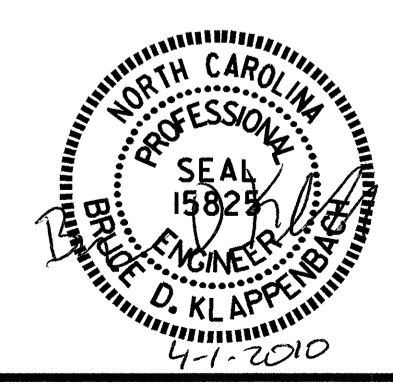


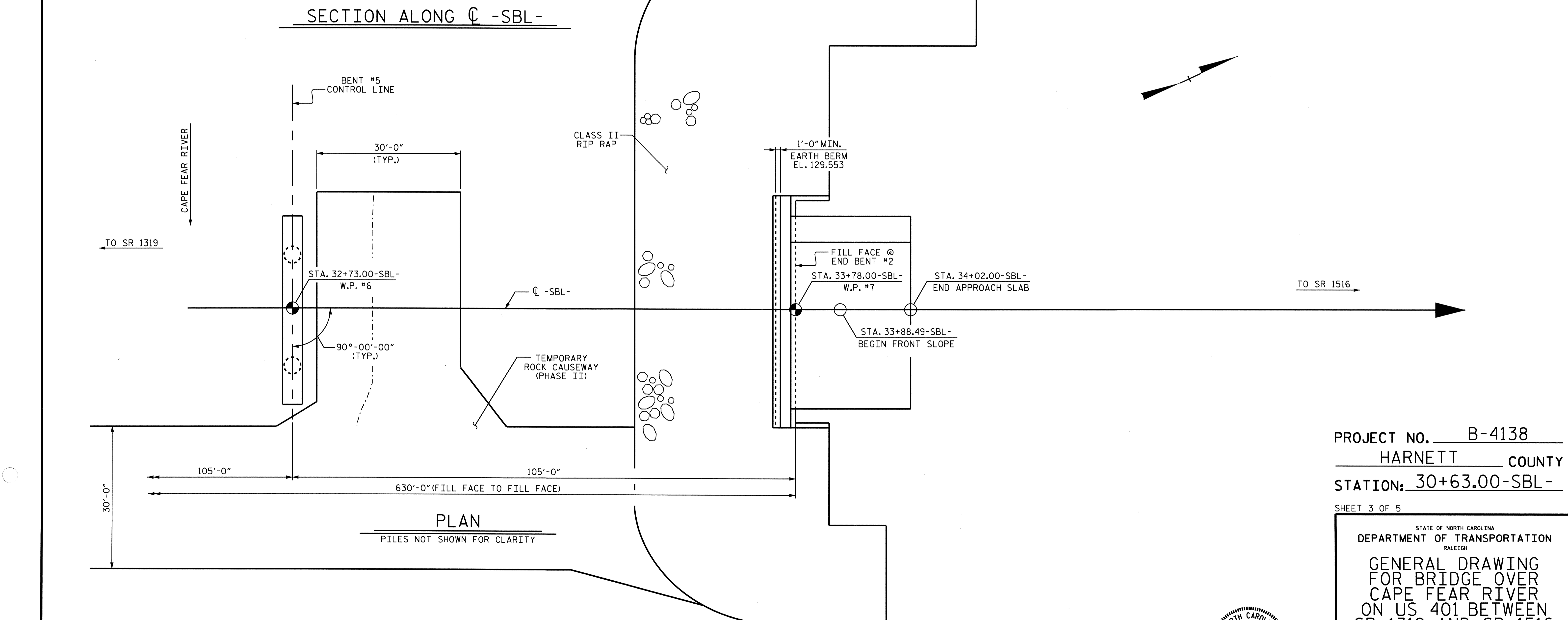
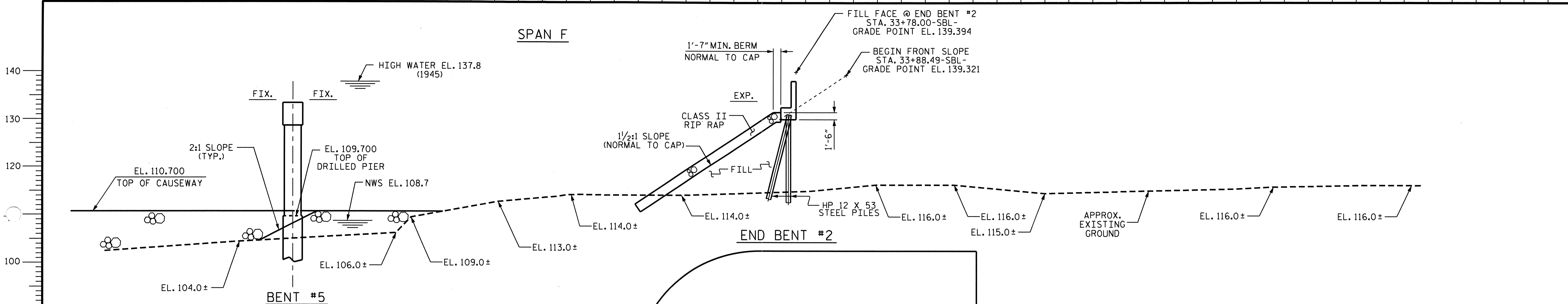
PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 2 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE OVER CAPE FEAR RIVER ON US 401 BETWEEN SR 1319 AND SR 1516					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-2
					TOTAL SHEETS 59



DRAWN BY : M. G. SHAIKH DATE : 01-26-10  
 CHECKED BY : C. R. YARBROUGH DATE : 02-04-10

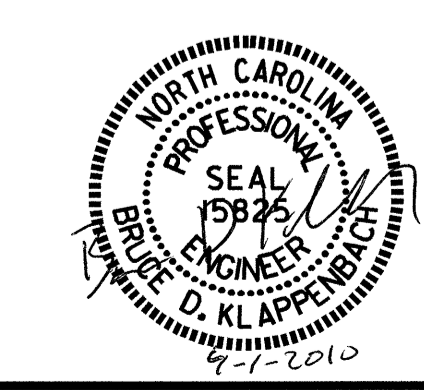
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PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 3 OF 5

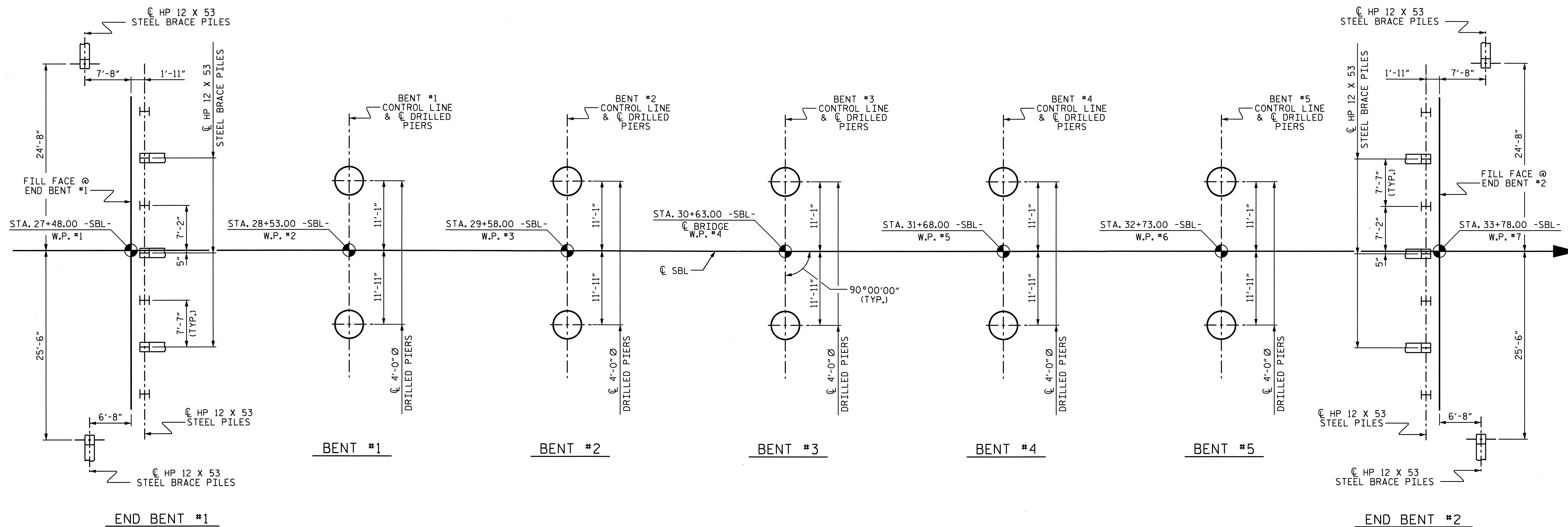
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 CAPE FEAR RIVER  
 ON US 401 BETWEEN  
 SR 1319 AND SR 1516

REVISIONS						SHEET NO. S-3
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			



DRAWN BY : M. G. SHAIKH DATE : 01-26-10  
 CHECKED BY : C. R. YARBROUGH DATE : 02-04-10

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### FOUNDATION LAYOUT

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20-45 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1 AND BENT NO. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO. 1 TO BENT NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 805 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 100 TSF AT BENT NO. 1 AND BENT NO. 2 AND 80 TSF AT BENT NO. 3 AND BENT NO. 4.

DRILLED PIERS AT BENT NO. 5 ARE DESIGNED FOR A FACTORED RESISTANCE OF 820 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 90 TSF AT BENT NO. 5.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1 TO BENT NO. 5. DO NOT EXTEND CASING BELOW ELEVATION 99.0 FT, 95.0 FT, 96.5 FT, AND 95.5 FT AT BENT NO. 1, BENT NO. 2, BENT NO. 3, BENT NO. 4, AND BENT NO. 5, RESPECTIVELY, WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL PERMANENT STEEL CASING AT BENT NO. 1 TO BENT NO. 5 BY VIBRATING, SCREWING OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 102.0 FT.

INSTALL DRILLED PIERS AT BENT NO. 1, BENT NO. 2, BENT NO. 3, BENT NO. 4, AND BENT NO. 5 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 89.0 FT, 89.0 FT, 84.0 FT, 85.0 FT, AND 85.0 FT RESPECTIVELY, AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1, BENT NO. 2, BENT NO. 3, BENT NO. 4, AND BENT NO. 5 ARE ELEVATION 97.0 FT, 97.0 FT, 93.0 FT, 94.5 FT, AND 93.5 FT, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT NO. 1 TO BENT NO. 5.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

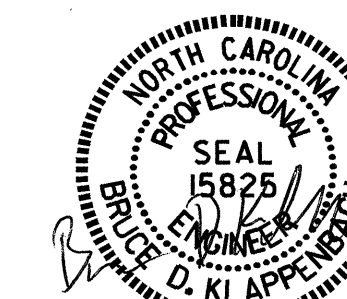
CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CROSSHOLE SONIC LOGGING, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 CAPE FEAR RIVER  
 ON US 401 BETWEEN  
 SR 1319 & SR 1516

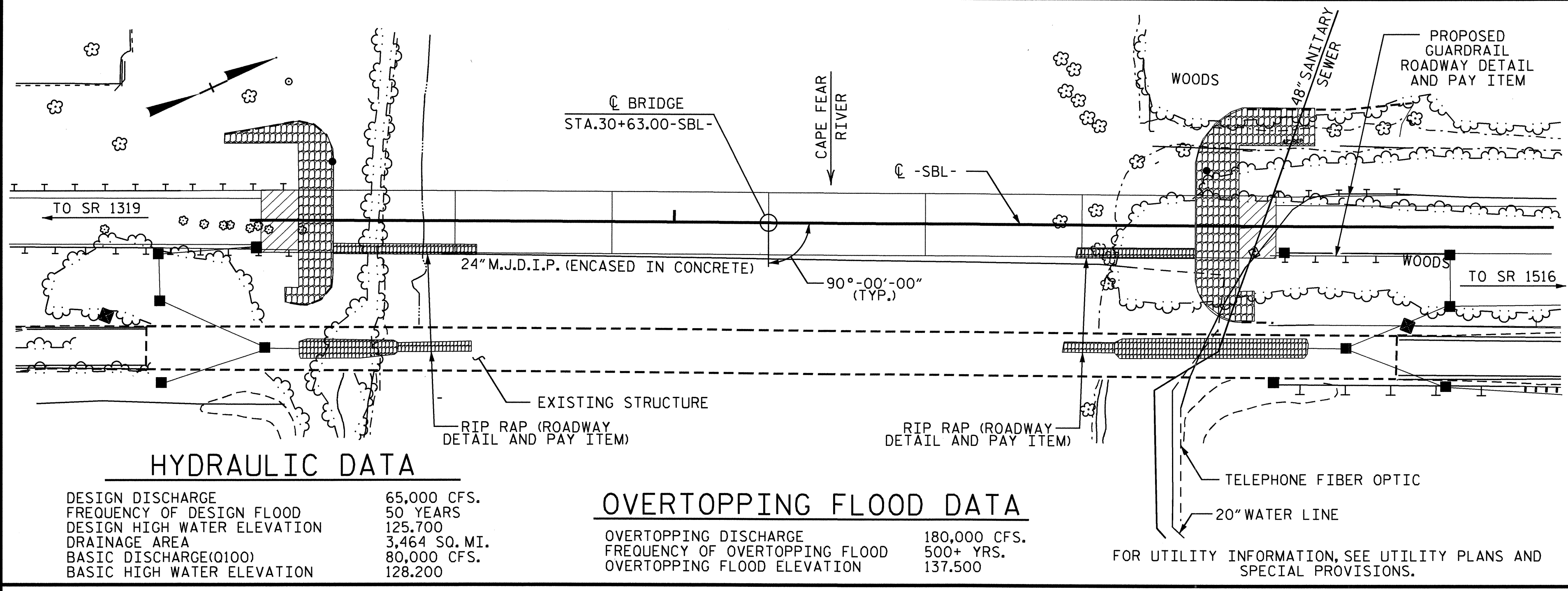


DRAWN BY: W. B. HILL DATE: 01/10  
 CHECKED BY: M. G. SHAIKH DATE: 01/10

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			59

BENCH MARK IS RR SPIKE IN 20" PINE; STA. 25+84.00-L-, 139.000' RT.; EL. 133.710 NGVD 29



HYDRAULIC DATA

DESIGN DISCHARGE	65,000 CFS.
FREQUENCY OF DESIGN FLOOD	50 YEARS
DESIGN HIGH WATER ELEVATION	125.700
DRAINAGE AREA	3,464 SQ. MI.
BASIC DISCHARGE(Q100)	80,000 CFS.
BASIC HIGH WATER ELEVATION	128.200

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	180,000 CFS.
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	137.500

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	SID INSPECTION	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE								26628	20865		LUMP SUM	
END BENT NO. 1										37.1		5651
BENT NO. 1			19.4	22.0	21.4					48.2		13206
BENT NO. 2			20.4	21.0	21.4					48.4		13237
BENT NO. 3			23.4	28.0	29.4					48.4		13879
BENT NO. 4			22.4	27.0	26.4					48.3		13716
BENT NO. 5			24.4	25.0	28.4					48.0		13662
END BENT NO. 2										37.1		5651
TOTAL	LUMP SUM	LUMP SUM	110.0	123.0	127.0	5	5	26628	20865	315.5	LUMP SUM	79002

TOTAL BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		2 BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	EXPANSION JOINT SEALS	TELEPHONE CONDUIT AND HANGER SYSTEM
	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		30	3117.92			620.02	678.00	627.81			LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO. 1				9	225				355	395				
BENT NO. 1	2058													
BENT NO. 2	2071													
BENT NO. 3	2316													
BENT NO. 4	2255													
BENT NO. 5	2232													
END BENT NO. 2				9	270				585	650				
TOTAL	10932	30	3117.92	18	495	620.02	678.00	627.81	940	1045	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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.

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

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

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

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 16 SPANS, 1 @ 34'-1", 1 @ 35'-0", 13 @ 52'-6", AND 1 @ 51'-7", WITH A REINFORCED CONCRETE DECK ON 4 LINES OF W33 X 130 I-BEAMS @ 8'-0" CENTERS, WITH A CLEAR ROADWAY WIDTH OF 28.2 FT. ON CONCRETE CAPS AND STEEL H-PILES AT END BENT 1 AND 2, AND REINFORCED CONCRETE POST AND BEAM AT THE INTERIOR BENTS, LOCATED DOWNSTREAM FROM THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT ONLY ONE TEMPORARY ROCK CAUSEWAY SHALL BE IN PLACE AT A TIME.

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 SPICED 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 30+63.00 -SBL-."

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 30+63.00 -SBL-.

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 PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 30+63.00-SBL-, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4138

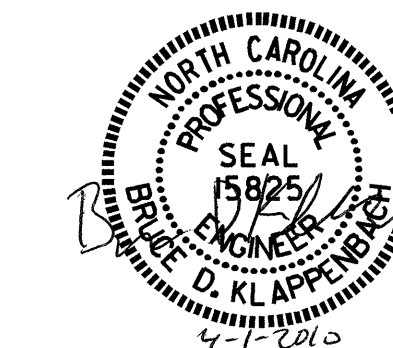
HARNETT COUNTY

STATION: 30+63.00-SBL-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE OVER  
CAPE FEAR RIVER  
ON US 401 BETWEEN  
SR 1319 AND SR 1516



REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: M. G. SHAIKH DATE: 01-26-10  
CHECKED BY: C. R. YARBROUGH DATE: 02-04-10

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.002	--	1.75	0.789	1.7	C	EL	51.5	0.884	2.07	D	I	41.2	0.80	0.884	1.00	C	I	51.5		
	HL-93(Opr)	N/A	--	2.202	--	1.35	0.789	2.2	C	EL	51.5	0.884	2.68	D	I	41.2	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.441	51.894	1.75	0.789	2.39	C	EL	51.5	0.884	2.71	D	I	41.2	0.80	0.789	1.44	C	EL	51.5		
	HS-20(Opr)	36.000	--	3.096	111.439	1.35	0.789	3.1	C	EL	51.5	0.884	3.51	D	I	41.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.436	46.392	1.4	0.789	7.12	C	EL	51.5	0.884	8	D	I	41.2	0.80	0.789	3.44	C	EL	51.5	
		SNGARBS2	20.000	--	2.481	49.621	1.4	0.789	5.14	C	EL	51.5	0.884	5.71	D	I	41.2	0.80	0.789	2.48	C	EL	51.5	
		SNAGRIS2	22.000	--	2.318	50.987	1.4	0.789	4.8	C	EL	51.5	0.884	5.31	D	I	41.2	0.80	0.789	2.32	C	EL	51.5	
		SNCOTTS3	27.250	--	1.708	46.535	1.4	0.789	3.54	C	EL	51.5	0.884	4	D	I	41.2	0.80	0.789	1.71	C	EL	51.5	
		SNAGGRS4	34.925	--	1.396	48.766	1.4	0.789	2.89	C	EL	51.5	0.884	3.33	D	I	41.2	0.80	0.789	1.40	C	EL	51.5	
		SNS5A	35.550	--	1.367	48.614	1.4	0.789	2.83	C	EL	51.5	0.884	3.38	D	I	41.2	0.80	0.789	1.37	C	EL	51.5	
		SNS6A	39.950	--	1.242	49.625	1.4	0.789	2.57	C	EL	51.5	0.884	3.09	D	I	41.2	0.80	0.789	1.24	C	EL	51.5	
	TTST	SNS7B	42.000	--	1.182	49.663	1.4	0.789	2.45	C	EL	51.5	0.884	3.04	D	I	41.2	0.80	0.789	1.18	C	EL	51.5	
		TNAGRIT3	33.000	--	1.511	49.866	1.4	0.789	3.13	C	EL	51.5	0.884	3.67	D	I	41.2	0.80	0.789	1.51	C	EL	51.5	
		TNT4A	33.075	--	1.514	50.088	1.4	0.789	3.14	C	EL	51.5	0.884	3.57	D	I	41.2	0.80	0.789	1.51	C	EL	51.5	
		TNT6A	41.600	--	1.227	51.025	1.4	0.789	2.54	C	EL	51.5	0.884	3.25	D	I	41.2	0.80	0.789	1.23	C	EL	51.5	
		TNT7A	42.000	--	1.227	51.516	1.4	0.789	2.54	C	EL	51.5	0.884	3.18	D	I	41.2	0.80	0.789	1.23	C	EL	51.5	
		TNT7B	42.000	--	1.254	52.669	1.4	0.789	2.6	C	EL	51.5	0.884	2.96	D	I	41.2	0.80	0.789	1.25	C	EL	51.5	
		TNAGRIT4	43.000	--	1.204	51.771	1.4	0.789	2.49	C	EL	51.5	0.884	2.87	D	I	41.2	0.80	0.789	1.20	C	EL	51.5	
TNAGT5A	45.000	--	1.14	51.32	1.4	0.789	2.36	C	EL	51.5	0.884	2.86	D	I	41.2	0.80	0.789	1.14	C	EL	51.5			
TNAGT5B	45.000	3	1.131	50.91	1.4	0.789	2.34	C	EL	51.5	0.884	2.73	D	I	41.2	0.80	0.789	1.13	C	EL	51.5			

### LOAD FACTORS:

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

	YEAR	ADTT
CURRENT	2009	1254
FUTURE	2035	2314

### NOTES:

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

### COMMENTS:

1. SPAN C AND SPAN D ARE IDENTICAL.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

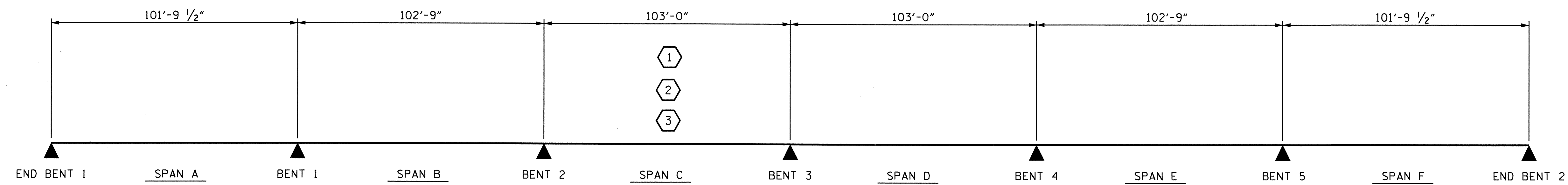
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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

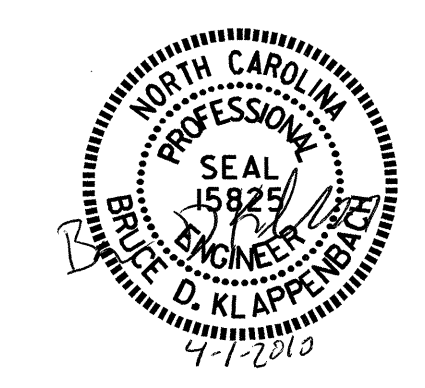


## LRFR SUMMARY

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)



ASSEMBLED BY: S.T. CHAMPION DATE: 02/10  
 CHECKED BY: G.W. DICKEY DATE: 02/10  
 DRAWN BY: MAA 1/08 REV. 11/12/08R MAA/GM  
 CHECKED BY: GM/DI 2/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			59

**NOTES**

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

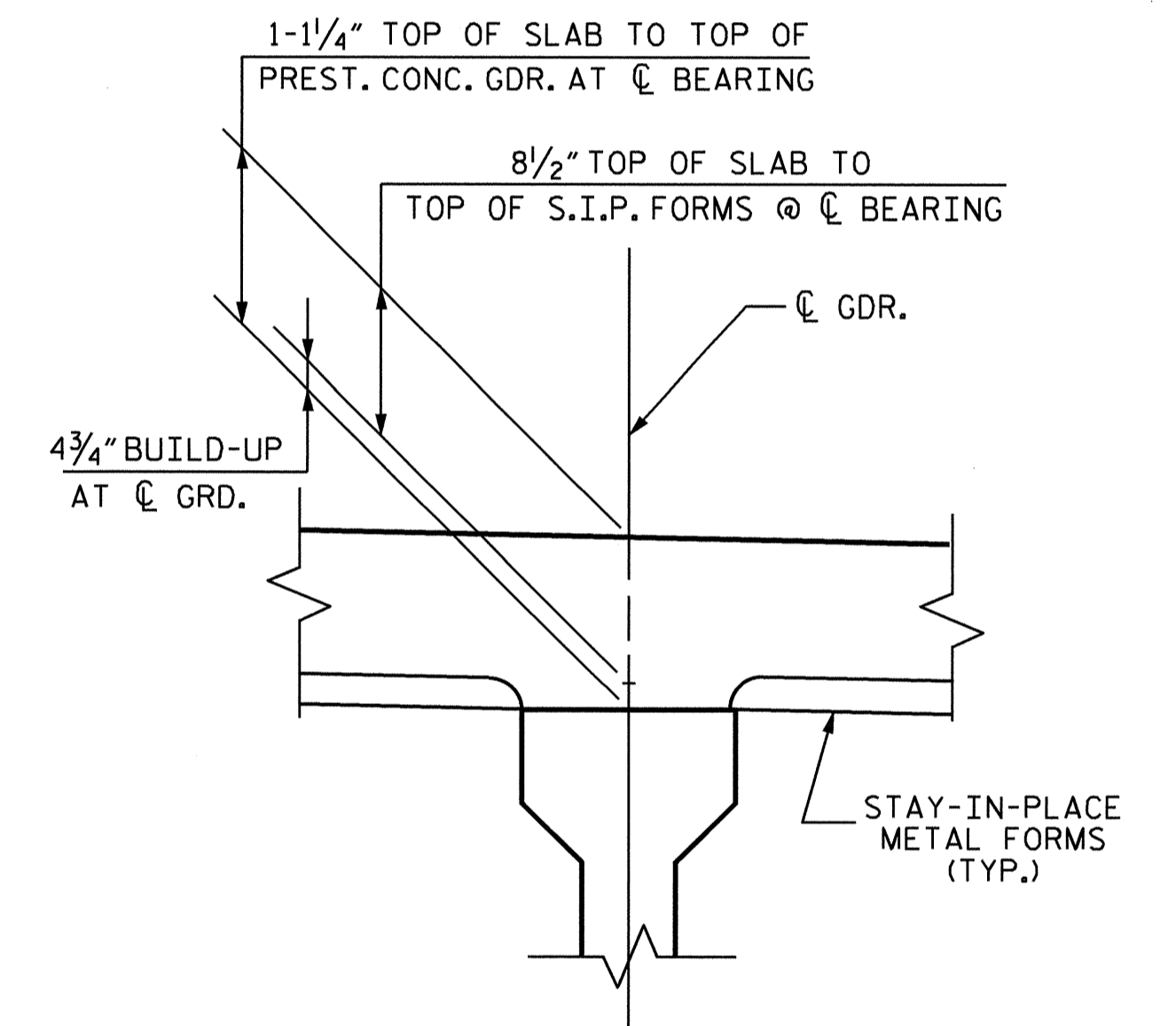
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

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

\*USE THIS SIZE BAR SUPPORT IN THE AREAS WITH THE #4 'B' BARS. FOR OTHER AREAS WITH #6 'B' BARS, USE THE BAR SUPPORT AS SHOWN IN THE TYPICAL SECTION AT BENT.

FOR CONCRETE INSERTS, SEE STRUCTURE UTILITY PLANS. THE USE OF ADHESIVE ANCHORS SHALL NOT BE ALLOWED.



**DETAIL A**

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

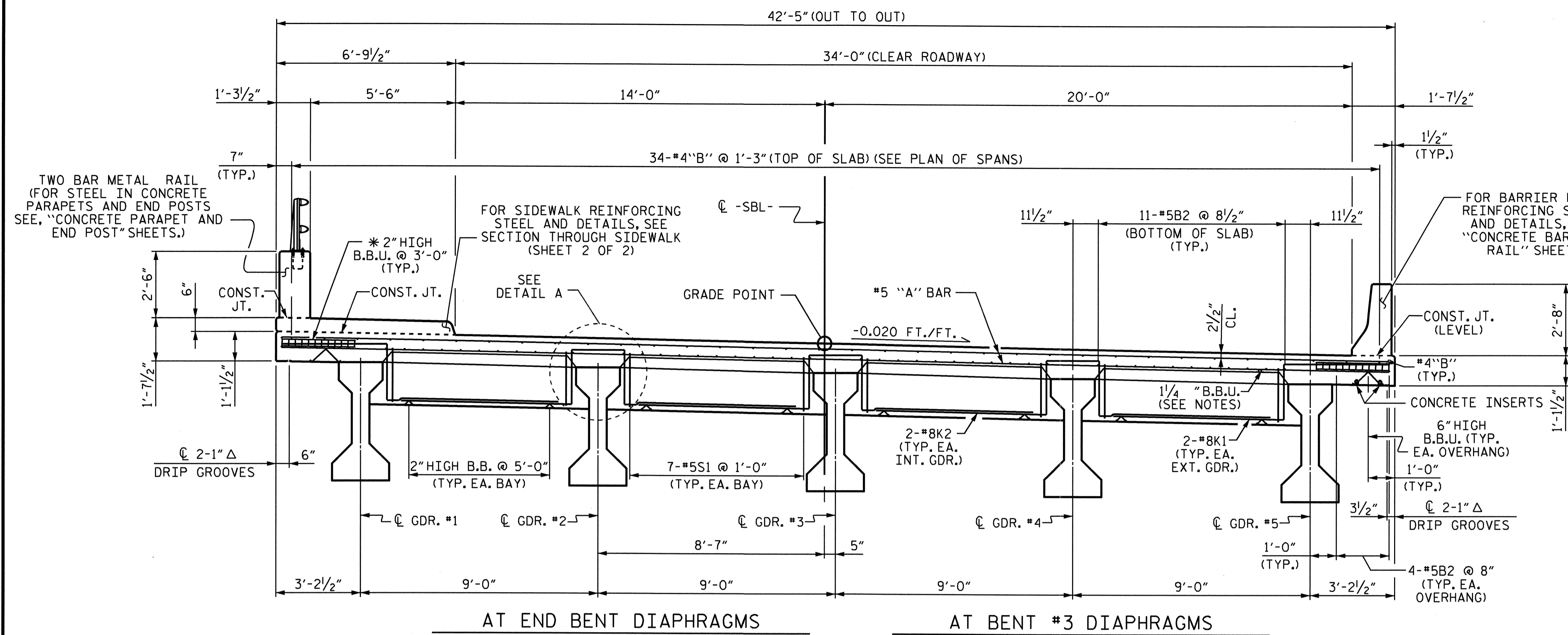
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

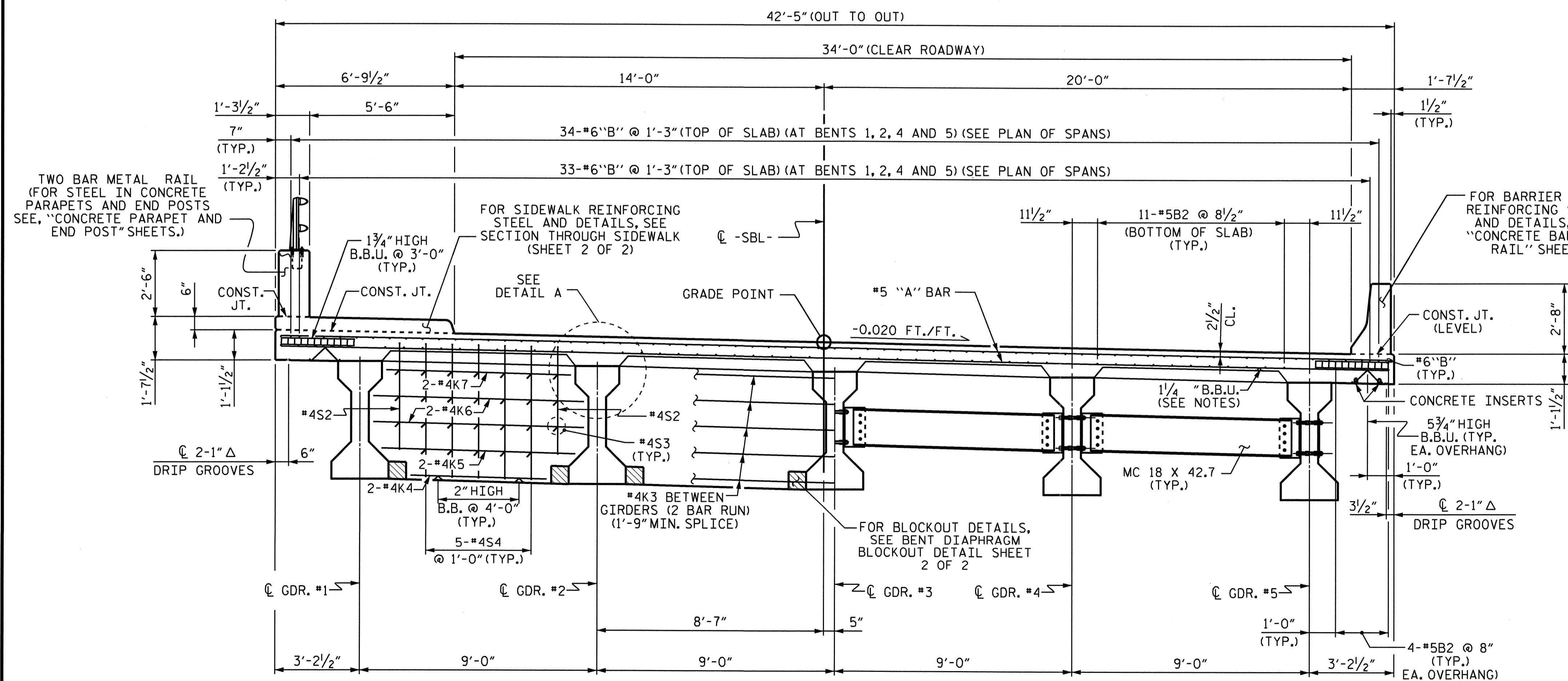
**SUPERSTRUCTURE  
 TYPICAL SECTION**

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

S-7  
TOTAL SHEETS  
59



**TYPICAL SECTION**

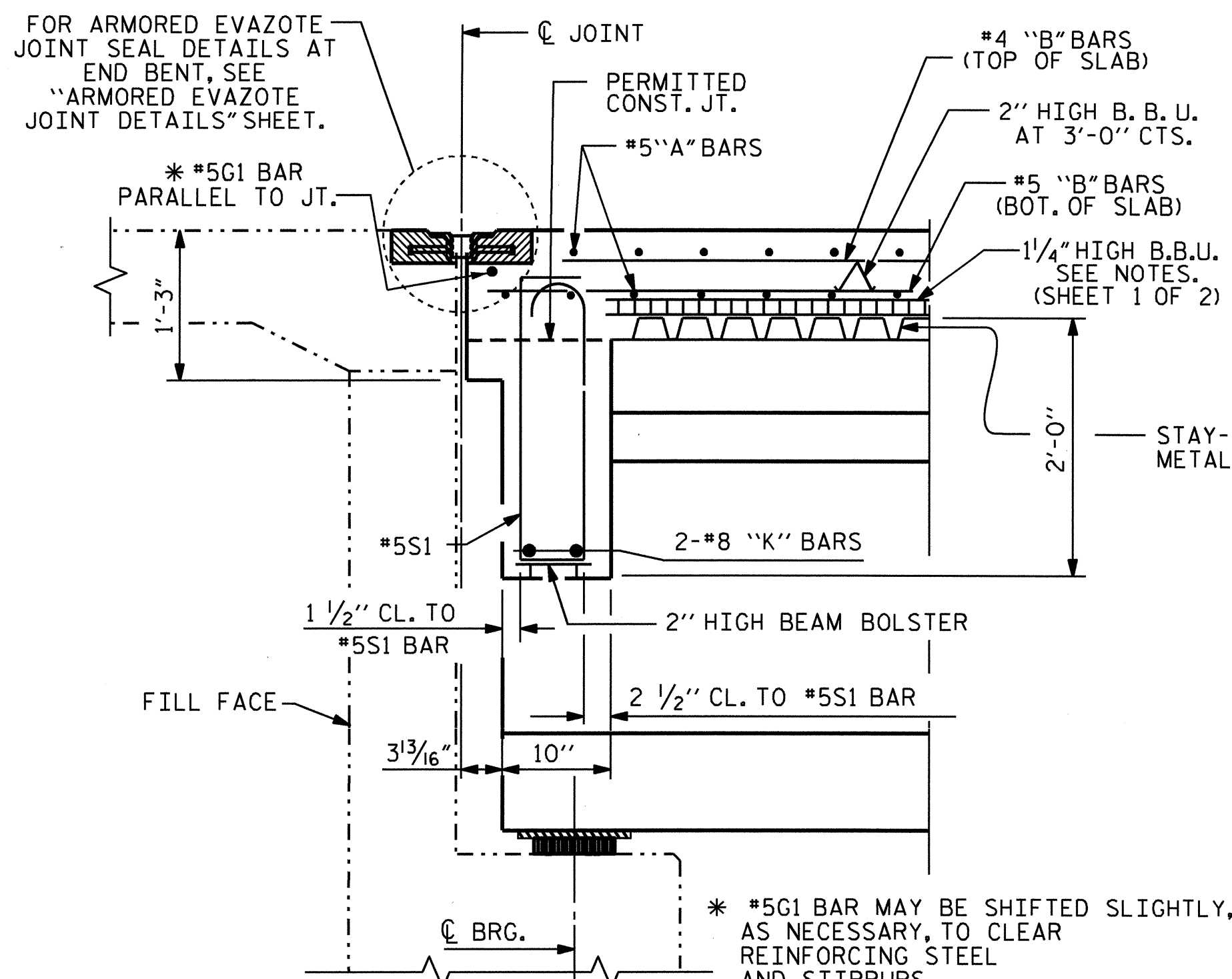


**TYPICAL SECTION**

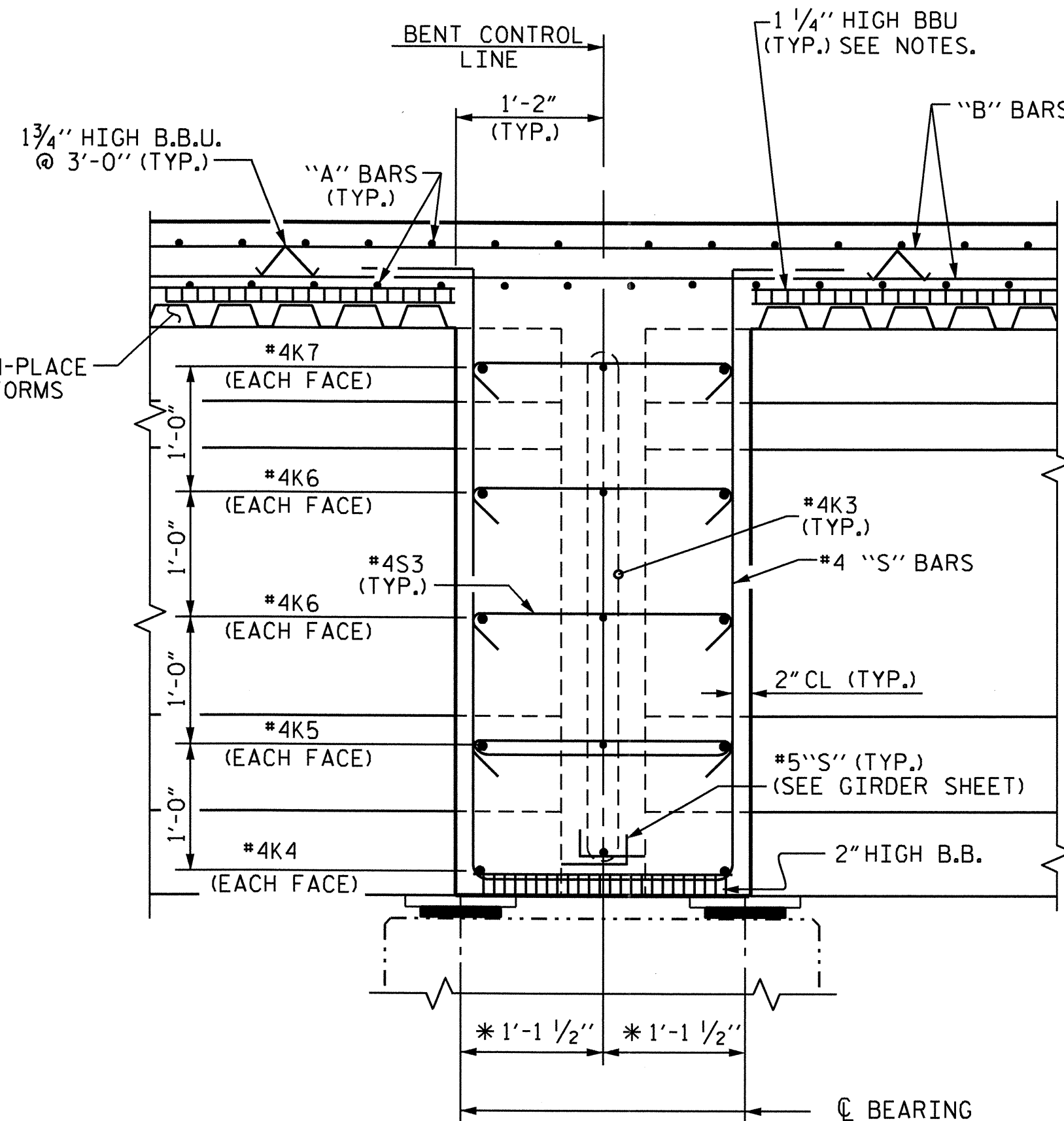
DRAWN BY: H. T. BARBOUR DATE: 3-23-09  
 CHECKED BY: M. G. SHAIKH DATE: 2-10

31-MAR-2010 14:13  
 R:\Structures\barbour\micrstation\b4138.sd.ts.dgn  
 tbarbour



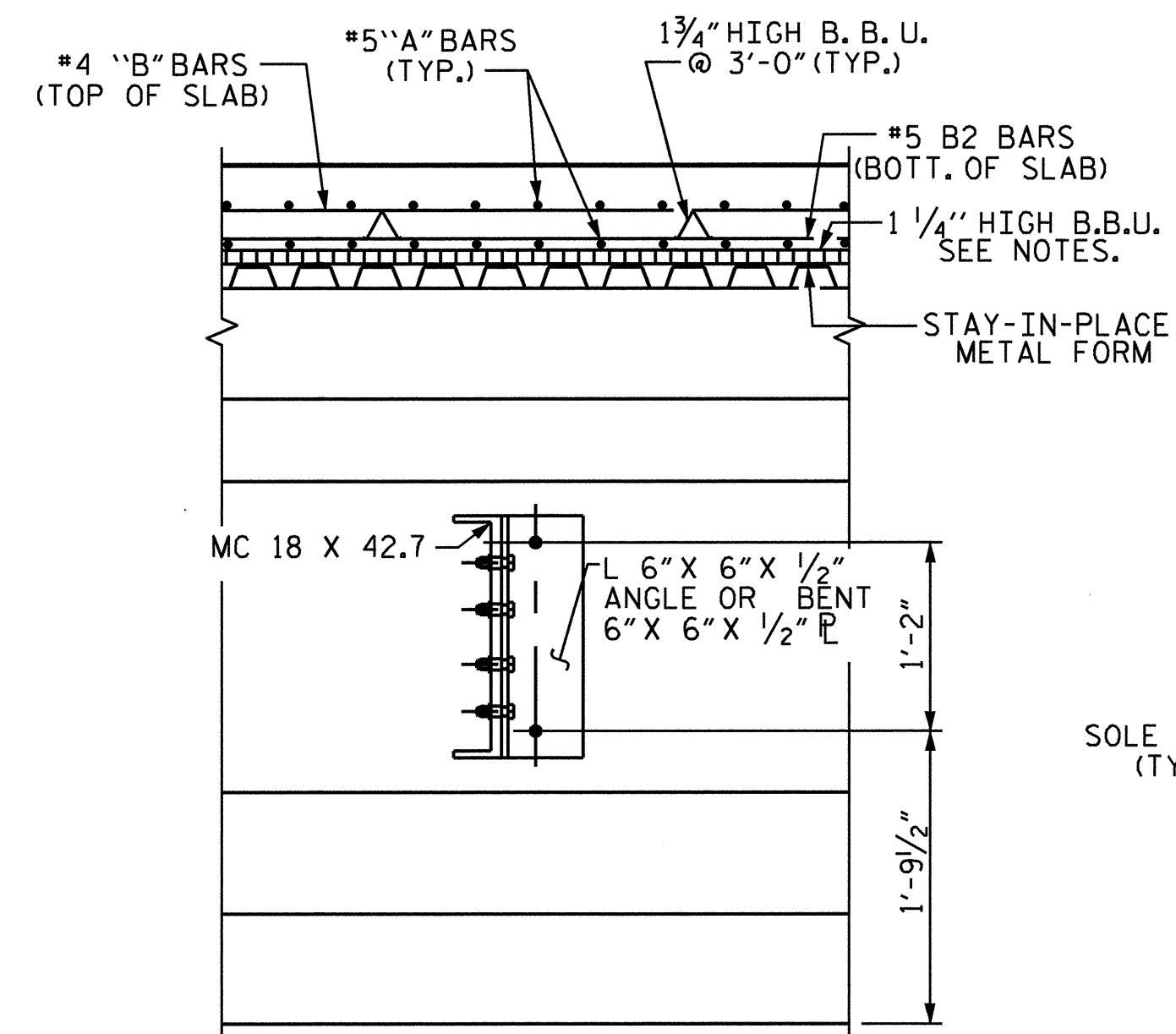


SECTION @ END BENT DIAPHRAGM

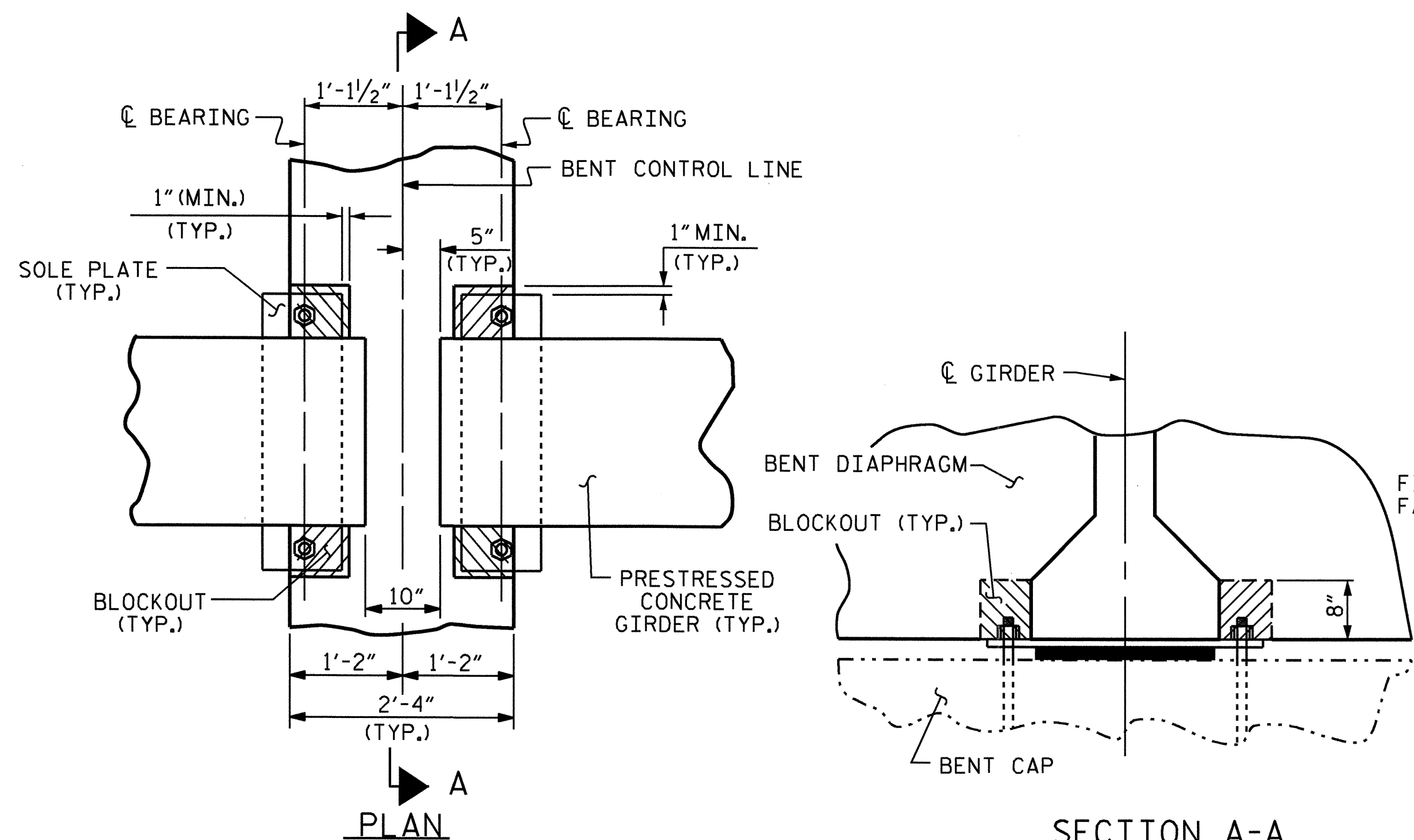


SECTION AT BENT DIAPHRAGM

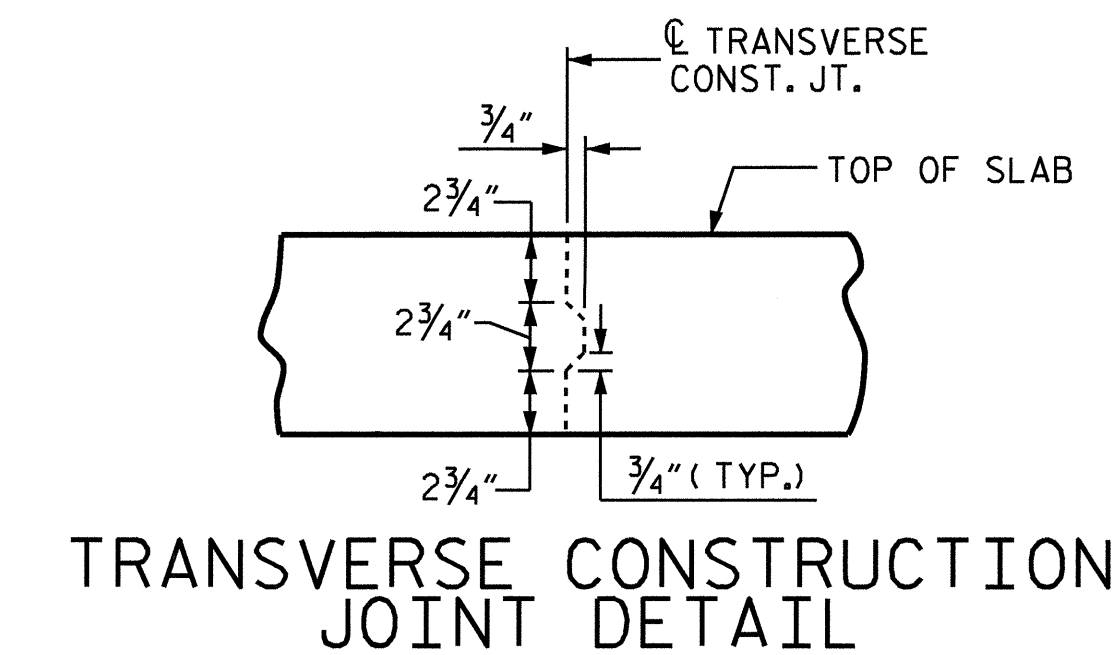
\* MEASURED ALONG CL GIRDER



SECTION AT INTERMEDIATE STEEL DIAPHRAGM



BENT DIAPHRAGM BLOCKOUT DETAIL

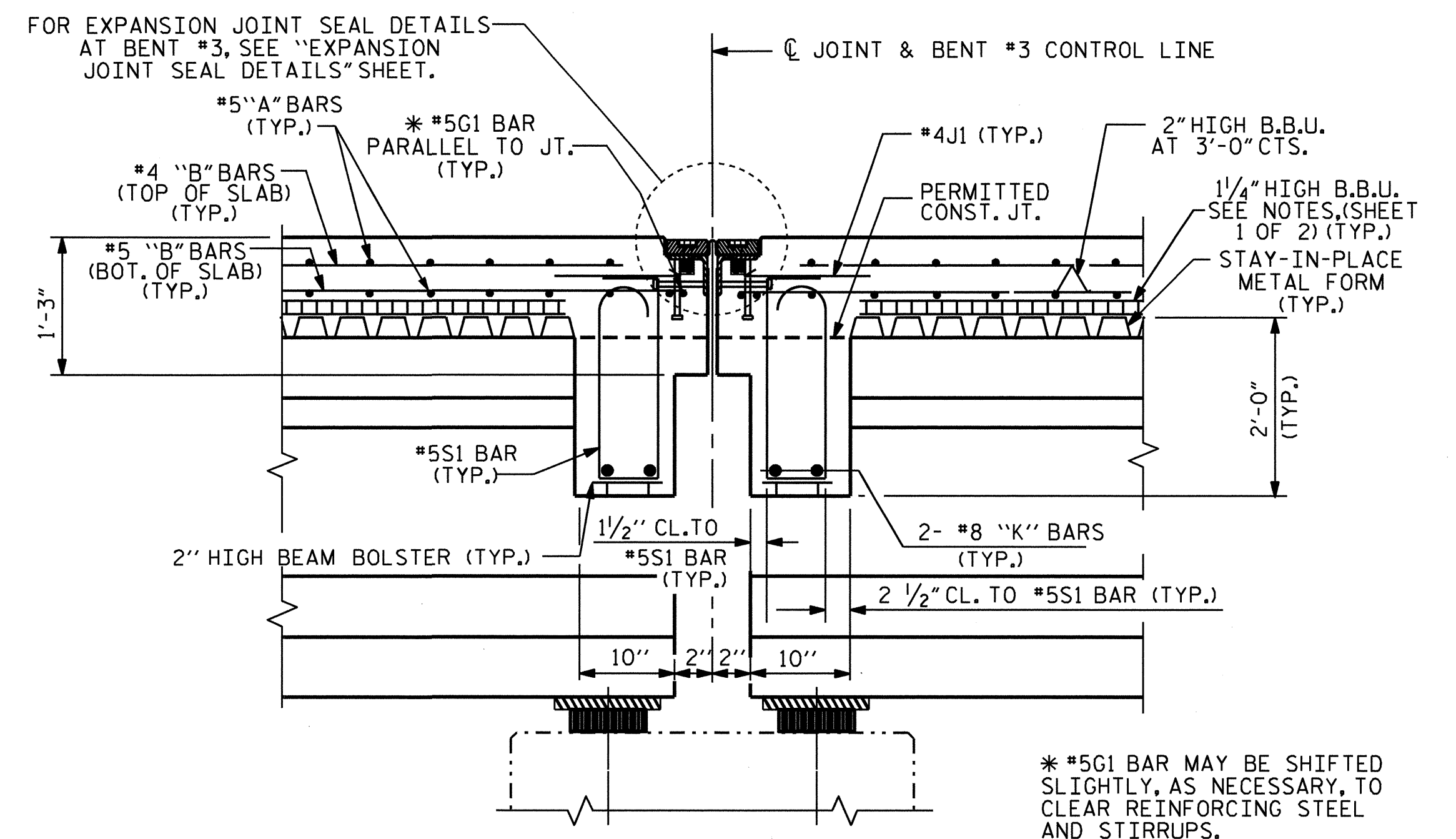


TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT EXCEPT AT BENT #3

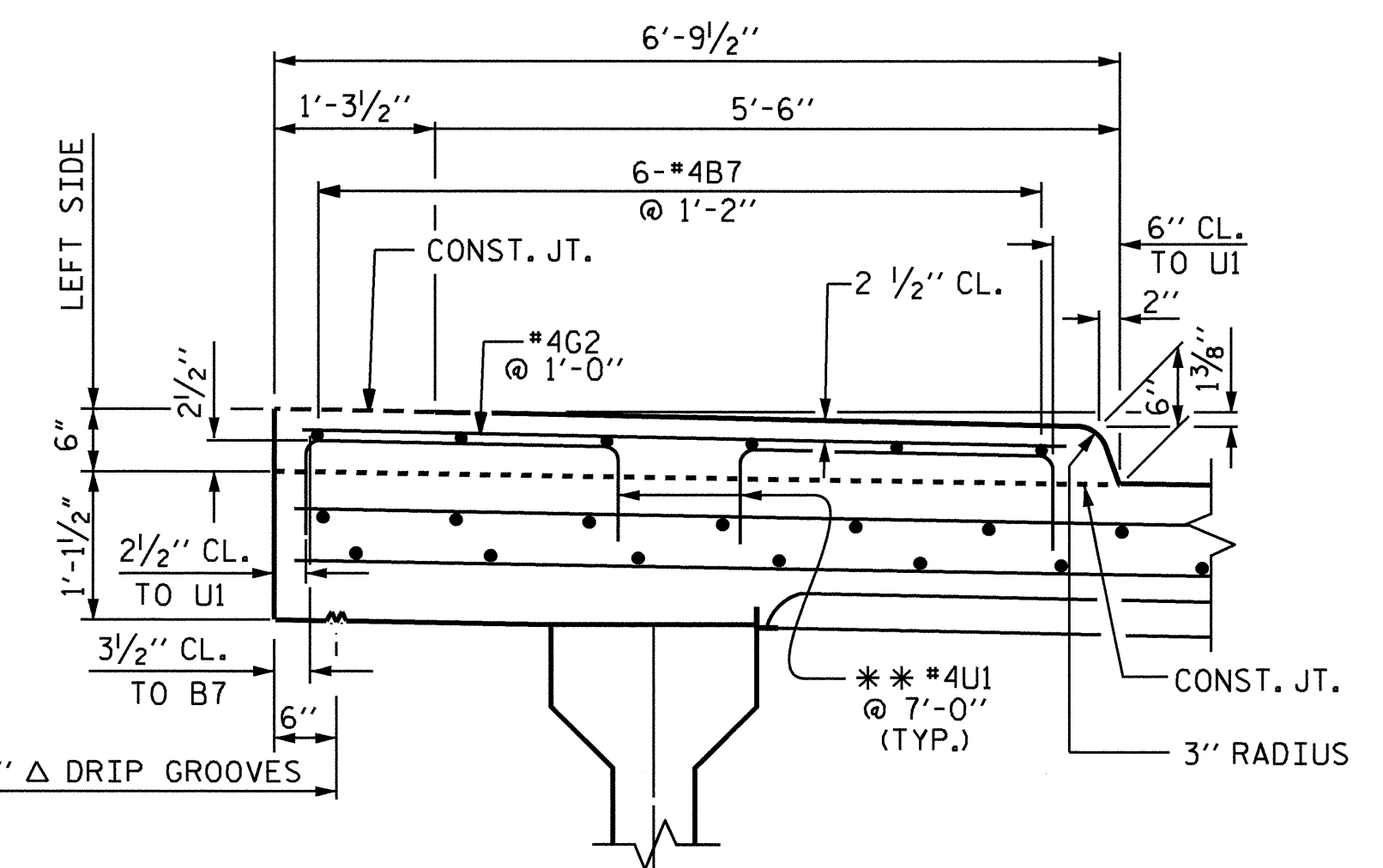
DRAWN BY: H. I. BARBOUR DATE: 3-24-09  
CHECKED BY: M. G. SHAIKH DATE: 2-10

31-MAR-2010 14:13  
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tbarbour



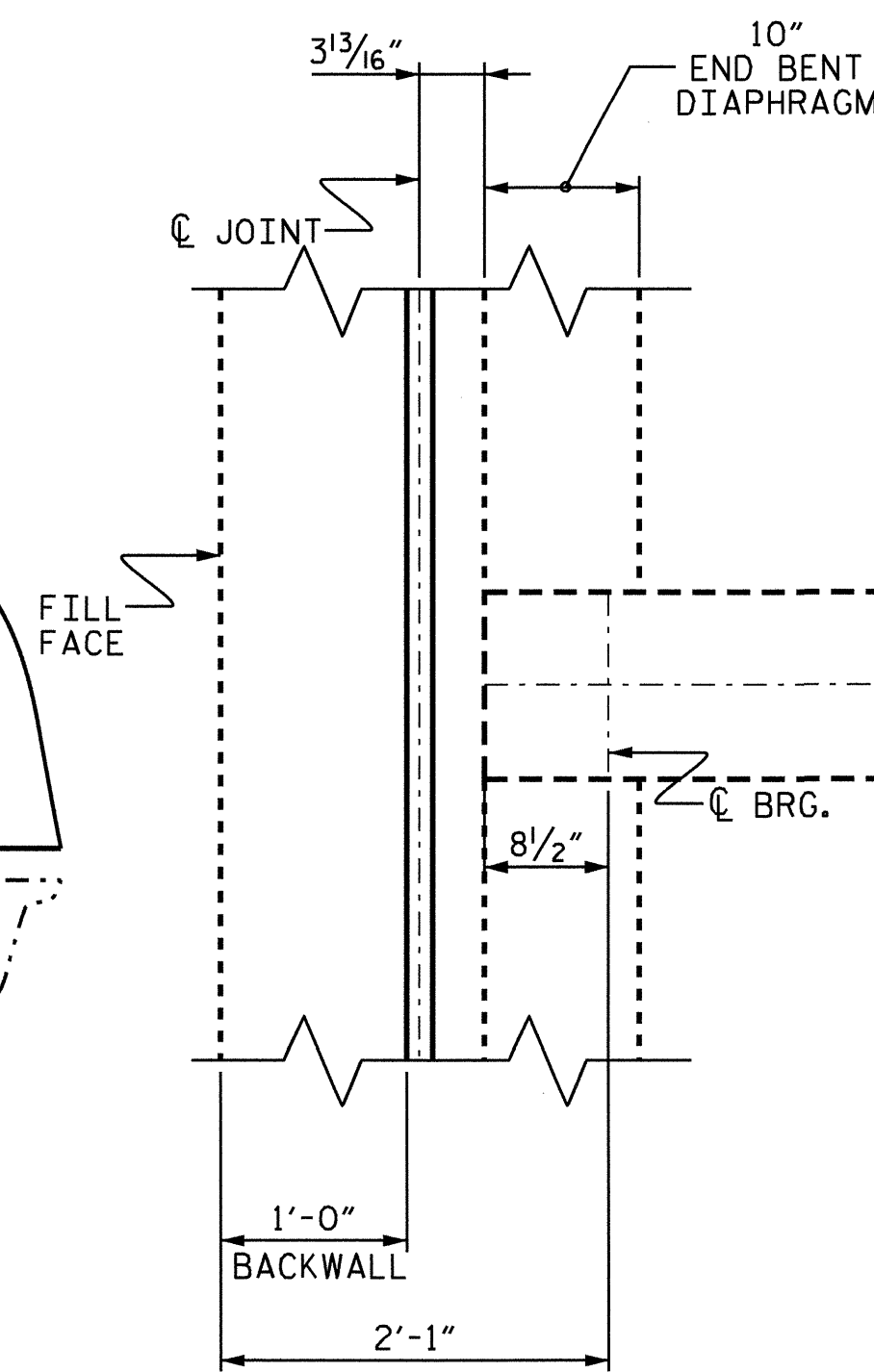
SECTION @ BENT DIAPHRAGM

(BENT #3)



SECTION THROUGH SIDEWALK

\* #4U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.



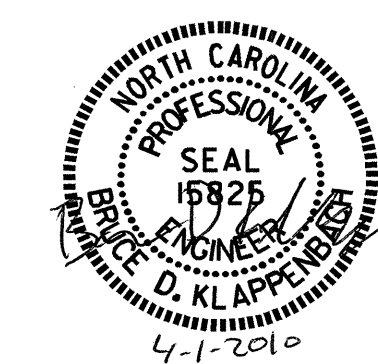
END BENT DIAPHRAGM

PROJECT NO. B-4138  
HARNETT COUNTY  
STATION: 30+63.00-SBL-

SHEET 2 OF 2

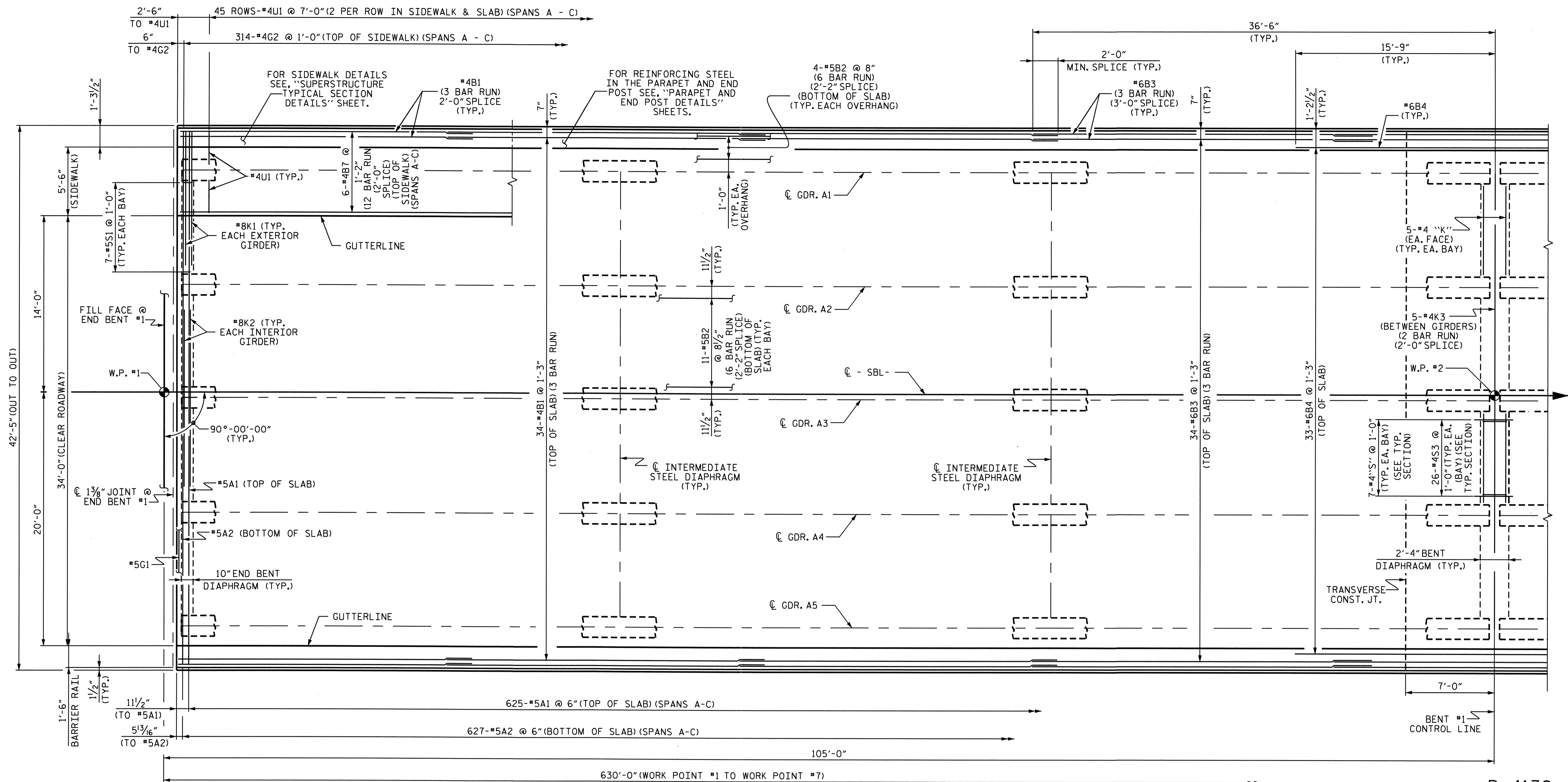
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					59

STR. #2



FOR LOCATION OF CONCRETE INSERTS, SEE STRUCTURE UTILITIES PLAN.

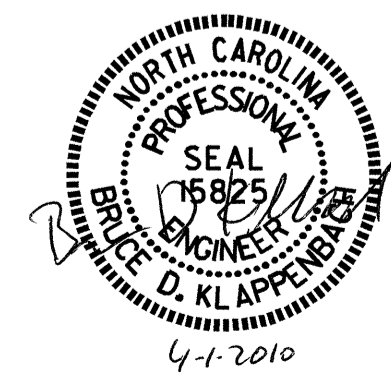
**SPAN A**

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 1 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

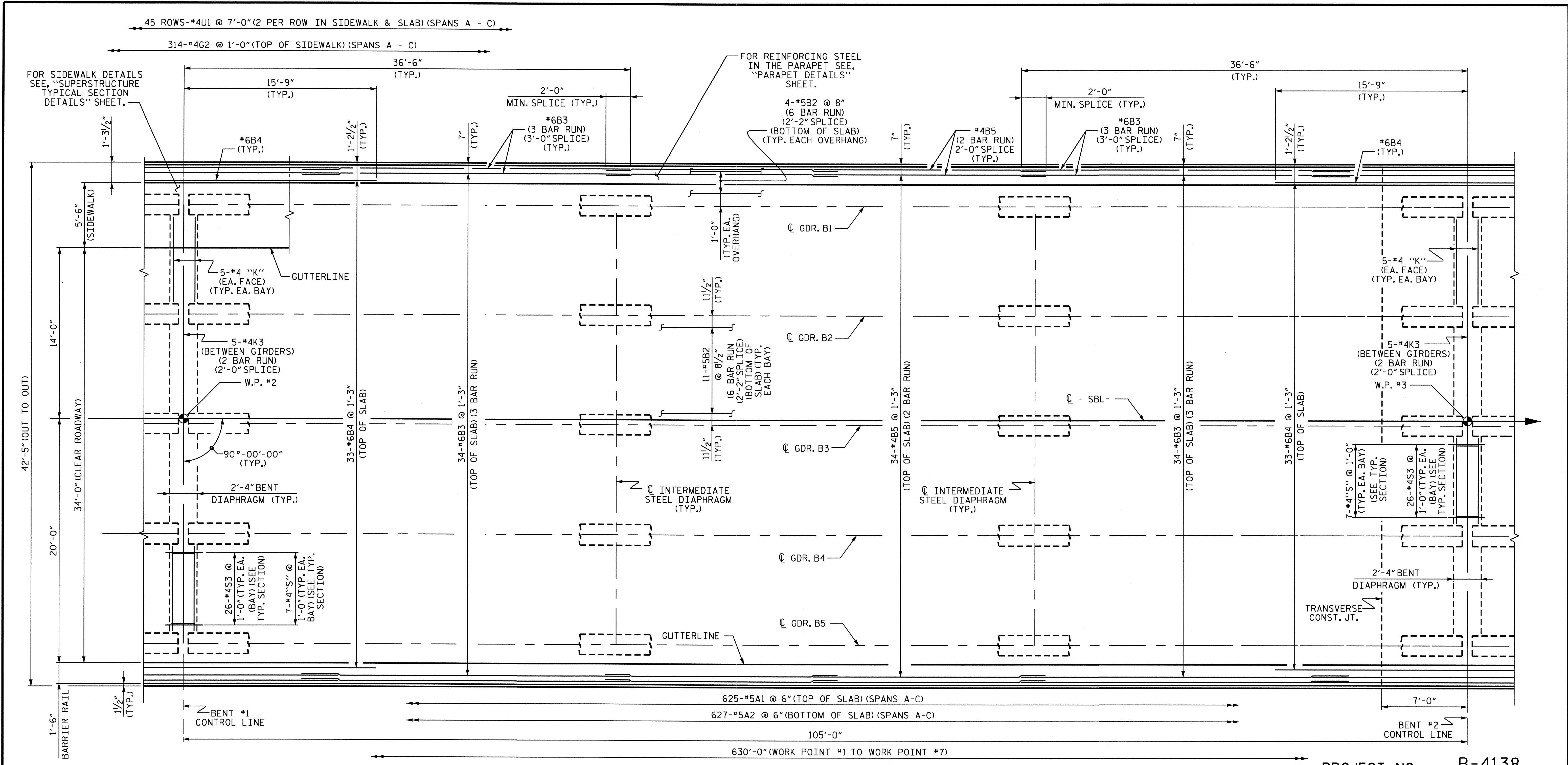
**SUPERSTRUCTURE  
 PLAN OF SPAN A**



REVISIONS						SHEET NO. 5-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: H. T. BARBOUR DATE: 4-08-09  
 CHECKED BY: M. G. SHAIKH DATE: 2-10

31-MAR-2010 14:13  
 R:\Structures\barbour\microstation\b4138.sd.s\*1-6.dgn  
 tbarbour



**SPAN B**

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00-SBL-

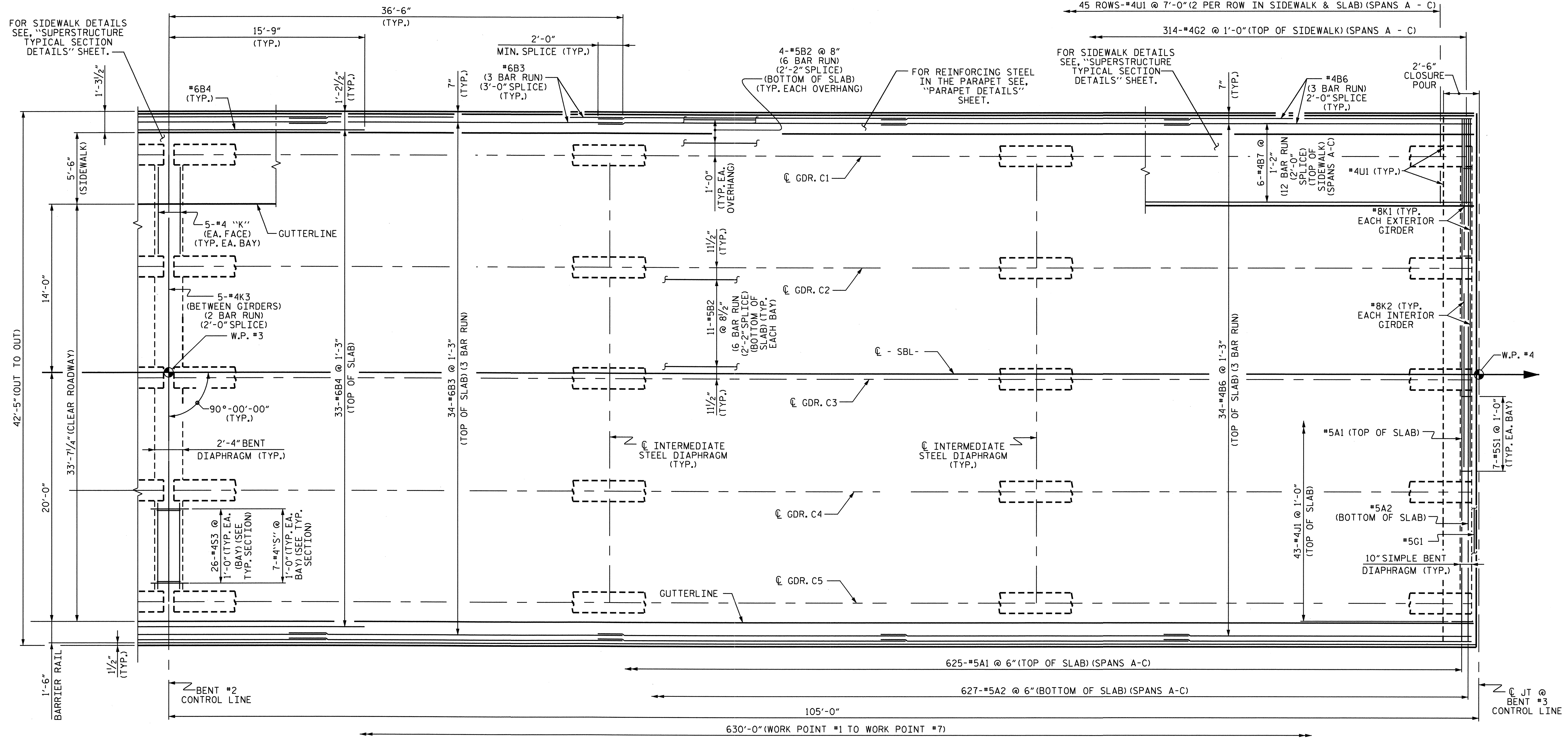
SHEET 2 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



DRAWN BY: H. I. BARBOUR DATE: 4-08-09  
 CHECKED BY: M. G. SHAIKH DATE: 2-10

SHEET NO. 5-10  
 TOTAL SHEETS 59



SPAN C

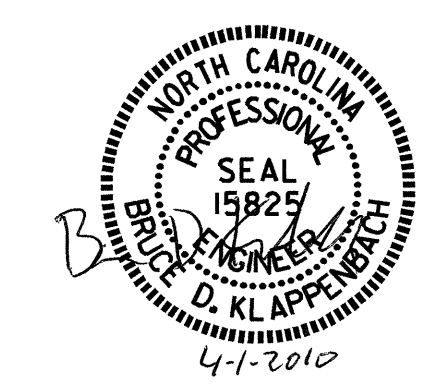
PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

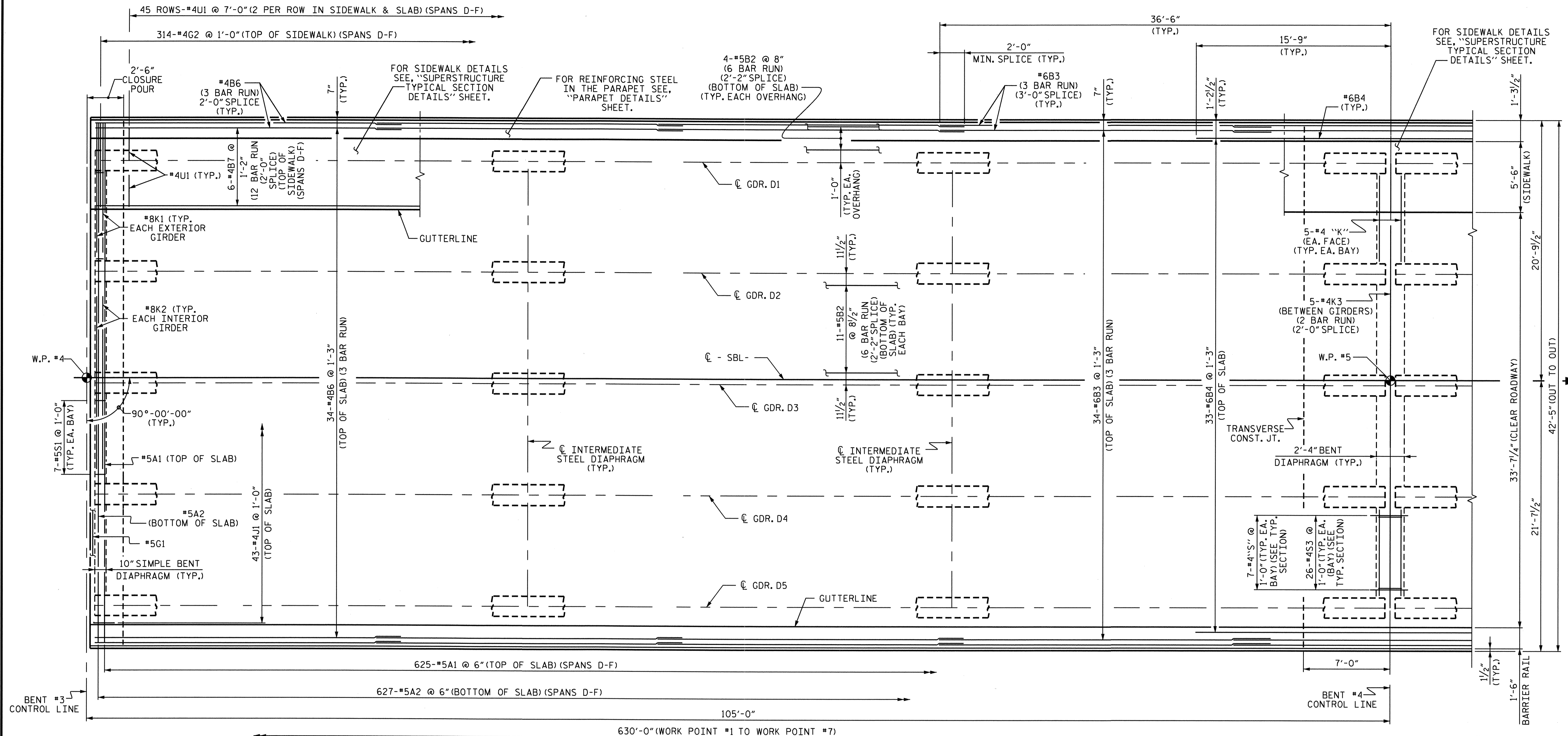
**SUPERSTRUCTURE  
 PLAN OF SPAN C**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL	59
2			4			SHEETS	59



DRAWN BY : H. T. BARBOUR DATE : 4-08-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
 R:\ Structures\ tbarbour \ microstation \ b4138.sd.s\*1-6.dgn  
 tbarbour



FOR LOCATION OF CONCRETE INSERTS, SEE STRUCTURE UTILITIES PLAN.

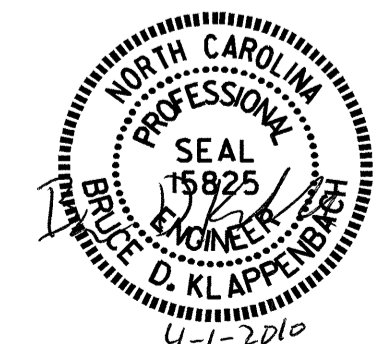
SPAN D

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

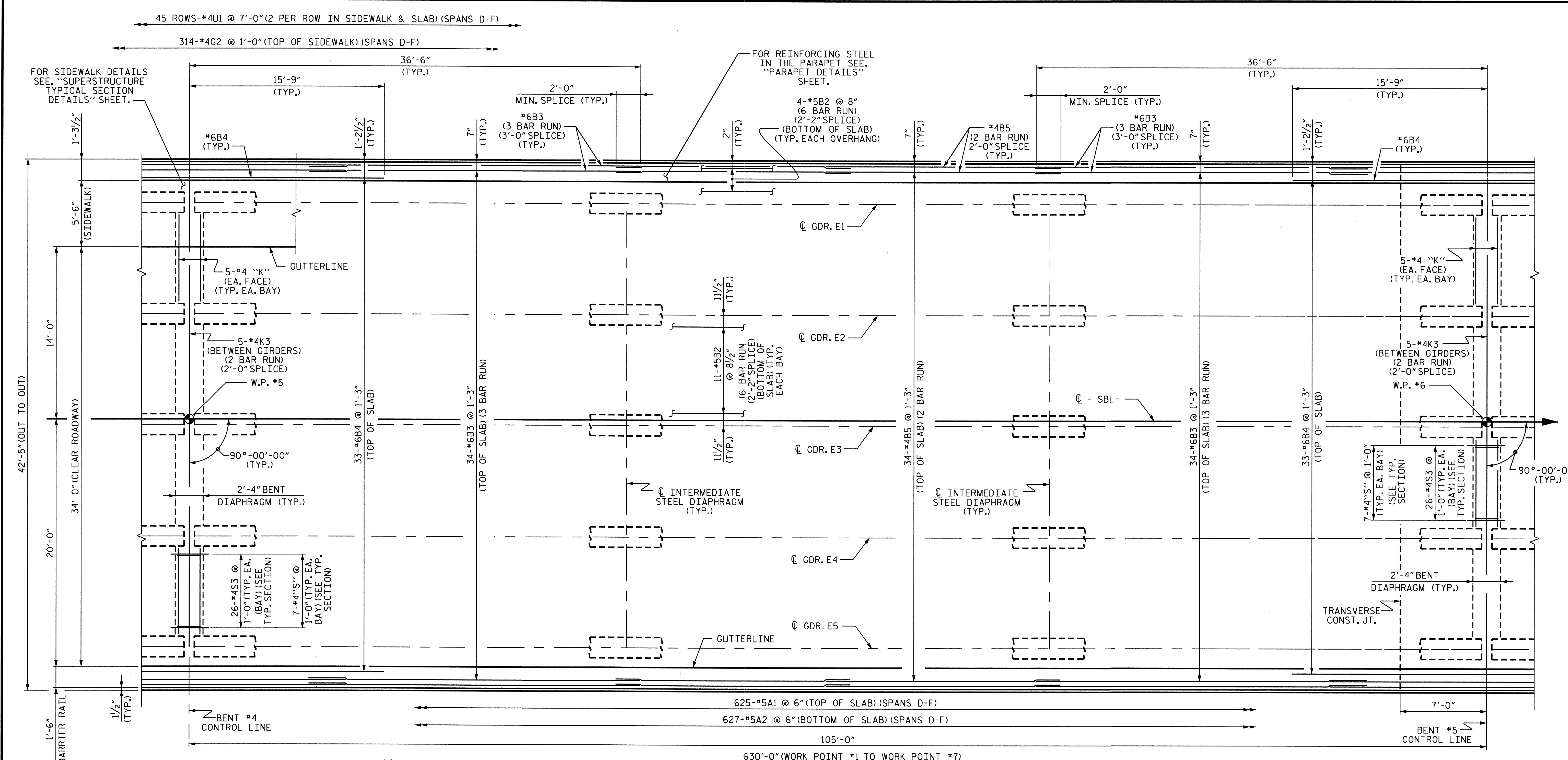
SUPERSTRUCTURE  
 PLAN OF SPAN D



REVISIONS					SHEET NO. 5-12
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 59
2			4		

DRAWN BY: H. T. BARBOUR DATE: 4-08-09  
 CHECKED BY: M. G. SHAIKH DATE: 2-10

31-MAR-2010 14:23  
 N:\Structures\barbour\microstation\b4138.sd.s\*1-6.dgn  
 tbarbour



**SPAN E**

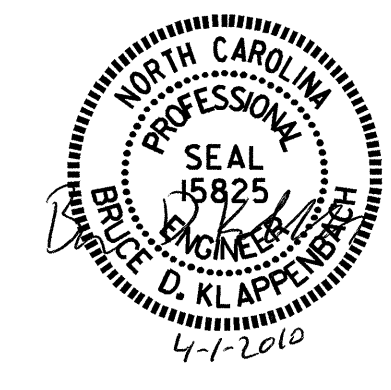
PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 5 OF 6

FOR LOCATION OF CONCRETE INSERTS, SEE  
 STRUCTURE UTILITIES PLAN.

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

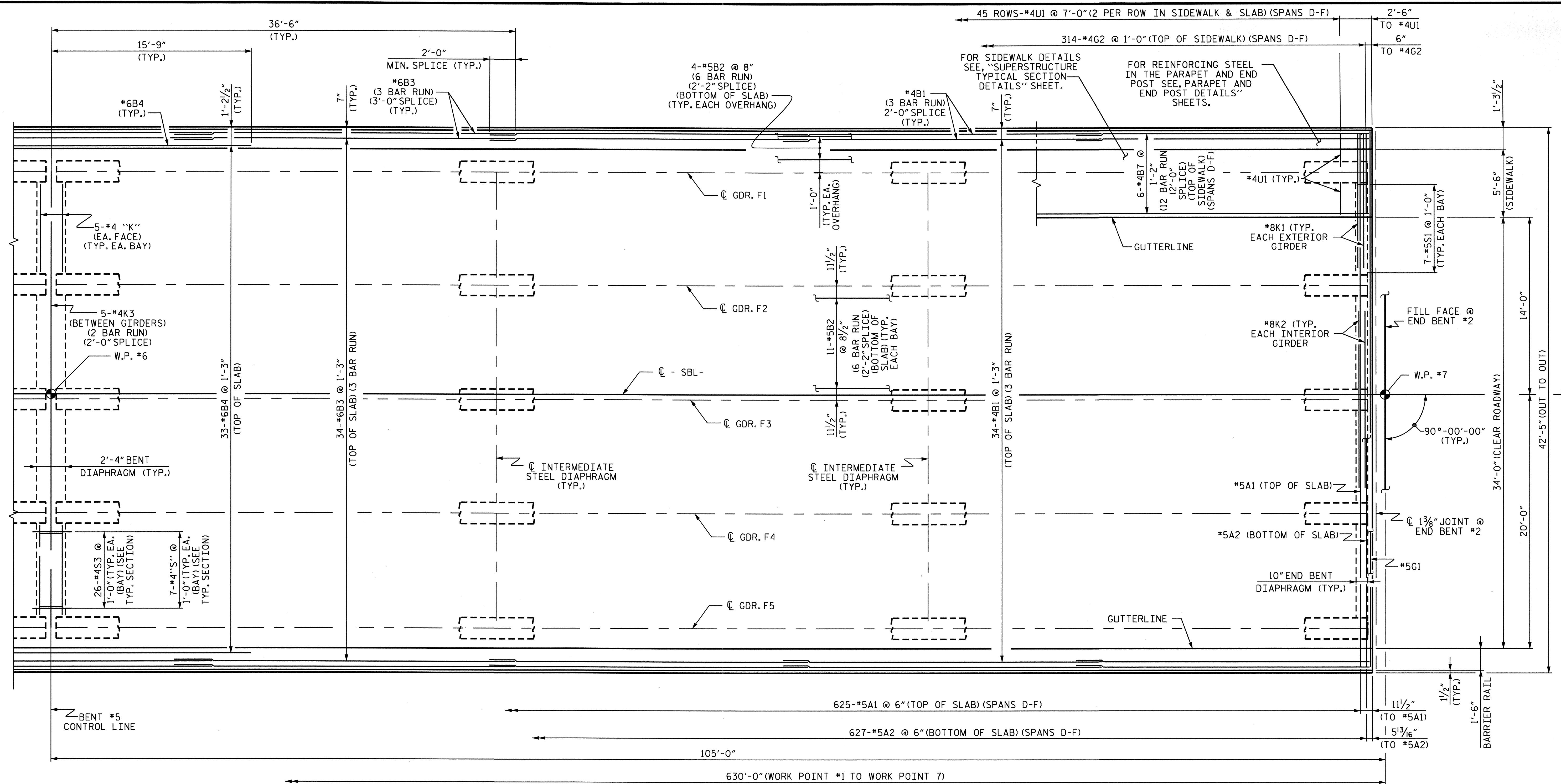
**SUPERSTRUCTURE  
 PLAN OF SPAN E**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			59



DRAWN BY : H. T. BARBOUR DATE : 4-08-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
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 tbarbour



FOR LOCATION OF CONCRETE INSERTS, SEE STRUCTURE UTILITIES PLAN.

