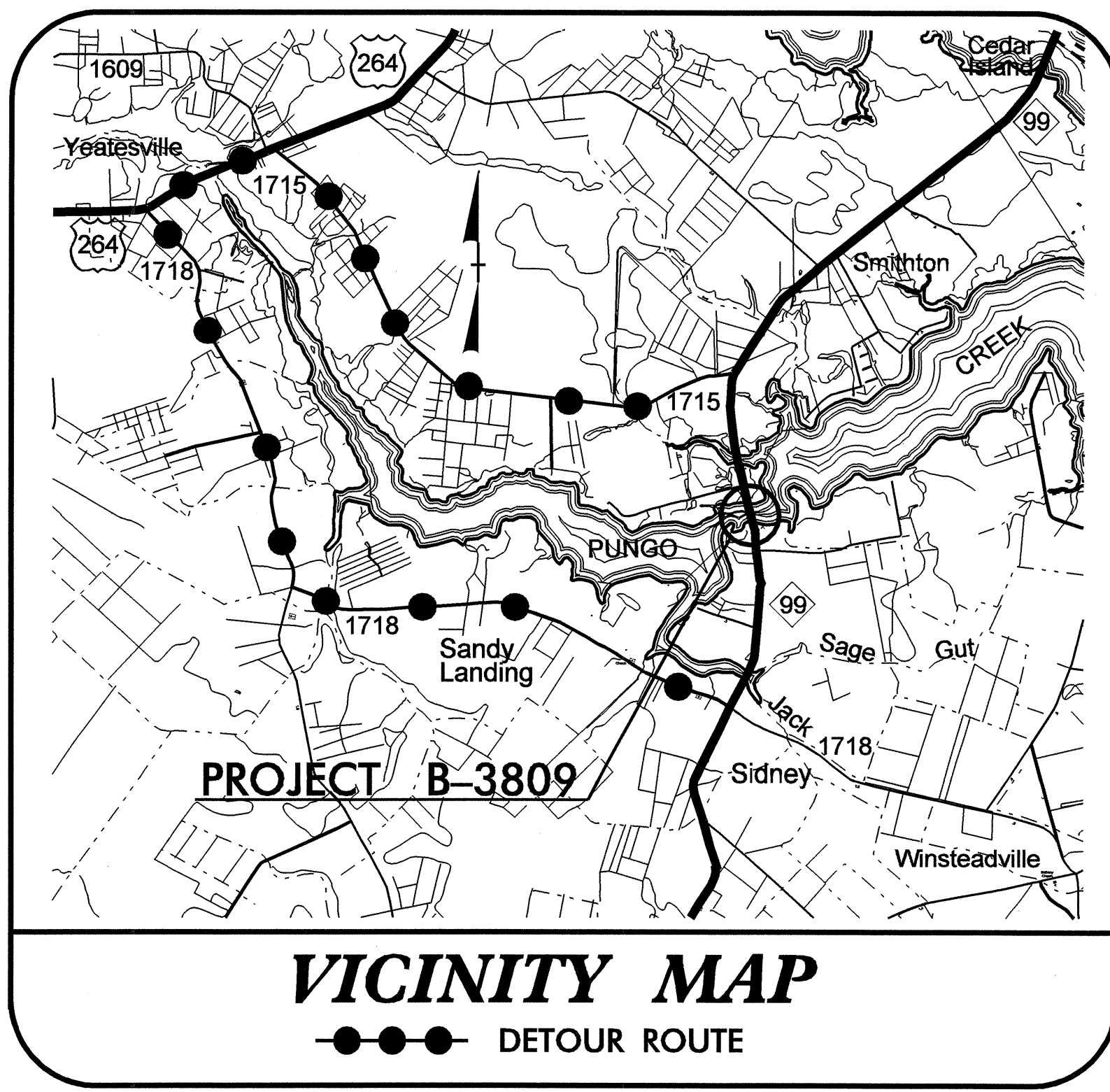


**CONTRACT: C202325 TIP PROJECT: B-3809**



NEAREST SHIPPING POINT: BELHAVEN ON CLNA RR APPROX. 4.2 MILES FROM PROJECT

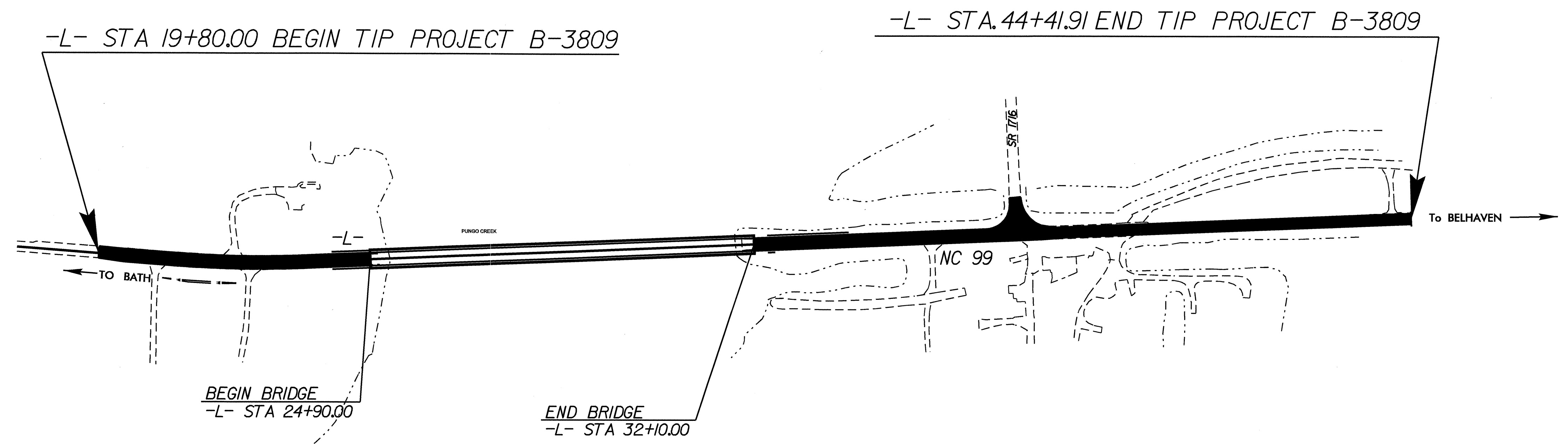
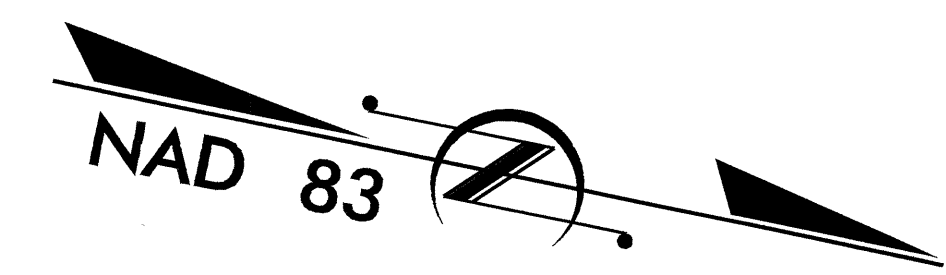
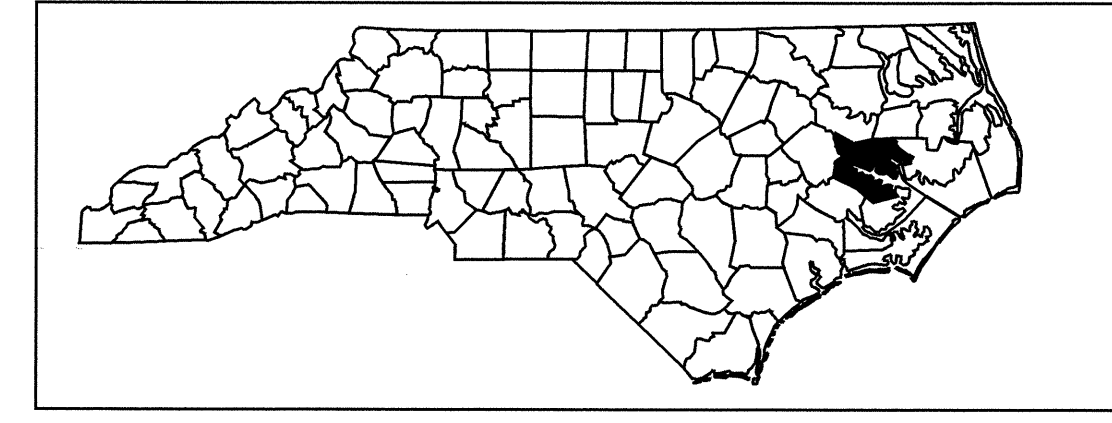
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# BEAUFORT COUNTY

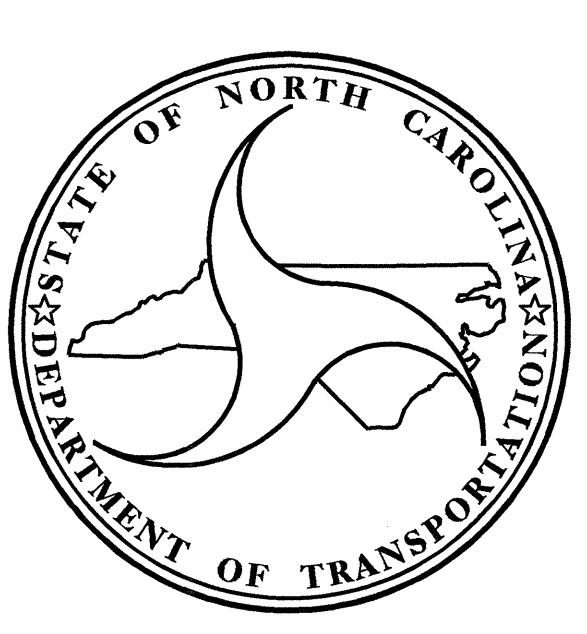
**LOCATION : BRIDGE 64 OVER PUNGO CREEK ON NC 99**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3809		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33264.1.1	BRSTP-99 (2)	PE	
33264.2.1	BRSTP-99 (2)	R/W & UTIL.	
33264.3.1	BRSTP-99 (6)	CONST.	



## STRUCTURE



**DESIGN DATA**

ADT 2007 =	3,400
ADT 2030 =	5,600
DHV =	10 %
D =	60 %
T =	9 % *
V =	60 MPH
* TTST 3 %	DUAL 6 %
FUNC CLASS =	RURAL MAJOR COLLECTOR

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-3809 =	0.331 MI.
LENGTH OF STRUCTURE TIP PROJECT B-3809 =	0.136 MI.
TOTAL LENGTH OF TIP PROJECT B-3809 =	0.467 MI.

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

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2006 STANDARD SPECIFICATIONS

<b>LETTING DATE:</b> FEBRUARY 16, 2010	<b>N. N. BULLOCK, PE</b> PROJECT ENGINEER
	<b>D. R. CALHOUN, PE</b> PROJECT DESIGN ENGINEER

**STRUCTURE DESIGN UNIT**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

P.E.

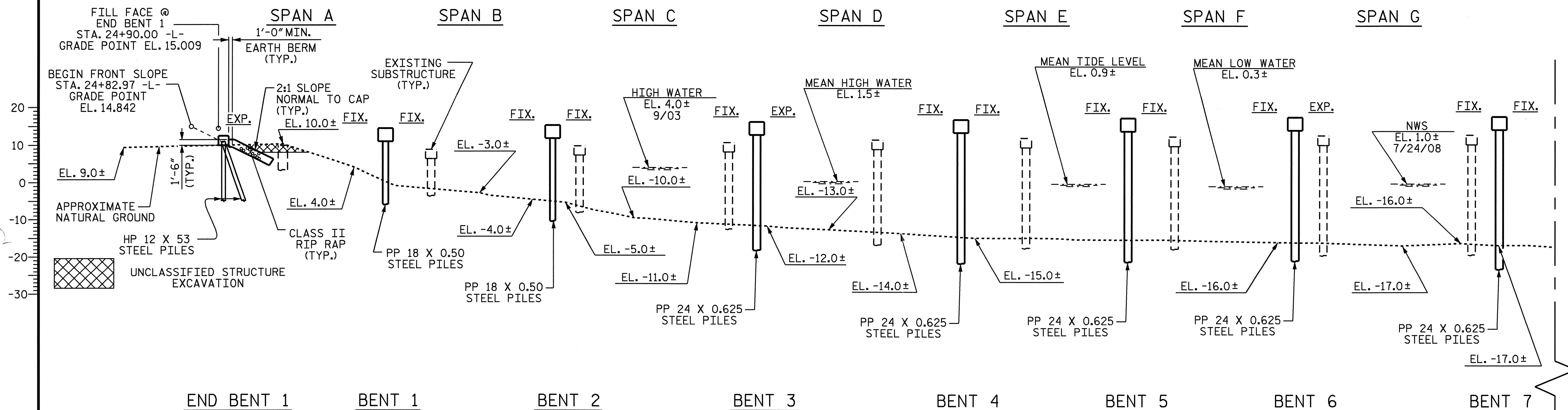
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

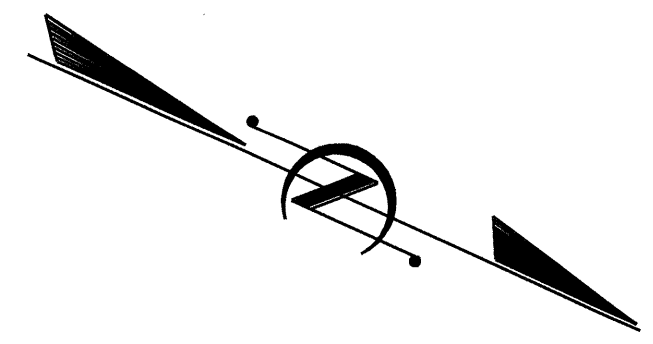
APPROVED  
DIVISION ADMINISTRATOR

DATE

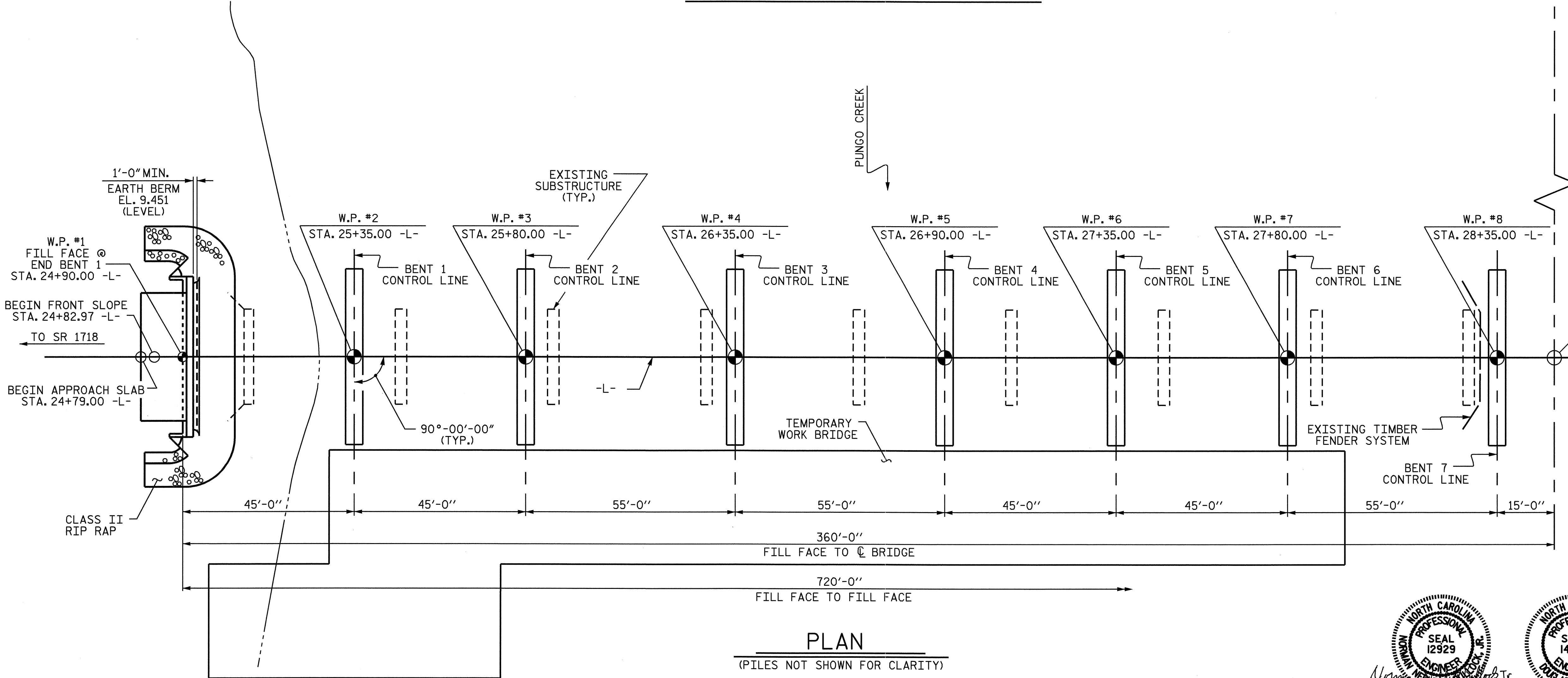
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GRADE DATA  
 (+)2.7954% (-)2.7354%  
 PI STA. 28+50.00 -L-  
 EL. = 25.230  
 VC = 860.00'

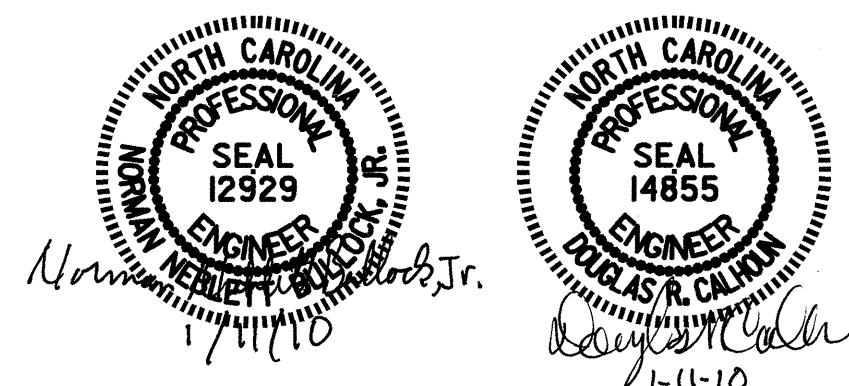


**SECTION ALONG -L-**



PROJECT NO. B-3809  
 BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 1 OF 5 REPLACES BRIDGE NO. 64

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 PUNGO CREEK ON  
 NC 99 BETWEEN  
 SR 1718 AND SR 1715

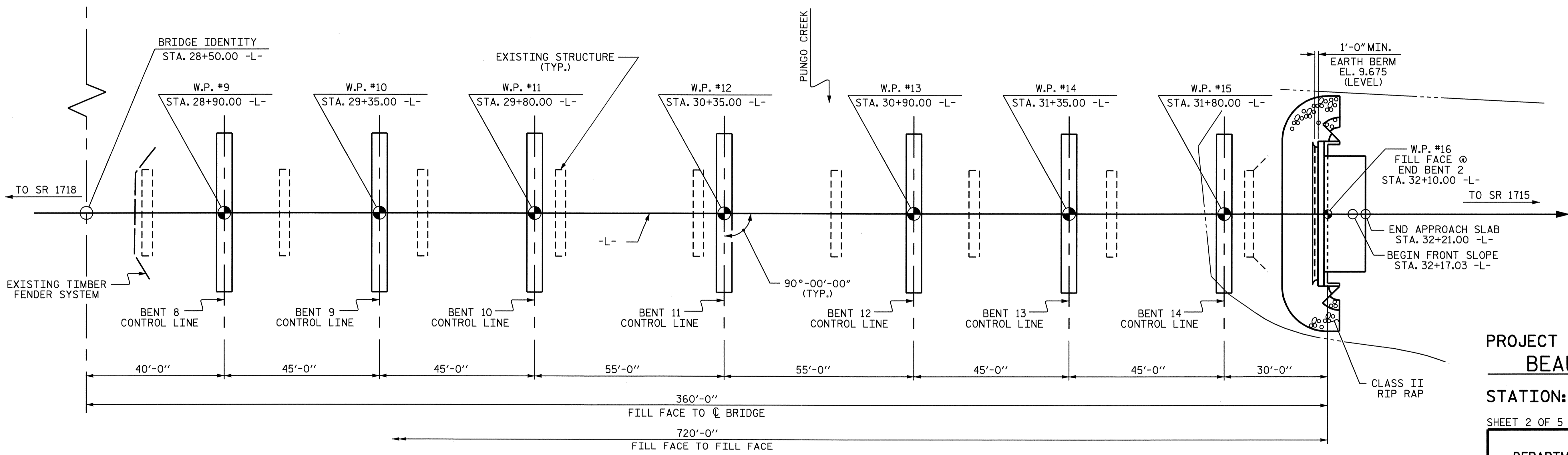
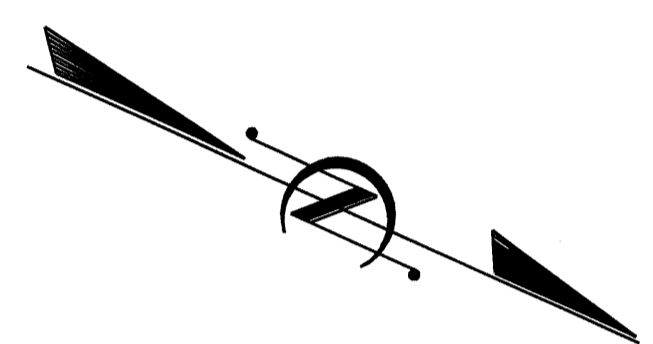
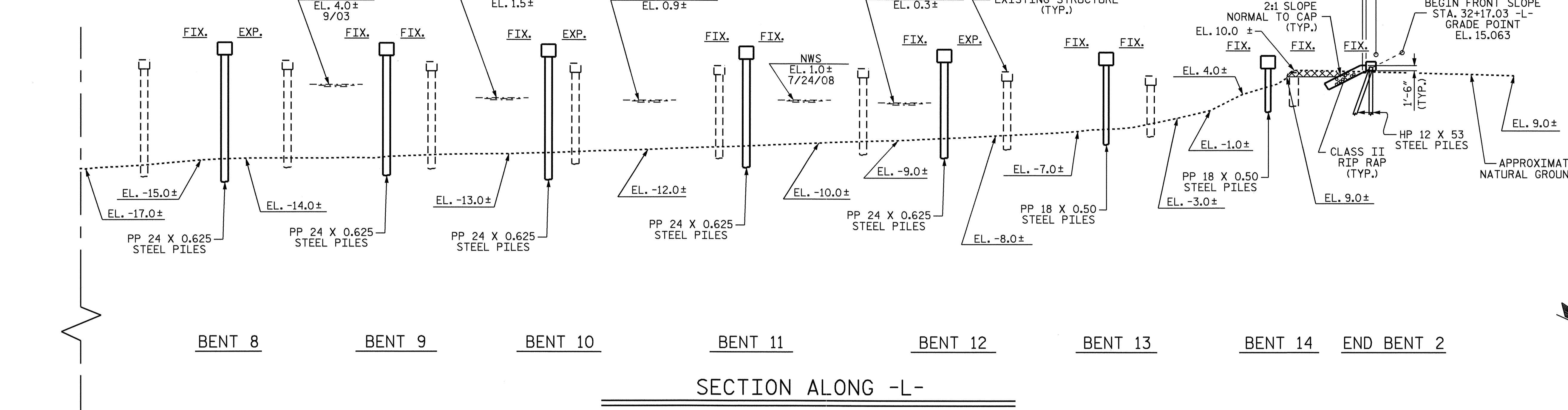
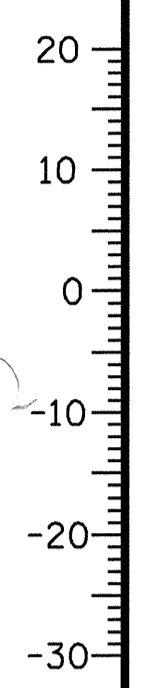


DRAWN BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : D.R. CALHOUN DATE : 9/10/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			39

(+)-2.7954% (-)-2.7354%

PI STA. 28+50.00 -L-  
 EL. = 25.230  
 VC = 860.00'

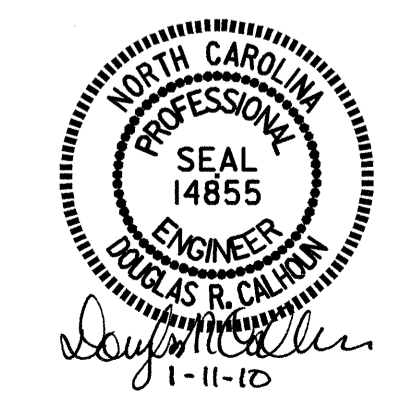


**PLAN**

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 2 OF 5

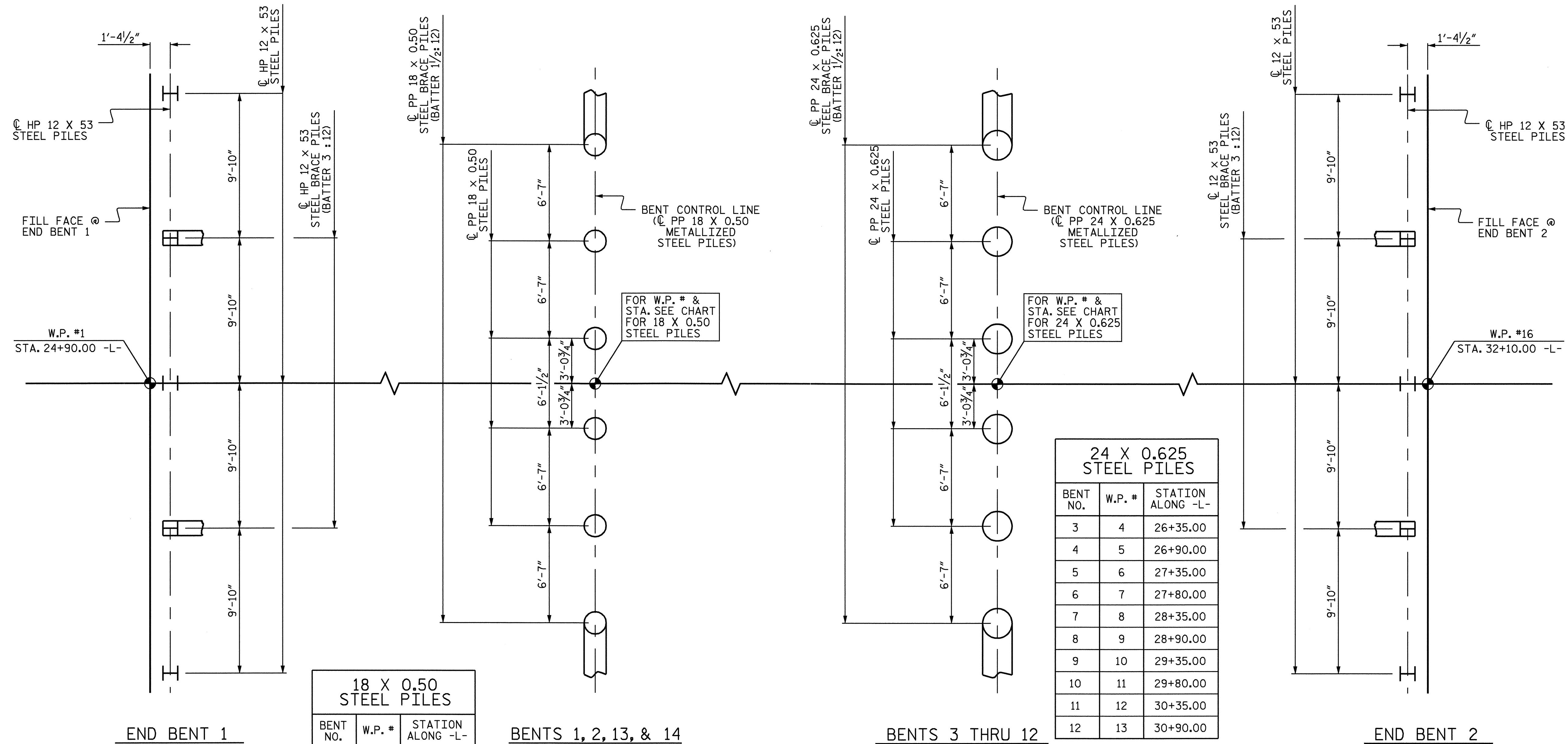
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 PUNGO CREEK ON  
 NC 99 BETWEEN  
 SR 1718 AND SR 1715



DRAWN BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : D.R. CALHOUN DATE : 9/10/09

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			39



24 X 0.625 STEEL PILES		
BENT NO.	W.P. #	STATION ALONG -L-
3	4	26+35.00
4	5	26+90.00
5	6	27+35.00
6	7	27+80.00
7	8	28+35.00
8	9	28+90.00
9	10	29+35.00
10	11	29+80.00
11	12	30+35.00
12	13	30+90.00

18 X 0.50 STEEL PILES		
BENT NO.	W.P. #	STATION ALONG -L-
1	2	25+35.00
2	3	25+80.00
13	14	31+35.00
14	15	31+80.00

### FOUNDATION LAYOUT

(DIMENSIONS LOCATING END BENT & BENT PILES ARE SHOWN TO CENTERLINE OF PILES)

### FOUNDATION NOTES :

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.

PILES AT BENTS 1, 2, 13, AND 14 ARE DESIGNED FOR A FACTORED RESISTANCE OF 135 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE FOR BENT 1 AND 2 AND 185 TONS PER PILE FOR BENT 13 AND 14. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

PILES AT BENTS 3 THRU 10 AND BENT 12 ARE DESIGNED FOR A FACTORED RESISTANCE OF 145 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

PILES AT BENTS 11 ARE DESIGNED FOR A FACTORED RESISTANCE OF 145 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 245 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

INSTALL PILES AT BENT 1 THRU 14 TO AN TIP ELEVATION NO HIGHER THAN -38, -38, -50, -53, -53, -60, -60, -53, -47, -47, -40, -38, AND -33 FT. RESPECTIVELY.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 THRU 14 ARE ELEVATION -10, -15, -24, -27, -27, -27, -29, -27, -27, -24, -24, -18, -15, AND -15 FT. RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 50,000 FT-LBS PER BLOW TO 100,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 THRU 7. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 83,000 FT-LBS PER BLOW TO 135,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 8 THRU 14. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.

TESTING THE FIRST PRODUCTION PILES WITH THE PILE DRIVING ANALYZER DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT 1 AND 14. FOR PILE DRIVING ANALYZER, SEE PILES SPECIAL PROVISION.

TESTING PILES WITH THE PILE DRIVING ANALYZER DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT 4, 8, AND 14. FOR PILE DRIVING ANALYZER, SEE PILES SPECIAL PROVISION.

PIPE PILE PLATES ARE REQUIRED FOR PIPE PILES AT BENTS 1 THRU BENT 7, BENT 13 AND 14. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER.

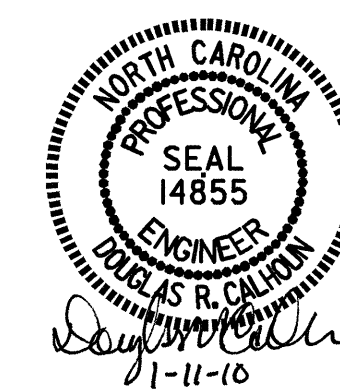
PIPE PILE PLATES MAY BE REQUIRED THE PIPE PILES AT BENTS 8 THRU 12. THE ENGINEER WILL DETERMINE THE NEED FOR PIPE PILES PLATES AFTER DRIVING TEST PILES OR A FEW INITIAL PRODUCTION PILES. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER.

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 PUNGO CREEK ON  
 NC 99 BETWEEN  
 SR 1718 AND SR 1715



DRAWN BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : D.R. CALHOUN DATE : 9/10/09

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

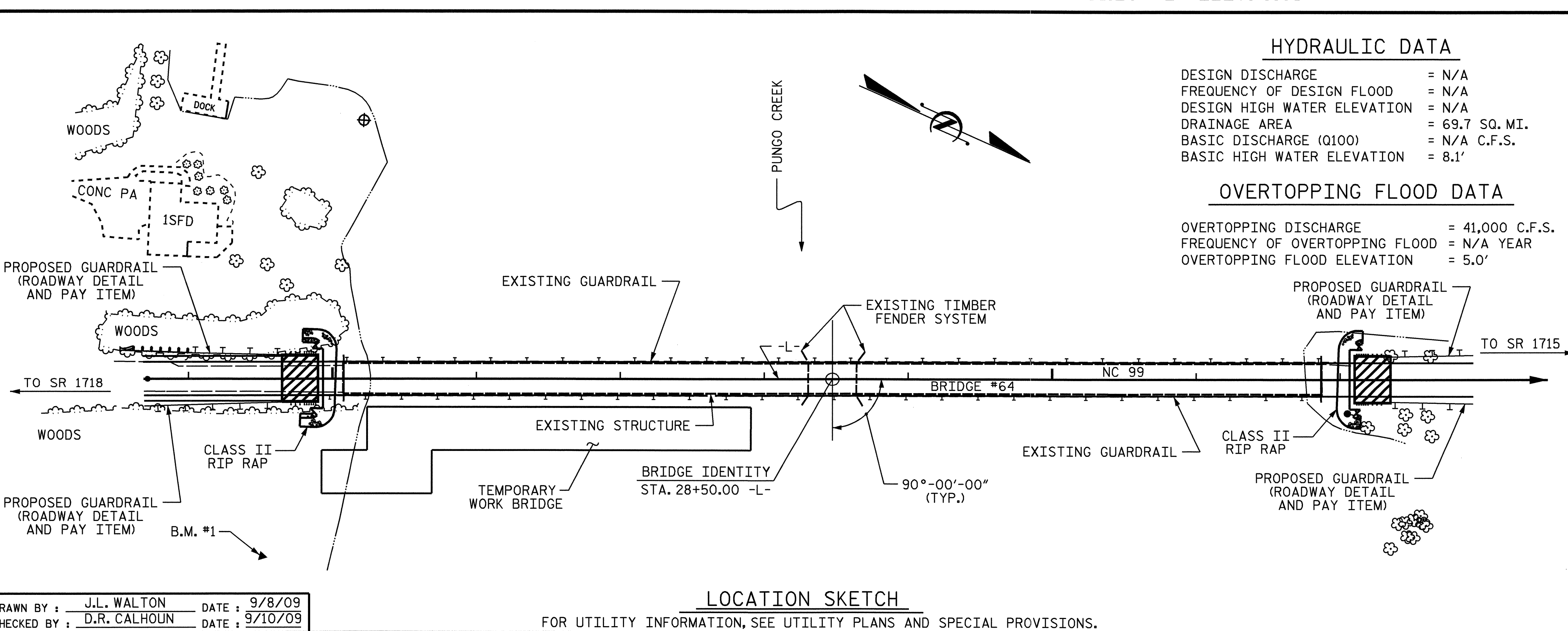
TOTAL SHEETS: 39

**TOTAL BILL OF MATERIAL**

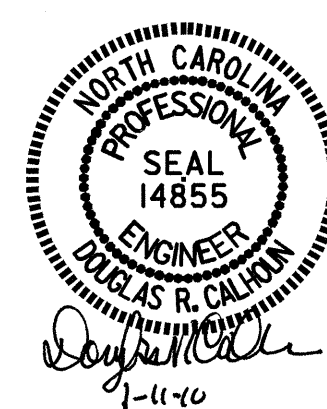
	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	PDA ASSISTANCE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	HP 12 X 53 STEEL PILES	PP 24 X 0.625 METALLIZED STEEL PILES	PP 18 X 0.50 METALLIZED STEEL PILES	PIPE PILE PLATES	PILE REDRIVES	TWO BAR METAL RAIL	1'-2" X 2'-7 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	SOLAR ARRAY SUPPORT PLATFORM	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS				
	LUMP SUM	LUMP SUM	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.		
SUPERSTRUCTURE							LUMP SUM								1420.50	1435.50			LUMP SUM	LUMP SUM	180	8592.00		
END BENT 1					LUMP SUM	13.8		2219	5	300							105	117						
BENT 1			1	1		11.3		2494			6	540	6	6										
BENT 2						11.3		2494			6	540	6	6										
BENT 3						14.4		2733		6	540	6	6											
BENT 4			1	1		14.4		2733		6	540	6	6											
BENT 5						14.4		2733		6	630	6	6											
BENT 6						14.4		2733		6	630	6	6											
BENT 7						14.4		2733		6	630	6	6											
BENT 8			1	1		14.4		2733		6	630	6	6											
BENT 9						14.4		2733		6	570	6	6											
BENT 10						14.4		2733		6	630	6	6											
BENT 11						14.4		2733		6	540	6	6											
BENT 12			1	1		14.4		2733		6	540	6	6											
BENT 13						11.3		2494			6	300	6	6										
BENT 14			1	1		11.3		2494			6	300	6	6										
END BENT 2					LUMP SUM	13.8		2219	5	325														
TOTAL	LUMP SUM	LUMP SUM	5	5	LUMP SUM	216.8	LUMP SUM	41,744	10	625	60	5,880	24	1,680	84	94	1420.50	1435.50	193	215	LUMP SUM	LUMP SUM	180	8592.00

NOTE: CAST IN PLACE TOTAL BILL OF MATERIAL IS SHOWN. THE CONTRACTOR HAS THE OPTION TO USE THE PRECAST OPTION AT NO ADDITIONAL CHARGE TO THE DEPARTMENT. SEE SHEETS S-27 THRU S-32 FOR PRECAST OPTION.

BM #1 : "DAVIS RESET 1984" BRASS CAP IN A CONCRETE MONUMENT 123.81' RT. OF 24+51.20 -L- ELEV. 8.01'



PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 4 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING  
 FOR BRIDGE OVER  
 PUNGO CREEK ON  
 NC 99 BETWEEN  
 SR 1718 AND SR 1715**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : D.R. CALHOUN DATE : 9/10/09

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NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF SEVENTEEN (1 @ 40'-3", 15 @ 40'-0", 1 @ 40'-3") REINFORCED CONCRETE DECK SPANS ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 22'-0" ON REINFORCED CONCRETE CAP END BENTS AND BENTS WITH TIMBER PILES AND A TIMBER FENDER SYSTEM LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.

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.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC DESIGN FOR SEISMIC PERFORMANCE ZONE 1.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 28+50.00 -L-."

A TEMPORARY WORK BRIDGE SHALL BE PERMITTED FOR CONSTRUCTION OF BRIDGE. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 28+50.00 -L-.

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE PARAPET, BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE BENT CAPS SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

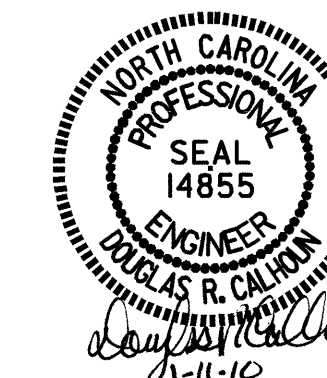
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 PUNGO CREEK ON  
 NC 99 BETWEEN  
 SR 1718 AND SR 1715

DRAWN BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : D.R. CALHOUN DATE : 9/10/09

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			39

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (%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 (%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	1.17	--	1.75	0.273	1.59	C	ER	26.938	0.536	1.17	B	ER	2.194	0.80	0.273	1.17	C	ER	26.938		
	HL-93 (OPERATING)	N/A		1.51	--	1.35	0.273	2.07	C	ER	26.938	0.536	1.51	B	ER	2.194	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.33	47.880	1.75	0.273	1.94	C	ER	26.938	0.536	1.33	B	ER	2.194	0.80	0.273	1.46	C	ER	26.938		
	HS-20 (OPERATING)	36.000		1.78	64.080	1.35	0.273	2.59	C	ER	26.938	0.536	1.78	B	ER	2.194	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.06	41.310	1.40	0.277	4.75	B	ER	21.938	0.536	3.50	B	ER	2.194	0.80	0.273	3.06	C	ER	26.938	
		SNGARBS2	20.000		2.38	47.600	1.40	0.273	3.77	C	ER	26.938	0.536	2.58	B	ER	2.194	0.80	0.273	2.38	C	ER	26.938	
		SNAGRIS2	22.000		2.30	50.600	1.40	0.273	3.64	C	ER	26.938	0.536	2.42	B	ER	2.194	0.80	0.273	2.30	C	ER	26.938	
		SNCOTTS3	27.250		1.53	41.693	1.40	0.277	2.37	B	ER	21.938	0.536	1.76	B	ER	2.194	0.80	0.273	1.53	C	ER	26.938	
		SNAGGRS4	34.925		1.31	45.752	1.40	0.273	2.08	C	ER	26.938	0.536	1.52	B	ER	2.194	0.80	0.273	1.31	C	ER	26.938	
		SNS5A	35.550		1.29	45.860	1.40	0.273	2.03	C	ER	26.938	0.536	1.57	B	ER	2.194	0.80	0.273	1.29	C	ER	26.938	
		SNS6A	39.950		1.19	47.541	1.40	0.273	1.89	C	ER	26.938	0.536	1.46	B	ER	2.194	0.80	0.273	1.19	C	ER	26.938	
	SNS7B	42.000		1.14	47.880	1.40	0.273	1.80	C	ER	26.938	0.536	1.47	B	ER	2.194	0.80	0.273	1.14	C	ER	26.938		
	TRUCK TRACTOR SEMI-TRAILER (TST)	TNAGRIT3	33.000		1.46	48.180	1.40	0.273	2.31	C	ER	26.938	0.536	1.71	B	ER	2.194	0.80	0.273	1.46	C	ER	26.938	
		TNT4A	33.075		1.48	48.951	1.40	0.273	2.33	C	ER	26.938	0.536	1.64	B	ER	2.194	0.80	0.273	1.48	C	ER	26.938	
		TNT6A	41.600		1.21	50.336	1.40	0.273	1.93	C	ER	26.938	0.536	1.60	B	ER	2.194	0.80	0.273	1.21	C	ER	26.938	
		TNT7A	42.000		1.24	52.080	1.40	0.273	1.95	C	ER	26.938	0.536	1.48	B	ER	2.194	0.80	0.273	1.24	C	ER	26.938	
		TNT7B	42.000		1.29	54.180	1.40	0.273	2.03	C	ER	26.938	0.536	1.41	B	ER	2.194	0.80	0.273	1.29	C	ER	26.938	
		TNAGRIT4	43.000		1.21	52.030	1.40	0.273	1.93	C	ER	26.938	0.536	1.35	B	ER	2.194	0.80	0.273	1.21	C	ER	26.938	
TNAGT5A		45.000		1.14	51.300	1.40	0.273	1.80	C	ER	26.938	0.536	1.39	B	ER	2.194	0.80	0.273	1.14	C	ER	26.938		
TNAGT5B	45.000		③	1.13	50.850	1.40	0.273	1.77	C	ER	26.938	0.536	1.28	B	ER	2.194	0.80	0.273	1.13	C	ER	26.938		

### LOAD FACTORS:

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

	YEAR	ADTT
CURRENT	2007	184
FUTURE	2030	302

### NOTES:

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

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

### COMMENTS:

1. THIS BRIDGE HAS BEEN DESIGNED USING SIMPLE SPAN ANALYSIS.

- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

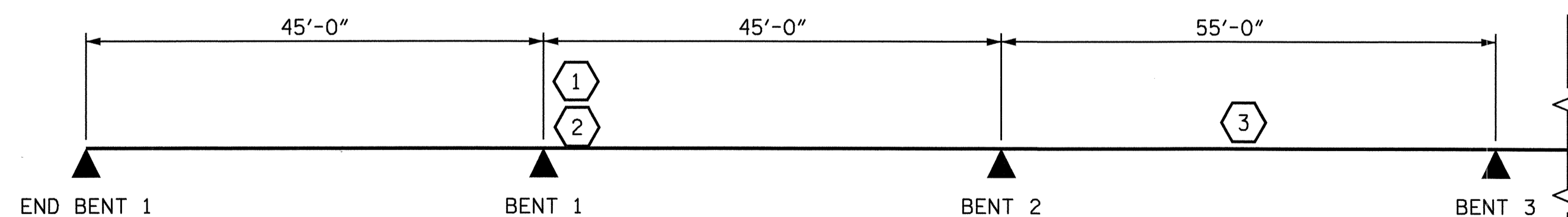
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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

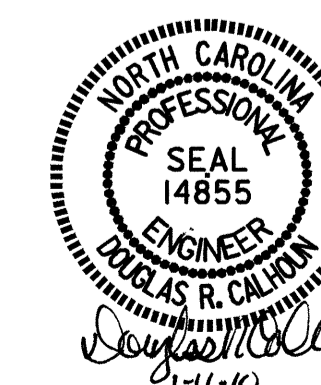


### LRFR SUMMARY

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

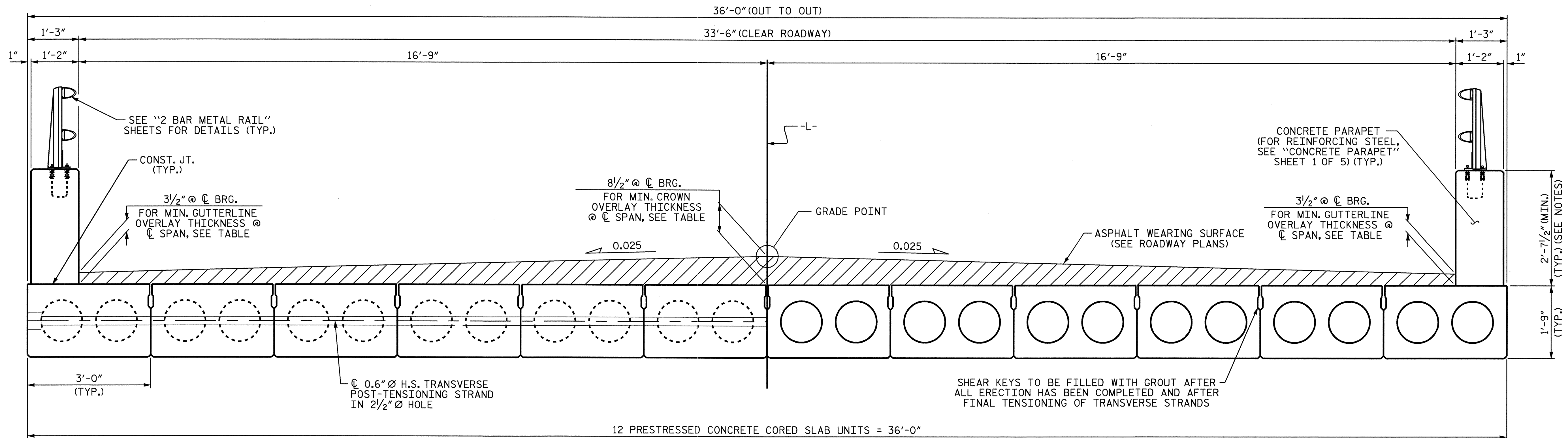
ASSEMBLED BY : J.L. WALTON DATE : 9/8/09  
 CHECKED BY : W.A. ARAFAT DATE : 9/10/09  
 DRAWN BY : MAA 1/08  
 CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			39



AT DIAPHRAGMS

TYPICAL SECTION

AT 12" Ø VOIDS

MIN. OVERLAY THICKNESS @ C SPAN		
SPAN	@ GUTTERLINE	@ CROWN
A, B, E, F, I, J, M, & N	2 7/16"	7 1/16"
C, D, G, H, K, & L	1 1/2"	6 1/2"
0	3 3/8"	8 1/8"

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION

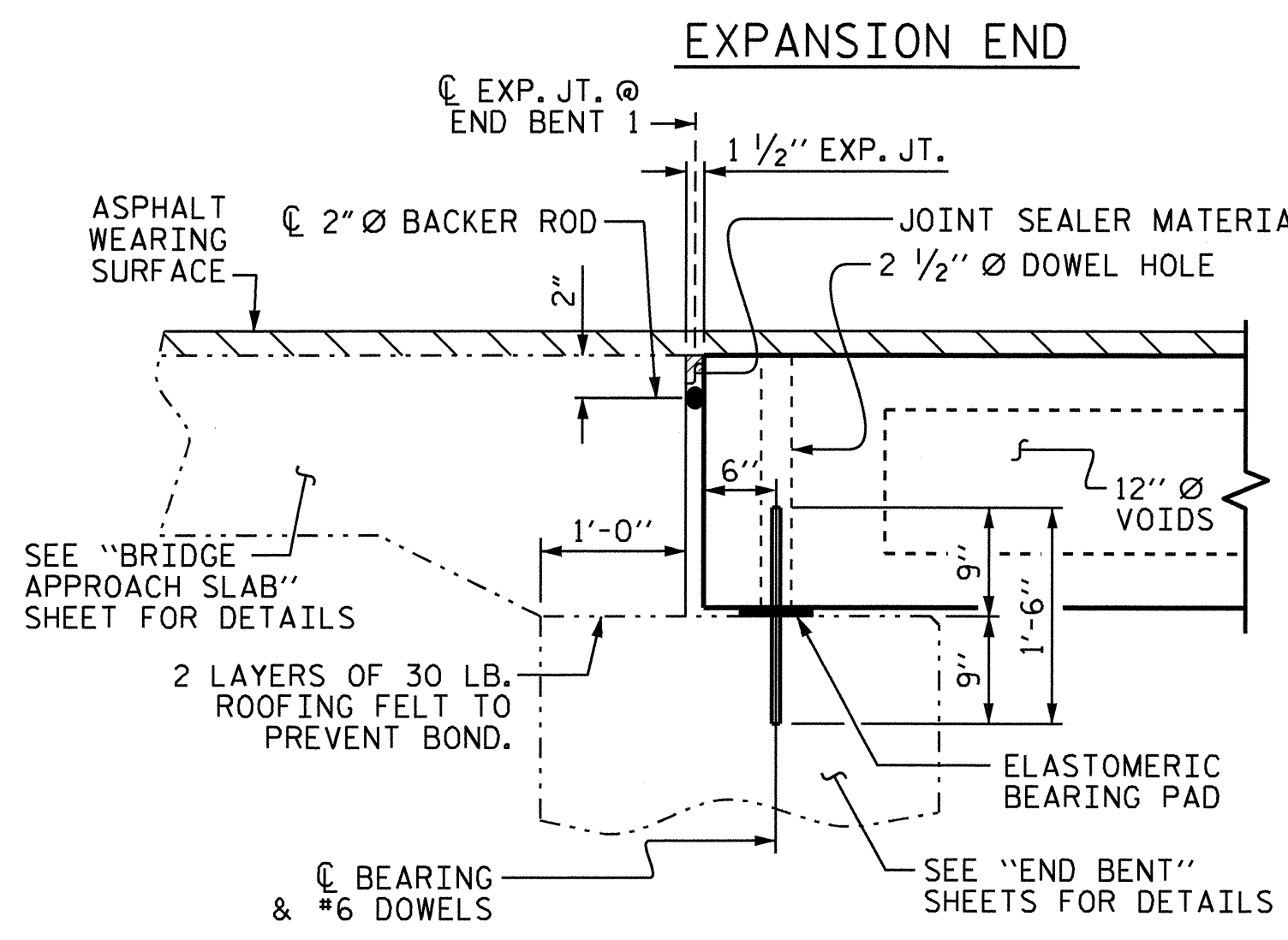


DRAWN BY : B.N. GRADY DATE : 6/17/09  
 CHECKED BY : J.L. WALTON DATE : 7/22/09

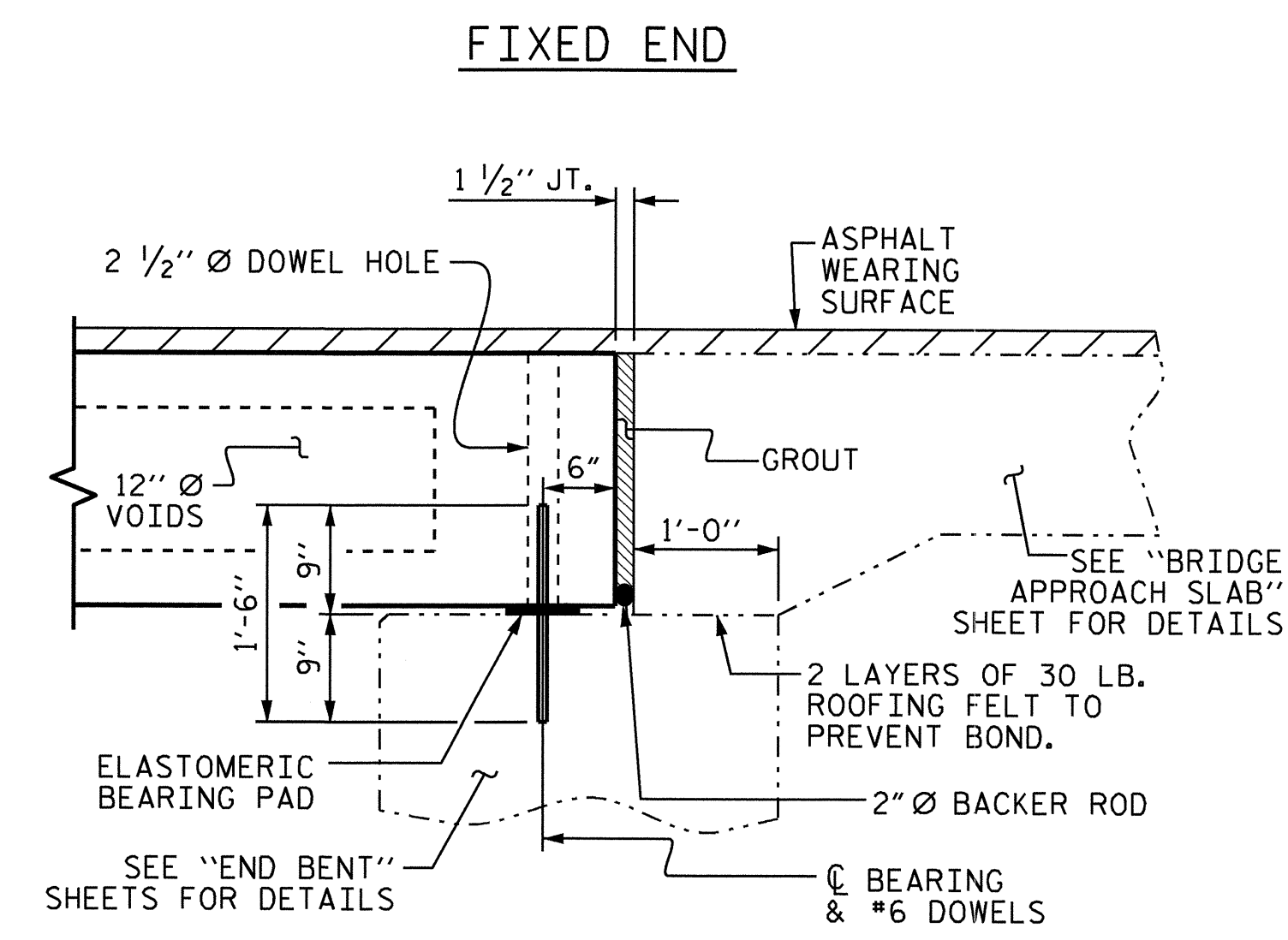
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 jmya

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			39

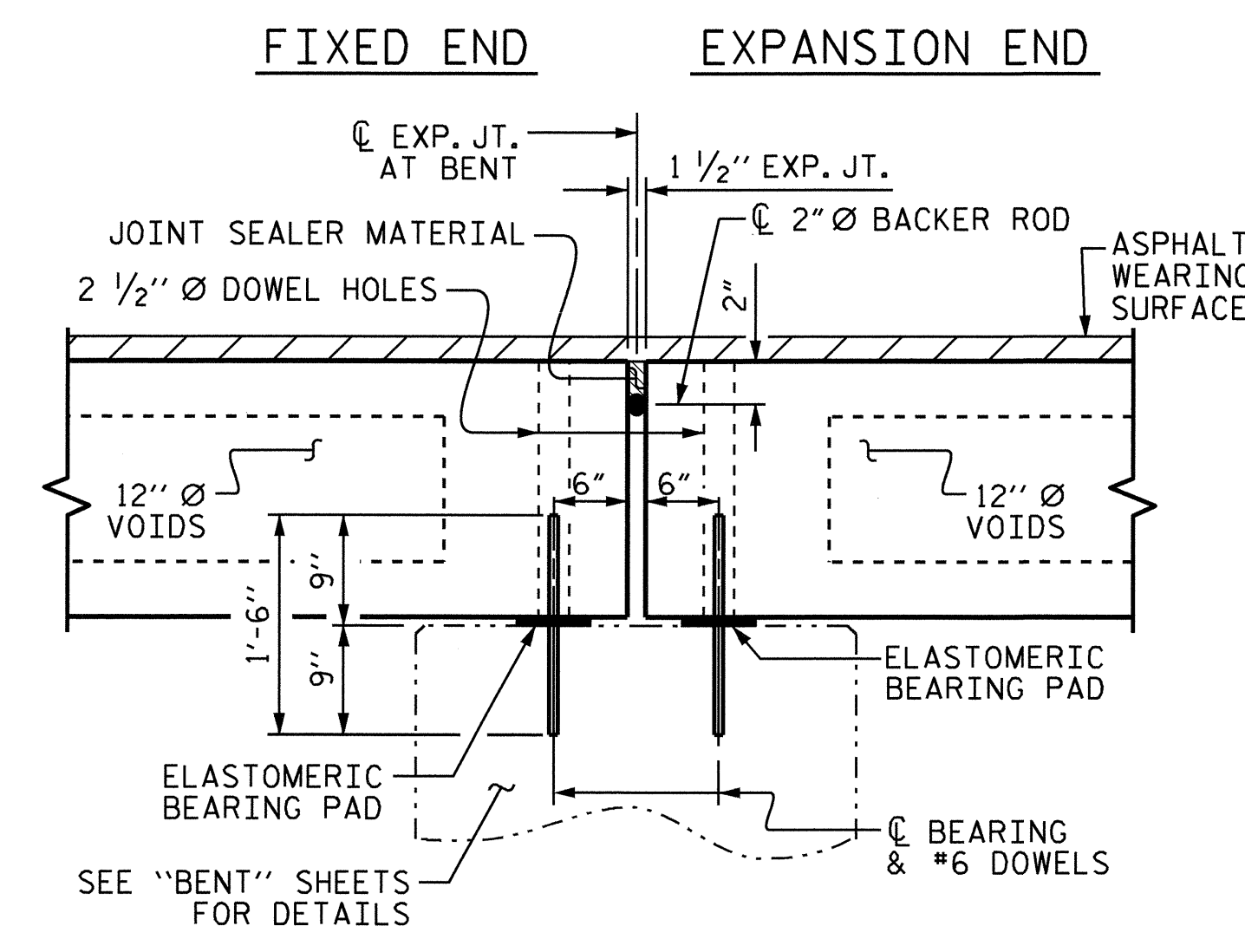




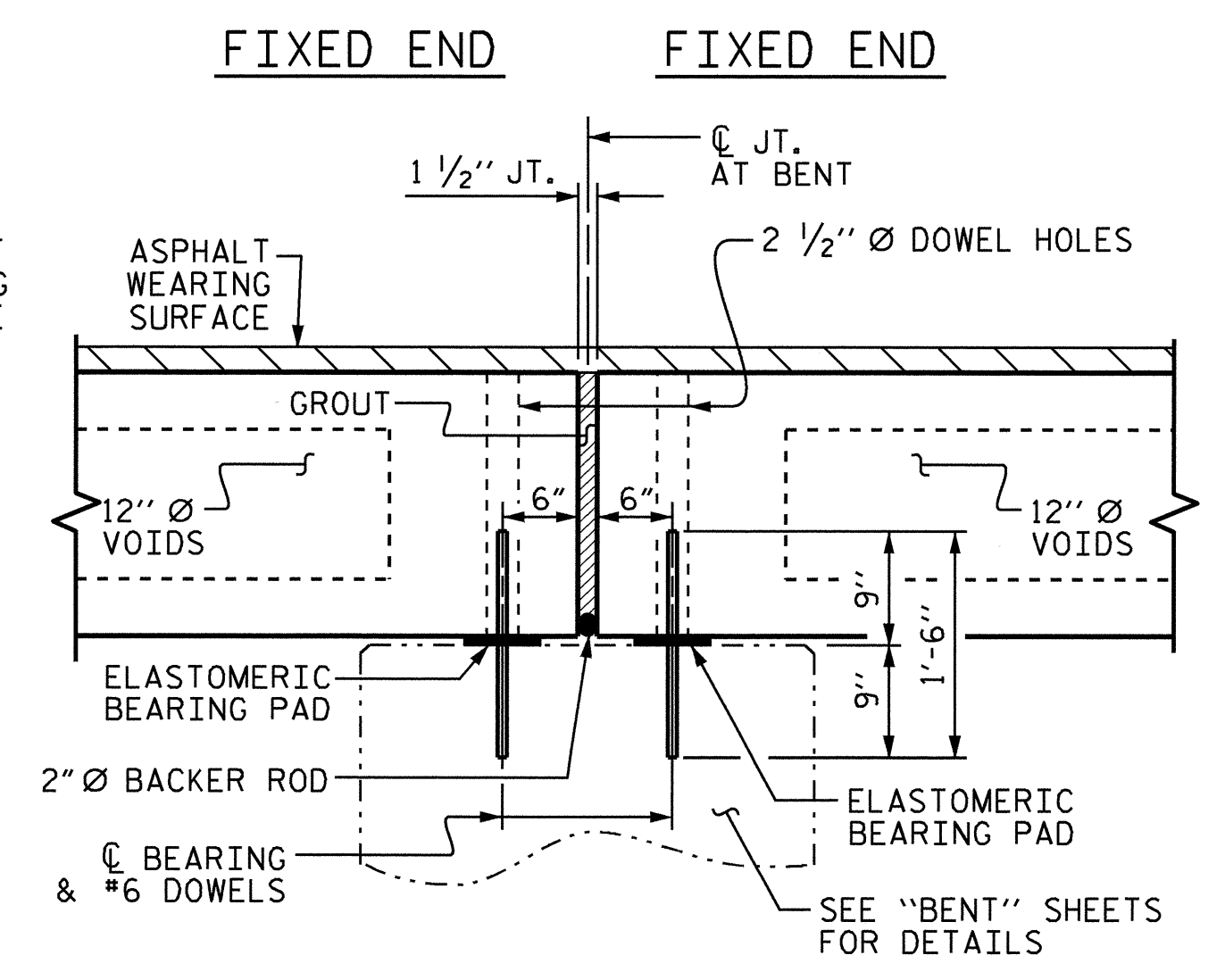
SECTION AT END BENT 1



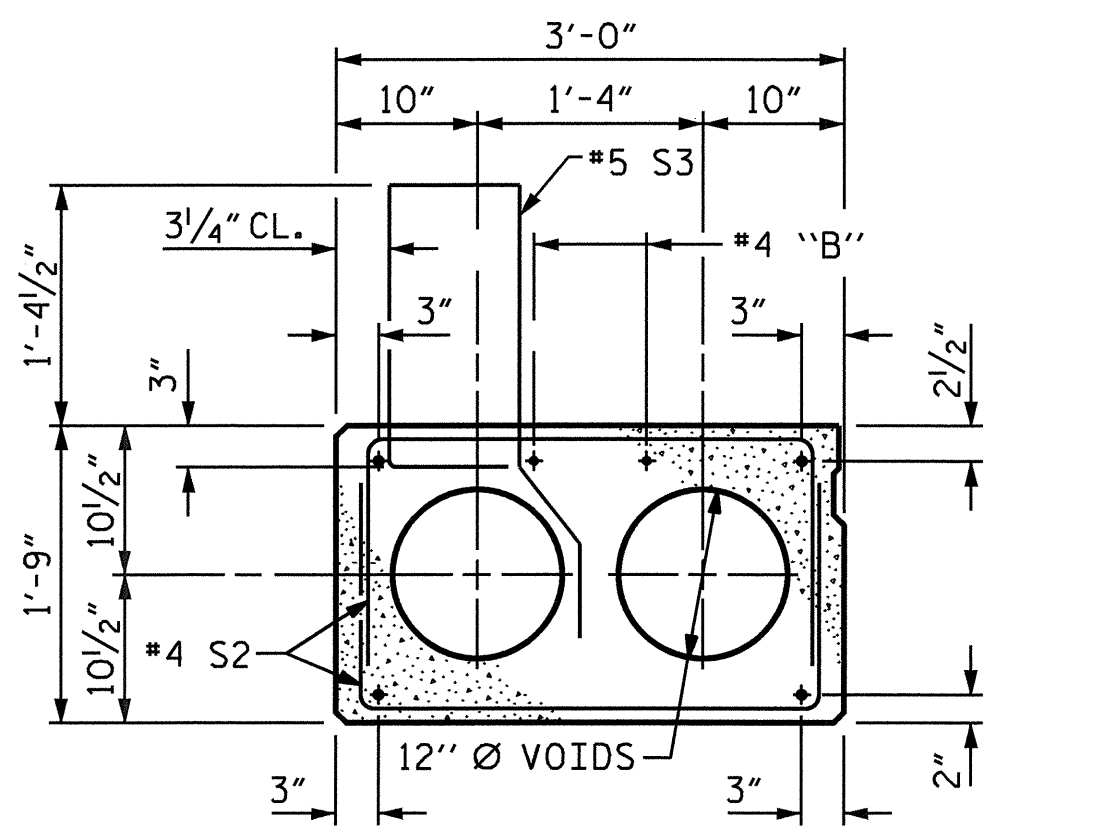
SECTION AT END BENT 2



SECTION AT BENT  
(BENTS 3, 6, 8, 10, & 12)

