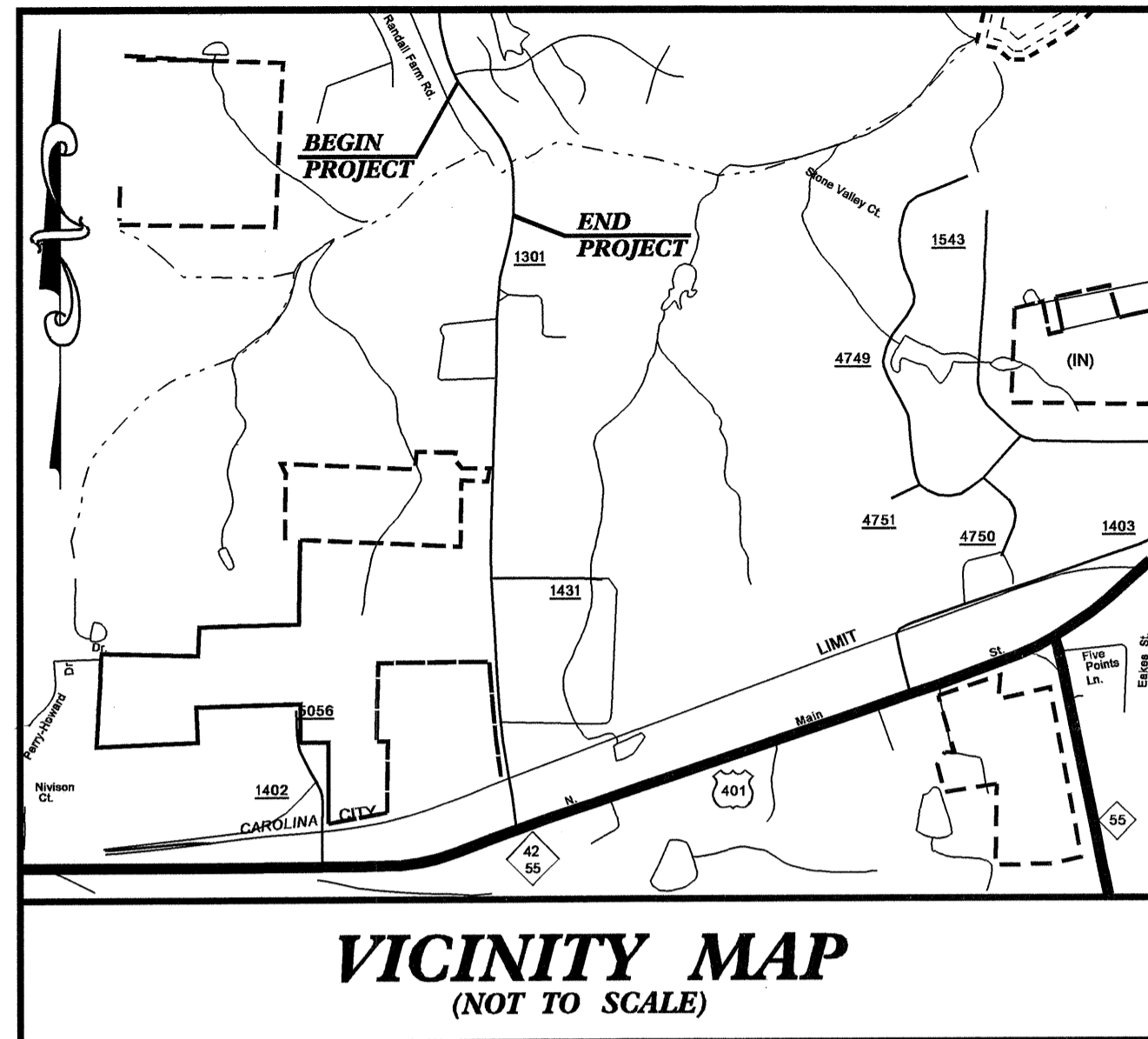


TIP PROJECT: B-4302

CONTRACT: C202089

STRUCTURE



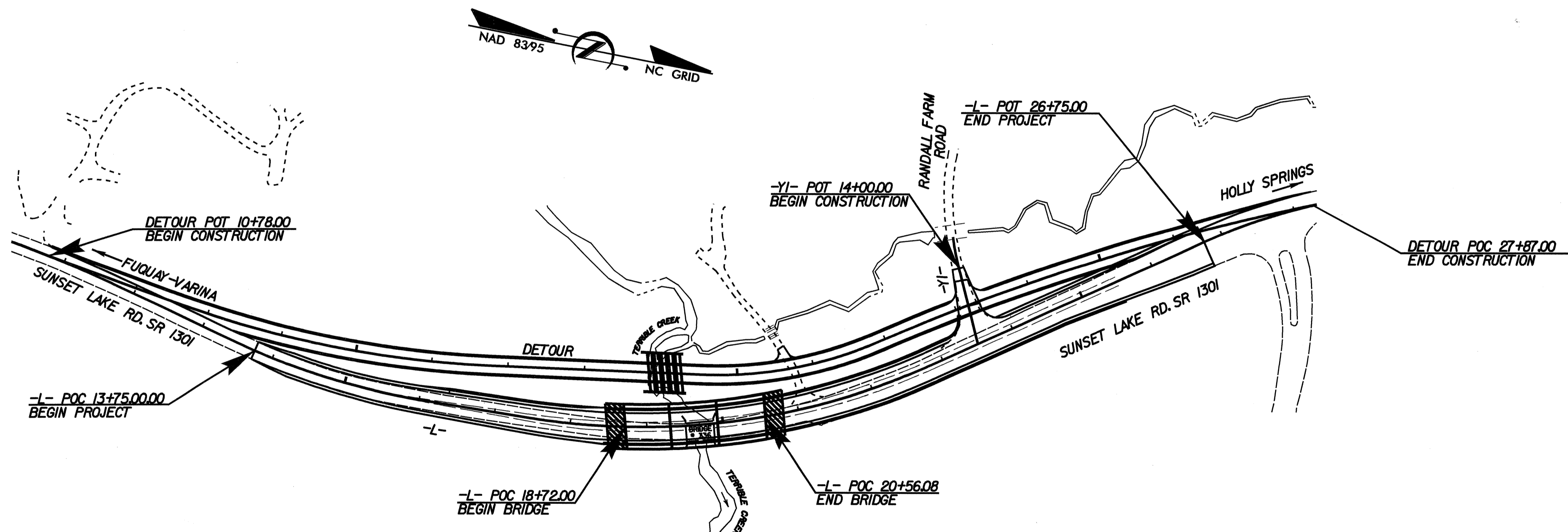
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WAKE COUNTY**

**LOCATION: BRIDGE No. 336 OVER TERRIBLE CREEK  
ON SR 1301 (SUNSET LAKE ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	
N.C.	B-4302	
WBS PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION
33639.1.1	BRZ-1301(2)	P.E.
33639.2.1	BRZ-1301(2)	R /W, UTIL.
33639.3.1	BRZ-1301(2)	CONST.



\*\* DESIGN EXCEPTION REQUIRED FOR STOPPING SIGHT DISTANCE



**DESIGN DATA**

ADT 2008 = 14,100  
 ADT 2030 = 28,500  
 DHV = 10 %  
 D = 60 %  
 T = 4 % \*  
 \*\* V = 50 MPH  
 \* TTST 1% + DUAL 3%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4302 = 0.211 MI  
 LENGTH STRUCTURE TIP PROJECT B-4302 = 0.035 MI  
 TOTAL LENGTH TIP PROJECT B-4302 = 0.246 MI

2006 STANDARDS SPECIFICATION

LETTING DATE:  
May 19, 2009

Prepared in the Office of:  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
 1000 Birch Ridge Drive Raleigh, N.C. 27610

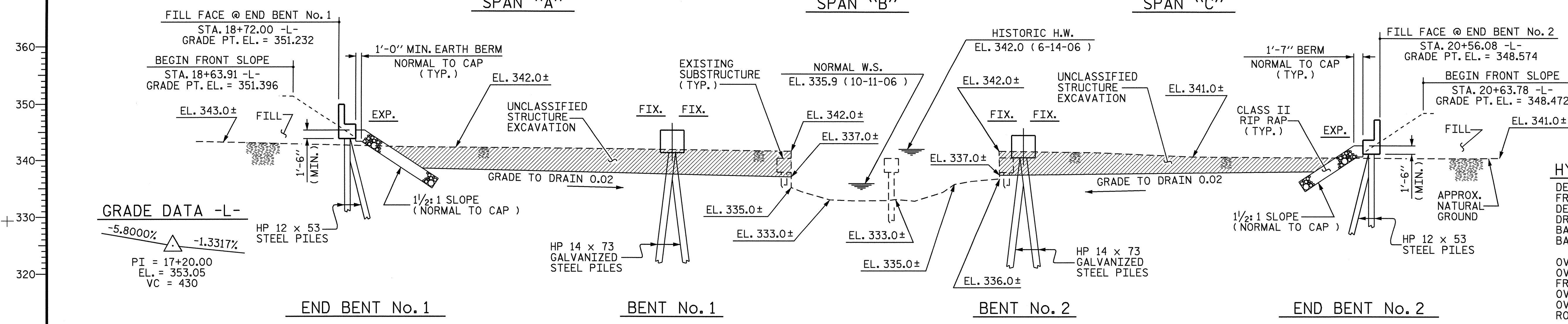
**B.S. COX, P.E.**  
PROJECT ENGINEER

**T.J. BEACH, P.E.**  
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

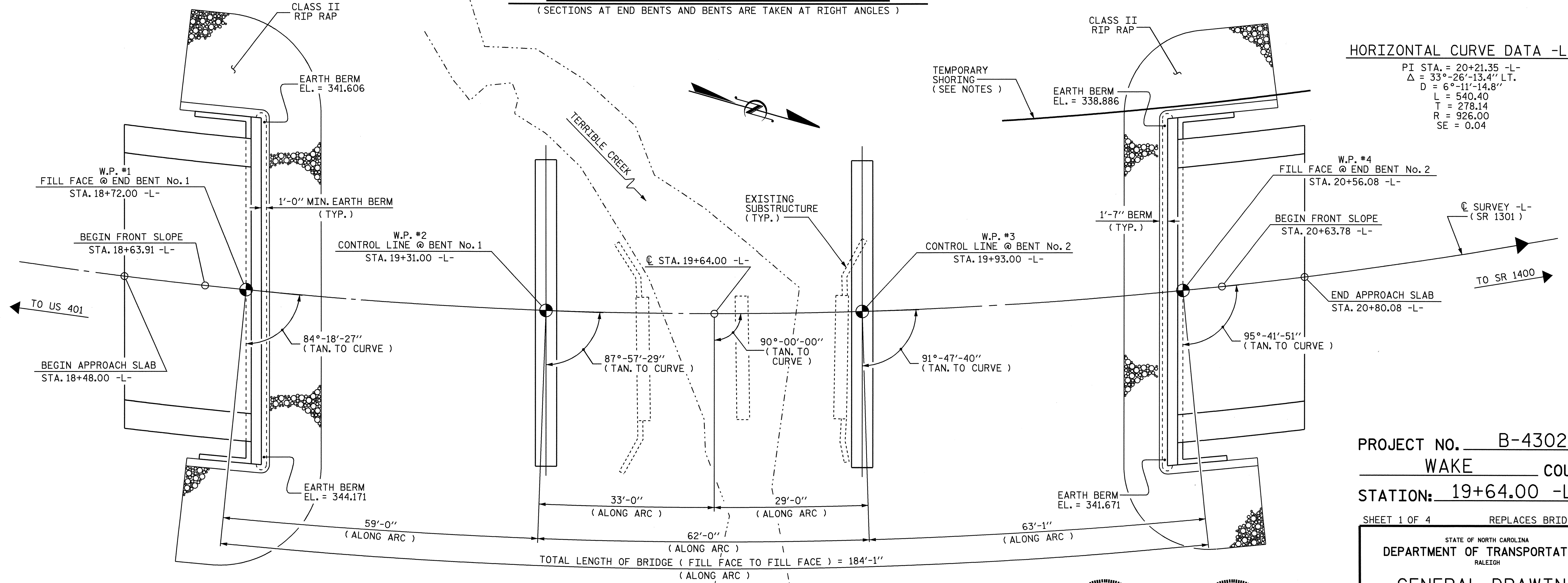
P.E.  
STATE HIGHWAY ENGINEER - DESIGN  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED FOR  
DIVISION ADMINISTRATOR DATE



**SECTION ALONG C SURVEY -L-**

(SECTIONS AT END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES)



PROJECT NO. **B-4302**  
**WAKE** COUNTY  
 STATION: **19+64.00 -L-**

SHEET 1 OF 4      REPLACES BRIDGE #336

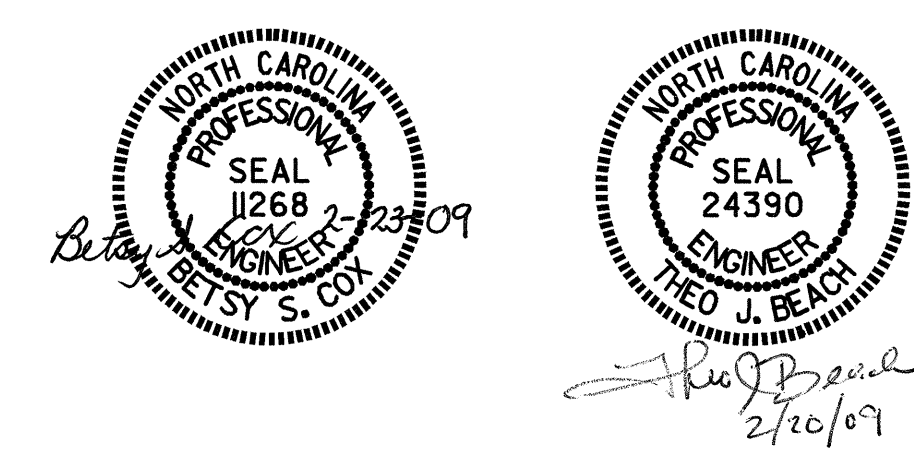
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

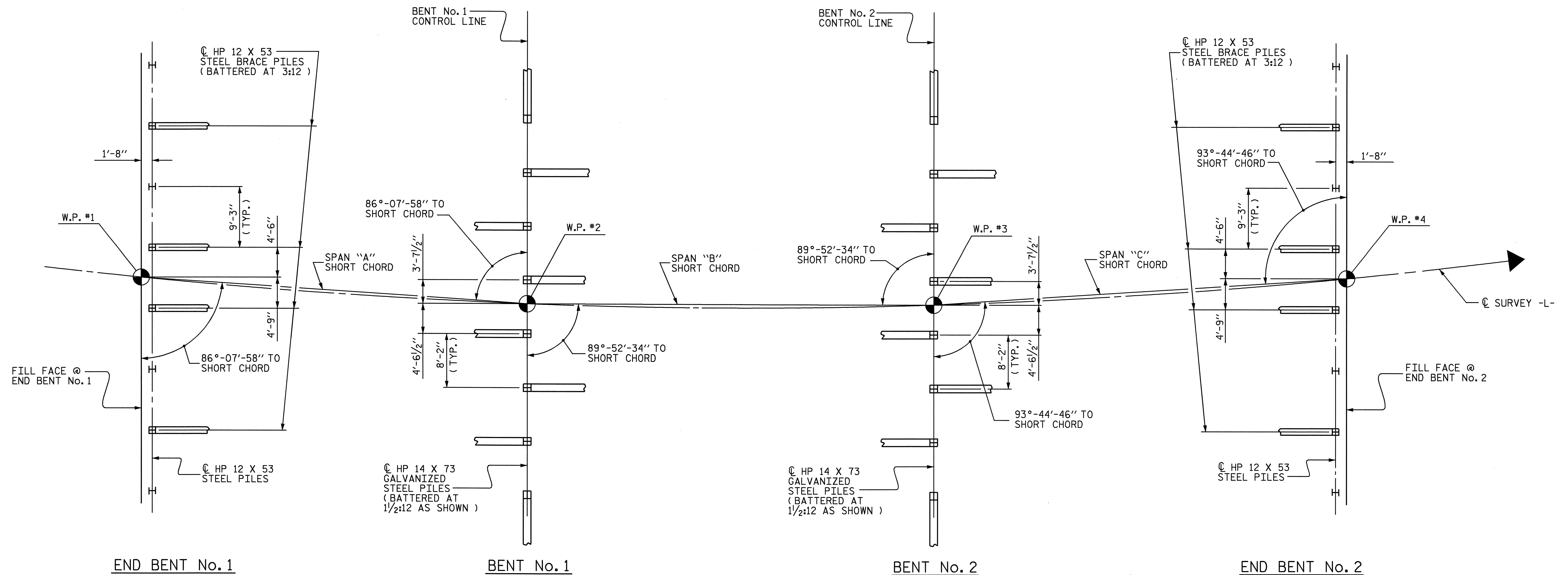
**GENERAL DRAWING**

BRIDGE ON  
 SR 1301 ( SUNSET LAKE RD. )  
 OVER TERRIBLE CREEK  
 BETWEEN US 401 AND SR 1400

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1	
1			3			TOTAL	45
2			4			SHEETS	

DRAWN BY : **MIKE BRITT**      DATE : **1-5-09**  
 CHECKED BY : **T.J. BEACH**      DATE : **1-13-09**





**FOUNDATION LAYOUT**

(DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF THE PILE AT THE BOTTOM OF THE CAP)

**NOTES**

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENT No.1 AND END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

PILES AT BENT No.1 AND BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 195 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 325 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR.

THE SCOUR CRITICAL ELEVATION FOR BENT No.1 IS ELEVATION 328 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT No.2 IS ELEVATION 330 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

GALVANIZE THE TOP 30 FEET MINIMUM OF EACH HP 14 x 73 PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

FOR ADDITIONAL NOTES, SEE SHEET 4 OF 4.

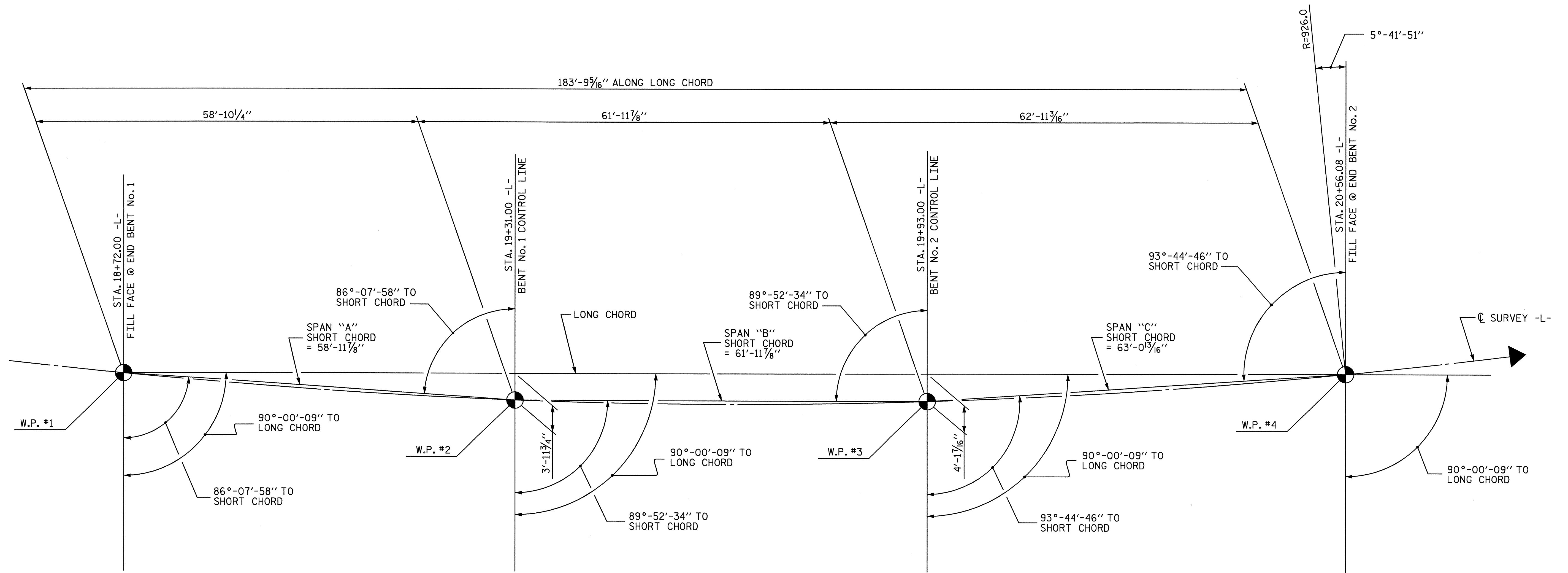
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA						SHEET NO. S-2
DEPARTMENT OF TRANSPORTATION RALEIGH						
GENERAL DRAWING						
BRIDGE ON SR 1301 (SUNSET LAKE RD.) OVER TERRIBLE CREEK BETWEEN US 401 AND SR 1400						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			45
2			4			

DRAWN BY : MIKE BRITT DATE : 1-7-09  
 CHECKED BY : T.J. BEACH DATE : 1-13-09



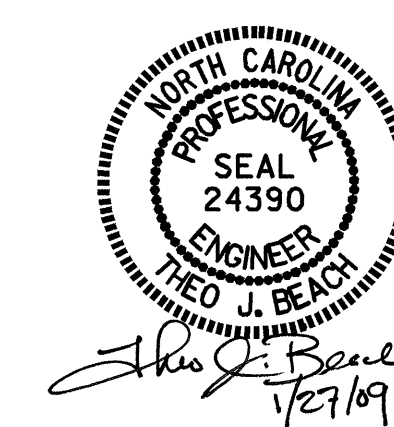
**LONG CHORD LAYOUT**  
ALL BENTS ARE PARALLEL

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**LONG CHORD LAYOUT**



DRAWN BY: MIKE BRITT DATE: 1-7-09  
 CHECKED BY: T.J. BEACH DATE: 1-13-09

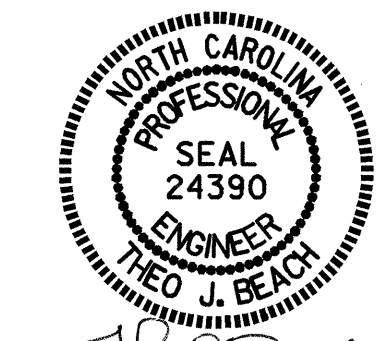
23-JAN-2009 13:50  
 r:\structures\gen\_draw\b4302.gdgn  
 tbeach

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			45

NOTES (CONTINUED FROM SHEET 2 OF 4)

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".
- THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 18'-6" OF REINFORCED CONCRETE DECK WITH ASPHALT WEARING SURFACE ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24'-1" ON REINFORCED CONCRETE CAP ON TIMBER PILE END BENTS & BENT AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- 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 40 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- 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.
- 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 19+64.00 -L-".
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY CHOOSE TO UTILIZE THE STANDARD OVERHANG FALSEWORK BRACING SYSTEM. SEE "STANDARD OVERHANG FALSEWORK" SHEETS.



*Theo J. Beach*  
2/26/09

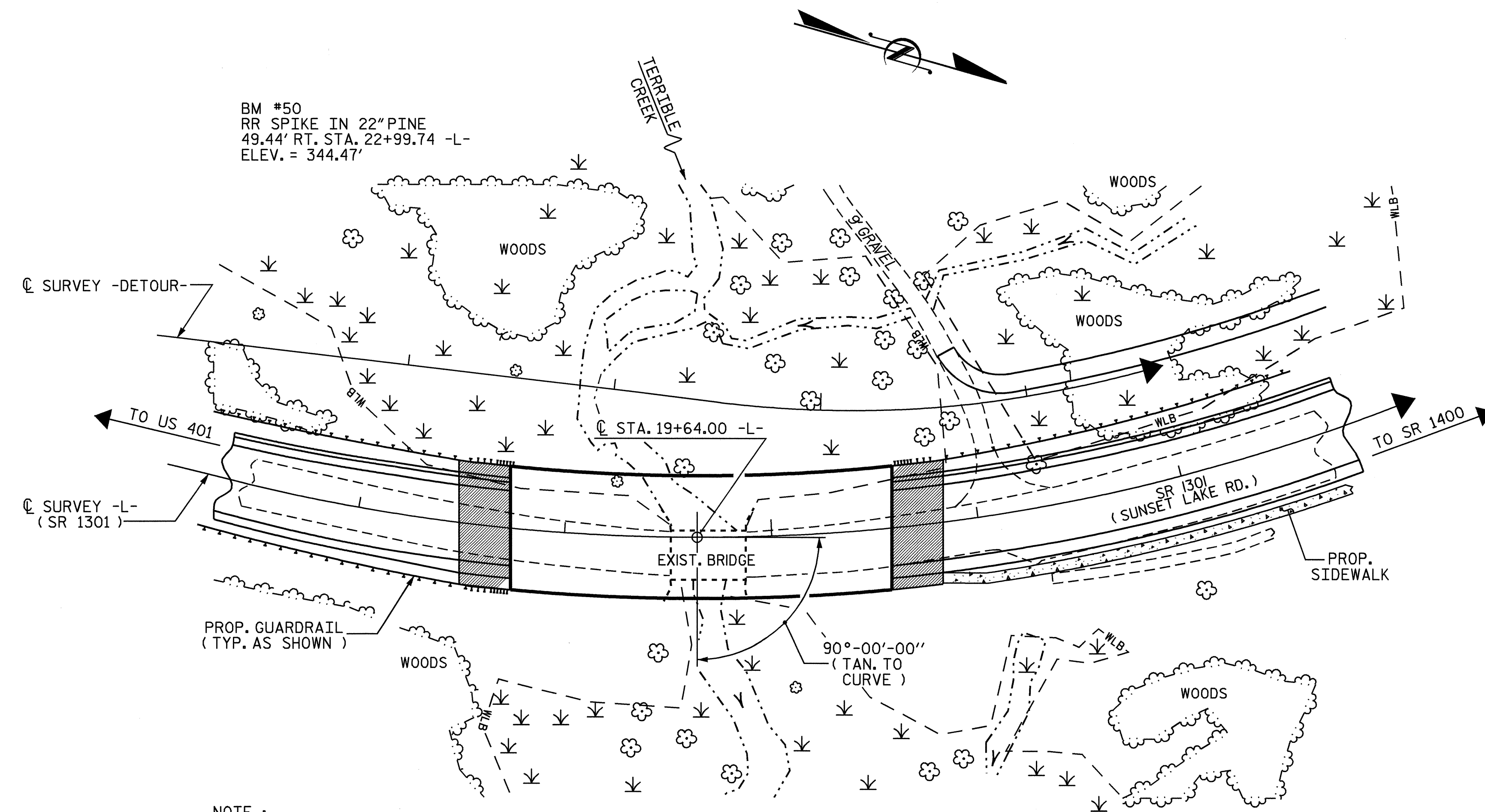
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE ON  
 SR 1301 (SUNSET LAKE RD.)  
 OVER TERRIBLE CREEK  
 BETWEEN US 401 AND SR 1400

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			45



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

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 12 x 53 STEEL PILES	HP 14 x 73 GALVANIZED STEEL PILES	TWO BAR METAL RAIL	1'-2" x 3'-2 3/4" CONCRETE PARAPET	1'-2" x 3'-8" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS			
	LUMP SUM	CU.YDS.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	No.	LIN.FT.	No.	LIN.FT.	No.	LIN.FT.	LIN.FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM		
SUPERSTRUCTURE			11,207	10,268		LUMP SUM		24	1,435.08									LUMP SUM	LUMP SUM	
END BENT No. 1		845			37.0		6,574		8	240				240	267					
BENT No. 1					26.7		4,392			8	220									
BENT No. 2					26.6		4,392			8	220									
END BENT No. 2		555			36.6		6,508		8	280				195	217					
TOTAL	LUMP SUM	1,400	11,207	10,268	126.9	LUMP SUM	21,866	24	1,435.08	16	520	16	440	348.14	181.89	181.92	435	484	LUMP SUM	LUMP SUM

DRAWN BY: MIKE BRITT DATE: 1-12-09  
 CHECKED BY: T.J. BEACH DATE: 1-13-09

# 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 (γ <sub>LL</sub> )	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 (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.001	--	1.75	0.750	1.34	B	EL	29.911	0.750	1.00	B	I	53.840	0.80	0.750	1.10	B	EL	29.911		
	HL-93 (OPERATING)	N/A		1.297	--	1.35	0.750	1.73	B	EL	29.911	0.750	1.30	B	I	53.840	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.00	②	1.287	46.333	1.80	0.750	2.12	B	EL	29.911	0.814	1.29	A	I	11.148	1.00	0.750	1.33	B	EL	29.911		
	HS-20 (OPERATING)	36.00		1.716	61.777	1.35	0.750	2.83	B	EL	29.911	0.814	1.72	A	I	11.148	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.50		2.946	39.768	1.53	0.750	4.58	B	EL	29.911	0.814	2.95	A	I	11.148	1.00	0.750	2.87	B	EL	29.911	
		NGARBS2	20.00		2.131	42.619	1.53	0.750	3.50	B	EL	29.911	0.814	2.13	A	I	11.148	1.00	0.750	2.19	B	EL	29.911	
		NAGRIS2	22.00		1.600	40.790	1.53	0.750	2.48	B	EL	29.911	0.814	1.60	A	I	11.148	1.00	0.750	1.56	B	EL	29.911	
		NCOTTS3	27.25		1.531	41.386	1.53	0.750	2.37	B	EL	29.911	0.814	1.53	A	I	11.148	1.00	0.750	1.49	B	EL	29.911	
		NAGGRS4	34.93		1.249	43.623	1.53	0.750	1.94	B	EL	29.911	0.814	1.25	A	I	11.148	1.00	0.750	1.21	B	EL	29.911	
		NS5A	35.55		1.279	45.464	1.53	0.750	1.90	B	EL	29.911	0.814	1.28	A	I	11.148	1.00	0.750	1.19	B	EL	29.911	
		NS6A	39.95		1.178	47.047	1.53	0.750	1.75	B	EL	29.911	0.814	1.18	A	I	11.148	1.00	0.750	1.10	B	EL	29.911	
		NS7B	42.00		1.172	49.208	1.53	0.750	1.67	B	EL	29.911	0.814	1.17	A	I	11.148	1.00	0.750	1.05	B	EL	29.911	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	NAGRIT3	33.00		1.346	44.511	1.53	0.750	2.15	B	EL	29.911	0.814	1.35	A	I	11.148	1.00	0.750	1.35	B	EL	29.911	
		NT4A	33.08		1.300	48.355	1.53	0.750	1.91	B	EL	29.911	0.814	1.30	A	I	11.148	1.00	0.750	1.20	B	EL	29.911	
		NT6A	41.60		1.587	60.296	1.53	0.750	2.80	B	EL	29.911	0.814	1.59	A	I	11.148	1.00	0.750	1.75	B	EL	29.911	
		NT7A	42.00		1.275	53.055	1.53	0.750	1.78	B	EL	29.911	0.814	1.28	A	I	11.148	1.00	0.750	1.11	B	EL	29.911	
		NT7B	42.00	③	1.122	47.125	1.53	0.750	1.79	B	EL	29.911	0.814	1.20	A	I	11.148	1.00	0.750	1.12	B	EL	29.911	
		NAGRIT4	43.00		1.133	47.601	1.53	0.750	1.87	B	EL	29.911	0.814	1.13	A	I	11.148	1.00	0.750	1.17	B	EL	29.911	
NAGRIT5A	45.00		1.397	62.862	1.53	0.750	2.25	B	EL	29.911	0.814	1.40	A	I	11.148	1.00	0.750	1.41	B	EL	29.911			
NAGRIT5B	45.00		1.400	63.018	1.53	0.750	2.57	B	EL	23.929	0.814	1.40	A	I	11.148	1.00	0.750	1.66	B	EL	29.911			

### LOAD FACTORS:

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

LEGAL LOAD RATING FACTORS	YEAR	ADTT	γ <sub>L</sub>
	2008	14,100	N/A
	2030	28,500	1.53

### NOTES:

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

MINIMUM RATING FACTORS FOR LEGAL LOAD RATING ARE BASED ON THE STRENGTH I LIMIT STATE.

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

### COMMENTS:

FOR SPANS B AND C, THE PRESTRESSED CONCRETE GIRDER DESIGN/RATING PROGRAM REPORTS EQUAL RATING FACTORS FOR ALL CATEGORIES.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

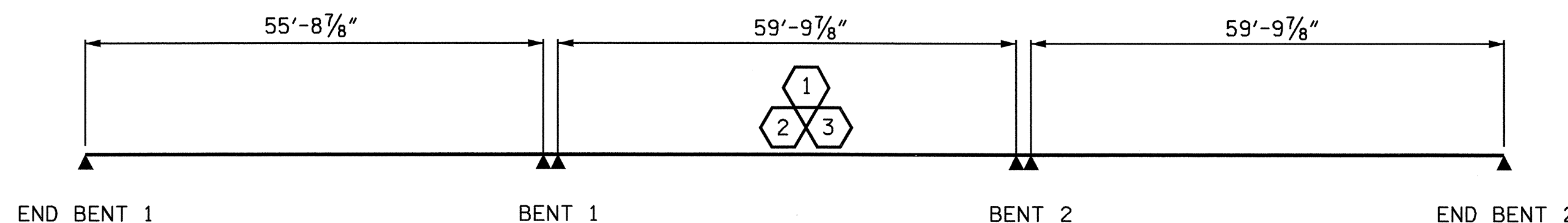
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

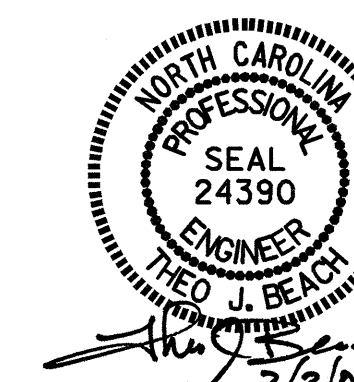
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



## LRFR SUMMARY

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

ASSEMBLED BY: T.J. BANKOVICH DATE: 2/2/09  
 CHECKED BY: T.J. BEACH DATE: 2/2/09  
 DRAWN BY: MAA 1/08 REV. 11/12/08R MAA/GM  
 CHECKED BY: GM/DI 2/08



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:
1			3		
2			4		
					5
					TOTAL SHEETS 45

**NOTES:**

PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. A TOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

FOR SIDEWALK REINFORCING STEEL AND DETAILS SEE "SIDEWALK DETAILS" SHEETS.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

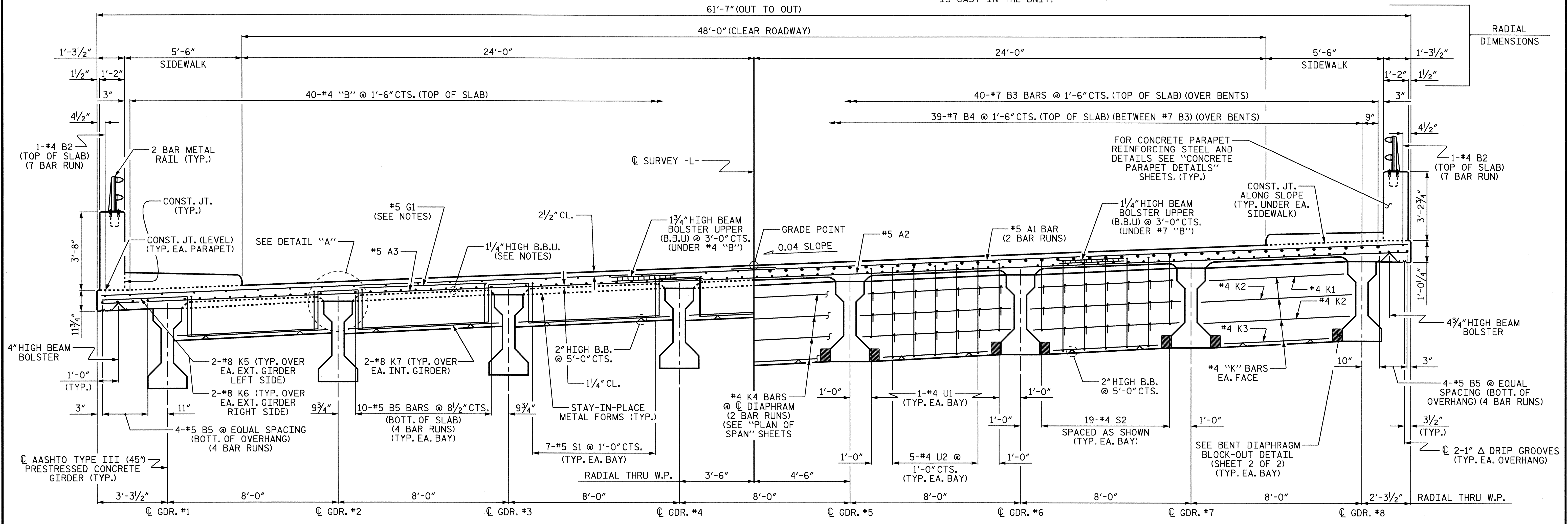
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE JOINT IN THE DECK SHALL BE SAWS PRIOR TO THE CASTING OF THE PARAPET, END POSTS AND SIDEWALK.

#5 G1 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

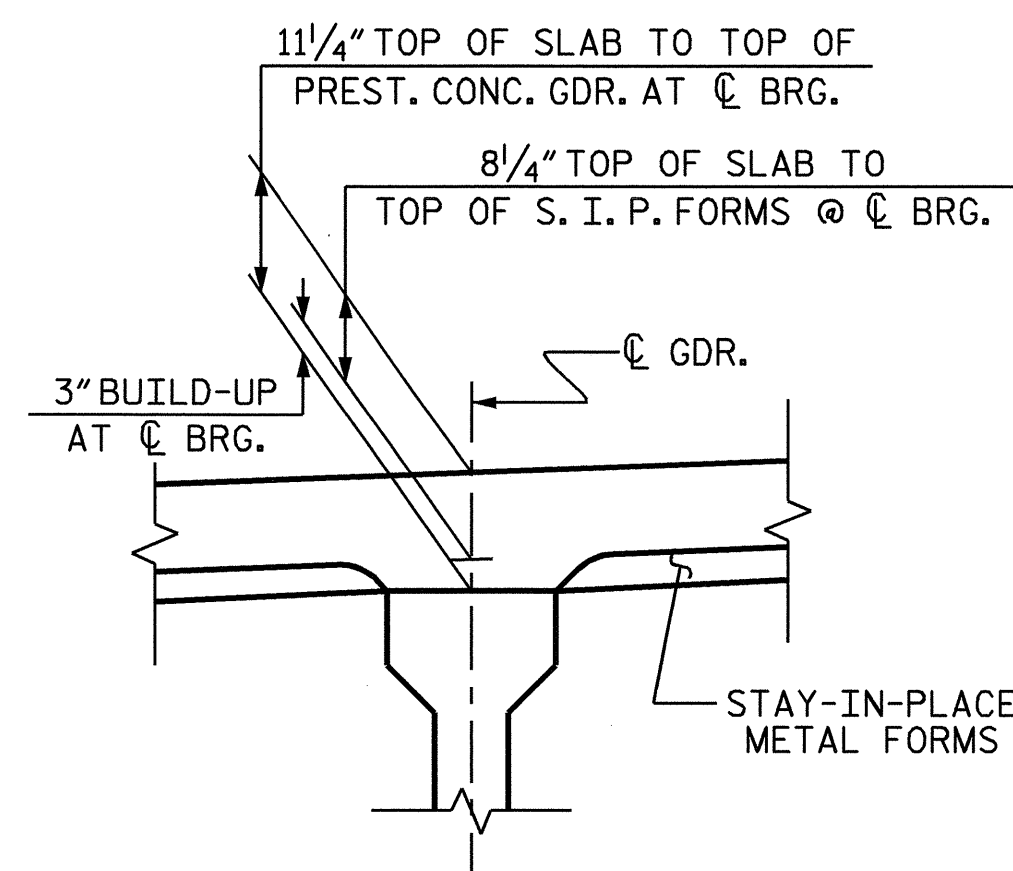


**HALF TYPICAL SECTION**

(SHOWING END BENT DIAPHRAGMS)

**HALF TYPICAL SECTION**

(SHOWING CONTINUOUS FOR LIVE LOAD DIAPHRAGMS)



**DETAIL "A"**

NOTE:  
FOR INTERMEDIATE DIAPHRAGMS  
SEE "STANDARD INTERMEDIATE  
DIAPHRAGMS" SHEET

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 1 OF 2

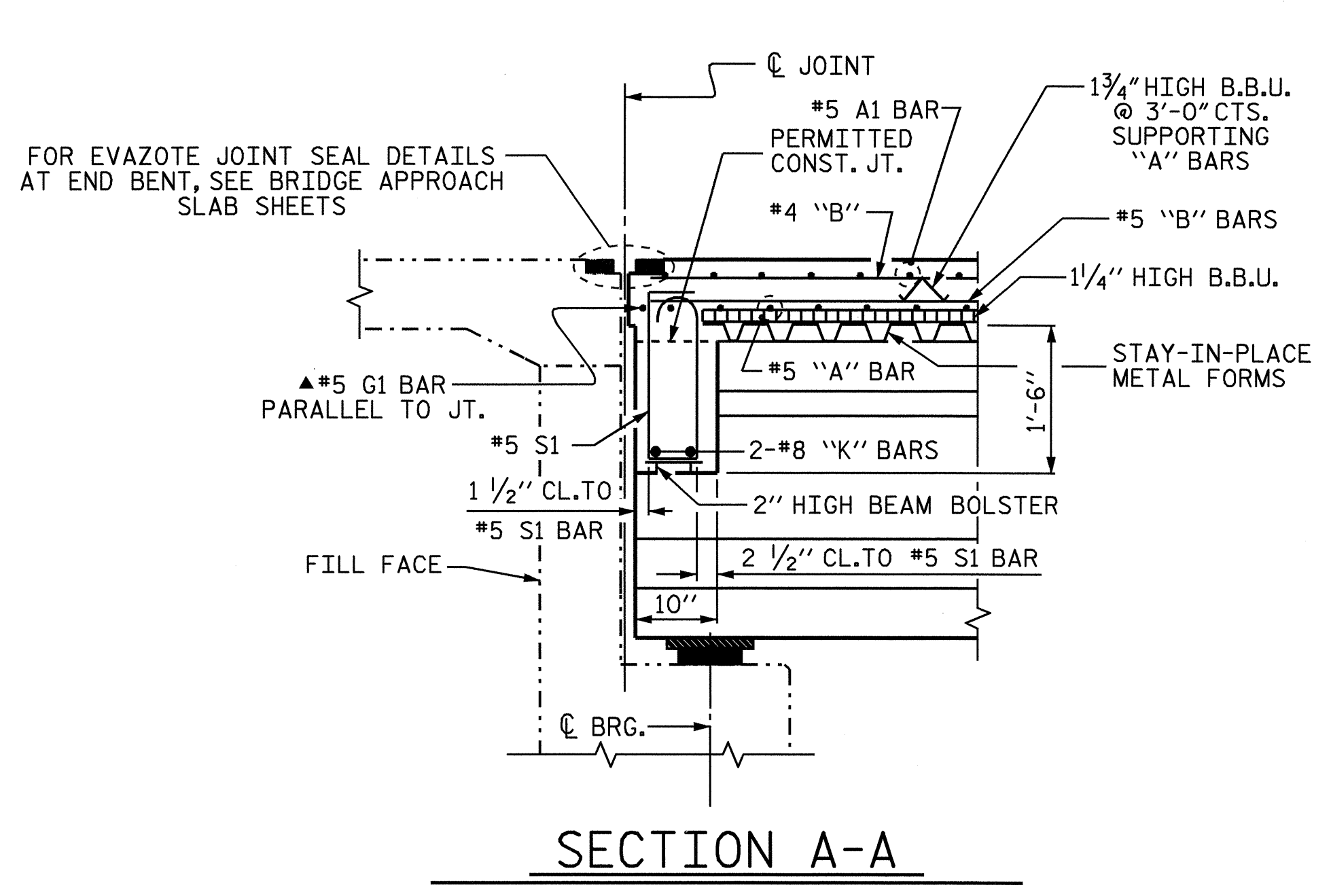
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION



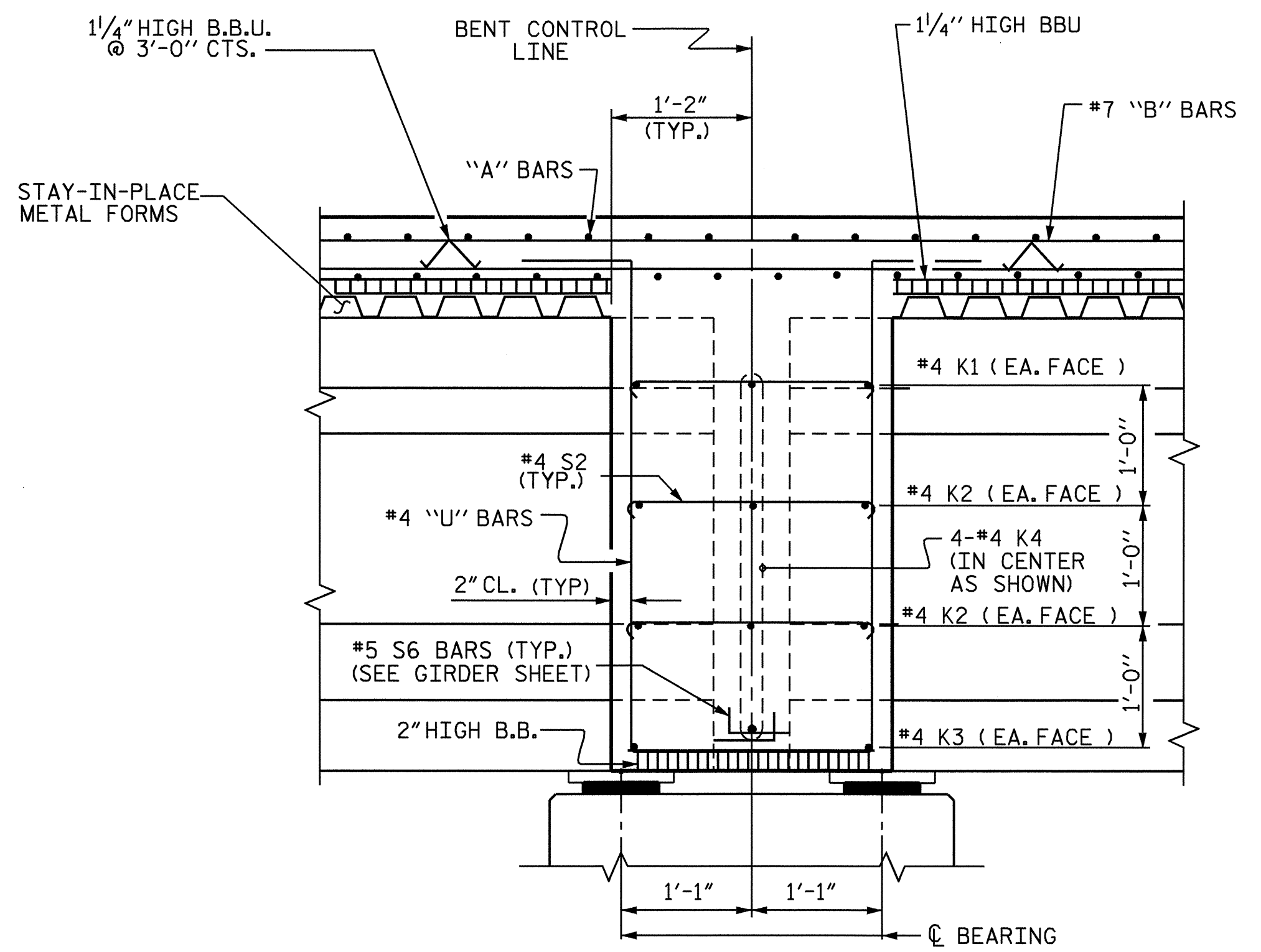
DRAWN BY: T. BANKOVICH DATE: 3-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 8-2008

REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

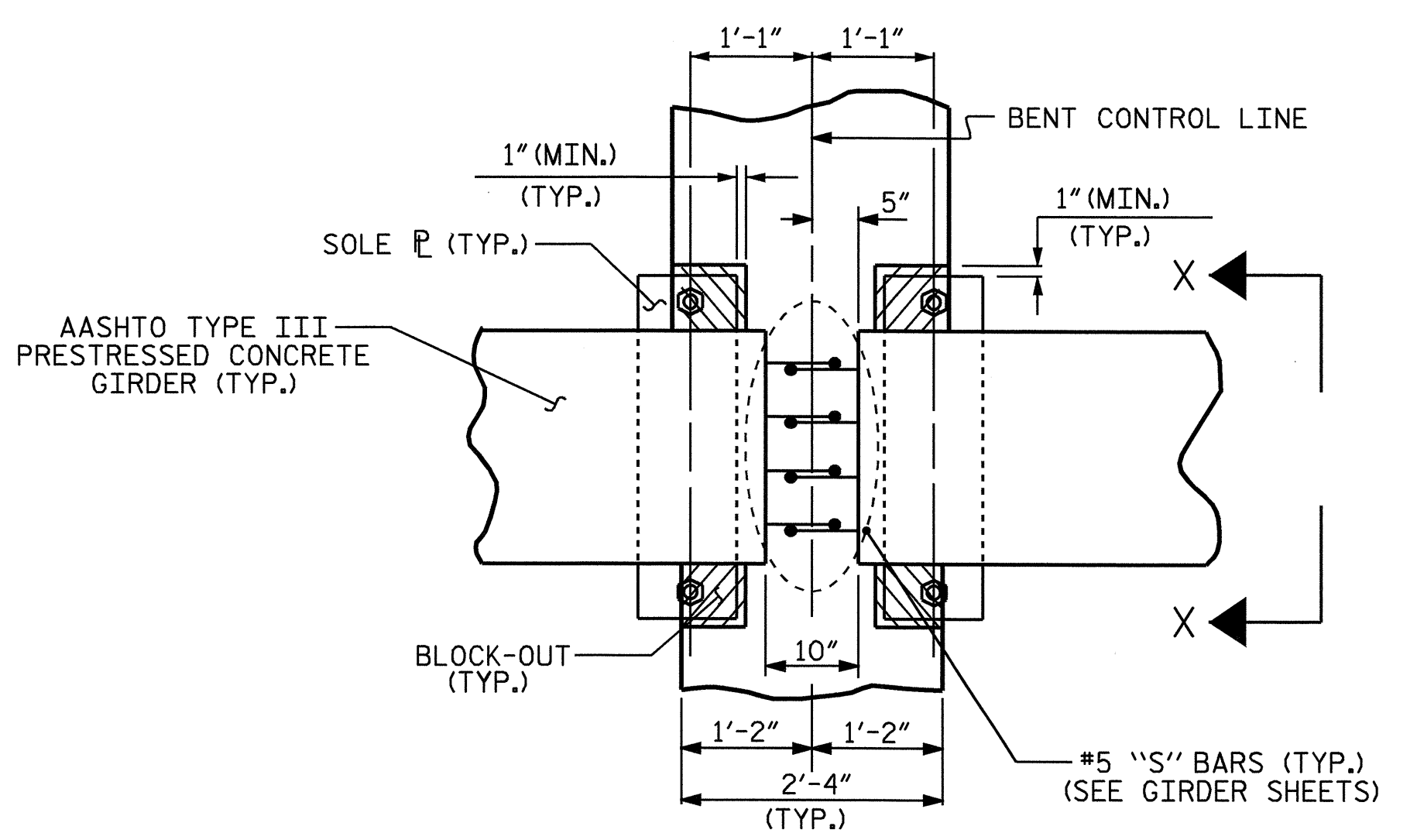
**NOTES:**  
 FOR LOCATION OF SECTIONS SEE "PLAN OF SPAN" SHEETS.  
 ▲ #5 G1 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



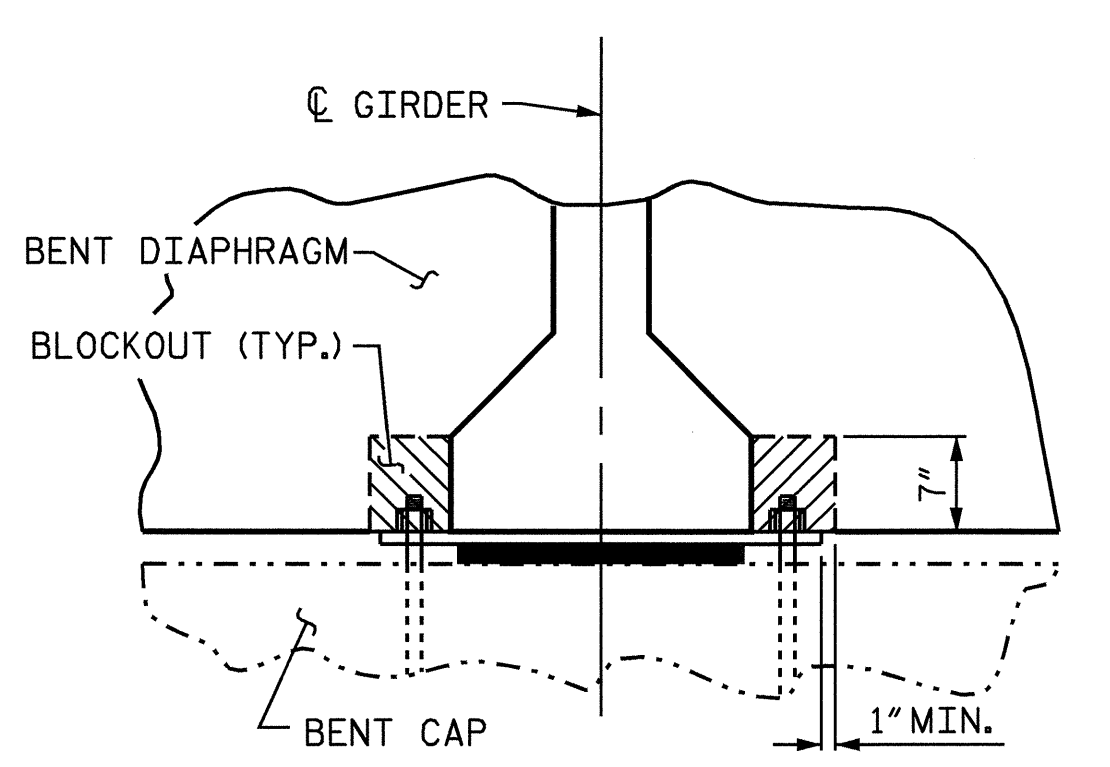
**SECTION A-A**



**SECTION B-B**



**PLAN**



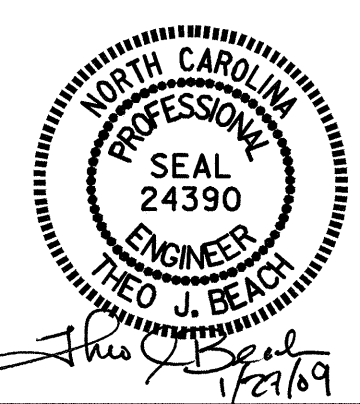
**SECTION X-X**

**BENT DIAPHRAGM BLOCK-OUT DETAIL**

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 2

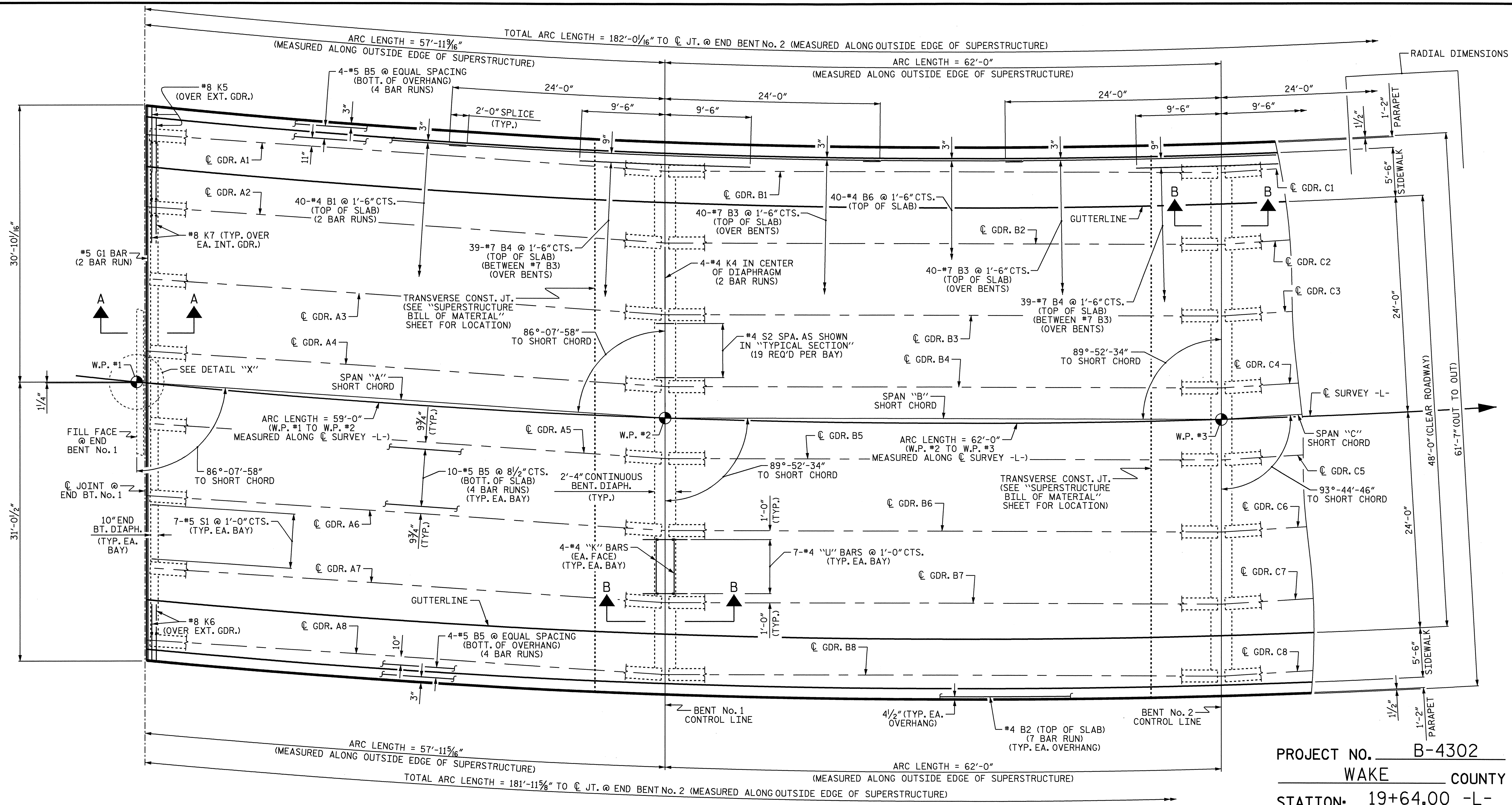
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION



DRAWN BY: T. BANKOVICH DATE: 3-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 8-2008

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			45





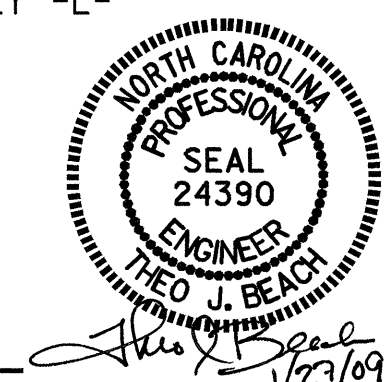
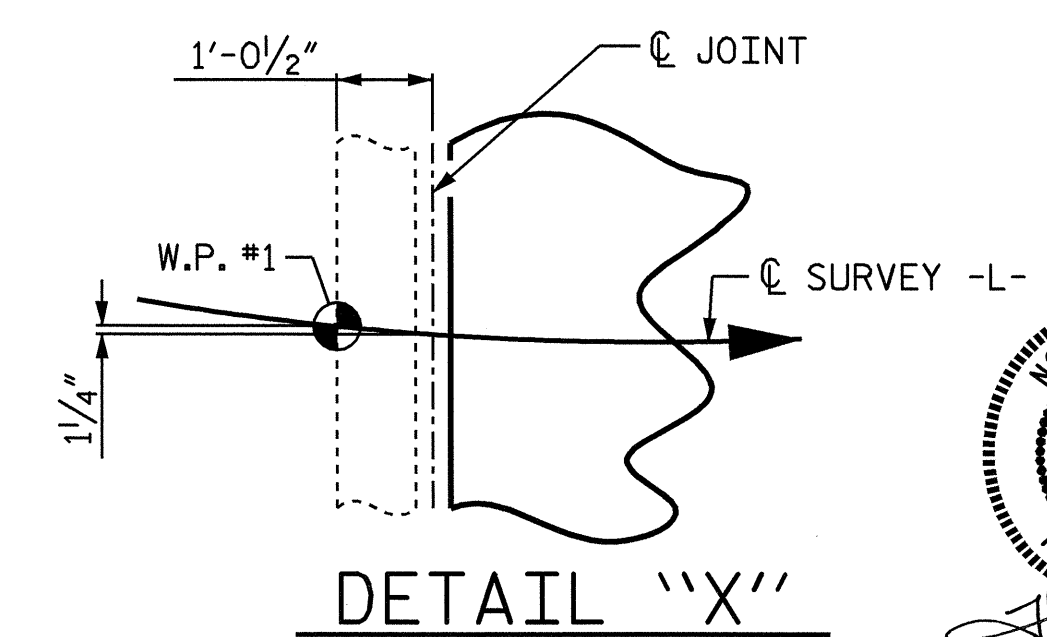
SPAN "A"

SPAN "B"

PARTIAL PLAN OF SPAN

NOTES:

- FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEETS. FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS
- FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 2 OF 2.
- FOR "A" BAR PLACEMENT, SEE "A" BAR PLACEMENT SHEET.
- FOR LOCATIONS OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEET.



PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-8					TOTAL SHEETS 45

DRAWN BY: T. BANKOVICH DATE: 3-2008  
CHECKED BY: S.B. WILLIAMS DATE: 8-2008

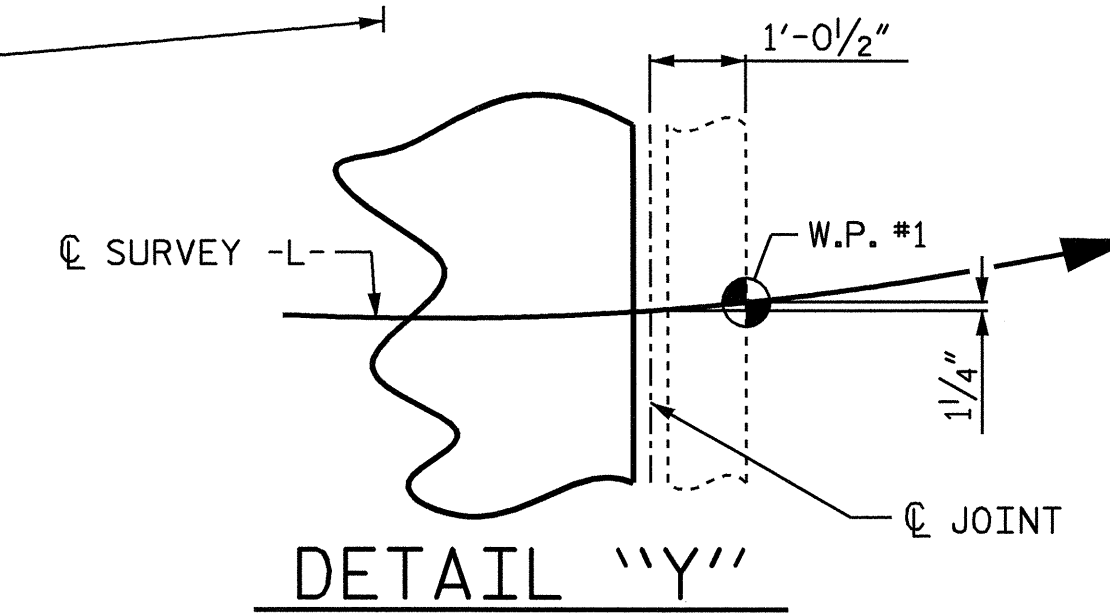
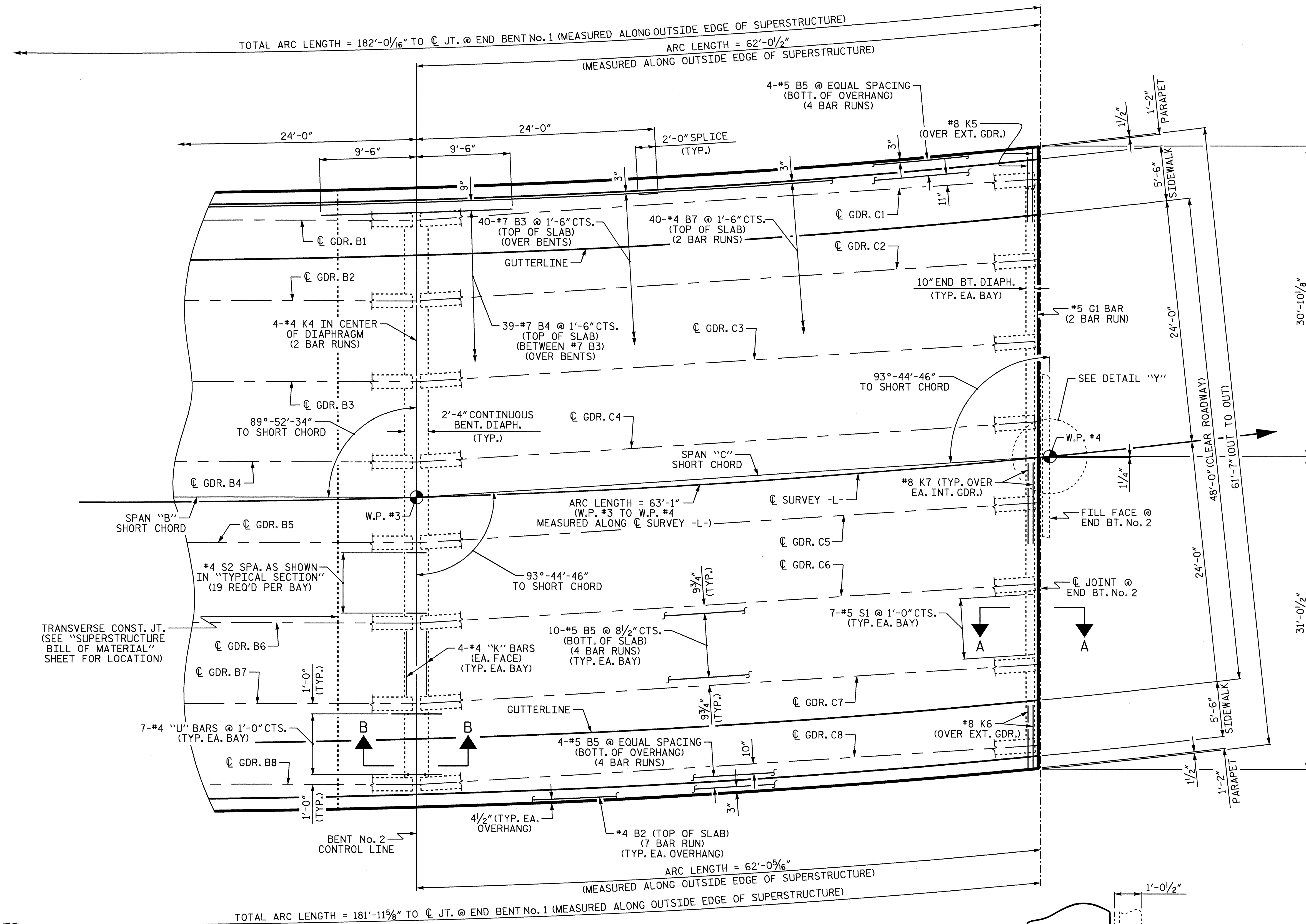
NOTES:

FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEETS. FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEETS

FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 2 OF 2.

