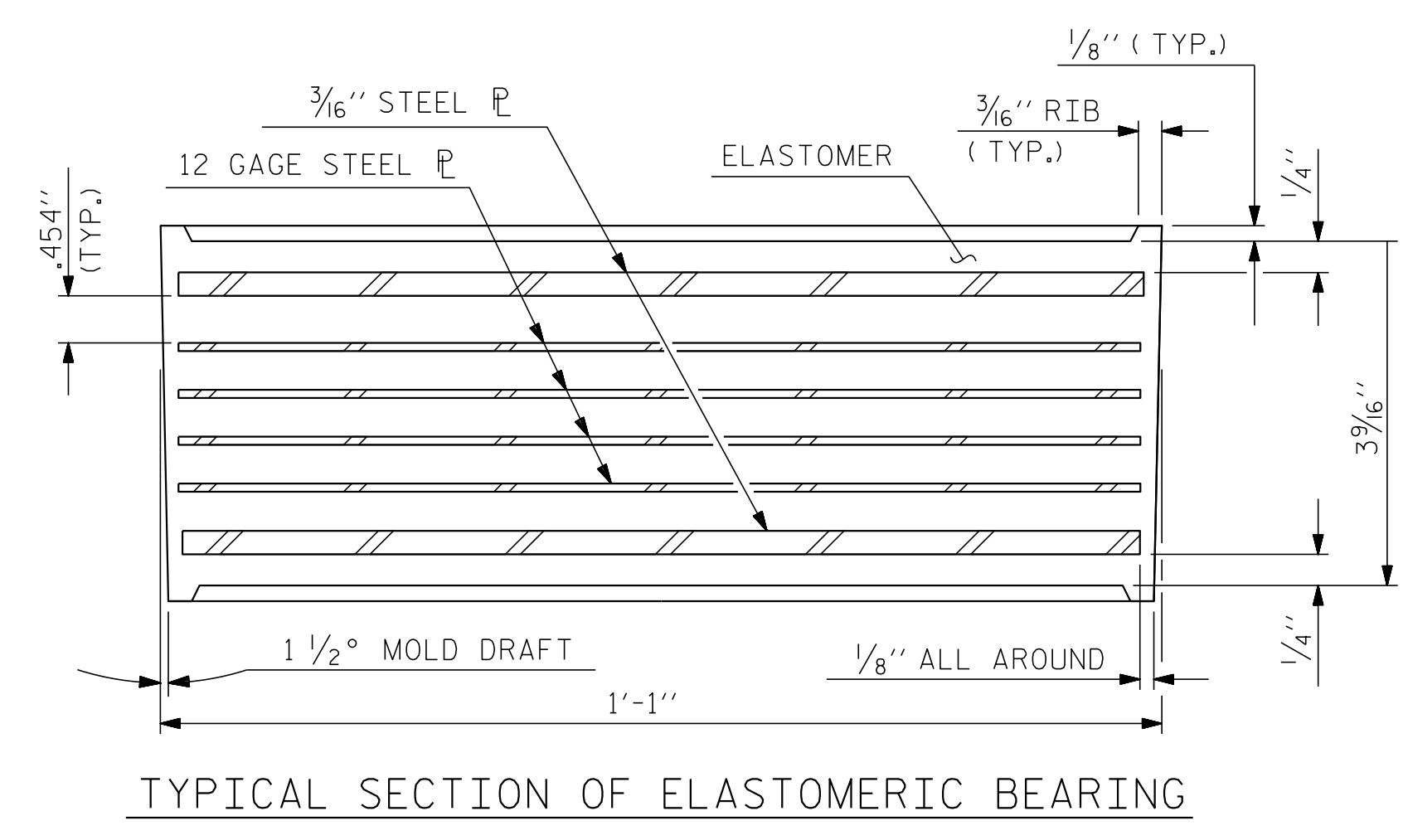
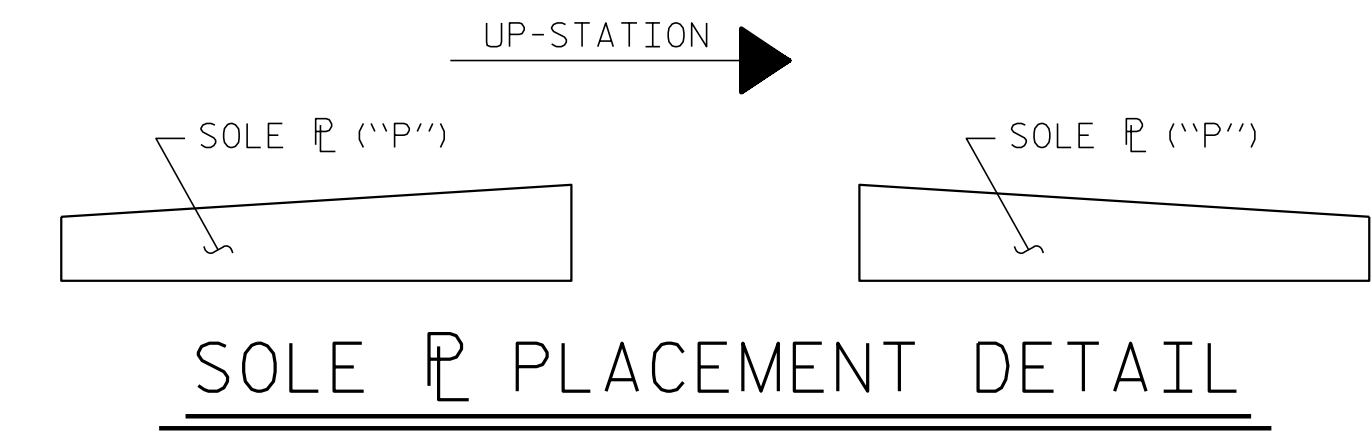
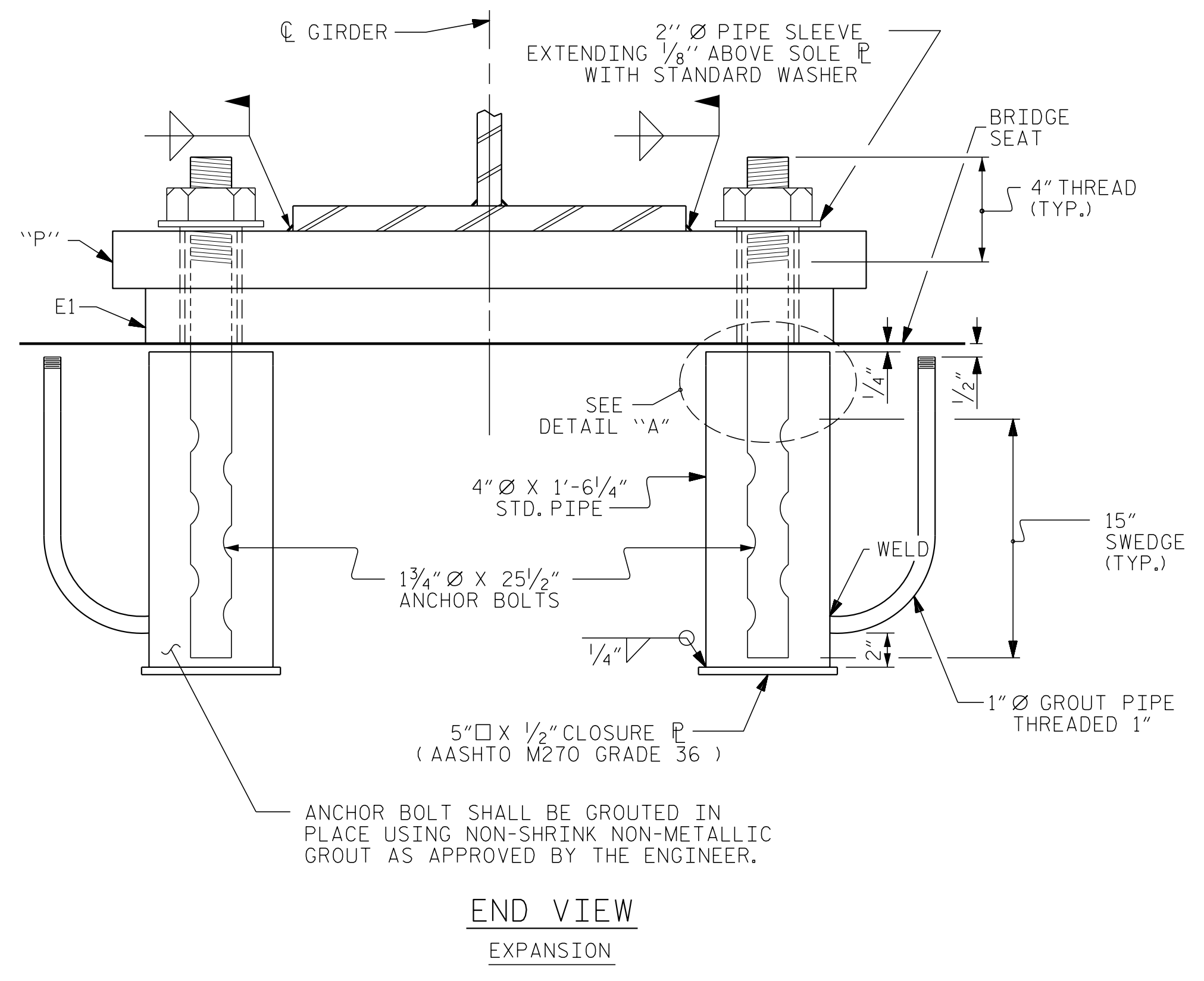
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

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 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.



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

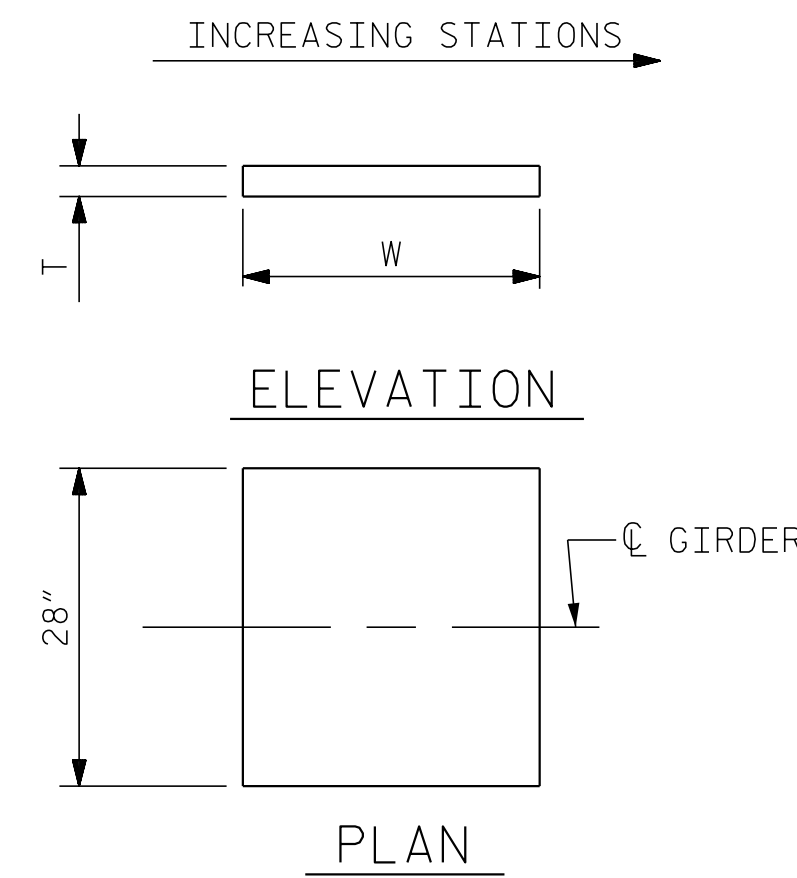
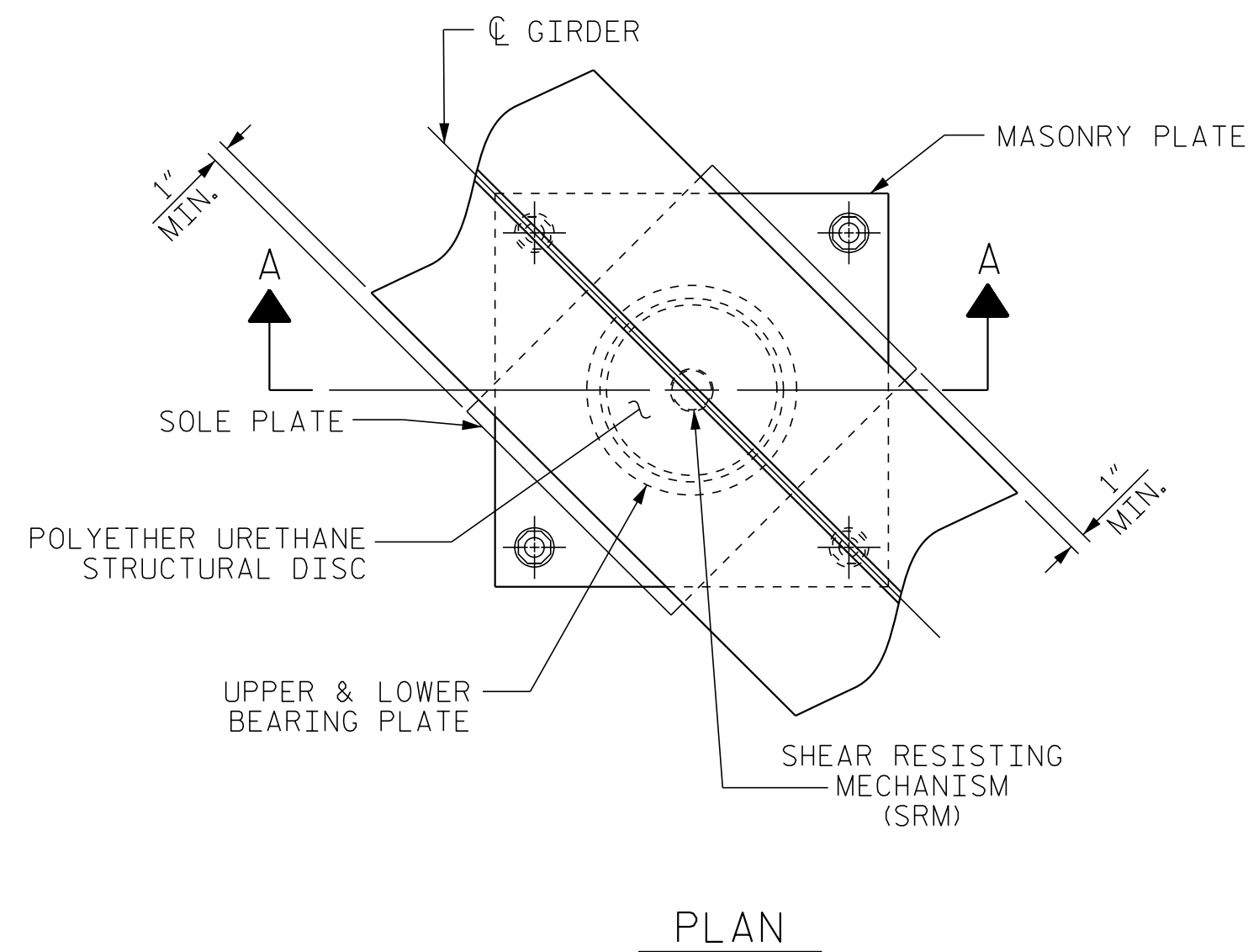
ENGINEER OF RECORD:  
 Greg M. Oll  
 PROFESSIONAL SEAL 37400  
 ENGINEER  
 GREGORY M. OLL  
 6/17/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD ELASTOMERIC BEARING DETAILS (STEEL SUPERSTRUCTURE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S01-15
TOTAL SHEETS 32

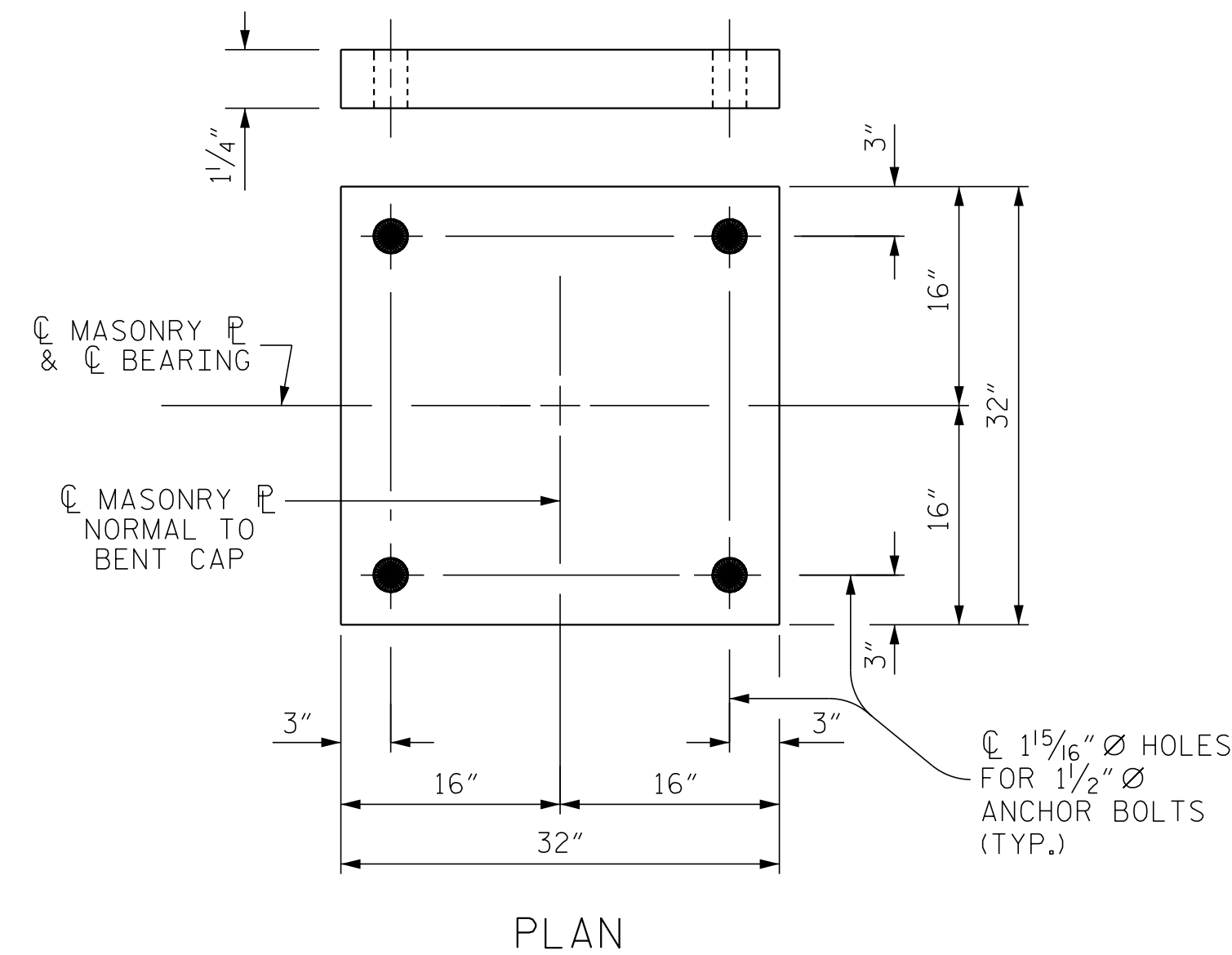
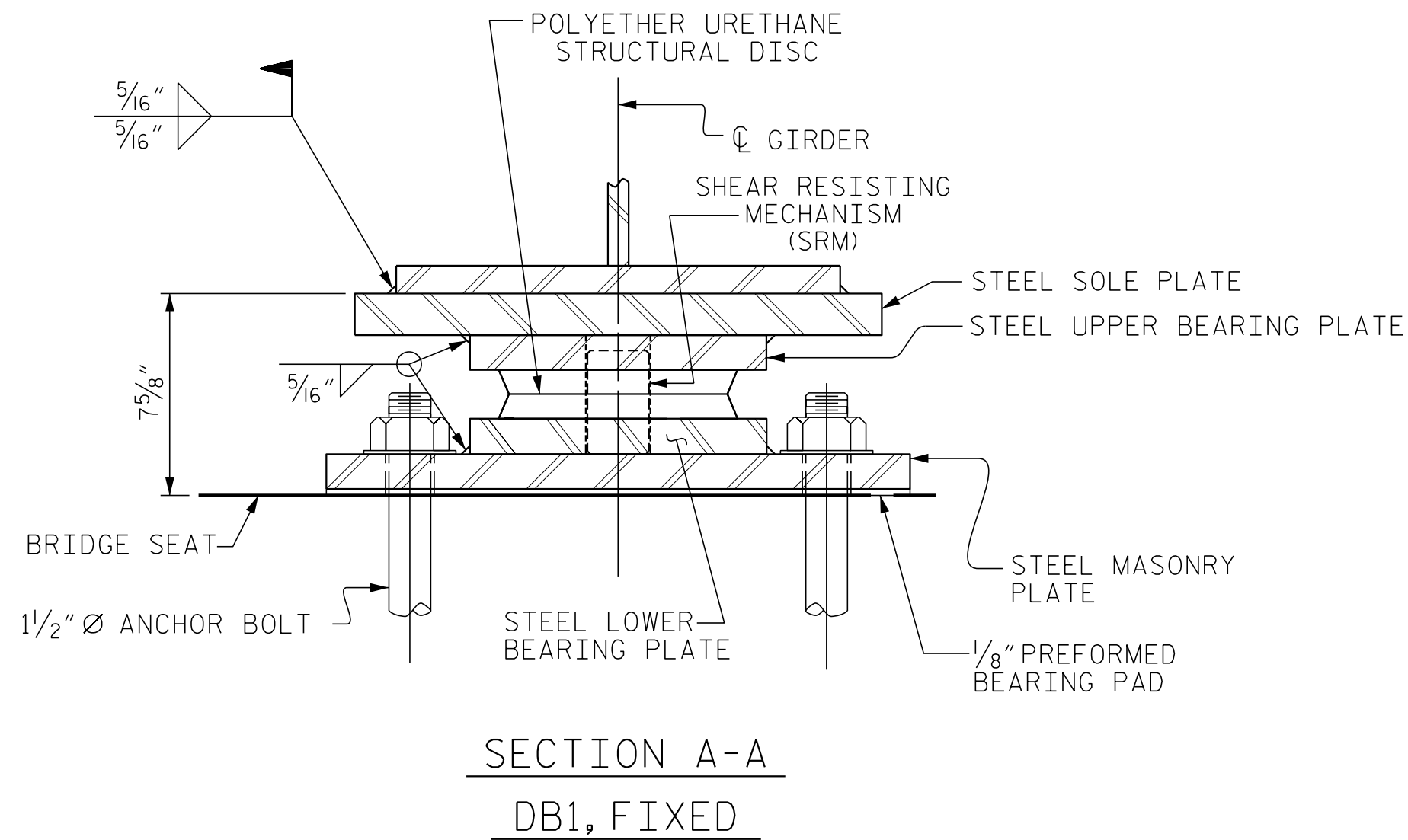
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NOTE:  
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS



MASONRY PLATE DETAILS

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.
- SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

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DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	LOADS AND MOVEMENT			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY			UNFACTORED VERTICAL LOAD (KIPS)	DEAD	LIVE		
DB1 (FIXED)	M1	BENT 1	4	DC	DW	LL+IM	171	0.0
				405	51	453		

DRAWN BY : D. HODGE DATE : 4/17  
 CHECKED BY : B.C. HUNT DATE : 5/17

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ENGINEER OF RECORD:  
 Greg M. O'Neil  
 PROFESSIONAL SEAL 37400  
 GREGORY M. O'NEIL  
 6/6/2017

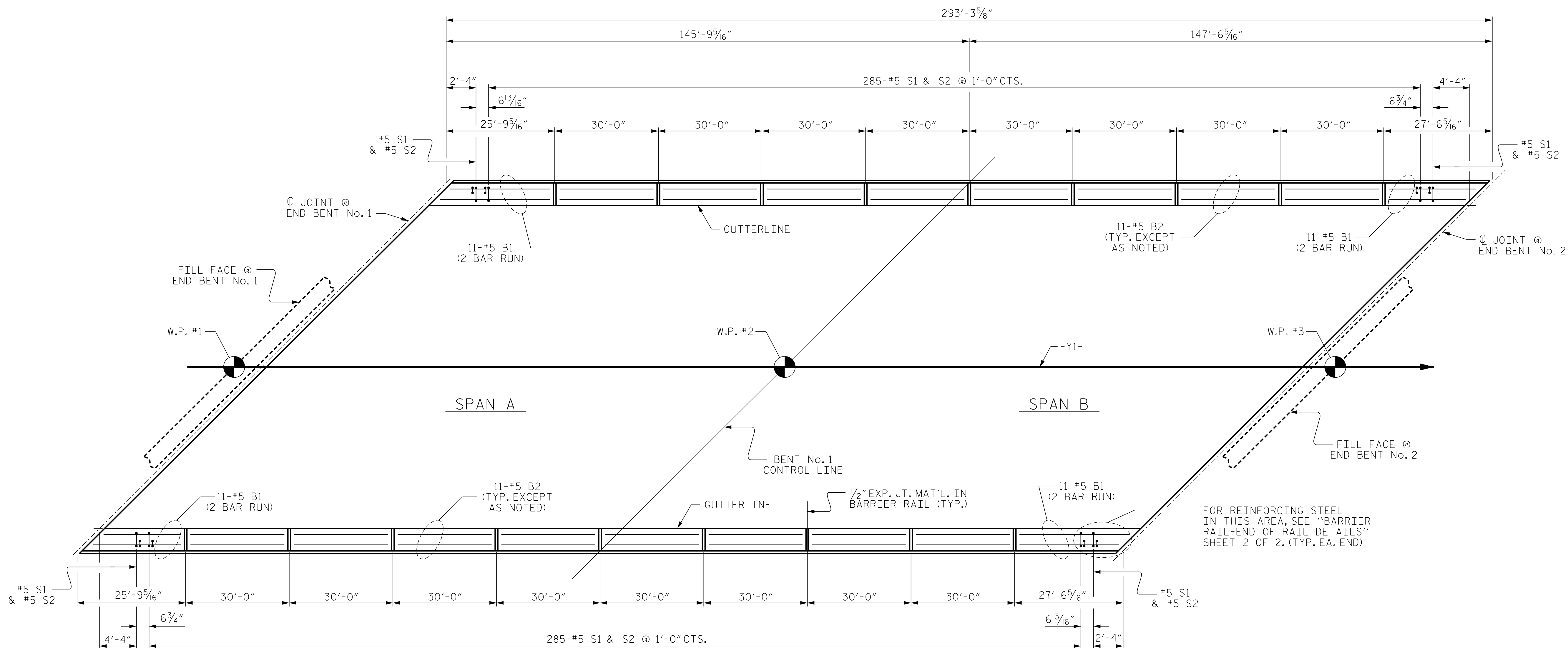
ETHERILL ENGINEERING  
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 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DISC BEARING DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			32
2			4			





PLAN OF CONCRETE BARRIER RAIL

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.

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 17+77.11 -Y1-

SHEET 1 OF 2

ENGINEER OF RECORD:  
*Gregory M. O'Neil*  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. O'NEIL  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CONCRETE BARRIER RAIL

REVISIONS

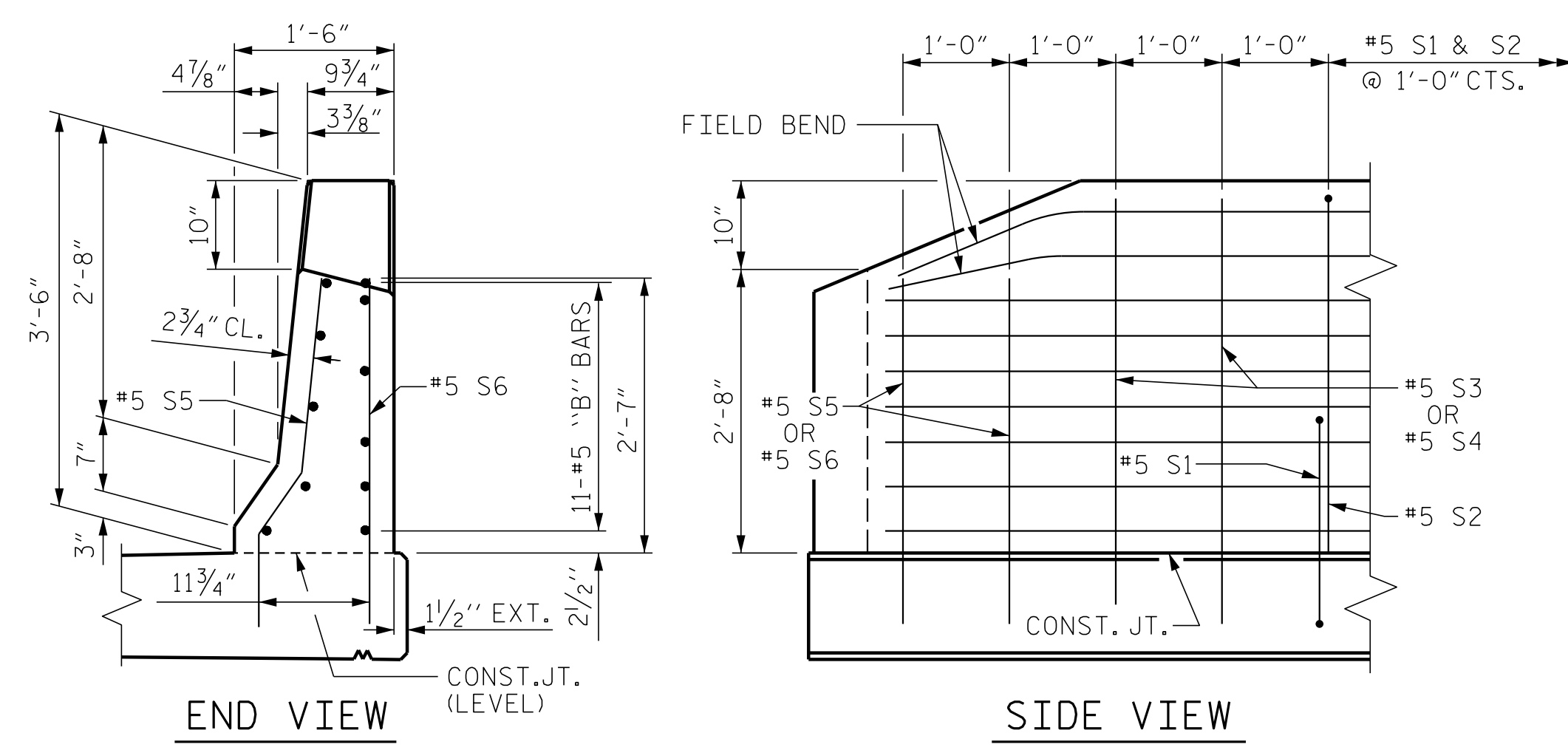
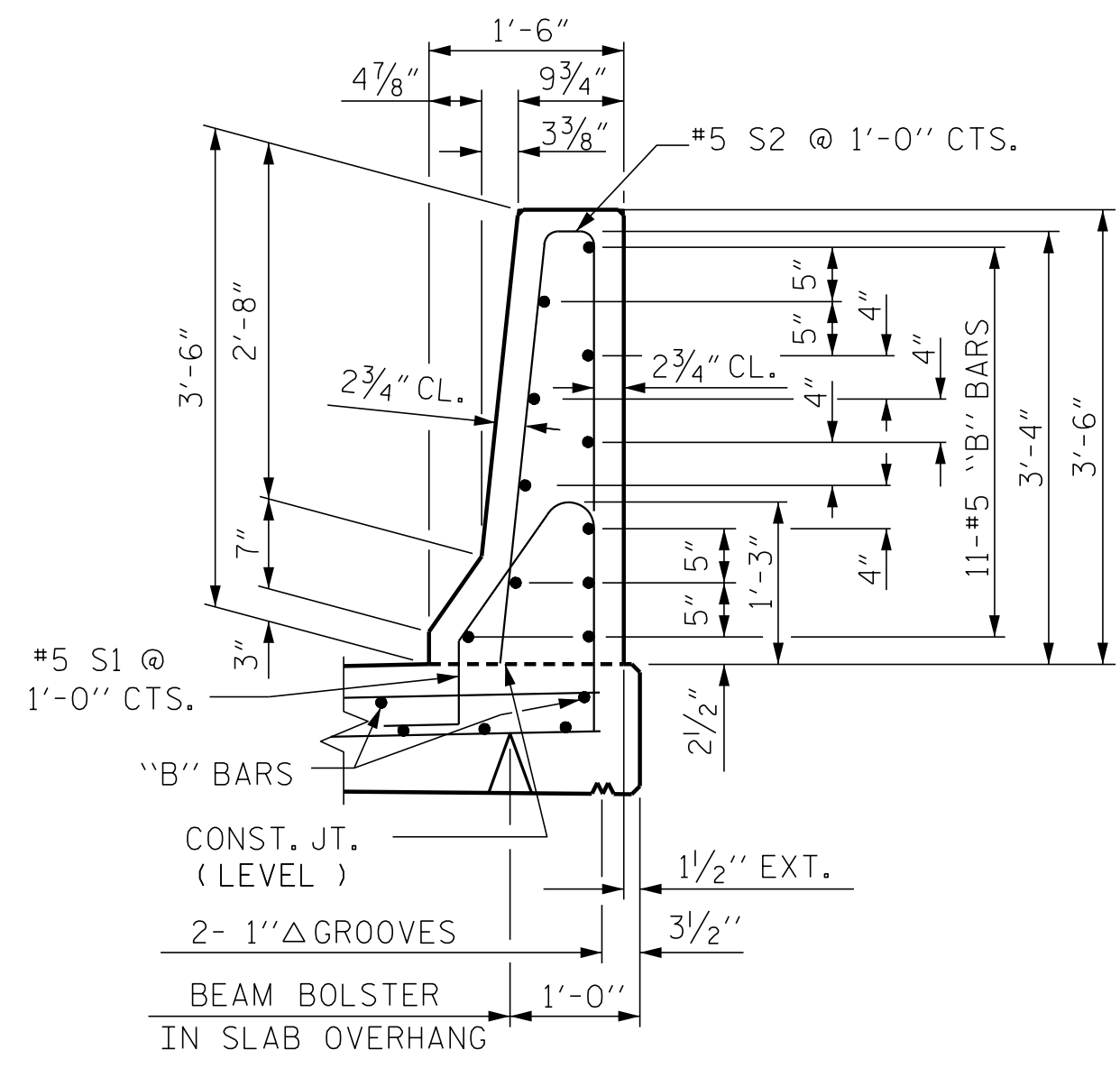
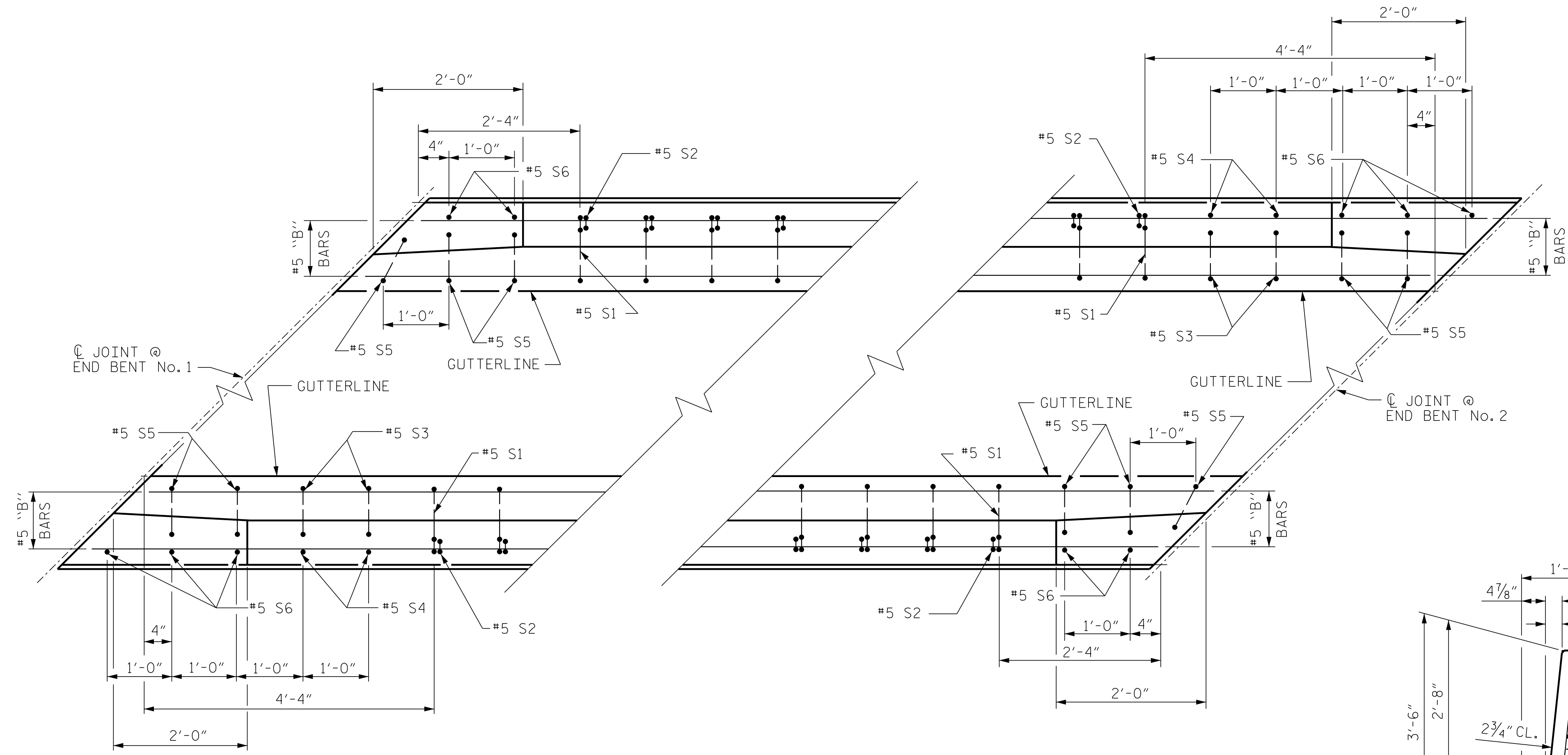
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SHEET NO.  
S01-17  
TOTAL SHEETS  
32

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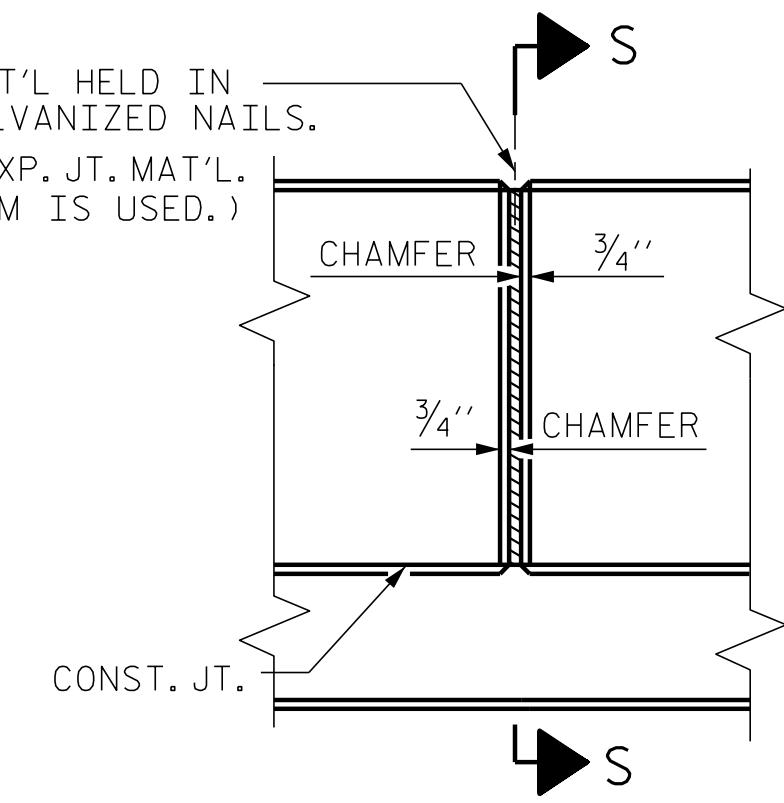
DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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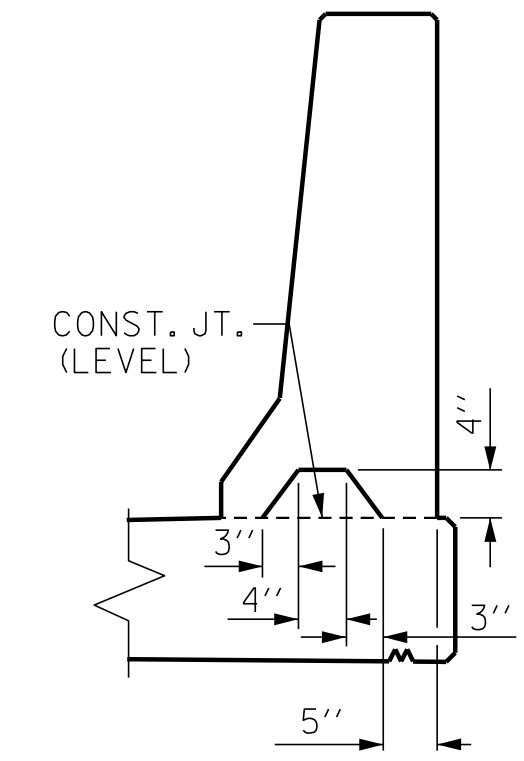


END OF RAIL DETAILS  
FOR ADHESIVE ANCHORING AT SAWED JOINTS

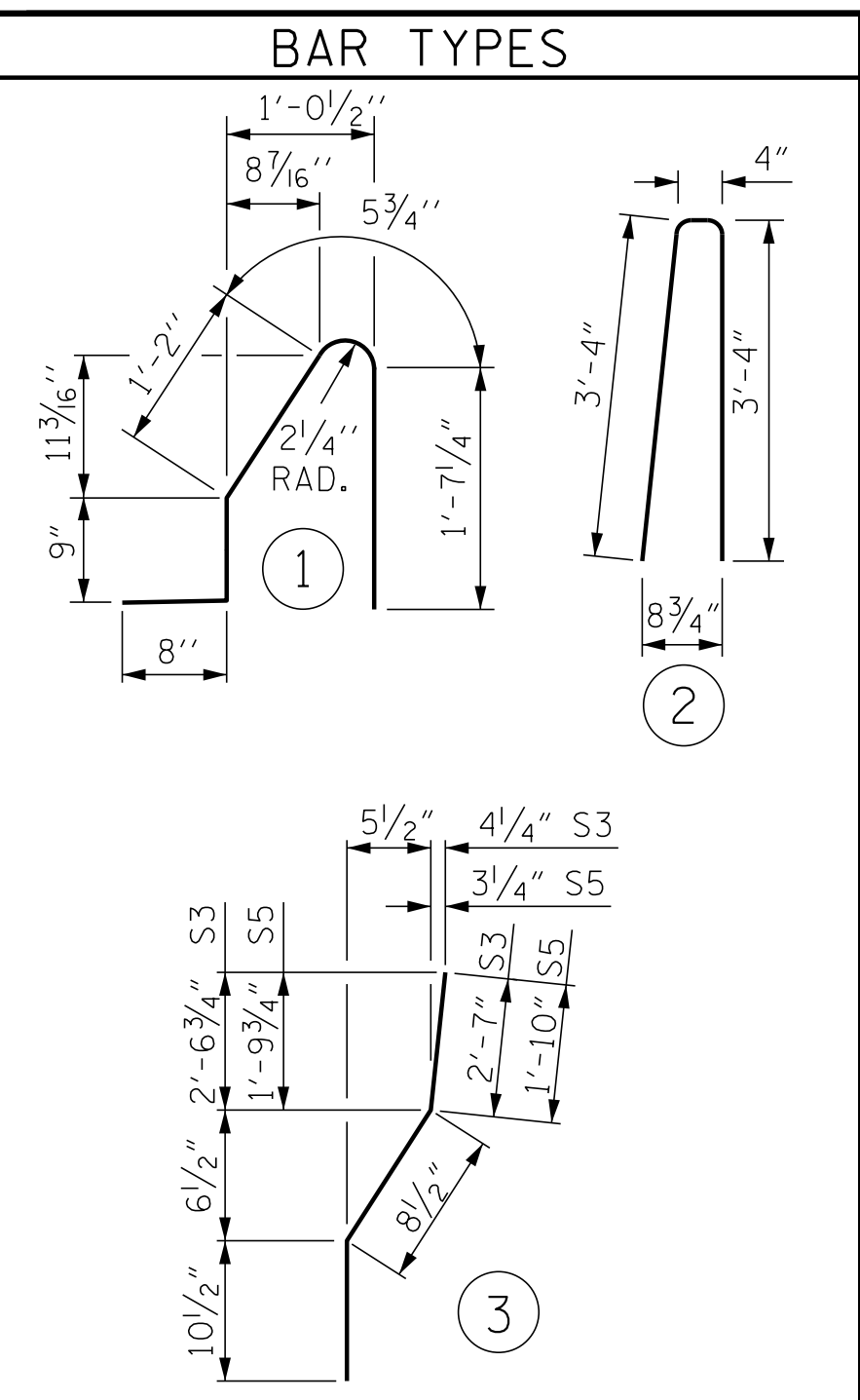
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
( NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



BARRIER RAIL DETAILS



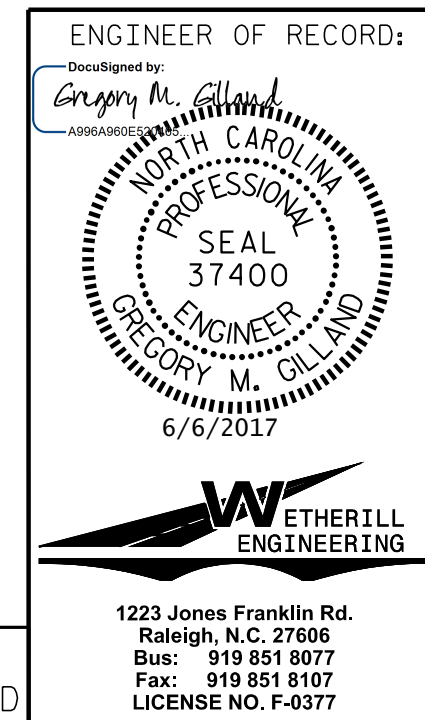
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	574	#5	1	4'-8"	2794
* S2	574	#5	2	7'-0"	4191
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	10	#5	3	3'-5"	36
* S6	10	#5	STR	3'-3"	34
* B1	88	#5	STR	15'-10"	1453
* B2	176	#5	STR	29'-7"	5431
* EPOXY COATED REINFORCING STEEL					13,973 LBS.
CLASS AA CONCRETE					79.7 CU. YDS.
CONCRETE BARRIER RAIL					586.60 LIN. FT.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-  
SHEET 2 OF 2



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

SHEET NO. S01-18  
TOTAL SHEETS 32

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ASSEMBLED BY : D. HODGE	DATE : 4/17
CHECKED BY : B.C. HUNT	DATE : 5/17
DRAWN BY : ARB 5/87	REV. 10/1/11 MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377



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.)

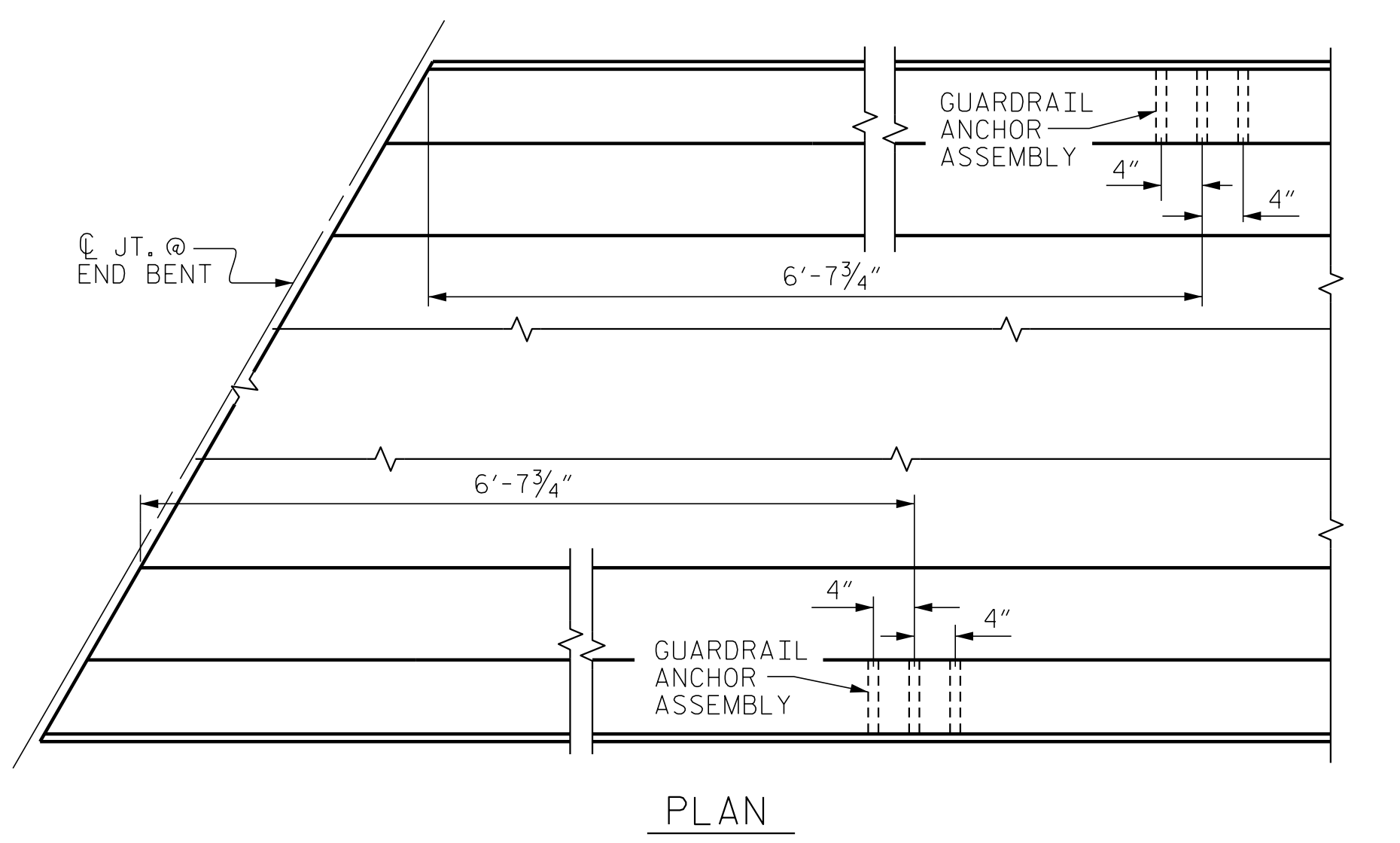
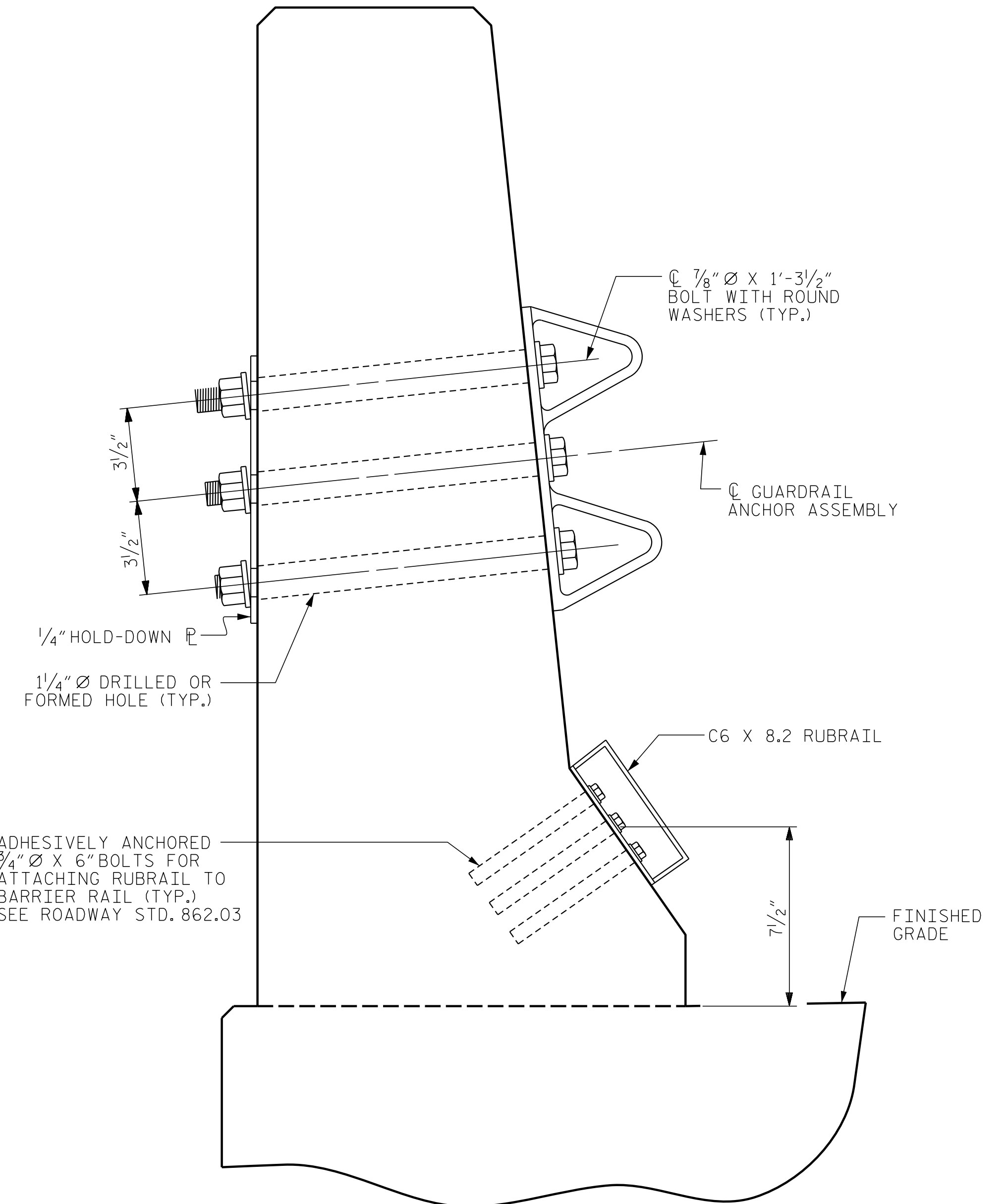
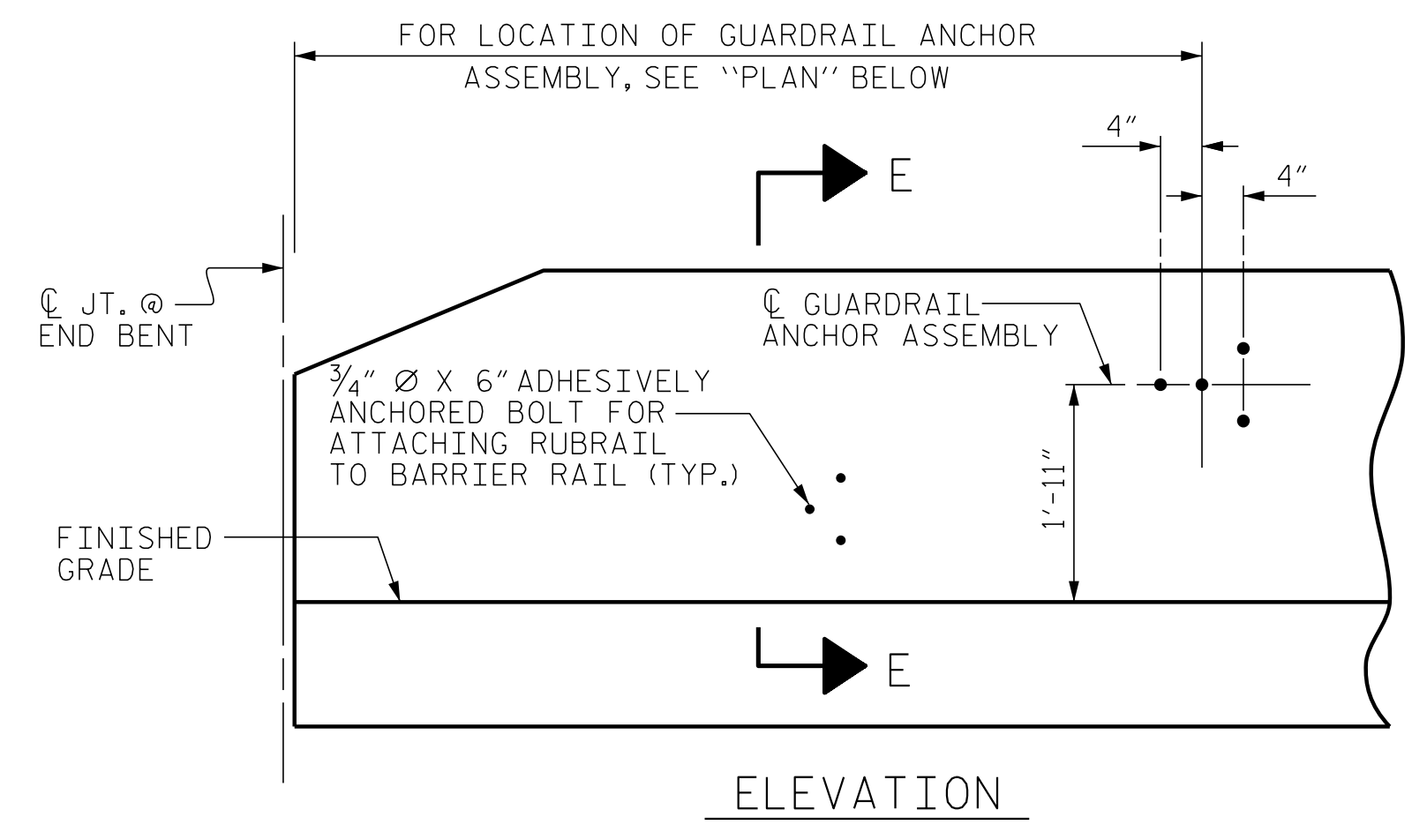
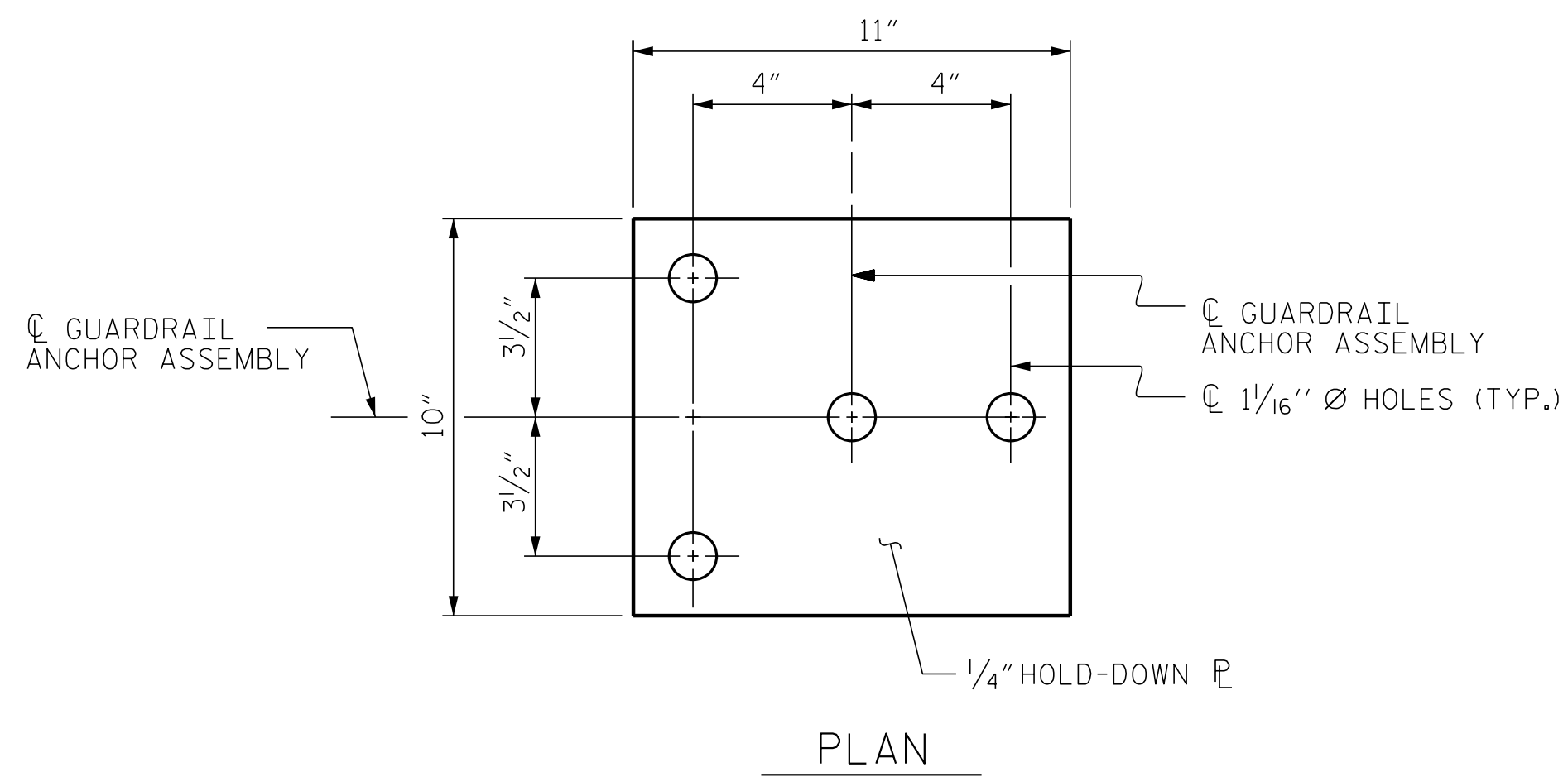
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

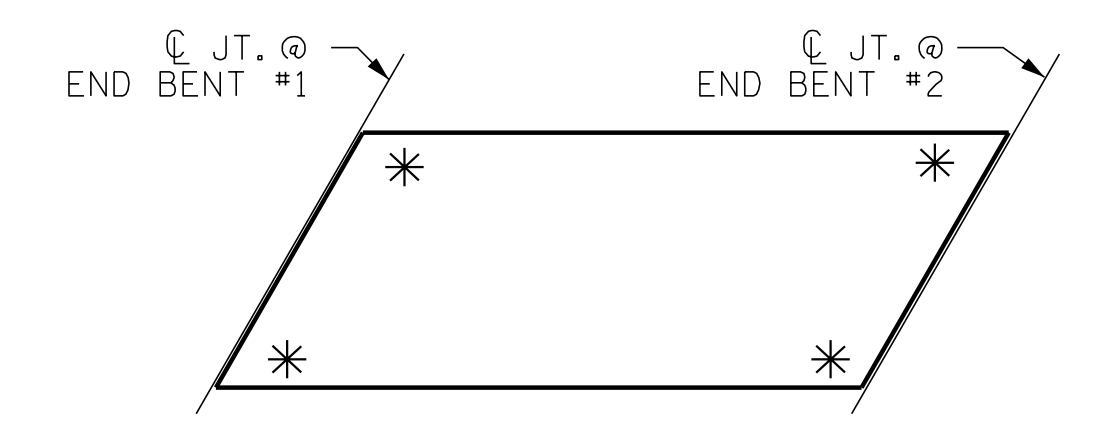
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

ENGINEER OF RECORD:  
 Designed by: Gregory M. Olland  
 REGISTERED PROFESSIONAL ENGINEER  
 NORTH CAROLINA  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/6/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

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

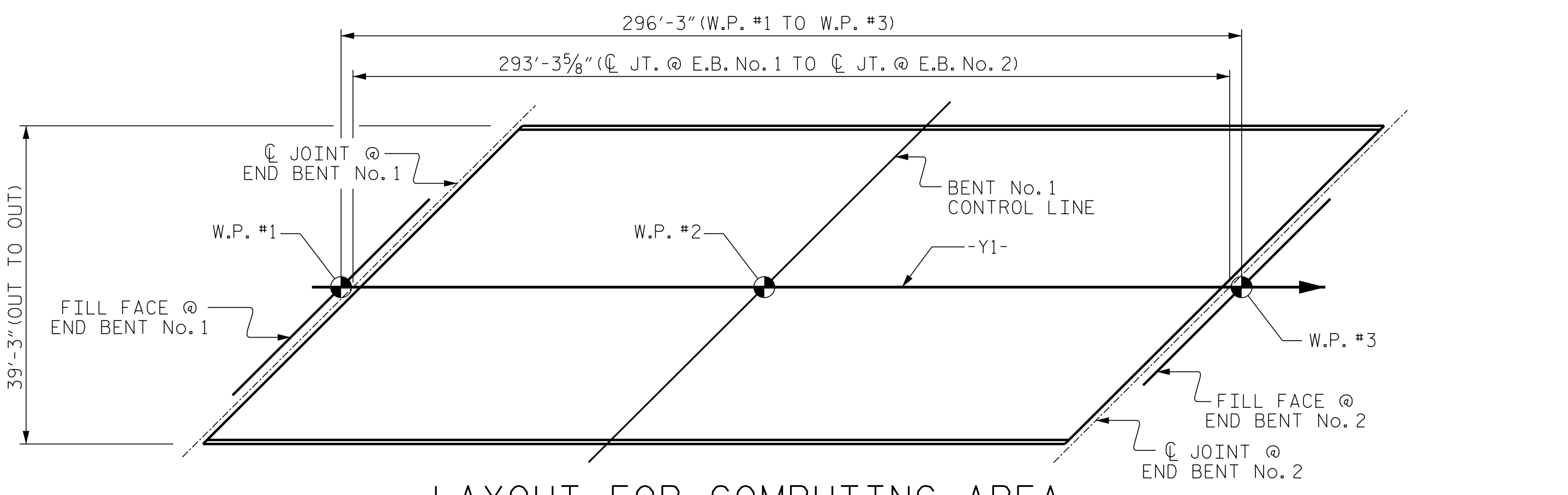
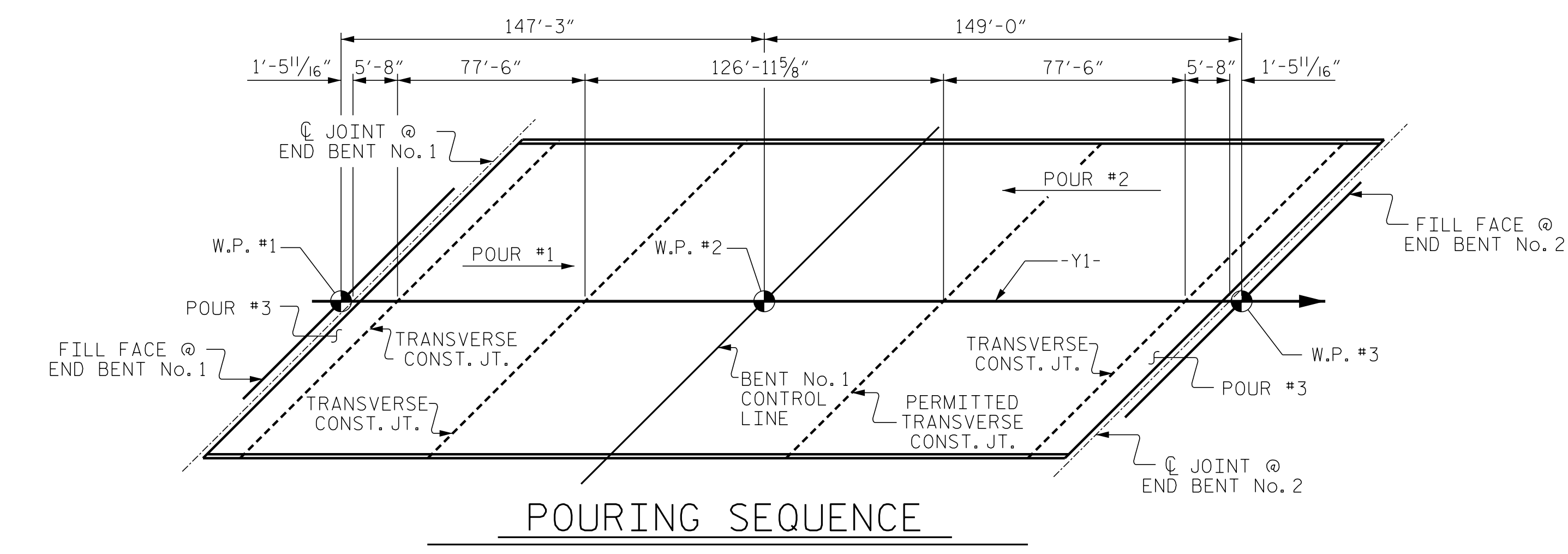
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			32

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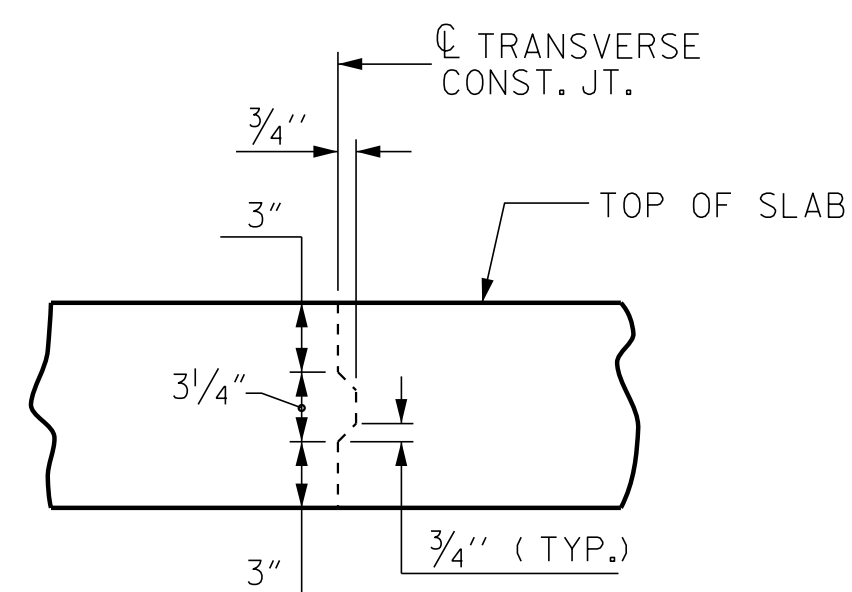
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ASSEMBLED BY : D. HODGE	DATE : 5/17
CHECKED BY : B.C. HUNT	DATE : 5/17
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM





LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 11,512)

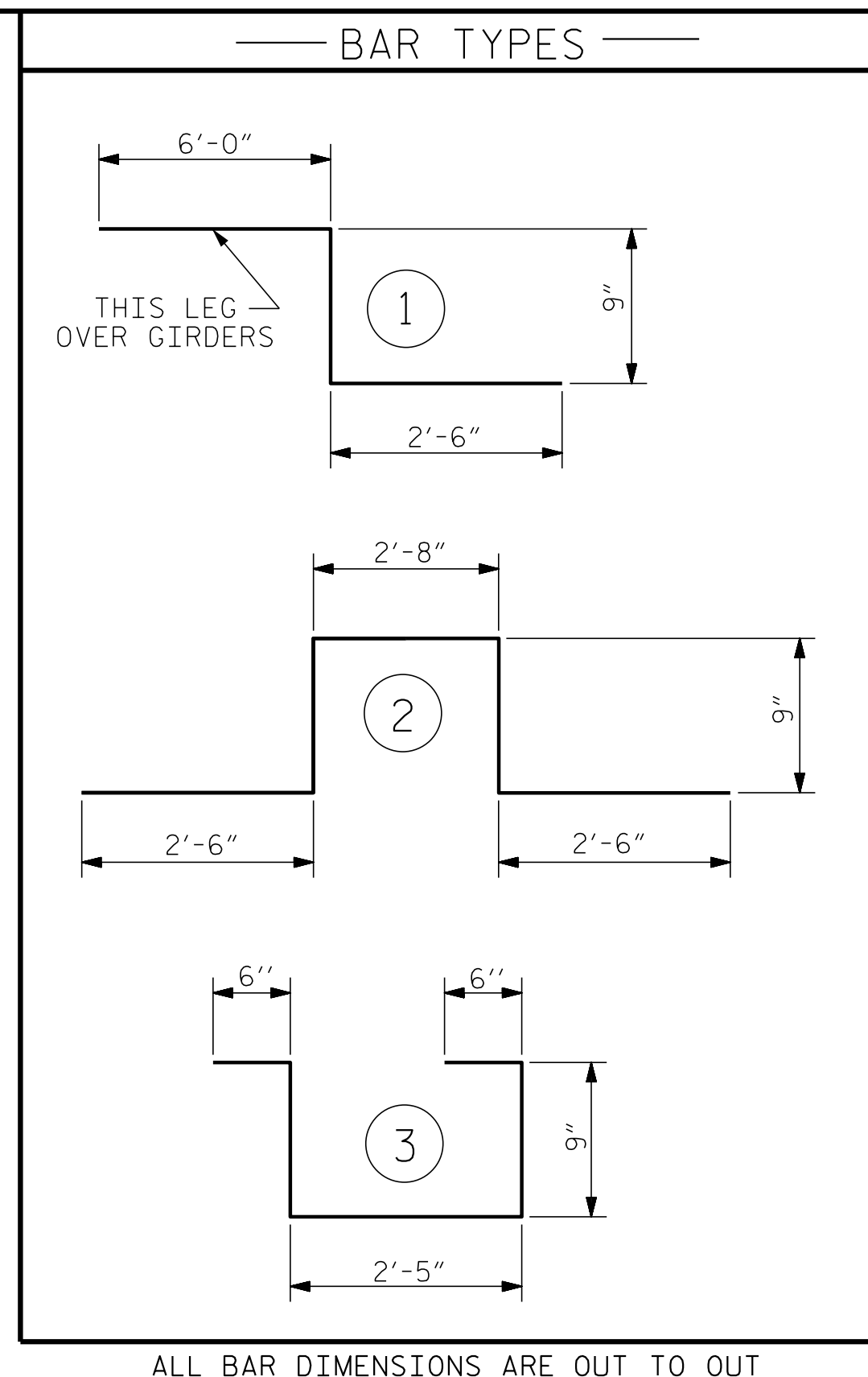


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

GROOVING BRIDGE FLOORS	
APPROACH SLABS	885 SQ.FT.
BRIDGE DECK	9,617 SQ.FT.
TOTAL	10,502 SQ.FT.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL													
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	554	#5	STR	38'-11"	22487	A201	6	#5	STR	37'-7"	235		
A2	554	#5	STR	38'-11"	22487	A202	6	#5	STR	36'-3"	227		
*A3	6	#6	STR	23'-2"	209	A203	6	#5	STR	34'-11"	219		
						A204	6	#5	STR	33'-6"	210		
*A101	6	#5	STR	37'-7"	235	A205	6	#5	STR	32'-2"	201		
*A102	6	#5	STR	36'-3"	227	A206	6	#5	STR	30'-9"	192		
*A103	6	#5	STR	34'-11"	219	A207	6	#5	STR	29'-5"	184		
*A104	6	#5	STR	33'-6"	210	A208	6	#5	STR	28'-0"	175		
*A105	6	#5	STR	32'-2"	201	A209	6	#5	STR	26'-8"	167		
*A106	6	#5	STR	30'-9"	192	A210	6	#5	STR	25'-3"	158		
*A107	6	#5	STR	29'-5"	184	A211	6	#5	STR	23'-11"	150		
*A108	6	#5	STR	28'-0"	175	A212	6	#5	STR	22'-6"	141		
*A109	6	#5	STR	26'-8"	167	A213	6	#5	STR	21'-2"	132		
*A110	6	#5	STR	25'-3"	158	A214	6	#5	STR	19'-10"	124		
*A111	6	#5	STR	23'-11"	150	A215	6	#5	STR	18'-5"	115		
*A112	6	#5	STR	22'-6"	141	A216	6	#5	STR	17'-1"	107		
*A113	6	#5	STR	21'-2"	132	A217	6	#5	STR	15'-8"	98		
*A114	6	#5	STR	19'-10"	124	A218	6	#5	STR	14'-4"	90		
*A115	6	#5	STR	18'-5"	115	A219	6	#5	STR	12'-11"	81		
*A116	6	#5	STR	17'-1"	107	A220	6	#5	STR	11'-7"	72		
*A117	6	#5	STR	15'-8"	98	A221	6	#5	STR	10'-2"	64		
*A118	6	#5	STR	14'-4"	90	A222	6	#5	STR	8'-10"	55		
*A119	6	#5	STR	12'-11"	81	A223	6	#5	STR	7'-5"	46		
*A120	6	#5	STR	11'-7"	72	A224	6	#5	STR	6'-1"	38		
*A121	6	#5	STR	10'-2"	64	A225	6	#5	STR	4'-9"	30		
*A122	6	#5	STR	8'-10"	55	A226	6	#5	STR	3'-4"	21		
*A123	6	#5	STR	7'-5"	46								
*A124	6	#5	STR	6'-1"	38	*B1	104	#4	STR	25'-1"	1743		
*A125	6	#5	STR	4'-9"	30	*B2	152	#6	STR	54'-8"	12481		
*A126	6	#5	STR	3'-4"	21	*B3	104	#4	STR	25'-7"	1777		
						*B4	22	#4	STR	28'-6"	419		
						B5	282	#5	STR	50'-8"	14902		
						*G1	2	#5	STR	55'-1"	115		
						*K1	12	#5	1	9'-3"	116		
						*K2	12	#5	2	9'-2"	115		
						*K3	18	#5	STR	12'-7"	236		
						*S1	72	#4	3	4'-11"	236		

REINFORCING STEEL LBS. 40,721  
\* EPOXY COATED REINFORCING STEEL LBS. 43,266

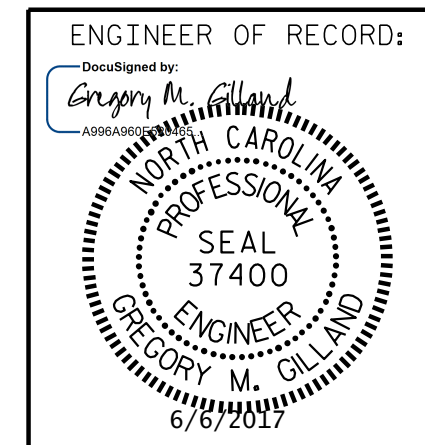
\* THESE BARS ARE EPOXY COATED.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
TOTALS**	379.3	40,721	43,266