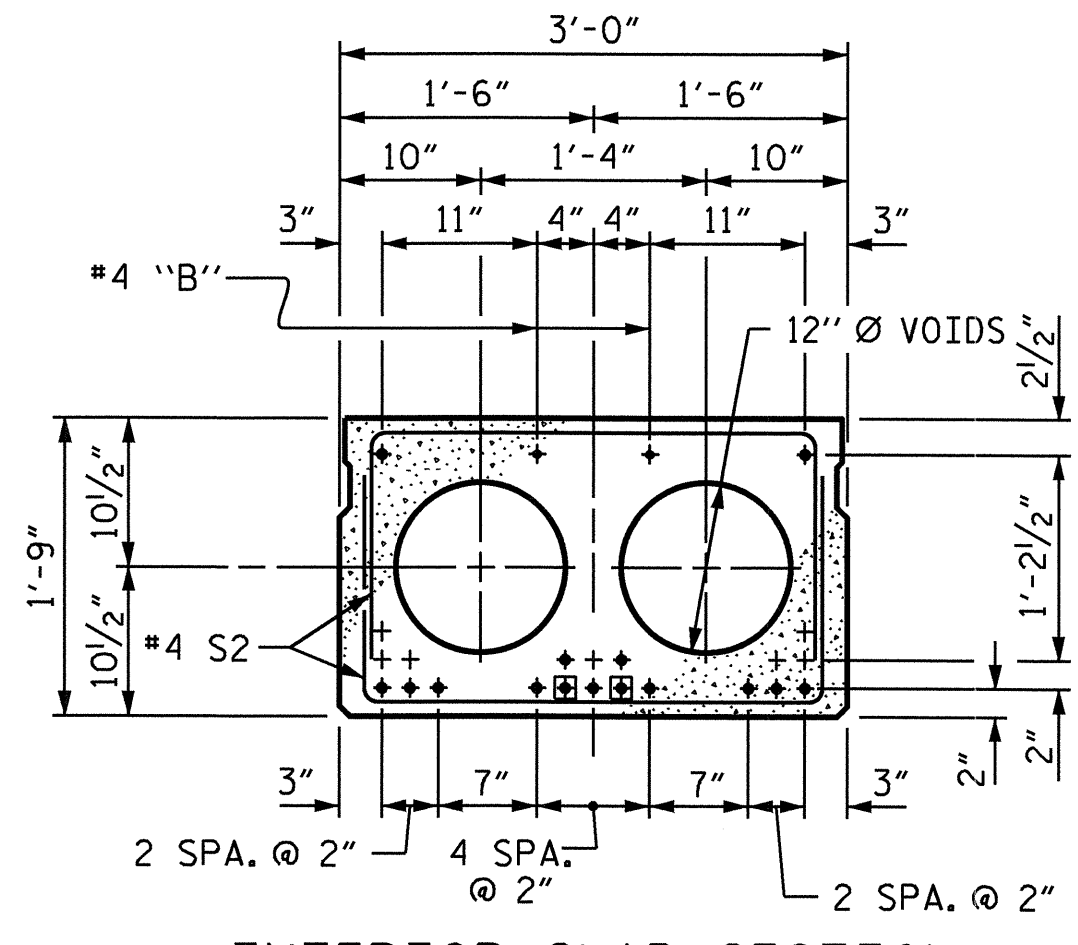


SECTION AT BENT  
(BENTS 1, 2, 4, 5, 7, 9, 11, 13, & 14)



EXTERIOR SLAB SECTION

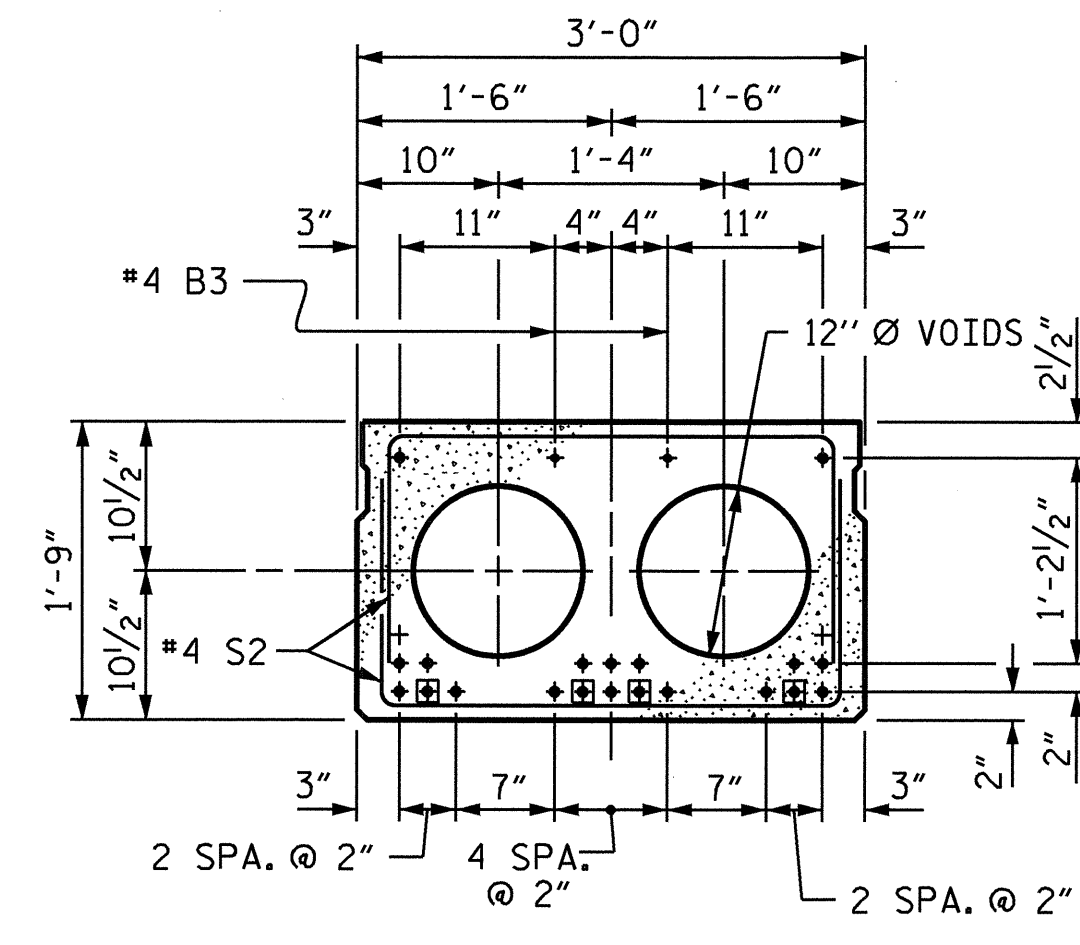
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION  
0.6" Ø LOW RELAXATION STRAND LAYOUT  
(15 STRANDS, 2 SHEATHED)

SPANS A, B, E, F, I, J, M & N

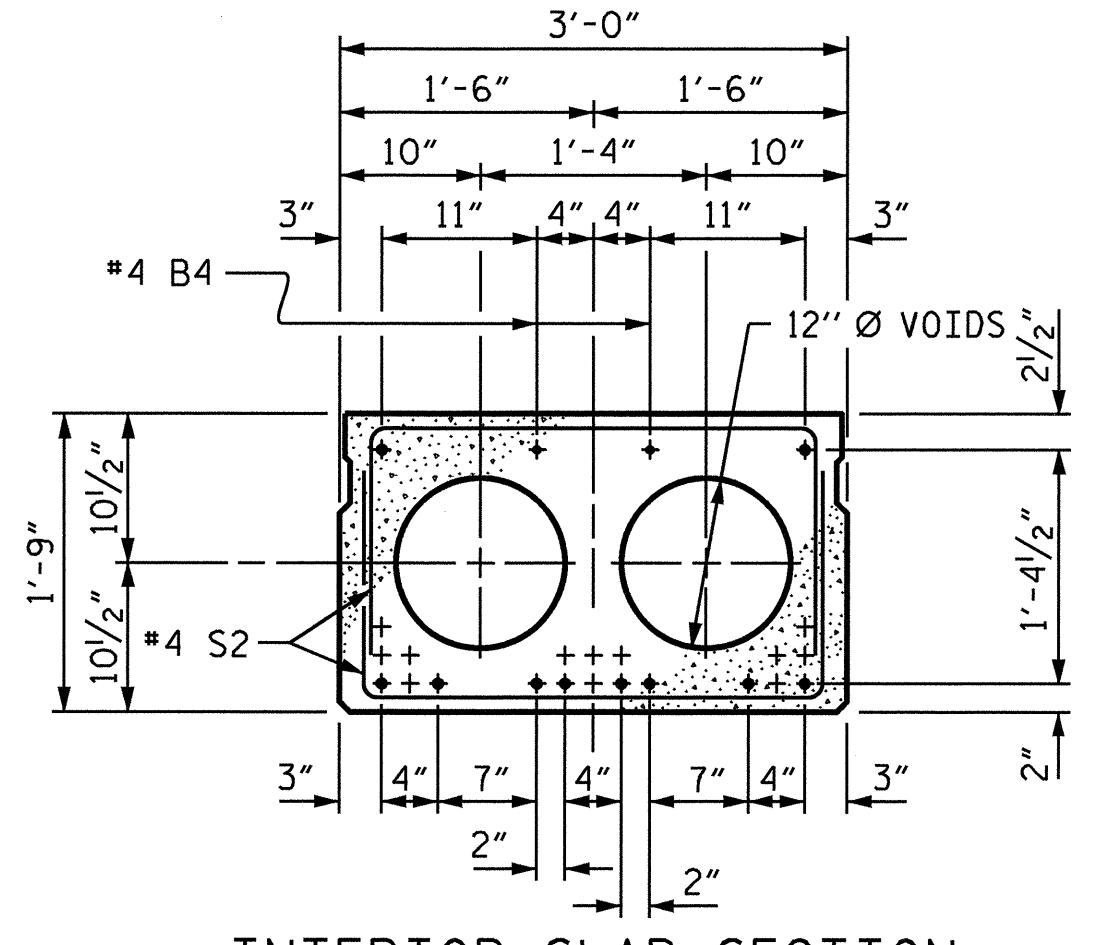
THE BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



INTERIOR SLAB SECTION  
0.6" Ø LOW RELAXATION STRAND LAYOUT  
(20 STRANDS, 4 SHEATHED)

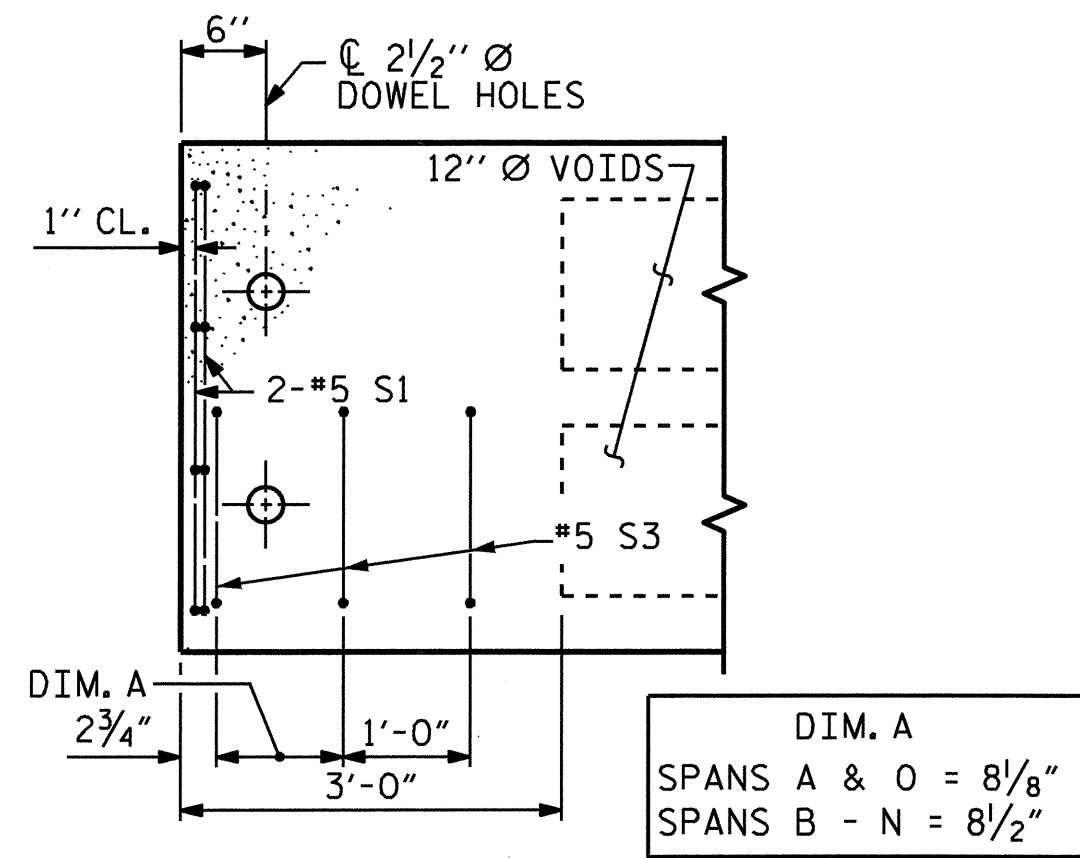
SPANS C, D, G, H, K & L

THE BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



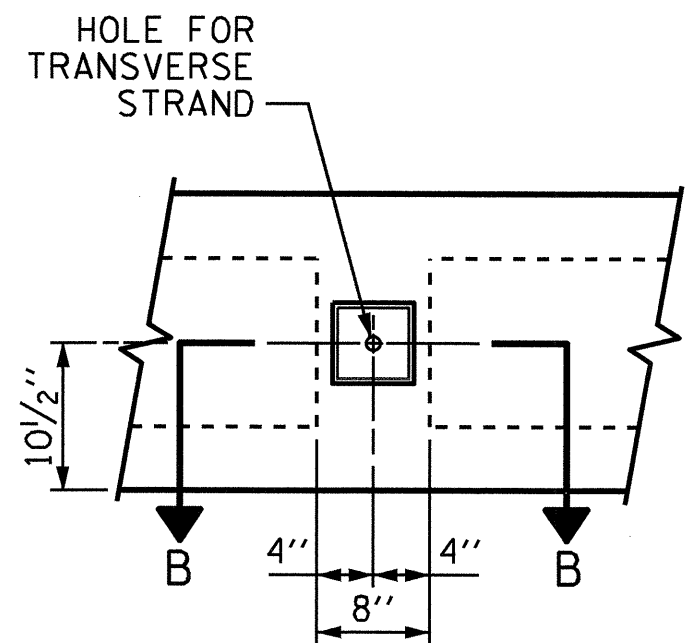
INTERIOR SLAB SECTION  
0.6" Ø LOW RELAXATION STRAND LAYOUT  
(10 STRANDS)

SPAN 0

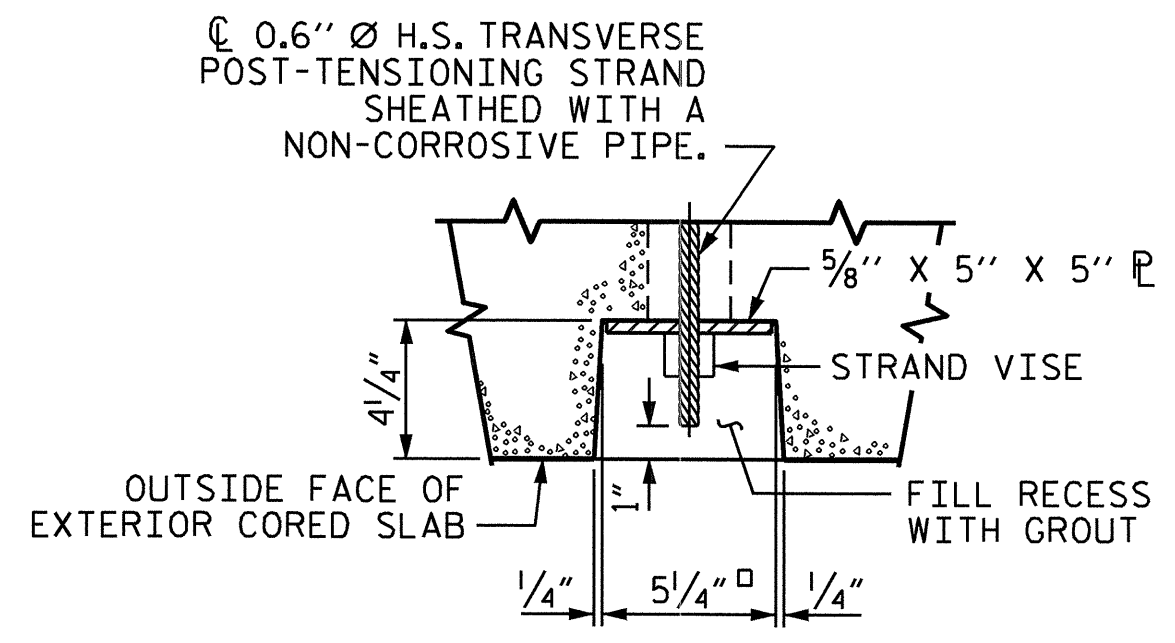


PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.

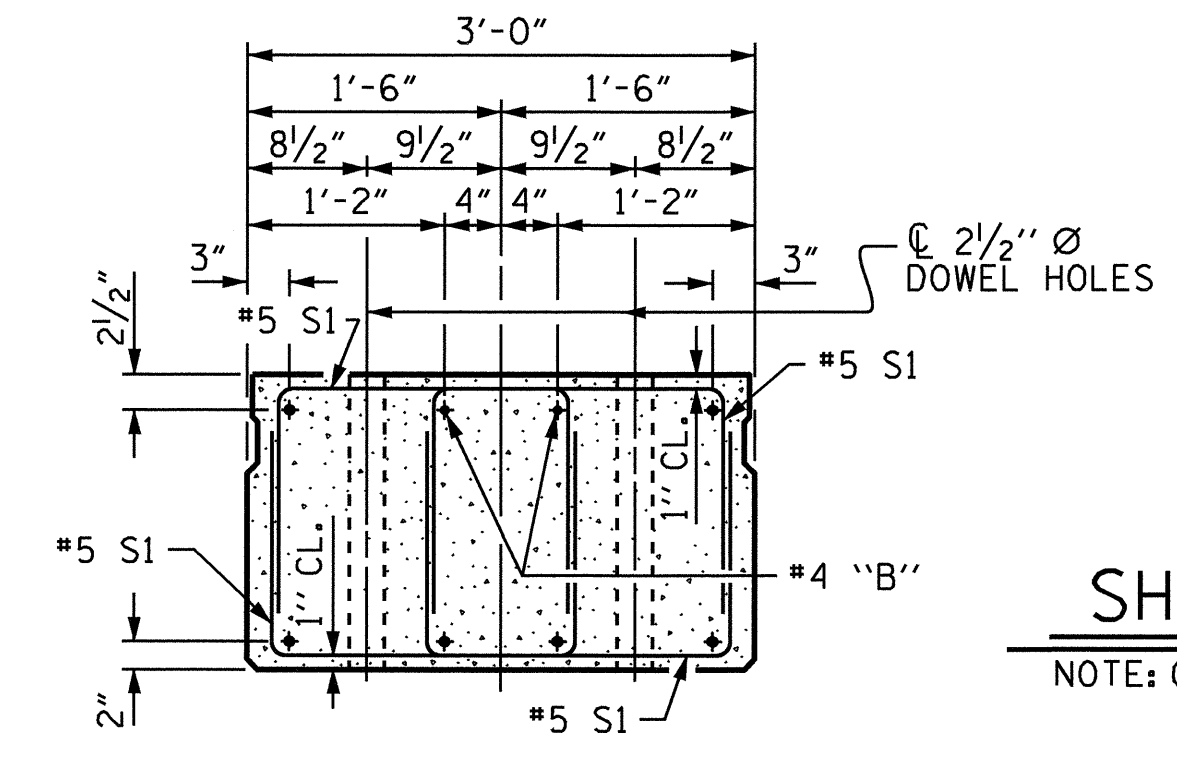


ELEVATION VIEW



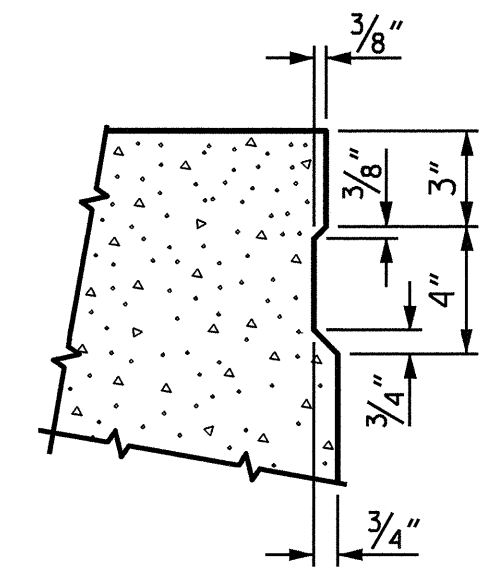
SECTION B-B

GRouted RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



END ELEVATION

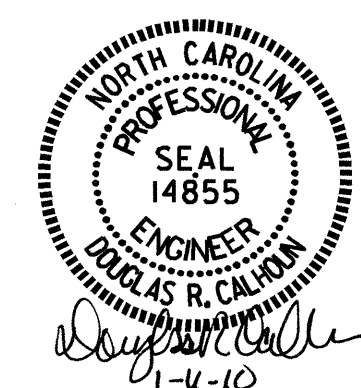
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB SECTION SHOWN-EXTERIOR SLAB SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

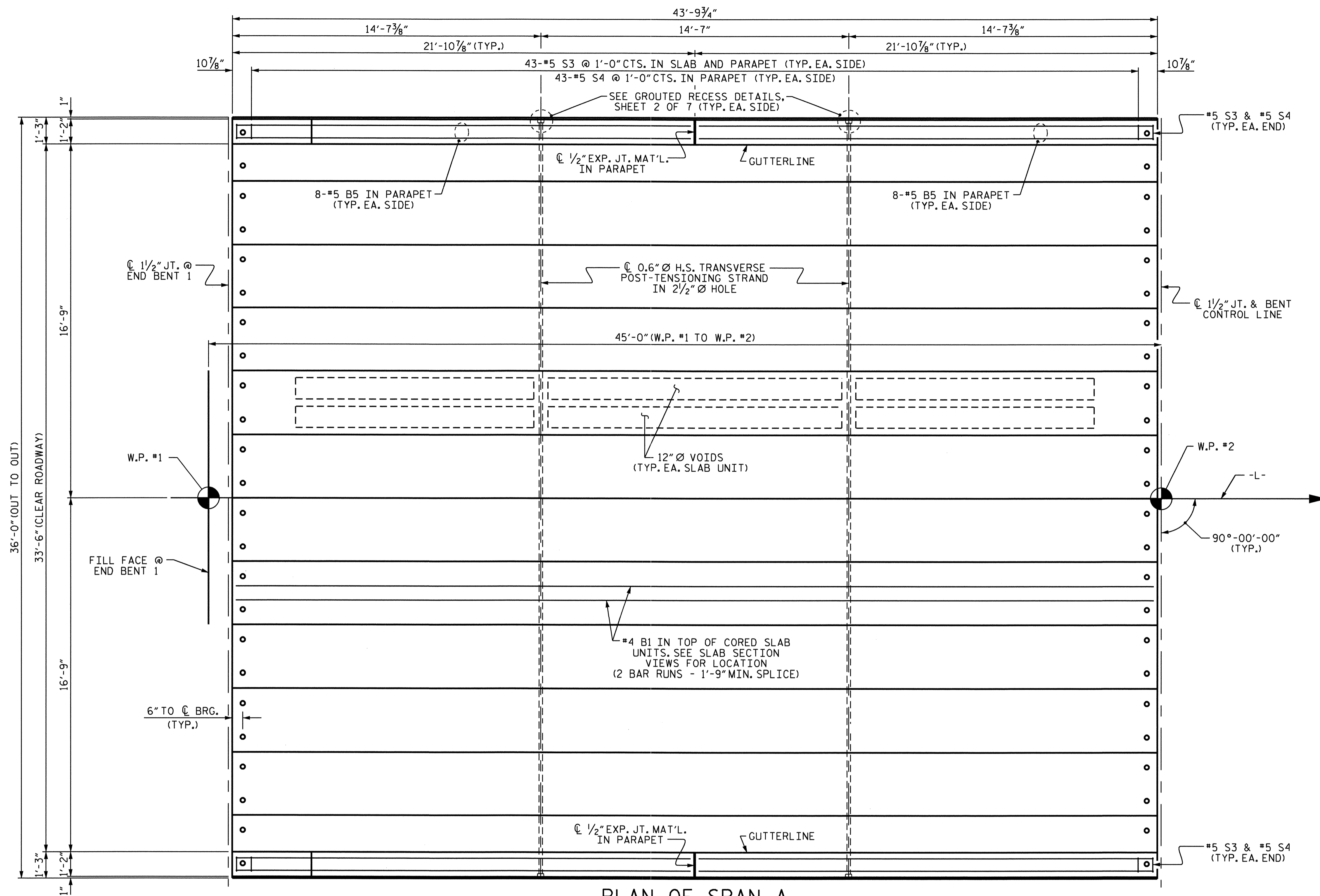
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

ASSEMBLED BY : B.N. GRADY	DATE : 6/17/09
CHECKED BY : J.L. WALTON	DATE : 7/24/09
DRAWN BY : WJH 4/89	REV. 10/17/00 RWW/LES
CHECKED BY : FCJ 5/89	REV. 7/10/01RR RWW/LES
	REV. 5/1/06 TLA/GM

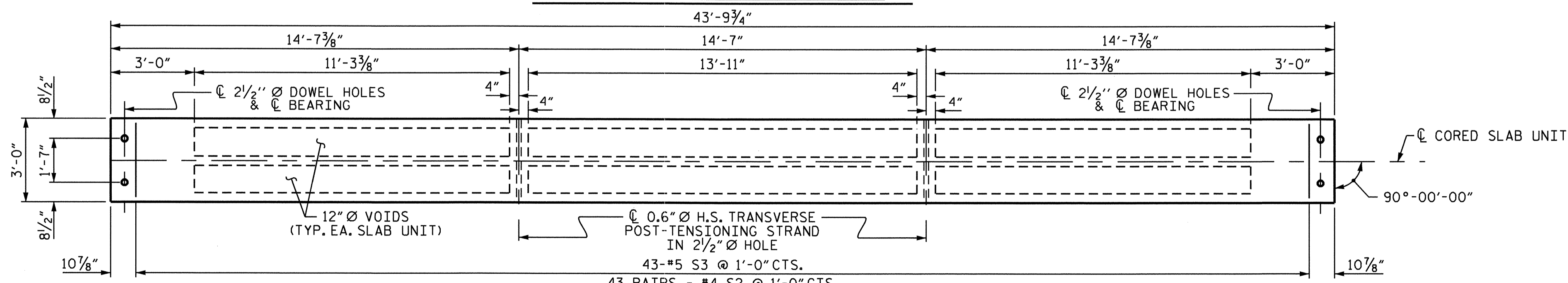


PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-  
SHEET 2 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-8
					TOTAL SHEETS 39

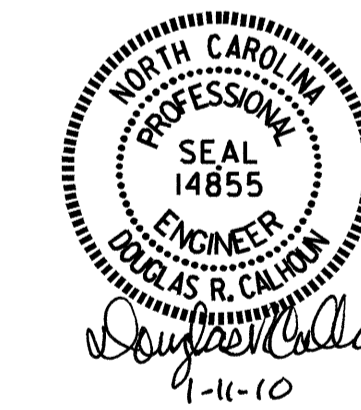


PLAN OF SPAN A



PLAN OF CORED SLAB UNIT

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 2 OF 7.



PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 3 OF 7

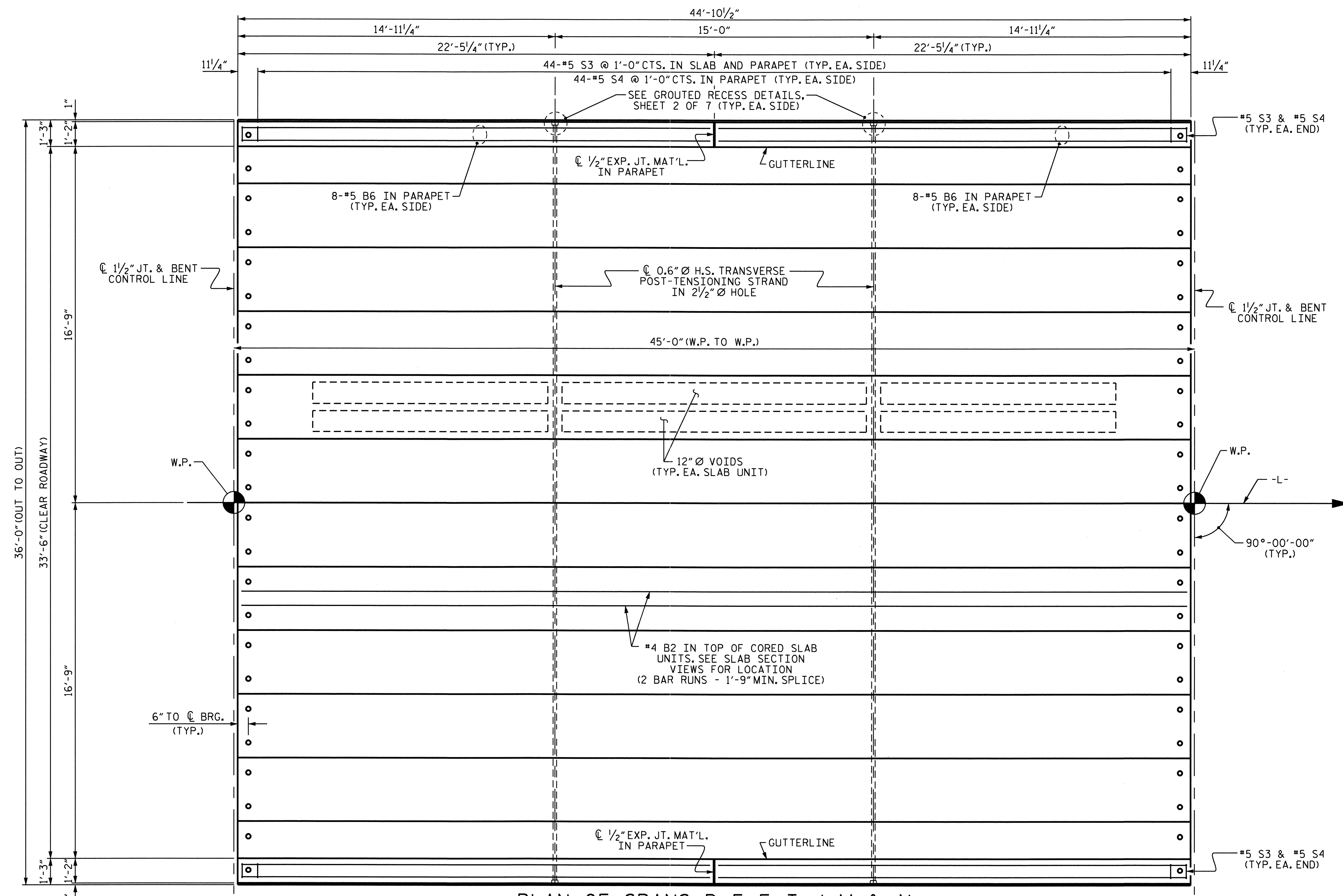
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN A

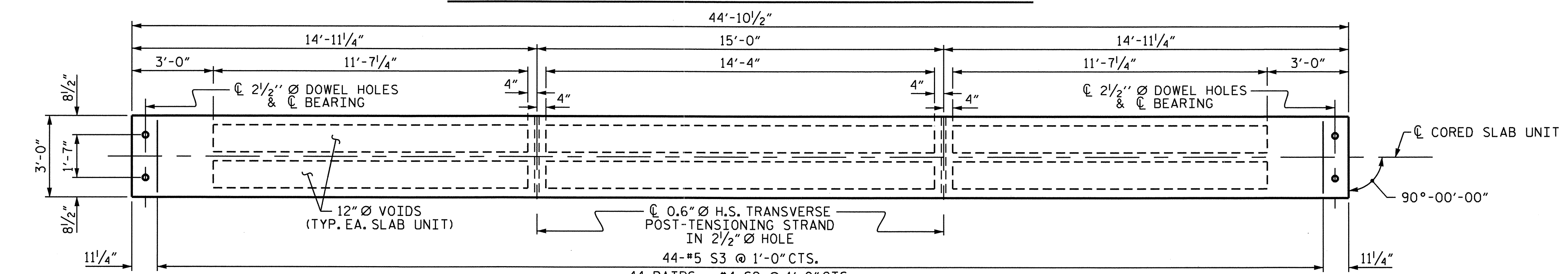
DRAWN BY : B.N. GRADY DATE : 6/19/09  
 CHECKED BY : J.L. WALTON DATE : 7/24/09

24-NOV-2009 14:45  
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 jwalton

REVISIONS						SHEET NO. S-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

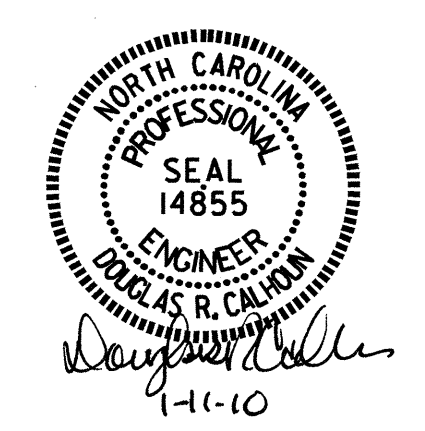


PLAN OF SPANS B, E, F, I, J, M, & N



PLAN OF CORED SLAB UNIT

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
 FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 2 OF 7.



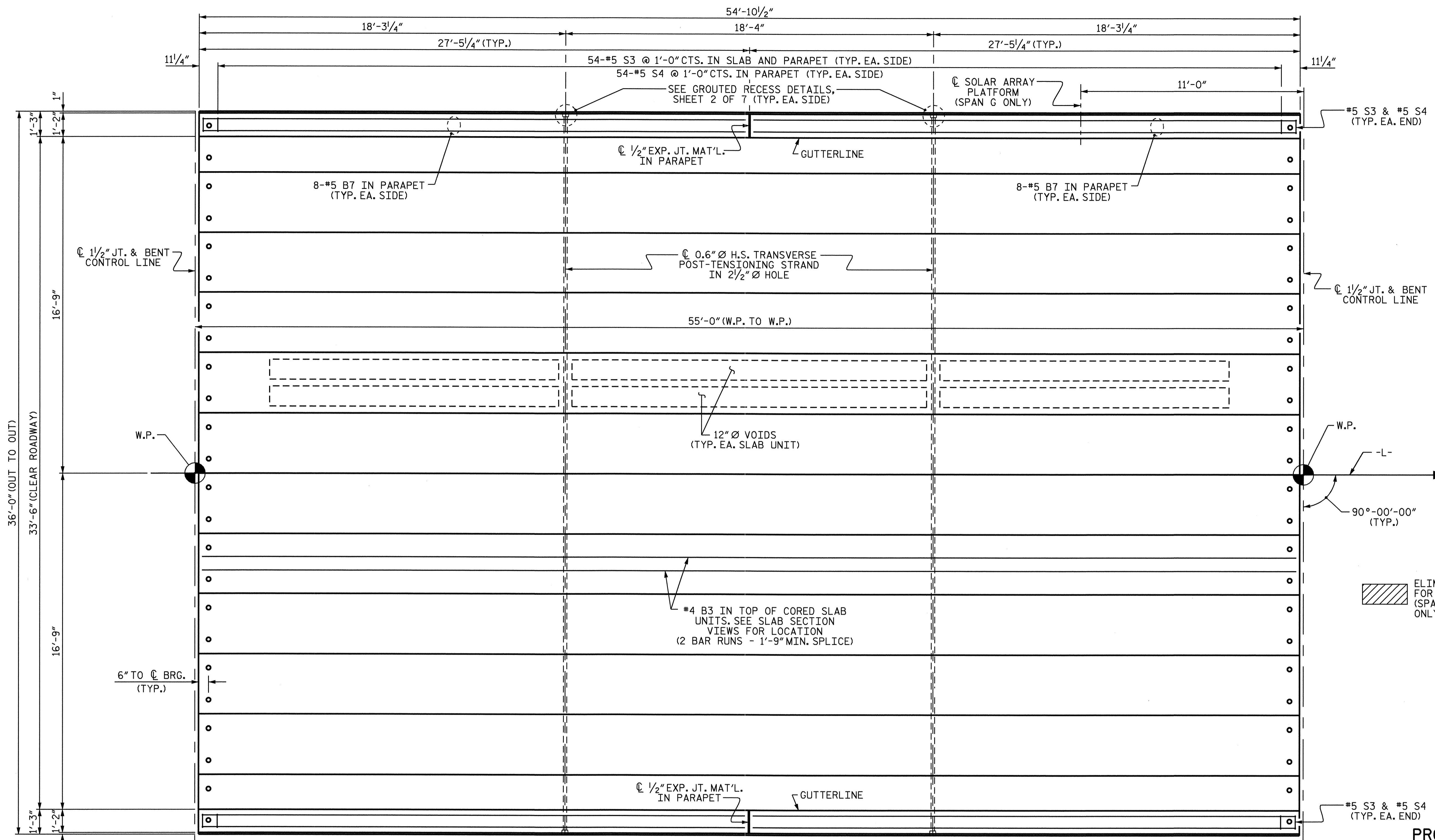
PROJECT NO. B-3809  
 BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 B, E, F, I, J, M, & N

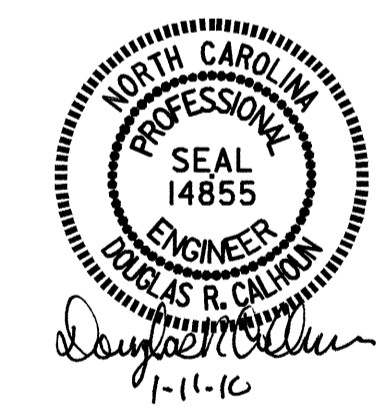
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : B.N. GRADY DATE : 6/19/09  
 CHECKED BY : J.L. WALTON DATE : 7/24/09

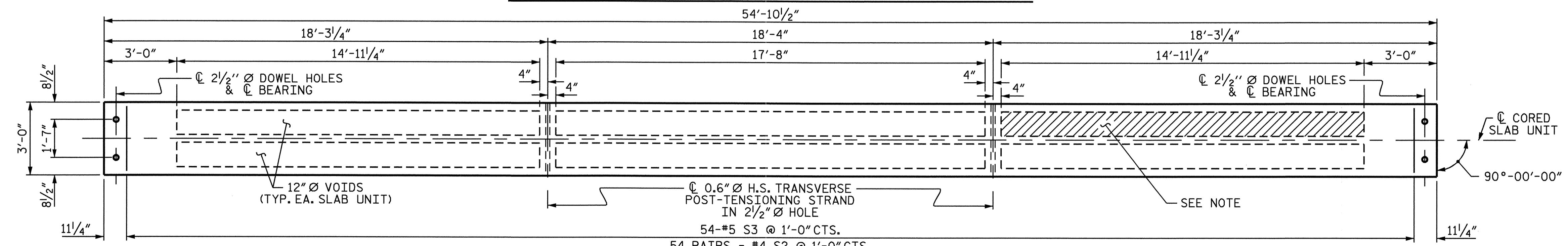
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 jwalton



ELIMINATE 12" Ø VOIDS AT THIS LOCATION FOR ATTACHMENT OF SOLAR ARRAY PLATFORM. (SPAN G, LEFT EXTERIOR CORED SLAB UNIT ONLY)



PLAN OF SPANS C, D, G, H, K, & L



PLAN OF CORED SLAB UNIT

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 2 OF 7.

PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

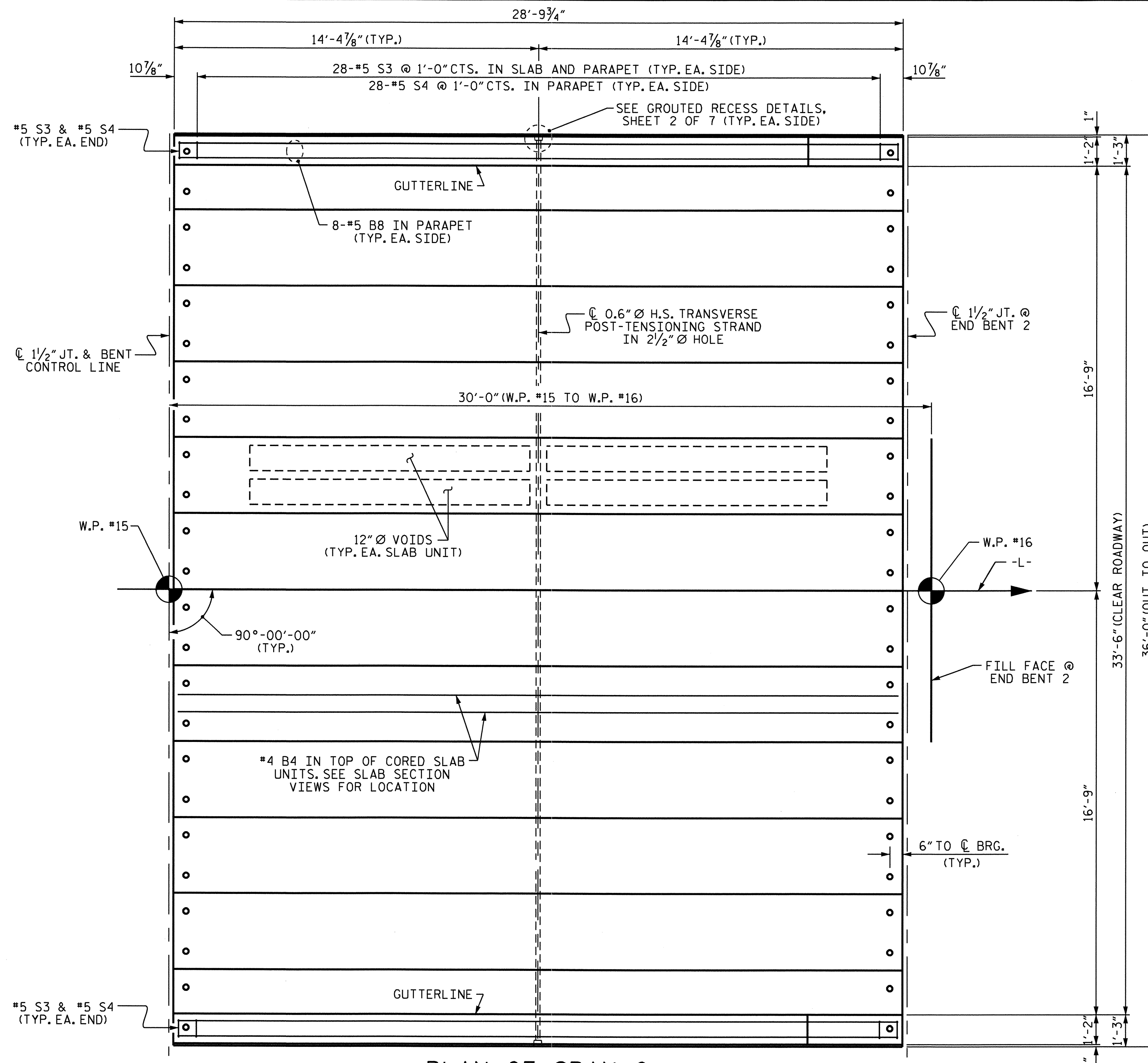
SHEET 5 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

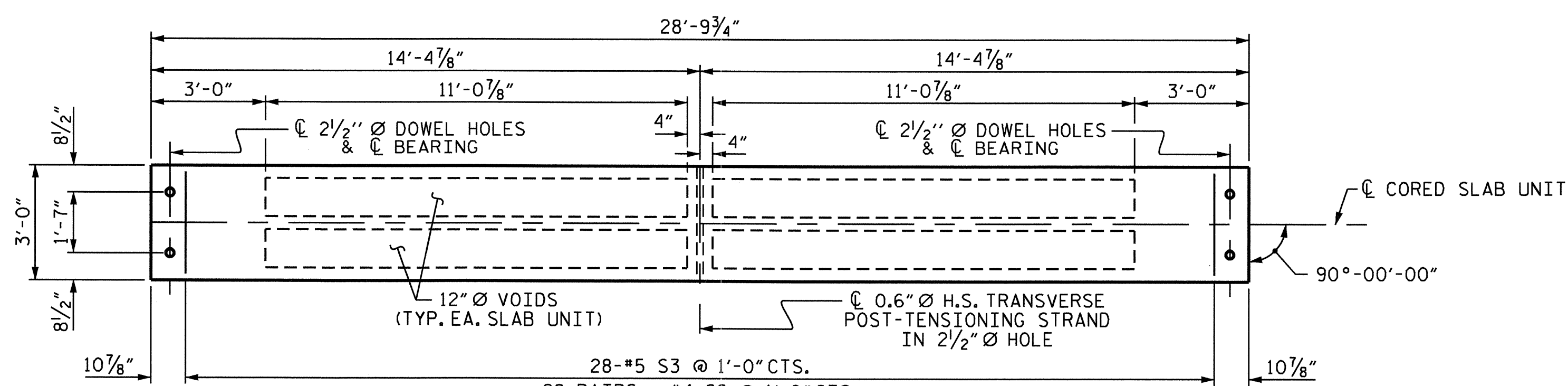
SUPERSTRUCTURE  
PLAN OF SPANS  
C, D, G, H, K, & L

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			39

DRAWN BY: B.N. GRADY DATE: 6/19/09  
CHECKED BY: J.L. WALTON DATE: 7/24/09

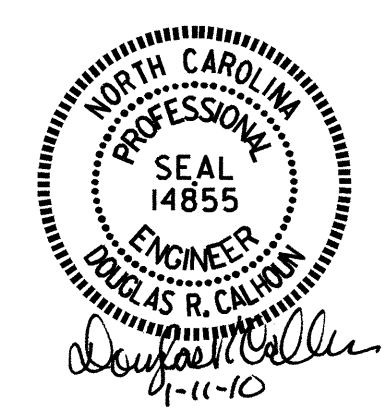


PLAN OF SPAN 0



PLAN OF CORED SLAB UNIT

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)  
FOR REINFORCING STEEL AT END OF CORED SLABS, SEE "PART PLAN EXTERIOR SECTION", SHEET 2 OF 7.



PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

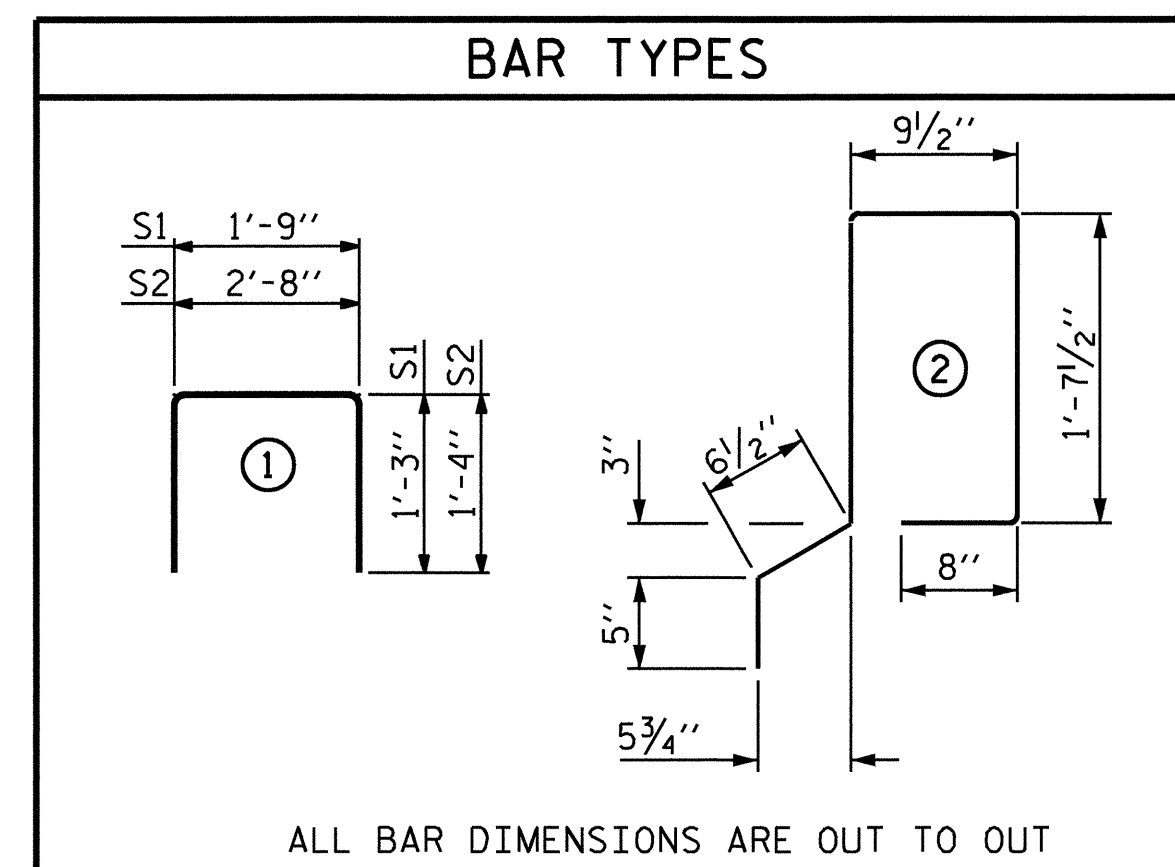
SHEET 6 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN 0					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-12
TOTAL SHEETS					39

DRAWN BY: B.N. GRADY DATE: 6/19/09  
CHECKED BY: J.L. WALTON DATE: 7/24/09

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jwalton

BILL OF MATERIAL FOR ONE CORED SLAB SECTION															
SPAN A								SPANS B, E, F, I, J, M, & N							
				EXTERIOR UNIT		INTERIOR UNIT						EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	4	#4	STR	22'-8"	61	22'-8"	61	B2	4	#4	STR	23'-2"	62	23'-2"	62
S1	8	#5	1	4'-3"	35	4'-3"	35	S1	8	#5	1	4'-3"	35	4'-3"	35
S2	86	#4	1	5'-4"	306	5'-4"	306	S2	88	#4	1	5'-4"	314	5'-4"	314
* S3	45	#5	2	5'-8"	266			* S3	46	#5	2	5'-8"	272		
REINFORCING STEEL				402 LBS.		402 LBS.		REINFORCING STEEL				411 LBS.		411 LBS.	
* EPOXY COATED REINFORCING STEEL				266 LBS.				* EPOXY COATED REINFORCING STEEL				272 LBS.			
6500 P.S.I. CONCRETE				6.3 CU. YDS.		6.3 CU. YDS.		6500 P.S.I. CONCRETE				6.5 CU. YDS.		6.4 CU. YDS.	
0.6" Ø L.R. STRANDS				No.		15		0.6" Ø L.R. STRANDS				No.		15	
SPANS C, D, G, H, K, & L								SPAN O							
				EXTERIOR UNIT		INTERIOR UNIT						EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	28'-2"	75	28'-2"	75	B4	2	#4	STR	28'-5"	38	28'-5"	38
S1	8	#5	1	4'-3"	35	4'-3"	35	S1	8	#5	1	4'-3"	35	4'-3"	35
S2	108	#4	1	5'-4"	385	5'-4"	385	S2	56	#4	1	5'-4"	200	5'-4"	200
* S3	56	#5	2	5'-8"	331			* S3	30	#5	2	5'-8"	177		
REINFORCING STEEL				495 LBS.		495 LBS.		REINFORCING STEEL				273 LBS.		273 LBS.	
* EPOXY COATED REINFORCING STEEL				331 LBS.				* EPOXY COATED REINFORCING STEEL				177 LBS.			
8500 P.S.I. CONCRETE				7.8 CU. YDS.		7.8 CU. YDS.		5000 P.S.I. CONCRETE				4.3 CU. YDS.		4.2 CU. YDS.	
0.6" Ø L.R. STRANDS				No.		20		0.6" Ø L.R. STRANDS				No.		10	



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

**NOTES**

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2 1/2" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI FOR SPANS A, B, E, F, I, J, M, N, & O AND 6000 PSI FOR SPANS C, D, G, H, K, & L.

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

PRESTRESSED CONCRETE CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE TO THE STANDARD SPECIFICATIONS. NO SEPARATE PAYMENT WILL BE MADE FOR CALCIUM NITRITE CORROSION INHIBITOR.

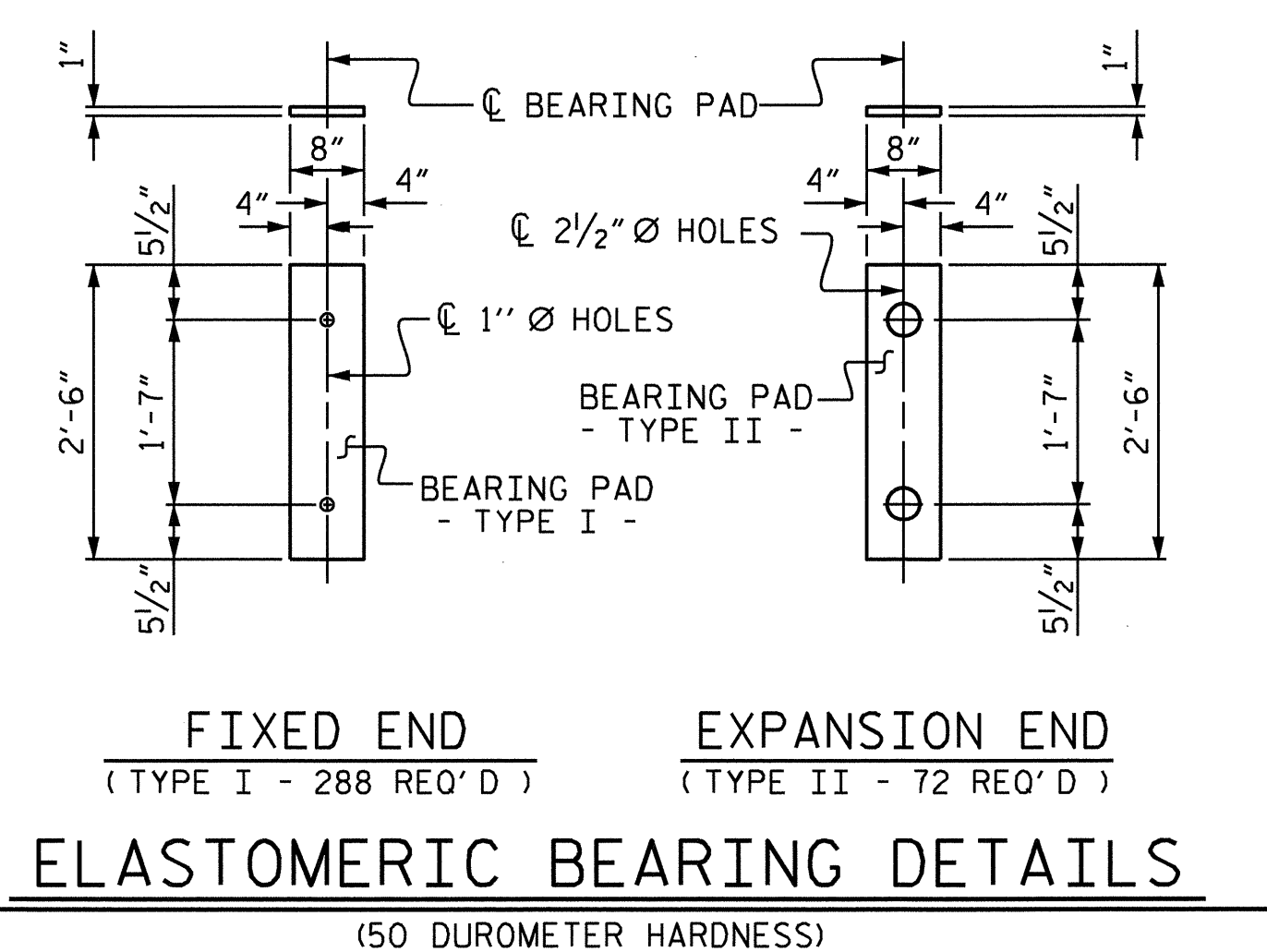
FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

DEAD LOAD DEFLECTION AND CAMBER				
	SPAN A	SPANS B, E, F, I, J, M, & N	SPANS C, D, G, H, K, & L	SPAN O
CAMBER (SLAB ALONE IN PLACE) ↑	1/16"	1/2"	2 1/2"	1/2"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** ↓	3/16"	1/4"	7/16"	1/16"
FINAL CAMBER ↑	1/4"	1/4"	2 1/16"	7/16"

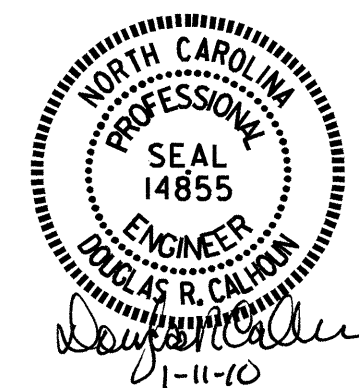
\*\* INCLUDES FUTURE WEARING SURFACE

CORED SLAB UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.-SPAN A	2	43'-9 3/4"	87'-7 1/2"
INTERIOR C.S.-SPAN A	10	43'-9 3/4"	438'-1 1/2"
EXTERIOR C.S.-SPANS B, E, F, I, J, M, & N	14	44'-10 1/2"	628'-3"
INTERIOR C.S.-SPANS B, E, F, I, J, M, & N	70	44'-10 1/2"	3141'-3"
EXTERIOR C.S.-SPANS C, D, G, H, K, & L	12	54'-10 1/2"	658'-6"
INTERIOR C.S.-SPANS C, D, G, H, K, & L	60	54'-10 1/2"	3292'-6"
EXTERIOR C.S.-SPAN O	2	28'-9 3/4"	57'-7 1/2"
INTERIOR C.S.-SPAN O	10	28'-9 3/4"	288'-1 1/2"
TOTAL	180		8592'-0"



ASSEMBLED BY : B.N. GRADY	DATE : 6/29/09
CHECKED BY : J.L. WALTON	DATE : 7/24/09
DRAWN BY : WJH 4/89	REV. 7/10/01 RWW/LES
CHECKED BY : FCJ 5/89	REV. 5/7/03RRR RWW/JTE
	REV. 5/1/06 TLA/GM

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jwalton

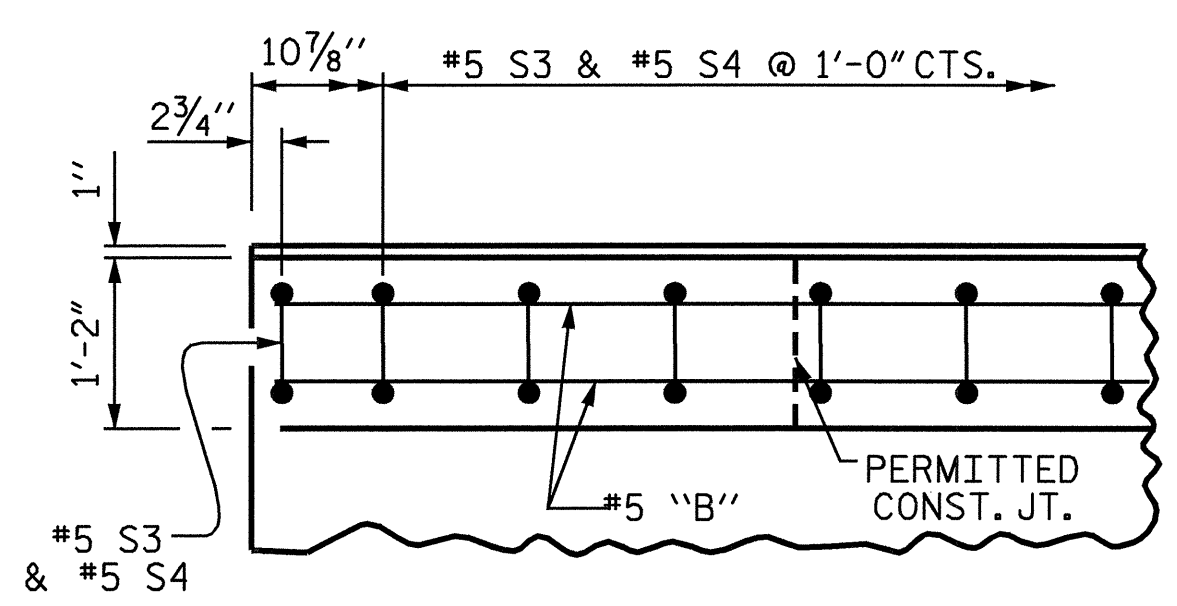


PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

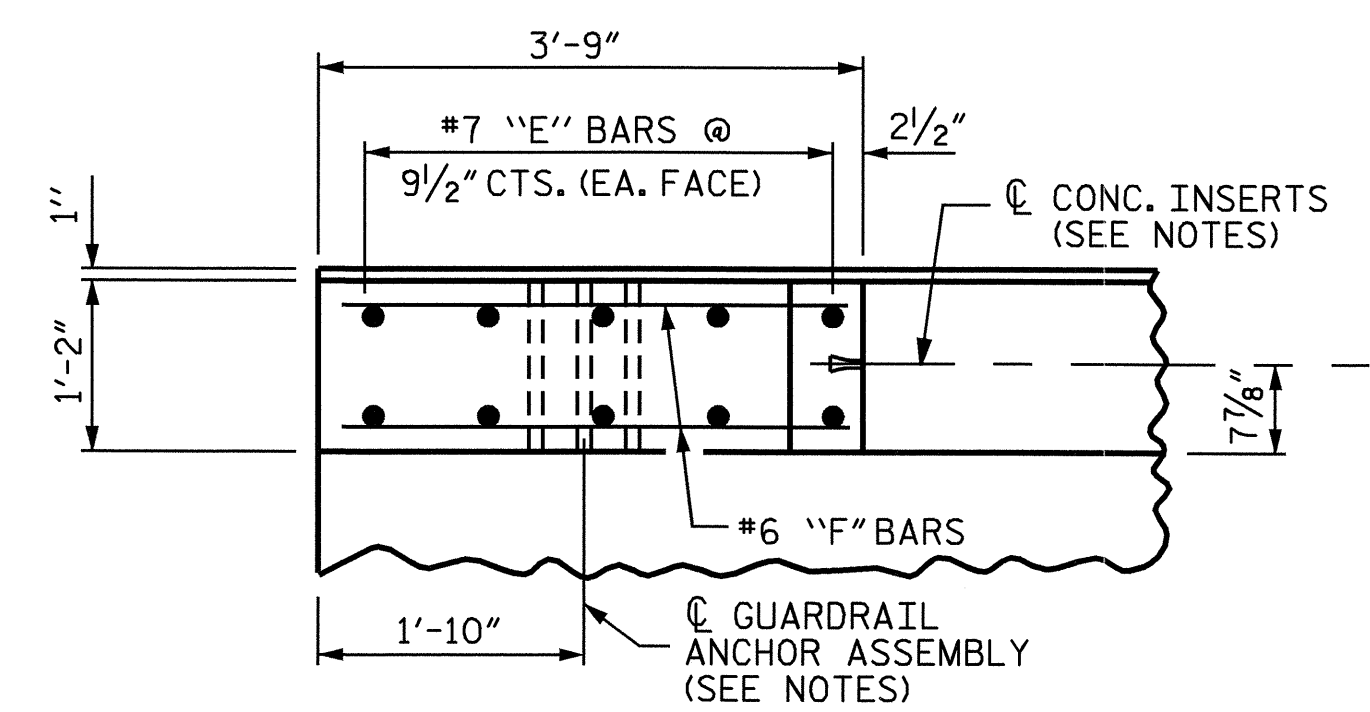
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			39

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

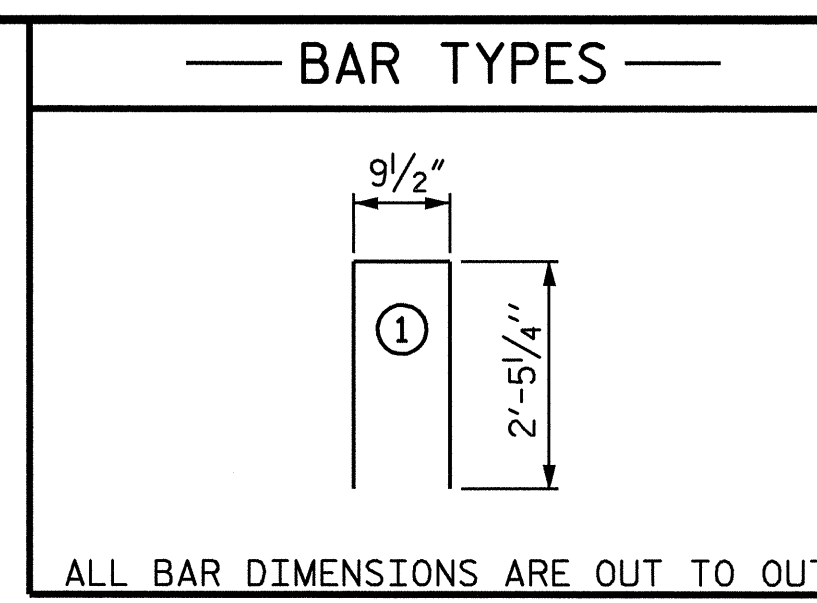
STD. NO. PCS3



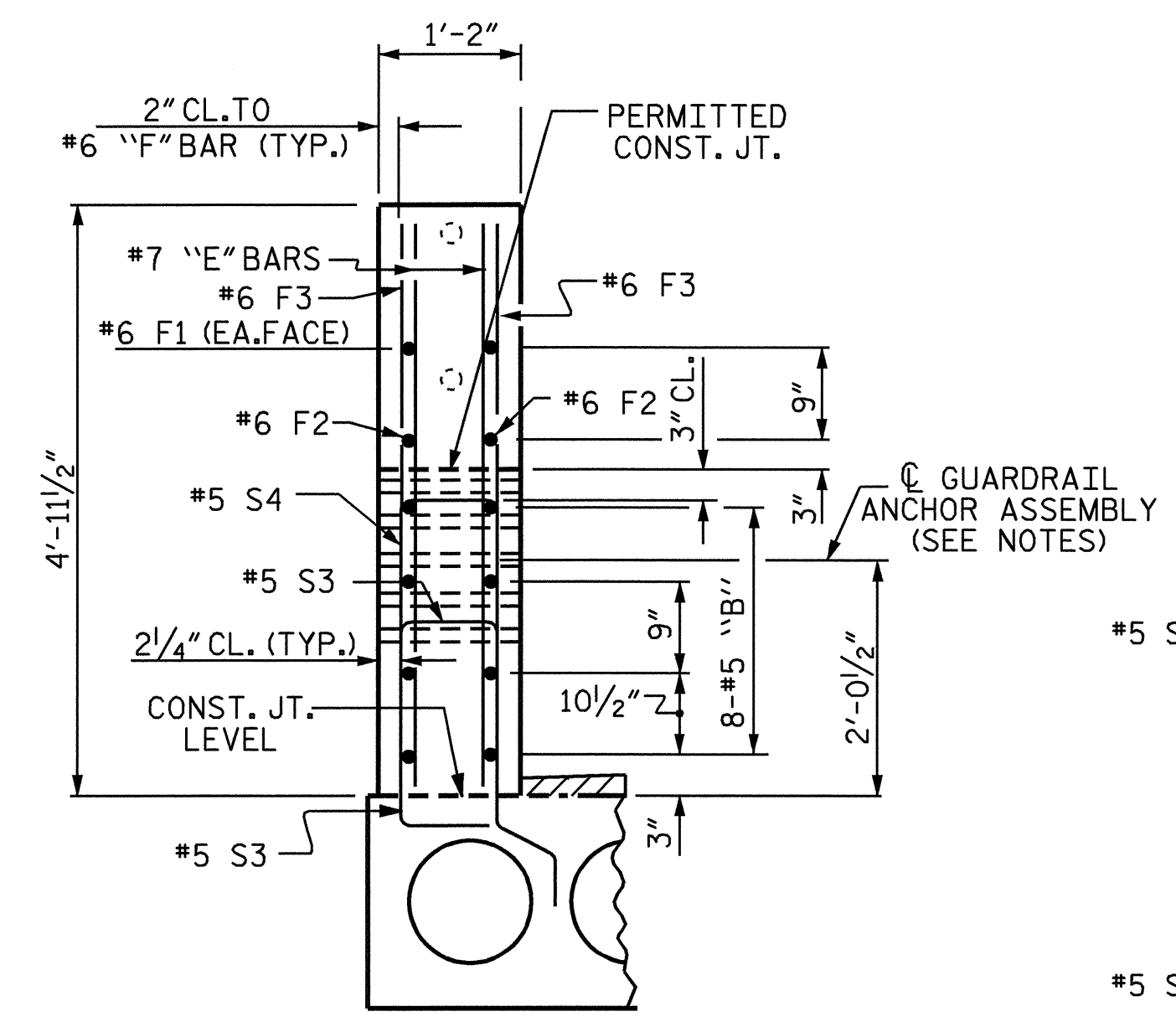
PLAN OF PARAPET



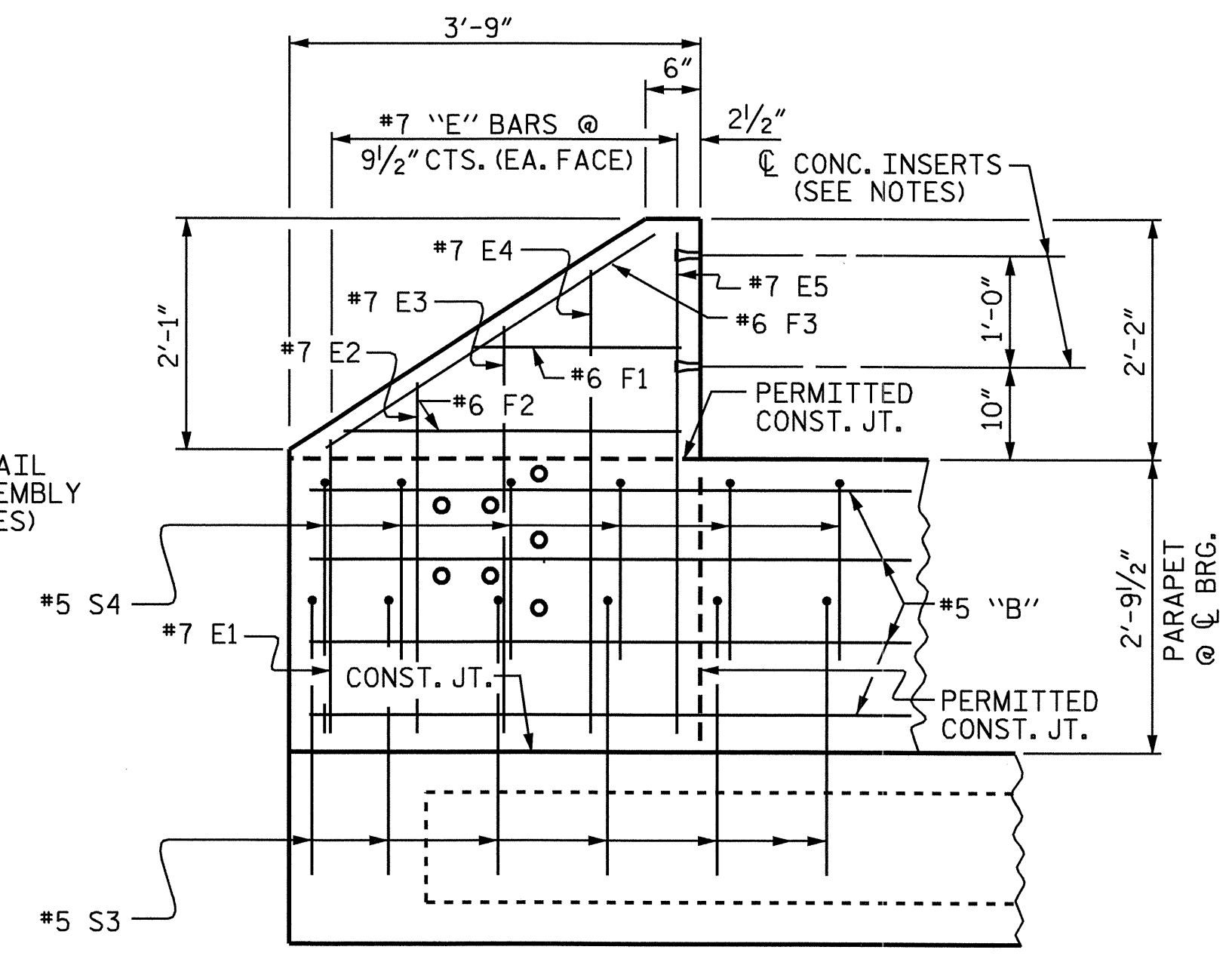
PLAN OF END POST



BILL OF MATERIAL PARAPETS AND END POSTS						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B5	32	#5	STR	21'-6"	718	
*B6	224	#5	STR	22'-1"	5159	
*B7	192	#5	STR	27'-1"	5424	
*B8	16	#5	STR	28'-5"	474	
*E1	8	#7	STR	2'-7"	42	
*E2	8	#7	STR	3'-1"	50	
*E3	8	#7	STR	3'-7"	59	
*E4	8	#7	STR	4'-1"	67	
*E5	8	#7	STR	4'-5"	72	
*F1	8	#6	STR	1'-10"	22	
*F2	8	#6	STR	3'-0"	36	
*F3	8	#6	STR	3'-8"	44	
*S4	1466	#5	1	5'-8"	8665	
* EPOXY COATED REINF. STEEL =				20832	LBS	
CLASS AA CONCRETE					169.9 C.Y.	
CONCRETE PARAPET					1435.50 L.F.	

