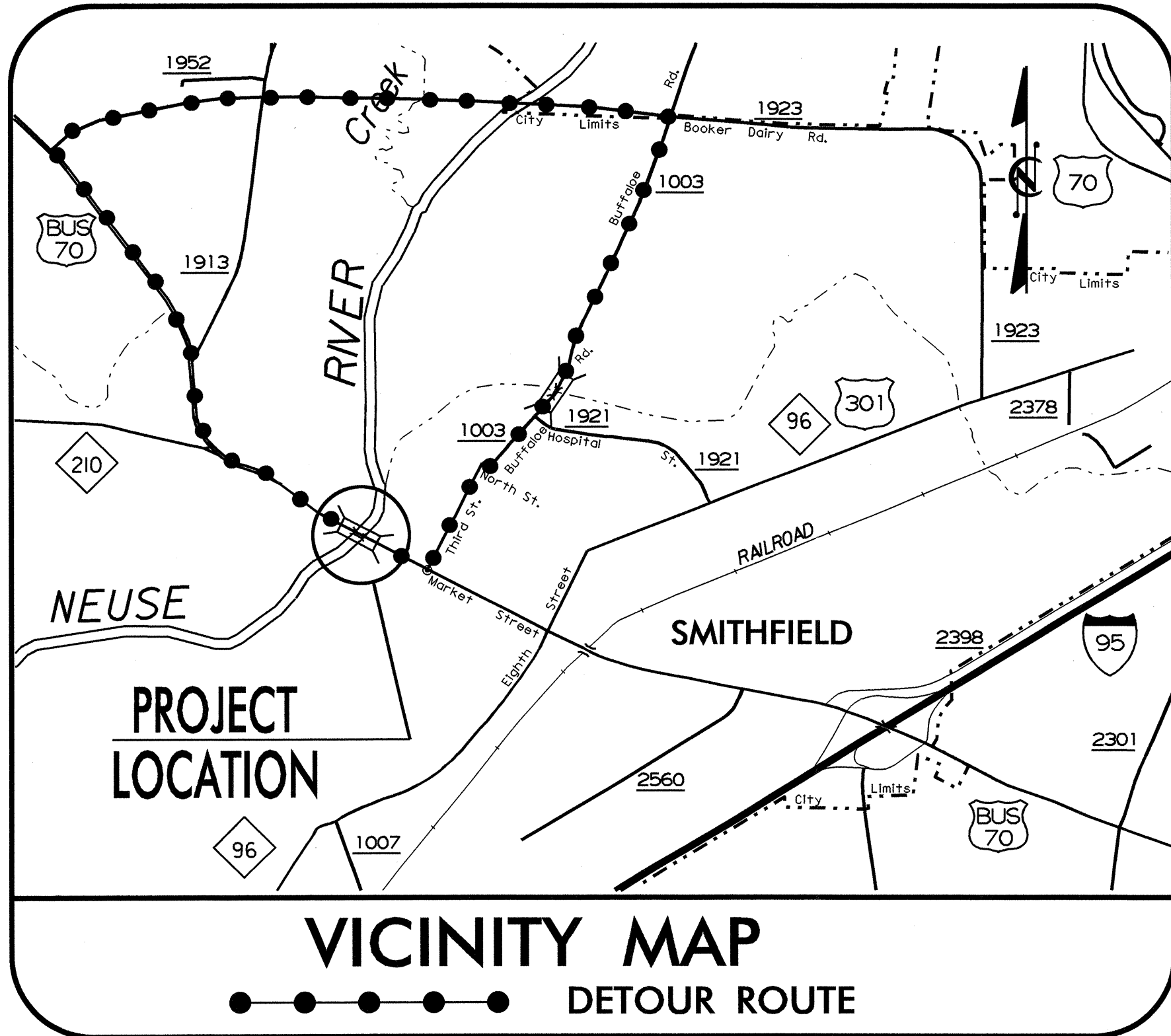


**CONTRACT: C202783 TIP PROJECT: B-3864**



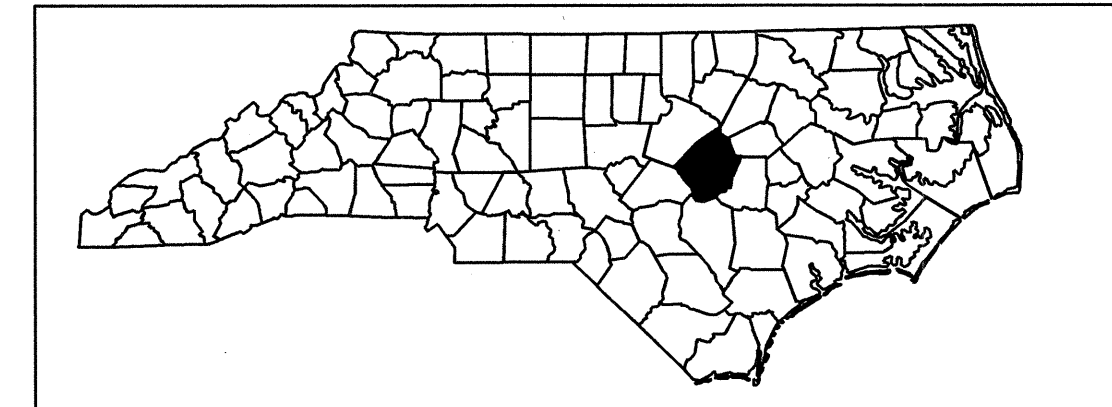
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# JOHNSTON COUNTY

**LOCATION : BRIDGE NO. 40 OVER NEUSE RIVER  
ON US 70 BUSINESS**

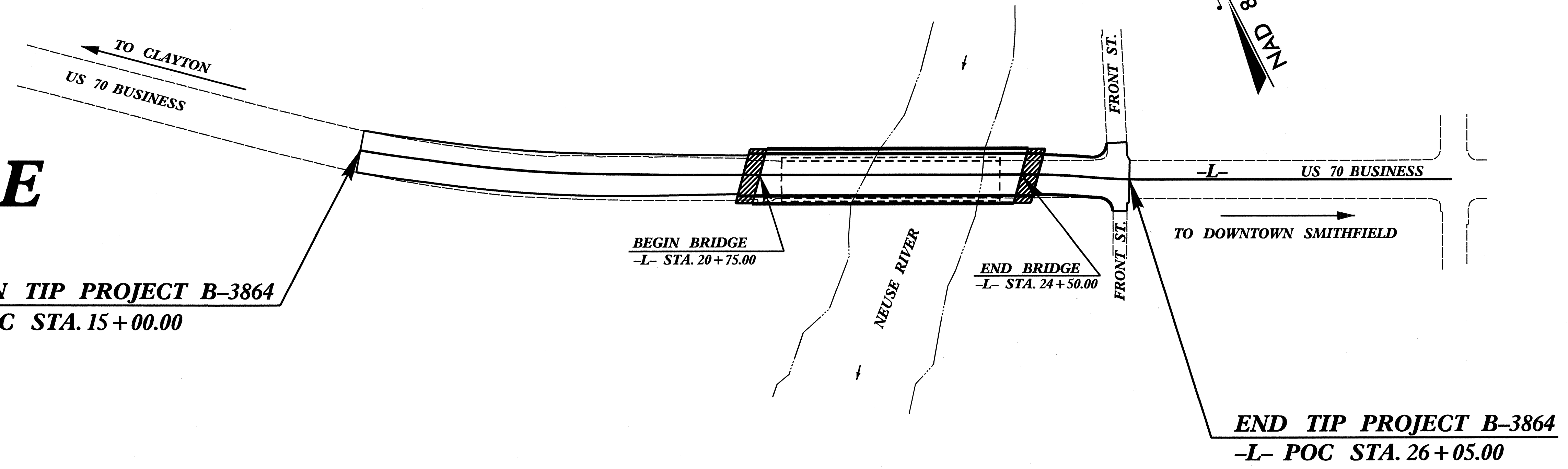
**TYPE OF WORK : GRADING, PAVING, DRAINAGE,  
STRUCTURE & SIGNALS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3864		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33310.1.1	BRSTP-70B(3)	PE	
33310.2.1	BRSTP-70B(3)	RW & UTIL.	
33310.3.1	BRSTP-70B(3)	CONST.	

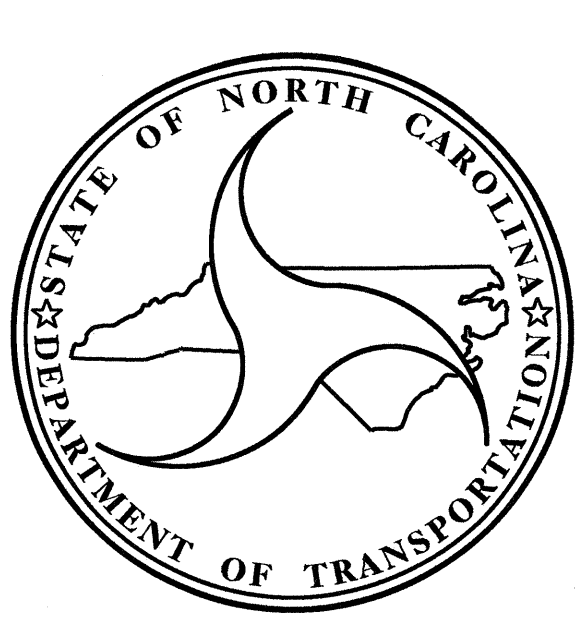


## STRUCTURE

**BEGIN TIP PROJECT B-3864**  
-L- POC STA. 15+00.00



**END TIP PROJECT B-3864**  
-L- POC STA. 26+05.00



**DESIGN DATA**

ADT 2012 =	27,400
ADT 2032 =	43,100
DHV =	10 %
D =	55 %
T =	3 % *
V =	50 MPH **

\*( TTST 1% + DUAL 2% )  
REGIONAL TIER  
FUNC. CLASS =  
PRINCIPAL ARTERIAL

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-3864 =	0.138 MI.
LENGTH OF STRUCTURE TIP PROJECT B-3864 =	0.071 MI.
TOTAL LENGTH OF TIP PROJECT B-3864 =	0.209 MI.

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 BIRCH RIDGE DR. RALEIGH, NC 27610

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2012 STANDARD SPECIFICATIONS

<b>LETTING DATE:</b> FEBRUARY 21, 2012	<b>N. N. BULLOCK, PE</b> PROJECT ENGINEER
	<b>D. R. CALHOUN, PE</b> PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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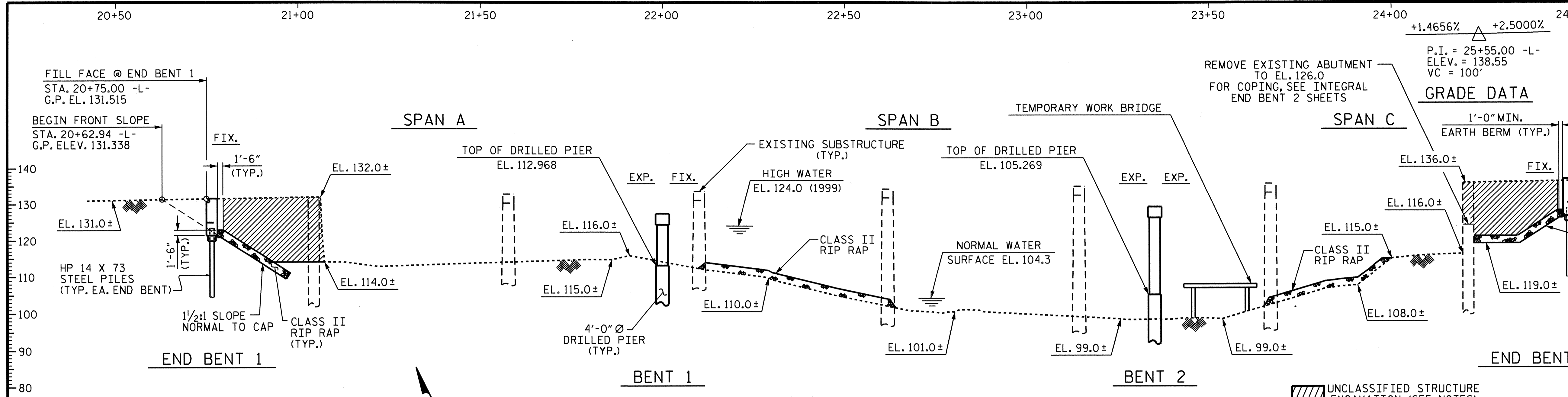
STATE DESIGN ENGINEER  
**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

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APPROVED  
DIVISION ADMINISTRATOR

DATE

04-JAN-2012 12:18  
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**SECTION ALONG -L-**  
(SECTION @ END BENTS AND BENTS TAKEN AT RIGHT ANGLES)

**PLAN**  
(PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

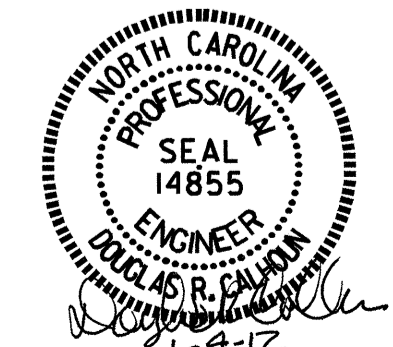
PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE NO. 40

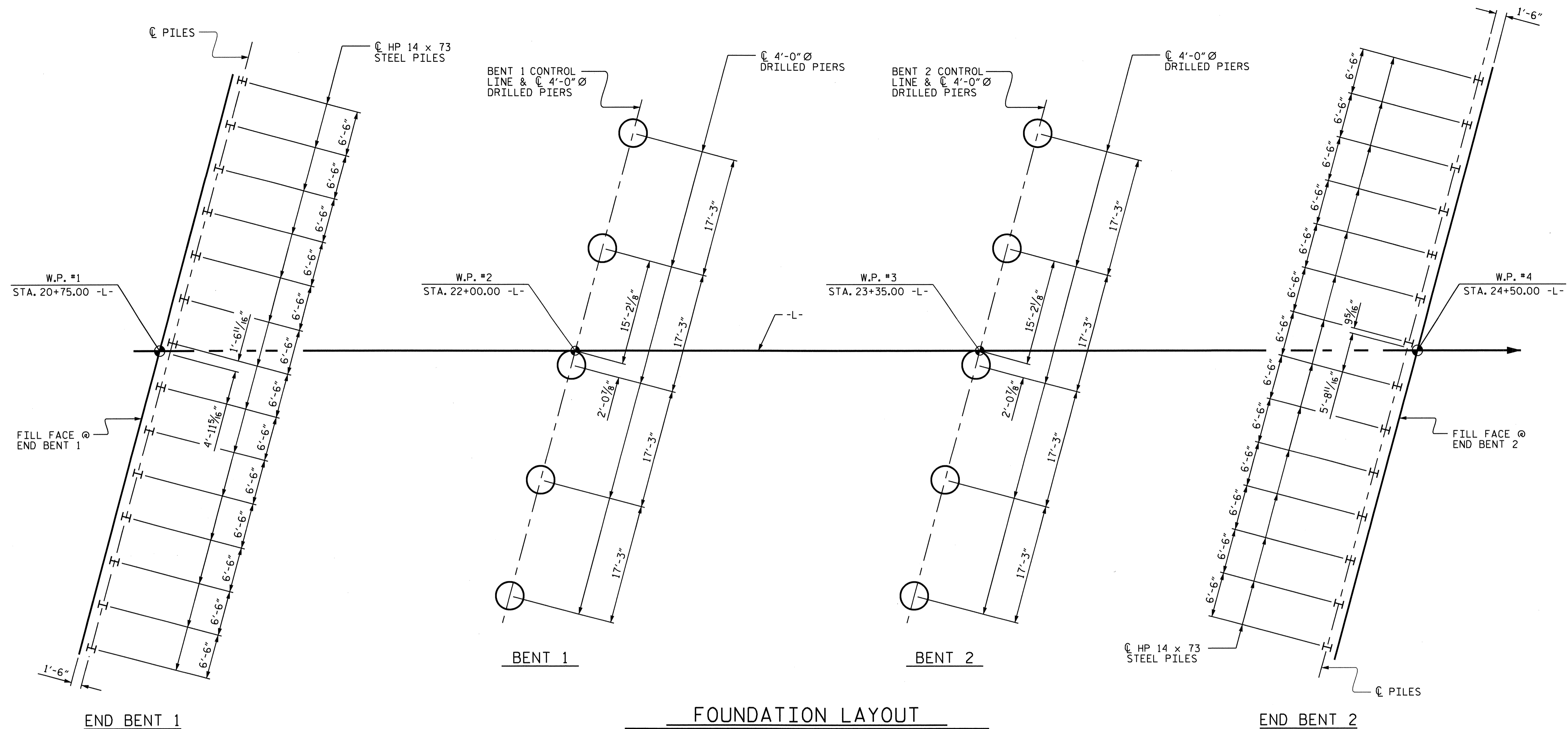
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER NEUSE RIVER  
 ON US 70 BUSINESS  
 BETWEEN NC 210 AND SR 1003

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1	
1			3			TOTAL SHEETS	42
2			4				

DRAWN BY: E. G. ALLEN DATE: 10-13-11  
 CHECKED BY: B. N. GRADY DATE: 10-19-11





**FOUNDATION LAYOUT**  
 (DIMENSIONS LOCATING END BENT PILES AND BENT DRILLED PIERS ARE SHOWN TO CENTERLINE PILES AND DRILLED PIERS)

**FOUNDATION NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 135 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 225 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 530 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 515 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 91.5 FT. AT PIERS 1, 2 AND 3 AND ELEVATION 86.0 FT. AT PIERS 4 AND 5, RESPECTIVELY, WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL PERMANENT STEEL CASINGS AT BENT 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 91.5 FT.

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 73.0 FT. AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 79.0 FT. (PIERS 1 & 2), 77.0 FT. (PIER 3), AND 75.0 FT. (PIERS 4 & 5) RESPECTIVELY AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATIONS FOR BENT 1 AND 2 ARE 109.0 FT. AND 90.0 FT. RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

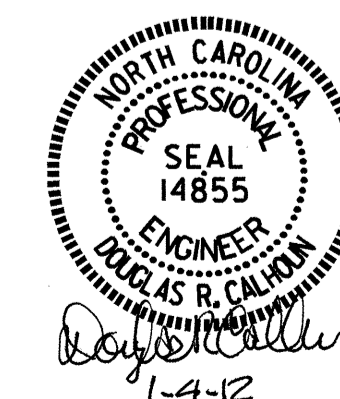
SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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.

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.

DRAWN BY : E. G. ALLEN DATE : 10-13-11  
 CHECKED BY : B. N. GRADY DATE : 10-19-11

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PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER NEUSE RIVER  
 ON US 70 BUSINESS  
 BETWEEN NC 210 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			42
2			4			

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	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	STRUCTURAL STEEL	HP 14 X 73 STEEL PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	CLASSIC CONCRETE BRIDGE RAIL	
	LUMP SUM	LUMP SUM	LINE. FT.	LINE. FT.	LINE. FT.	EA.	EA.	EA.	LUMP SUM	SO. FEET	SO. FEET	CU. YDS.	LUMP SUM	LBS.	LBS.	APPROX. LBS.	NO.	LINE. FT.	LINE. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM	LINE. FT.
SUPERSTRUCTURE										29,750	23,474		LUMP SUM			972,170				746.55		LUMP SUM	LUMP SUM	746.55
																				▲ 990	▲ 1102			
END BENT 1									LUMP SUM			44.1		8,154			14	420						
BENT 1			144.00	56.00								76.8		24,036	6214									
BENT 2			76.67	65.00	79.8							94.0		23,521	6041									
END BENT 2									LUMP SUM			47.6		8,433			14	560		■ 646	■ 718			
TOTAL	LUMP SUM	LUMP SUM	220.67	121.00	79.8	1	1	1	LUMP SUM	29,750	23,474	262.5	LUMP SUM	64,144	12,255	972,170	28	980	746.55	1636	1820	LUMP SUM	LUMP SUM	746.55

**NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 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.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 THE EXISTING STRUCTURE CONSISTING OF SIX (1 @ 52'-3", 4 @ 52'-5", 1 @ 52'-3") REINFORCED CONCRETE FLOOR ON REINFORCED CONCRETE DECK GIRDER SPANS WITH A CLEAR ROADWAY WIDTH OF 52'-1" AND SUPPORTED BY REINFORCED CONCRETE ABUTMENTS ON PILE FOOTINGS AND REINFORCED CONCRETE POST AND BEAM BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE ABUTMENT AT END BENT 2 SHALL BE REMOVED TO ELEVATION 126.0. FOR COPING DETAIL, SEE SHEET S-38.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 55'-0" FT. EACH SIDE OF CENTERLINE OF EXISTING ROADWAY AND 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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS AT BENT 1 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.

A TEMPORARY WORK BRIDGE SHALL BE PERMITTED FOR CONSTRUCTION OF THE BRIDGE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 22+62.50 -L-. THE STONE ON MATTING ACCESS TO TEMPORARY WORK BRIDGE WILL BE INCLUDED IN THIS PAY ITEM.

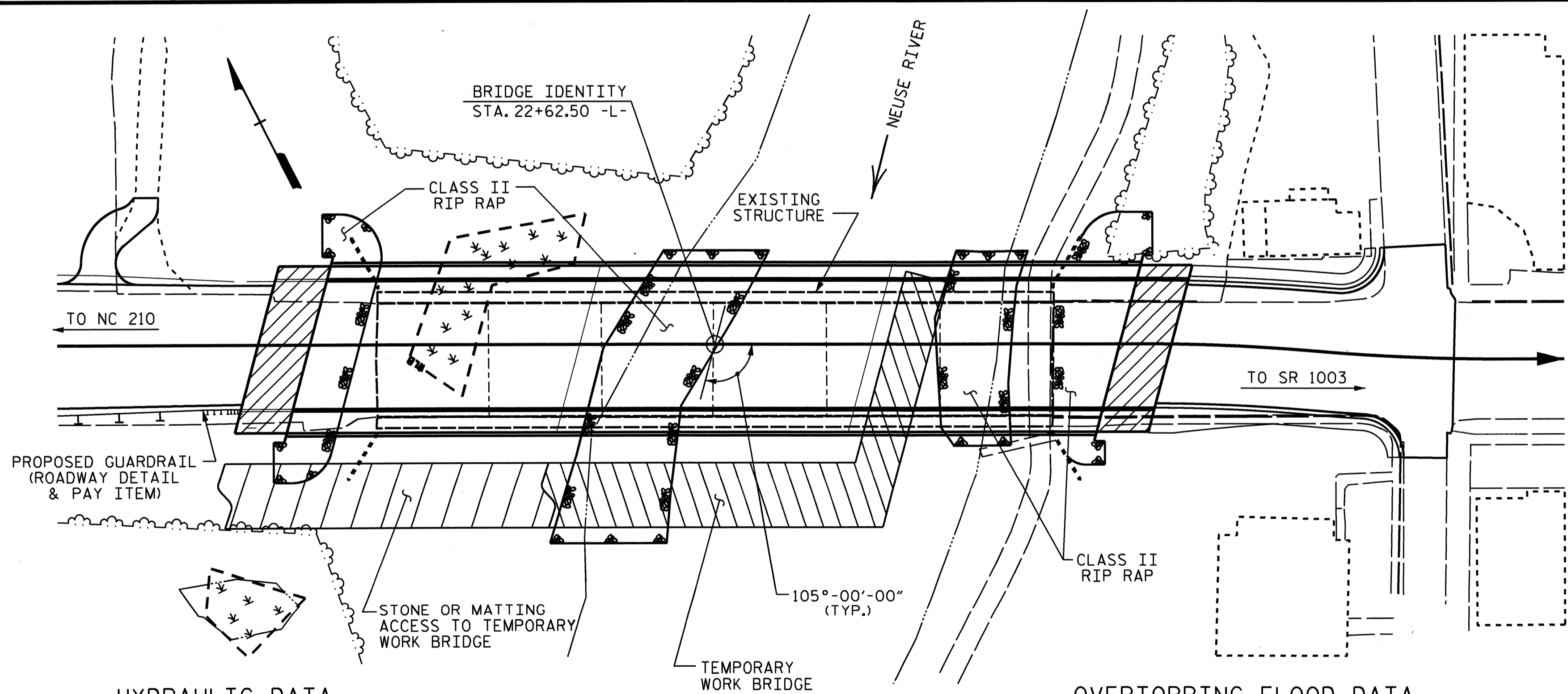
FOR ELECTRICAL CONDUIT SYSTEM AT STATION 22+62.50 -L-, SEE SPECIAL PROVISIONS.

FOR ELECTRICAL CONDUIT SYSTEM FOR UNDERPASS LIGHTING AT STATION 22+62.50 -L-, SEE SPECIAL PROVISIONS.

ELECTRICAL CONDUIT SYSTEM	ELECTRICAL CONDUIT SYSTEM FOR UNDERPASS LIGHTING
LUMP SUM	LUMP SUM
LUMP SUM	LUMP SUM

▲ INCLUDES LEFT BANK  
 ■ INCLUDES RIGHT BANK

**BM #2 : RR SPIKE IN BASE OF POWER POLE #4383 50' RT. OF STA. 17+80.00 -L-, ELEV. 128.61**



**HYDRAULIC DATA**

DESIGN DISCHARGE = 20500 C.F.S.  
 FREQUENCY OF DESIGN FLOOD = 50 YRS.  
 DESIGN HIGH WATER ELEVATION = 124.2  
 DRAINAGE AREA = 1206 SQ. MI.  
 BASE DISCHARGE (Q100) = 25100 C.F.S.  
 BASE HIGH WATER ELEVATION = 125.6

**OVERTOPPING FLOOD DATA**

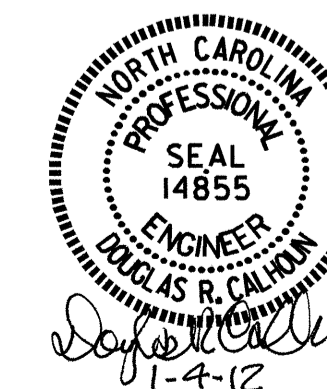
OVERTOPPING DISCHARGE = 19700 C.F.S.  
 FREQUENCY OF OVERTOPPING FLOOD = 25+ YRS.  
 OVERTOPPING FLOOD ELEVATION = 123.4

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**LOCATION SKETCH**

DRAWN BY : E. G. ALLEN DATE : 10-13-11  
 CHECKED BY : B. N. GRADY DATE : 10-19-11

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PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER NEUSE RIVER  
 ON US 70 BUSINESS  
 BETWEEN NC 210 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-3
2			4			42

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		
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.12	--	1.75	0.667	1.50	B	INT.	66.50	0.925	1.12	B	INT.	133.00	1.30	0.679	1.44	C	INT.	56.23		
	HL-93 (OPERATING)	N/A		1.45	--	1.35	0.667	1.95	B	INT.	66.50	0.925	1.45	B	INT.	133.00	1.00	0.679	1.88	C	INT.	56.23		
	HS-20 (INVENTORY)	36.00	②	1.57	56.565	1.75	0.557	1.73	B	EXT.	66.50	0.925	1.57	B	INT.	133.00	1.30	0.679	2.32	C	INT.	56.23		
	HS-20 (OPERATING)	36.00		2.04	73.325	1.35	0.557	2.24	B	EXT.	66.50	0.925	2.04	B	INT.	133.00	1.00	0.679	3.02	C	INT.	56.23		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.70	49.928	1.40	0.557	3.70	B	EXT.	66.50	0.925	4.04	B	INT.	133.00	1.30	0.679	5.59	C	INT.	56.23	
		SNGARBS2	20.000		3.08	61.563	1.40	0.557	3.08	B	EXT.	66.50	0.925	3.09	B	INT.	133.00	1.30	0.679	4.01	C	INT.	56.23	
		SNAGRIS2	22.000		2.89	63.677	1.40	0.557	2.95	B	EXT.	66.50	0.925	2.89	B	INT.	133.00	1.30	0.679	3.74	C	INT.	56.23	
		SNCOTTS3	27.250		2.38	64.788	1.40	0.557	2.47	B	EXT.	66.50	0.925	2.38	B	INT.	133.00	1.30	0.679	2.78	C	INT.	56.23	
		SNAGGRS4	34.925		1.99	69.397	1.40	0.557	2.14	B	EXT.	66.50	0.925	1.99	B	INT.	133.00	1.30	0.679	2.26	C	INT.	56.23	
		SNS5A	35.550		1.98	70.231	1.40	0.557	2.10	B	EXT.	66.50	0.925	1.98	B	INT.	133.00	1.30	0.679	2.21	C	INT.	56.23	
		SNS6A	39.950		1.80	72.040	1.40	0.557	1.96	B	EXT.	66.50	0.925	1.80	B	INT.	133.00	1.30	0.679	2.01	C	INT.	56.23	
		SNS7B	42.000		1.76	73.807	1.40	0.557	1.90	B	EXT.	66.50	0.925	1.76	B	INT.	133.00	1.30	0.679	1.91	C	INT.	56.23	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.11	69.741	1.40	0.557	2.25	B	EXT.	66.50	0.925	2.11	B	INT.	133.00	1.30	0.679	2.44	C	INT.	56.23	
		TNT4A	33.075		2.09	69.140	1.40	0.557	2.25	B	EXT.	66.50	0.925	2.09	B	INT.	133.00	1.30	0.679	2.45	C	INT.	56.23	
		TNT6A	41.600		1.80	75.015	1.40	0.557	1.93	B	EXT.	66.50	0.925	1.80	B	INT.	133.00	1.30	0.679	1.98	C	INT.	56.23	
		TNT7A	42.000		1.78	74.772	1.40	0.557	1.93	B	EXT.	66.50	0.925	1.78	B	INT.	133.00	1.30	0.679	1.98	C	INT.	56.23	
		TNT7B	42.000		1.73	72.842	1.40	0.557	1.95	B	EXT.	66.50	0.925	1.73	B	INT.	133.00	1.30	0.679	2.02	C	INT.	56.23	
		TNAGRIT4	43.000		1.70	73.095	1.40	0.557	1.90	B	EXT.	66.50	0.925	1.70	B	INT.	133.00	1.30	0.679	1.94	C	INT.	56.23	
TNAGT5A	45.000		1.65	74.427	1.40	0.557	1.83	B	EXT.	66.50	0.925	1.65	B	INT.	133.00	1.30	0.679	1.84	C	INT.	56.23			
TNAGT5B	45.000		③	1.63	73.390	1.40	0.557	1.81	B	EXT.	66.50	0.925	1.63	B	INT.	133.00	1.30	0.679	1.82	C	INT.	56.23		

NOTES:

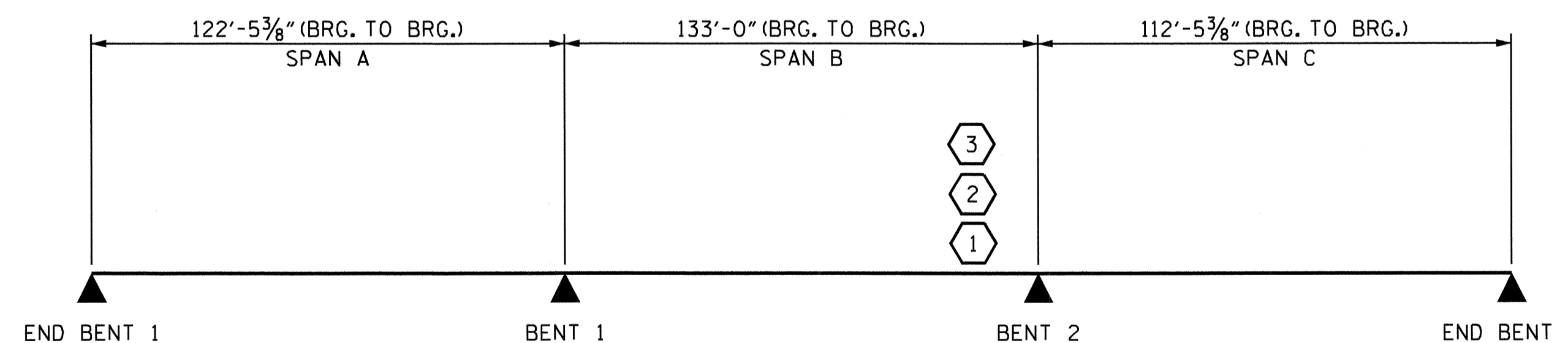
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

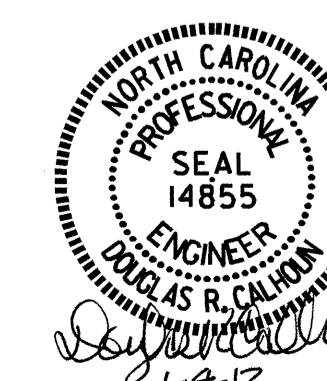
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- 2.
- 3.
- 4.

#	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 EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



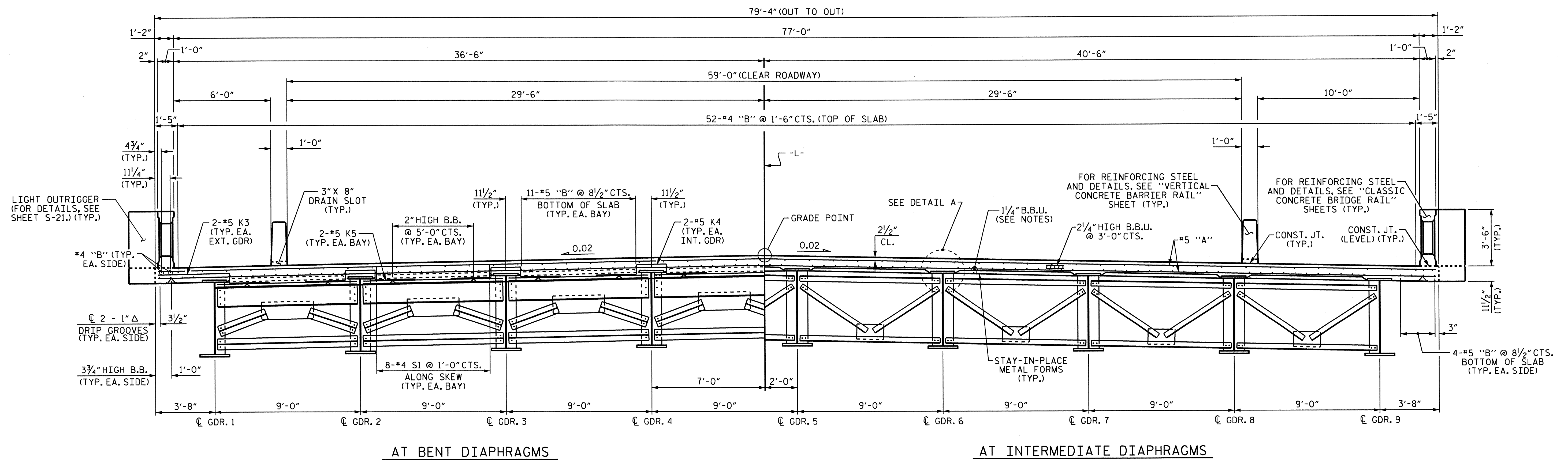
LRFR SUMMARY

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD						S-4
LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC)						TOTAL SHEETS
REVISIONS						42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : K. P. SEDAI	DATE : 10/19/11
CHECKED BY : W. S. ARAFAT	DATE : 10/19/11
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	



TYPICAL SECTION

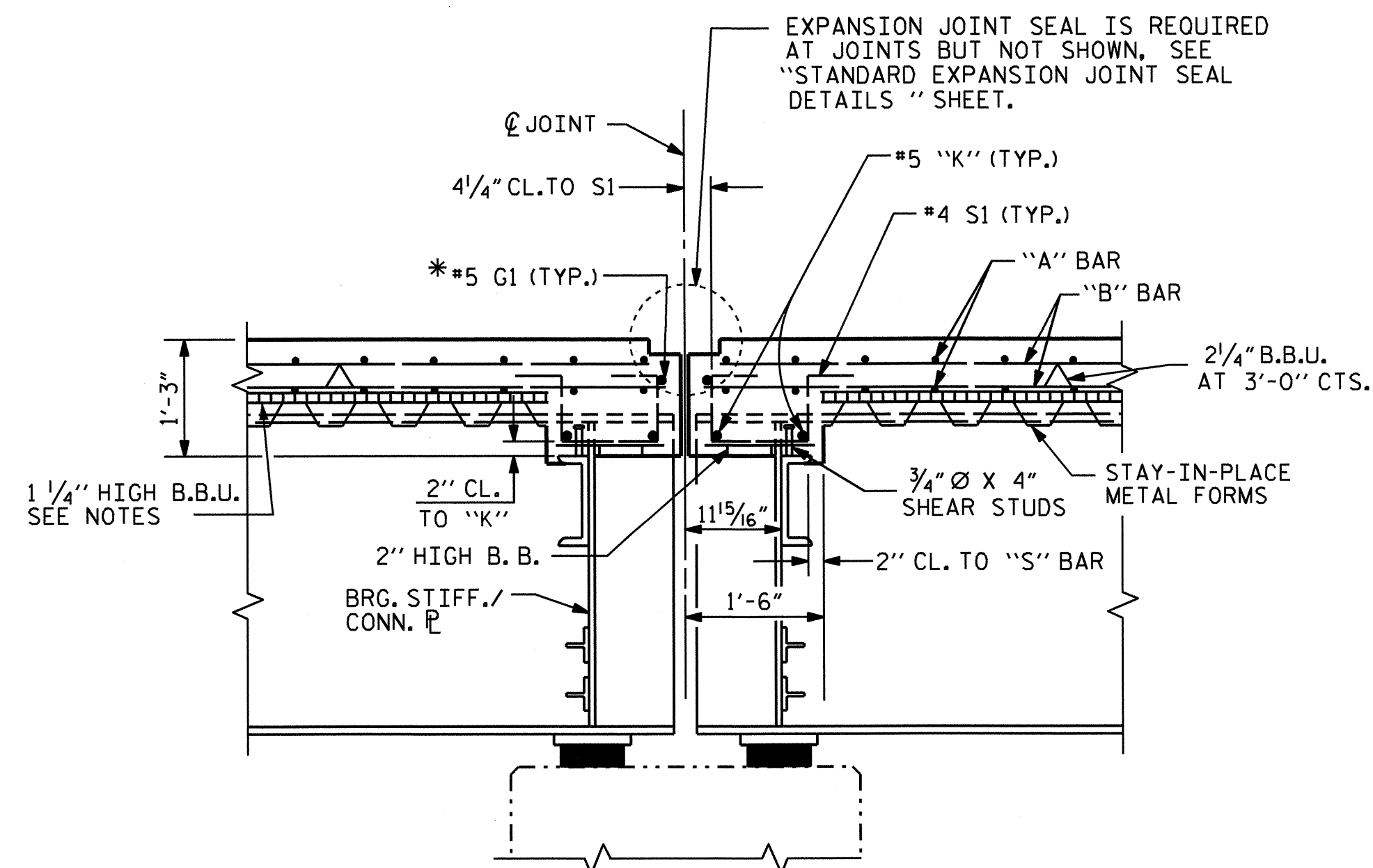
NOTES

PROVIDE 1/4" 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.

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

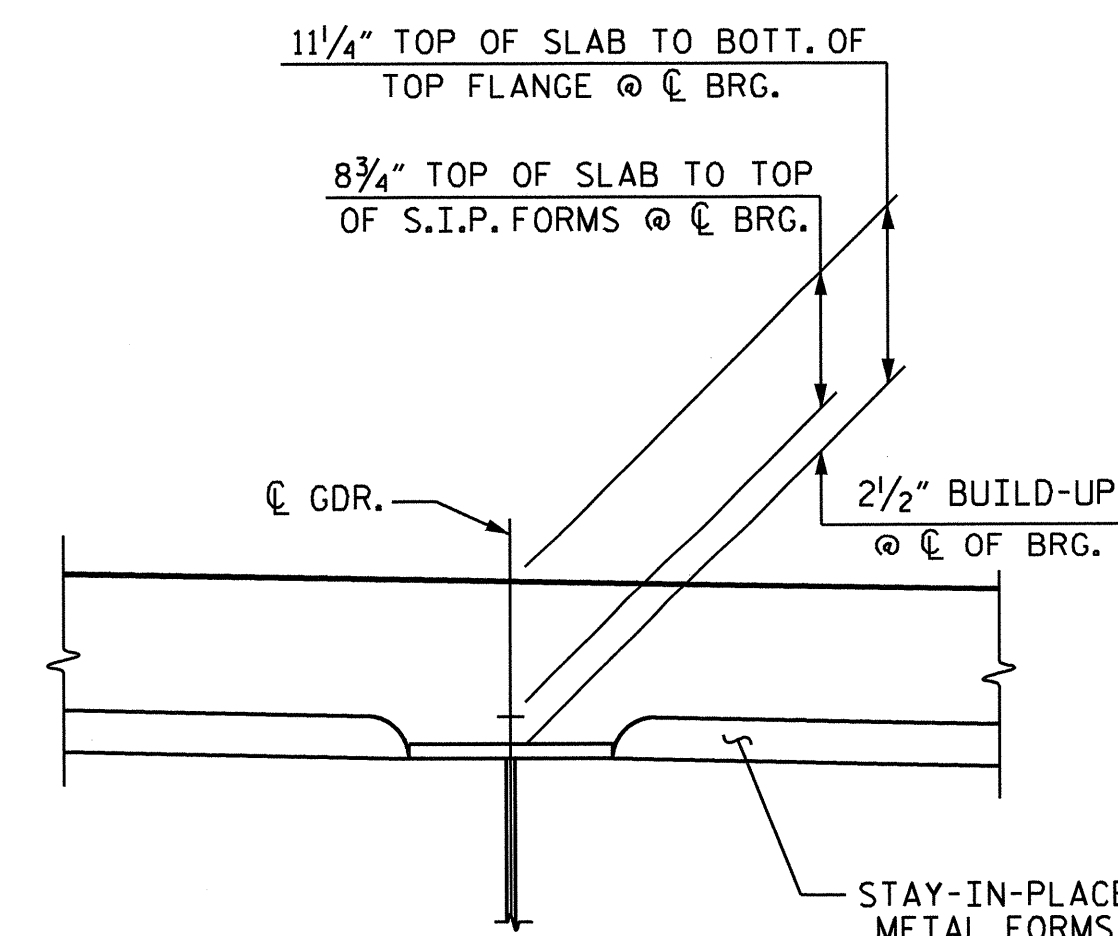
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

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.



SECTION THRU BENT DIAPHRAGM

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



DETAIL A

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 2

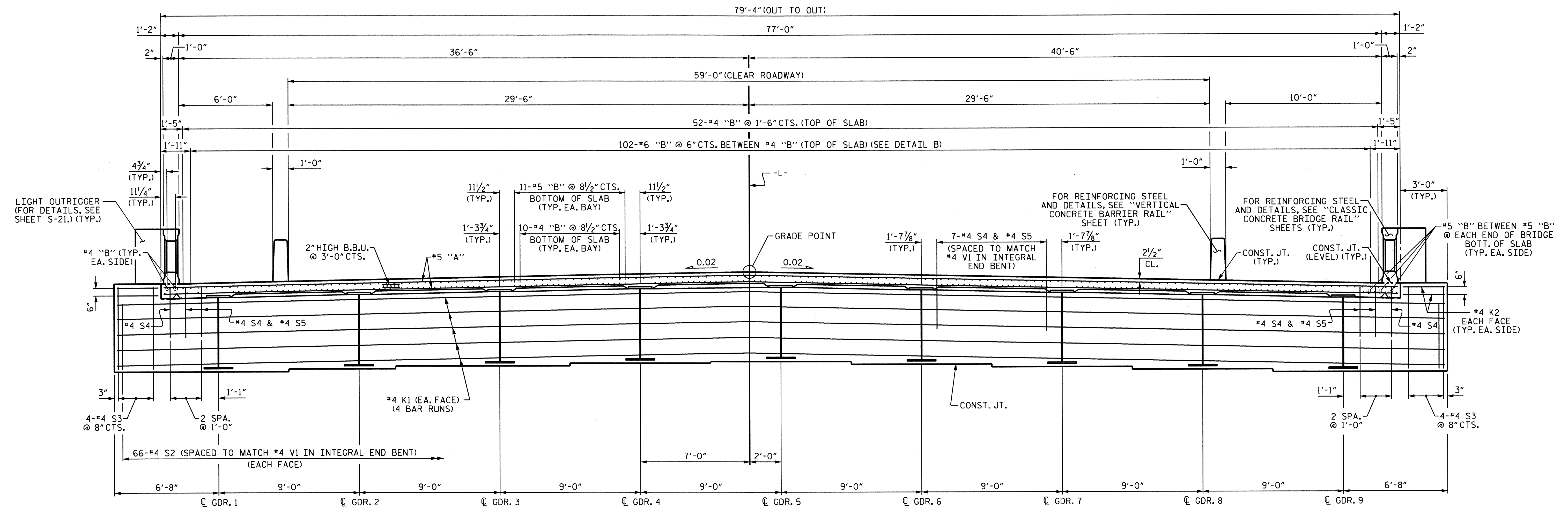
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION

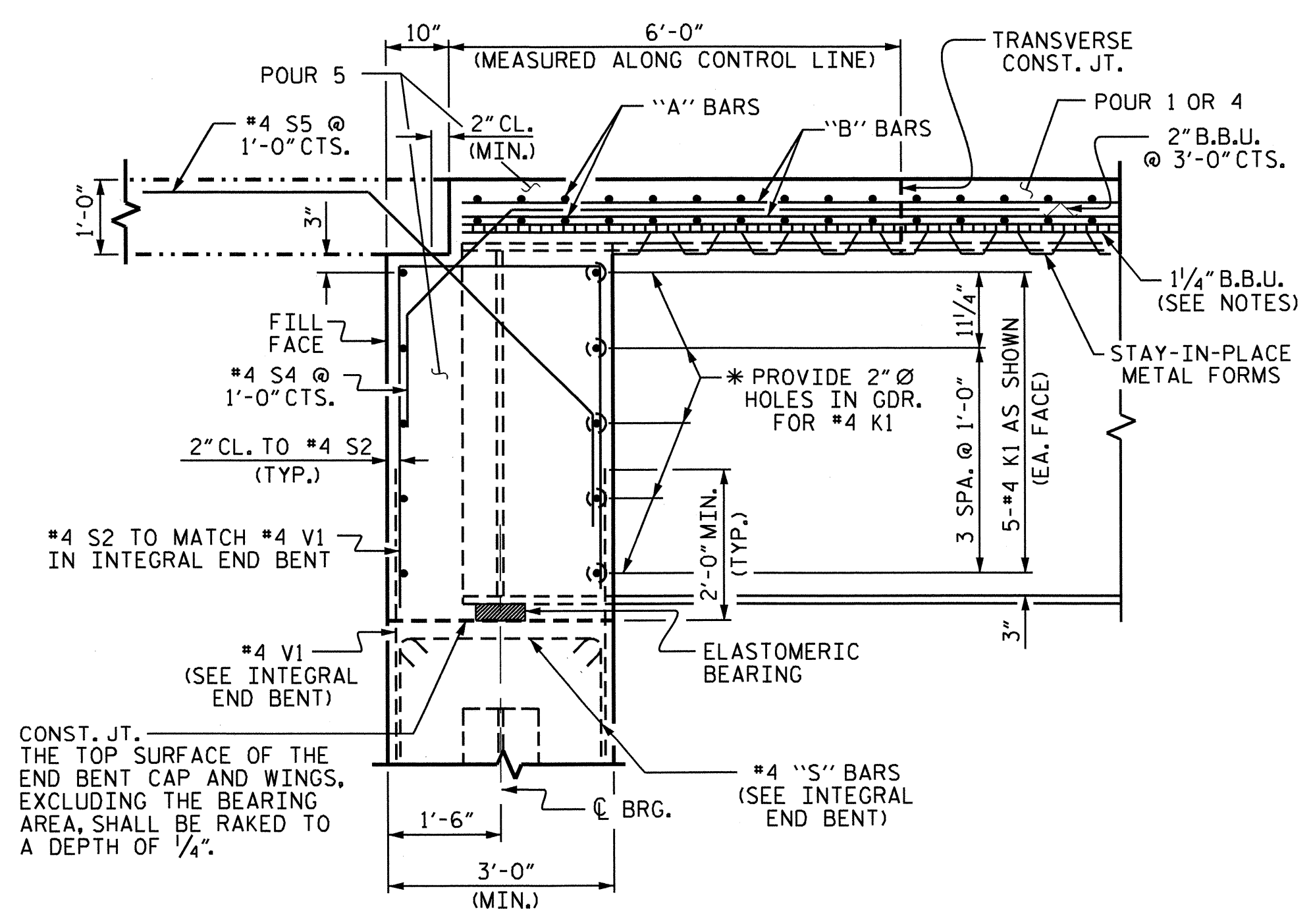


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5	
1			3			TOTAL SHEETS	
2			4			42	

DRAWN BY : B.N. GRADY DATE : 5/23/11  
 CHECKED BY : J.L. WALTON DATE : 7/14/11

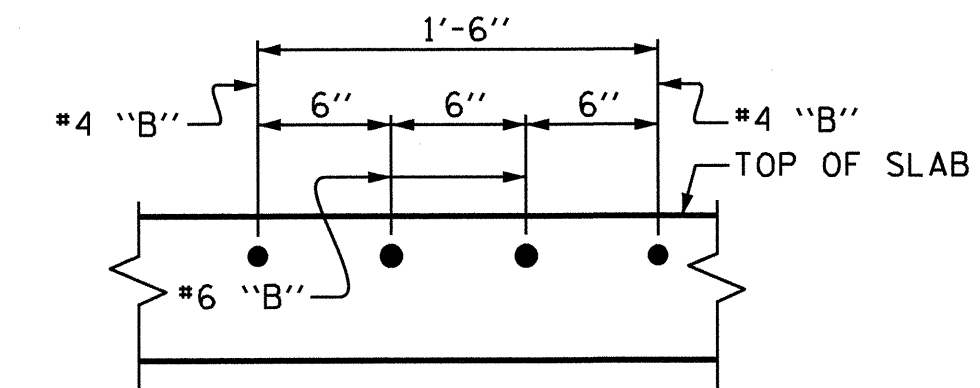


TYPICAL SECTION @ INTEGRAL END BENT



SECTION A-A

\* DIAMETER OF HOLES IN WEB MAY BE INCREASED TO ACCOMMODATE SKEW



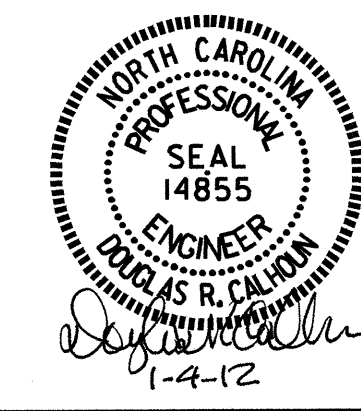
DETAIL B

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 2

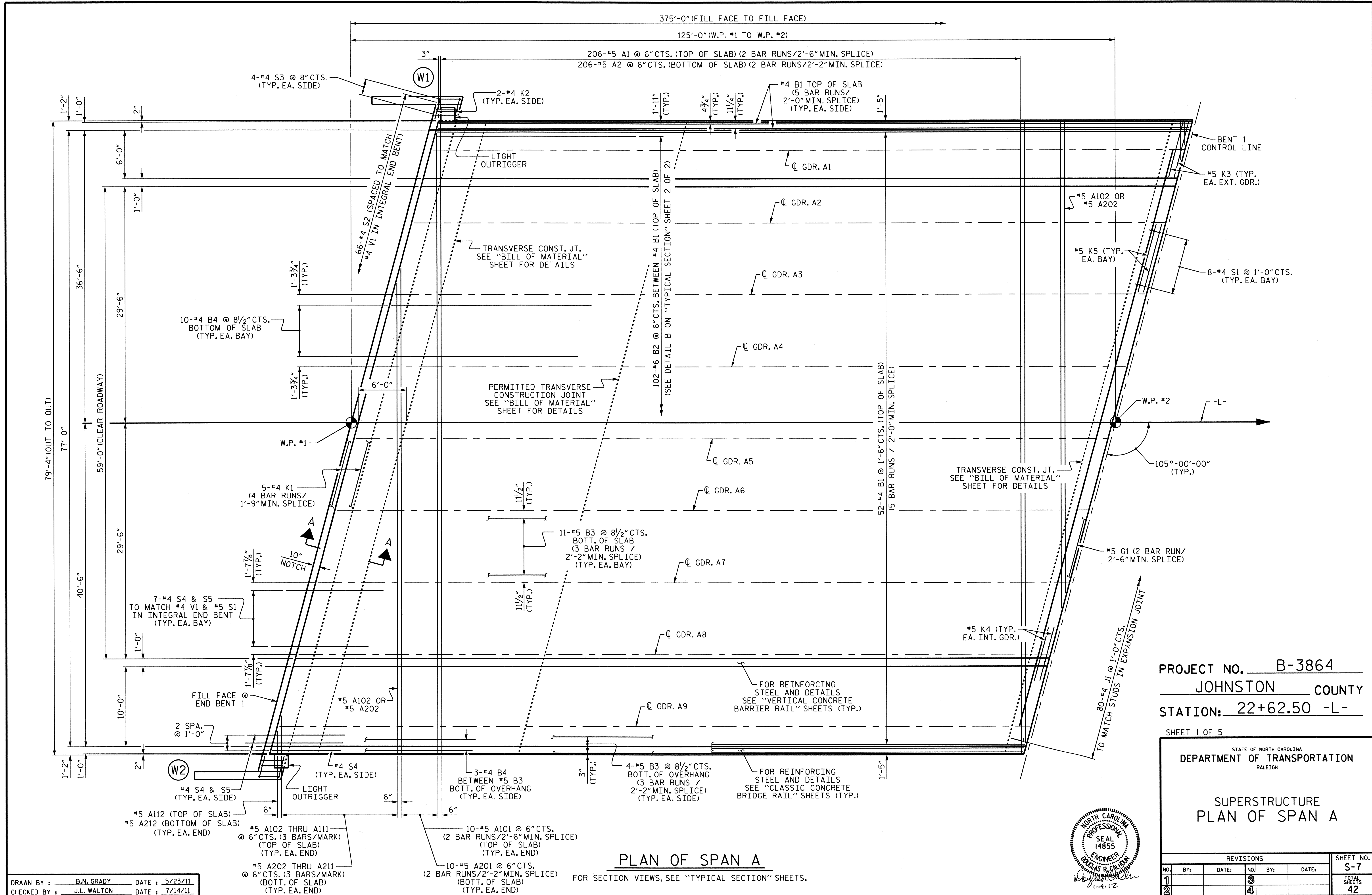
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6	
1			3			TOTAL	42
2			4			SHEETS	

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11



**PLAN OF SPAN A**

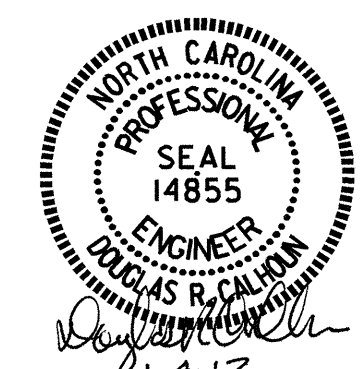
FOR SECTION VIEWS, SEE "TYPICAL SECTION" SHEETS.

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN A**



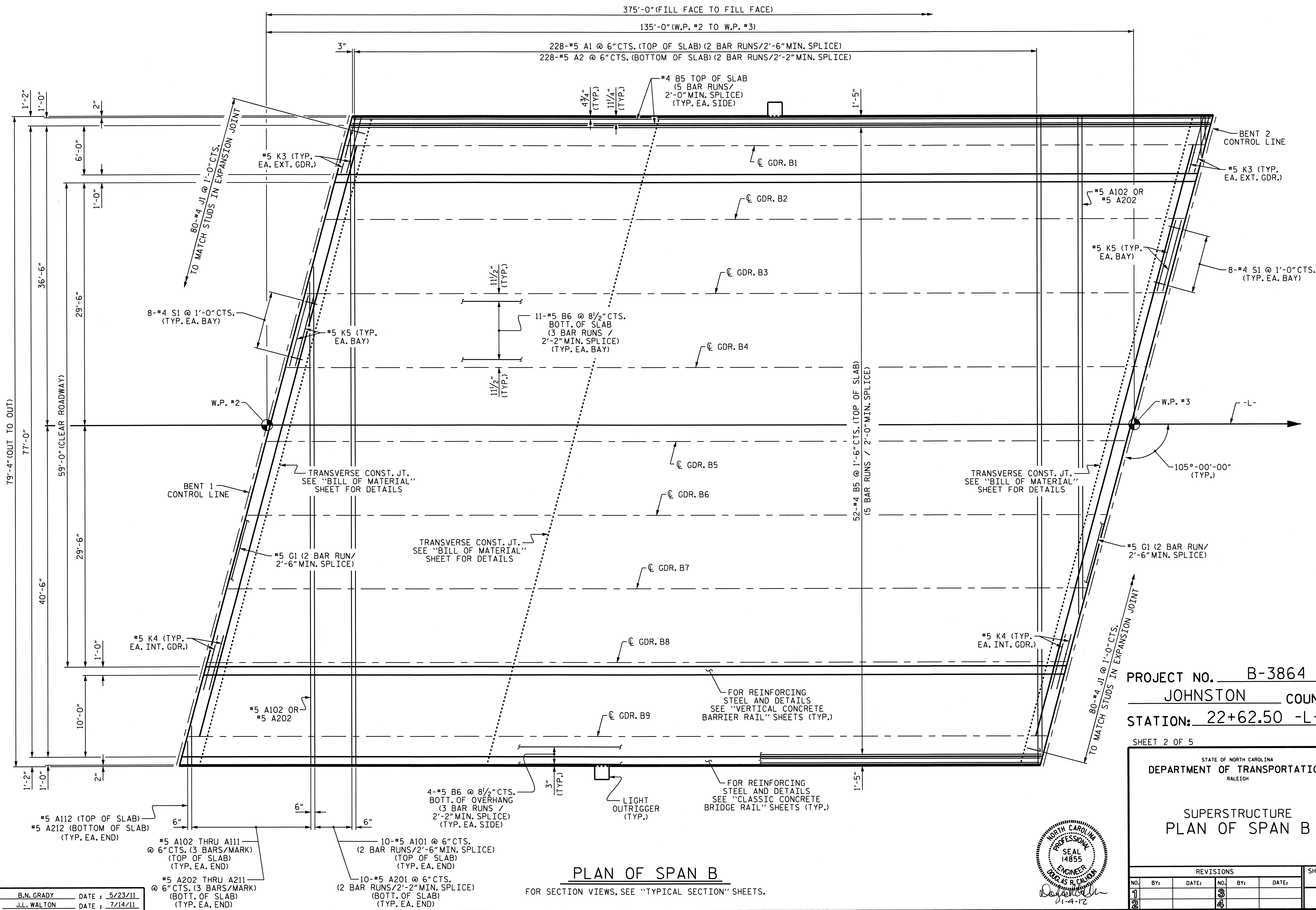
REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS  
**42**

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11

04-JAN-2012 12:15  
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**PLAN OF SPAN B**

FOR SECTION VIEWS, SEE "TYPICAL SECTION" SHEETS.

DRAWN BY : B.N. GRADY DATE : 5/23/11  
 CHECKED BY : J.L. WALTON DATE : 7/14/11

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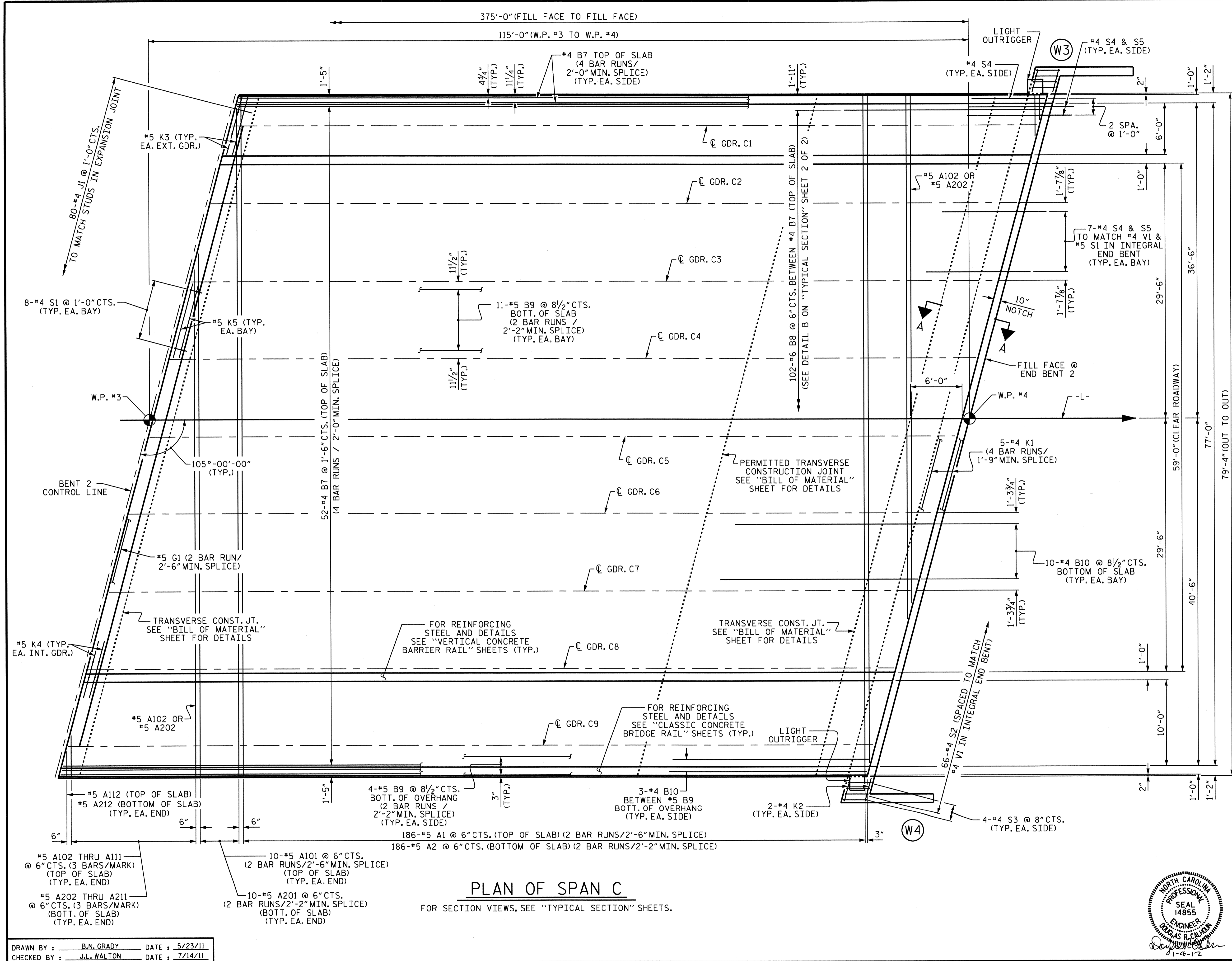


PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			42

**SUPERSTRUCTURE PLAN OF SPAN B**



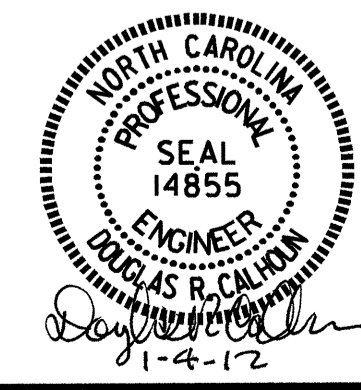
**PLAN OF SPAN C**

FOR SECTION VIEWS, SEE "TYPICAL SECTION" SHEETS.

PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

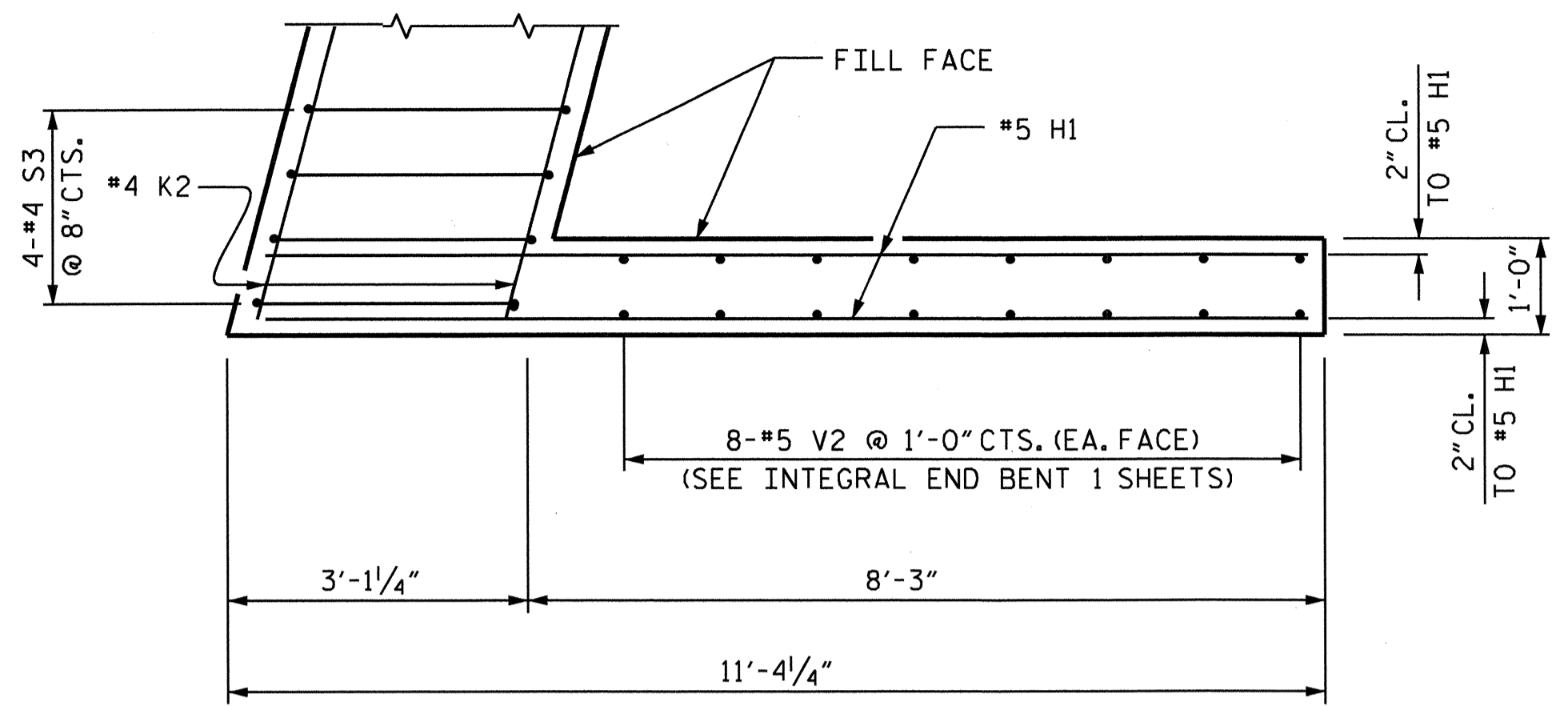
SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN C					
SHEET NO. <b>S-9</b>					
TOTAL SHEETS <b>42</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

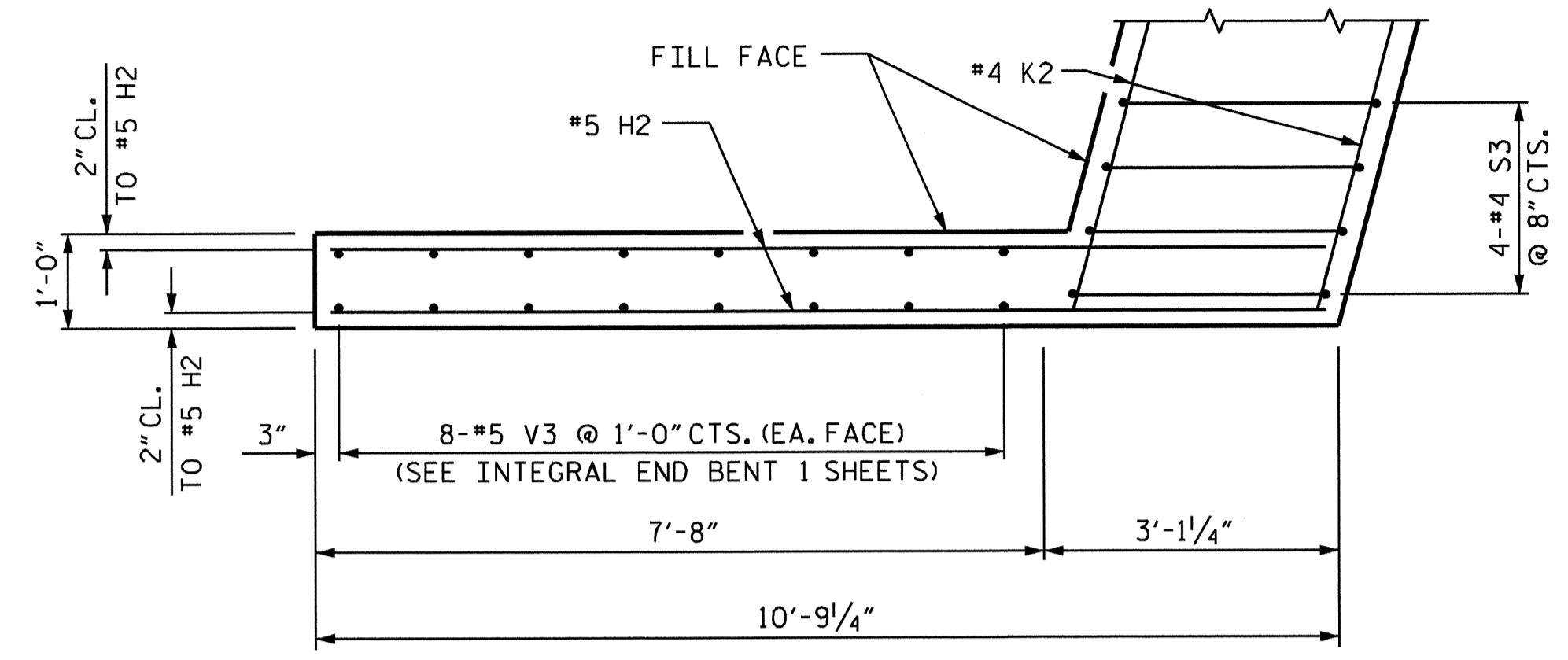


DRAWN BY : B.N. GRADY DATE : 5/23/11  
 CHECKED BY : J.L. WALTON DATE : 7/14/11

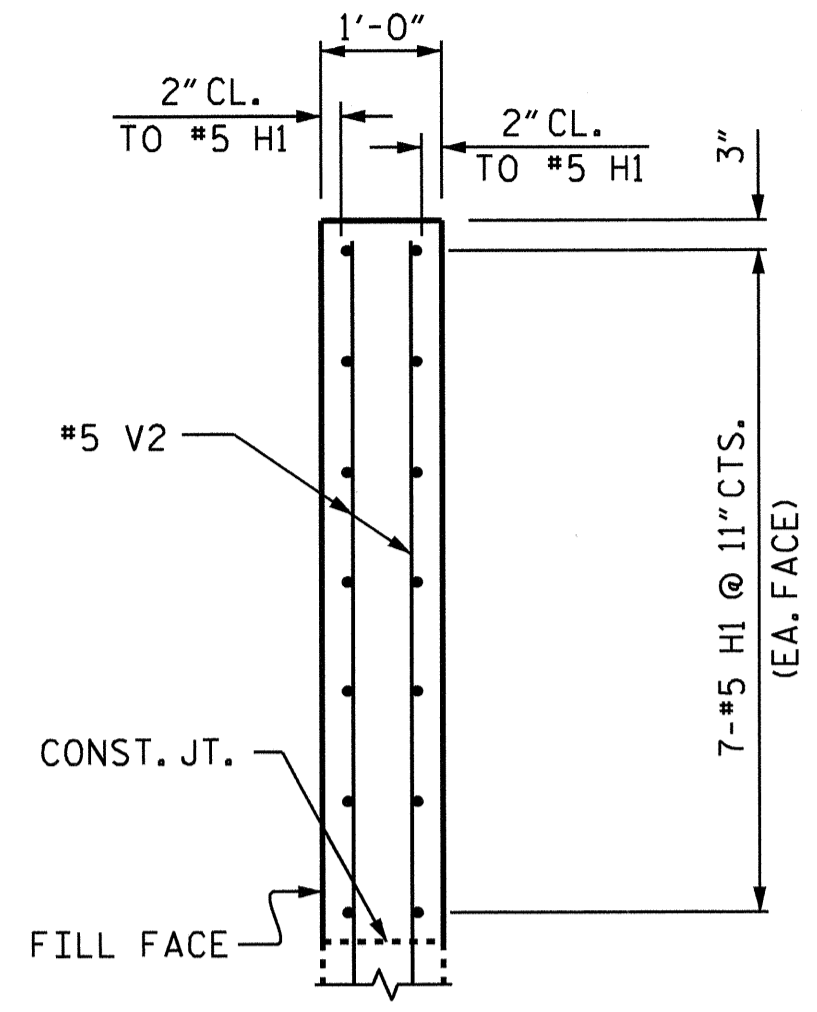
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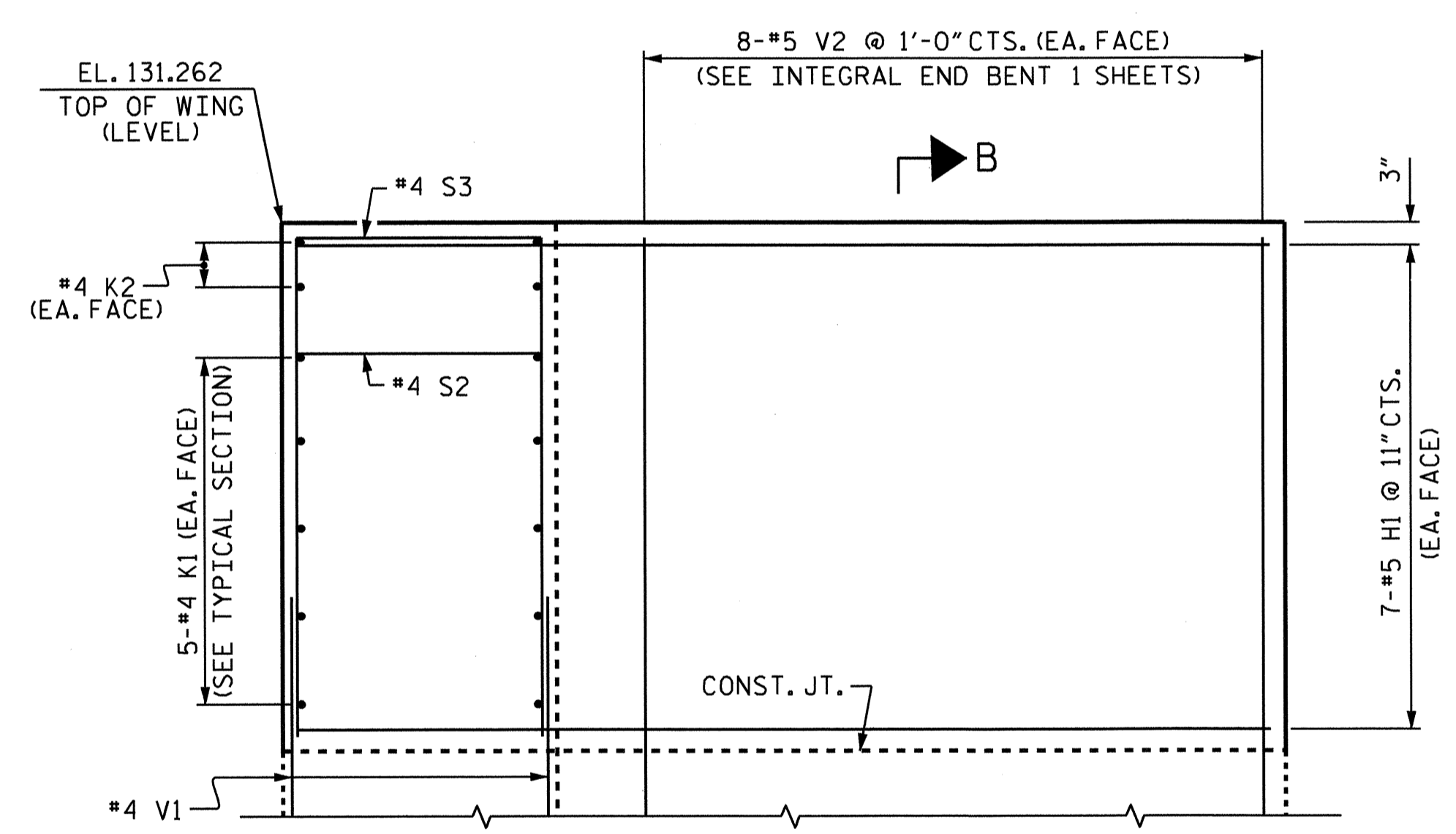
PLAN (W1)