FOR "A" BAR PLACEMENT, SEE "A" BAR PLACEMENT SHEET.

FOR LOCATIONS OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEET.



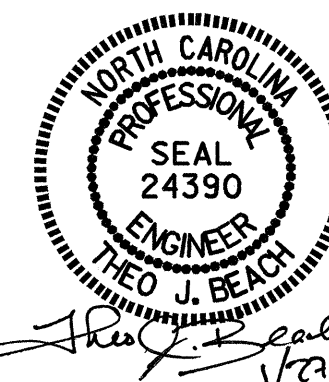
PARTIAL PLAN OF SPAN

DETAIL "Y"

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 2

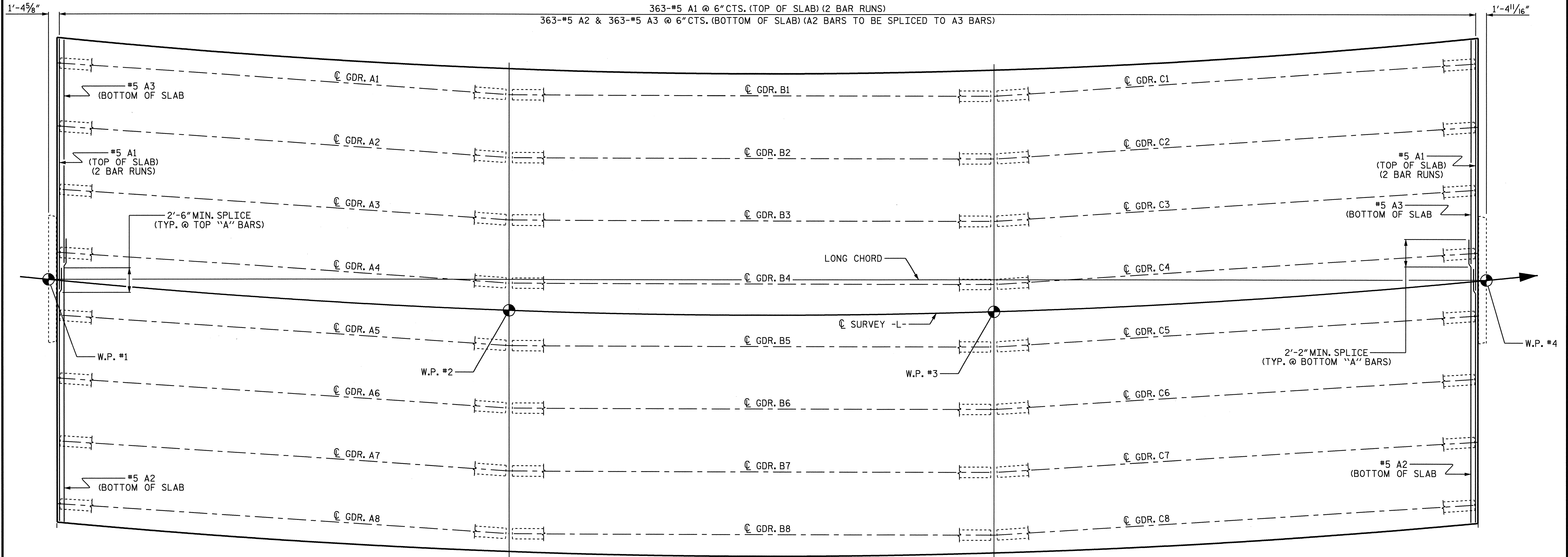
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS



REVISIONS						SHEET NO. S-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY: T. BANKOVICH DATE: 3-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 8-2008

23-JAN-2009 11:39  
 F:\structures\super\_draw\b-4302.sd.s\*.dgn  
 tbeach



**“A” BAR PLACEMENT**

“A” BARS TO BE PLACED PERPENDICULAR TO THE LONG CHORD AND SPACED ALONG THE LONG CHORD

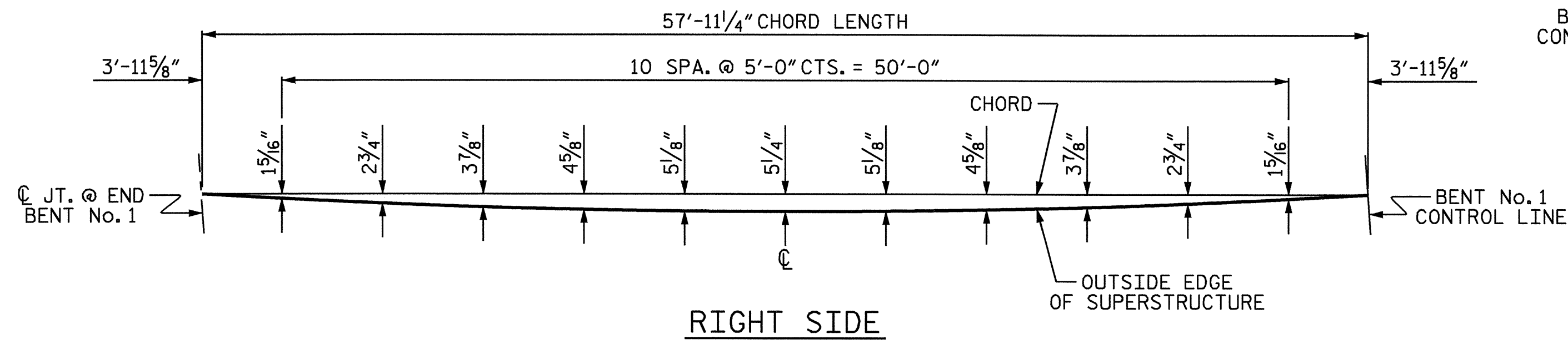
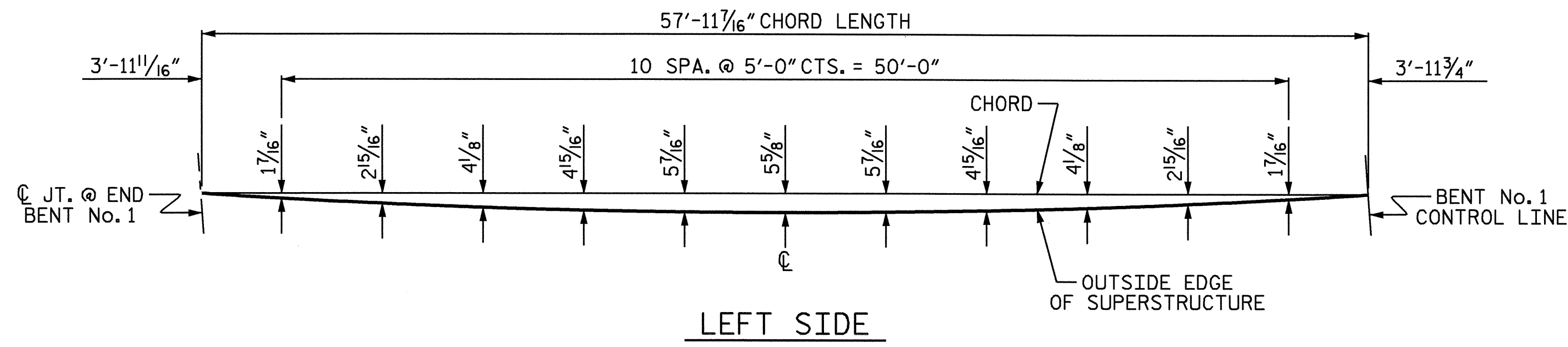
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**“A” BAR PLACEMENT**

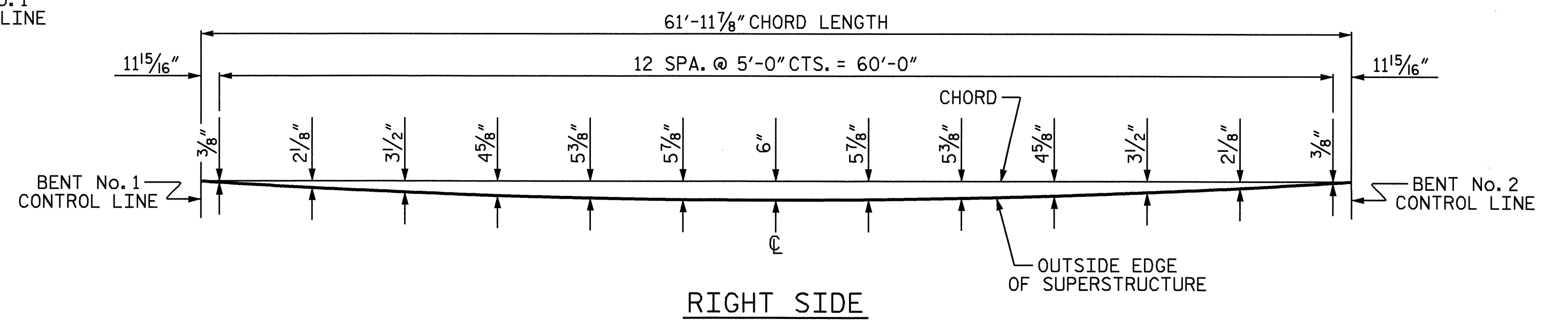
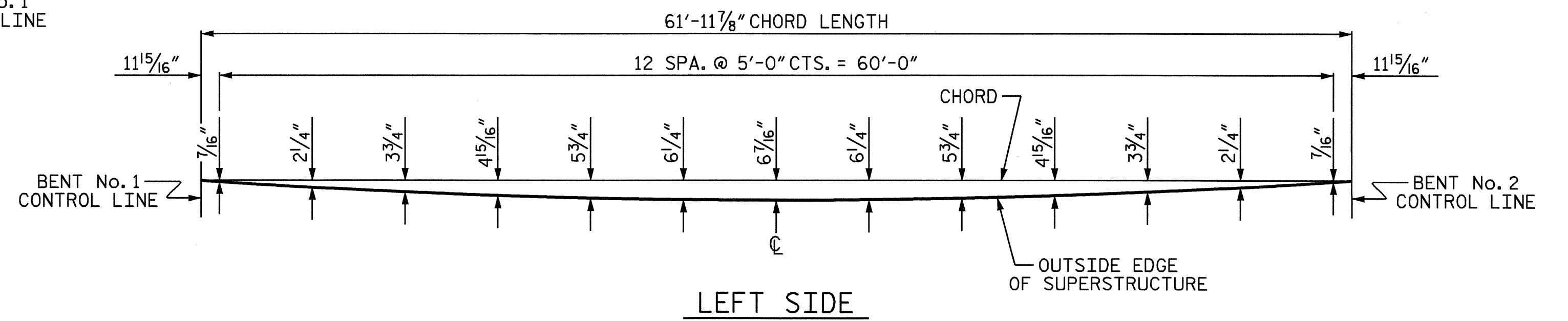
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS 45	
2			4				



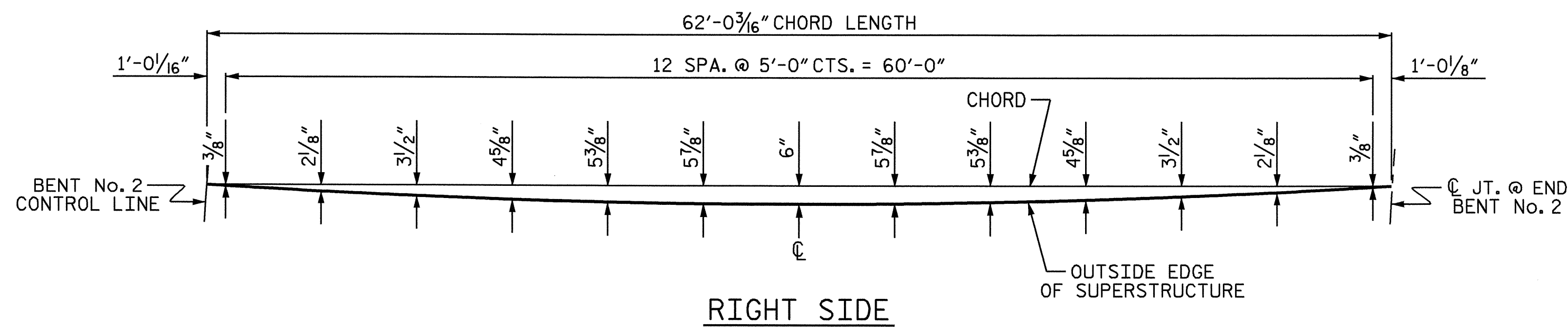
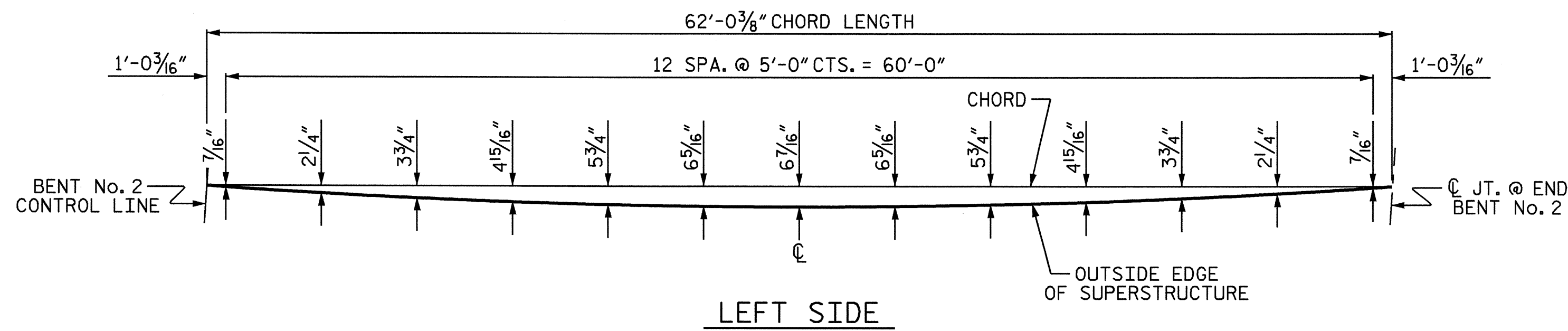
DRAWN BY : T. BANKOVICH DATE : 9-2008  
 CHECKED BY : S.B. WILLIAMS DATE : 9-2008



SPAN "A" ARC OFFSETS



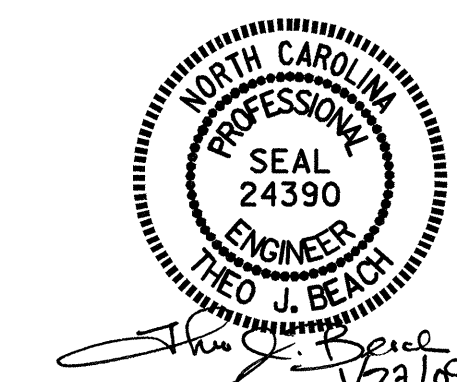
SPAN "B" ARC OFFSETS



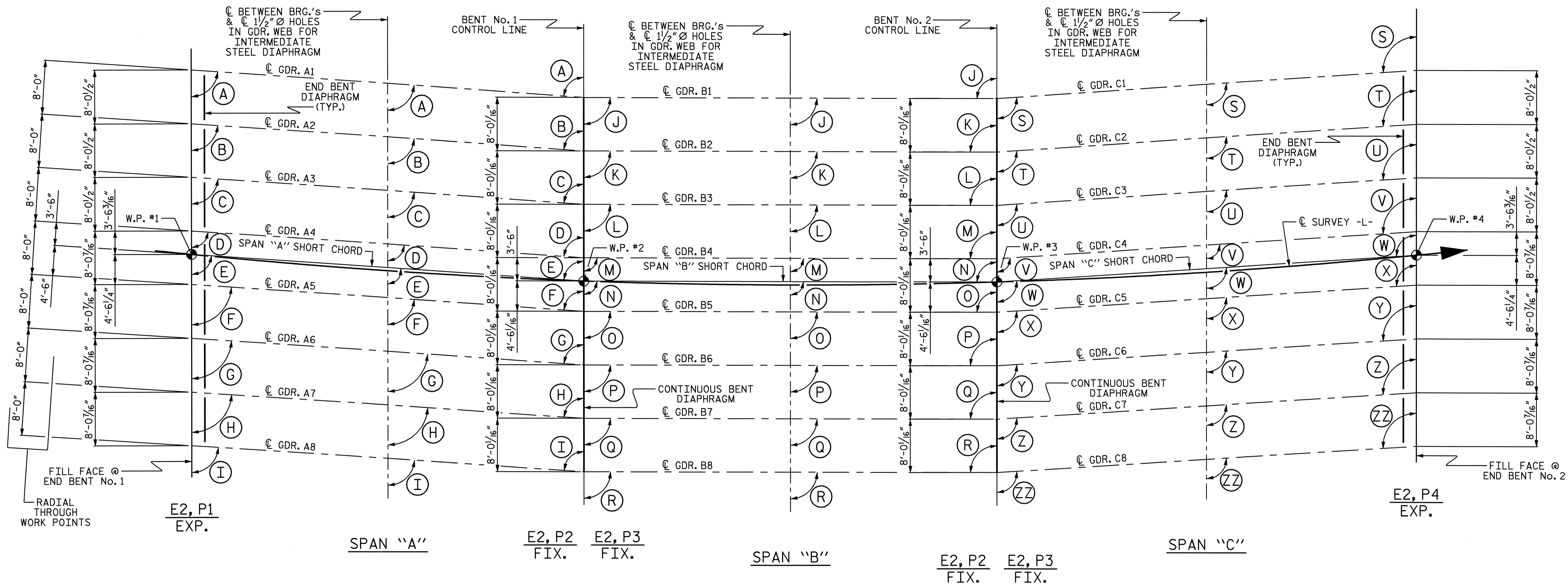
SPAN "C" ARC OFFSETS

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
ARC OFFSETS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-11
					TOTAL SHEETS 45



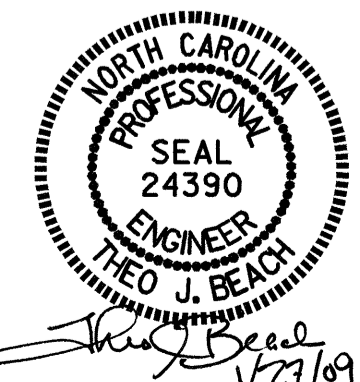
DRAWN BY: I. BANKOVICH DATE: 3-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 10-2008



ANGLES

(A) 86°-00'-51"	(K) 89°-52'-25"	(T) 93°-49'-36"
(B) 86°-02'-58"	(L) 89°-52'-29"	(U) 93°-47'-36"
(C) 86°-05'-03"	(M) 89°-52'-33"	(V) 93°-45'-37"
(D) 86°-07'-05"	(N) 89°-52'-34"	(W) 93°-44'-46"
(E) 86°-07'-58"	(O) 89°-52'-36"	(X) 93°-43'-40"
(F) 86°-09'-06"	(P) 89°-52'-40"	(Y) 93°-41'-45"
(G) 86°-11'-04"	(Q) 89°-52'-44"	(Z) 93°-39'-53"
(H) 86°-13'-00"	(R) 89°-52'-48"	(ZZ) 93°-38'-02"
(I) 86°-14'-55"	(S) 93°-51'-39"	
(J) 89°-52'-21"		

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

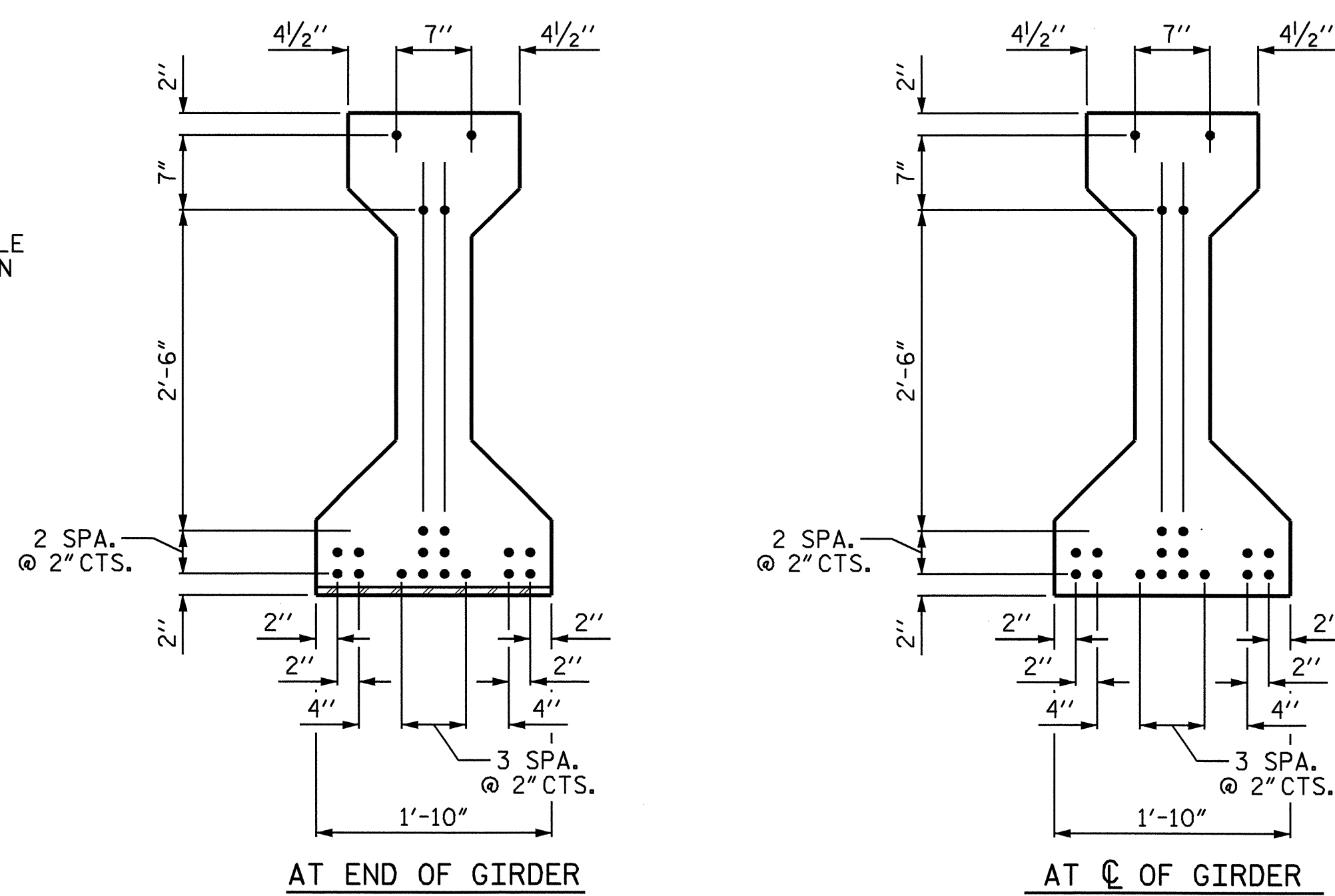
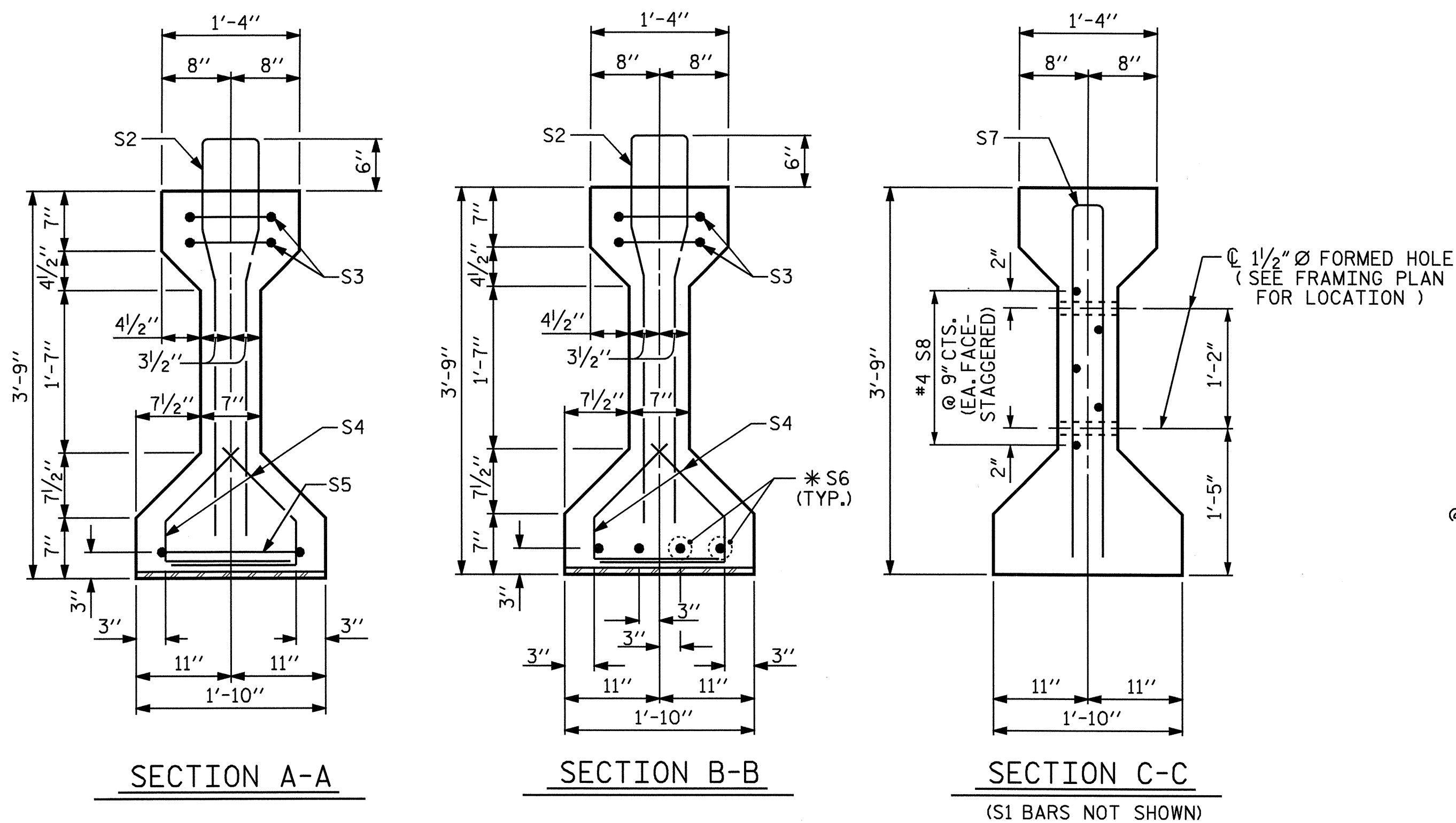


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 GIRDER LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			45

DRAWN BY: T. BANKOVICH DATE: 4-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 8-2008



0.6" Ø LOW RELAXATION STRAND LAYOUT

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

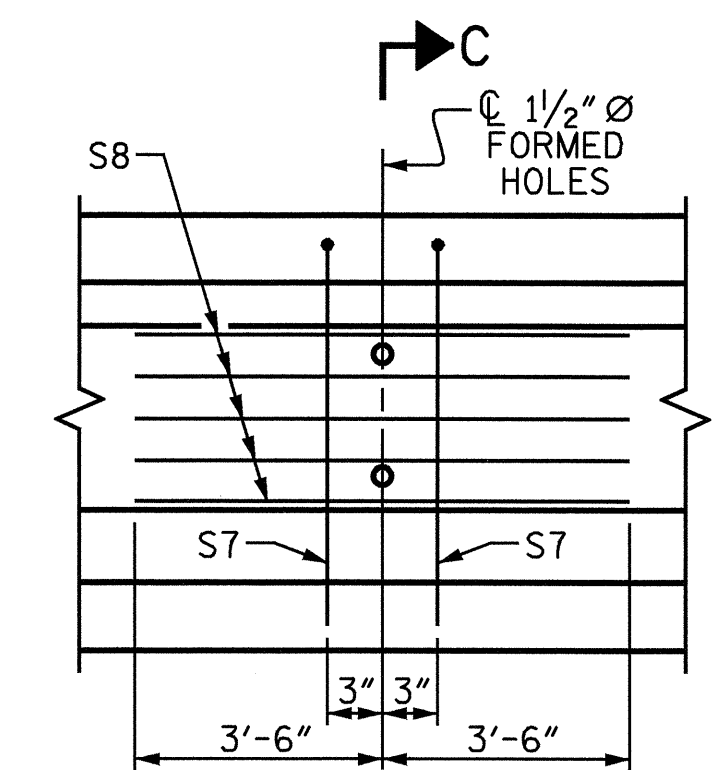
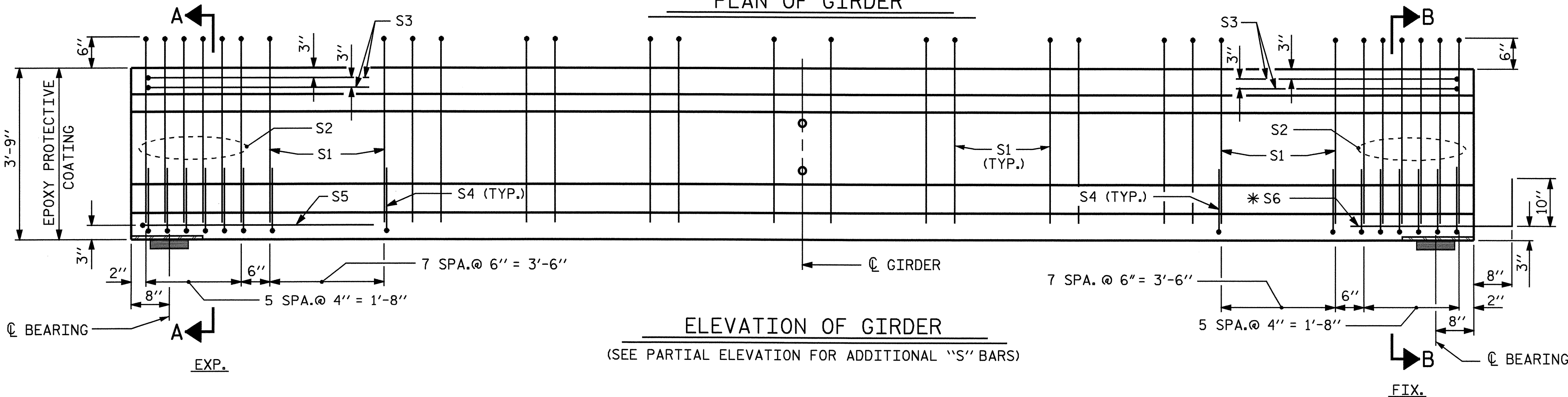
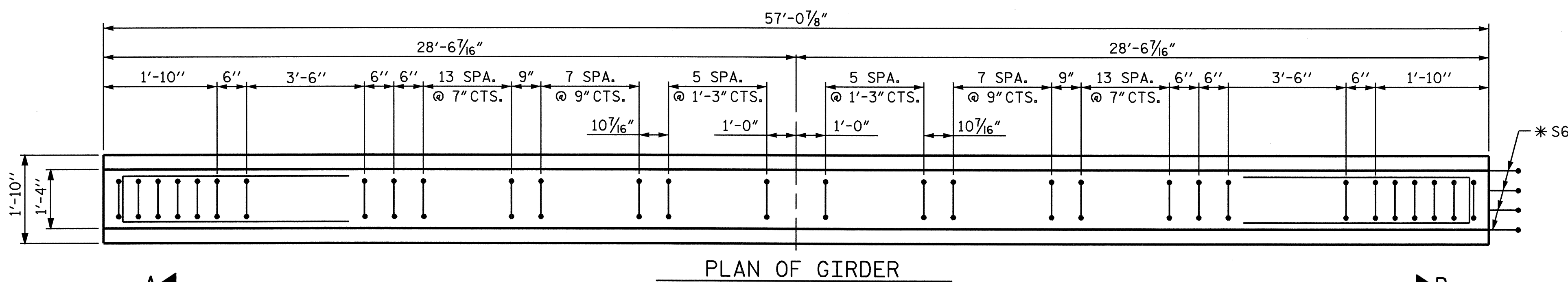
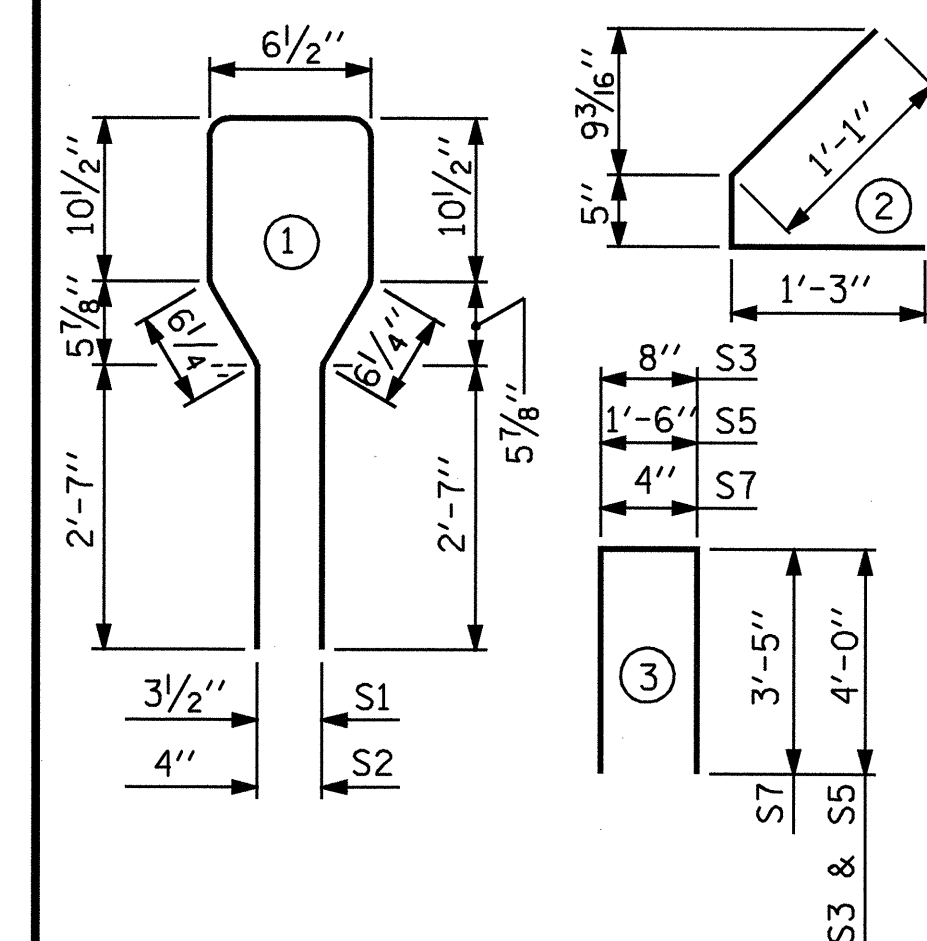
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	74	#4	1	8'-6"	420
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#5	2	2'-9"	161
S5	1	#4	3	9'-6"	6
*S6	4	#5	STR	3'-8"	15
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

QUANTITIES FOR ONE GIRDER

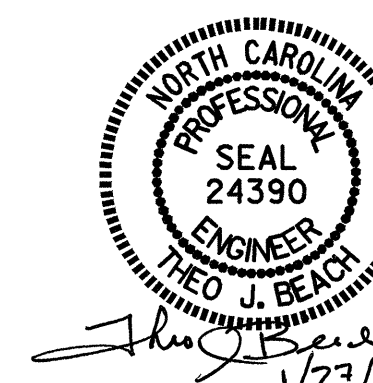
	REINFORCING STEEL LB.	5500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS No. 1 THRU 8	816	8.2	20

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	57'-0 7/8"	456.58'

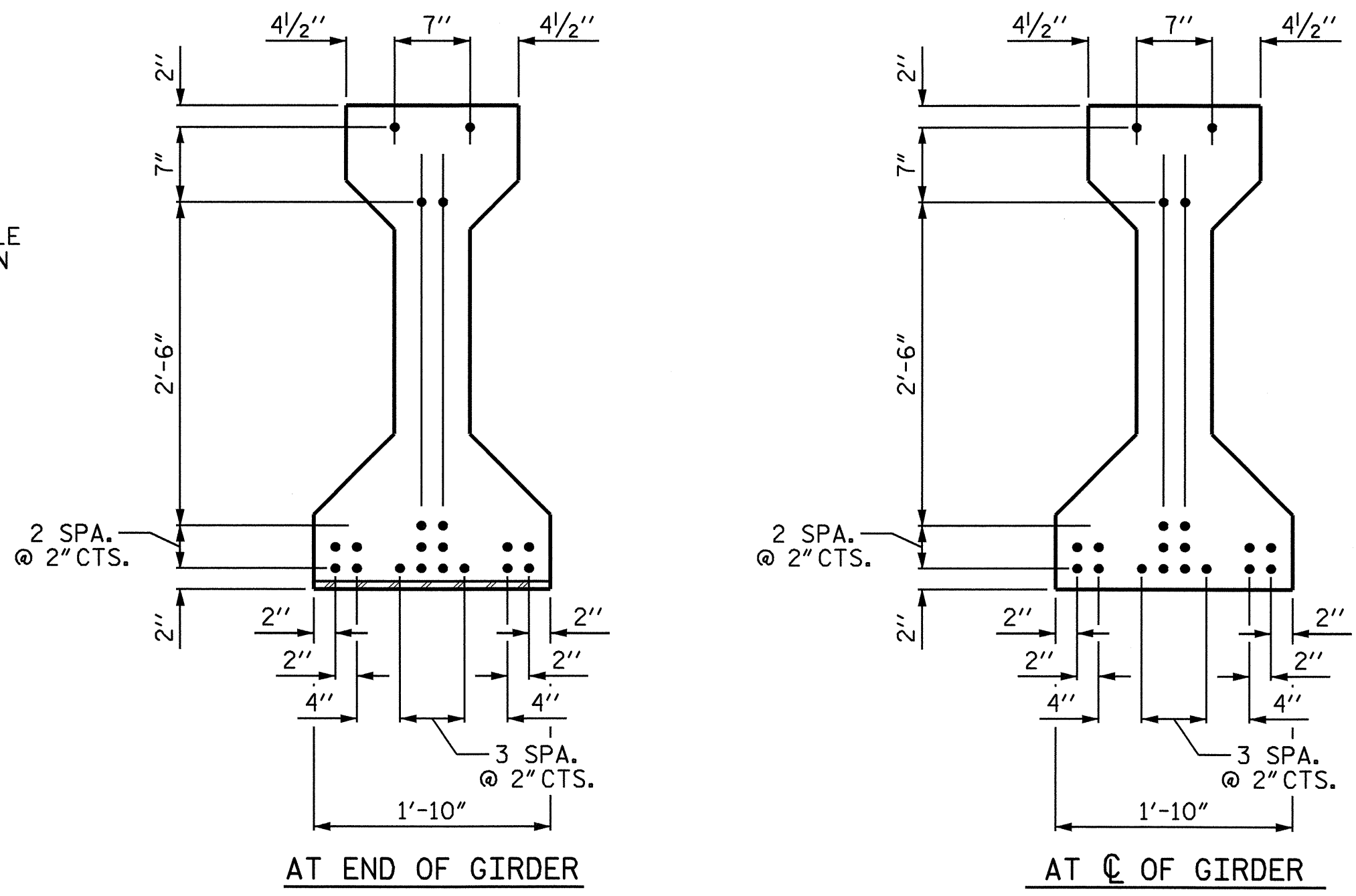
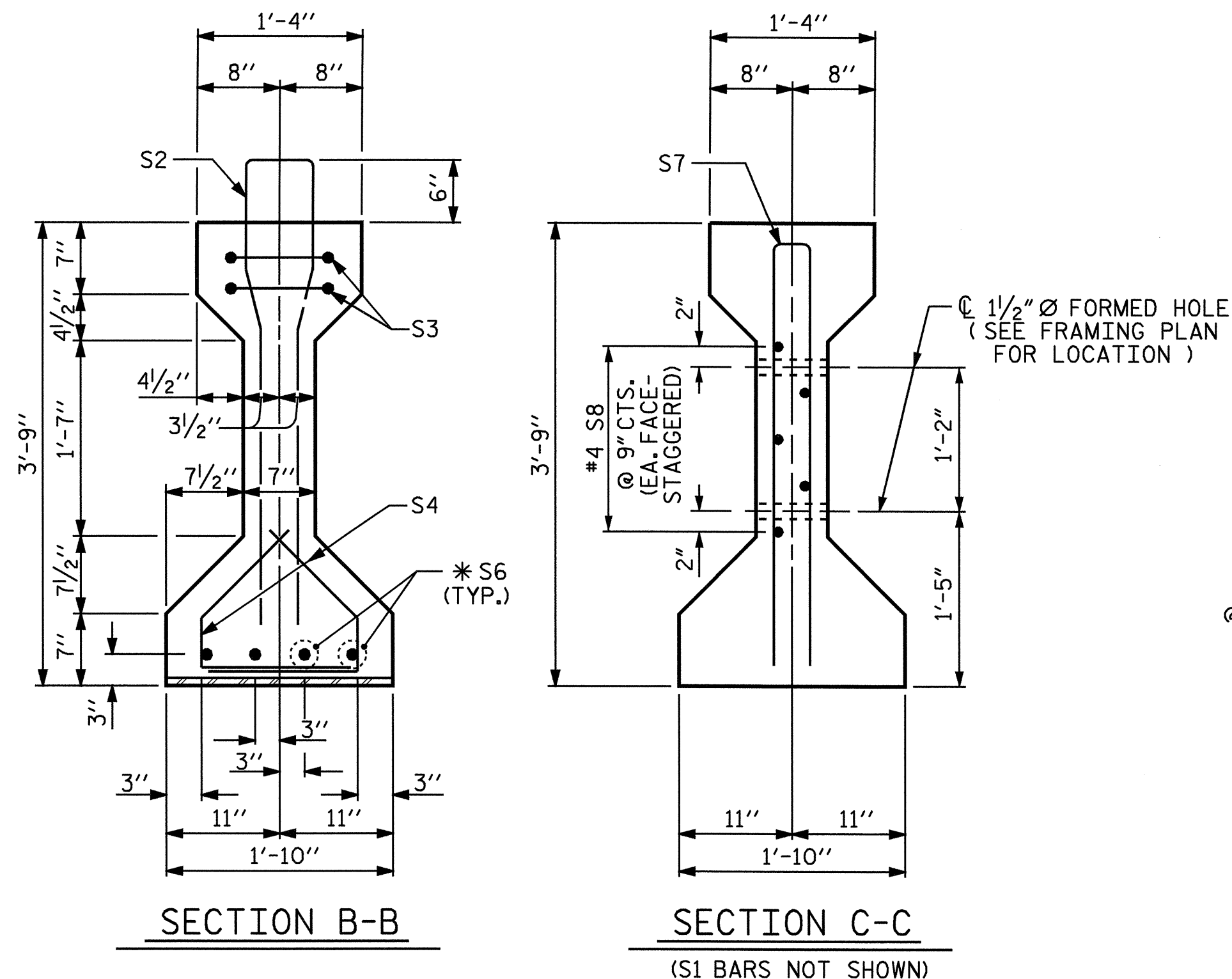
PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE III  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
"SPAN A"



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			45

ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 9-2008
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM



**0.6" Ø L. R. GRADE 270 STRANDS**

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

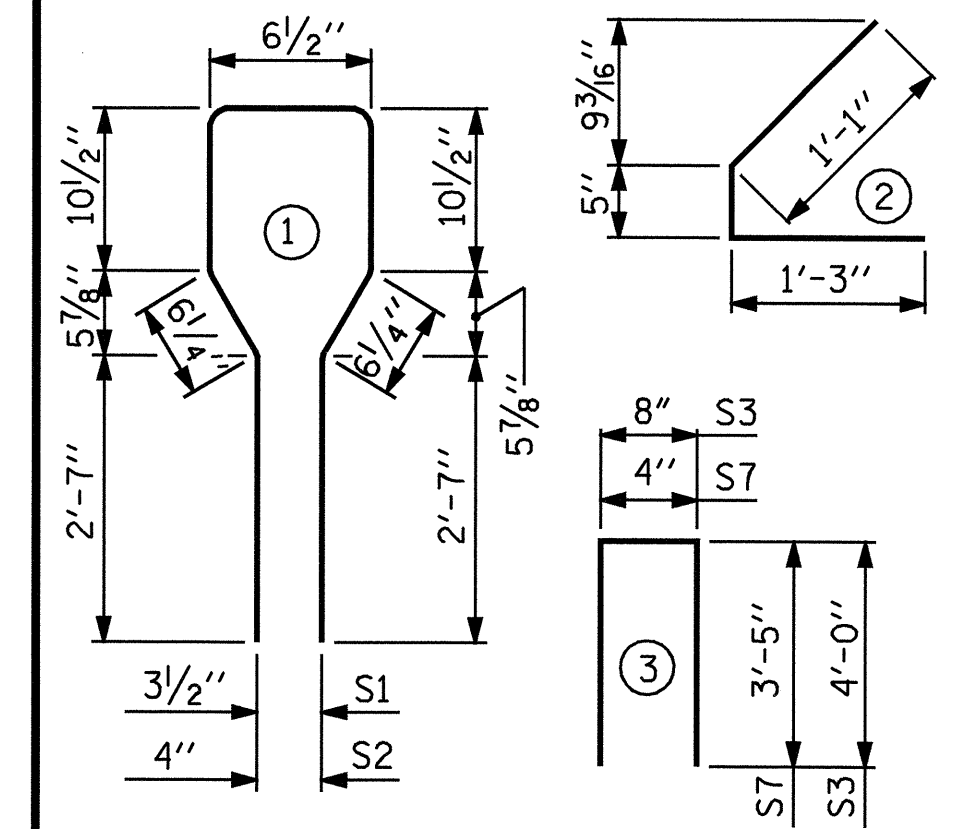
**REINFORCING STEEL FOR ONE GIRDER**

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#4	1	8'-6"	466
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#5	2	2'-9"	161
*S6	8	#5	STR	3'-8"	31
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

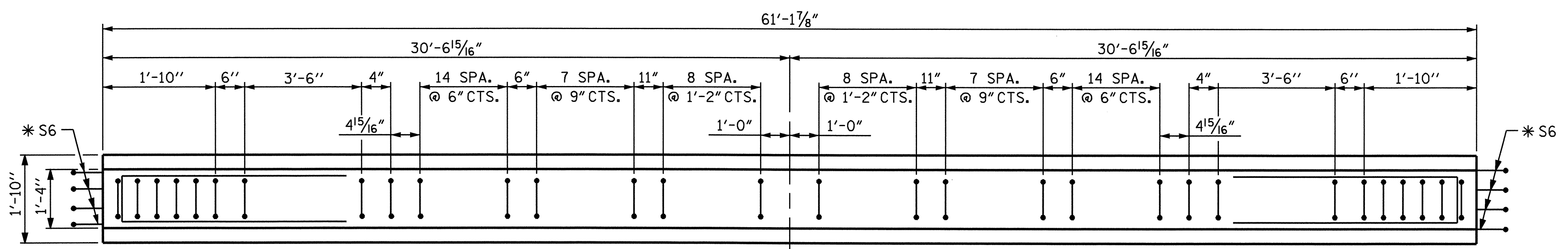
\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**

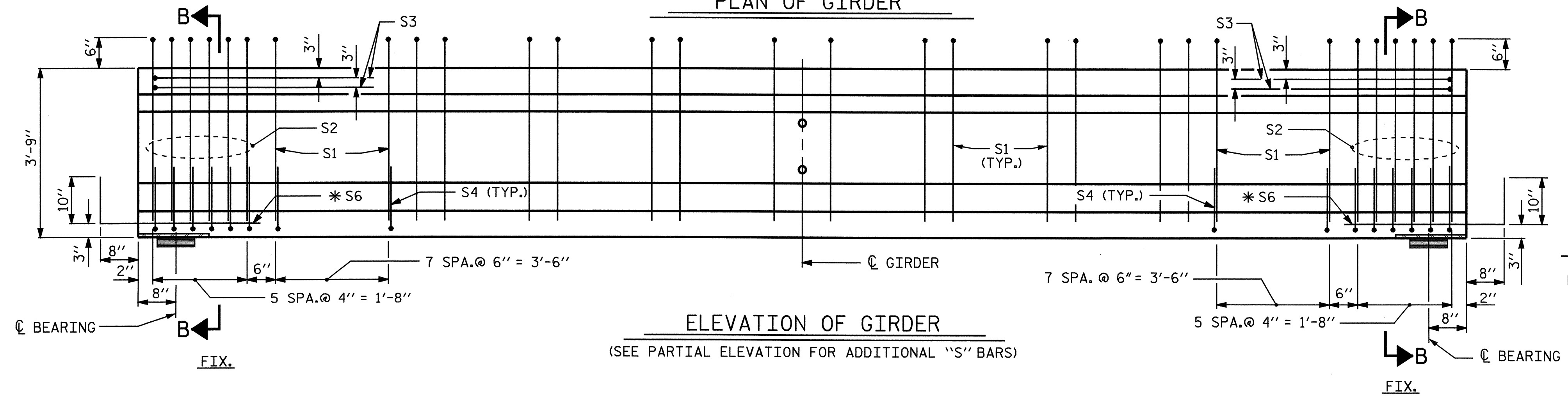
ALL BAR DIMENSIONS ARE OUT-TO-OUT



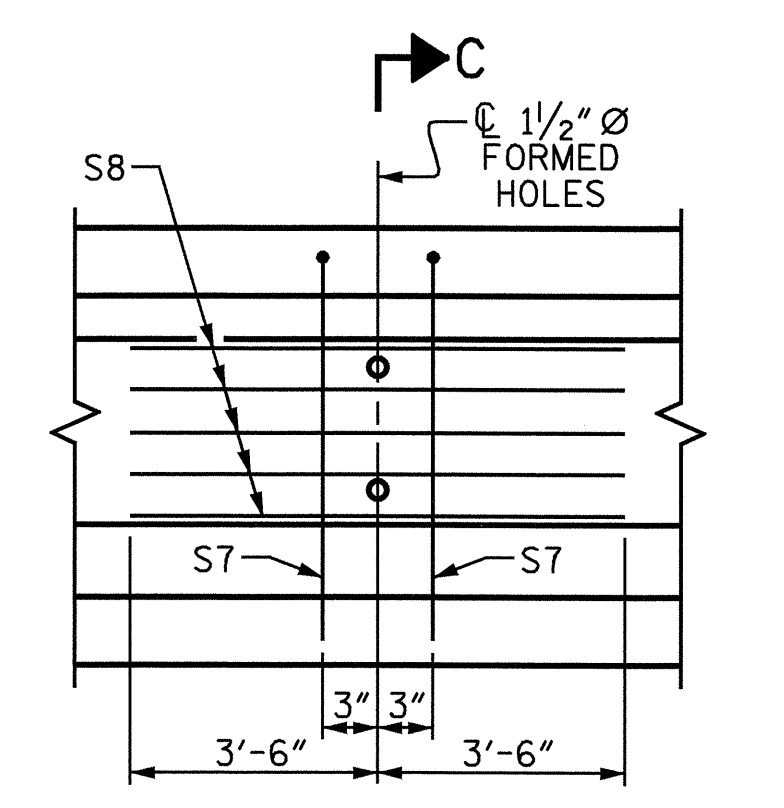
**0.6" Ø LOW RELAXATION STRAND LAYOUT**



PLAN OF GIRDER



ELEVATION OF GIRDER  
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

**QUANTITIES FOR ONE GIRDER**

	REINFORCING STEEL LB.	5500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS No. 1 THRU 8	872	8.8	20

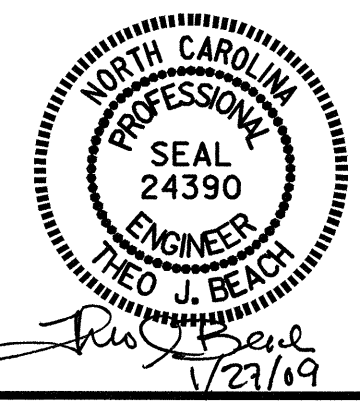
**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
8	61'-1 1/8"	489.25'

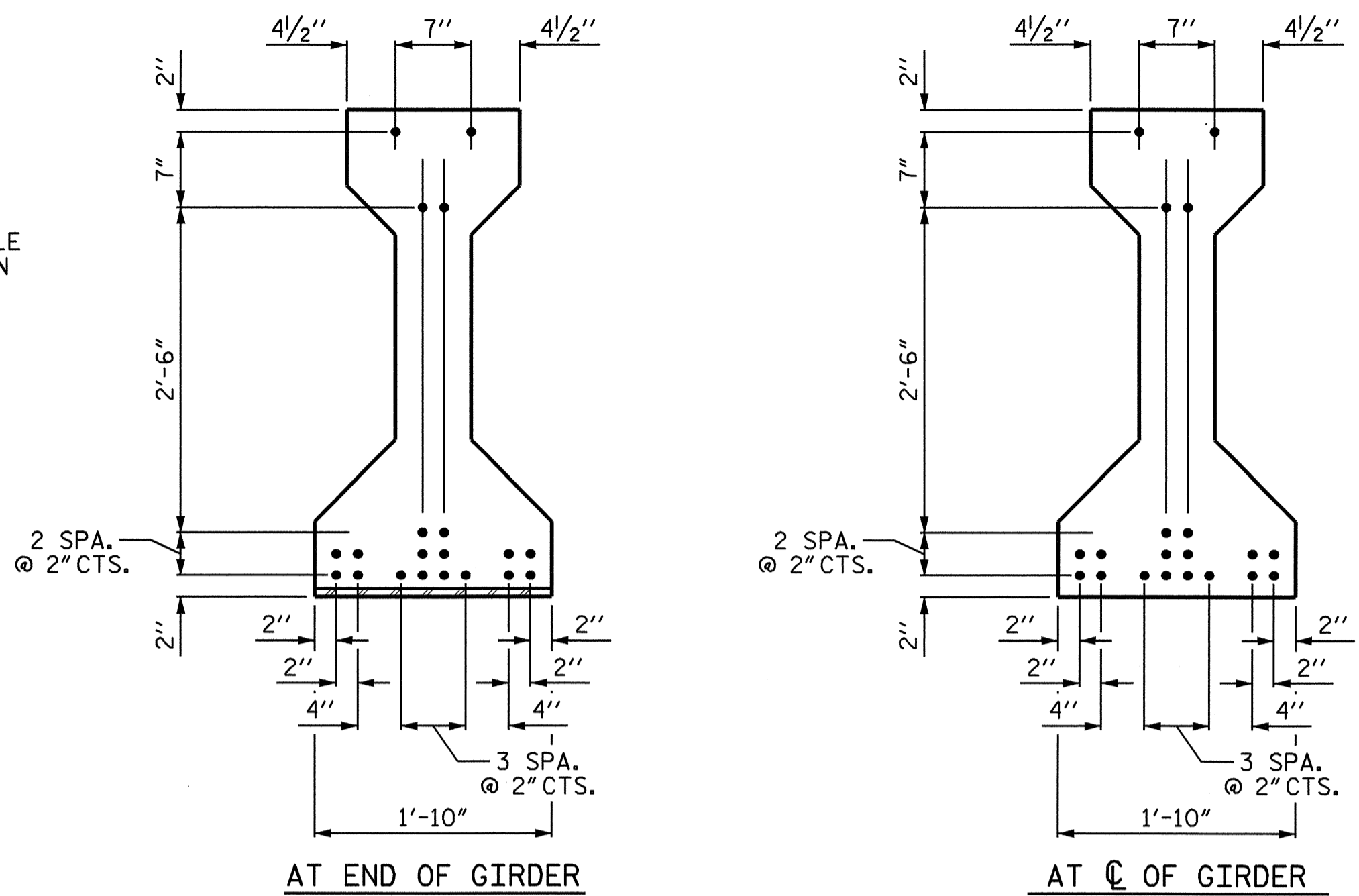
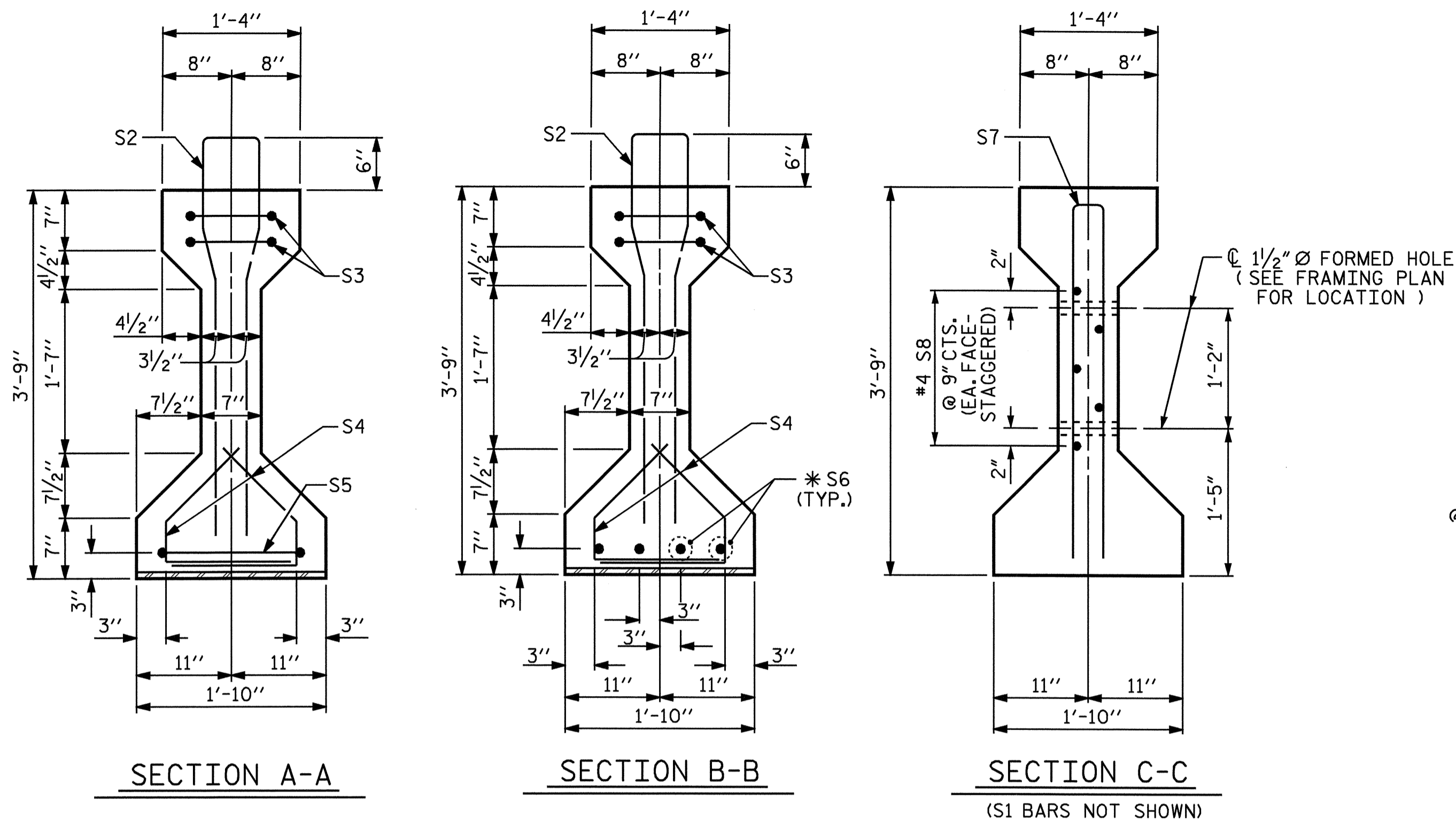
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 "SPAN B"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 45
2			4			



ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 9-2008
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM



0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

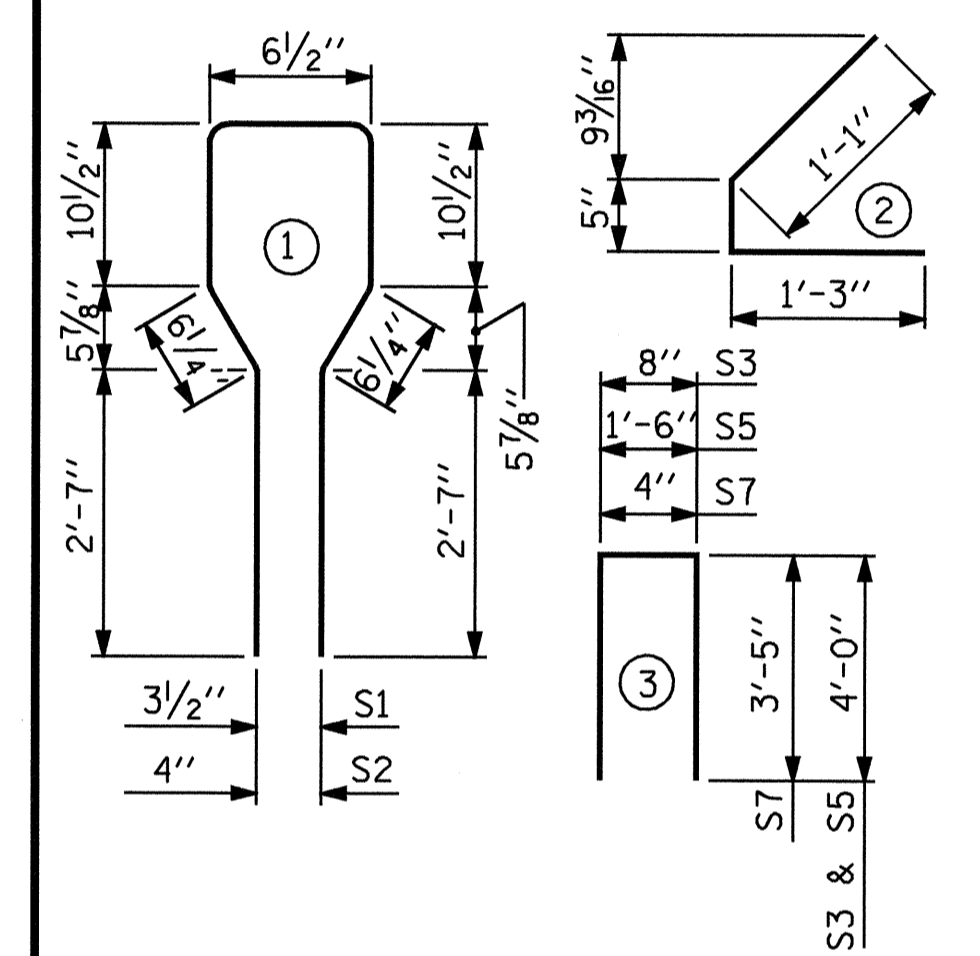
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#4	1	8'-6"	466
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#5	2	2'-9"	161
S5	1	#4	3	9'-6"	6
*S6	4	#5	STR	3'-8"	15
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

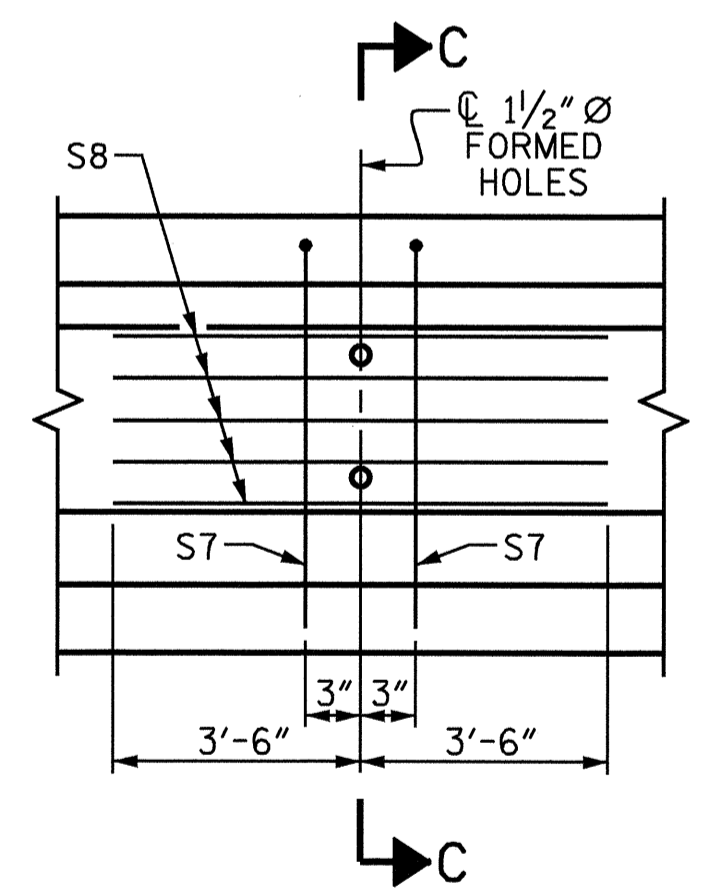
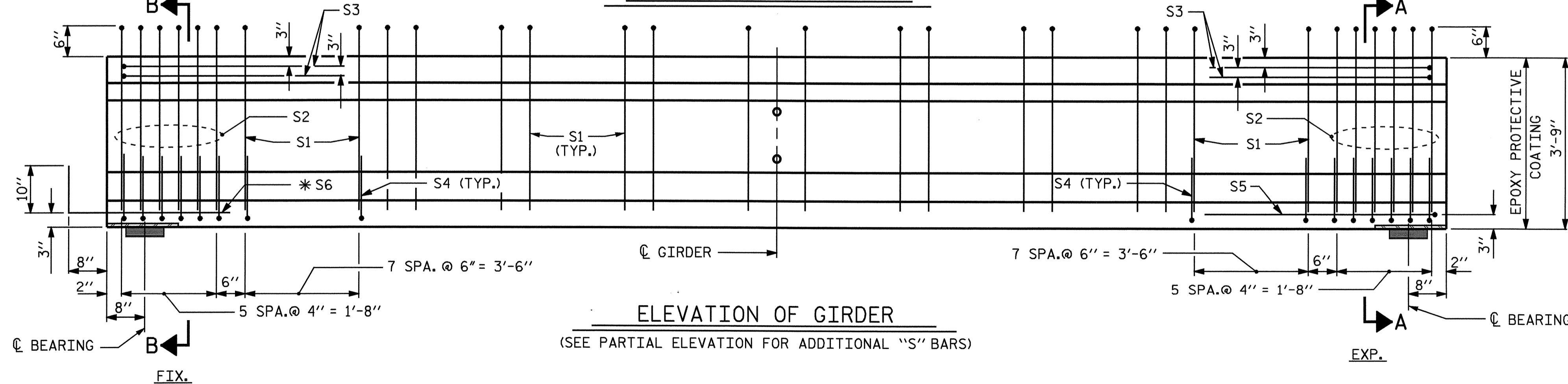
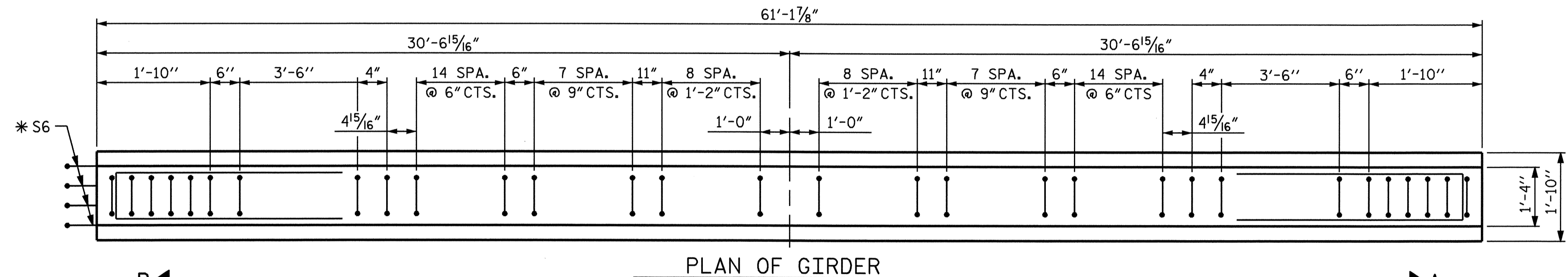
\*NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