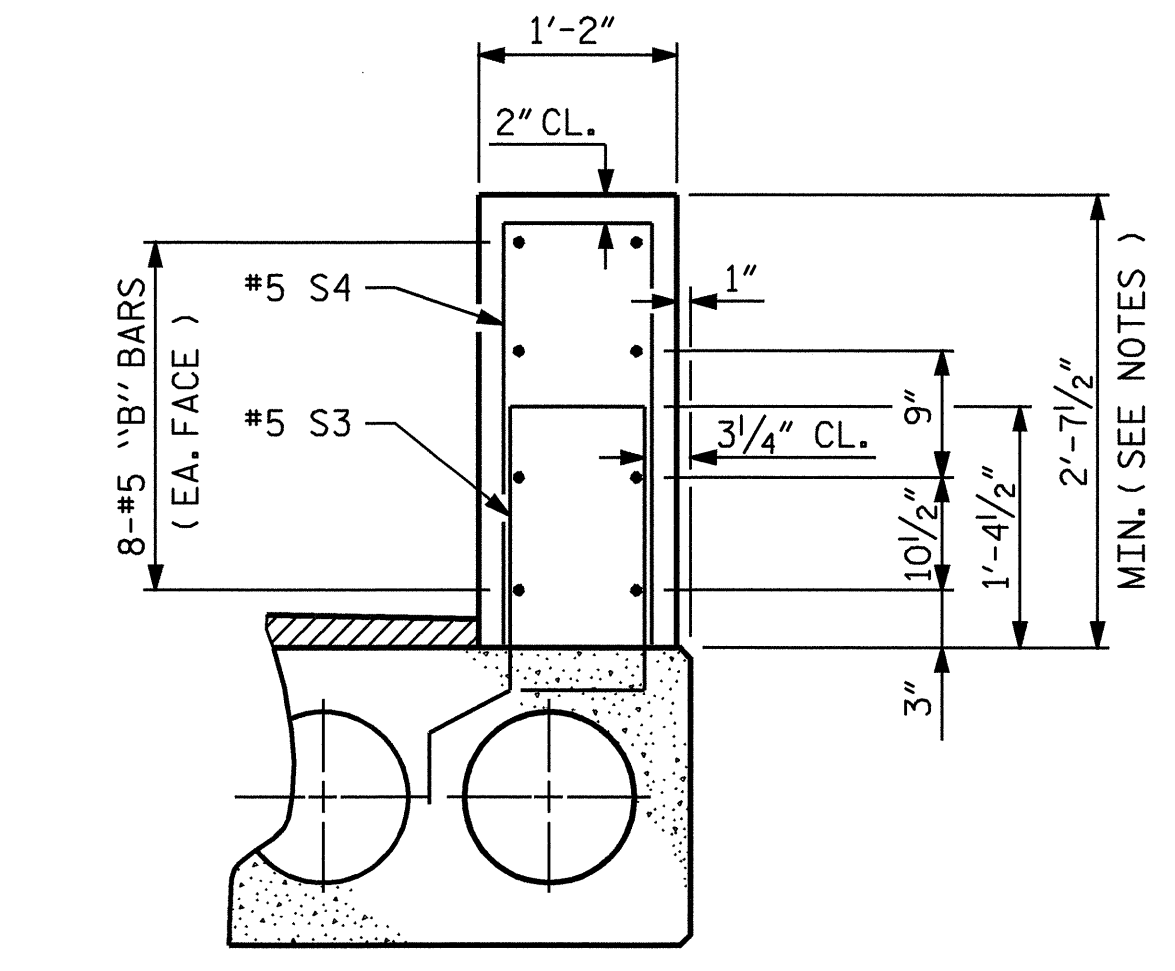


END VIEW



ELEVATION

PARAPET AND END POST FOR TWO-BAR RAIL



TWO BAR METAL RAIL PARAPET SECTION

NOTES

- ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.
- FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET 4 OF 5 AND "GUARDRAIL ANCHORAGE DETAILS" SHEET 5 OF 5.
- \*5 S3 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR CORED SLAB UNITS.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- ALL BAR SUPPORTS USED IN THE PARAPET AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.
- THE 1/2" EXPANSION JOINT IN THE PARAPET MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE #5 S3 & #5 S4 BARS.
- FOR REINFORCING STEEL LAYOUT, SEE PLAN OF SPANS.
- FOR ATTACHMENT OF SOLAR ARRAY PLATFORM TO PARAPET, SEE "SOLAR ARRAY PLATFORM" SHEET.

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

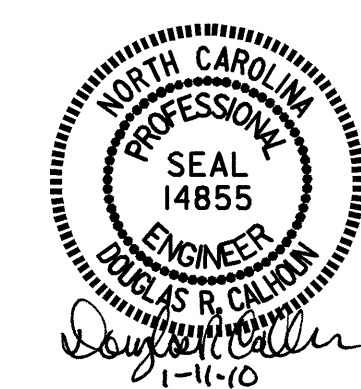
SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 CONCRETE PARAPET AND  
 PARAPET END POST  
 DETAILS

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

TOTAL SHEETS: **S-14**  
 TOTAL SHEETS: **S-39**



DRAWN BY : B.N. GRADY DATE : 6/30/09  
 CHECKED BY : J.L. WALTON DATE : 7/28/09

11-JAN-2010 11:39  
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**NOTES**

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

**GENERAL NOTES**

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

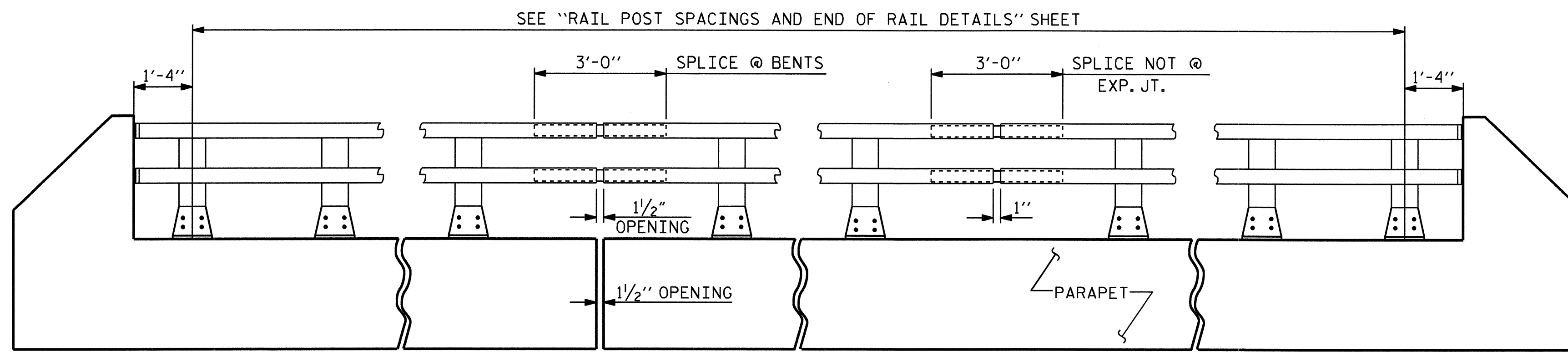
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

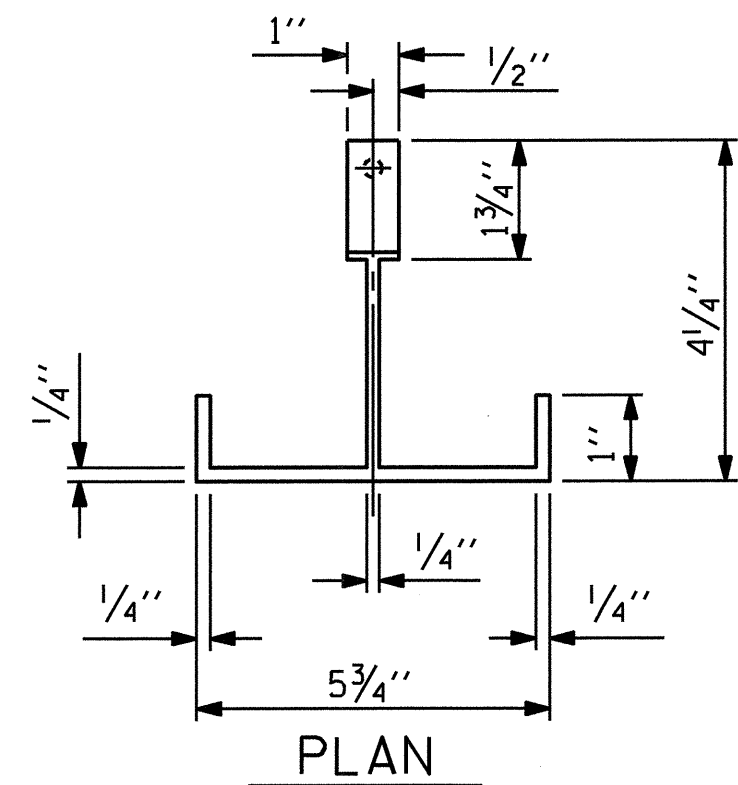
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 1420.50 LIN. FT.

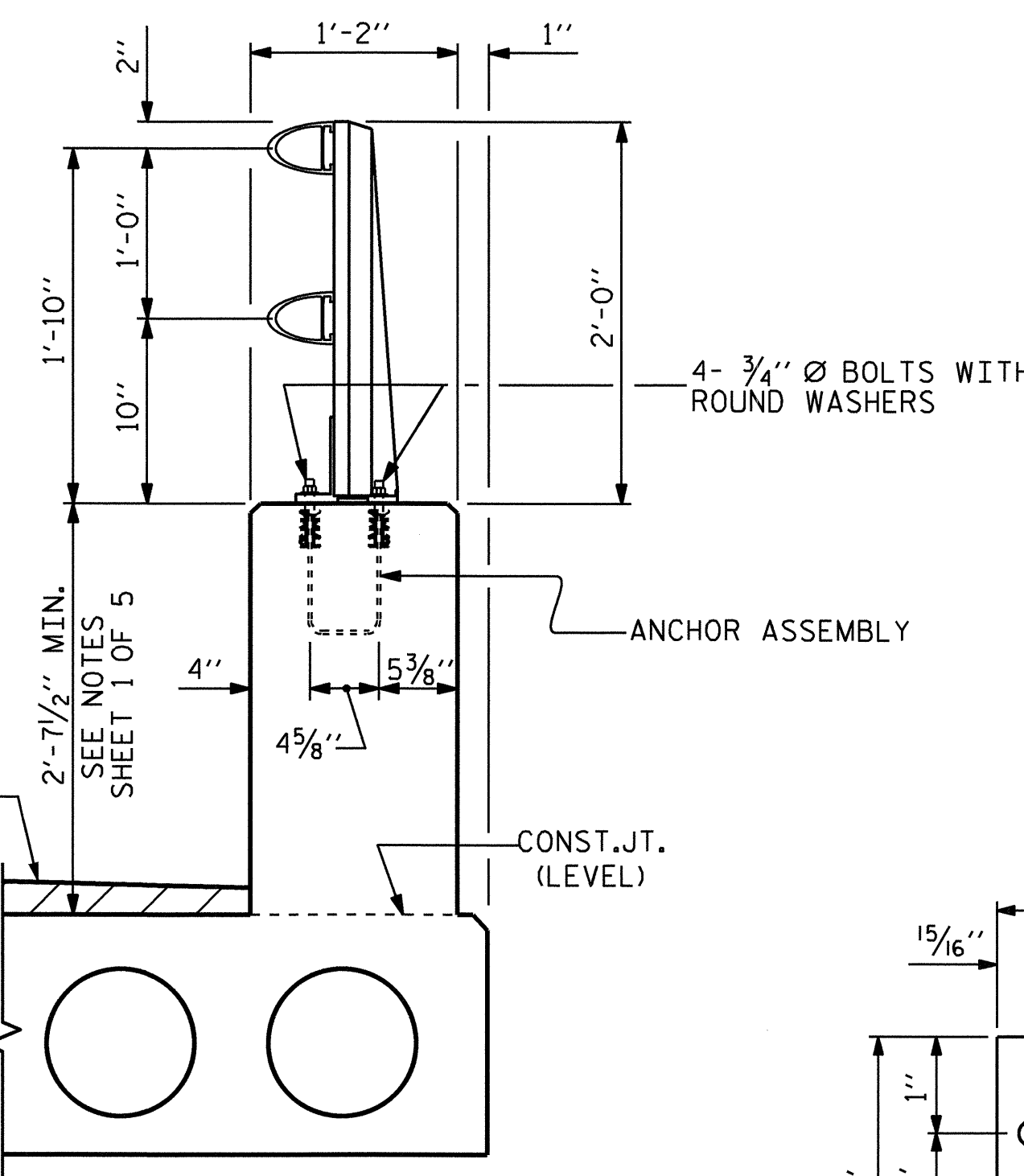


**ELEVATION**

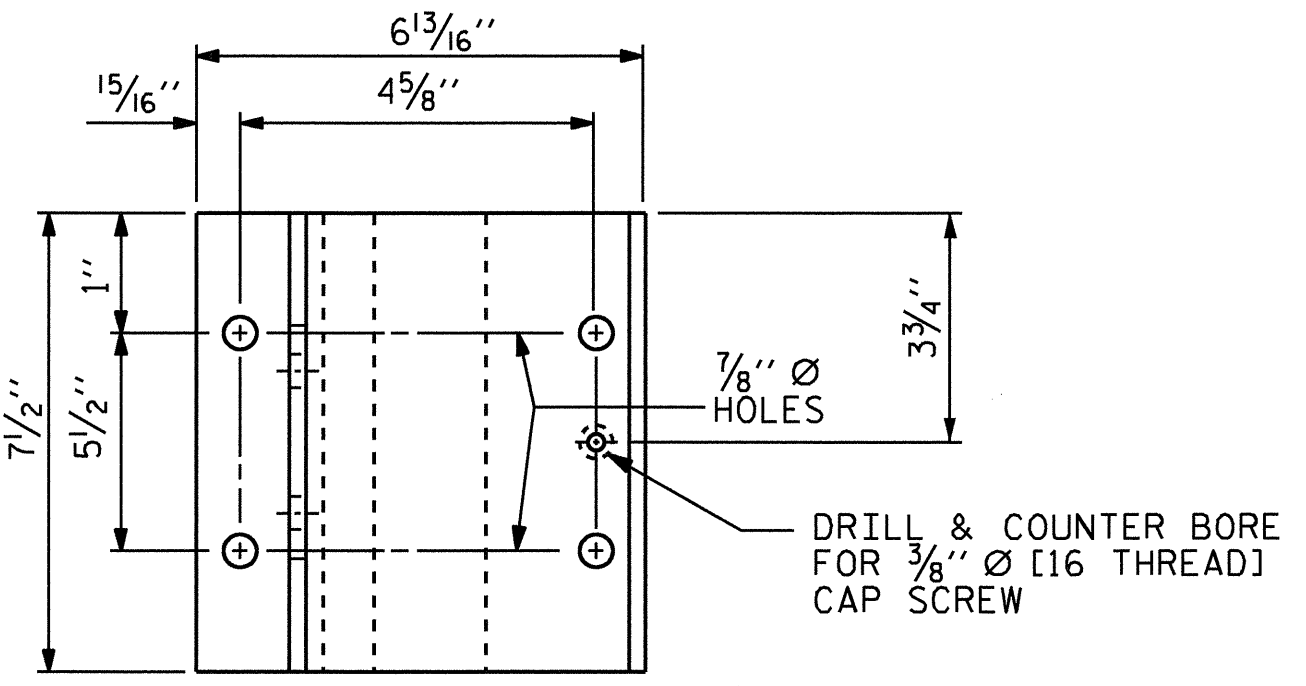
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



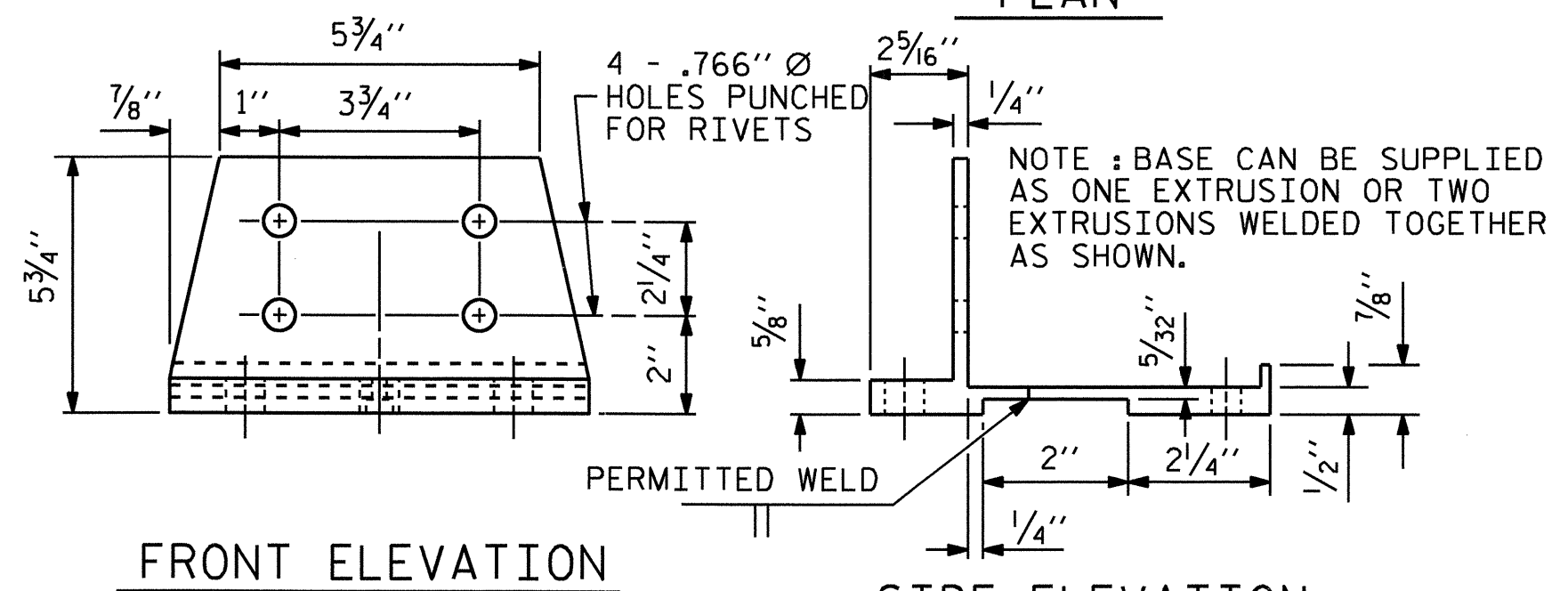
**PLAN**



**SECTION THRU PARAPET AND RAIL**



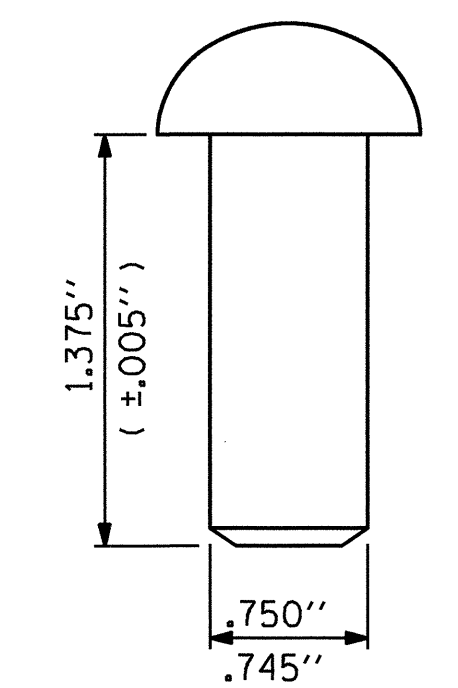
**PLAN**



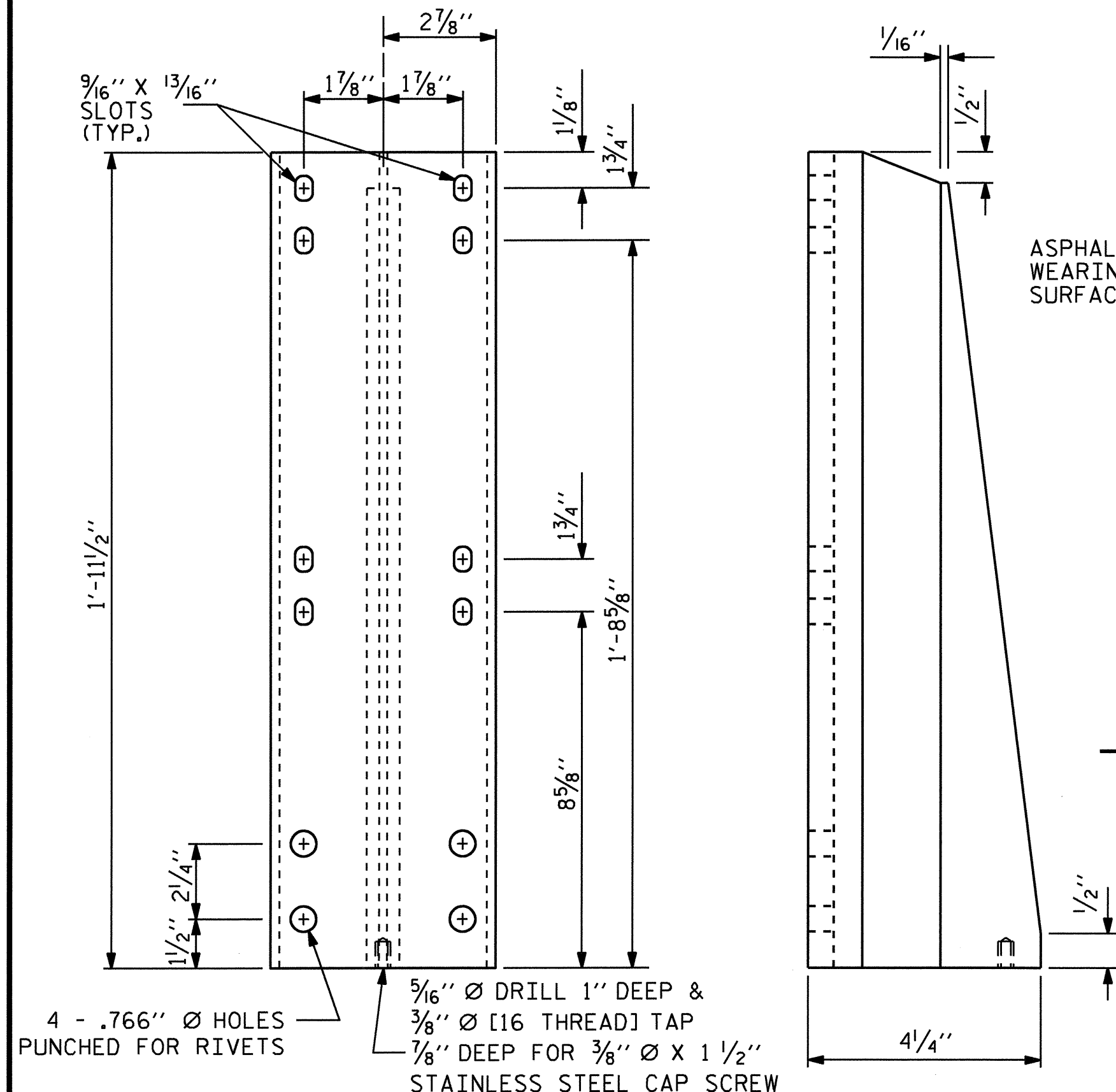
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**



**FRONT ELEVATION**

**SIDE ELEVATION**

**DETAILS OF POST**

ASSEMBLED BY : B.N. GRADY	DATE : 6/30/09
CHECKED BY : J.L. WALTON	DATE : 7/28/09
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

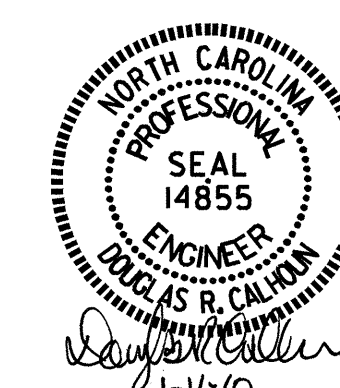
SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 2 BAR METAL RAIL

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

TOTAL SHEETS  
 39





NOTES

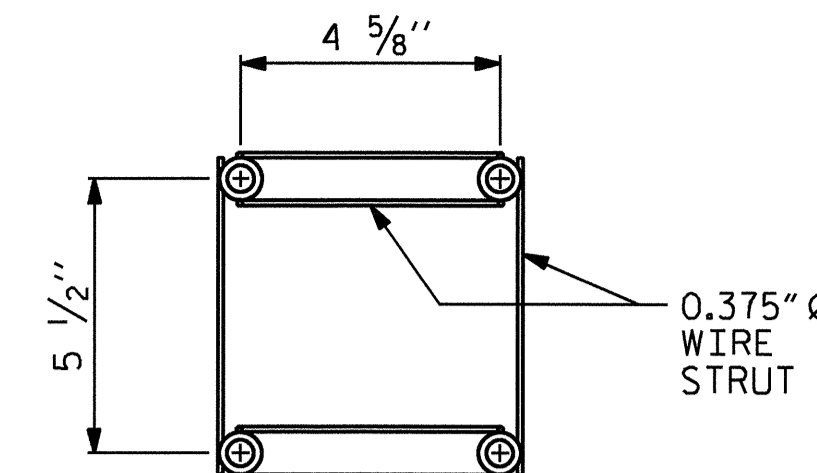
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

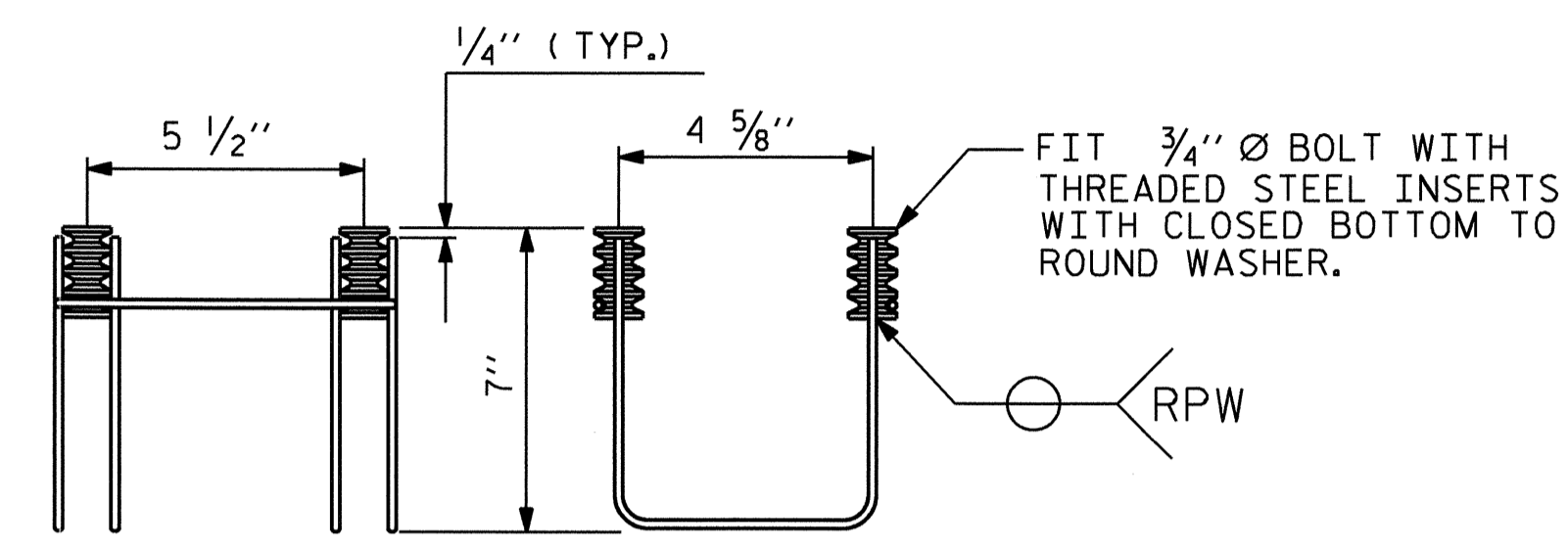
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



PLAN



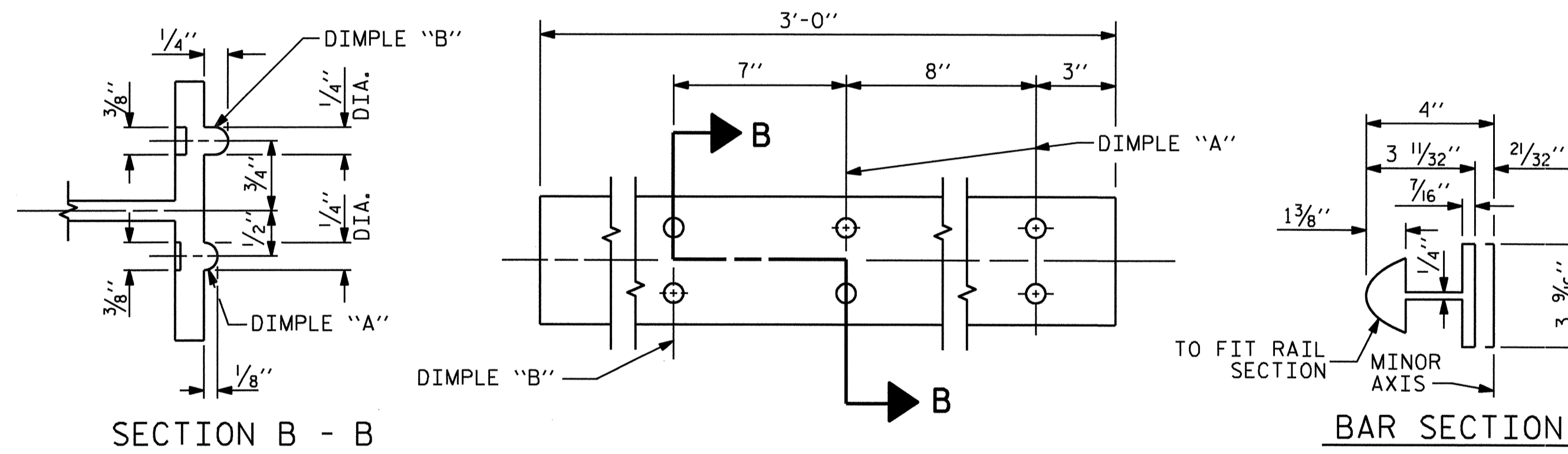
SIDE VIEW

ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

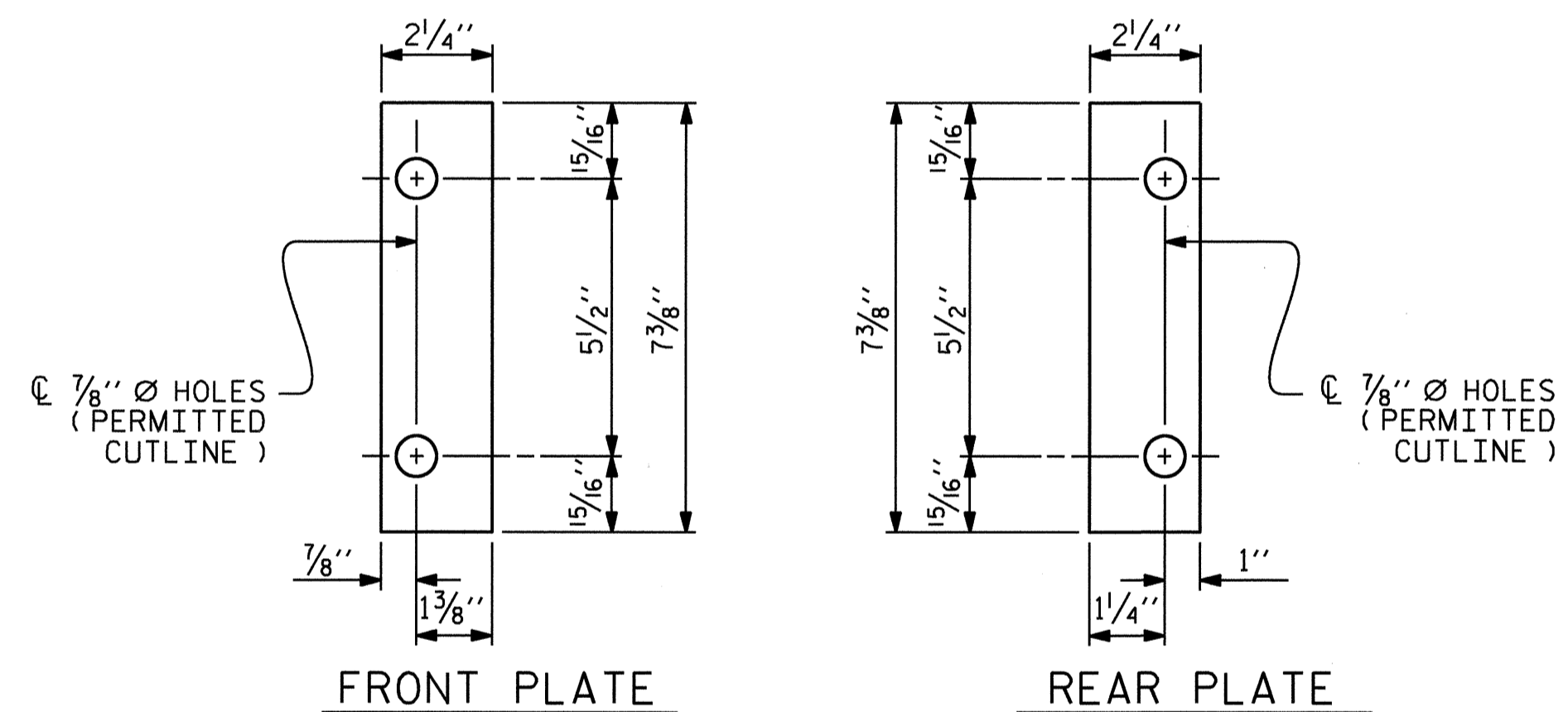
( 224 ASSEMBLIES REQUIRED )



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

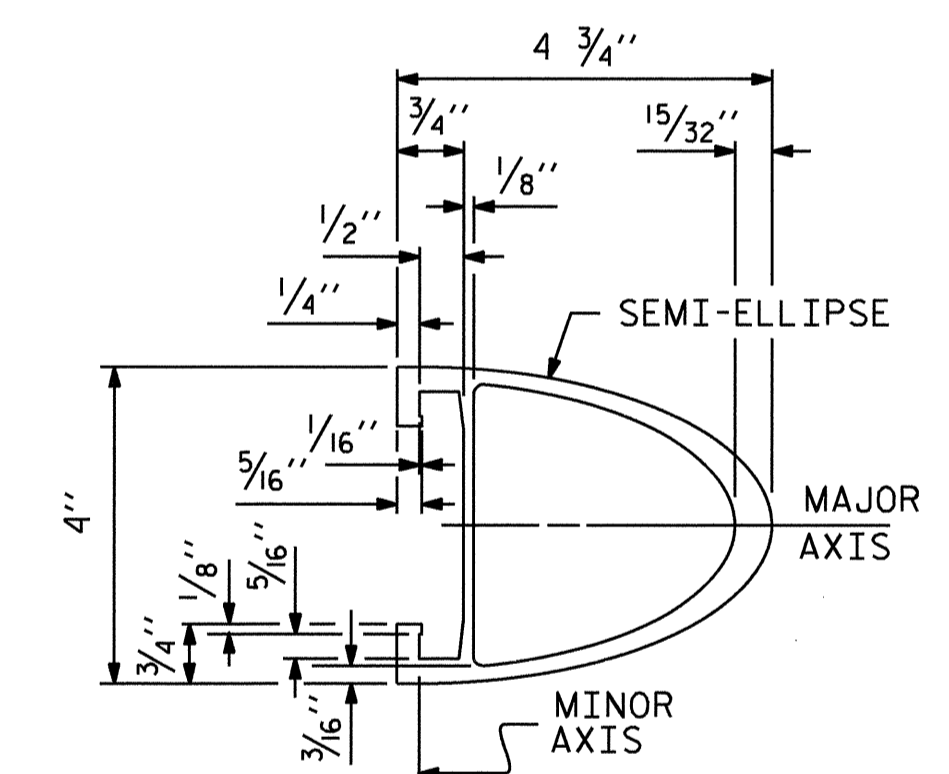


FRONT PLATE

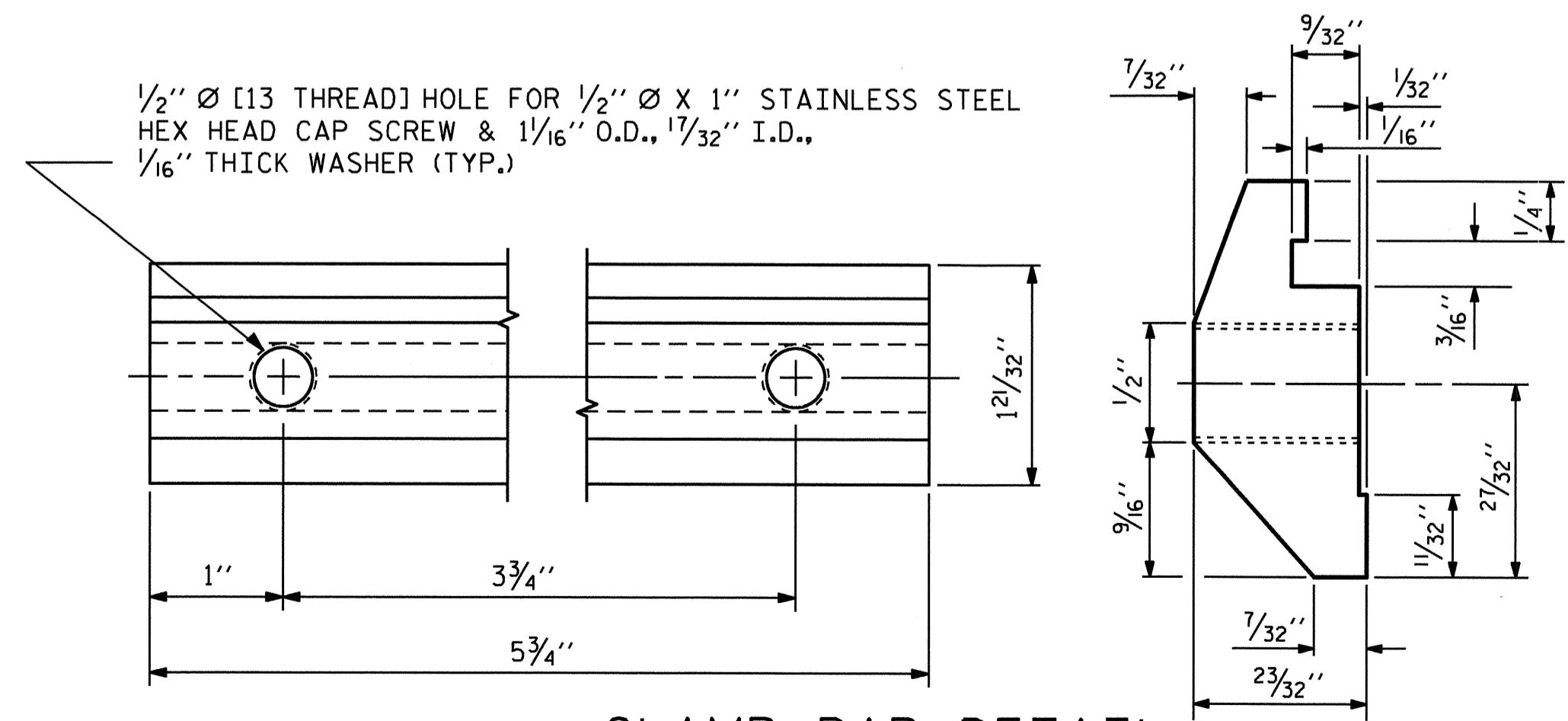
REAR PLATE

SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

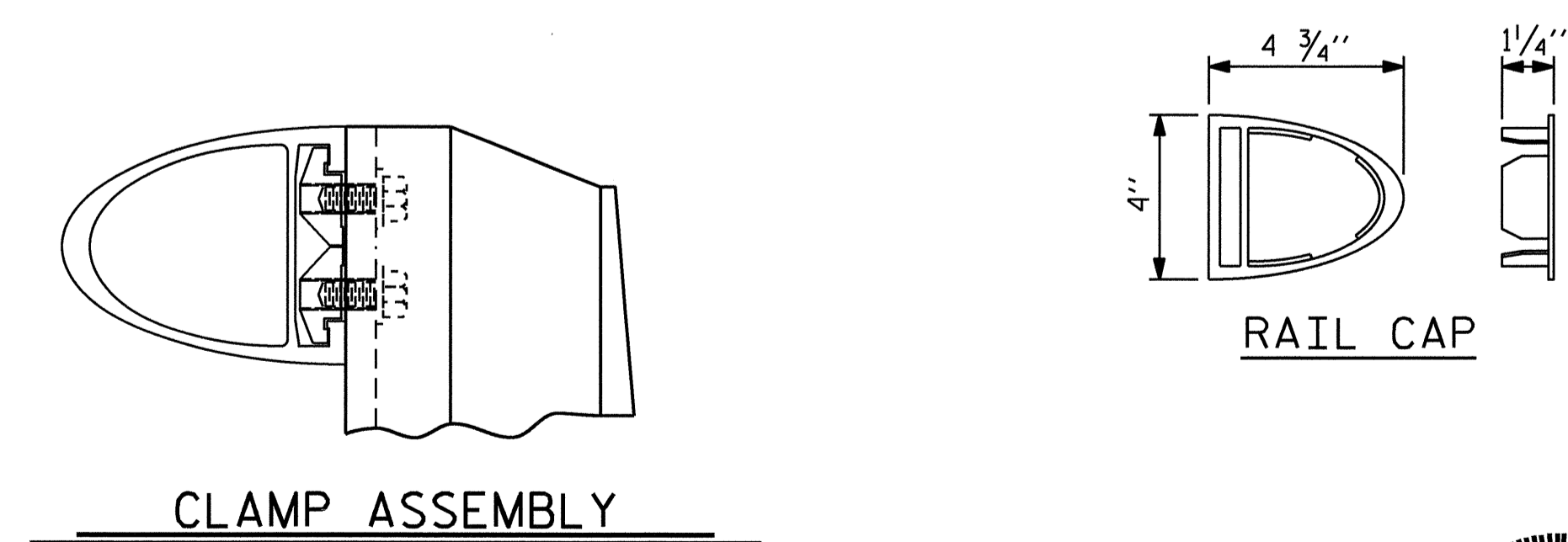


RAIL SECTION



CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

RAIL CAP

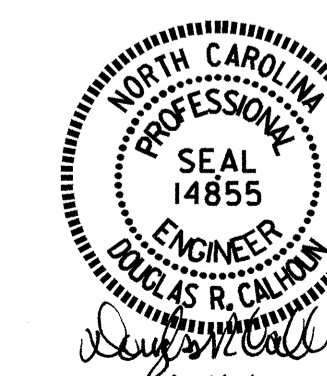
PROJECT NO. B-3809  
 BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

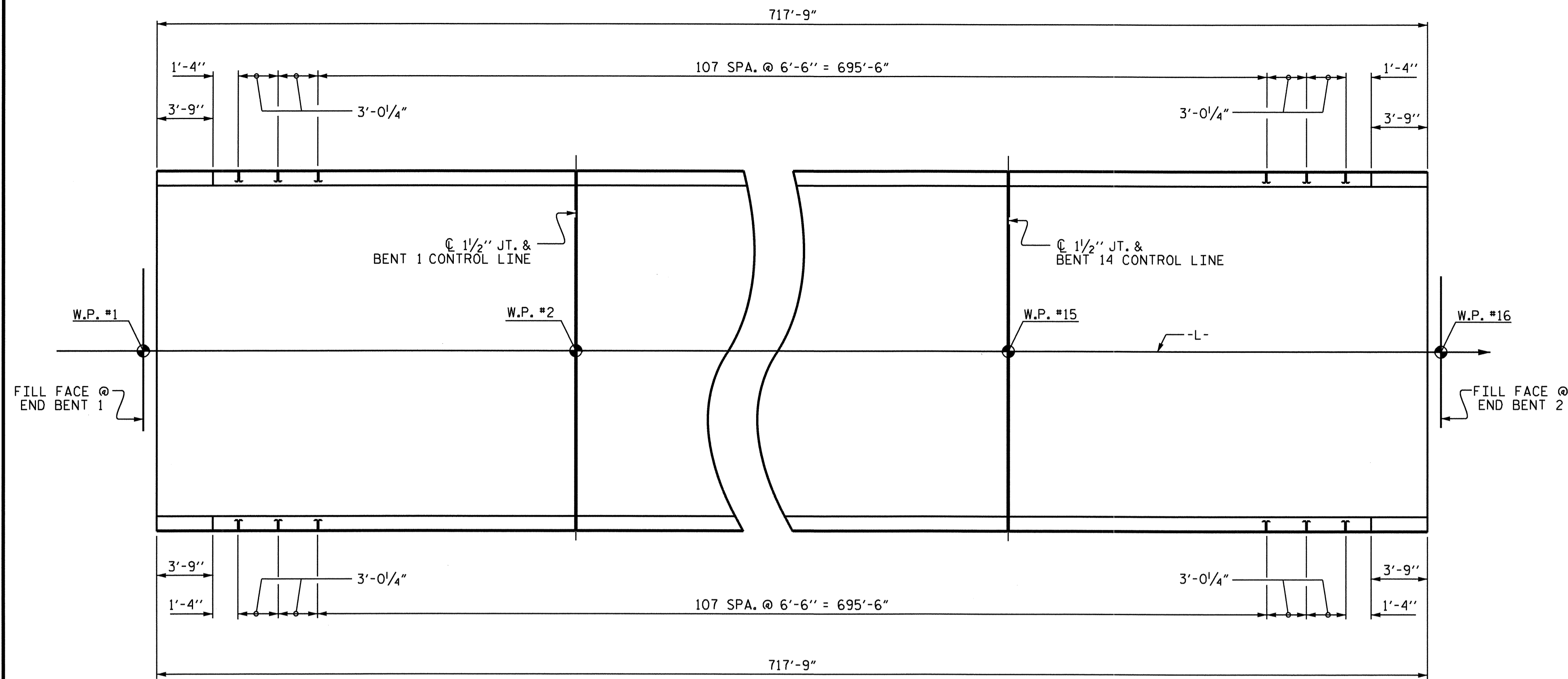
STANDARD

2 BAR METAL RAIL



ASSEMBLED BY : B.N. GRADY	DATE : 6/30/09
CHECKED BY : J.L. WALTON	DATE : 7/28/09
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			39



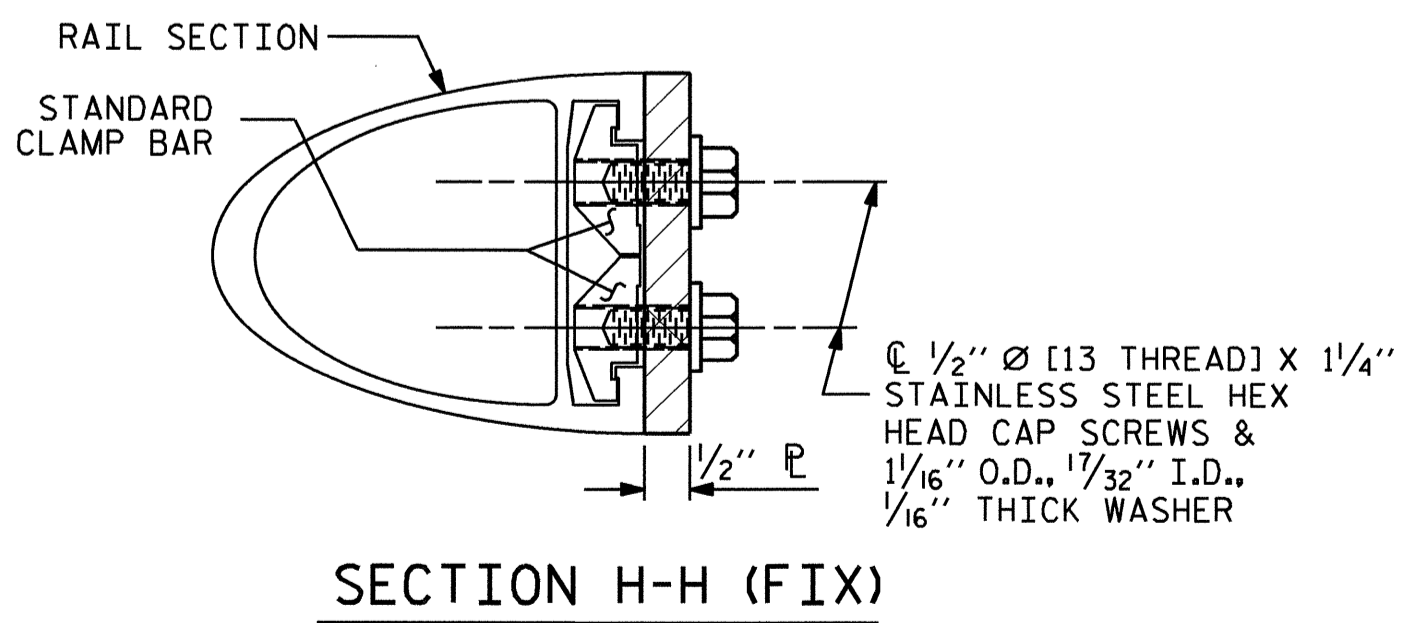
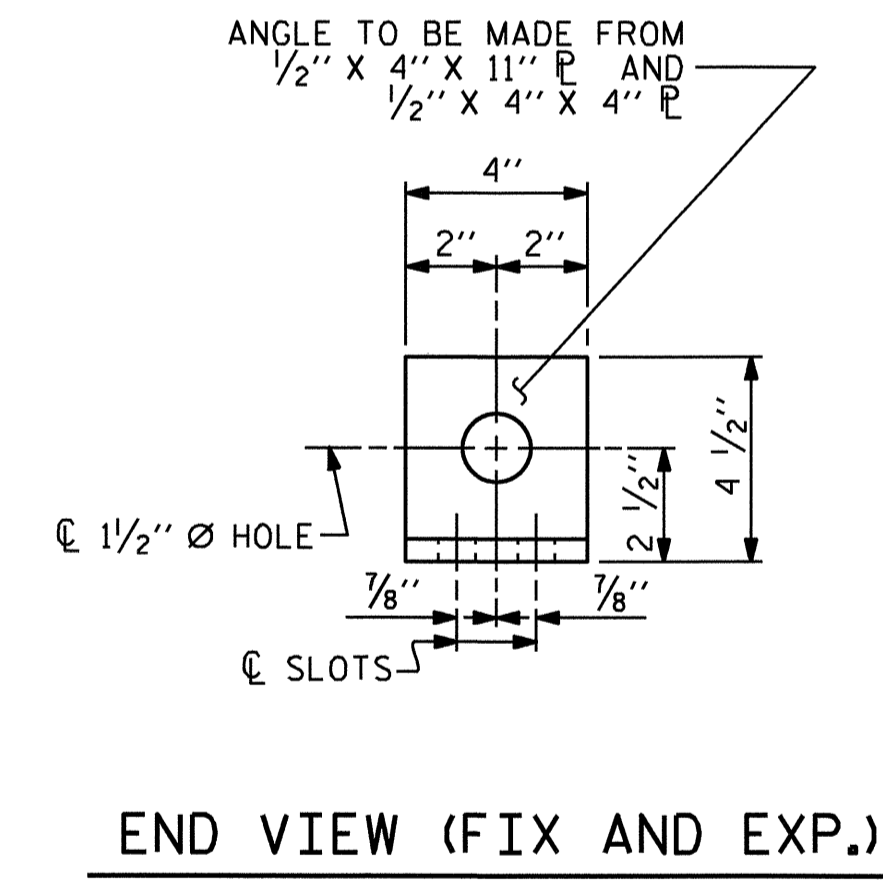
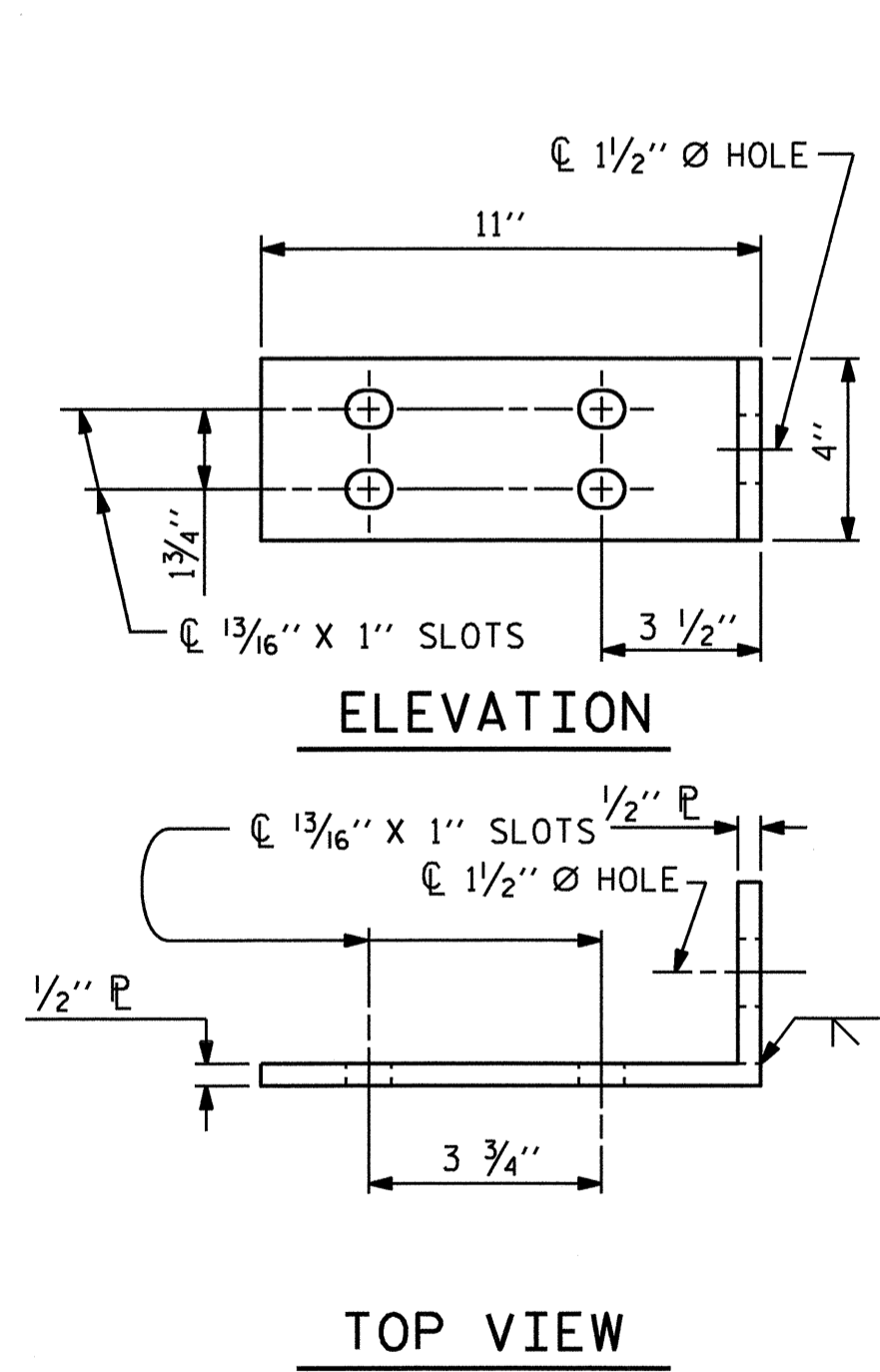
**PLAN OF RAIL POST SPACINGS**

**NOTES**  
**STRUCTURAL CONCRETE INSERT**  
 THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:  
 A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".  
 B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)  
 C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

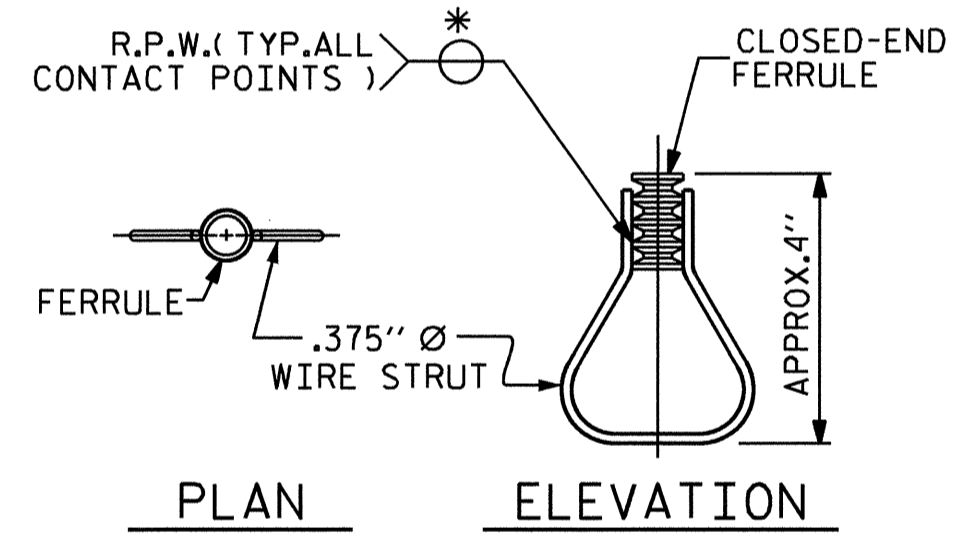
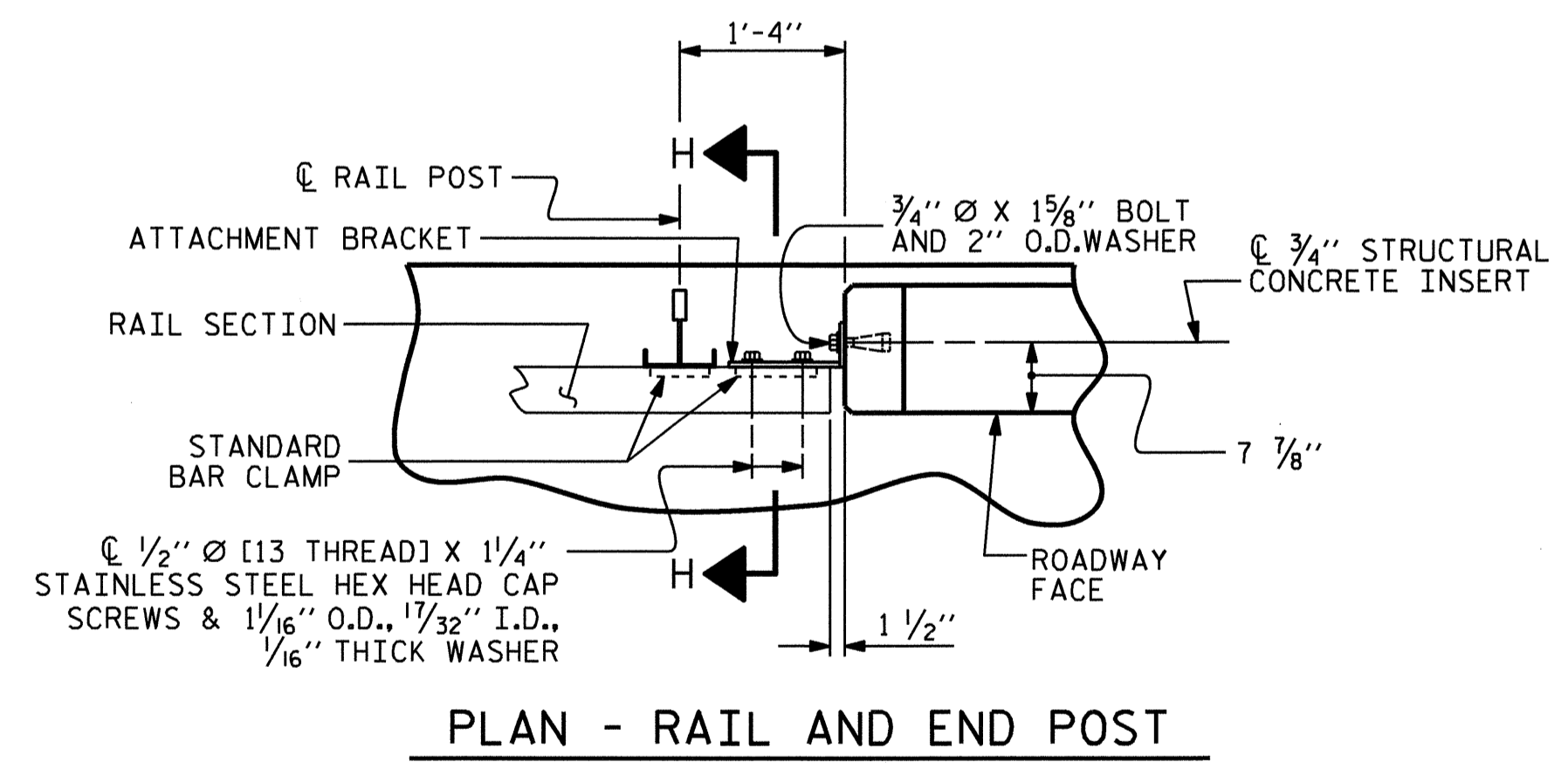
**NOTES**  
**METAL RAIL TO END POST CONNECTION**  
 THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:  
 A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.  
 B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.  
 C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.  
 D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).  
 E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.  
 THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.  
 THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



**FIXED**



**STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. **B-3809**  
**BEAUFORT** COUNTY  
 STATION: **28+50.00 -L-**

SHEET 4 OF 5  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD**  
**RAIL POST SPACINGS**  
**AND**  
**END OF RAIL DETAILS**  
 FOR ONE OR TWO BAR METAL RAILS



ASSEMBLED BY : B.N. GRADY	DATE : 6/30/09
CHECKED BY : J.L. WALTON	DATE : 7/28/09
DRAWN BY : FCJ 1/88	REV. 10/17/00 LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

**DETAILS FOR ATTACHING METAL RAIL TO END POST**

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

TOTAL SHEETS: **39**

NOTES

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

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

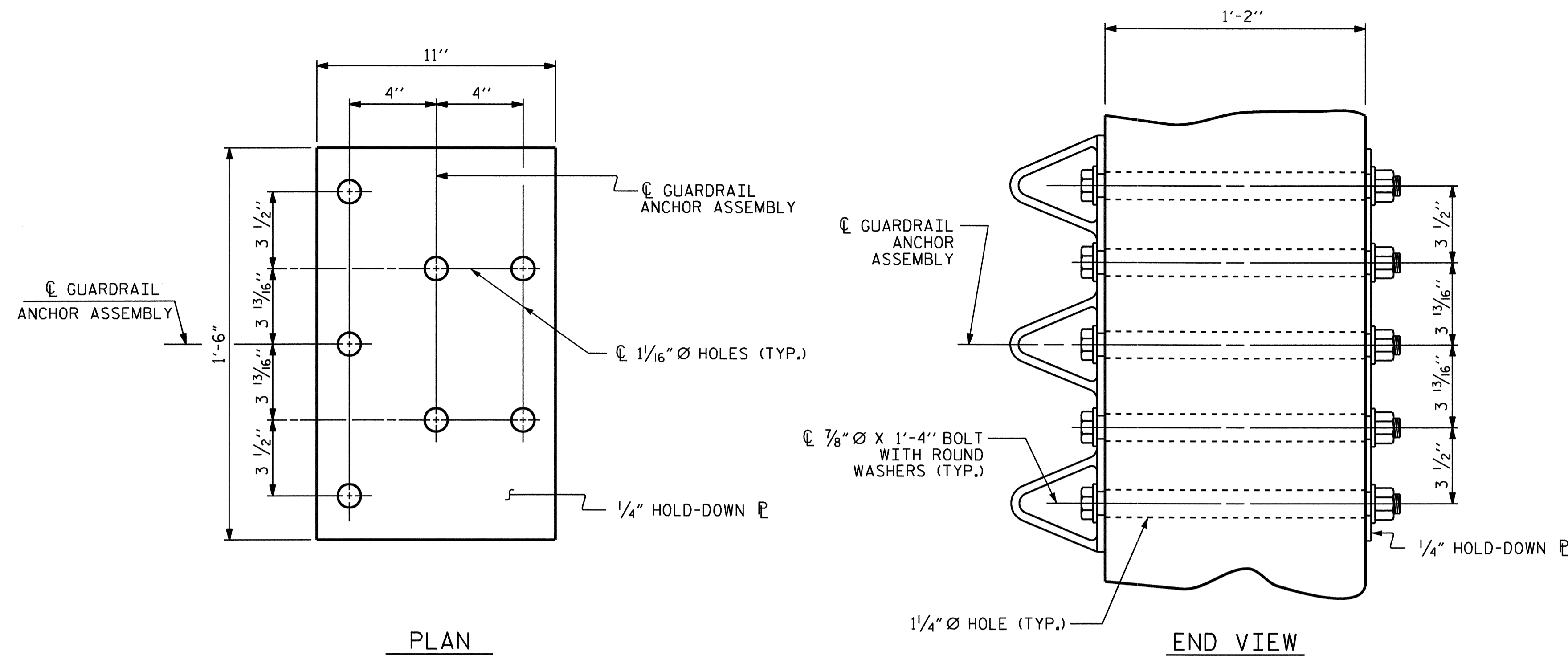
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

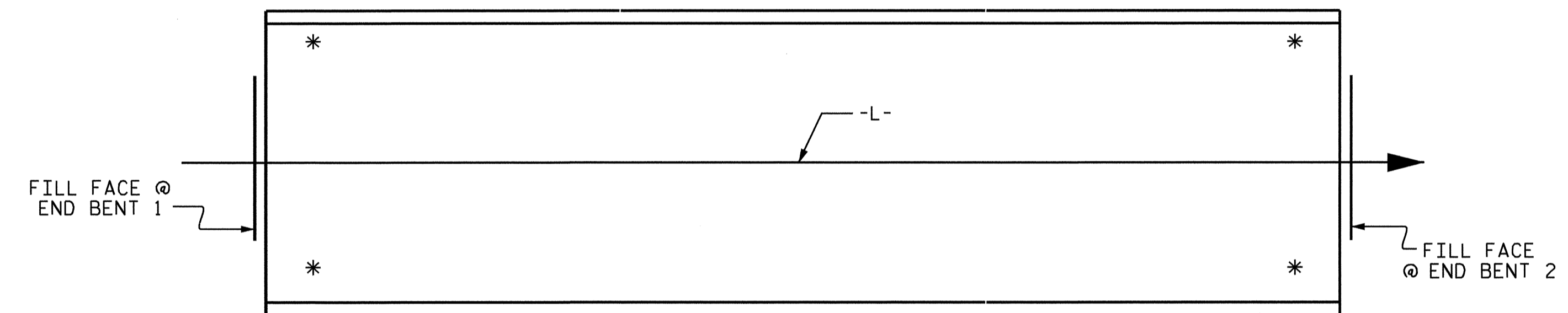
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST 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.

