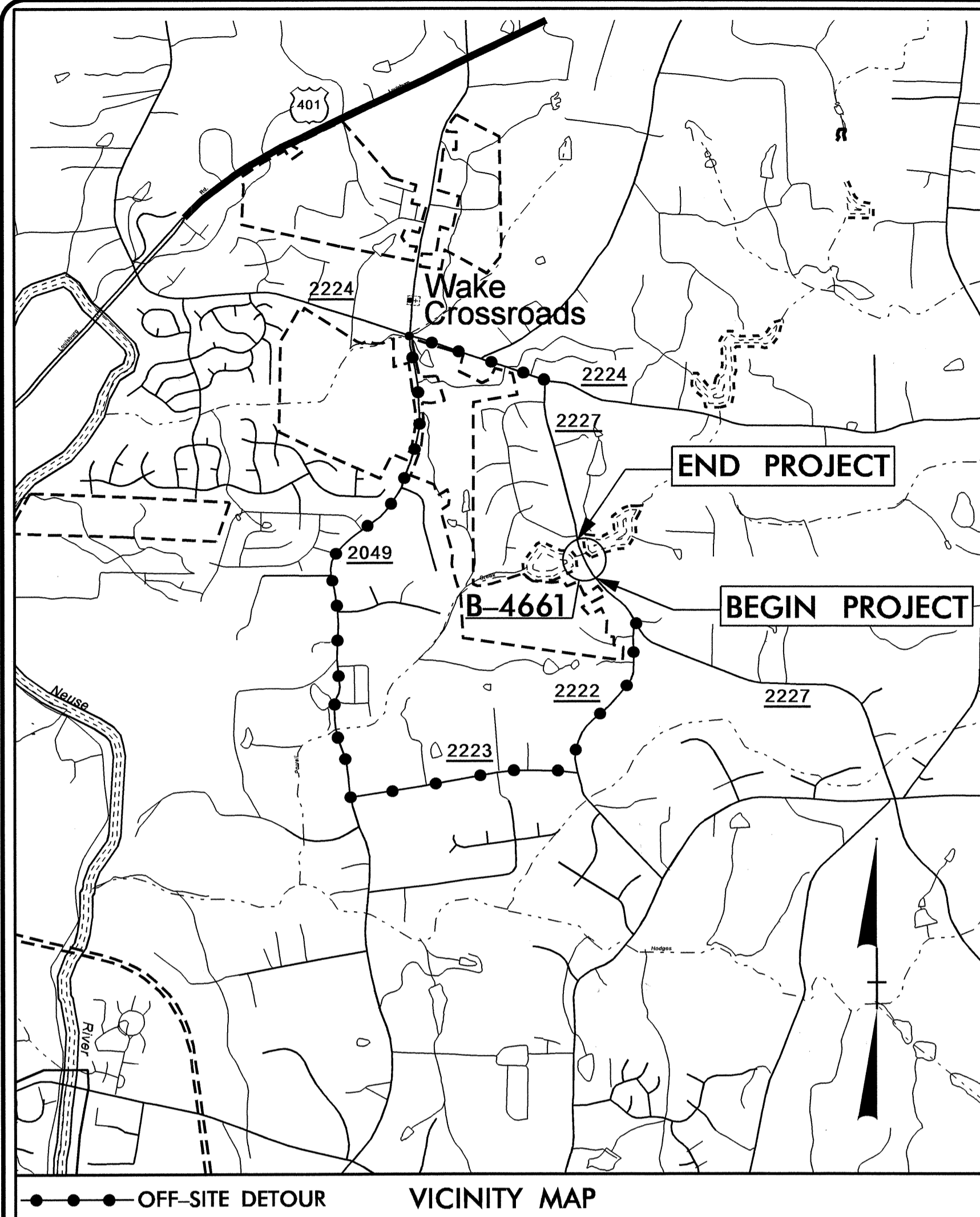


TIP PROJECT: B-4661

CONTRACT: C202751



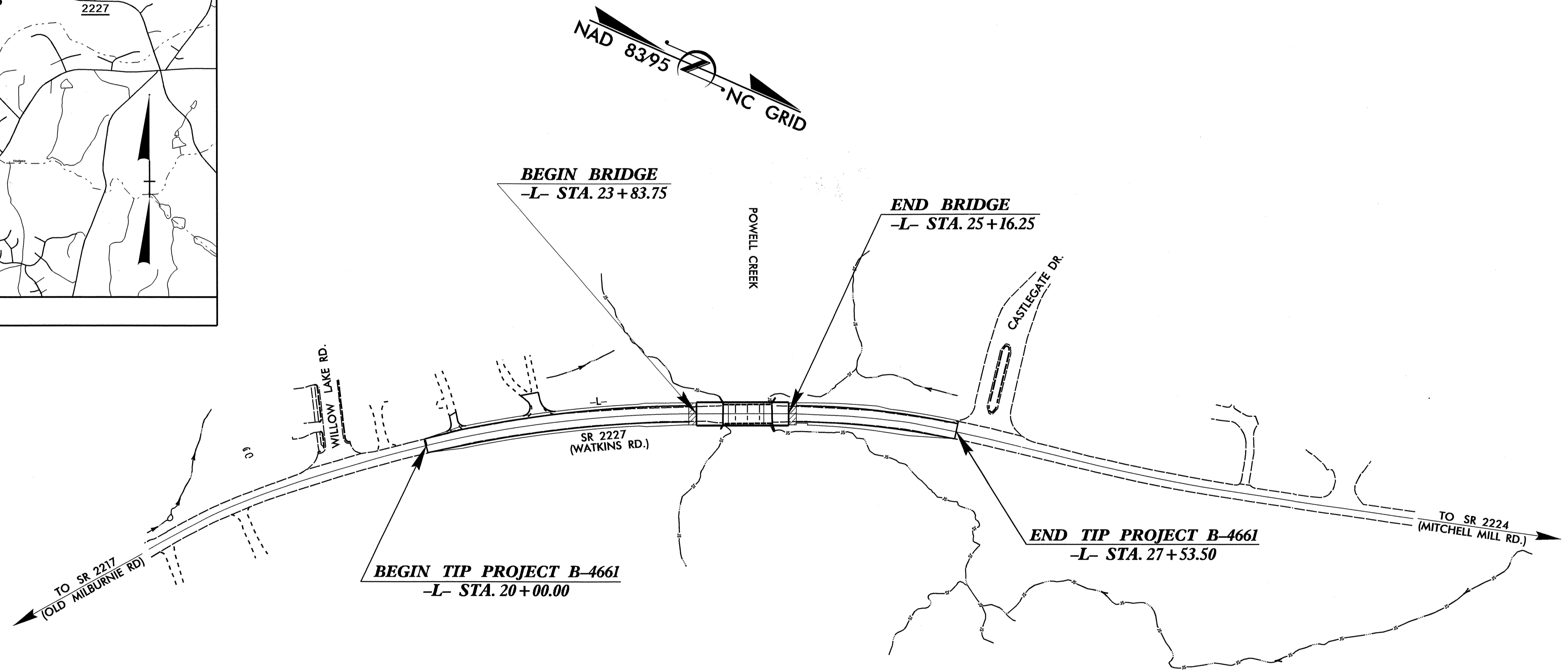
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# WAKE COUNTY

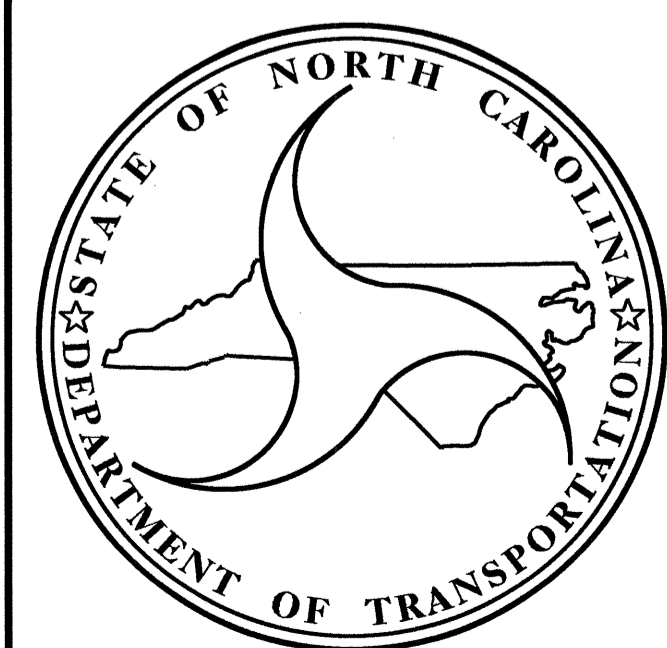
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4661		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33823.1.1	BRZ-2227(1)	P.E.	
33823.2.1	BRZ-2227(1)	R/W, UTIL	
33823.3.1	BRZ-2227(1)	CONST.	

**LOCATION:** BRIDGE NO. 151 OVER POWELL CREEK  
ON SR 2227 (WATKINS RD.) BETWEEN SR 2224  
(MITCHELL MILL RD.) AND SR 2217 (OLD MILBURNIE RD.)

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



STRUCTURE



**DESIGN DATA**

ADT 2012 =	4900
ADT 2032 =	10100
DHV =	10 %
D =	60 %
T =	5 % *
V =	50 MPH

\* (TTST 1% + DUAL 4%)  
FUNC CLASS = URBAN  
MINOR COLLECTOR

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJ. B-4661 =	0.118 MILES
LENGTH STRUCTURES TIP PROJ. B-4661 =	0.025 MILES
TOTAL LENGTH OF TIP PROJ. B-4661 =	0.143 MILES

2012 STANDARD SPECIFICATIONS

**LETTING DATE:**  
JANUARY 17, 2012

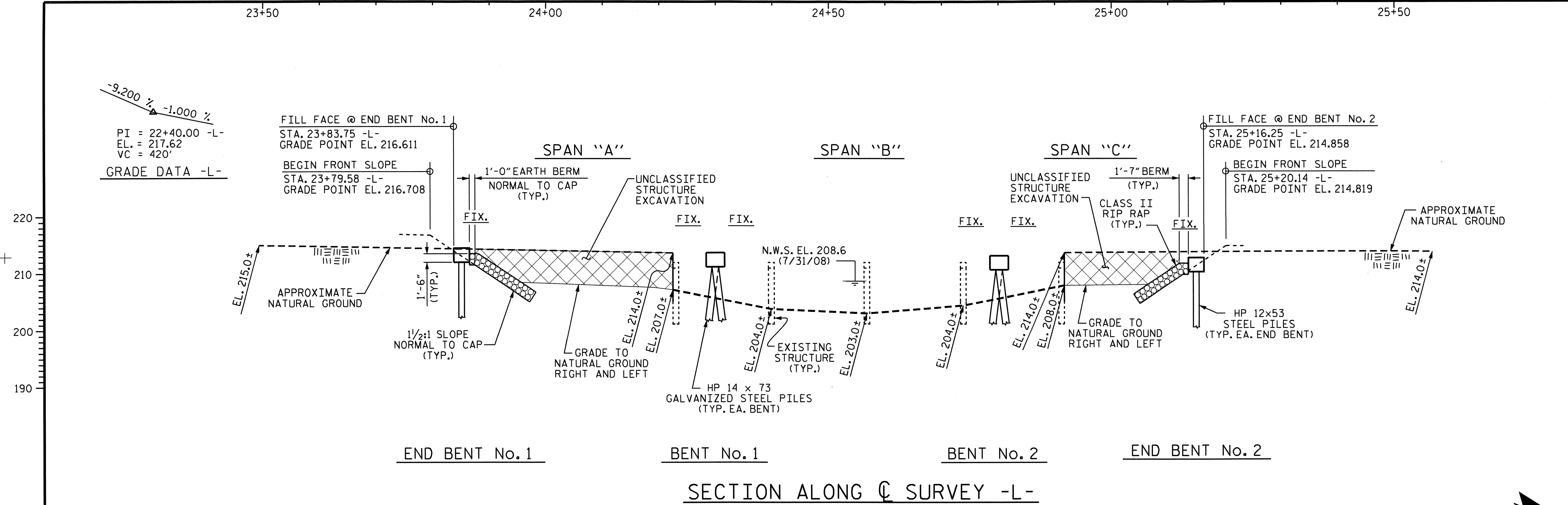
Prepared in the Office of:  
**DEPARTMENT OF TRANSPORTATION**  
1000 BIRCH RIDGE DR.  
RALEIGH, N.C. 27610

**B. S. COX, P.E.**  
PROJECT ENGINEER

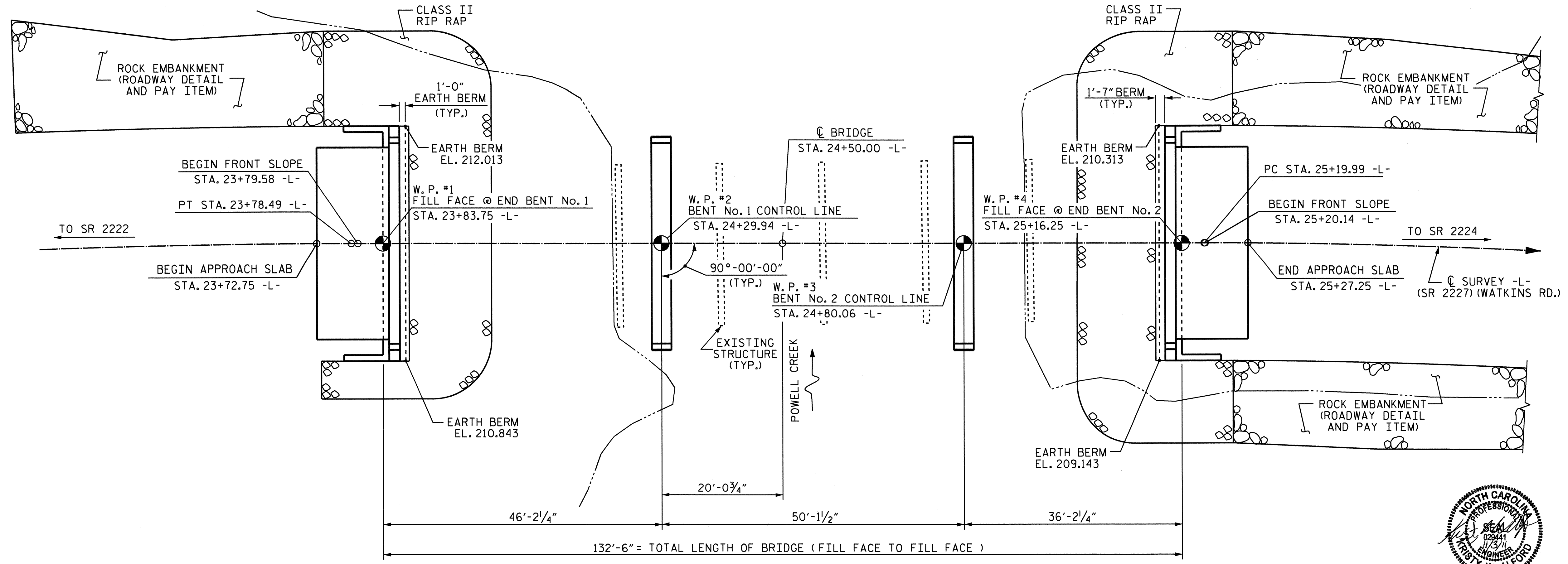
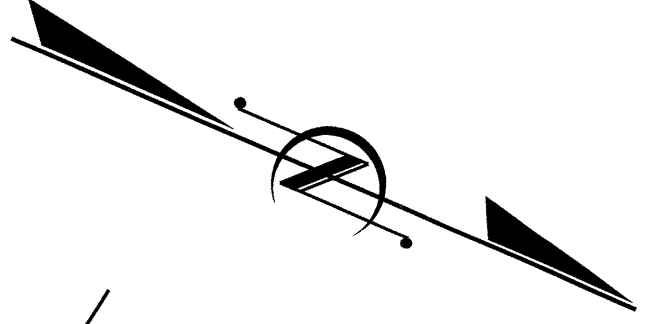
**K. W. ALFORD, P.E.**  
PROJECT DESIGN ENGINEER



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-  
 SHEET 1 OF 2 REPLACES BRIDGE No. 151

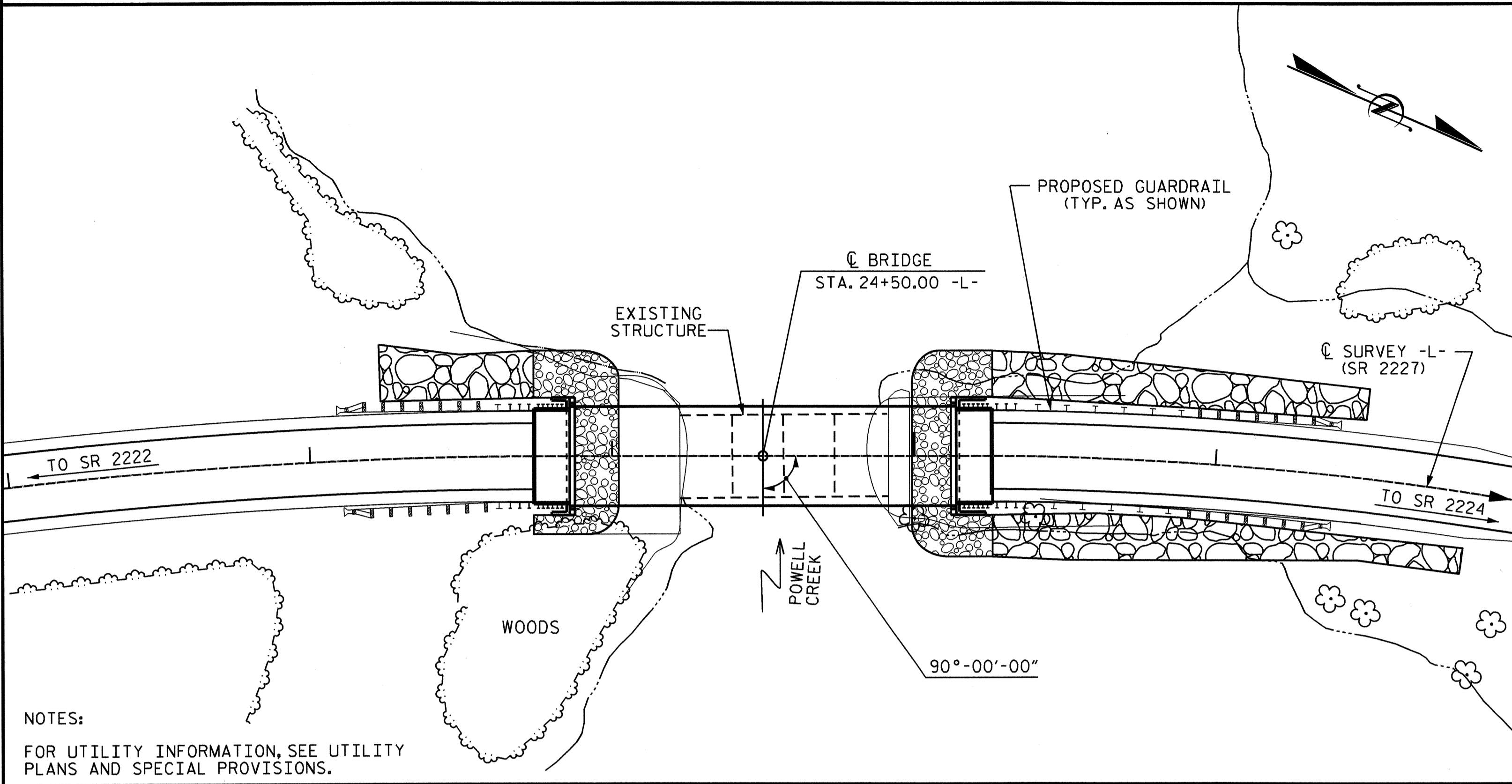


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 POWELL CREEK ON  
 SR 2227 (WATKINS RD.)  
 BETWEEN SR 2222 & SR 2224

DRAWN BY: A. V. ROYAL DATE: 03/11  
 CHECKED BY: T. M. GARRISON DATE: 03/11

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



NOTES:  
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 1 @ 17'-9", 2 @ 17'-0", 1 @ 17'-9" SPANS WITH A REINFORCED CONCRETE DECK ON TIMBER JOISTS, WITH A CLEAR ROADWAY WIDTH OF 23.6', WITH TIMBER CAP AND TIMBER PILE END BENTS AND BENTS WITH A CRUTCH BENT AT END BENT No. 1, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING STRUCTURE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE STRUCTURE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISION FOR REMOVAL OF EXISTING STRUCTURE.

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 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 PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 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.

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

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 61 TONS PER PILE.

PILES AT END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.

PILES AT BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 135 TONS PER PILE.

PILES AT BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR.

DRIVE PILES AT BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 AND BENT No. 2 IS ELEVATION 191.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

GALVANIZED STEEL PILES ARE REQUIRED IN ACCORDANCE WITH THE SECTION 450 OF THE STANDARD SPECIFICATIONS.

STEEL PILE POINTS ARE REQUIRED FOR STEEL PILES AT BENT No. 1 AND BENT No. 2.

HYDROGRAPHIC DATA

DESIGN DISCHARGE \_\_\_\_\_ 2,800 CFS  
 FREQUENCY OF DESIGN FLOOD \_\_\_\_\_ 25 YR  
 DESIGN HIGH WATER ELEVATION \_\_\_\_\_ 214.0  
 DRAINAGE AREA \_\_\_\_\_ 9 SQ.MI.  
 BASE DISCHARGE (Q100) \_\_\_\_\_ 3,600 CFS  
 BASE HIGH WATER ELEVATION \_\_\_\_\_ 214.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE \_\_\_\_\_ 4,100 CFS  
 FREQUENCY OF OVERTOPPING FLOOD \_\_\_\_\_ 100 YR+  
 OVERTOPPING FLOOD ELEVATION \_\_\_\_\_ 214.7

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES	HP 14 X 73 GALVANIZED STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 2'-10" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CORED SLABS			
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	NO.	LIN. FT.	
SUPERSTRUCTURE									245.5	260.5					33	1430.0	
END BENT No.1		LUMP SUM	14.3		2129	7	105					145	165				
BENT No.1			10.8		2162			8	200	8							
BENT No.2			10.8		2162			8	240	8							
END BENT No.2		LUMP SUM	14.3		2129	7	175				100	115					
TOTAL	LUMP SUM	LUMP SUM	50.2	LUMP SUM	8582	14	280	16	440	16	245.5	260.5	245	280	LUMP SUM	33	1430.0

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 POWELL CREEK ON  
 SR 2227 (WATKINS RD.)  
 BETWEEN SR 2222 & SR 2224

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

DRAWN BY: A. V. ROYAL DATE: 03/11  
 CHECKED BY: T. M. GARRISON DATE: 03/11

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.088	--	1.75	0.277	1.34	45'	EL	22	0.539	1.23	45'	EL	2.2	0.80	0.277	1.09	45'	EL	22		
	HL-93(Opr)	N/A	--	1.59	--	1.35	0.277	1.74	45'	EL	22	0.539	1.59	45'	EL	2.2	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.336	48.104	1.75	0.277	1.65	45'	EL	22	0.539	1.45	45'	EL	2.2	0.80	0.277	1.34	45'	EL	22		
	HS-20(Opr)	36.000	--	1.882	67.763	1.35	0.277	2.14	45'	EL	22	0.539	1.88	45'	EL	2.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.611	35.252	1.4	0.277	4.02	45'	EL	22	0.539	4.01	45'	EL	2.2	0.80	0.277	2.61	45'	EL	22	
		SNGARBS2	20.000	--	2.108	42.166	1.4	0.277	3.25	45'	EL	22	0.539	2.94	45'	EL	2.2	0.80	0.277	2.11	45'	EL	22	
		SNAGRIS2	22.000	--	2.067	45.466	1.4	0.277	3.15	45'	EL	17.6	0.539	2.77	45'	EL	2.2	0.80	0.277	2.07	45'	EL	22	
		SNCOTTS3	27.250	--	1.304	35.527	1.4	0.277	2.01	45'	EL	22	0.539	2.01	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		SNAGGRS4	34.925	--	1.15	40.181	1.4	0.277	1.77	45'	EL	22	0.539	1.74	45'	EL	2.2	0.80	0.277	1.15	45'	EL	22	
		SNS5A	35.550	--	1.121	39.841	1.4	0.277	1.73	45'	EL	22	0.539	1.79	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		SNS6A	39.950	--	1.056	42.175	1.4	0.277	1.63	45'	EL	22	0.539	1.67	45'	EL	2.2	0.80	0.277	1.06	45'	EL	22	
	SNS7B	42.000	3	1.006	42.268	1.4	0.277	1.55	45'	EL	22	0.539	1.68	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22		
	TTST	TNAGRIT3	33.000	--	1.296	42.759	1.4	0.277	2	45'	EL	22	0.539	1.96	45'	EL	2.2	0.80	0.277	1.30	45'	EL	22	
		TNT4A	33.075	--	1.309	43.305	1.4	0.277	2.02	45'	EL	22	0.539	1.88	45'	EL	2.2	0.80	0.277	1.31	45'	EL	22	
		TNT6A	41.600	--	1.099	45.712	1.4	0.277	1.69	45'	EL	22	0.539	1.83	45'	EL	2.2	0.80	0.277	1.10	45'	EL	22	
		TNT7A	42.000	--	1.12	47.043	1.4	0.277	1.73	45'	EL	22	0.539	1.69	45'	EL	2.2	0.80	0.277	1.12	45'	EL	22	
		TNT7B	42.000	--	1.166	48.975	1.4	0.277	1.8	45'	EL	22	0.539	1.61	45'	EL	2.2	0.80	0.277	1.17	45'	EL	22	
		TNAGRIT4	43.000	--	1.111	47.757	1.4	0.277	1.71	45'	EL	22	0.539	1.55	45'	EL	2.2	0.80	0.277	1.11	45'	EL	22	
TNAGT5A		45.000	--	1.033	46.505	1.4	0.277	1.59	45'	EL	22	0.539	1.59	45'	EL	2.2	0.80	0.277	1.03	45'	EL	22		
TNAGT5B	45.000	--	1.009	45.408	1.4	0.277	1.56	45'	EL	22	0.539	1.47	45'	EL	2.2	0.80	0.277	1.01	45'	EL	22			

LOAD FACTORS:

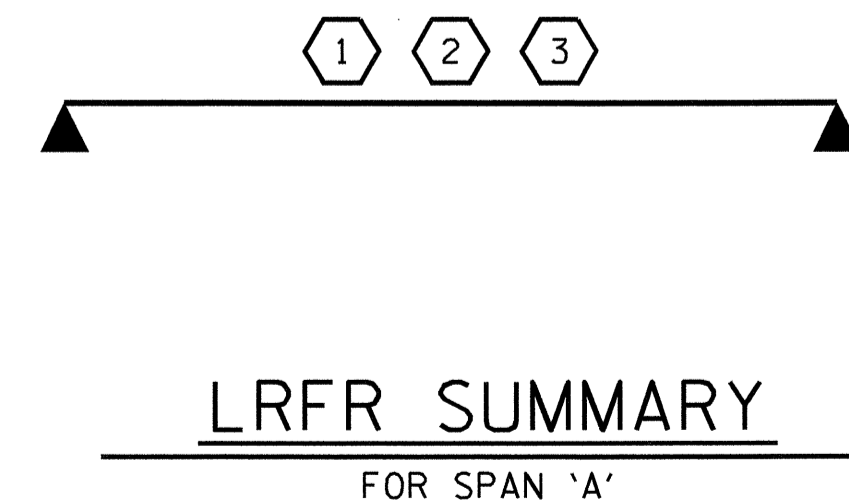
DESIGN LOAD RATING FACTORS	LIMIT STATE	Y <sub>dc</sub>	Y <sub>w</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. B-4661

WAKE COUNTY

STATION: 24+50.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
45' CORED SLAB UNIT  
90° SKEW  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : M. TOM DATE : 08/10  
CHECKED BY : T. BANKOVICH DATE : 09/10  
DRAWN BY : CVC 6/10  
CHECKED BY : DNS 6/10

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(I <sub>nv</sub> )	N/A	1	1.394	--	1.75	0.276	1.57	50'	EL	24.5	0.531	<b>1.39</b>	50'	EL	<b>2.45</b>	0.80	0.276	1.44	50'	EL	24.5		
	HL-93(O <sub>pr</sub> )	N/A	--	1.807	--	1.35	0.276	2.03	50'	EL	24.5	0.531	1.81	50'	EL	2.45	N/A	--	--	--	--	--		
	HS-20(I <sub>nv</sub> )	36.000	2	1.667	60.007	1.75	0.276	1.95	50'	EL	24.5	0.531	<b>1.67</b>	50'	EL	<b>2.45</b>	0.80	0.276	1.79	50'	EL	24.5		
	HS-20(O <sub>pr</sub> )	36.000	--	2.161	77.787	1.35	0.276	2.52	50'	EL	24.5	0.531	2.16	50'	EL	2.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.635	49.079	1.4	0.276	4.95	50'	EL	24.5	0.531	4.7	50'	EL	2.45	0.80	0.276	3.64	50'	EL	24.5	
		SNGARBS2	20.000	--	2.871	57.42	1.4	0.276	3.91	50'	EL	24.5	0.531	3.42	50'	EL	2.45	0.80	0.276	2.87	50'	EL	24.5	
		SNAGRIS2	22.000	--	2.778	61.109	1.4	0.276	3.78	50'	EL	19.6	0.531	3.21	50'	EL	2.45	0.80	0.276	2.78	50'	EL	24.5	
		SNCOTTS3	27.250	--	1.814	49.418	1.4	0.276	2.47	50'	EL	24.5	0.531	2.36	50'	EL	2.45	0.80	0.276	1.81	50'	EL	24.5	
		SNAGGRS4	34.925	--	1.577	55.063	1.4	0.276	2.15	50'	EL	24.5	0.531	2.01	50'	EL	2.45	0.80	0.276	1.58	50'	EL	24.5	
		SNS5A	35.550	--	1.537	54.657	1.4	0.276	2.09	50'	EL	24.5	0.531	2.07	50'	EL	2.45	0.80	0.276	1.54	50'	EL	24.5	
		SNS6A	39.950	--	1.438	57.43	1.4	0.276	1.96	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
	SNS7B	42.000	--	1.37	57.54	1.4	0.276	1.87	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.37	50'	EL	24.5		
	TTST	TNAGRIT3	33.000	--	1.761	58.118	1.4	0.276	2.4	50'	EL	24.5	0.531	2.25	50'	EL	2.45	0.80	0.276	1.76	50'	EL	24.5	
		TNT4A	33.075	--	1.777	58.759	1.4	0.276	2.42	50'	EL	24.5	0.531	2.17	50'	EL	2.45	0.80	0.276	1.78	50'	EL	24.5	
		TNT6A	41.600	--	1.48	61.558	1.4	0.276	2.01	50'	EL	24.5	0.531	2.08	50'	EL	2.45	0.80	0.276	1.48	50'	EL	24.5	
		TNT7A	42.000	--	1.502	63.087	1.4	0.276	2.05	50'	EL	24.5	0.531	1.94	50'	EL	2.45	0.80	0.276	1.50	50'	EL	24.5	
		TNT7B	42.000	--	1.566	65.773	1.4	0.276	2.13	50'	EL	24.5	0.531	1.84	50'	EL	2.45	0.80	0.276	1.57	50'	EL	24.5	
		TNAGRIT4	43.000	--	1.486	63.902	1.4	0.276	2.02	50'	EL	24.5	0.531	1.77	50'	EL	2.45	0.80	0.276	1.49	50'	EL	24.5	
TNAGT5A		45.000	--	1.388	62.47	1.4	0.276	1.89	50'	EL	24.5	0.531	1.8	50'	EL	2.45	0.80	0.276	1.39	50'	EL	24.5		
TNAGT5B	45.000	3	1.36	61.206	1.4	0.276	1.85	50'	EL	24.5	0.531	1.68	50'	EL	2.45	0.80	0.276	<b>1.36</b>	50'	EL	<b>24.5</b>			

LOAD FACTORS:

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

NOTES:

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

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

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

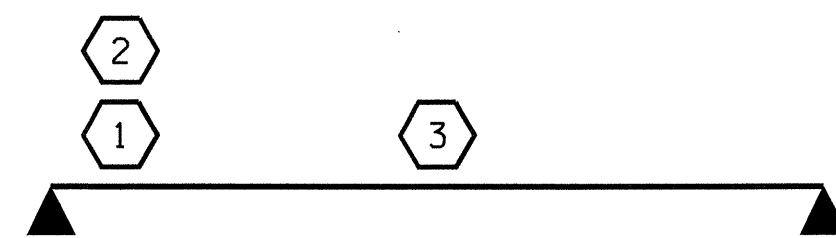
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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



LRFR SUMMARY  
FOR SPAN 'B'

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 50' CORED SLAB UNIT  
 90° SKEW  
 (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY : M. TOM DATE : 08/10  
 CHECKED BY : T. BANKOVICH DATE : 09/10  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.032	--	1.75	0.28	1.36	35'	EL	17	0.561	<b>1.03</b>	35'	EL	1.7	0.80	0.28	1.05	35'	EL	17		
	HL-93(0pr)	N/A	--	1.338	--	1.35	0.28	1.77	35'	EL	17	0.561	1.34	35'	EL	1.7	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.189	42.81	1.75	0.28	1.79	35'	EL	13.6	0.561	<b>1.19</b>	35'	EL	<b>1.7</b>	0.80	0.28	1.39	35'	EL	17		
	HS-20(0pr)	36.000	--	1.542	55.494	1.35	0.28	2.32	35'	EL	13.6	0.561	1.54	35'	EL	1.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.4	32.402	1.4	0.28	3.89	35'	EL	17	0.561	3.06	35'	EL	1.7	0.80	0.28	2.40	35'	EL	17	
		SNGARBS2	20.000	--	2.052	41.044	1.4	0.28	3.29	35'	EL	13.6	0.561	2.32	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNAGRIS2	22.000	--	2.053	45.174	1.4	0.28	3.26	35'	EL	13.6	0.561	2.21	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNCOTTS3	27.250	--	1.202	32.744	1.4	0.28	1.95	35'	EL	17	0.561	1.54	35'	EL	1.7	0.80	0.28	1.20	35'	EL	17	
		SNAGGRS4	34.925	--	1.111	38.816	1.4	0.28	1.8	35'	EL	17	0.561	1.38	35'	EL	1.7	0.80	0.28	1.11	35'	EL	17	
		SNS5A	35.550	--	1.079	38.354	1.4	0.28	1.75	35'	EL	17	0.561	1.46	35'	EL	1.7	0.80	0.28	1.08	35'	EL	17	
		SNS6A	39.950	--	1.041	41.601	1.4	0.28	1.69	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.04	35'	EL	17	
	SNS7B	42.000	3	1.009	42.368	1.4	0.28	1.61	35'	EL	17	0.561	1.4	35'	EL	1.7	0.80	0.28	<b>1.01</b>	35'	EL	17		
	TTST	TNAGRIT3	33.000	--	1.286	42.439	1.4	0.28	2.08	35'	EL	17	0.561	1.6	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT4A	33.075	--	1.285	42.512	1.4	0.28	2.08	35'	EL	17	0.561	1.51	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT6A	41.600	--	1.126	46.84	1.4	0.28	1.82	35'	EL	17	0.561	1.48	35'	EL	1.7	0.80	0.28	1.13	35'	EL	17	
		TNT7A	42.000	--	1.163	48.833	1.4	0.28	1.89	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.14	35'	EL	17	
		TNT7B	42.000	--	1.144	48.061	1.4	0.28	1.85	35'	EL	17	0.561	1.33	35'	EL	1.7	0.80	0.28	1.14	35'	EL	17	
		TNAGRIT4	43.000	--	1.158	49.81	1.4	0.28	1.86	35'	EL	13.6	0.561	1.28	35'	EL	1.7	0.80	0.28	1.16	35'	EL	17	
TNAGT5A		45.000	--	1.068	48.071	1.4	0.28	1.73	35'	EL	17	0.561	1.35	35'	EL	1.7	0.80	0.28	1.07	35'	EL	17		
TNAGT5B	45.000	--	1.031	46.373	1.4	0.28	1.67	35'	EL	17	0.561	1.21	35'	EL	1.7	0.80	0.28	1.03	35'	EL	17			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>OW</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

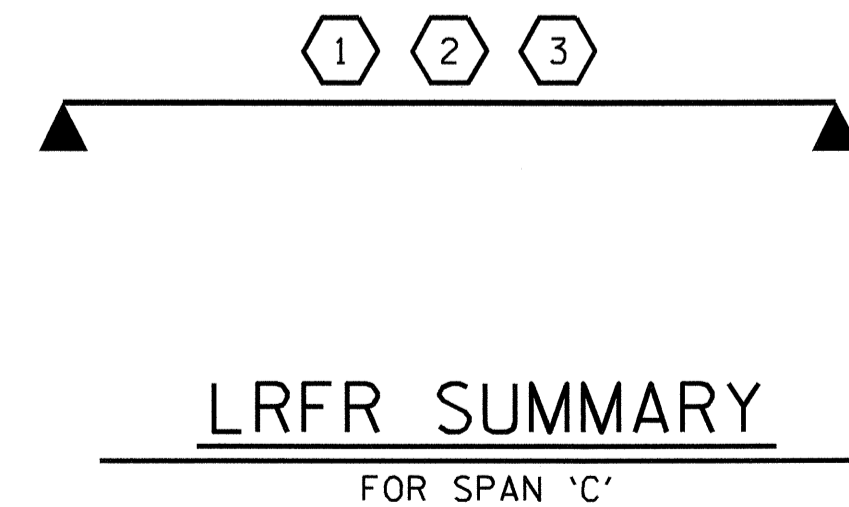
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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



PROJECT NO. B-4661  
WAKE COUNTY  
STATION: 24+50.00 -L-

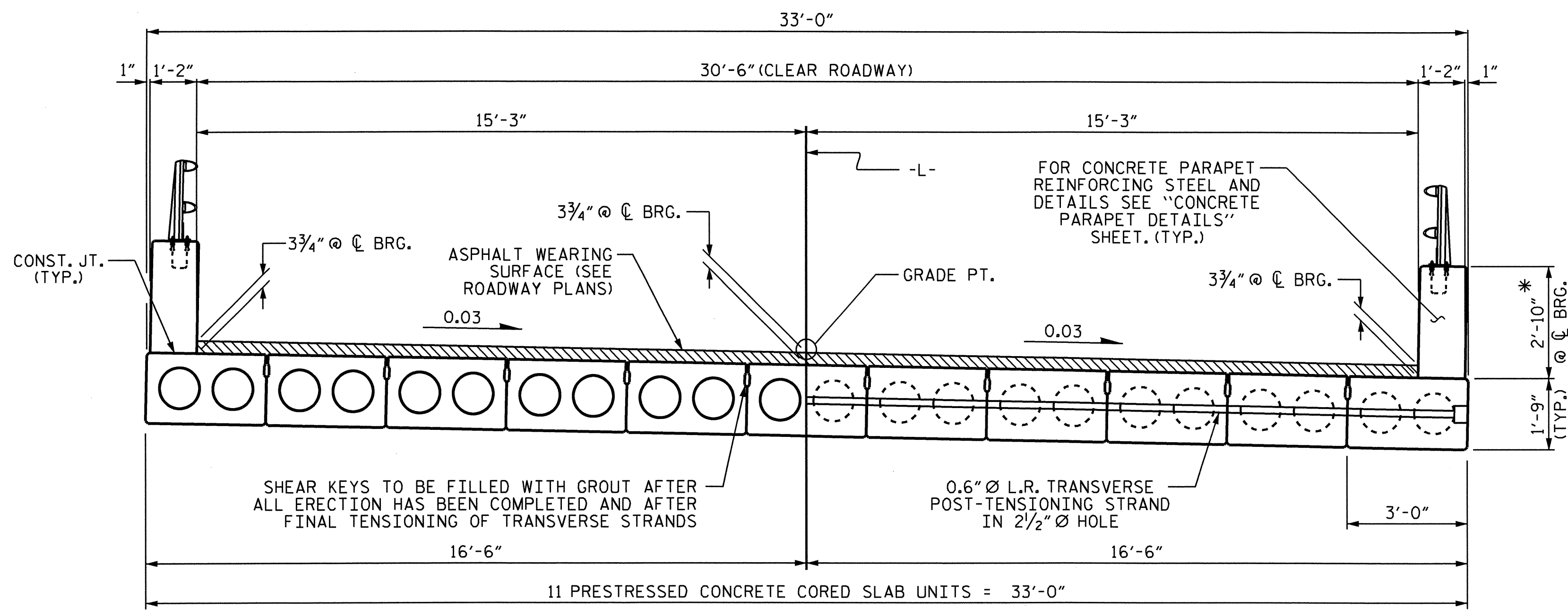
SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
35' CORED SLAB UNIT  
90° SKEW  
(NON-INTERSTATE TRAFFIC)