0.6" Ø LOW RELAXATION STRAND LAYOUT



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

QUANTITIES FOR ONE GIRDER

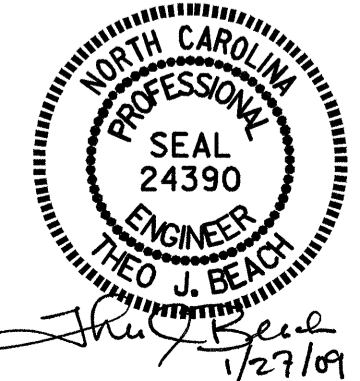
	REINFORCING STEEL LB.	5500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS No. 1 THRU 8	862	8.8	20

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	61'-1 7/8"	489.25'

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE III  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
"SPAN C"



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			45

ASSEMBLED BY: T. BANKOVICH DATE: 4-2008  
CHECKED BY: S.B. WILLIAMS DATE: 9-2008  
DRAWN BY: ELR 8/91 REV. 7/17/98 RWW/LES  
CHECKED BY: GRP 8/91 REV. 10/17/00R RWW/LES  
REV. 5/1/06 TLA/GM



**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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2' BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

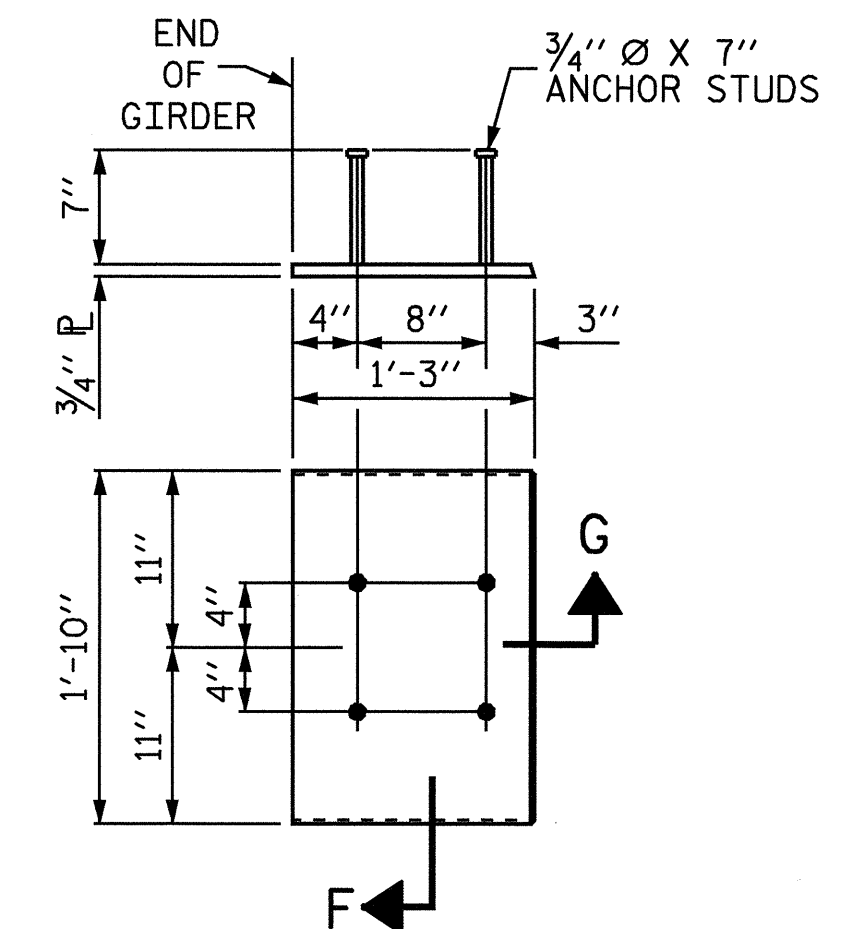
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4500 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

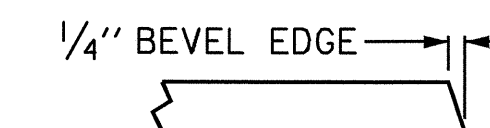
FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

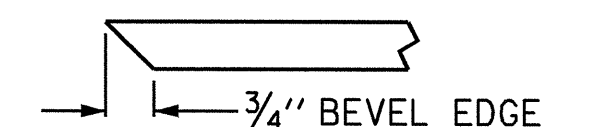


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDERS

(2 REQ'D PER GIRDER)



SECTION "G"



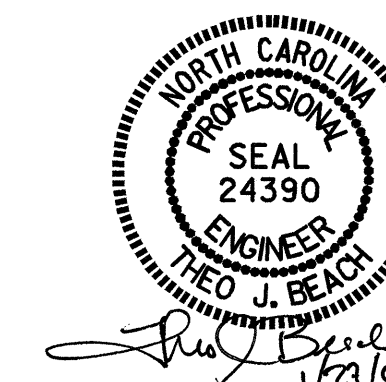
SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
SPAN "A"																							
0.6" Ø LOW RELAXATION	GIRDER A1										GIRDER A2, A3, A6, & A7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.034	0.065	0.089	0.104	0.109	0.104	0.089	0.065	0.034	0	0	0.034	0.065	0.089	0.104	0.109	0.104	0.089	0.065	0.034	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.012	0.023	0.032	0.037	0.039	0.037	0.032	0.023	0.012	0	0	0.012	0.023	0.032	0.036	0.038	0.036	0.032	0.023	0.012	0
FINAL CAMBER	↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0
SPAN "B" & SPAN "C"																							
0.6" Ø LOW RELAXATION	GIRDER A4 & A5										GIRDER A8												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.034	0.065	0.089	0.104	0.109	0.104	0.089	0.065	0.034	0	0	0.034	0.065	0.089	0.104	0.109	0.104	0.089	0.065	0.034	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.011	0.021	0.028	0.033	0.039	0.033	0.028	0.021	0.011	0	0	0.011	0.021	0.029	0.034	0.036	0.034	0.029	0.021	0.011	0
FINAL CAMBER	↑	0	5/16"	9/16"	3/4"	7/8"	7/8"	7/8"	3/4"	9/16"	5/16"	0	0	1/4"	1/2"	3/4"	7/8"	7/8"	7/8"	3/4"	1/2"	1/4"	0
0.6" Ø LOW RELAXATION	GIRDER B1 & C1										GIRDER B2, B3, B6, B7, C2, C3, C6, & C7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.071	0.097	0.113	0.119	0.113	0.097	0.071	0.037	0	0	0.037	0.071	0.097	0.113	0.119	0.113	0.097	0.071	0.037	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.016	0.031	0.042	0.049	0.052	0.049	0.042	0.031	0.016	0	0	0.016	0.030	0.041	0.048	0.051	0.048	0.041	0.030	0.016	0
FINAL CAMBER	↑	0	1/4"	1/2"	5/8"	3/4"	13/16"	3/4"	5/8"	1/2"	1/4"	0	0	1/4"	1/2"	11/16"	3/4"	13/16"	3/4"	11/16"	1/2"	1/4"	0
0.6" Ø LOW RELAXATION	GIRDER B4, B5, C4, & C5										GIRDER B8 & C8												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.037	0.071	0.097	0.113	0.119	0.113	0.097	0.071	0.037	0	0	0.037	0.071	0.097	0.113	0.119	0.113	0.097	0.071	0.037	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.014	0.027	0.037	0.044	0.046	0.044	0.037	0.027	0.014	0	0	0.015	0.028	0.038	0.045	0.047	0.045	0.038	0.028	0.015	0
FINAL CAMBER	↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	
2			4			45	

ASSEMBLED BY : T. BANKOVICH DATE : 4-2008  
CHECKED BY : S.B. WILLIAMS DATE : 9-2008

DRAWN BY : ELR 11/91  
CHECKED BY : GRP 11/91

REV. 10/17/00 RWW/LES  
REV. 7/10/01RR LES/RDR  
REV. 5/1/06 TLA/GM

**STRUCTURAL STEEL NOTES**

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

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

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

THE CHANNELS, ANGLES, WASHERS, PLATE WASHERS, AND DIRECT TENSION INDICATORS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

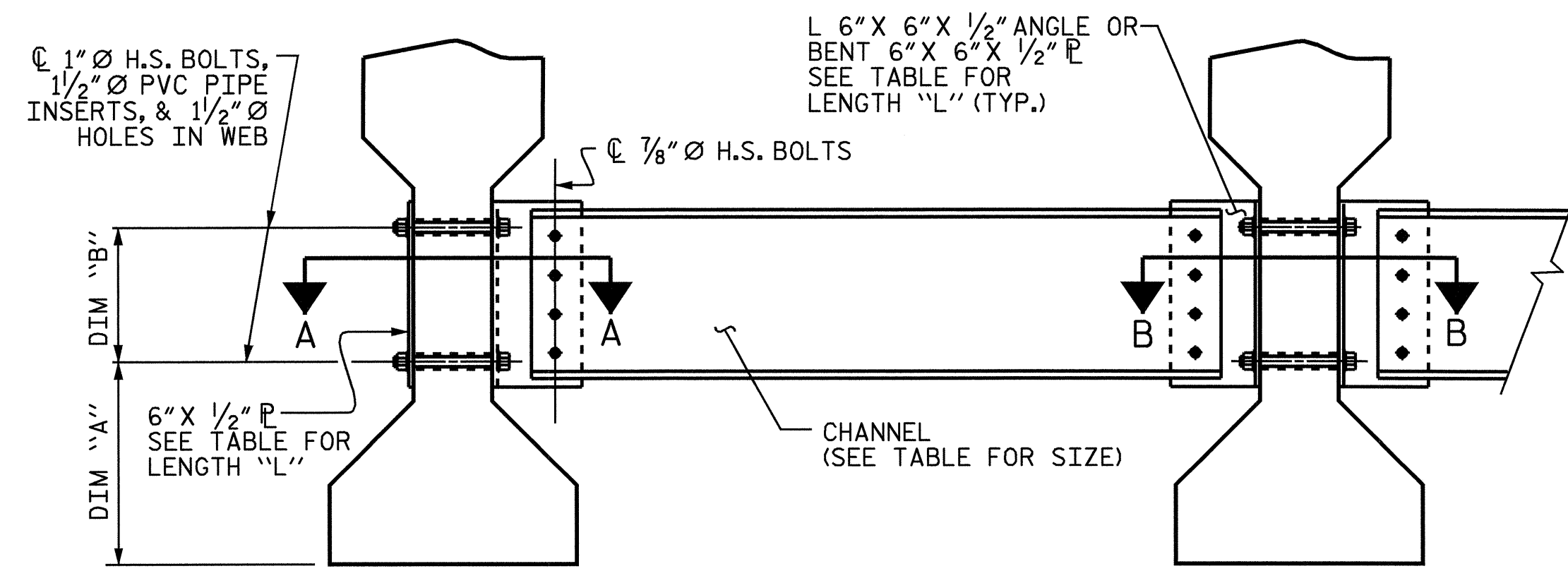
PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

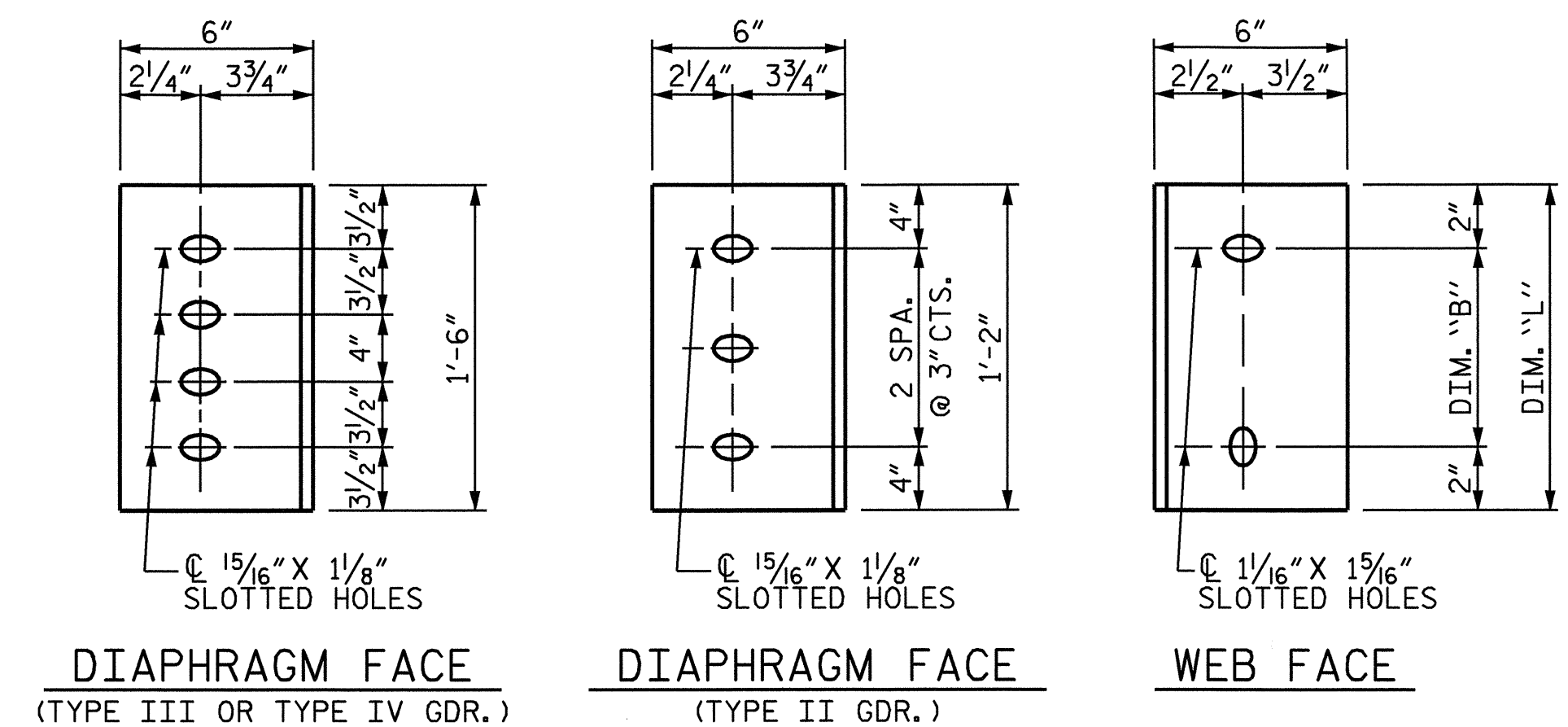
IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

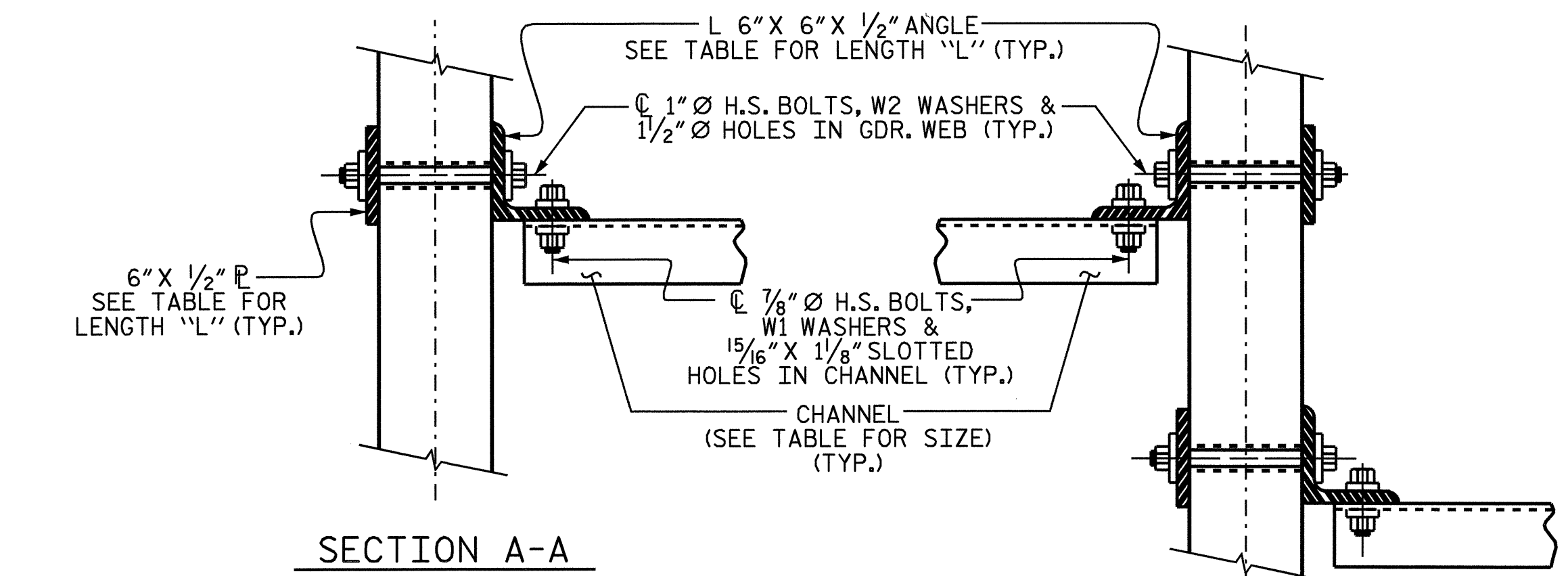


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM (TYPE III OR TYPE IV GIRDER SHOWN)



CONNECTOR PLATE DETAILS



CONNECTION DETAILS (FOR SKEW < 70° OR SKEW > 110°)

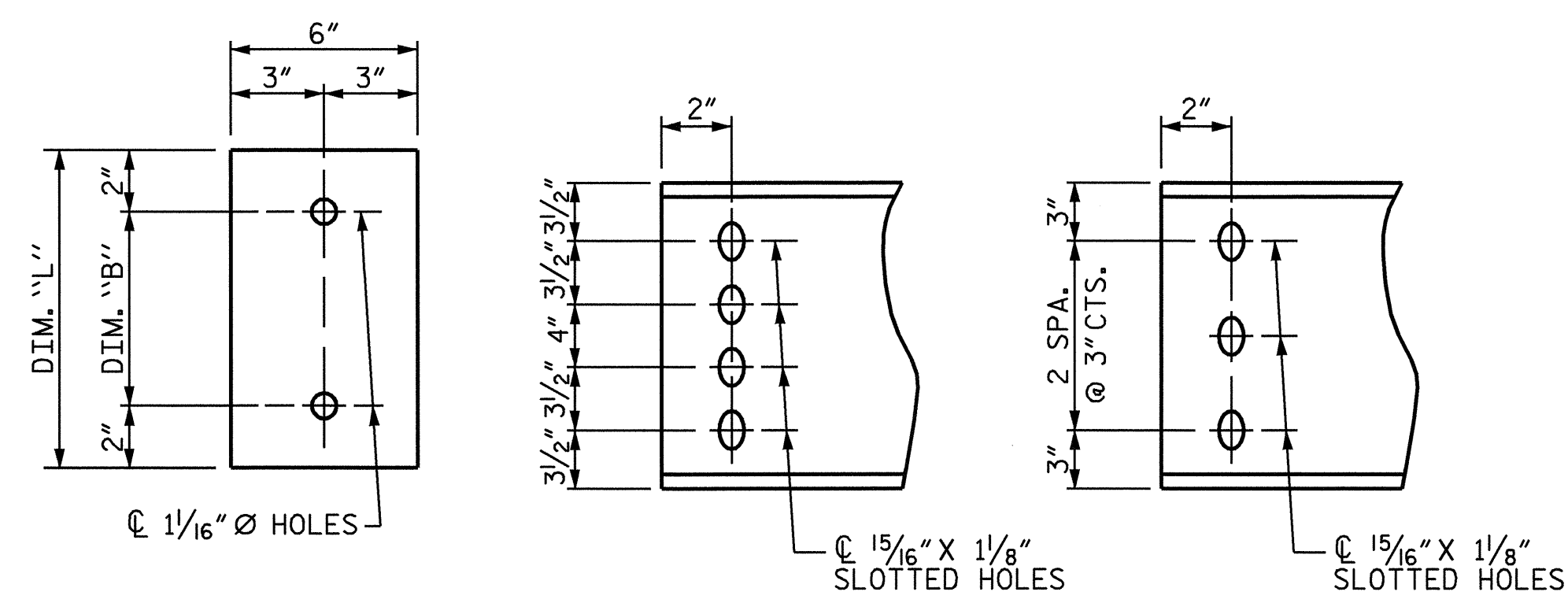
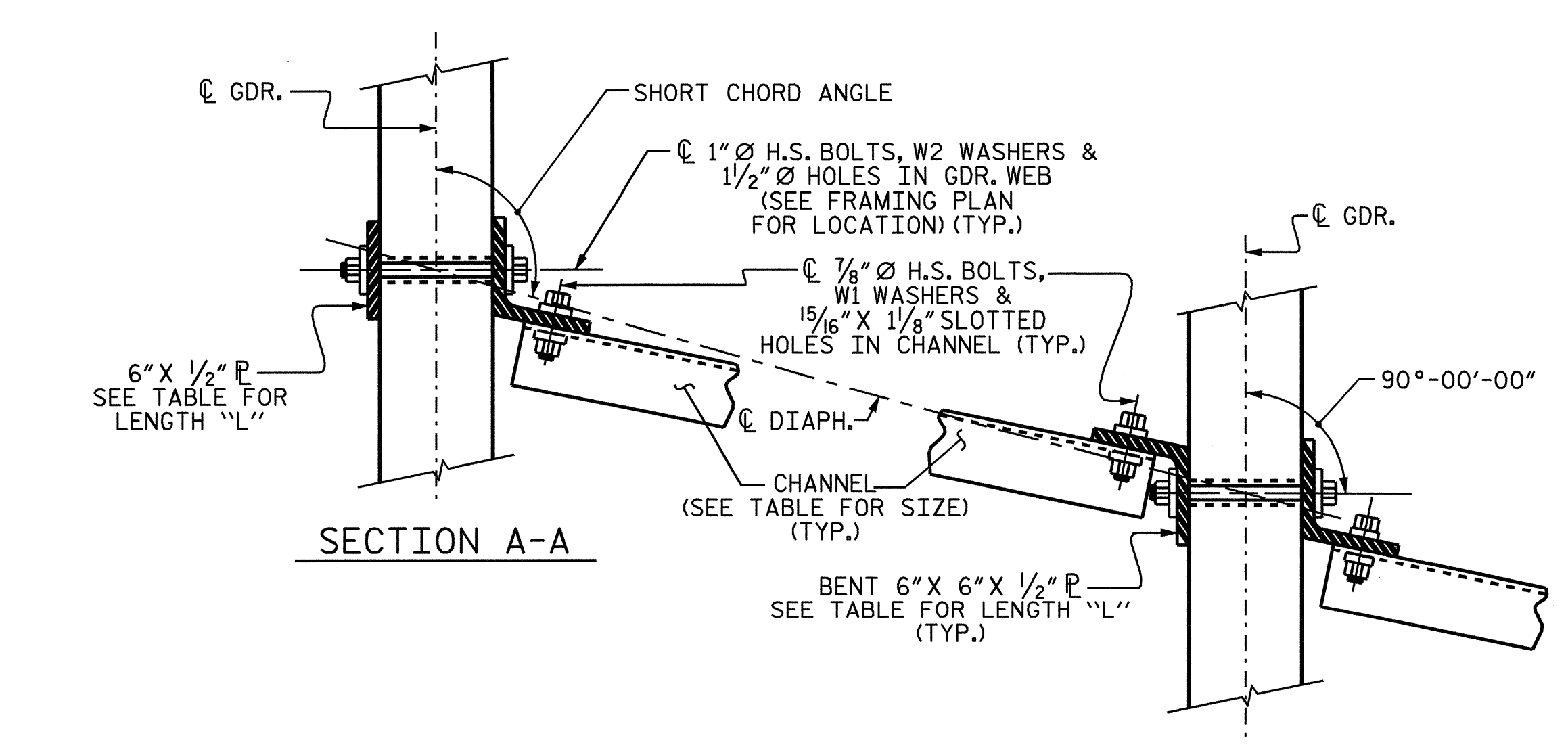
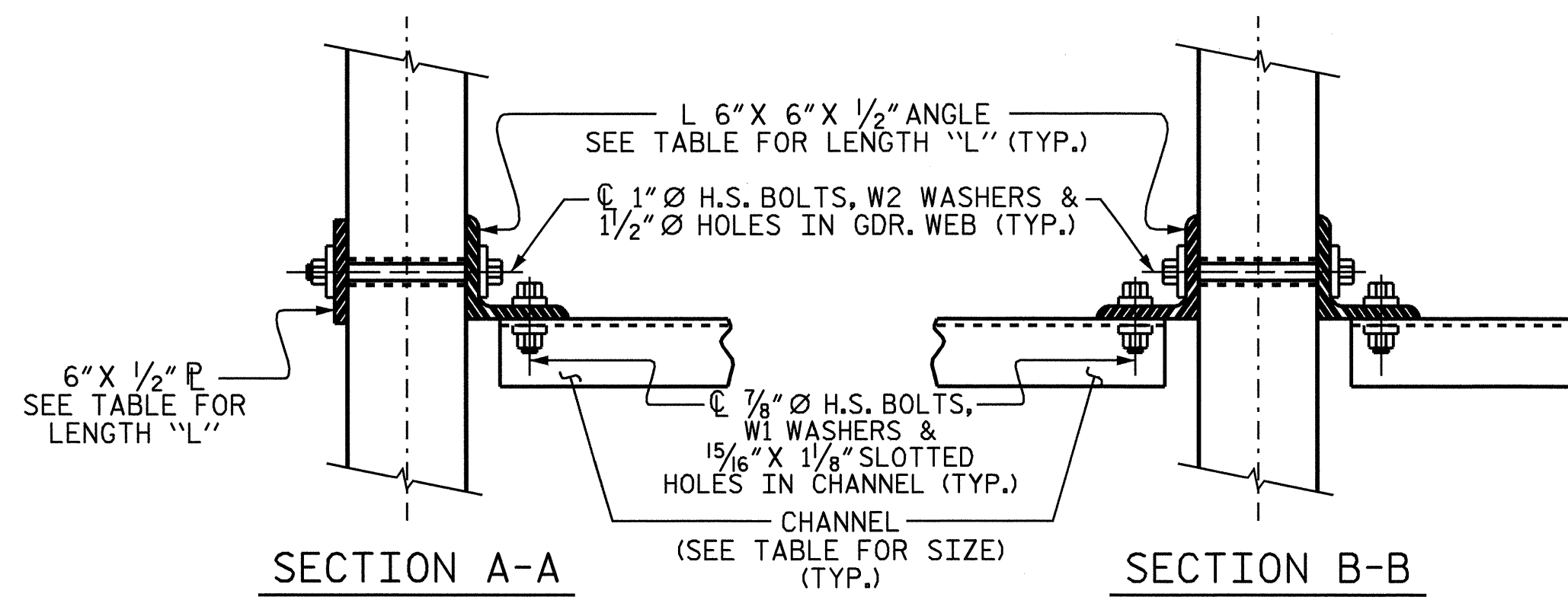


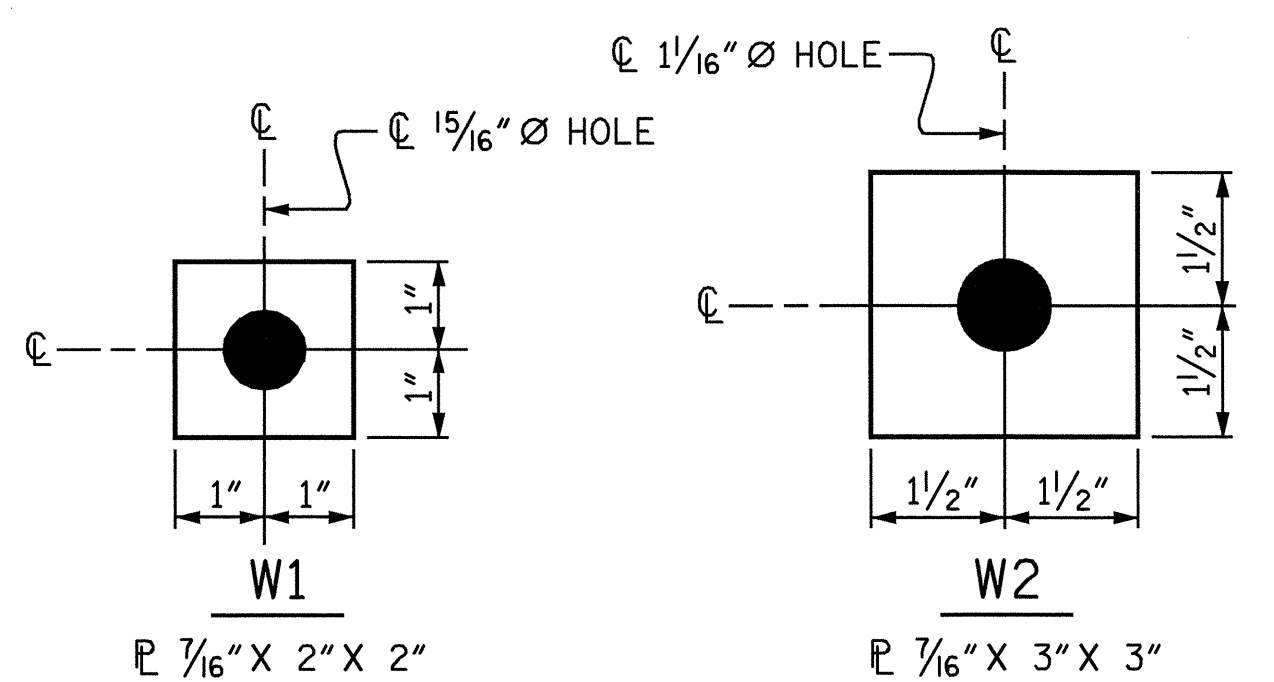
PLATE DETAILS CHANNEL END CHANNEL END



CONNECTION DETAILS (FOR 70° < SKEW < 90° OR 90° < SKEW < 110°)



CONNECTION DETAILS (FOR SKEW = 90°)



USE WITH 7/8" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS  
USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

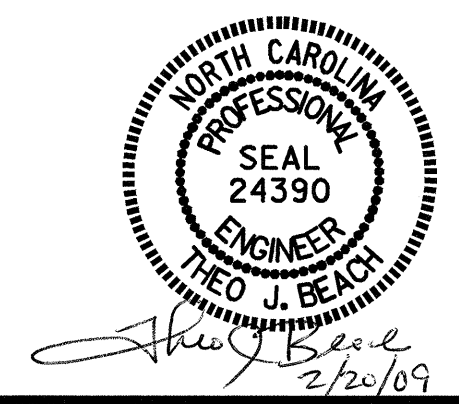
WASHER DETAILS

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

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WAKE COUNTY  
STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
INTERMEDIATE  
STEEL DIAPHRAGMS  
FOR TYPE II, III, & IV  
PRESTRESSED CONCRETE  
GIRDERS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			45

ASSEMBLED BY : T. BANKOVICH DATE : 4-2008  
CHECKED BY : S.B. WILLIAMS DATE : 8-2008  
DRAWN BY : TLA 6/05  
CHECKED BY : VC 6/05  
ADDED 10/21/05  
REV. 5/1/06R KMM/GM

### NOTES

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

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

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

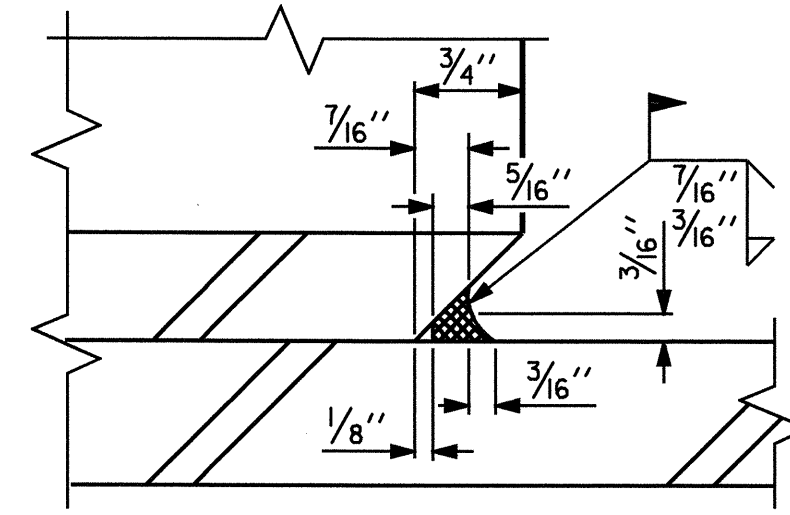
WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

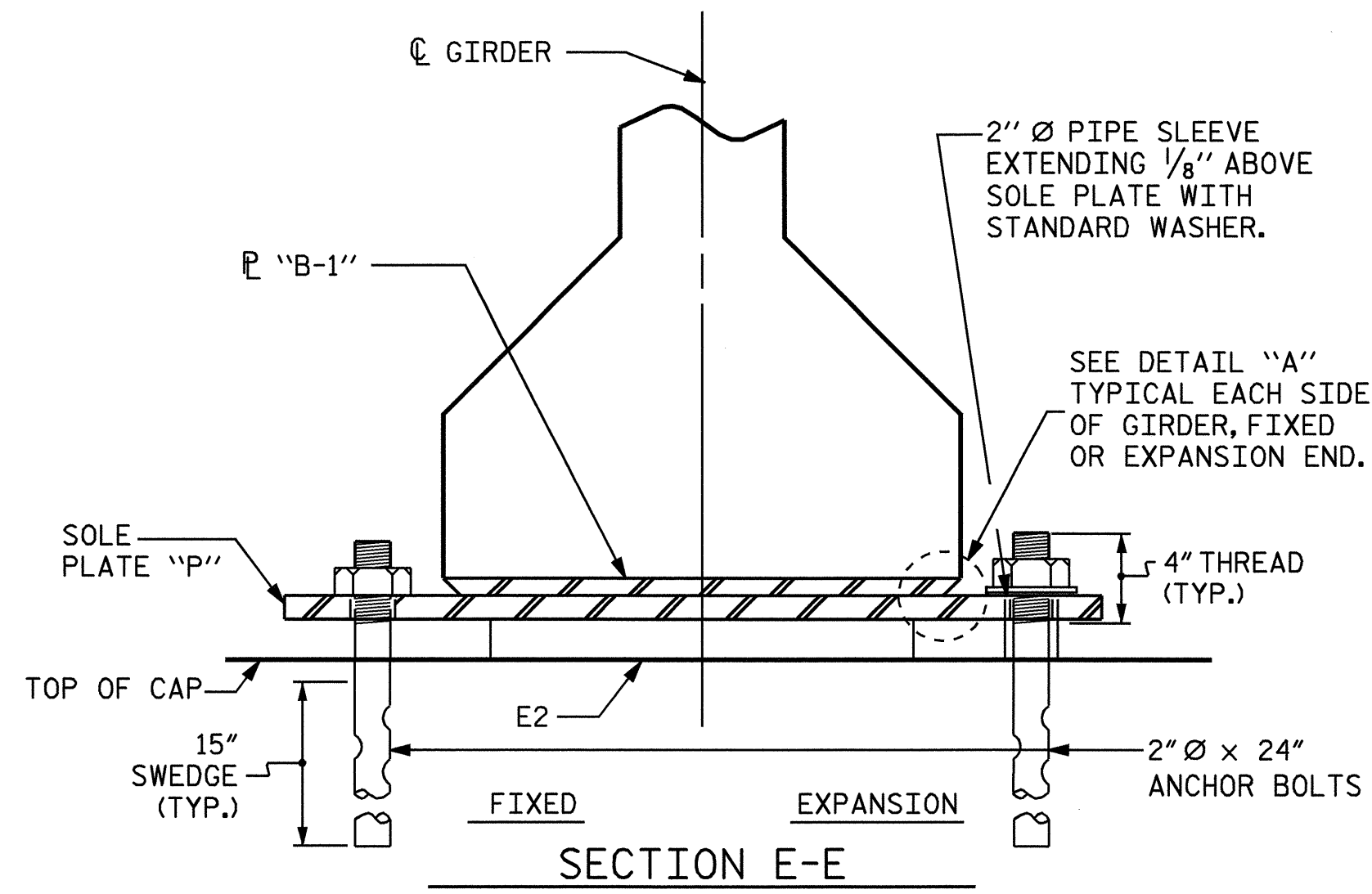
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

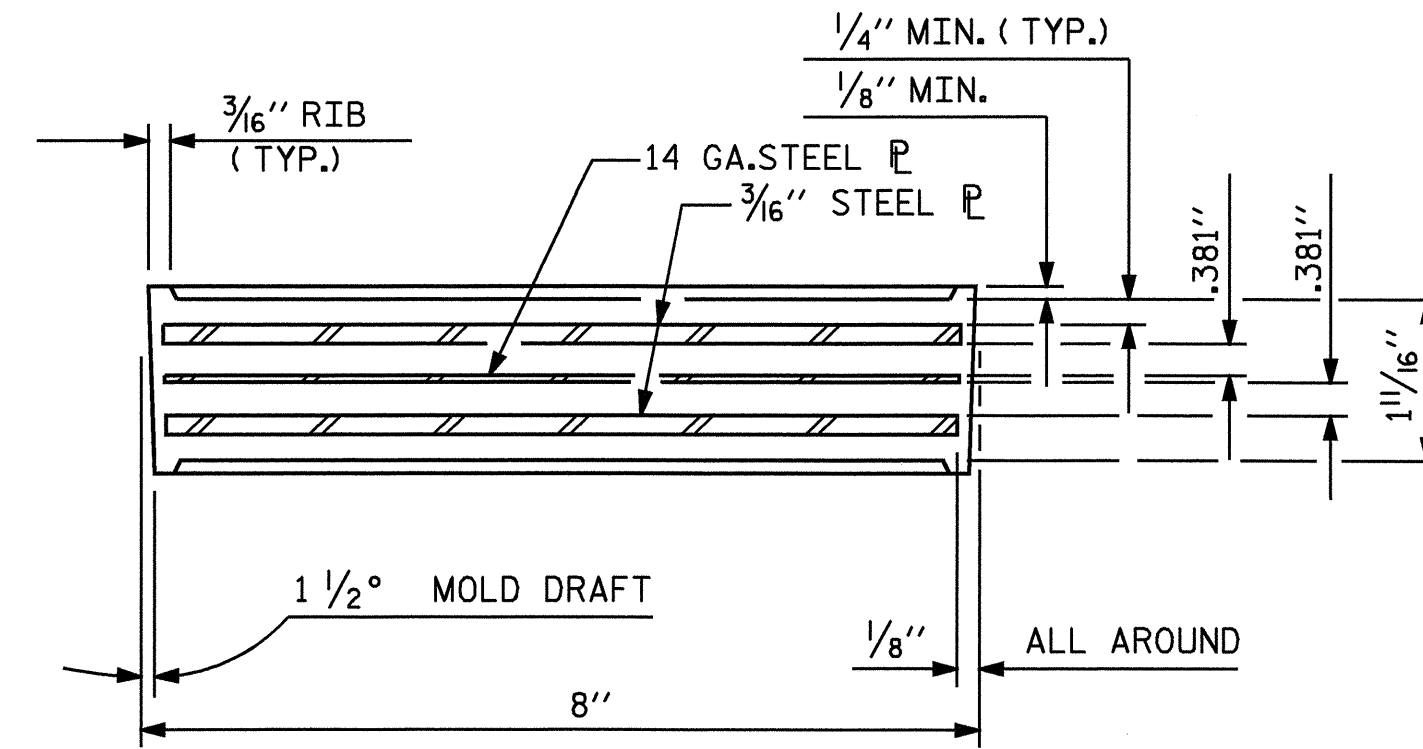
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



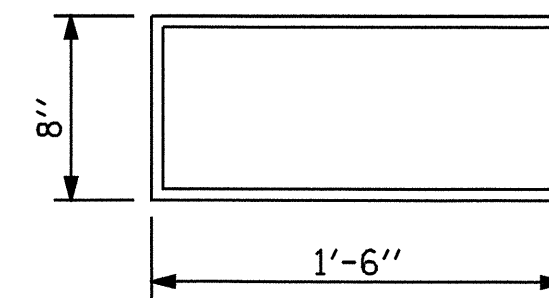
**DETAIL "A"**



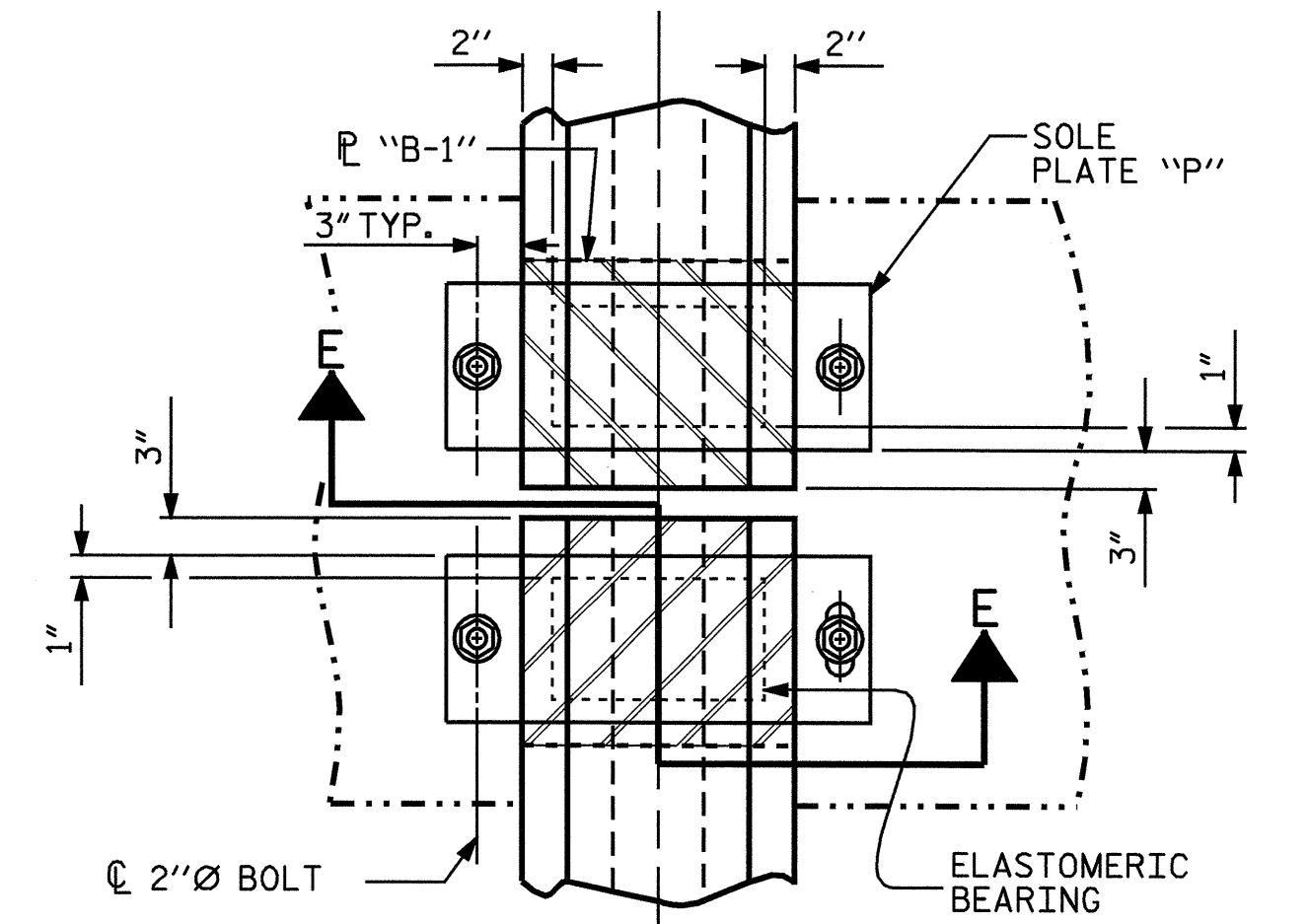
**SECTION E-E**



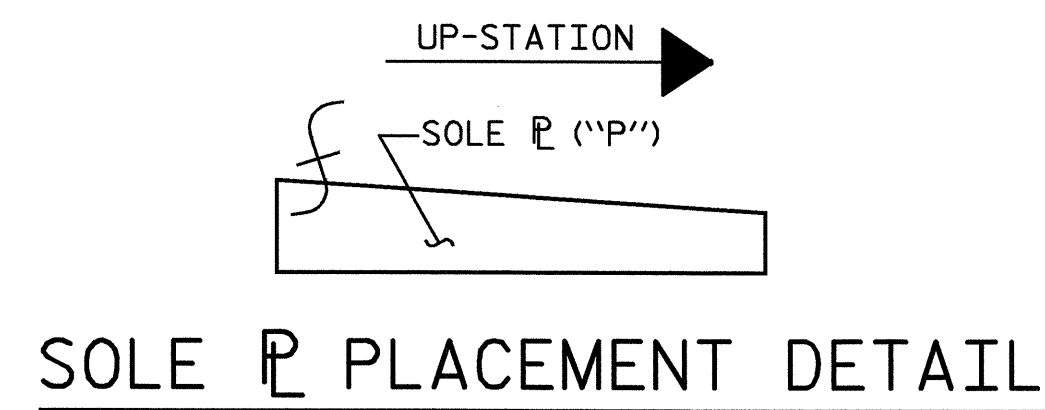
**TYPICAL SECTION OF ELASTOMERIC BEARINGS**



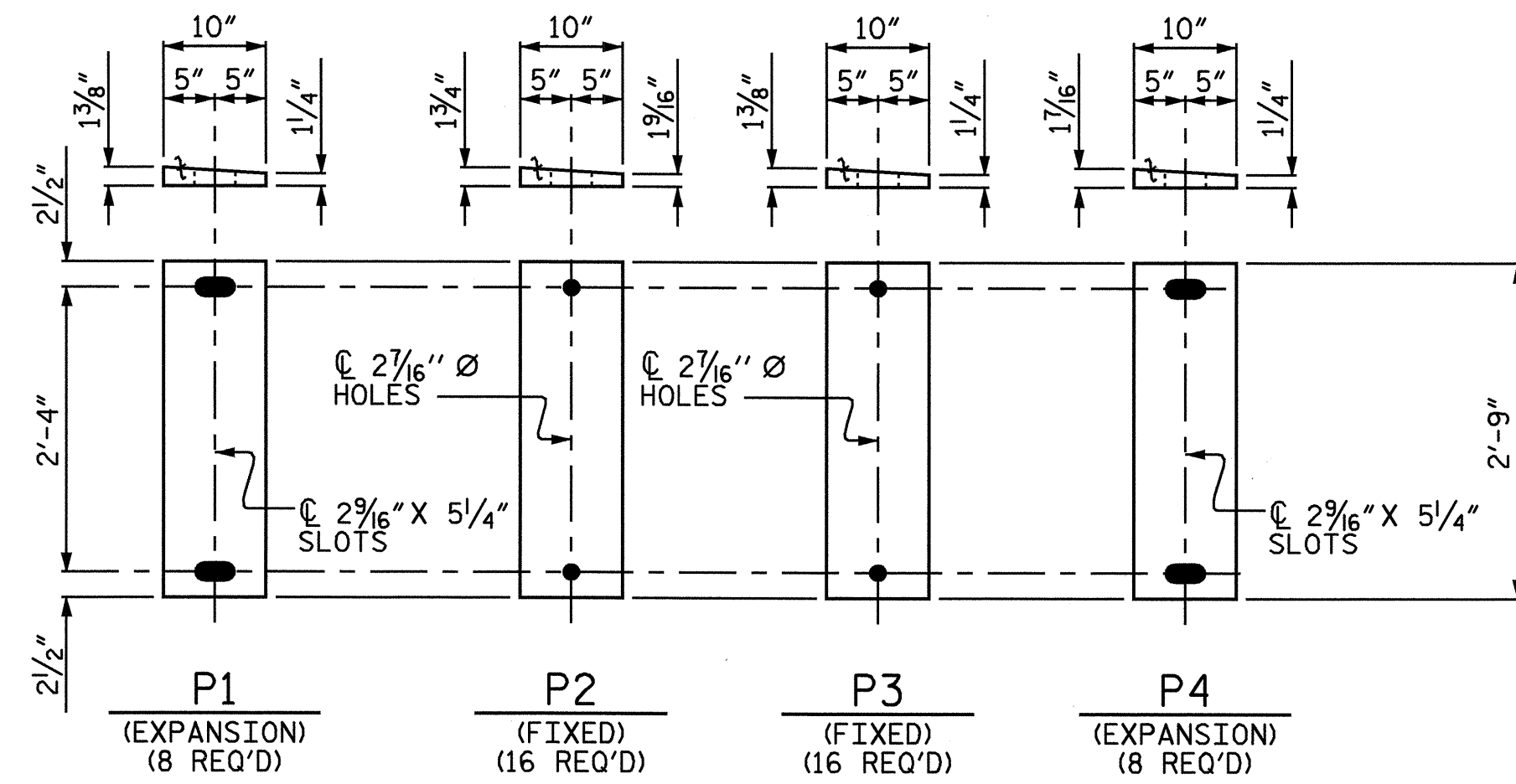
**E2 (48 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE III**



**TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT) TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)**



**SOLE "P" PLACEMENT DETAIL**

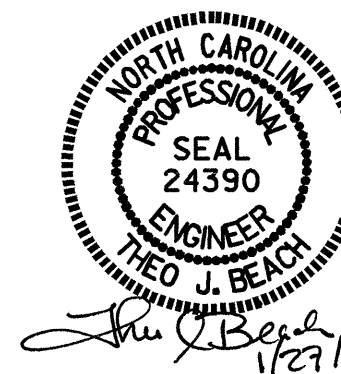


**SOLE PLATE DETAILS ("P")**

- LOAD RATINGS -	
	MAX.D.L.+L.L.
45"PCG -TYPE III	167 K

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
**ELASTOMERIC BEARING DETAILS**  
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			45

ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 8-2008
DRAWN BY : WJH 8/89	REV. 10/17/00 RWW/LES
CHECKED BY : CRK 8/89	REV. 7/10/01 RWW/LES
	REV. 5/1/06 TLA/GM

**NOTES:**

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

THE #5 S1 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.

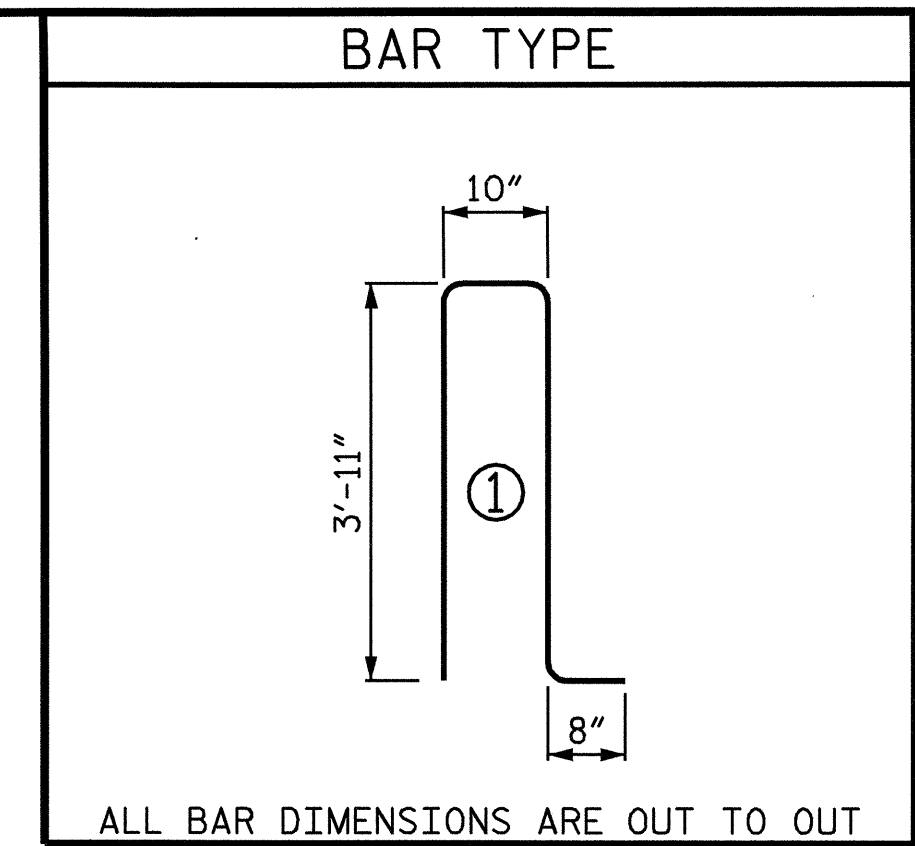
FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

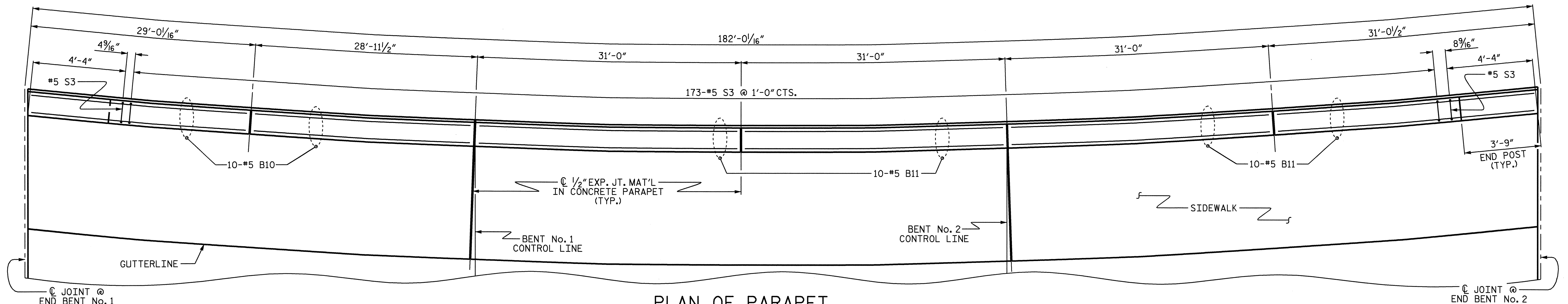
THE JOINT IN DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

THE #5 S2 & #5 S4 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD FOR THE #5 S2 & #5 S4 BAR IS 18.6 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

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.

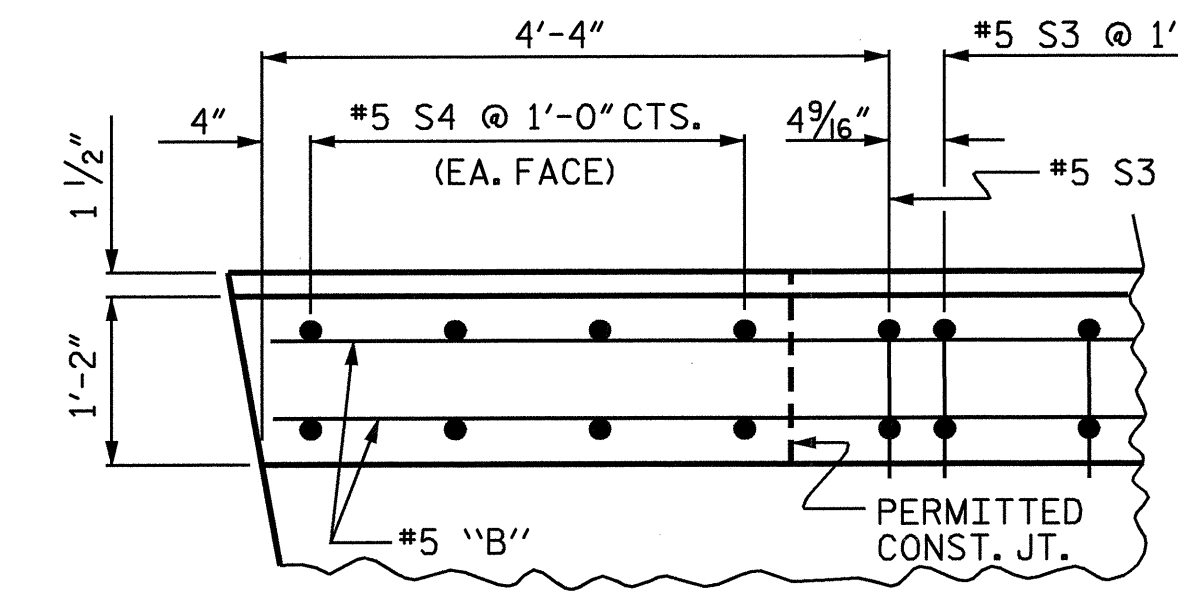


BILL OF MATERIAL					
PARAPET AND END POST					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B10	20	#5	STR	28'-6"	595
*B11	40	#5	STR	30'-7"	1276
*E1	4	#7	STR	3'-7"	29
*E2	4	#7	STR	4'-0"	33
*E3	4	#7	STR	4'-5"	36
*E4	4	#7	STR	4'-10"	40
*E5	4	#7	STR	5'-2"	42
*F1	4	#6	STR	1'-11"	12
*F2	4	#6	STR	3'-1"	19
*F3	4	#6	STR	3'-4"	20
*S3	175	#5	1	9'-4"	1704
*S4	16	#5	STR	4'-2"	70
* EPOXY COATED REINF. STEEL					3876 LBS.
CLASS AA CONCRETE					29.2 C.Y.
1'-2" X 3'-8" CONCRETE PARAPET					181.92 L.F.
* THESE BARS ARE EPOXY COATED					

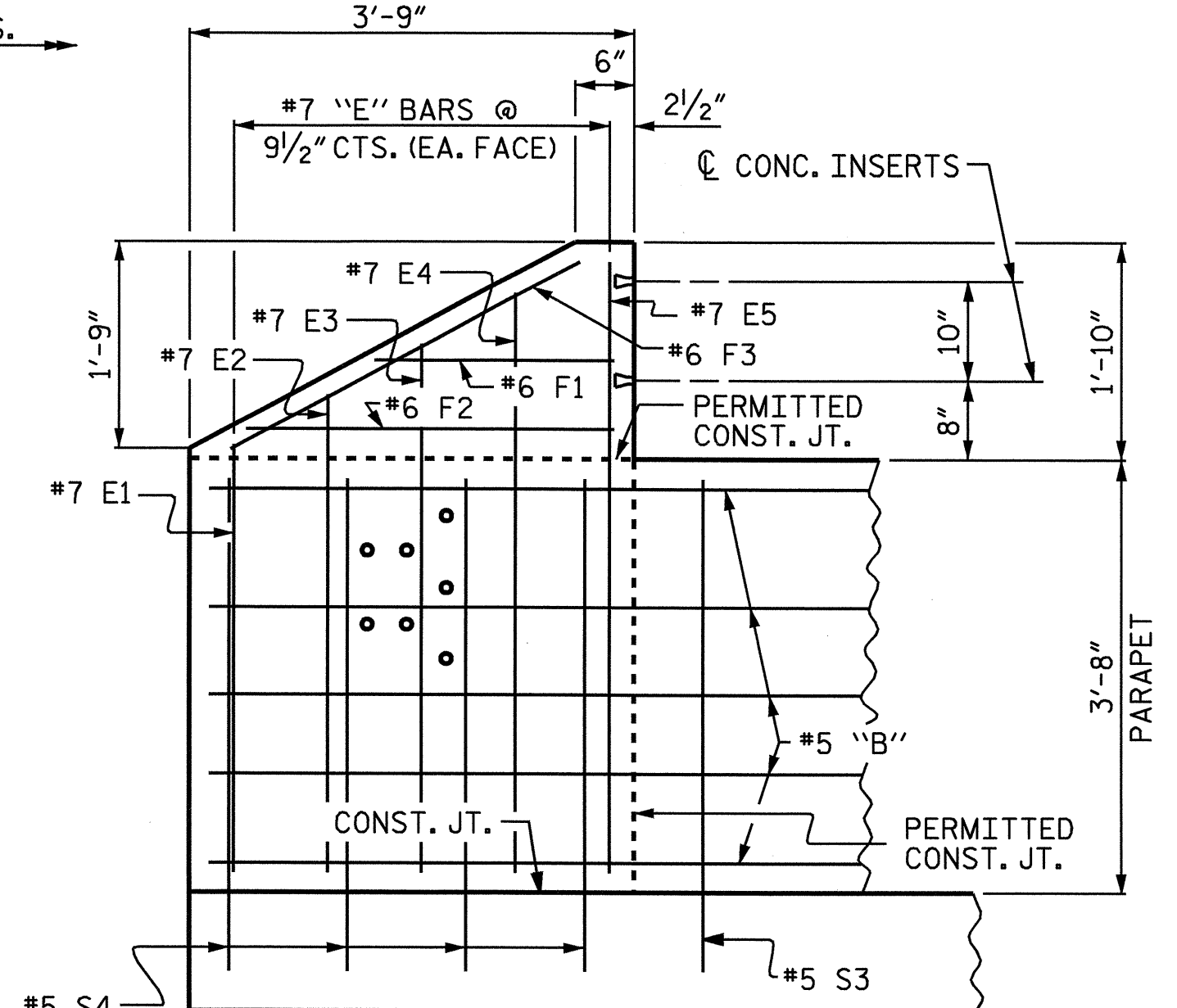


**PLAN OF PARAPET**

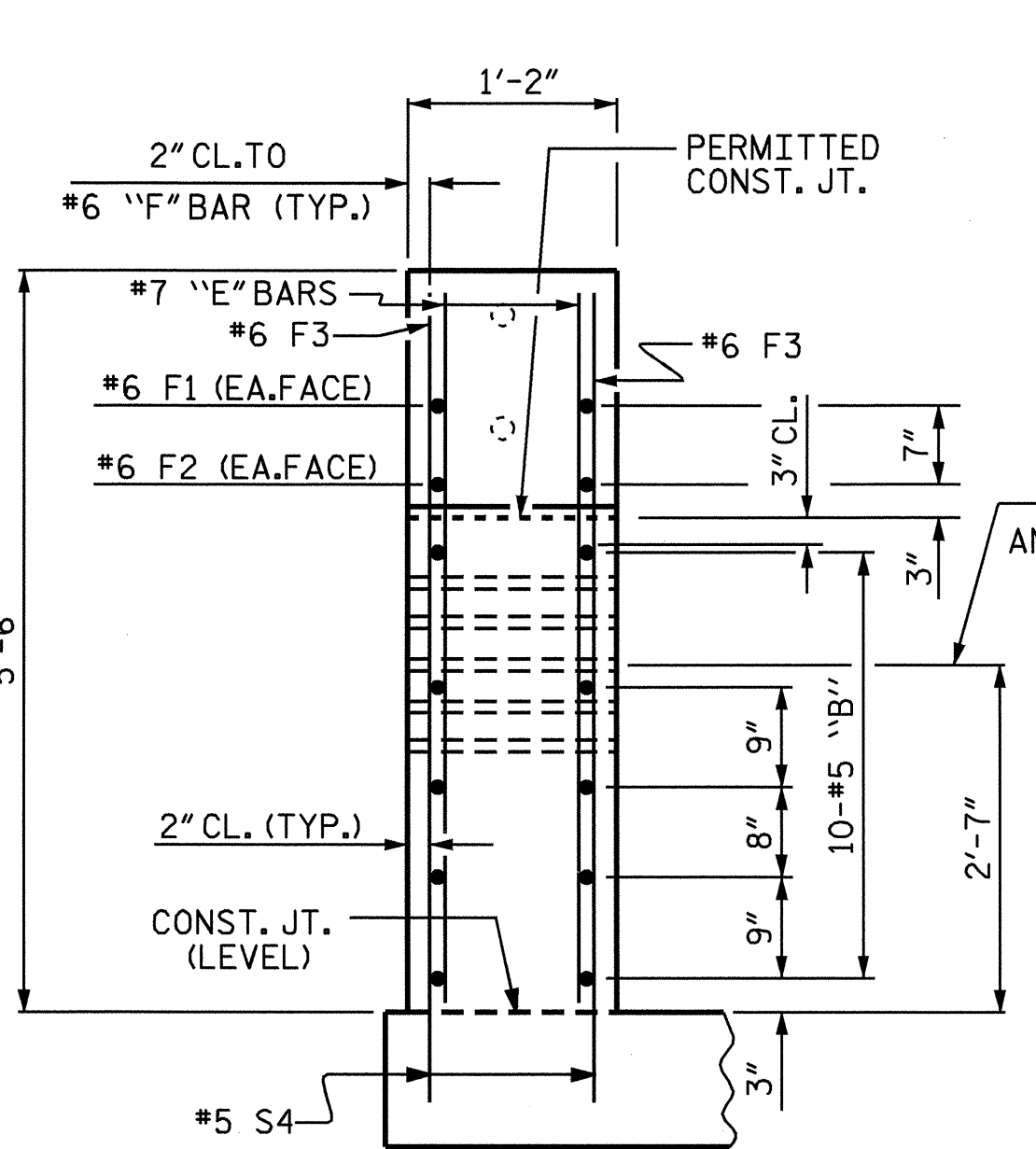
DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF PARAPET