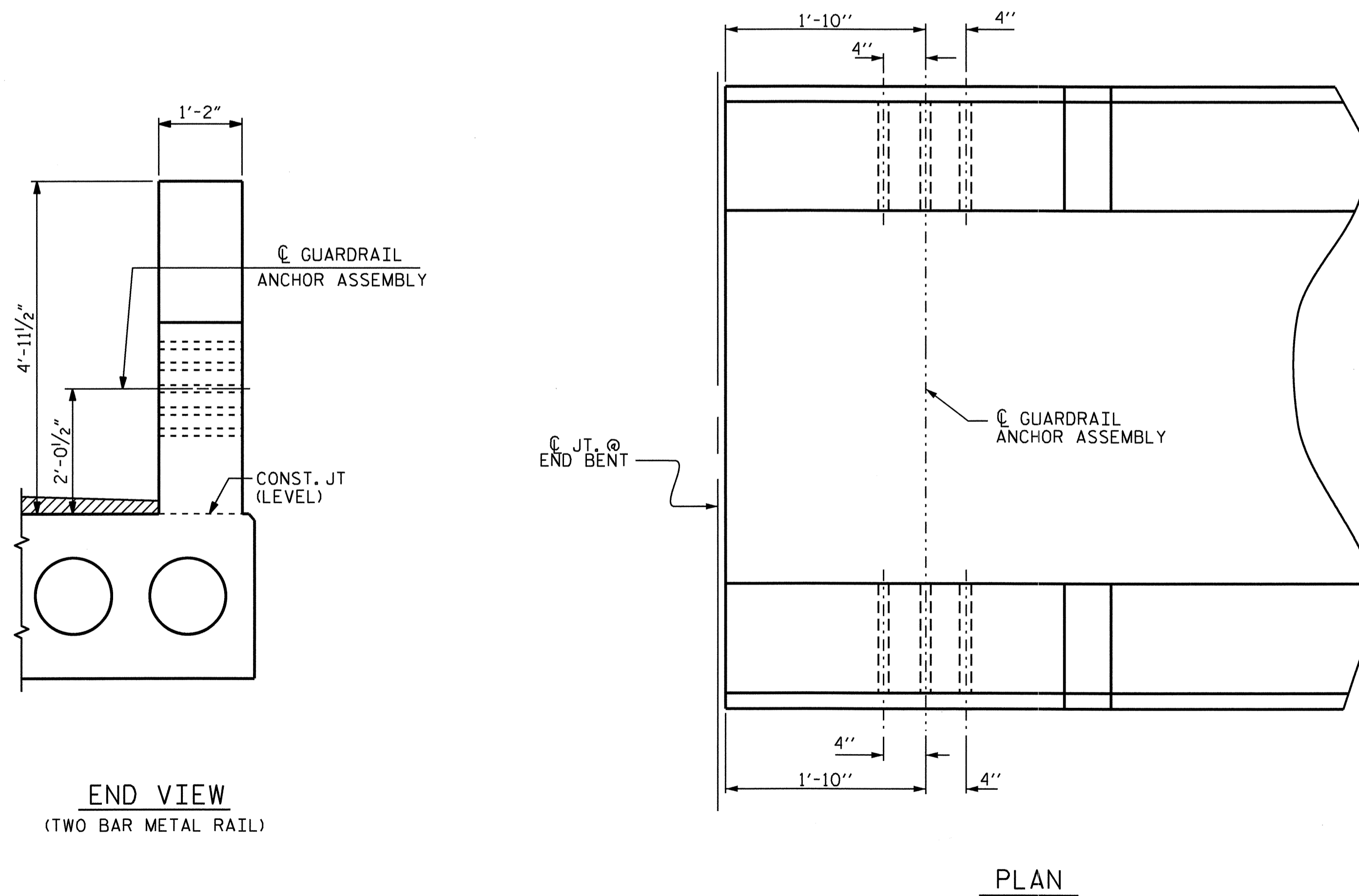


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



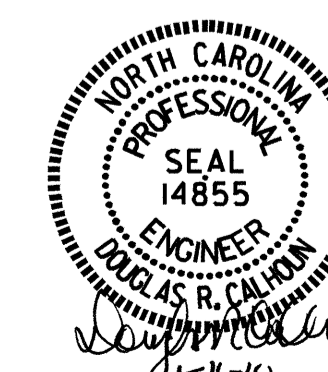
END VIEW  
(TWO BAR METAL RAIL)

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : B.N. GRADY	DATE : 6/30/09
CHECKED BY : J.L. WALTON	DATE : 7/28/09
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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v:\projects-b\3809\structures\final plans\b3809.sd.2mr.01.dgn  
jwalton



PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

SHEET 5 OF 5

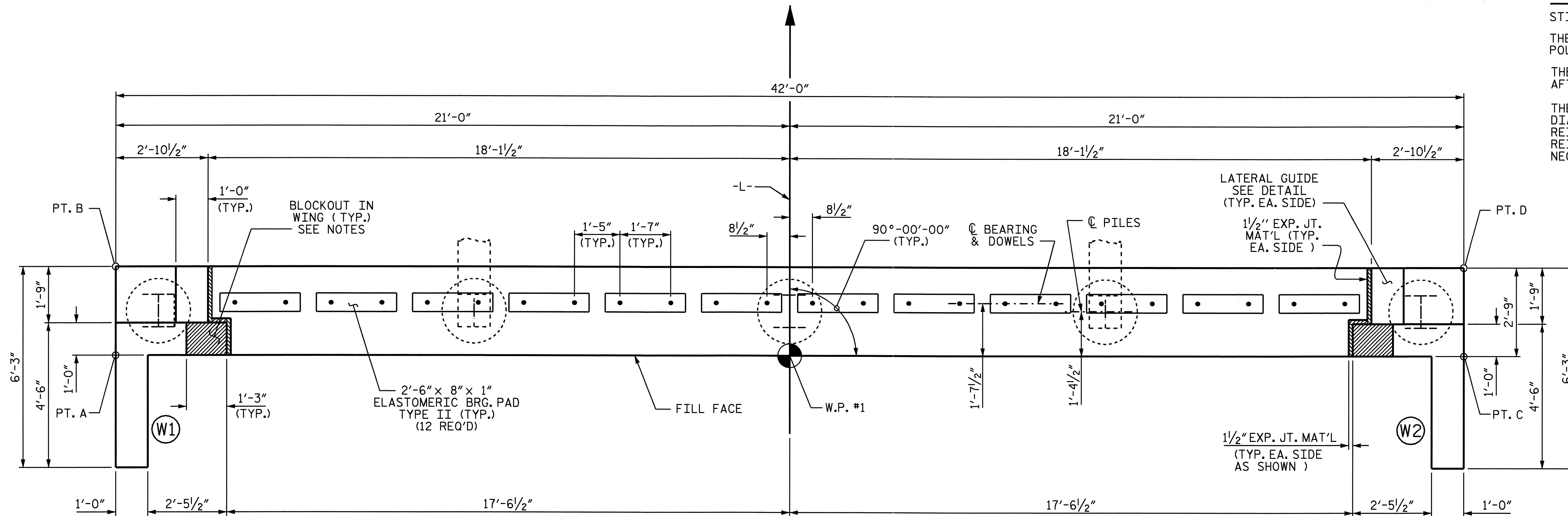
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
DETAILS  
FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			39

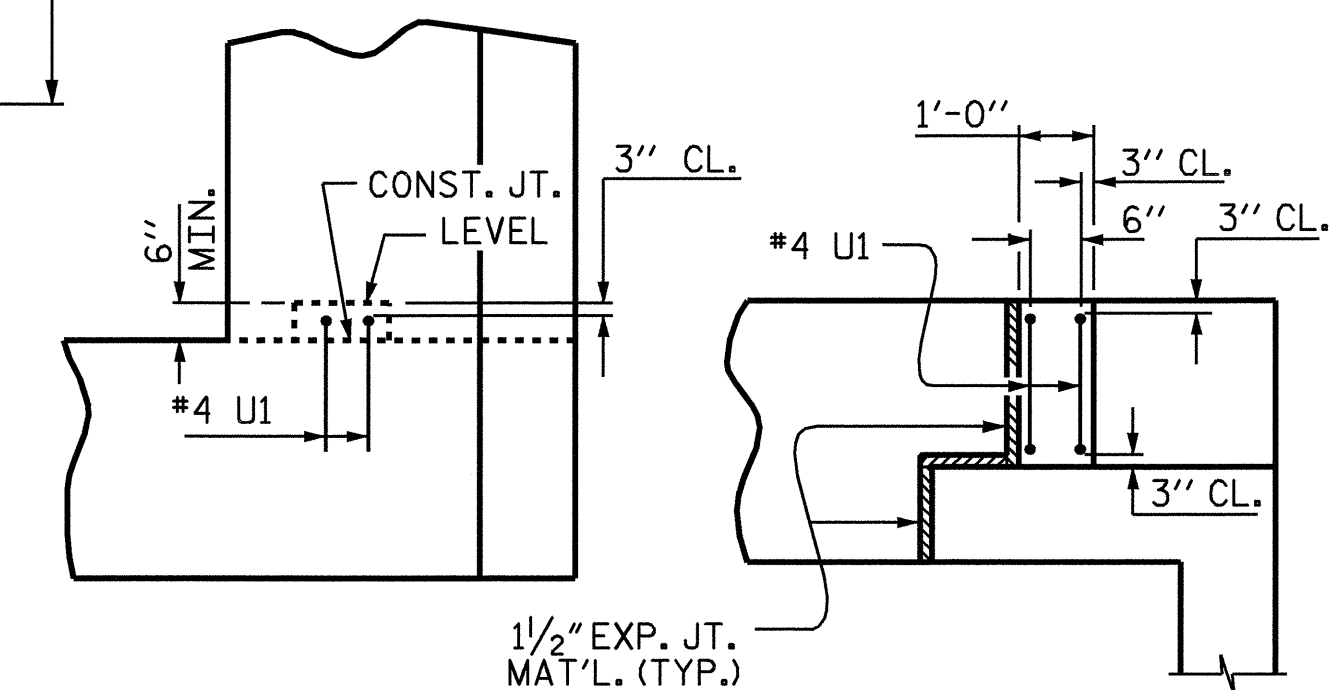
STD. NO. BMR8

**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.  
 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.



**PLAN**

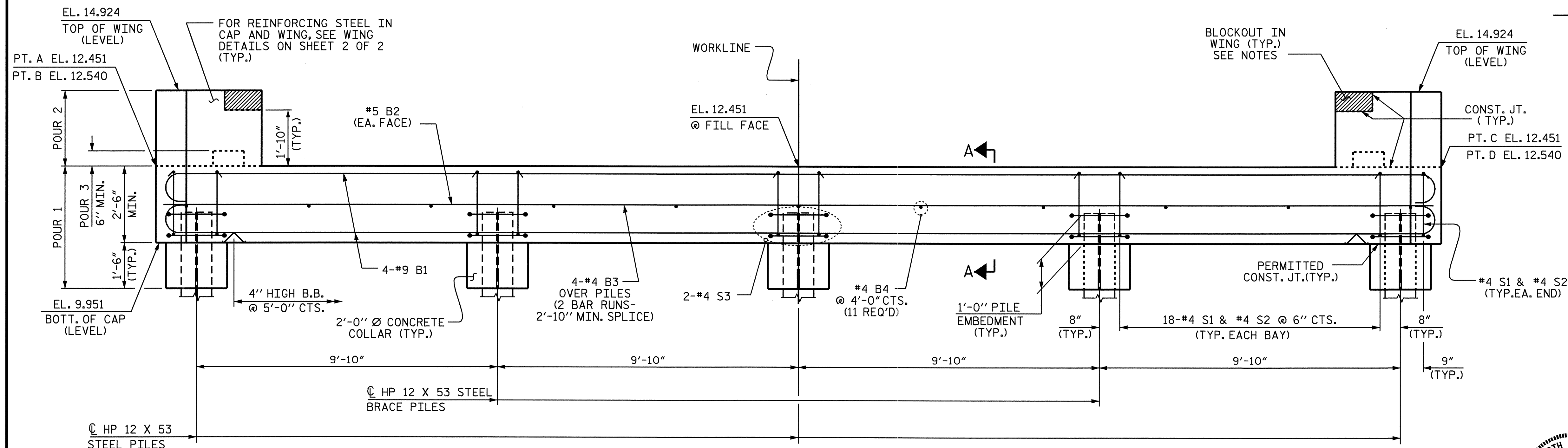


**ELEVATION**

**PLAN**

**LATERAL GUIDE**

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



**ELEVATION**

PROJECT NO. B-3809  
 BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 2

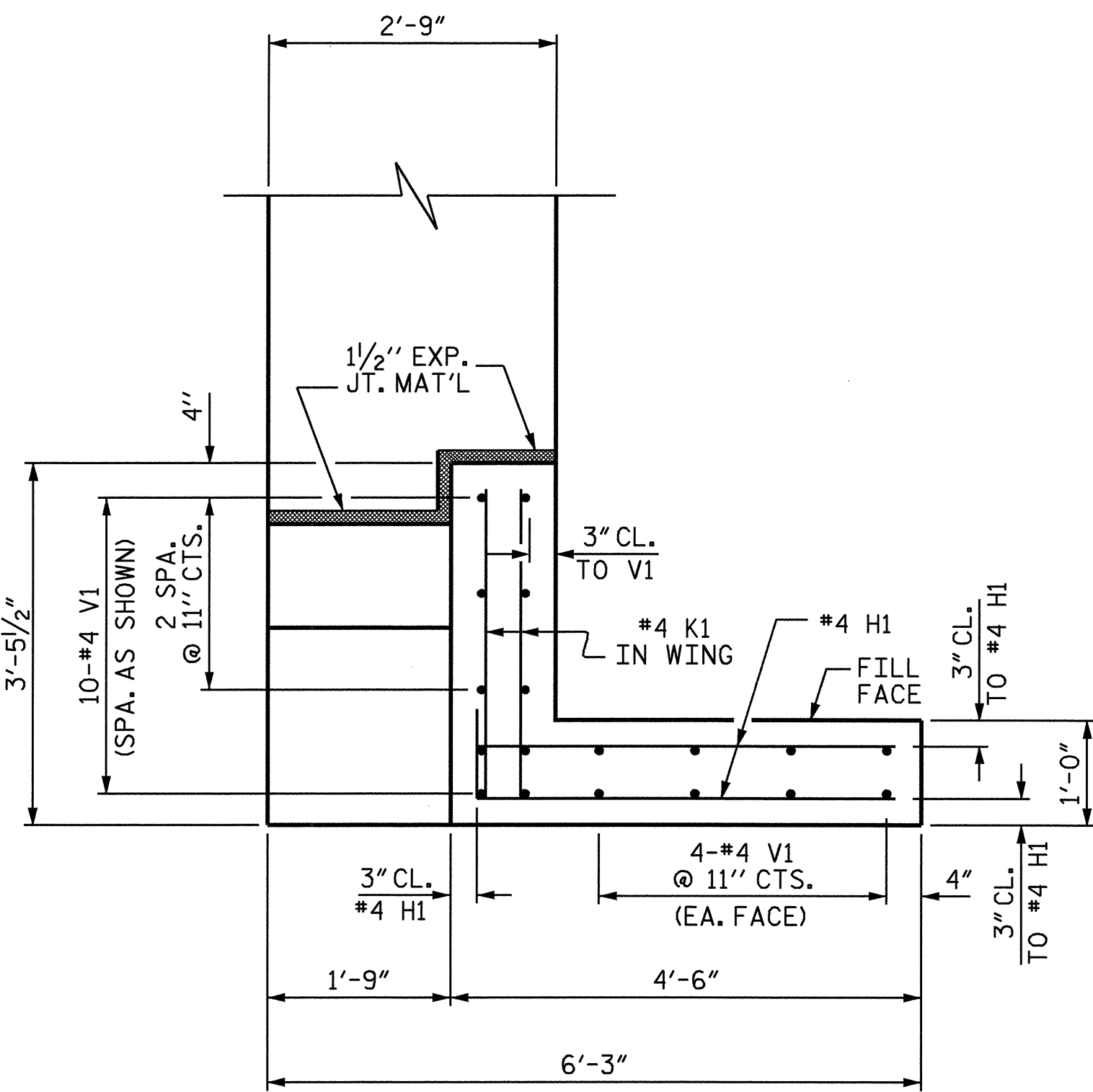
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1

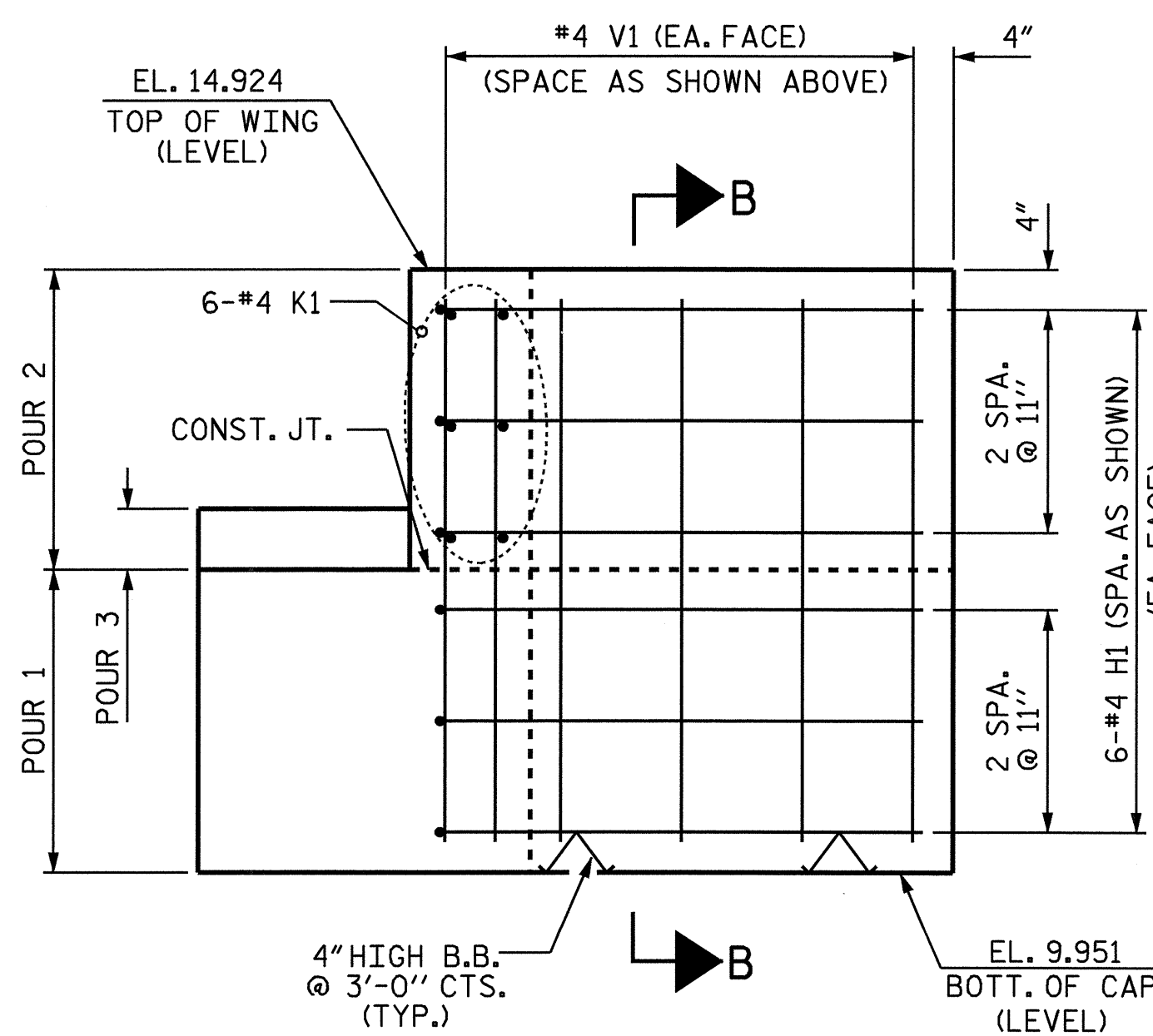


DRAWN BY : J. MYA DATE : 7-31-09  
 CHECKED BY : J. L. WALTON DATE : 8-14-09

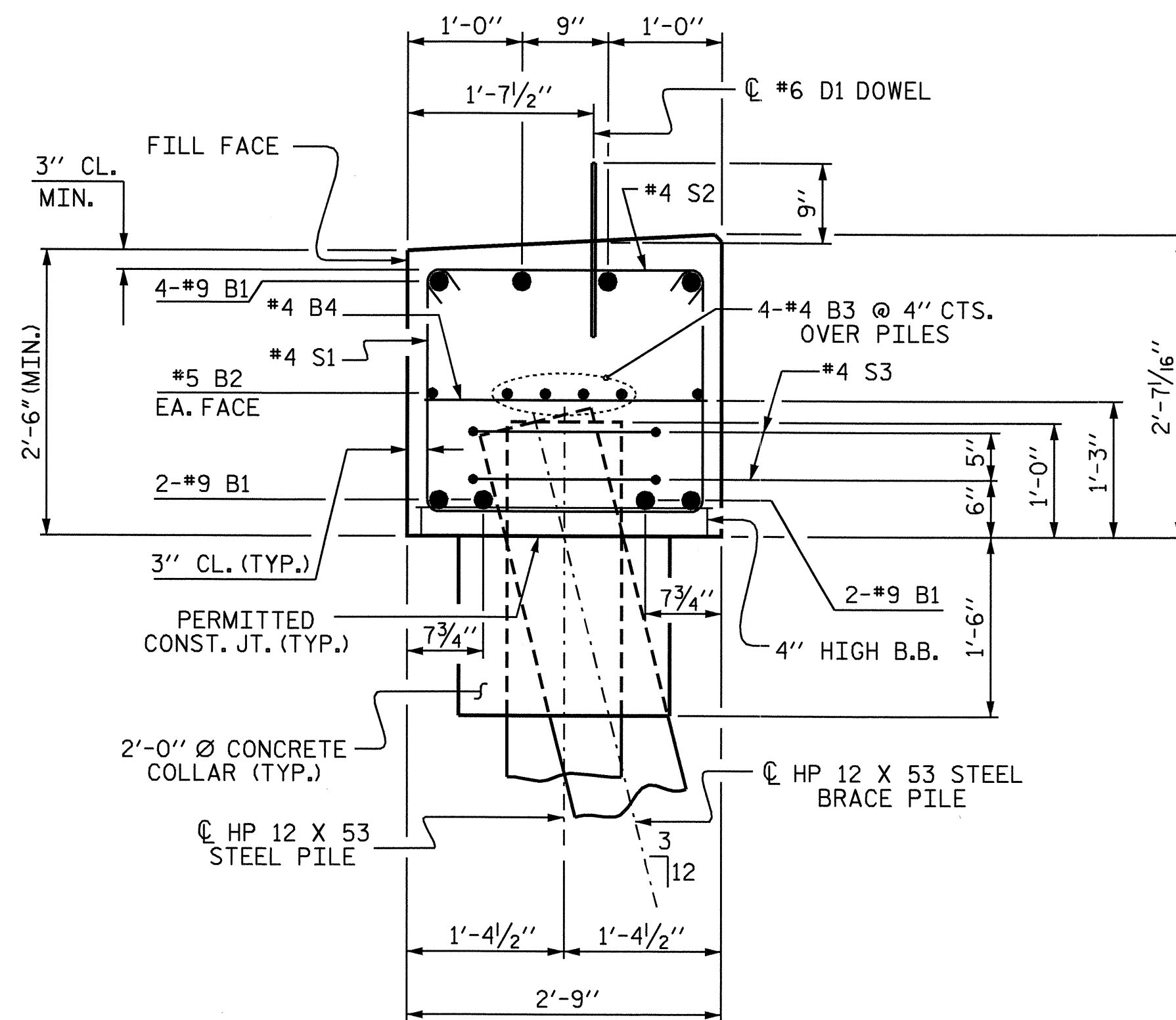
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			39



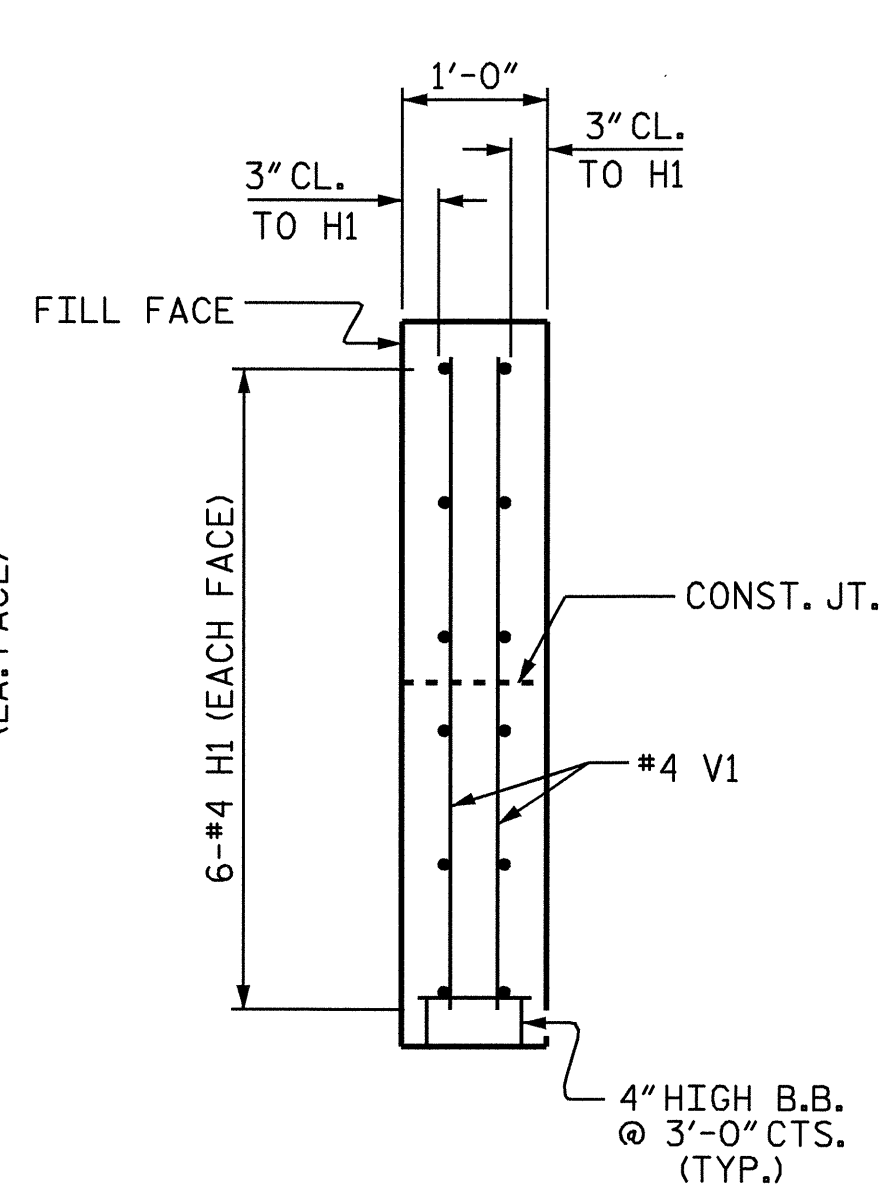
PLAN OF WING - W1  
(WING 2 SIMILAR)



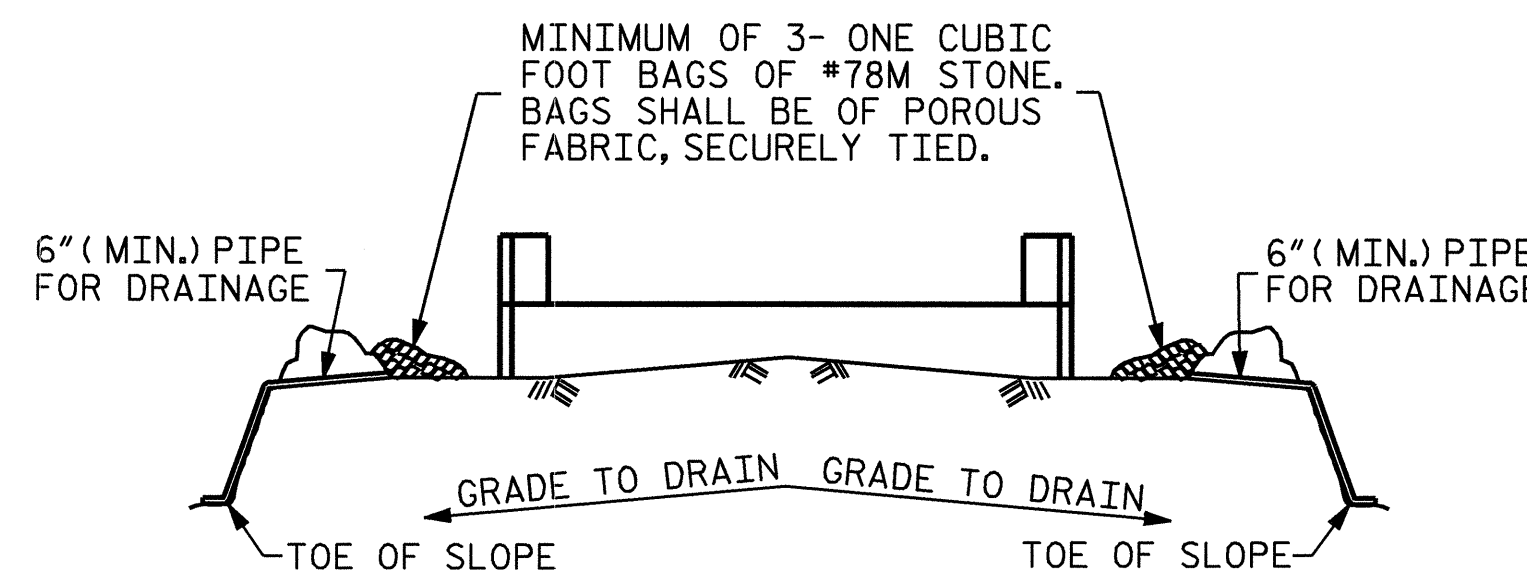
ELEVATION OF WING - W1  
(WING 2 SIMILAR)



SECTION A-A



SECTION B-B



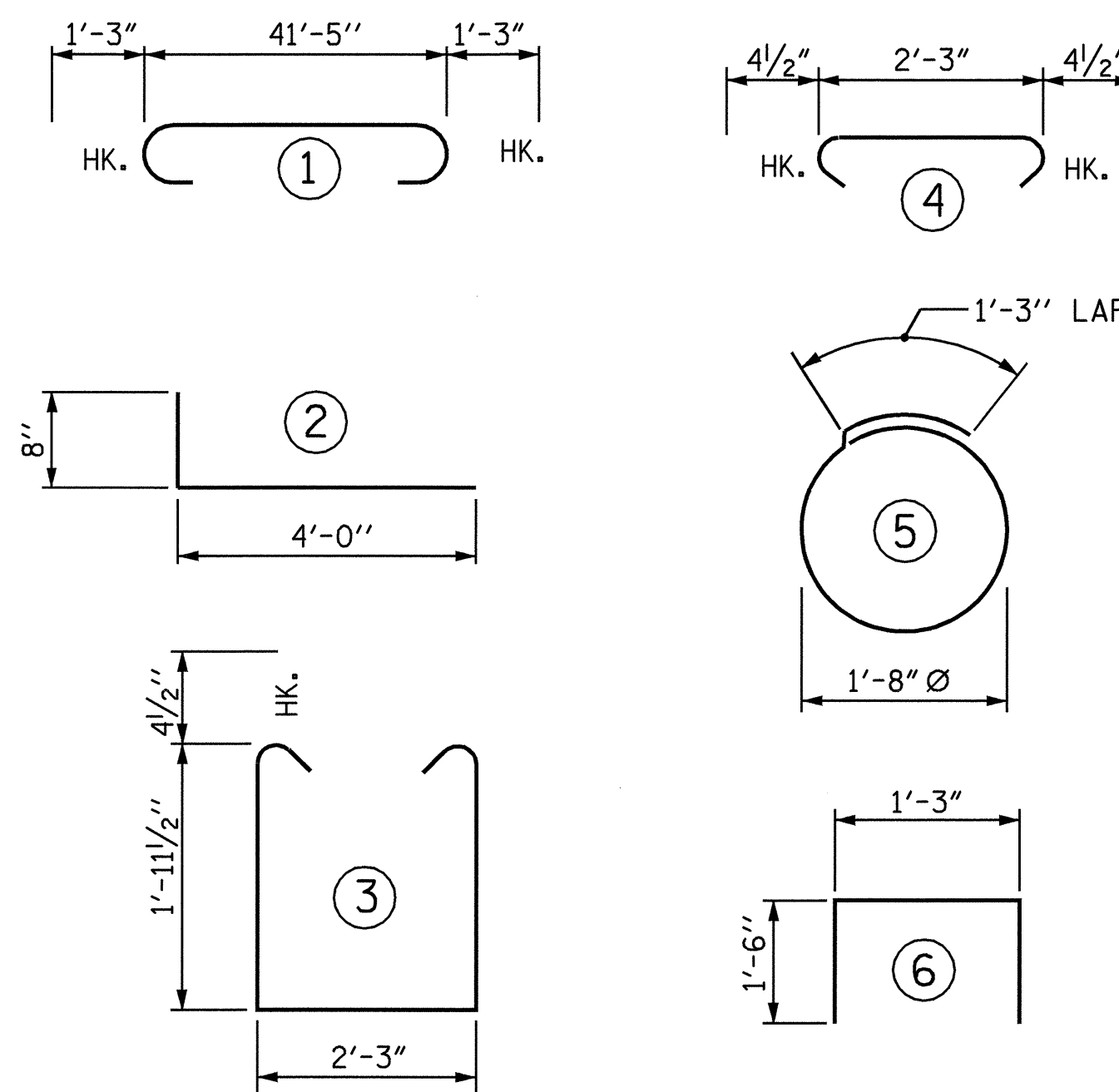
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

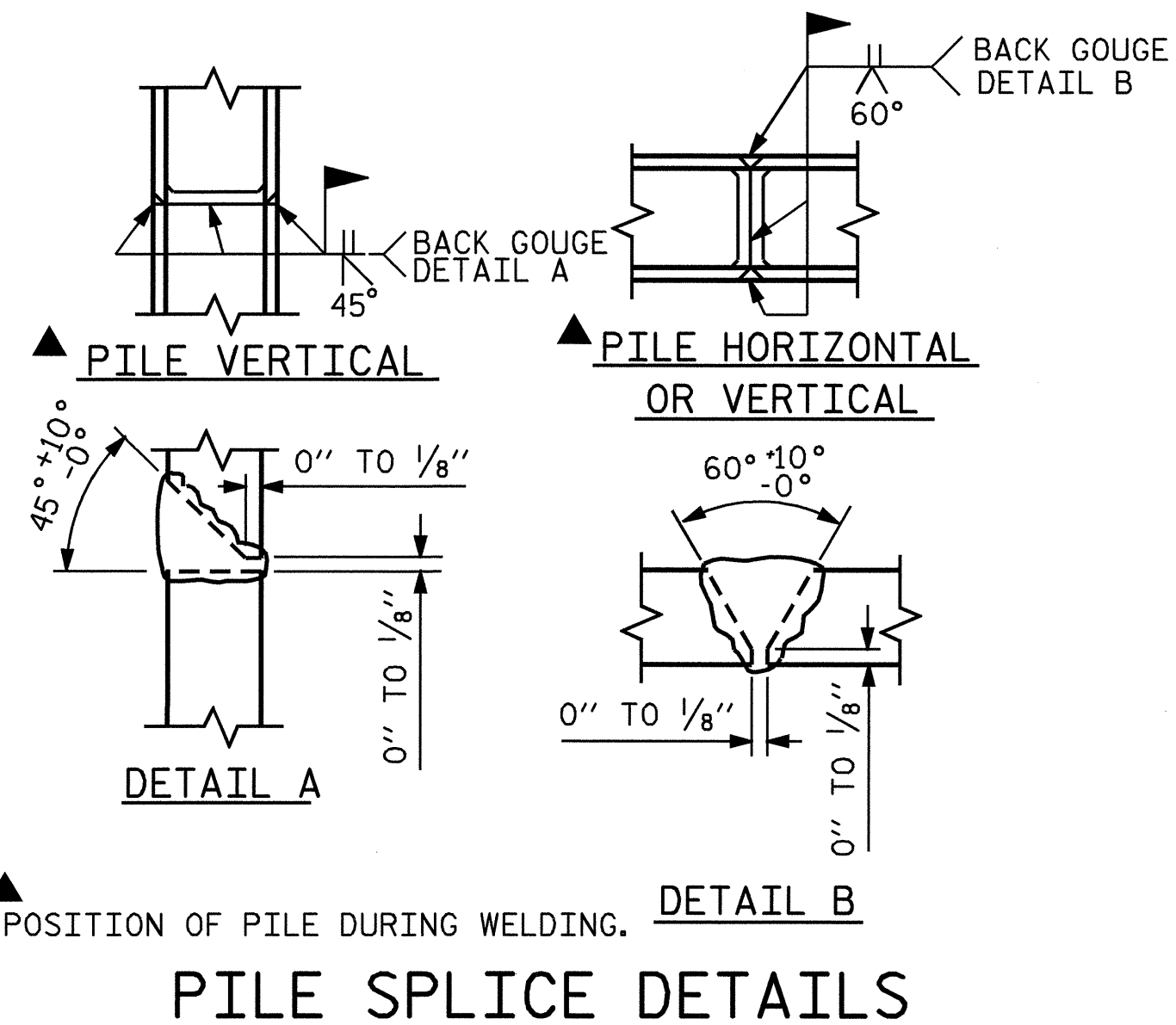
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT 1

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	#8	1	43'-11"	1195
*B2	#5	STR	41'-6"	87
*B3	#4	STR	22'-2"	118
*B4	#4	STR	2'-3"	17
*D1	#6	STR	1'-6"	54
*H1	#4	2	4'-8"	75
*K1	#4	STR	2'-11"	23
*S1	#4	3	6'-11"	342
*S2	#4	4	3'-0"	148
*S3	#4	5	6'-6"	43
*U1	#4	6	4'-3"	11
*V1	#4	STR	4'-5"	106
*EPOXY COATED REINFORCING STEEL				LBS 2219

CLASS AA CONCRETE BREAKDOWN

POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WINGS)	C.Y.	12.4
POUR 2 (UPPER PART OF WINGS)	C.Y.	1.3
POUR 3 (LATERAL GUIDES)	C.Y.	0.1
TOTAL	C.Y.	13.8

HP 12 X 53 STEEL PILES :  
NO. : 5

LIN. FT. : 300

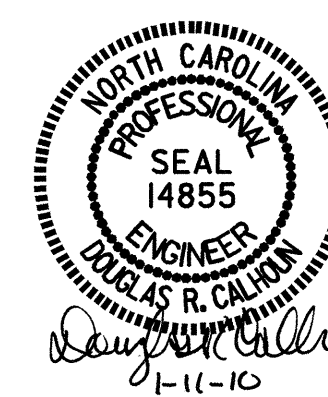
PILE REDRIVES NO. 5

PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT 1



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

S-20  
TOTAL SHEETS 39

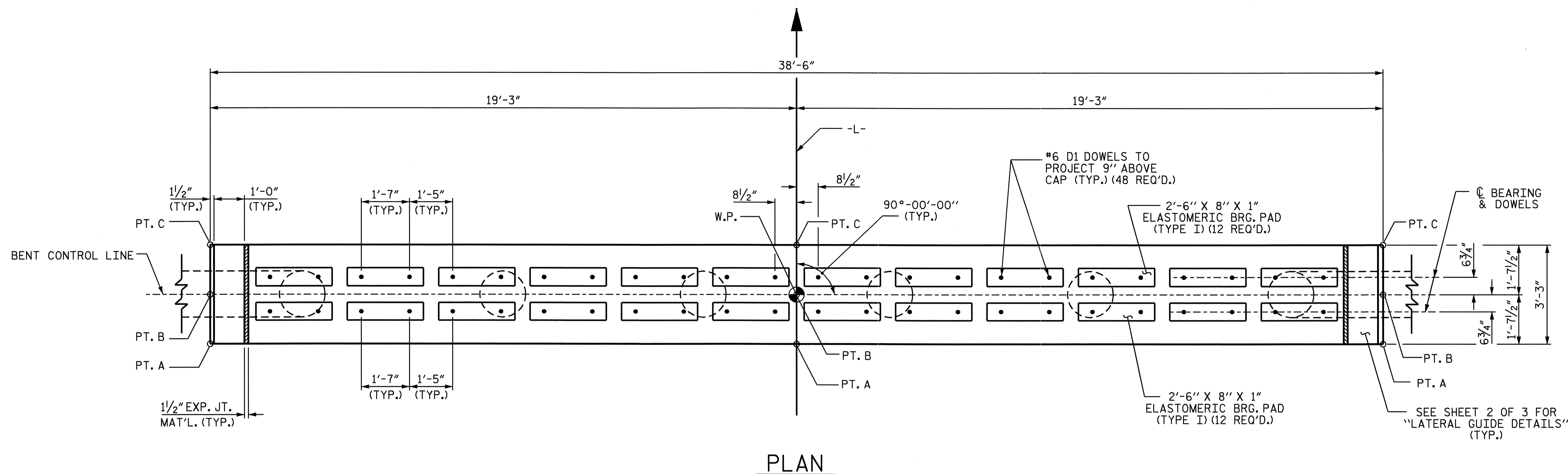
DRAWN BY : J. MYA DATE : 7-31-09  
CHECKED BY : J. L. WALTON DATE : 8-14-09

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jmya

**NOTES**

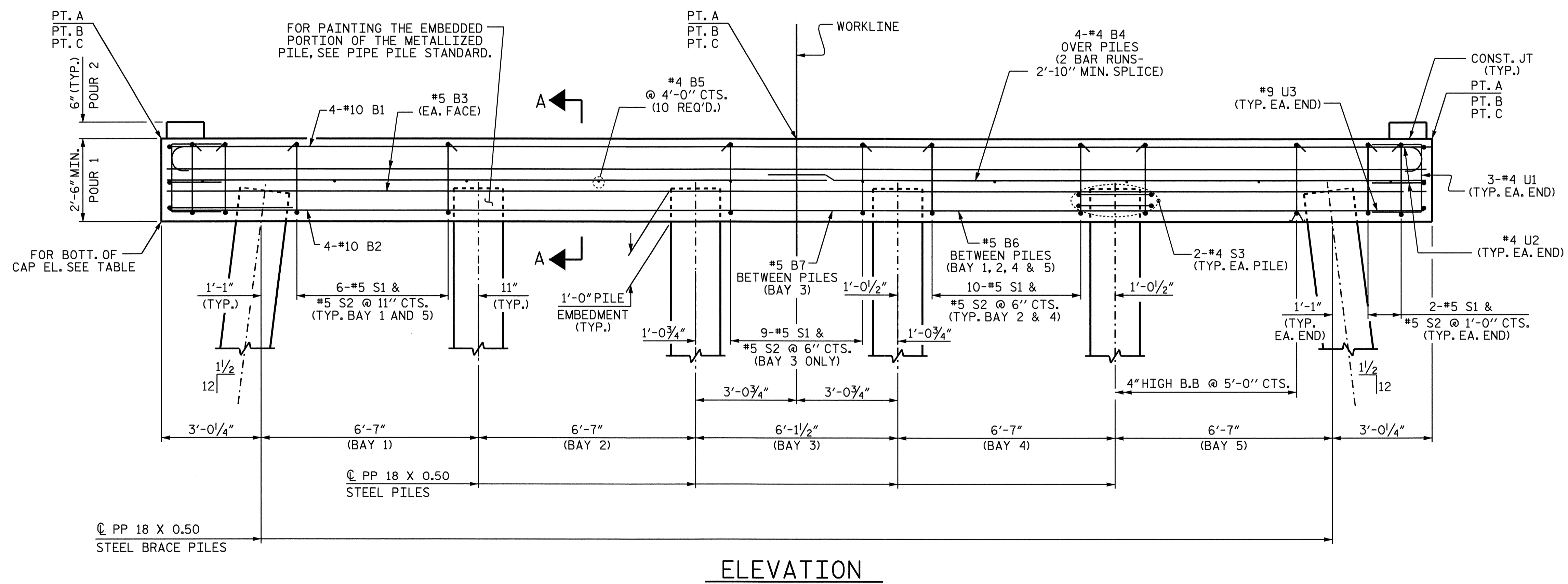
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.



**PLAN**

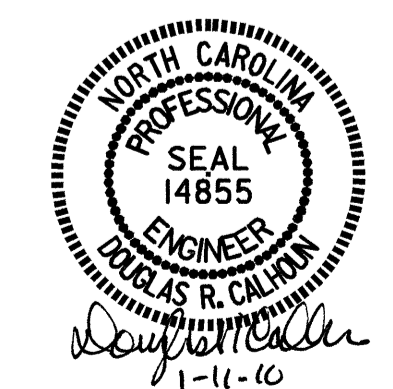
W.P.	BENT NO.	BOTT. OF CAP ELEV.	PT.A	PT.B	PT.C
2	1	10.930	13.430	13.451	13.477
3	2	11.805	14.305	14.305	14.352
14	13	11.704	14.251	14.204	14.204
15	14	10.812	13.359	13.333	13.312



**ELEVATION**

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

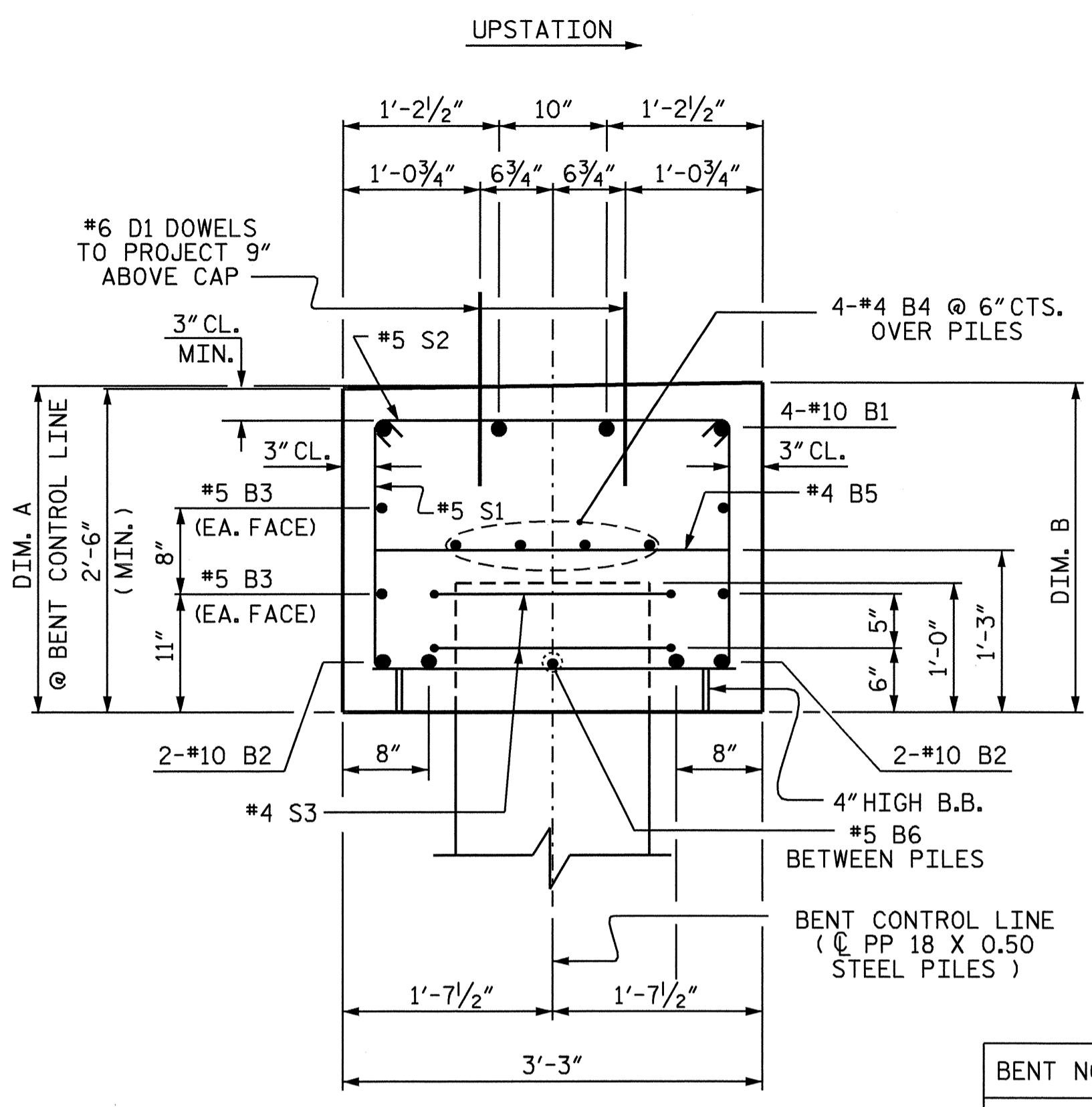
SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENTS 1, 2, 13 & 14



DRAWN BY: J. MYA DATE: 8-16-09  
 CHECKED BY: J. L. WALTON DATE: 9-11-09

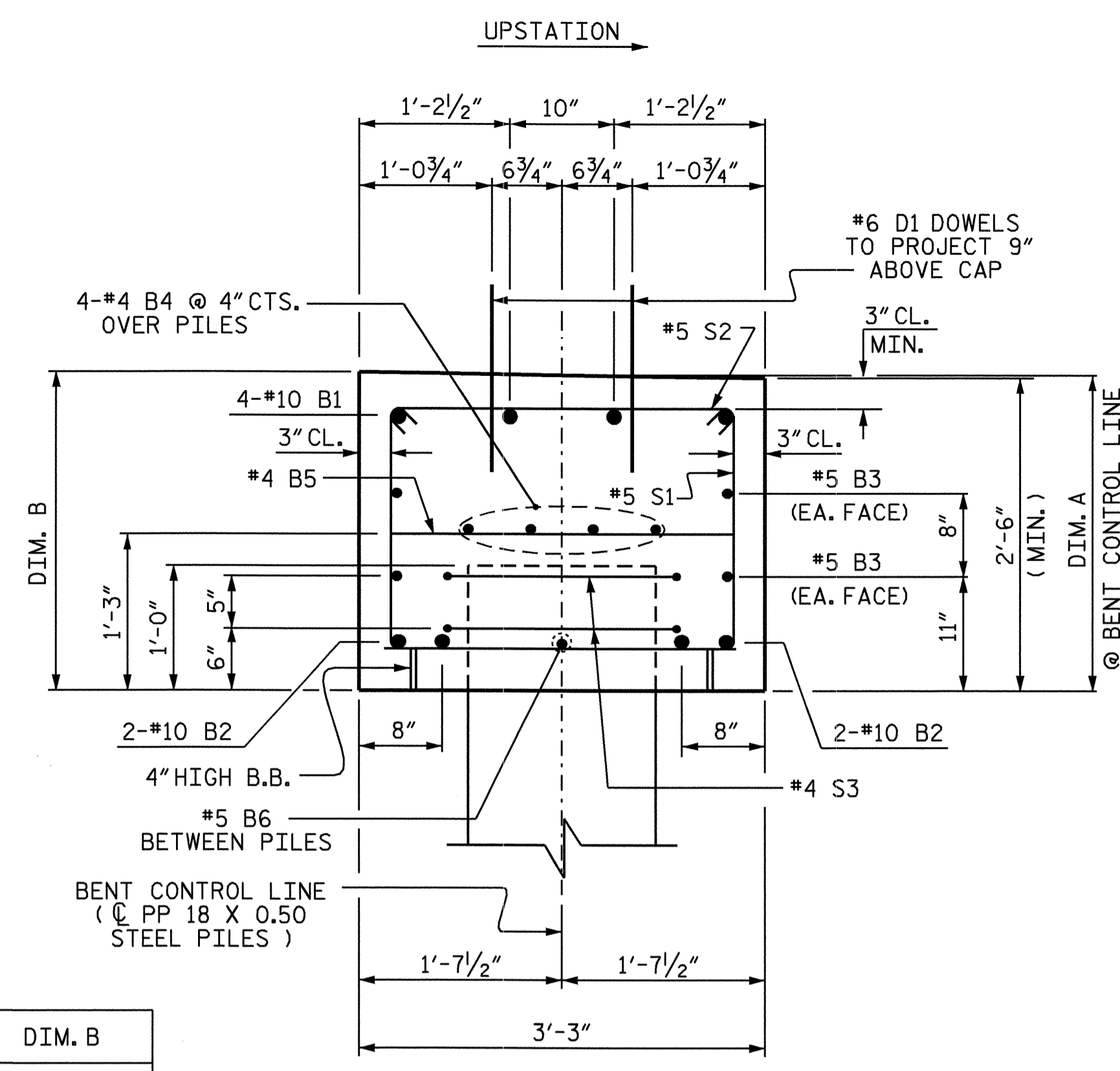
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			39

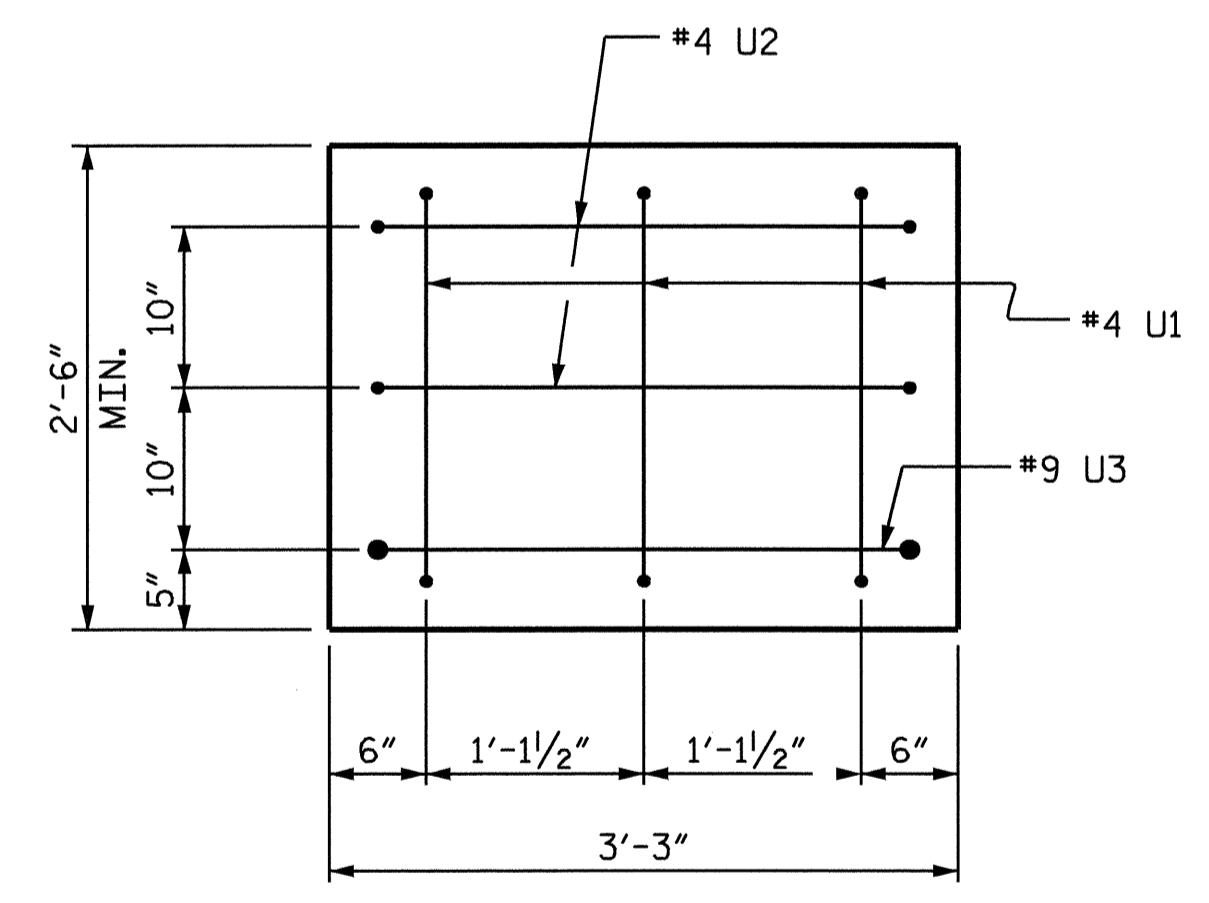


**SECTION A-A**  
(BENTS 1 & 2)

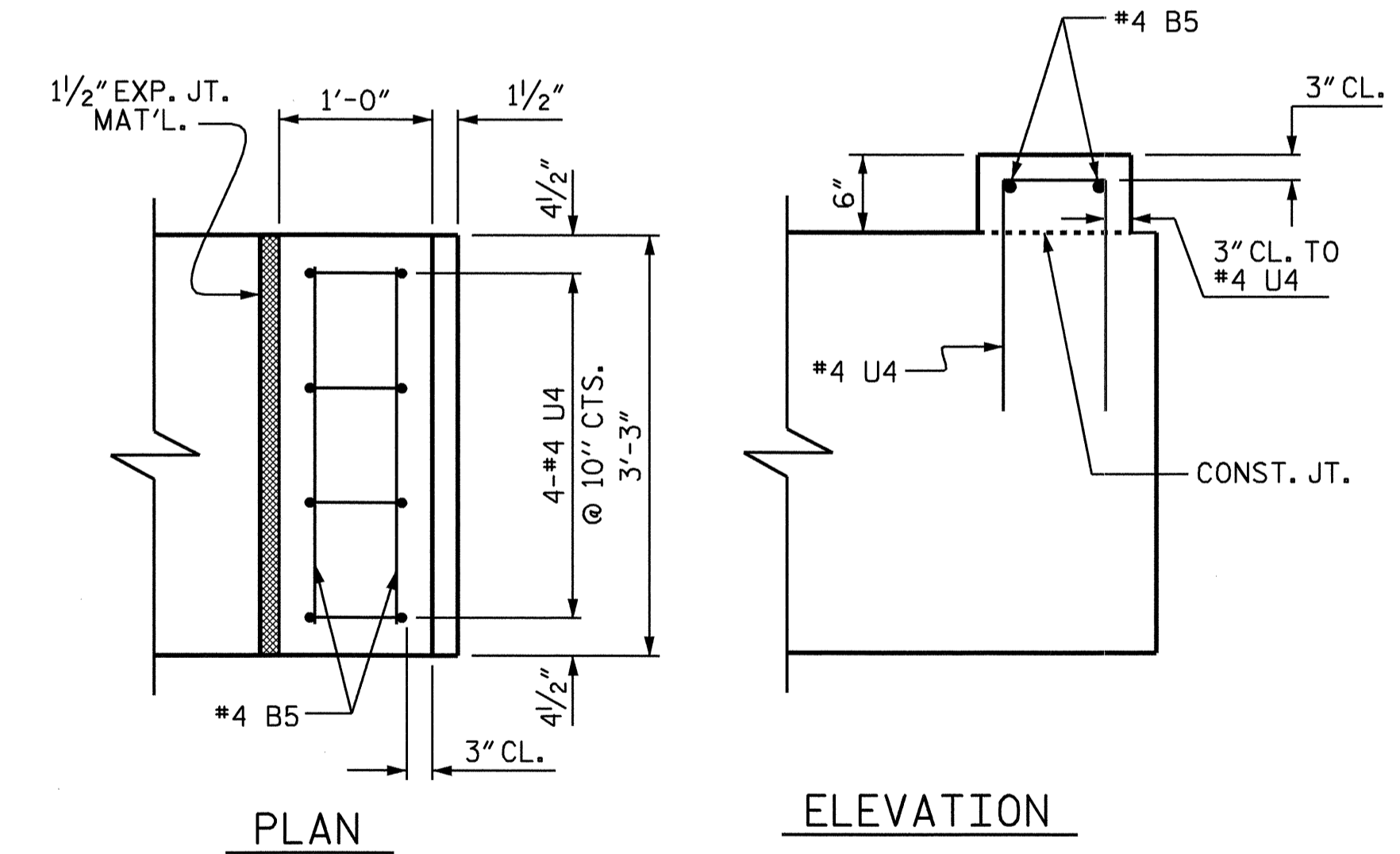
BENT NO.	DIM. A	DIM. B
1	2'-6 1/4"	2'-6 3/16"
2	2'-6"	2'-6 3/16"
13	2'-6"	2'-6 3/16"
14	2'-6 1/4"	2'-6 3/16"



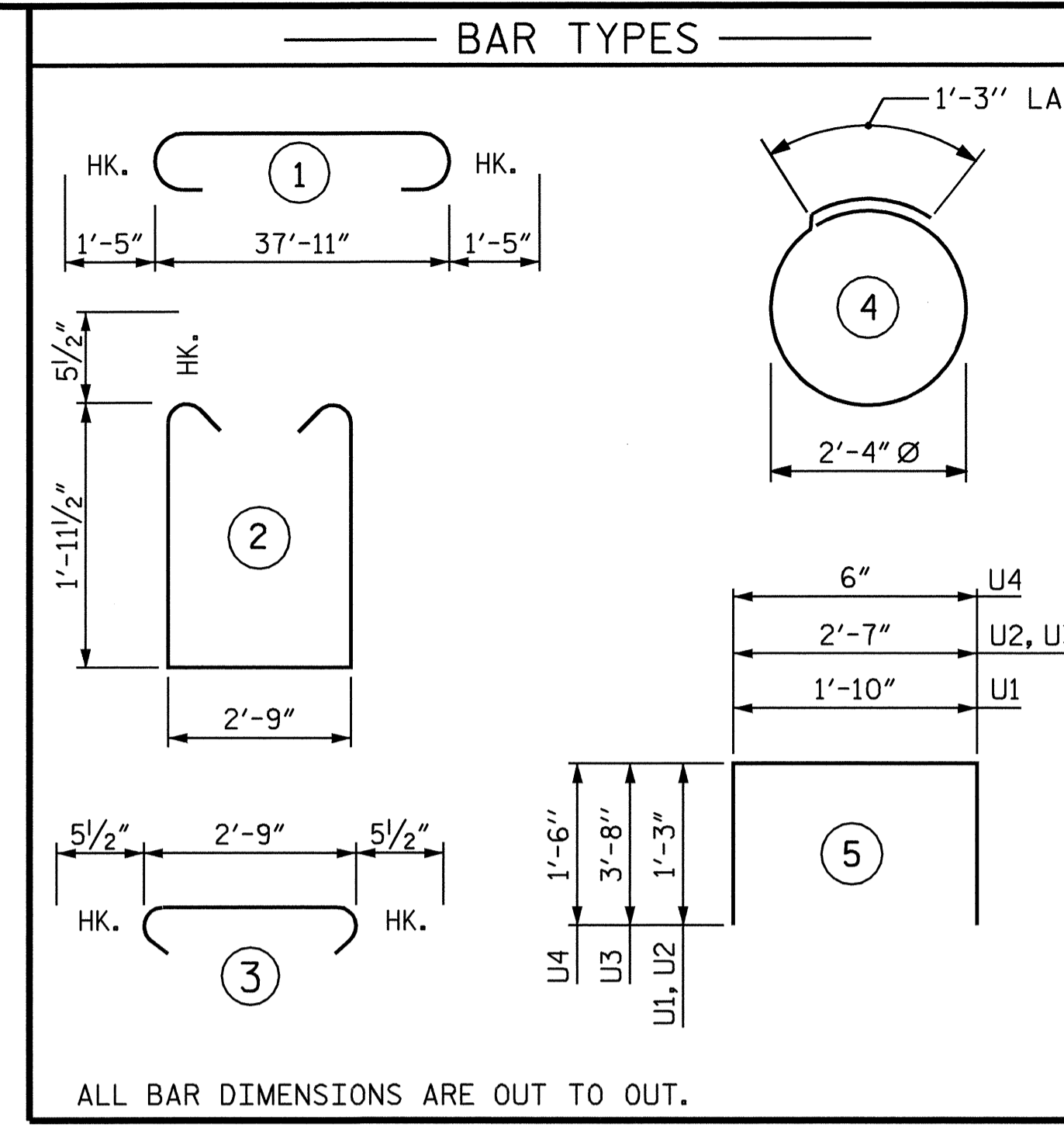
**SECTION A-A**  
(BENTS 13 & 14)



**END VIEW**  
(TYP. EA. END)



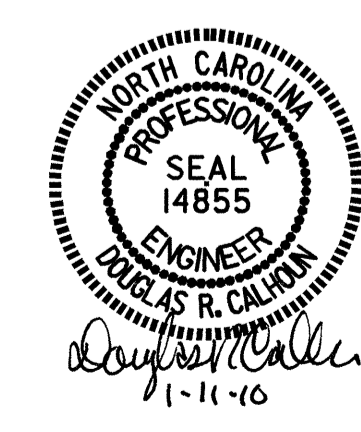
**LATERAL GUIDE REINFORCING DETAIL**  
RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR BY ROTATION



ALL BAR DIMENSIONS ARE OUT TO OUT.  
▲ CONCRETE DISPLACED BY THE 18" STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.