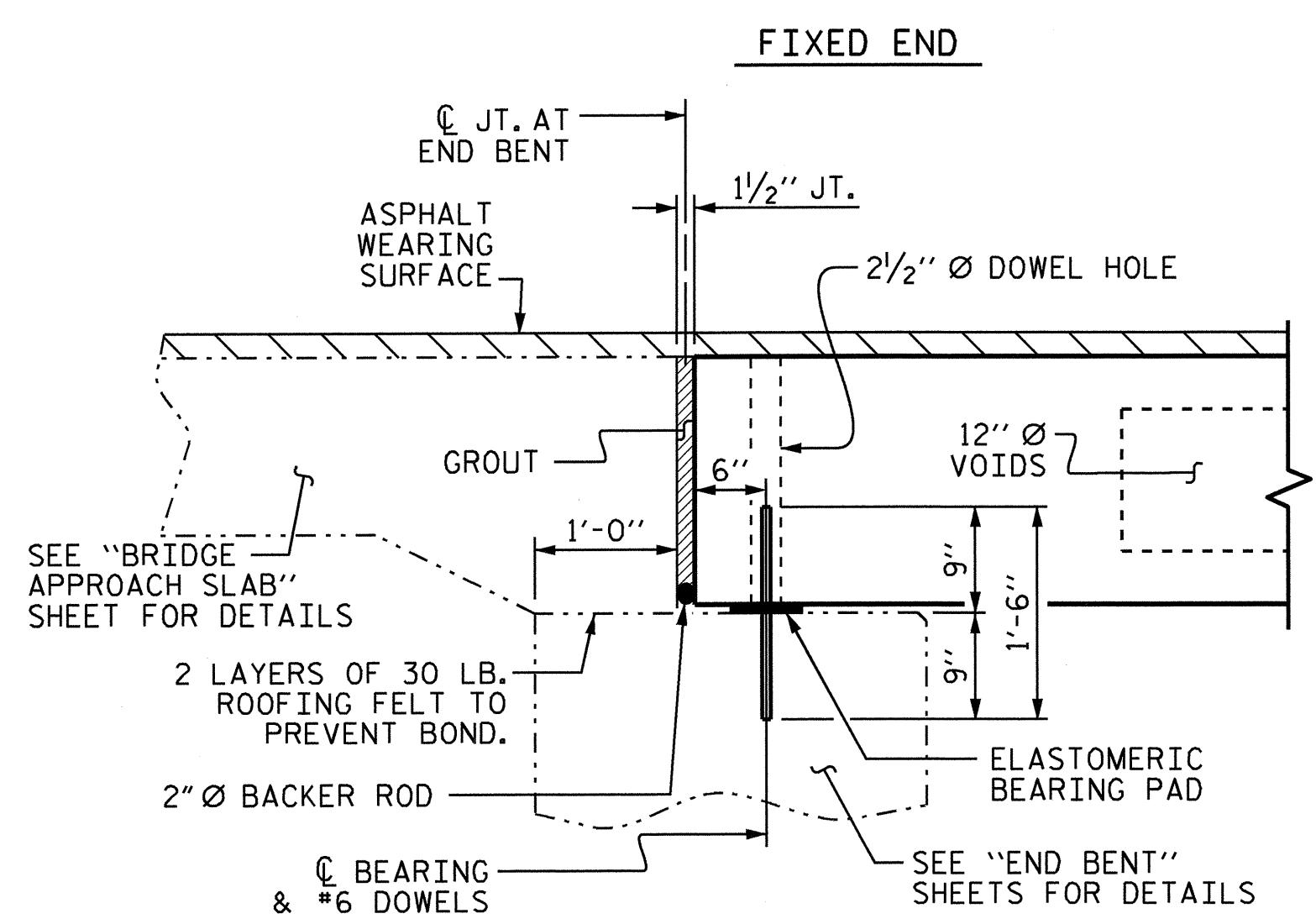
ASSEMBLED BY : M. TOM DATE : 08/10  
CHECKED BY : T. BANKOVICH DATE : 09/10  
DRAWN BY : CVC 6/10  
CHECKED BY : DNS 6/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			24

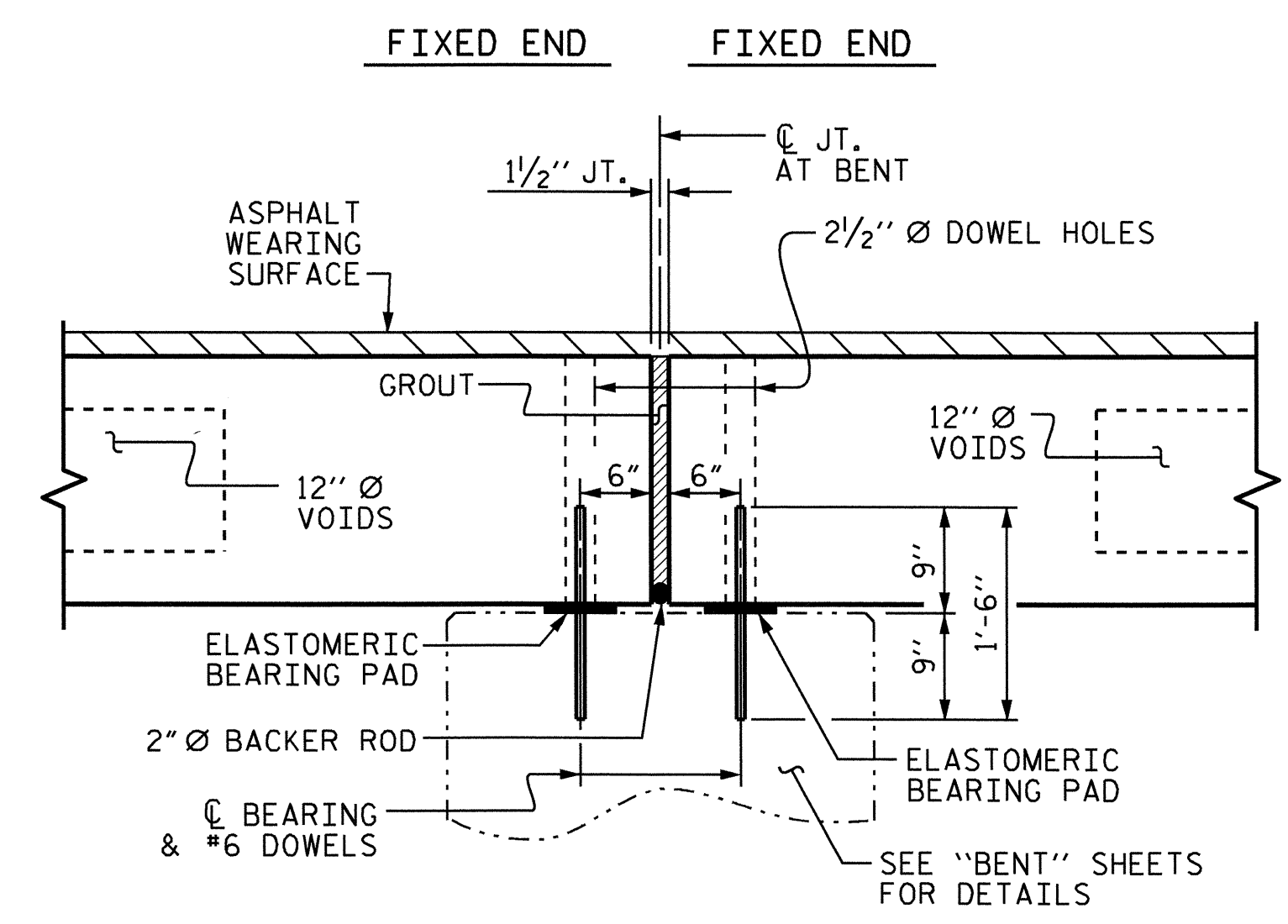


HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
**TYPICAL SECTION**  
 HALF SECTION THROUGH VOIDS

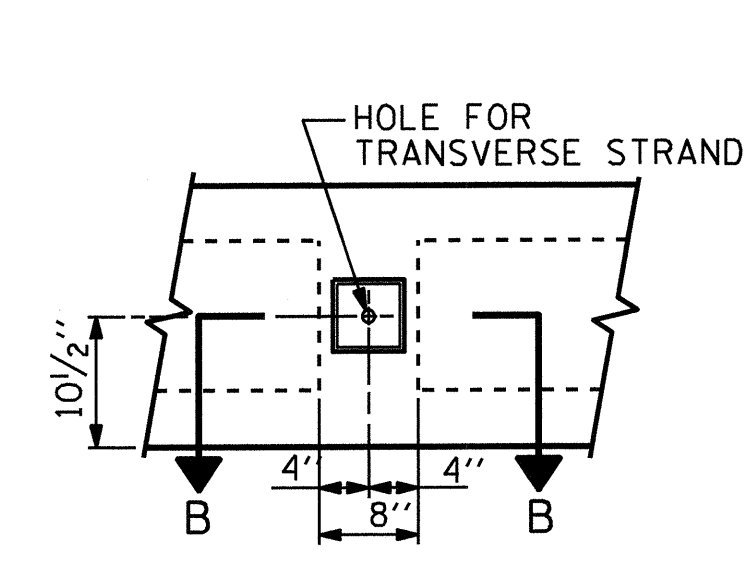
\* - THE MAXIMUM CONCRETE PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE CONCRETE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE CONCRETE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "2 BAR METAL RAIL" SHEET 1 OF 2.



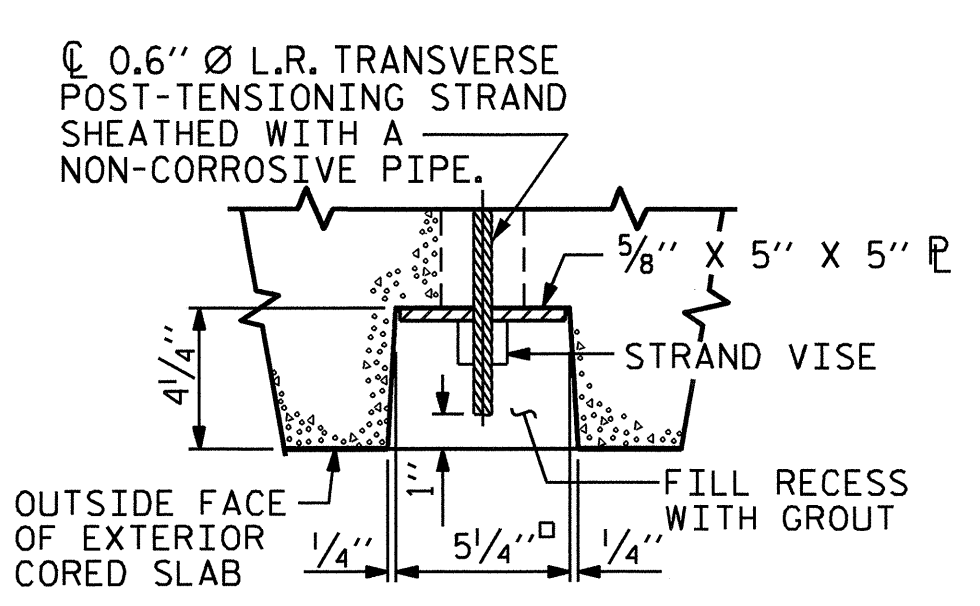
**SECTION AT END BENT**



**SECTION AT BENT**

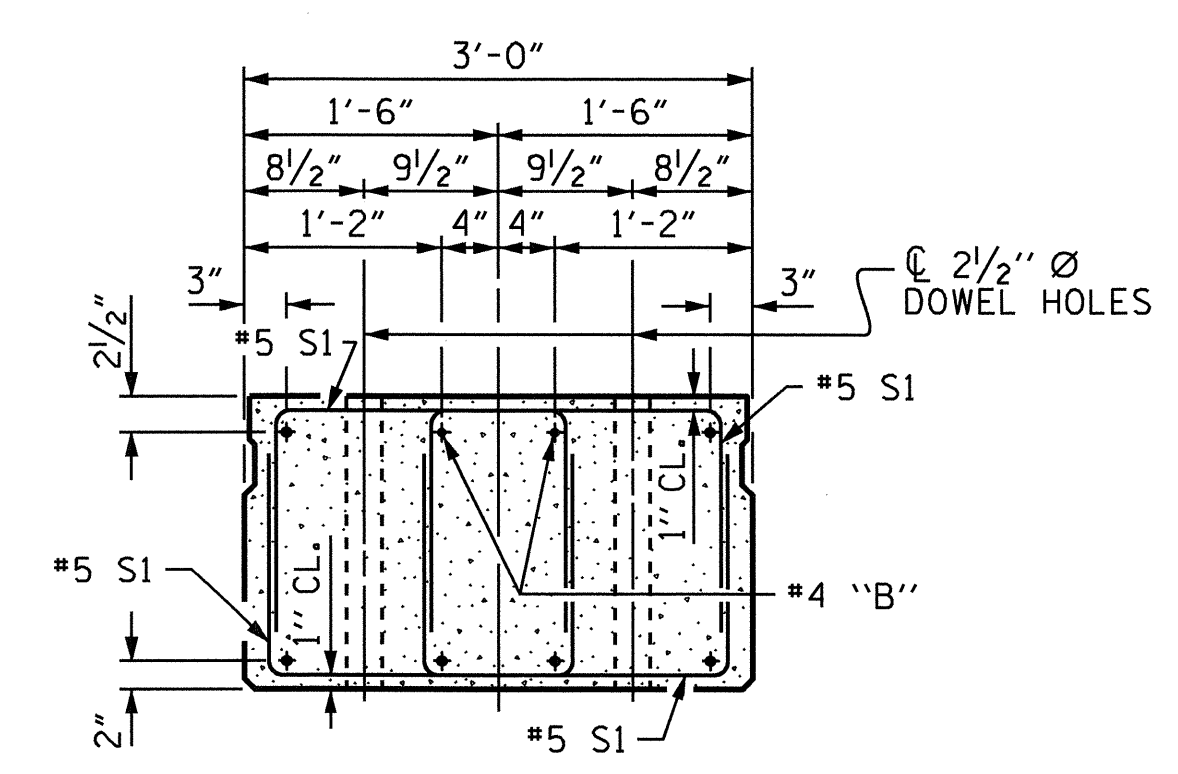


**ELEVATION VIEW**



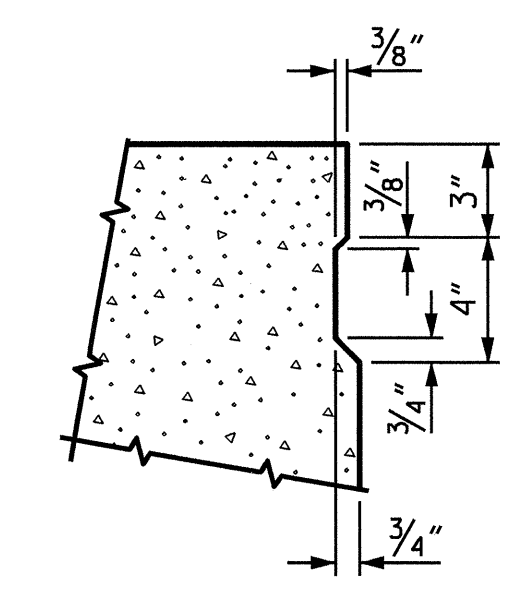
**SECTION B-B**

**GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS**

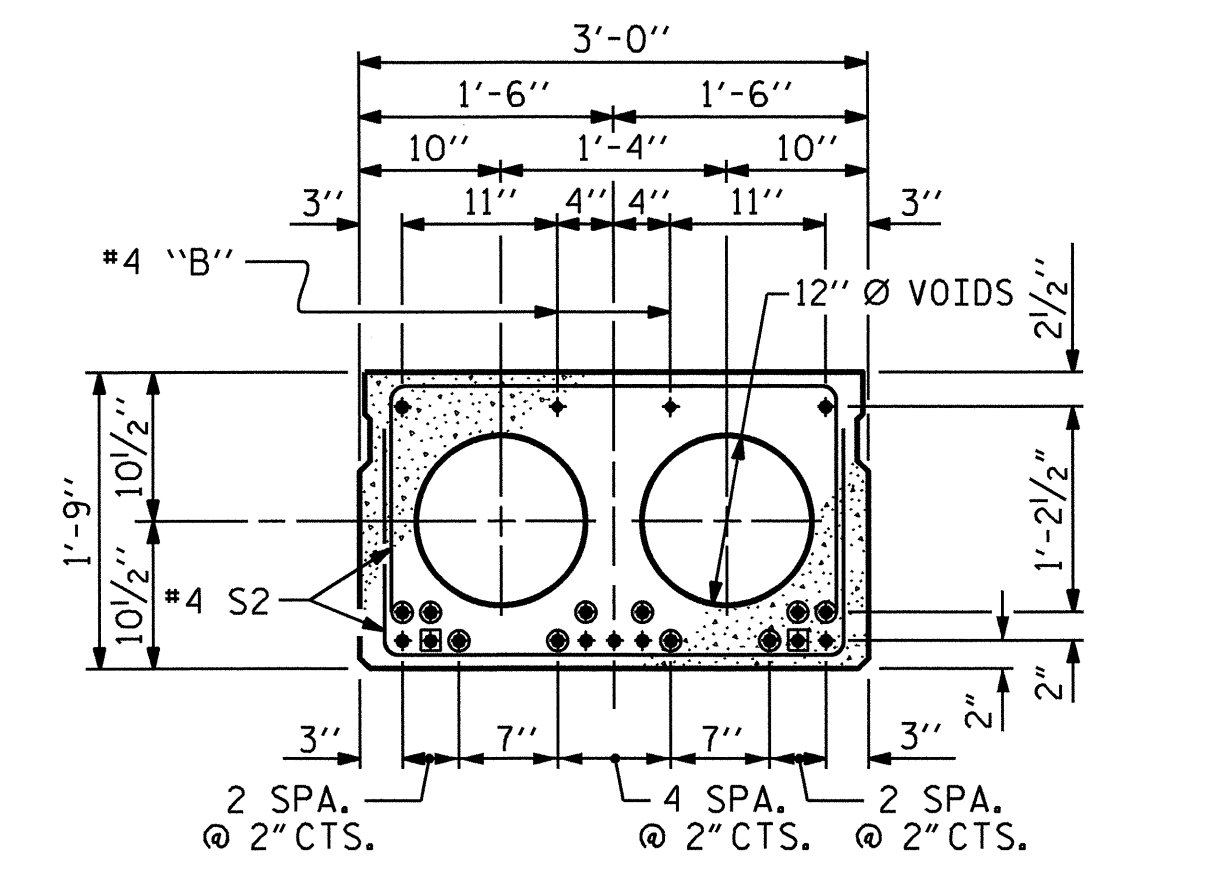


**END ELEVATION**

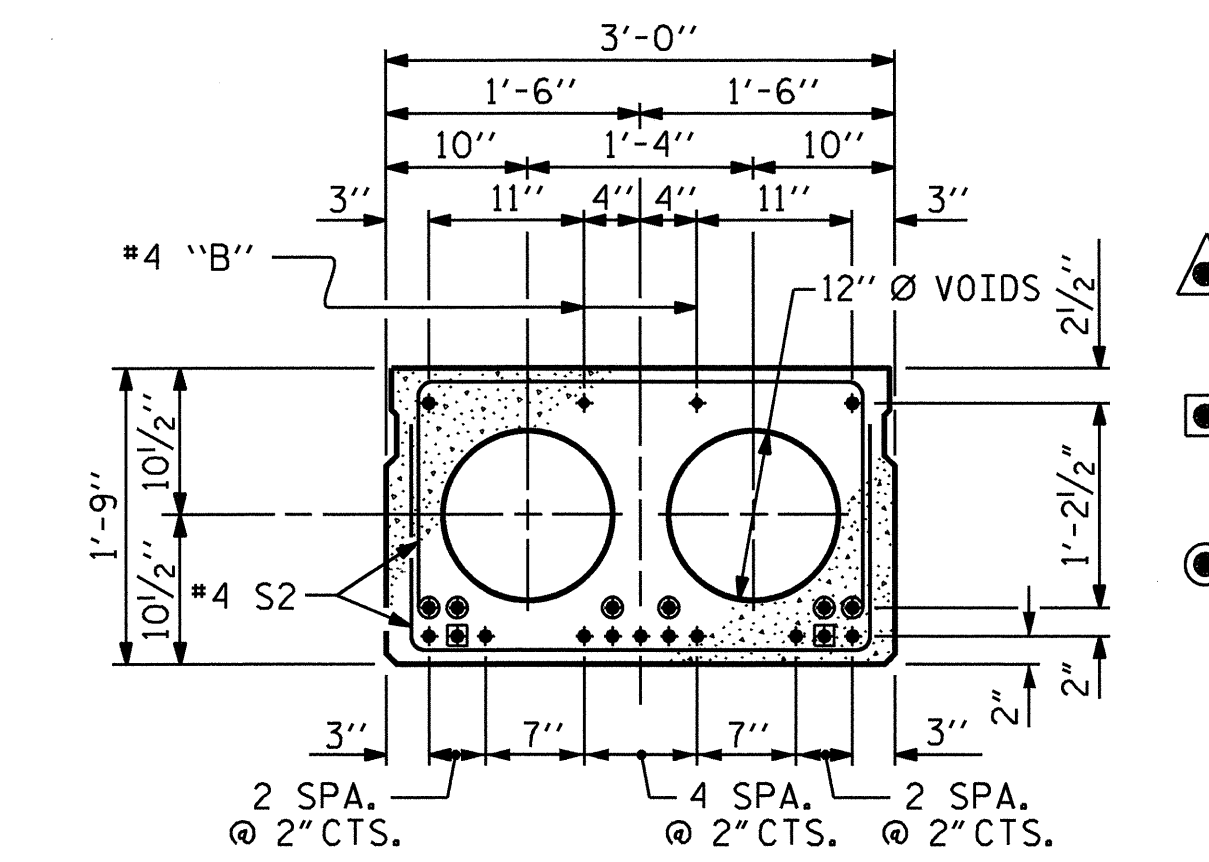
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



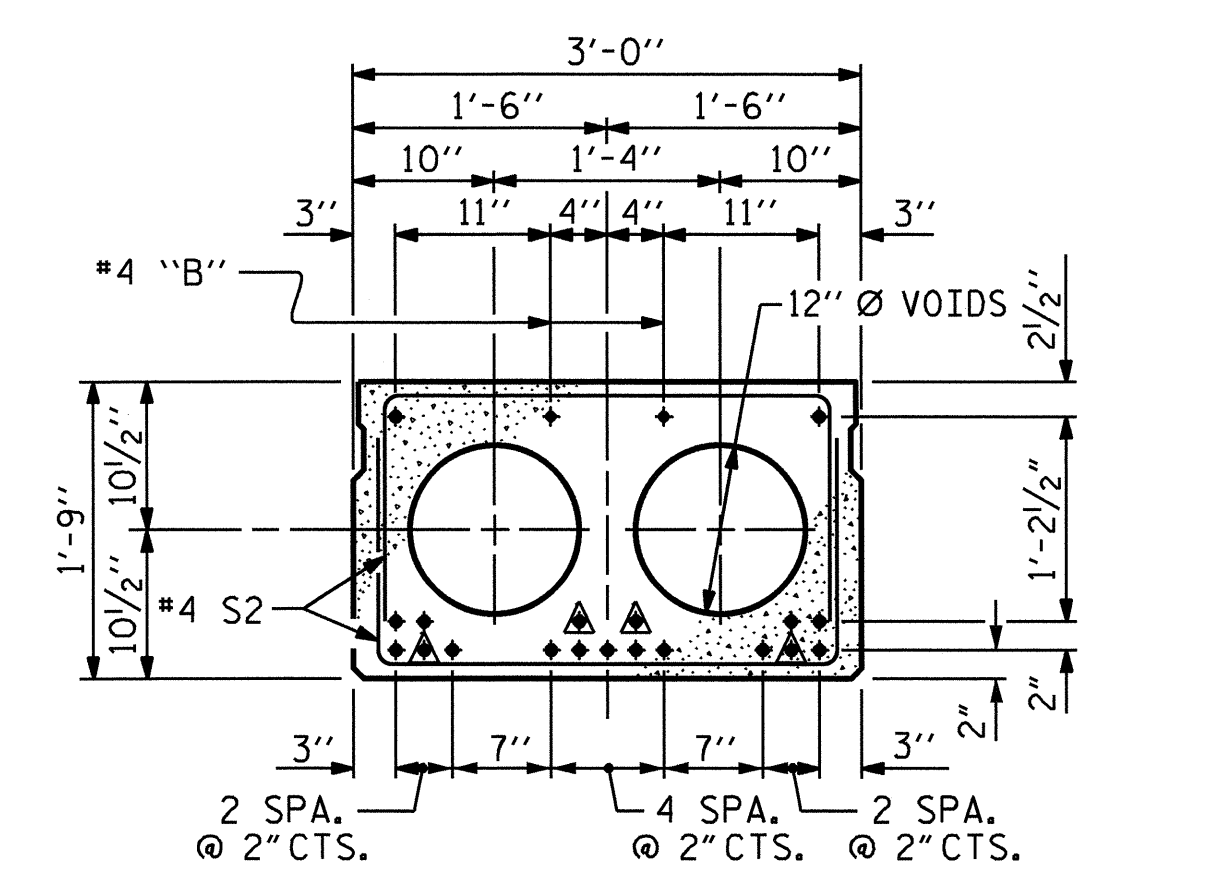
**SHEAR KEY DETAIL**  
 NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



**STRAND LAYOUT FOR 35' UNIT**  
 (9 STRANDS REQUIRED)

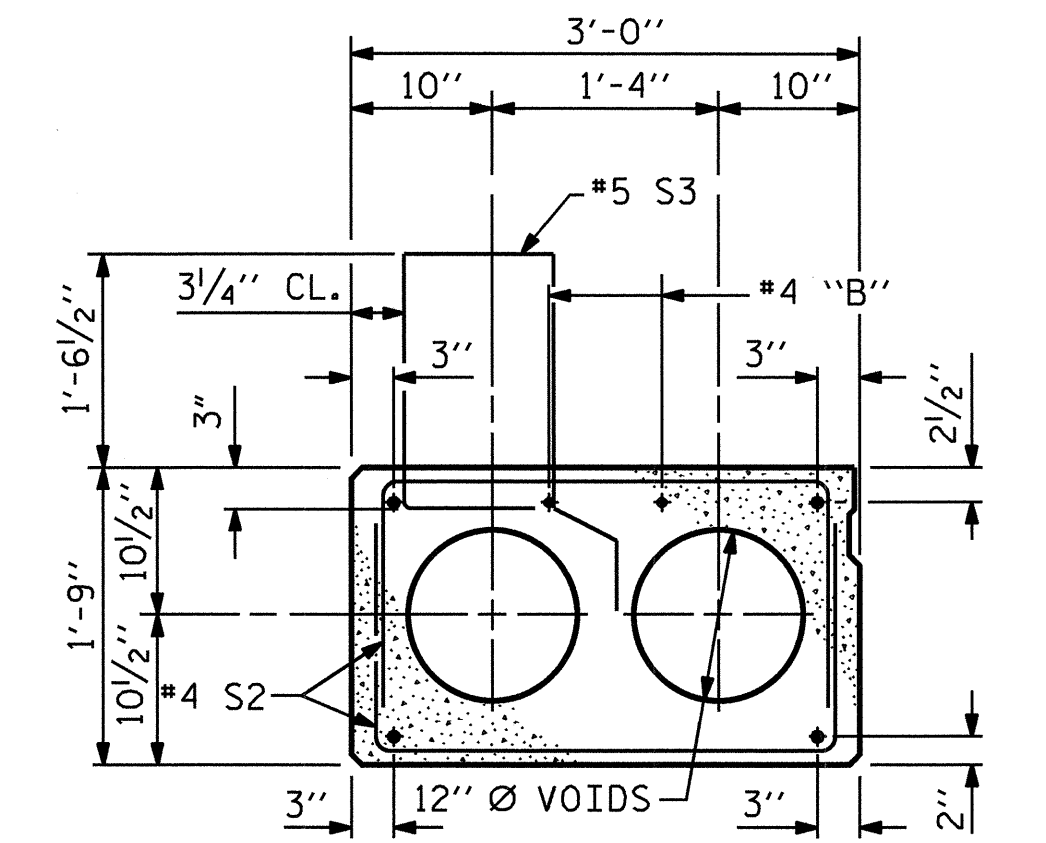


**STRAND LAYOUT FOR 45' UNIT**  
 (13 STRANDS REQUIRED)



**STRAND LAYOUT FOR 50' UNIT**  
 (19 STRANDS REQUIRED)

**INTERIOR SLAB SECTION**  
 0.6" Ø LOW RELAXATION



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

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

**DEBONDING LEGEND**

PROJECT NO. B-4661  
 WAKE COUNTY  
 STATION: 24+50.00 -L-

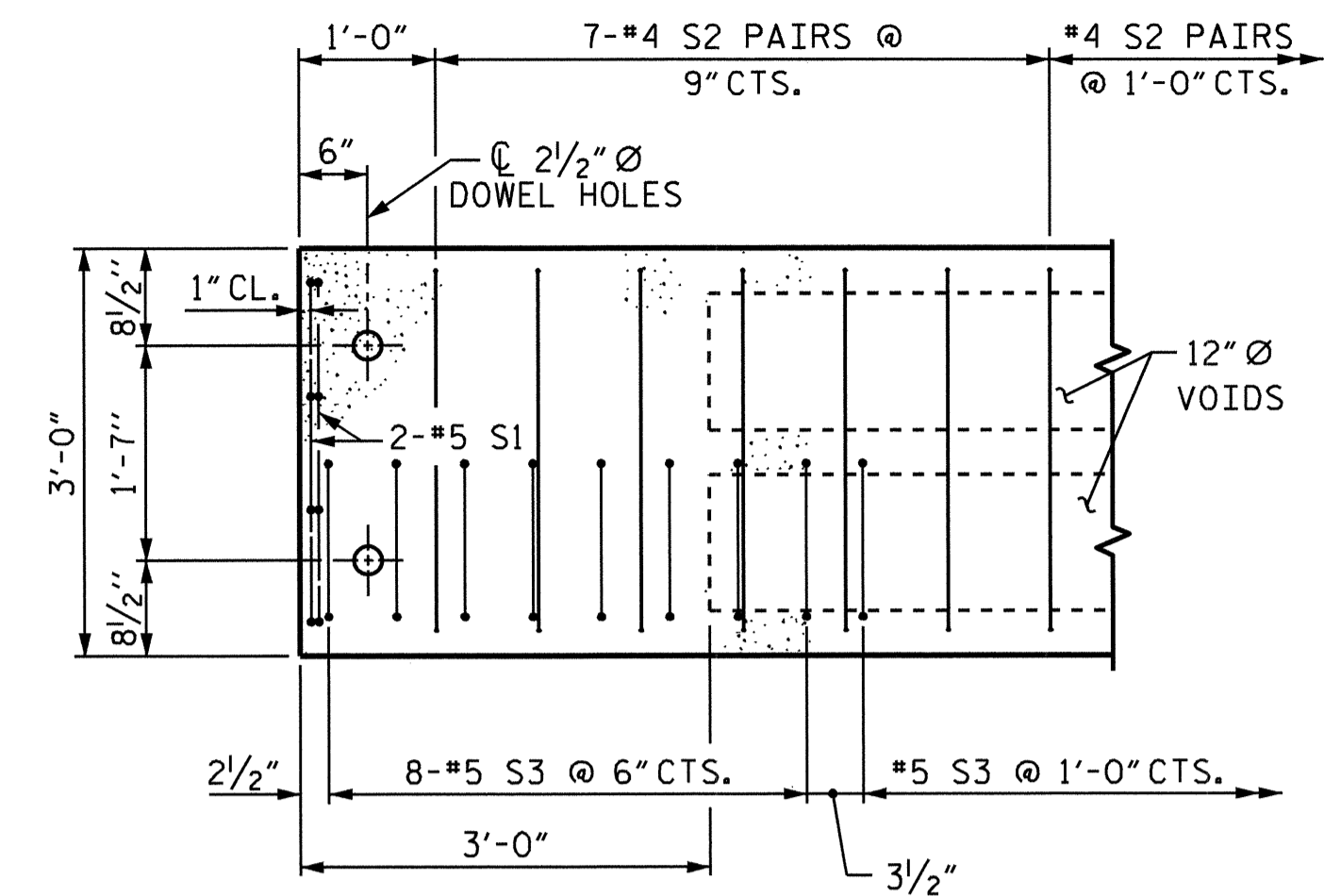
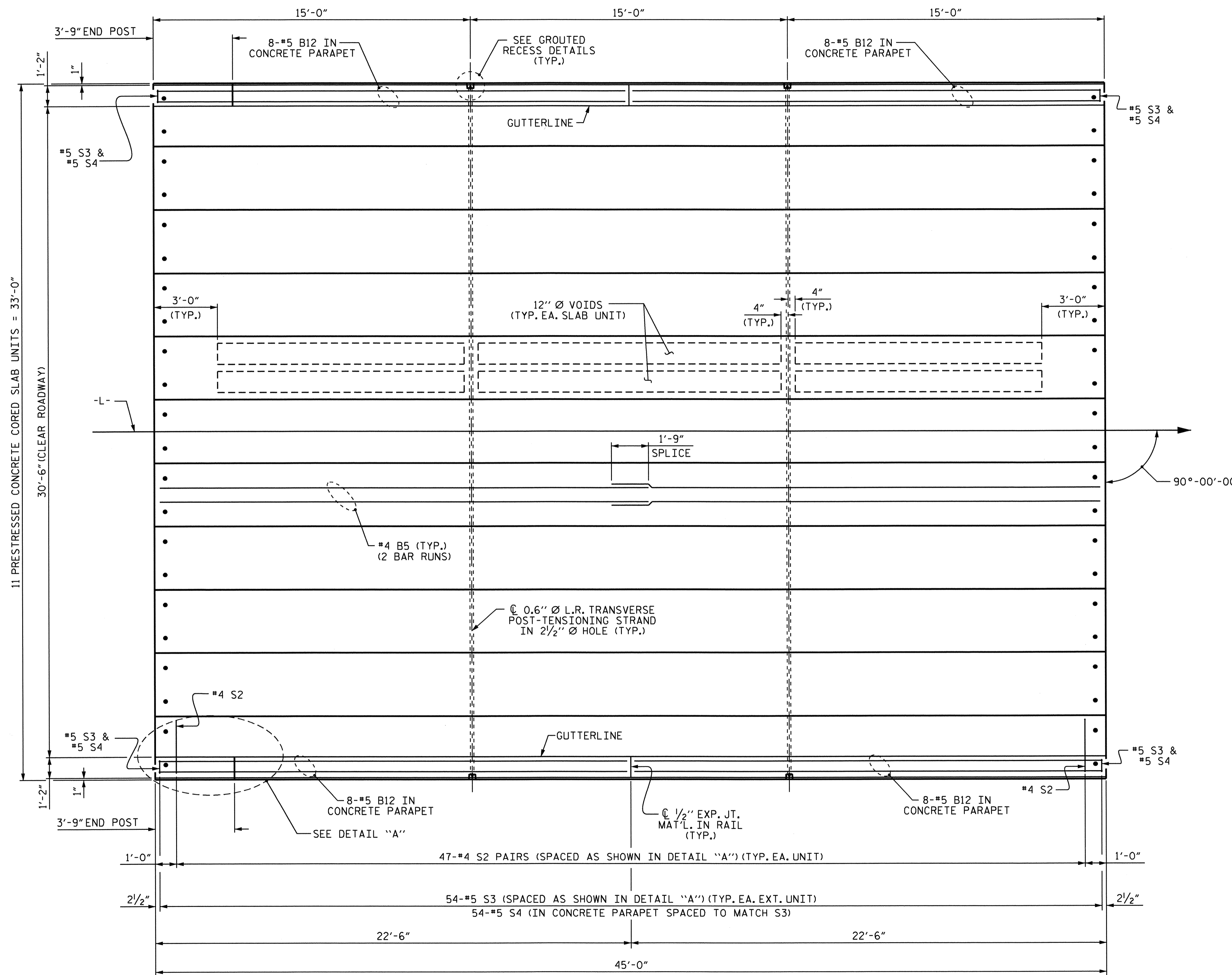
SHEET 1 OF 6

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



ASSEMBLED BY : V. T. DOAN	DATE : 08-10
CHECKED BY : M. K. TOM	DATE : 08-10
DRAWN BY : DGE 3/09	
CHECKED BY : BCH 3/09	

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S-6
1			3	TOTAL SHEETS 24
2			4	



