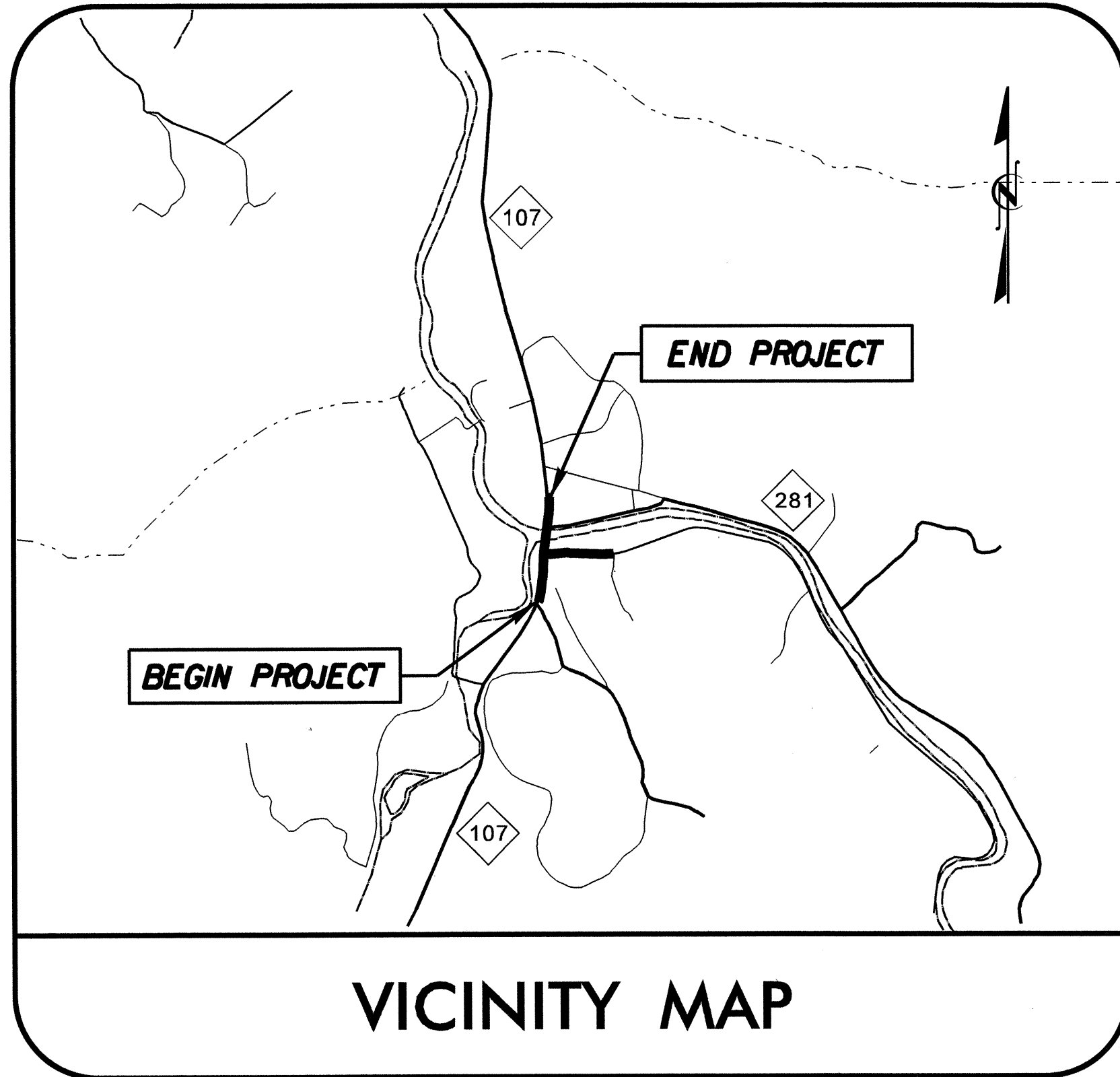


**CONTRACT: C201166 TIP PROJECT: B-3480**



VICINITY MAP

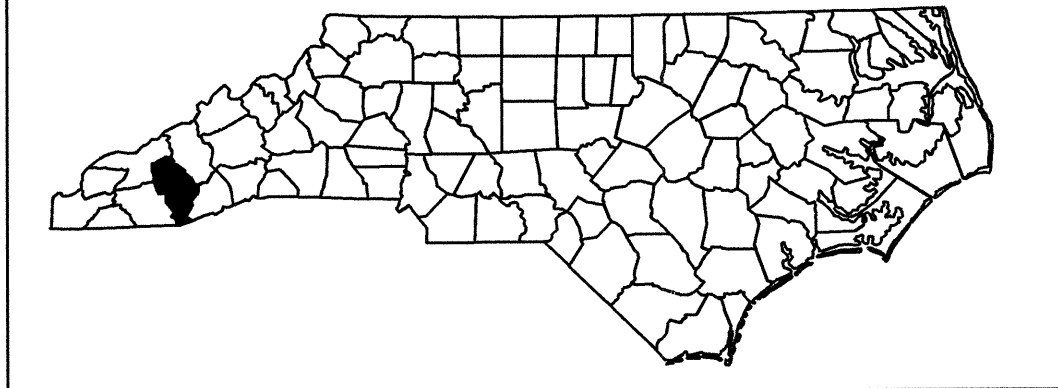
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**JACKSON COUNTY**