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

CONCRETE BREAKDOWN	
	CLASS AA CONCRETE (CU. YDS.)
POUR #1	99.1
POUR #2	261.4
POUR #3	18.8
TOTALS	379.3

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 17+77.11 -Y1-



ETHERILL ENGINEERING  
1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

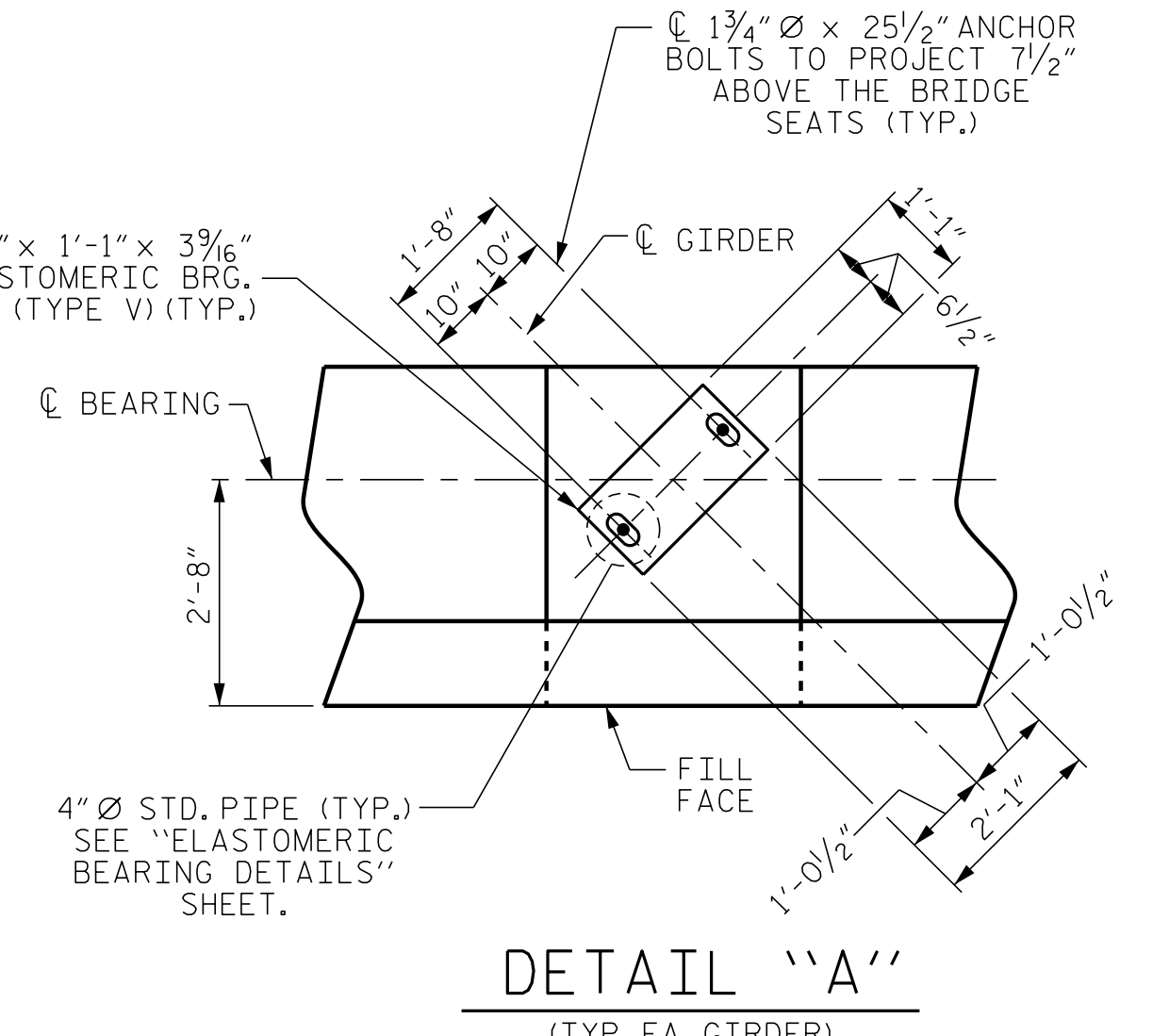
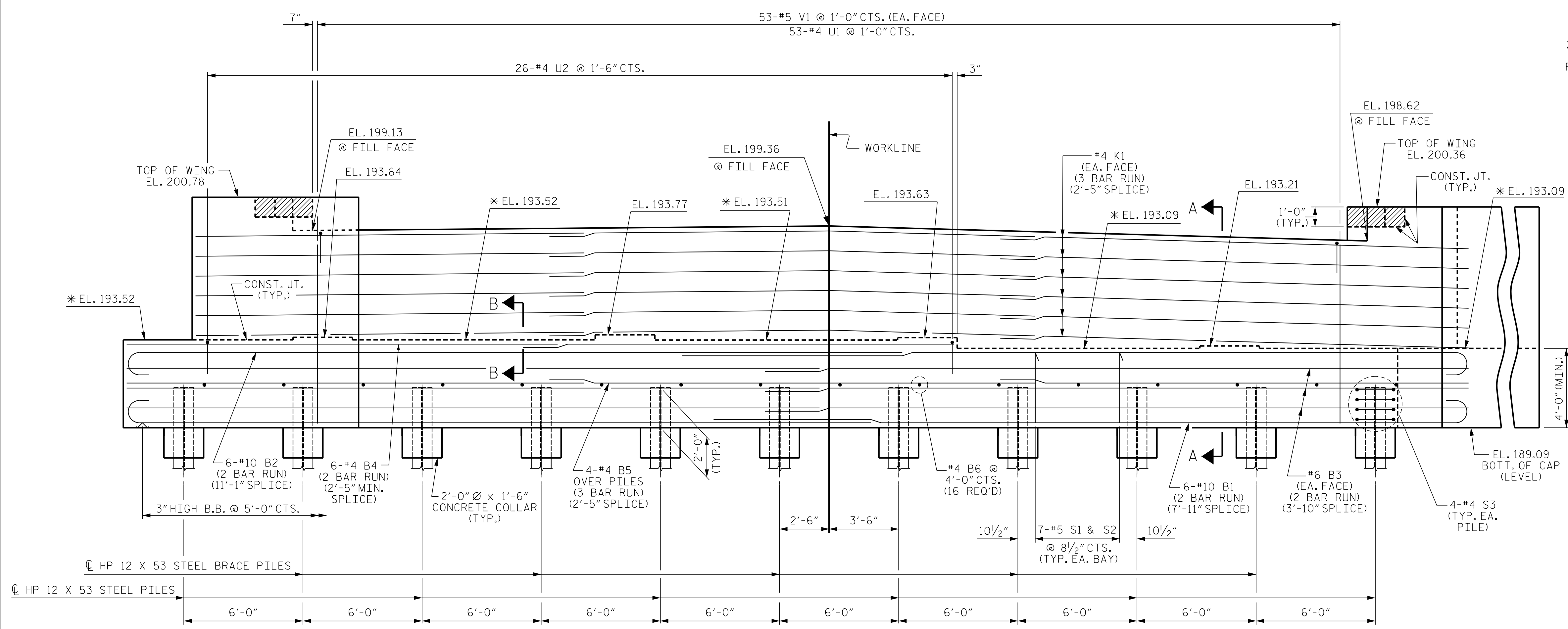
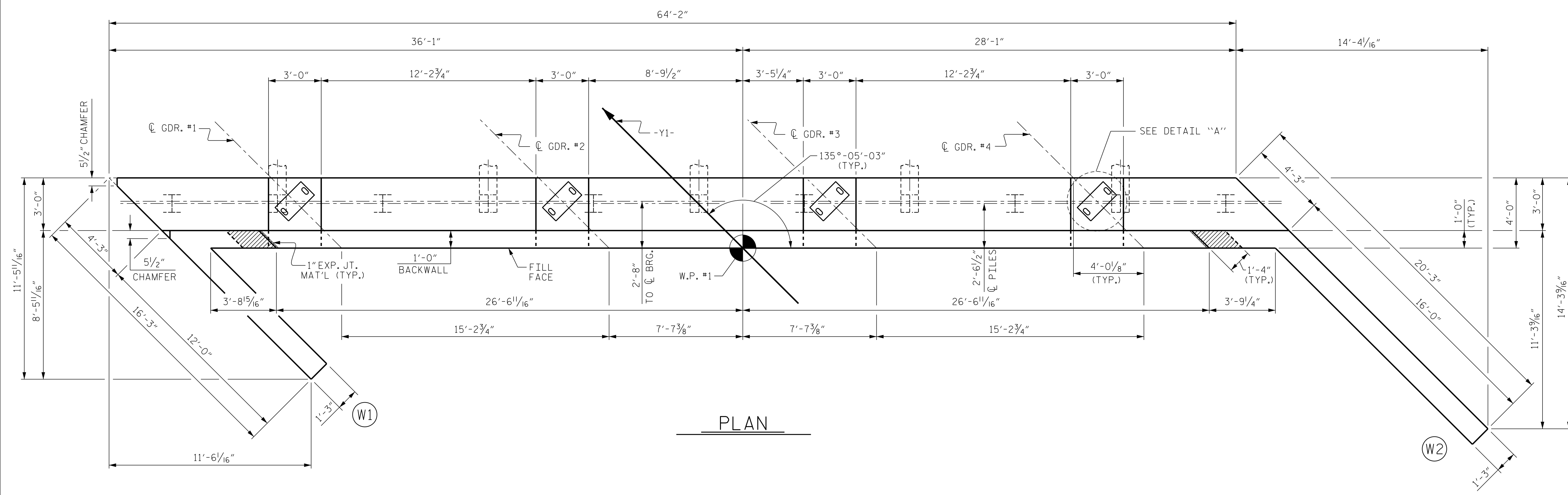
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BILL OF MATERIAL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	SO1-20	
1			3			TOTAL SHEETS	
2			4			32	

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 5/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

SHEET 1 OF 3

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

SHEET NO. S01-21  
 TOTAL SHEETS 32

ENGINEER OF RECORD:  
 Gregory M. Olland  
 PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/6/2017

ETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

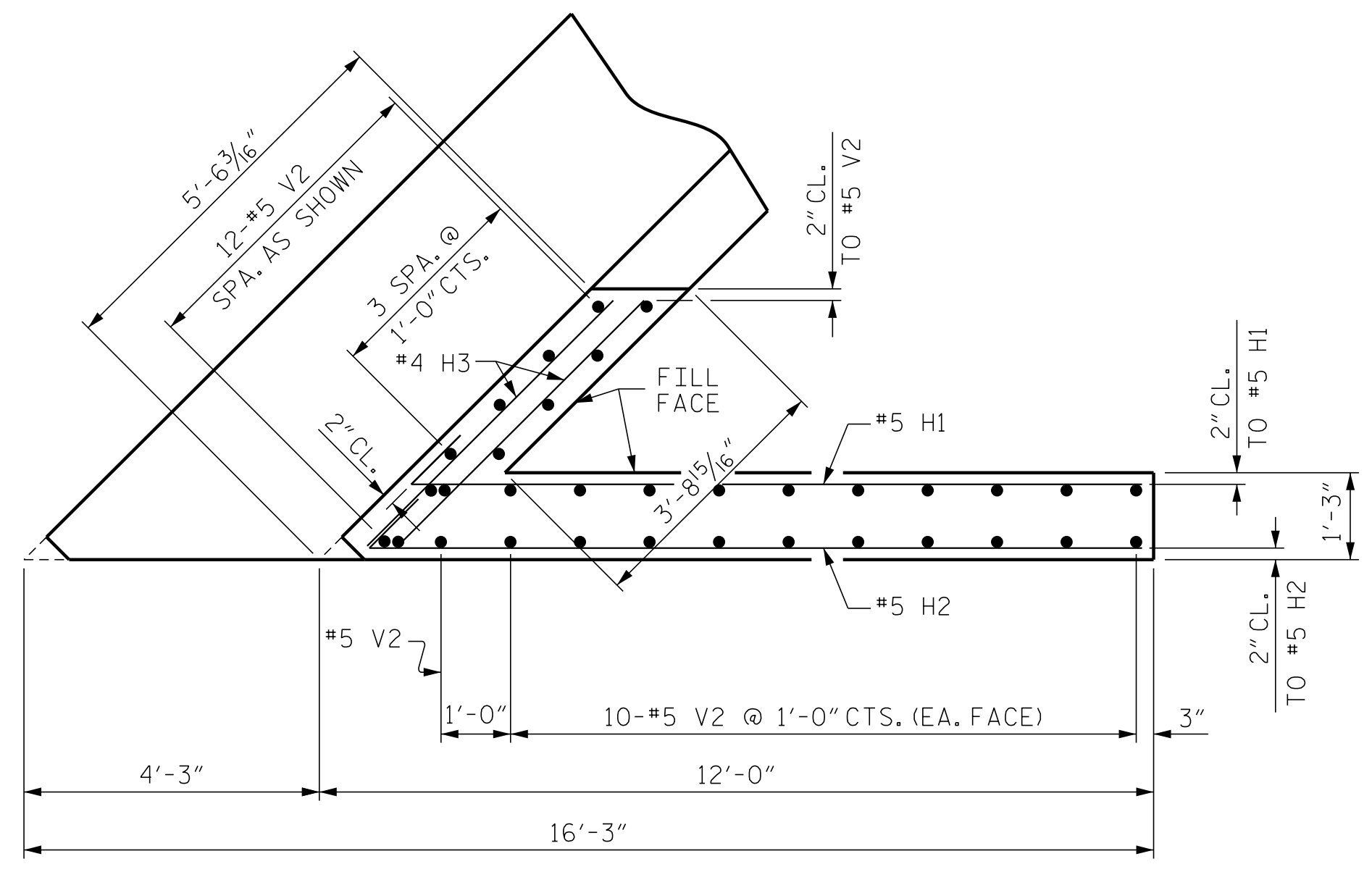
\* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS. SEE SECTION A-A, SHEET 3 OF 3.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

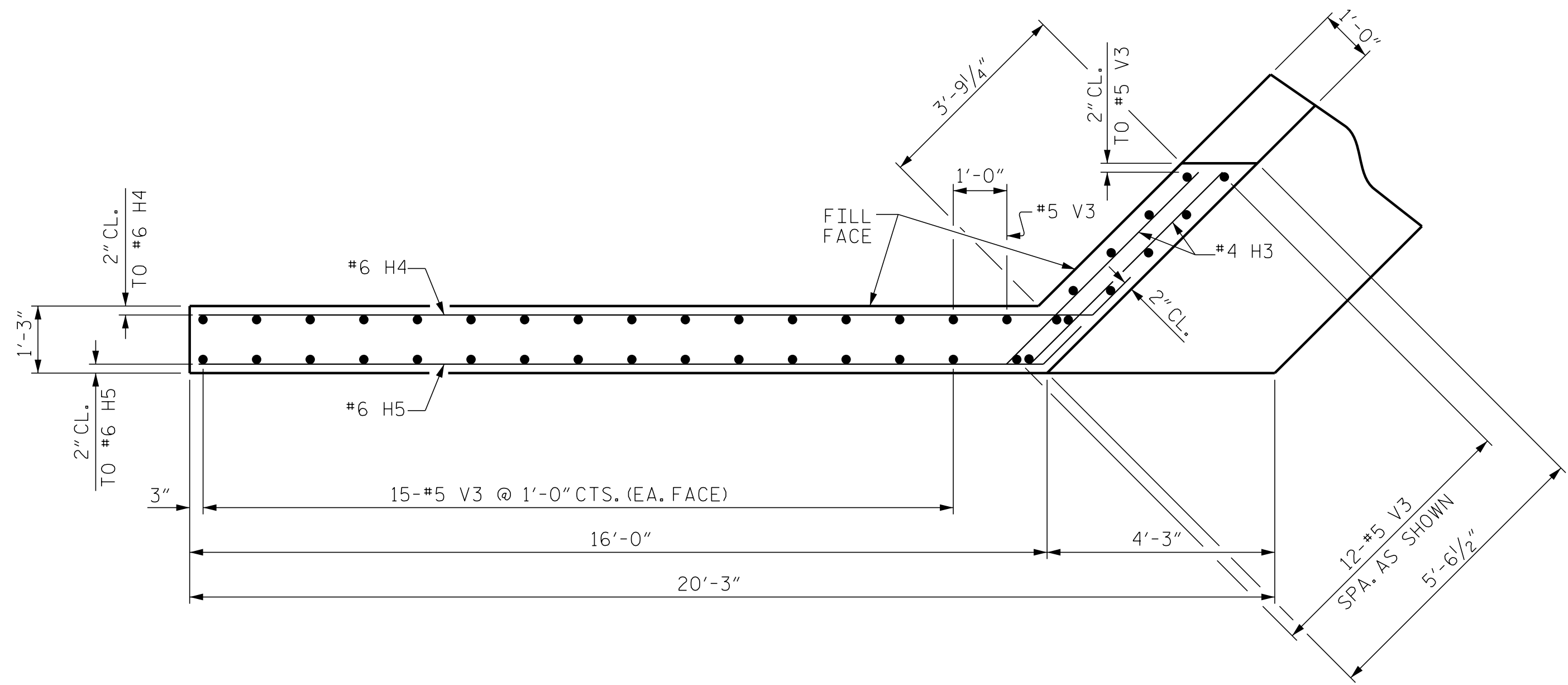
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 CHECKED BY: B.C. HUNT DATE: 5/17

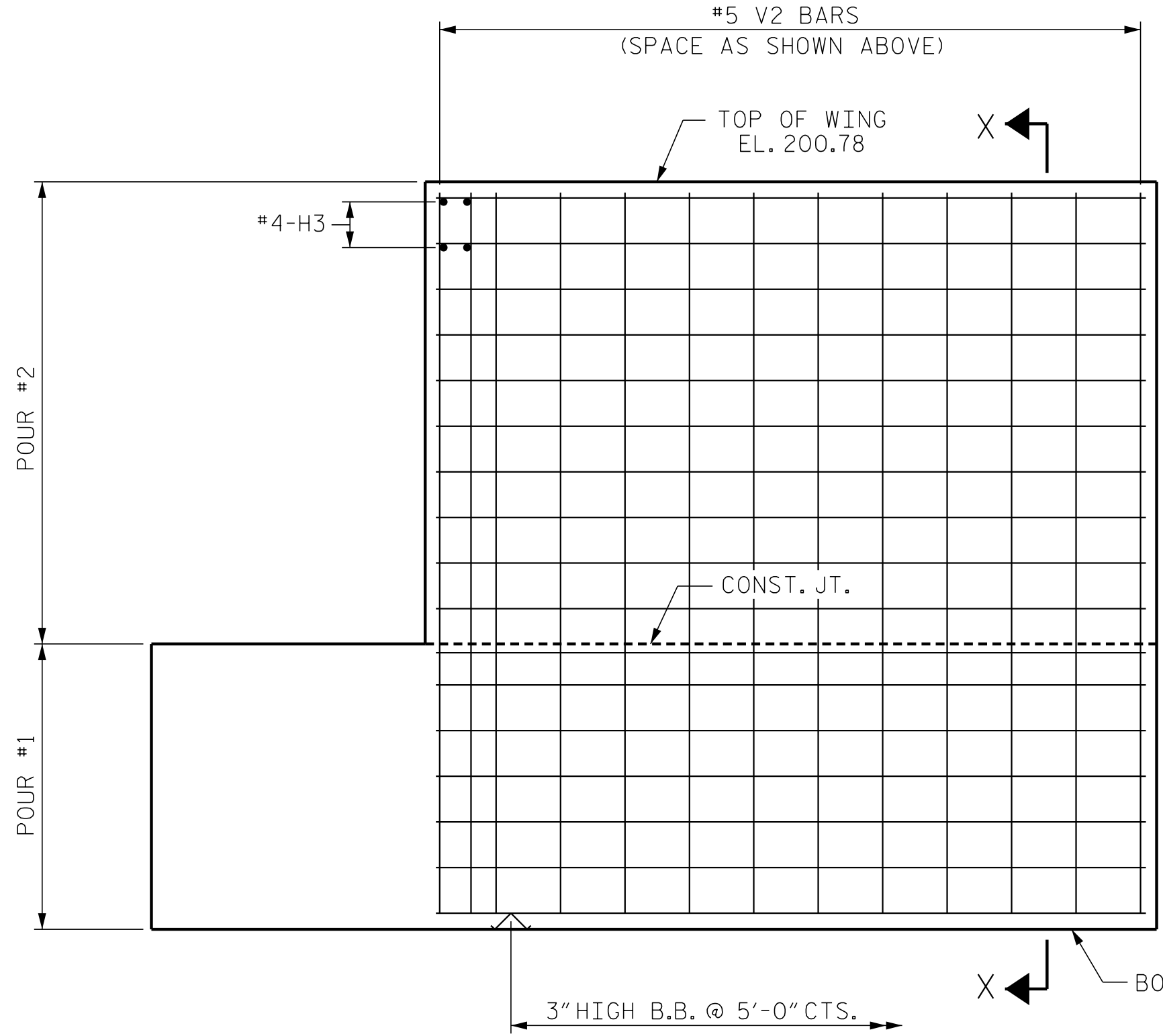




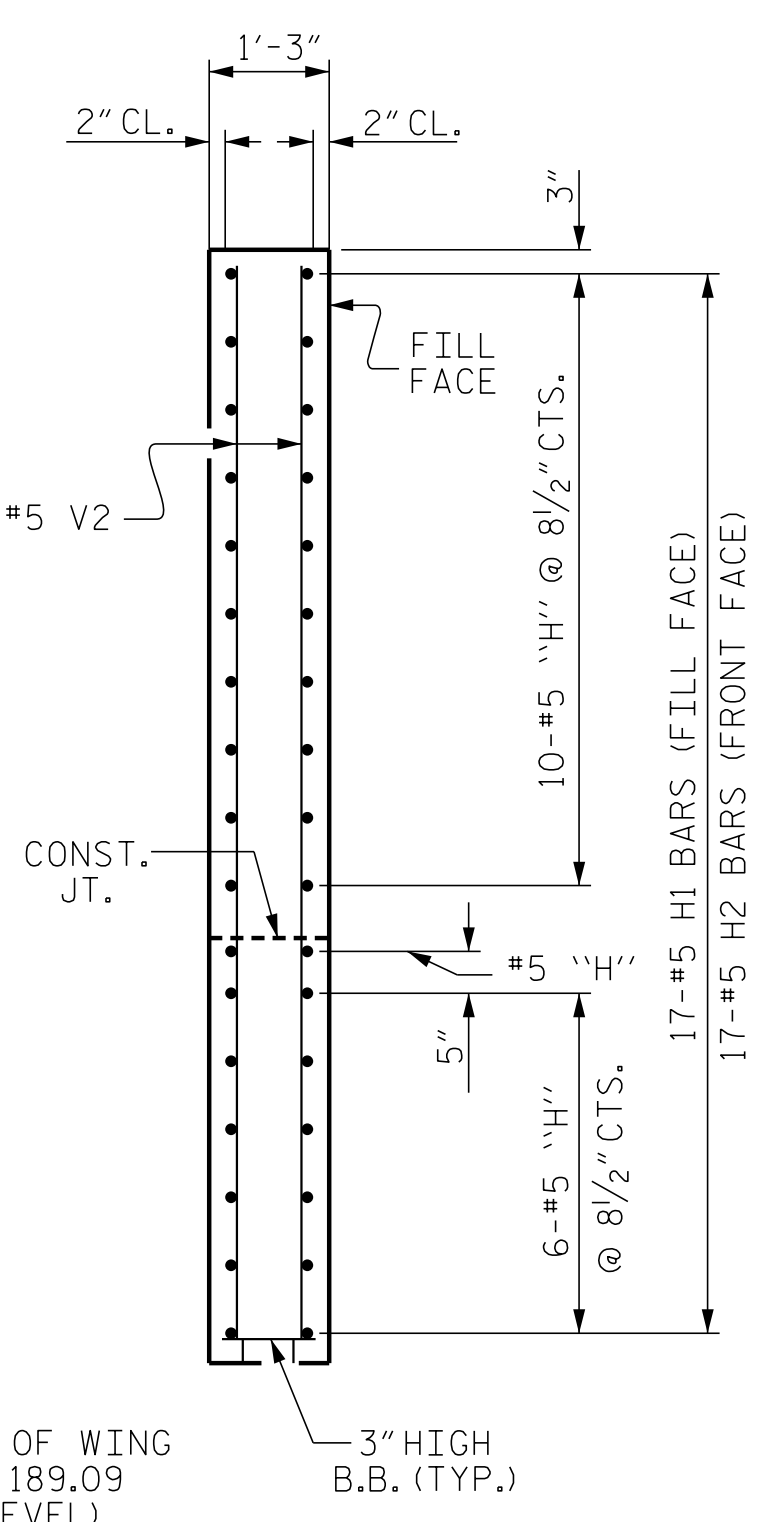
PLAN OF WING - (W1)



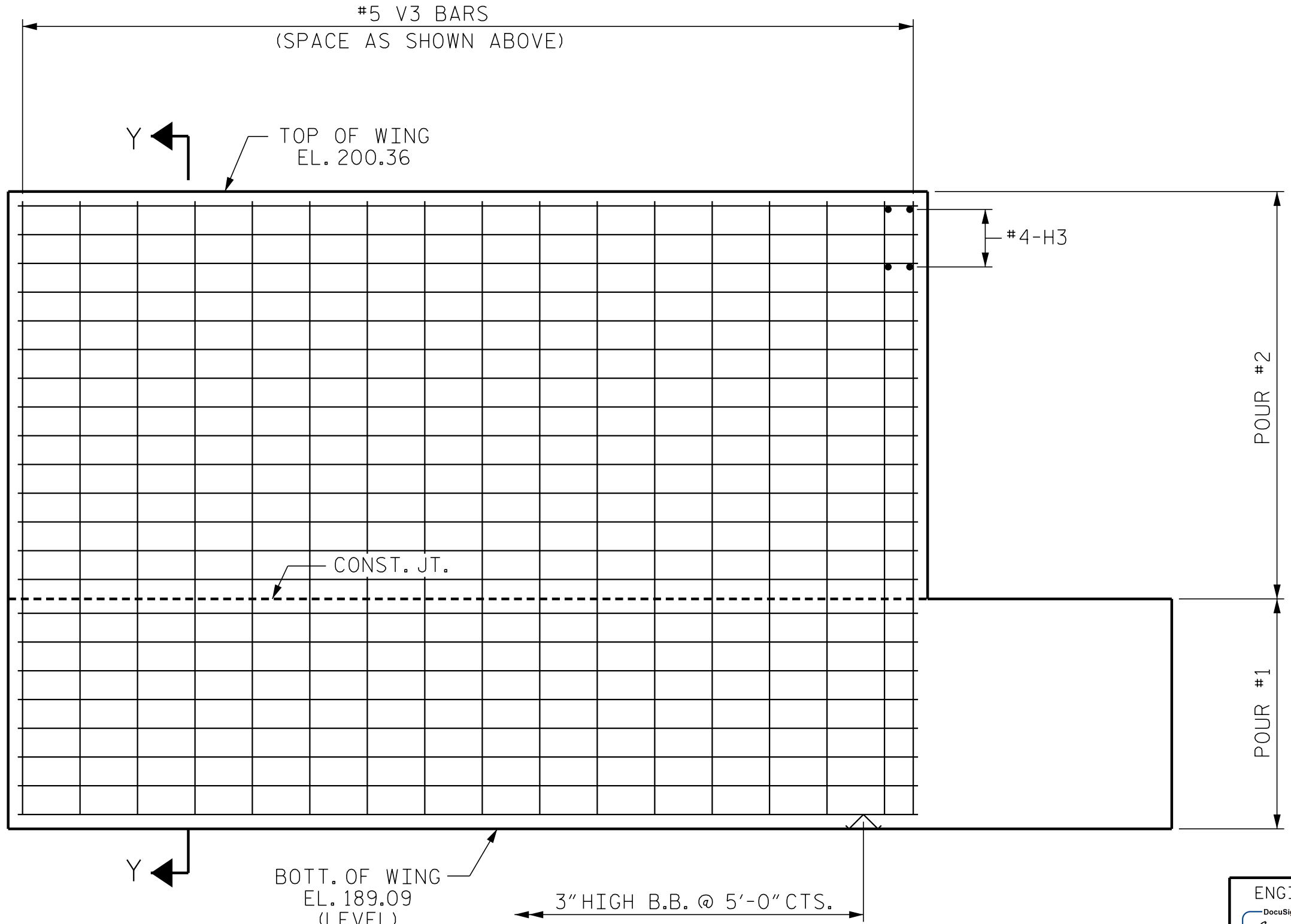
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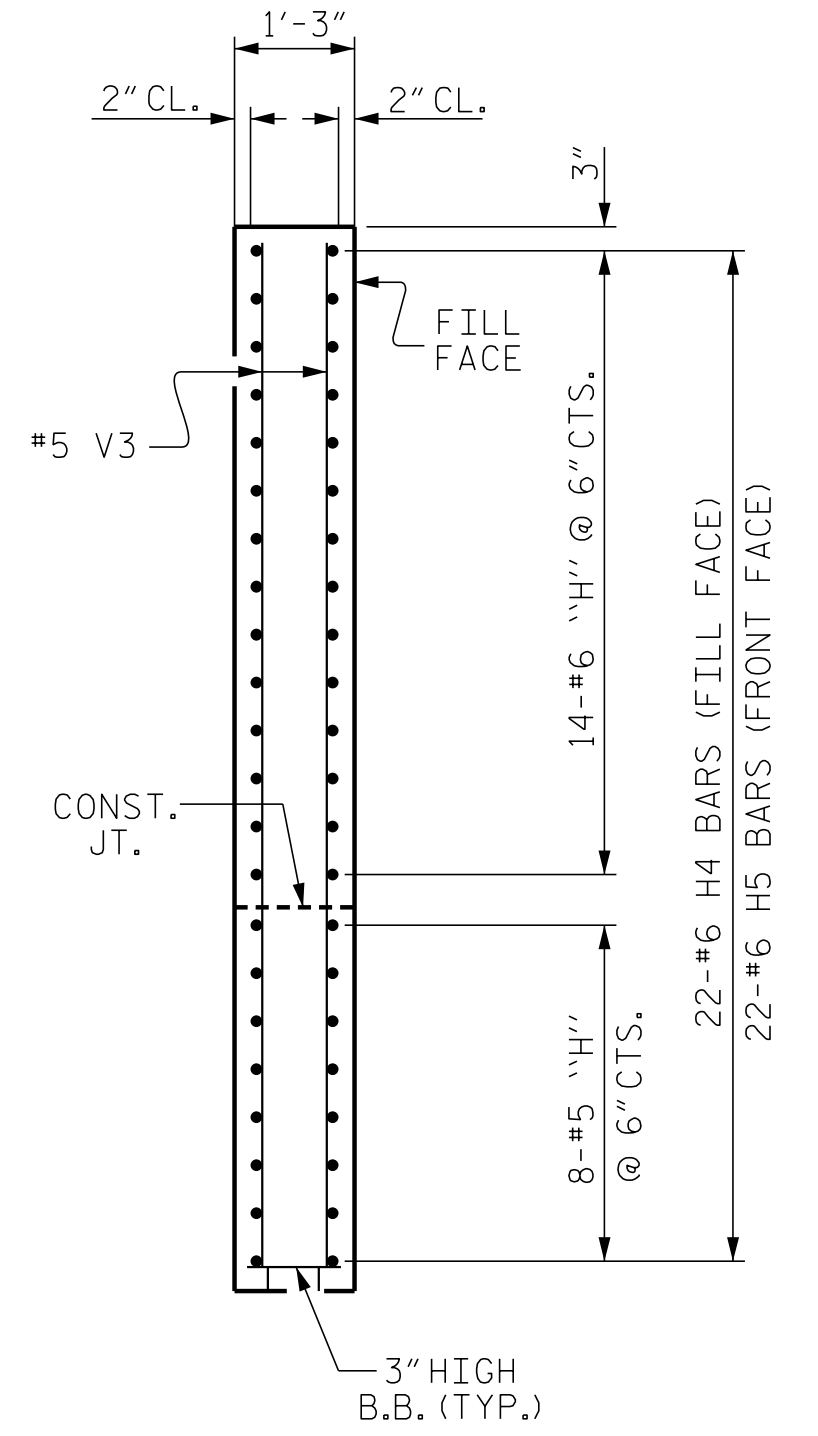
ELEVATION OF WING - (W1)



SECTION X-X

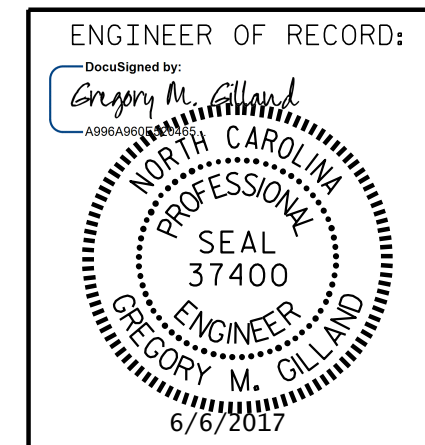


ELEVATION OF WING - (W2)



SECTION Y-Y

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT No. 1

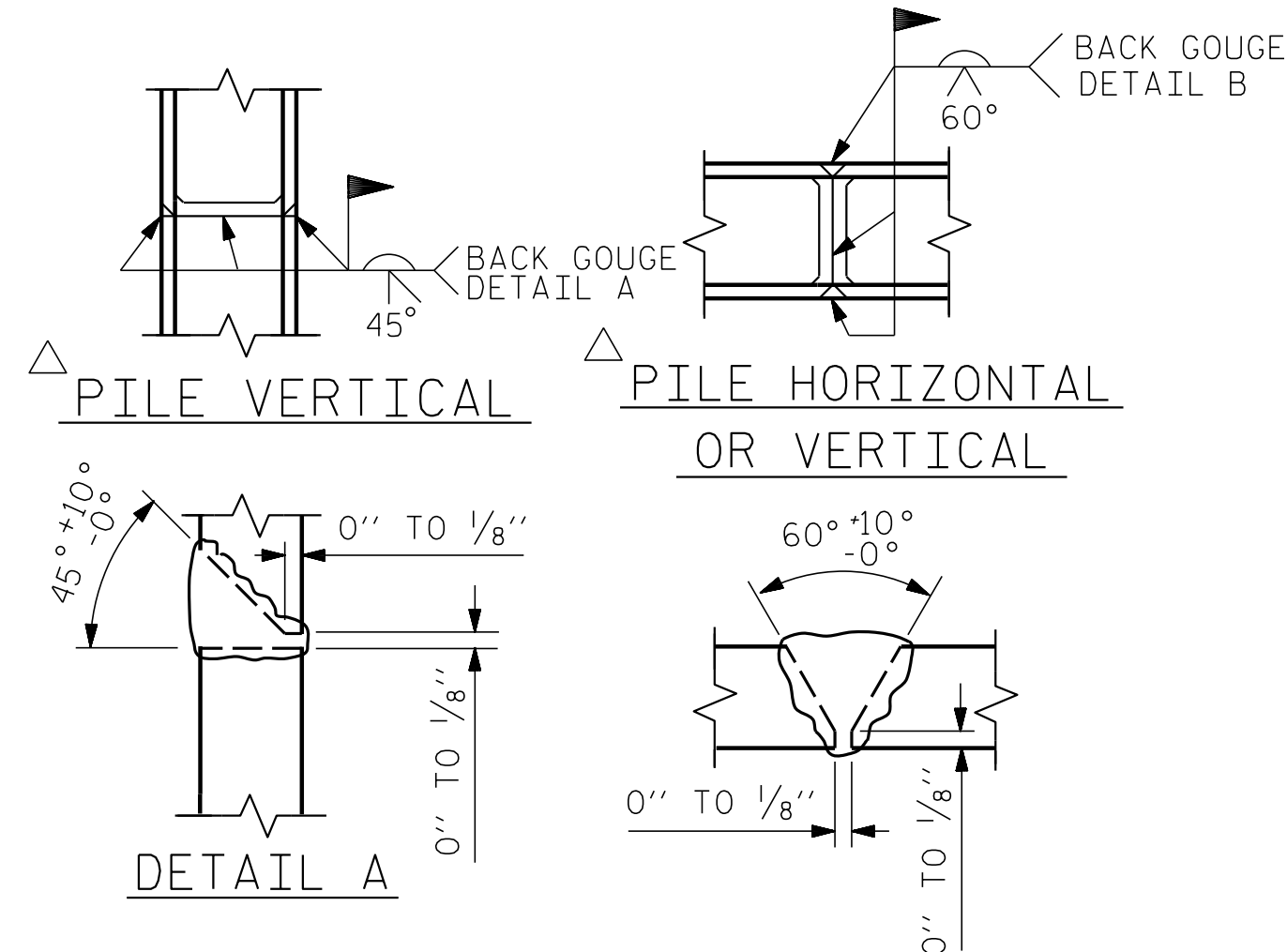
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NO.	BY:	DATE:	NO.	BY:	DATE:	S01-22
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: D. HODGE DATE: 5/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

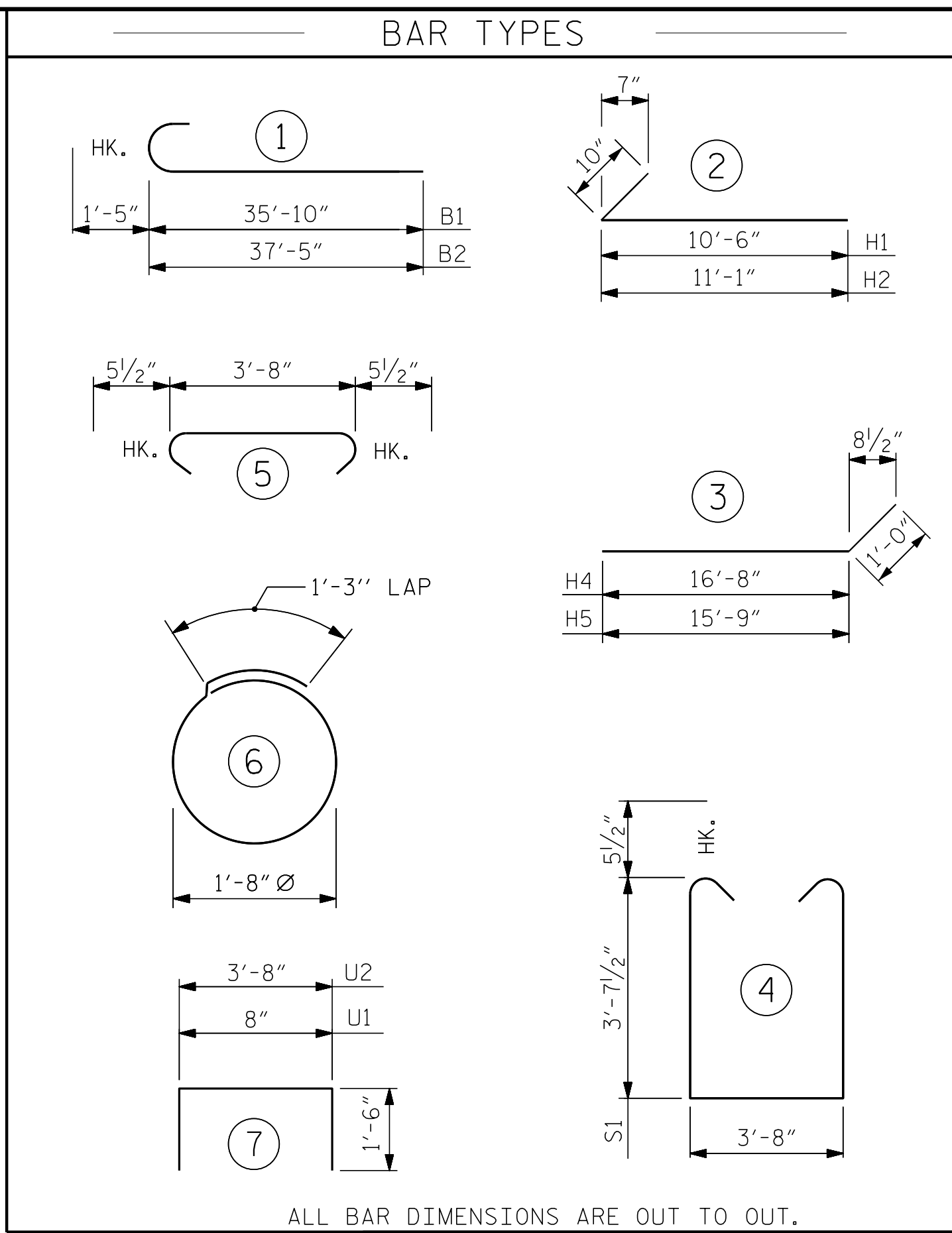
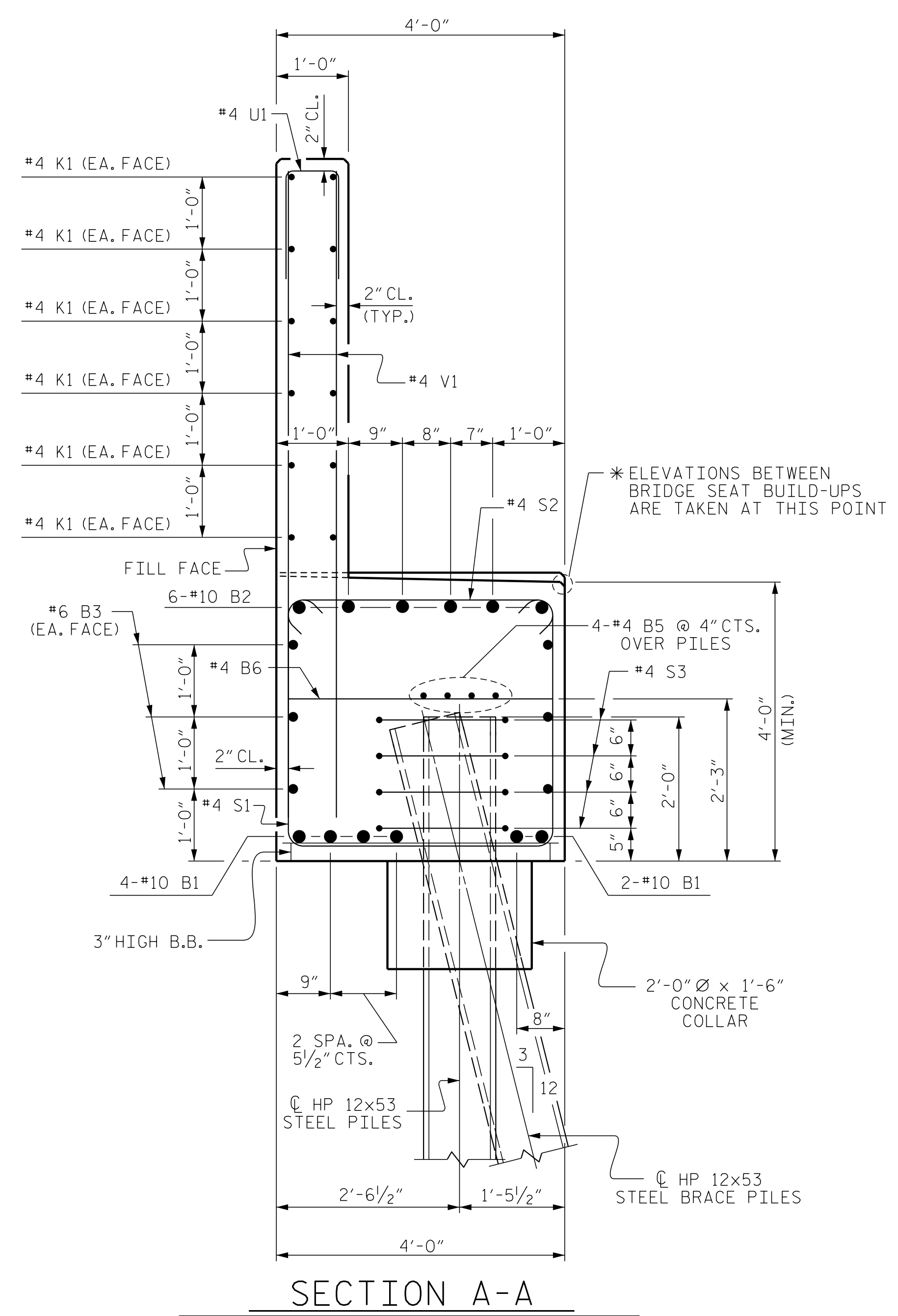
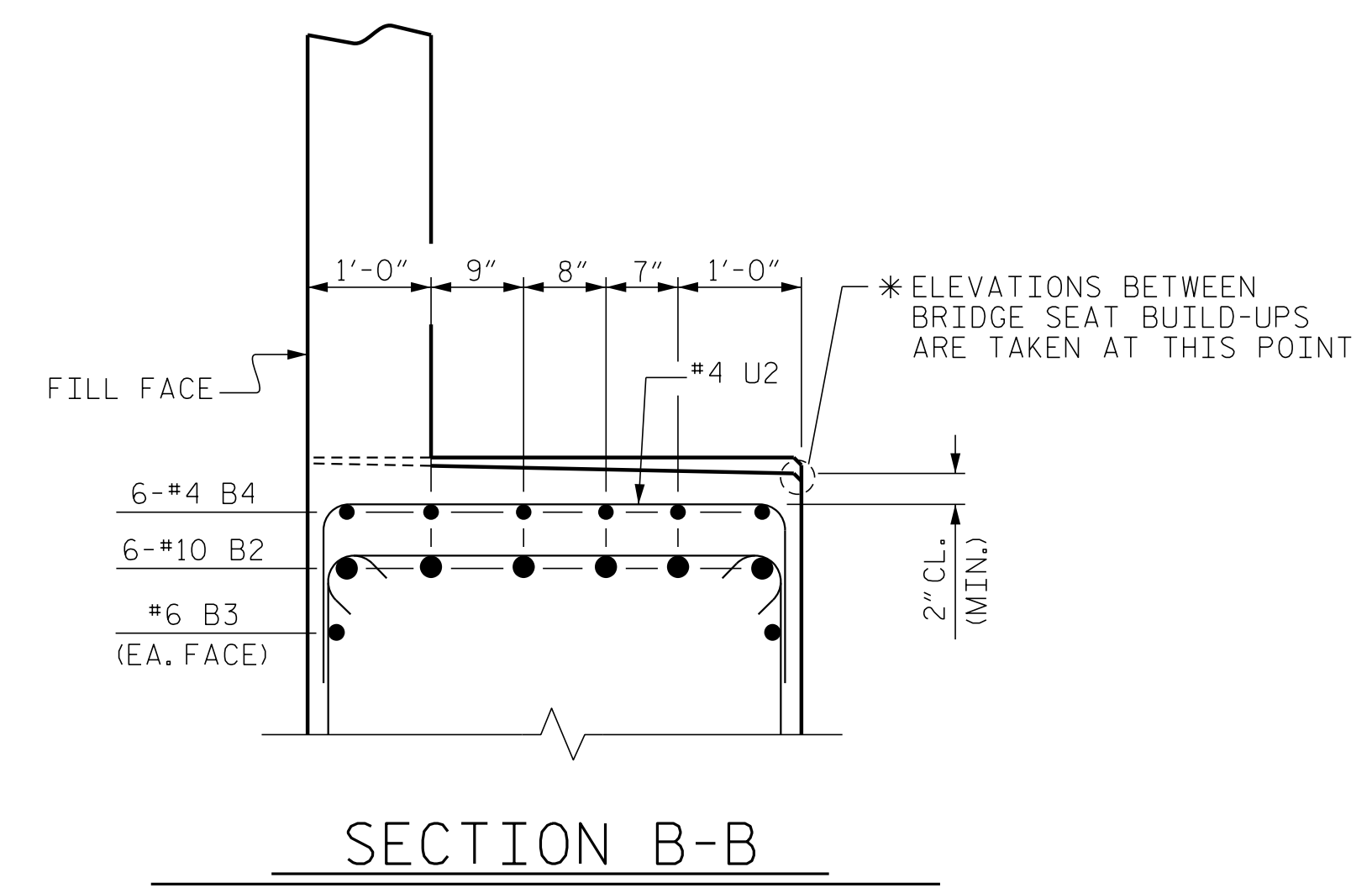
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 UNLESS ALL SIGNATURES COMPLETED

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**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**NOTES**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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.

**BILL OF MATERIAL**

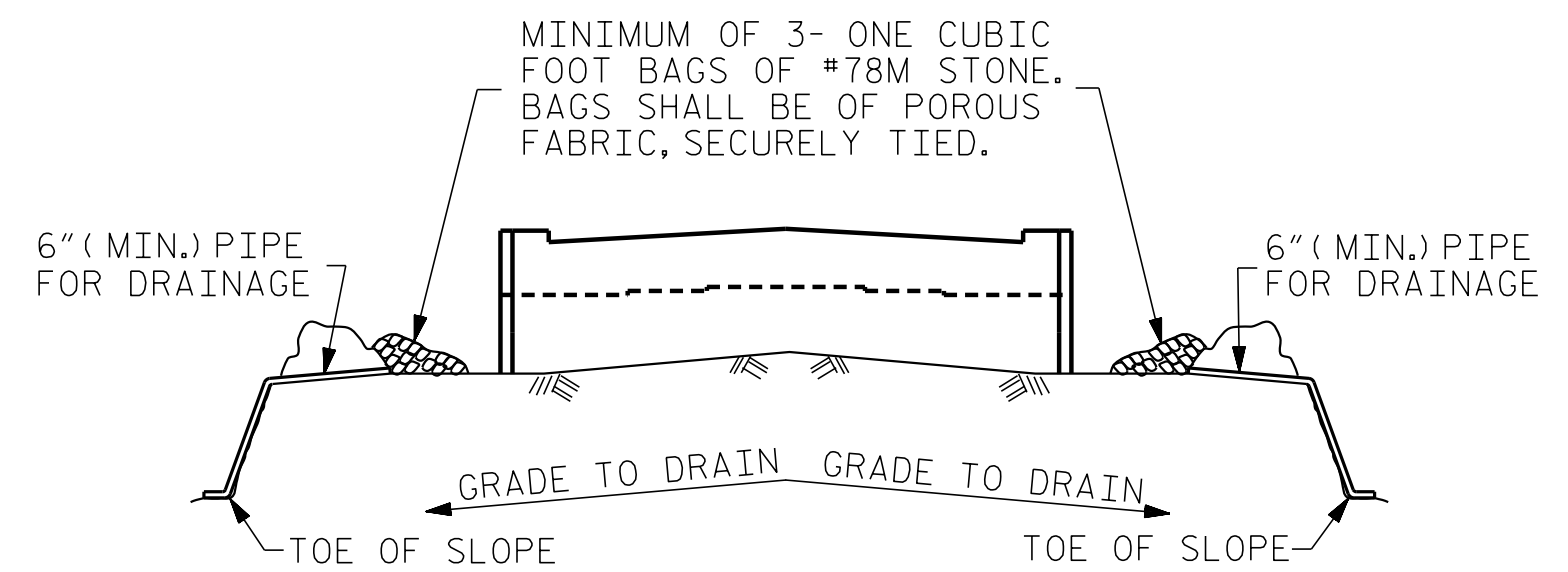
**END BENT No. 1**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	37'-3"	1923
B2	12	#10	1	38'-10"	2005
B3	12	#6	STR	33'-10"	610
B4	12	#4	STR	22'-1"	177
B5	12	#4	STR	22'-11"	184
B6	16	#4	STR	3'-8"	39
H1	17	#5	2	11'-4"	201
H2	17	#5	2	11'-11"	211
H3	8	#4	STR	4'-10"	26
H4	22	#6	3	17'-8"	584
H5	22	#6	3	16'-9"	553
K1	36	#4	STR	22'-10"	549
S1	70	#5	4	11'-10"	864
S2	70	#5	5	4'-7"	335
S3	44	#4	6	6'-6"	191
U1	53	#4	7	3'-8"	130
U2	26	#4	7	6'-8"	116
V1	106	#5	STR	9'-1"	1004
V2	33	#5	STR	11'-3"	387
V3	43	#5	STR	10'-10"	486

REINFORCING STEEL 10,575 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, CONC. COLLARS & LOWER PART OF WINGS	47.6 C.Y.
POUR #2	BACKWALL AND UPPER PART OF WINGS	22.7 C.Y.
TOTAL CLASS A CONCRETE		70.3 C.Y.
HP 12 X 53 STEEL PILES		
NO: 11		605 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES		11 EA.
PILE REDRIVES		6 EA.



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**

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 17+77.11 -Y1-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1

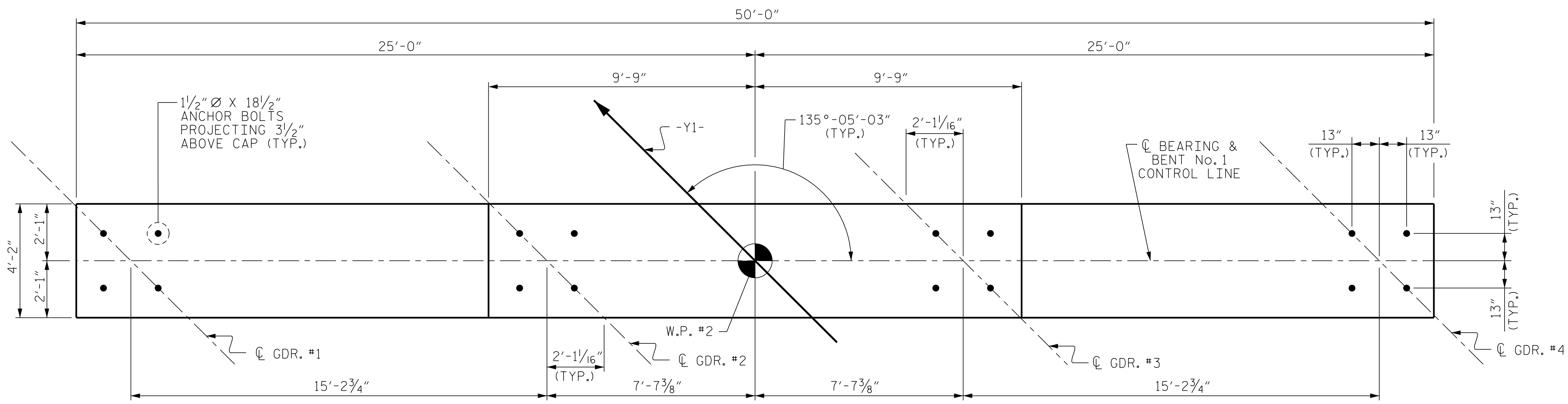
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NO.	BY:	DATE:	NO.	BY:	DATE:	S01-23	
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2			4				

DRAWN BY: D. HODGE DATE: 5/17

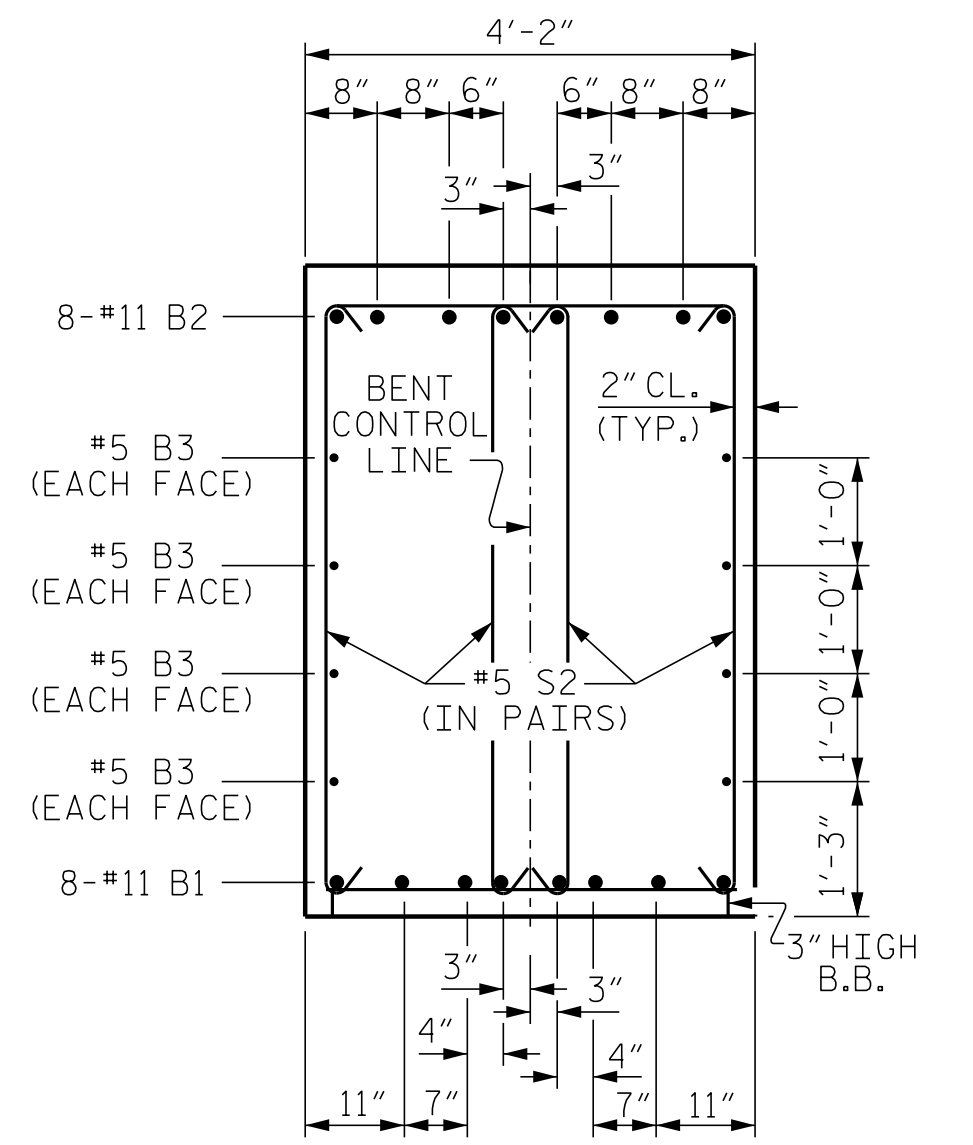
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

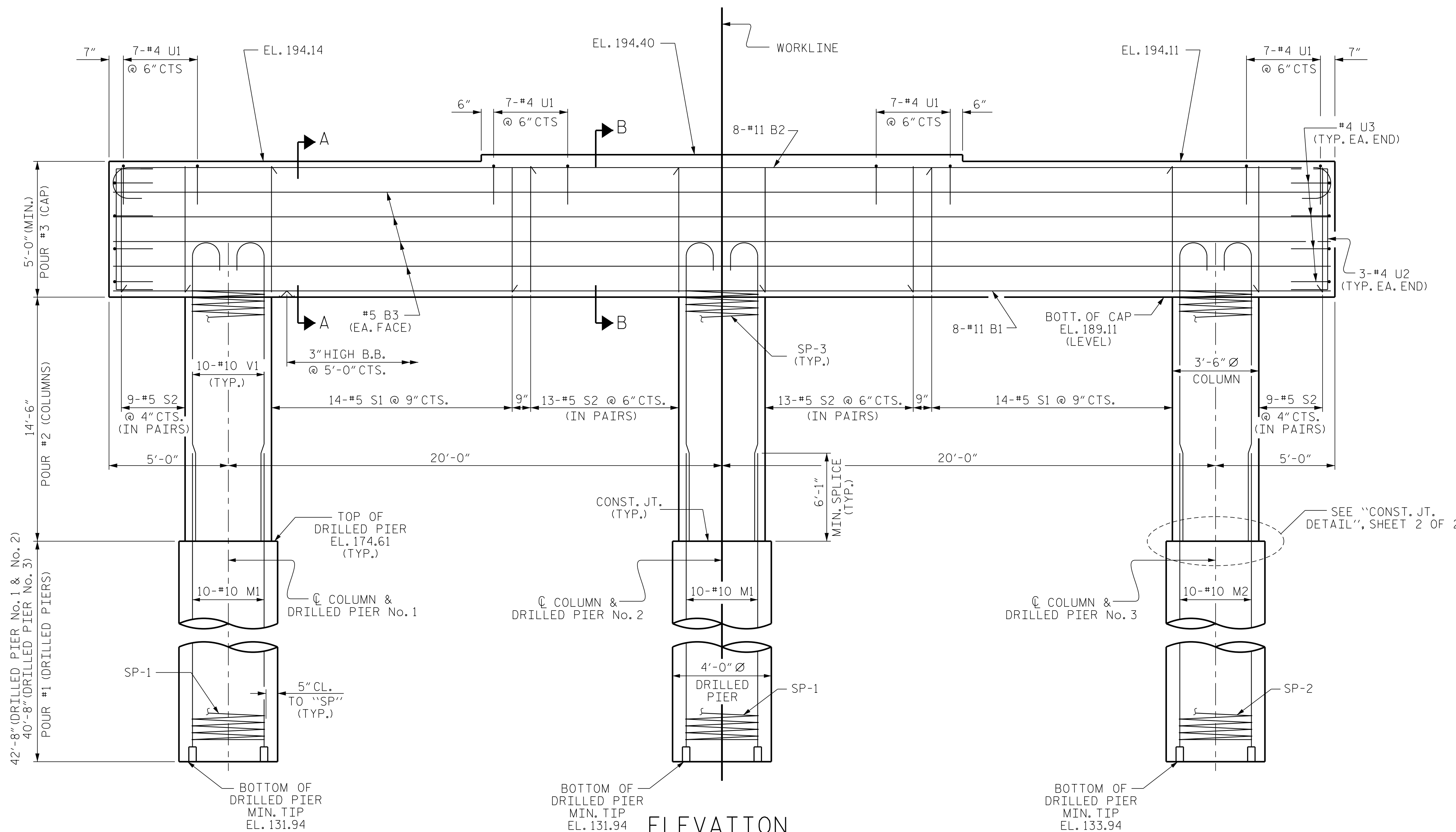
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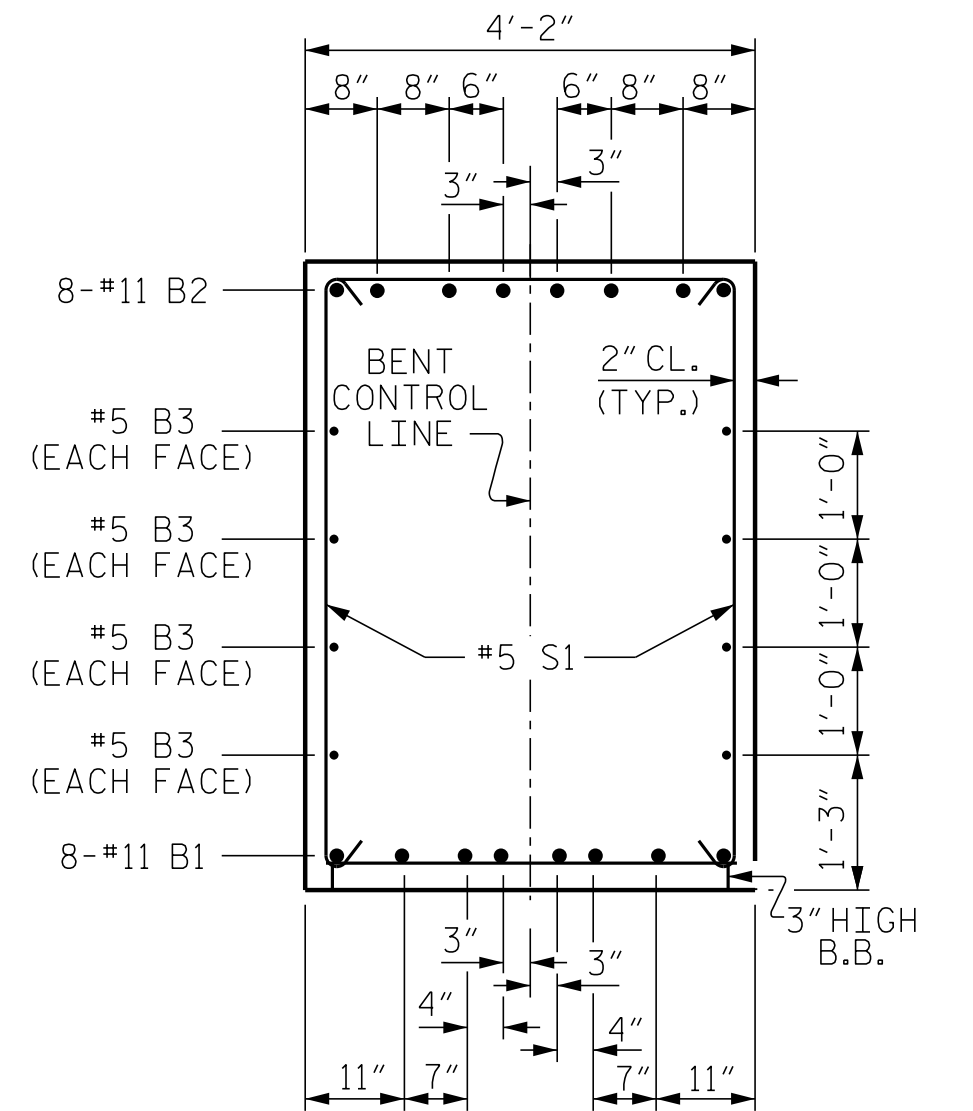
PLAN



SECTION B-B

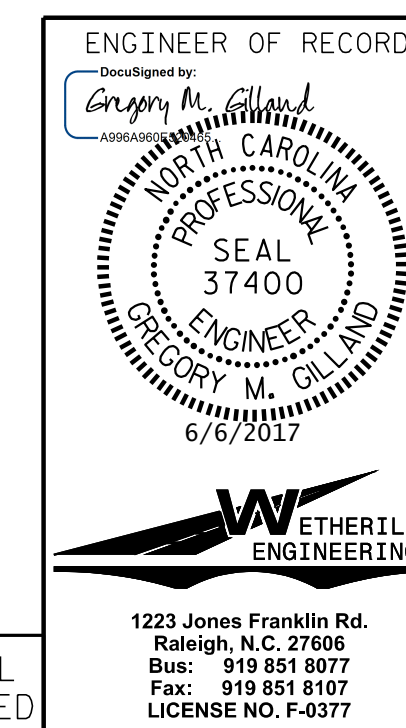


ELEVATION



SECTION A-A

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S01-24					TOTAL SHEETS 32

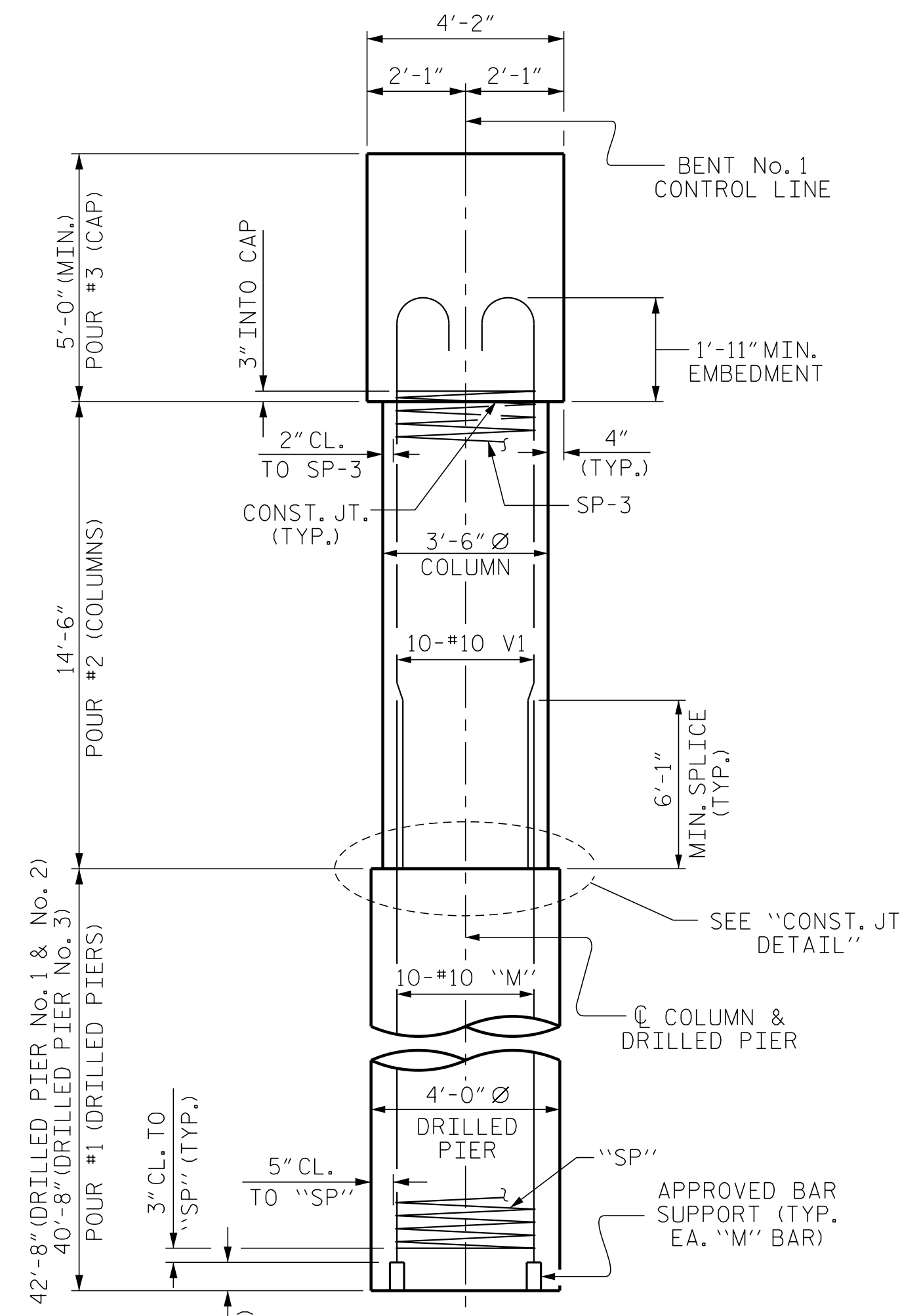
DRAWN BY: D. HODGE DATE: 5/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER EXCEPT AS NOTED.

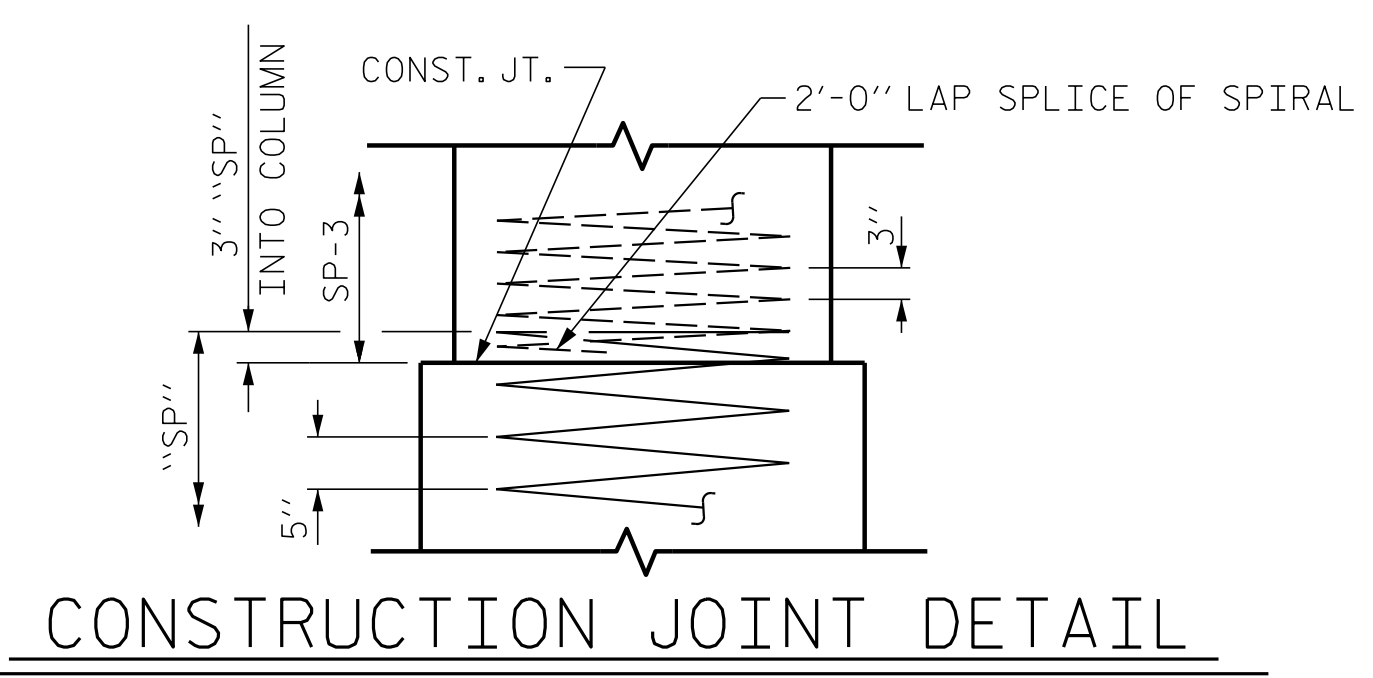
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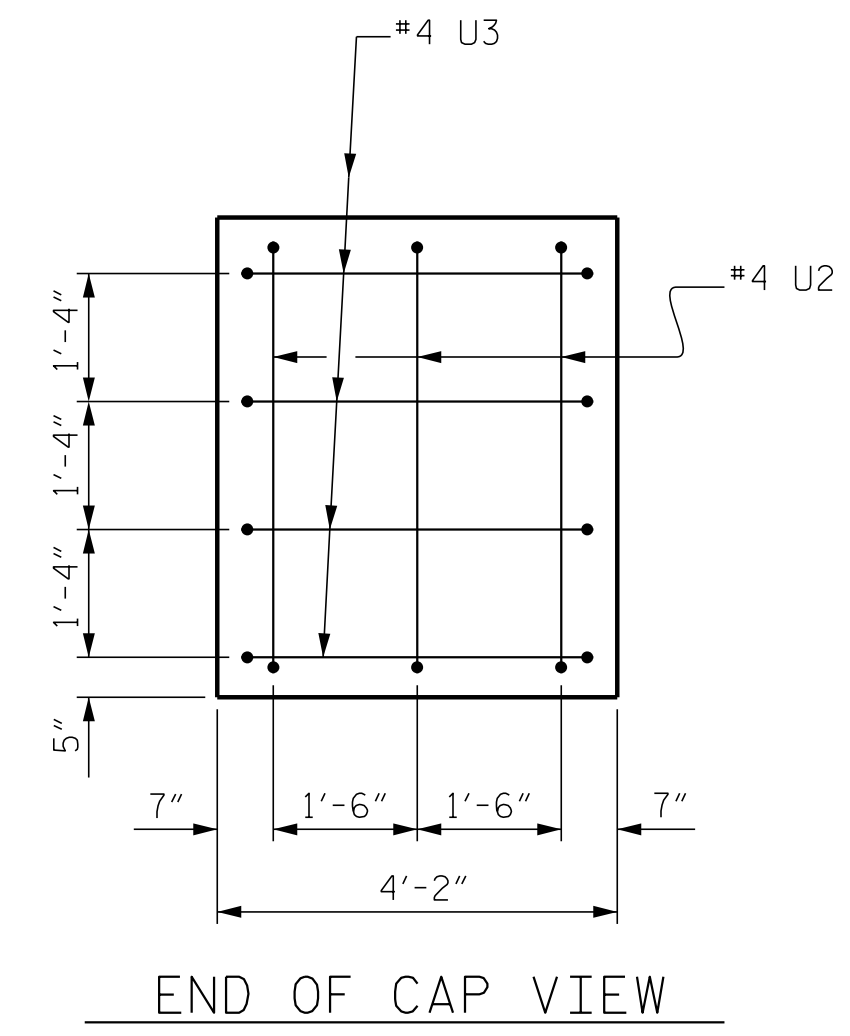




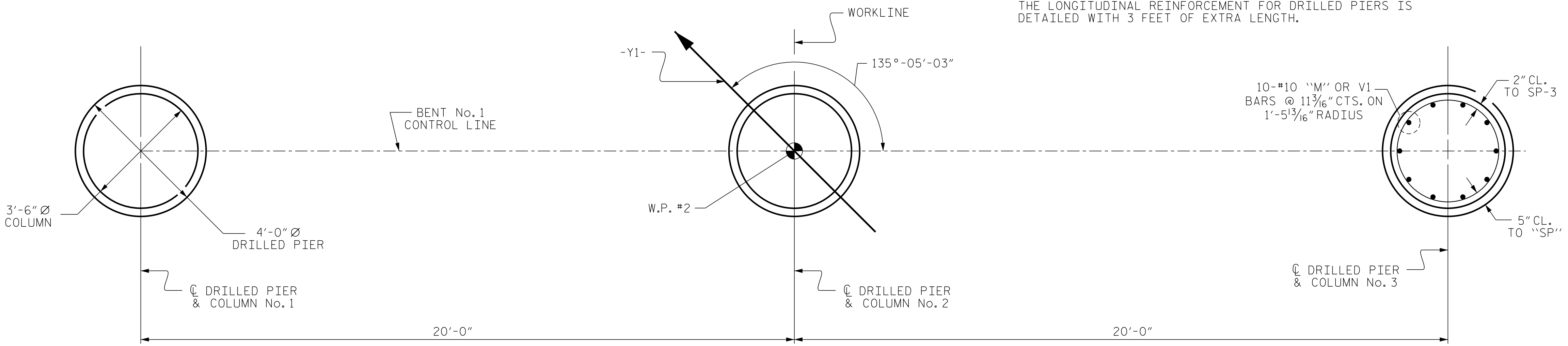
END ELEVATION



CONSTRUCTION JOINT DETAIL



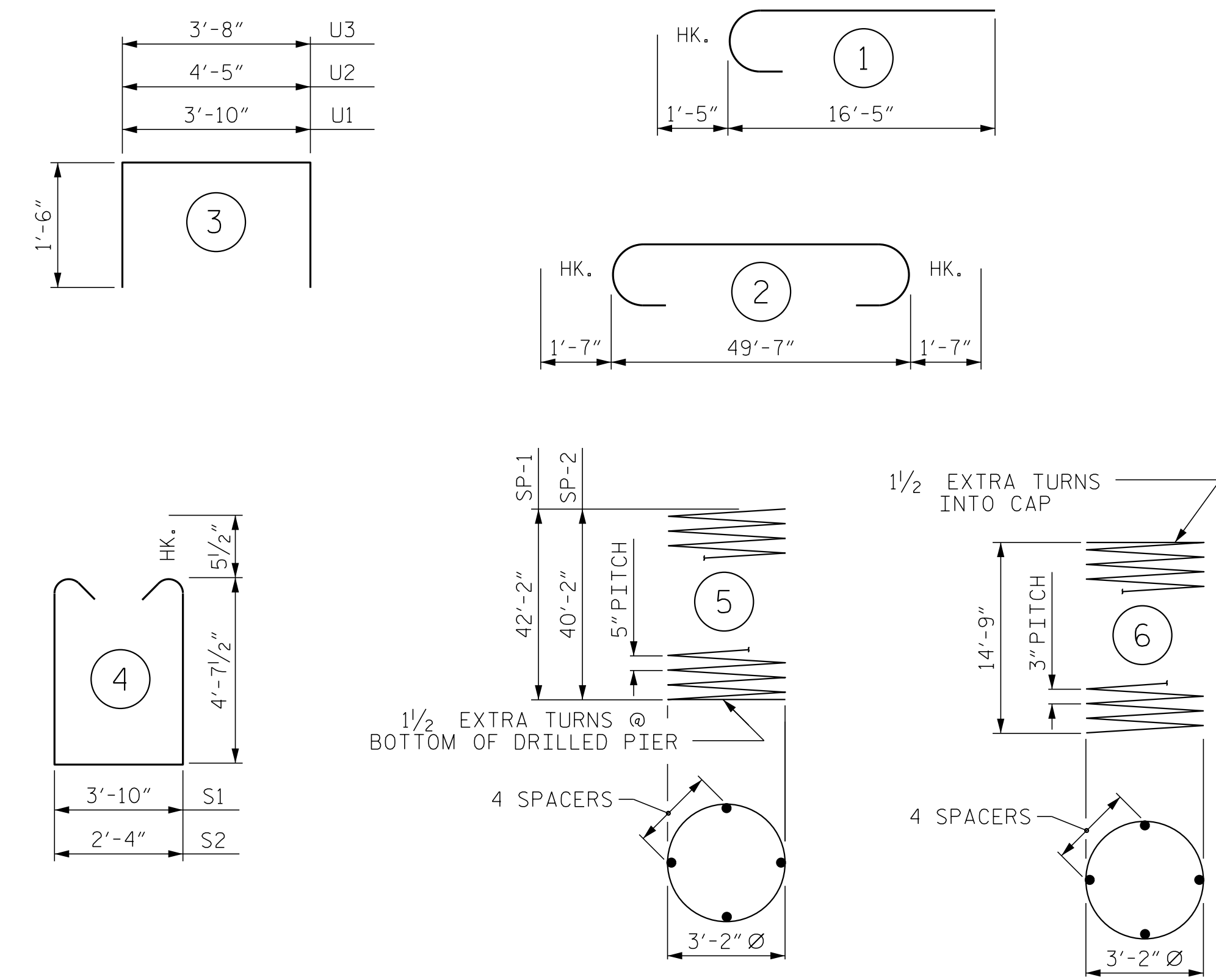
END OF CAP VIEW



PLAN OF DRILLED PIERS AND COLUMNS

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."  
 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 ONE FOOT BELOW THE GROUND LINE.  
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

BILL OF MATERIAL

BENT No. 1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	49'-8"	2111
B2	8	#11	2	52'-9"	2242
B3	8	#5	STR	49'-8"	414
M1	20	#10	STR	51'-3"	4411
M2	10	#10	STR	49'-3"	2119
S1	28	#5	4	14'-0"	409
S2	88	#5	4	12'-6"	1147
U1	28	#4	3	6'-10"	128
U2	6	#4	3	7'-5"	30
U3	8	#4	3	6'-8"	36
V1	30	#10	1	17'-10"	2302

REINFORCING STEEL 15,349 LBS.