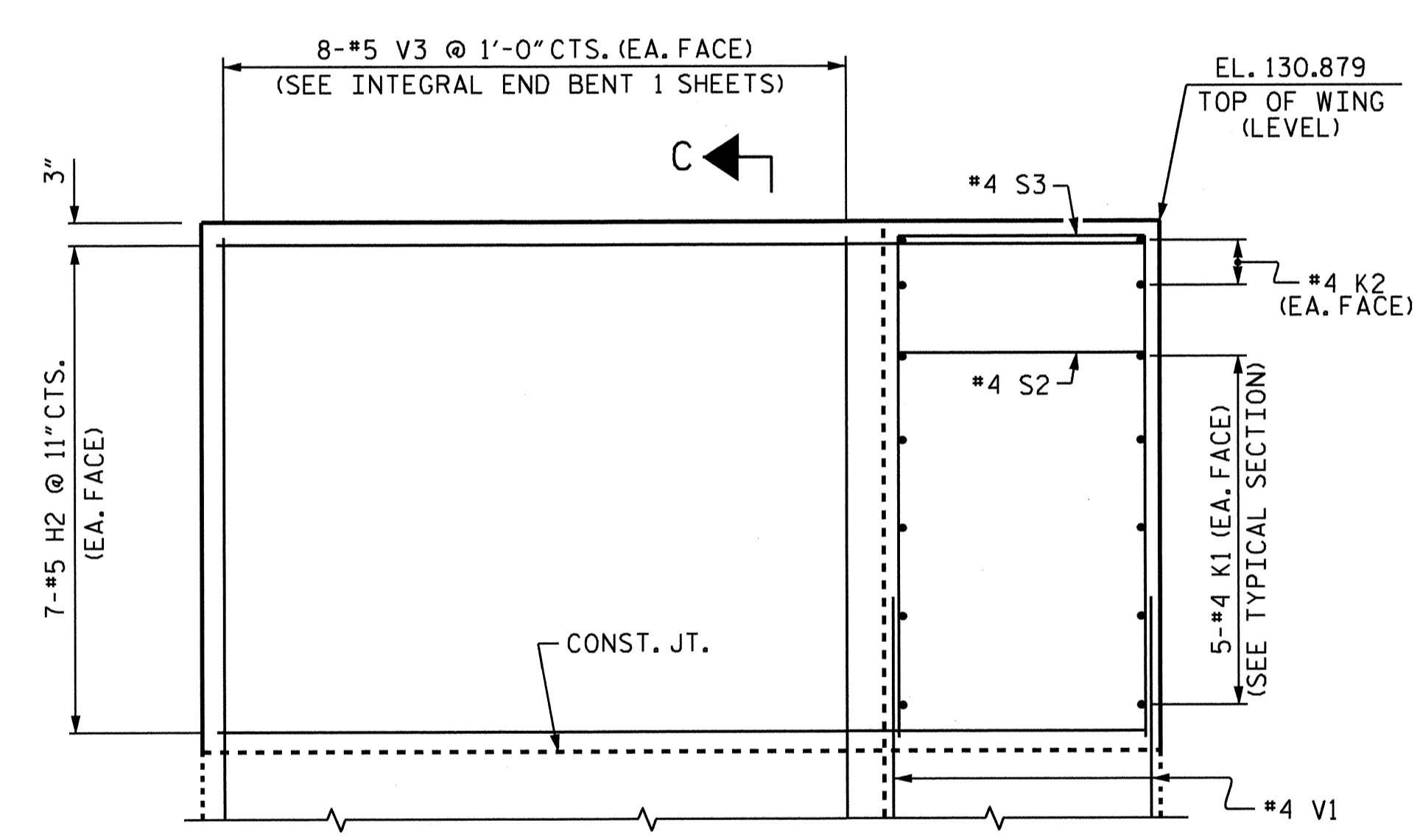
PLAN (W2)



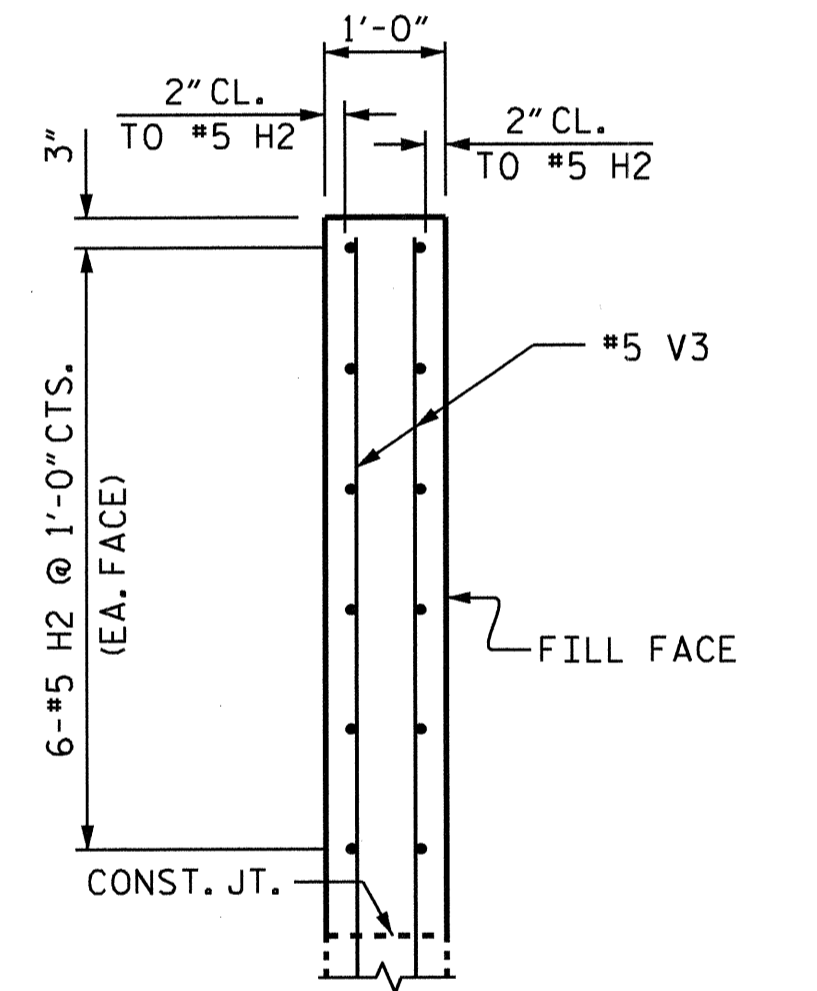
SECTION B-B



ELEVATION (W1)



ELEVATION (W2)



SECTION C-C

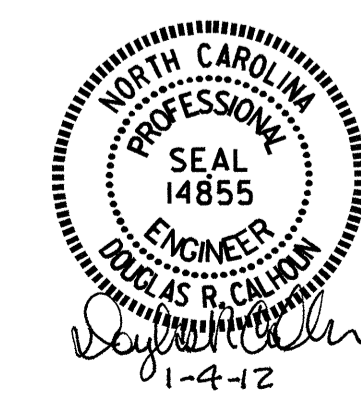
UPPER WINGS AT INTEGRAL END BENT 1  
 (FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT 1 SHEETS)

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

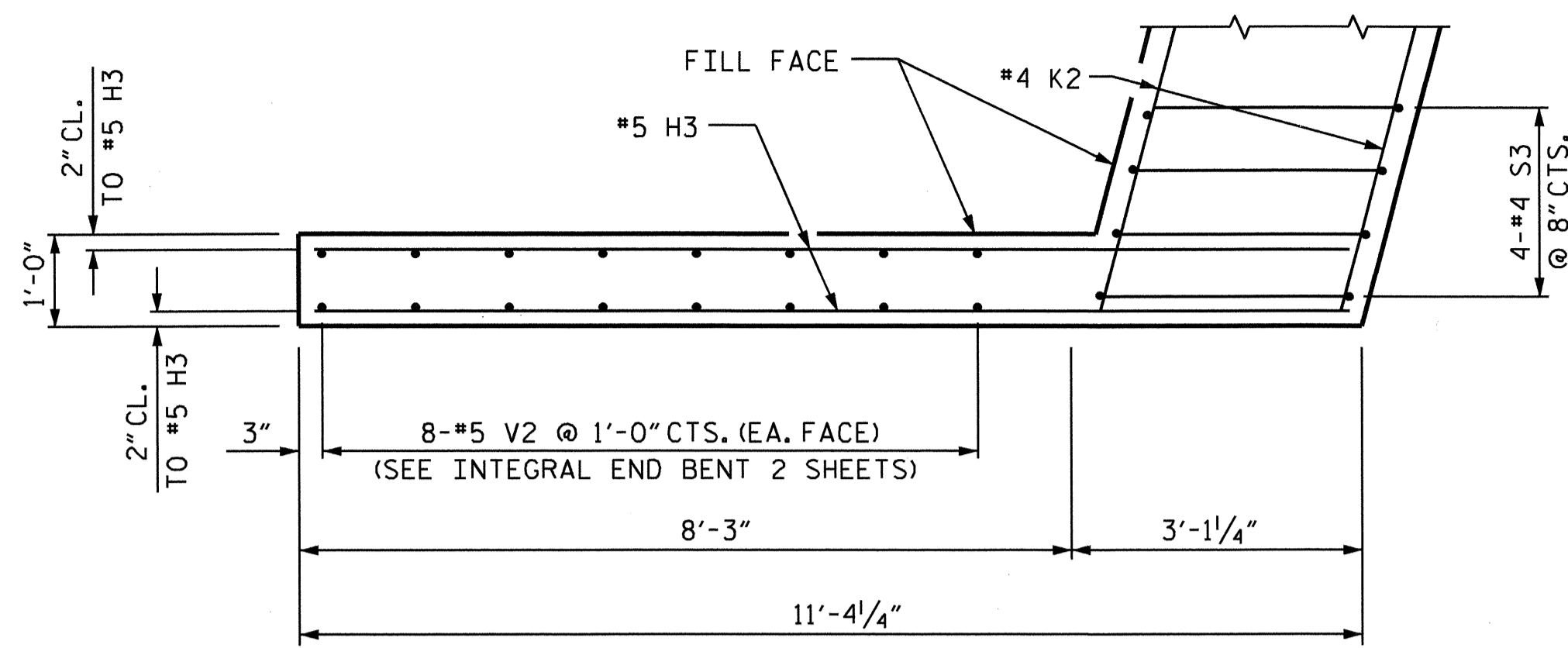
SUPERSTRUCTURE  
 PLAN OF SPAN  
 DETAILS



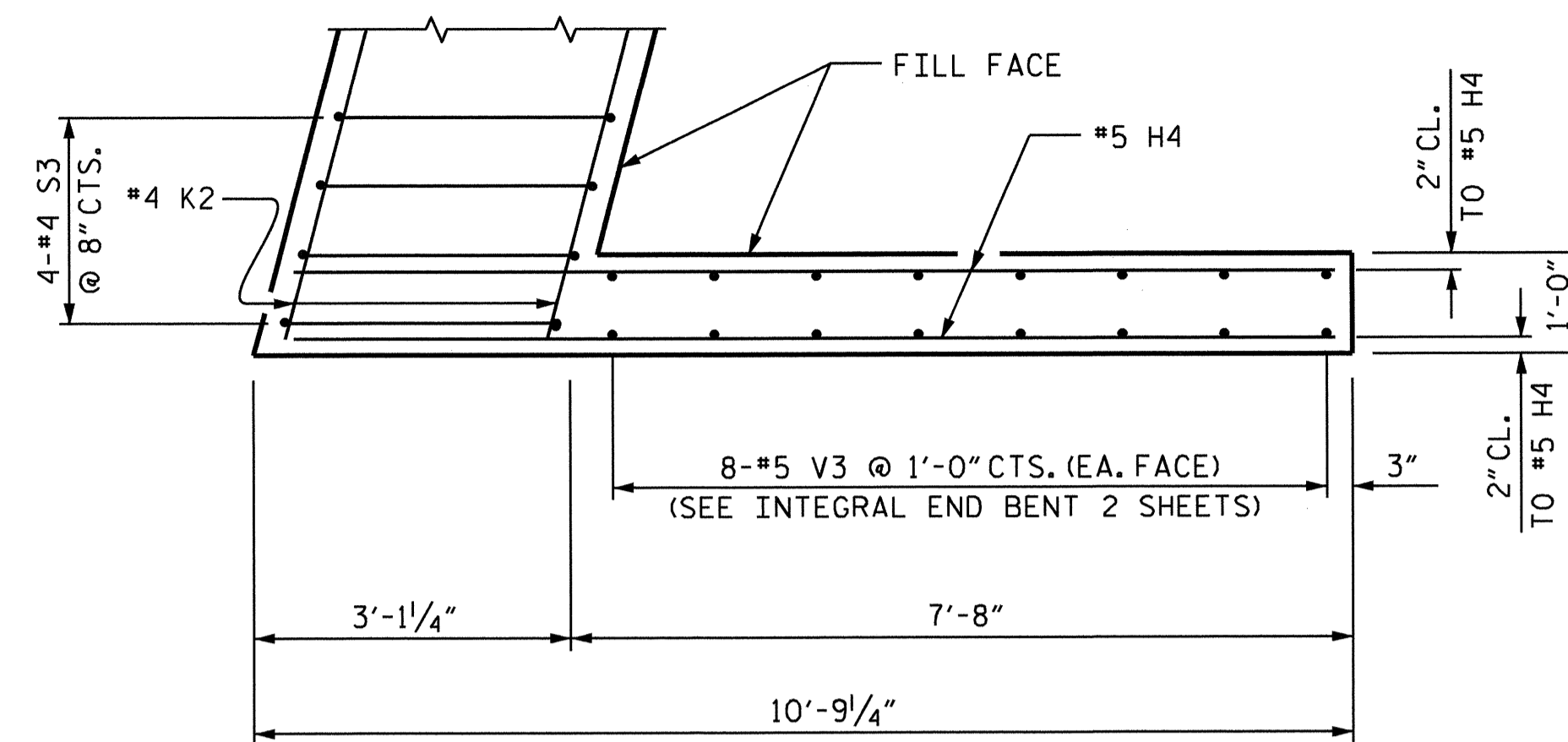
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL	42
2			4			SHEETS	

DRAWN BY : B.N. GRADY DATE : 10/19/11  
 CHECKED BY : E.G. ALLEN DATE : 11/4/11

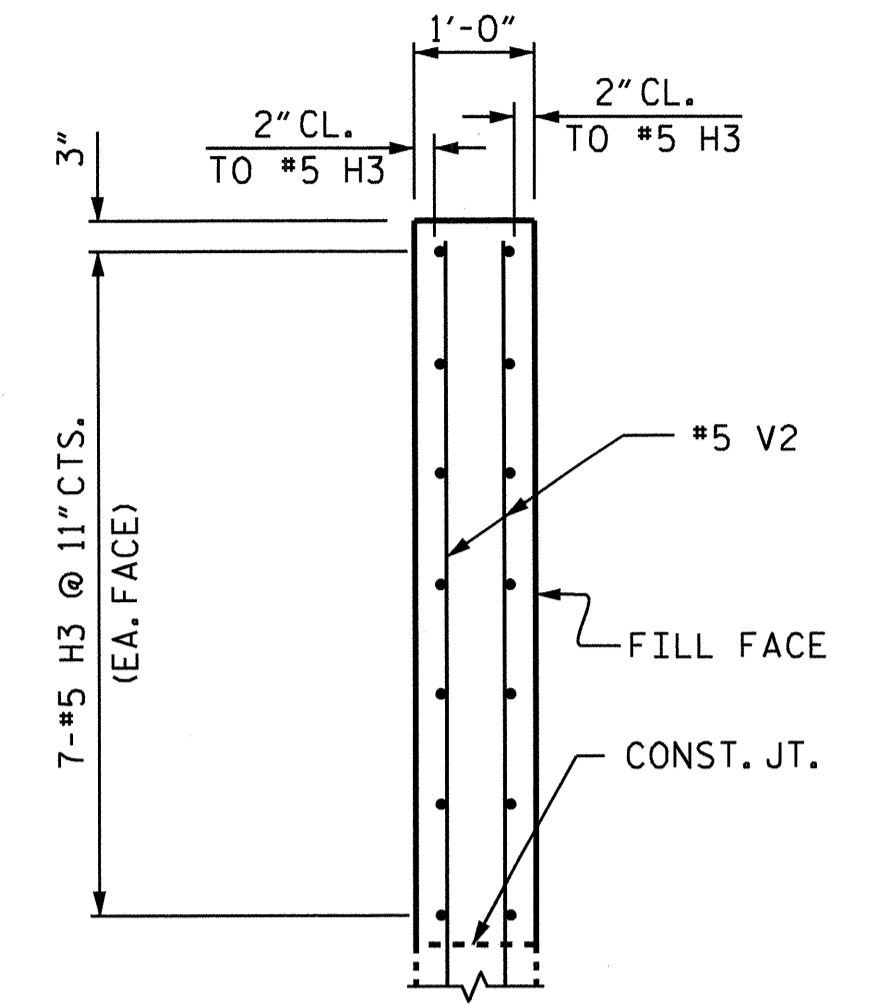
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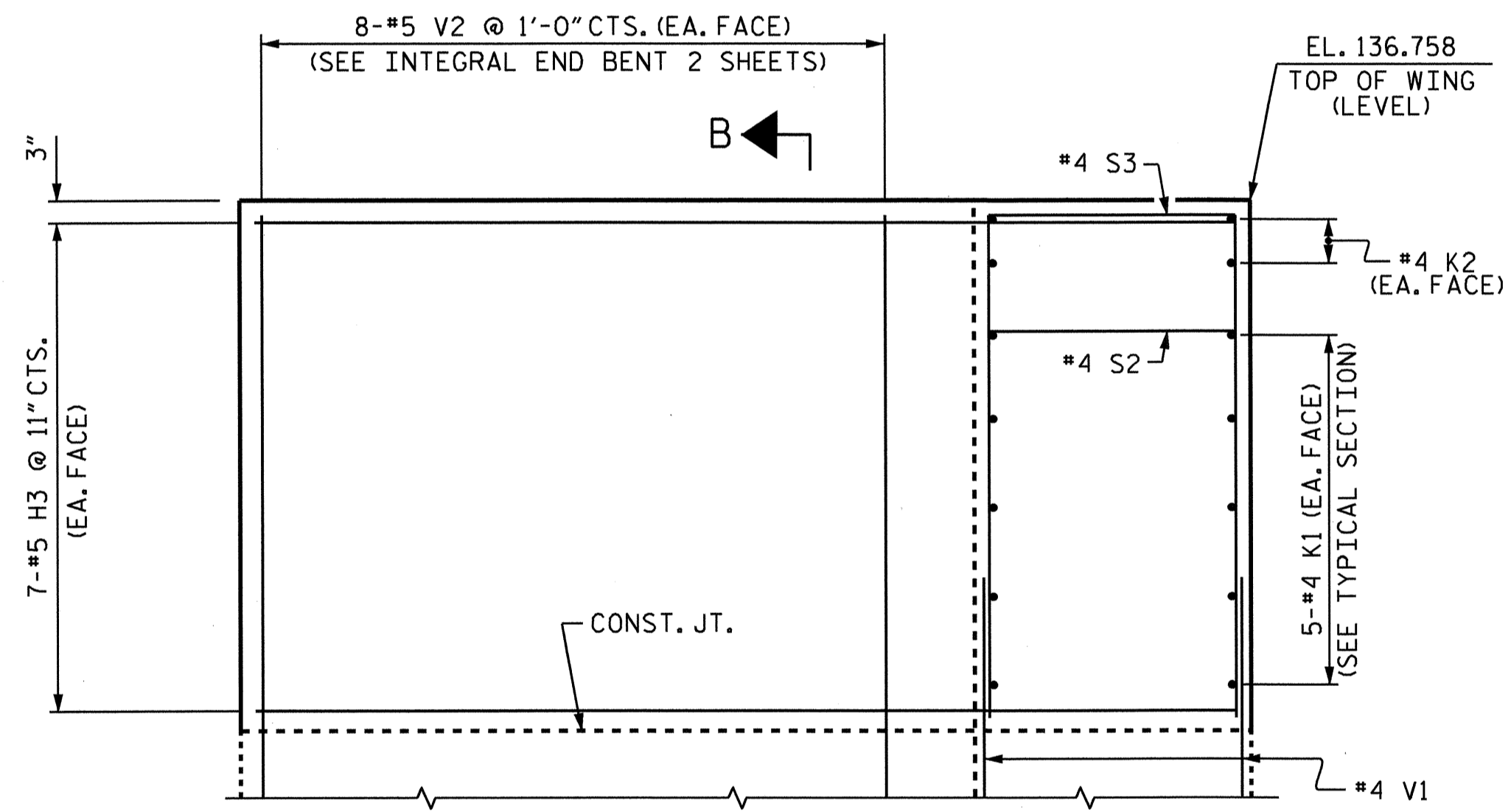
PLAN (W3)



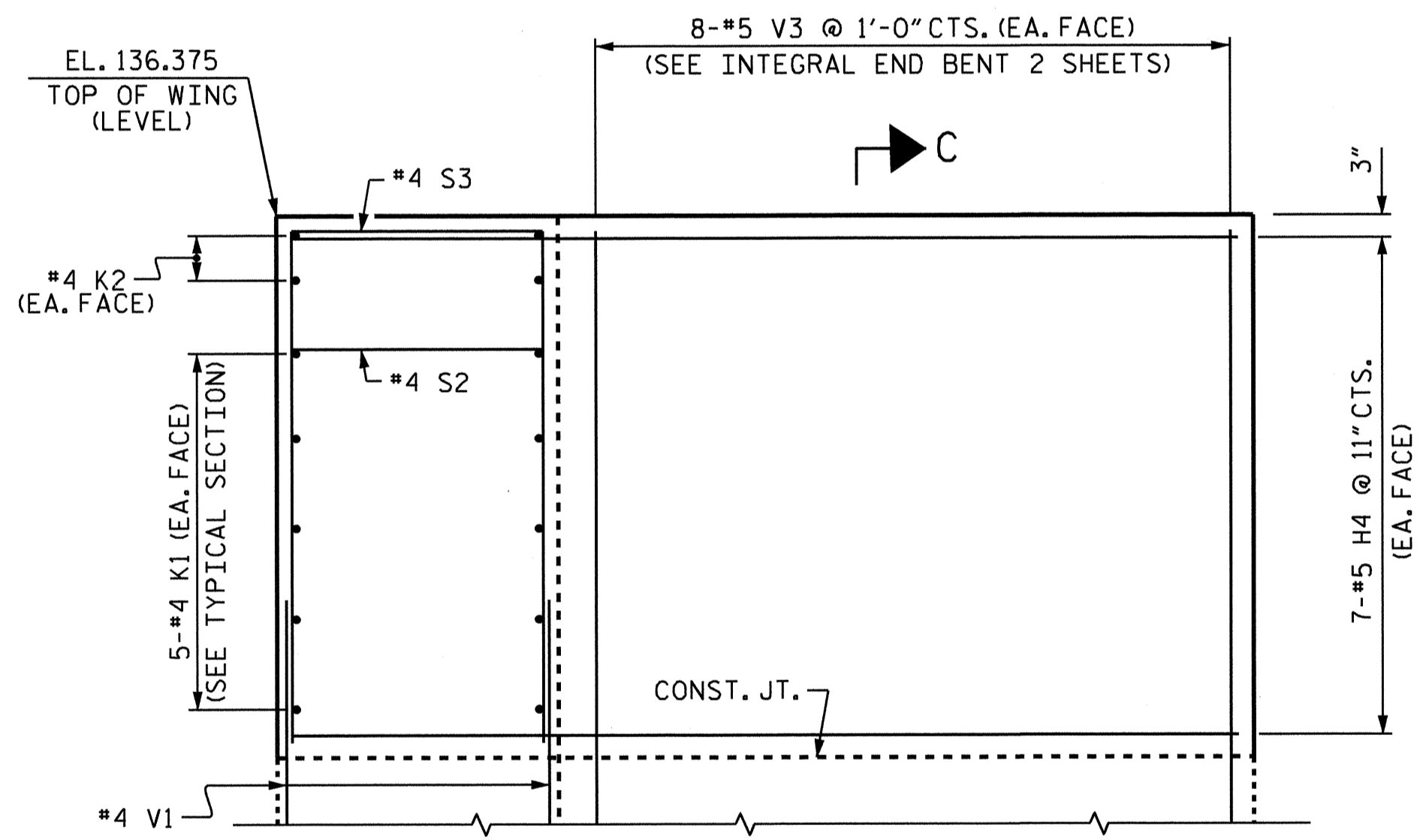
PLAN (W4)



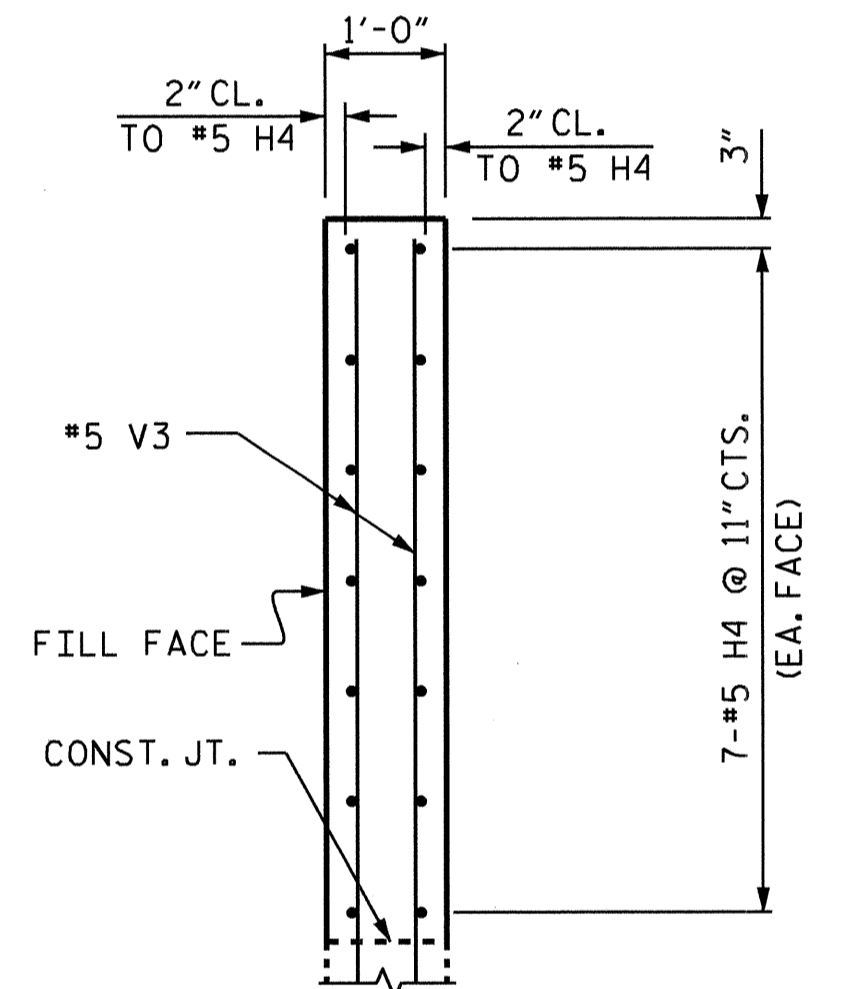
SECTION B-B



ELEVATION (W3)



ELEVATION (W4)



SECTION C-C

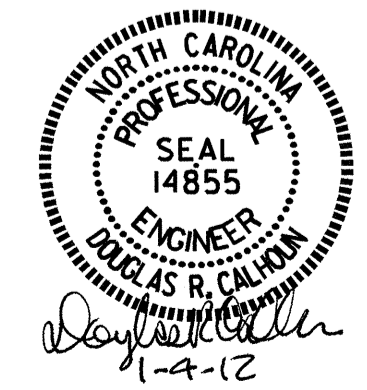
**UPPER WINGS AT INTEGRAL END BENT 2**  
 (FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE INTEGRAL END BENT 2 SHEETS)

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

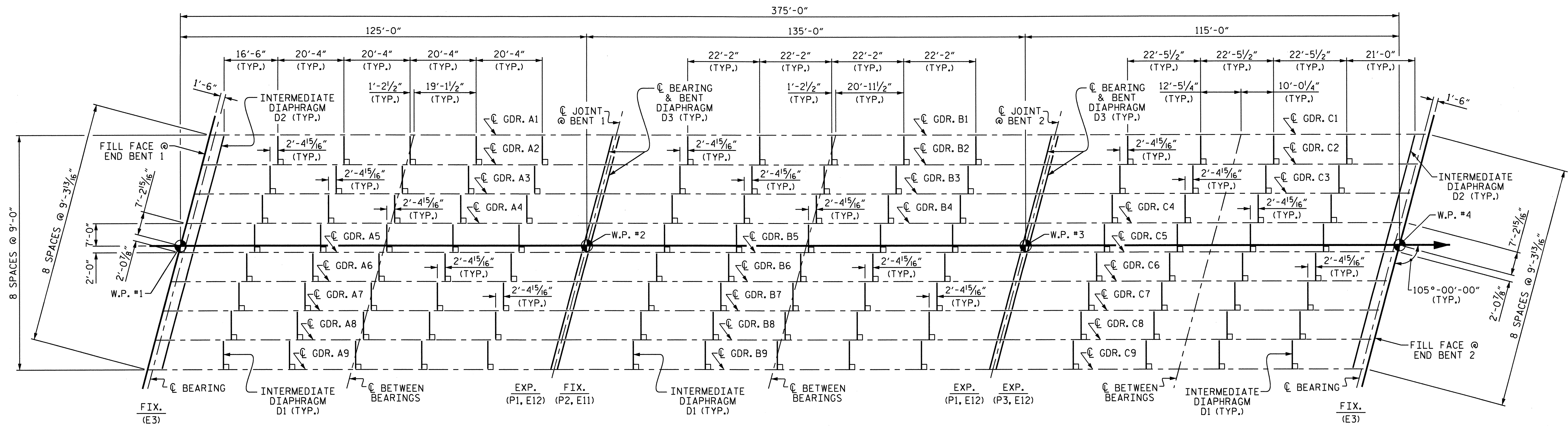
SUPERSTRUCTURE  
 PLAN OF SPAN  
 DETAILS



DRAWN BY: B.N. GRADY DATE: 10/19/11  
 CHECKED BY: E.G. ALLEN DATE: 11/4/11

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-11	
2			4			42	

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**FRAMING PLAN**

**DEAD LOAD DEFLECTION TABLE FOR GIRDERS**

	SPAN A																					
	GIRDERS 1 & 9																					
	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	0.015	0.030	0.043	0.056	0.066	0.075	0.083	0.088	0.091	0.092	0.091	0.088	0.083	0.075	0.066	0.056	0.043	0.030	0.015	0.000	
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.038	0.087	0.134	0.175	0.211	0.242	0.267	0.285	0.295	0.299	0.295	0.285	0.267	0.242	0.211	0.175	0.134	0.087	0.038	0.000	
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.007	0.014	0.020	0.026	0.031	0.035	0.038	0.040	0.042	0.042	0.042	0.040	0.038	0.035	0.031	0.026	0.020	0.014	0.007	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.060	0.131	0.197	0.257	0.308	0.352	0.387	0.413	0.428	0.434	0.428	0.413	0.387	0.352	0.308	0.257	0.197	0.131	0.060	0.000	
REQUIRED CAMBER	0	1/16"	1 3/16"	2 3/8"	3 1/16"	3 1/16"	4 1/4"	4 5/8"	4 5/8"	5 1/8"	5 3/16"	5 3/16"	5 1/8"	4 5/8"	4 1/4"	3 1/16"	3 1/16"	2 3/8"	1 9/16"	1 1/16"	0	
	GIRDERS 2, 3, 7, & 8																					
	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	0.016	0.031	0.045	0.057	0.068	0.077	0.085	0.090	0.094	0.095	0.094	0.090	0.085	0.077	0.068	0.057	0.045	0.031	0.016	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.038	0.088	0.134	0.176	0.212	0.243	0.268	0.286	0.297	0.300	0.297	0.286	0.268	0.243	0.212	0.176	0.134	0.088	0.038	0.000	
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.007	0.013	0.019	0.025	0.030	0.034	0.037	0.039	0.041	0.041	0.041	0.039	0.037	0.034	0.030	0.025	0.019	0.013	0.007	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.060	0.132	0.198	0.258	0.310	0.354	0.390	0.415	0.431	0.436	0.431	0.415	0.390	0.354	0.310	0.258	0.198	0.132	0.060	0.000	
REQUIRED CAMBER	0	3/4"	1 1/16"	2 3/8"	3 1/8"	3 3/4"	4 1/4"	4 11/16"	5"	5 3/16"	5 1/4"	5 3/16"	5"	4 11/16"	4 1/4"	3 3/4"	3 1/8"	2 3/8"	1 9/16"	3/4"	0	
	GIRDERS 4, 5, & 6																					
	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	0.016	0.031	0.045	0.057	0.068	0.077	0.085	0.090	0.094	0.095	0.094	0.090	0.085	0.077	0.068	0.057	0.045	0.031	0.016	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.038	0.088	0.135	0.177	0.213	0.244	0.269	0.287	0.298	0.302	0.298	0.287	0.269	0.244	0.213	0.177	0.135	0.088	0.038	0.000	
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	0.054	0.119	0.180	0.234	0.282	0.322	0.354	0.377	0.392	0.396	0.392	0.377	0.354	0.322	0.282	0.234	0.180	0.119	0.054	0.000	
REQUIRED CAMBER	0	5/8"	1 1/16"	2 1/8"	2 3/16"	3 3/16"	3 7/16"	4 1/4"	4 1/2"	4 11/16"	4 3/4"	4 11/16"	4 1/2"	4 1/4"	3 7/8"	3 3/8"	2 13/16"	2 1/8"	1 7/16"	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).

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 6



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS 42	
2			4				

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
		SPAN B																			
		GIRDERS 1 & 9																			
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	0.020	0.040	0.059	0.075	0.090	0.102	0.112	0.119	0.123	0.124	0.123	0.119	0.112	0.102	0.090	0.075	0.059	0.040	0.020	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.051	0.113	0.171	0.223	0.268	0.306	0.337	0.359	0.373	0.377	0.373	0.359	0.337	0.306	0.268	0.223	0.171	0.113	0.051	0.000
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.009	0.018	0.026	0.033	0.039	0.045	0.049	0.052	0.054	0.055	0.054	0.052	0.049	0.045	0.039	0.033	0.026	0.018	0.009	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.080	0.171	0.255	0.331	0.397	0.452	0.497	0.530	0.549	0.556	0.549	0.530	0.497	0.452	0.397	0.331	0.255	0.171	0.080	0.000
REQUIRED CAMBER	0	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>16</sub> "	4"	4 <sup>3</sup> / <sub>4</sub> "	5 <sup>1</sup> / <sub>16</sub> "	5 <sup>15</sup> / <sub>16</sub> "	6 <sup>3</sup> / <sub>8</sub> "	6 <sup>9</sup> / <sub>16</sub> "	6 <sup>11</sup> / <sub>16</sub> "	6 <sup>9</sup> / <sub>16</sub> "	6 <sup>3</sup> / <sub>8</sub> "	5 <sup>15</sup> / <sub>16</sub> "	5 <sup>7</sup> / <sub>16</sub> "	4 <sup>3</sup> / <sub>4</sub> "	4"	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	1 <sup>5</sup> / <sub>16</sub> "	0
		GIRDERS 2, 3, 7, & 8																			
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	0.021	0.041	0.060	0.077	0.092	0.105	0.115	0.122	0.126	0.128	0.126	0.122	0.015	0.105	0.092	0.077	0.060	0.041	0.021	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.051	0.113	0.172	0.224	0.269	0.308	0.339	0.361	0.375	0.379	0.375	0.361	0.339	0.308	0.269	0.224	0.172	0.113	0.051	0.000
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.009	0.017	0.025	0.032	0.038	0.043	0.047	0.050	0.052	0.053	0.052	0.050	0.047	0.043	0.038	0.032	0.025	0.017	0.009	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.081	0.172	0.257	0.333	0.400	0.456	0.501	0.534	0.554	0.560	0.554	0.534	0.501	0.456	0.400	0.333	0.257	0.172	0.081	0.000
REQUIRED CAMBER	0	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>16</sub> "	4"	4 <sup>13</sup> / <sub>16</sub> "	5 <sup>1</sup> / <sub>2</sub> "	6"	6 <sup>3</sup> / <sub>8</sub> "	6 <sup>5</sup> / <sub>8</sub> "	6 <sup>3</sup> / <sub>4</sub> "	6 <sup>5</sup> / <sub>8</sub> "	6 <sup>3</sup> / <sub>8</sub> "	6"	5 <sup>1</sup> / <sub>2</sub> "	4 <sup>13</sup> / <sub>16</sub> "	4"	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	1 <sup>5</sup> / <sub>16</sub> "	0
		GIRDERS 4, 5, & 6																			
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	0.021	0.041	0.060	0.077	0.092	0.105	0.115	0.122	0.126	0.128	0.126	0.122	0.115	0.105	0.092	0.077	0.060	0.041	0.021	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.051	0.114	0.173	0.225	0.271	0.310	0.341	0.363	0.377	0.382	0.377	0.363	0.341	0.310	0.271	0.225	0.173	0.114	0.051	0.000
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.072	0.155	0.233	0.303	0.363	0.414	0.455	0.485	0.503	0.510	0.503	0.485	0.455	0.414	0.363	0.303	0.233	0.155	0.072	0.000
REQUIRED CAMBER	0	7 <sup>8</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>13</sup> / <sub>16</sub> "	3 <sup>5</sup> / <sub>8</sub> "	4 <sup>3</sup> / <sub>8</sub> "	5"	5 <sup>1</sup> / <sub>16</sub> "	5 <sup>13</sup> / <sub>16</sub> "	6 <sup>1</sup> / <sub>16</sub> "	6 <sup>1</sup> / <sub>8</sub> "	6 <sup>1</sup> / <sub>16</sub> "	5 <sup>13</sup> / <sub>16</sub> "	5 <sup>7</sup> / <sub>16</sub> "	5"	4 <sup>3</sup> / <sub>8</sub> "	3 <sup>5</sup> / <sub>8</sub> "	2 <sup>13</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	7 <sup>8</sup> / <sub>16</sub> "	0

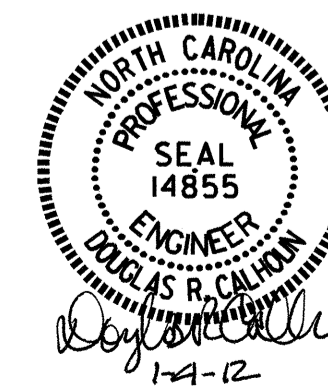
\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
		SPAN C																			
		GIRDERS 1 & 9																			
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	0.011	0.022	0.032	0.041	0.049	0.056	0.061	0.065	0.068	0.068	0.068	0.065	0.061	0.056	0.049	0.041	0.032	0.022	0.011	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.028	0.069	0.107	0.141	0.171	0.197	0.217	0.232	0.241	0.244	0.241	0.232	0.217	0.197	0.171	0.141	0.107	0.069	0.028	0.000
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.006	0.011	0.016	0.021	0.025	0.028	0.031	0.033	0.034	0.034	0.034	0.033	0.031	0.028	0.025	0.021	0.016	0.011	0.006	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.045	0.102	0.155	0.203	0.245	0.280	0.309	0.330	0.342	0.346	0.342	0.330	0.309	0.280	0.245	0.203	0.155	0.102	0.045	0.000
REQUIRED CAMBER	0	3 <sup>1</sup> / <sub>16</sub> "	1 <sup>1</sup> / <sub>4</sub> "	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>16</sub> "	2 <sup>15</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>15</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	4 <sup>3</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	3 <sup>15</sup> / <sub>16</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	2 <sup>15</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>16</sub> "	0
		GIRDERS 2, 3, 7, & 8																			
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	0.011	0.023	0.033	0.042	0.050	0.057	0.063	0.067	0.070	0.070	0.070	0.067	0.063	0.057	0.050	0.042	0.033	0.023	0.011	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.028	0.069	0.107	0.141	0.171	0.196	0.216	0.231	0.240	0.243	0.240	0.231	0.216	0.196	0.171	0.141	0.107	0.069	0.028	0.000
DEFLECTION DUE TO WEIGHT OF RAILS	0.000	0.005	0.011	0.016	0.020	0.024	0.027	0.030	0.032	0.033	0.033	0.033	0.032	0.030	0.027	0.024	0.020	0.016	0.011	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.045	0.102	0.155	0.203	0.245	0.281	0.309	0.330	0.343	0.347	0.343	0.330	0.309	0.281	0.245	0.203	0.155	0.102	0.045	0.000
REQUIRED CAMBER	0	3 <sup>1</sup> / <sub>16</sub> "	1 <sup>1</sup> / <sub>4</sub> "	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>16</sub> "	2 <sup>15</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>15</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	4 <sup>3</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>8</sub> "	3 <sup>15</sup> / <sub>16</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	2 <sup>15</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>16</sub> "	0
		GIRDERS 4, 5, & 6																			
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		0.011	0.023	0.033	0.042	0.050	0.057	0.063	0.067	0.070	0.070	0.070	0.067	0.063	0.057	0.050	0.042	0.033	0.023	0.011	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *		0.028	0.069	0.106	0.140	0.170	0.196	0.216	0.231	0.240	0.243	0.240	0.231	0.216	0.196	0.170	0.140	0.106	0.069	0.028	0.000
DEFLECTION DUE TO WEIGHT OF RAILS		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION		0.040	0.091	0.139	0.183	0.221	0.253	0.279	0.298	0.309	0.313	0.309	0.298	0.279	0.253	0.221	0.183	0.139	0.091	0.040	0.000
REQUIRED CAMBER		1 <sup>2</sup> / <sub>2</sub> "	1 <sup>1</sup> / <sub>16</sub> "	1 <sup>11</sup> / <sub>16</sub> "	2 <sup>3</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	3 <sup>9</sup> / <sub>16</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>4</sub> "	3 <sup>11</sup> / <sub>16</sub> "	3 <sup>9</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	2 <sup>3</sup> / <sub>16</sub> "	1 <sup>11</sup> / <sub>16</sub> "	1 <sup>1</sup> / <sub>16</sub> "	1 <sup>2</sup> / <sub>2</sub> "	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).

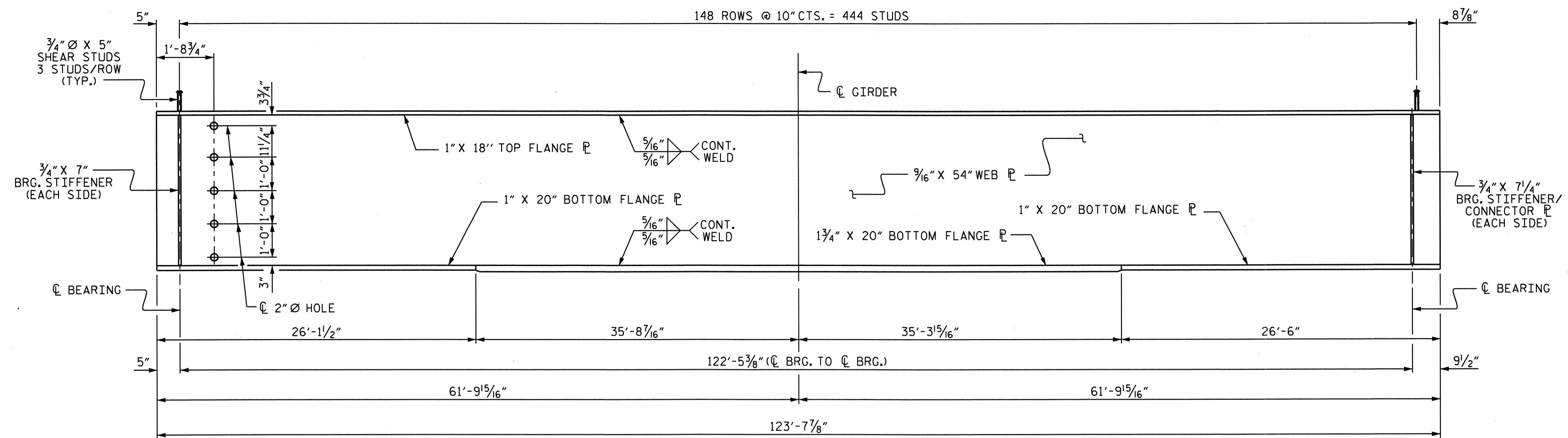
PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 2 OF 6

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



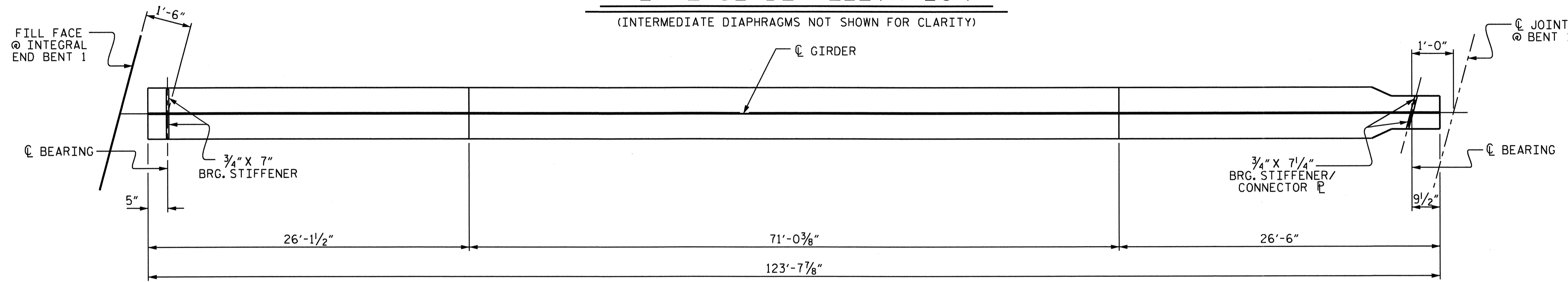
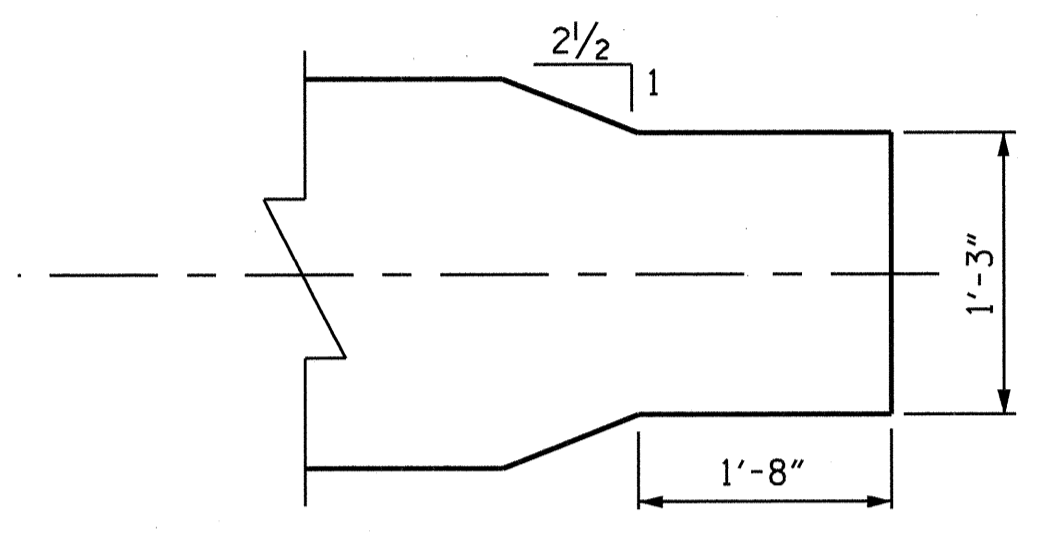
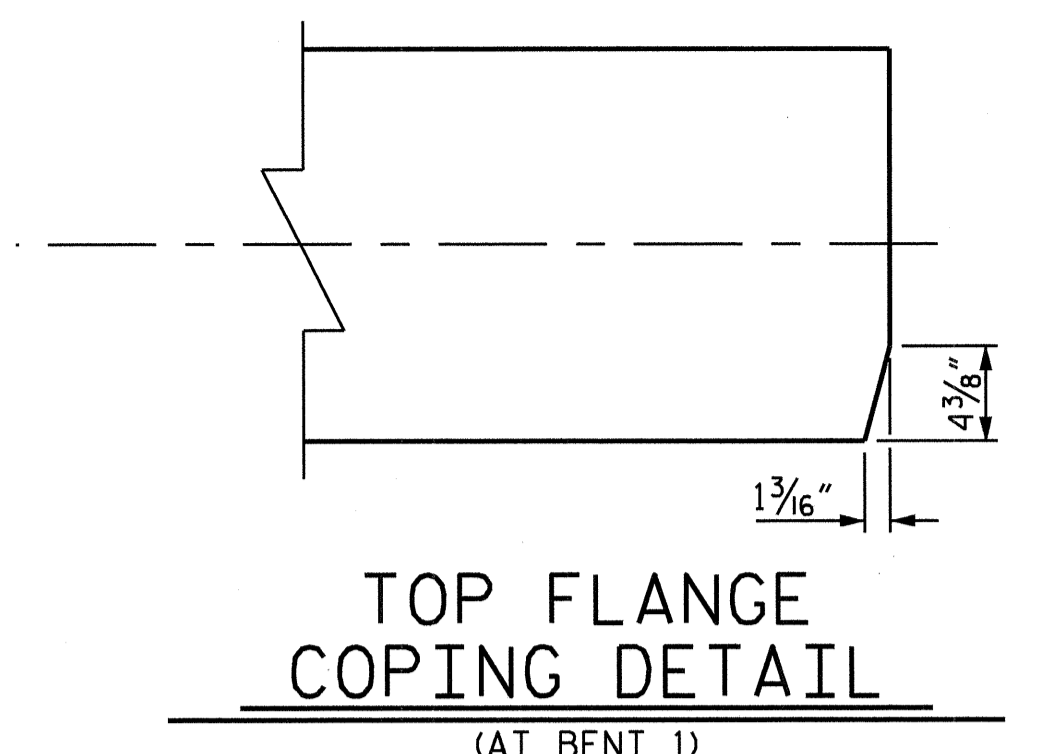
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11

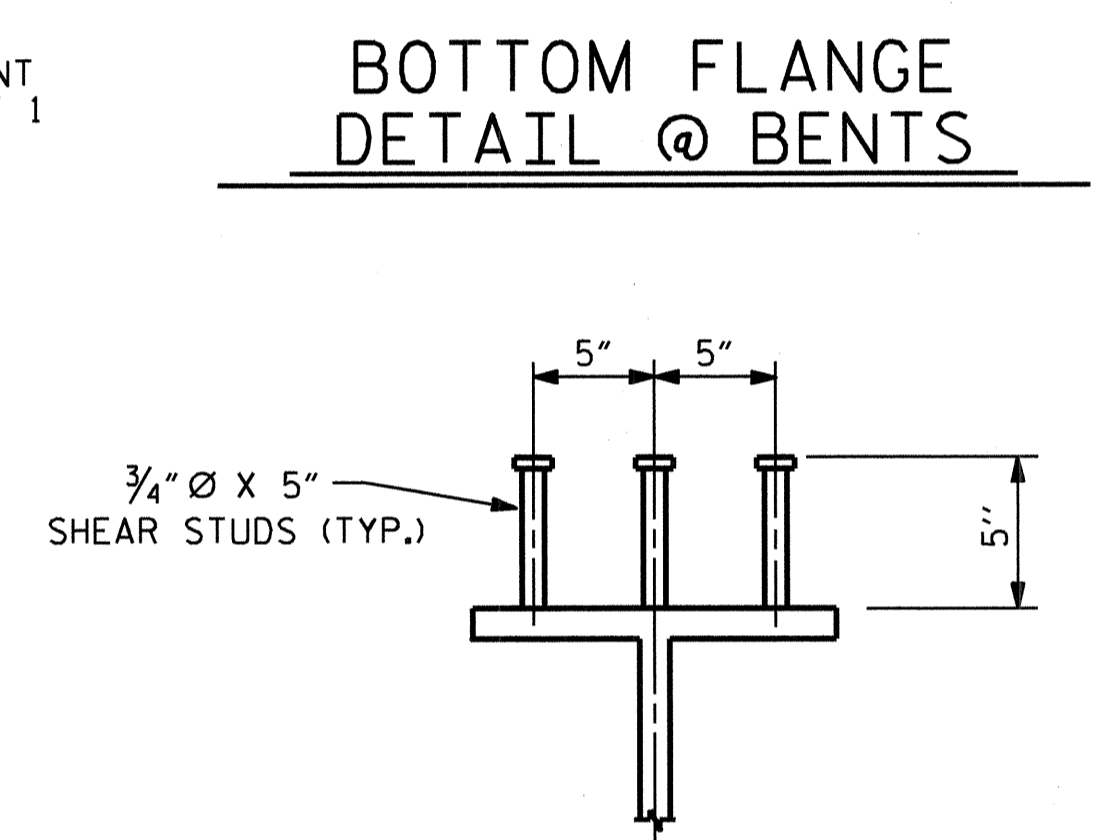


**PLATE GIRDER ELEVATION**

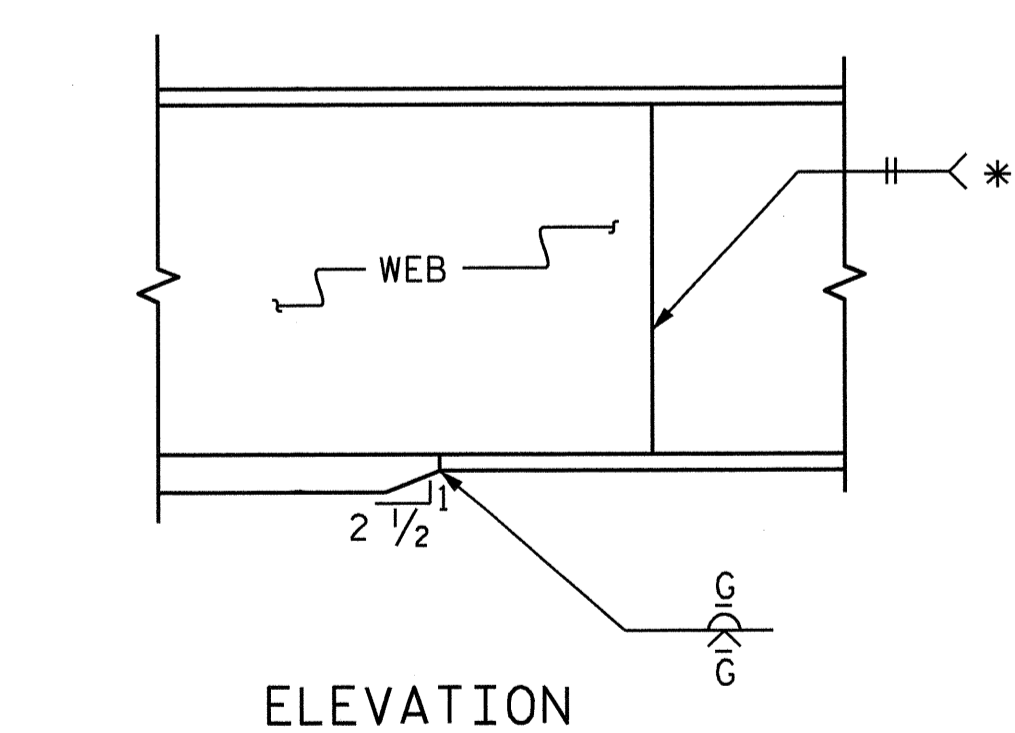
(INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY)



**BOTTOM FLANGE DETAIL**

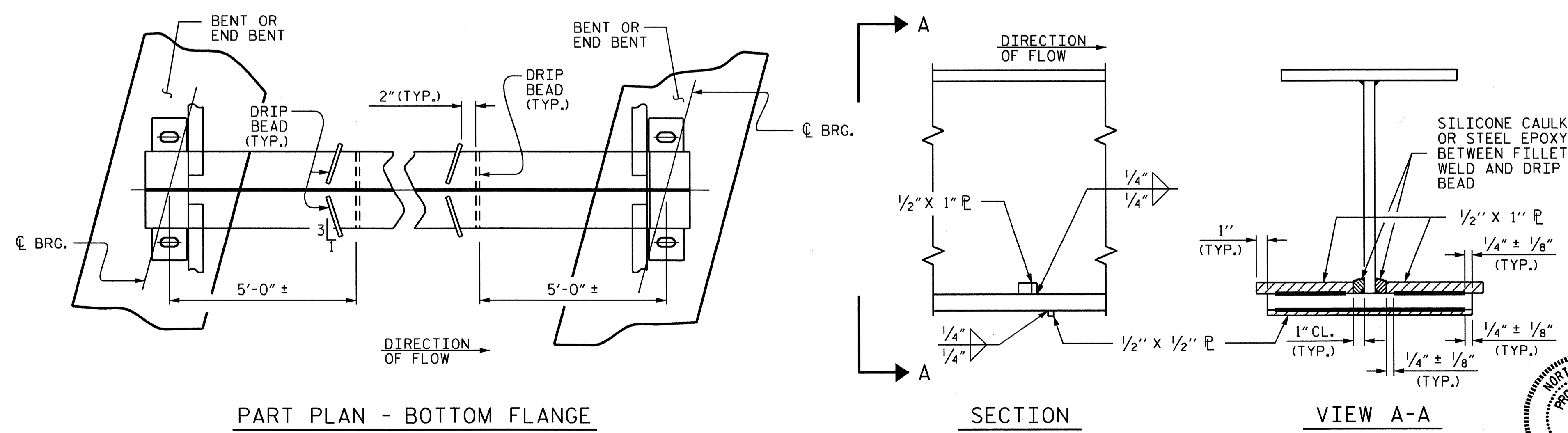


**SHEAR STUD DETAILS**



**TYPICAL FLANGE AND WEB BUTT JOINT**

\* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS

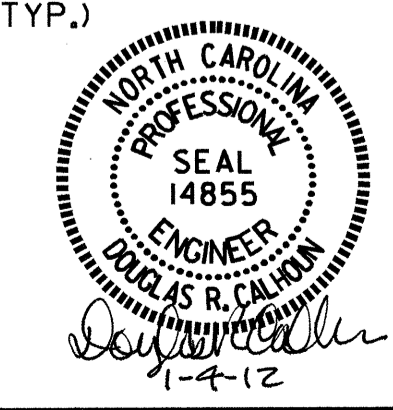


**DRIP BEAD DETAILS**

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

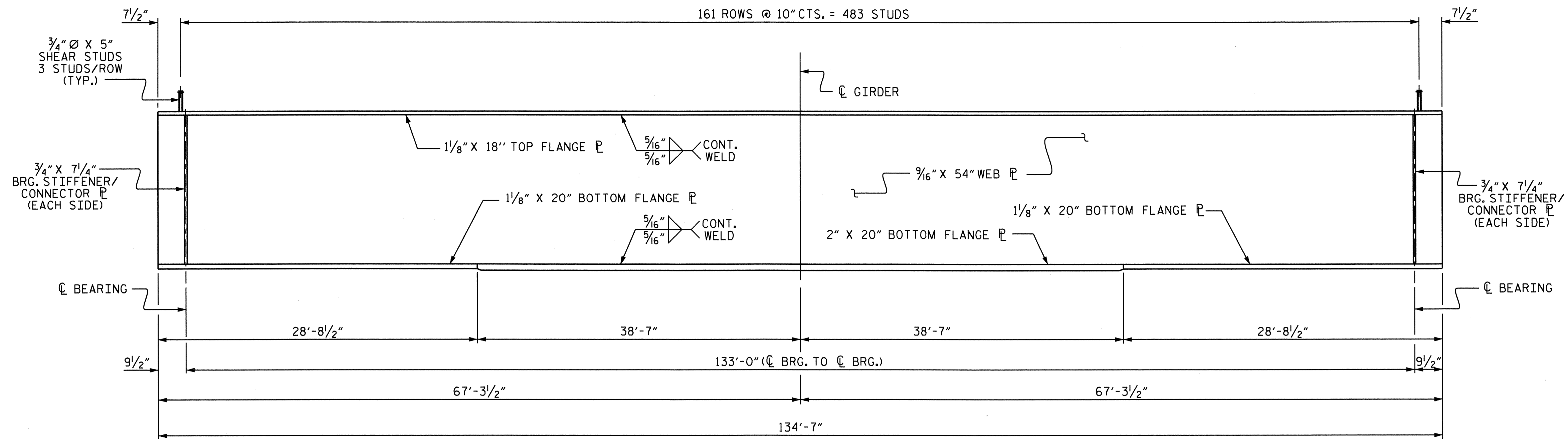
SHEET 3 OF 6

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



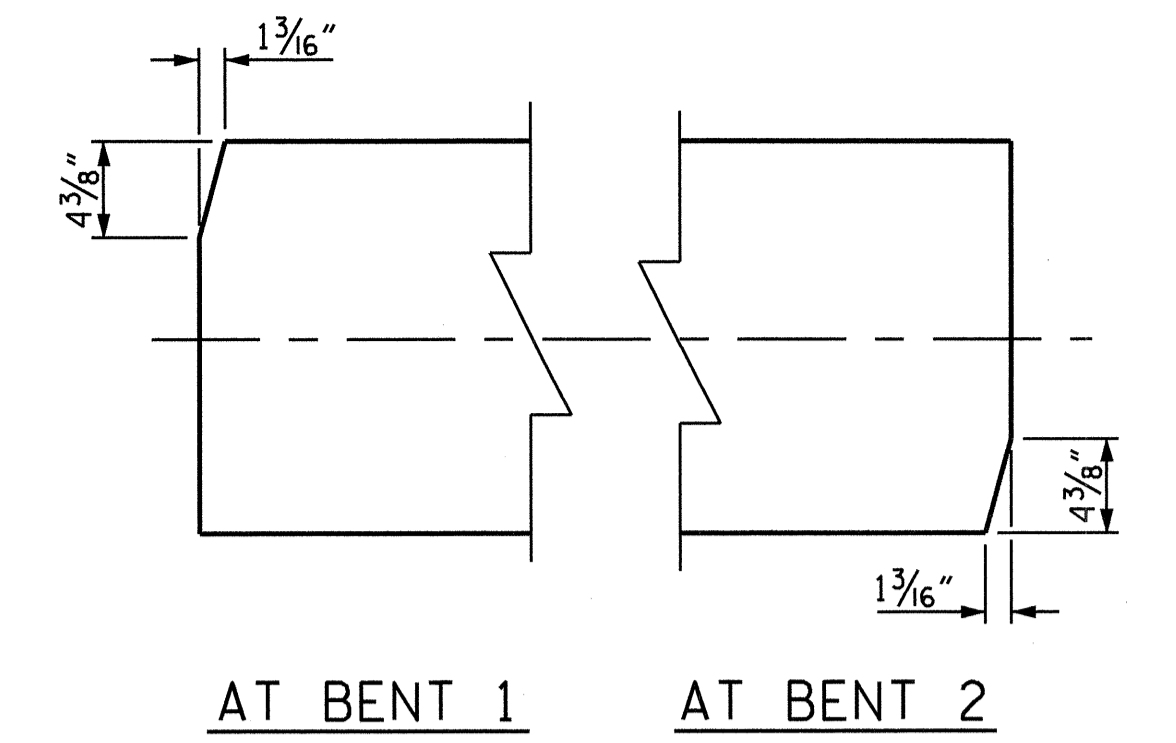
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	42
2			4				

DRAWN BY : B.N. GRADY DATE : 5/23/11  
 CHECKED BY : J.L. WALTON DATE : 7/14/11

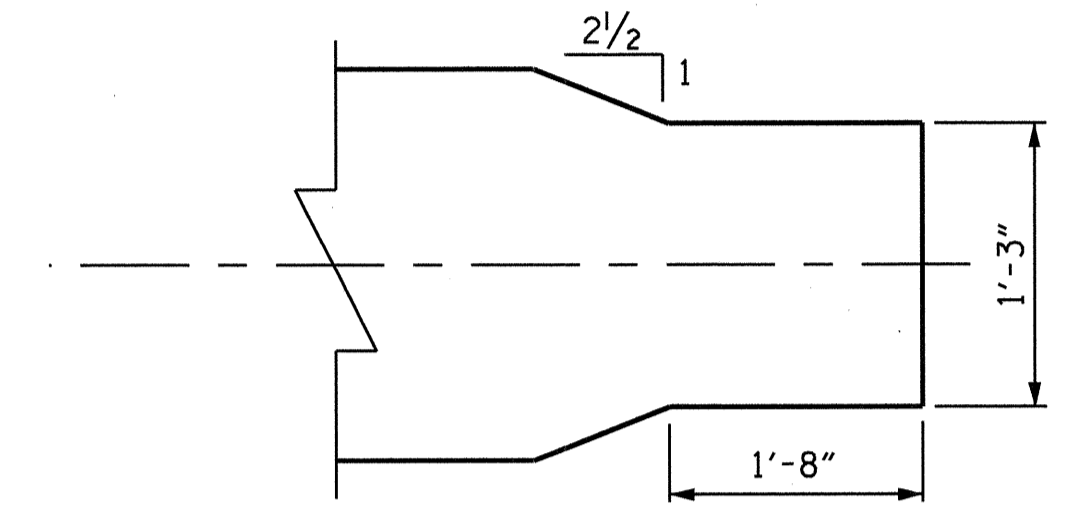


**PLATE GIRDER ELEVATION**

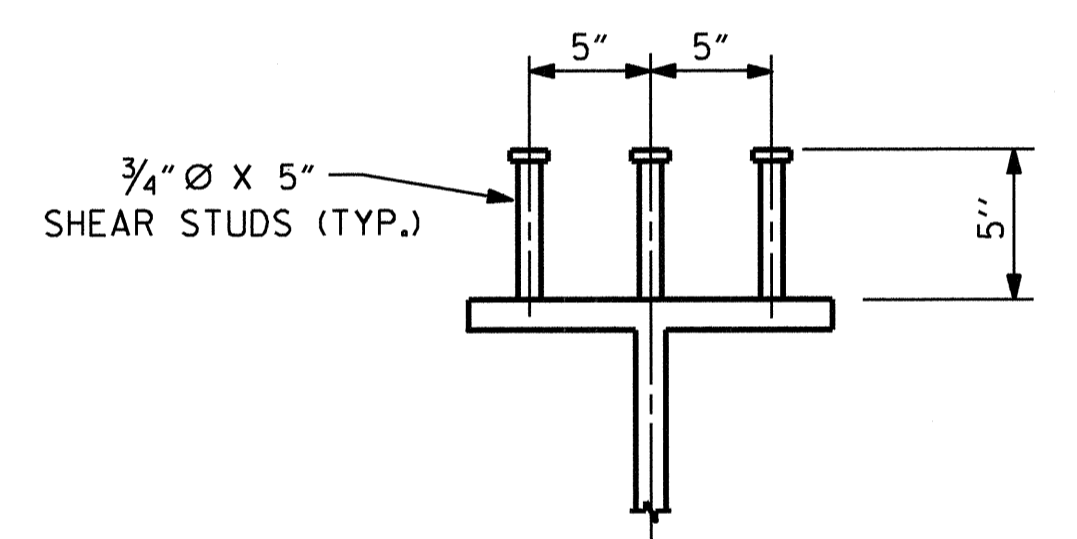
(INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY)



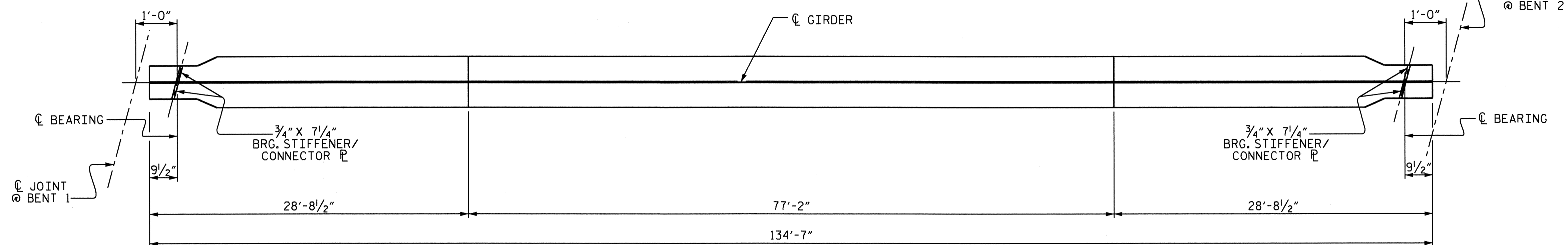
**TOP FLANGE COPING DETAIL**



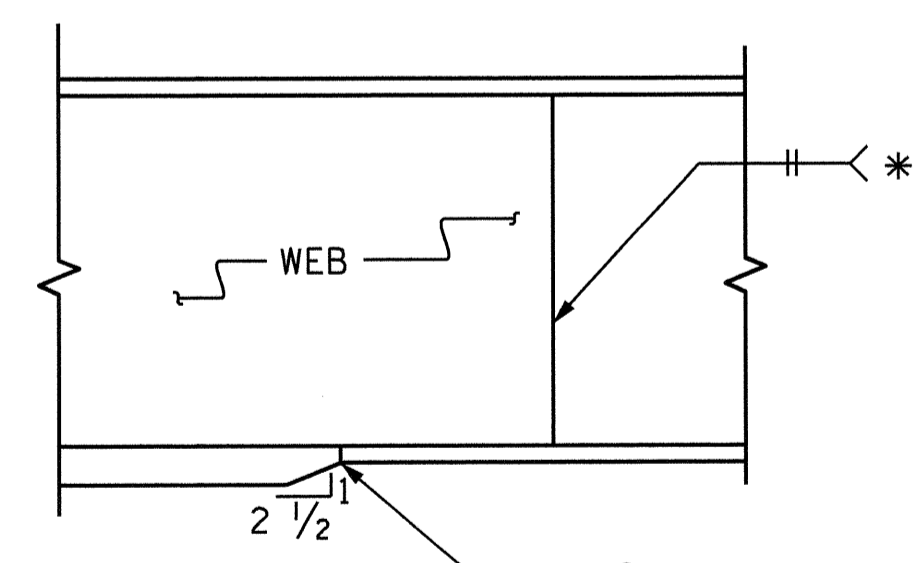
**BOTTOM FLANGE DETAIL @ BENTS**



**SHEAR STUD DETAILS**

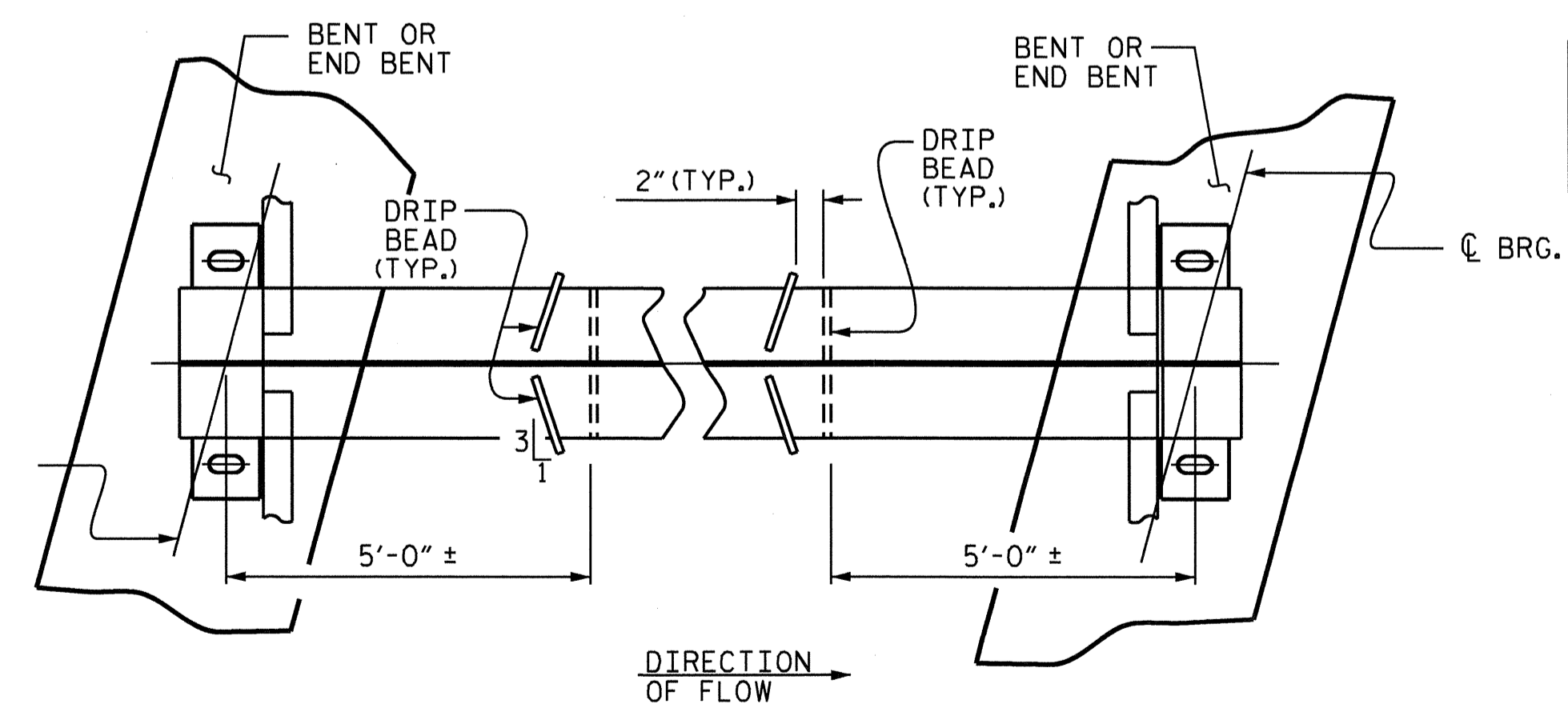


**BOTTOM FLANGE DETAIL**

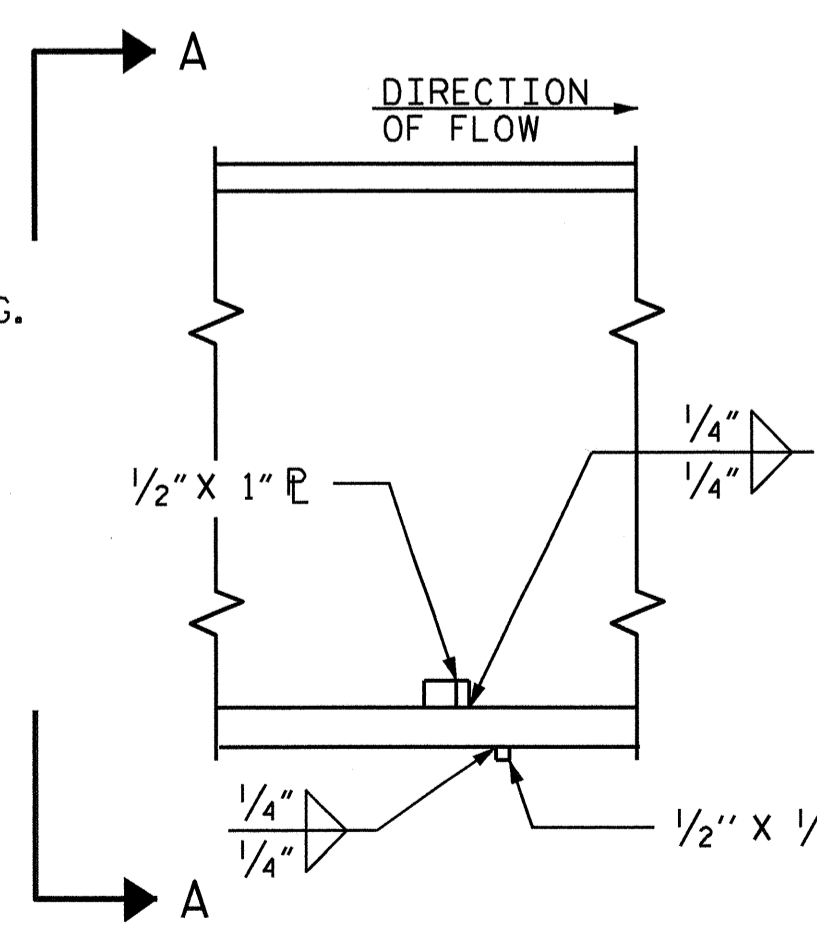


**TYPICAL FLANGE AND WEB BUTT JOINT**

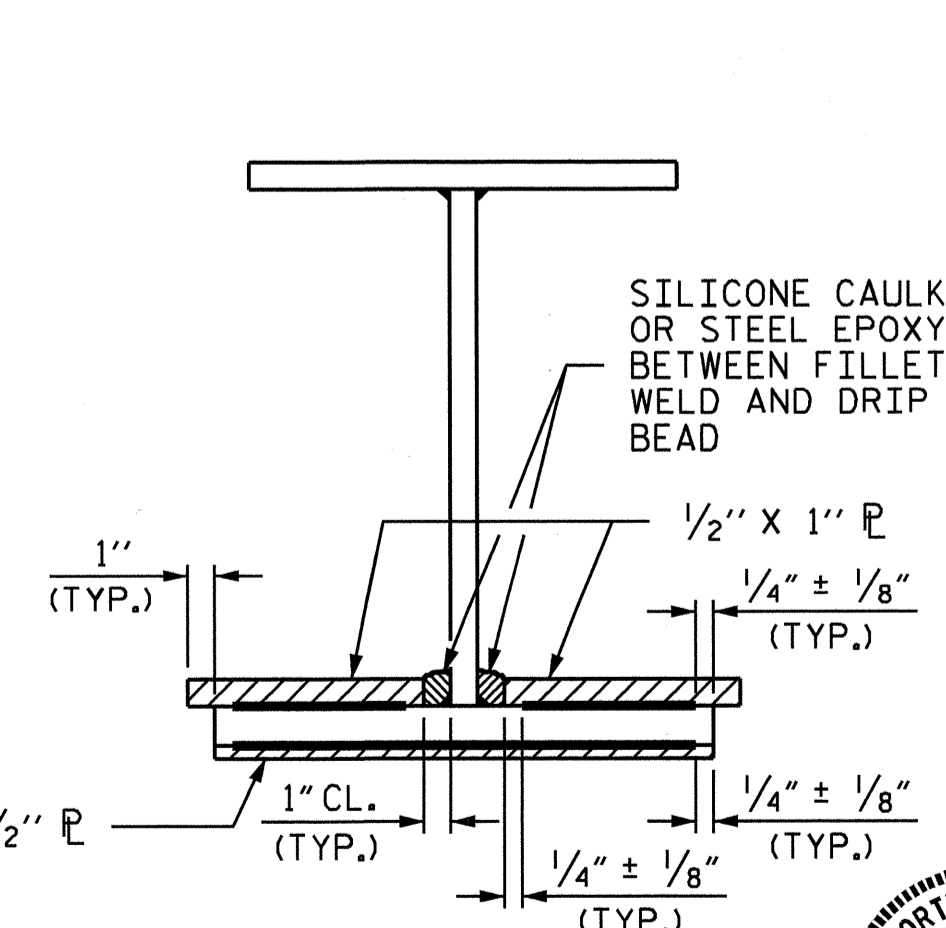
\* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS



**PART PLAN - BOTTOM FLANGE**



**SECTION**



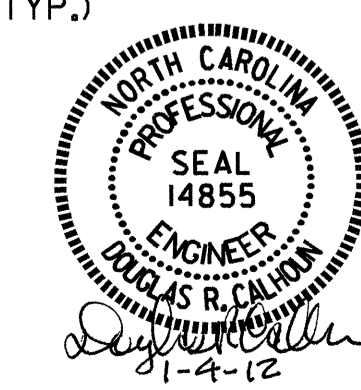
**VIEW A-A**

**DRIP BEAD DETAILS**

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 4 OF 6

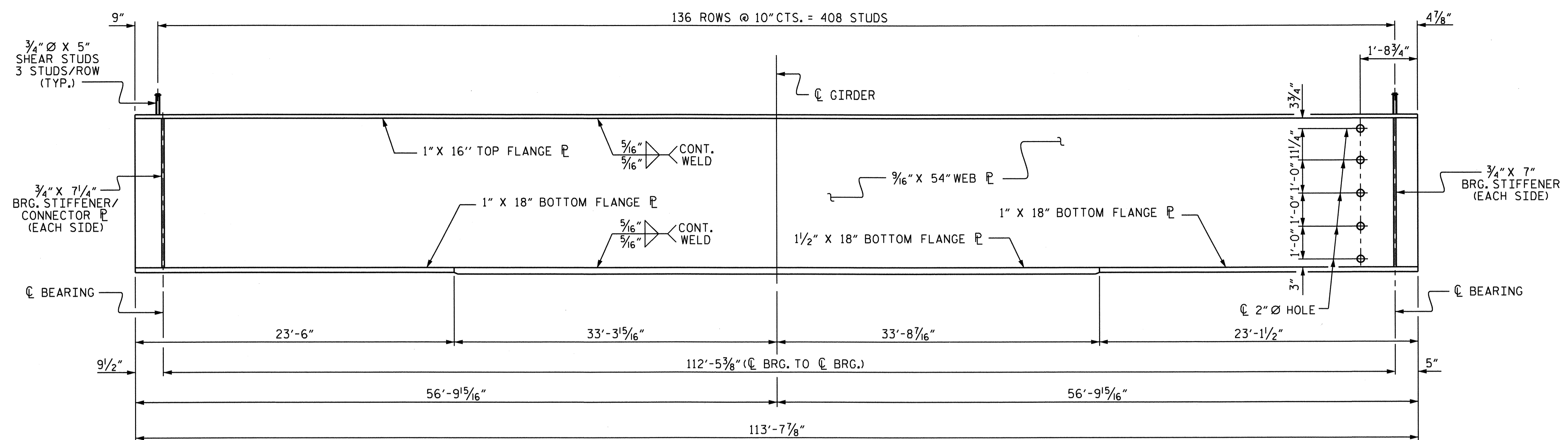
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS  
 SPAN B



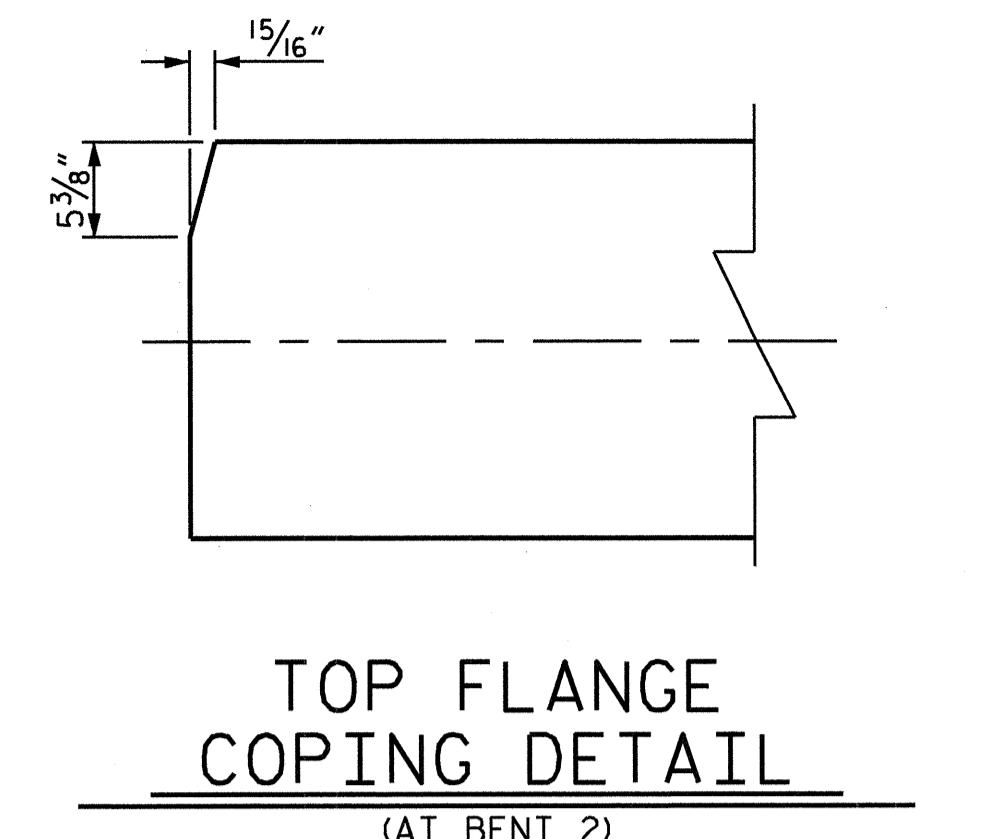
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	42
2			4				

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11

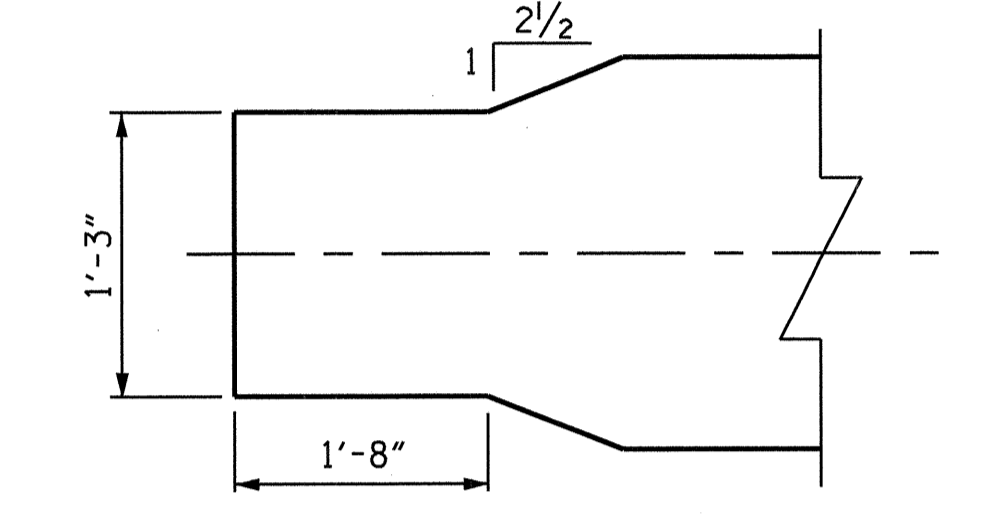




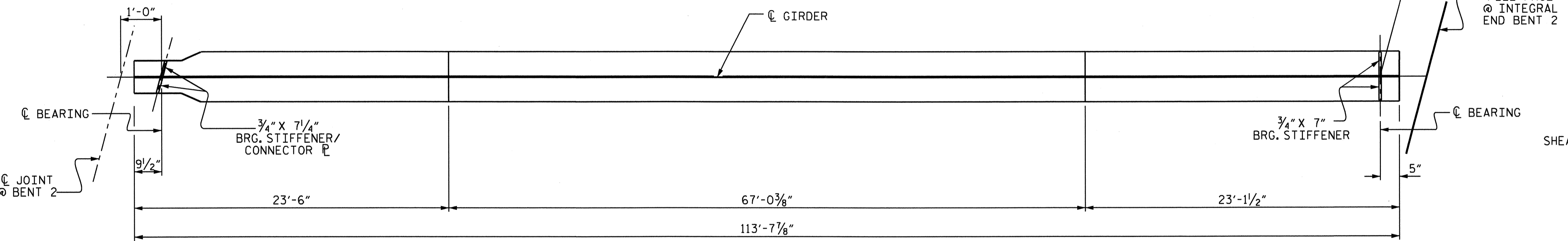
**PLATE GIRDER ELEVATION**  
(INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY)



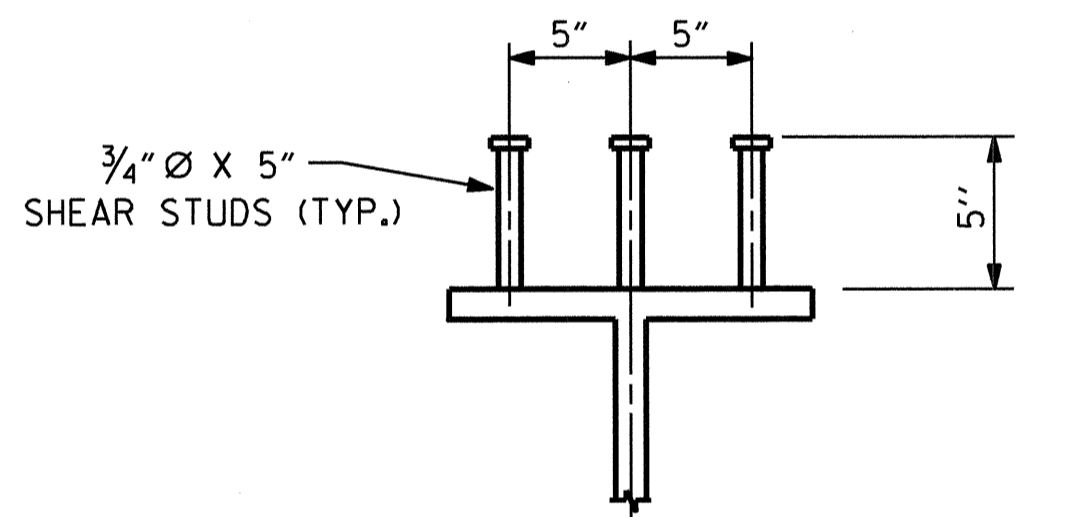
**TOP FLANGE COPING DETAIL**  
(AT BENT 2)



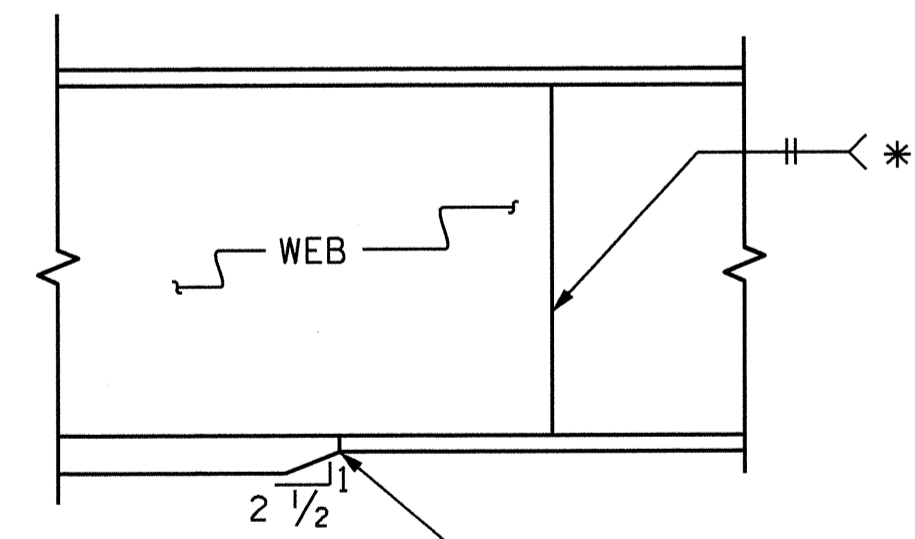
**BOTTOM FLANGE DETAIL @ BENTS**



**BOTTOM FLANGE DETAIL**

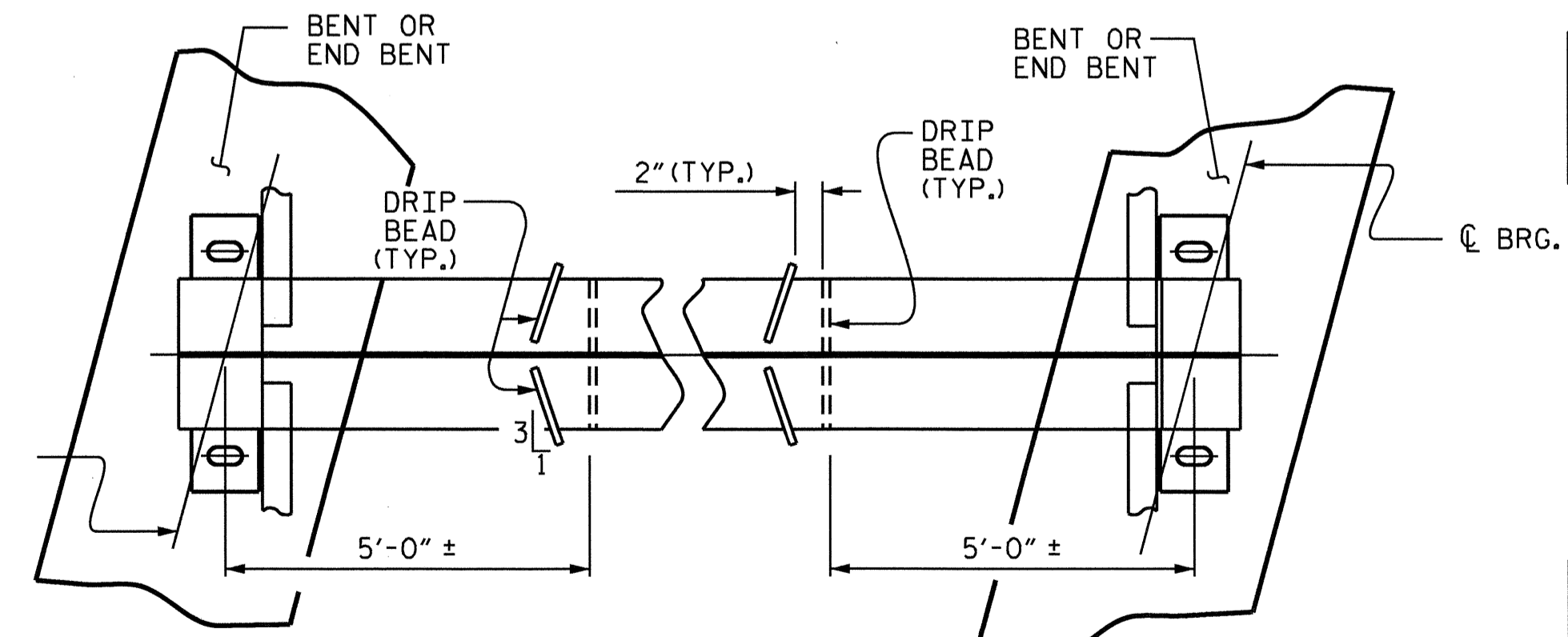


**SHEAR STUD DETAILS**

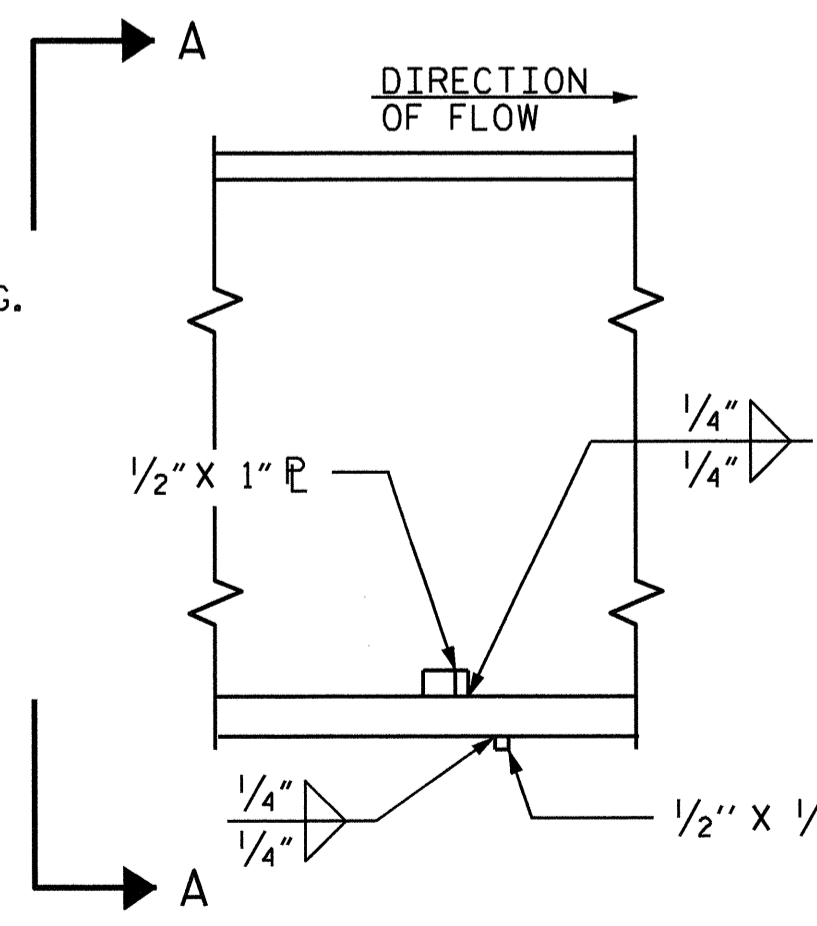


**TYPICAL FLANGE AND WEB BUTT JOINT**

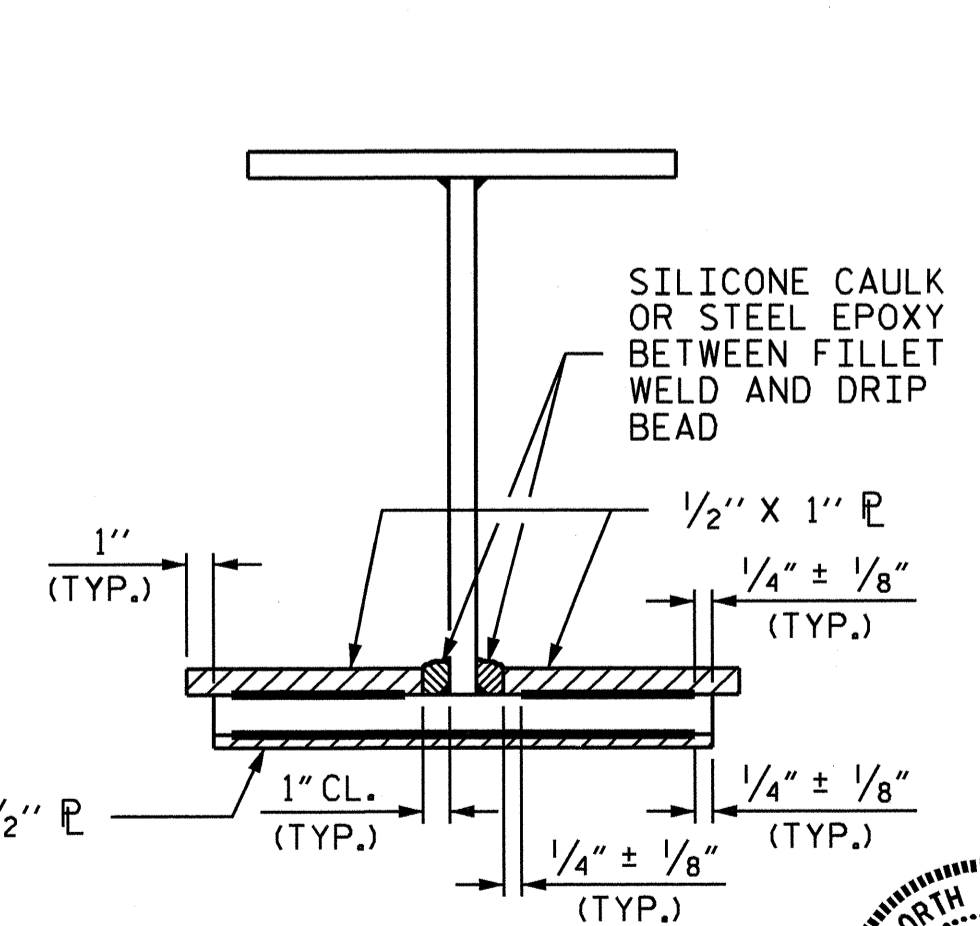
\* GRIND SMOOTH AND FLUSH ON OUTSIDE OF EXTERIOR GIRDERS



**PART PLAN - BOTTOM FLANGE**

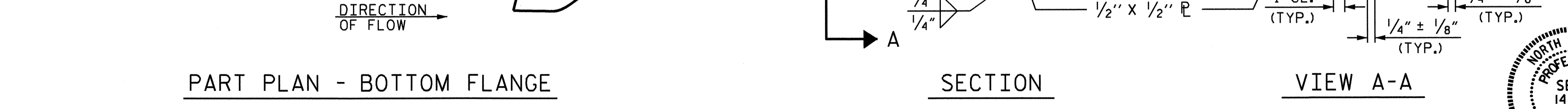


**SECTION**



**VIEW A-A**

SILICONE CAULK OR STEEL EPOXY BETWEEN FILLET WELD AND DRIP BEAD

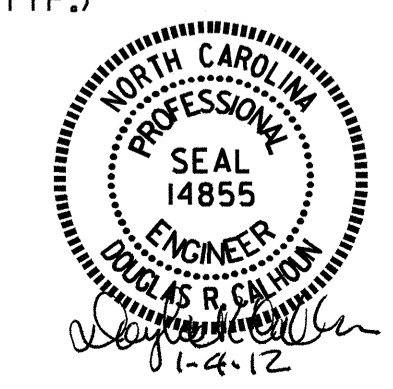


**DRIP BEAD DETAILS**

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

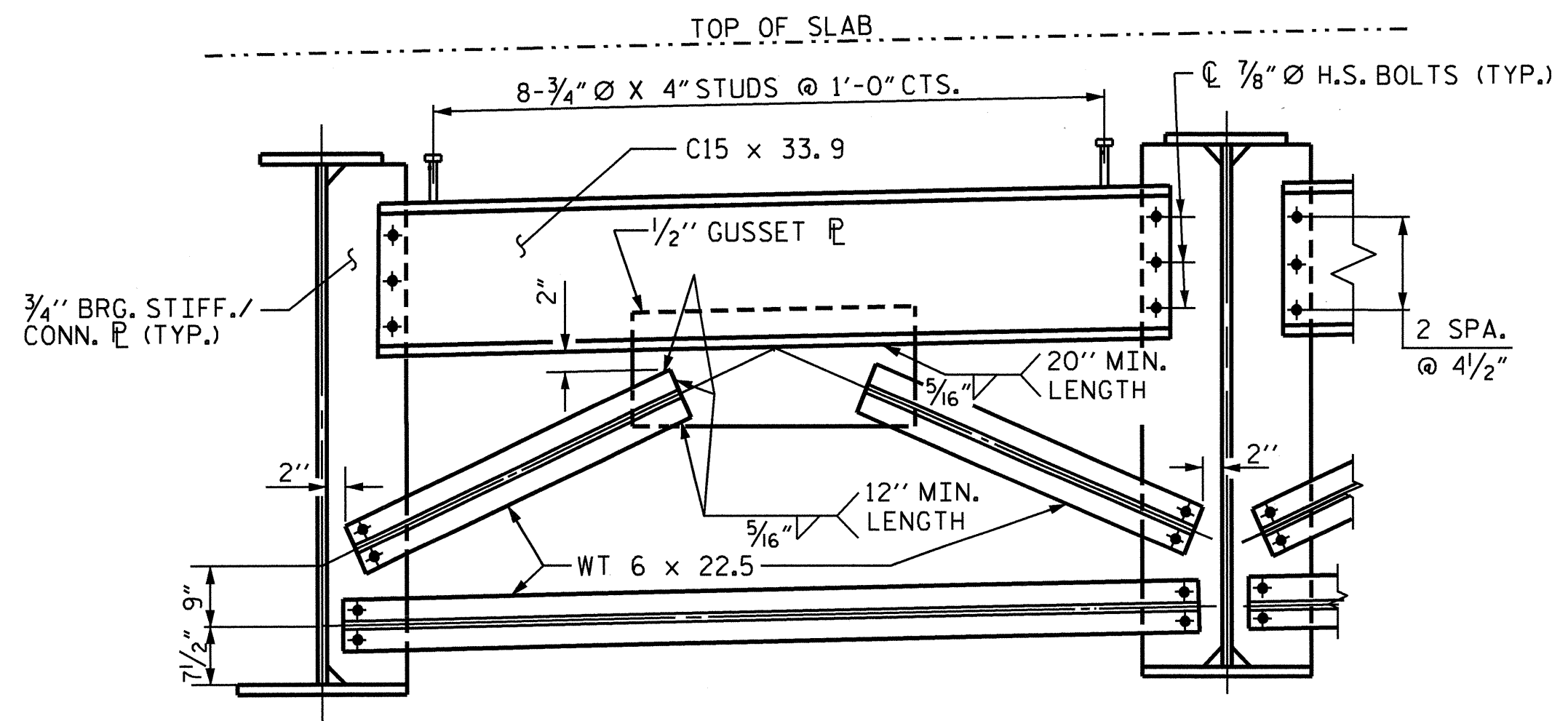
SHEET 5 OF 6

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

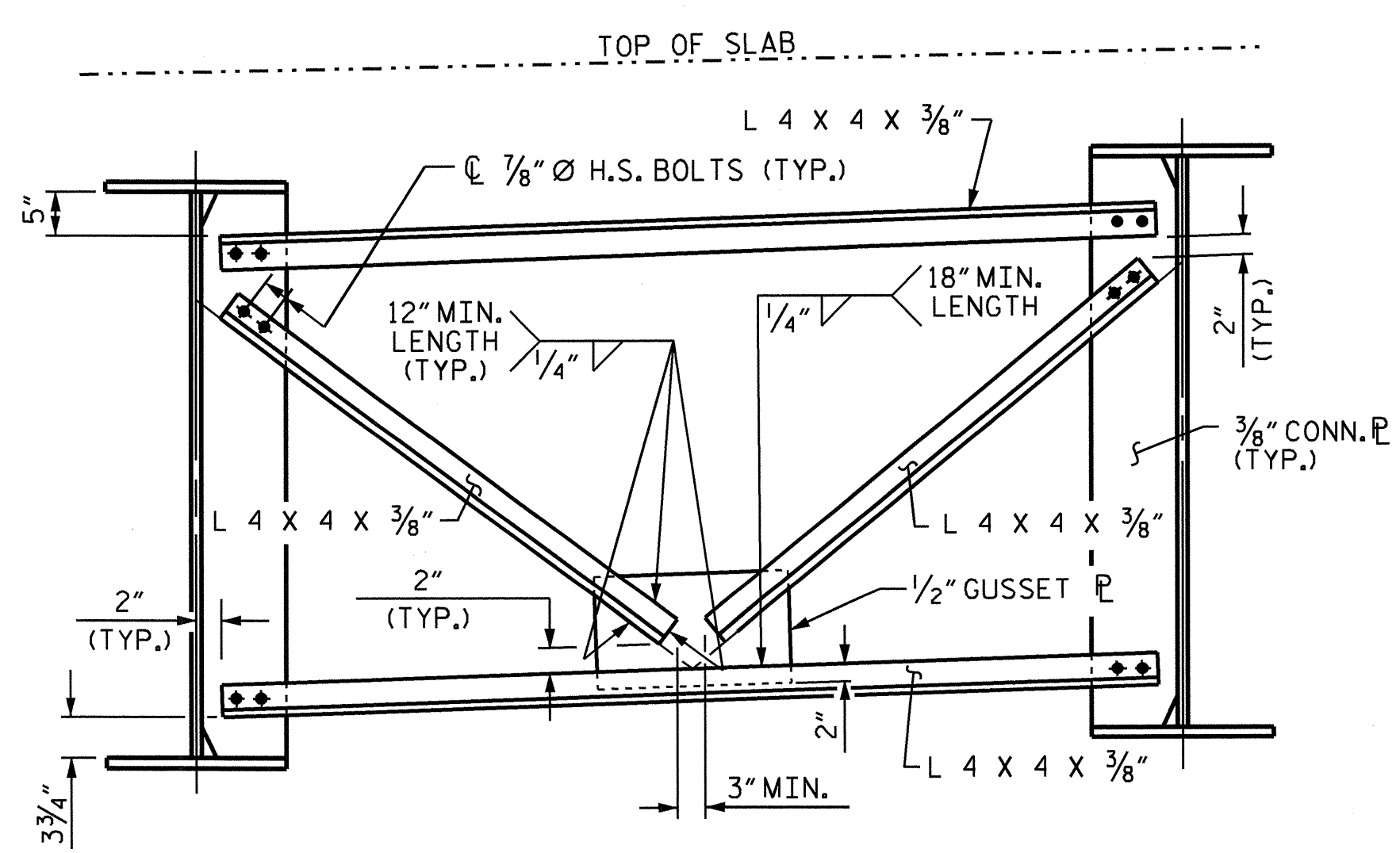


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	
2			4			42	

DRAWN BY: B.N. GRADY DATE: 5/23/11  
 CHECKED BY: J.L. WALTON DATE: 7/14/11



TYPICAL BENT DIAPHRAGM (D3)



TYPICAL INTERMEDIATE DIAPHRAGM (D1 OR D2)

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.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES (IF USED) FOR ALL GIRDERS IN ALL SPANS. A CHARPY V-NOTCH TEST IS ALSO REQUIRED FOR TOP FLANGE PLATES FOR ALL GIRDERS IN SPANS A AND C, 25 FT. FROM ENDS OF GIRDERS AT INTEGRAL END BENTS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED FOR ALL GIRDERS IN SPANS A AND C, 25 FT FROM ENDS OF GIRDERS AT INTEGRAL END BENTS.

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.

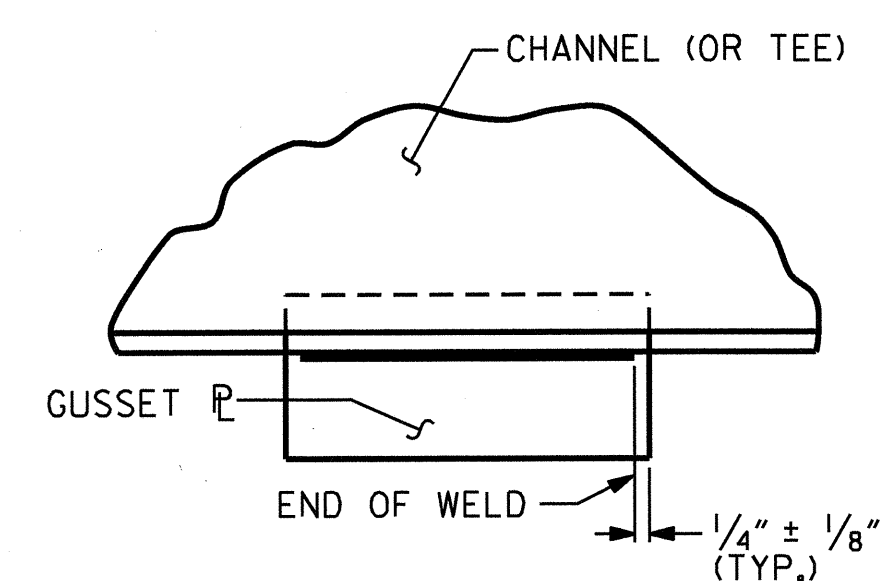
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

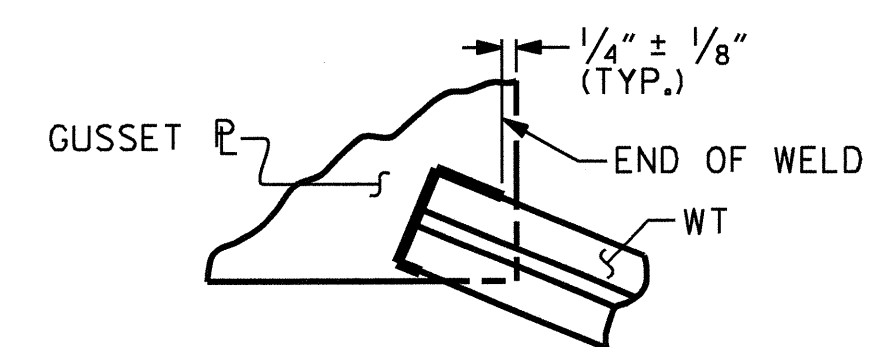
BEARING STIFFENERS AT BENTS ARE TO BE PLACED ALONG SKEW AND USED AS CONNECTOR PLATES. BEARING STIFFENERS AT BENTS AND END BENTS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

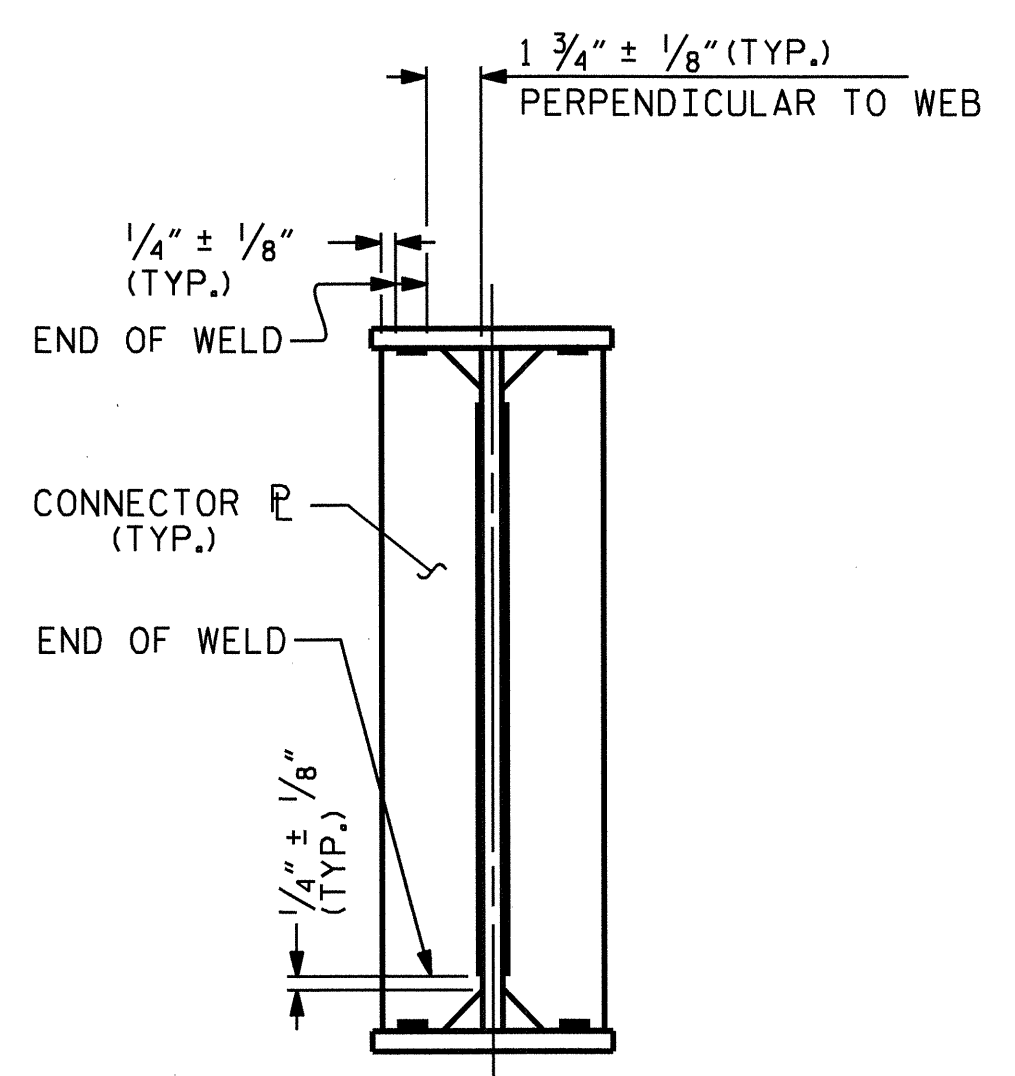
FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



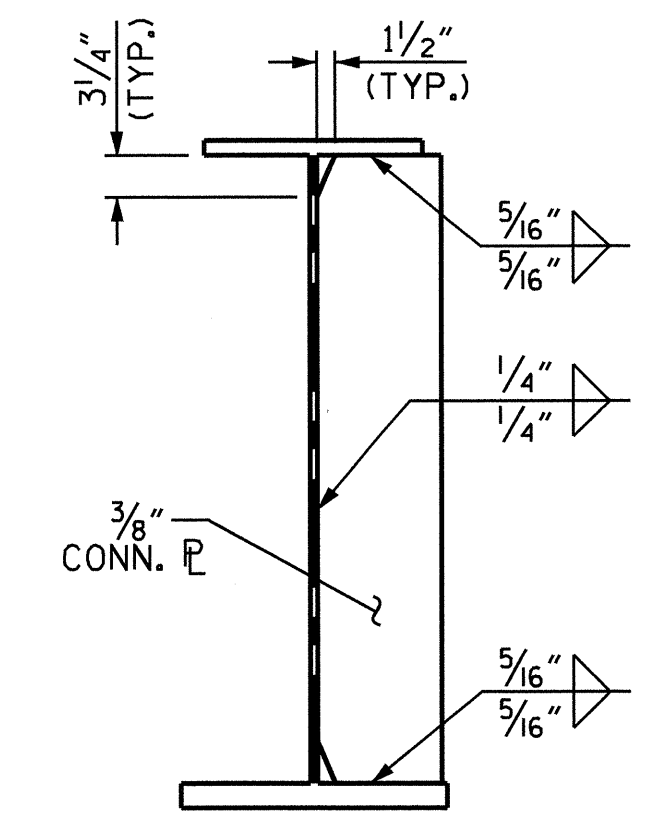
TYPICAL GUSSET PLATE CONNECTION



TYPICAL "TEE" TO GUSSET PLATE CONNECTION

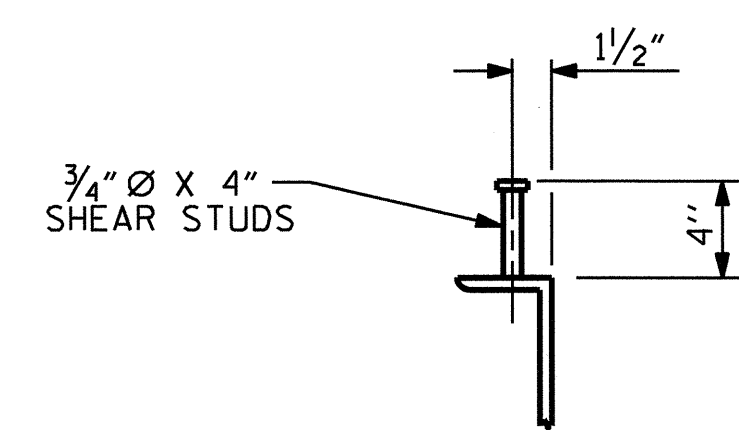


TYPICAL STIFFENER & CONNECTOR PLATE CONNECTIONS

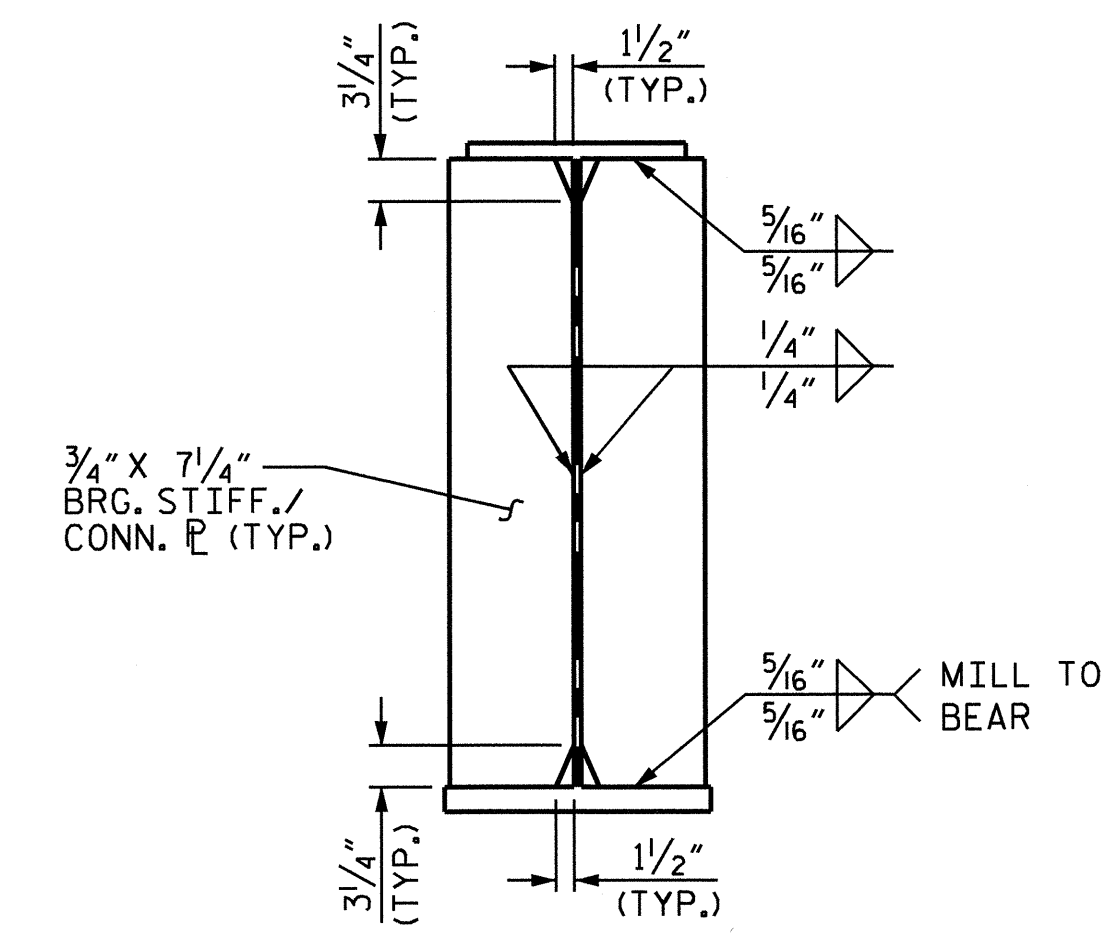


CONNECTOR PLATE

WELD TERMINATION DETAILS



SHEAR STUD DETAILS



BEARING STIFFENER/CONNECTOR PLATE

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SHEET 6 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
STRUCTURAL STEEL  
DETAILS



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17	
1			3			TOTAL SHEETS	
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NOTES

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

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

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

FOR 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.

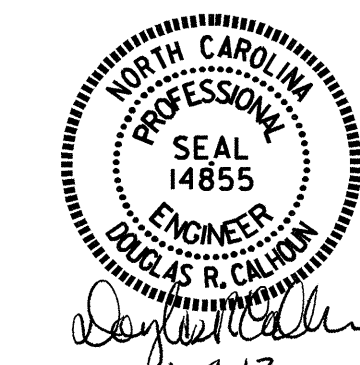
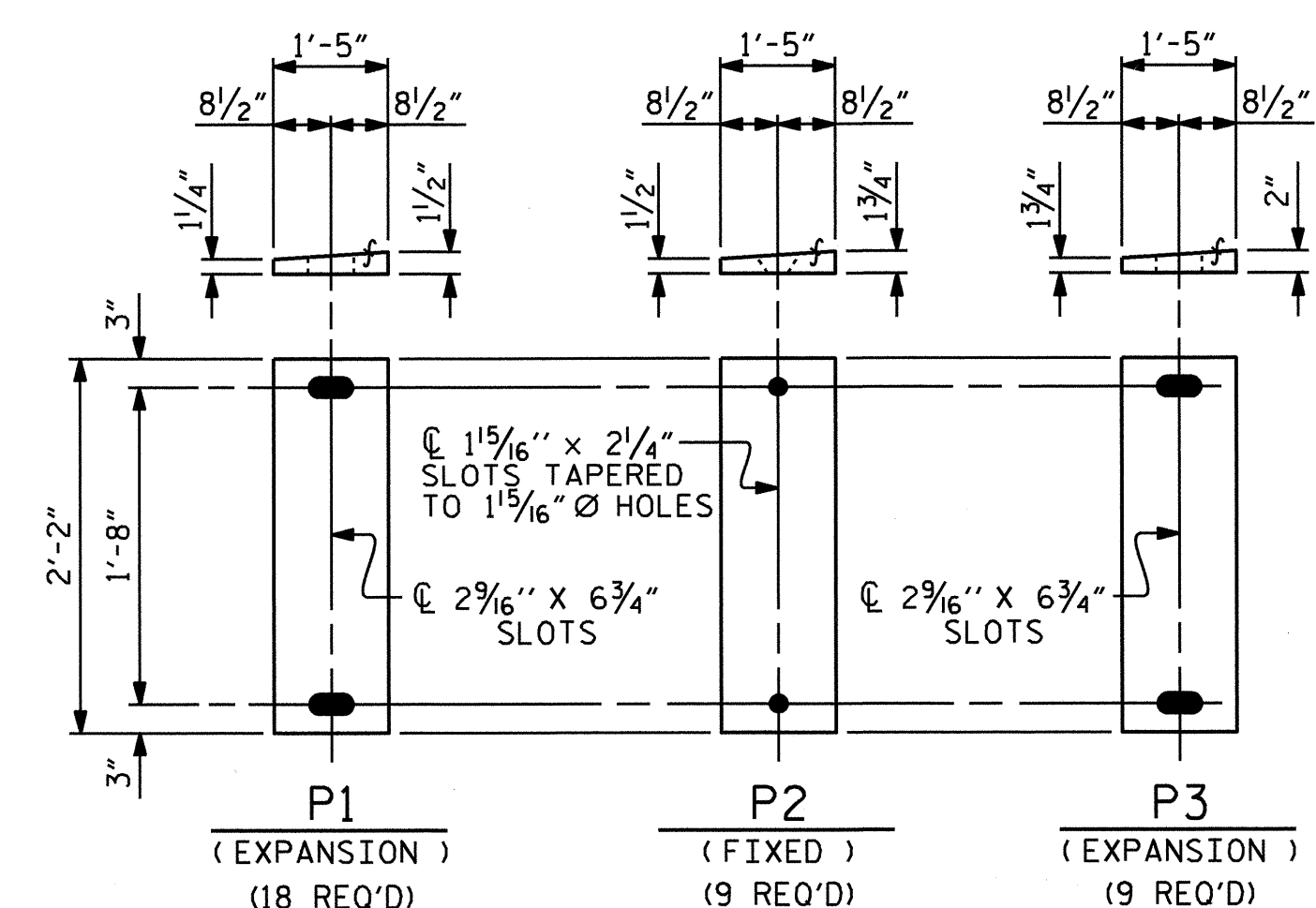
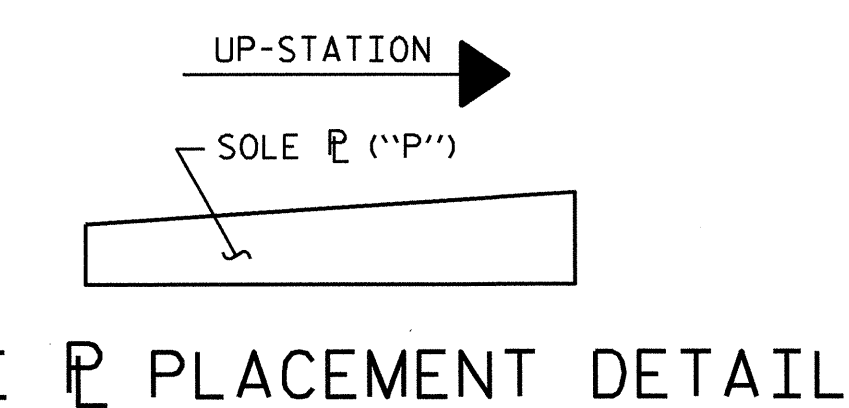
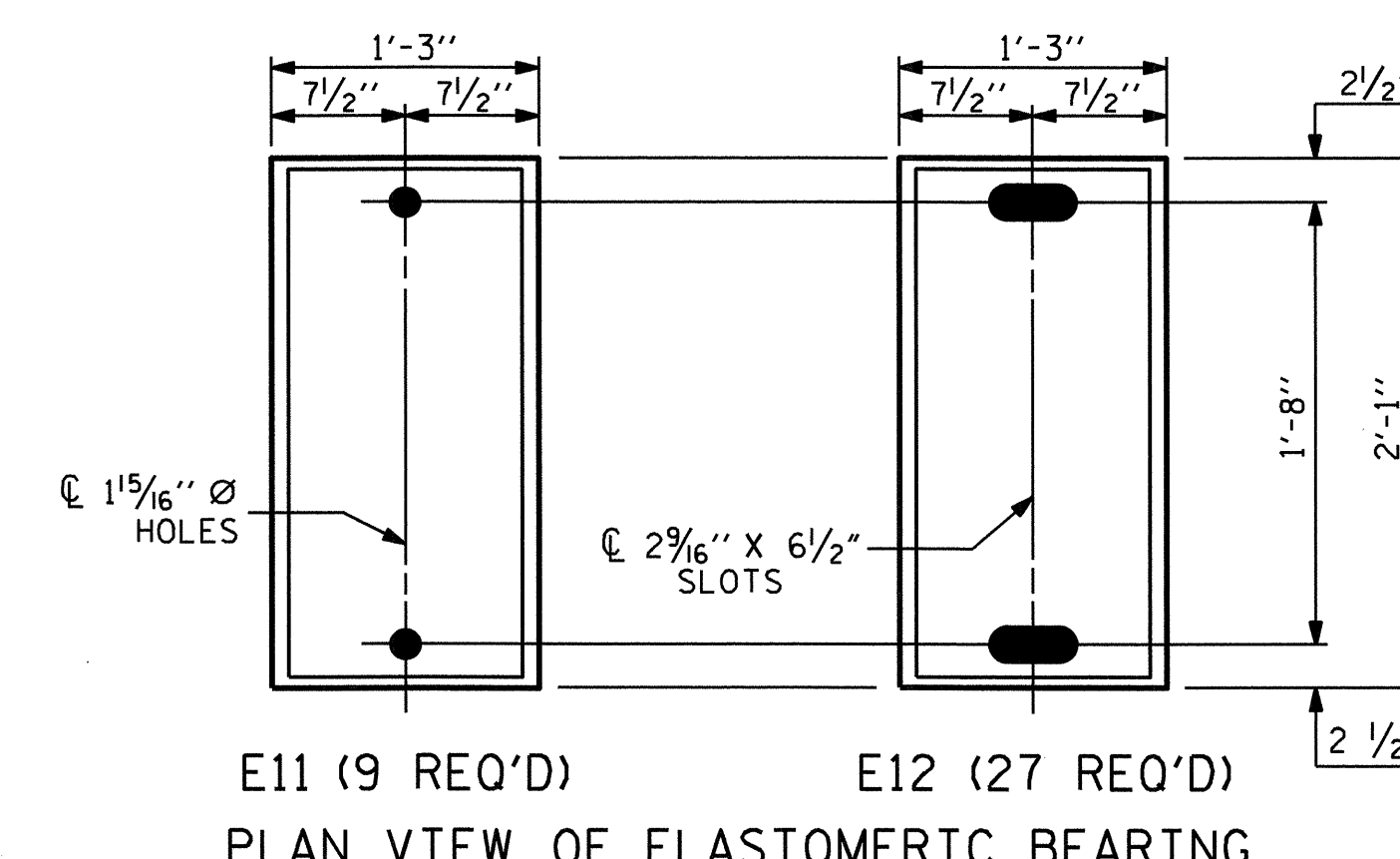
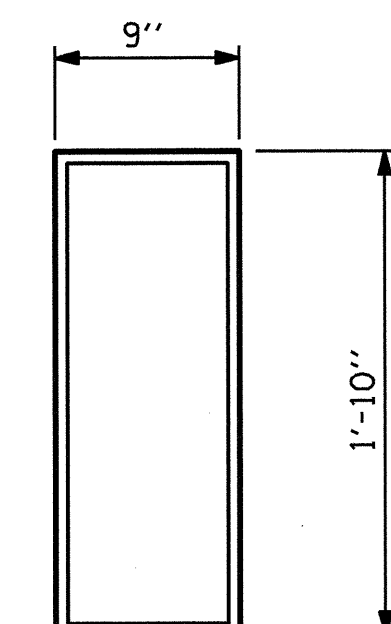
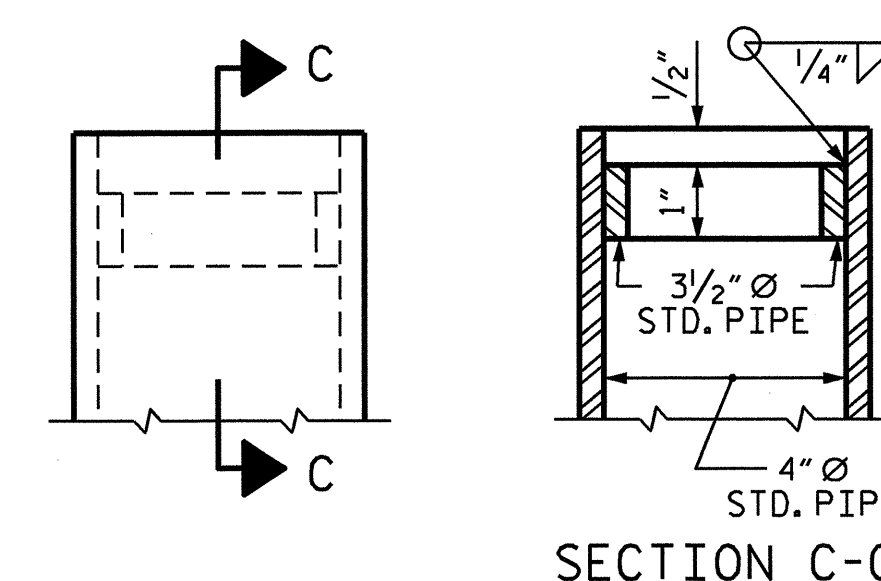
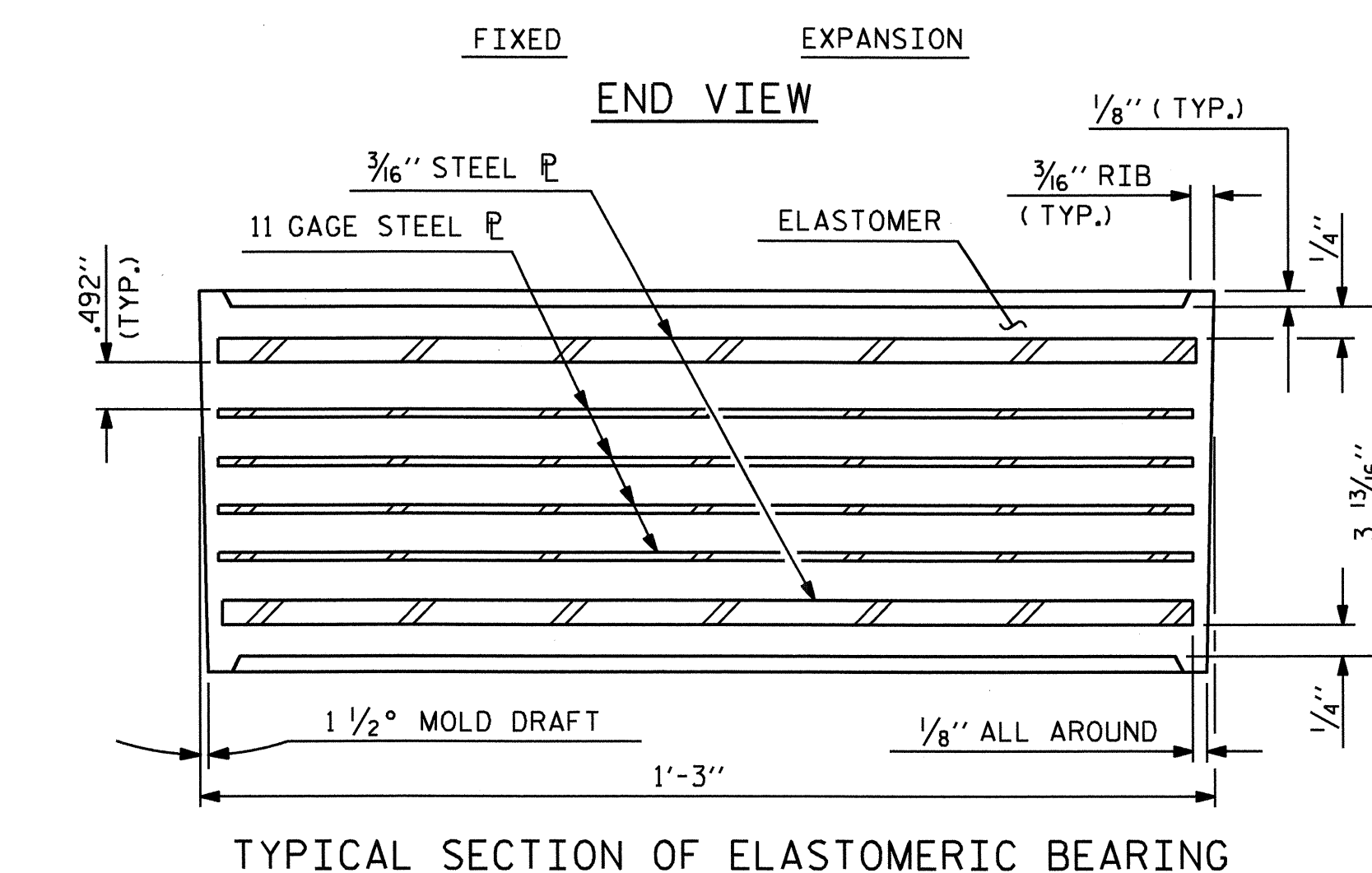
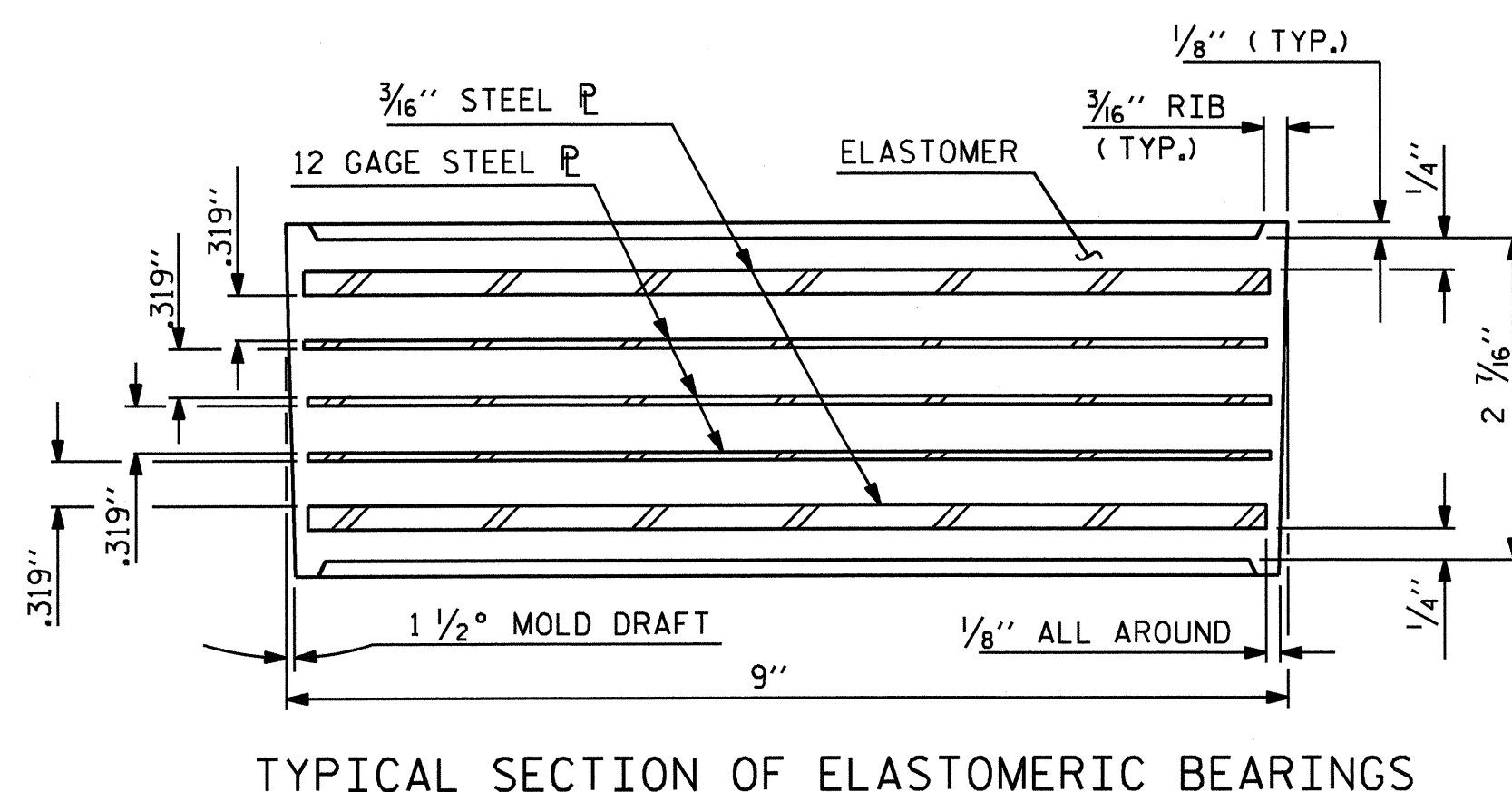
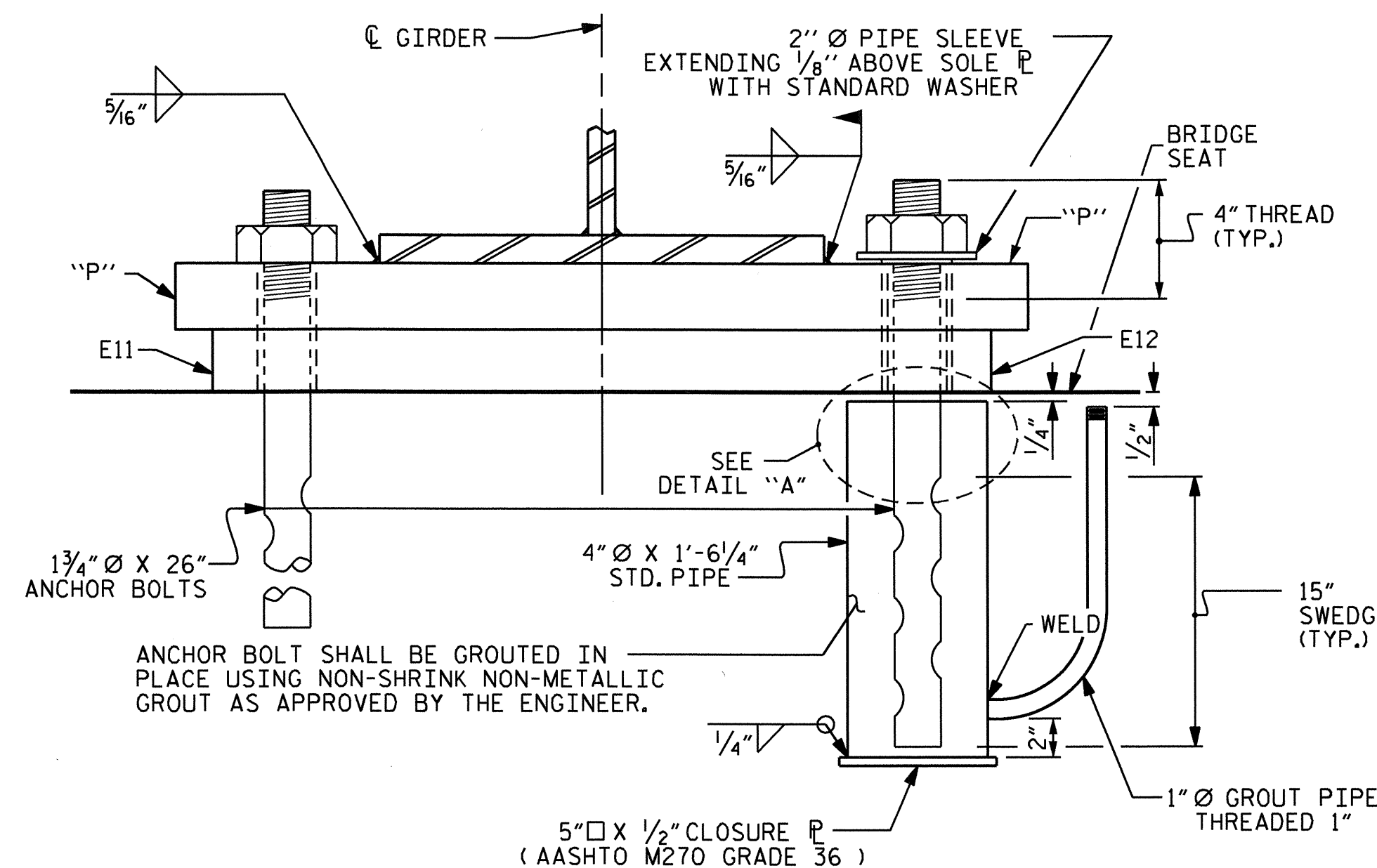
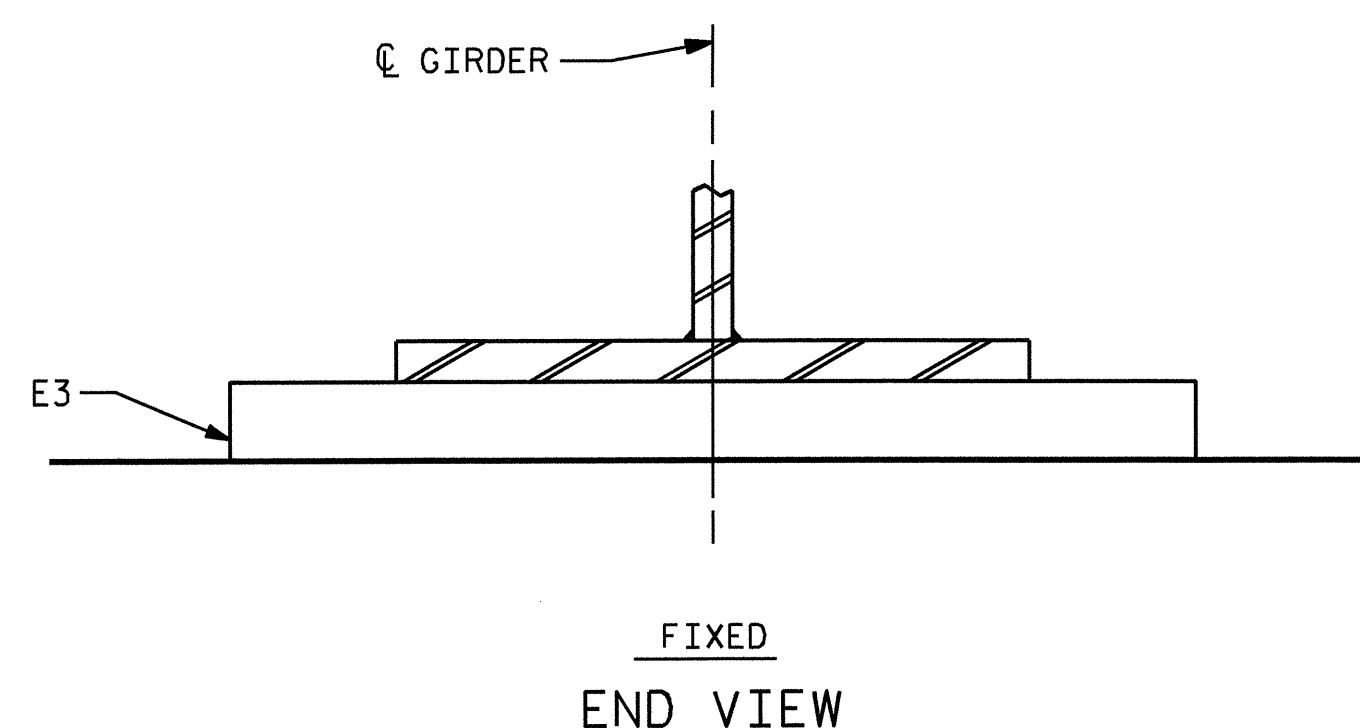
THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES TO ACCOMMODATE GIRDER TRANSLATION AND END ROTATION:

- ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ANCHOR BOLTS, SOLE PLATE, AND ELASTOMERIC BEARING SLOTS SHALL BE CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
- AFTER CENTERING THE SLOTS AND ANCHOR BOLTS, THE SOLE PLATES SHALL BE FIELD WELDED TO THE GIRDER FLANGES AND ANCHOR BOLTS GROUTED.

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

- LOAD RATINGS -	
	MAX.D.L.+L.L.
TYPE II	119 K
TYPE VI	262 K

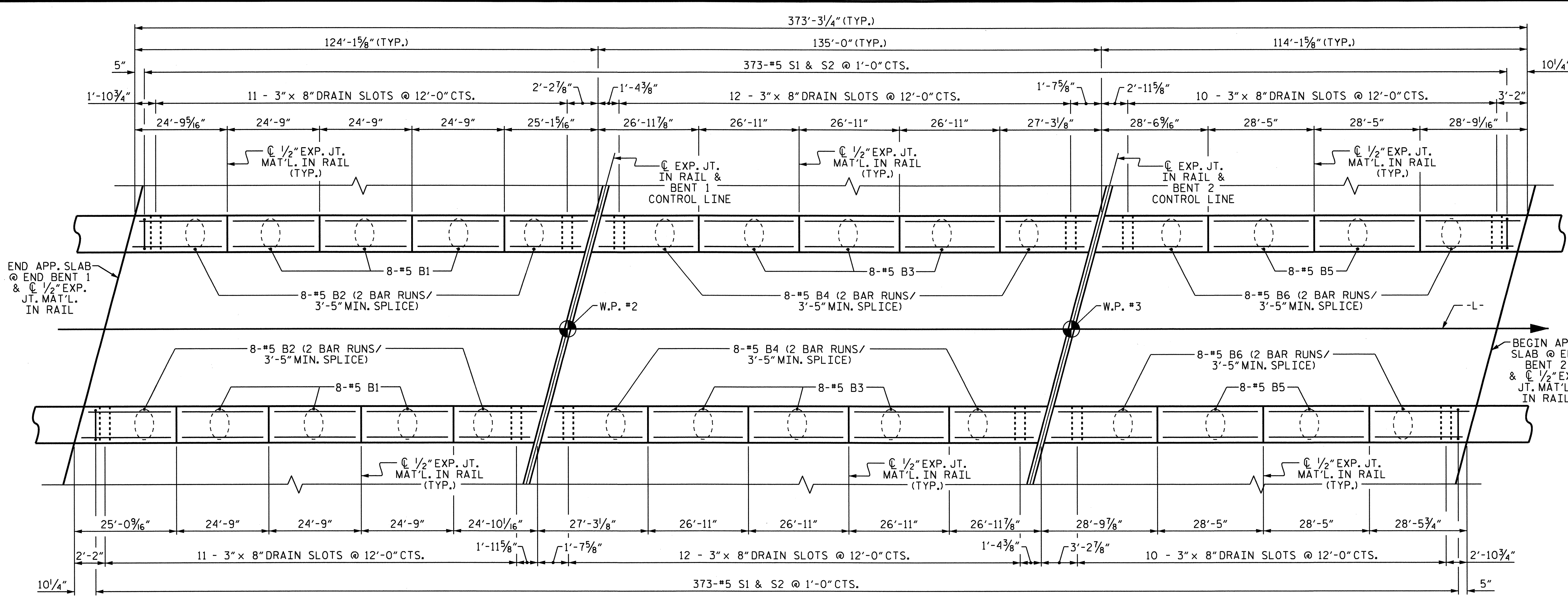


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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD ELASTOMERIC BEARING DETAILS (STEEL SUPERSTRUCTURE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

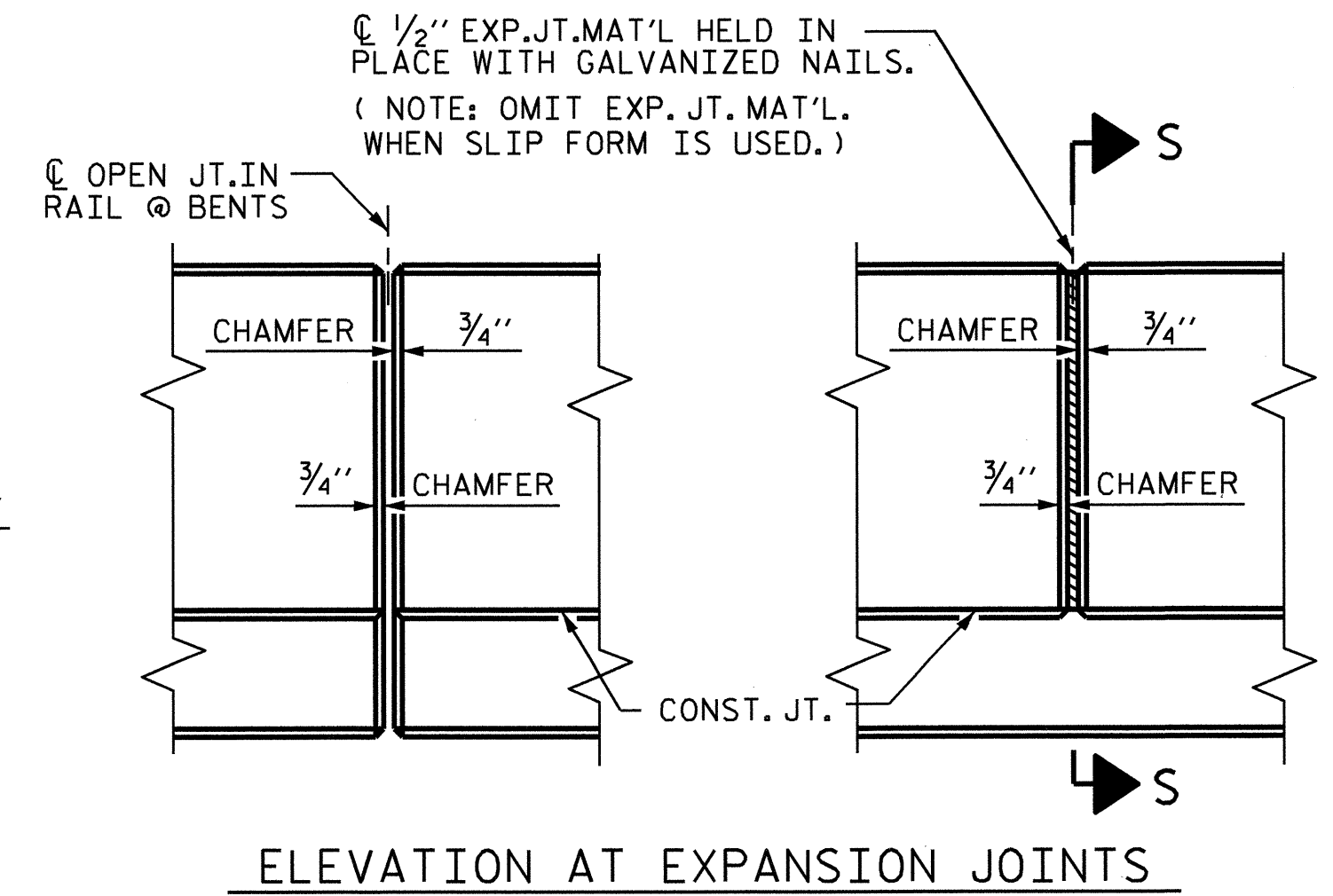
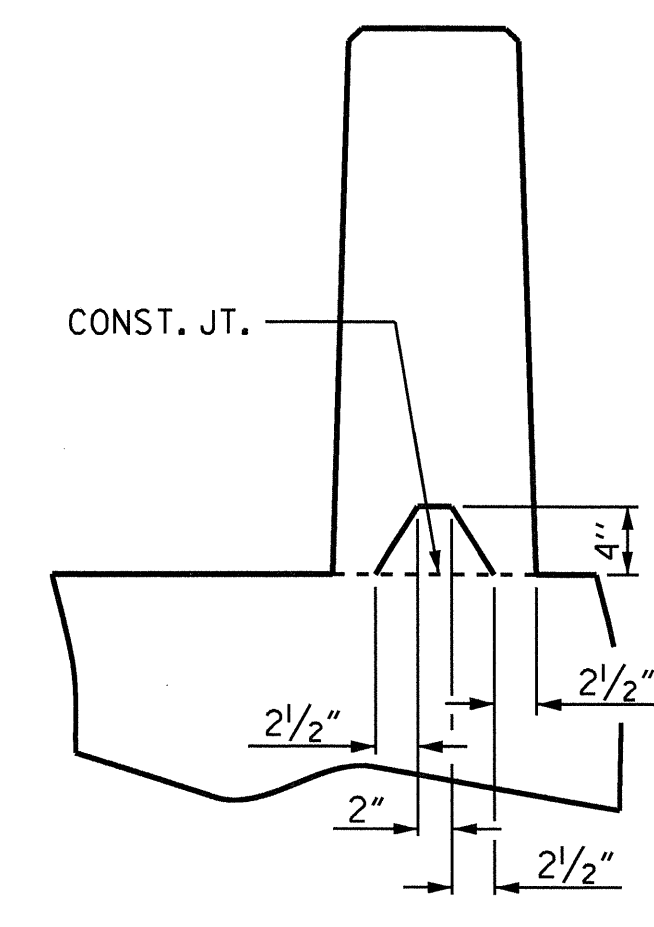
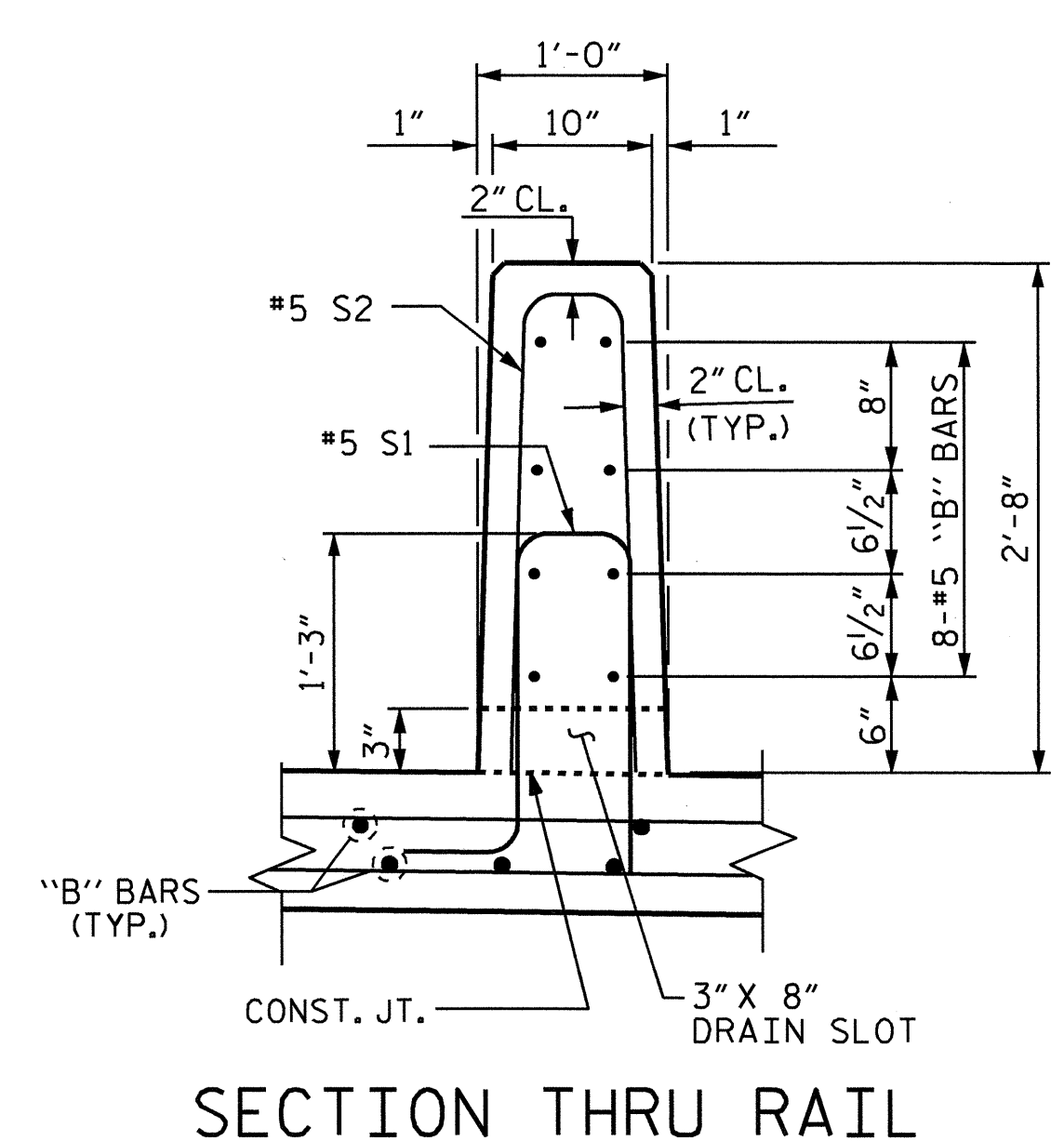
SHEET NO.				
S-18				
TOTAL SHEETS				
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ASSEMBLED BY : B.N. GRADY	DATE : 5/23/11
CHECKED BY : J.L. WALTON	DATE : 7/14/11
DRAWN BY : EEM 10/95	REV. 7/10/01 LES/RDR
CHECKED BY : PEK 10/95	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



**PLAN OF RAIL**

FOR BLOCKOUT IN RAIL AT EXPANSION JOINT SEALS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET



**BAR TYPES**

1  
 2

ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	48	#5	STR	24'-4"	1218
* B2	64	#5	STR	14'-1"	940
* B3	48	#5	STR	26'-6"	1327
* B4	64	#5	STR	15'-2"	1012
* B5	32	#5	STR	28'-0"	935
* B6	64	#5	STR	15'-11"	1062
* S1	746	#5	1	5'-1"	3955
* S2	746	#5	2	5'-6"	4279
* EPOXY COATED REINFORCING STEEL				14728 LBS.	
CLASS AA CONCRETE				67.1 CU. YDS.	
VERTICAL CONCRETE BARRIER RAIL				746.55 LIN. FT.	