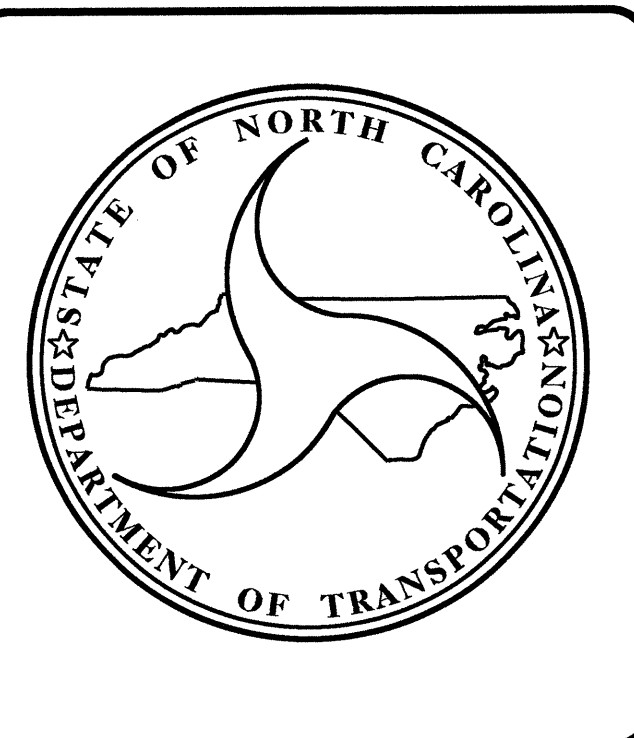
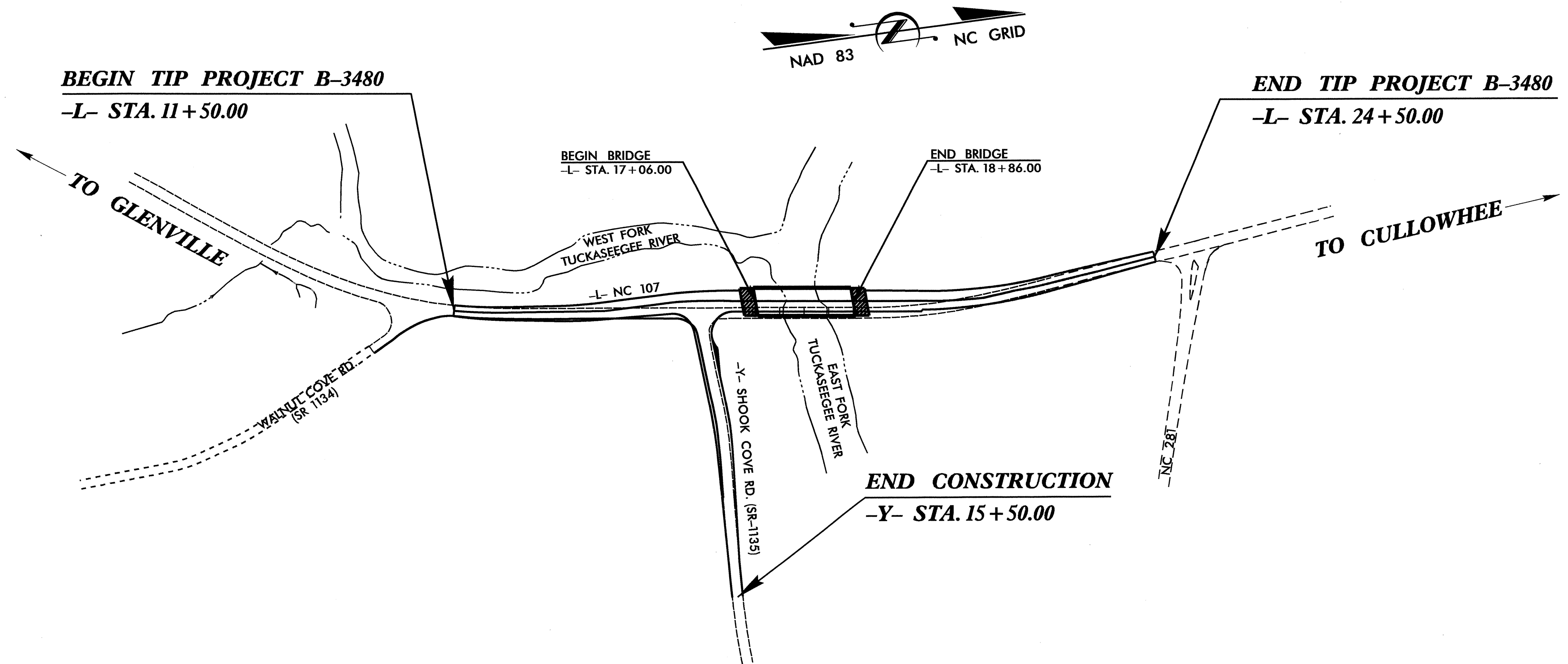
**LOCATION : BRIDGE NO. 39 OVER  
EAST FORK TUCKASEGEE RIVER ON NC 107**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3480		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33097.1.1	BRSTP-107 (3)	PE	
33097.2.1	BRSTP-107 (3)	RW & UTIL.	
33097.3.1	BRSTP-107 (8)	CONST.	



**STRUCTURE**



**DESIGN DATA**

ADT 2010 = 6,200  
ADT 2030 = 11,600  
DHV = 13  
D = 55 %  
T = 5 % \*  
V = 50 MPH  
\* TTST 1 % DUAL 4 %  
FUNC. CLASS = RURAL MINOR ARTERIAL

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-3480 = 0.220 MI.  
LENGTH OF STRUCTURE TIP PROJECT B-3480 = 0.034 MI.  
TOTAL LENGTH OF TIP PROJECT B-3480 = 0.254 MI.