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF SPAN A

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF SPAN A

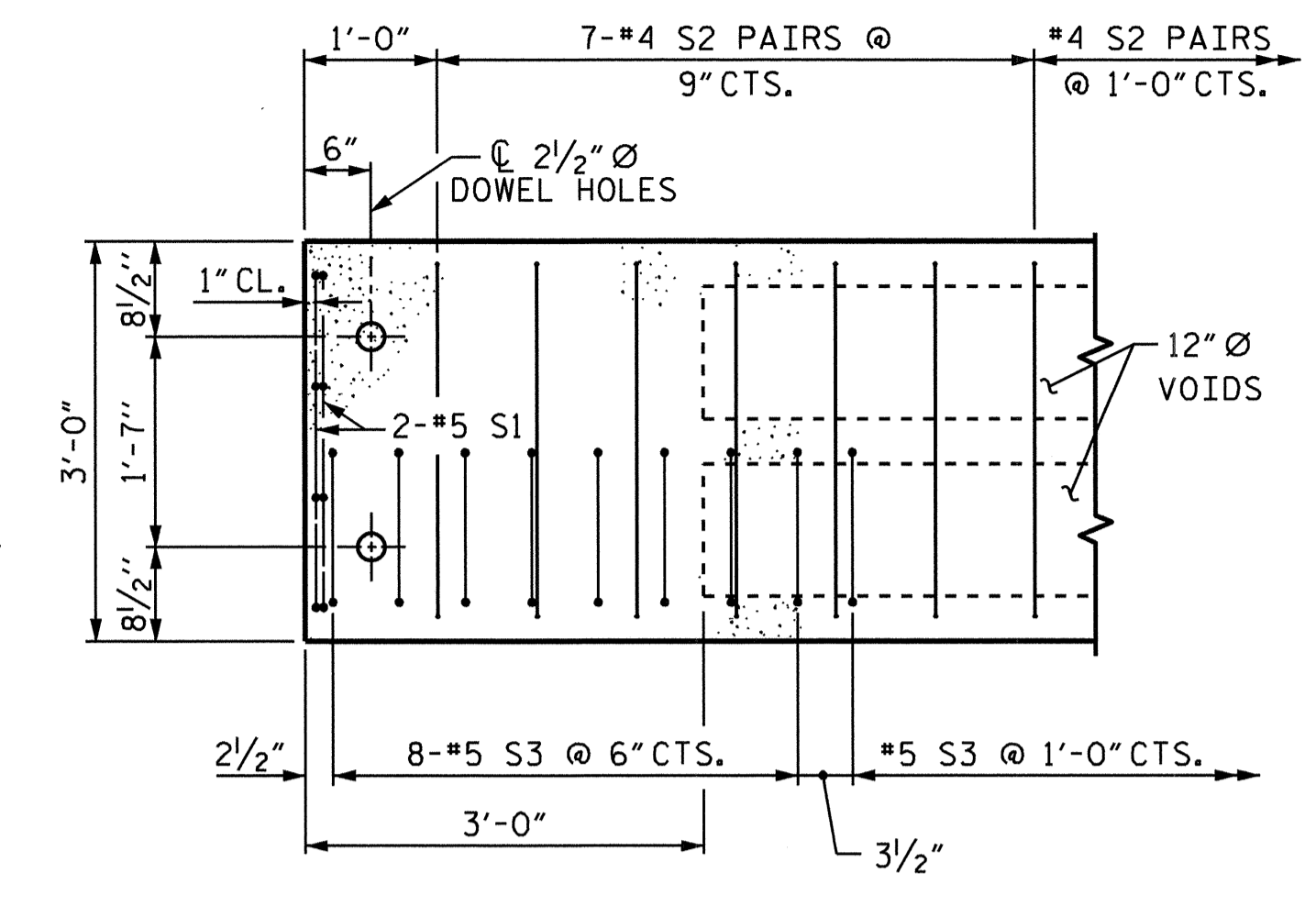
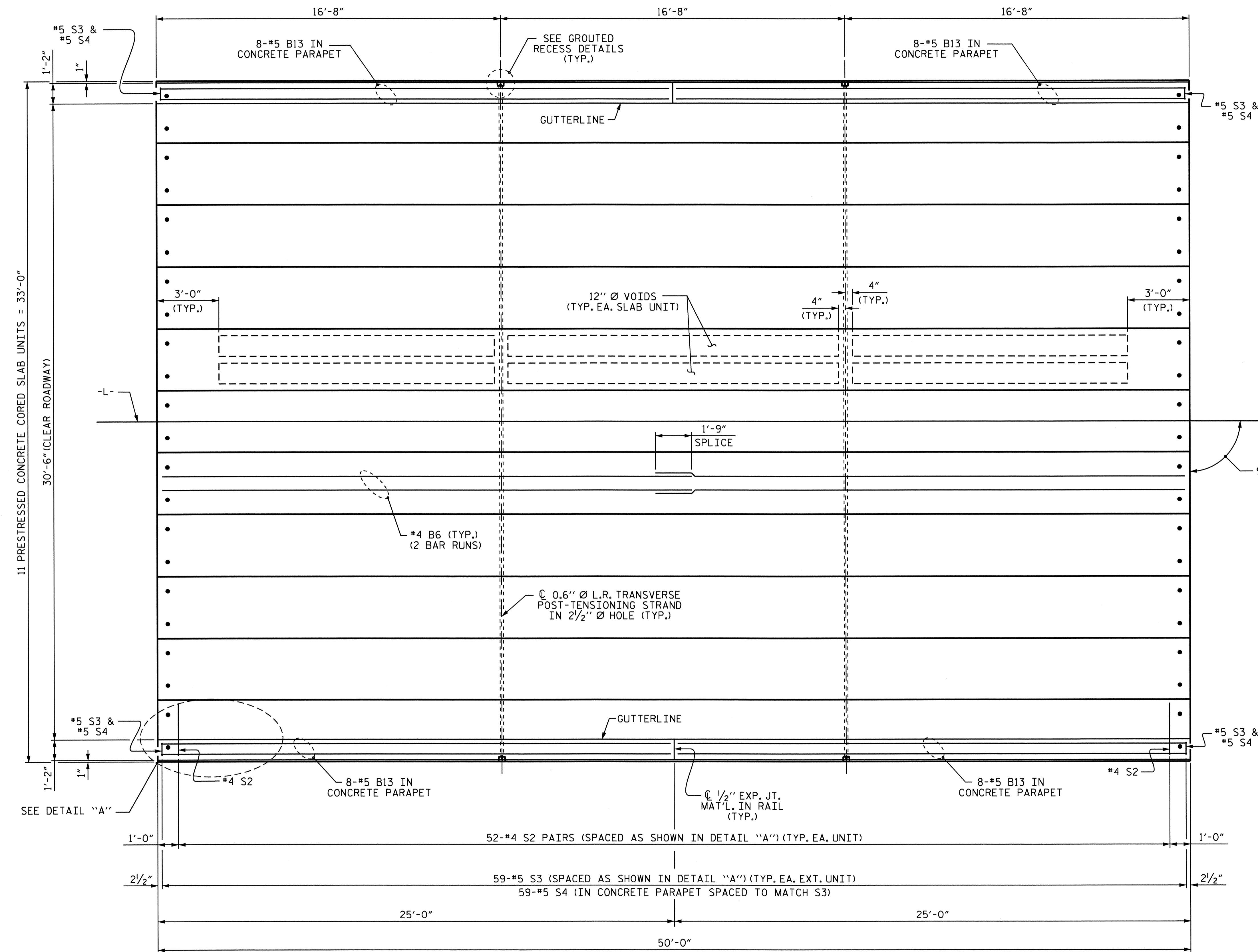


ASSEMBLED BY : V. T. DOAN DATE : 08-10  
 CHECKED BY : M. K. TOM DATE : 08-10  
 DRAWN BY : DGE 3/09  
 CHECKED BY : BCH 3/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			24

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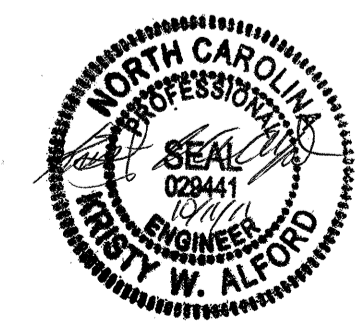


DETAIL "A"  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF SPAN B

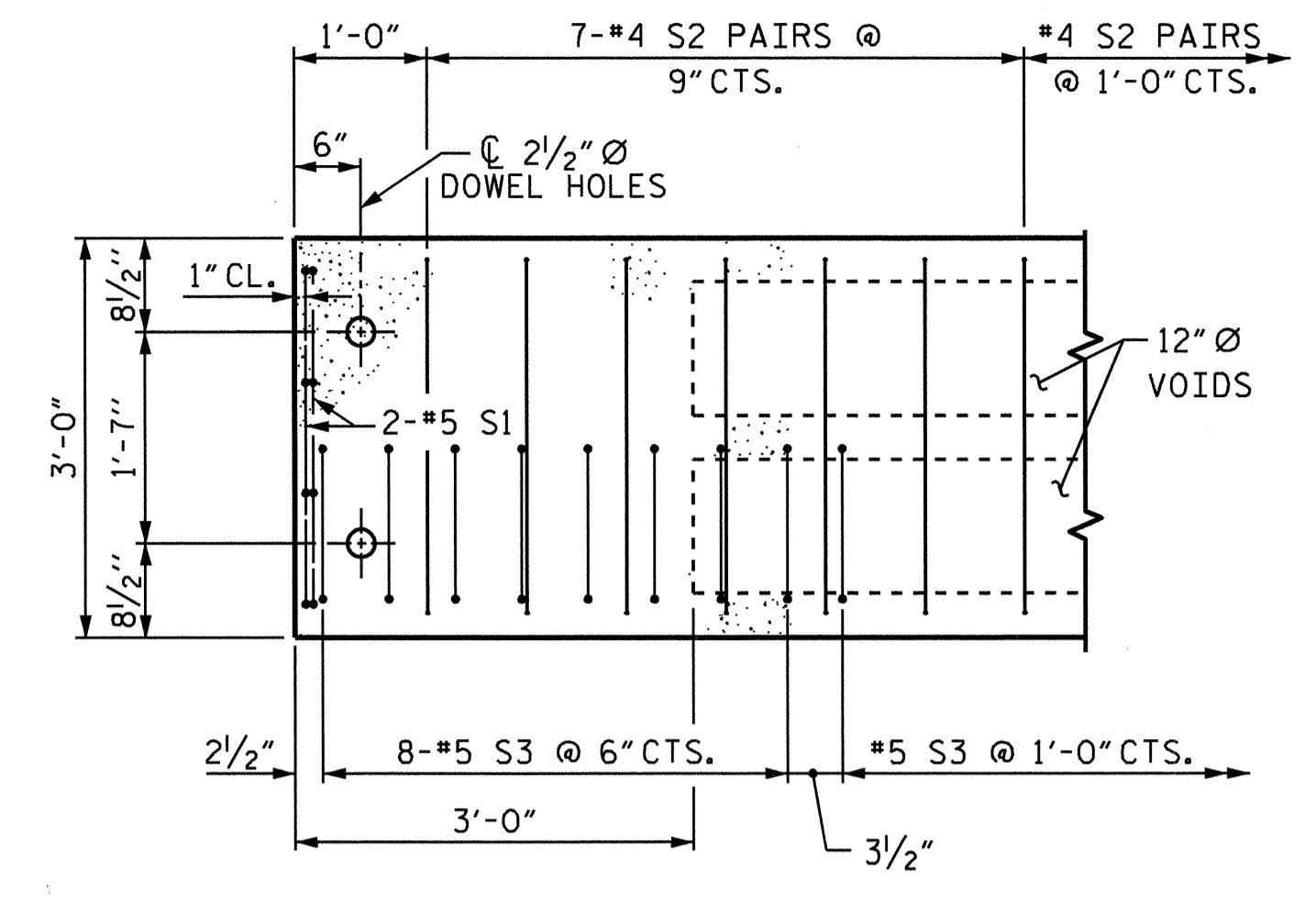
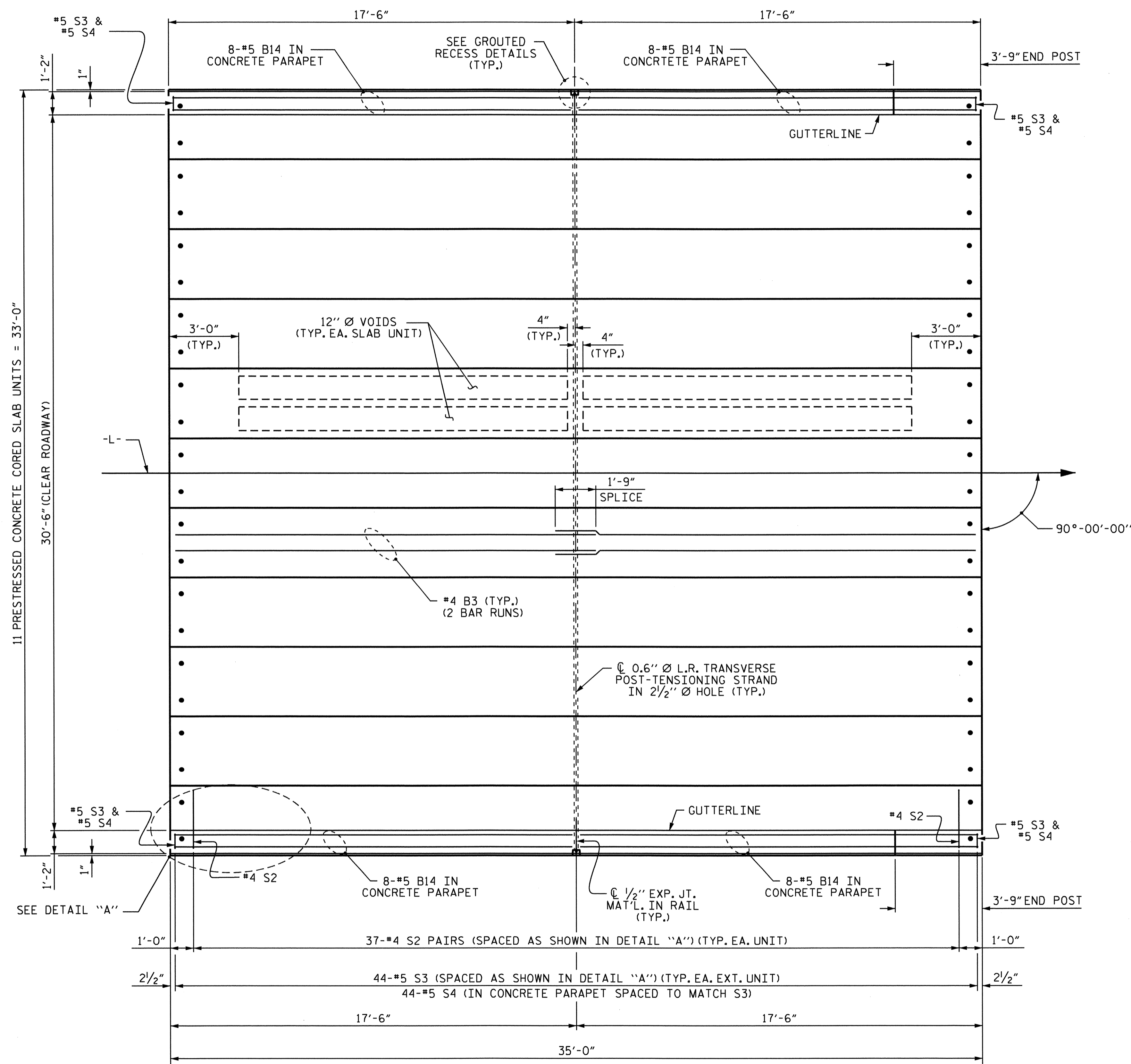
PROJECT NO. B-4661  
 WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 3 OF 6



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-8
PLAN OF SPAN B						TOTAL SHEETS 24
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : V. T. DOAN	DATE : 08-10
CHECKED BY : M. K. TOM	DATE : 08-10
DRAWN BY : DGE 3/09	
CHECKED BY : BCH 3/09	



DETAIL "A"  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

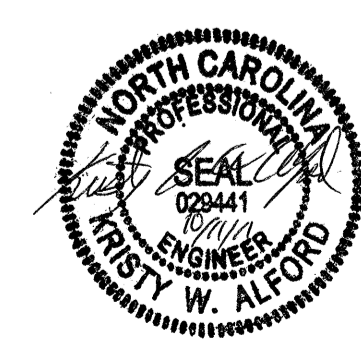
PLAN OF SPAN C

PROJECT NO. B-4661  
 WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

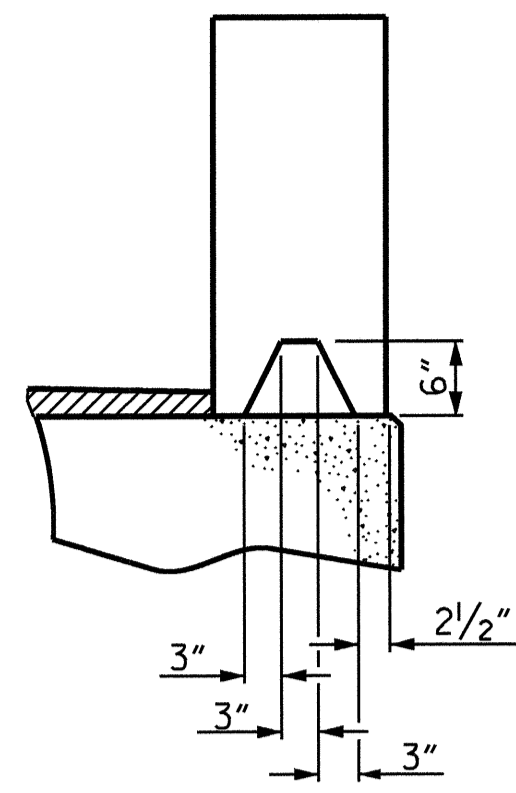
PLAN OF SPAN C



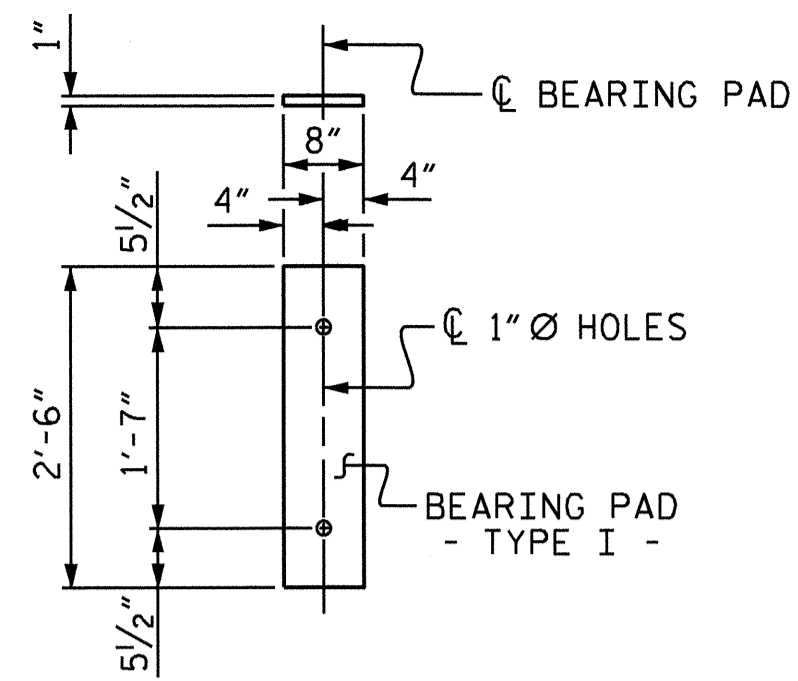
ASSEMBLED BY : V. T. DOAN DATE : 08-10  
 CHECKED BY : M. K. TOM DATE : 08-10  
 DRAWN BY : DGE 3/09  
 CHECKED BY : BCH 3/09

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9	
1			3			TOTAL SHEETS	
2			4			24	

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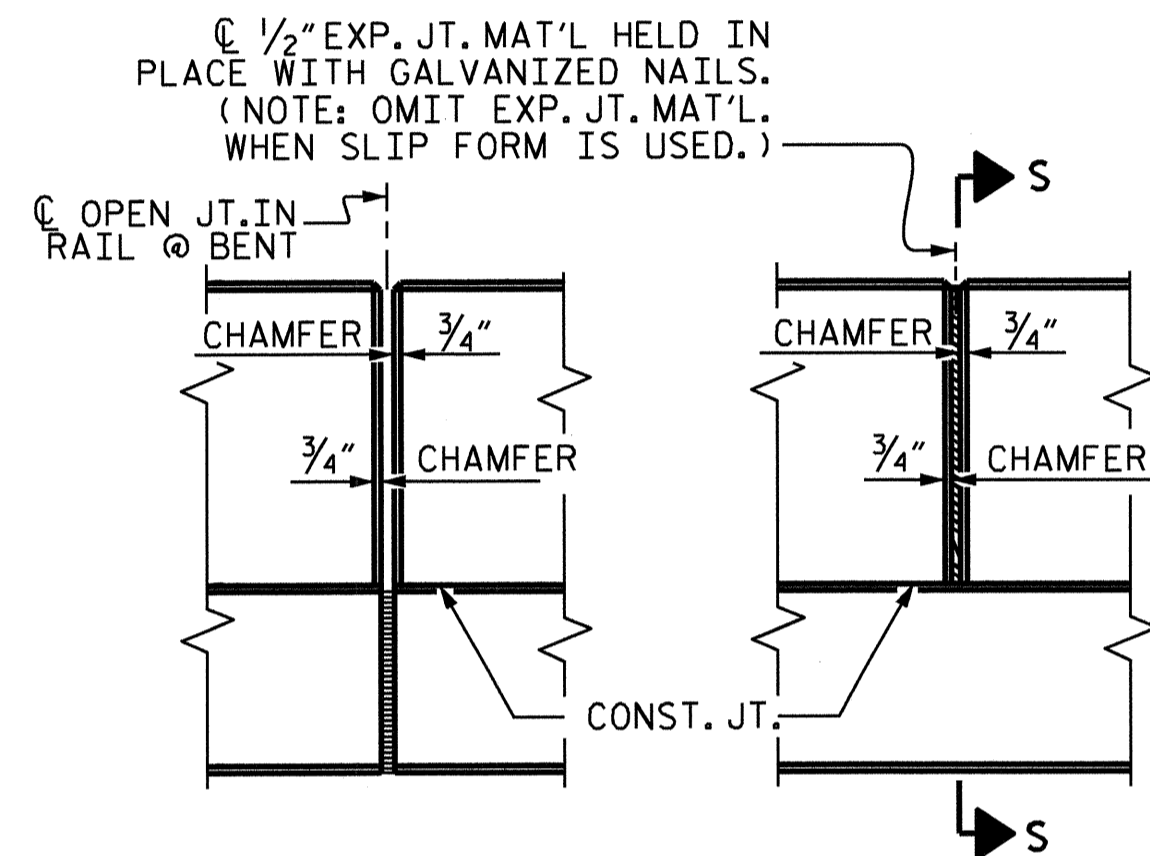
**SECTION S-S**  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)



**FIXED END**  
(TYPE I - 66 REQ'D)

**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



**ELEVATION AT EXPANSION JOINTS**

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

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
<b>SPAN A</b>			
EXTERIOR C.S.	2	45'-0"	90'-0"
INTERIOR C.S.	9	45'-0"	405'-0"
<b>SPAN B</b>			
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	9	50'-0"	450'-0"
<b>SPAN C</b>			
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	9	35'-0"	315'-0"
<b>TOTAL</b>	<b>33</b>		<b>1430'-0"</b>

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT		
	ASPHALT OVERLAY THICKNESS	PARAPET HEIGHT
	@ MID-SPAN	@ MID-SPAN
SPAN A	2 5/8"	2'-8 7/8"
SPAN B	1 1/2"	2'-7 3/4"
SPAN C	3 3/8"	2'-9 5/8"

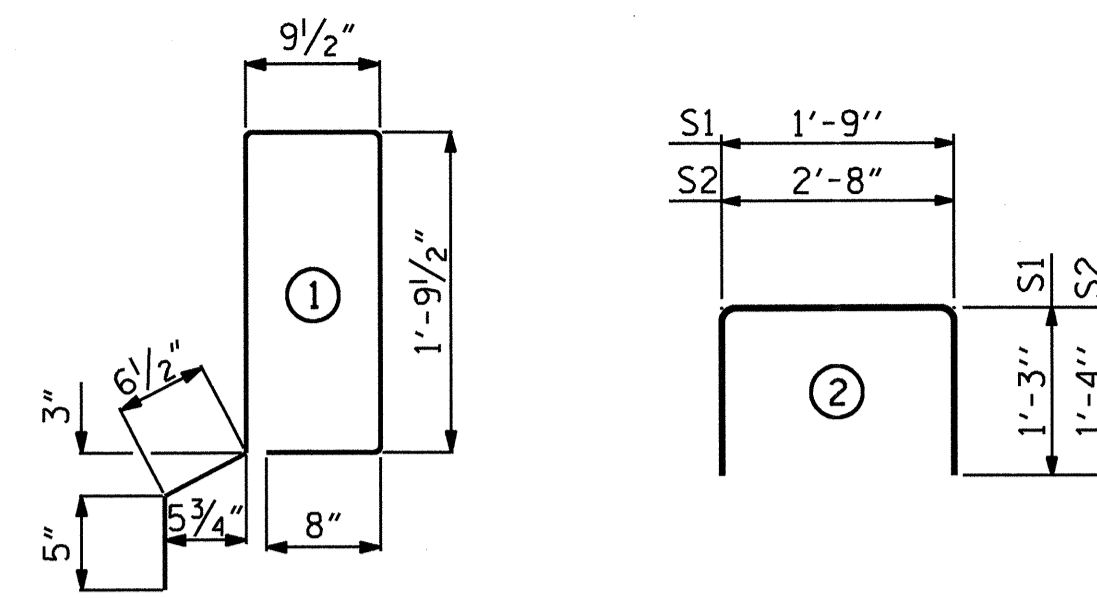
DEAD LOAD DEFLECTION AND CAMBER			
	3'-0" x 1'-9" 0.6" Ø L.R. STRAND		
	45' UNIT	50' UNIT	35' UNIT
CAMBER ( SLAB ALONE IN PLACE )	1/4" ↑	2 1/2" ↑	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓	1/4" ↓	1/8" ↓
FINAL CAMBER	1/8" ↑	2 1/4" ↑	3/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

ASSEMBLED BY : V. T. DOAN DATE : 08-10  
 CHECKED BY : M. K. TOM DATE : 08-10  
 DRAWN BY : DGE 5/09  
 CHECKED BY : BCH 6/09

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**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL FOR ONE 45' CORED SLAB UNIT**

SPAN A				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62
S1	8	#5	2	4'-3"	35	4'-3"	35
S2	94	#4	2	5'-4"	335	5'-4"	335
* S3	54	#5	1	6'-0"	338		
REINFORCING STEEL				LBS.	432		432
* EPOXY COATED REINFORCING STEEL				LBS.	338		
6500 P.S.I. CONCRETE				CU. YDS.	6.5		6.5
0.6" Ø L.R. STRANDS				No.	13		13

**BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT**

SPAN B				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	2	4'-3"	35	4'-3"	35
S2	104	#4	2	5'-4"	371	5'-4"	371
* S3	59	#5	1	6'-0"	369		
REINFORCING STEEL				LBS.	475		475
* EPOXY COATED REINFORCING STEEL				LBS.	369		
6500 P.S.I. CONCRETE				CU. YDS.	7.1		7.1
0.6" Ø L.R. STRANDS				No.	19		19

**BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT**

SPAN C				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	2	4'-3"	35	4'-3"	35
S2	74	#4	2	5'-4"	264	5'-4"	264
* S3	44	#5	1	6'-0"	275		
REINFORCING STEEL				LBS.	348		348
* EPOXY COATED REINFORCING STEEL				LBS.	275		
5000 P.S.I. CONCRETE				CU. YDS.	5.1		5.1
0.6" Ø L.R. STRANDS				No.	9		9



**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" 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, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS, AT LEAST SIX 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.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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 THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

**CONCRETE RELEASE STRENGTH**

UNIT	PSI
45' UNIT (SPAN A)	4000
50' UNIT (SPAN B)	4900
35' UNIT (SPAN C)	4000

PROJECT NO. B-4661

WAKE COUNTY

STATION: 24+50.00 -L-

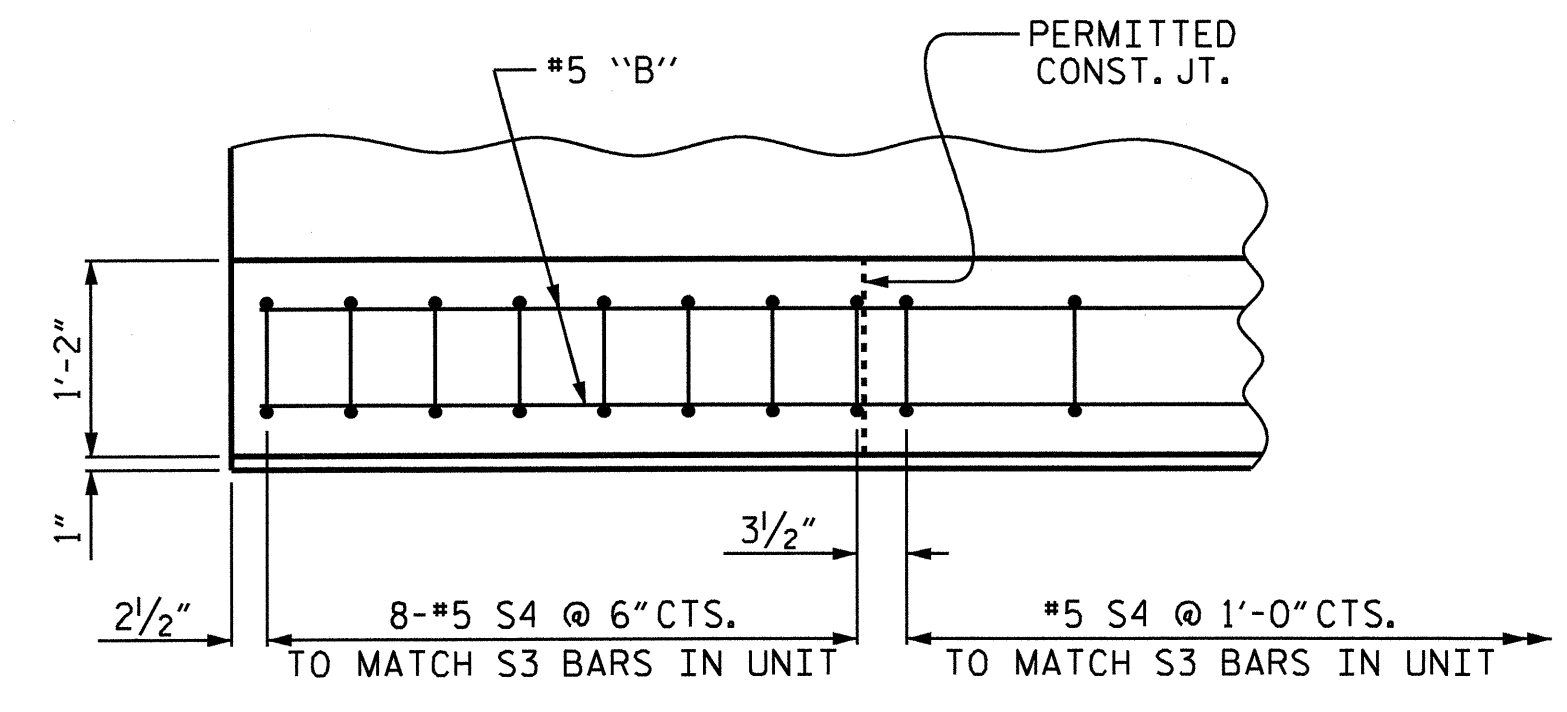
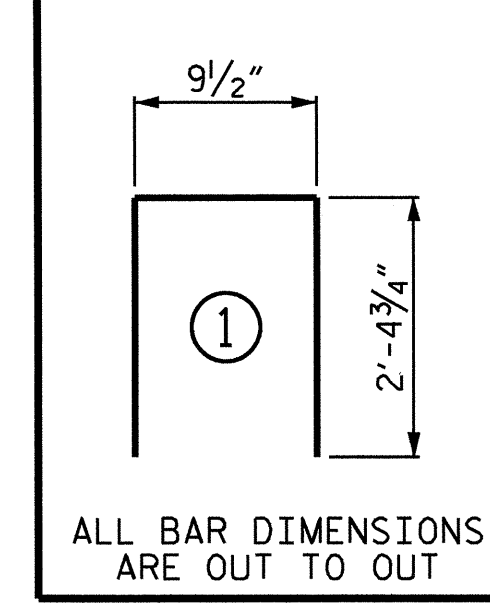
SHEET 5 OF 6

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

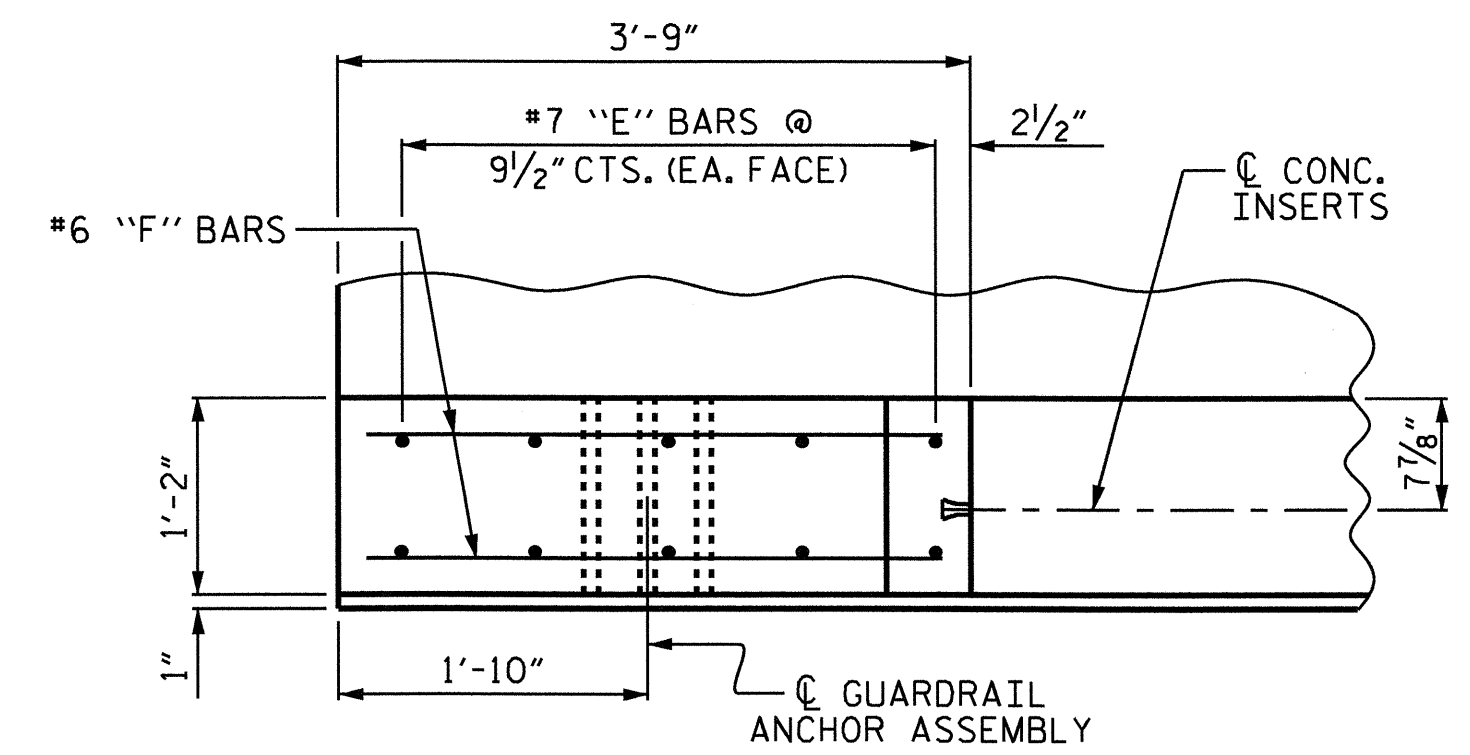
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS 24	
2			4				

STD. NO. 21" PCS3-33-90S

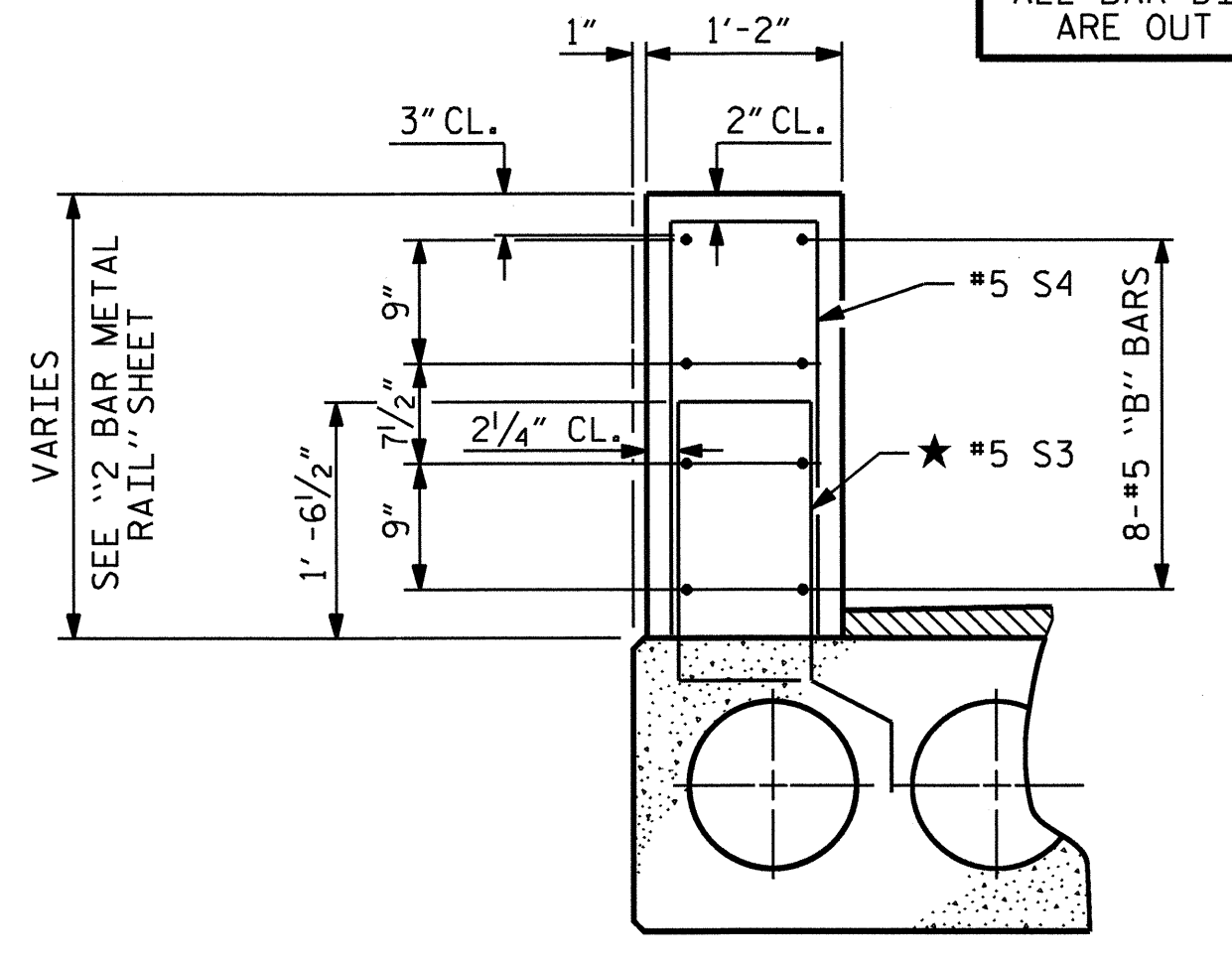
BAR TYPE		BILL OF MATERIAL				
PARAPETS AND END POSTS						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B12	32	#5	STR	22'-1"	737	
* B13	32	#5	STR	24'-7"	820	
* B14	32	#5	STR	17'-1"	570	
* E1	8	#7	STR	2'-9"	45	
* E2	8	#7	STR	3'-3"	53	
* E3	8	#7	STR	3'-9"	61	
* E4	8	#7	STR	4'-3"	69	
* E5	8	#7	STR	4'-8"	76	
* F1	8	#6	STR	1'-10"	22	
* F2	8	#6	STR	3'-0"	36	
* F3	8	#6	STR	3'-4"	40	
* S4	314	#5	1	5'-7"	1829	
* EPOXY COATED REINF. STEEL				4358 LBS.		
CLASS AA CONCRETE				32.7 C.Y.		
1'-2" X 2'-10"				260.5 L.F.		
CONCRETE PARAPET				* THESE BARS ARE EPOXY COATED		