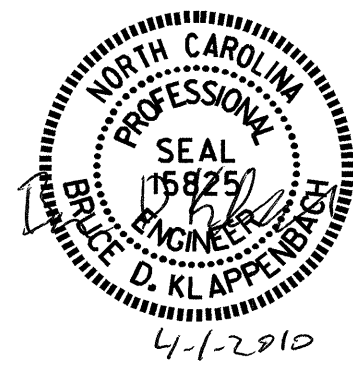
SPAN F

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

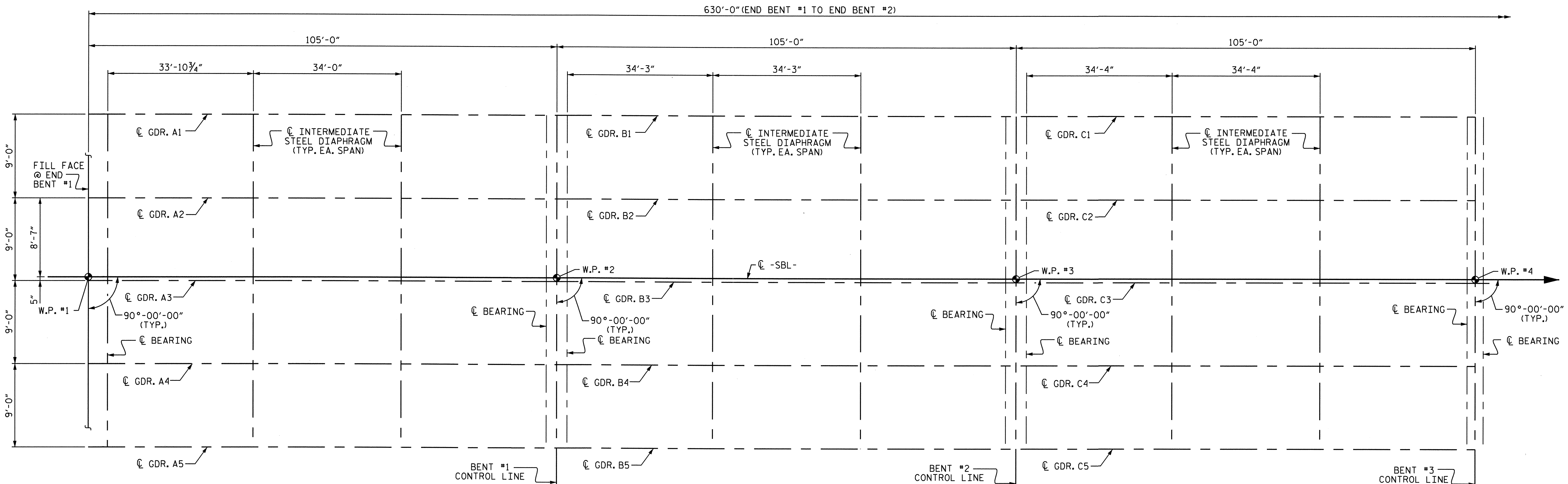
**SUPERSTRUCTURE  
 PLAN OF SPAN F**



DRAWN BY : H. T. BARBOUR DATE : 4-08-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
 R:\Structures\barbour\microstation\b4138\_sd\_s\*1-6.dgn  
 tbarbour

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			59



EXP.  
E1, P1

SPAN A

FIX.  
E1, P2

FIX.  
E1, P3

SPAN B

FIX.  
E1, P2

FIX.  
E1, P3

SPAN C

EXP.  
E1, P4

EXP.  
E1, P6

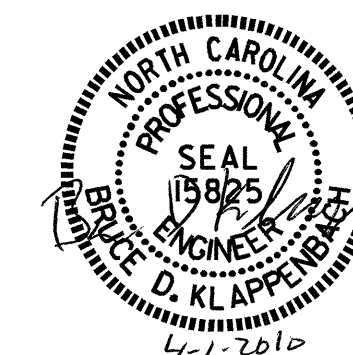
FRAMING PLAN

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 FRAMING PLAN  
 SPANS A, B, & C



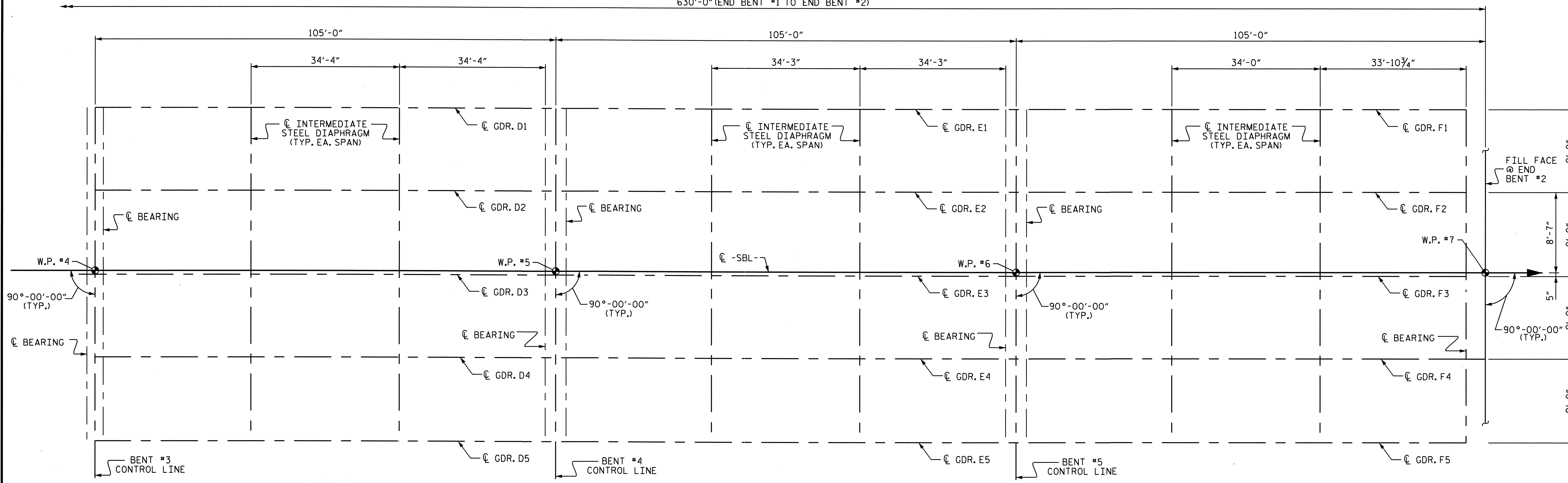
DRAWN BY : H. I. BARBOUR DATE : 3-25-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
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 tbarbour

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			59



630'-0" (END BENT #1 TO END BENT #2)



EXP.  
E1, P4

SPAN D

FIX.  
E1, P5

SPAN E

FIX.  
E1, P5

SPAN F

EXP.  
E1, P4

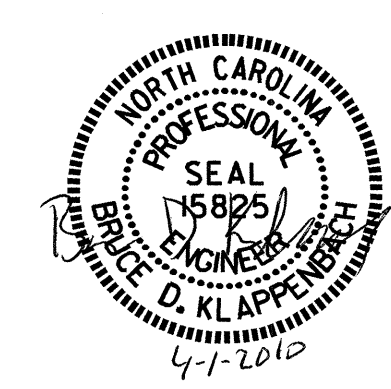
FRAMING PLAN

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

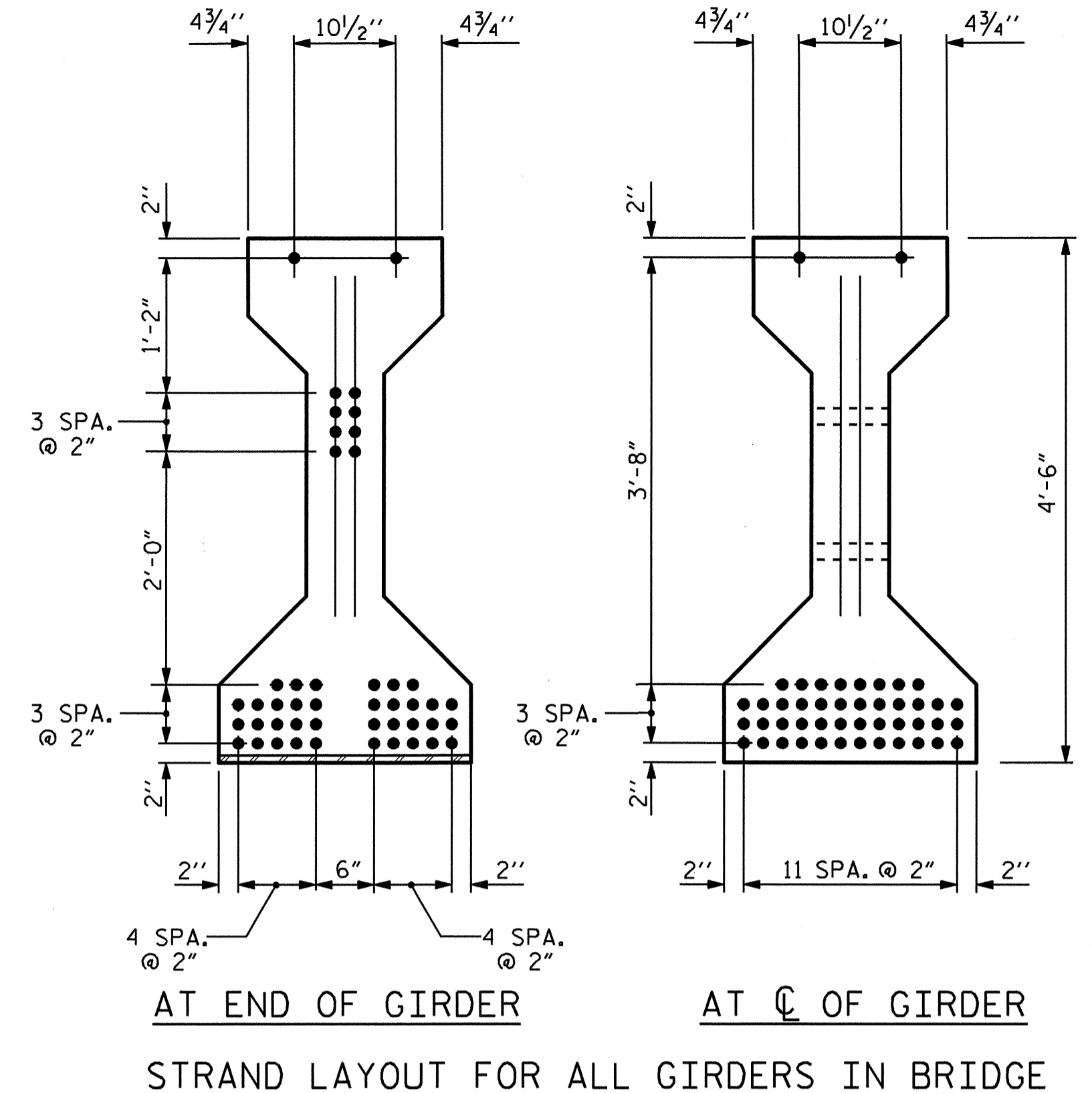
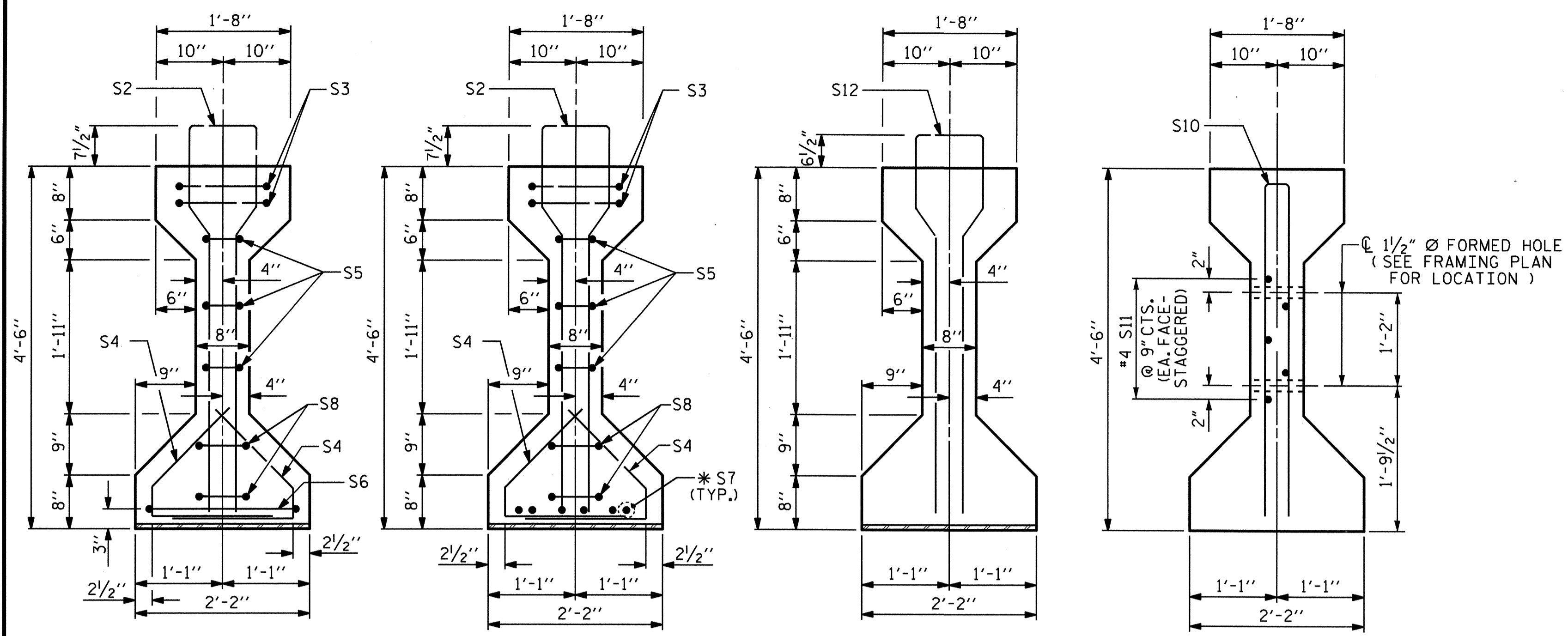
SUPERSTRUCTURE  
 FRAMING PLAN  
 SPANS D, E, & F



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			59

DRAWN BY : H. T. BARBOUR DATE : 3-25-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
 R:\Structures\barbour\microstation\b4138.sd.fp.dgn  
 tbarbour



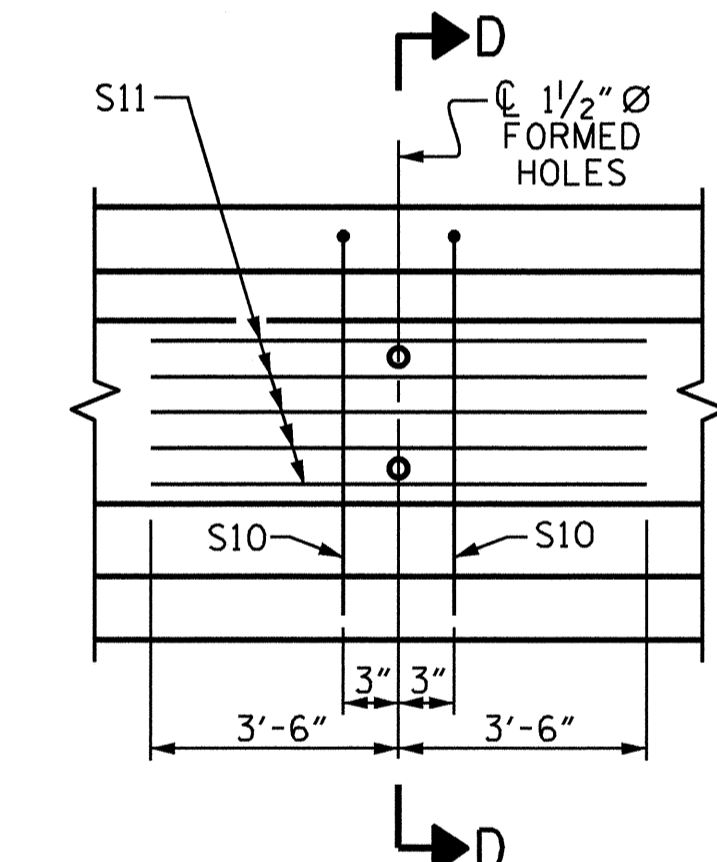
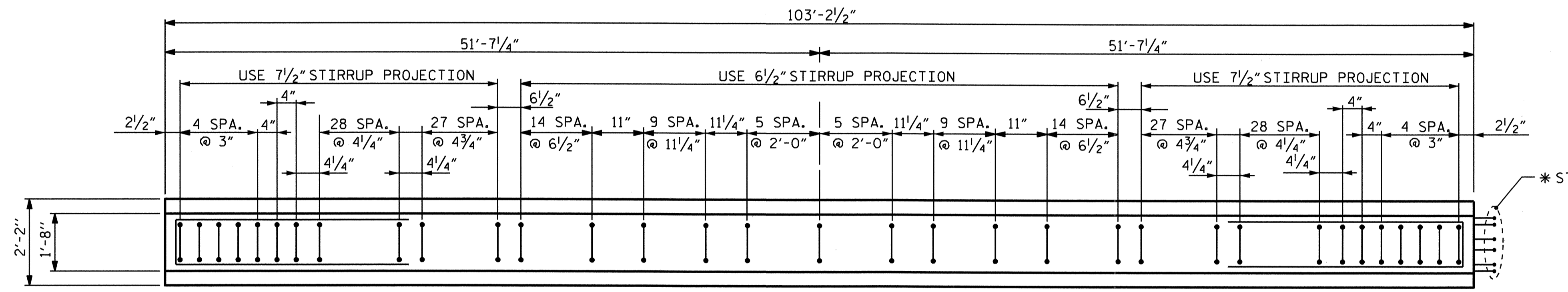
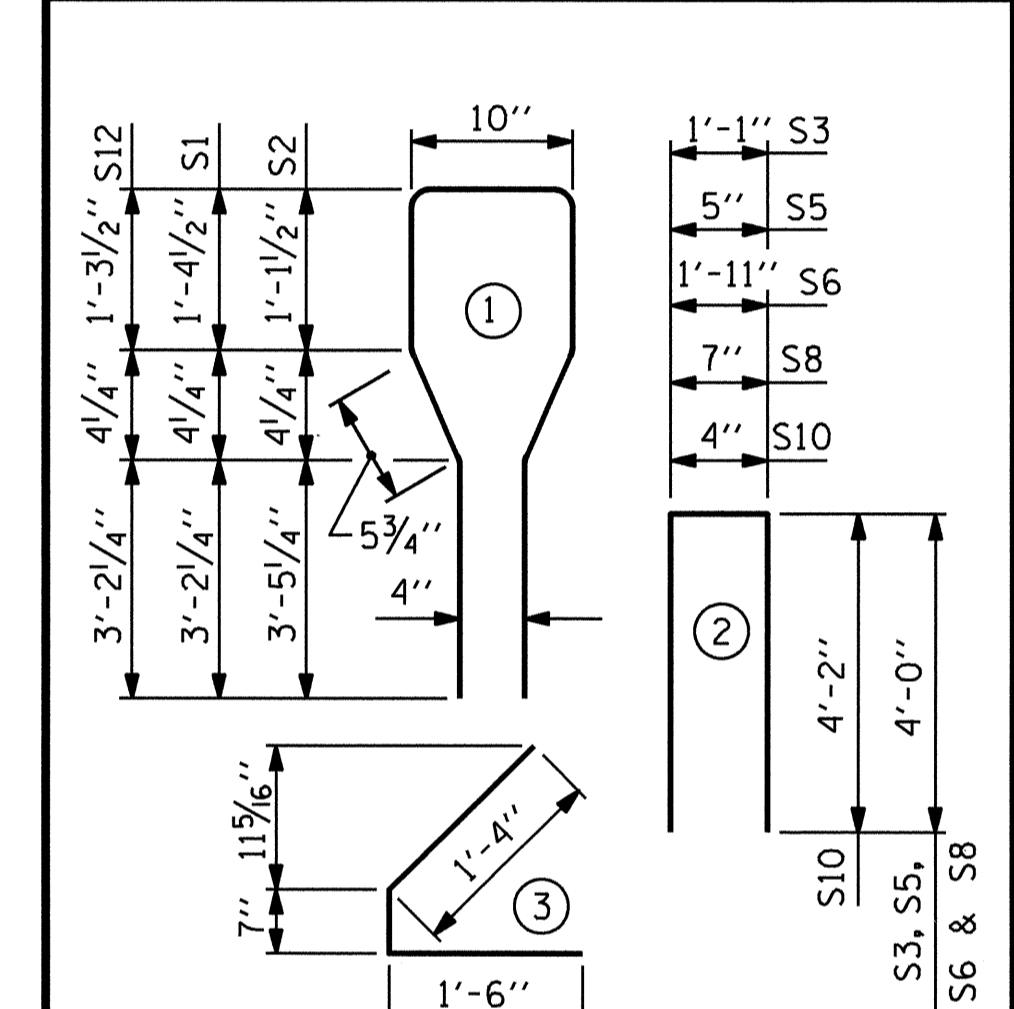
\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET

0.60" 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

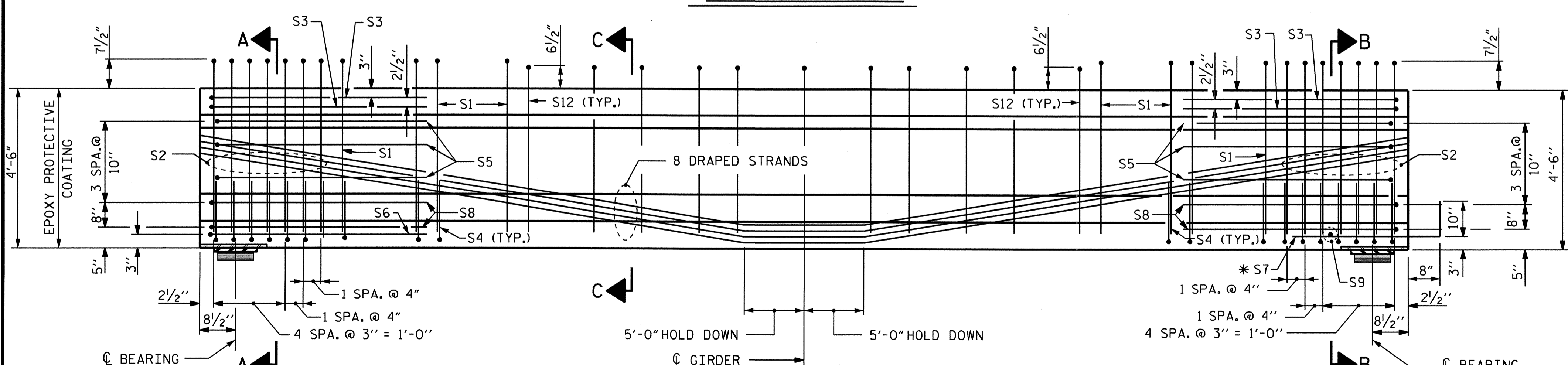
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	114	#4	1	10'-11"	831
S2	14	#6	1	10'-11"	230
S3	4	#4	2	9'-1"	24
S4	148	#4	3	3'-5"	338
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	61	#4	1	10'-9"	438

\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER  
(SEE FRAMING PLAN  
FOR LOCATION)



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	10,000 PSI CONCRETE	0.60" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPANS A & F.	1990	20.9	46

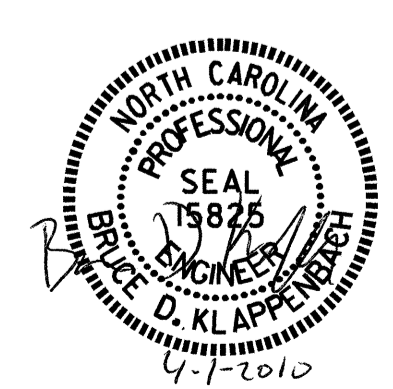
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	103'-2 1/2"	1032.08

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 1 OF 4

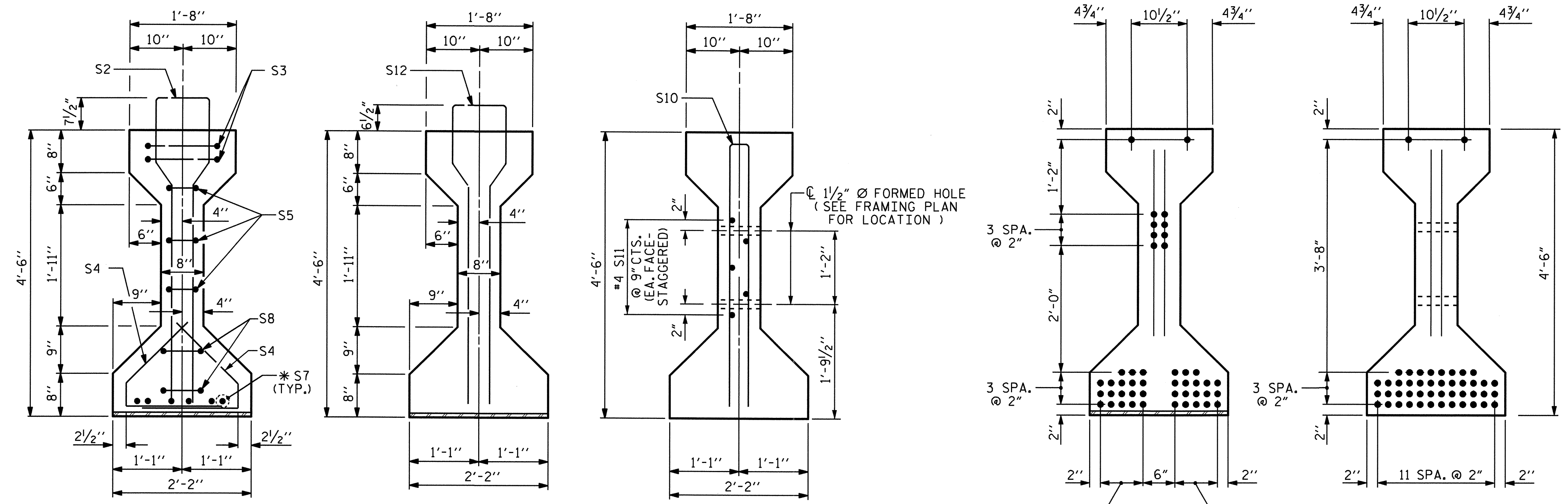
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPANS A & F

REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			



ASSEMBLED BY : H. T. BARBOUR DATE : 4-09-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10  
 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



SECTION B-B

SECTION C-C

SECTION D-D

AT END OF GIRDER  
AT C OF GIRDER  
STRAND LAYOUT FOR ALL GIRDERS IN BRIDGE

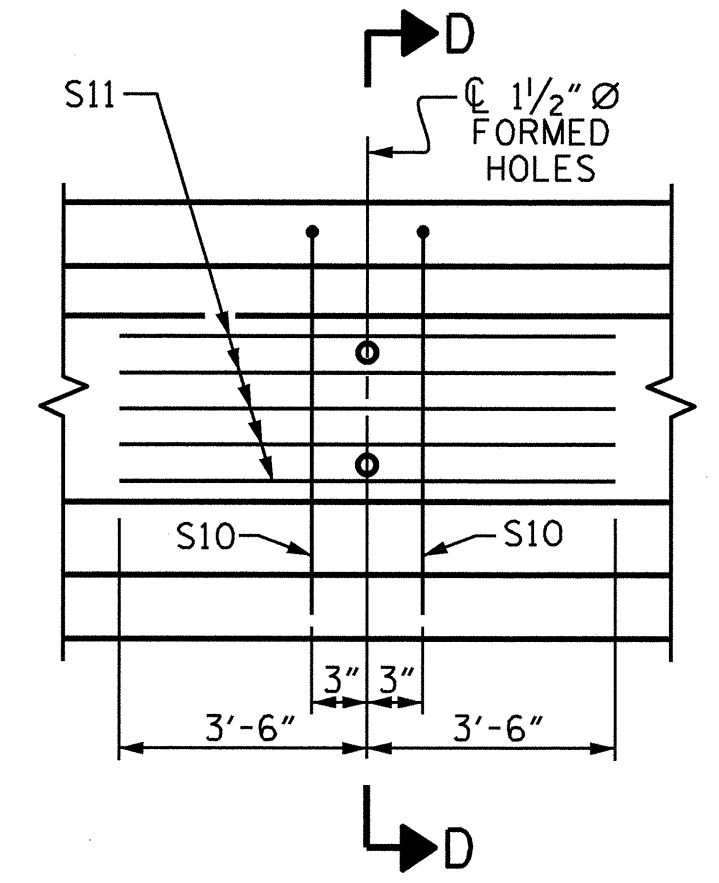
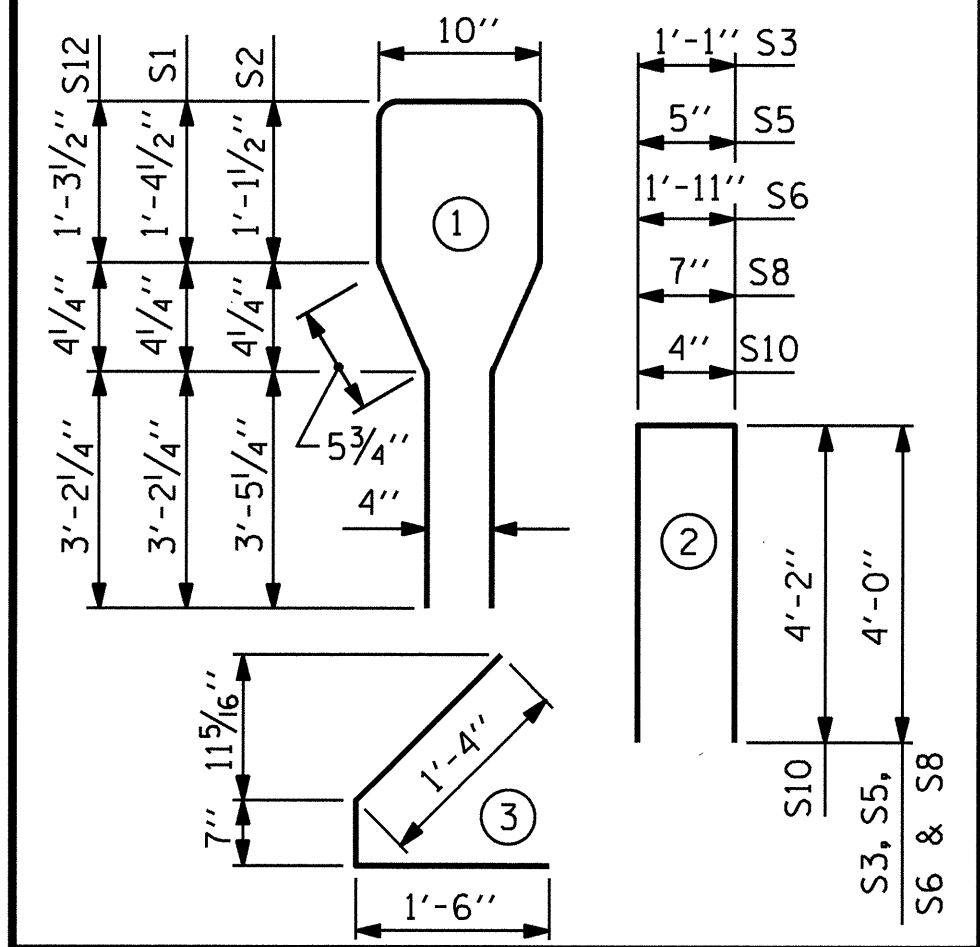
\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET

0.60" 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

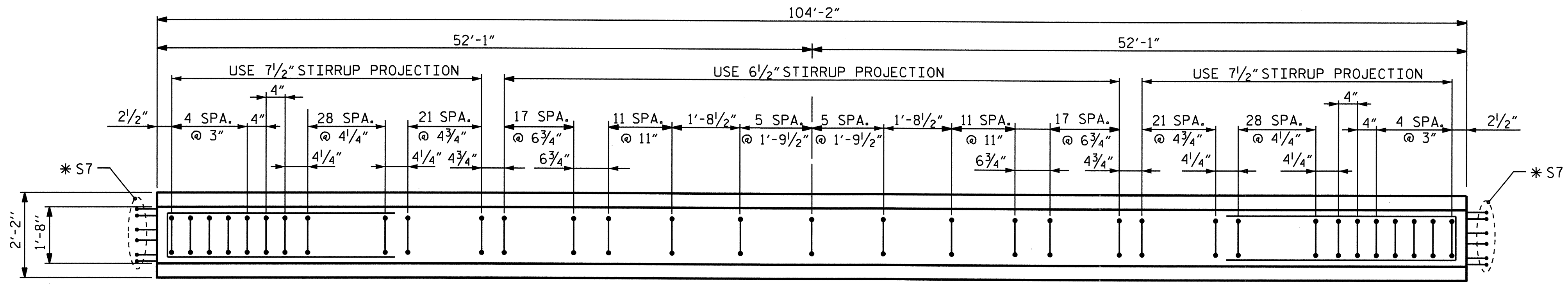
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	102	#4	1	10'-11"	744
S2	14	#6	1	10'-11"	230
S3	4	#4	2	9'-1"	24
S4	148	#4	3	3'-5"	338
S5	6	#4	2	8'-5"	34
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	71	#4	1	10'-9"	510

\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

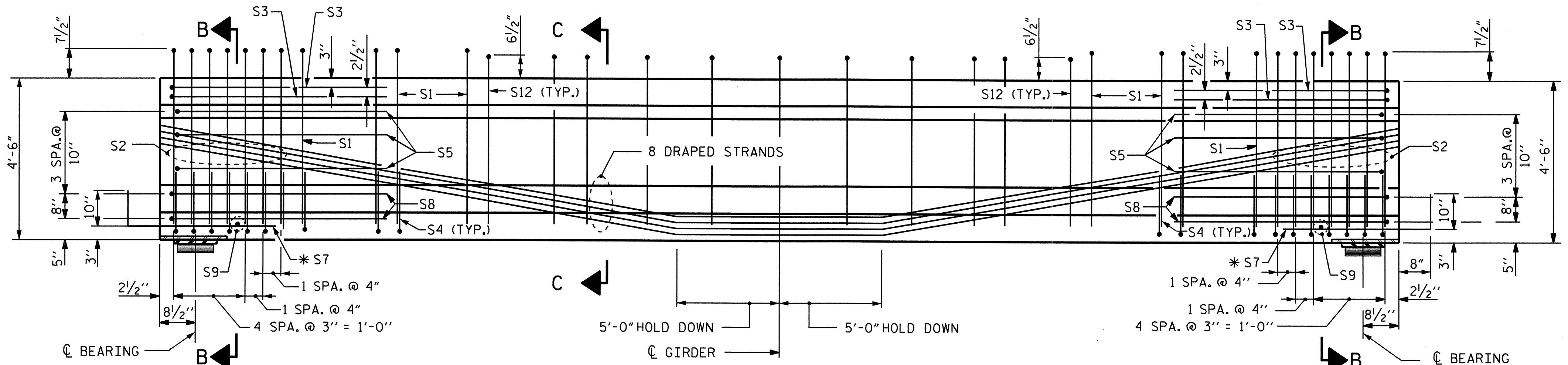
BAR TYPES  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER



PLAN OF GIRDER



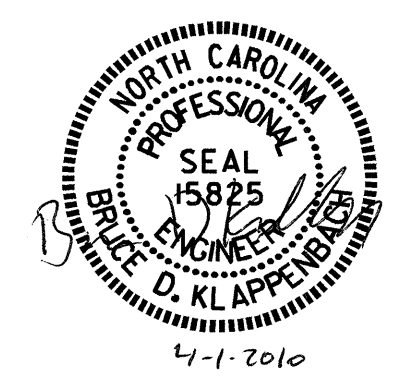
ELEVATION OF GIRDER

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	10,000 PSI CONCRETE	0.60" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPANS B & E	1991	21.1	46

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	104'-2"	1041.67

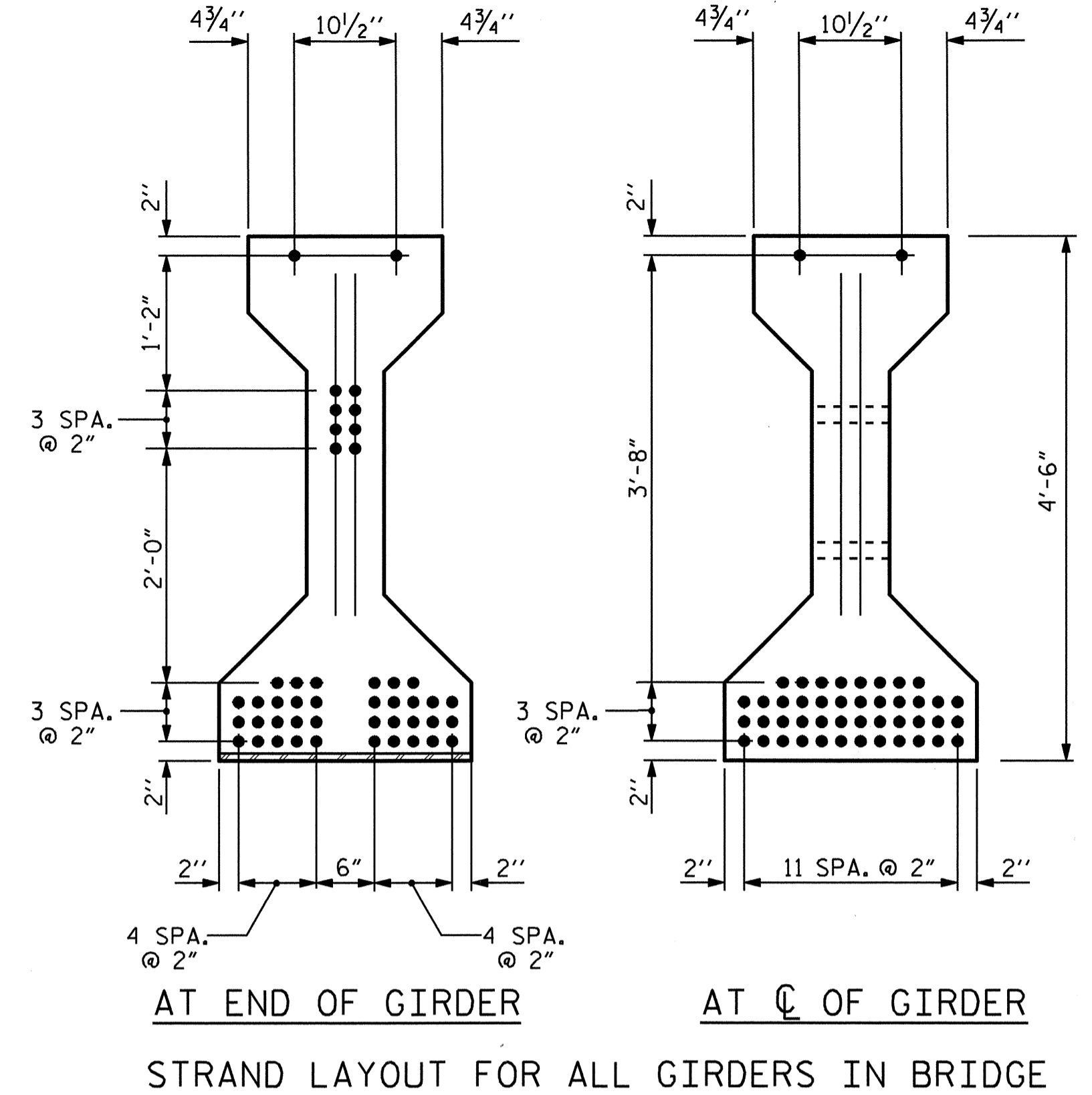
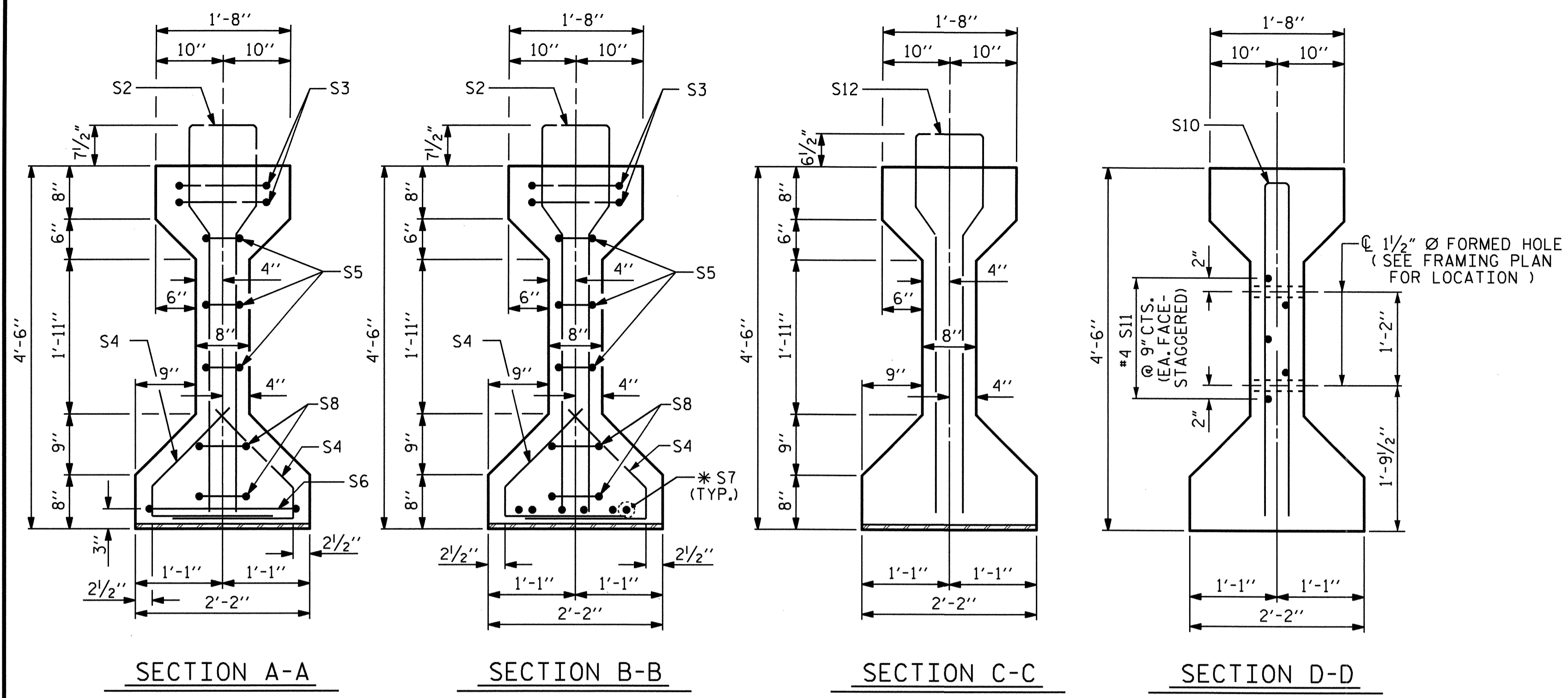
PROJECT NO. B-4138  
HARNETT COUNTY  
STATION: 30+63.00-SBL-  
SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPANS B & E

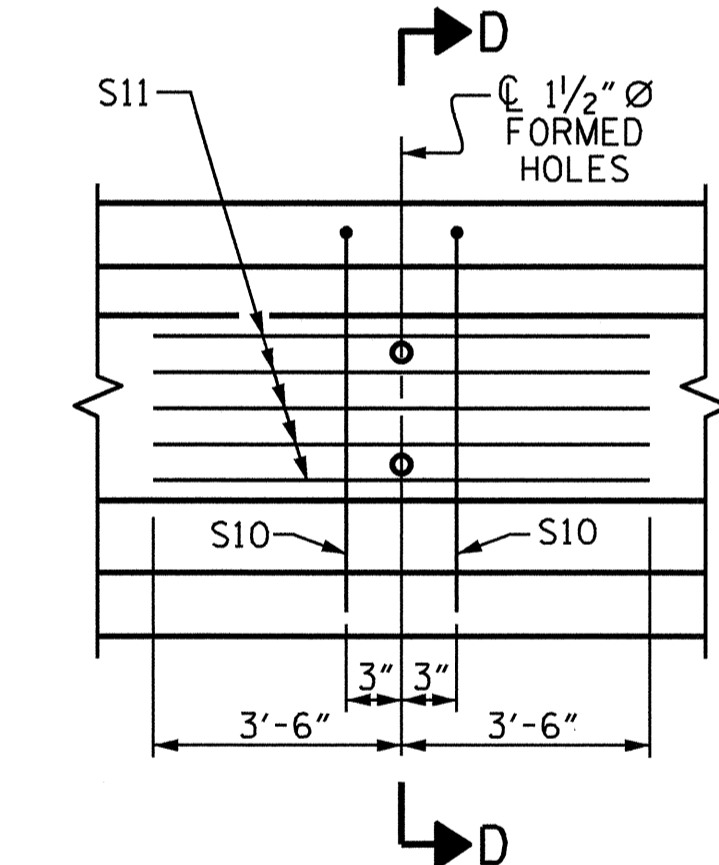
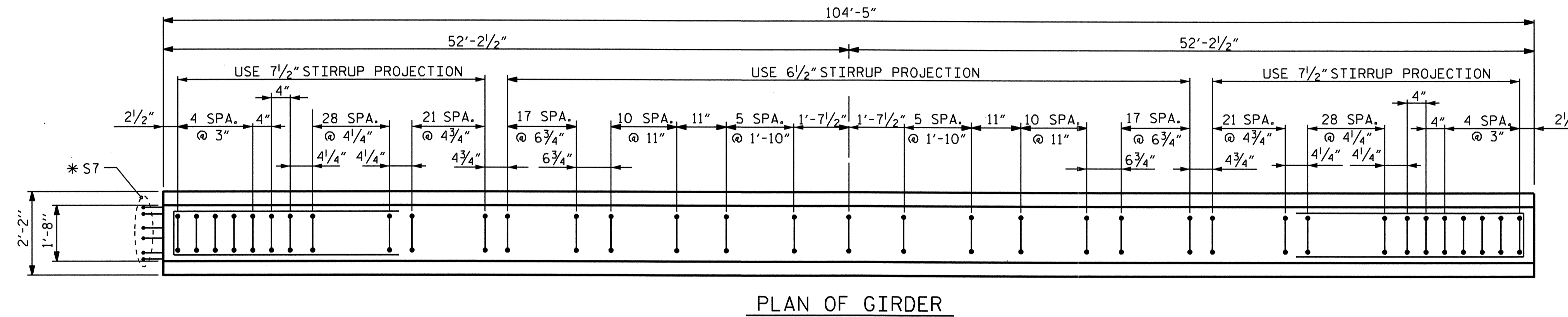


REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY: H. T. BARBOUR DATE: 4-09-09  
CHECKED BY: M. G. SHAIKH DATE: 2-10  
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



\* FOR S7 BARS, SEE  
DETAIL "A" OF  
PRESTRESSED  
CONCRETE GIRDER  
CONTINUOUS FOR LIVE  
LOAD DETAILS SHEET

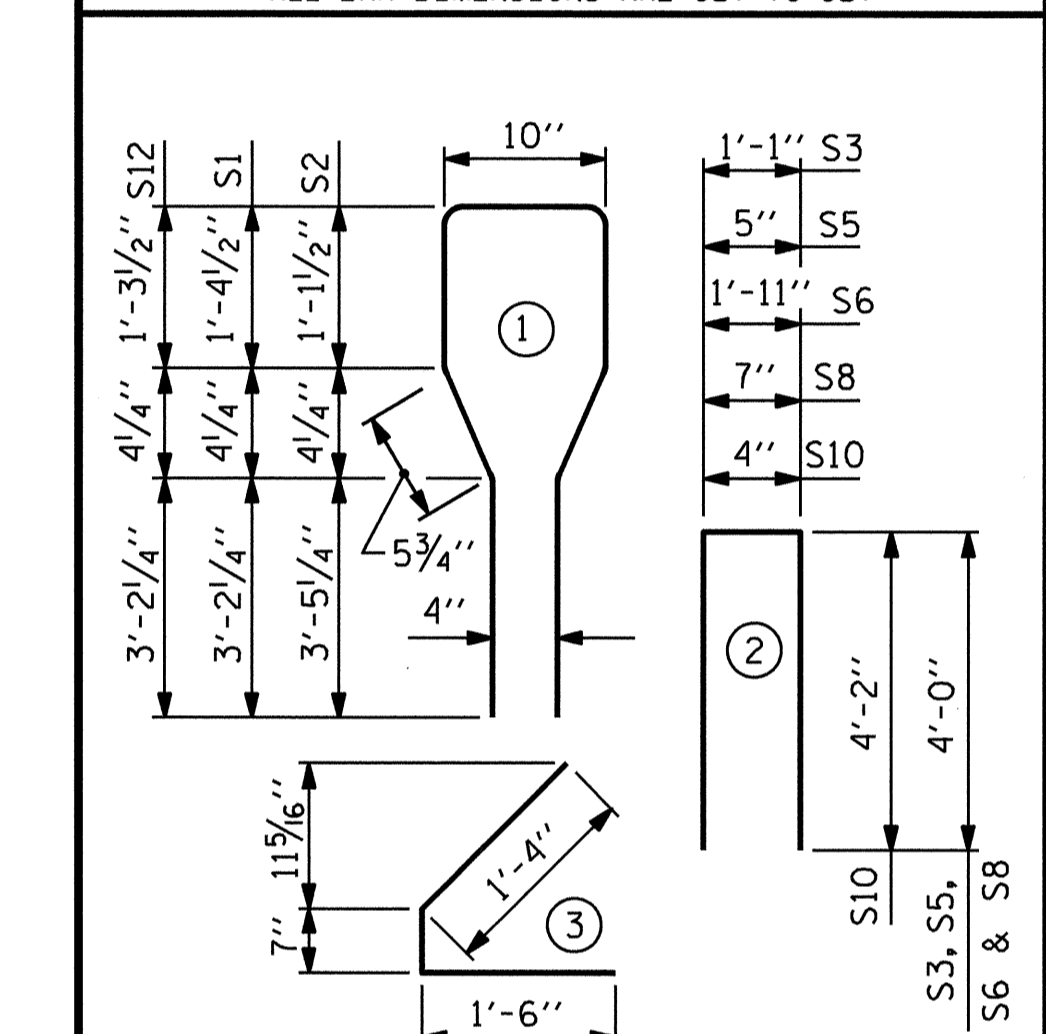


0.60" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	102	#4	1	10'-11"	744
S2	14	#6	1	10'-11"	230
S3	4	#4	2	9'-1"	24
S4	148	#4	3	3'-5"	338
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S12	71	#4	1	10'-9"	510

\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	10,000 PSI CONCRETE	0.60" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPANS C & D	1975	21.2	46

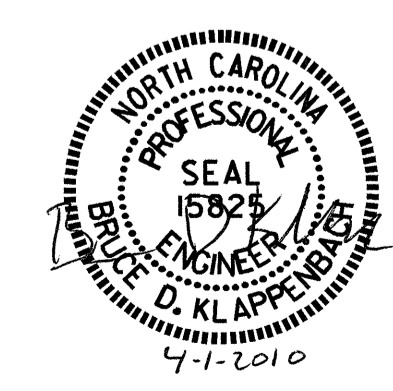
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
10	104'-5"	1044.17

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 SPANS C & D

REVISIONS						SHEET NO. S-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			



ASSEMBLED BY: H. T. BARBOUR DATE: 4-09-09  
 CHECKED BY: M. G. SHAIKH DATE: 2-10  
 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.

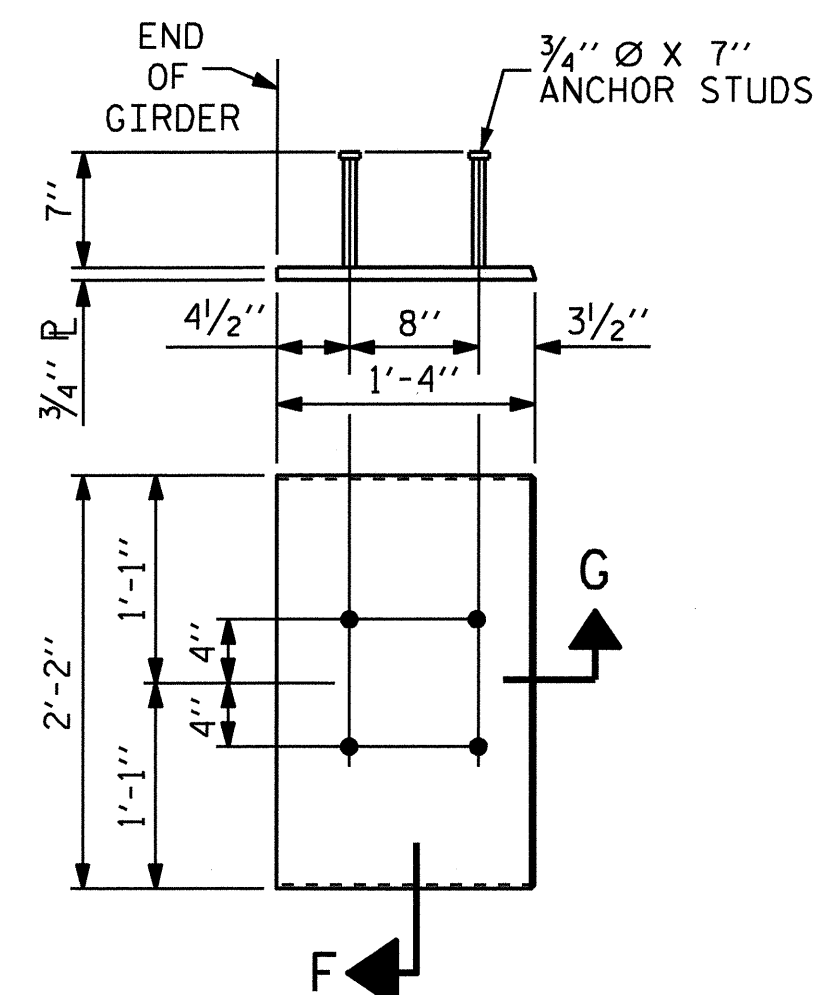
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 8000 PSI.

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

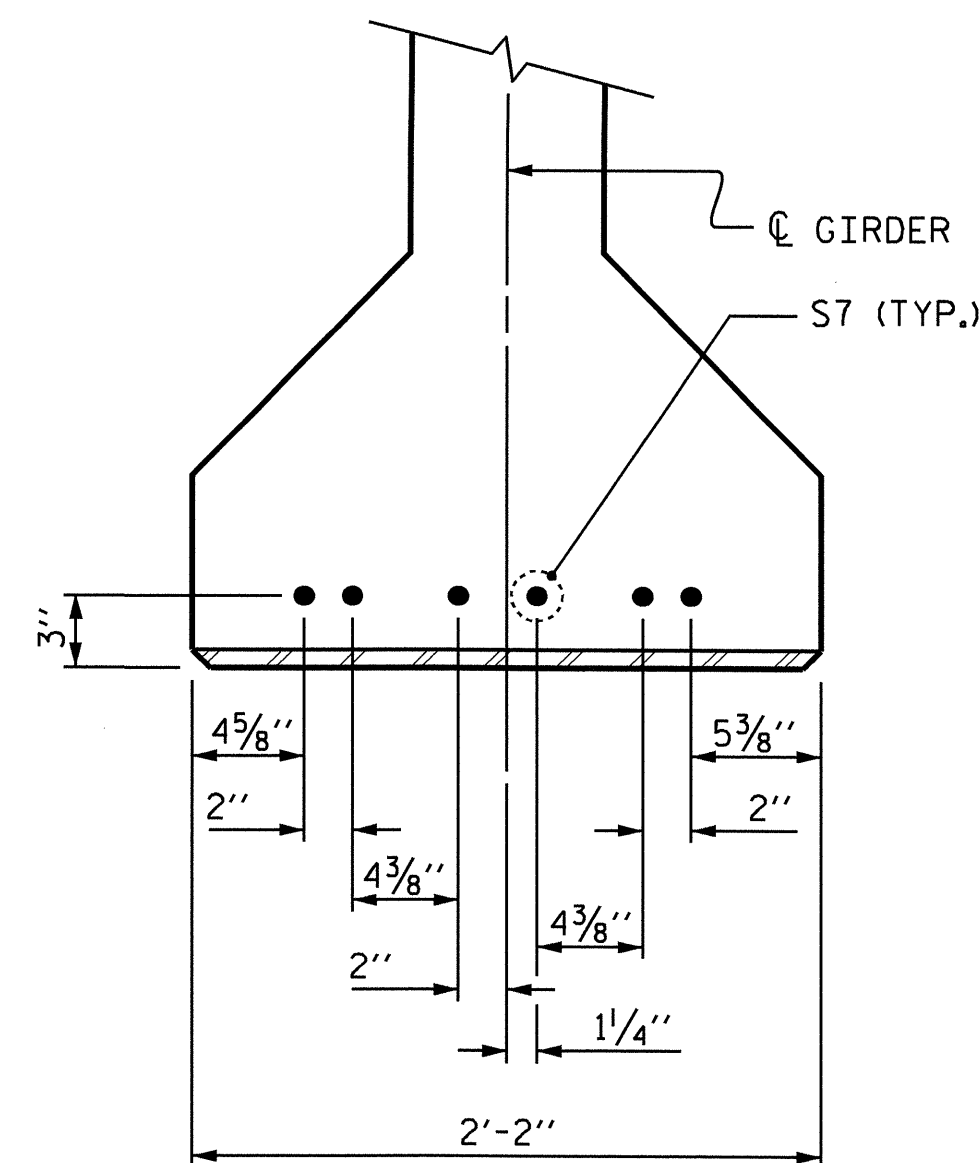
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

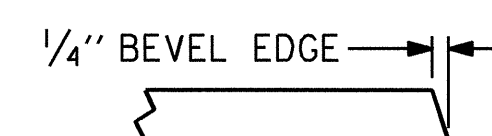


**EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER**

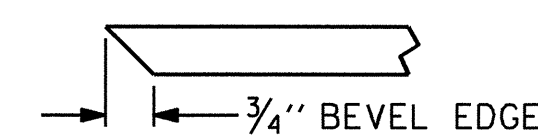


**DETAIL "A"**

(FOR AASHTO TYPE IV GIRDERS)



**SECTION "G"**



**SECTION "F"**

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE SPANS A & F																																	
0.6" Ø LOW RELAXATION	GIRDER 1											GIRDERS 2, 3 & 4										GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	1.669	3.159	4.324	5.065	5.318	5.065	4.324	3.159	1.669	0.0	0.0	1.669	3.159	4.324	5.065	5.318	5.065	4.324	3.159	1.669	0.0	0.0	1.669	3.159	4.324	5.065	5.318	5.065	4.324	3.159	1.669	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.0	0.649	1.228	1.681	1.968	2.067	1.968	1.681	1.228	0.649	0.0	0.0	0.676	1.279	1.750	2.050	2.153	2.050	1.750	1.279	0.676	0.0	0.0	0.645	1.220	1.670	1.956	2.053	1.956	1.670	1.220	0.645	0.0
FINAL CAMBER	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>8</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0	0.0	1"	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>9</sup> / <sub>16</sub> "	3"	3 <sup>3</sup> / <sub>8</sub> "	3"	2 <sup>9</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	1"	0.0	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>4</sub> "	3 <sup>3</sup> / <sub>8</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0

DEAD LOAD DEFLECTION TABLE SPANS B & E																																	
0.6" Ø LOW RELAXATION	GIRDER 1											GIRDERS 2, 3 & 4										GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	1.685	3.187	4.363	5.110	5.366	5.110	4.363	3.187	1.685	0.0	0.0	1.685	3.187	4.363	5.110	5.366	5.110	4.363	3.187	1.685	0.0	0.0	1.685	3.187	4.363	5.110	5.366	5.110	4.363	3.187	1.685	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.0	0.674	1.274	1.745	2.043	2.146	2.043	1.745	1.274	0.674	0.0	0.0	0.702	1.327	1.817	2.128	2.235	2.128	1.817	1.327	0.702	0.0	0.0	0.669	1.266	1.733	2.030	2.132	2.030	1.733	1.266	0.669	0.0
FINAL CAMBER	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0	0.0	1"	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>9</sup> / <sub>16</sub> "	3"	3 <sup>3</sup> / <sub>8</sub> "	3"	2 <sup>9</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	1"	0.0	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0

DEAD LOAD DEFLECTION TABLE SPANS C & D																																	
0.6" Ø LOW RELAXATION	GIRDER 1											GIRDERS 2, 3 & 4										GIRDER 5											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	1.688	3.194	4.373	5.122	5.378	5.122	4.373	3.194	1.688	0.0	0.0	1.688	3.194	4.373	5.122	5.378	5.122	4.373	3.194	1.688	0.0	0.0	1.688	3.194	4.373	5.122	5.378	5.122	4.373	3.194	1.688	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.0	0.680	1.287	1.762	2.063	2.167	2.063	1.762	1.287	0.680	0.0	0.0	0.708	1.340	1.835	2.149	2.257	2.149	1.835	1.340	0.708	0.0	0.0	0.676	1.278	1.750	2.050	2.153	2.050	1.750	1.278	0.676	0.0
FINAL CAMBER	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	3 <sup>3</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0	0.0	1"	1 <sup>7</sup> / <sub>8</sub> "	2 <sup>9</sup> / <sub>16</sub> "	3"	3 <sup>3</sup> / <sub>8</sub> "	3"	2 <sup>9</sup> / <sub>16</sub> "	1 <sup>7</sup> / <sub>8</sub> "	1"	0.0	0.0	1"	1 <sup>5</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>5</sup> / <sub>8</sub> "	1 <sup>5</sup> / <sub>16</sub> "	1"	0.0

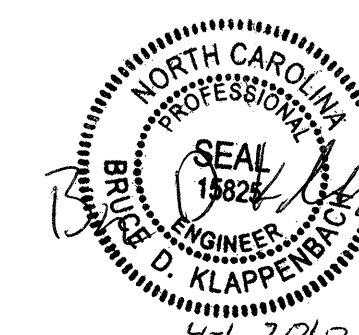
\* INCLUDES FUTURE WEARING SURFACE. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS**



ASSEMBLED BY : H.T. BARBOUR DATE : 3-25-09  
 CHECKED BY : M.G. SHAIKH DATE : 2-10  
 DRAWN BY : ELR 11/91 REV. 10/17/00 RWW/LES  
 CHECKED BY : GRP 11/91 REV. 7/10/01RR LES/RDR  
 REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS 59
2			4			

**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. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

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.

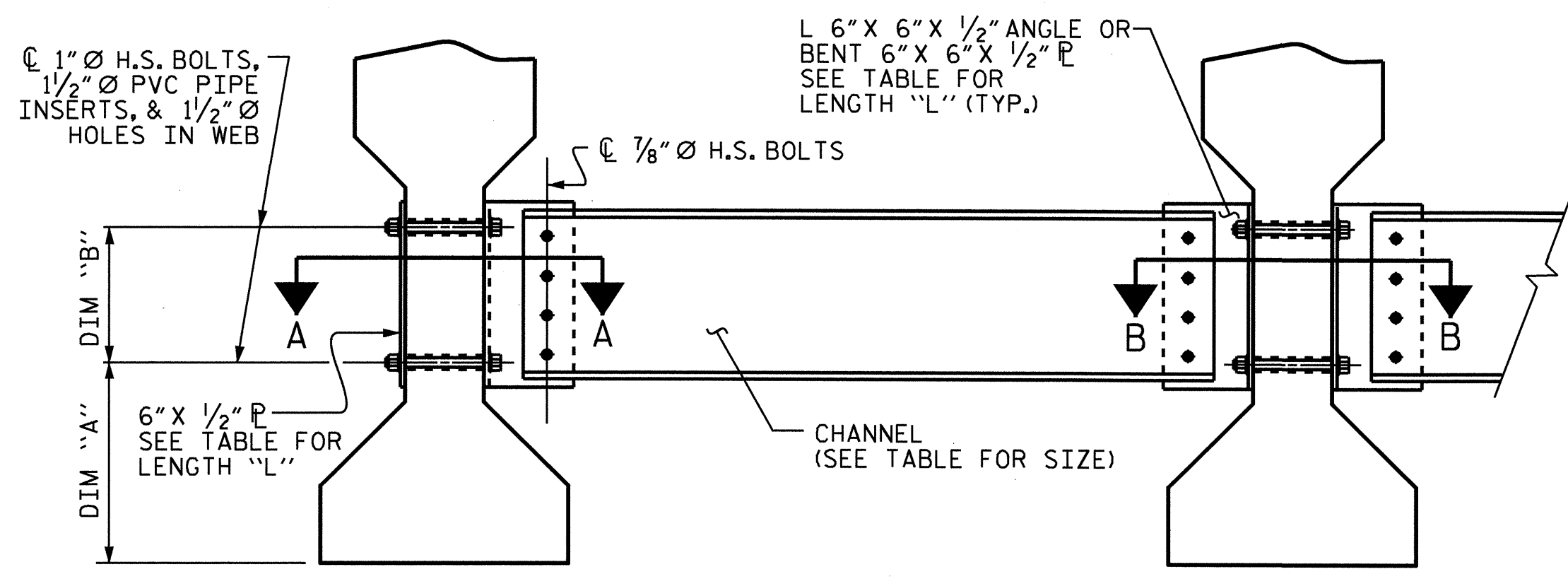
PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

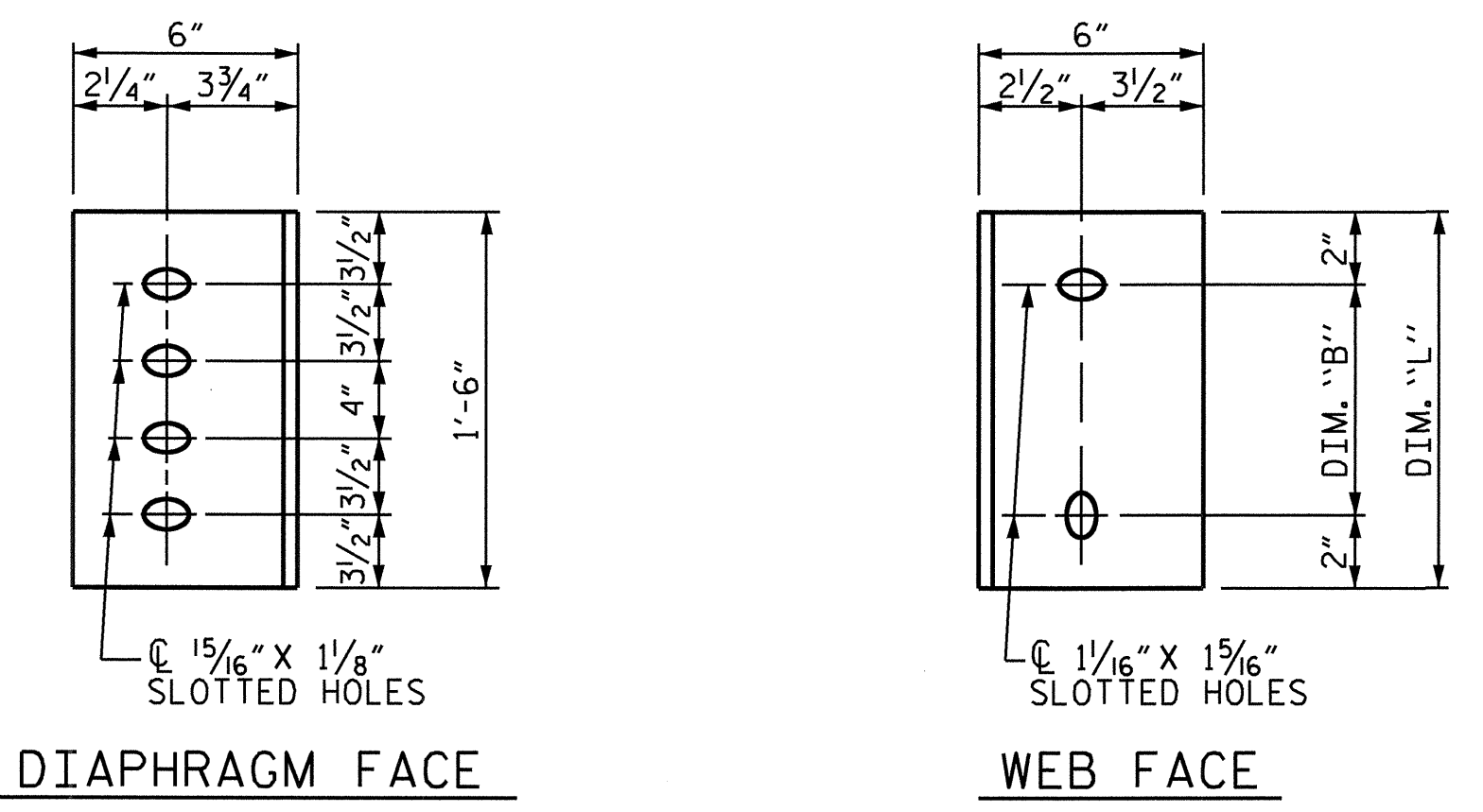
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

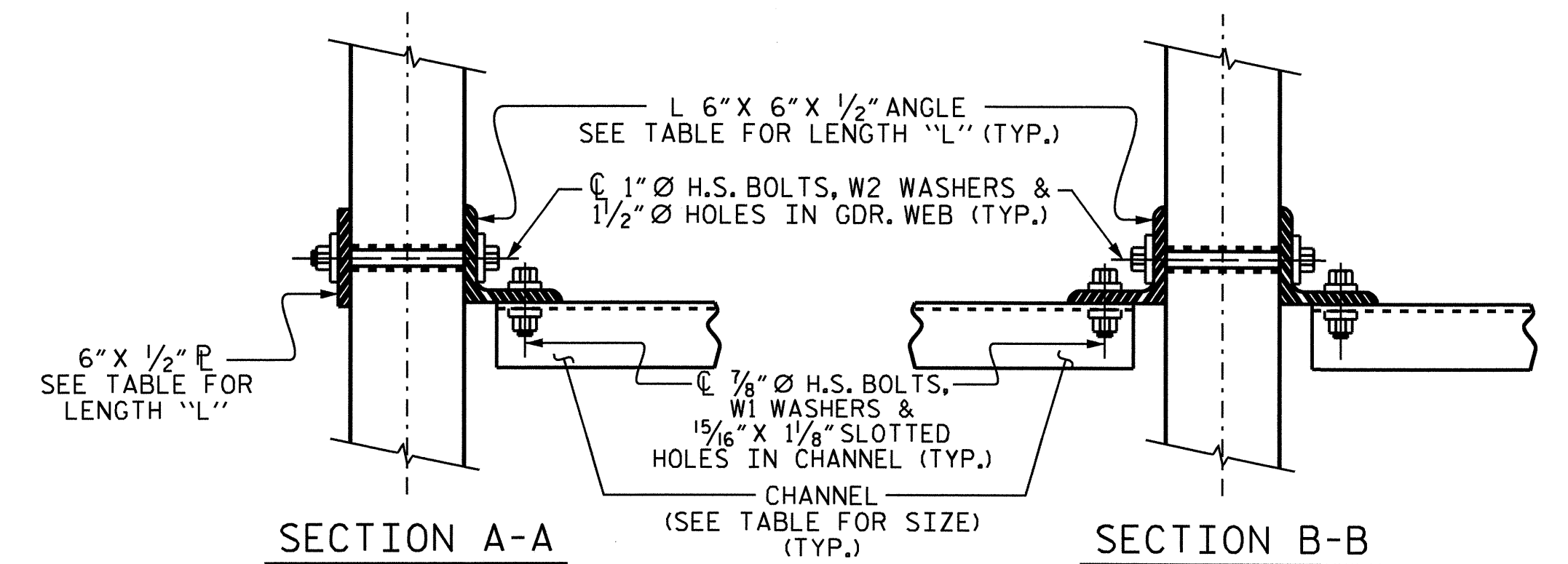
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



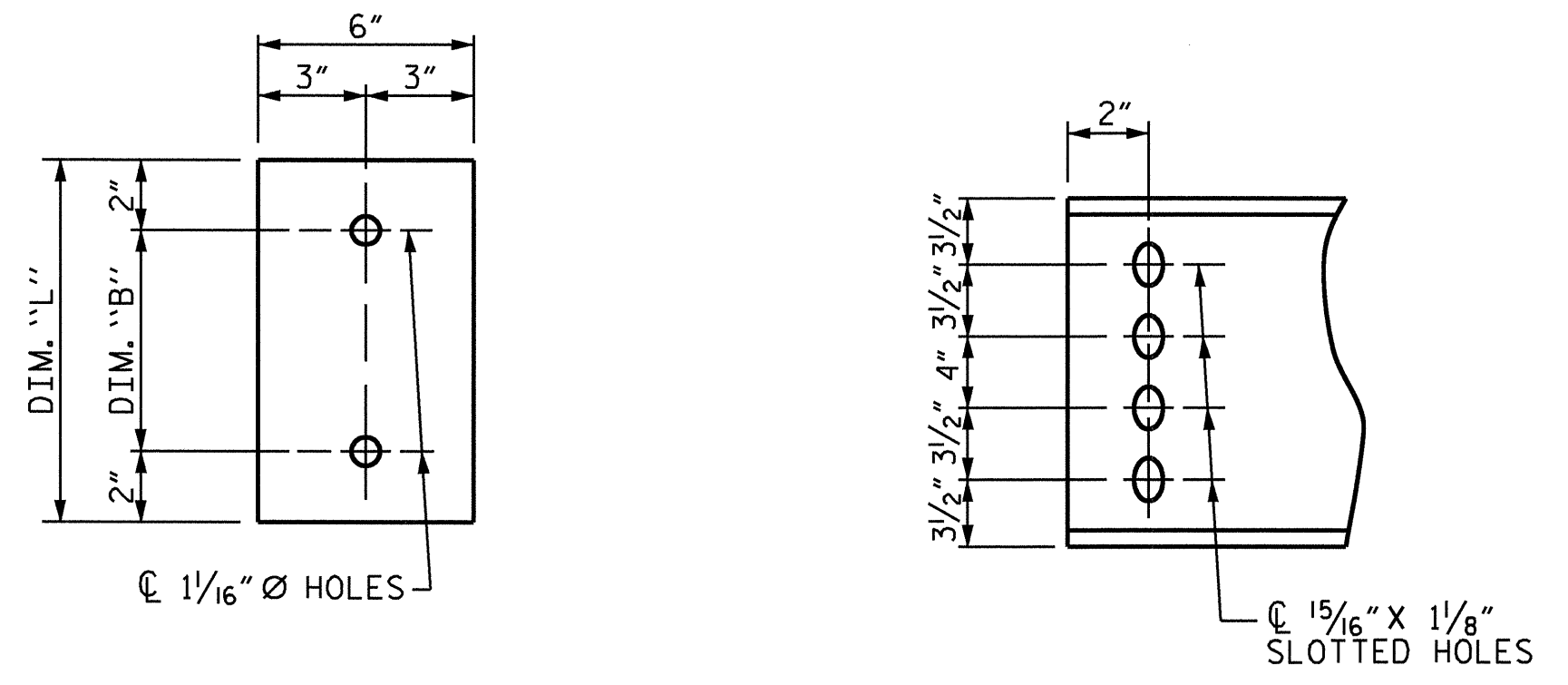
**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



**DIAPHRAGM FACE**      **WEB FACE**  
**CONNECTOR PLATE DETAILS**



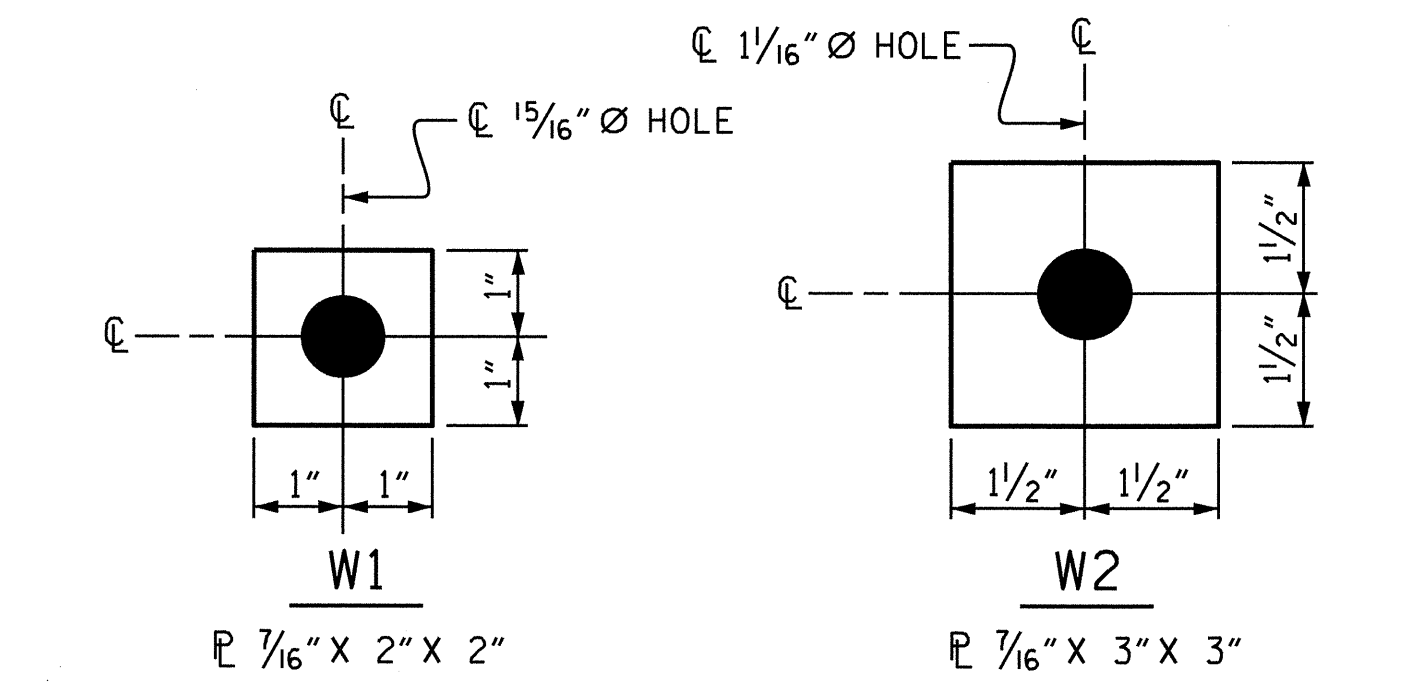
**SECTION A-A**      **SECTION B-B**  
**CONNECTION DETAILS**



**PLATE DETAILS**      **CHANNEL END**

**TABLE**

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"



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

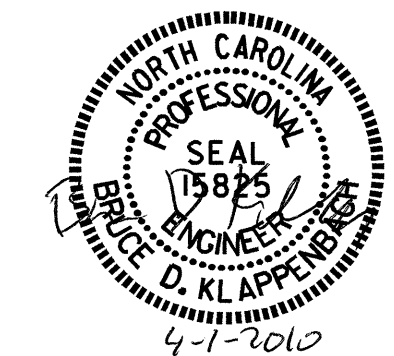
USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

**WASHER DETAILS**

PROJECT NO. B-4138  
HARNETT COUNTY  
STATION: 30+63.00-L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

INTERMEDIATE  
STEEL DIAPHRAGMS  
FOR IV  
PRESTRESSED CONCRETE  
GIRDERS



REVISIONS						SHEET NO. S-21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY : H. T. BARBOUR    DATE : 3-25-09  
CHECKED BY : M. G. SHAIKH    DATE : 2-10

DRAWN BY : TLA    6/05    ADDED 10/21/05    KMM/GM  
CHECKED BY : VC    6/05    REV. 5/1/06R

**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.

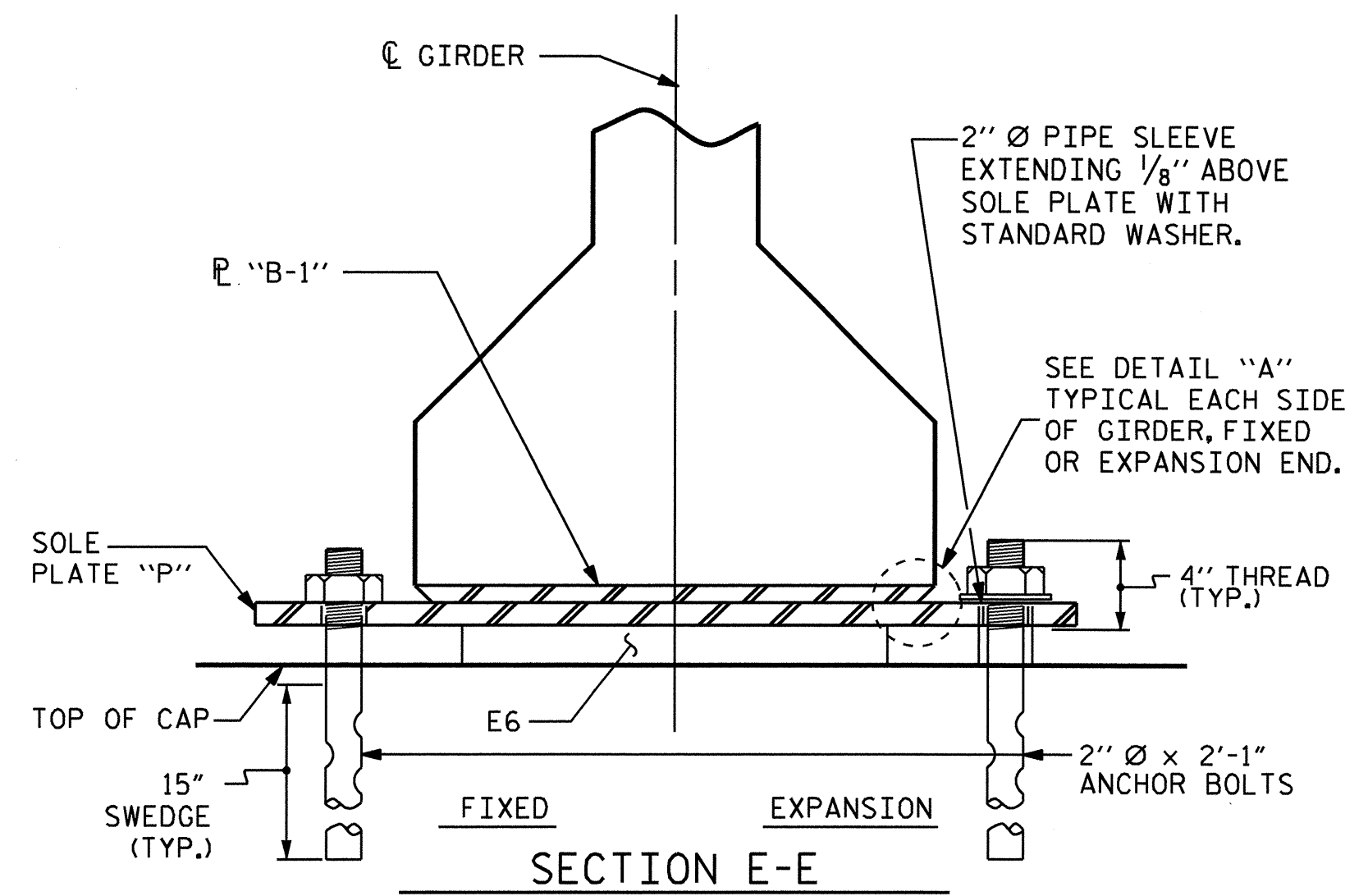
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

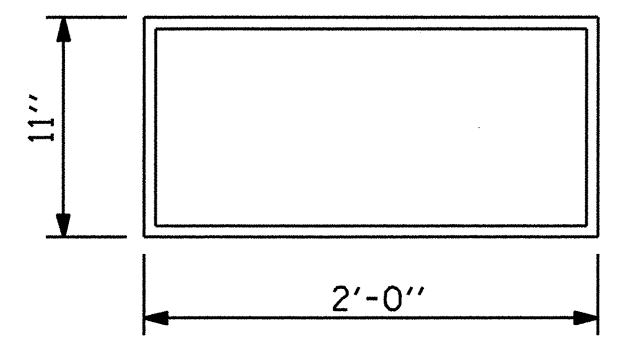
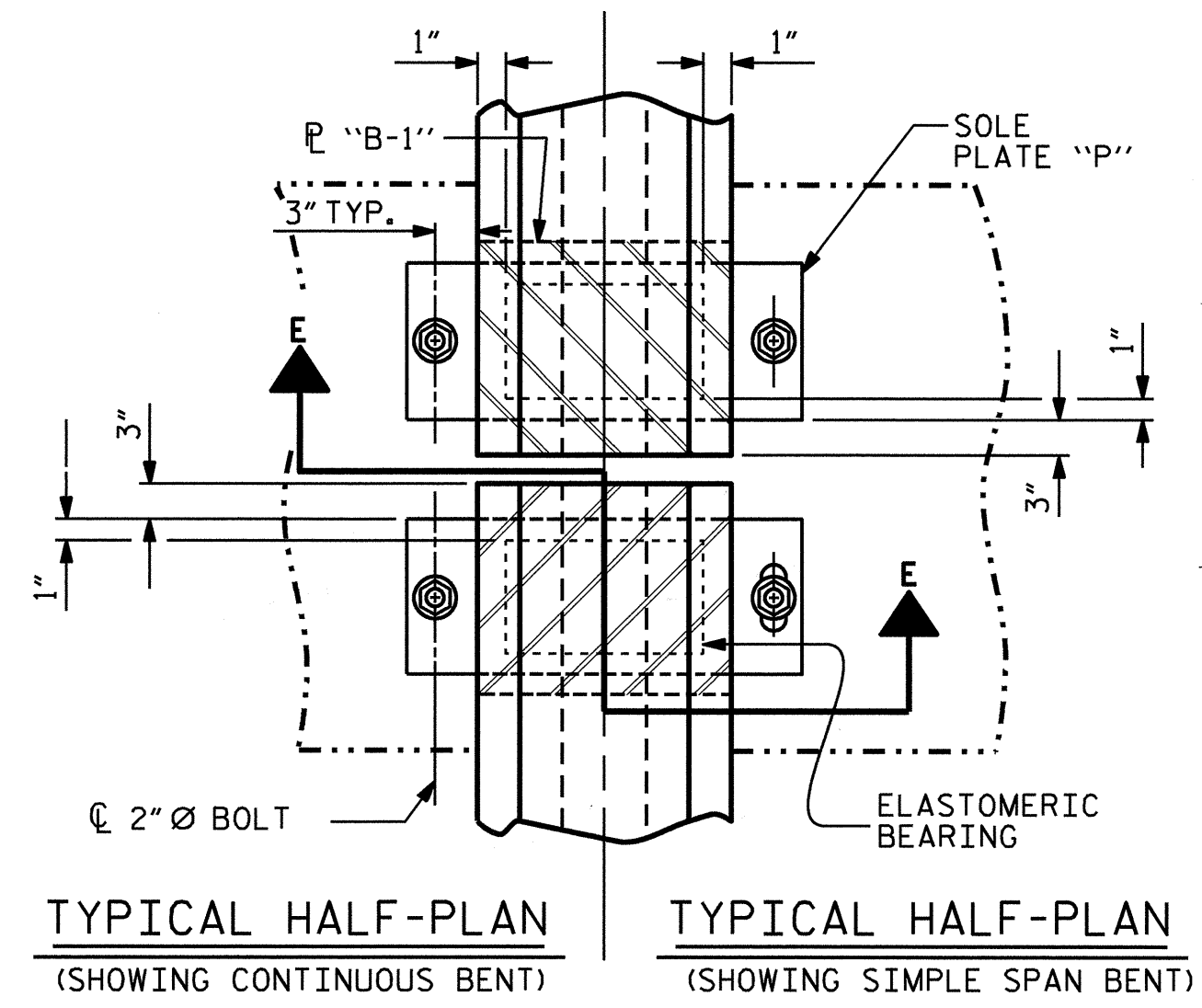
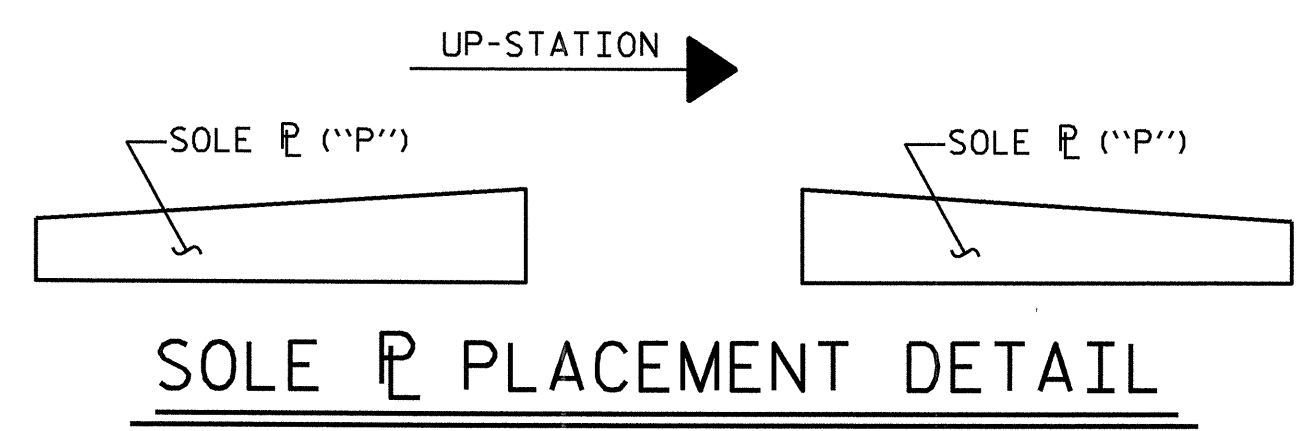
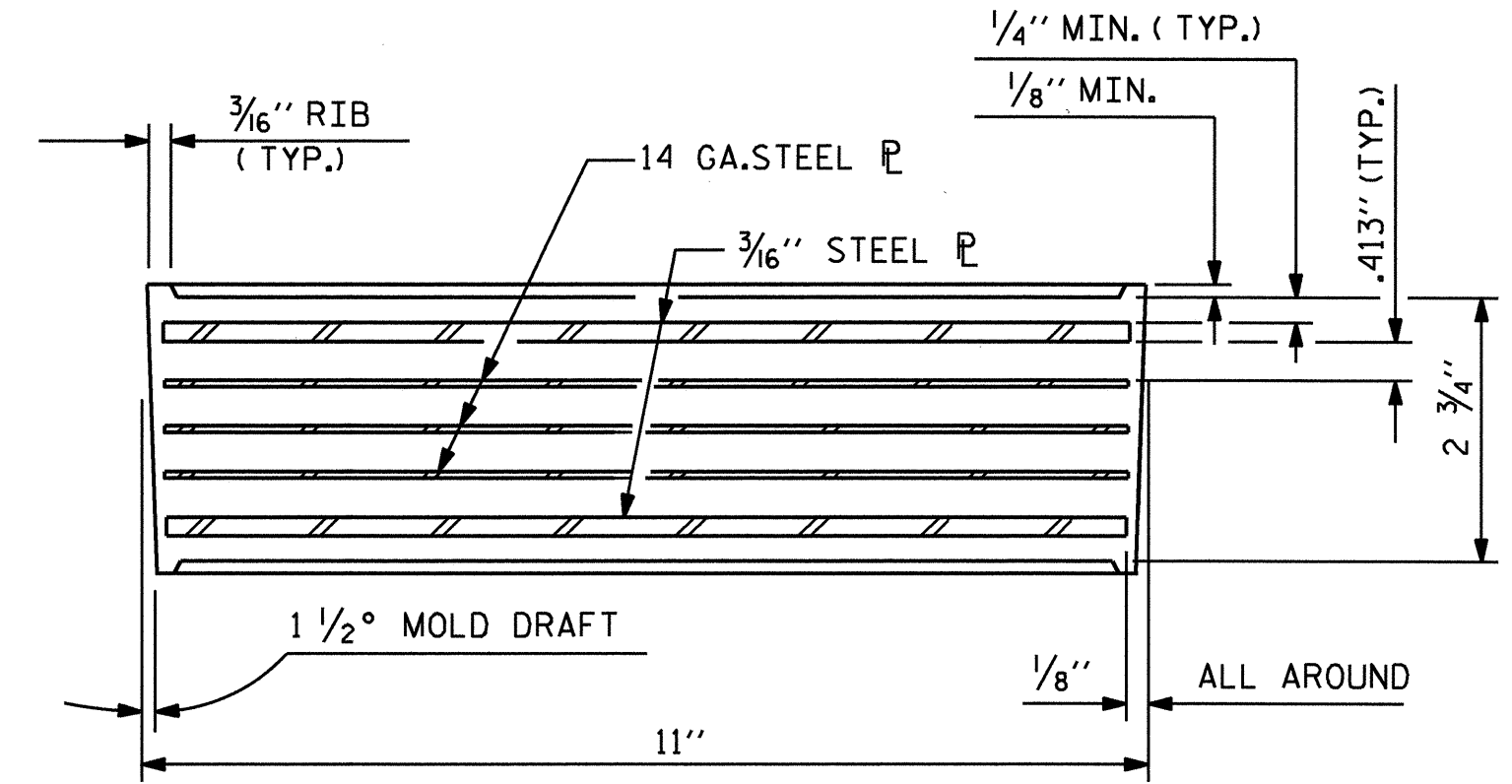
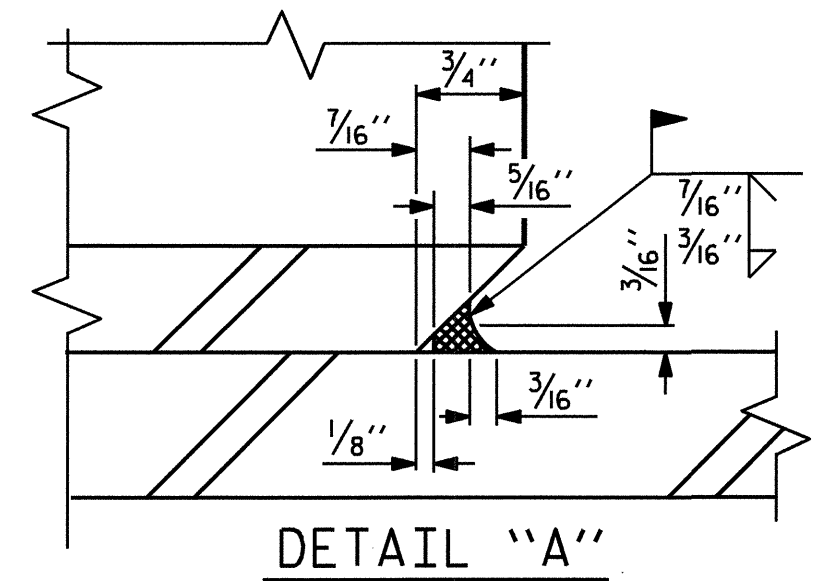
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

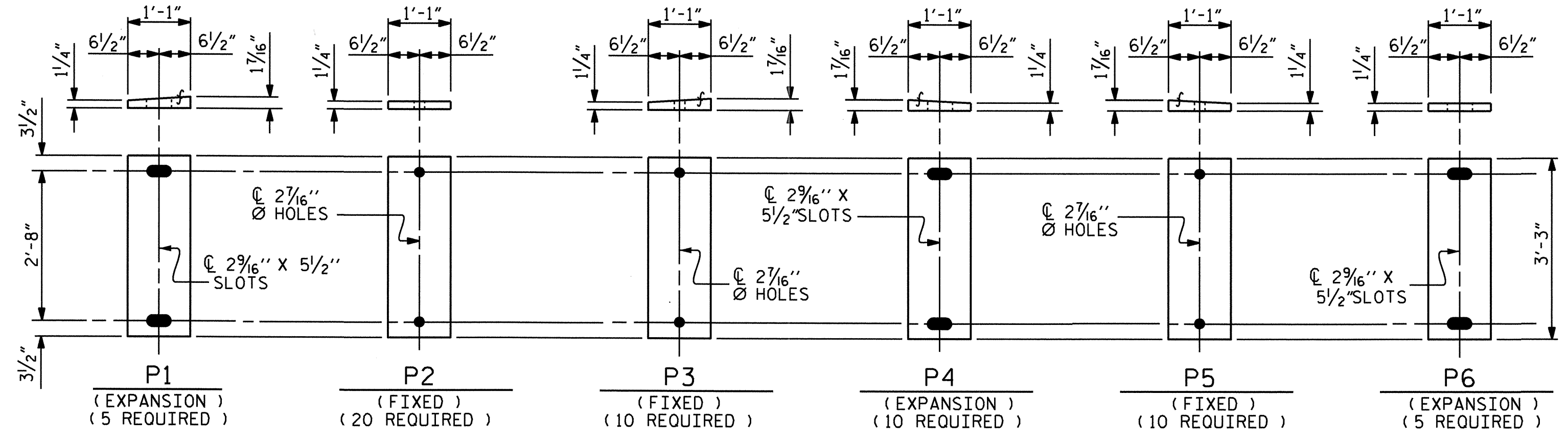
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE VII	264 K



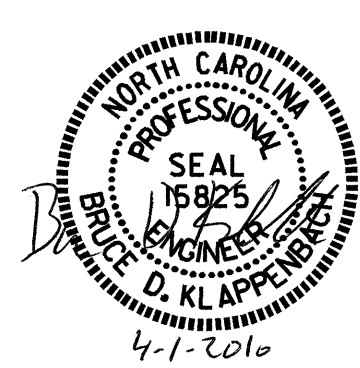
E1 (60 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE VII



PROJECT NO. B-4138  
HARNETT COUNTY  
STATION: 30+63.00-SBL-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**ELASTOMERIC BEARING DETAILS**  
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE



REVISONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					59

ASSEMBLED BY :	H. T. BARBOUR	DATE :	4-02-09
CHECKED BY :	M. G. SHAIKH	DATE :	2-10
DRAWN BY :	EEM 2/97	REV. 8/16/99	RWW/LES
CHECKED BY :	VAP 2/97	REV. 10/17/00	RWW/LES
		REV. 5/1/06	TLA/GM

**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 "RAIL POST SPACING & END OF RAIL DETAILS".

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.

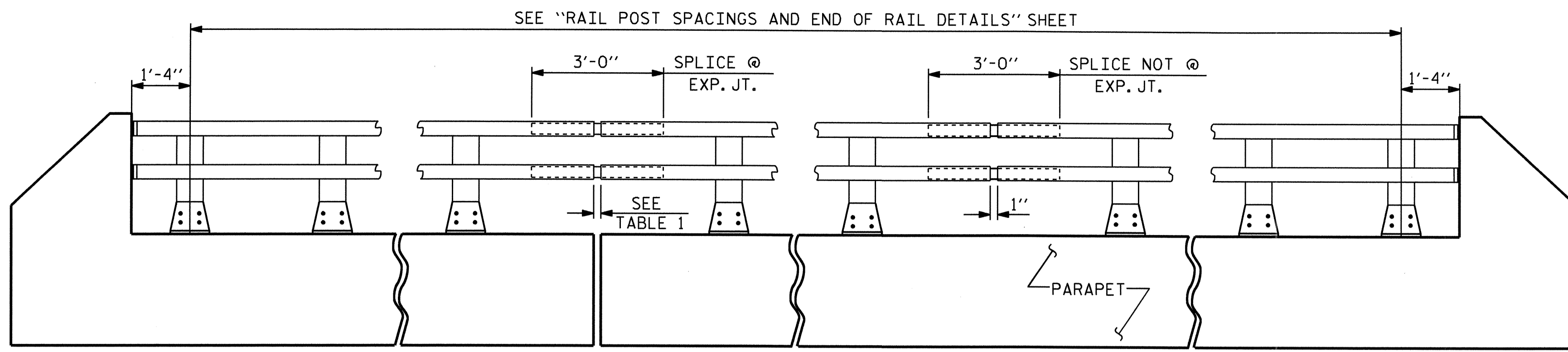
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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.

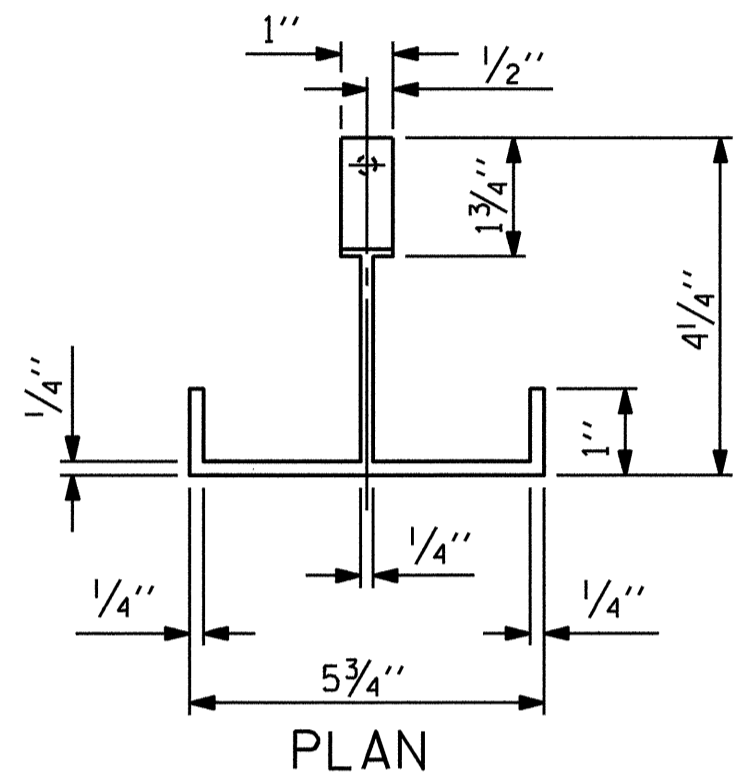
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR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

PAY LENGTH = 620.02 LIN. FT.

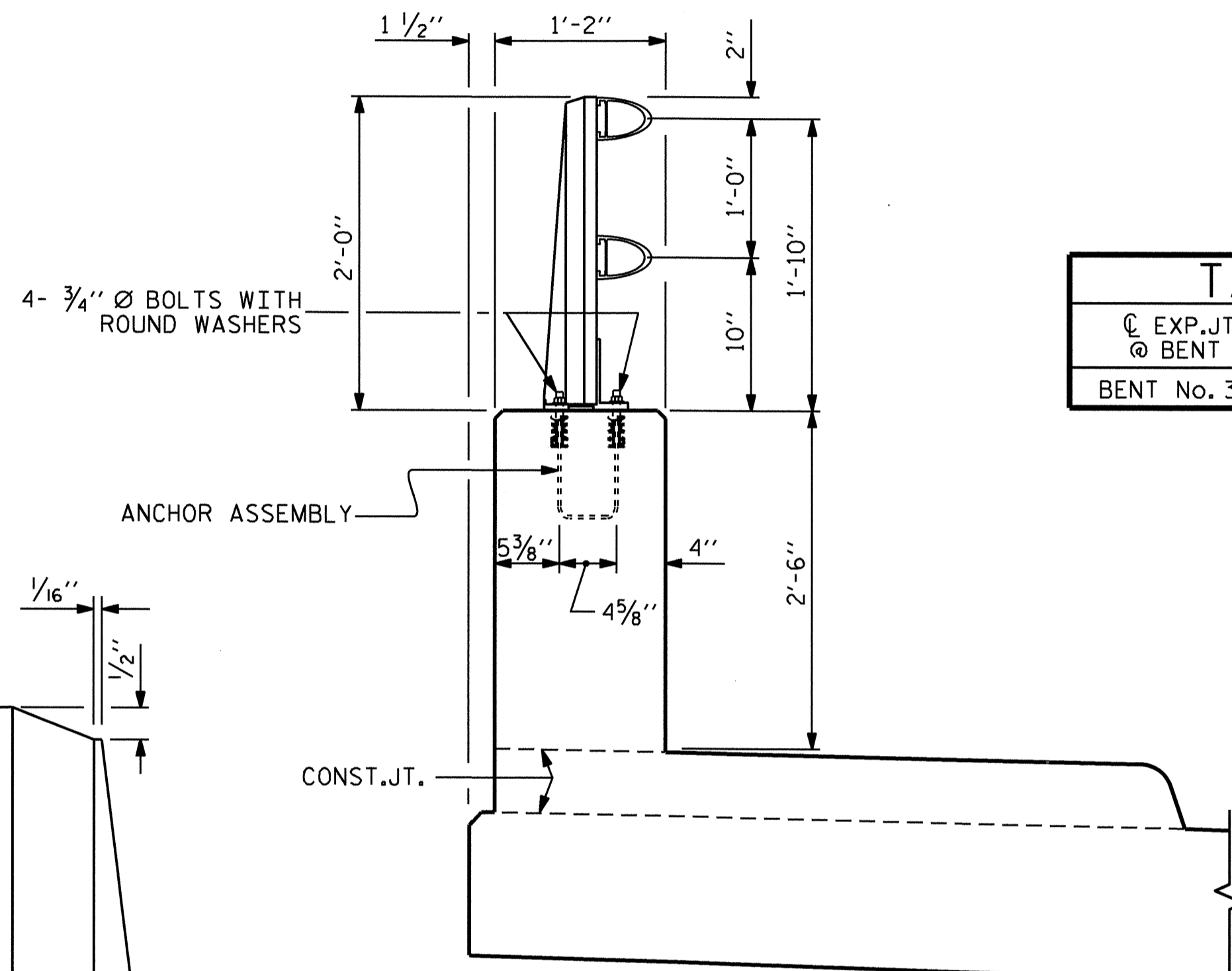


**ELEVATION**

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING & END OF RAIL DETAILS".