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

2012 STANDARD SPECIFICATIONS

**LETTING DATE:**  
MARCH 20, 2012

PROJECT ENGINEER  
**A. K. PASCHAL, PE**  
PROJECT DESIGN ENGINEER

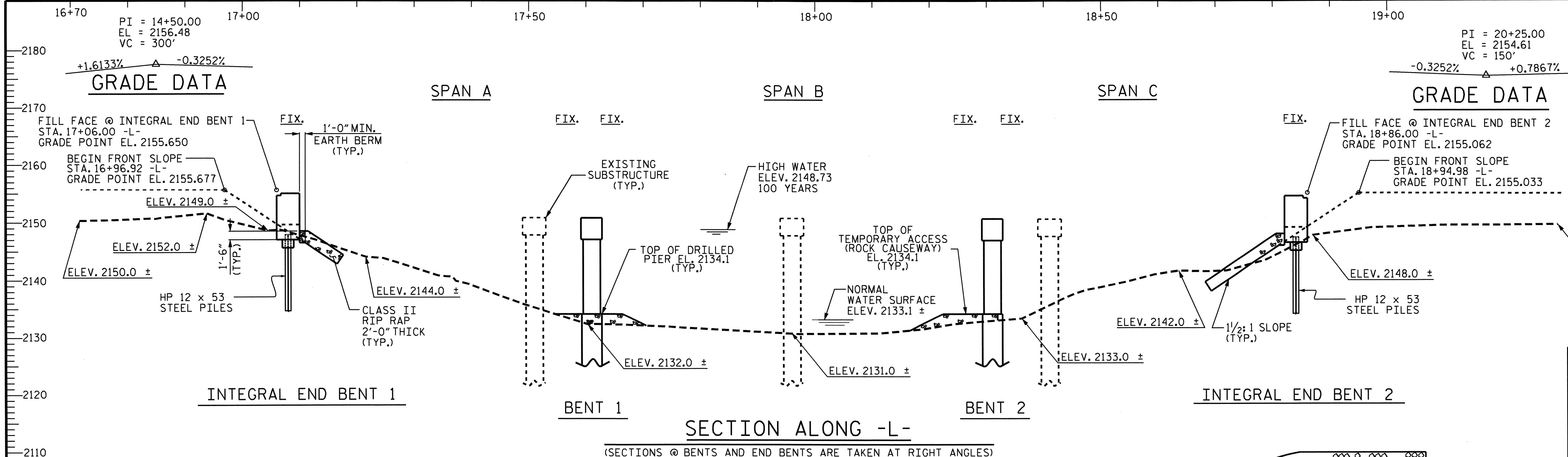