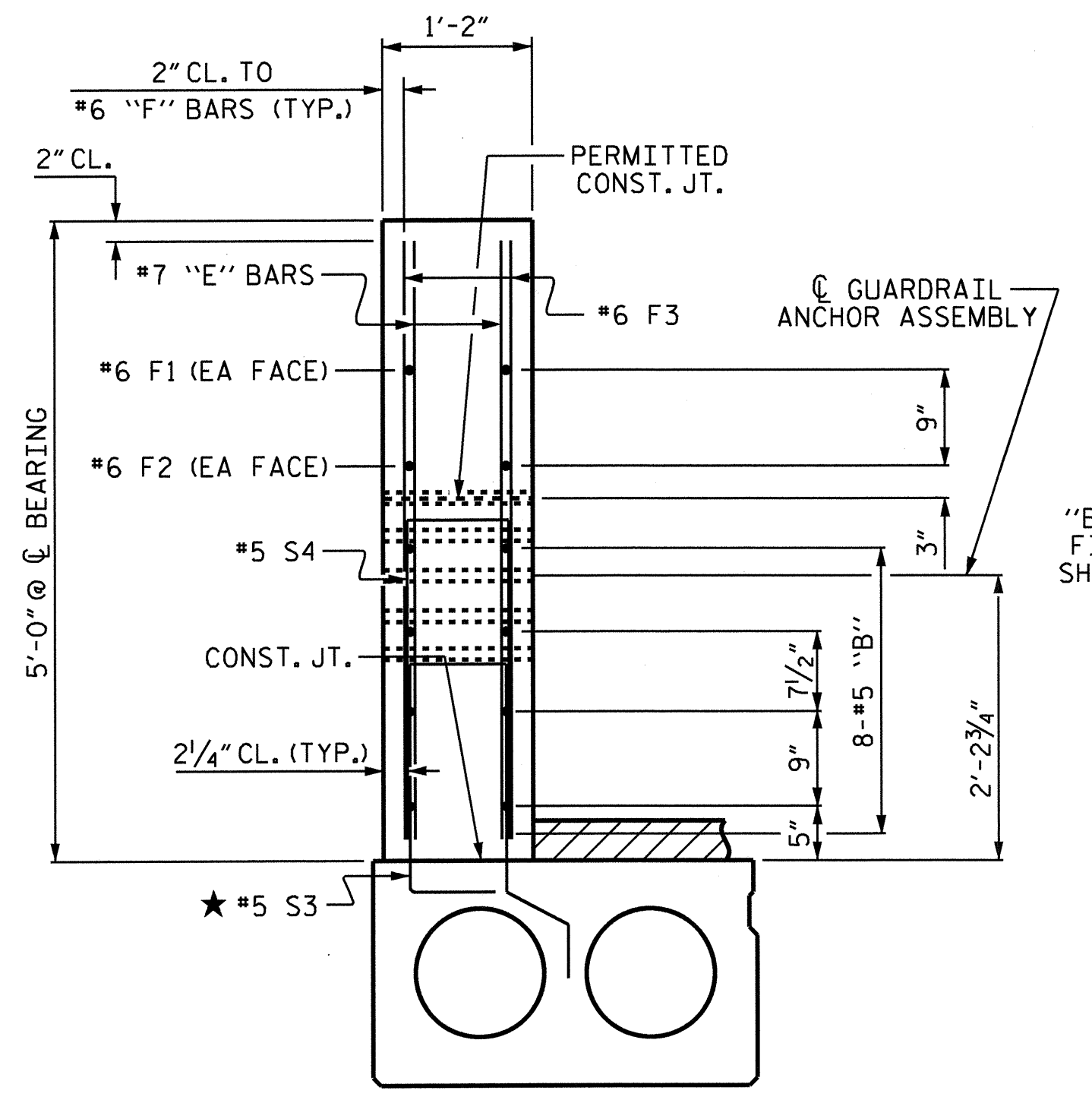
PLAN OF PARAPET  
END BENT No. 1 END SHOWN  
END BENT No. 2 SIMILAR



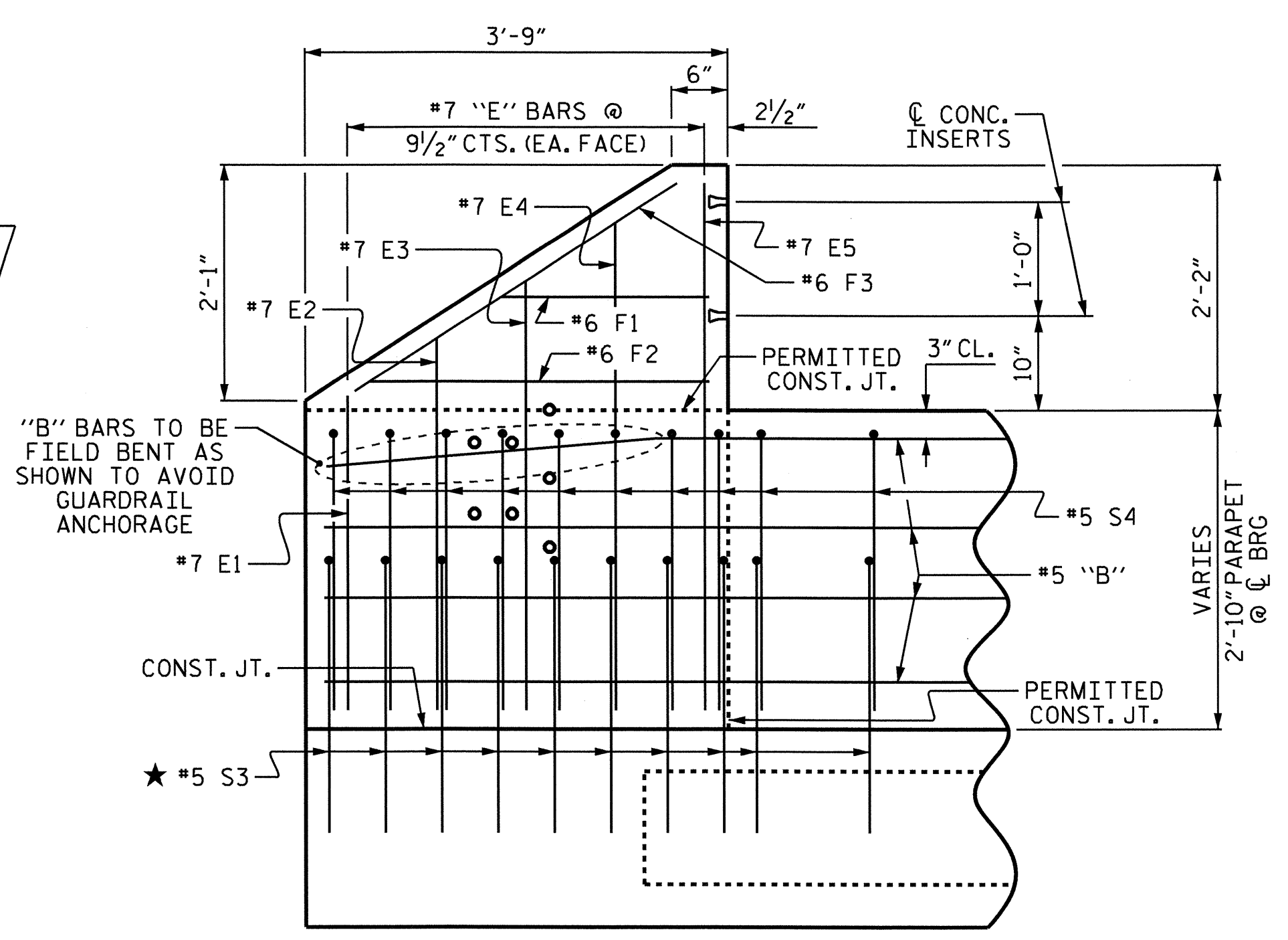
PLAN OF END POST  
END BENT No. 1 END SHOWN  
END BENT No. 2 SIMILAR



TWO BAR METAL  
RAIL PARAPET SECTION



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

NOTES:

- ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.
- THE #5 S4 AND #5 S3 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.
- FOR DETAILS FOR CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.
- FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAIL" SHEET.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- \* #5 S3 BARS INCLUDED IN BILL OF MATERIAL FOR CORED SLAB UNIT.

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 6 OF 6



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 DETAILS

DRAWN BY : T. BANKOVICH DATE : 8-2010  
 CHECKED BY : M. K. TOM DATE : 8-2010

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			24

**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.

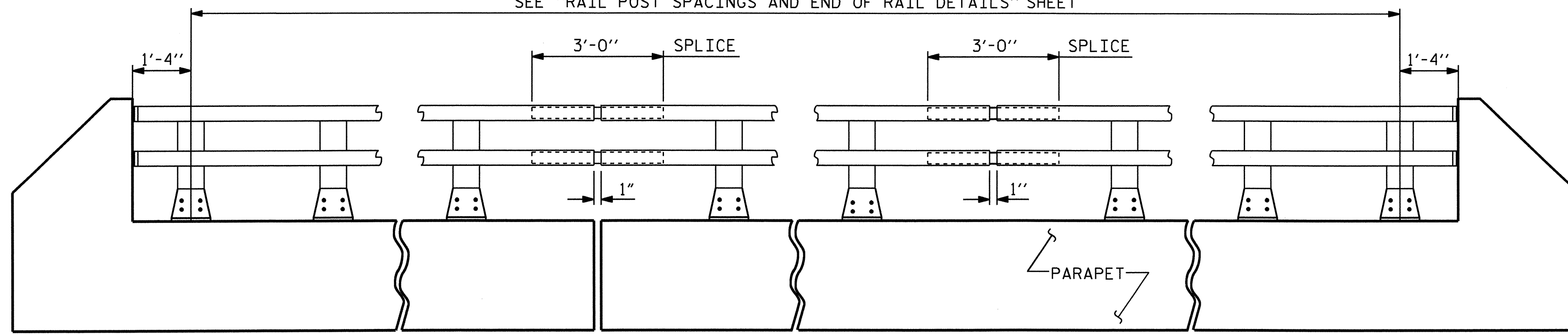
CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE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

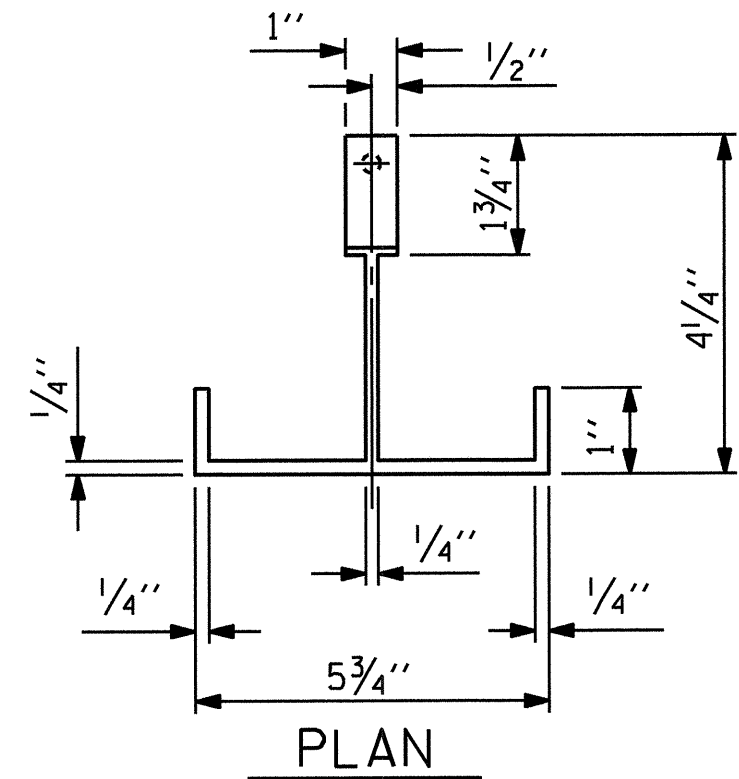
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

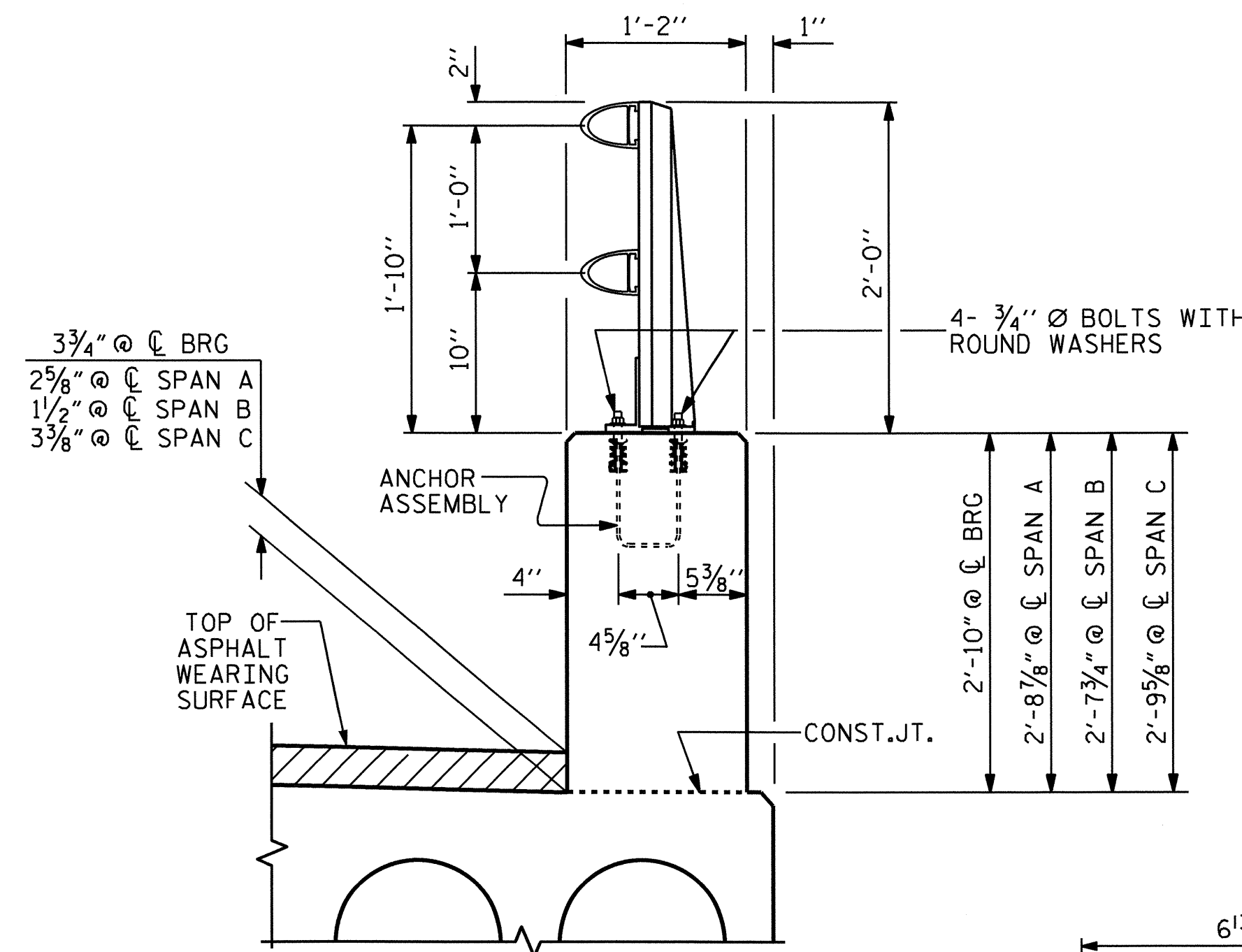


**ELEVATION**

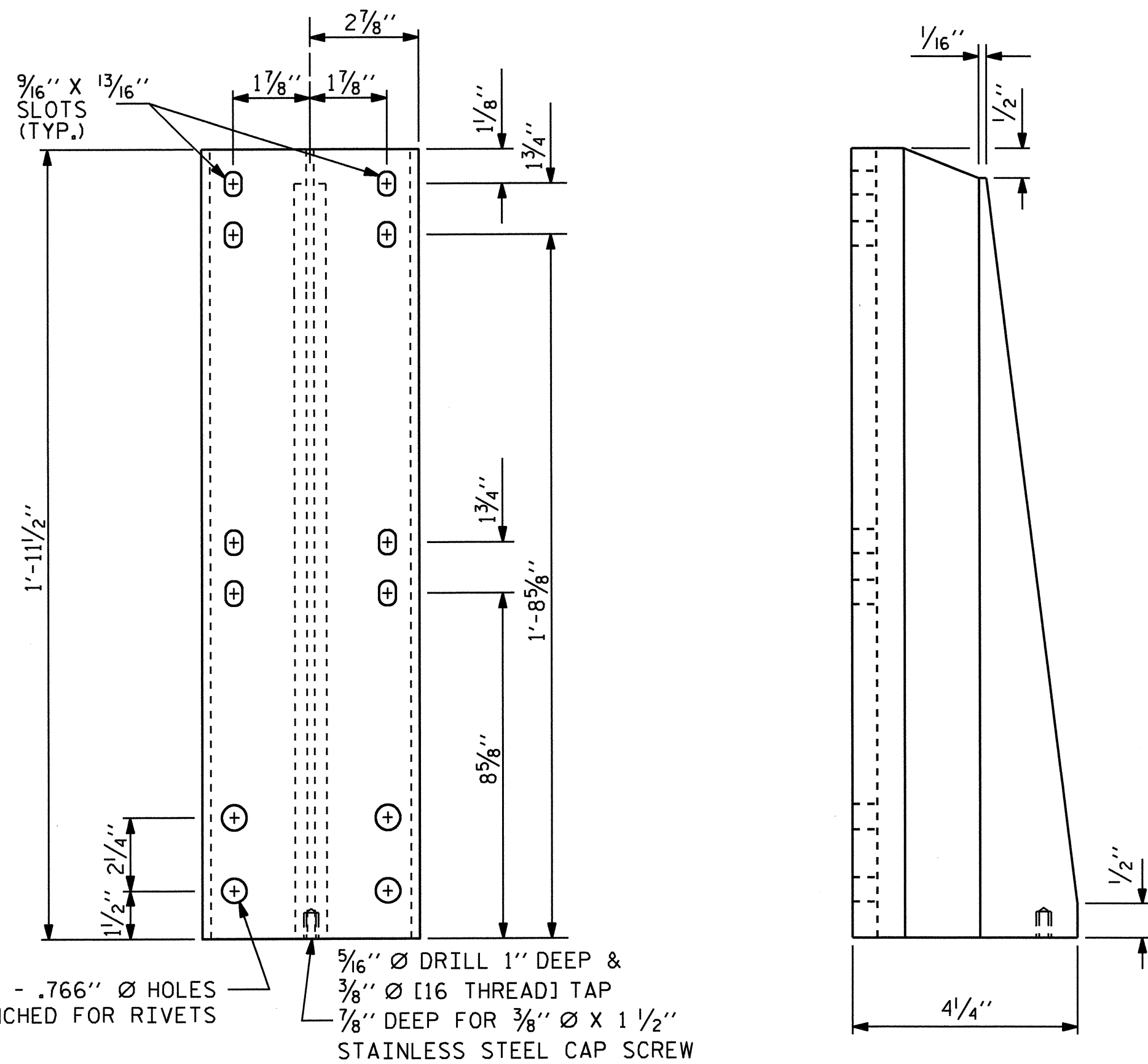
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



**PLAN**



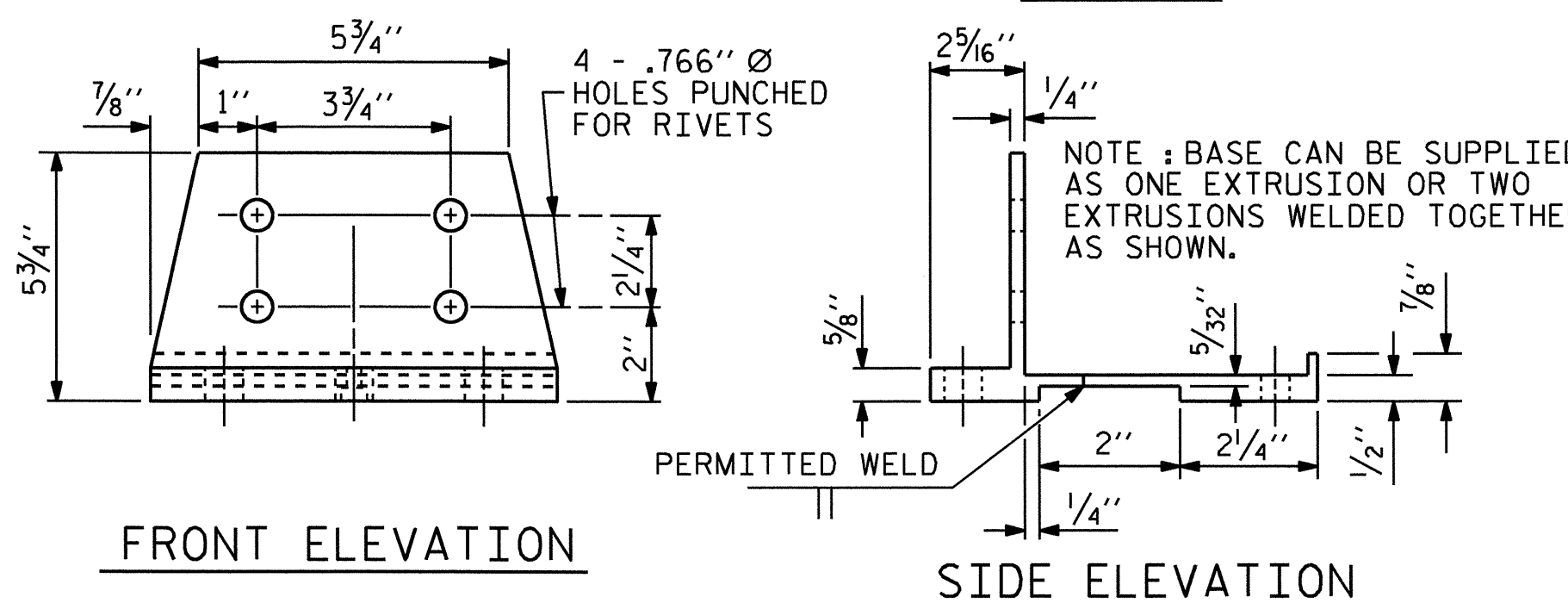
**SECTION THRU PARAPET AND RAIL**



**FRONT ELEVATION**

**SIDE ELEVATION**

**DETAILS OF POST**

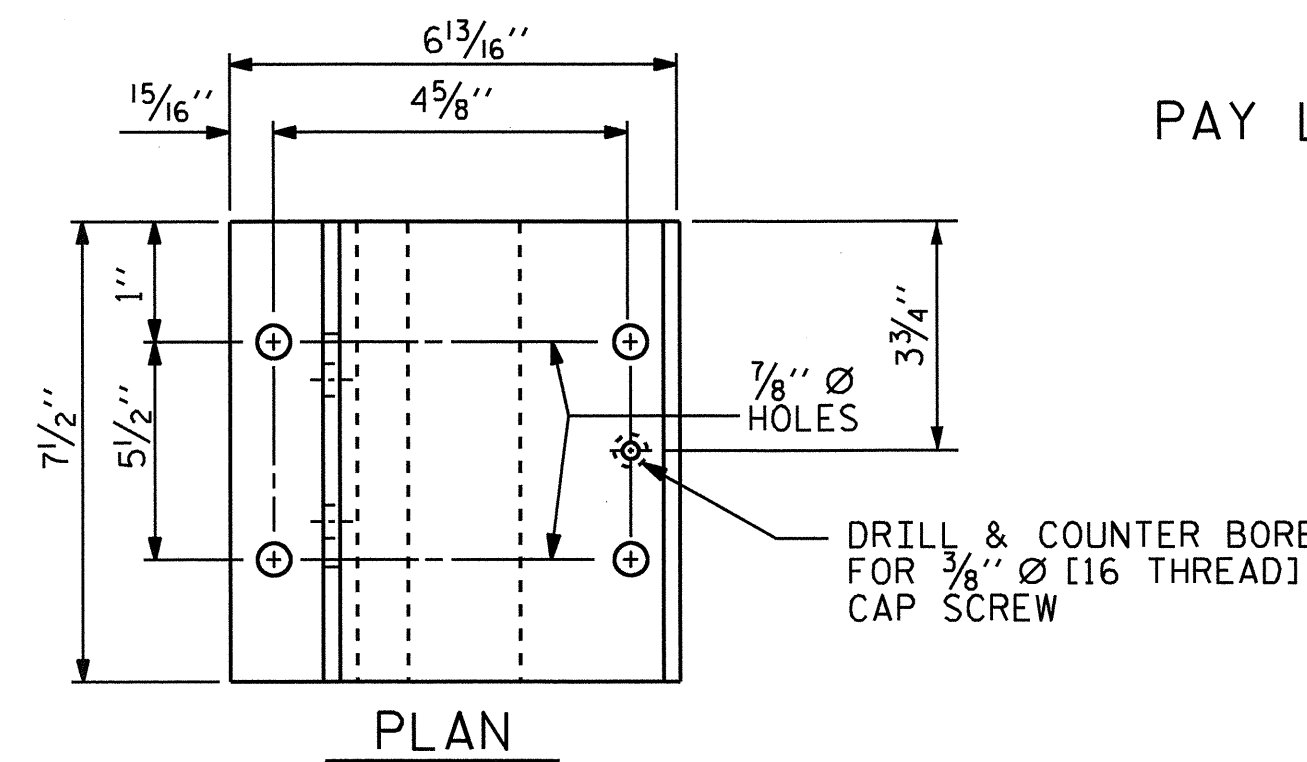


**FRONT ELEVATION**

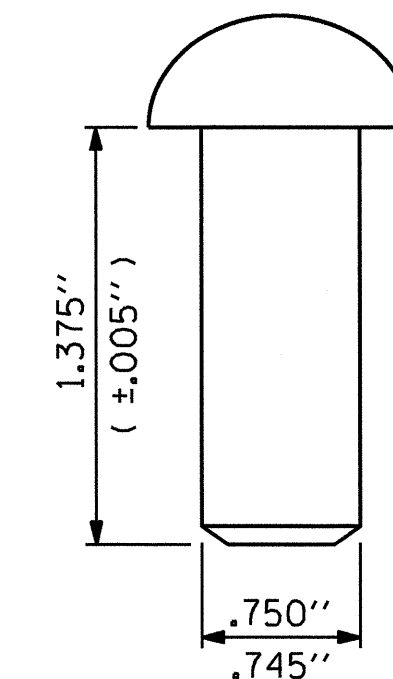
**SIDE ELEVATION**

**POST BASE DETAILS**

PAY LENGTH = 245.50 LIN. FT.



**PLAN**



**RIVET DETAIL**

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-12
STANDARD 2 BAR METAL RAIL						TOTAL SHEETS 24
REVISIONS						NO. BY DATE NO. BY DATE
1			3			
2			4			



NOTES

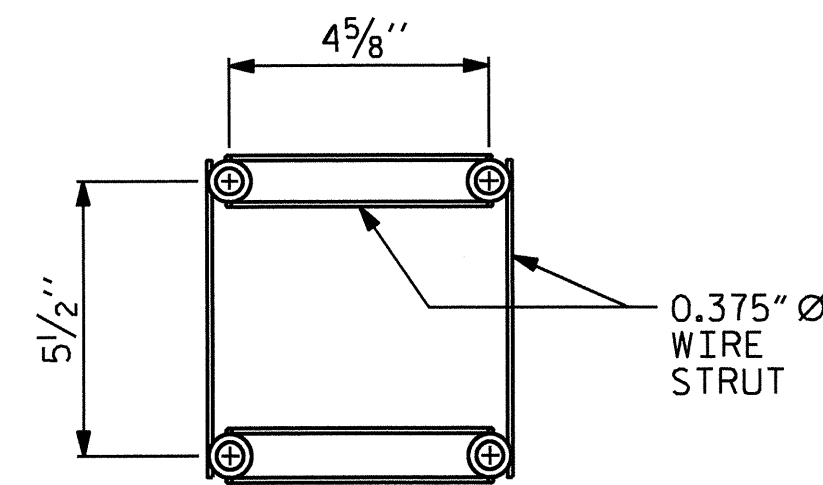
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

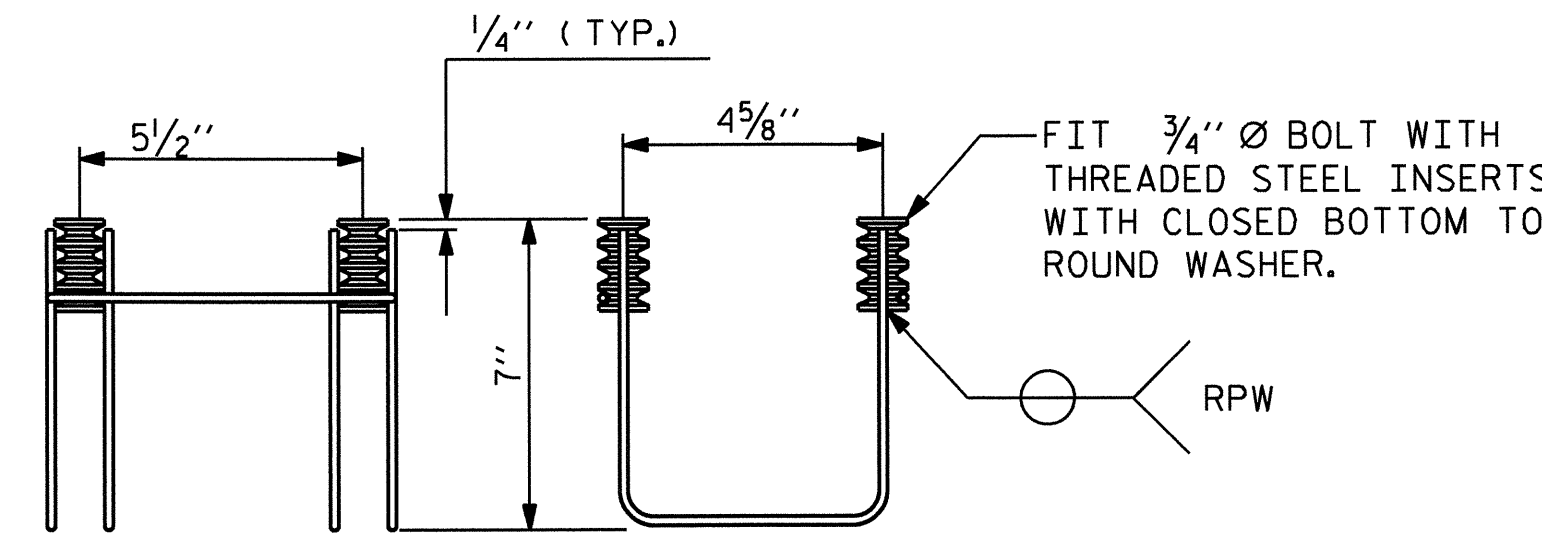
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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.

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

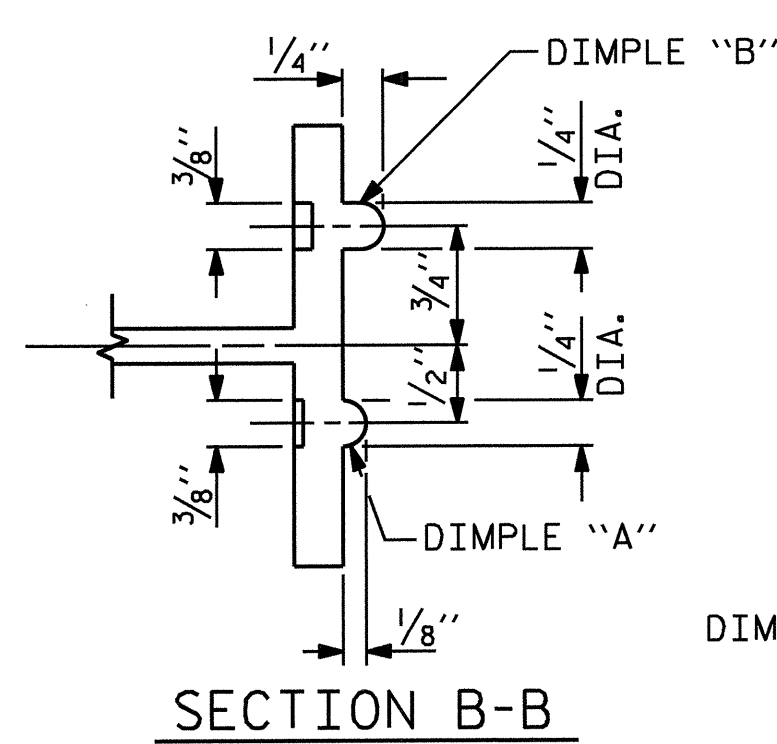


SIDE VIEW ELEVATION

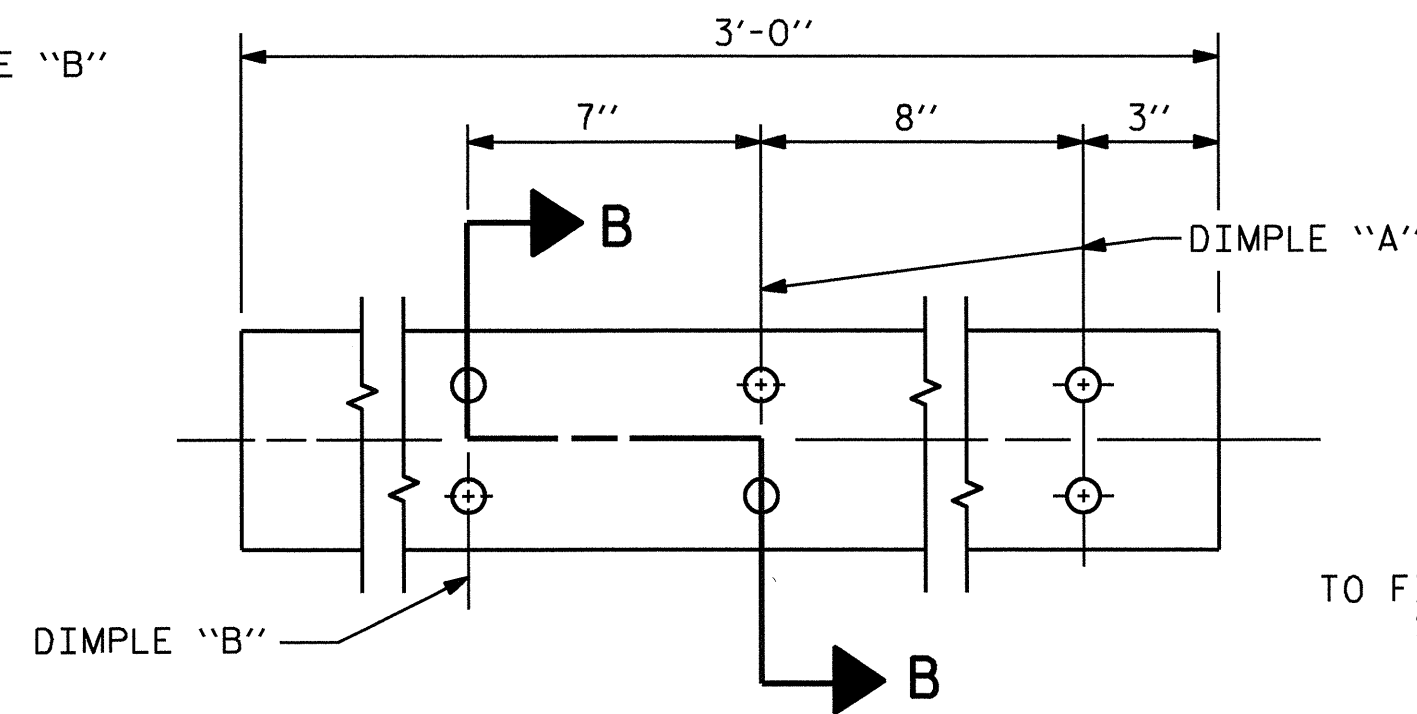
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

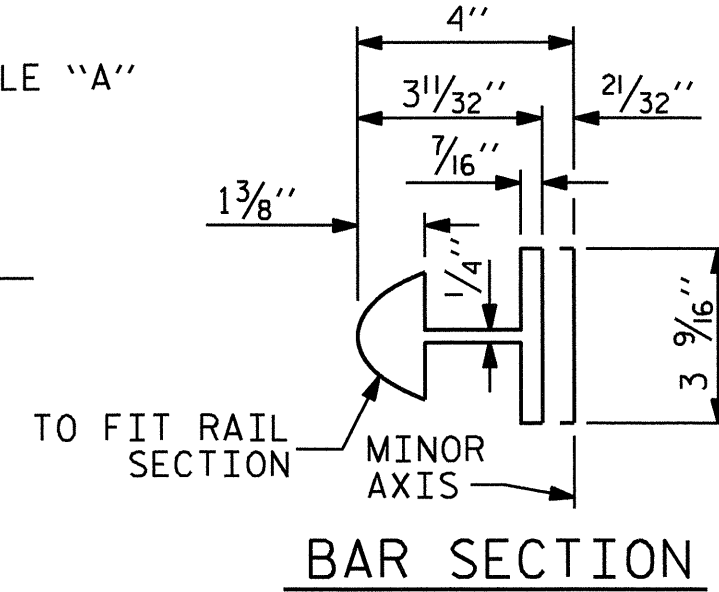
( 46 ASSEMBLIES REQUIRED )