SP-1	2	*	5	1006'-4"	2099
SP-2	1	*	5	959'-10"	1001
SP-3	3	**	6	594'-2"	1191

SPIRAL COLUMN REINFORCING STEEL 4,291 LBS.

\* THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 \*\* THE SP-3 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)	15.5 C.Y.
POUR #3 (CAP)	39.5 C.Y.

TOTAL CLASS A CONCRETE 55.0 C.Y.

DRILLED PIERS:

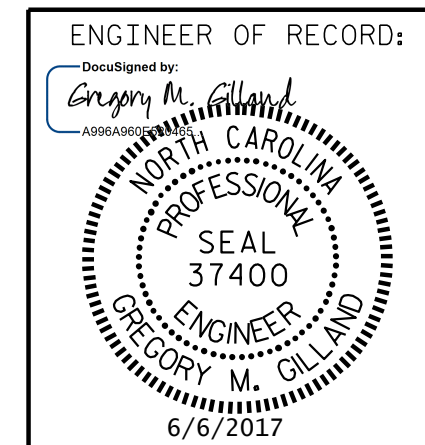
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	58.6 C.Y.
4'-0" Ø DRILLED PIER IN SOIL	105.00 LIN. FT.
4'-0" Ø DRILLED PIER NOT IN SOIL	21.00 LIN. FT.
CSL TUBES	522 LIN. FT.
CSL TESTING	1 EA.
SID INSPECTIONS	1 EA.
SPT TESTING	1 EA.

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 17+77.11 -Y1-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

REVISIONS

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

SHEET NO. S01-25

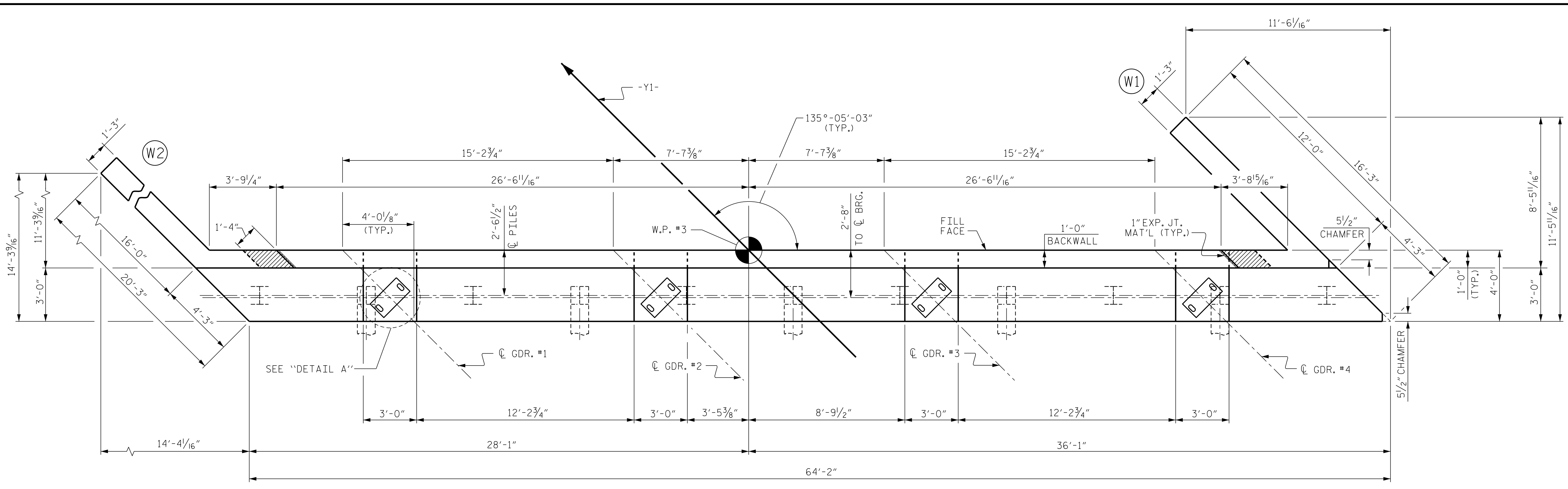
TOTAL SHEETS 32

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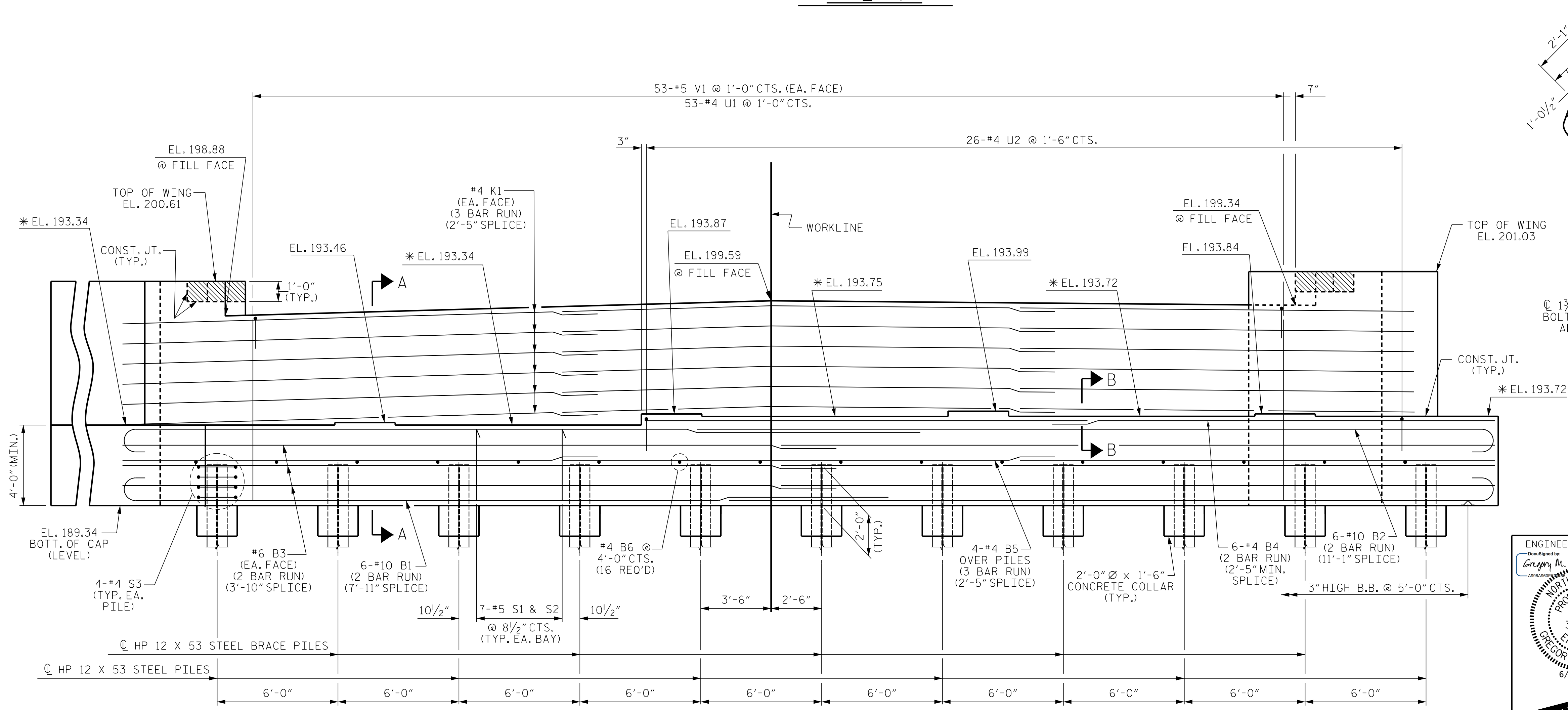
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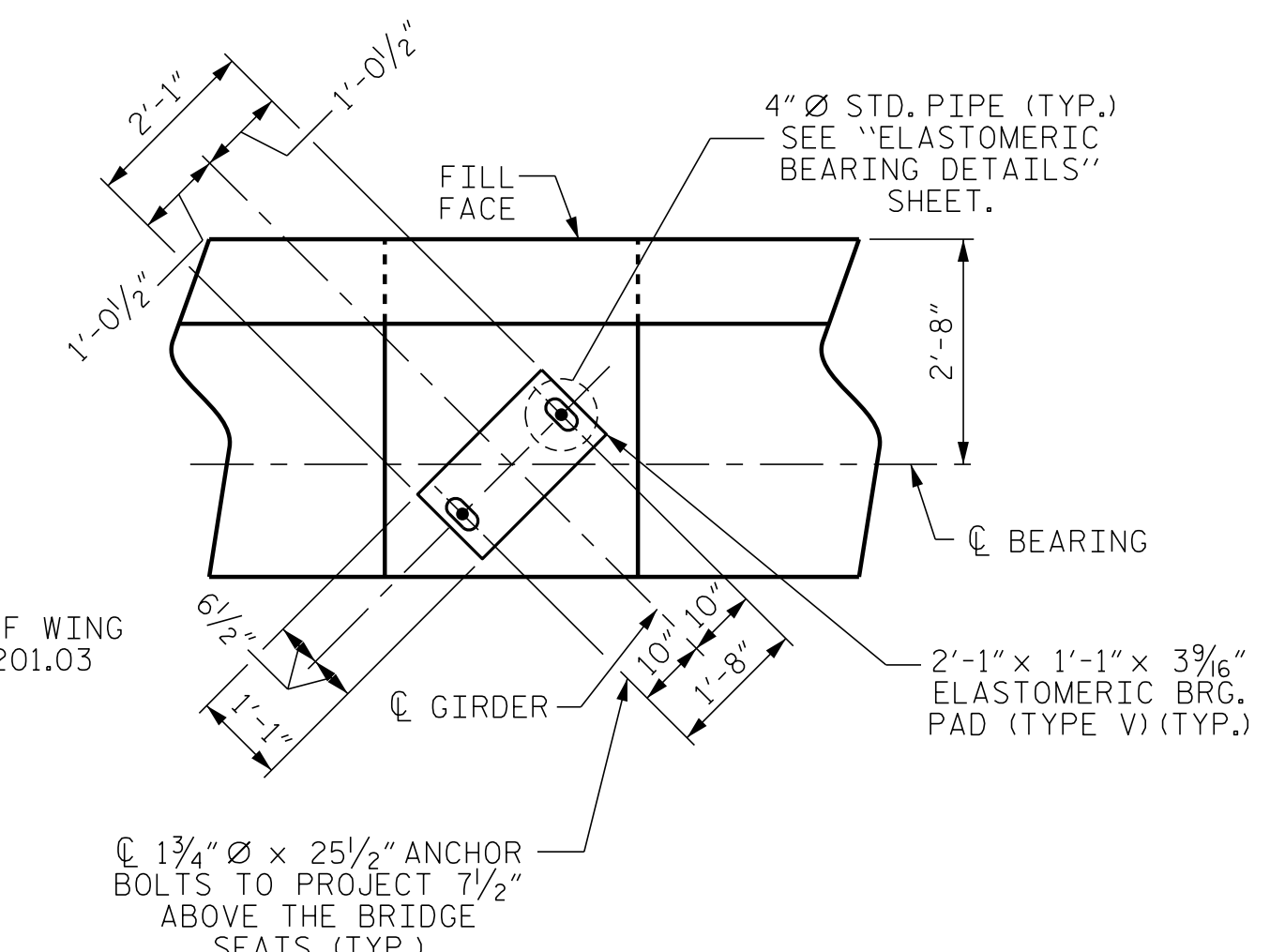




PLAN



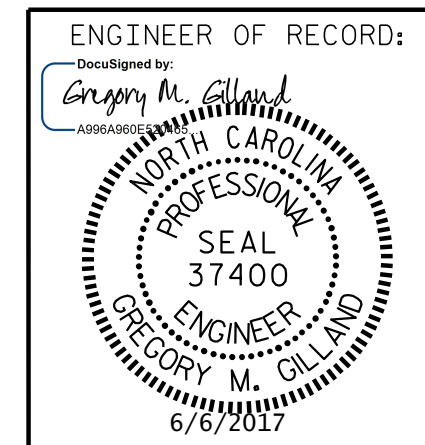
ELEVATION



DETAIL "A"  
(TYP. EA. GIRDER)

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

SHEET 1 OF 3



1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

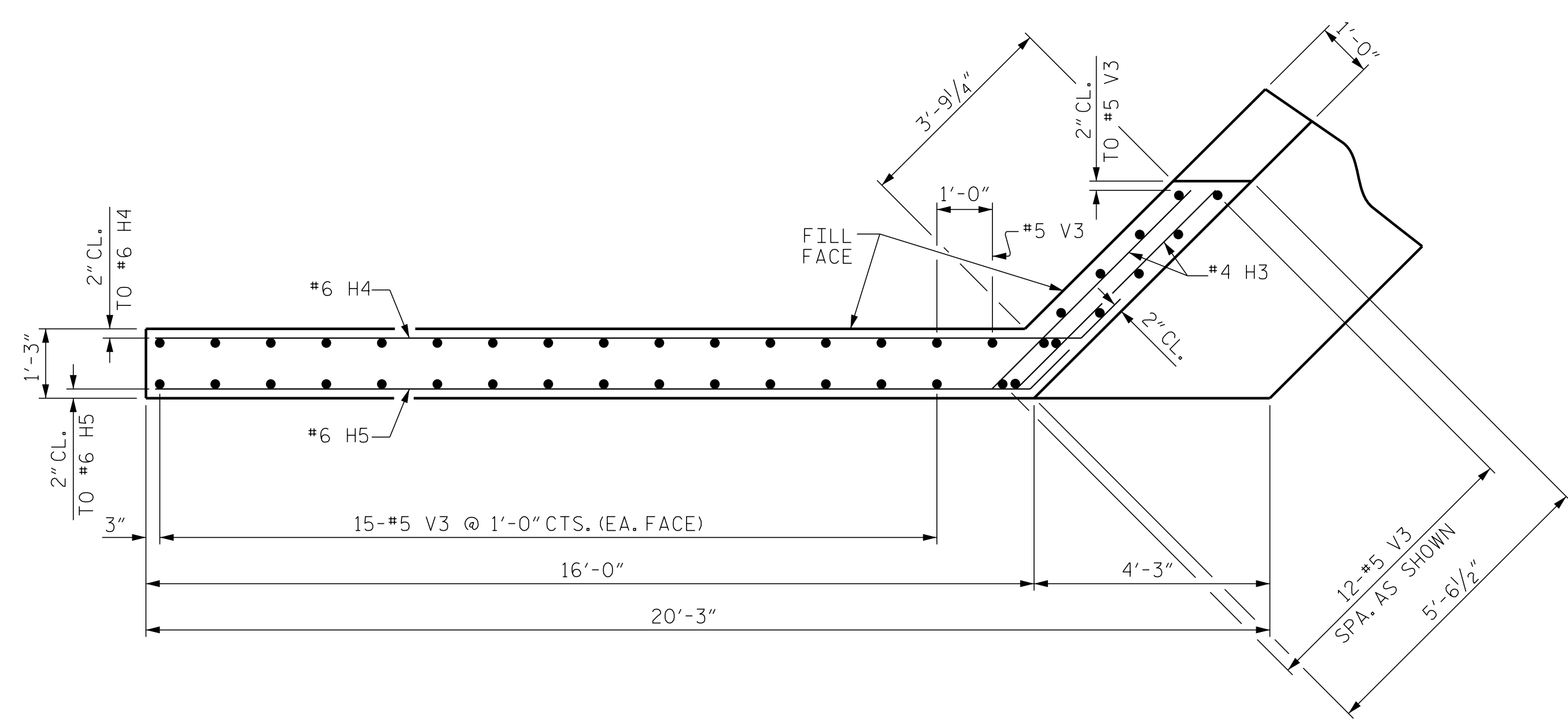
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S01-26					TOTAL SHEETS 32

\* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS. SEE SECTION A-A, SHEET 3 OF 3.

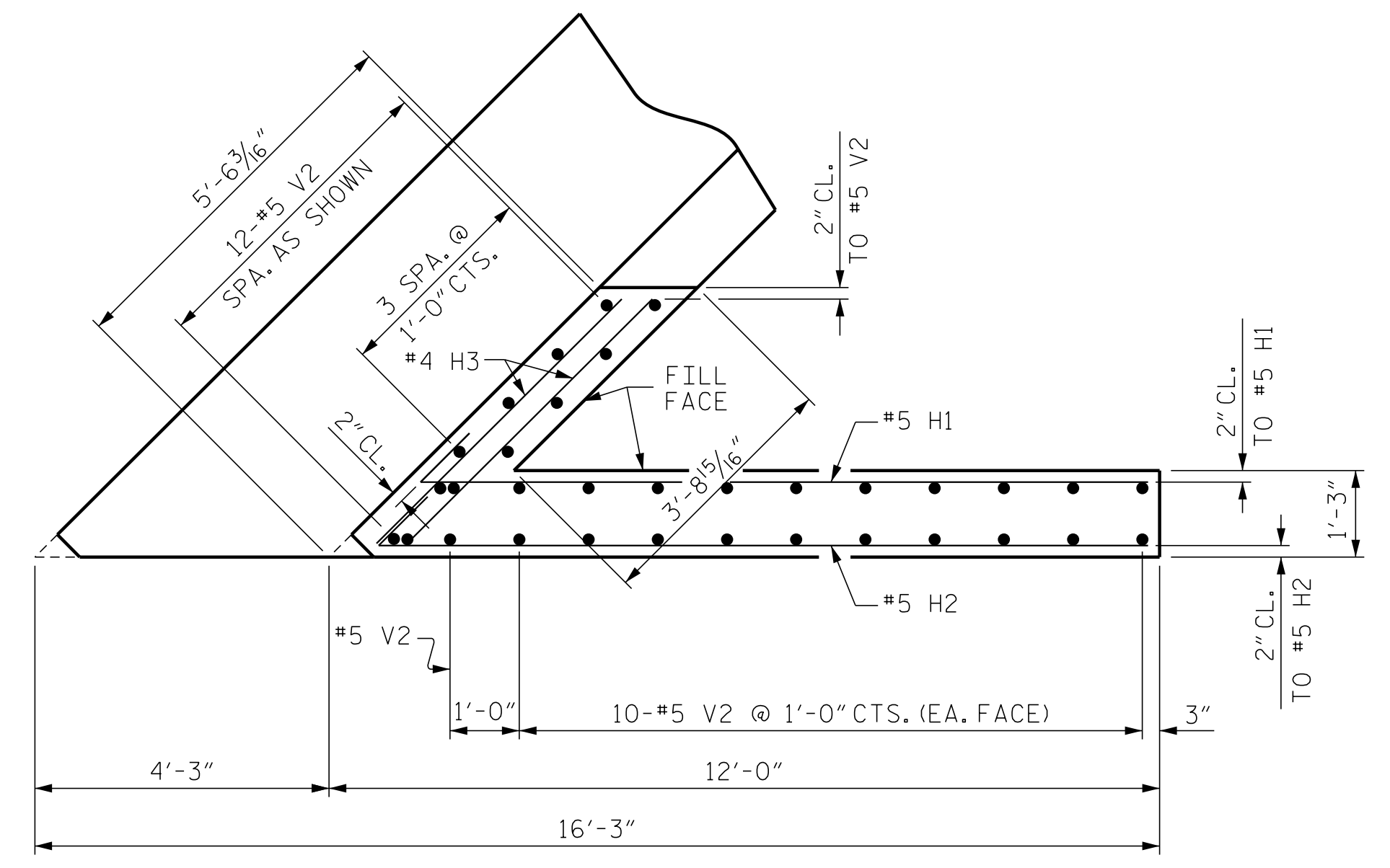
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 CHECKED BY: B.C. HUNT DATE: 5/17

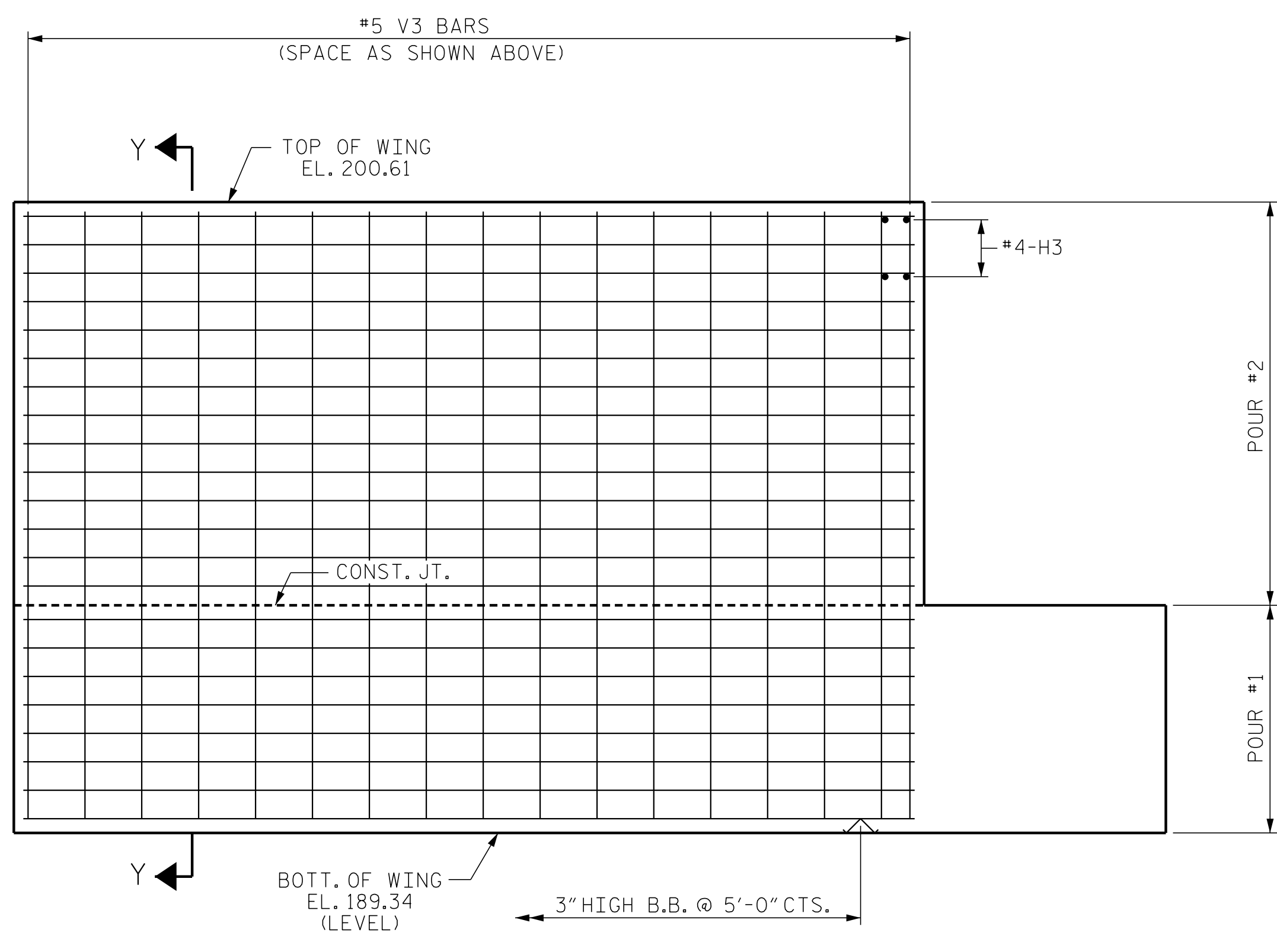
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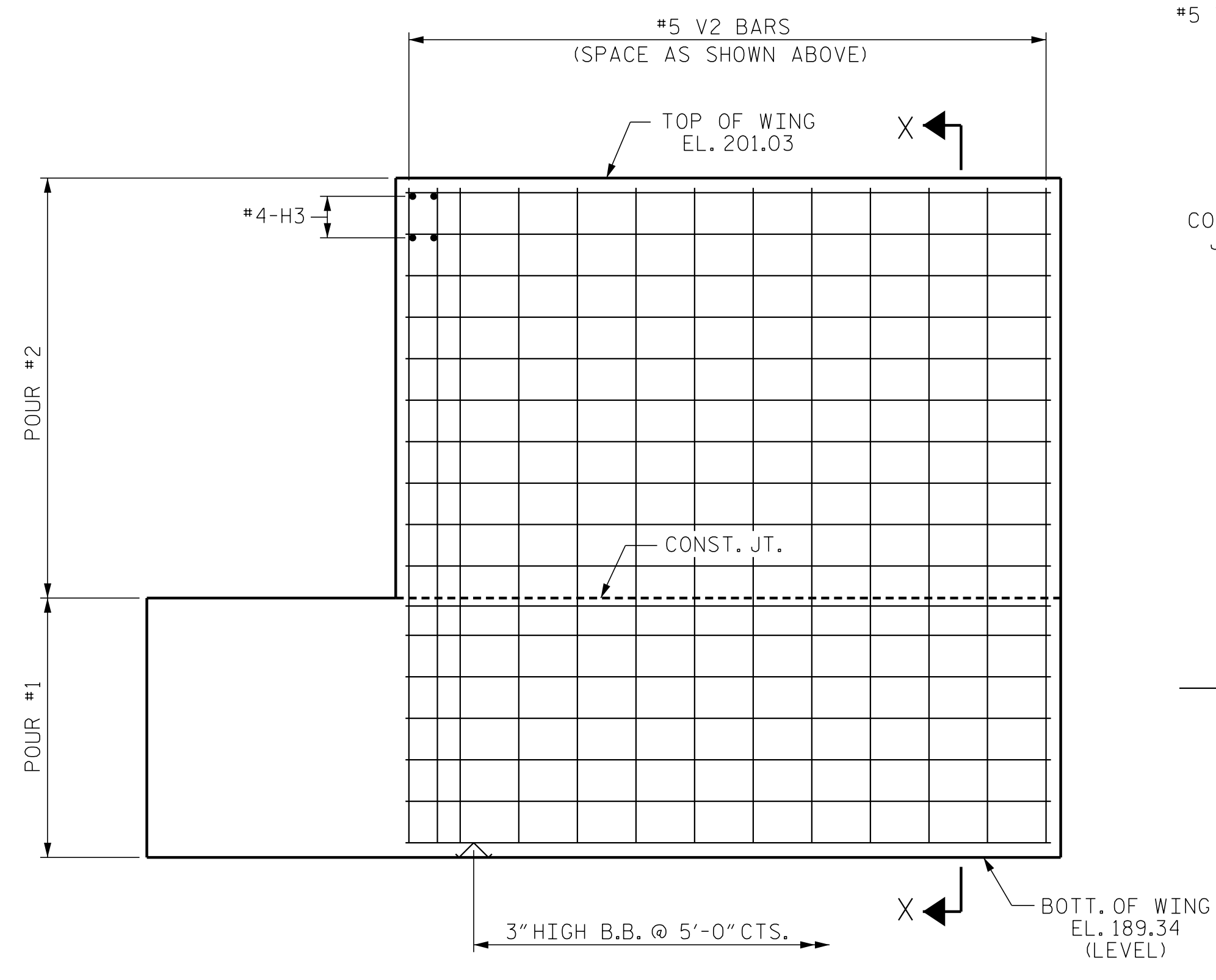
PLAN OF WING - (W2)



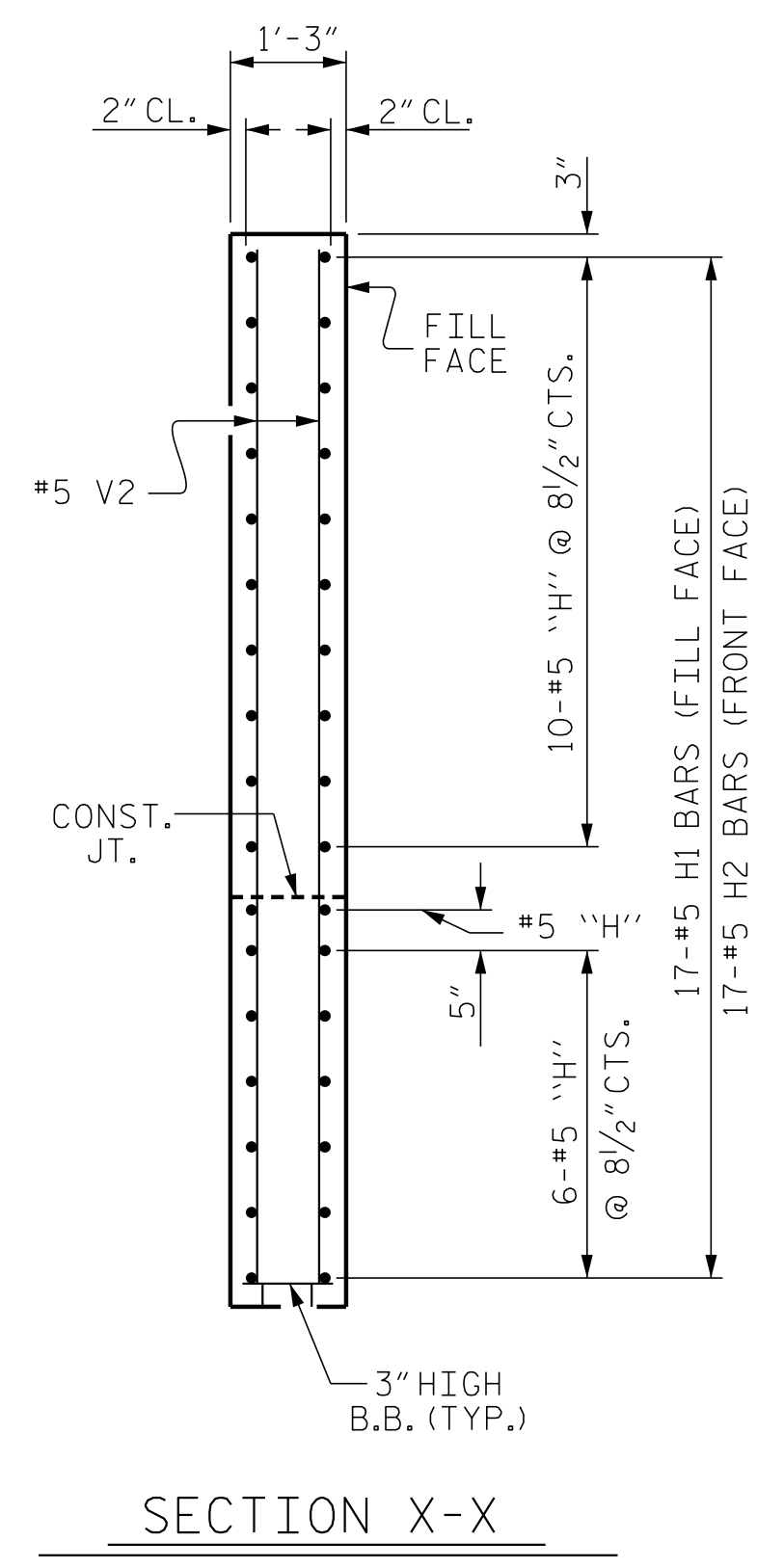
PLAN OF WING - (W1)



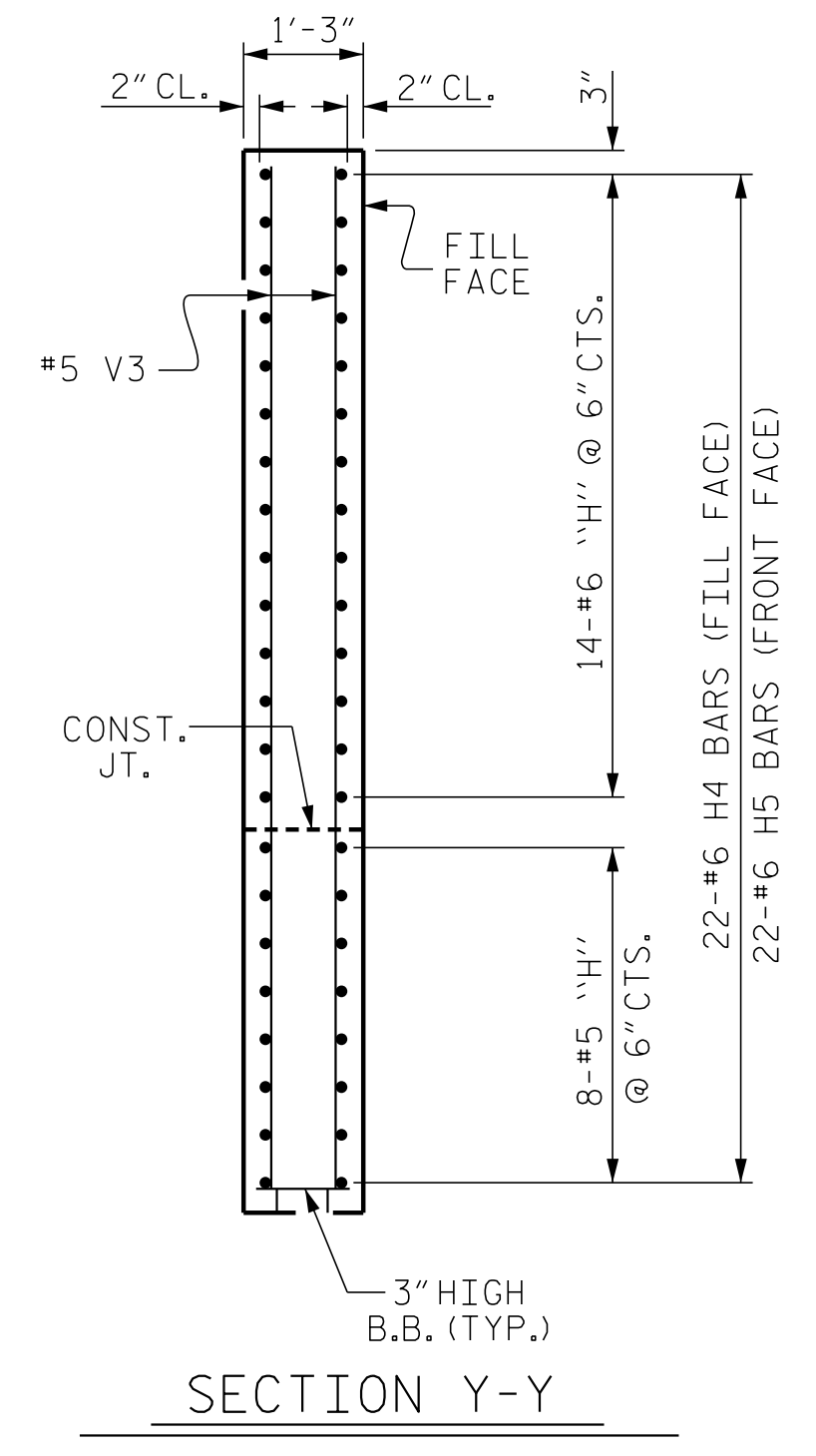
ELEVATION OF WING - (W2)



ELEVATION OF WING - (W1)

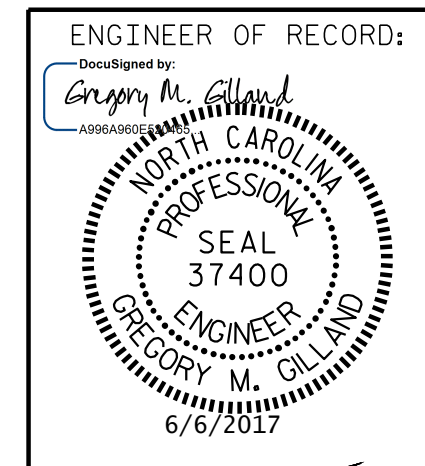


SECTION X-X



SECTION Y-Y

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 3



ETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
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 Fax: 919 851 8107  
 LICENSE NO. F-0377

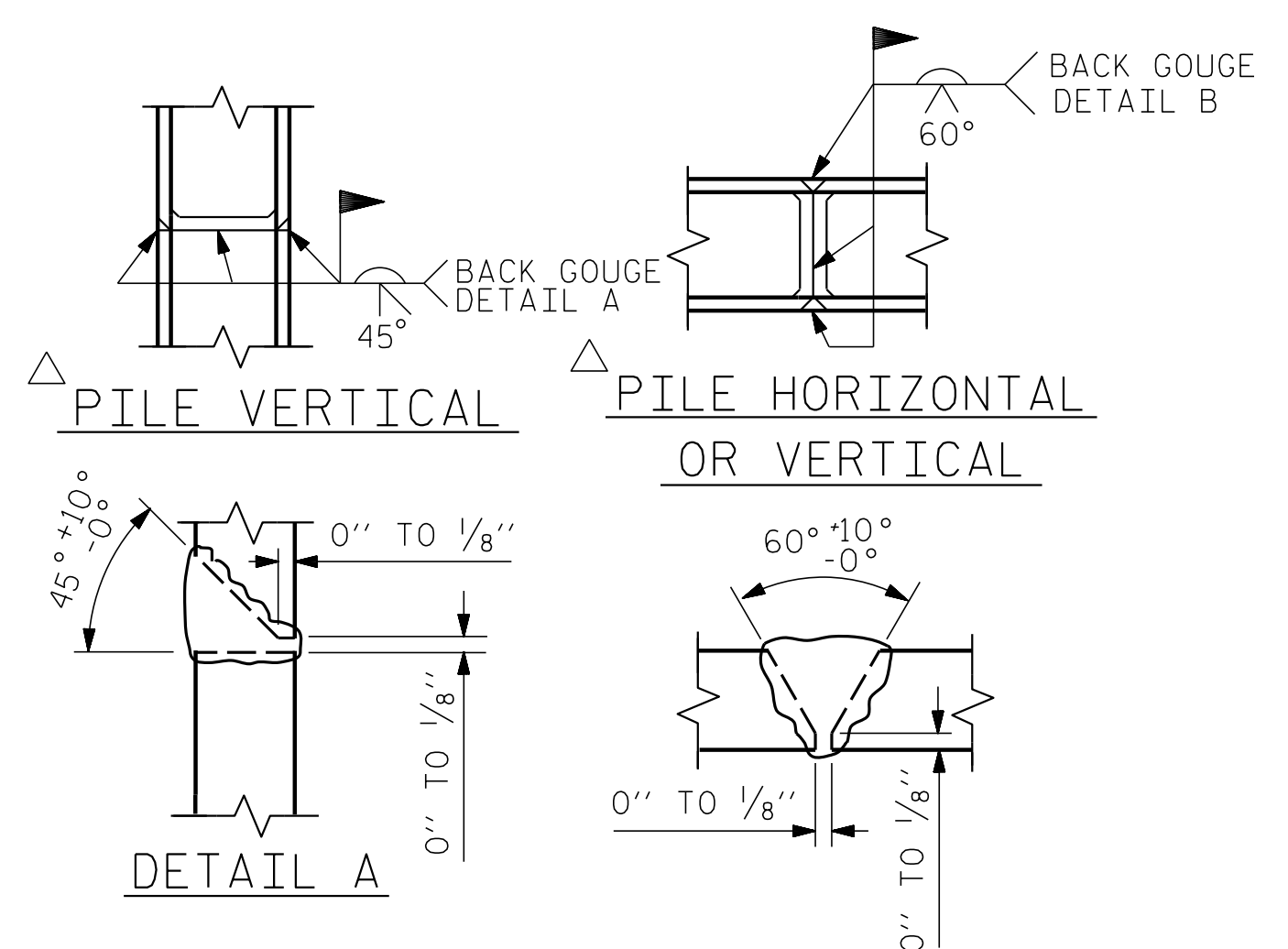
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S01-27					TOTAL SHEETS 32

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 CHECKED BY: B.C. HUNT DATE: 5/17

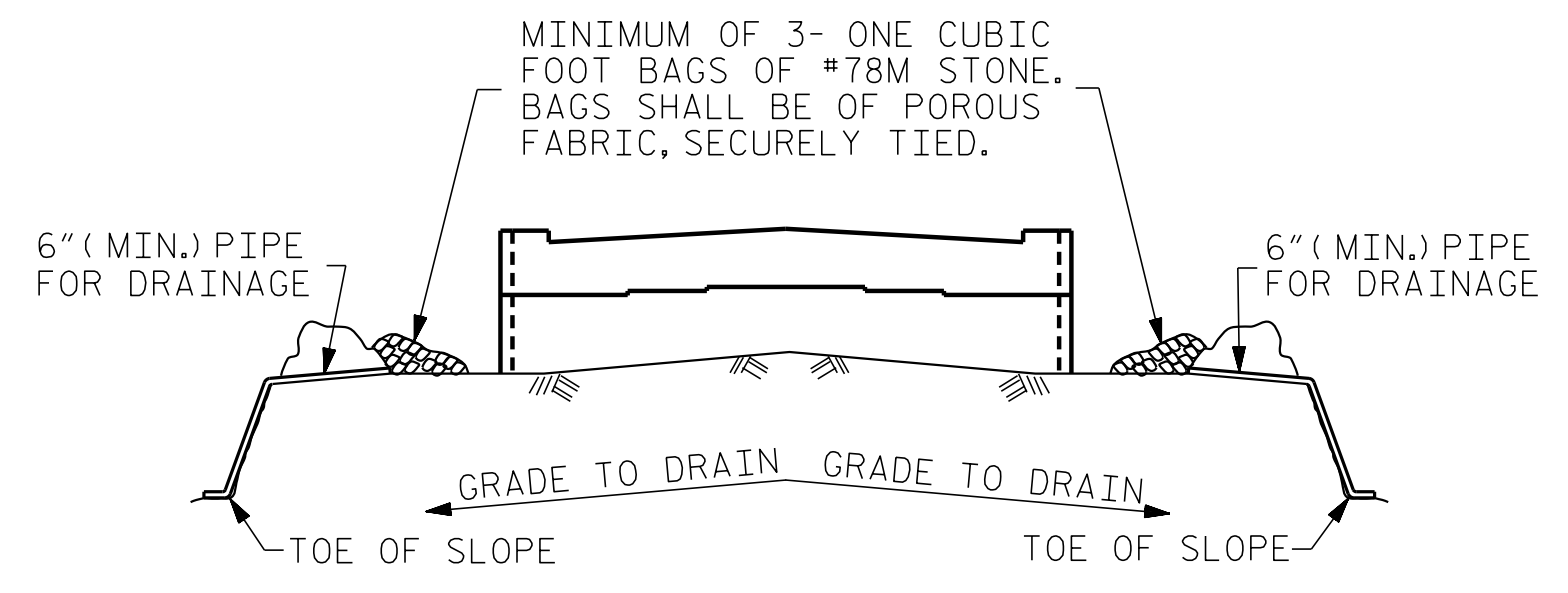
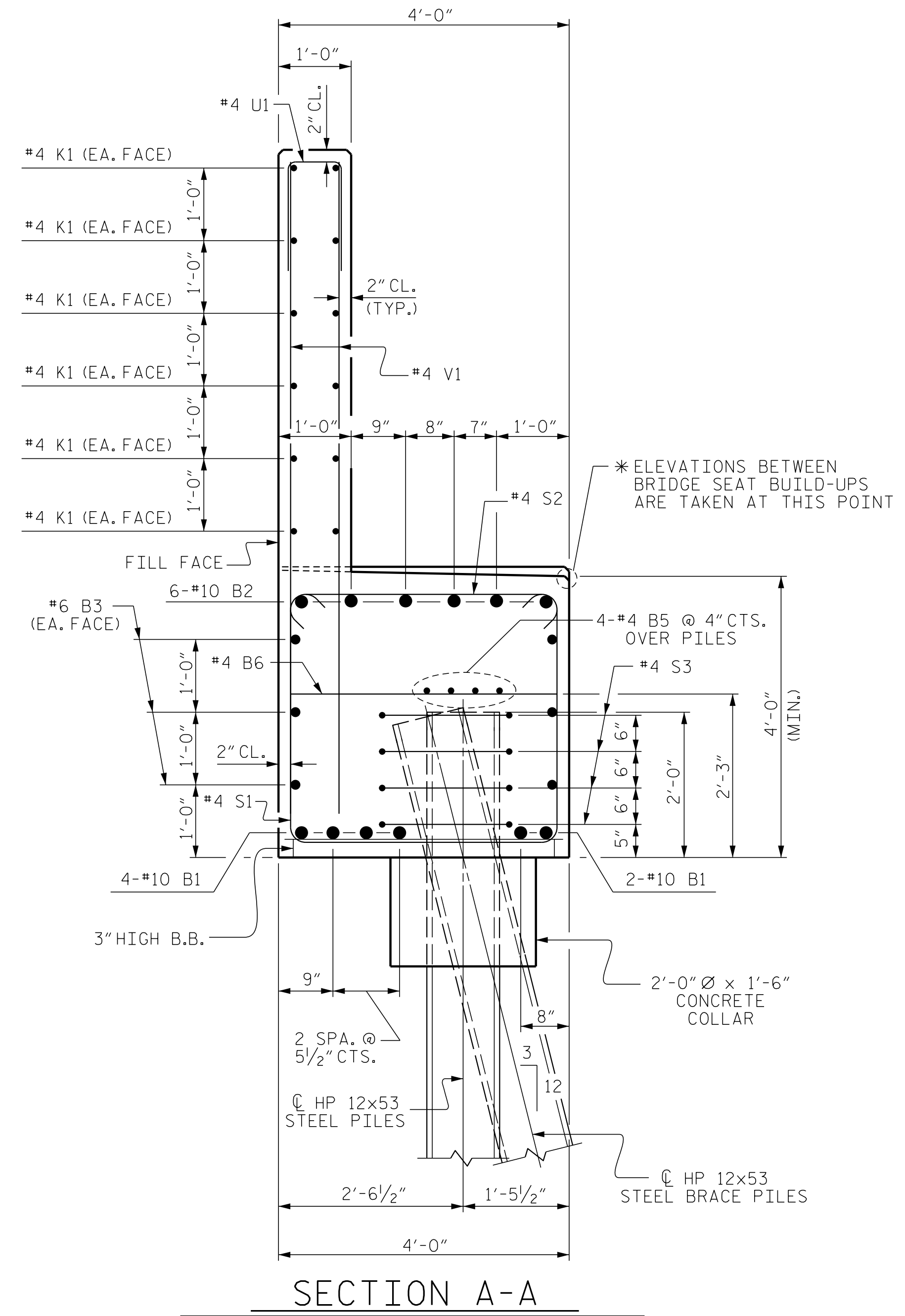
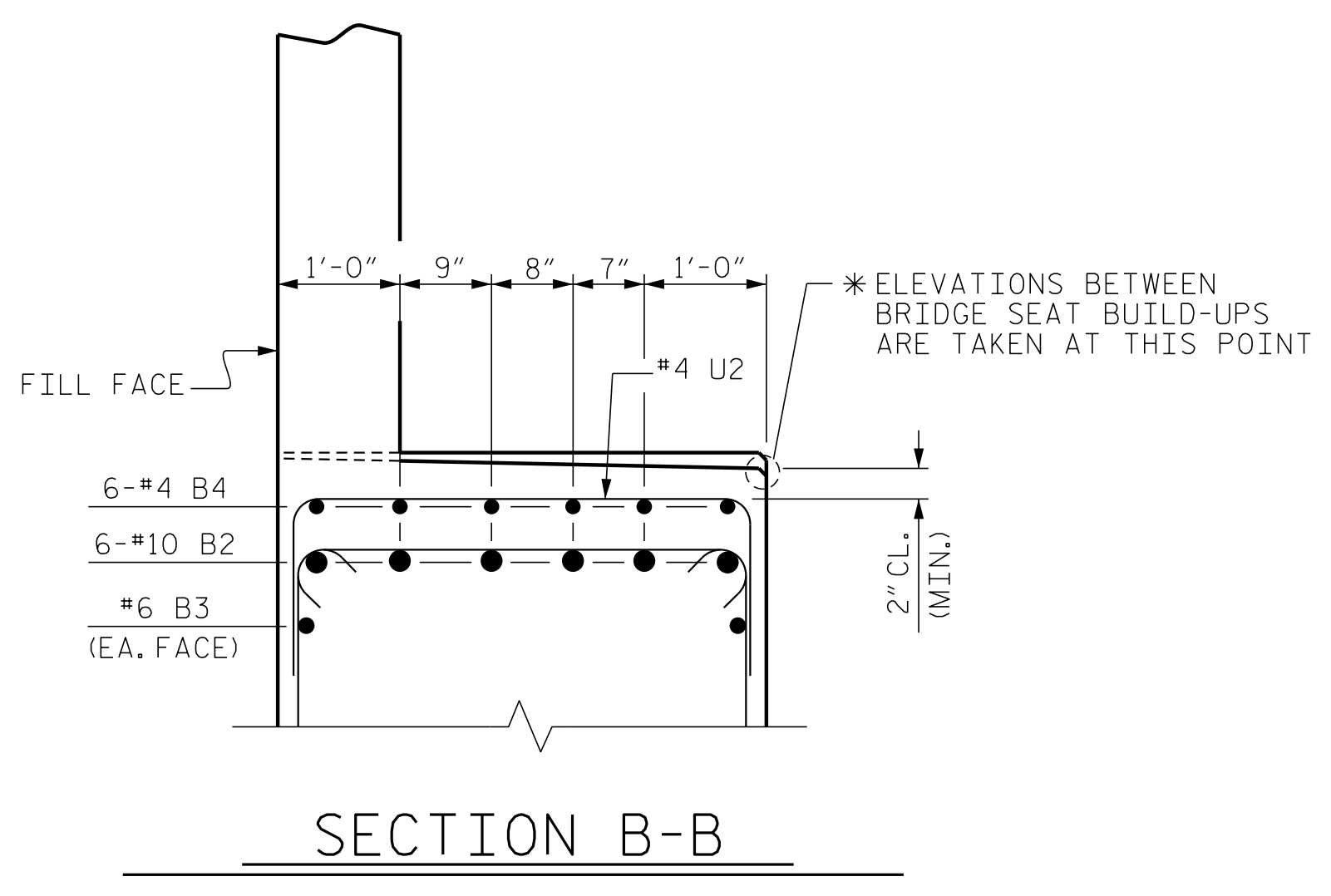
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POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**



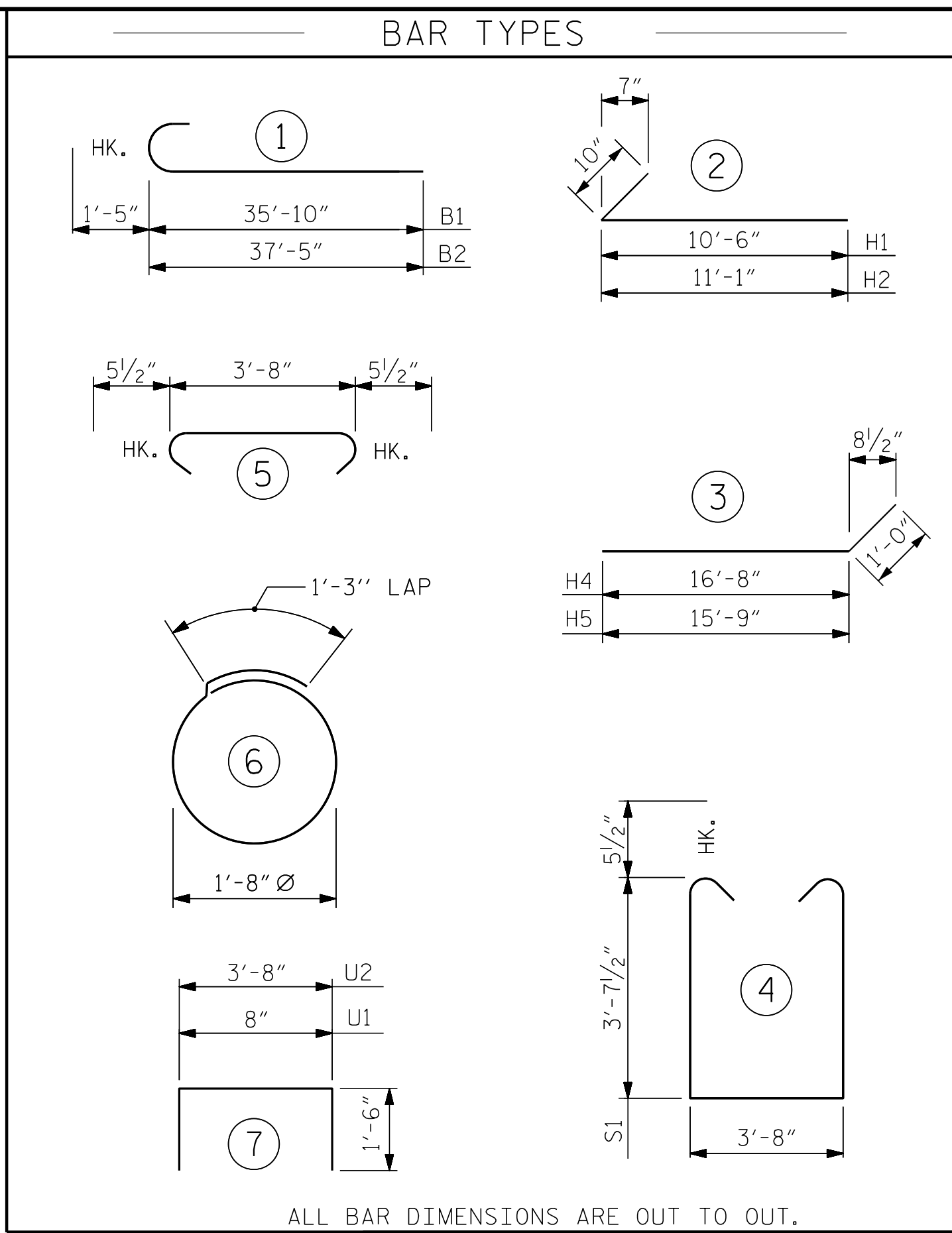
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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**



**BILL OF MATERIAL**

**END BENT No. 2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	37'-3"	1923
B2	12	#10	1	38'-10"	2005
B3	12	#6	STR	33'-10"	610
B4	12	#4	STR	22'-1"	177
B5	12	#4	STR	22'-11"	184
B6	16	#4	STR	3'-8"	39
H1	17	#5	2	11'-4"	201
H2	17	#5	2	11'-11"	211
H3	8	#4	STR	4'-10"	26
H4	22	#6	3	17'-8"	584
H5	22	#6	3	16'-9"	553
K1	36	#4	STR	22'-10"	549
S1	70	#5	4	11'-10"	864
S2	70	#5	5	4'-7"	335
S3	44	#4	6	6'-6"	191
U1	53	#4	7	3'-8"	130
U2	26	#4	7	6'-8"	116
V1	106	#5	STR	9'-1"	1004
V2	33	#5	STR	11'-3"	387
V3	43	#5	STR	10'-10"	486

REINFORCING STEEL 10,575 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, CONC. COLLARS & LOWER PART OF WINGS	47.6 C.Y.
POUR #2	BACKWALL AND UPPER PART OF WINGS	22.7 C.Y.
TOTAL CLASS A CONCRETE		70.3 C.Y.
HP 12 X 53 STEEL PILES		
NO: 11		575 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES		11 EA.
PILE REDRIVES		6 EA.

**NOTES**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

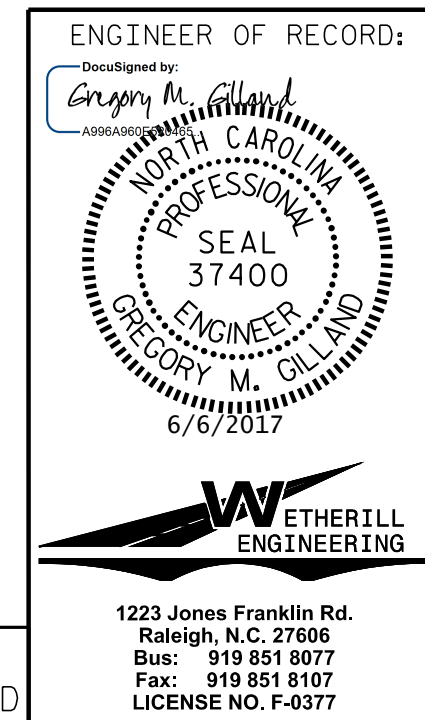
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT No. 2**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-28	
1			3			TOTAL SHEETS	
2			4			32	

DRAWN BY: D. HODGE DATE: 5/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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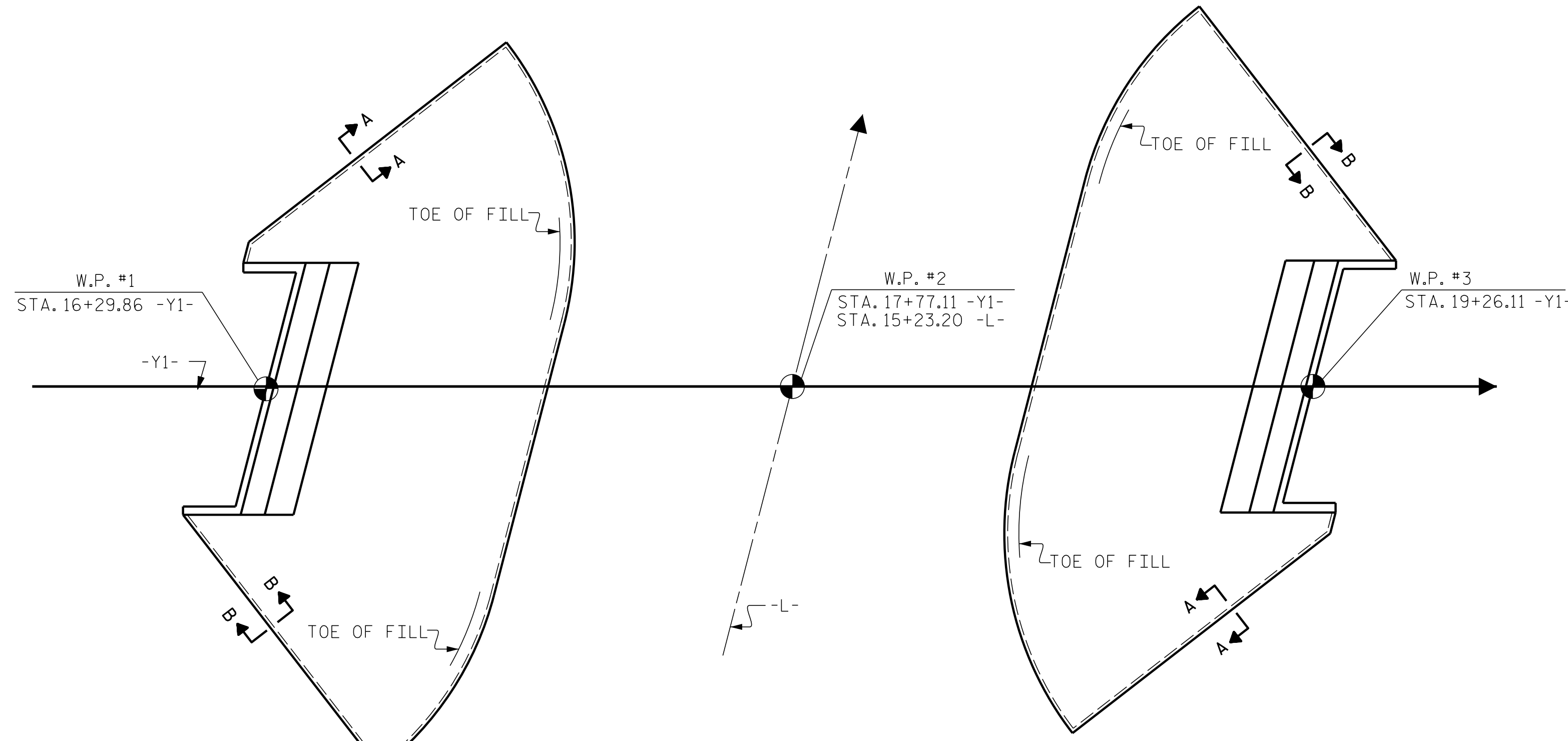


**GENERAL NOTES**

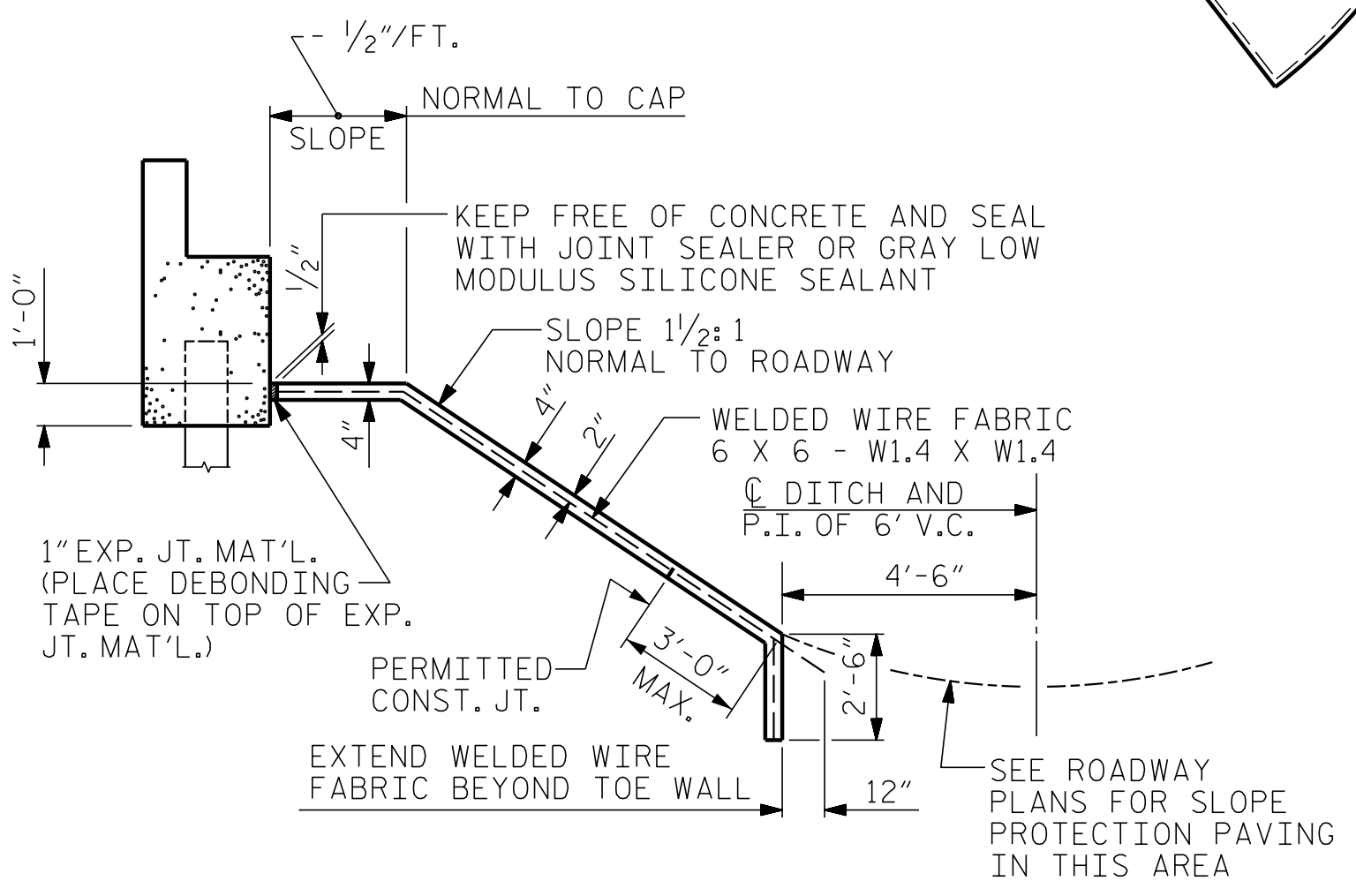
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE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

BRIDGE @ STA. 17+77.11 -Y1-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	330	830
END BENT 2	395	905

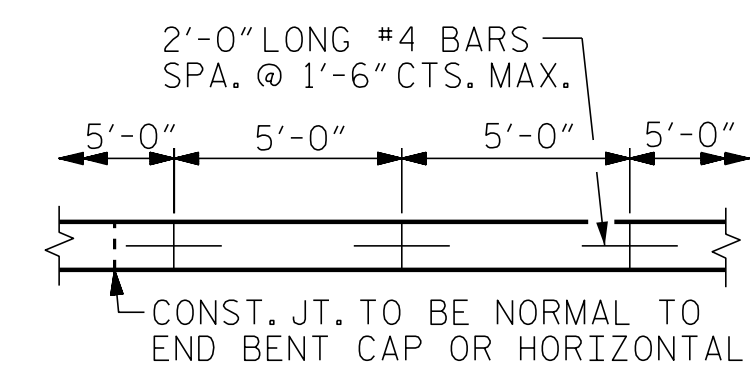
\* QUANTITY SHOWN IS BASED ON 5' POURS.



**PLAN**

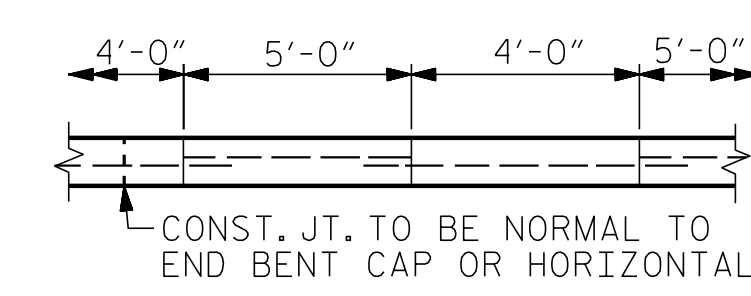


**SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH**



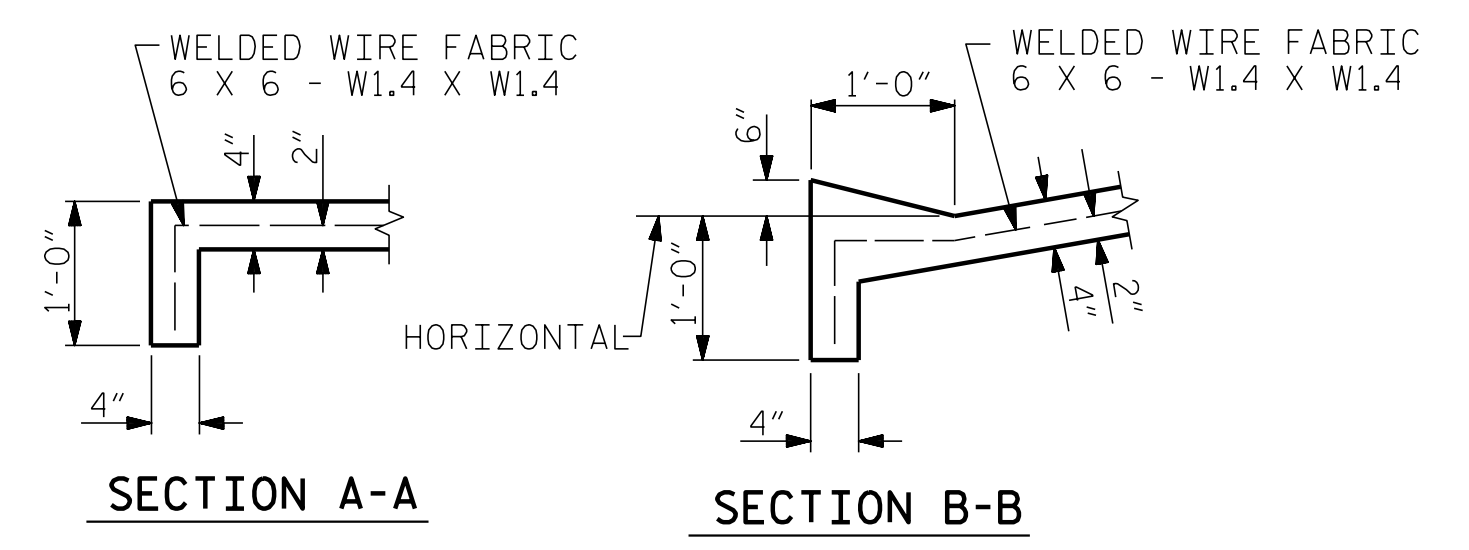
STRIP WIDTHS MAY VARY IN CURVED PORTION.

**POURING DETAIL**



POUR A 4'-0" STRIP FIRST, STRIP WIDTHS MAY VARY IN CURVED PORTION.