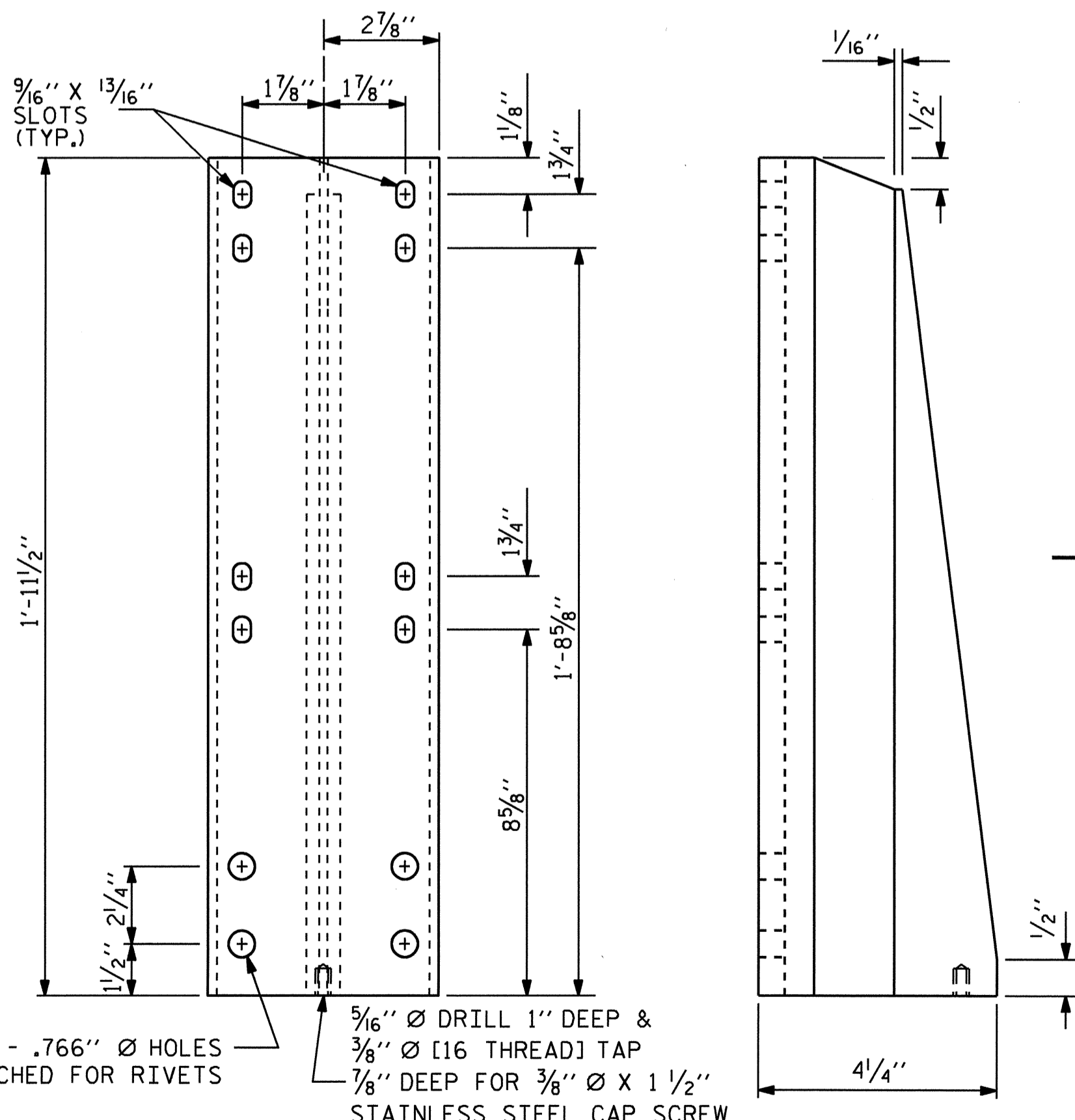


**PLAN**



**SECTION THRU PARAPET AND RAIL**

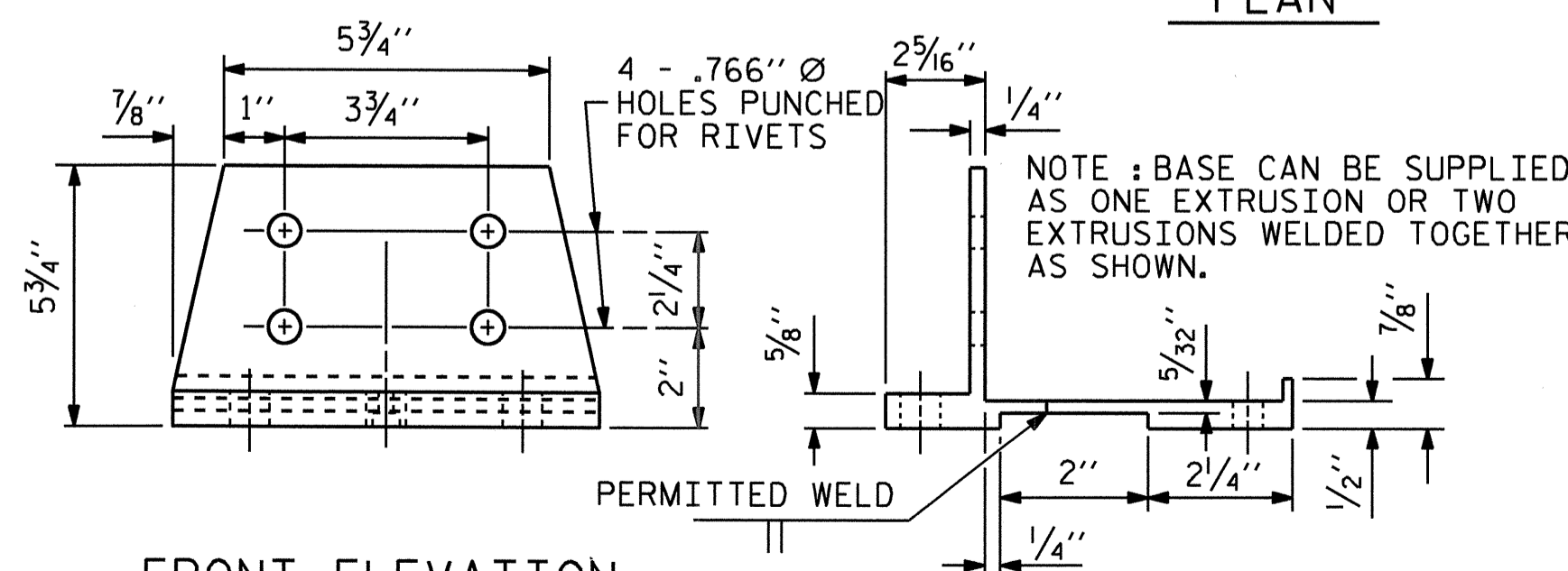
EXP. JT. @ BENT	RAIL OPENING
BENT No. 3	2 3/8"



**FRONT ELEVATION**

**SIDE ELEVATION**

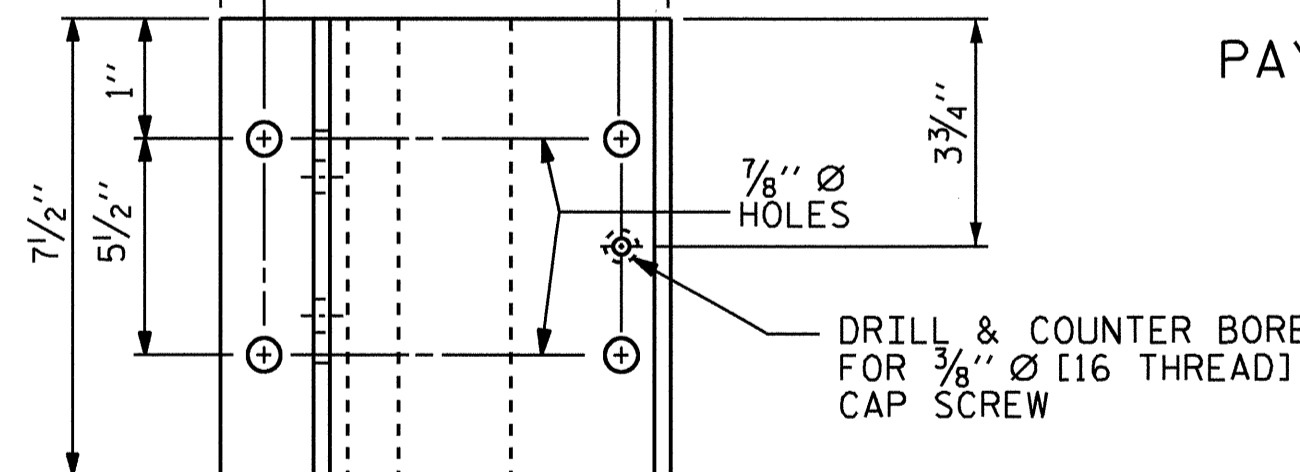
**DETAILS OF POST**



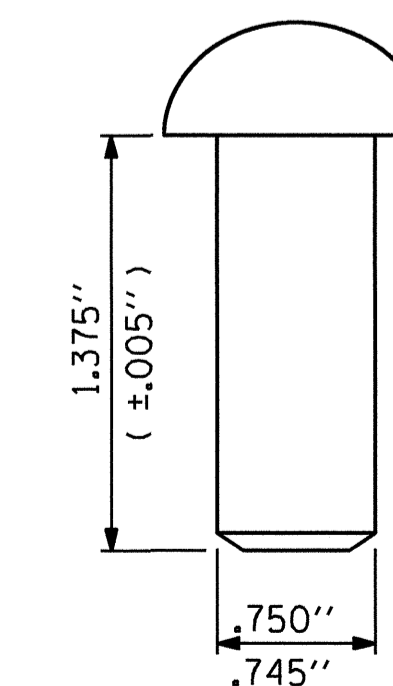
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**PLAN**



**RIVET DETAIL**

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 1 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**2 BAR METAL RAIL**



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-23
1			3			TOTAL SHEETS
2			4			59

ASSEMBLED BY : H. T. BARBOUR	DATE : 12-07-09
CHECKED BY : M. G. SHAIKH	DATE : 2-10
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM



NOTES

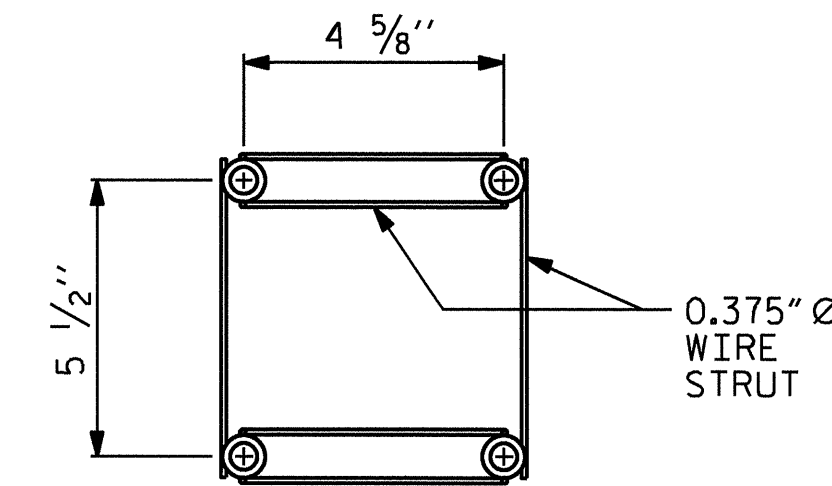
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

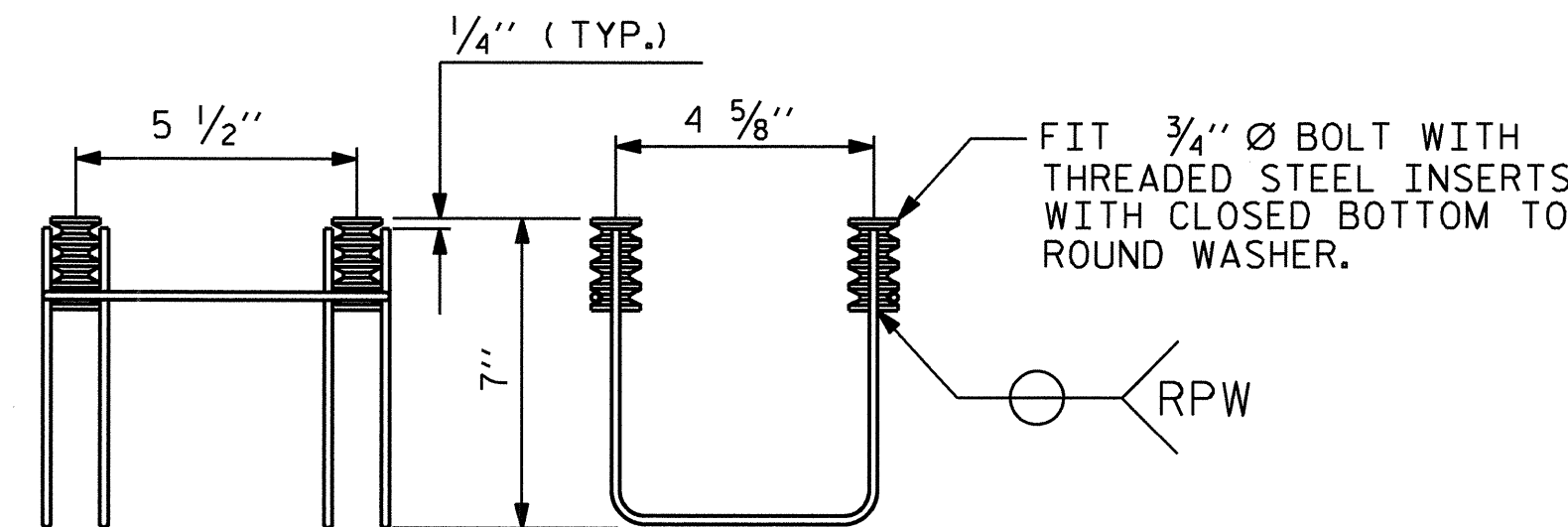
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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



PLAN



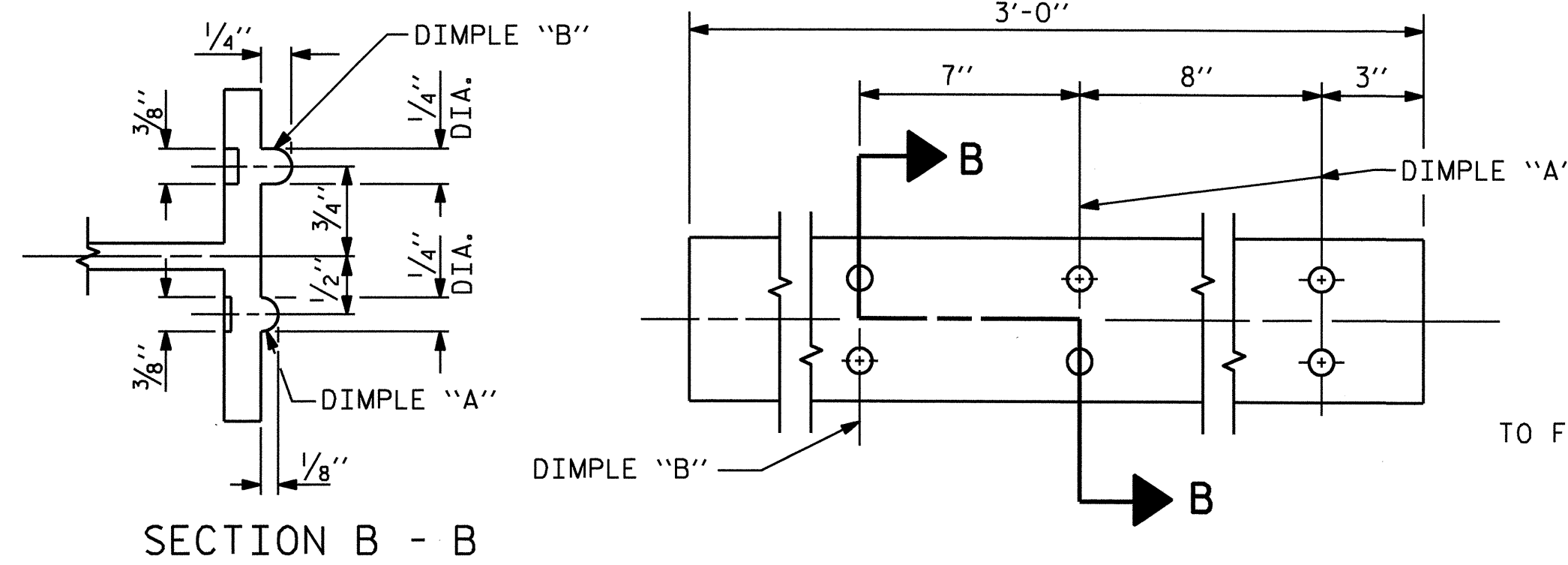
SIDE VIEW

ELEVATION

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

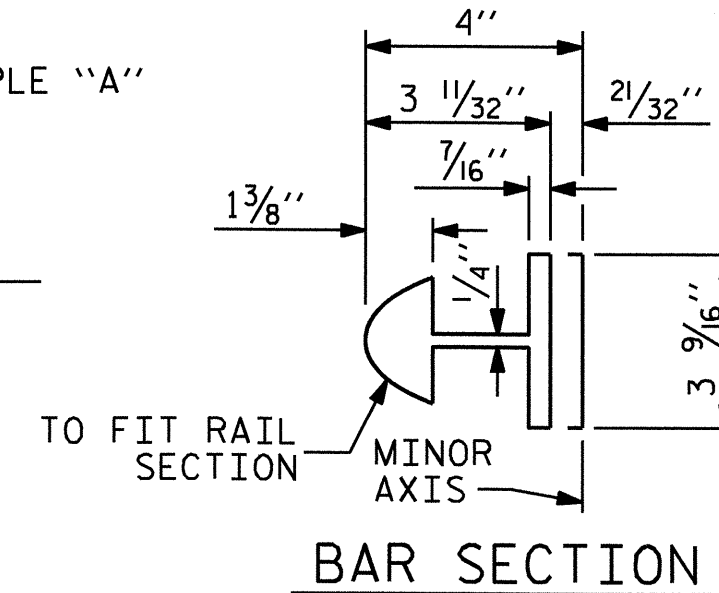
4-BOLT METAL RAIL ANCHOR ASSEMBLY

( 98 ASSEMBLIES REQUIRED )

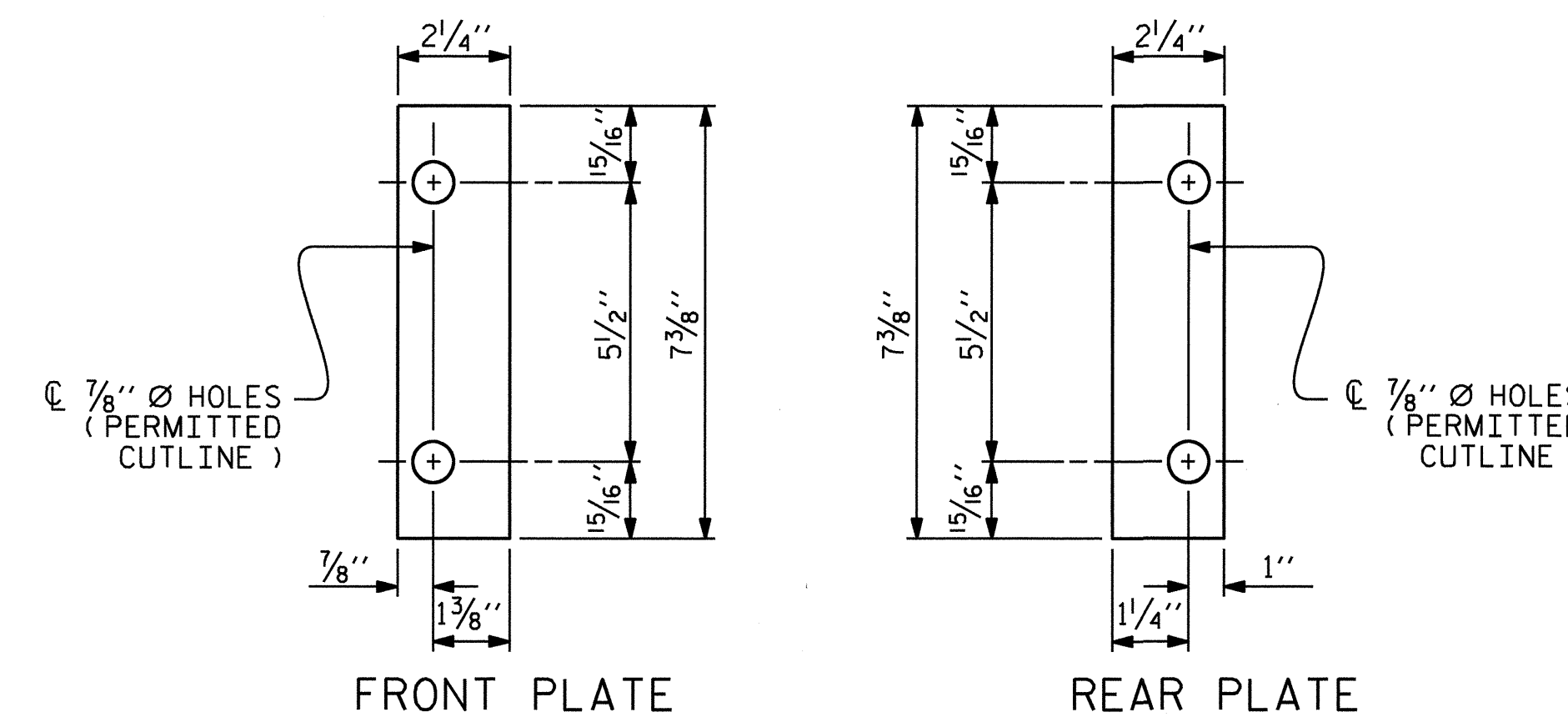


SECTION B - B

EXPANSION BAR DETAILS



BAR SECTION

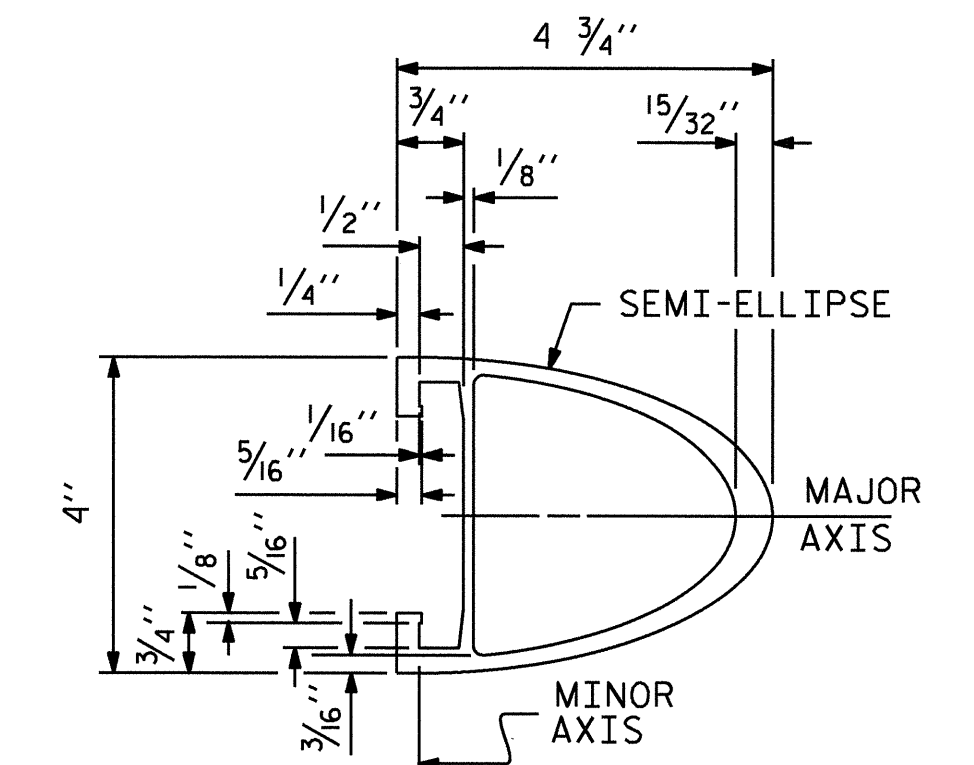


FRONT PLATE

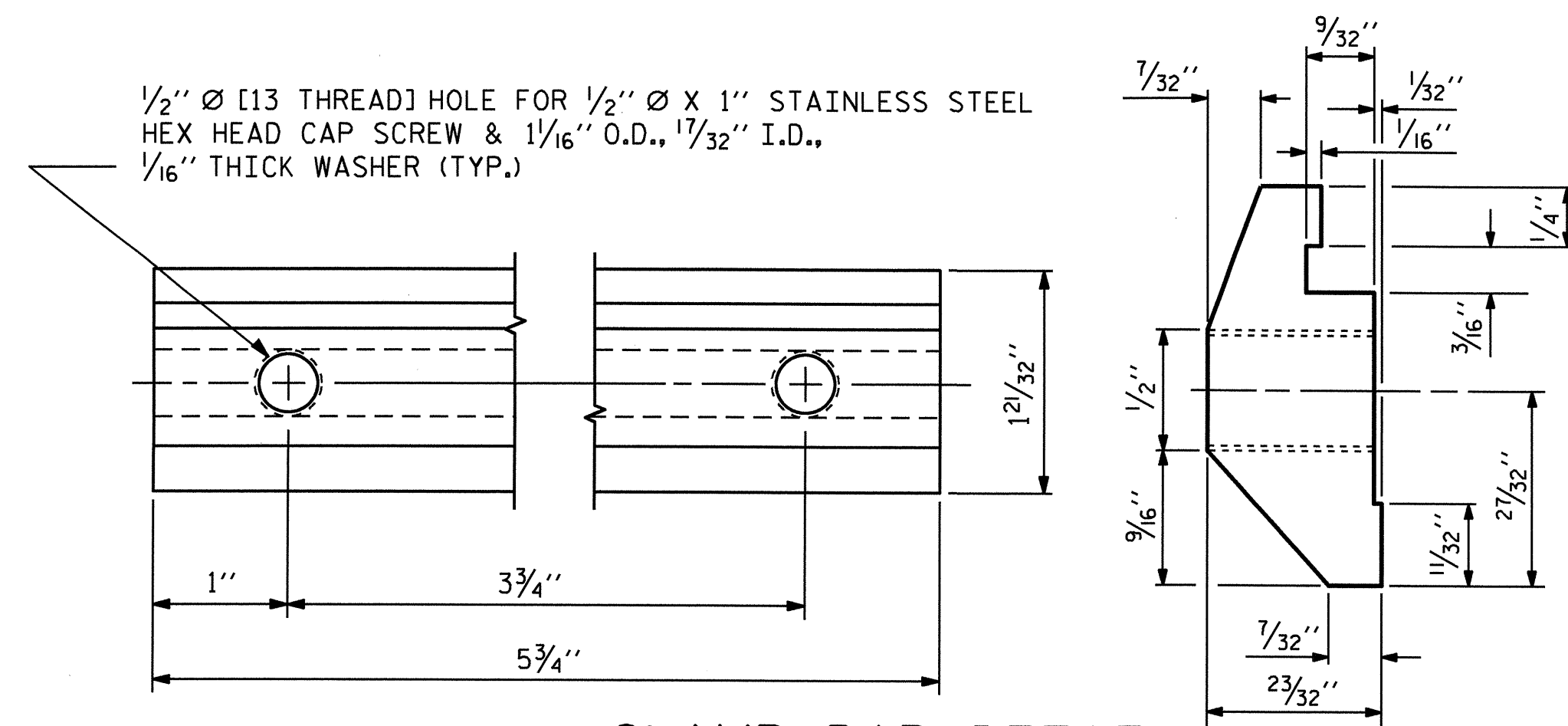
REAR PLATE

SHIM DETAILS

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

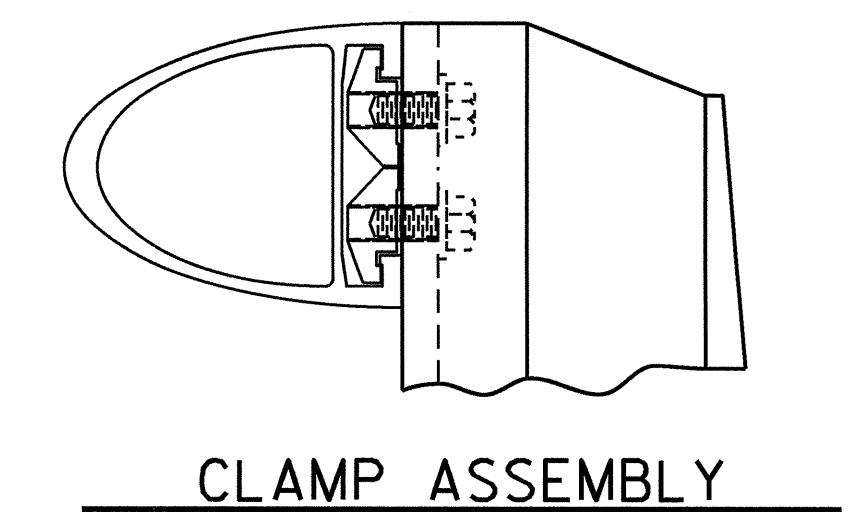


RAIL SECTION

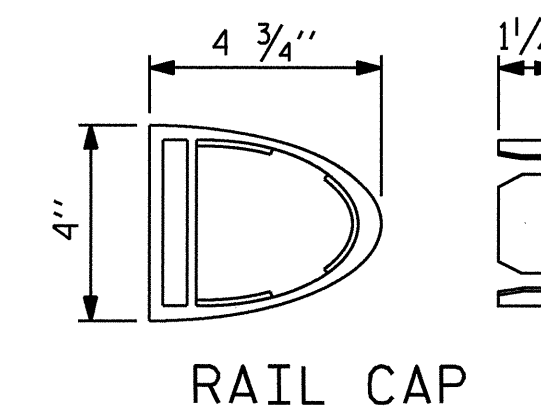


CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

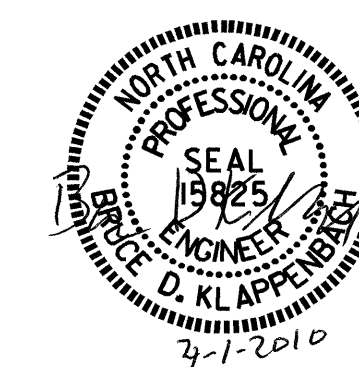


RAIL CAP

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

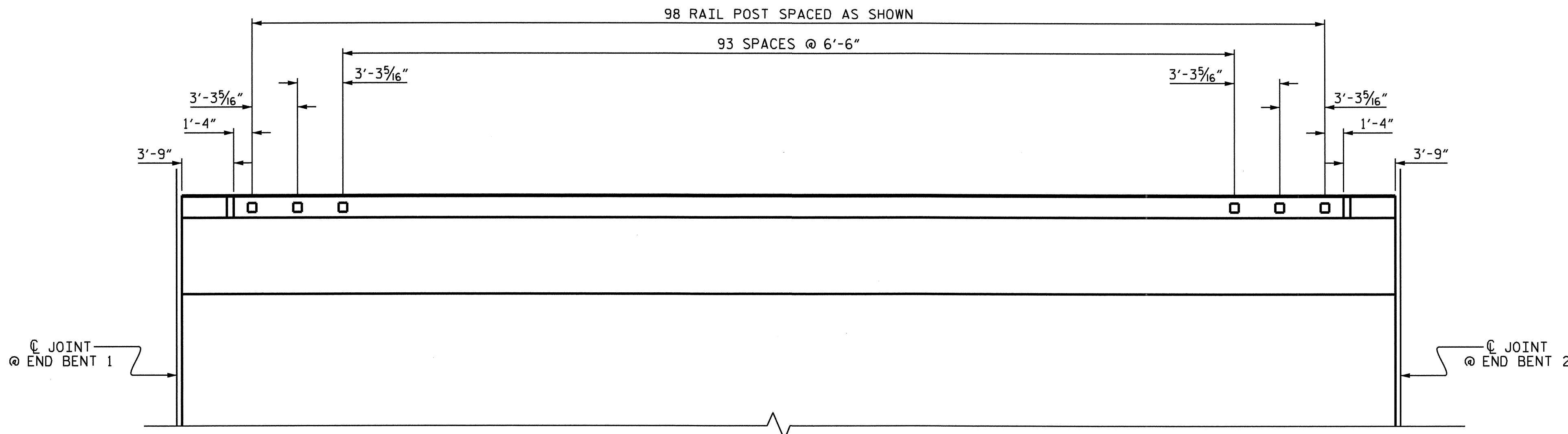
SHEET 2 OF 6

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

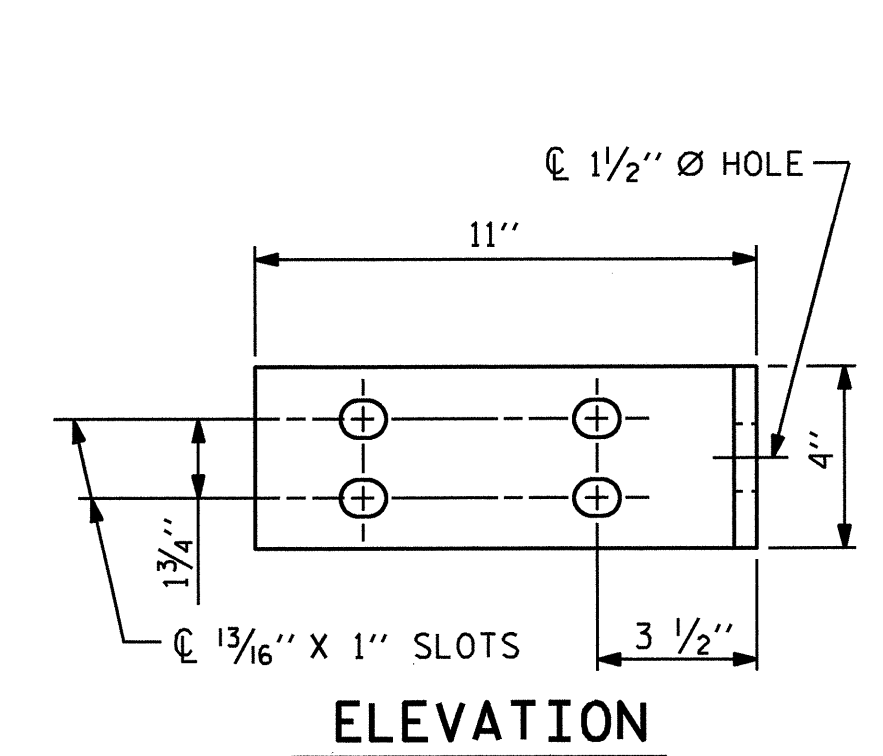


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			59

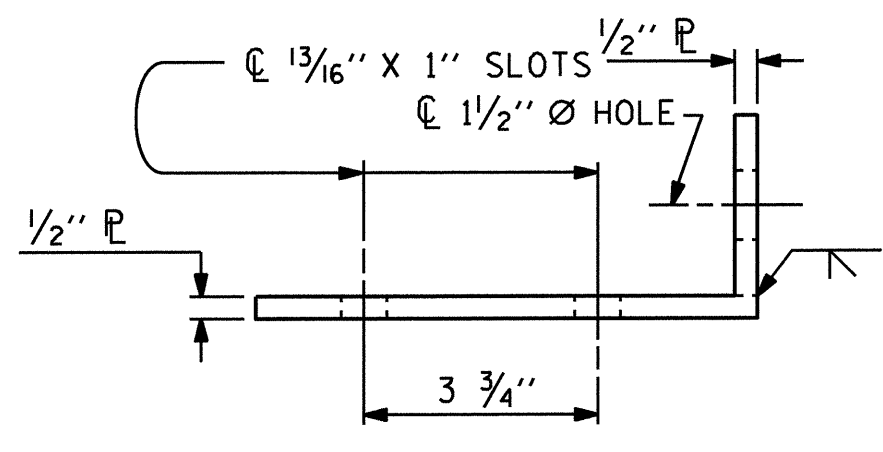
ASSEMBLED BY : H. T. BARBOUR	DATE : 12-07-09
CHECKED BY : M. G. SHAIKH	DATE : 2-10
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM



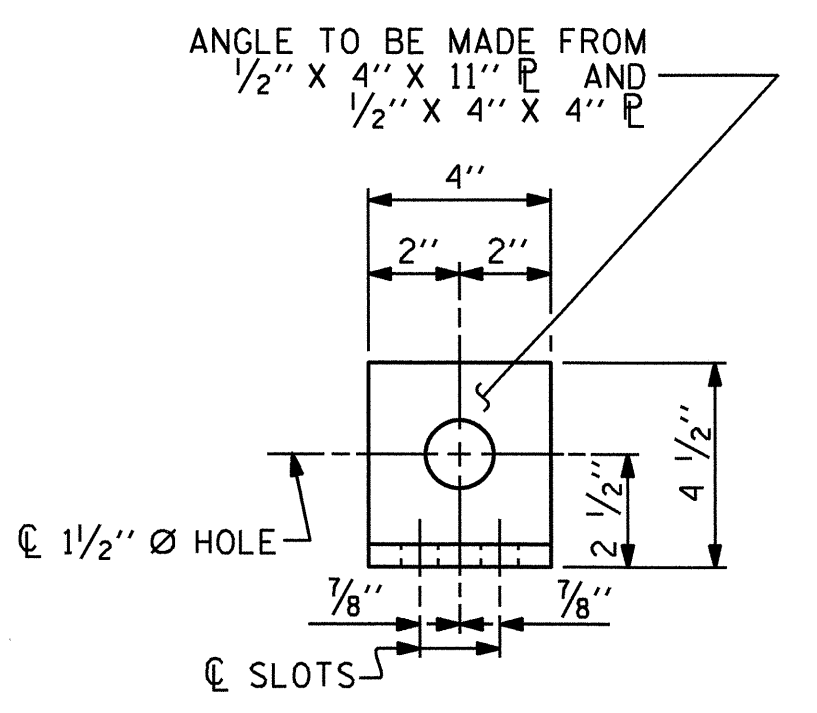
**PLAN OF RAIL POST SPACINGS**



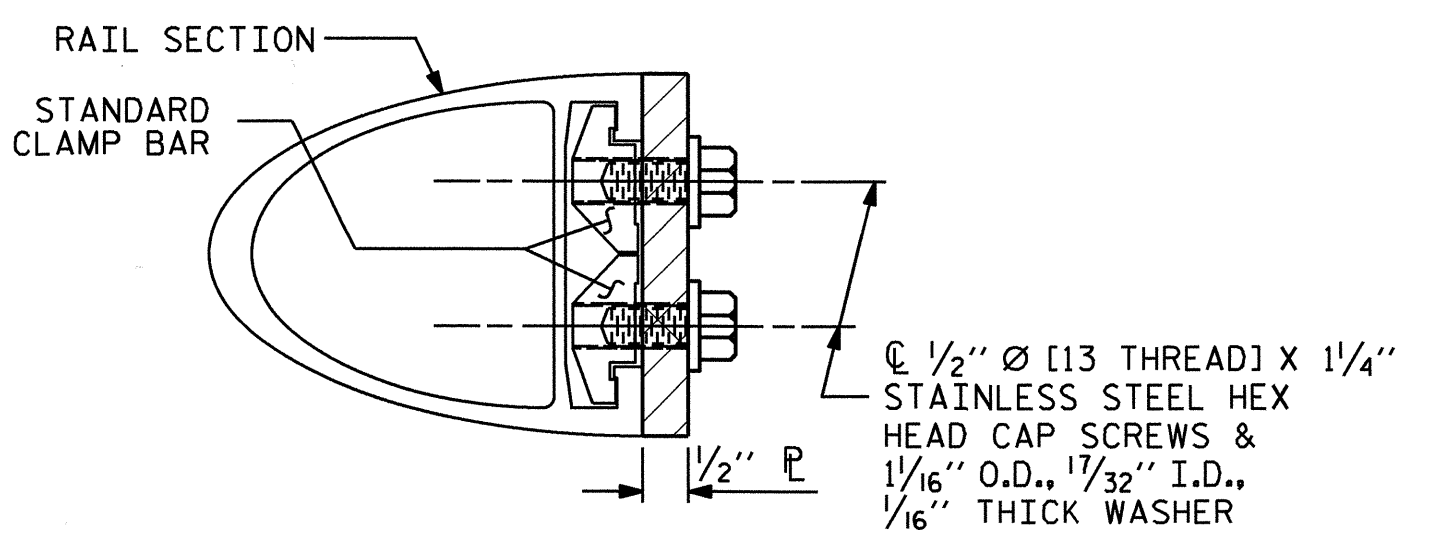
**ELEVATION**



**TOP VIEW**



**END VIEW (FIX AND EXP.)**



**SECTION H-H (FIX)**

**FIXED**

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

**NOTES**

**STRUCTURAL CONCRETE INSERT**

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

**NOTES**

**METAL RAIL TO END POST CONNECTION**

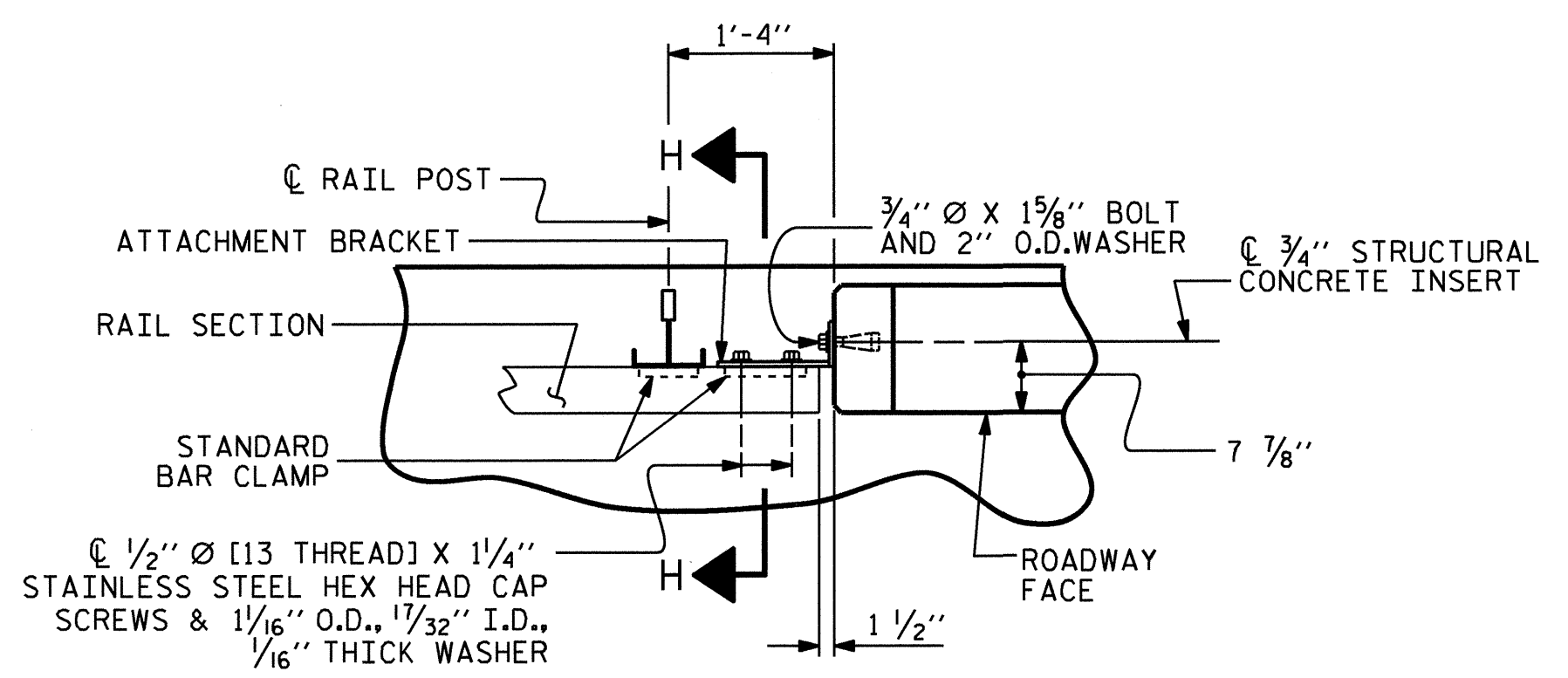
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A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

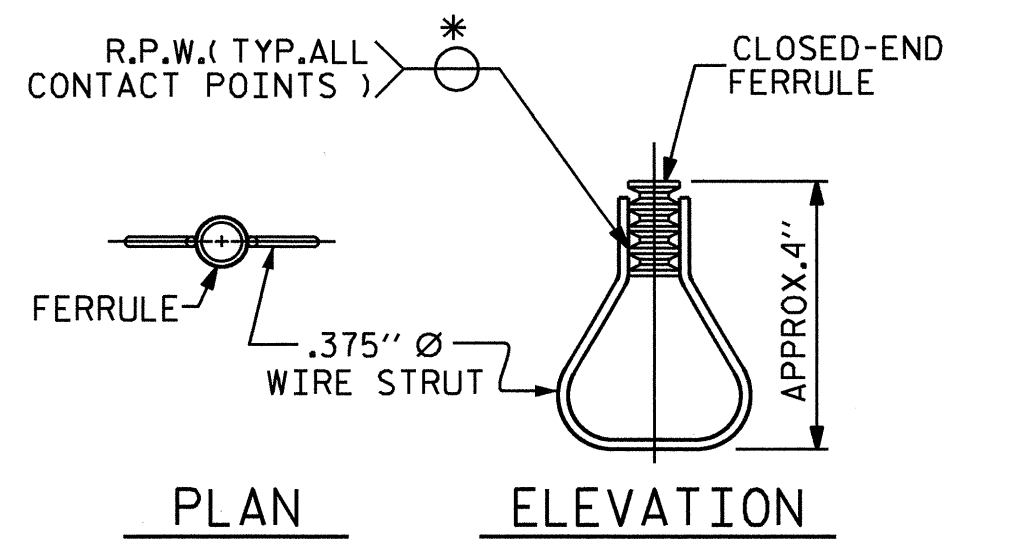
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.



**PLAN - RAIL AND END POST**



**STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 3 OF 6

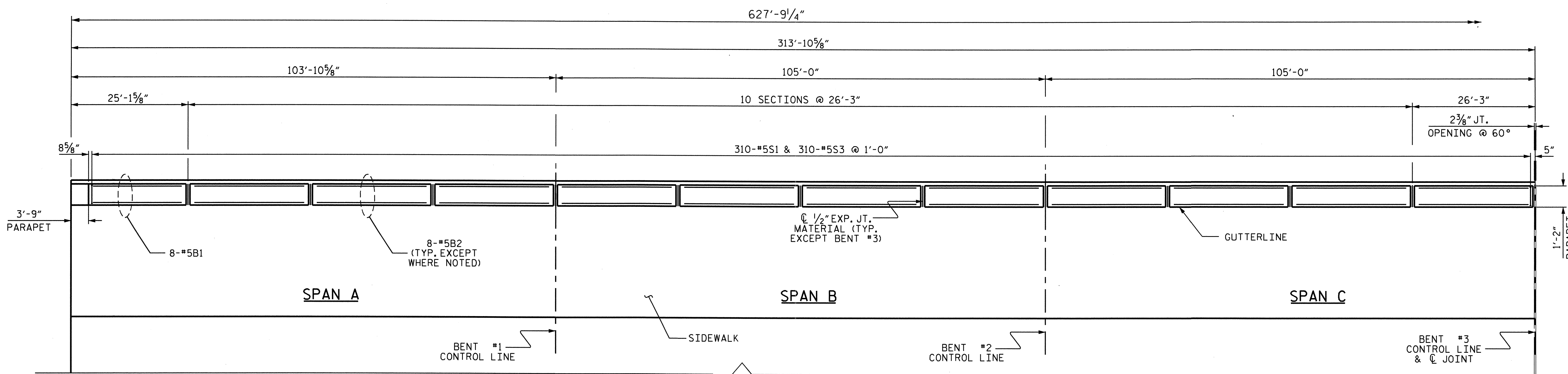
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS**  
 FOR ONE OR TWO BAR METAL RAILS

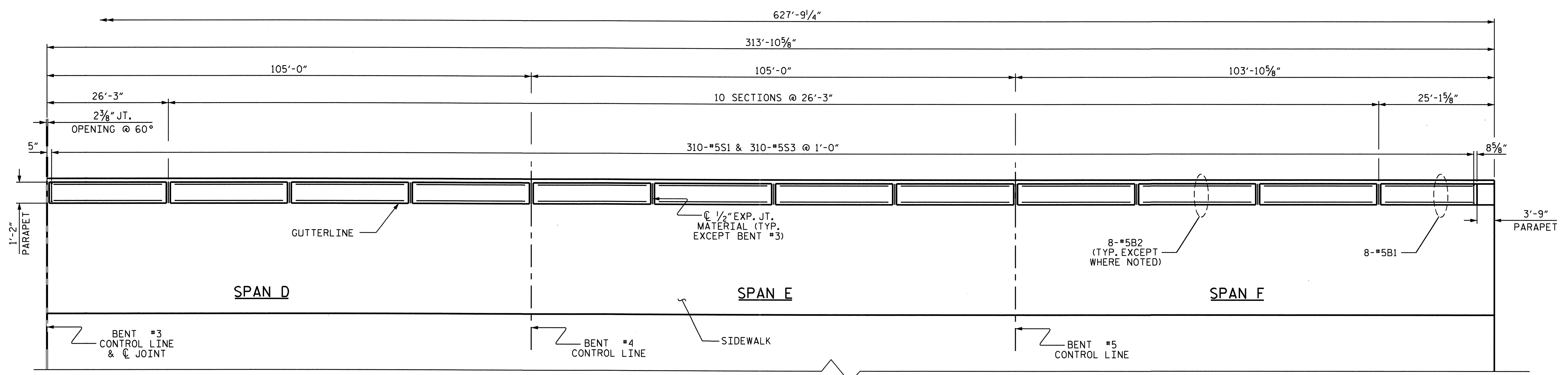


REVISIONS						SHEET NO. S-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY : H. T. BARBOUR	DATE : 12-07-09
CHECKED BY : M. G. SHAIKH	DATE : 2-10
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



PLAN OF PARAPET



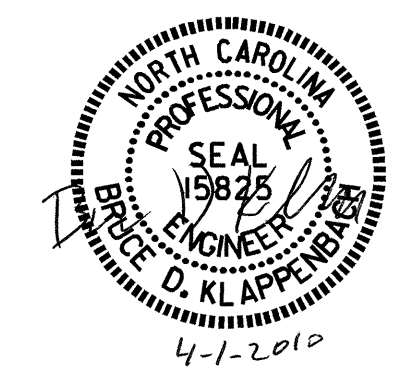
PLAN OF PARAPET

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

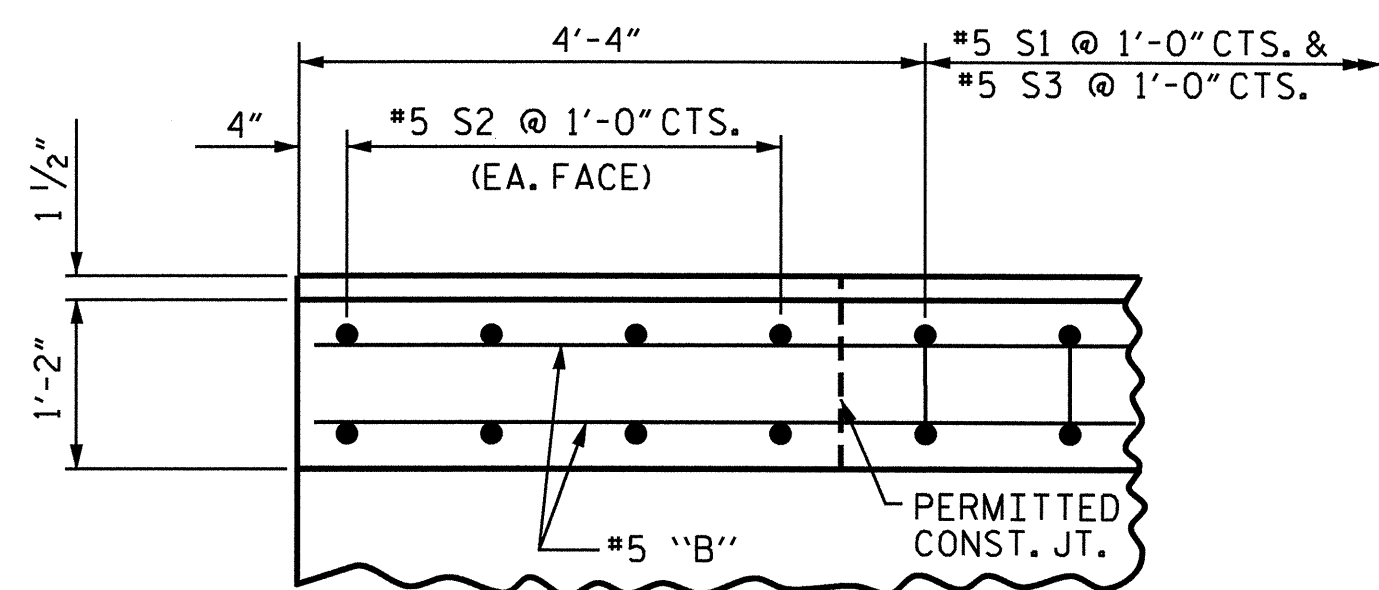
**PARAPET AND  
 END POST DETAILS  
 FOR TWO BAR  
 METAL RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			59

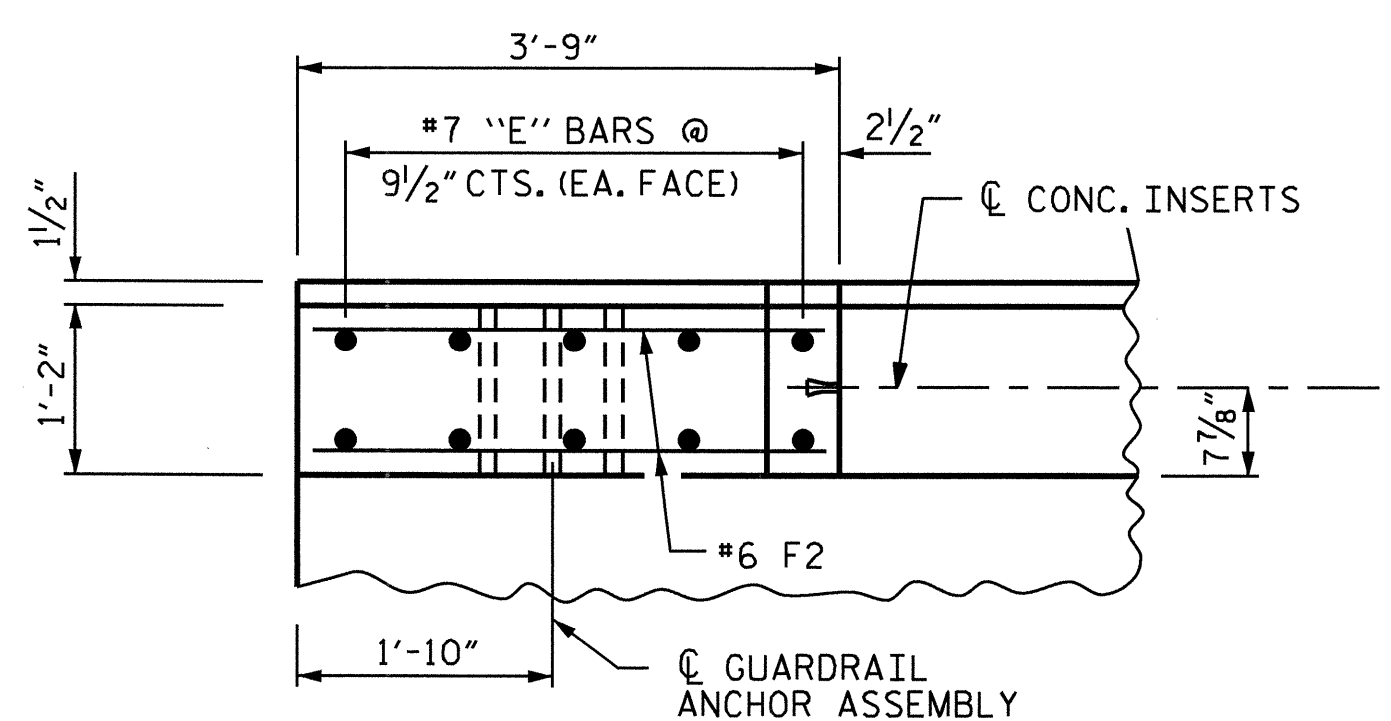


DRAWN BY : H. T. BARBOUR DATE : 12-11-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

31-MAR-2010 14:13  
 R:\Structures\barbour\microstation\b4138.sd\_2mr.dgn  
 tbarbour



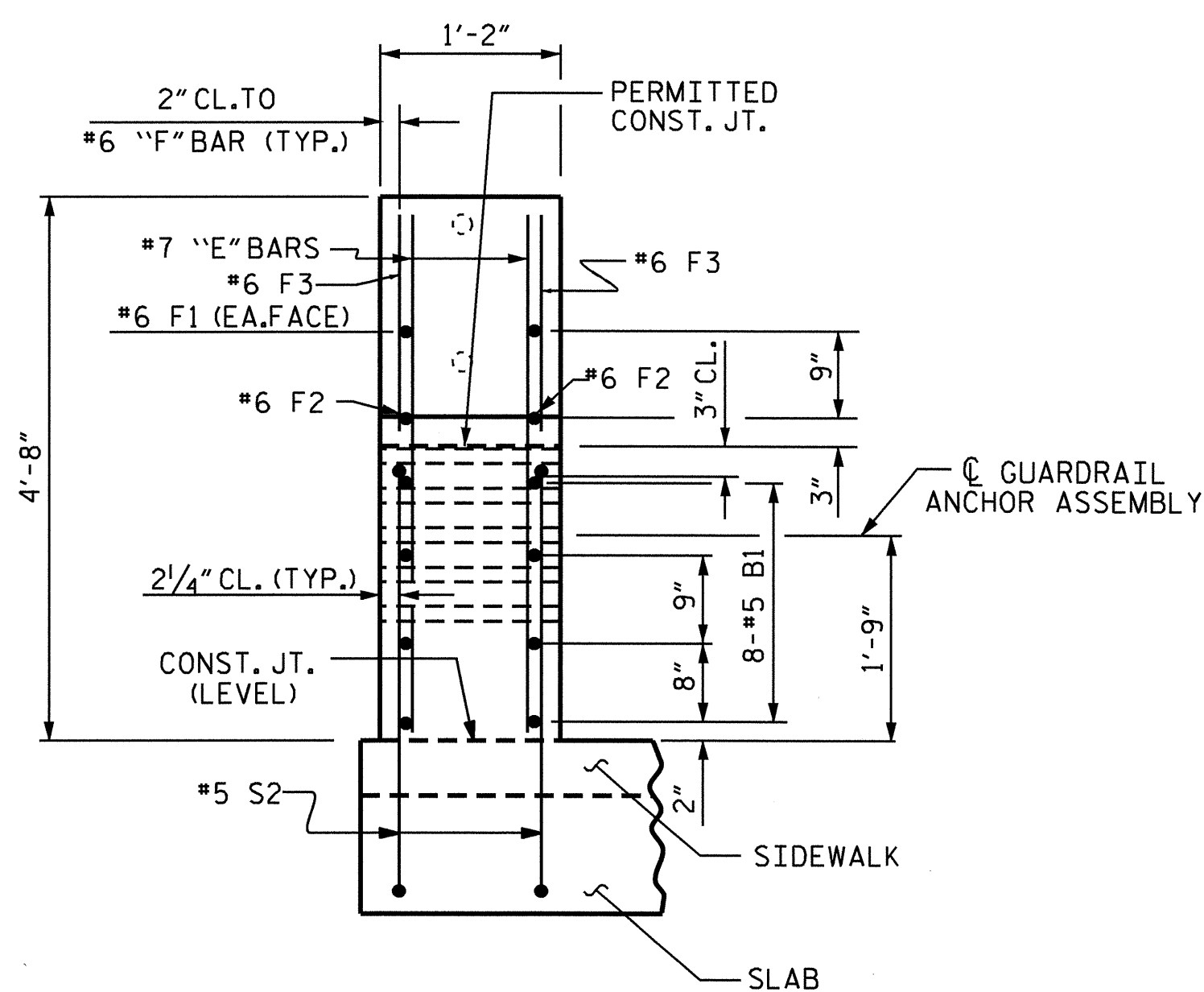
PLAN OF PARAPET



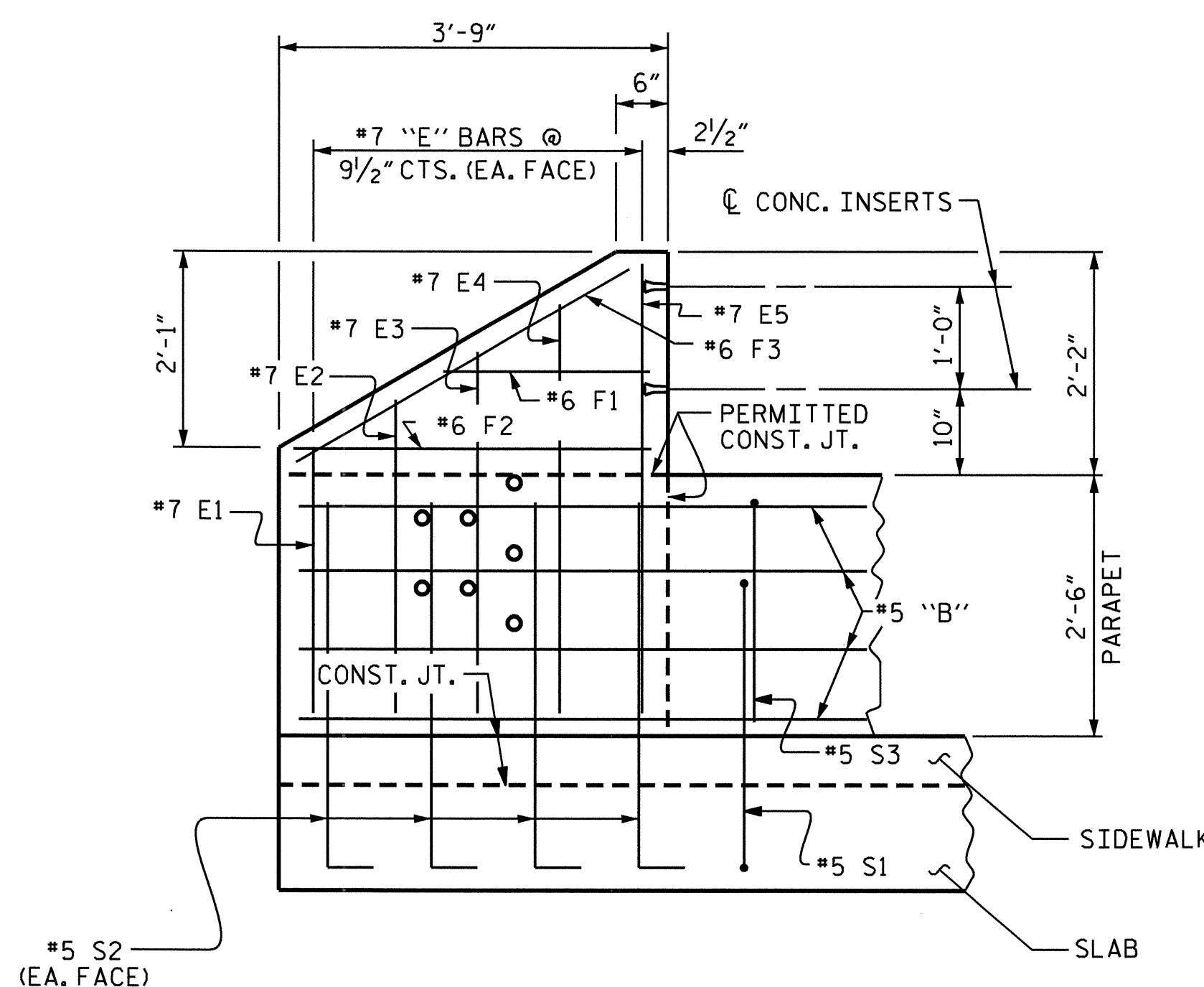
PLAN OF END POST

BAR TYPE		BILL OF MATERIAL FOR PARAPETS AND END POSTS				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B1	16	#5	STR	24'-8"	412	
* B2	176	#5	STR	25'-11"	4757	
* E1	4	#7	STR	2'-6"	20	
* E2	4	#7	STR	3'-0"	25	
* E3	4	#7	STR	3'-6"	29	
* E4	4	#7	STR	4'-0"	33	
* E5	4	#7	STR	4'-4"	35	
* F1	4	#6	STR	1'-10"	11	
* F2	4	#6	STR	3'-0"	18	
* F3	4	#6	STR	3'-8"	22	
* S1	620	#5	1	6'-1"	3934	
* S2	16	#5	2	4'-4"	72	
* S3	620	#5	3	5'-1"	3287	
* EPOXY COATED REINF. STEEL				LBS.	12655	
CLASS A CONCRETE				CU. YDS.	68.1	
TOTAL LIN. FT. OF CONCRETE PARAPET					627.81	

ALL BAR DIMENSIONS ARE OUT TO OUT.

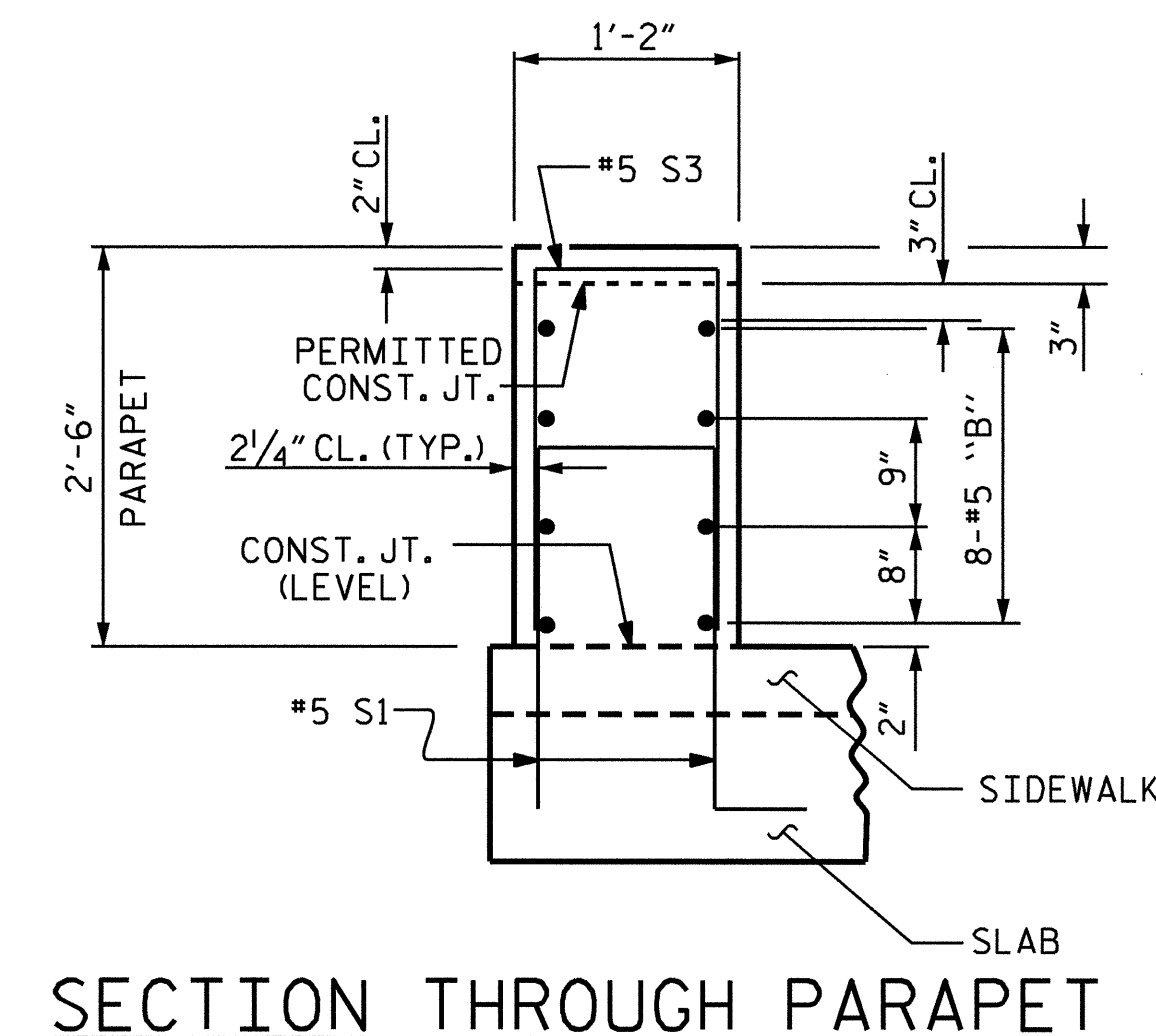


END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL



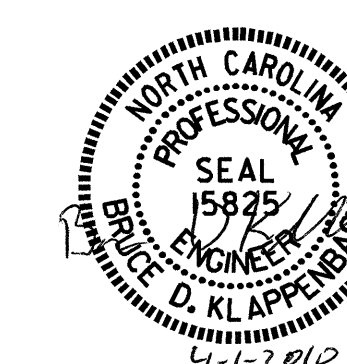
SECTION THROUGH PARAPET

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 5 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PARAPET AND  
 END POST DETAILS  
 FOR TWO BAR  
 METAL RAIL



REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY : H. I. BARBOUR DATE : 10-21-09  
 CHECKED BY : M. G. SHAIKH DATE : 2-10

NOTES

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

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

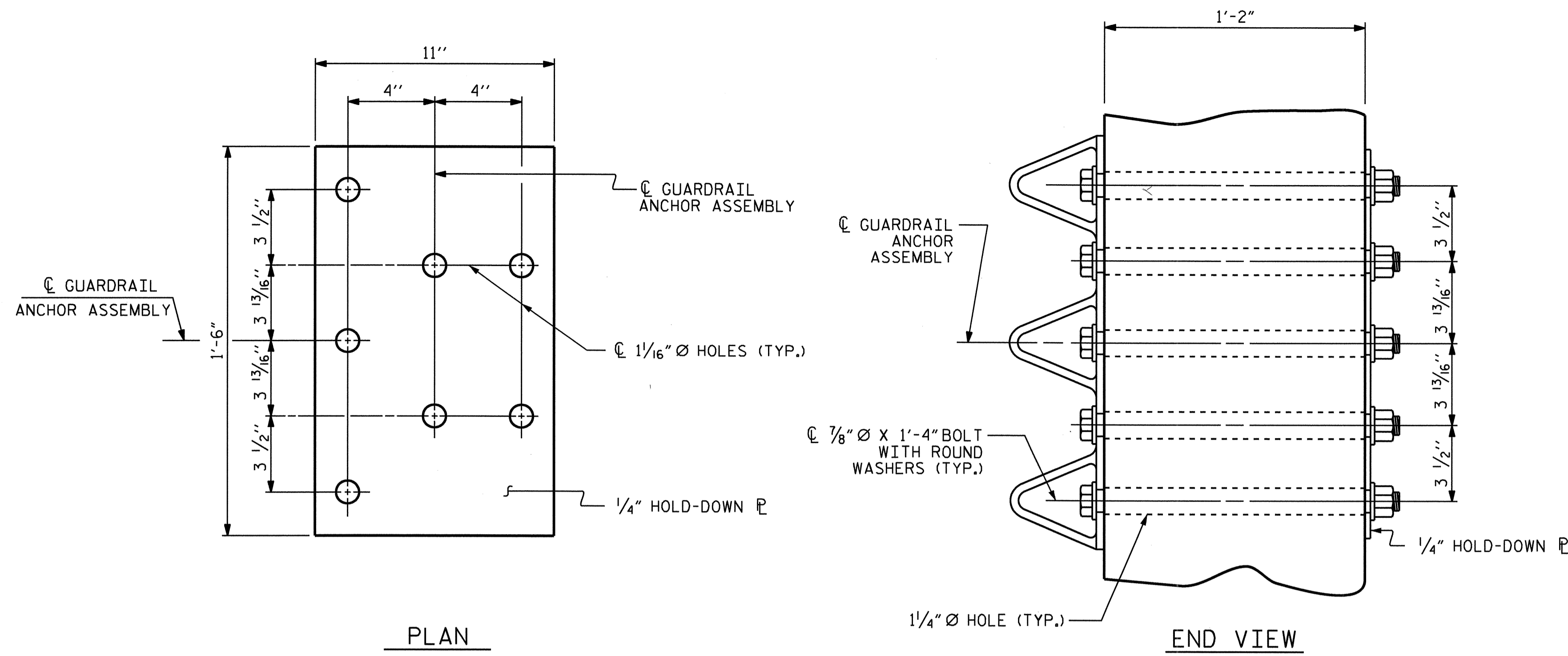
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

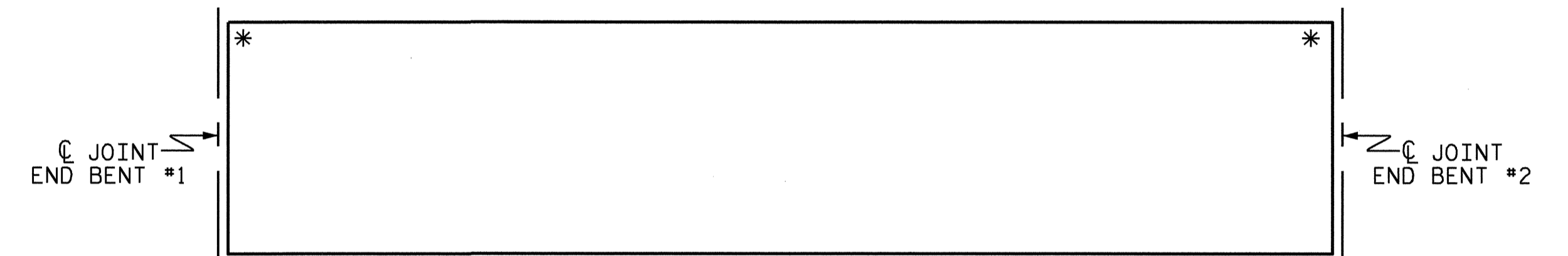
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

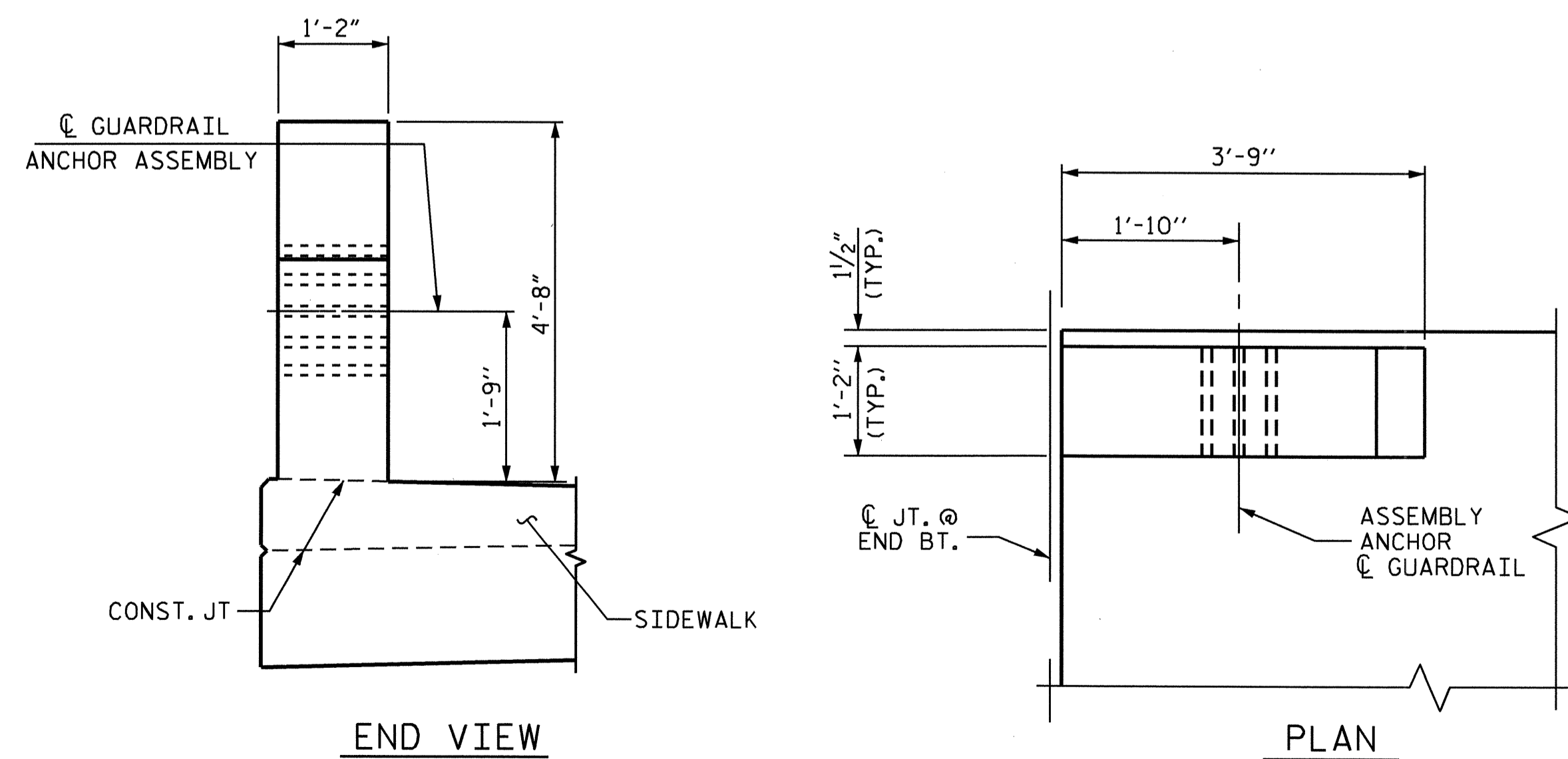


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT FOR 2 BAR METAL RAIL

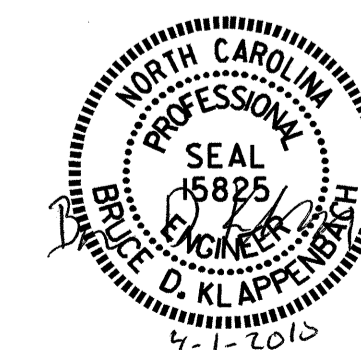


LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 6 OF 6

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



ASSEMBLED BY :	H. T. BARBOUR	DATE :	12-08-09
CHECKED BY :	M. G. SHAIKH	DATE :	2-06-10
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:	5-28
1			3			TOTAL SHEETS
2			4			59

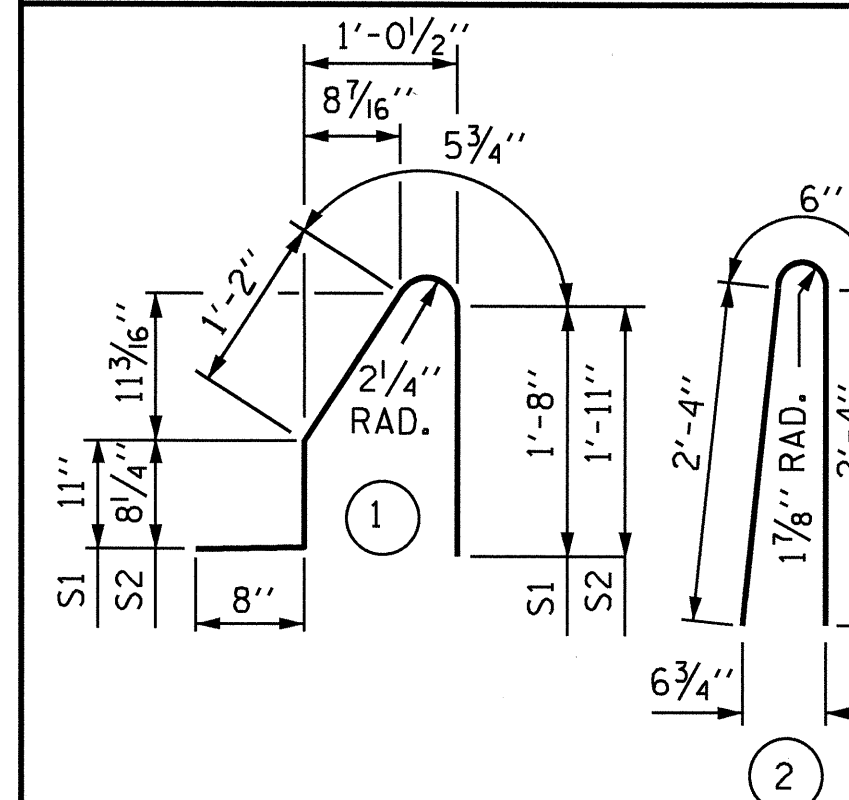
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES

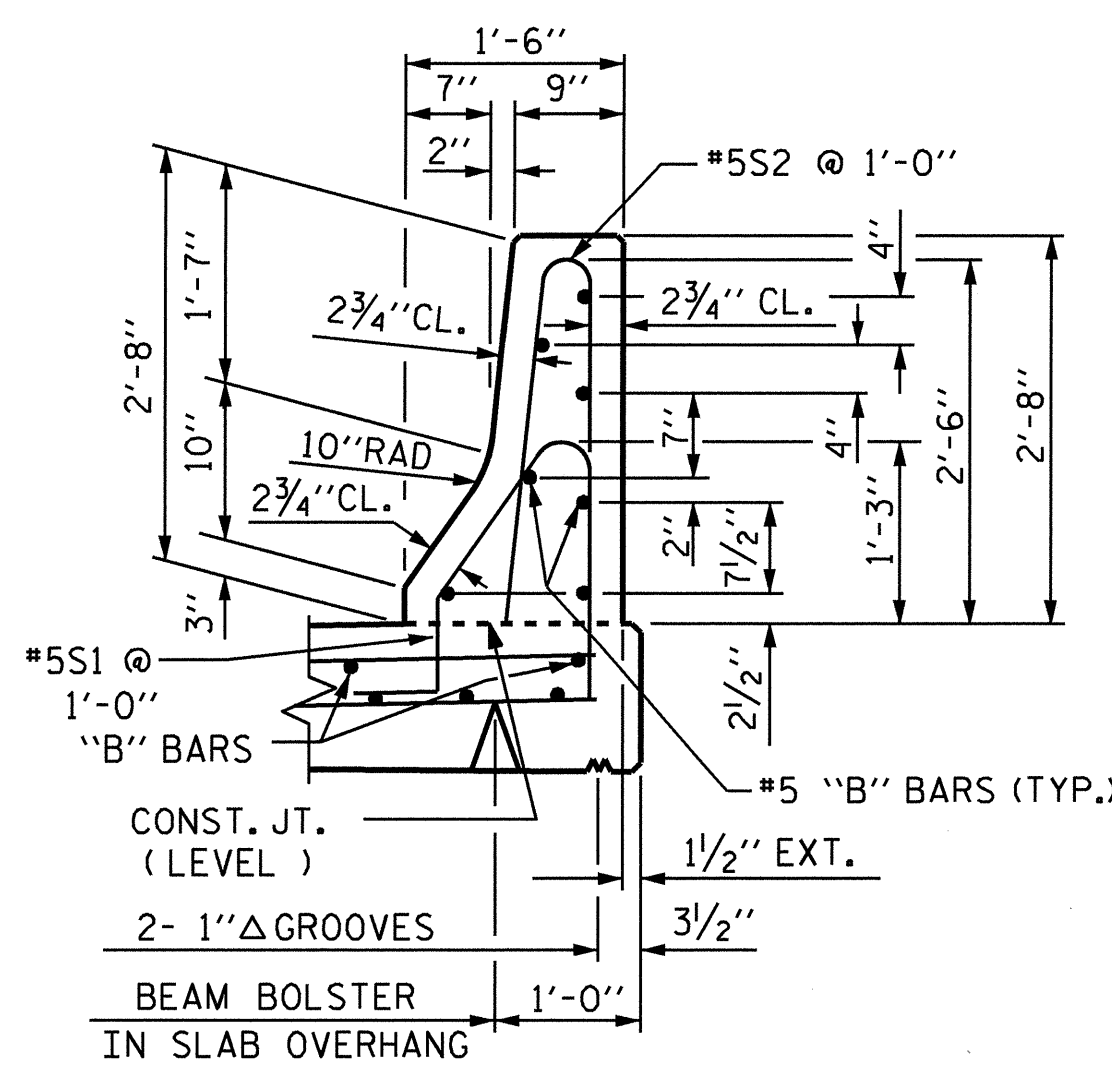


ALL BAR DIMENSIONS ARE OUT TO OUT

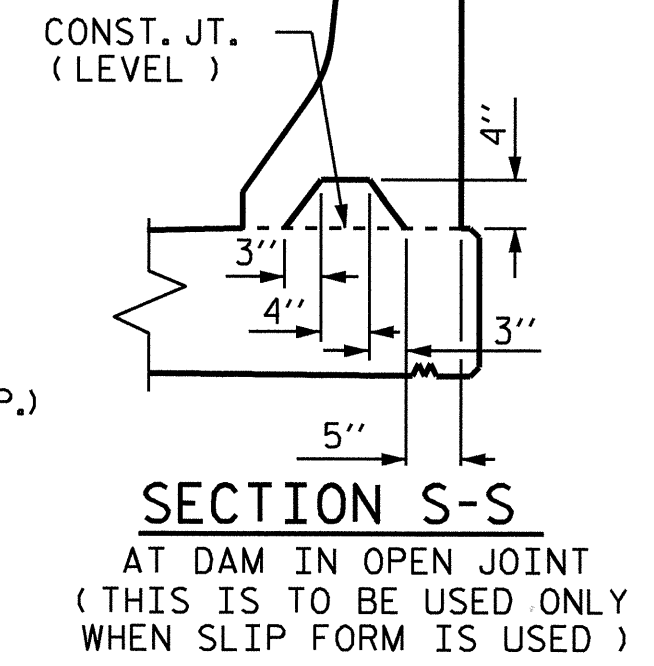
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

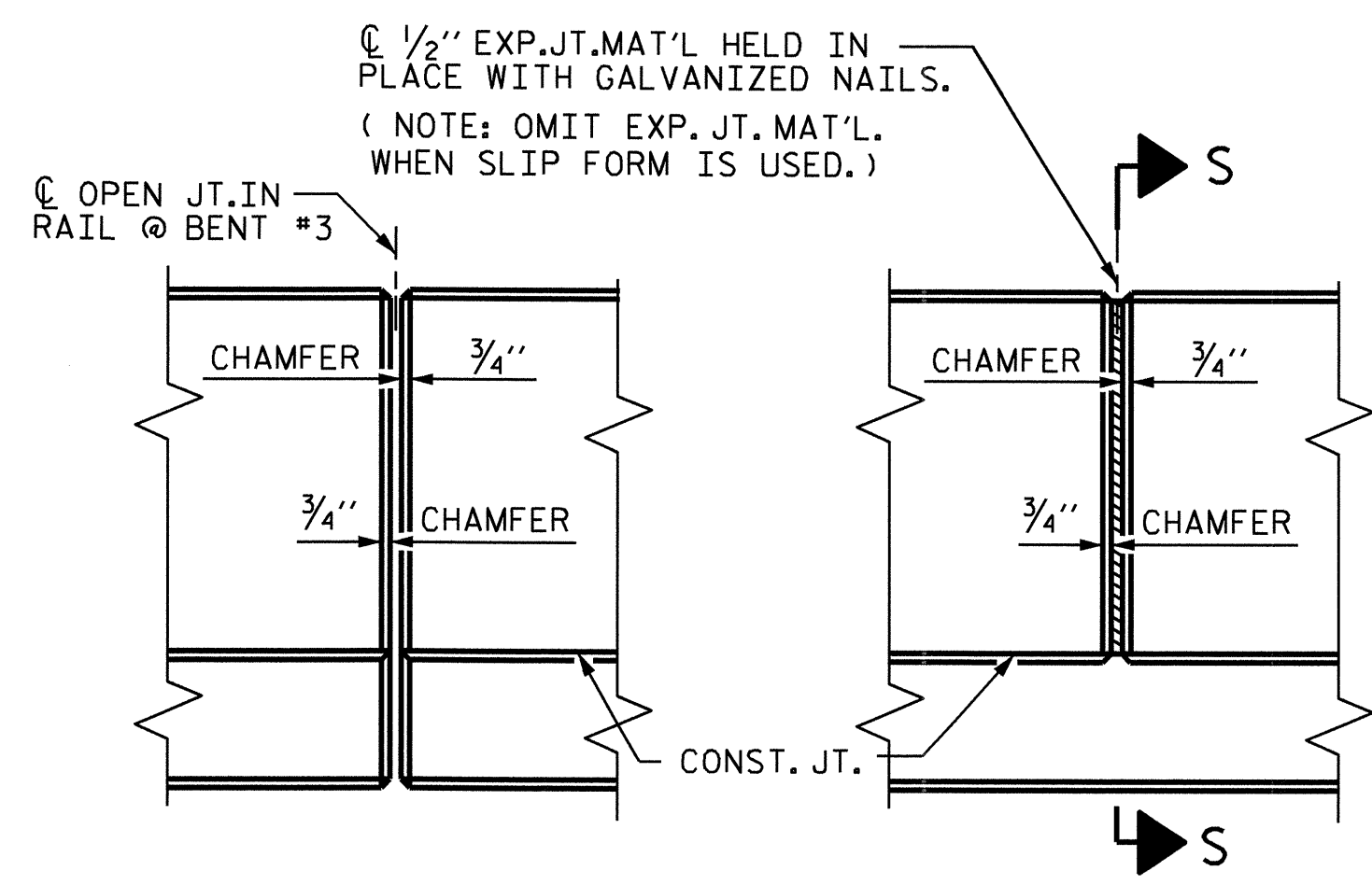
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	28	#5	STR.	24'-8"	360
* B2	154	#5	STR.	25'-11"	4163
* S1	678	#5	1	4'-8"	3300
* S2	678	#5	2	5'-2"	3654
* S3	50	#5	1	5'-2"	269
* EPOXY COATED REINFORCING STEEL					11746 LBS.
CLASS AA CONCRETE					67.9 CU. YDS.
CONCRETE BARRIER RAIL					678.0 LIN. FT.



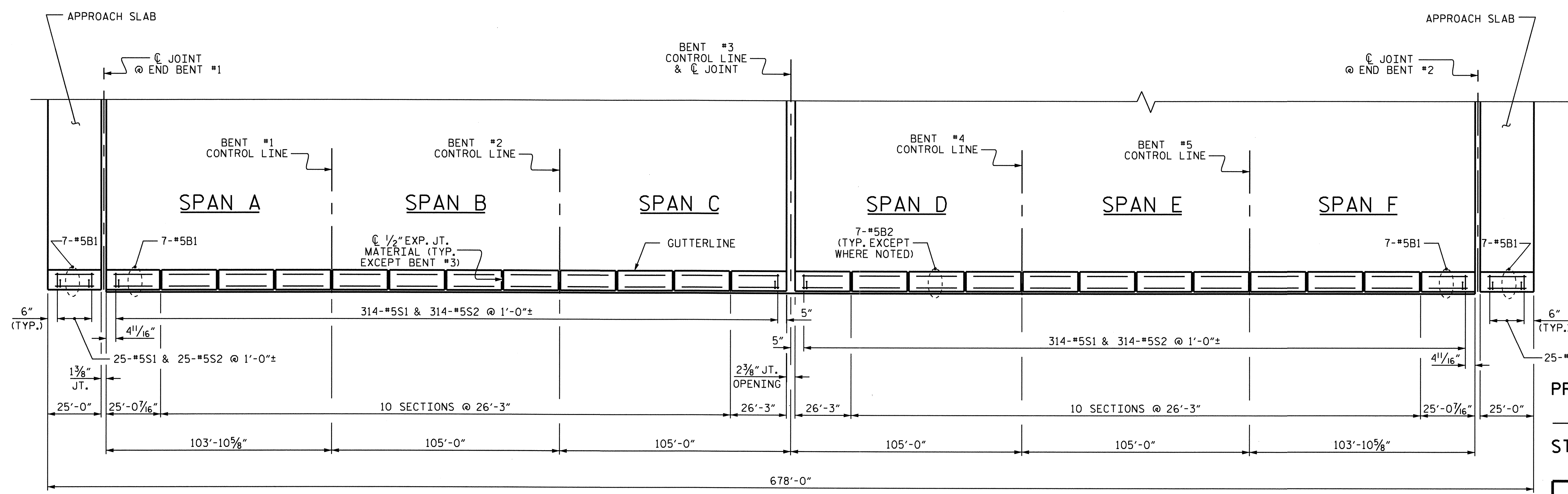
SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



PLAN

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

CONCRETE BARRIER RAIL



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY :	H. T. BARBOUR	DATE :	3-31-09
CHECKED BY :	M. G. SHAIKH	DATE :	2-10
DRAWN BY :	ARB 5/87	REV. 10/17/00	RWW/LES
CHECKED BY :	SJD 9/87	REV. 5/7/03R	RWW/JTE
		REV. 5/1/06	TLA/GM

31-MAR-2010 14:14  
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 tbarbour

NOTES

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

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

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

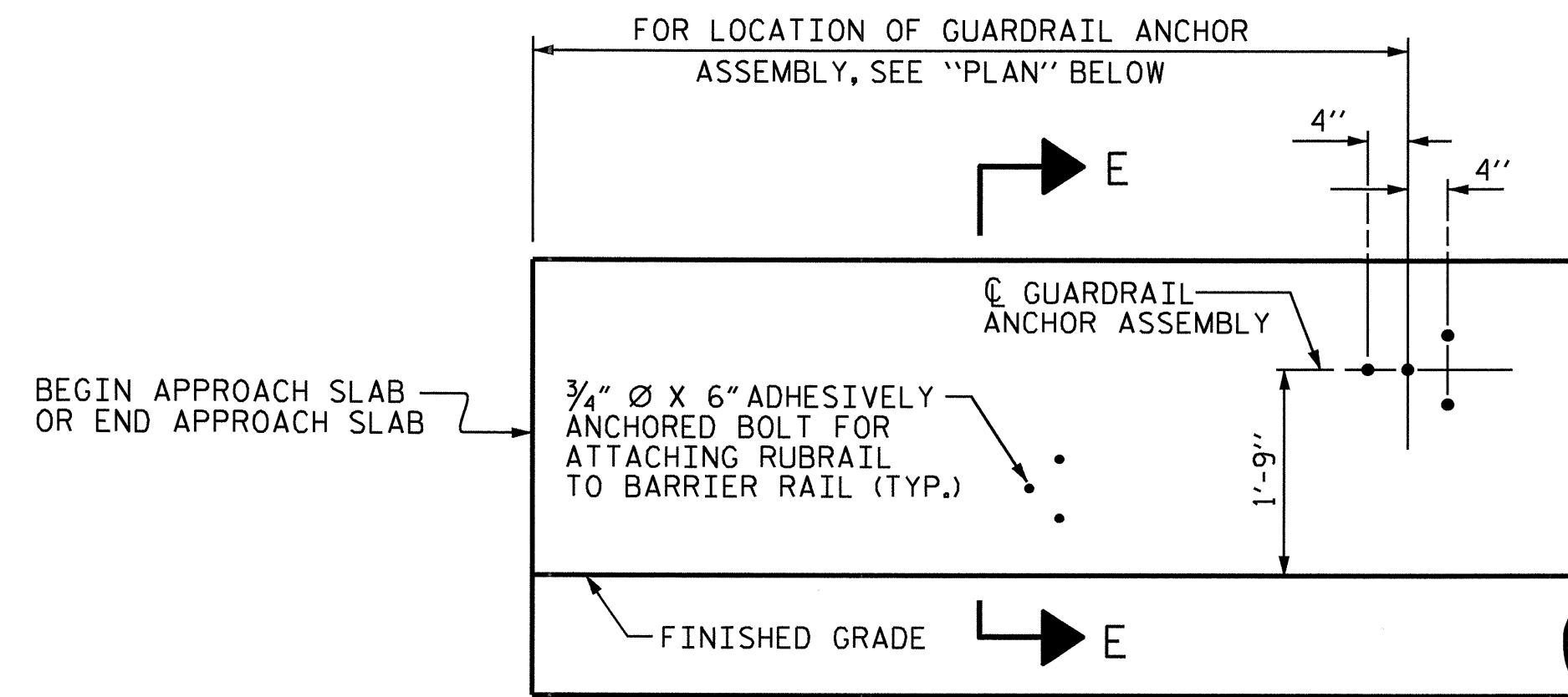
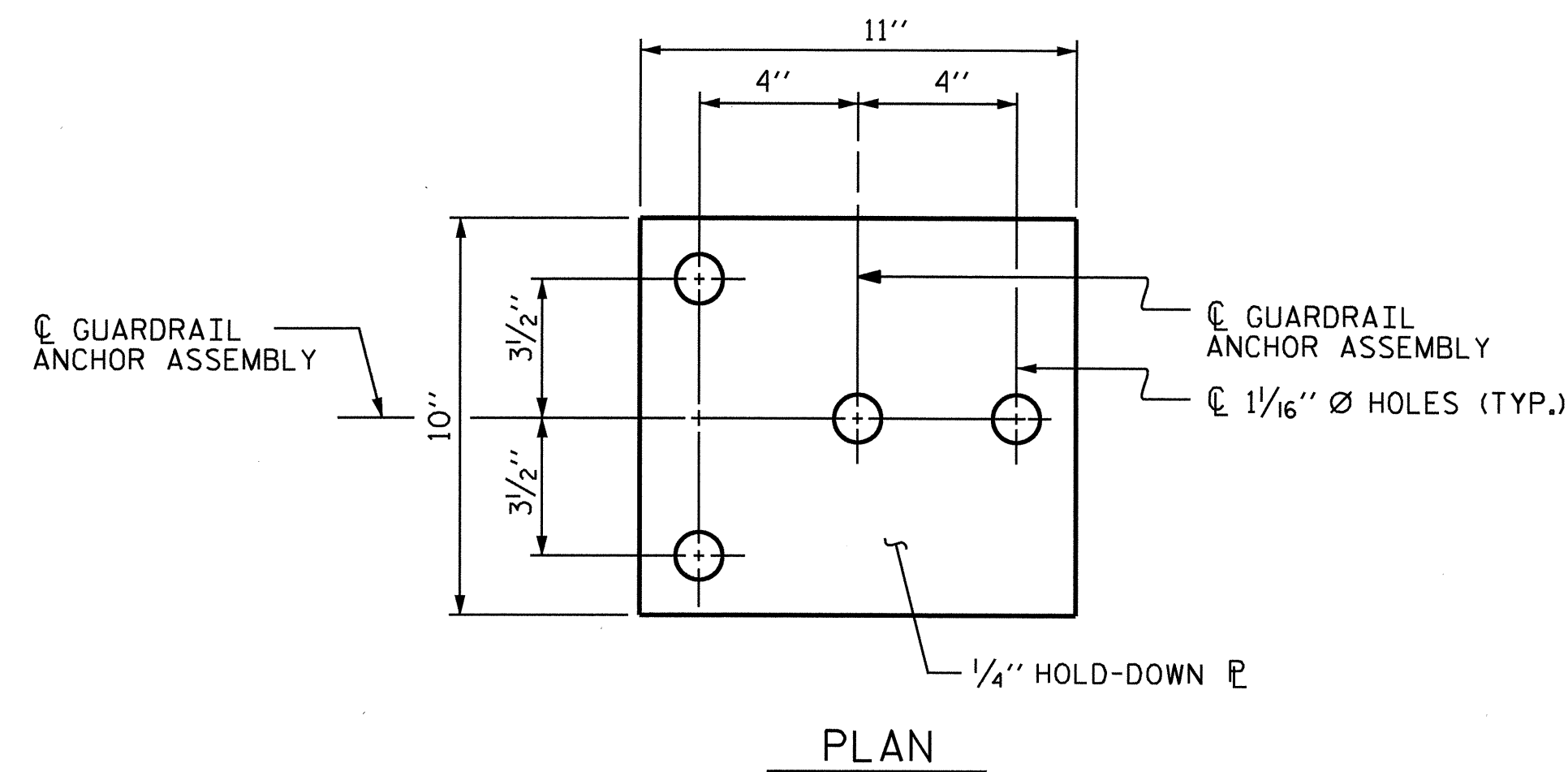
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

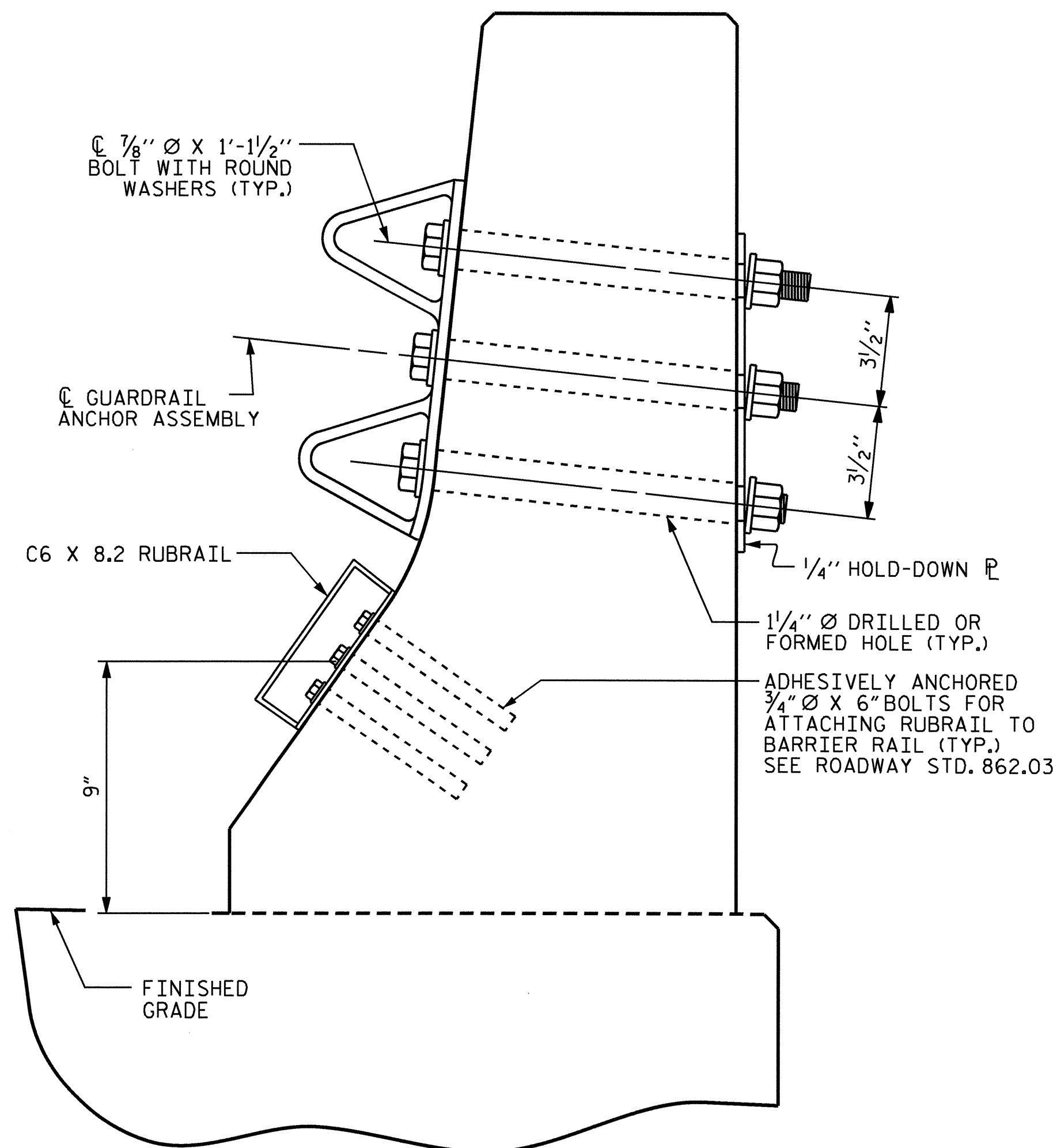
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

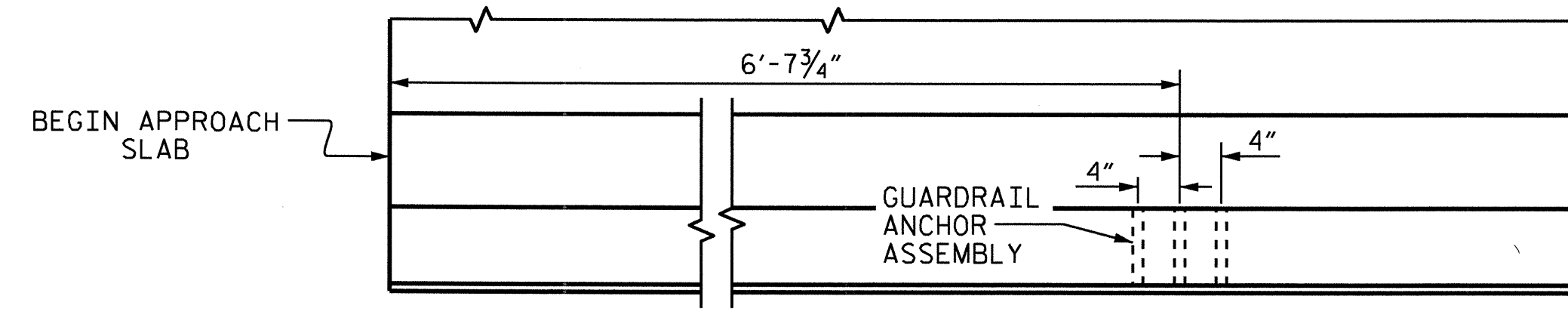
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

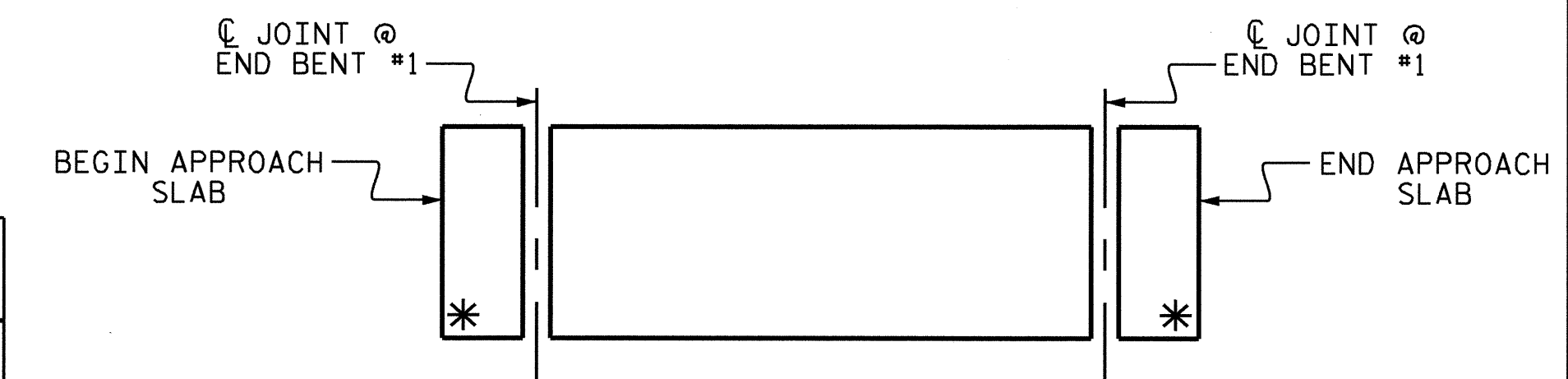


GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

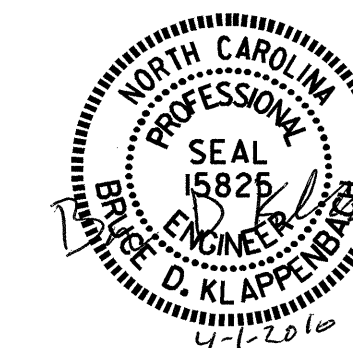
APPROACH SLAB #1 SHOWN, APPROACH SLAB #2 SIMILAR.