BILL OF MATERIAL					
BENT 1, 2, 13 OR 14					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	4	#10	1	40'-9"	701
*B2	4	#10	STR	38'-0"	654
*B3	4	#5	STR	38'-0"	159
*B4	8	#4	STR	20'-5"	109
*B5	14	#4	STR	2'-9"	26
*B6	4	#5	STR	4'-7"	19
*B7	1	#5	STR	4'-1"	4
*D1	48	#6	STR	1'-6"	108
*S1	45	#5	2	7'-7"	356
*S2	45	#5	3	3'-8"	172
*S3	12	#4	4	8'-7"	69
*U1	6	#4	5	4'-4"	17
*U2	4	#4	5	5'-1"	14
*U3	2	#9	5	9'-11"	67
*U4	8	#4	5	3'-6"	19
* EPOXY COATED REINFORCING STEEL					2494 LBS.
CLASS AA CONCRETE					
▲ POUR 1 (CAP)					C.Y. 11.2
POUR 2 (LATERAL GUIDE)					C.Y. 0.1
▲ TOTAL					C.Y. 11.3
PP 18 X 0.50 STEEL PILES					
	NO.	LIN. FT.			
BENT 1	6	540			
BENT 2	6	540			
BENT 13	6	300			
BENT 14	6	300			
PILE REDRIVES :					
BENT 1	NO. :	6			
BENT 2	NO. :	6			
BENT 13	NO. :	6			
BENT 14	NO. :	6			
PIPE PILE PLATES :					
BENT 1	NO. :	6			
BENT 2	NO. :	6			
BENT 13	NO. :	6			
BENT 14	NO. :	6			
PDA TESTING : (EA.)					
BENT 1	-----				
BENT 2	1				
BENT 13	-----				
BENT 14	1				
PDA ASSISTANCE : (EA.)					
BENT 1	-----				
BENT 2	1				
BENT 13	-----				
BENT 14	1				

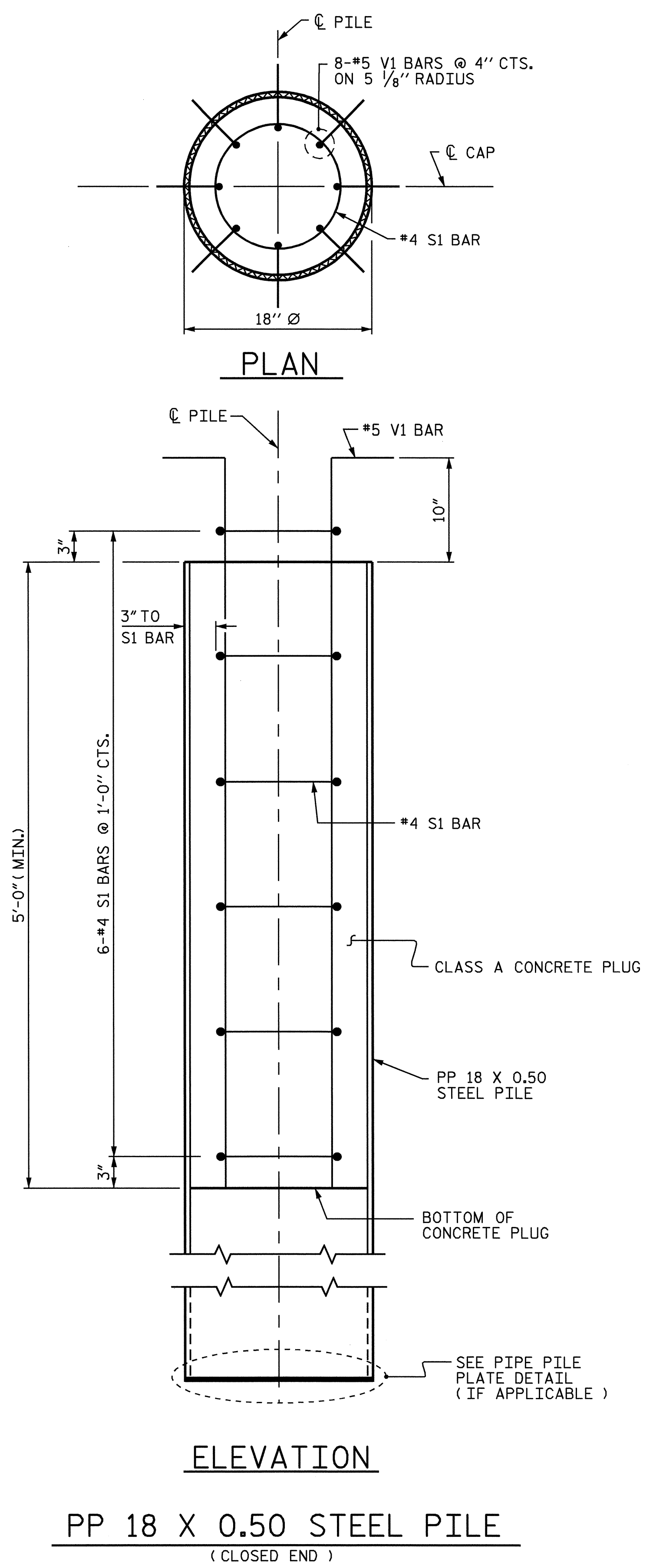
PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 2 OF 3



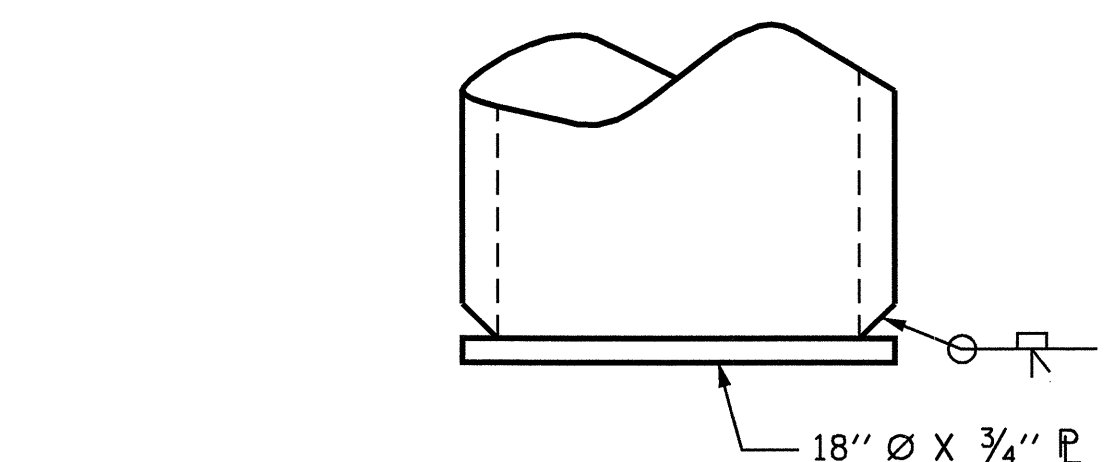
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENTS 1, 2, 13 AND 14					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : J. MYA DATE : 8-16-09  
 CHECKED BY : J. L. WALTON DATE : 9-11-09

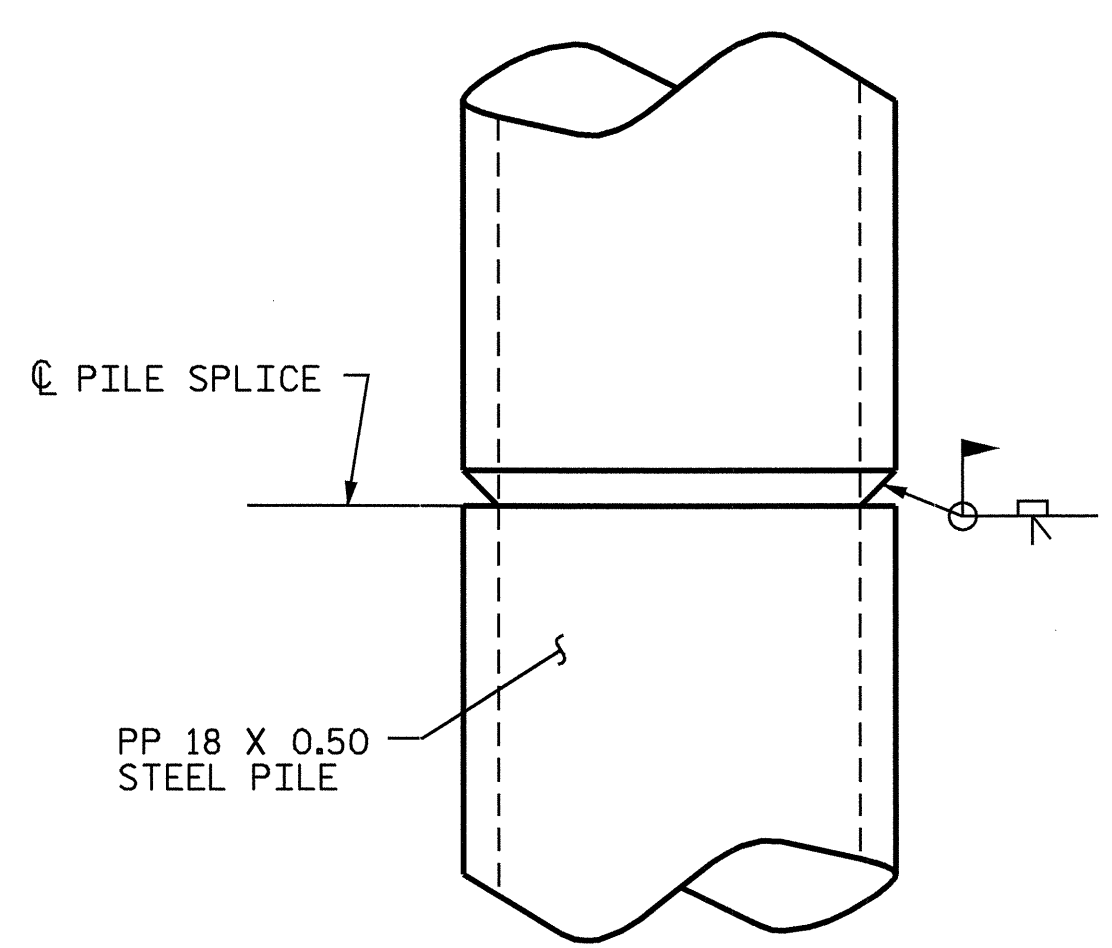
SHEET NO.  
S-22  
TOTAL SHEETS  
39



PP 18 X 0.50 STEEL PILE  
(CLOSED END)



PIPE PILE PLATE DETAIL  
(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-A1-1350) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO THE UPPER PORTION OF THE PILES FOR THE LENGTHS SHOWN IN CHART, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND METALLIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 STEEL PILES.

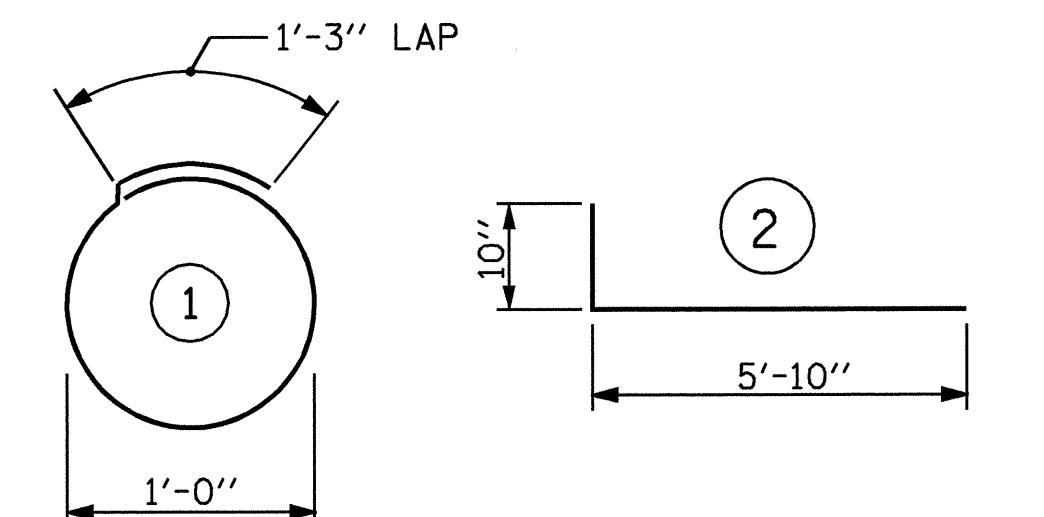
AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ONE  
PP 18 X 0.50 STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =				74	lbs

CLASS A CONCRETE  
5'-0" MINIMUM PLUG 0.3 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

THERMAL SPRAYED COATING  
FOR PP 18 X 0.50 STEEL PILES :

	LIN. FT. EA. PILE
BENT 1	17.00
BENT 2	23.00
BENT 13	19.00
BENT 14	11.00

PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
18" STEEL PIPE PILE



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS 39	
2			4				

ASSEMBLED BY : J. MYA	DATE : 8-16-09
CHECKED BY : J. L. WALTON	DATE : 9-11-09
DRAWN BY : RWW 1/01	REV. 5/7/03 RWW/JTE
CHECKED BY : LES 1/01	REV. 10/1/05 LBG/TLA
	REV. 5/1/06R MAA/KMM

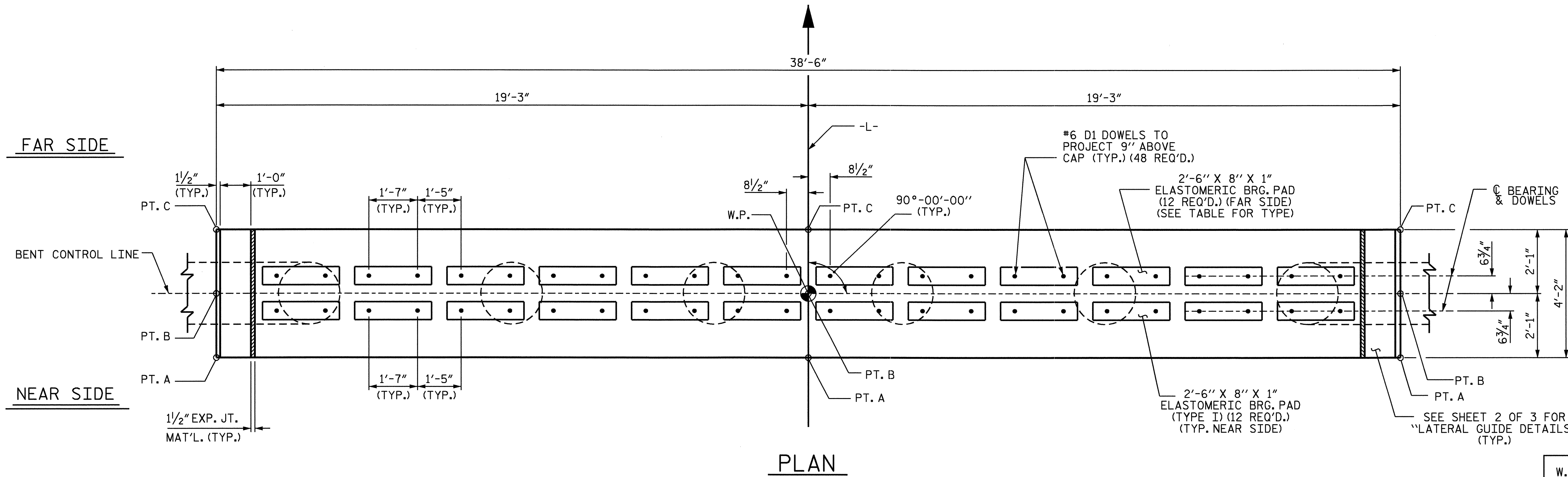


**NOTES**

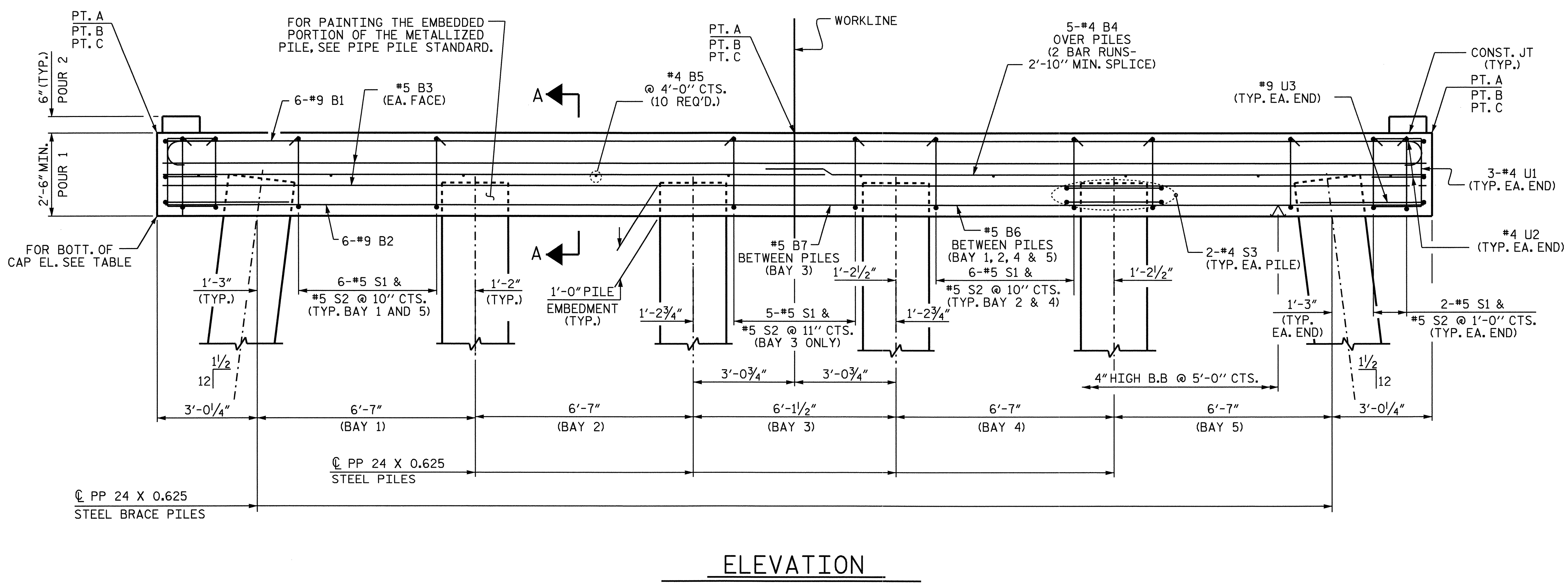
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

FOR ATTACHMENT OF 1" GALVANIZED RIGID STEEL CONDUIT TO BENT 7, SEE "NAVIGATIONAL LIGHTING AND CONDUIT SYSTEM" SHEET.



W.P.	BENT NO.	BOTT. OF CAP ELEV.	PT.A	PT.B	PT.C	FAR SIDE BRG. TYPE
4	3	12.682	15.182	15.182	15.229	TYPE II
5	4	13.363	15.863	15.863	15.910	TYPE I
6	5	13.776	16.276	16.276	16.307	TYPE I
7	6	14.059	16.559	16.559	16.590	TYPE II
8	7	14.228	16.728	16.728	16.759	TYPE I
9	8	14.200	16.731	16.700	16.700	TYPE II
10	9	14.031	16.562	16.531	16.531	TYPE I
11	10	13.732	16.263	16.232	16.232	TYPE II
12	11	13.189	15.736	15.689	15.689	TYPE I
13	12	12.452	14.999	14.952	14.952	TYPE II

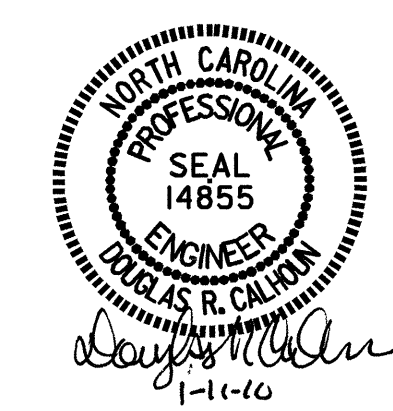


PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

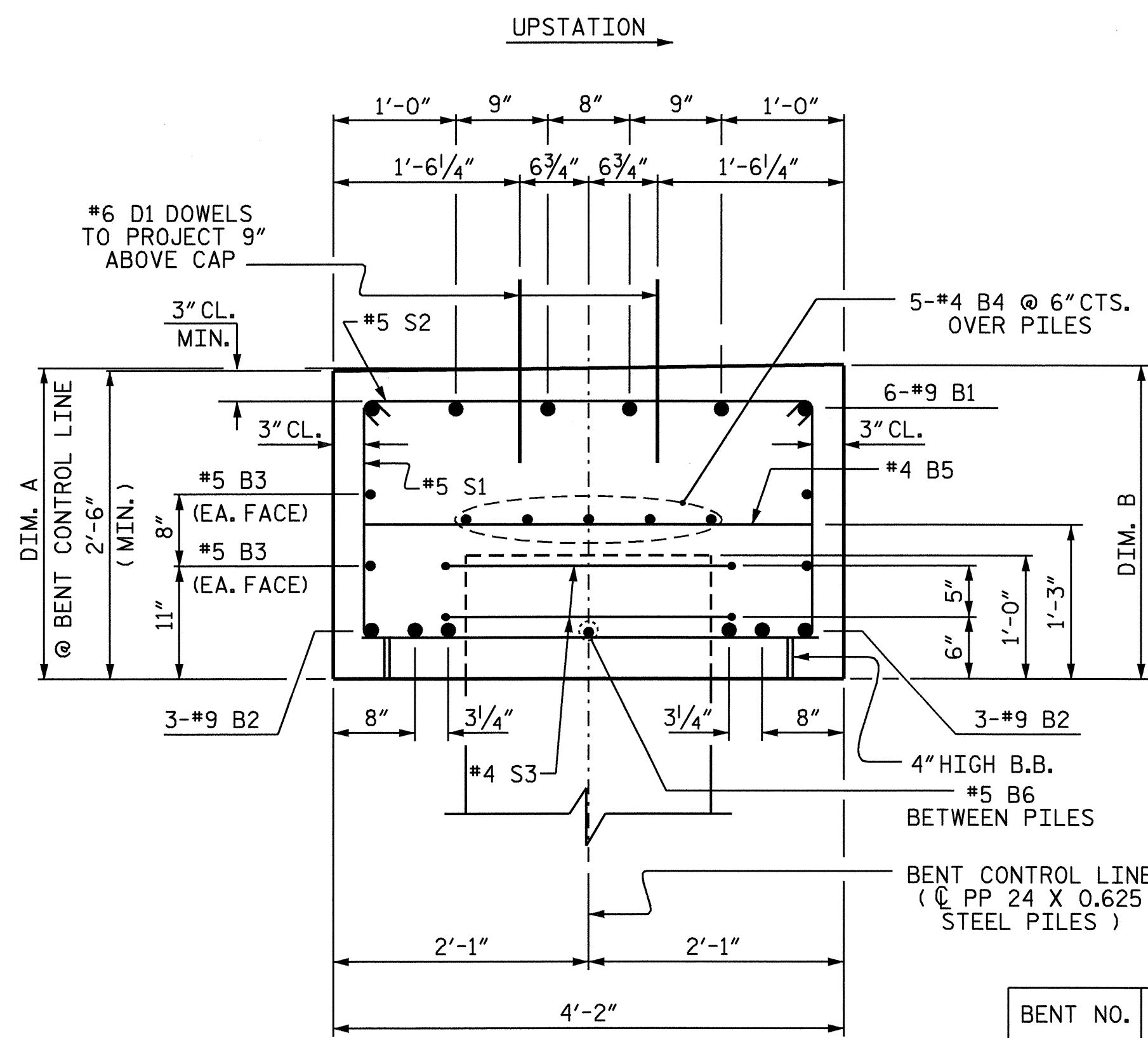
SUBSTRUCTURE  
 BENTS 3 THRU 12



DRAWN BY : J. MYA DATE : 8-16-09  
 CHECKED BY : J. L. WALTON DATE : 9-11-09

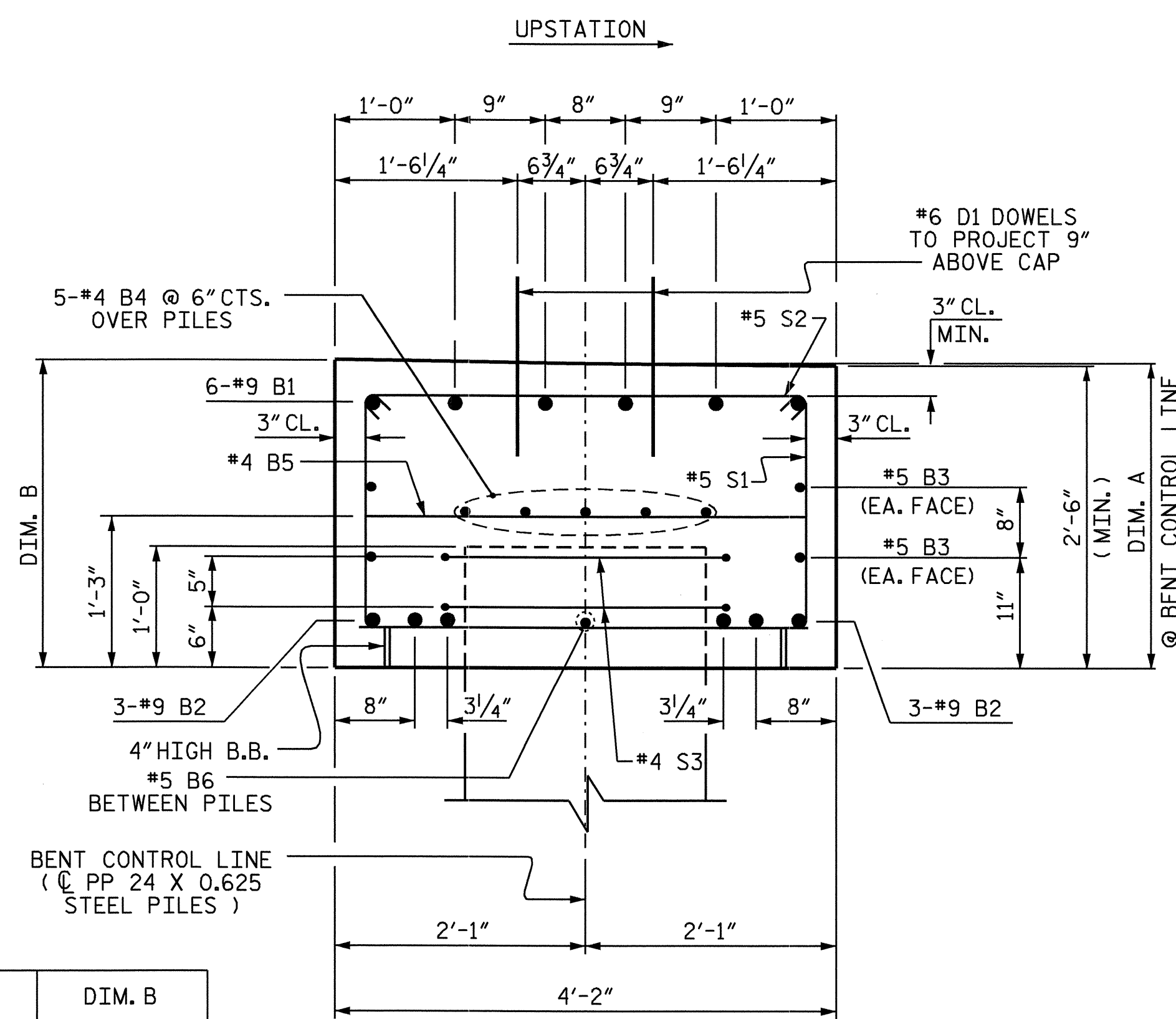
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	39
2			4				

11-JAN-2010 11:38  
 Y:\Structures\Final Plans\B-3809.SD.B\*.dgn  
 bngrody

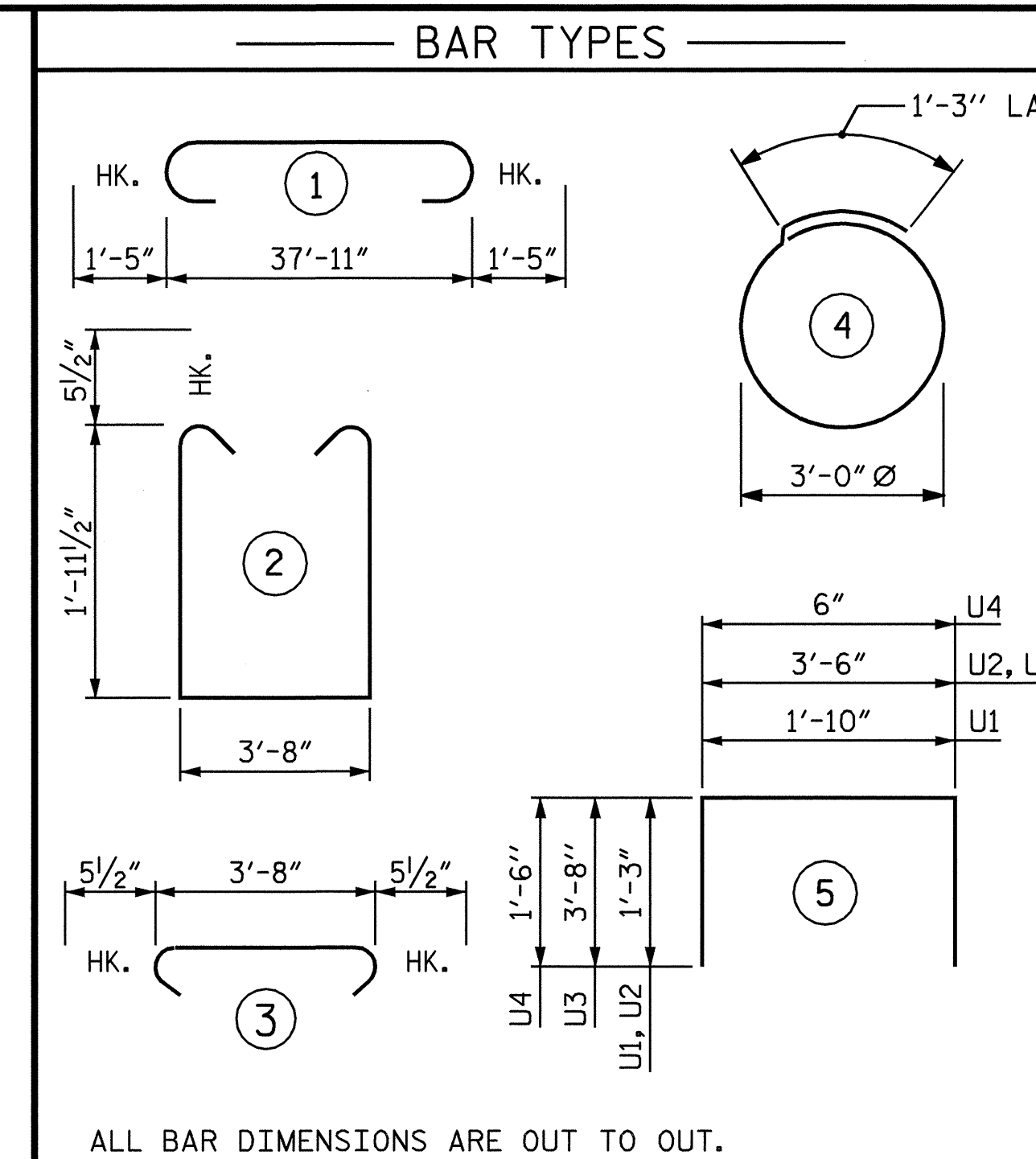


**SECTION A-A**  
(BENTS 3 THRU 7)

BENT NO.	DIM. A	DIM. B
3 & 4	2'-6"	2'-6 <sup>9</sup> / <sub>16</sub> "
5, 6 & 7	2'-6"	2'-6 <sup>3</sup> / <sub>8</sub> "
8, 9 & 10	2'-6"	2'-6 <sup>3</sup> / <sub>8</sub> "
11 & 12	2'-6"	2'-6 <sup>9</sup> / <sub>16</sub> "

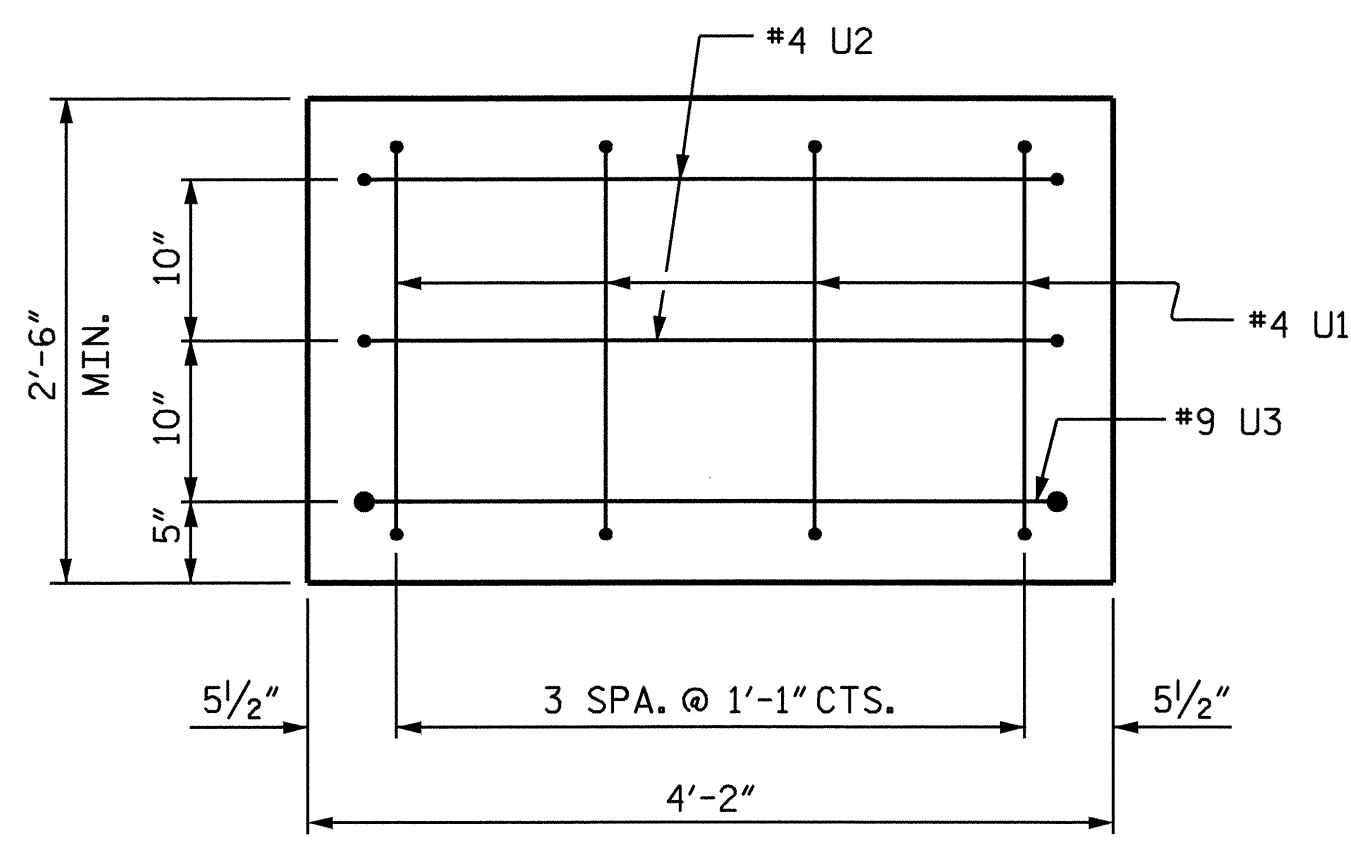


**SECTION A-A**  
(BENTS 8 THRU 12)

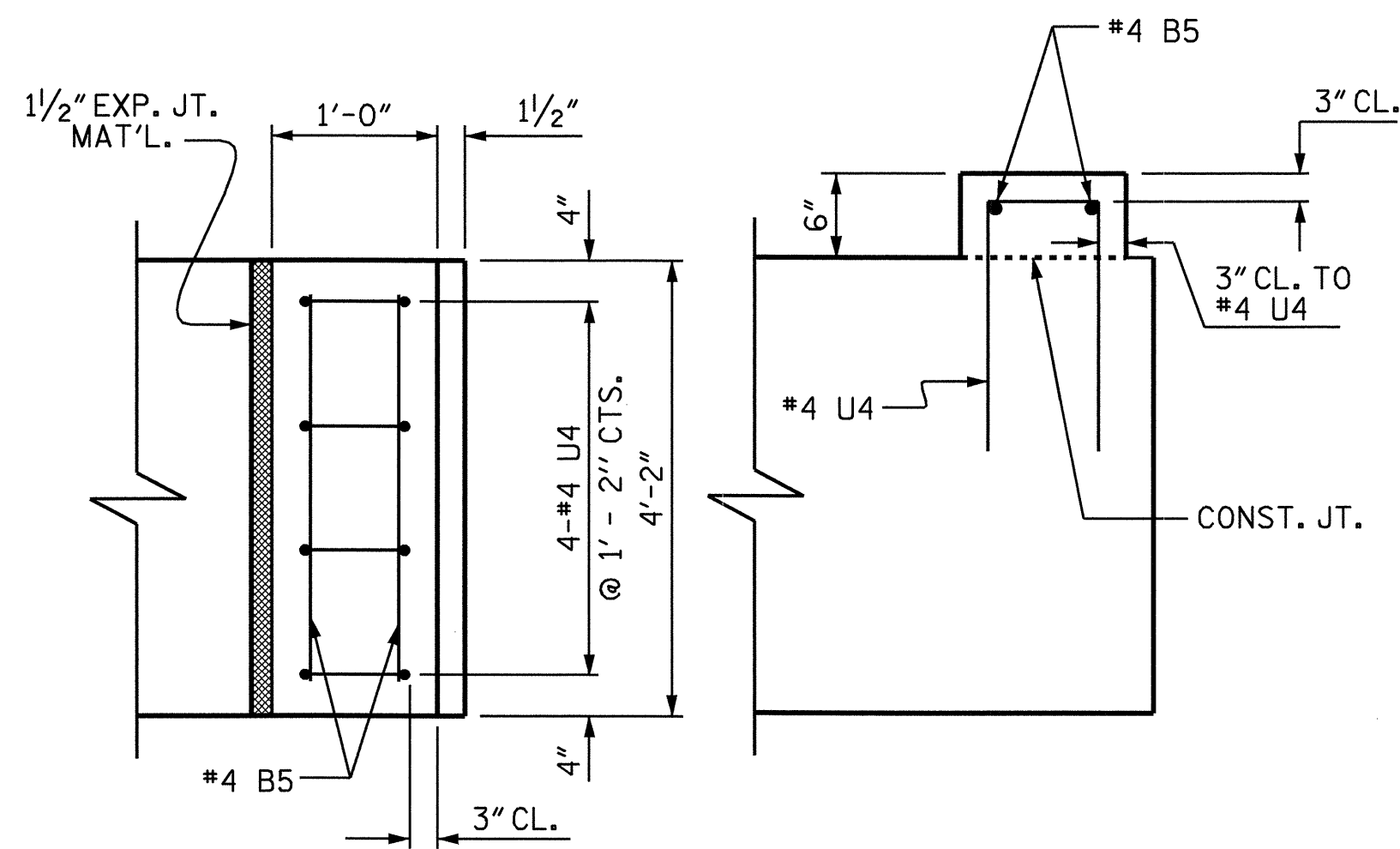


ALL BAR DIMENSIONS ARE OUT TO OUT.  
▲ CONCRETE DISPLACED BY THE 24\"/>

BILL OF MATERIAL					
BENT 3 THRU 12					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	6	#9	1	40'-9"	831
*B2	6	#9	STR	38'-0"	775
*B3	4	#5	STR	38'-0"	159
*B4	10	#4	STR	20'-5"	136
*B5	14	#4	STR	3'-8"	34
*B6	4	#5	STR	4'-1"	17
*B7	1	#5	STR	3'-7"	4
*D1	48	#6	STR	1'-6"	108
*S1	33	#5	2	8'-6"	293
*S2	33	#5	3	4'-7"	158
*S3	12	#4	4	10'-8"	86
*U1	8	#4	5	4'-4"	23
*U2	4	#4	5	6'-0"	16
*U3	2	#9	5	10'-10"	74
*U4	8	#4	5	3'-6"	19
* EPOXY COATED REINFORCING STEEL					2733 LBS.
CLASS AA CONCRETE					
▲ POUR 1 (CAP)					C.Y. 14.2
POUR 2 (LATERAL GUIDE)					C.Y. 0.2
▲ TOTAL					C.Y. 14.4
PP 24 X 0.625 STEEL PILES					
	NO.	LIN. FT.			
BENT 3	6	540			
BENT 4	6	540			
BENT 5	6	630			
BENT 6	6	630			
BENT 7	6	630			
BENT 8	6	630			
BENT 9	6	570			
BENT 10	6	630			
BENT 11	6	540			
BENT 12	6	540			
PILE REDRIVES :		BENT 3	NO. : 6		
		BENT 4	NO. : 6		
		BENT 5	NO. : 6		
		BENT 6	NO. : 6		
		BENT 7	NO. : 6		
		BENT 8	NO. : 6		
STEEL PILE :		BENT 9	NO. : 6		
PLATES		BENT 10	NO. : 6		
		BENT 11	NO. : 6		
		BENT 12	NO. : 6		
PDA TESTING	EA.	1 (BENT 4, 8 & 12)			
PDA ASSISTANCE	EA.	1 (BENT 4, 8 & 12)			



**END VIEW**



**LATERAL GUIDE REINFORCING DETAIL**  
RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR BY ROTATION

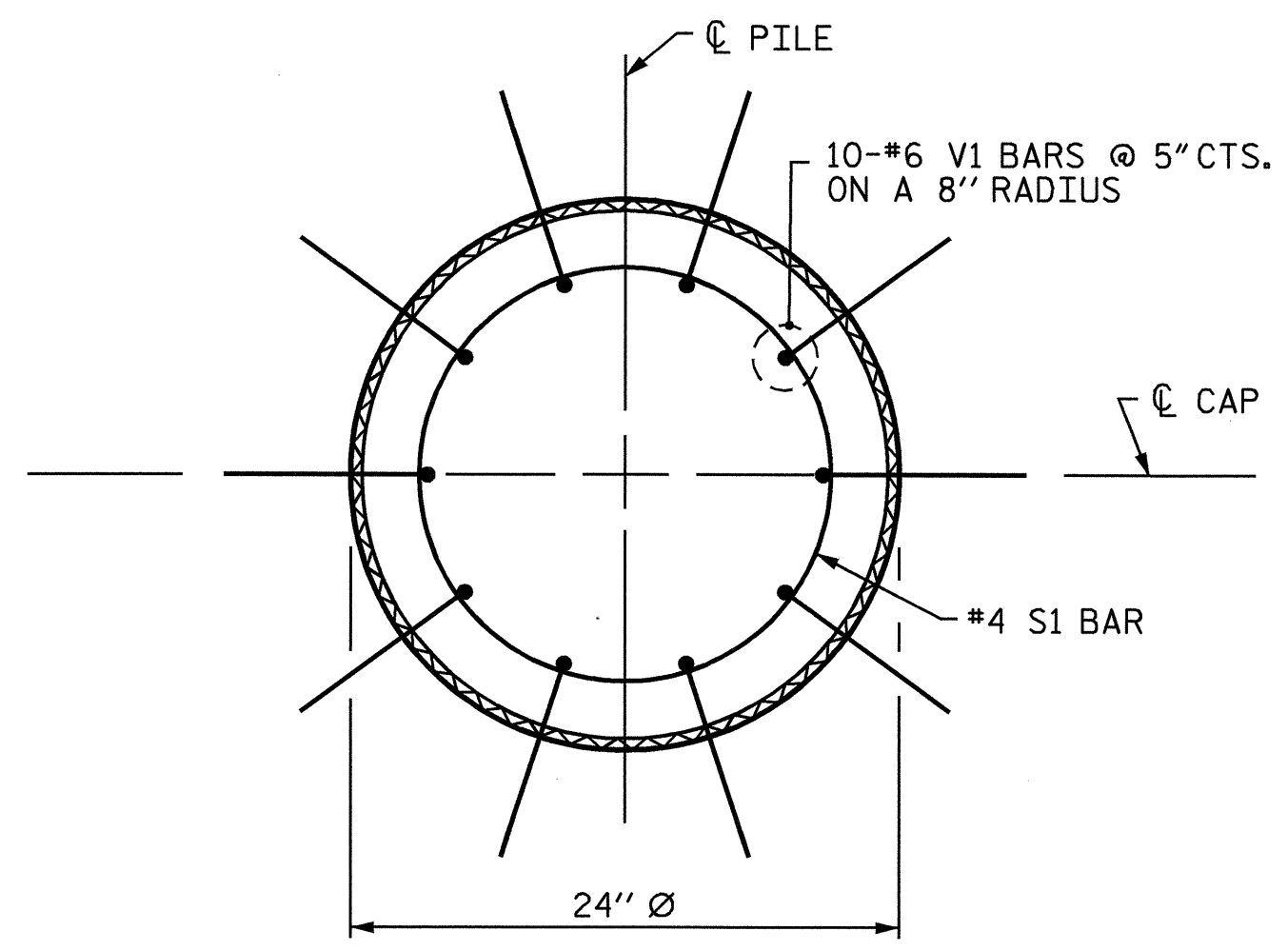
PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-  
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENTS 3 THRU 12					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-25
					TOTAL SHEETS 39

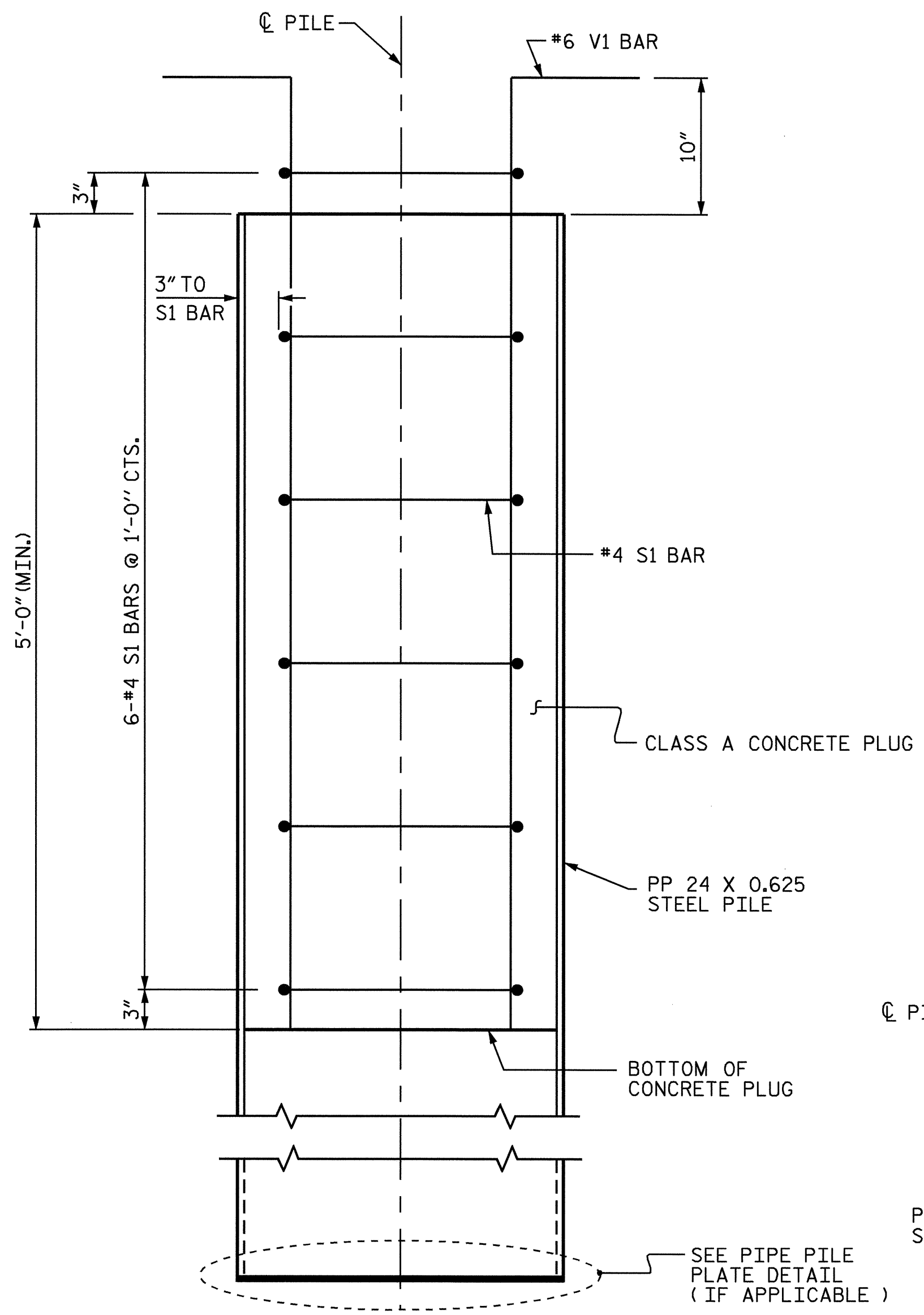


DRAWN BY : J. MYA DATE : 8-16-09  
CHECKED BY : J.L. WALTON DATE : 9-11-09

11-JAN-2010 11:39  
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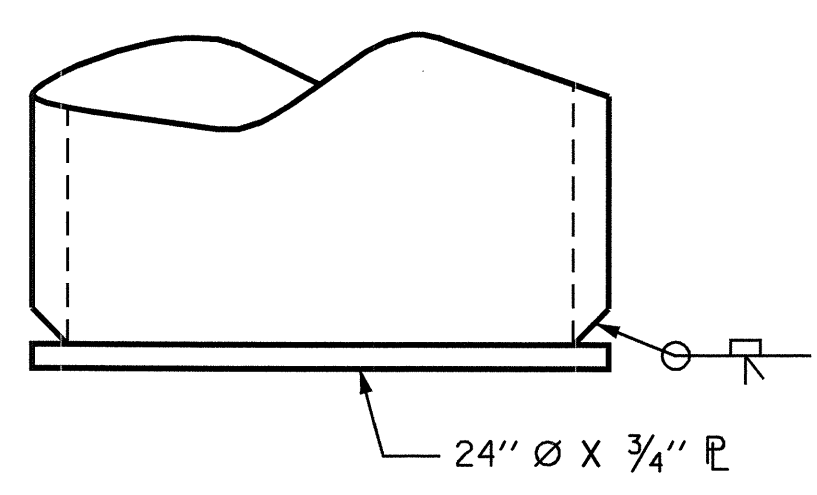


PLAN

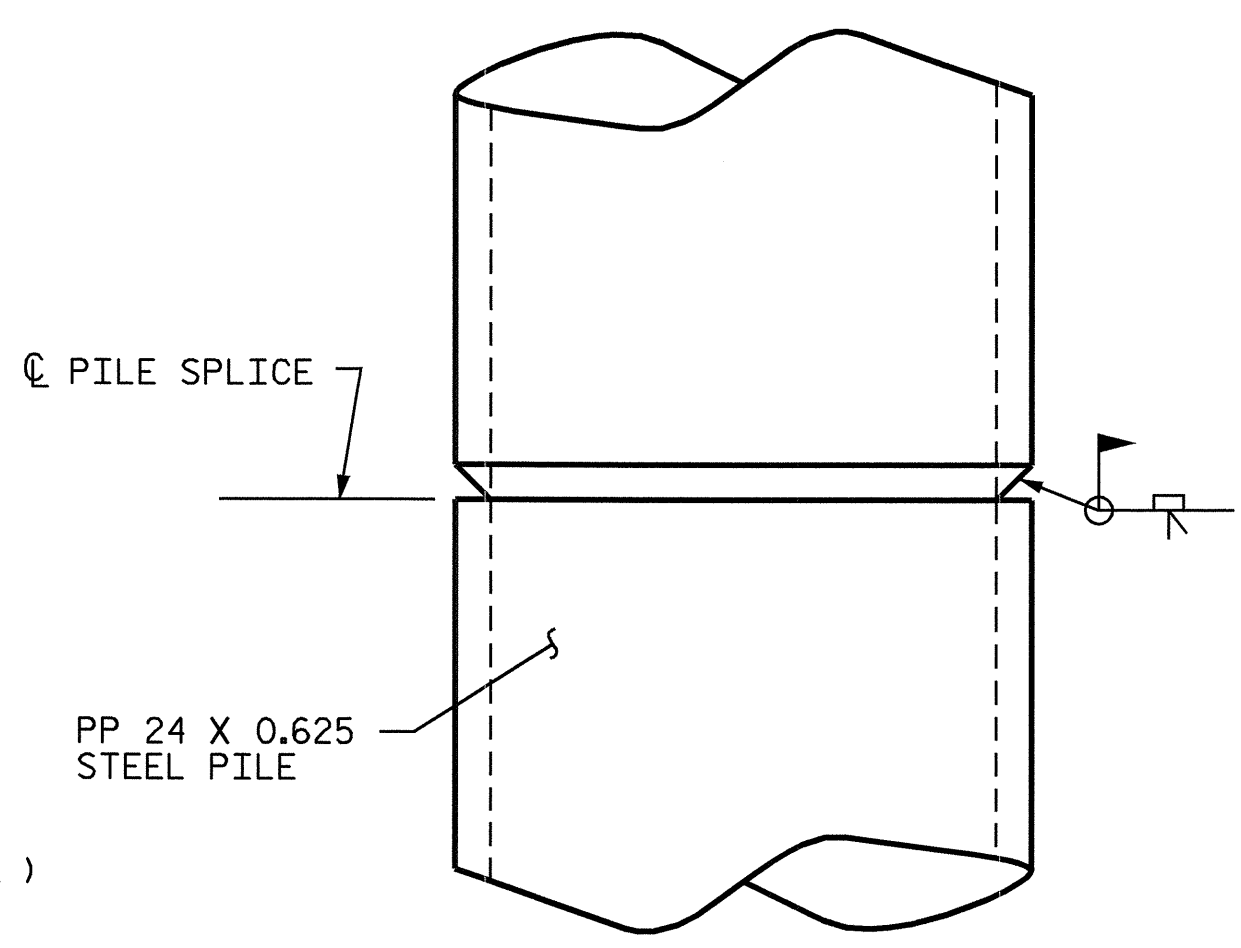


ELEVATION

PP 24 X 0.625 STEEL PILE  
(CLOSED END)



PIPE PILE PLATE DETAIL  
(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-A1-1350) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO THE UPPER PORTION OF THE PILES FOR THE LENGTHS SHOWN IN CHART, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND METALLIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.625 STEEL PILES.

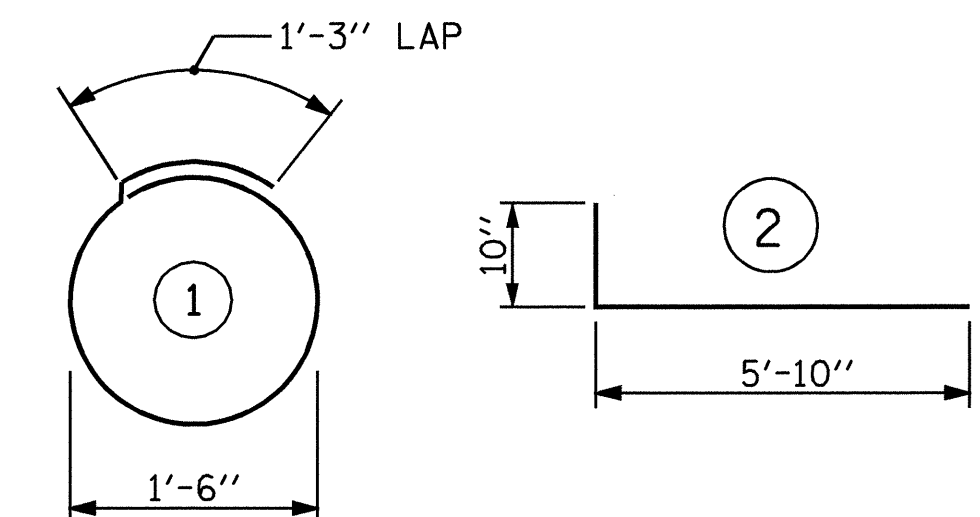
AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ONE  
PP 24 X 0.625 STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100
REINFORCING STEEL =				124	lbs

CLASS A CONCRETE  
5'-0" MINIMUM PLUG 0.5 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

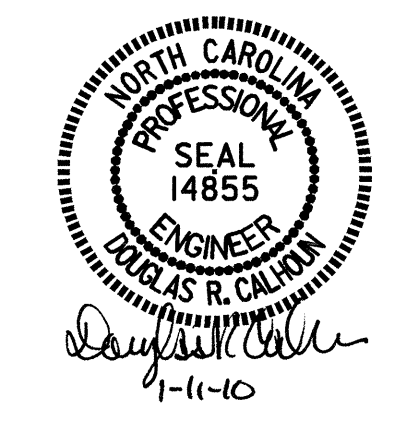
THERMAL SPRAYED COATING  
FOR PP 24 X 0.625 STEEL PILES :

	LIN. FT. EA. PILE
BENT 3	31.00
BENT 4	34.00
BENT 5	35.00
BENT 6	36.00
BENT 7	37.00
BENT 8	35.00
BENT 9	34.00
BENT 10	33.00
BENT 11	30.00
BENT 12	27.00

PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
24" STEEL PIPE PILE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS 39
2			4			

ASSEMBLED BY : J. MYA	DATE : 8-16-09
CHECKED BY : J. L. WALTON	DATE : 9-11-09
DRAWN BY : TLA 8/05	ADDED 10/1/05
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/KMM

**NOTES:**

AT THE CONTRACTOR'S OPTION, A PRECAST CAP MAY BE SUBSTITUTED FOR THE CAST IN PLACE BENT CAP. TWO PRECAST UNITS WILL BE REQUIRED FOR THIS OPTION.

STIRRUPS AND U1 BARS IN THE PRECAST CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

ALL REINFORCING STEEL AND BAR SUPPORTS SHALL BE EPOXY COATED ACCORDING TO THE STANDARD SPECIFICATIONS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

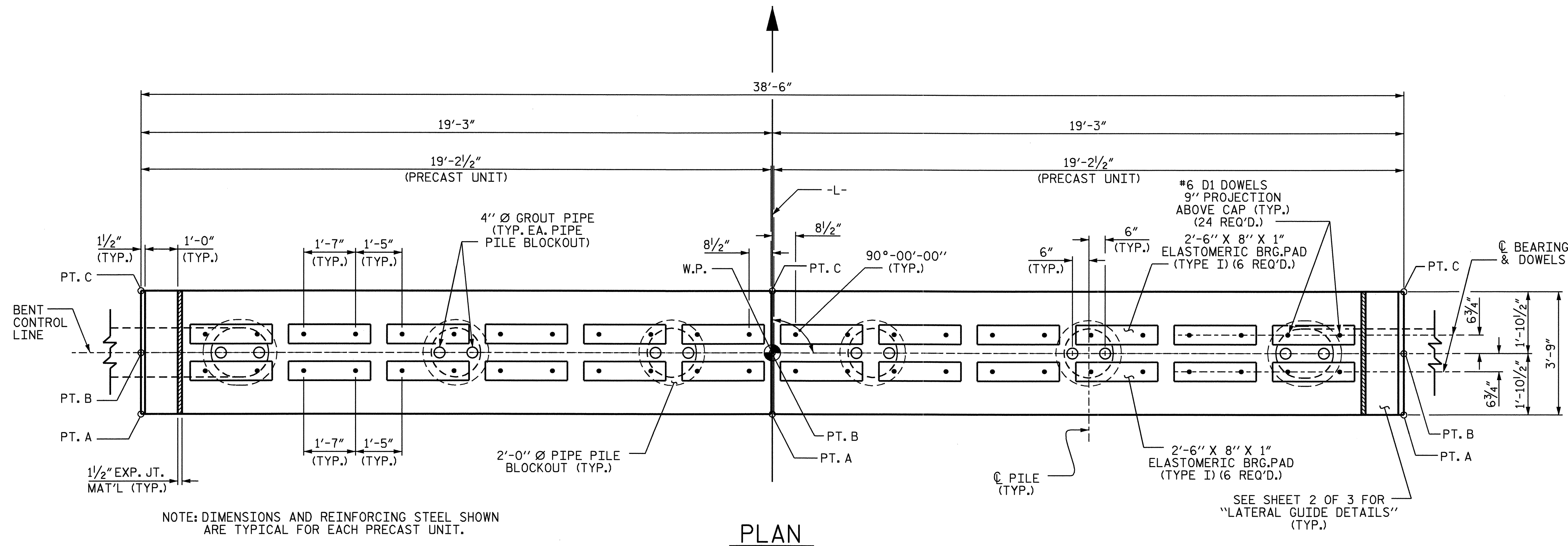
DOWELS SHALL BE PRESET IN THE PRECAST CAP IN THE LOCATIONS SHOWN ON THE PLANS. DRILLING AND ADHESIVE ANCHORING OF DOWELS AFTER CASTING WILL NOT BE ALLOWED.

TWO LIFTING LOOPS SHALL BE ALLOWED IN THE PRECAST CAP FOR EACH STAGE IN ACCORDANCE WITH ARTICLE 1077-10 OF THE STANDARD SPECIFICATIONS WITH THE FOLLOWING ADDITIONS. THE LIFTING LOOPS SHALL BE BURNED OFF PRIOR TO PLACING THE ELASTOMERIC BEARING PADS. THE ENDS OF THE LIFTING LOOPS TO BE BURNED OFF SHALL BE RECESSED AND GROUTED. SEE DETAIL FOR GROUTED RECESS FOR LIFTING LOOPS. FOR GROUT SEE SPECIAL PROVISION FOR GROUT FOR PRECAST BENTS.

TWO 4 INCH Ø GROUT PIPES SHALL BE PROVIDED AT EACH PILE BLOCKOUT. THE 4 INCH Ø GROUT PIPES SHALL BE CUT FROM SCHEDULE 40 PVC PIPE.