**OPTIONAL POURING DETAIL**



**SECTION A-A**

**SECTION B-B**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-

SHEET 1 OF 2

ENGINEER OF RECORD:  
 Designed by: Gregory M. Gilland  
 PROFESSIONAL SEAL  
 37400  
 ENGINEER  
 GREGORY M. GILLAND  
 6/6/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

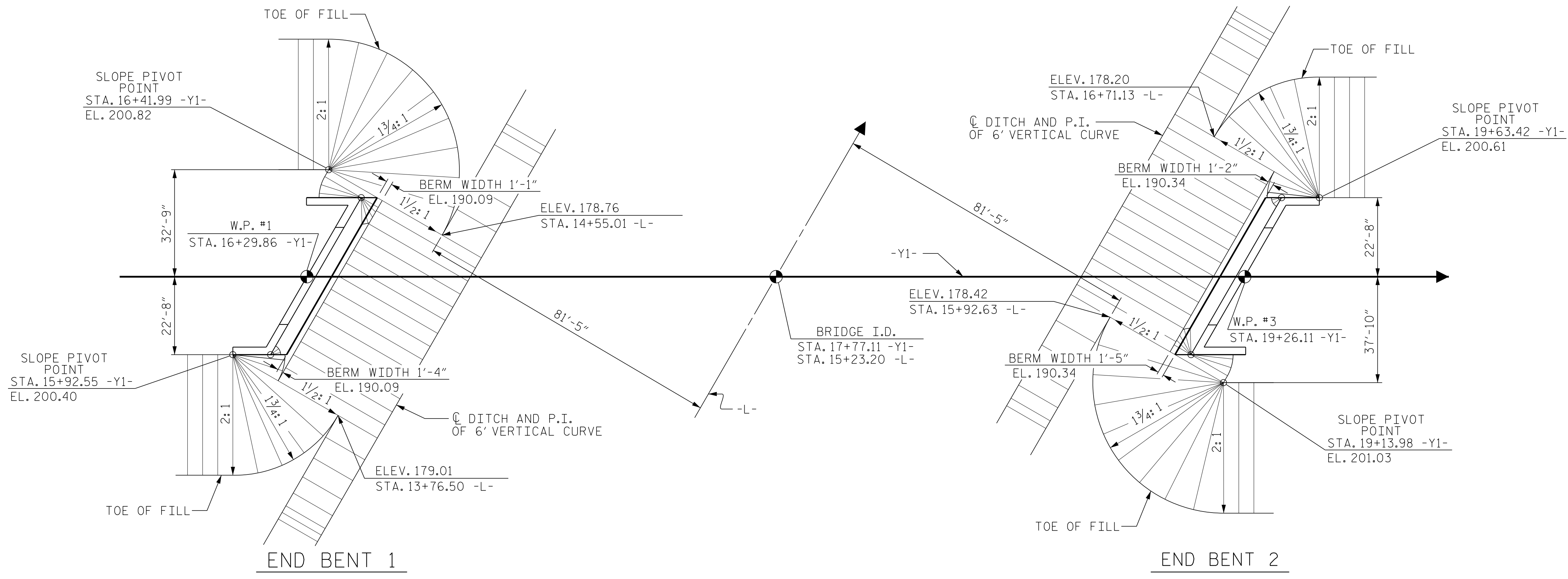
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SLOPE PROTECTION DETAILS**

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NO.	BY:	DATE:	NO.	BY:	DATE:	S01-29
1			3			TOTAL SHEETS
2			4			32

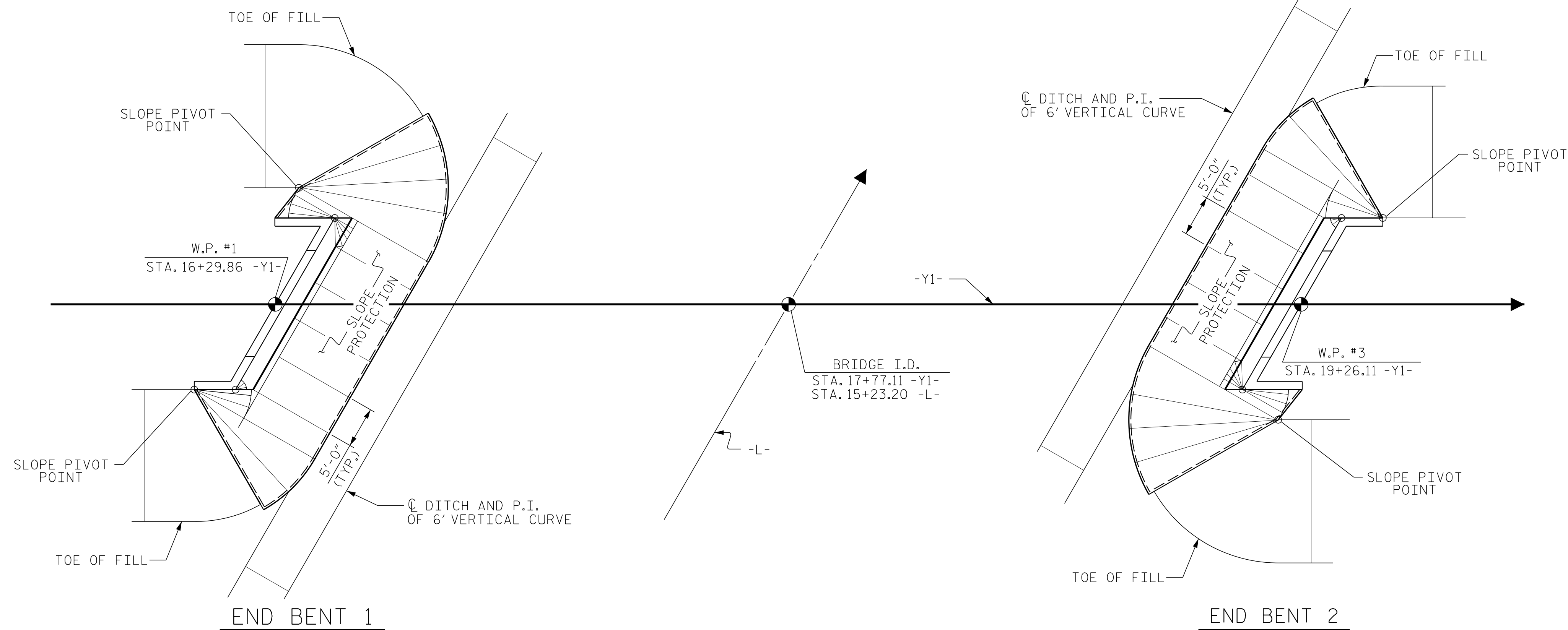
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 CHECKED BY: G.M. GILLAND DATE: 5-17



**PLAN - GRADING**



**PLAN - CONCRETE PLACEMENT**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 2 OF 2



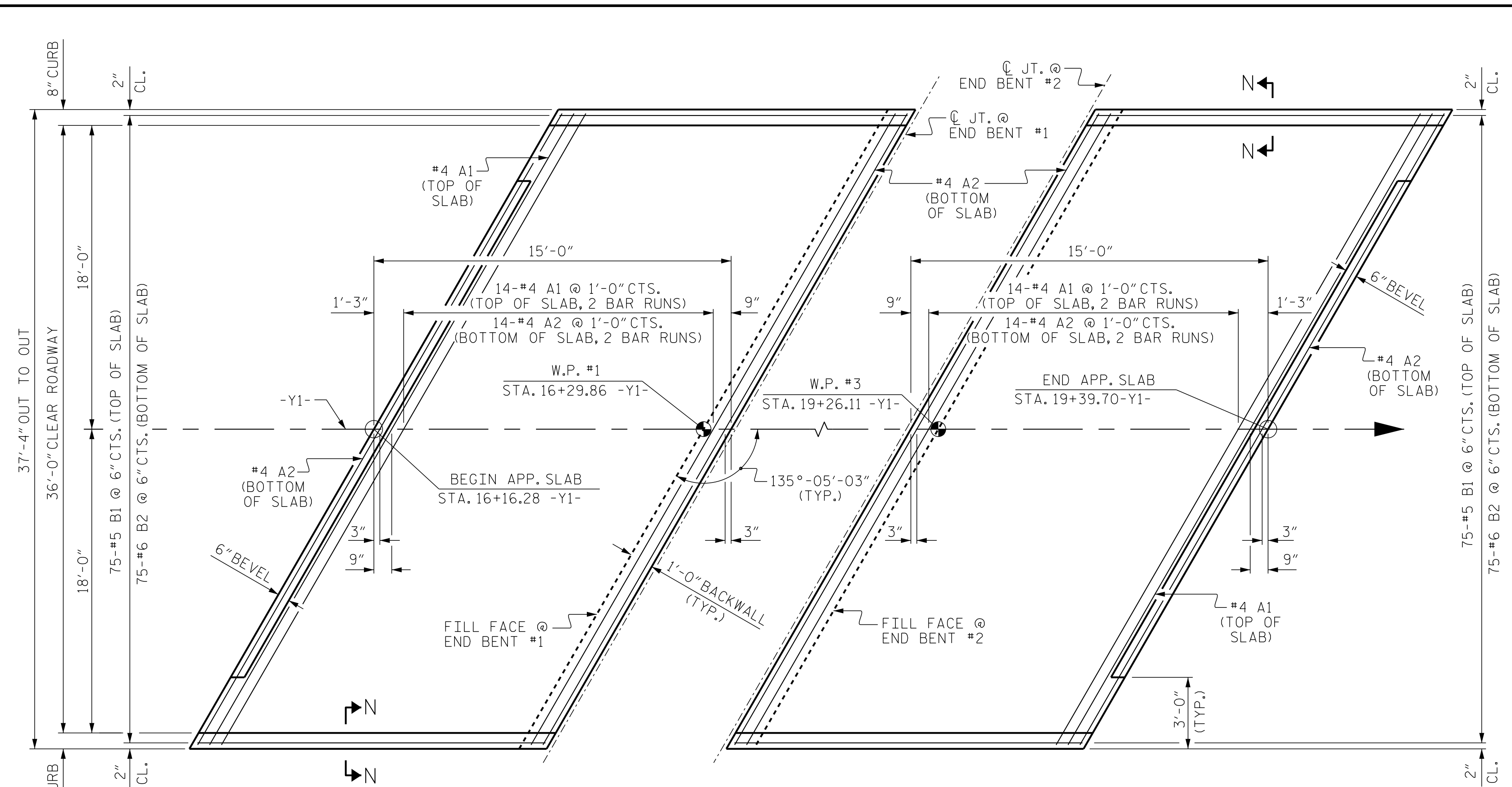
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<b>SLOPE PROTECTION DETAILS</b>					
REVISIONS					
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2			4		
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					TOTAL SHEETS 32

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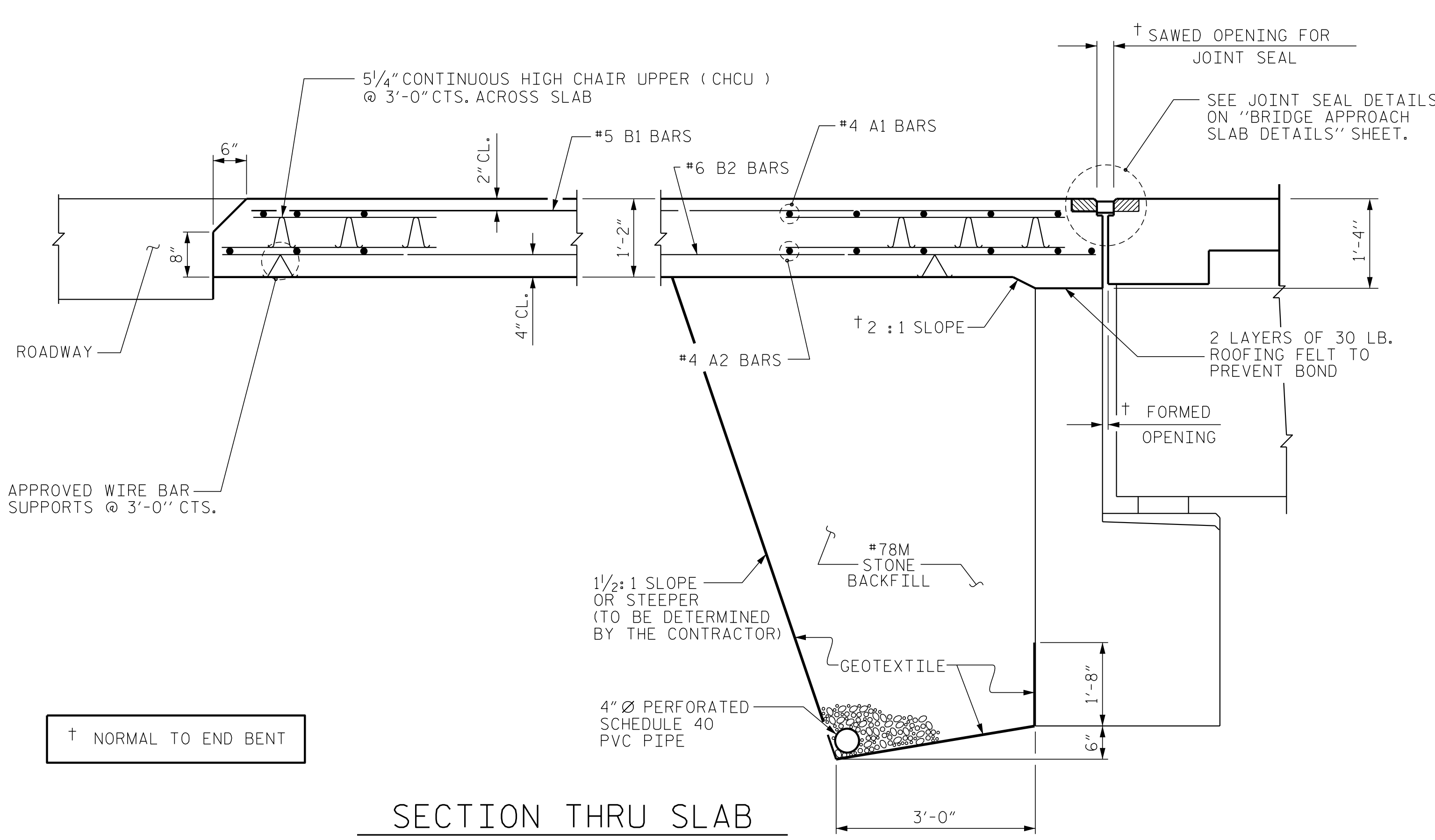
PLAN @ END BENT #1  
 PLAN @ END BENT #2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

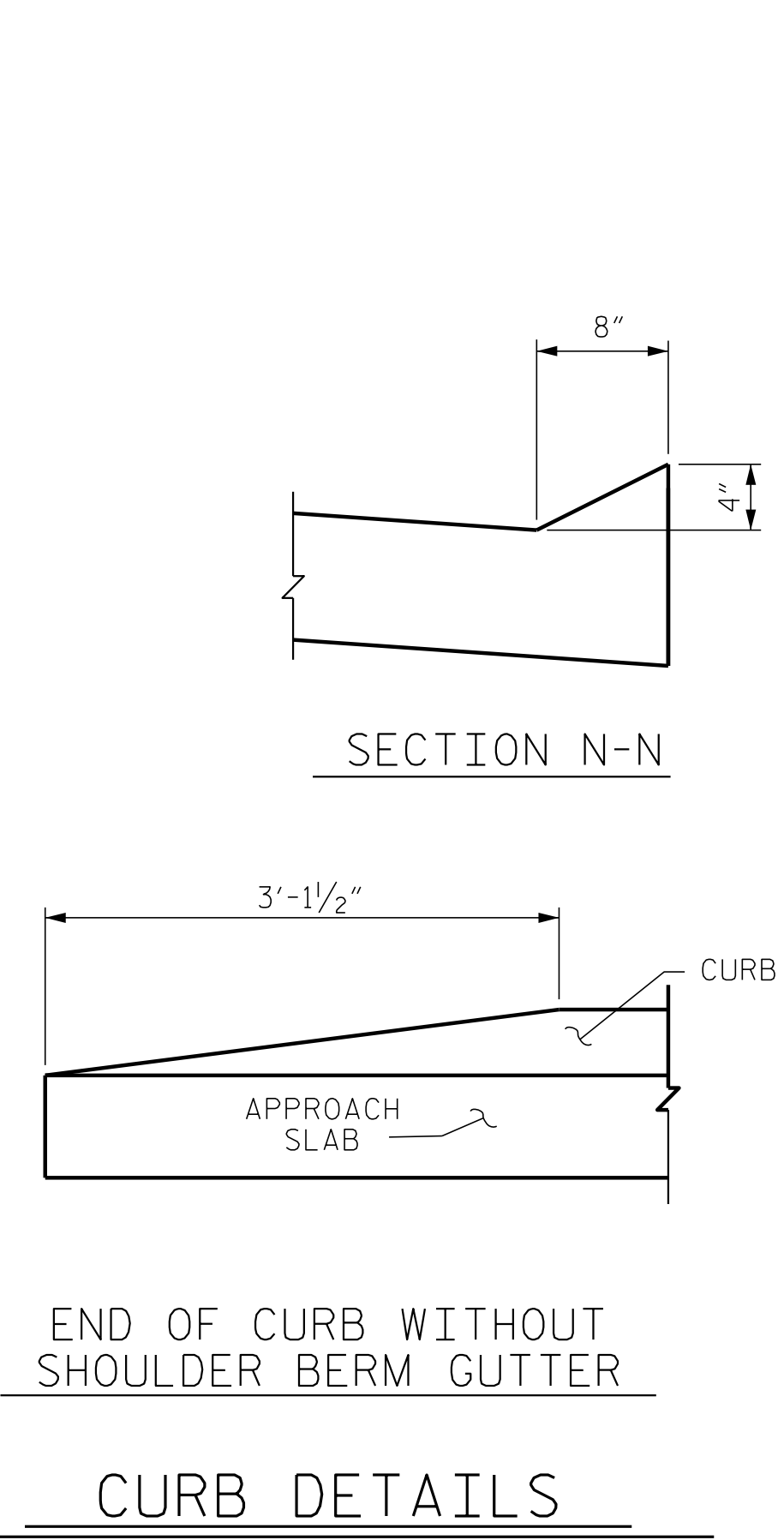
- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- #78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- #78M STONE 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.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE BARRIER RAIL.
- WITH FOAM JOINT SEAL
- FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

2'-0" SPLICE FOR A1  
 1'-9" SPLICE FOR A2

BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	30	#4	STR	27'-3"	546	
A2	32	#4	STR	27'-1"	579	
*B1	75	#5	STR	13'-5"	1050	
B2	75	#6	STR	14'-6"	1633	
REINFORCING STEEL					LBS.	2,212
*EPOXY COATED REINFORCING STEEL					LBS.	1,596
CLASS AA CONCRETE					C. Y.	24.2
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	30	#4	STR	27'-3"	546	
A2	32	#4	STR	27'-1"	579	
*B1	75	#5	STR	13'-5"	1050	
B2	75	#6	STR	14'-6"	1633	
REINFORCING STEEL					LBS.	2,212
*EPOXY COATED REINFORCING STEEL					LBS.	1,596
CLASS AA CONCRETE					C. Y.	24.2

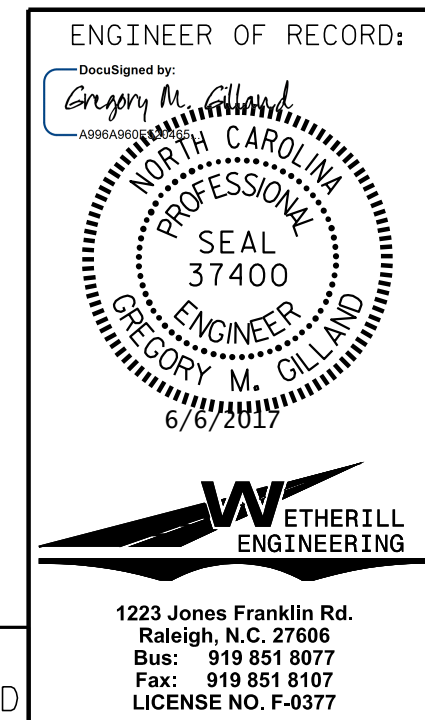


SECTION THRU SLAB



CURB DETAILS

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 17+77.11 -Y1-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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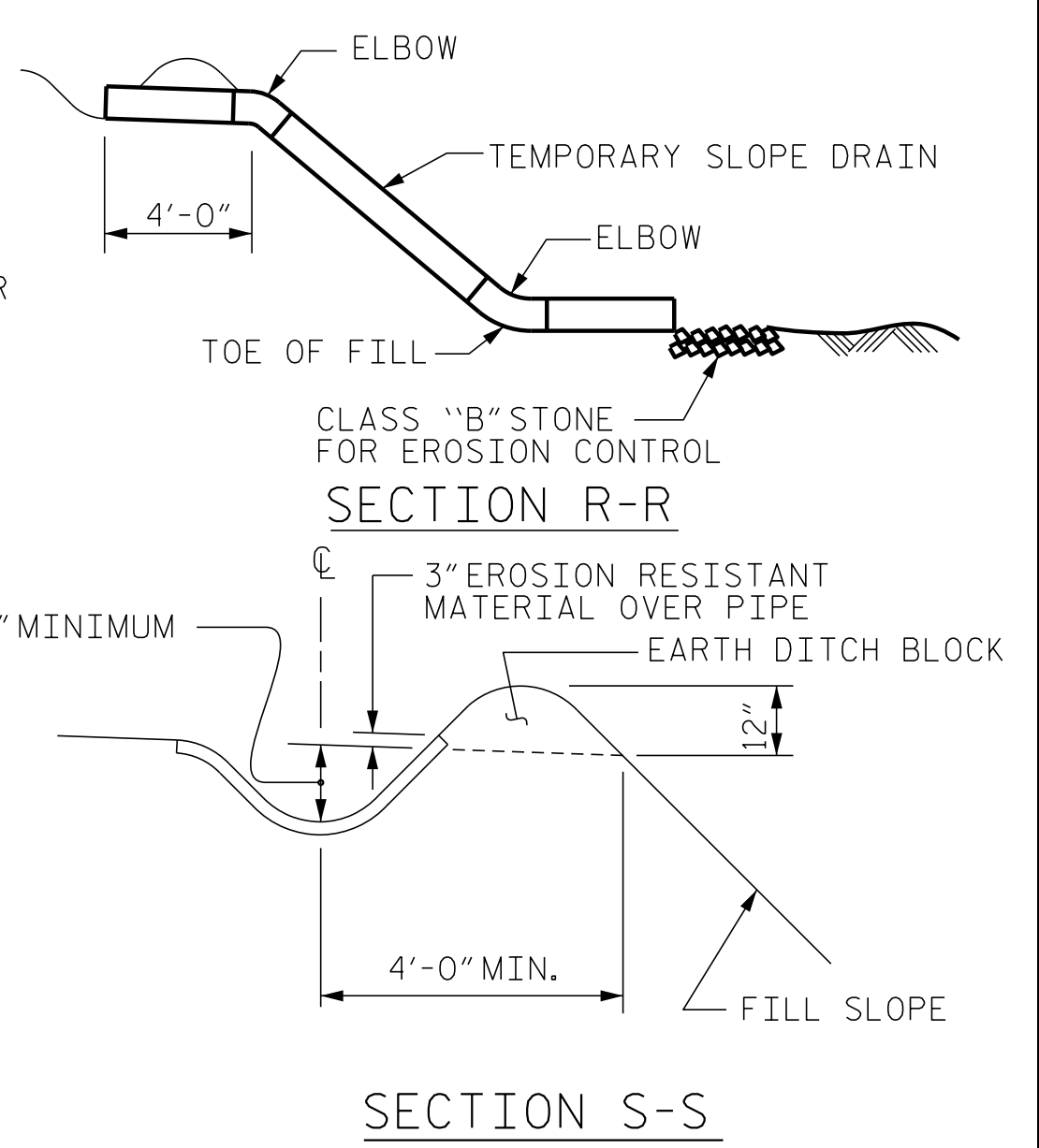
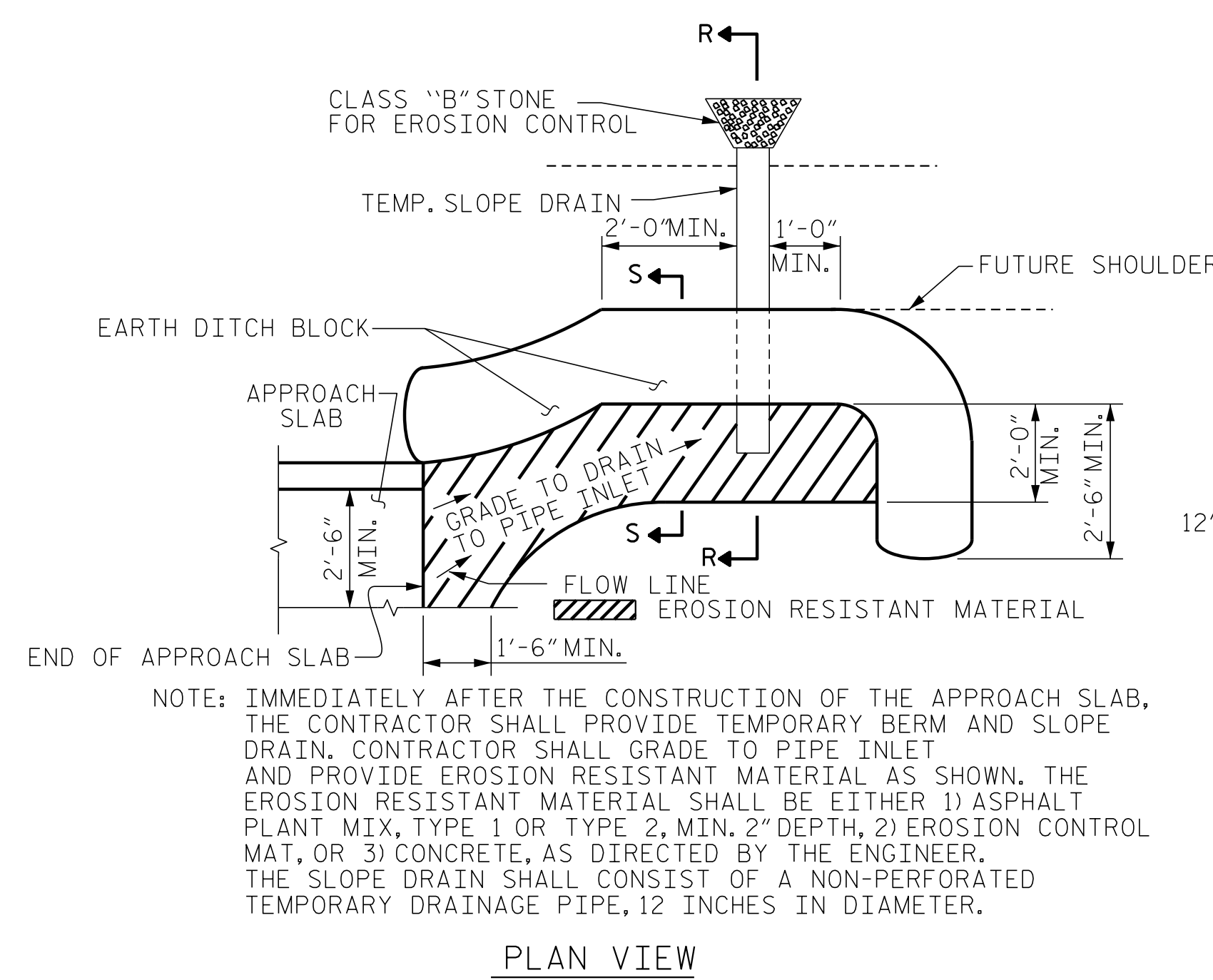
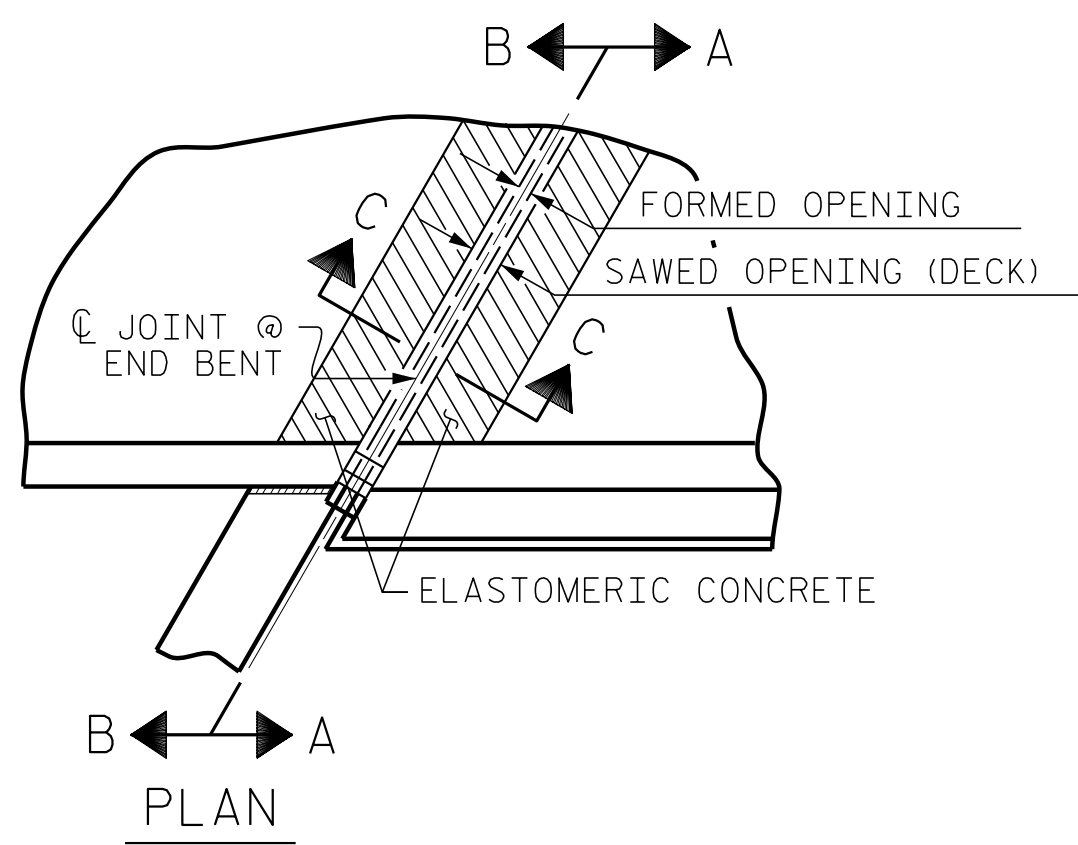
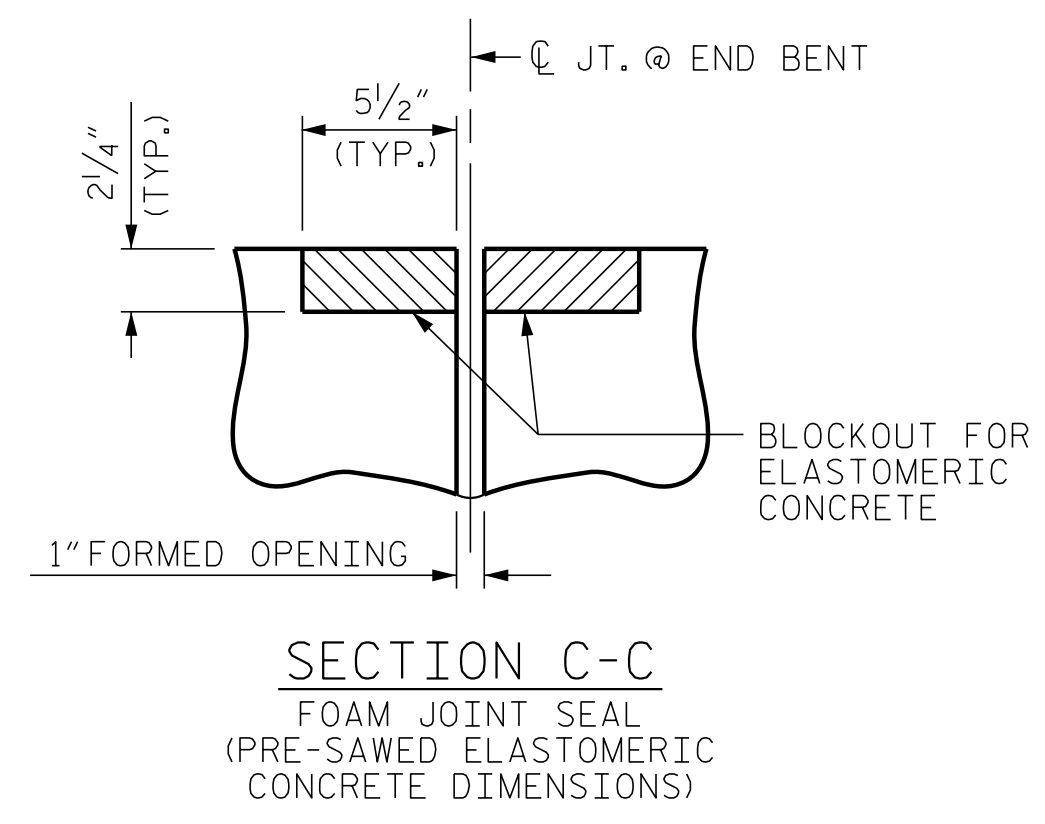
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 CHECKED BY: T. ROUNTREE DATE: 5/17

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 LICENSE NO. F-0377

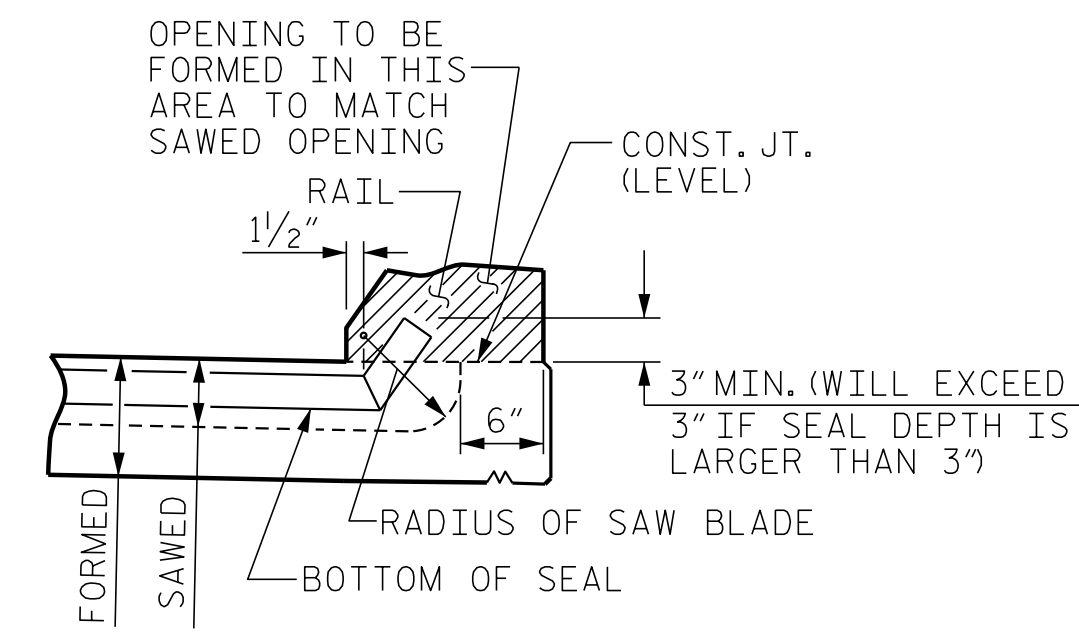
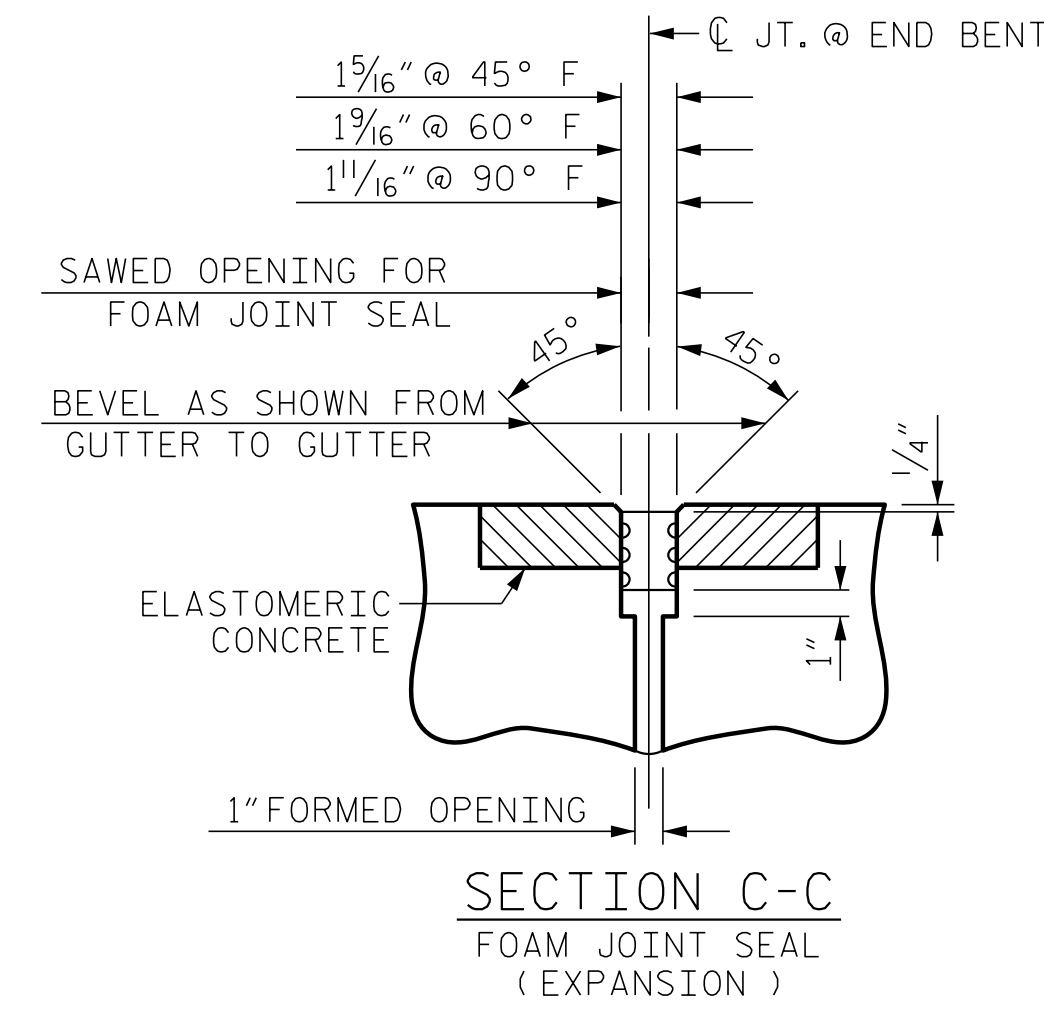
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 TOTAL SHEETS  
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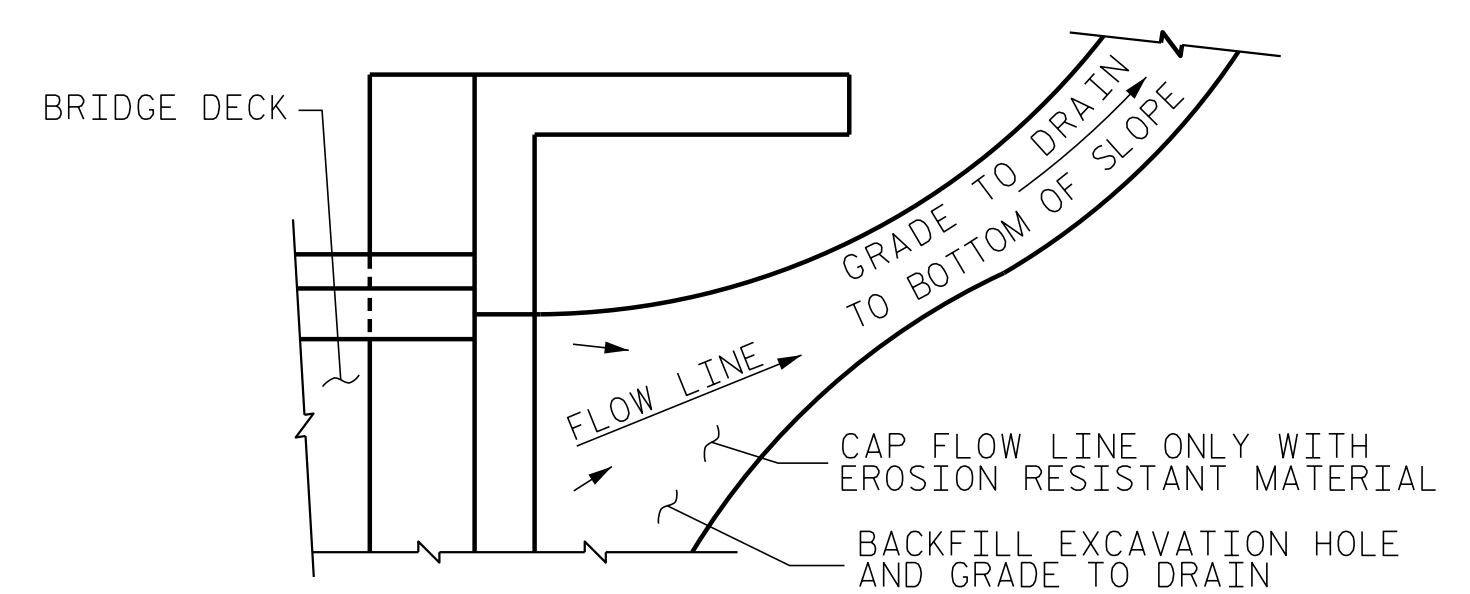


### TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

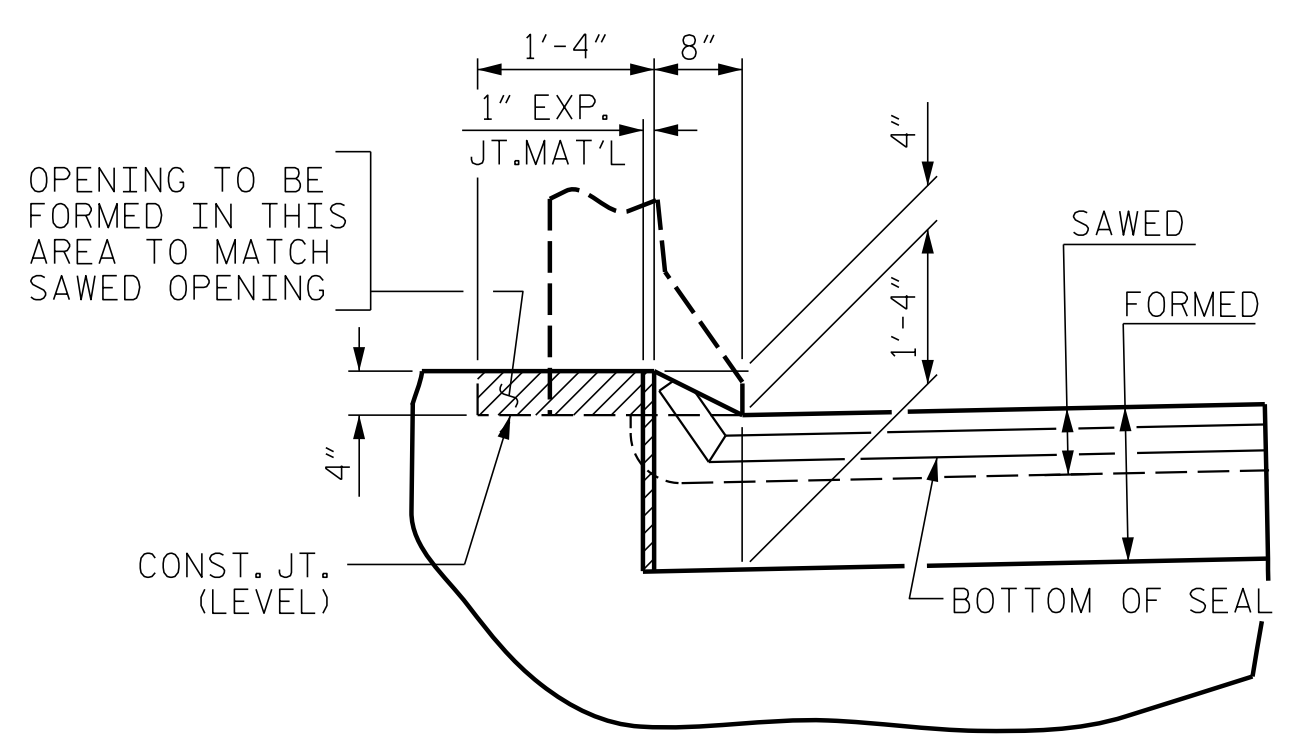


SECTION A-A



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



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.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	8.8
2	8.8
TOTAL	17.6

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 17+77.11 -Y1-

SHEET 2 OF 2

ENGINEER OF RECORD:  
  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

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

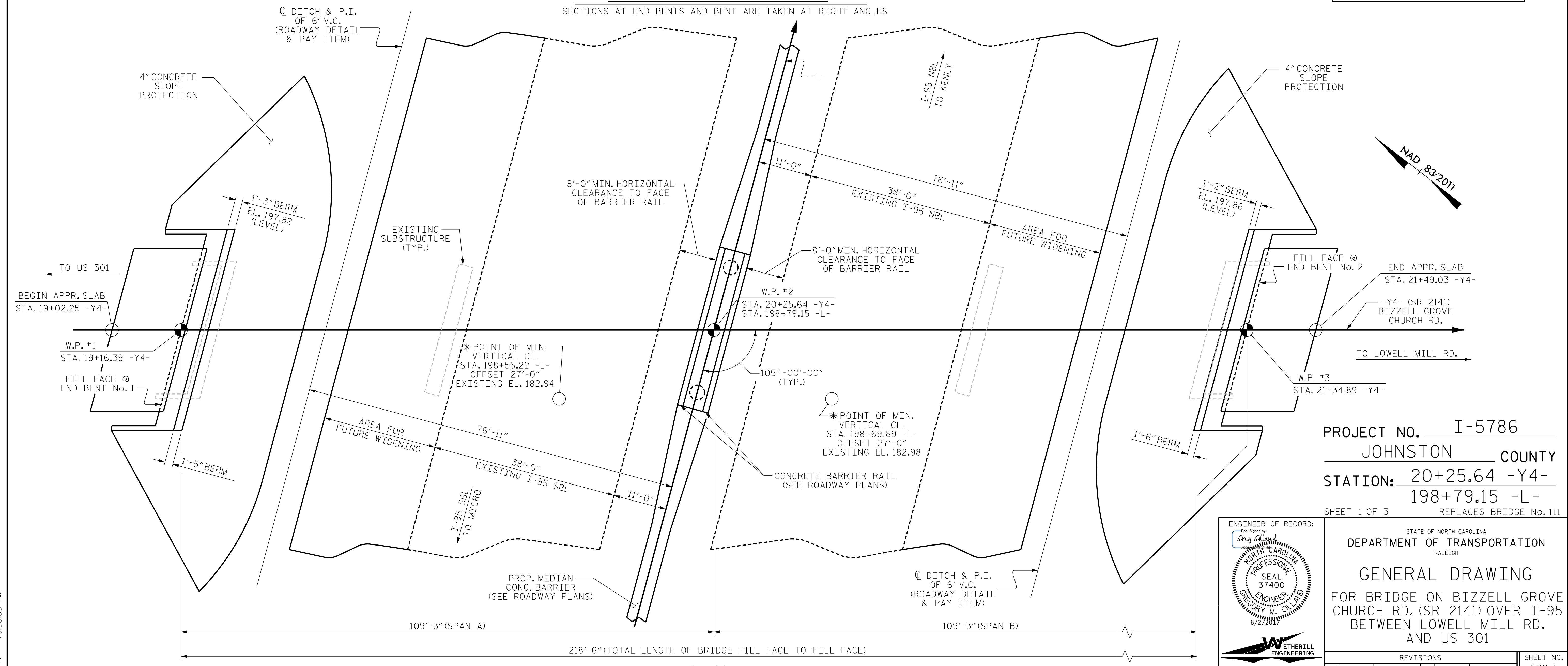
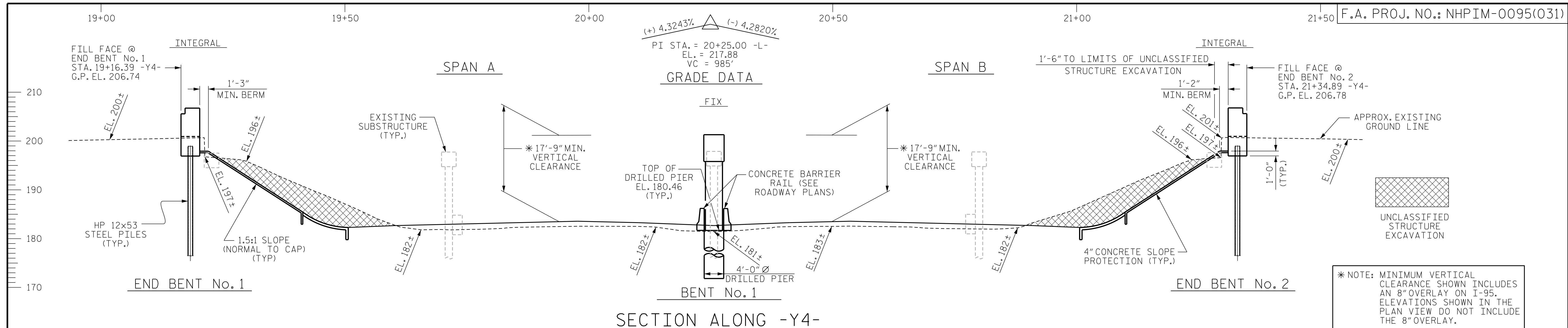
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SHEET NO. S01-32  
 TOTAL SHEETS 32

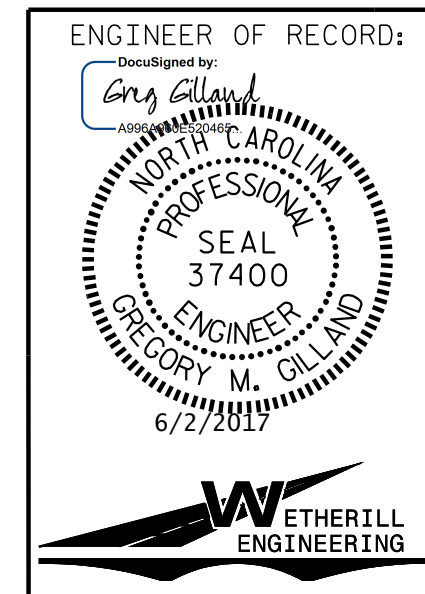
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PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
198+79.15 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE No. 111



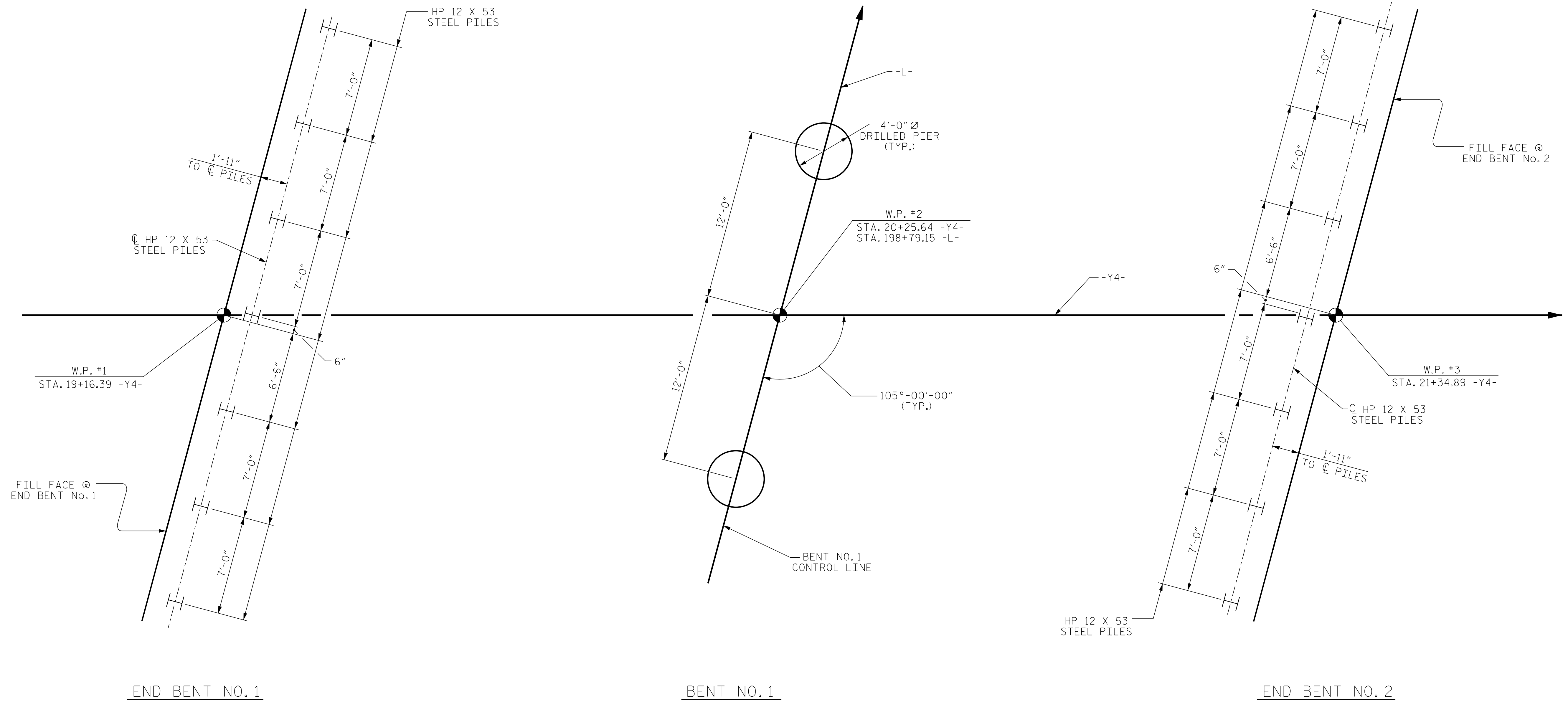
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON BIZZELL GROVE CHURCH RD. (SR 2141) OVER I-95 BETWEEN LOWELL MILL RD. AND US 301					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-1					TOTAL SHEETS 31

DRAWN BY: D. HODGE DATE: 5/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

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**FOUNDATION LAYOUT**

**NOTES:**

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

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

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

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 770 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 20 TSF.

INSTALL DRILLED PIERS AT BENT NO. 1, LEFT, TO A TIP ELEVATION NO HIGHER THAN 125.0 WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT NO. 1, RIGHT, TO A TIP ELEVATION NO HIGHER THAN 130.0 WITH THE REQUIRED TIP RESISTANCE.

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.

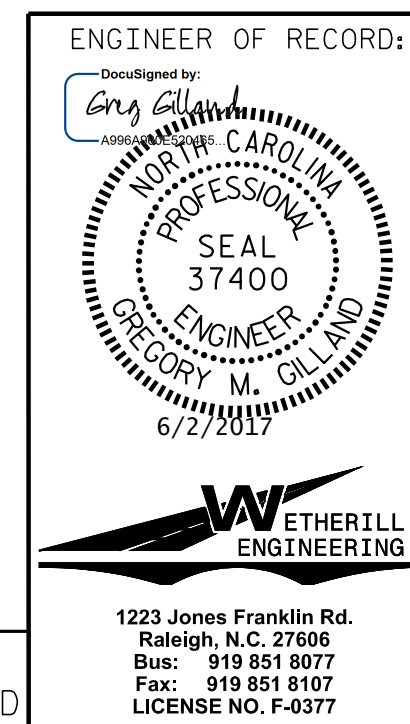
CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FEET OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NOS. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON BIZZELL GROVE  
 CHURCH RD. (SR 2141) OVER I-95  
 BETWEEN LOWELL MILL RD.  
 AND US 301

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-2
1			3			TOTAL SHEETS
2			4			31

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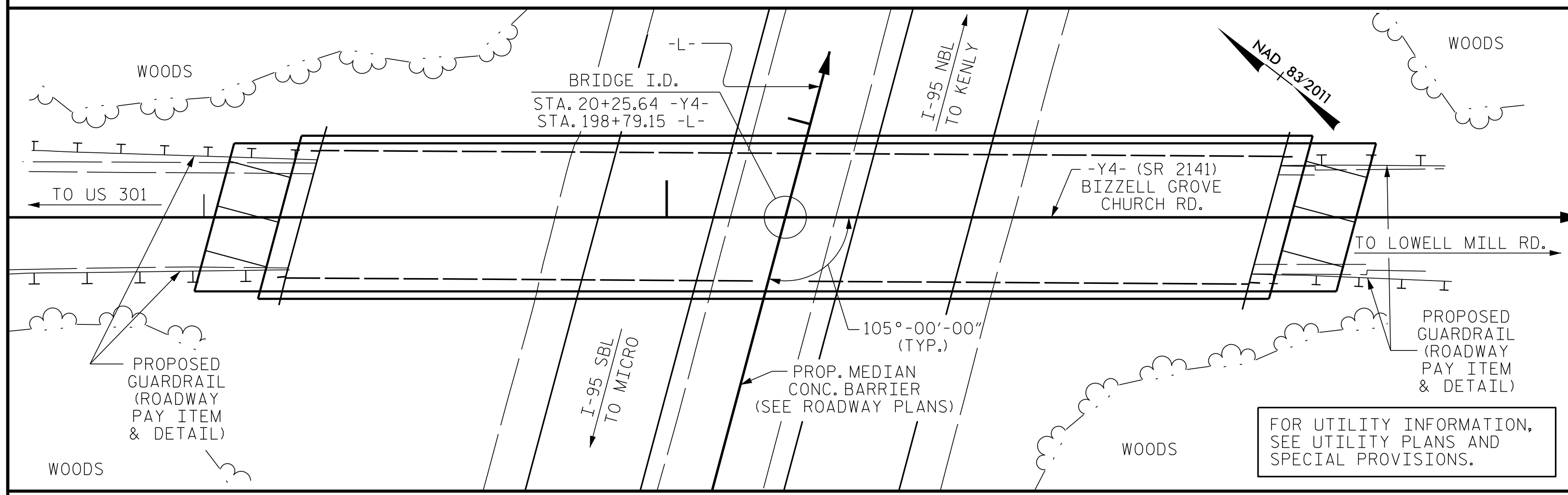
1223 Jones Franklin Rd.  
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 LICENSE NO. F-0377

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DRAWN BY : B.C. HUNT DATE : 5-17  
 CHECKED BY : J.V. ROUNTREE DATE : 5-17



TBM #10 - 60d NAIL IN 17' PINE, 55' RT OF BL STA. 192+22.00 -L-, ELEV 186.45



LOCATION SKETCH

**TOTAL BILL OF MATERIAL**

	REMOVAL OF EXISTING STRUCTURE	4'-0" Ø DRILLED PIERS IN SOIL	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 289,400 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 x 53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	ASBESTOS ASSESSMENT	
	LUMP SUM	LIN. FT.	EACH	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EA.	No.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM							8,576	8,111		LUMP SUM			LUMP SUM					433.54		LUMP SUM	LUMP SUM	
END BENT 1										36.6		5,329			7	7	410	4		240			
BENT 1		106.00		1	2	1				42.7		12,865	3,425										
END BENT 2										36.6		5,329			7	7	335	4		245			
TOTAL	LUMP SUM	106.00	1	1	2	1	LUMP SUM	8,576	8,111	115.9	LUMP SUM	23,523	3,425	LUMP SUM	14	14	745	8	433.54	485	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 FALSEWORK AND FORMWORK, 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 BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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".

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS @ 52'-6" WITH A REINFORCED CONCRETE DECK ON 4 LINES OF I-BEAMS AND A CLEAR ROADWAY WIDTH OF 24'-1" ON REINFORCED CONCRETE BENTS ON PRESTRESSED PILES AND REINFORCED CONCRETE END BENTS ON PRESTRESSED PILES AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED.

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 EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

THE CONTRACTOR SHALL SUBMIT A GIRDER ERECTION SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

SHEET 3 OF 3

ENGINEER OF RECORD:  
 Designed by: *Greg Gillen*  
 Approved by: *Greg Gillen*  
 NORTH CAROLINA PROFESSIONAL SEAL 37400  
 GREGORY M. OLLAND  
 ENGINEER  
 6/2/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE ON BIZZELL GROVE CHURCH RD. (SR 2141) OVER I-95 BETWEEN LOWELL MILL RD. AND US 301

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

DRAWN BY : D. HODGE DATE : 5/17  
 CHECKED BY : B.C. HUNT DATE : 5/17

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

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 (γ <sub>LL</sub> )	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ <sub>LL</sub> )	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	1.14	--	1.75	0.891	1.14	A	E	107.27	1.056	1.68	A	I	107.27	1.30	0.891	1.95	A	E	42.91		
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.891	1.48	A	E	107.27	1.056	2.17	A	I	107.27	1.00	0.891	2.54	A	E	42.91		
	HS-20 (INVENTORY)	36.00	②	2.48	89.28	1.75	0.891	2.74	A	E	42.91	1.056	2.48	A	I	107.27	1.30	0.891	2.72	A	E	42.91		
	HS-20 (OPERATING)	36.00		3.22	115.92	1.35	0.891	3.55	A	E	42.91	1.056	3.22	A	I	107.27	1.00	0.891	3.54	A	E	42.91		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	③	6.40	86.40	1.40	0.891	8.07	A	E	42.91	1.056	7.96	A	I	107.27	1.30	0.891	6.40	A	E	42.91	
		SNGARBS2	20.000		4.63	92.60	1.40	0.891	5.84	A	E	42.91	1.056	5.47	A	I	107.27	1.30	0.891	4.63	A	E	42.91	
		SNAGRIS2	22.000		4.33	95.26	1.40	0.891	5.46	A	E	42.91	1.056	5.01	A	I	107.27	1.30	0.891	4.33	A	E	42.91	
		SNCOTTS3	27.250		3.20	87.20	1.40	0.891	4.03	A	E	42.91	1.056	3.95	A	I	107.27	1.30	0.891	3.20	A	E	42.91	
		SNAGGRS4	34.925		2.62	91.50	1.40	0.891	3.31	A	E	42.91	1.056	2.98	A	I	107.27	1.30	0.891	2.62	A	E	42.91	
		SNS5A	35.550		2.58	91.72	1.40	0.891	3.25	A	E	42.91	1.056	2.96	A	I	107.27	1.30	0.891	2.58	A	E	42.91	
		SNS6A	39.950		2.34	93.48	1.40	0.891	2.95	A	E	42.91	1.056	2.66	A	I	107.27	1.30	0.891	2.34	A	E	42.91	
		SNS7B	42.000		2.24	94.08	1.40	0.891	2.82	A	E	42.91	1.056	2.55	A	I	107.27	1.30	0.891	2.24	A	E	42.91	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.87	94.71	1.40	0.891	3.61	A	E	42.91	1.056	3.37	A	I	107.27	1.30	0.891	2.87	A	E	42.91	
		TNT4A	33.075		2.85	94.26	1.40	0.891	3.58	A	E	42.91	1.056	3.17	A	I	107.27	1.30	0.891	2.85	A	E	42.91	
		TNT6A	41.600		2.32	96.51	1.40	0.891	2.93	A	E	42.91	1.056	2.63	A	I	107.27	1.30	0.891	2.32	A	E	42.91	
		TNT7A	42.000		2.32	97.44	1.40	0.891	2.93	A	E	42.91	1.056	2.60	A	I	107.27	1.30	0.891	2.32	A	E	42.91	
		TNT7B	42.000		2.35	98.70	1.40	0.891	2.96	A	E	42.91	1.056	2.54	A	I	107.27	1.30	0.891	2.35	A	E	42.91	
		TNAGRIT4	43.000		2.27	97.61	1.40	0.891	2.86	A	E	42.91	1.056	2.47	A	I	107.27	1.30	0.891	2.27	A	E	42.91	
TNAGT5A	45.000		2.17	97.65	1.40	0.891	2.73	A	E	42.91	1.056	2.40	A	I	107.27	1.30	0.891	2.17	A	E	42.91			
TNAGT5B	45.000		2.14	96.30	1.40	0.891	2.69	A	E	42.91	1.056	2.36	A	I	107.27	1.30	0.891	2.14	A	E	42.91			
FATIGUE	HL-93 (INVENTORY)	γ <sub>LL</sub> =0.75																						

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	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.

**COMMENTS:**  
 1.  
 2.  
 3.  
 4.

Ⓝ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) \*\*

② DESIGN LOAD RATING (HS-20) \*\*

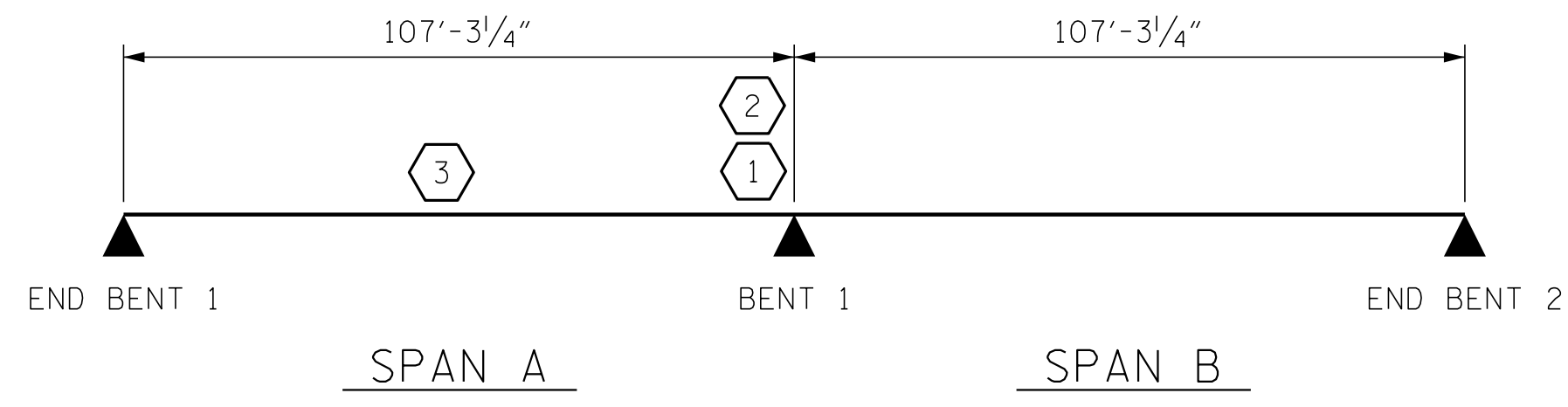
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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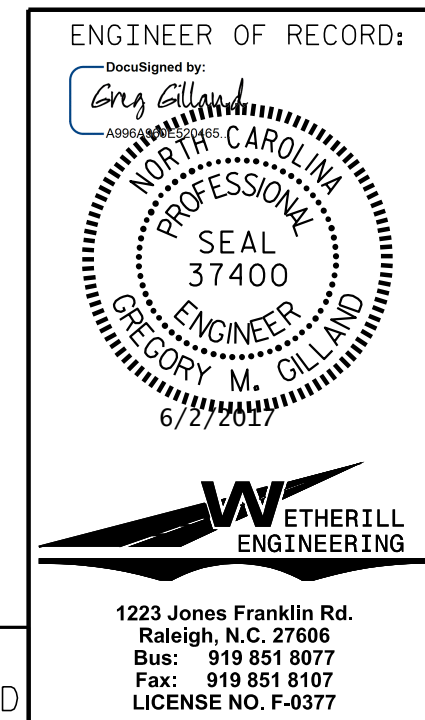
GIRDER LOCATION

I - INTERIOR GIRDER  
 E - EXTERIOR GIRDER



### LRFR SUMMARY

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD

LRFR SUMMARY FOR  
 STEEL GIRDERS  
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-4
1			3			TOTAL SHEETS
2			4			31

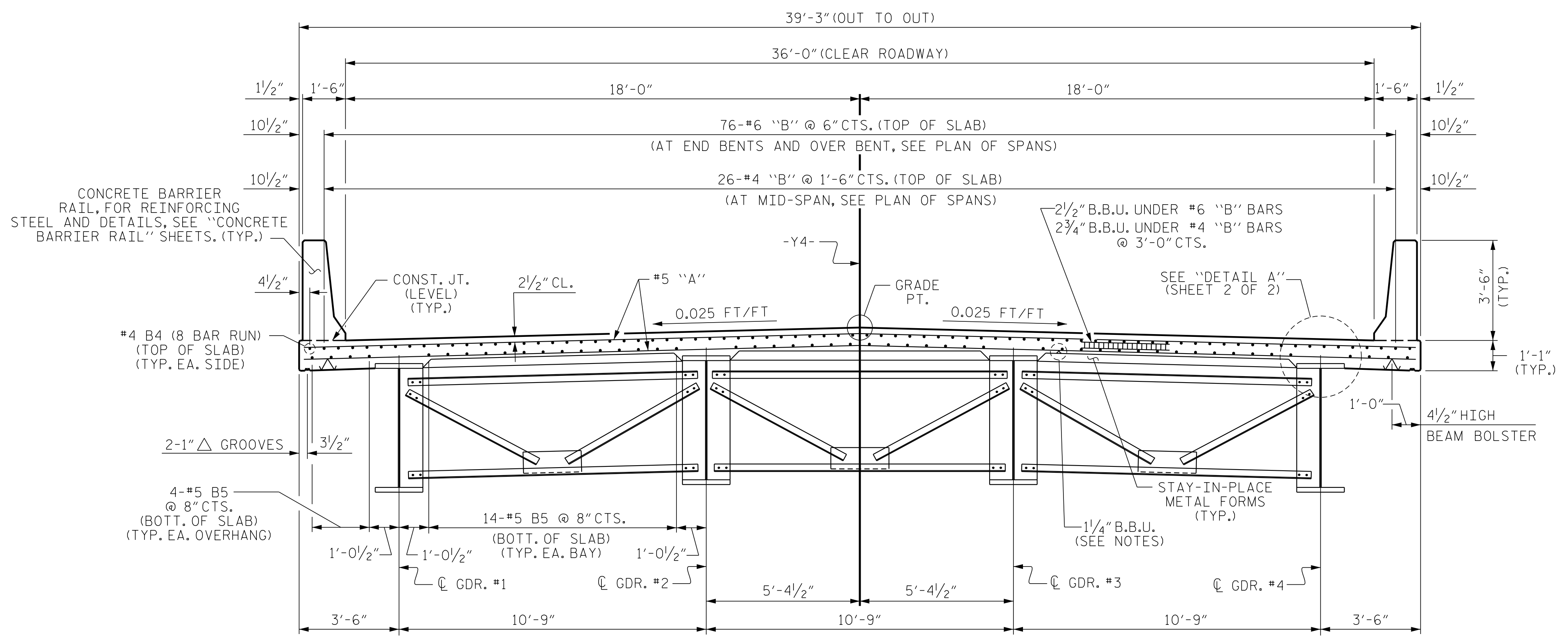
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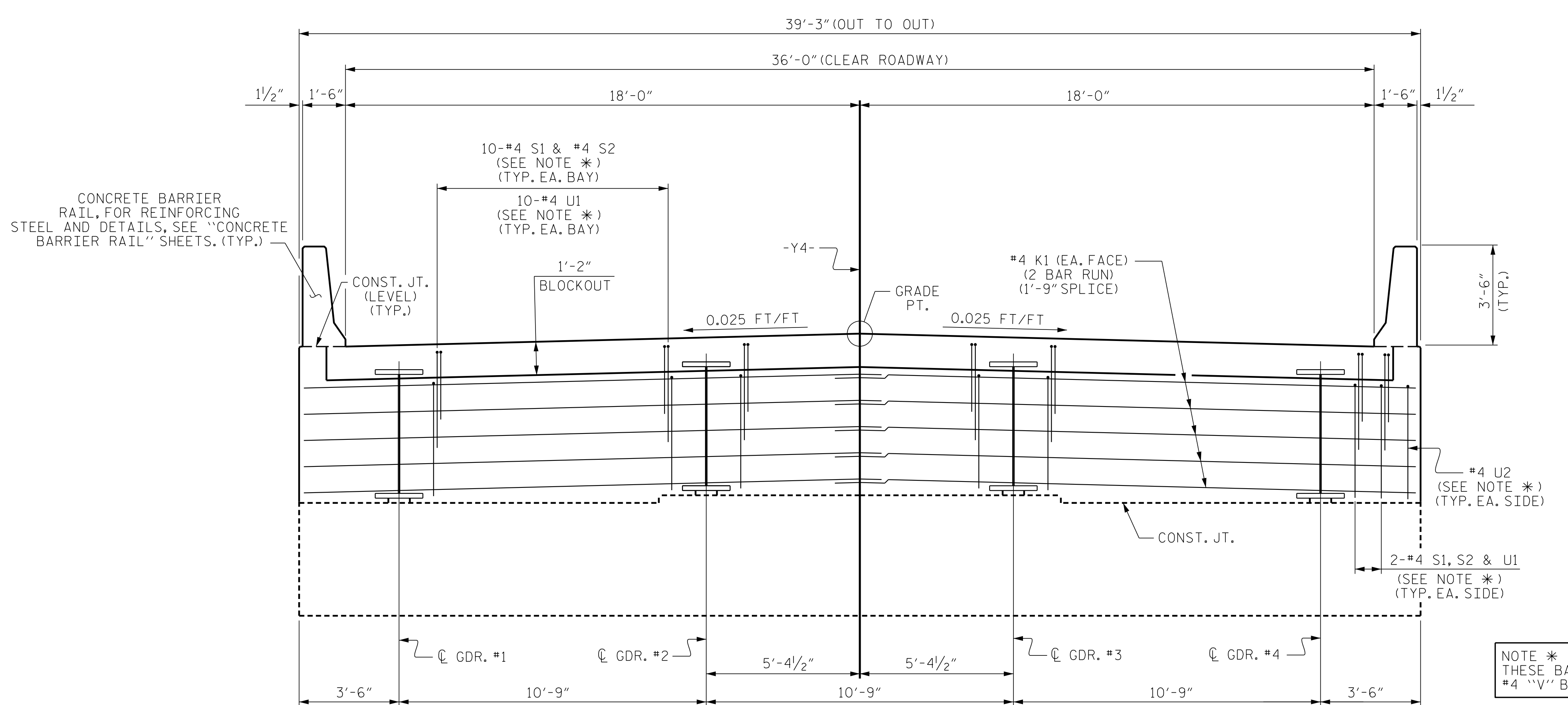
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ASSEMBLED BY : D. HODGE	DATE : 5/17
CHECKED BY : B.C. HUNT	DATE : 5/17
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM





**TYPICAL SECTION**  
(SHOWING INTERMEDIATE AND BENT DIAPHRAGM)



**TYPICAL SECTION @ INTEGRAL END BENT**  
(DECK REINFORCEMENT NOT SHOWN FOR CLARITY)

**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 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.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND 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.

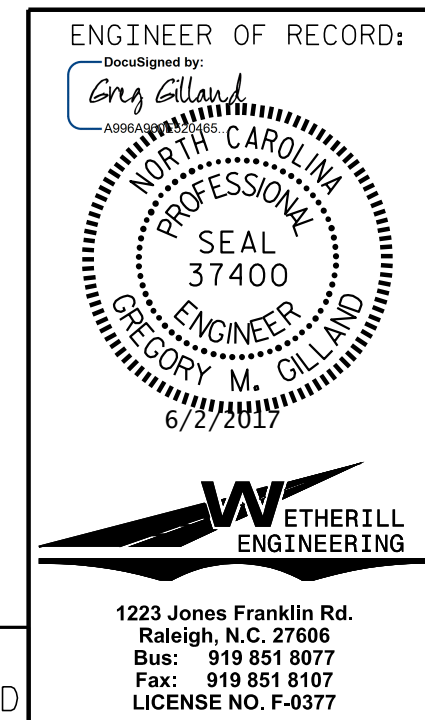
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DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 4/17

NOTE \*  
THESE BARS ARE TO MATCH #4 'V' BARS IN END BENT

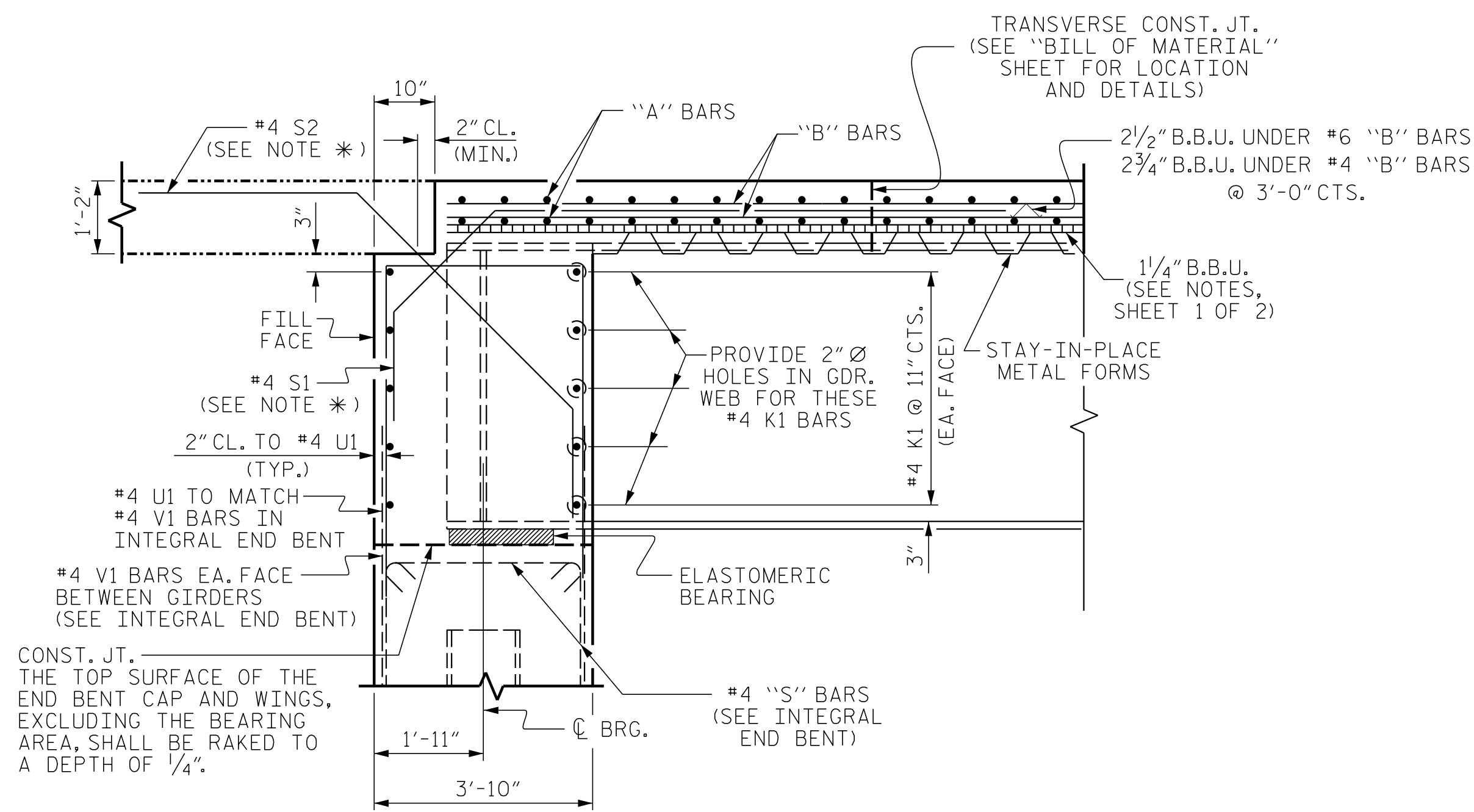
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PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 2

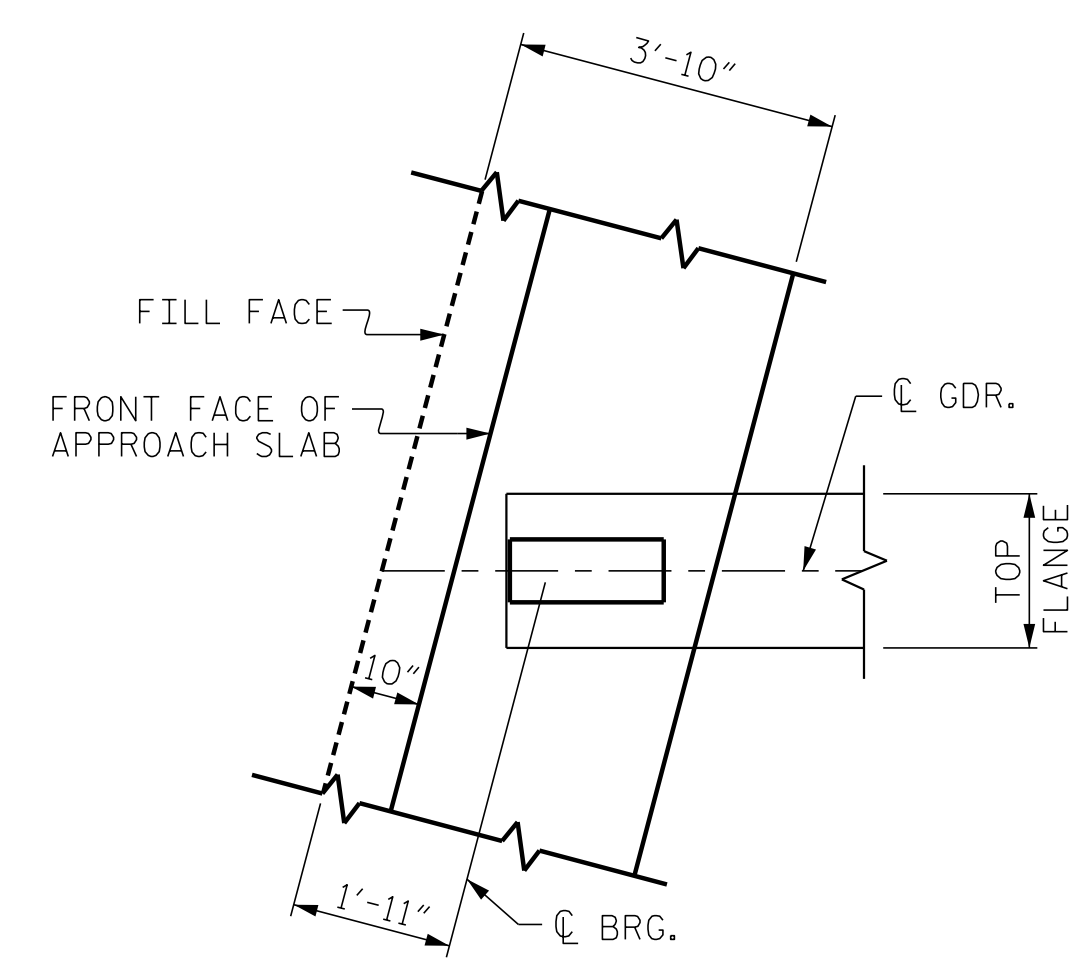


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
SHEET NO. S02-5					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 31

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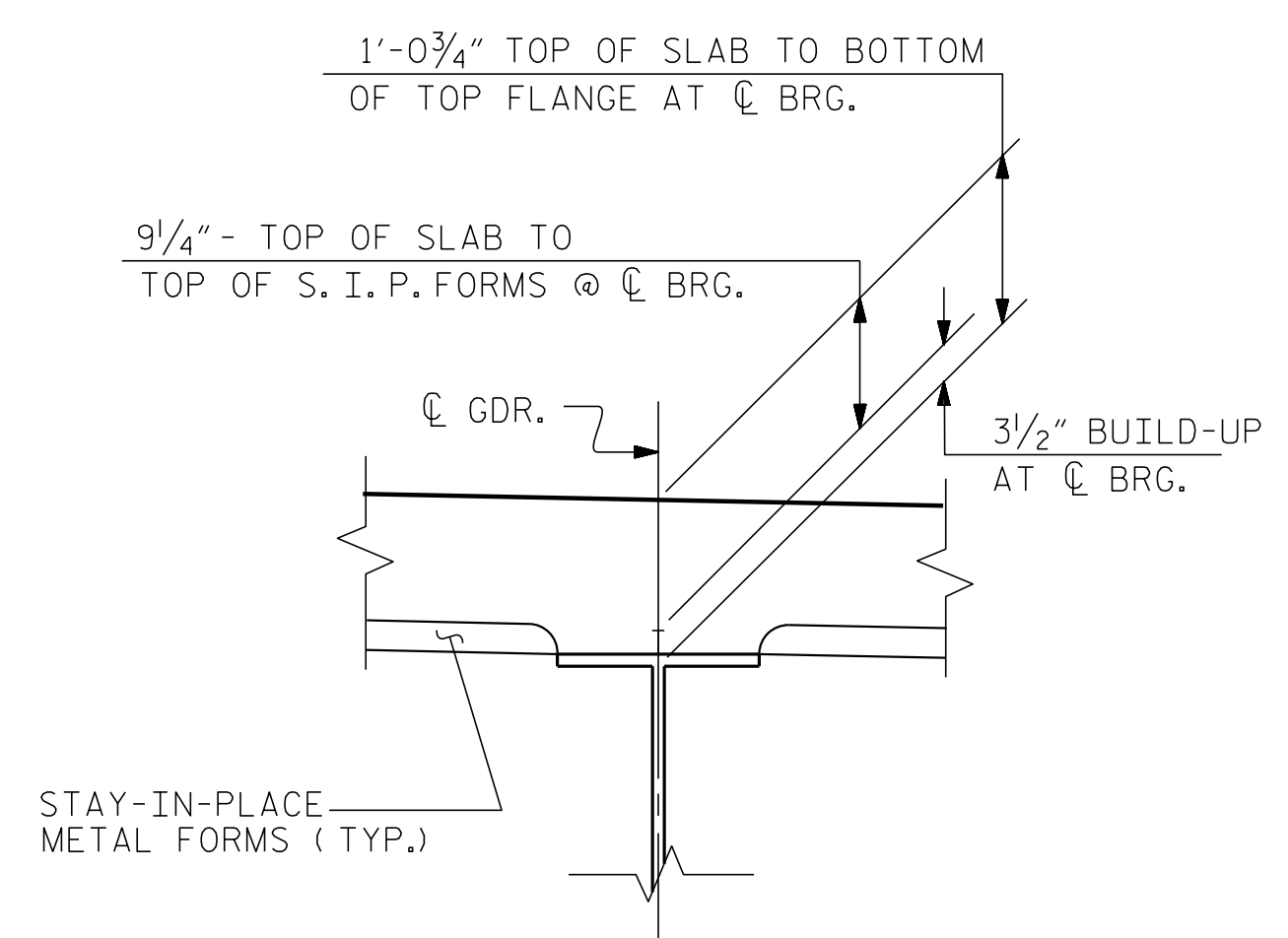


END OF GIRDER DETAIL AT INTEGRAL END BENT



PLAN OF GIRDER AT INTEGRAL END BENT

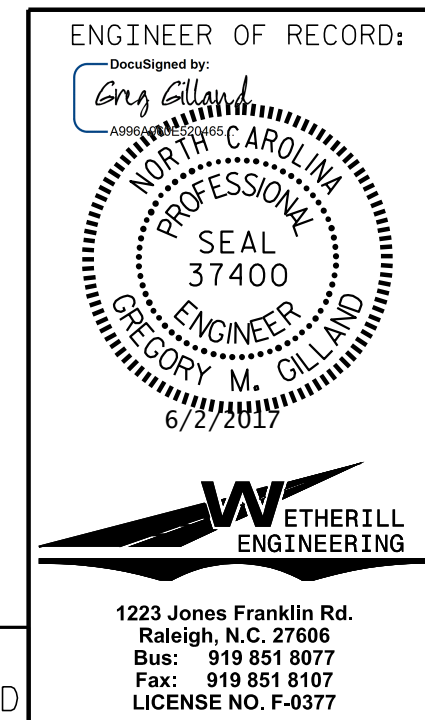
NOTE \*  
THESE BARS ARE TO MATCH  
#4 'V' BARS IN END BENT



DETAIL "A"

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-6
1			3			TOTAL SHEETS
2			4			31