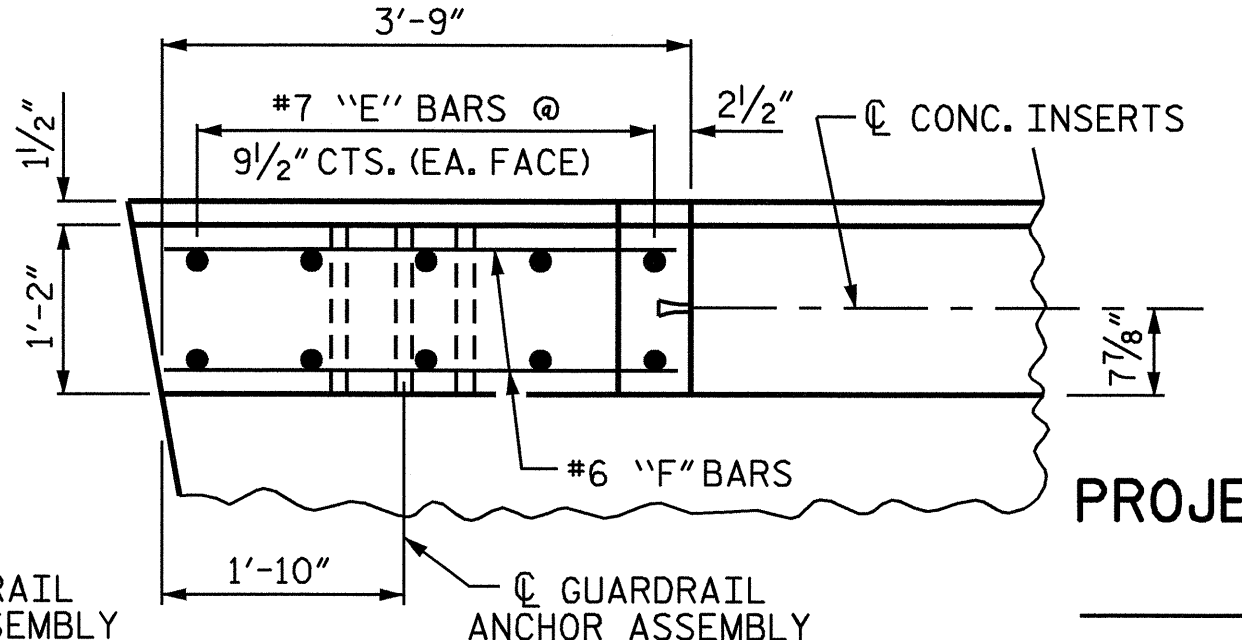
PLAN OF PARAPET  
END BENT No. 1 END SHOWN  
END BENT No. 2 END SIMILAR



ELEVATION



END VIEW



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

PROJECT NO. B-4302

WAKE COUNTY

STATION: 19+64.00 -L-

SHEET 1 OF 2

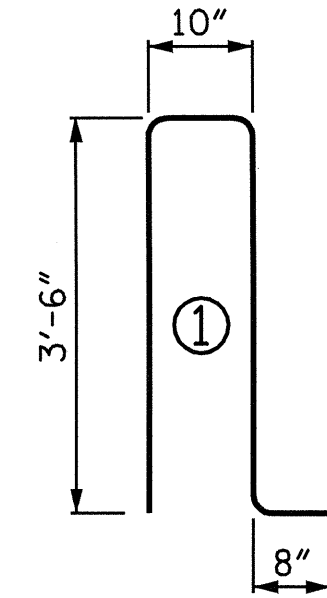
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
CONCRETE PARAPET  
DETAILS  
(LEFT SIDE)



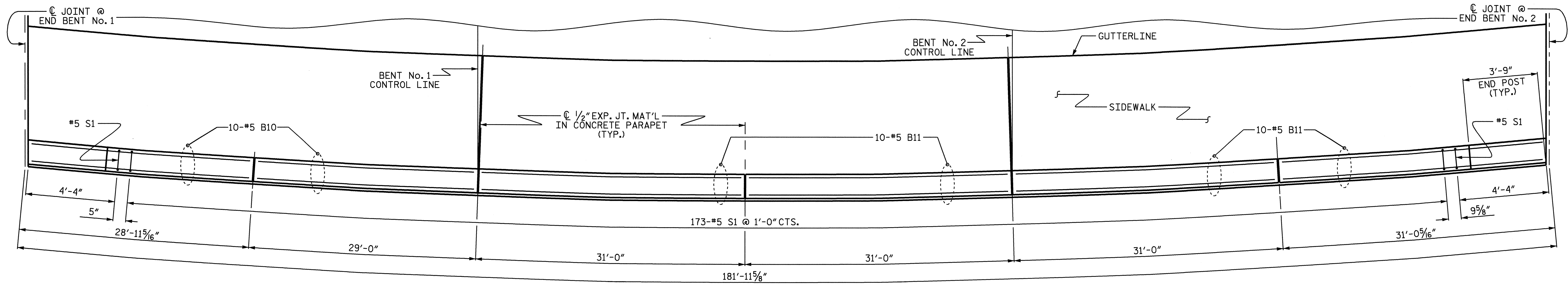
REVISIONS						SHEET NO. S-19 TOTAL SHEETS 45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: T. BANKOVICH DATE: 9-2008  
CHECKED BY: S.B. WILLIAMS DATE: 9-2008

BAR TYPE		BILL OF MATERIAL PARAPET AND END POST				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B10	20	#5	STR	28'-6"	595	
*B11	40	#5	STR	30'-7"	1276	
*E6	4	#7	STR	3'-2"	26	
*E7	4	#7	STR	3'-7"	29	
*E8	4	#7	STR	4'-0"	33	
*E9	4	#7	STR	4'-5"	36	
*E10	4	#7	STR	4'-8"	38	
*F1	4	#6	STR	1'-11"	12	
*F2	4	#6	STR	3'-1"	19	
*F3	4	#6	STR	3'-4"	20	
*S1	175	#5	1	8'-6"	1551	
*S2	16	#5	STR	3'-9"	63	
* EPOXY COATED REINF. STEEL					3698 LBS.	
CLASS AA CONCRETE					25.7 C.Y.	
1'-2" X 3'-2 3/4" CONCRETE PARAPET					181.89 L.F.	
* THESE BARS ARE EPOXY COATED						

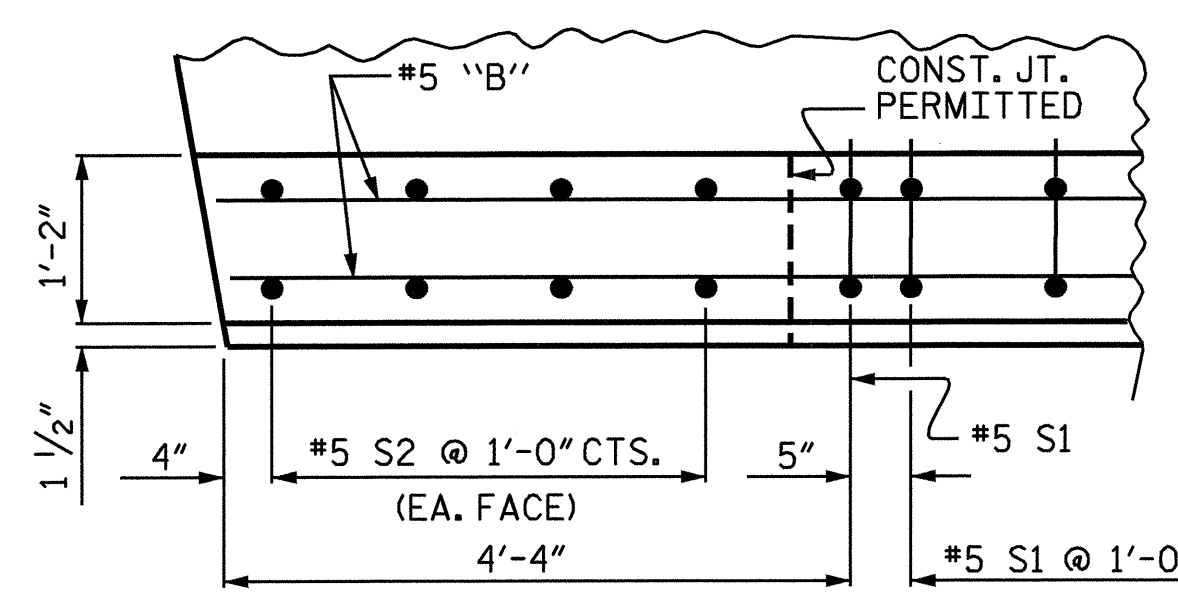


ALL BAR DIMENSIONS ARE OUT TO OUT

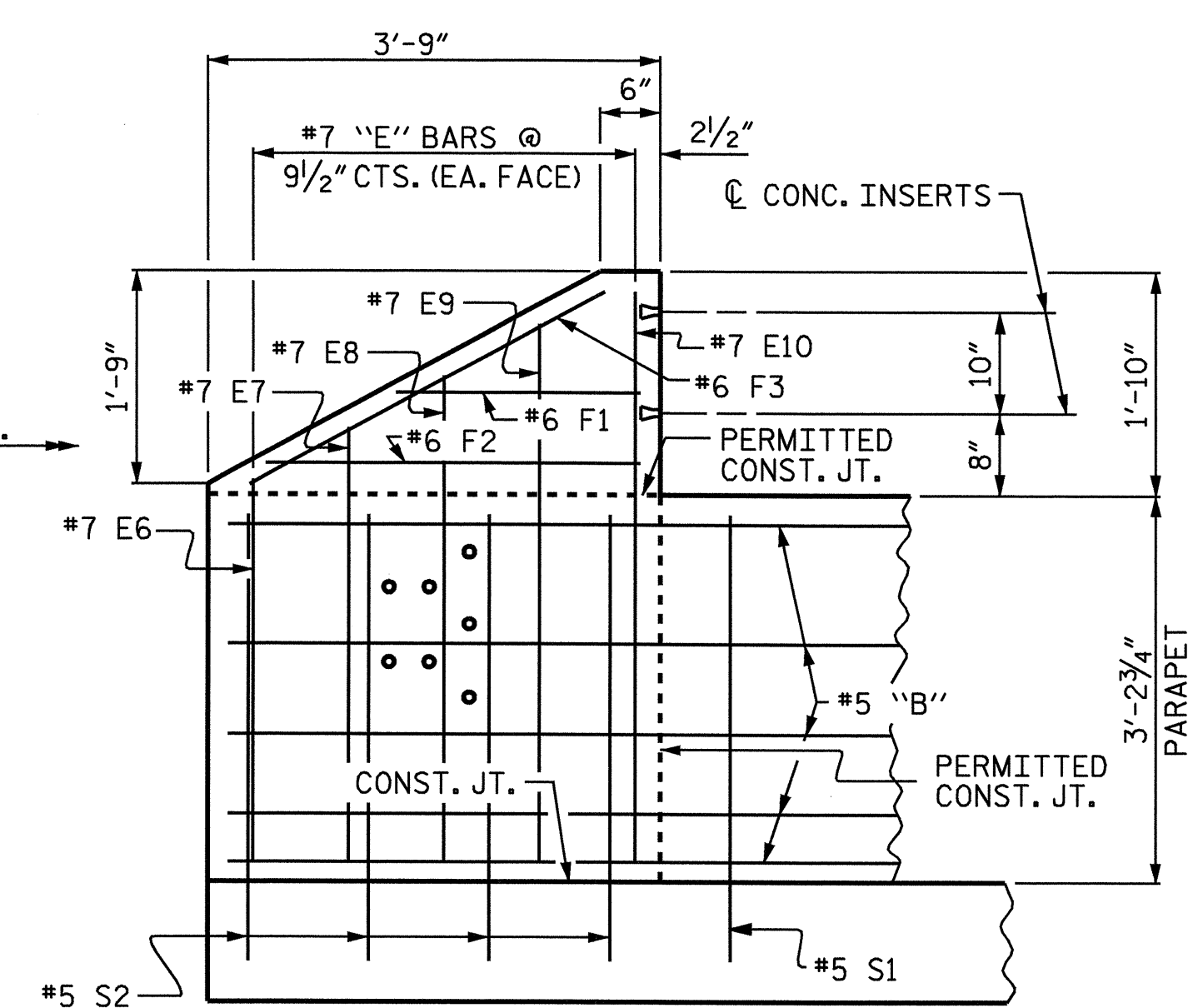


PLAN OF PARAPET

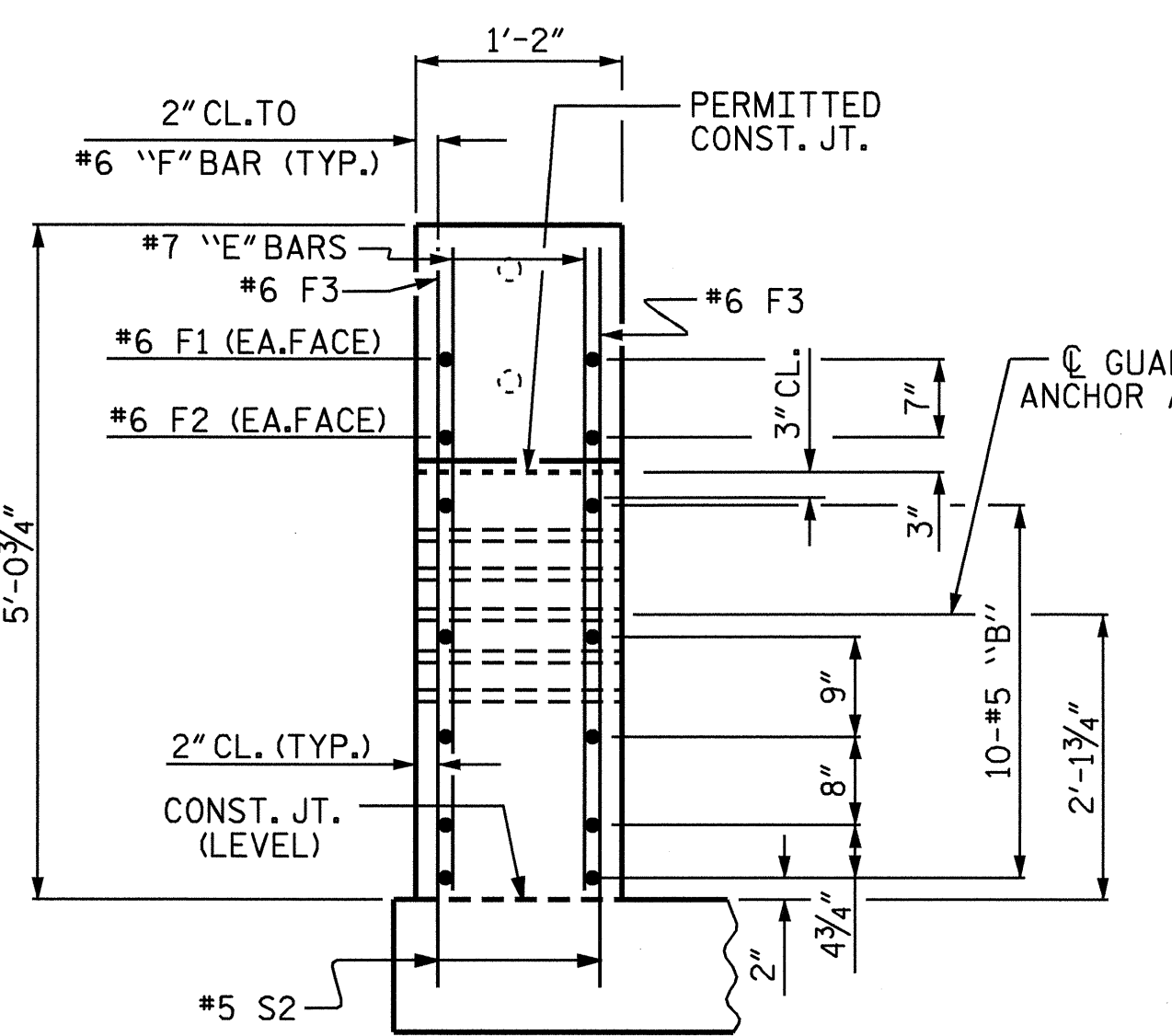
DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF PARAPET



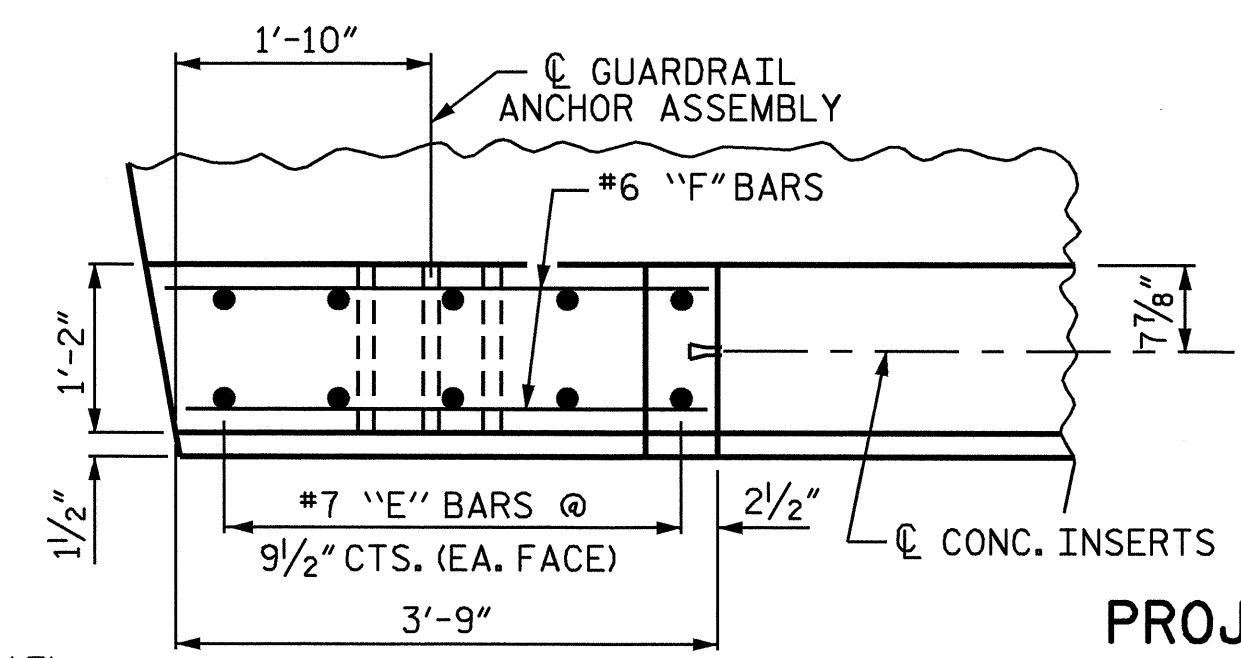
PLAN OF PARAPET  
END BENT No. 1 END SHOWN  
END BENT No. 2 END SIMILAR



ELEVATION



END VIEW



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

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

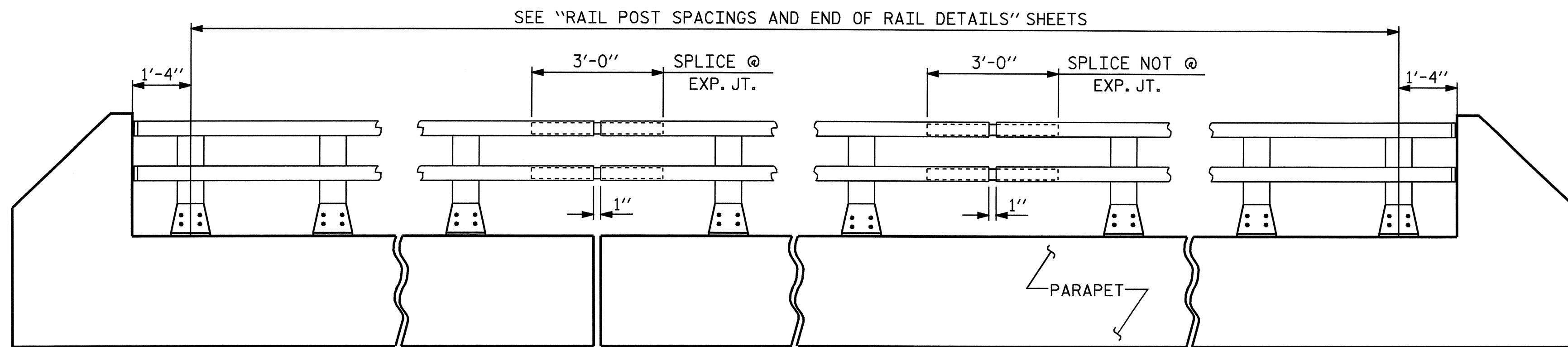
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
CONCRETE PARAPET  
DETAILS  
(RIGHT SIDE)



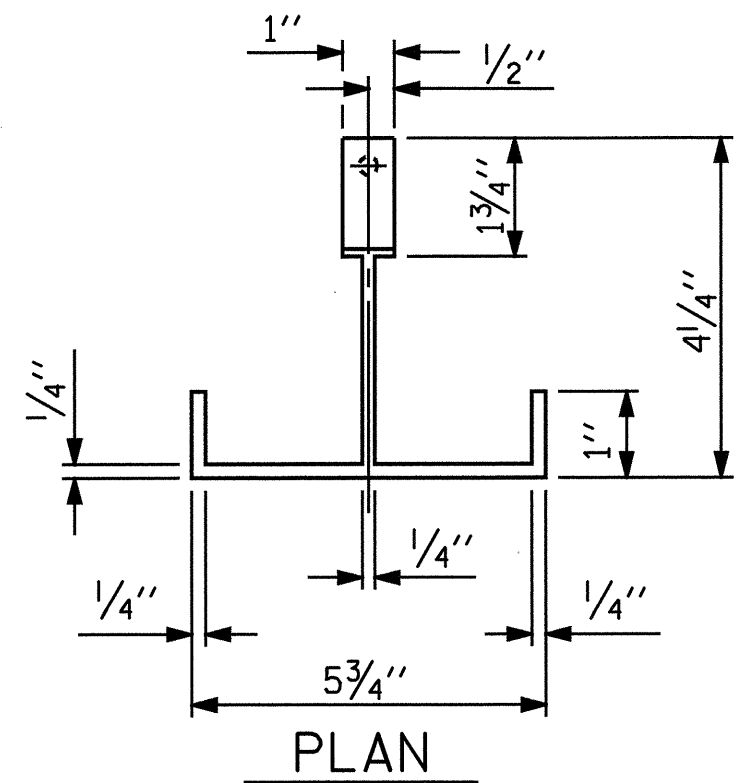
DRAWN BY: T. BANKOVICH DATE: 9-2008  
CHECKED BY: S.B. WILLIAMS DATE: 9-2008

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

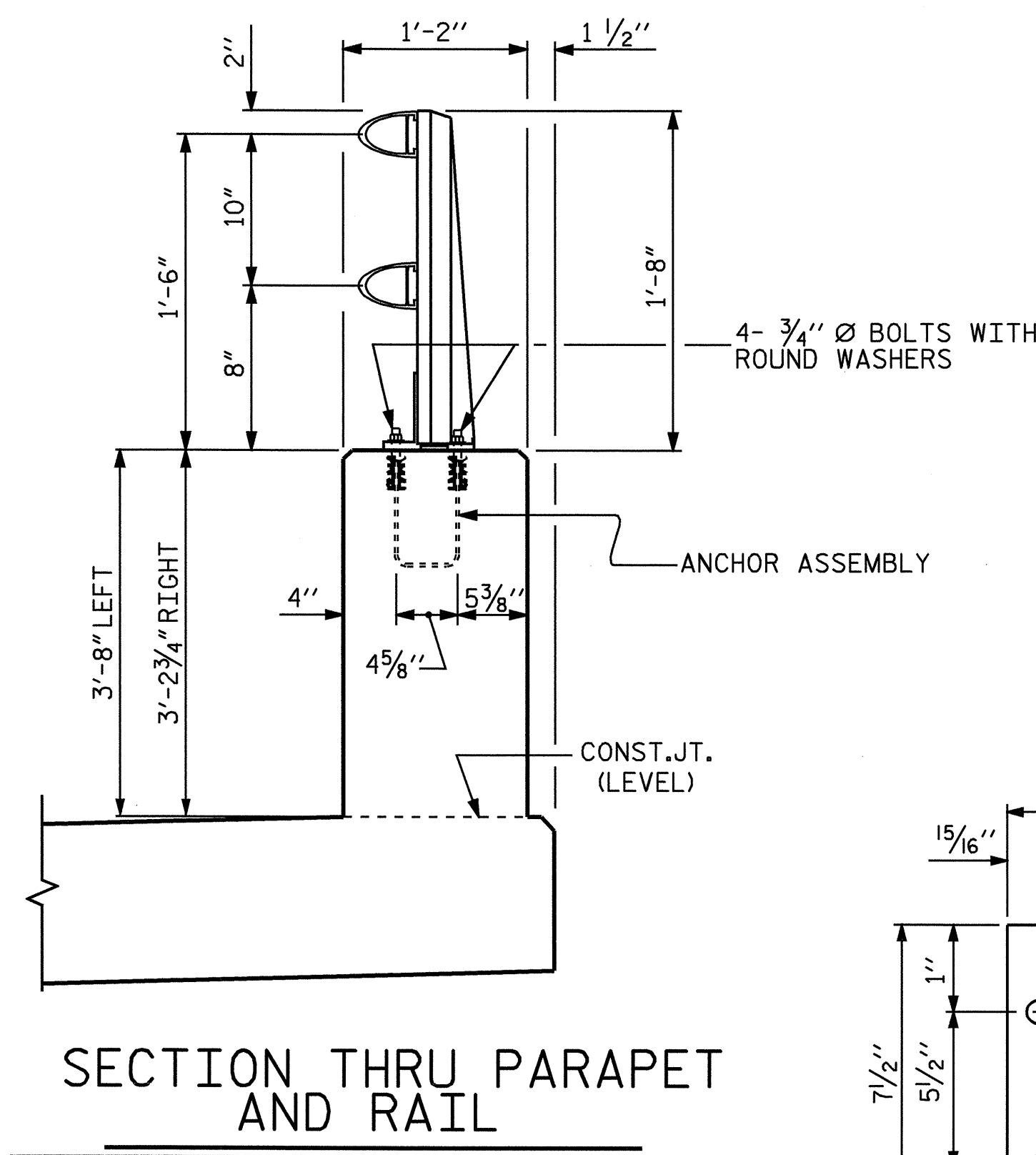


**ELEVATION**

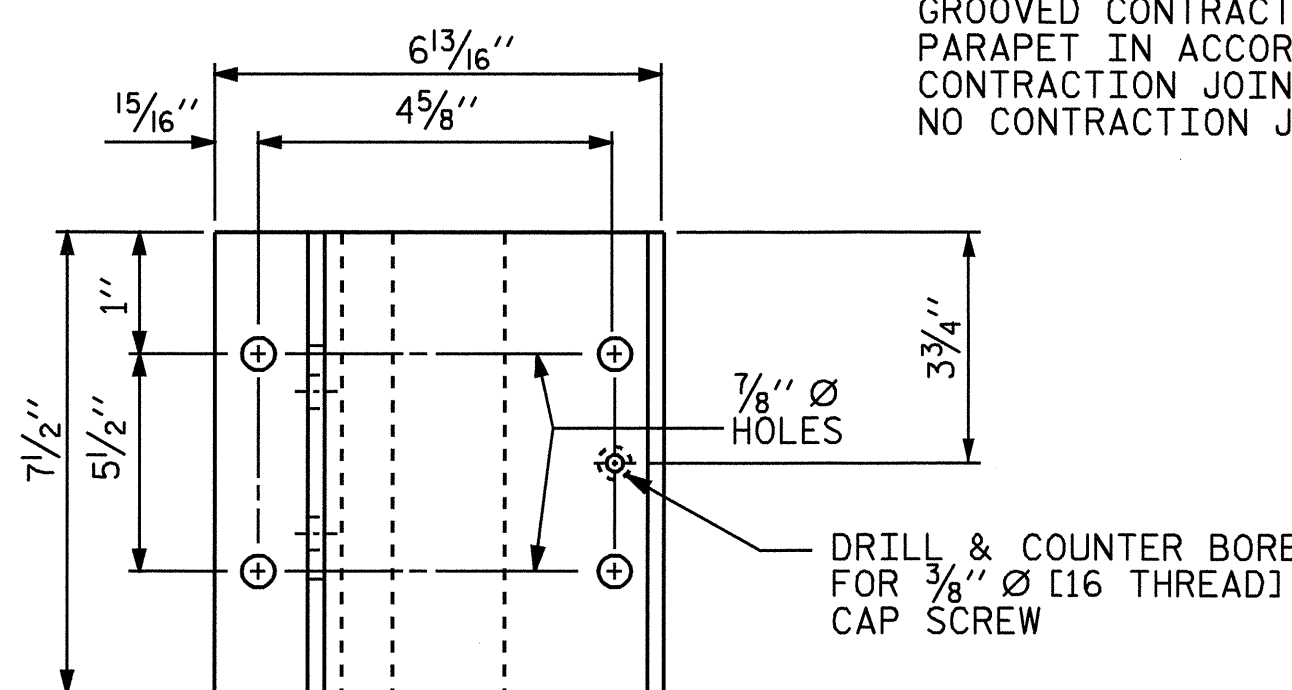
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



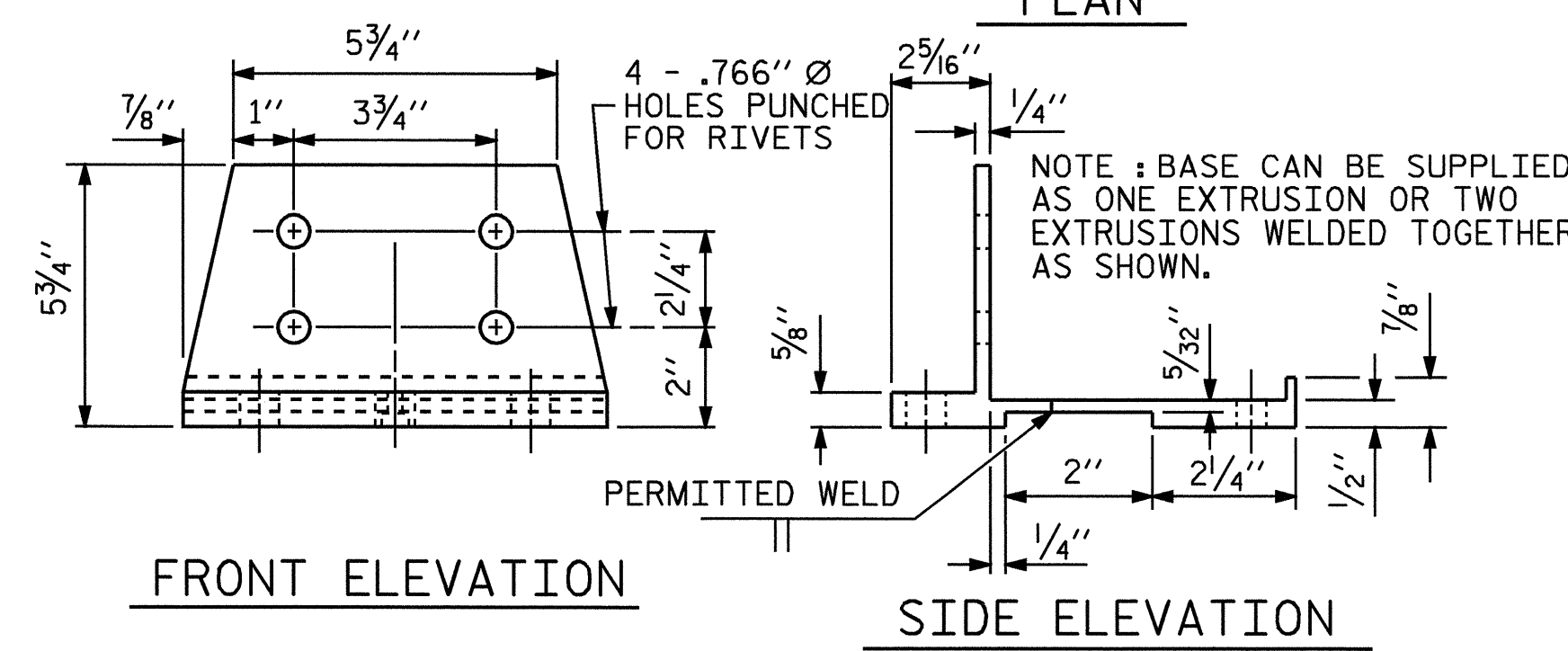
**PLAN**



**SECTION THRU PARAPET AND RAIL**



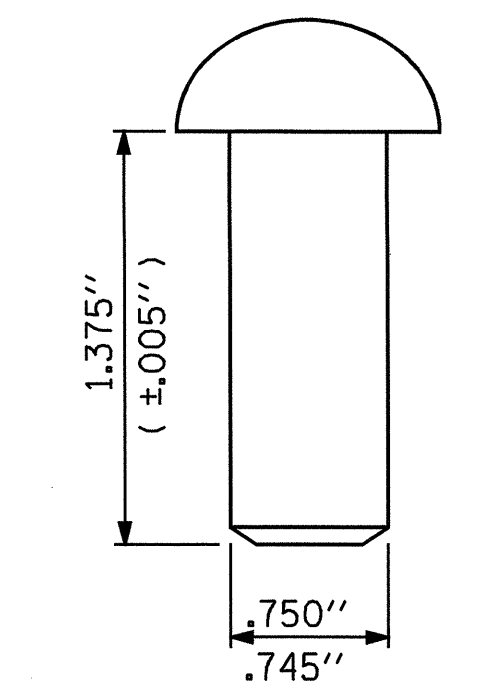
**PLAN**



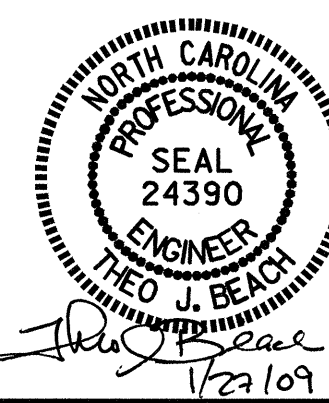
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**



**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.

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.

PAY LENGTH = 348.14 LIN. FT.

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

REVISIONS						SHEET NO. S-21 TOTAL SHEETS 45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 8-2008
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/1/03R RWW/JTE
	REV. 5/1/06 TLA/GM

NOTES

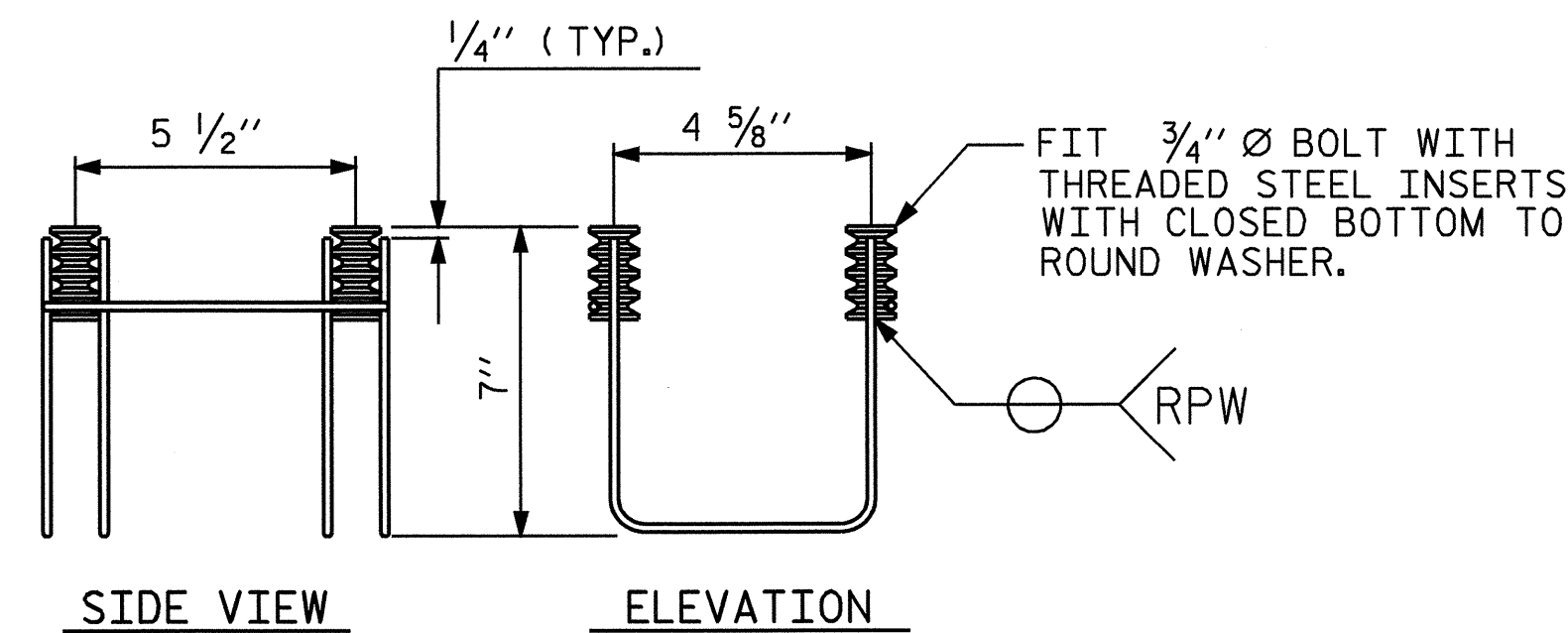
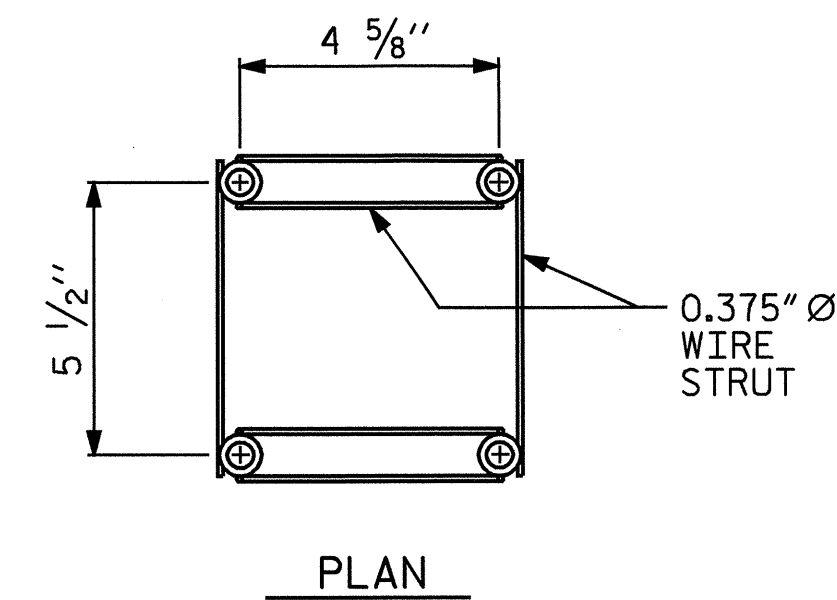
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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.

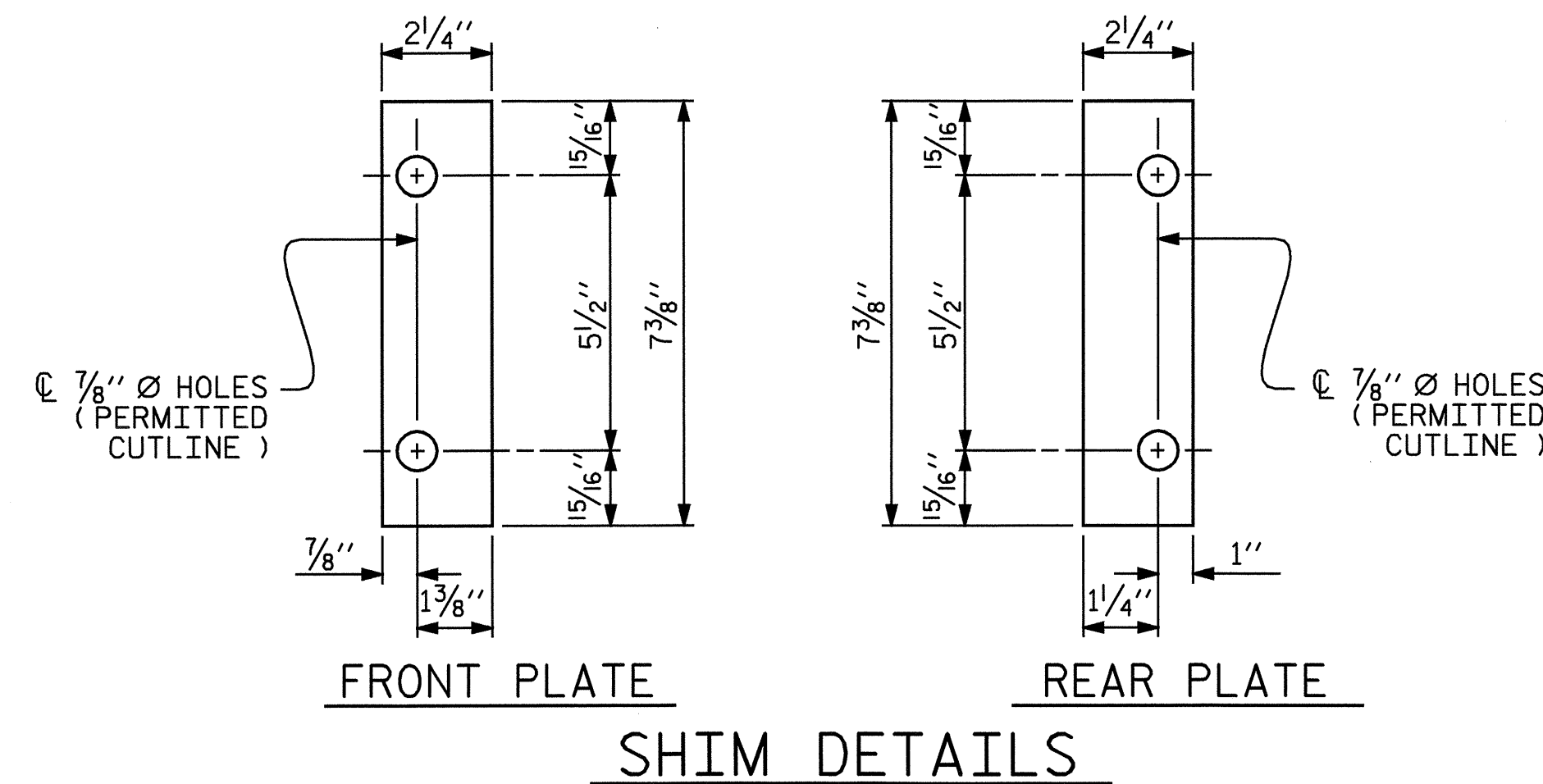
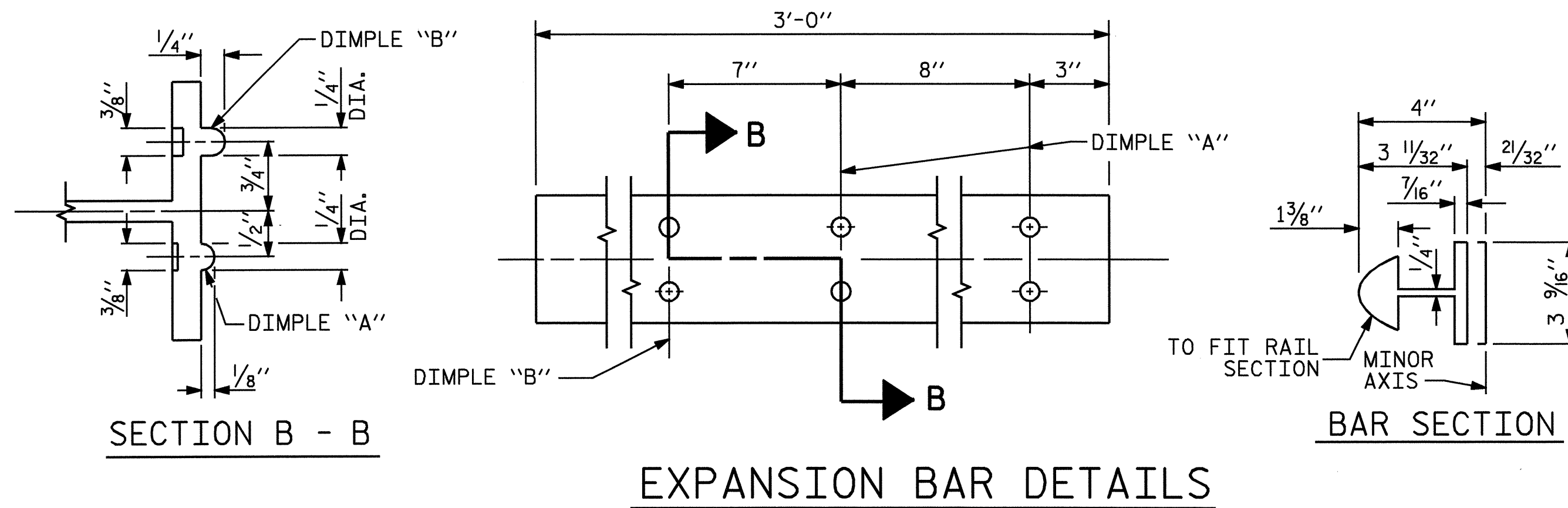
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



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

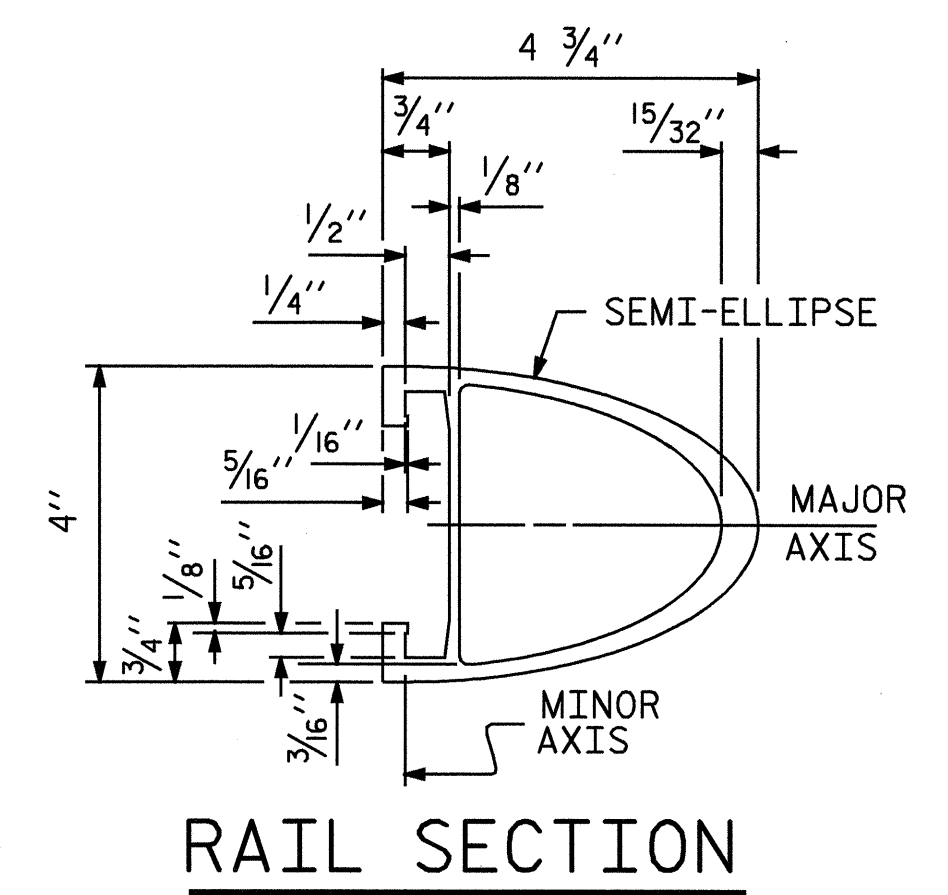
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(58 ASSEMBLIES REQUIRED)

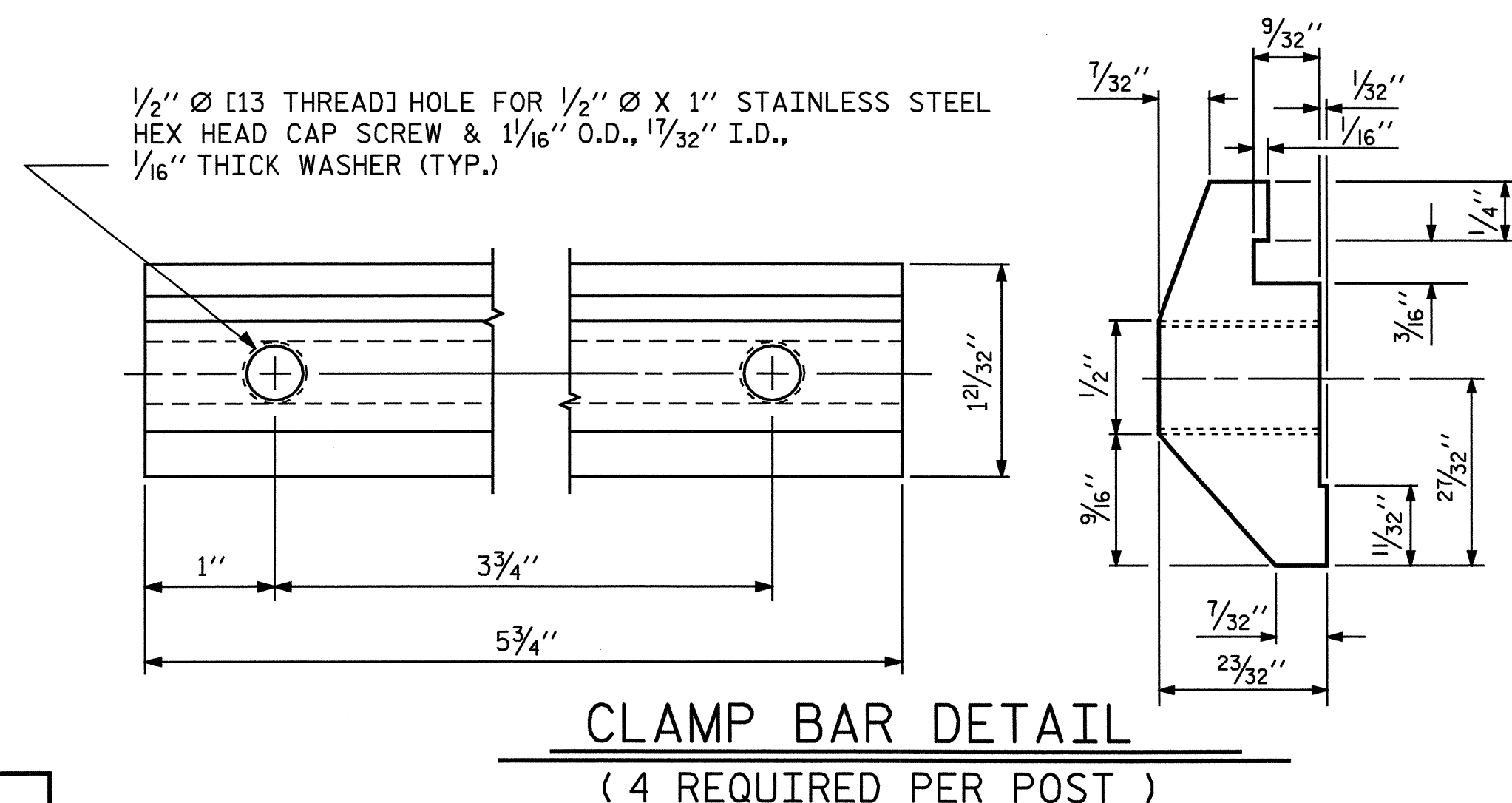


SHIM DETAILS

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

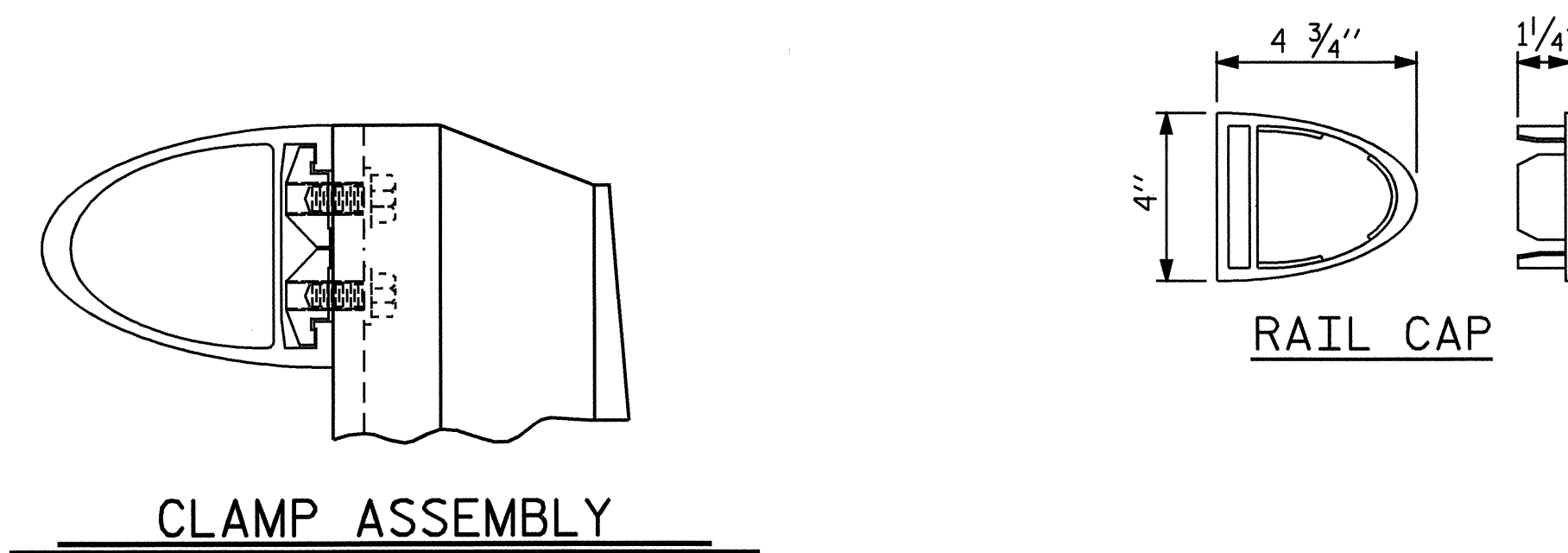


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



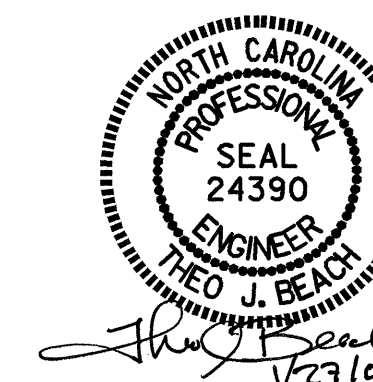
CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

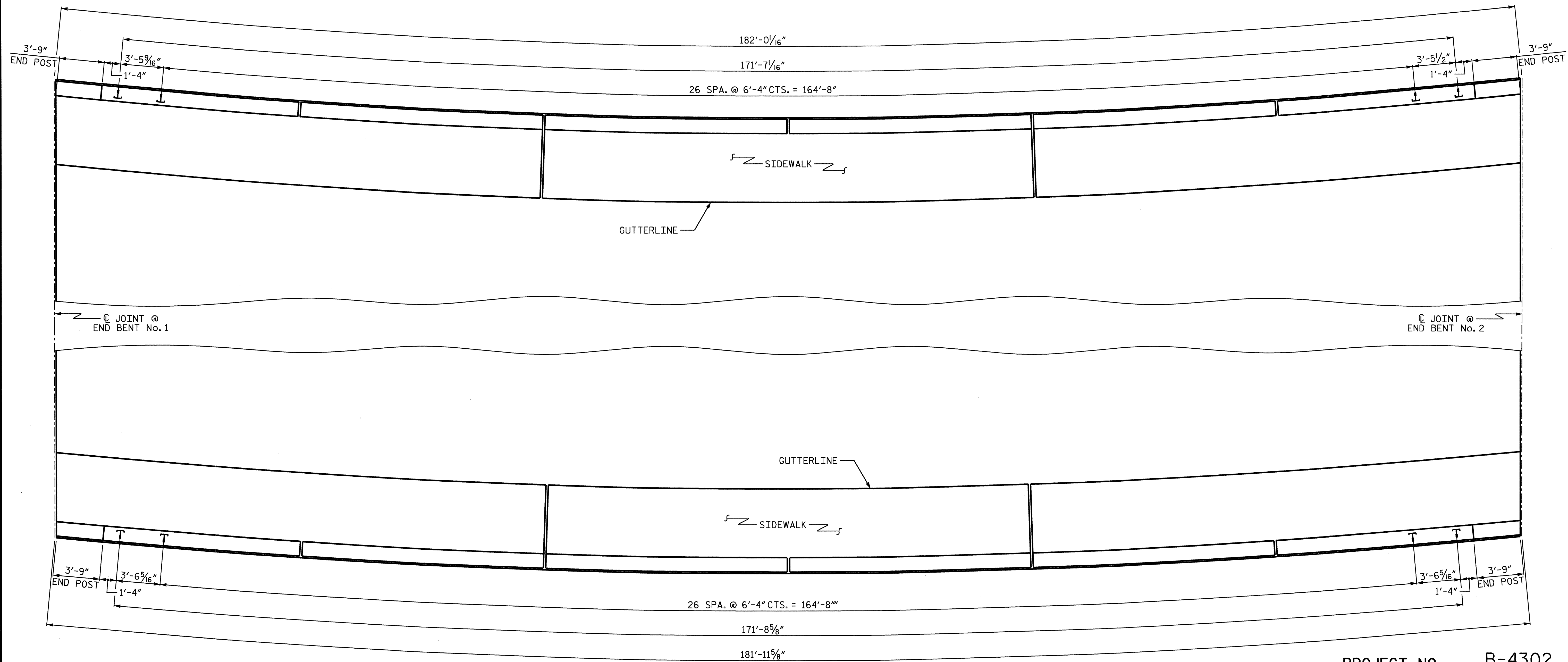
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
2 BAR METAL RAIL



REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 10-2008
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM



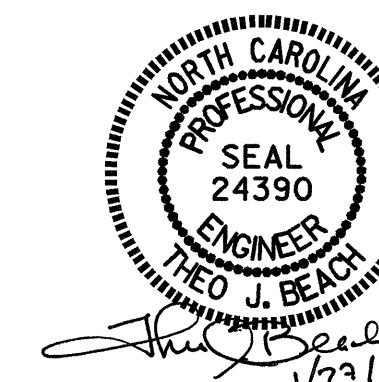
**PLAN OF RAIL POST SPACING**

DIMENSION ARE MEASURED ALONG THE ARC AT THE BACK FACE OF PARAPET

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 RAIL POST  
 SPACINGS



DRAWN BY : T. BANKOVICH DATE : 9-2008  
 CHECKED BY : S.B. WILLIAMS DATE : 9-2008

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 45
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 1/2".
- 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:

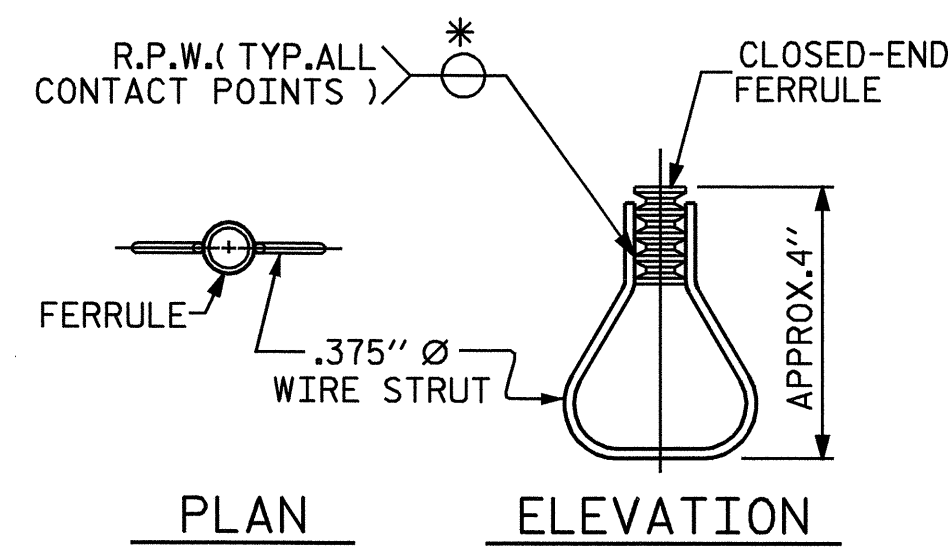
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE 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.

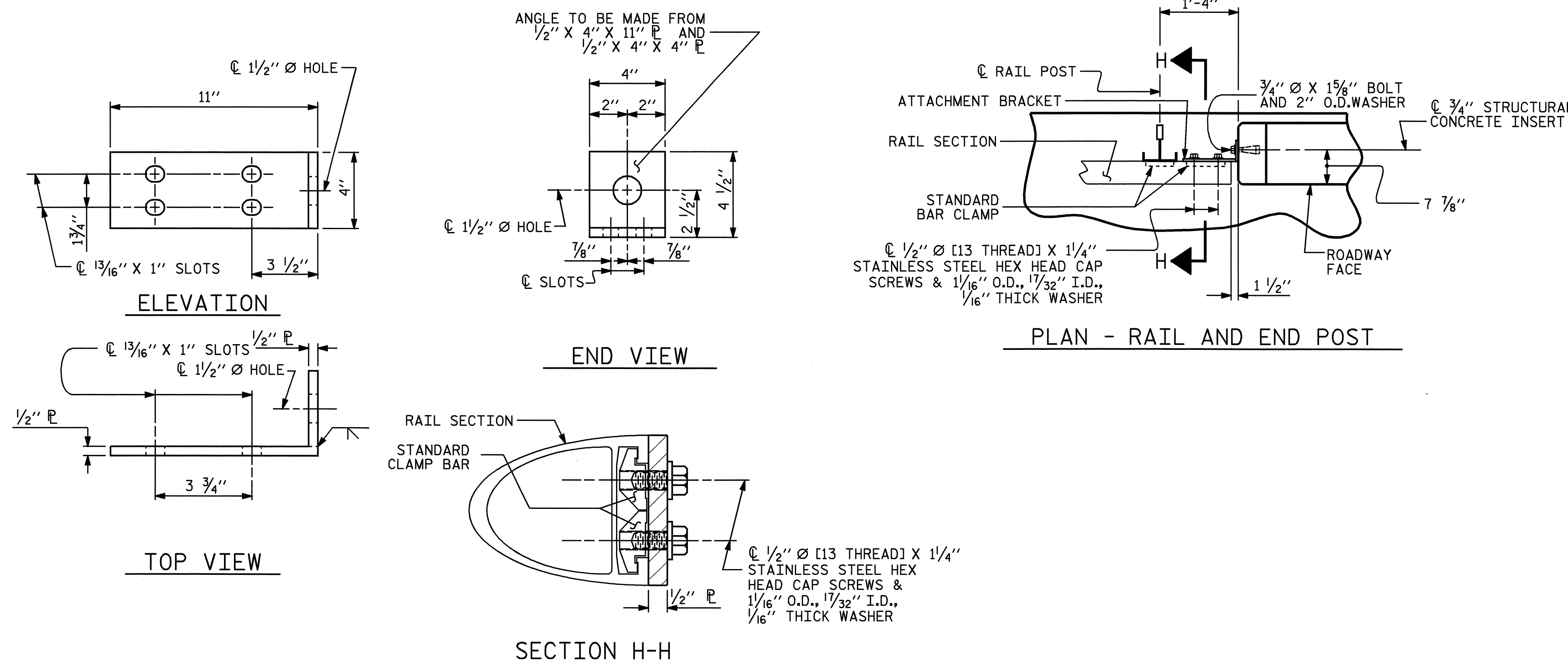
THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.



STRUCTURAL CONCRETE INSERT

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

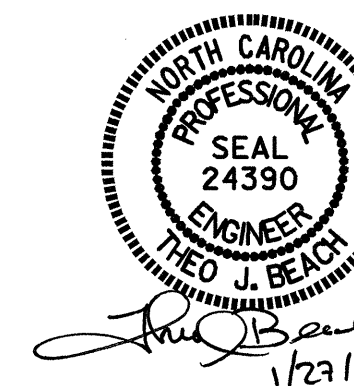


DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			45

STD. NO. BMR2

ASSEMBLED BY : T. BANKOVICH	DATE : 4-2008
CHECKED BY : S.B. WILLIAMS	DATE : 8-2008
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 M11.