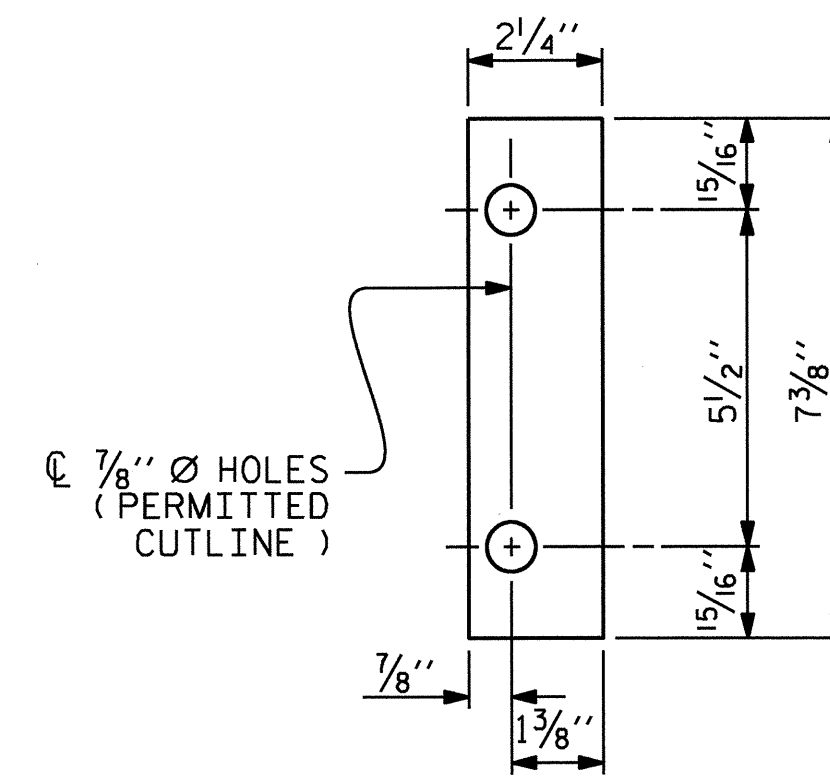
SECTION B-B



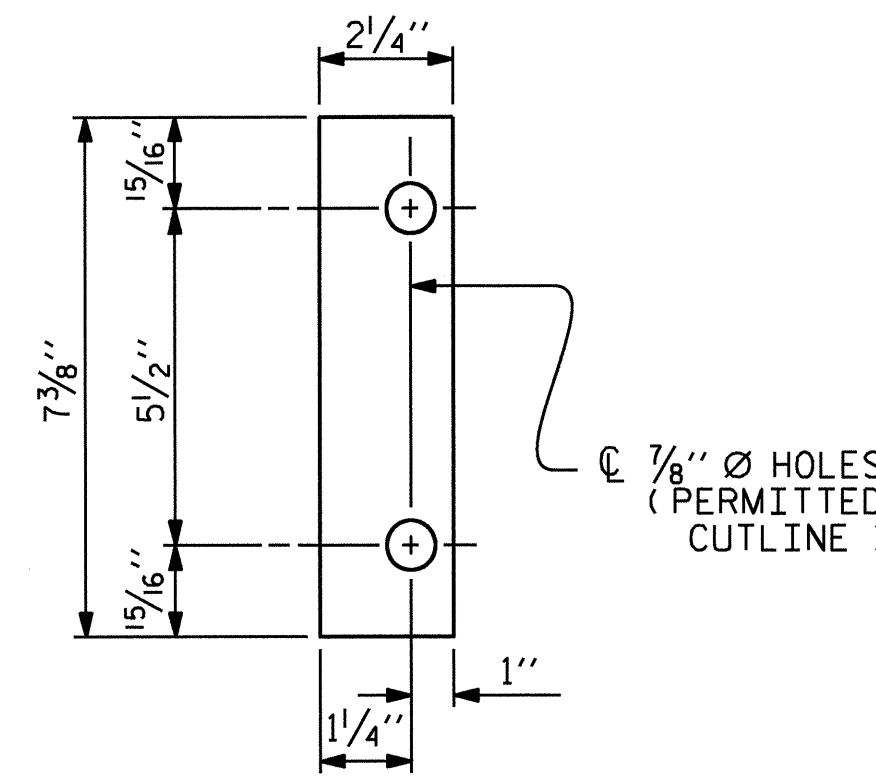
EXPANSION BAR DETAILS



BAR SECTION



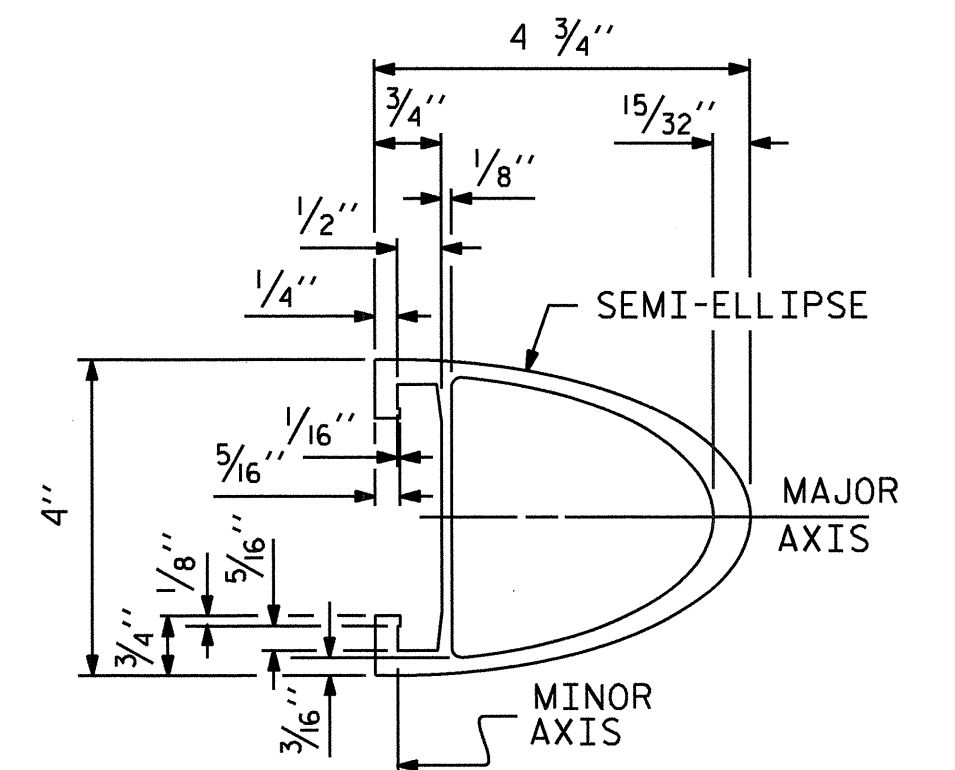
FRONT PLATE



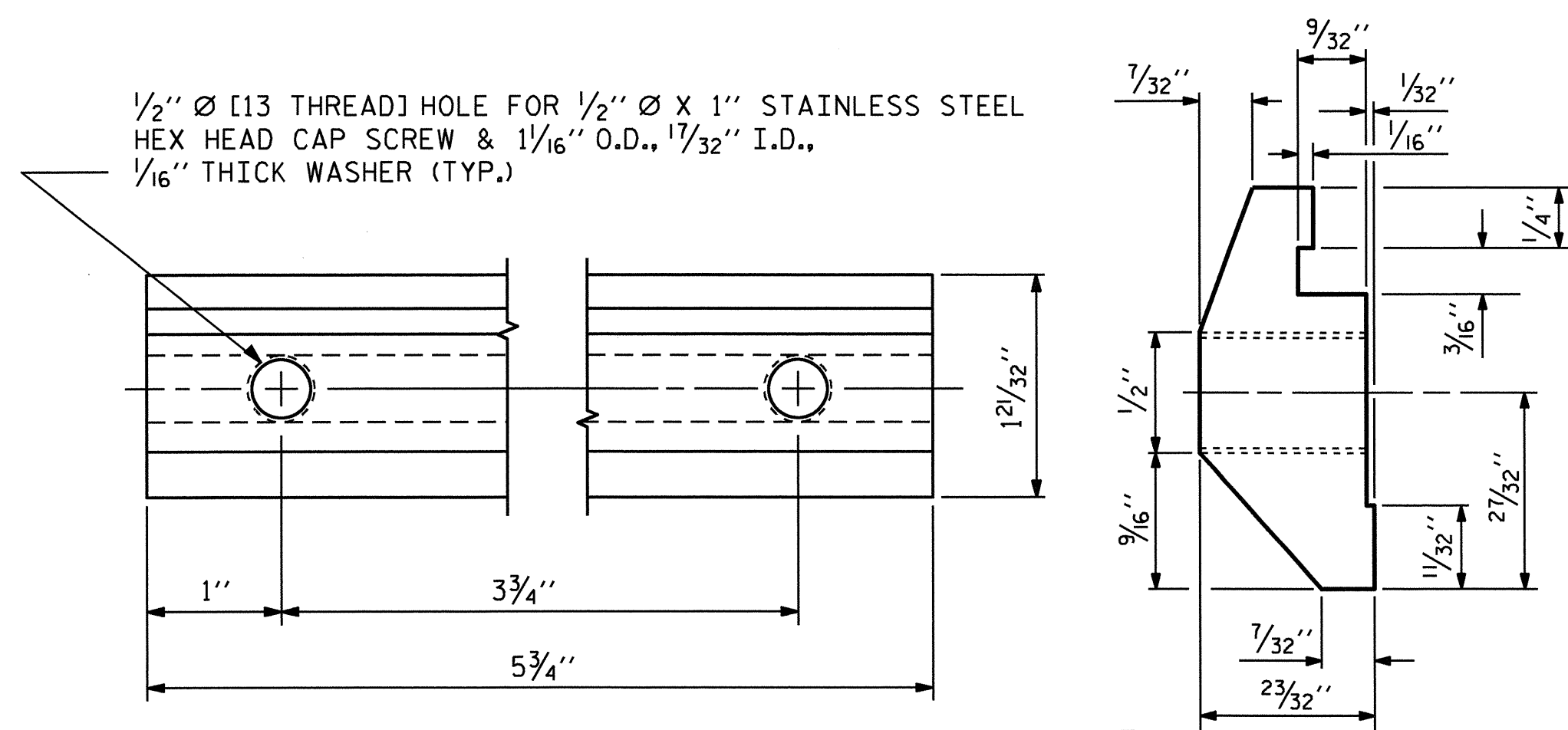
REAR PLATE

SHIM DETAILS

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

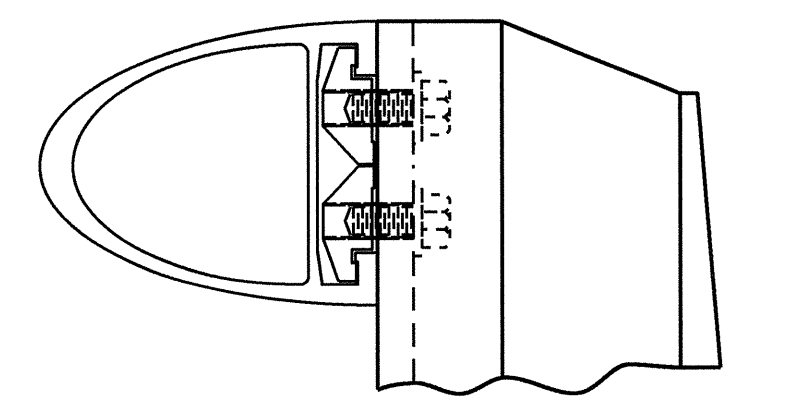


RAIL SECTION

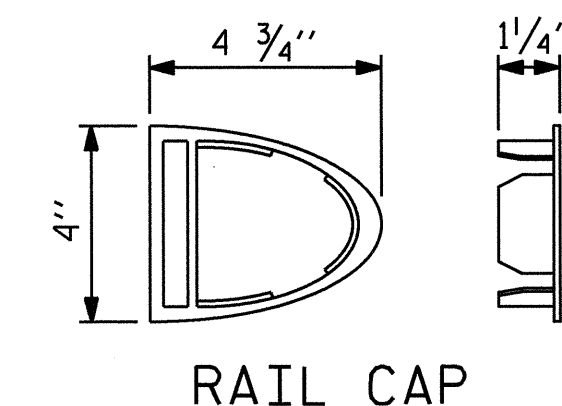


CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4661  
WAKE COUNTY  
STATION: 24+50.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

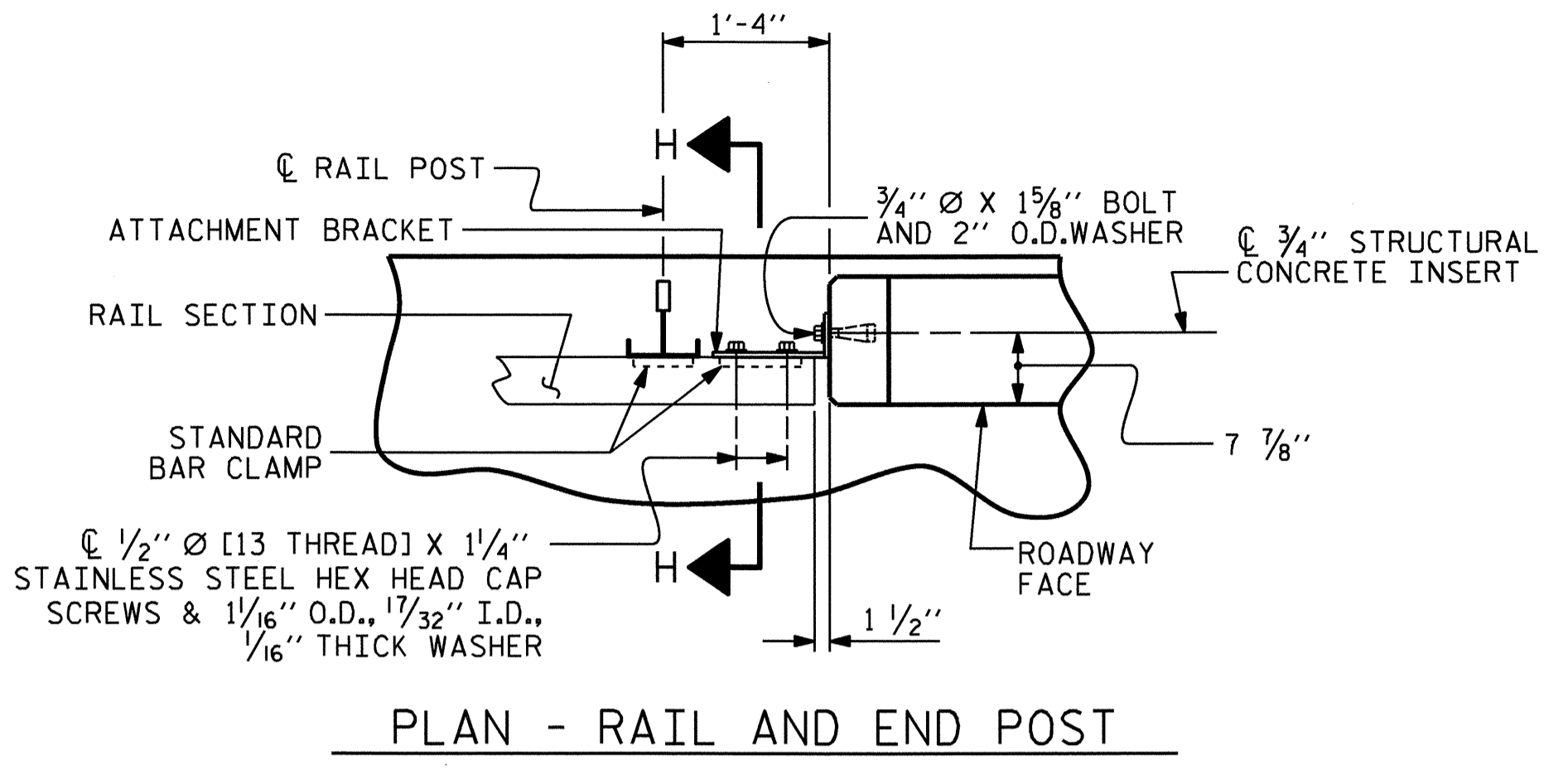
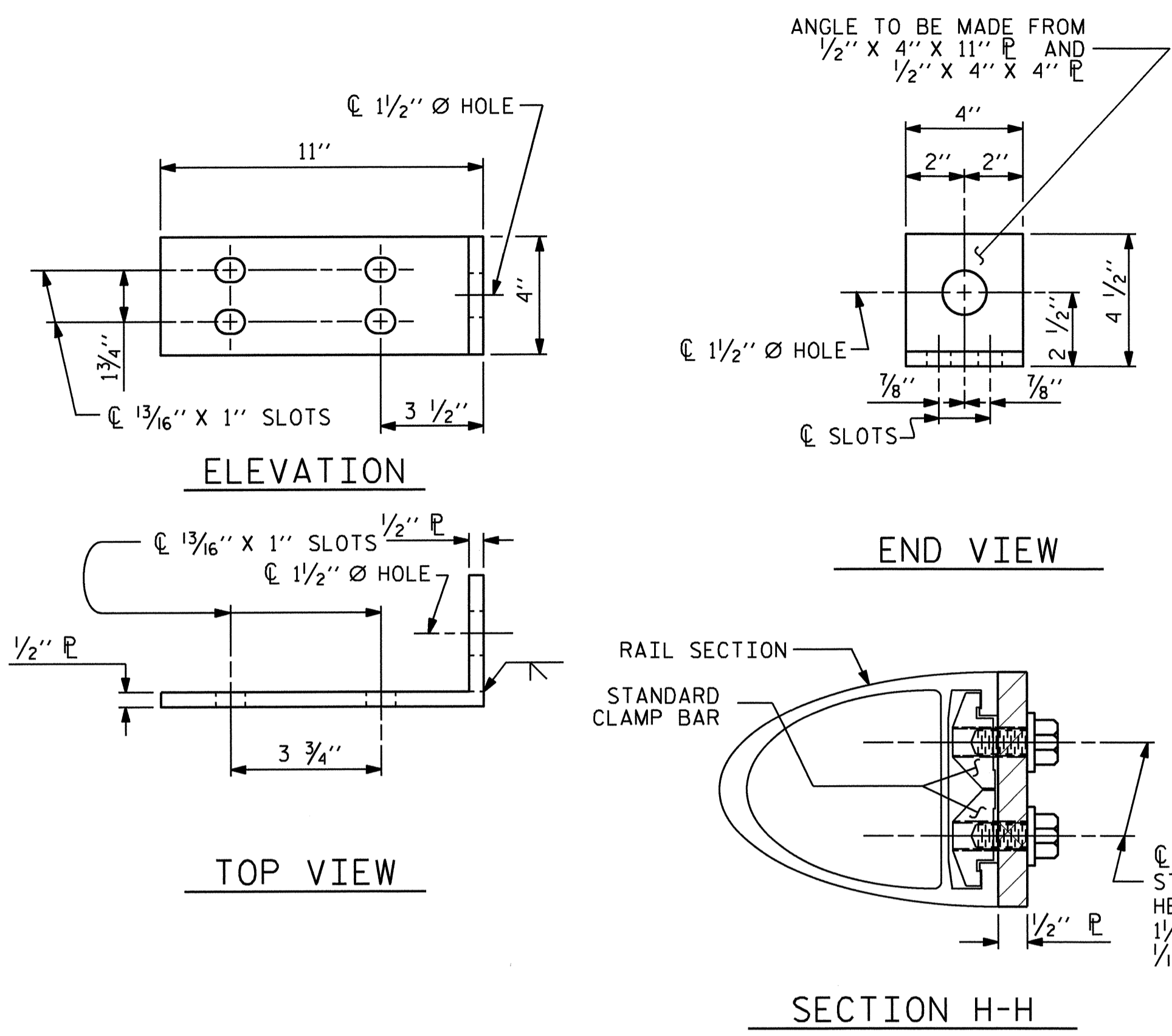
STANDARD

2 BAR METAL RAIL



ASSEMBLED BY : V. T. DOAN	DATE : 08-10
CHECKED BY : M. K. TOM	DATE : 08-10
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:	S-13
1			3			TOTAL SHEETS 24
2			4			



**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.

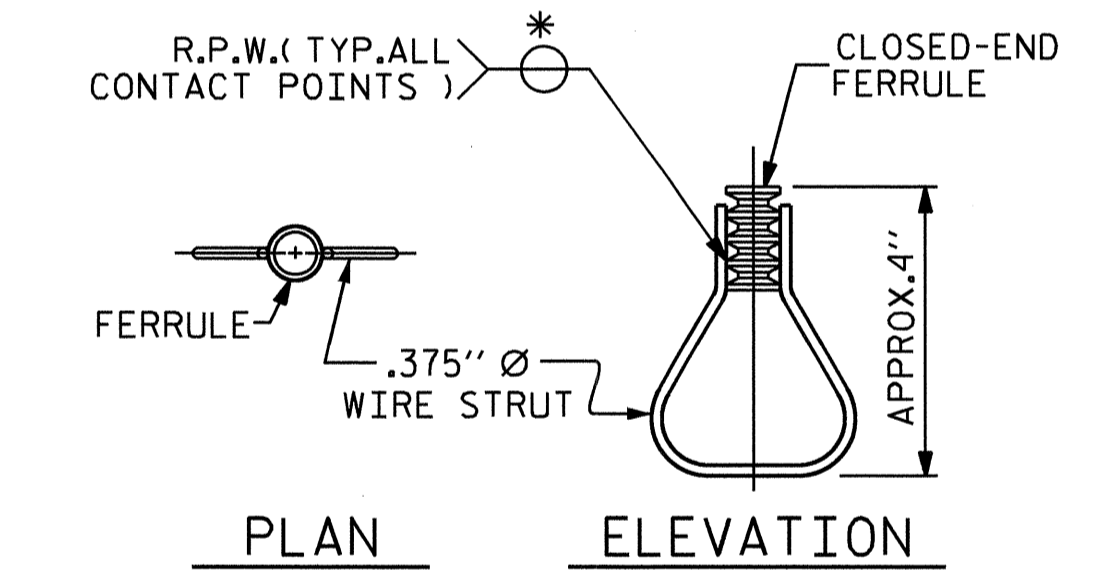
THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

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.

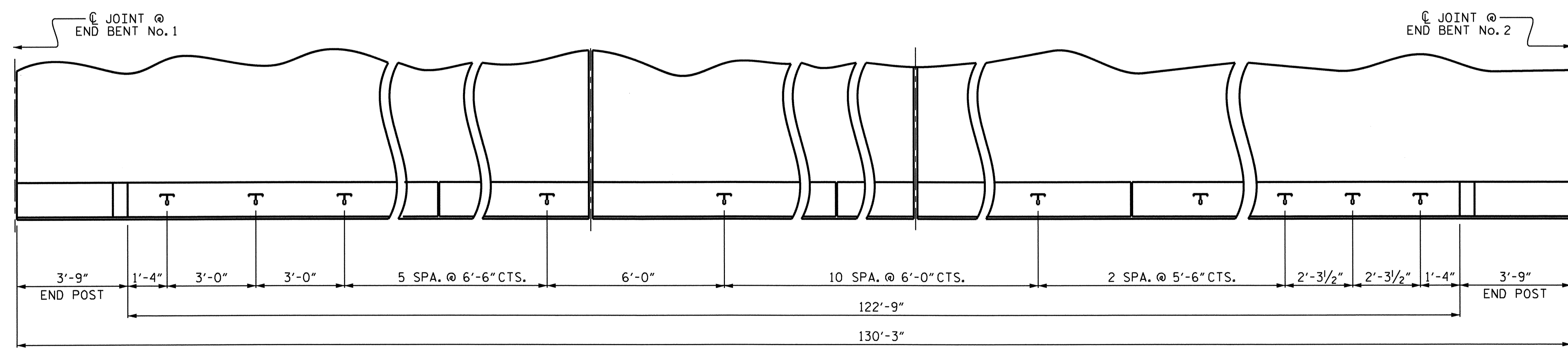
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT 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.

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



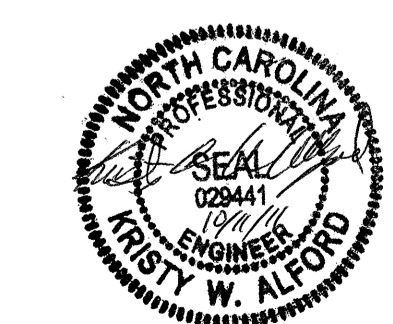
**STRUCTURAL CONCRETE INSERT**

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



**PLAN OF RAIL POST SPACING**  
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS					
REVISIONS					SHEET NO. S-14
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 24
2			4		

ASSEMBLED BY : T. BANKOVICH	DATE : 8-2010
CHECKED BY : M. K. TOM	DATE : 8-2010
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

NOTES

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

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

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

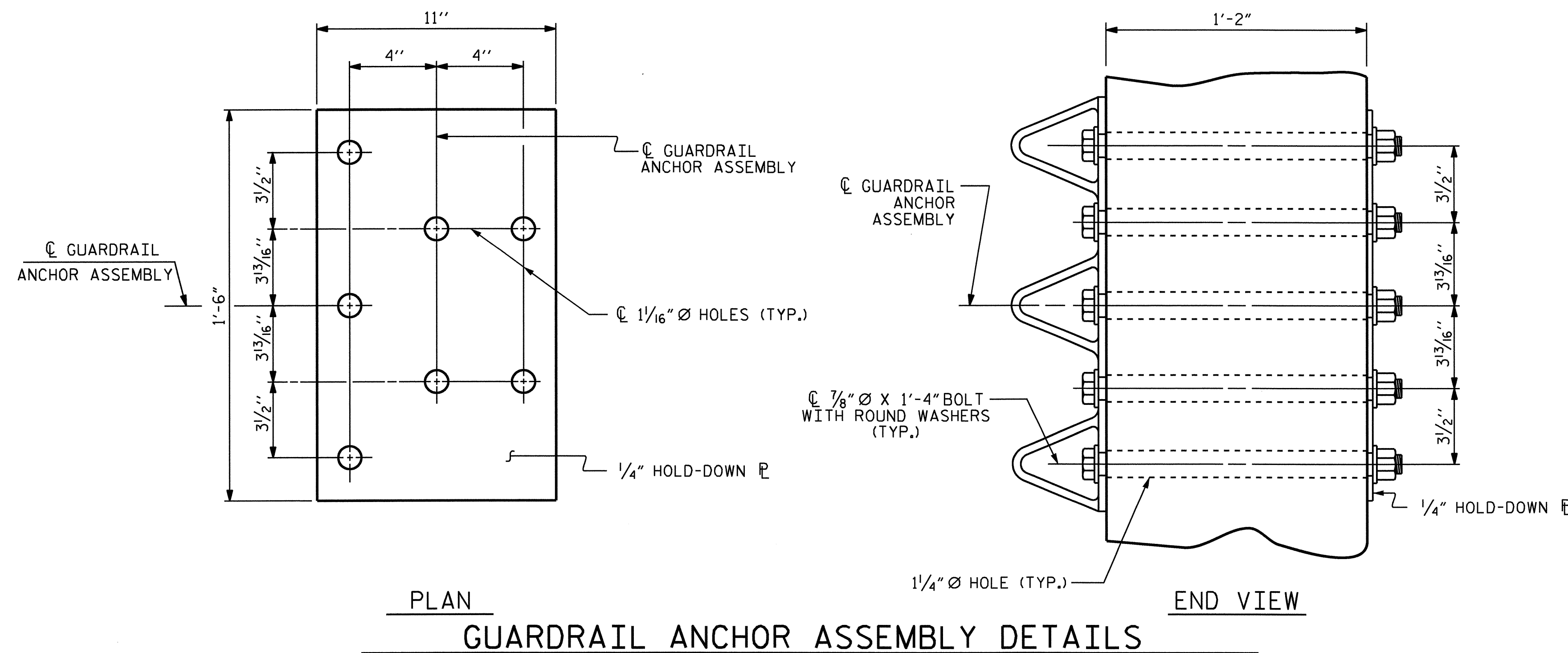
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

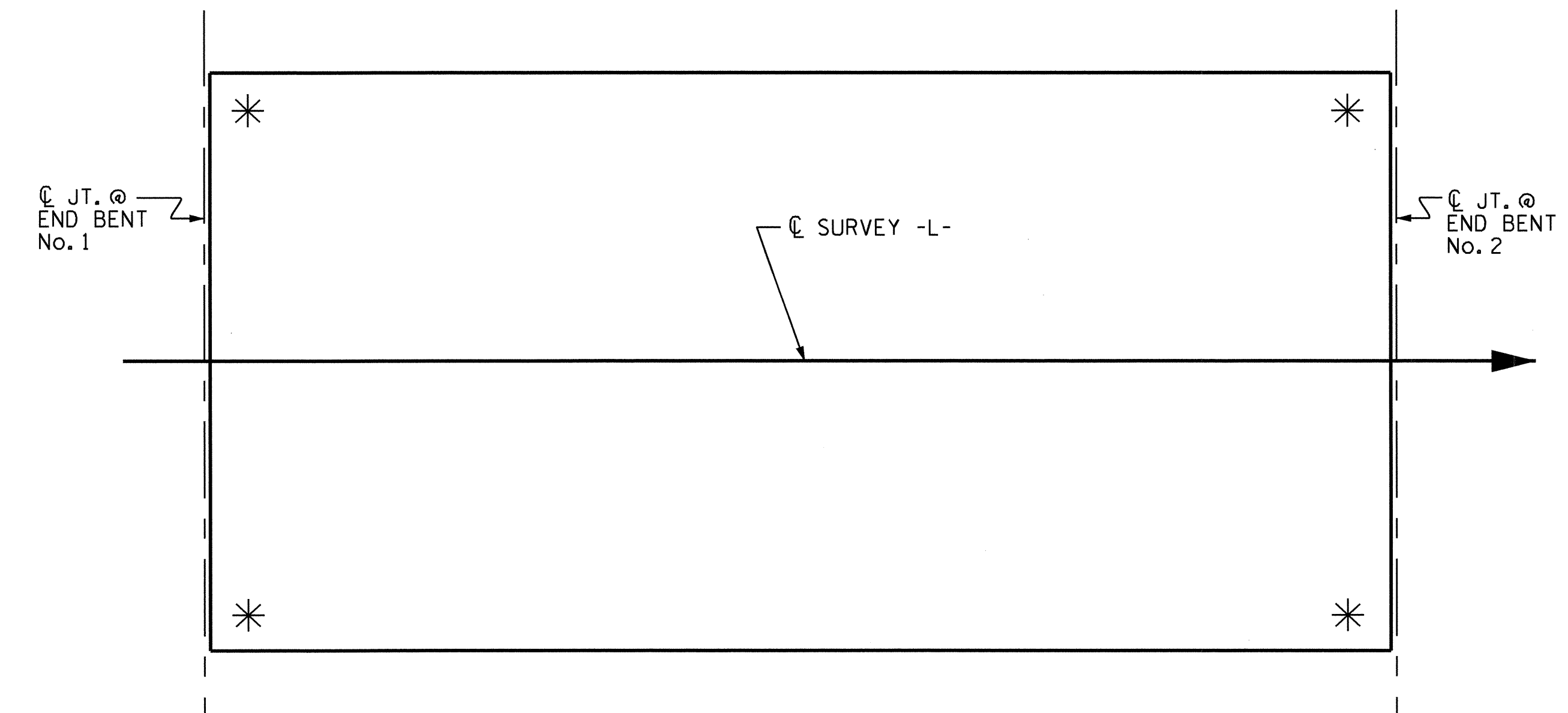
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

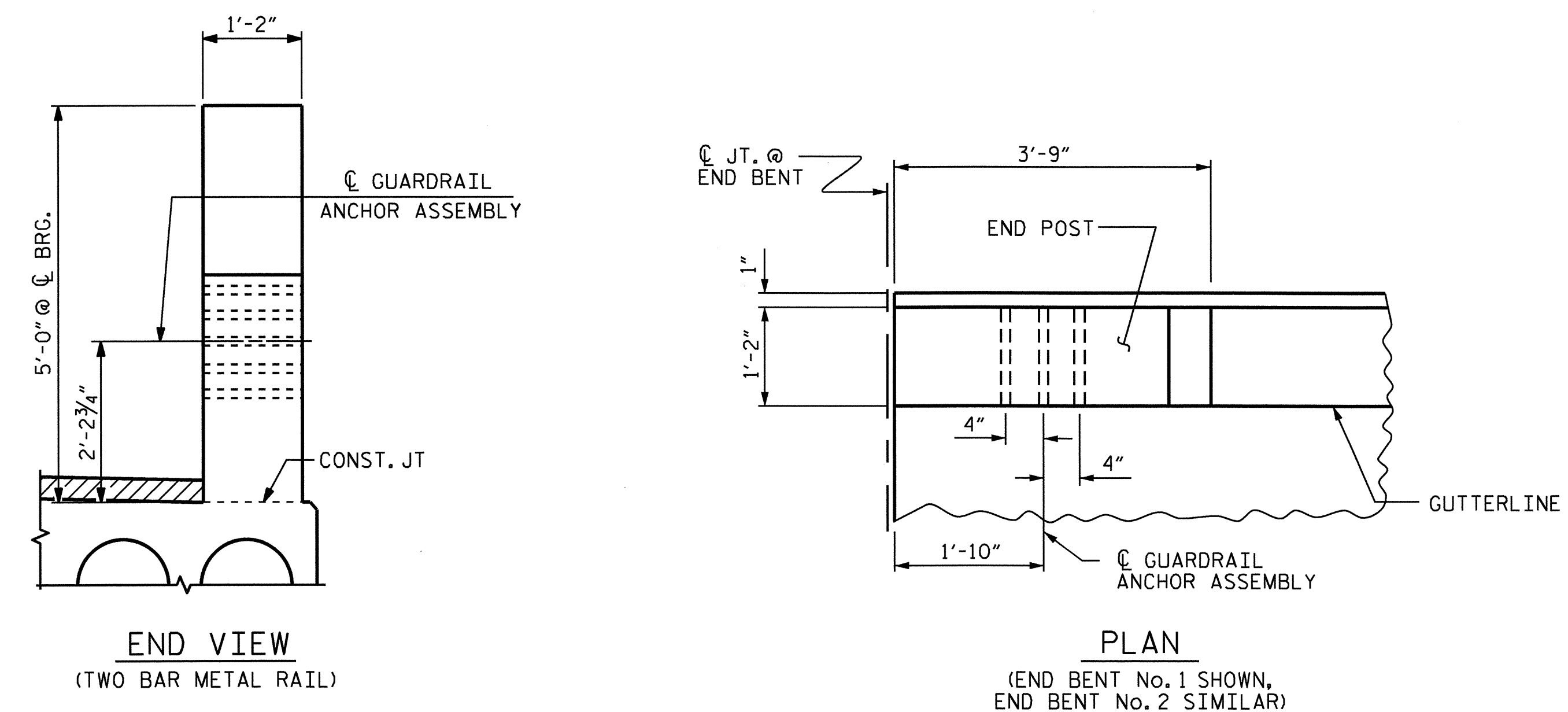
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN  
GUARDRAIL ANCHOR ASSEMBLY DETAILS  
END VIEW



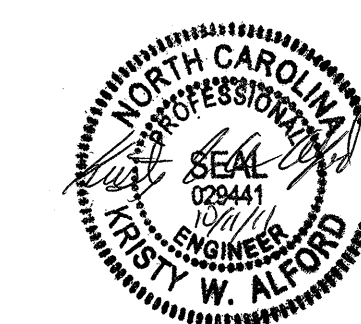
SKETCH SHOWING POINTS OF ATTACHMENT  
\* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW  
(TWO BAR METAL RAIL)  
PLAN  
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR)

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4661  
WAKE COUNTY  
STATION: 24+50.00 -L-



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

ASSEMBLED BY : V. T. DOAN	DATE : 08-10
CHECKED BY : M. K. TOM	DATE : 08-10
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RCW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			24



NOTES

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

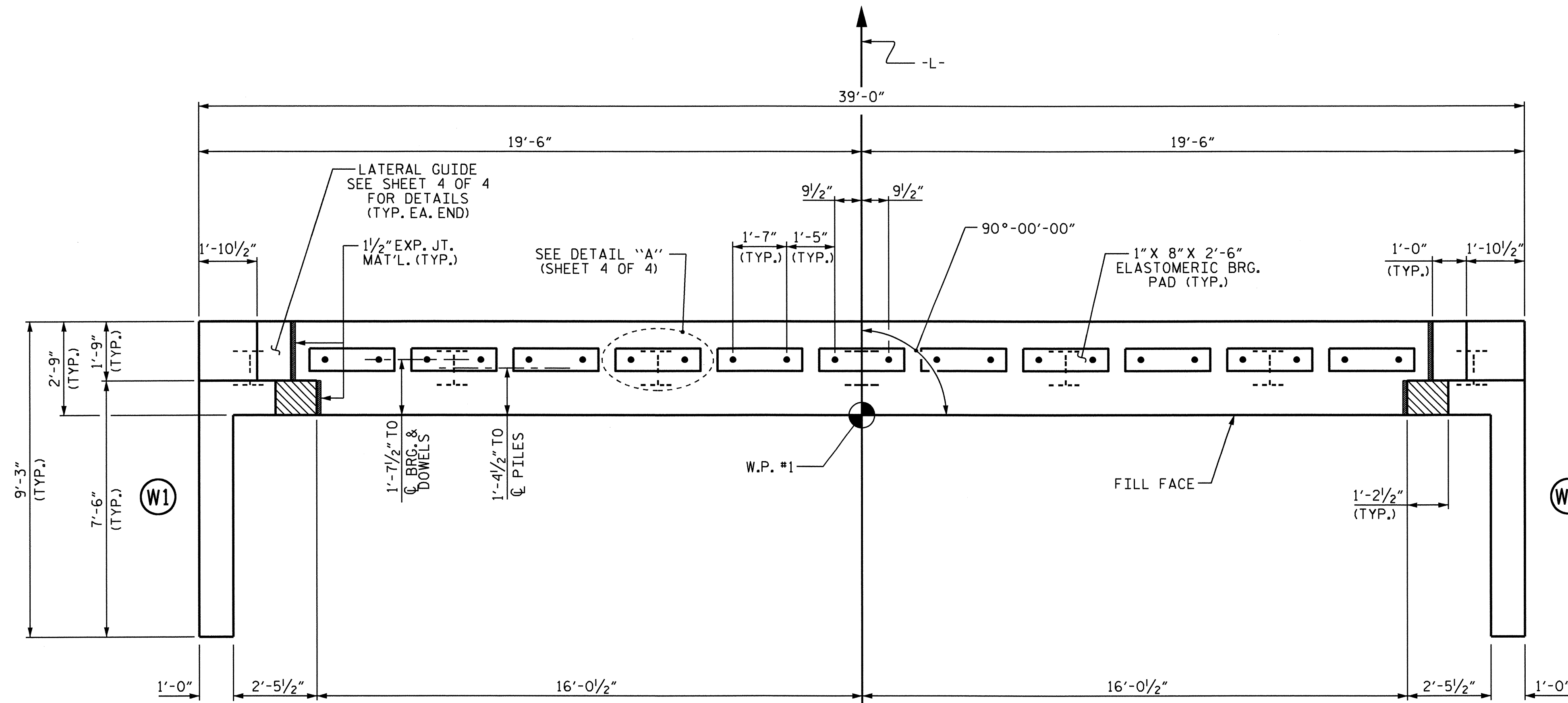
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

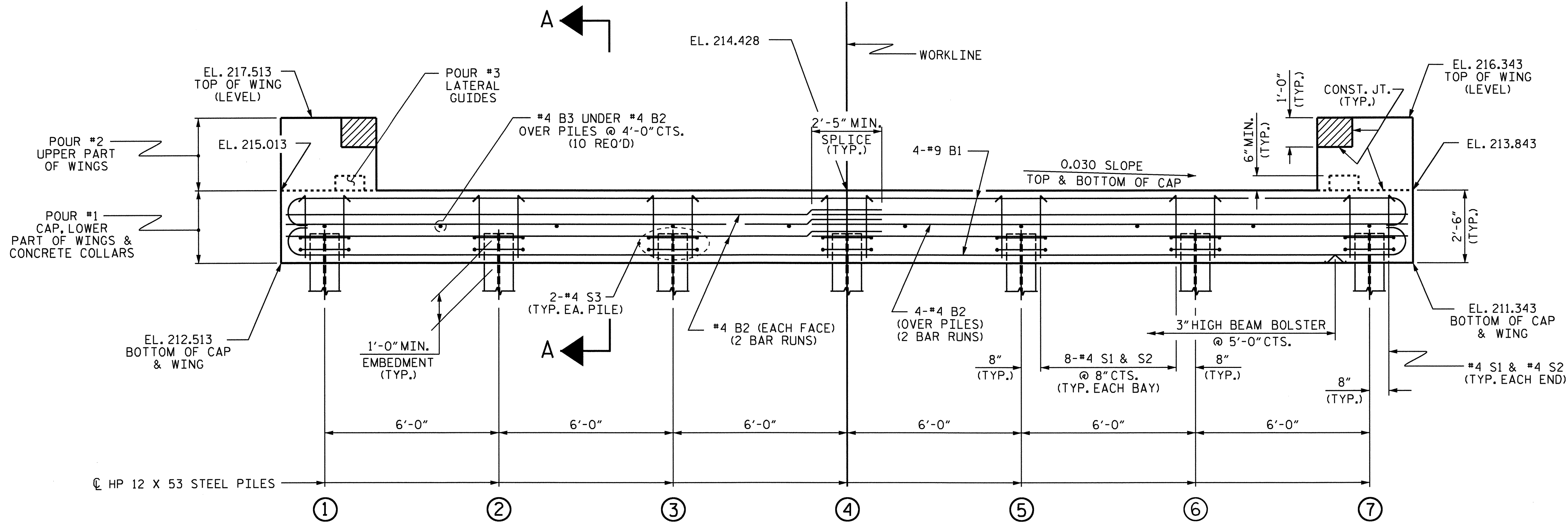
FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PLAN