\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

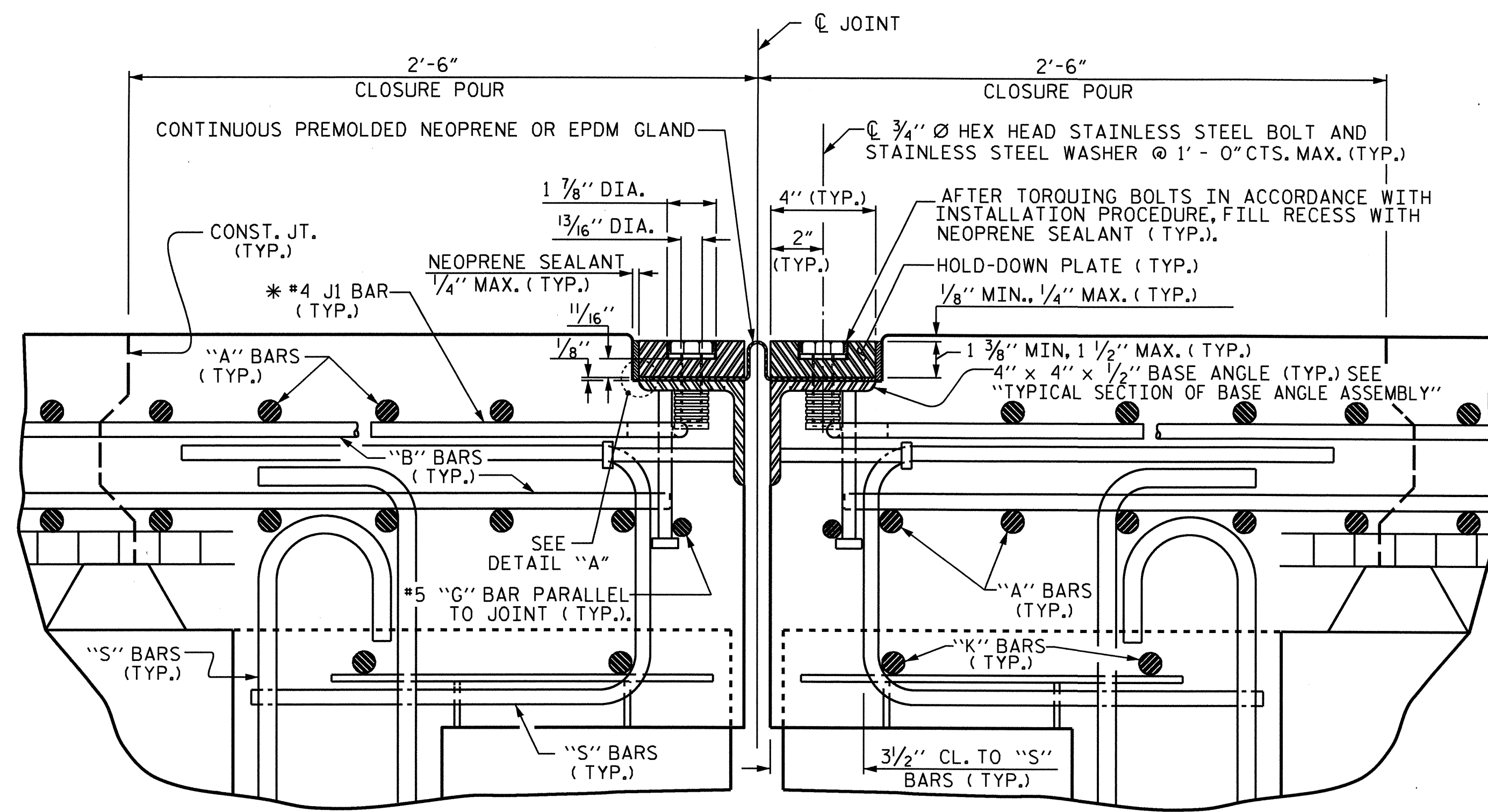
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL



ASSEMBLED BY :	H. T. BARBOUR	DATE :	9-20-07
CHECKED BY :	M. G. SHAIKH	DATE :	2-10
DRAWN BY :	TLA 5/06	ADDED :	5/1/06R KMM/GM
CHECKED BY :	GM 5/06		

31-MAR-2010 14:14  
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 tbarbour

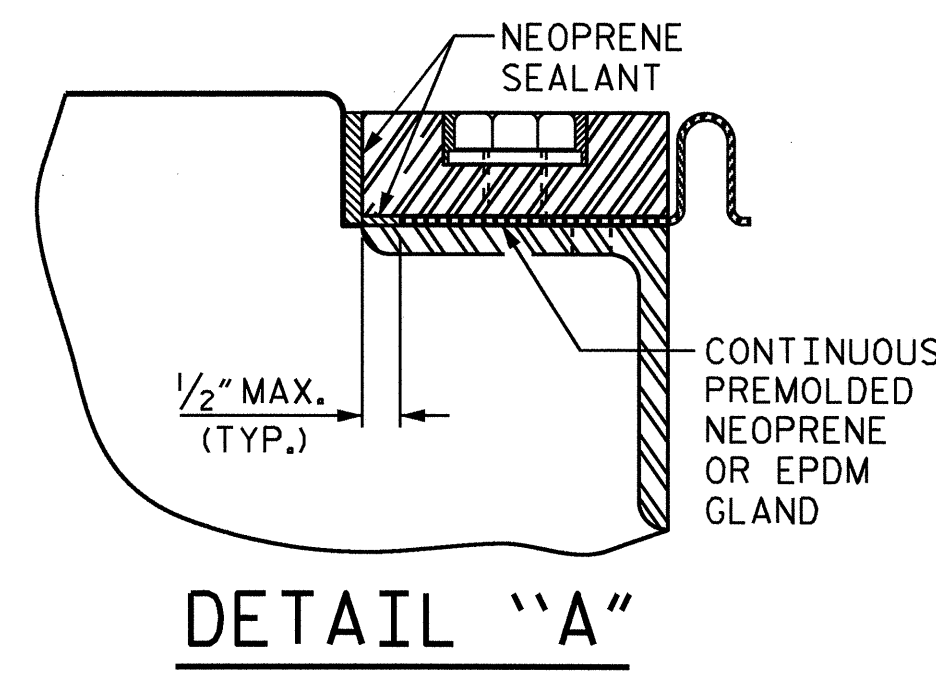
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			59



**EXPANSION JOINT DETAILS**

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

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

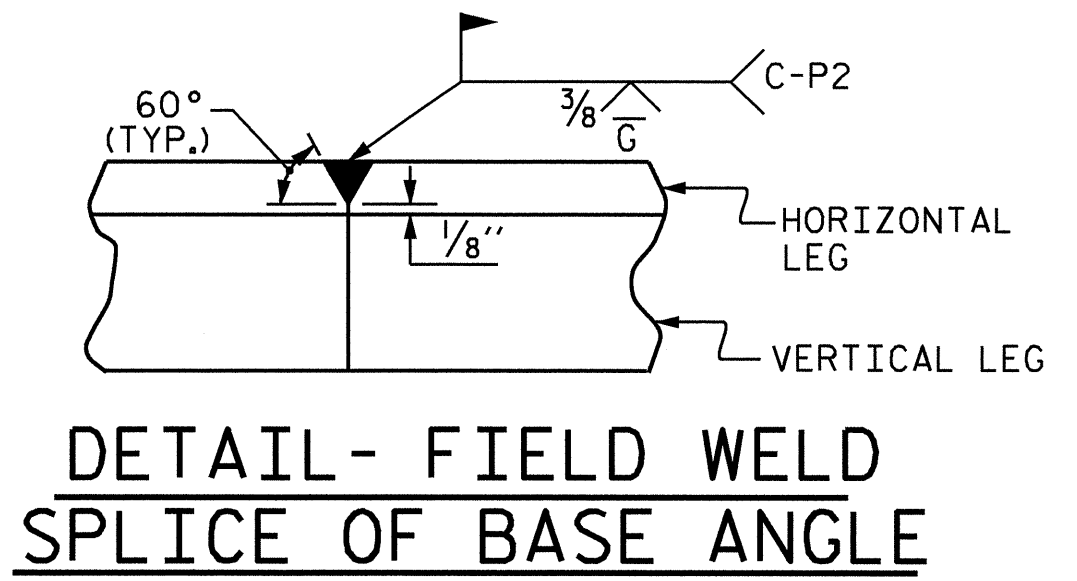
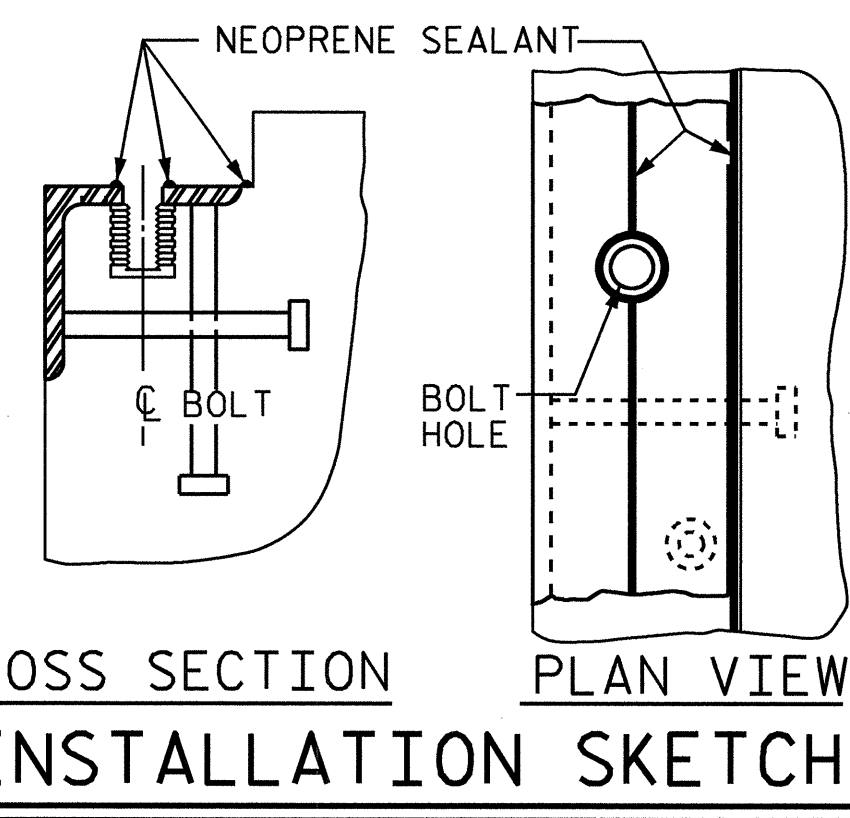


**INSTALLATION PROCEDURE**

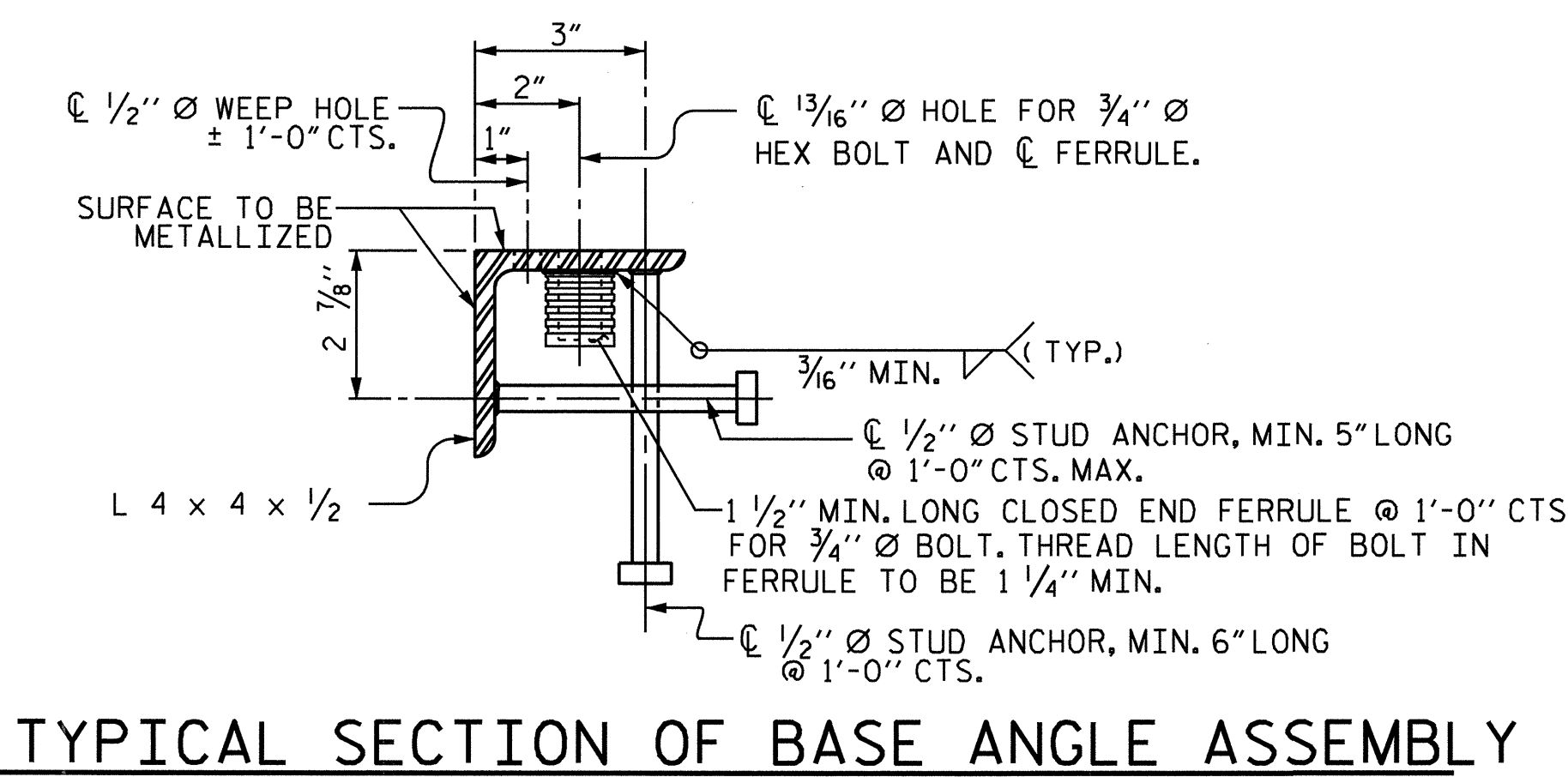
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 1/8" TO 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. THE TORQUE WRENCH SHALL BE CALIBRATED IN ACCORDANCE WITH SECTION 440-10 (D) OF THE STANDARD SPECIFICATIONS. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

**GENERAL NOTES**

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



MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
3	90°-00'-00"	2 5/8"	2 13/16"	2 3/8"	1 1/16"



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

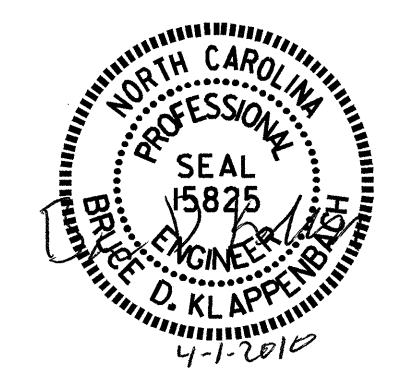
SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**EXPANSION JOINT SEAL DETAILS (BENT #3)**

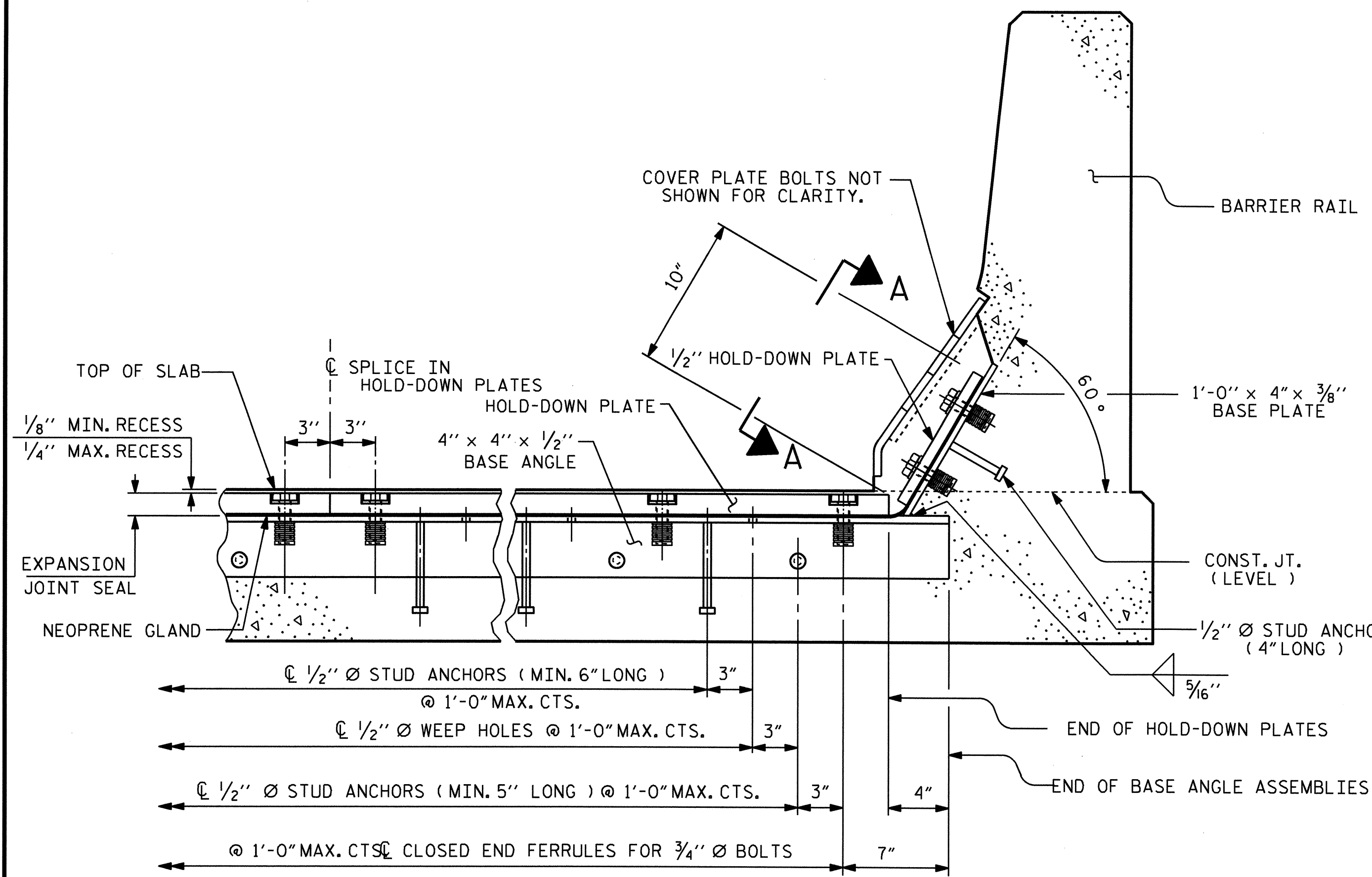
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS 59

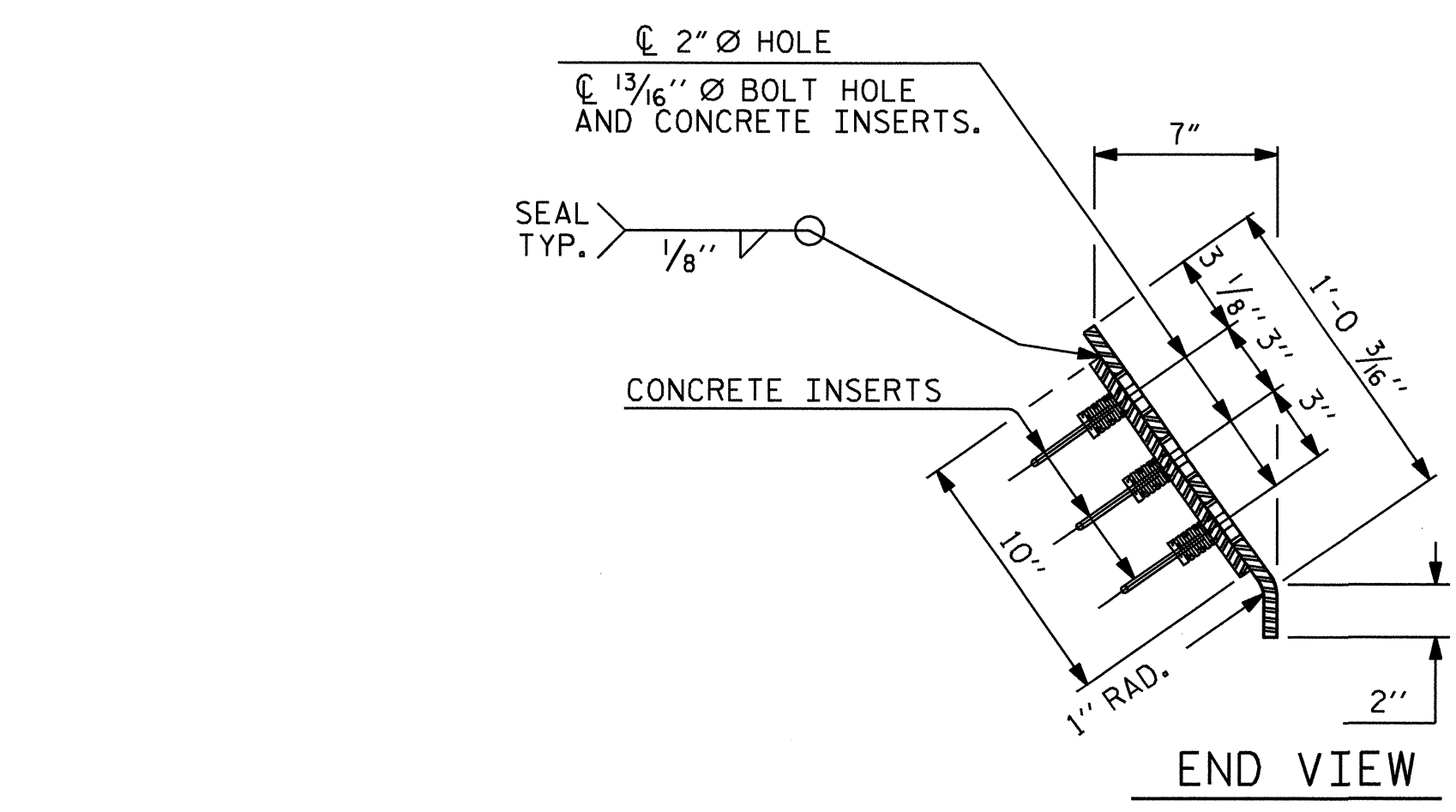


ASSEMBLED BY: H. T. BARBOUR DATE: 3-31-09  
 CHECKED BY: M.G. SHAIKH DATE: 2/10  
 DRAWN BY: REK 9/87 REV. 10/17/00 RWW/LES  
 CHECKED BY: CRK 10/87 REV. 5/7/03R RWW/JTE  
 REV. 5/1/06 TLA/GM

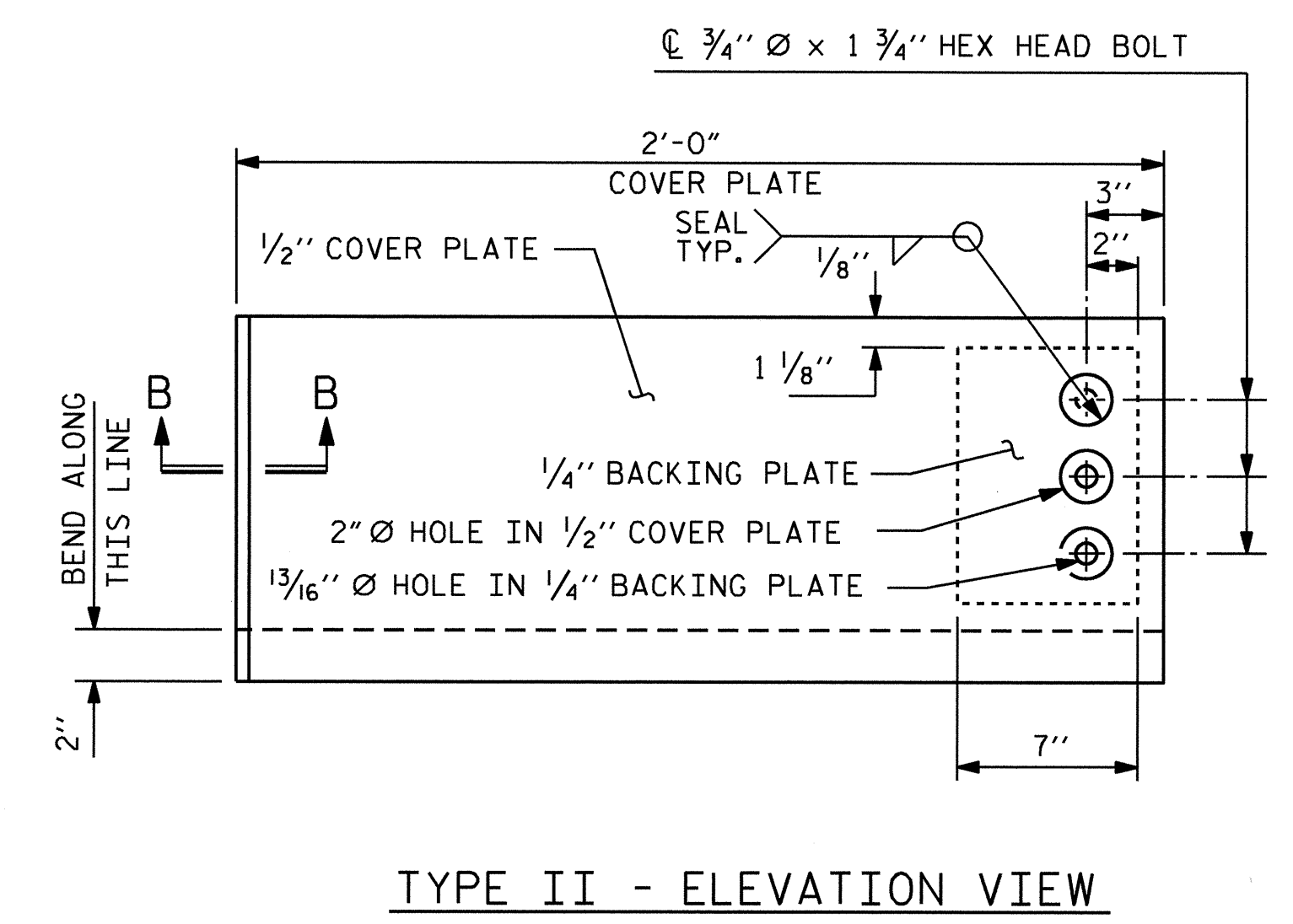




SECTION THRU RAIL NORMAL TO JOINT

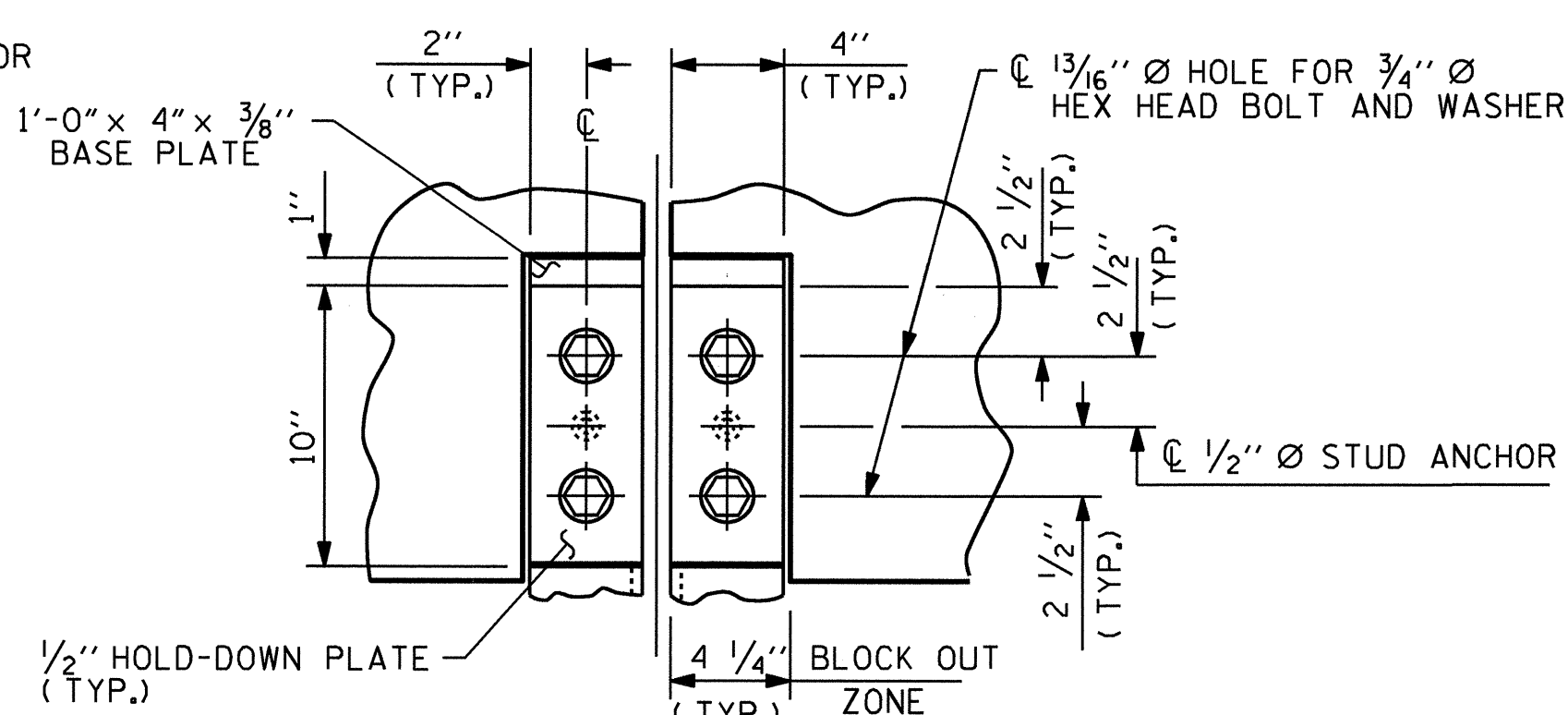


END VIEW

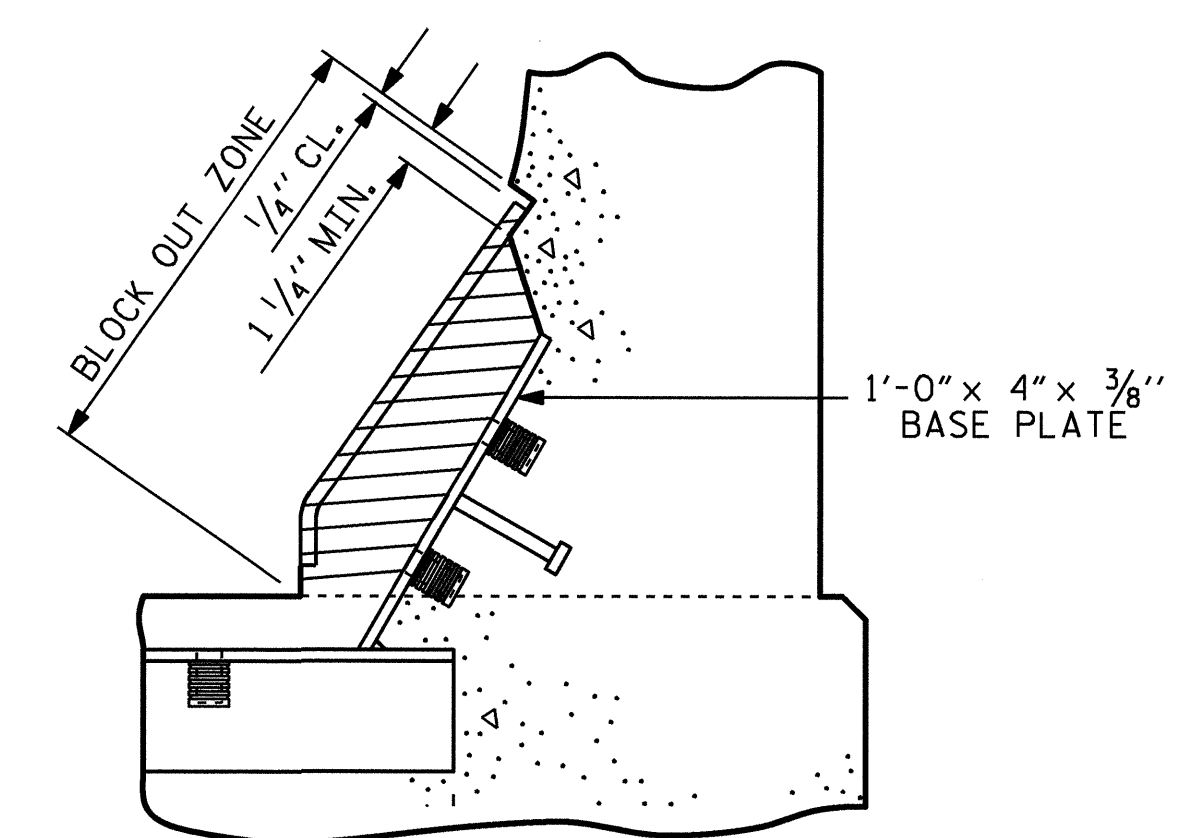


TYPE II - ELEVATION VIEW

COVER PLATE DETAILS

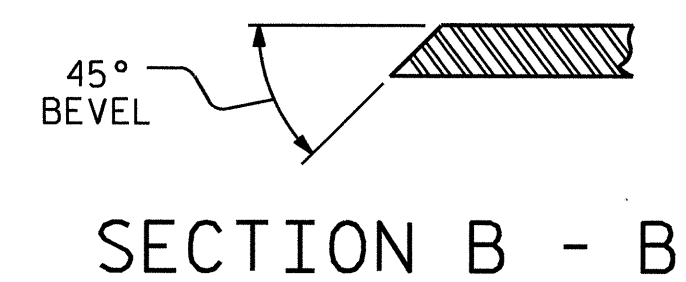


SECTION A - A

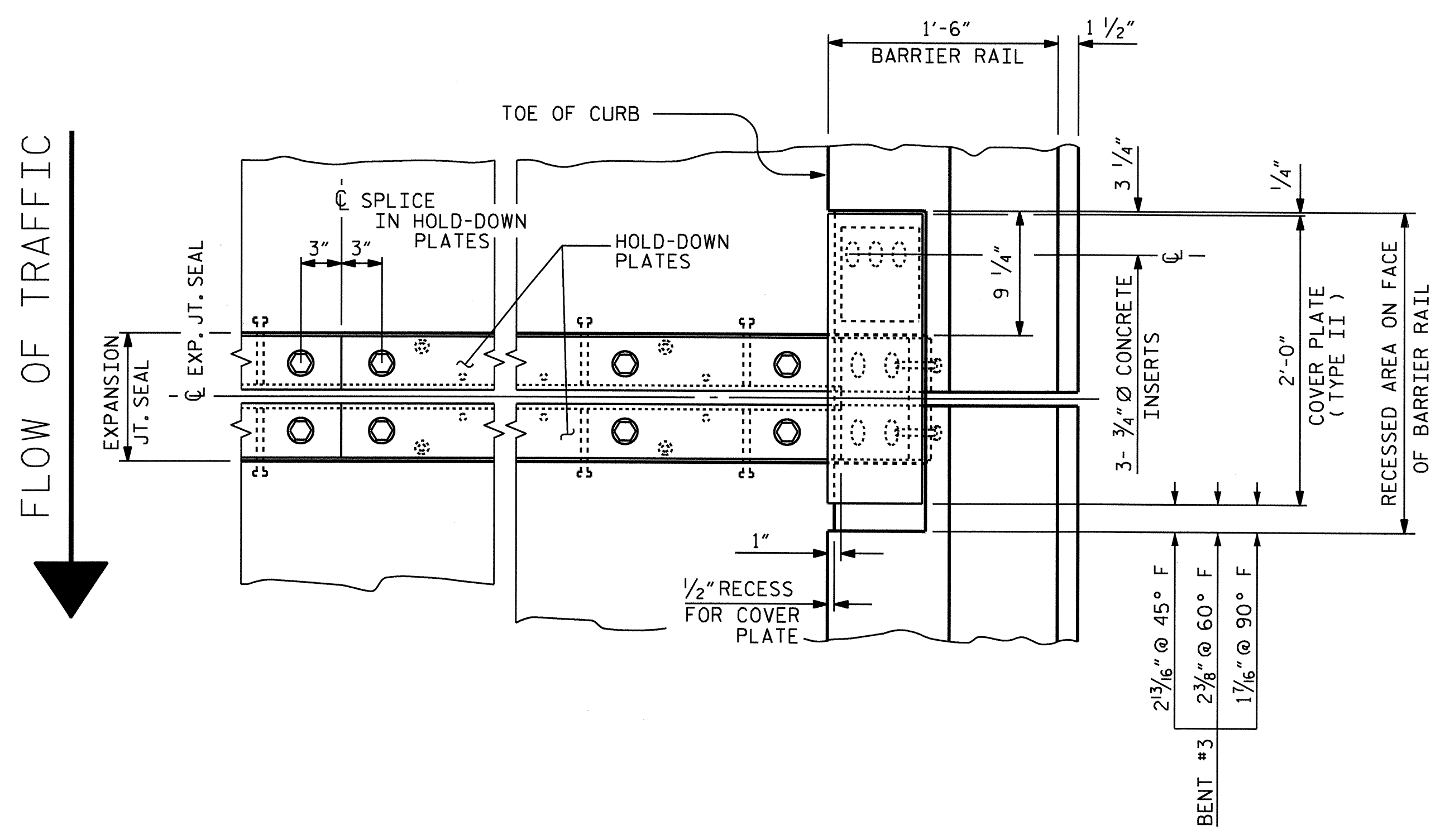


BLOCK OUT DETAIL

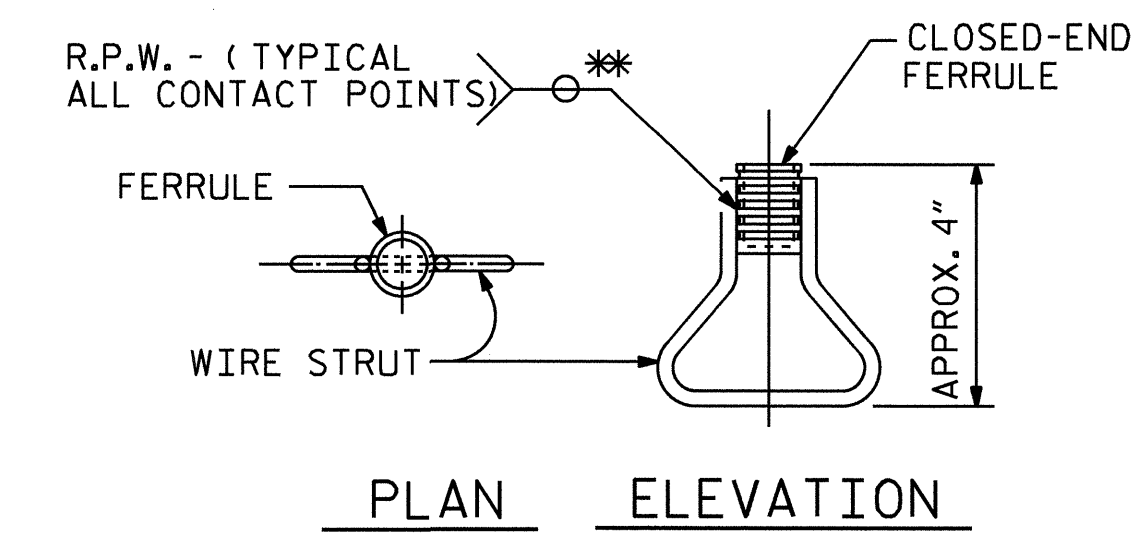
SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B

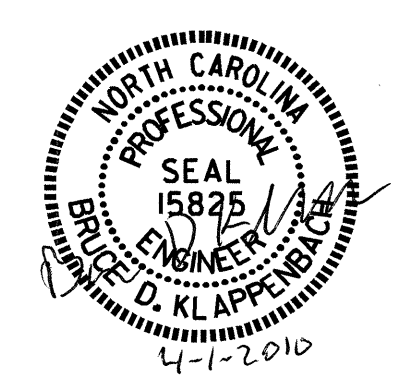


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



CONCRETE INSERT

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

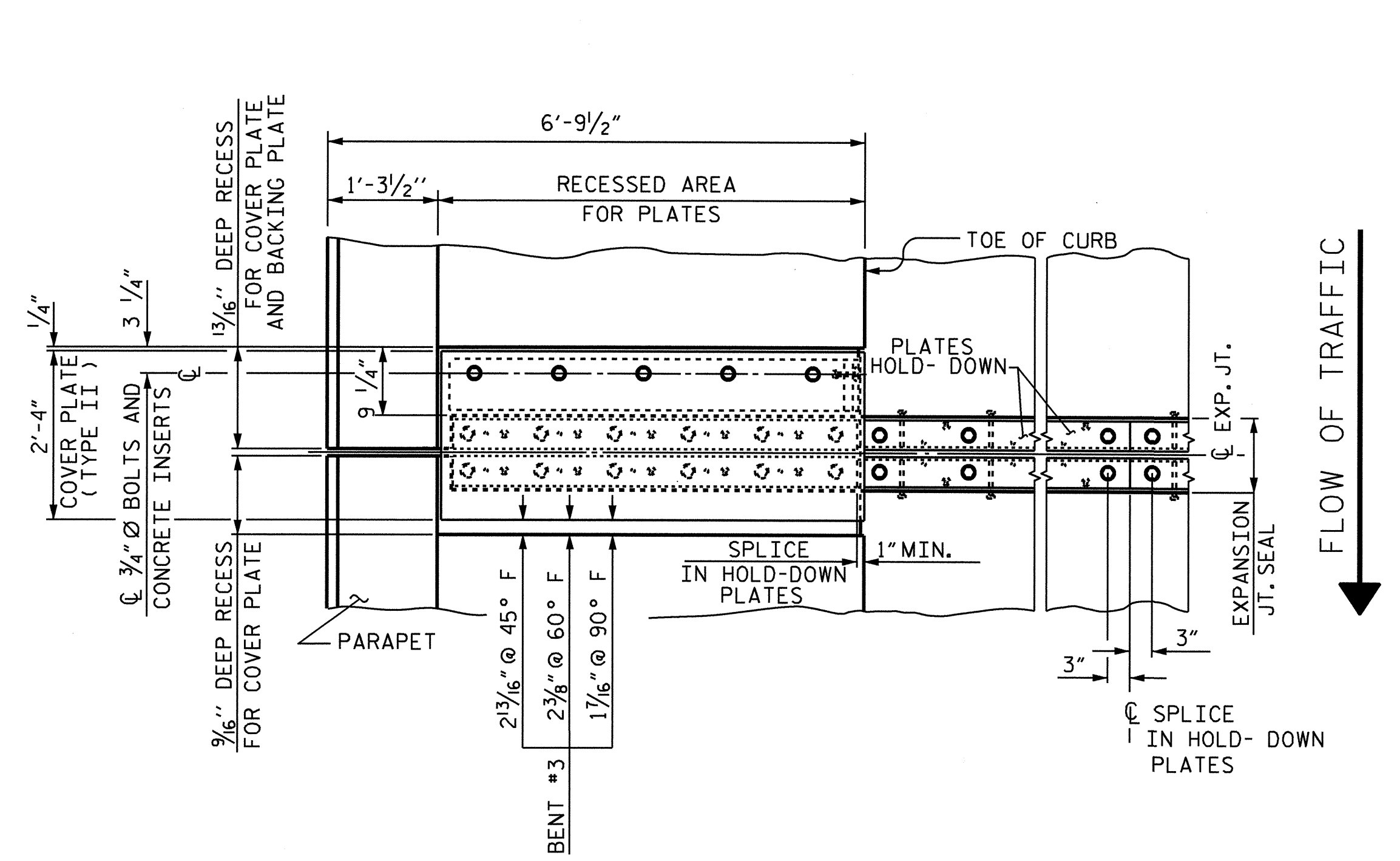


PROJECT NO. B-4138  
HARNETT COUNTY  
STATION: 30+63.00-SBL-

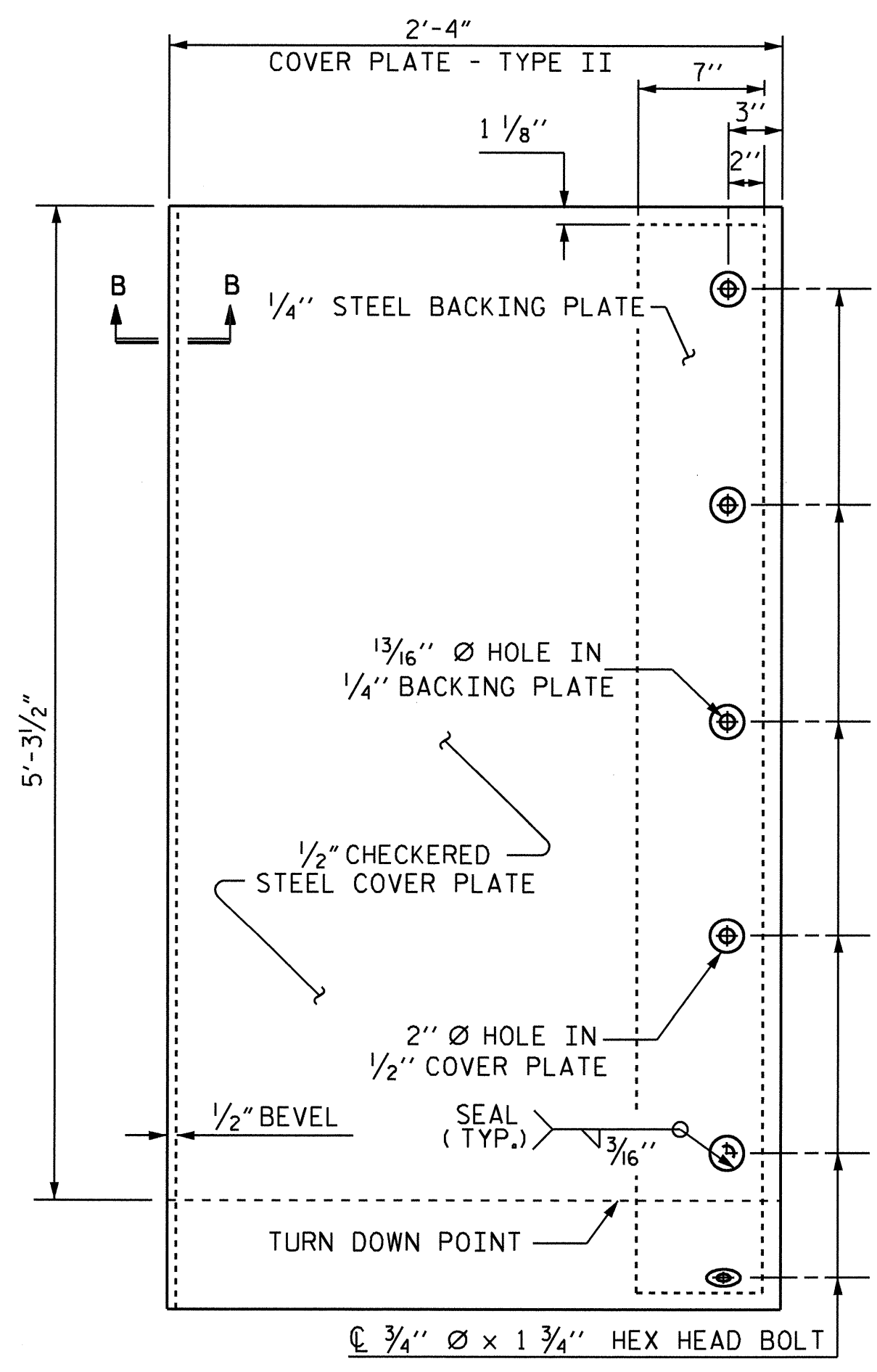
SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL (RIGHT SIDE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-32
					TOTAL SHEETS 59

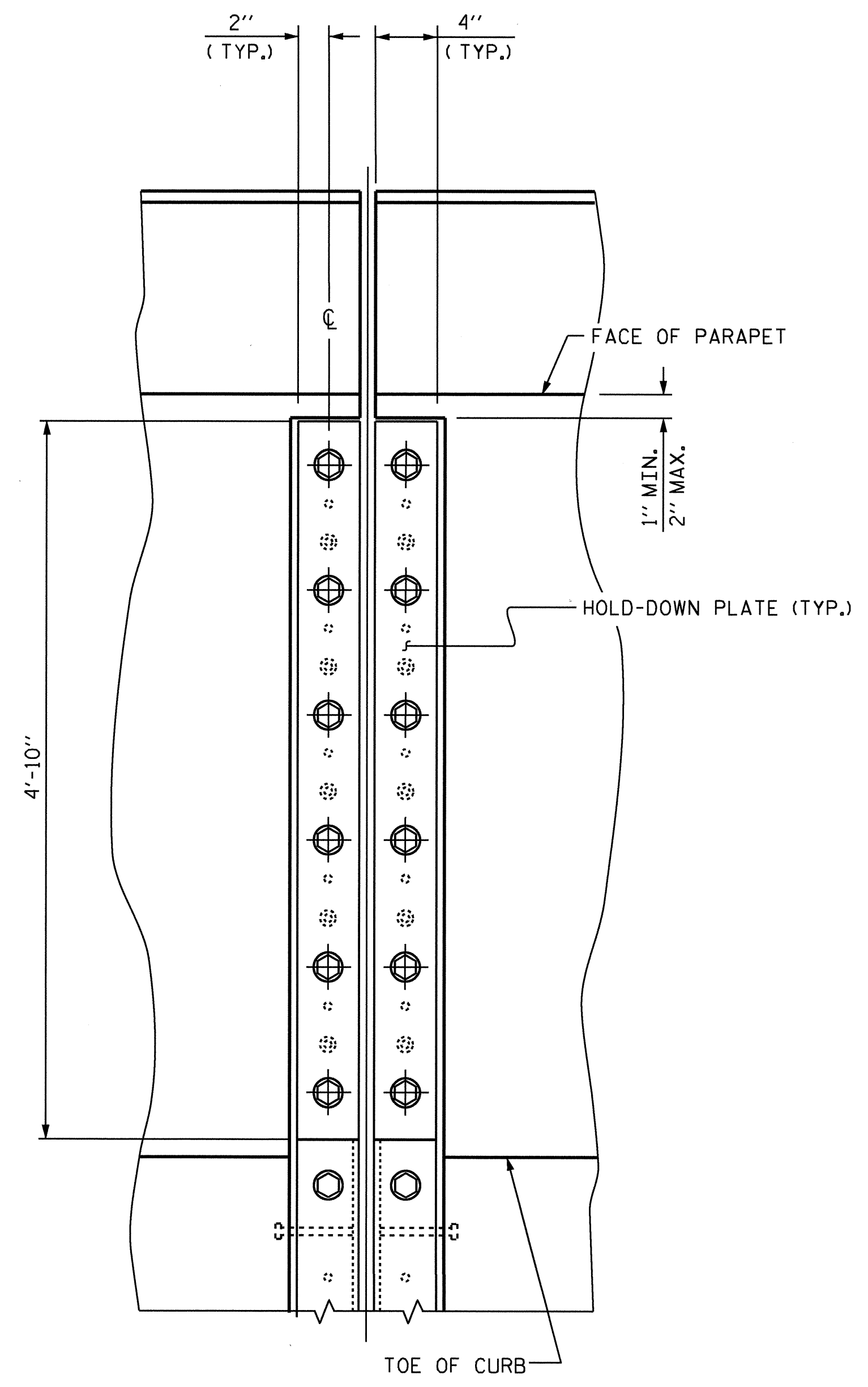
ASSEMBLED BY : H. T. BARBOUR	DATE : 4-01-09
CHECKED BY : M.G. SHAIKH	DATE : 2/10
DRAWN BY : REK 9/87	REV. 7/17/98 RWW/LES
CHECKED BY : CRK 10/87	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM



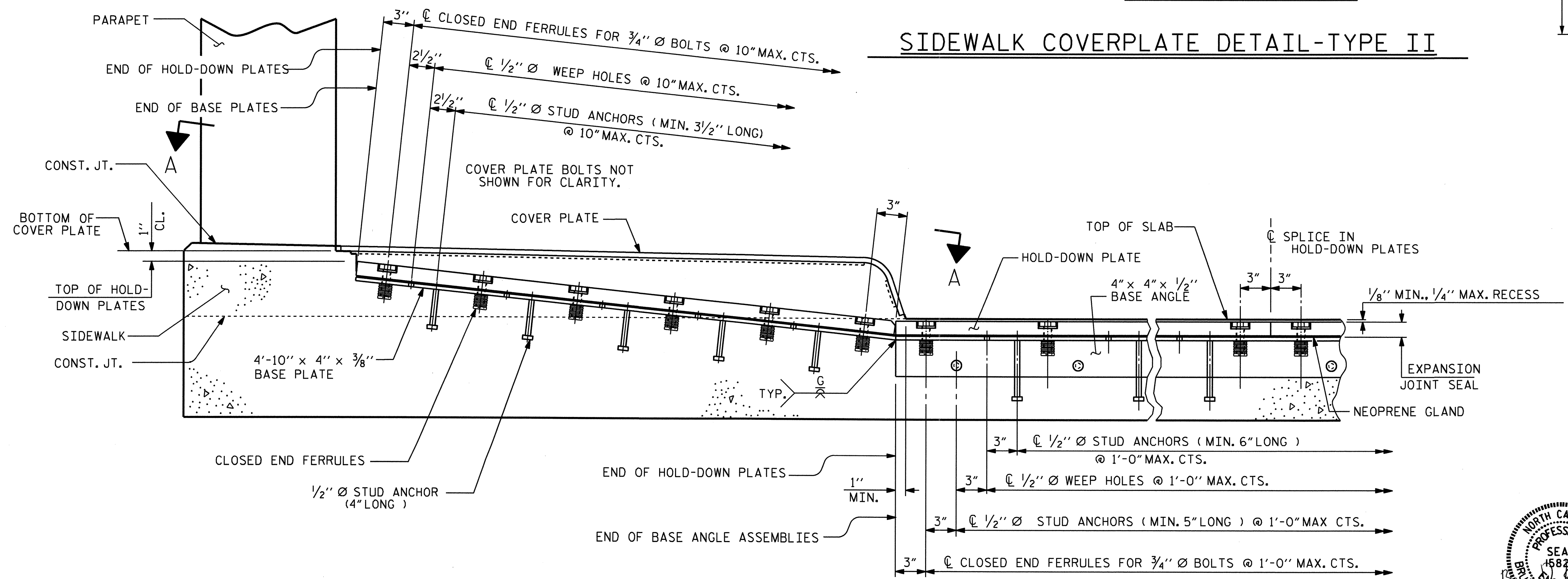
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



SIDEWALK COVERPLATE DETAIL-TYPE II



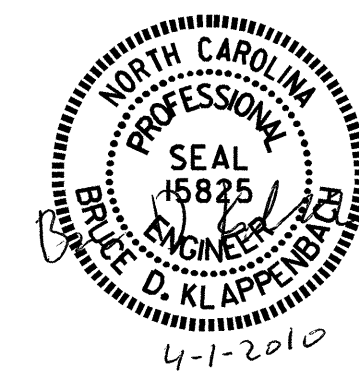
SECTION A - A



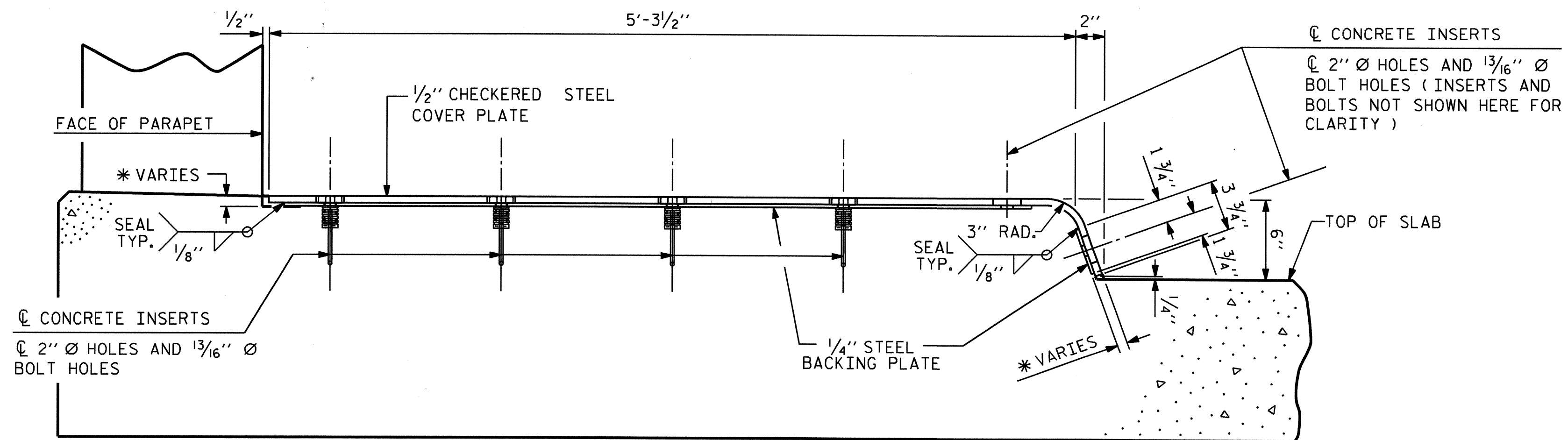
SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
EXPANSION JOINT SEAL DETAILS FOR SIDEWALK				
SHEET NO. S-33				
REVISIONS				
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 59



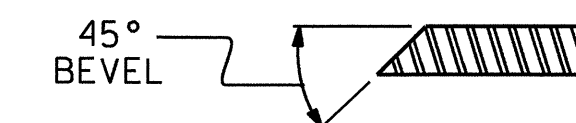
ASSEMBLED BY : H. T. BARBOUR	DATE : 4-02-09
CHECKED BY : M.G. SHAIKH	DATE : 2/10
DRAWN BY : REK 10/87	REV. 6/1/94 EEM/GRP
CHECKED BY : CRK 1/88	REV. 2/6/97 EEM/RGW
	REV. 5/1/06 TLA/GM



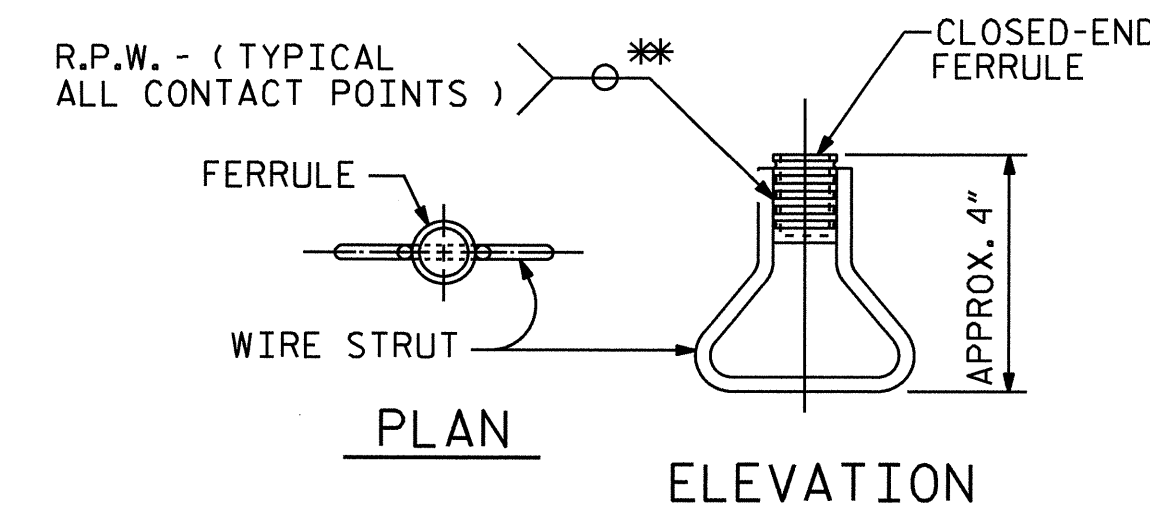
**END VIEW**  
(NORMAL TO SIDEWALK)

\* CONCRETE RECESS DIMENSIONS:

- 13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
- 3/8" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

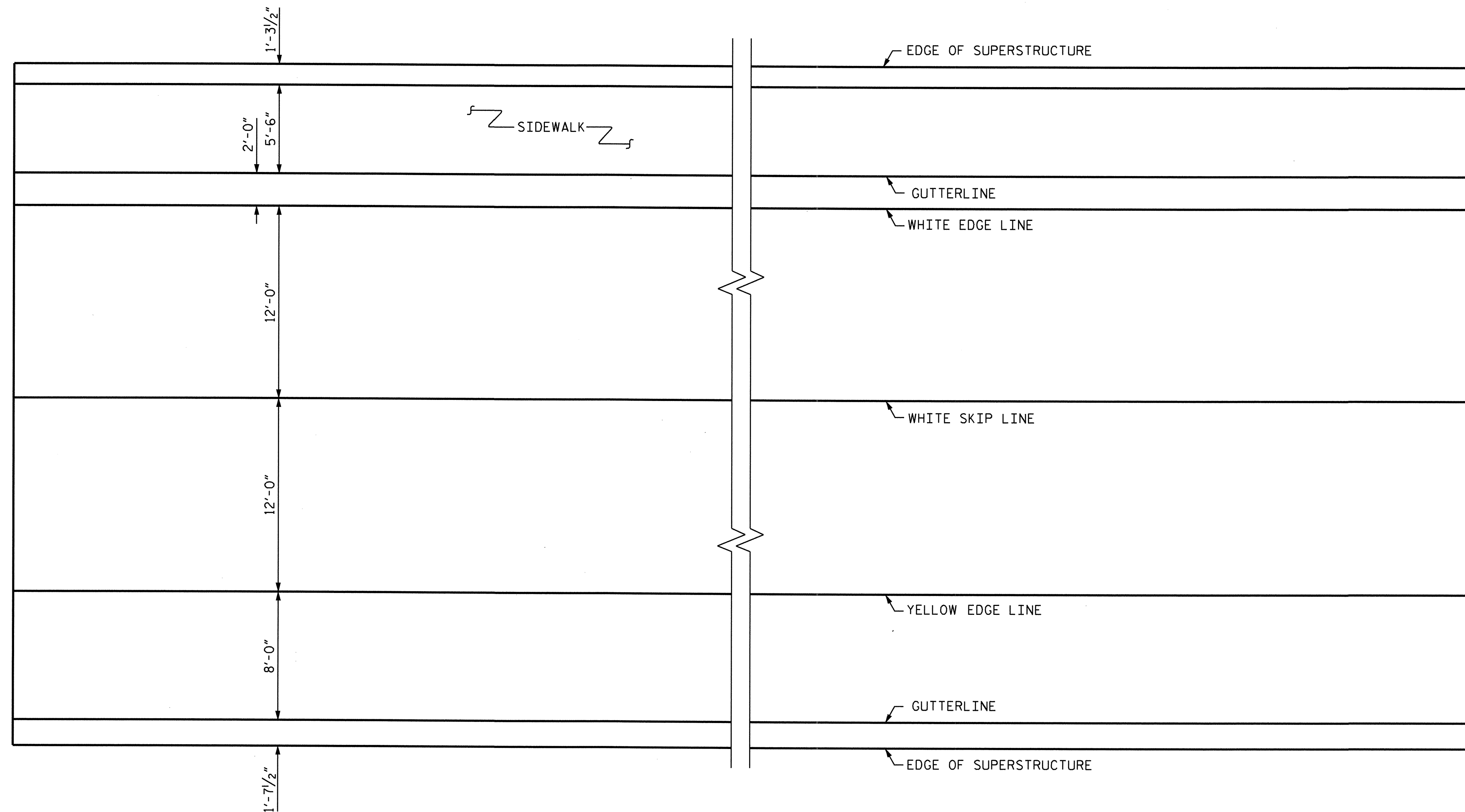


**SECTION B - B**



**CONCRETE INSERT**

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



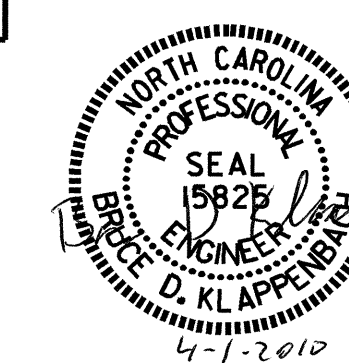
**PAVEMENT MARKING ALIGNMENT**

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

EXPANSION JOINT  
 SEAL DETAILS  
 FOR SIDEWALK

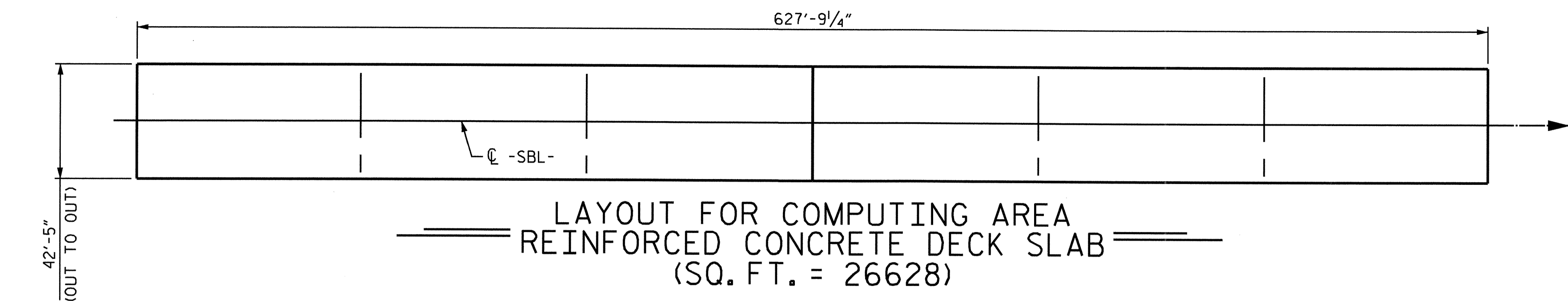


ASSEMBLED BY : H. T. BARBOUR	DATE : 4-02-09
CHECKED BY : M.G. SHAIKH	DATE : 2/10
DRAWN BY : REK 10/87	REV. 7/17/98 RWW/LES
CHECKED BY : CRK 1/88	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

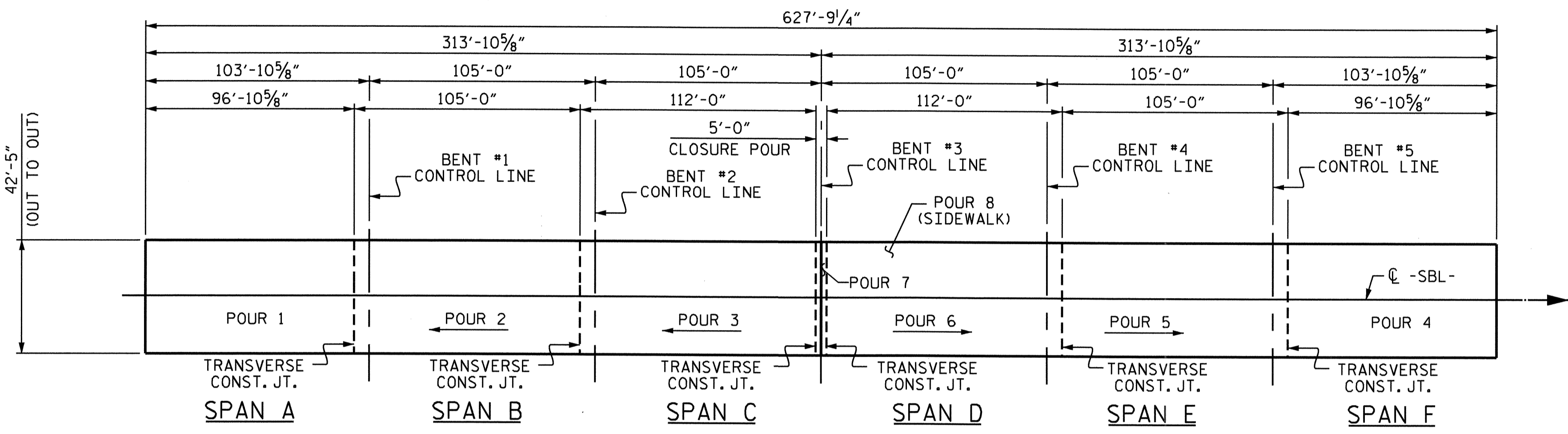
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 barbour

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			59

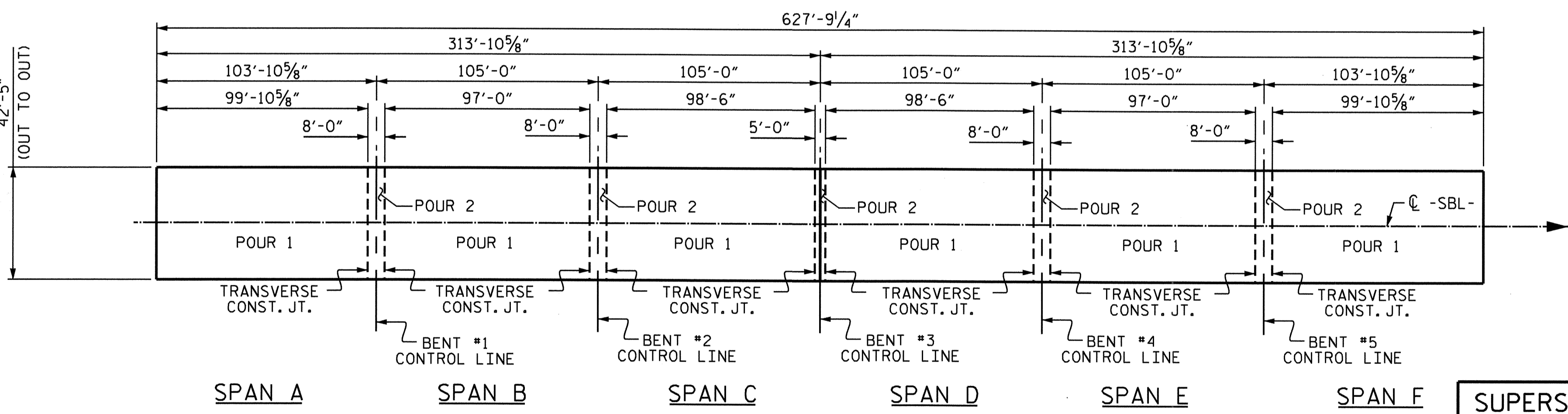
STD. NO. EJS4



LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 26628)



POURING SEQUENCE



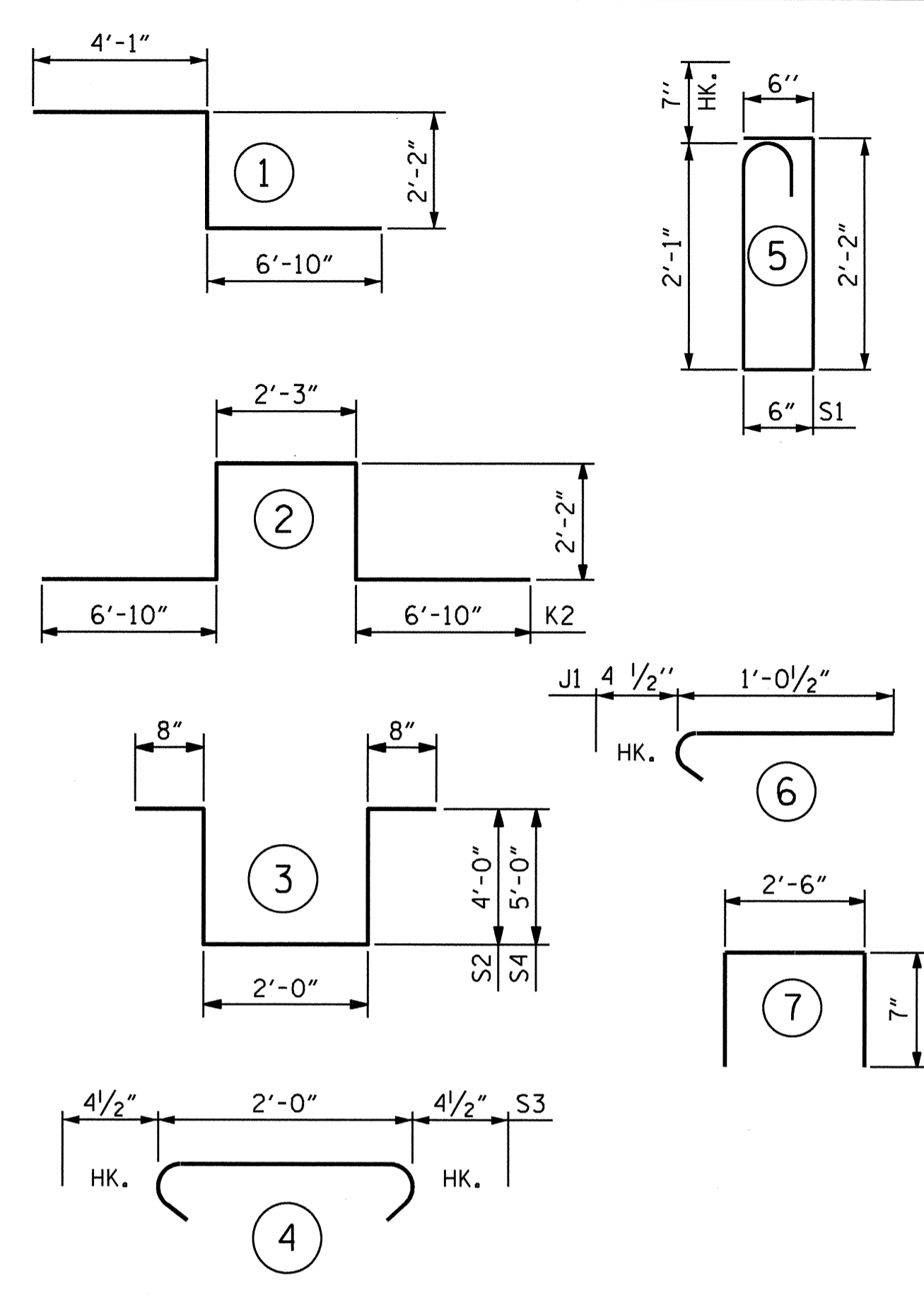
OPTIONAL POURING SEQUENCE

POUR 2 CAN NOT BE STARTED UNTIL ALL ADJACENT  
POUR 1 REACH A MINIMUM OF 3000 PSI.

REINFORCING BAR SCHEDULE

SPANS A THRU F						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	1250	#5	STR	42'-1"	54866	
A2	1254	#5	STR	42'-1"	55042	
* B1	216	#4	STR	24'-5"	3523	
B2	624	#5	STR	54'-1"	35199	
* B3	432	#6	STR	26'-4"	17087	
* B4	132	#6	STR	31'-6"	6245	
* B5	144	#4	STR	19'-0"	1828	
* B6	216	#4	STR	24'-10"	3583	
* B7	144	#4	STR	28'-0"	2693	
* G1	4	#5	STR	42'-1"	176	
* G2	628	#4	STR	6'-5"	2692	
* J1	86	#4	6	1'-5"	81	
* K1	16	#8	1	13'-1"	559	
* K2	24	#8	2	20'-3"	1298	
K3	40	#4	STR	18'-11"	505	
K4	32	#4	STR	5'-2"	110	
K5	32	#4	STR	7'-4"	157	
K6	64	#4	STR	8'-0"	342	
K7	32	#4	STR	7'-0"	150	
* S1	112	#5	5	5'-10"	681	
S2	32	#4	3	11'-4"	242	
S3	416	#4	4	2'-9"	764	
S4	80	#4	3	13'-4"	713	
* U1	180	#4	7	3'-8"	441	
REINFORCING STEEL					= 93224 LBS.	
* EPOXY COATED REINF. STEEL					= 97609 LBS.	
GROOVING BRIDGE FLOORS						
BRIDGE DECK					19385 SQ.FT.	
APPROACH SLABS					1480 SQ.FT.	
TOTAL					20865 SQ.FT.	

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	139.4		
POUR 2	163.3		
POUR 3	167.7		
POUR 4	139.4		
POUR 5	163.3		
POUR 6	167.7		
POUR 7	11.5		
POUR 8 (SIDEWALK)	115.4		
TOTALS**	1067.7	93224	97609

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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"			

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



REVISIONS						SHEET NO. S-35
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY : H.T. BARBOUR DATE : 4-15-09  
CHECKED BY : M.G. SHAIKH DATE : 2-10  
DRAWN BY : JMB 5/87 REV. 6/1/94 EEM/GRP  
CHECKED BY : SJD 9/87 REV. 8/16/99 RWW/LES

**NOTES**

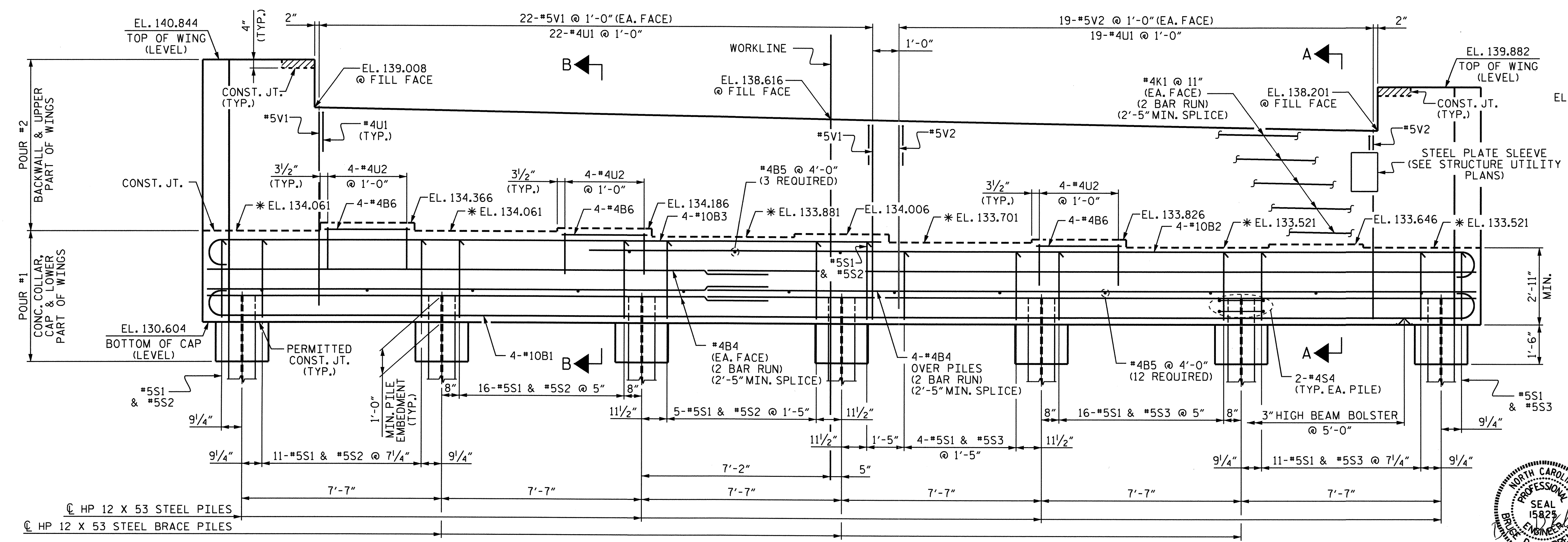
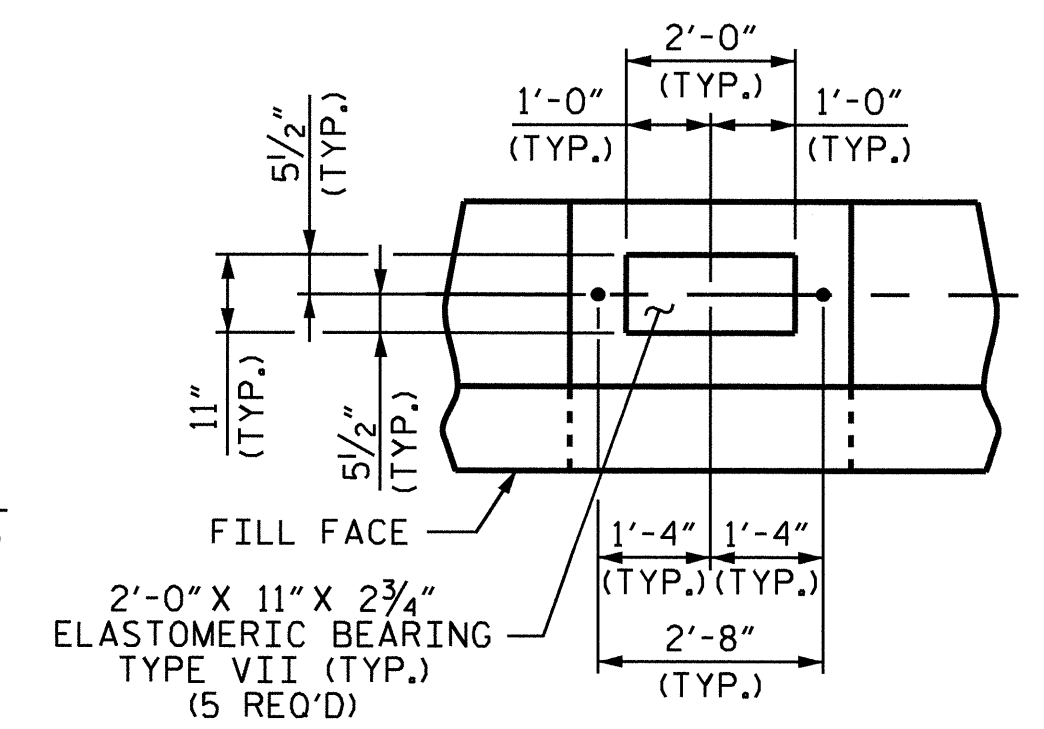
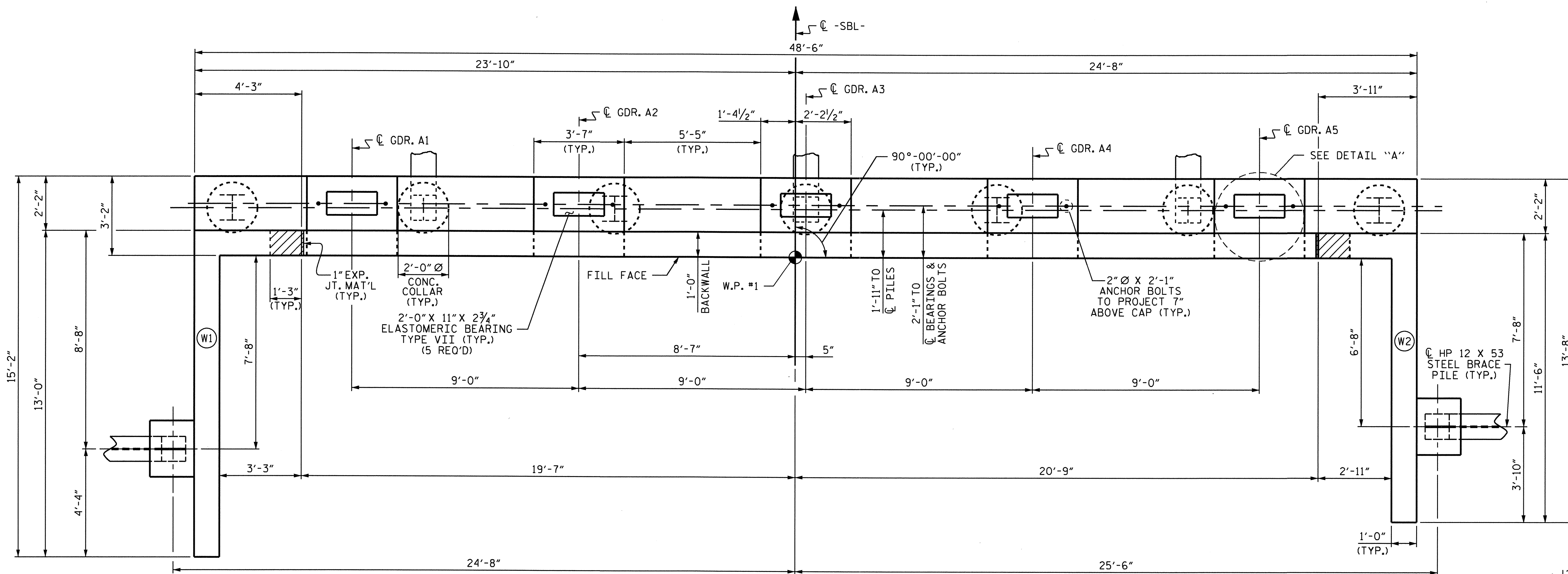
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE. THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

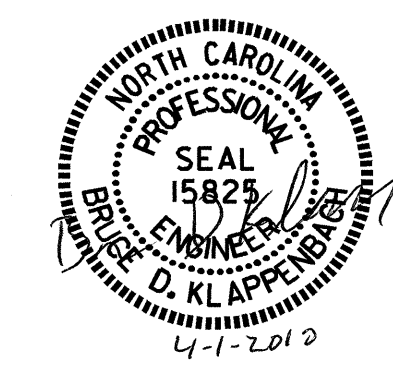
REINFORCING STEEL IN BACKWALL SHALL BE FIELD CUT AS NECESSARY TO AVOID INTERFERENCE WITH THE STEEL PLATE SLEEVE. FOR LOCATION OF STEEL PLATE SLEEVE, SEE STRUCTURE UTILITY PLANS.



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

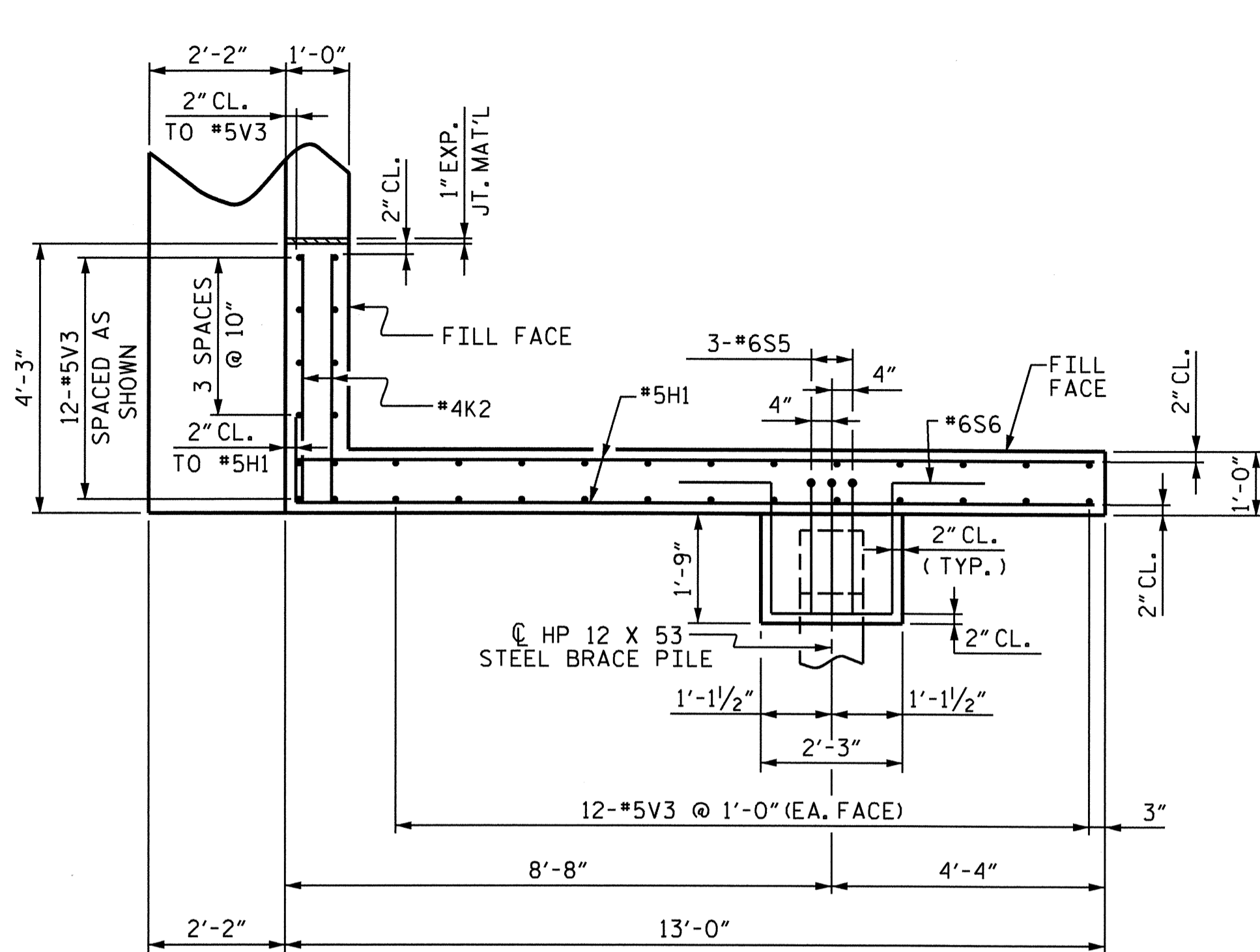
SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
END BENT #1**

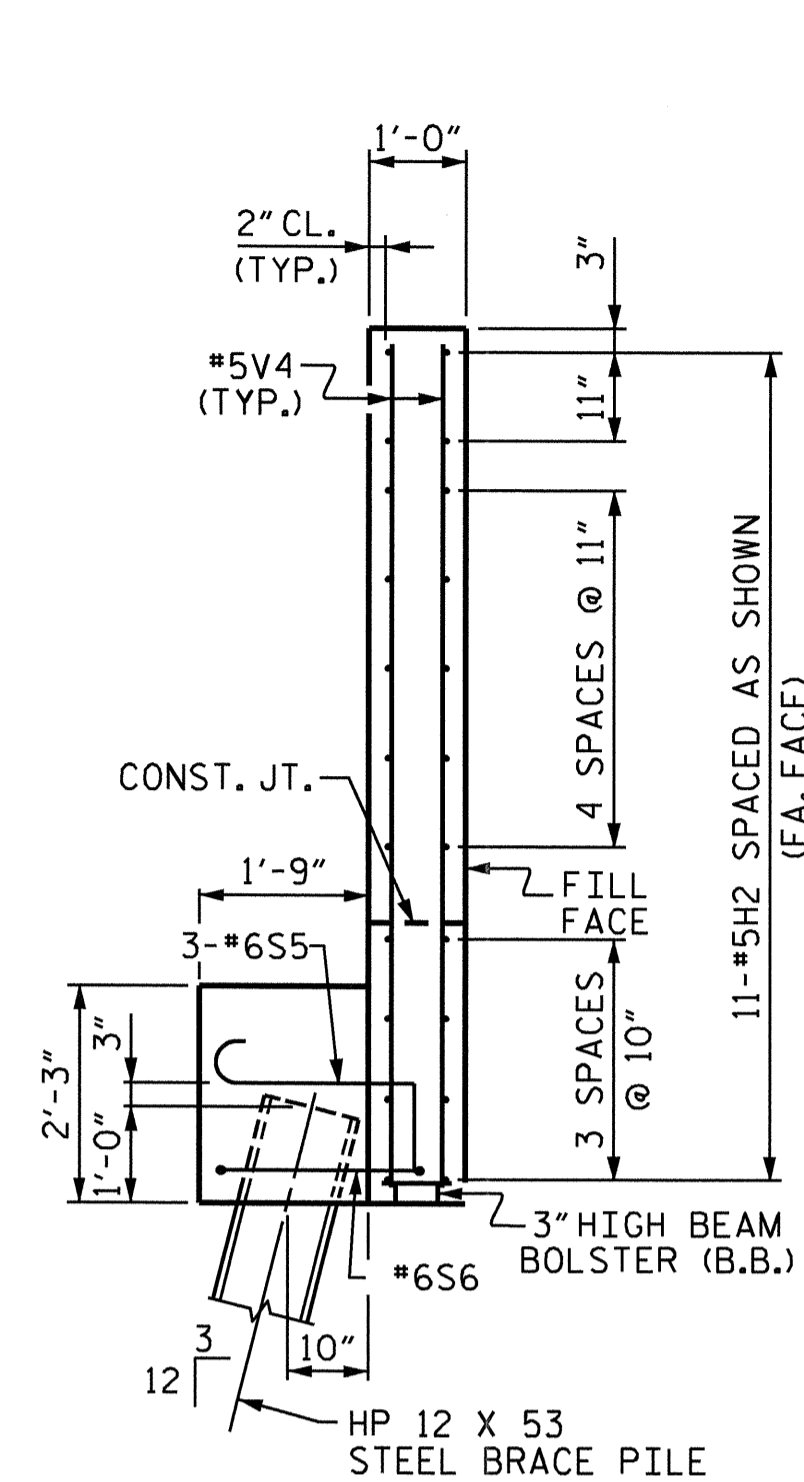


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					59

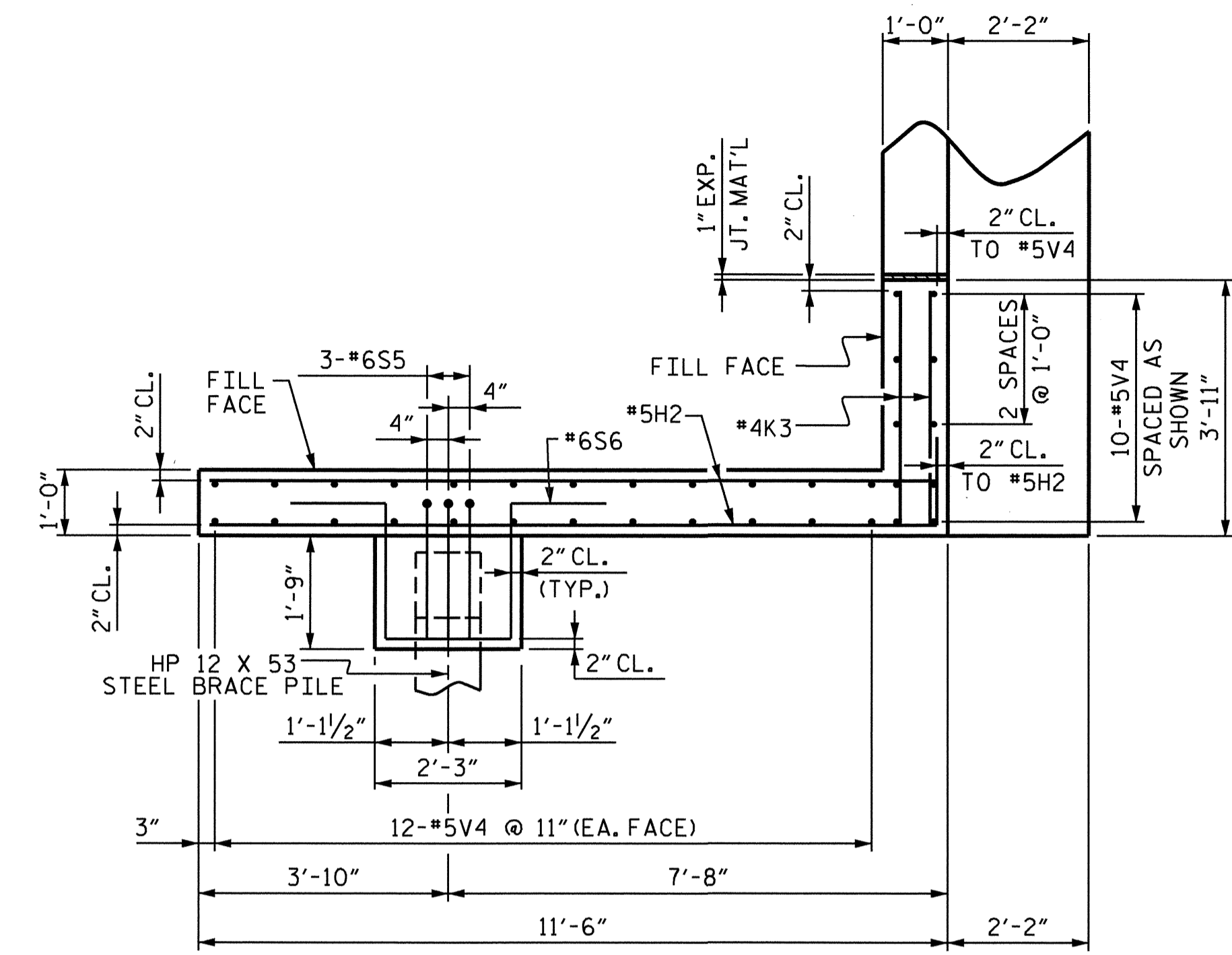
DRAWN BY: C.R. YARBROUGH DATE: 11/09  
 CHECKED BY: M.G. SHAIKH DATE: 01/10



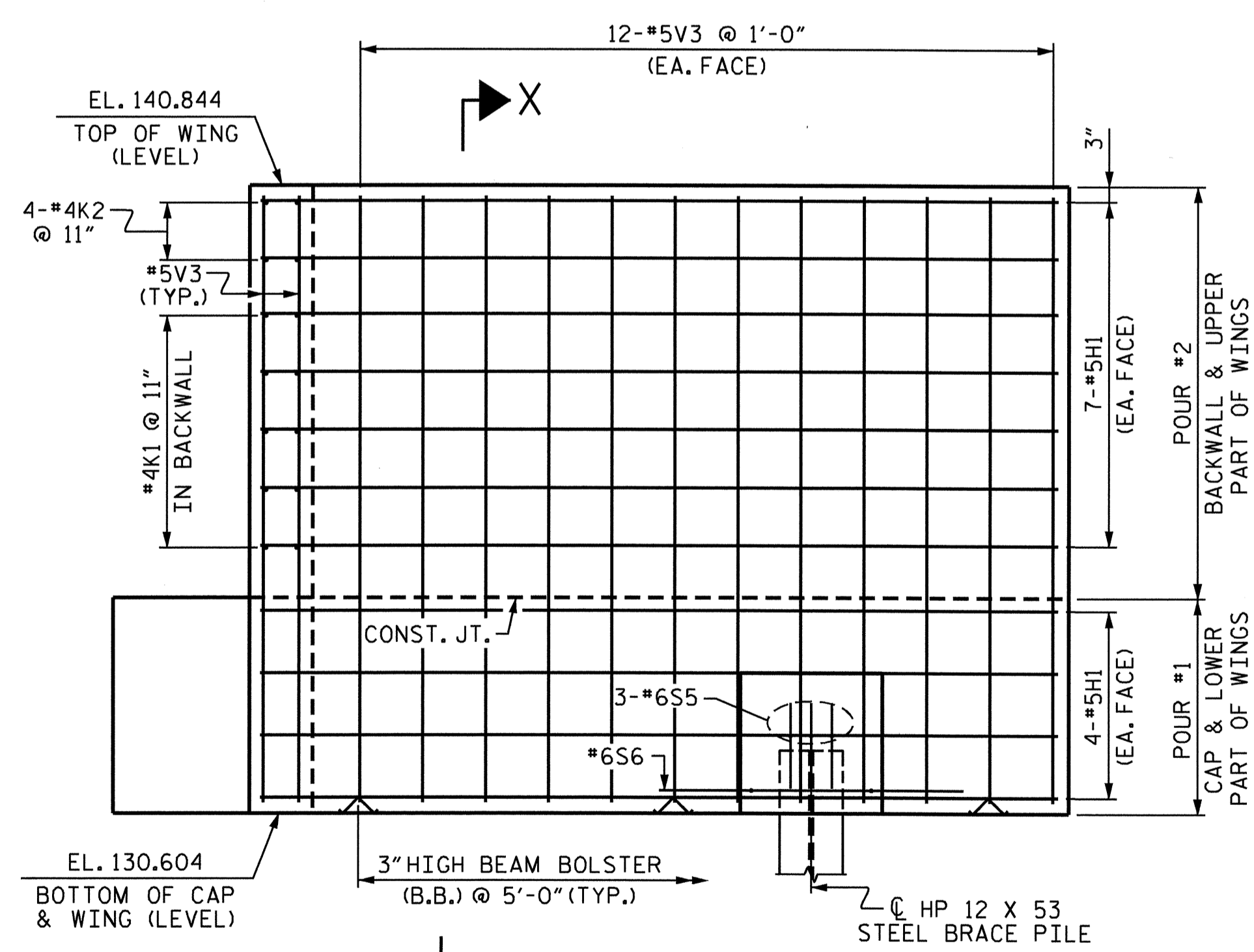
PLAN OF LEFT WING (W1)



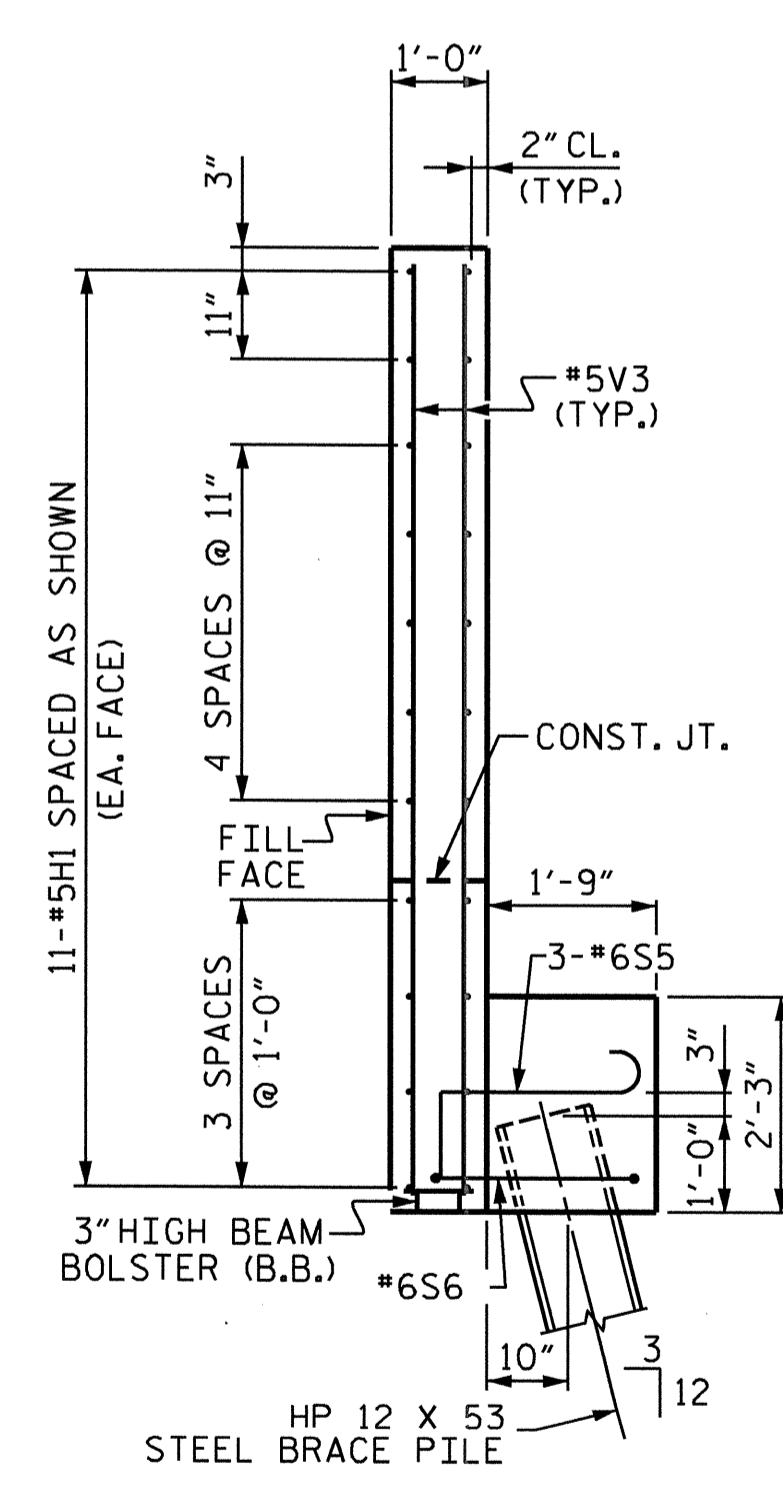
SECTION Y-Y



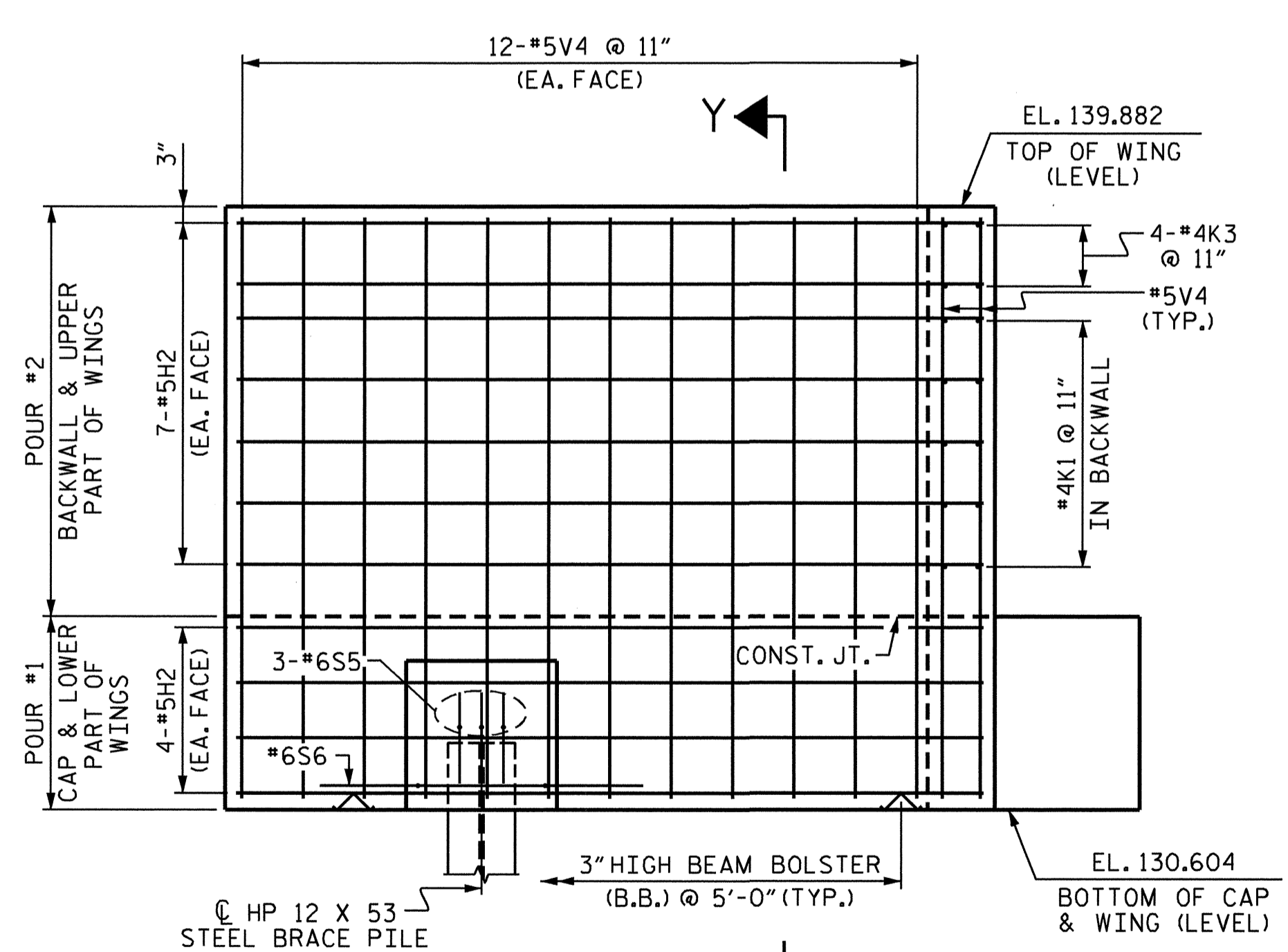
PLAN OF RIGHT WING (W2)



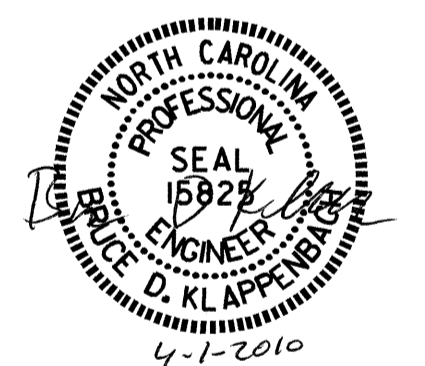
ELEVATION OF LEFT WING (W1)



SECTION X-X



ELEVATION OF RIGHT WING (W2)



PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

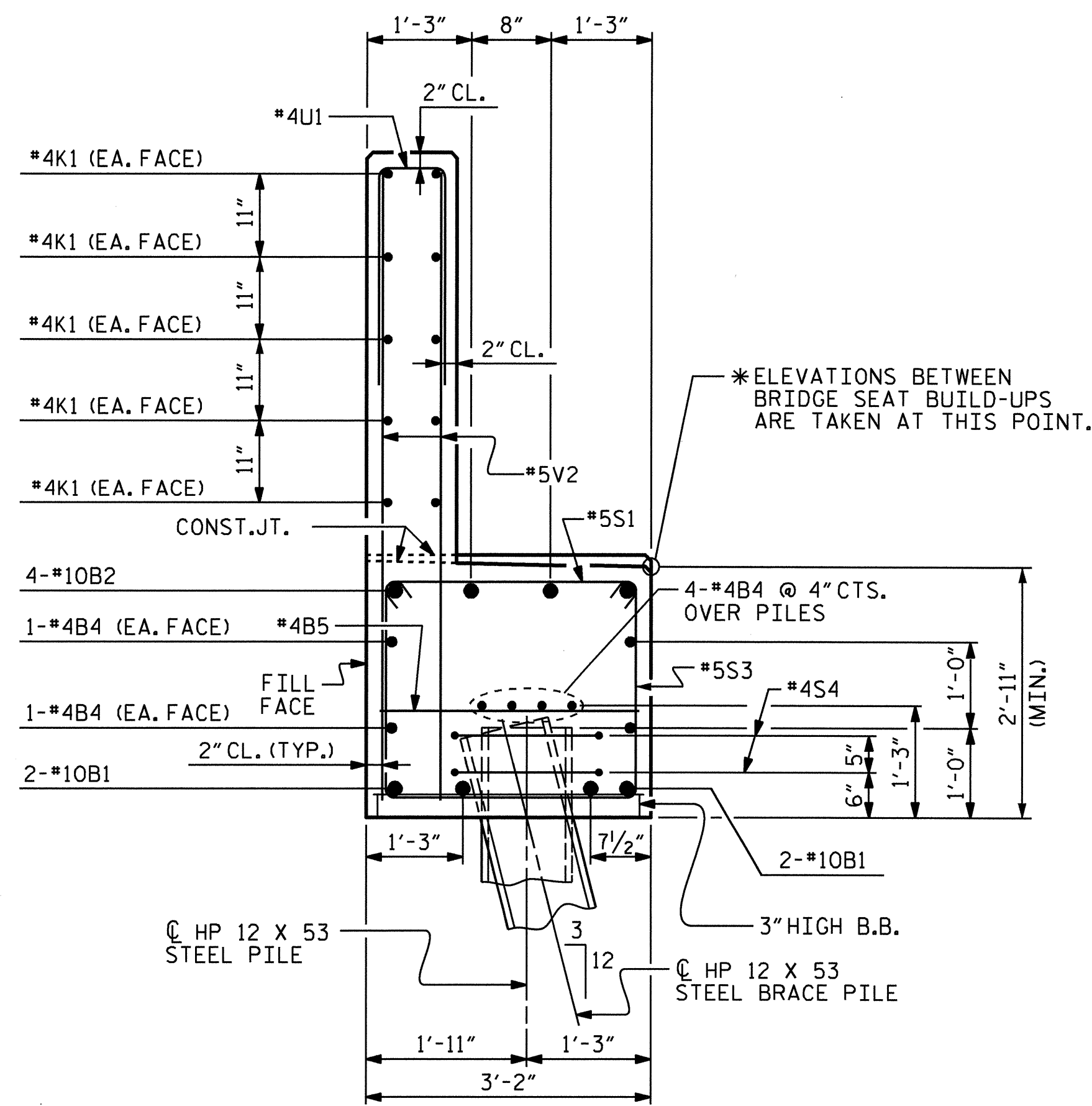
SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #1

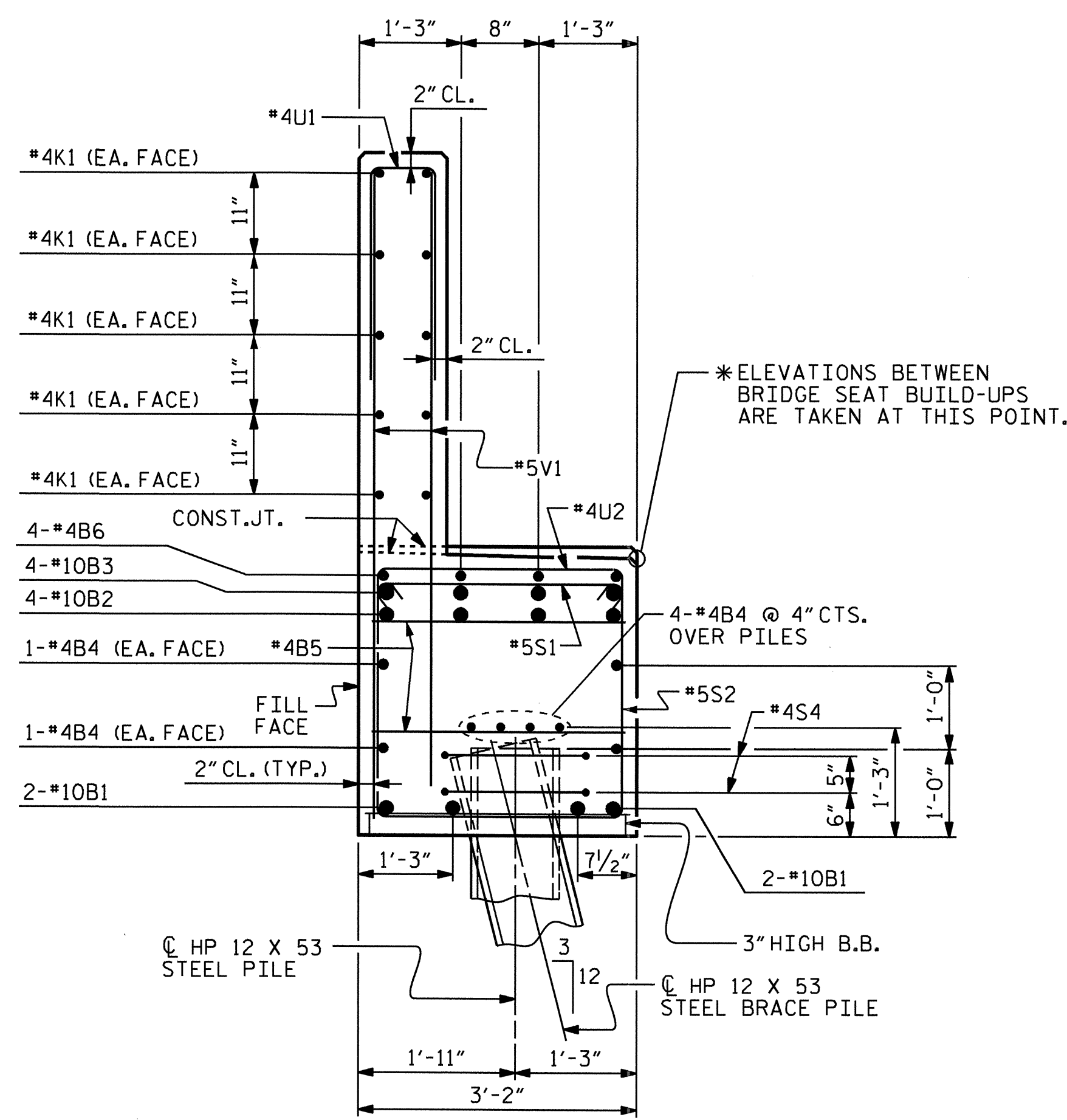
REVISIONS						SHEET NO. S-37
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

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 CHECKED BY: M.G. SHAIKH DATE: 01/10

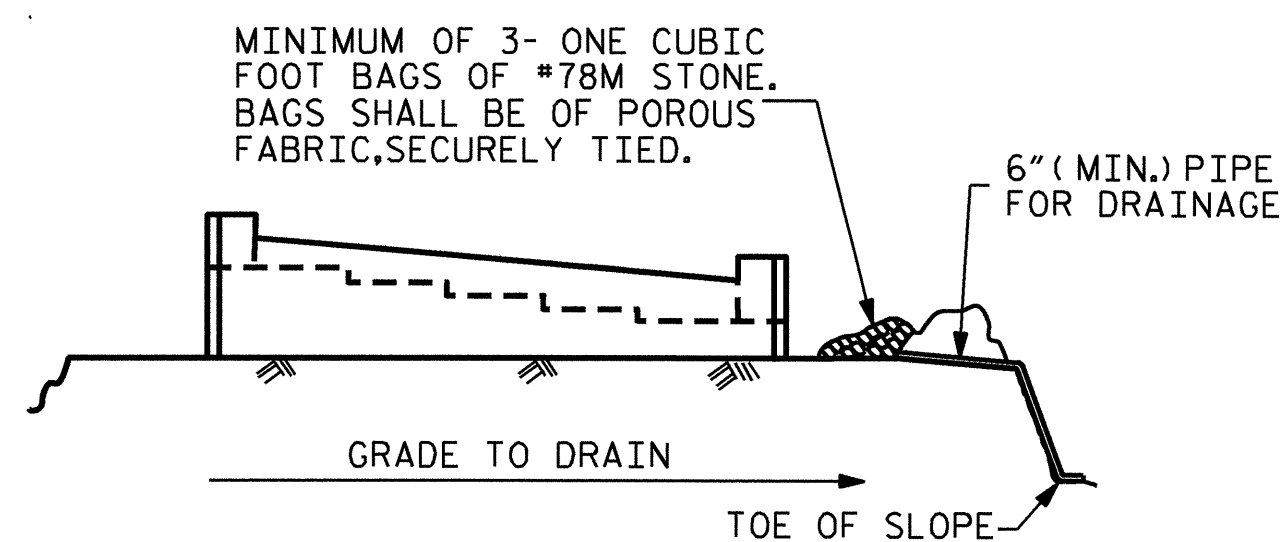
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 cyarborough