**STRUCTURES MANAGEMENT**

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

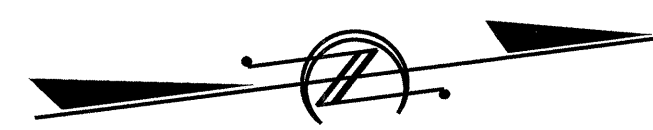
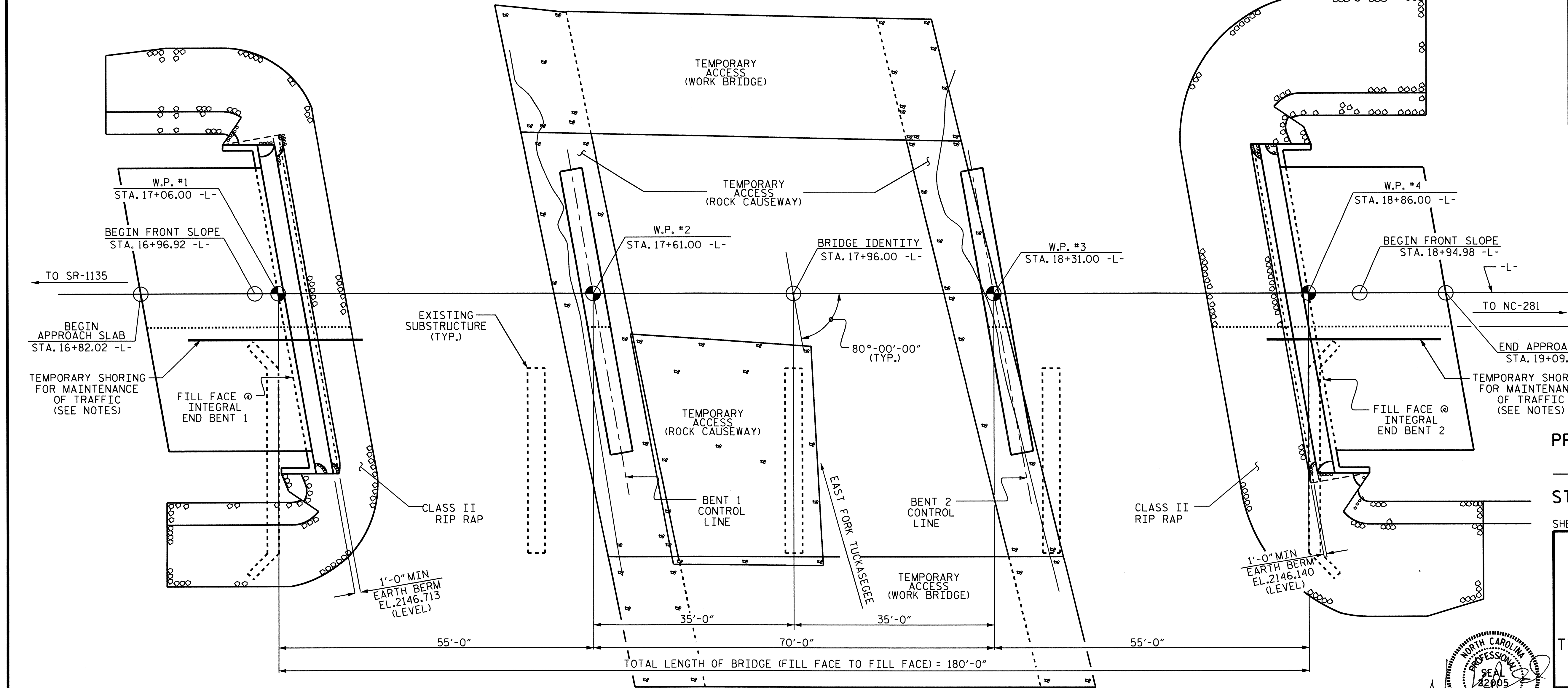
P.E.  
STATE DESIGN ENGINEER  
**DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED  
DIVISION ADMINISTRATOR  
DATE