**NOTES**

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

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.

DRAIN SLOTS MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH #5 S1 BARS.

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 STATION: 22+62.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**VERTICAL CONCRETE BARRIER RAIL**

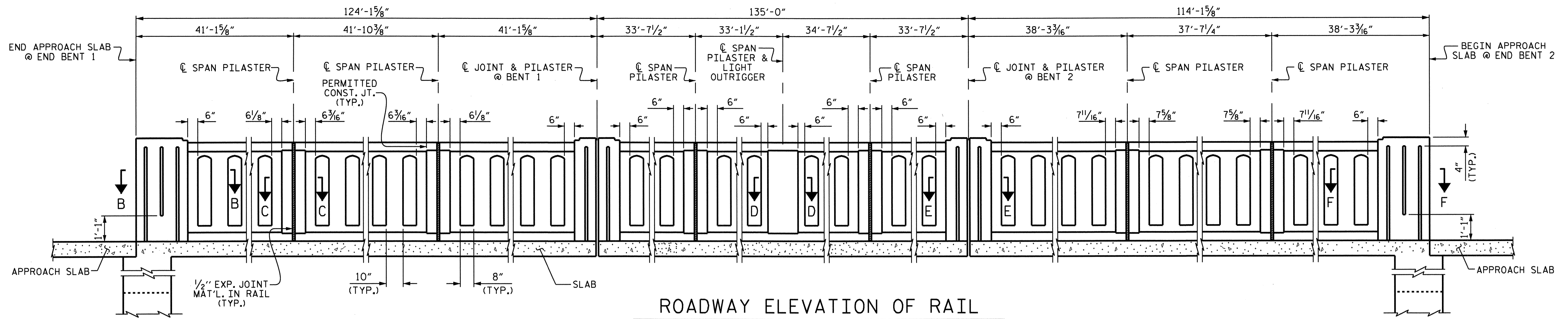
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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ASSEMBLED BY : B.N. GRADY DATE : 5/23/11  
 CHECKED BY : J.L. WALTON DATE : 7/14/11  
 DRAWN BY : MAA 5/10 ADDED 5/6/10  
 CHECKED BY : GM 5/10

STD. NO. CBR2(SHT 2)



**ROADWAY ELEVATION OF RAIL**

CHAMFERS NOT SHOWN FOR CLARITY

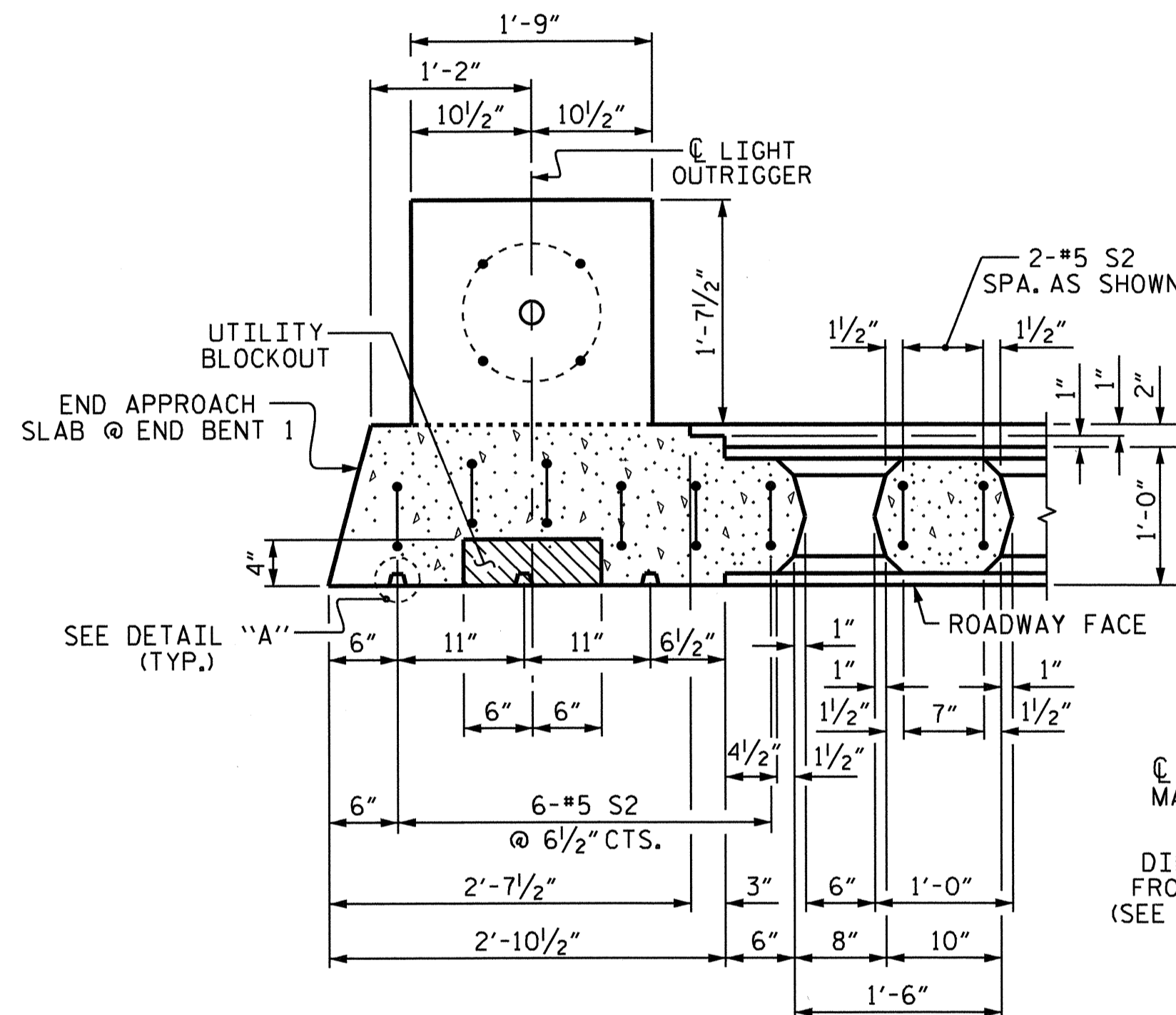
**NOTES:**

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

ALL REINFORCING STEEL IN THE CLASSIC CONCRETE BRIDGE RAIL SHALL BE EPOXY COATED.

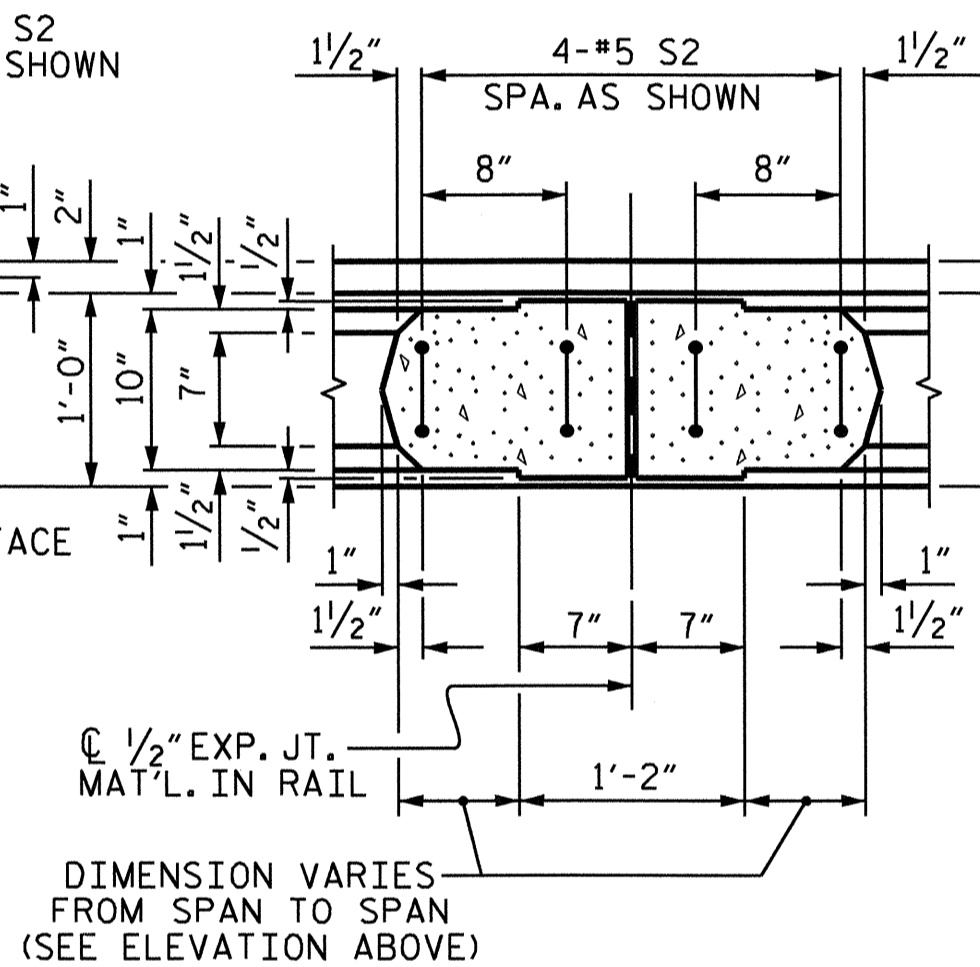
FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

ALL PARTS OF THE CLASSIC BRIDGE RAIL INCLUDING, BUT NOT LIMITED TO THE REINFORCING STEEL, CLASS AA CONCRETE, AND INCIDENTALS SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT OF "CLASSIC CONCRETE BRIDGE RAIL".



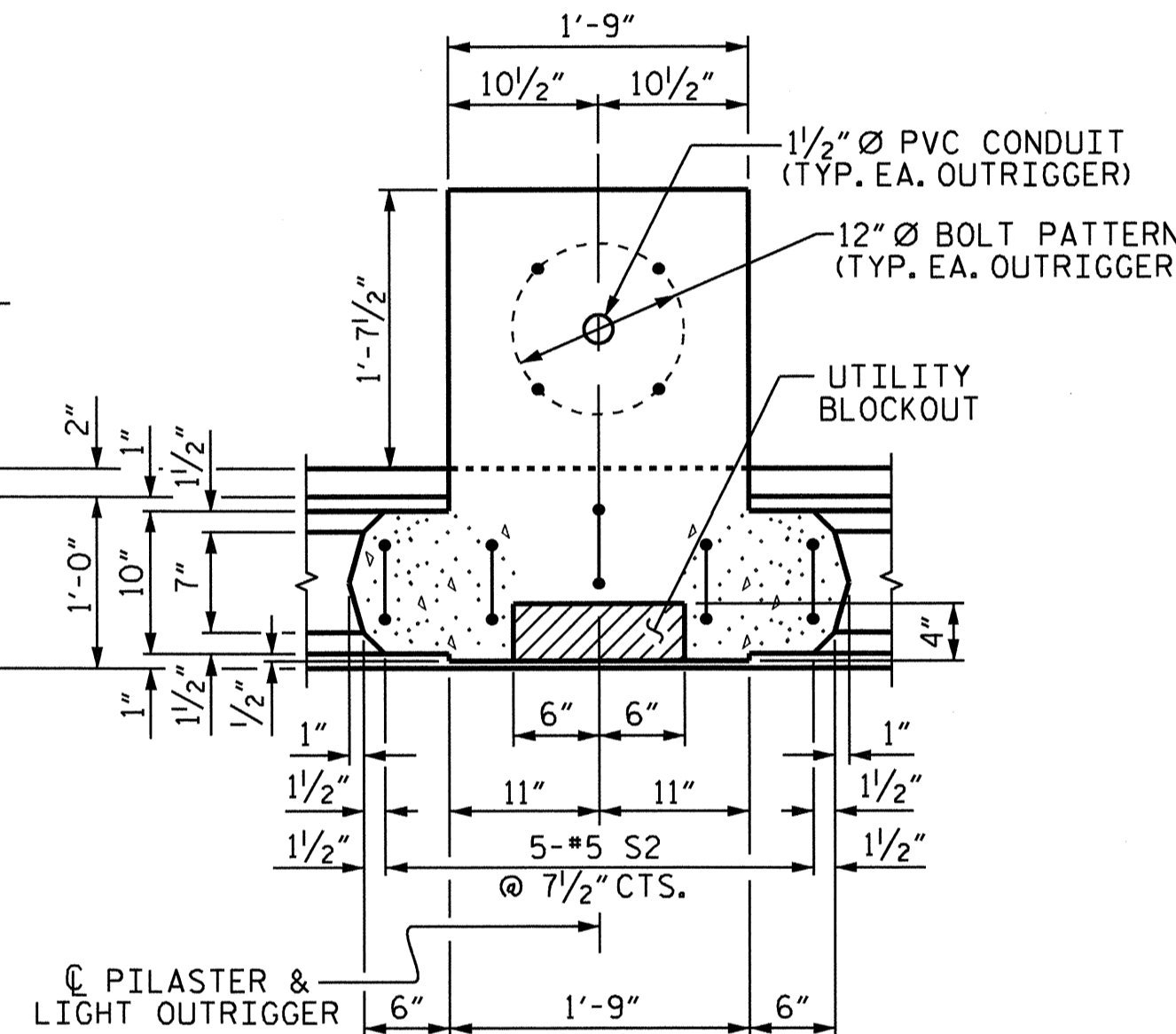
**SECTION B-B**

SHOWING END BENT 1 PILASTER & LIGHT OUTRIGGER  
(FOR LIGHT OUTRIGGER REINFORCING STEEL DETAILS, SEE SHEET 2 OF 4)



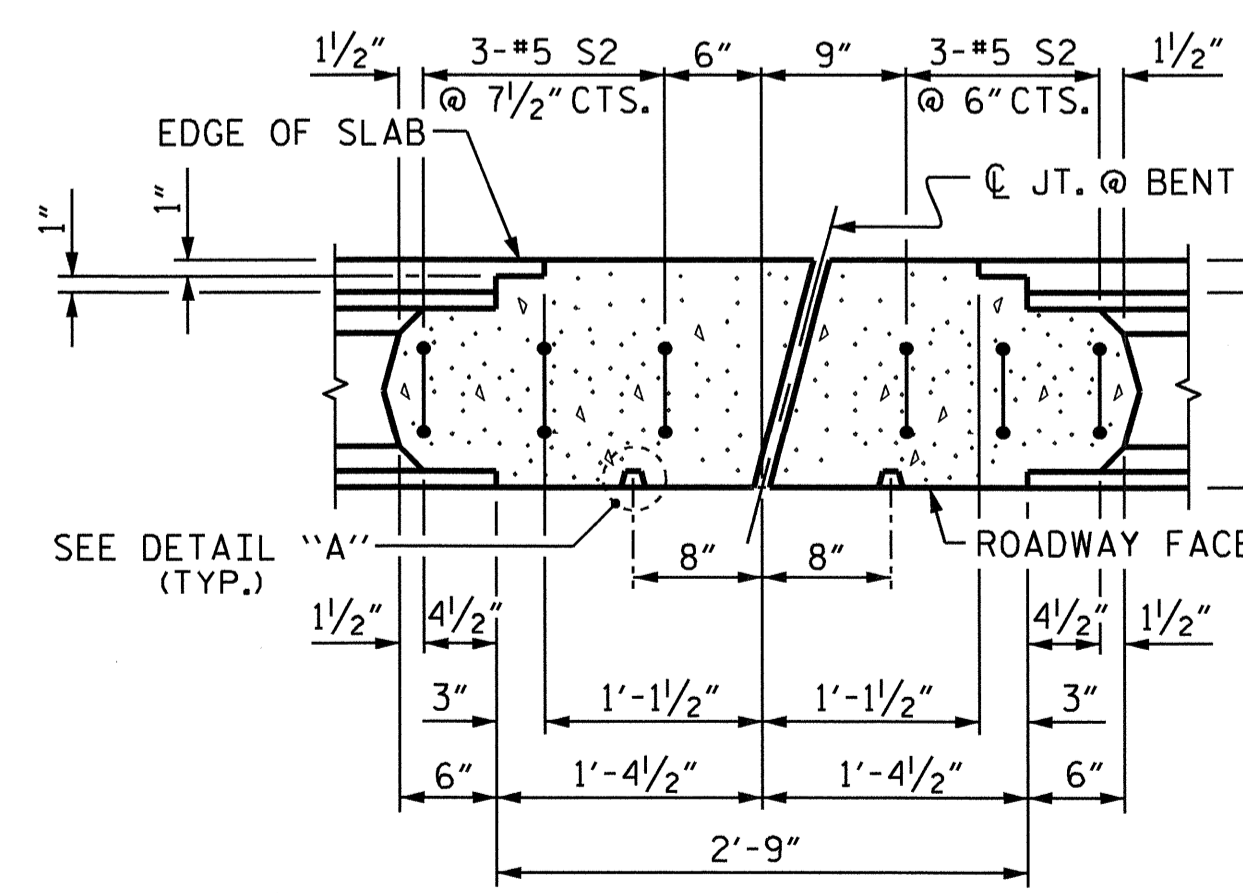
**SECTION C-C**

SHOWING SPAN PILASTER



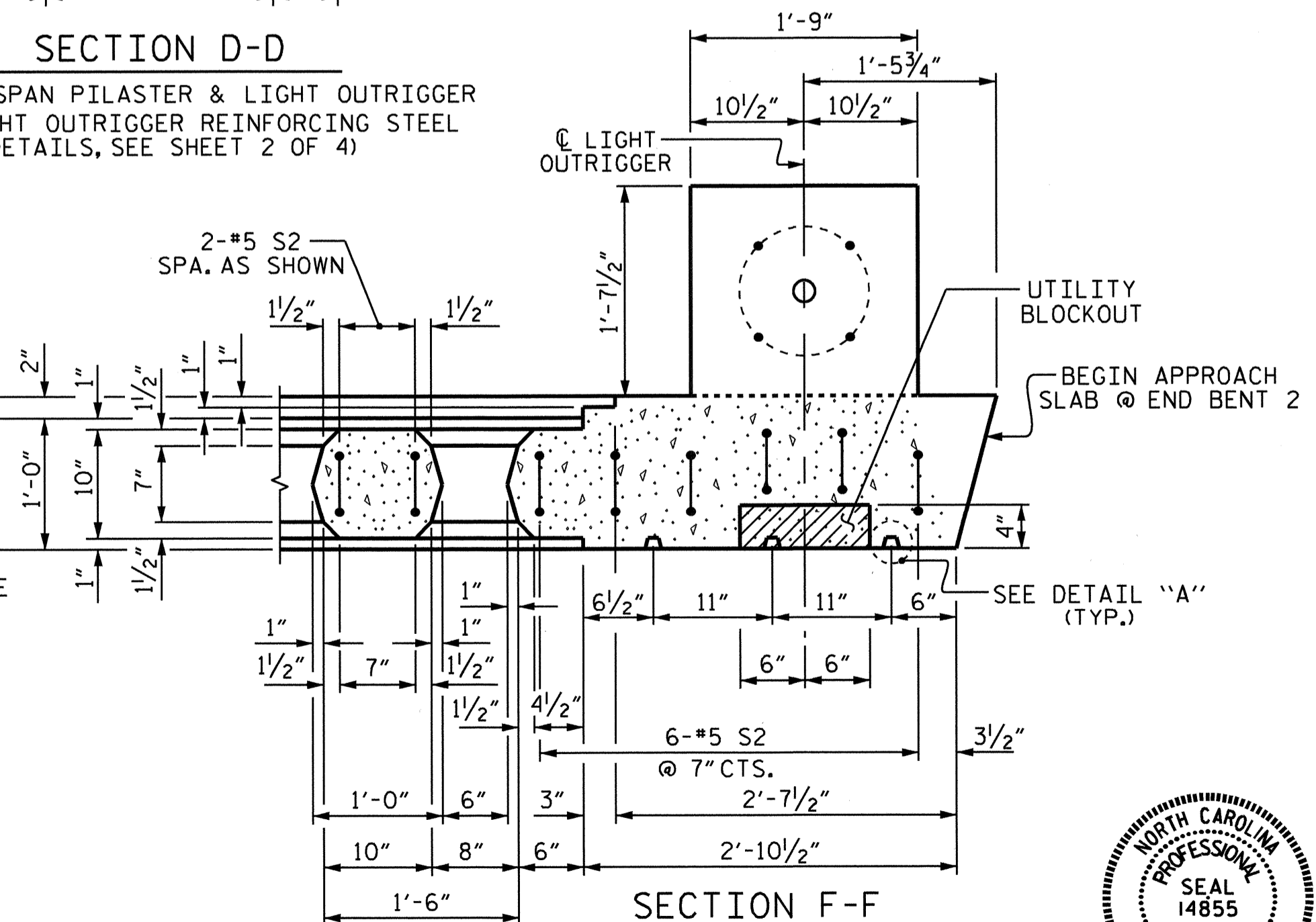
**SECTION D-D**

SHOWING SPAN PILASTER & LIGHT OUTRIGGER  
(FOR LIGHT OUTRIGGER REINFORCING STEEL DETAILS, SEE SHEET 2 OF 4)



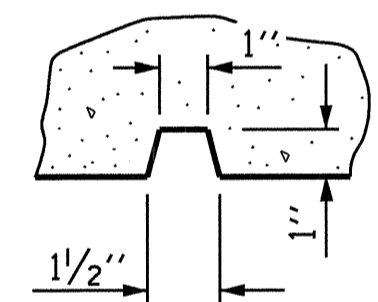
**SECTION E-E**

SHOWING BENT PILASTER FOR BLOCKOUT, SEE "EXPANSION JOINT SEAL DETAILS" SHEET



**SECTION F-F**

SHOWING END BENT 2 PILASTER & LIGHT OUTRIGGER  
(FOR LIGHT OUTRIGGER REINFORCING STEEL DETAILS, SEE SHEET 2 OF 4)



**DETAIL "A"**

PROJECT NO. B-3864

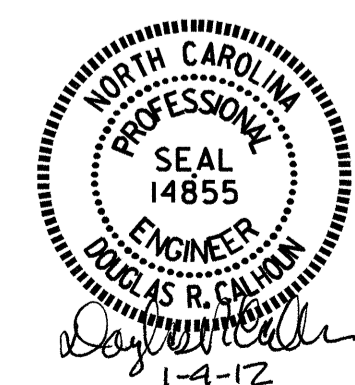
JOHNSTON COUNTY

STATION: 22+62.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**CLASSIC CONCRETE  
BRIDGE RAIL**



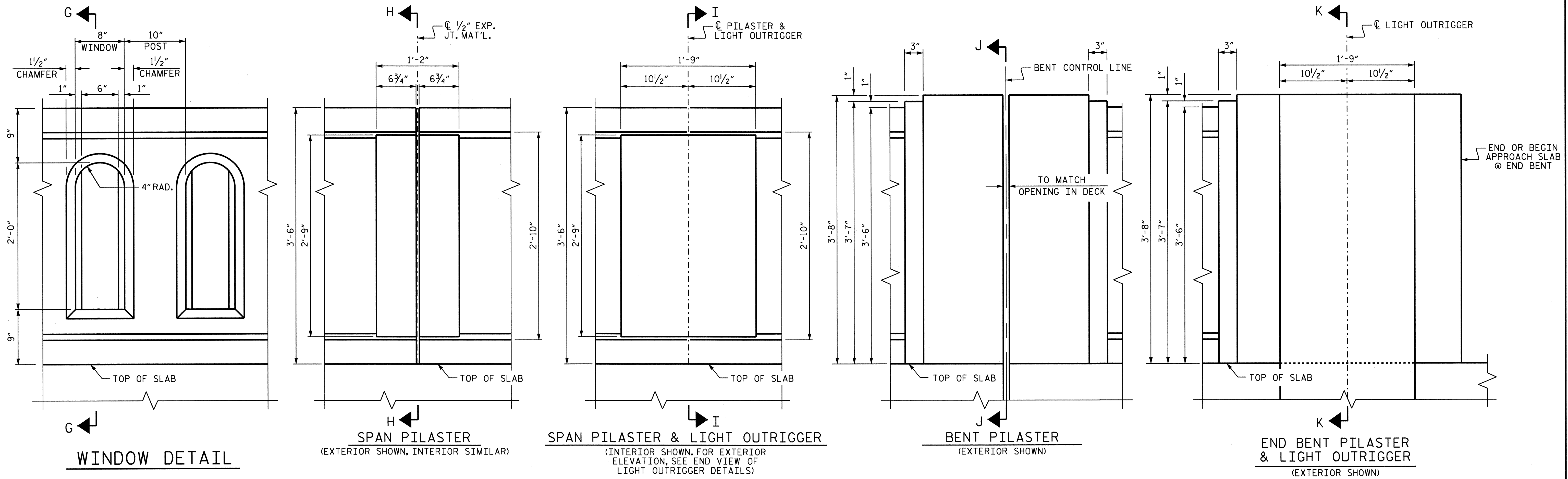
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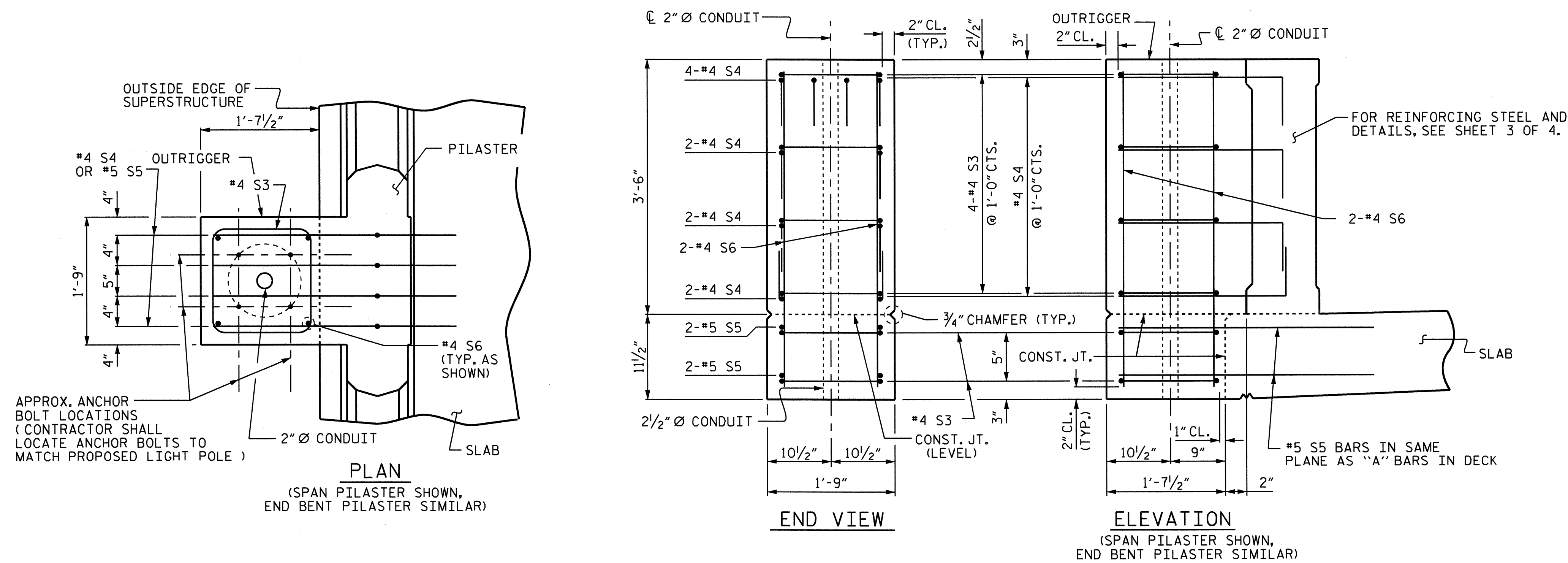
**PARTIAL PLAN**

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS 42
2			4			



**PILASTER ELEVATIONS**  
 (FOR SECTION VIEWS, SEE SHEET 3 OF 4)



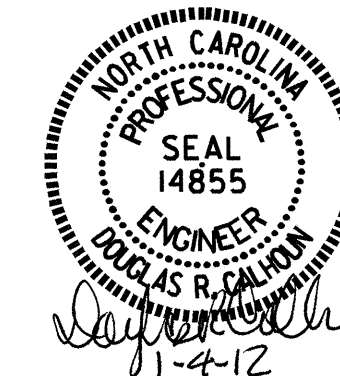
**LIGHT OUTRIGGER DETAILS**

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

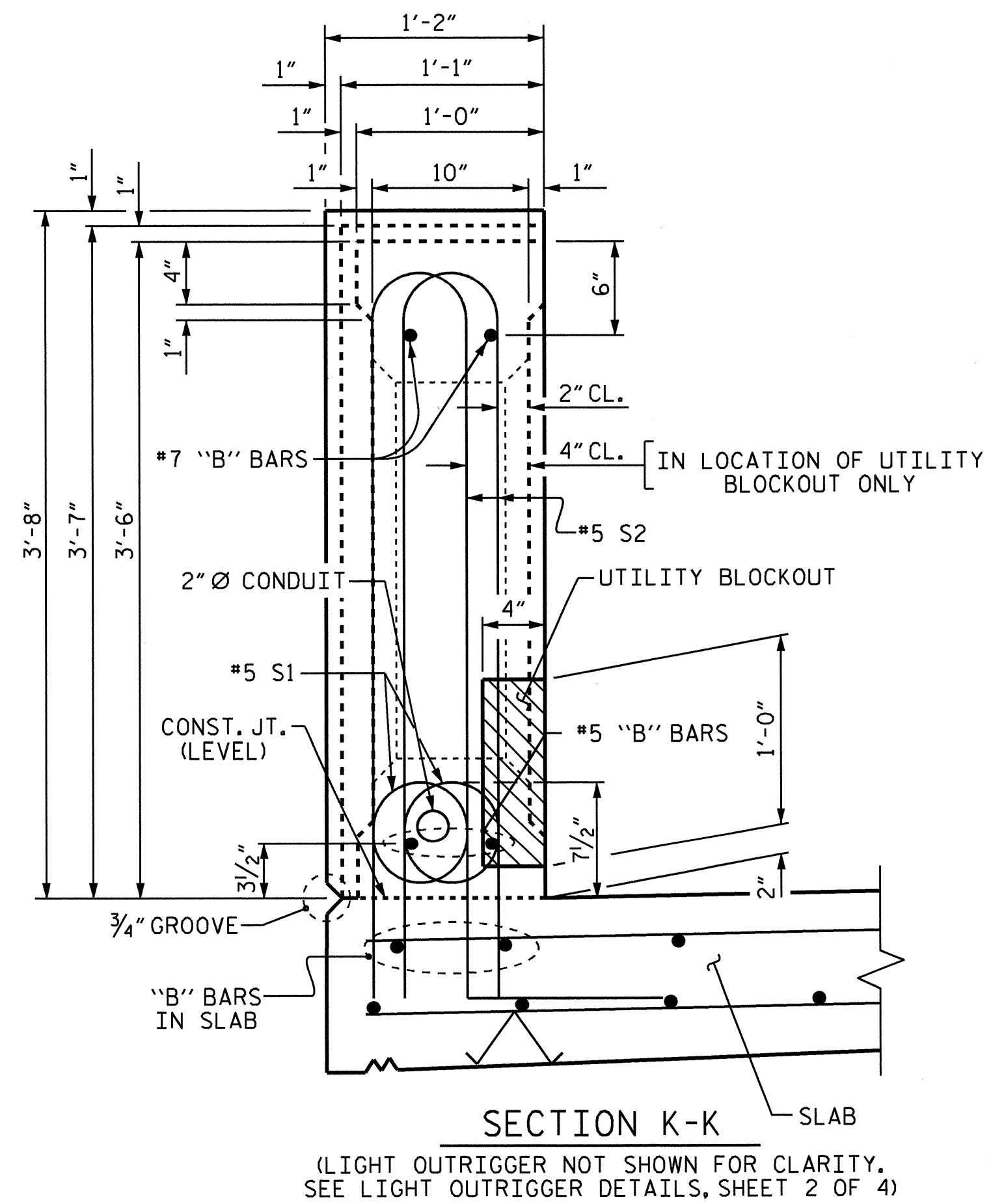
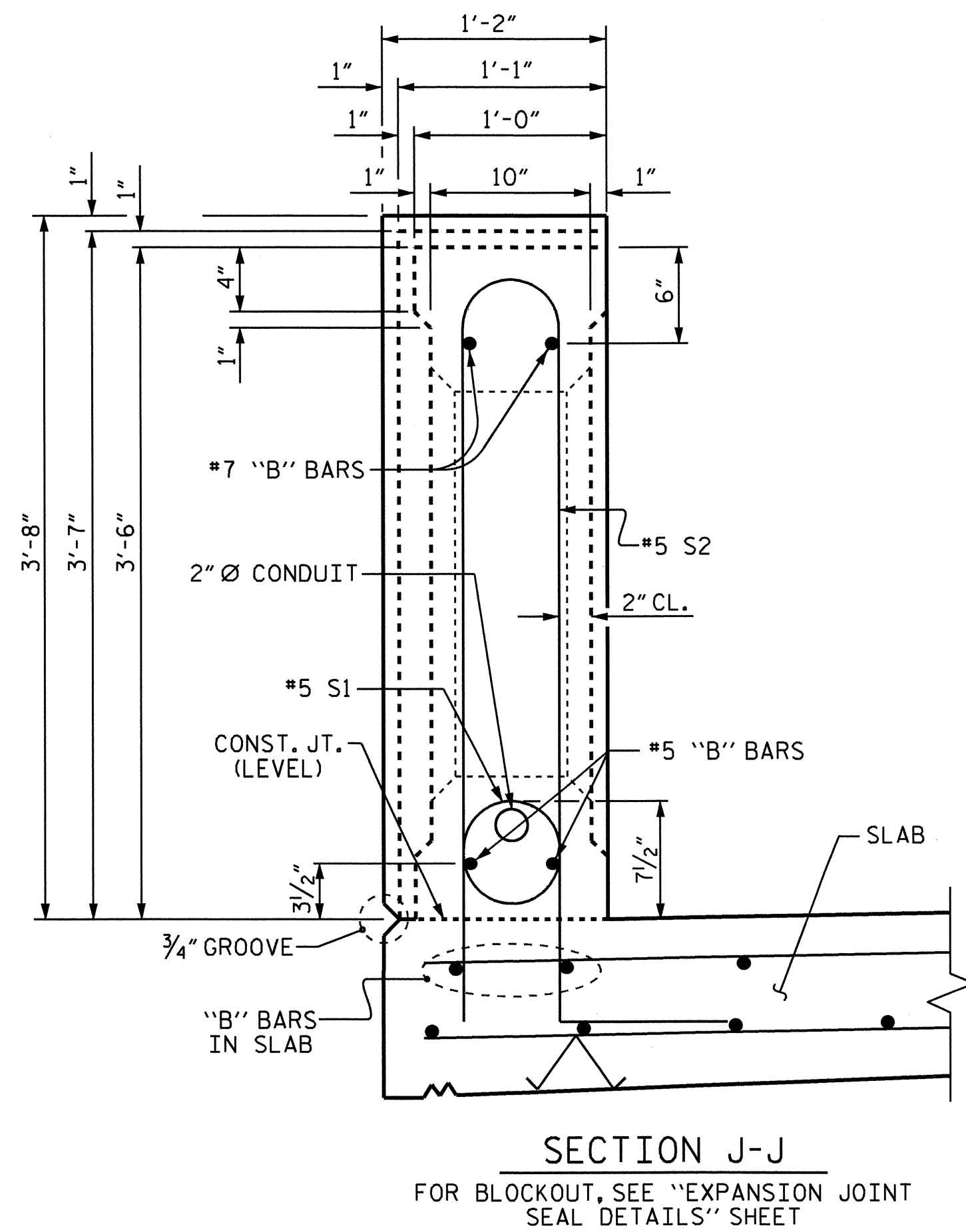
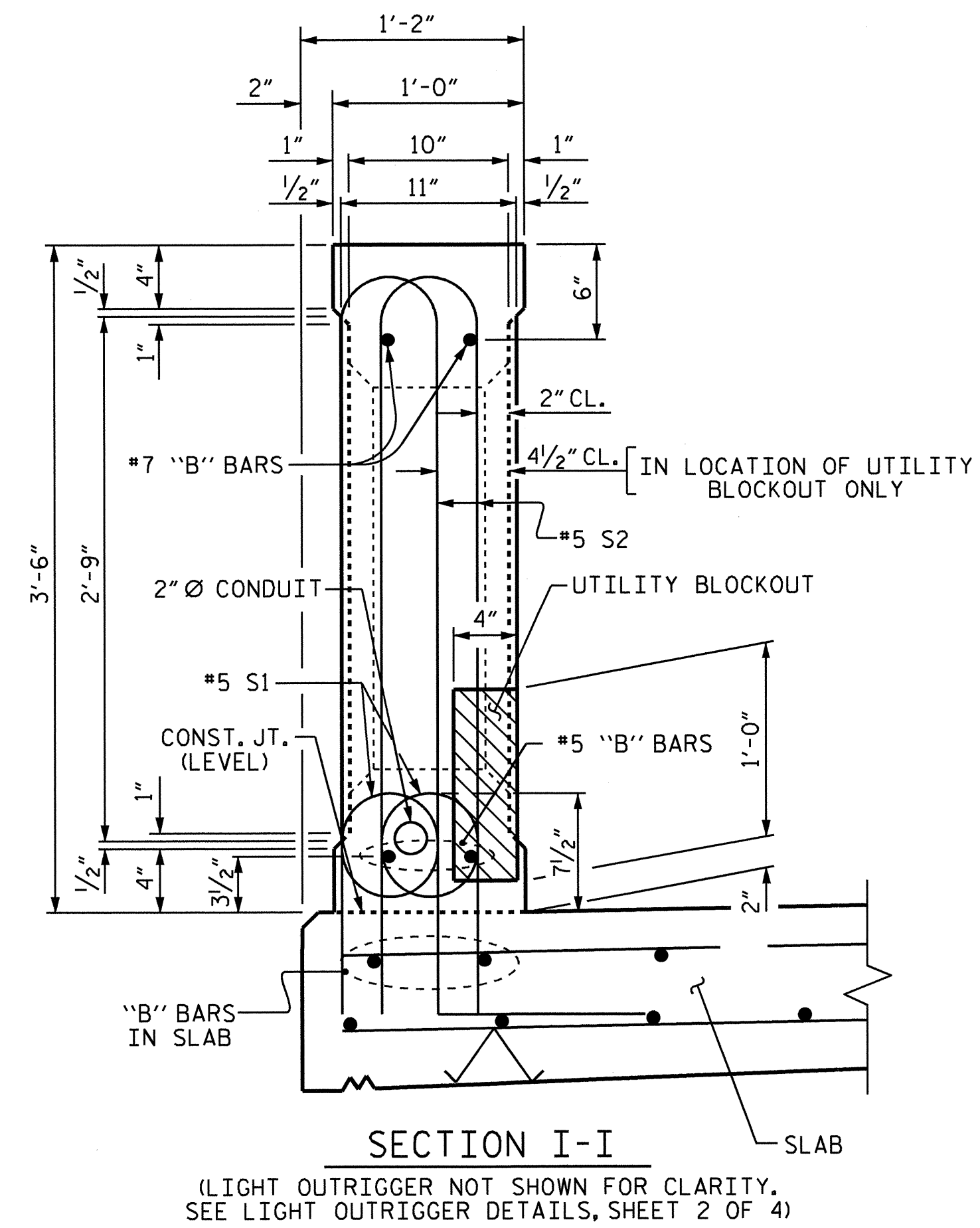
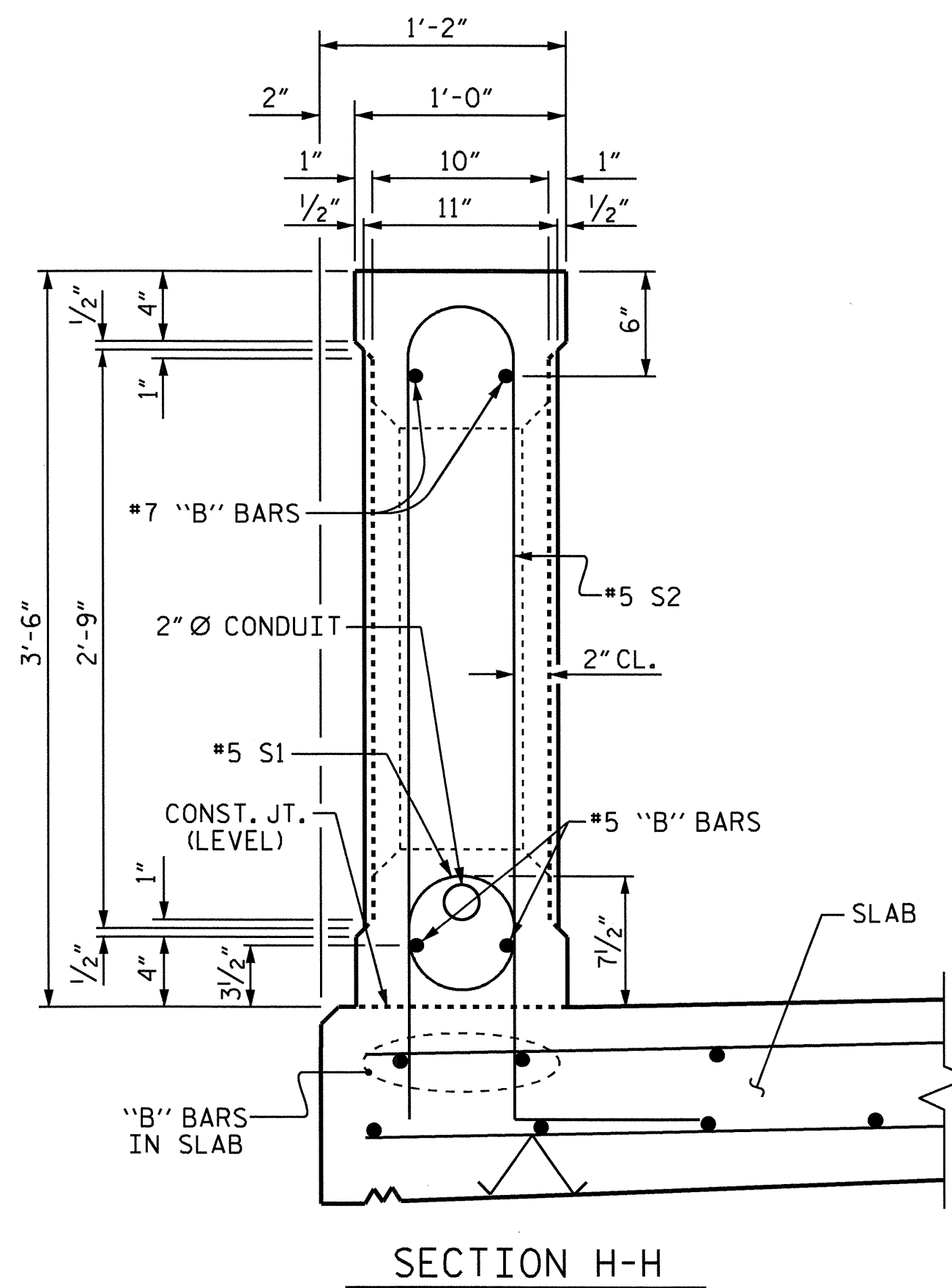
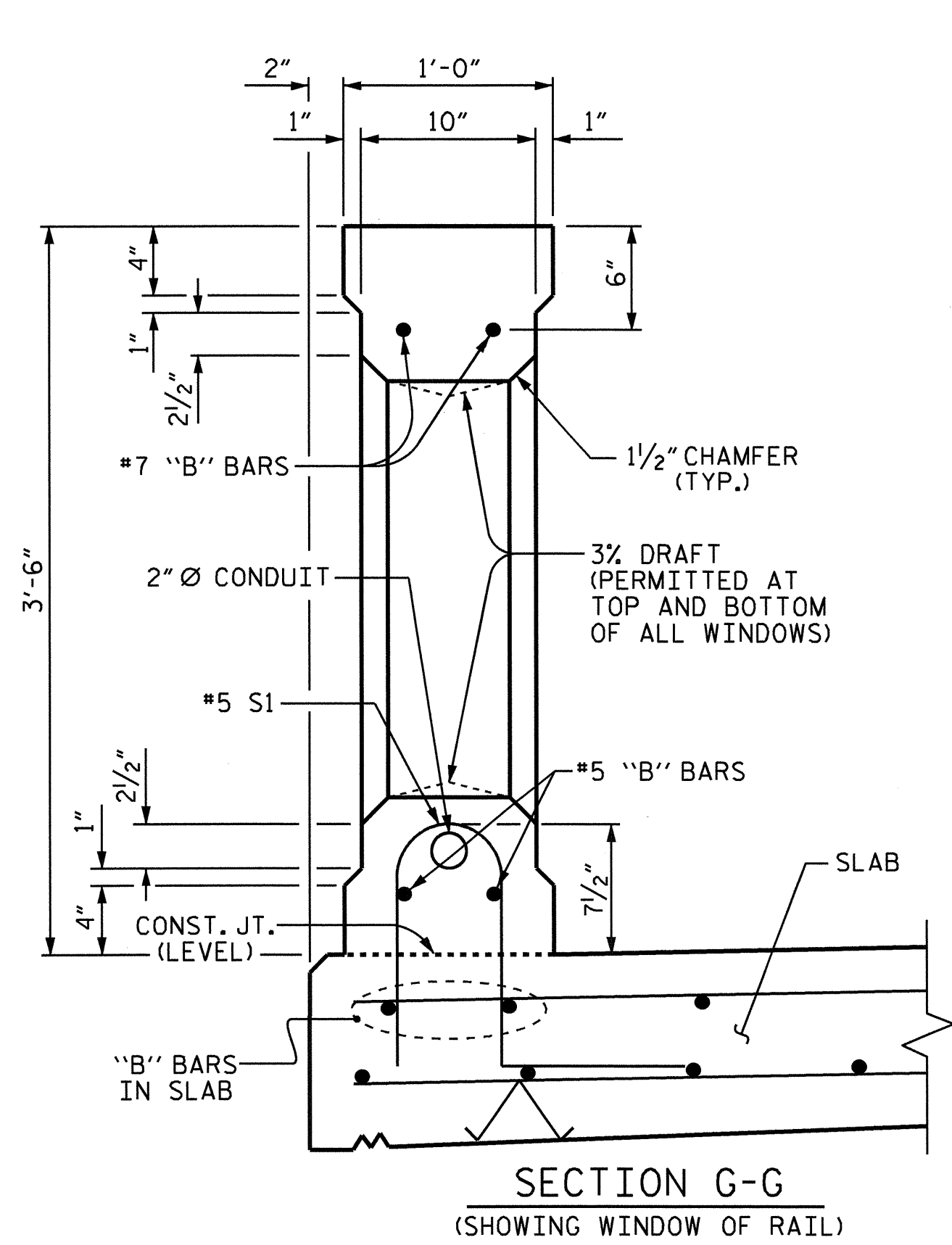
**CLASSIC CONCRETE  
 BRIDGE RAIL**



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1			3			S-21	
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JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

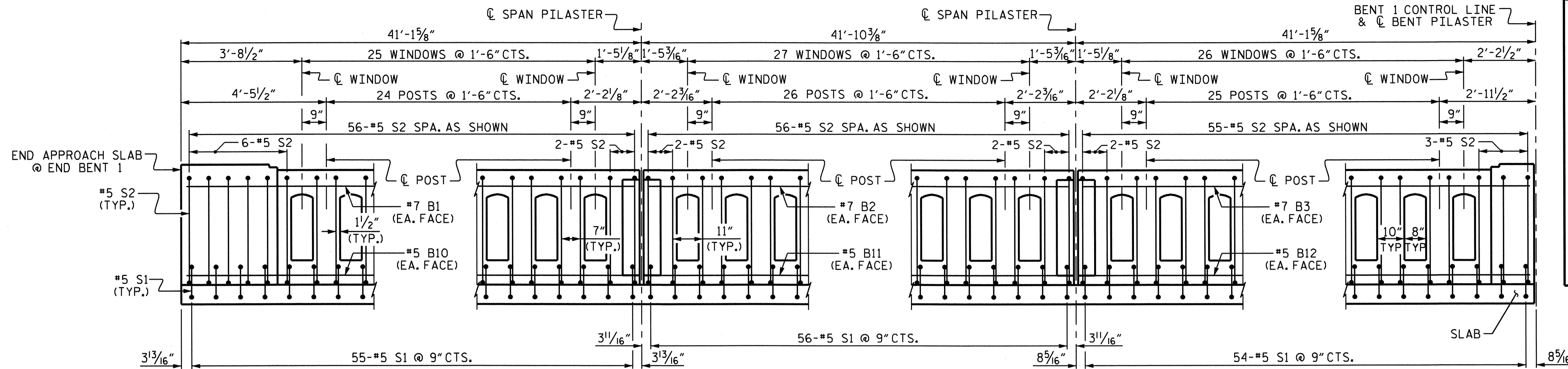
CLASSIC CONCRETE  
 BRIDGE RAIL



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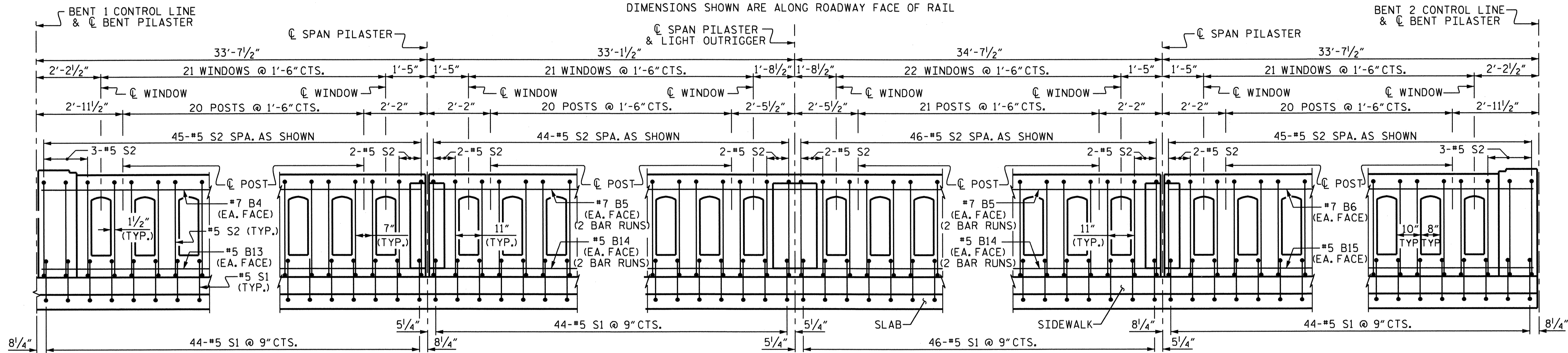
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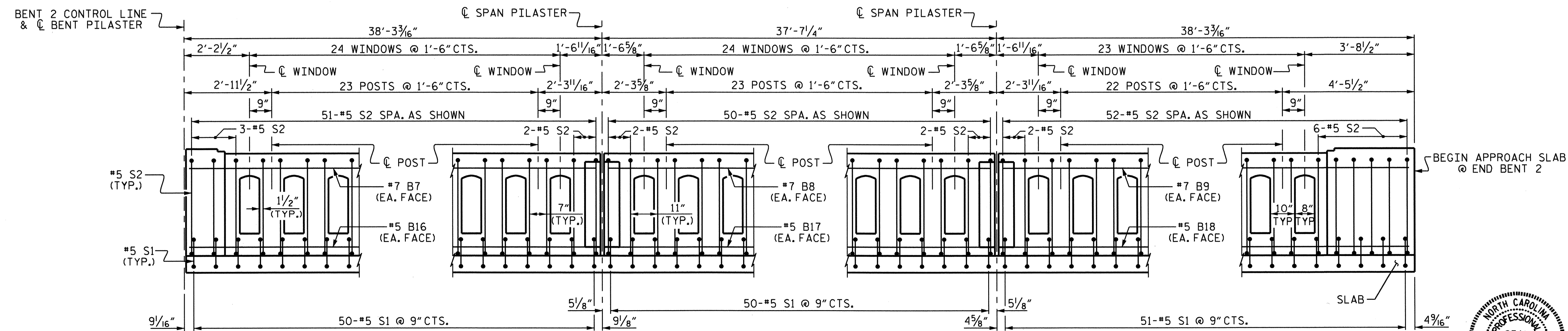
**REINFORCING PLACEMENT- SPAN "A"**

DIMENSIONS SHOWN ARE ALONG ROADWAY FACE OF RAIL



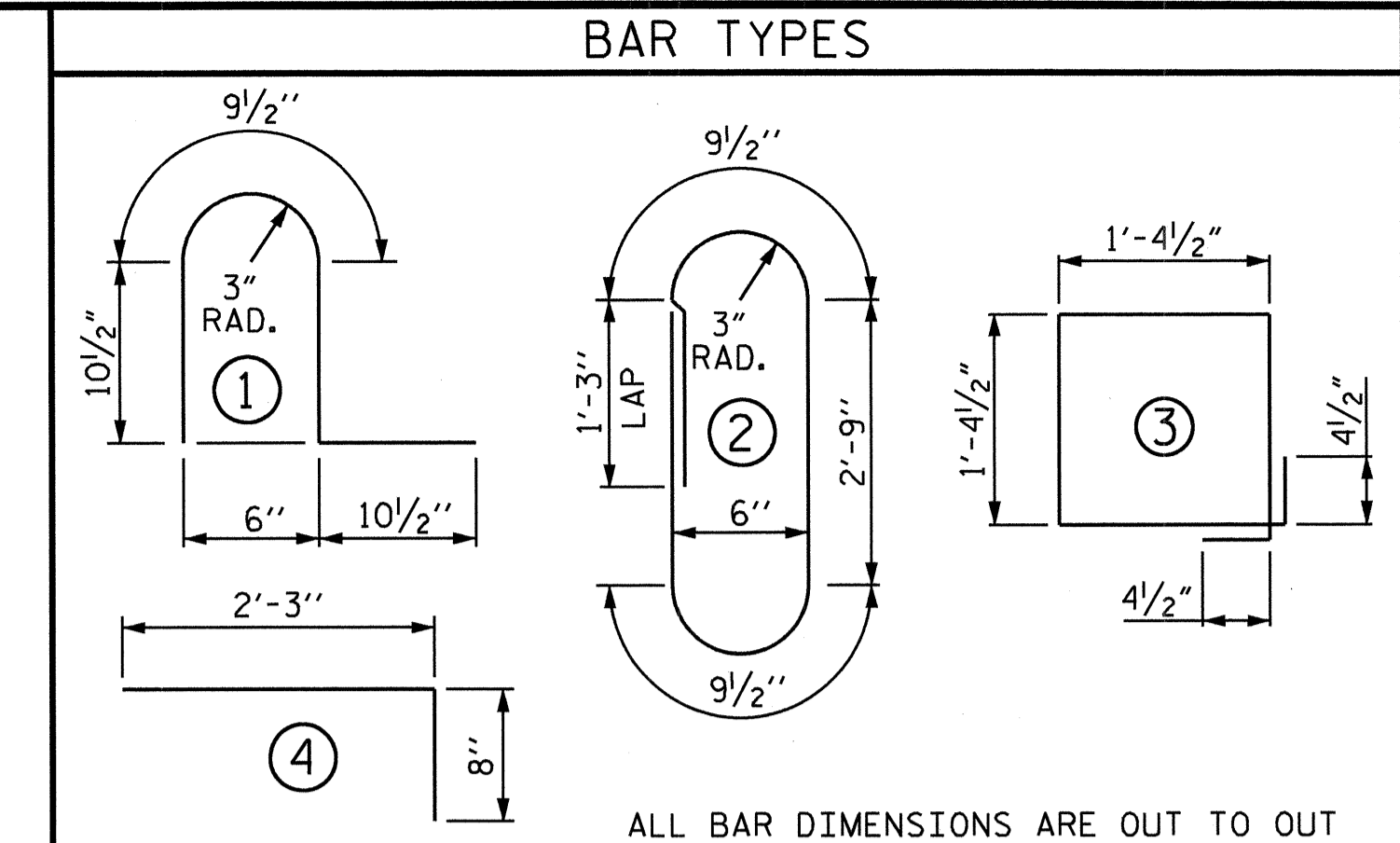
**REINFORCING PLACEMENT- SPAN "B"**

DIMENSIONS SHOWN ARE ALONG ROADWAY FACE OF RAIL



**REINFORCING PLACEMENT- SPAN "C"**

DIMENSIONS SHOWN ARE ALONG ROADWAY FACE OF RAIL



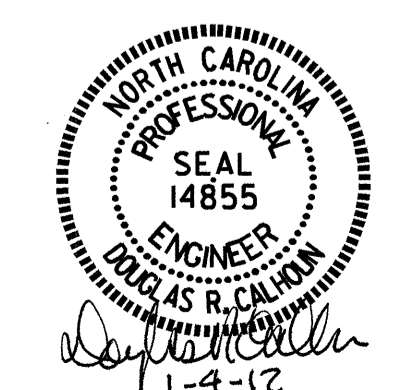
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR CLASSIC BRIDGE RAILING ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	4	#7	STR	40'-7"	332
*B2	4	#7	STR	41'-5"	339
*B3	4	#7	STR	40'-9"	333
*B4	4	#7	STR	33'-0"	270
*B5	8	#7	STR	37'-5"	612
*B6	4	#7	STR	33'-3"	272
*B7	4	#7	STR	37'-8"	308
*B8	4	#7	STR	37'-2"	304
*B9	4	#7	STR	37'-11"	310
*B10	4	#5	STR	40'-7"	169
*B11	4	#5	STR	41'-5"	173
*B12	4	#5	STR	40'-9"	170
*B13	4	#5	STR	33'-0"	138
*B14	8	#5	STR	35'-5"	296
*B15	4	#5	STR	33'-3"	139
*B16	4	#5	STR	37'-8"	157
*B17	4	#5	STR	37'-2"	155
*B18	4	#5	STR	37'-11"	158
*S1	988	#5	1	3'-5"	3521
*S2	1000	#5	2	8'-4"	8692
*S3	36	#4	3	6'-3"	150
*S4	60	#4	4	2'-11"	117
*S5	24	#5	STR	3'-7"	90
*S6	24	#4	STR	4'-1"	65
* EPOXY COATED REINFORCING STEEL				17270 LBS.	
CLASS AA CONCRETE				66.2 CU. YDS.	
CLASSIC CONCRETE BRIDGE RAIL				746.55 LIN. FT.	

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**CLASSIC CONCRETE  
 BRIDGE RAIL**

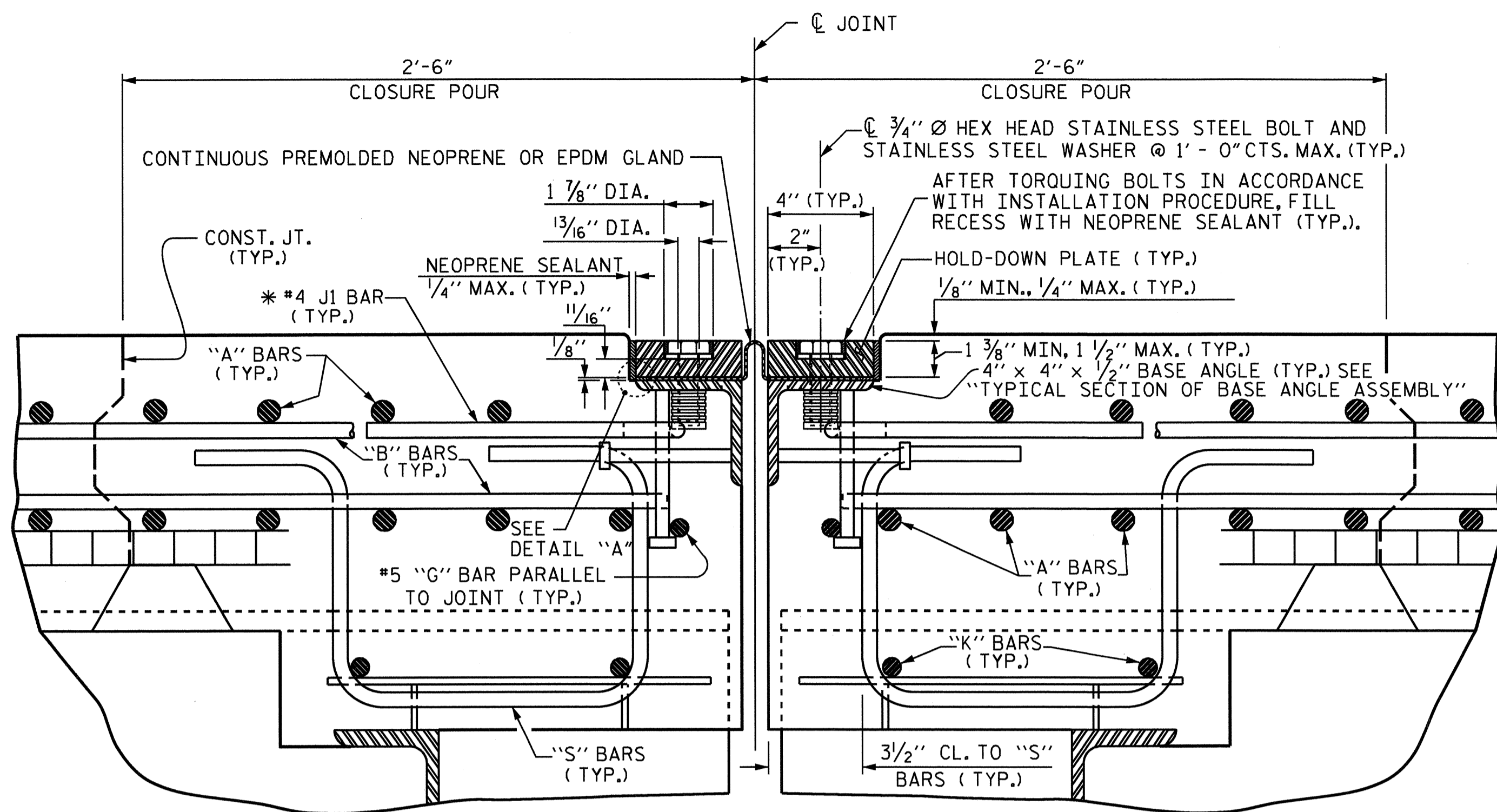


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1			3			TOTAL SHEETS
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**EXPANSION JOINT DETAILS**

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

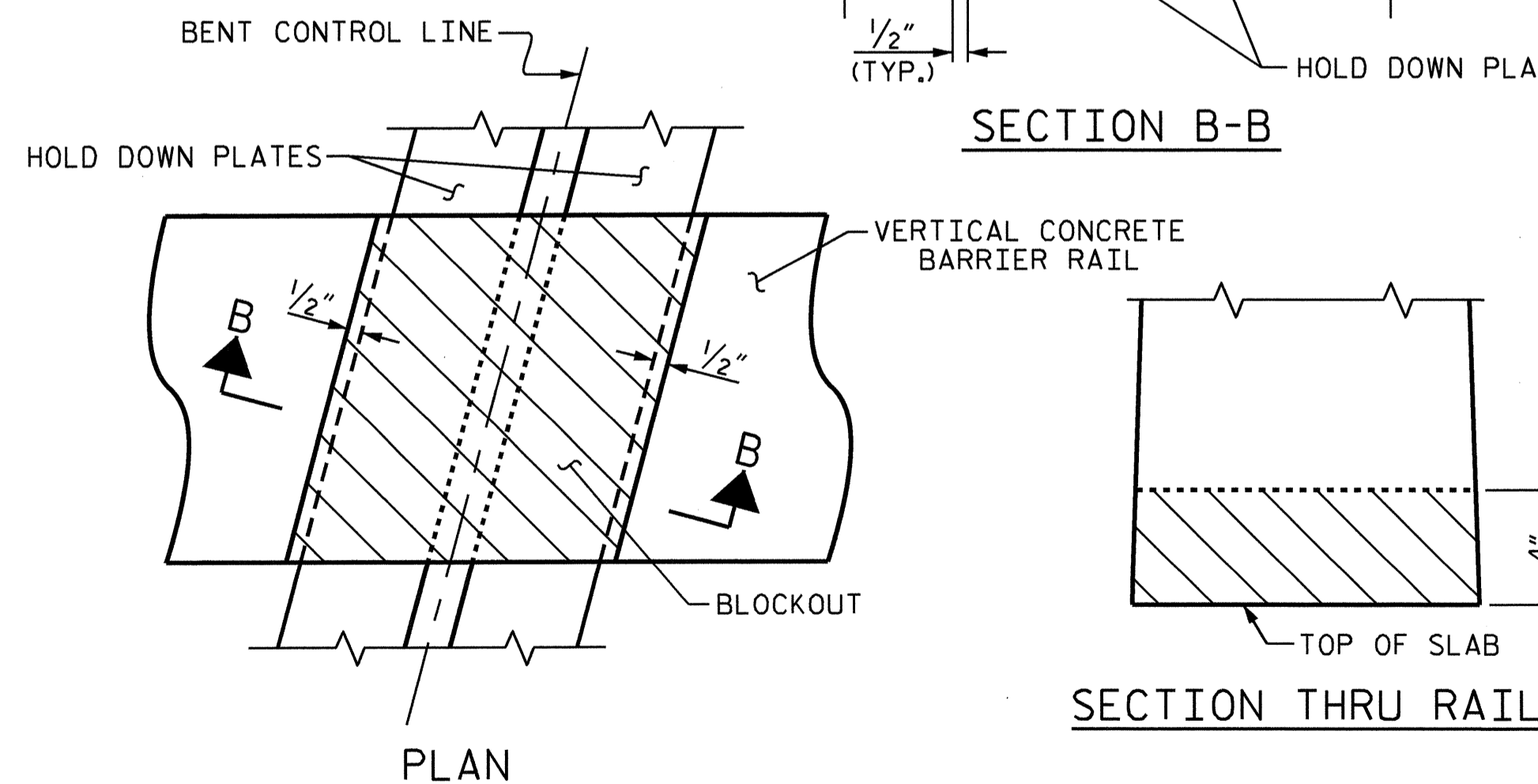
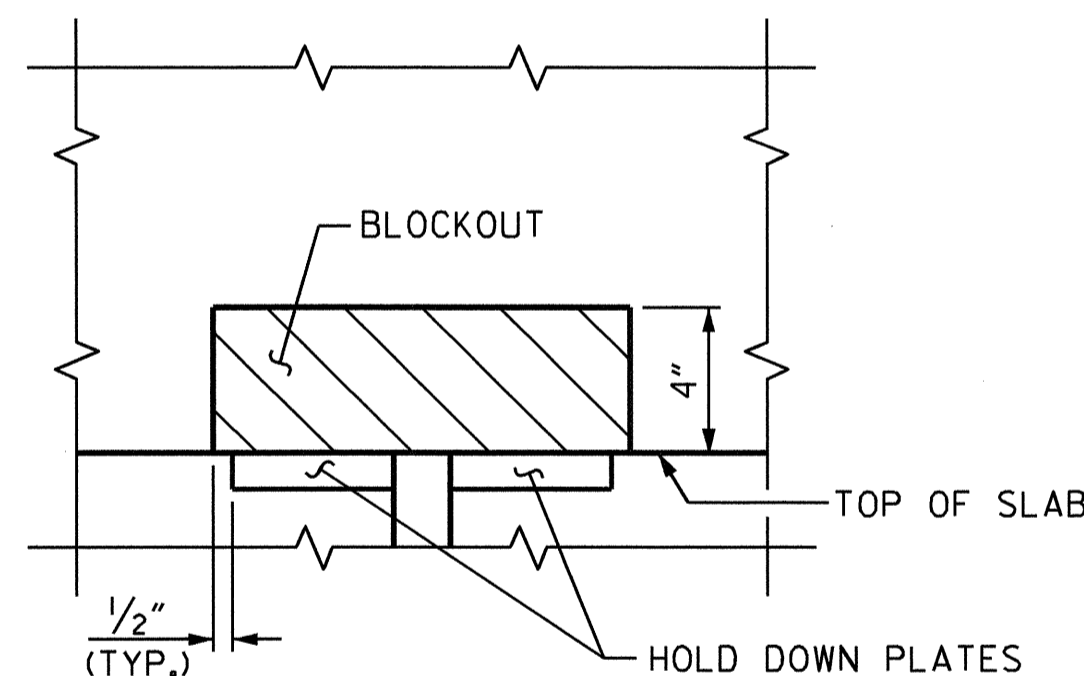
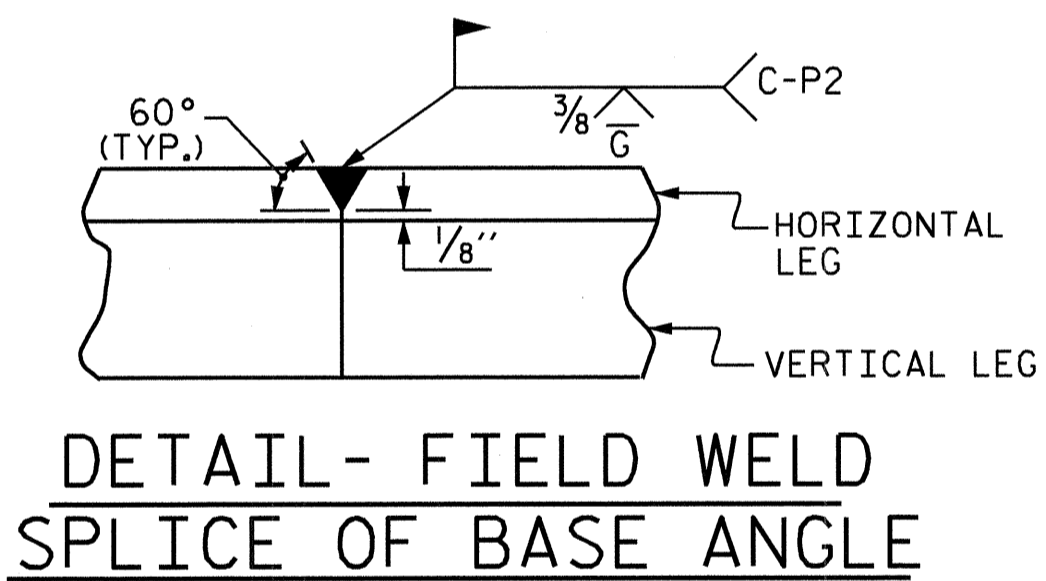
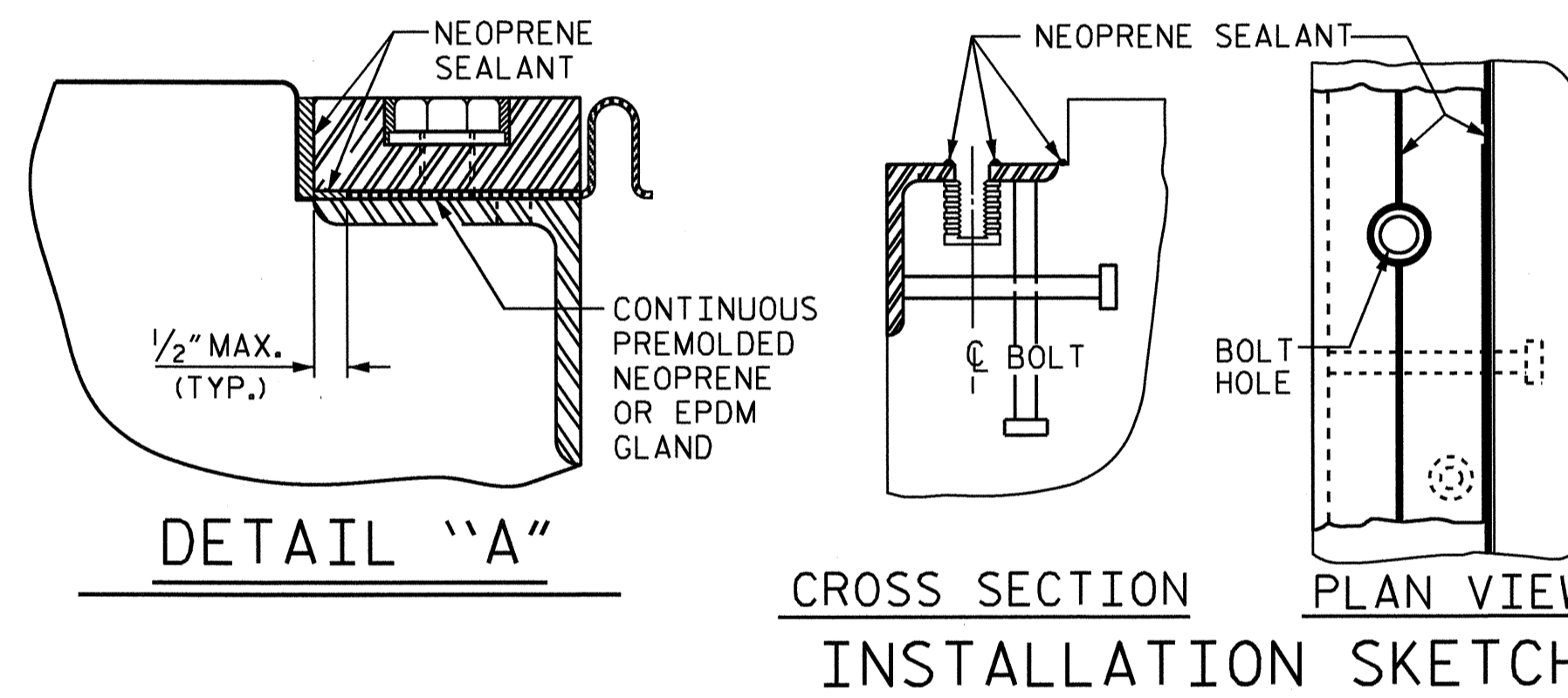
\* THE QUANTITY OF #4 JI BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. JI BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF JI BARS SPECIFIED, ADDITIONAL JI BARS WILL NOT BE REQUIRED.