SECTION A-A



SECTION B-B

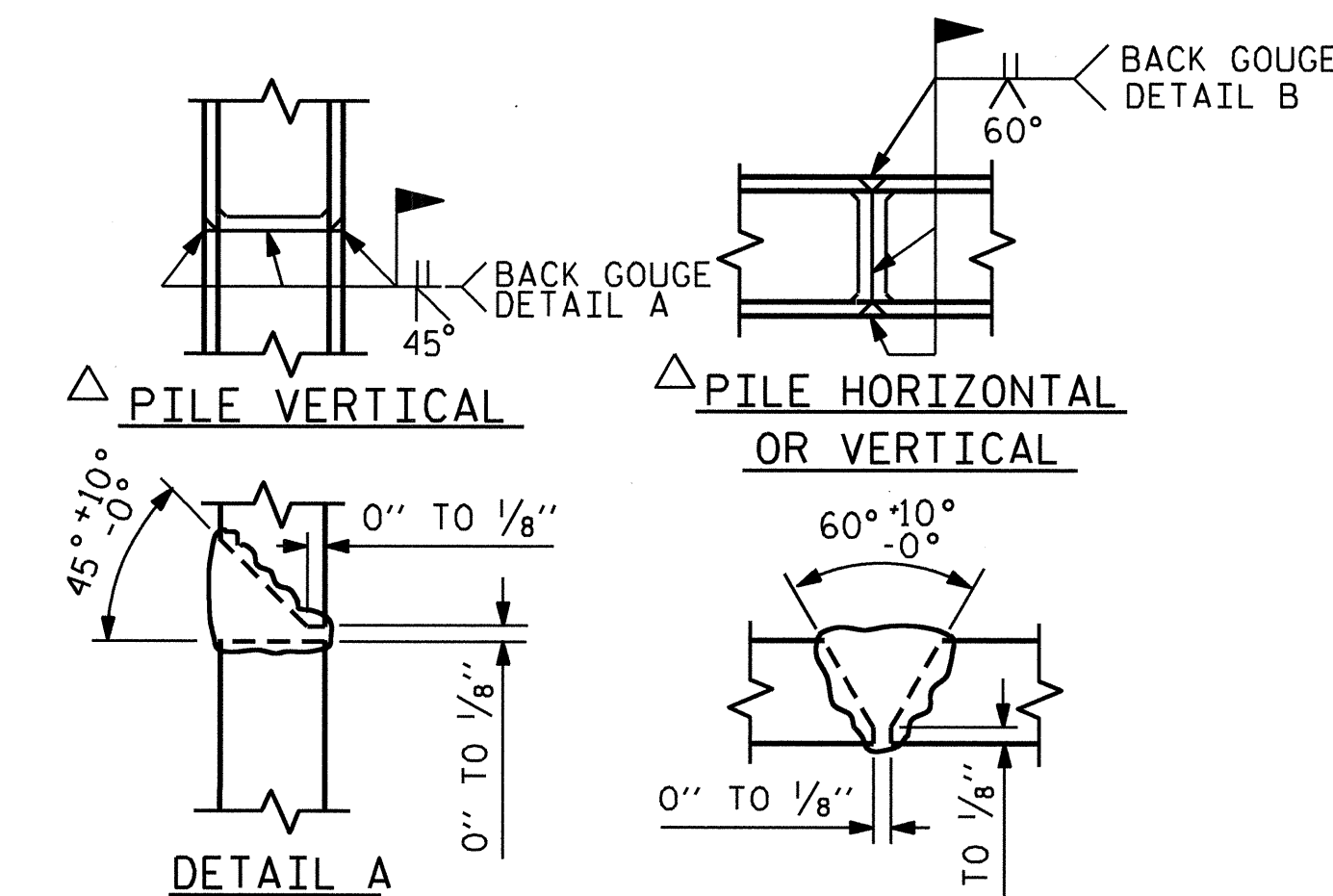


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

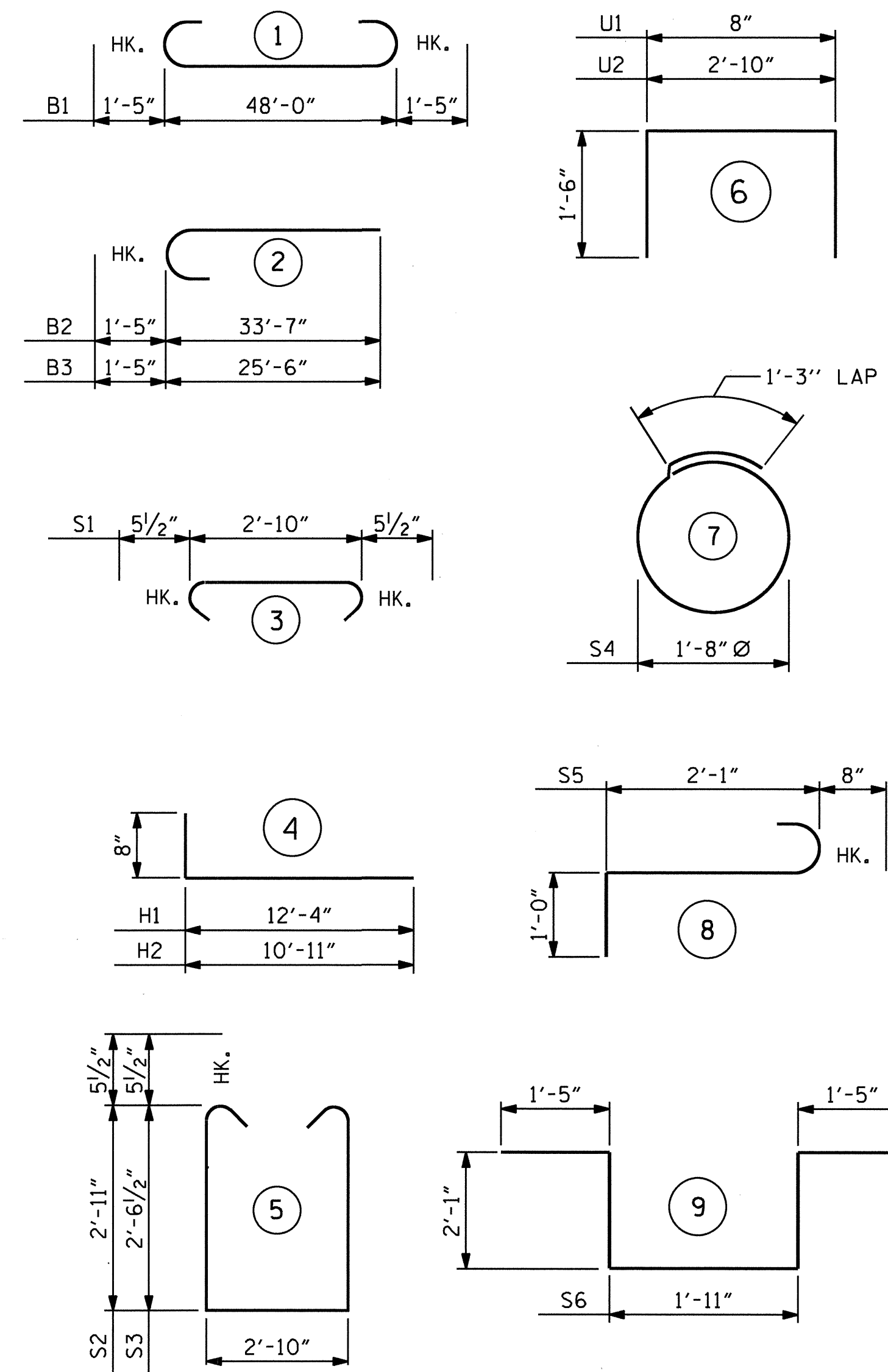
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

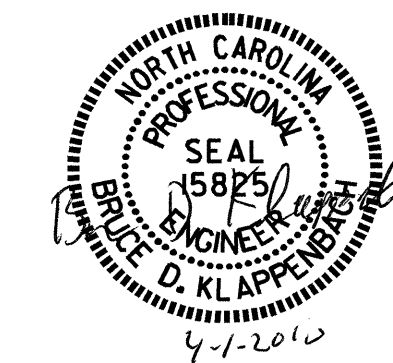
END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	50'-10"	875
B2	4	#10	2	35'-0"	602
B3	4	#10	2	26'-11"	463
B4	16	#4	STR	25'-4"	271
B5	15	#4	STR	2'-10"	28
B6	12	#4	STR	3'-3"	26
H1	22	#5	4	13'-0"	298
H2	22	#5	4	11'-7"	266
K1	20	#4	STR	25'-4"	338
K2	4	#4	STR	3'-11"	10
K3	4	#4	STR	3'-7"	10
S1	66	#5	3	3'-9"	258
S2	34	#5	5	9'-7"	340
S3	32	#5	5	8'-10"	295
S4	14	#4	7	6'-6"	61
S5	6	#6	8	3'-9"	34
S6	2	#6	9	8'-11"	27
U1	41	#4	6	3'-8"	100
U2	12	#4	6	5'-10"	47
V1	44	#5	STR	7'-5"	340
V2	38	#5	STR	7'-0"	277
V3	36	#5	STR	9'-10"	369
V4	34	#5	STR	8'-11"	316
REINFORCING STEEL =					5651 LBS
CLASS A CONCRETE					
POUR #1 (COLLAR, CAP & LOWER PART OF WINGS)					C.Y. 23.1
POUR #2 (BACKWALL & UPPER PART OF WINGS)					C.Y. 14.0
TOTAL					C.Y. 37.1
HP 12 X 53 STEEL PILES					
NO. 9 LIN. FT.					225

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #1



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

DRAWN BY: C.R. YARBROUGH DATE: 11/09  
 CHECKED BY: M.G. SHAIKH DATE: 01/10

**NOTES**

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

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

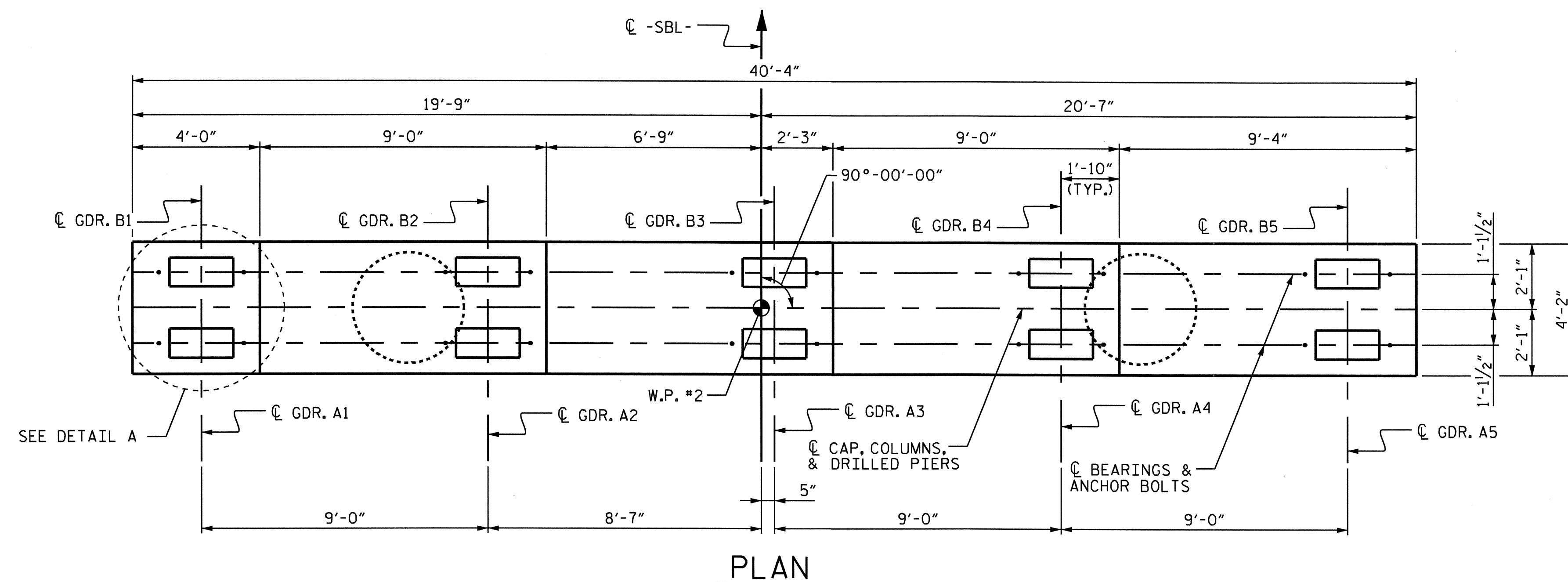
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

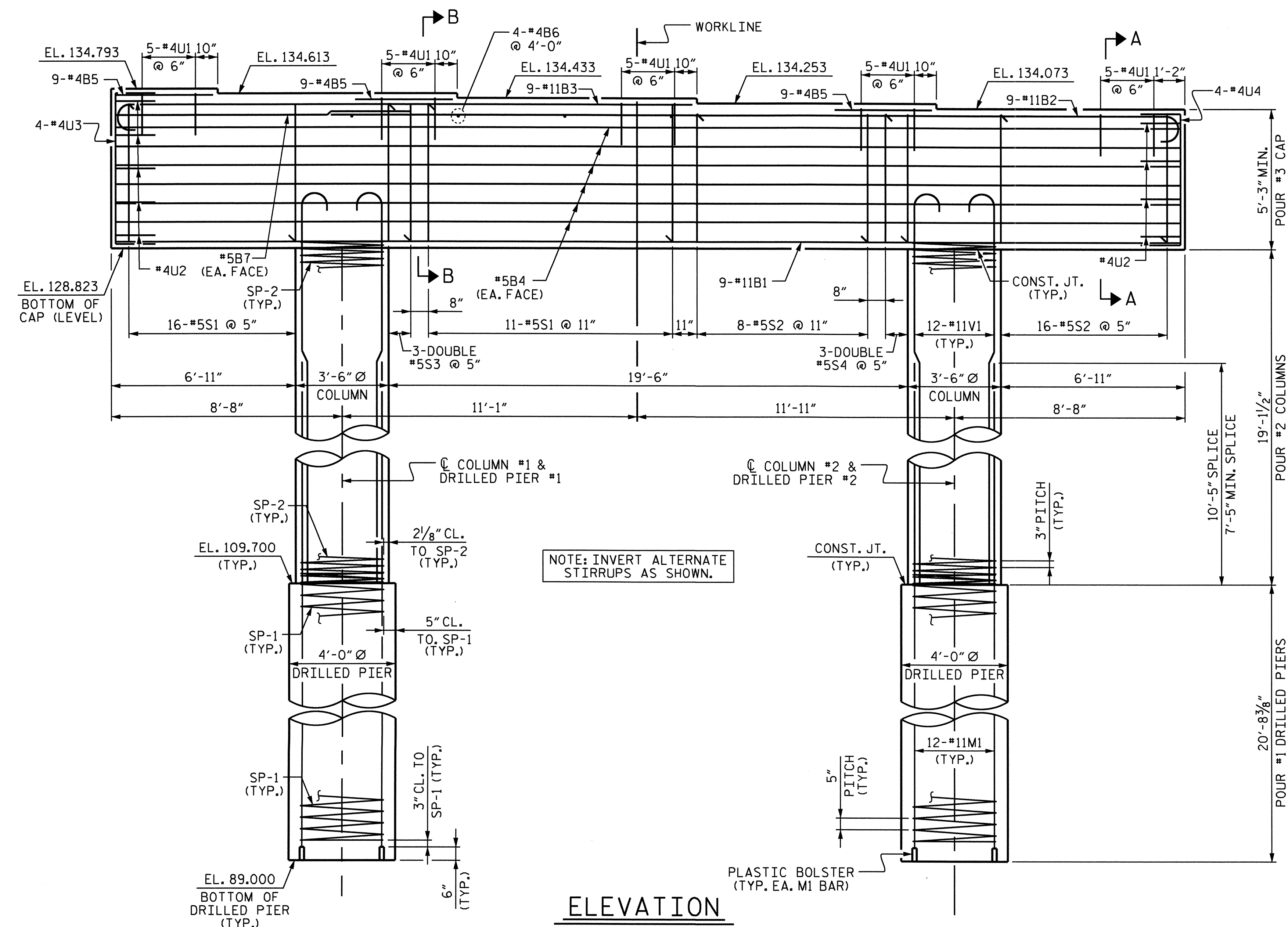
FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

**SPAN B**

**SPAN A**

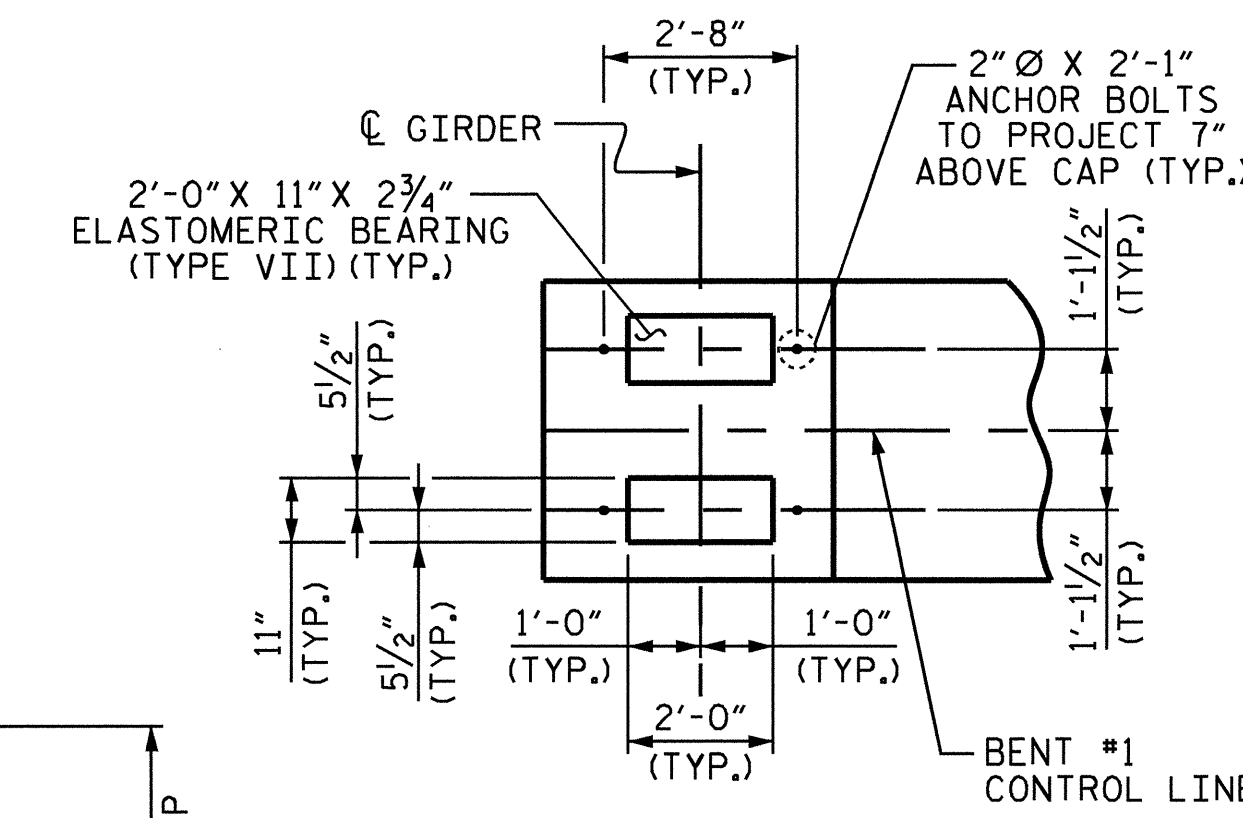


**PLAN**

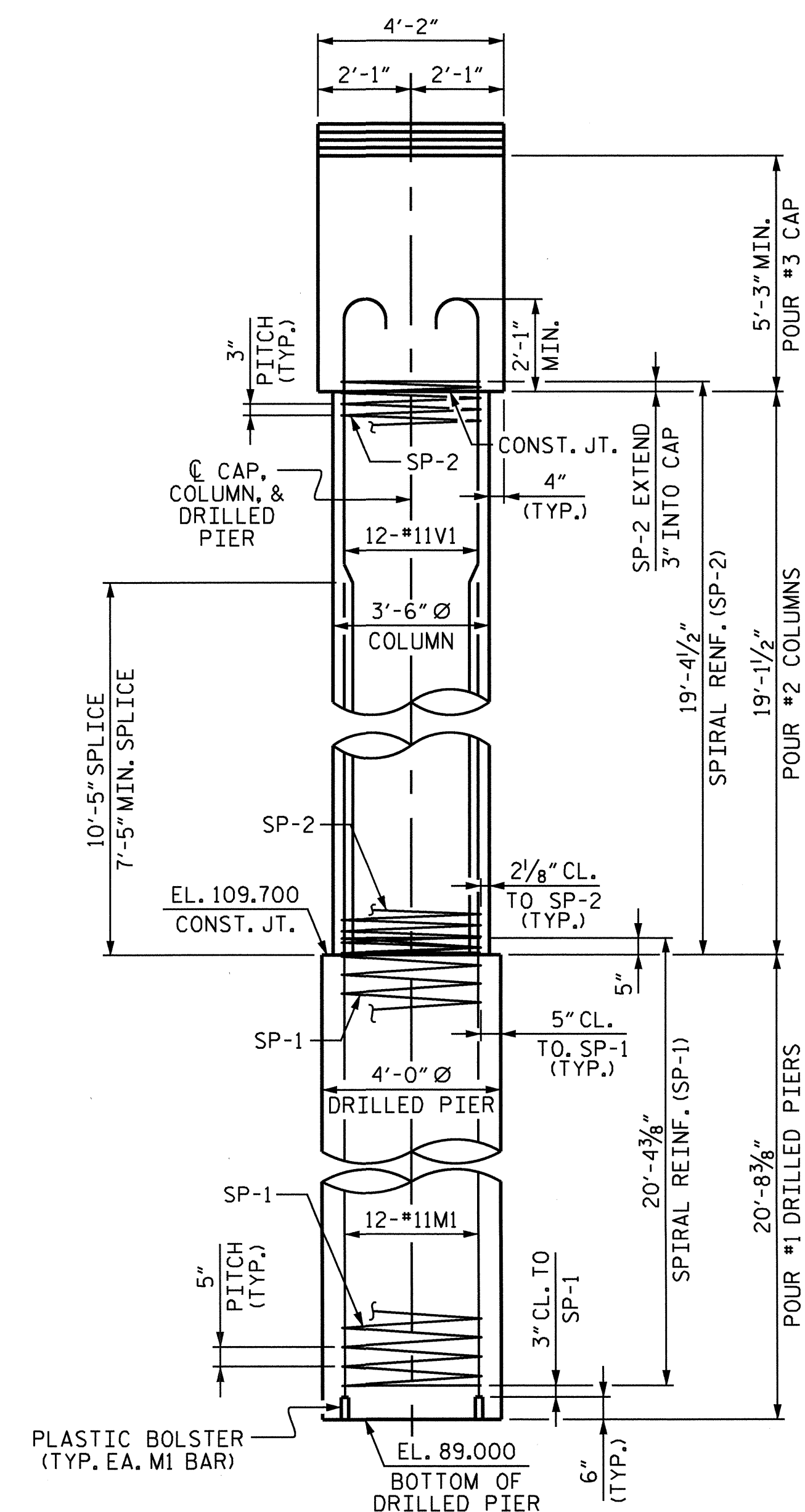


**ELEVATION**

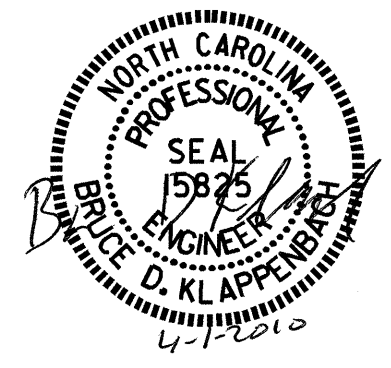
ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL



**DETAIL A**



**RIGHT END ELEVATION**



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

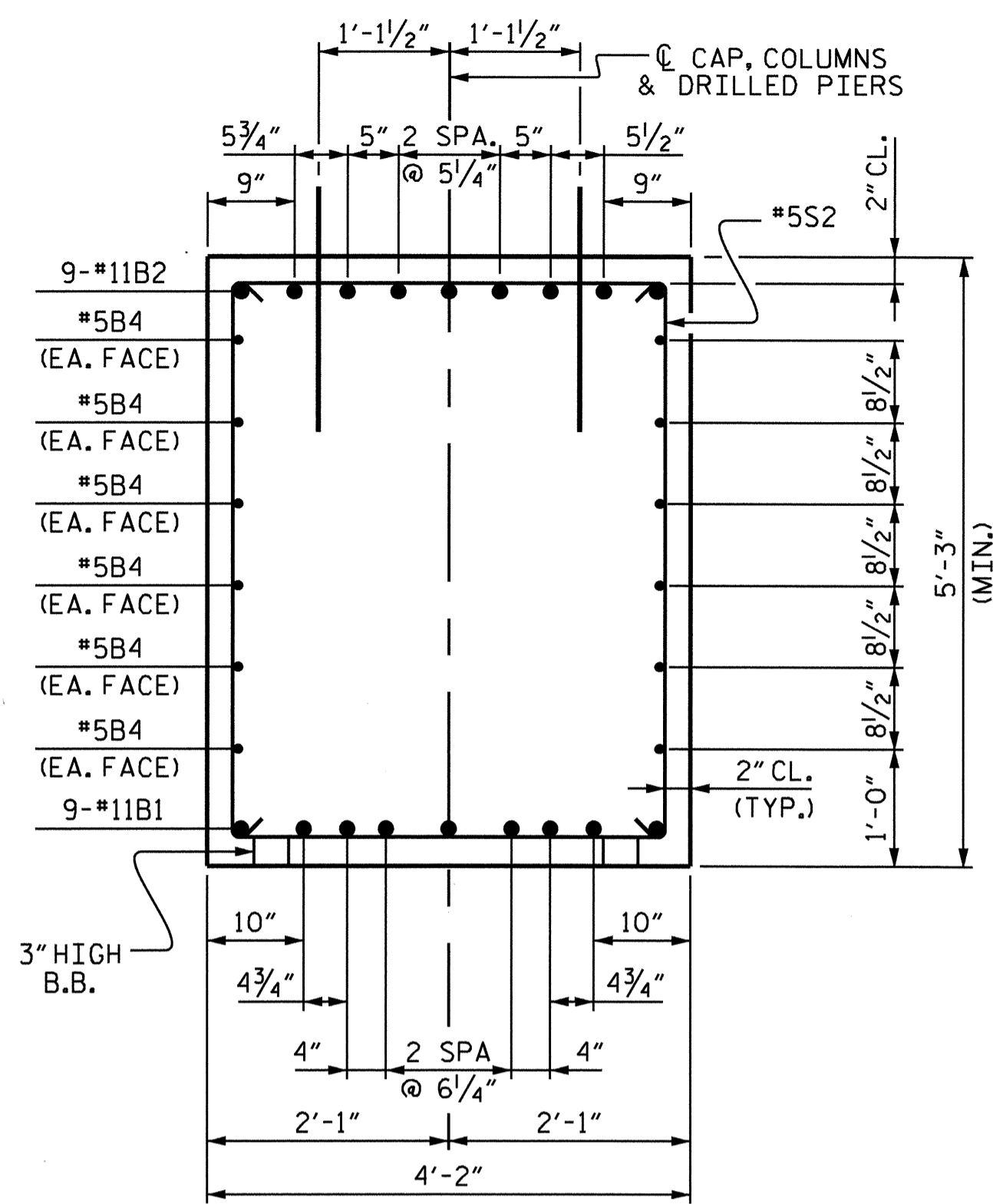
SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
**BENT #1**

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					59

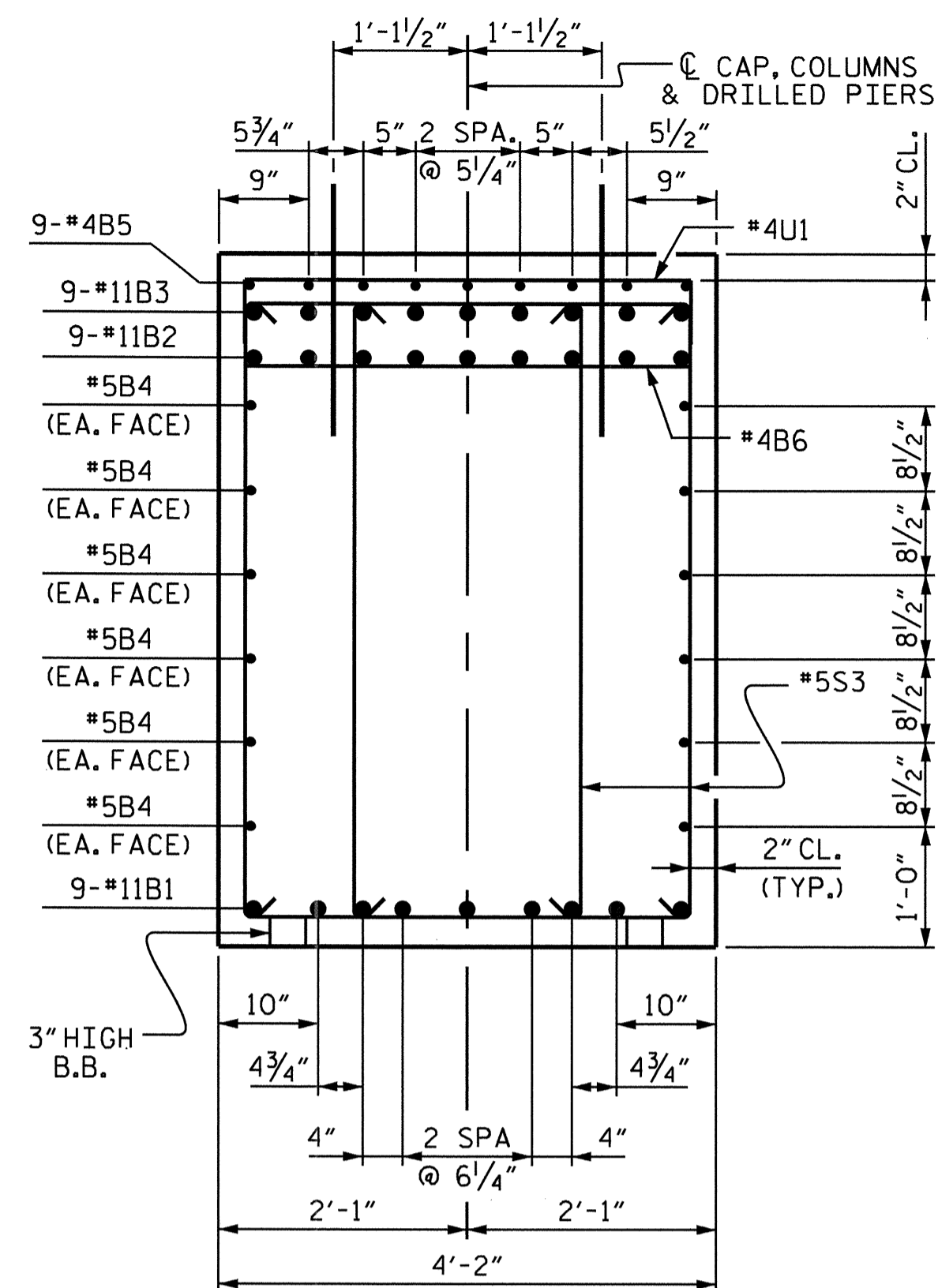
DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

31-MAR-2010 13:59  
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 cyarbro

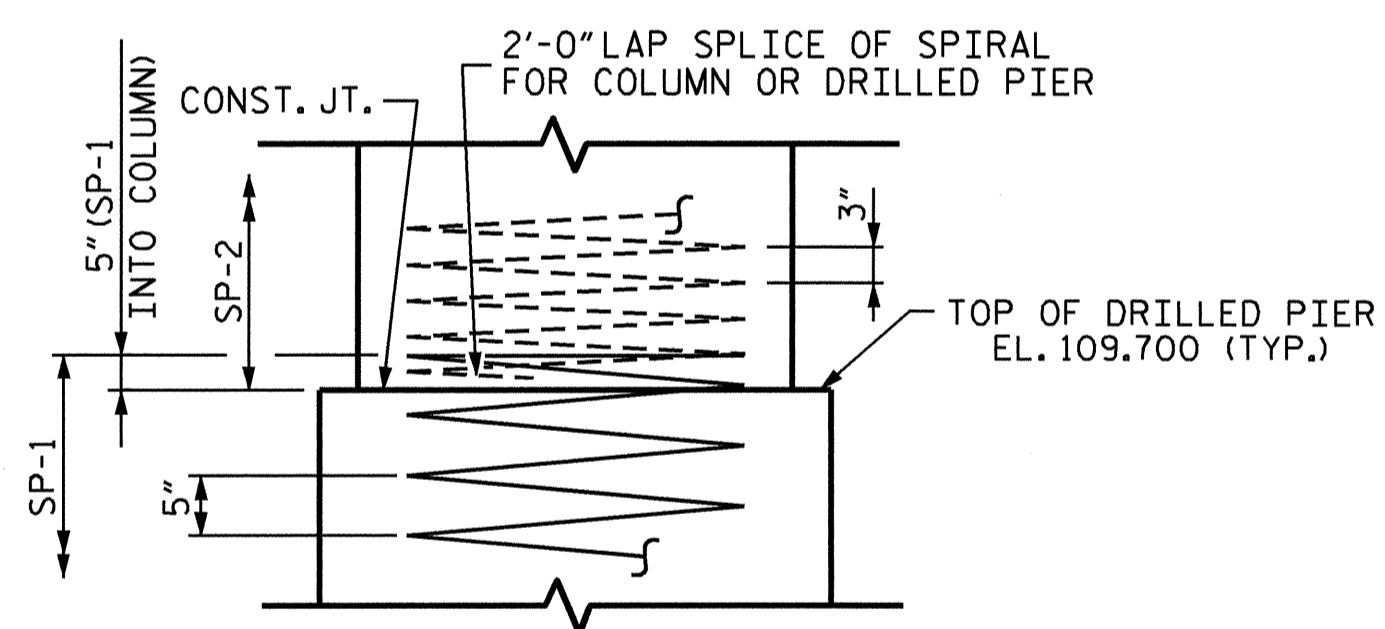




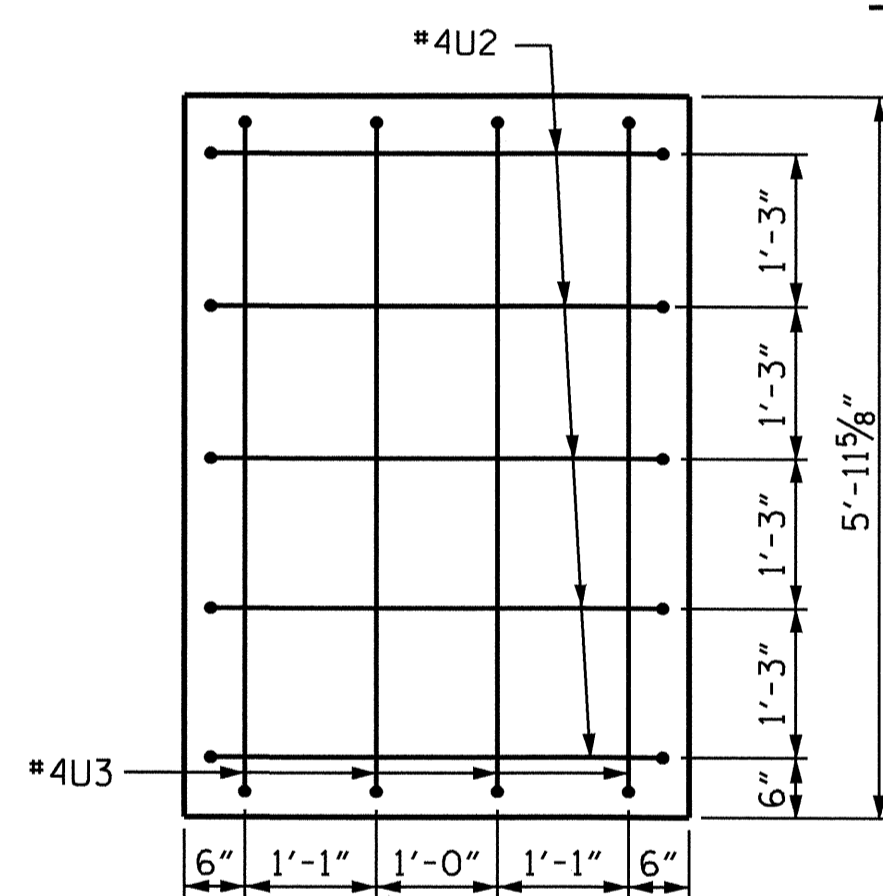
SECTION A-A



SECTION B-B

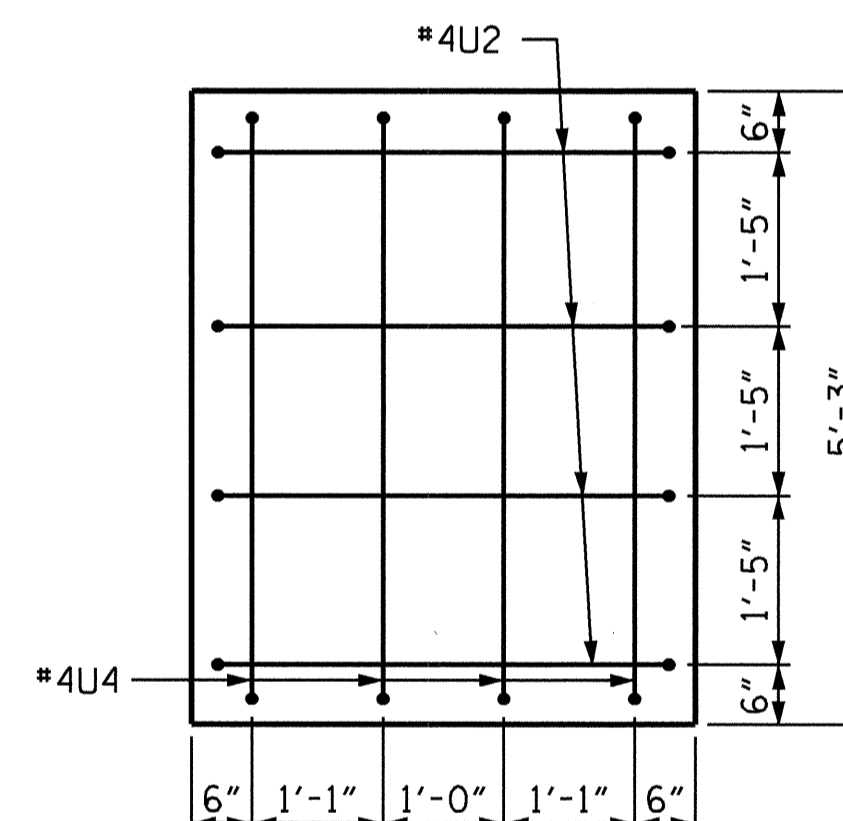


CONSTRUCTION JOINT DETAIL



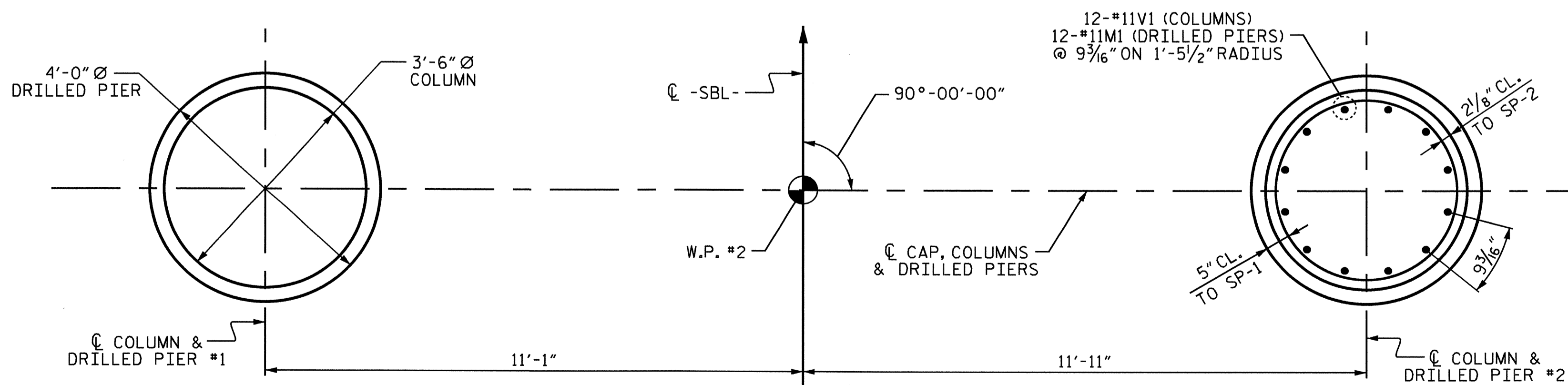
LEFT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U3 BARS



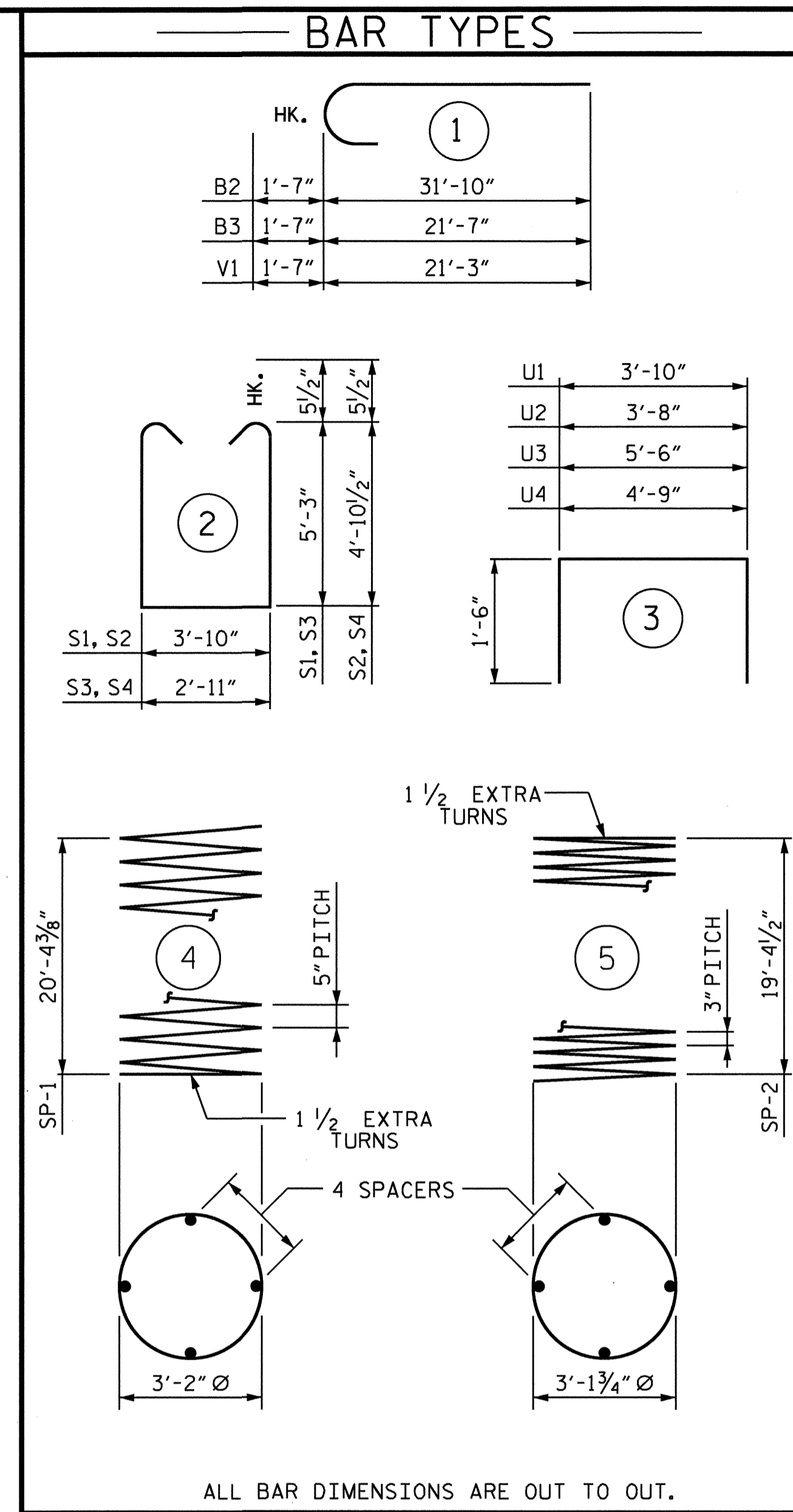
RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U4 BARS



PLAN OF COLUMNS AND DRILLED PIERS

(COLUMNS AND DRILLED PIERS ARE IDENTICAL)



\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#11	STR	40'-0"	1913
B2	9	#11	1	33'-5"	1598
B3	9	#11	1	23'-2"	1108
B4	12	#5	STR	40'-0"	501
B5	27	#4	STR	3'-8"	66
B6	4	#4	STR	3'-10"	10
B7	2	#5	STR	11'-1"	23
M1	24	#11	STR	30'-8"	3910
S1	27	#5	2	15'-3"	429
S2	24	#5	2	14'-6"	363
S3	6	#5	2	14'-4"	90
S4	6	#5	2	13'-7"	85
U1	25	#4	3	6'-10"	114
U2	9	#4	3	6'-8"	40
U3	4	#4	3	8'-6"	23
U4	4	#4	3	7'-9"	21
V1	24	#11	1	22'-10"	2912

REINFORCING STEEL = 13206 LBS

SP-1	2	*	4	493'-10"	1030
SP-2	2	**	5	769'-5"	1028

SPIRAL REINFORCING STEEL = 2058 LBS

CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)		13.6 C.Y.
POUR #3 (CAP)		34.6 C.Y.
TOTAL		48.2 C.Y.

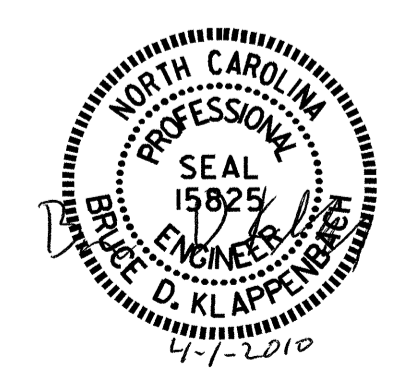
DRILLED PIERS

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	19.3 C.Y.
4'-0" Ø DRILLED PIERS NOT IN SOIL	22.0 LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL	19.4 LIN. FT.
4'-0" Ø PERMANENT STEEL CASING	21.4 LIN. FT.
CSL TUBES	185.6 FT.

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

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

SUBSTRUCTURE  
 BENT #1



REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	5-40
1			3	TOTAL SHEETS
2			4	59

DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

**NOTES**

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

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

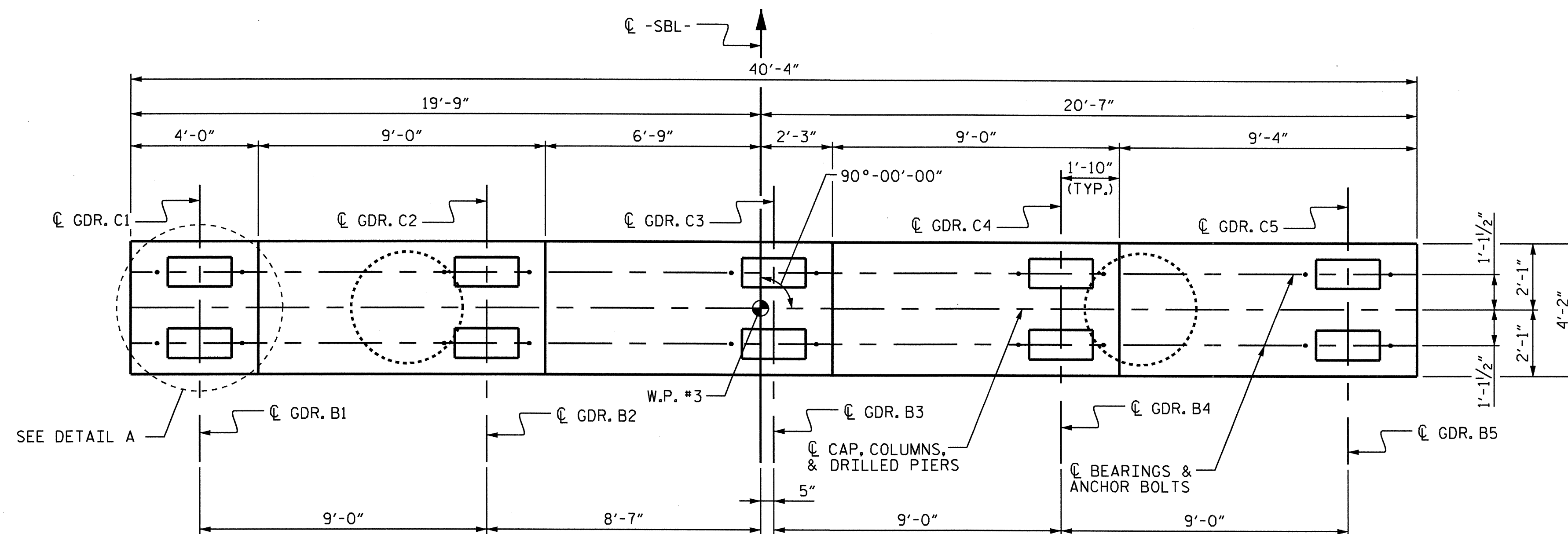
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

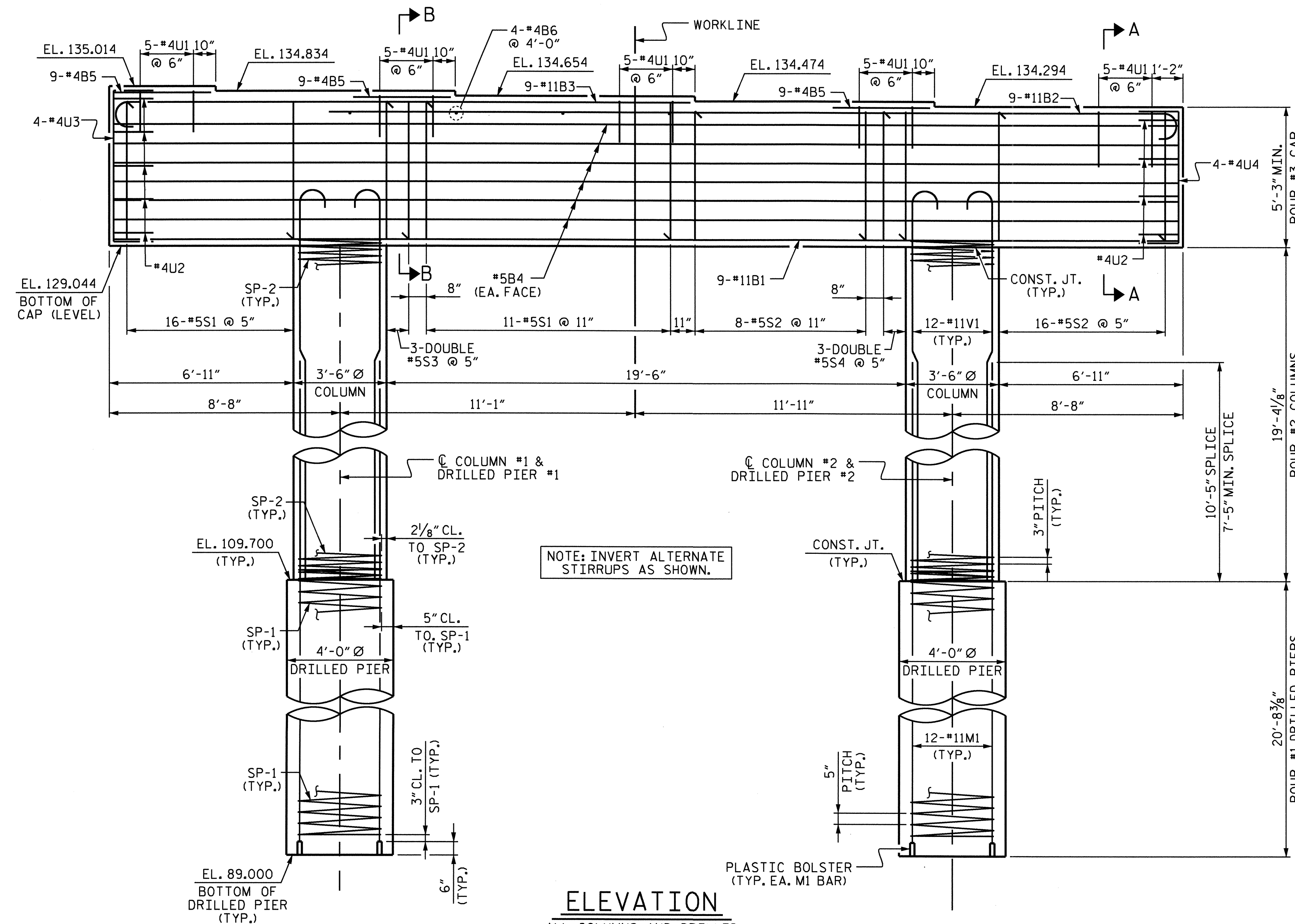
FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

**SPAN C**

**SPAN B**

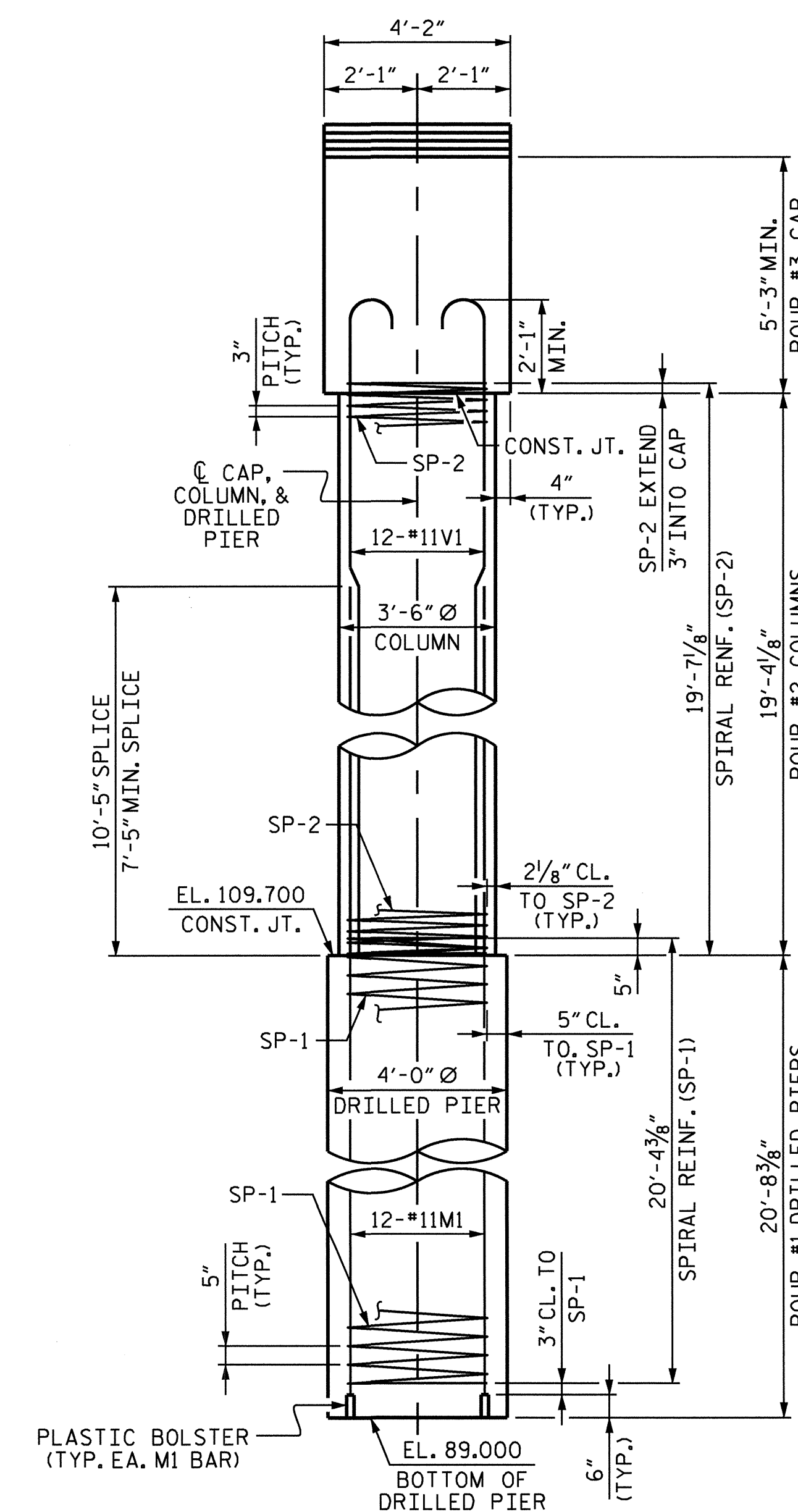


**PLAN**

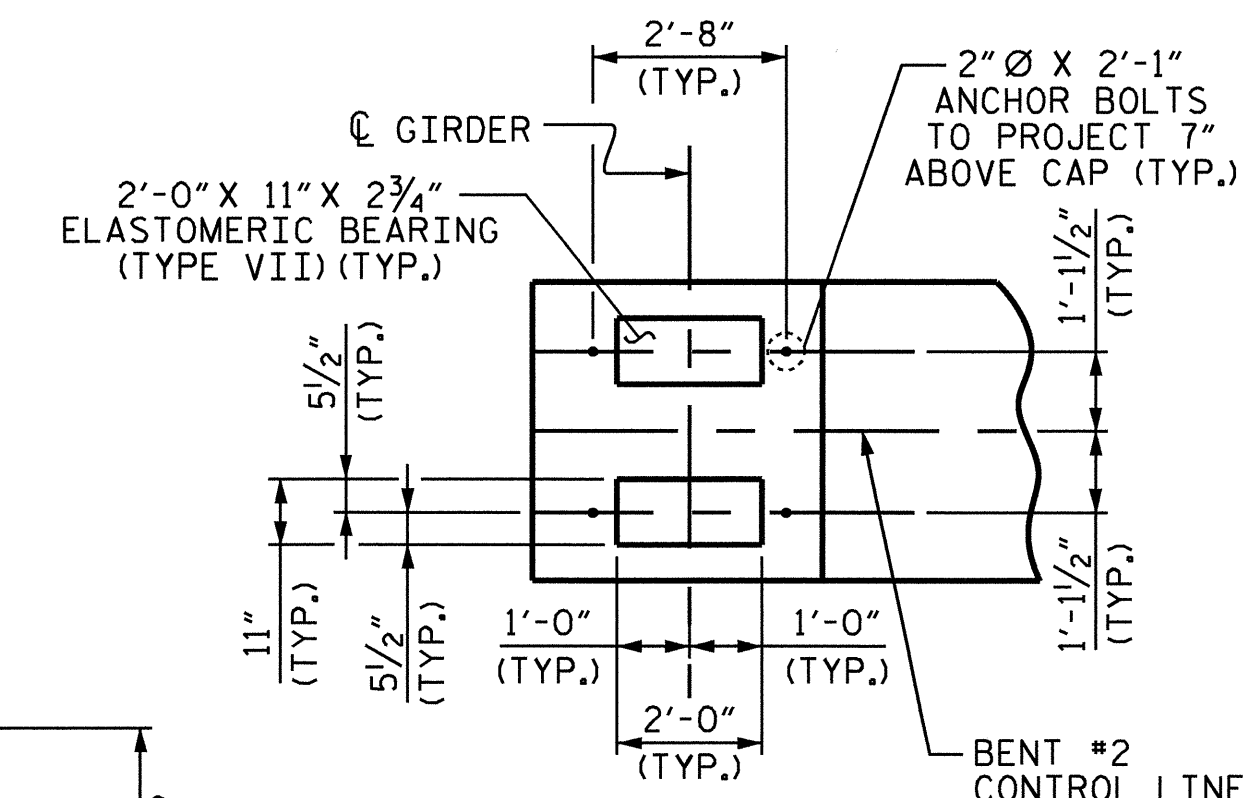


**ELEVATION**

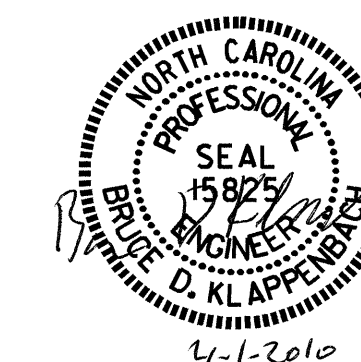
ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL



**RIGHT END ELEVATION**



**DETAIL A**



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

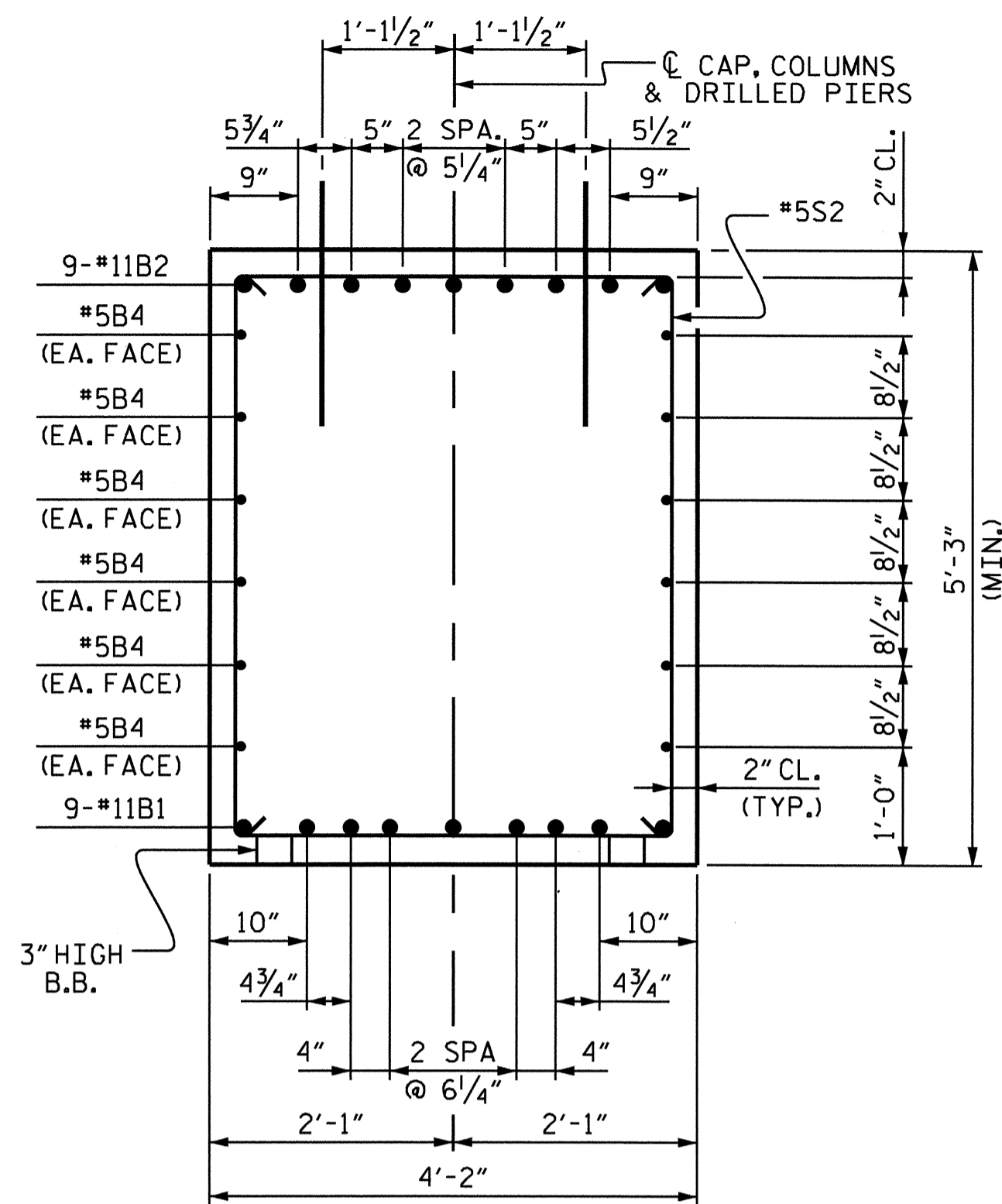
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

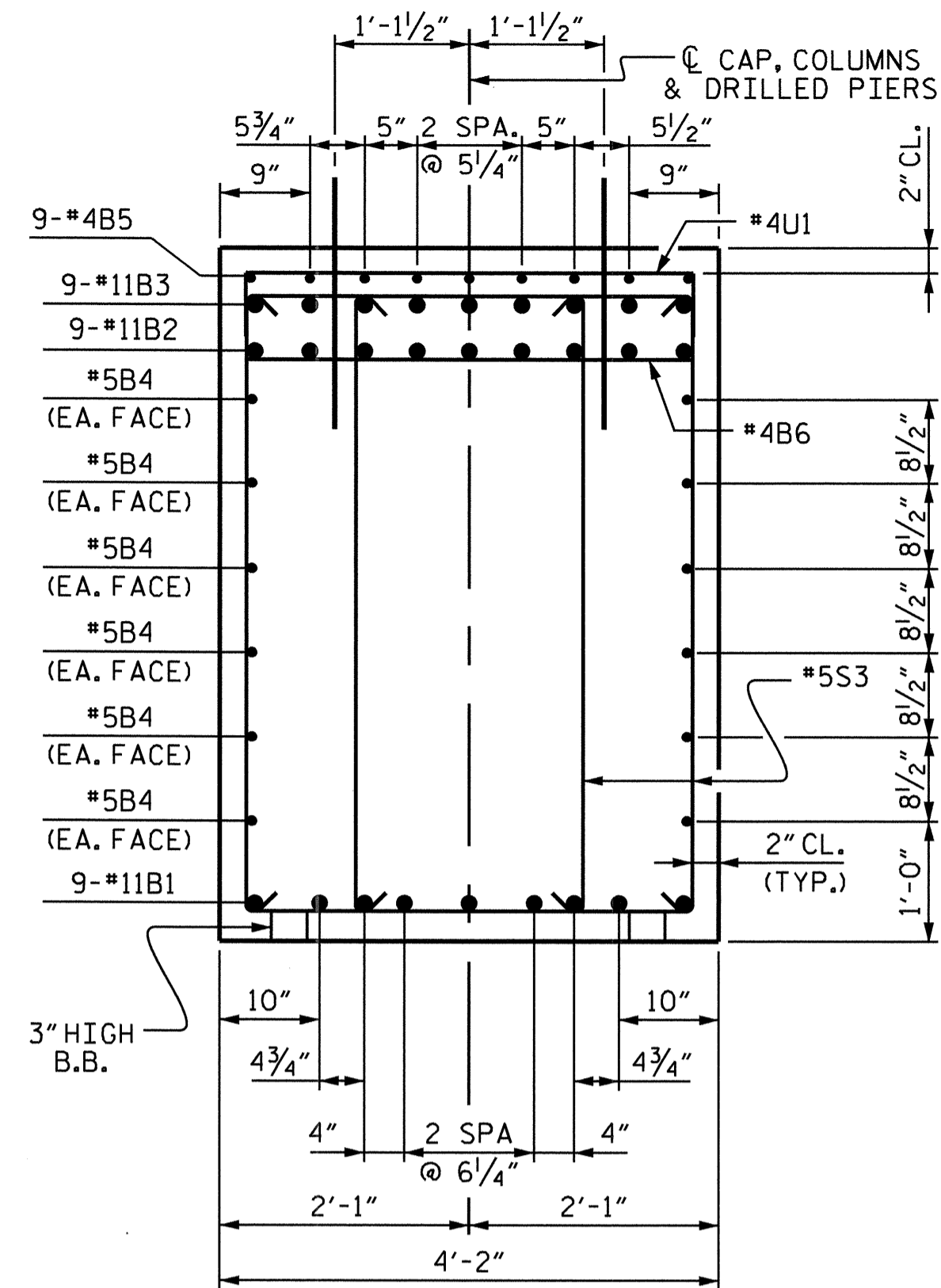
**SUBSTRUCTURE  
 BENT #2**

REVISIONS						SHEET NO. S-41
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

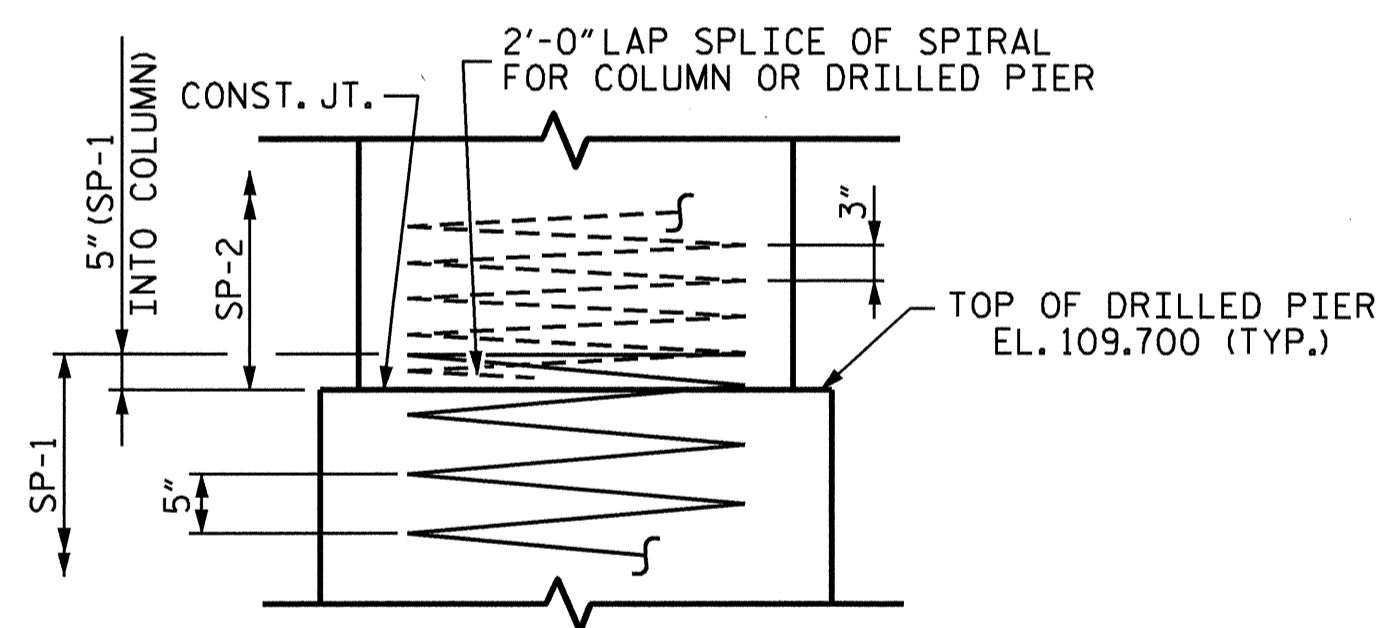
DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10



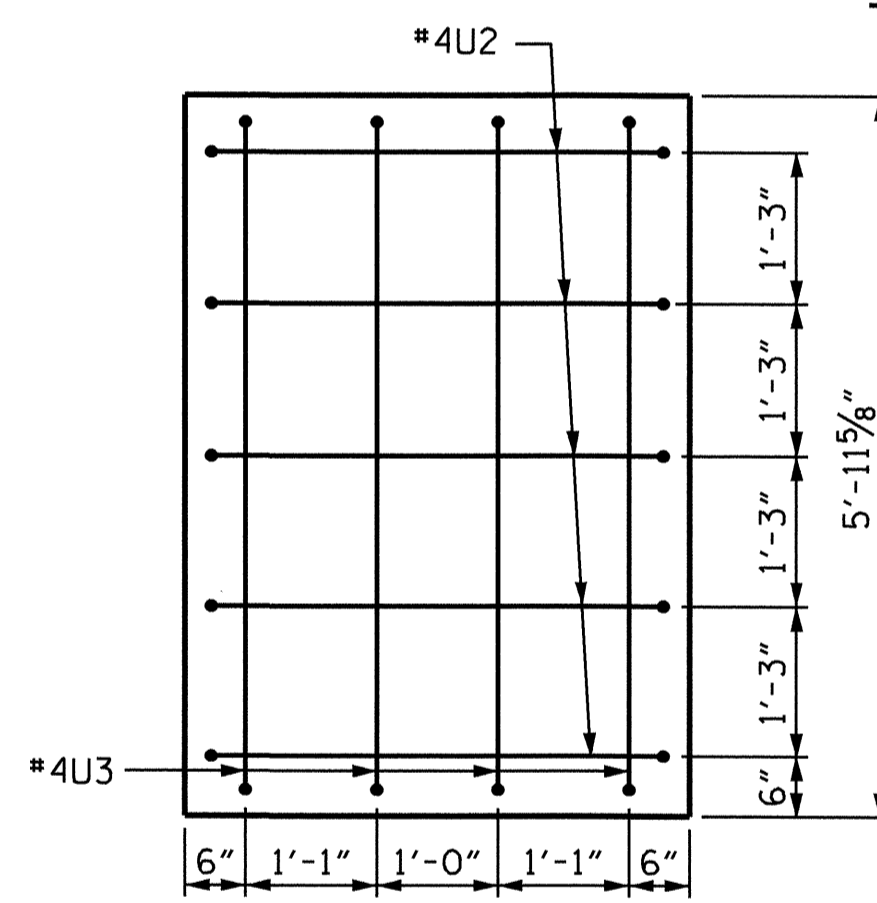
SECTION A-A



SECTION B-B

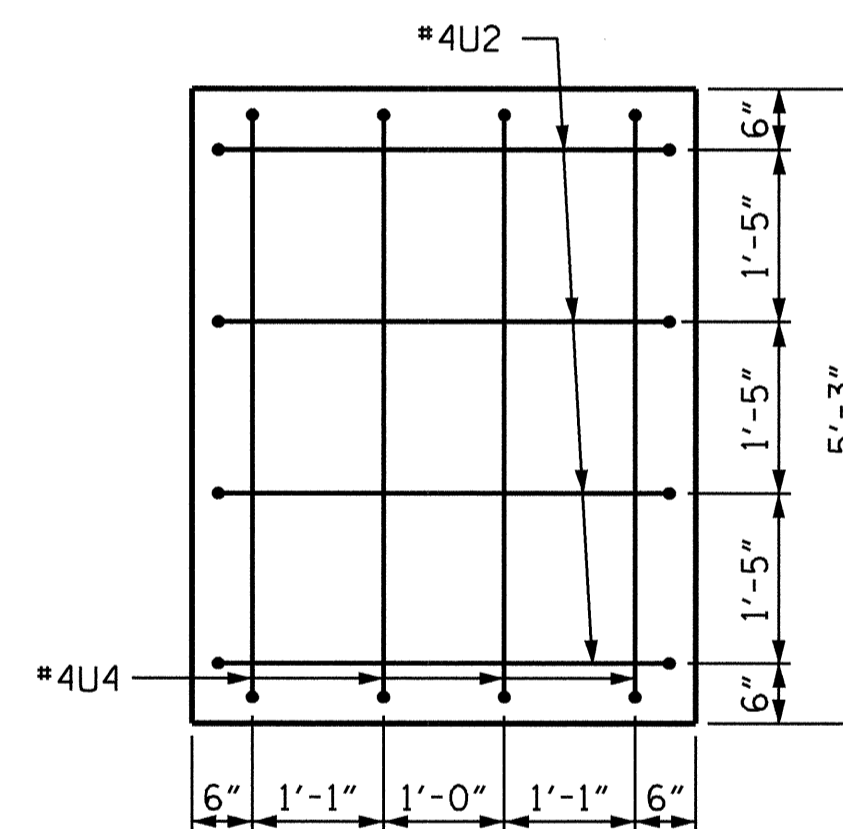


CONSTRUCTION JOINT DETAIL



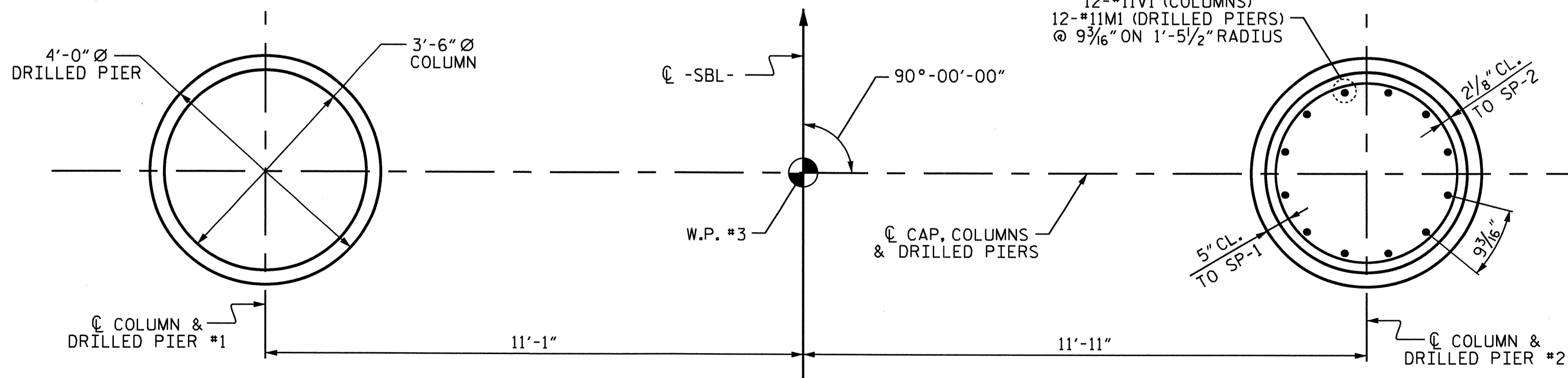
LEFT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U3 BARS



RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U4 BARS



PLAN OF COLUMNS AND DRILLED PIERS

(COLUMNS AND DRILLED PIERS ARE IDENTICAL)

**BAR TYPES**

**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#11	STR	40'-0"	1913
B2	9	#11	1	33'-5"	1598
B3	9	#11	1	23'-2"	1108
B4	12	#5	STR	40'-0"	501
B5	27	#4	STR	3'-8"	66
B6	4	#4	STR	3'-10"	10
B7	2	#5	STR	11'-1"	23
M1	24	#11	STR	30'-8"	3910
S1	27	#5	2	15'-3"	429
S2	24	#5	2	14'-6"	363
S3	6	#5	2	14'-4"	90
S4	6	#5	2	13'-7"	85
U1	25	#4	3	6'-10"	114
U2	9	#4	3	6'-8"	40
U3	4	#4	3	8'-6"	23
U4	4	#4	3	7'-9"	21
V1	24	#11	1	23'-1"	2943
REINFORCING STEEL =					13237 LBS
SP-1	2	*	4	493'-10"	1030
SP-2	2	**	5	779'-2"	1041
SPIRAL REINFORCING STEEL =					2071 LBS
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					13.8 C.Y.
POUR #3 (CAP)					34.6 C.Y.
TOTAL					48.4 C.Y.
DRILLED PIERS					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					19.3 C.Y.
4'-0" Ø DRILLED PIERS NOT IN SOIL					21.0 LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL					20.4 LIN. FT.
4'-0" Ø PERMANENT STEEL CASING					21.4 LIN. FT.
CSL TUBES					185.6 FT.

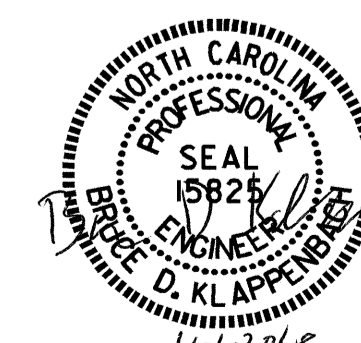
\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT #2



REVISIONS						SHEET NO. S-42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

**NOTES**

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

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

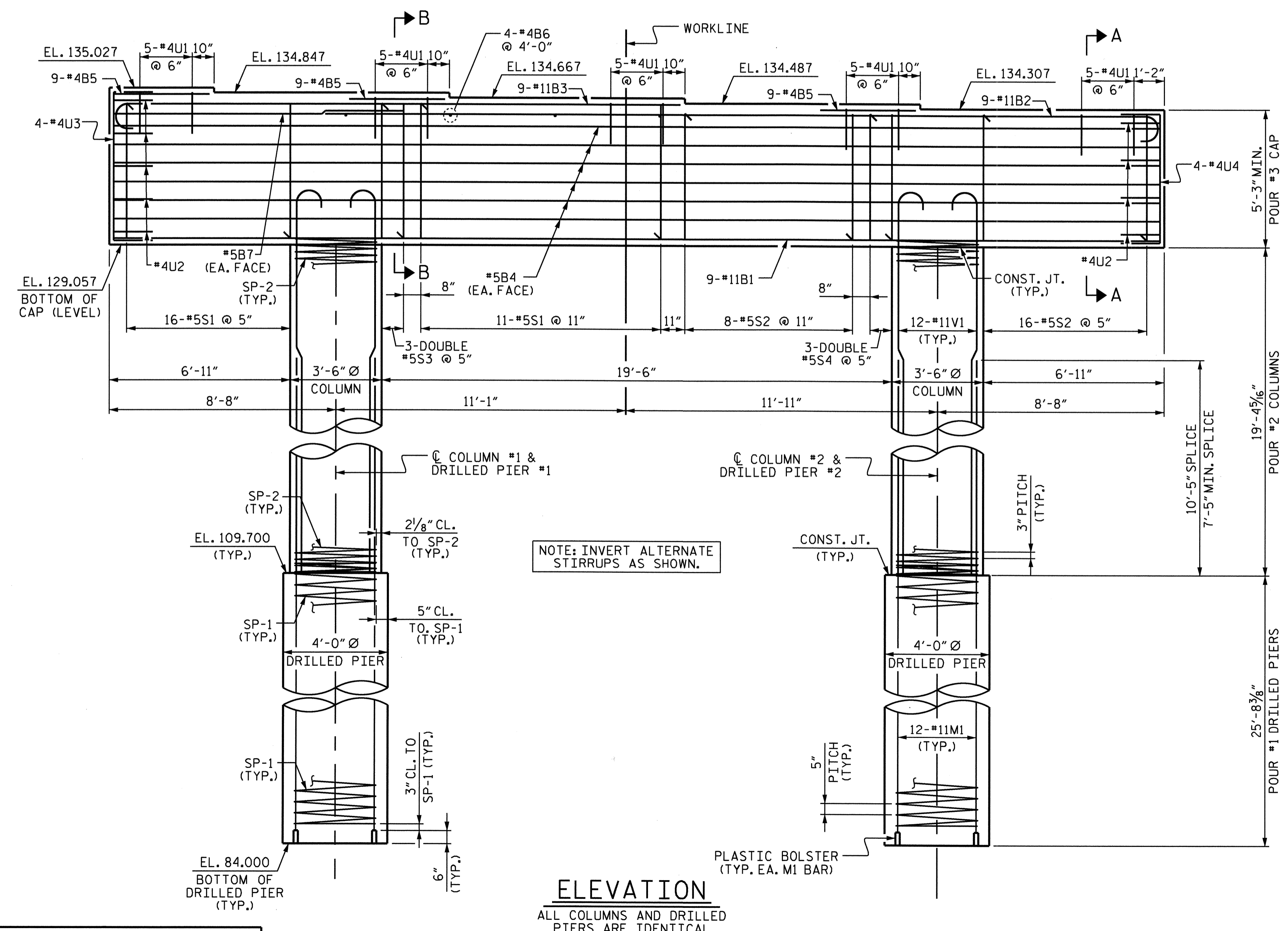
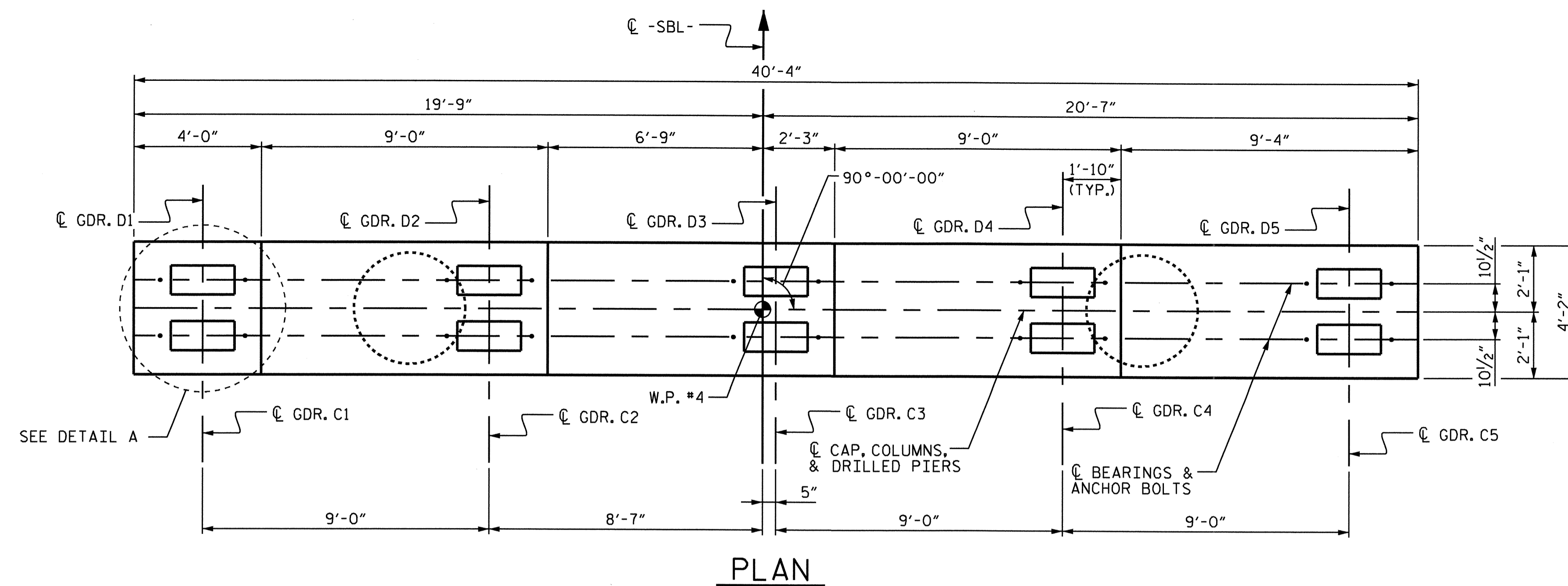
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

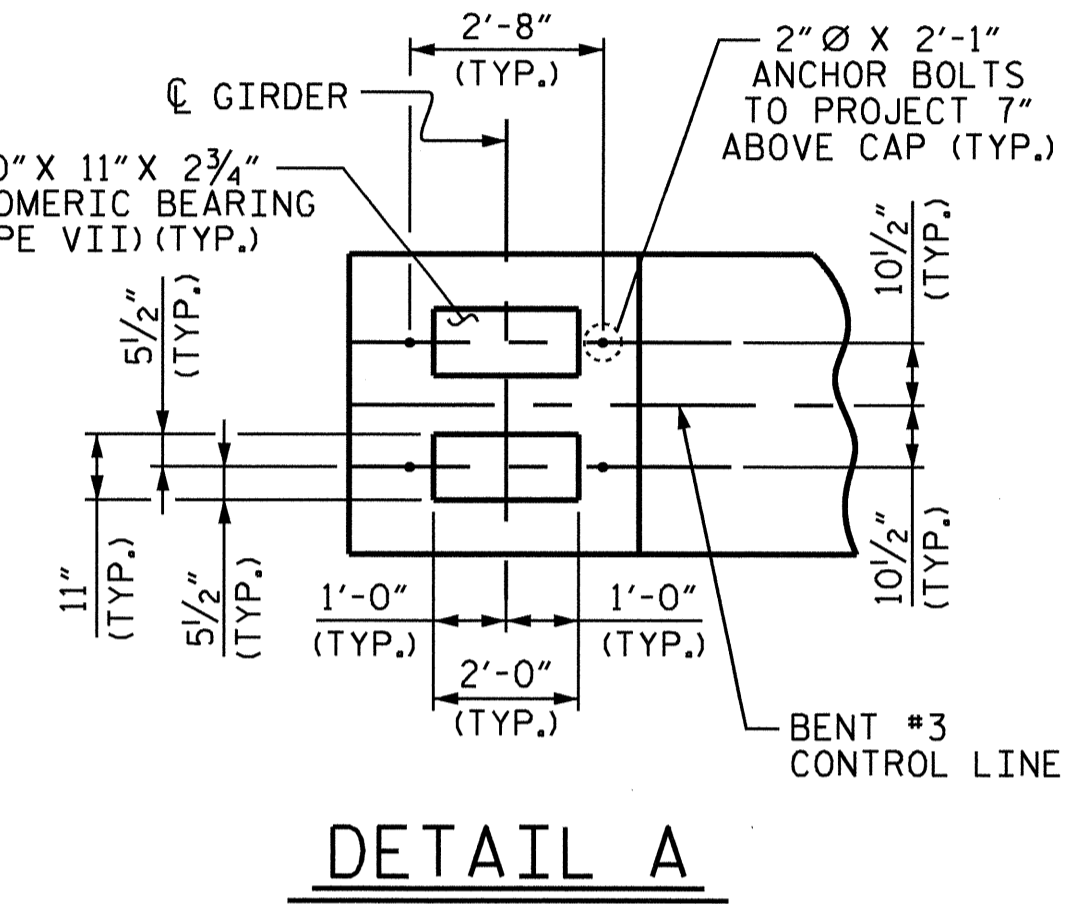
FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

**SPAN D**

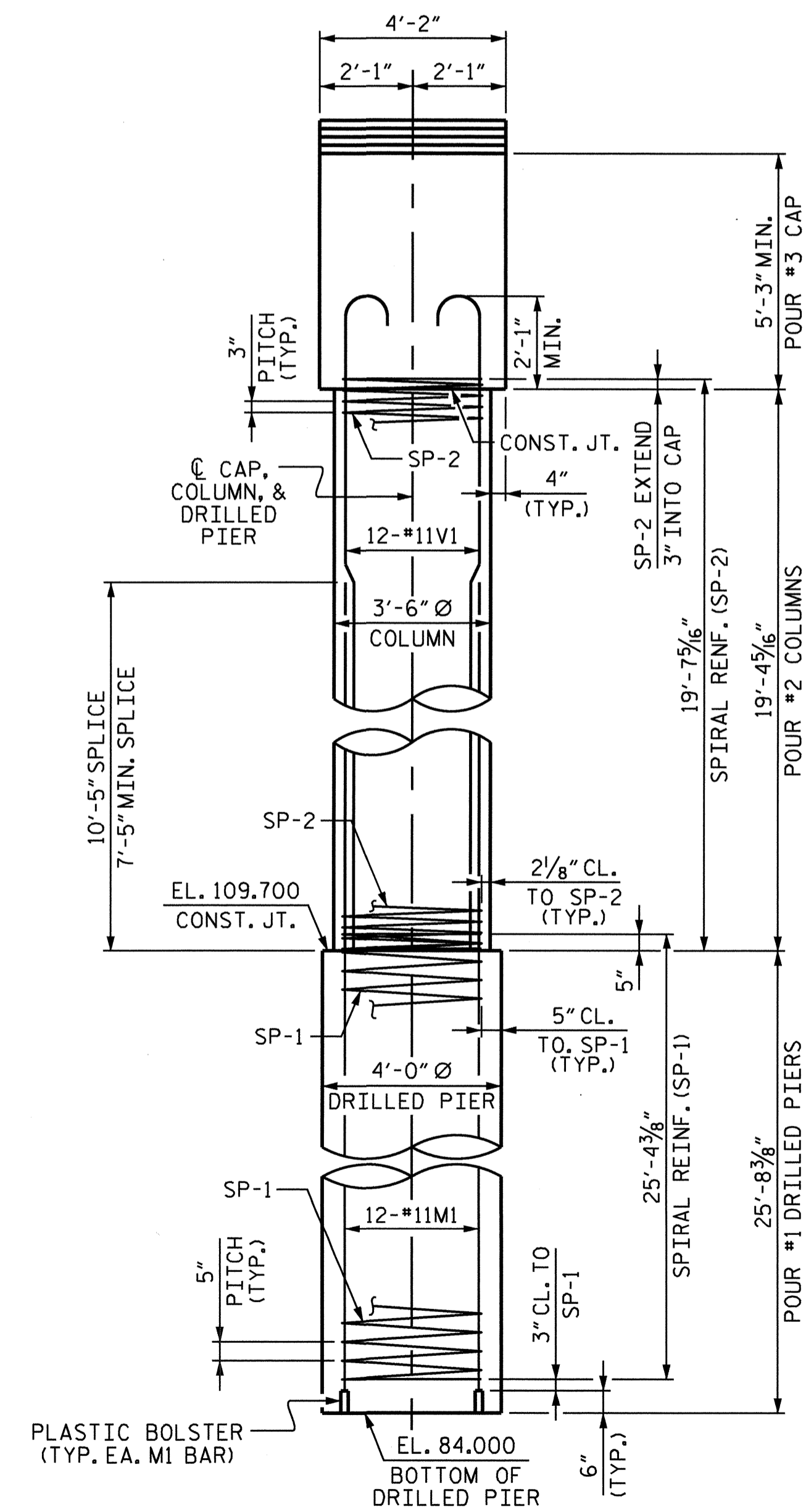
**SPAN C**



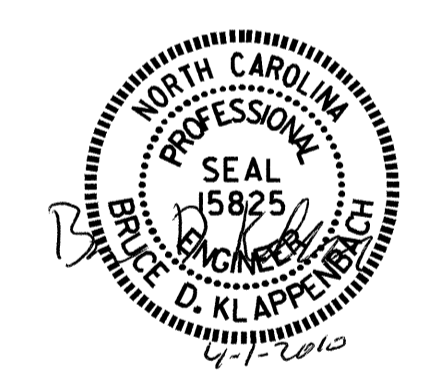
**ELEVATION**  
ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL



**DETAIL A**



**RIGHT END ELEVATION**



PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 1 OF 2

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

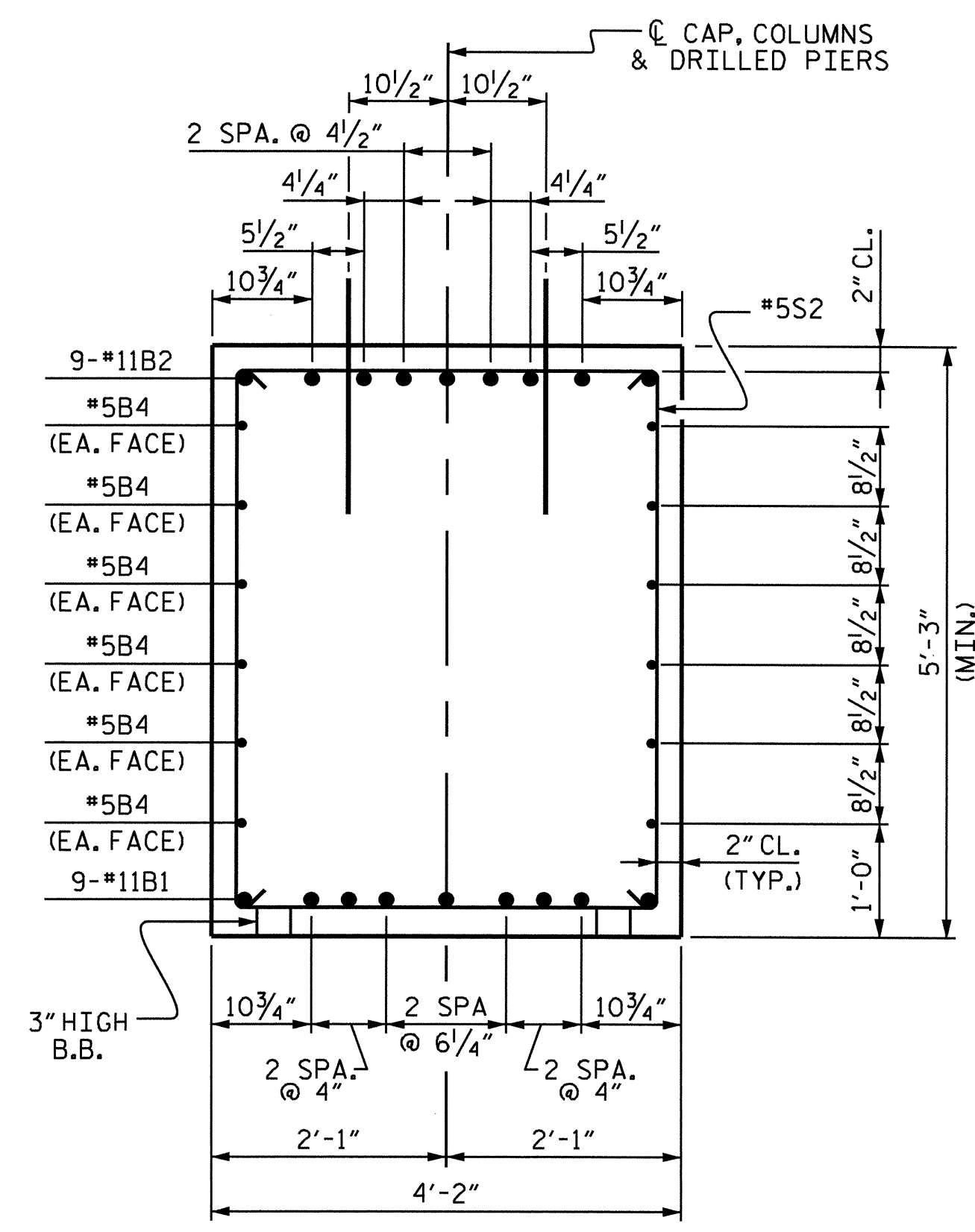
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**  
**BENT #3**

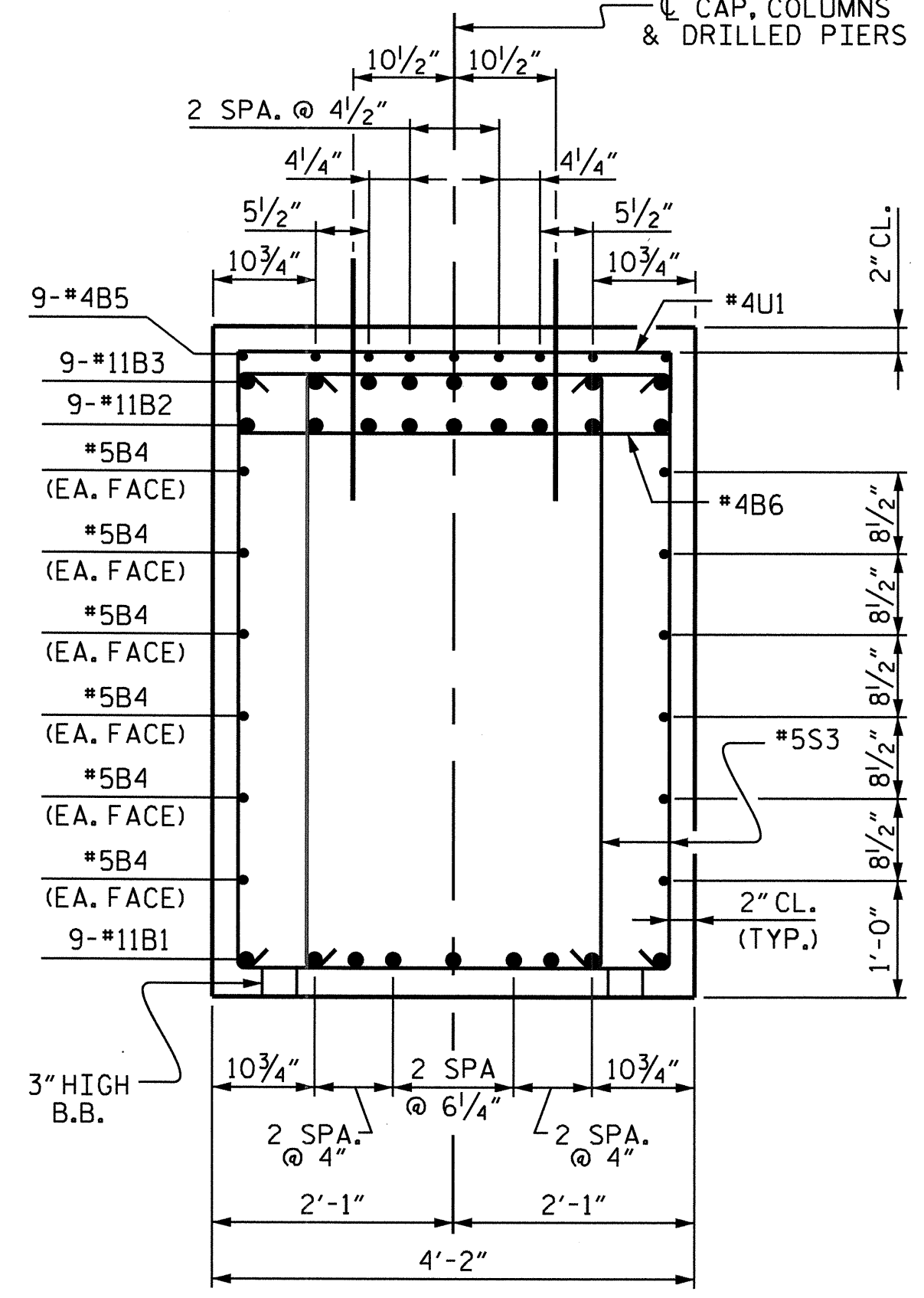
TOTAL SHEETS: 59

DRAWN BY : C.R. YARBROUGH DATE : 12/09  
 CHECKED BY : D.A. GLADDEN DATE : 01/10

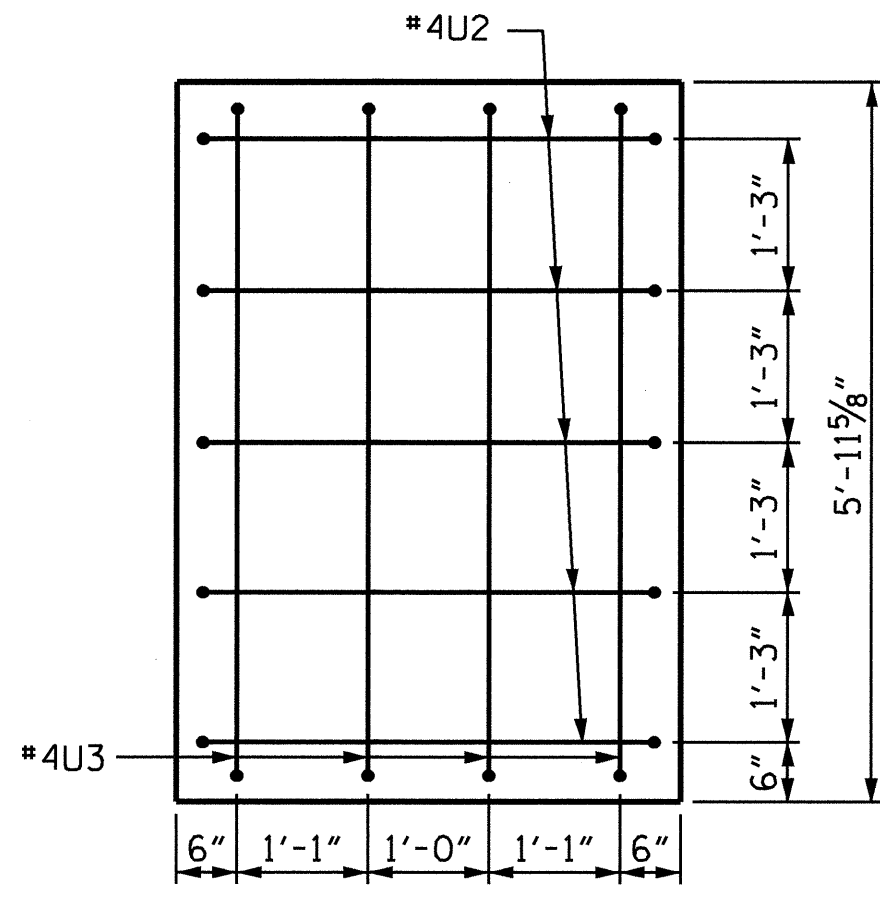
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 cyarbro



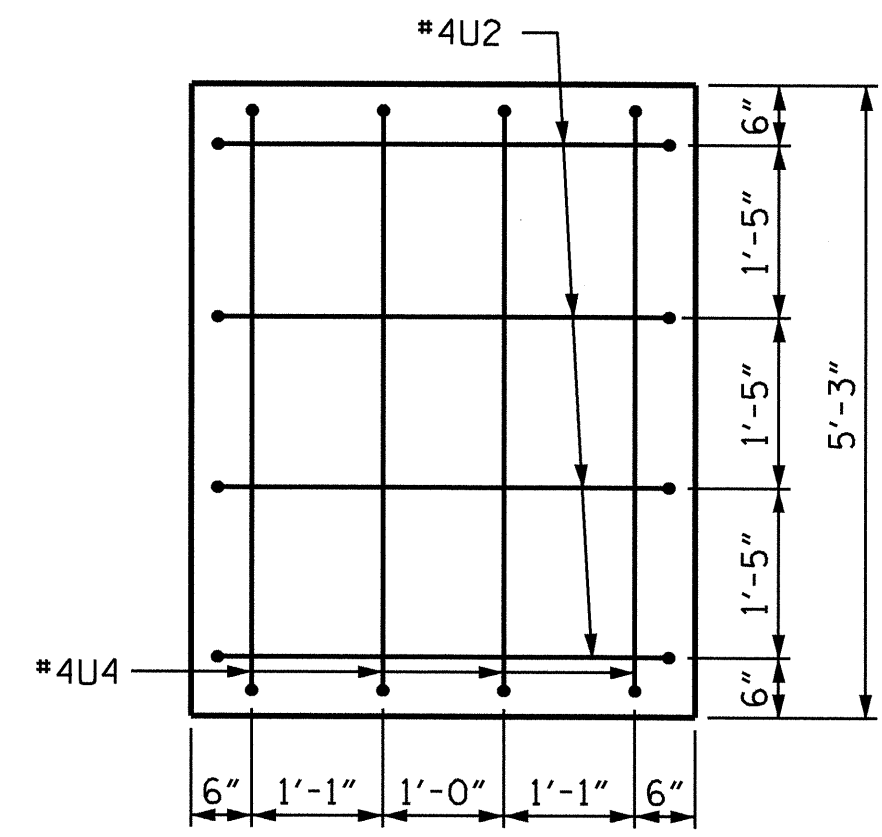
SECTION A-A



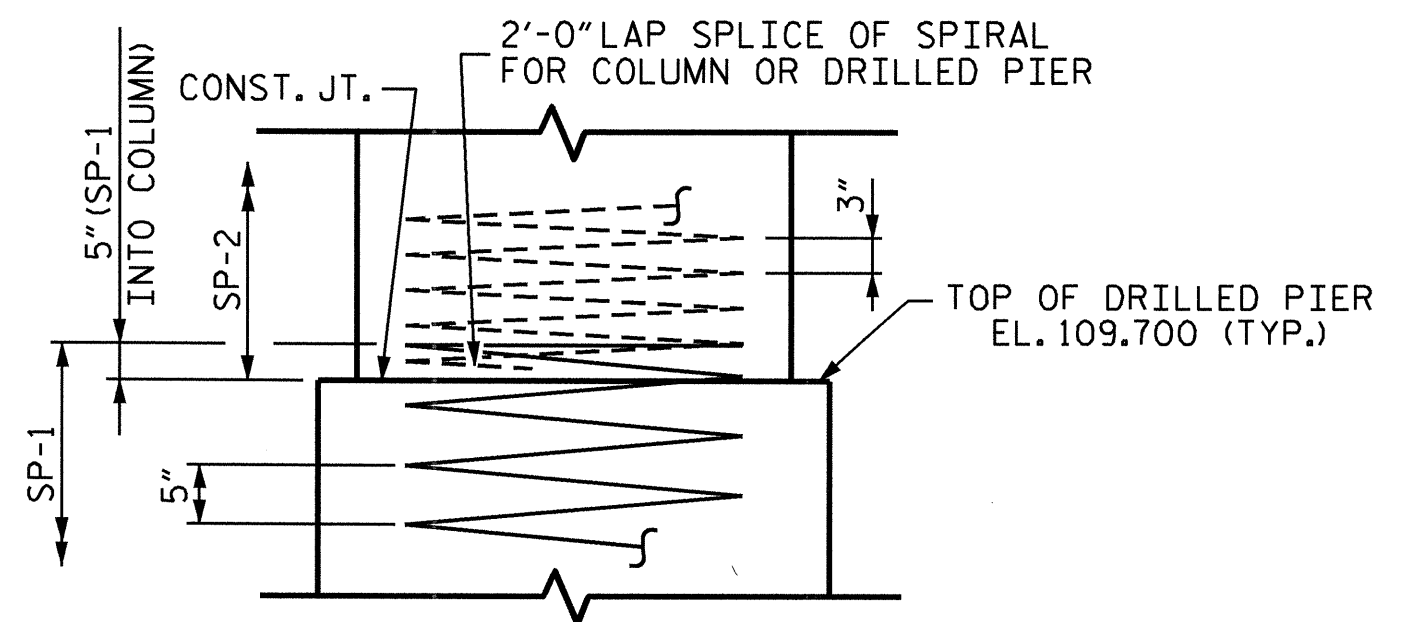
SECTION B-B



LEFT END VIEW



RIGHT END VIEW



CONSTRUCTION JOINT DETAIL

**BAR TYPES**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#11	STR	40'-0"	1913
B2	#11	1	33'-5"	1598
B3	#11	1	23'-2"	1108
B4	#5	STR	40'-0"	501
B5	#4	STR	3'-8"	66
B6	#4	STR	3'-10"	10
B7	#5	STR	11'-1"	23
M1	#11	STR	35'-8"	4548
S1	#5	2	15'-3"	429
S2	#5	2	14'-6"	363
S3	#5	2	14'-8"	92
S4	#5	2	13'-11"	87
U1	#4	3	6'-10"	114
U2	#4	3	6'-8"	40
U3	#4	3	8'-6"	23
U4	#4	3	7'-9"	21
V1	#11	1	23'-1"	2943

REINFORCING STEEL = 13879 LBS

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	2	*	4	611'-1"	1275
SP-2	2	**	5	779'-2"	1041

SPIRAL REINFORCING STEEL = 2316 LBS

CLASS A CONCRETE BREAKDOWN

POUR	DESCRIPTION	QUANTITY
POUR #2 (COLUMNS)		13.8 C.Y.
POUR #3 (CAP)		34.6 C.Y.
TOTAL		48.4 C.Y.