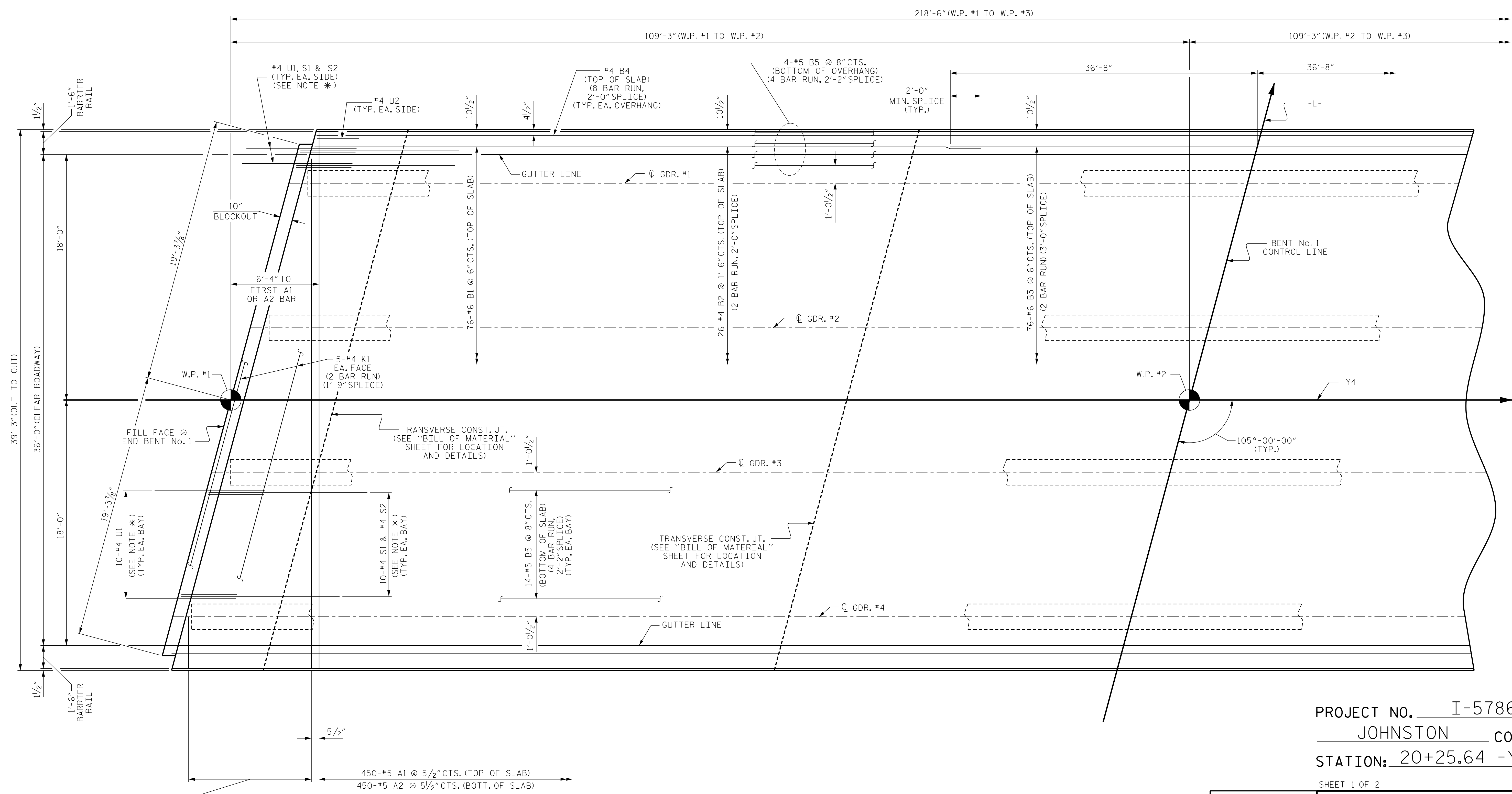
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 4/17

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### PLAN OF SPAN A

\* THESE BARS ARE TO MATCH SPACING OF THE #4 "V" BARS IN END BENT.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 2

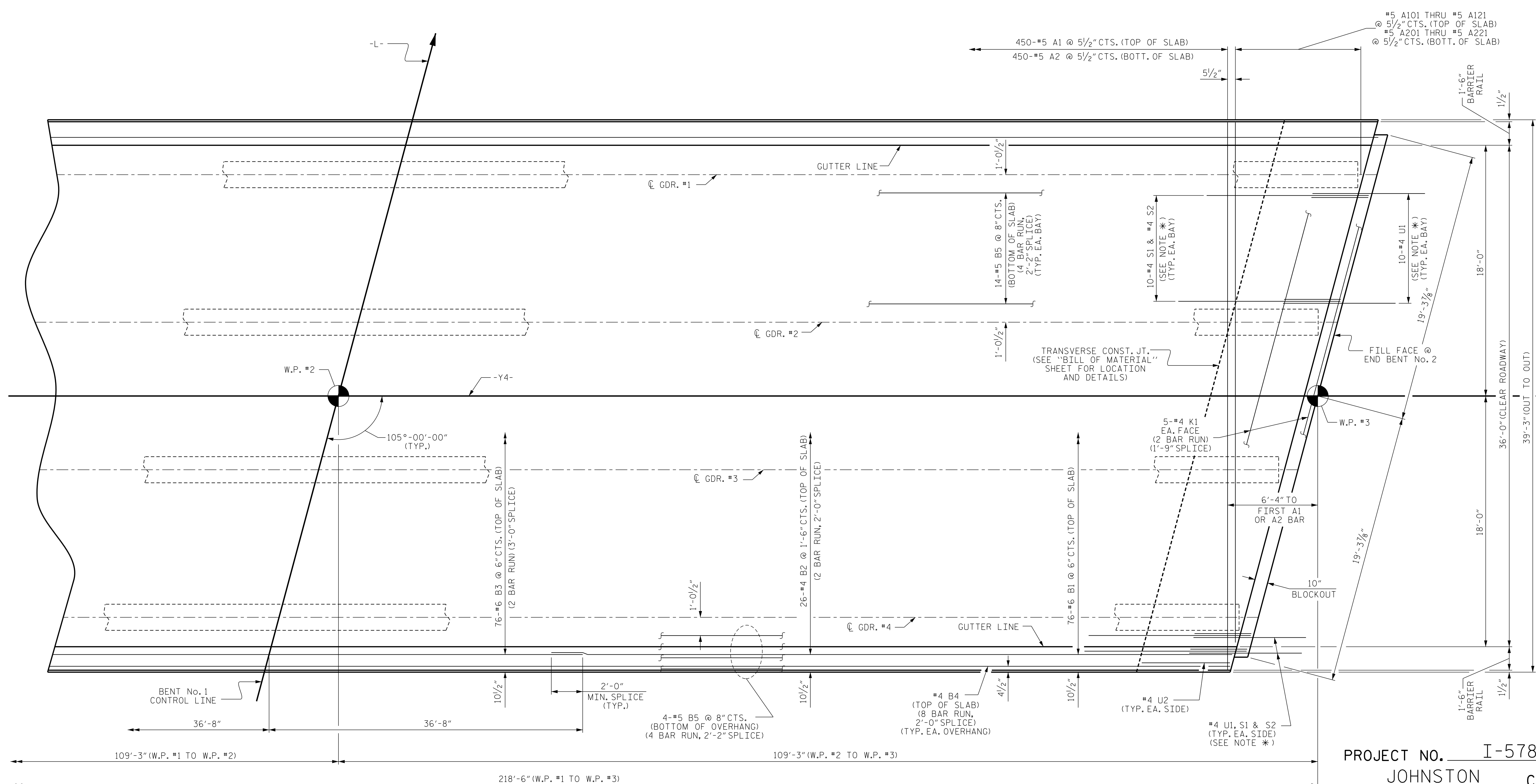
ENGINEER OF RECORD:  
*Gregory M. Olland*  
 PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/2/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-7					TOTAL SHEETS 31

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 CHECKED BY: B.C. HUNT DATE: 4/17

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### PLAN OF SPAN B

\* THESE BARS ARE TO MATCH SPACING OF THE #4 "V" BARS IN END BENT.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

SHEET 2 OF 2

DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 4/17

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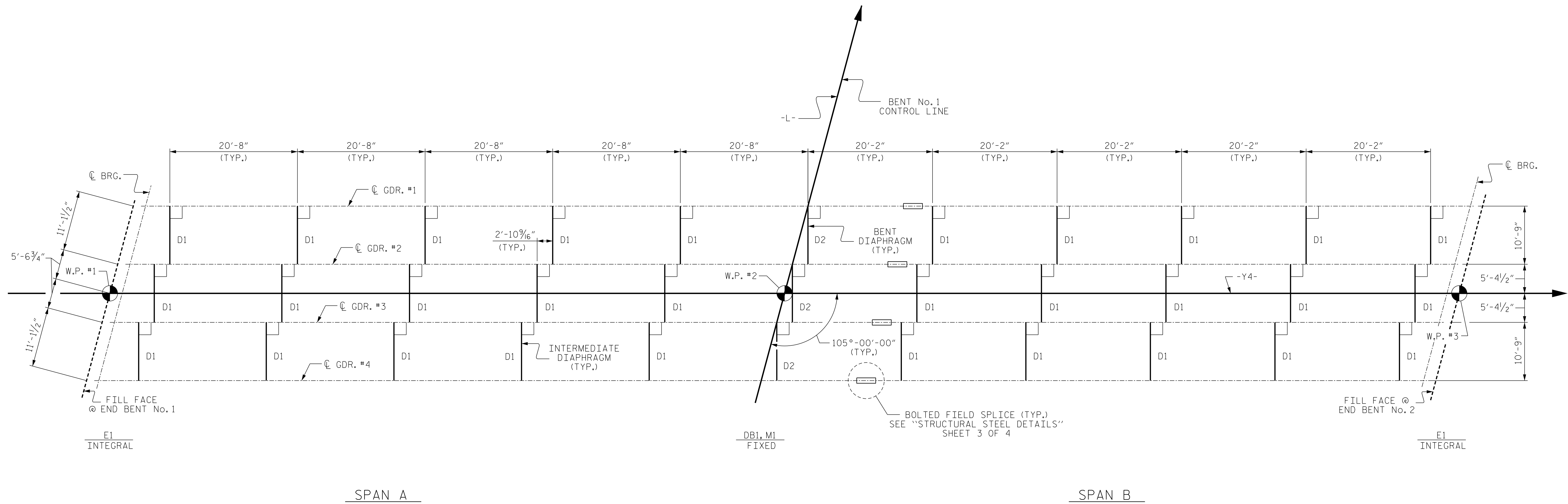
ENGINEER OF RECORD:  
 Greg Gill  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 37400  
 GREGORY M. OLL AND  
 6/2/2017

ETHERILL  
 ENGINEERING

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 Raleigh, N.C. 27606  
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 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-8					TOTAL SHEETS 31





FRAMING PLAN

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

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 CHECKED BY: B.C. HUNT DATE: 4/17

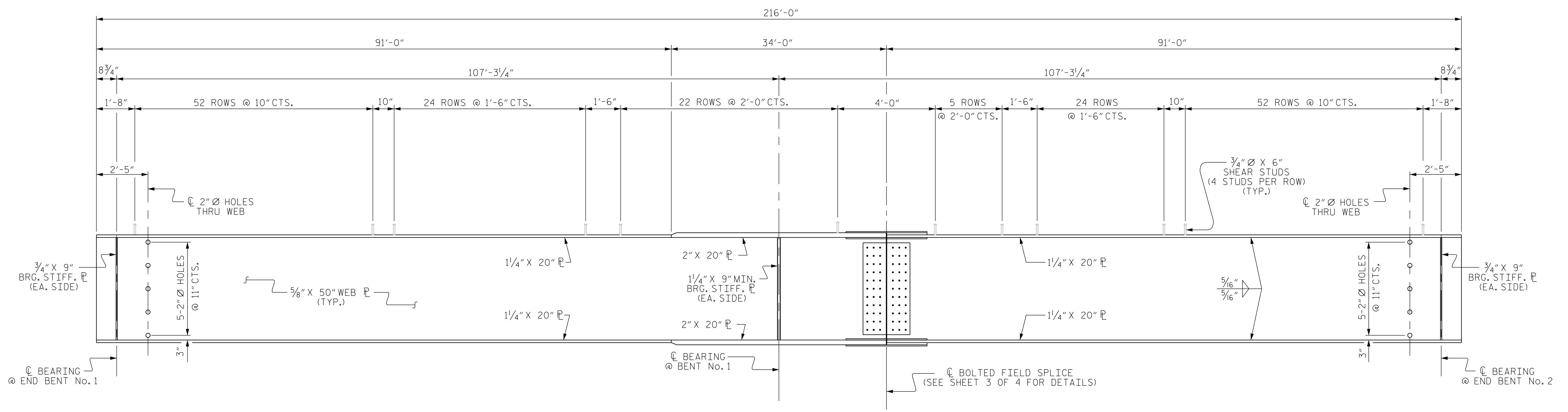
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ENGINEER OF RECORD:  
 Greg Olland  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 37400  
 ENGINEER  
 GREGORY M. OLLAND  
 6/2/2017  
 WETHERILL  
 ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

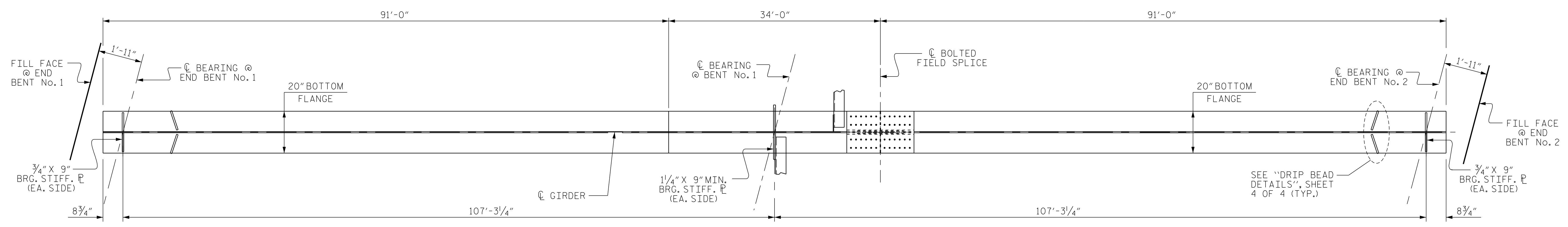
SUPERSTRUCTURE  
 FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-9
1			3			TOTAL SHEETS
2			4			31



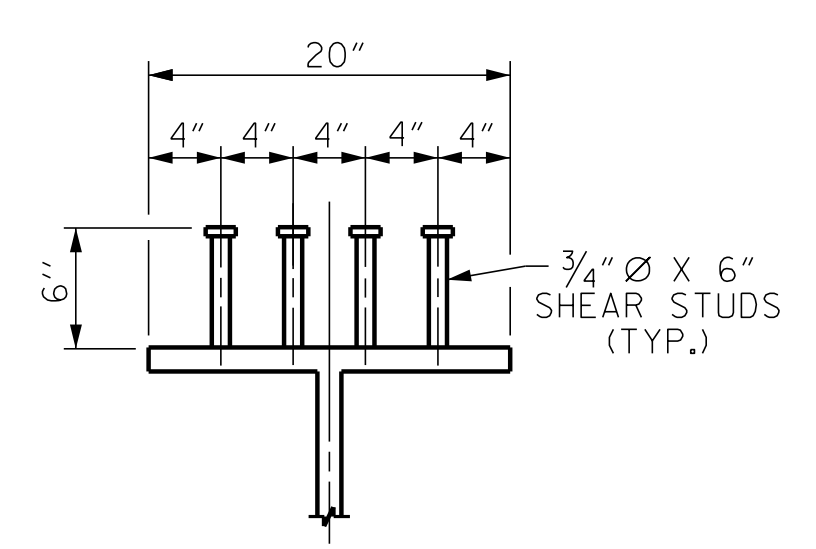
**ELEVATION OF GIRDER**

(FOR CLARITY, INTERMEDIATE CONNECTOR PLATES NOT SHOWN, FOR PLACEMENT, SEE "FRAMING PLAN" SHEET.)

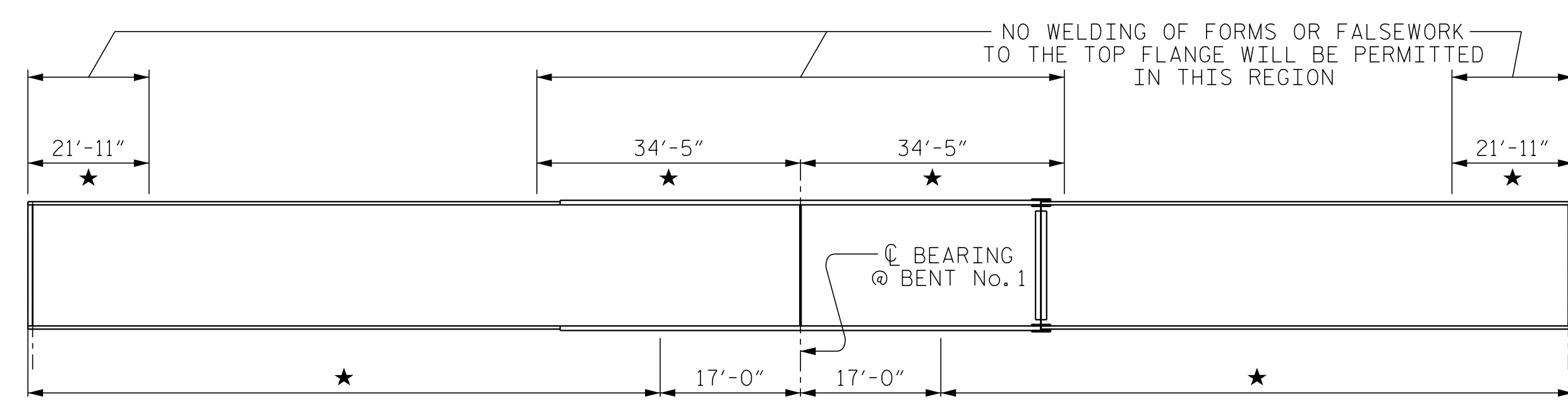


**BOTTOM FLANGE DETAIL**

(FOR CLARITY, INTERMEDIATE CONNECTOR PLATES NOT SHOWN, FOR PLACEMENT, SEE "FRAMING PLAN" SHEET.)



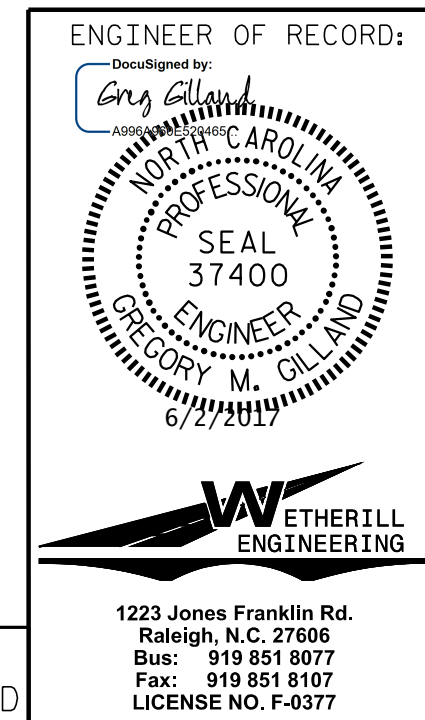
**SHEAR STUD DETAILS**  
(TYP. EA. GIRDER)



**CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS**

\* CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS. CHARPY V-NOTCH TEST ARE REQUIRED FOR 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 FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 4



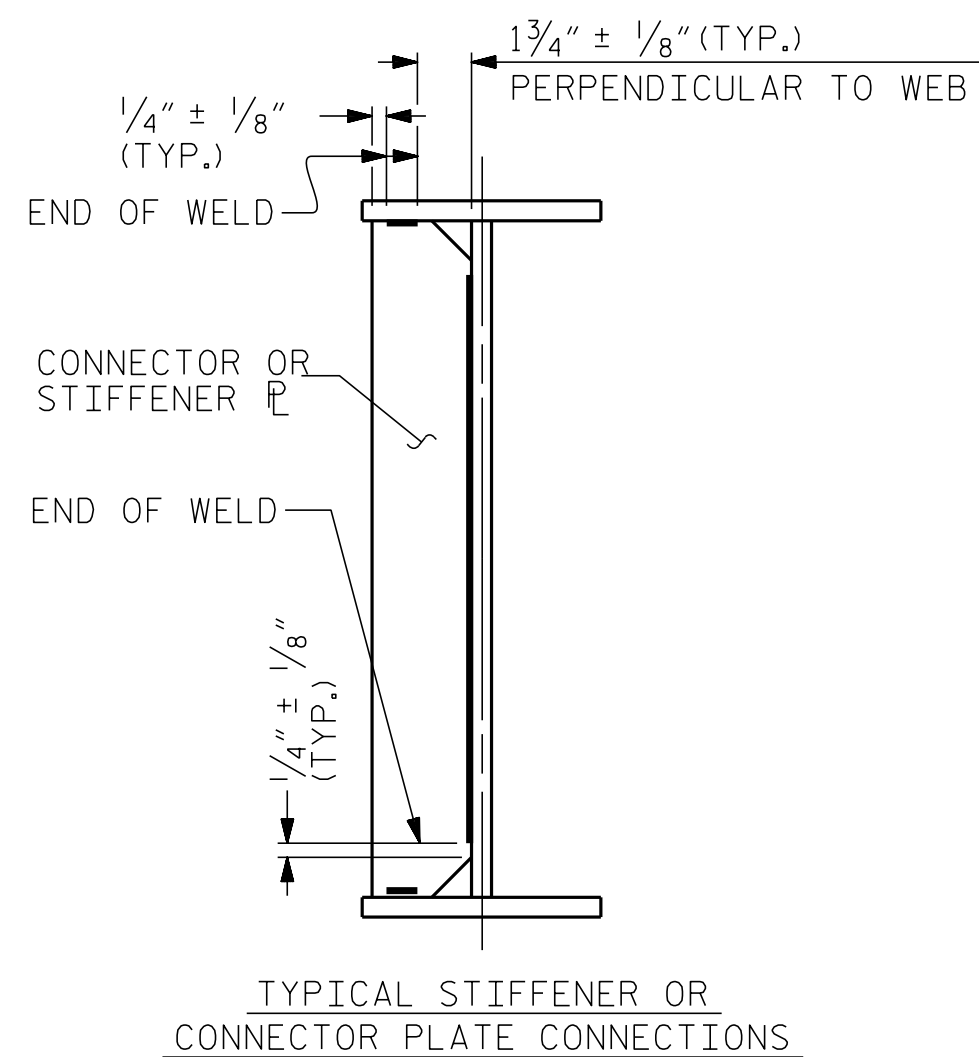
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUPERSTRUCTURE STRUCTURAL STEEL DETAILS	
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S02-10
2			TOTAL SHEETS
			31

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 CHECKED BY: B.C. HUNT DATE: 4/17

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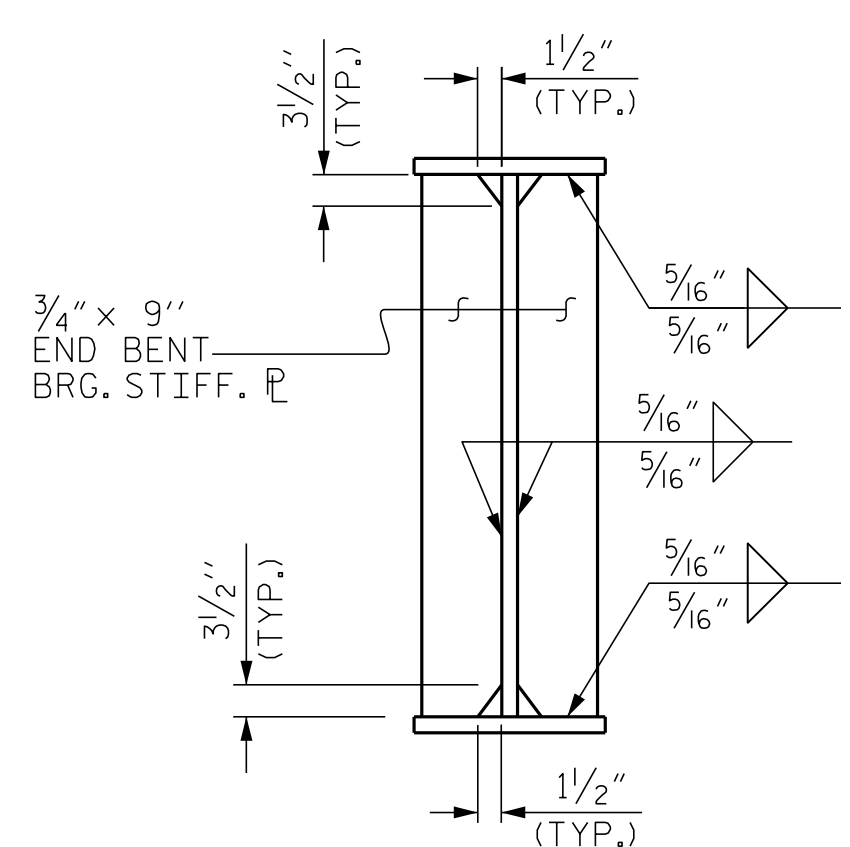
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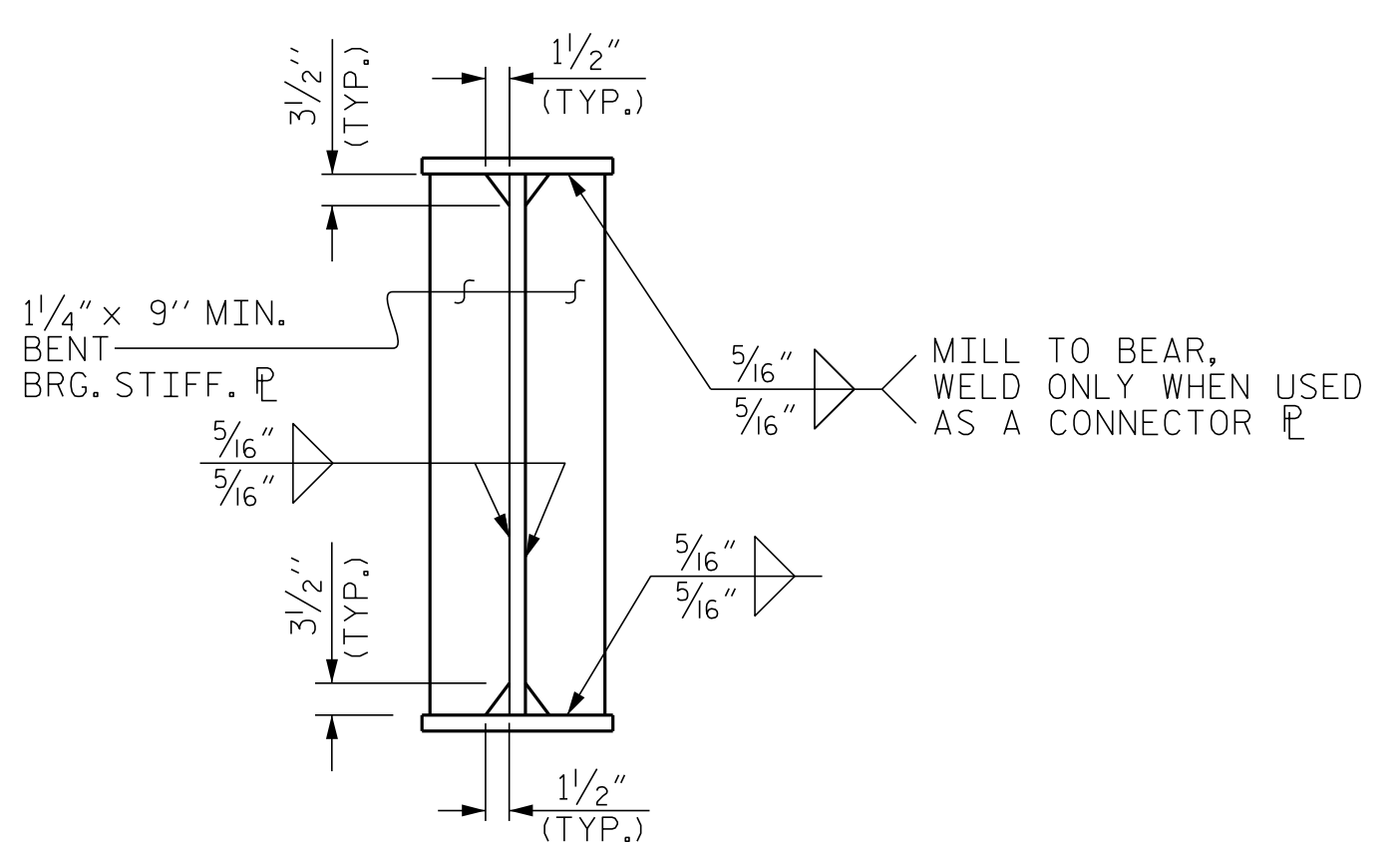


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

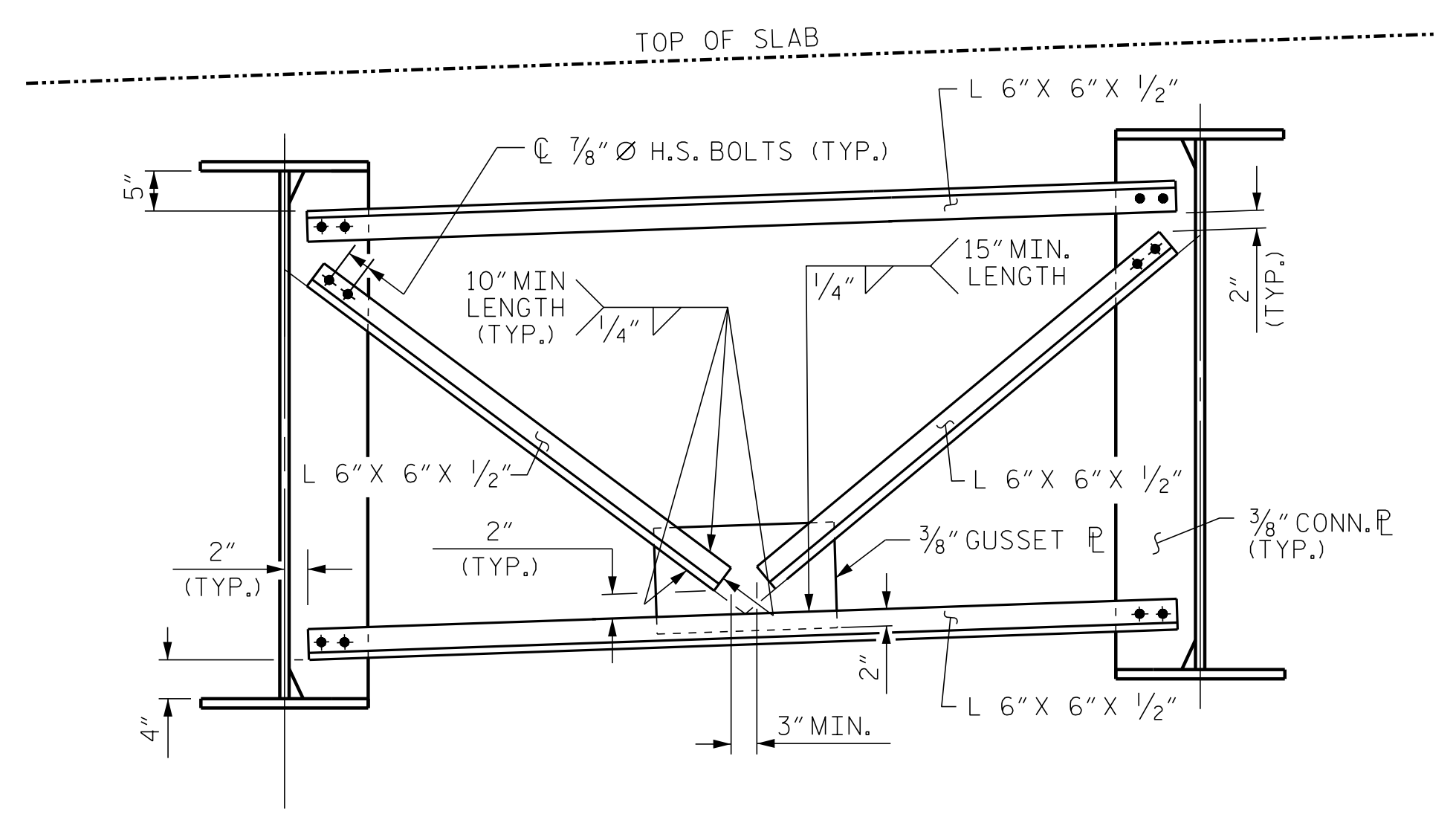
WELD TERMINATION DETAILS



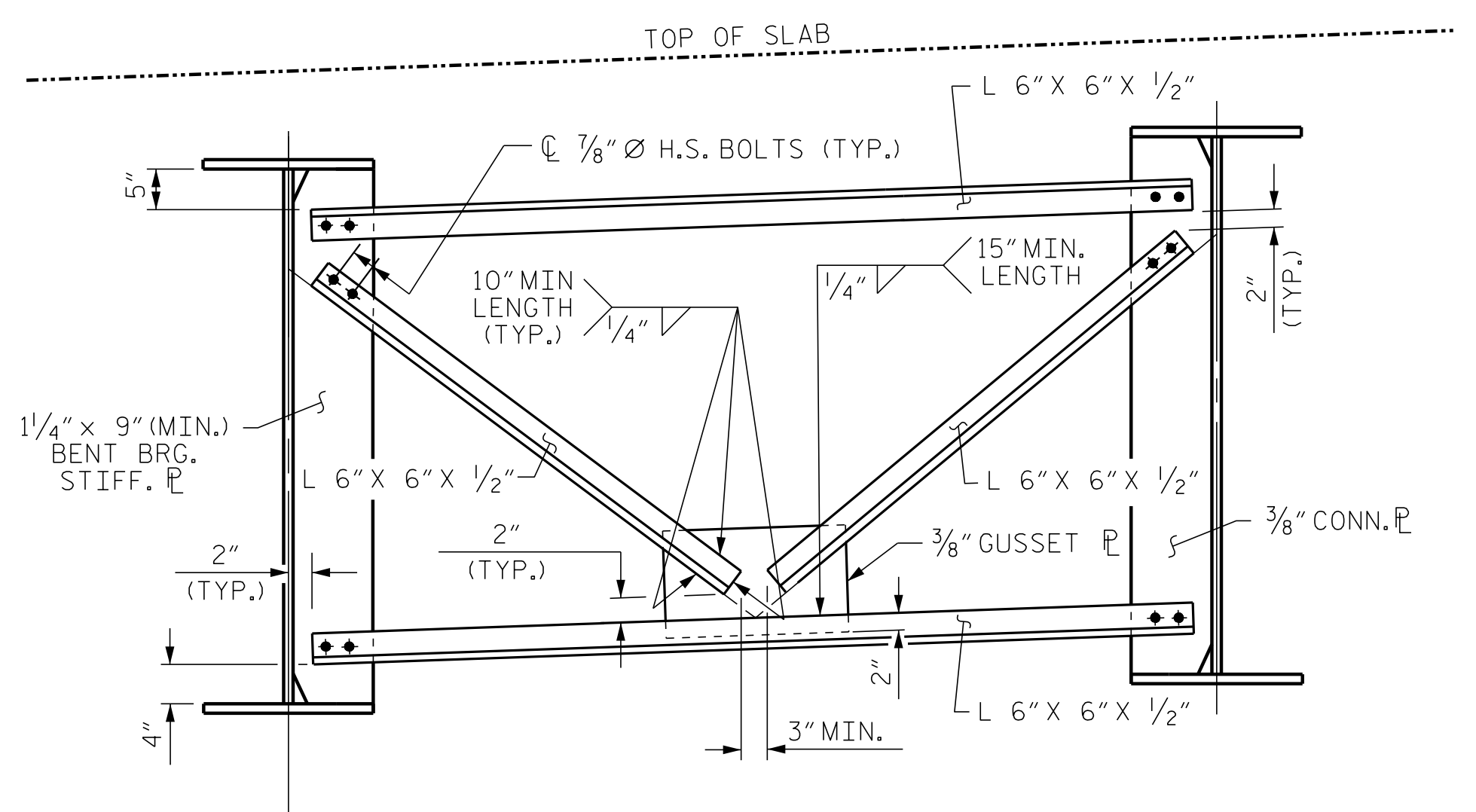
BEARING STIFFENER (AT END BENTS)



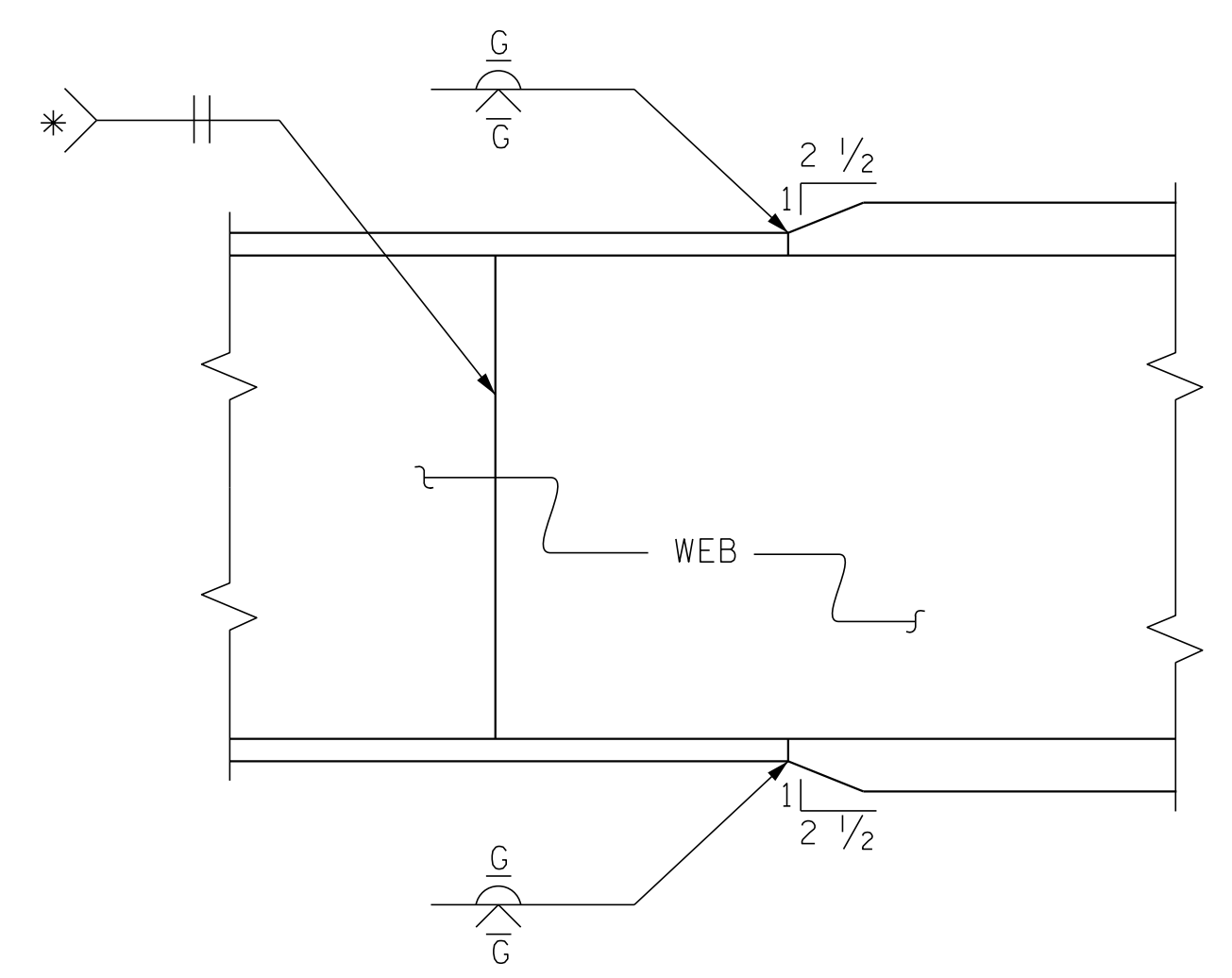
BEARING STIFFENER (AT INTERIOR BENT)



TYPICAL INTERMEDIATE DIAPHRAGM ( D1 )

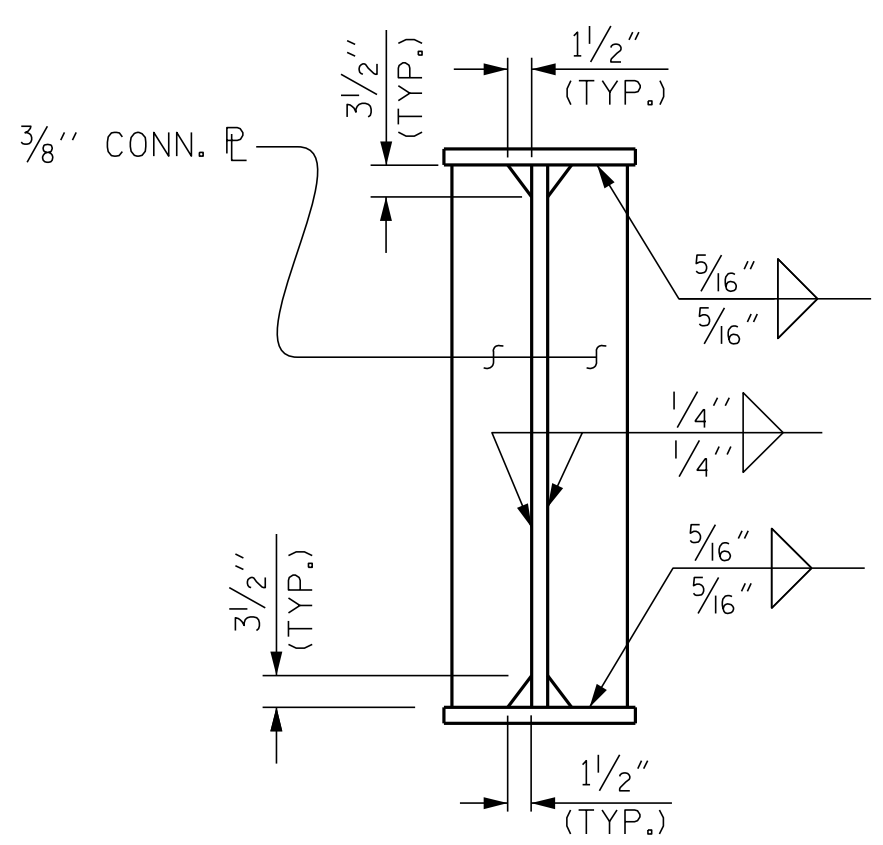


TYPICAL BENT DIAPHRAGM ( D2 )



TYPICAL FLANGE AND WEB BUTT JOINT

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



CONNECTOR PLATE (AT INTERMEDIATE DIAPHRAGM)

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 2 OF 4

ENGINEER OF RECORD:  
 Greg M. Etherill  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/2/2017  
 W ETHERILL ENGINEERING

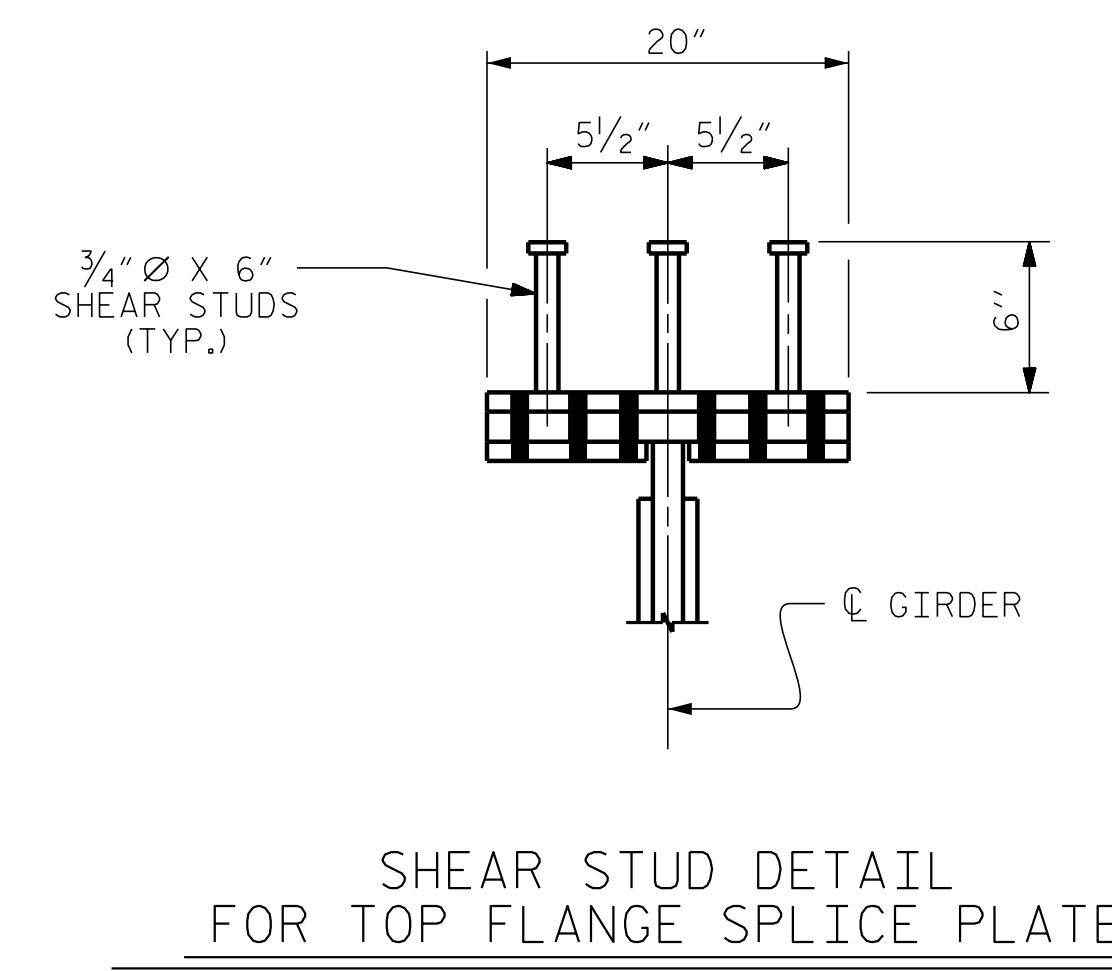
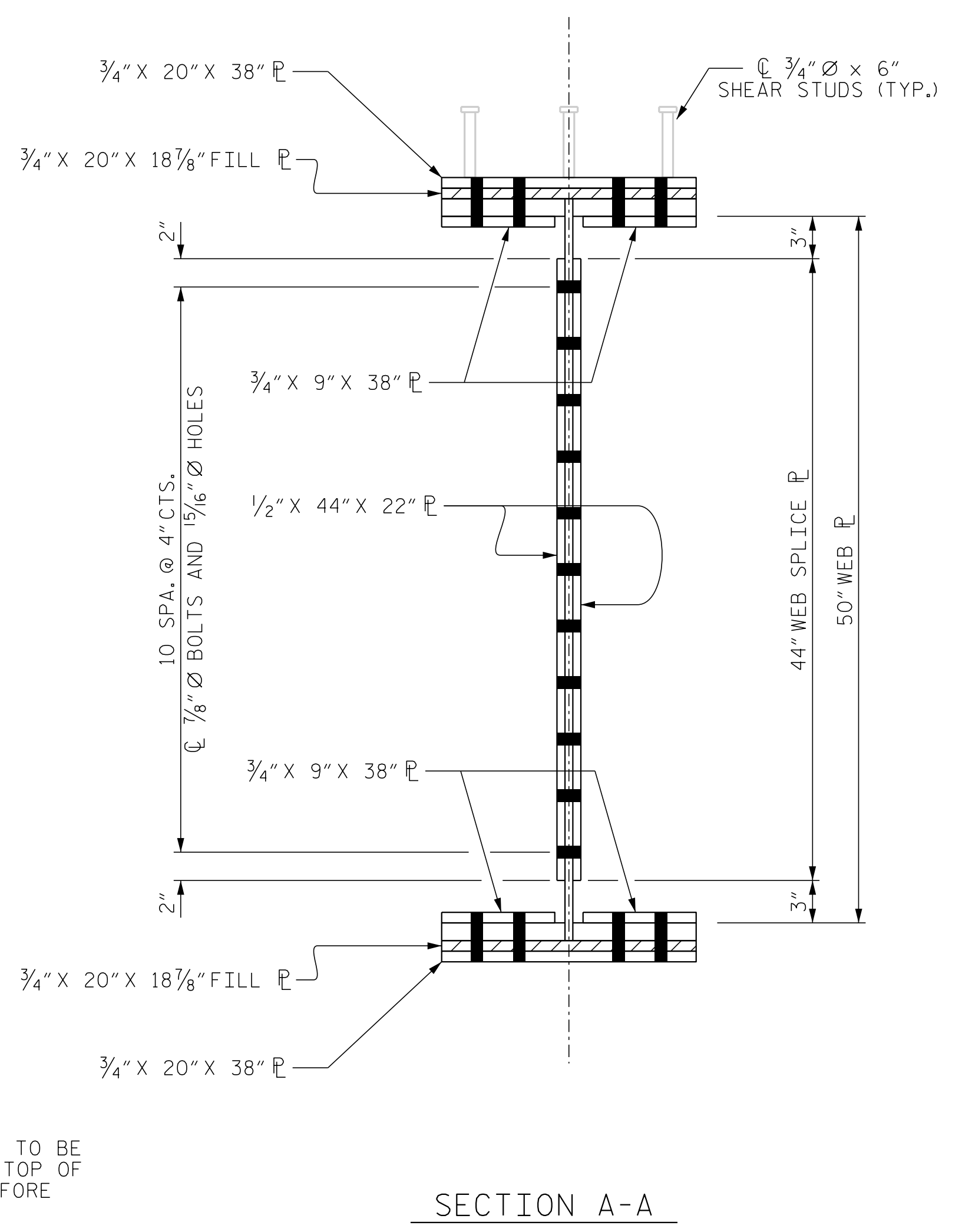
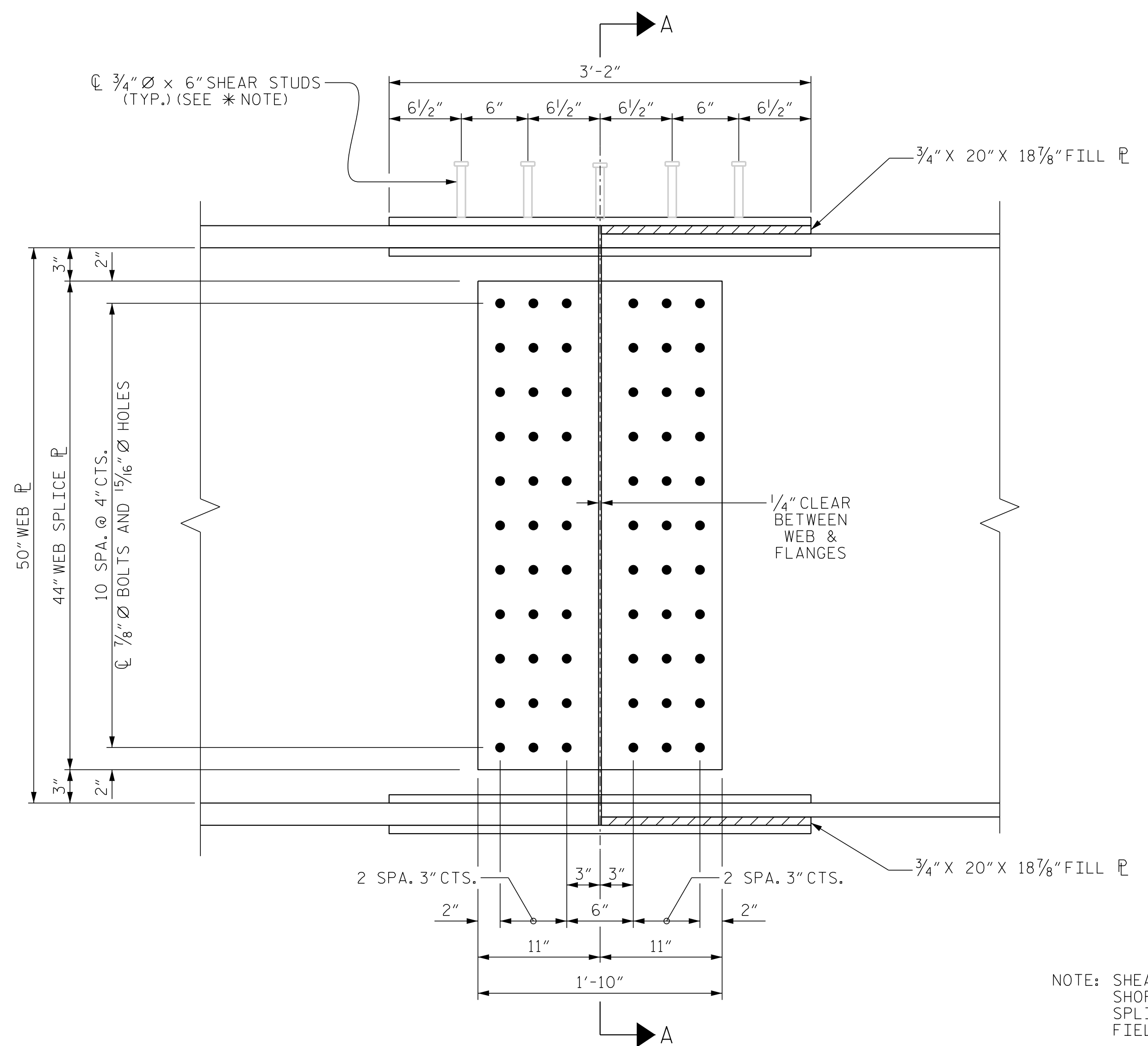
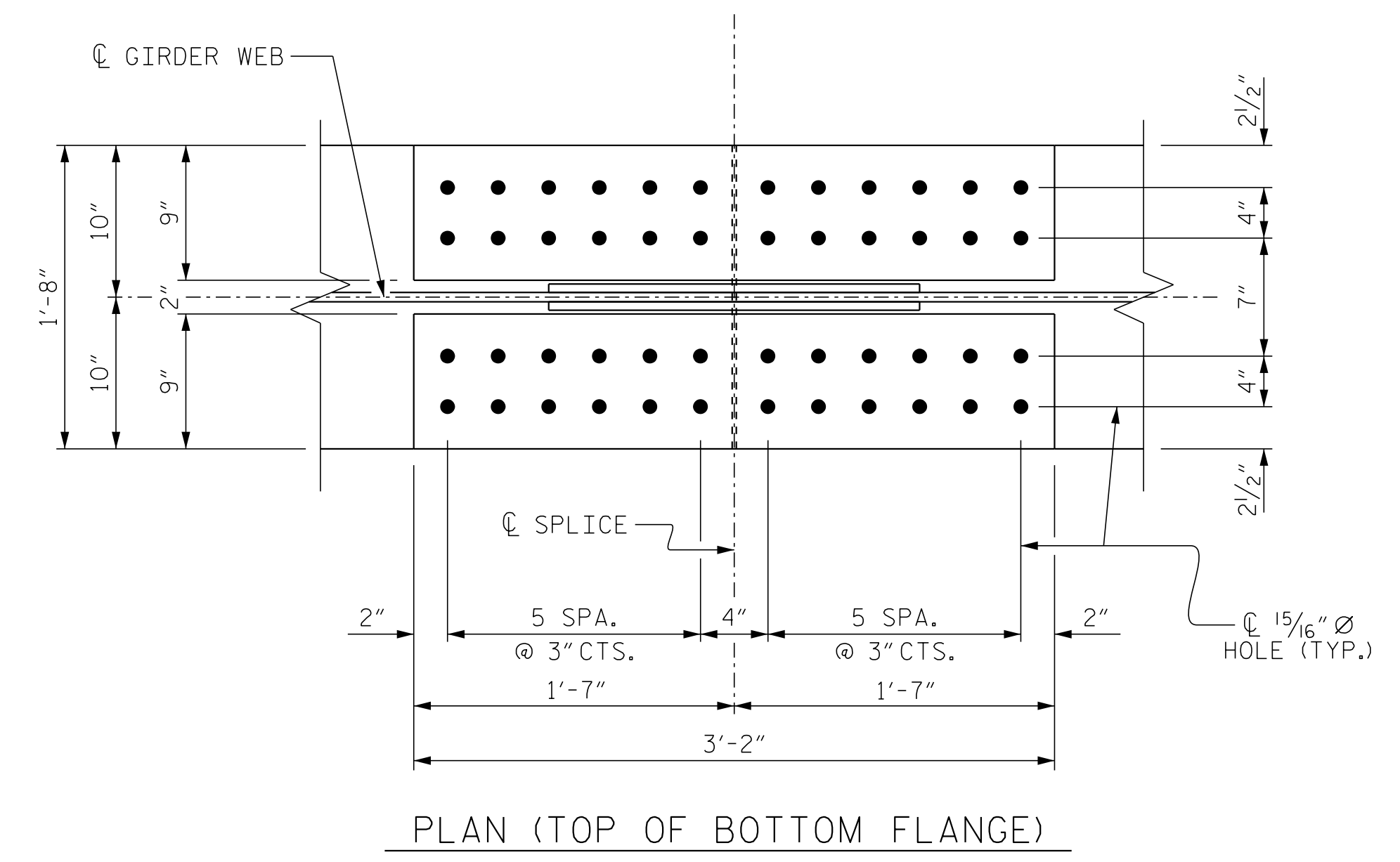
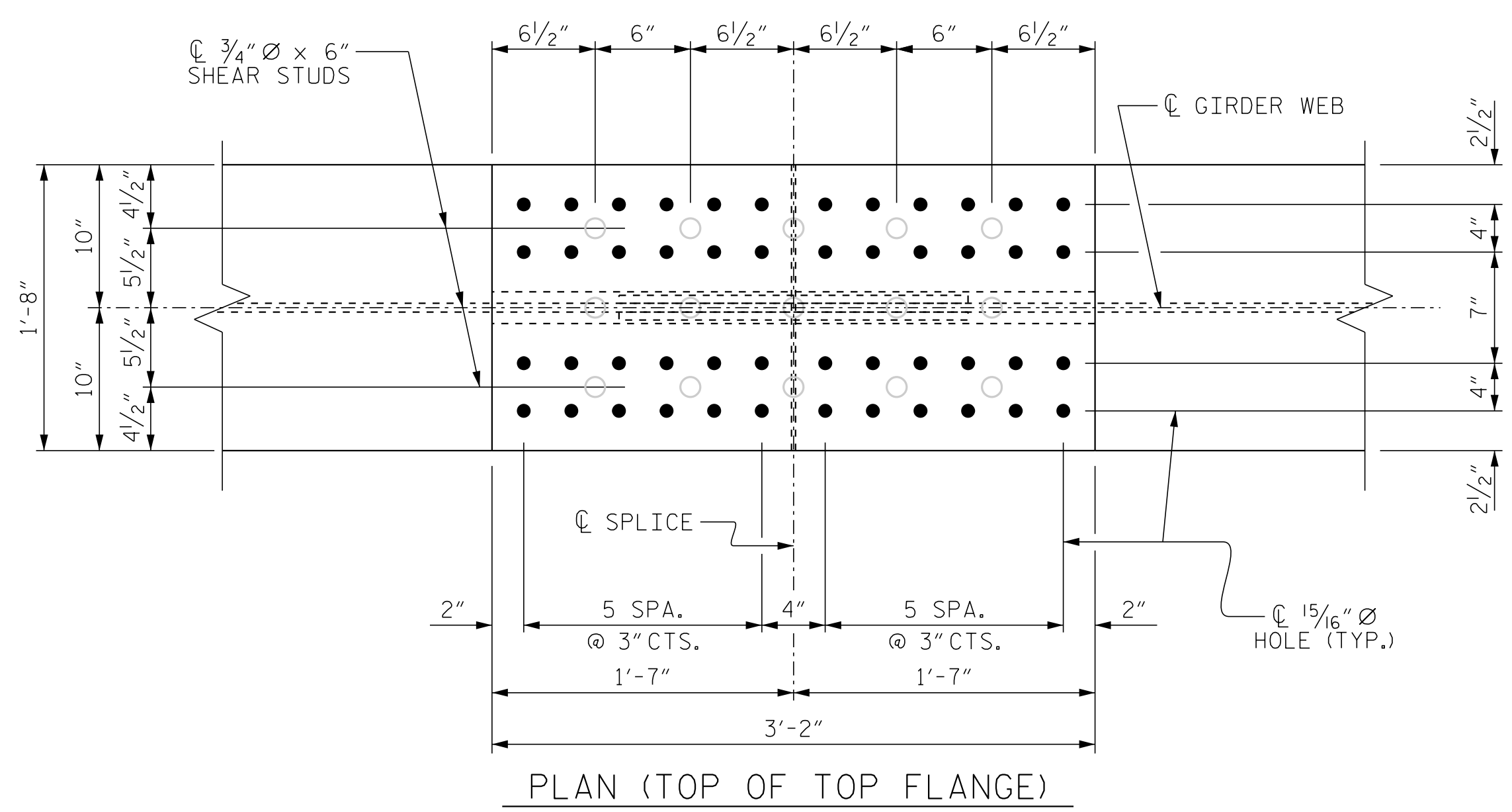
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-11					TOTAL SHEETS 31

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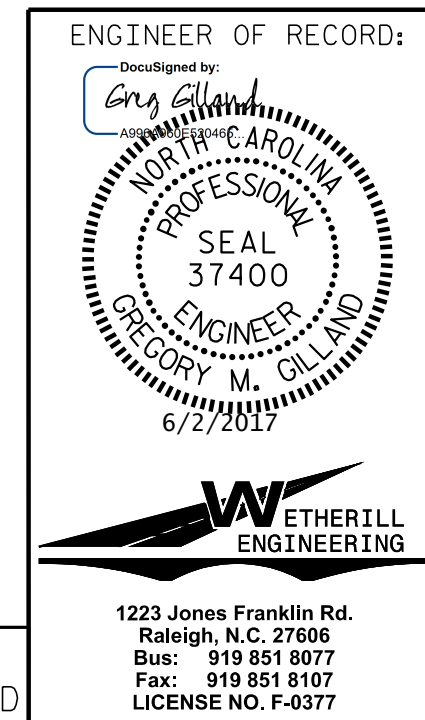
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 6/11/2017 2:27:31 PM

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

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 3 OF 4



ENGINEER OF RECORD:		STATE OF NORTH CAROLINA	
		DEPARTMENT OF TRANSPORTATION	
		RALEIGH	
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS			
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S02-12
2			TOTAL SHEETS 31

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**STRUCTURAL STEEL NOTES :**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

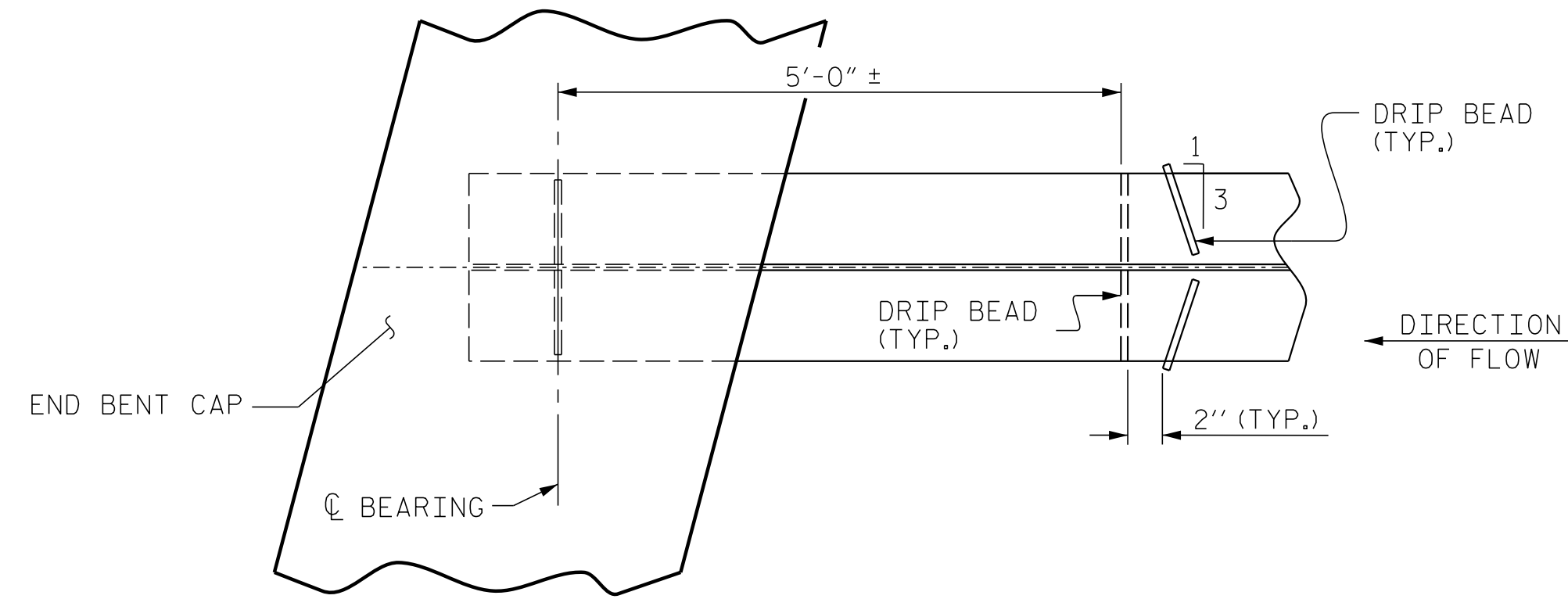
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

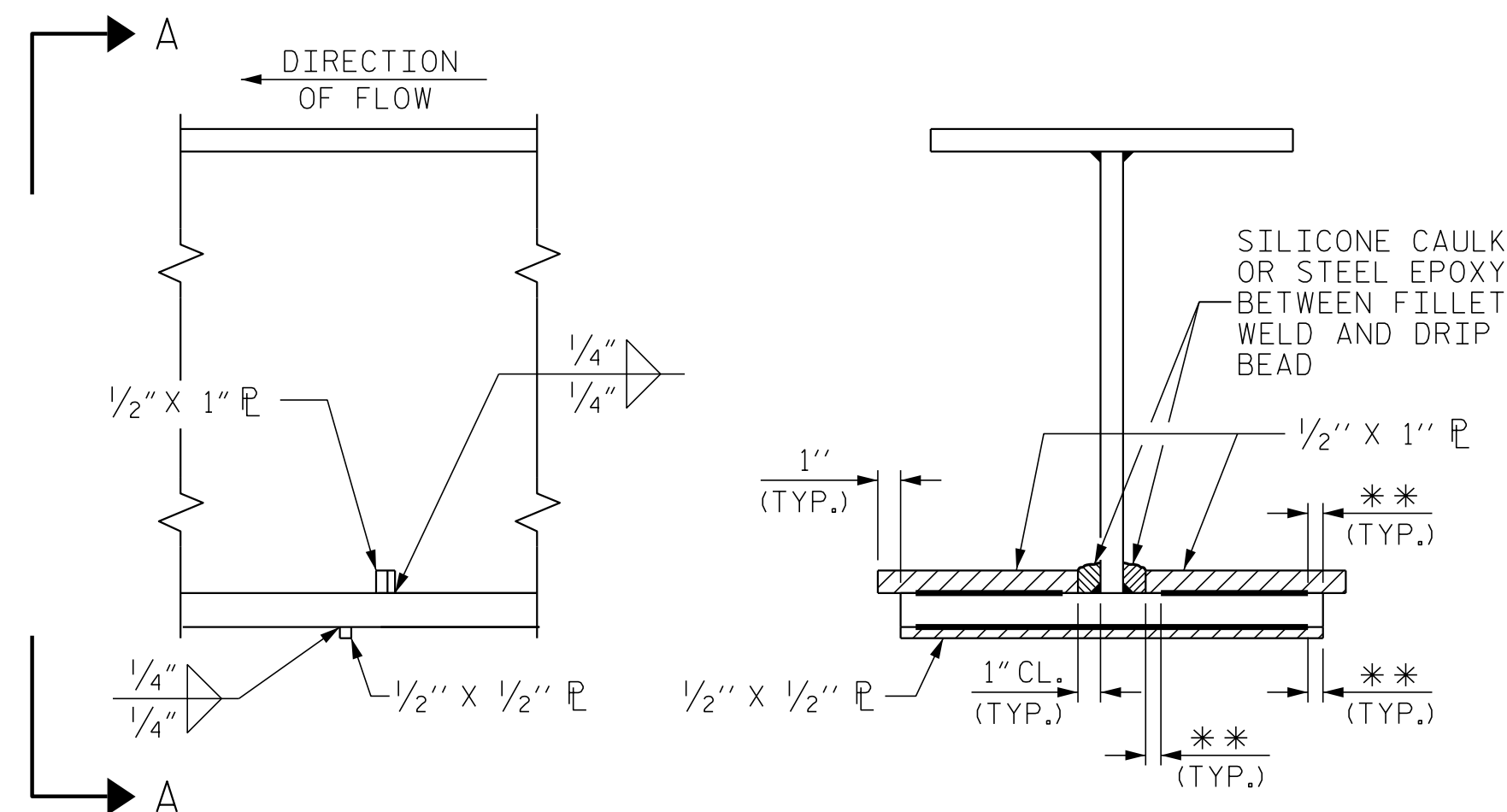
STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

END OF GIRDERS SHALL BE PLUMB.

WHEN BEARING STIFFENERS ARE USED AS CONNECTOR PLATES THE FABRICATOR MAY ADJUST THE WIDTH AS NECESSARY, 9" MINIMUM, BEARING STIFFENERS MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.



**PART PLAN - BOTTOM FLANGE**  
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR)



**SECTION**      **VIEW A-A**  
\*\* SEE "WELD TERMINATION DETAILS" SHEET 2 OF 4  
**DRIP BEAD DETAILS**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

SHEET 4 OF 4

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CHECKED BY : B.C. HUNT      DATE : 4/17

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ENGINEER OF RECORD:  
DocuSigned by:  
*Gregory M. Olland*  
NORTH CAROLINA  
PROFESSIONAL  
SEAL  
37400  
ENGINEER  
GREGORY M. OLLAND  
ETHERILL  
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LICENSE NO. F-0377

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

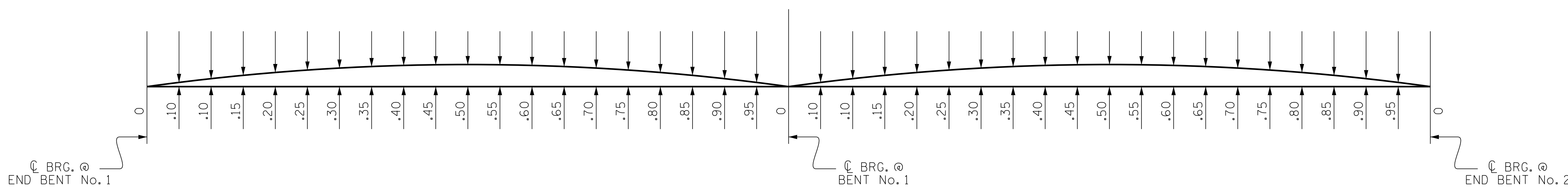
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			31

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN A - GIRDERS 1 THRU 4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.005	0.010	0.014	0.018	0.021	0.023	0.025	0.025	0.025	0.024	0.022	0.020	0.017	0.014	0.010	0.007	0.004	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.020	0.039	0.057	0.072	0.084	0.093	0.099	0.102	0.101	0.096	0.089	0.079	0.067	0.054	0.041	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.005	0.008	0.010	0.012	0.013	0.014	0.014	0.014	0.013	0.012	0.011	0.010	0.008	0.006	0.004	0.003	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.028	0.054	0.079	0.100	0.117	0.129	0.138	0.141	0.140	0.133	0.123	0.110	0.094	0.076	0.057	0.039	0.024	0.011	0.003	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.024	0.045	0.064	0.080	0.094	0.106	0.114	0.121	0.124	0.126	0.124	0.121	0.114	0.106	0.094	0.080	0.064	0.045	0.024	0.000
REQUIRED CAMBER ↑	0	5/16"	13/16"	11/16"	23/16"	29/16"	213/16"	3"	31/8"	33/16"	31/8"	215/16"	23/4"	21/2"	23/16"	113/16"	17/16"	11/16"	11/16"	5/16"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
SPAN B - GIRDERS 1 THRU 4																					
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.001	0.002	0.004	0.007	0.010	0.014	0.017	0.020	0.022	0.024	0.025	0.025	0.025	0.023	0.021	0.018	0.014	0.010	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.002	0.008	0.017	0.028	0.041	0.054	0.067	0.079	0.089	0.096	0.101	0.102	0.099	0.093	0.084	0.072	0.057	0.039	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.000	0.001	0.003	0.004	0.006	0.008	0.010	0.011	0.012	0.013	0.014	0.014	0.014	0.013	0.012	0.010	0.008	0.005	0.003	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.003	0.011	0.024	0.039	0.057	0.076	0.094	0.110	0.123	0.133	0.140	0.141	0.138	0.129	0.117	0.100	0.079	0.054	0.028	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.024	0.045	0.064	0.080	0.094	0.106	0.114	0.121	0.124	0.126	0.124	0.121	0.114	0.106	0.094	0.080	0.064	0.045	0.024	0.000
REQUIRED CAMBER ↑	0	5/16"	11/16"	11/16"	17/16"	113/16"	23/16"	21/2"	23/4"	215/16"	31/8"	33/16"	31/8"	3"	213/16"	29/16"	23/16"	111/16"	13/16"	5/8"	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



**SCHEMATIC CAMBER ORDINATES**

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
DEAD LOAD  
DEFLECTION TABLES

REVISIONS

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

SHEET NO.  
S02-14  
TOTAL SHEETS  
31

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 4/17

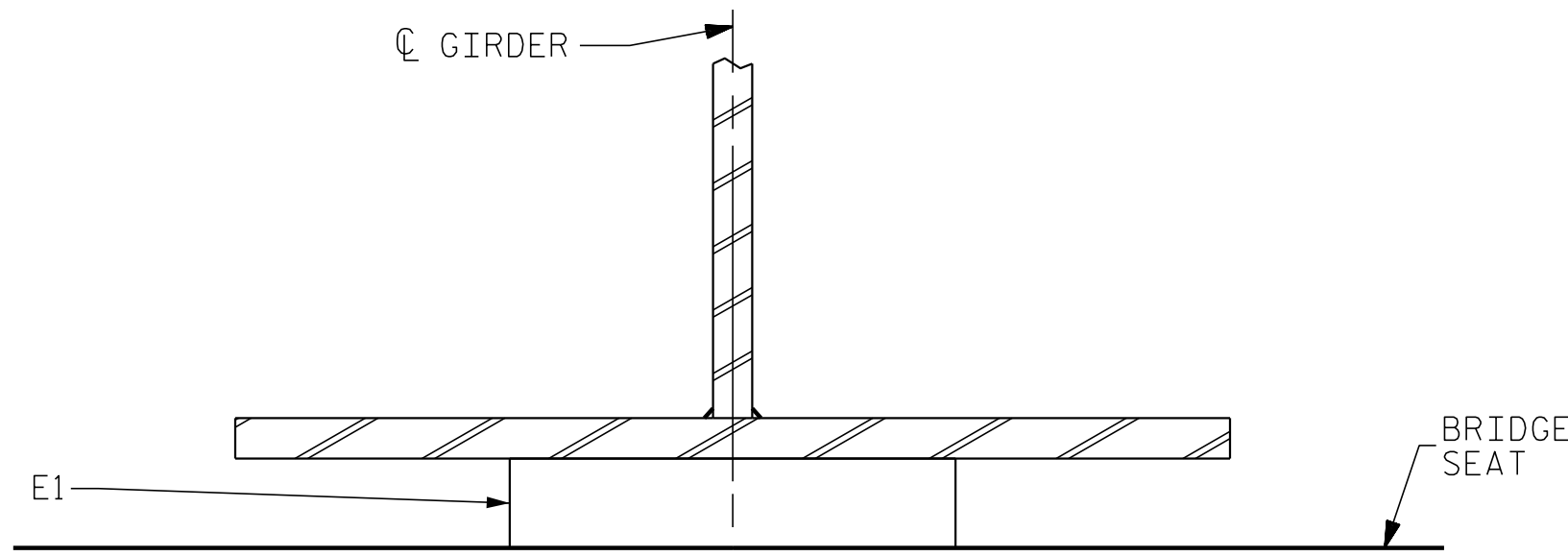
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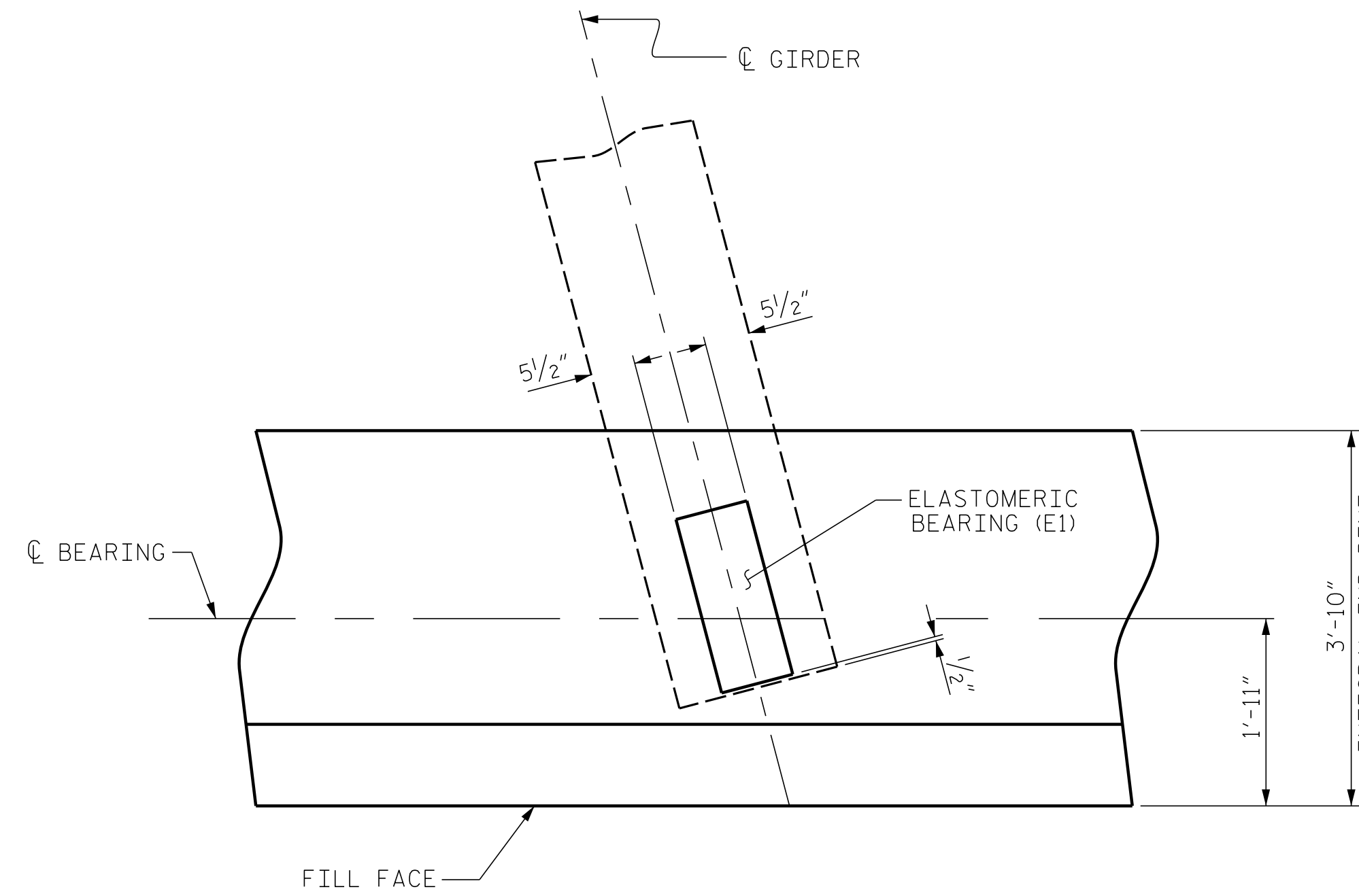
NOTES

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.