05-11-2012 08:37  
 W:\STRUCTURE\B3480\Plan\107.dwg  
 bborowald

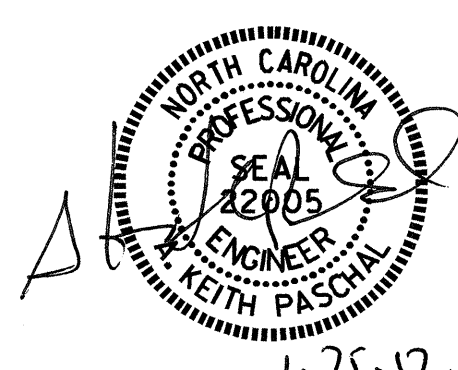


I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE NO.39

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER EAST FORK  
 TUCKASEE ON NC-107 BETWEEN  
 SR-1135 AND NC-281

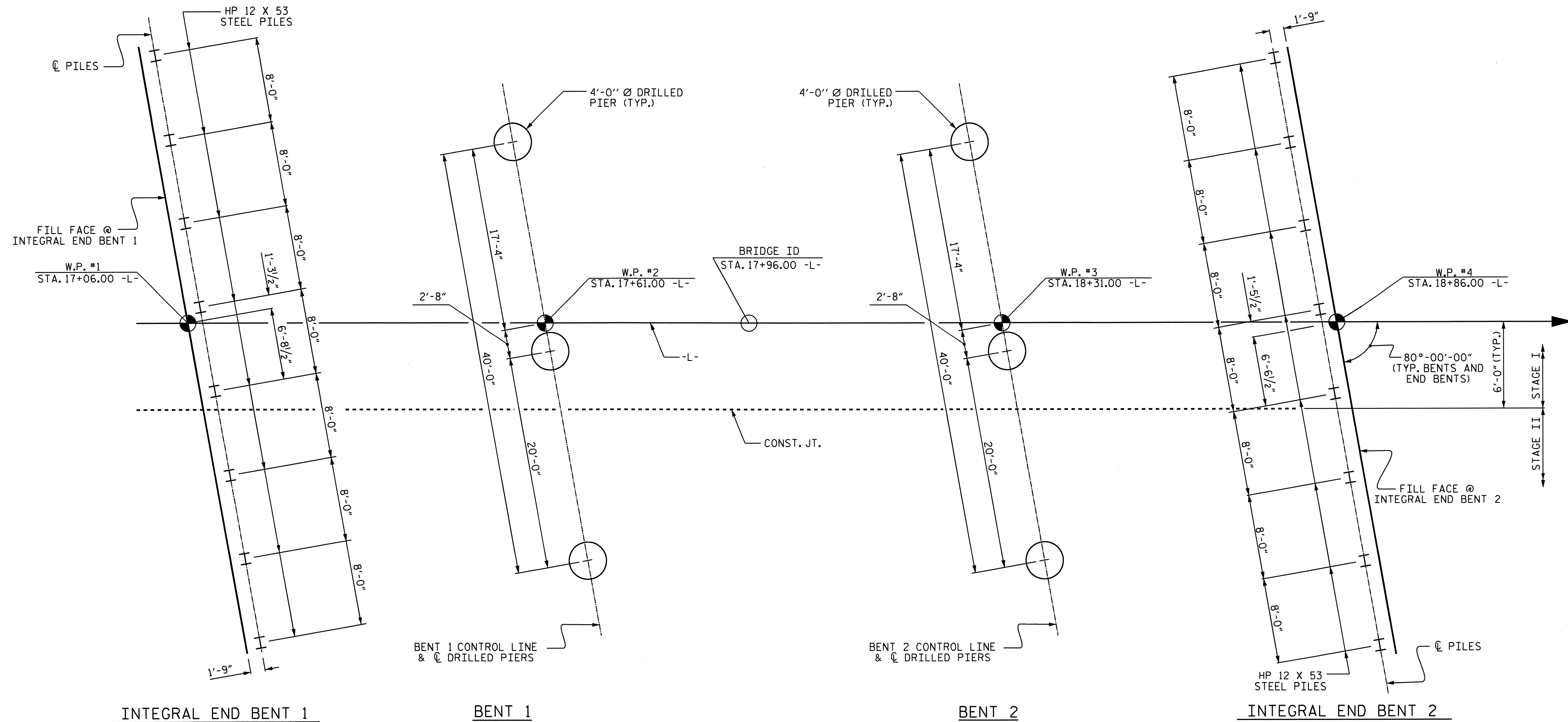


DRAWN BY: B. N. BARODAWALA DATE: 03/20/11  
 CHECKED BY: J. D. HAWK DATE: 9/15/11

**PLAN**  
 (PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

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





INTEGRAL END BENT 1

BENT 1

FOUNDATION LAYOUT

BENT 2

INTEGRAL END BENT 2

(DIMENSIONS LOCATING PILES & DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES & DRILLED PIERS)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 450.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25.0 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2123.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASINGS.

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2083.0 FT. (LT.) AND 2080.0 FT. (CT.) AND 2064.0 FT. (RT.) AND SATISFY THE REQUIRED TIP RESISTANCE.

SPT TESTING IS REQUIRED FOR DRILLED PIERS AT BENT 1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. FOR SID TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS 2097.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 450.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25.0 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. IF REQUIRED, DO NOT EXTEND CASINGS BELOW ELEVATION 2123.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASINGS.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2080.0 (LT.), 2090.0 FT. (CT.) AND 2075.0 FT. (RT.) AND SATISFY THE REQUIRED TIP RESISTANCE.

SPT TESTING IS REQUIRED FOR DRILLED PIERS AT BENT 2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENT 2. FOR SID TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS 2101.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

OBSERVE A ONE (1) MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, INTEGRAL END BENTS AND REINFORCED BRIDGE APPROACH FILLS BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT INTEGRAL END BENT 1 AND 2.