**INSTALLATION PROCEDURE**

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

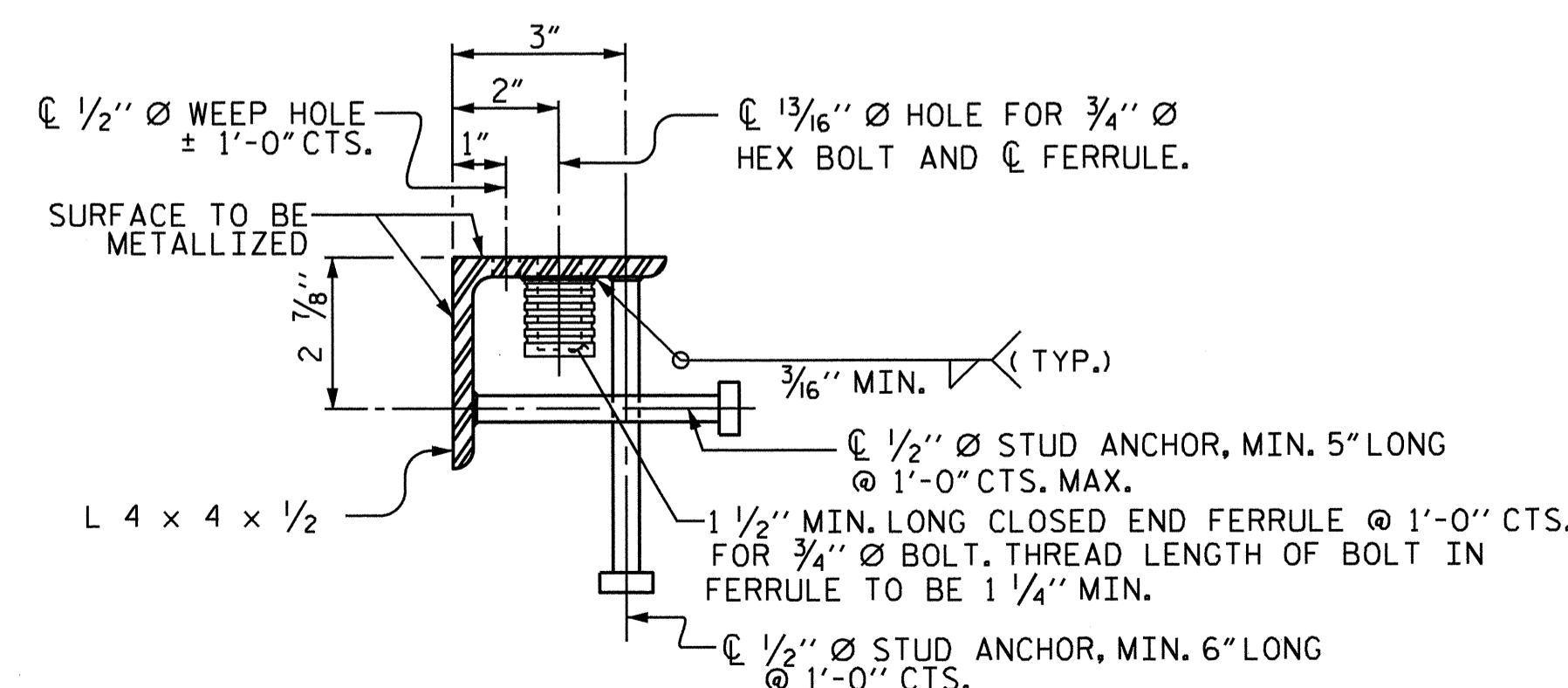
**GENERAL NOTES**

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



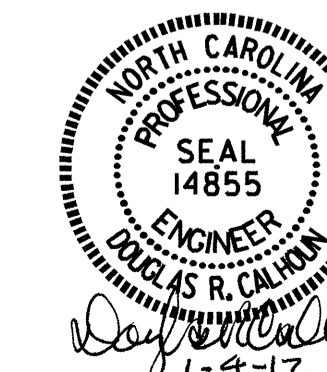
**VERTICAL CONCRETE BARRIER RAIL BLOCKOUT DETAILS**

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	105°	1 1/4"	1 13/16"	1 5/8"	1 1/4"
2	105°	2 1/2"	2 9/16"	2 3/16"	1 1/2"



**TYPICAL SECTION OF BASE ANGLE ASSEMBLY**

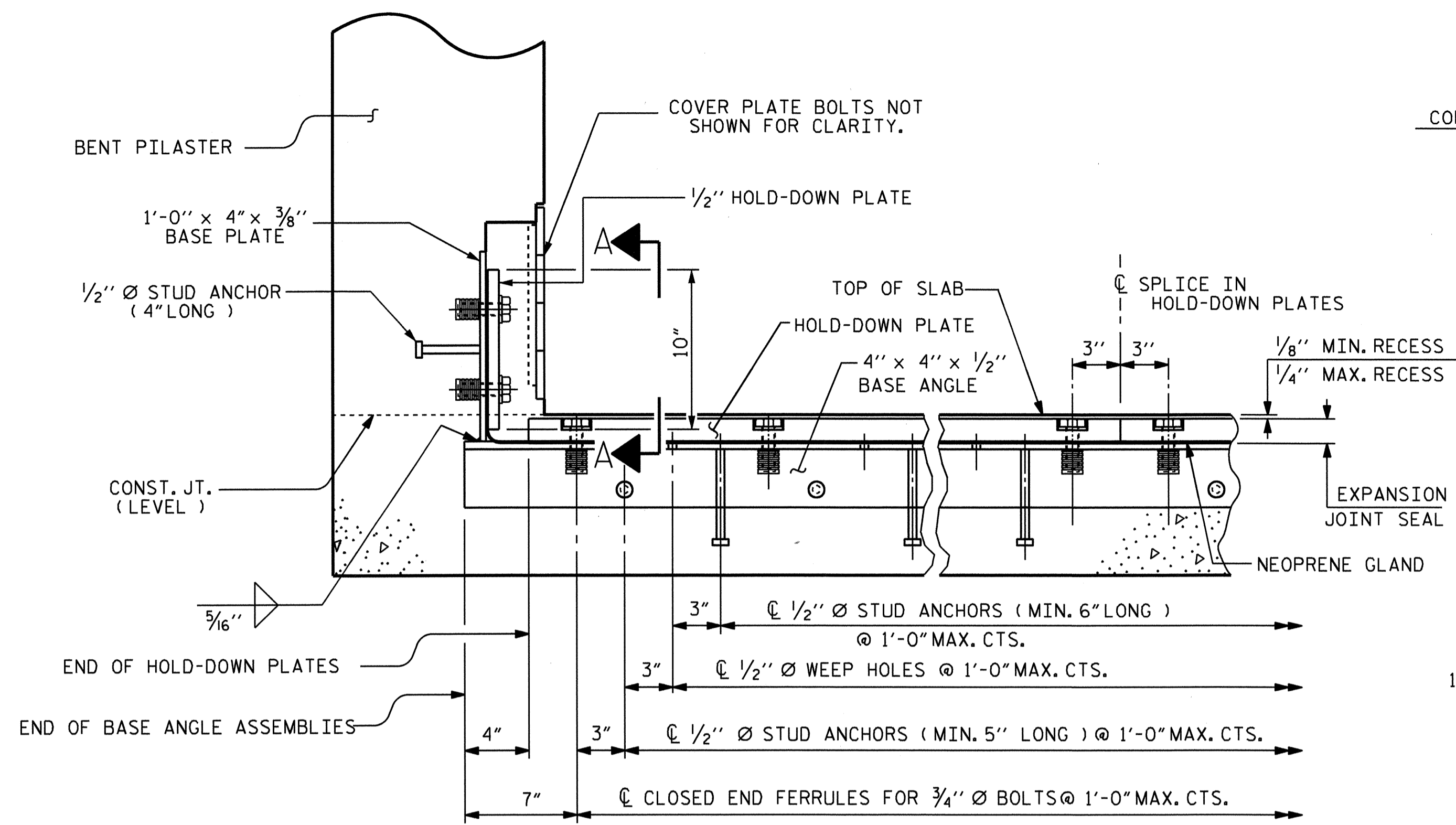
ASSEMBLED BY : B.N. GRADY	DATE : 5/23/11
CHECKED BY : J.L. WALTON	DATE : 7/14/11
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM



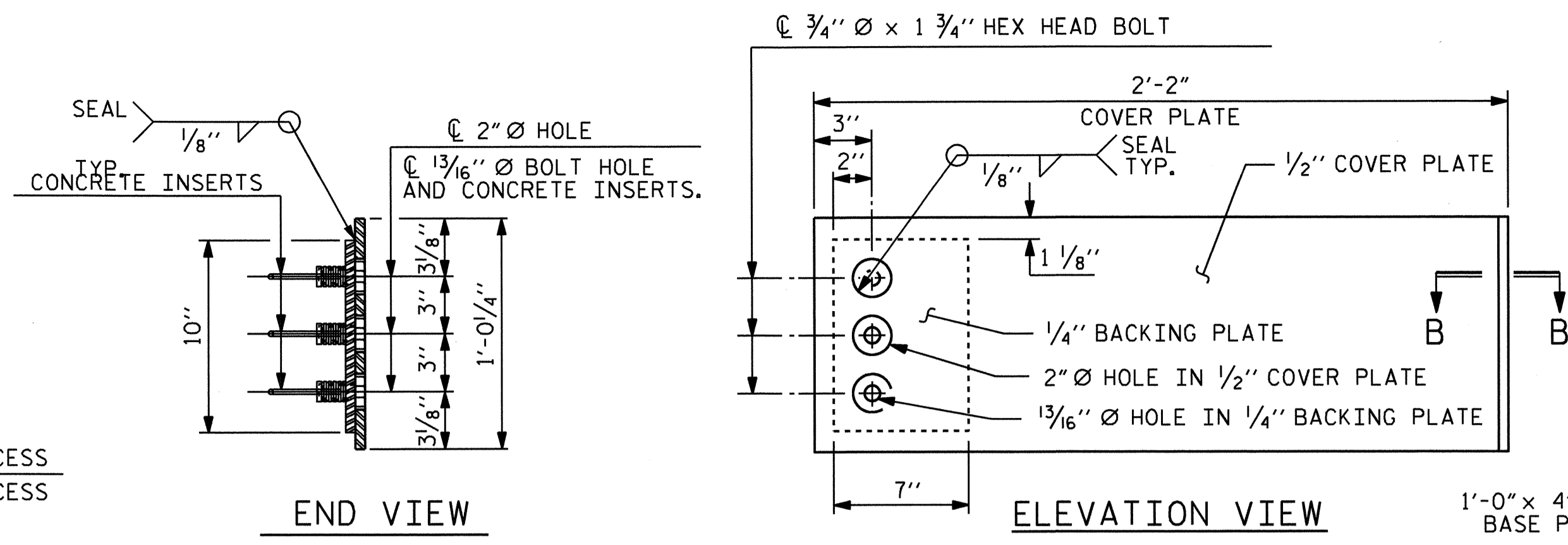
PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 2

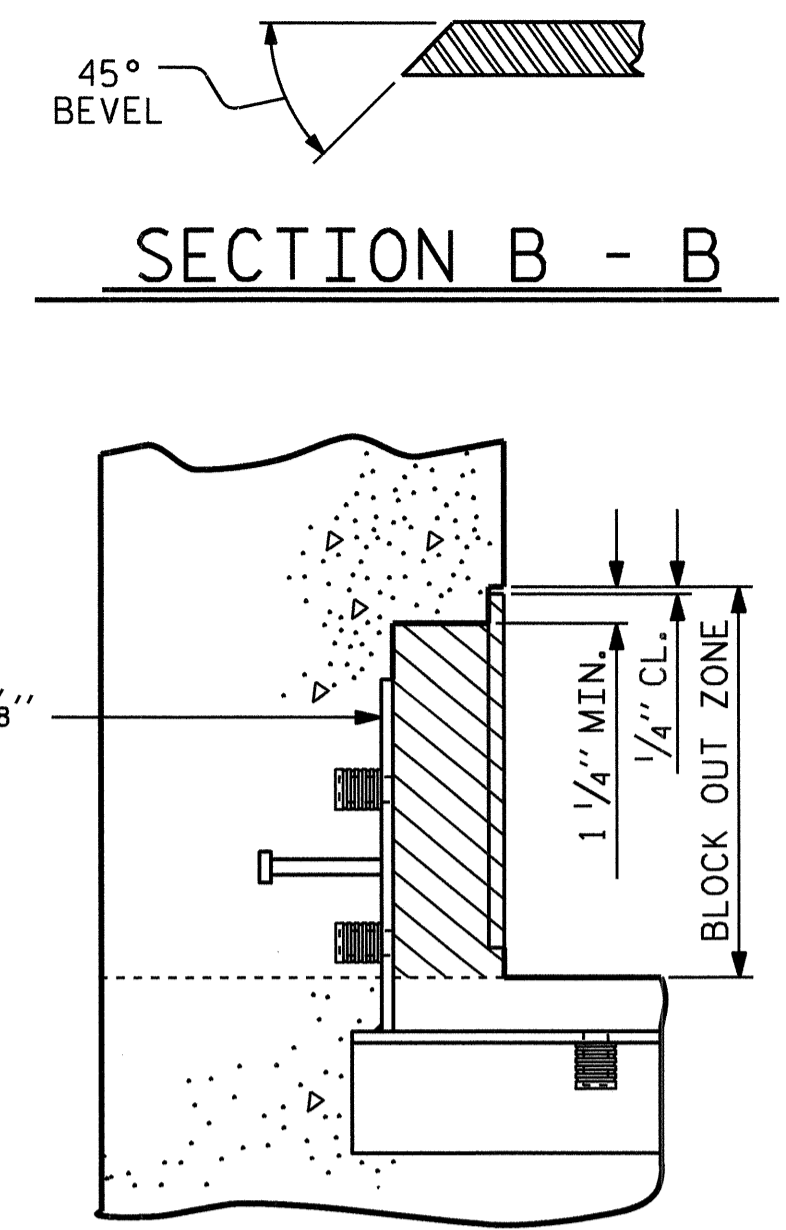
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD EXPANSION JOINT SEAL DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-24
					TOTAL SHEETS 42



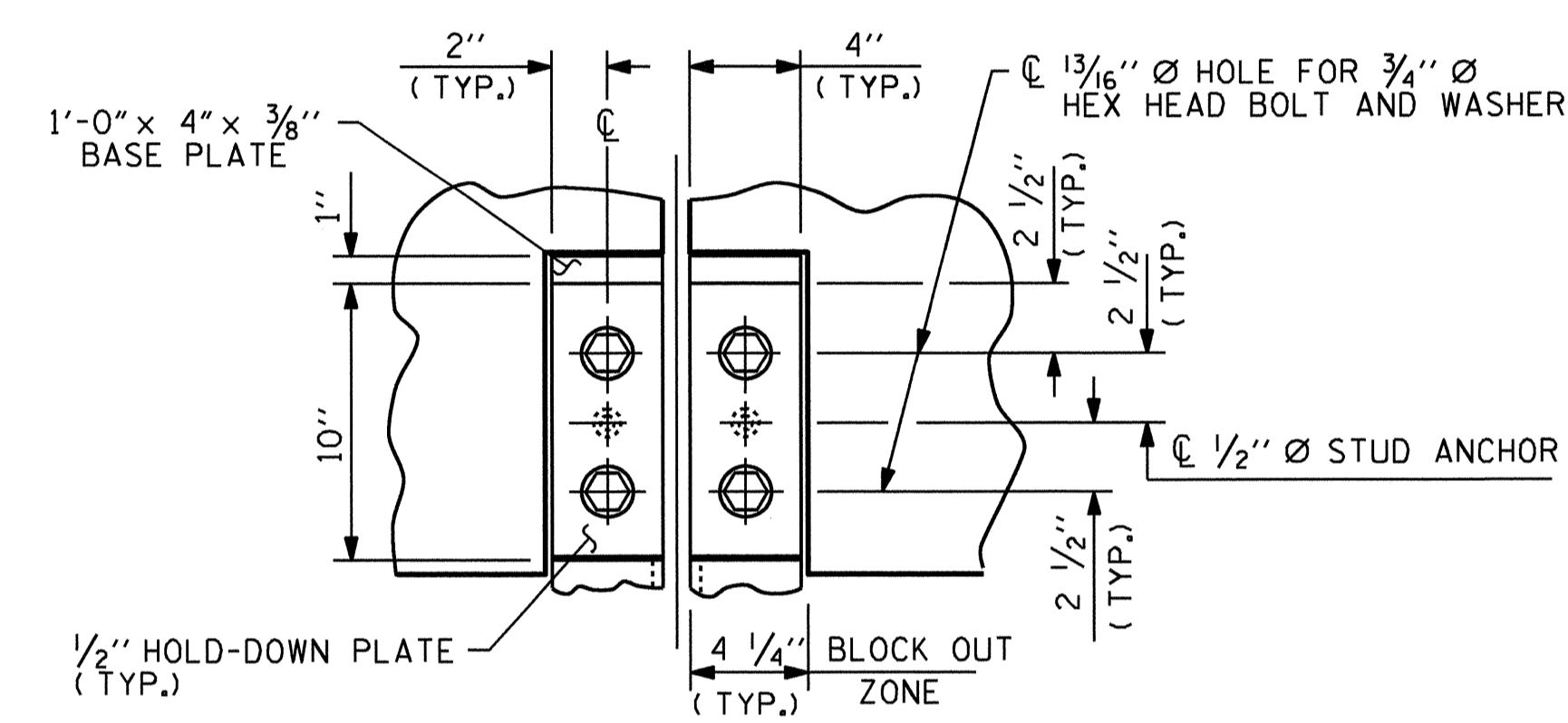
SECTION THRU RAIL NORMAL TO JOINT



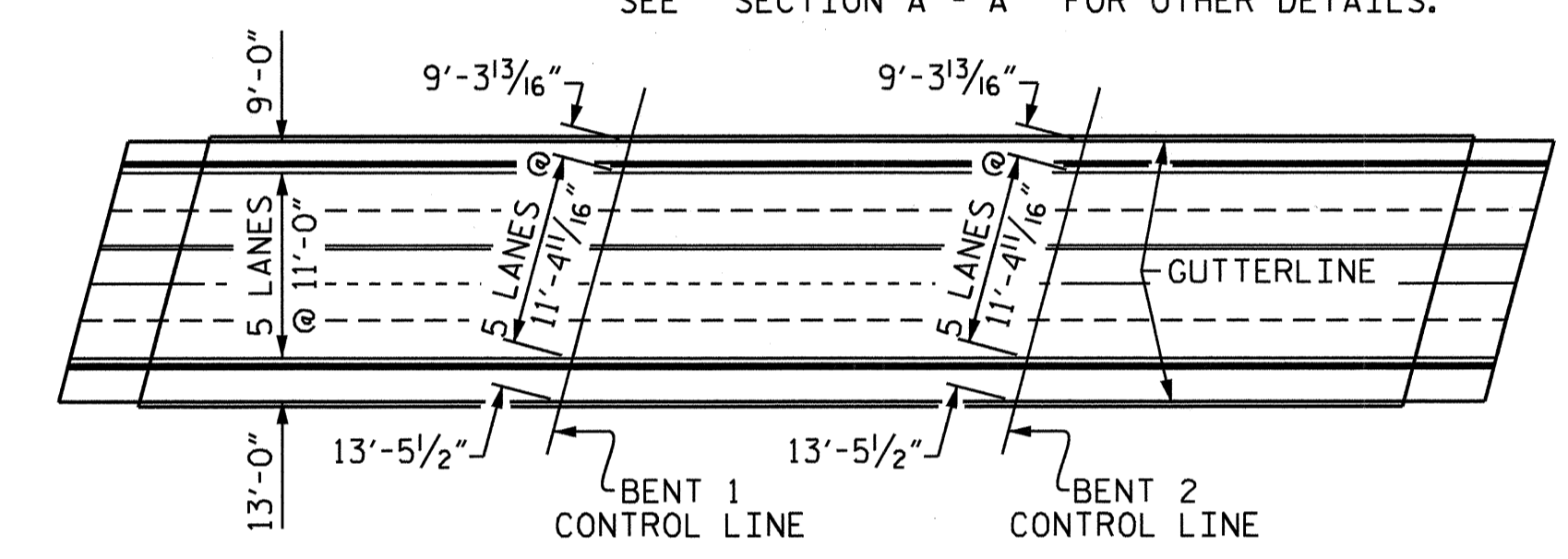
COVER PLATE DETAILS



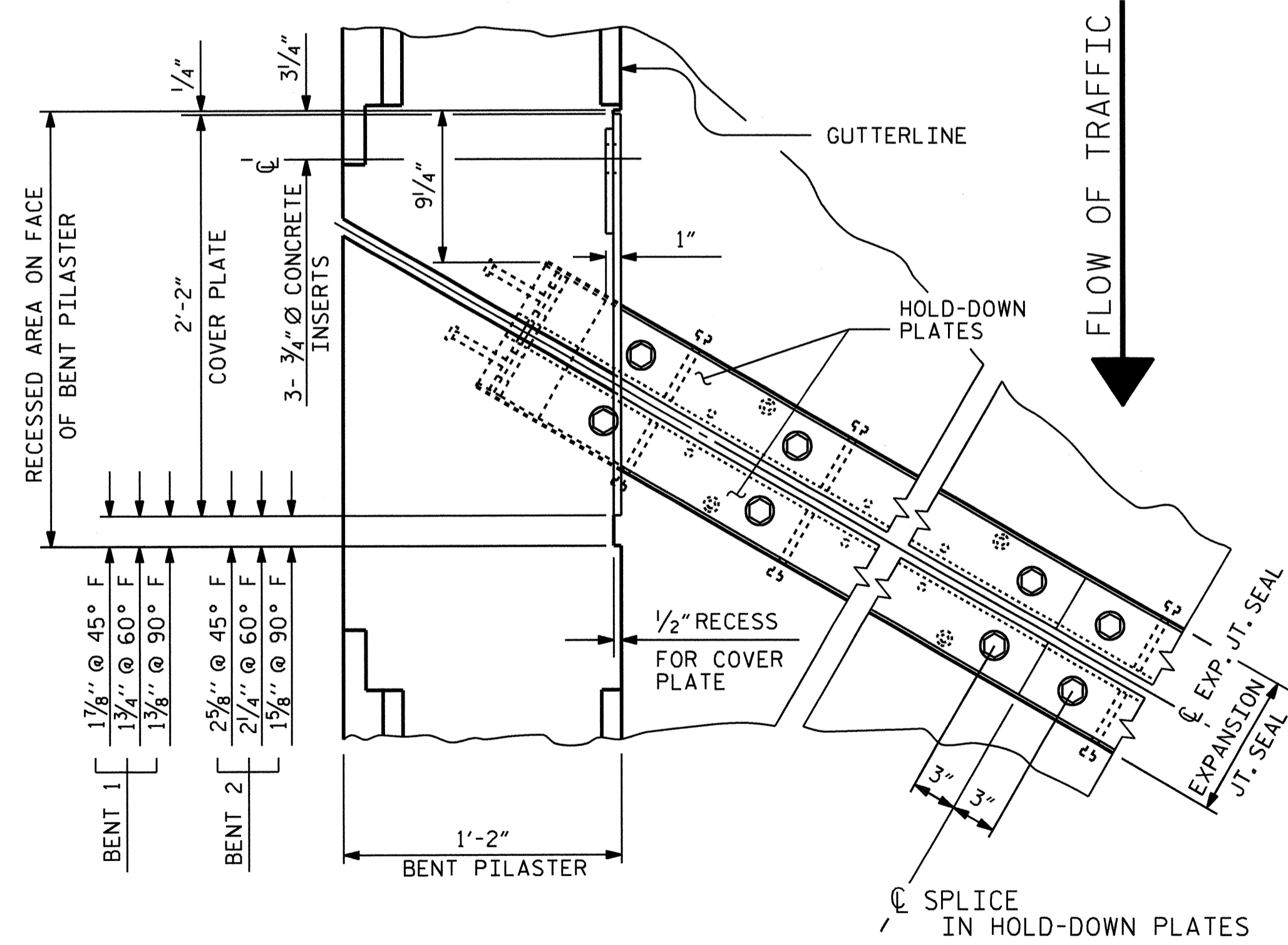
BLOCK OUT DETAIL



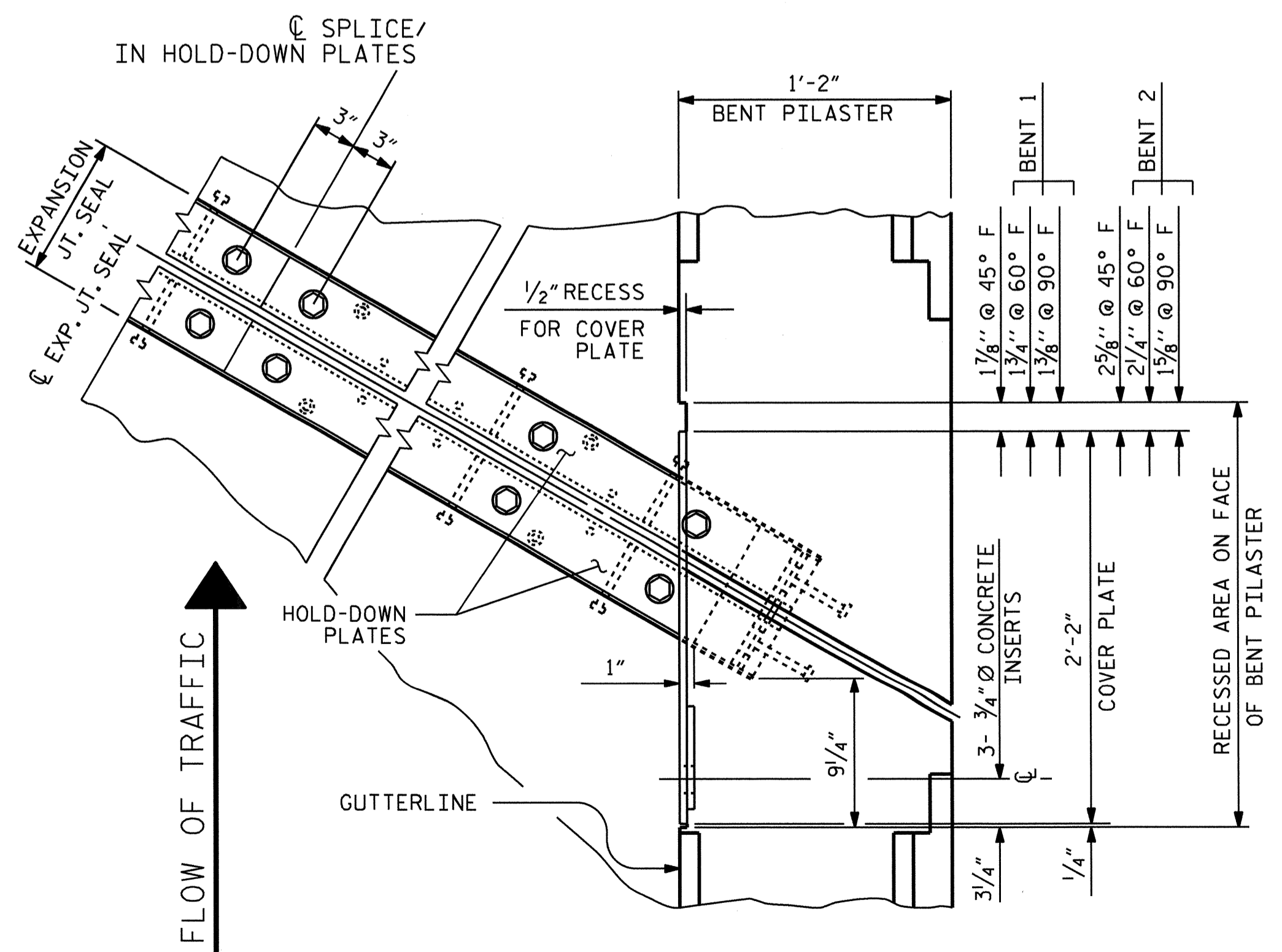
SECTION A - A



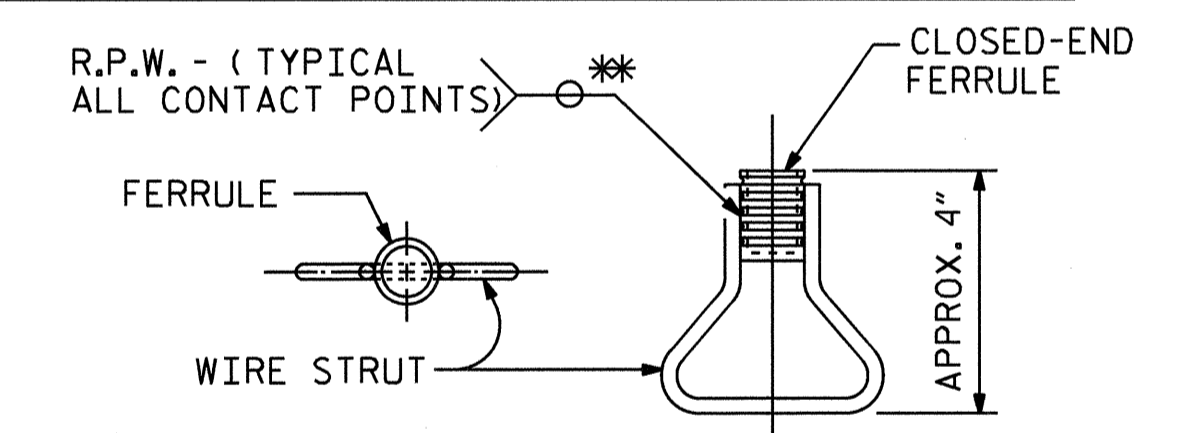
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



PLAN ELEVATION CONCRETE INSERT

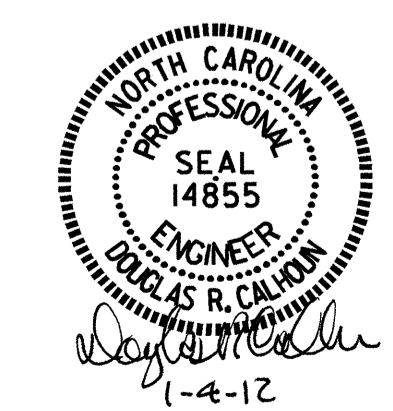
\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 2

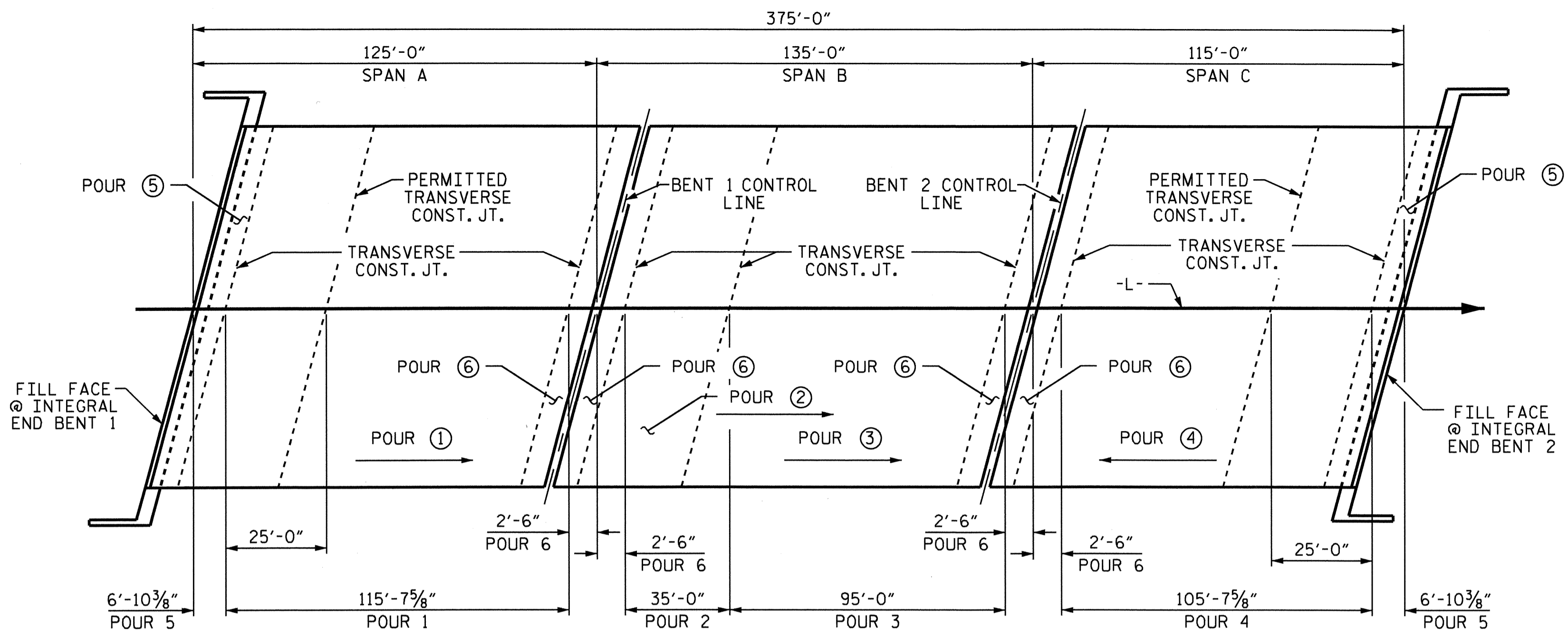
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

EXPANSION JOINT SEAL  
 DETAILS FOR CLASSIC  
 CONCRETE BRIDGE RAIL

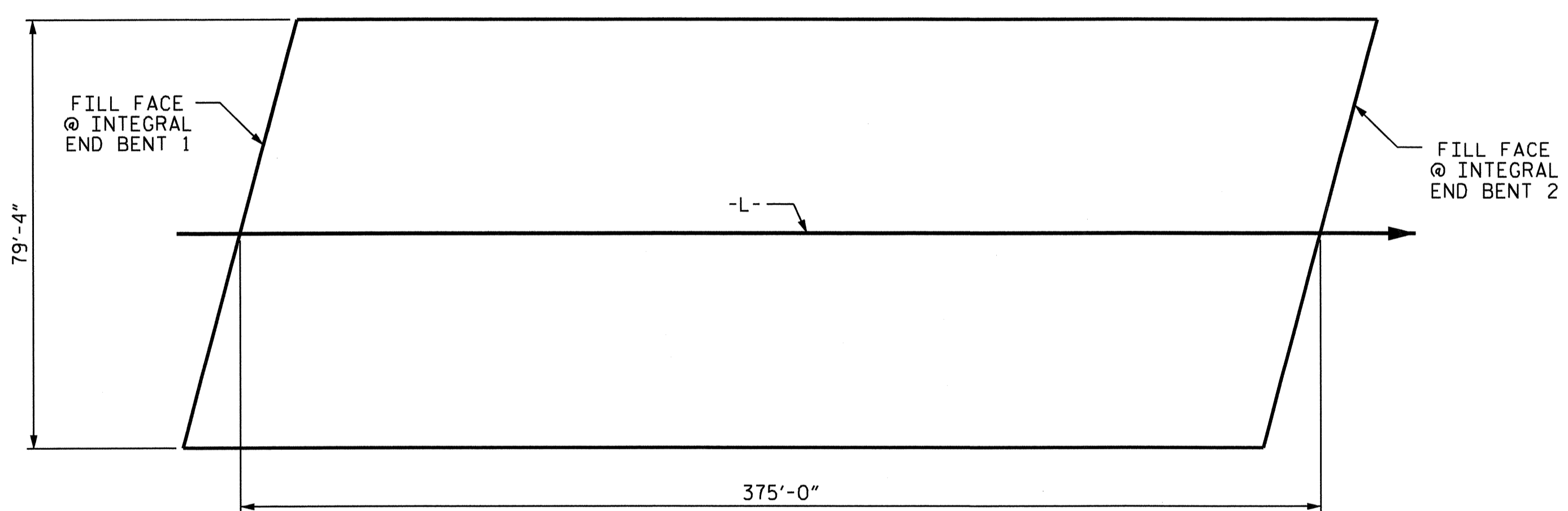


ASSEMBLED BY : B.N. GRADY	DATE : 5/23/11
CHECKED BY : J.L. WALTON	DATE : 7/14/11
DRAWN BY : REK 9/87	REV. 7/17/98 RWW/LES
CHECKED BY : CRK 10/87	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

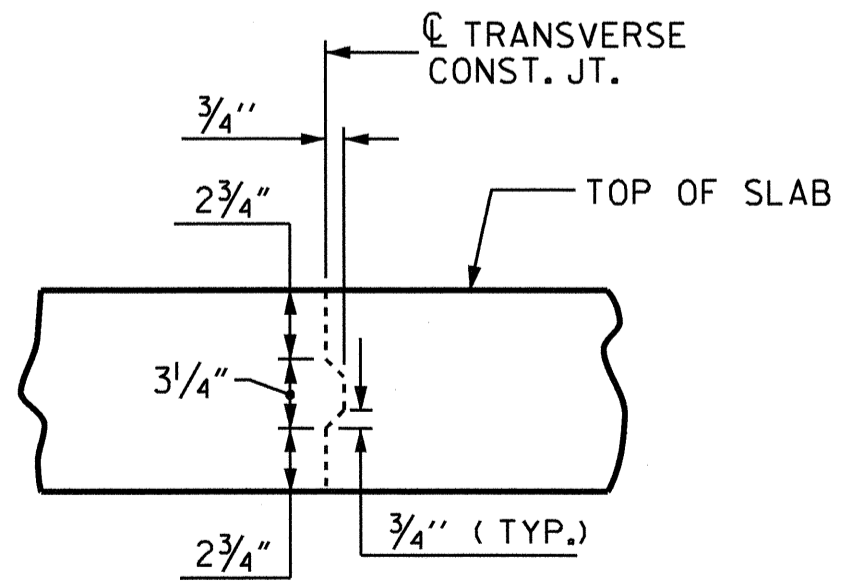
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			42



**POURING SEQUENCE**



**LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (29750 SQ. FT.)**



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

**GROOVING BRIDGE FLOORS**

BRIDGE DECK	20749 SQ.FT.
APPROACH SLABS	2725 SQ.FT.
TOTAL	23474 SQ.FT.

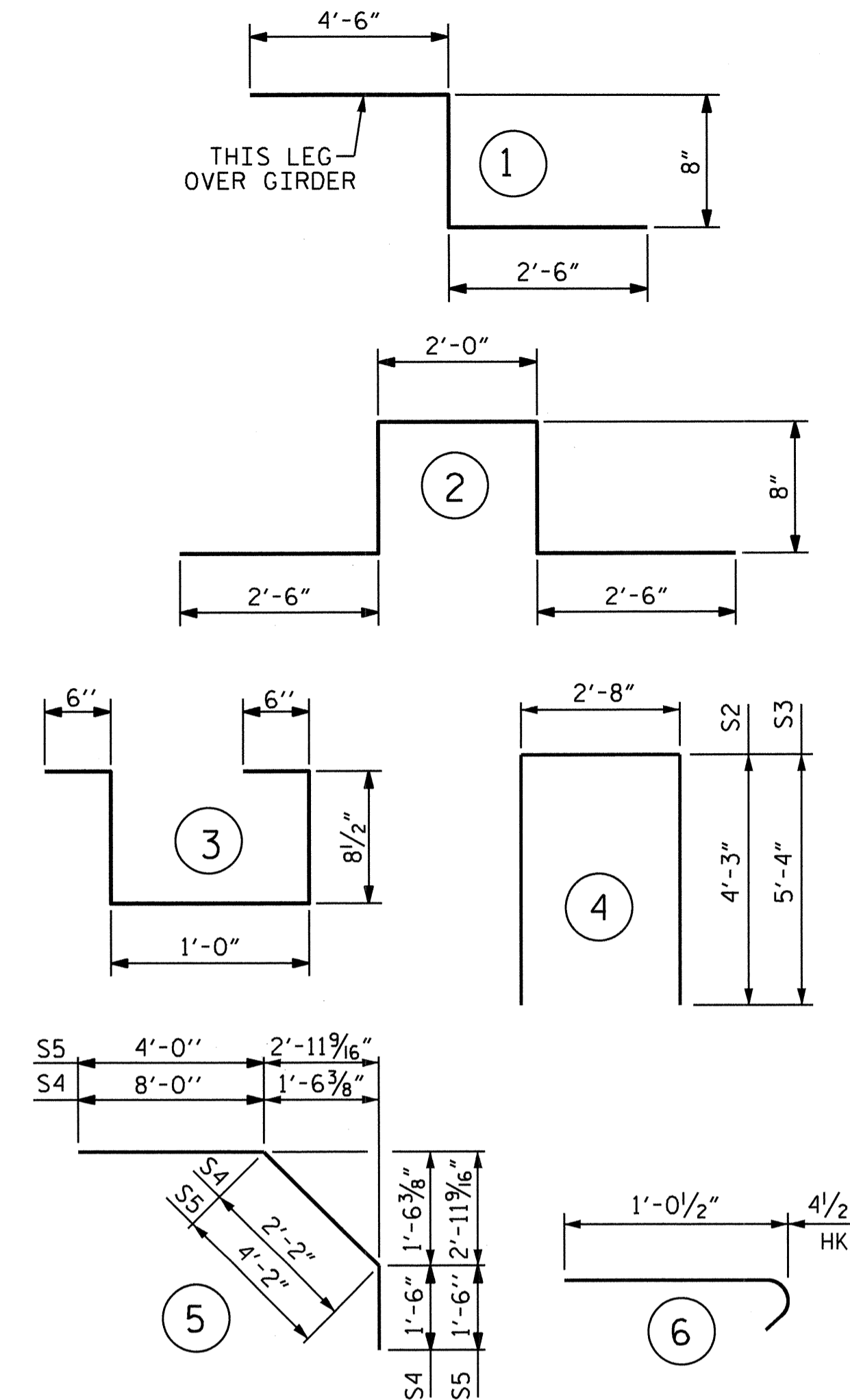
**SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS**

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"	—	—	—

**REINFORCING BAR SCHEDULE**

SPANS A, B, & C					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	1240	#5	STR	40'-9"	52703
A2	1240	#5	STR	40'-7"	52487
* A101	120	#5	STR	40'-1"	5017
* A102	18	#5	STR	55'-2"	1036
* A103	18	#5	STR	49'-7"	931
* A104	18	#5	STR	44'-0"	826
* A105	18	#5	STR	38'-4"	720
* A106	18	#5	STR	32'-9"	615
* A107	18	#5	STR	27'-2"	510
* A108	18	#5	STR	21'-7"	405
* A109	18	#5	STR	16'-0"	300
* A110	18	#5	STR	10'-4"	194
* A111	18	#5	STR	4'-9"	89
* A112	6	#5	STR	2'-11"	18
A201	120	#5	STR	39'-11"	4996
A202	18	#5	STR	55'-2"	1036
A203	18	#5	STR	49'-7"	931
A204	18	#5	STR	44'-0"	826
A205	18	#5	STR	38'-4"	720
A206	18	#5	STR	32'-9"	615
A207	18	#5	STR	27'-2"	510
A208	18	#5	STR	21'-7"	405
A209	18	#5	STR	16'-0"	300
A210	18	#5	STR	10'-4"	194
A211	18	#5	STR	4'-9"	89
A212	6	#5	STR	2'-11"	18
* B1	280	#4	STR	26'-5"	4941
* B2	102	#6	STR	25'-0"	3830
B3	288	#5	STR	42'-9"	12841
B4	86	#4	STR	25'-0"	1436
* B5	280	#4	STR	28'-7"	5346
B6	288	#5	STR	46'-4"	13918
* B7	224	#4	STR	30'-0"	4489
* B8	102	#6	STR	23'-0"	3524
B9	192	#5	STR	58'-0"	11615
B10	86	#5	STR	23'-0"	2063
* G1	8	#5	STR	42'-2"	352
H1	14	#5	STR	10'-9"	157
H2	14	#5	STR	10'-5"	152
H3	14	#5	STR	11'-0"	161
H4	14	#5	STR	10'-2"	148
* J1	320	#4	6	1'-5"	303
K1	80	#4	STR	23'-4"	1247
K2	16	#4	STR	2'-9"	29
* K3	16	#5	1	7'-8"	128
* K4	56	#5	2	8'-4"	487
K5	64	#5	STR	8'-10"	590
* S1	256	#4	3	3'-5"	584
S2	132	#4	4	11'-2"	985
S3	16	#4	4	13'-4"	143
* S4	124	#4	5	11'-8"	966
* S5	120	#4	5	9'-8"	775
REINFORCING STEEL =					108612 LBS
* EPOXY COATED REINF. STEEL =					89089 LBS

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**— SUPERSTRUCTURE BILL OF MATERIAL —**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)		
* J1	320	#4 6	1'-5"	303	
K1	80	#4 STR	23'-4"	1247	
K2	16	#4 STR	2'-9"	29	
* K3	16	#5 1	7'-8"	128	POUR 5
* K4	56	#5 2	8'-4"	487	POUR 6
K5	64	#5 STR	8'-10"	590	
TOTALS**	1042.9	108612	89317		

\*\* QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED  
▲ CONCRETE IN THE UPPER WINGS OF END BENTS IS INCLUDED IN POUR 5.

PROJECT NO. B-3864  
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STATION: 22+62.50 -L-

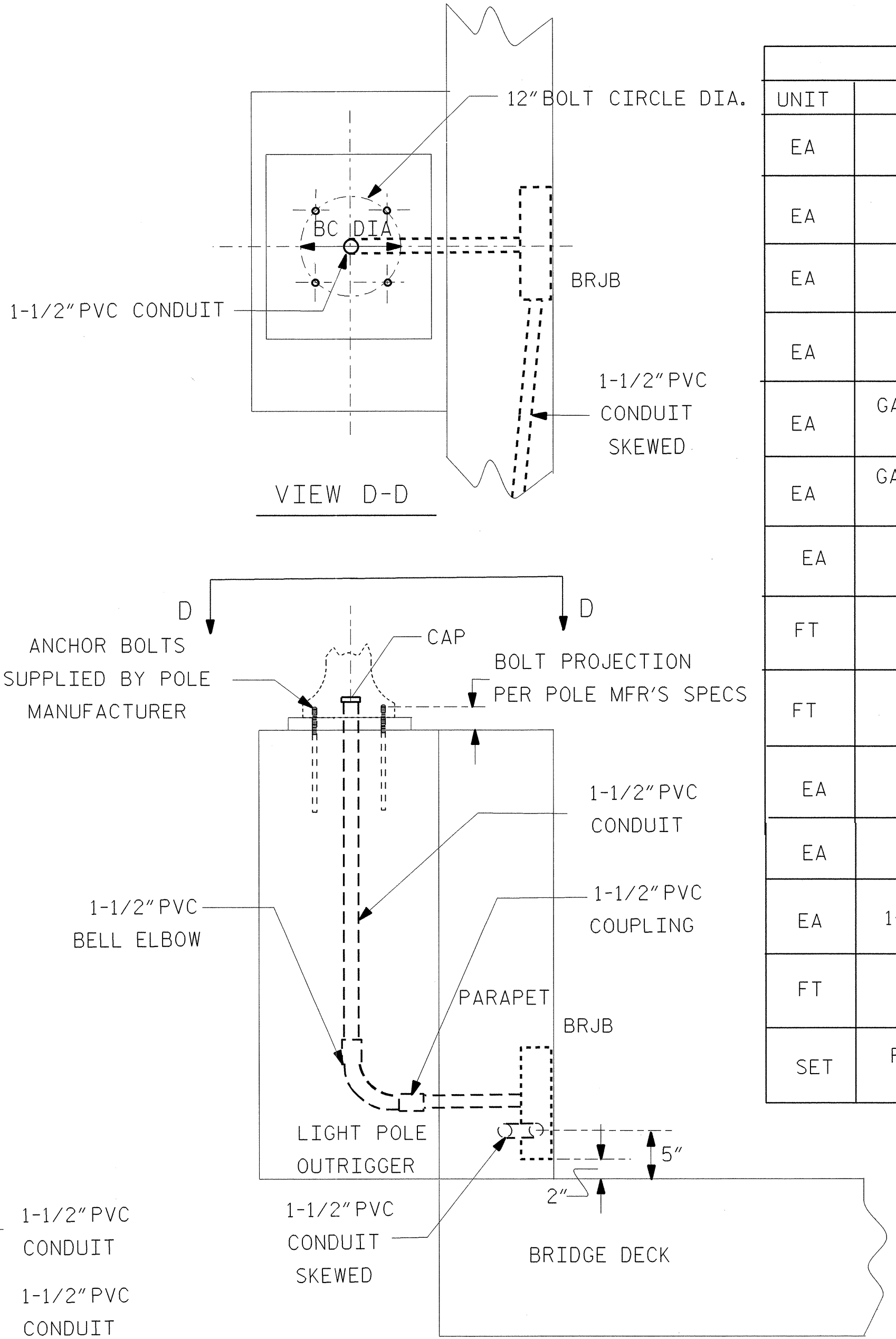
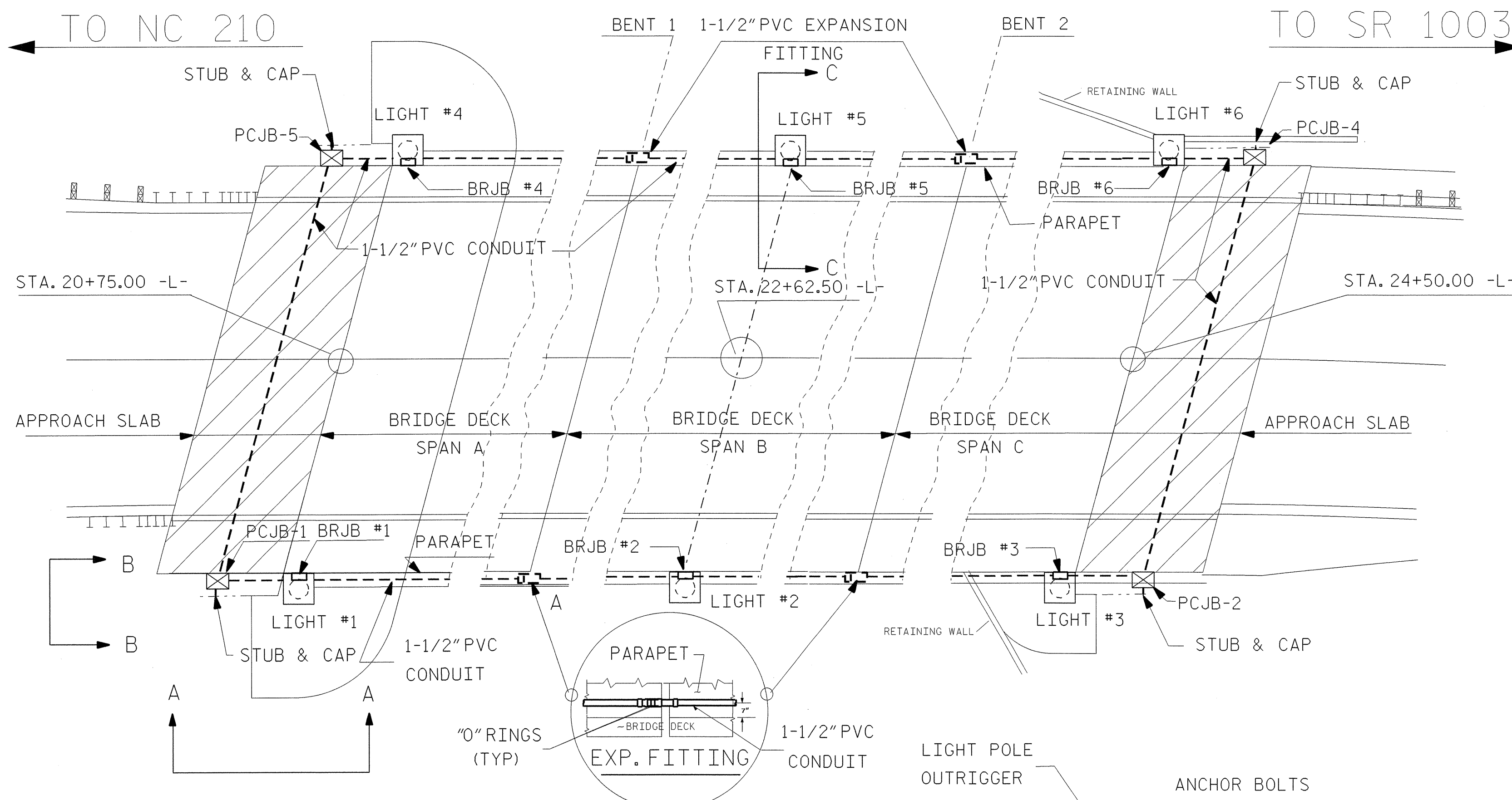


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**STANDARD SUPERSTRUCTURE BILL OF MATERIAL**

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	42
1			3			
2			4			

ASSEMBLED BY : B.N. GRADY DATE : 5/23/11  
CHECKED BY : J.L. WALTON DATE : 7/14/11  
DRAWN BY : JMB 5/87 REV. 6/1/94 EEM/GRP  
CHECKED BY : SJD 9/87 REV. 8/16/99 RWW/LES  
REV. 5/1/06 TLA/GM

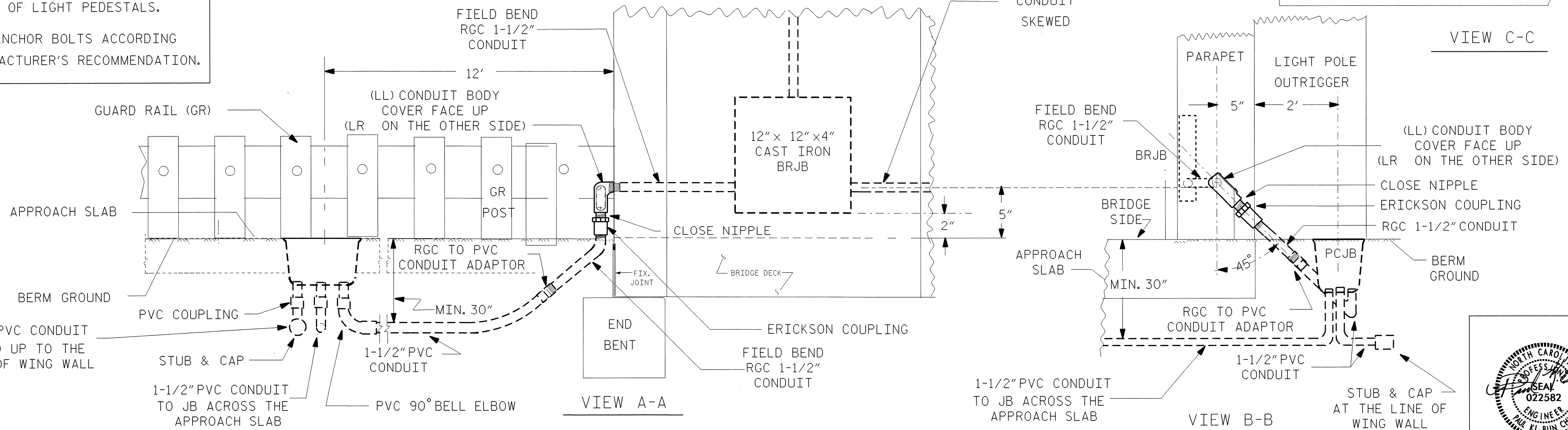
USE FOR ELECTRICAL CONDUIT SYSTEM ONLY



ESTIMATED BILL OF MATERIALS table with columns for UNIT, ITEM, and QNTY.

- NOTES section with four numbered items regarding power service coordination, connection, light pedestals, and anchor bolts.

CONDUIT LAYOUT

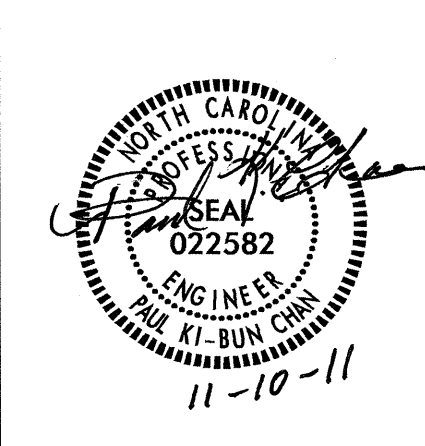


PROJECT NO. B-3864 JOHNSTON COUNTY STATION: 22+62.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

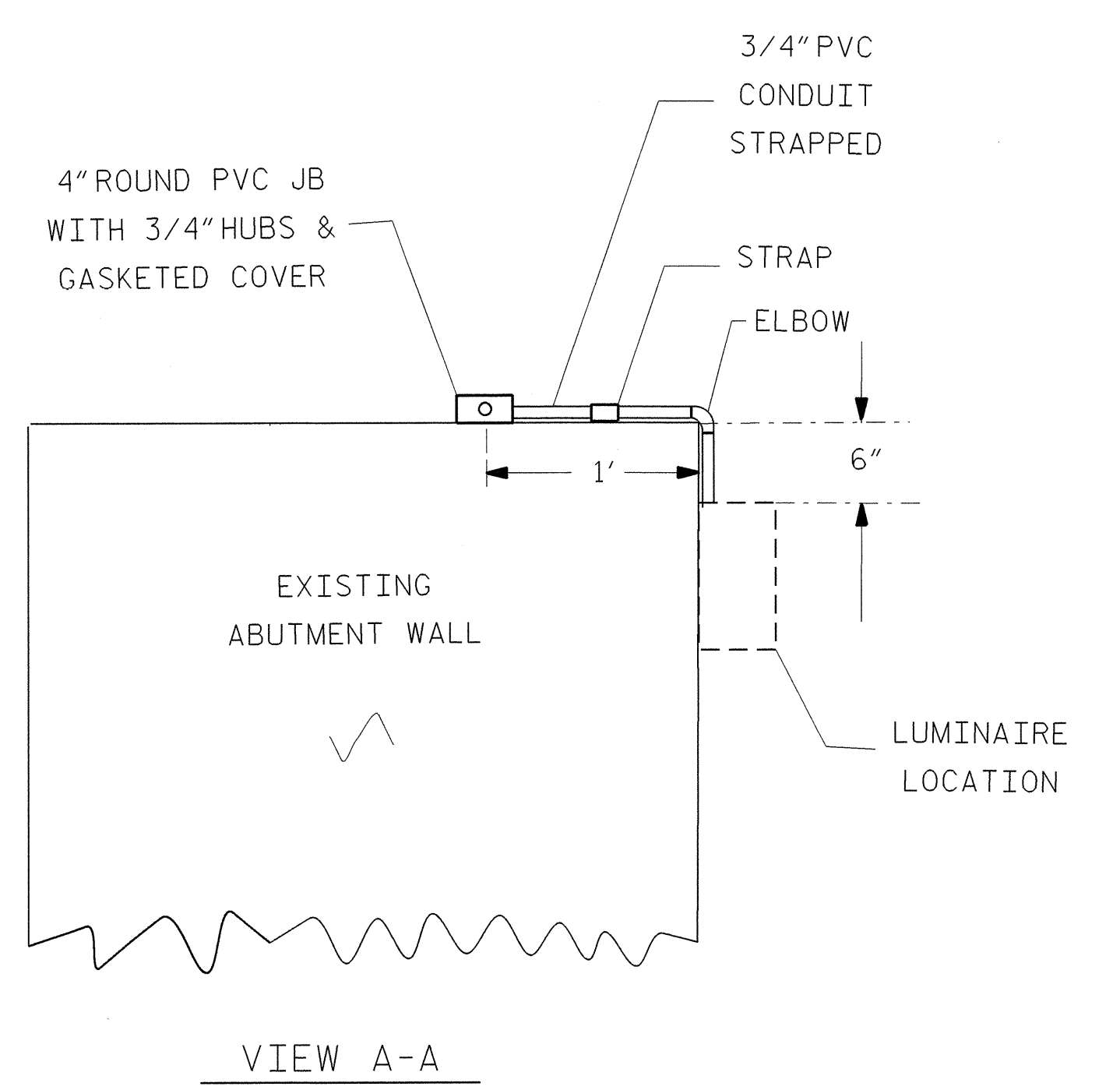
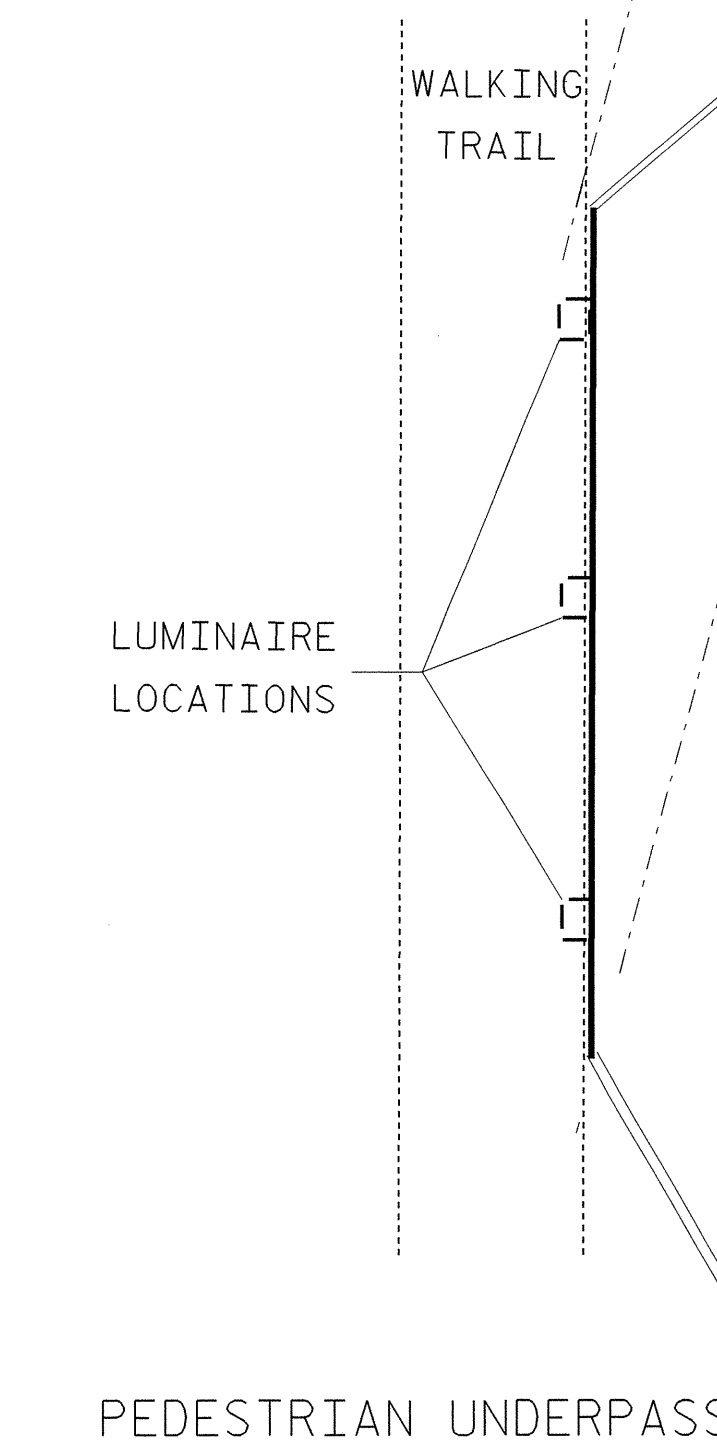
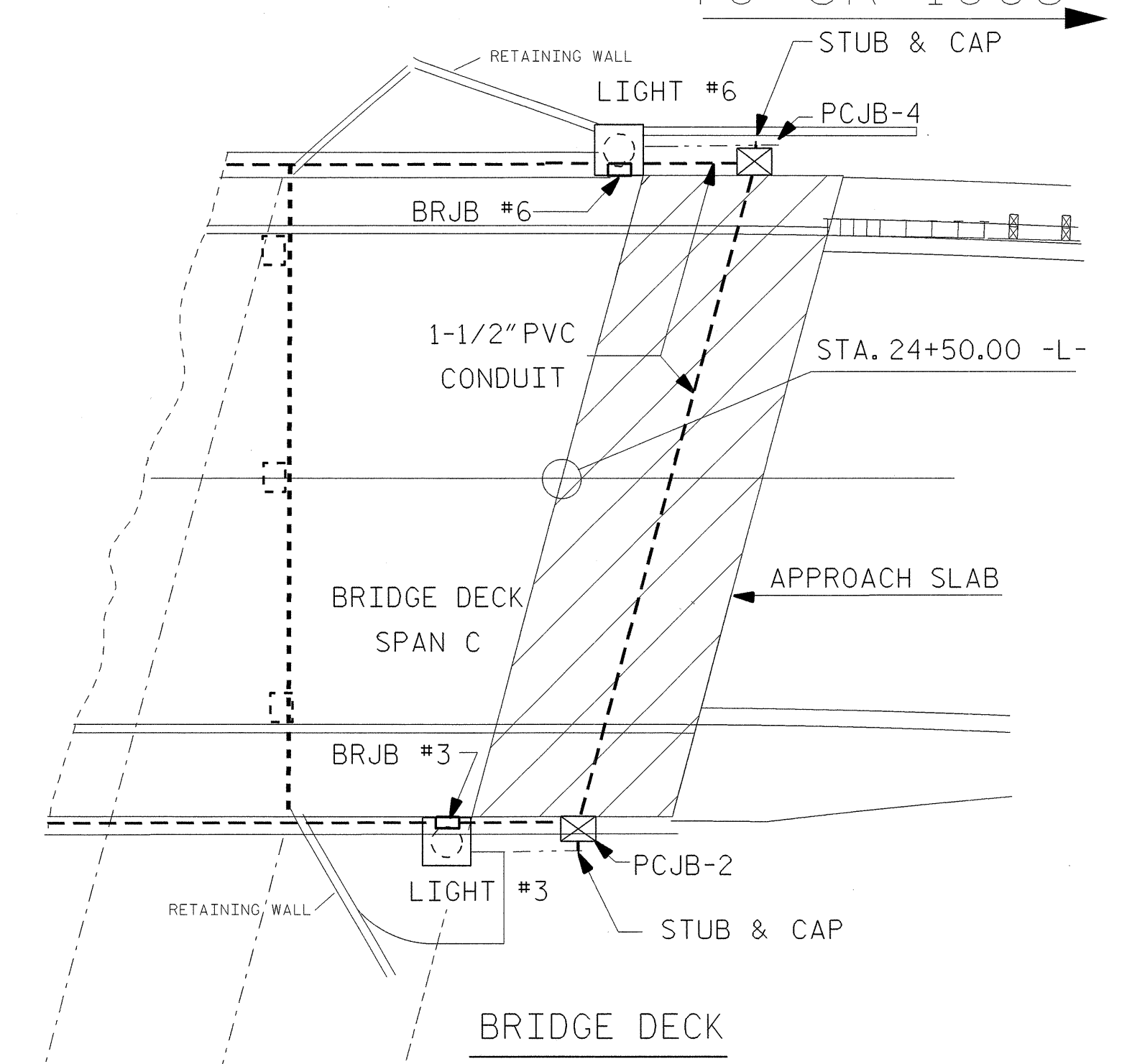
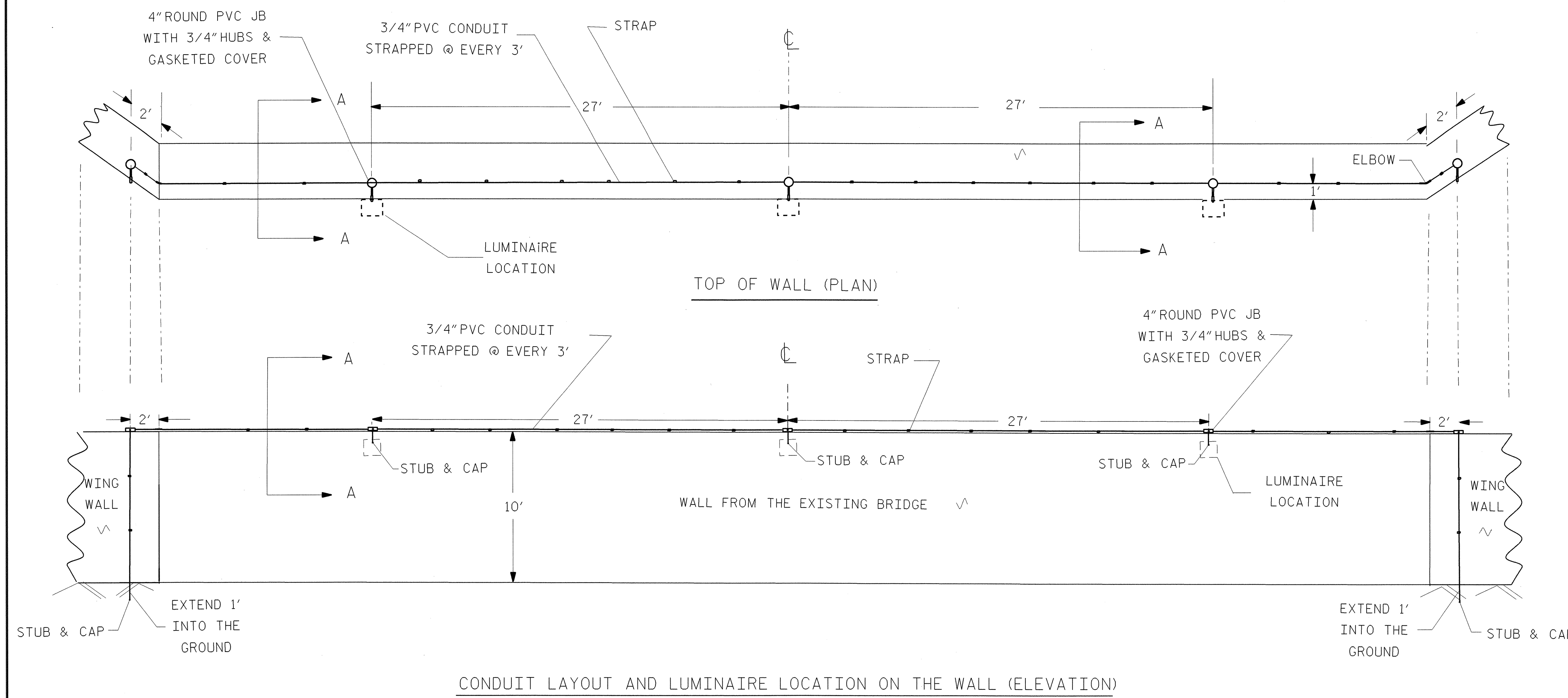
BRIDGE OVER NEUSE RIVER ON US 70 BUSINESS BETWEEN NC 210 AND SR 1003

REVISIONS table with columns for NO., BY, DATE, and SHEET NO.



DRAWN BY: \*SKS LIGHTING & ELECTRICAL DATE: 11/10/11

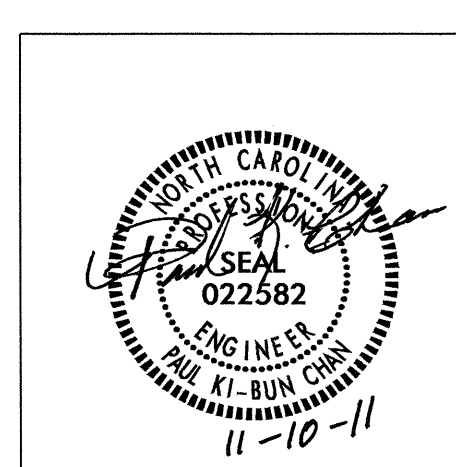
TO SR 1003



ESTIMATED BILL OF MATERIALS		
UNIT	ITEM	QTY
EA	4" ROUND PVC JB WITH 3/4" HUB & GASKETED COVER	5
FT	3/4" PVC CONDUIT	96
EA	STRAP FOR 3/4" PVC CONDUIT @ EVERY 3'	40
EA	3/4" PVC 90° ELBOW	5
EA	3/4" PVC 30° ELBOW	2
FT	PULL LINE	100

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JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 1  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 UNDERPASS CONDUIT SYSTEM  
 BRIDGE OVER NEUSE RIVER  
 ON US 70 BUSINESS BETWEEN  
 NC 210 AND SR 1003



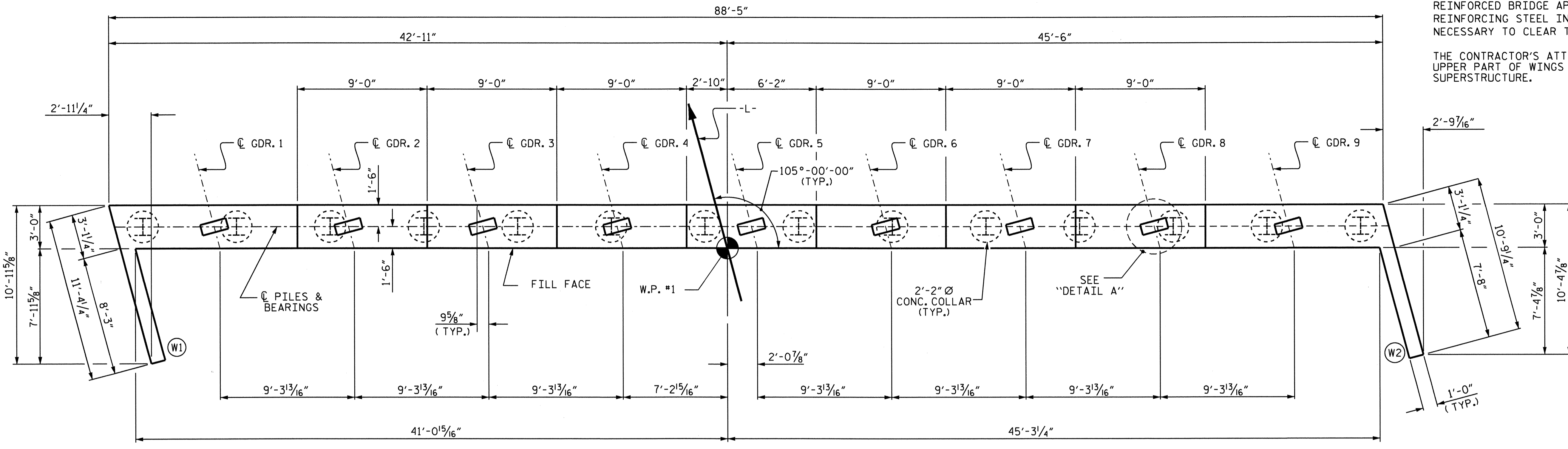
DRAWN BY : SKS LIGHTING & ELECTRICAL DATE : 11/10/11  
 CHECKED BY : \_\_\_\_\_ DATE : \_\_\_\_\_

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
TOTAL SHEETS				42

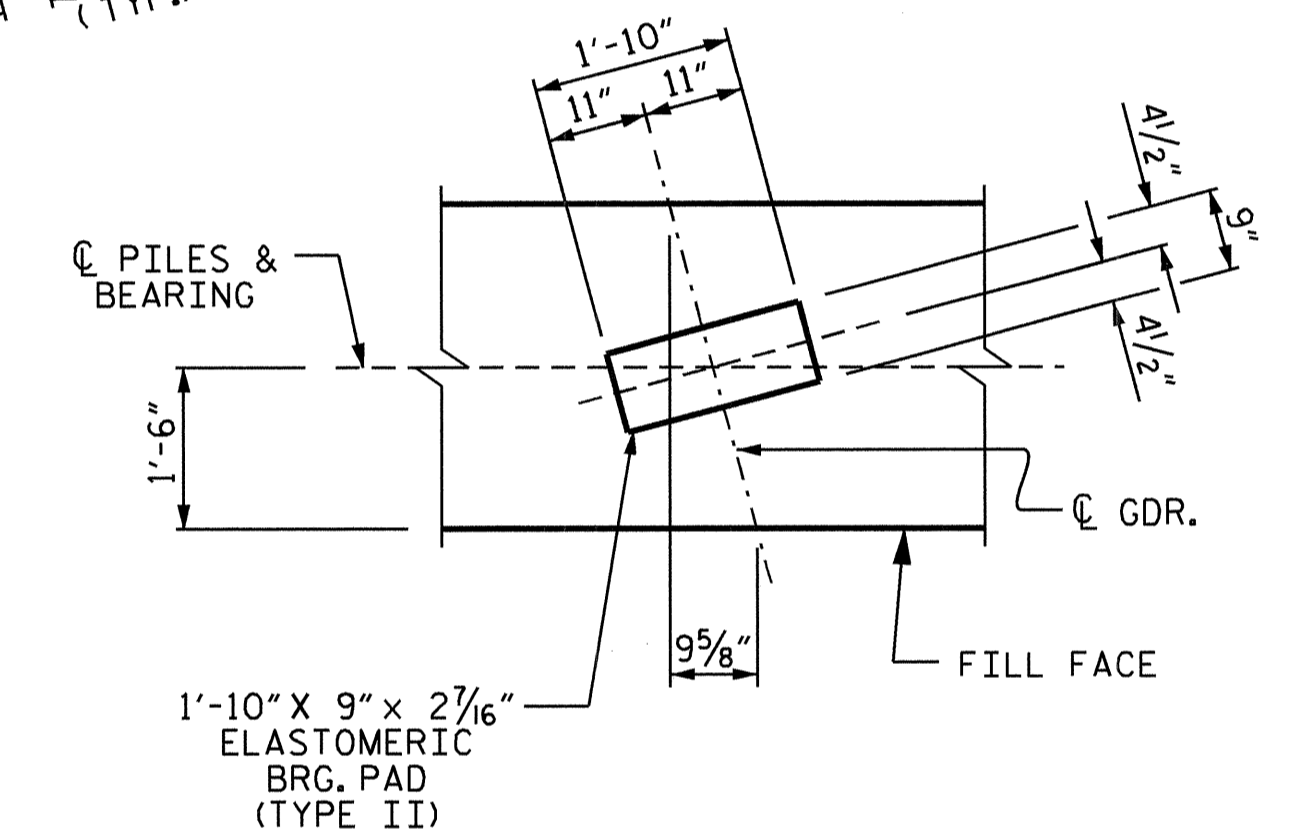
**NOTES**

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

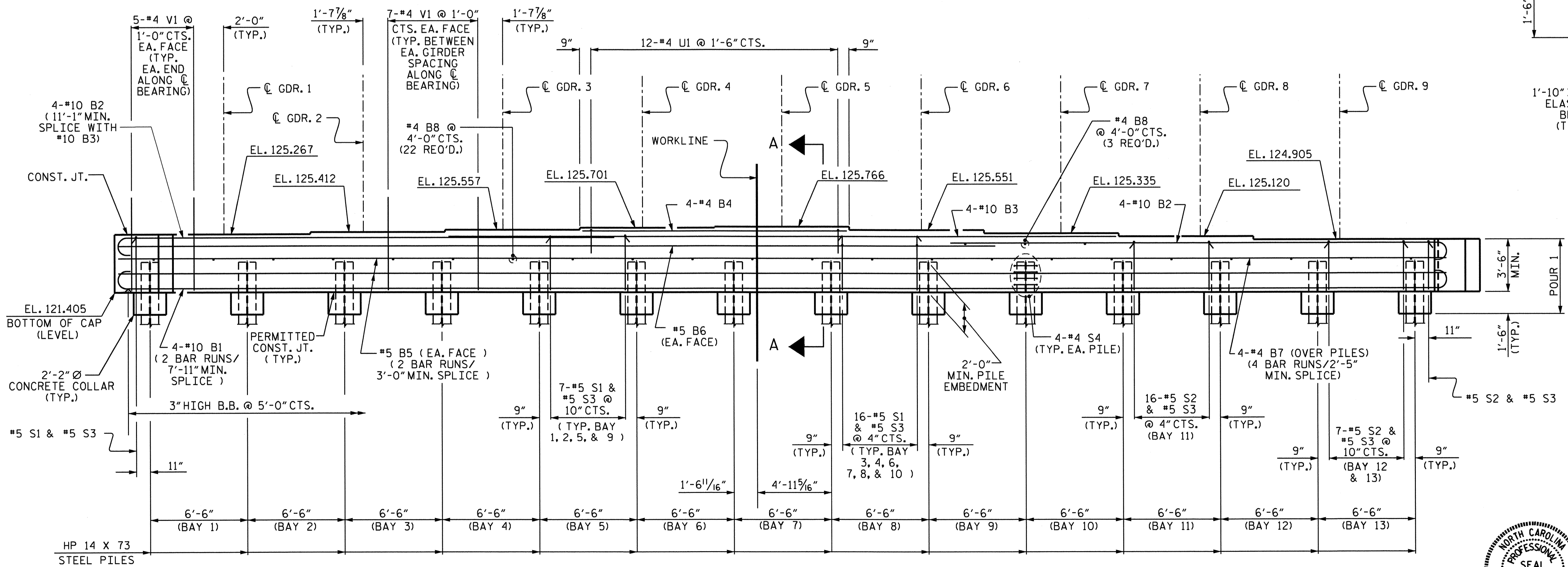
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.