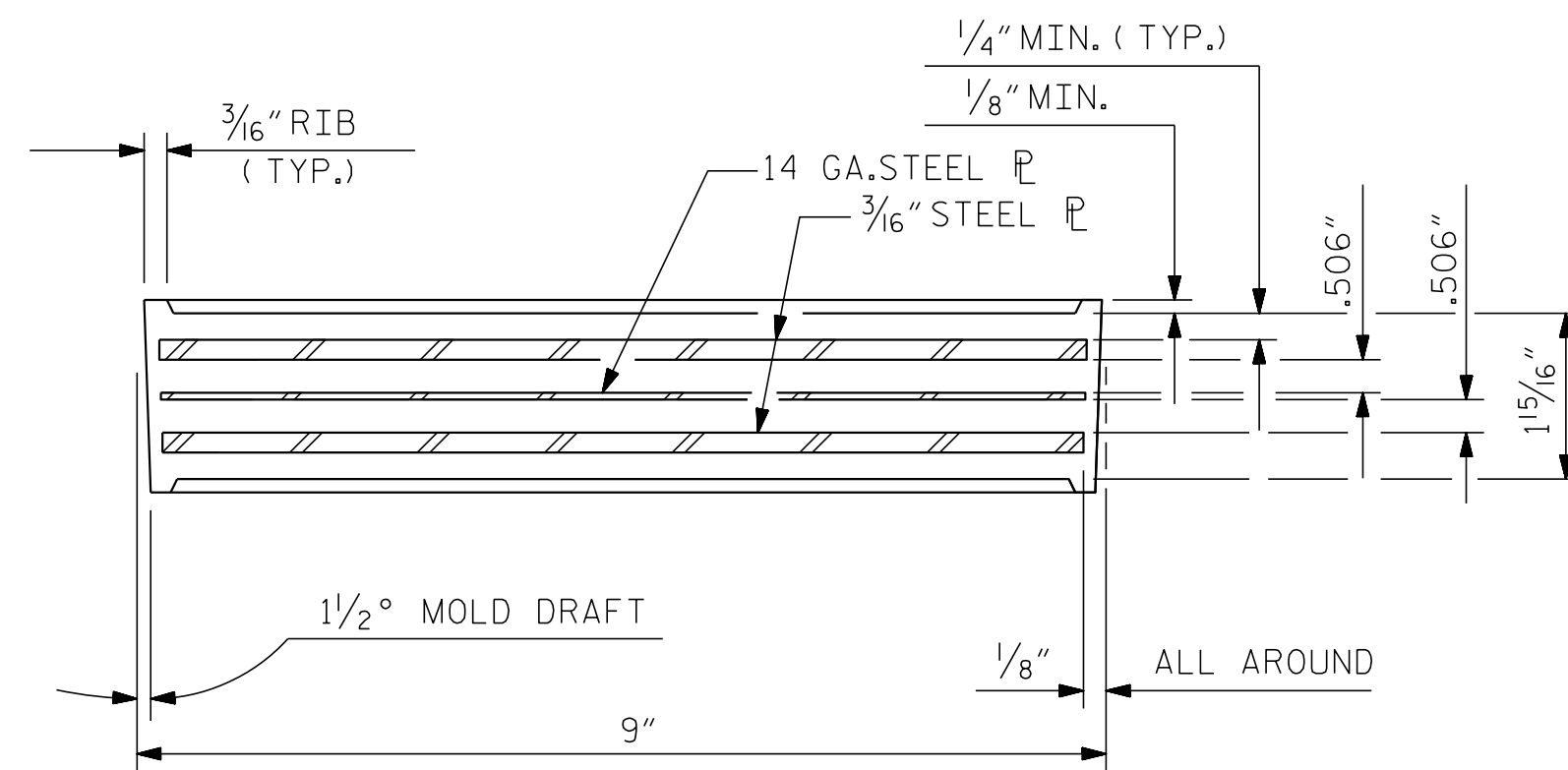


FIXED  
END VIEW

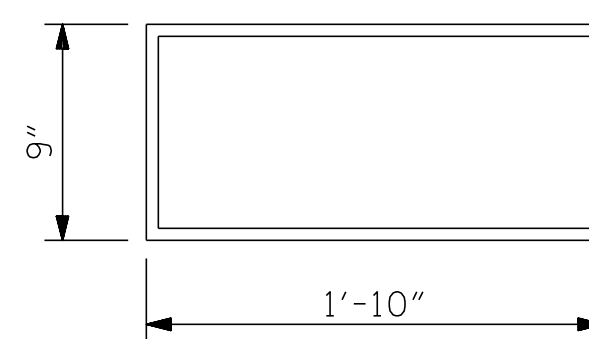


PLAN VIEW AT END BENTS

(SHOWING INTEGRAL END BENT)



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 ( 8 REQ'D )  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE IV

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

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

ENGINEER OF RECORD:  
  
 GREGORY M. OLLAND  
 6/2/2017  
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 Fax: 919 851 8107  
 LICENSE NO. F-0377

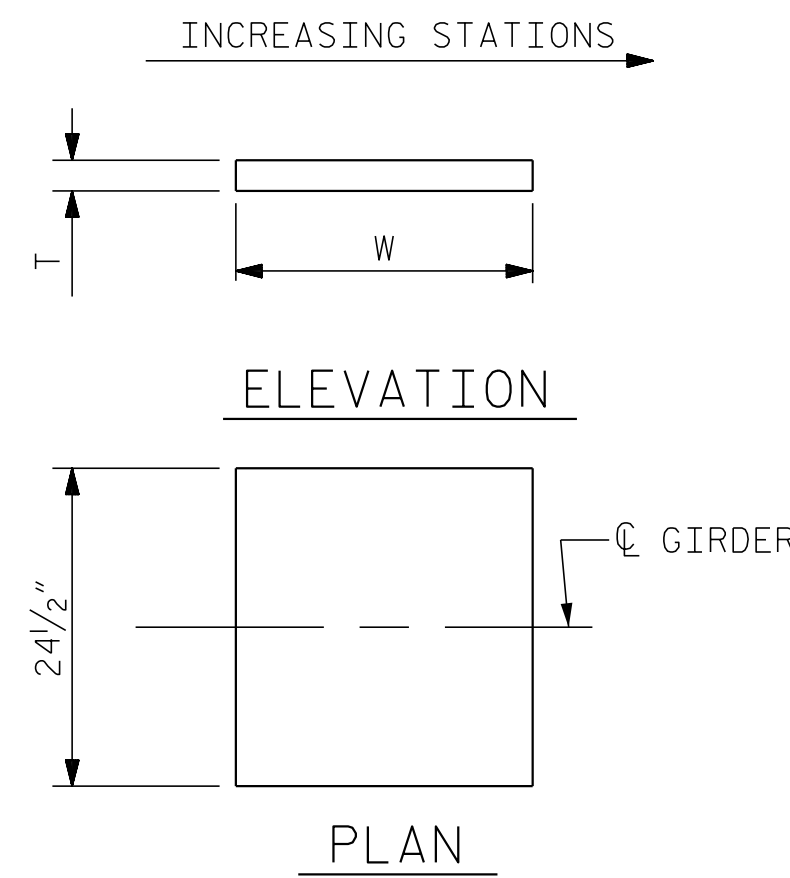
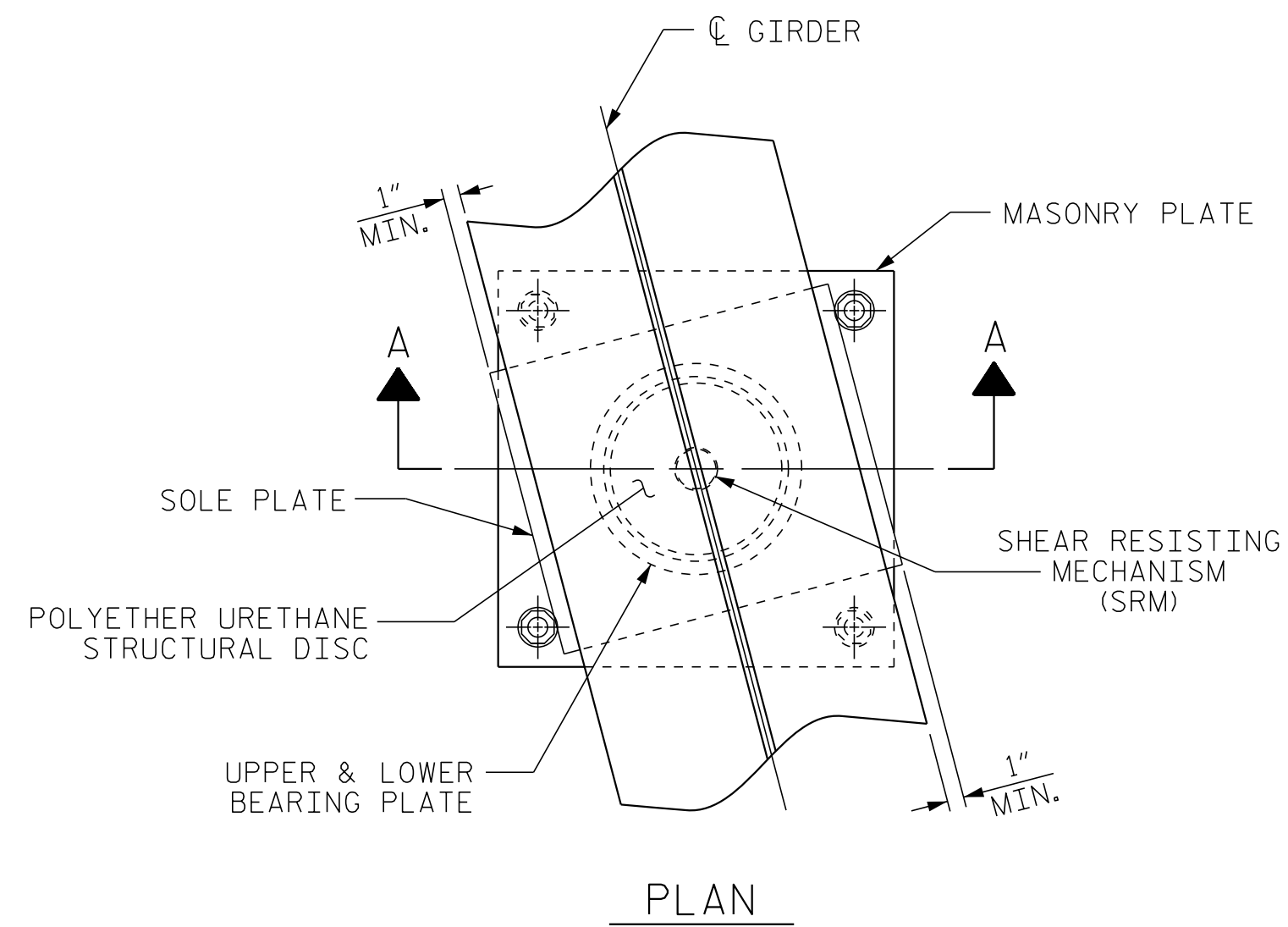
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 ELASTOMERIC BEARING  
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S02-15
1			3			TOTAL SHEETS
2			4			31

DOCUMENT NOT CONSIDERED FINAL  
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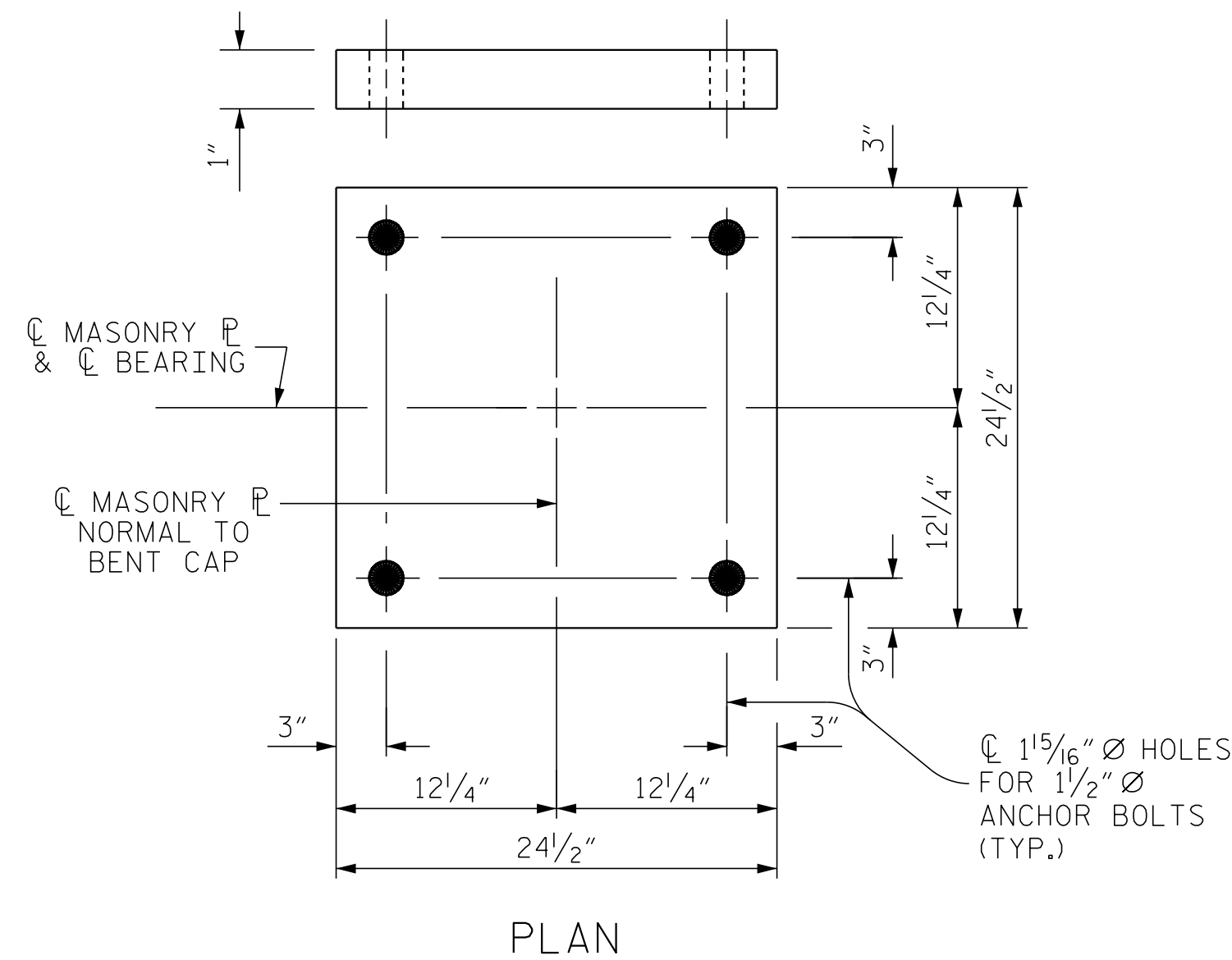
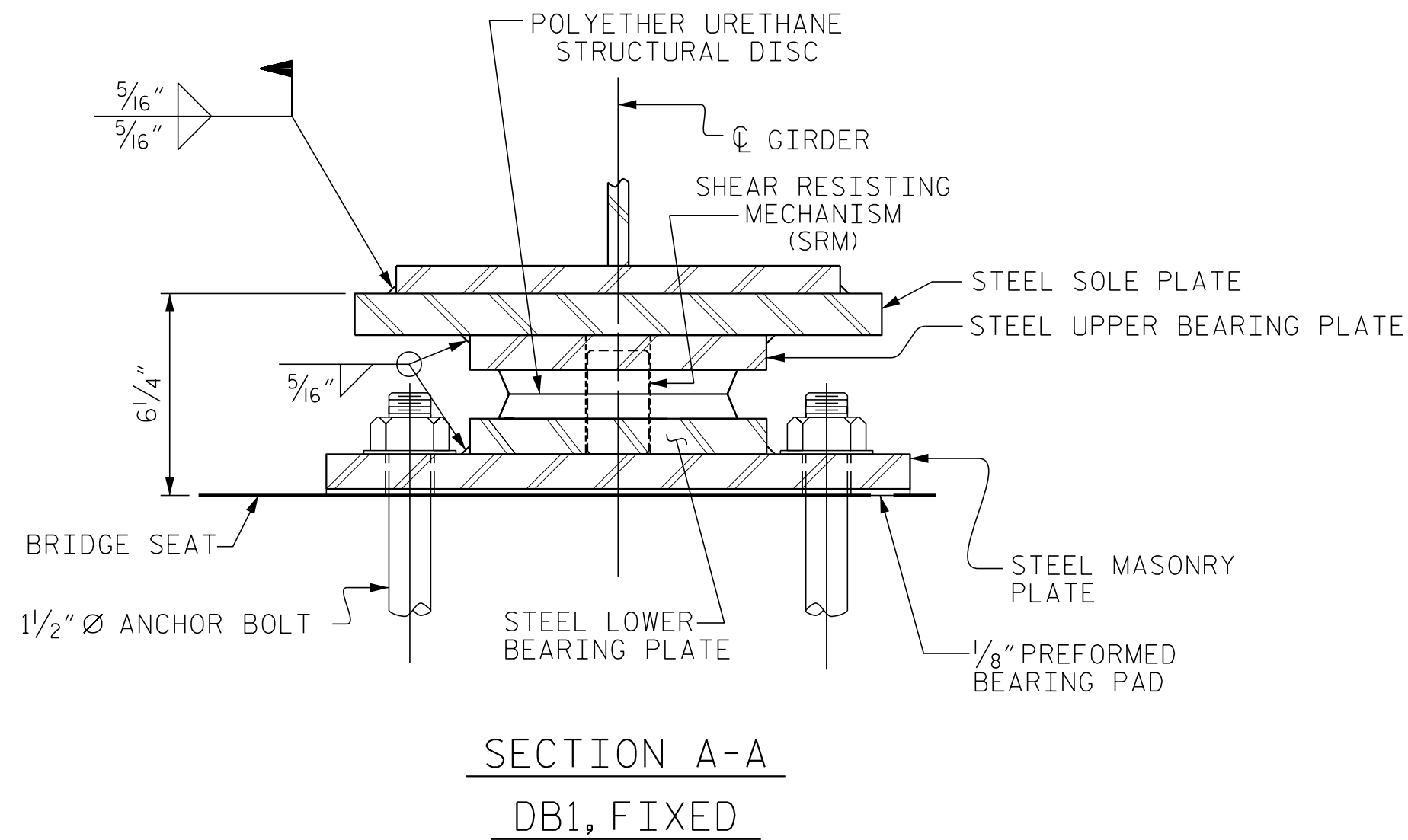
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DRAWN BY : D. HODGE DATE : 4/17  
 CHECKED BY : B.C. HUNT DATE : 4/17



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

SOLE PLATE DETAILS



MASONRY PLATE DETAILS

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.  
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.  
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.  
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.  
THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

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DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY			DC	DW	LIVE LL+IM		
DB1 (FIXED)	M1	BENT 1	4	289	37	261	115	0.0

DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 4/17

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ENGINEER OF RECORD:  
*Gregory M. O'Neil*  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 37400  
6/2/2017

ETHERILL ENGINEERING  
1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

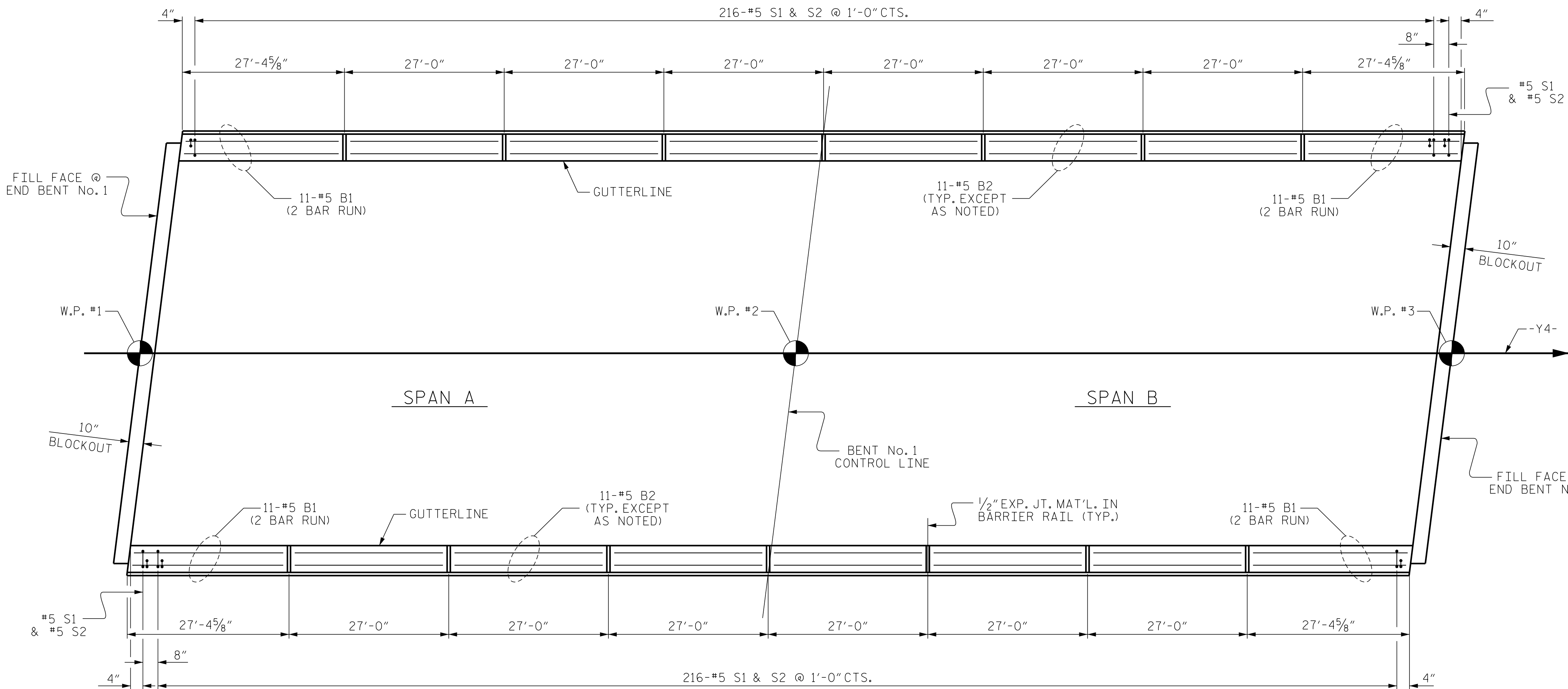
**DISC BEARING DETAILS**

REVISIONS

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

SHEET NO. S02-16  
TOTAL SHEETS 31





PLAN OF CONCRETE BARRIER RAIL

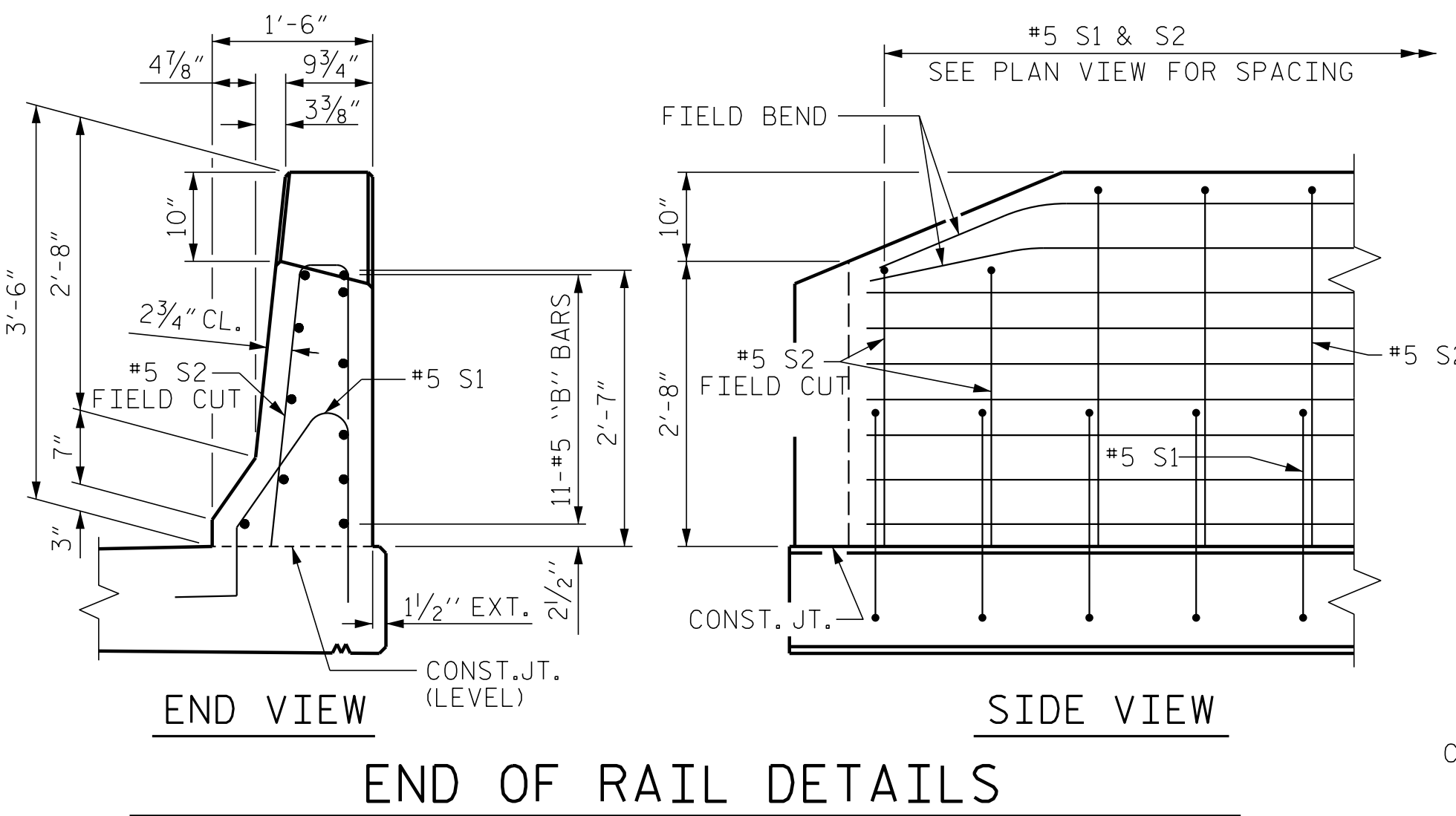
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					
BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	434	#5	1	4'-8"	2112
* S2	434	#5	2	7'-0"	3169
* B1	88	#5	STR	15'-5"	1415
* B2	132	#5	STR	26'-7"	3660
* EPOXY COATED REINFORCING STEEL					10,356 LBS.
CLASS AA CONCRETE					58.9 CU. YDS.
CONCRETE BARRIER RAIL					433.54 LIN. FT.

NOTES

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

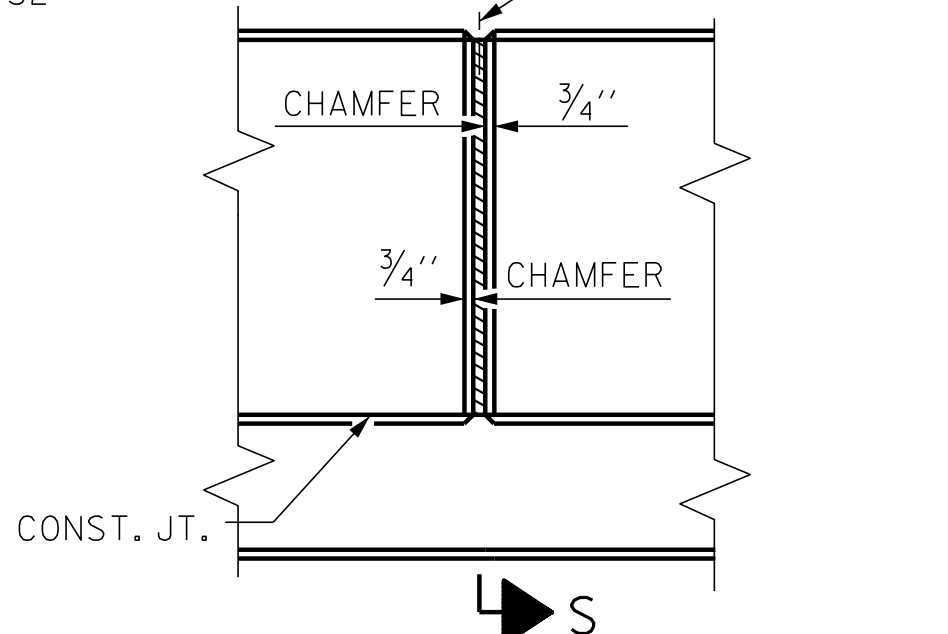
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

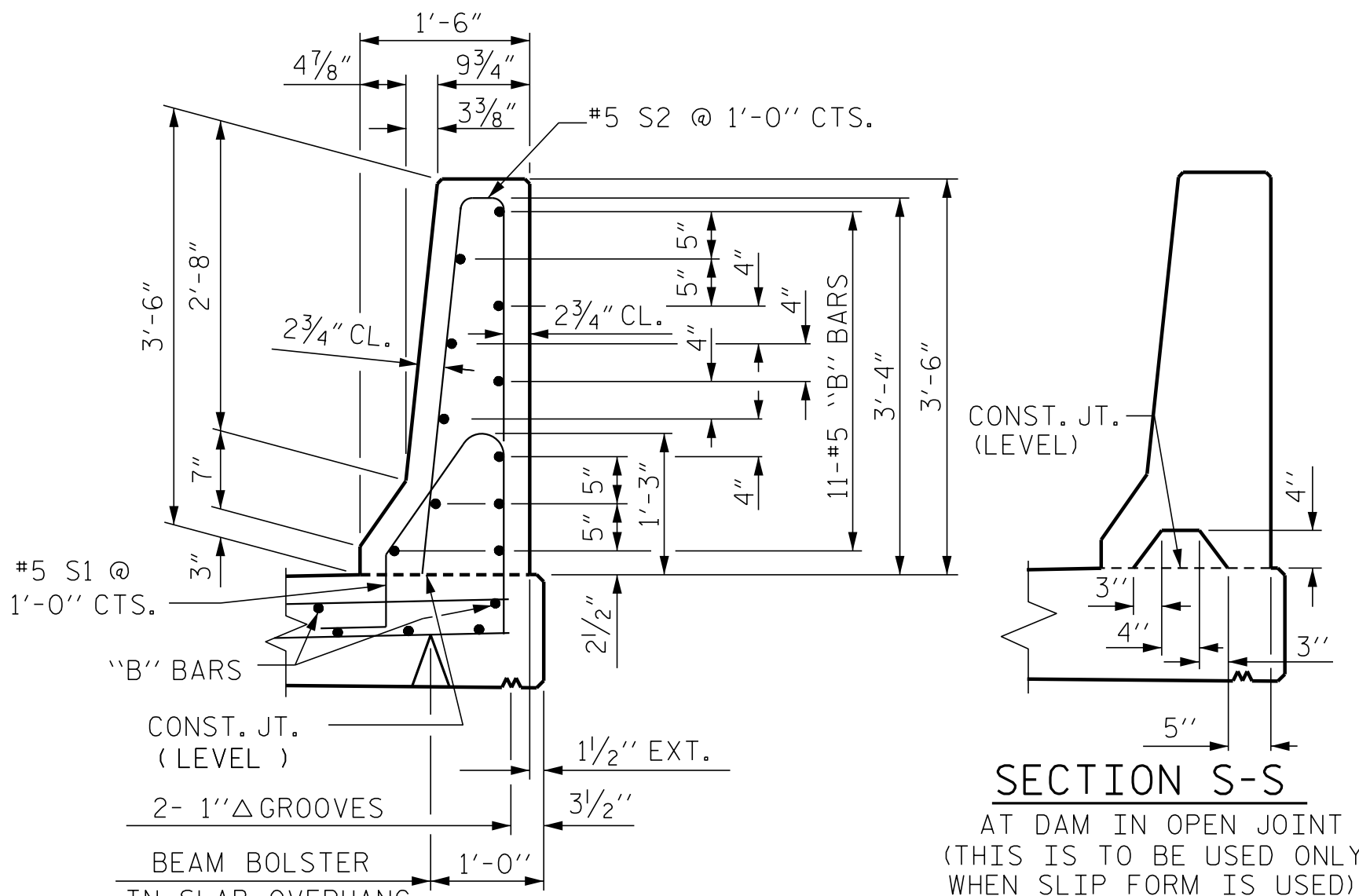


END OF RAIL DETAILS

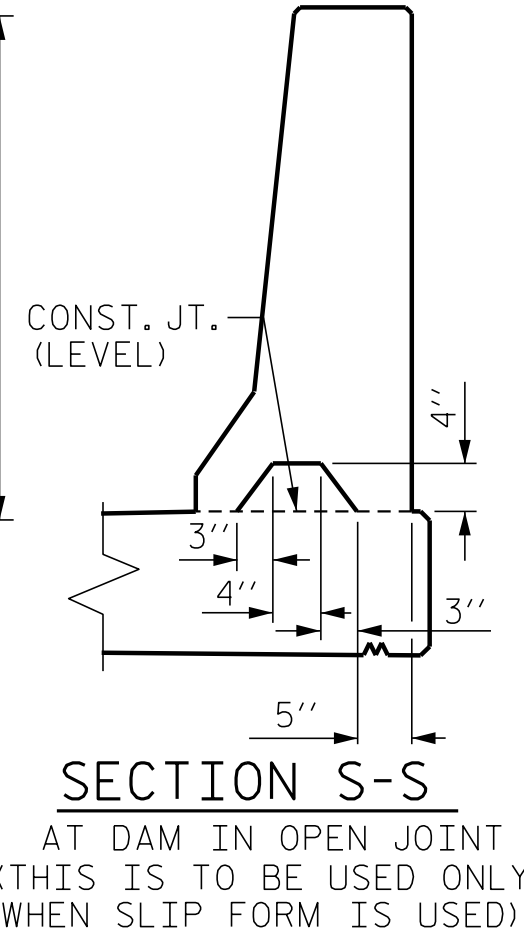
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



SECTION THRU RAIL



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

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

ENGINEER OF RECORD:  
Designed by: Greg Gilliam  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 37400  
GREGORY M. OIL AND LAND  
6/27/2017  
ETHERILL ENGINEERING  
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LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-17					TOTAL SHEETS 31

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DRAWN BY: D. HODGE DATE: 4/17  
CHECKED BY: B.C. HUNT DATE: 4/17

DOCUMENT NOT CONSIDERED FINAL  
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NOTES

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

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

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

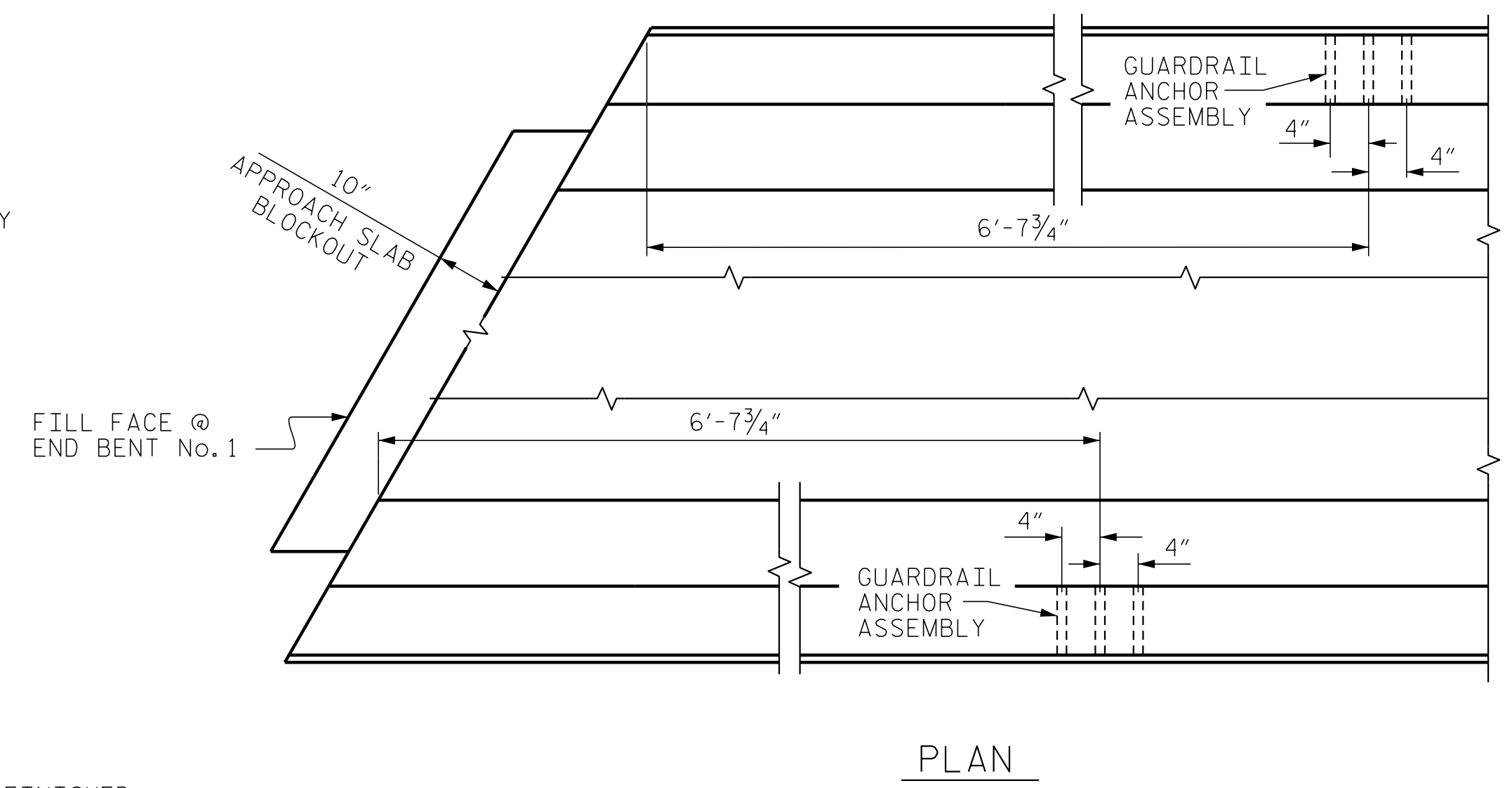
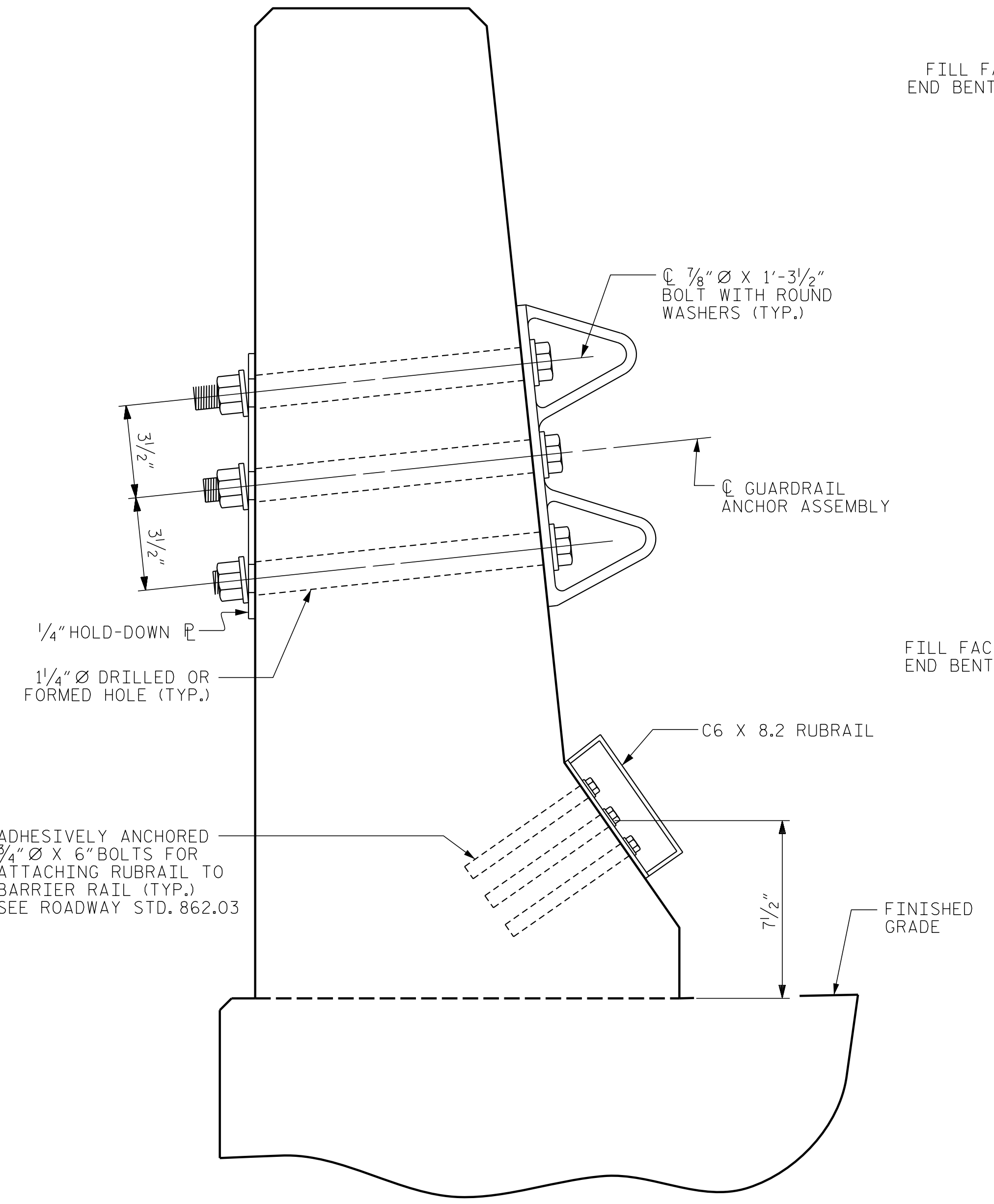
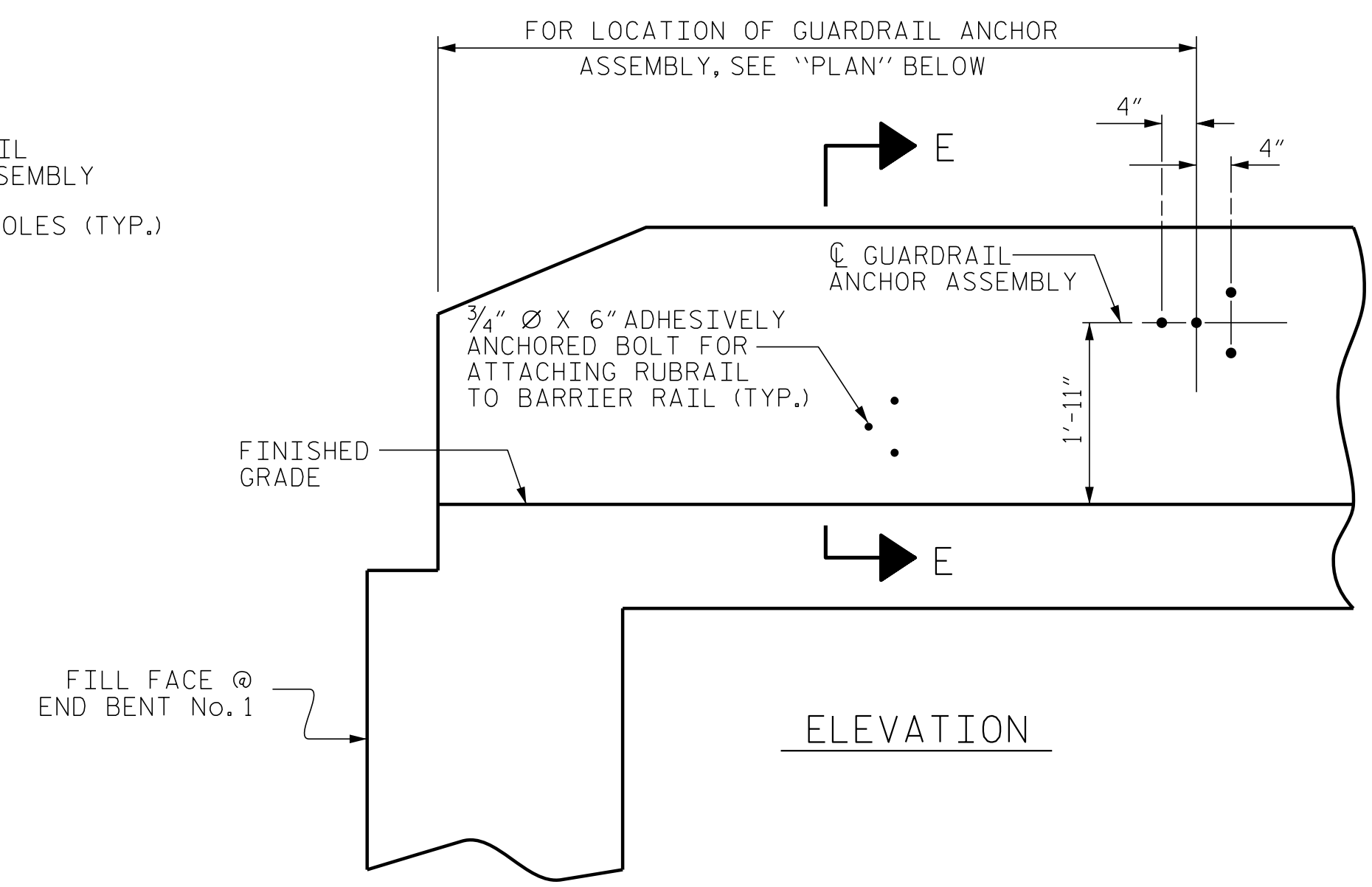
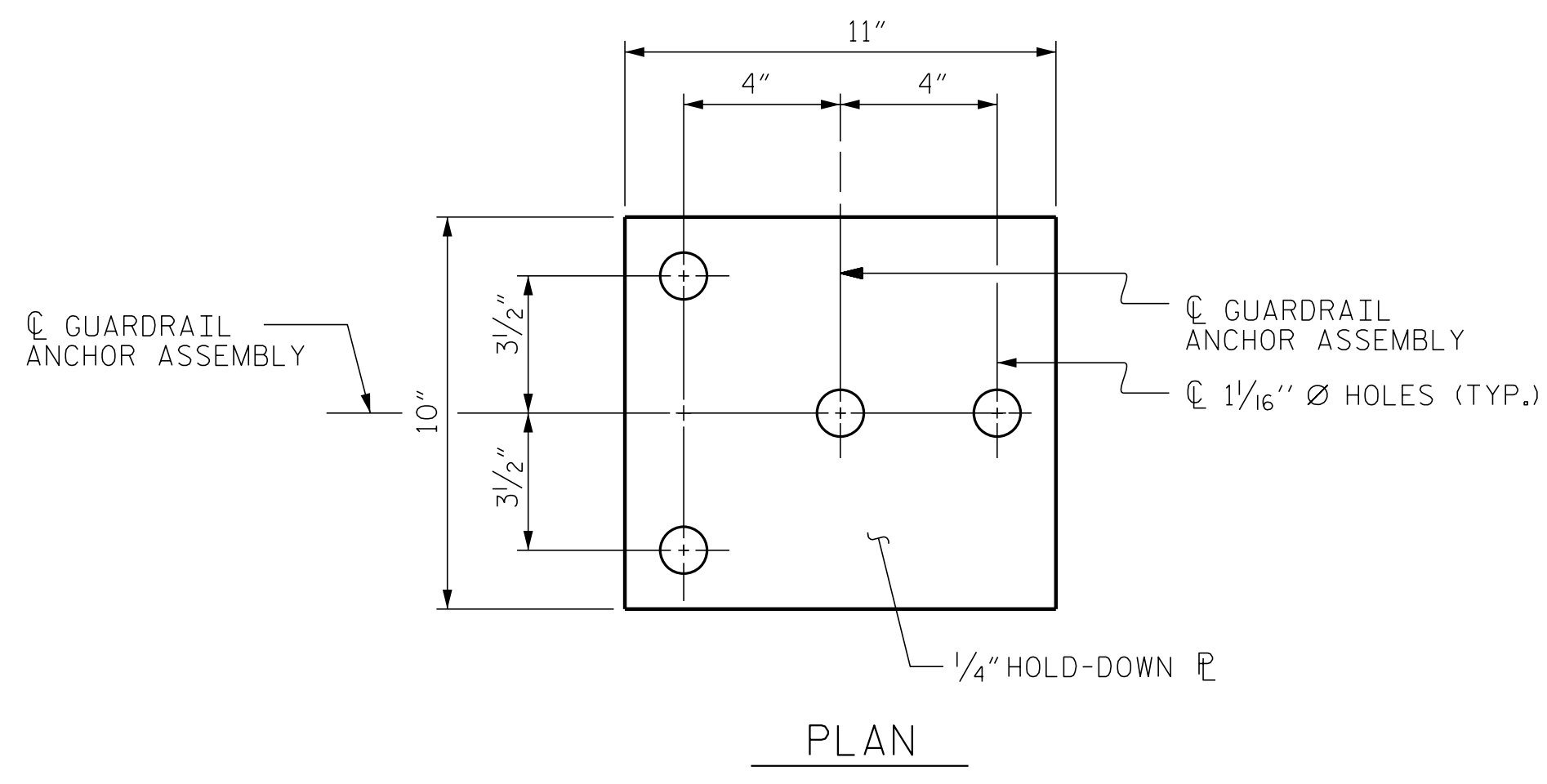
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

THE 1 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

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR.

SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

ENGINEER OF RECORD:  
  
 GREGORY M. OLLAND  
 6/2/2017  
 ETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
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 Fax: 919 851 8107  
 LICENSE NO. F-0377

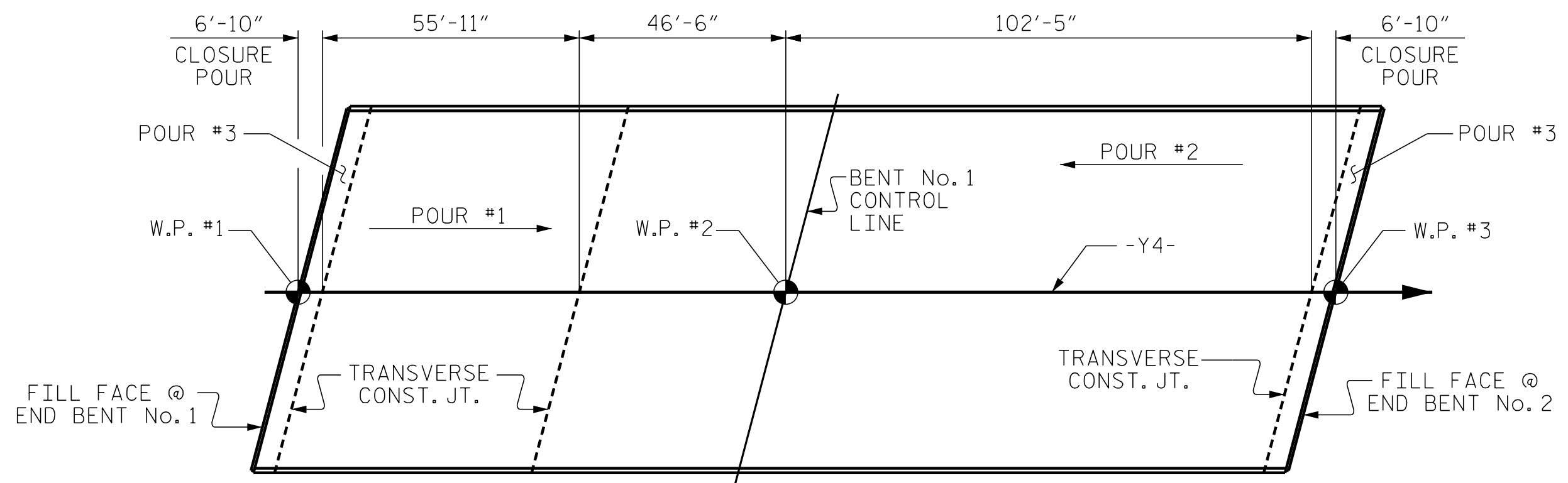
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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SHEET NO. S02-18					TOTAL SHEETS 31

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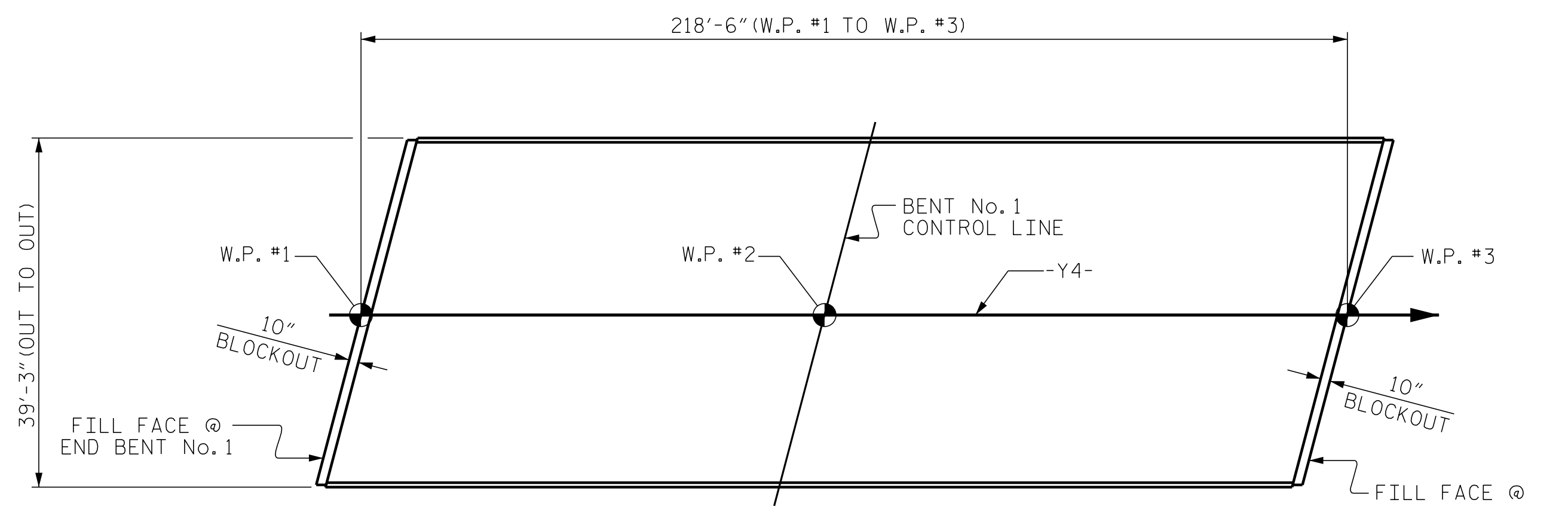
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ASSEMBLED BY : D. HODGE	DATE : 4/17
CHECKED BY : B.C. HUNT	DATE : 4/17
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

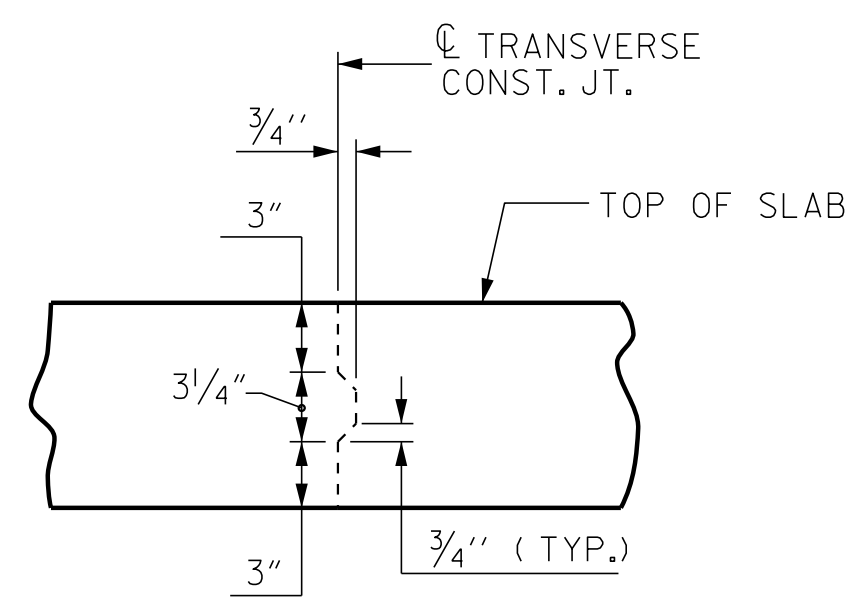




POURING SEQUENCE



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB  
( SQ. FT. = 8,576 )

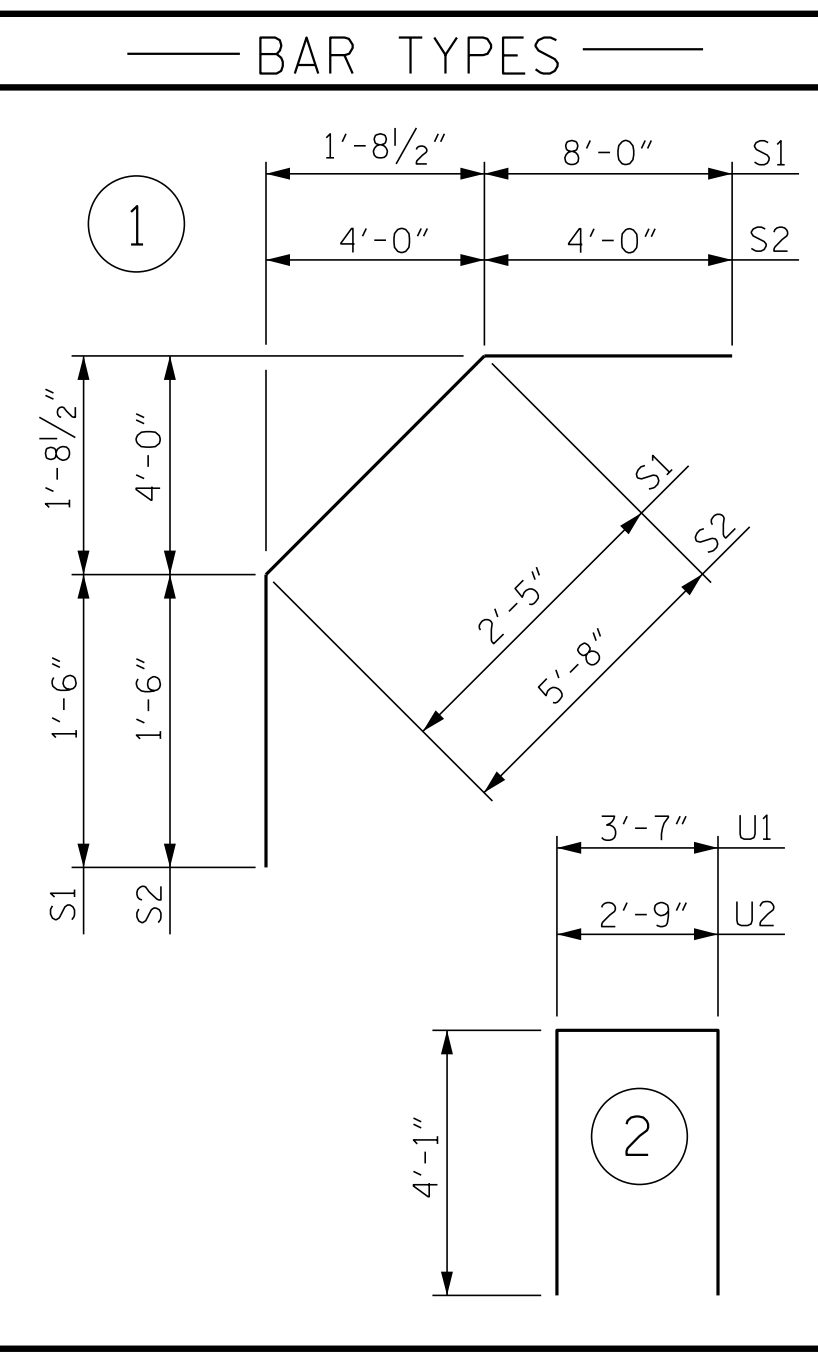


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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	957 SQ.FT.
BRIDGE DECK	7,154 SQ.FT.
TOTAL	8,111 SQ.FT.



ALL BAR DIMENSIONS ARE OUT TO OUT

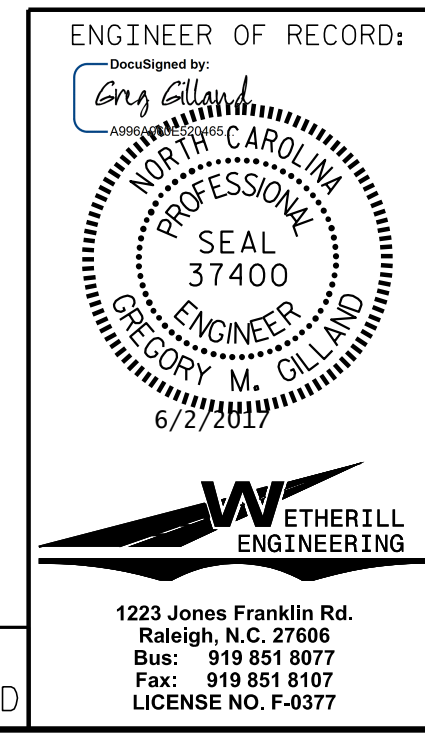
BILL OF MATERIAL												
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	450	#5	STR	38'-11"	18266	A201	2	#5	STR	37'-7"	78	
A2	450	#5	STR	38'-11"	18266	A202	2	#5	STR	35'-10"	75	
						A203	2	#5	STR	34'-1"	71	
* A101	2	#5	STR	37'-7"	78	A204	2	#5	STR	32'-5"	68	
* A102	2	#5	STR	35'-10"	75	A205	2	#5	STR	30'-8"	64	
* A103	2	#5	STR	34'-1"	71	A206	2	#5	STR	29'-0"	60	
* A104	2	#5	STR	32'-5"	68	A207	2	#5	STR	27'-3"	57	
* A105	2	#5	STR	30'-8"	64	A208	2	#5	STR	25'-7"	53	
* A106	2	#5	STR	29'-0"	60	A209	2	#5	STR	23'-10"	50	
* A107	2	#5	STR	27'-3"	57	A210	2	#5	STR	22'-2"	46	
* A108	2	#5	STR	25'-7"	53	A211	2	#5	STR	20'-5"	43	
* A109	2	#5	STR	23'-10"	50	A212	2	#5	STR	18'-9"	39	
* A110	2	#5	STR	22'-2"	46	A213	2	#5	STR	17'-0"	35	
* A111	2	#5	STR	20'-5"	43	A214	2	#5	STR	15'-4"	32	
* A112	2	#5	STR	18'-9"	39	A215	2	#5	STR	13'-7"	28	
* A113	2	#5	STR	17'-0"	35	A216	2	#5	STR	11'-11"	25	
* A114	2	#5	STR	15'-4"	32	A217	2	#5	STR	10'-2"	21	
* A115	2	#5	STR	13'-7"	28	A218	2	#5	STR	8'-6"	18	
* A116	2	#5	STR	11'-11"	25	A219	2	#5	STR	6'-9"	14	
* A117	2	#5	STR	10'-2"	21	A220	2	#5	STR	5'-1"	11	
* A118	2	#5	STR	8'-6"	18	A221	2	#5	STR	3'-4"	7	
* A119	2	#5	STR	6'-9"	14							
* A120	2	#5	STR	5'-1"	11	* B1	152	#6	STR	21'-6"	4909	
* A121	2	#5	STR	3'-4"	7	* B2	104	#4	STR	28'-1"	1951	
						* B3	152	#6	STR	38'-2"	8714	
						* B4	16	#4	STR	28'-10"	308	
						B5	200	#5	STR	55'-9"	11629	
						K1	40	#4	STR	21'-1"	563	
						* S1	68	#4	1	11'-11"	541	
						* S2	68	#4	1	11'-2"	507	
						U1	68	#4	2	11'-9"	534	
						U2	4	#4	2	10'-11"	29	
REINFORCING STEEL										LBS.	31,916	
* EPOXY COATED REINFORCING STEEL										LBS.	36,091	
* THESE BARS ARE EPOXY COATED.												

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	* EPOXY COATED REINFORCING STEEL
	( CU. YDS. )	( LBS. )	( LBS. )
TOTALS**	334.0	31,916	36,091

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

CONCRETE BREAKDOWN	
	CLASS AA CONCRETE
	( CU. YDS. )
POUR #1	73.1
POUR #2	194.6
POUR #3	66.3
TOTALS	334.0

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-

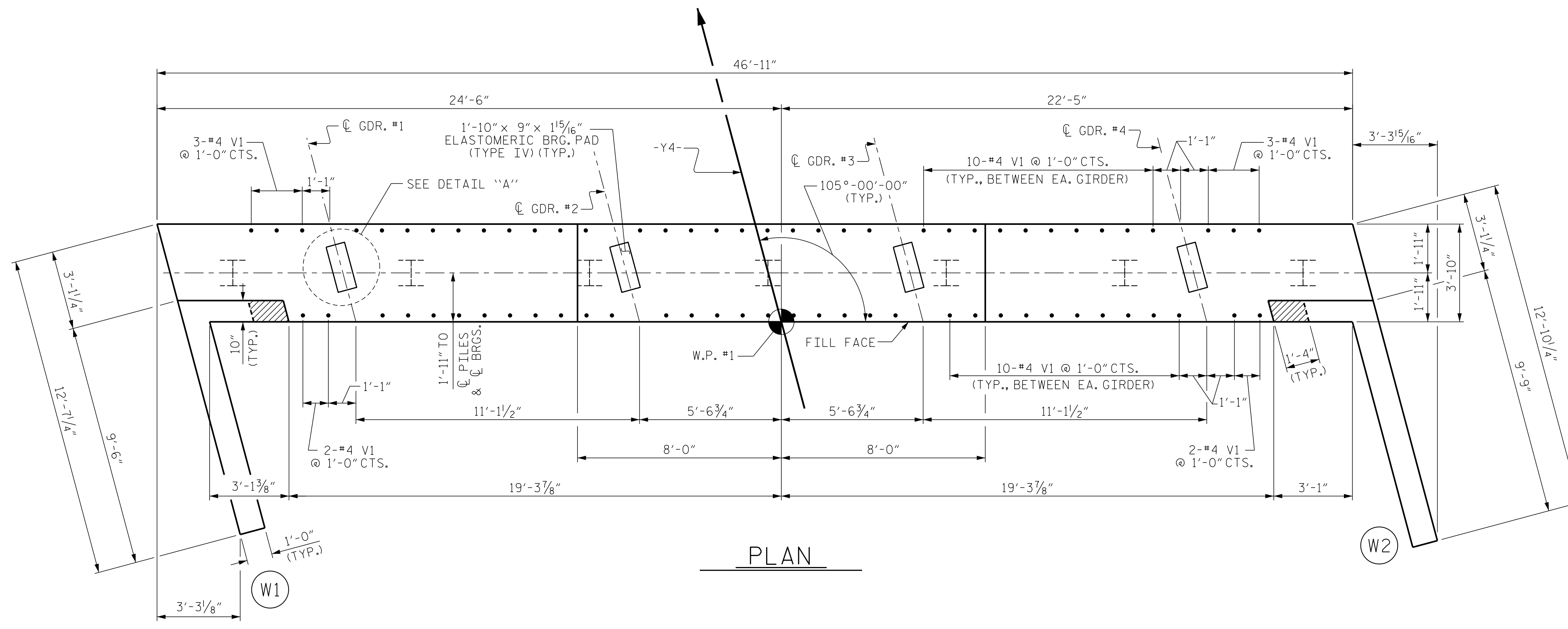


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
BILL OF MATERIAL

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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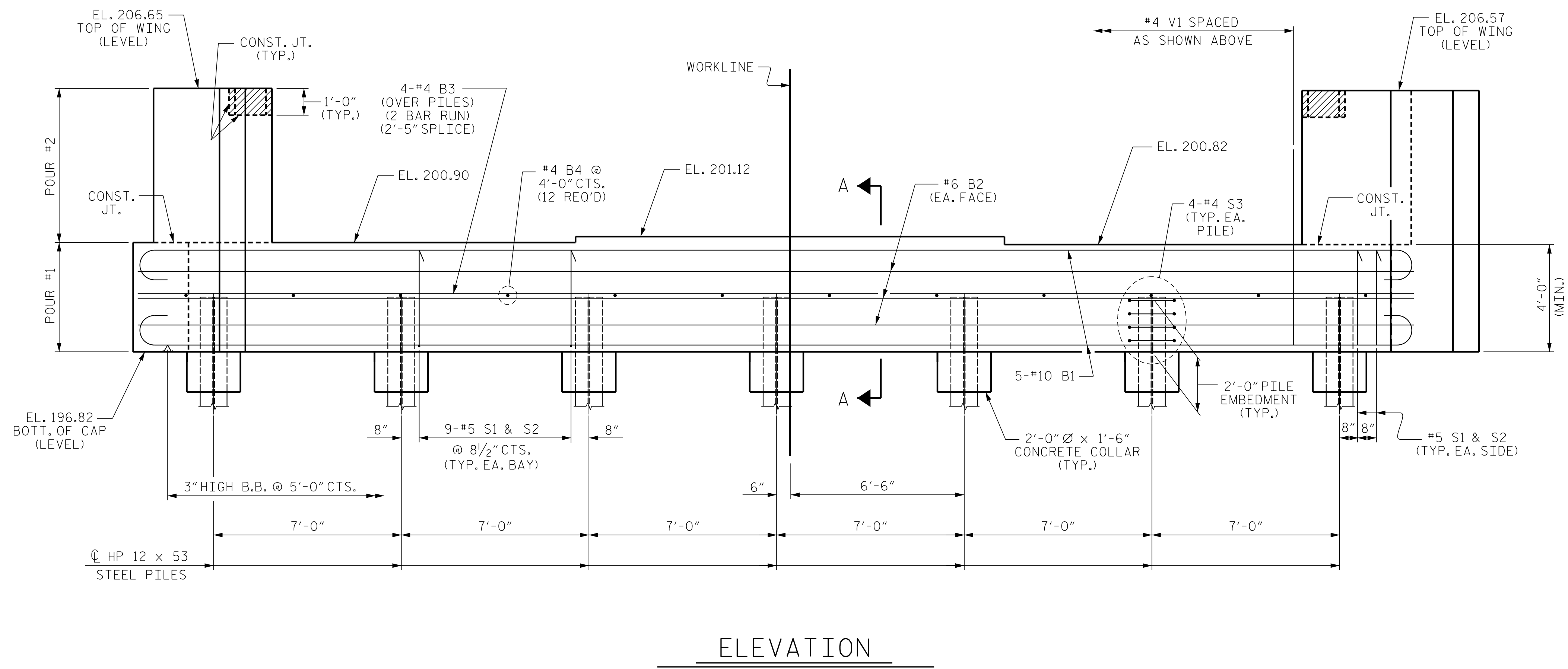
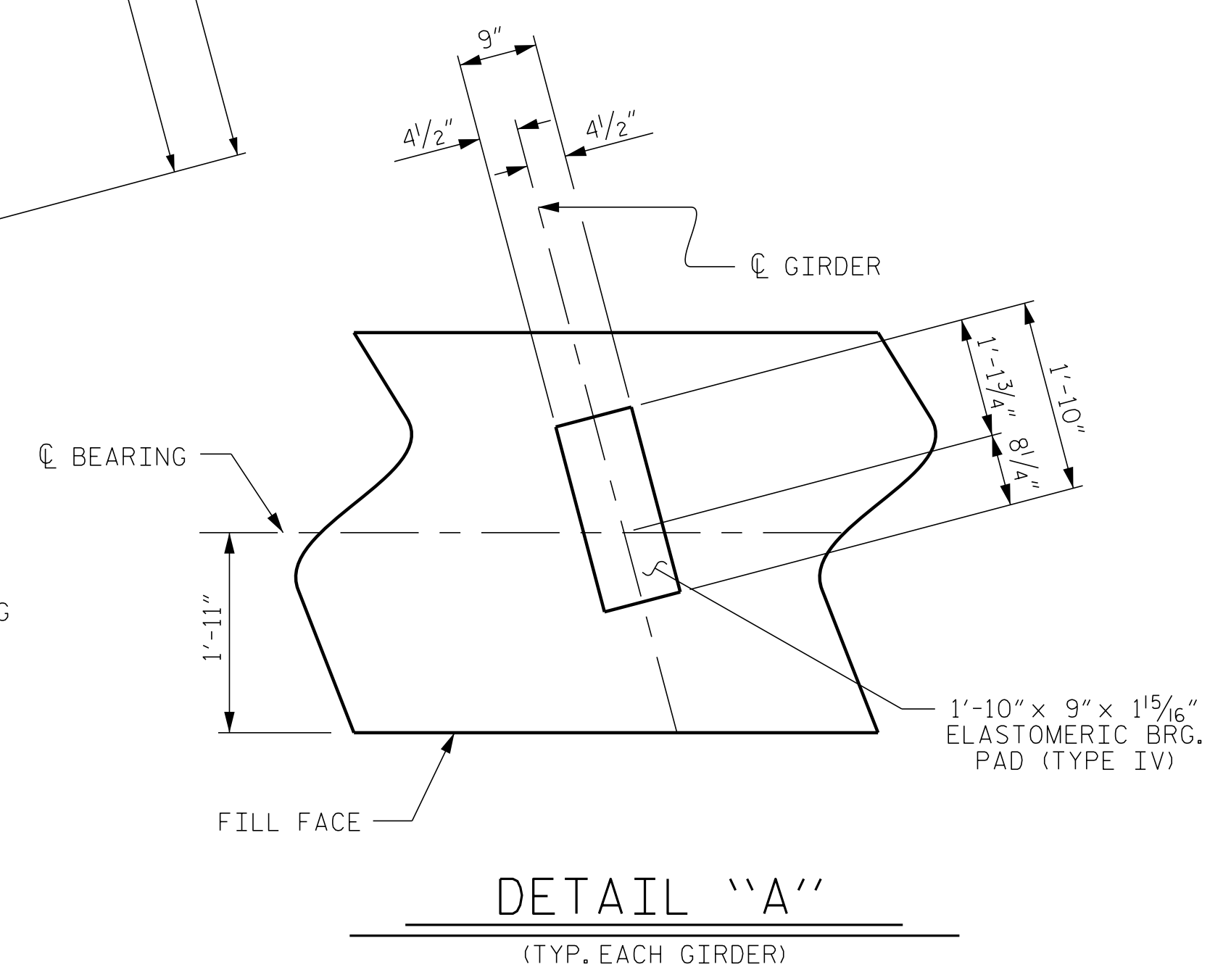
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TOTAL SHEETS 31



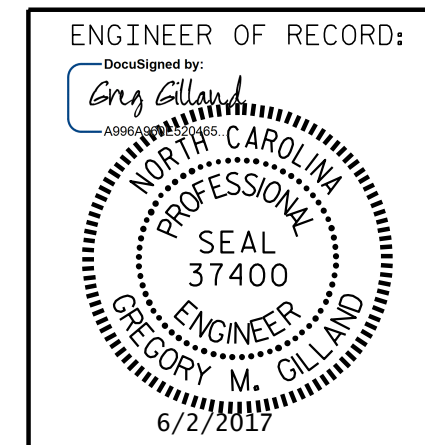
**NOTES**

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

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



PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 3



**ETHERILL ENGINEERING**  
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 LICENSE NO. F-0377

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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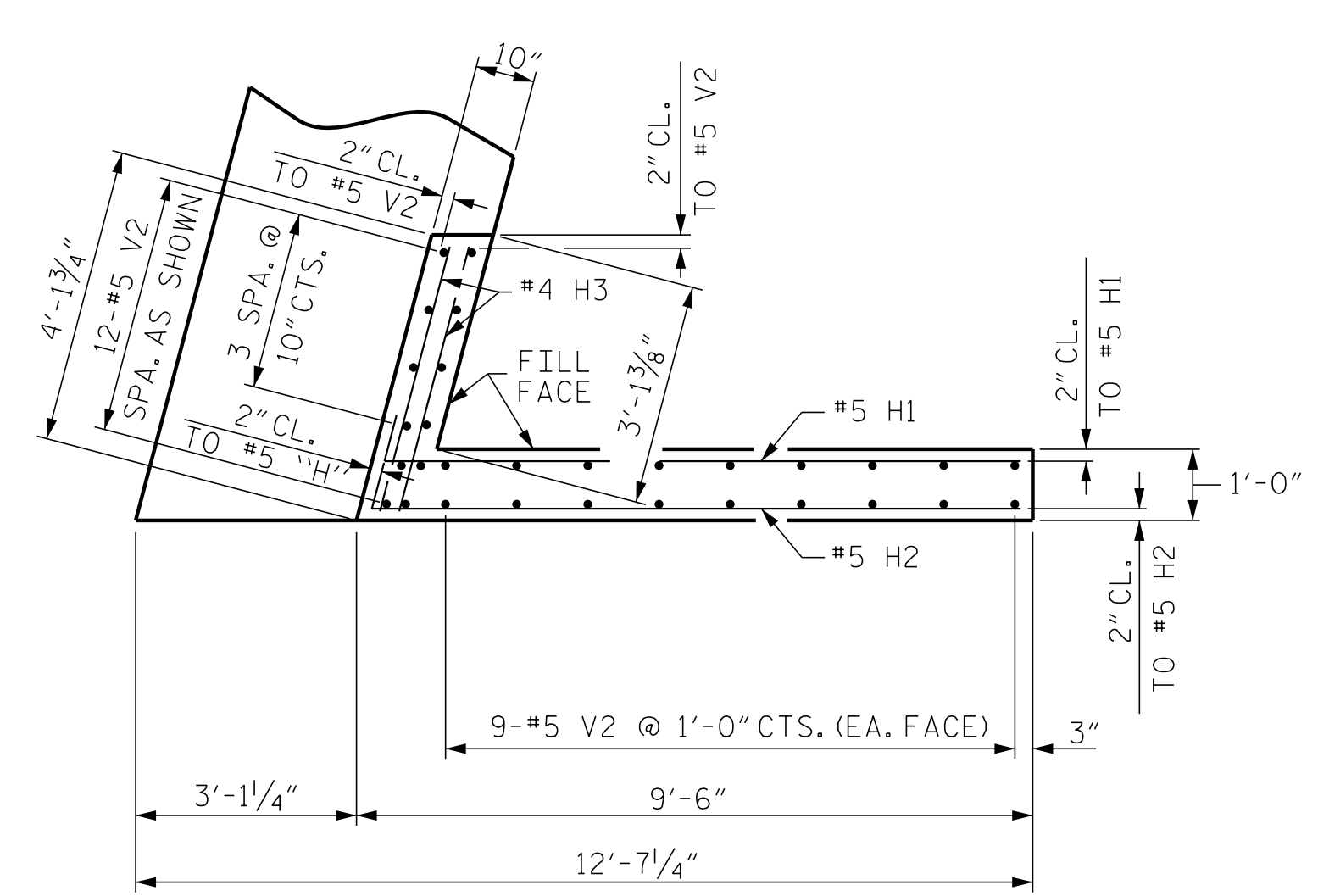
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DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