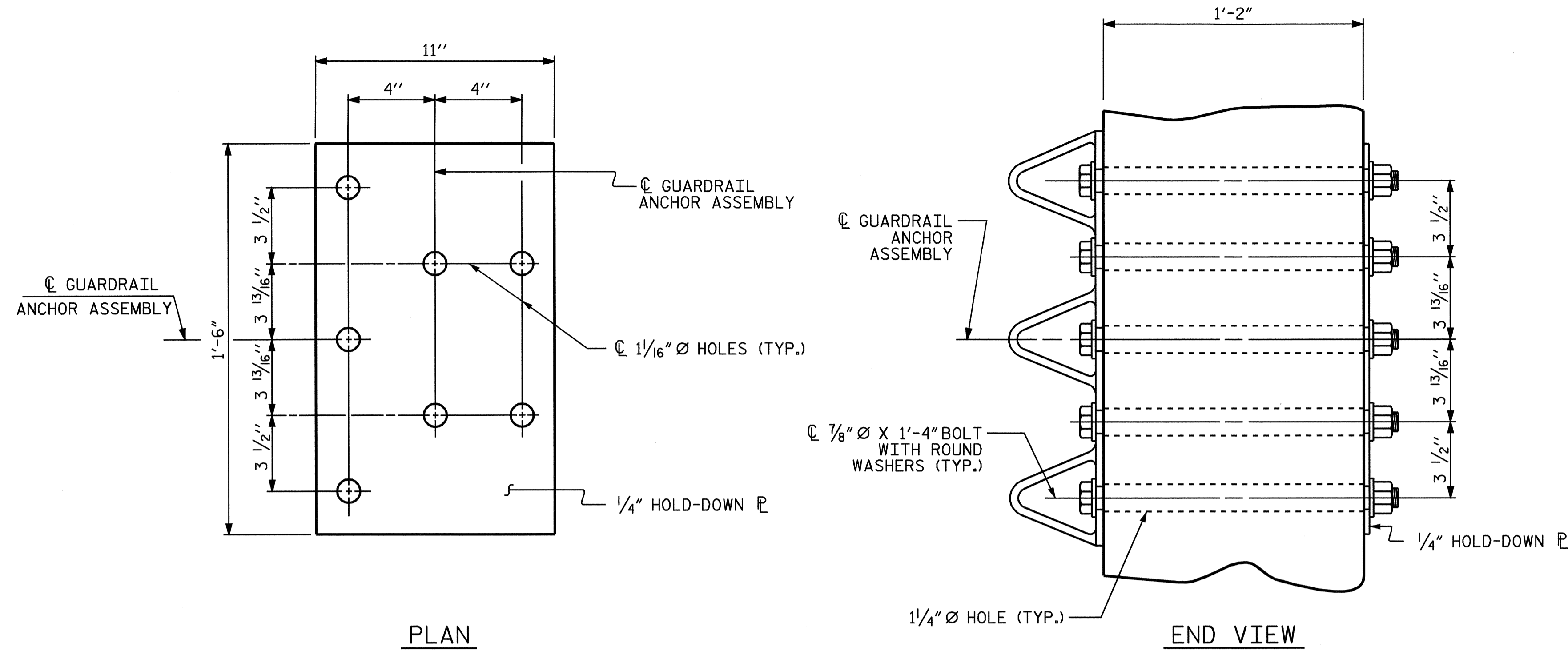
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

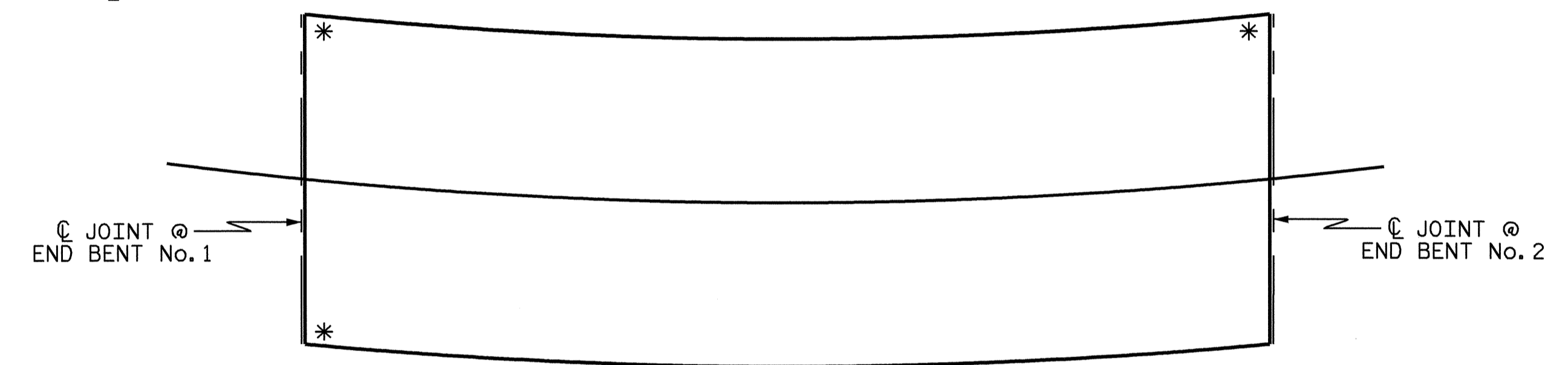
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

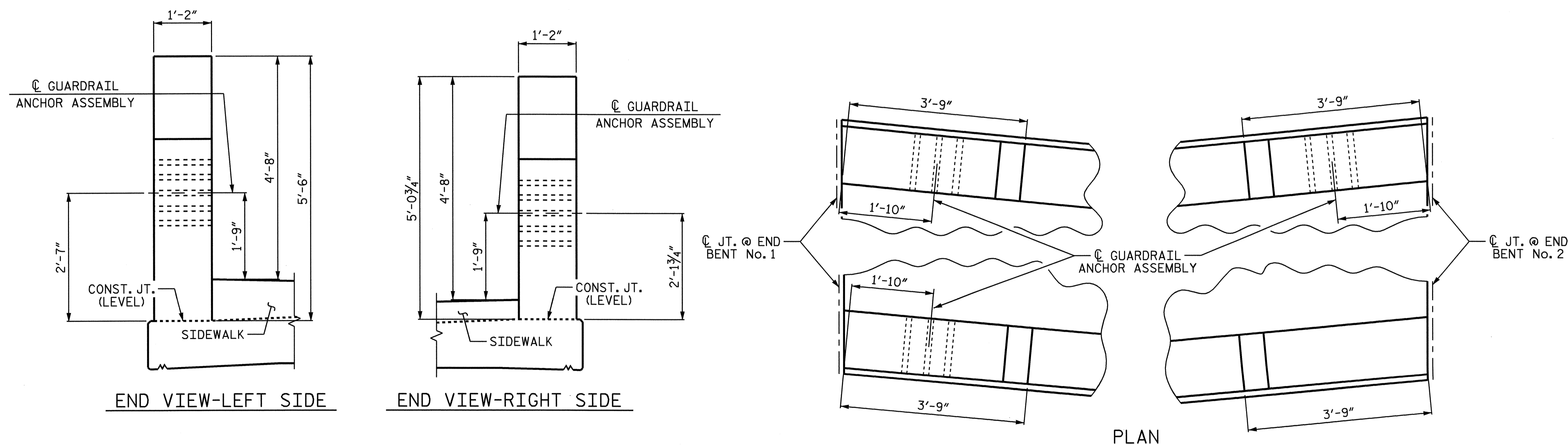
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\*LOCATION OF GUARDRAIL ATTACHMENT



END VIEW-LEFT SIDE

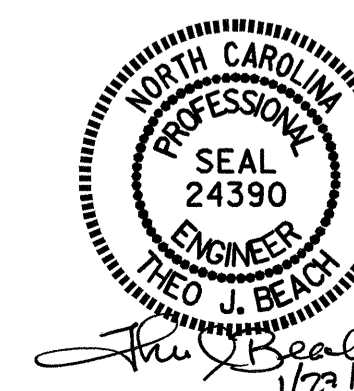
END VIEW-RIGHT SIDE

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

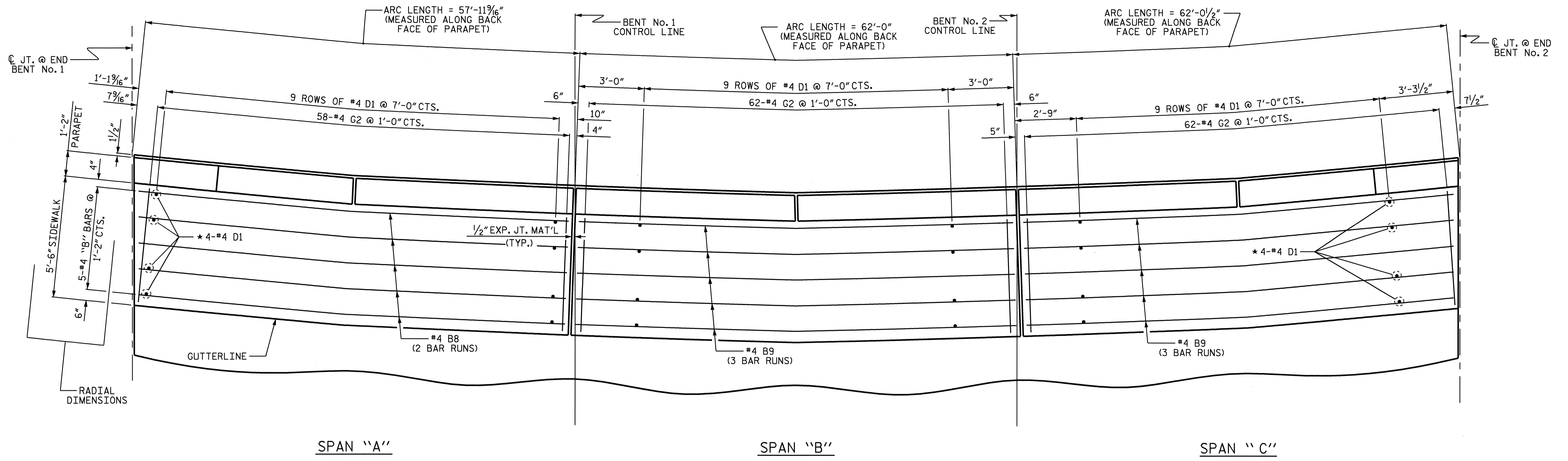
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

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

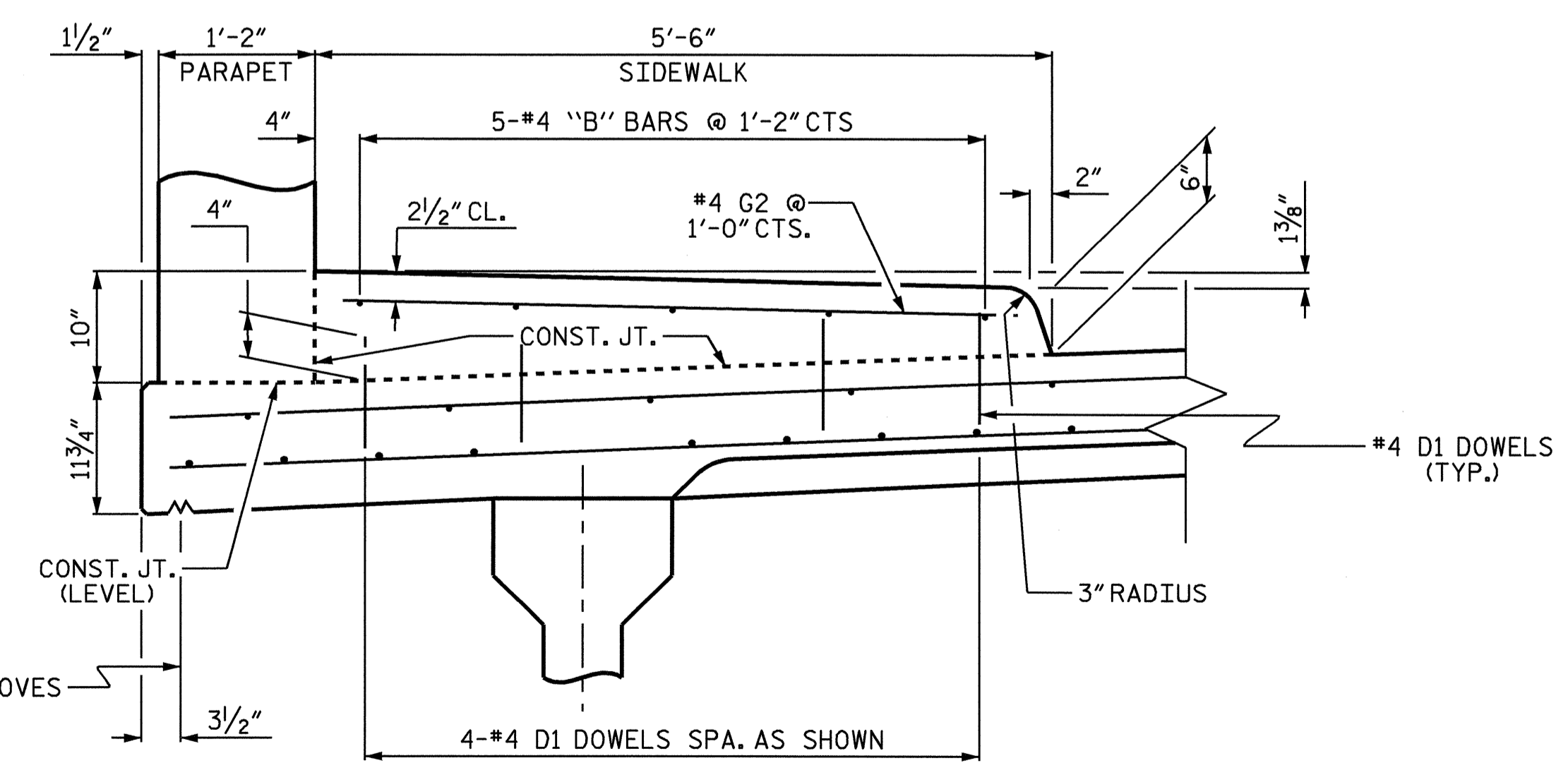


ASSEMBLED BY : T. BANKOVICH	DATE : 4/2008
CHECKED BY : S.B. WILLIAMS	DATE : 10-2008
DRAWN BY : EEM 6/94	REV. 10/17/00 RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS 45
2			4			



PLAN OF LEFT SIDEWALK



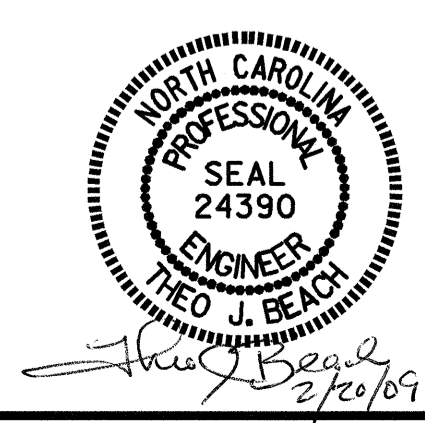
SECTION THRU LEFT SIDEWALK

NOTES:

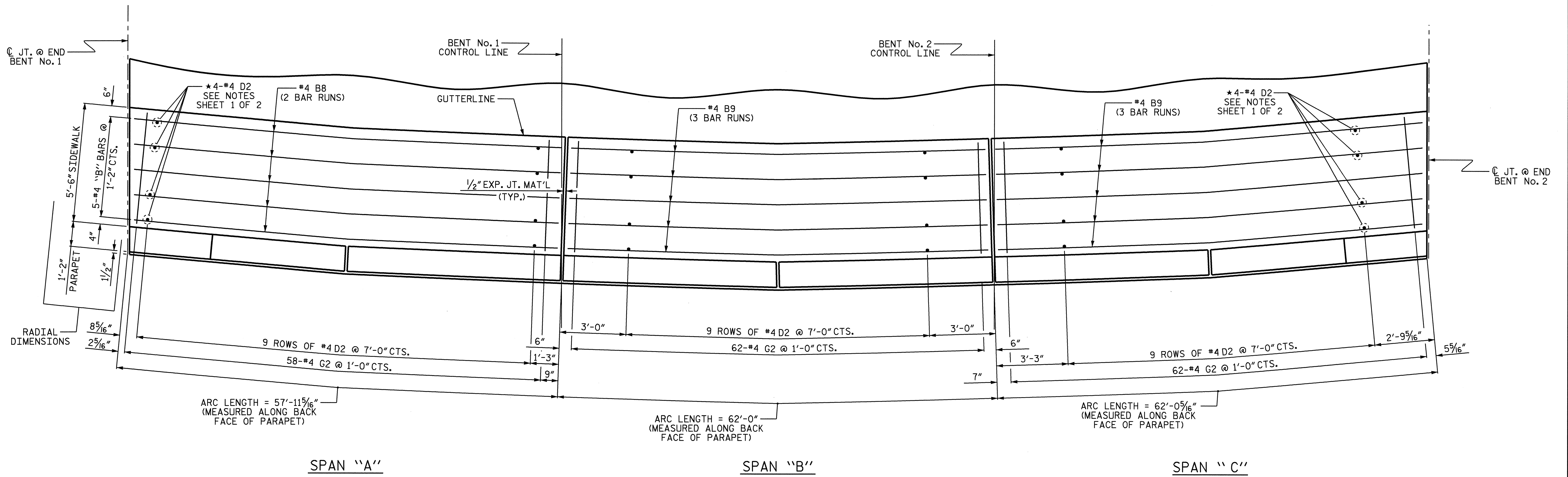
- THE JOINT IN THE DECK AT THE END BENTS SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALKS.
- THE DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF, EXCEPT AS NOTED.
- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.
- \* THESE DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT AT THE END BENTS. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED IN PLACE.
- FOR SIDEWALK REINFORCEMENT AND CONCRETE QUANTITIES SEE SUPERSTRUCTURE "BILL OF MATERIAL", SHEET S-28.

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-  
 SHEET 1 OF 2

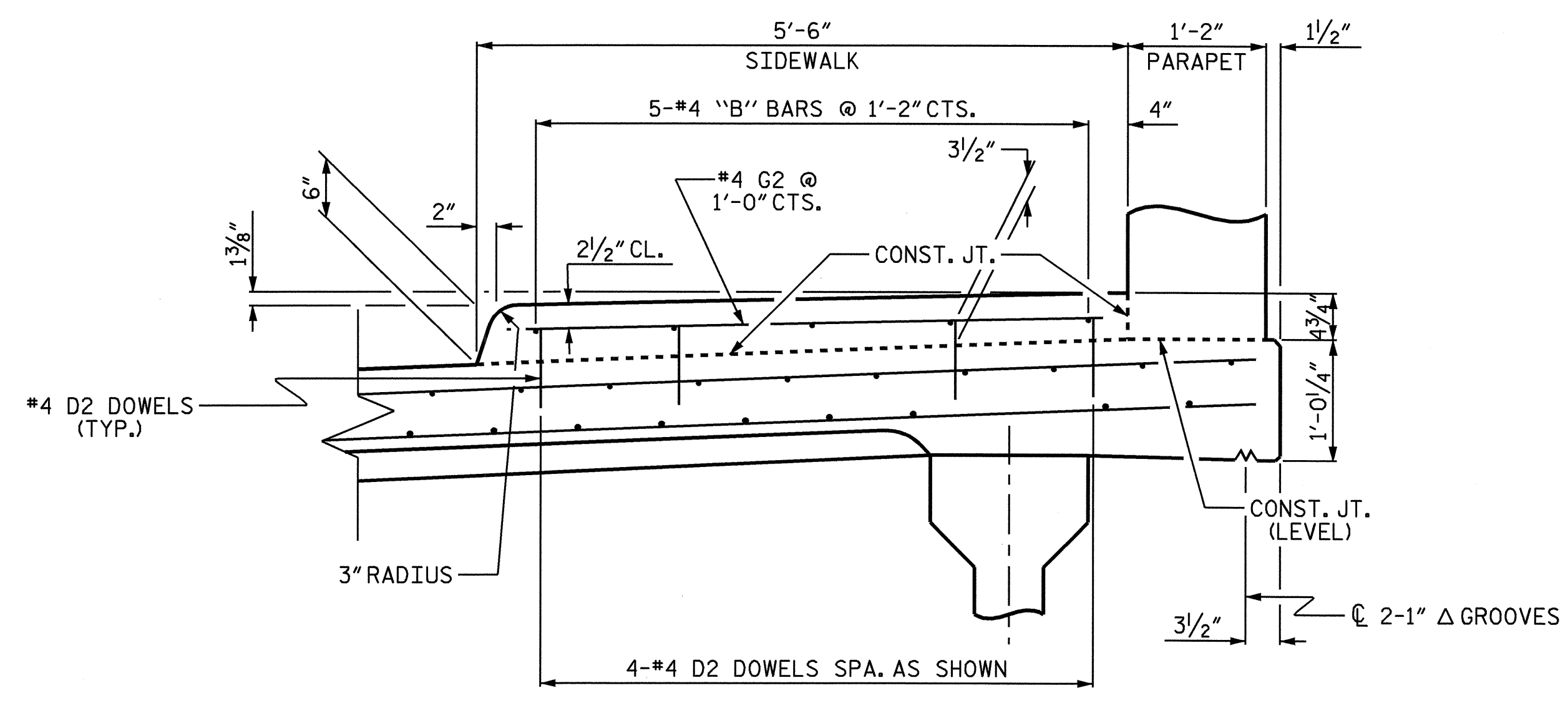
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
SIDEWALK DETAILS (LEFT SIDE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					45



DRAWN BY: T. BANKOVICH DATE: 4-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 8-2008



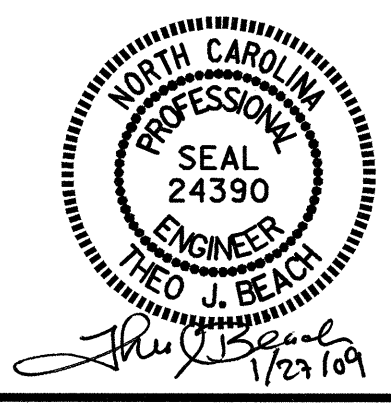
PLAN OF RIGHT SIDEWALK



SECTION THRU RIGHT SIDEWALK

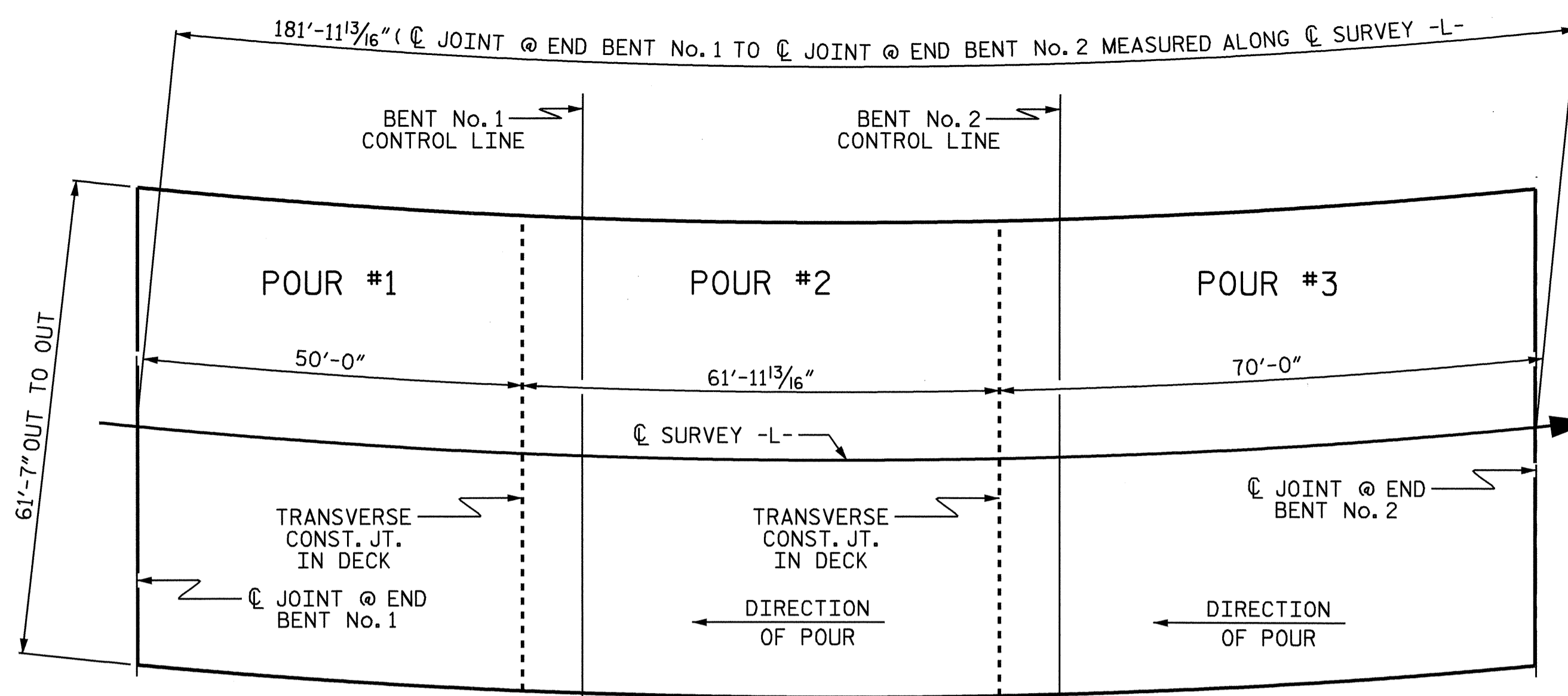
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 SIDEWALK DETAILS  
 (RIGHT SIDE)



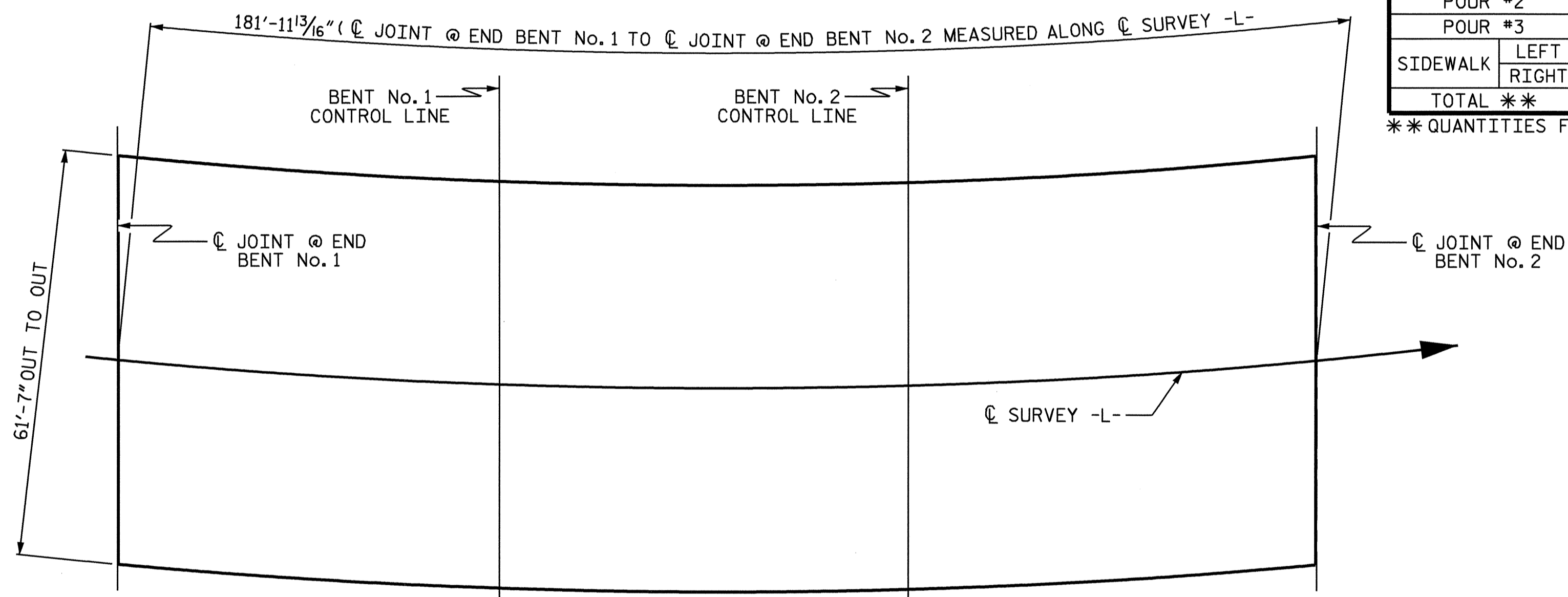
DRAWN BY: T. BANKOVICH DATE: 4-2008  
 CHECKED BY: S.B. WILLIAMS DATE: 10-2008

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27	
1			3			TOTAL SHEETS 45	
2			4				

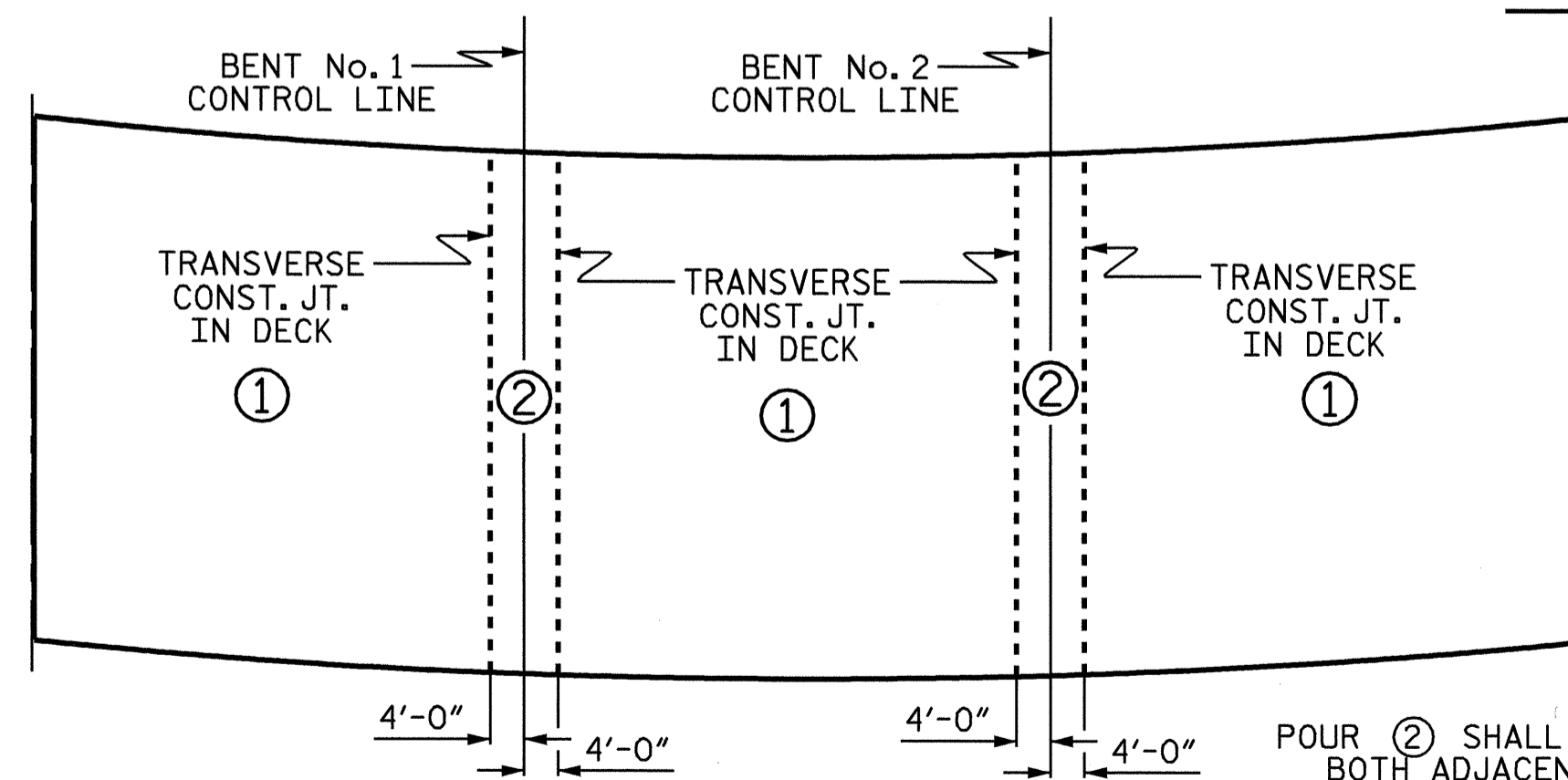


**POURING SEQUENCE**

DIMENSION ARE MEASURED ALONG THE CL SURVEY -L-



**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**  
(SQ. FT. = 11207)



POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI

**OPTIONAL DECK POUR DETAIL**

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

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

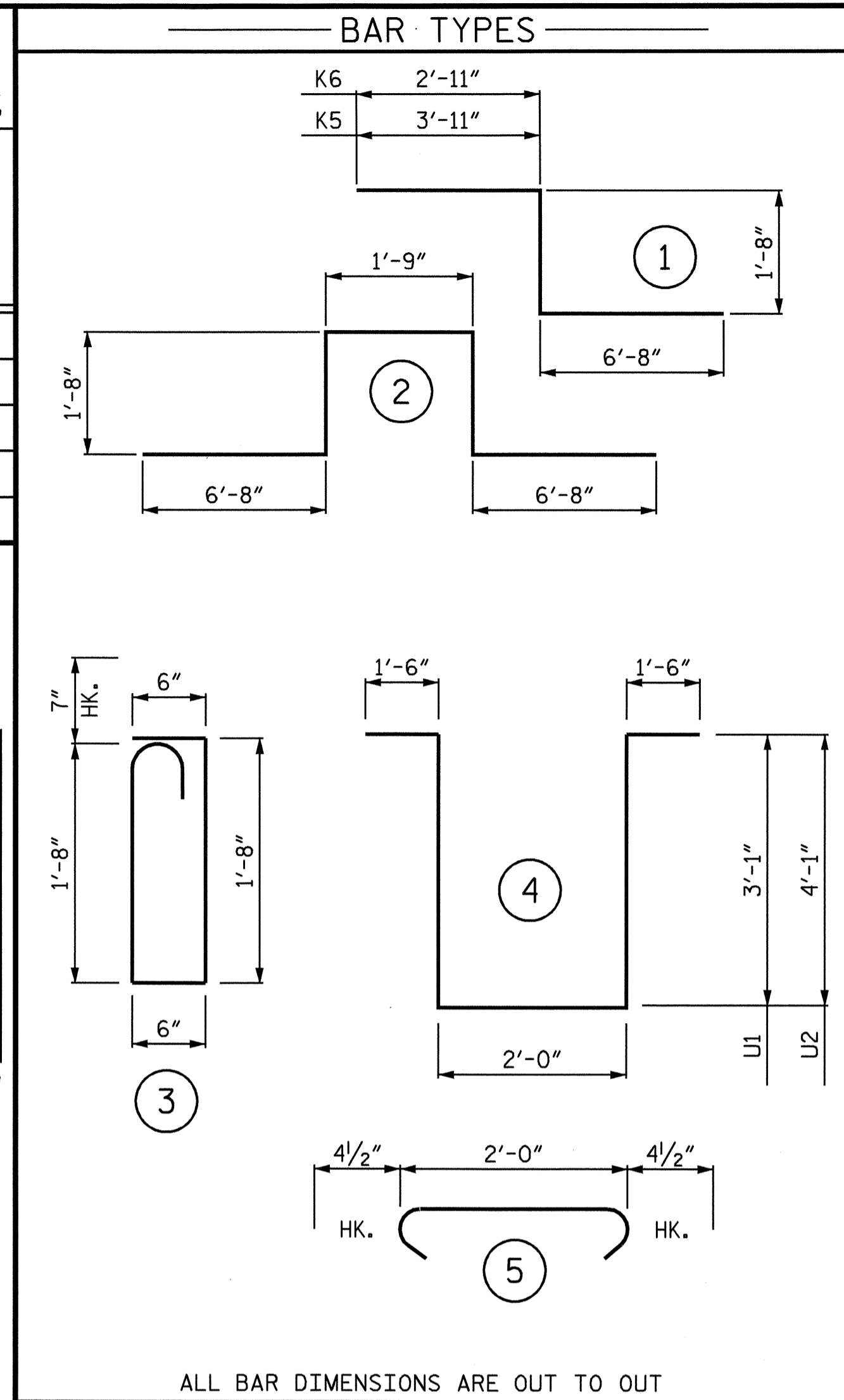
**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2,134 SQ. FT.
BRIDGE DECK	8,134 SQ. FT.
TOTAL	10,268 SQ. FT.

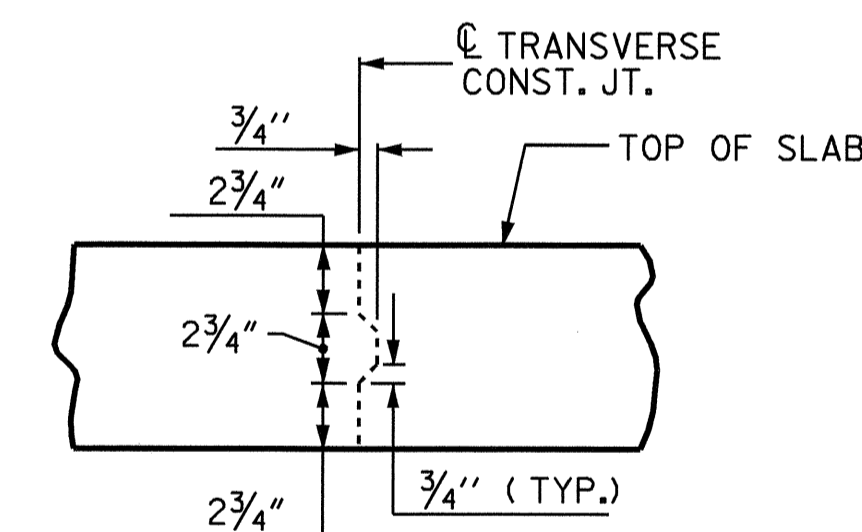
**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	95.0		
POUR #2	132.5		
POUR #3	149.3		
SIDEWALK LEFT	24.5		
SIDEWALK RIGHT	16.5		
TOTAL **	417.8	40,626	42,471

\*\* QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED



ALL BAR DIMENSIONS ARE OUT TO OUT



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

**BILL OF MATERIAL**

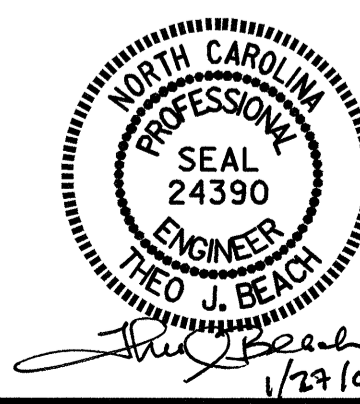
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	726	#5	STR	31'-10"	24105
A2	363	#5	STR	35'-3"	13346
A3	363	#5	STR	28'-3"	10696
* B1	80	#4	STR	19'-0"	1015
* B2	14	#4	STR	27'-8"	259
* B3	80	#7	STR	48'-0"	7849
* B4	78	#7	STR	19'-0"	3029
B5	312	#5	STR	47'-1"	15322
* B6	40	#4	STR	18'-0"	481
* B7	80	#4	STR	20'-11"	1118
* B8	20	#4	STR	29'-10"	399
* B9	60	#4	STR	21'-11"	878
* D1	108	#4	STR	10"	60
* D2	108	#4	STR	9"	54
* G1	4	#5	STR	32'-1"	134
* G2	364	#4	STR	5'-0"	1216
K1	28	#4	STR	6'-4"	118
K2	56	#4	STR	6'-10"	256
K3	28	#4	STR	4'-9"	89
K4	16	#4	STR	29'-0"	310
* K5	4	#8	1	12'-3"	131
* K6	4	#8	1	11'-3"	120
* K7	24	#4	2	18'-5"	295
* S1	98	#5	3	4'-11"	503
S2	266	#4	5	2'-9"	489
* U1	28	#4	4	11'-2"	209
* U2	70	#4	4	13'-2"	616

REINFORCING STEEL 40,626 LBS.  
\* EPOXY COATED REINF. STEEL 42,471 LBS.

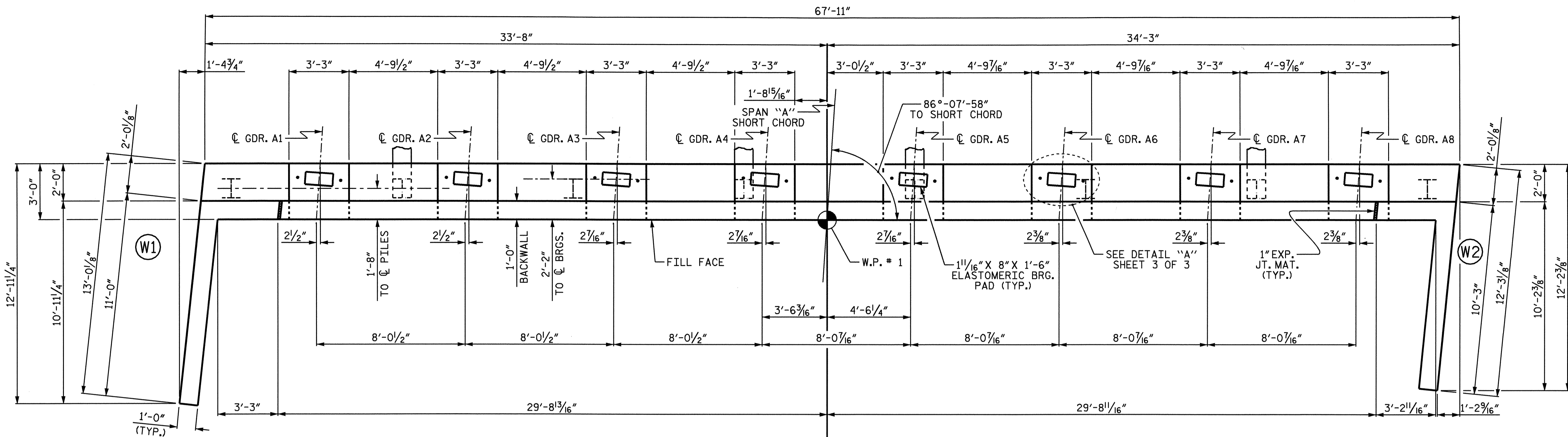
PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

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

REVISIONS						SHEET NO. S-28
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			



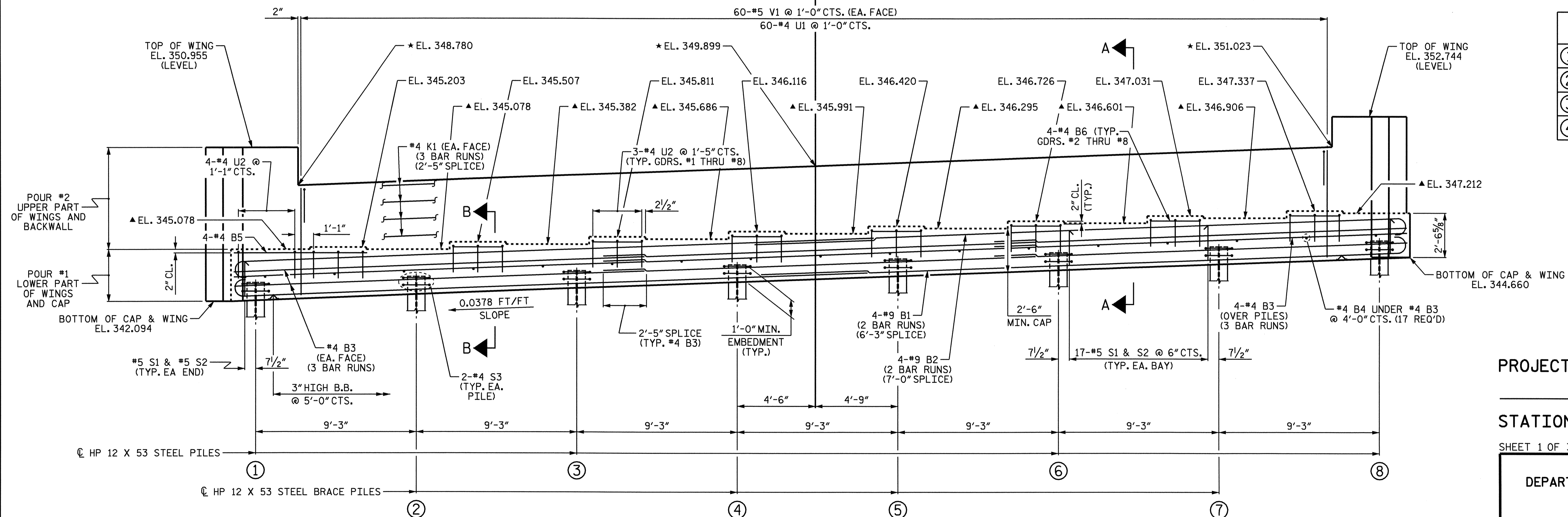
DRAWN BY: T. BANKOVICH DATE: 4-2008  
CHECKED BY: S.B. WILLIAMS DATE: 8-2008



PLAN

WORKLINE

**NOTES:**  
 ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.  
 #5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.  
 STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 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.  
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
 THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACKWALL AT THE RATE OF 2%.  
 \* THIS ELEVATION TAKEN AT FILL FACE OF BACKWALL.

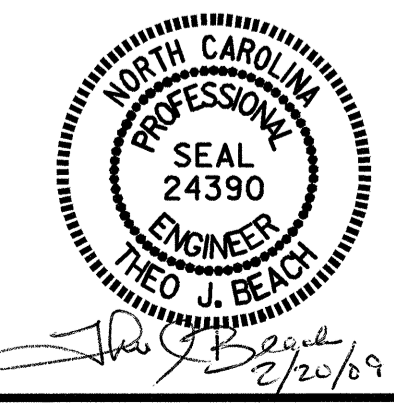


ELEVATION

TOP OF PILE ELEVATIONS			
①	343.177	⑤	344.575
②	343.526	⑥	344.925
③	343.876	⑦	345.274
④	344.225	⑧	345.624

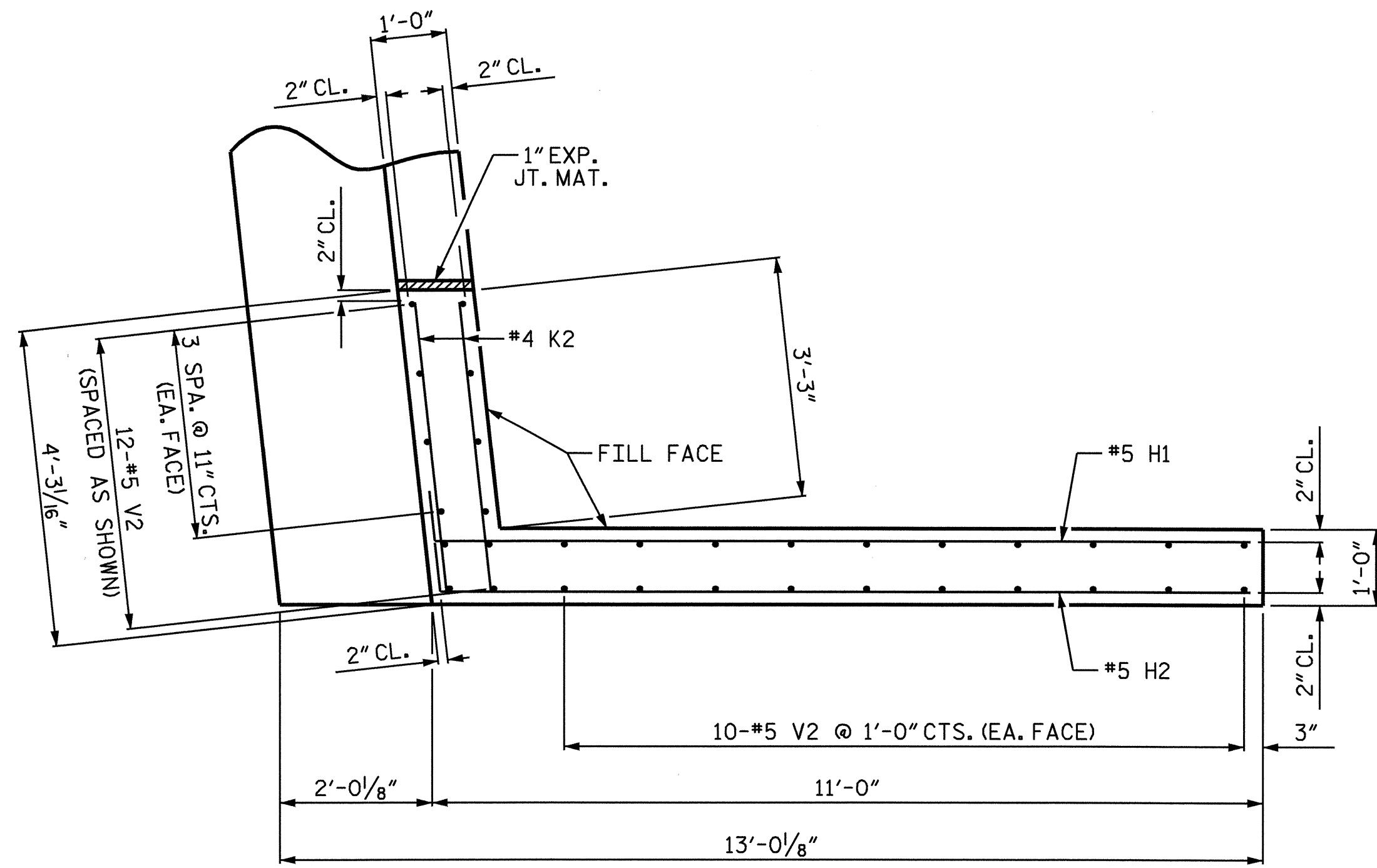
PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT No. 1

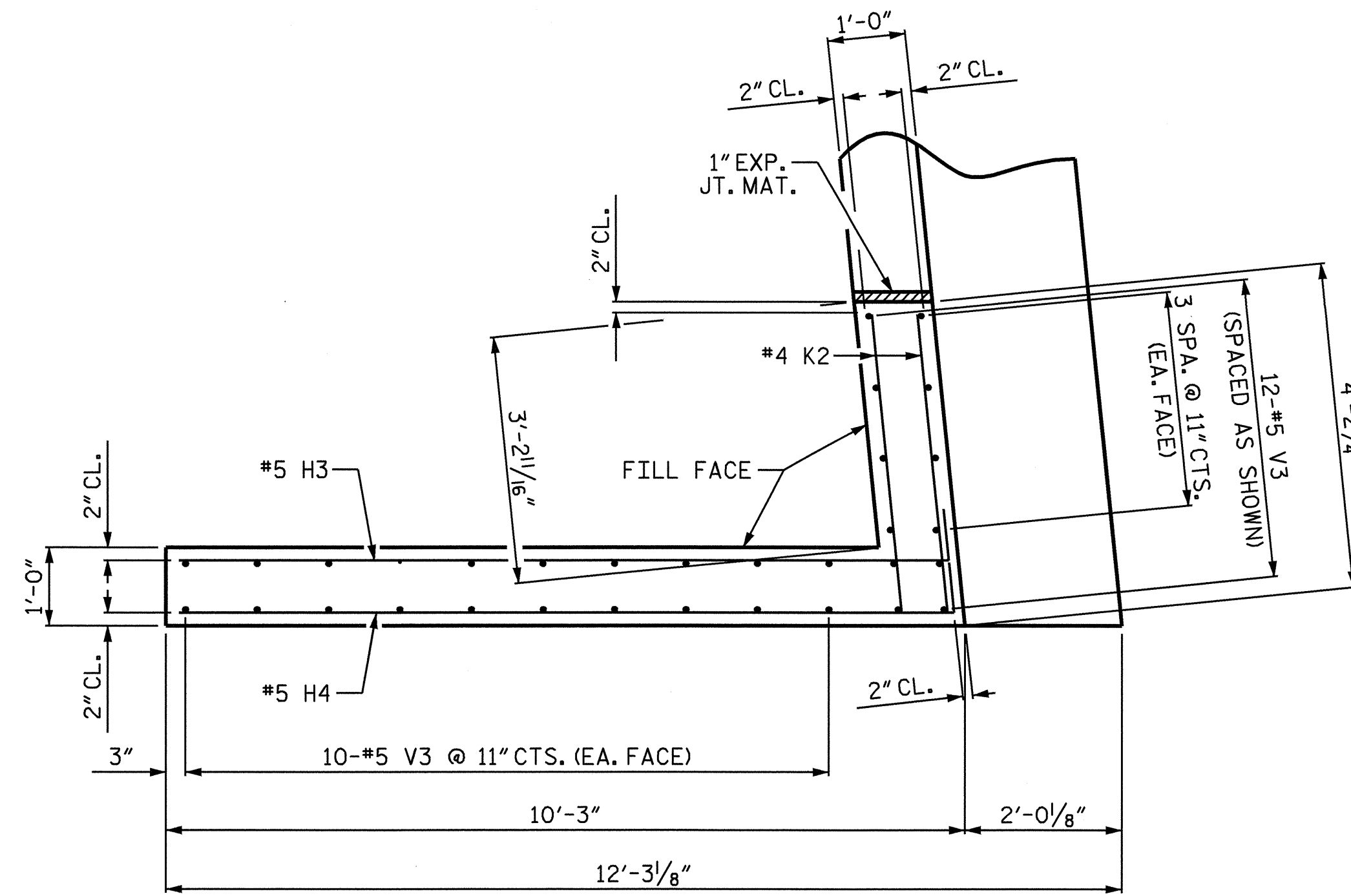


DRAWN BY: T. BANKOVICH DATE: 5-2008  
 CHECKED BY: M.L. BROWN DATE: 7-2008

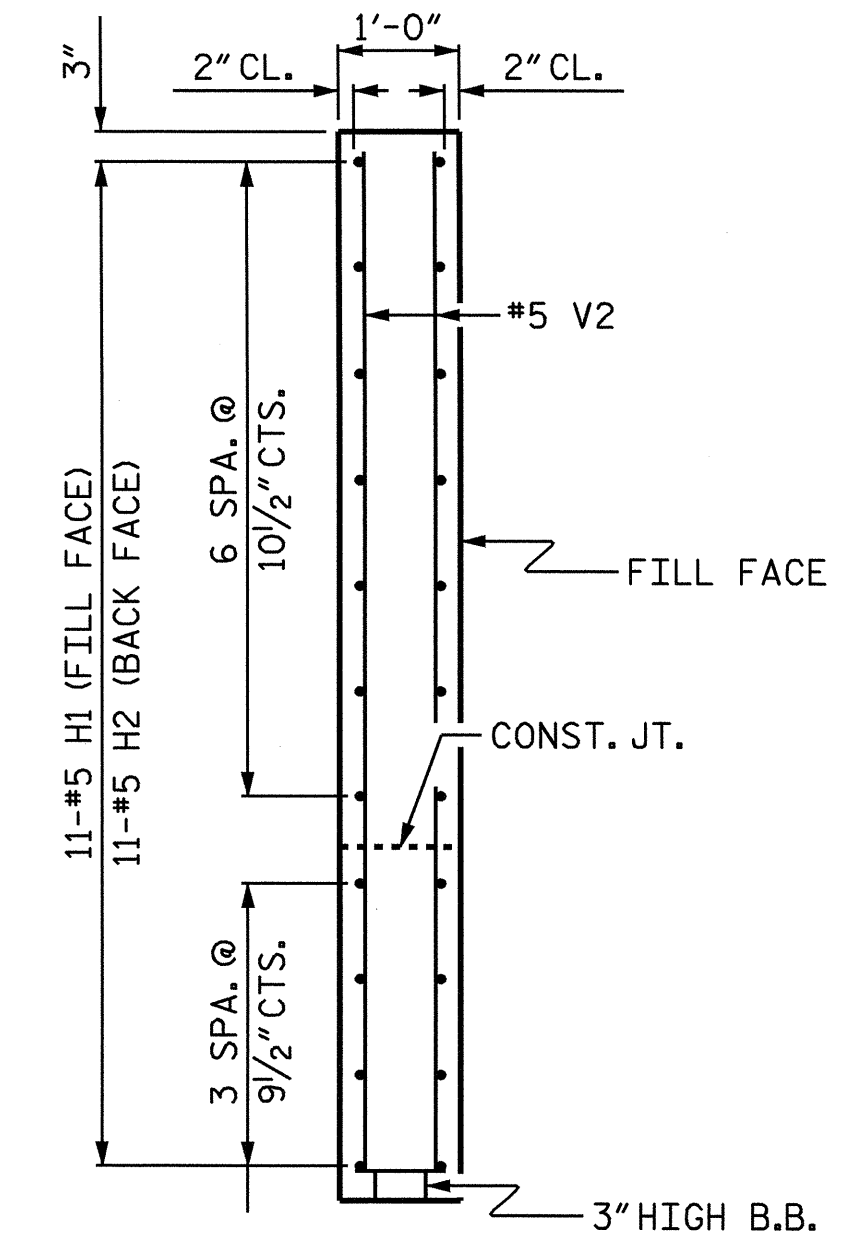
REVISIONS						SHEET NO. S-29
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			



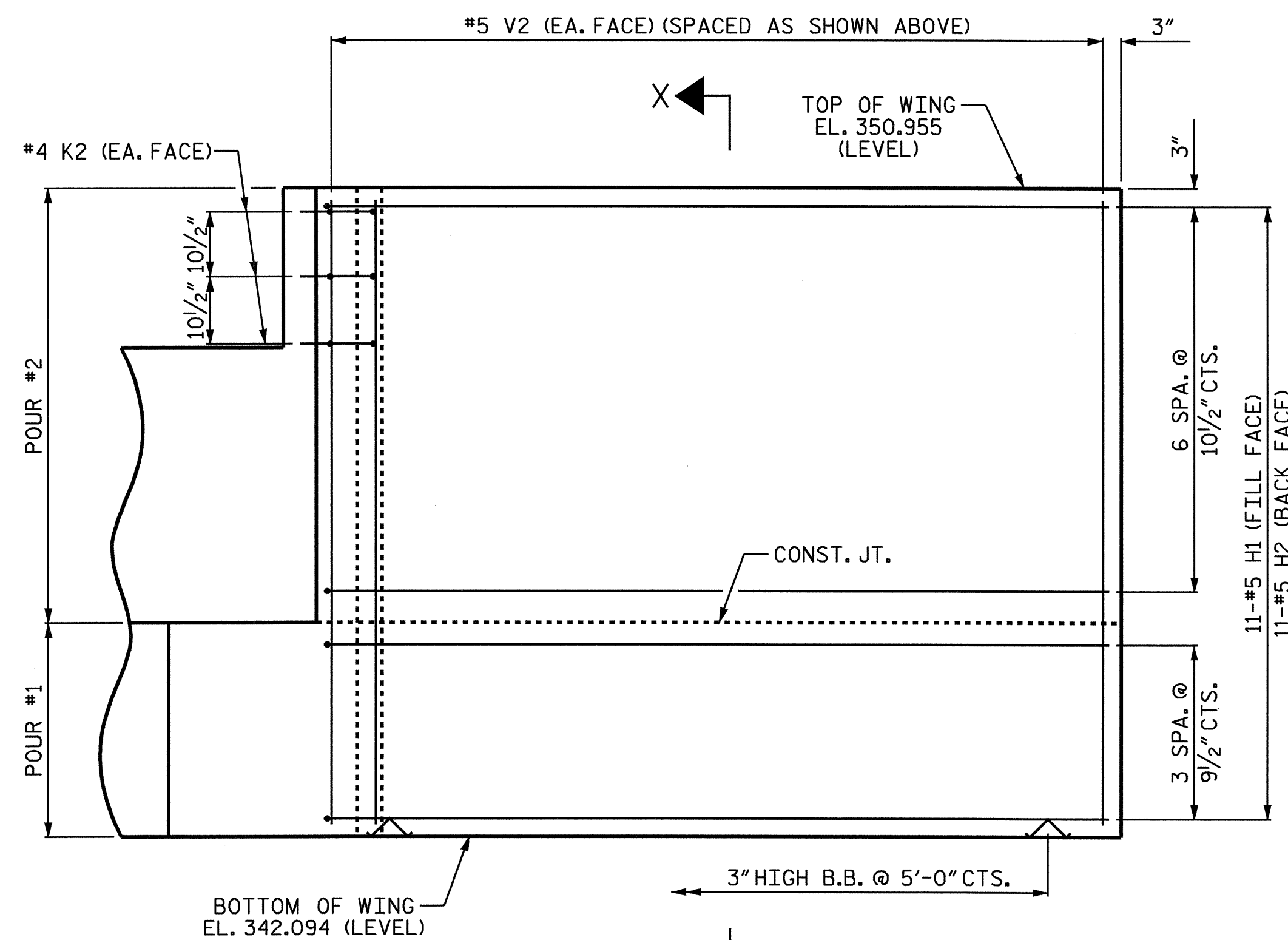
PLAN OF WING (W1)



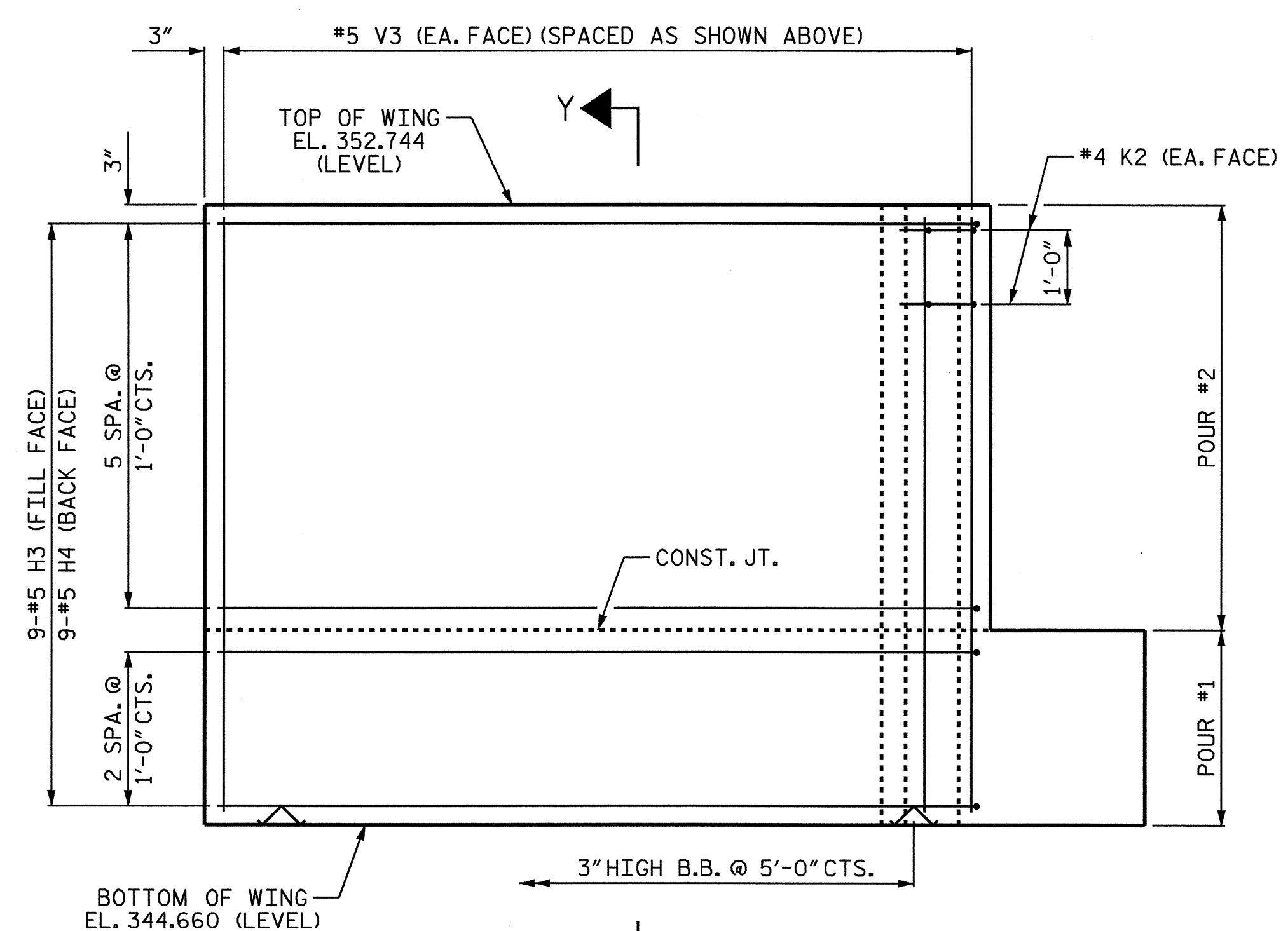
PLAN OF WING (W2)



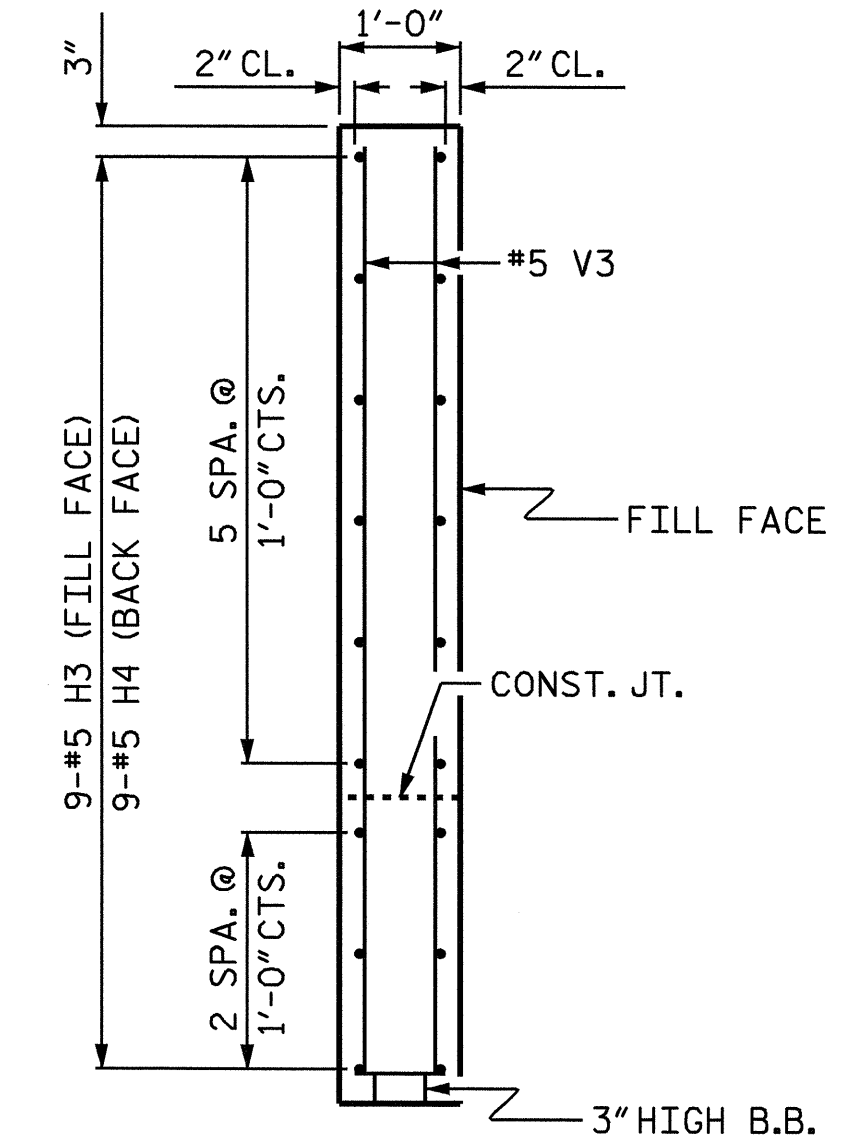
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

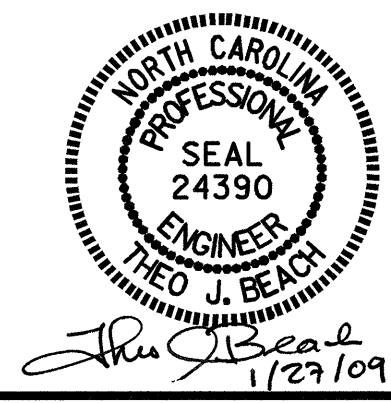


SECTION Y-Y

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

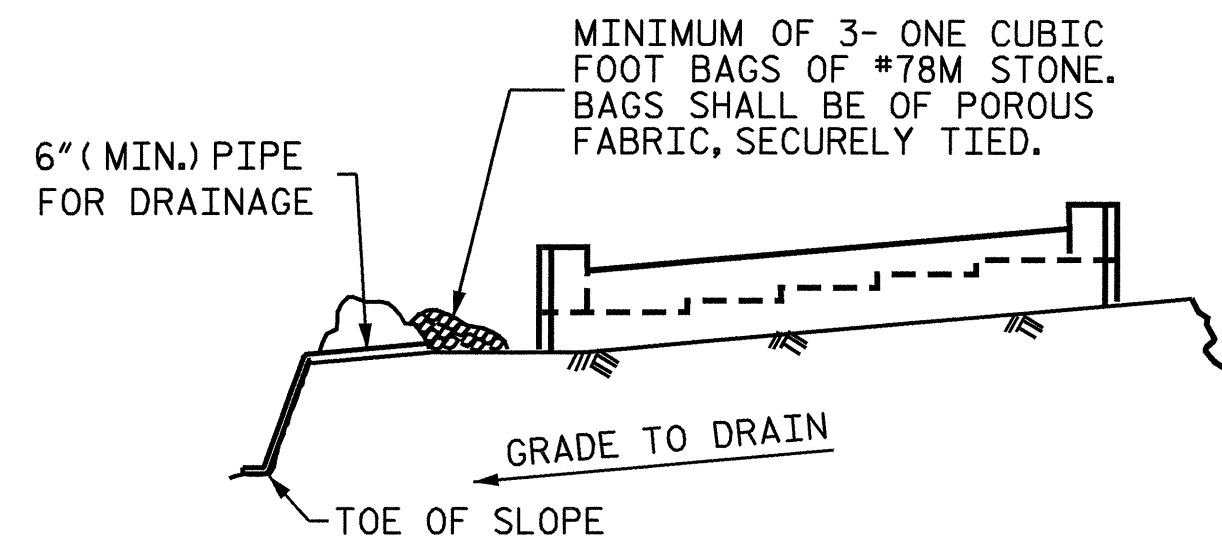
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-30
TOTAL SHEETS					45