**PLAN**



**DETAIL A**  
(TYP. EA. BEARING)



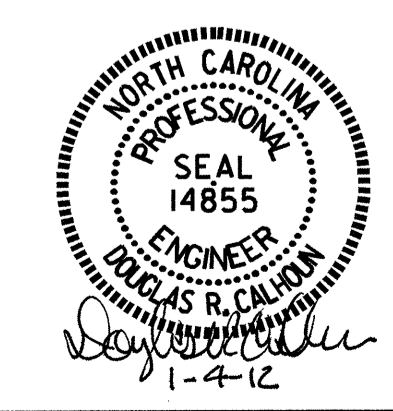
**ELEVATION**

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

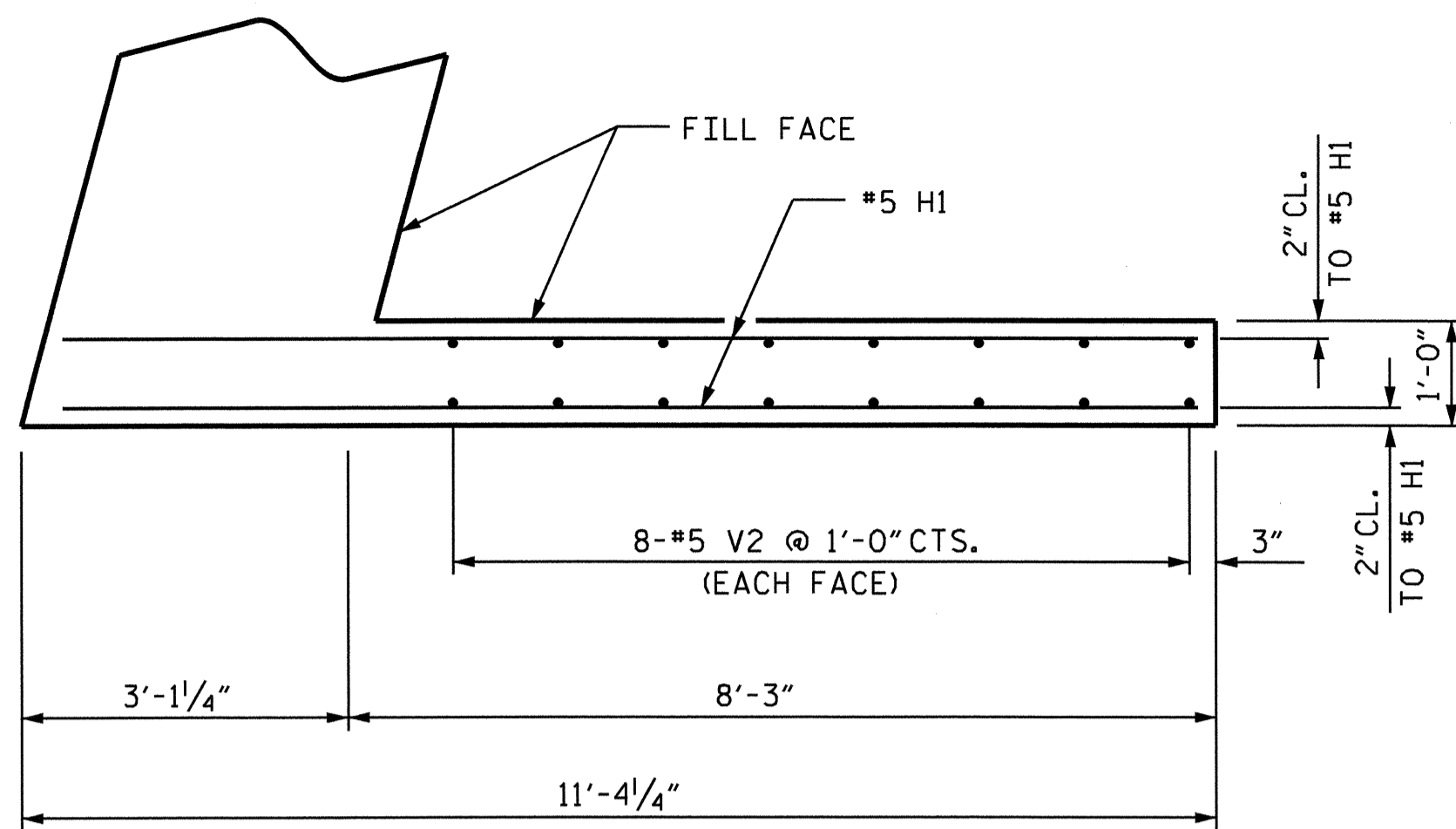
**SUBSTRUCTURE  
 INTEGRAL END BENT 1**



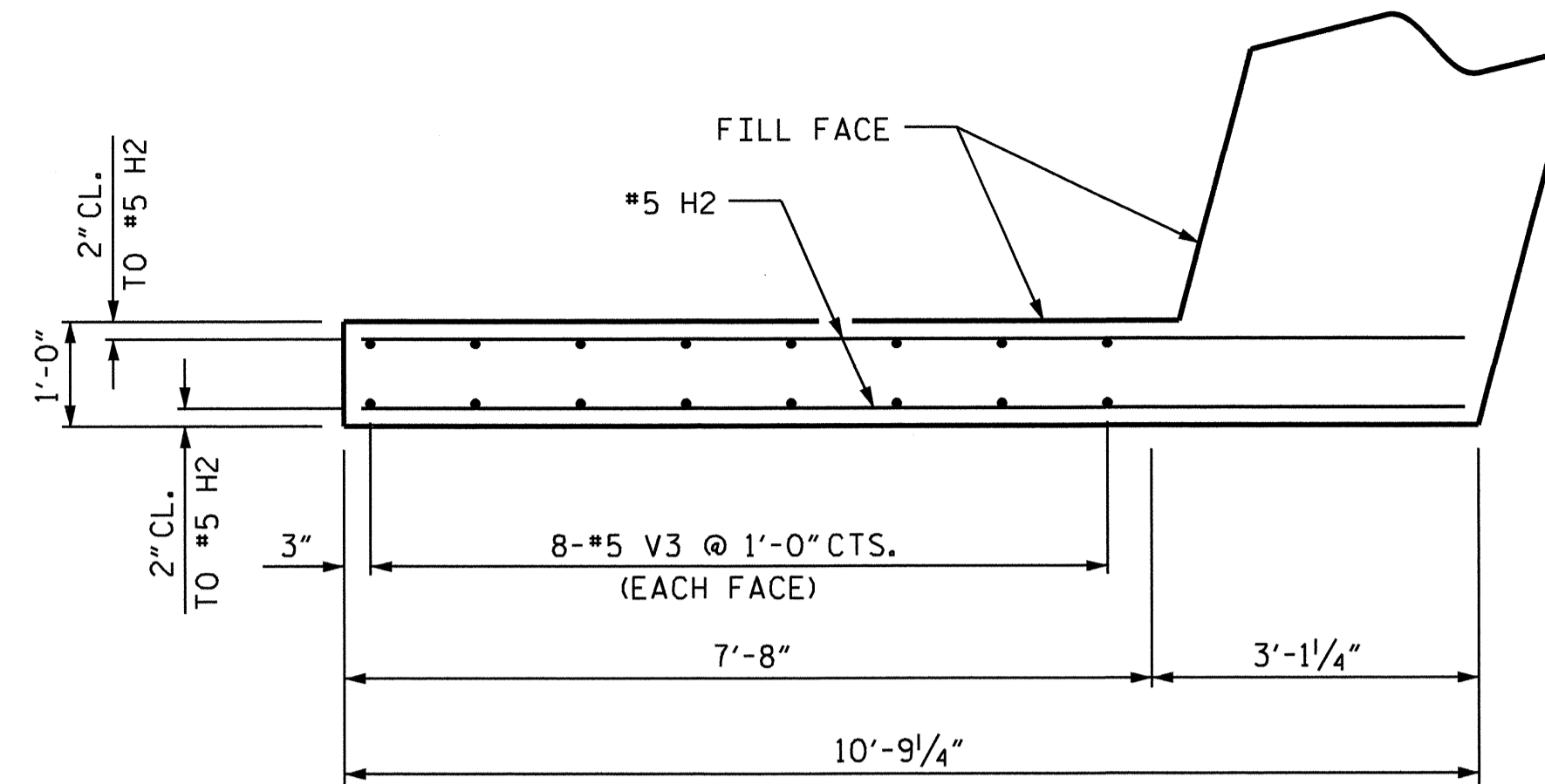
DRAWN BY: J.L. WALTON DATE: 5/2/11  
 CHECKED BY: K.P. SEDA DATE: 5/25/11

04-JAN-2012 12:08  
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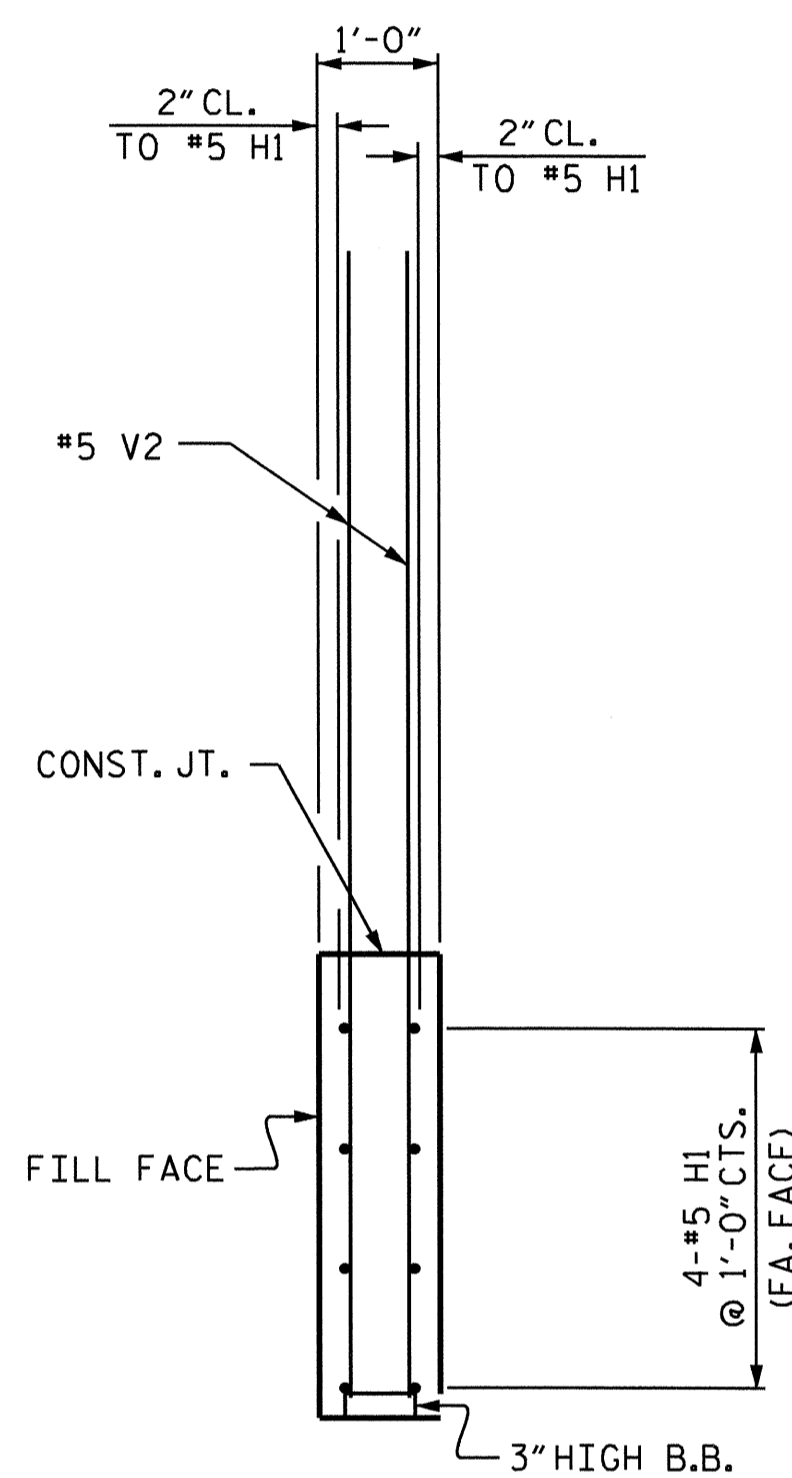
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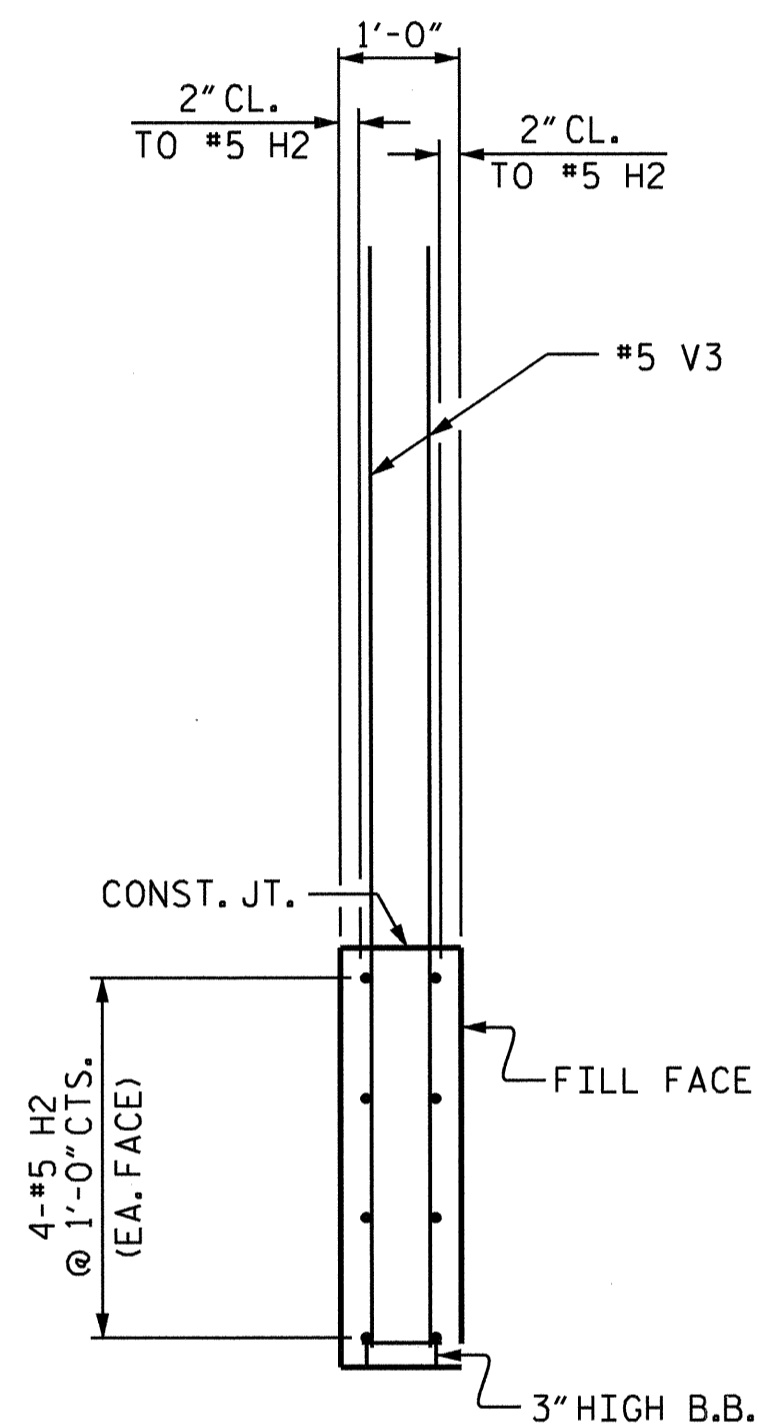
PLAN (W1)



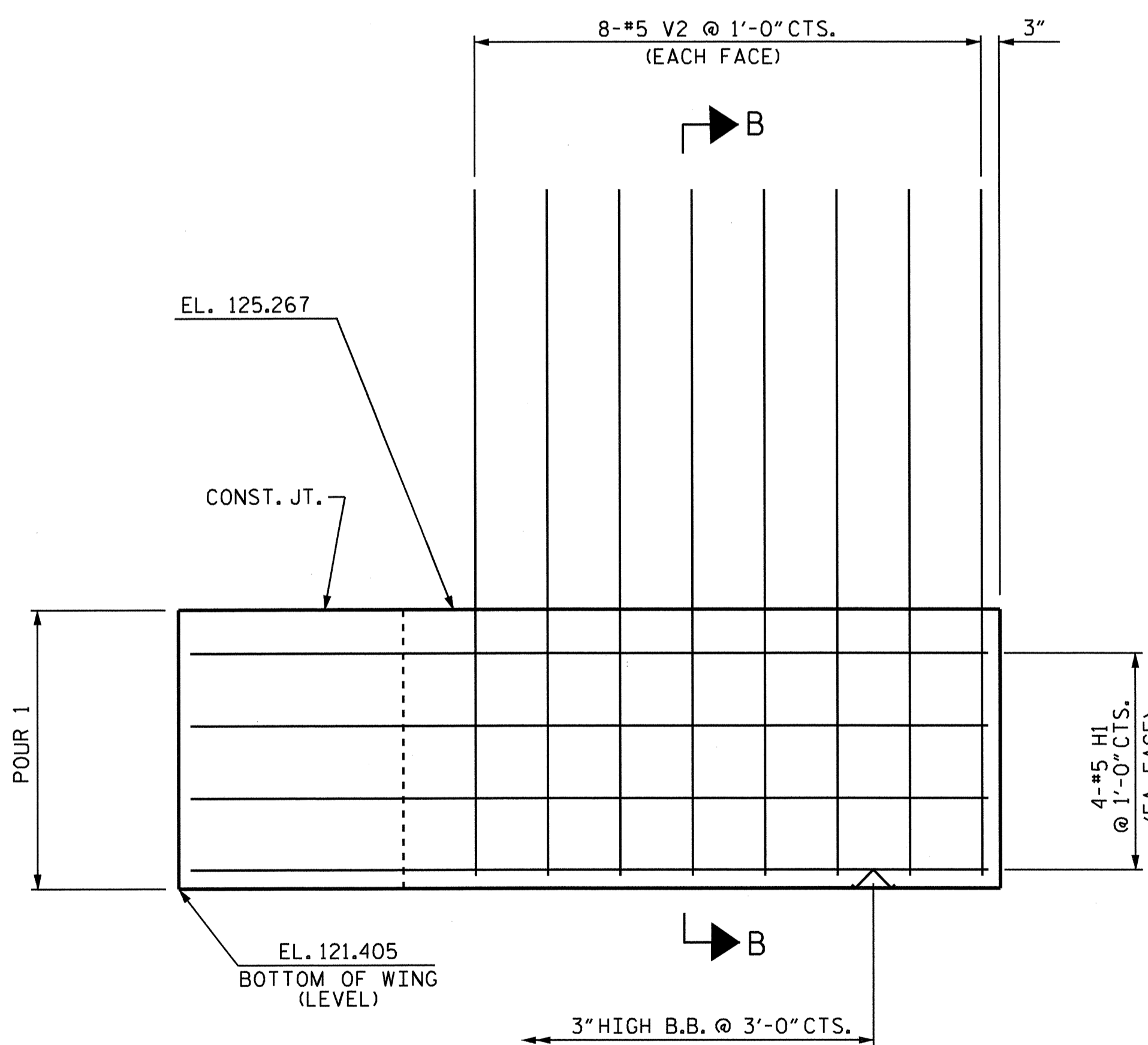
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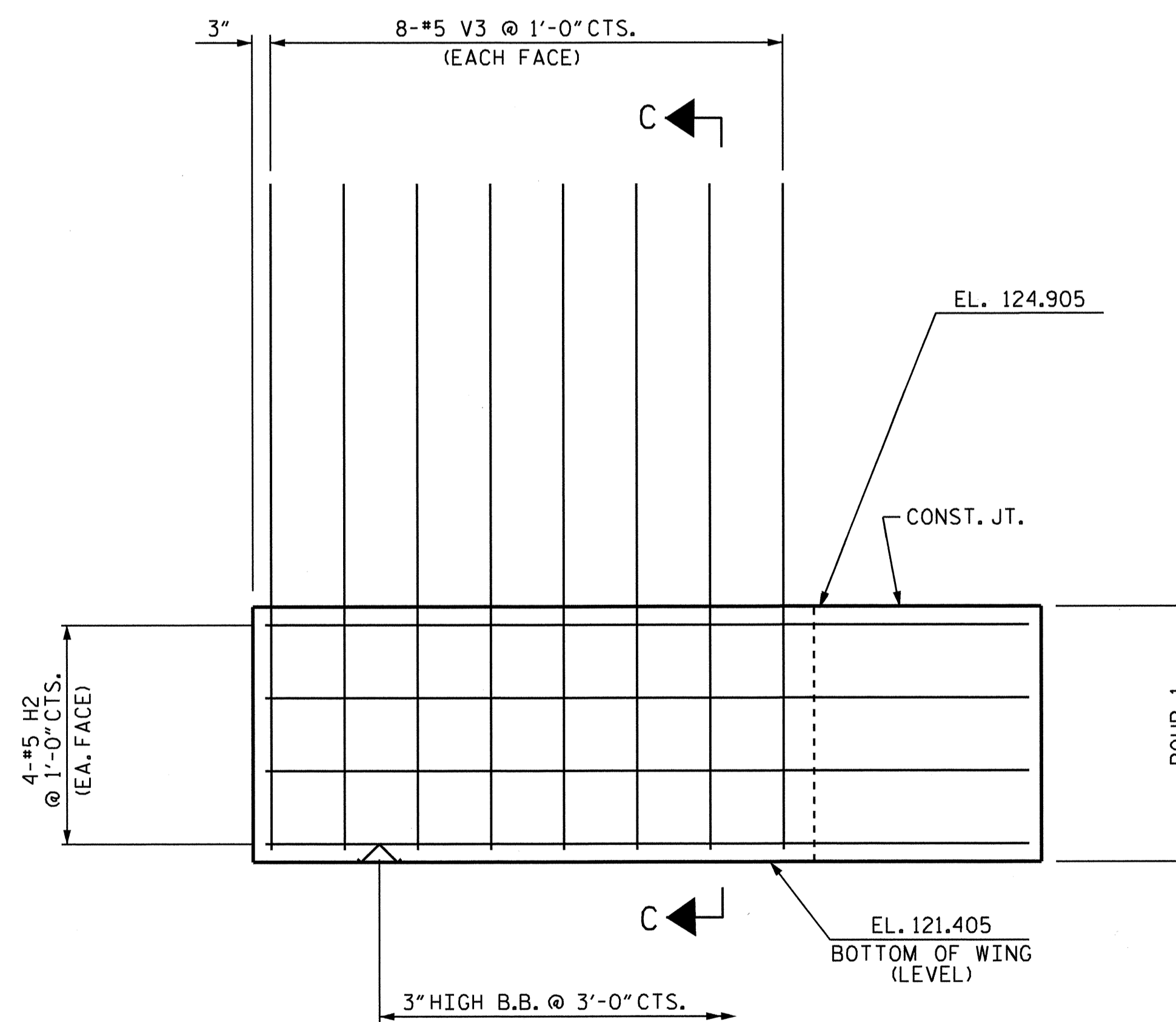
SECTION B-B



SECTION C-C



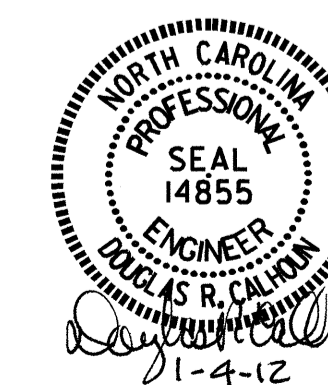
ELEVATION (W1)



ELEVATION (W2)

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 2 OF 3

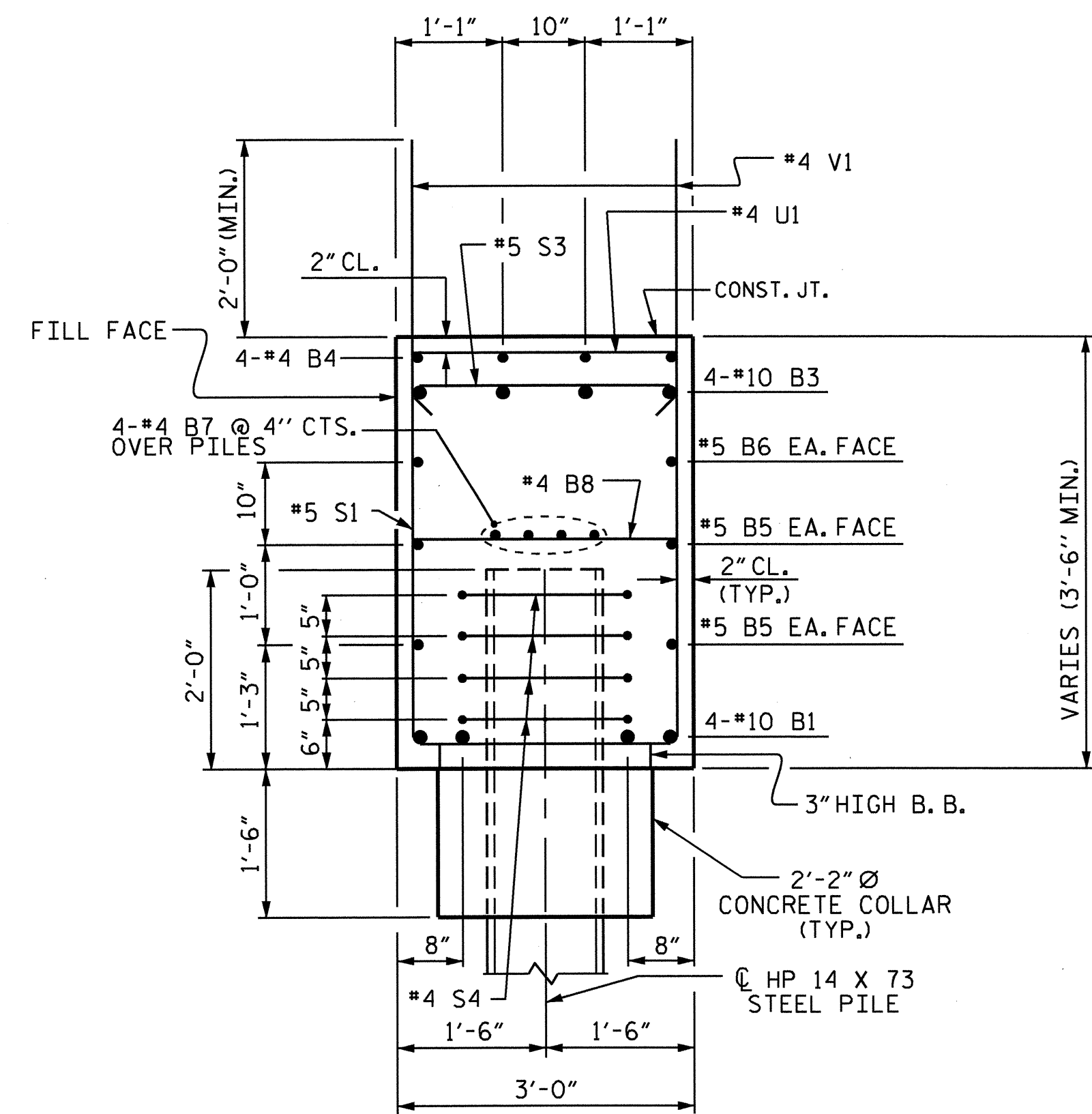
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 1



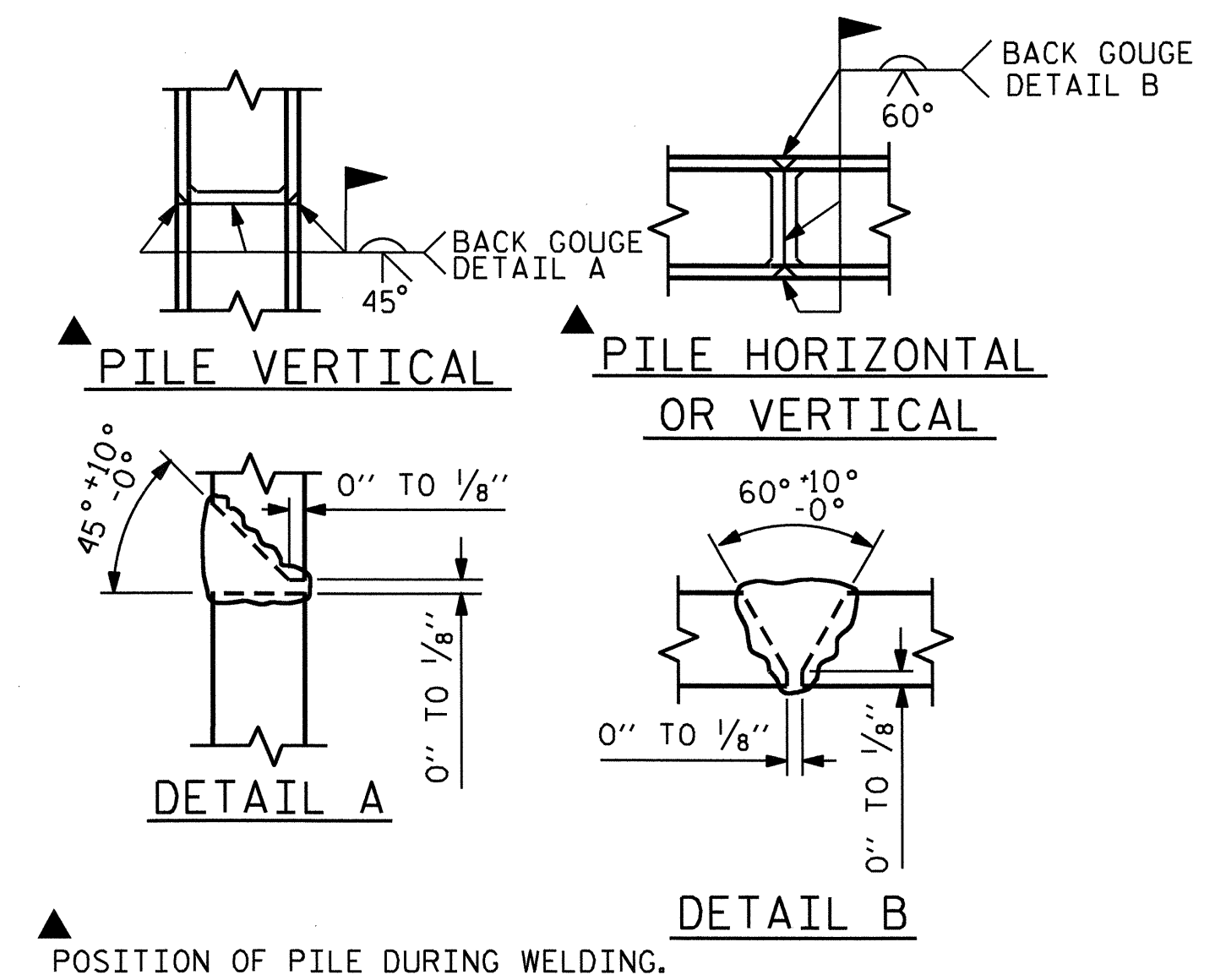
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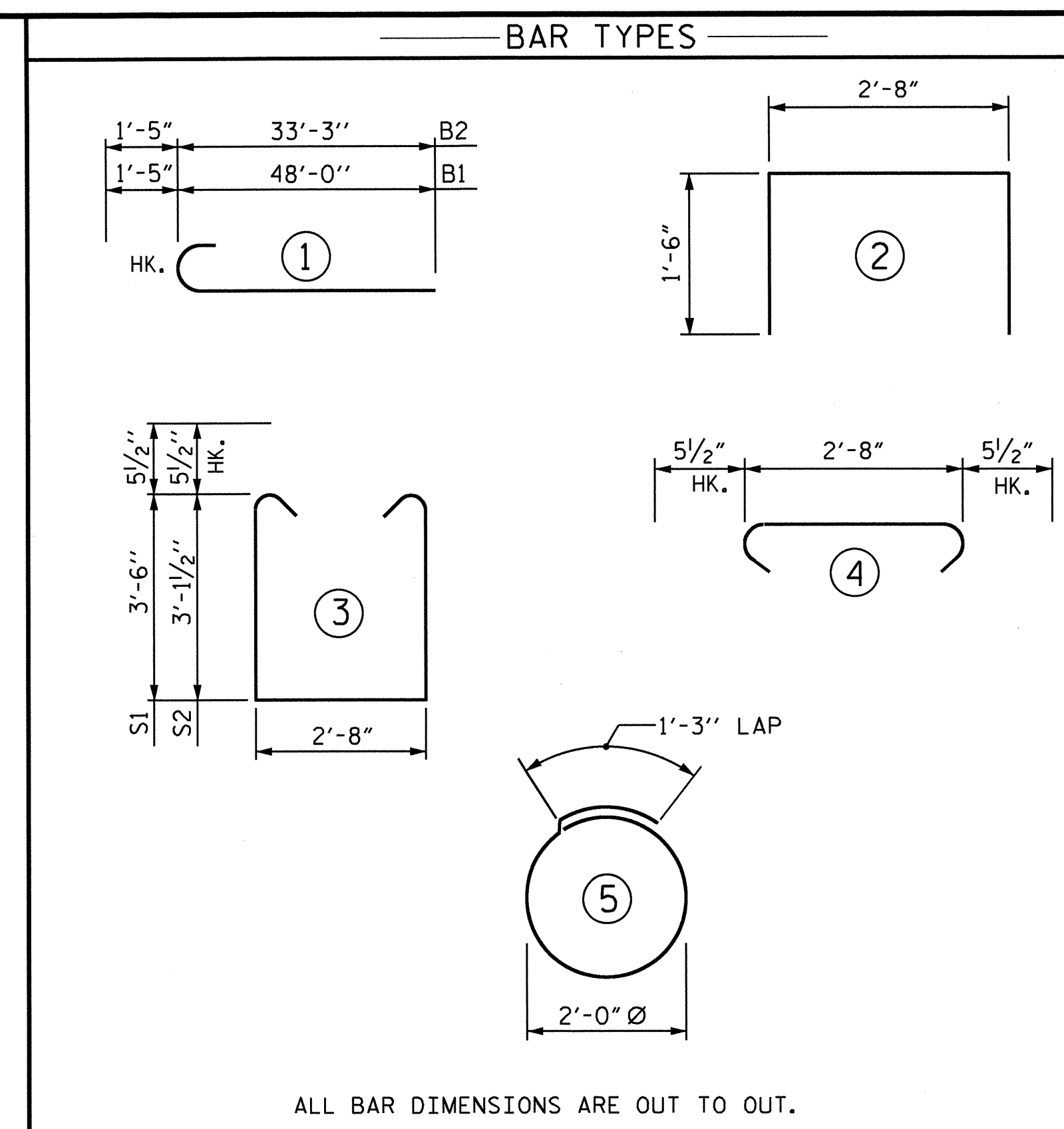
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2			4				



SECTION A-A

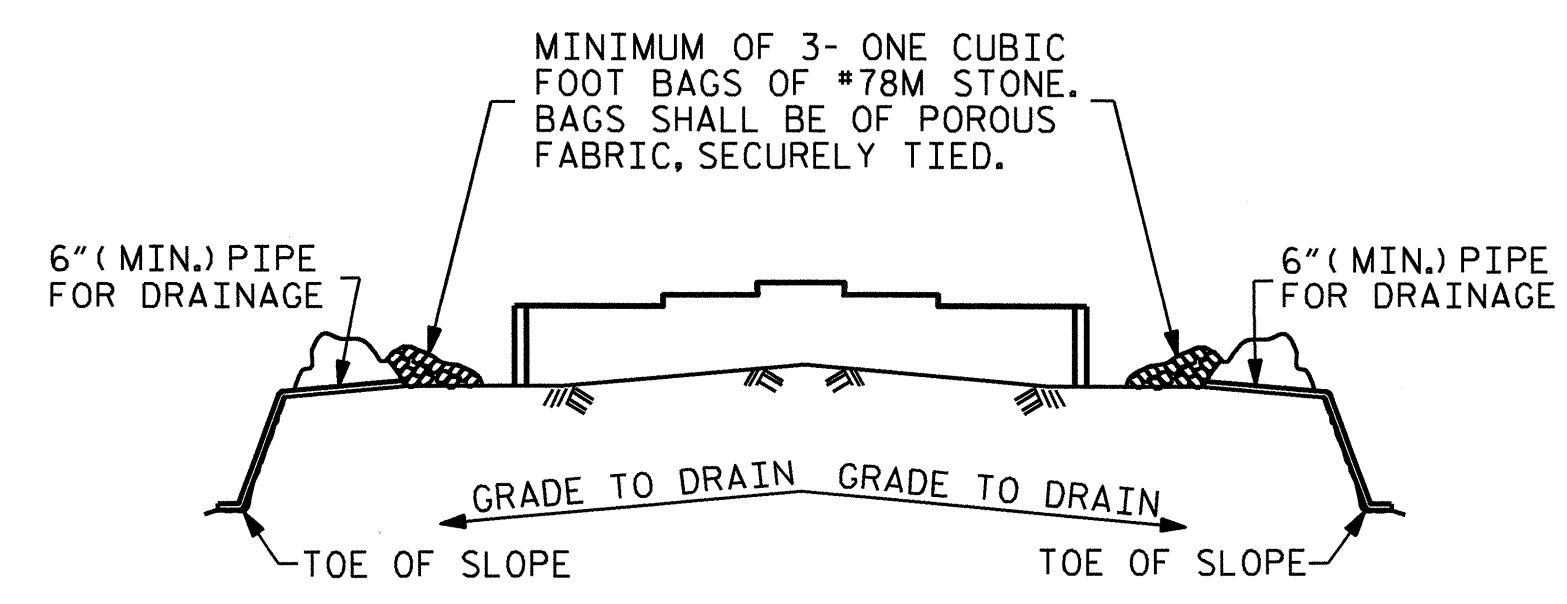


PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	49'-5"	1701
B2	8	#10	1	34'-8"	1193
B3	4	#10	STR	44'-8"	769
B4	4	#4	STR	17'-8"	47
B5	8	#5	STR	45'-7"	380
B6	2	#5	STR	58'-8"	122
B7	16	#4	STR	23'-10"	255
B8	25	#4	STR	2'-8"	45
H1	8	#5	STR	10'-9"	90
H2	8	#5	STR	10'-5"	87
S1	125	#5	3	10'-7"	1380
S2	31	#5	3	9'-10"	318
S3	156	#5	4	3'-7"	583
S4	56	#4	5	7'-7"	284
U1	12	#4	2	5'-8"	45
V1	132	#4	STR	6'-2"	544
V2	16	#5	STR	9'-6"	159
V3	16	#5	STR	9'-1"	152
REINFORCING STEEL					LBS 8154
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, CONCRETE COLLARS LOWER PART OF WINGS) C.Y. 44.1					
TOTAL					C.Y. 44.1
HP 14 X 73 STEEL PILES NO. : 14					420 FT.



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. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

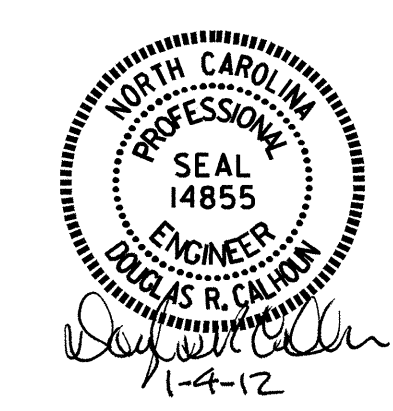
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

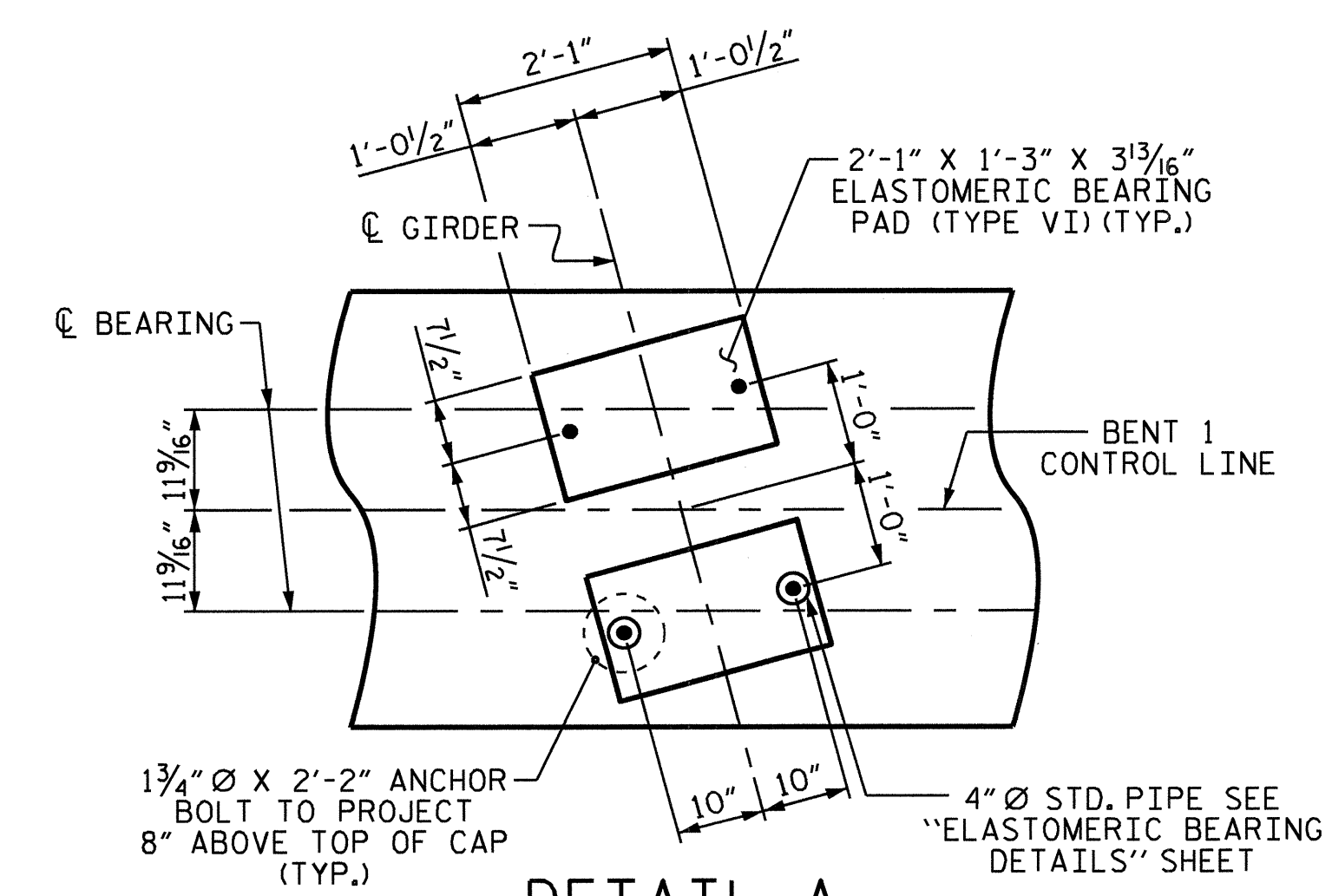
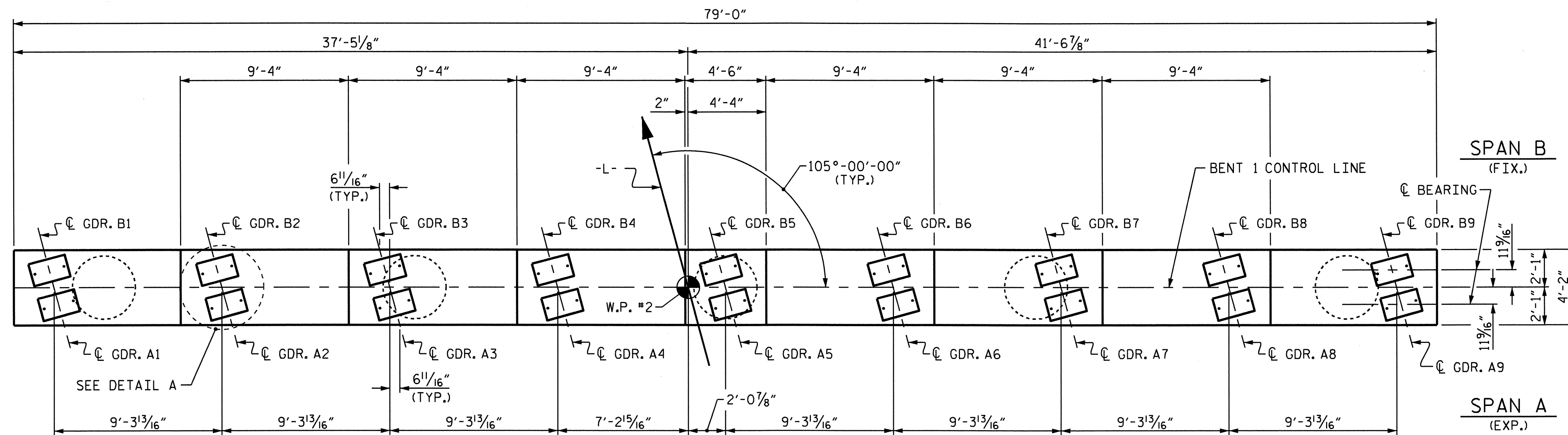
SUBSTRUCTURE  
 INTEGRAL END BENT 1

REVISIONS						SHEET NO.	
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2			4				

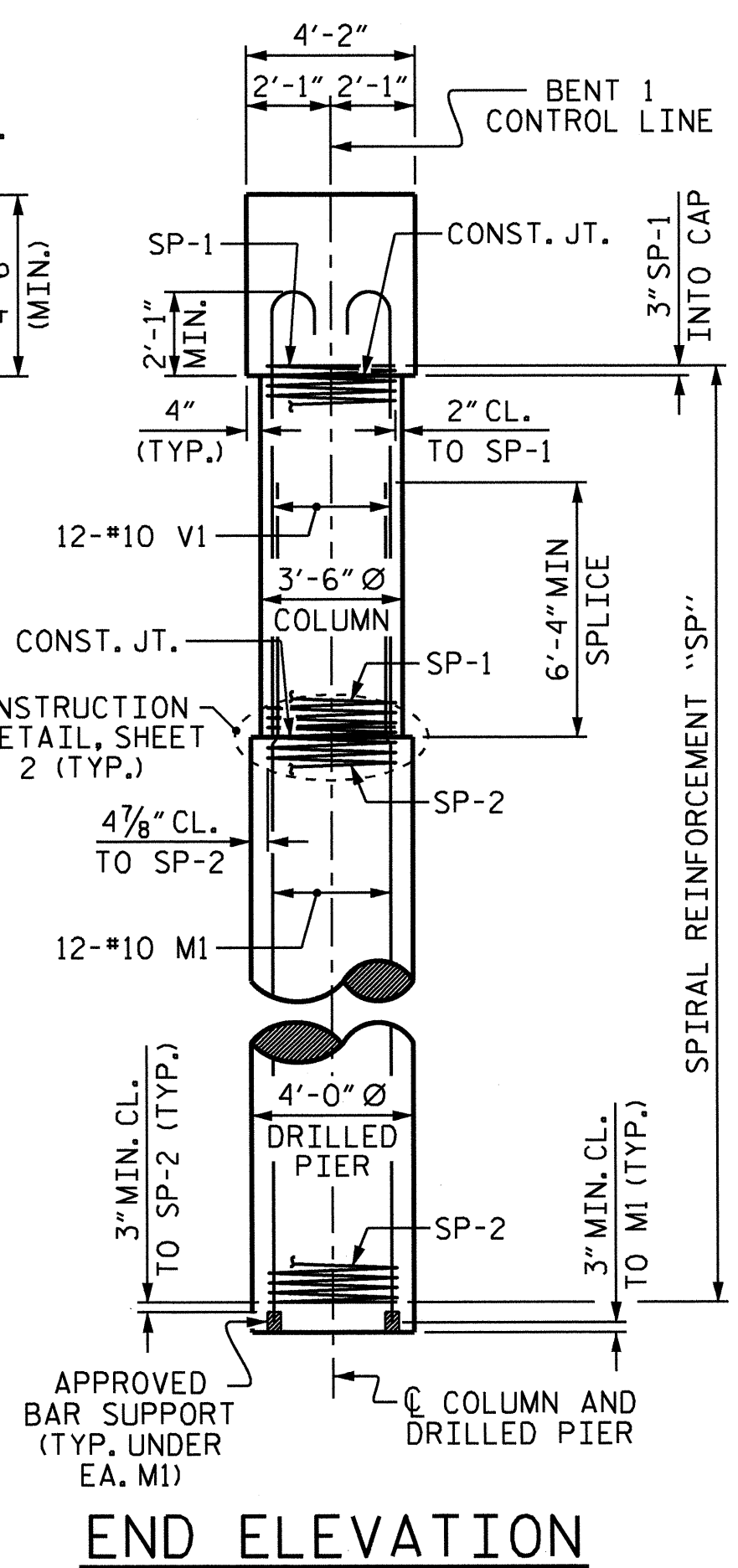
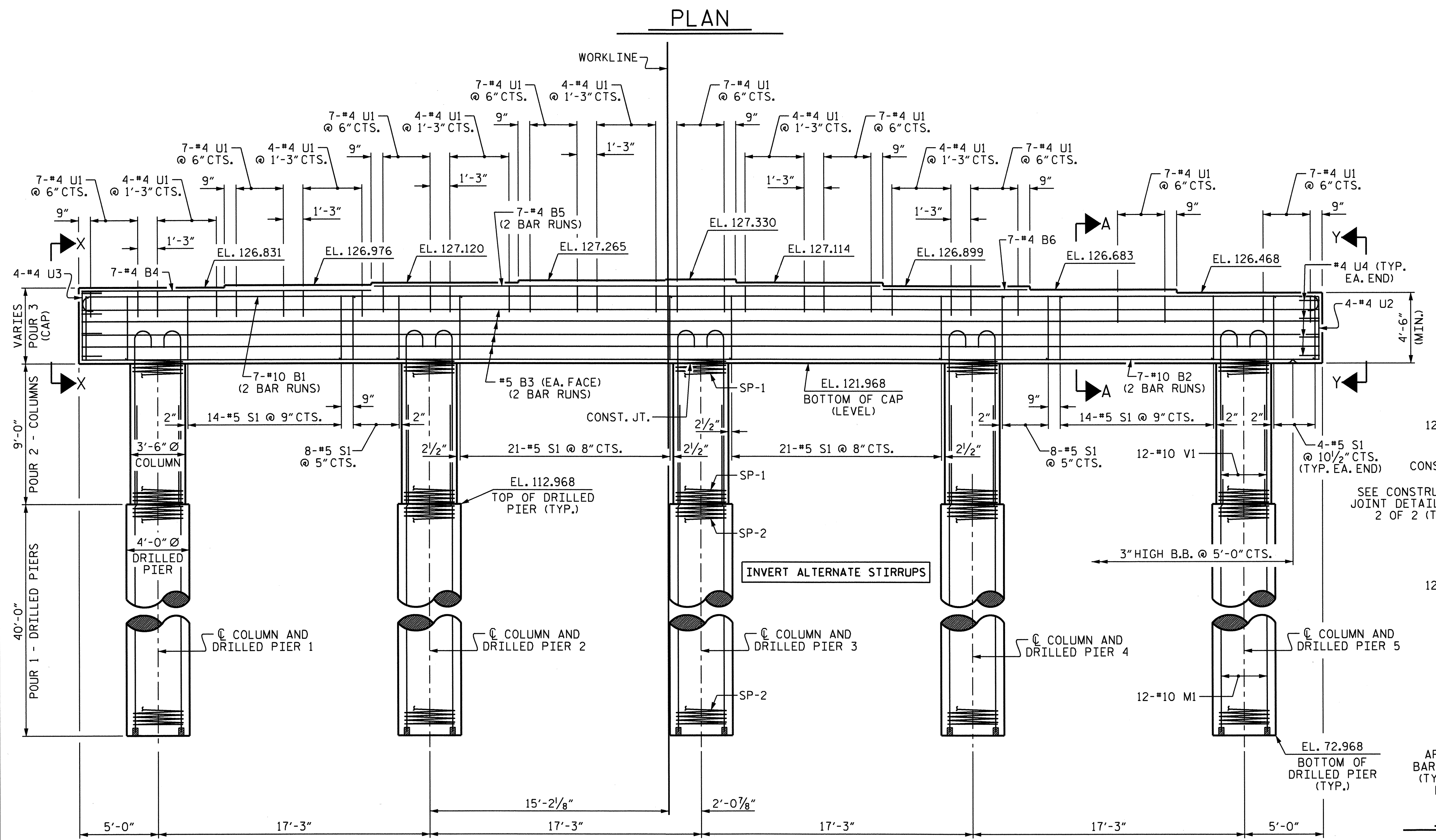
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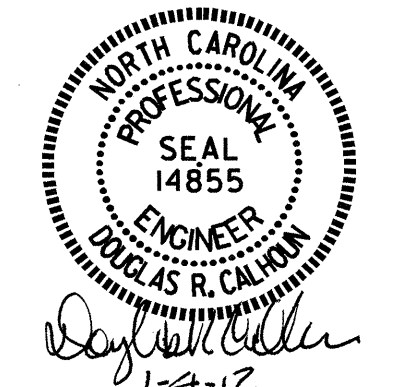




**DETAIL A**  
(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)



**END ELEVATION**



PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

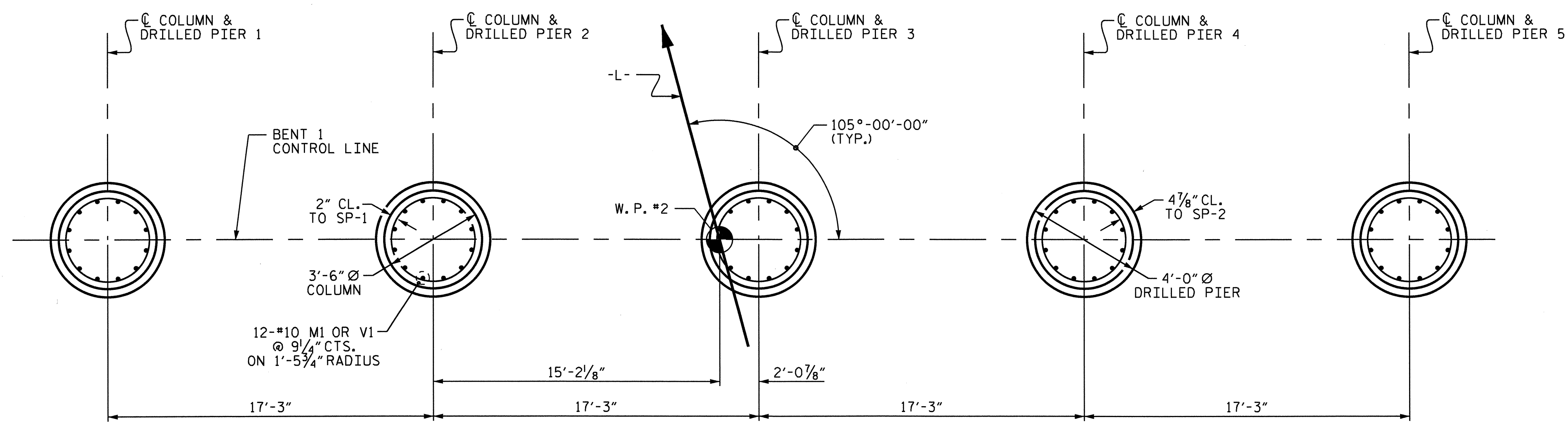
**SUBSTRUCTURE  
 BENT 1**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32	
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 CHECKED BY : J.L. WALTON  
 DATE : 9/8/11  
 DATE : 9/21/11

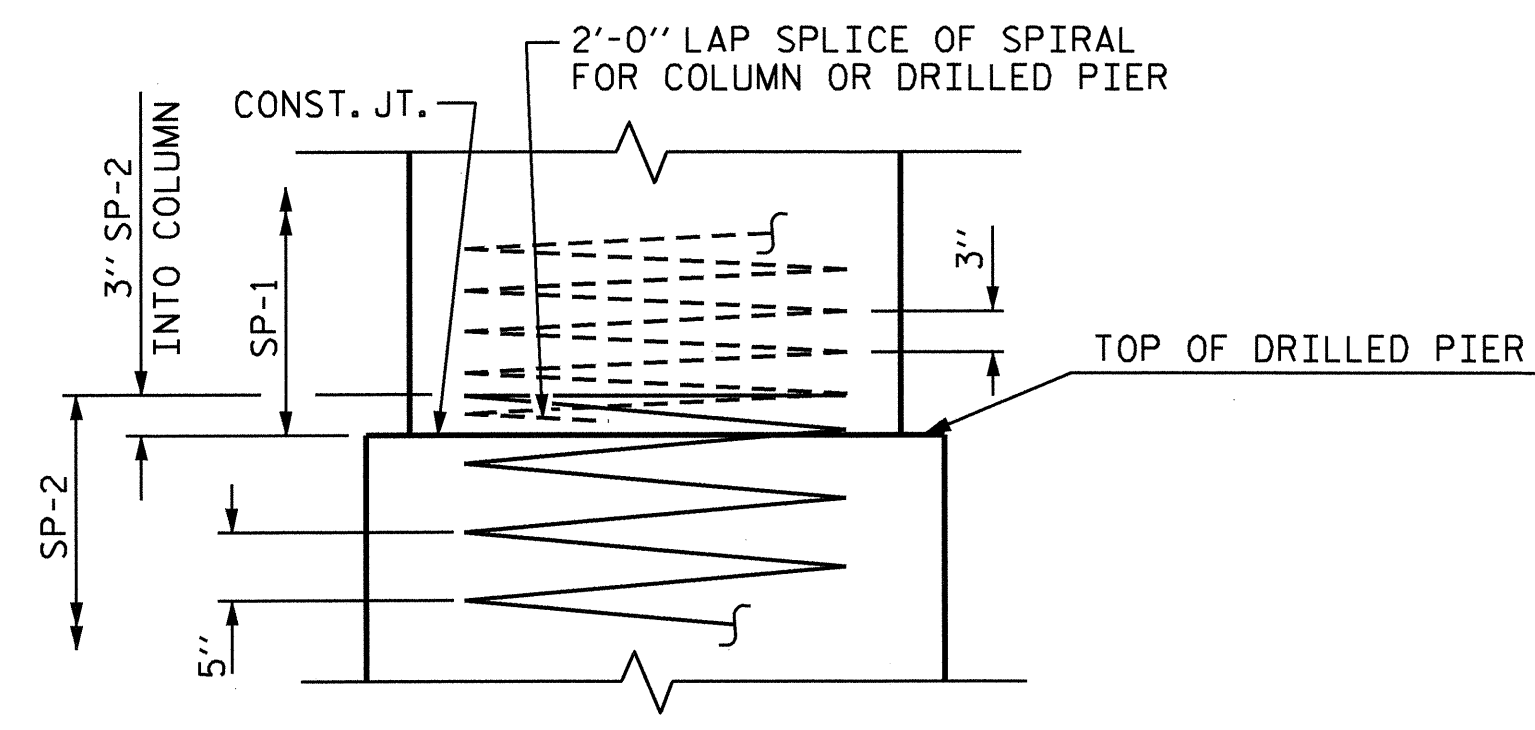
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)

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**PLAN OF COLUMNS AND DRILLED PIERS**

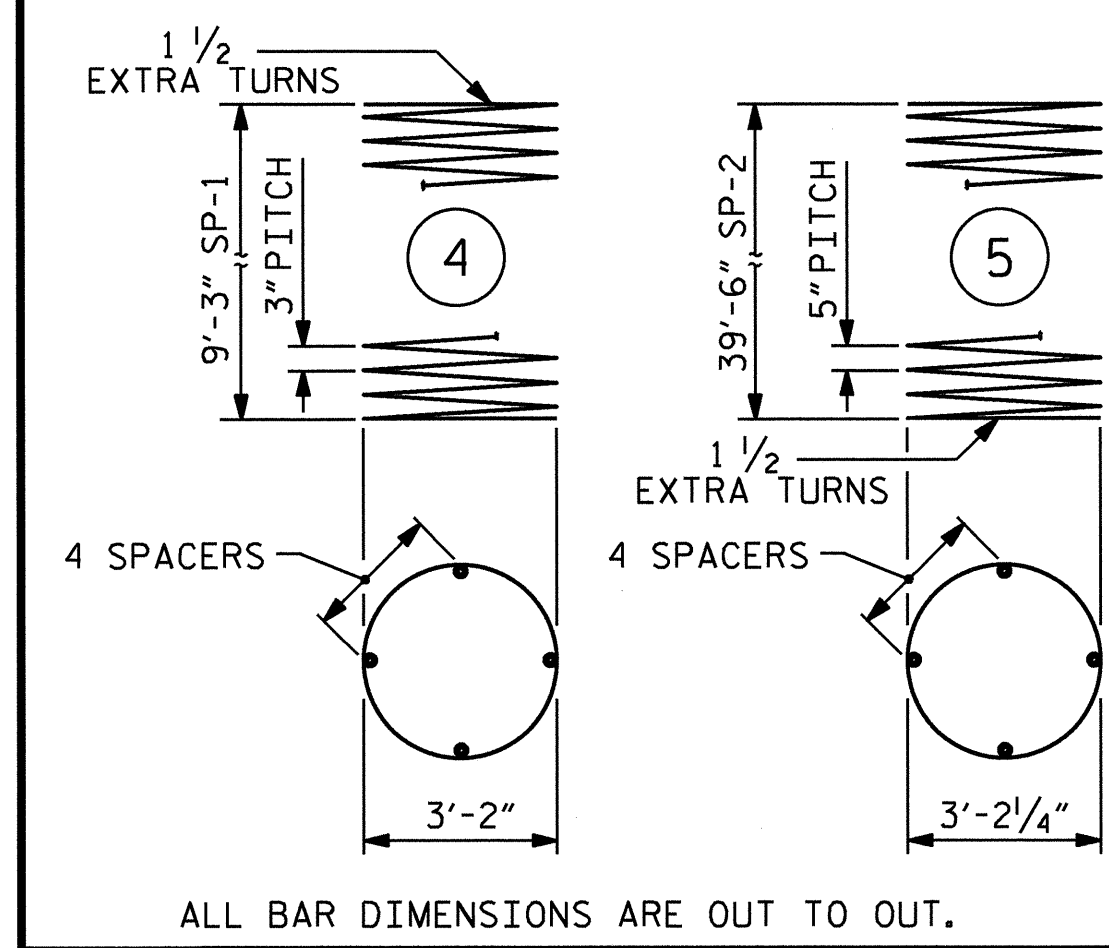
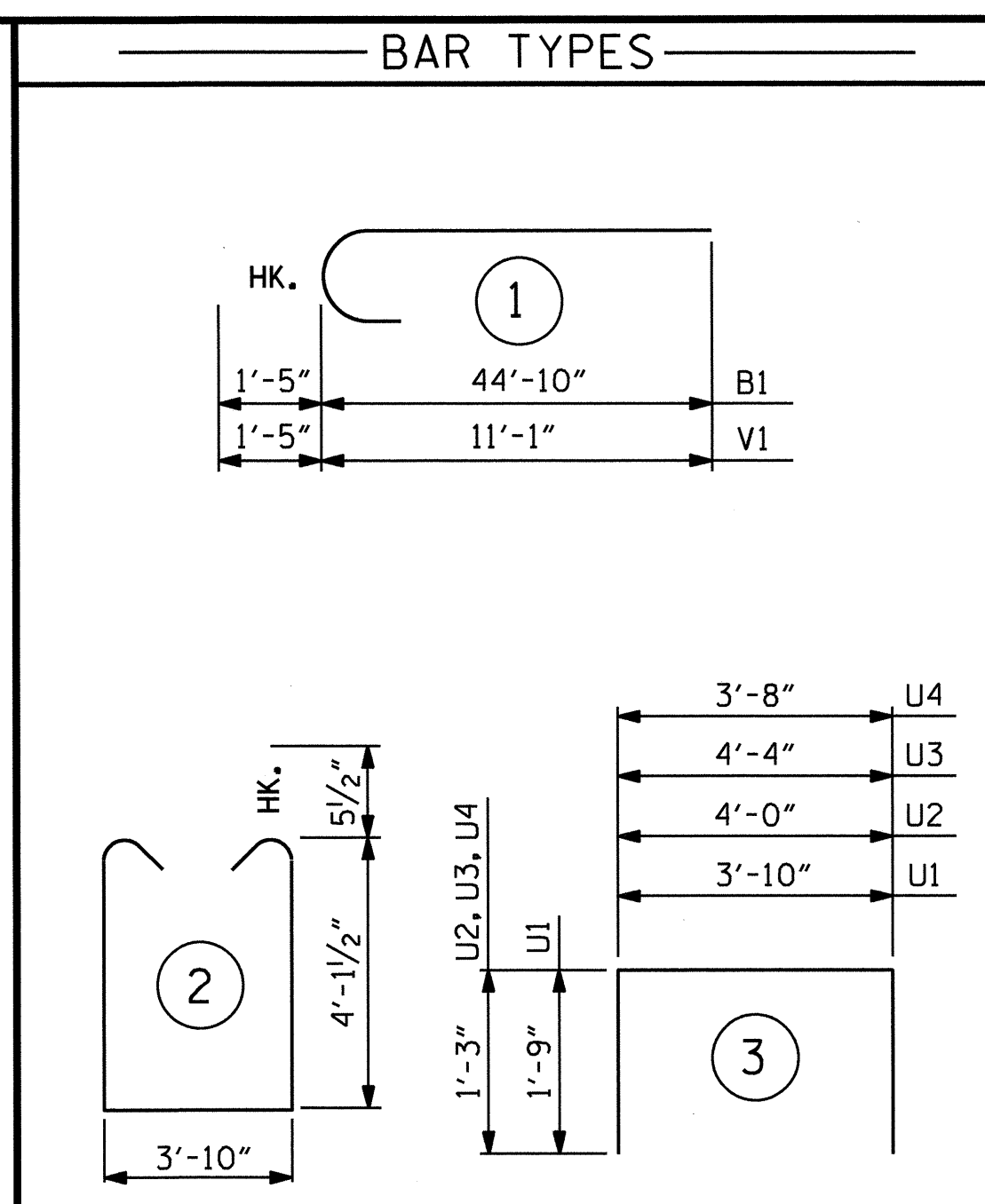
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)



**CONSTRUCTION JOINT DETAIL**

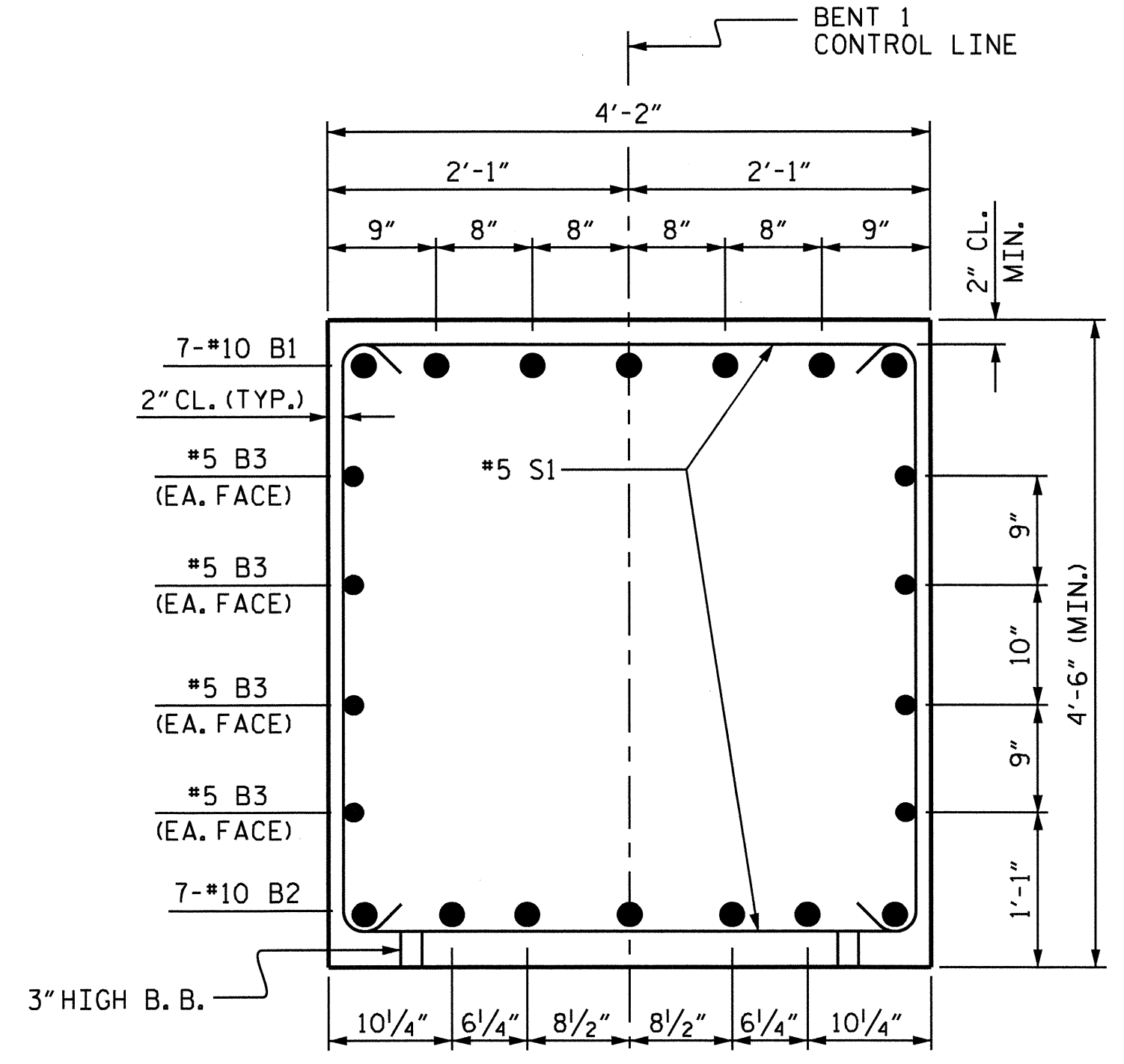
**NOTES**

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 CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.  
 FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.  
 EPOXY COAT THE BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.  
 THE TOP SURFACE AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND MEHTOD SHALL NOT BE USED.  
 NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES, CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.  
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

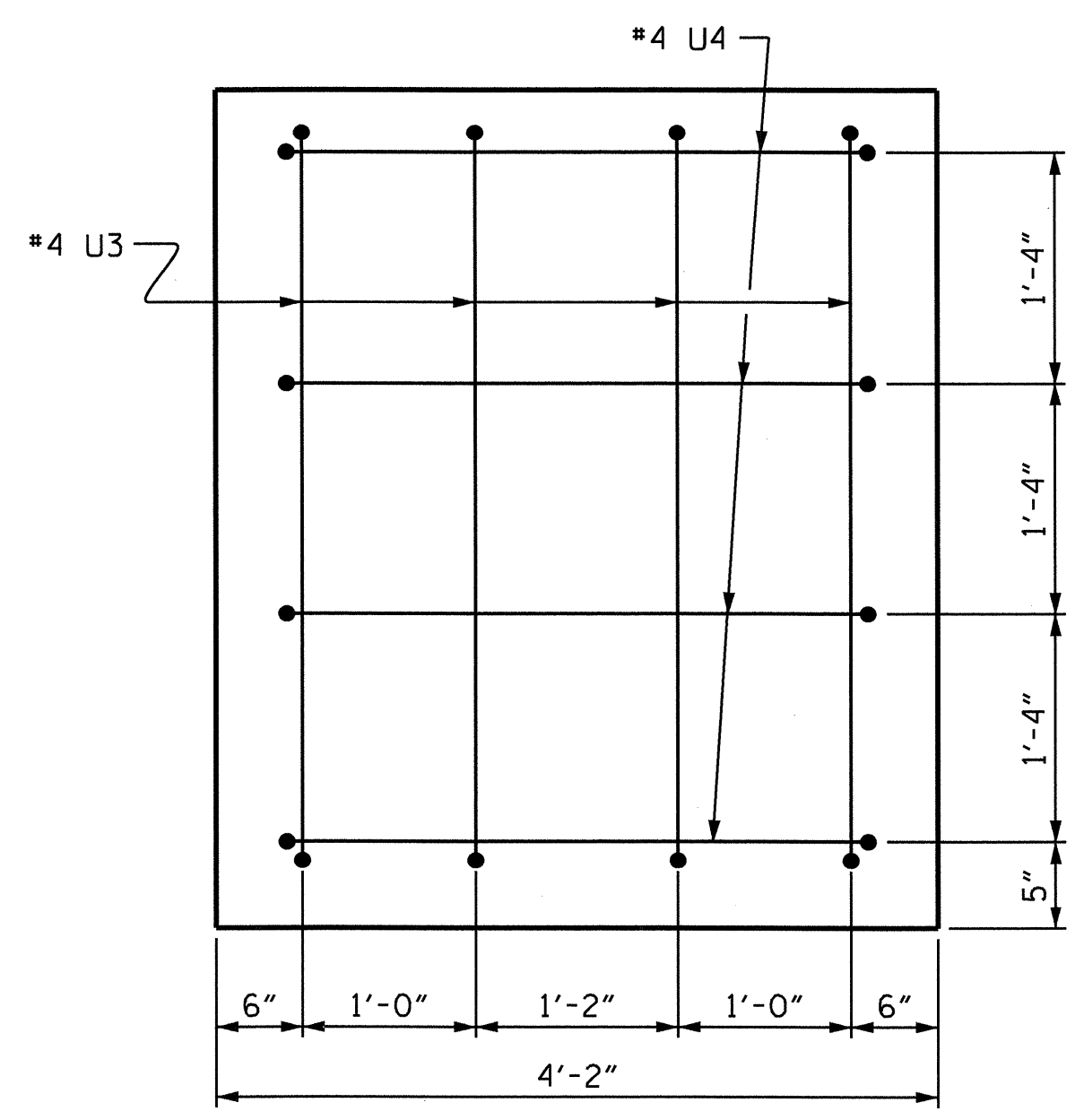


ALL BAR DIMENSIONS ARE OUT TO OUT.  
 \*\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR,  
 ▲ SEE NOTES

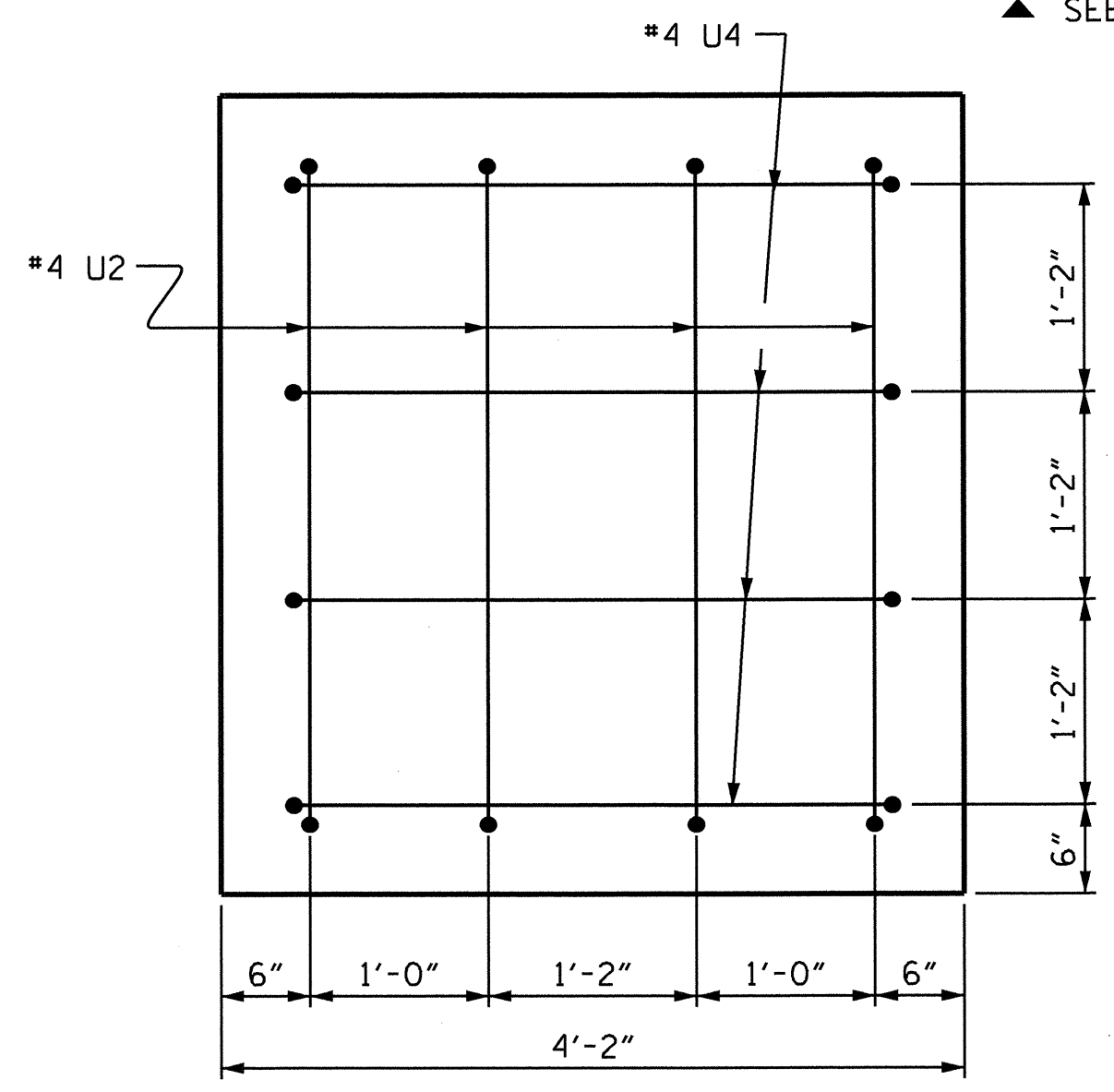
SPLICE CHART	
BAR	MIN. SPLICE LENGTH
#10 B1	11'-1"
#10 B2	7'-11"
#5 B3	3'-0"
#4 B5	2'-5"



**SECTION A-A**



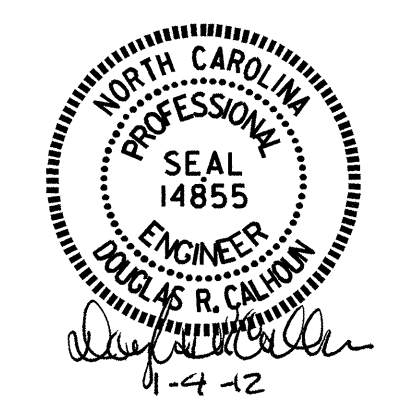
**VIEW X-X**



**VIEW Y-Y**

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#10	1	46'-3"	2786
B2	14	#10	STR	43'-4"	2610
B3	16	#5	STR	40'-10"	681
B4	7	#4	STR	18'-5"	86
B5	14	#4	STR	17'-4"	162
B6	7	#4	STR	9'-2"	43
M1	60	#10	STR	49'-1"	12672
S1	94	#5	2	13'-0"	1275
U1	87	#4	3	7'-4"	426
U2	4	#4	3	6'-6"	17
U3	4	#4	3	6'-10"	18
U4	8	#4	3	6'-2"	33
V1	60	#10	1	12'-6"	3227
REINFORCING STEEL					24036 LBS.
SP-1	5	***	4	377'-6"	1261
SP-2	5	**	5	949'-10"	4953
SPIRAL COLUMN REINFORCING STEEL					6214 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)					16.1 CU.YDS.
POUR 3 (CAP)					60.7 CU.YDS.
TOTAL CLASS A CONCRETE					76.8 CU.YDS.
4'-0" Ø DRILLED PIERS					
DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)					93.1 CU.YDS.
4'-0" Ø DRILLED PIERS IN SOIL :					
					144.00 LIN. FT.
4'-0" Ø DRILLED PIERS NOT IN SOIL :					
					56.00 LIN. FT.
CSL TUBES ▲					825 LIN. FT.