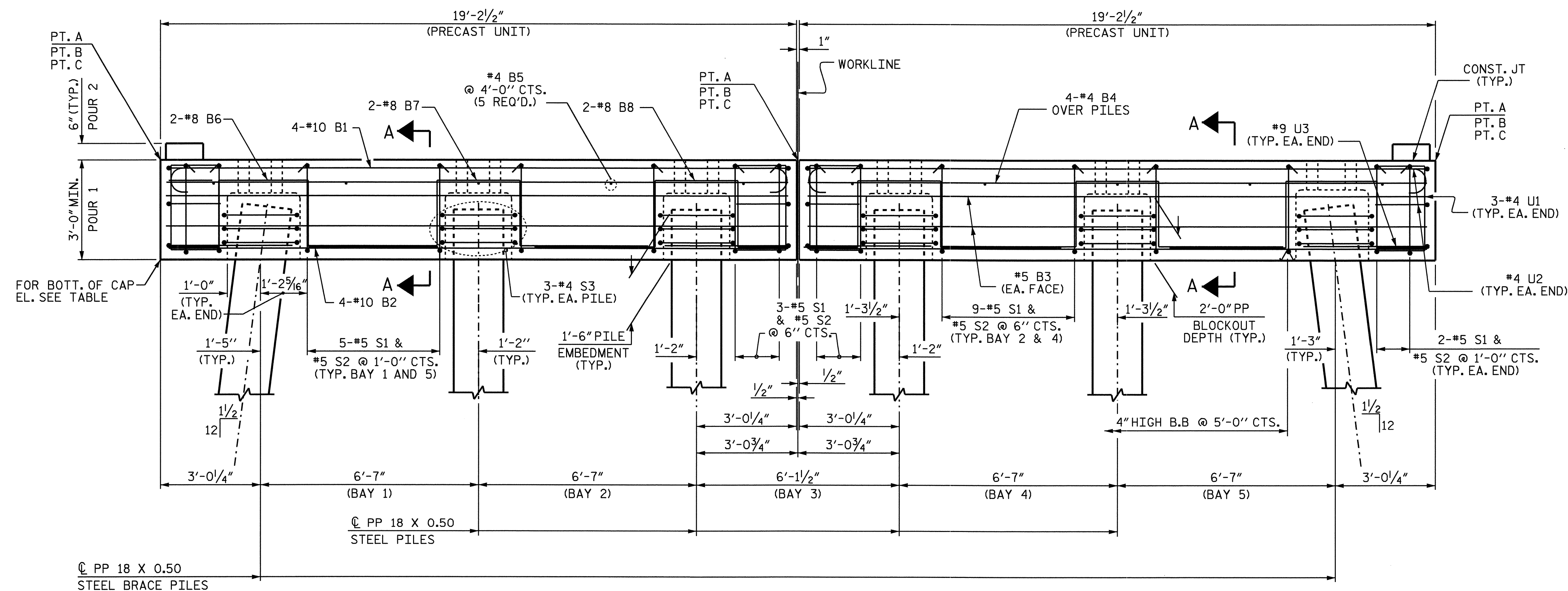
THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO SUPPORT THE PRECAST CAPS IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP SO NO LIVE OR FRESH GROUT COMES IN CONTACT WITH THE STREAM UNTIL THE GROUT HAS HARDENED.

FOR GROUT FOR PRECAST BENTS, SEE SPECIAL PROVISION.



NOTE: DIMENSIONS AND REINFORCING STEEL SHOWN ARE TYPICAL FOR EACH PRECAST UNIT.

**PLAN**

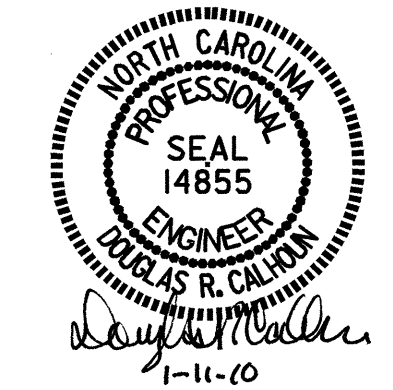


**ELEVATION**

W.P.	BENT NO.	BOTT. OF CAP ELEV.	PT.A	PT.B	PT.C
2	1	10.430	13.430	13.451	13.477
3	2	11.305	14.305	14.305	14.352
14	13	11.204	14.251	14.204	14.204
15	14	10.312	13.359	13.333	13.312

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 3

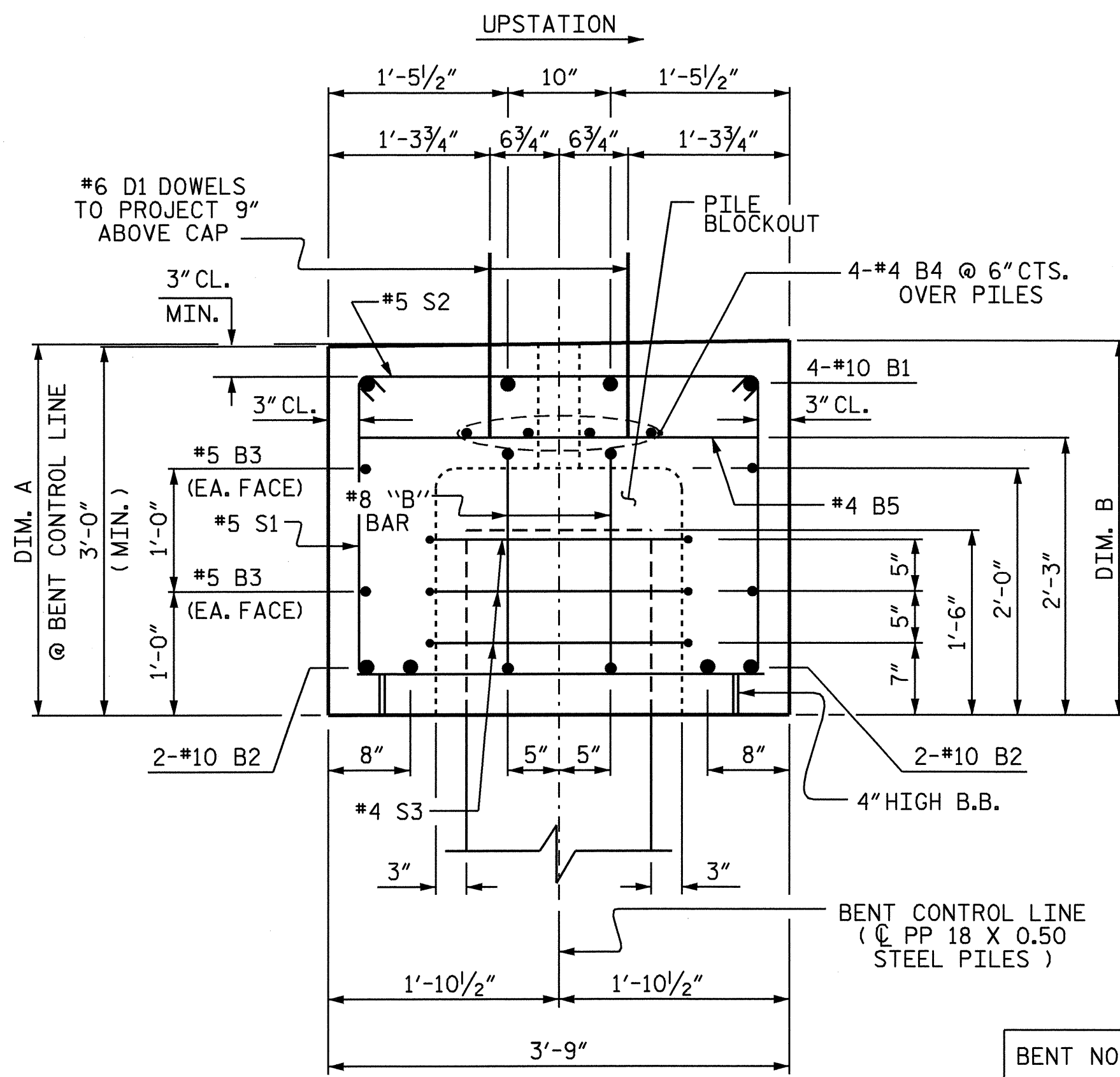


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

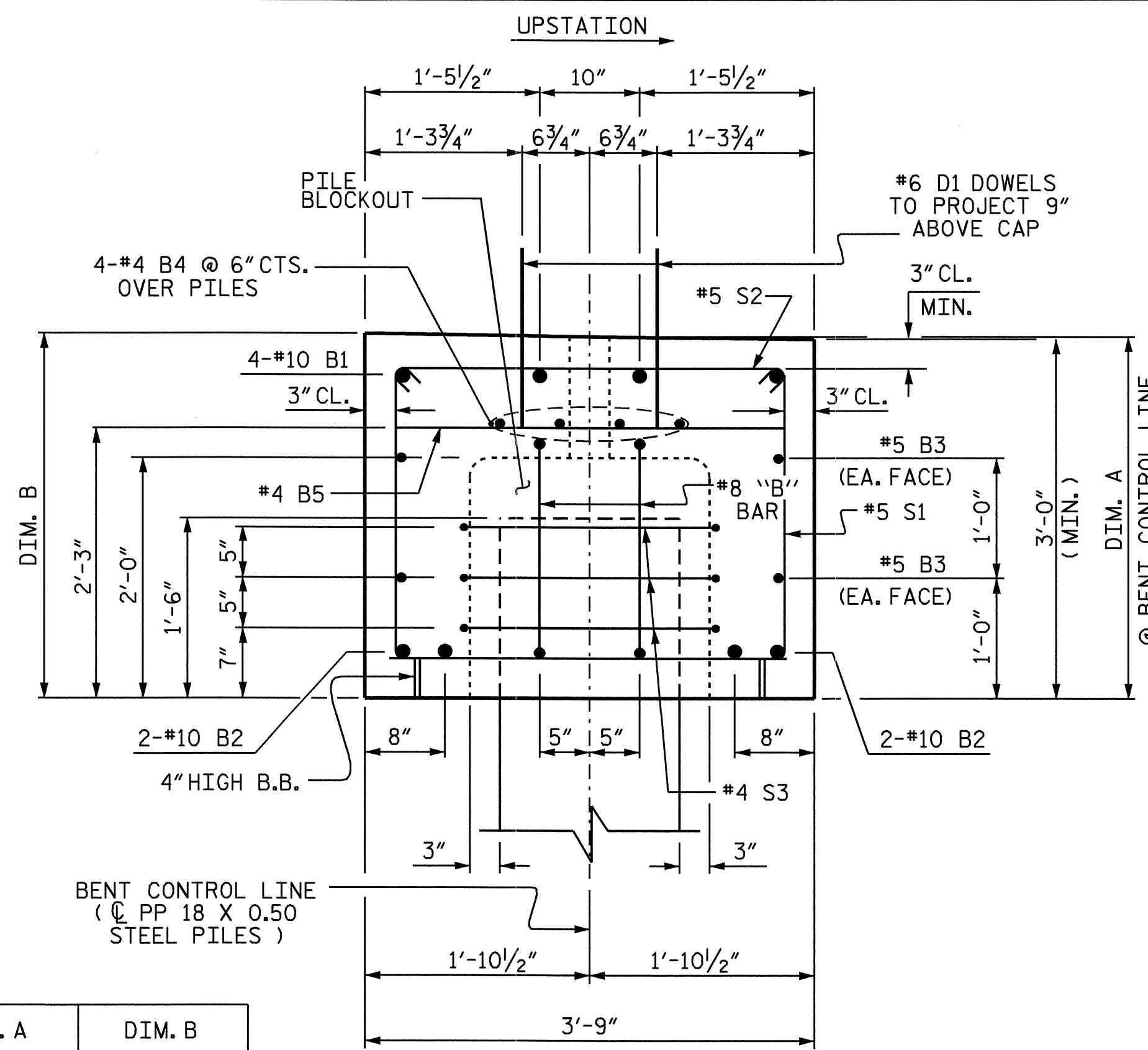
SUBSTRUCTURE  
 BENTS 1, 2, 13, & 14  
 (PRECAST OPTION)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27	
1			3			TOTAL SHEETS 39	
2			4				

DRAWN BY: J. MYA DATE: 8-20-09  
 CHECKED BY: J. L. WALTON DATE: 9-28-09

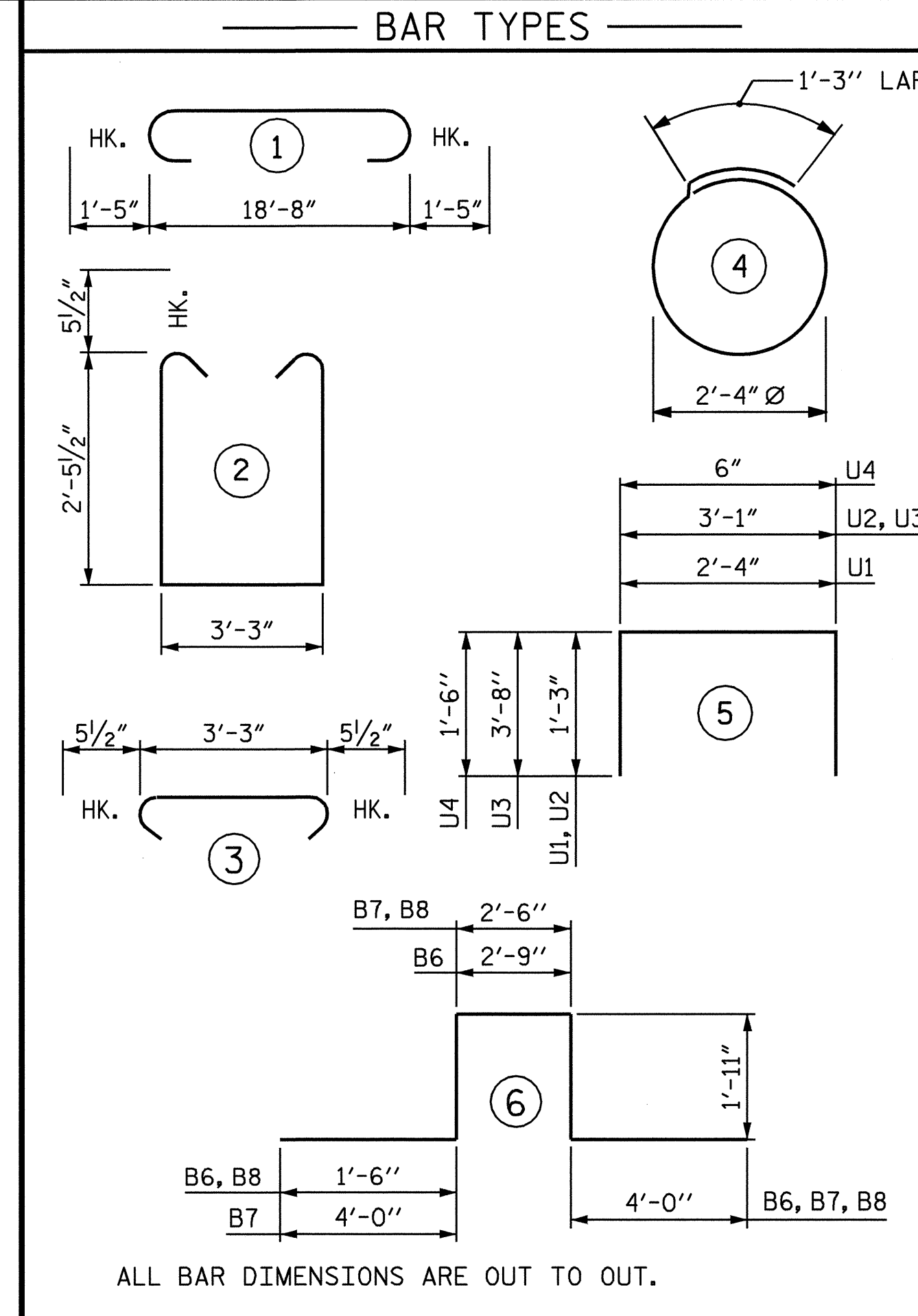


**SECTION A-A**  
(BENTS 1 & 2)



**SECTION A-A**  
(BENTS 13 & 14)

BENT NO.	DIM. A	DIM. B
1	3'-0 1/4"	3'-0 9/16"
2	3'-0"	3'-0 9/16"
13	3'-0"	3'-0 9/16"
14	3'-0 1/4"	3'-0 9/16"



▲ CONCRETE DISPLACED BY THE PILE BLOCKOUTS HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.  
● CONCRETE DISPLACED BY THE 18" STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.

**BILL OF MATERIAL FOR 2 PRECAST UNITS**

BENT 1, 2, 3 OR 14

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	#10	1	21'-6"	740
*B2	8	#10	STR	18'-8"	643
*B3	8	#5	STR	18'-8"	156
*B4	8	#4	STR	18'-8"	100
*B5	14	#4	STR	3'-3"	30
*B6	4	#8	6	12'-1"	129
*B7	4	#8	6	14'-4"	153
*B8	4	#8	6	11'-10"	126
*D1	48	#6	STR	1'-6"	108
*S1	38	#5	2	9'-1"	360
*S2	38	#5	3	4'-2"	165
*S3	18	#4	4	8'-7"	103
*U1	12	#4	5	4'-10"	39
*U2	8	#4	5	5'-7"	30
*U3	4	#9	5	10'-5"	142
*U4	8	#4	4	3'-6"	19

\* EPOXY COATED REINFORCING STEEL 3043 LBS.  
CLASS AA CONCRETE  
▲ POUR 1 (CAP) C.Y. 14.7  
▲ POUR 2 (LATERAL GUIDE) C.Y. 0.1  
▲ TOTAL C.Y. 14.8

PILE BLOCKOUT CONCRETE ● C.Y. : 0.8

PP 18 X 0.50 STEEL PILES

	NO.	LIN. FT.
BENT 1	6	540
BENT 2	6	540
BENT 13	6	300
BENT 14	6	300

PILE REDRIVES :

BENT 1	NO. : 6
BENT 2	NO. : 6
BENT 13	NO. : 6
BENT 14	NO. : 6

PIPE PILE PLATES :

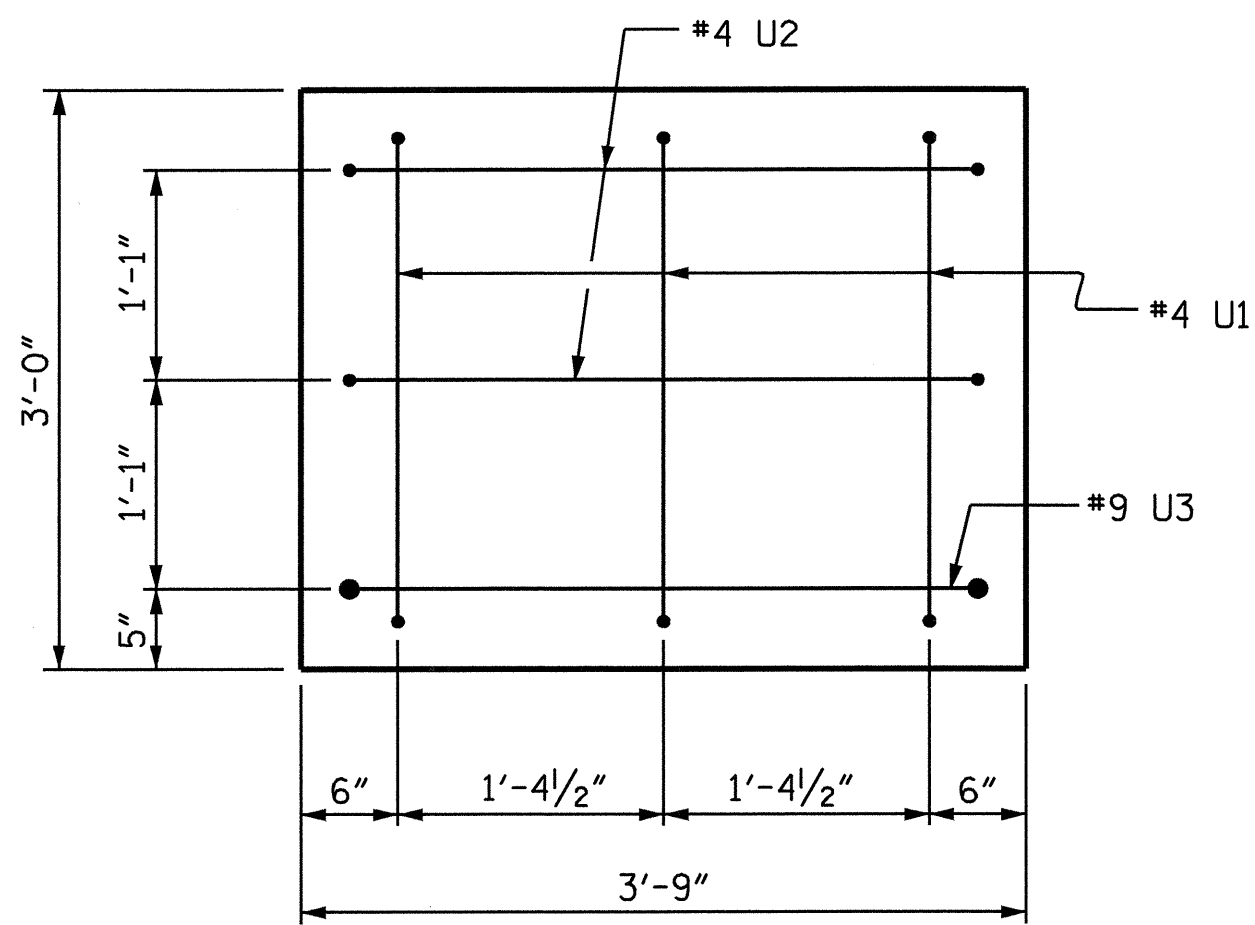
BENT 1	NO. : 6
BENT 2	NO. : 6
BENT 13	NO. : 6
BENT 14	NO. : 6

PDA TESTING : (EA.)

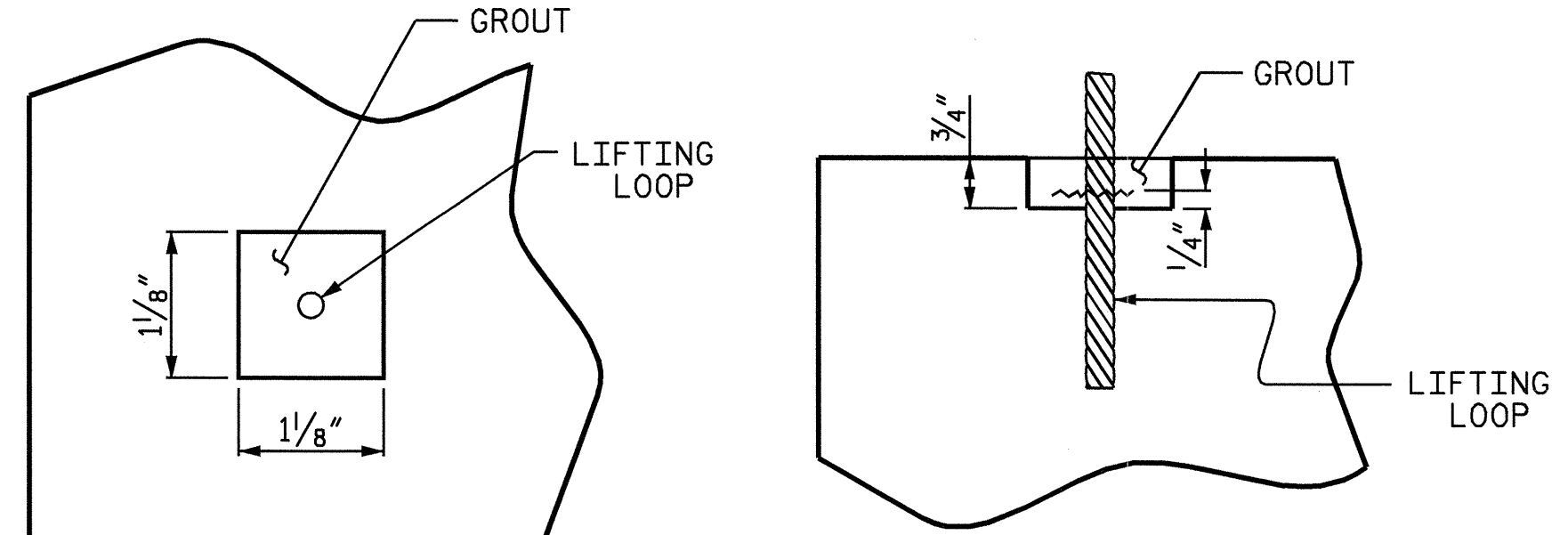
BENT 1	-----
BENT 2	1
BENT 13	-----
BENT 14	1

PDA ASSISTANCE : (EA.)

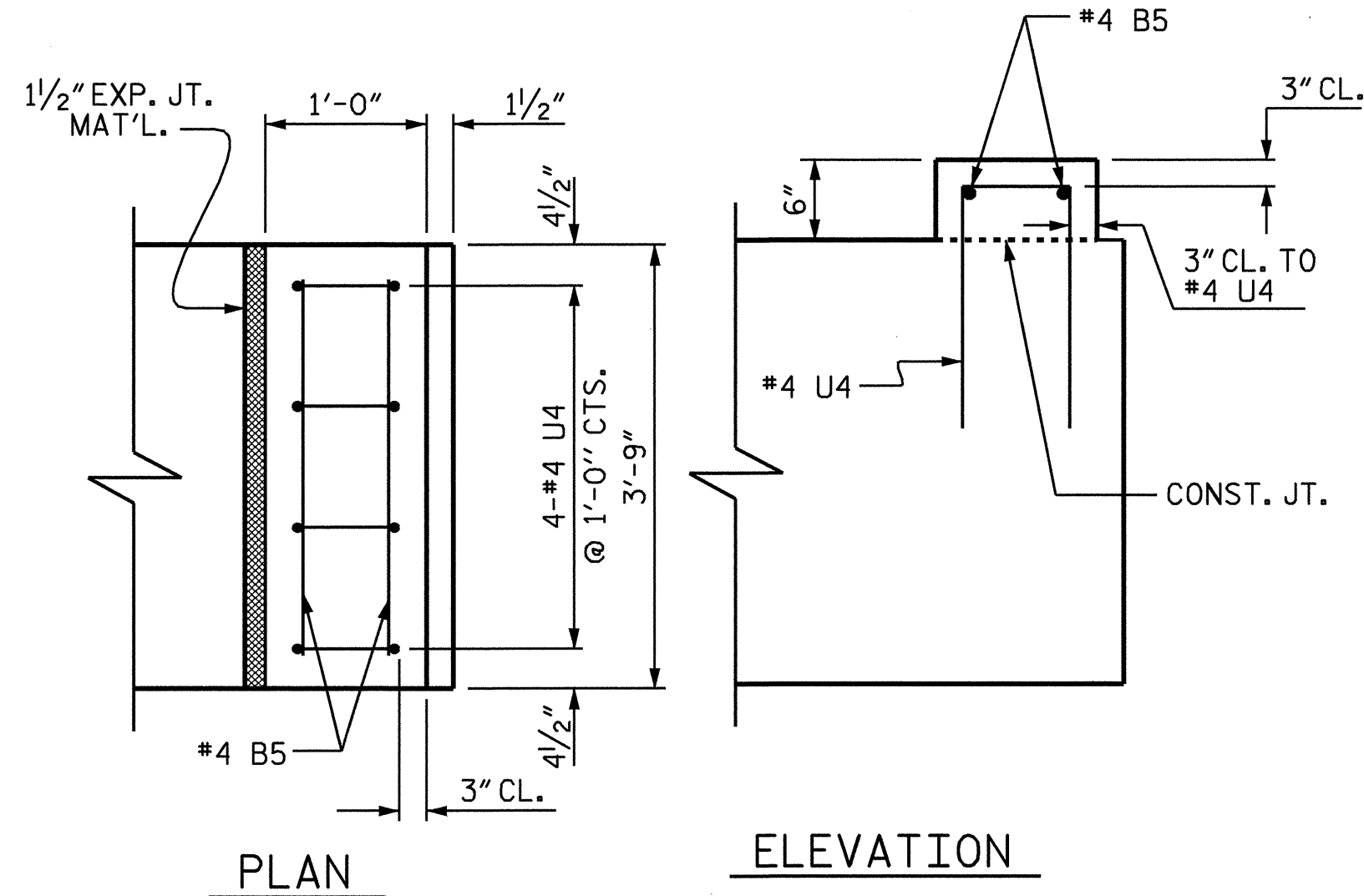
BENT 1	-----
BENT 2	1
BENT 13	-----
BENT 14	1



**END VIEW**



**PLAN**  
**ELEVATION**  
**GROUTED RECESS FOR LIFTING LOOPS**  
LIFTING LOOPS TO BE CUT 1/4" ABOVE BOTTOM OF RECESS.



**PLAN**  
**ELEVATION**  
**LATERAL GUIDE REINFORCING DETAIL**  
RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR BY ROTATION

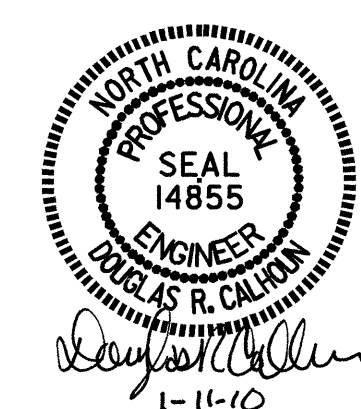
PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-  
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENTS 1, 2, 13 AND 14  
(PRECAST OPTION)

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

TOTAL SHEETS: 39



DRAWN BY : J. MYA DATE : 8-16-09  
CHECKED BY : J. L. WALTON DATE : 9-11-09

**BILL OF MATERIAL FOR ONE  
PP 18 X 0.50 STEEL PILE**

CLASS A CONCRETE	
5'-0" MINIMUM PLUG	0.3 CY

**THERMAL SPRAYED COATING  
FOR PP 18 X 0.50 STEEL PILES :**

	LIN. FT. EA. PILE
BENT 1	17.50
BENT 2	23.50
BENT 13	19.50
BENT 14	11.50

**NOTES**

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-A1-1350) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO THE UPPER PORTION OF THE PILES FOR THE LENGTHS SHOWN IN CHART, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

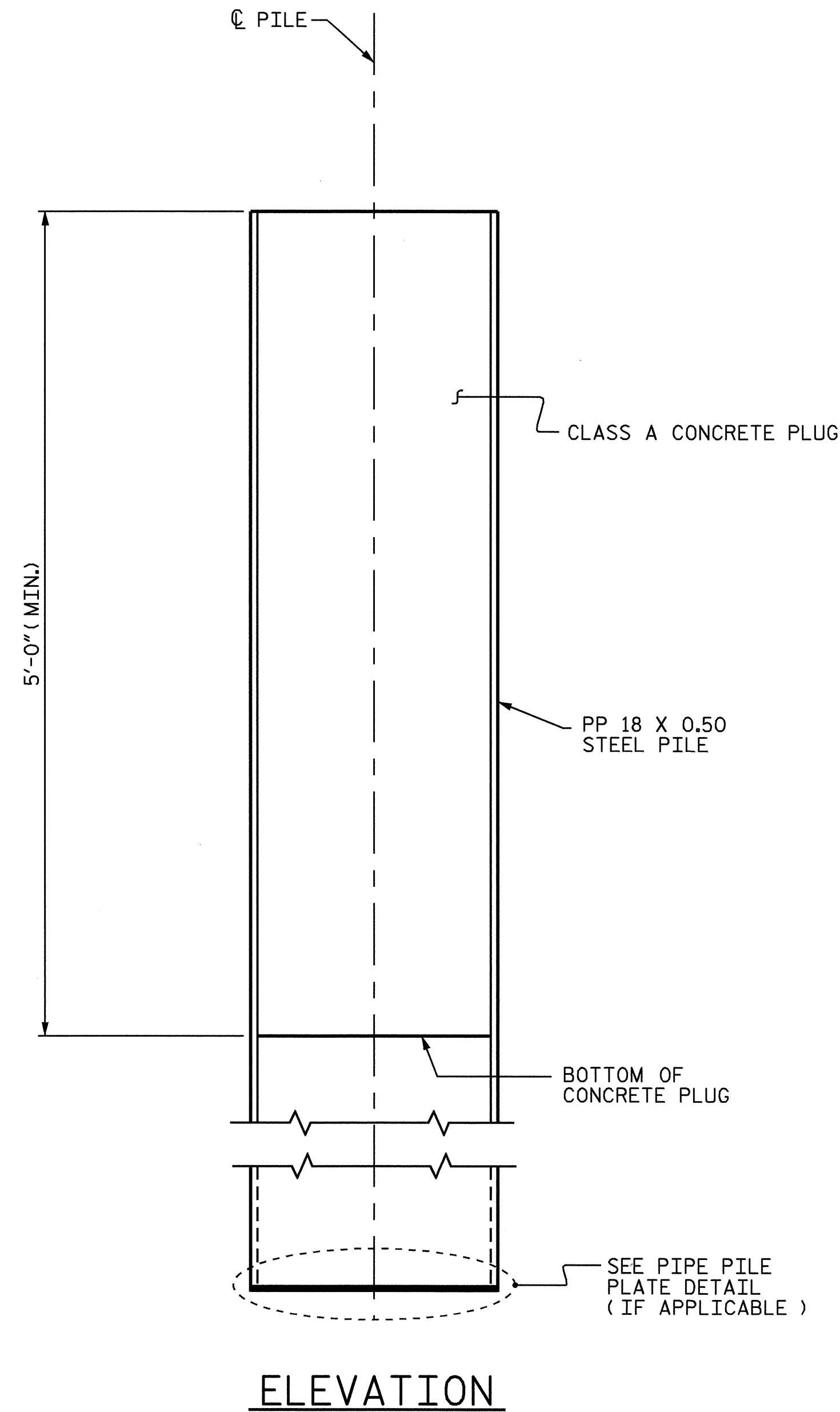
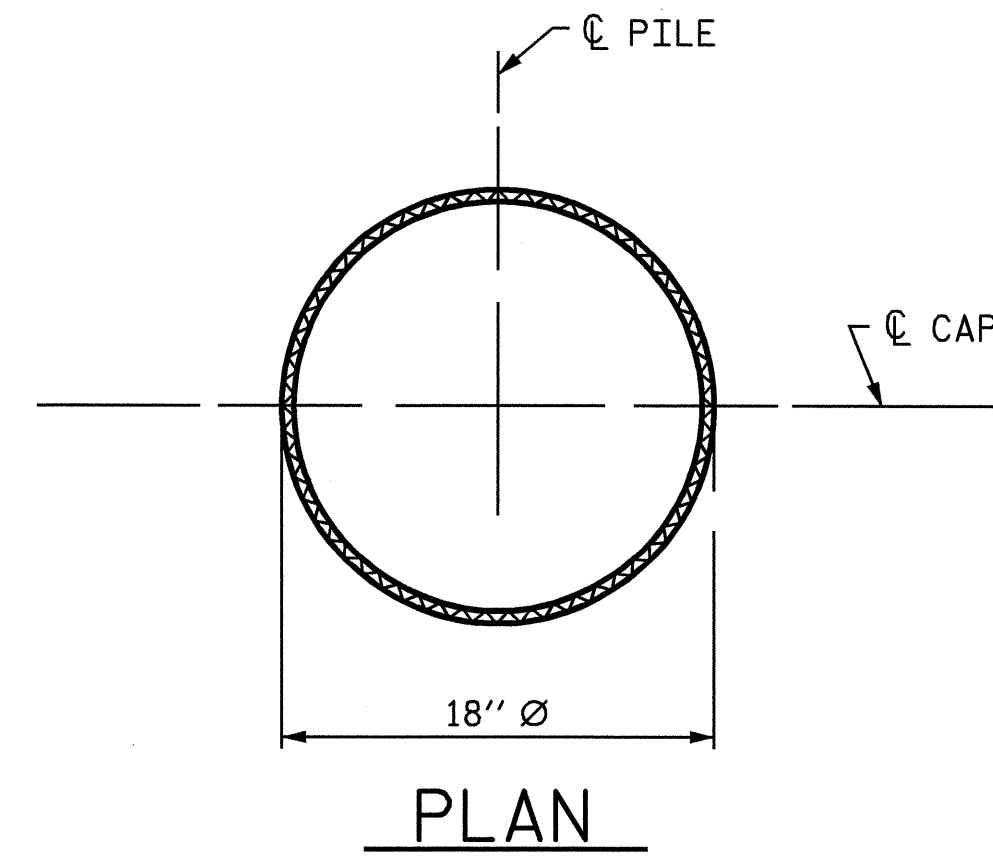
PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING CONCRETE FOR THE CONCRETE PLUG.

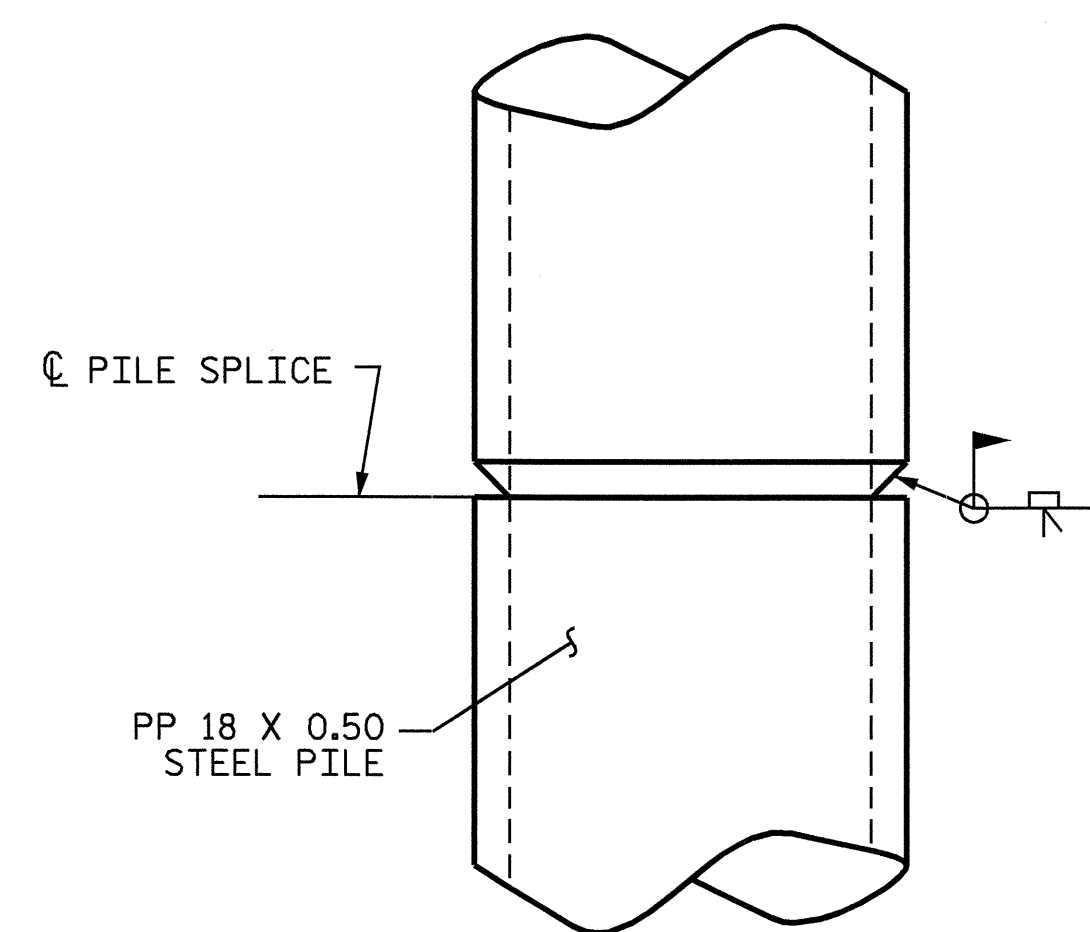
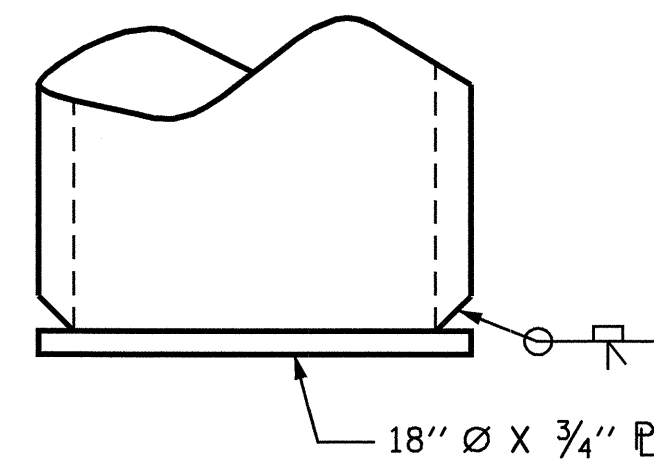
FORM THE CONCRETE PLUG SUCH THAT THE CONCRETE DOES NOT MOVE. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE CLASS A CONCRETE, AND METALLIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 STEEL PILES.

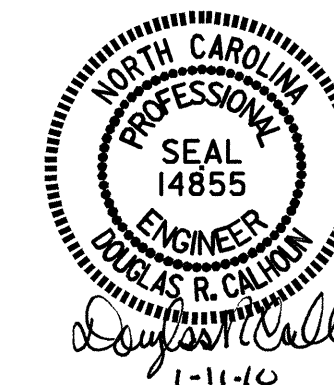
AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.



**PP 18 X 0.50 STEEL PILE  
(CLOSED END)**



ASSEMBLED BY : J. MYA	DATE : 8-16-09
CHECKED BY : J. L. WALTON	DATE : 9-28-09
DRAWN BY : RWW 1/01	REV. 5/7/03 RWW/JTE
CHECKED BY : LES 1/01	REV. 10/1/05 LBG/TLA
	REV. 5/1/06R MAA/KMM

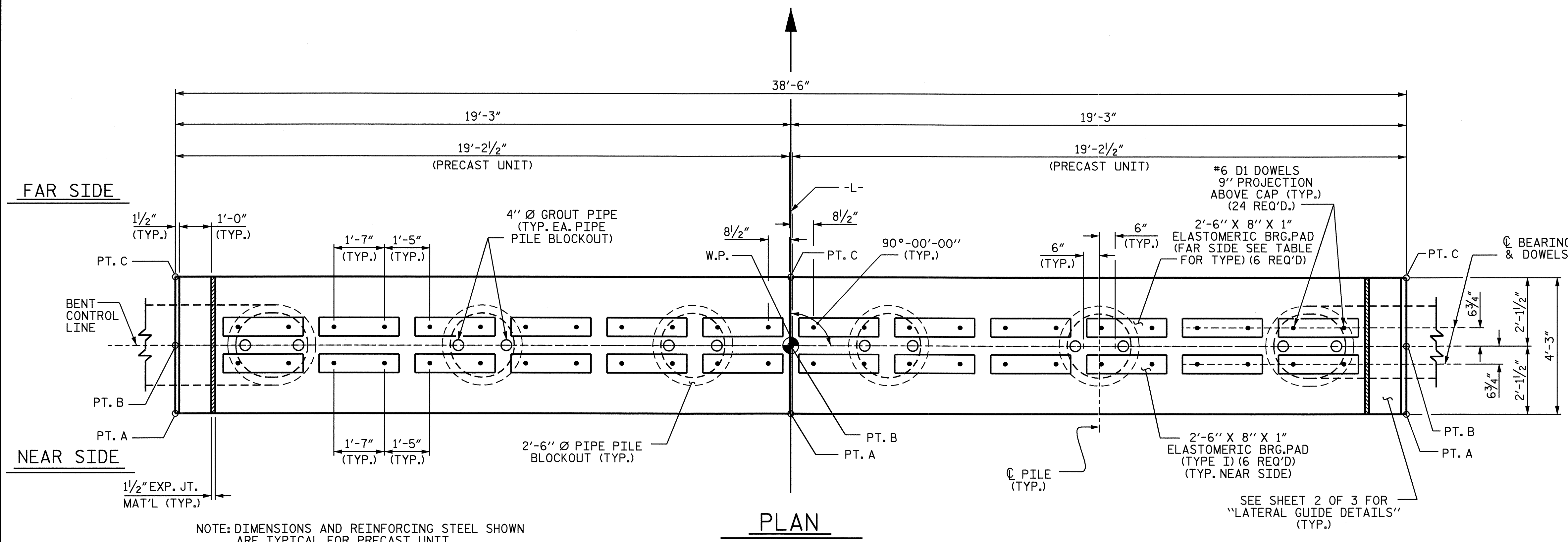


PROJECT NO. B-3809  
BEAUFORT COUNTY  
STATION: 28+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
18" STEEL PIPE PILE  
(PRECAST OPTION)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			39



**NOTES:**

AT THE CONTRACTOR'S OPTION, A PRECAST CAP MAY BE SUBSTITUTED FOR THE CAST IN PLACE BENT CAP. TWO PRECAST UNITS WILL BE REQUIRED FOR THIS OPTION.

STIRRUPS AND UI BARS IN THE PRECAST CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

ALL REINFORCING STEEL AND BAR SUPPORTS SHALL BE EPOXY COATED ACCORDING TO THE STANDARD SPECIFICATIONS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

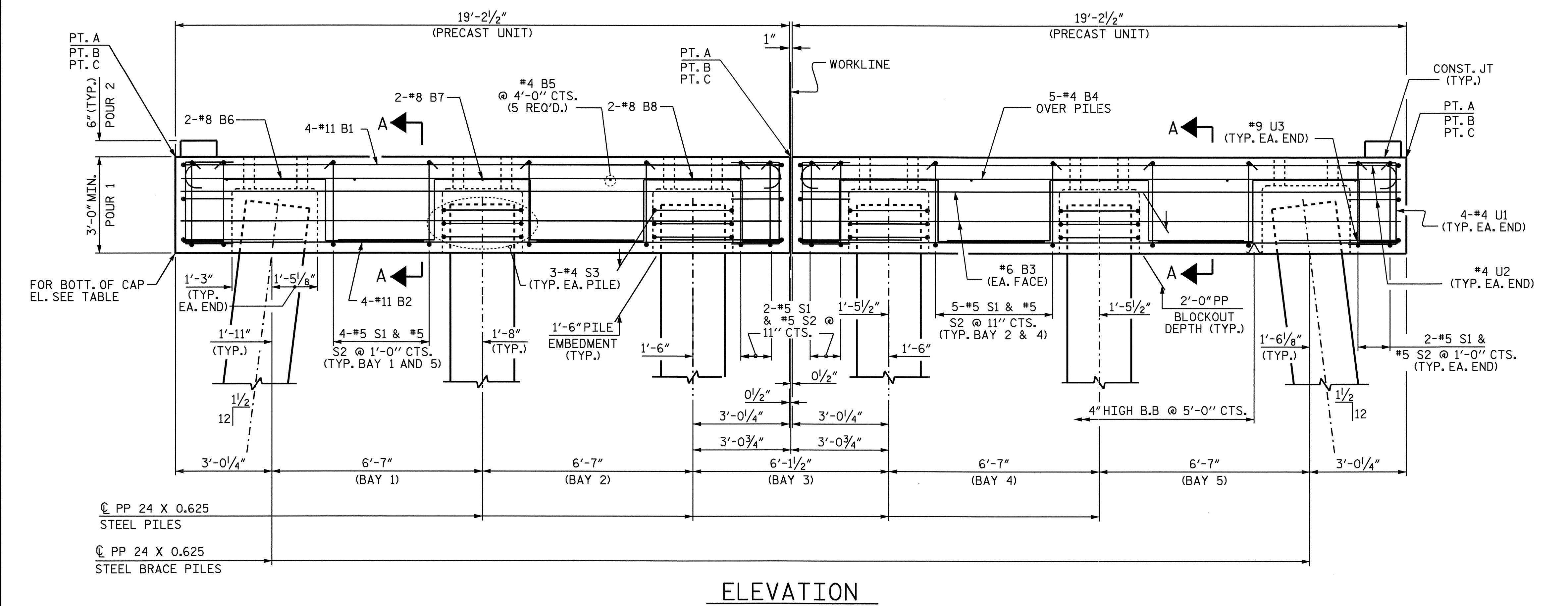
DOWELS SHALL BE PRESET IN THE PRECAST CAP IN THE LOCATIONS SHOWN ON THE PLANS. DRILLING AND ADHESIVE ANCHORING OF DOWELS AFTER CASTING WILL NOT BE ALLOWED.

TWO LIFTING LOOPS SHALL BE ALLOWED IN THE PRECAST CAP FOR EACH STAGE IN ACCORDANCE WITH ARTICLE 1077-10 OF THE STANDARD SPECIFICATIONS WITH THE FOLLOWING ADDITIONS. THE LIFTING LOOPS SHALL BE BURNED OFF PRIOR TO PLACING THE ELASTOMERIC BEARING PADS. THE ENDS OF THE LIFTING LOOPS TO BE BURNED OFF SHALL BE RECESSED AND GROUTED. SEE DETAIL FOR GROUTED RECESS FOR LIFTING LOOPS. FOR GROUT SEE SPECIAL PROVISION FOR GROUT FOR PRECAST BENTS.

TWO 4 INCH Ø GROUT PIPES SHALL BE PROVIDED AT EACH PILE BLOCKOUT. THE 4 INCH Ø GROUT PIPES SHALL BE CUT FROM SCHEDULE 40 PVC PIPE.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO SUPPORT THE PRECAST CAPS IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP SO NO LIVE OR FRESH GROUT COMES IN CONTACT WITH THE STREAM UNTIL THE GROUT HAS HARDENED.

FOR GROUT FOR PRECAST BENTS, SEE SPECIAL PROVISION.



W.P.	BENT NO.	BOTT. OF CAP ELEV.	PT.A	PT.B	PT.C	FAR SIDE BRG. TYPE
4	3	12.182	15.182	15.182	15.229	TYPE II
5	4	12.863	15.863	15.863	15.910	TYPE I
6	5	13.276	16.276	16.276	16.307	TYPE I
7	6	13.559	16.559	16.559	16.590	TYPE II
8	7	13.728	16.728	16.728	16.759	TYPE I
9	8	13.700	16.731	16.700	16.700	TYPE II
10	9	13.531	16.562	16.531	16.531	TYPE I
11	10	13.232	16.263	16.232	16.232	TYPE II
12	11	12.689	15.736	15.689	15.689	TYPE I
13	12	11.952	14.999	14.952	14.952	TYPE II

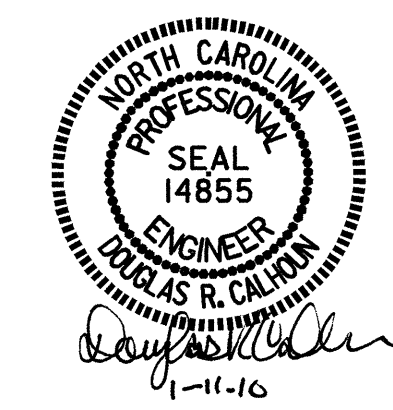
PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

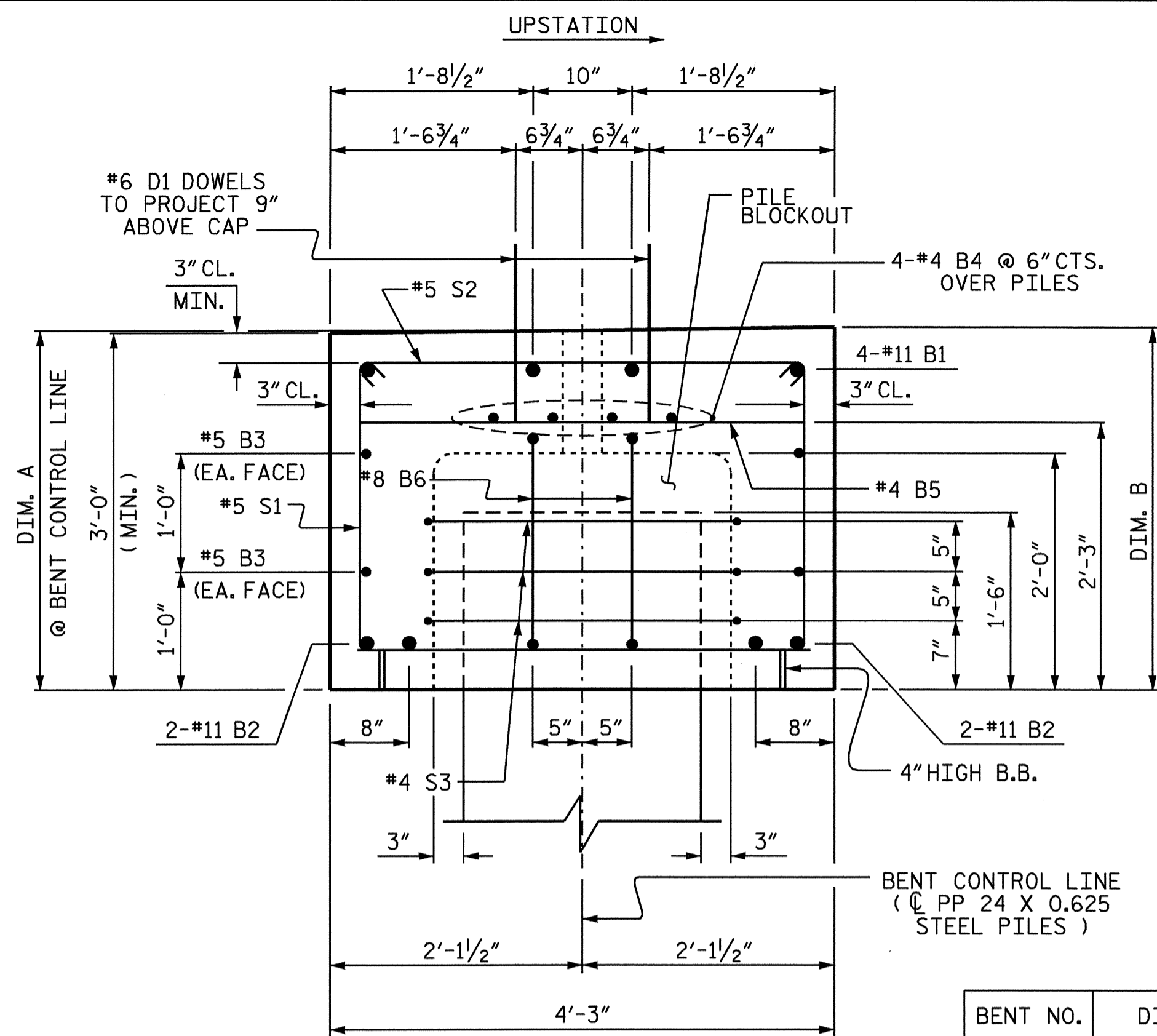
SUBSTRUCTURE  
 BENTS 3 THRU 12  
 (PRECAST OPTION)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			39



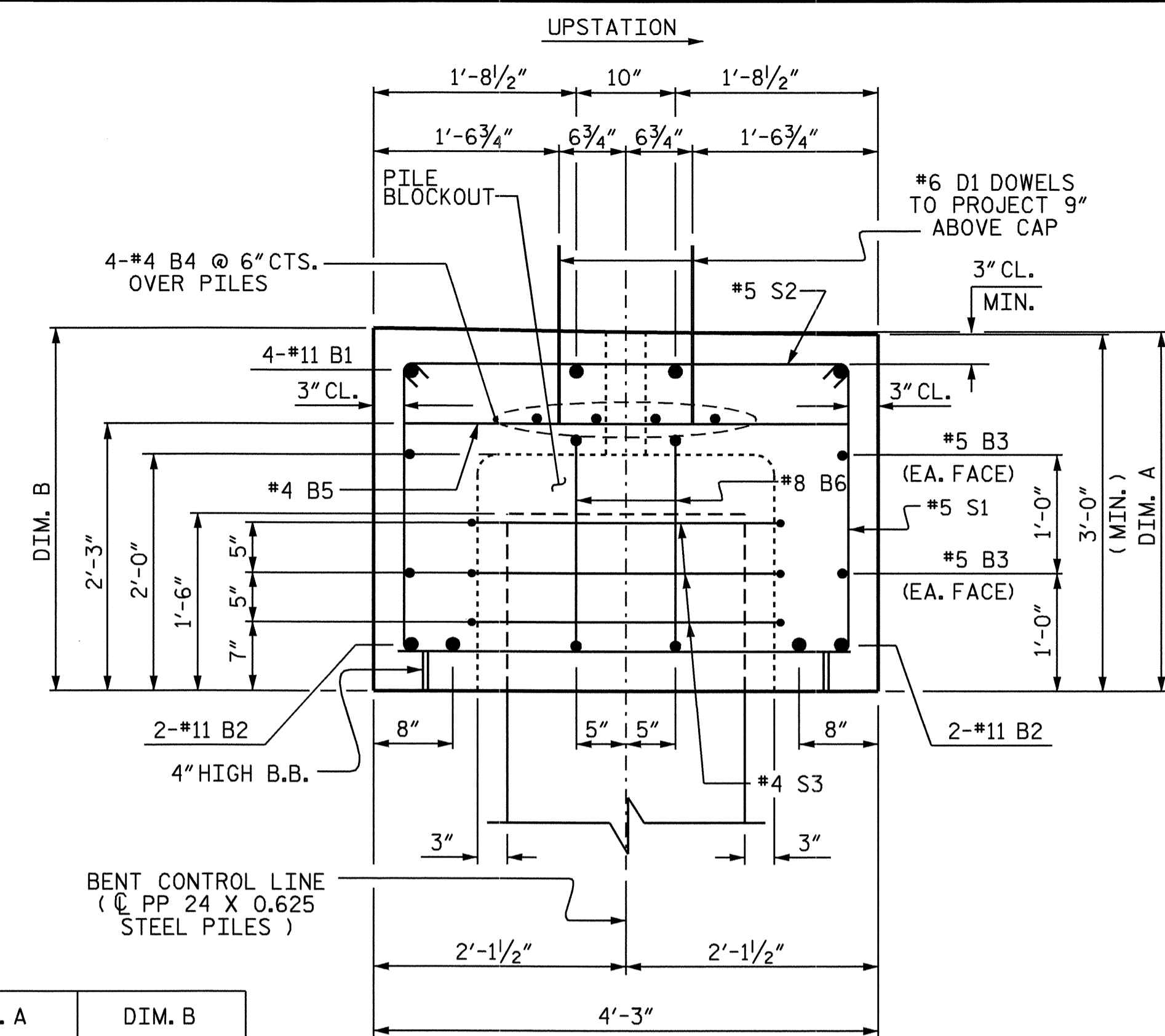
DRAWN BY: J. MYA DATE: 8-16-09  
 CHECKED BY: J. L. WALTON DATE: 9-28-09

11-JAN-2010 11:37  
 Y:\Structures\Final Plans\B-3809.S0.B\*.dgn  
 bngady

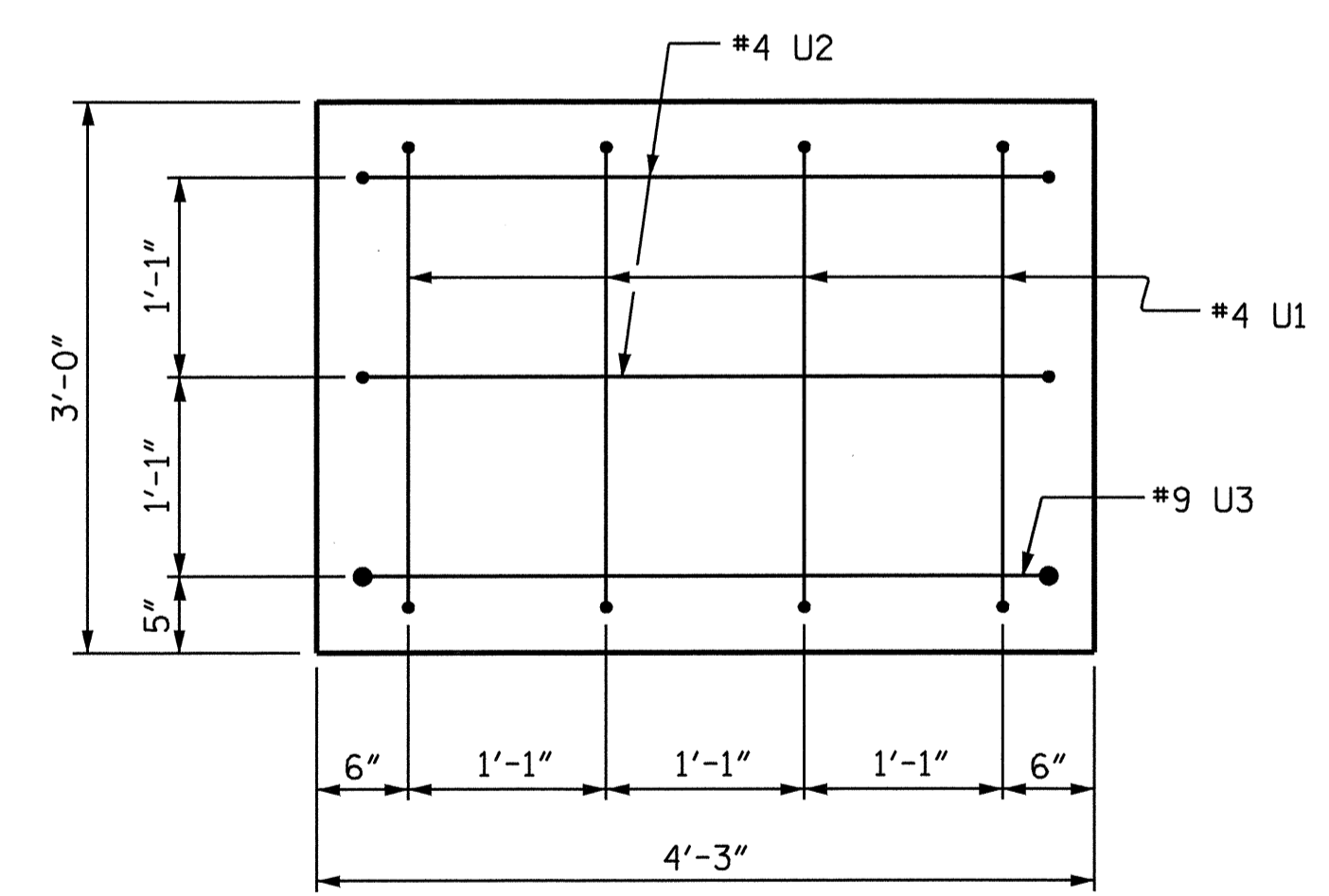


**SECTION A-A**  
(BENTS 3 THRU 7)

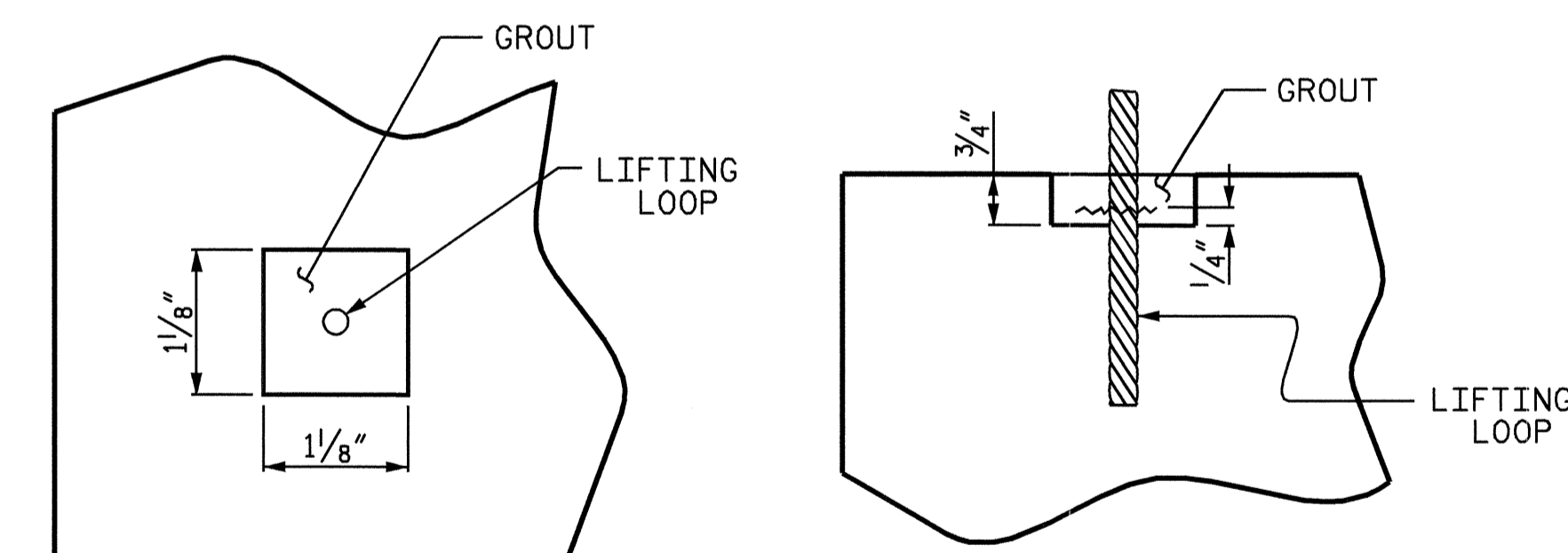
BENT NO.	DIM. A	DIM. B
3 & 4	3'-0"	3'-0 <sup>9</sup> / <sub>16</sub> "
5, 6 & 7	3'-0"	3'-0 <sup>3</sup> / <sub>8</sub> "
8, 9 & 10	3'-0"	3'-0 <sup>3</sup> / <sub>8</sub> "
11 & 12	3'-0"	3'-0 <sup>9</sup> / <sub>16</sub> "



**SECTION A-A**  
(BENTS 8 THRU 12)

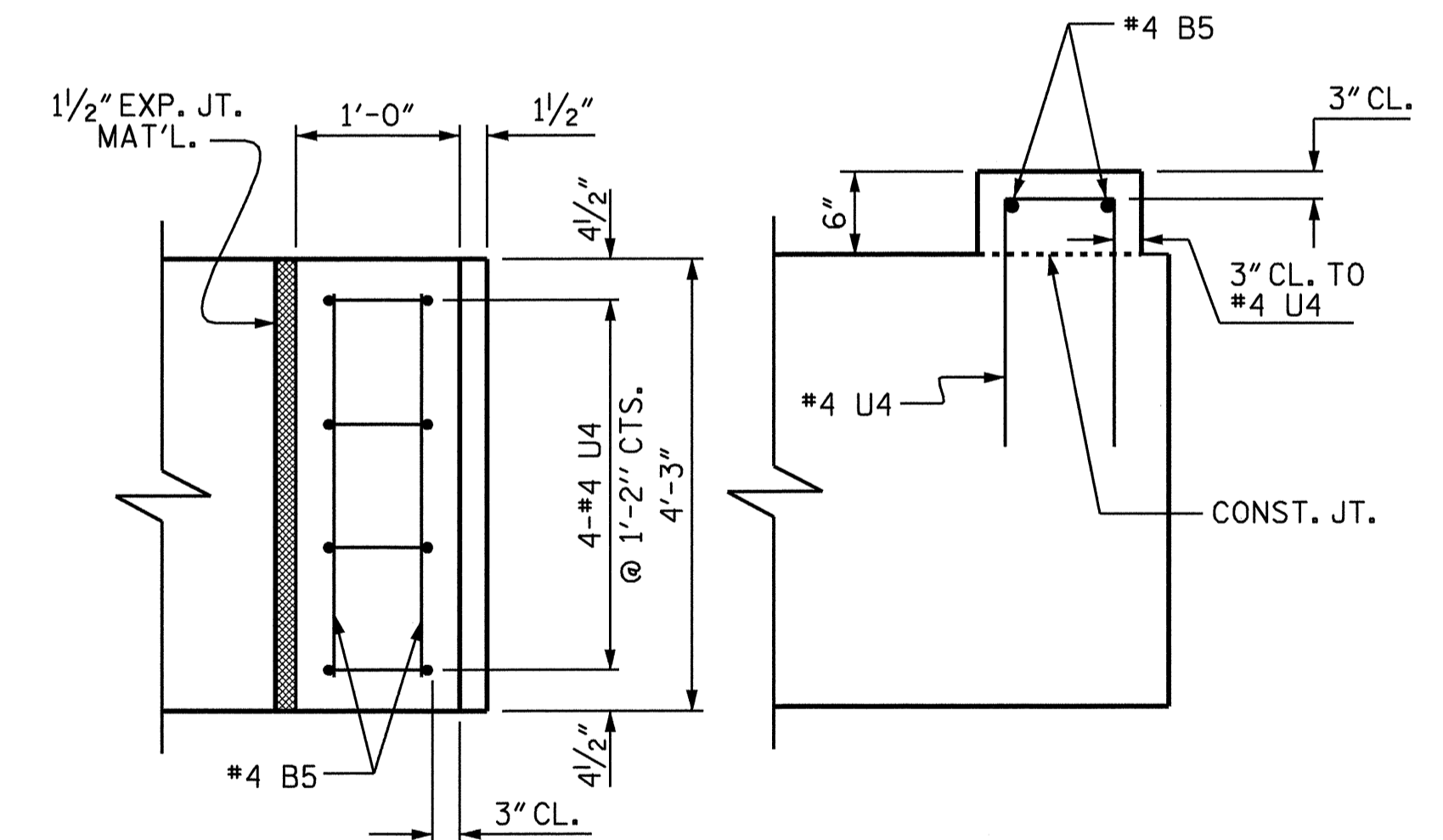


**END VIEW**



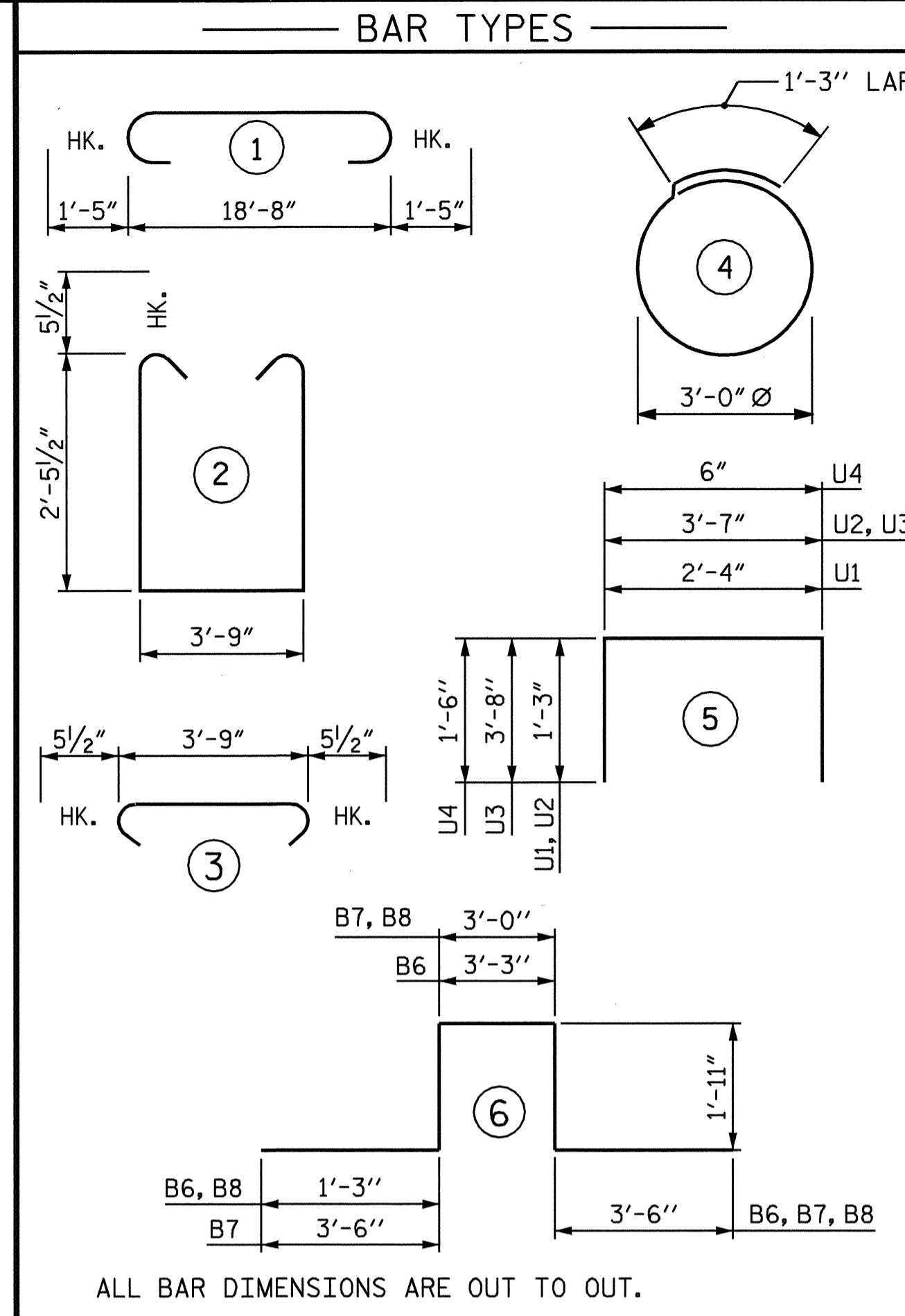
**PLAN**  
**ELEVATION**  
**GROUTED RECESS FOR LIFTING LOOPS**

LIFTING LOOPS TO BE CUT 1/4" ABOVE BOTTOM OF RECESS.