DRAWN BY: T. BANKOVICH DATE: 5-2008  
 CHECKED BY: M.L. BROWN DATE: 7-2008

23-JAN-2009 12:13  
 F:\structures\Sub\_Draw\B-4302.sd.e\* 1.dgn  
 tbeach

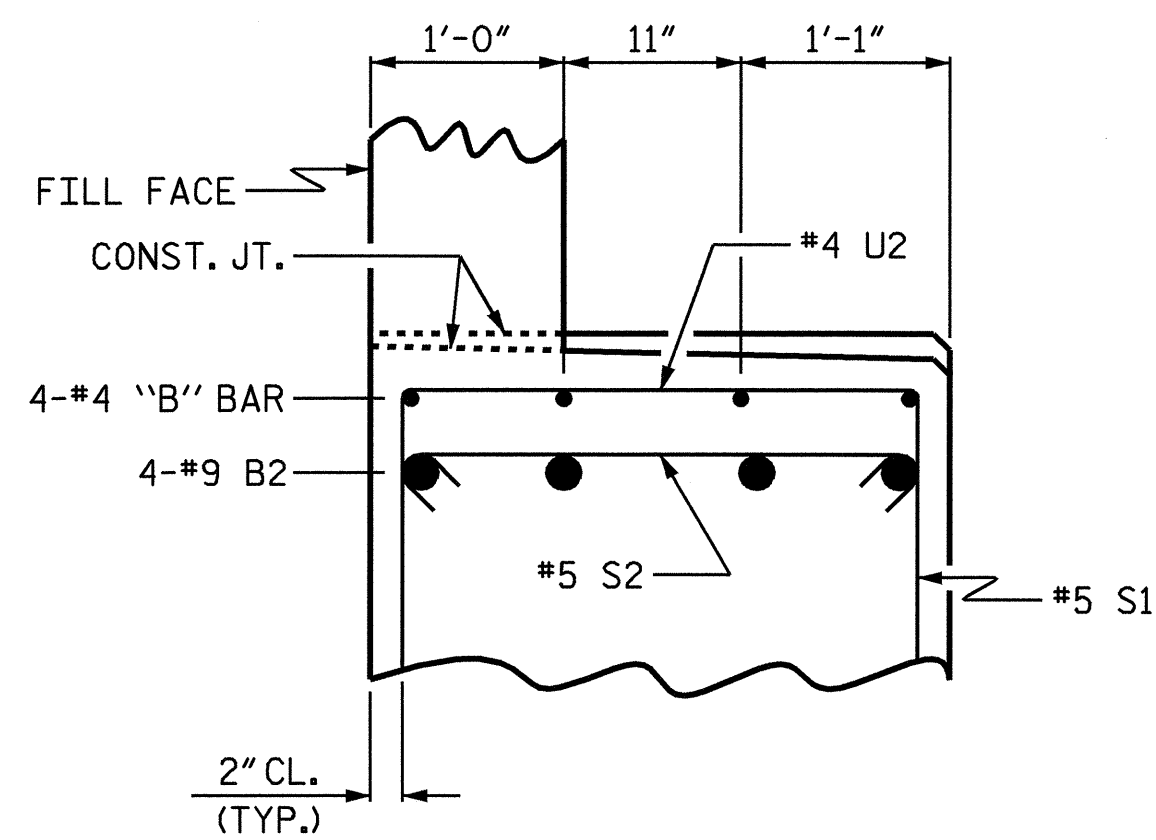


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

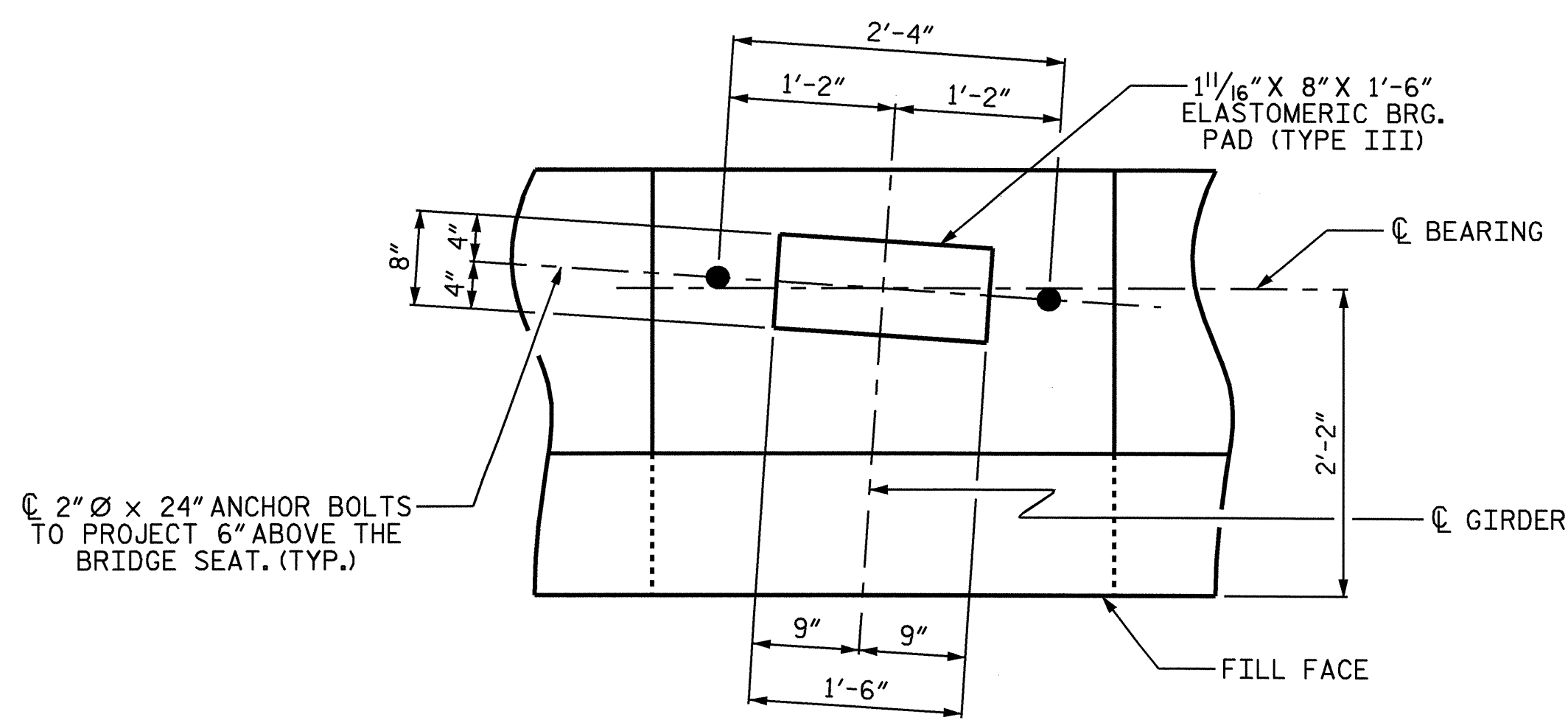
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

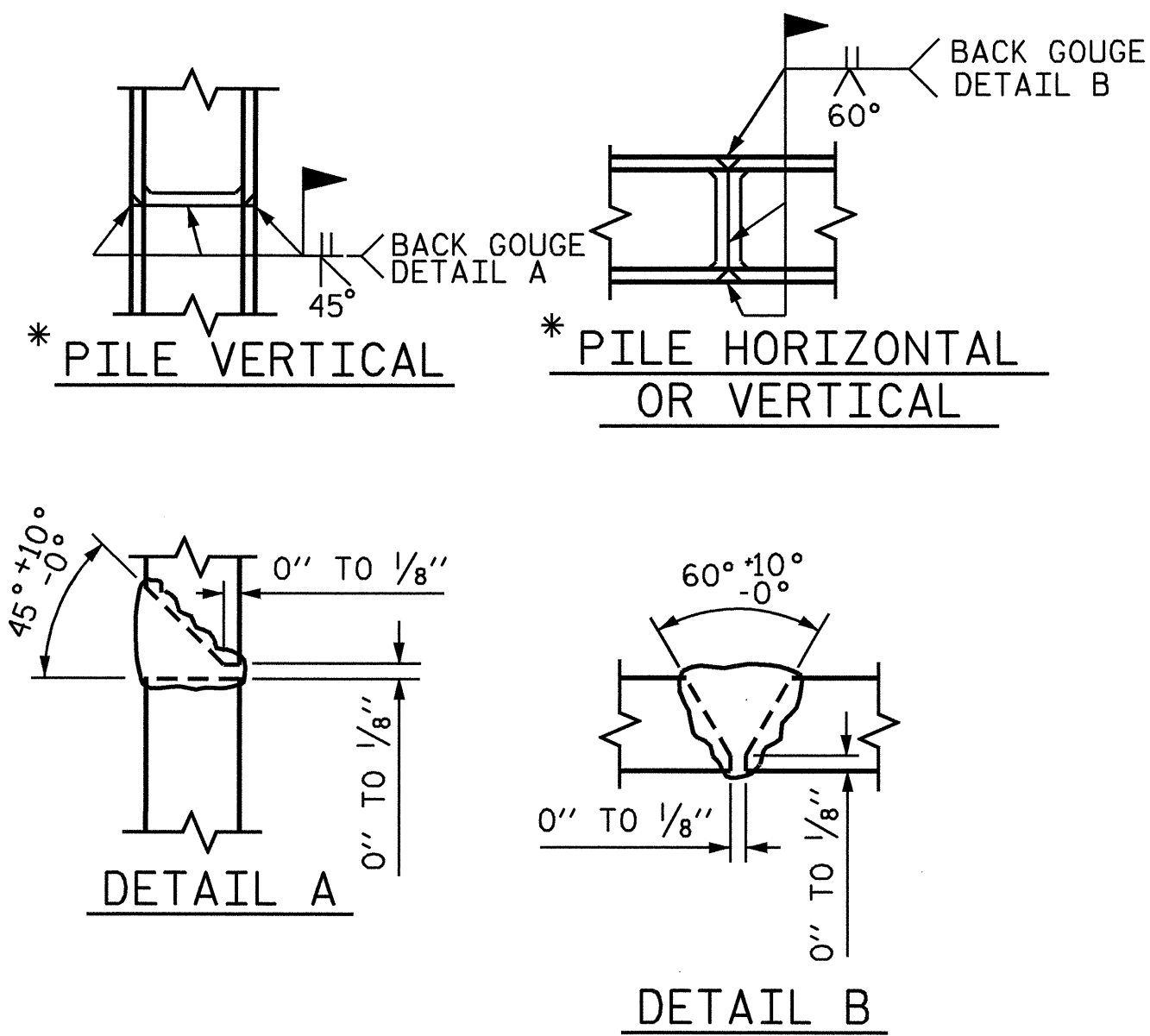
### TEMPORARY DRAINAGE AT END BENT



PARTIAL SECTION B-B

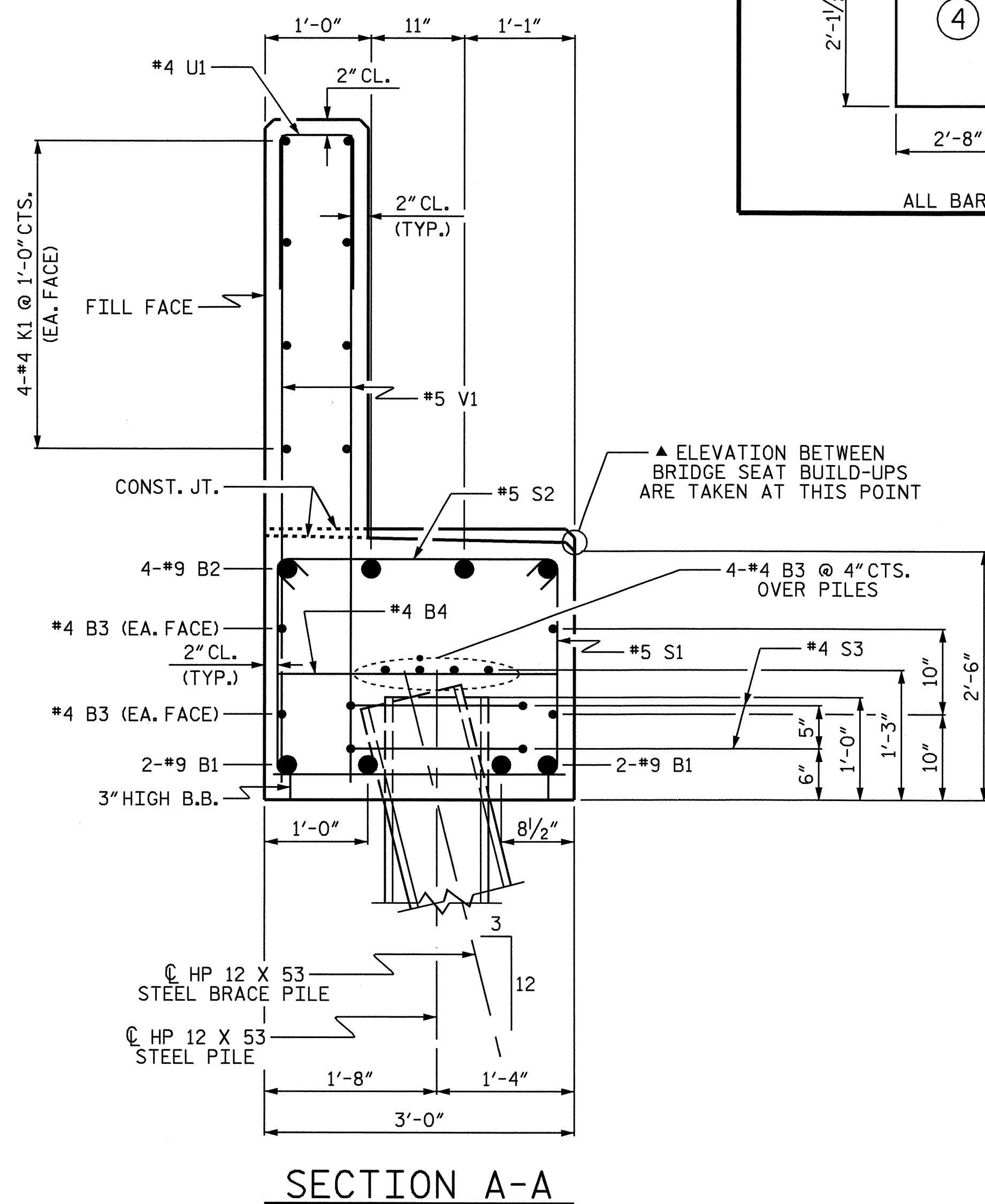


DETAIL "A"  
(TYP. EA. GIRDER)

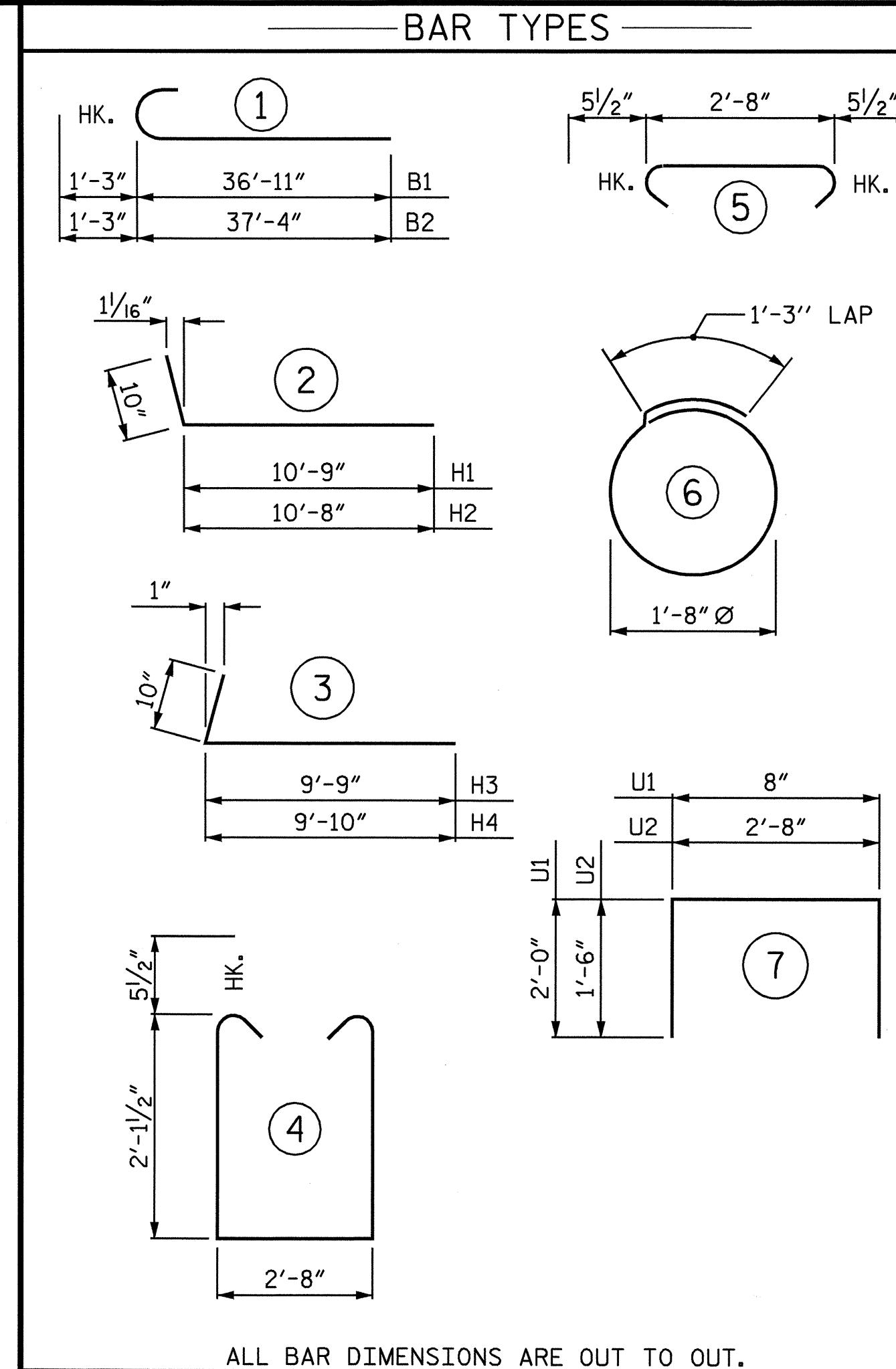


\* POSITION OF PILE DURING WELDING.

### PILE SPLICE DETAILS



SECTION A-A



### BILL OF MATERIAL

#### END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-2"	1038
B2	8	#9	1	38'-7"	1049
B3	24	#4	STR	24'-2"	387
B4	17	#4	STR	2'-8"	30
B5	4	#4	STR	7'-5"	20
B6	28	#4	STR	2'-11"	55
H1	11	#5	2	11'-7"	133
H2	11	#5	2	11'-6"	132
H3	9	#5	3	10'-7"	99
H4	9	#5	3	10'-8"	100
K1	24	#4	STR	24'-2"	387
K2	10	#4	STR	3'-10"	26
S1	121	#5	4	7'-10"	989
S2	121	#5	5	3'-7"	452
S3	16	#4	6	6'-6"	69
U1	60	#4	7	4'-8"	187
U2	28	#4	7	5'-8"	106
V1	120	#5	STR	6'-2"	772
V2	32	#5	STR	8'-6"	284
V3	32	#5	STR	7'-9"	259

REINFORCING STEEL 6574 LBS.

#### CLASS A CONCRETE

POUR #1 (CAP & LOWER WING)	22.7 C.Y.
POUR #2 (UPPER WING & BACKWALL)	14.3 C.Y.
TOTAL =	37.0 C.Y.

#### HP 12 X 53 STEEL PILES

No. = 8 240 LIN. FT.

PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

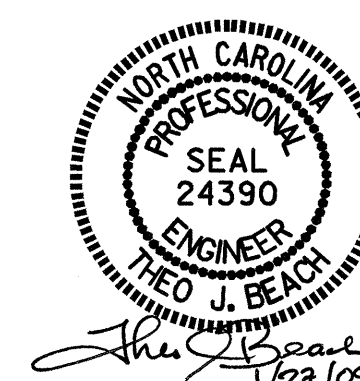
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE

### END BENT No. 1

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

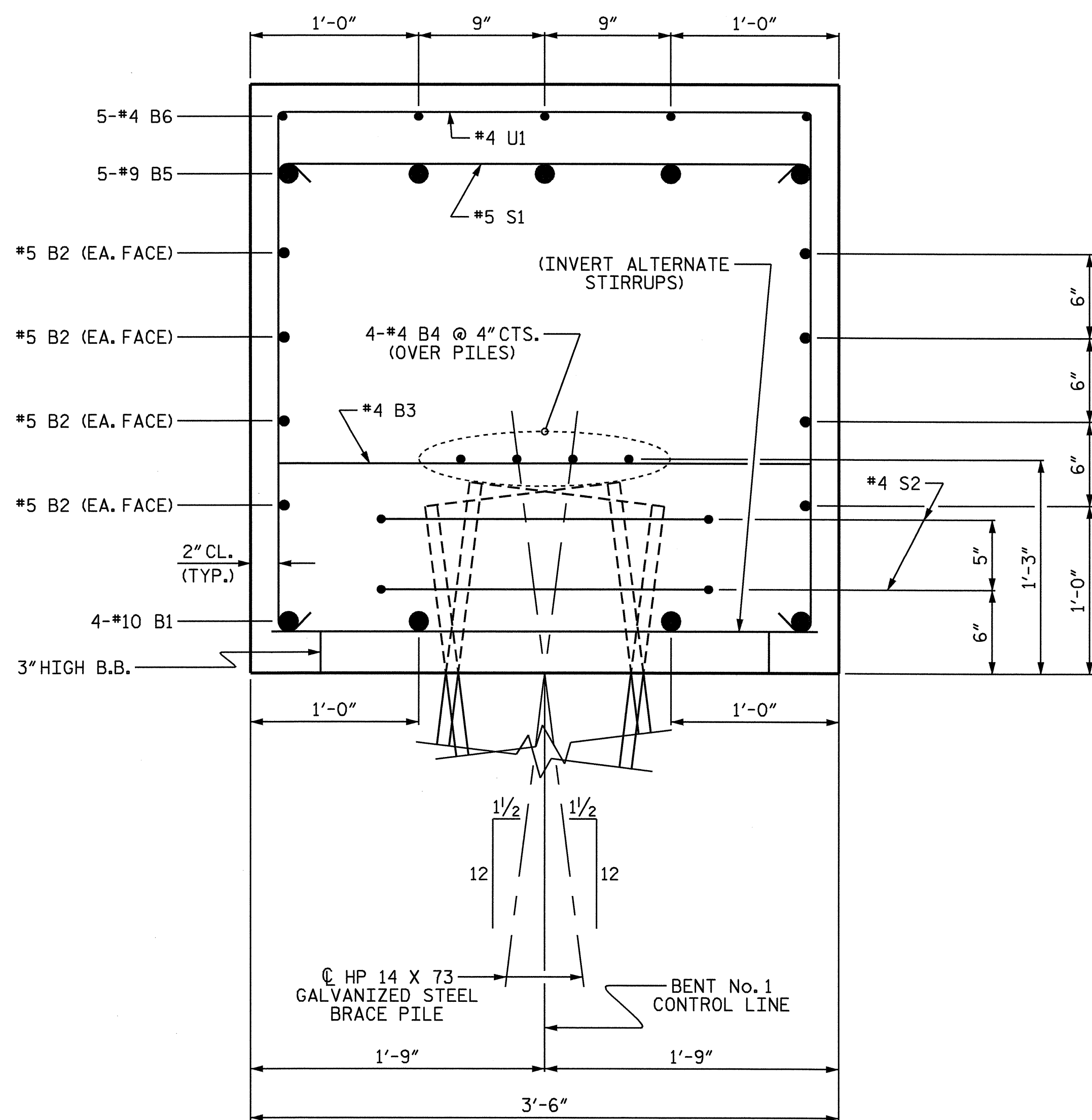
TOTAL SHEETS 45



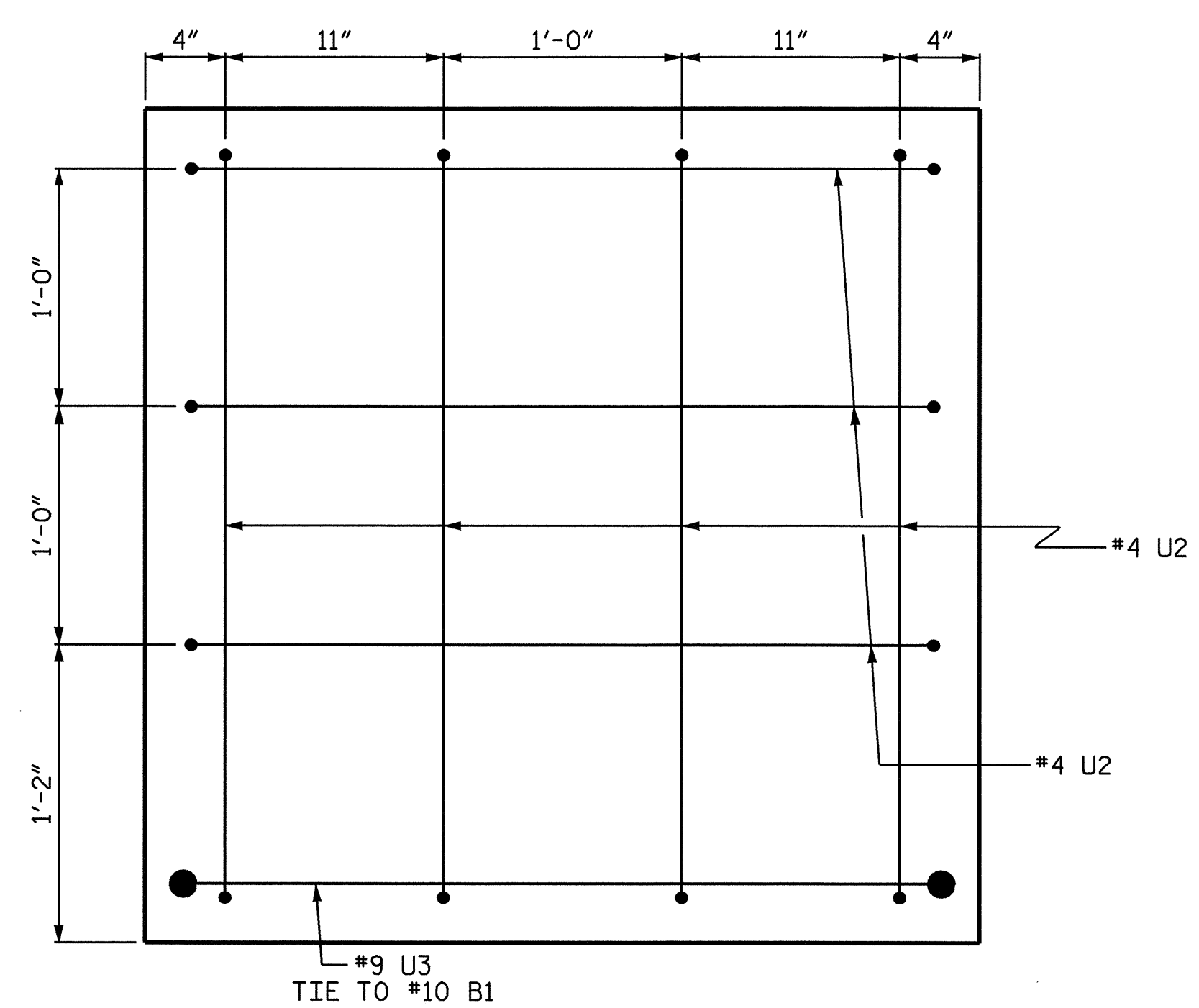
DRAWN BY: T. BANKOVICH DATE: 5-2008  
CHECKED BY: M.L. BROWN DATE: 7-2008



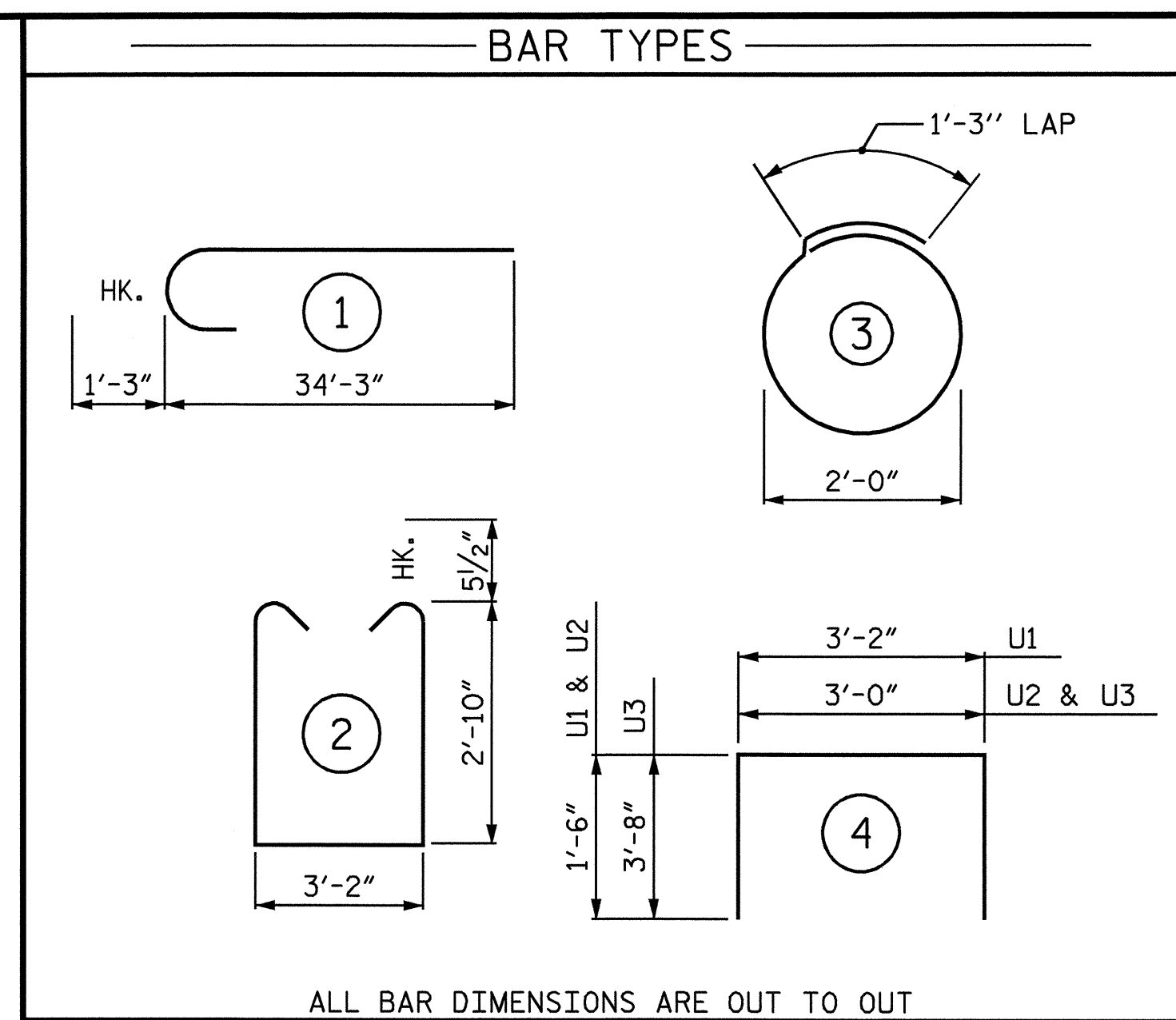




SECTION A-A

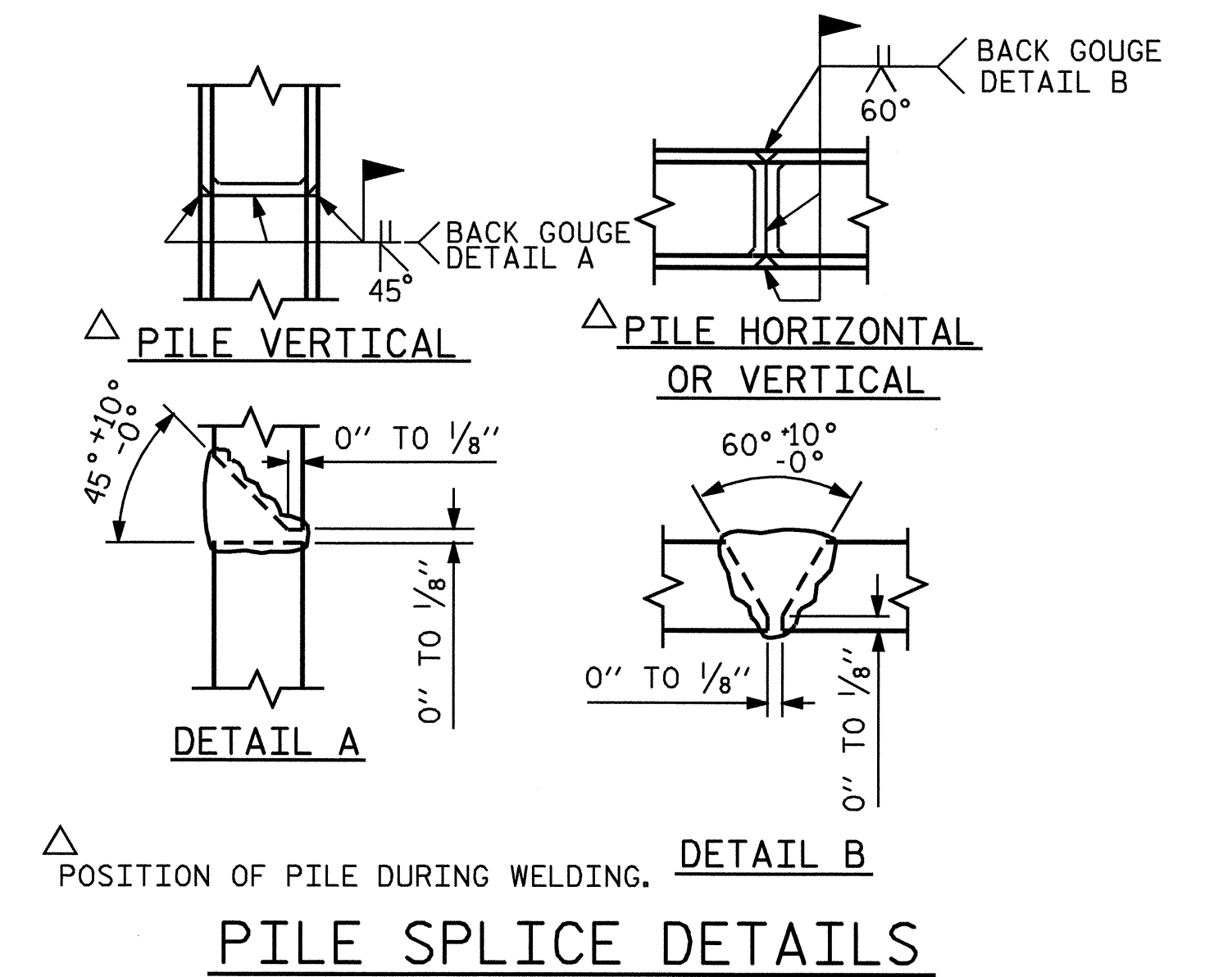


SECTION X-X  
(TYP. EA. END)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR	33'-10"	1165
B2	16	#5	STR	31'-4"	523
B3	15	#4	STR	3'-2"	32
B4	12	#4	STR	21'-7"	173
B5	10	#9	1	35'-6"	1207
B6	5	#4	STR	5'-3"	18
B7	30	#4	STR	7'-10"	157
B8	5	#4	STR	3'-5"	11
S1	58	#5	2	9'-9"	590
S2	16	#4	3	7'-7"	81
U1	75	#4	4	6'-2"	309
U2	14	#4	4	6'-0"	56
U3	2	#9	4	10'-4"	70
REINFORCING STEEL					4392 LBS.
CLASS A CONCRETE					
POUR #1 (CAP)				26.7 C.Y.	
TOTAL =				26.7 C.Y.	
HP 14 X 73 GALVANIZED STEEL PILES					
No. = 8				220 LIN. FT.	



PILE SPLICE DETAILS

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-33
TOTAL SHEETS					45

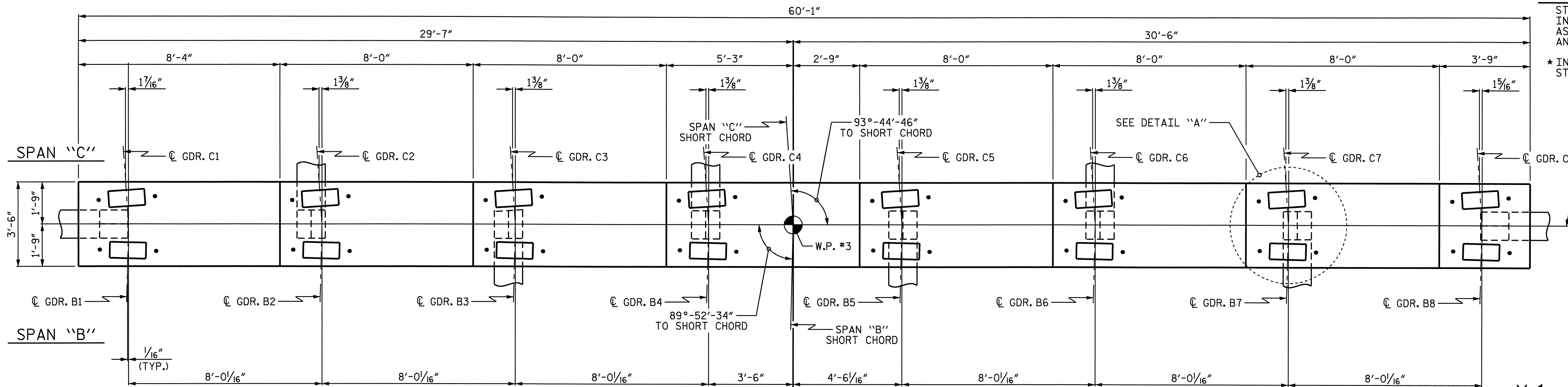


DRAWN BY: T. BANKOVICH DATE: 1-2009  
 CHECKED BY: T. BEACH DATE: 1-2009

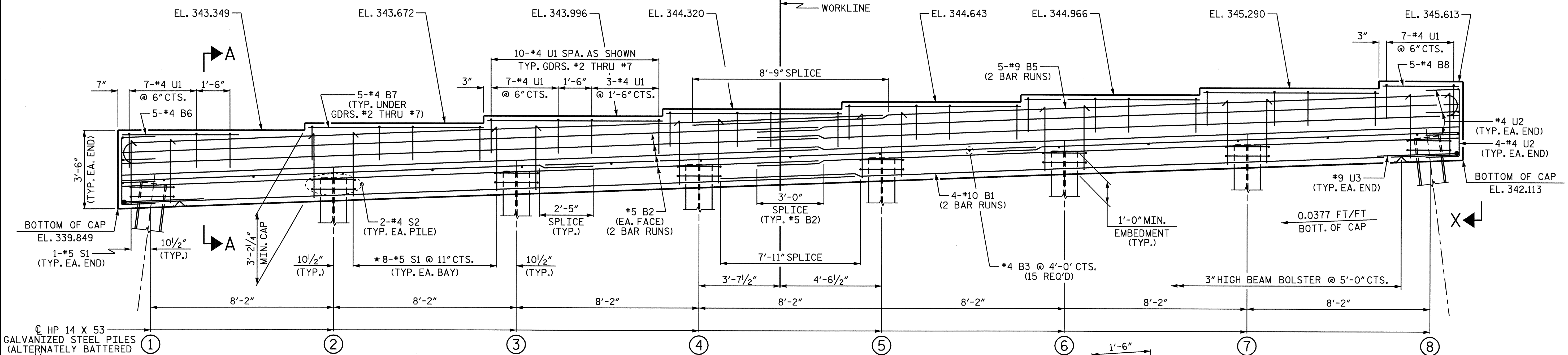
**NOTES:**

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

\* INVERT ALTERNATE STIRRUPS AS SHOWN



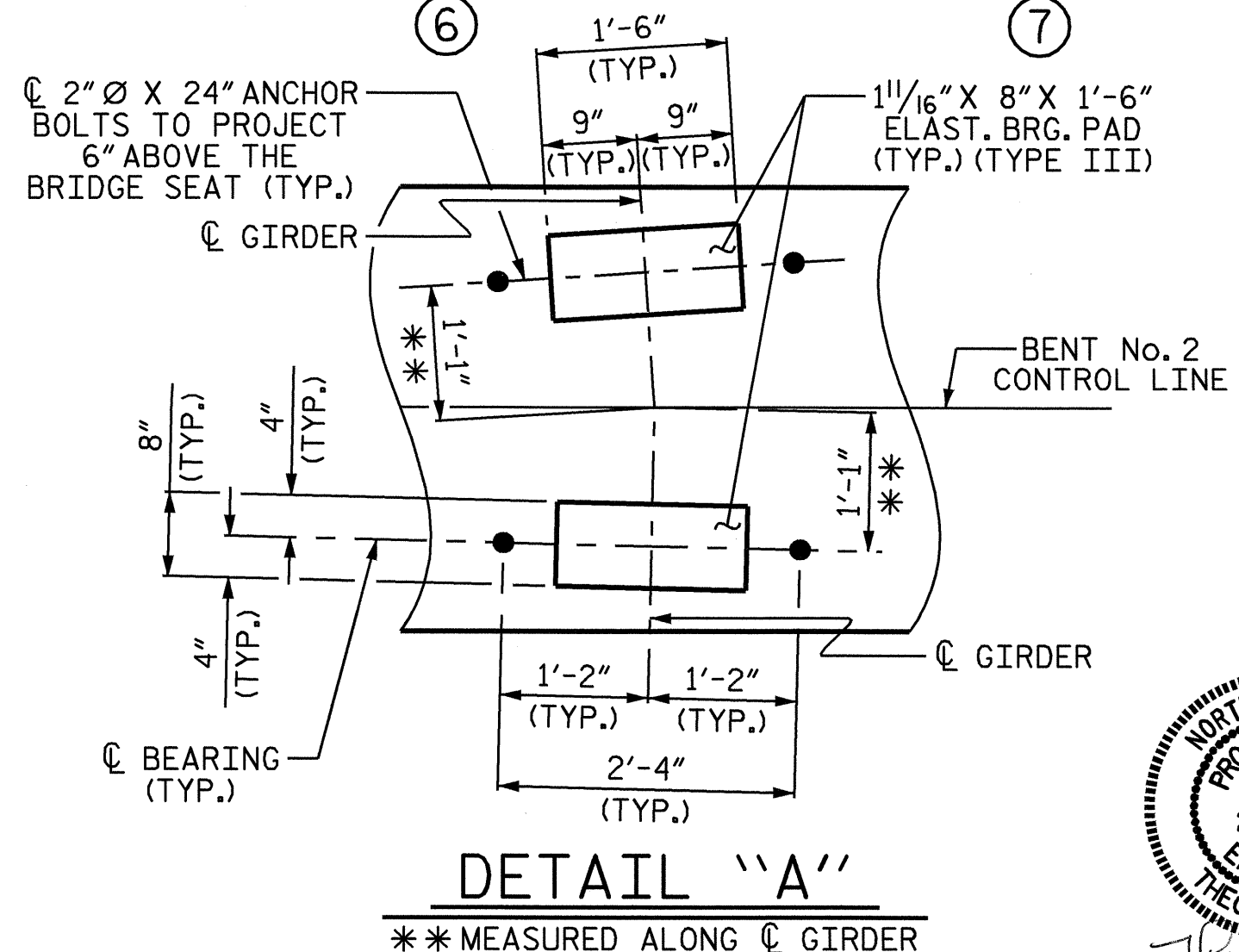
**PLAN**



**ELEVATION**

HP 14 X 53 GALVANIZED STEEL PILES (ALTERNATELY BATTERED 1/2:1 AS SHOWN)

TOP OF PILE ELEVATION	
① 340.926	⑤ 342.158
② 341.234	⑥ 342.466
③ 341.542	⑦ 342.774
④ 341.850	⑧ 343.082



**DETAIL "A"**

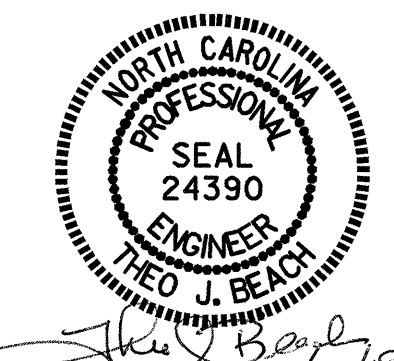
PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

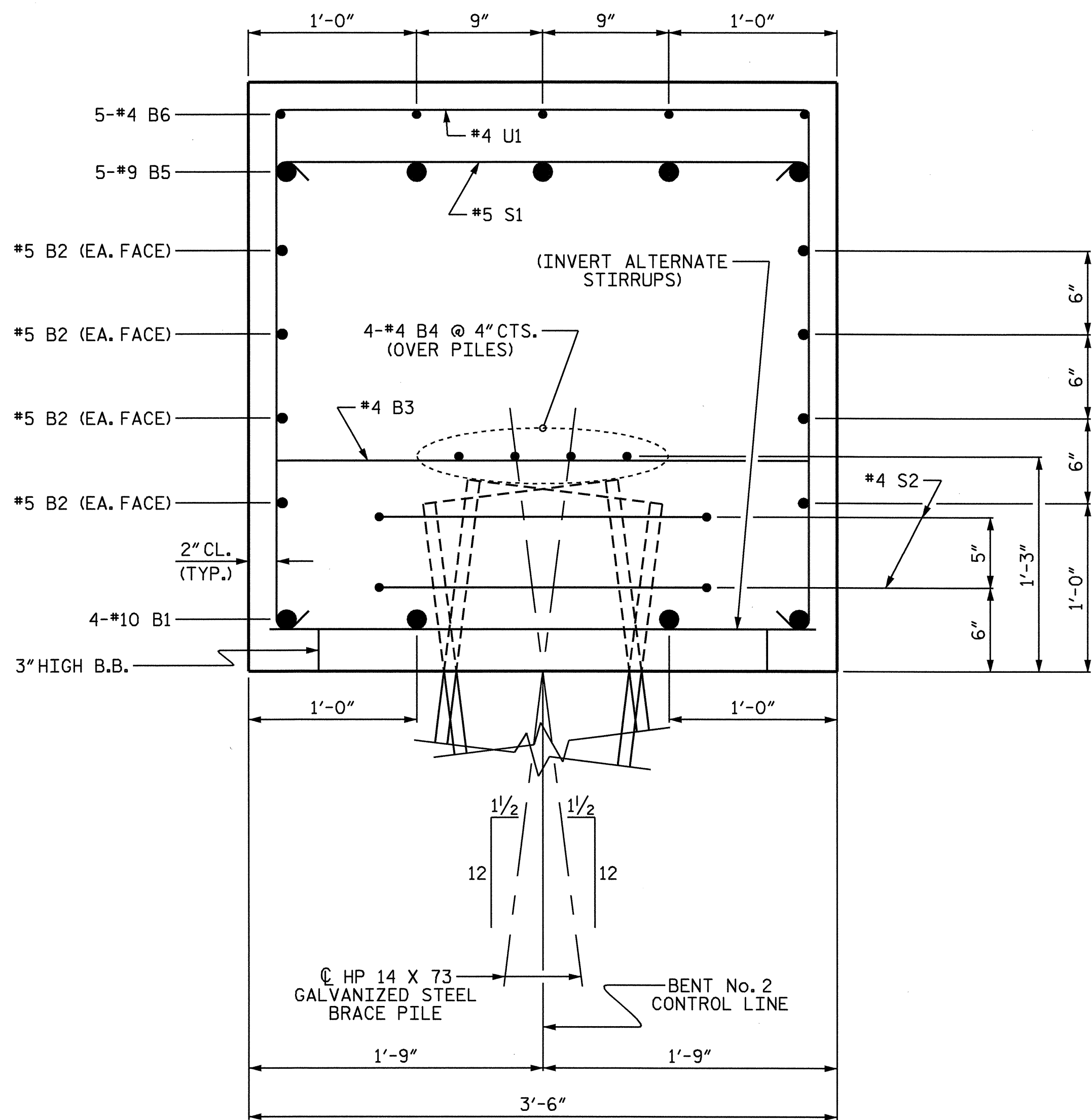
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT No. 2

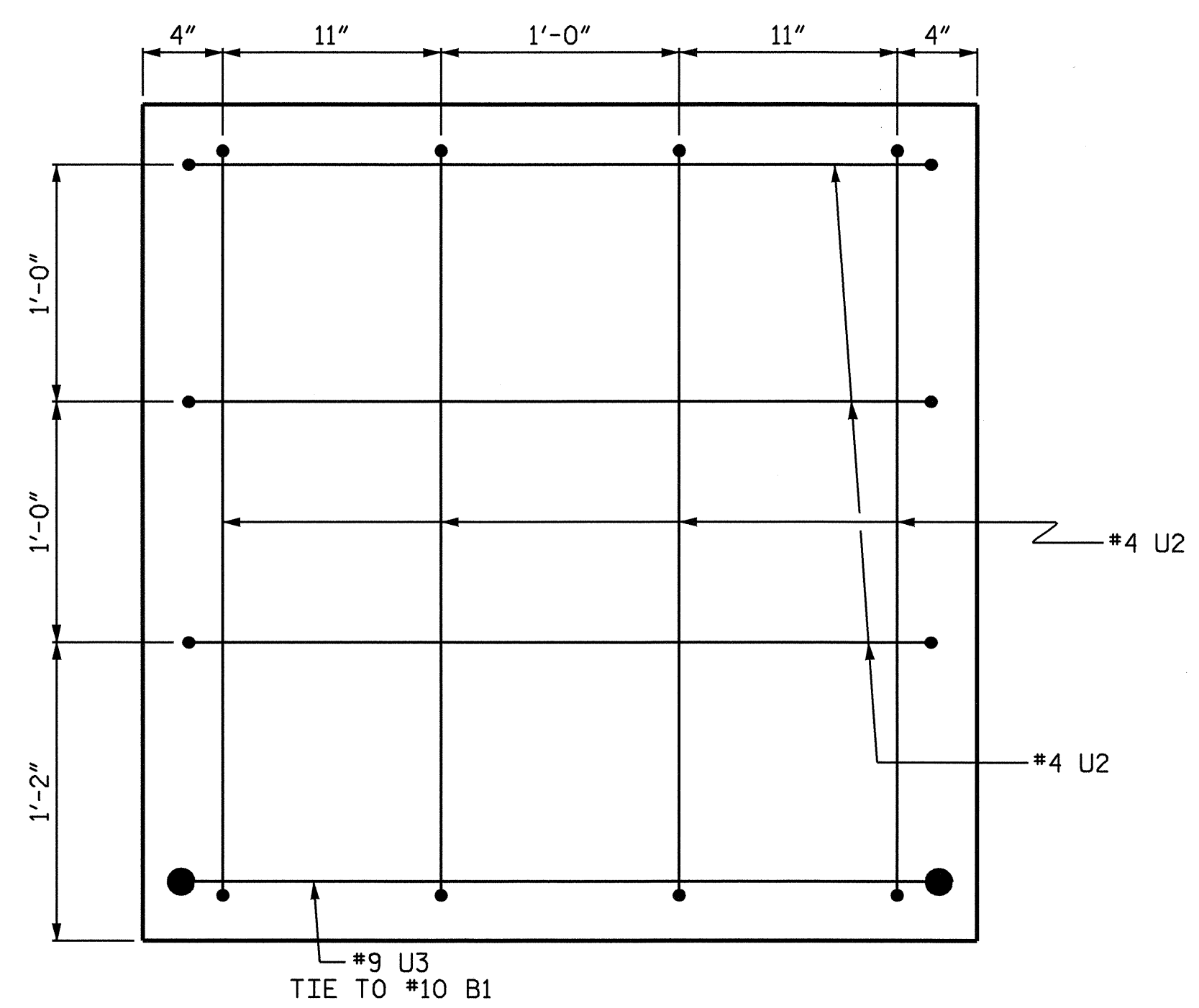
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS	45
2			4				

DRAWN BY: T. BANKOVICH DATE: 1-2009  
 CHECKED BY: T. BEACH DATE: 1-2009

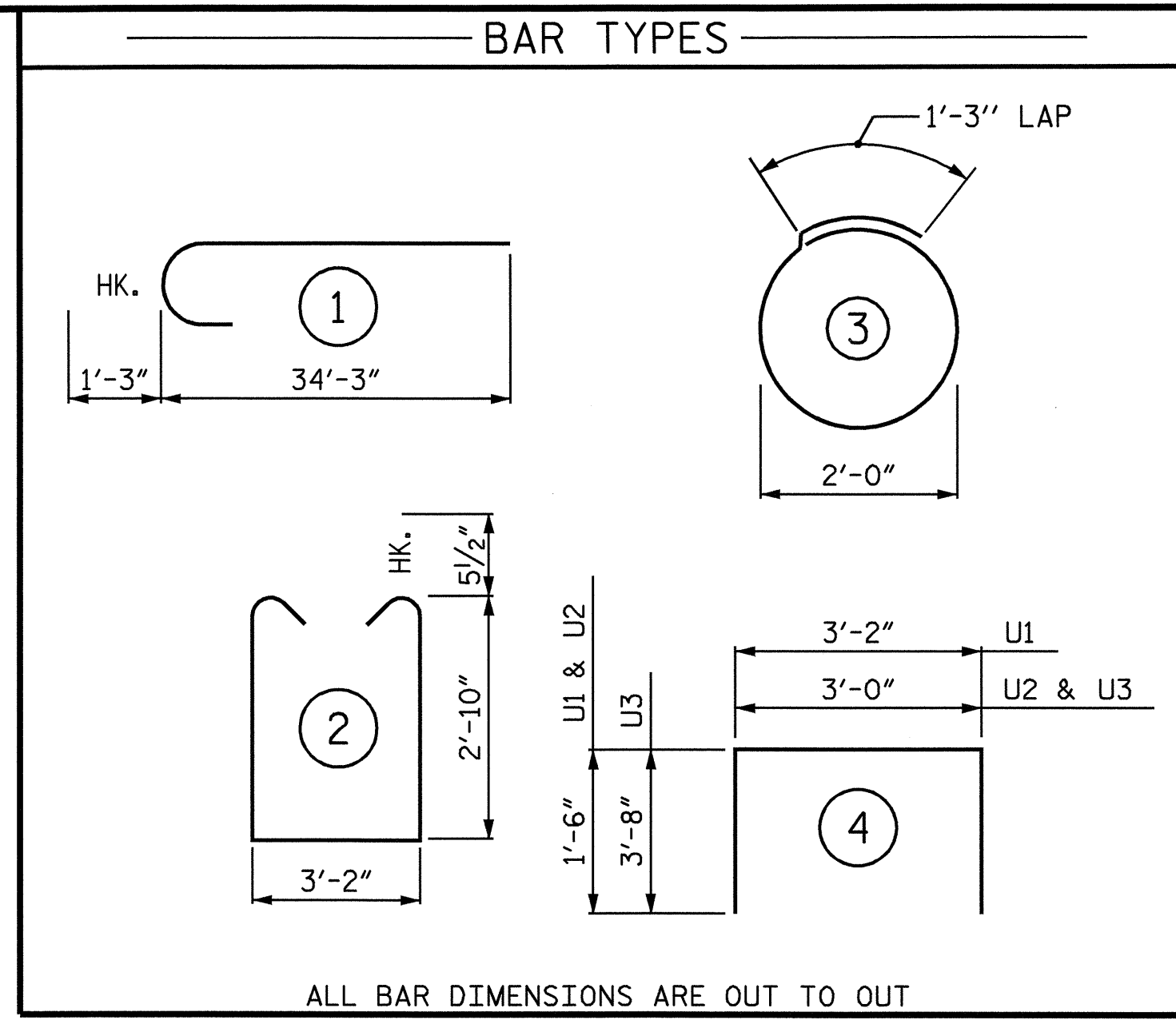




SECTION A-A

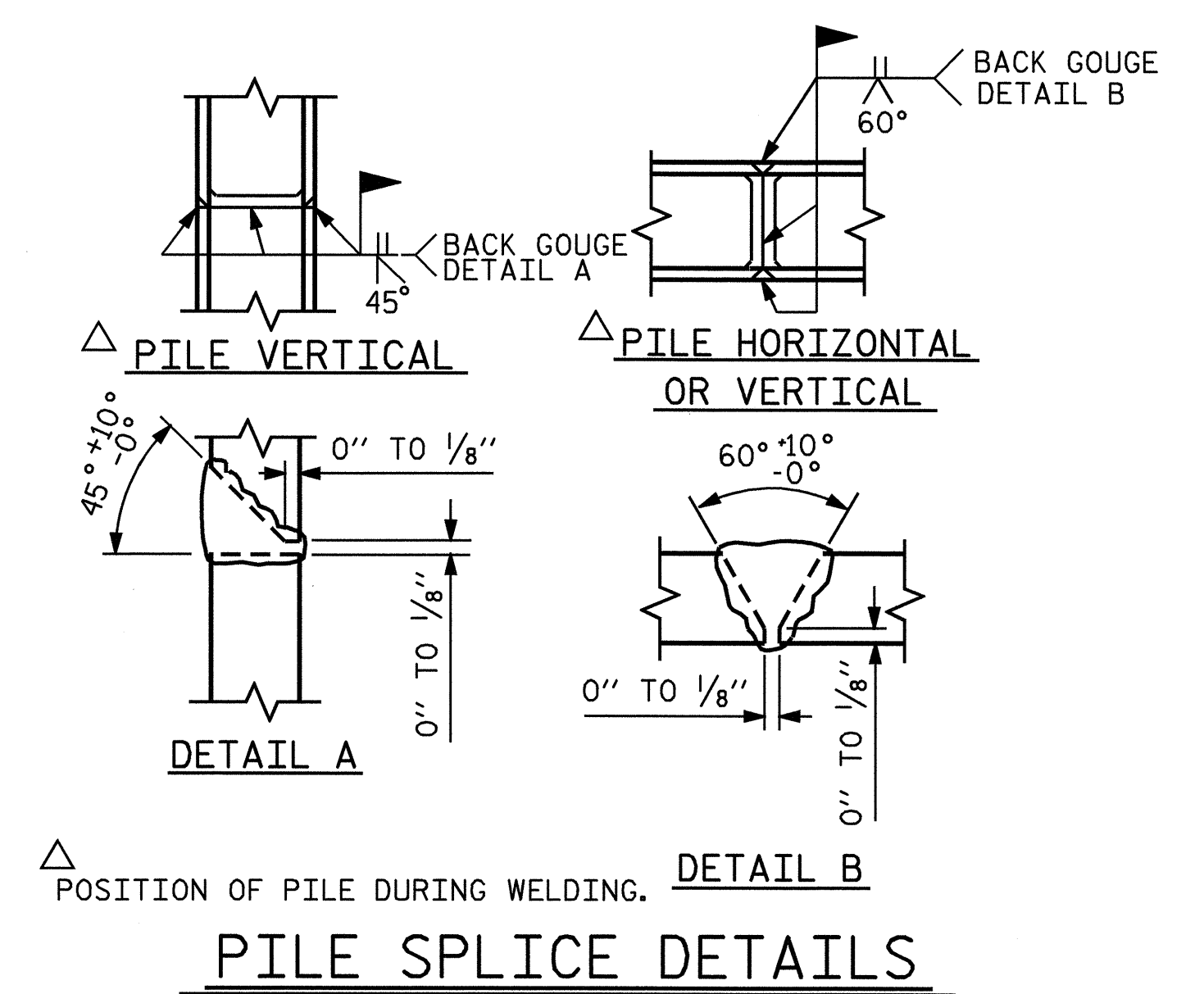


SECTION X-X  
(TYP. EA. END)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	STR	33'-10"	1165
B2	16	#5	STR	31'-4"	523
B3	15	#4	STR	3'-2"	32
B4	12	#4	STR	21'-7"	173
B5	10	#9	1	35'-6"	1207
B6	5	#4	STR	5'-3"	18
B7	30	#4	STR	7'-10"	157
B8	5	#4	STR	3'-5"	11
S1	58	#5	2	9'-9"	590
S2	16	#4	3	7'-7"	81
U1	75	#4	4	6'-2"	309
U2	14	#4	4	6'-0"	56
U3	2	#9	4	10'-4"	70
REINFORCING STEEL					4392 LBS.
CLASS A CONCRETE					
POUR #1 (CAP)					26.6 C.Y.
TOTAL =					26.6 C.Y.
HP 14 X 73 GALVANIZED STEEL PILES					
No. = 8					220 LIN. FT.



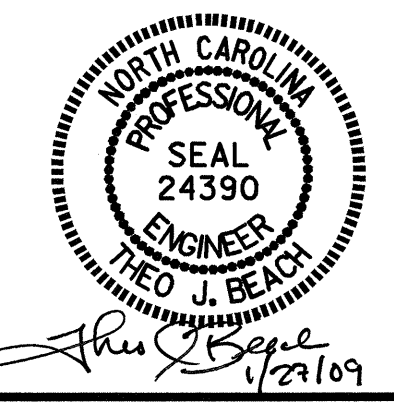
PILE SPLICE DETAILS

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

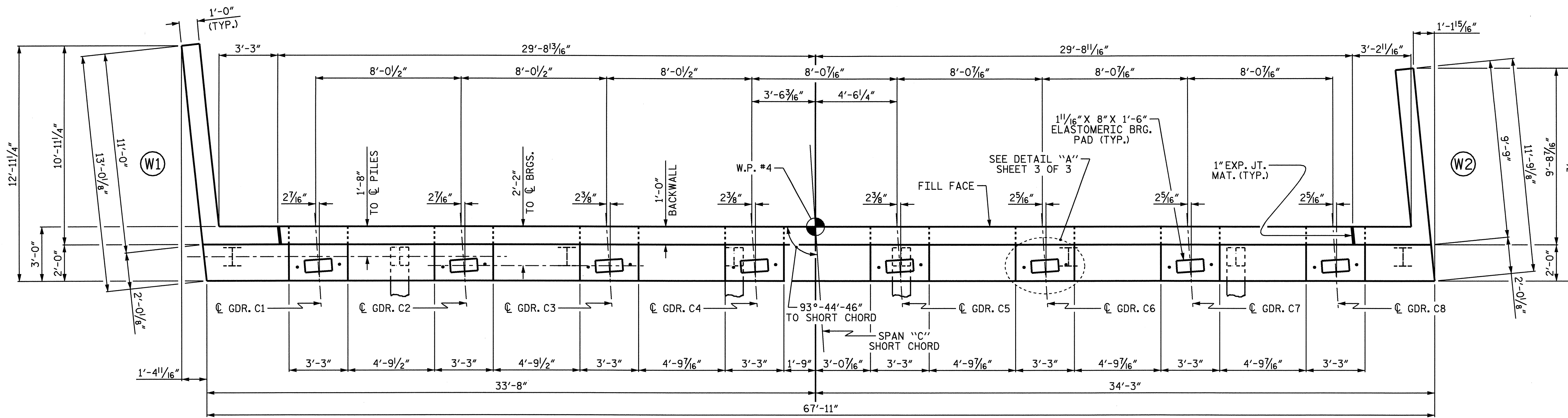
SHEET 2 OF 2

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

SHEET NO. S-35  
TOTAL SHEETS 45

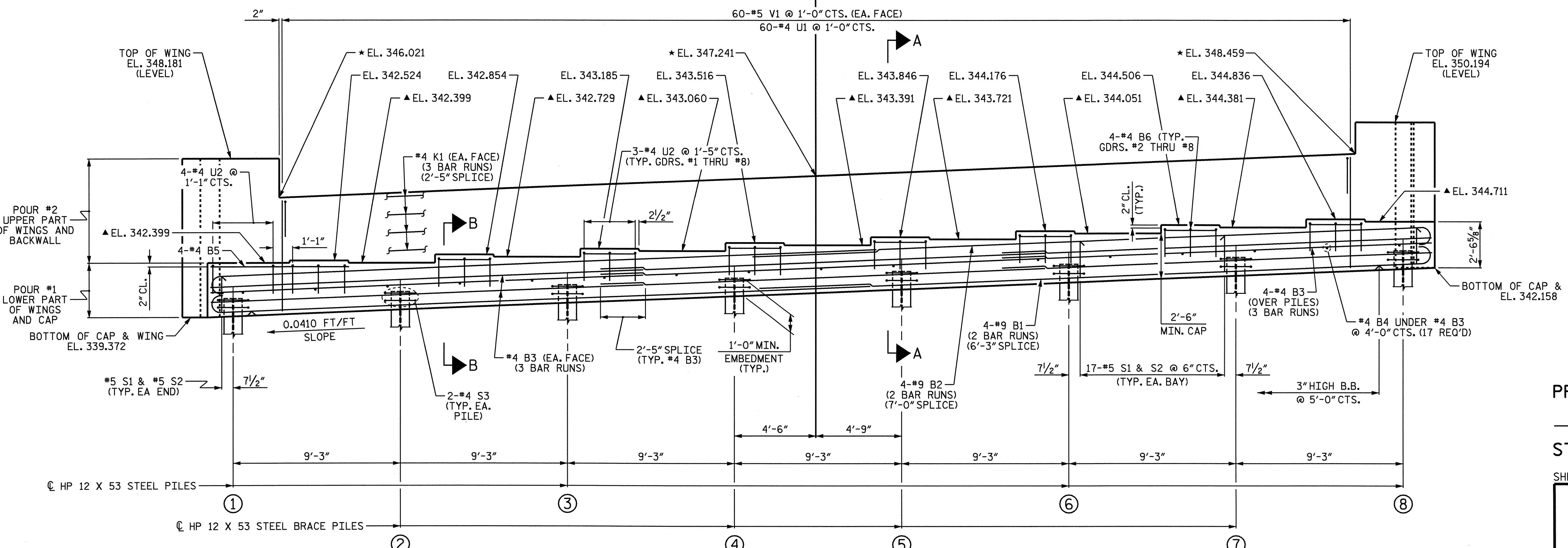


DRAWN BY: T. BANKOVICH DATE: 1-2009  
 CHECKED BY: T. BEACH DATE: 1-2009



PLAN

- NOTES:**
- ▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A ON SHEET 3 OF 3.
  - \*#5 V1 BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.
  - STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
  - 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.
  - BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
  - THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACKWALL AT THE RATE OF 2%.
  - \* THIS ELEVATION TAKEN AT FILL FACE OF BACKWALL.