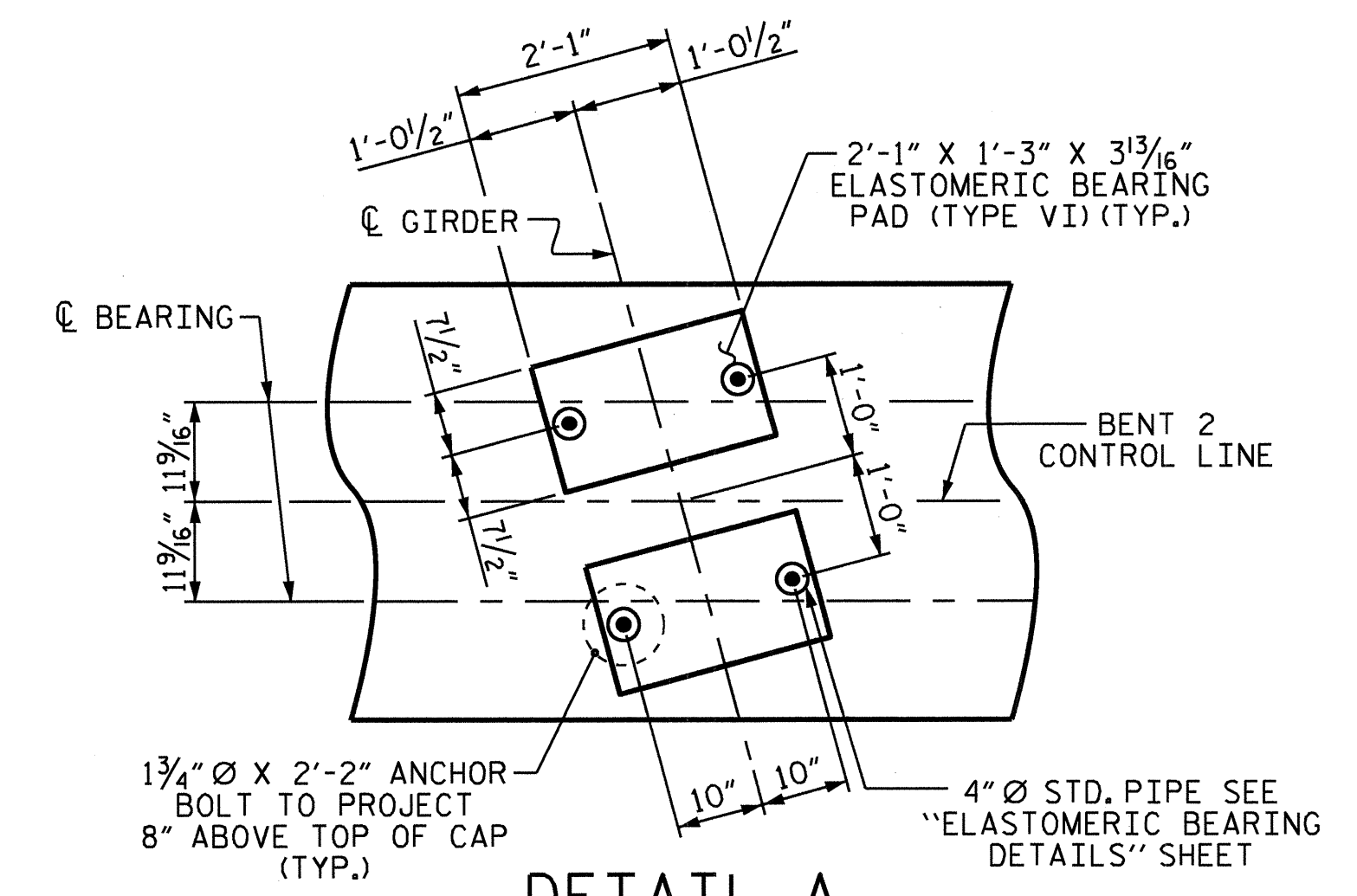
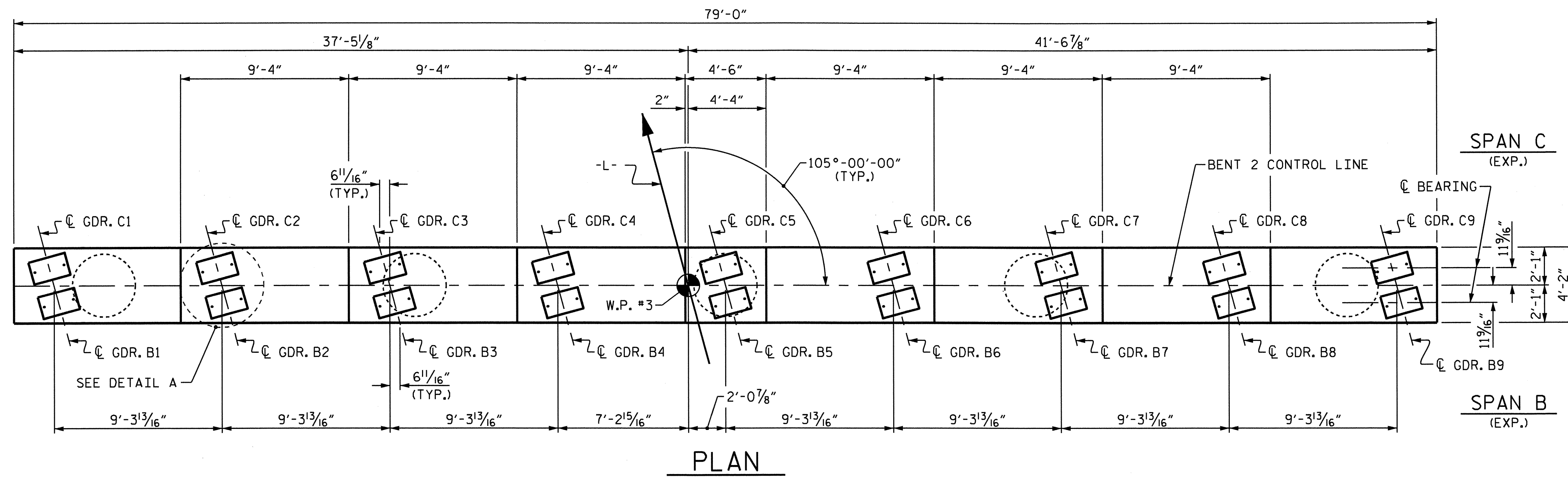
PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 2 OF 2



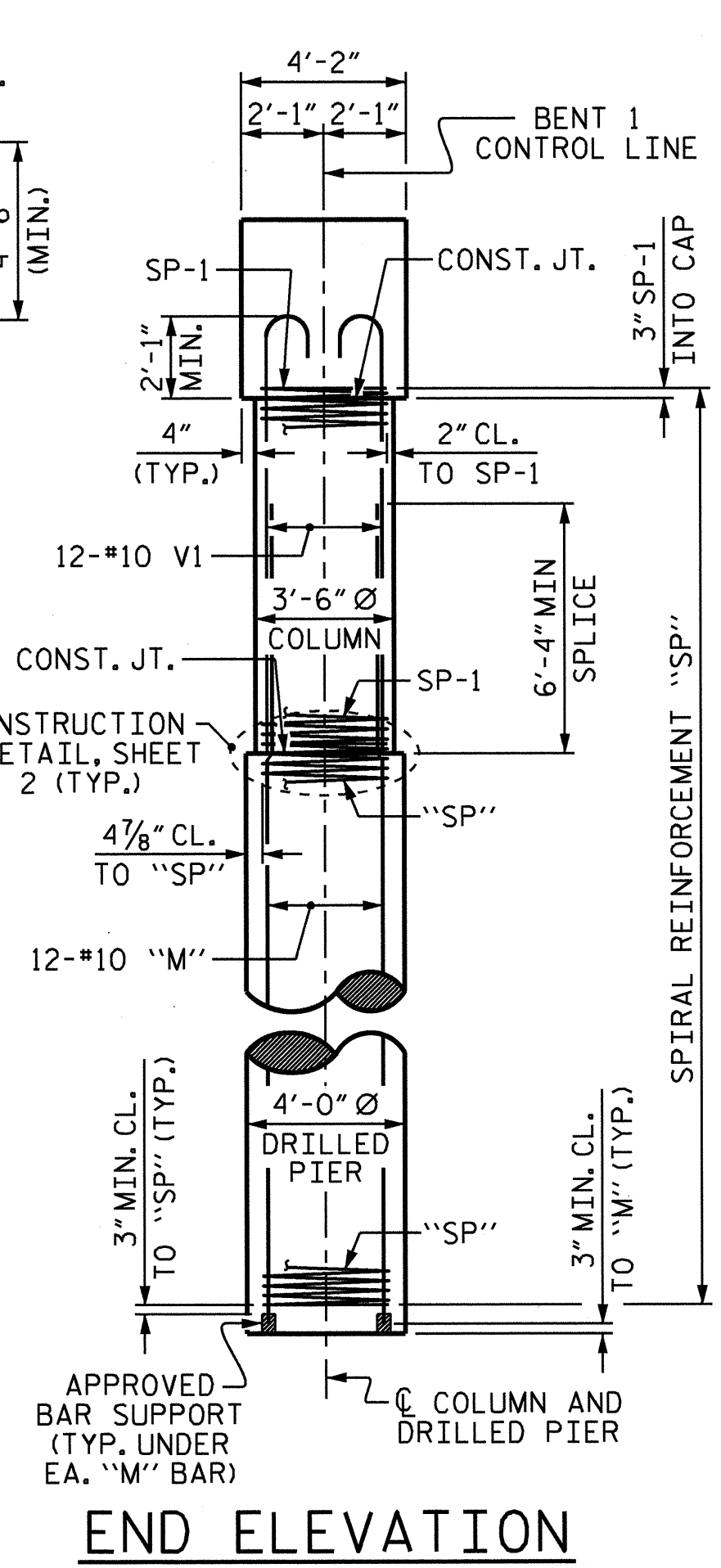
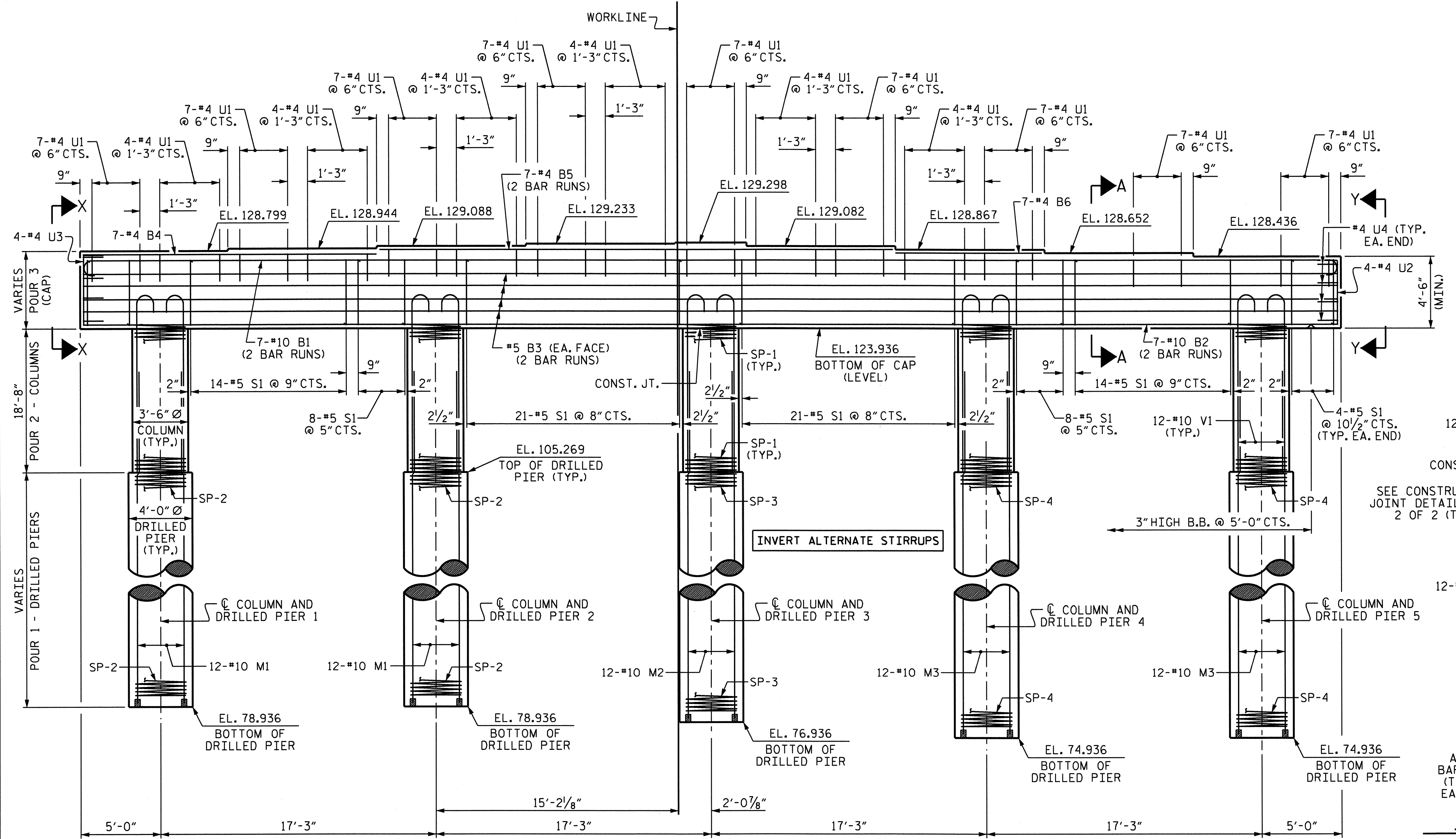
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SUBSTRUCTURE BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

DRAWN BY : B.N. GRADY DATE : 9/8/11  
 CHECKED BY : J.L. WALTON DATE : 9/21/11

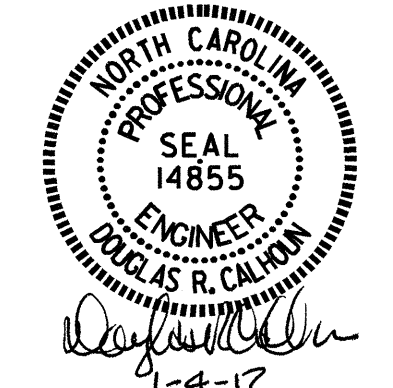
SHEET NO.  
S-33  
TOTAL SHEETS  
42



DETAIL A  
(DETAILS AND DIMENSIONS ARE TYPICAL FOR EACH BEARING)



END ELEVATION



PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

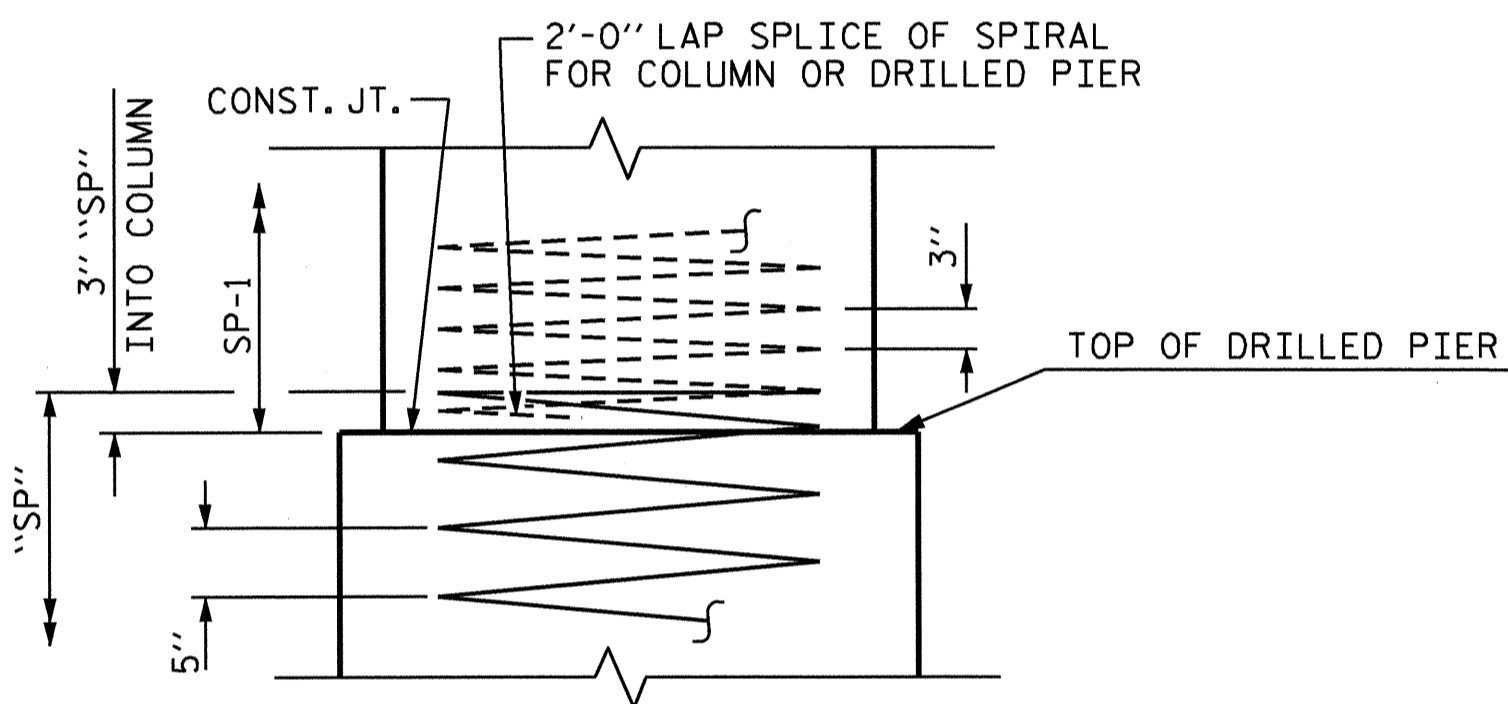
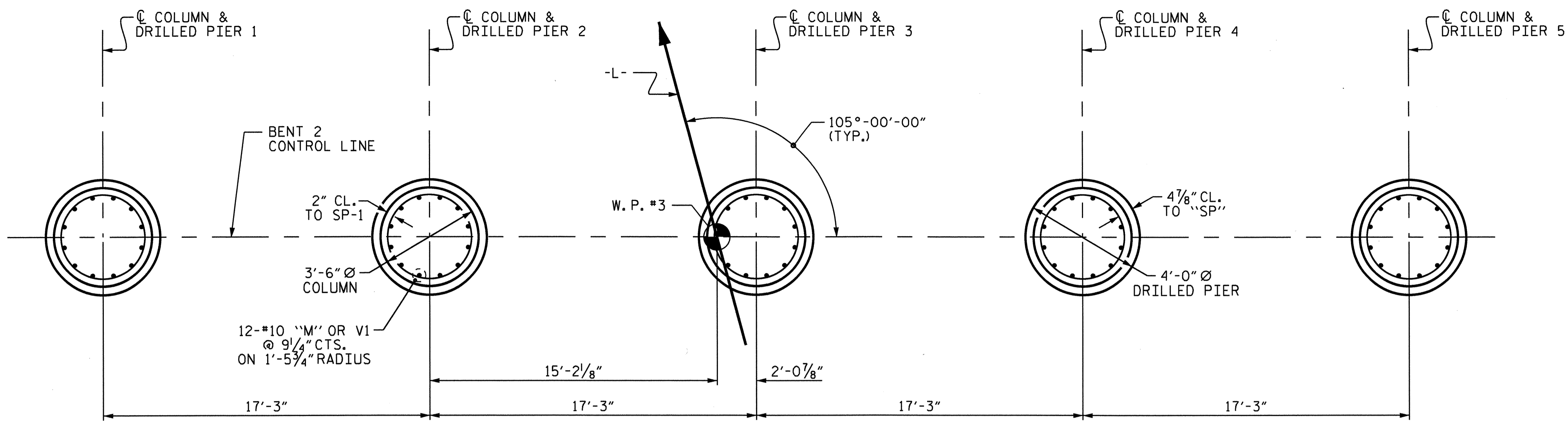
SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
BENT 2

DRAWN BY : B.N. GRADY DATE : 9/8/11  
 CHECKED BY : J.L. WALTON DATE : 9/22/11

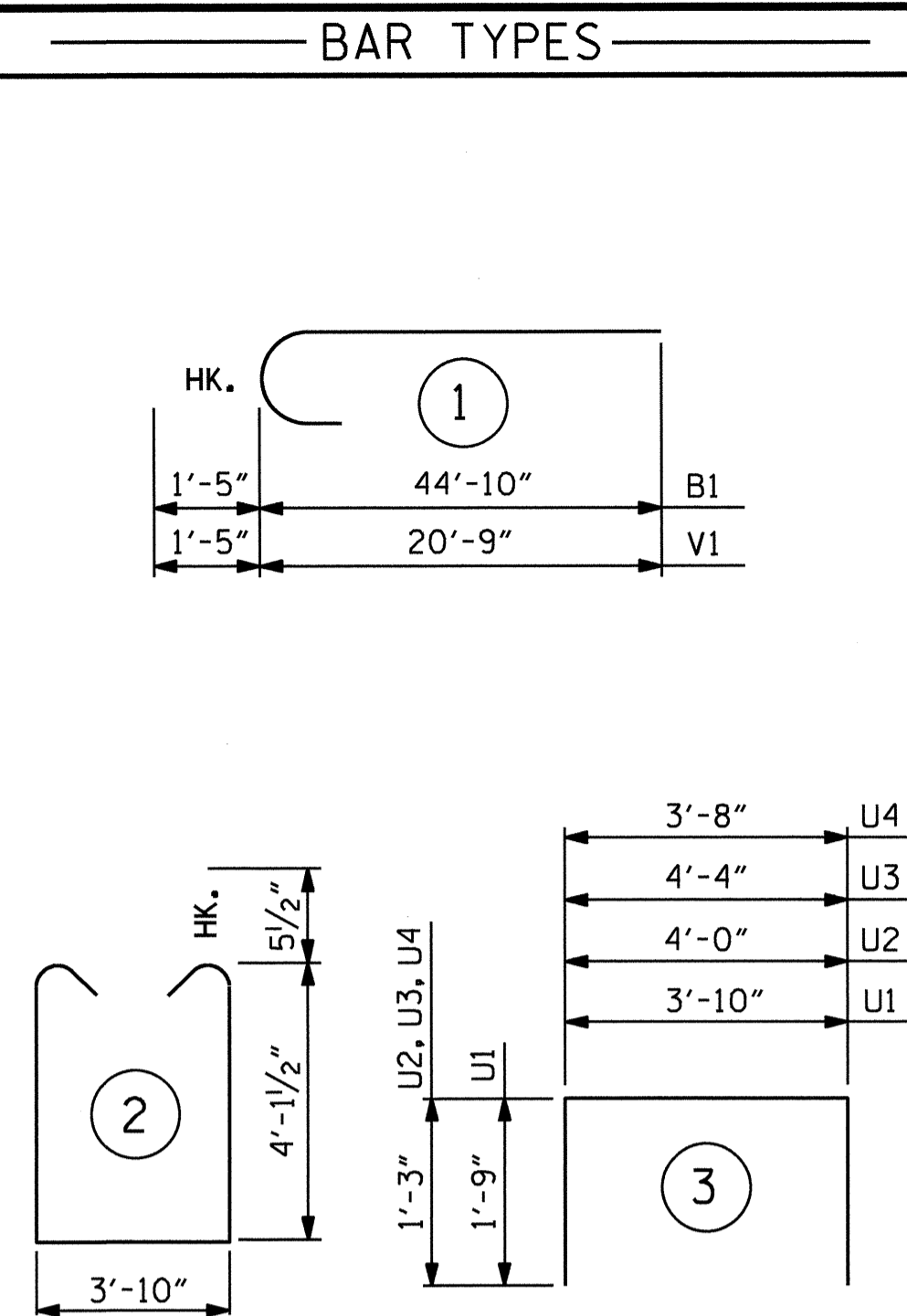
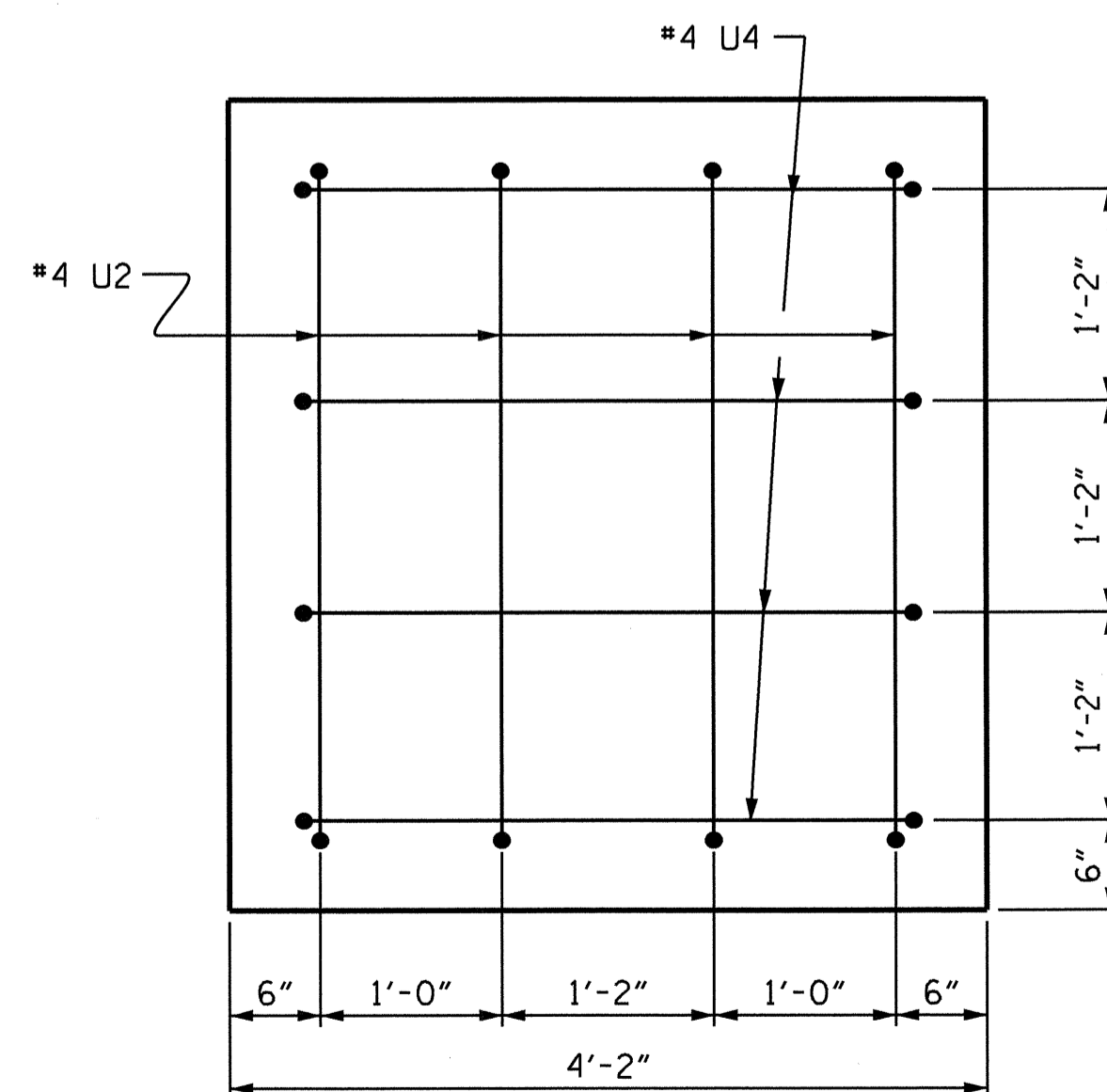
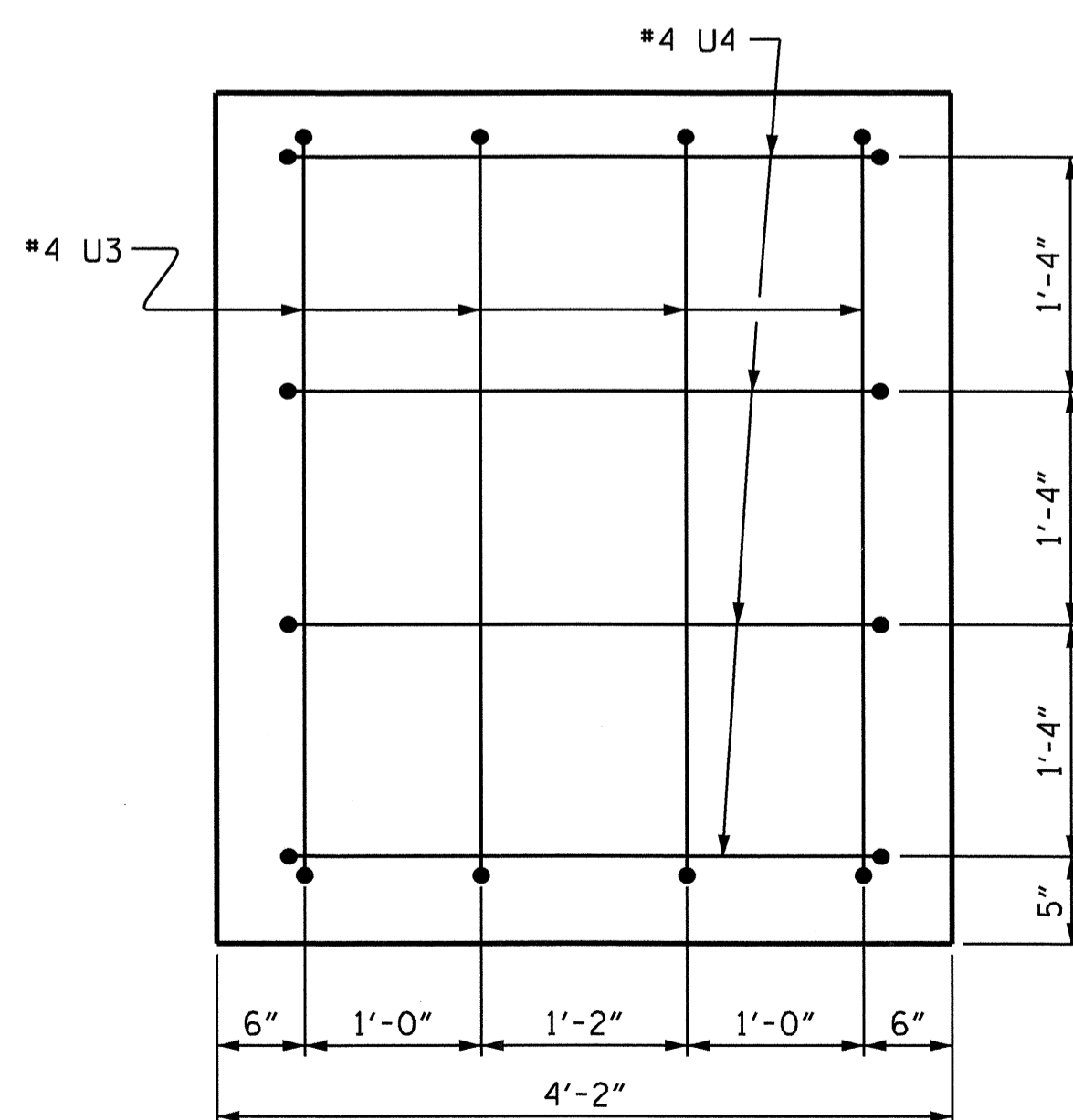
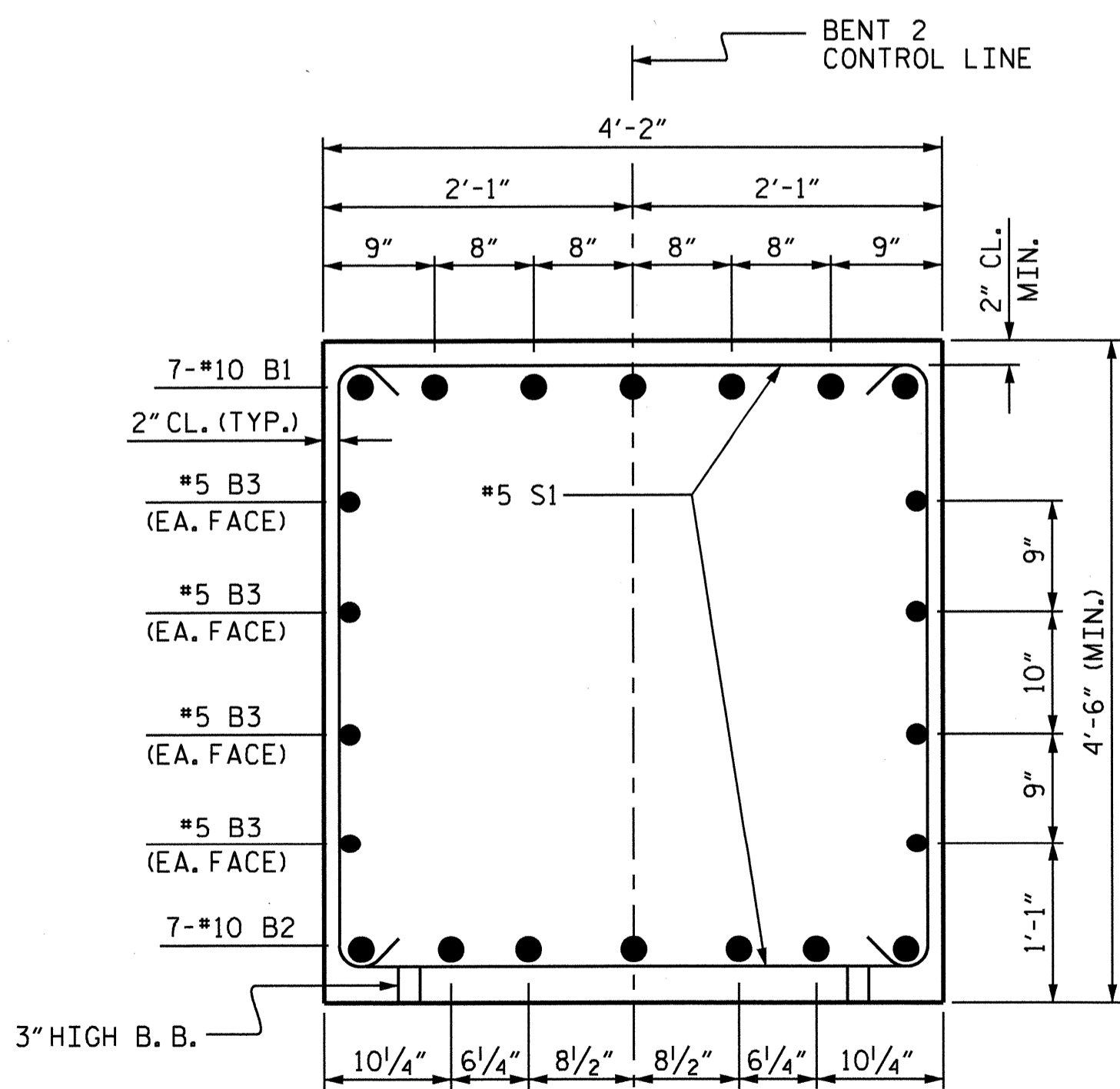
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS	
2			4			42	



**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 CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.
- EPOXY COAT THE BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.
- THE TOP SURFACE AREAS OF THE BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



**BILL OF MATERIAL**

**BENT 2**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	14	#10	1	46'-3"	2786
B2	14	#10	STR	43'-4"	2610
B3	16	#5	STR	40'-10"	681
B4	7	#4	STR	18'-5"	86
B5	14	#4	STR	17'-4"	162
B6	7	#4	STR	9'-2"	43
M1	24	#10	STR	35'-5"	3658
M2	12	#10	STR	37'-5"	1932
M3	24	#10	STR	39'-5"	4071
S1	94	#5	2	13'-0"	1275
U1	87	#4	3	7'-4"	426
U2	4	#4	3	6'-6"	17
U3	4	#4	3	6'-10"	18
U4	8	#4	3	6'-2"	33
V1	60	#10	1	22'-2"	5723

REINFORCING STEEL 23521 LBS.

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	5	***	4	757'-5"	2530
SP-2	2	**	5	625'-1"	1304
SP-3	1	**	5	674'-3"	703
SP-4	2	**	5	721'-0"	1504

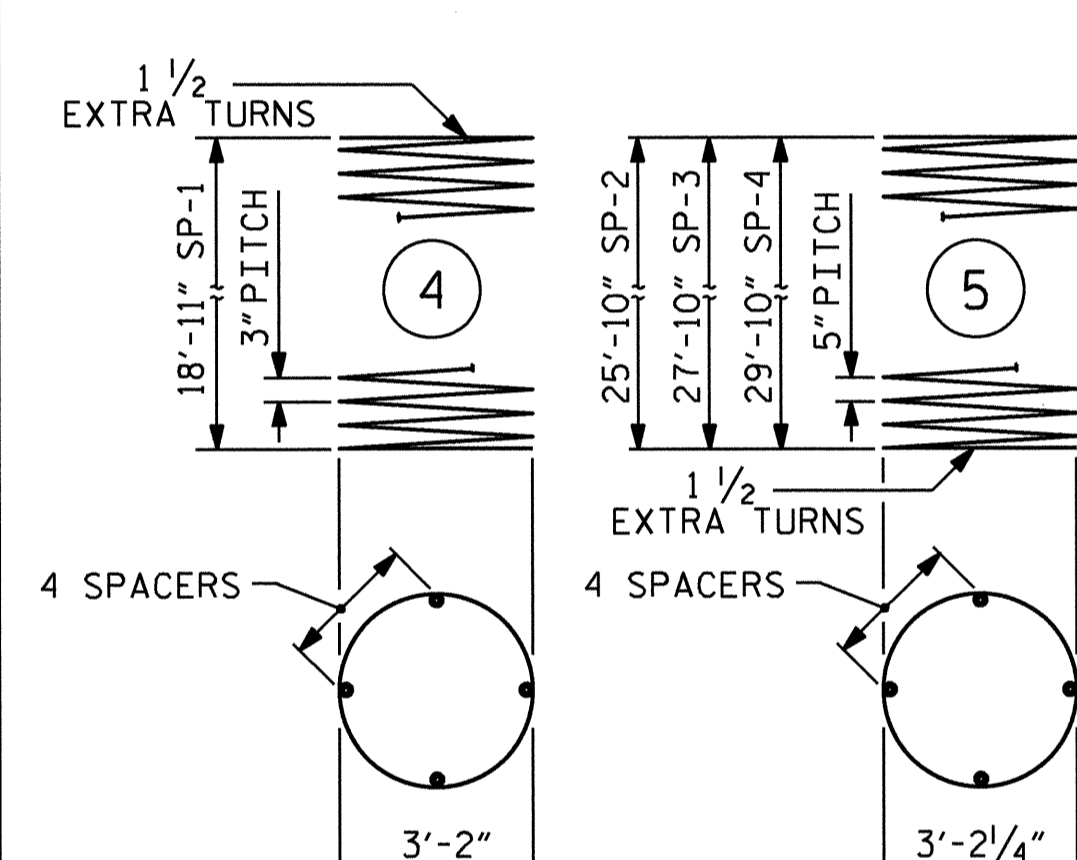
SPIRAL COLUMN REINFORCING STEEL 6041 LBS.

**CLASS A CONCRETE BREAKDOWN**

POUR	DESCRIPTION	VOLUME (CU. YDS.)
POUR 2	(COLUMNS)	33.3
POUR 3	(CAP)	60.7
TOTAL	CLASS A CONCRETE	94.0

**4'-0" Ø DRILLED PIERS**

DESCRIPTION	VOLUME (CU. YDS.)
DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)	66.0
4'-0" Ø DRILLED PIERS IN SOIL	76.67 LIN. FT.
4'-0" Ø DRILLED PIERS NOT IN SOIL	65.00 LIN. FT.
PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	79.8 LIN. FT.
CSL TUBES	587 LIN. FT.



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

\*\* THE SP-2, SP-3, AND SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

▲ SEE NOTES

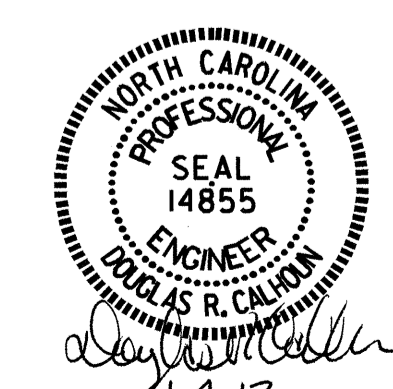
PROJECT NO. B-3864

JOHNSTON COUNTY

STATION: 22+62.50 -L-

SHEET 2 OF 2

BAR	MIN. SPLICE LENGTH
#10 B1	11'-1"
#10 B2	7'-11"
#5 B3	3'-0"
#4 B5	2'-5"



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE BENT 2**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS 42
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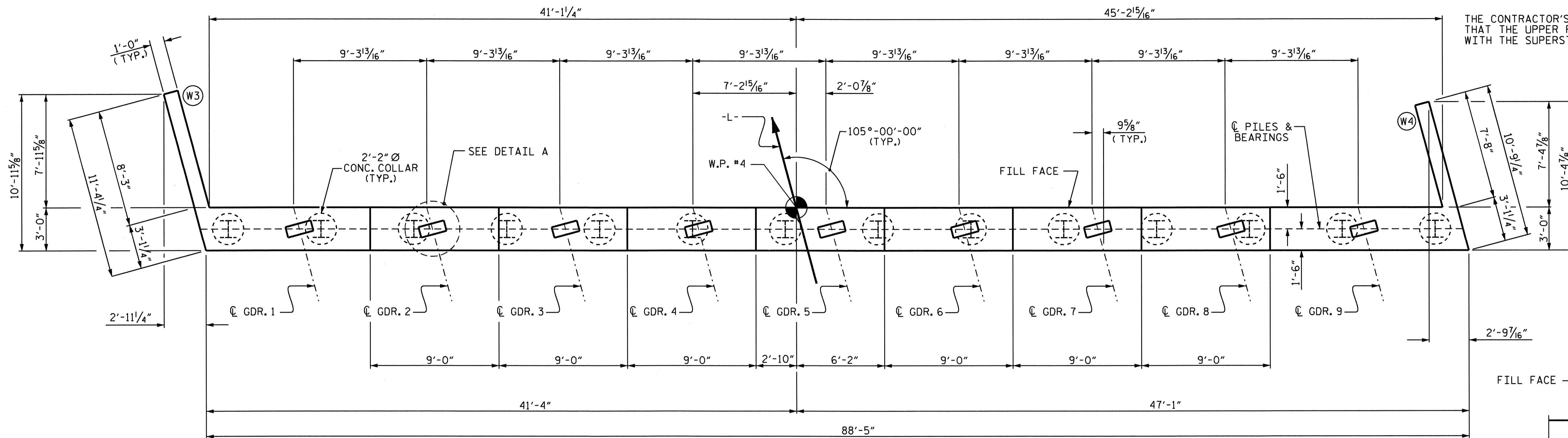
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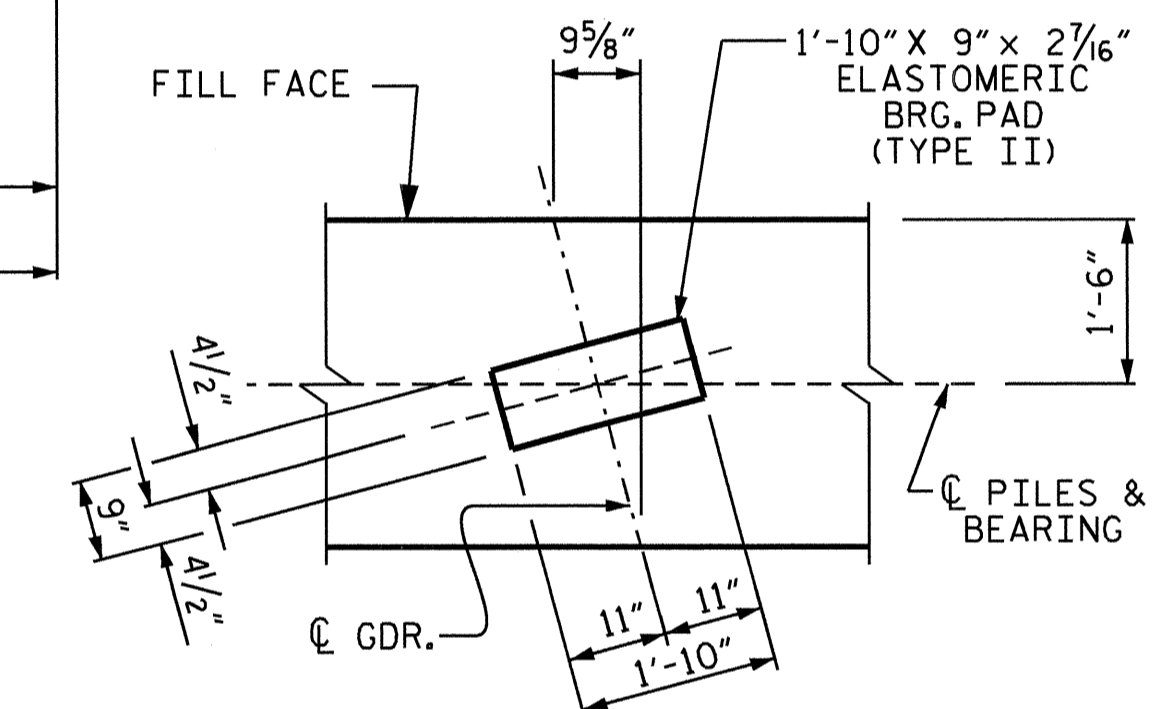
**NOTES**

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

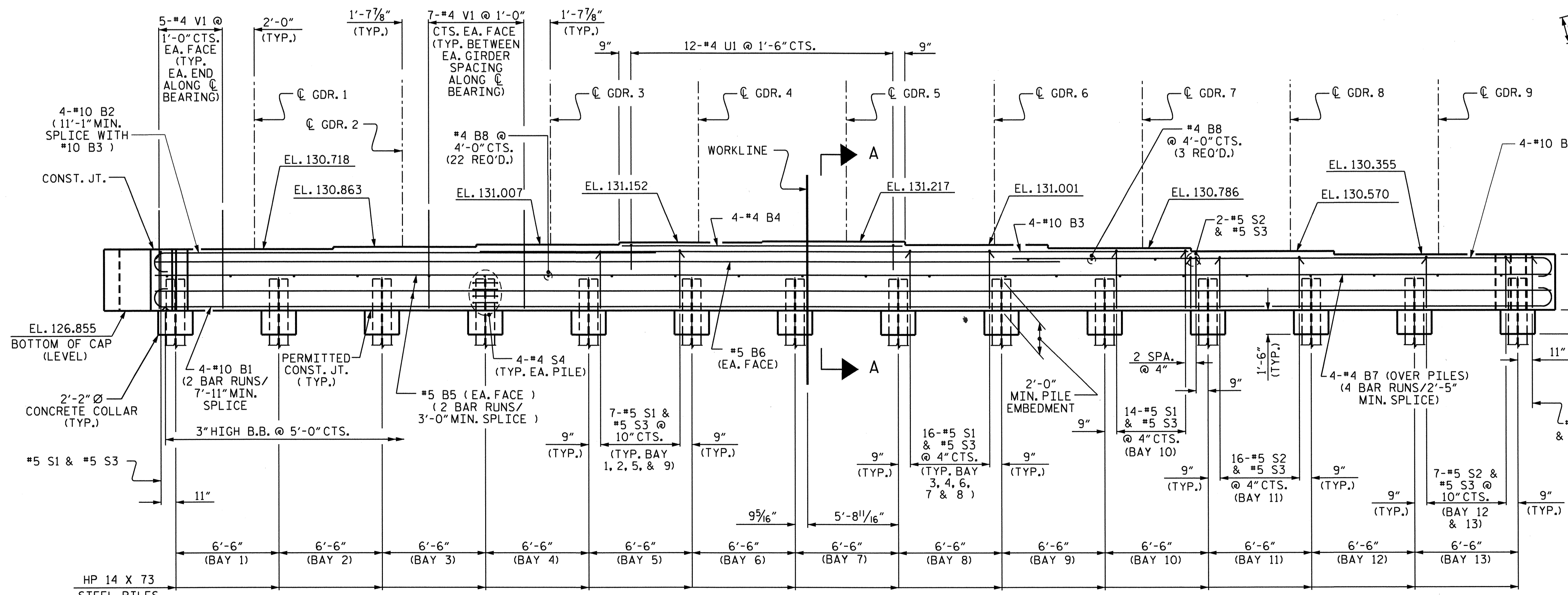
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.



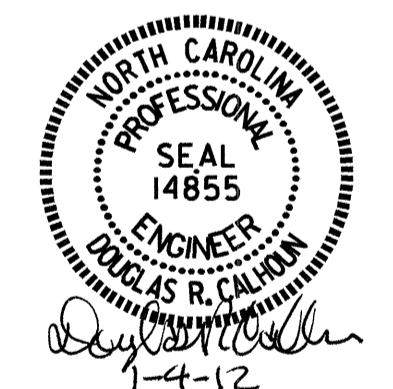
**PLAN**



**DETAIL A**  
(TYP. EA. BEARING)



**ELEVATION**



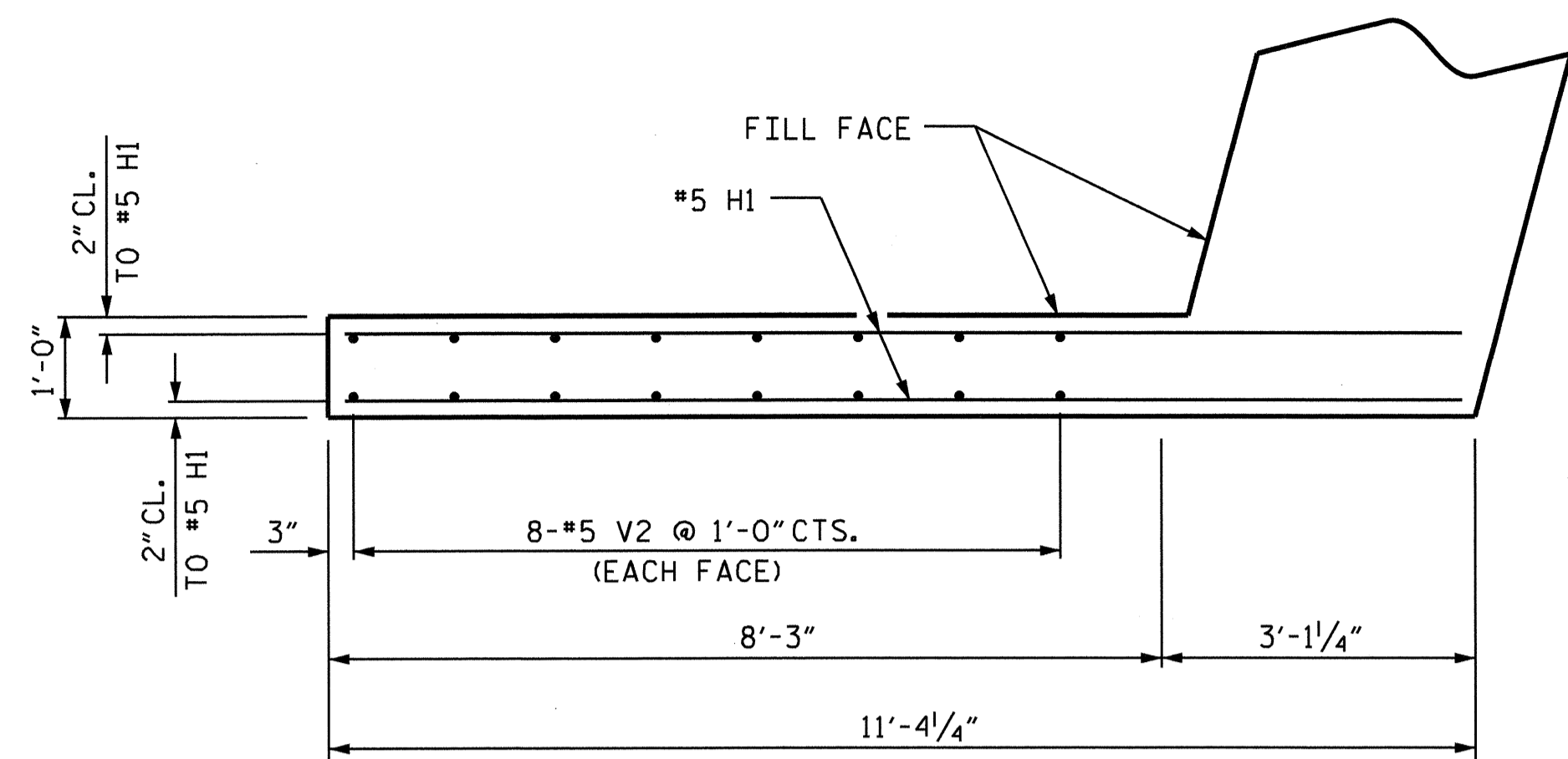
PROJECT NO. **B-3864**  
**JOHNSTON COUNTY**  
 STATION: **22+62.50 -L-**  
 SHEET 1 OF 3

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

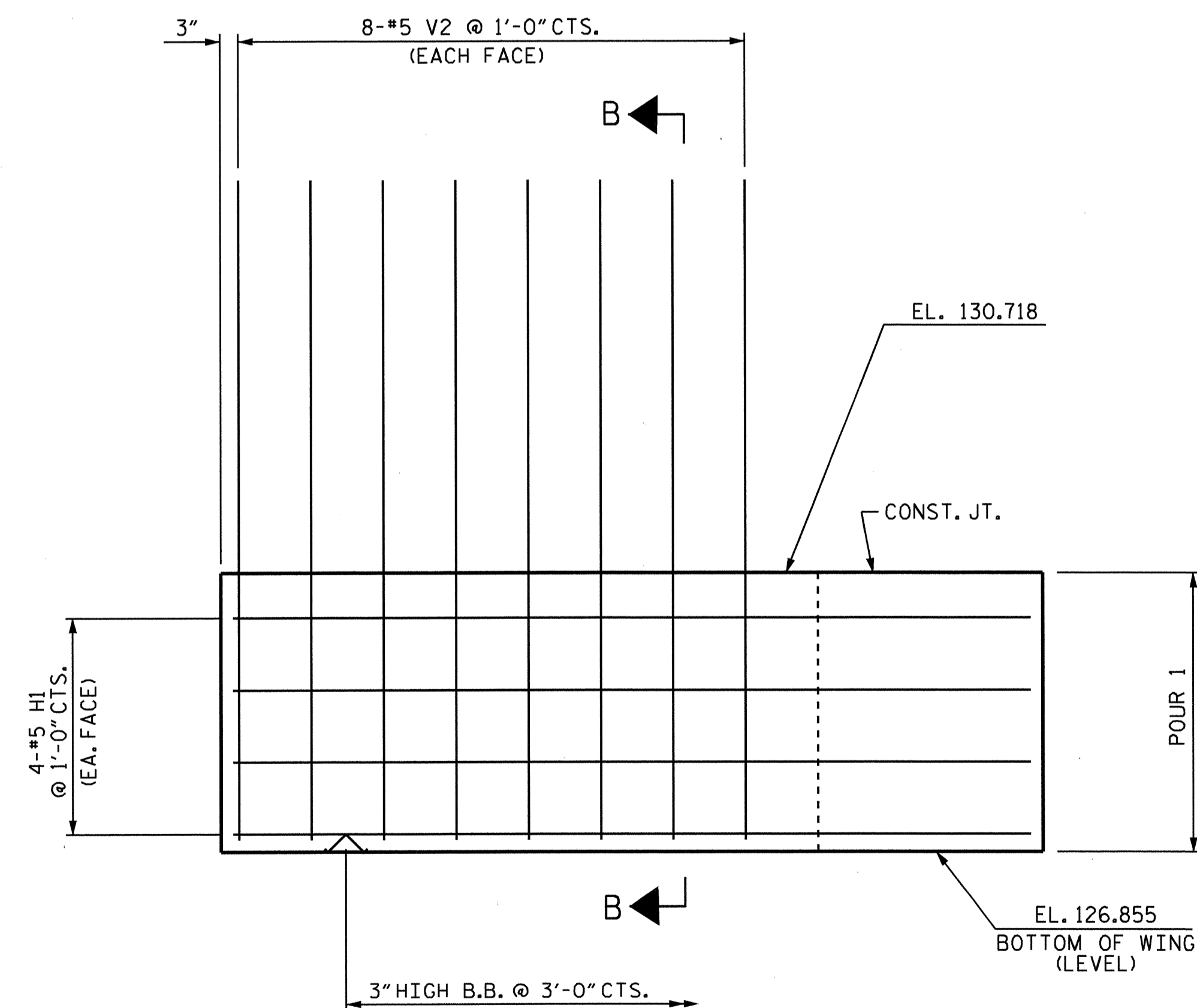
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-36	
1			3			TOTAL SHEETS 42	
2			4				

DRAWN BY: **J.L. WALTON** DATE: **5/2/11**  
 CHECKED BY: **K.P. SEDA** DATE: **5/25/11**

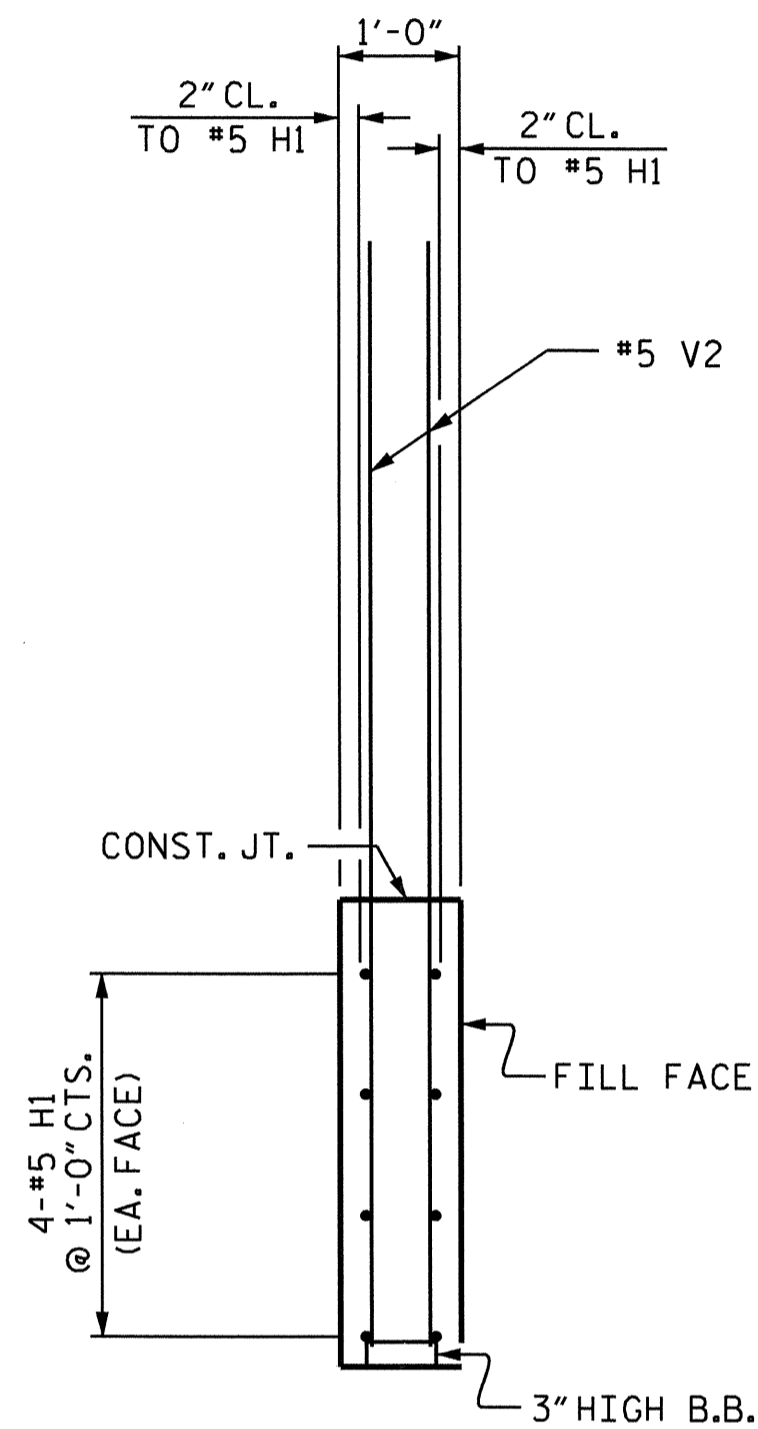
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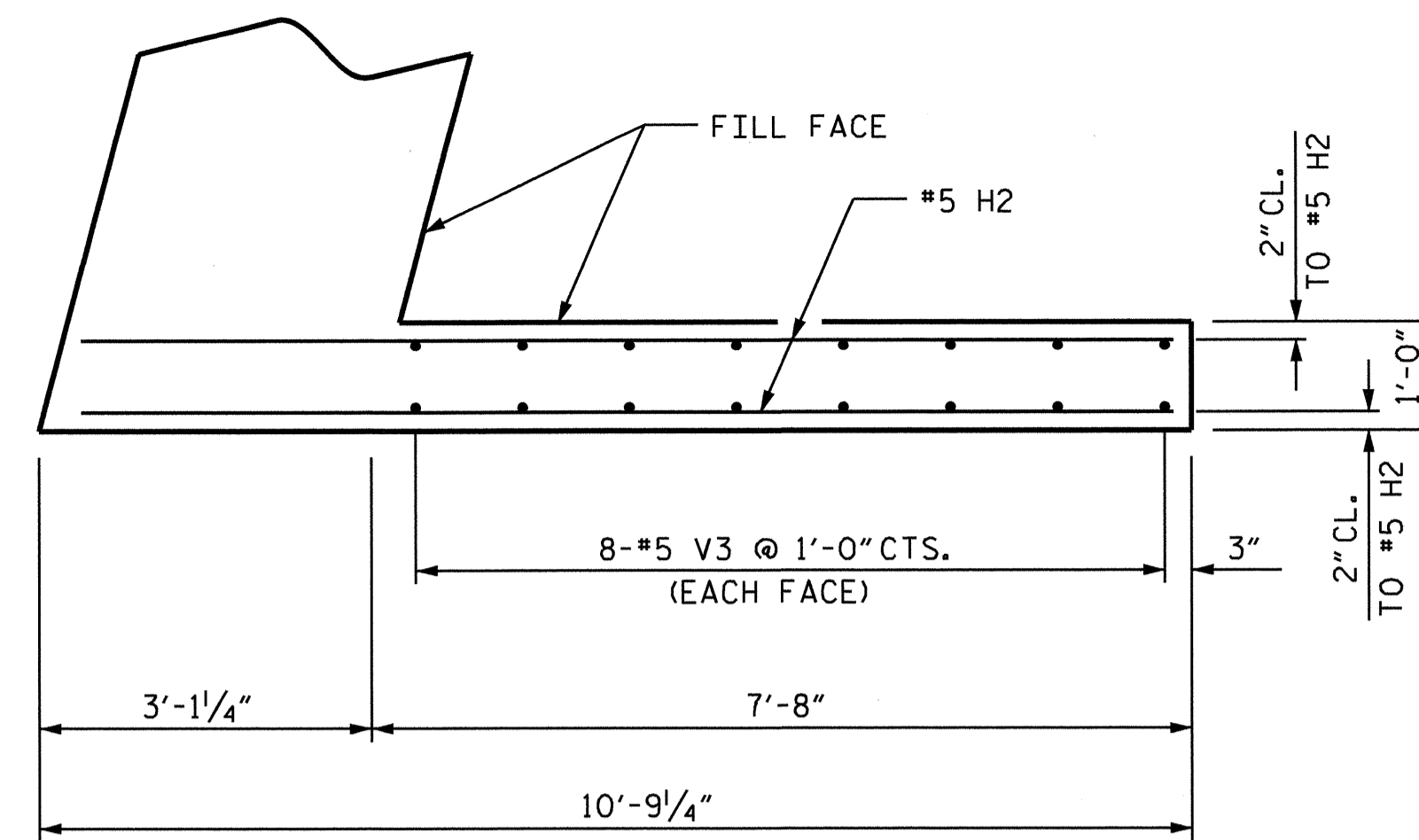
PLAN (W3)



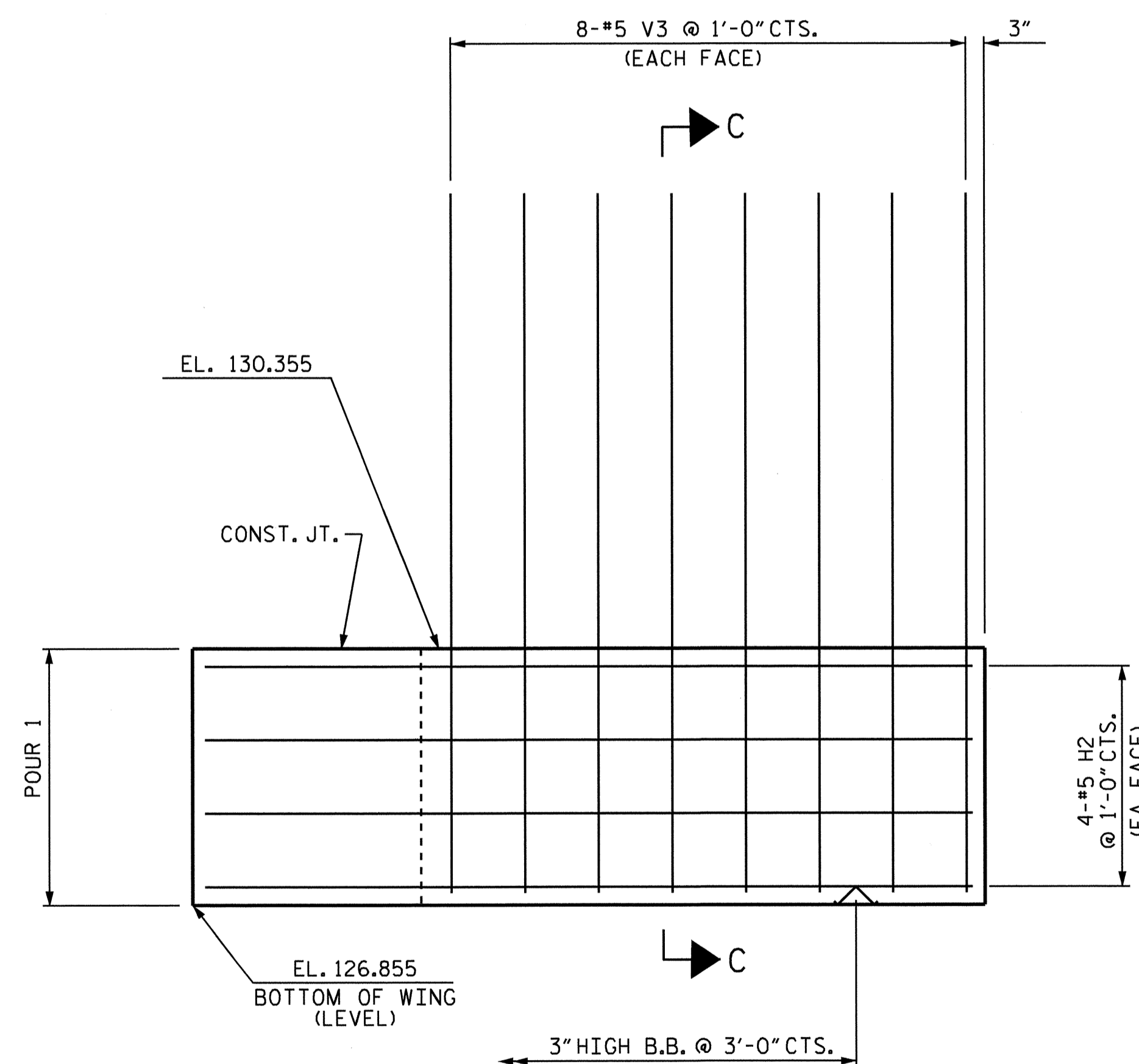
ELEVATION (W3)



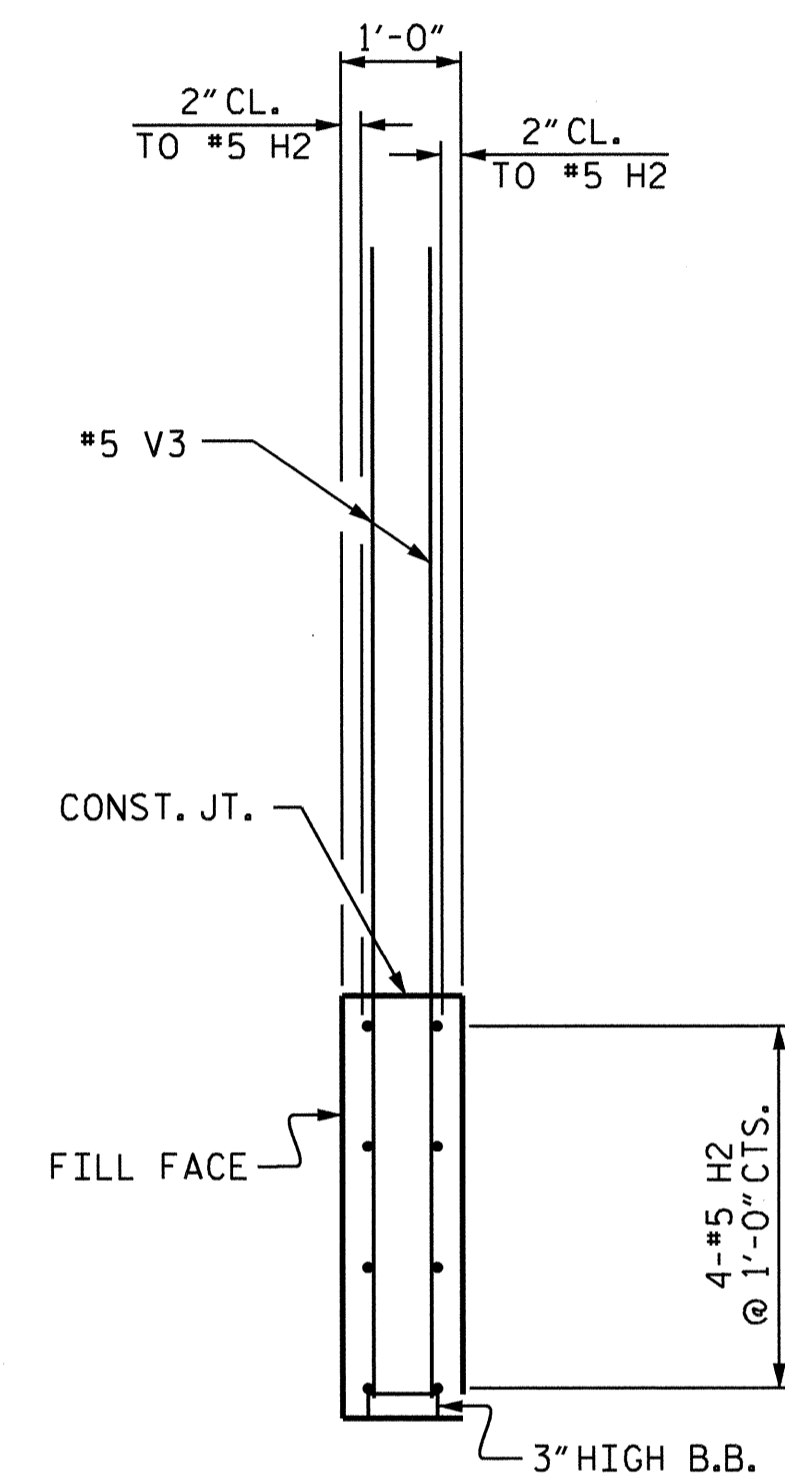
SECTION B-B



PLAN (W4)



ELEVATION (W4)

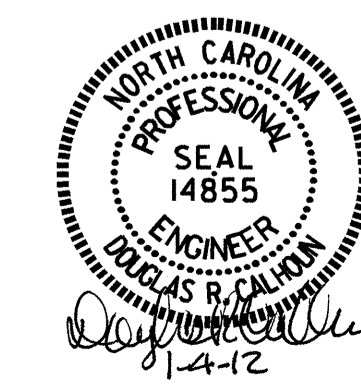


SECTION C-C

PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 3

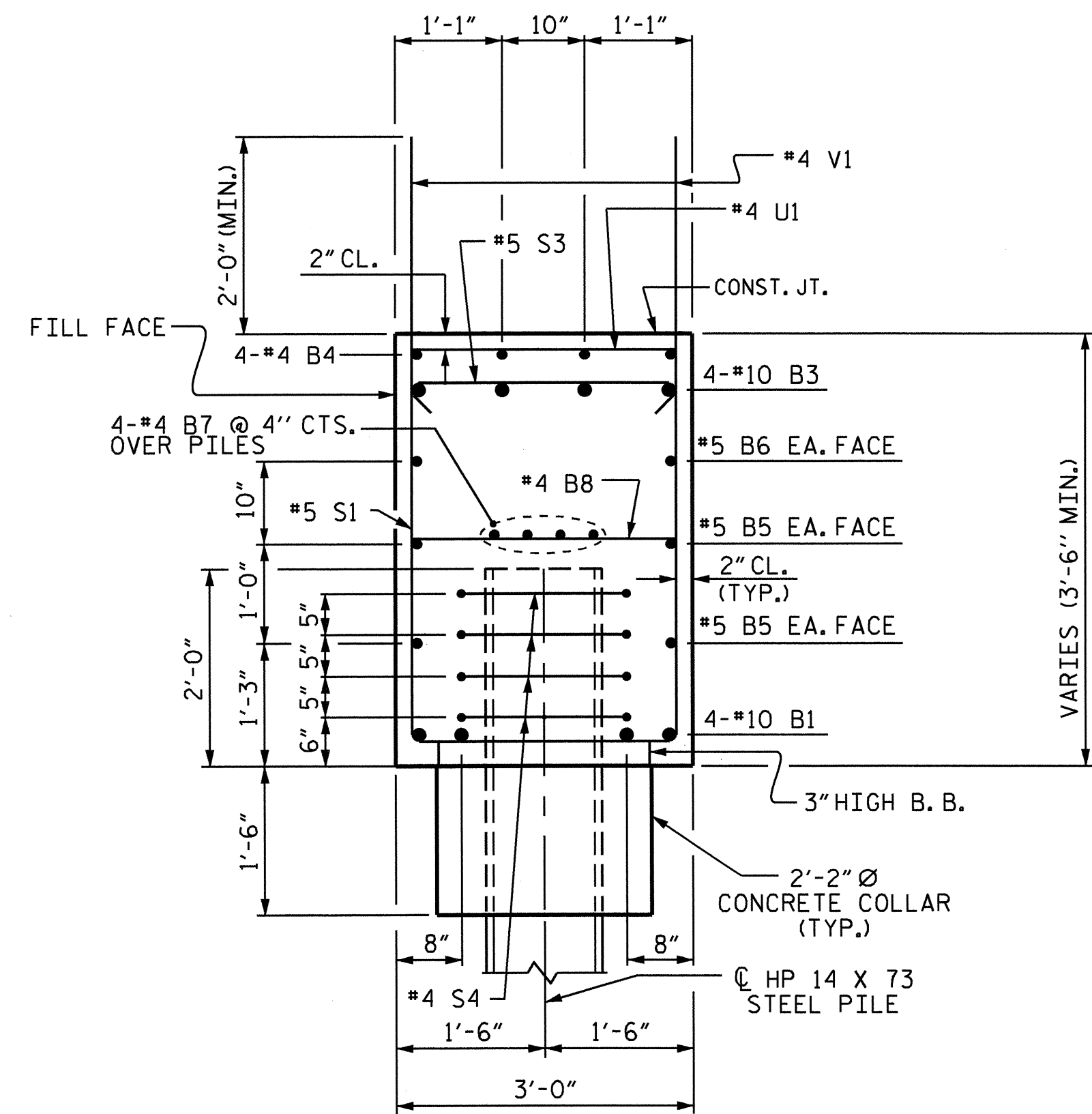
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 2