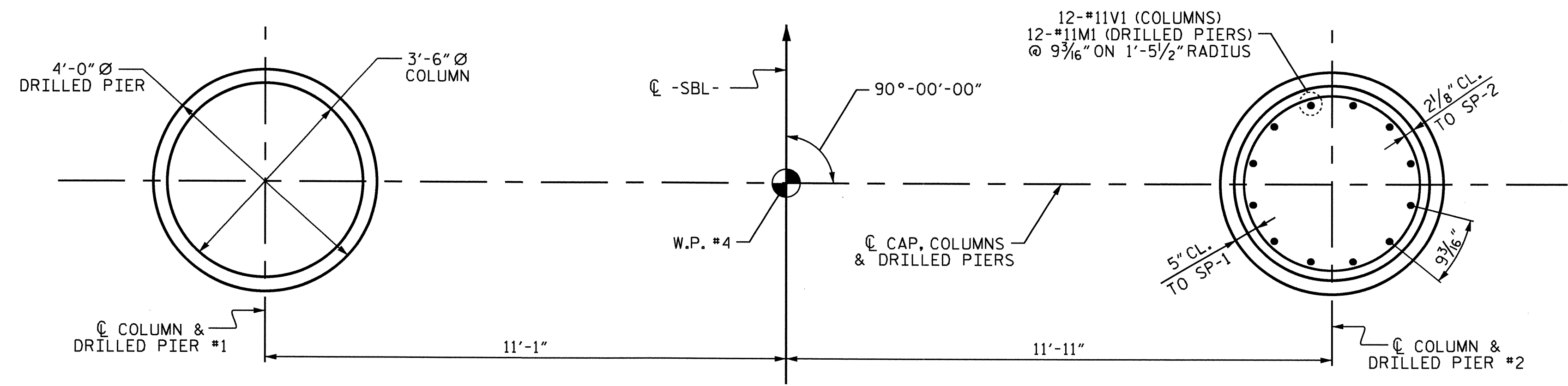
DRILLED PIERS

DESCRIPTION	QUANTITY
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	23.9 C.Y.
4'-0" Ø DRILLED PIERS NOT IN SOIL	28.0 LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL	23.4 LIN. FT.
4'-0" Ø PERMANENT STEEL CASING	29.4 LIN. FT.
CSL TUBES	225.6 FT.

ALL BAR DIMENSIONS ARE OUT TO OUT.

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PLAN OF COLUMNS AND DRILLED PIERS

(COLUMNS AND DRILLED PIERS ARE IDENTICAL)

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**  
**BENT #3**

REVISIONS						SHEET NO. S-44
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

**NOTES**

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

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

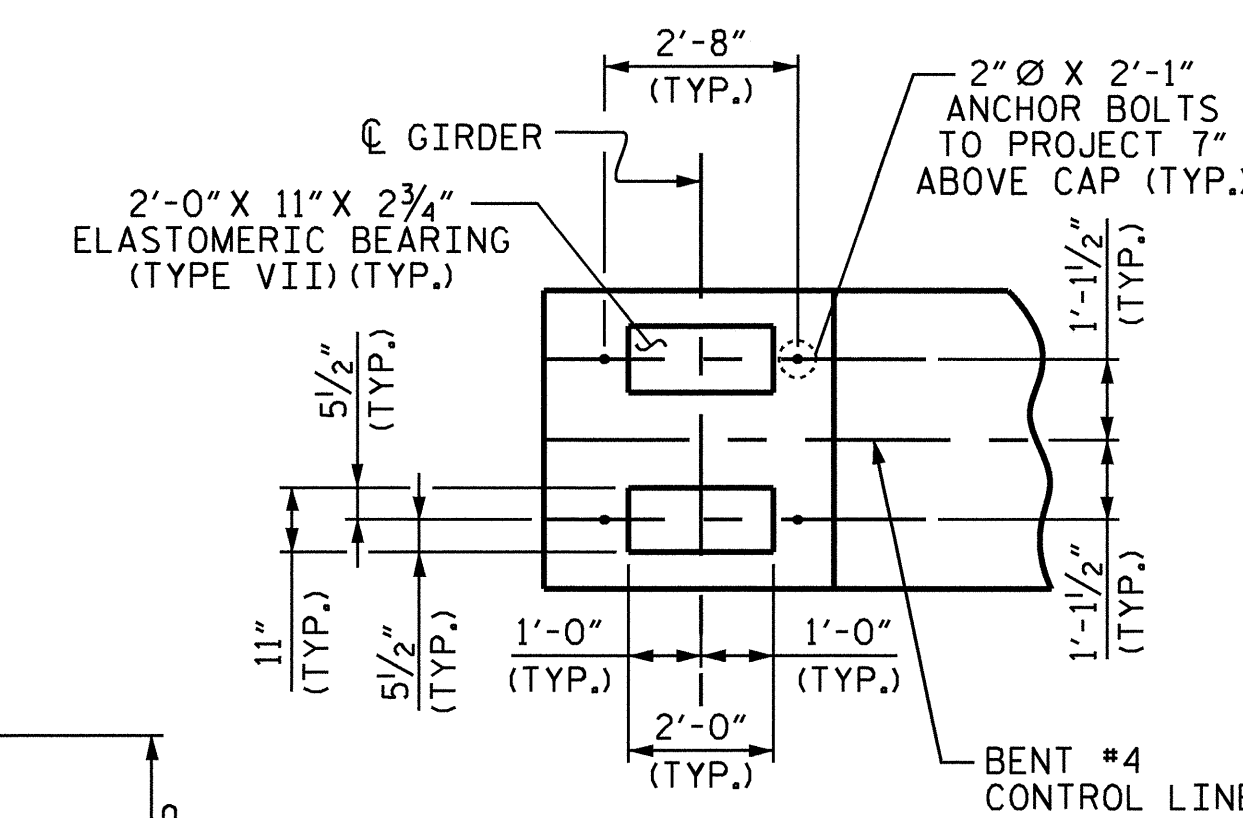
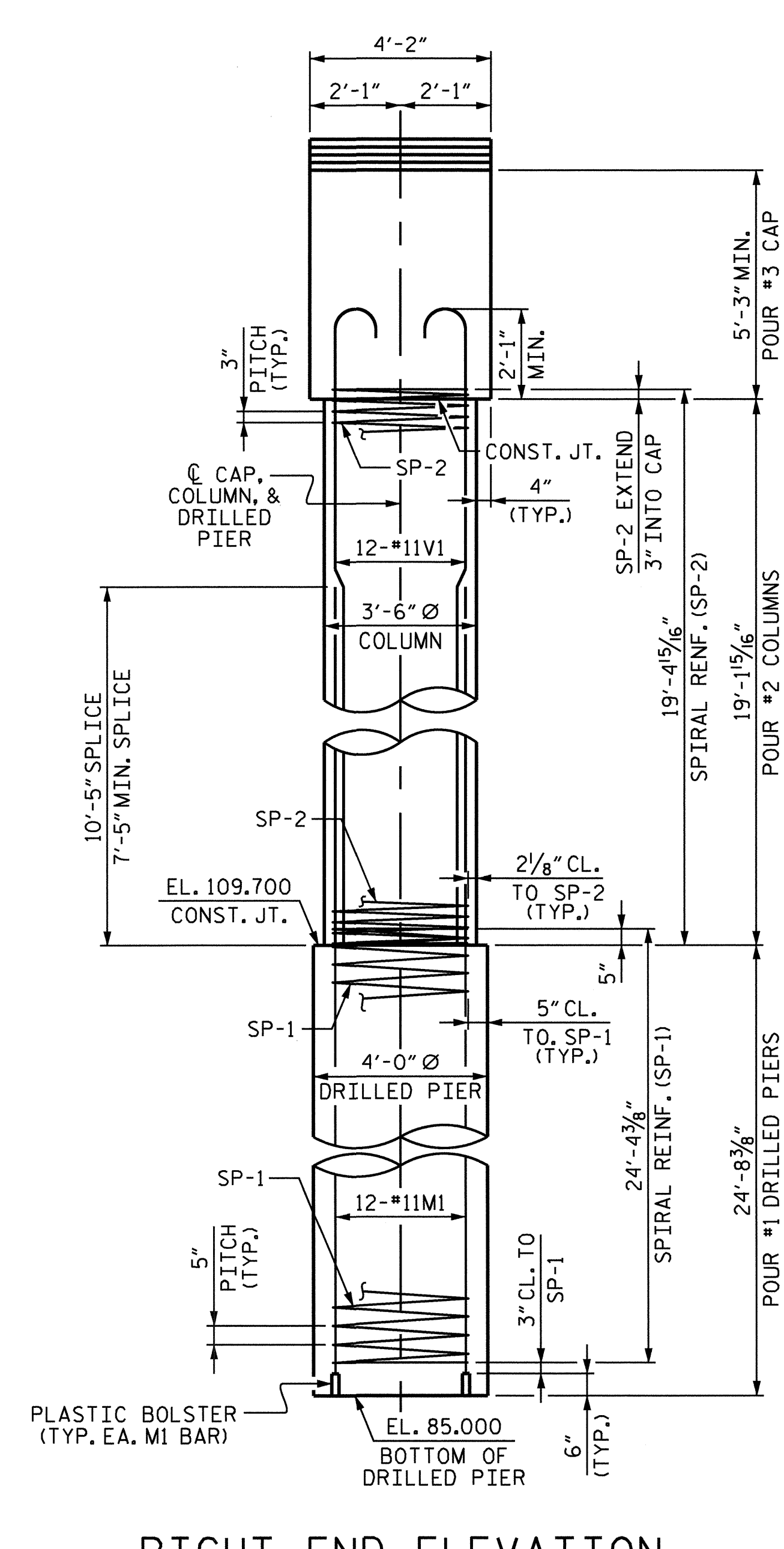
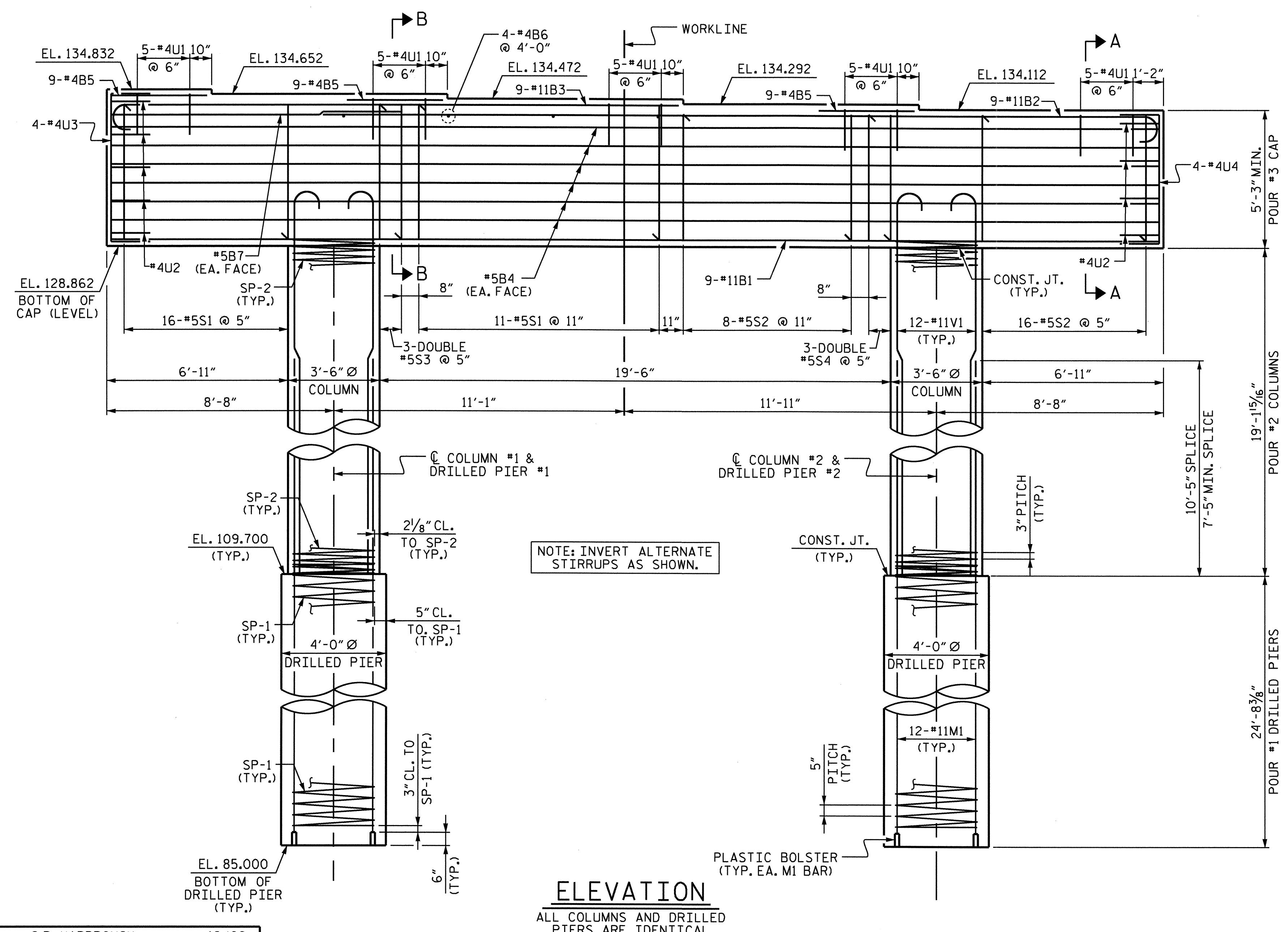
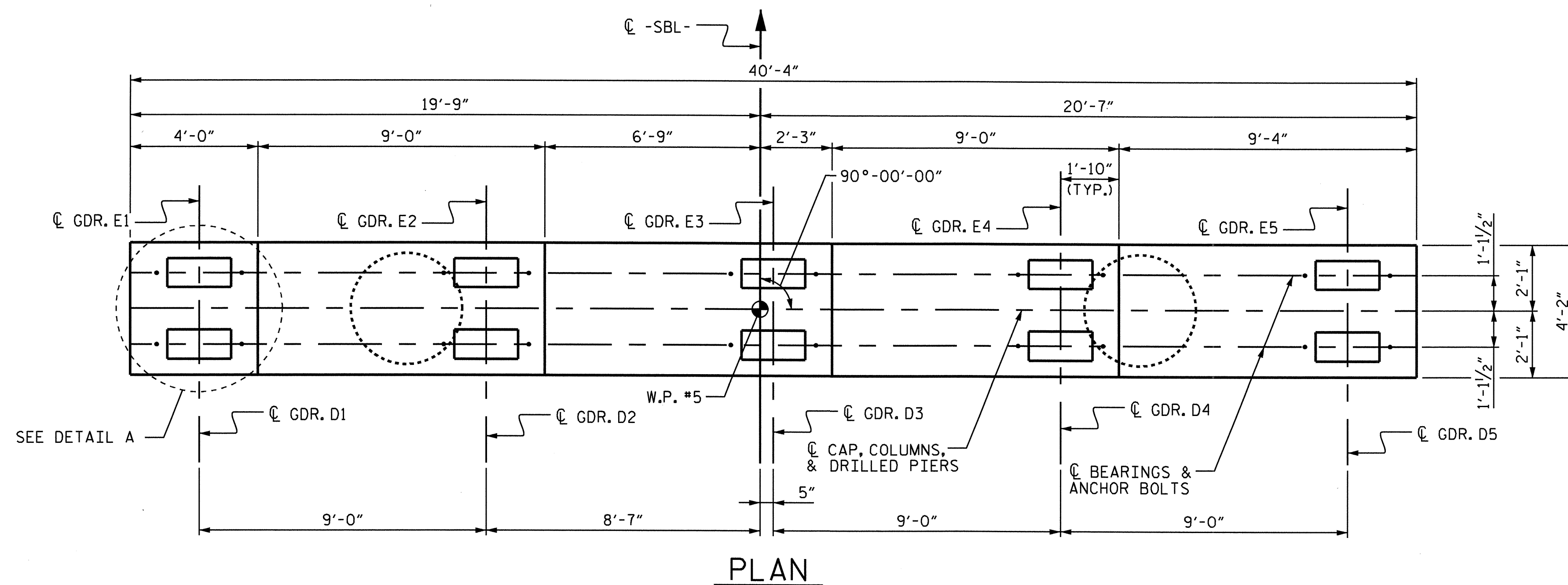
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

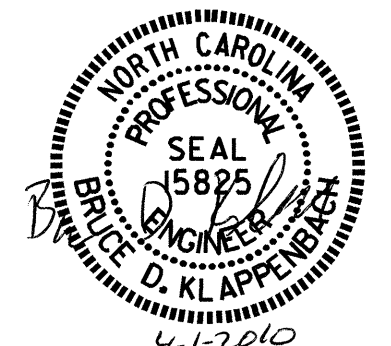
FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

**SPAN E**

**SPAN D**



**DETAIL A**



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 1 OF 2

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

TOTAL SHEETS: 59

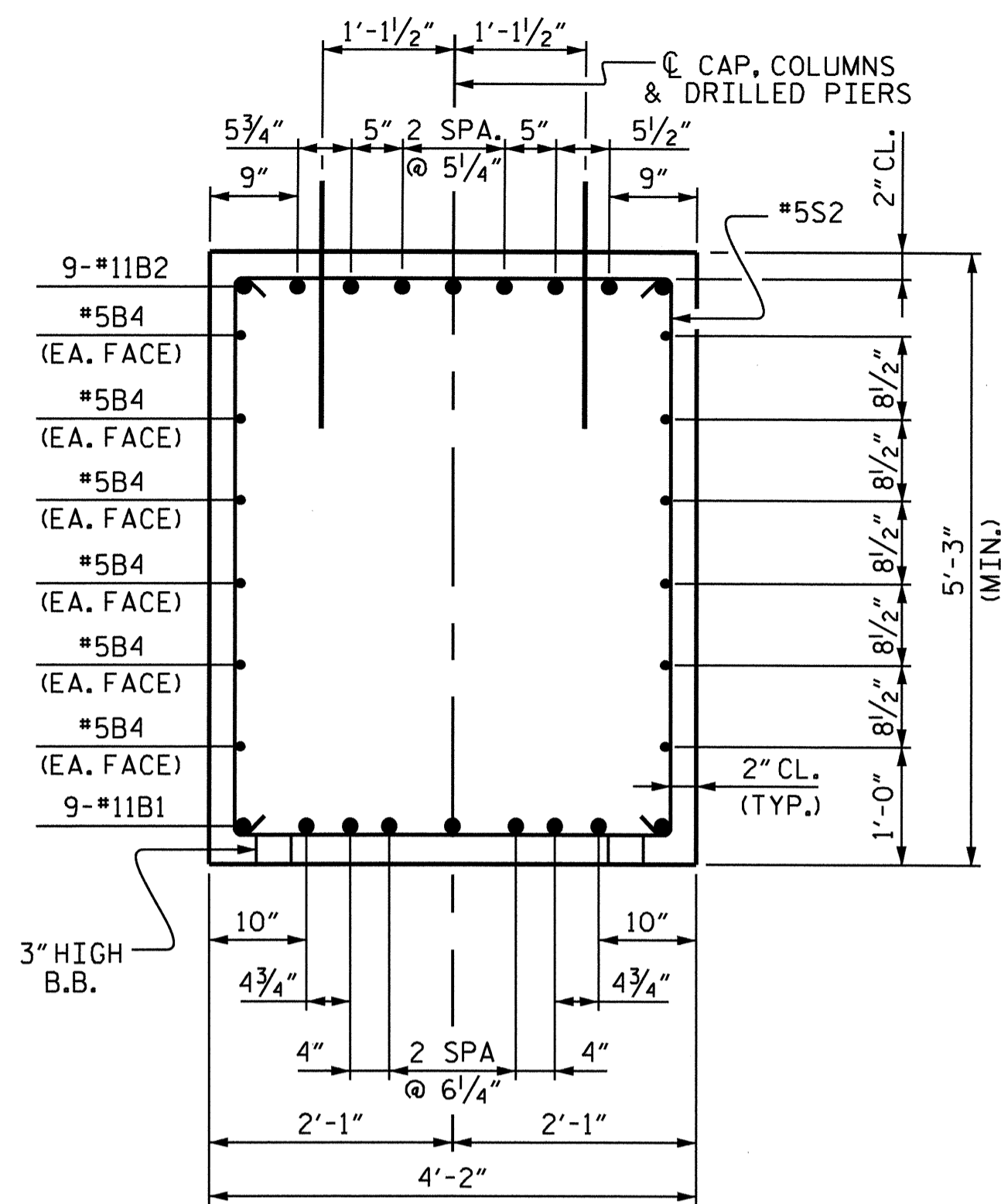
DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

31-MAR-2010 13:58  
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 cyarbro

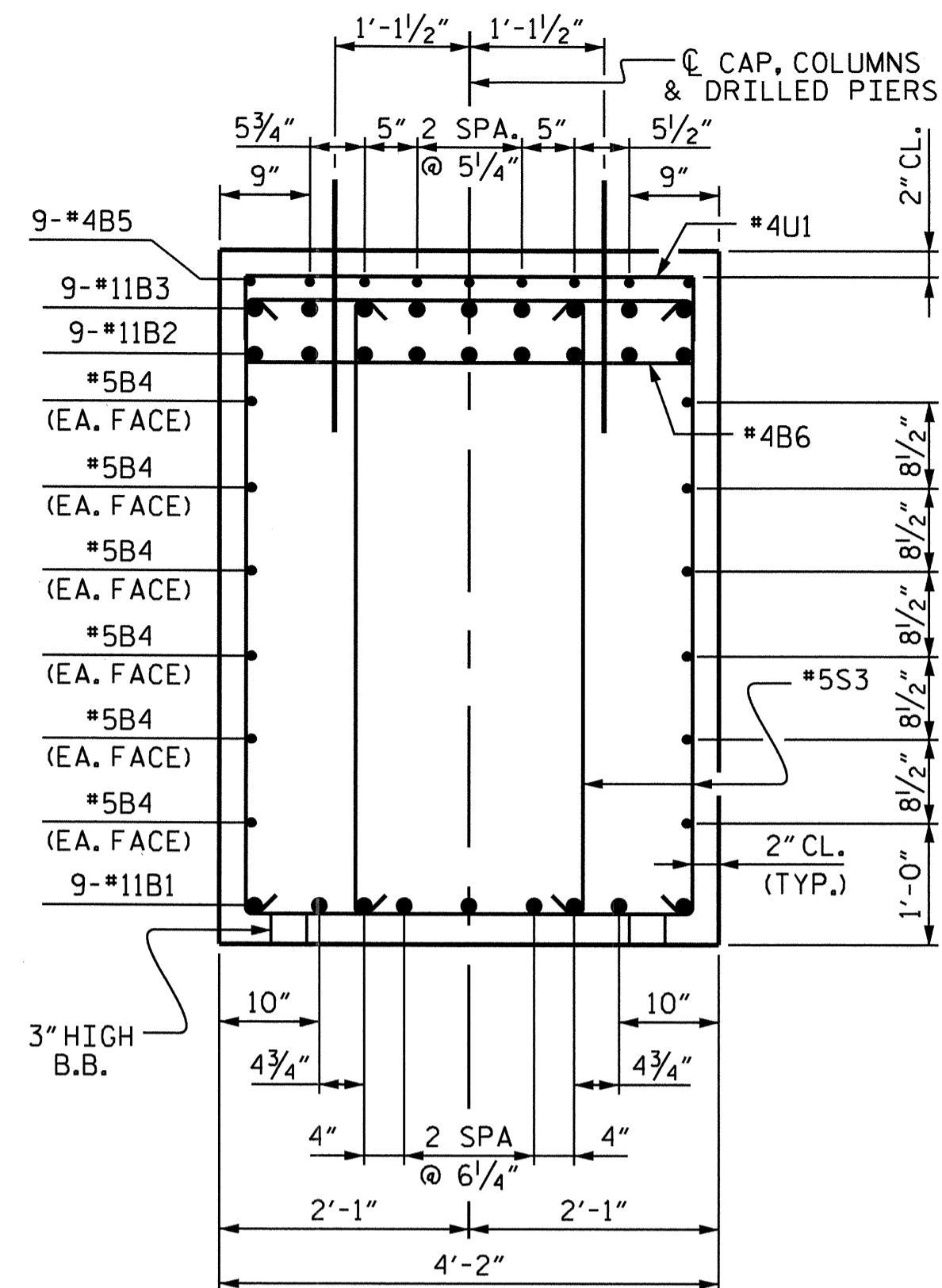
**ELEVATION**  
 ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL

**RIGHT END ELEVATION**

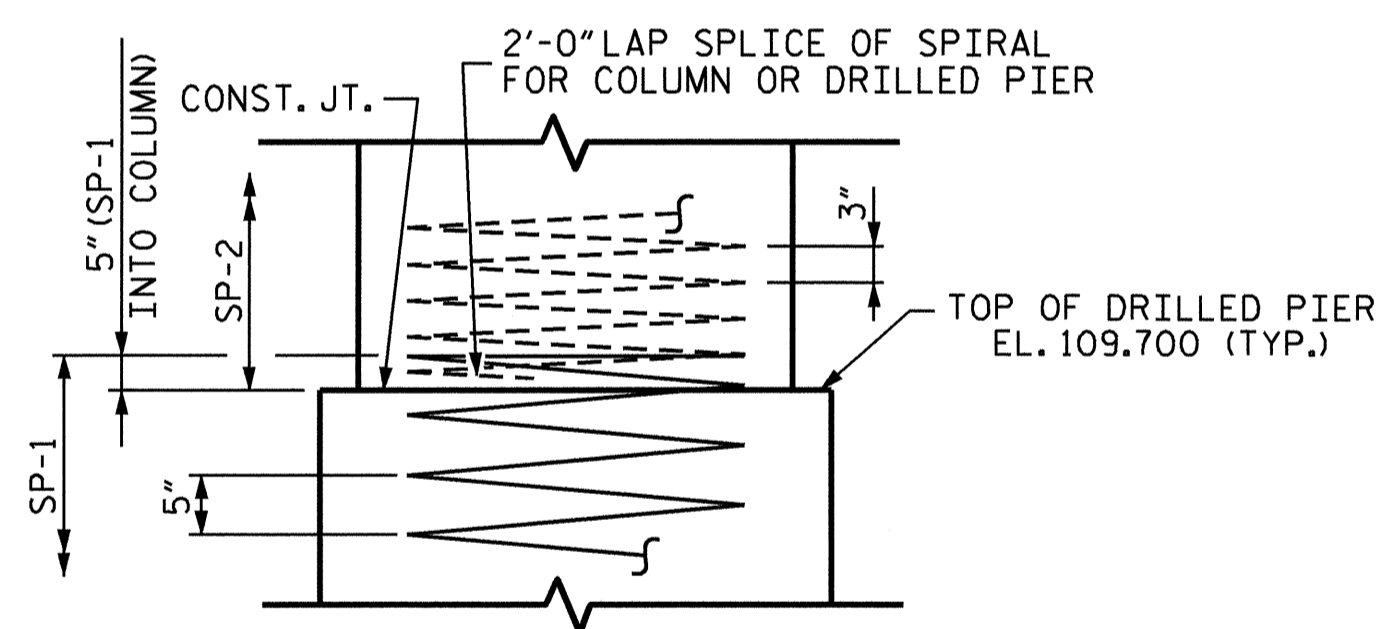
**SUBSTRUCTURE**  
**BENT #4**



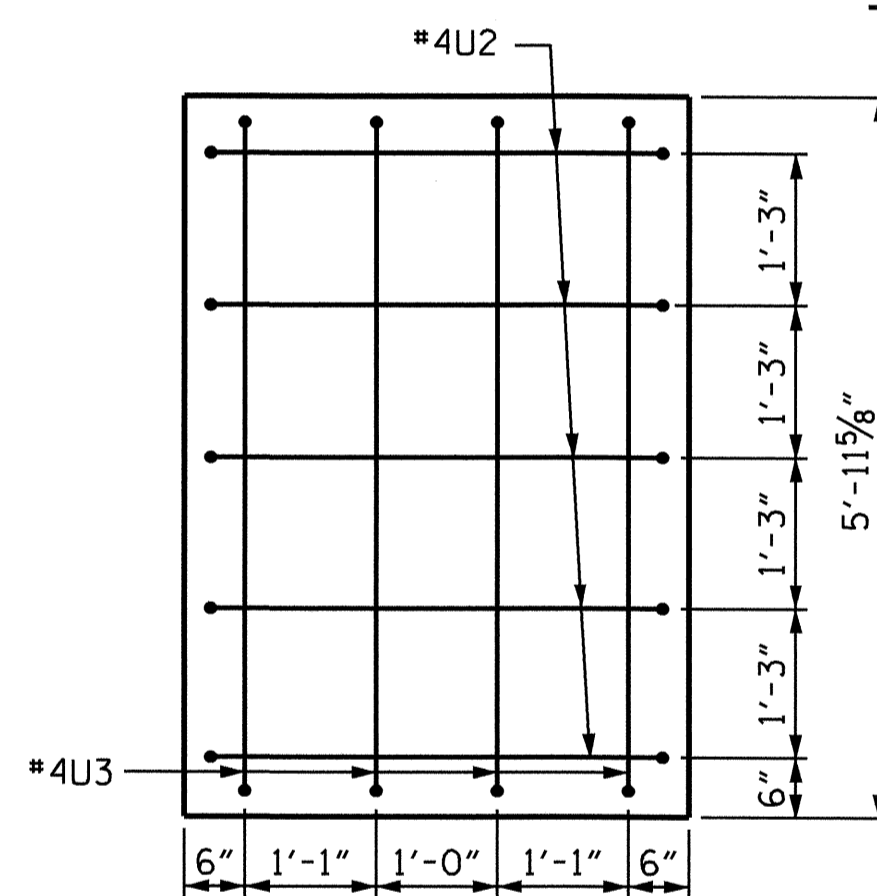
SECTION A-A



SECTION B-B

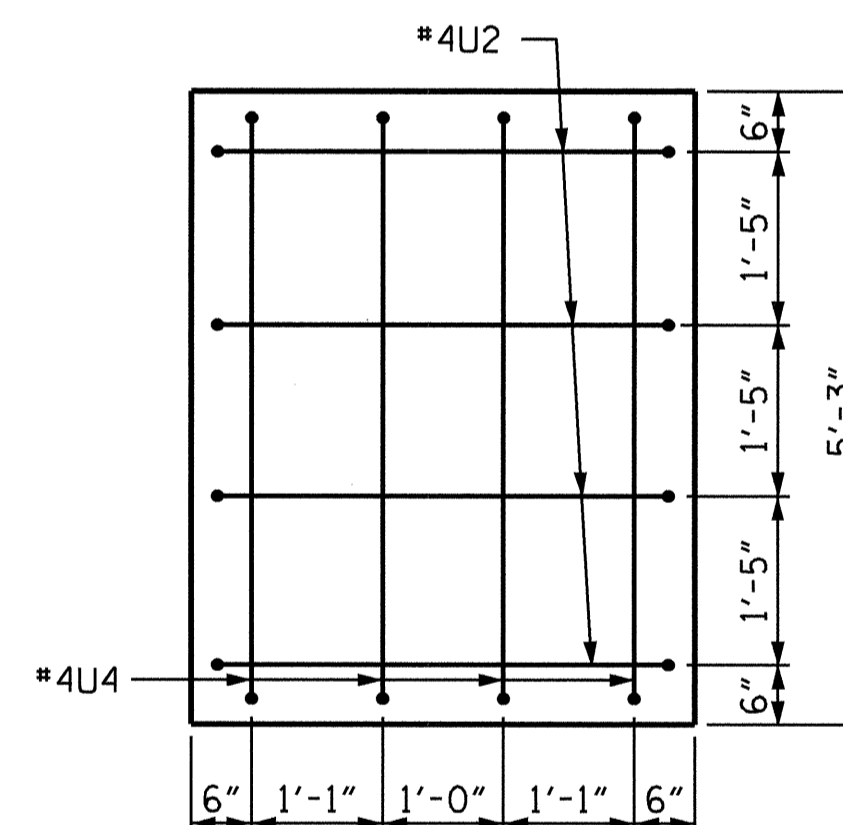


CONSTRUCTION JOINT DETAIL



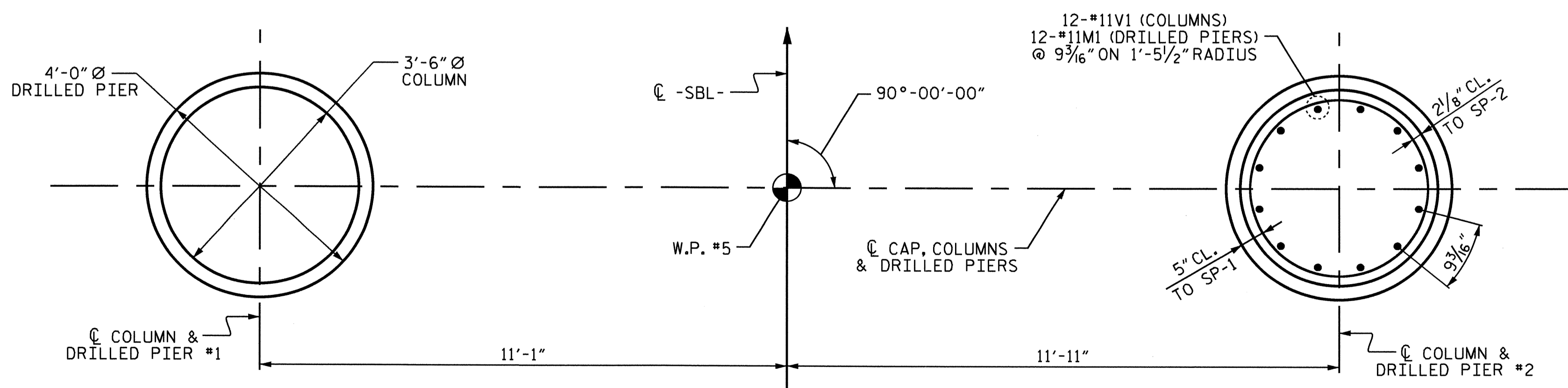
LEFT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U3 BARS



RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U4 BARS



PLAN OF COLUMNS AND DRILLED PIERS

(COLUMNS AND DRILLED PIERS ARE IDENTICAL)

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#11	STR	40'-0"	1913
B2	9	#11	1	33'-5"	1598
B3	9	#11	1	23'-2"	1108
B4	12	#5	STR	40'-0"	501
B5	27	#4	STR	3'-8"	66
B6	4	#4	STR	3'-10"	10
B7	2	#5	STR	11'-1"	23
M1	24	#11	STR	34'-8"	4420
S1	27	#5	2	15'-3"	429
S2	24	#5	2	14'-6"	363
S3	6	#5	2	14'-4"	90
S4	6	#5	2	13'-7"	85
U1	25	#4	3	6'-10"	114
U2	9	#4	3	6'-8"	40
U3	4	#4	3	8'-6"	23
U4	4	#4	3	7'-9"	21
V1	24	#11	1	22'-10"	2912
REINFORCING STEEL = 13716 LBS					
SP-1	2	*	4	586'-8"	1224
SP-2	2	**	5	771'-10"	1031
SPIRAL REINFORCING STEEL = 2255 LBS					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				13.7	C.Y.
POUR #3 (CAP)				34.6	C.Y.
TOTAL				48.3	C.Y.
DRILLED PIERS					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				23.0	C.Y.
4'-0" Ø DRILLED PIERS NOT IN SOIL				27.0	LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL				22.4	LIN. FT.
4'-0" Ø PERMANENT STEEL CASING				26.4	LIN. FT.
CSL TUBES				217.6	FT.

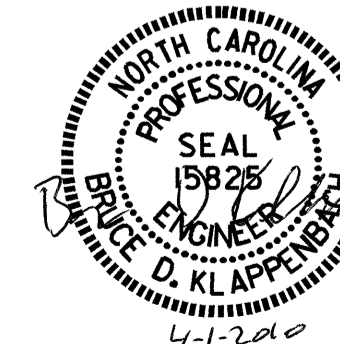
\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT #4



REVISIONS						SHEET NO. S-46
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

**NOTES**

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

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

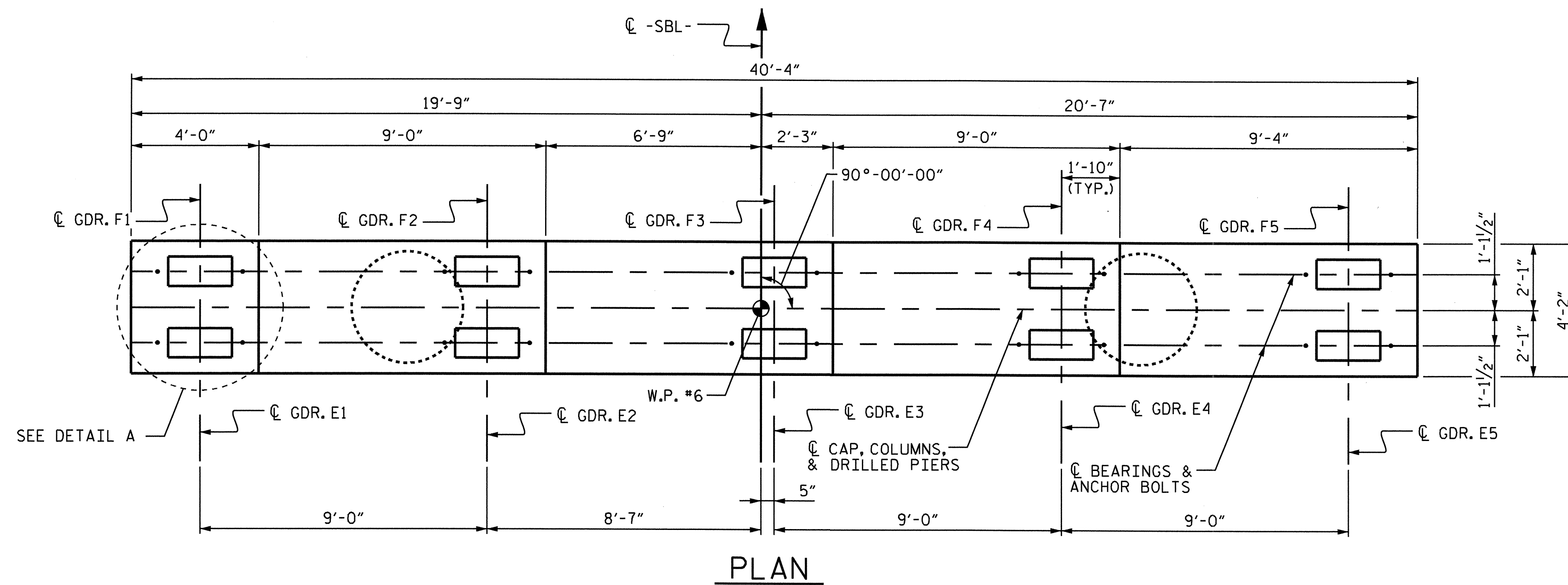
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

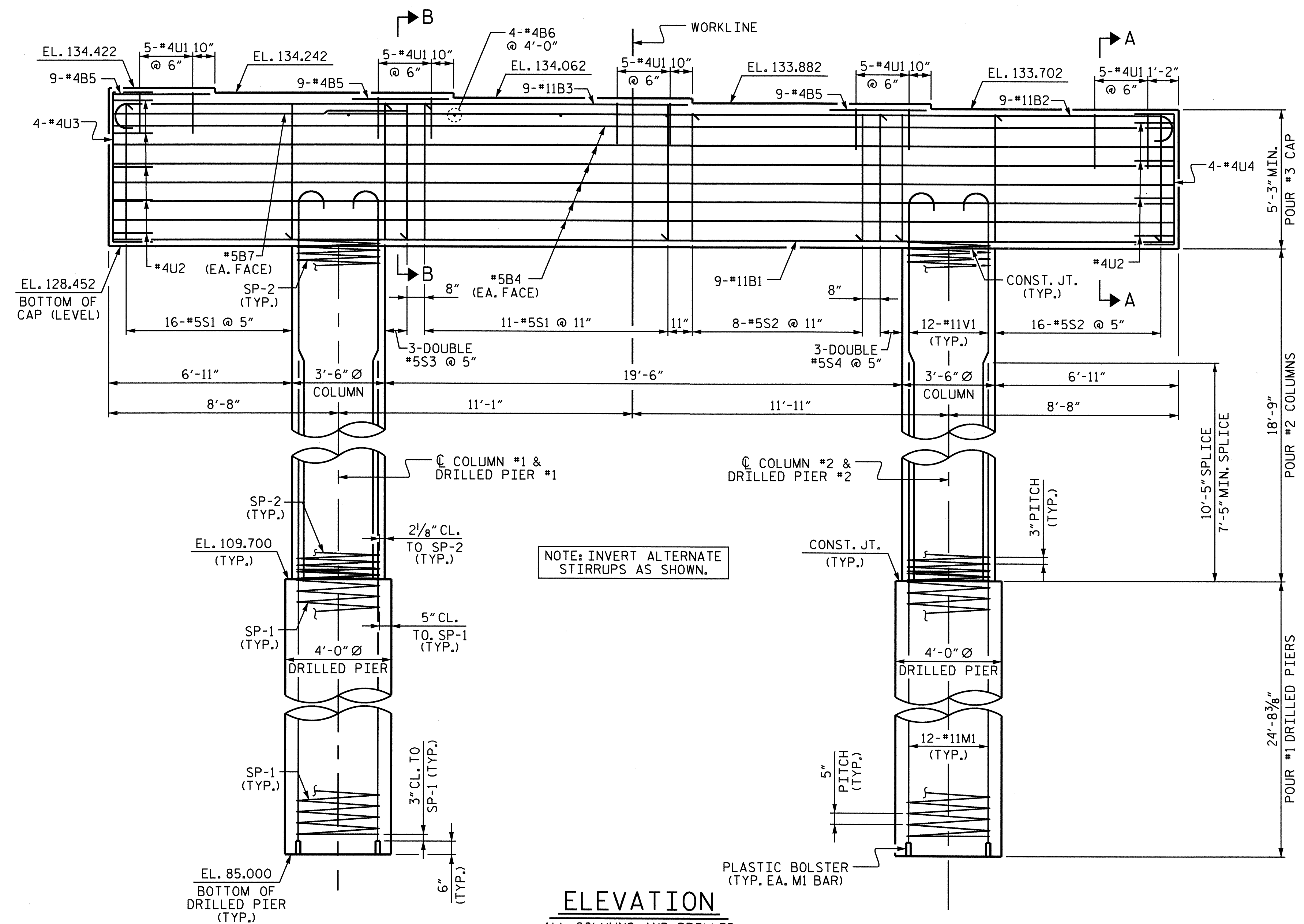
FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.

**SPAN F**

**SPAN E**

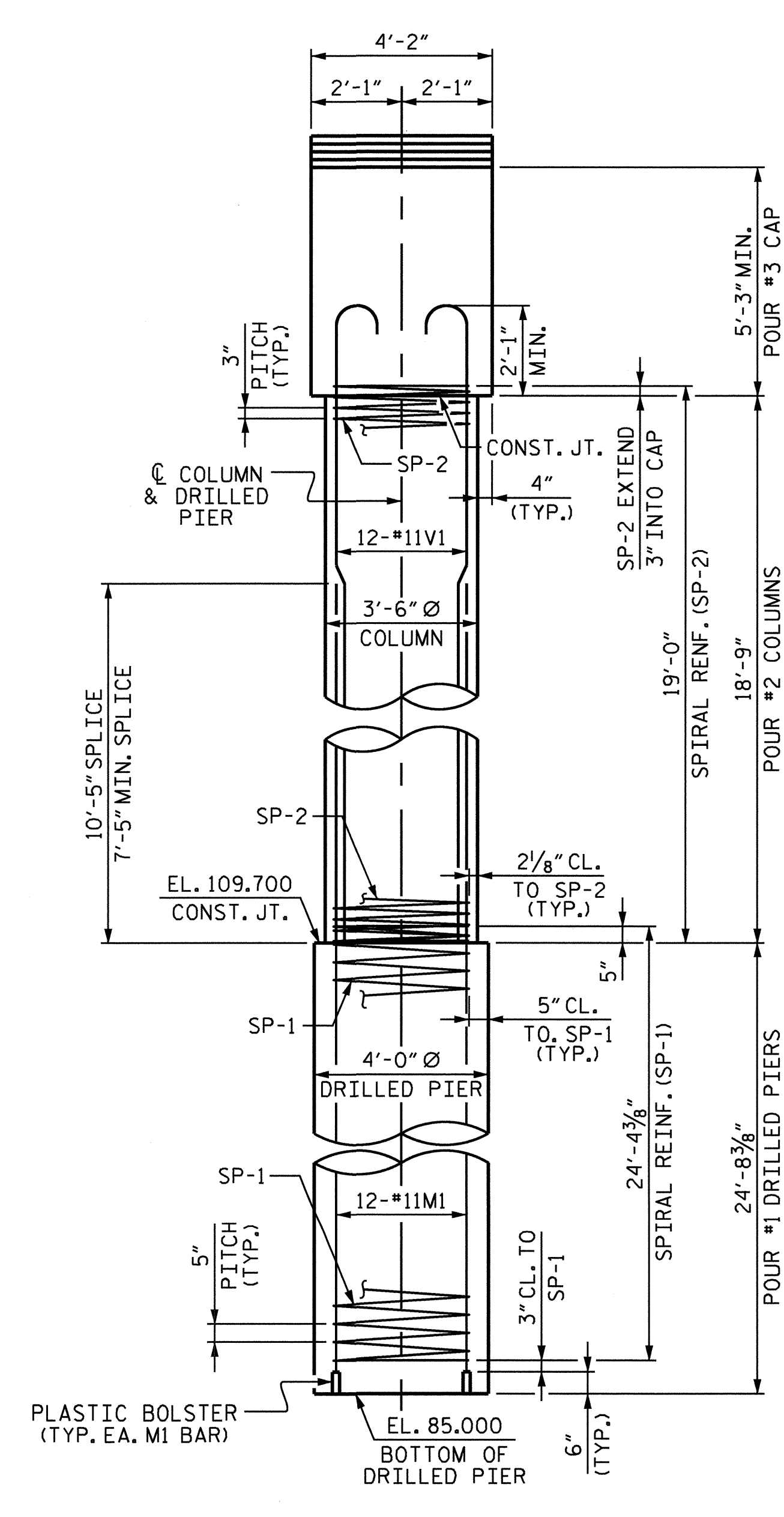


**PLAN**

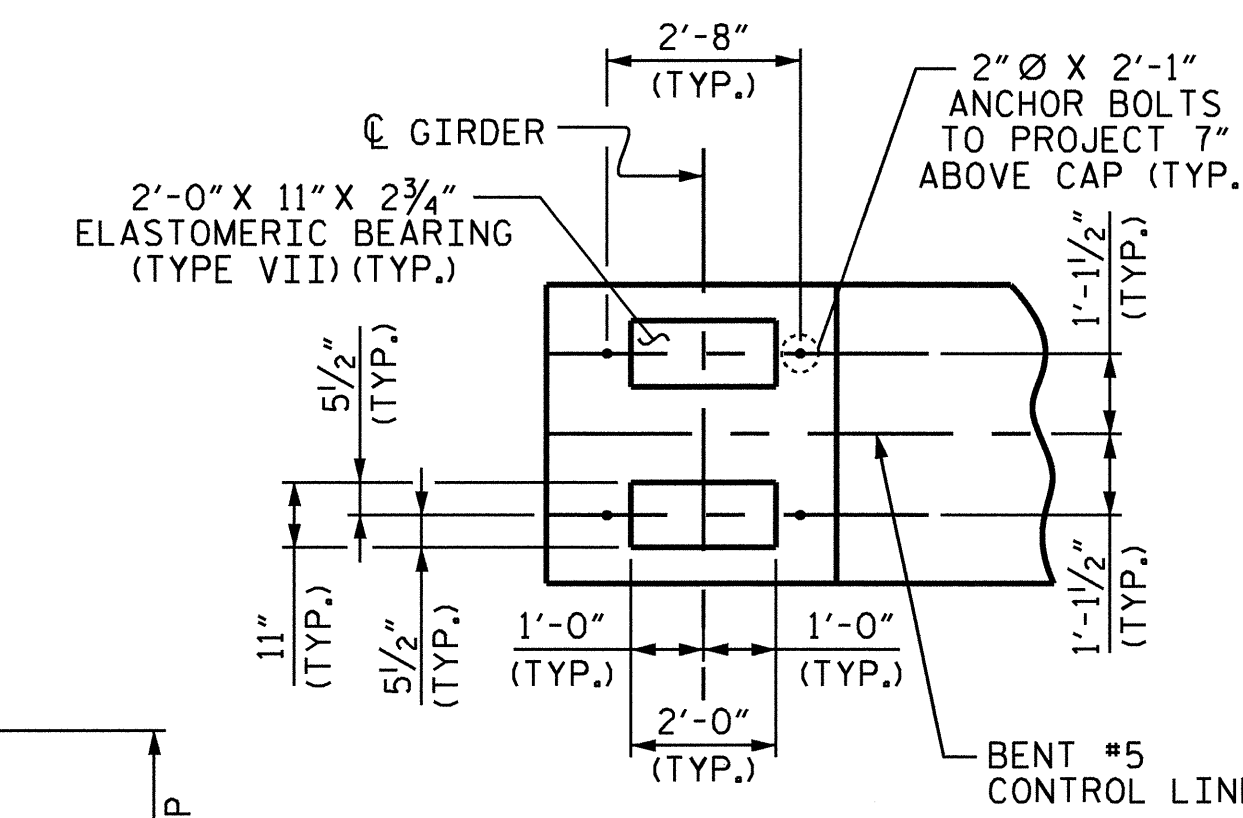


**ELEVATION**

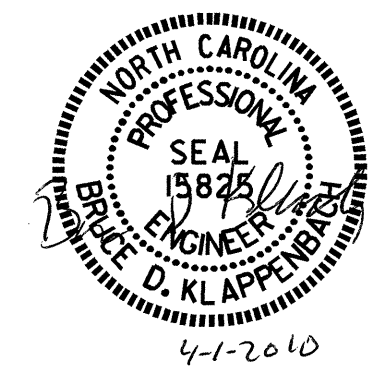
ALL COLUMNS AND DRILLED PIERS ARE IDENTICAL



**RIGHT END ELEVATION**



**DETAIL A**



PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

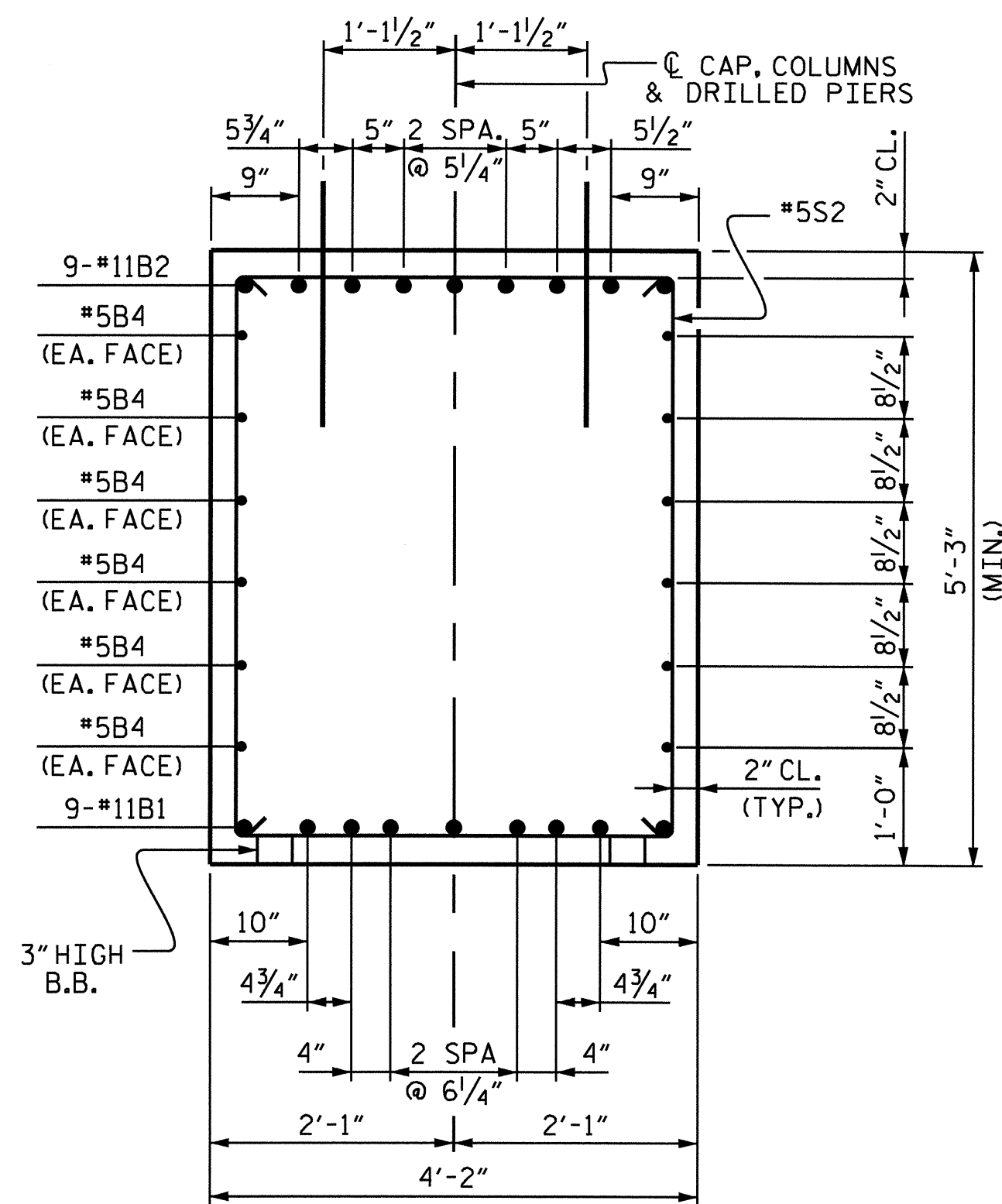
SHEET 1 OF 2

REVISIONS						SHEET NO. S-47
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

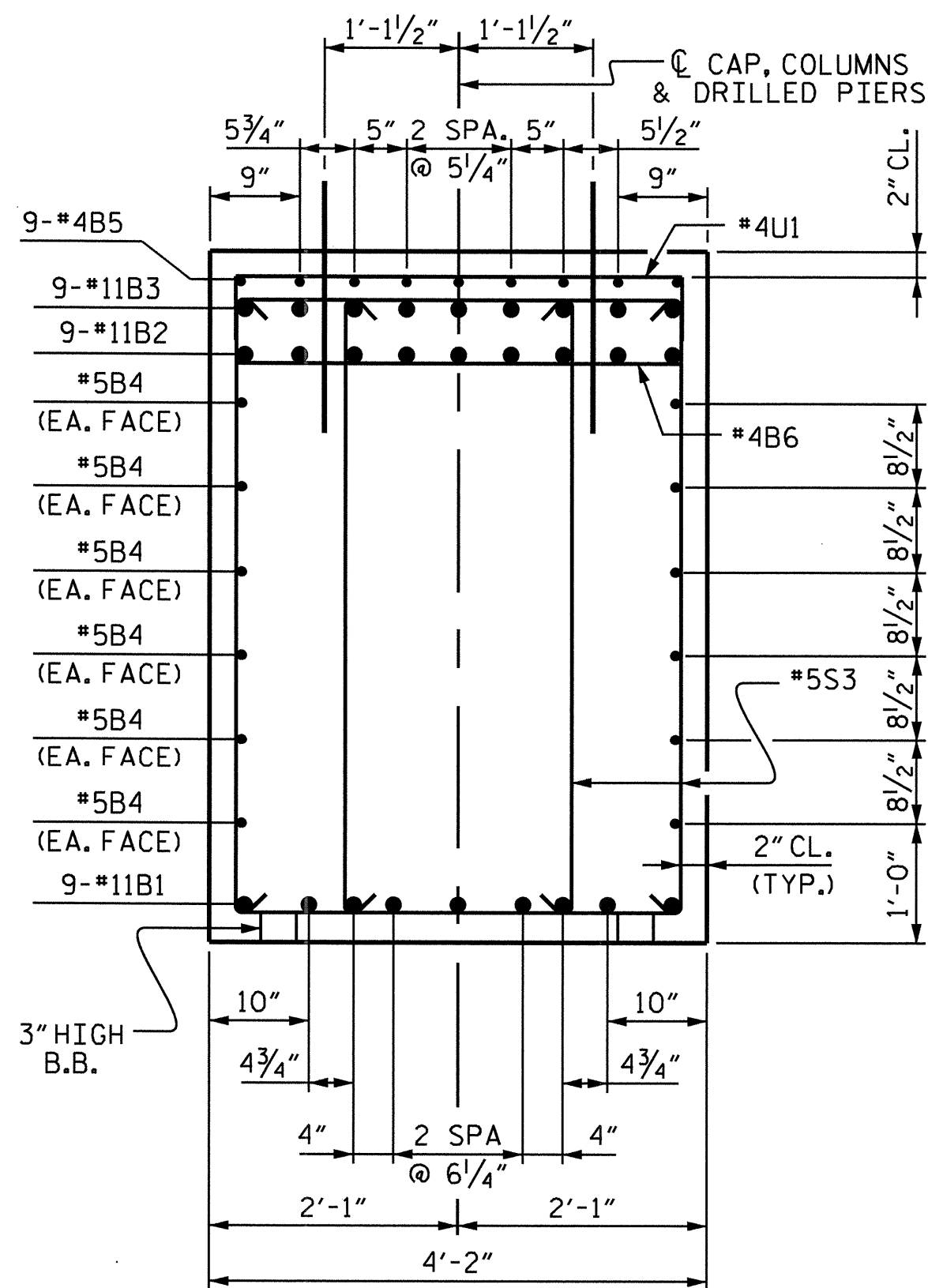
DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

31-MAR-2010 13:57  
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 cyarbro

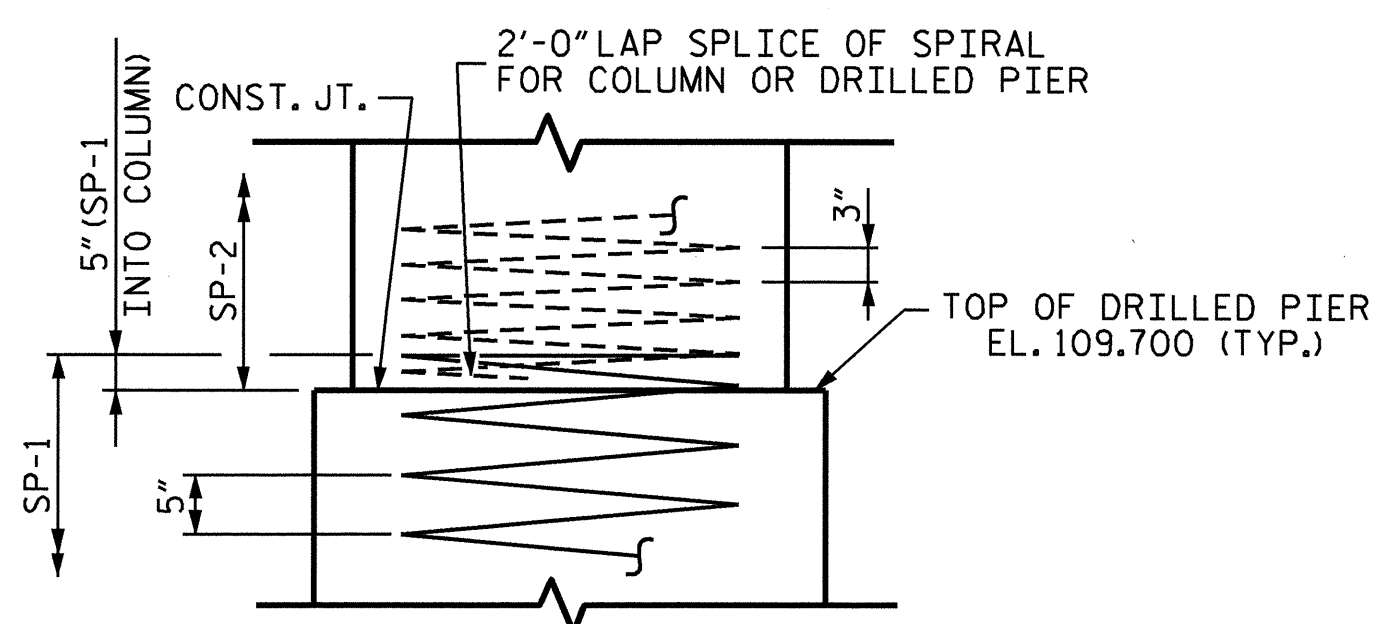




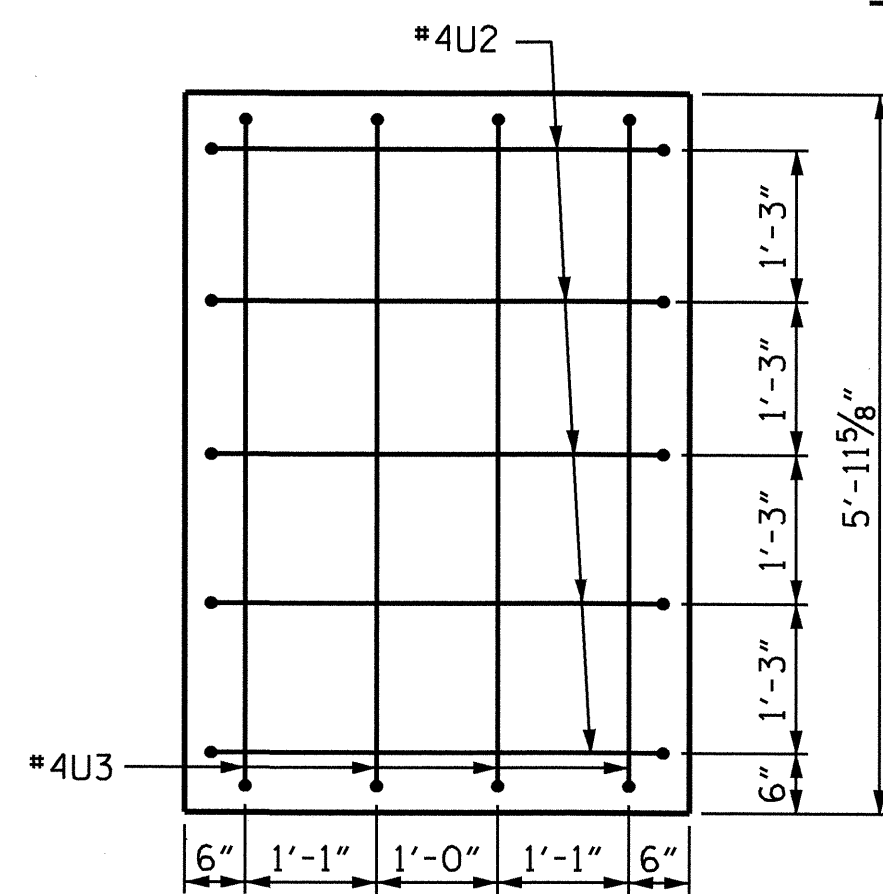
SECTION A-A



SECTION B-B

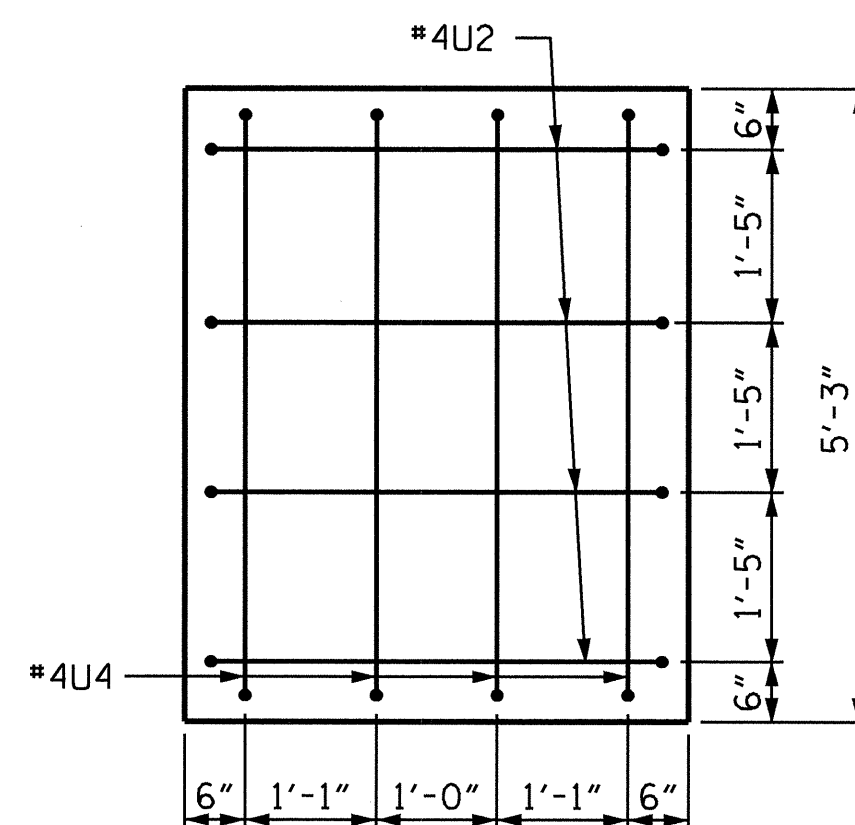


CONSTRUCTION JOINT DETAIL



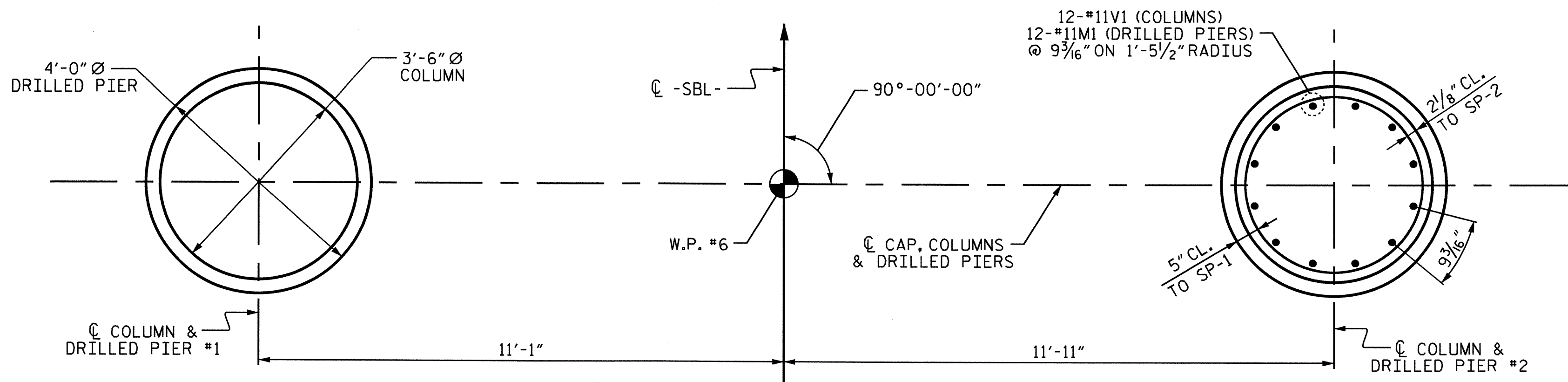
LEFT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U3 BARS



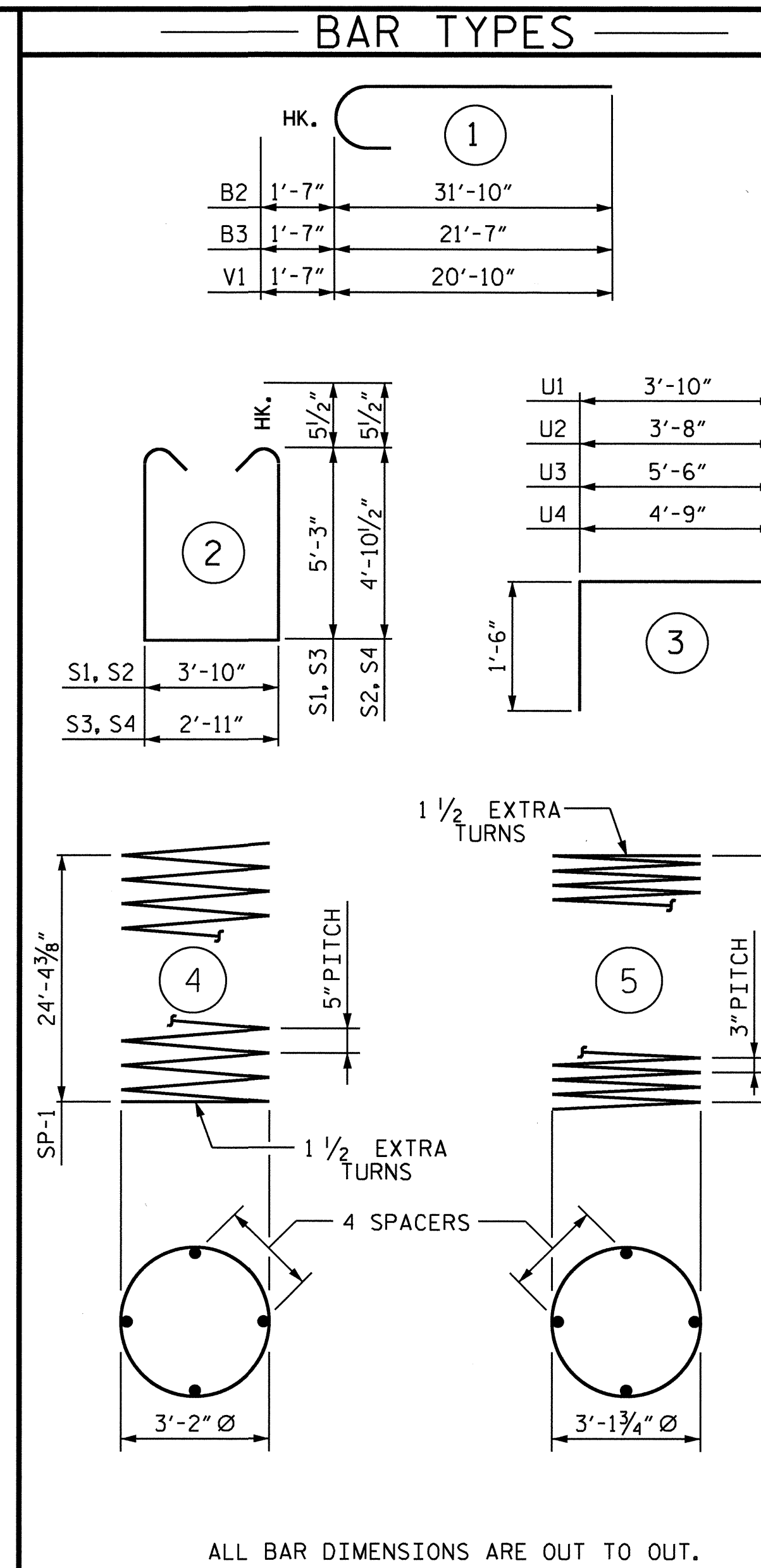
RIGHT END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2 AND #4U4 BARS



PLAN OF COLUMNS AND DRILLED PIERS

(COLUMNS AND DRILLED PIERS ARE IDENTICAL)



\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
 \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#11	STR	40'-0"	1913
B2	9	#11	1	33'-5"	1598
B3	9	#11	1	23'-2"	1108
B4	12	#5	STR	40'-0"	501
B5	27	#4	STR	3'-8"	66
B6	4	#4	STR	3'-10"	10
B7	2	#5	STR	11'-1"	23

M1	24	#11	STR	34'-8"	4420
S1	27	#5	2	15'-3"	429
S2	24	#5	2	14'-6"	363
S3	6	#5	2	14'-4"	90
S4	6	#5	2	13'-7"	85

U1	25	#4	3	6'-10"	114
U2	9	#4	3	6'-8"	40
U3	4	#4	3	8'-6"	23
U4	4	#4	3	7'-9"	21

V1	24	#11	1	22'-5"	2858
----	----	-----	---	--------	------

REINFORCING STEEL = 13662 LBS

SP-1	2	*	4	586'-8"	1224
SP-2	2	**	5	754'-10"	1008

SPIRAL REINFORCING STEEL = 2232 LBS

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	13.4 C.Y.
POUR #3 (CAP)	34.6 C.Y.

TOTAL 48.0 C.Y.

DRILLED PIERS

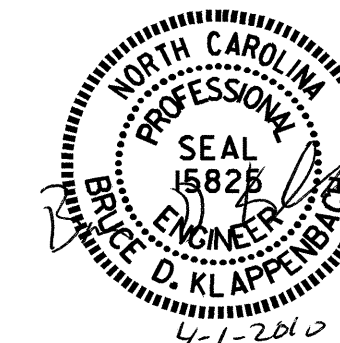
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	23.0 C.Y.
4'-0" Ø DRILLED PIERS NOT IN SOIL	25.0 LIN. FT.
4'-0" Ø DRILLED PIERS IN SOIL	24.4 LIN. FT.
4'-0" Ø PERMANENT STEEL CASING	28.4 LIN. FT.
CSL TUBES	217.6 FT.

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 HARNETT COUNTY  
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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 RALEIGH

SUBSTRUCTURE  
 BENT #5



REVISIONS						SHEET NO. S-48
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

DRAWN BY: C.R. YARBROUGH DATE: 12/09  
 CHECKED BY: D.A. GLADDEN DATE: 01/10

# NOTES

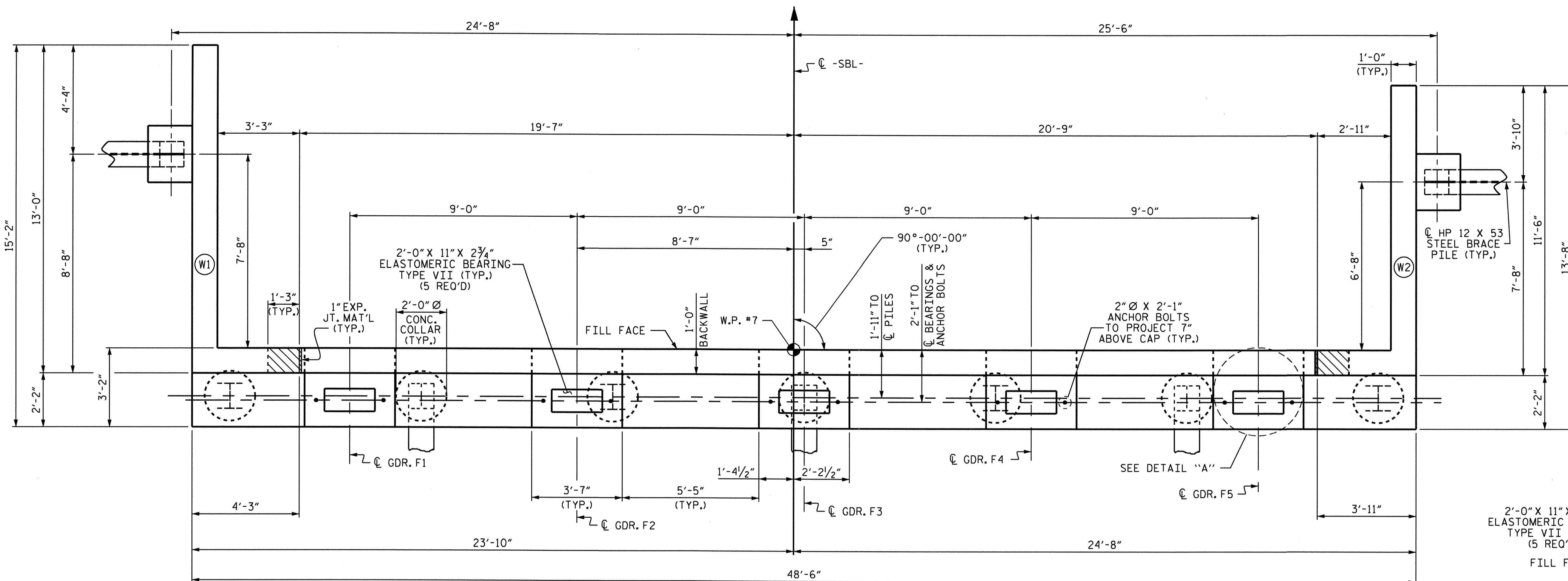
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

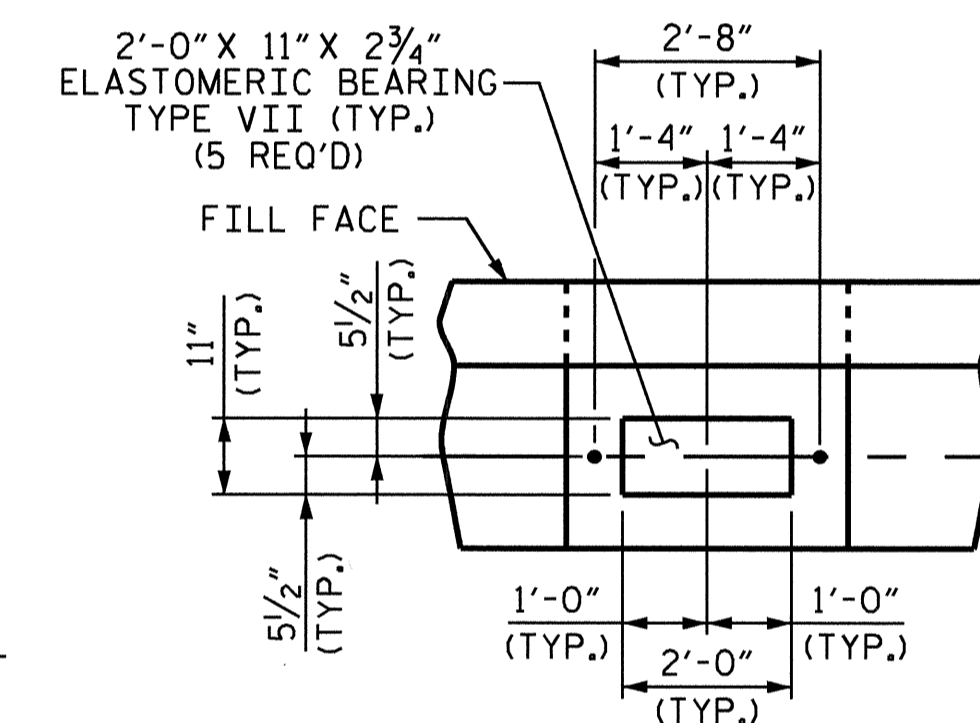
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE. THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

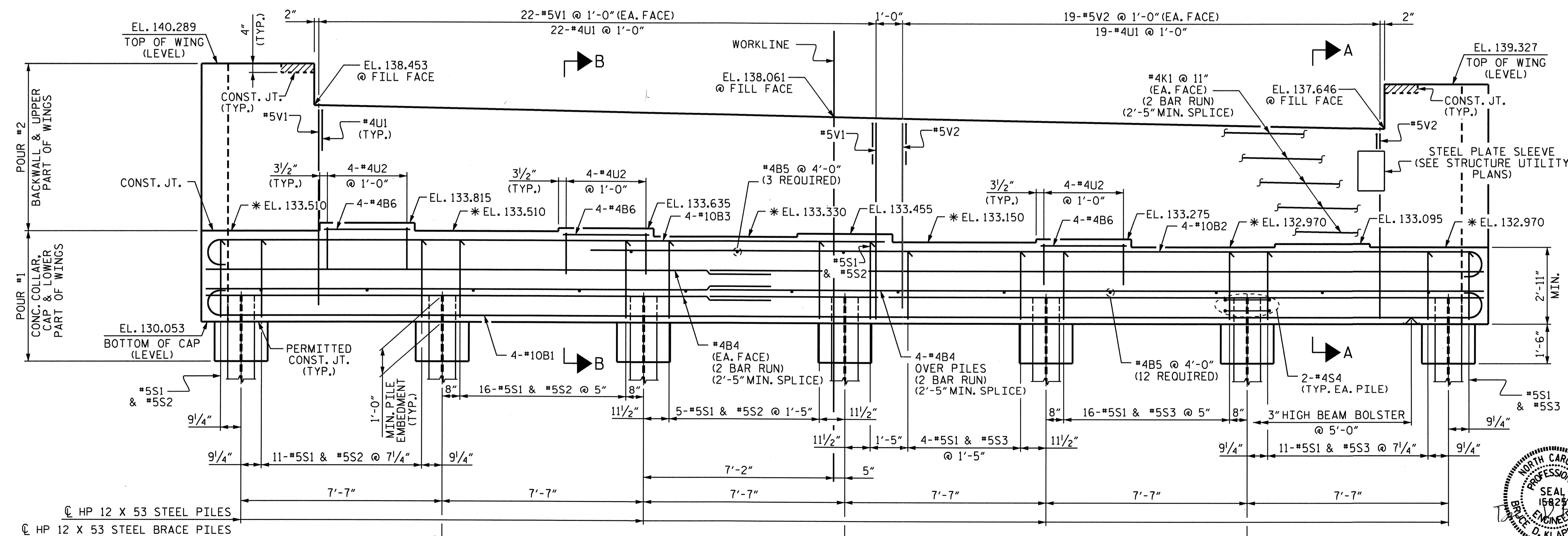
REINFORCING STEEL IN BACKWALL SHALL BE FIELD CUT AS NECESSARY TO AVOID INTERFERENCE WITH THE STEEL PLATE SLEEVE. FOR LOCATION OF STEEL PLATE SLEEVE, SEE STRUCTURE UTILITY PLANS.



**PLAN**



**DETAIL A**



**ELEVATION**

(WING PILES NOT SHOWN FOR CLARITY)

DRAWN BY : C.R. YARBROUGH DATE : 11/09  
 CHECKED BY : M.G. SHAIKH DATE : 01/10

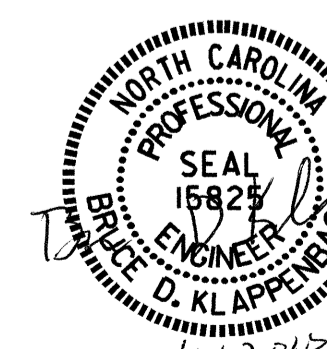
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 cyarbro

PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

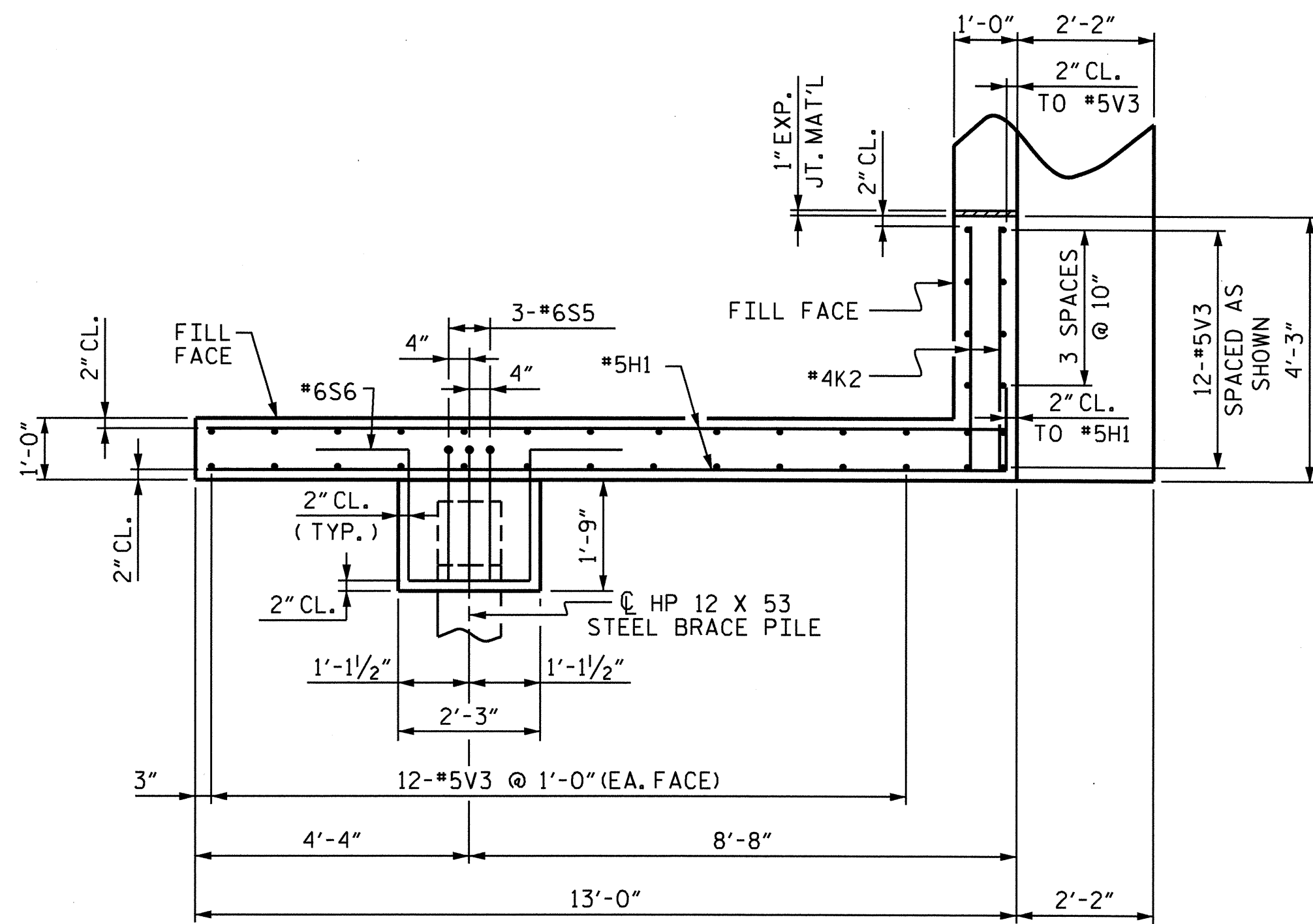
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

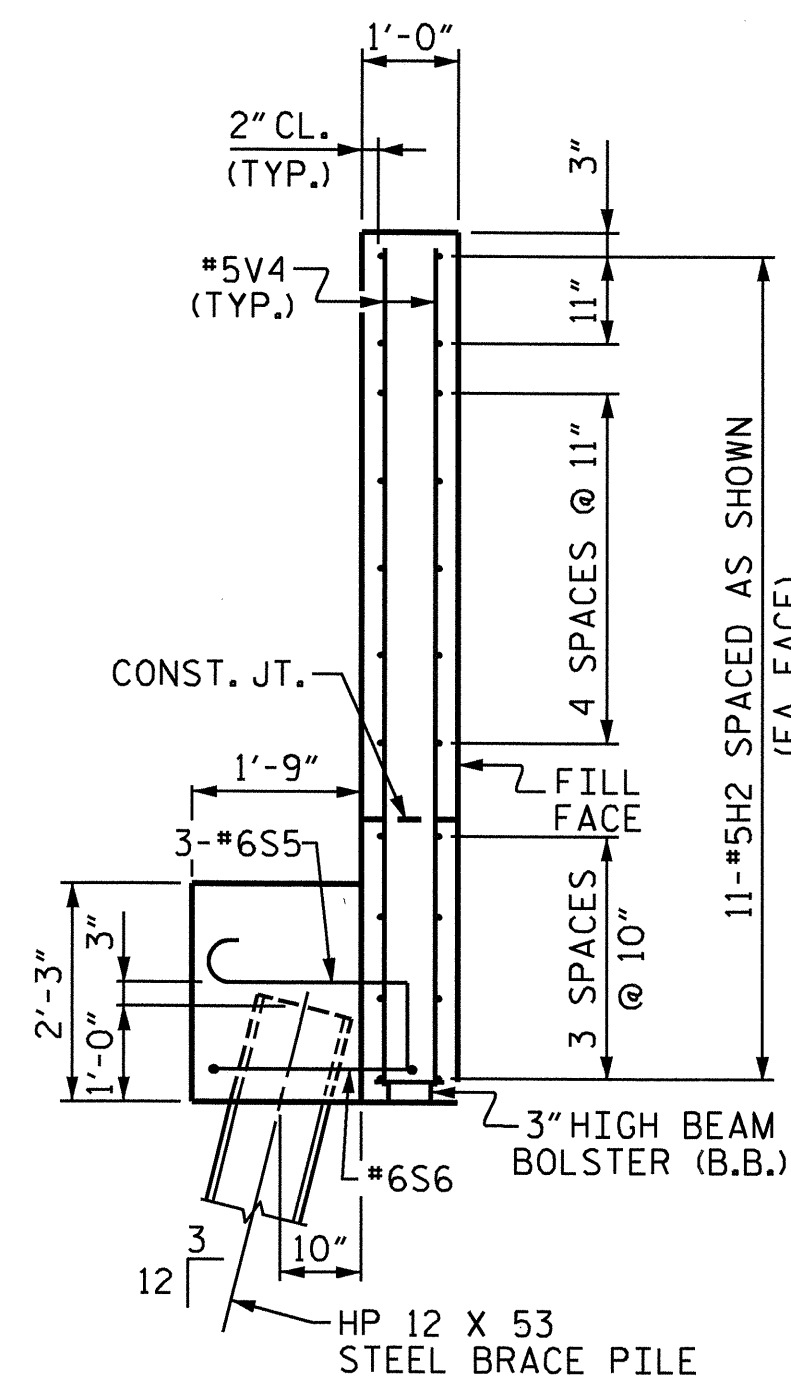
## SUBSTRUCTURE END BENT #2



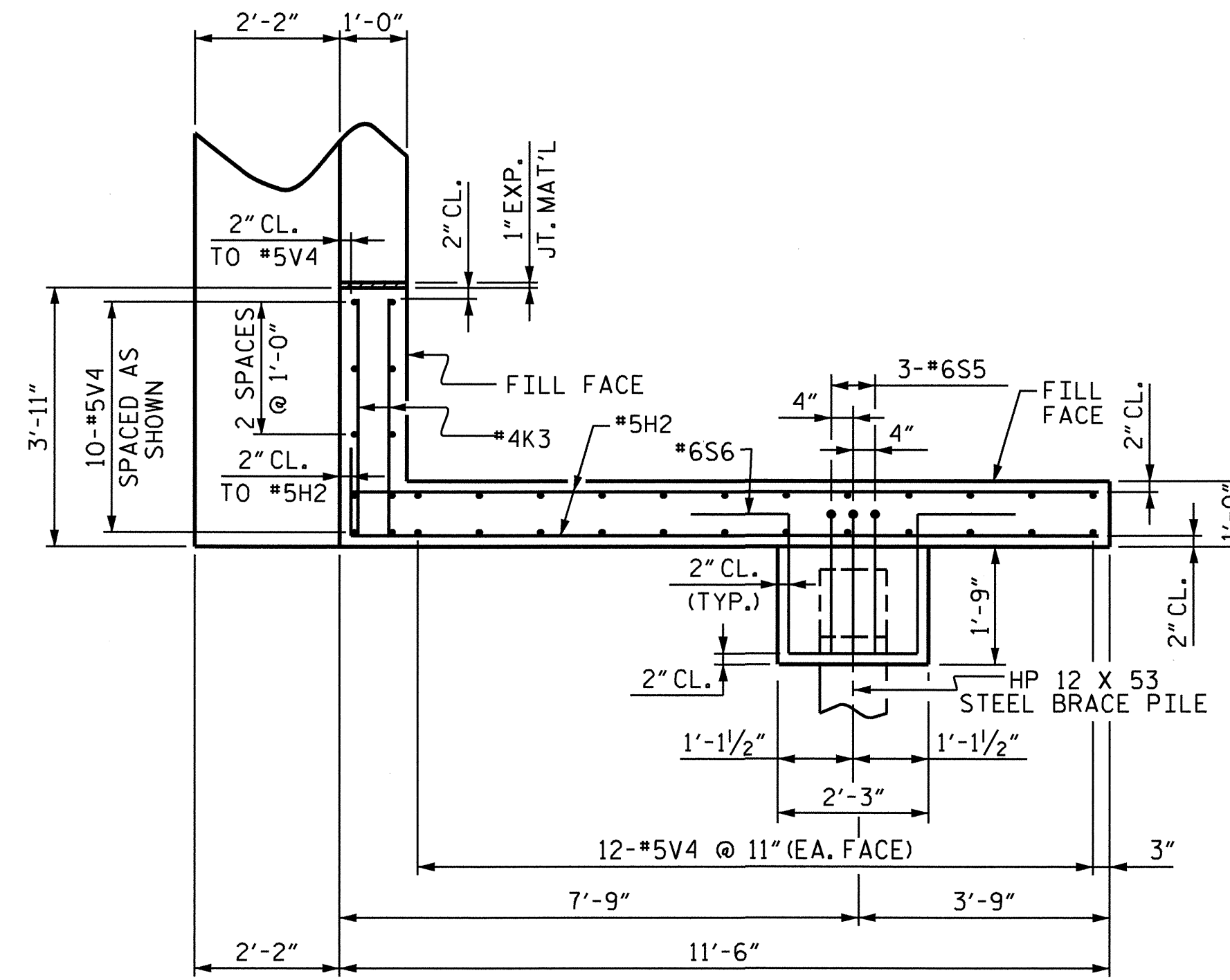
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS 59					



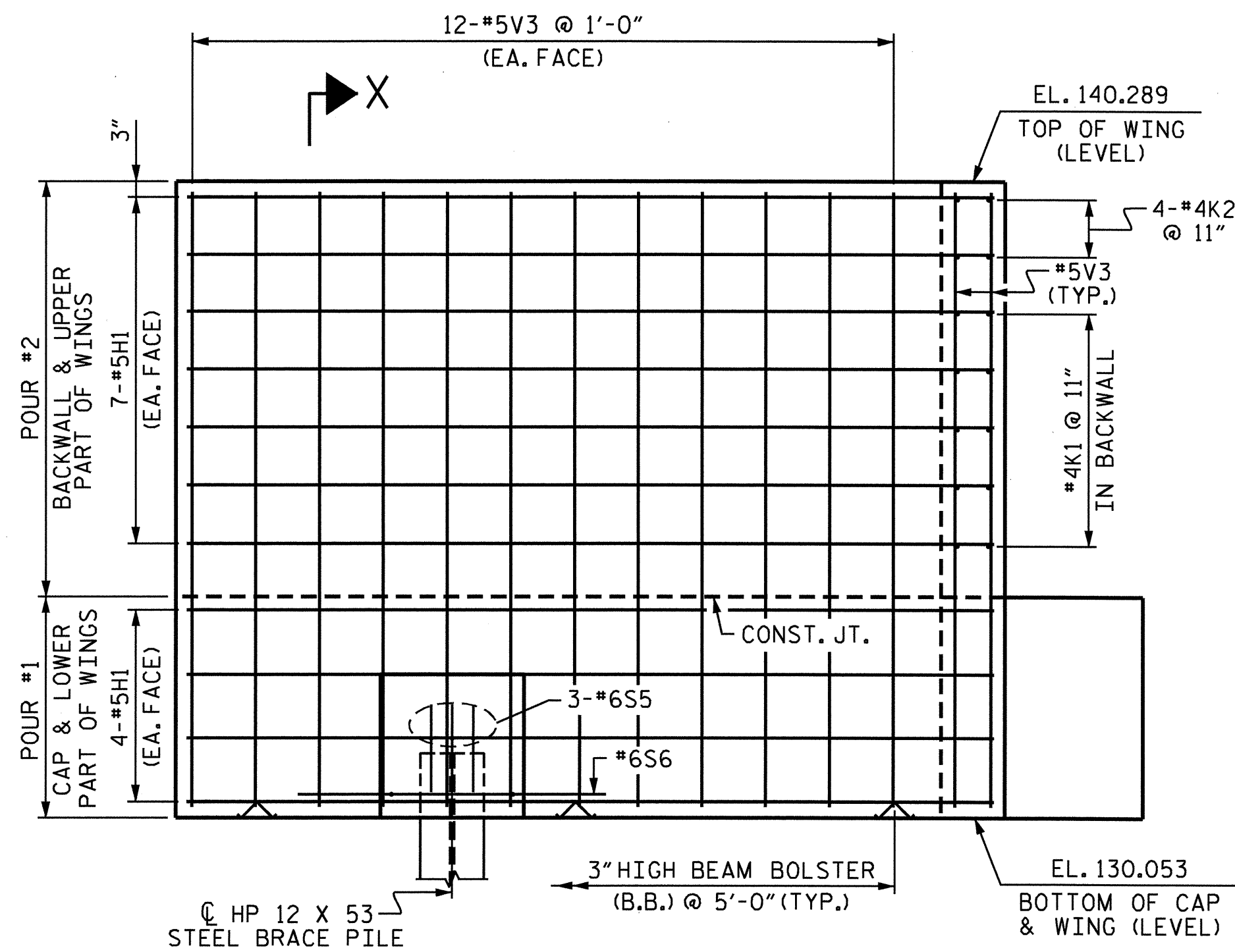
PLAN OF LEFT WING (W1)