TOP OF PILE ELEVATIONS	
①	213.483
②	213.303
③	213.123
④	212.943
⑤	212.763
⑥	212.583
⑦	212.403



ELEVATION

WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-4661  
WAKE COUNTY  
STATION: 24+50.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-16
SUBSTRUCTURE END BENT No. 1						TOTAL SHEETS 24
REVISIONS						NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			4
2			4			



ASSEMBLED BY : V. T. DOAN DATE : 08-10  
CHECKED BY : T. BANKOVICH DATE : 08-10  
DRAWN BY : DGE 02/10  
CHECKED BY : MKT 02/10

NOTES

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

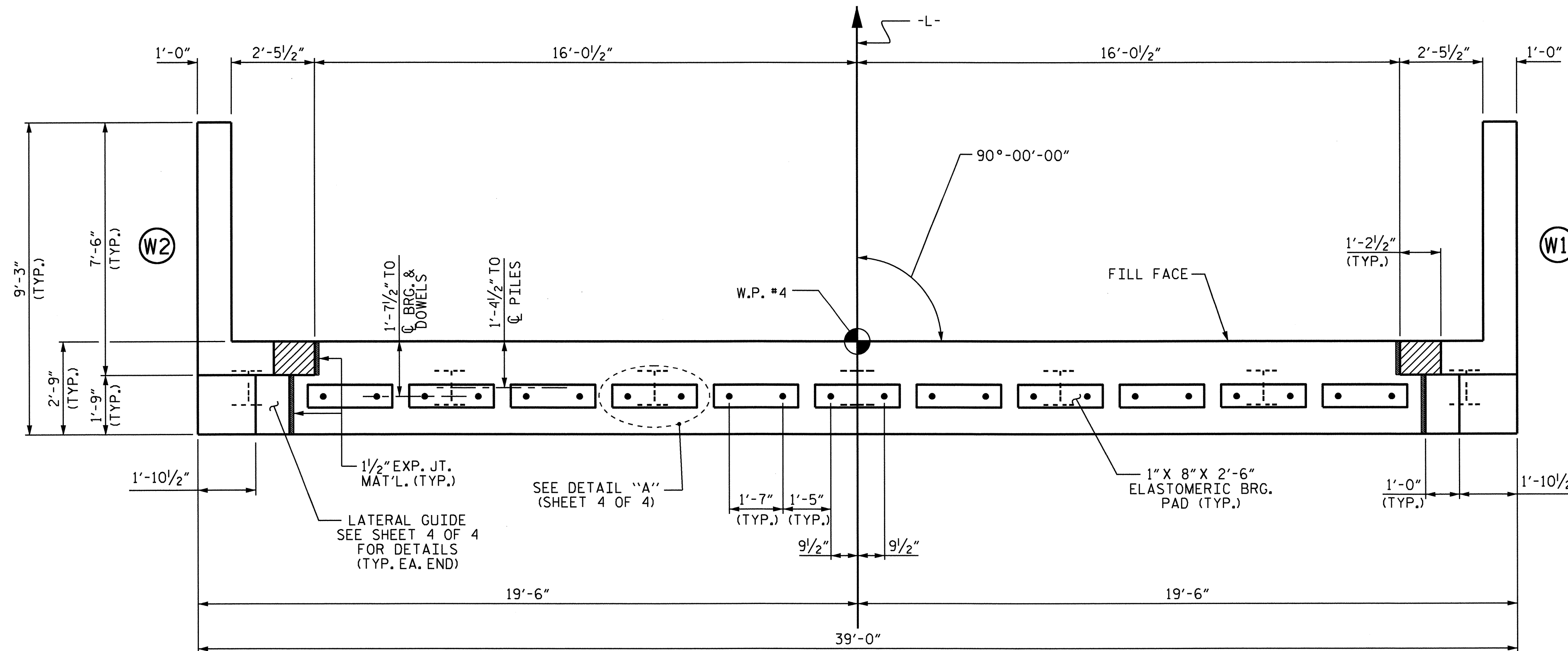
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

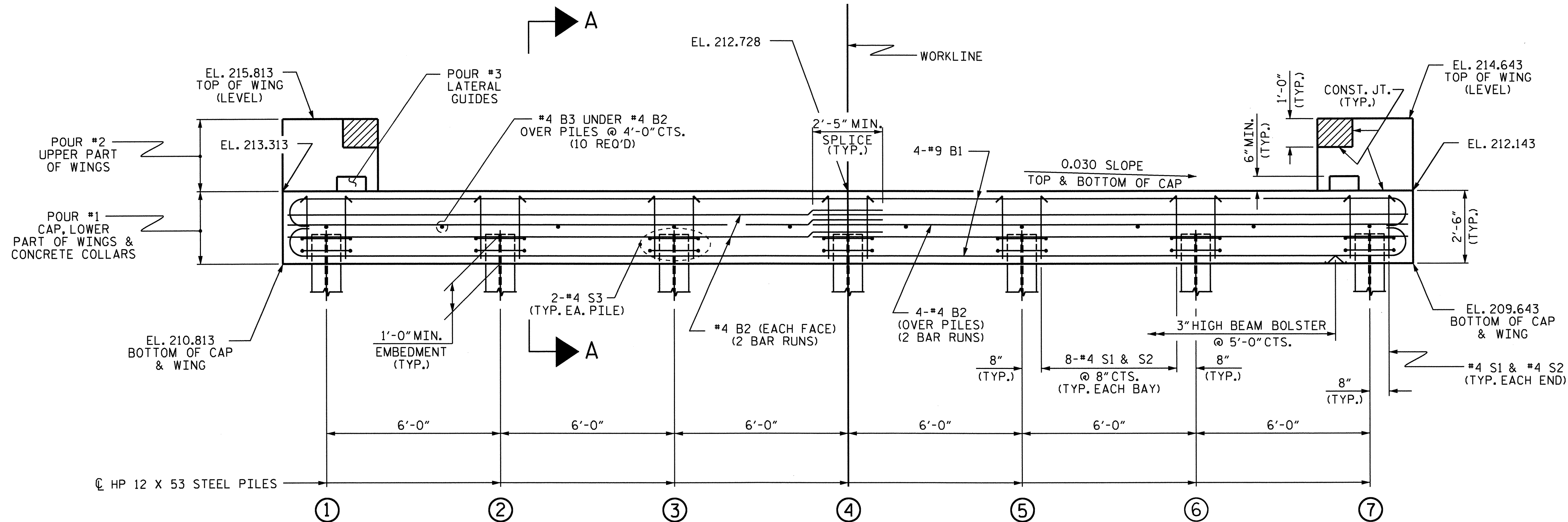
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.  
FOR SECTION A-A, SEE SHEET 4 OF 4.  
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS	
①	211.783
②	211.603
③	211.423
④	211.243
⑤	211.063
⑥	210.883
⑦	210.703

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 2 OF 4

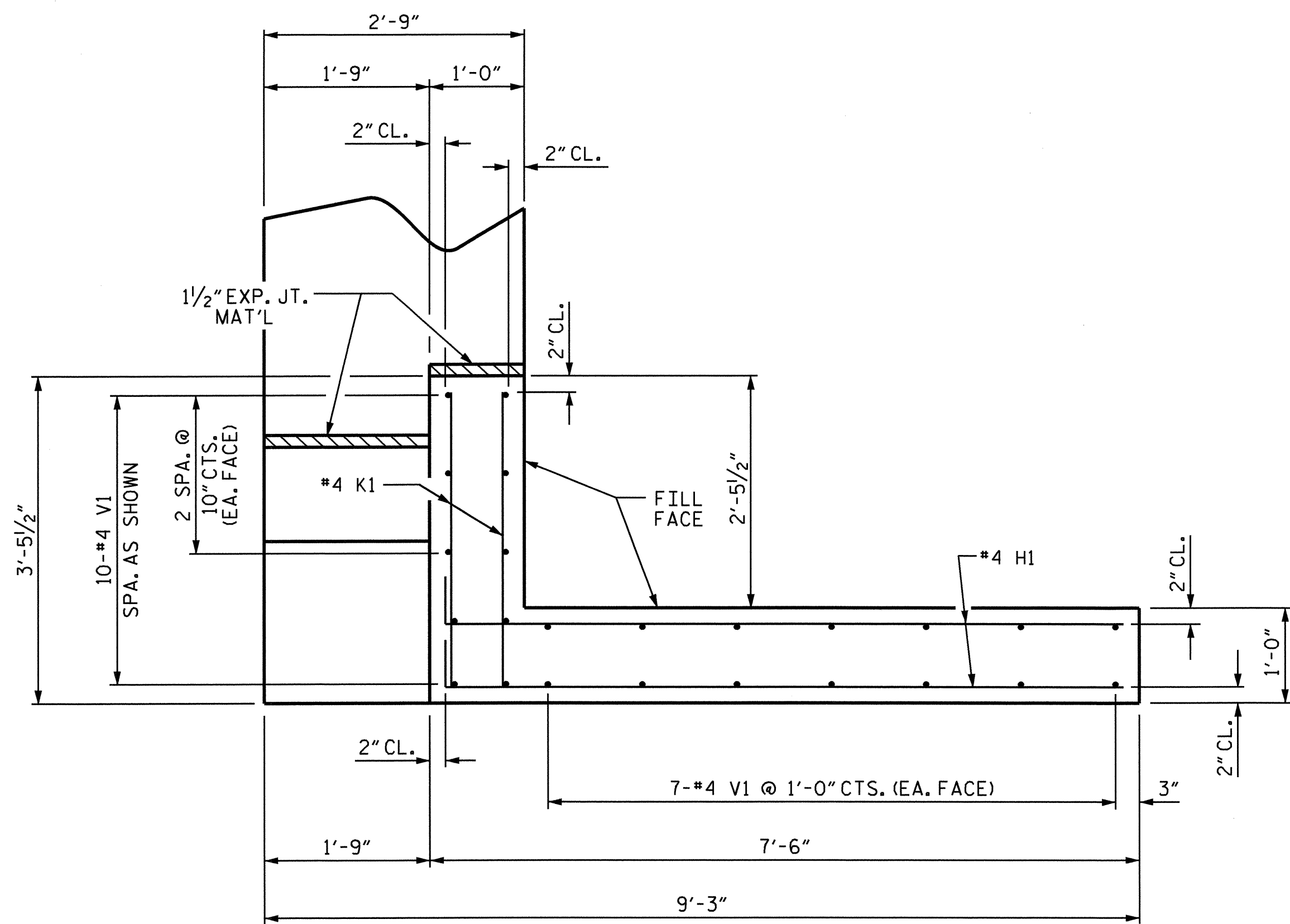
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2

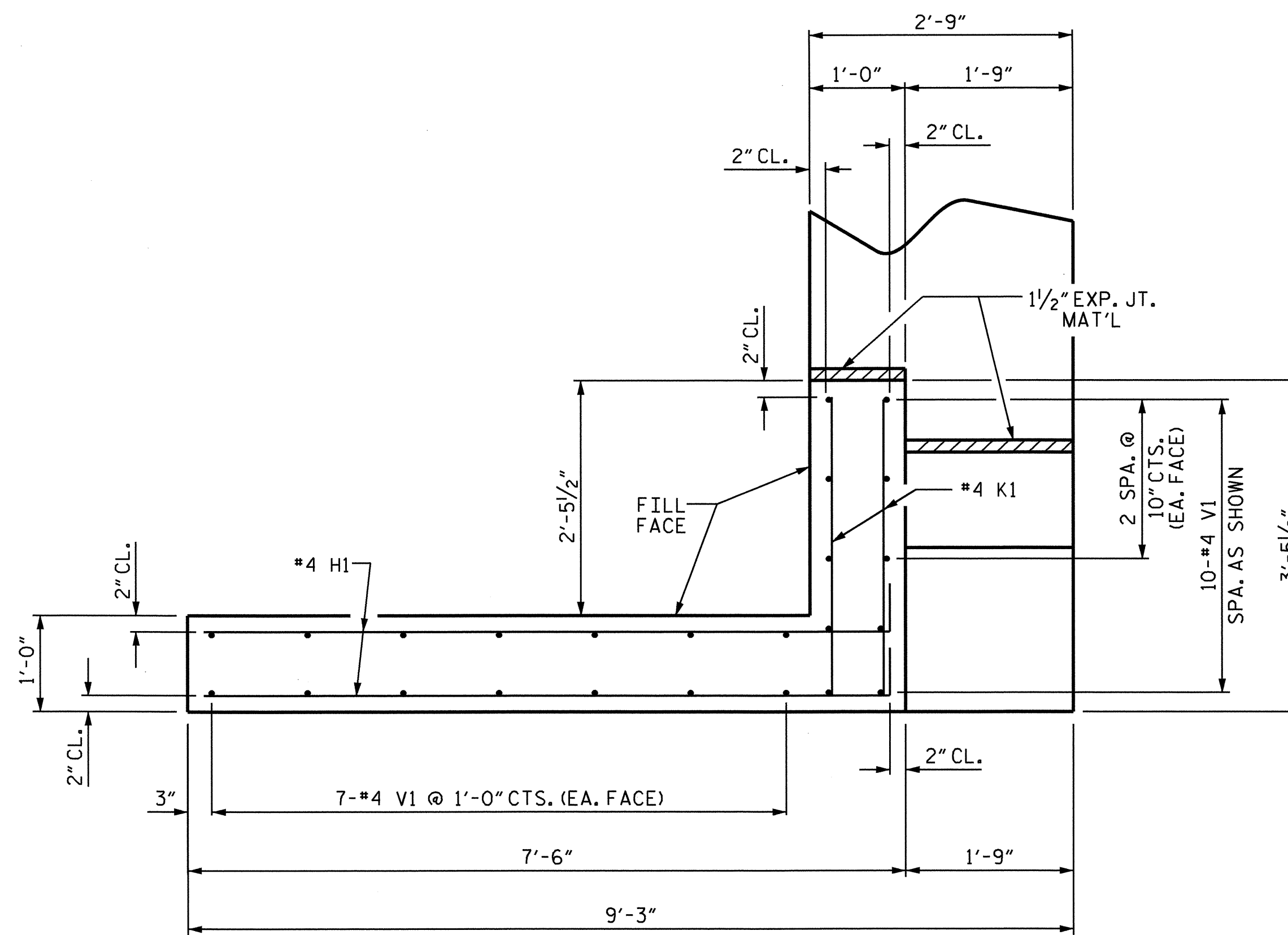


ASSEMBLED BY : V. T. DOAN DATE : 08-10  
 CHECKED BY : T. BANKOVICH DATE : 08-10  
 DRAWN BY : DGE 02/10  
 CHECKED BY : MKT 02/10

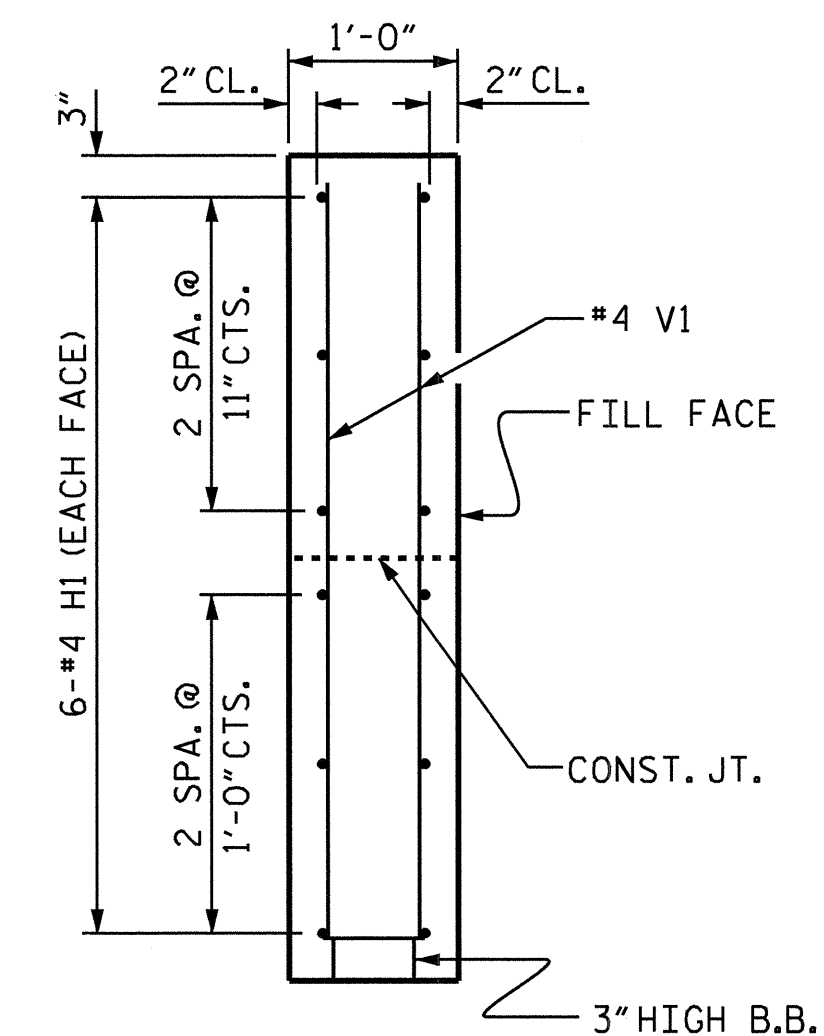
REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



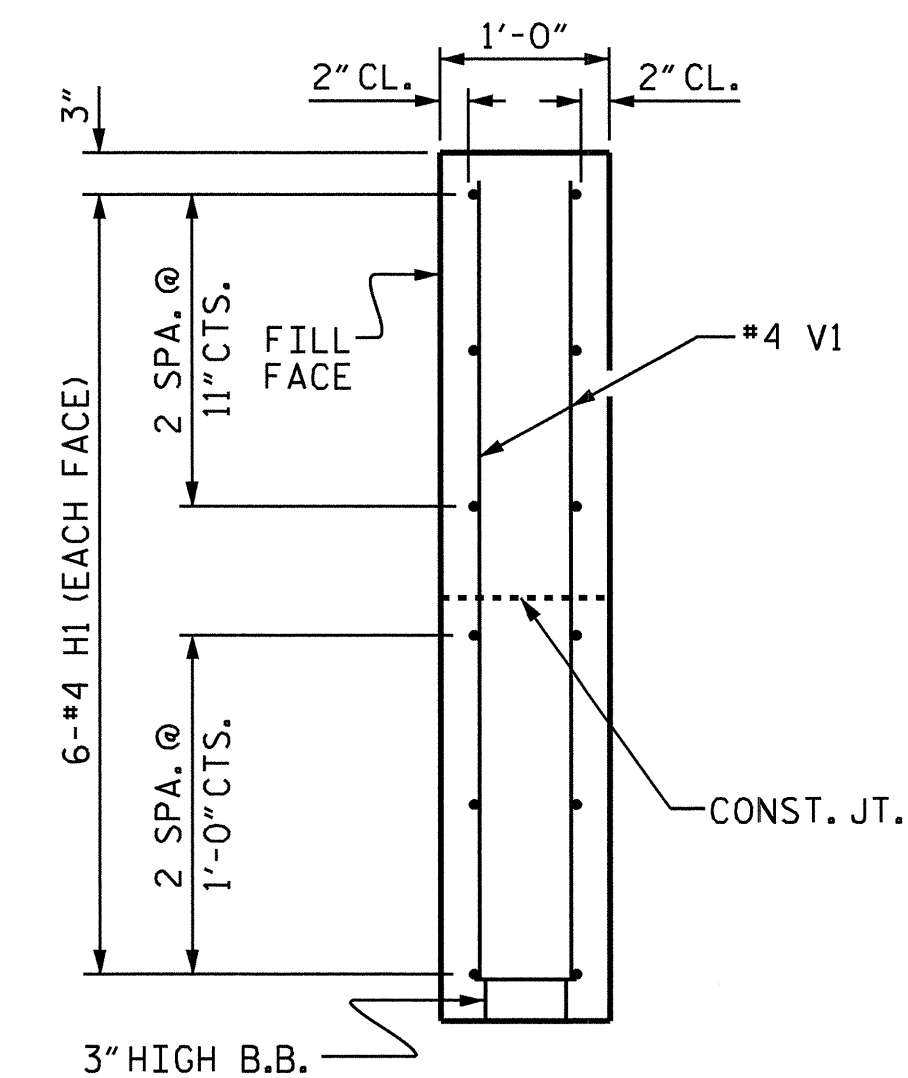
PLAN OF WING (W1)



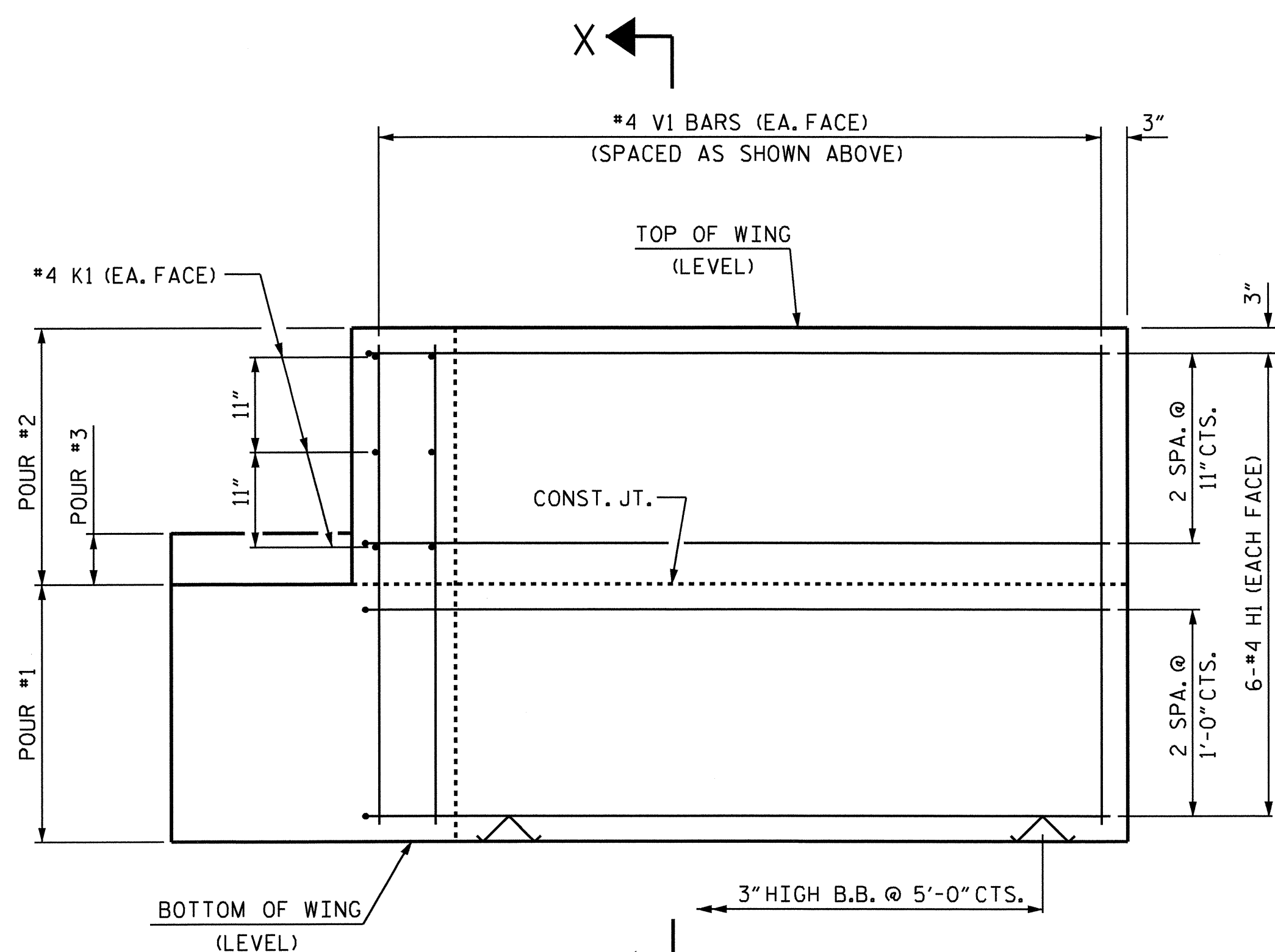
PLAN OF WING (W2)



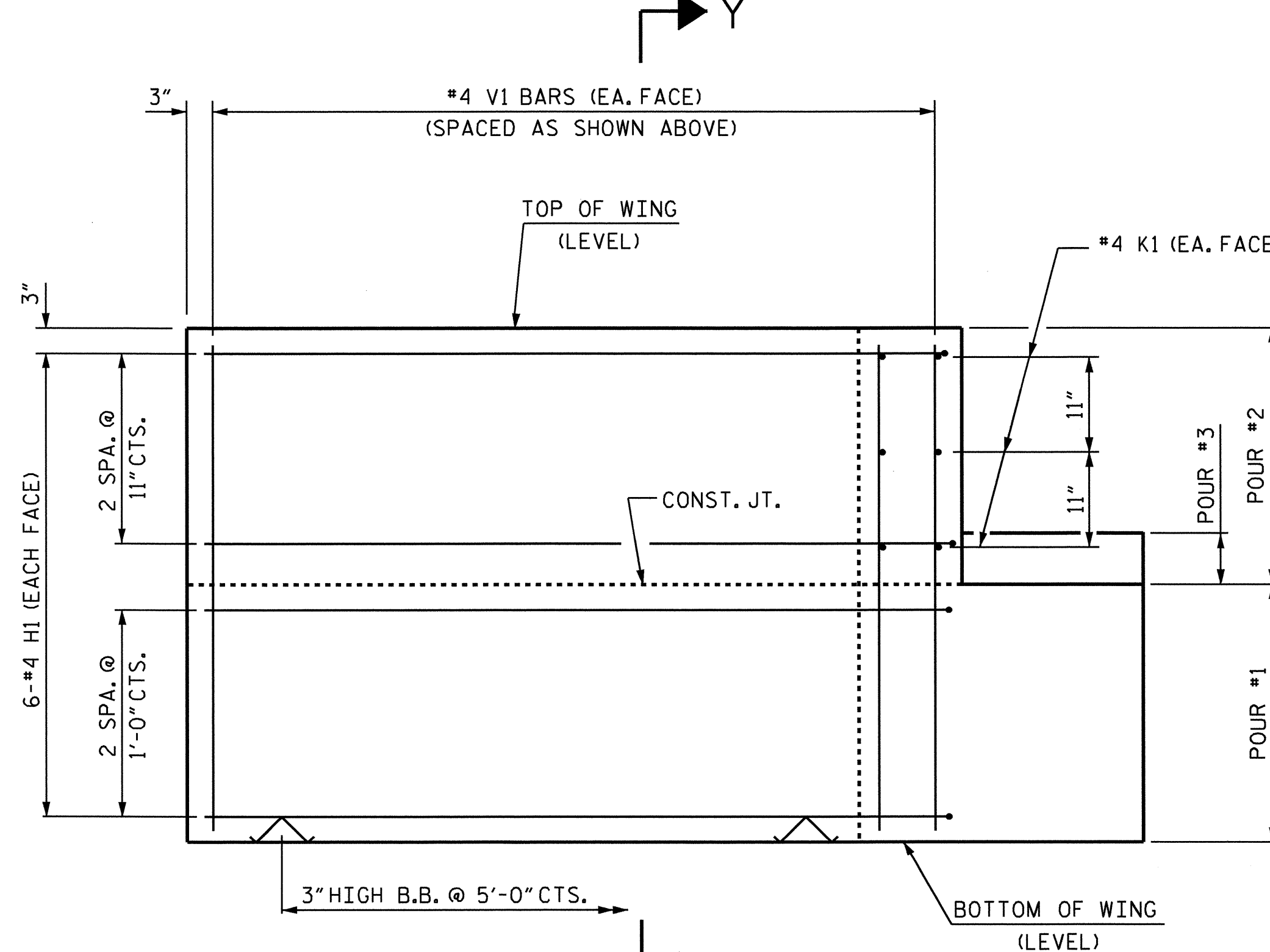
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

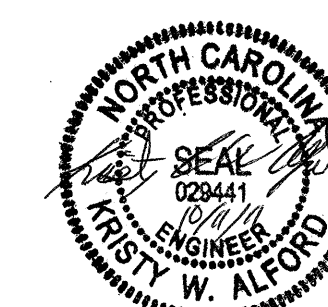
WING DETAILS

PROJECT NO. B-4661  
 WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT  
 WING DETAILS

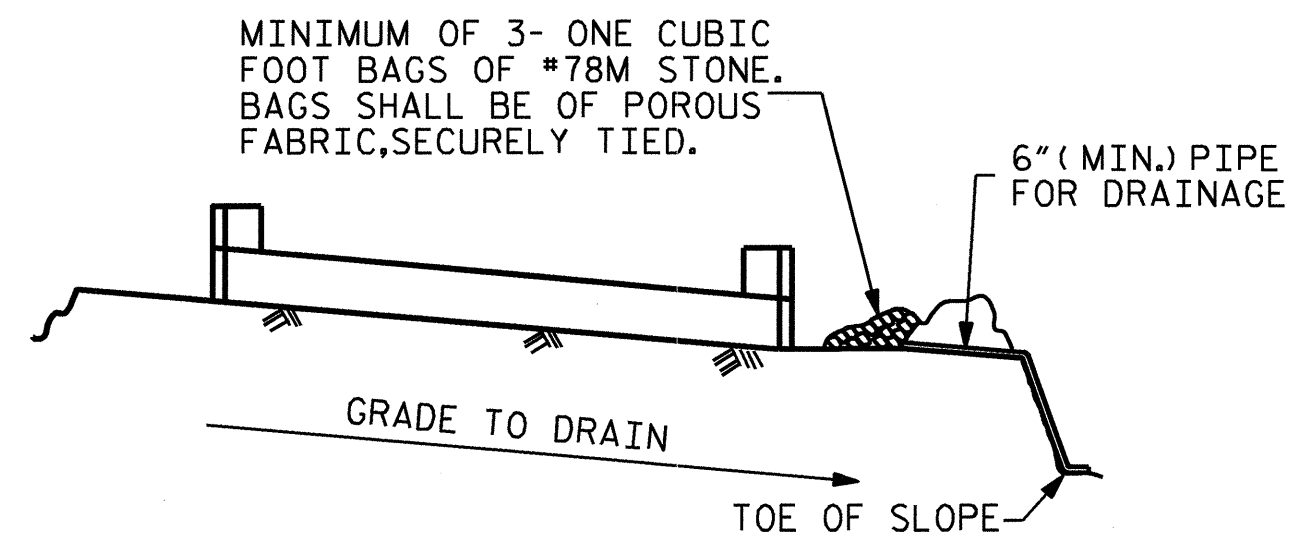


ASSEMBLED BY: V. T. DOAN DATE: 08-10  
 CHECKED BY: T. BANKOVICH DATE: 08-10  
 DRAWN BY: DGE 02/10  
 CHECKED BY: MKT 02/10

07-OCT-2011 13:52  
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18	
1			3			TOTAL SHEETS	
2			4			24	

STD. NO. EB\_33\_90S



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

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN

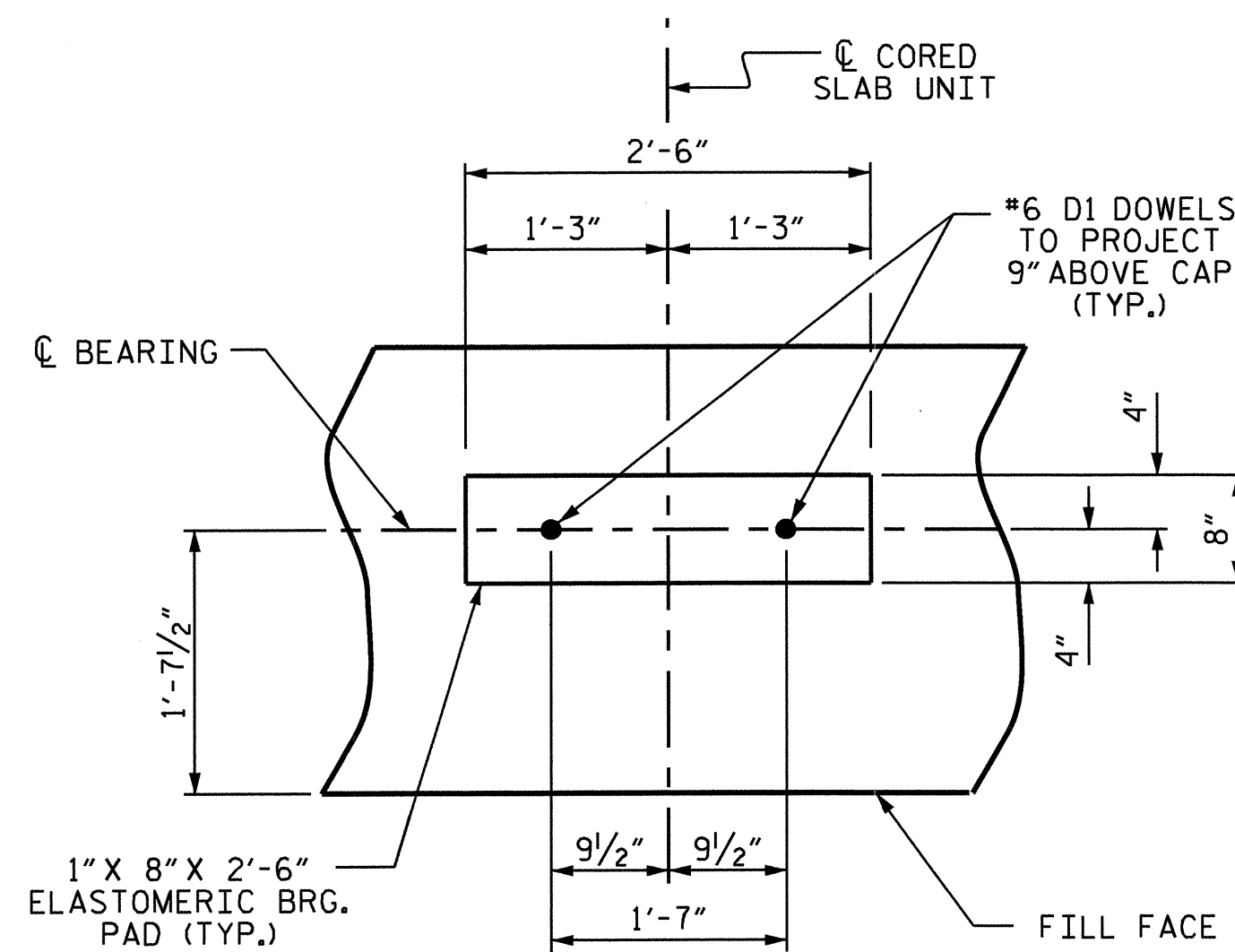
TOE OF SLOPE

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.