**PLAN**  
**ELEVATION**  
**LATERAL GUIDE REINFORCING DETAIL**

RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR BY ROTATION



ALL BAR DIMENSIONS ARE OUT TO OUT.

- ▲ CONCRETE DISPLACED BY THE PILE BLOCKOUTS HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.
- CONCRETE DISPLACED BY THE 24" STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.

**BILL OF MATERIAL FOR 2 PRECAST UNITS**

**BENTS 3 THRU 12**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	#8	#11	1	21'-6"	914
*B2	#8	#11	STR	18'-8"	793
*B3	#8	#5	STR	18'-8"	224
*B4	#8	#4	STR	18'-8"	100
*B5	14	#4	STR	3'-9"	35
*B6	4	#8	6	11'-10"	126
*B7	4	#8	6	13'-10"	148
*B8	4	#8	6	11'-7"	124
*D1	48	#6	STR	1'-6"	108
*S1	26	#5	2	9'-7"	260
*S2	26	#5	3	4'-8"	127
*S3	18	#4	4	10'-8"	128
*U1	16	#4	5	4'-10"	52
*U2	8	#4	5	6'-1"	33
*U3	4	#9	5	10'-11"	148
*U4	8	#4	5	3'-6"	19

\* EPOXY COATED REINFORCING STEEL 3339 LBS.

CLASS AA CONCRETE

▲ POUR 1 (CAP) C.Y. 16.0

POUR 2 (LATERAL GUIDE) C.Y. 0.2

▲ TOTAL C.Y. 16.2

PILE BLOCKOUT CONCRETE ● C.Y. : 1.1

PP 24 X 0.625 STEEL PILES

BENT NO.	LIN. FT.	
BENT 3	6	540
BENT 4	6	540
BENT 5	6	630
BENT 6	6	630
BENT 7	6	630
BENT 8	6	630
BENT 9	6	570
BENT 10	6	630
BENT 11	6	540
BENT 12	6	540

PILE REDRIVES :	BENT 3	NO. : 6
	BENT 4	NO. : 6
	BENT 5	NO. : 6
	BENT 6	NO. : 6
	BENT 7	NO. : 6
	BENT 8	NO. : 6
STEEL PILE : PLATES	BENT 9	NO. : 6
	BENT 10	NO. : 6
	BENT 11	NO. : 6
	BENT 12	NO. : 6

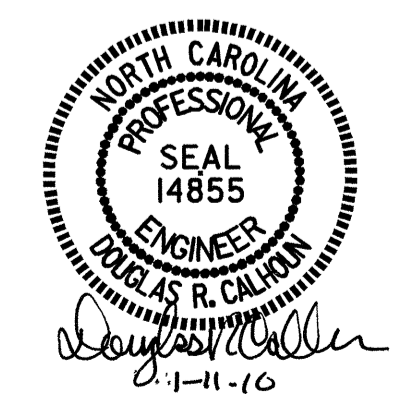
PDA TESTING	EA.	1 (BENT 4, 8 & 12)
PDA ASSISTANCE	EA.	1 (BENT 4, 8 & 12)

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

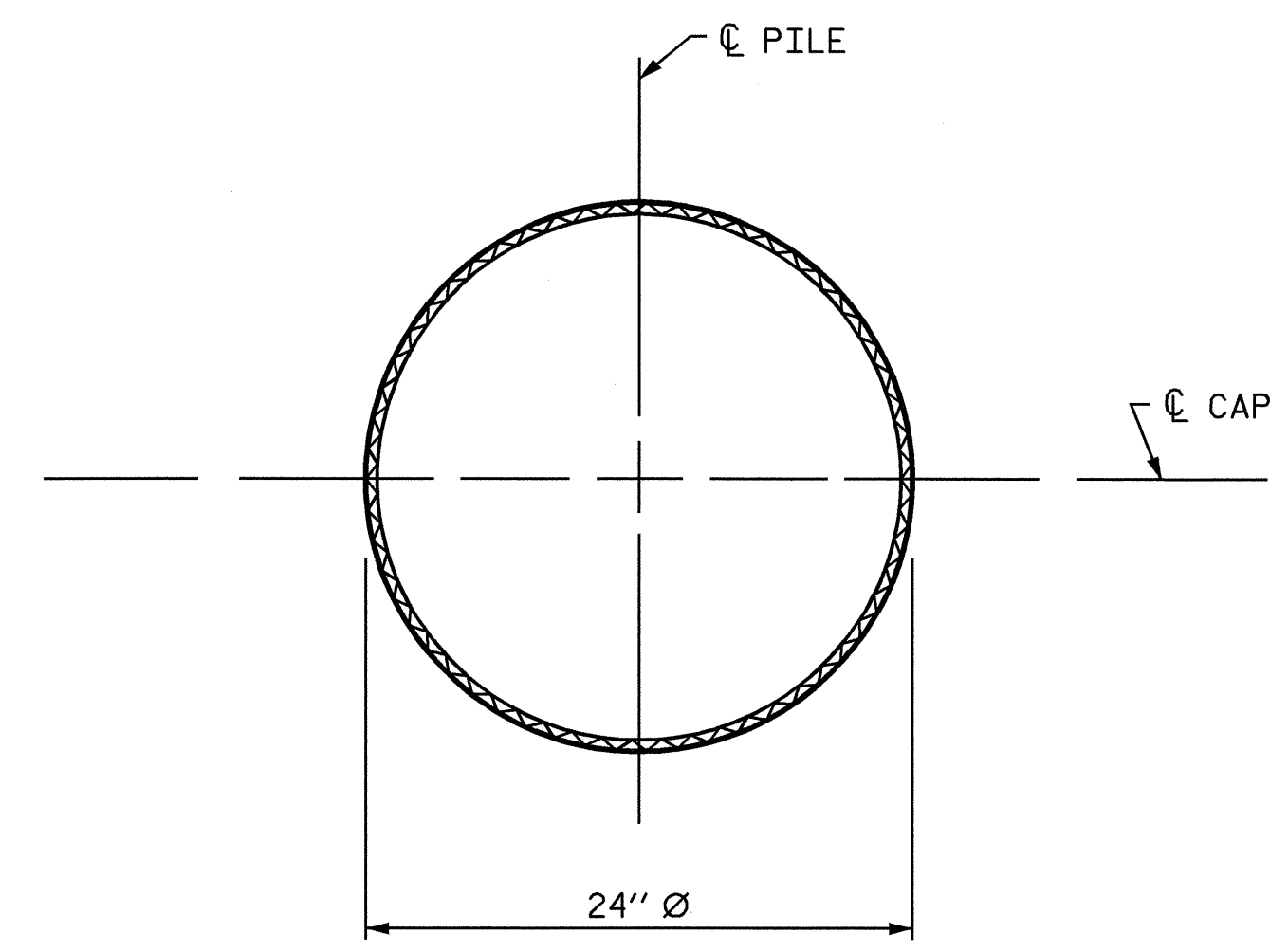
SUBSTRUCTURE  
 BENTS 3 THRU 12  
 (PRECAST OPTION)



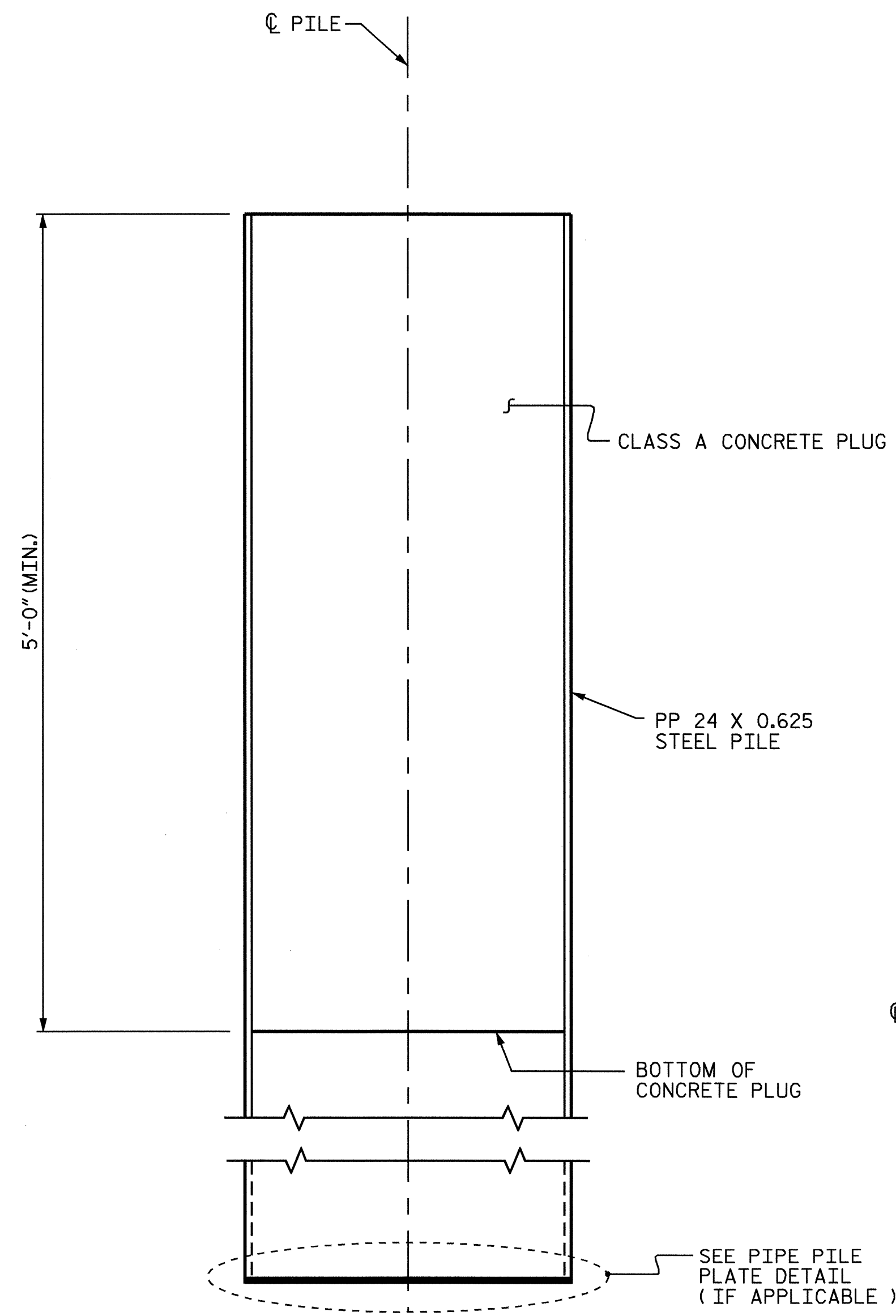
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : J. MYA DATE : 8-16-09  
 CHECKED BY : J. L. WALTON DATE : 9-11-09



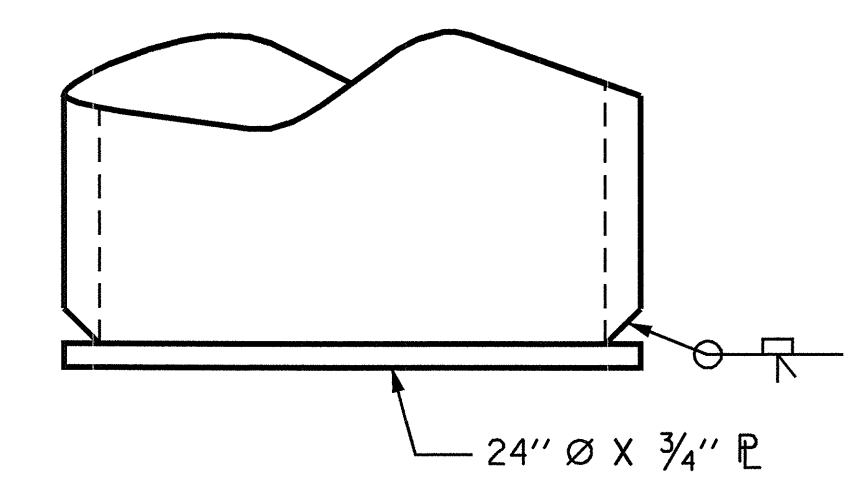


**PLAN**

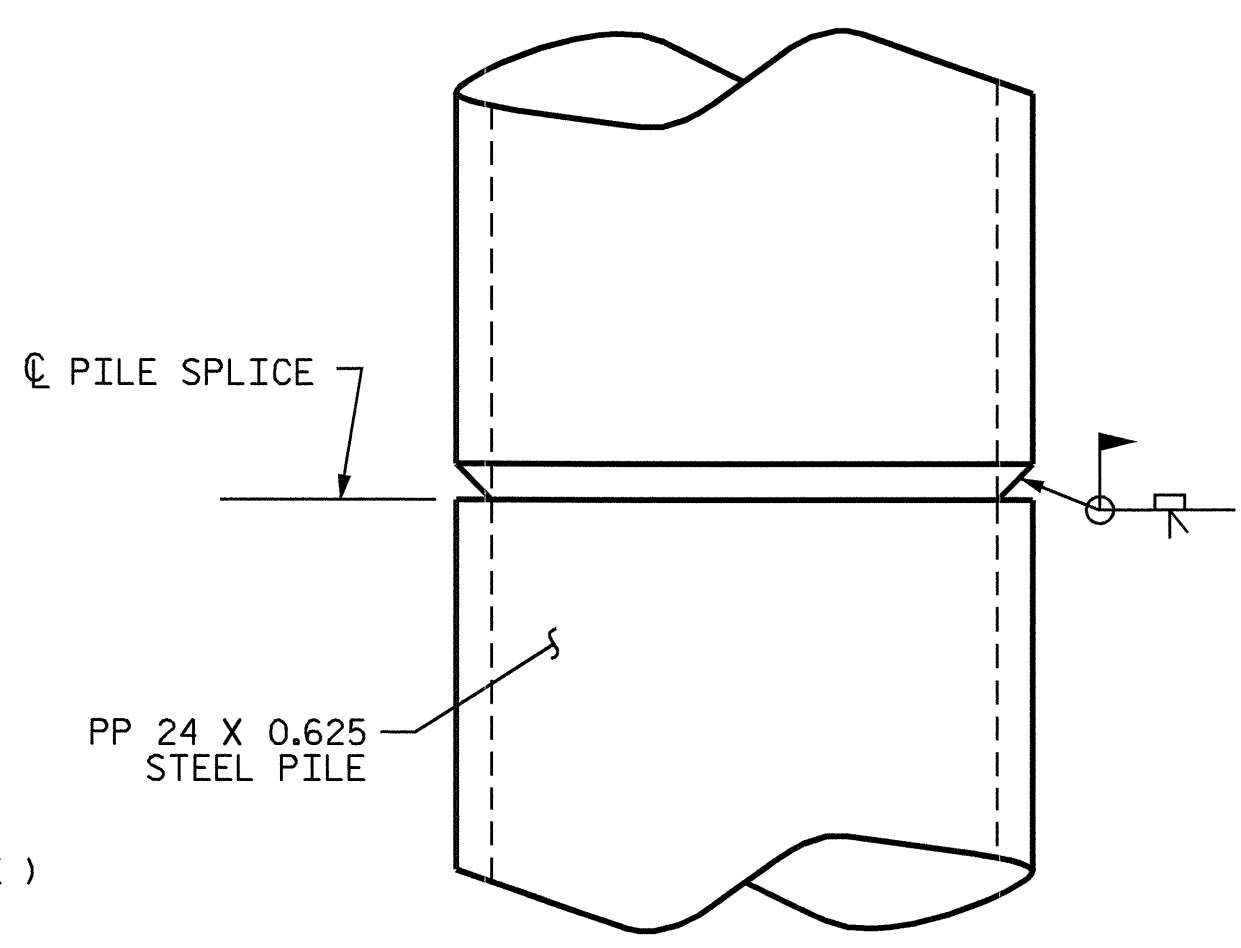


**ELEVATION**

**PP 24 X 0.625 STEEL PILE**  
(CLOSED END)



**PIPE PILE PLATE DETAIL**  
(IF APPLICABLE)



**PIPE PILE SPLICE DETAIL**

**NOTES**

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-A1-1350) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO THE UPPER PORTION OF THE PILES FOR THE LENGTHS SHOWN IN CHART, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE CONCRETE DOES NOT MOVE. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE CLASS A CONCRETE, AND METALLIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.625 STEEL PILES.

AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

**BILL OF MATERIAL FOR ONE PP 24 X 0.625 STEEL PILE**

CLASS A CONCRETE	0.5 CY
5'-0" MINIMUM PLUG	

THERMAL SPRAYED COATING FOR PP 24 X 0.625 STEEL PILES :

	LIN. FT. EA. PILE
BENT 3	31.50
BENT 4	34.50
BENT 5	35.50
BENT 6	36.50
BENT 7	37.50
BENT 8	35.50
BENT 9	34.50
BENT 10	33.50
BENT 11	30.50
BENT 12	27.50

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 24" STEEL PIPE PILE  
 (PRECAST OPTION)



ASSEMBLED BY : J. MYA	DATE : 8-16-09
CHECKED BY : J. L. WALTON	DATE : 9-28-09
DRAWN BY : TLA 8/05	ADDED 10/1/05
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/KMM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS 39
2			4			

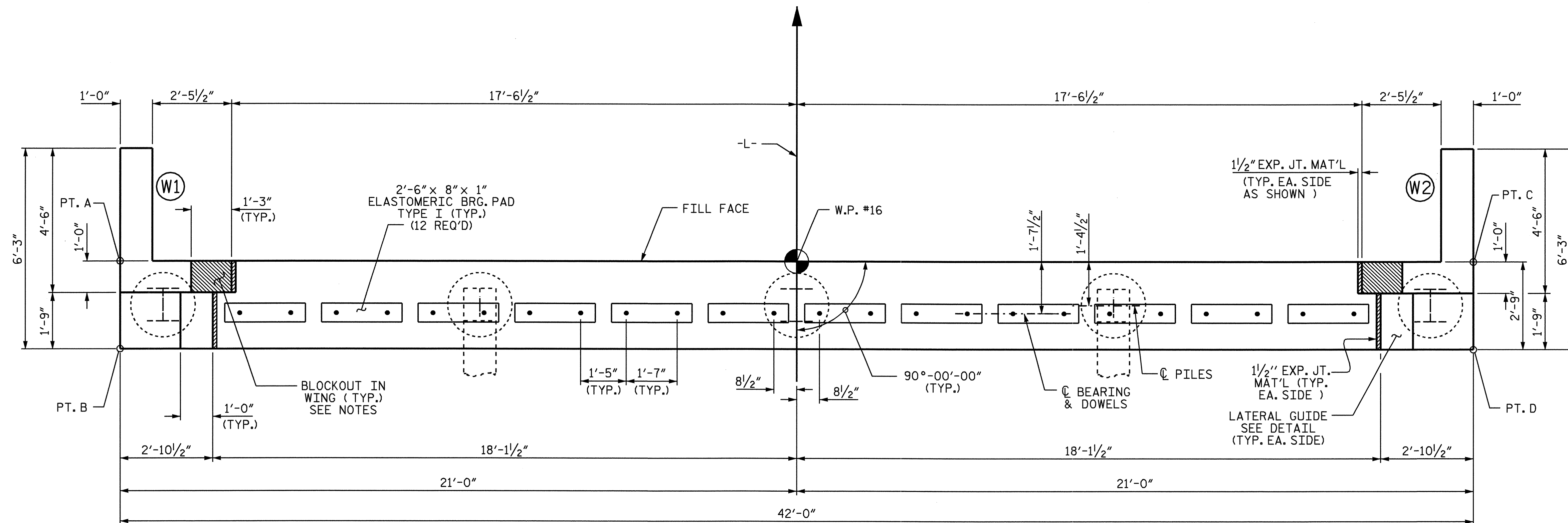
**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

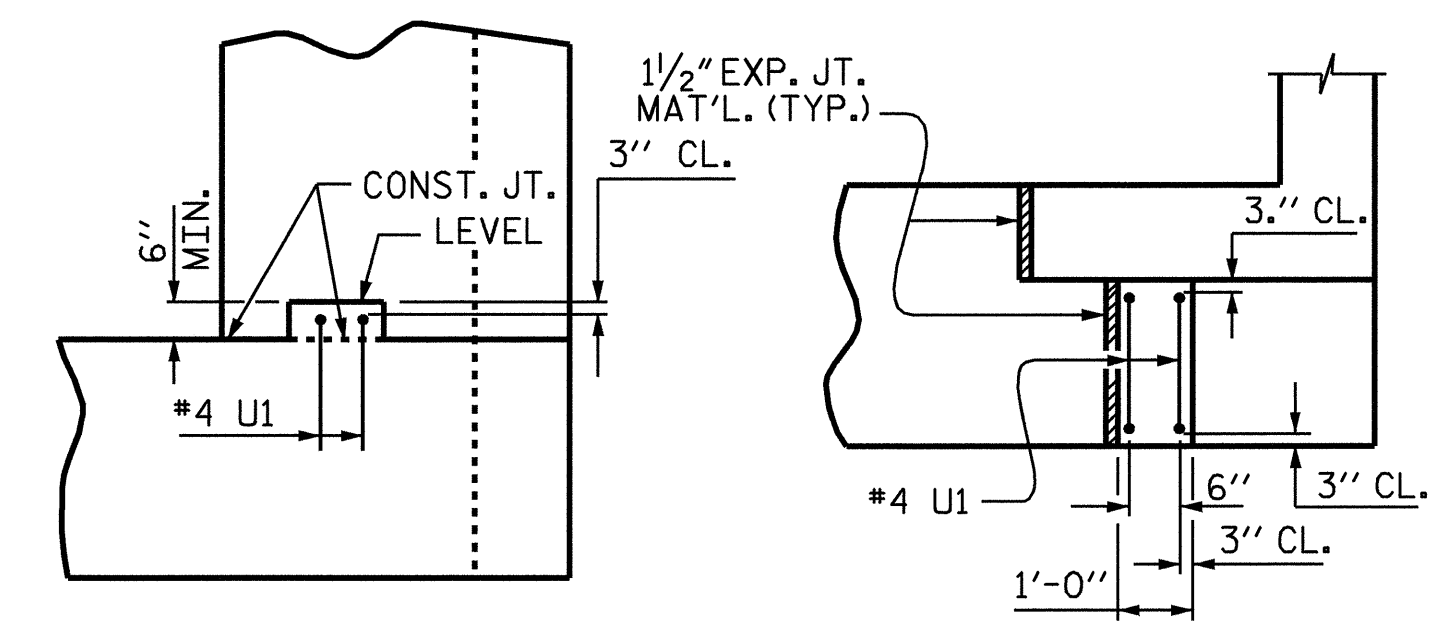
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

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.



**PLAN**

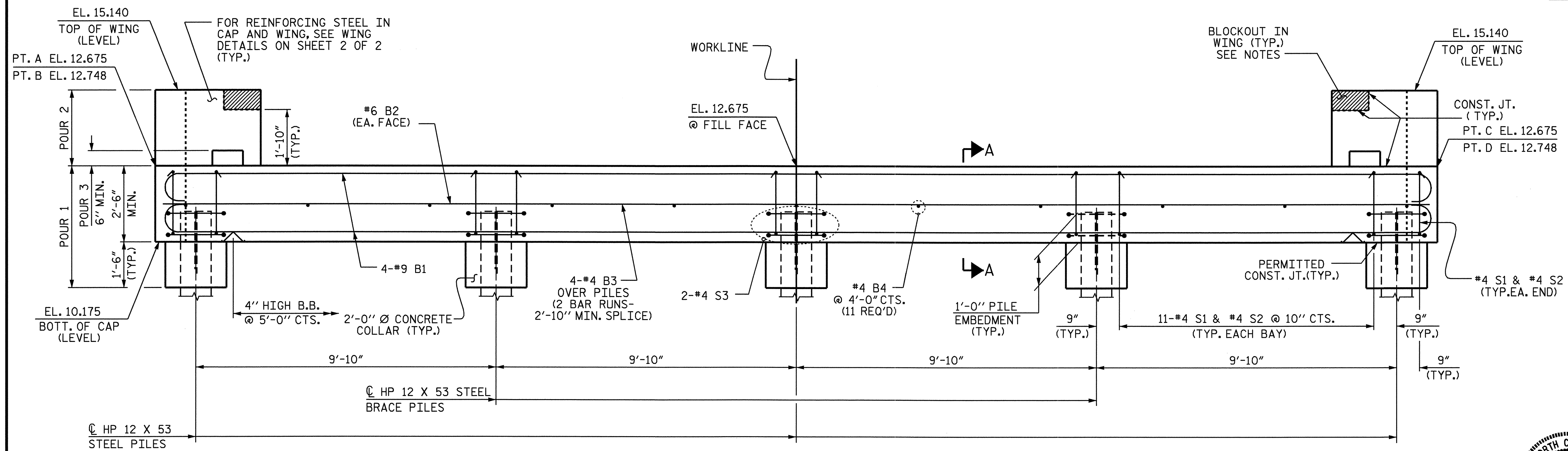


**ELEVATION**

**PLAN**

**LATERAL GUIDE**

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



**ELEVATION**

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT 2**

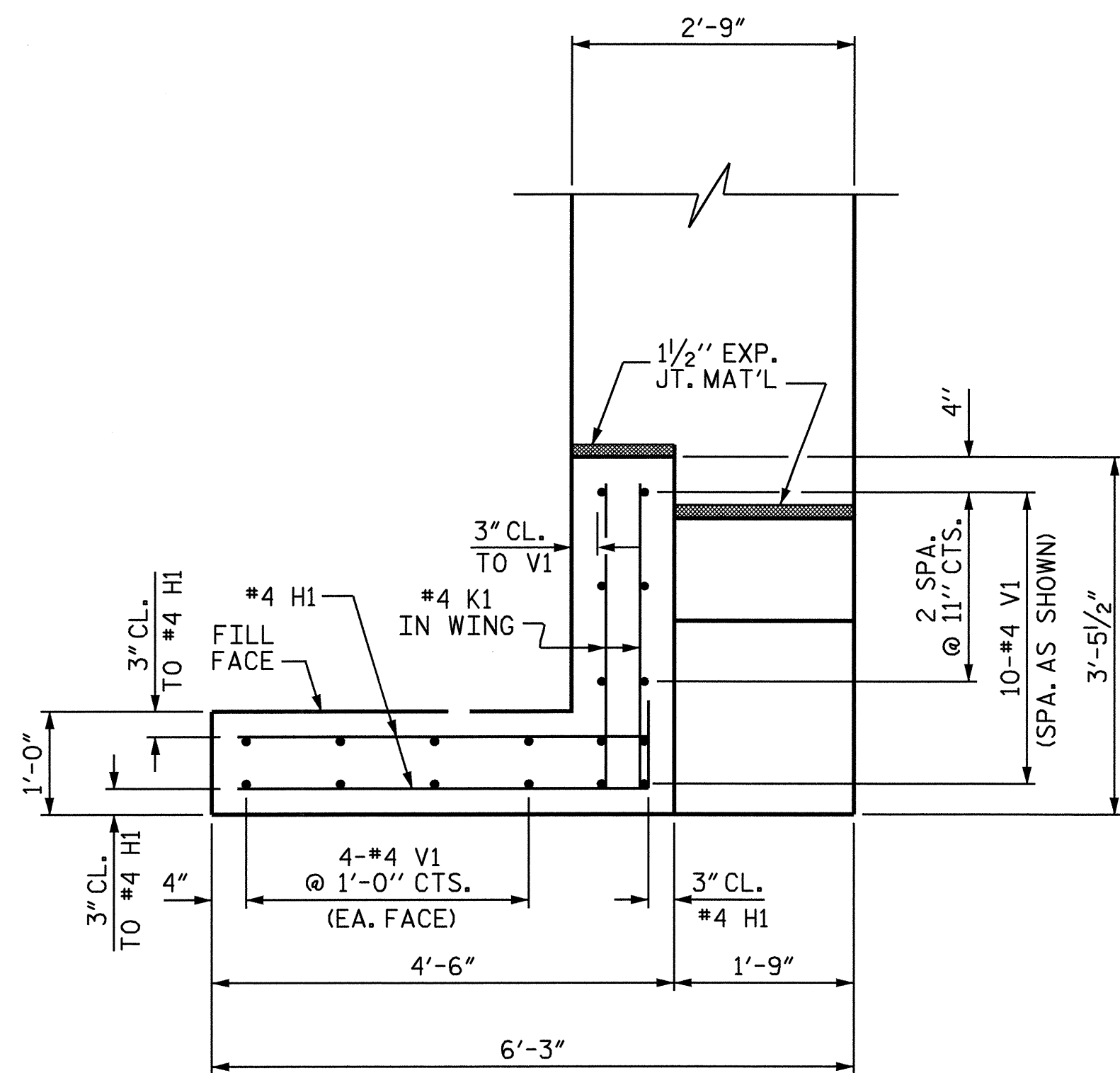
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. **S-33**  
 TOTAL SHEETS **39**

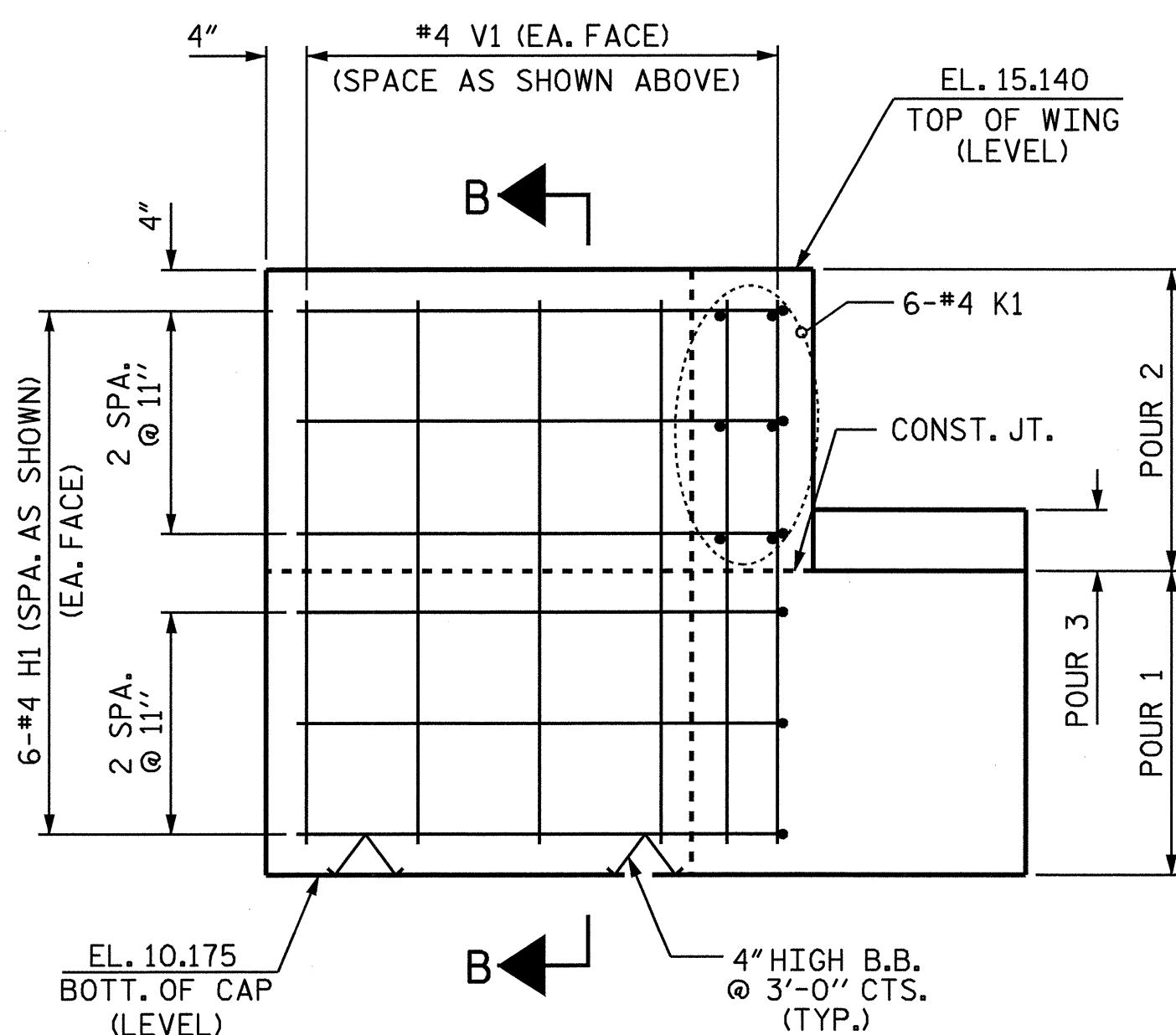


DRAWN BY: J. MYA DATE: 7-31-09  
 CHECKED BY: J. L. WALTON DATE: 8-14-09

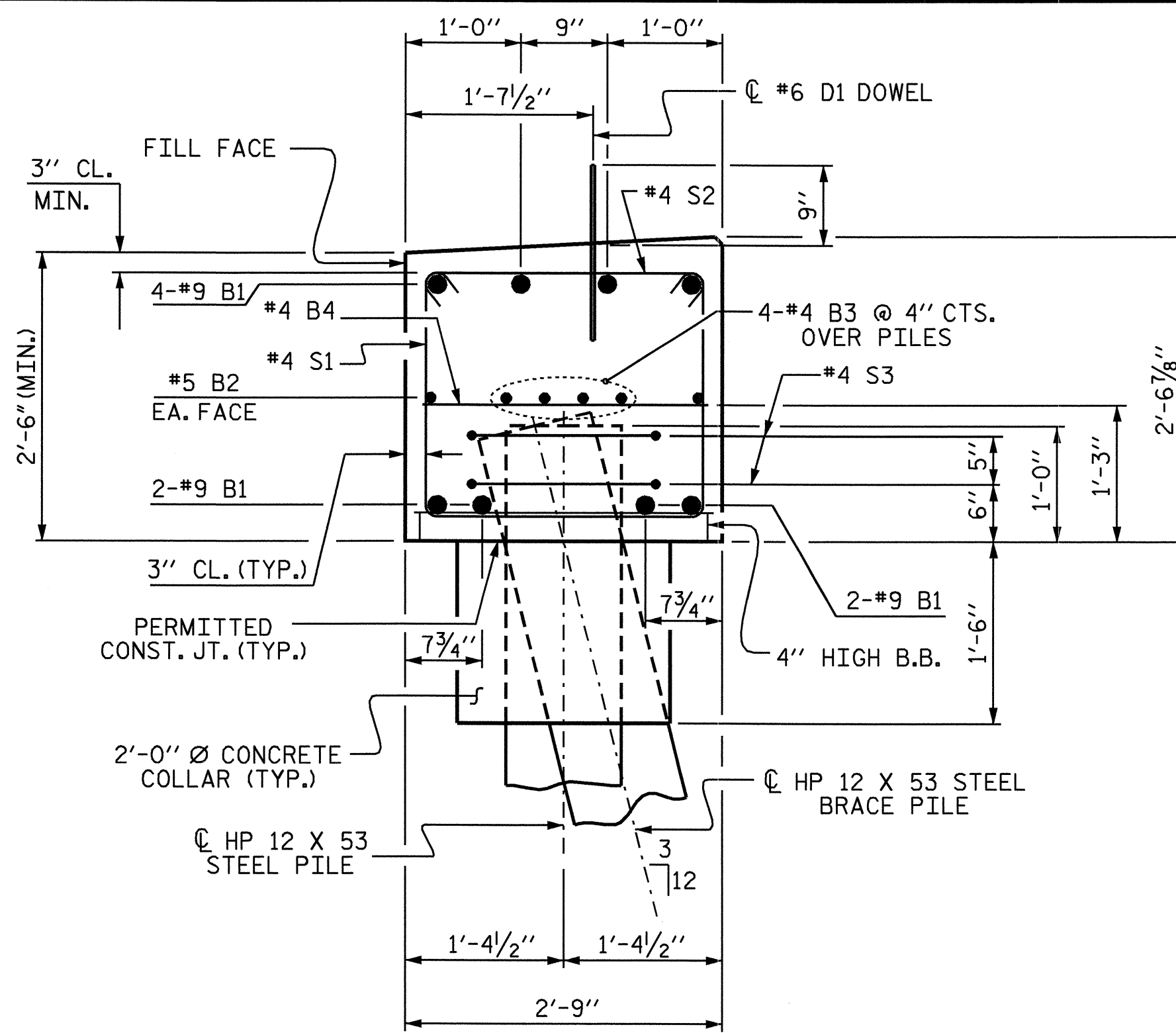
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 jmya



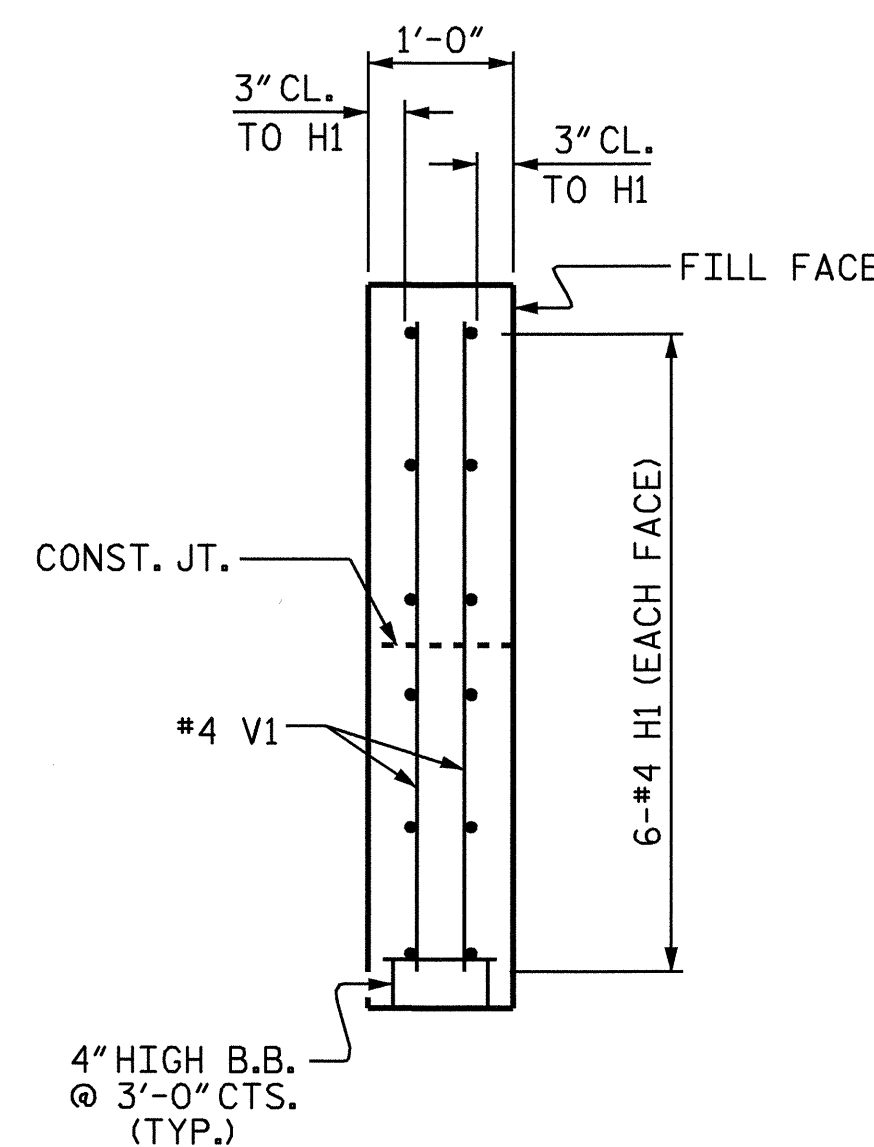
PLAN OF WING - W1  
(WING 2 SIMILAR)



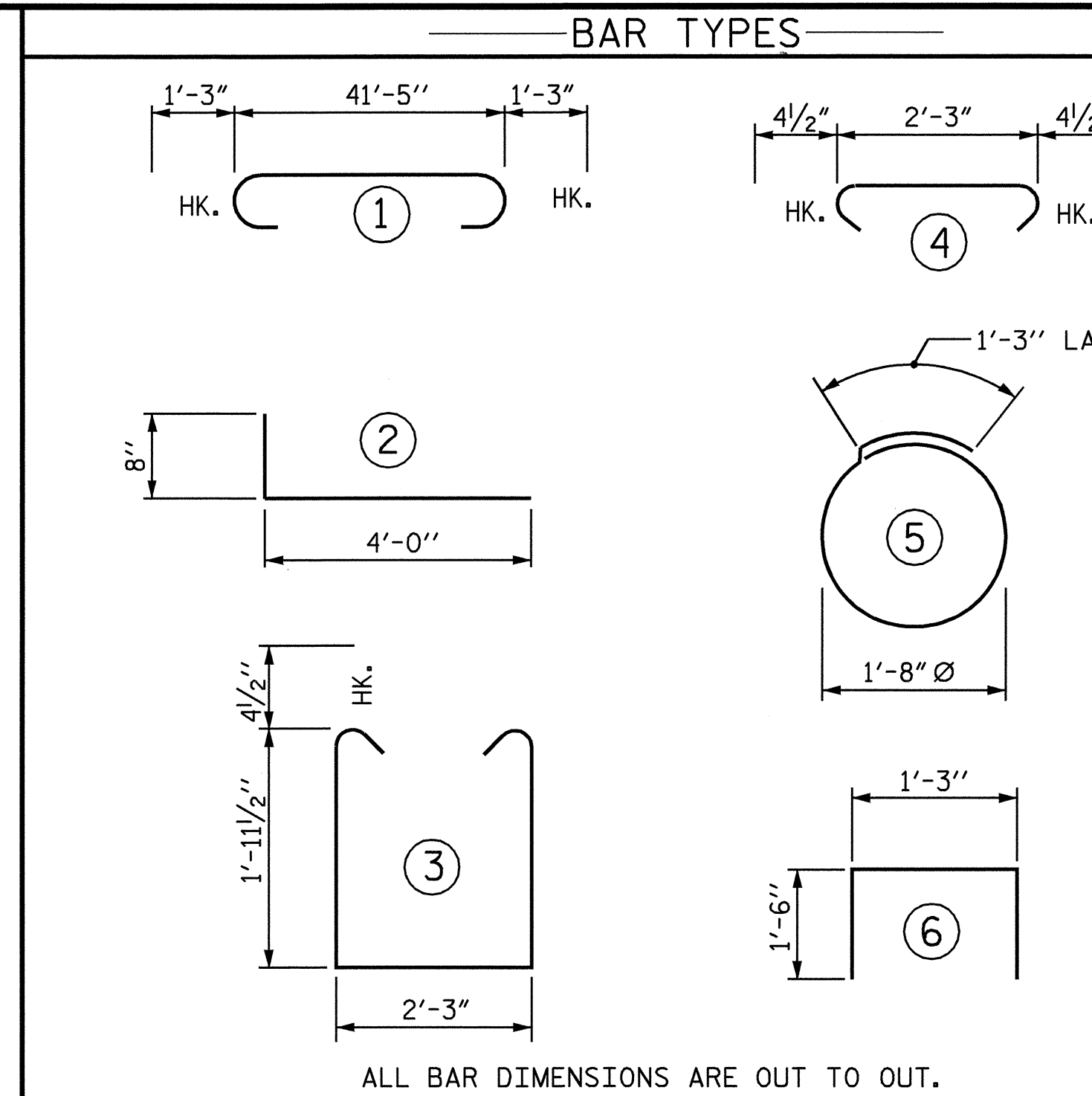
ELEVATION OF WING - W1  
(WING 2 SIMILAR)



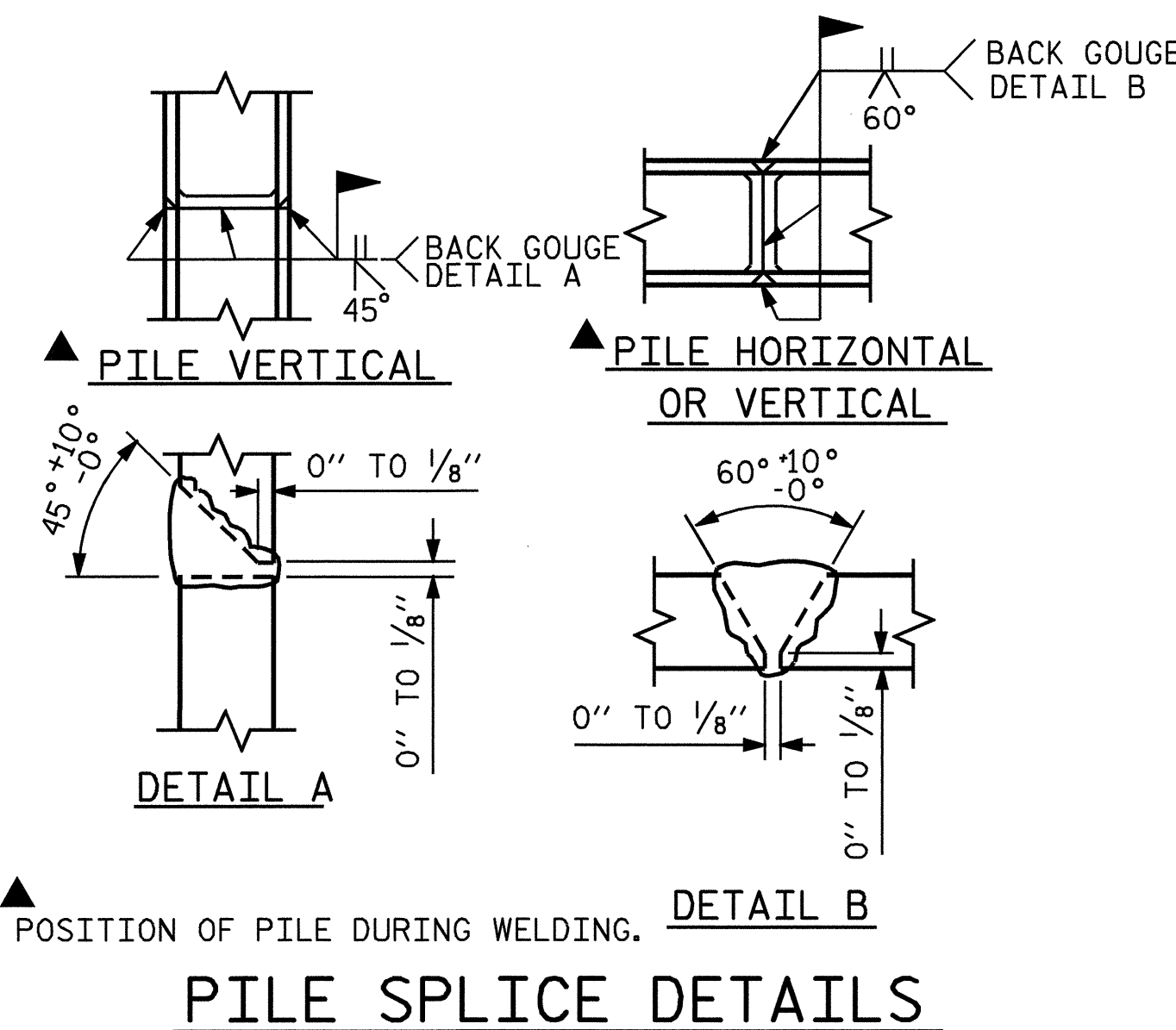
SECTION A-A



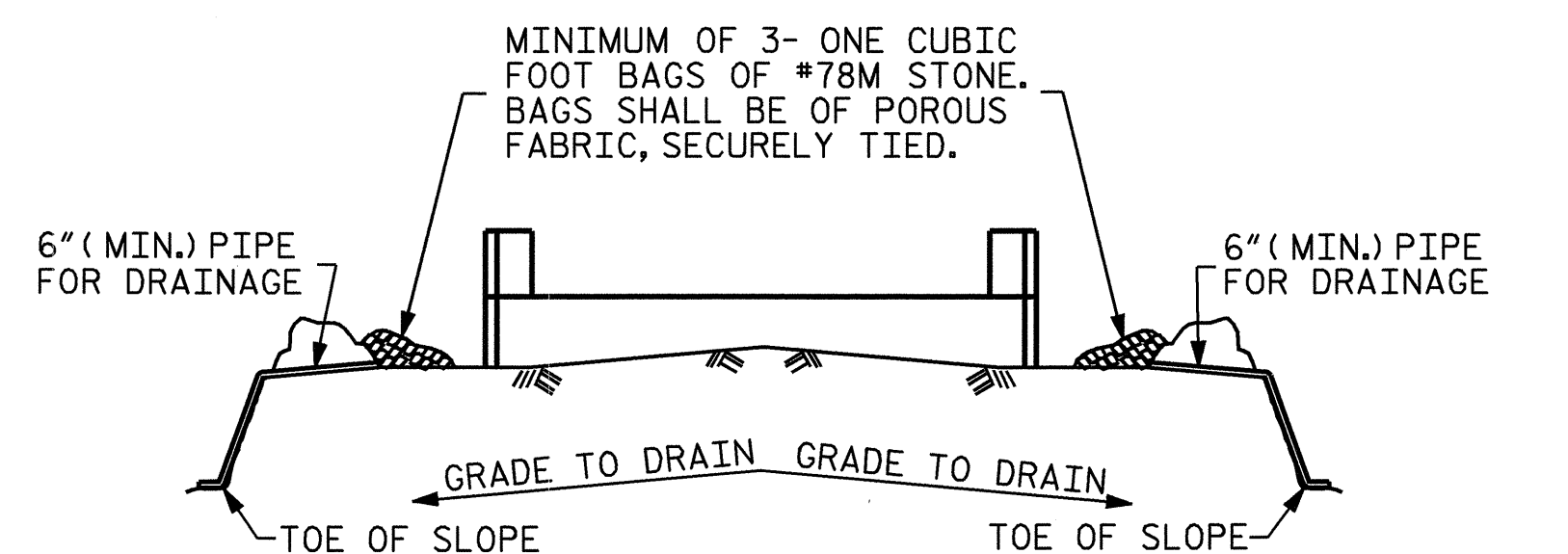
SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.



PILE SPLICE DETAILS



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

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

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

TEMPORARY DRAINAGE AT END BENT

BILL OF MATERIAL

END BENT 2

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	#9	1	43'-11"	1195
*B2	2	#5	STR	41'-6"	87
*B3	8	#4	STR	22'-2"	118
*B4	11	#4	STR	2'-3"	17
*D1	24	#6	STR	1'-6"	54
*H1	24	#4	2	4'-8"	75
*K1	12	#4	STR	2'-11"	23
*S1	74	#4	3	6'-11"	342
*S2	74	#4	4	3'-0"	148
*S3	10	#4	5	6'-6"	43
*U1	4	#4	6	4'-3"	11
*V1	36	#4	STR	4'-5"	106
				* EPOXY COATED REINFORCING STEEL	LBS 2219

CLASS AA CONCRETE BREAKDOWN

POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WINGS)	C.Y.	12.4
POUR 2 (UPPER PART OF WINGS)	C.Y.	1.3
POUR 3 (LATERAL GUIDES)	C.Y.	0.1
TOTAL	C.Y.	13.8

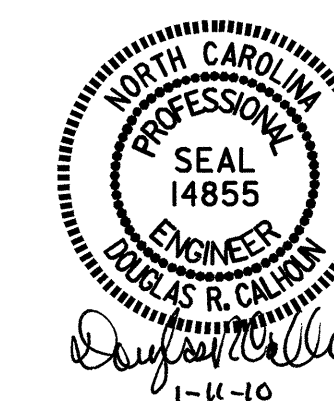
HP 12 X 53 STEEL PILES :		
NO. : 5		LIN. FT. : 325
PILE REDRIVES	NO.	5

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2



REVISIONS

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

SHEET NO.  
**S-34**  
 TOTAL SHEETS  
**39**

DRAWN BY : J. MYA DATE : 7-31-09  
 CHECKED BY : J. L. WALTON DATE : 8-14-09

BILL OF MATERIAL		
ITEM	NUMBER	DESCRIPTION
B1	5	L6 x 6 x 3/4
B2	5	L6 x 6 x 3/4
B3	2	L3 x 3 x 1/4
B4	5	L3 x 3 x 1/4
B5	1	L3/2 x 3/2 x 1/4
B6	1	L3 x 3 x 1/4
B7	1	P 3/8 x 4 1/2
B8	4	L3 x 3 x 1/4
B9	2	P 3/8 x 4 1/2
B10	1	P 1/2 x 10
B11	5	P 1 x 16
B12	5	P 3/4 x 16
B13	3	L4 x 4 x 5/8
B14	3	P 2 x 1/2
B15	3	P 8 x 1/2
B16	3	P 3 x 1/2
B17	4	L2 x 2 x 1/4
B18	5	P 16 x 1/4
1"x4" OPEN GRID FLOOR W/ 3/16"x3/4" BRG. BARS		

**NOTES:**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50.

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

FOR SOLAR ARRAY PLATFORM, SEE SPECIAL PROVISIONS.

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. NO PULL-OUT TEST REQUIRED.

EXTREME CARE SHALL BE TAKEN TO ENSURE PRESTRESSED STRANDS ARE MISSED WHEN INSTALLING ADHESIVELY ANCHORED BOLTS IN CORED SLAB UNIT.

ALL STRUCTURAL MEMBERS, OPEN GRID FLOOR, BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

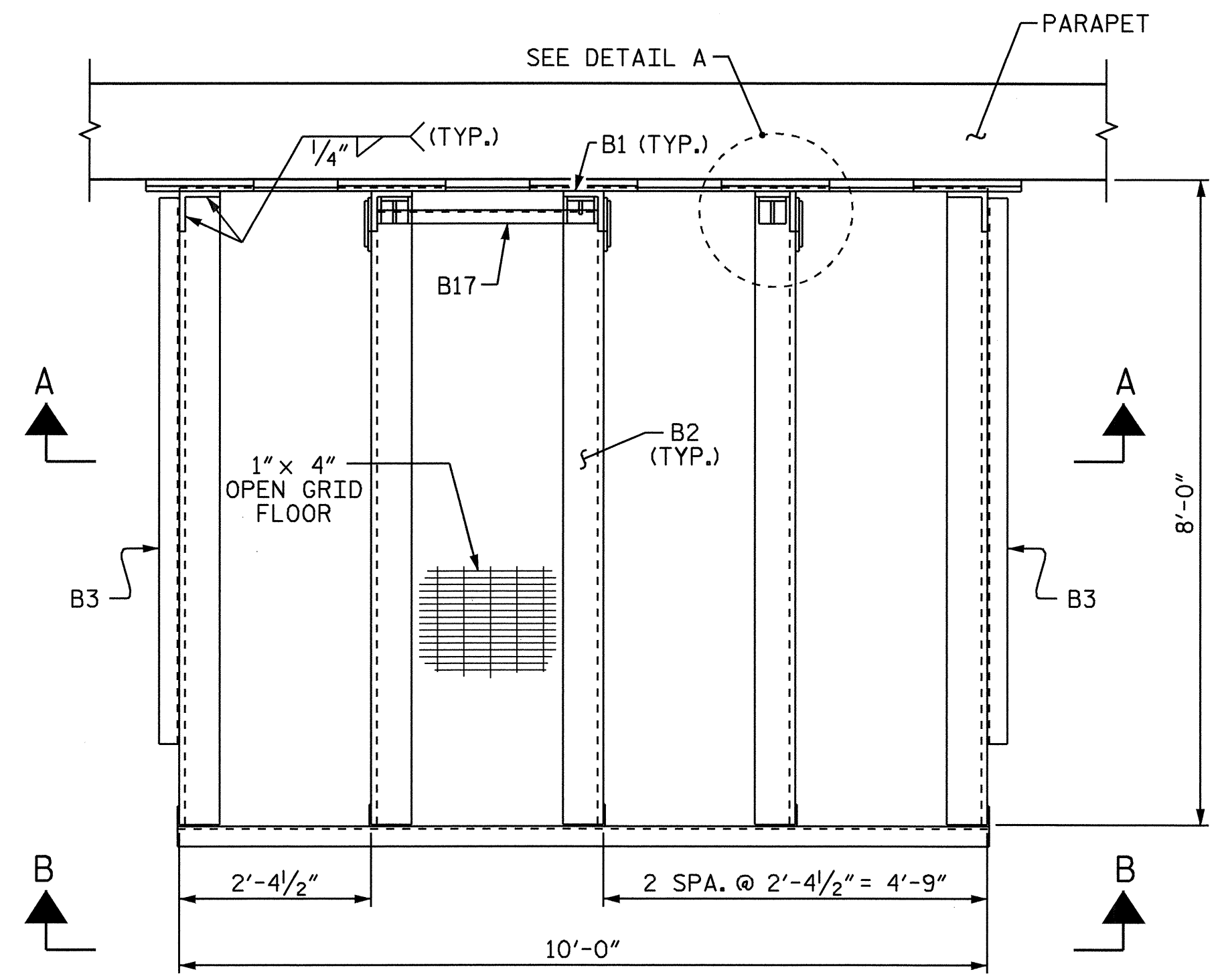
THE 1" DIAMETER HOLES IN THE PARAPET SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE PARAPET SHALL BE SNUG TIGHTENED, FOLLOWED BY AN ADDITIONAL 1/4" TURN.

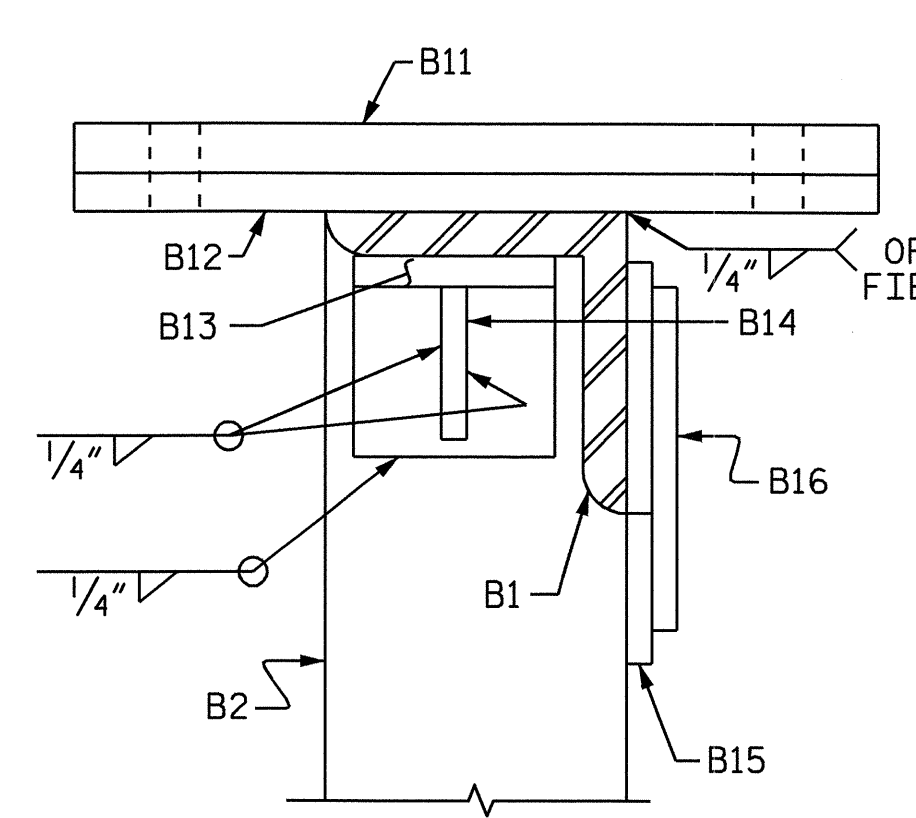
AFTER INSTALLATION, THE EXPOSED THREADS OF THE BOLTS SHALL BE BURRED WITH A SHARP POINTED TOOL.

OPEN GRID FLOOR SHALL BE WELDED SECURELY TO EACH HORIZONTAL FLOOR MEMBER.