ELEVATION

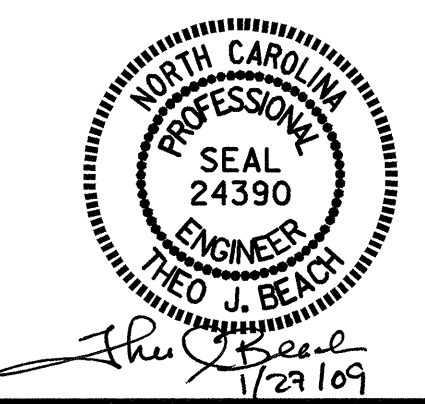
TOP OF PILE ELEVATIONS			
①	340.463	⑤	341.980
②	340.842	⑥	342.360
③	341.222	⑦	342.740
④	341.601	⑧	343.119

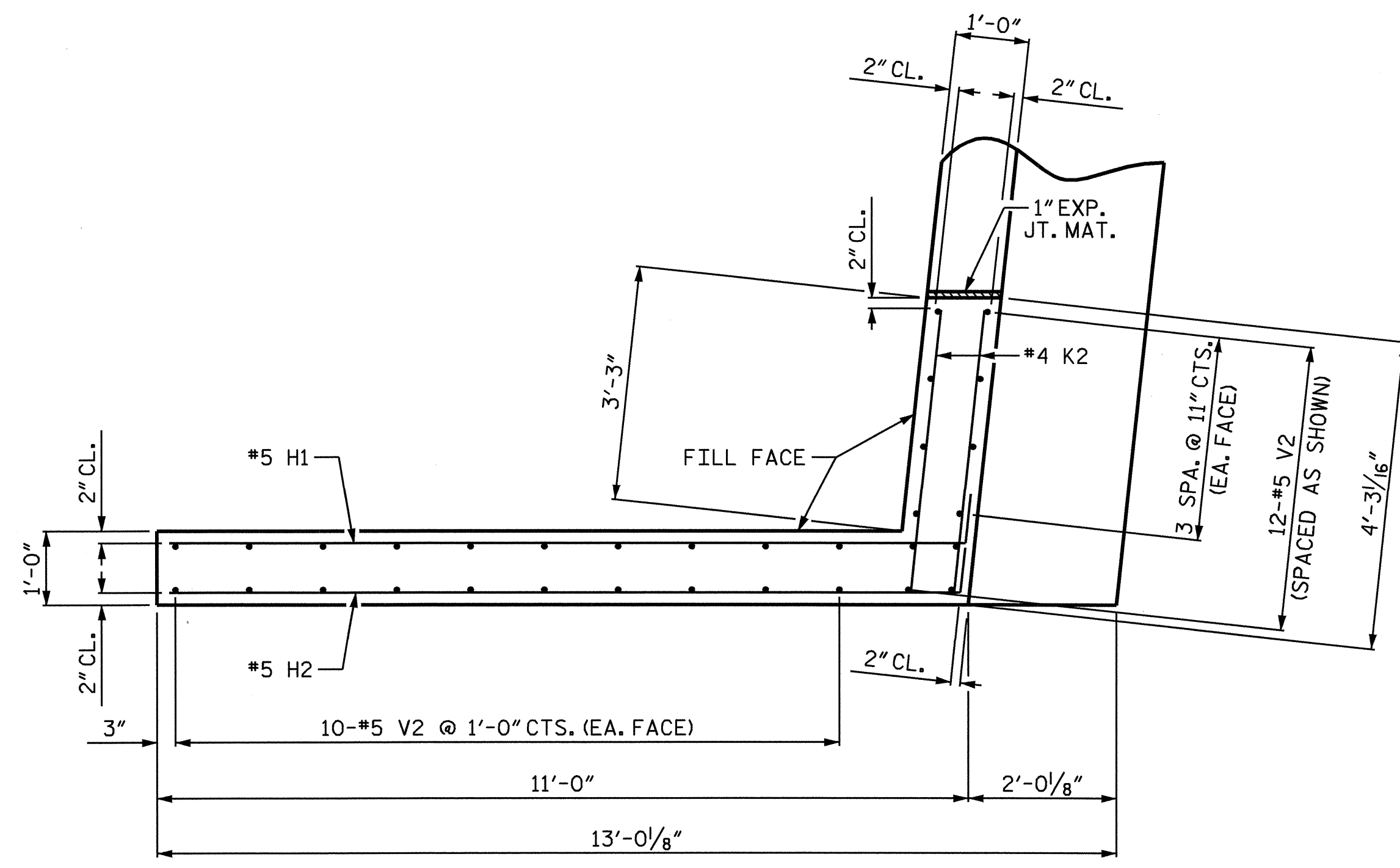
PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-  
 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT No. 2

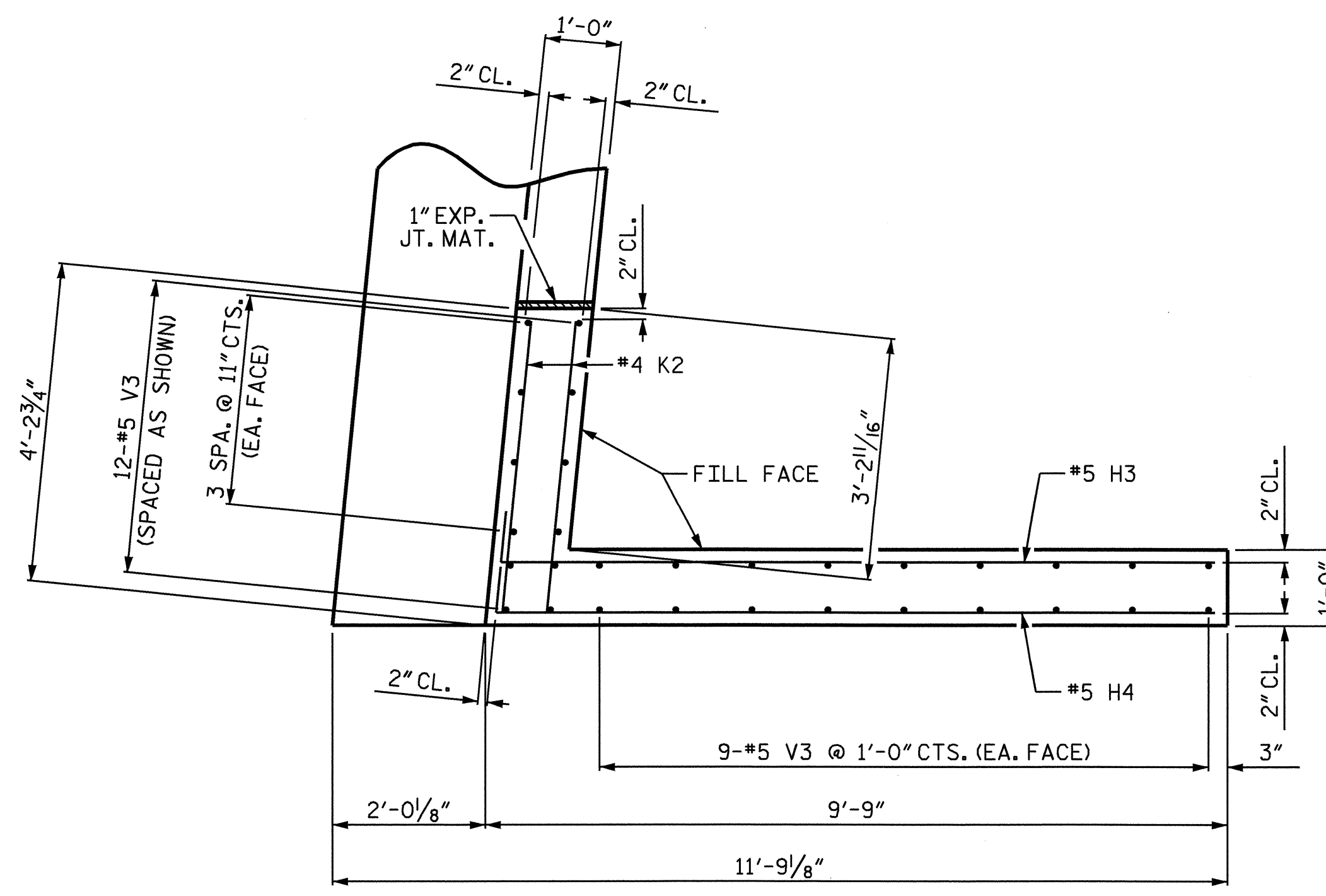
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36	
1			3			TOTAL SHEETS	
2			4			45	

DRAWN BY: T. BANKOVICH DATE: 5-2008  
 CHECKED BY: M.L. BROWN DATE: 7-2008

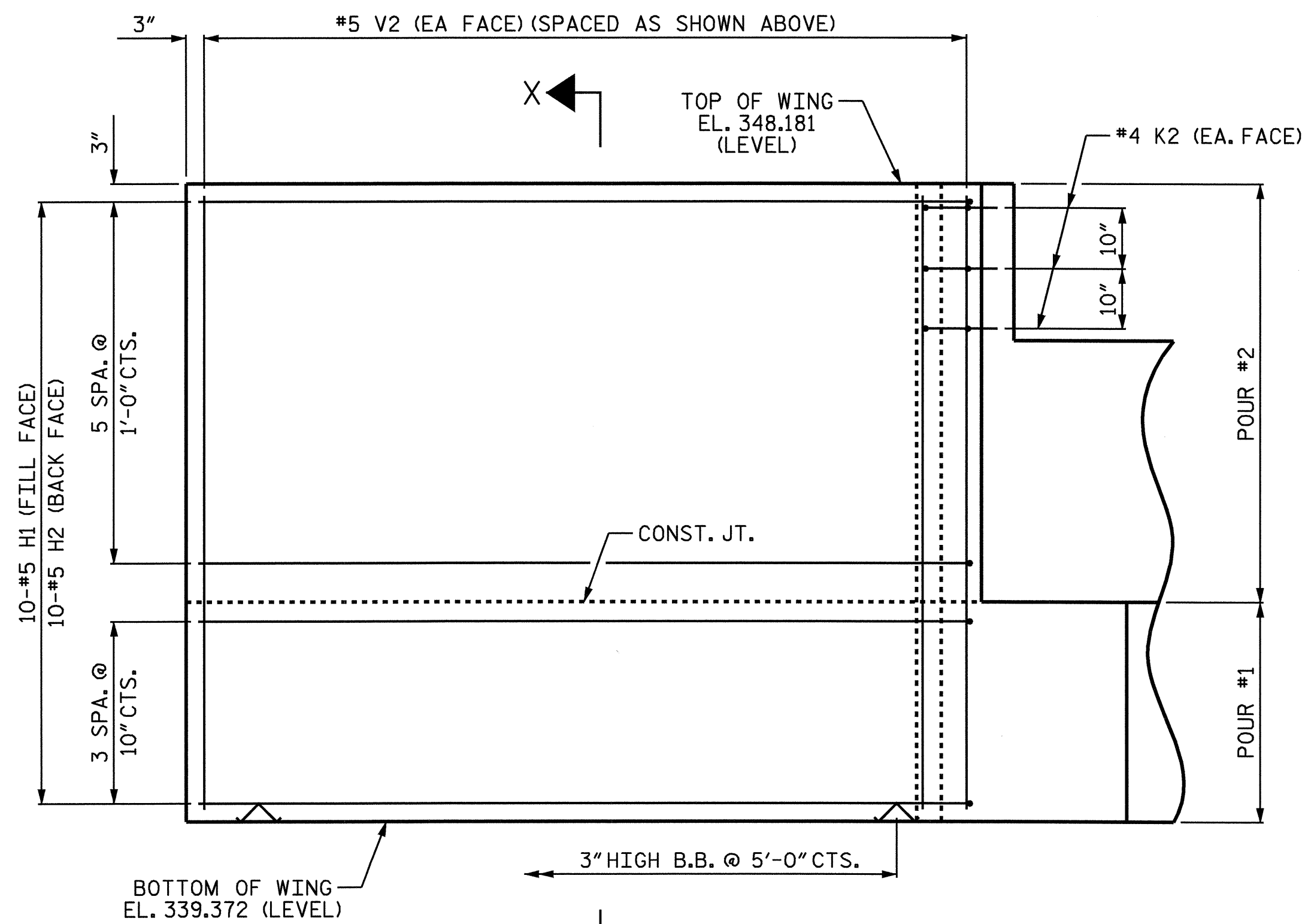




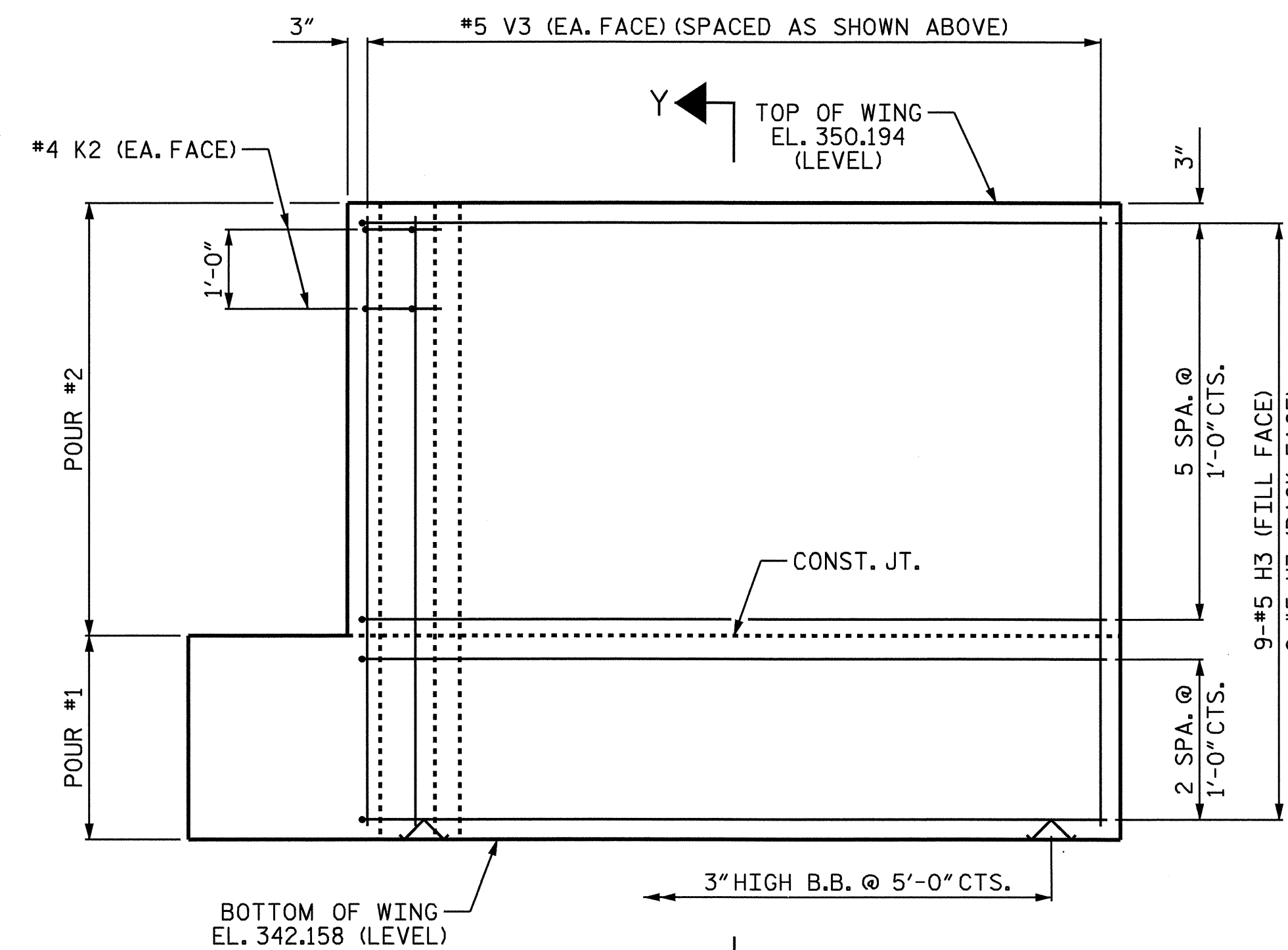
PLAN OF WING (W1)



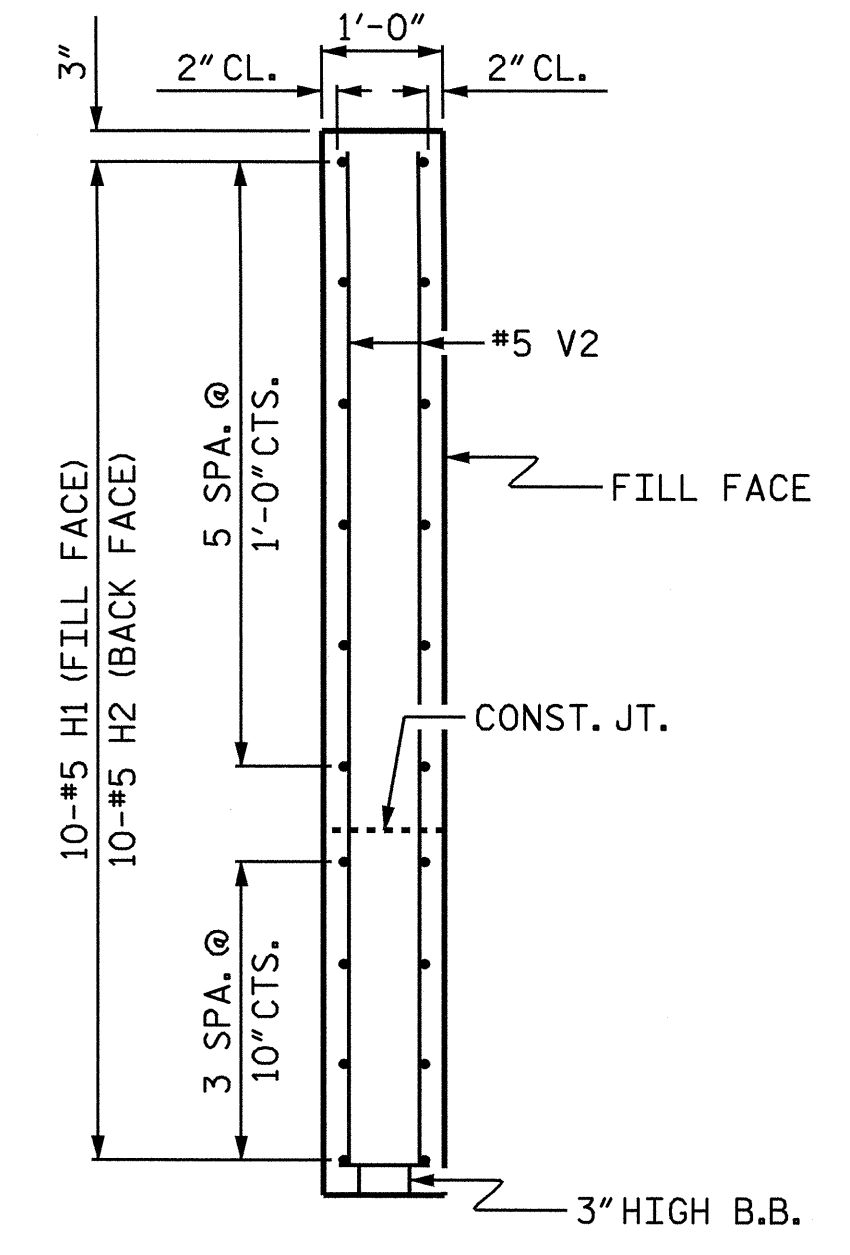
PLAN OF WING (W2)



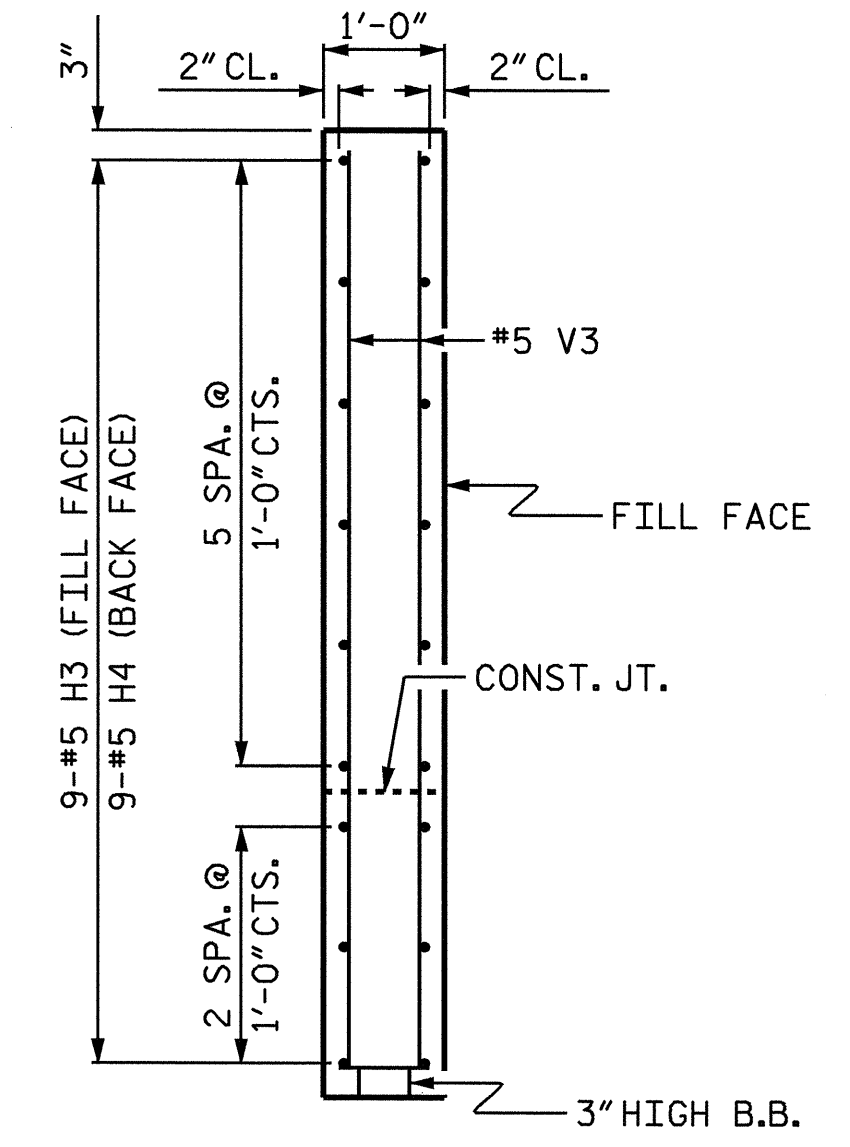
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

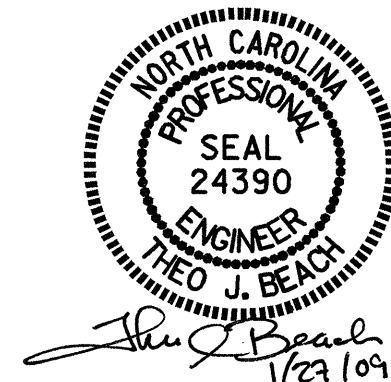


SECTION Y-Y

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

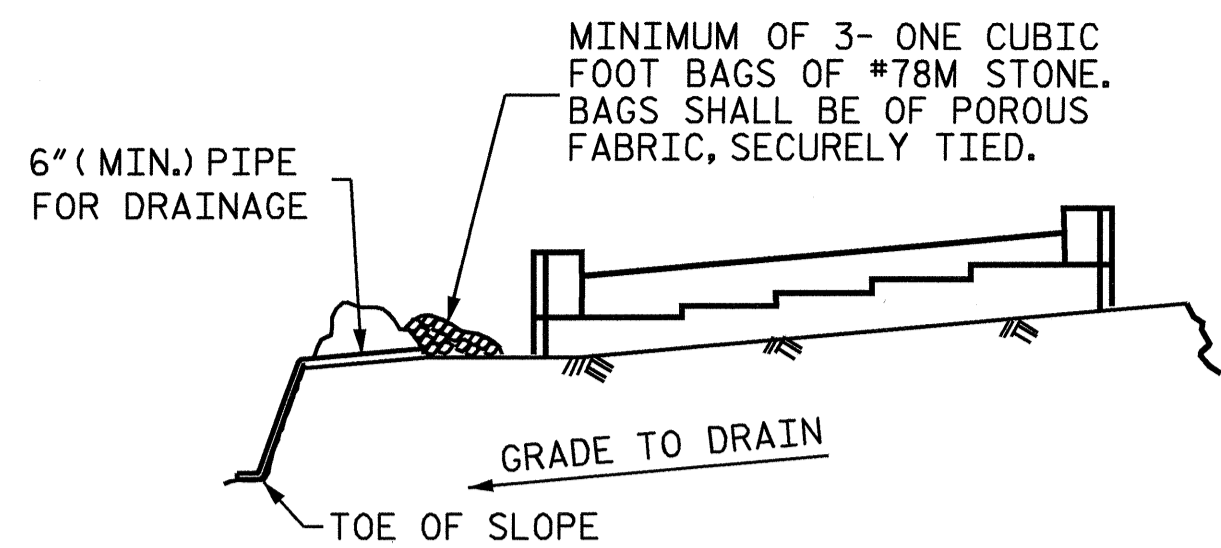
SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT No. 2



DRAWN BY: T. BANKOVICH DATE: 5-2008  
 CHECKED BY: M.L. BROWN DATE: 7-2008

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37	
1			3			TOTAL SHEETS	
2			4			45	

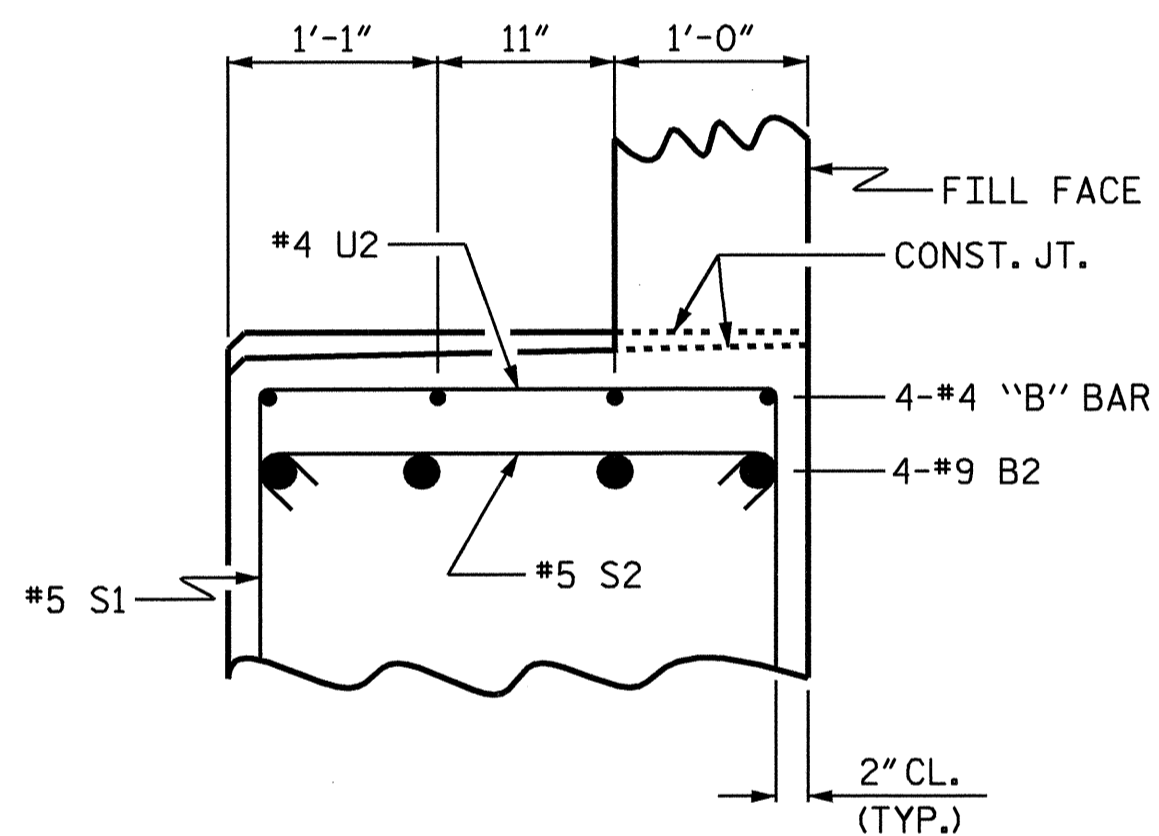


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

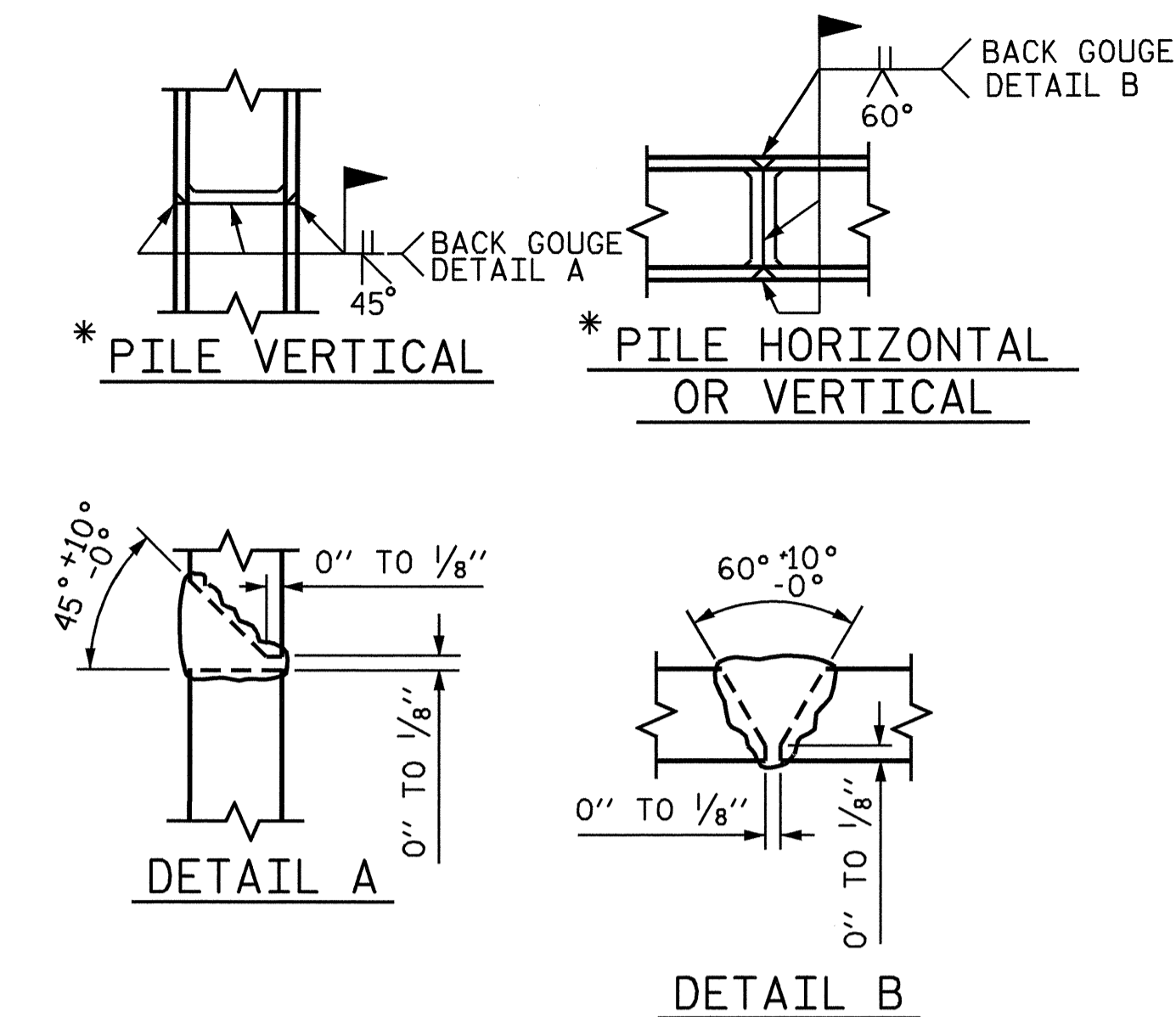
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT

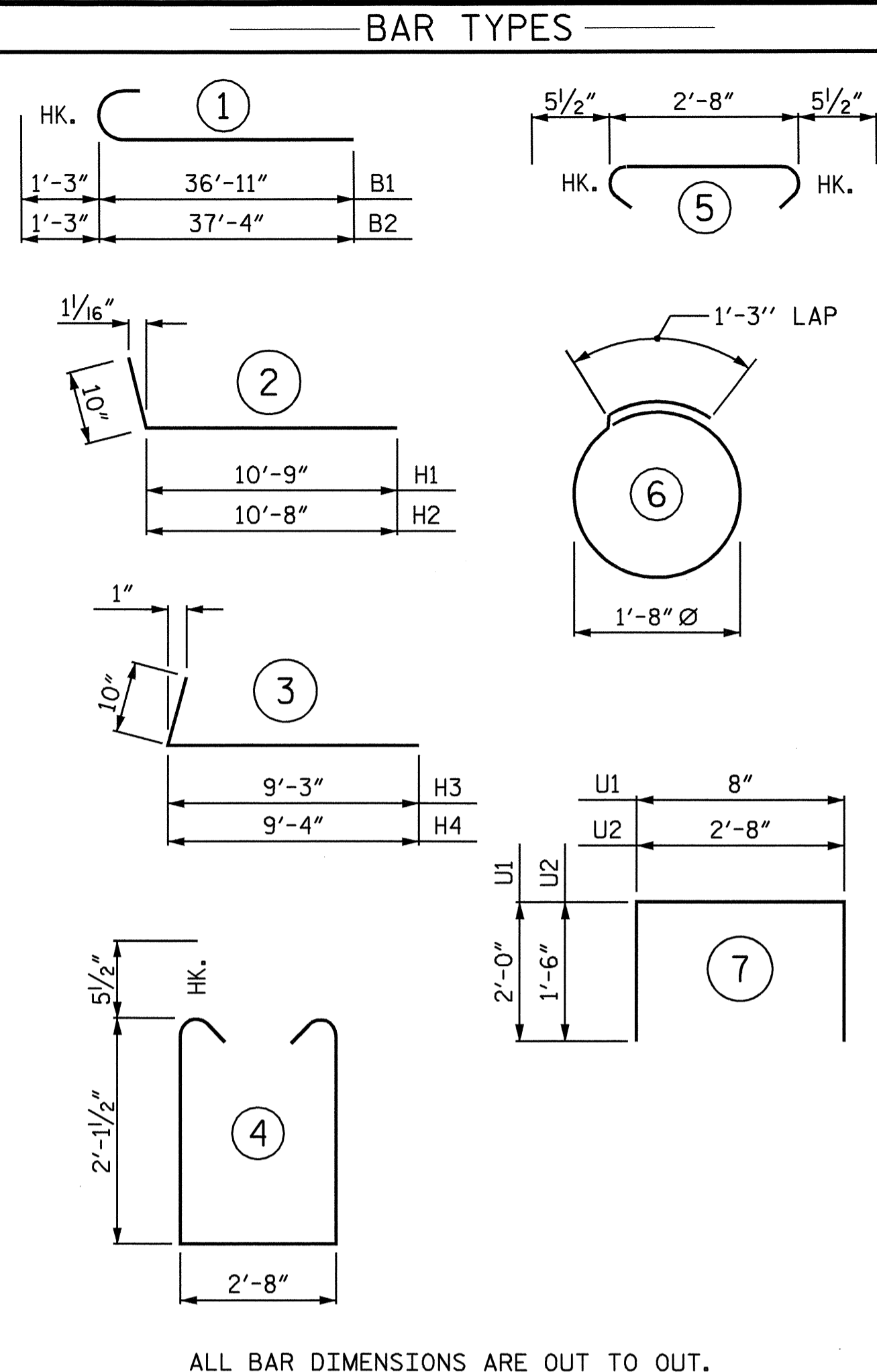


### PARTIAL SECTION B-B

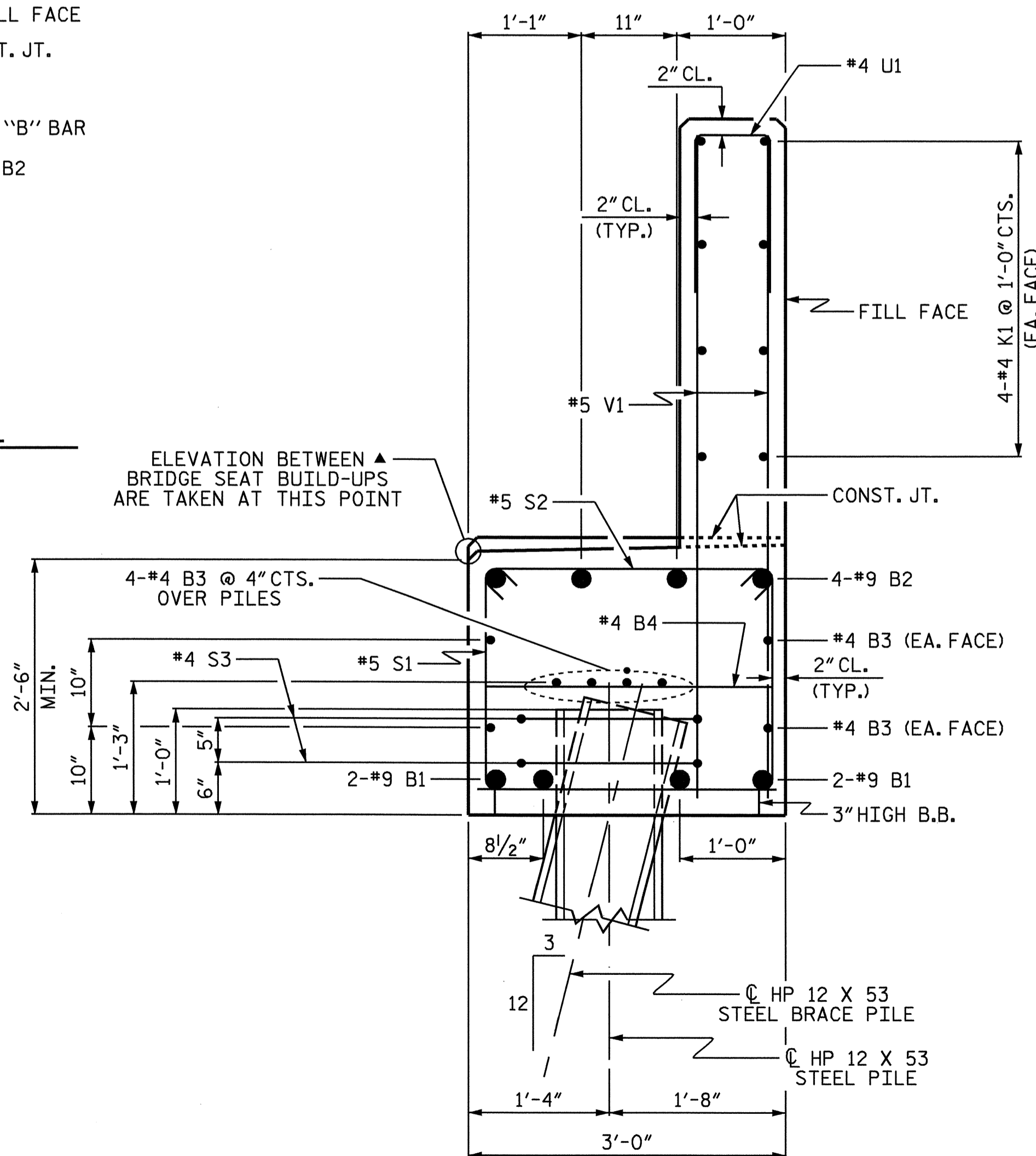


\* POSITION OF PILE DURING WELDING.

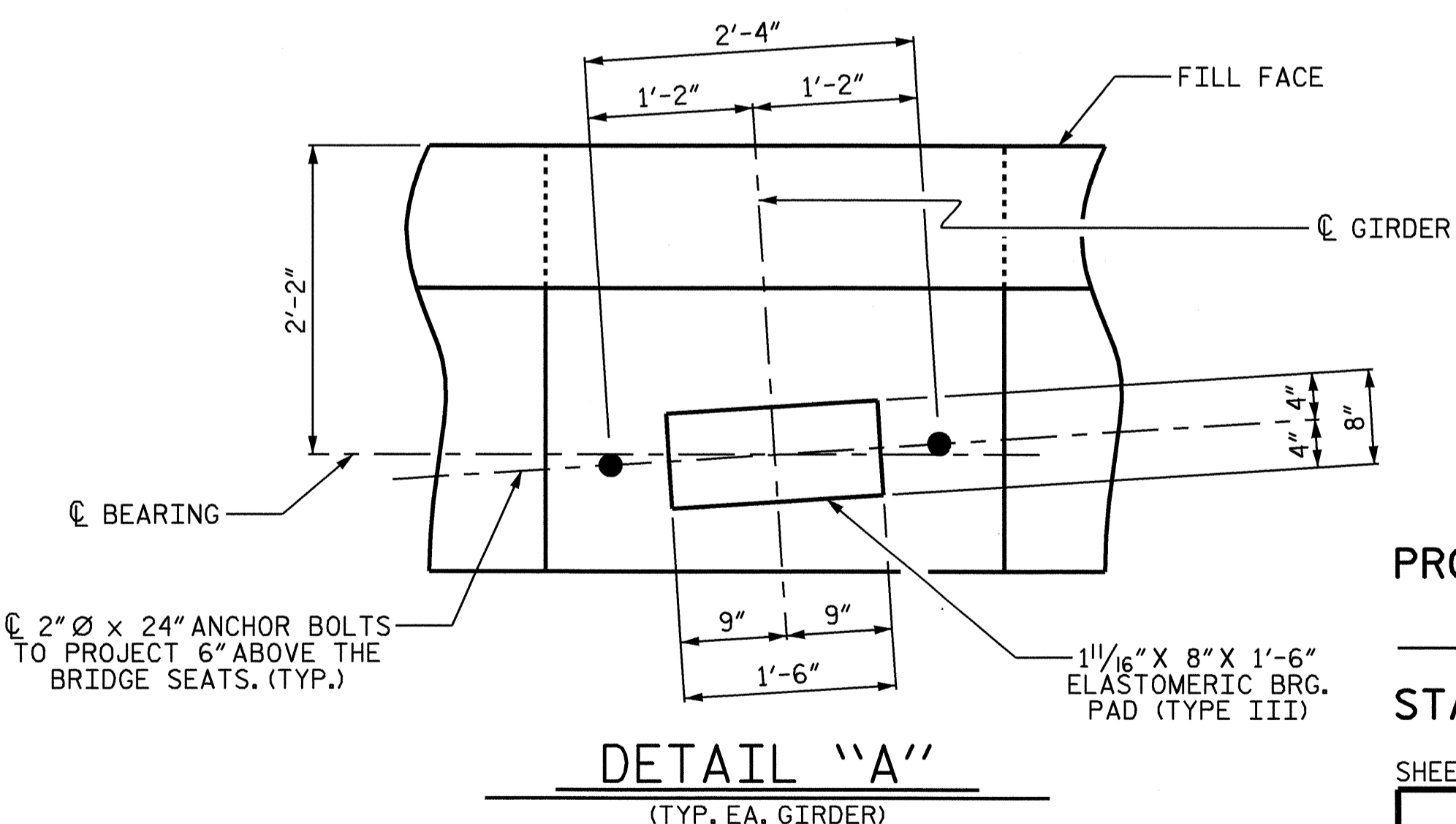
### PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	38'-2"	1038
B2	8	#9	1	38'-7"	1049
B3	24	#4	STR	24'-2"	387
B4	17	#4	STR	2'-8"	30
B5	4	#4	STR	7'-5"	20
B6	28	#4	STR	2'-11"	55
H1	10	#5	2	11'-7"	121
H2	10	#5	2	11'-6"	120
H3	9	#5	3	10'-1"	95
H4	9	#5	3	10'-2"	95
K1	24	#4	STR	24'-2"	387
K2	10	#4	STR	3'-10"	26
S1	121	#5	4	7'-10"	989
S2	121	#5	5	3'-7"	452
S3	16	#4	6	6'-6"	69
U1	60	#4	7	4'-8"	187
U2	28	#4	7	5'-8"	106
V1	120	#5	STR	6'-1"	761
V2	32	#5	STR	8'-5"	281
V3	30	#5	STR	7'-8"	240
REINFORCING STEEL				6508 LBS.	
CLASS A CONCRETE					
POUR #1 (CAP & LOWER WING)				22.6 C.Y.	
POUR #2 (UPPER WING & BACKWALL)				14.0 C.Y.	
TOTAL				36.6 C.Y.	
HP 12 X 53 STEEL PILES					
No. = 8				280 LIN. FT.	



### SECTION A-A



PROJECT NO. B-4302

WAKE COUNTY

STATION: 19+64.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

END BENT No. 2

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

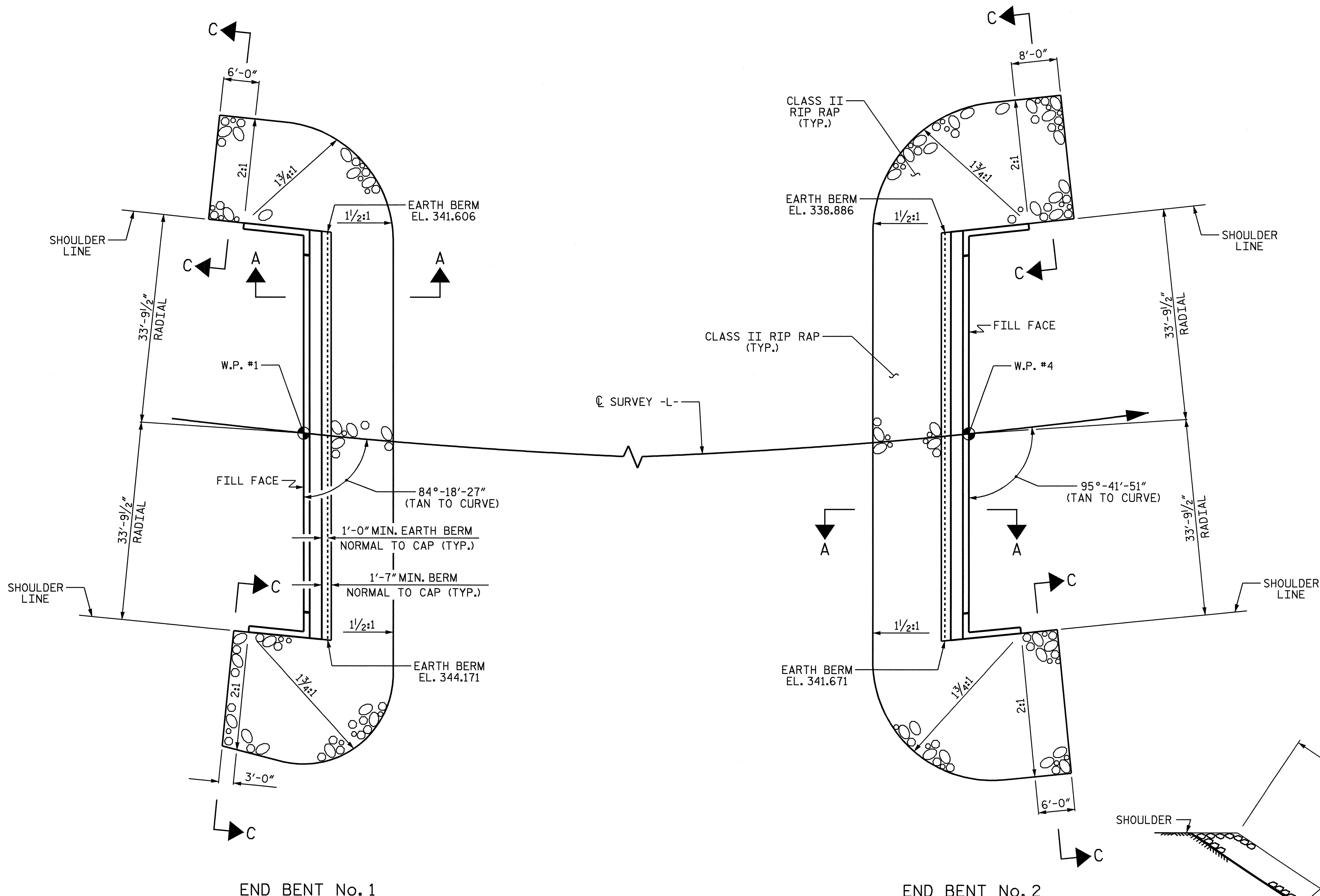
SHEET NO. S-38

TOTAL SHEETS 45



DRAWN BY: T. BANKOVICH DATE: 5-2008

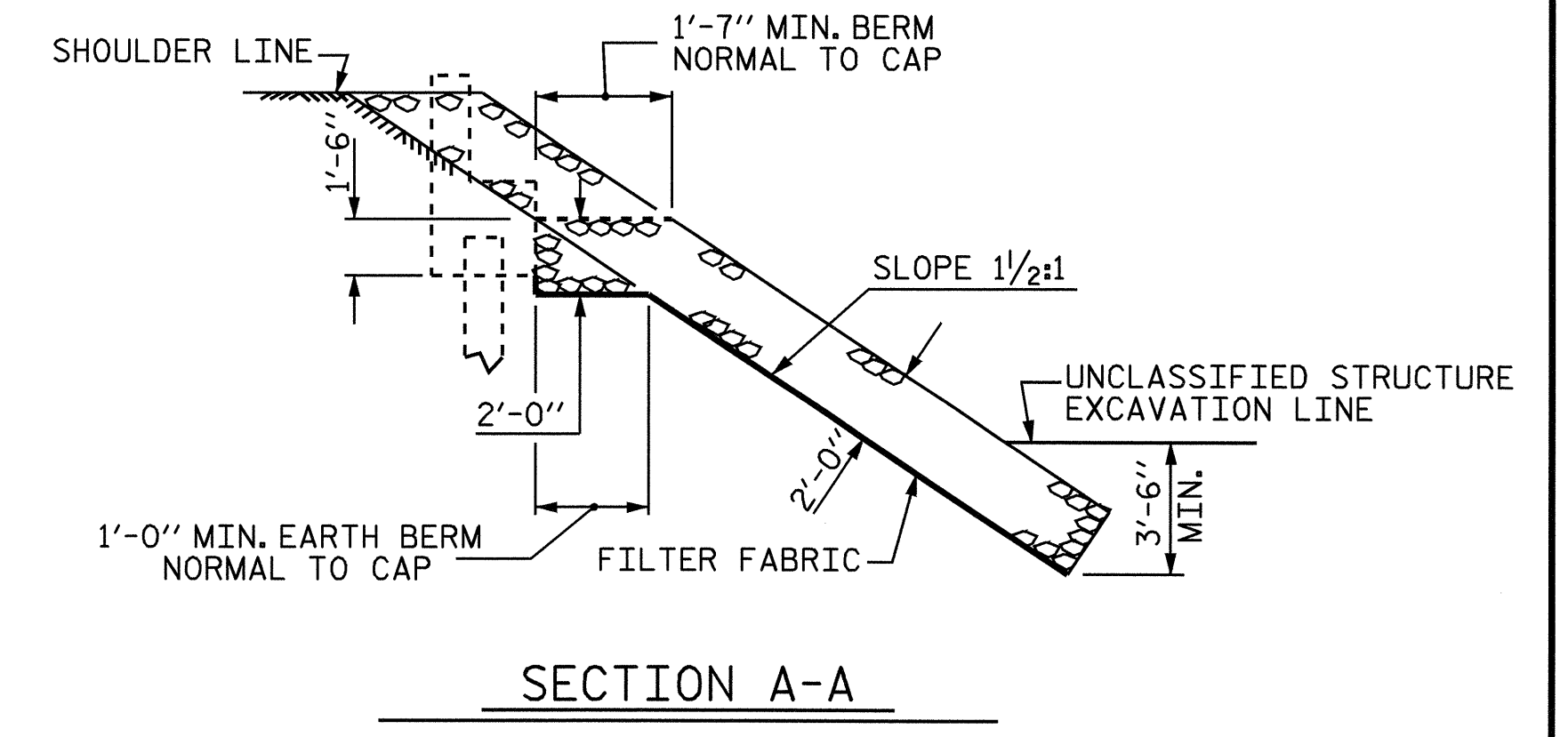
CHECKED BY: M.L. BROWN DATE: 7-2008



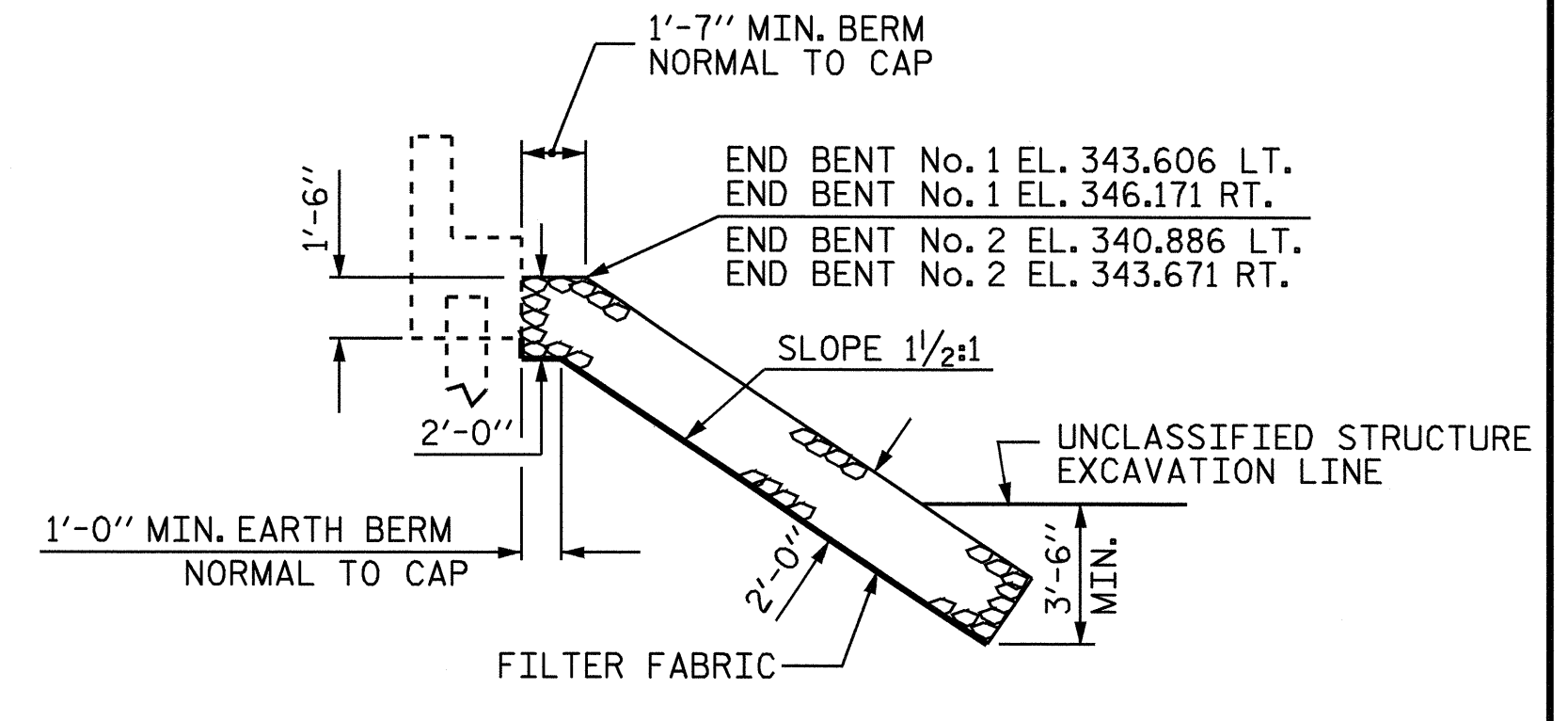
END BENT No. 1

END BENT No. 2

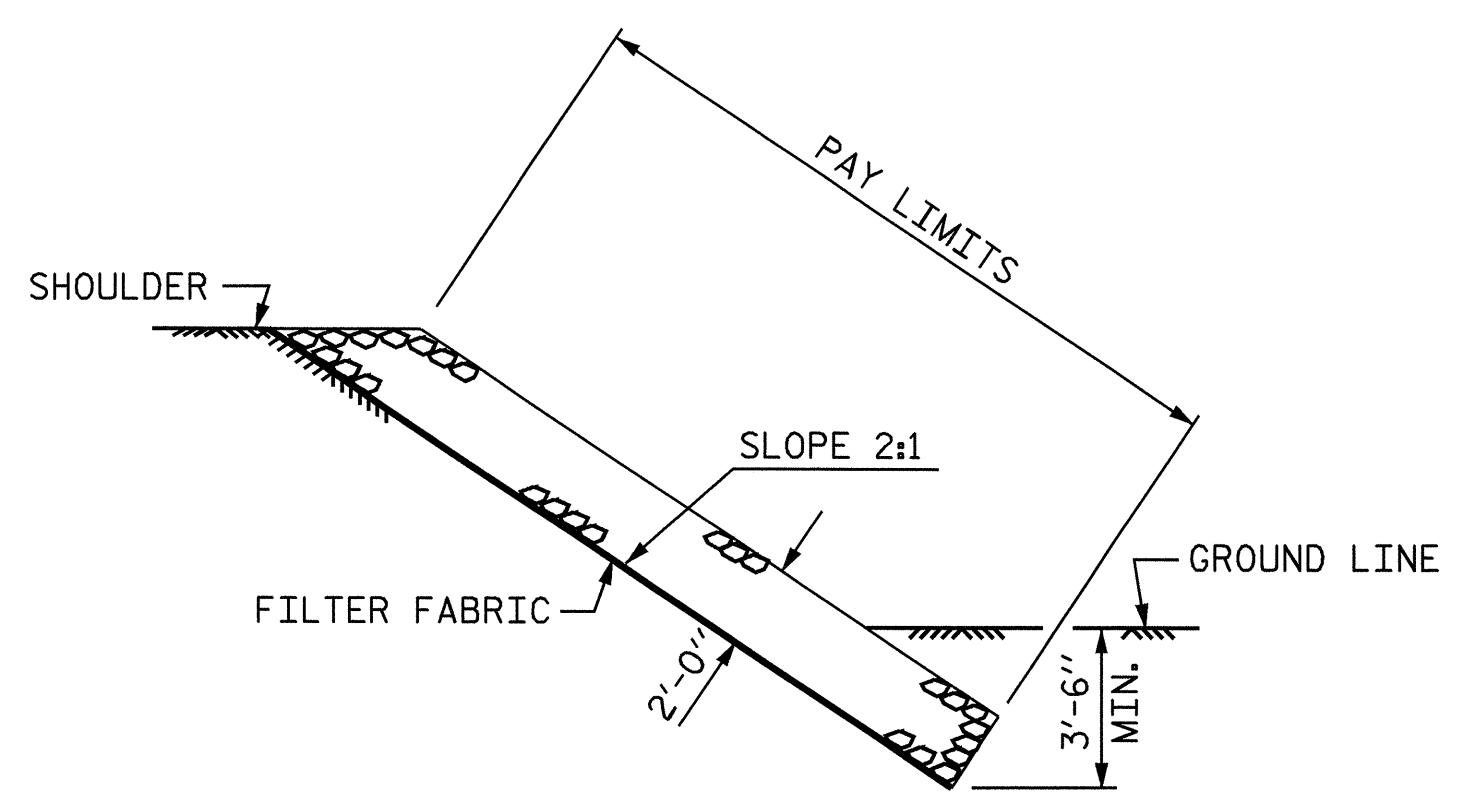
PLAN OF RIP RAP



SECTION A-A



SECTION C-C



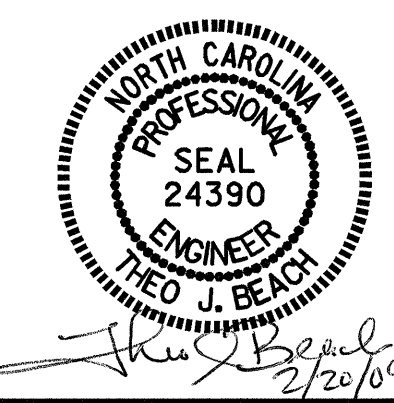
SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+64.00 -L-	RIp RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	240	267
END BENT 2	195	217

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 = RIP RAP DETAILS =

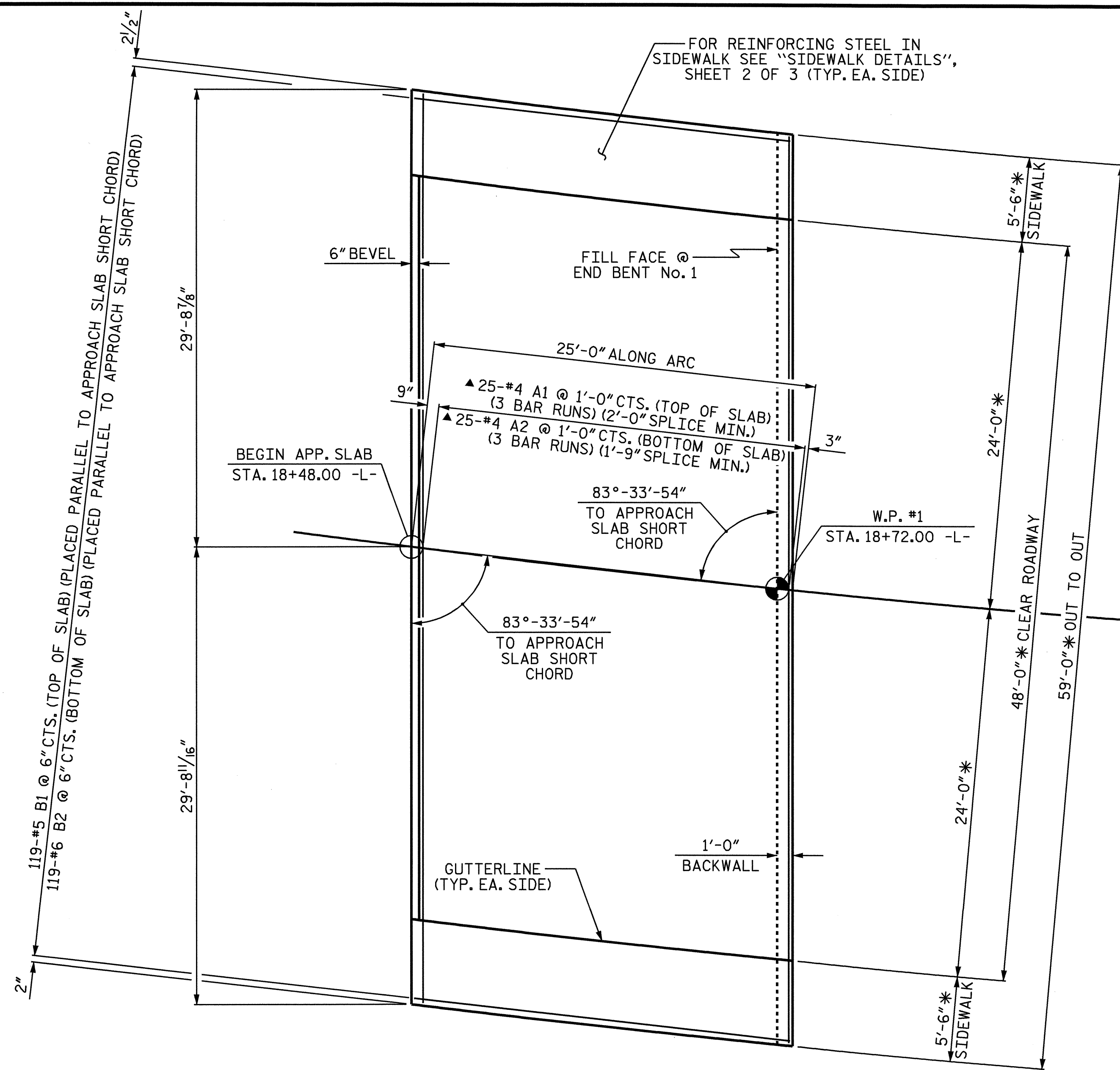
REVISIONS						SHEET NO. S-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			