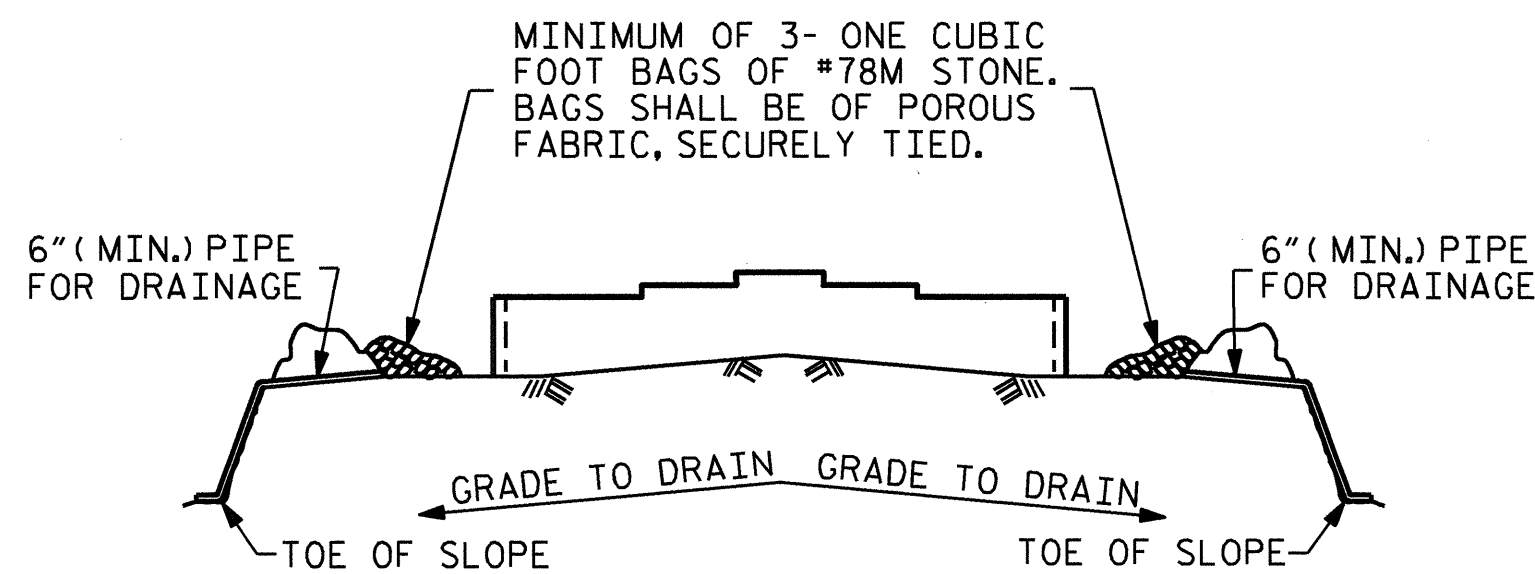
DRAWN BY: J.L. WALTON DATE: 5/2/11  
 CHECKED BY: K.P. SEDAI DATE: 5/25/11

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37	
1			3			TOTAL SHEETS	
2			4			42	



SECTION A-A

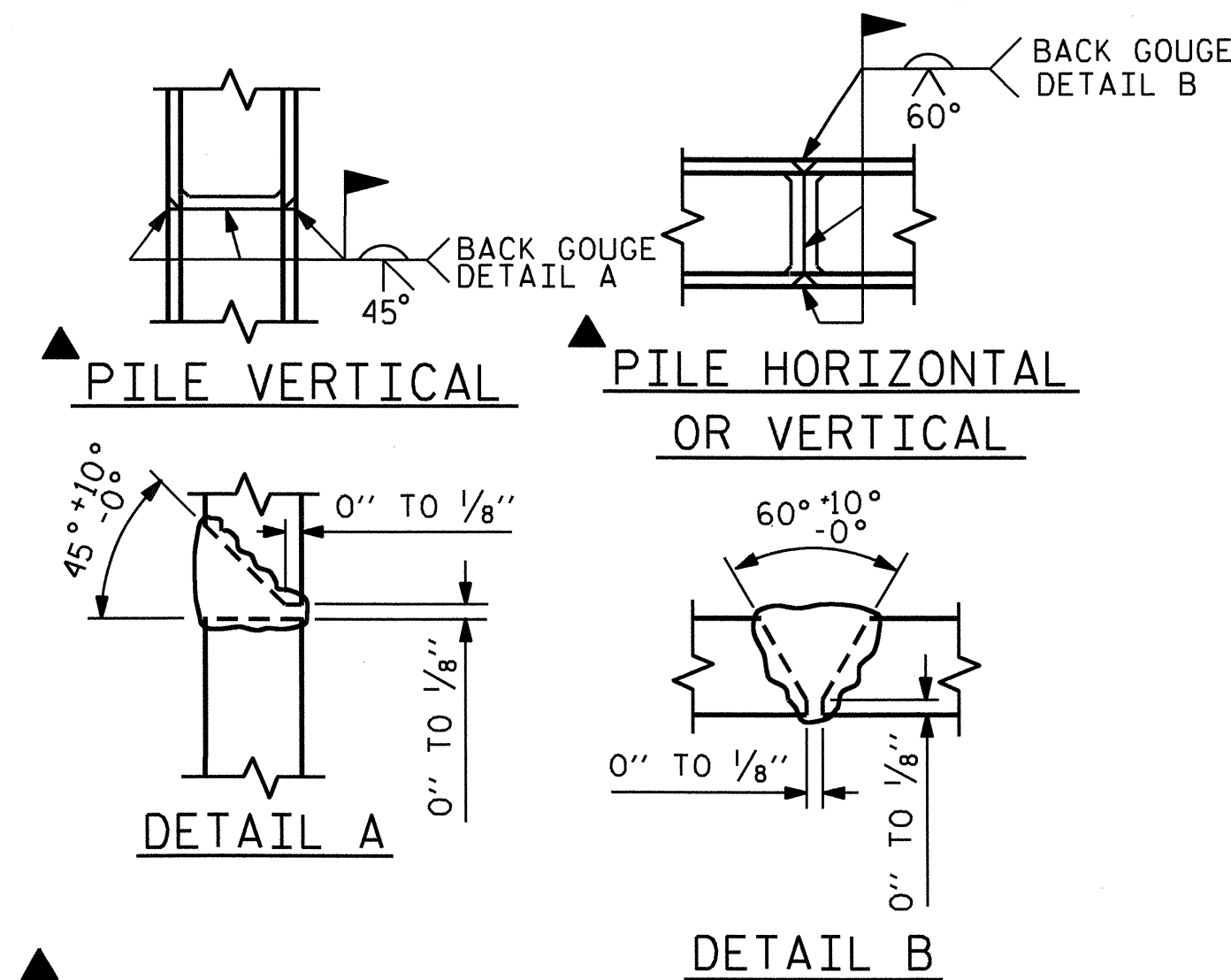


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

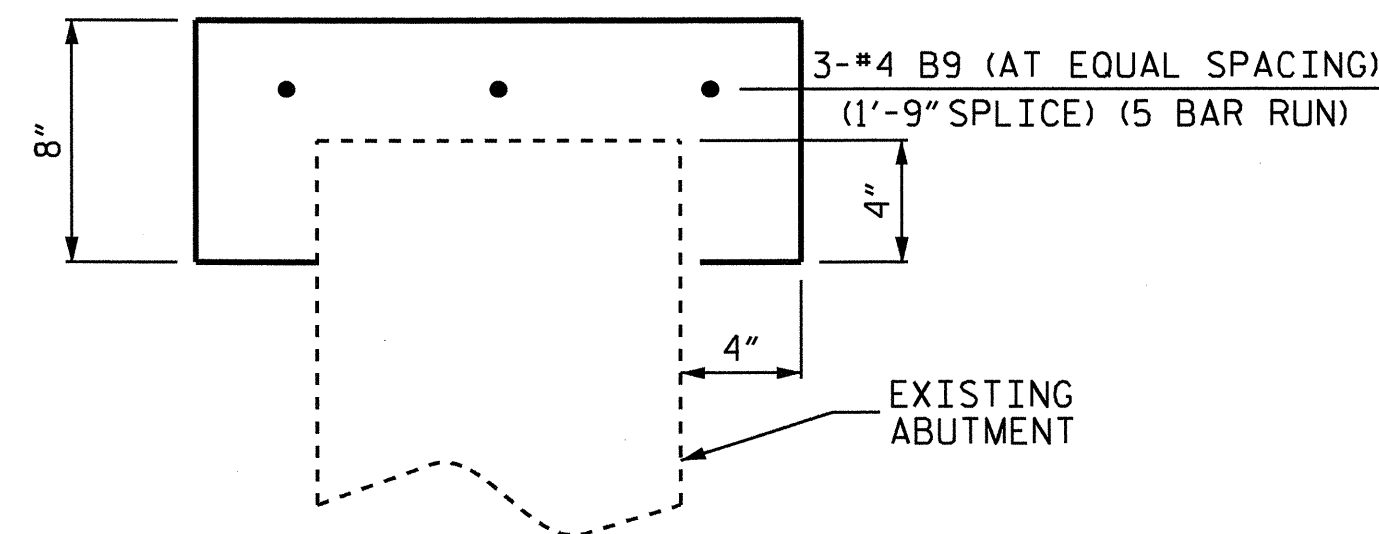
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

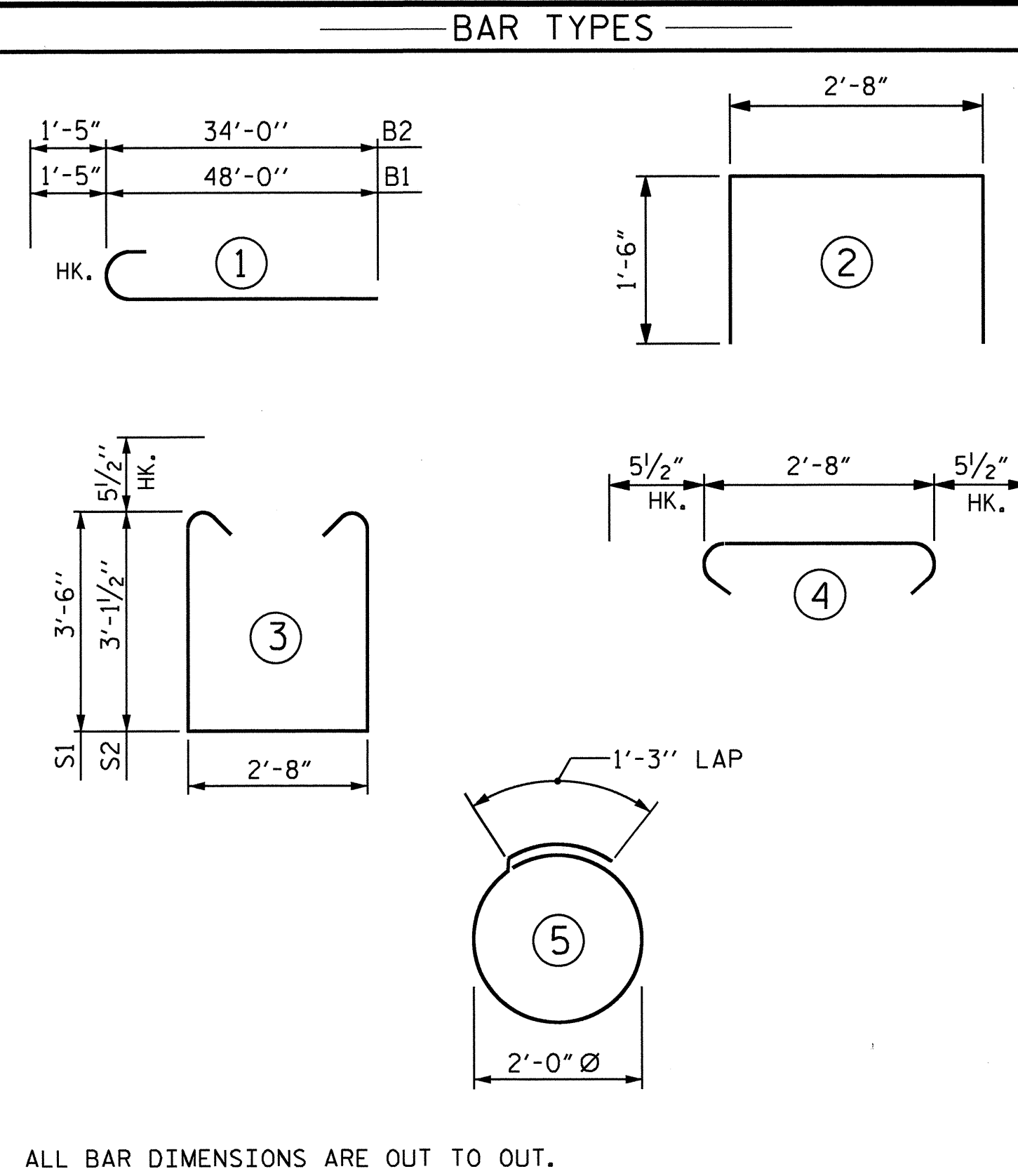


AFTER PARTIAL REMOVAL OF EXISTING ABUTMENT AT END BENT 2, PROVIDE CONCRETE COPING AS SHOWN FOR THE FULL LENGTH OF THE ABUTMENT.

CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE TOTAL BILL OF MATERIAL QUANTITIES FOR END BENT 2 ON SHEET S-3.

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

COPING FOR EXISTING ABUTMENT @ END BENT 2



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	49'-5"	1701
B2	8	#10	1	35'-5"	1219
B3	4	#10	STR	44'-8"	769
B4	4	#4	STR	17'-8"	47
B5	8	#5	STR	45'-7"	380
B6	2	#5	STR	58'-8"	122
B7	16	#4	STR	23'-10"	255
B8	25	#4	STR	2'-8"	45
H1	8	#5	STR	11'-0"	92
H2	8	#5	STR	10'-2"	85
S1	123	#5	3	10'-7"	1358
S2	33	#5	3	9'-10"	338
S3	156	#5	4	3'-7"	583
S4	56	#4	5	7'-7"	284
U1	12	#4	2	5'-8"	45
V1	132	#4	STR	6'-2"	544
V2	16	#5	STR	9'-6"	159
V3	16	#5	STR	9'-2"	153

REINFORCING STEEL	LBS	8179
CLASS A CONCRETE BREAKDOWN		
POUR 1 (CAP, CONCRETE COLLARS LOWER PART OF WINGS)	C.Y.	44.1
TOTAL	C.Y.	44.1
HP 14 X 73 STEEL PILES NO. : 14		560

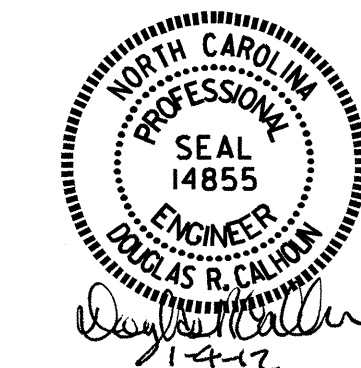
BILL OF MATERIAL

COPING FOR EXISTING ABUTMENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B9	15	#4	STR	25'-4"	254
REINFORCING STEEL	LBS	254			
CLASS A CONCRETE	C.Y.	3.5			

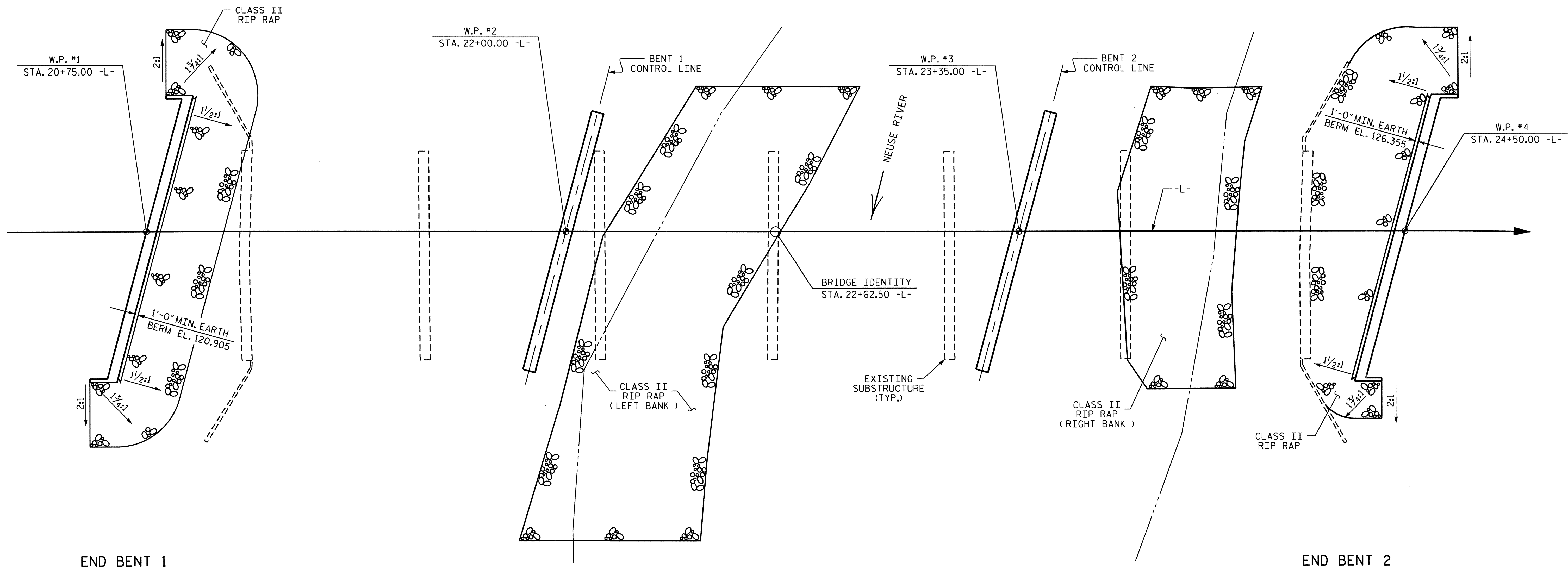
PROJECT NO. B-3864  
 JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 3 OF 3  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 2



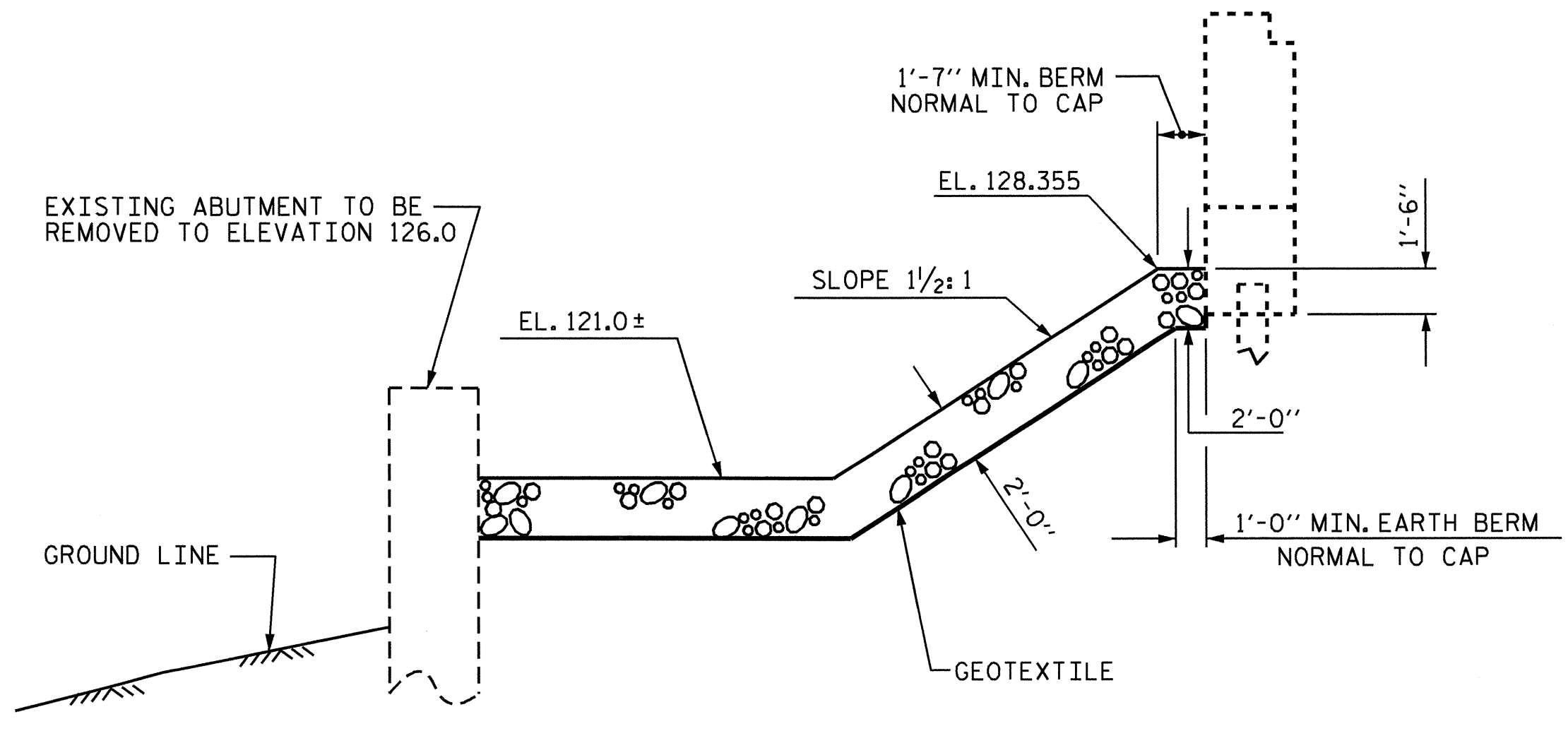
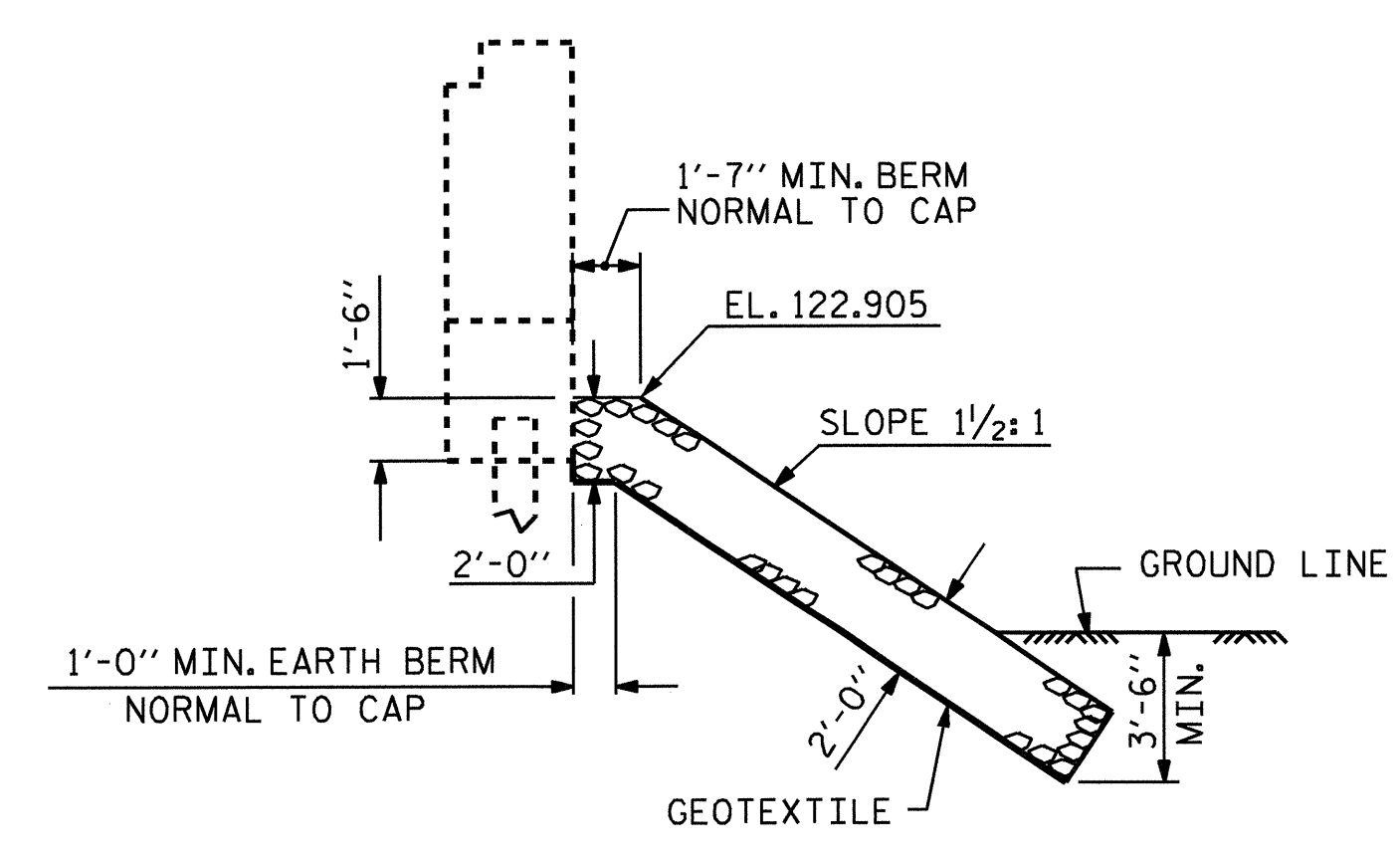
DRAWN BY: J.L. WALTON DATE: 5/2/11  
 CHECKED BY: K.P. SEDA DATE: 5/25/11

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	42
1			3			
2			4			



PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+62.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	295	330
LEFT BANK	695	772
RIGHT BANK	322	358
END BENT 2	324	360



SECTION  
BERM RIP RAPPED

PROJECT NO. B-3864  
JOHNSTON COUNTY  
STATION: 22+62.50 -L-

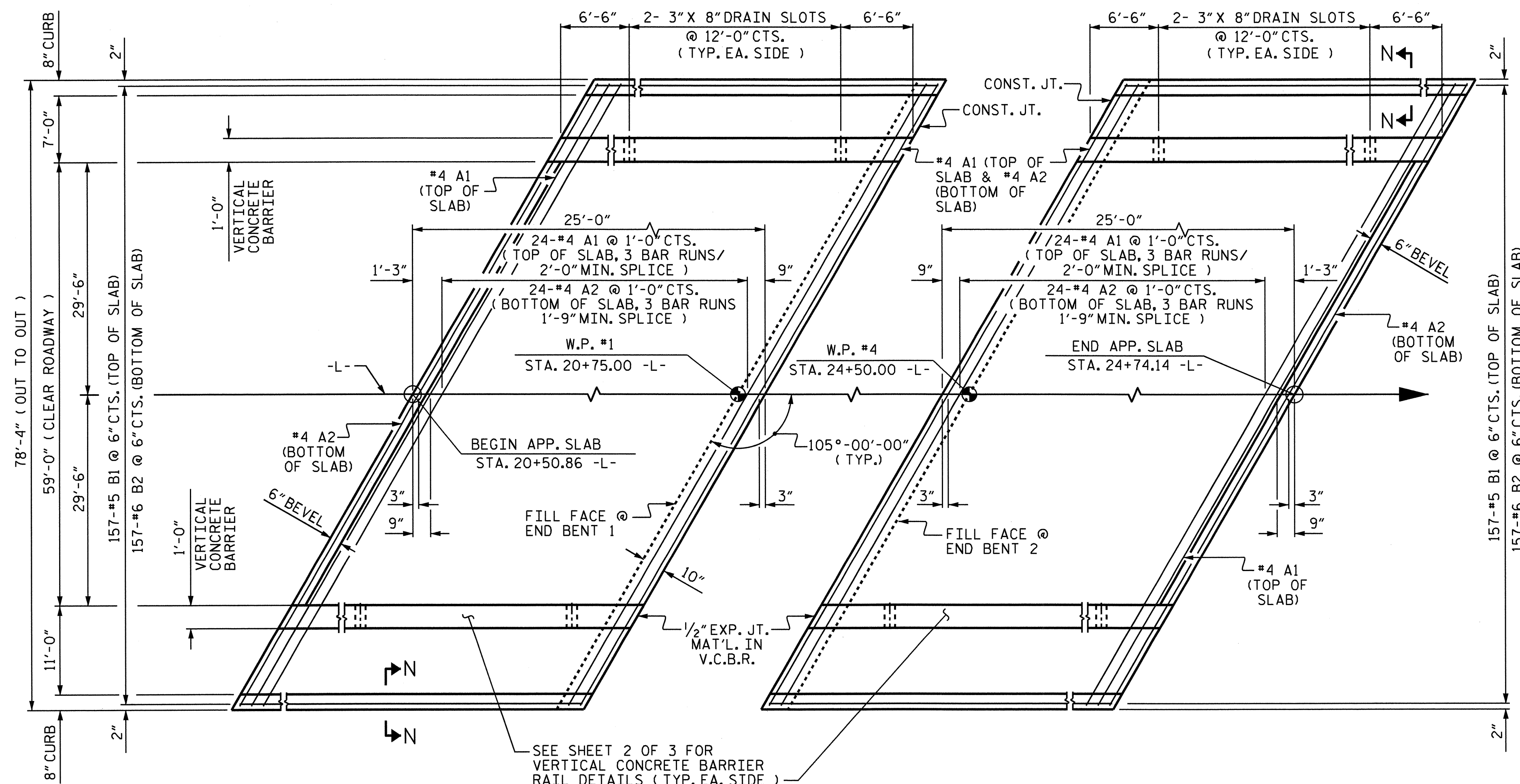


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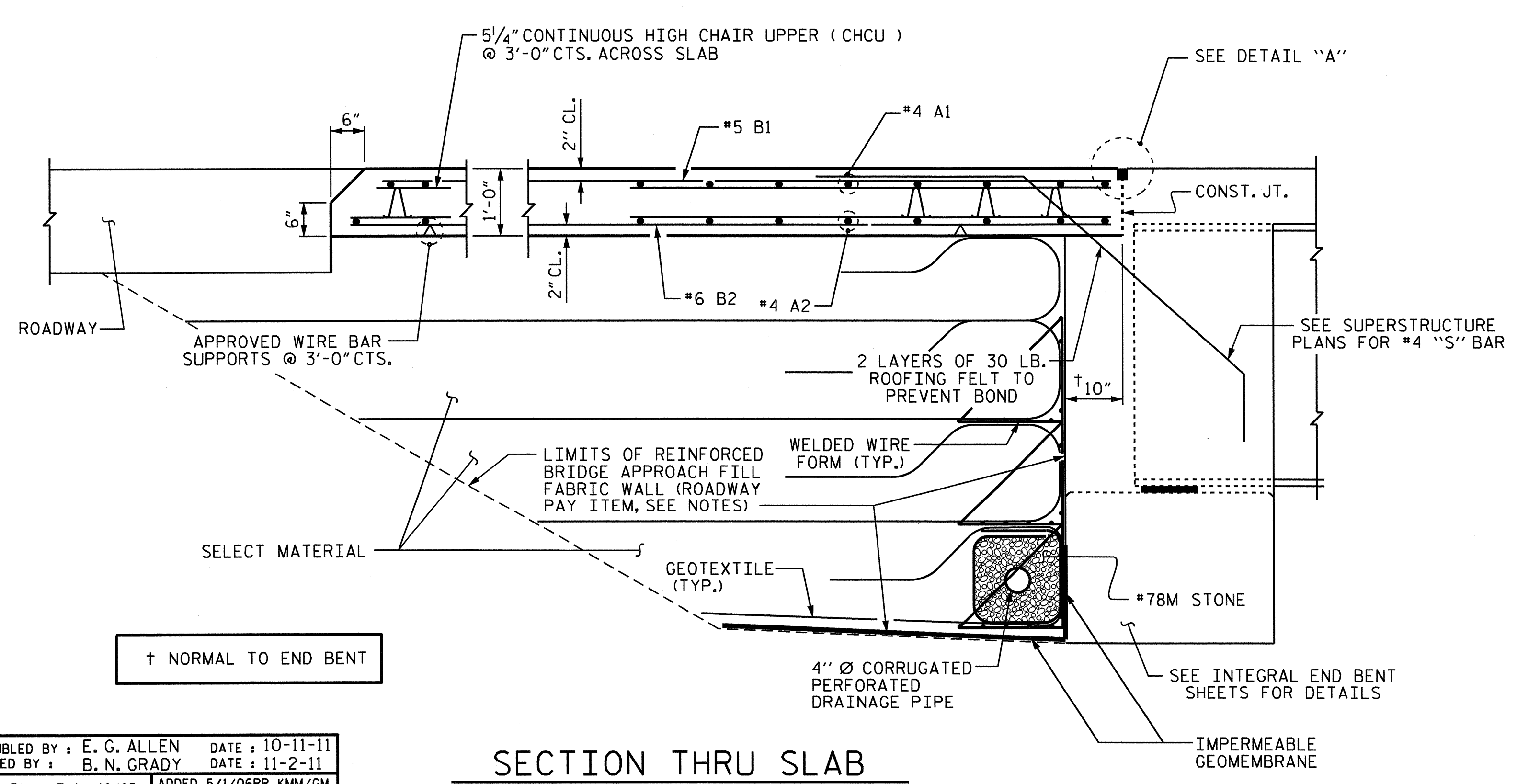
ASSEMBLED BY : E. G. ALLEN DATE : 10-18-11  
CHECKED BY : B. N. GRADY DATE : 11-02-11  
DRAWN BY : REK 1/84  
CHECKED BY : RDU 1/84

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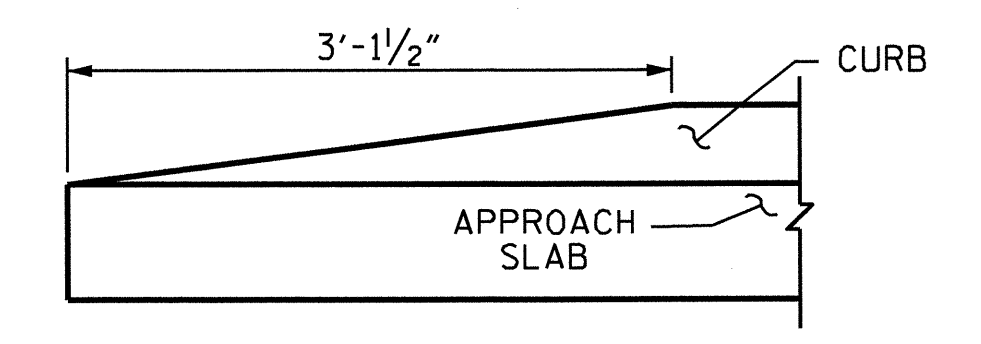
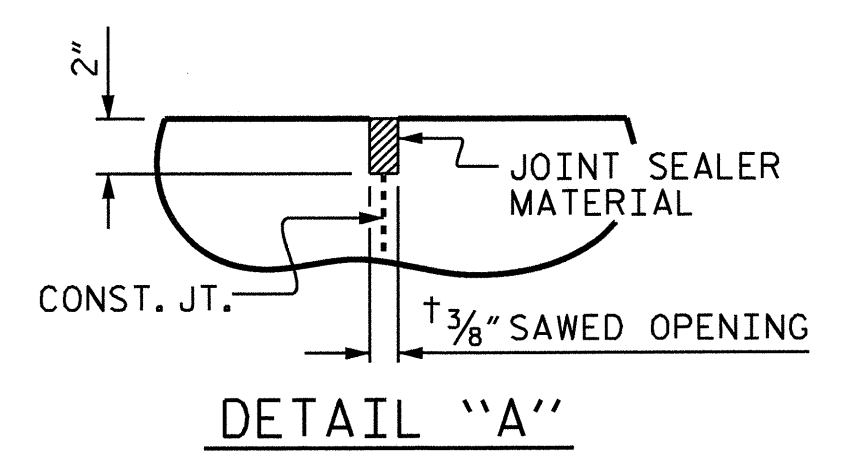




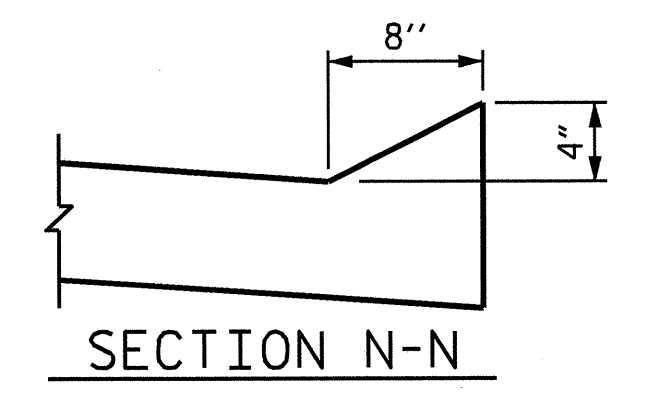
PLAN @ END BENT 1  
 PLAN @ END BENT 2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER  
 (OMIT TAPER WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTES

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

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

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

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE VERTICAL CONCRETE BARRIER RAIL WILL PAID FOR AT THE LUMP SUM PRICE FOR BRIDGE APPROACH SLABS.

3" X 8" DRAIN SLOTS MAY BE SHIFTED SLIGHTLY TO AVOID S1 BARS.

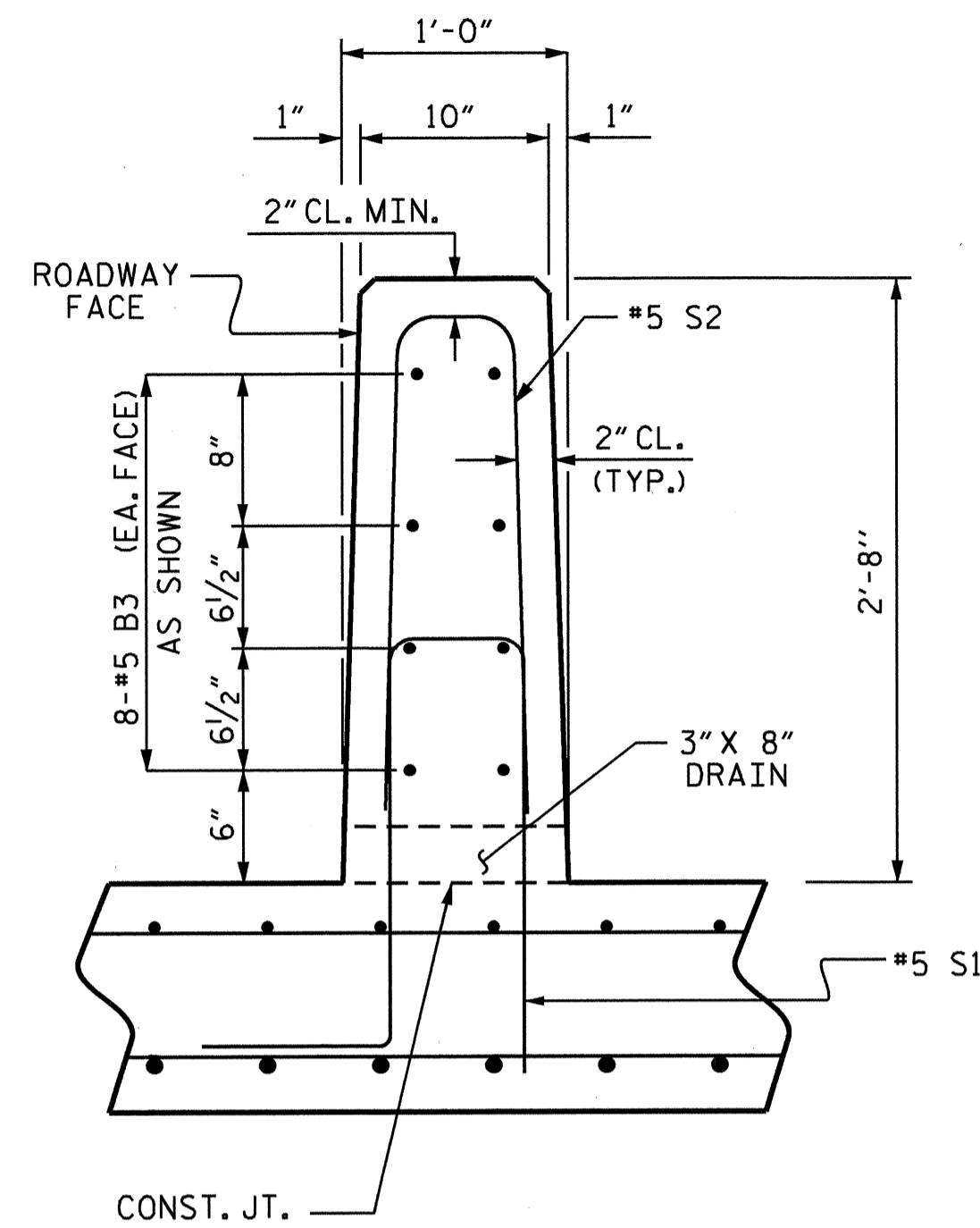
BILL OF MATERIAL						
FOR ONE APPROACH SLAB (2 REQ'D.)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	78	#4	STR	28'-3"	1472	
A2	78	#4	STR	28'-1"	1463	
* B1	157	#5	STR	24'-2"	3957	
B2	157	#6	STR	24'-7"	5797	
* B3	16	#5	STR	24'-7"	410	
* S1	58	#5	1	5'-5"	328	
* S2	58	#5	2	5'-6"	333	
REINFORCING STEEL				LBS.	7260	
* EPOXY COATED REINFORCING STEEL				LBS.	6500	
CLASS AA CONCRETE :						
SLAB & CURBS					72.5	C. Y.
VERTICAL BARRIER RAIL					4.5	C. Y.
TOTAL CLASS AA CONCRETE					77.0	C. Y.
BAR TYPES						
ALL BAR DIMENSIONS ARE OUT TO OUT						

PROJECT NO. B-3864  
JOHNSTON COUNTY  
 STATION: 22+62.50 -L-  
 SHEET 1 OF 3

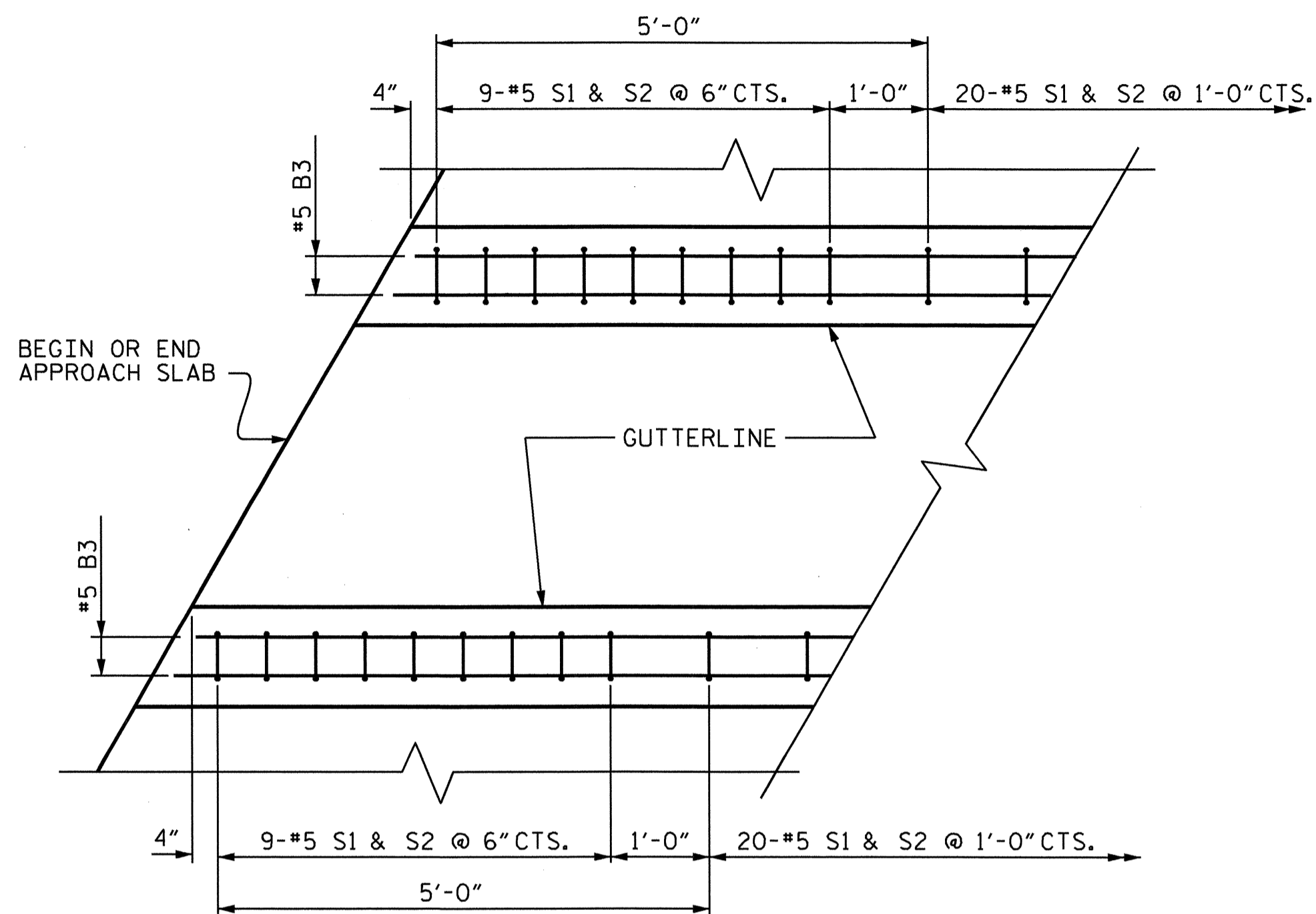
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			42

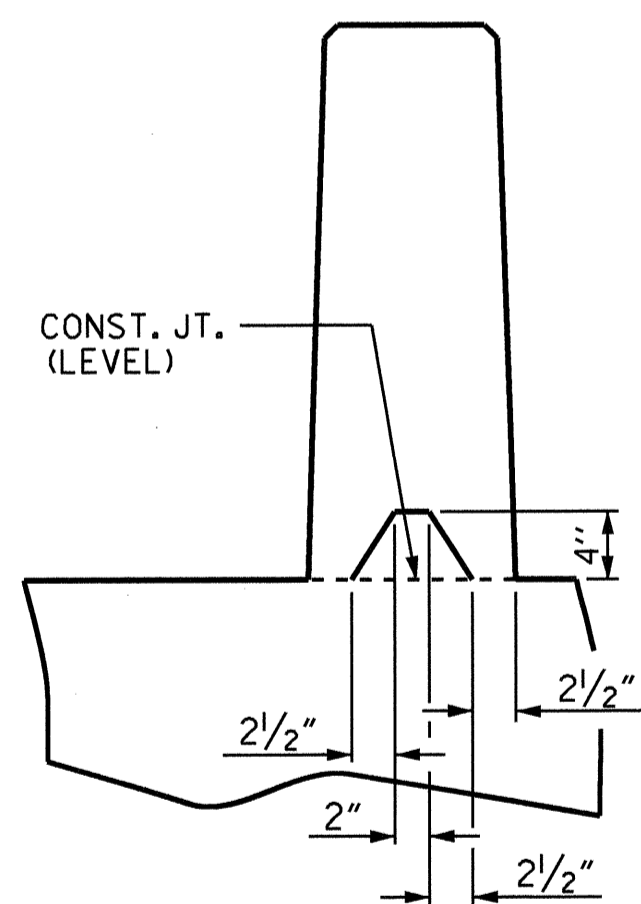
ASSEMBLED BY : E. G. ALLEN DATE : 10-11-11  
 CHECKED BY : B. N. GRADY DATE : 11-2-11  
 DRAWN BY : TLA 10/05  
 CHECKED BY : GM 5/06



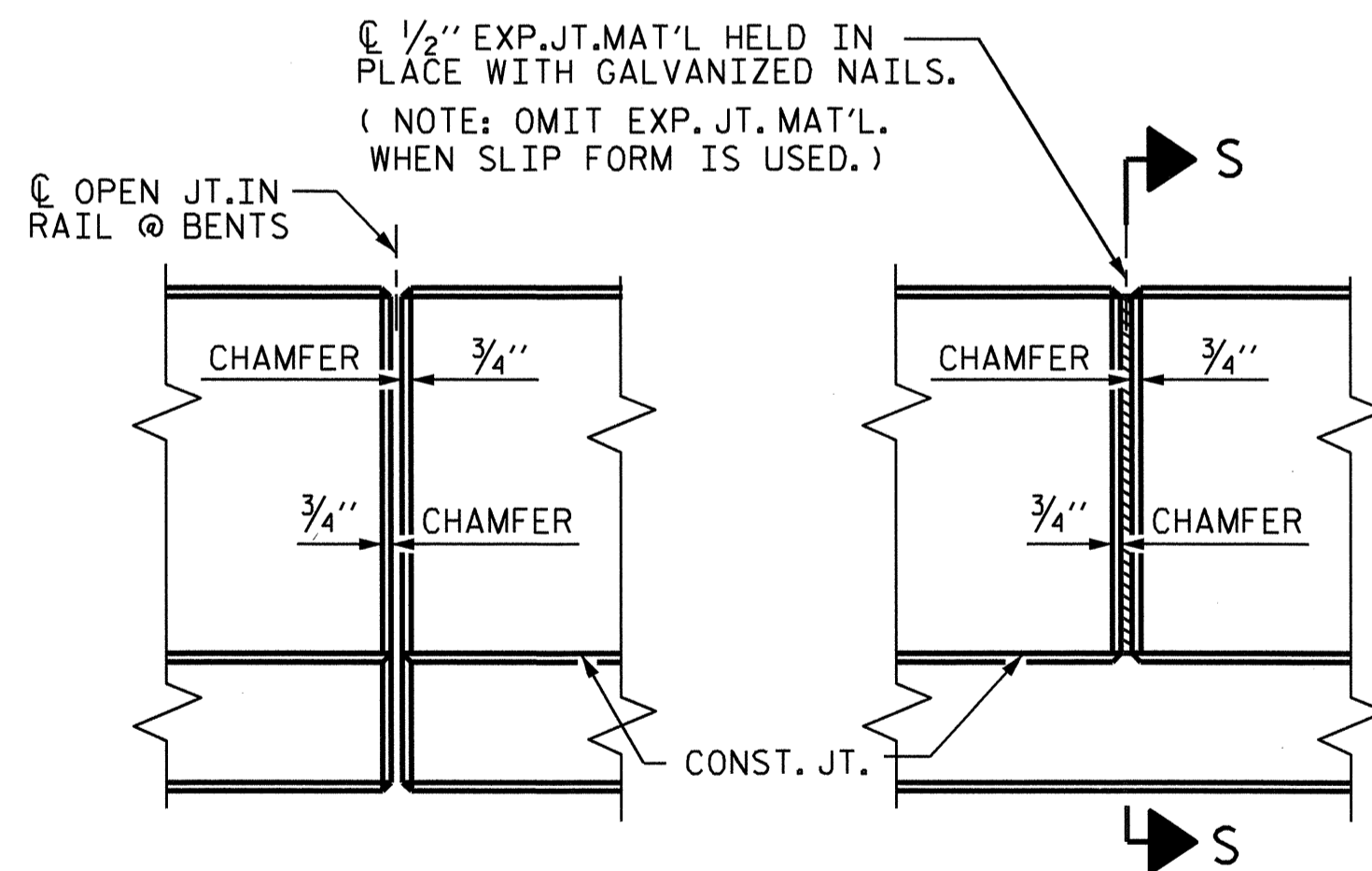
SECTION THRU RAIL



END OF RAIL DETAILS

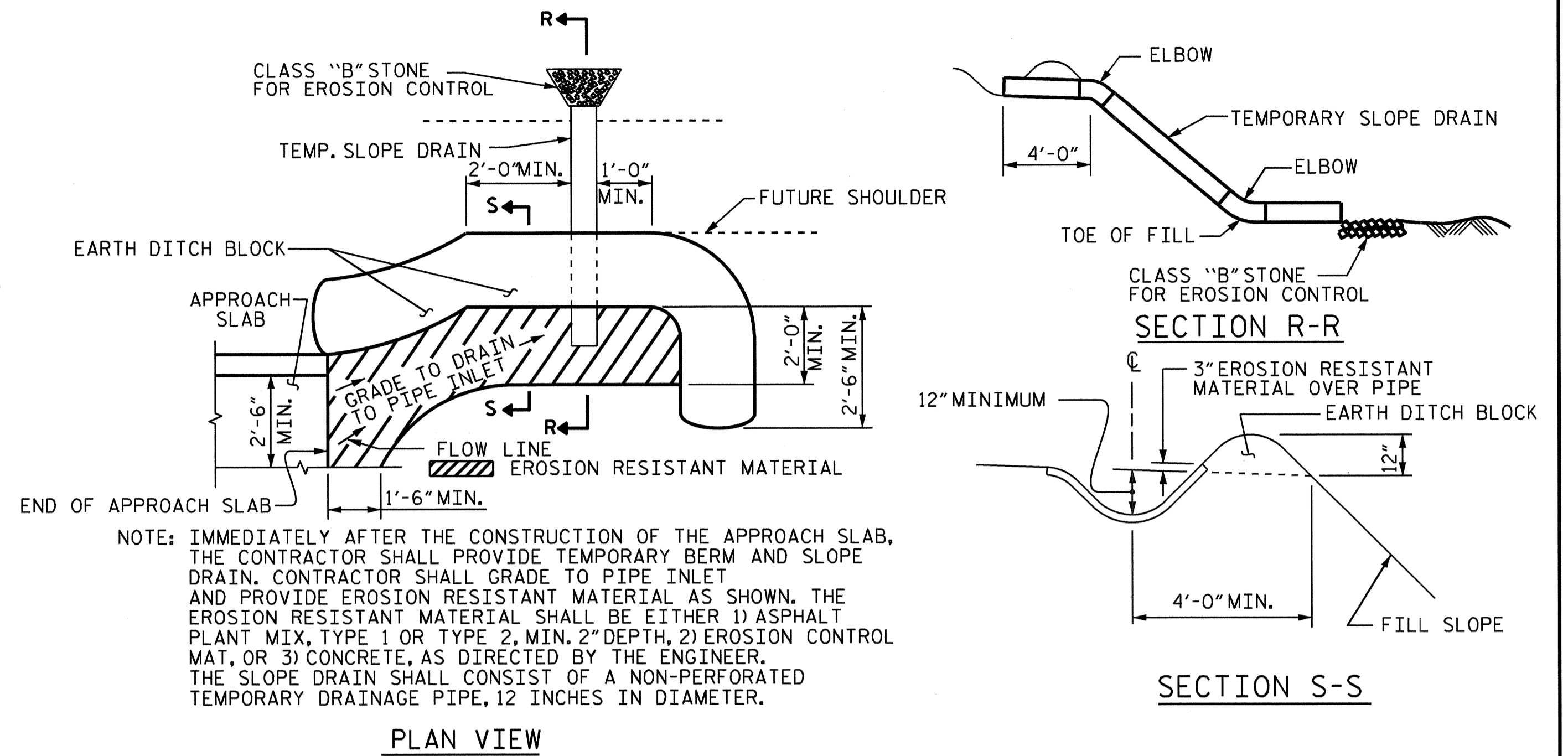


SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

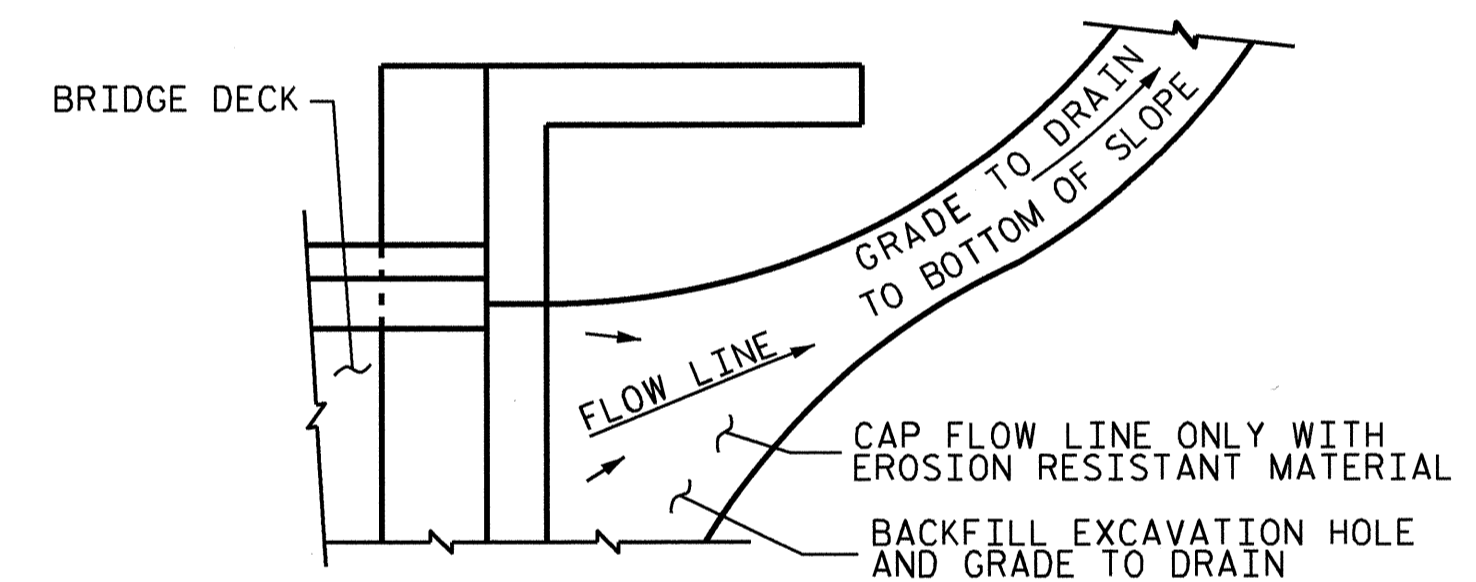
BARRIER RAIL DETAILS



PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



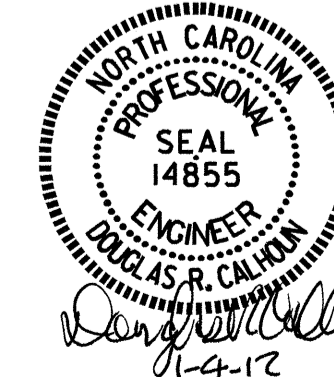
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

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JOHNSTON COUNTY  
 STATION: 22+62.50 -L-

SHEET 2 OF 3

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



ASSEMBLED BY : E. G. ALLEN DATE : 10-11-11  
 CHECKED BY : B. N. GRADY DATE : 11-3-11  
 DRAWN BY : FCJ 11/88 REV. 5/7/03 RWW/JTE  
 CHECKED BY : ARB 11/88 REV. 5/1/06RRR MAA/KMM  
 REV. 10/1/11 MAA/GM

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41	
1			3			TOTAL SHEETS	
2			4			42	

STD. NO. BAS4

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 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.)

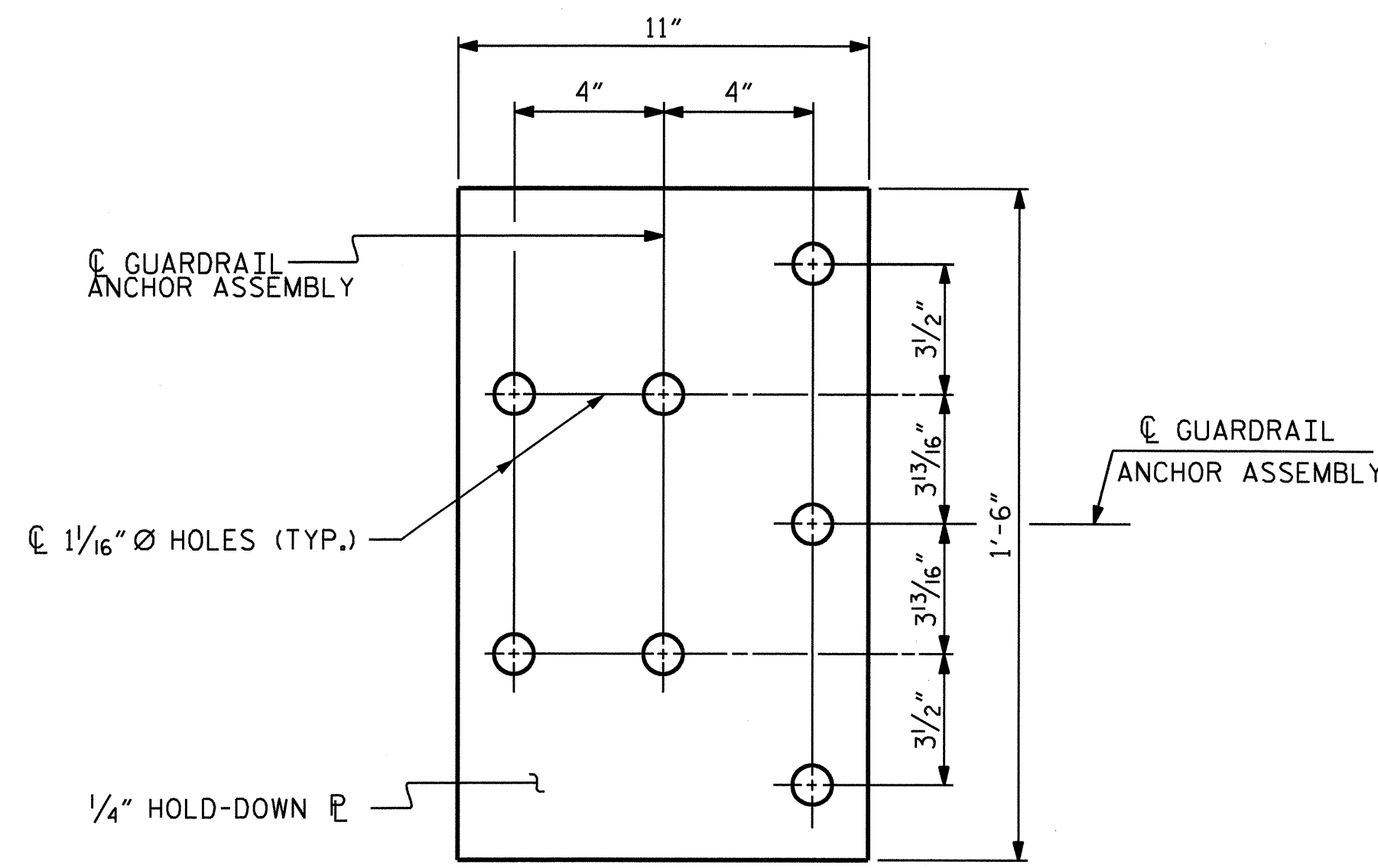
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

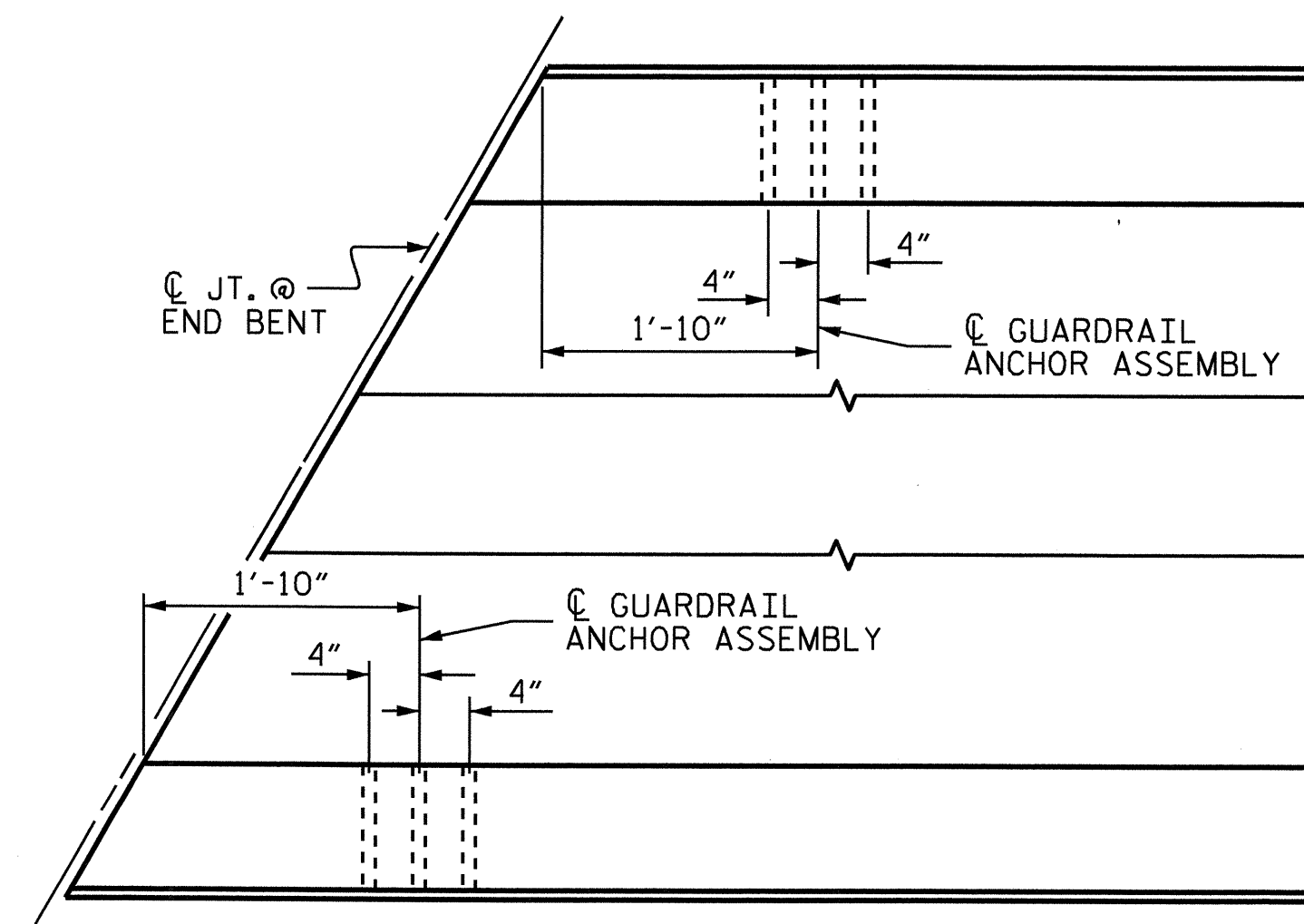
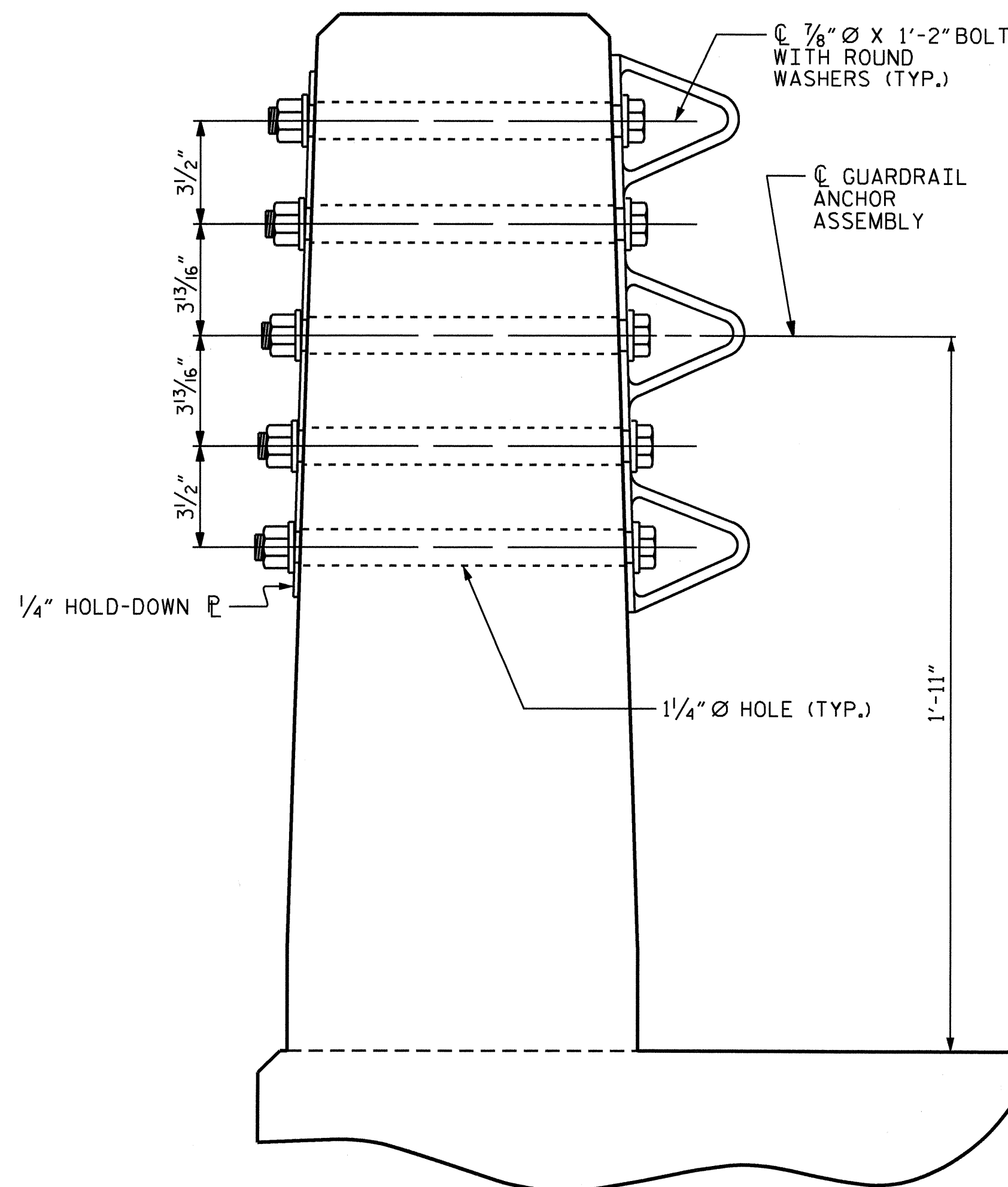
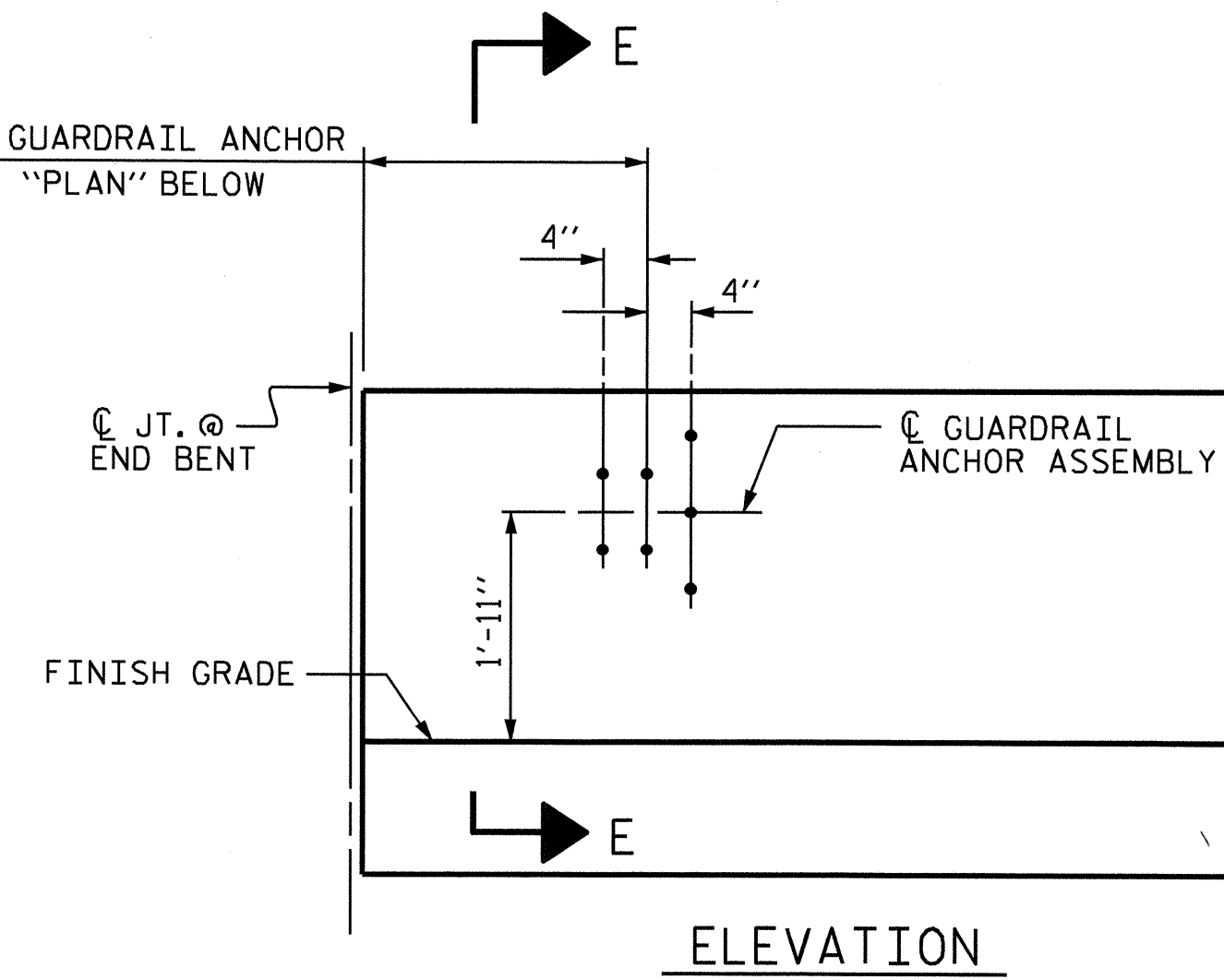
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

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

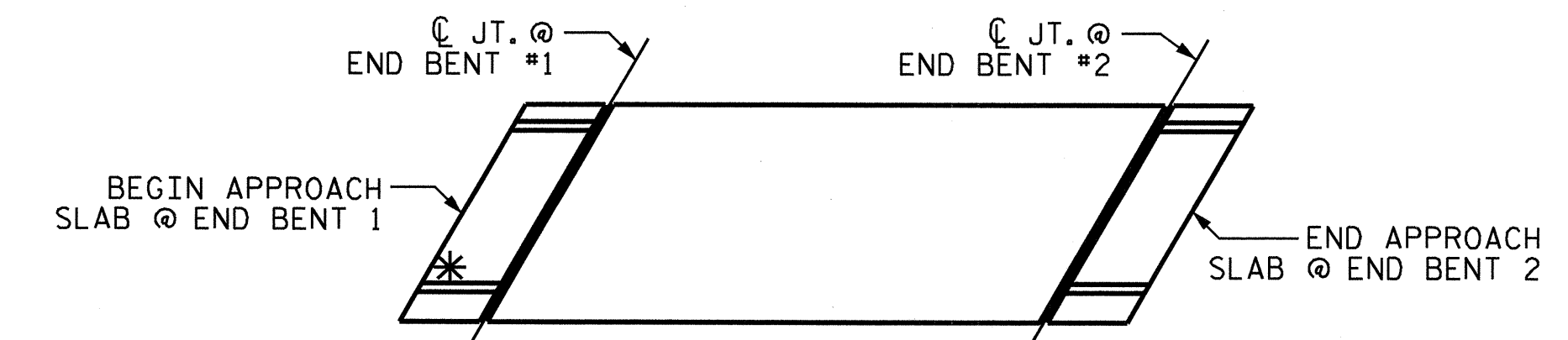


FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



LOCATION OF ANCHORS FOR GUARDRAIL

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

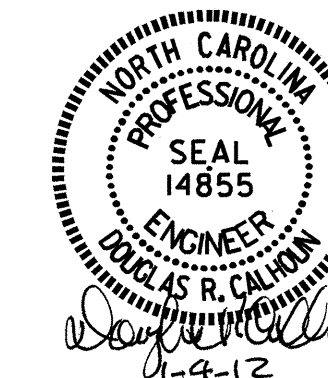


\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-3864  
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 STATION: 22+62.50 -L-

SHEET 3 OF 3

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



ASSEMBLED BY : E. G. ALLEN	DATE : 10-11-11
CHECKED BY : B. N. GRADY	DATE : 11-3-11
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11
	MAA/GM

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS 42
2			4			

(SHT 2) STD. NO. GRA3

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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