PROJECT NO. B-3480

JACKSON COUNTY

STATION: 17+96.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE OVER EAST FORK  
TUCKASEGEE ON NC-107 BETWEEN  
SR-1135 AND NC-281

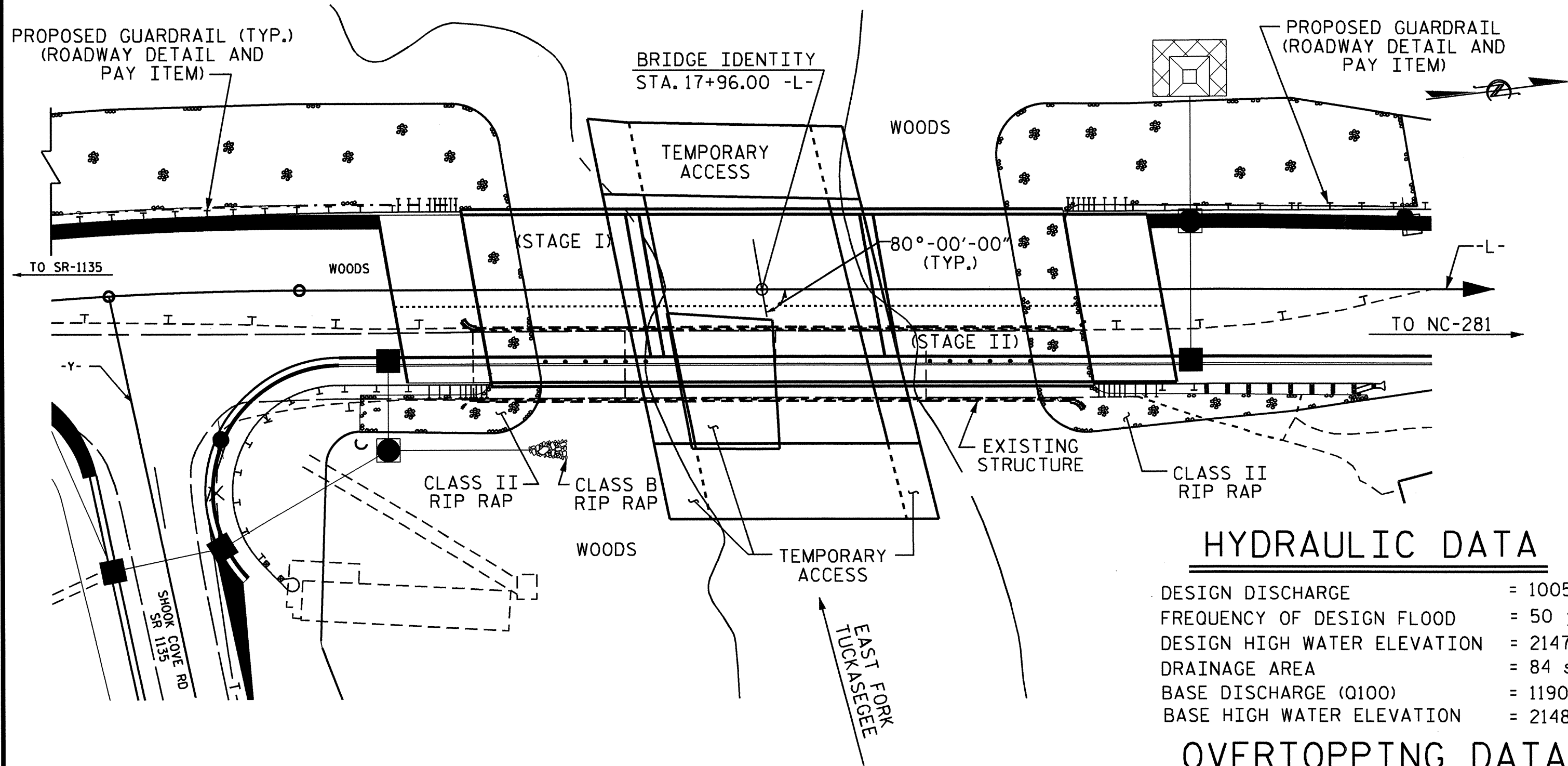


DRAWN BY : B. N. BARODAWALA DATE : 4/22/11  
CHECKED BY : J. D. HAWK DATE : 9/15/11

13-DEC-2011 09:55  
W:\Structures\Final Plans\B3480.sd.GD.dgn  
bbarodawala

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

BM 101 TUCKASEGEE GPS POINT (N 578858.7860, E 769839.8750) LOCATED AT INTERSECTION OF NC 281 & NC 107 NEAR THE POST OFFICE ELEV. 2160.230.



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

**HYDRAULIC DATA**

DESIGN DISCHARGE	= 10050 c.f.s.
FREQUENCY OF DESIGN FLOOD	= 50 years
DESIGN HIGH WATER ELEVATION	= 2147.57 FT.
DRAINAGE AREA	= 84 sq. ml.
BASE DISCHARGE (0100)	= 11900 c.f.s.
BASE HIGH WATER ELEVATION	= 2148.73 FT.

**OVERTOPPING DATA**

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= > 500 years
OVERTOPPING FLOOD ELEVATION	= N/A

**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.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-30F OF THE STANDARD 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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF FOUR SPANS-45 FT. EACH, WITH A CLEAR ROADWAY OF 20' ON REINFORCED CONCRETE DECK GIRDERS ON END BENTS WITH PILE FOOTINGS, REINFORCED CONCRETE POST & WEB INTERIOR BENTS WITH PILE FOOTINGS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE 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.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 17+96.00 -L-.

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