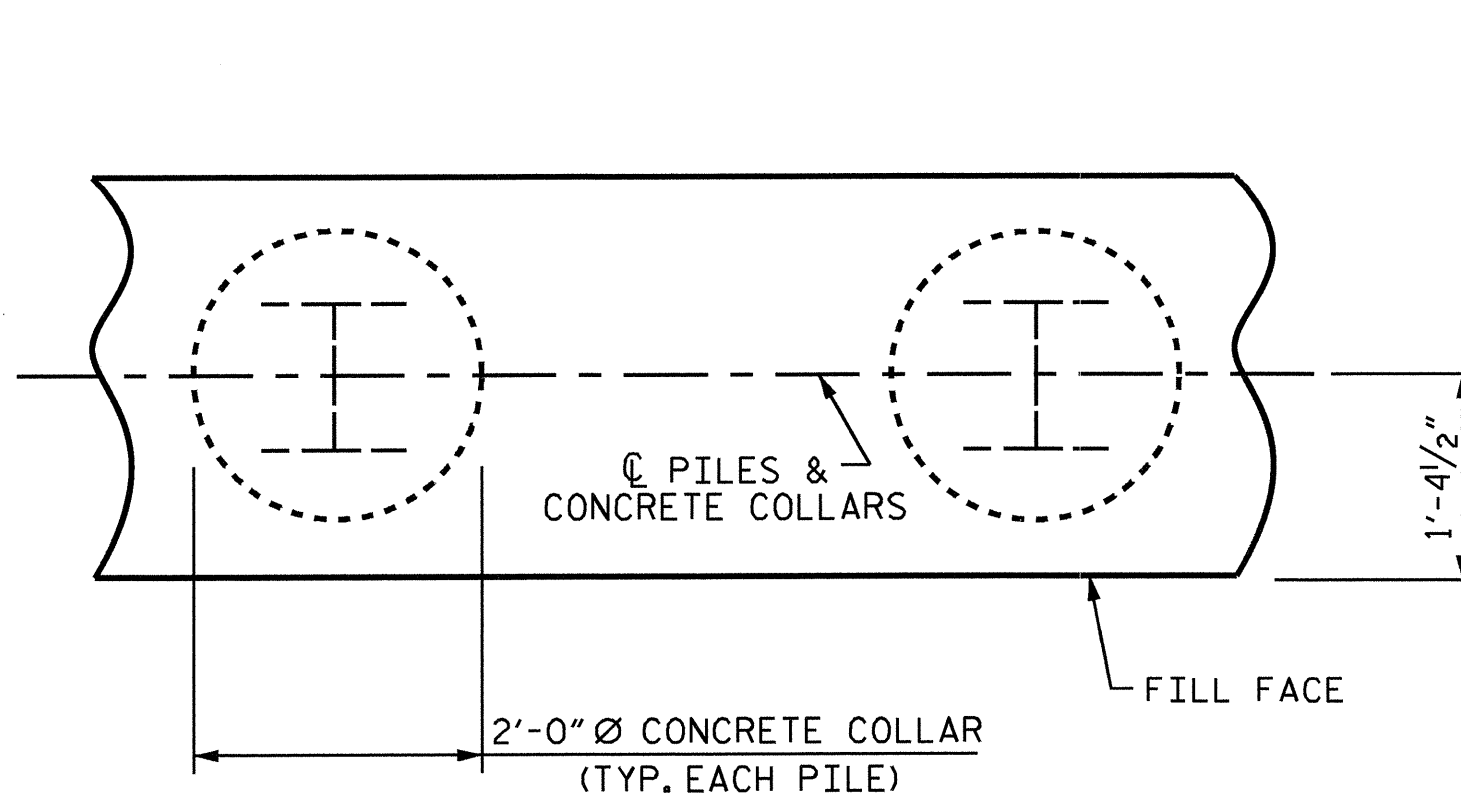
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



### DETAIL "A"

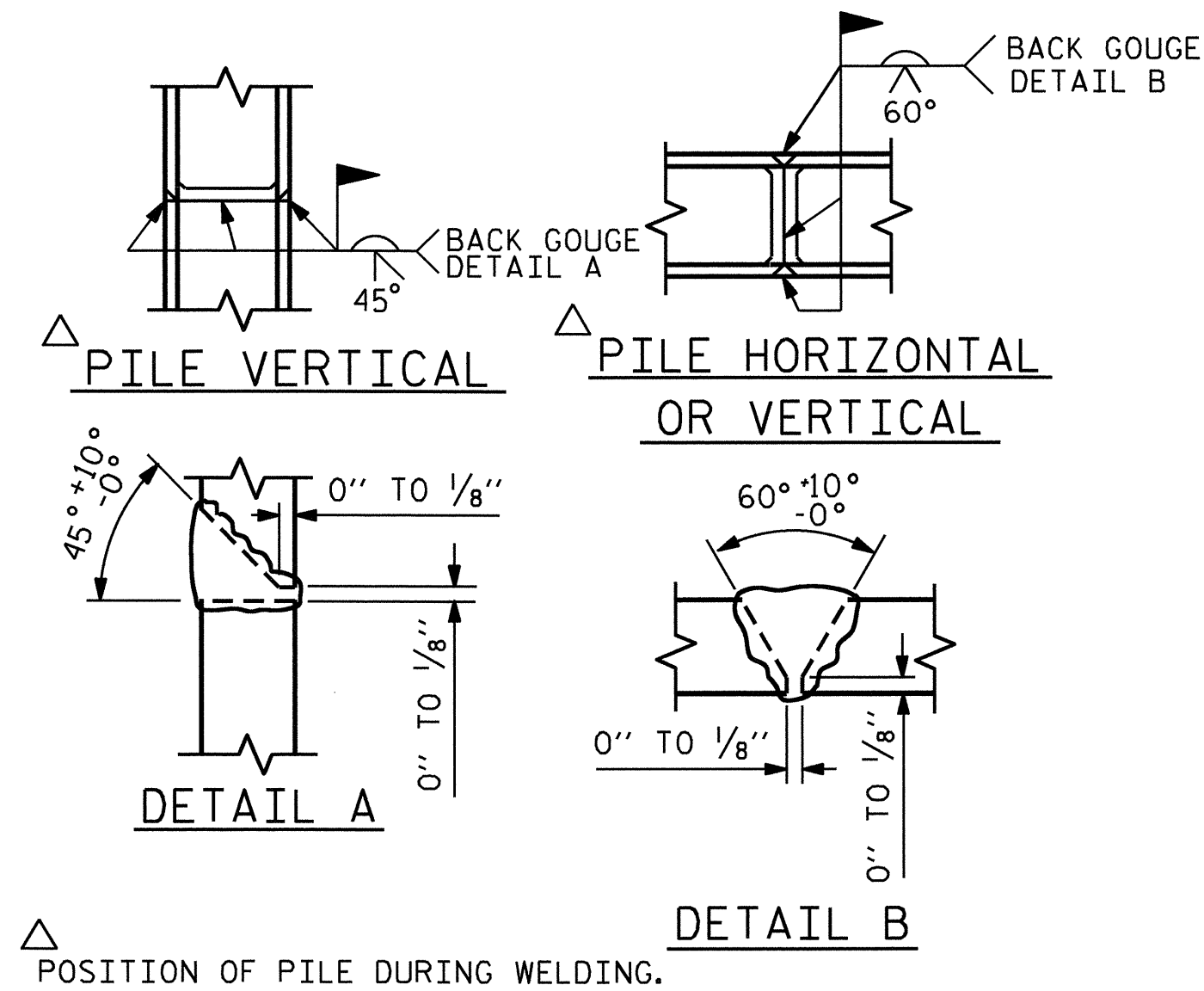
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### PLAN

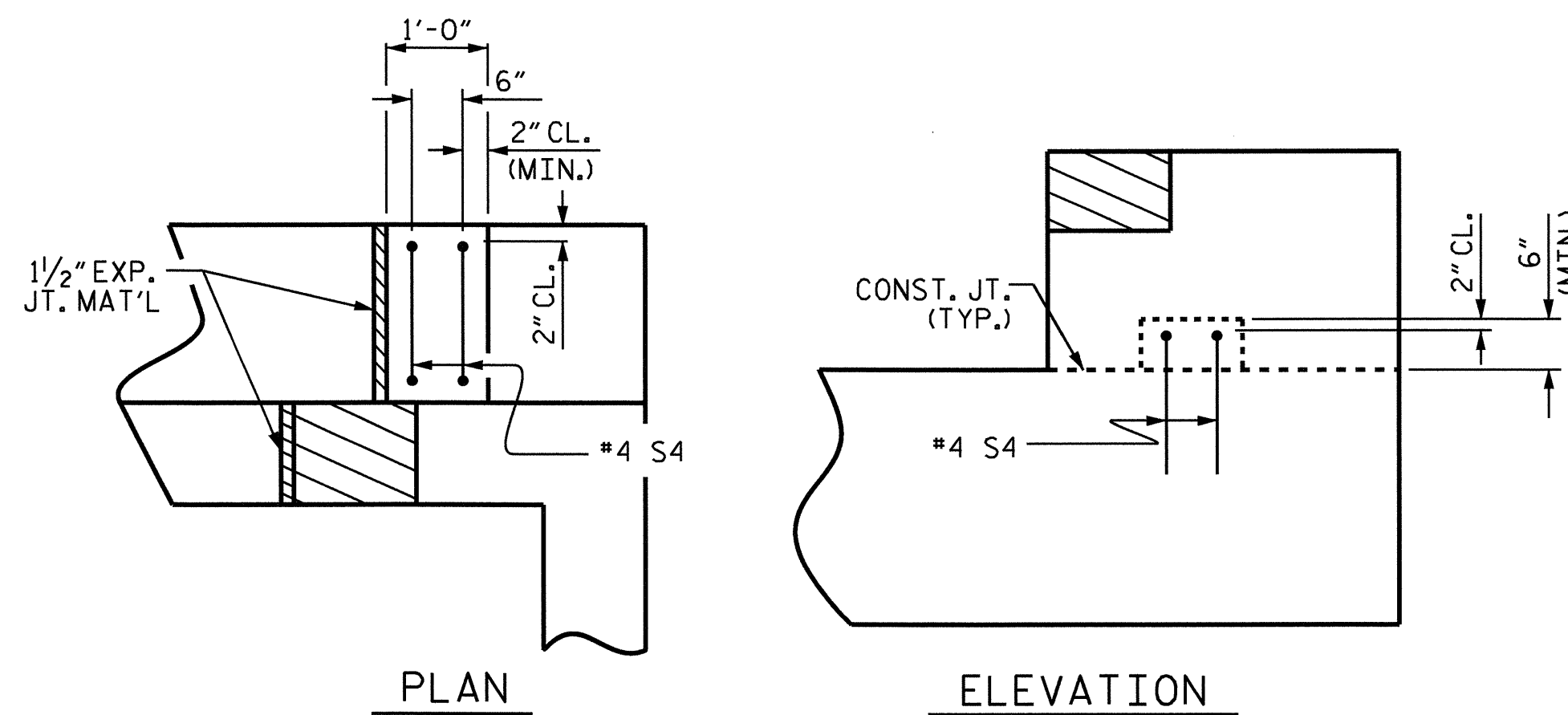
### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



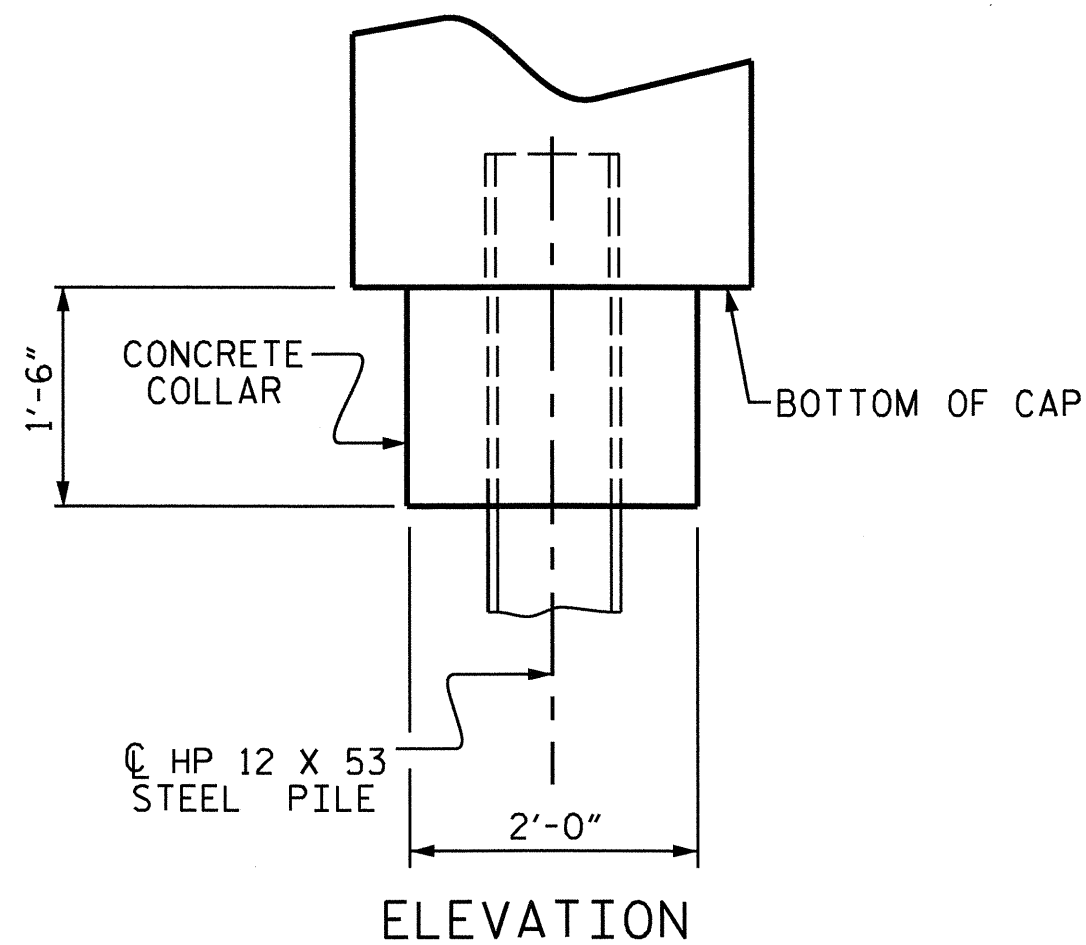
### PILE SPLICE DETAILS

POSITION OF PILE DURING WELDING.

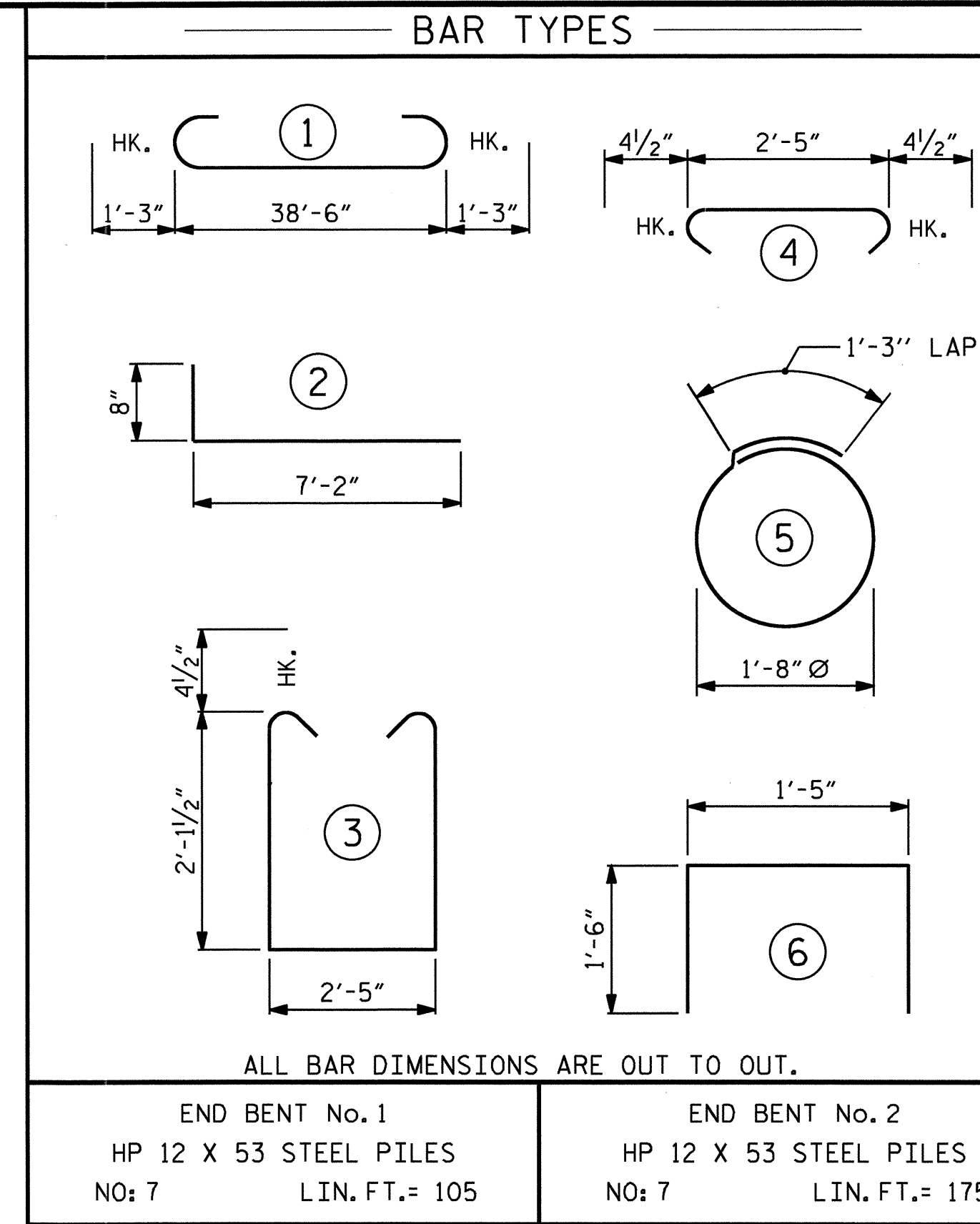


### LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)



### ELEVATION



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1  
HP 12 X 53 STEEL PILES  
NO: 7 LIN. FT.= 105

END BENT No. 2  
HP 12 X 53 STEEL PILES  
NO: 7 LIN. FT.= 175

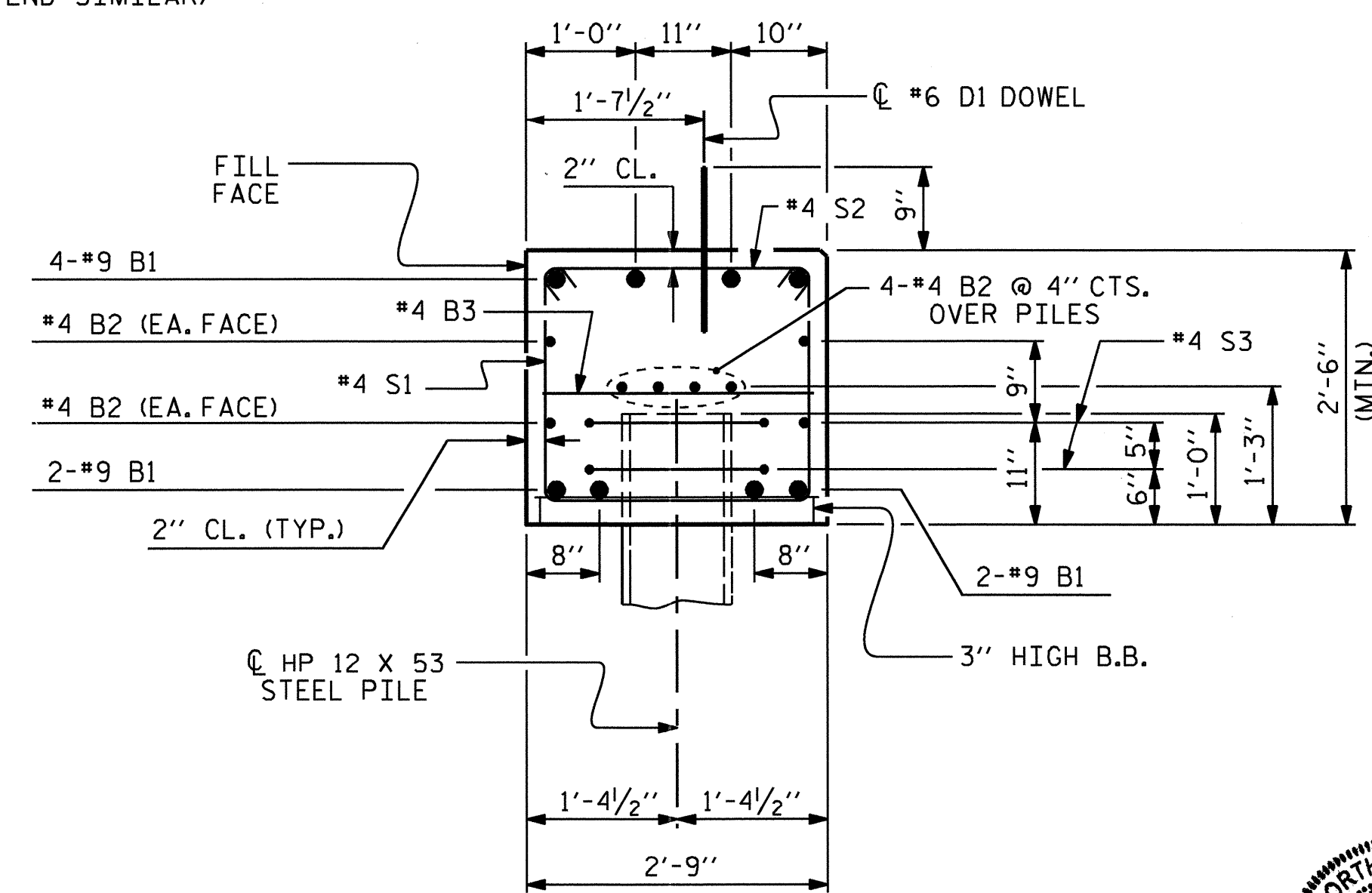
### BILL OF MATERIAL FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	16	#4	STR	20'-7"	220
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	3'-1"	25
S1	50	#4	3	7'-5"	248
S2	50	#4	4	3'-2"	106
S3	14	#4	5	6'-6"	61
S4	4	#4	6	4'-5"	12
V1	48	#4	STR	4'-8"	150

REINFORCING STEEL (FOR ONE END BENT) 2129 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS	12.4 C.Y.
POUR #2 UPPER PART OF WINGS	1.8 C.Y.
POUR #3 LATERAL GUIDES	0.1 C.Y.
<b>TOTAL CLASS A CONCRETE</b>	<b>14.3 C.Y.</b>



### SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PROJECT NO. B-4661  
WAKE COUNTY  
STATION: 24+50.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2  
DETAILS

ASSEMBLED BY : V. T. DOAN DATE : 08-10  
CHECKED BY : T. BANKOVICH DATE : 08-10  
DRAWN BY : DGE 02/10  
CHECKED BY : MKT 02/10

07-OCT-2011 13:51  
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REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

STD. NO. EB\_33\_90S

**NOTES**

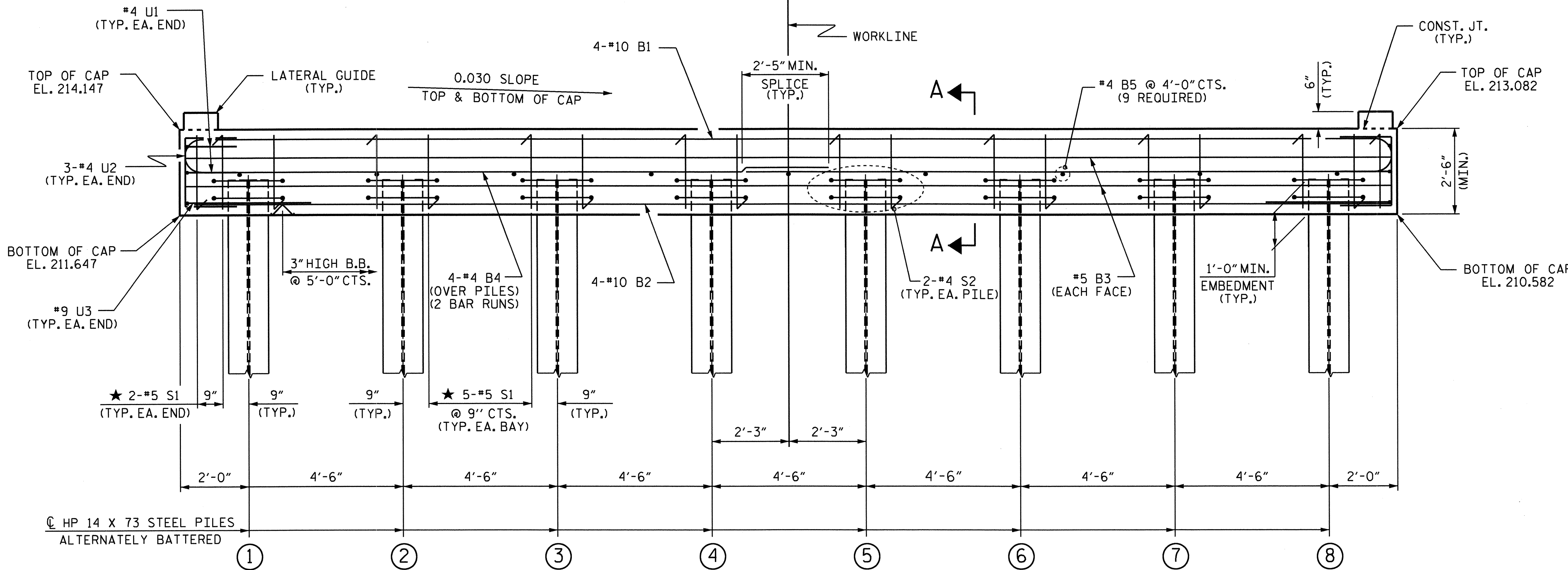
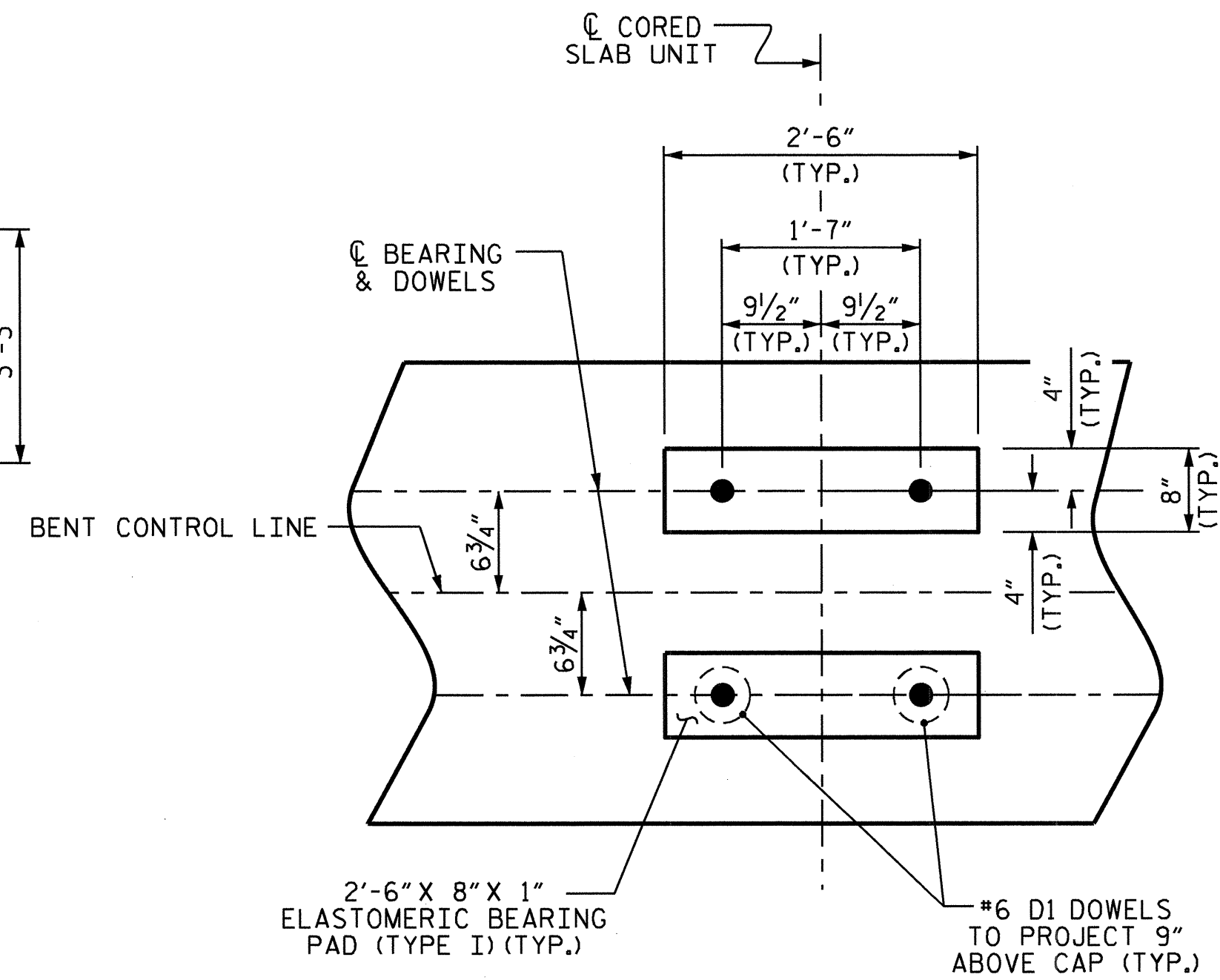
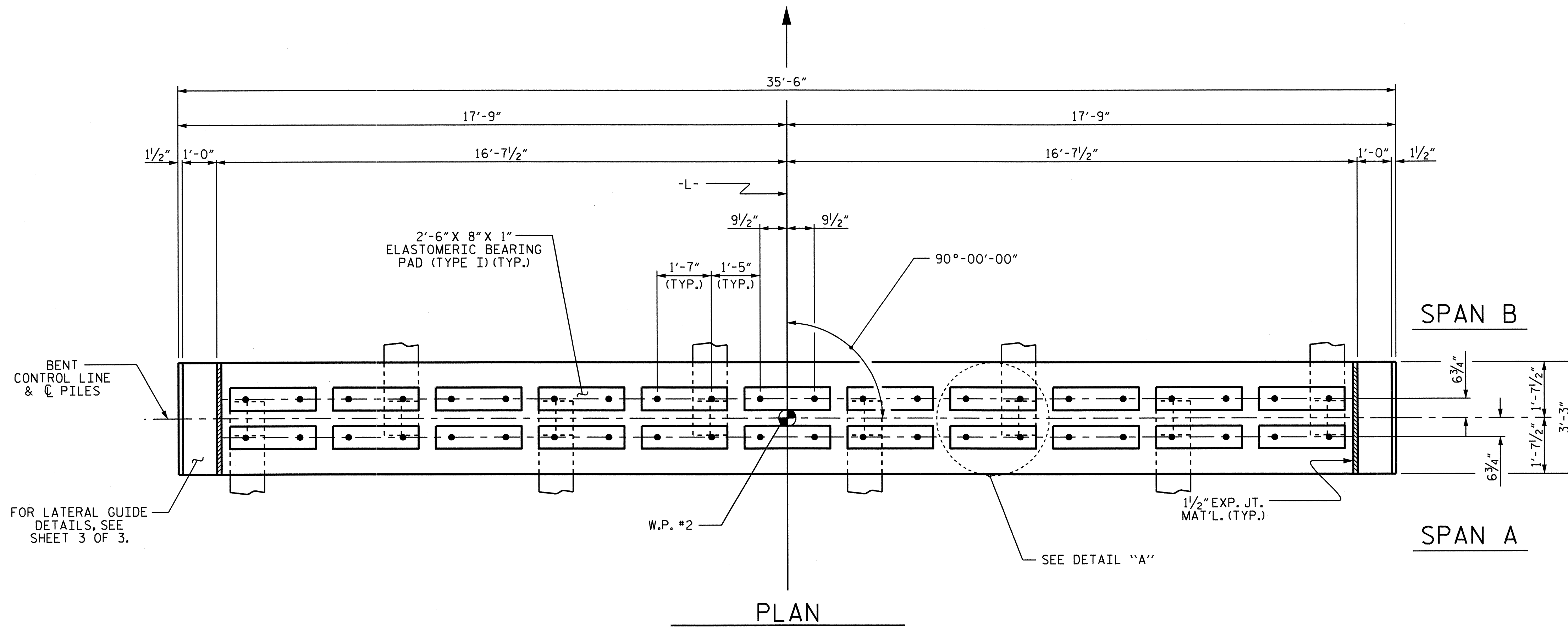
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

GALVANIZE THE FULL LENGTH OF EACH INTERIOR BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



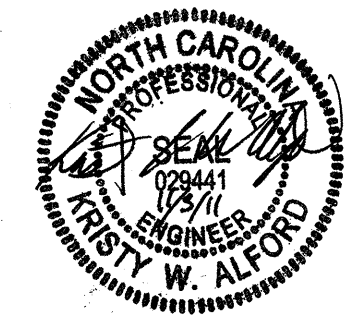
TOP OF PILE ELEVATIONS	
①	212.605
②	212.470
③	212.335
④	212.200
⑤	212.065
⑥	211.930
⑦	211.795
⑧	211.660

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1

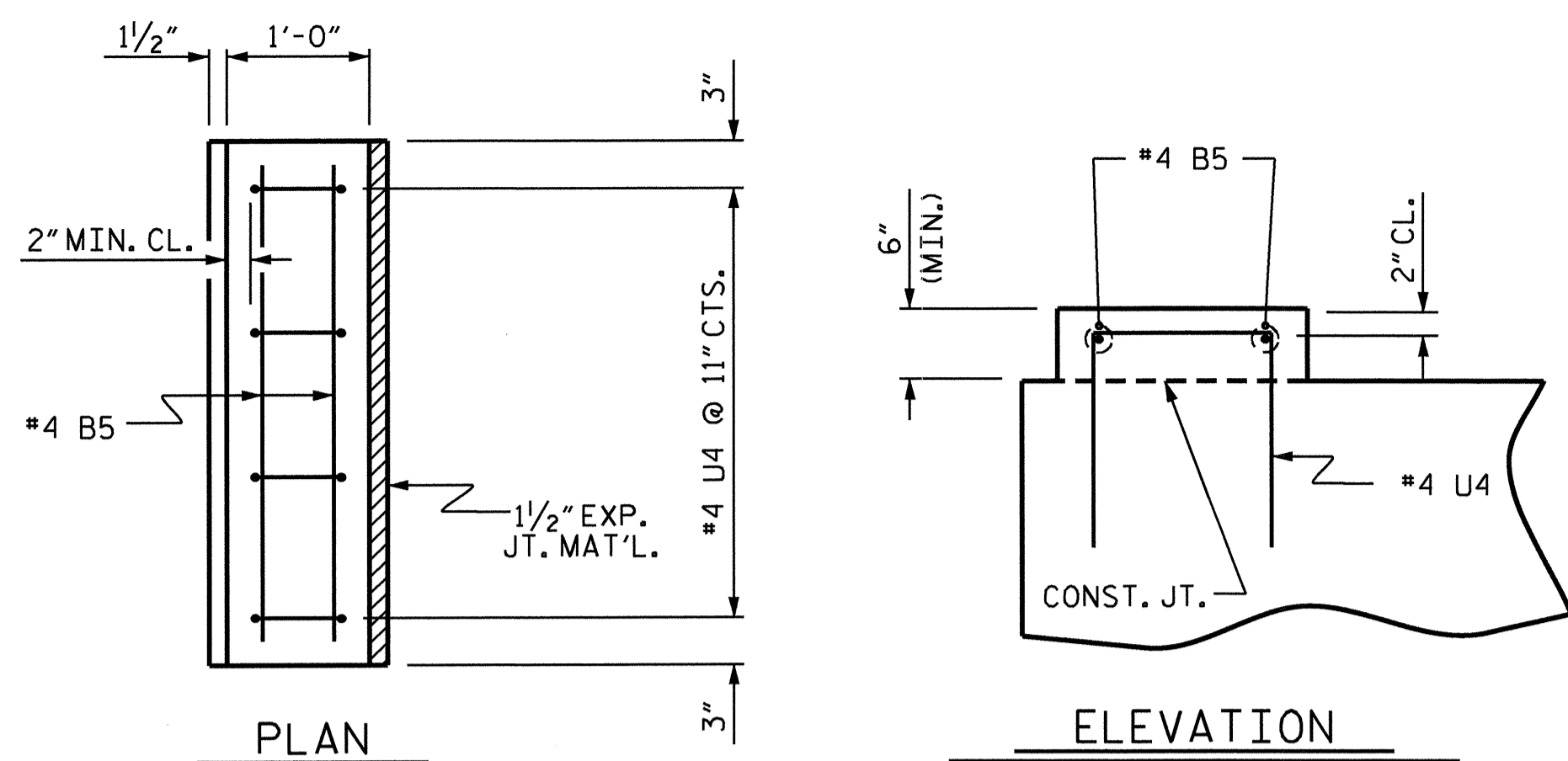


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY: V. T. DOAN DATE: 08-10  
 CHECKED BY: T. BANKOVICH DATE: 08-10  
 DRAWN BY: DGE 05/10  
 CHECKED BY: MKT 05/10

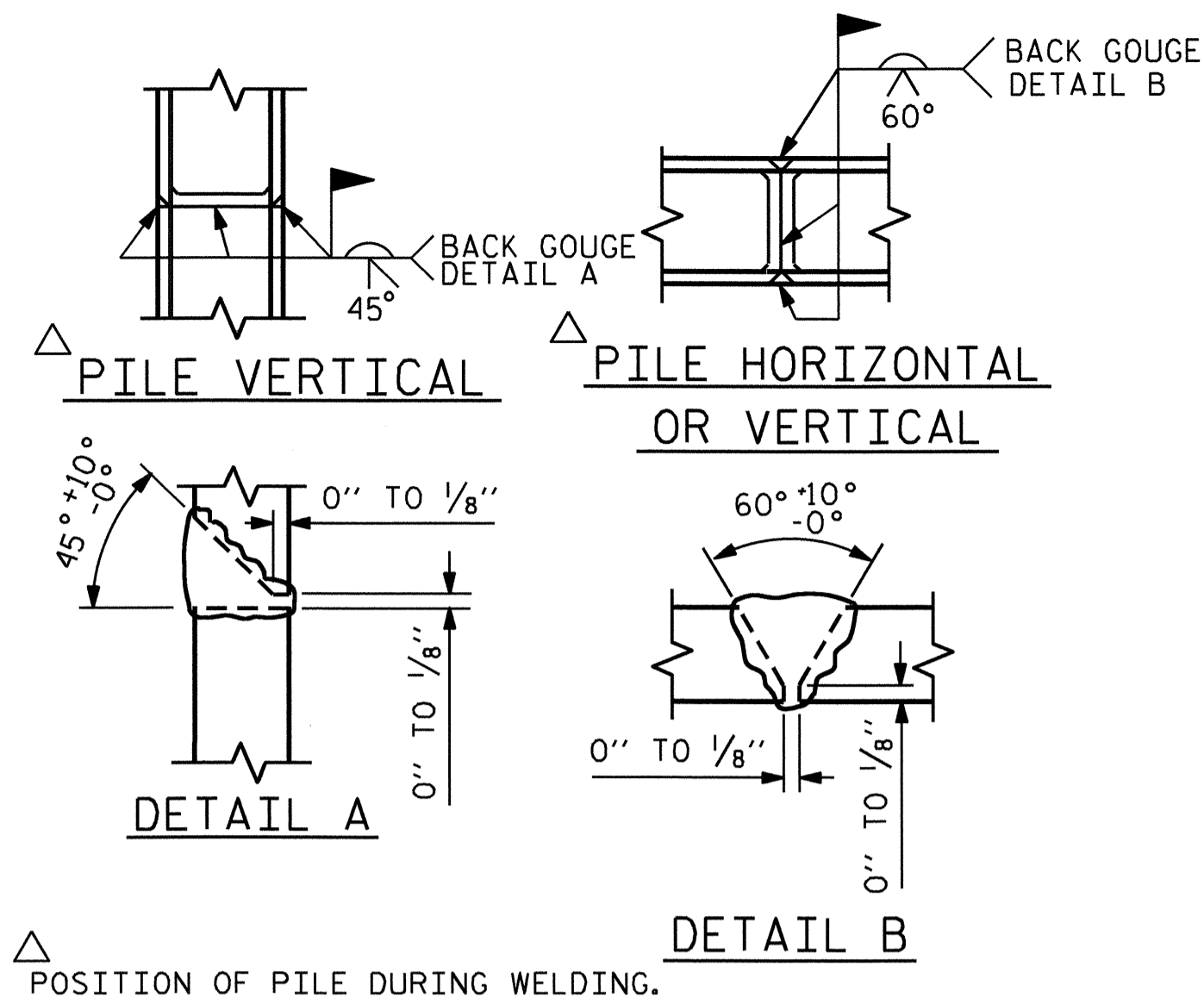
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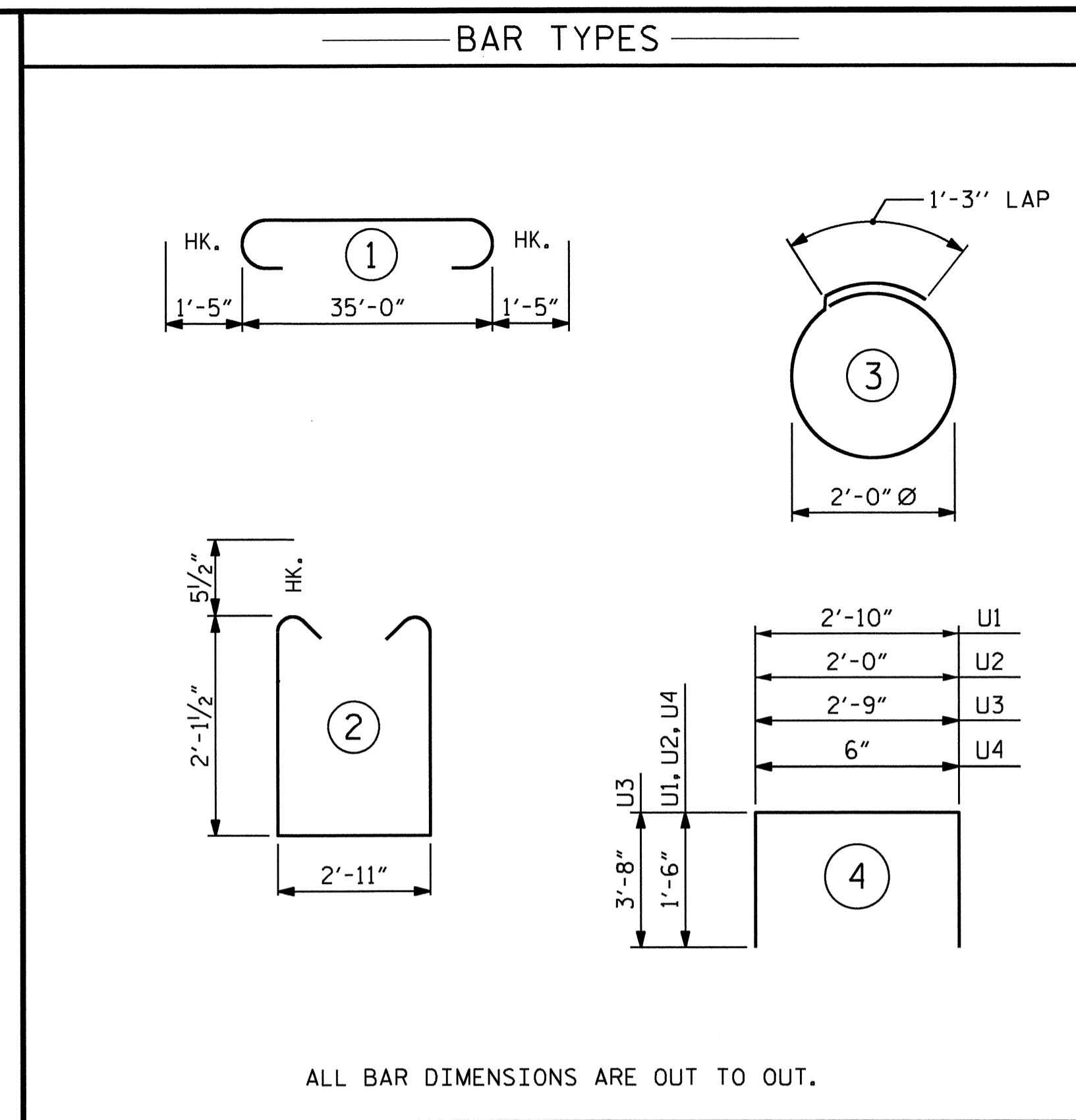
**LATERAL GUIDE DETAILS**

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)



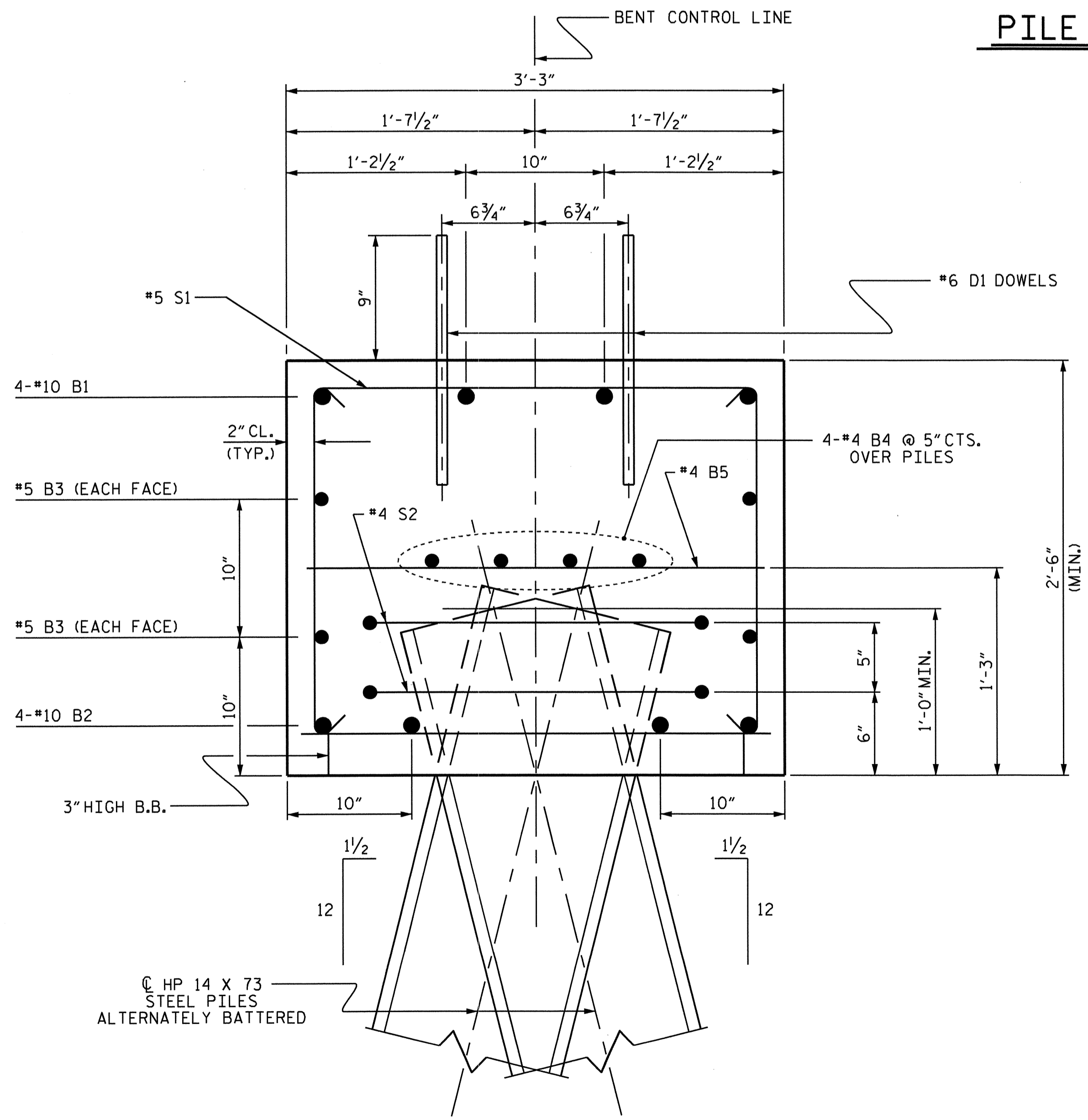
**PILE SPLICE DETAILS**

△ POSITION OF PILE DURING WELDING.