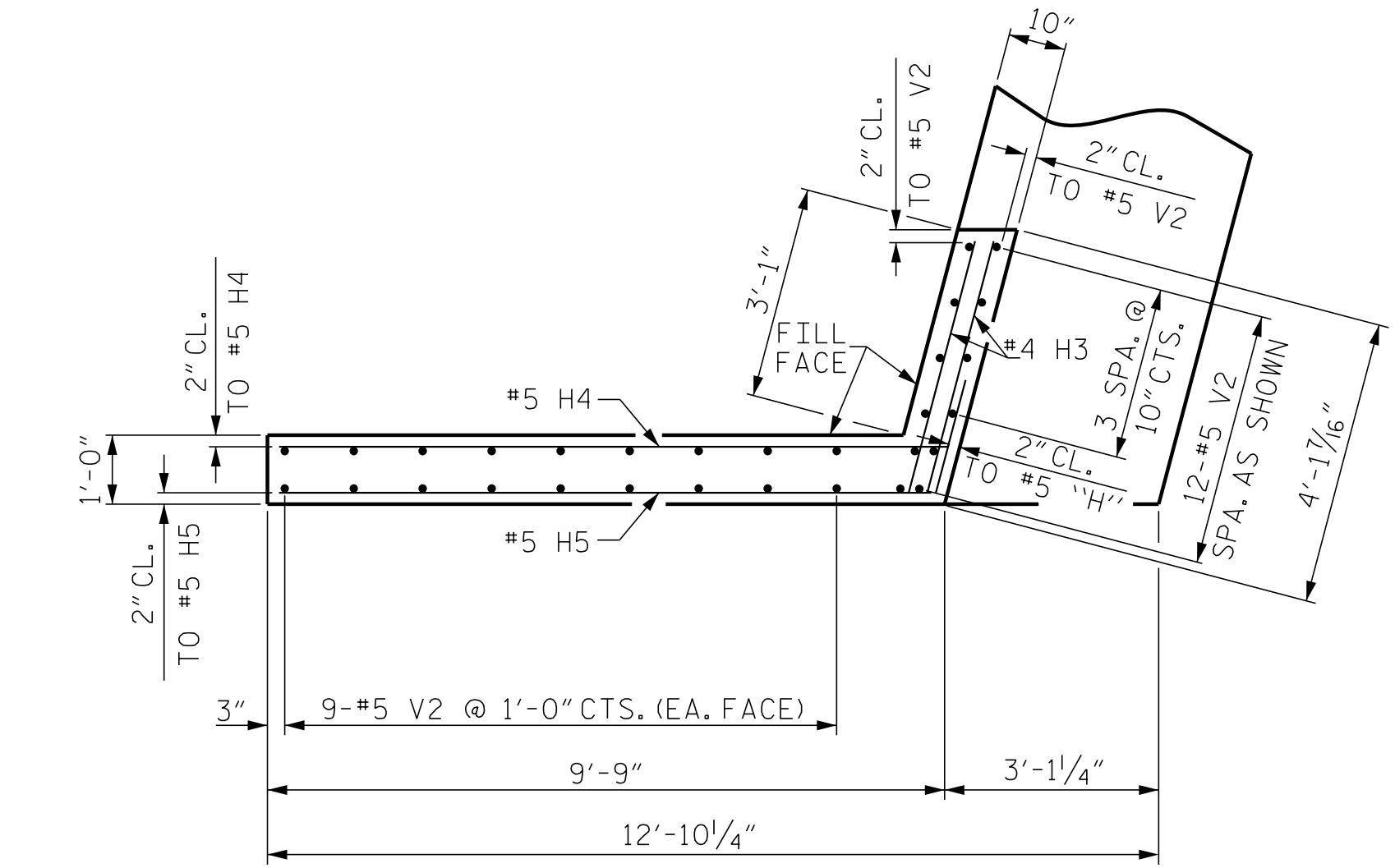
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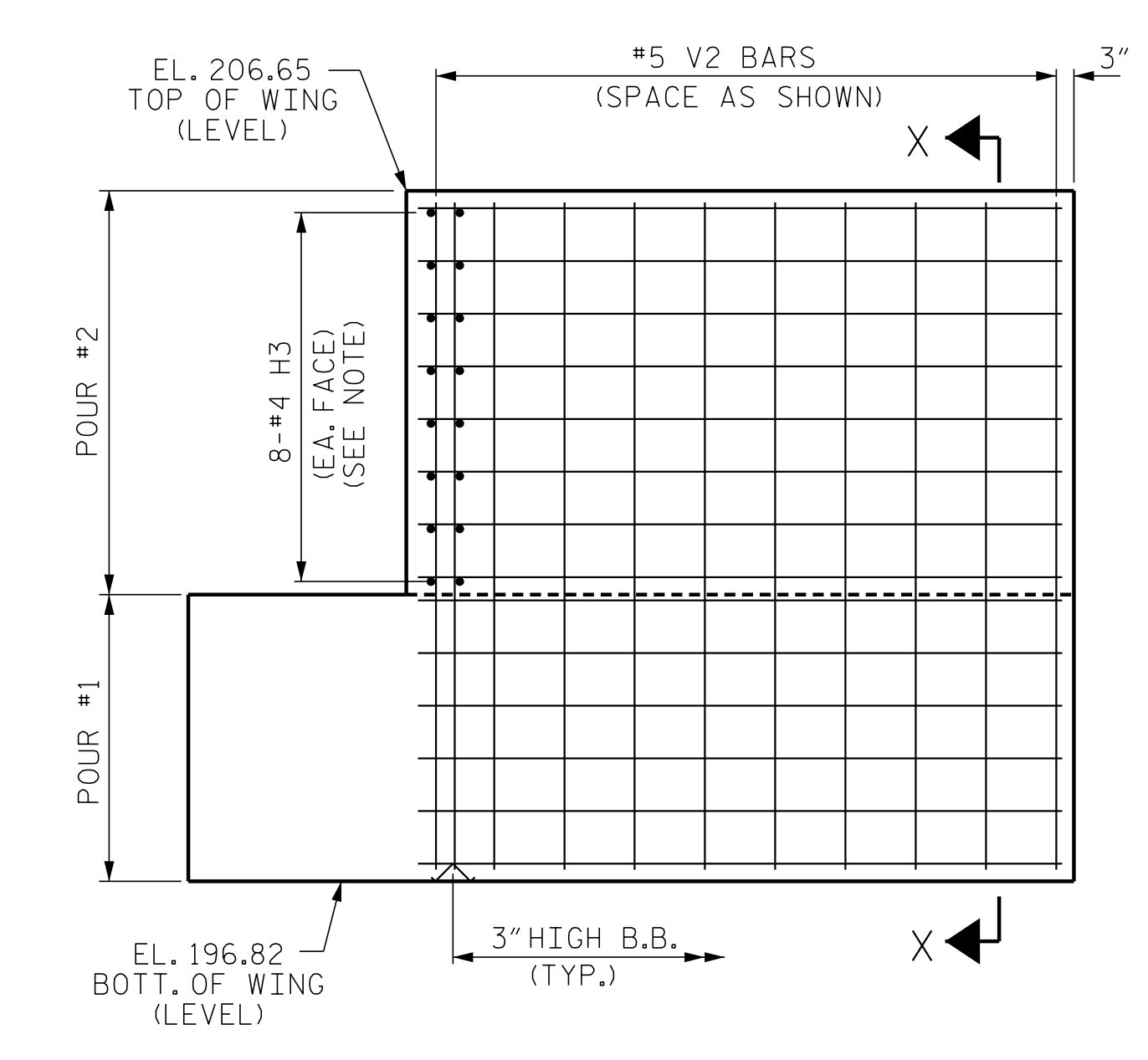




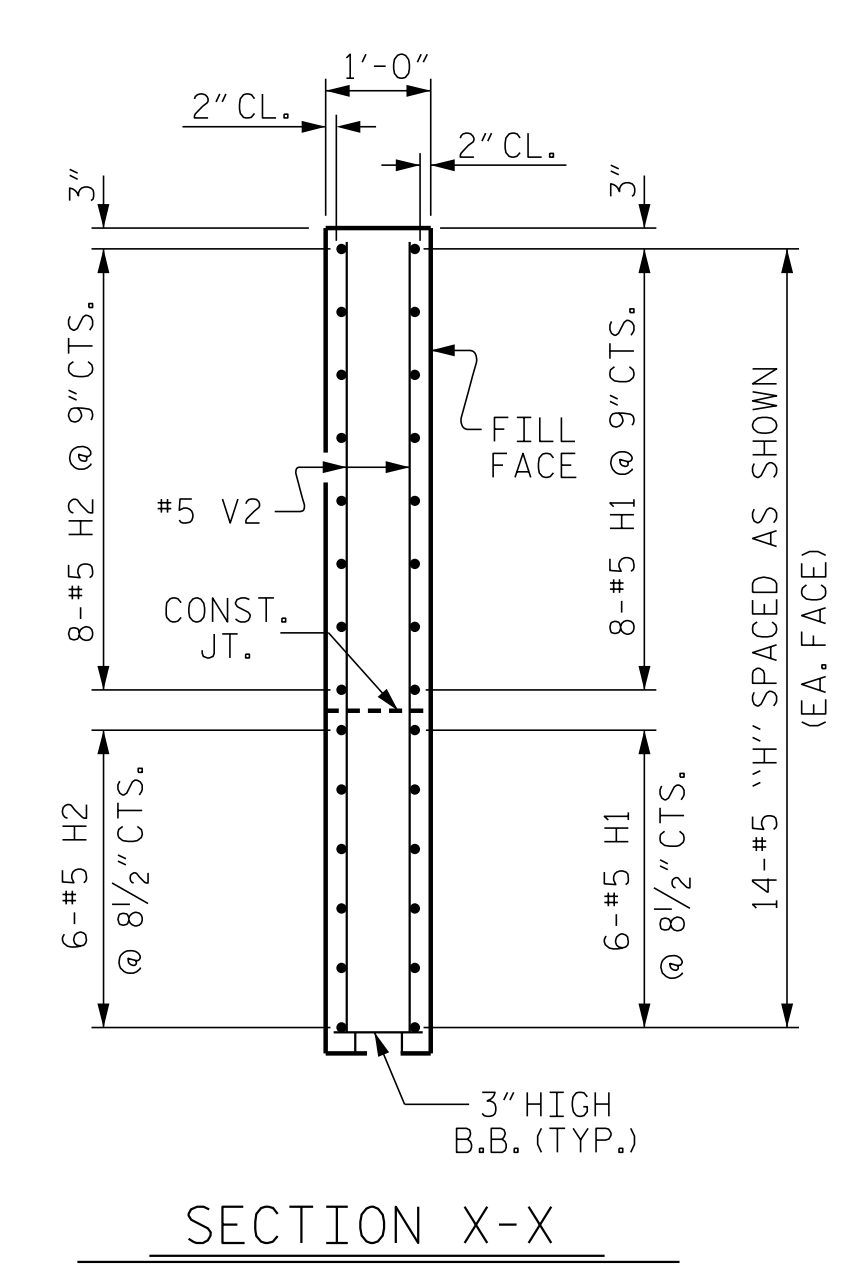
PLAN OF WING - (W1)



PLAN OF WING - (W2)

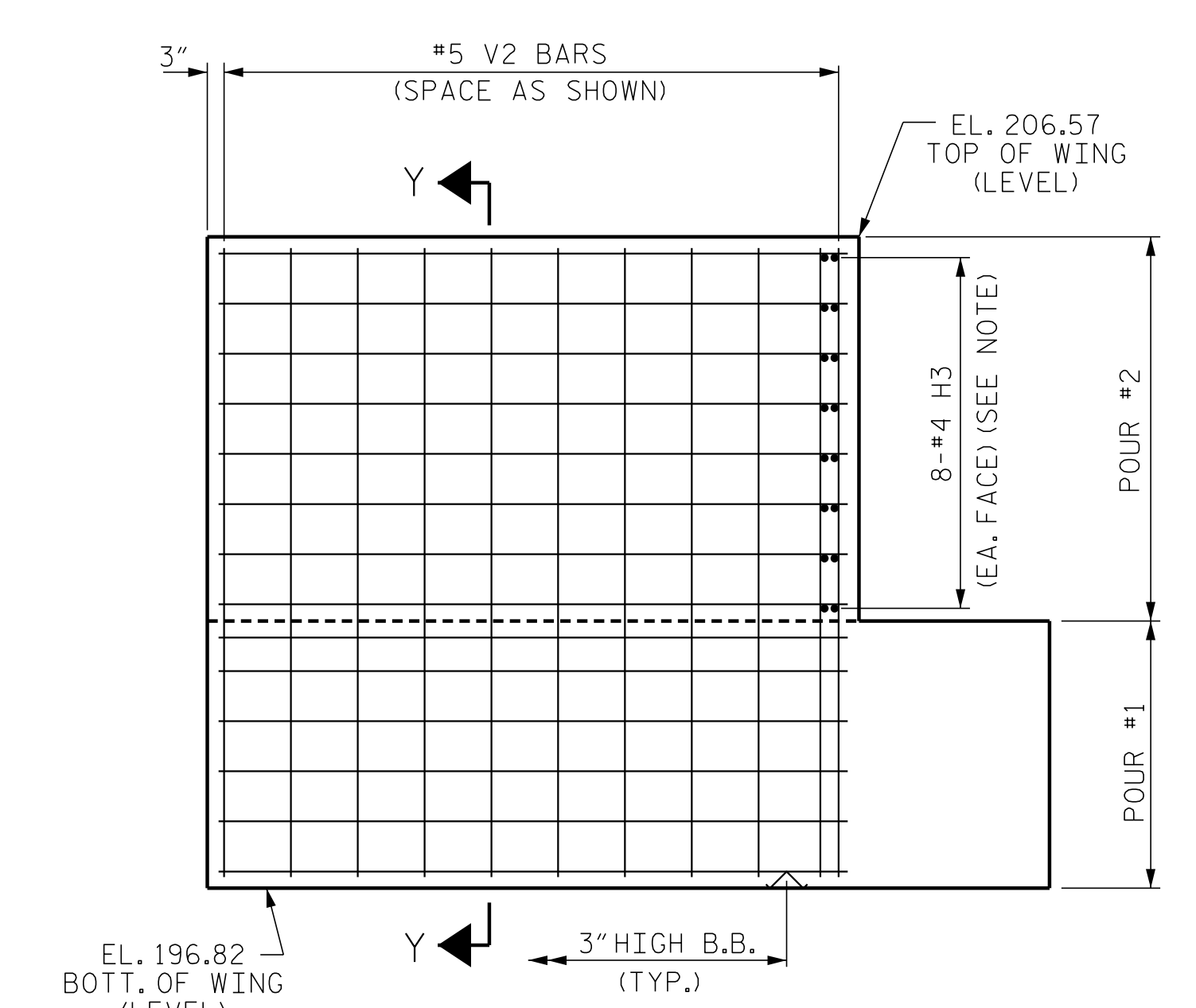


ELEVATION OF WING - (W1)

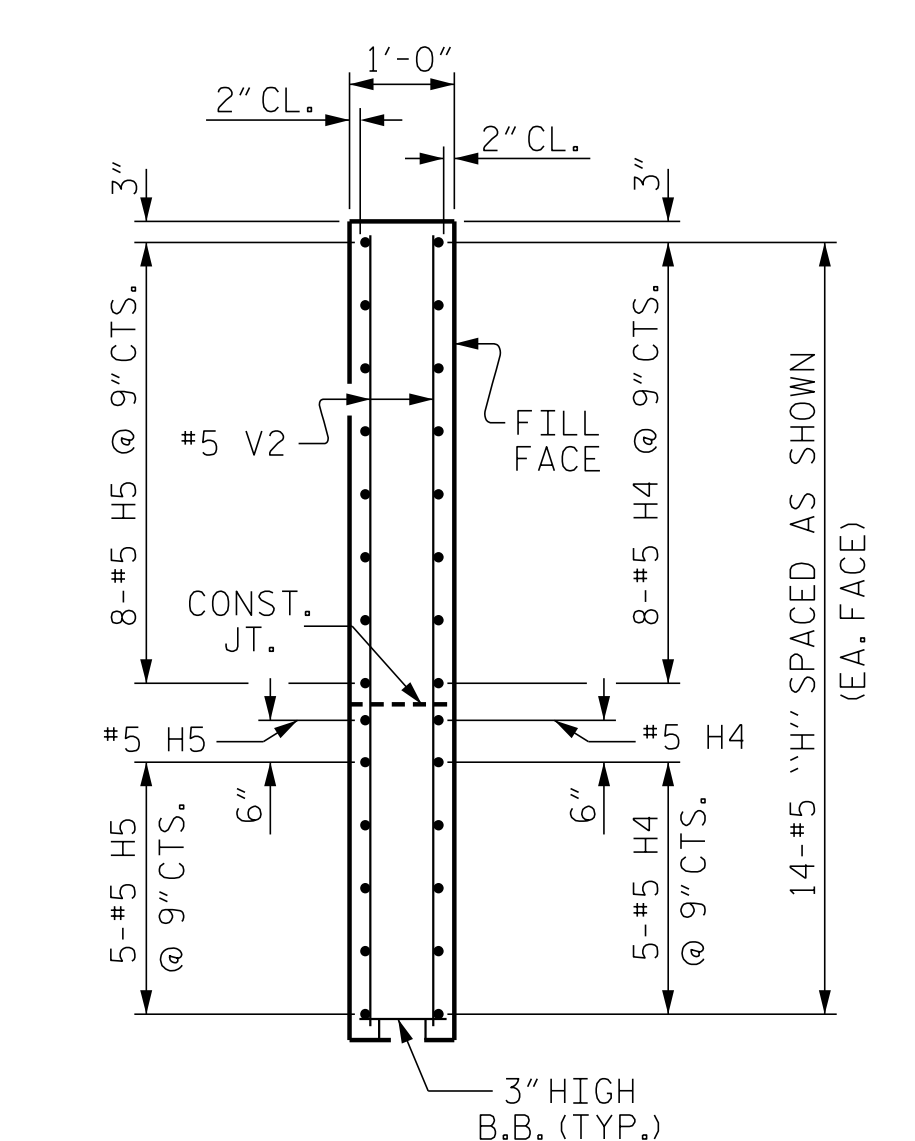


SECTION X-X

NOTE: #4 H3 TO MATCH SPACING OF #5 \"H\" BARS

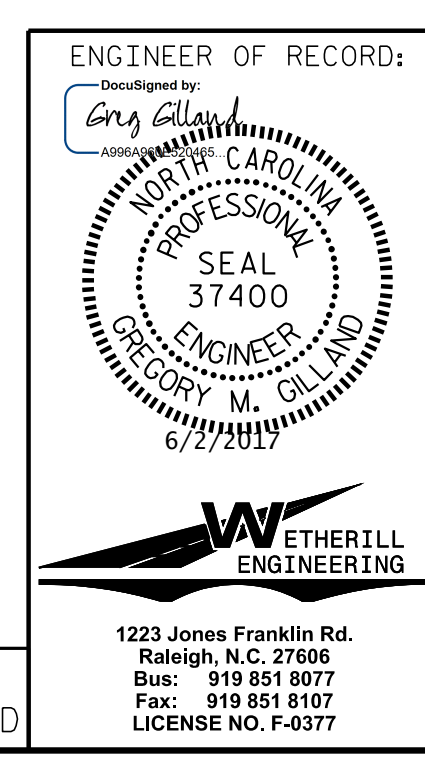


ELEVATION OF WING - (W2)



SECTION Y-Y

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 2 OF 3



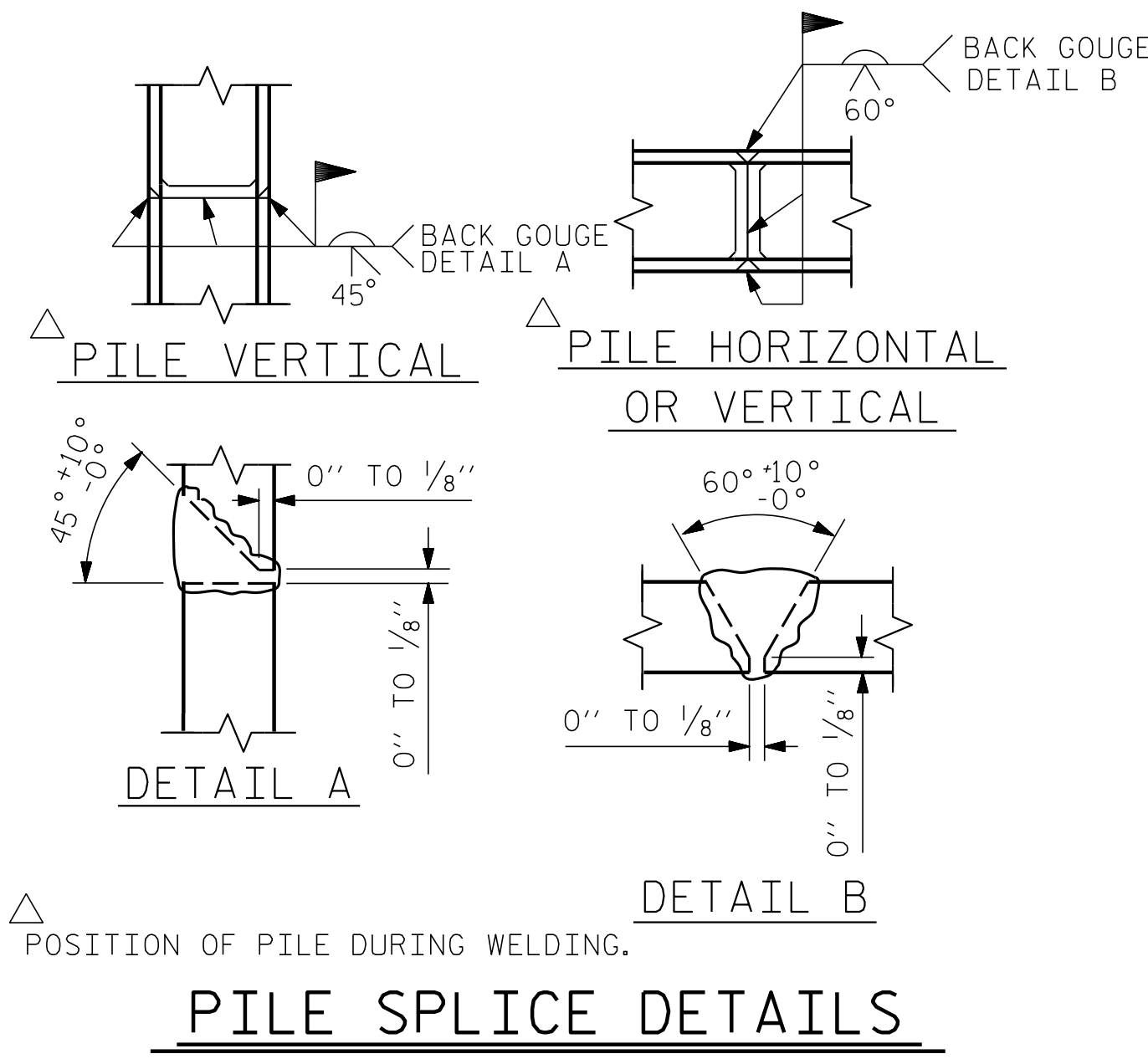
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S02-21			TOTAL SHEETS 31		

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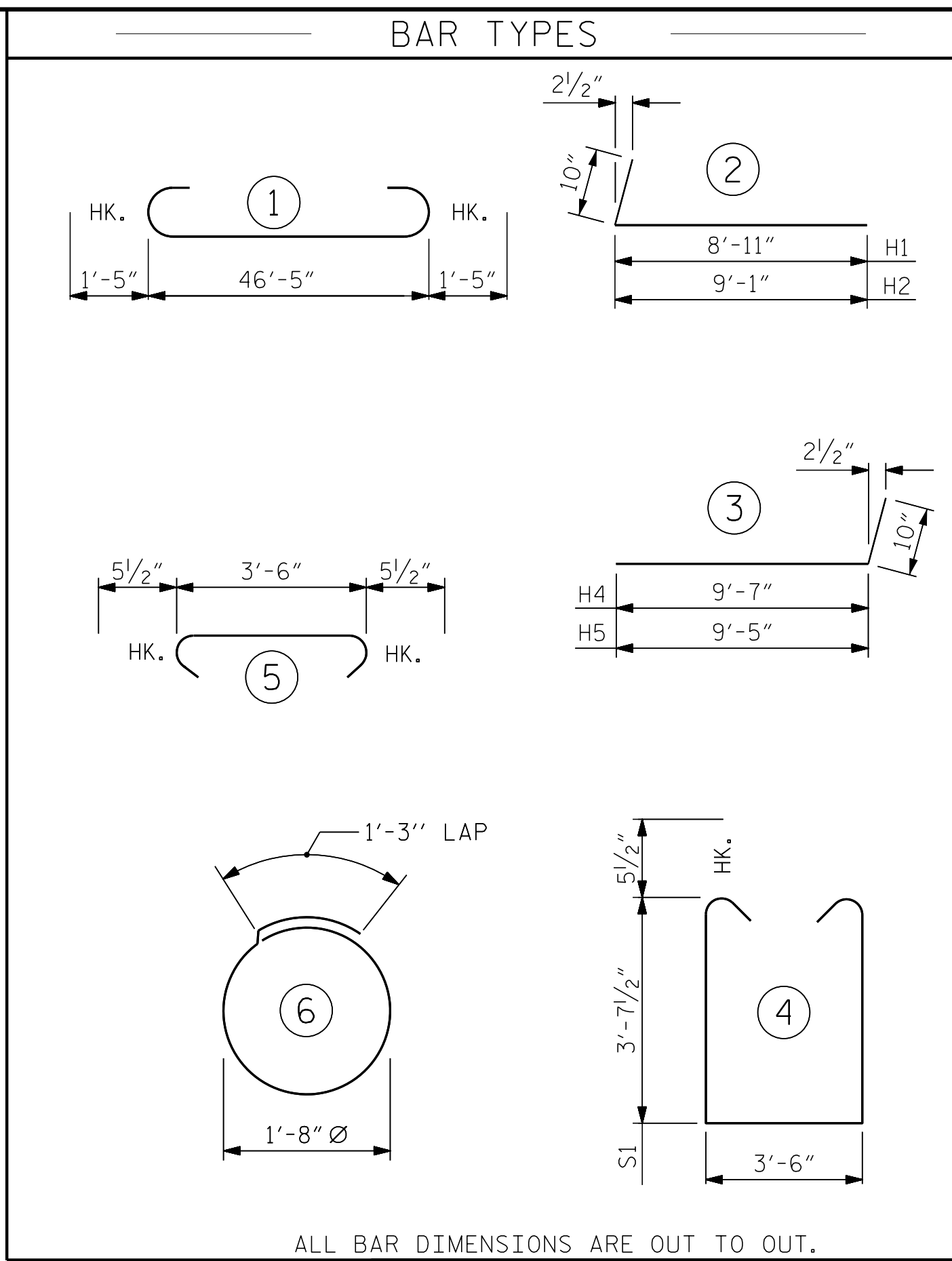
DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

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 LICENSE NO. F-0377

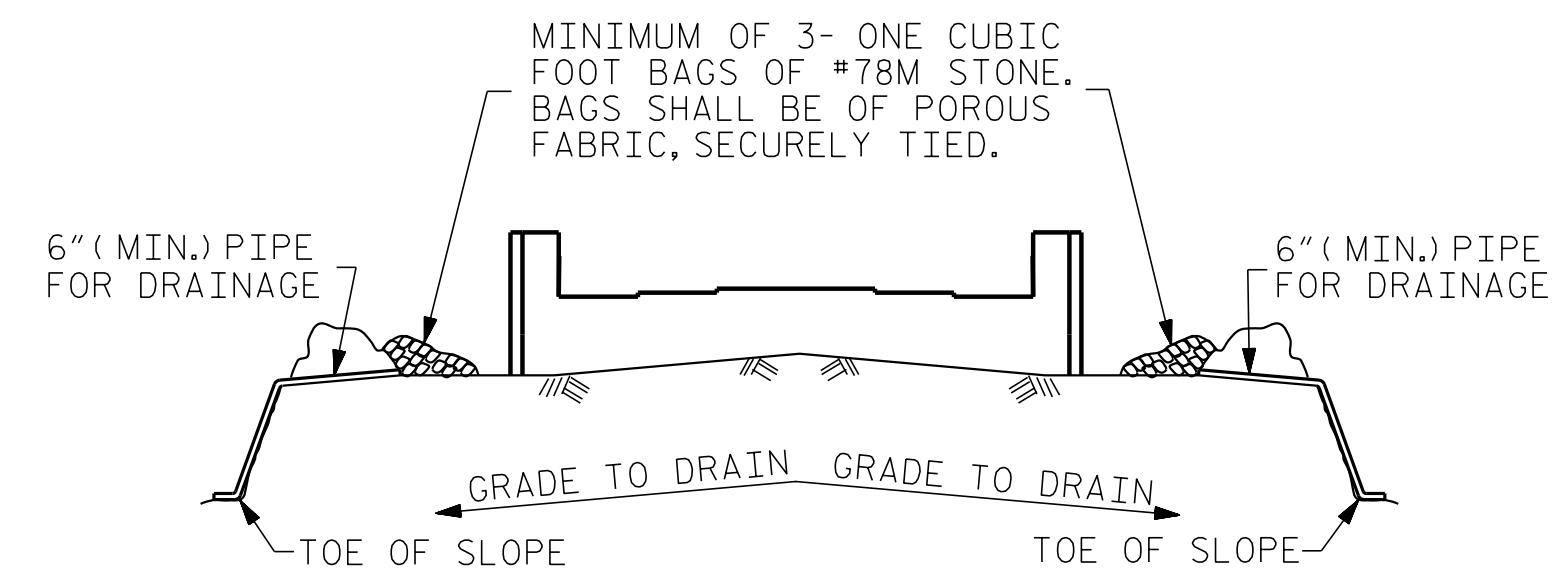


POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	49'-3"	2119
B2	6	#6	STR	46'-6"	419
B3	8	#4	STR	24'-6"	131
B4	12	#4	STR	3'-6"	28
H1	14	#5	2	9'-9"	142
H2	14	#5	2	9'-11"	145
H3	32	#4	STR	3'-9"	80
H4	14	#5	3	10'-5"	152
H5	14	#5	3	10'-3"	150
S1	58	#5	4	11'-8"	706
S2	58	#5	5	4'-5"	267
S3	28	#4	6	6'-6"	122
V1	70	#4	STR	6'-1"	284
V2	60	#5	STR	9'-4"	584
REINFORCING STEEL					5,329 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1	CAP, CONC. COLLARS & LOWER PART OF WINGS				31.4 C.Y.
POUR #2	UPPER PART OF WINGS				5.2 C.Y.
TOTAL CLASS A CONCRETE					36.6 C.Y.
HP 12 X 53 STEEL PILES					
NO: 7					410 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					7 EA.
PILE REDRIVES					4 EA.

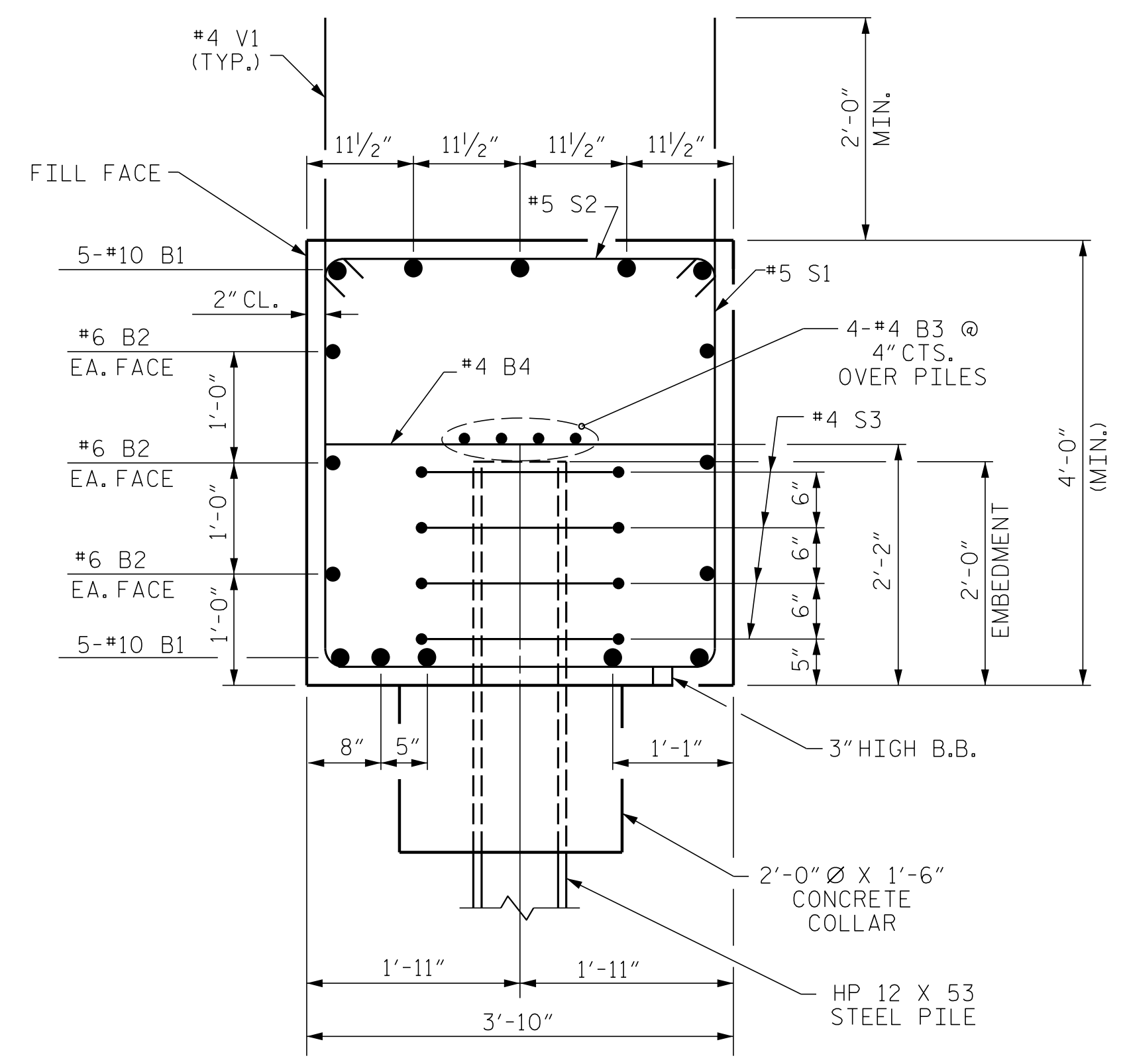


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

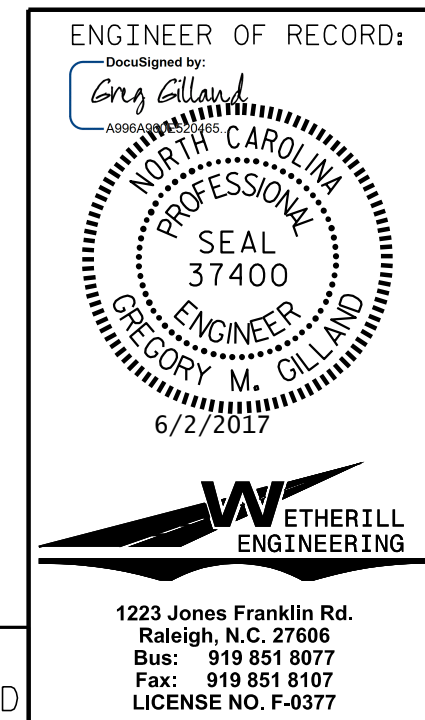
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**



**SECTION A-A**

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-22					TOTAL SHEETS 31

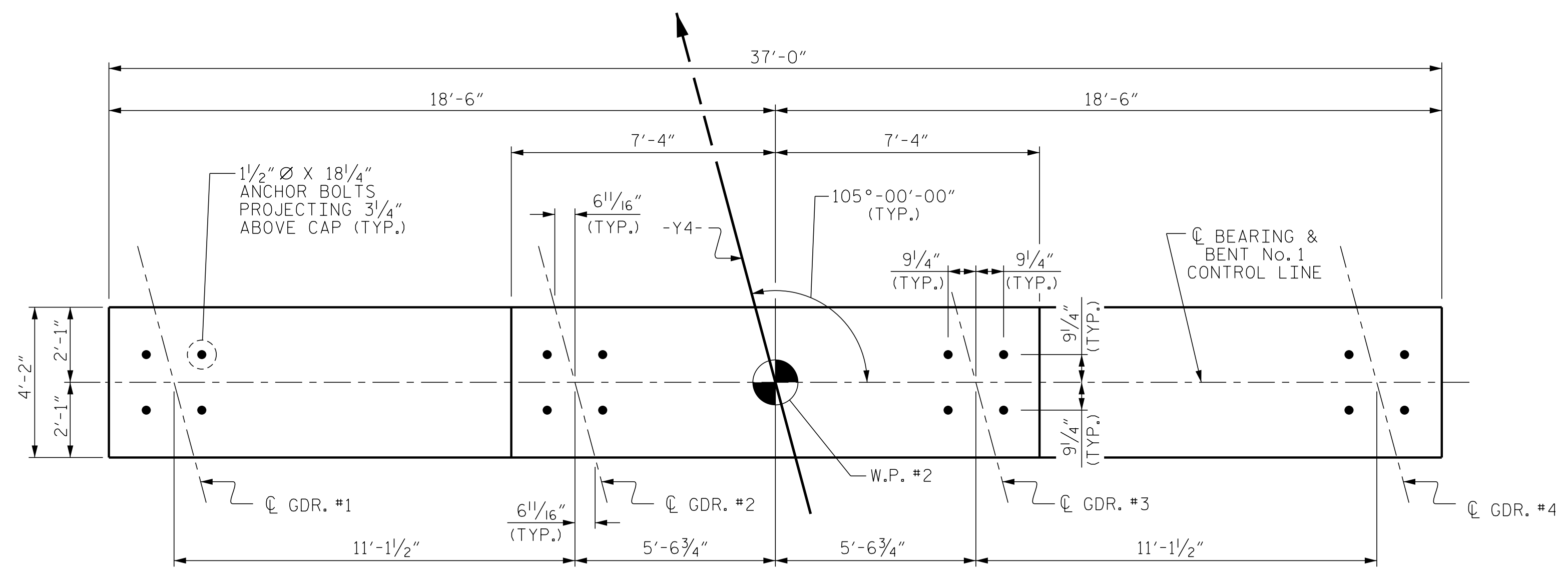
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PLAN

**NOTES**

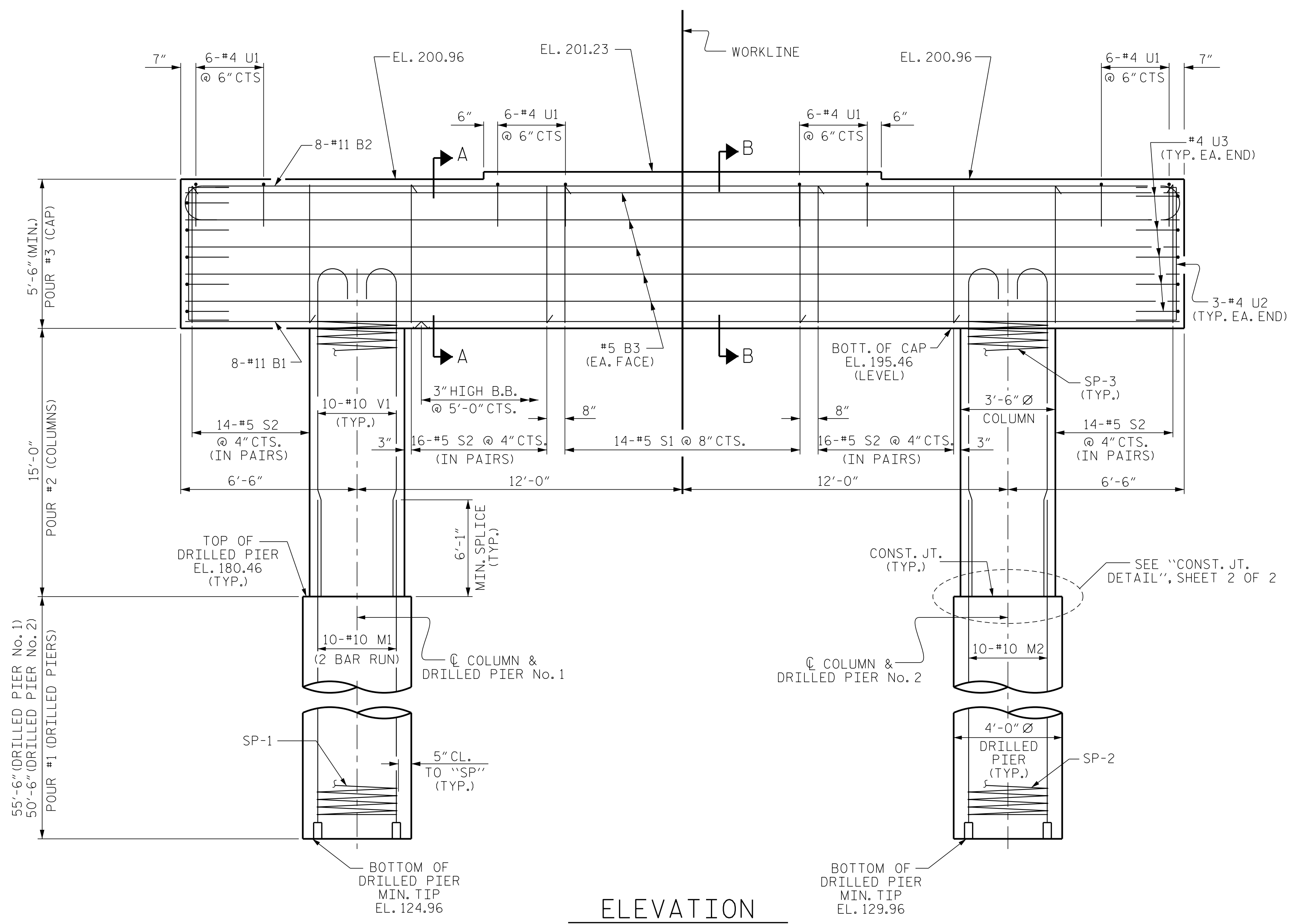
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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

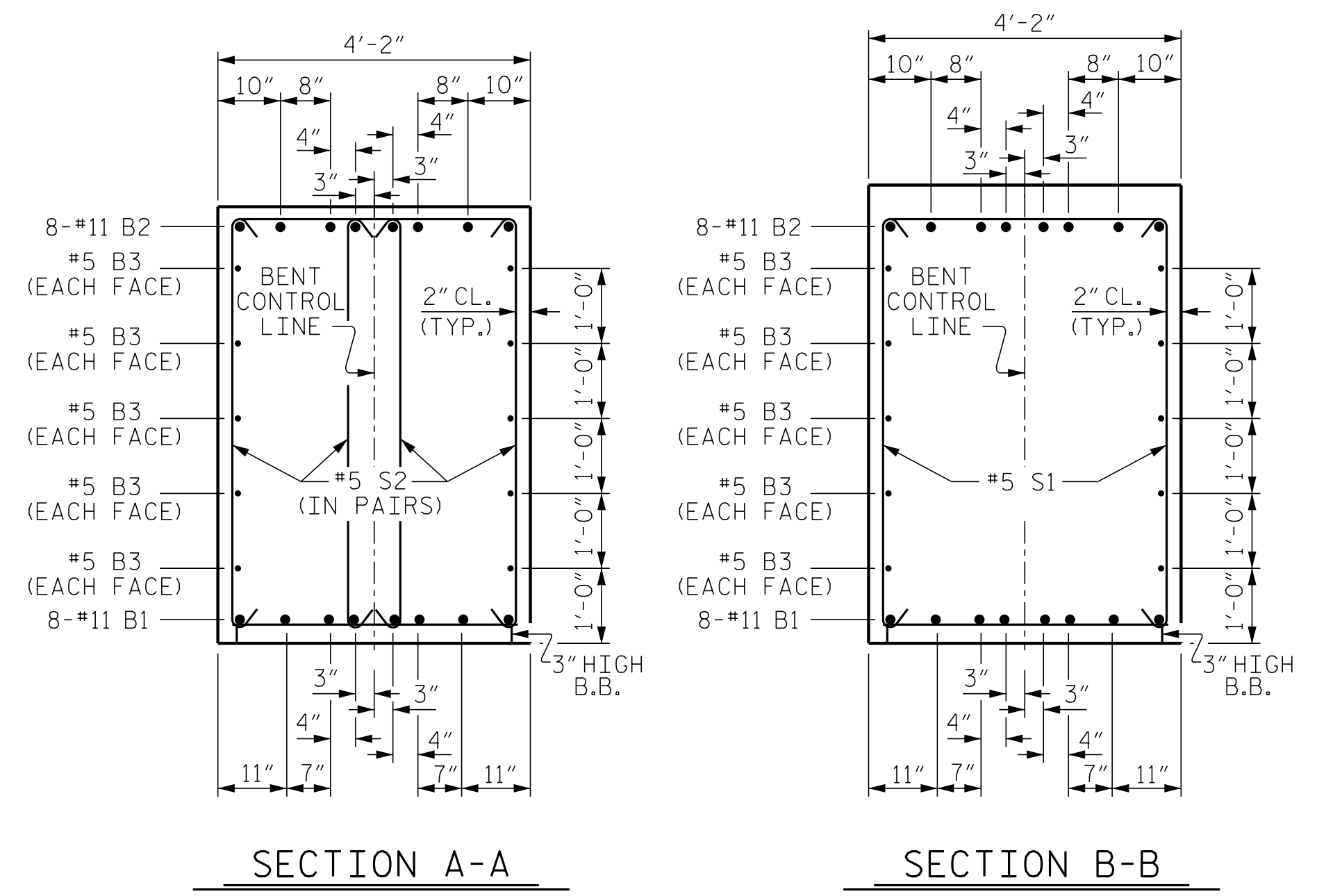
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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



ELEVATION

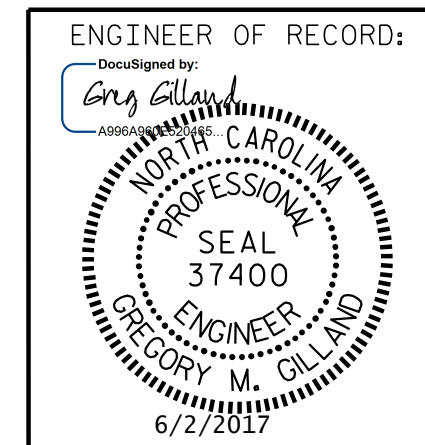
DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN.



SECTION A-A

SECTION B-B

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 2



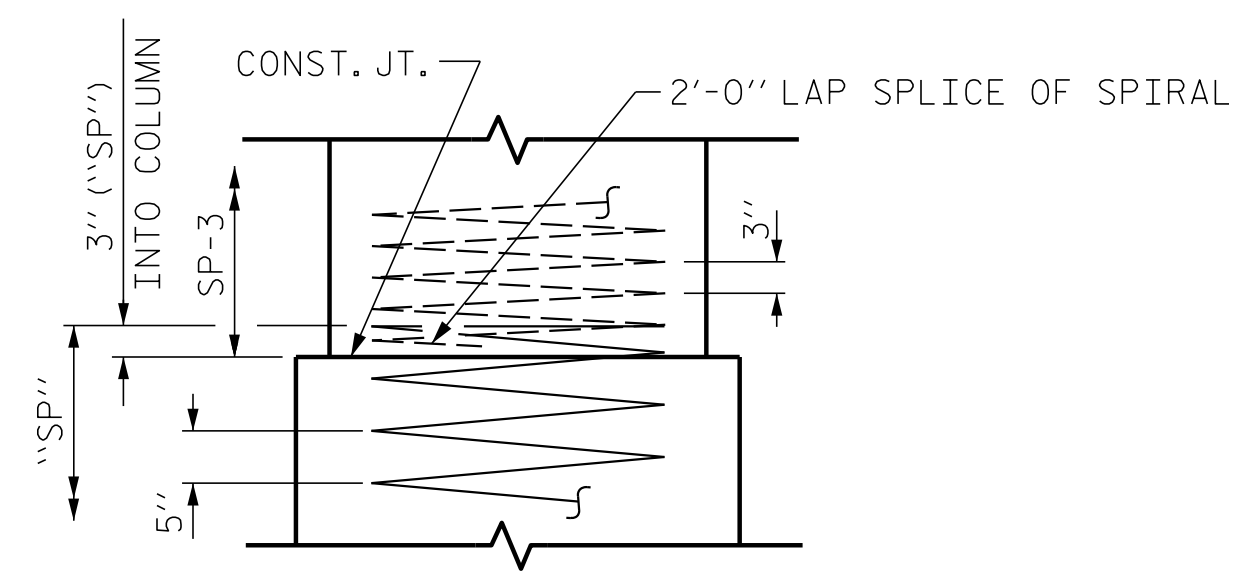
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S02-23					TOTAL SHEETS 31

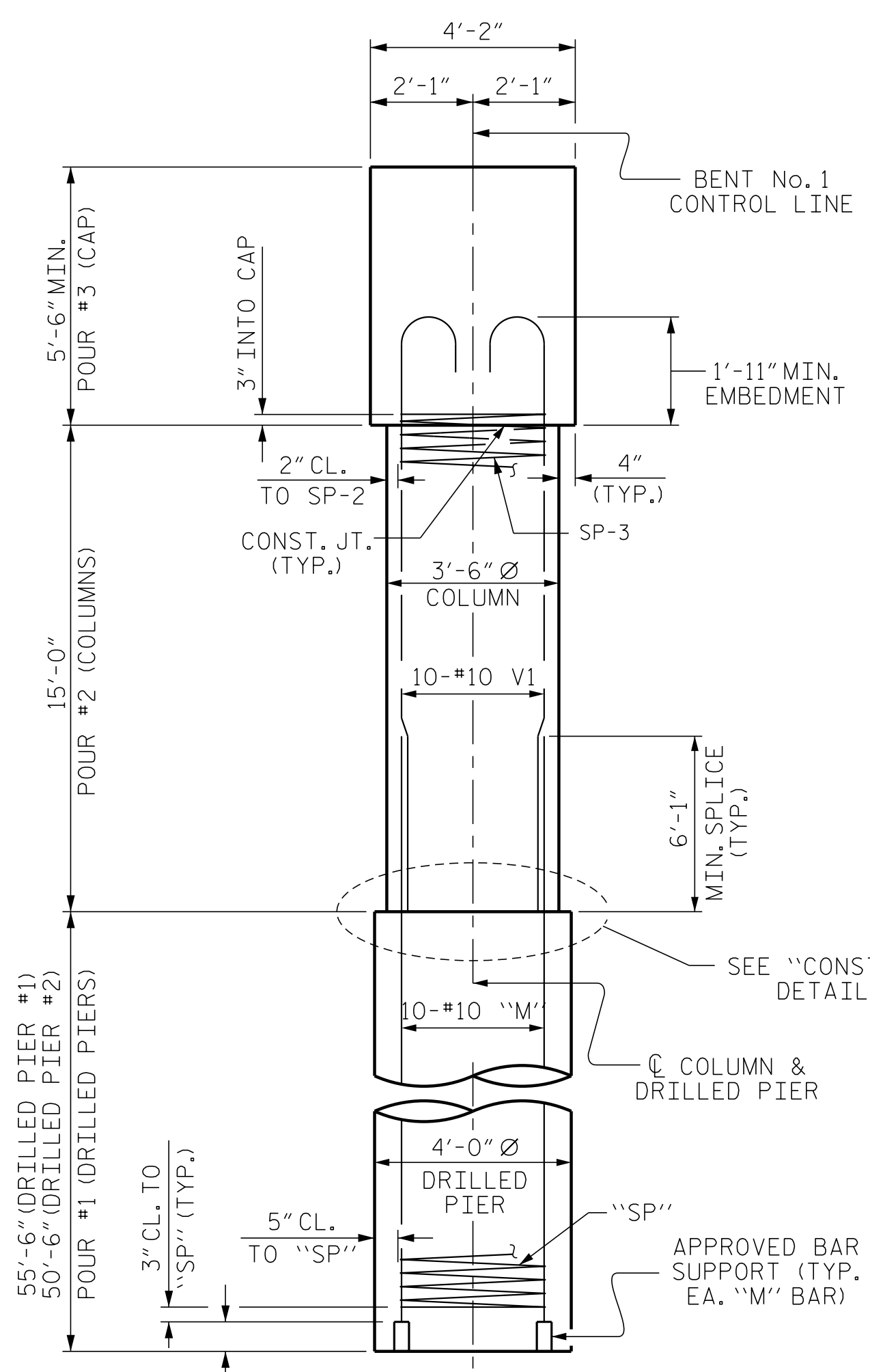
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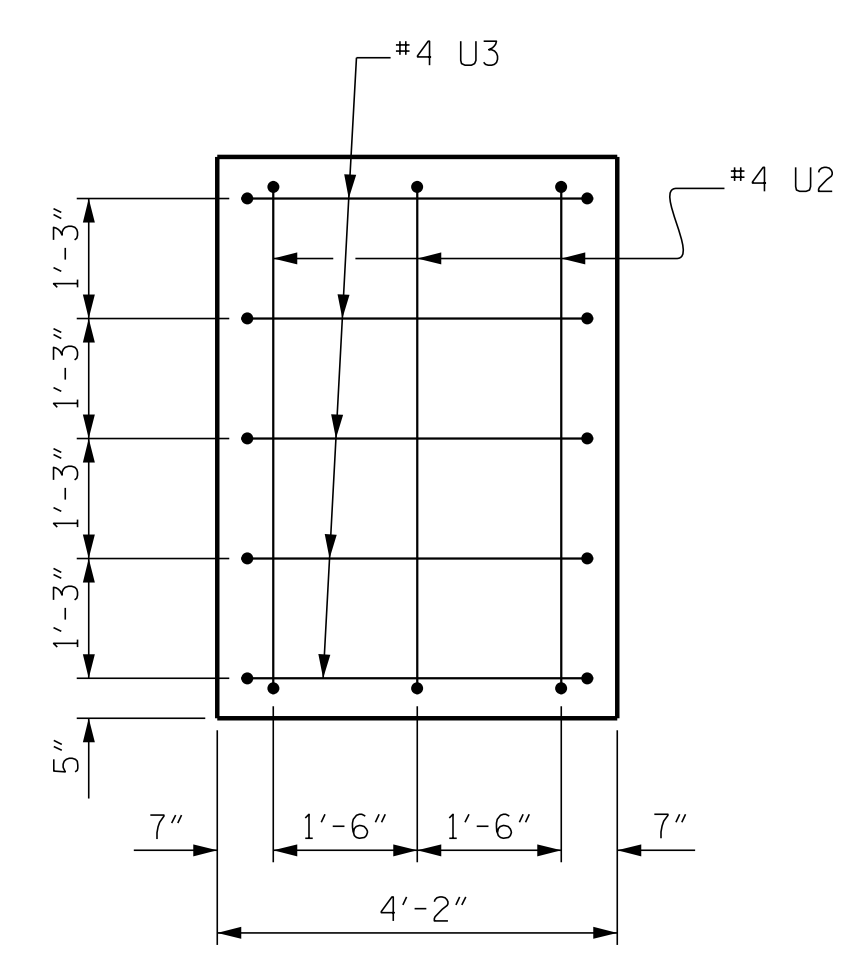
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 CHECKED BY: B.C. HUNT DATE: 5/17



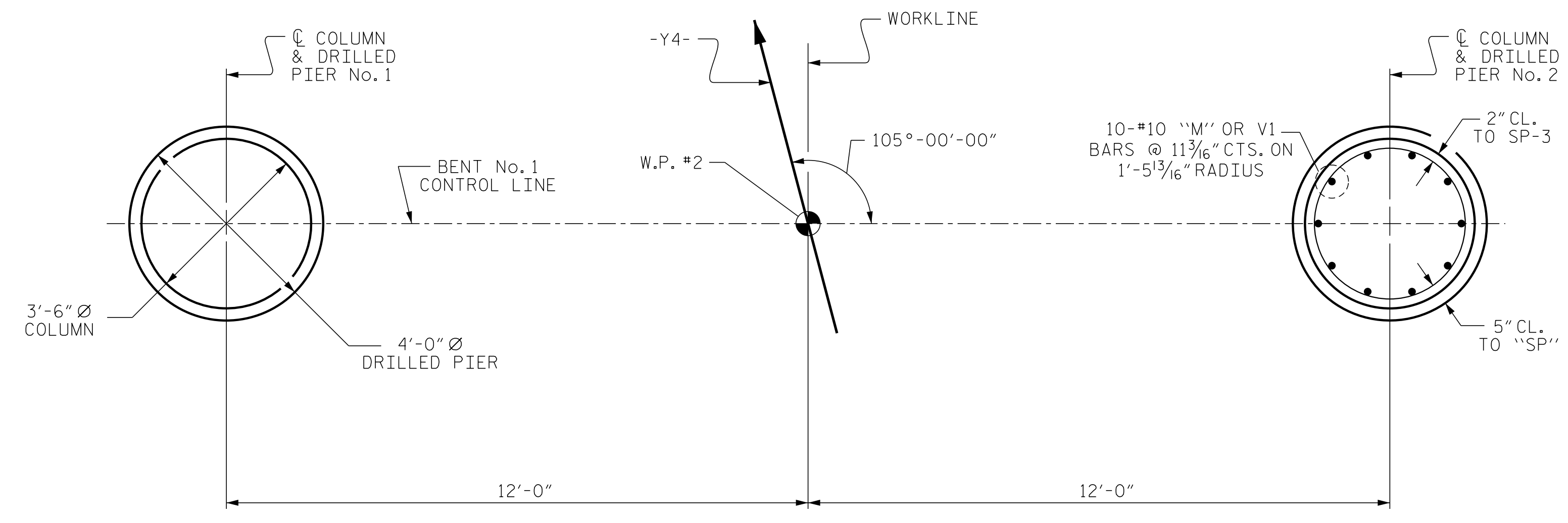
CONSTRUCTION JOINT DETAIL



END ELEVATION



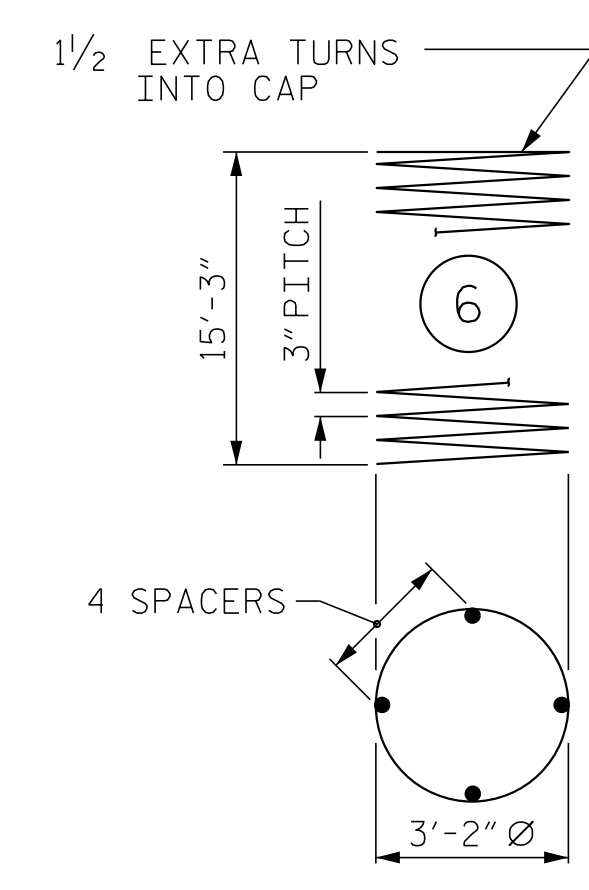
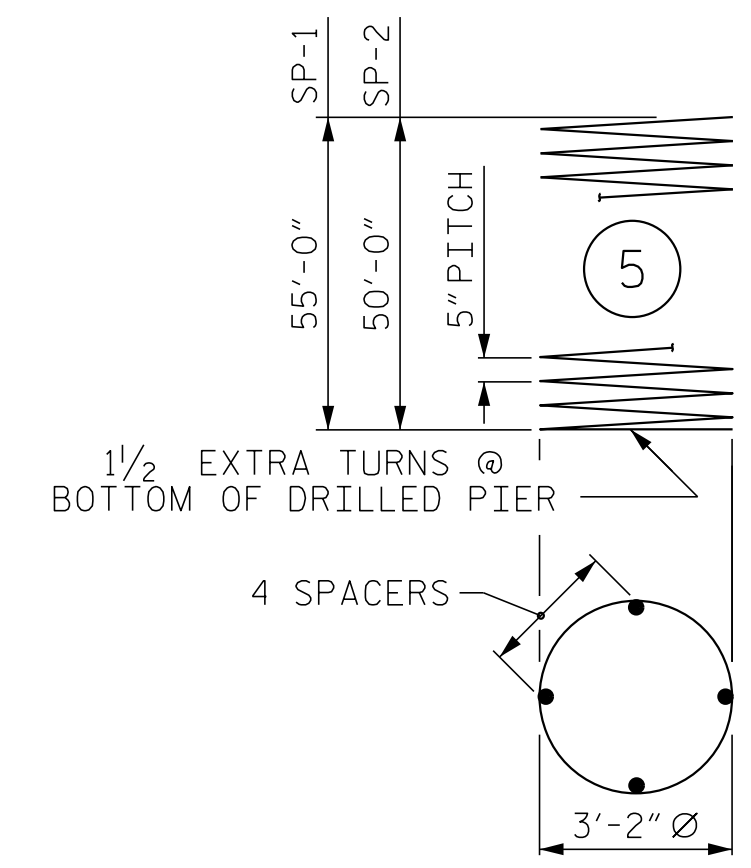
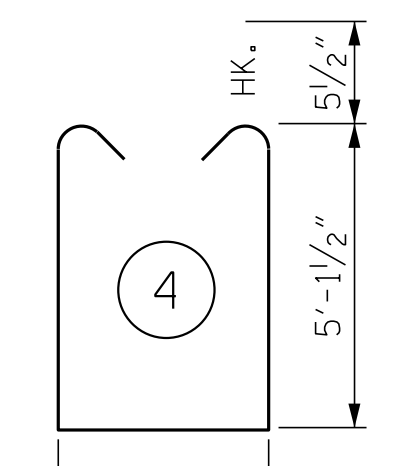
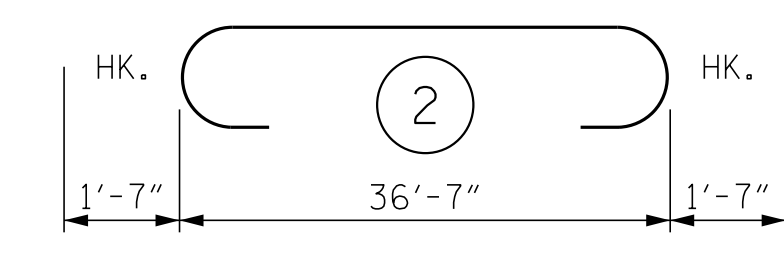
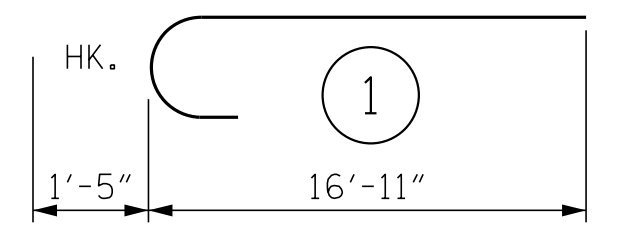
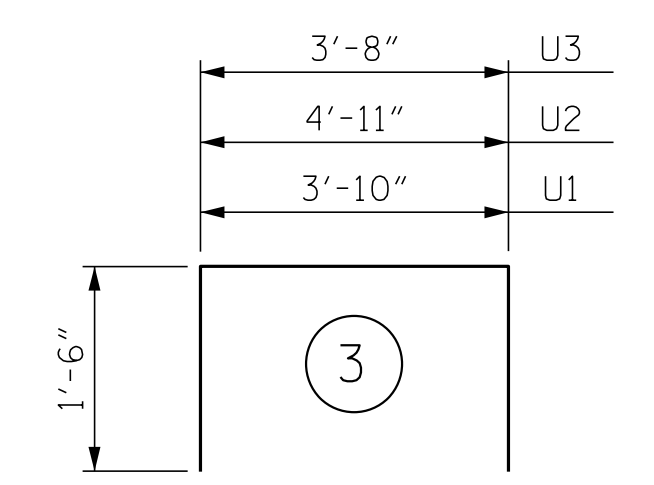
END OF CAP VIEW



PLAN OF DRILLED PIERS AND COLUMNS

(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR	36'-8"	1558
B2	8	#11	2	39'-9"	1690
B3	10	#5	STR	36'-8"	382
M1	20	#10	STR	35'-1"	3019
M2	10	#10	STR	59'-1"	2542
S1	14	#5	4	15'-0"	219
S2	120	#5	4	13'-6"	1690
U1	24	#4	3	6'-10"	110
U2	6	#4	3	7'-11"	32
U3	10	#4	3	6'-8"	45
V1	20	#10	1	18'-4"	1578

REINFORCING STEEL 12,865 LBS.

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	*	5	1307'-6"	1364
SP-2	1	*	5	1190'-0"	1241
SP-3	2	**	6	613'-10"	820

SPIRAL COLUMN REINFORCING STEEL 3,425 LBS.

\* THE SP-1 & SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR  
 \*\* THE SP-3 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)	10.7 C.Y.
POUR #3 (CAP)	32.0 C.Y.

TOTAL CLASS A CONCRETE 42.7 C.Y.

DRILLED PIERS:

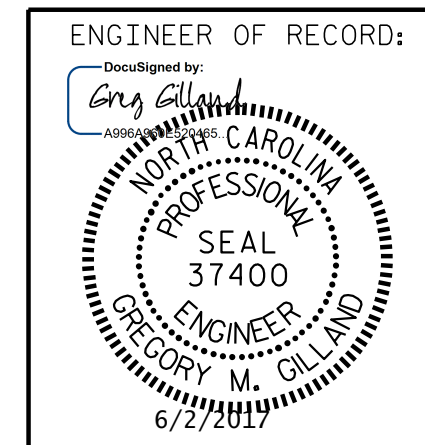
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	49.3 C.Y.
4'-0" Ø DRILLED PIER IN SOIL	106.00 LIN. FT.
CSL TUBES	436 LIN. FT.
CSL TESTING	1 EA.
SID INSPECTIONS	1 EA.
SPT TESTING	2 EA.

PROJECT NO. I-5786

JOHNSTON COUNTY

STATION: 20+25.64 -Y4-

SHEET 2 OF 2



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

REVISIONS

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

SHEET NO.  
 S02-24  
 TOTAL SHEETS  
 31

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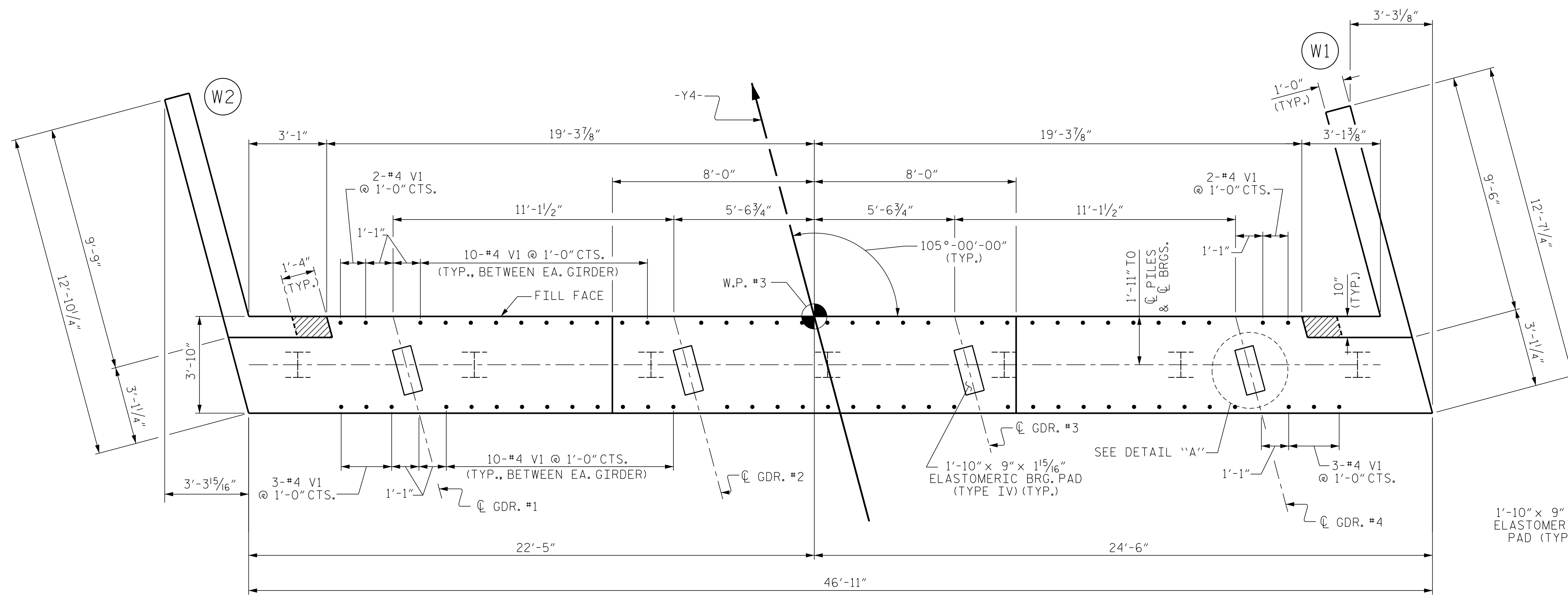
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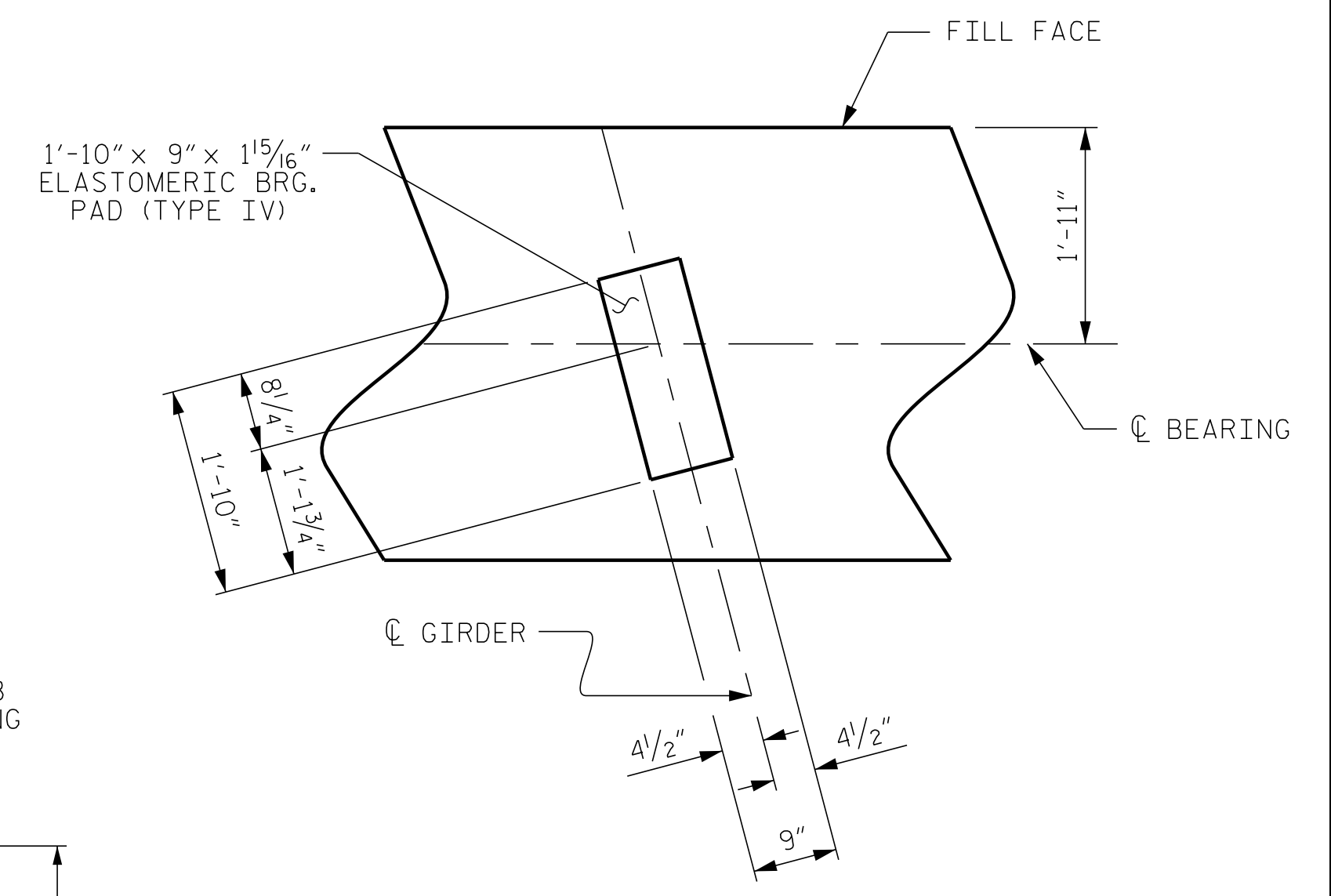
NOTES

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

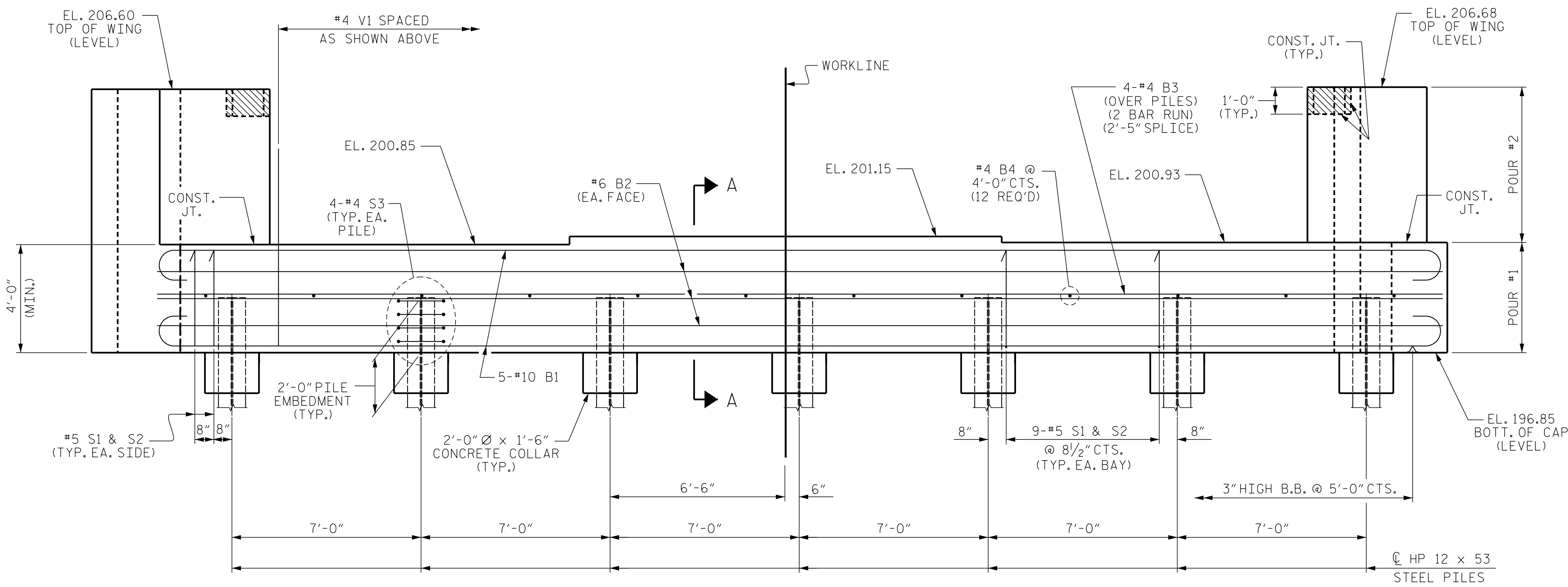
THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA AND THE AREA OUTSIDE THE EDGE OF SUPERSTRUCTURE, SHALL BE RAKED TO A DEPTH OF 1/4".