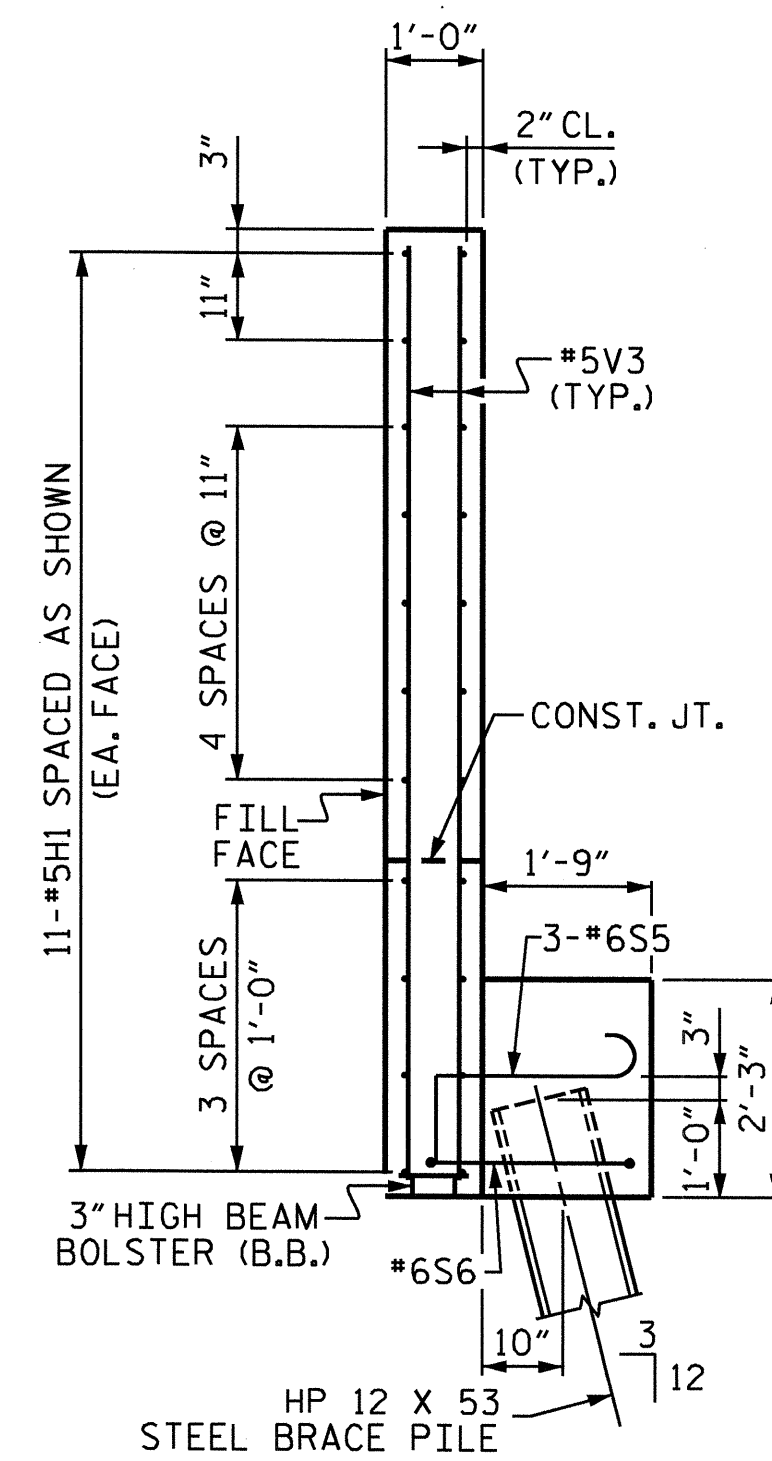
SECTION Y-Y



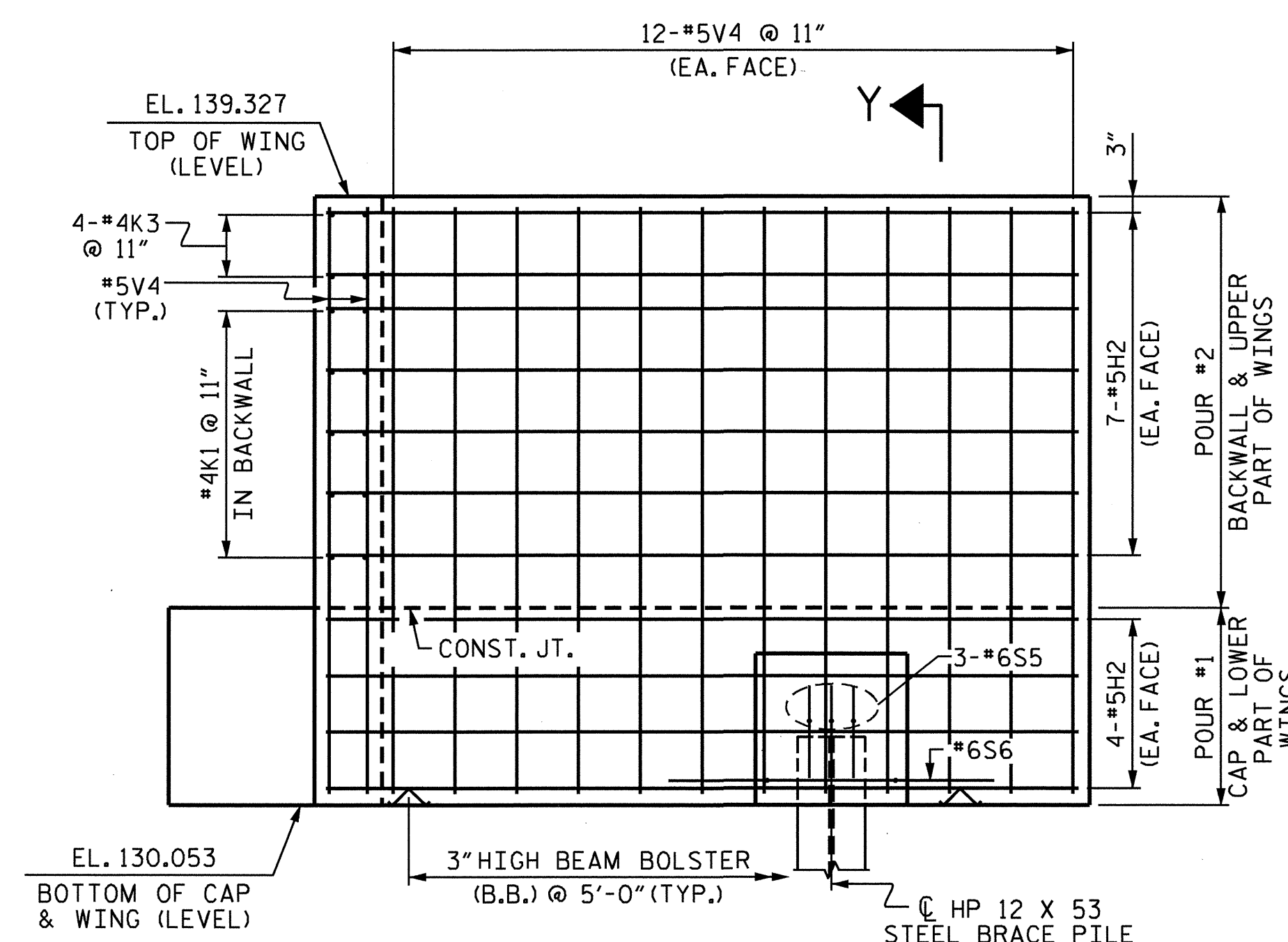
PLAN OF RIGHT WING (W2)



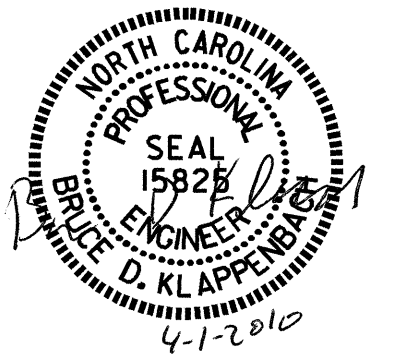
ELEVATION OF LEFT WING (W1)



SECTION X-X



ELEVATION OF RIGHT WING (W2)



PROJECT NO. B-4138  
 HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 2 OF 3

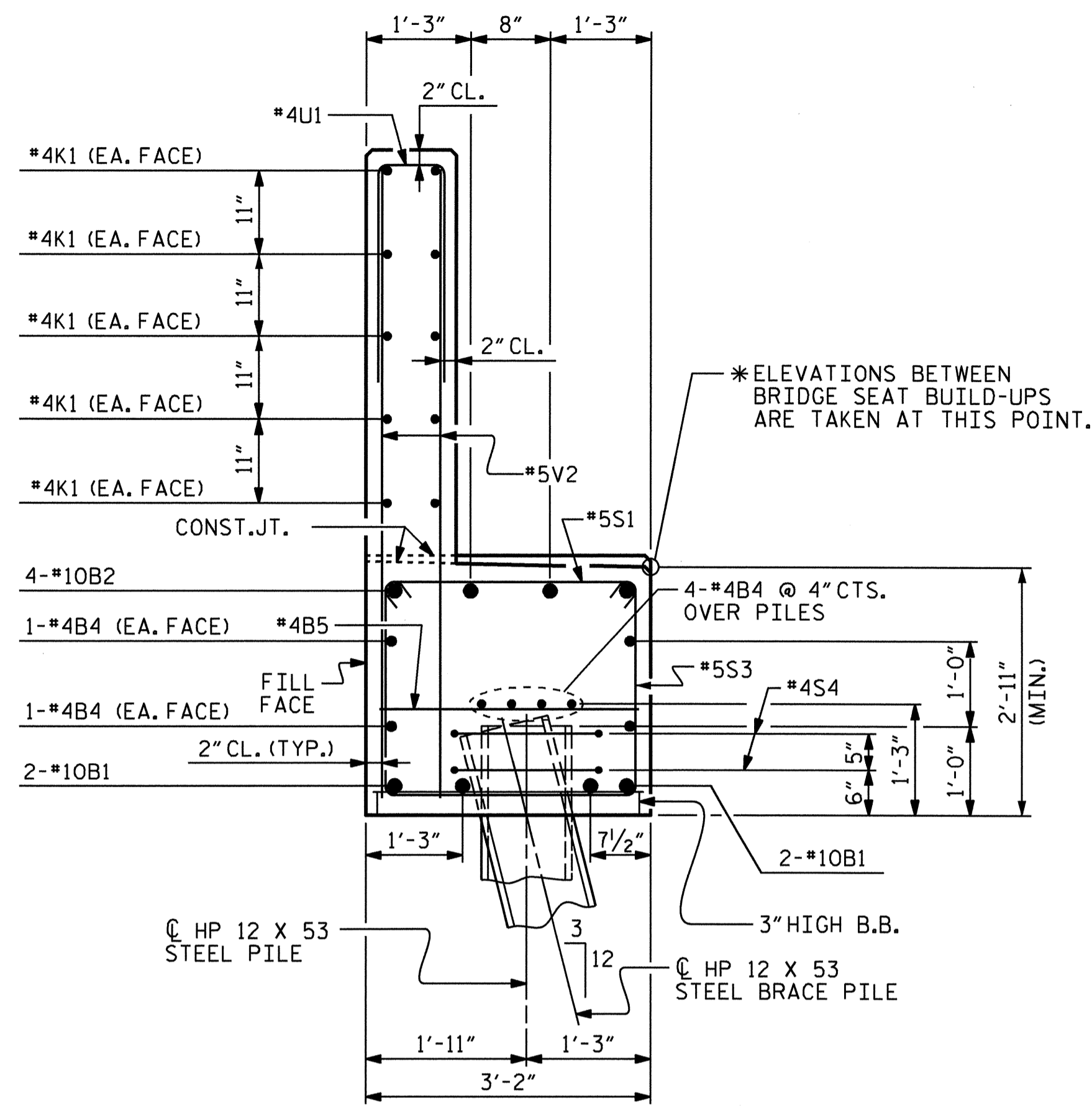
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #2

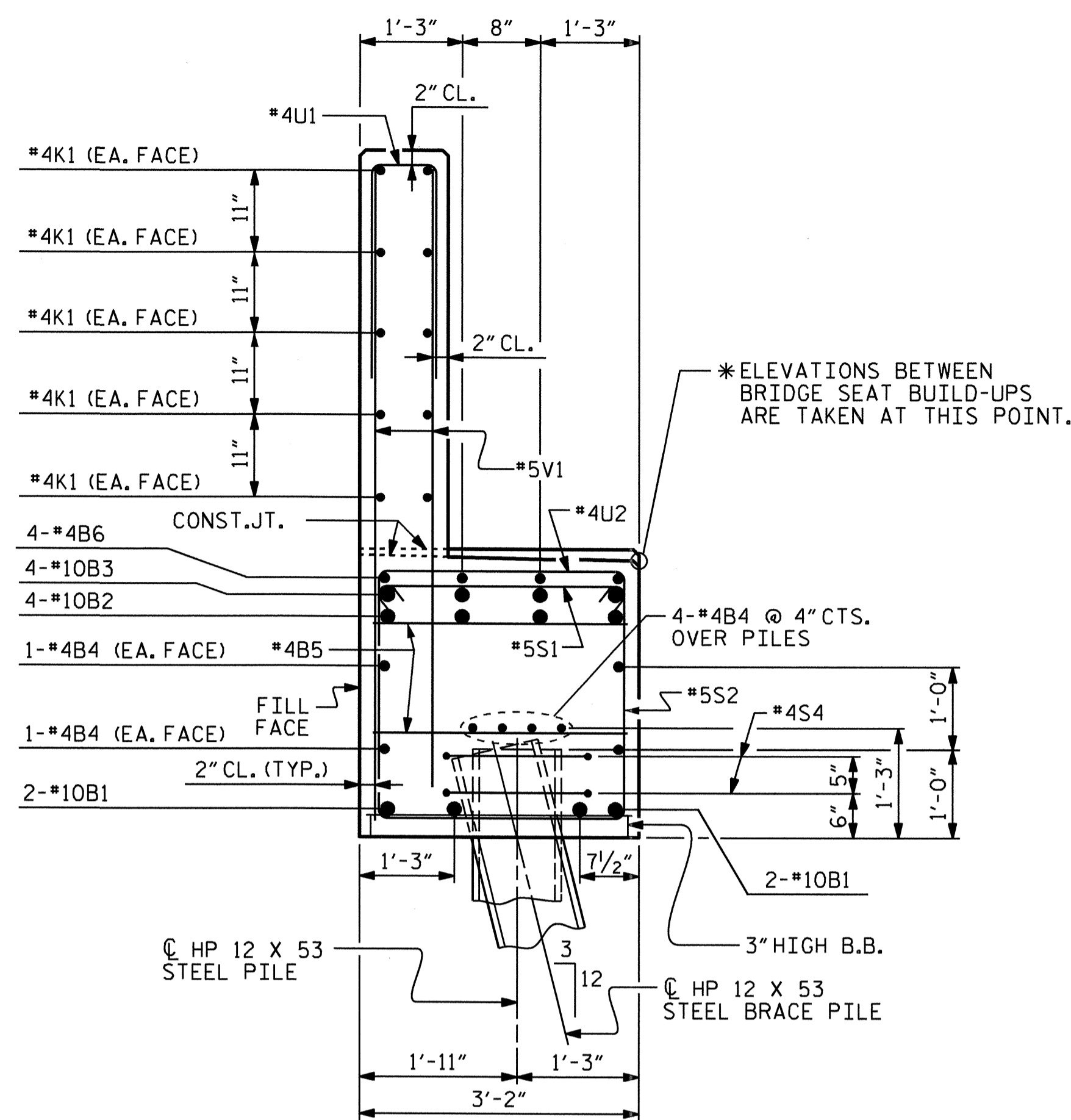
DRAWN BY: C.R. YARBROUGH DATE: 11/09  
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 cyarborough

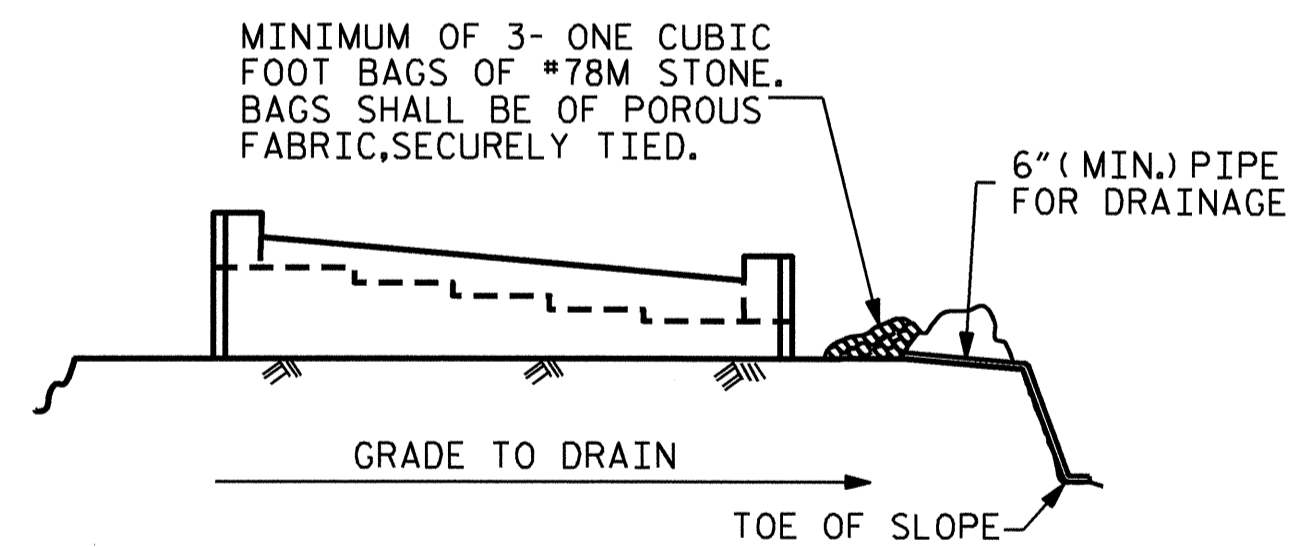
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-50
2			4			TOTAL SHEETS 59



SECTION A-A



SECTION B-B

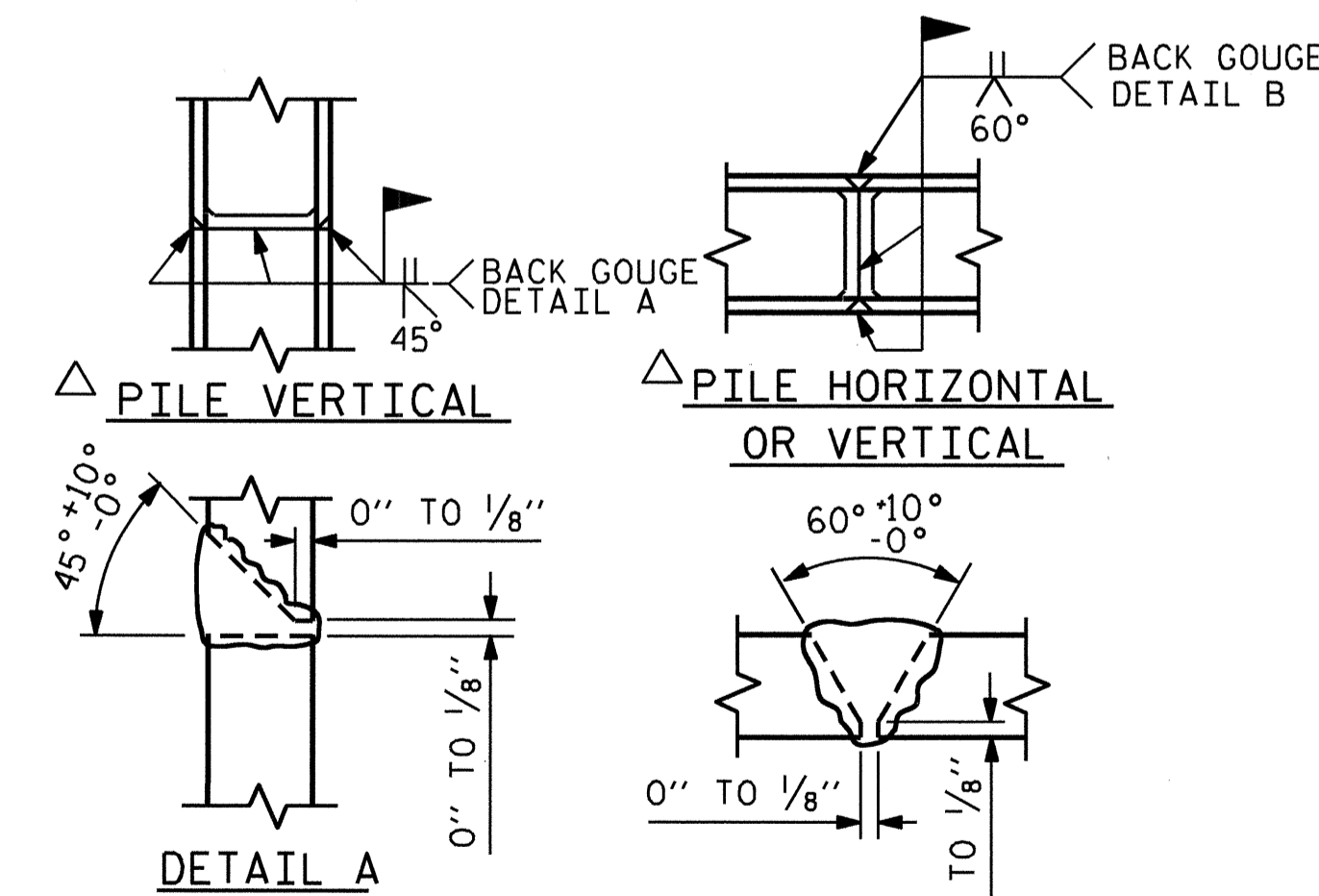


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

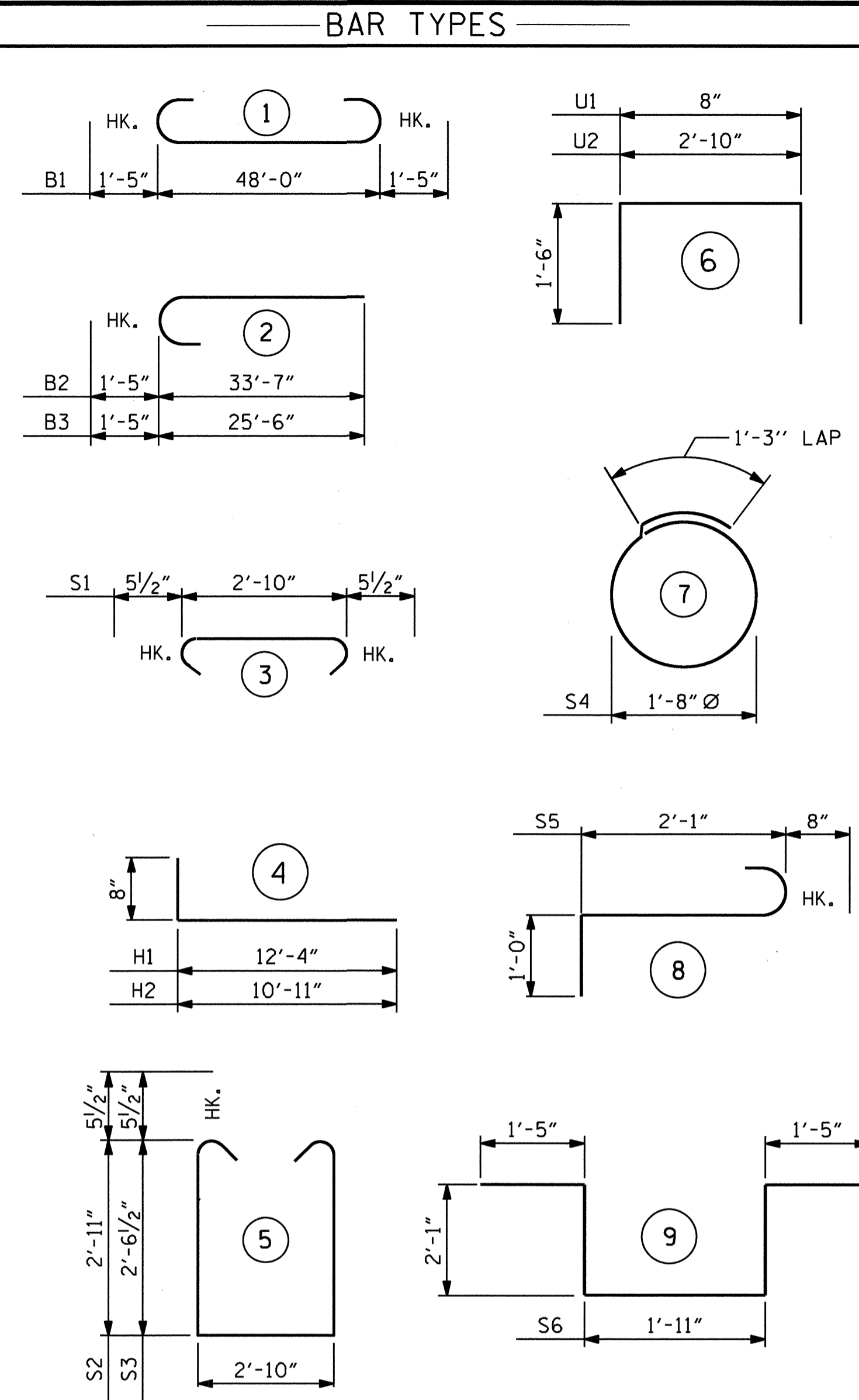
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING. PILE SPLICE DETAILS



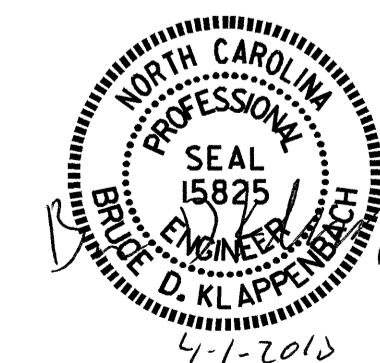
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	50'-10"	875
B2	4	#10	2	35'-0"	602
B3	4	#10	2	26'-11"	463
B4	16	#4	STR	25'-4"	271
B5	15	#4	STR	2'-10"	28
B6	12	#4	STR	3'-3"	26
H1	22	#5	4	13'-0"	298
H2	22	#5	4	11'-7"	266
K1	20	#4	STR	25'-4"	338
K2	4	#4	STR	3'-11"	10
K3	4	#4	STR	3'-7"	10
S1	66	#5	3	3'-9"	258
S2	34	#5	5	9'-7"	240
S3	32	#5	5	8'-10"	295
S4	14	#4	7	6'-6"	61
S5	6	#6	8	3'-9"	34
S6	2	#6	9	8'-11"	27
U1	41	#4	6	3'-8"	100
U2	12	#4	6	5'-10"	47
V1	44	#5	STR	7'-5"	340
V2	38	#5	STR	7'-0"	277
V3	36	#5	STR	9'-10"	369
V4	34	#5	STR	8'-11"	316
REINFORCING STEEL					= 5651 LBS
CLASS A CONCRETE					
POUR #1 (COLLAR, CAP & LOWER PART OF WINGS)					C.Y. 23.1
POUR #2 (BACKWALL & UPPER PART OF WINGS)					C.Y. 14.0
TOTAL					C.Y. 37.1
HP 12 X 53 STEEL PILES					NO. 9 LIN. FT. 270

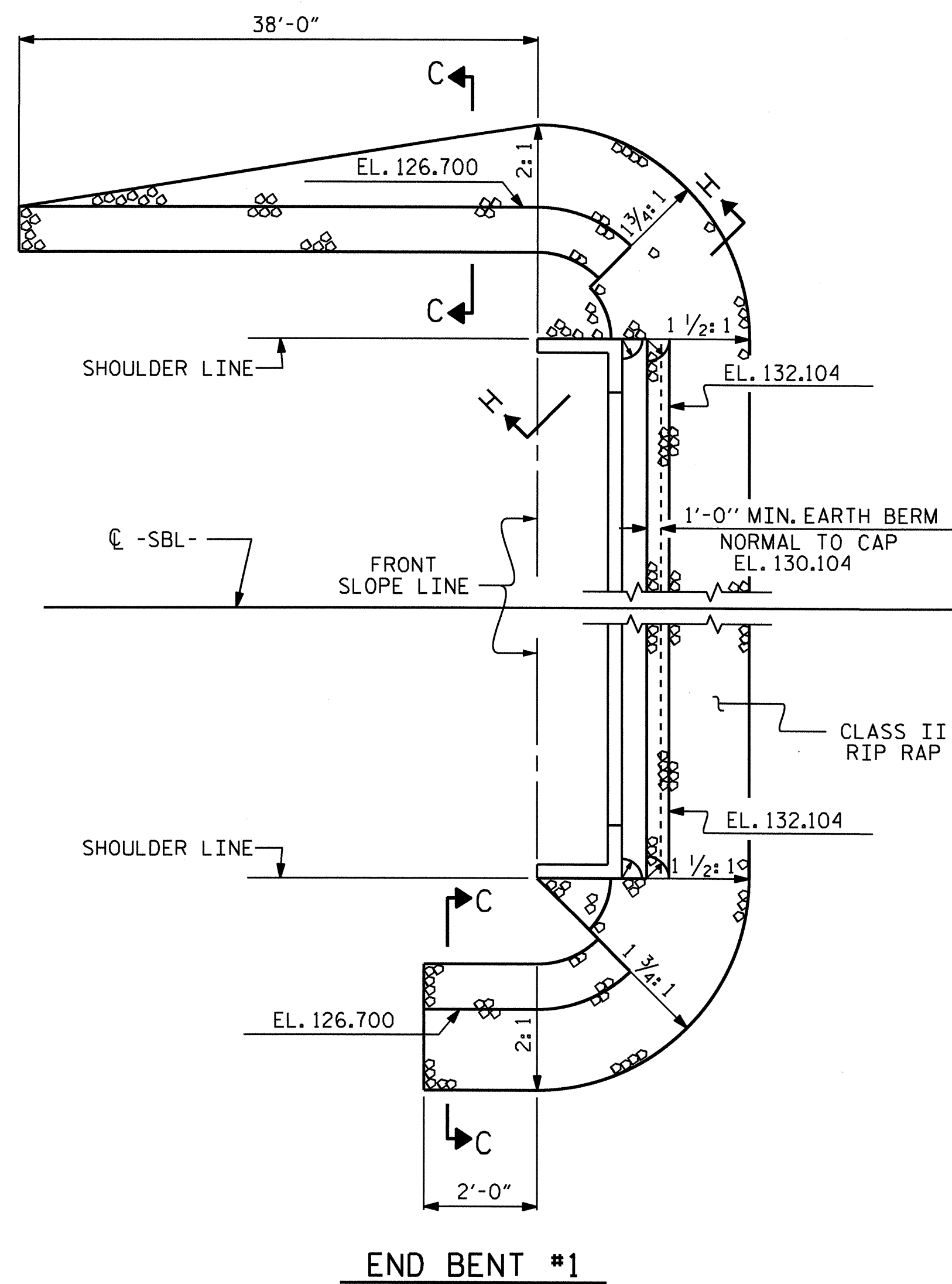
PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 3 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
SUBSTRUCTURE  
END BENT #2

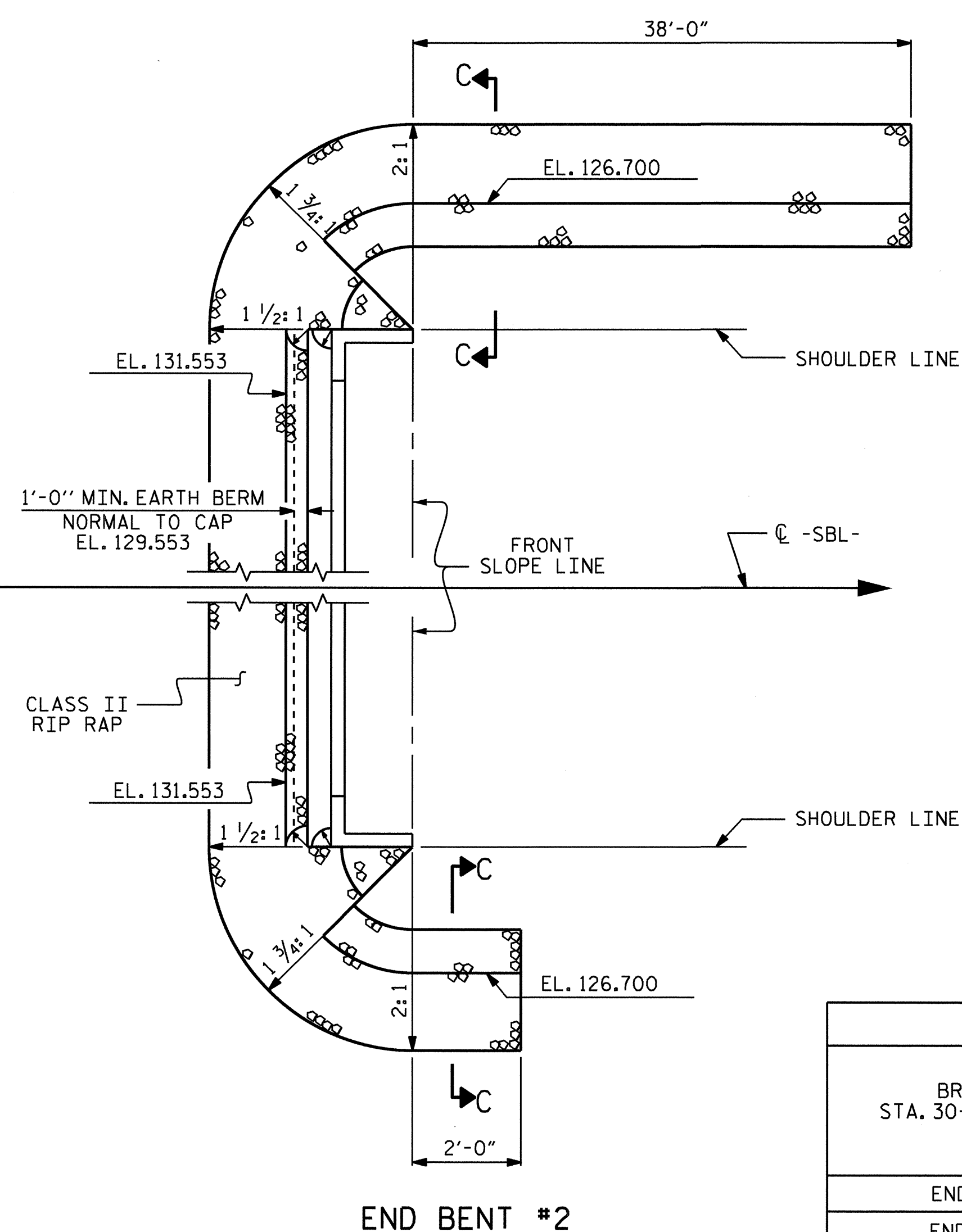


REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			59
2			4			

DRAWN BY: C.R. YARBROUGH DATE: 11/09  
 CHECKED BY: M.G. SHAIKH DATE: 01/10



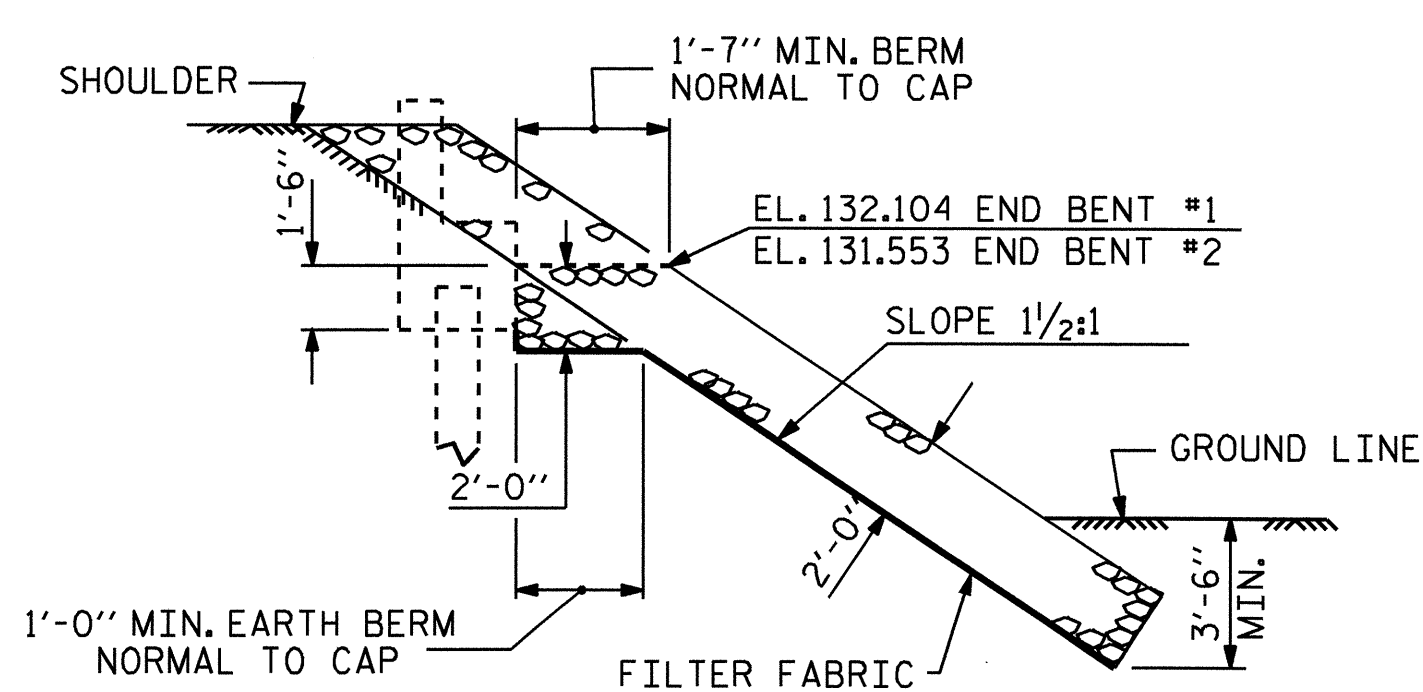
END BENT #1



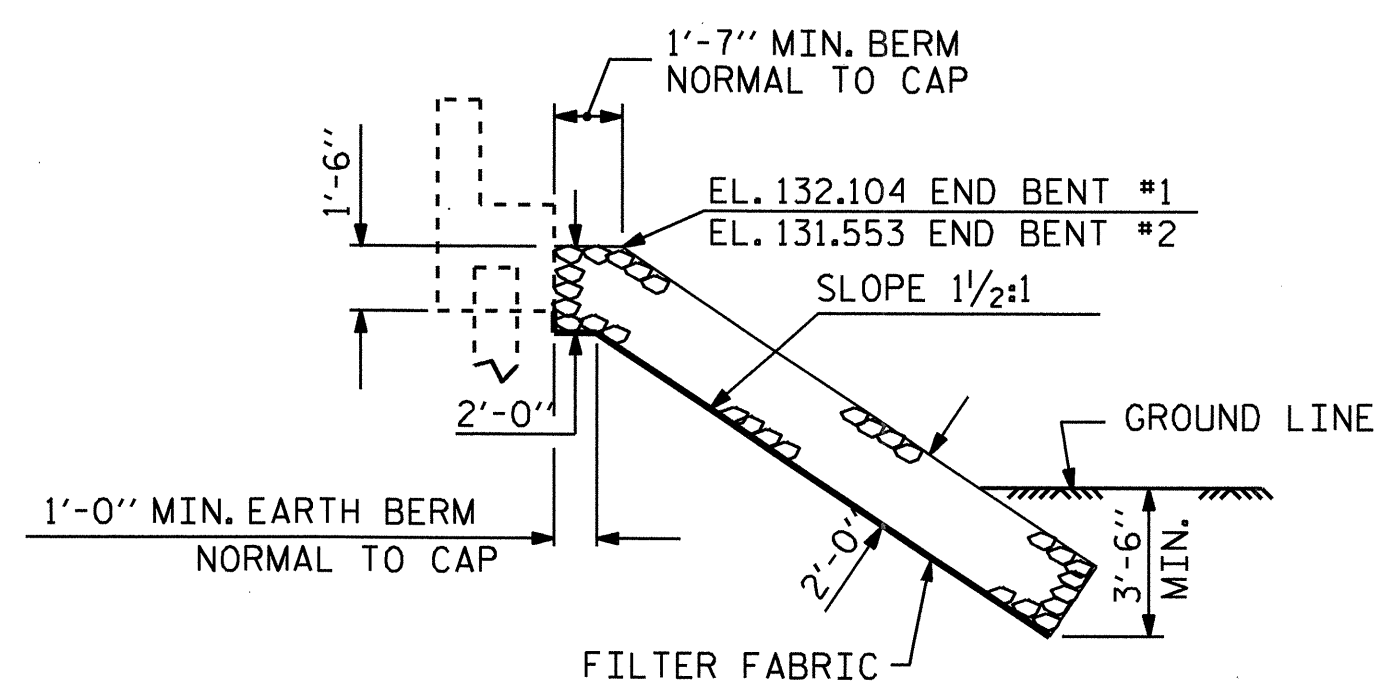
END BENT #2

PLAN

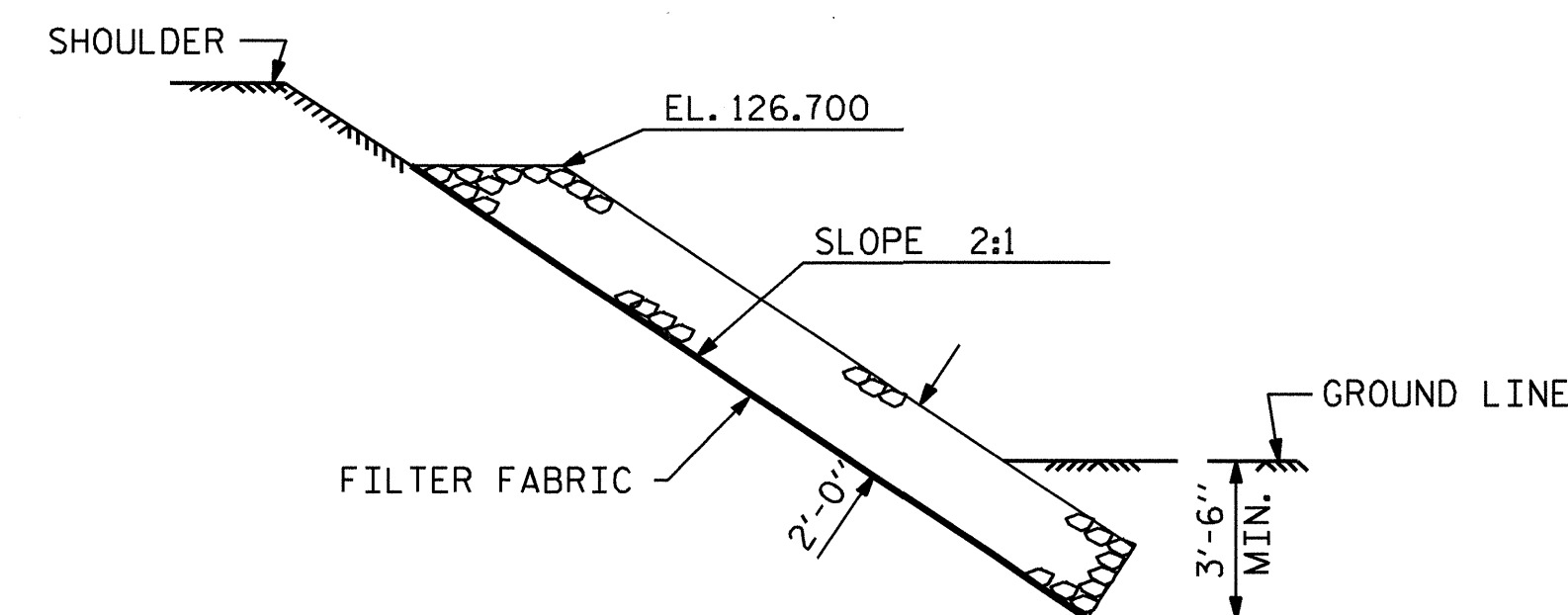
ESTIMATED QUANTITIES		
BRIDGE @ STA. 30+63.00 -SBL-	CLAS II RIP RAP	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	355	395
END BENT 2	585	650
TOTAL	940	1045



SECTION H-H



SECTION C-C  
BERM RIP RAPPED



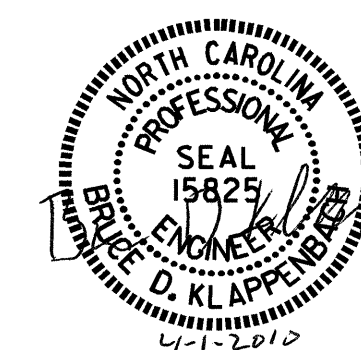
SECTION C-C

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 1 OF 1

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

— RIP RAP DETAILS —



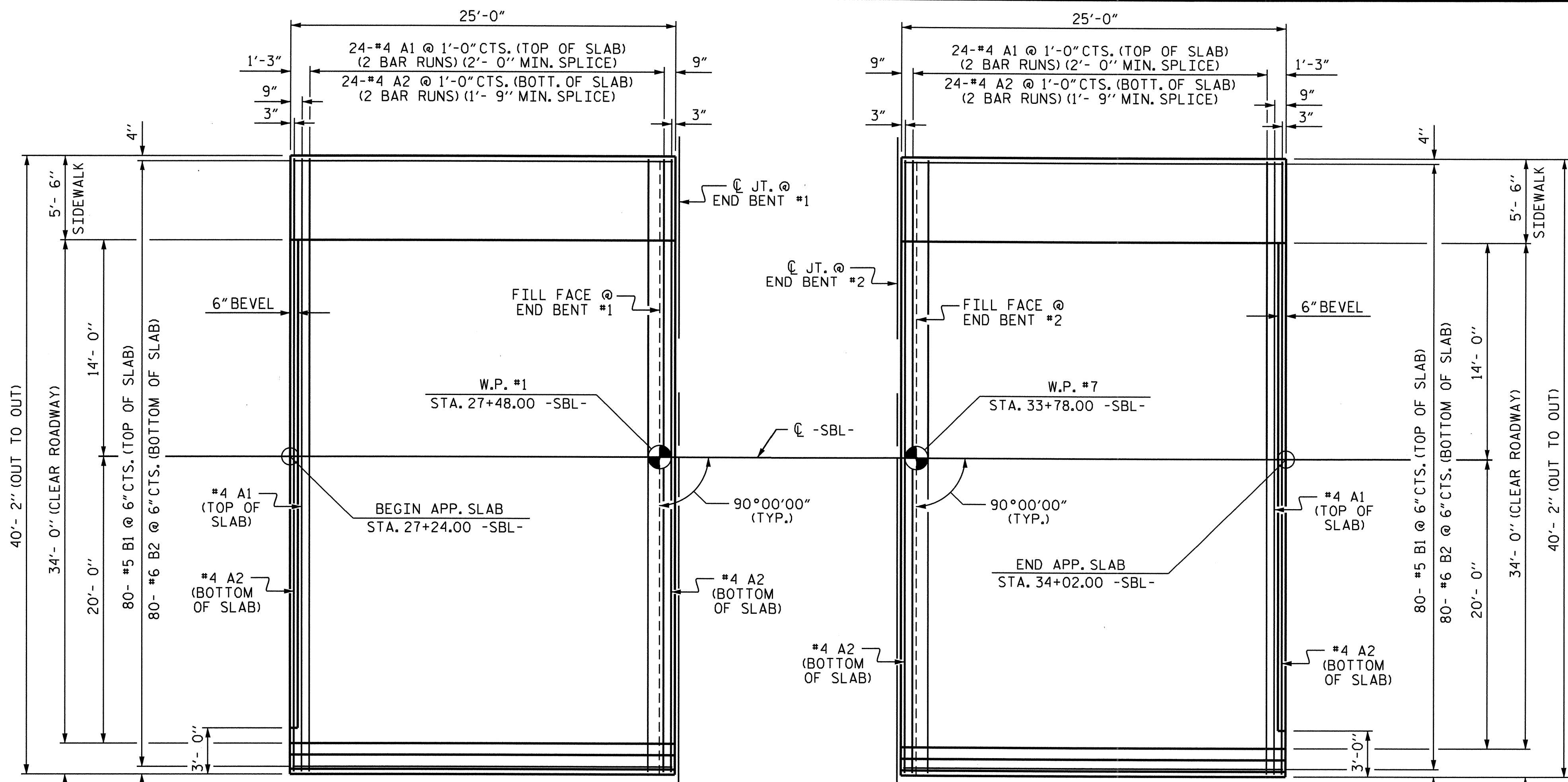
ASSEMBLED BY : W.B. HILL DATE : 12/09  
 CHECKED BY : B.D. KLAPPENBACH DATE : 02/10  
 DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES  
 CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 TLA/GM

31-MAR-2010 12:26  
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 bklappenbach

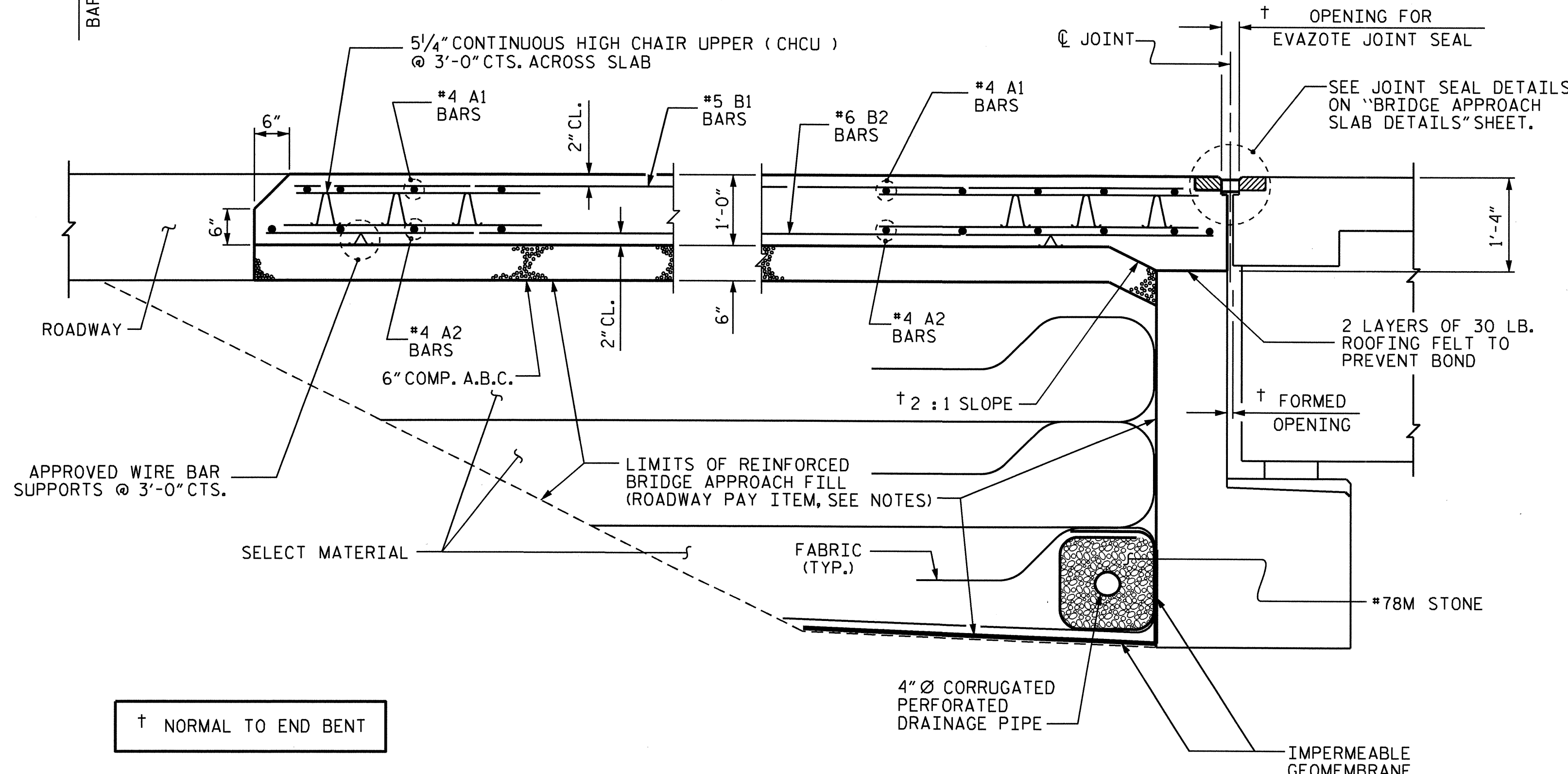
REVISIONS					SHEET NO. S-52
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS
2			4		59

SKREW 90°

STD. NO. RR2



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



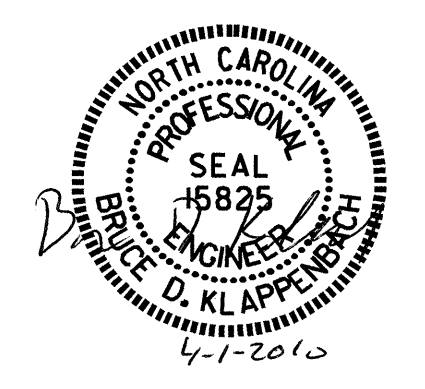
SECTION THRU SLAB

BILL OF MATERIAL														
APPROACH SLAB AT EB #1							APPROACH SLAB AT EB #2							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	50	#4	STR	20'-11"	699		*A1	50	#4	STR	20'-11"	699		
A2	52	#4	STR	20'-10"	724		A2	52	#4	STR	20'-10"	724		
*B1	80	#5	STR	23'- 9"	1982		*B1	80	#5	STR	23'- 9"	1982		
B2	80	#6	STR	24'- 8"	2964		B2	80	#6	STR	24'- 8"	2964		
*B3	4	#4	STR	24'- 8"	66		*B3	4	#4	STR	24'- 8"	66		
*G1	25	#4	STR	5'- 0"	84		*G1	25	#4	STR	5'- 0"	84		
*U1	8	#4		3'-2"	17		*U1	8	#4		3'-2"	17		
REINFORCING STEEL						LBS.	REINFORCING STEEL						LBS.	3688
*EPOXY COATED REINFORCING STEEL						LBS.	*EPOXY COATED REINFORCING STEEL						LBS.	2848
CLASS AA CONCRETE							CLASS AA CONCRETE							
POUR #1 (APPROACH SLAB)						C. Y.	POUR #1 (APPROACH SLAB)						C. Y.	35.7
POUR #2 (SIDEWALK)						C. Y.	POUR #2 (SIDEWALK)						C. Y.	2.8
TOTAL						C. Y.	TOTAL						C. Y.	38.5
BAR TYPE														

CONCRETE QUANTITY AND REINFORCING STEEL QUANTITY FOR THE BARRIER RAIL NOT INCLUDED IN THIS BILL OF MATERIAL.  
 FOR BARRIER RAIL CONCRETE QUANTITY AND REINFORCING STEEL QUANTITY SEE, "BARRIER RAIL SHEET".

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.



PROJECT NO. B-4138  
HARNETT COUNTY  
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SHEET 1 OF 4

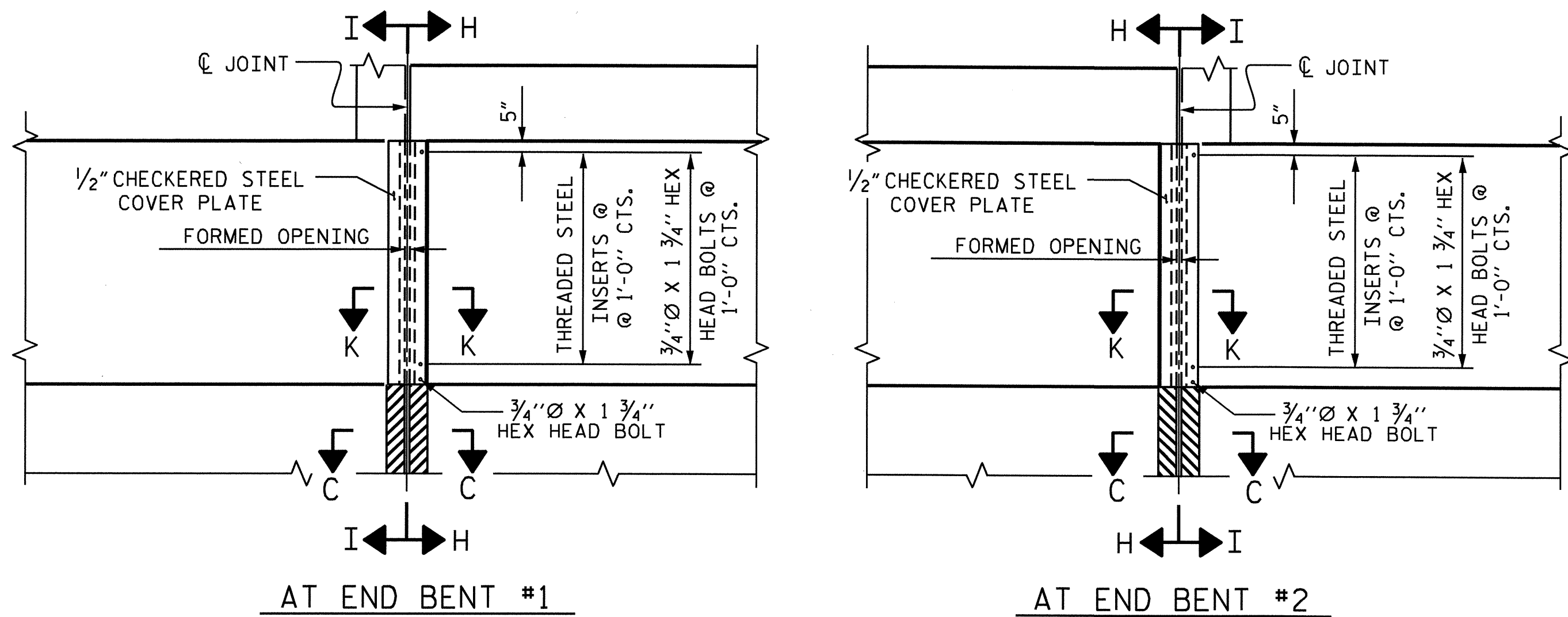
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT**

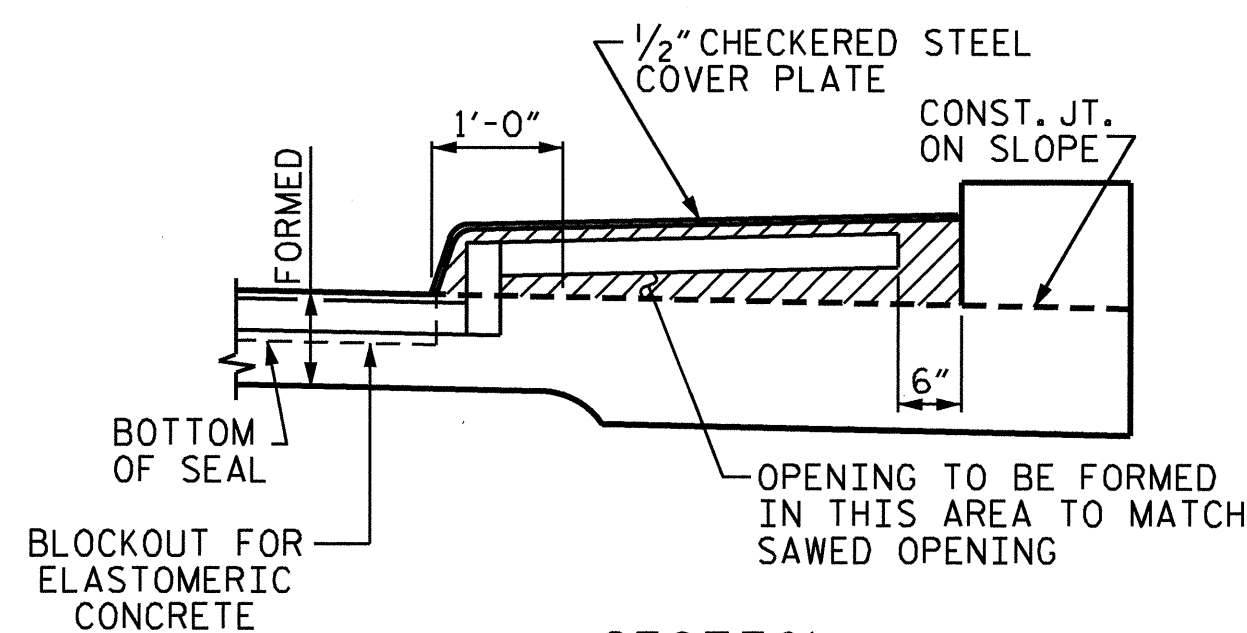
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-53
1			3			TOTAL SHEETS
2			4			59

ASSEMBLED BY : D. A. GLADDEN DATE : 6-11-09  
 CHECKED BY : W. B. HILL DATE : 8-9-09  
 DRAWN BY : EEM 3/95  
 CHECKED BY : VAP 3/95

REV. 7/10/01 LES/RDR  
 REV. 5/7/03R RWW/JTE  
 REV. 5/1/06R KMM/GM



AT END BENT #1  
AT END BENT #2  
PLAN OF EVAZOTE JOINT SEAL WITH SIDEWALK

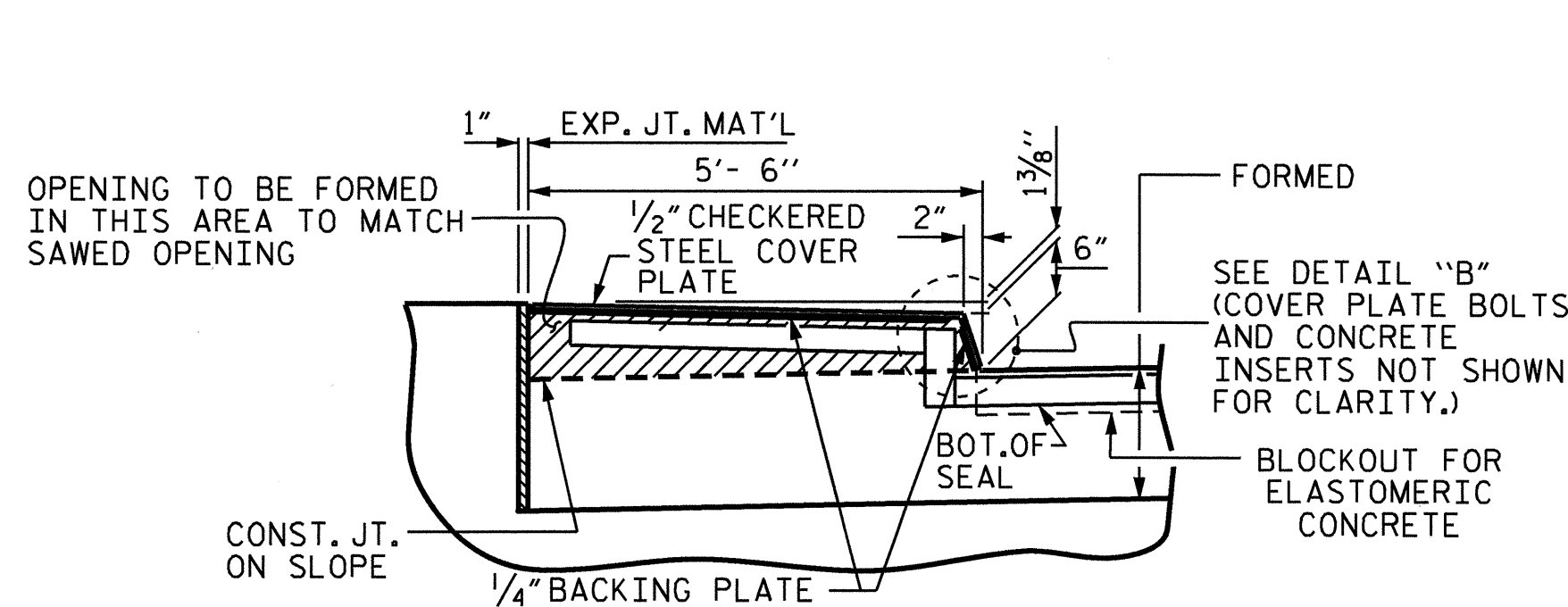


SECTION H-H

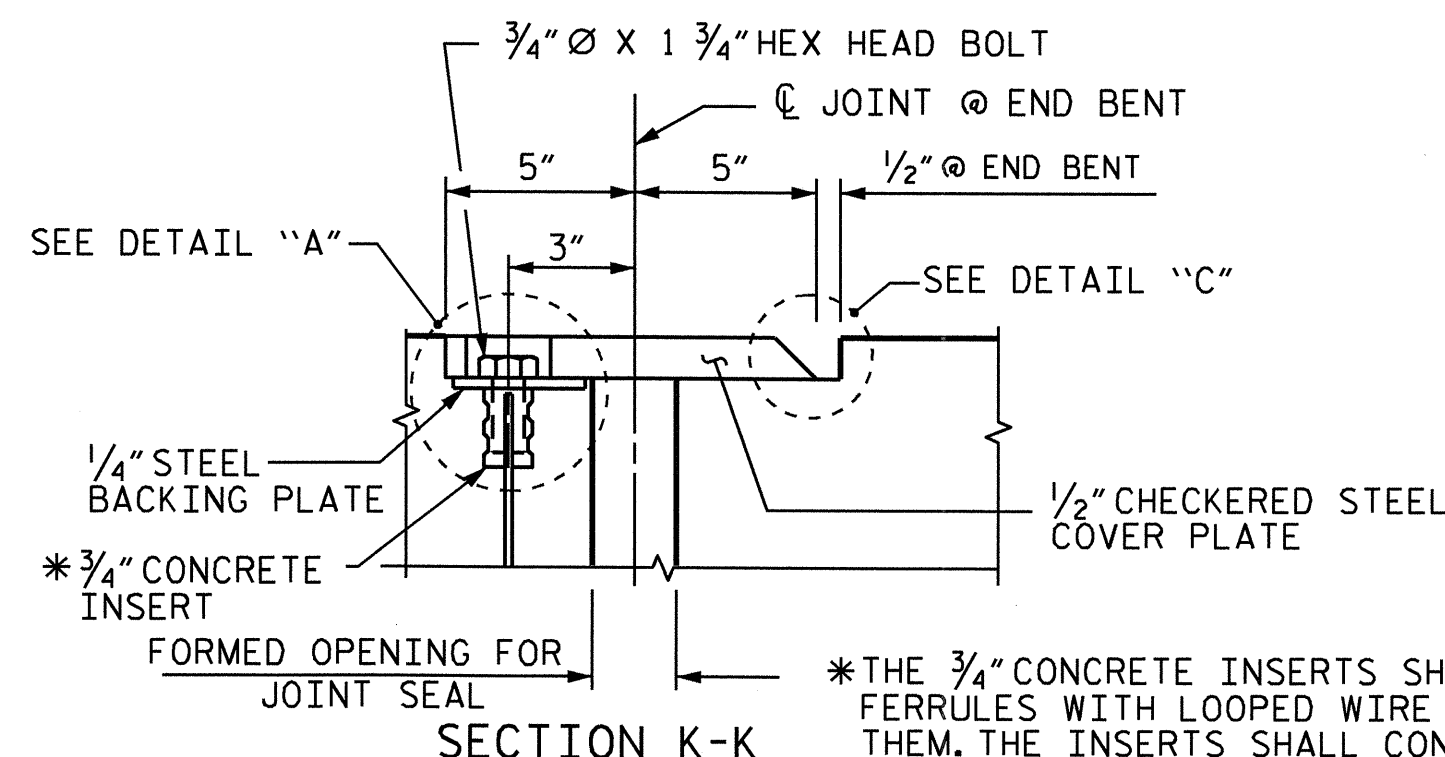
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD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

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

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".

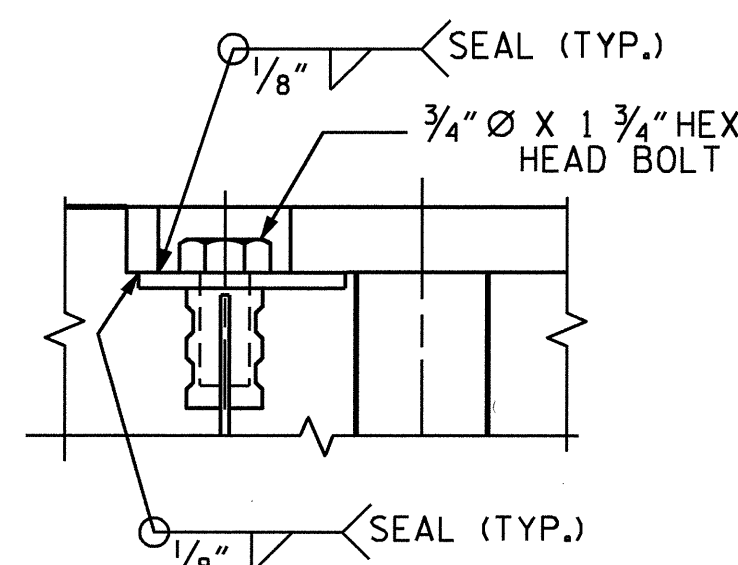


SECTION I-I

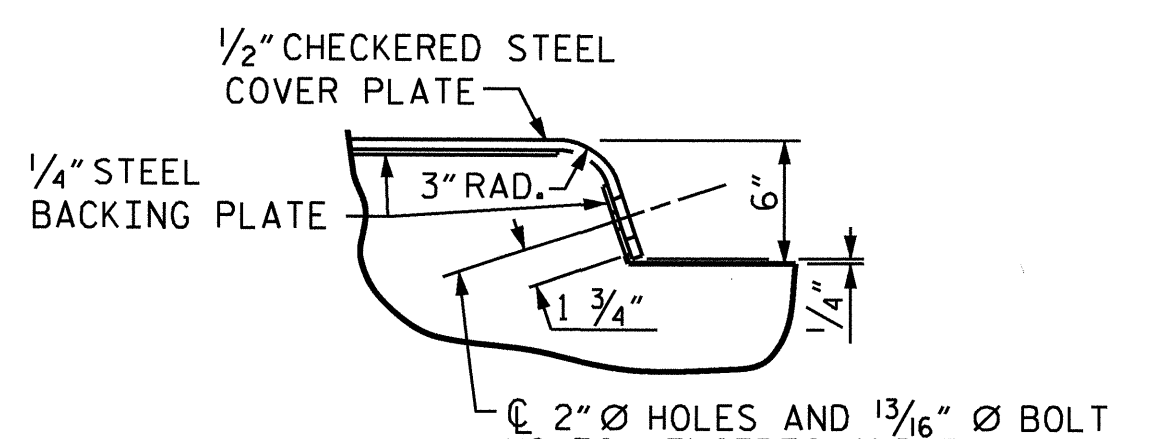


SECTION K-K

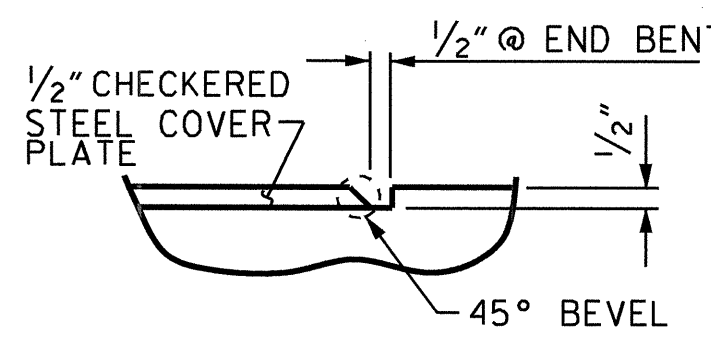
\*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



DETAIL "A"

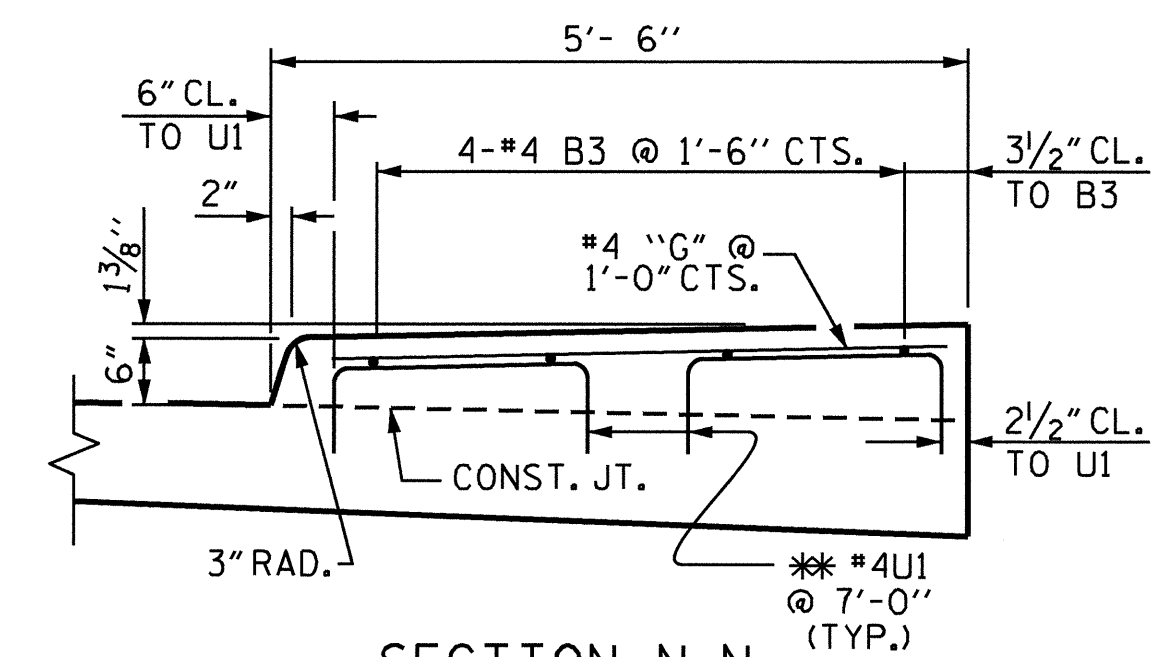


DETAIL "B"



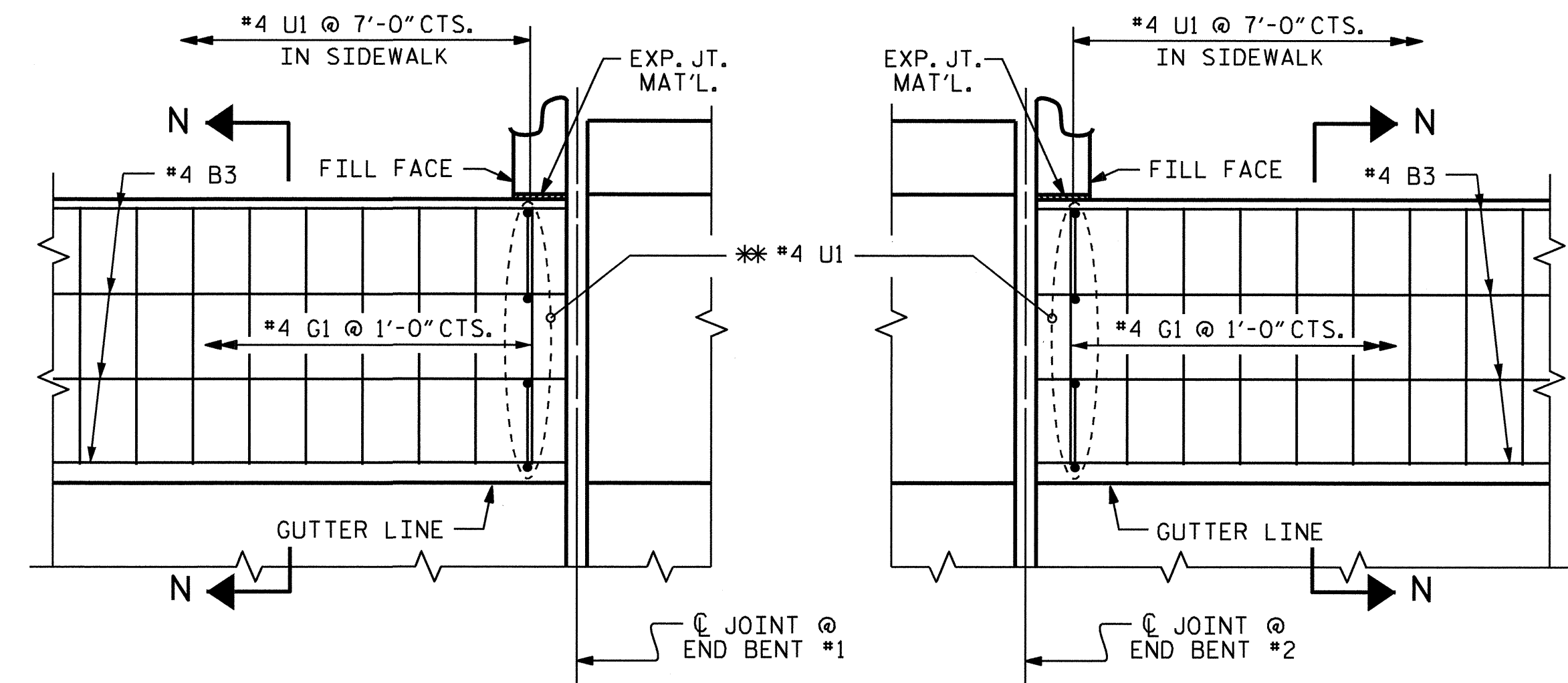
DETAIL "C"

JOINT SEAL DETAILS @ END BENT



SECTION N-N

\*\* #4 UI BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREED OFF.



PLAN AT END BENT #1

PLAN AT END BENT #2

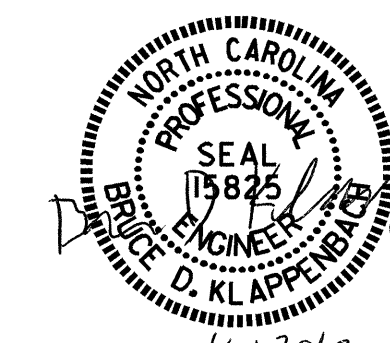
DETAILS OF SIDEWALK ON APPROACH SLAB

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH  
 SLAB DETAILS

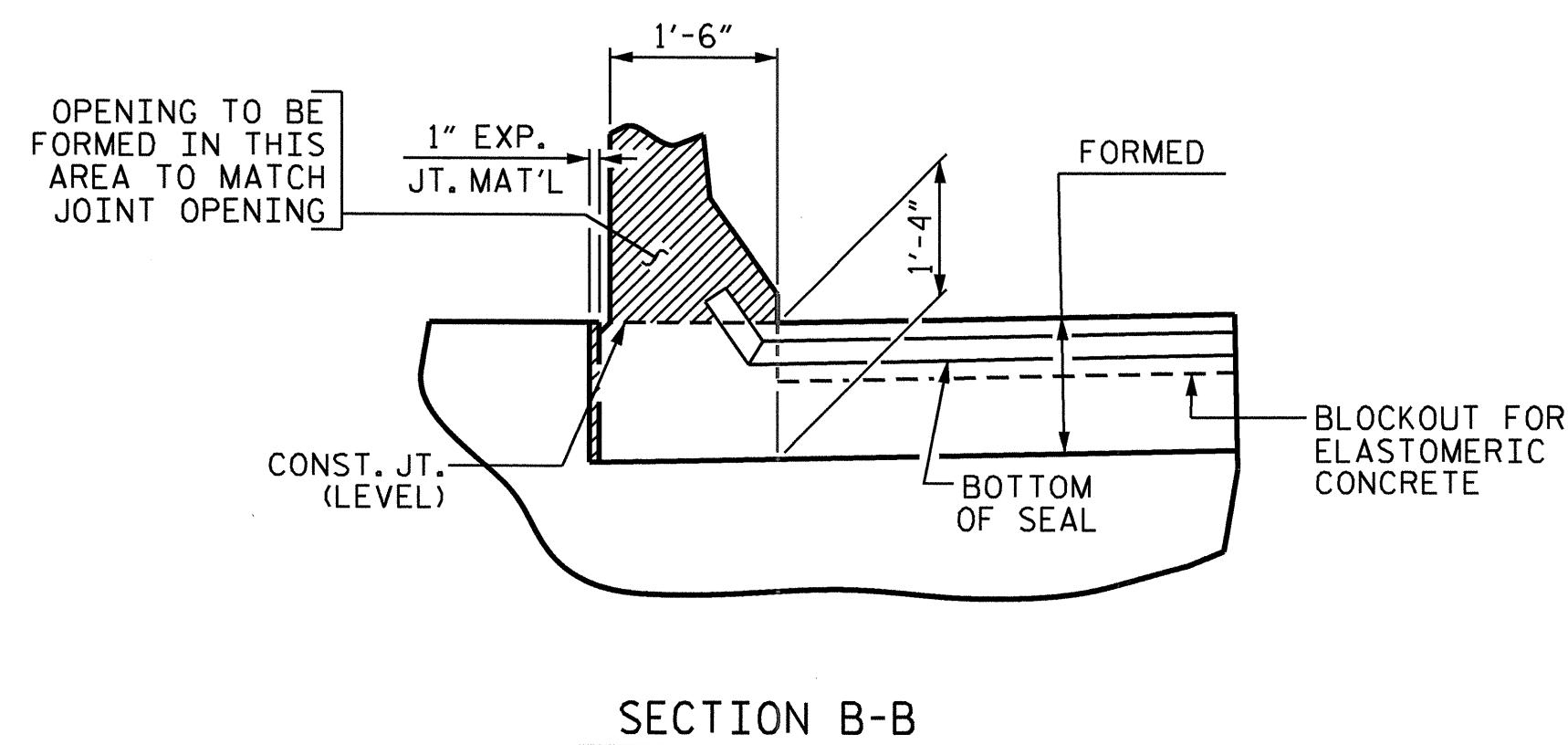
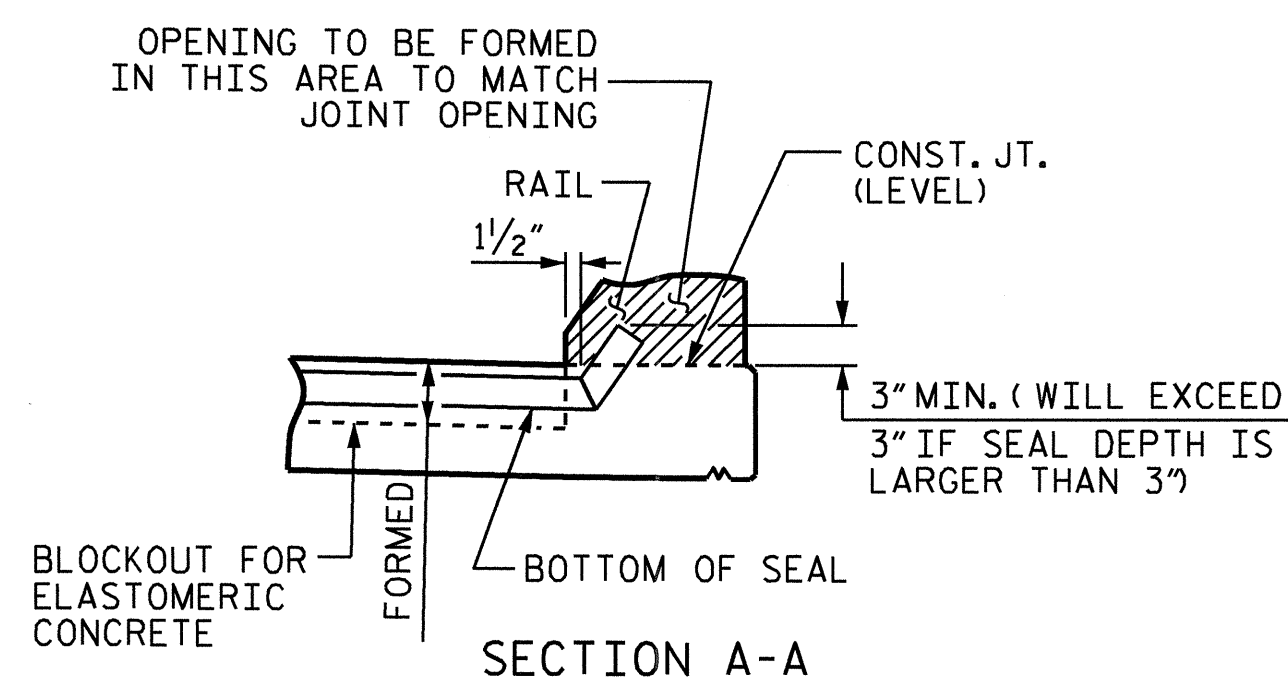
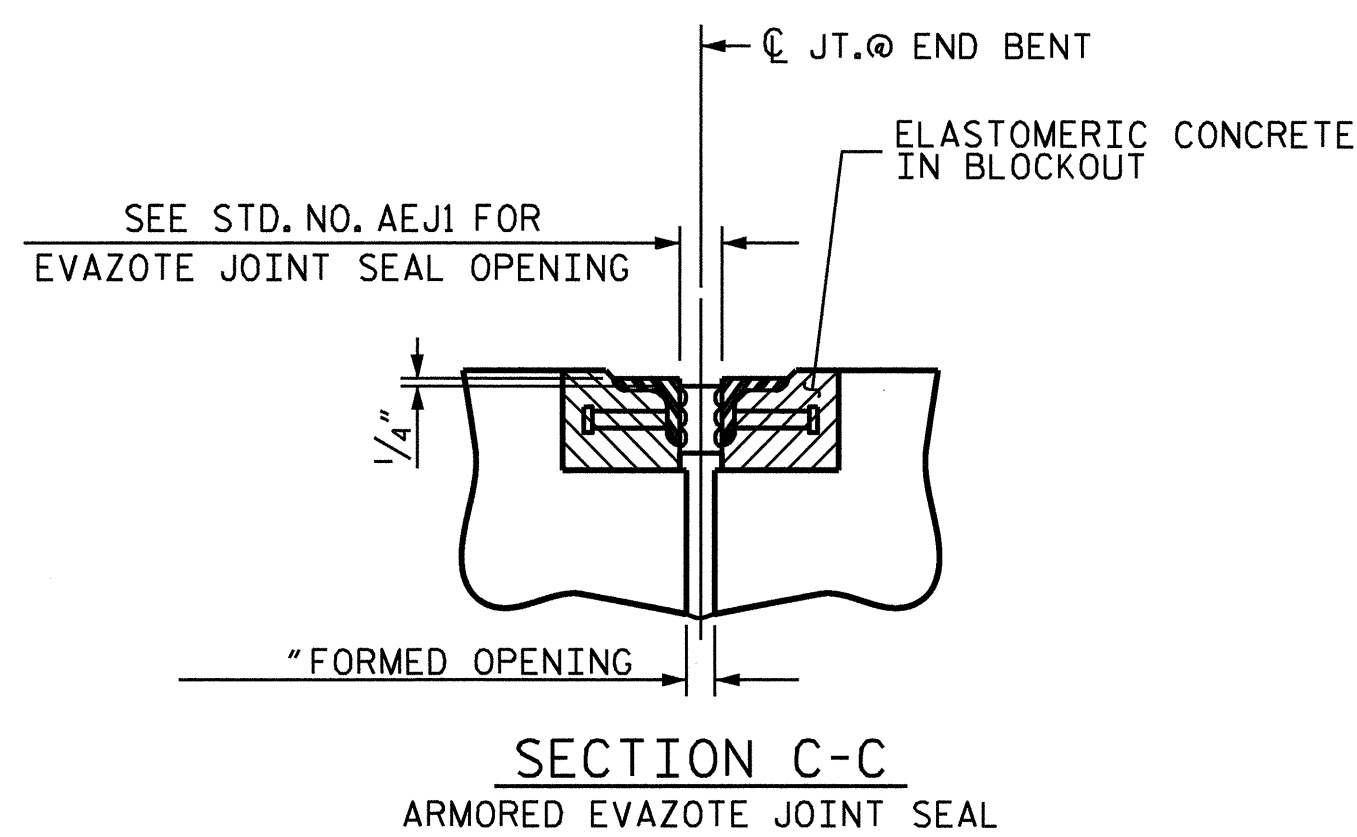
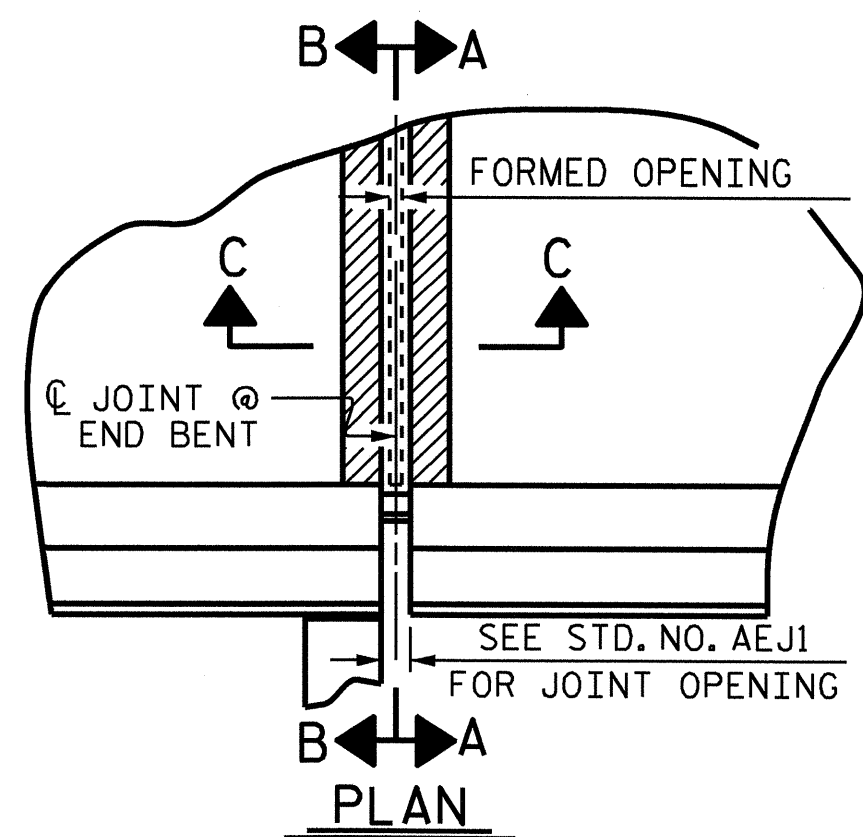


ASSEMBLED BY : D. A. GLADDEN DATE : 6-11-09  
 CHECKED BY : W. B. HILL DATE : 8-9-09  
 DRAWN BY : FCJ 11/88 REV. 10/17/00 RWW/LES  
 CHECKED BY : ARB 11/88 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06R MAA/KMM

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

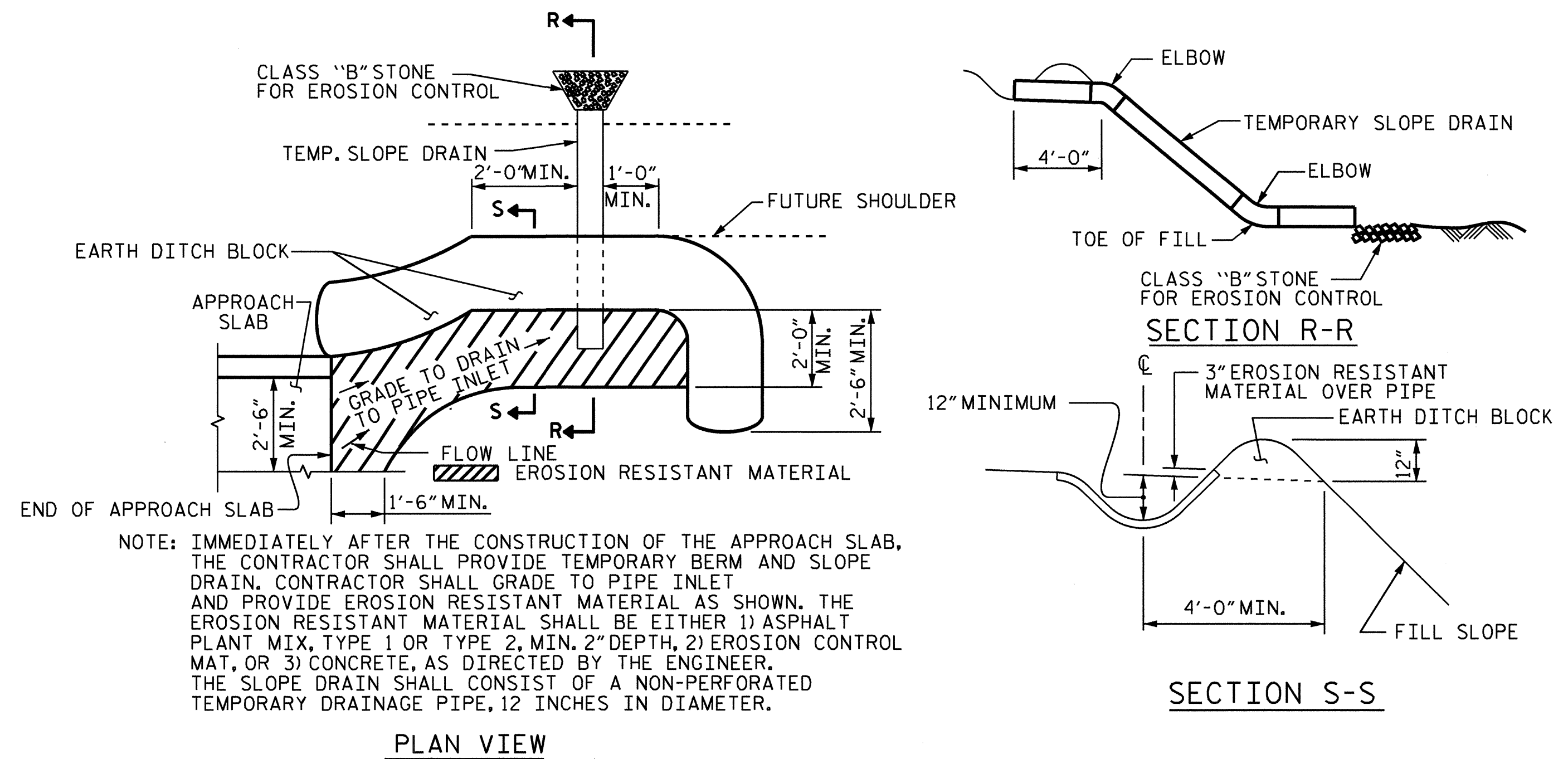
TOTAL SHEETS: 59

STD. NO. BAS10 (SHT 13)



**JOINT SEAL DETAILS @ END BENT**

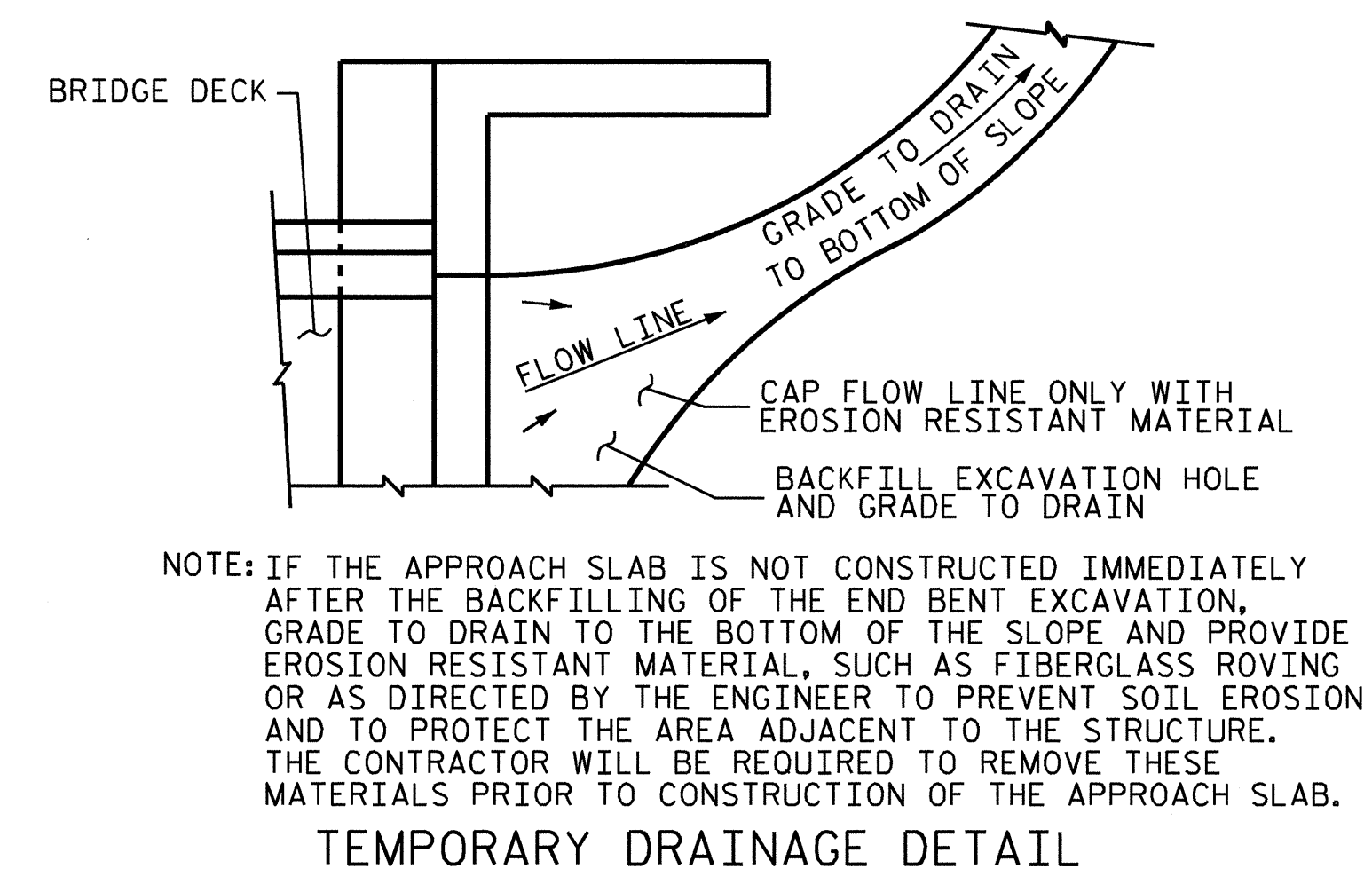
EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.



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.