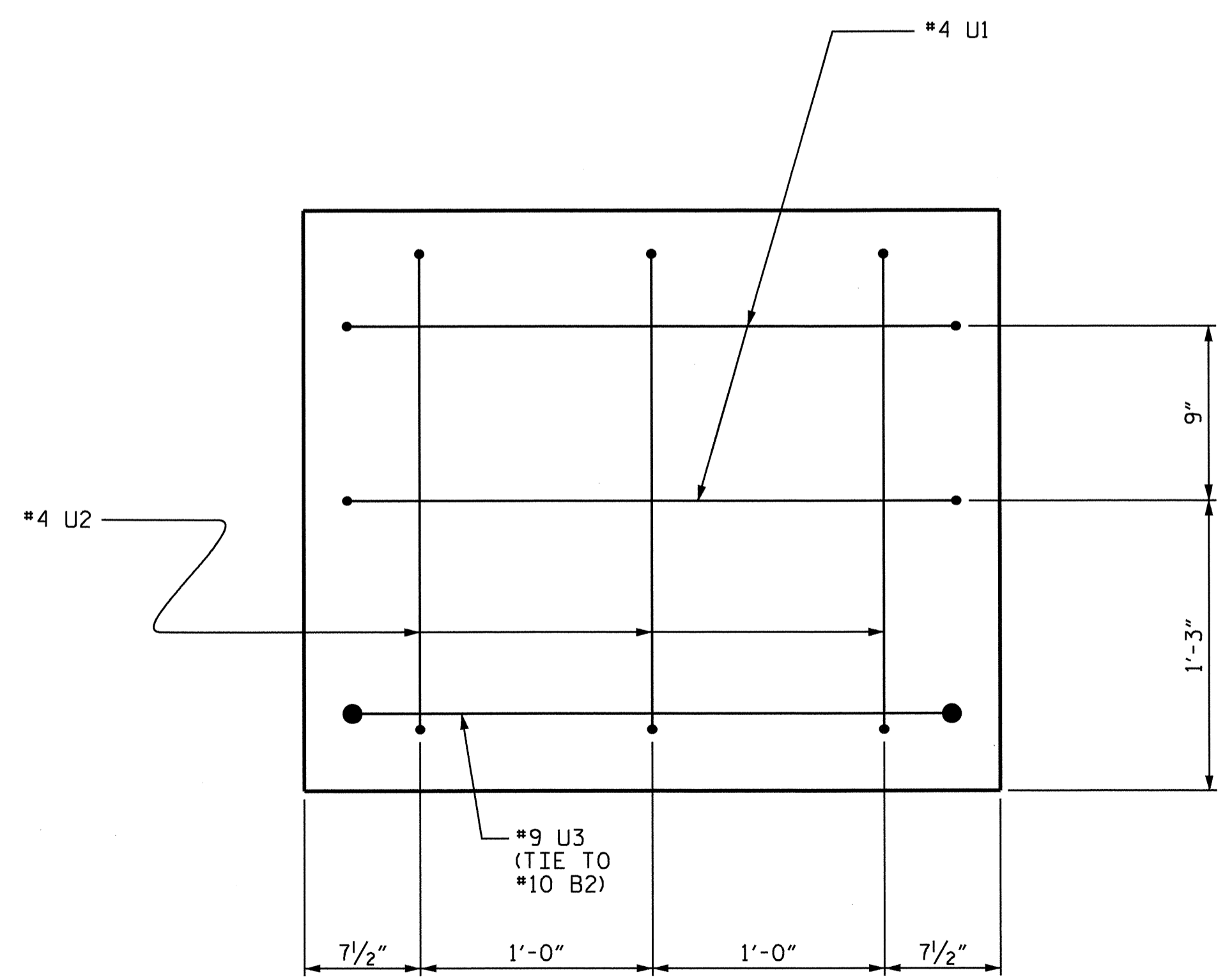


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	13	#4	STR	2'-11"	25
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
U4	8	#4	4	3'-6"	19
REINFORCING STEEL (FOR ONE BENT)				2162 LBS	
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
POUR #1 (CAP)				10.7 C.Y.	
POUR #2 (LATERAL GUIDES)				0.1 C.Y.	
TOTAL CLASS A CONCRETE				10.8 C.Y.	
HP 14 X 73 GALVANIZED STEEL PILES (FOR BENT No. 1)					
No. 8		LIN. FT.		200	
STEEL PILE POINTS EA.=8					
HP 14 X 73 GALVANIZED STEEL PILES (FOR BENT No. 2)					
No. 8		LIN. FT.		240	
STEEL PILE POINTS EA.=8					



**SECTION A-A**



**END OF CAP VIEW**  
(TYPICAL BOTH ENDS)

DRAWN BY: V. T. DOAN DATE: 08-10  
 CHECKED BY: T. BANKOVICH DATE: 08-10  
 DRAWN BY: DGE 05/10  
 CHECKED BY: MKT 05/10

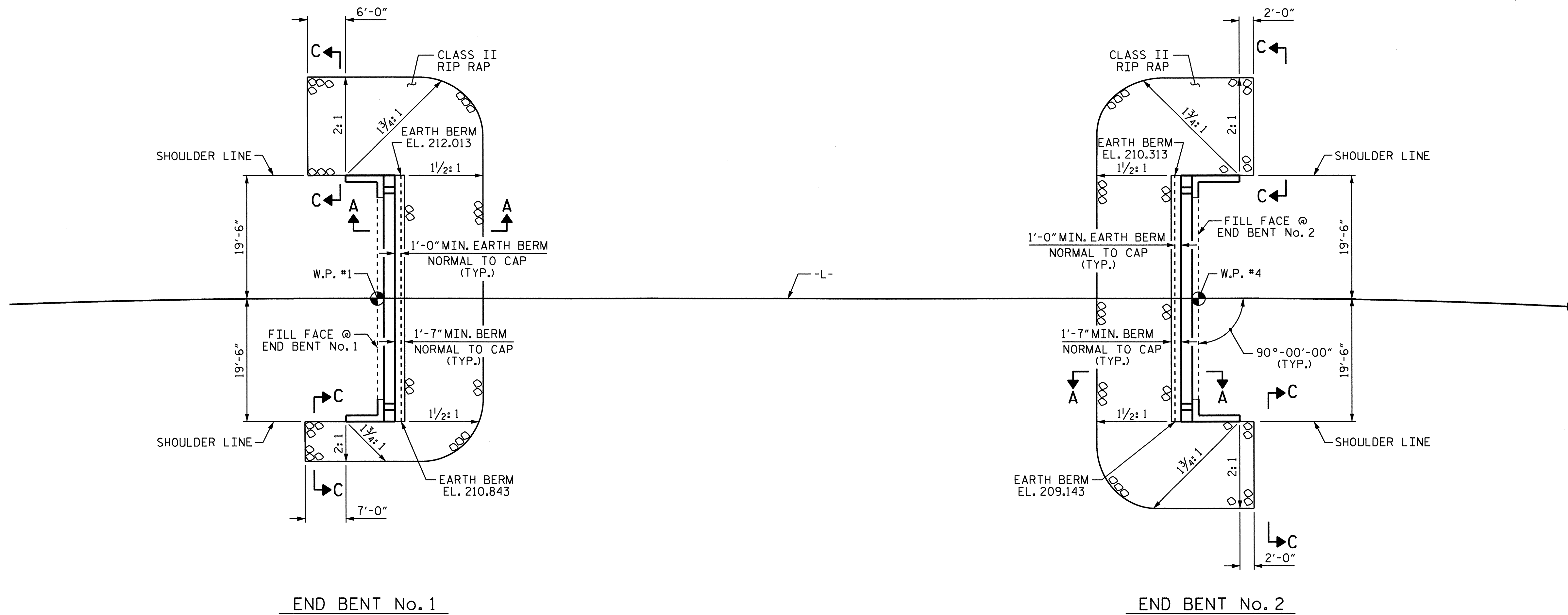
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PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-  
 SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			24

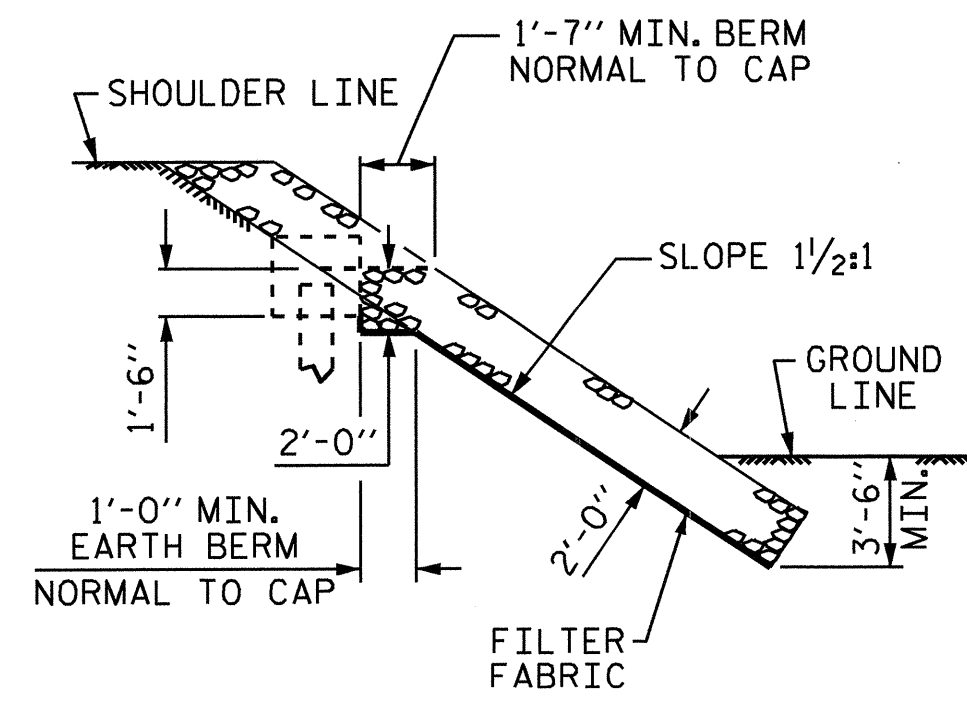


END BENT No. 1

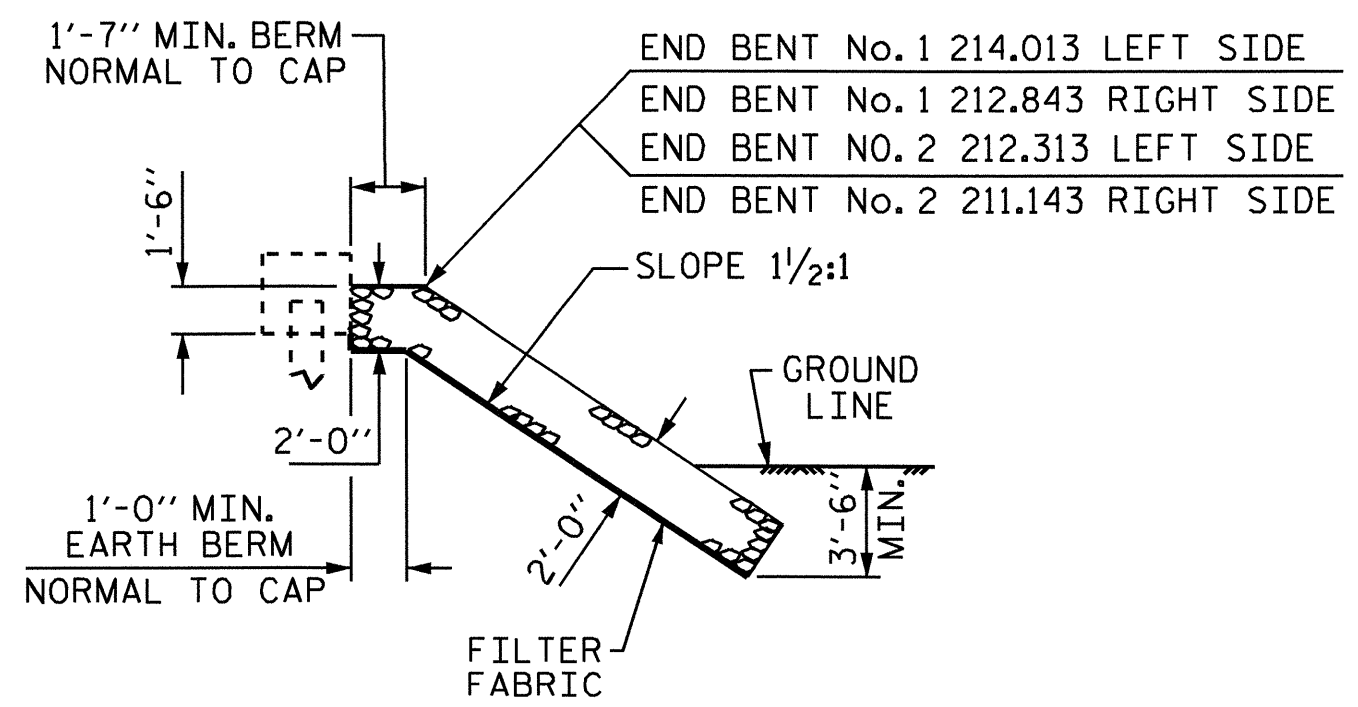
END BENT No. 2

PLAN OF RIP RAP

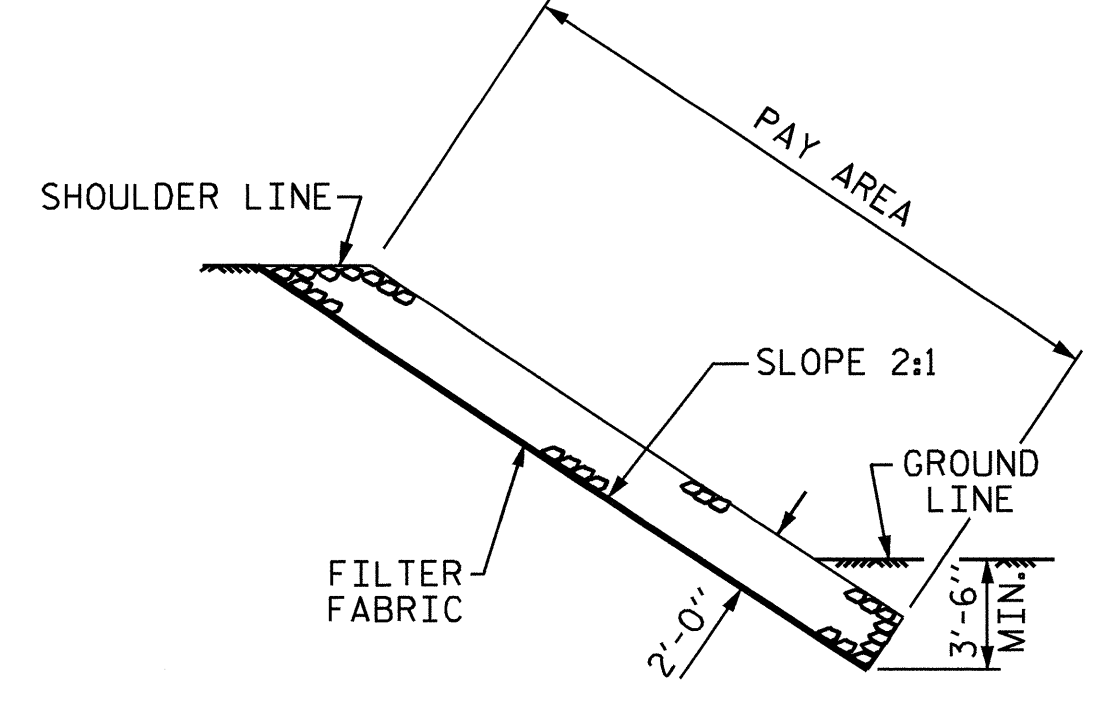
ESTIMATED QUANTITIES		
BRIDGE @ STA. 24+50.00 -L-	CLASS II RIP RAP	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	145	165
END BENT No. 2	100	115



SECTION A-A



SECTION C-C  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4661  
WAKE COUNTY  
 STATION: 24+50.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

RIP RAP DETAILS



REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: T. BANKOVICH DATE: 8-2010  
 CHECKED BY: M.K. TOM DATE: 8-2010

07-OCT-2011 13:50  
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 kalford



NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

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

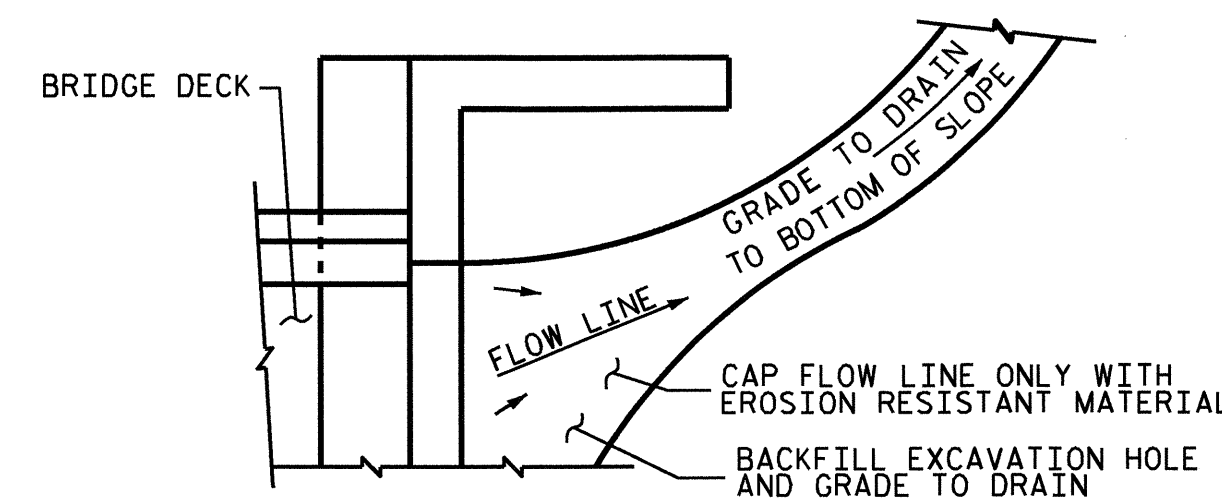
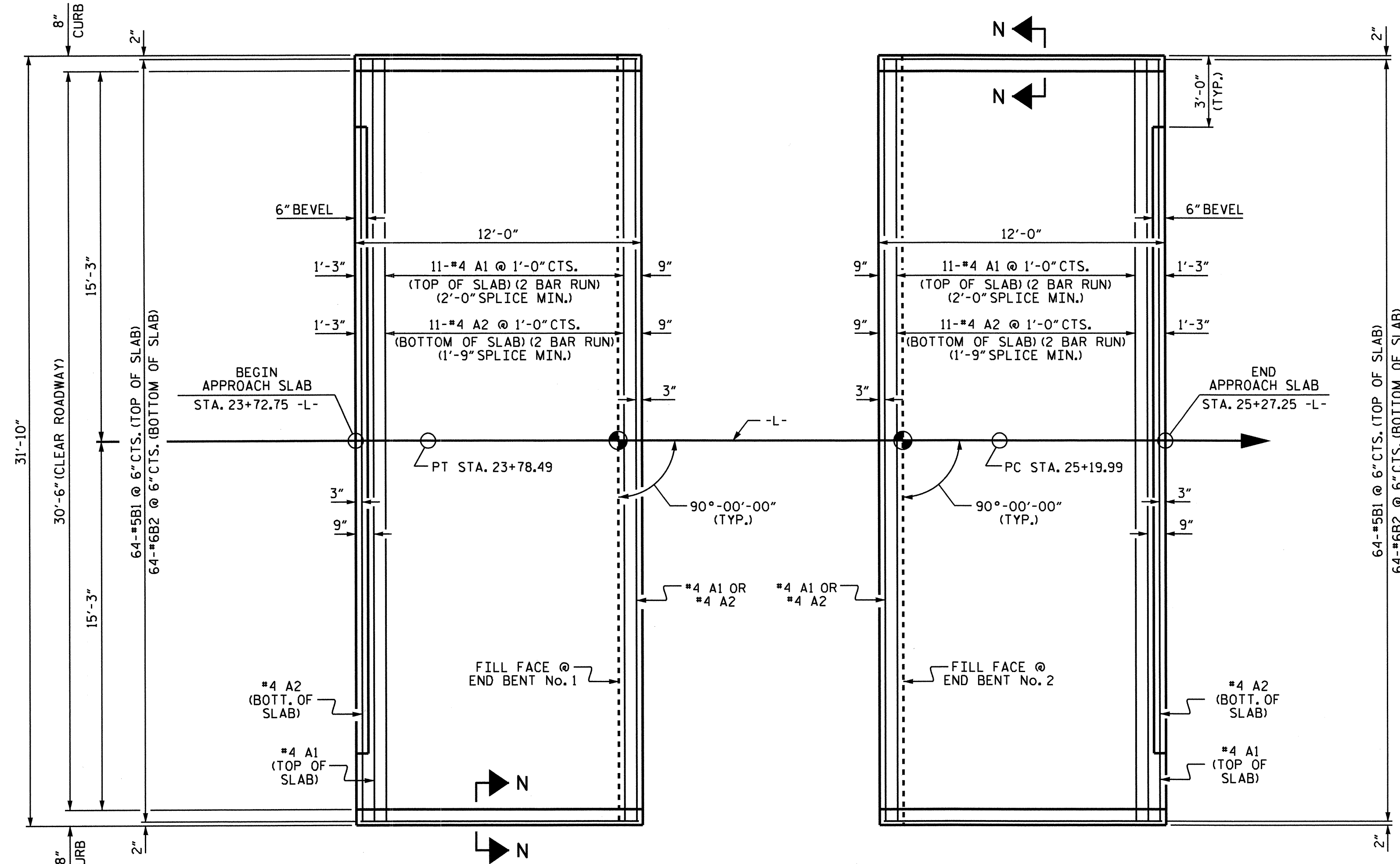
THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

THE CONTRACTOR HAS THE OPTION TO OMIT GROUT BETWEEN THE APPROACH SLAB AND THE CORED SLAB UNITS AND POUR THE APPROACH SLAB DIRECTLY AGAINST THE CORED SLAB UNITS. SEE "OPTIONAL JOINT DETAIL".

APPROACH SLAB GROOVING IS NOT REQUIRED.

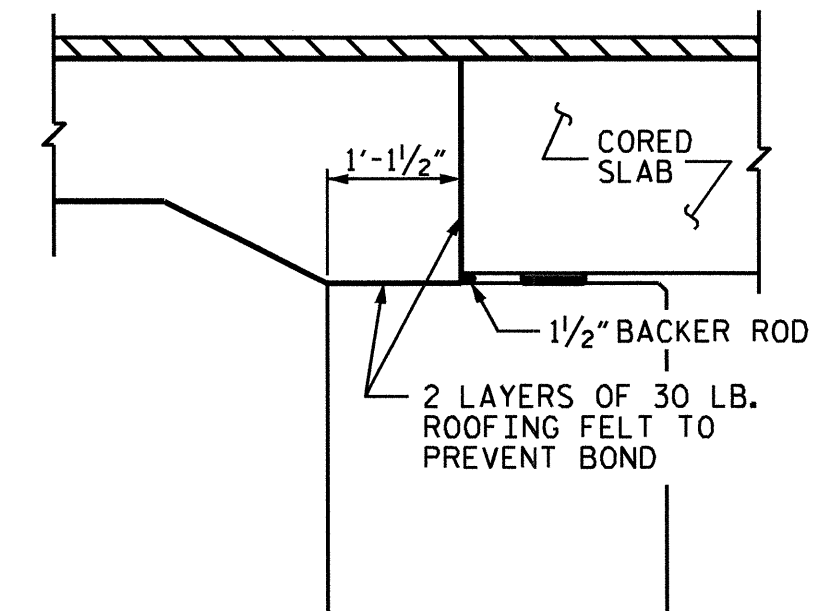
BILL OF MATERIAL

APPROACH SLAB AT EB No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-9"	291
A2	26	#4	STR	16'-8"	289
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1410
* EPOXY COATED REINFORCING STEEL					LBS. 1036
CLASS AA CONCRETE					C. Y. 17.8
APPROACH SLAB AT EB No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-9"	291
A2	26	#4	STR	16'-8"	289
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1410
* EPOXY COATED REINFORCING STEEL					LBS. 1036
CLASS AA CONCRETE					C. Y. 17.8

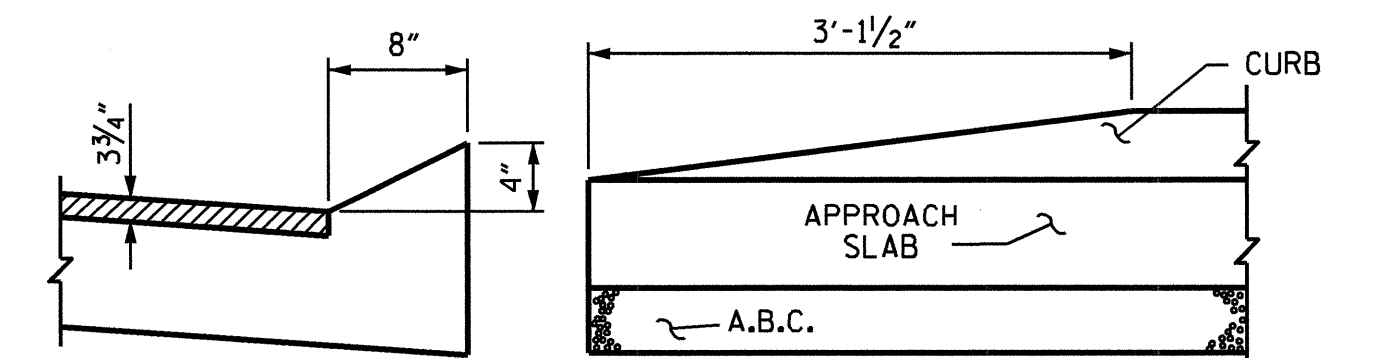


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

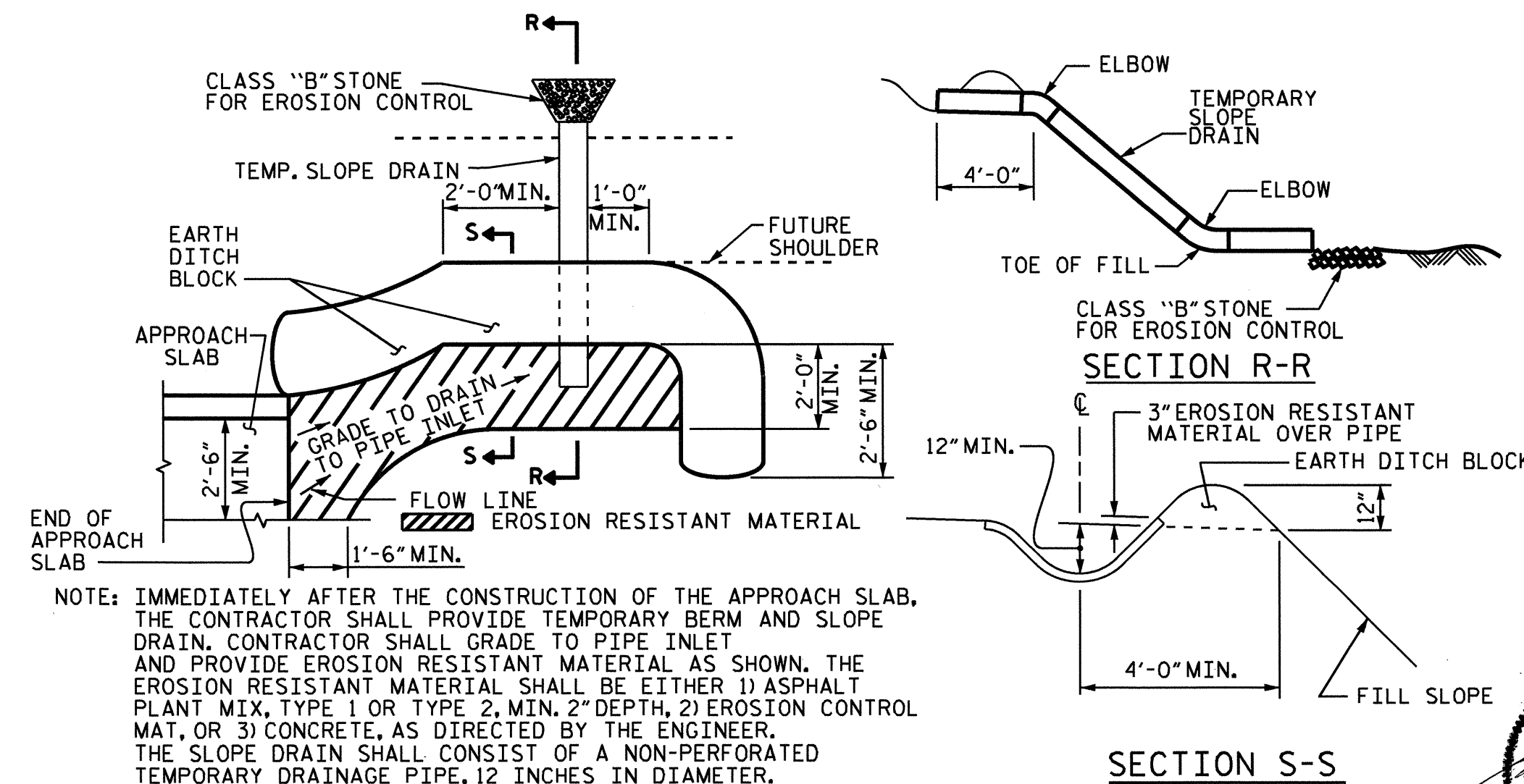
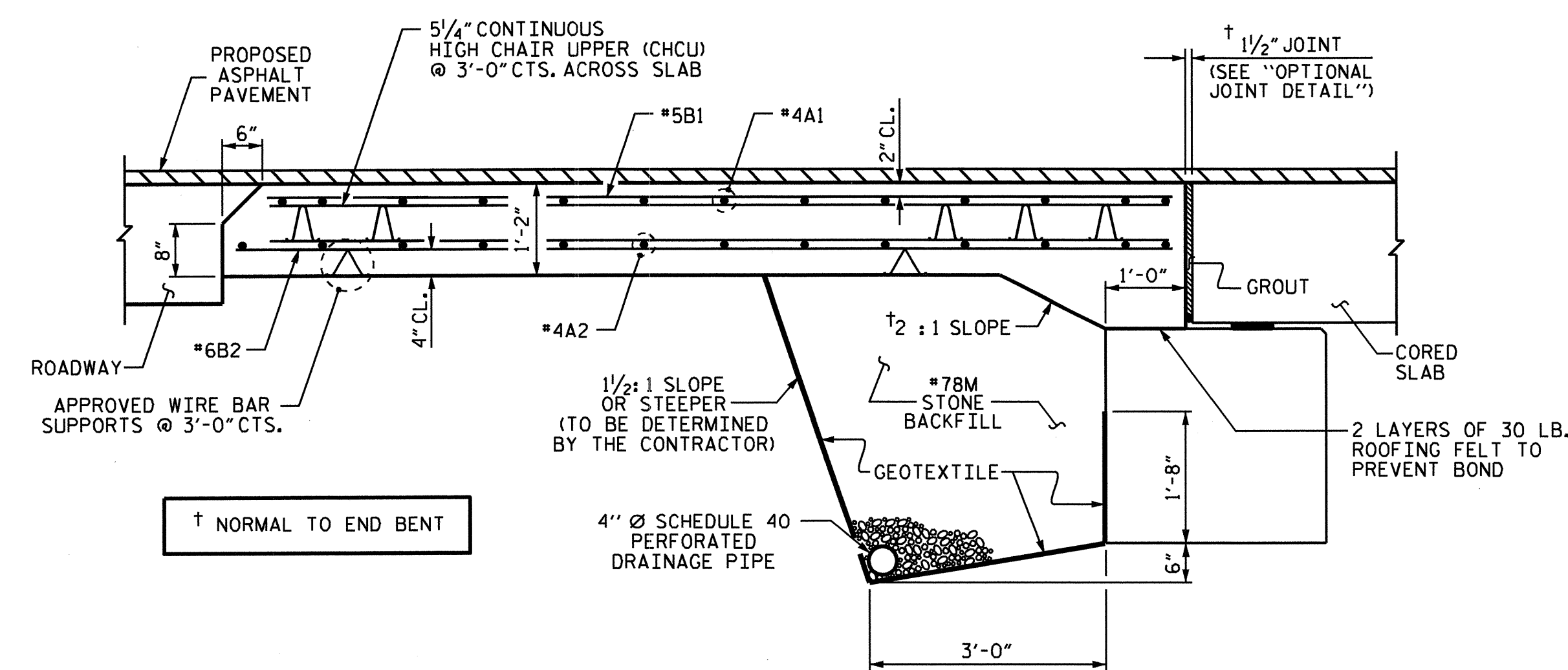
TEMPORARY DRAINAGE DETAIL



OPTIONAL JOINT DETAIL

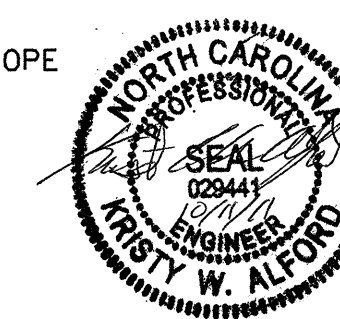


CURB DETAILS



BRIDGE NO. B-4661  
 WAKE COUNTY  
 STATION: 24+50.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 (SUB-REGIONAL TIER)  
 90° SKEW



ASSEMBLED BY: T. BANKOVICH DATE: 8-2010  
 CHECKED BY: M.K. TOM DATE: 8-2010  
 DRAWN BY: SHS/MAA 5-09  
 CHECKED BY: BCH 5-09

11-OCT-2011 08:12  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			24
2			4			24

STD. NO. BAS.33.90S

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISH AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

STD. NO. SN