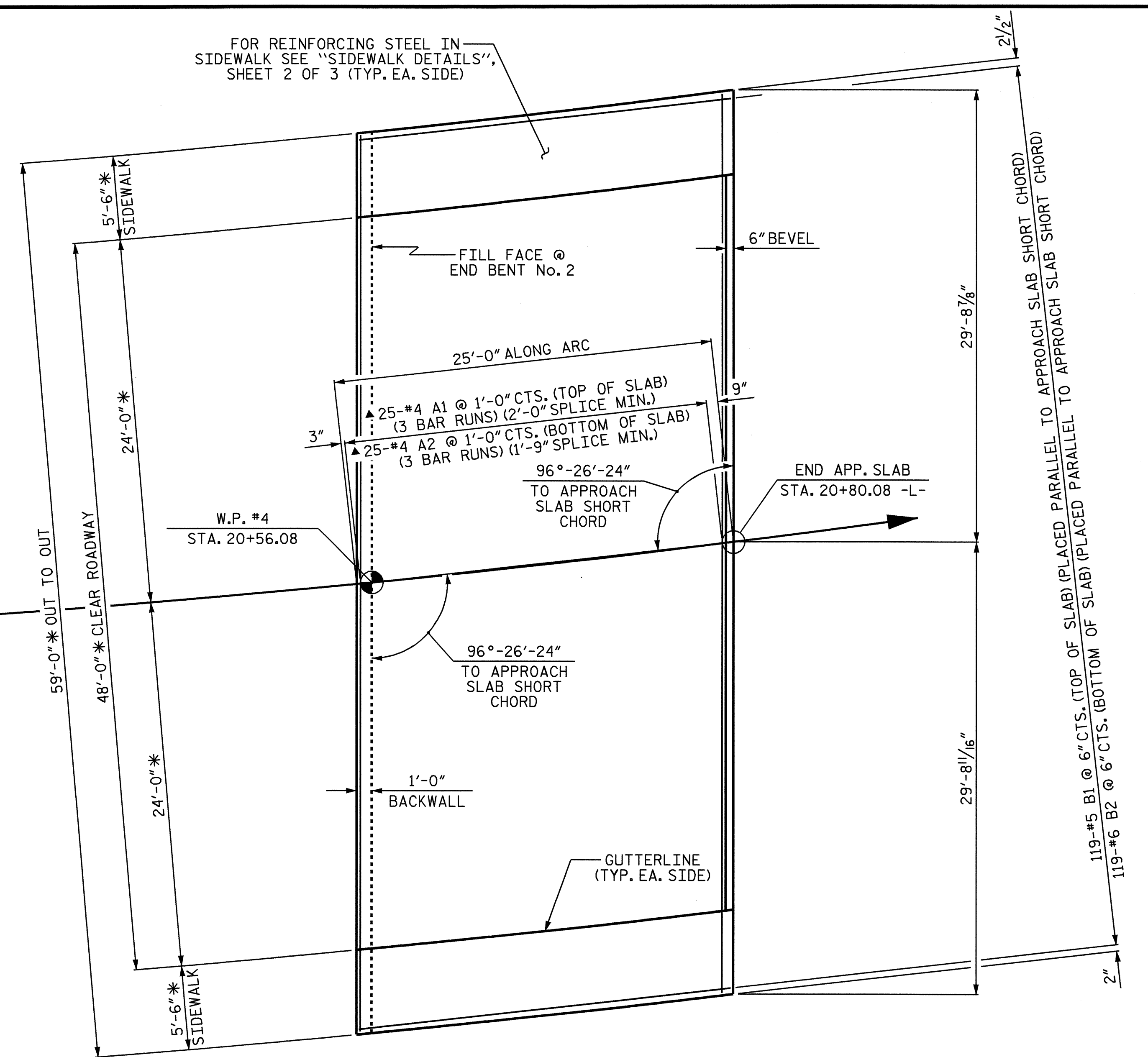
DRAWN BY : T. BANKOVICH DATE : 5-2008  
 CHECKED BY : M.L. BROWN DATE : 7-2008

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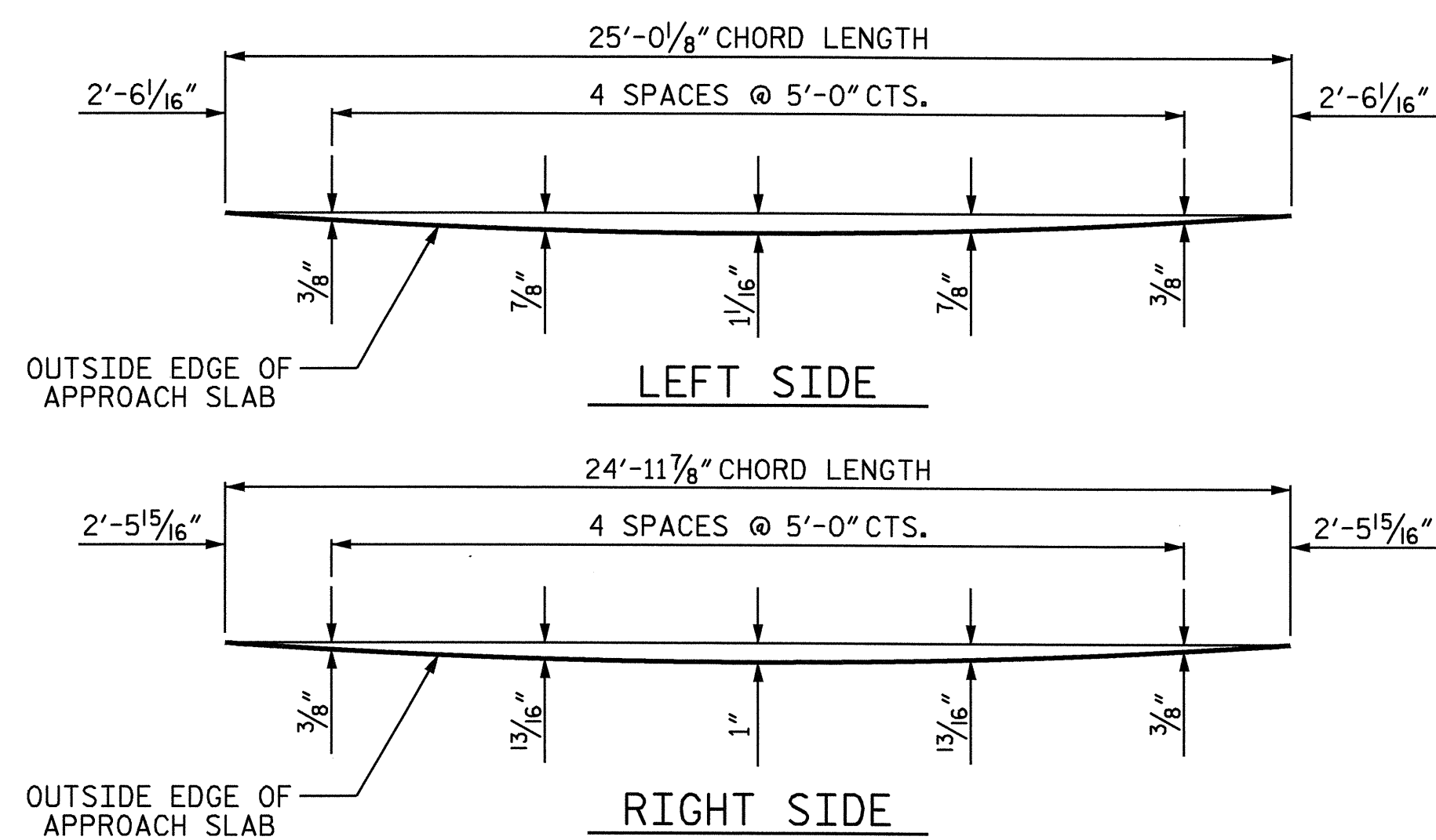
PLAN @ END BENT No. 1



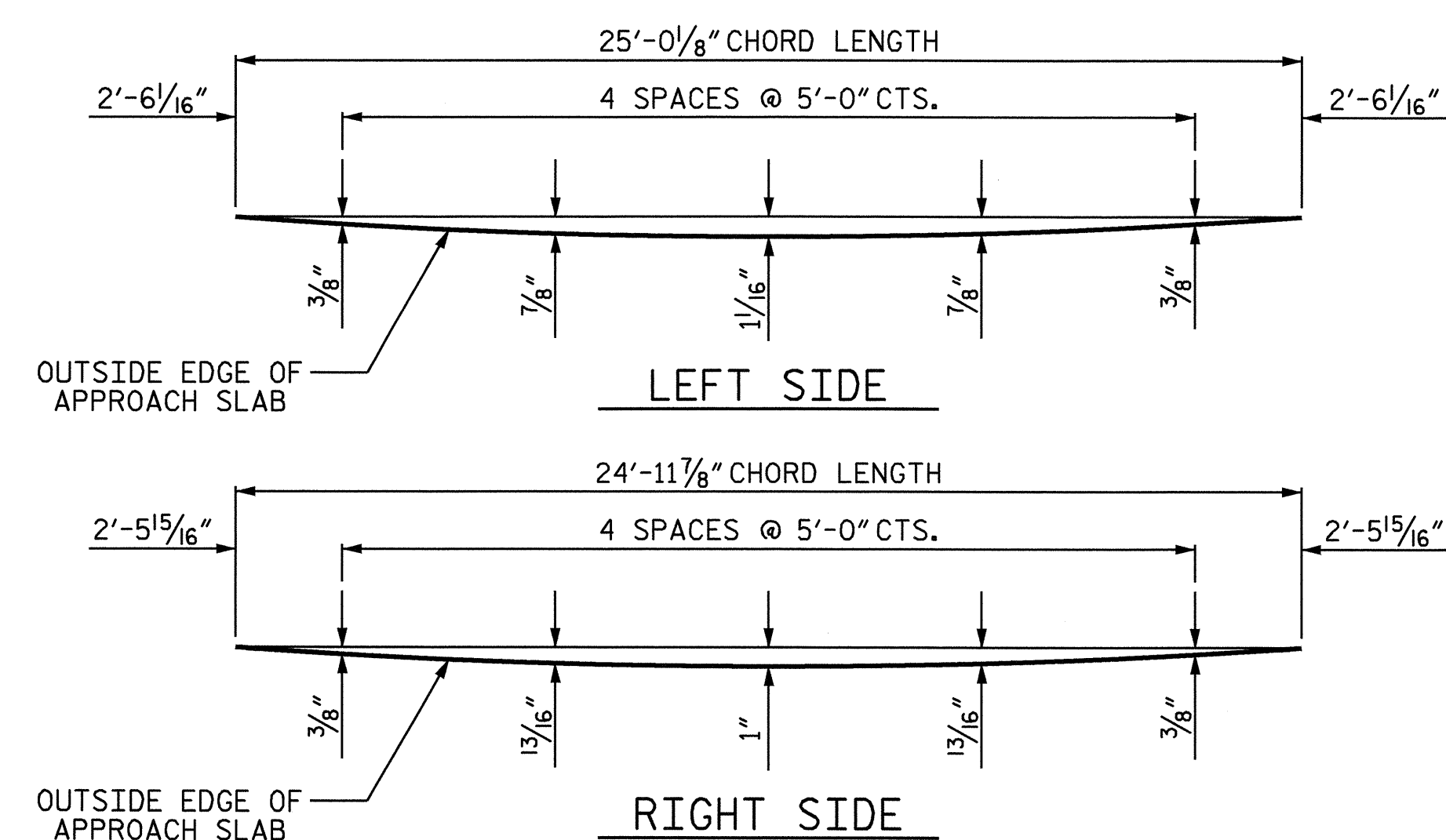
PLAN @ END BENT No. 2

PLAN OF APPROACH SLABS

NOTES:  
 \* MEASURED RADIALLY  
 ▲ "A" BARS ARE SPACED ALONG APPROACH SLAB CHORD AND PLACED PARALLEL TO FILL FACE



ARC OFFSETS @ END BENT No. 1



ARC OFFSETS @ END BENT No. 2

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

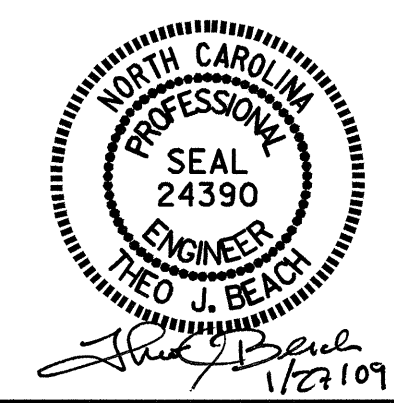
SHEET 1 OF 3

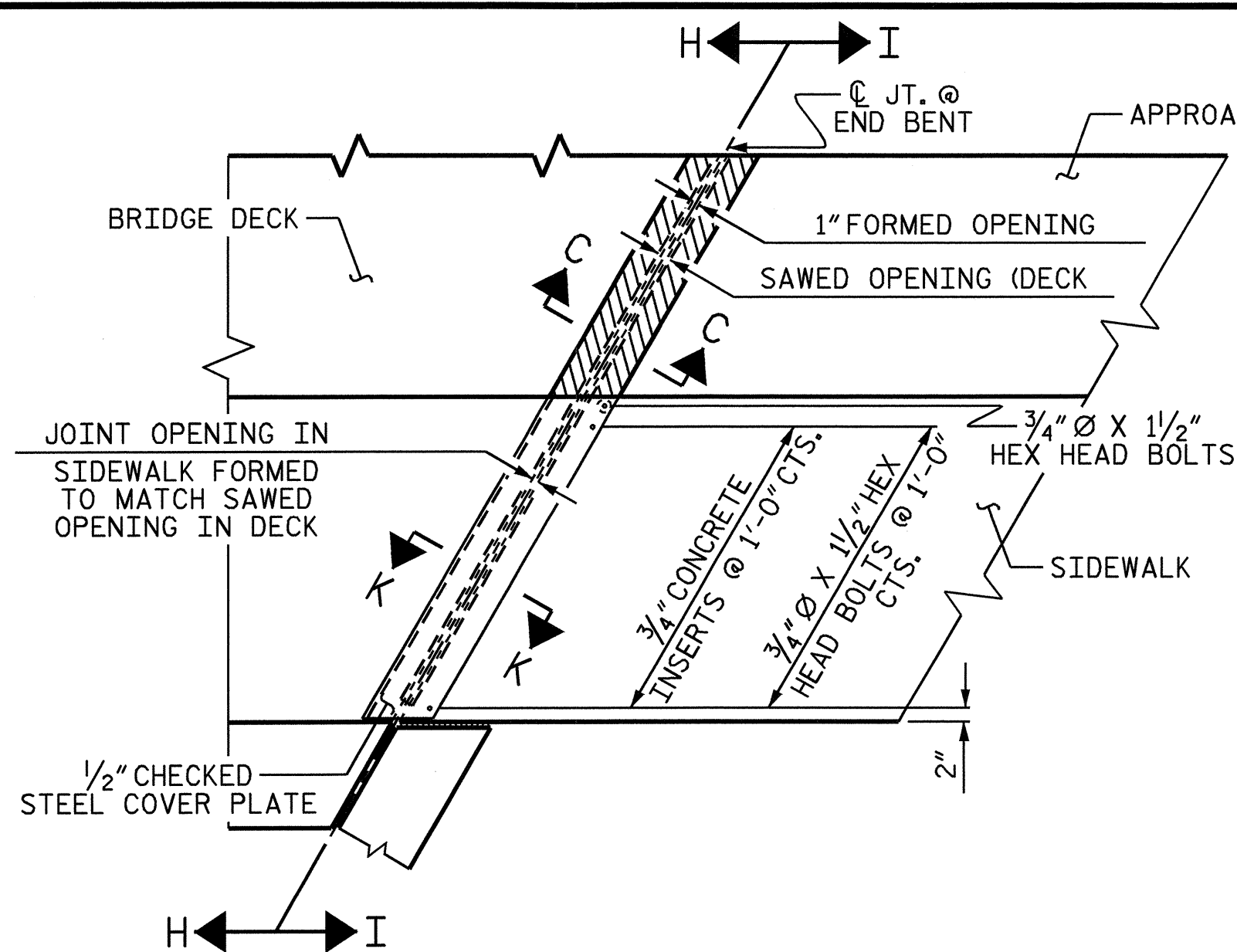
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB AND ARC OFFSETS

REVISIONS						SHEET NO. S-40
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY: T. BANKOVICH DATE: 5-2008  
 CHECKED BY: M.L. BROWN DATE: 7-2008

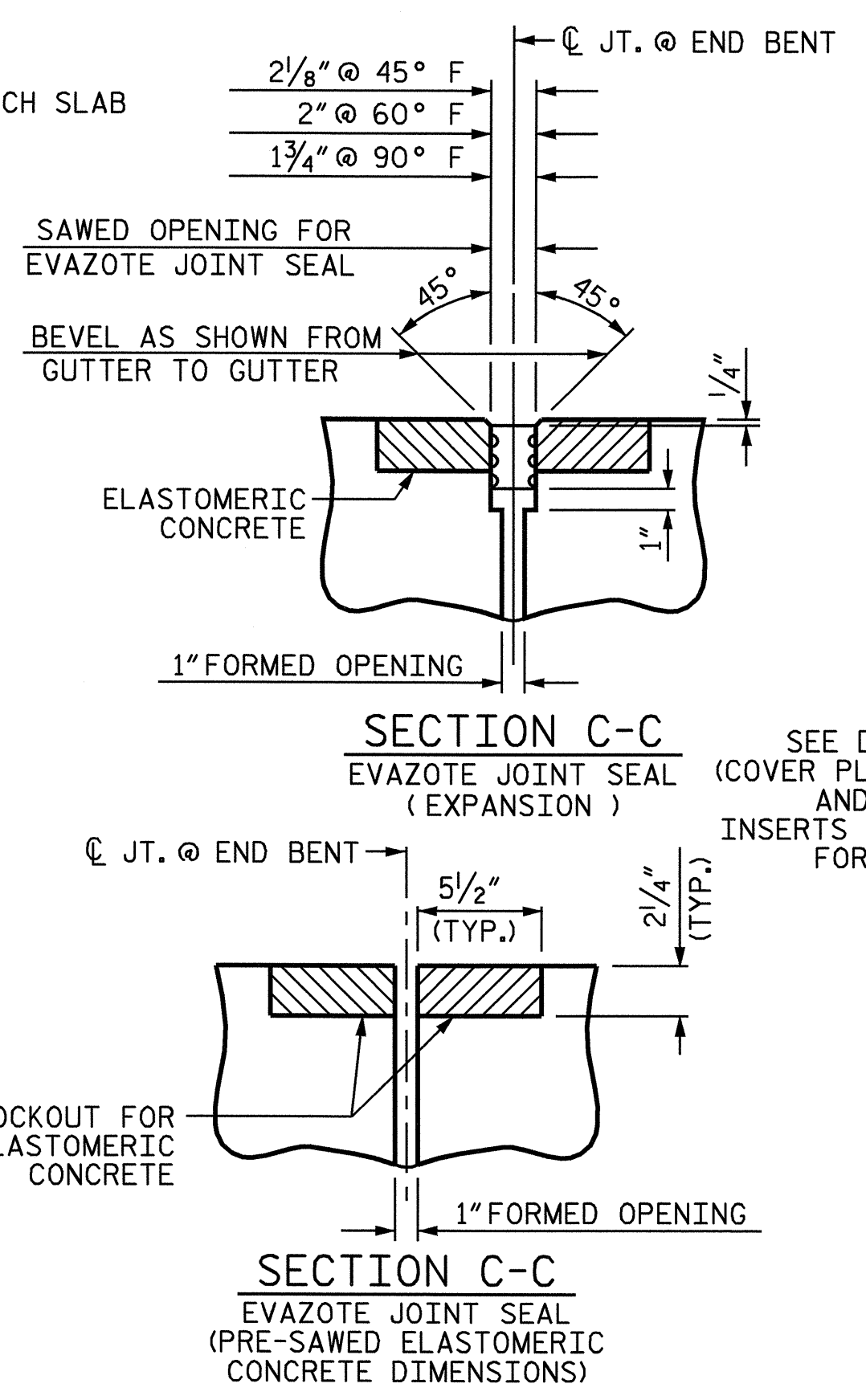




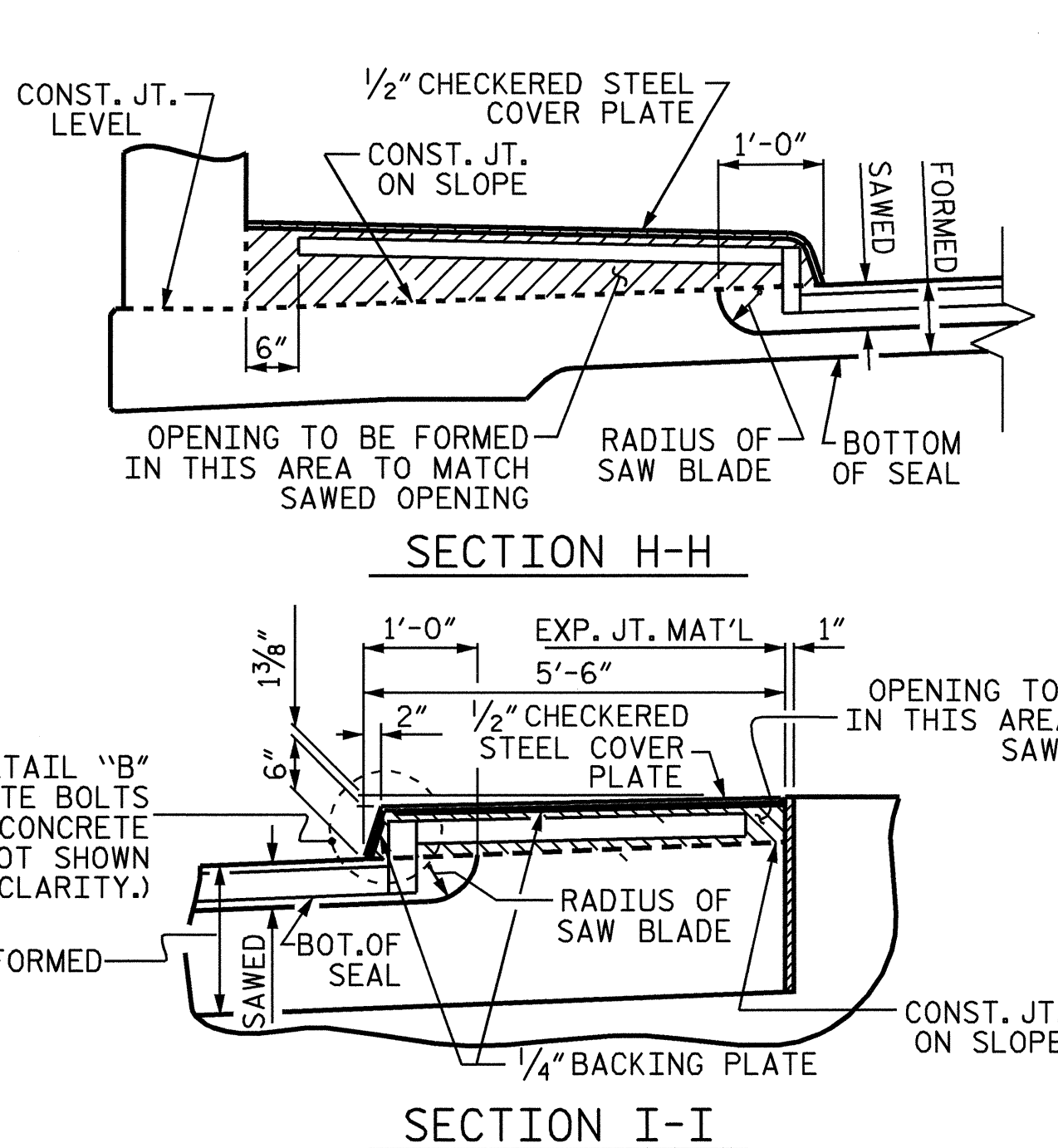
PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK  
PLAN VIEW @ END BENT No. 2 SHOWN END BENT No. 1 SIMILAR

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	8.3
2	8.3
TOTAL	16.6

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

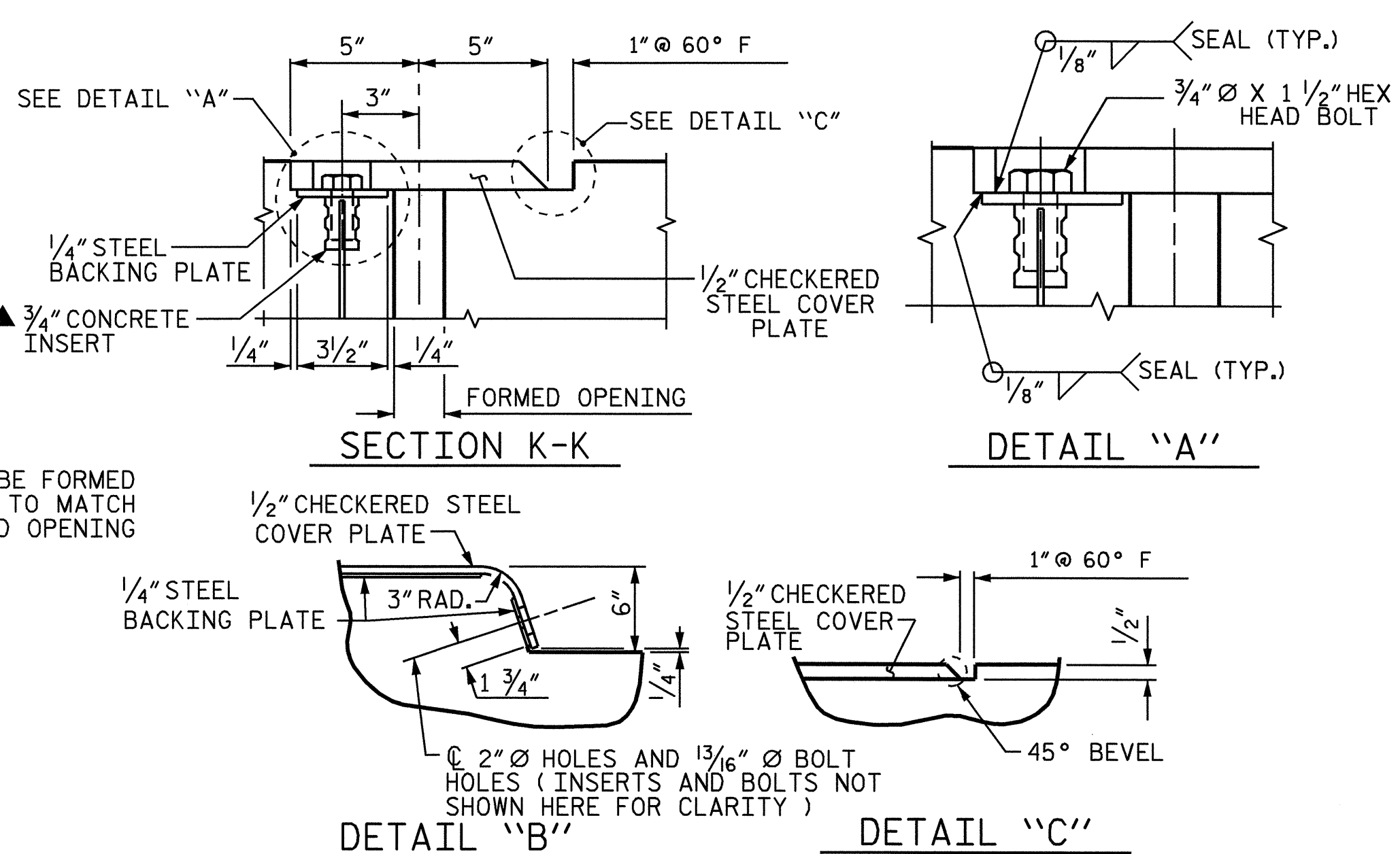


SECTION C-C  
EVAZOTE JOINT SEAL (PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION H-H

SECTION K-K



COVER PLATE NOTES:

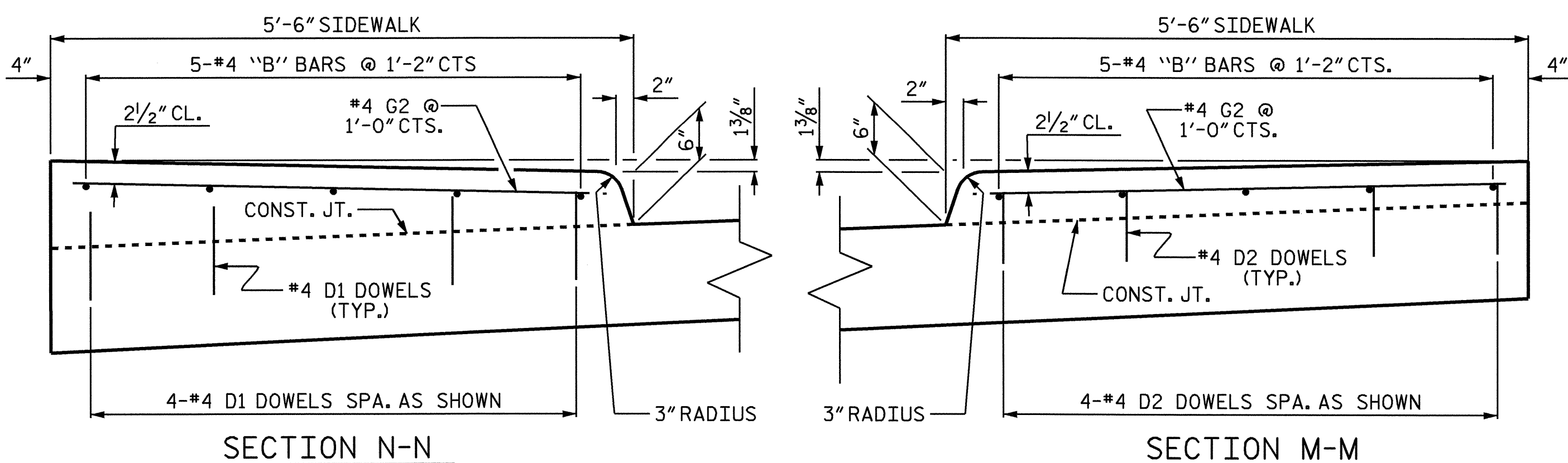
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, THESE SURFACES MAY BE METALLIZED TO A MINIMUM THICKNESS OF 6 MILS. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

THE 3/4" Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

▲ THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14, AND THE INSERTS SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR EVAZOTE JOINT SEALS.

JOINT SEAL DETAILS @ END BENT

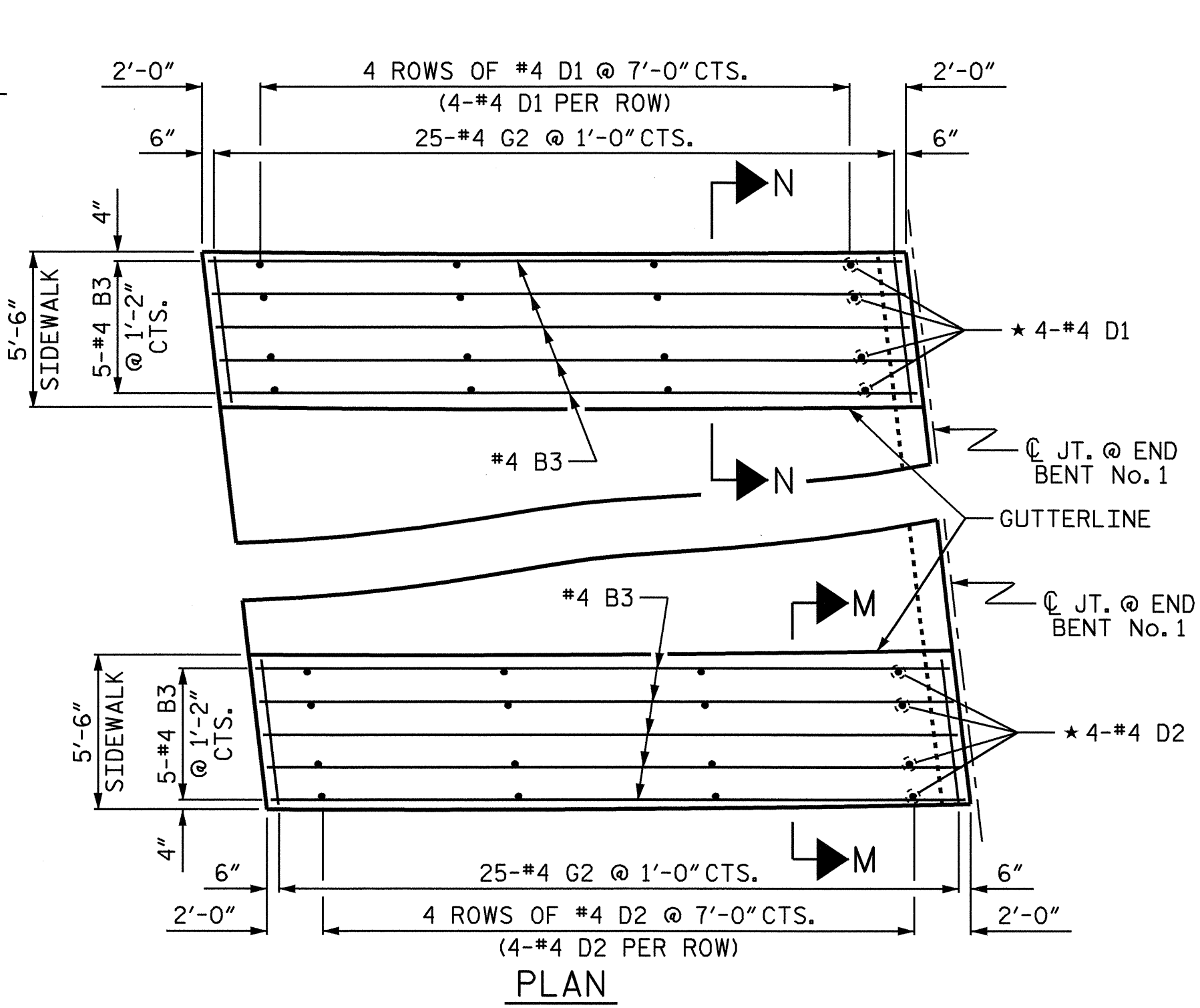


SECTION THRU SIDEWALK

SIDEWALK NOTES:

THE JOINT IN THE DECK AT THE END BENTS SHALL BE SAWS PRIOR TO THE CASTING OF THE SIDEWALK.  
\* THESE DOWELS ARE TO BE PLACED AFTER SAWING OF THE JOINT AT THE END BENTS. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED IN PLACE.  
THE DOWELS (EXCEPT AS NOTED ABOVE) MAY BE PUSHED INTO GREEN CONCRETE AFTER THE APPROACH SLAB IS FINISHED.  
ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.



DETAILS OF SIDEWALK ON APPROACH SLAB

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

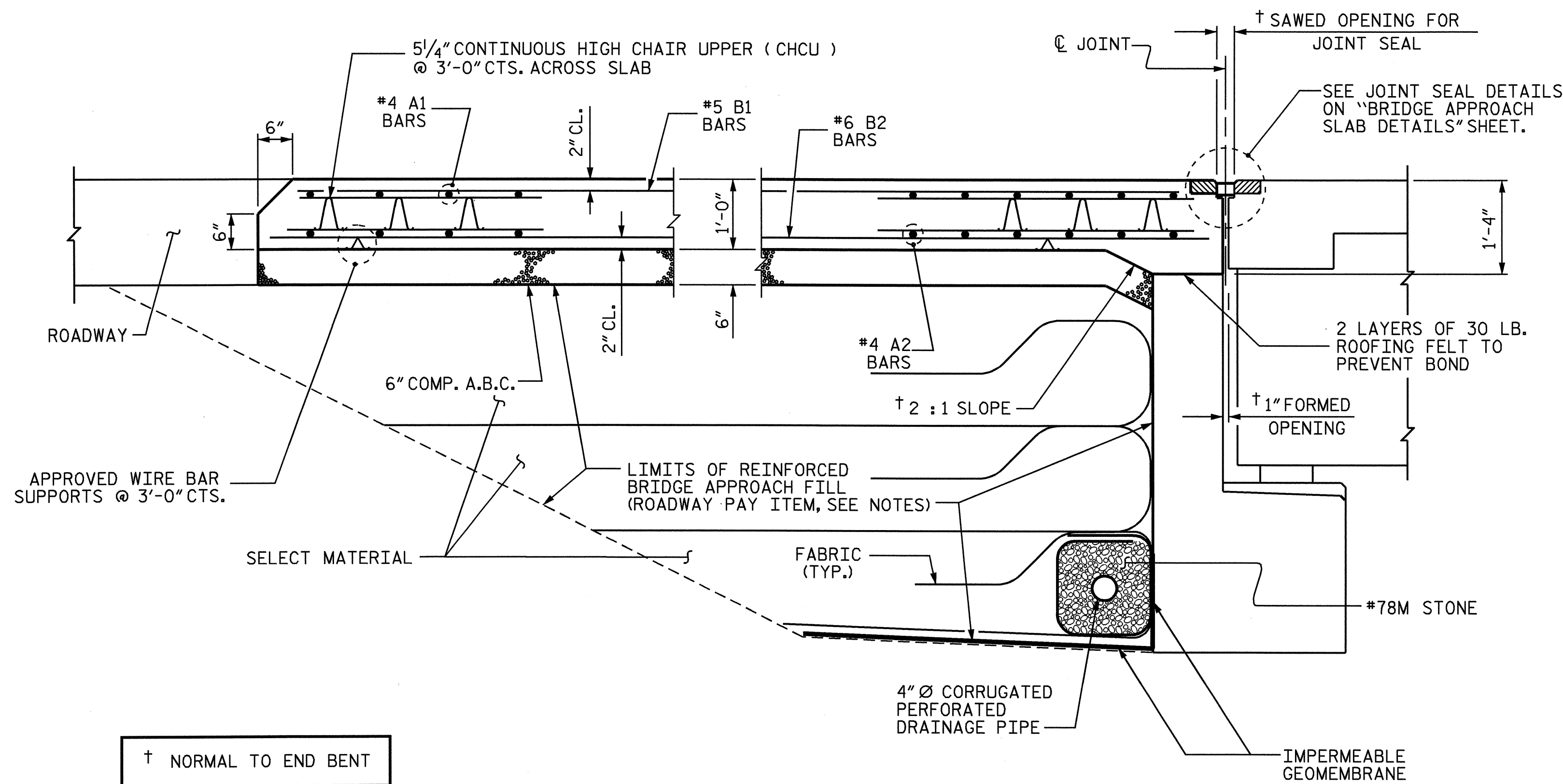
PROJECT NO. B-4302  
WAKE COUNTY  
STATION: 19+64.00 -L-

SHEET 2 OF 3

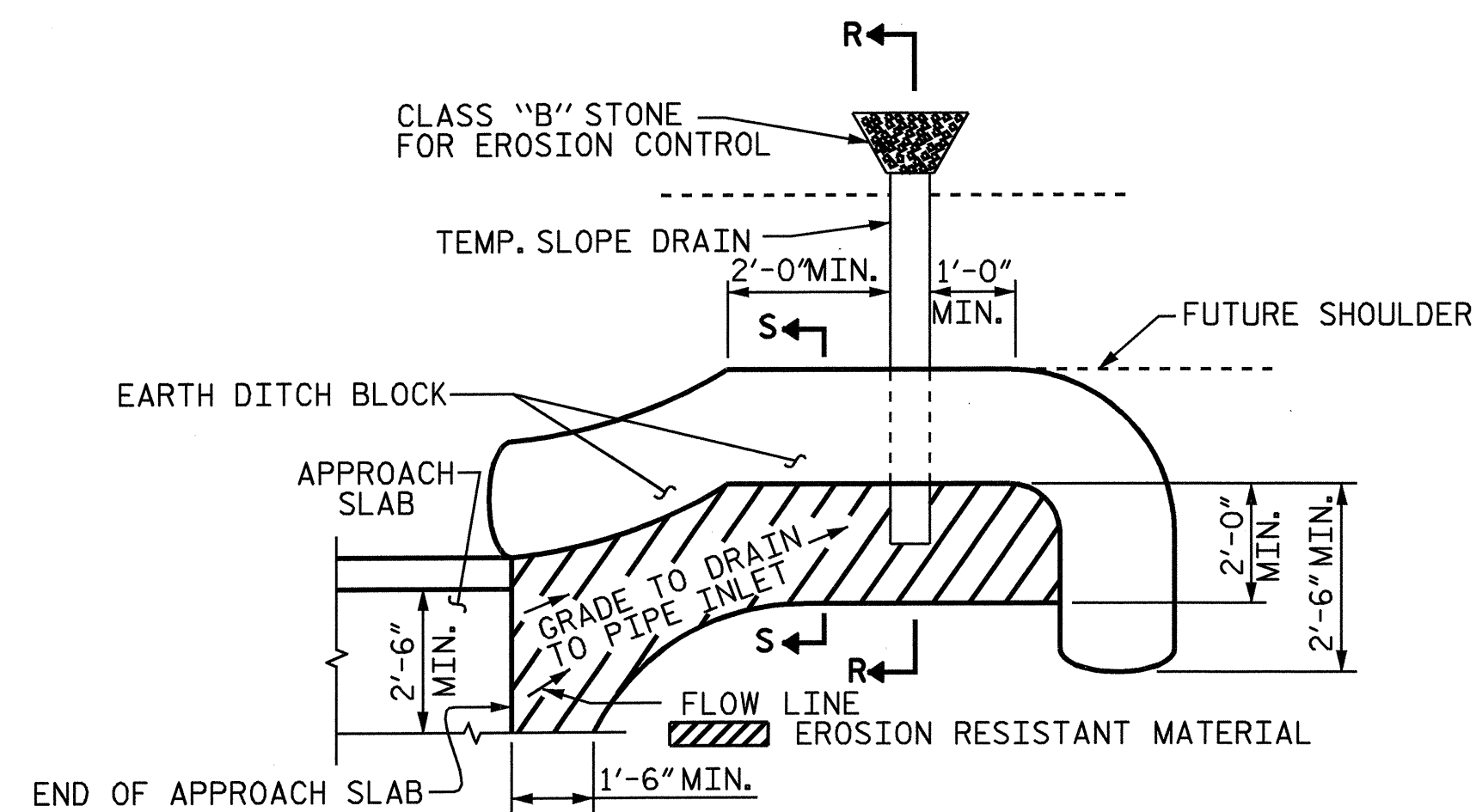
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



ASSEMBLED BY : T. BANKOVICH	DATE : 5-2008
CHECKED BY : M.L. BROWN	DATE : 7-2008
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/17/03 RWW/JTE
	REV. 5/1/06R MAA/KMM



SECTION THRU SLAB

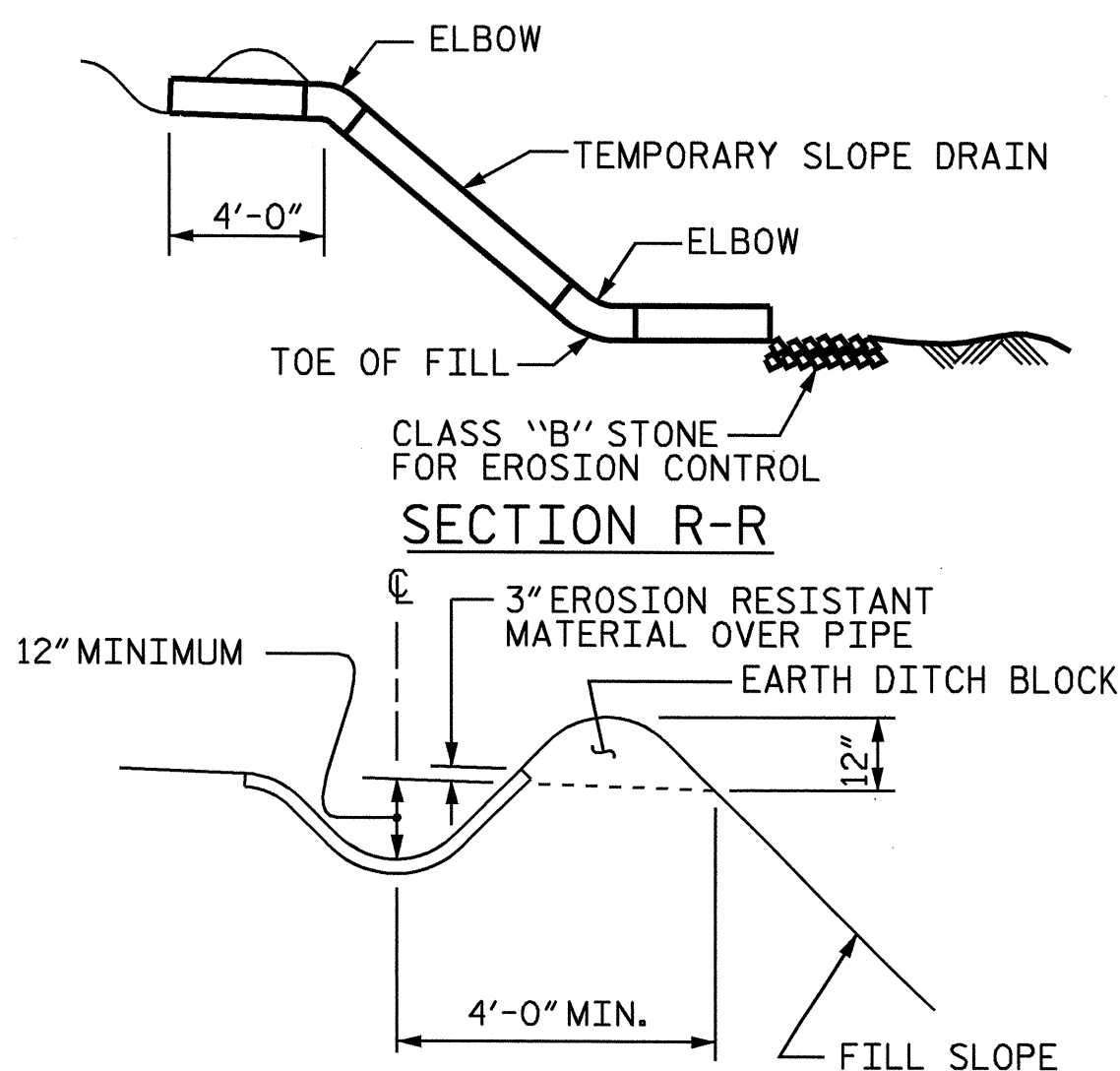


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

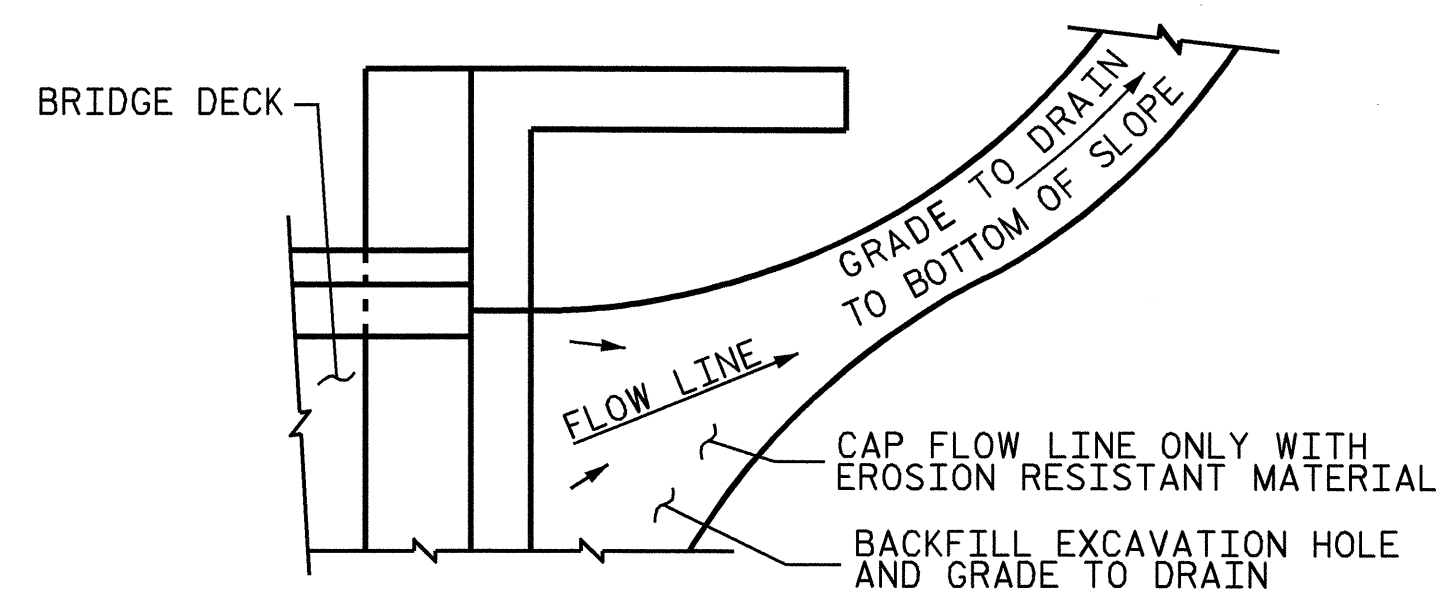
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION S-S



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

NOTES

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

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 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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND SIDEWALK.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

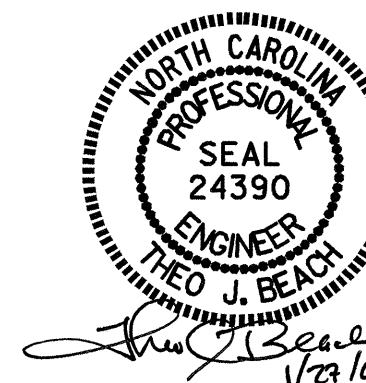
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	21'-0"	1052
A2	75	#4	STR	20'-10"	1044
*B1	119	#5	STR	23'-9"	2948
B2	119	#6	STR	24'-8"	4409
*B3	10	#4	STR	24'-8"	165
*D1	16	#4	STR	10"	9
*D2	16	#4	STR	9"	8
*G2	50	#4	STR	5'-0"	167
REINFORCING STEEL					5453 LBS.
*EPOXY COATED REINFORCING STEEL					4349 LBS.
CLASS AA CONCRETE					
POUR #1 (SLAB)					55.4 C. Y.
POUR #2 (SIDEWALKS)					5.7 C. Y.
TOTAL					61.1 C. Y.
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	21'-0"	1052
A2	75	#4	STR	20'-10"	1044
*B1	119	#5	STR	23'-9"	2948
B2	119	#6	STR	24'-8"	4409
*B3	10	#4	STR	24'-8"	165
*D1	16	#4	STR	10"	9
*D2	16	#4	STR	9"	8
*G2	50	#4	STR	5'-0"	167
REINFORCING STEEL					5453 LBS.
*EPOXY COATED REINFORCING STEEL					4349 LBS.
CLASS AA CONCRETE					
POUR #1 (SLAB)					55.4 C. Y.
POUR #2 (SIDEWALKS)					5.7 C. Y.
TOTAL					61.1 C. Y.

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			45

ASSEMBLED BY : T. BANKOVICH	DATE : 5-2008
CHECKED BY : M.L. BROWN	DATE : 7-2008
DRAWN BY : EEM 3/95	REV. 7/10/01 LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R RWW/JTE
	REV. 5/1/06R KMM/GM

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

- RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED  $R = 1.5$ .  $SLPB = R \times W$ . ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
- CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
- CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
- WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
- CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
- CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
- CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
- RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
- SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON UP TO 2'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)	
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.		
10	30				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000	
	40	3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000	
	50				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000	
12	30				2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000		
	40	3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000	
	50				2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000		
14	30				2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000		
	40	2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000	
	50				2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000		
16	30				2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	4000
	40	2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000	
	50				2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	4000

TABLE 1-2 (FOR USE ON OVER 2'-0" TO 2'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)			
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.				
10	30				3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40	3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000			
	50				3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30				2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	40	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000			
	50				2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
14	30				2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	4000
	40	2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	4000			
	50				2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	4000
16	30				2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	4000
	40	2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	4000			
	50				2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	4000

TABLE 1-3 (FOR USE ON OVER 2'-6" TO 3'-0" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)				
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.					
10	30								2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000	
	40								2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000				
12	30								2'-2"	2'-7"	2'-11"	4'-0"	4000		
	40								2'-2"	2'-7"	2'-11"	4'-0"	4000		
	50	2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000				
14	30								2'-0"	2'-4"	2'-8"	3'-8"	4000		
	40								2'-0"	2'-4"	2'-8"	3'-8"	4000		
	50	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000				
16	30								2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	4000
	40								2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	4000
	50	2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	2'-5"	3'-4"	5'-0"	4000		

TABLE 1-4 (FOR USE ON OVER 3'-0" TO 3'-6" OVERHANG (L) & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS (in)	BRACKET DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)							
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.								
10	30								2'-3"	2'-1"	2'-5"	2'-9"	3'-10"	4000				
	40								2'-3"	2'-1"	2'-5"	2'-9"	3'-10"	4000				
	50								2'-4"	2'-8"	3'-0"	3'-7"	4'-1"	4'-5"	4'-9"	5'-9"	6000	
12	30								2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
	40								2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000							
14	30								2'-1"	2'-8"	2'-2"	2'-6"	3'-5"	4000				
	40								2'-1"	2'-8"	2'-2"	2'-6"	3'-5"	4000				
	50								2'-1"	2'-8"	2'-2"	2'-6"	3'-5"	4000				
16	30								2'-2"	2'-5"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
	40								2'-2"	2'-5"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
	50	2'-2"	2'-5"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000							

DEFINITIONS

- SLPB = SCREED LOAD PER BRACKET (R x W)
- R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
- W = WHEEL LOAD
- S = BRACKET SPACING
- T = AVERAGE SLAB THICKNESS
- SWL = SAFE WORKING LOAD
- K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
- L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4302  
 WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD OVERHANG FALSEWORK  
 AASHTO TYPES  
 III, IV, V, AND VI



Chang-Chuan Victor Chao  
 1-16-2009

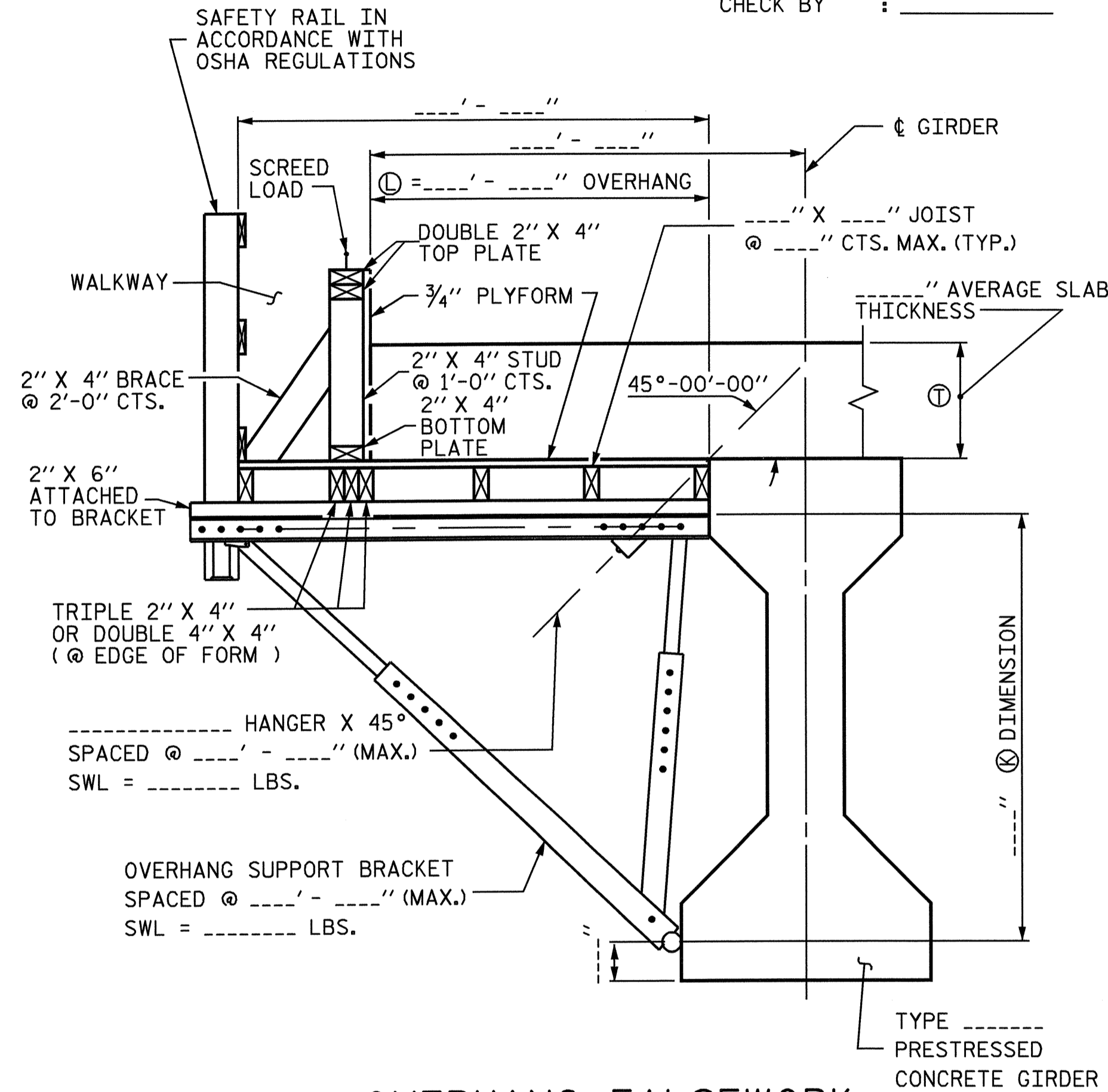
REVISIONS						SHEET NO. 5-48
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = \_\_\_\_\_ LBS.  
 NUMBER OF SCREED WHEELS = \_\_\_\_\_  
 SCREED WHEEL LOAD (W) = \_\_\_\_\_ LBS.  
 SCREED LOAD PER BRACKET = \_\_\_\_\_ LBS.

PROJECT No. : \_\_\_\_\_  
 COUNTY : \_\_\_\_\_  
 STATION : \_\_\_\_\_  
 DESCRIPTION : \_\_\_\_\_  
 DATE : \_\_\_\_\_  
 DESIGN BY : \_\_\_\_\_  
 CHECK BY : \_\_\_\_\_



OVERHANG FALSEWORK

NOTES

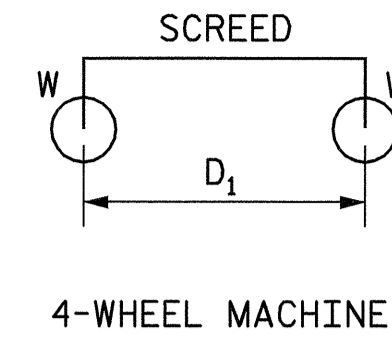
DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

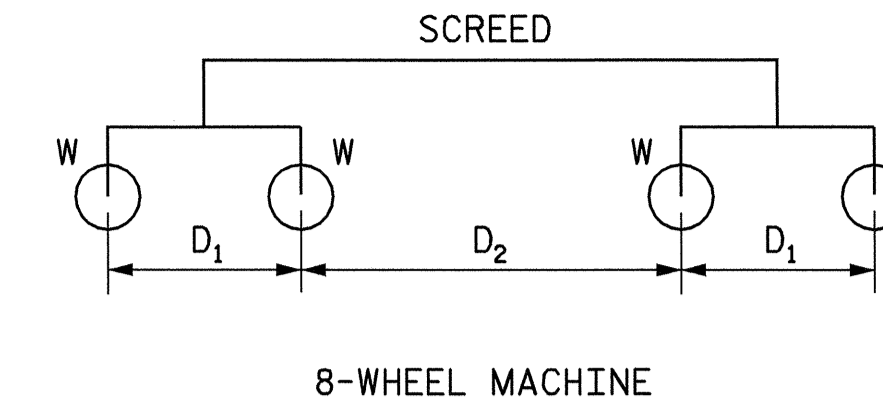
THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.



4-WHEEL MACHINE



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																	
		S/D <sub>2</sub>																	
S/D <sub>1</sub>		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
	<= 1.0	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71
1.1	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
1.2	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
1.3	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
1.4	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
1.5	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
1.6	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
1.7	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
1.8	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
1.9	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
2.0	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
2.2	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
2.4	2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67
2.6	2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73
2.8	2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79
3.0	3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83
3.5	3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93
4.0	4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
10	2 X 4	—	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	—	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	—	4' - 0"	4' - 6"	5' - 0"
	4 X 4	—	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	—	4' - 0"	4' - 3"	4' - 9"
	4 X 4	—	5' - 3"	5' - 9"	6' - 3"

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 2 OF 3

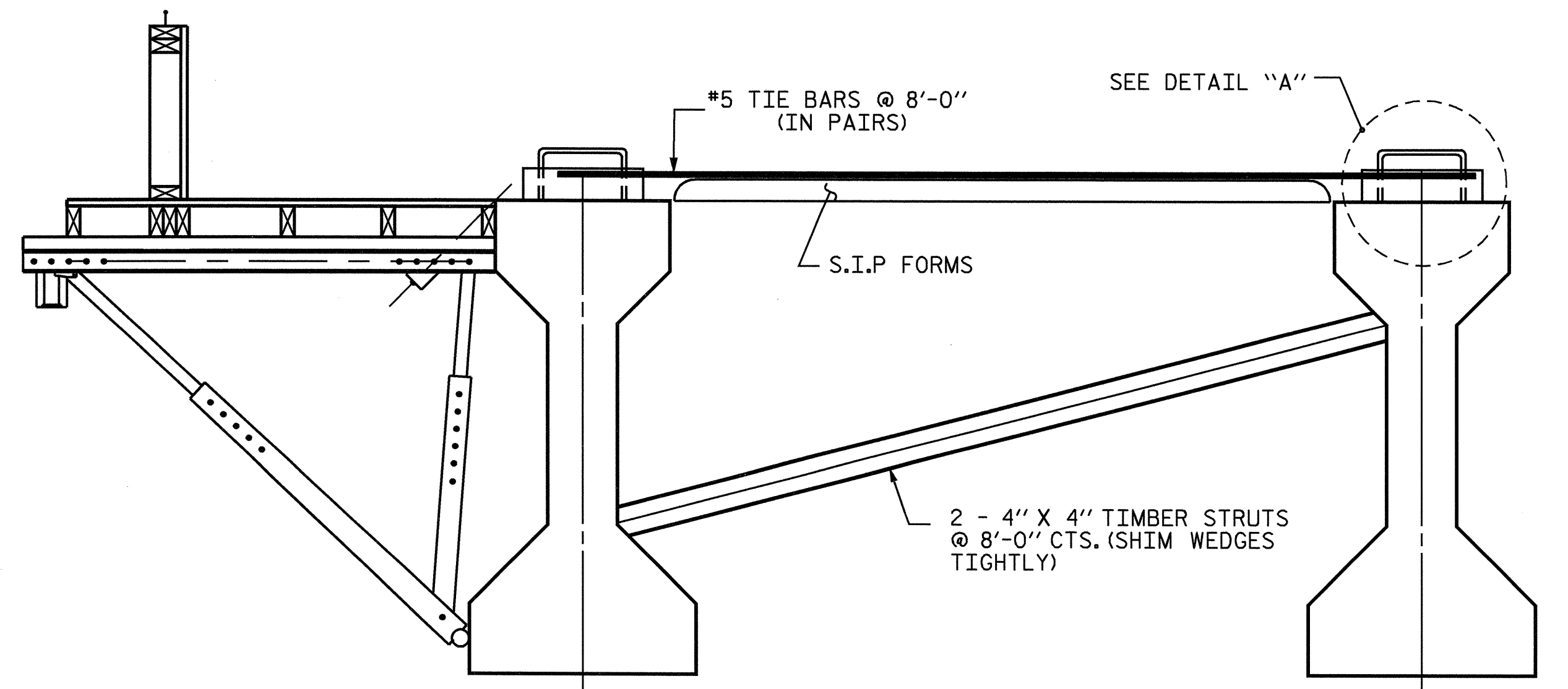


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD OVERHANG FALSEWORK  
 AASHTO TYPES  
 III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-44
2			4			45

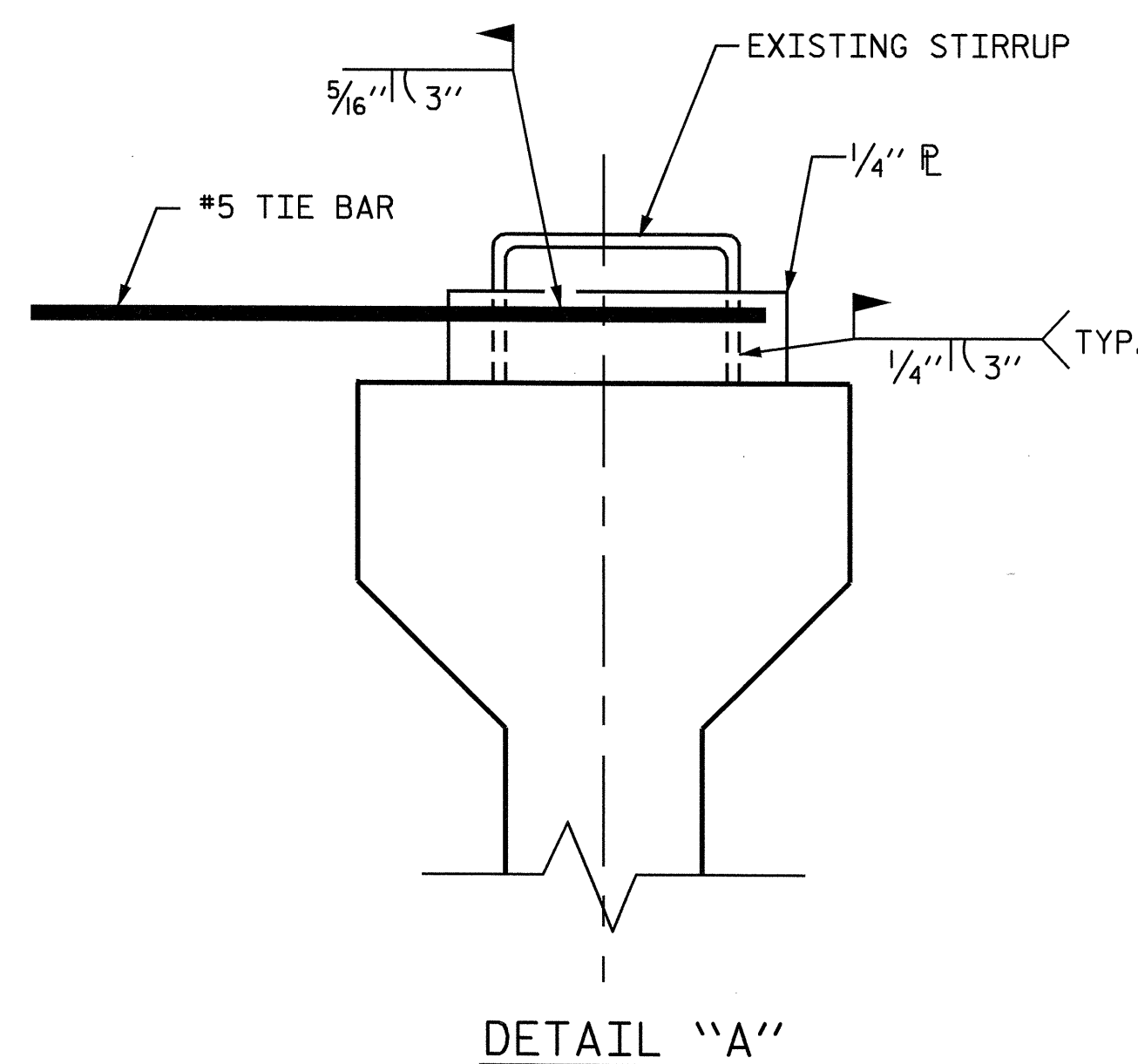
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DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	



EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 8'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

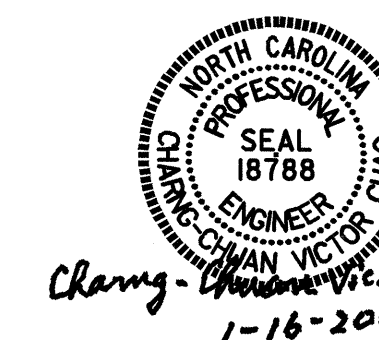
INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

PROJECT NO. B-4302  
WAKE COUNTY  
 STATION: 19+64.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD OVERHANG FALSEWORK  
 AASHTO TYPES  
 III, IV, V, AND VI



DRAWN BY: R. WRIGHT 06/04 DATE : \_\_\_\_\_  
 CHECKED BY: C. V. CHAO 06/04 DATE : \_\_\_\_\_

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-45
2			4			TOTAL SHEETS 45

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.  
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.  
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.  
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.  
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED, THE MAXIMUM SPACING SHALL BE 2'-0".  
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.  
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990

STD. NO. SN