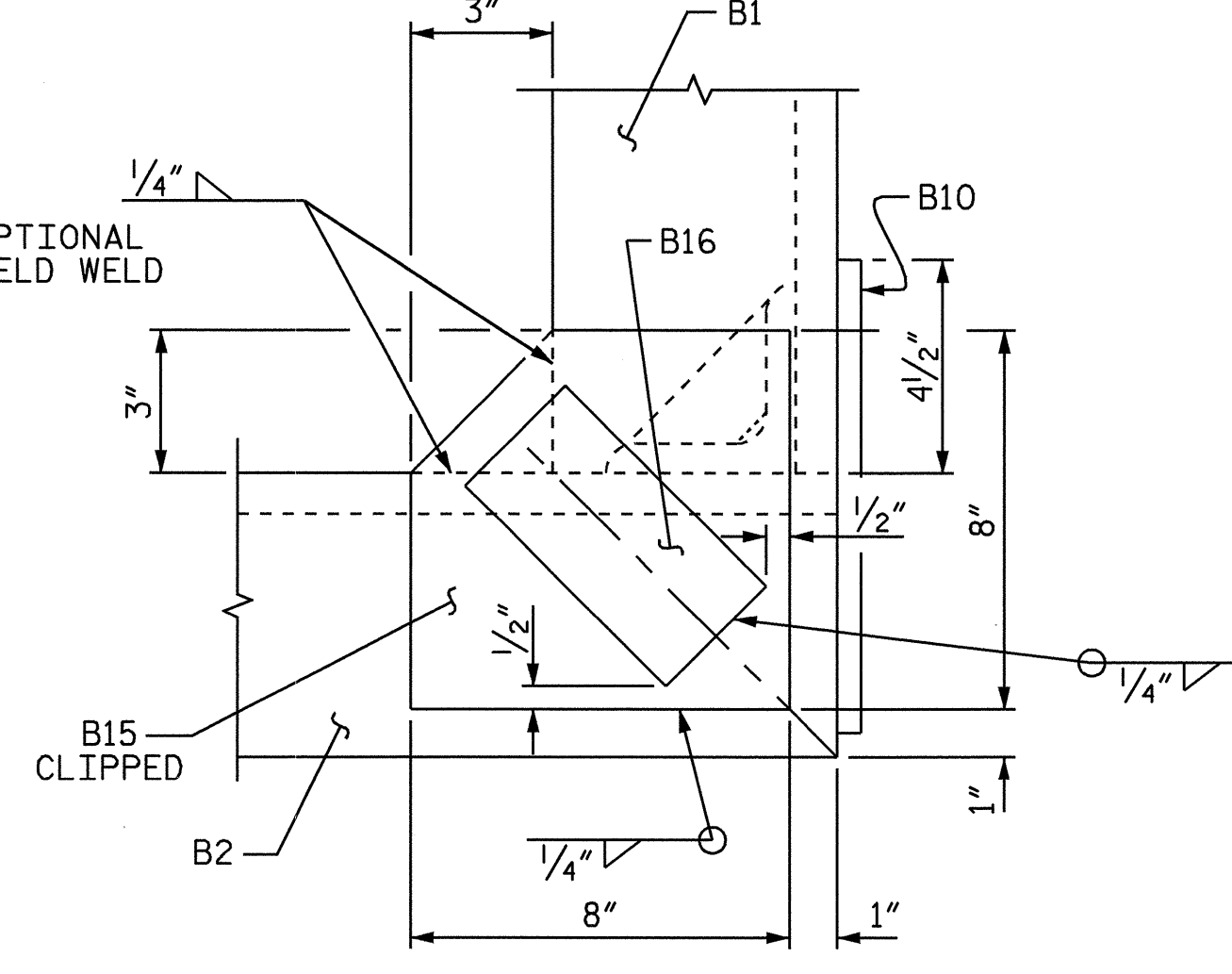
COMPLETELY SEAL ALL EDGES OF TIGHTLY CONTACTING SURFACES BY WELDING BEFORE GALVANIZING.



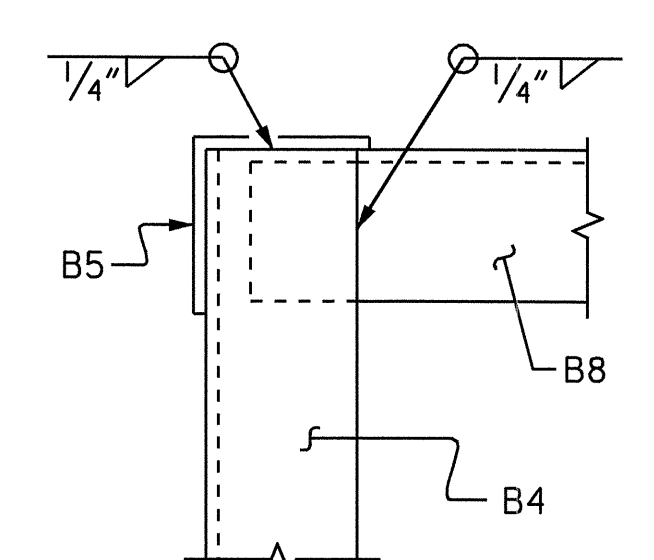
**PLAN**



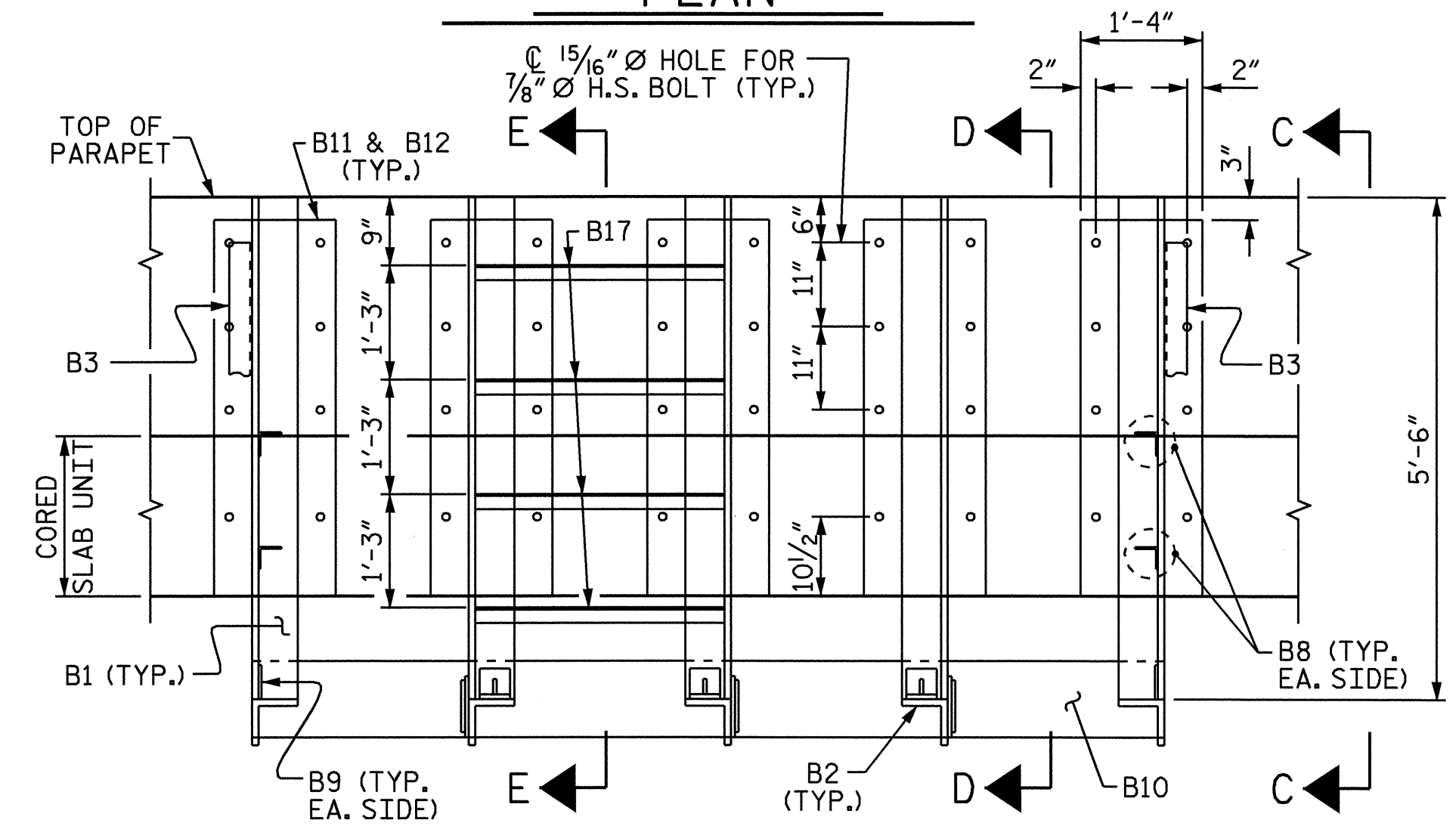
**DETAIL A**



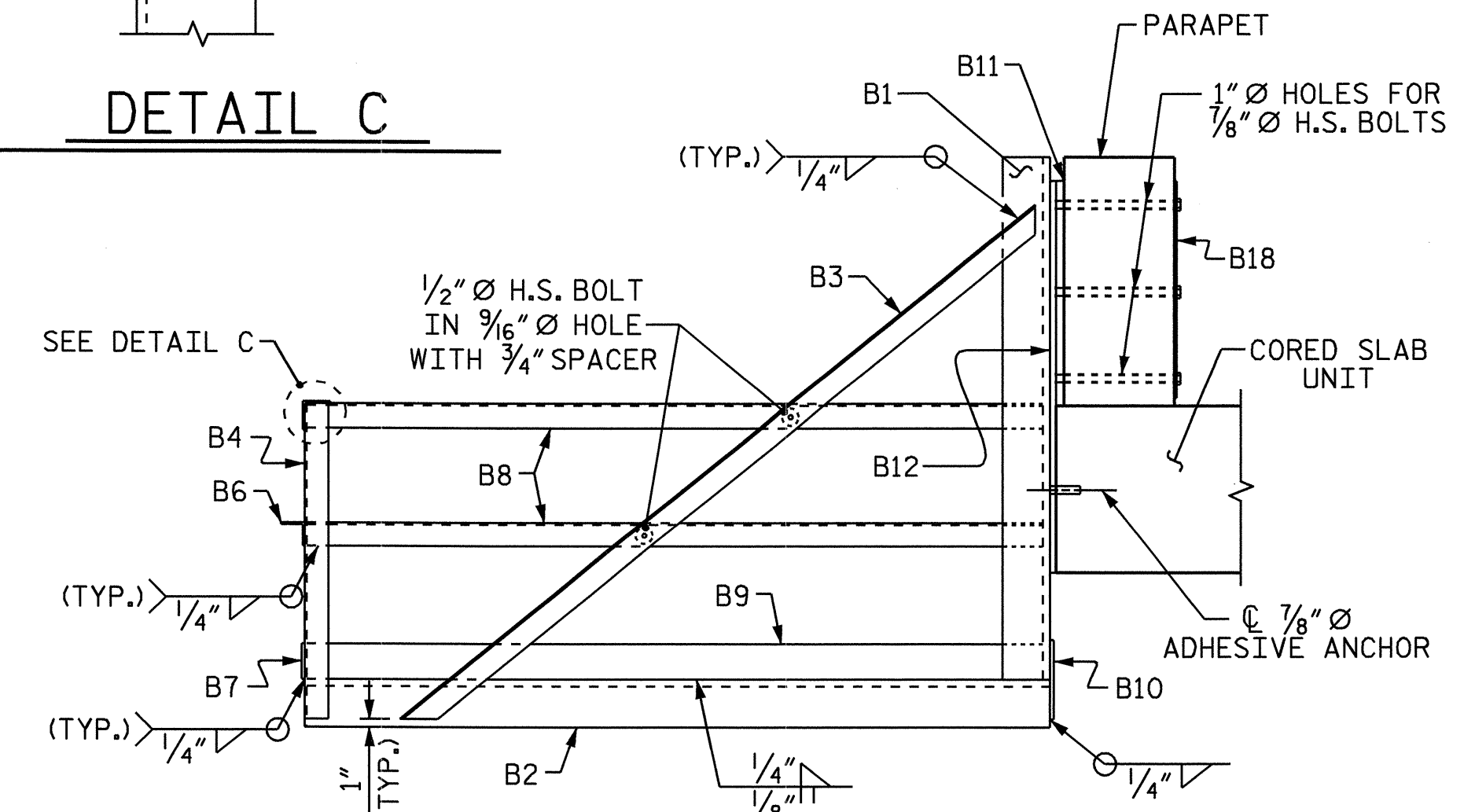
**DETAIL B**



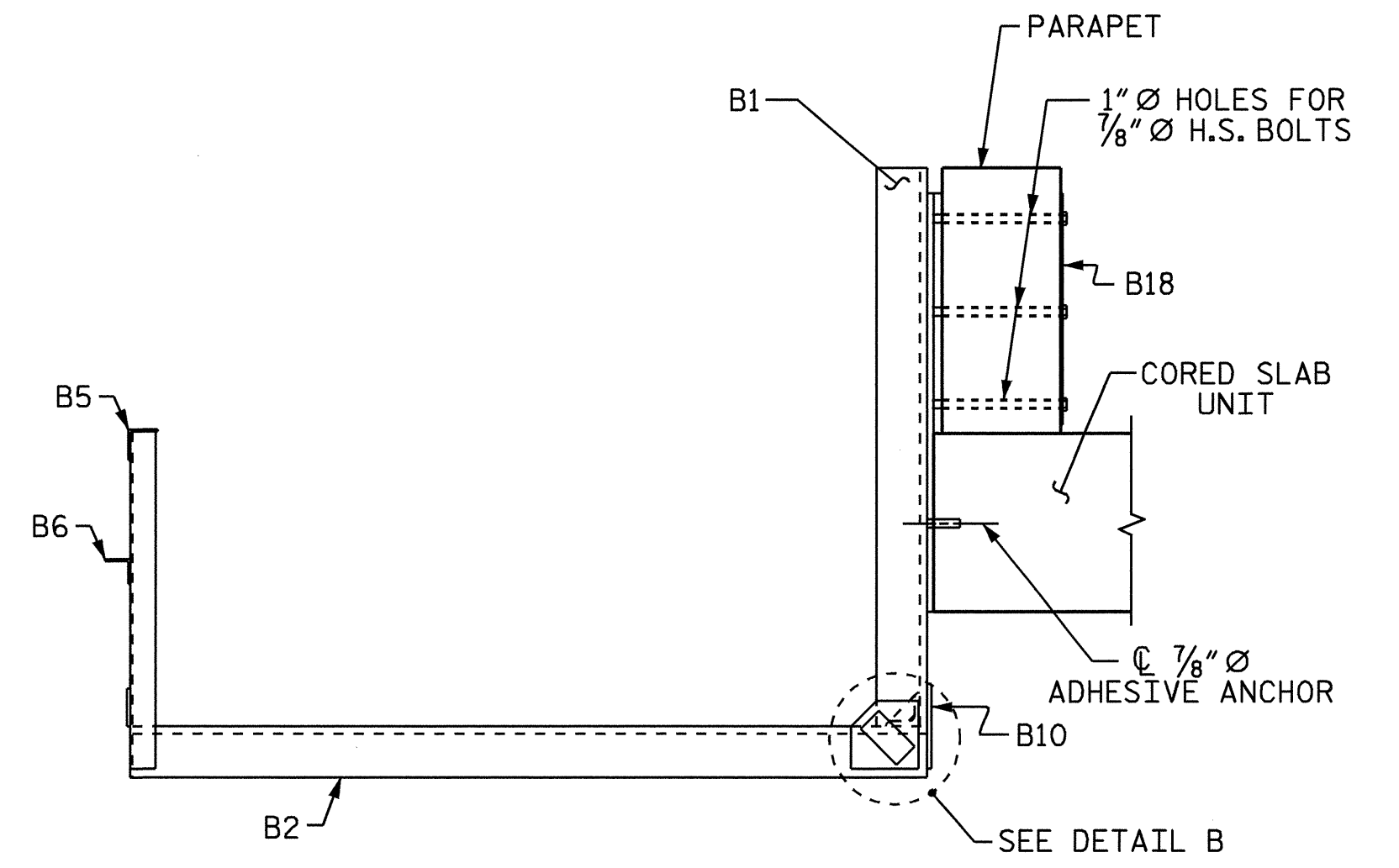
**DETAIL C**



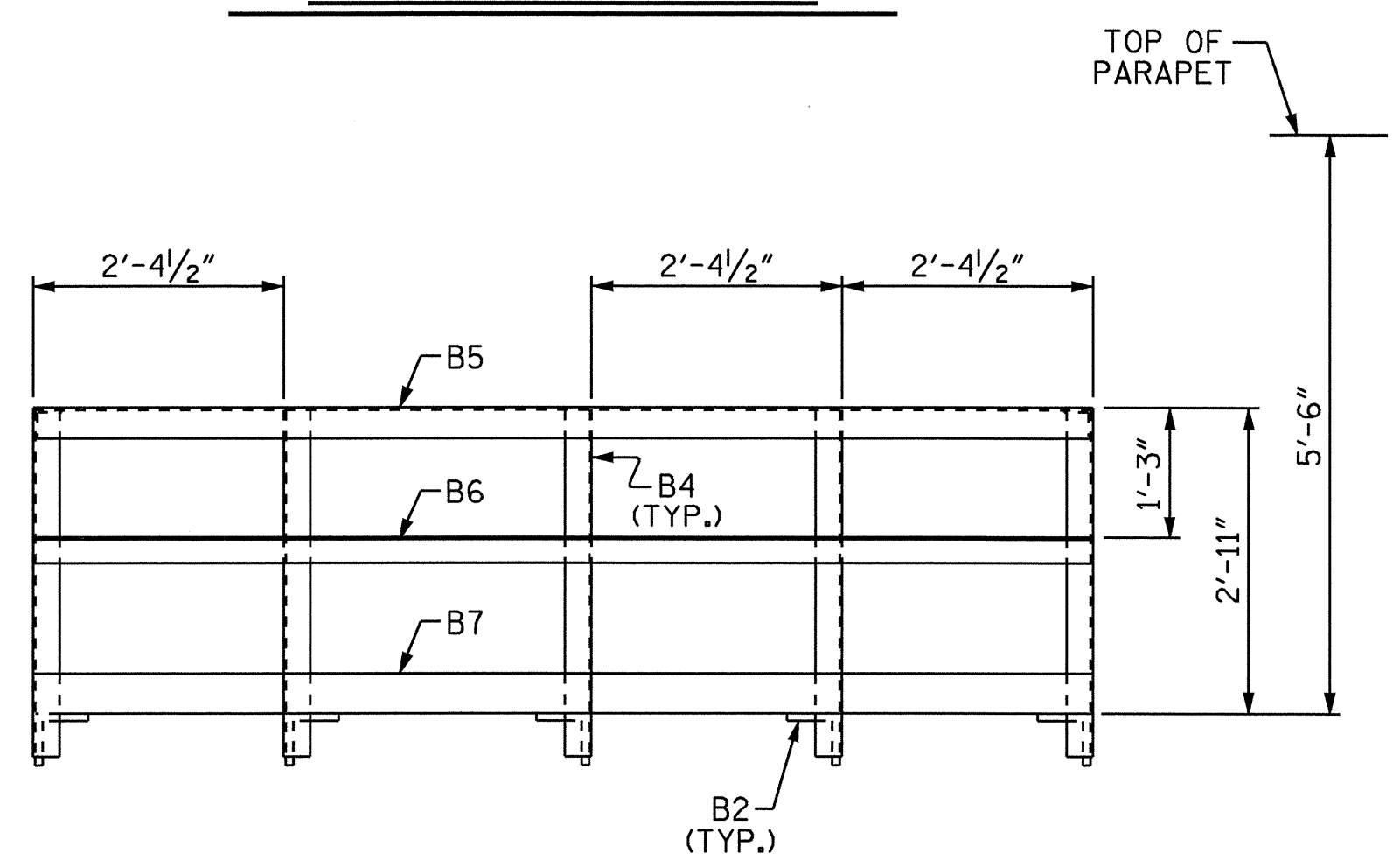
**SECTION A-A**



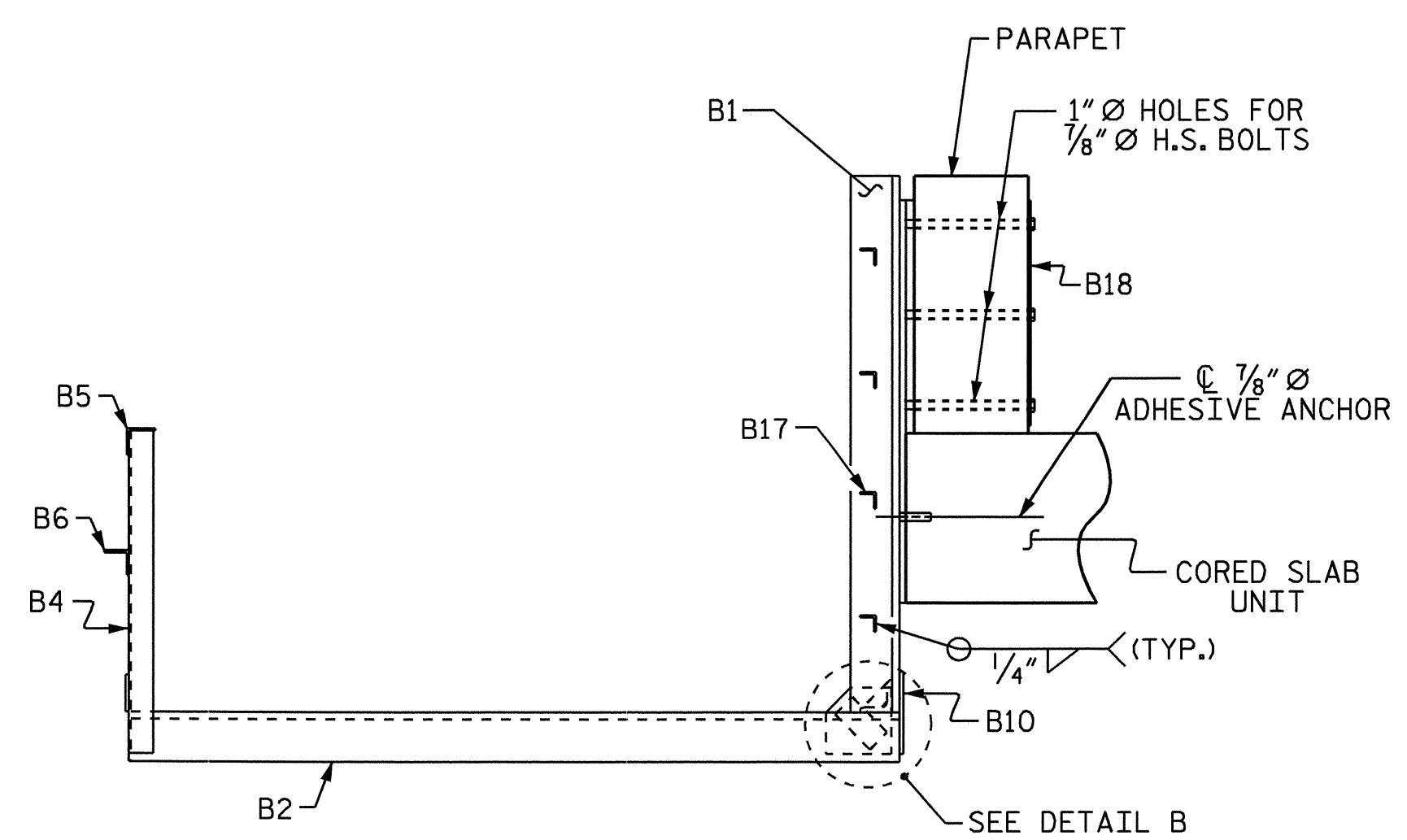
**VIEW C-C**



**SECTION D-D**



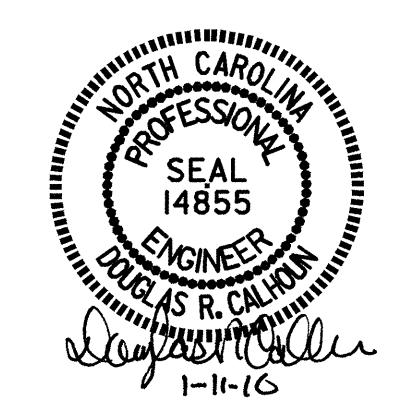
**VIEW B-B**



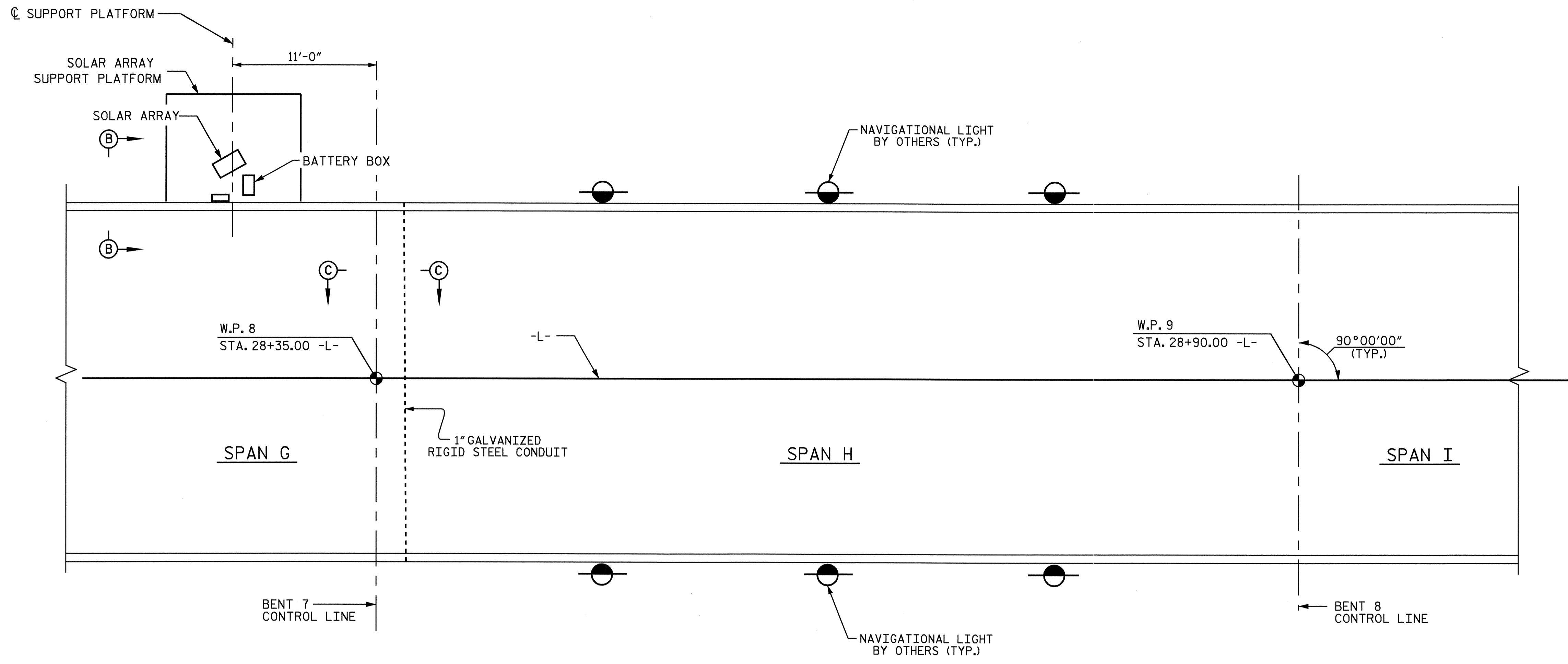
**SECTION E-E**

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

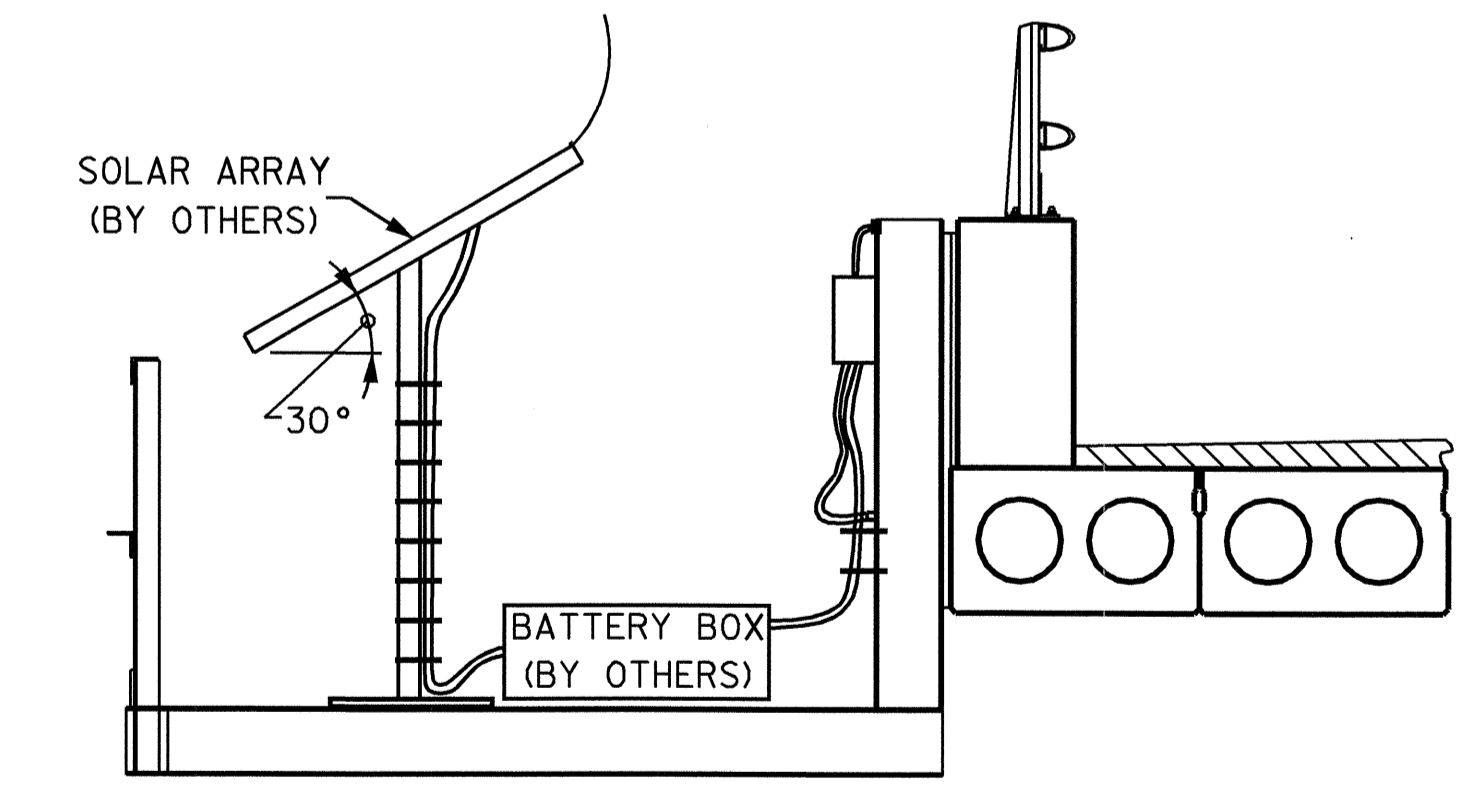
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SOLAR ARRAY PLATFORM					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



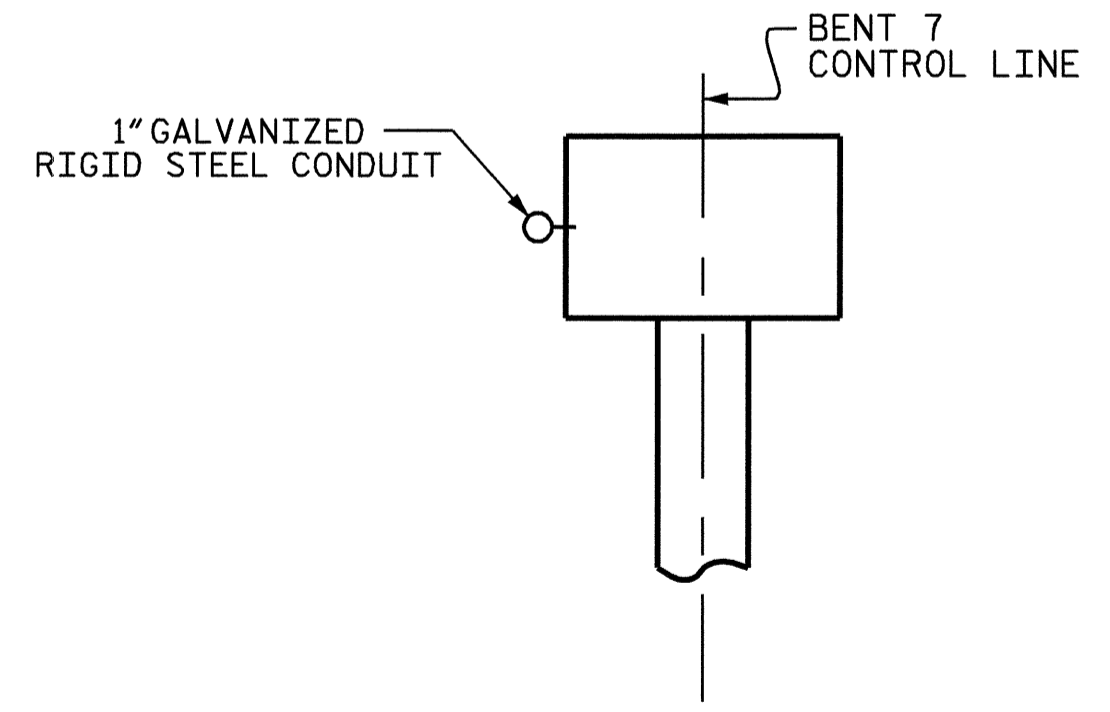
DRAWN BY : B.N. GRADY DATE : 11/19/09  
 CHECKED BY : D.R. CALHOUN DATE : 11/24/09



PLAN



SECTION B-B

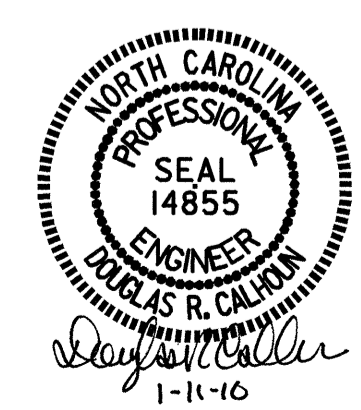


SECTION C-C

**NOTES:**  
 FOR NAVIGATIONAL LIGHTING SYSTEM, SEE SOLAR ARRAY SUPPORT PLATFORM SPECIAL PROVISION.  
 SEE "SOLAR ARRAY PLATFORM" SHEET FOR ADDITIONAL DETAILS.  
 1" GALVANIZED RIGID STEEL CONDUIT TO BE PLACED DURING BENT 7 CONSTRUCTION.

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

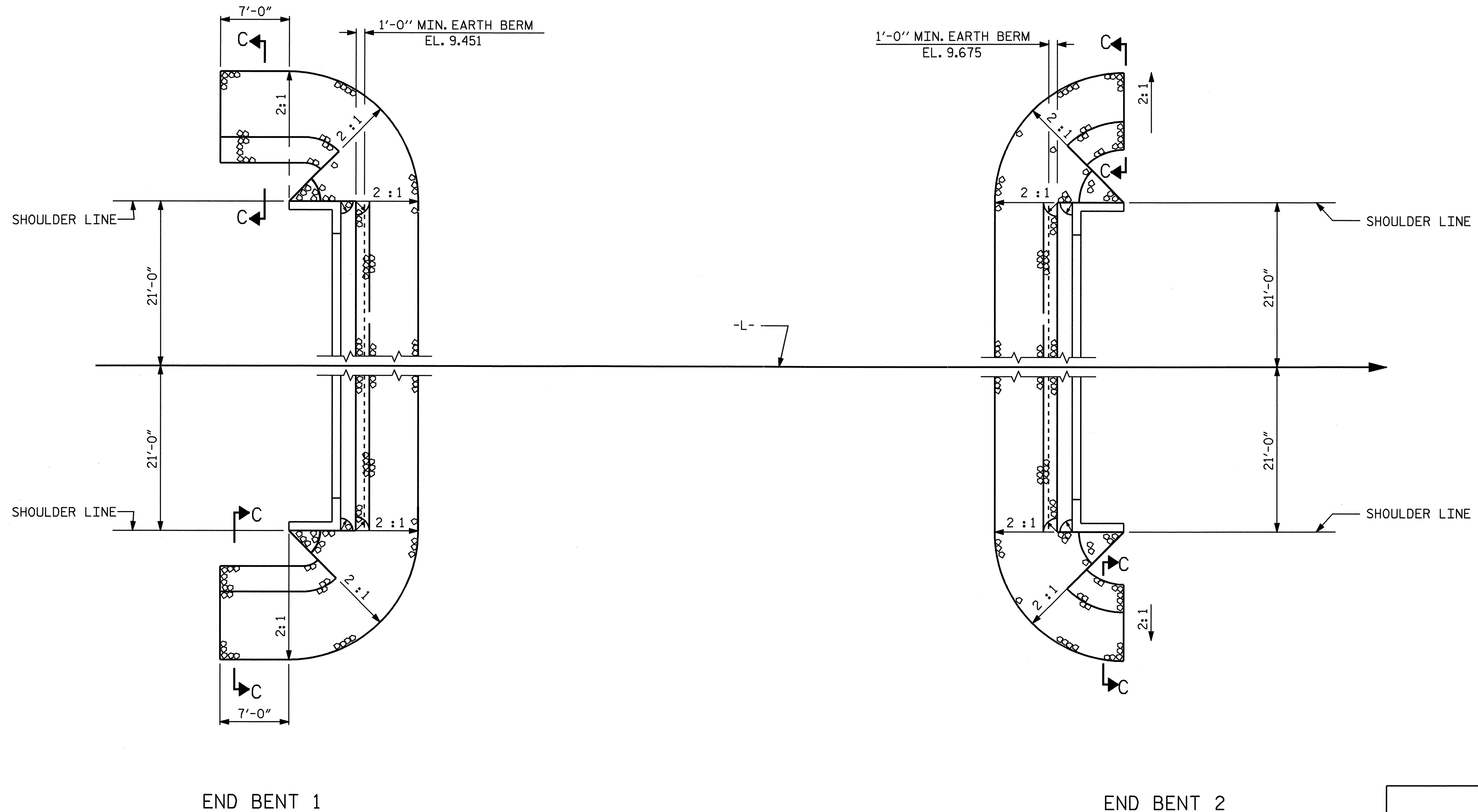
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 NAVIGATIONAL LIGHTING  
 AND  
 CONDUIT SYSTEM



DRAWN BY : B.N. GRADY DATE : 11/19/09  
 CHECKED BY : D.R. CALHOUN DATE : 11/24/09

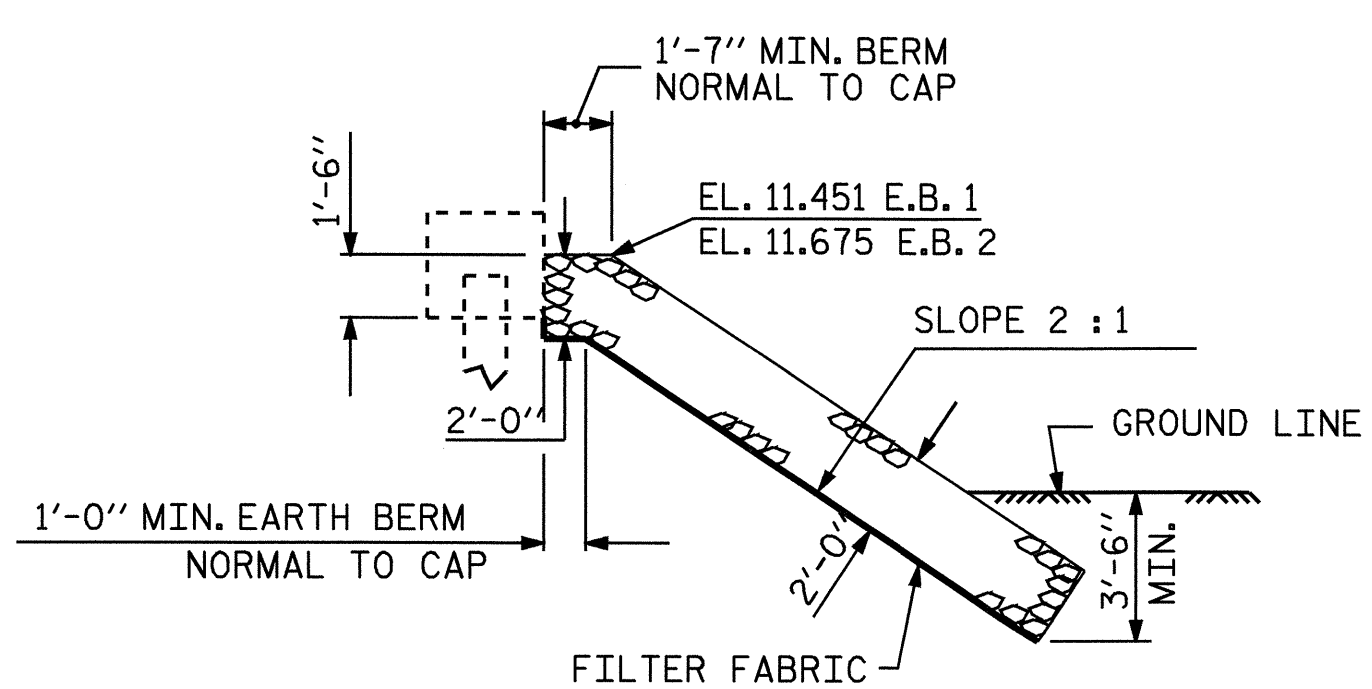
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
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2			4			39

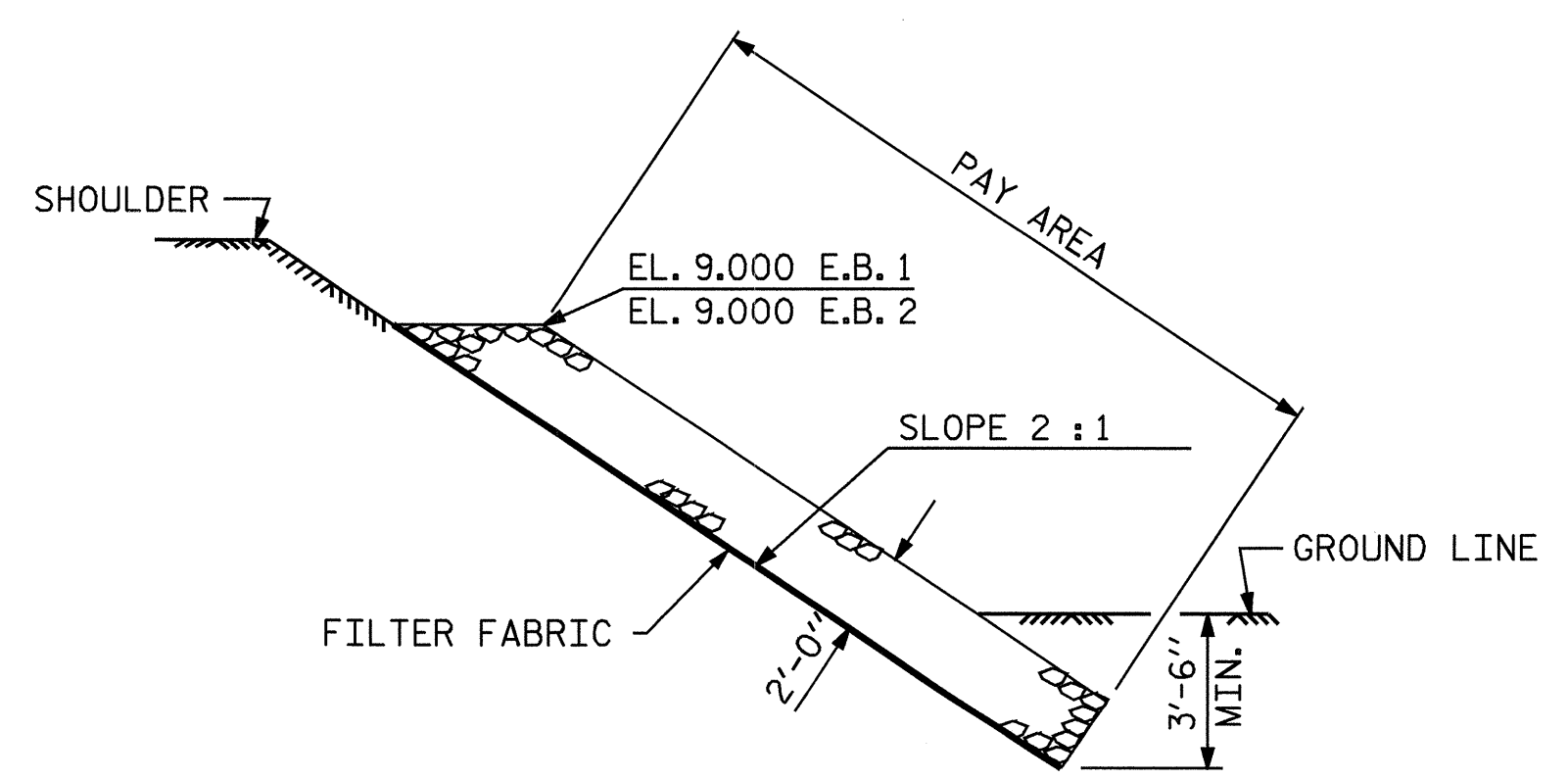


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 28+50.00 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	105	117
END BENT 2	88	98



SECTION C-C  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-



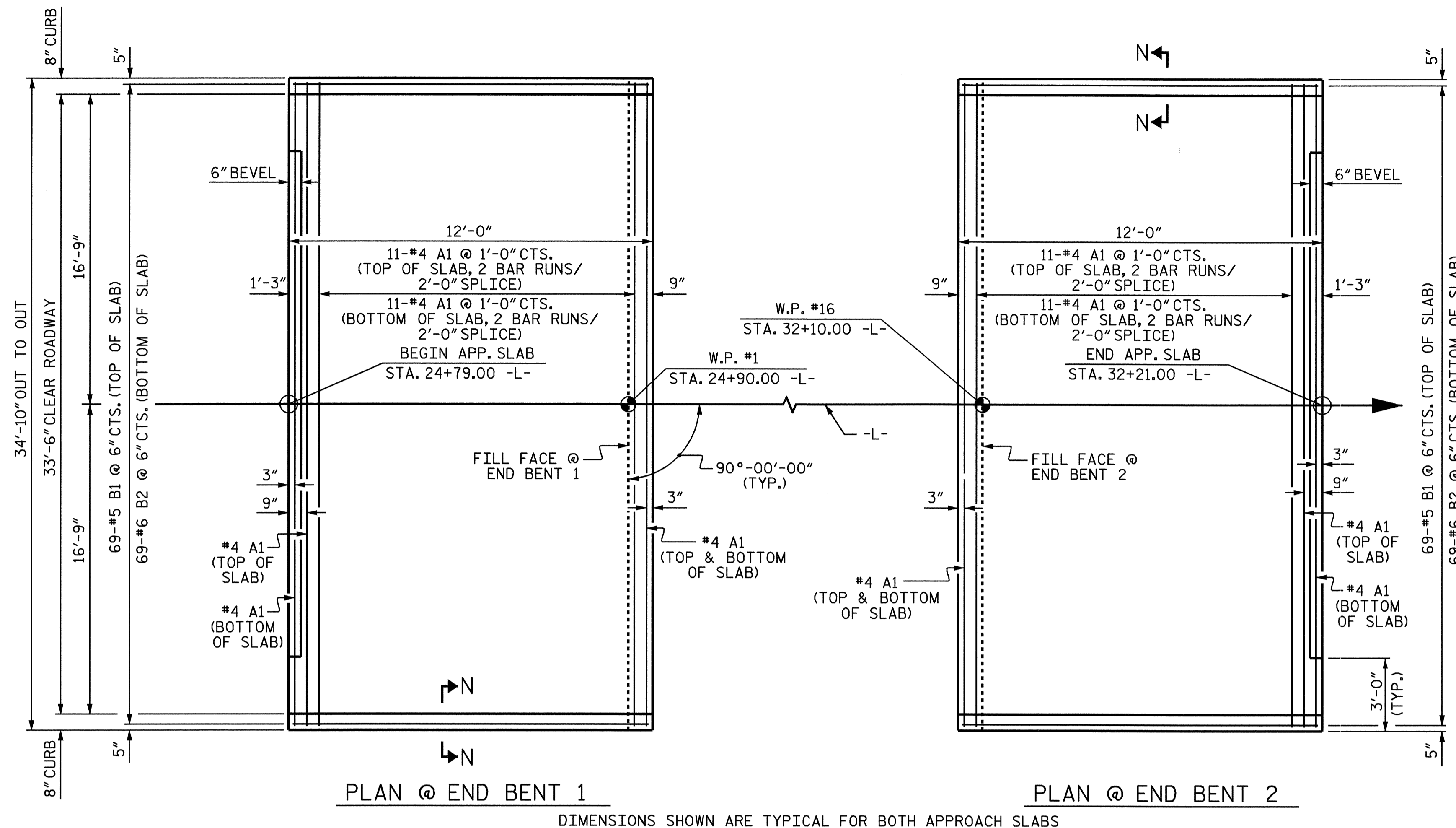
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : J.L. WALTON DATE : 8/25/09  
 CHECKED BY : B.N. GRADY DATE : 10/13/09  
 DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES  
 CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 TLA/GM

24-NOV-2009 15:24  
 z:\structures\final plans\b-3809.sd\_rr\_1.dgn  
 jmya



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

NOTES

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

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

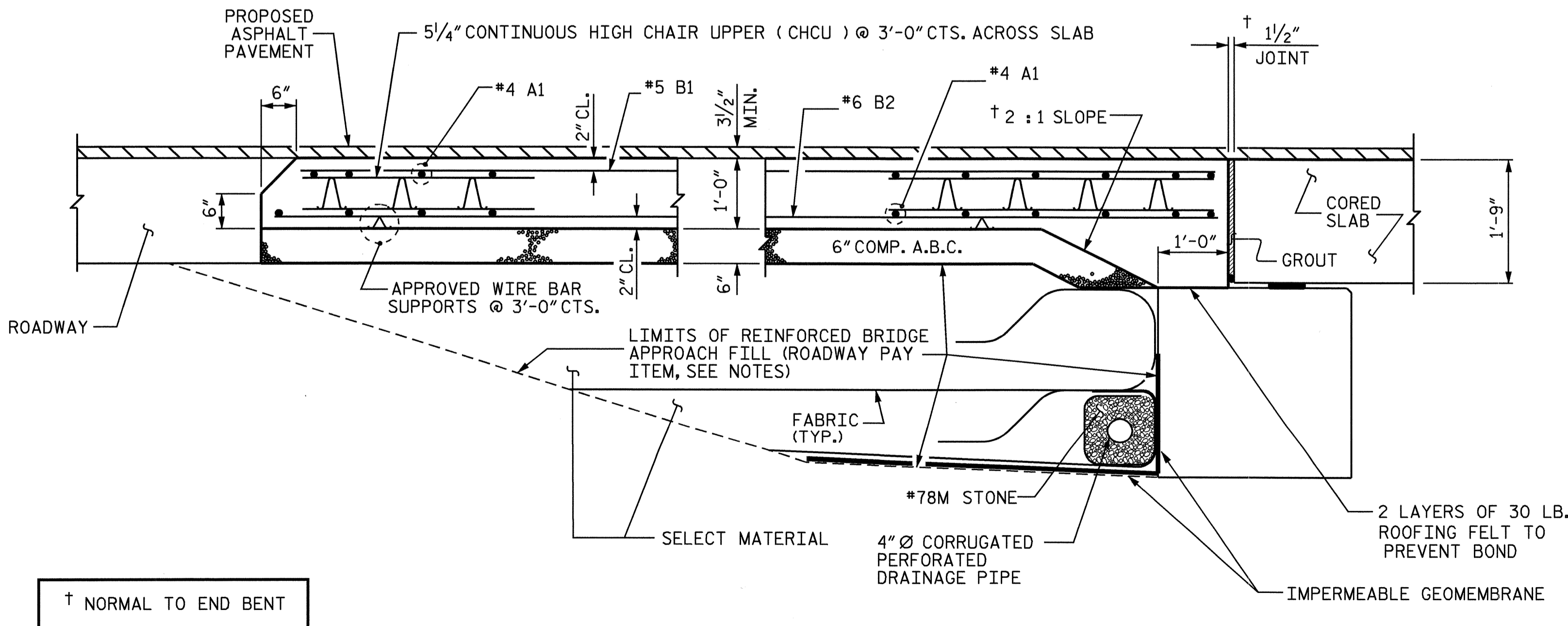
THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

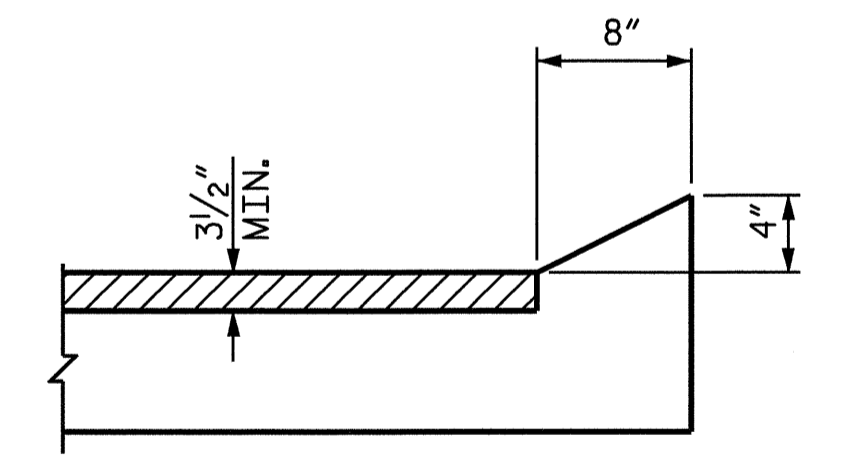
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

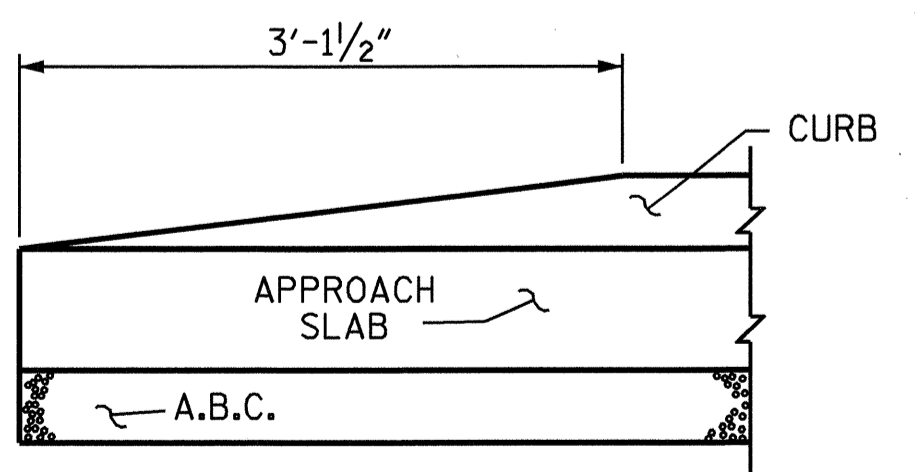
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	18'-2"	631
*B1	69	#5	STR	11'-2"	804
*B2	69	#6	STR	11'-6"	1192
*EPOXY COATED REINFORCING STEEL				LBS.	2627
CLASS AA CONCRETE				C. Y.	17.1



SECTION THRU SLAB



SECTION N-N



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

CURB DETAILS

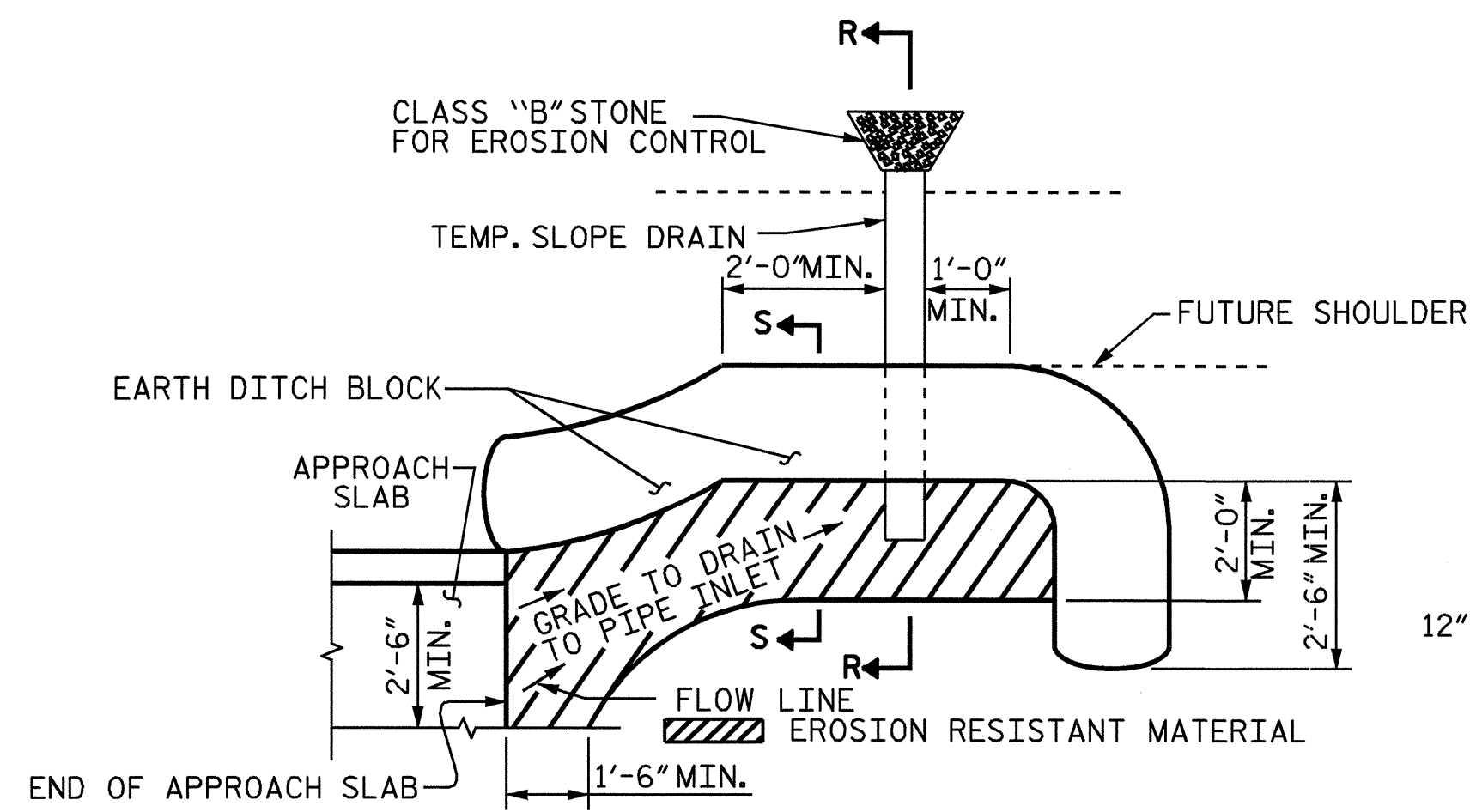
PROJECT NO. B-3809  
 BEAUFORT COUNTY  
 STATION: 28+50.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB



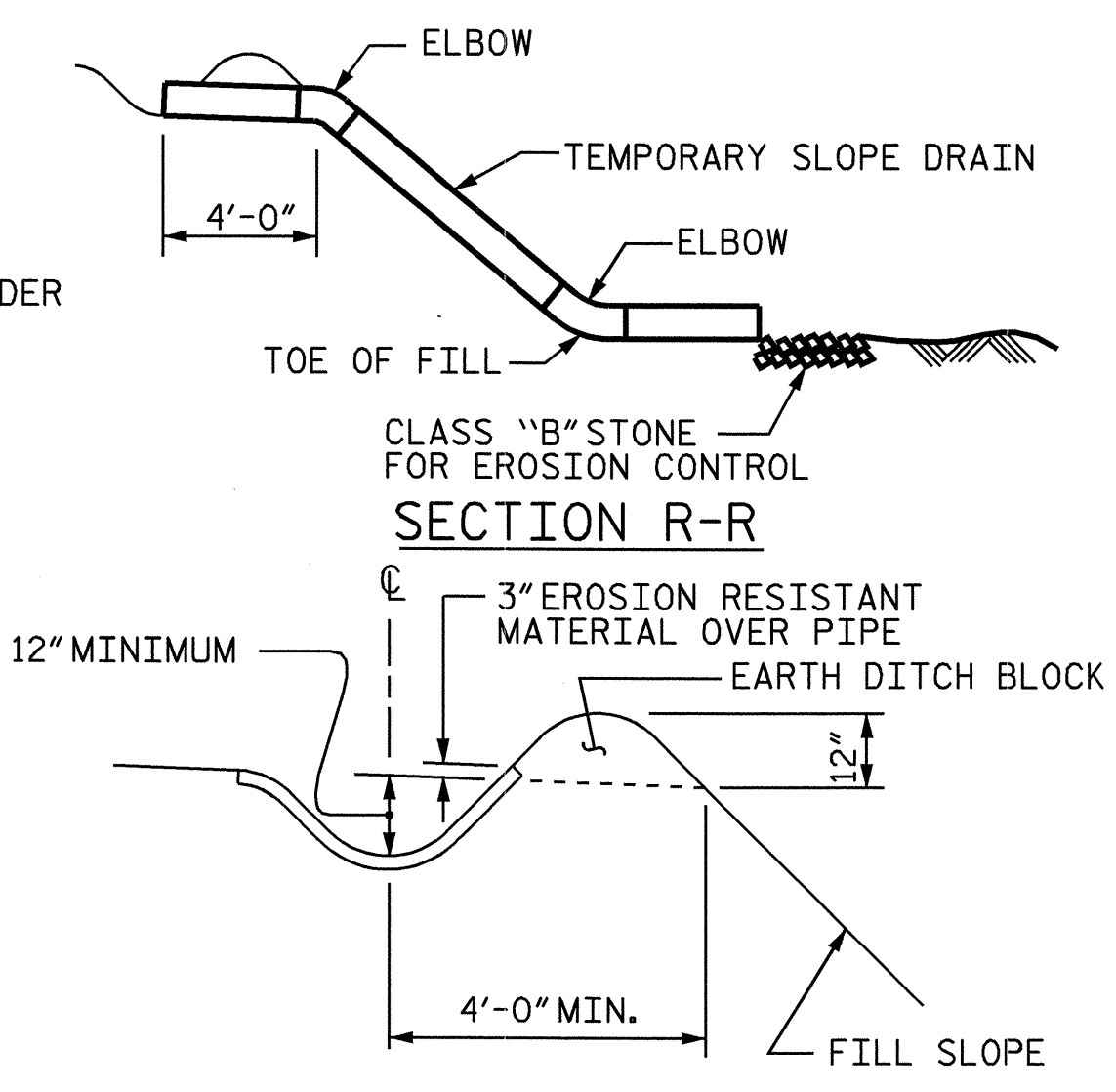
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY: J.L. WALTON	DATE: 8/20/09
CHECKED BY: D.R. CALHOUN	DATE: 8/27/09
DRAWN BY: FCJ 6/87	REV. 7/10/01 LES/RDR
CHECKED BY: EGA 6/87	REV. 5/7/03R RWW/JTE
	REV. 5/1/06R KMM/JM

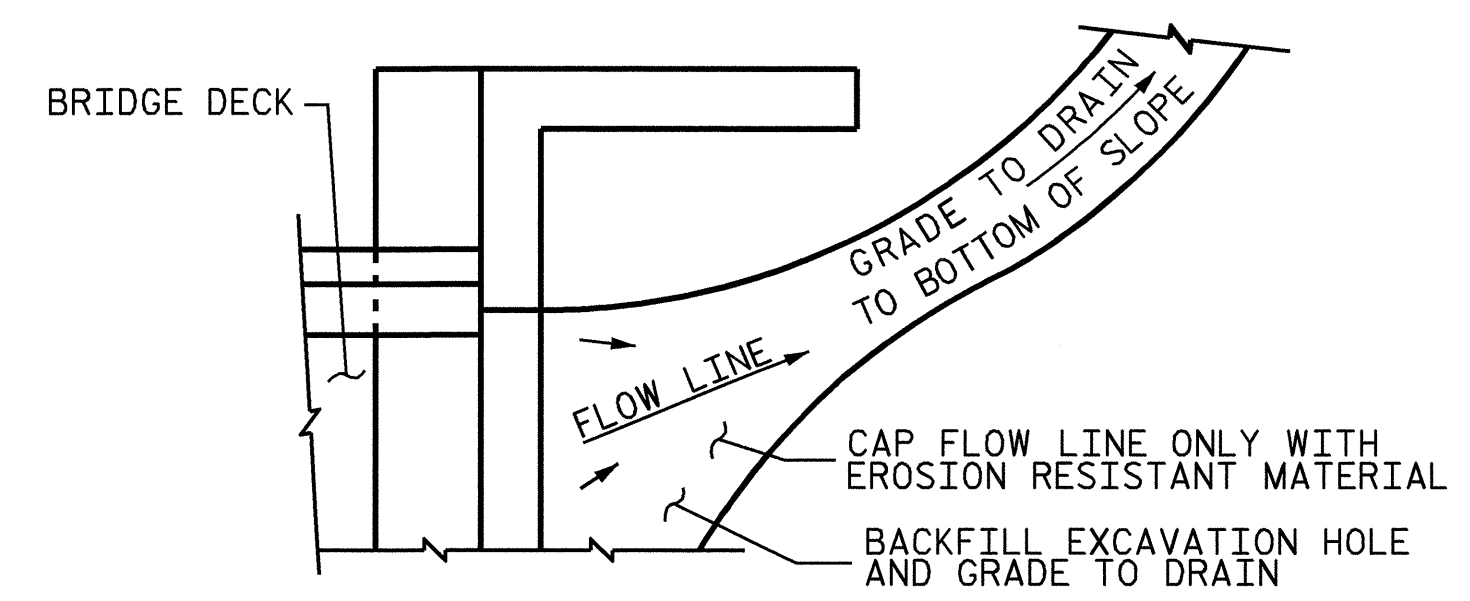


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



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.

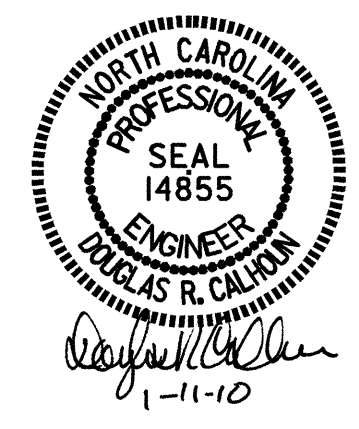
TEMPORARY DRAINAGE DETAIL

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-3809  
BEAUFORT COUNTY  
 STATION: 28+50.00 -L-

SHEET 2 OF 2



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

ASSEMBLED BY : J.L. WALTON	DATE : 8/20/09
CHECKED BY : D.R. CALHOUN	DATE : 8/27/09
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			39

STD. NO. BAS10