PLAN

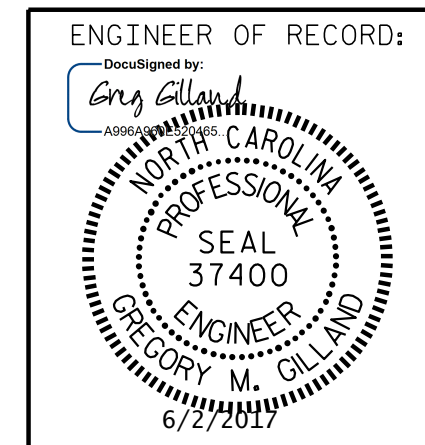


DETAIL "A"  
(TYP. EACH GIRDER)



ELEVATION

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 1 OF 3



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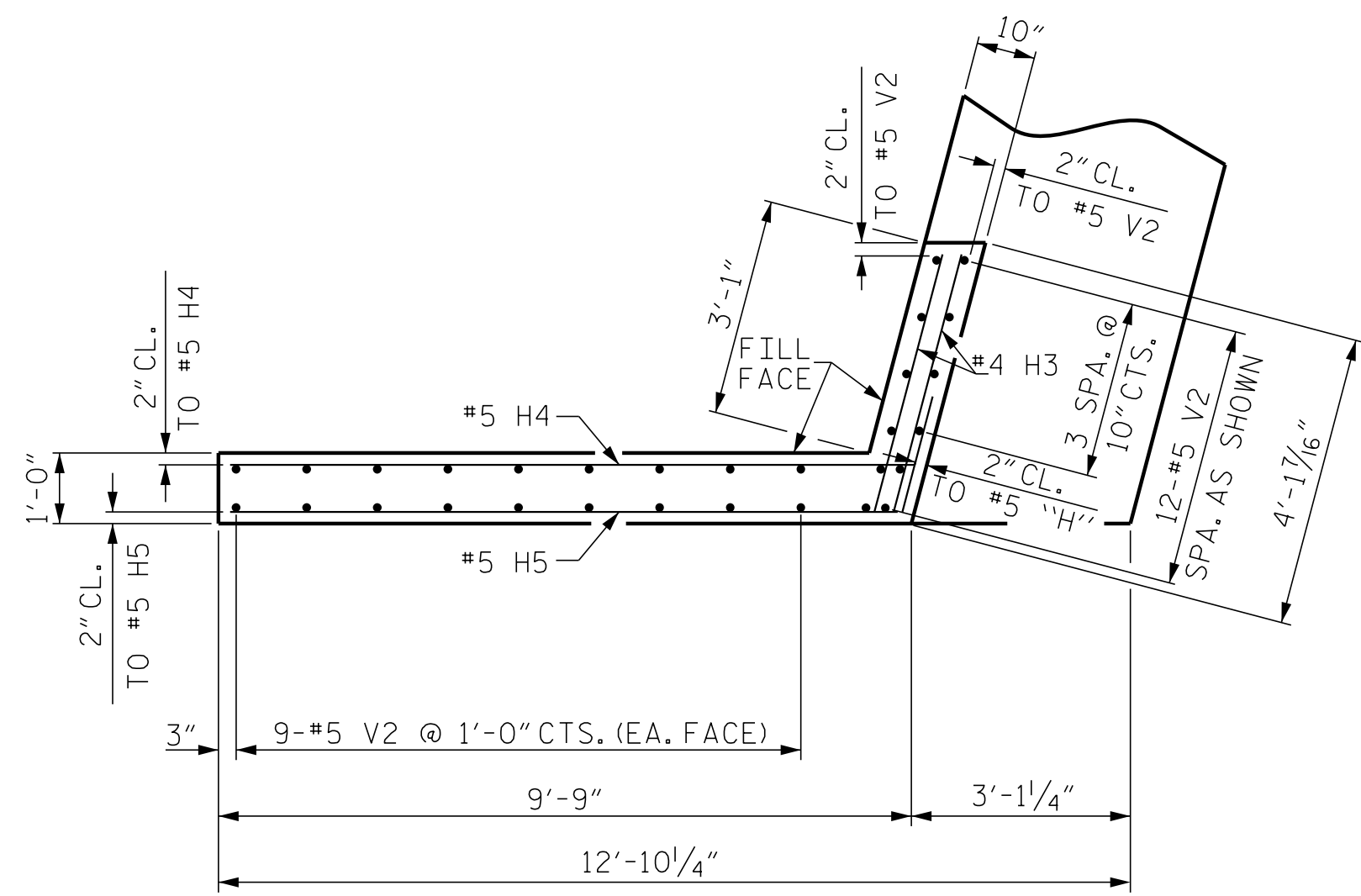
STATE OF NORTH CAROLINA		DEPARTMENT OF TRANSPORTATION	
RALEIGH		SUBSTRUCTURE	
END BENT No. 2		REVISIONS	
NO.	BY:	DATE:	NO.
1			3
2			4

SHEET NO. S02-25  
 TOTAL SHEETS 31

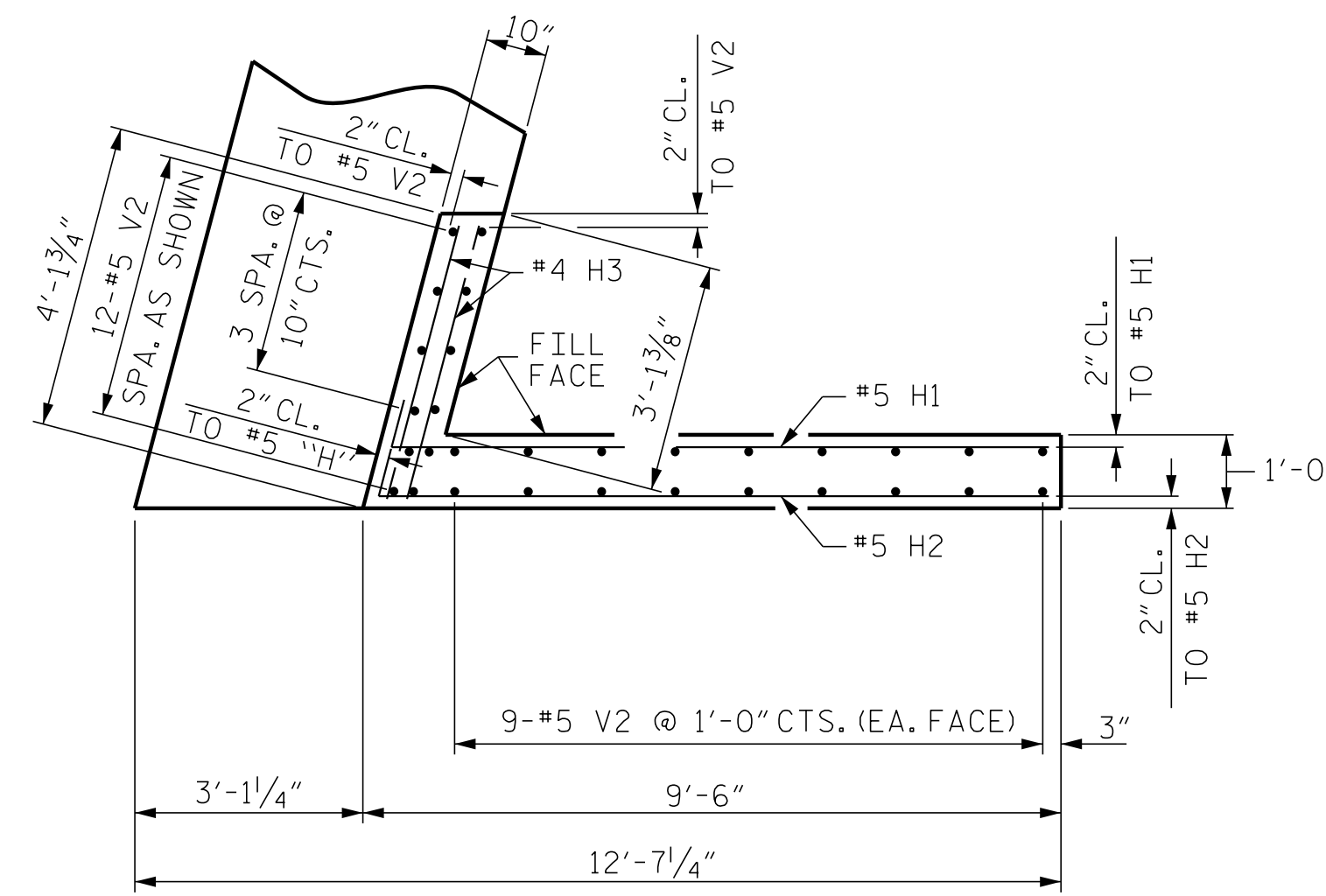
DRAWN BY: D. HODGE DATE: 4/17  
 CHECKED BY: B.C. HUNT DATE: 5/17

DOCUMENT NOT CONSIDERED FINAL  
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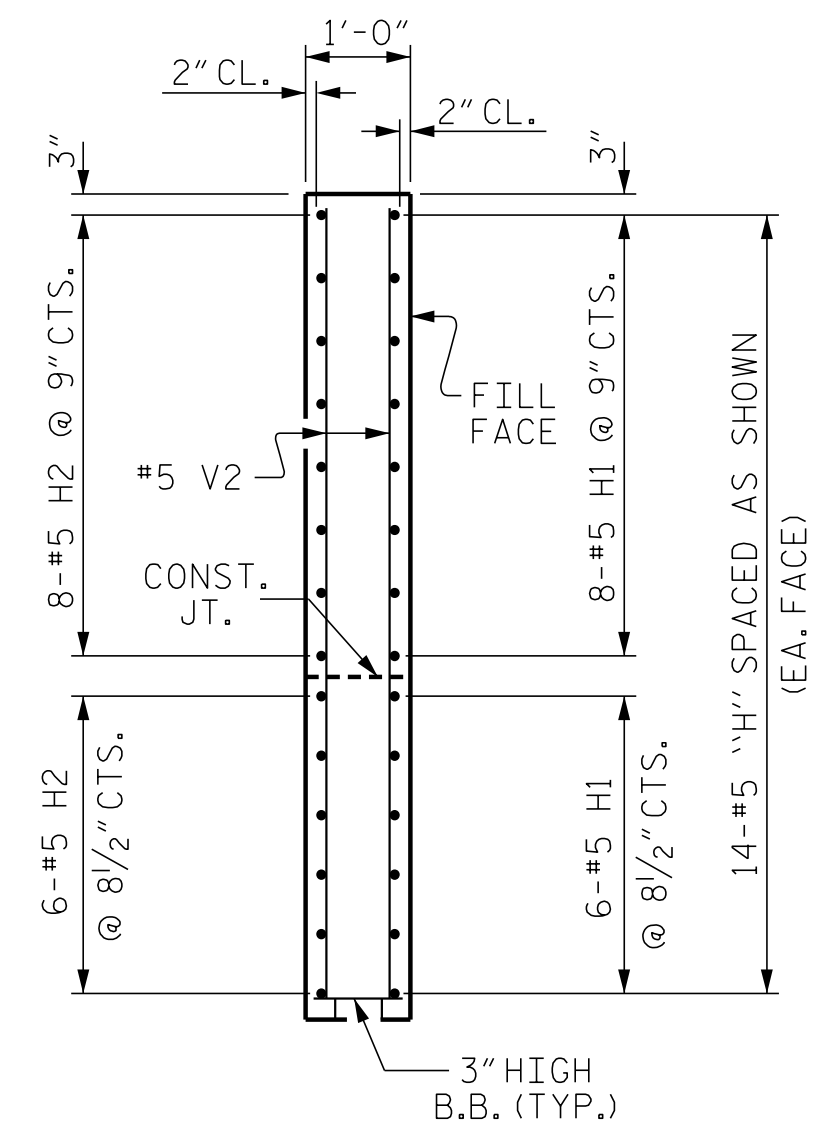
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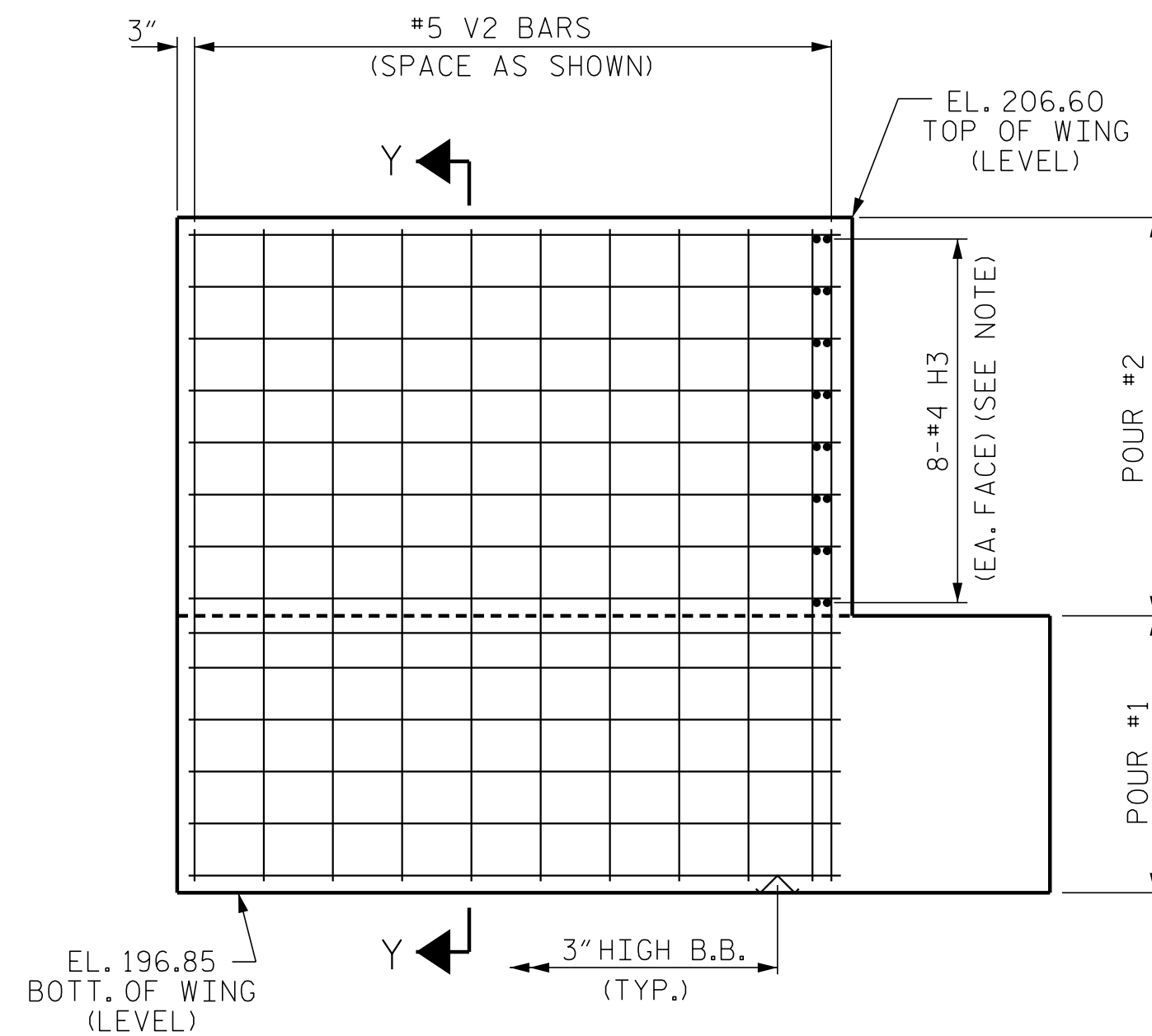
PLAN OF WING - (W2)



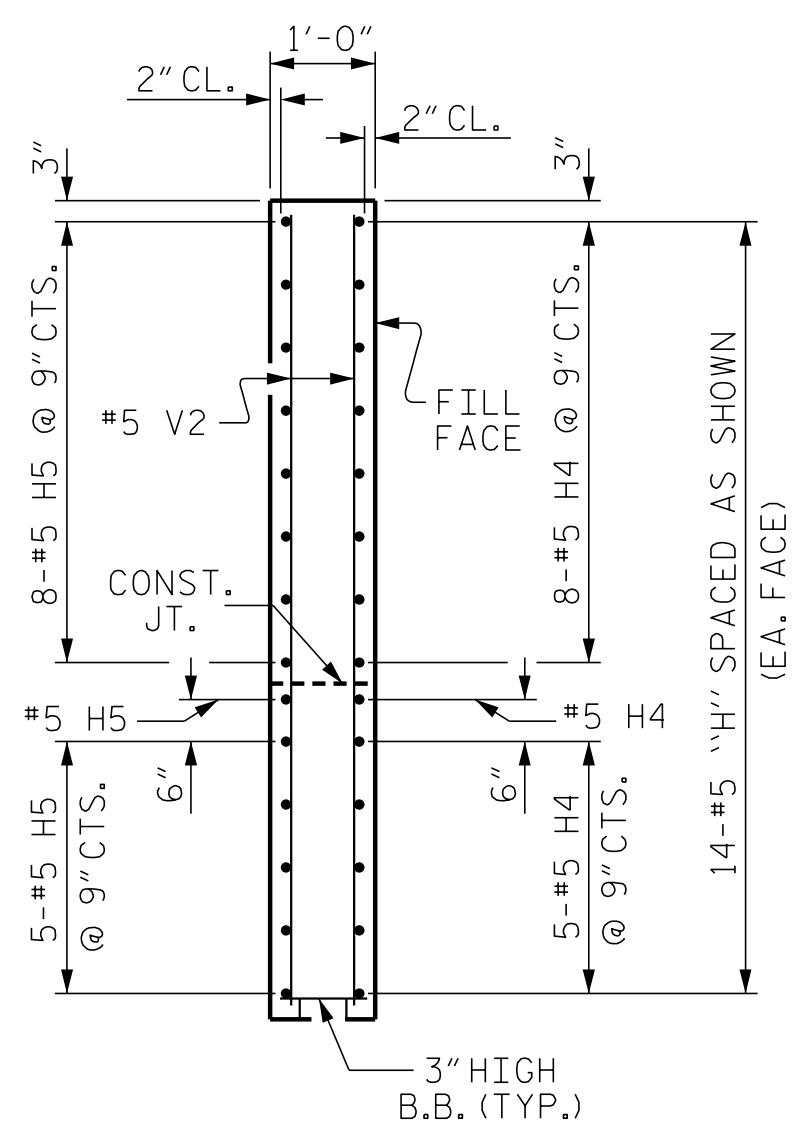
PLAN OF WING - (W1)



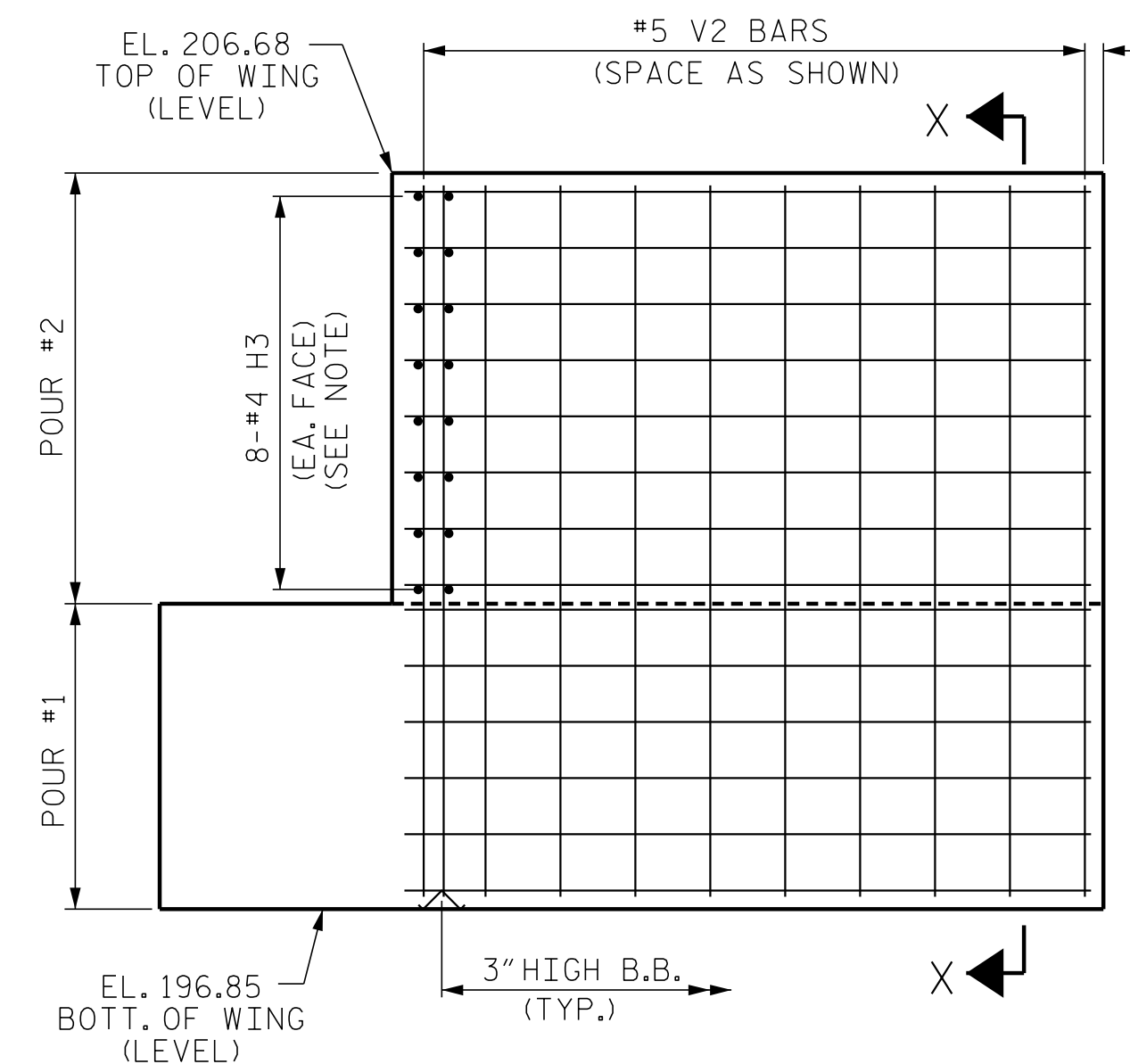
SECTION X-X



ELEVATION OF WING - (W2)



SECTION Y-Y



ELEVATION OF WING - (W1)

NOTE: #4 H3 TO MATCH SPACING OF #5 H HARS

PROJECT NO. I-5786  
 JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 2 OF 3

ENGINEER OF RECORD:  
 Greg Gill  
 NORTH CAROLINA PROFESSIONAL SEAL 37400  
 GREGORY M. OLLAND  
 6/2/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
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 DEPARTMENT OF TRANSPORTATION  
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SUBSTRUCTURE  
 END BENT No. 2

REVISIONS

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

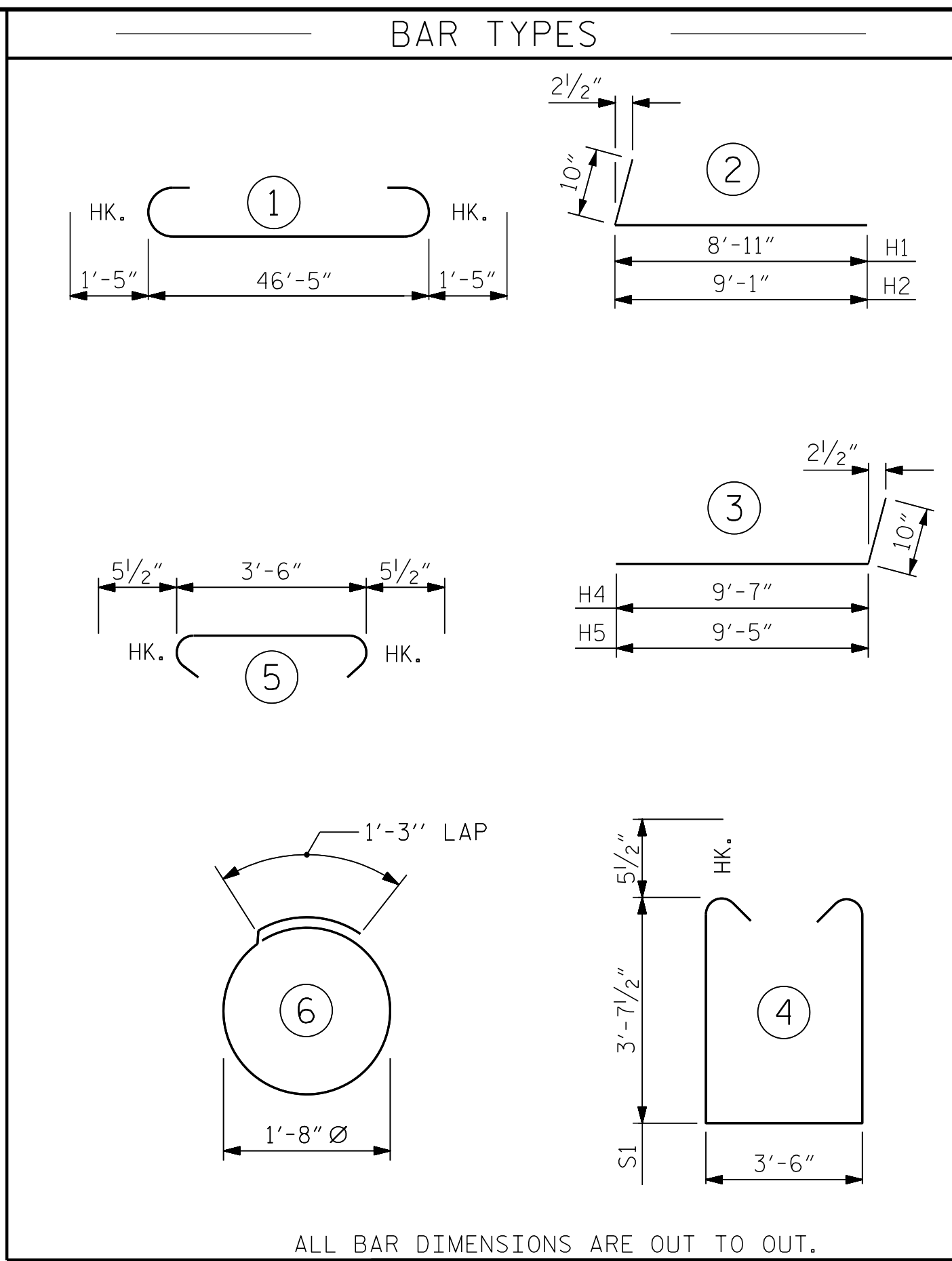
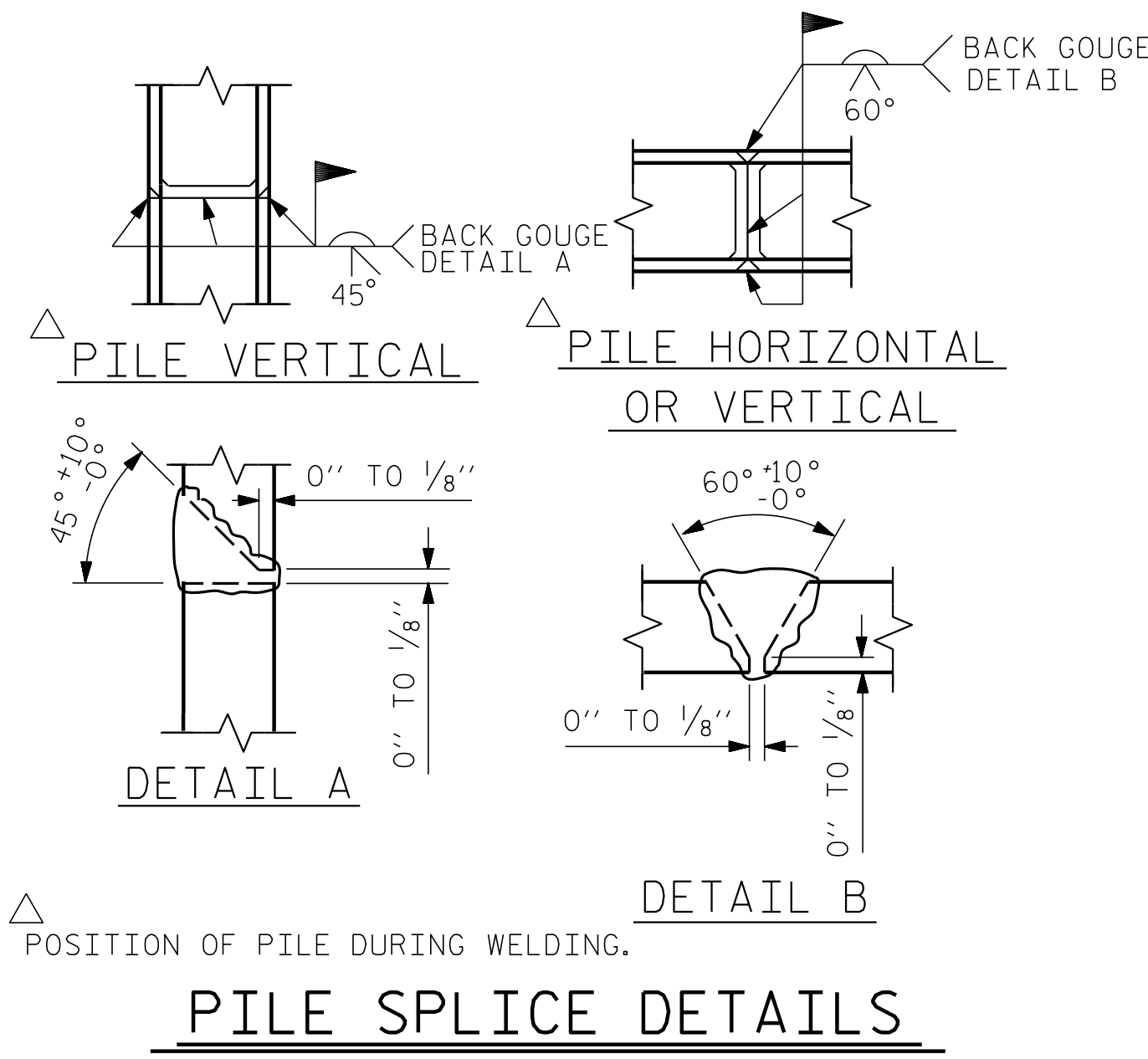
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 TOTAL SHEETS  
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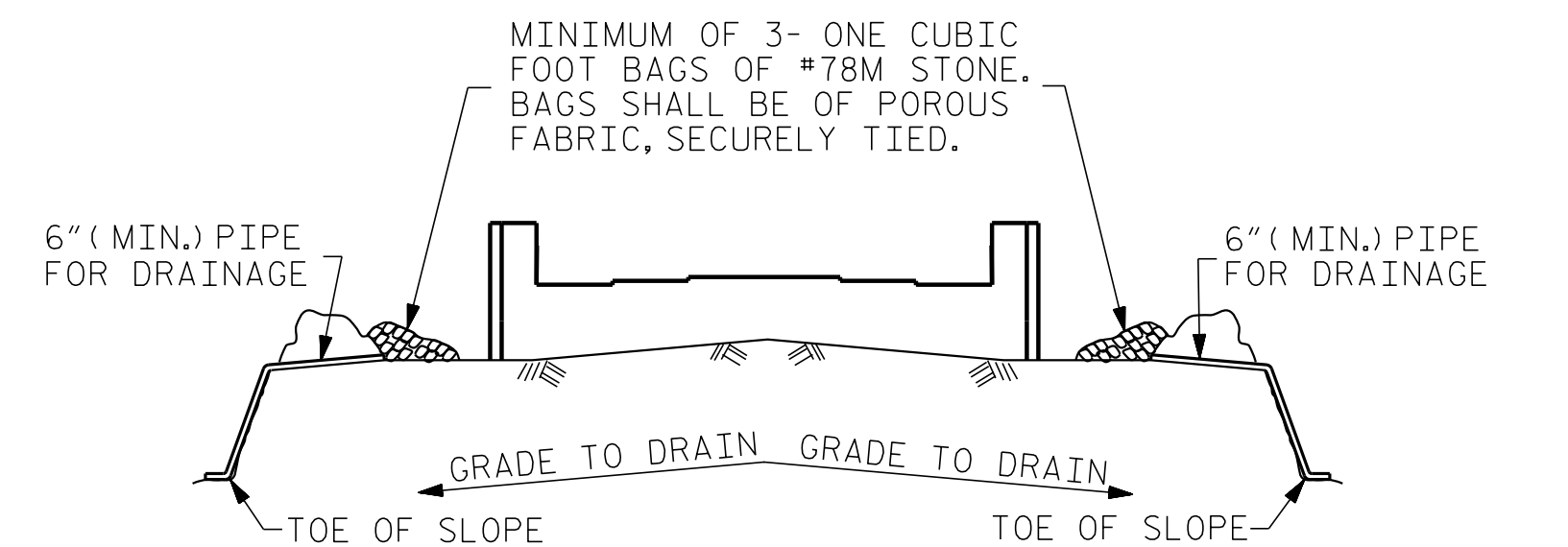




**BILL OF MATERIAL**

**END BENT No. 2**

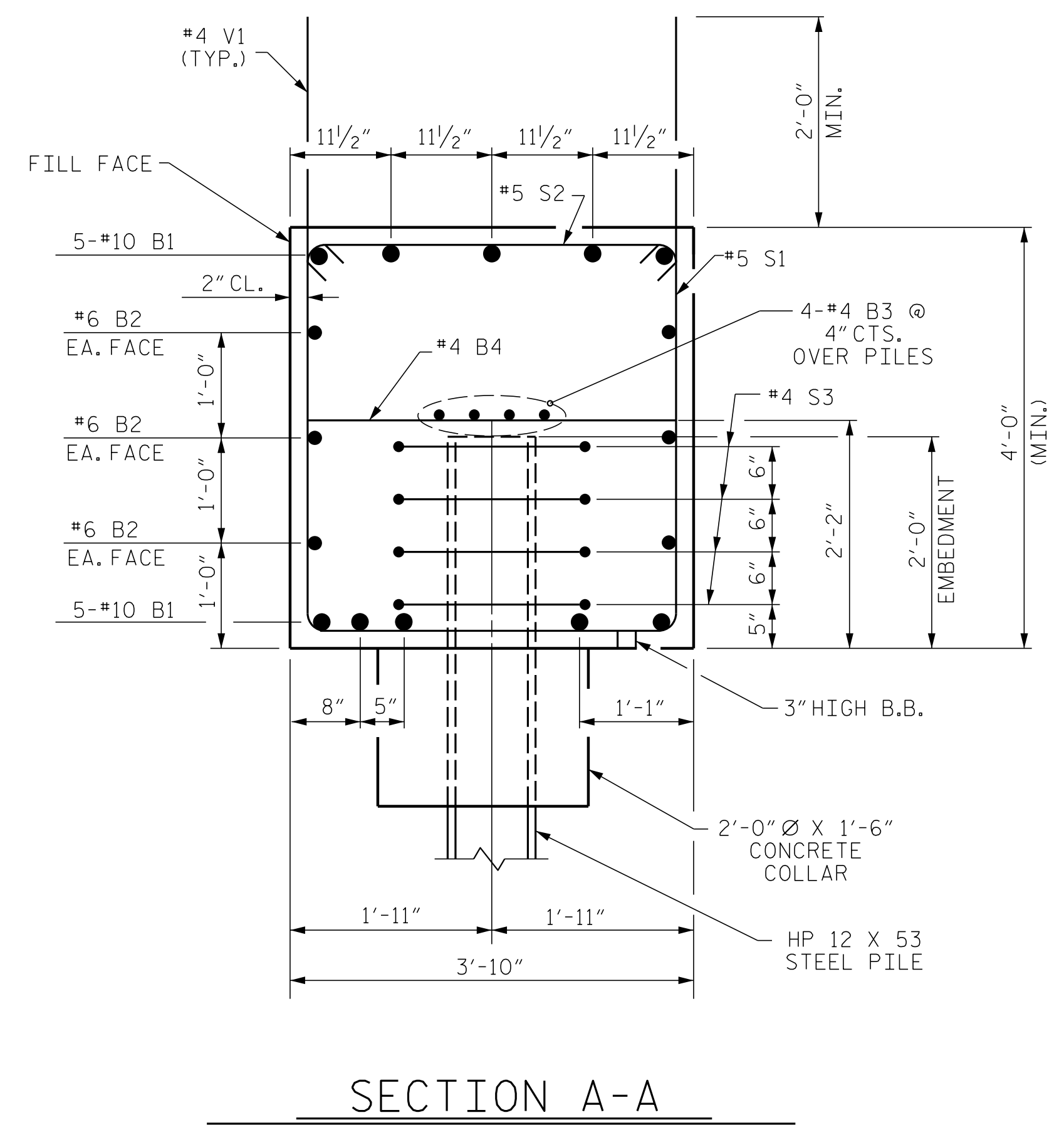
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	49'-3"	2119
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H4	14	#5	3	10'-5"	152
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REINFORCING STEEL					5,329 LBS.
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POUR #2	UPPER PART OF WINGS				5.2 C.Y.
TOTAL CLASS A CONCRETE					36.6 C.Y.
HP 12 X 53 STEEL PILES					
NO: 7					335 L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					7 EA.
PILE REDRIVES					4 EA.



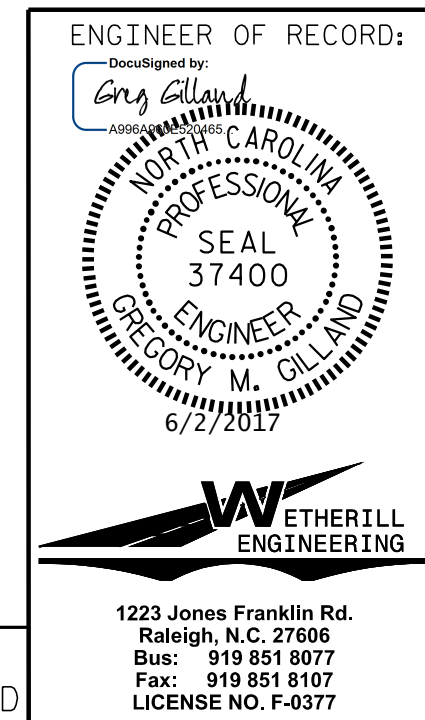
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT No. 2**

**REVISIONS**

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

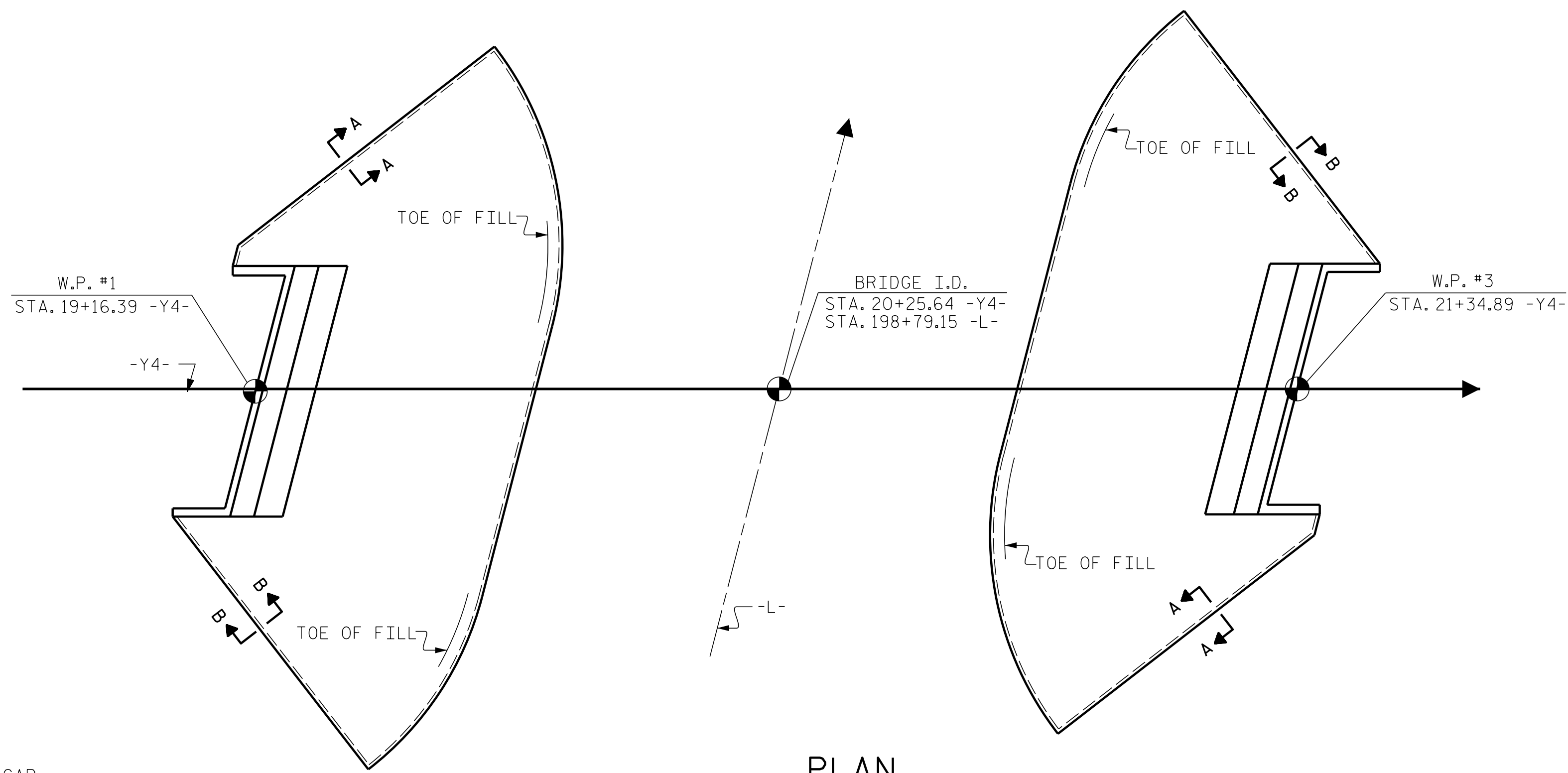
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 TOTAL SHEETS 31

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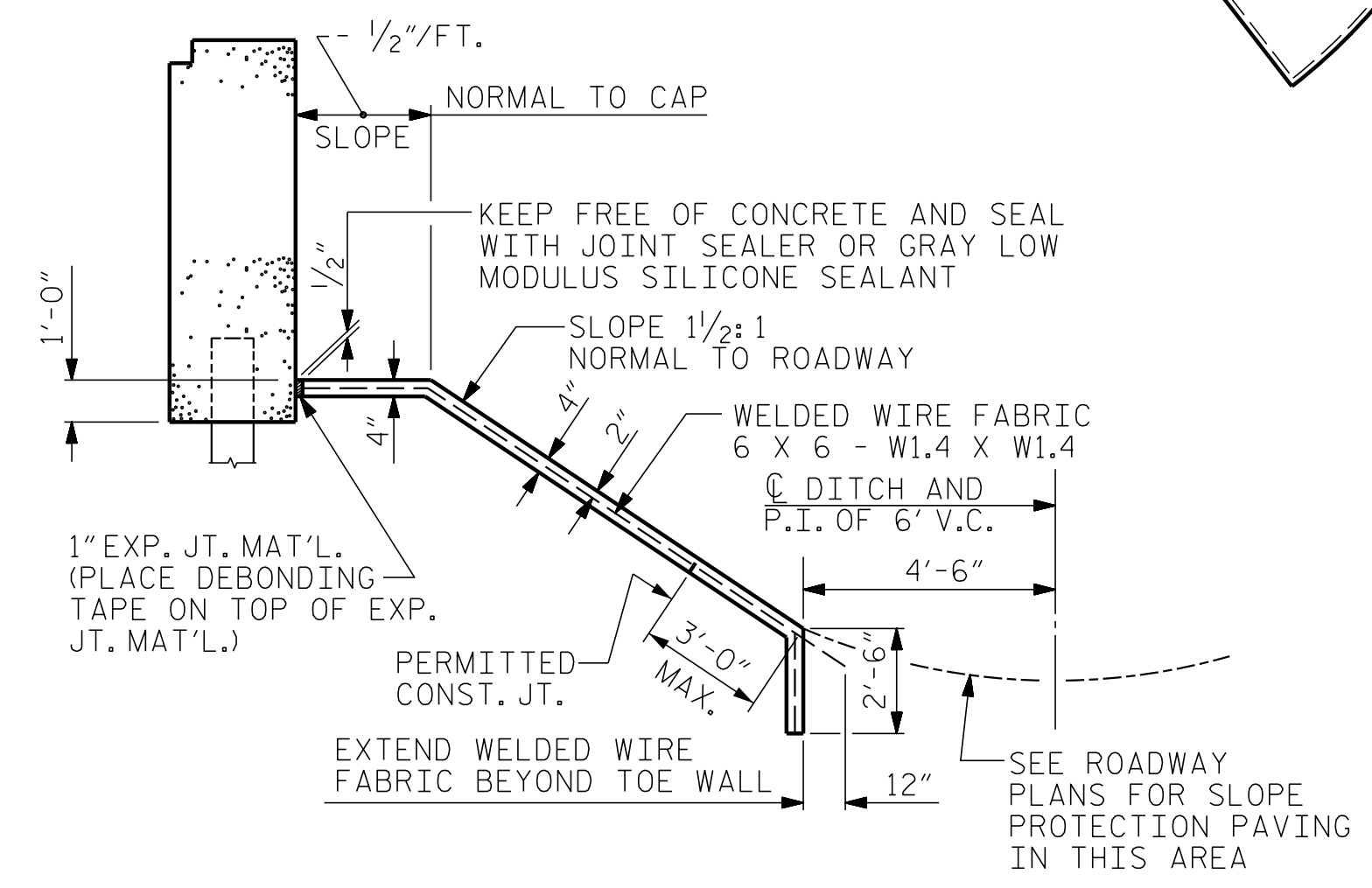
PLAN

**GENERAL NOTES**

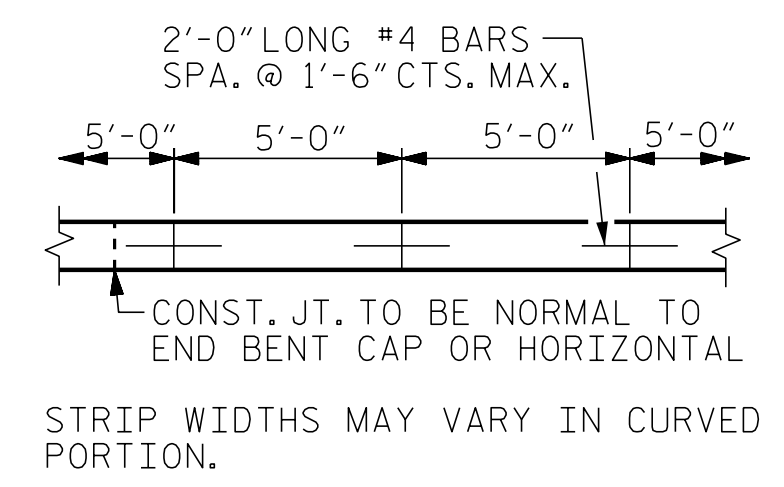
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE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

BRIDGE @ STA. 20+25.64 -Y4-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	240	625
END BENT 2	245	670

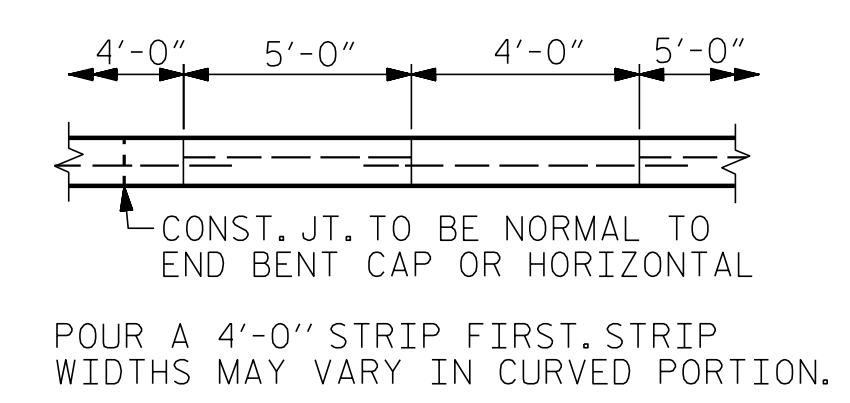
\* QUANTITY SHOWN IS BASED ON 5' POURS.



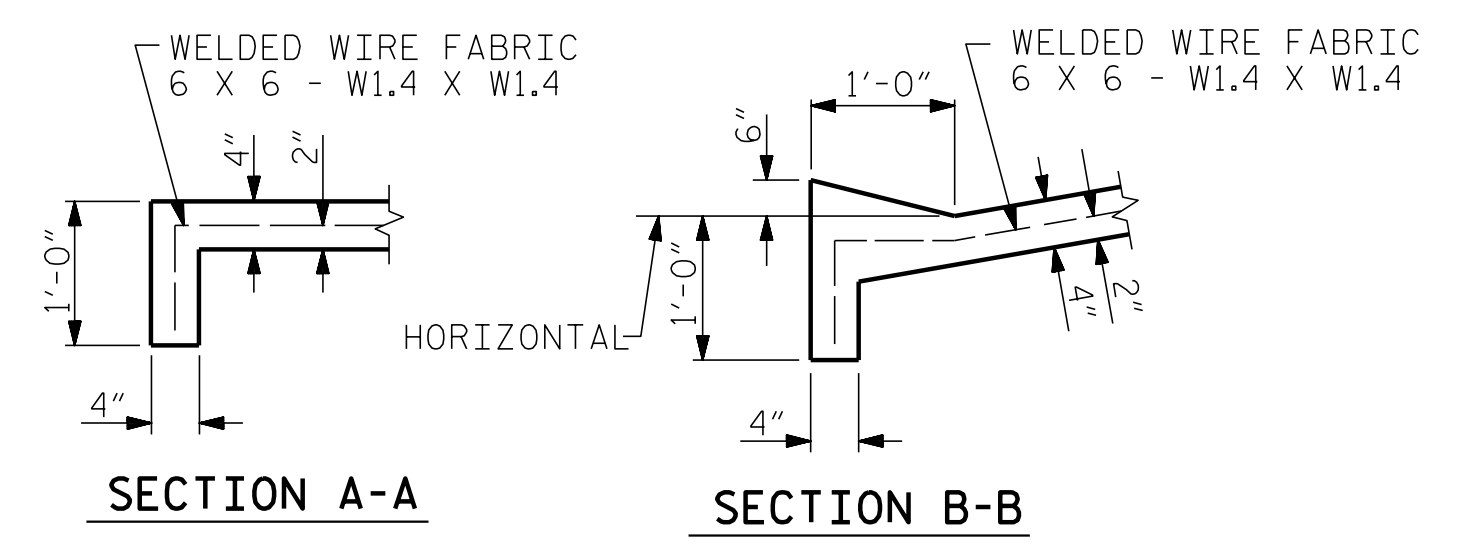
SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH



POURING DETAIL



OPTIONAL POURING DETAIL



SECTION A-A

SECTION B-B

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

SHEET 1 OF 2

ENGINEER OF RECORD:  
 Greg Gilliland  
 PROFESSIONAL ENGINEER  
 SEAL 37400  
 GREGORY M. OLLAND  
 6/2/2017  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

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

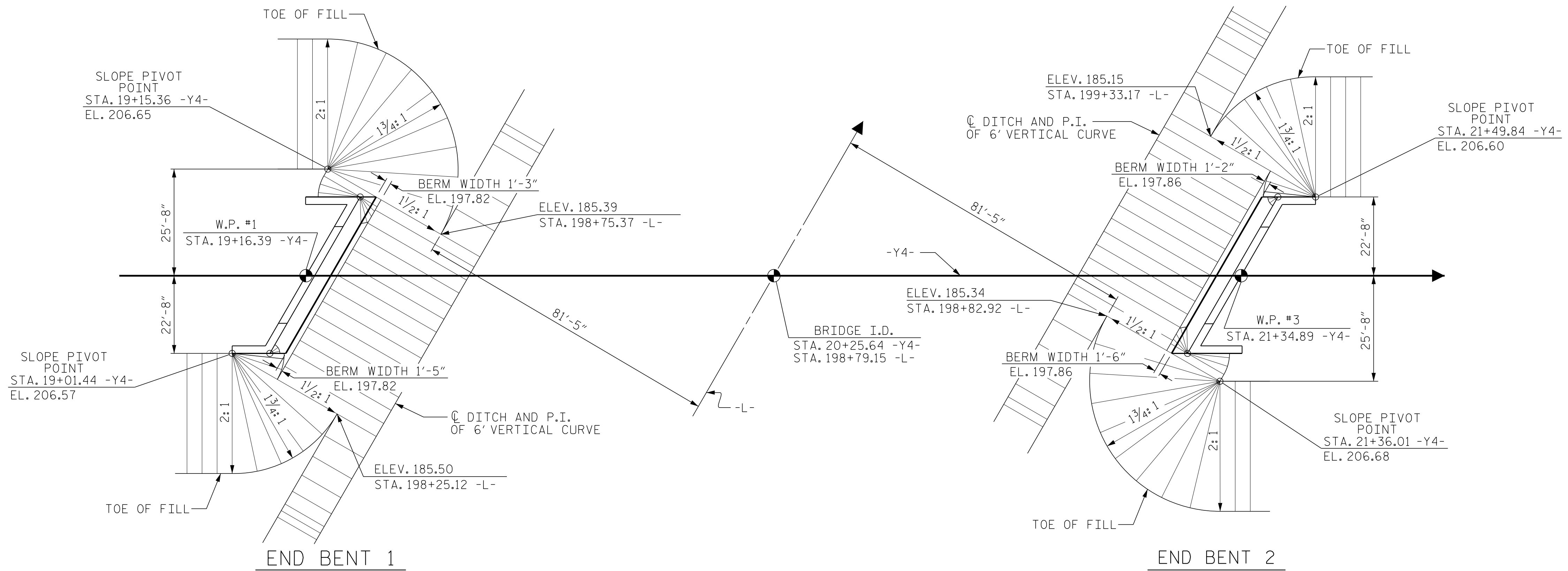
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			

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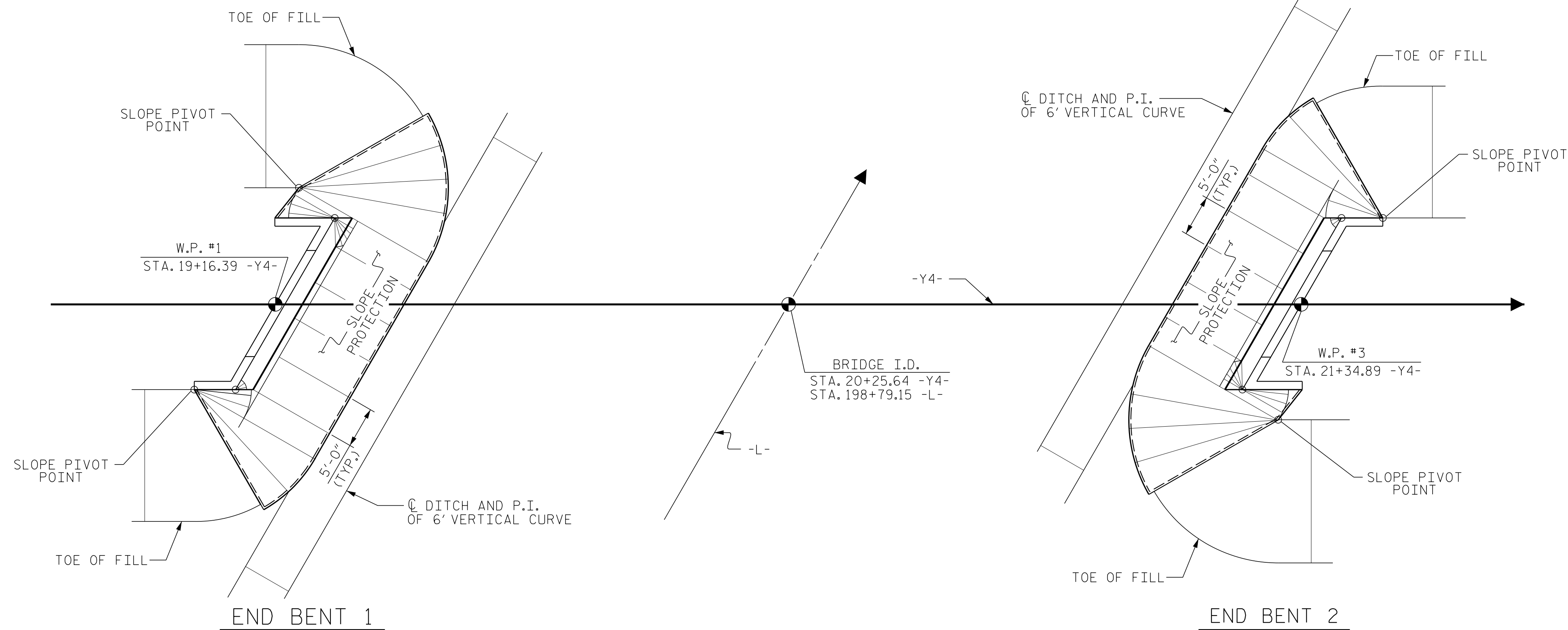
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DRAWN BY : B.C. HUNT DATE : 4-17  
 CHECKED BY : G.M. GILLAND DATE : 4-17





PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. I-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-  
 SHEET 2 OF 2



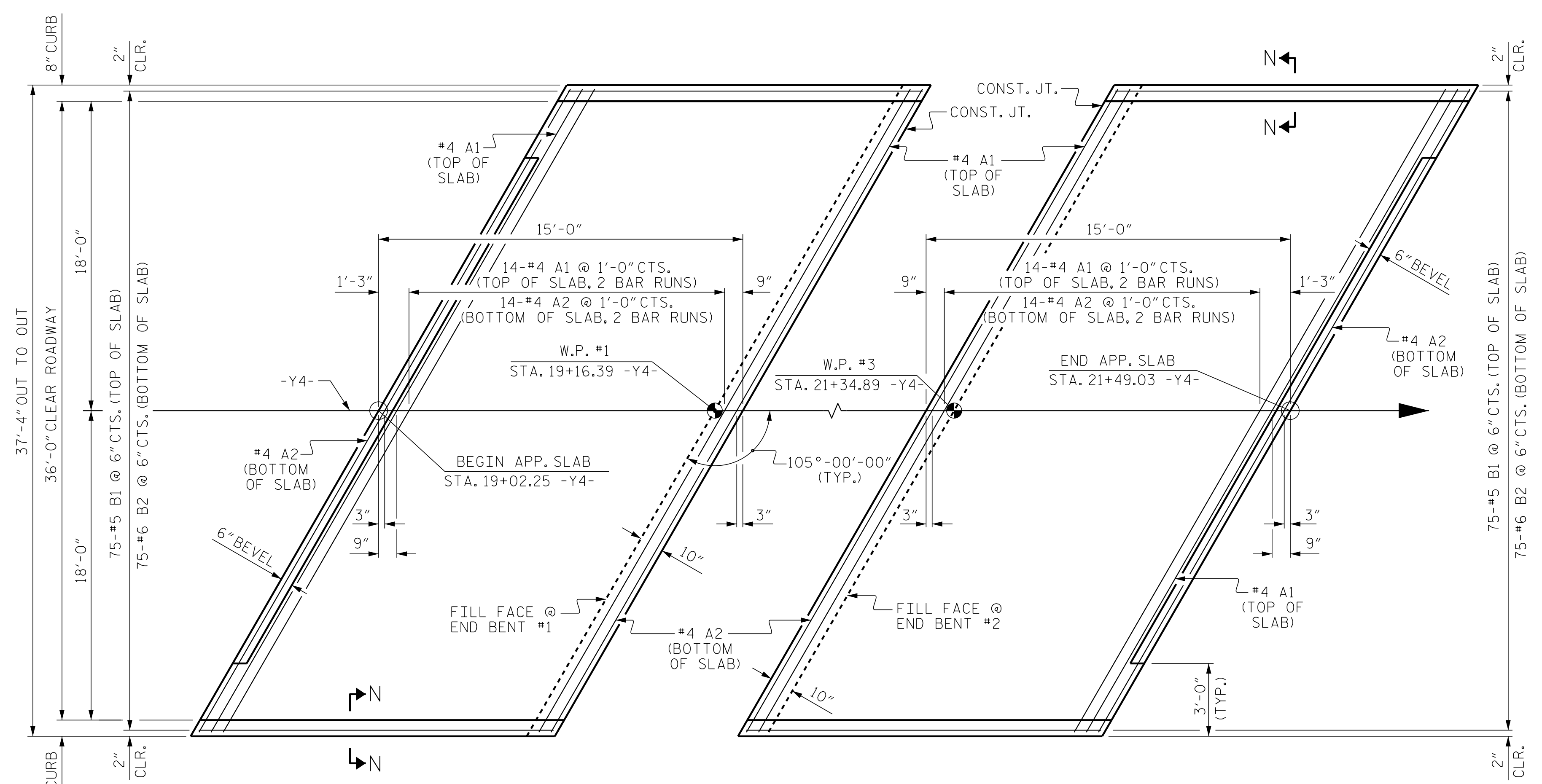
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SLOPE PROTECTION DETAILS					
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 TOTAL SHEETS 31

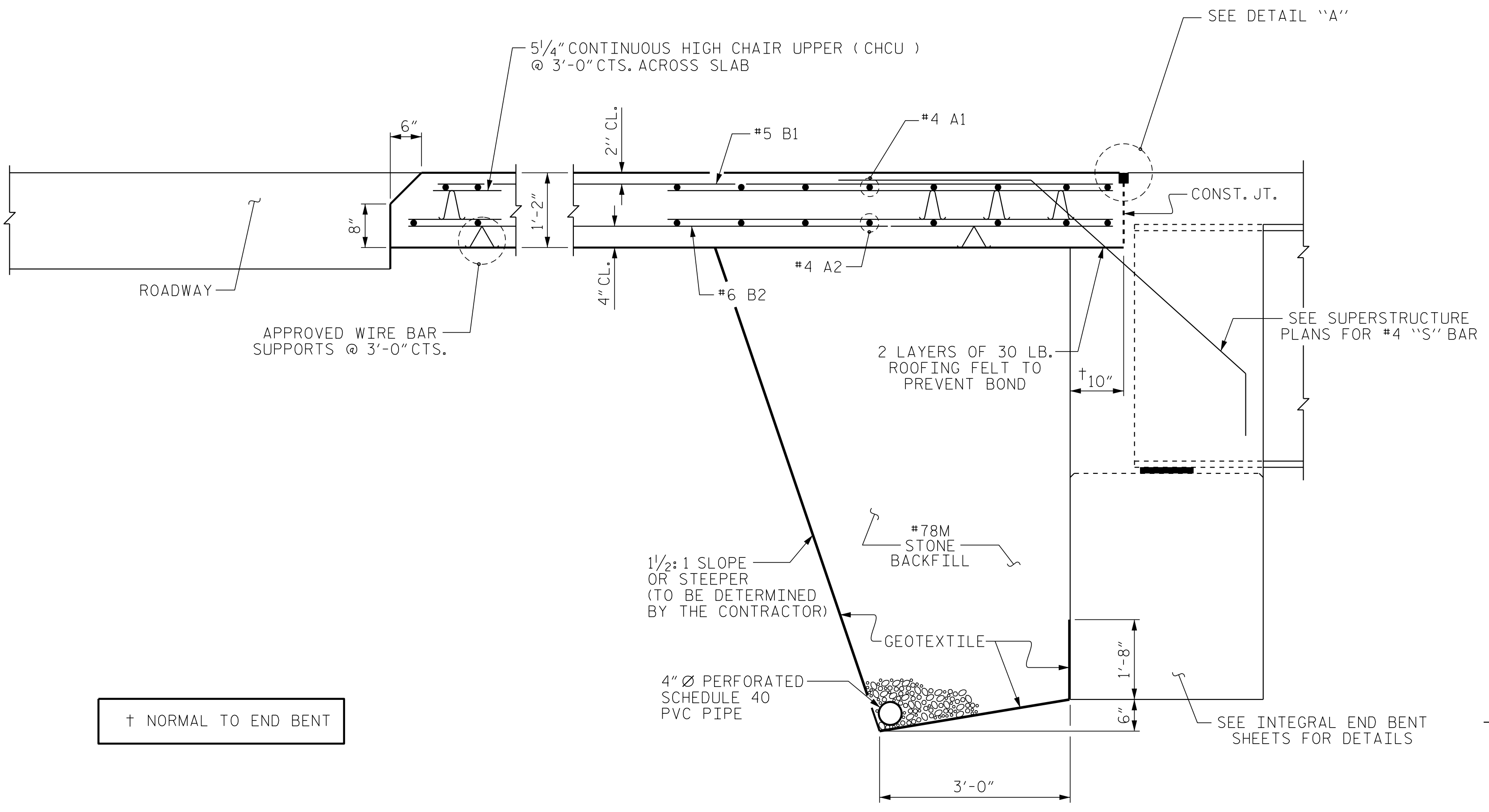
DRAWN BY: B.C. HUNT DATE: 4-17  
 CHECKED BY: G.M. GILLAND DATE: 5-17

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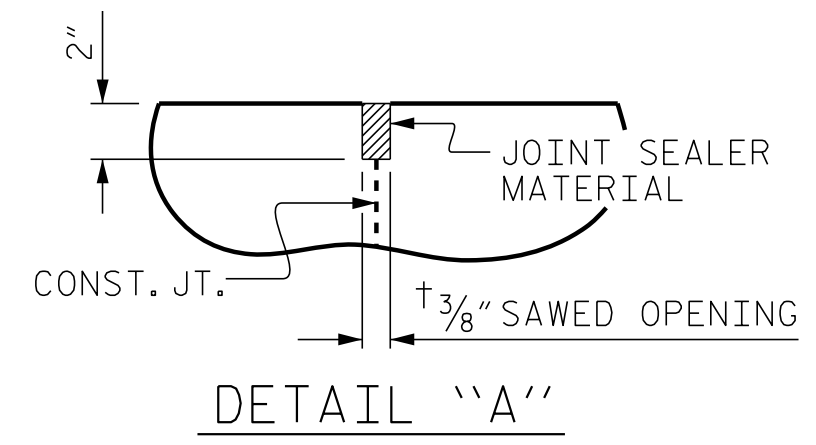
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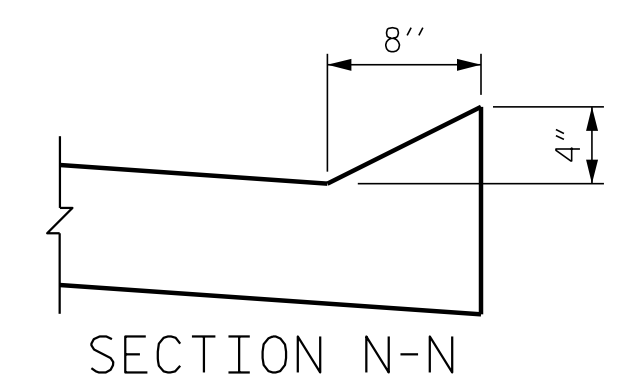
PLAN @ END BENT #1 PLAN @ END BENT #2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



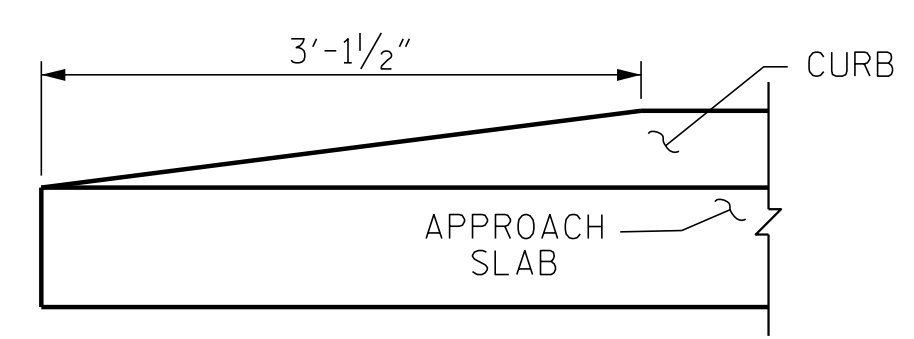
SECTION THRU SLAB



DETAIL "A"



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

2'-0" SPLICE FOR A1  
1'-9" SPLICE FOR A2

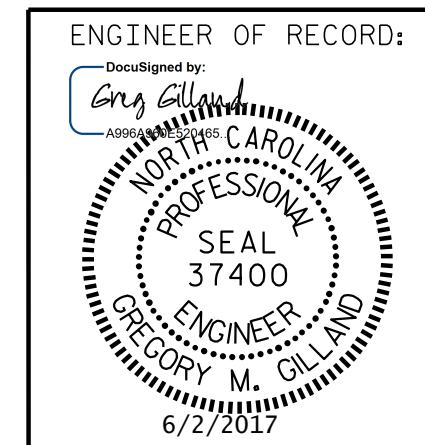
NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.  
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
#78M STONE 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.  
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.  
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	32	#4	STR	20'-2"	431
A2	32	#4	STR	20'-1"	429
*B1	75	#5	STR	14'-1"	1102
B2	75	#6	STR	14'-7"	1643
REINFORCING STEEL				LBS.	2,072
*EPOXY COATED REINFORCING STEEL				LBS.	1,533
CLASS AA CONCRETE				C. Y.	24.1
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	32	#4	STR	20'-2"	431
A2	32	#4	STR	20'-1"	429
*B1	75	#5	STR	14'-1"	1102
B2	75	#6	STR	14'-7"	1643
REINFORCING STEEL				LBS.	2,072
*EPOXY COATED REINFORCING STEEL				LBS.	1,533
CLASS AA CONCRETE				C. Y.	24.1

PROJECT NO. I-5786  
JOHNSTON COUNTY  
STATION: 20+25.64 -Y4-  
SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

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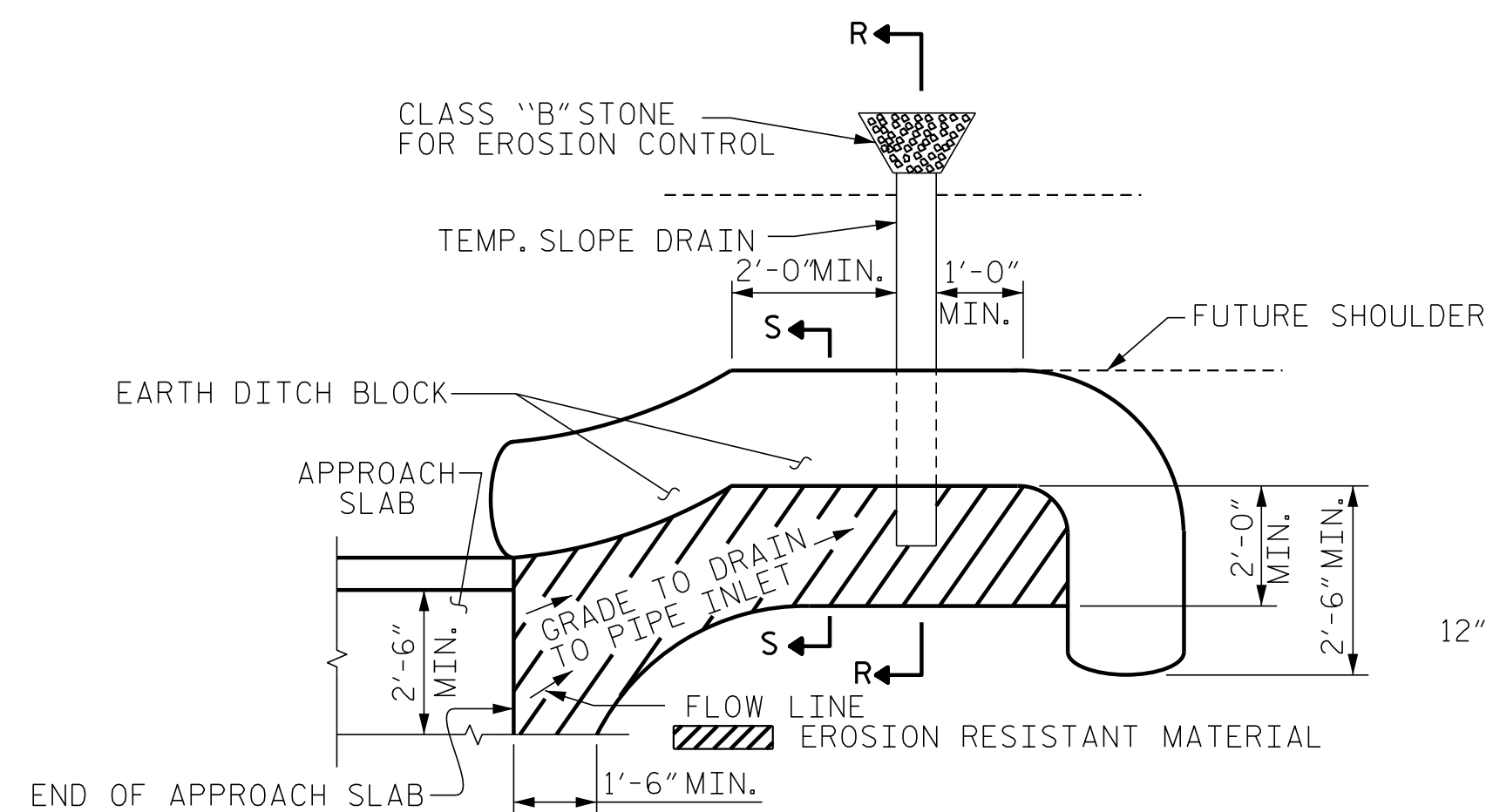
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TOTAL SHEETS 31

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CHECKED BY: T. ROUNTREE DATE: 5/17

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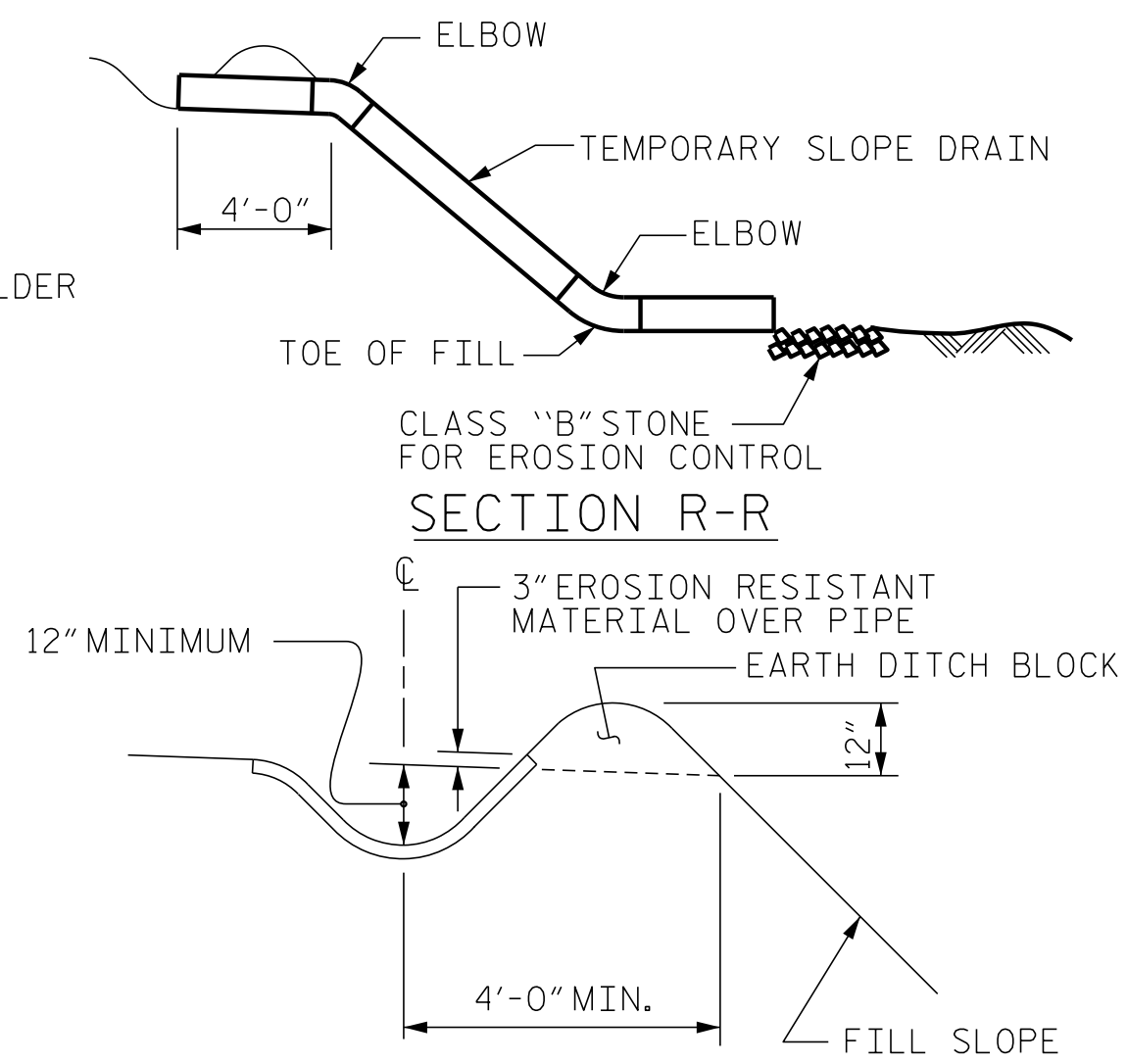
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NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE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

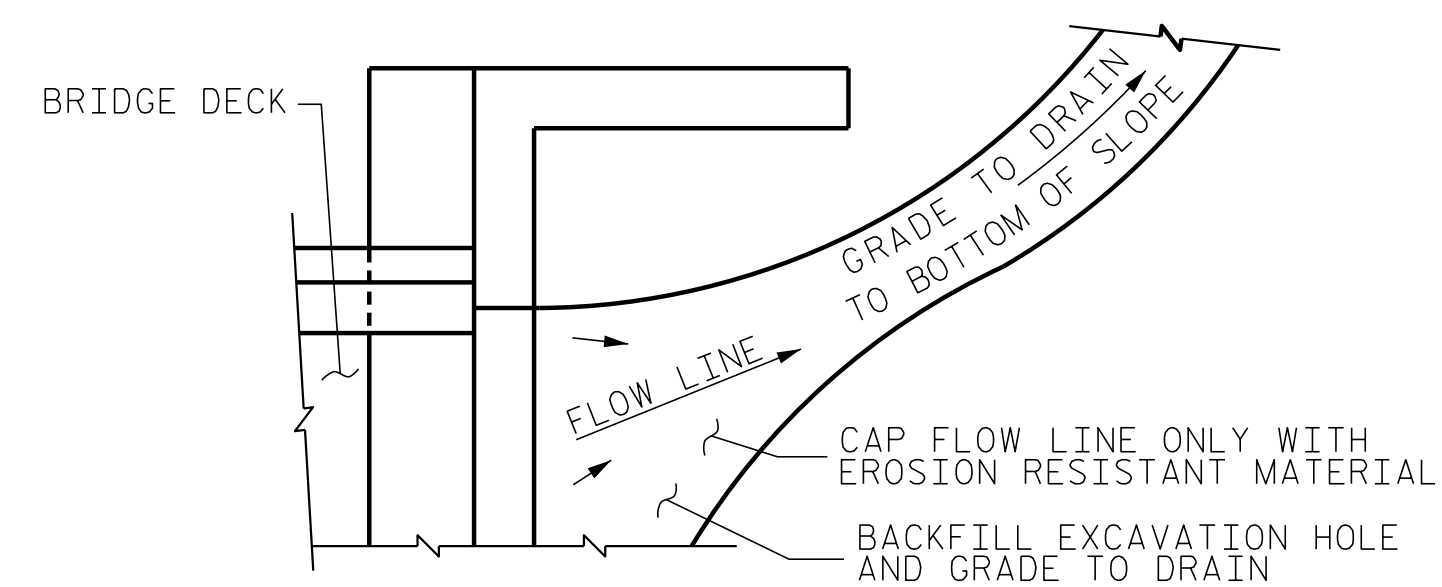
PLAN VIEW



SECTION S-S

## TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

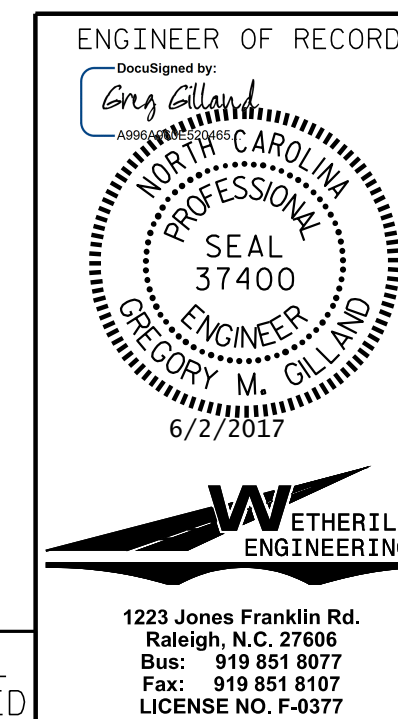


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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-5786  
JOHNSTON COUNTY  
 STATION: 20+25.64 -Y4-

SHEET 2 OF 2



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

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2			4			

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