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

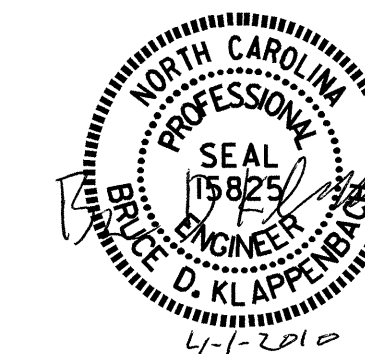


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

PROJECT NO. B-4138  
HARNETT COUNTY  
 STATION: 30+63.00 -SBL-

SHEET 3 OF 4

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



REVISIONS						SHEET NO. S-55
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 59
2			4			

STD. NO. BAS10 (SHT 23)

ASSEMBLED BY: D. A. GLADDEN DATE: 2-3-10  
 CHECKED BY: BRYAN HILL DATE: 2-6-10  
 DRAWN BY: FCJ 11/88 REV. 10/17/00 RWW/LES  
 CHECKED BY: ARB 11/88 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06R MAA/KMM



NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

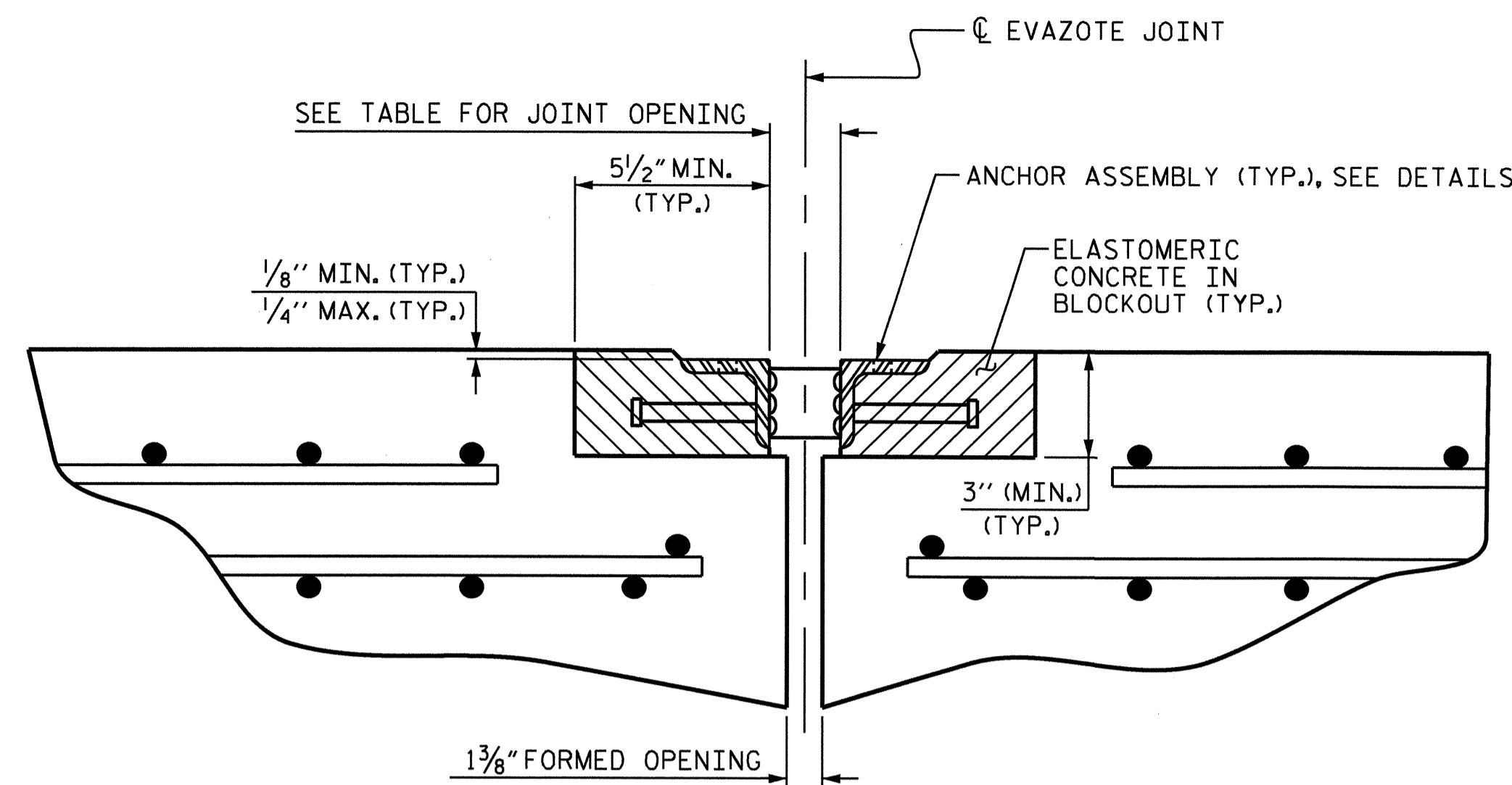
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

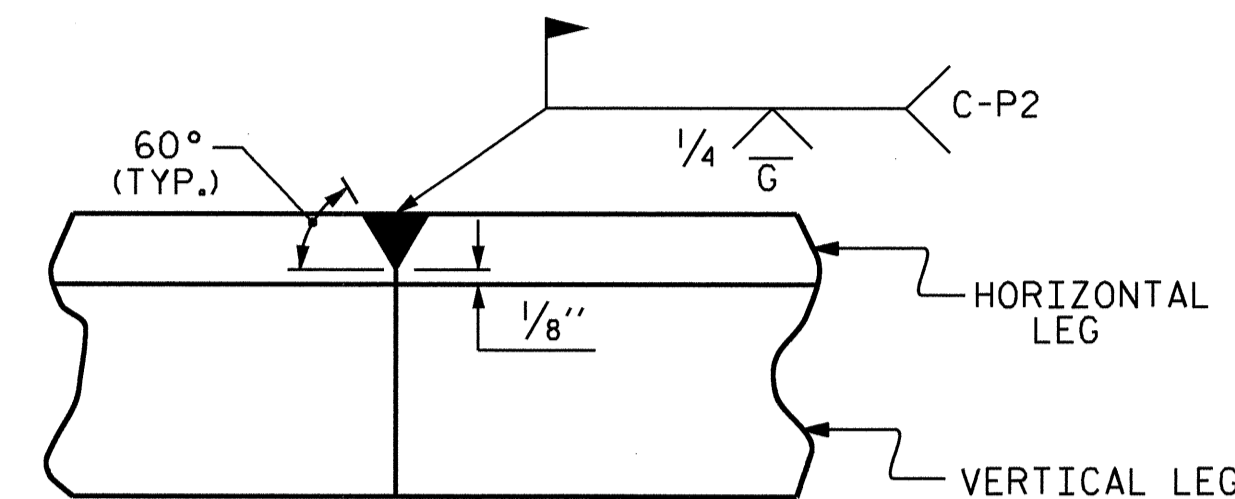
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

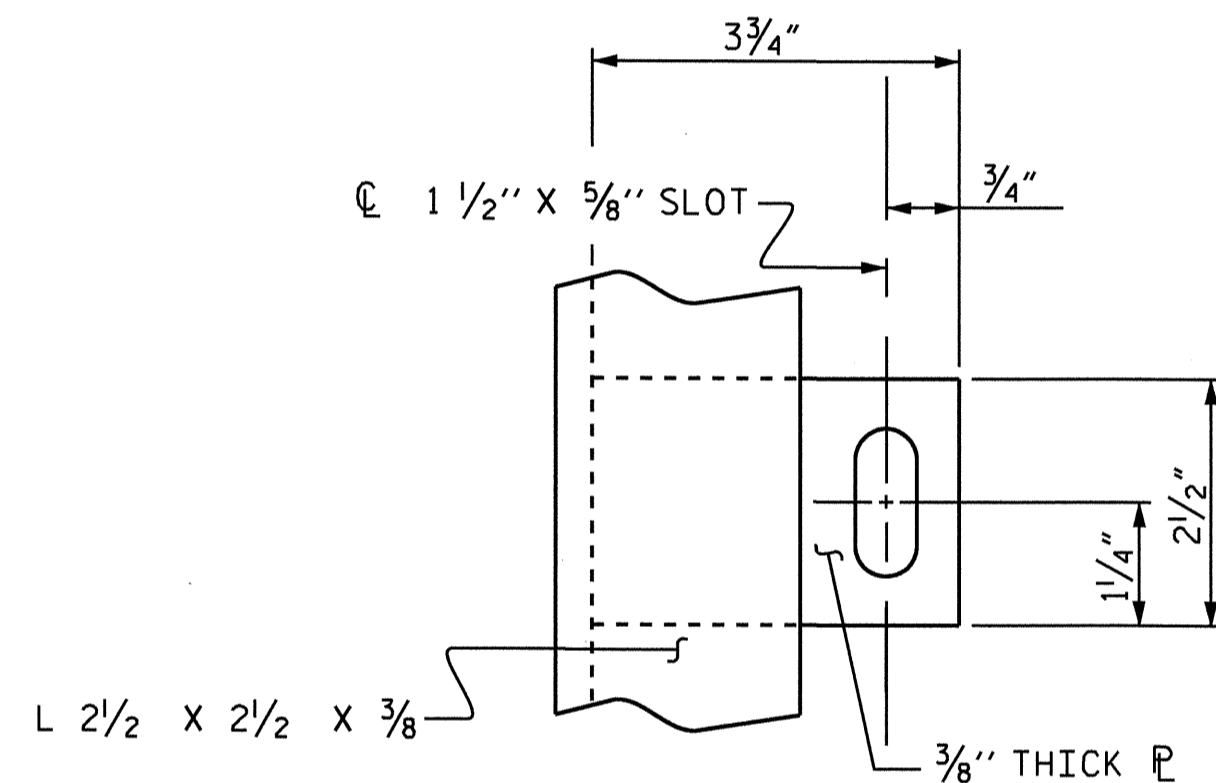


ARMORED JOINT DETAILS

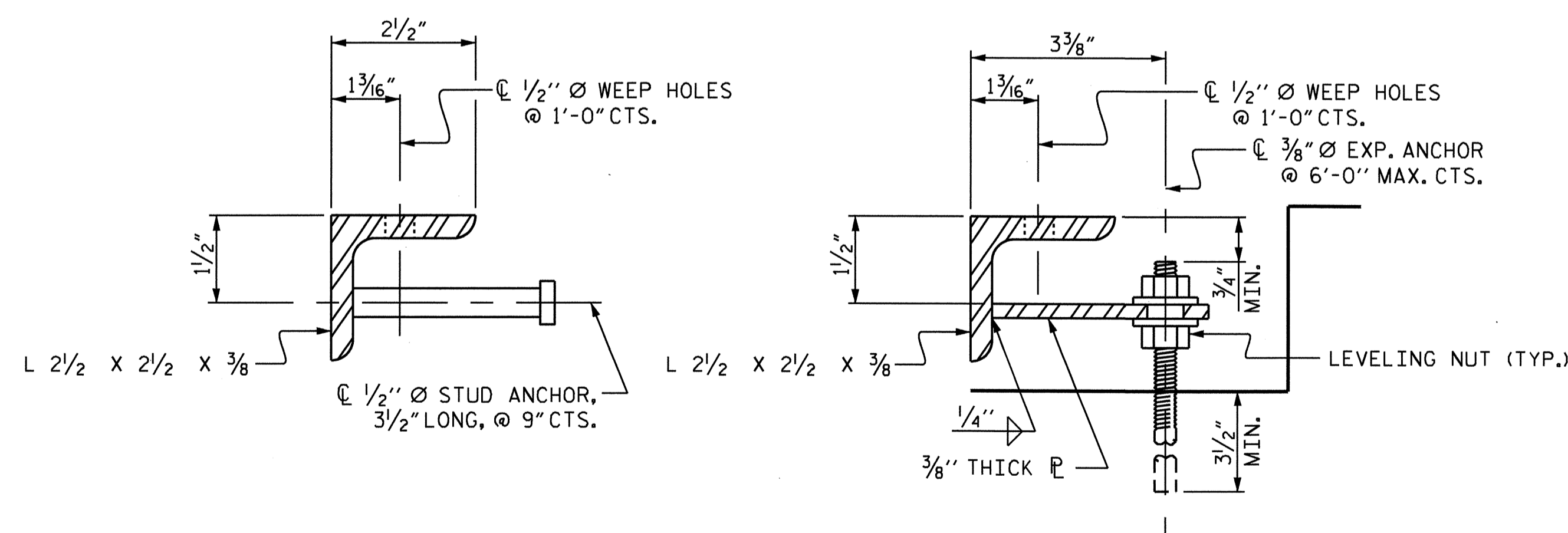
SECTION NORMAL TO JOINT AT BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



PLAN VIEW OF TAB



SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

MOVEMENT AND SETTING AT EVAZOTE JOINT

END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	90-00'-00"	3/8"	1 5/16"	2/16"	2/2"	2/4"
2	90-00'-00"	3/8"	1 5/16"	2/16"	2/2"	2/4"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

BILL OF MATERIAL

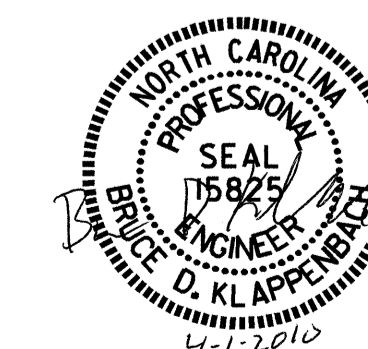
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	7.8	68'-0"
2	7.8	68'-0"

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

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SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ARMORED EVAZOTE  
 JOINT DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-56
1			3			TOTAL SHEETS 59
2			4			

ASSEMBLED BY : H. T. BARBOUR	DATE : 2-05-10
CHECKED BY :	DATE :
DRAWN BY : EEM 1/96	REV. 7/10/01 LES/RDR
CHECKED BY : RGW 1/96	REV. 5/7/03RR RWW/JTE
	REV. 5/1/06 TLA/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	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
	40	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	6000
	50	3'-6"	4'-0"	4'-5"	2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	6000
12	30	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000	
	40	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	6000	
	50	3'-2"	3'-7"	4'-1"	2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	6000	
14	30	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000	
	40	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	6000	
	50	2'-10"	3'-4"	3'-9"	2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	6000	
16	30	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000	
	40	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	6000	
	50	2'-8"	3'-0"	3'-5"	2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	6000	

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"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000	
	40	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	6000	
	50	3'-1"	3'-6"	4'-0"	2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	6000	
12	30	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000	
	40	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000	
	50	2'-9"	3'-2"	3'-7"	2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	6000	
14	30	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	4000		
	40	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	6000		
	50	2'-6"	2'-10"	3'-3"	2'-3"	2'-7"	3'-0"	4'-1"	6000		
16	30	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	4000		
	40	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	6000		
	50	2'-3"	2'-7"	2'-11"	2'-1"	2'-5"	2'-9"	3'-9"	6000		

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"	6000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	6'-7"	6000	
12	30				3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	4000	
	40				2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4000	
	50	2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	6'-7"	6000	
14	30				3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	4000	
	40				2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	6000	
	50	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	6000	
16	30				2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	4000	
	40				2'-0"	2'-4"	2'-8"	3'-8"	4'-0"	4000	
	50	2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	6000	

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'-11"	3'-7"	4'-3"	5'-9"	4000	
	40				2'-1"	2'-5"	2'-9"	3'-10"	4'-6"	4000	
	50	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	5'-9"	6000	
12	30				2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	4000	
	40				2'-2"	2'-9"	3'-4"	3'-7"	3'-11"	4000	
	50	2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	6000	
14	30				2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	4000	
	40				2'-0"	2'-7"	3'-0"	3'-3"	3'-6"	4000	
	50	2'-2"	2'-5"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	6000	
16	30				2'-4"	2'-10"	3'-5"	4'-3"	5'-2"	4000	
	40				2'-0"	2'-5"	2'-8"	2'-11"	3'-3"	4000	
	50	2'-2"	2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	3'-10"	4'-8"	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-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

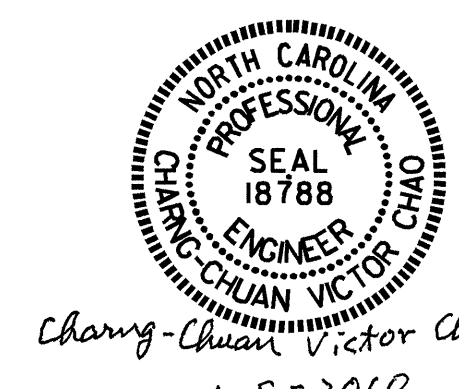
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES  
 III, IV, V, AND VI

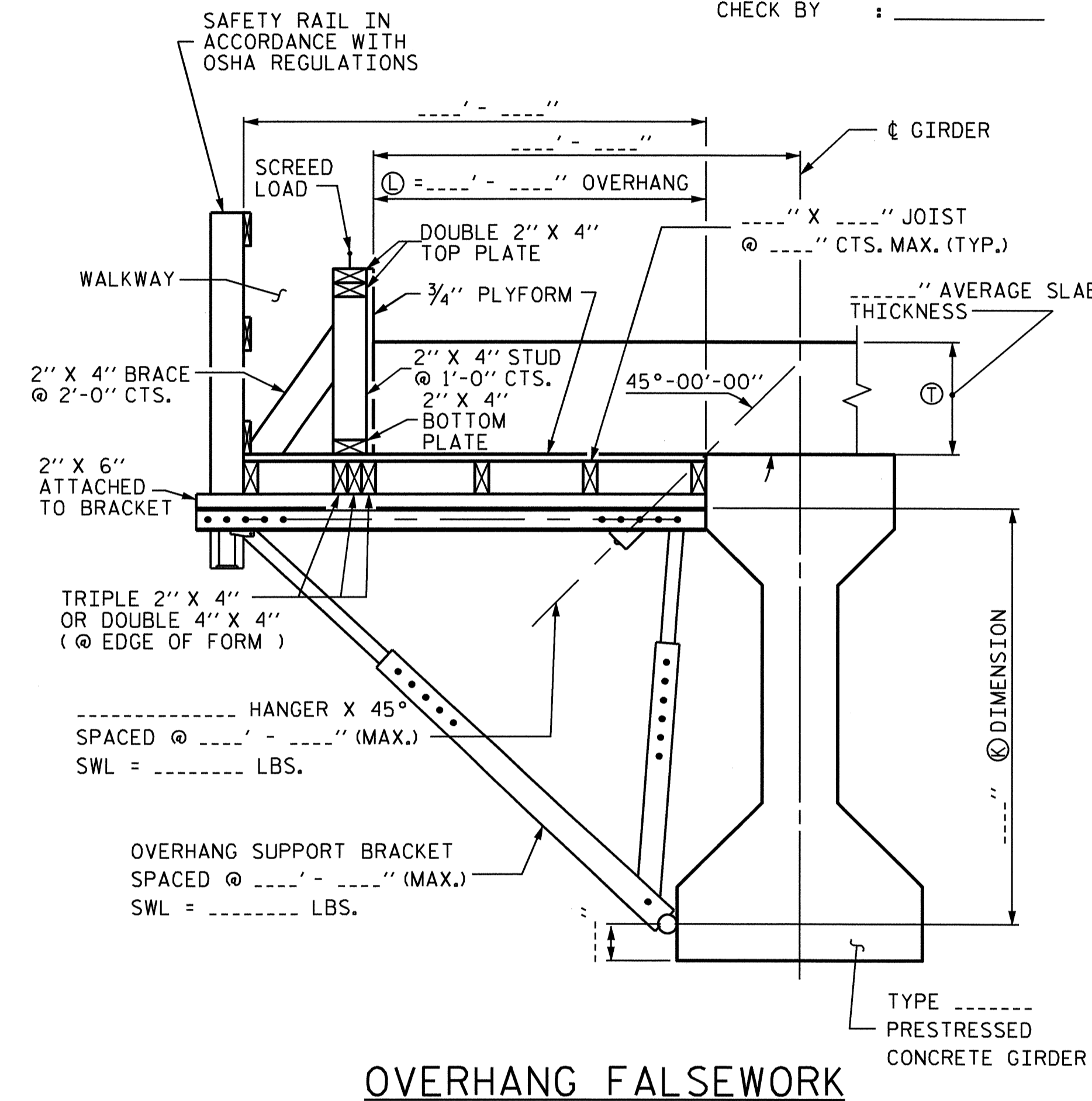
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-57
1			3			TOTAL SHEETS 59
2			4			



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

BRIDGE OVERHANG BRACKET SUMMARY

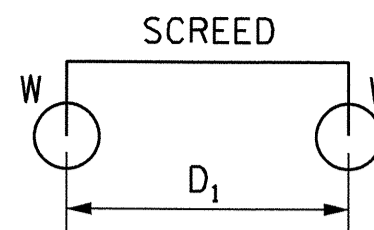
TOTAL SCREED WEIGHT = \_\_\_\_\_ LBS. PROJECT No. : \_\_\_\_\_  
 NUMBER OF SCREED WHEELS = \_\_\_\_\_ COUNTY : \_\_\_\_\_  
 SCREED WHEEL LOAD (W) = \_\_\_\_\_ LBS. STATION : \_\_\_\_\_  
 SCREED LOAD PER BRACKET = \_\_\_\_\_ LBS. DESCRIPTION : \_\_\_\_\_  
 DATE : \_\_\_\_\_  
 DESIGN BY : \_\_\_\_\_  
 CHECK BY : \_\_\_\_\_



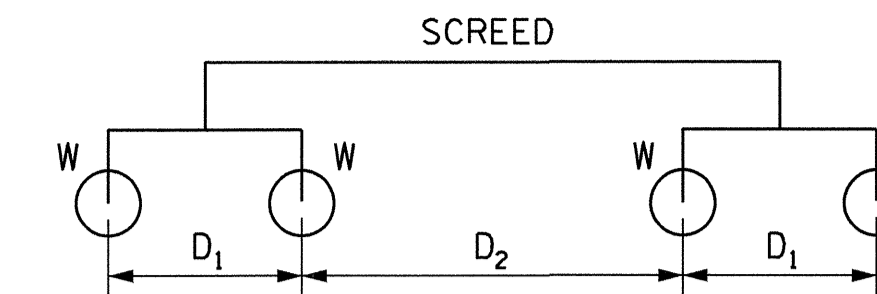
OVERHANG FALSEWORK

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>																	
		<= 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
S/D <sub>1</sub>	<= 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	1.75
	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	1.17	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	1.23	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	1.29	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	1.33	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	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.86	1.89	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	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	1.44	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	1.47	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	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	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	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	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	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	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	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	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

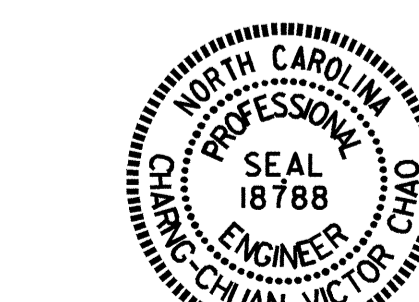
AVG. SLAB THICKNESS (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	---	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	---	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	---	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-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

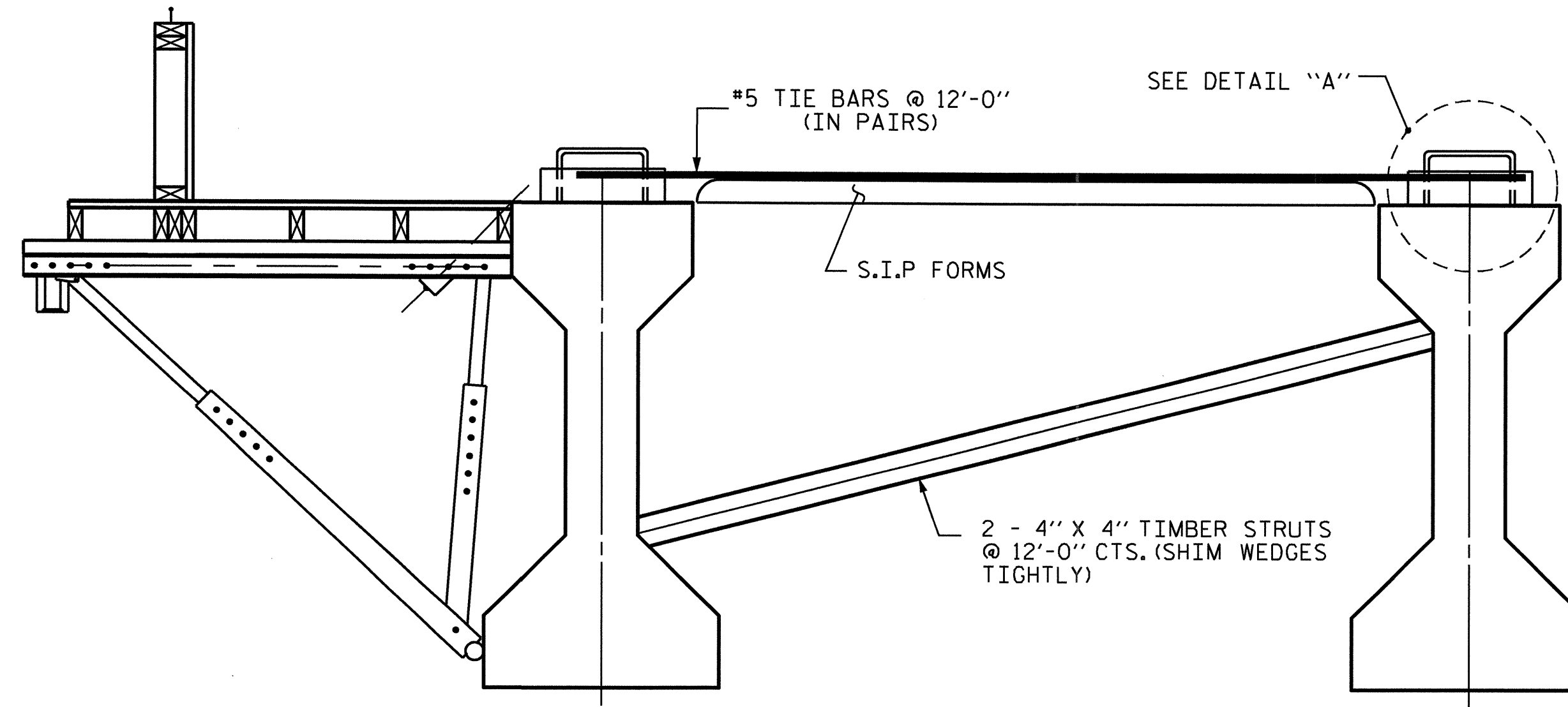
STANDARD OVERHANG FALSEWORK  
 AASHTO TYPES III, IV, V, AND VI



Chang-Chuan Victor Chao  
 1-8-2010

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-58	
1			3			TOTAL SHEETS 59	
2			4				

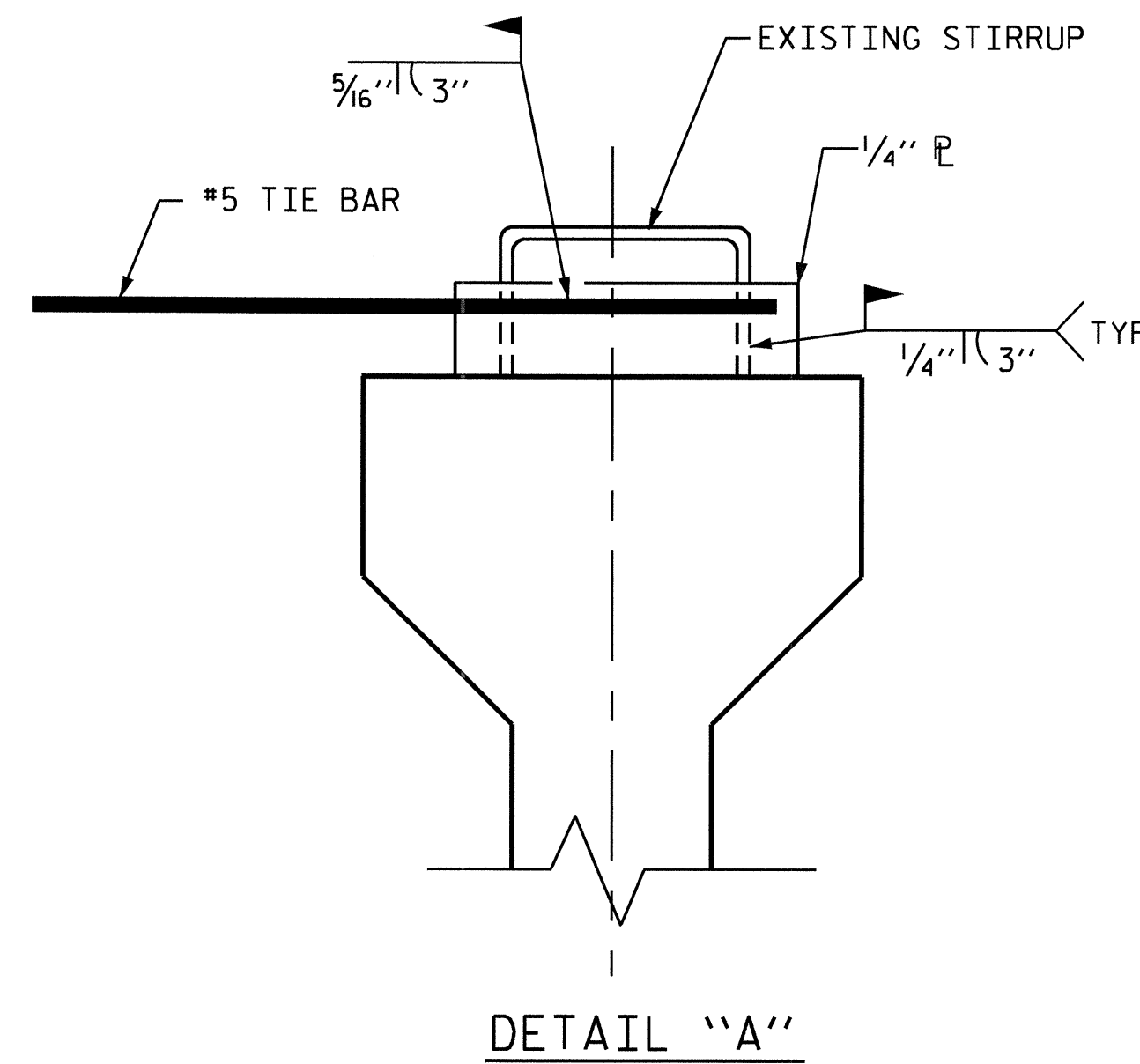
ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	



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 12'-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-4138  
HARNETT COUNTY  
 STATION: 30+63.00-SBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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



*Chang-Chuan Victor Chao*  
 1-8-2010

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

08-JAN-2010 09:52  
 d:\wdr\Victor\overhangfalsework\tiebar&strut\B-4138.type.iv\B4138overhangsheets.dgn  
 vchoo

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59	
1			3			TOTAL SHEETS	
2			4			59	

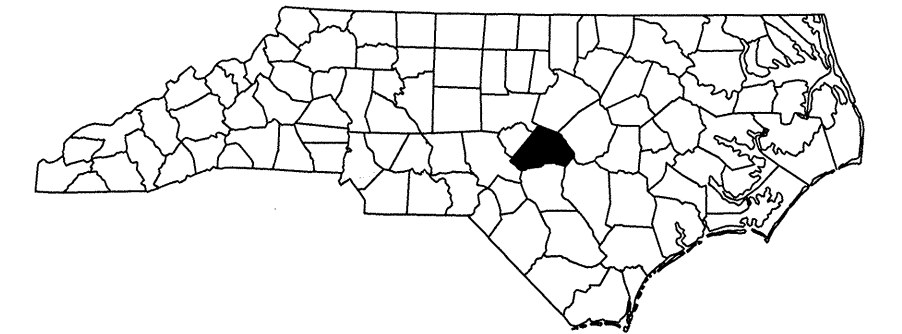
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4138	SU-1	10

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

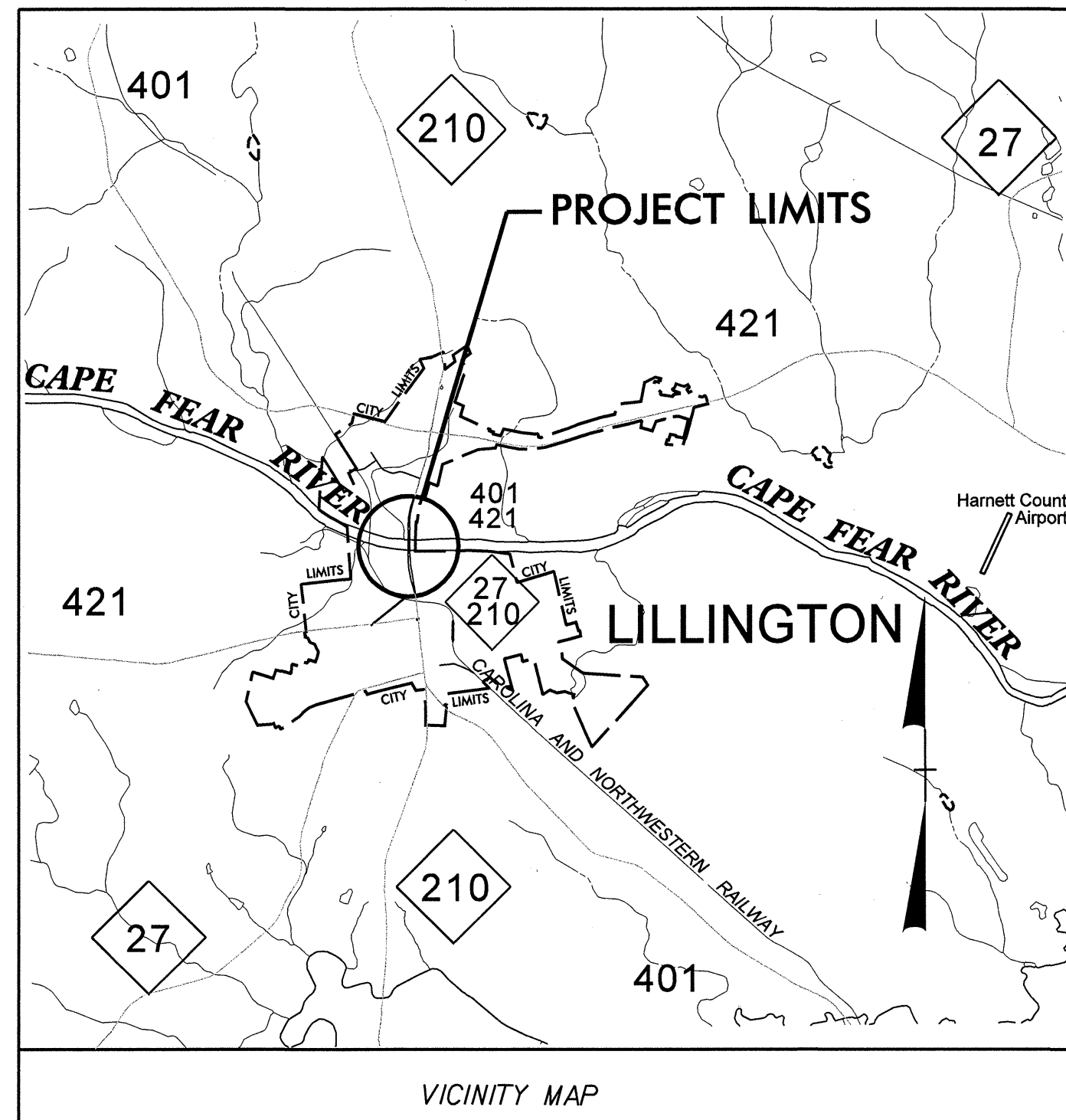
**STRUCTURE UTILITIES PLANS  
HARNETT COUNTY**

LOCATION: BRIDGE 46 OVER CAPE FEAR RIVER  
ON US 401

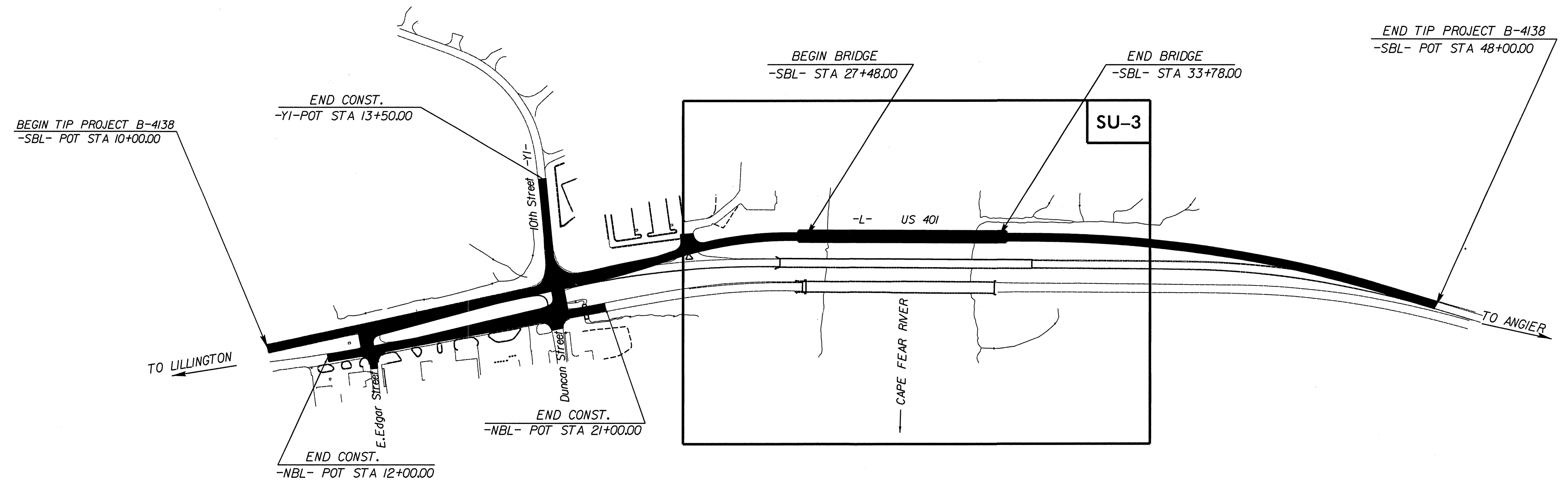
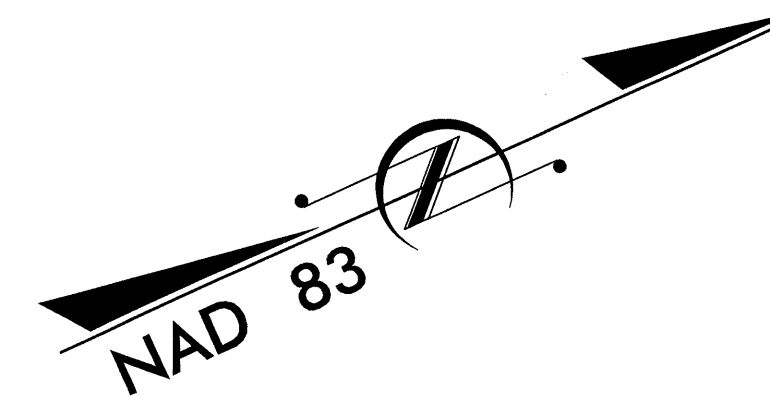
TYPE OF WORK: HANGER SYSTEM FOR TELEPHONE CONDUITS



SEE THIS SHEET FOR INDEX OF SHEETS  
SEE SHEET SU-2 FOR CONVENTIONAL PLAN SHEET SYMBOLS

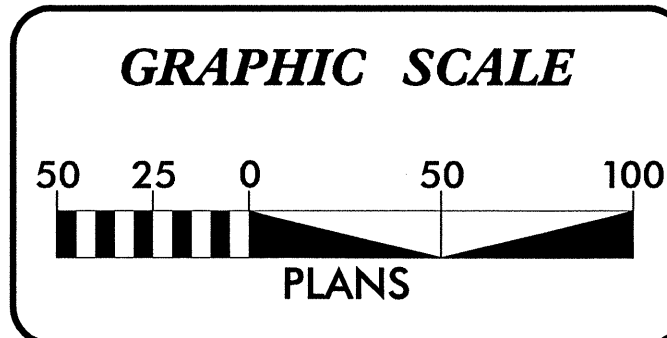


VICINITY MAP



TIP PROJECT: B-4138

CONTRACT:



INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
SU-1	TITLE SHEET
SU-2	SYMBOLS SHEET
SU-3	PLAN SHEET
SU-4 THRU SU-9	LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS
SU-10	HANGER ASSEMBLY DETAILS, DUCT BANK SECTION THROUGH BACK WALL, & UNDERGROUND DUCT BANK TYPICAL SECTION

**UTILITY OWNERS ON THIS PROJECT:**  
CENTURYLINK

**NCDOT CONTACTS FOR THIS PROJECT:**  
STRUCTURES: BRUCE KLAPPENBACH, P.E.  
UTILITIES: CARL BARCLAY, P.E. AND BO HEMPHILL, P.E.

SEAL:

UTILITY ENGINEER

STRUCTURE UTILITIES PLANS PREPARED BY:  
**dmp** DAVIS-MARTIN-POWELL & ASSOCIATES, INC.  
6415 OLD PLANK ROAD  
HIGH POINT, NC 27265  
PHONE: (336) 886-4821  
FAX: (336) 886-4458

PROJECT MANAGER: Randy McNeill, P.E.  
PROJECT ENGINEER & DESIGNER: Andy Larrick, P.E.

STRUCTURE UTILITIES PLANS PREPARED FOR:  
CENTURYLINK  
206 WEST CUMBERLAND ST.  
DUNN, NC 28334  
CONTACT: ROD MEDLIN, (252) 413-7711

\$\$\$\$\$ SYSTEMS \$\$\$ EDGNS \$\$\$ USER NAME \$\$\$

3/15/06

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ EDM
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB
Proposed Wetland Boundary	--- WLB
Existing Endangered Animal Boundary	--- EAB
Existing Endangered Plant Boundary	--- EPB

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	□

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	--- JS
Buffer Zone 1	--- BZ 1
Buffer Zone 2	--- BZ 2
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	---
Proposed Lateral, Tail, Head Ditch	-----
False Sump	□

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	○
Proposed Right of Way Line with Concrete or Granite Marker	◆
Existing Control of Access	⊗
Proposed Control of Access	⊕
Existing Easement Line	--- E
Proposed Temporary Construction Easement	--- E
Proposed Temporary Drainage Easement	--- TDE
Proposed Permanent Drainage Easement	--- PDE
Proposed Permanent Utility Easement	--- PUE
Proposed Temporary Utility Easement	--- TUE
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	--- C
Proposed Slope Stakes Fill	--- F
Proposed Wheel Chair Ramp	□ WCR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊗

### VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----
Orchard	○
Vineyard	□ Vineyard

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
Storm Sewer	--- S

### UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊕
U/G Power Cable Hand Hole	□
H-Frame Pole	●
Recorded U/G Power Line	--- P
Designated U/G Power Line (S.U.E.*)	--- P

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	--- T
Designated U/G Telephone Cable (S.U.E.*)	--- T
Recorded U/G Telephone Conduit	--- TC
Designated U/G Telephone Conduit (S.U.E.*)	--- TC
Recorded U/G Fiber Optics Cable	--- T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	--- T FO

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	--- W
Designated U/G Water Line (S.U.E.*)	--- W
Above Ground Water Line	--- A/G Water

### TV:

TV Satellite Dish	⊕
TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	--- TV
Designated U/G TV Cable (S.U.E.*)	--- TV
Recorded U/G Fiber Optic Cable	--- TV FO
Designated U/G Fiber Optic Cable (S.U.E.*)	--- TV FO

### GAS:

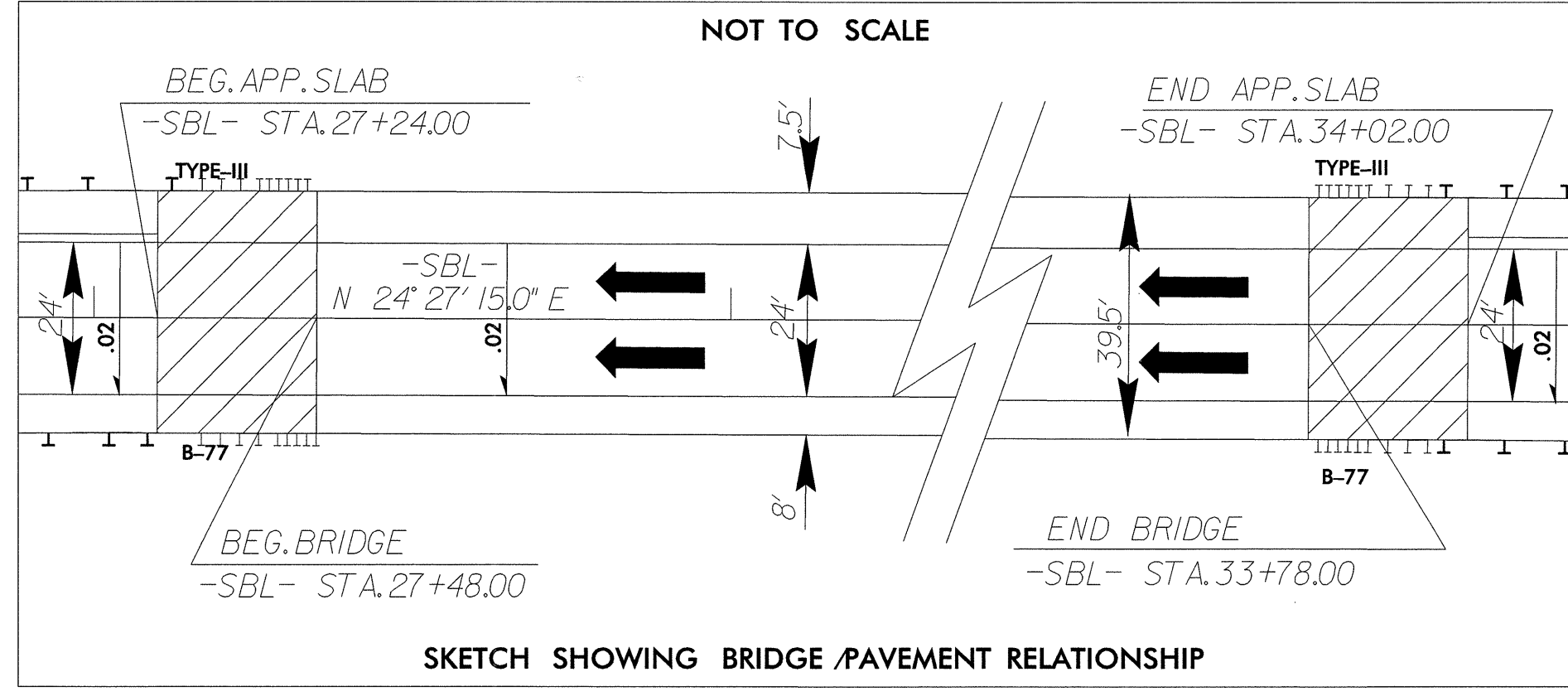
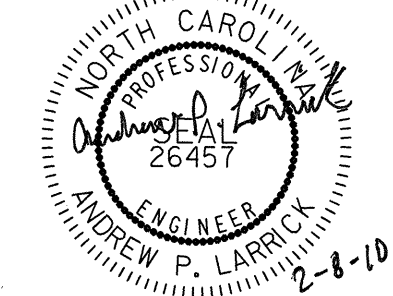
Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	--- G
Designated U/G Gas Line (S.U.E.*)	--- G
Above Ground Gas Line	--- A/G Gas

### SANITARY SEWER:

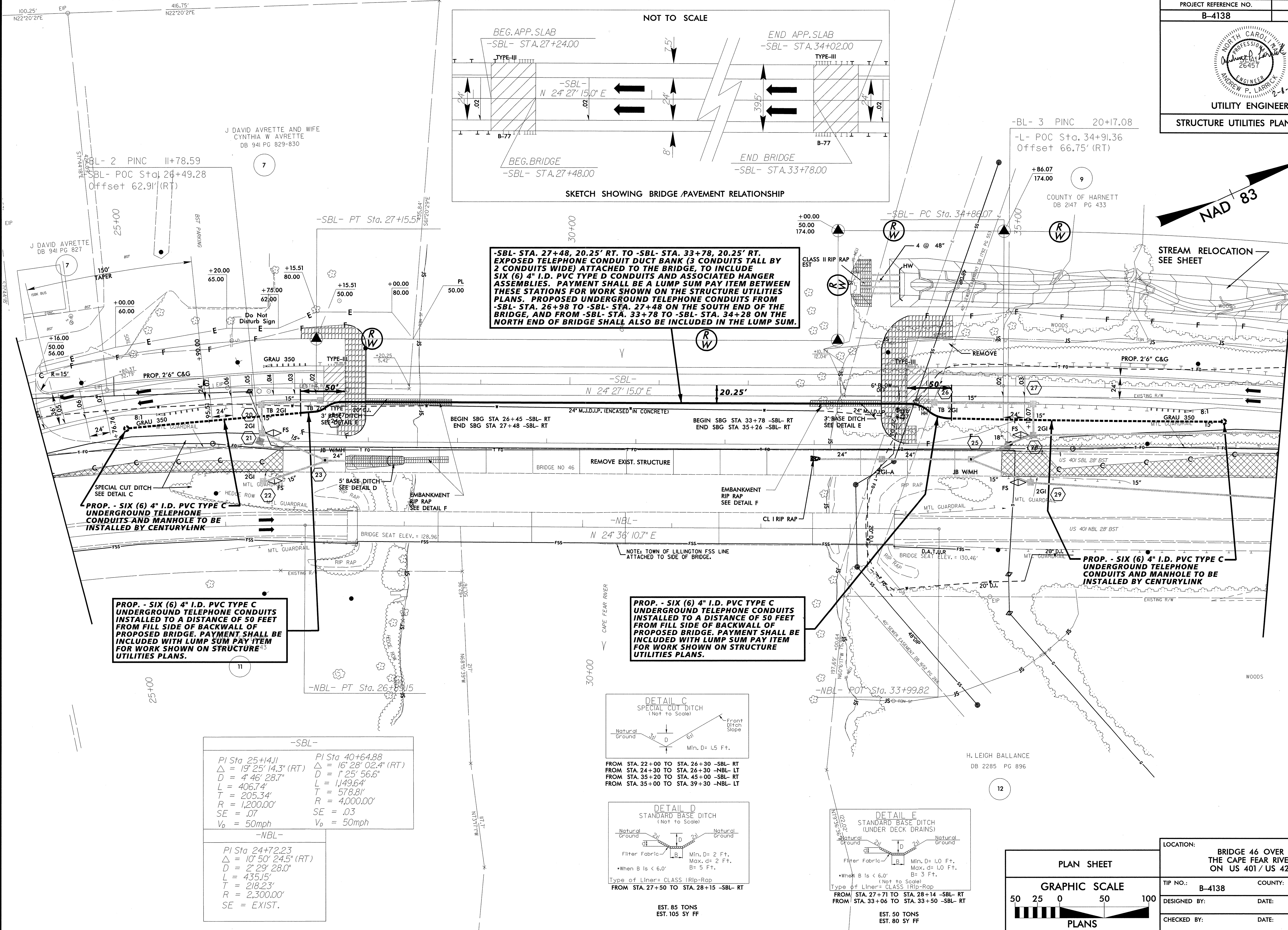
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	--- SS
Above Ground Sanitary Sewer	--- A/G Sanitary Sewer
Recorded SS Forced Main Line	--- FSS
Designated SS Forced Main Line (S.U.E.*)	--- FSS

### MISCELLANEOUS:

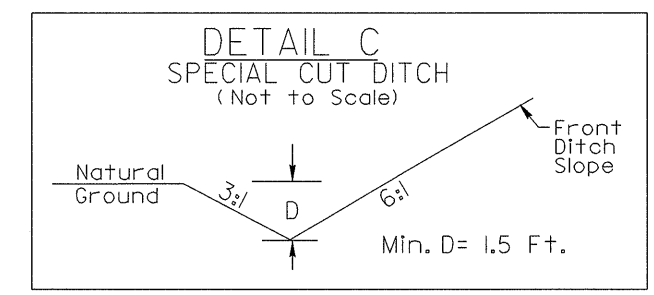
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	--- ?UTL
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.



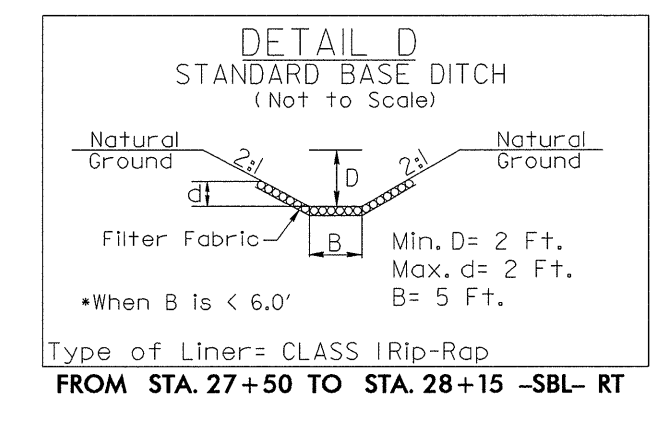
**-SBL- STA. 27+48, 20.25' RT. TO -SBL- STA. 33+78, 20.25' RT. EXPOSED TELEPHONE CONDUIT DUCT BANK (3 CONDUITS TALL BY 2 CONDUITS WIDE) ATTACHED TO THE BRIDGE, TO INCLUDE SIX (6) 4" I.D. PVC TYPE D CONDUITS AND ASSOCIATED HANGER ASSEMBLIES. PAYMENT SHALL BE A LUMP SUM PAY ITEM BETWEEN THESE STATIONS FOR WORK SHOWN ON THE STRUCTURE UTILITIES PLANS. PROPOSED UNDERGROUND TELEPHONE CONDUITS FROM -SBL- STA. 26+98 TO -SBL- STA. 27+48 ON THE SOUTH END OF THE BRIDGE, AND FROM -SBL- STA. 33+78 TO -SBL- STA. 34+28 ON THE NORTH END OF BRIDGE SHALL ALSO BE INCLUDED IN THE LUMP SUM.**



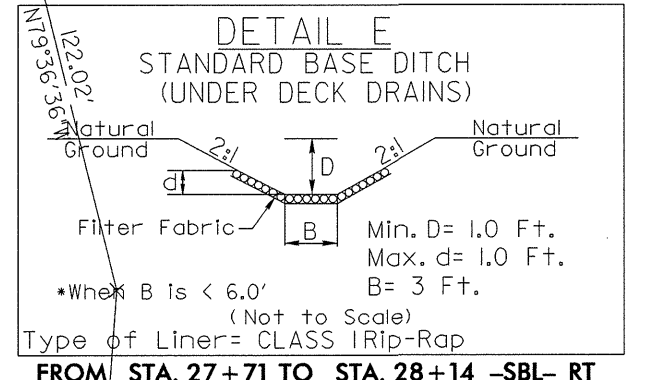
-SBL-	
PI Sta 25+14.11	PI Sta 40+64.88
$\Delta = 19' 25" 14.3" (RT)$	$\Delta = 16' 28" 02.4" (RT)$
$D = 4' 46" 28.7"$	$D = 1' 25" 56.6"$
$L = 406.74'$	$L = 1,149.64'$
$T = 205.34'$	$T = 578.81'$
$R = 1,200.00'$	$R = 4,000.00'$
$SE = .07$	$SE = .03$
$V_0 = 50\text{mph}$	$V_0 = 50\text{mph}$
-NBL-	
PI Sta 24+72.23	
$\Delta = 10' 50" 24.5" (RT)$	
$D = 2' 29" 28.0"$	
$L = 435.15'$	
$T = 218.23'$	
$R = 2,300.00'$	
$SE = \text{EXIST.}$	



FROM STA. 22+00 TO STA. 26+30 -SBL- RT  
FROM STA. 24+30 TO STA. 26+30 -NBL- LT  
FROM STA. 35+20 TO STA. 45+00 -SBL- RT  
FROM STA. 35+00 TO STA. 39+30 -NBL- LT



EST. 85 TONS  
EST. 105 SY FF



EST. 50 TONS  
EST. 80 SY FF

**PLAN SHEET**

**GRAPHIC SCALE**

50 25 0 50 100

**PLANS**

LOCATION: **BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421**

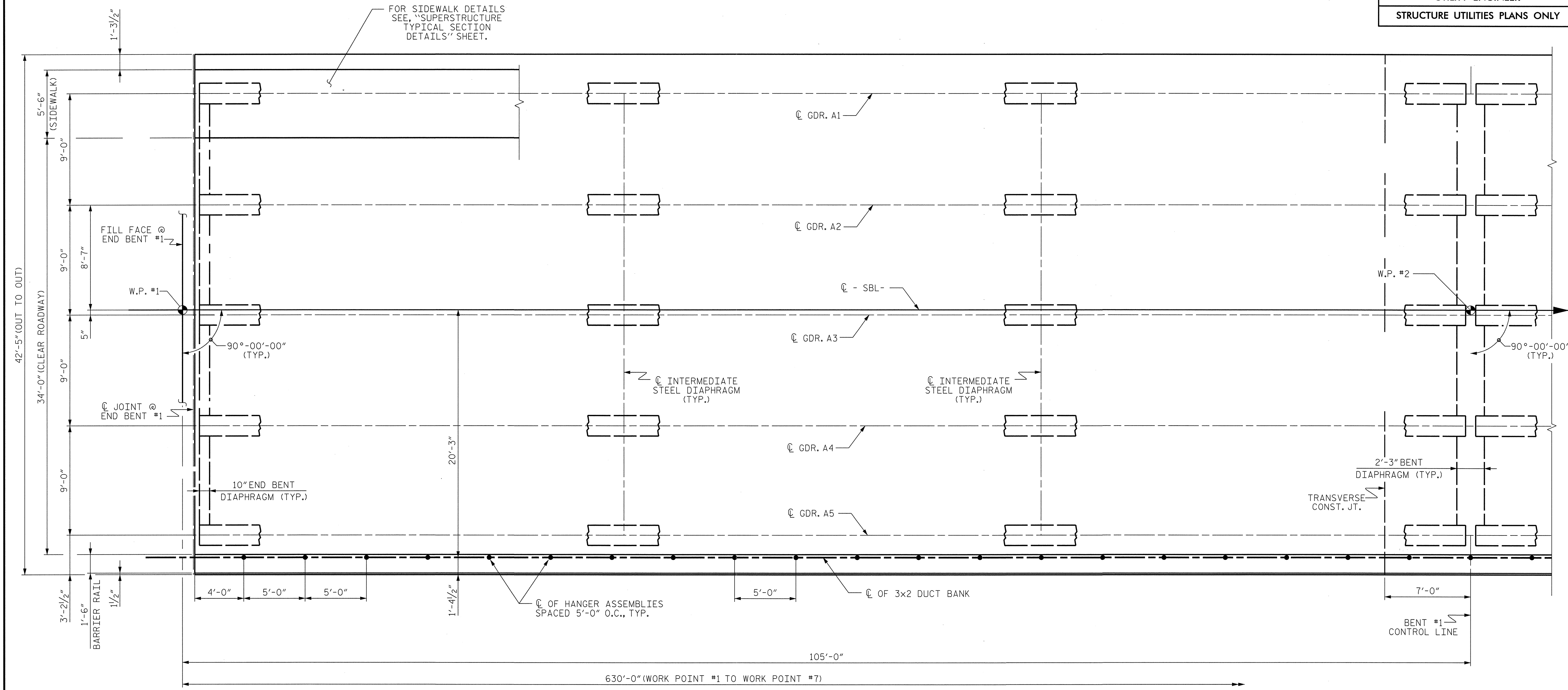
TIP NO.: **B-4138** COUNTY: **HARNETT**

DESIGNED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REVISIONS

8/17/99



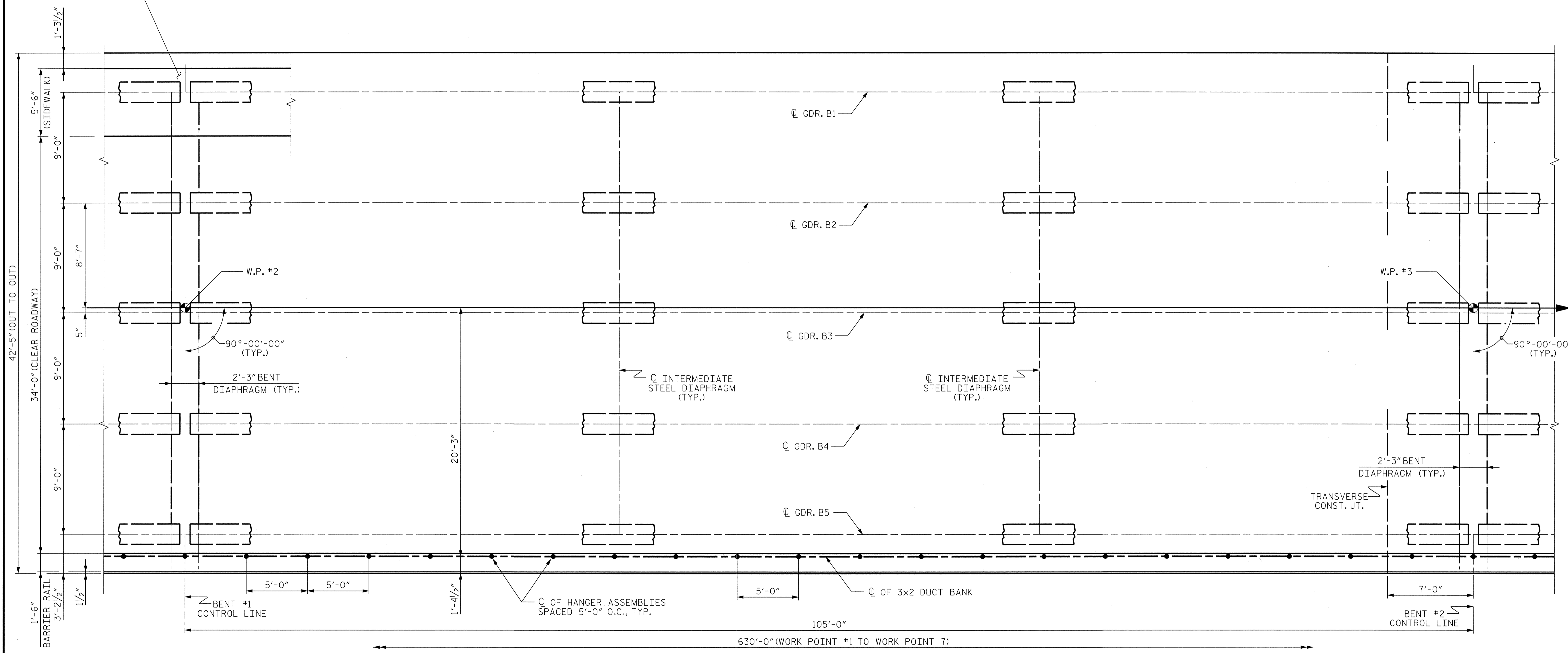
**SPAN A**

- NOTES:**
1. THE SUSPENDED PORTION OF THE 2x3 DUCT BANK IS FROM STA. 27+49.00 TO STA. 33+77.00, A TOTAL DISTANCE OF 628'-0".
  2. THE DUCT BANK SHALL BE CENTERED 20'-3" RIGHT OF THE -SBL- C.
  3. ALL CAST IN PLACE THREADED ANCHOR INSERTS SHALL ACCOMMODATE A 5/8" DIAMETER ANCHOR BOLT; SHALL BE CONSTRUCTED OF MALLEABLE IRON OR STEEL OR STAINLESS STEEL; HAVE A MINIMUM CONCRETE EMBEDMENT OF 2 1/4"; AND HAVE A MINIMUM LOAD CAPACITY OF 1,260 LBS.
  4. KEEP CONCRETE INSERTS AT LEAST 18 INCHES AWAY FROM TRANSVERSE CONSTRUCTION JOINTS.
  5. REFER TO SHEET SU-10 FOR ADDITIONAL DETAILS FOR THE DUCT BANK.

<b>LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS</b>  <b>PLANS</b>	LOCATION: <b>BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421</b>
	TIP NO.: B-4138      COUNTY: HARNETT
DESIGNED BY:	DATE:
CHECKED BY:	DATE:



FOR SIDEWALK DETAILS  
SEE "SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS" SHEET.

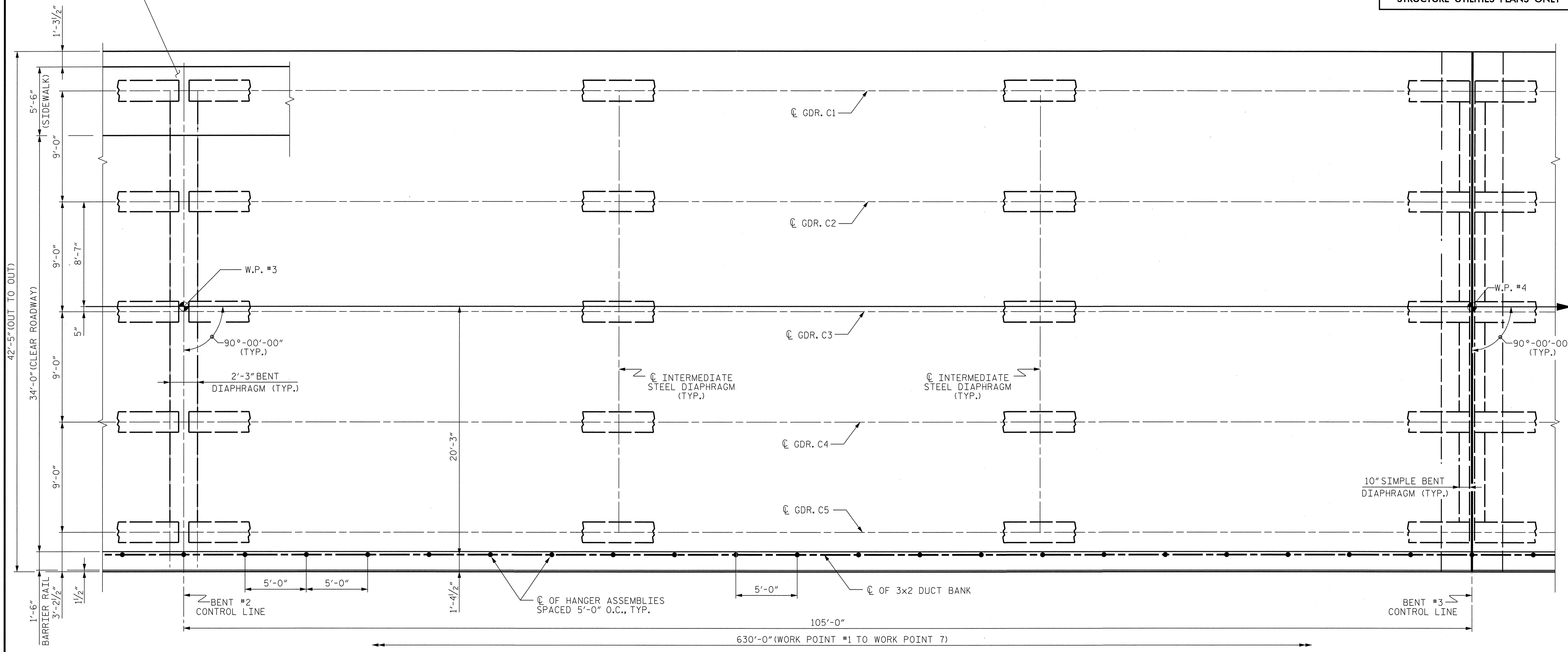


**SPAN B**

- NOTES:**
1. THE SUSPENDED PORTION OF THE 2x3 DUCT BANK IS FROM STA. 27+49.00 TO STA. 33+77.00, A TOTAL DISTANCE OF 628'-0".
  2. THE DUCT BANK SHALL BE CENTERED 20'-3" RIGHT OF THE -SBL- C.
  3. ALL CAST IN PLACE THREADED ANCHOR INSERTS SHALL ACCOMMODATE A 5/8" DIAMETER ANCHOR BOLT; SHALL BE CONSTRUCTED OF MALLEABLE IRON OR STEEL OR STAINLESS STEEL; HAVE A MINIMUM CONCRETE EMBEDMENT OF 2/4"; AND HAVE A MINIMUM LOAD CAPACITY OF 1,260 LBS.
  4. KEEP CONCRETE INSERTS AT LEAST 18 INCHES AWAY FROM TRANSVERSE CONSTRUCTION JOINTS.
  5. REFER TO SHEET SU-10 FOR ADDITIONAL DETAILS FOR THE DUCT BANK.

<b>LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS</b>   <b>PLANS</b>	LOCATION: <b>BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421</b>
	TIP NO.: <b>B-4138</b> COUNTY: <b>HARNETT</b>
DESIGNED BY:	DATE:
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FOR SIDEWALK DETAILS  
SEE, "SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS" SHEET.

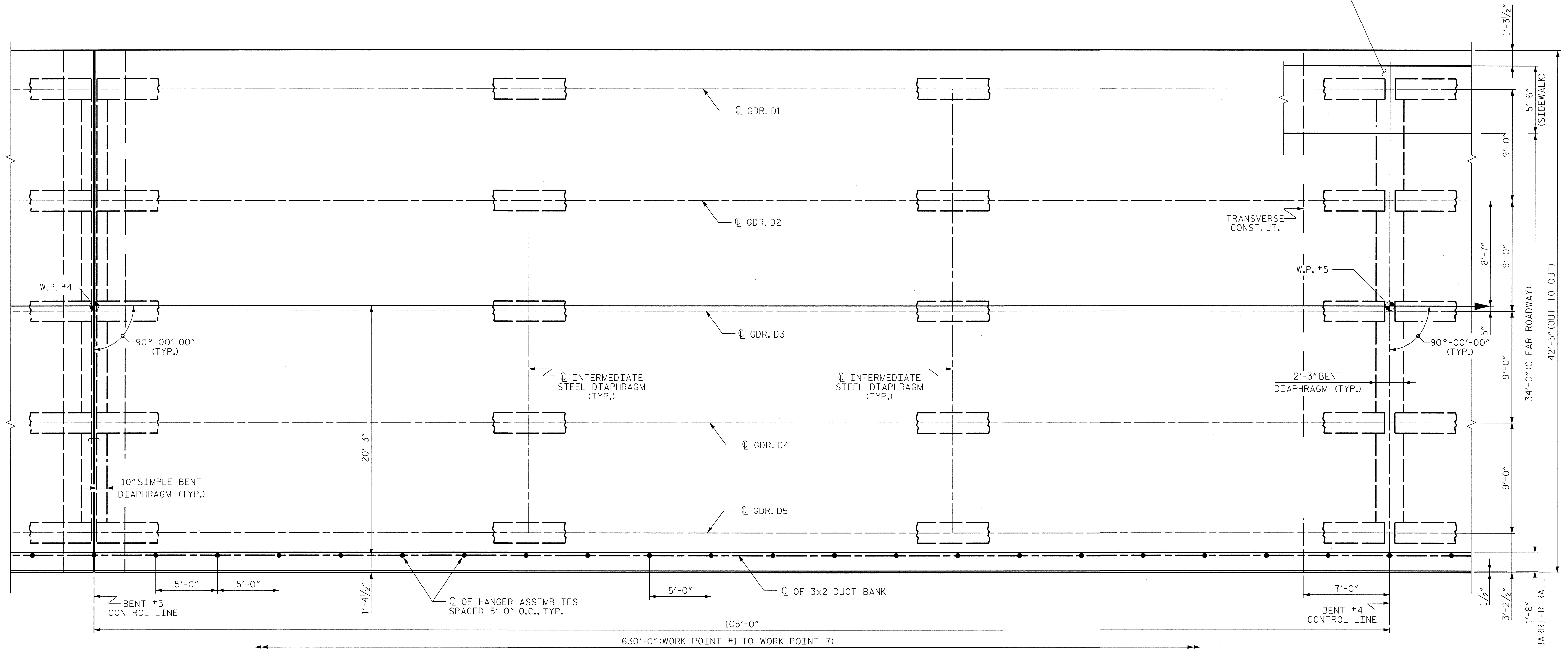


**SPAN C**

- NOTES:**
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  3. ALL CAST IN PLACE THREADED ANCHOR INSERTS SHALL ACCOMMODATE A 5/8" DIAMETER ANCHOR BOLT; SHALL BE CONSTRUCTED OF MALLEABLE IRON OR STEEL OR STAINLESS STEEL; HAVE A MINIMUM CONCRETE EMBEDMENT OF 2 1/4"; AND HAVE A MINIMUM LOAD CAPACITY OF 1,260 LBS.
  4. KEEP CONCRETE INSERTS AT LEAST 18 INCHES AWAY FROM TRANSVERSE CONSTRUCTION JOINTS.
  5. REFER TO SHEET SU-10 FOR ADDITIONAL DETAILS FOR THE DUCT BANK.

<b>LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS</b>  <b>GRAPHIC SCALE</b>  <b>PLANS</b>	<b>LOCATION:</b> <b>BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421</b>
	<b>TIP NO.:</b> B-4138 <b>COUNTY:</b> HARNETT <b>DESIGNED BY:</b> <b>DATE:</b> <b>CHECKED BY:</b> <b>DATE:</b>

FOR SIDEWALK DETAILS  
SEE "SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS" SHEET.



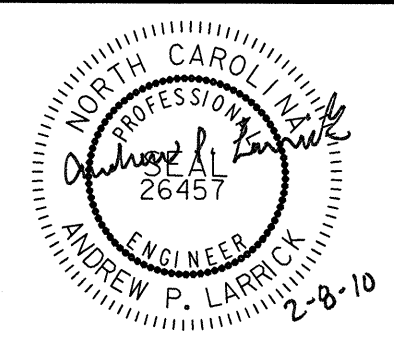
**SPAN D**

- NOTES:**
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  4. KEEP CONCRETE INSERTS AT LEAST 18 INCHES AWAY FROM TRANSVERSE CONSTRUCTION JOINTS.
  5. REFER TO SHEET SU-10 FOR ADDITIONAL DETAILS FOR THE DUCT BANK.

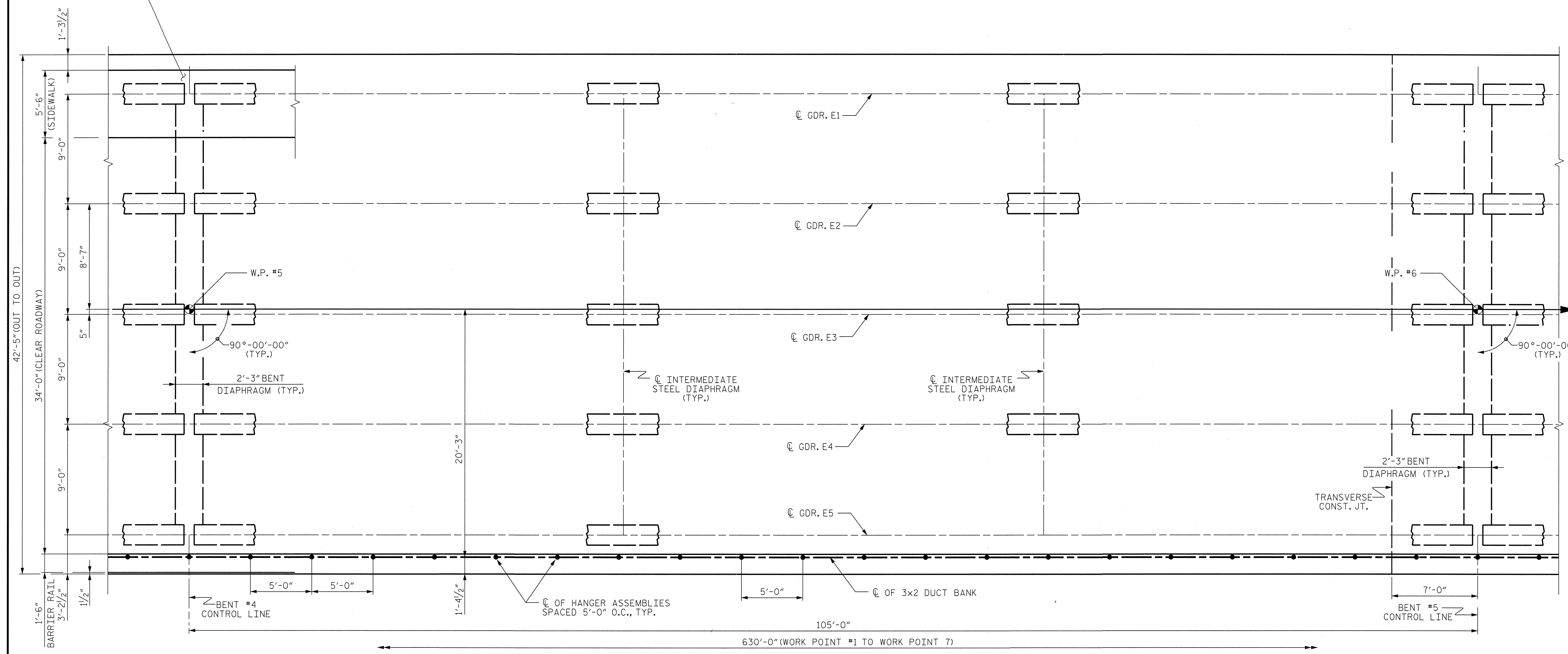
**LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS**

**GRAPHIC SCALE**  
 4 2 0 4 8  
 PLANS

LOCATION: <b>BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421</b>	
TIP NO.: B-4138	COUNTY: HARNETT
DESIGNED BY:	DATE:
CHECKED BY:	DATE:



FOR SIDEWALK DETAILS  
SEE, "SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS" SHEET.



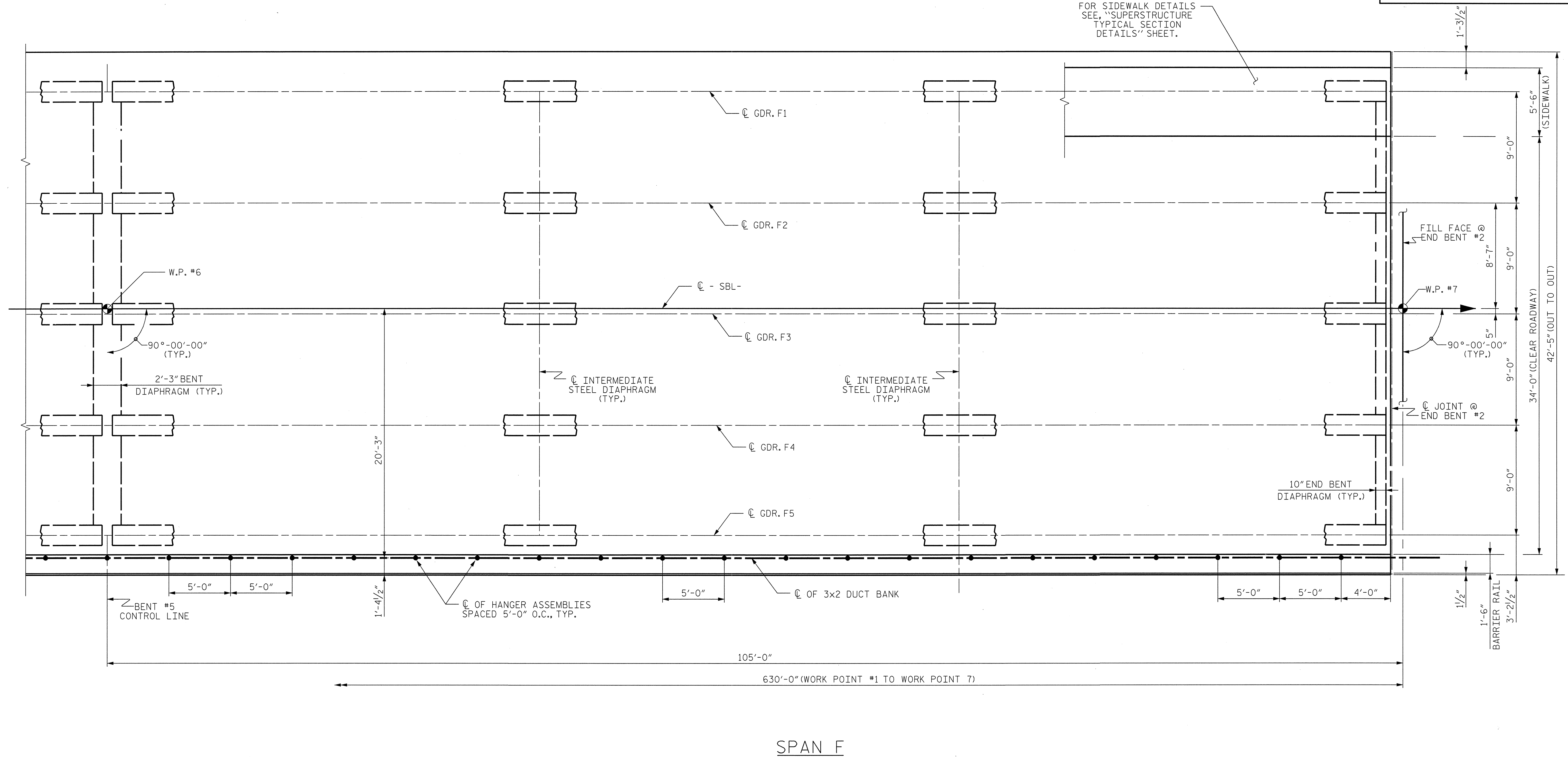
SPAN E

- NOTES:
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  4. KEEP CONCRETE INSERTS AT LEAST 18 INCHES AWAY FROM TRANSVERSE CONSTRUCTION JOINTS.
  5. REFER TO SHEET SU-10 FOR ADDITIONAL DETAILS FOR THE DUCT BANK.

LOCATION PLAN AND DETAILS  
FOR THREADED ANCHOR INSERTS

GRAPHIC SCALE  
4 2 0 4 8  
PLANS

LOCATION:	BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421	
TIP NO.:	B-4138	COUNTY: HARNETT
DESIGNED BY:		DATE:
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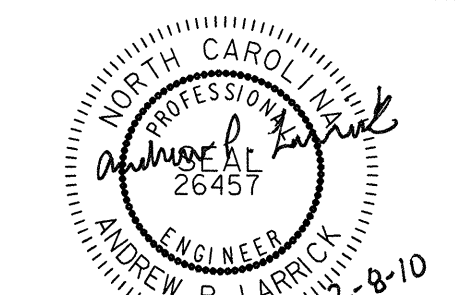


FOR SIDEWALK DETAILS  
SEE, "SUPERSTRUCTURE  
TYPICAL SECTION  
DETAILS" SHEET.

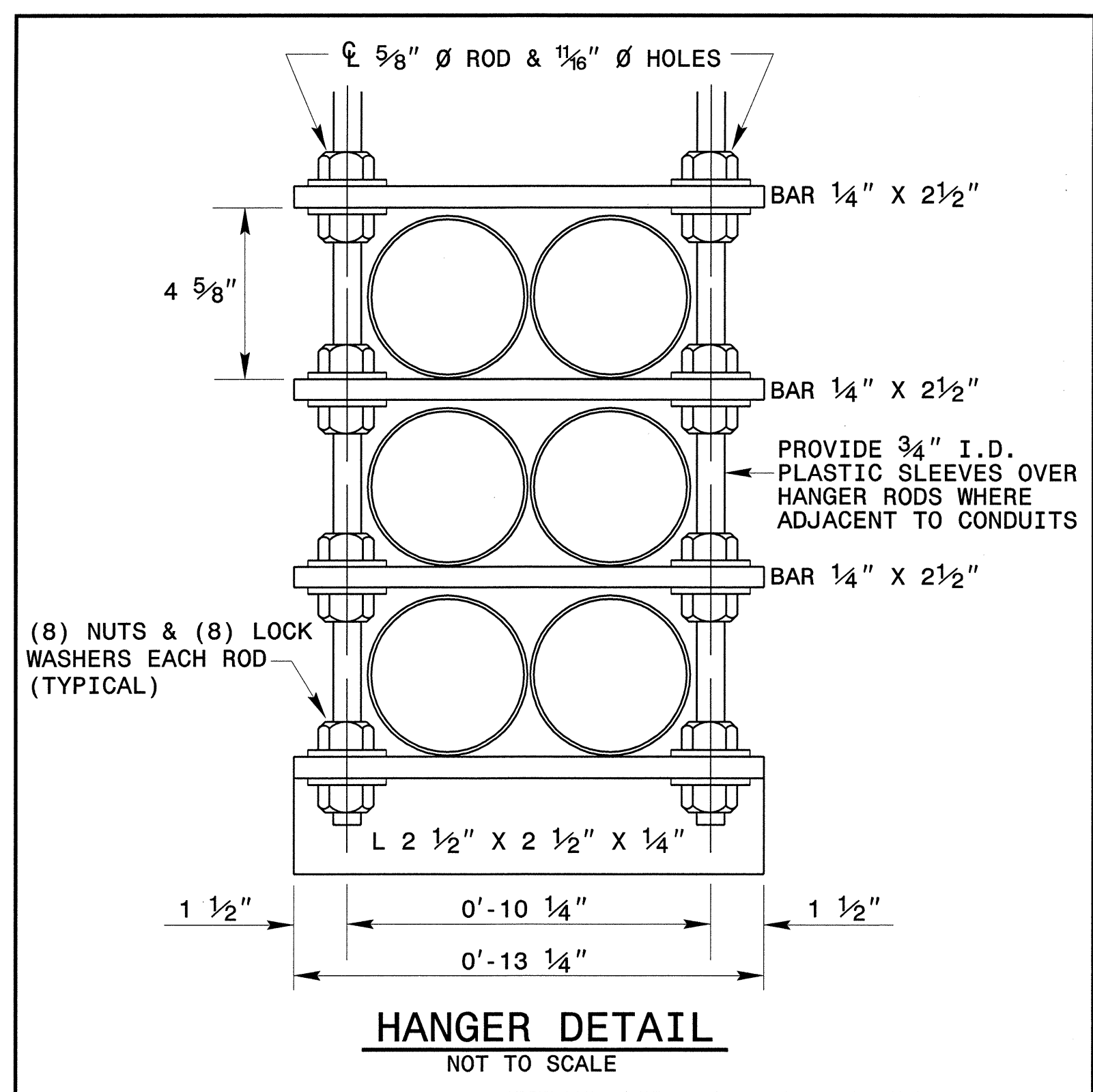
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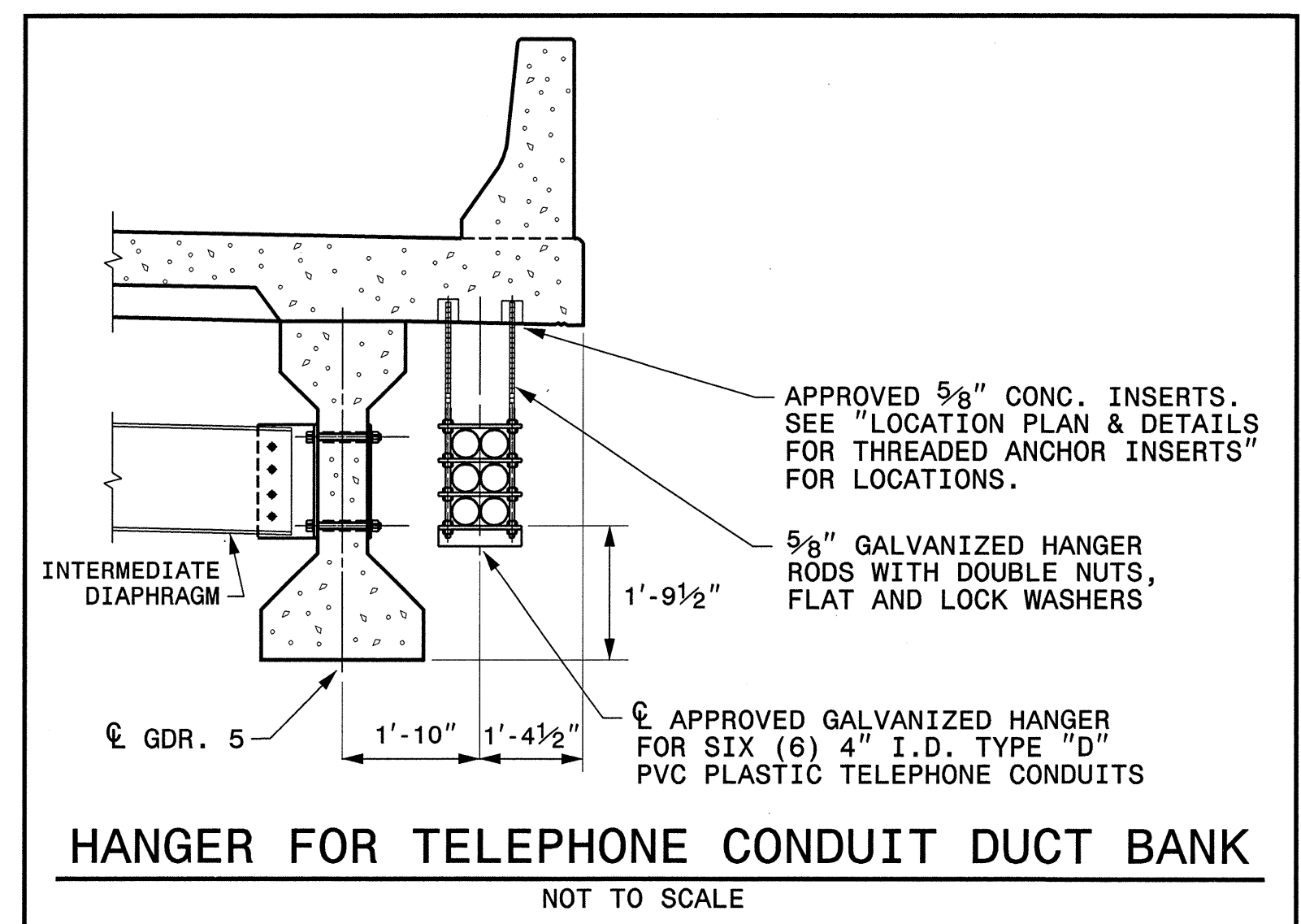
<b>LOCATION PLAN AND DETAILS FOR THREADED ANCHOR INSERTS</b>		LOCATION: <b>BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421</b>	
<b>GRAPHIC SCALE</b> 		TIP NO.: <b>B-4138</b>	COUNTY: <b>HARNETT</b>
DESIGNED BY:		DATE:	
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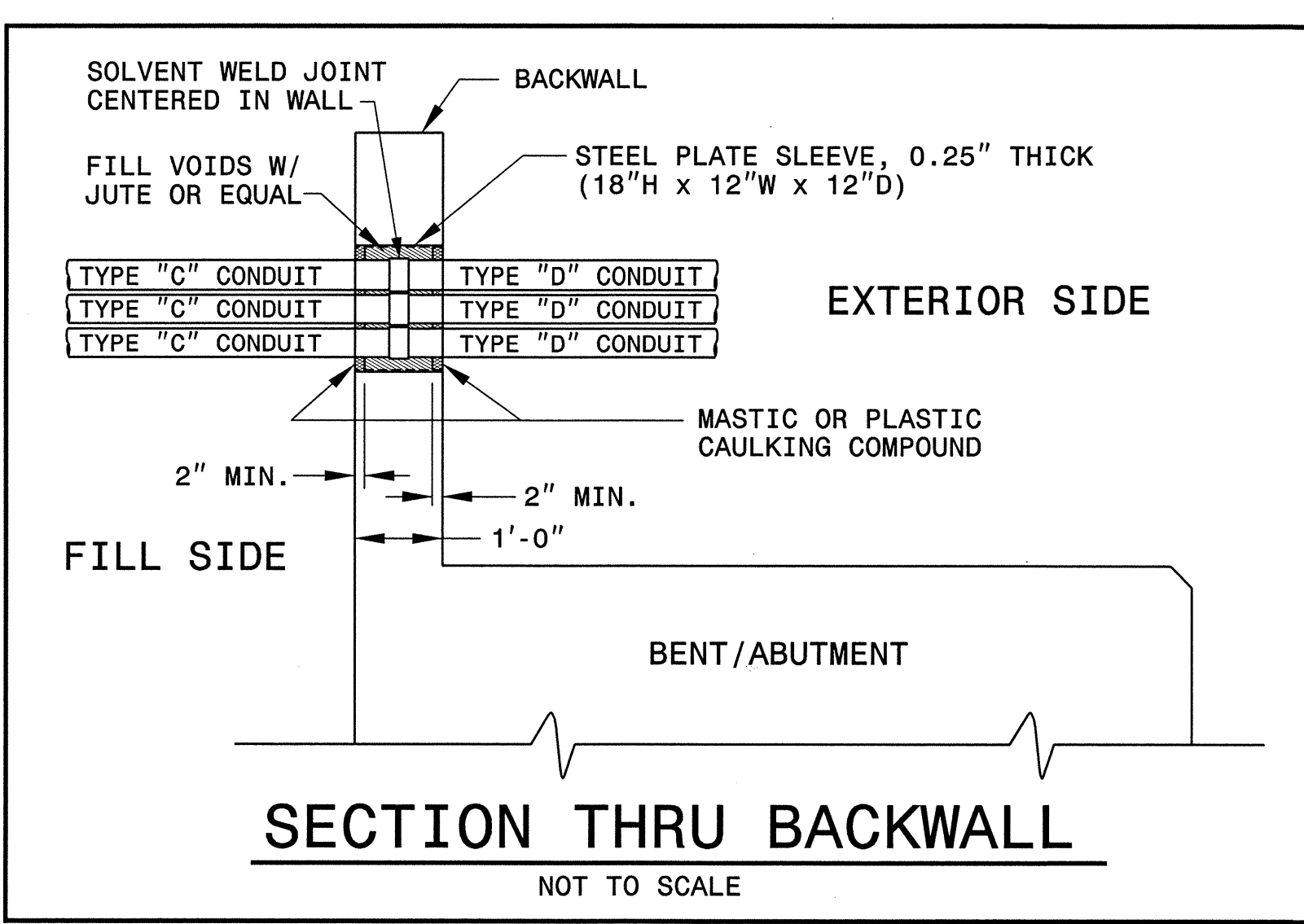
UTILITY ENGINEER  
STRUCTURE UTILITIES PLANS ONLY



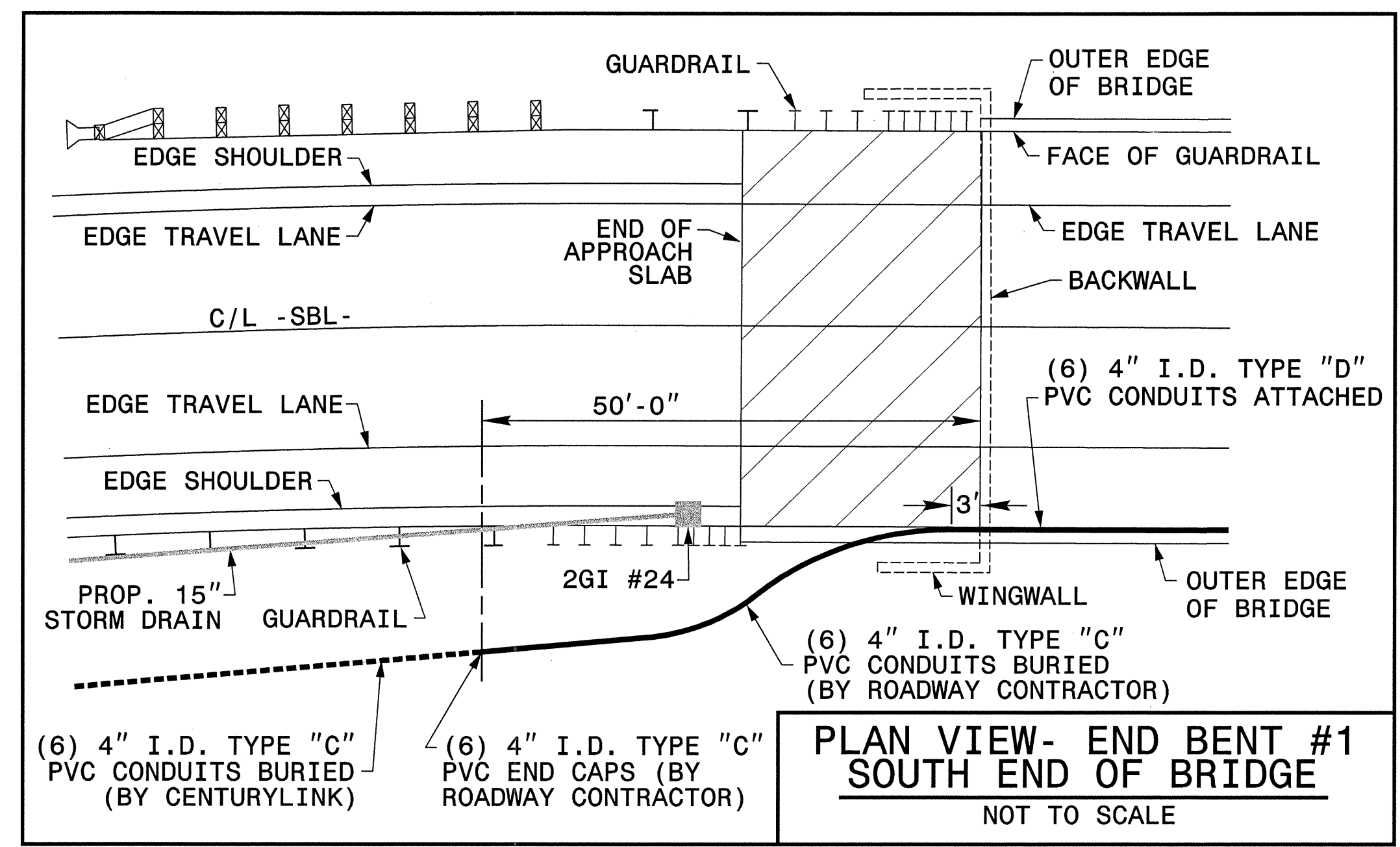
**HANGER DETAIL**  
NOT TO SCALE



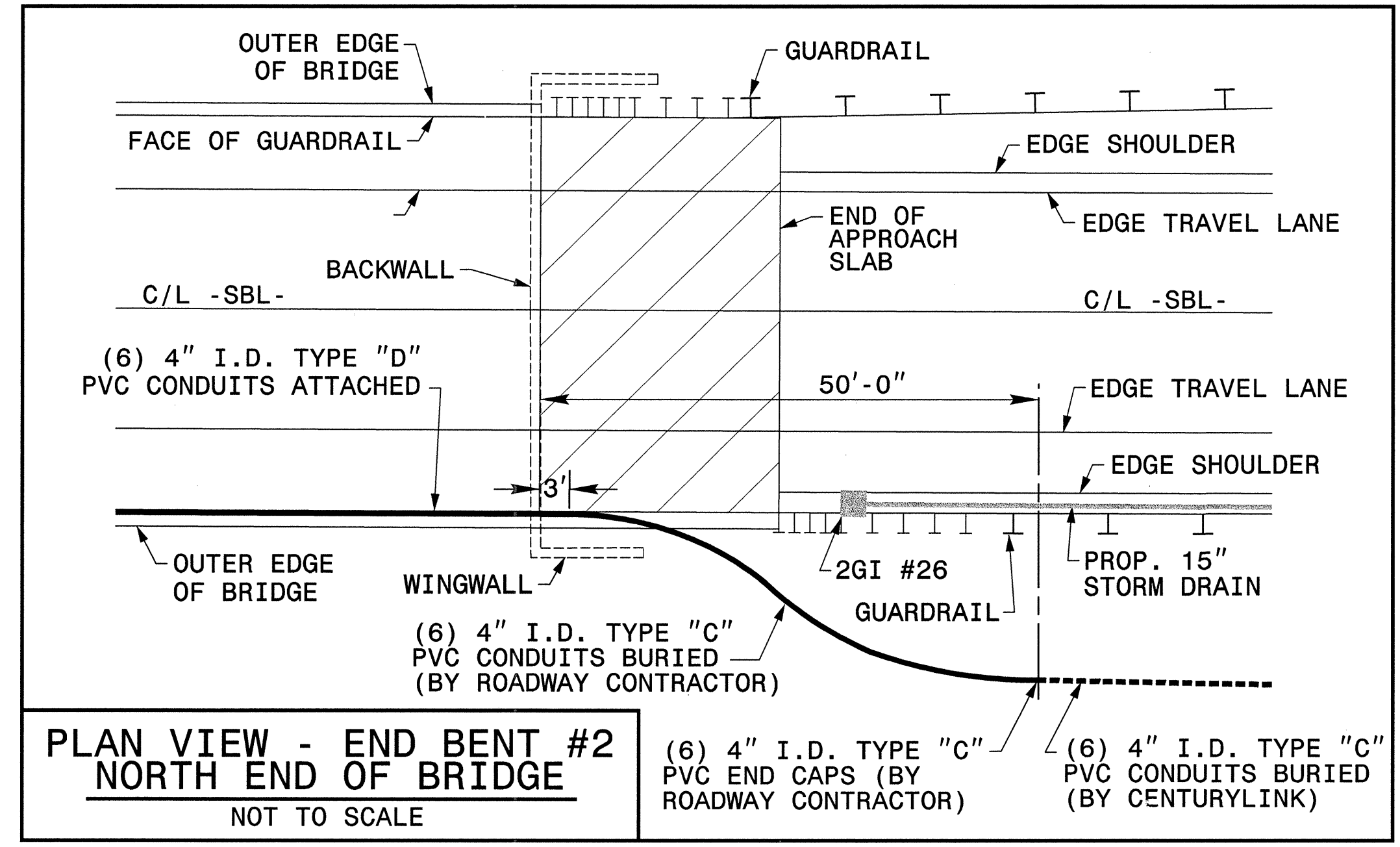
**HANGER FOR TELEPHONE CONDUIT DUCT BANK**  
NOT TO SCALE



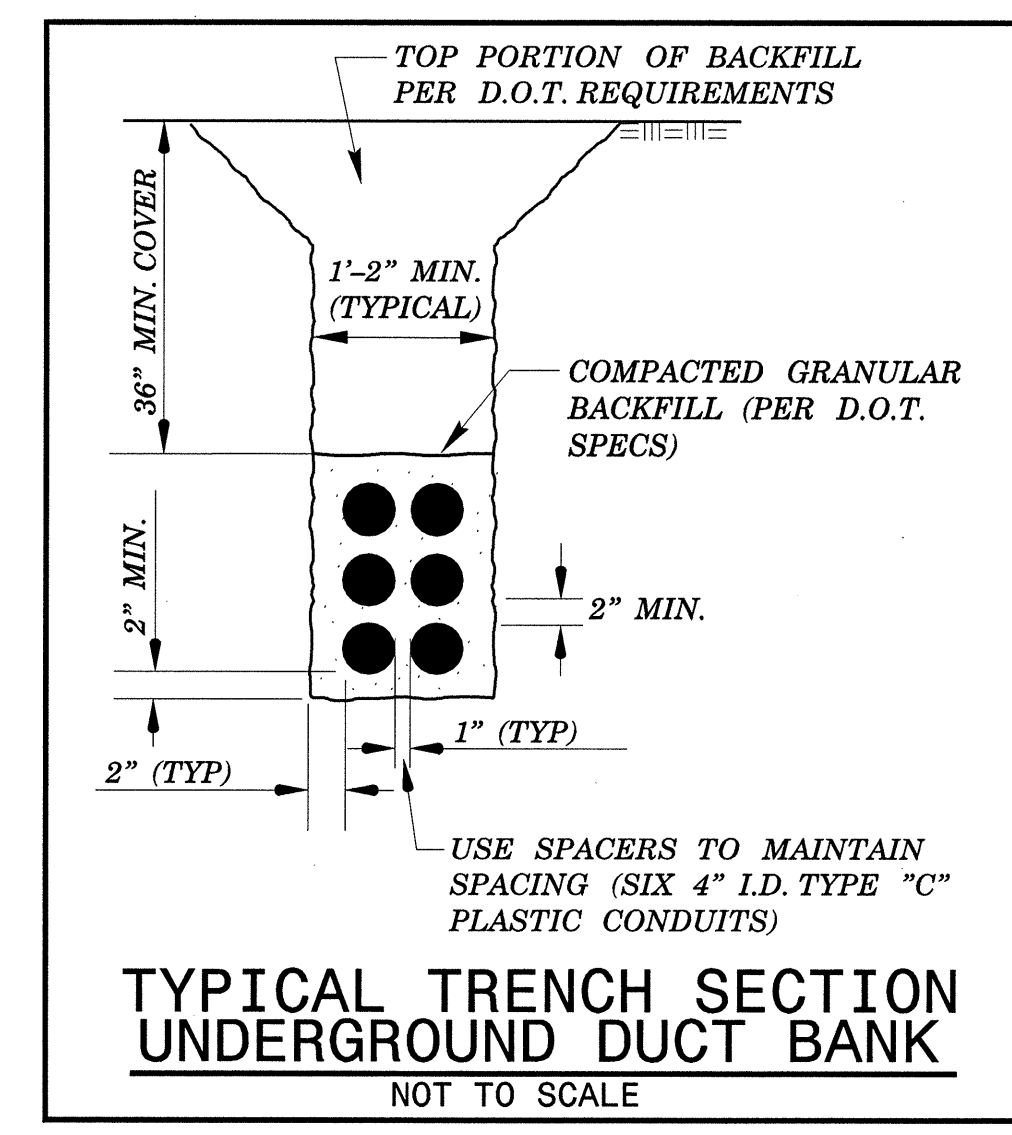
**SECTION THRU BACKWALL**  
NOT TO SCALE



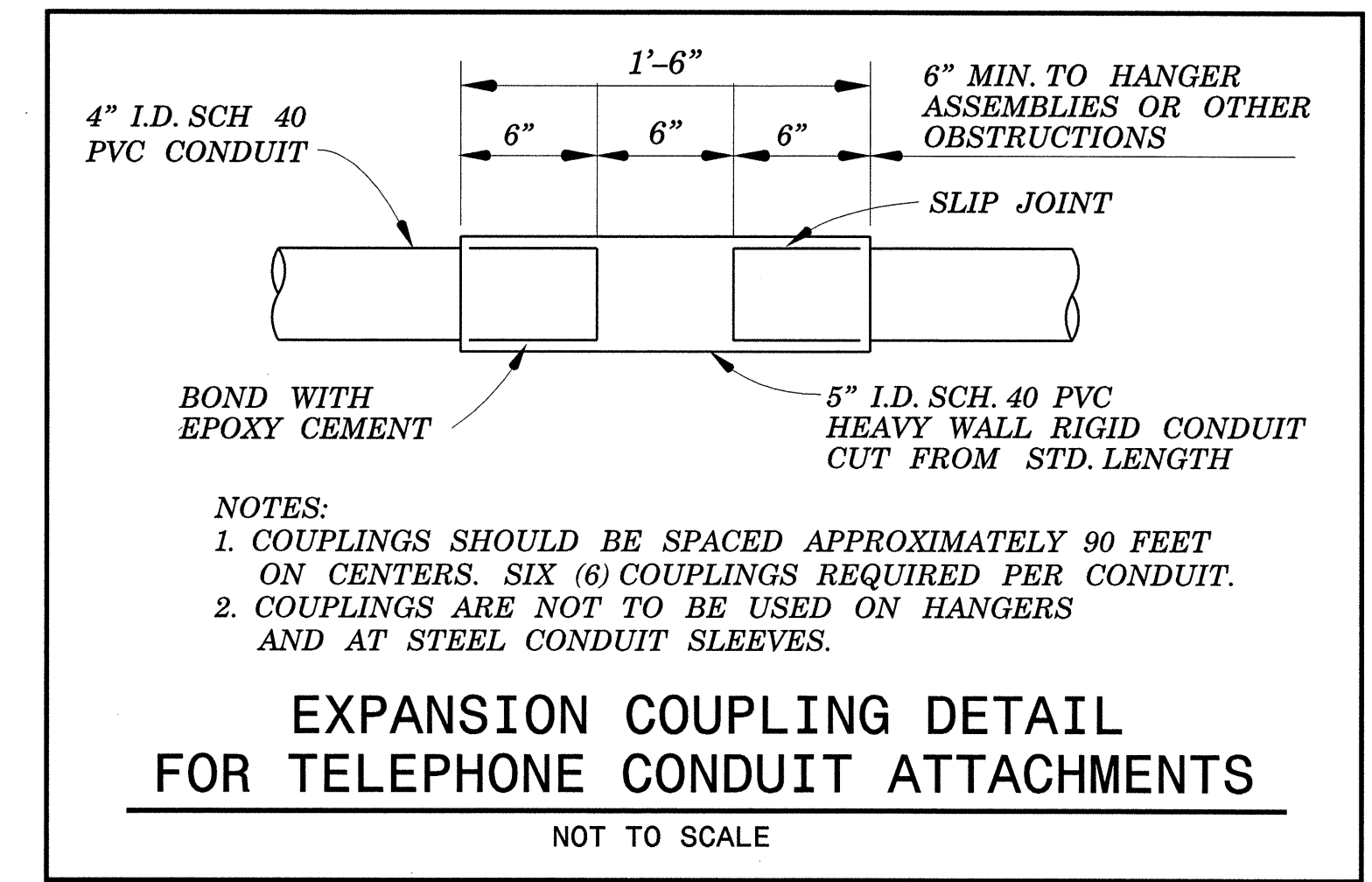
**PLAN VIEW - END BENT #1**  
**SOUTH END OF BRIDGE**  
NOT TO SCALE



**PLAN VIEW - END BENT #2**  
**NORTH END OF BRIDGE**  
NOT TO SCALE



**TYPICAL TRENCH SECTION**  
**UNDERGROUND DUCT BANK**  
NOT TO SCALE

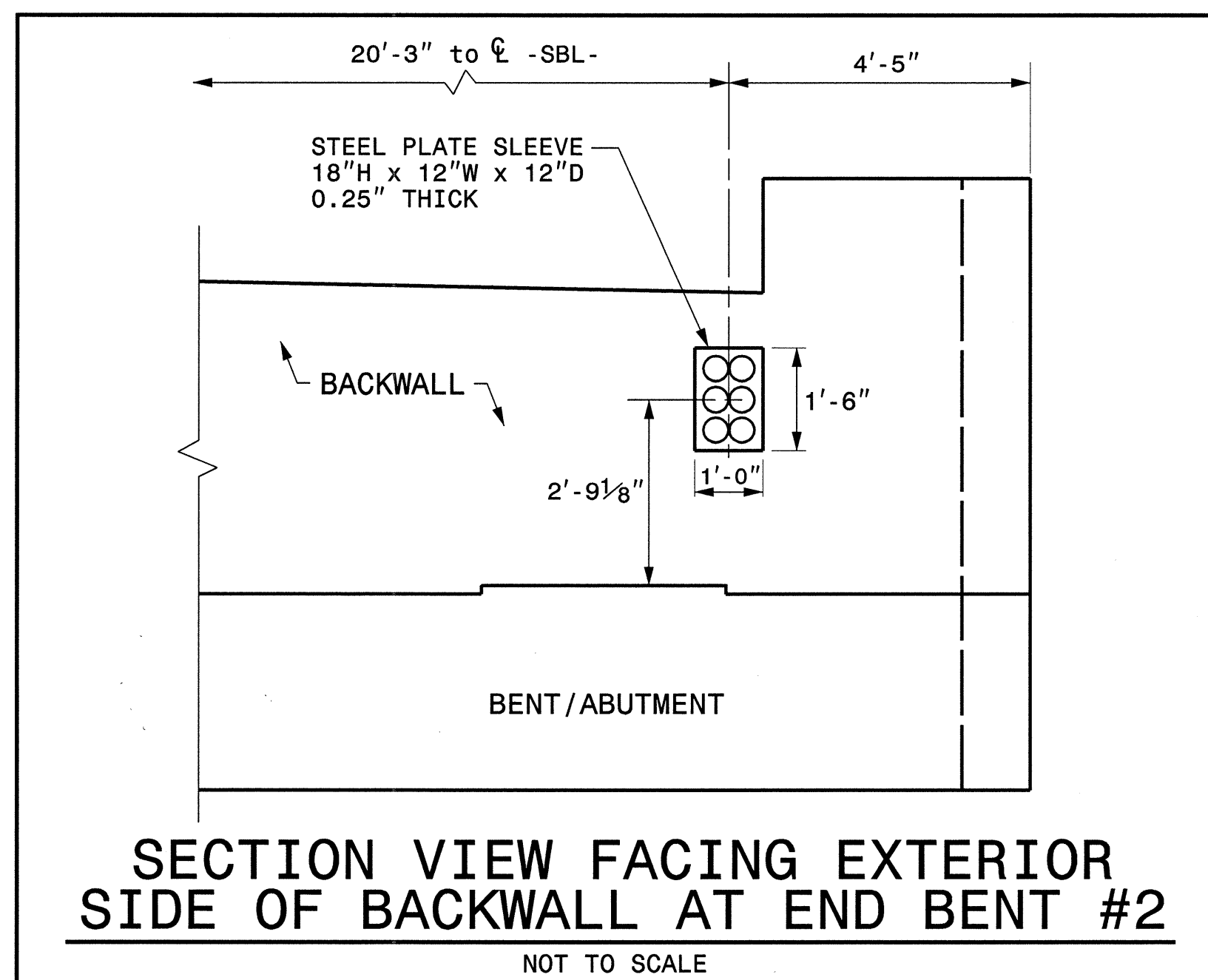


**EXPANSION COUPLING DETAIL**  
**FOR TELEPHONE CONDUIT ATTACHMENTS**  
NOT TO SCALE

**BILL OF MATERIALS FOR TELEPHONE CONDUITS**

NO.	UNITS	ITEMS
1	2 EA	STEEL PLATE SLEEVE, 0.25" THICK 1'-6" x 1'-0" x 1'-0" DIMENSIONS (AT END BENTS)
2	250 EA	5/8" APPROVED GALV. CONCRETE INSERTS (HANGER RODS)
3	125 EA	APPROVED TELE. CONDUIT GALV. HANGER ASSEMBLIES
4	3,774'	4" I.D. TYPE "D" PLASTIC CONDUIT
5	650'	4" I.D. TYPE "C" PLASTIC CONDUIT
6	50 lbs	JUTE
7	40 lbs	MASTIC OR PLASTIC CAULKING COMPOUND
8	12 EA	END PLUGS (OR CAPS) FOR 4" I.D. PLASTIC CONDUIT
9	36 EA	EXPANSION COUPLINGS
10	1 LOT	EPOXY CEMENT
11	1 LOT	PAINT (AS REQUIRED)

THESE ARE ESTIMATED QUANTITIES ONLY.



**SECTION VIEW FACING EXTERIOR**  
**SIDE OF BACKWALL AT END BENT #2**  
NOT TO SCALE

HANGER ASSEMBLY DETAILS, DUCT BANK SECTION THROUGH BACKWALL, & TYPICAL SECTION UNDERGROUND DUCT BANK

GRAPHIC SCALE  
AS NOTED

LOCATION:	BRIDGE 46 OVER THE CAPE FEAR RIVER ON US 401 / US 421
TIP NO.:	B-4138 COUNTY: HARNETT
DESIGNED BY:	DATE:
CHECKED BY:	DATE:

8/17/99

REVISIONS

SYTIME DESIGN CONSULTANTS

## 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