**TOTAL BILL OF MATERIAL**

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIERS	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	2 BAR METAL RAIL	3 BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS		
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	
SUPERSTRUCTURE									9435.0	9396.0		LUMP SUM			21	1232.88			170.60	170.60	178.10		LUMP SUM	
INTEGRAL END BENT 1											30.4		4571			8	480.0				167	185		
BENT 1			112.5	63.0	33.3	3	3				51.9		21521	5301										
BENT 2			115.5	42.0	33.3	3	3				51.9		21042	5349										
INTEGRAL END BENT 2											30.4		4568			8	440.0				284	315		
TOTAL	LUMP SUM	LUMP SUM	228.0	105.0	66.6	6	6	1	9435.0	9396.0	164.6	LUMP SUM	51702	10650	21	1232.88	16	920.0	170.60	170.60	178.10	451	500	LUMP SUM

PROJECT NO. B-3480

JACKSON COUNTY

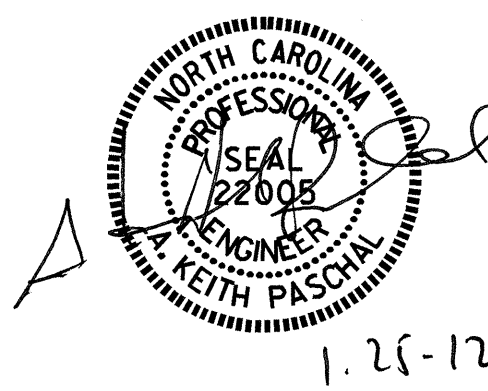
STATION: 17+96.00 -L-

SHEET 3 OF 3 REPLACES BRIDGE NO.39

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE OVER EAST FORK  
TUCKASEGEE ON NC-107 BETWEEN  
SR-1135 AND NC-281

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



DRAWN BY : B. N. BARODAWALA DATE : 3/20/11  
CHECKED BY : J. D. HAWK DATE : 9/15/11



LOAD FACTORS:

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

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	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTRIBUTION FACTORS (DF)
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.070	--	1.75	0.731	1.18	A	I	26.07	0.82	1.27	B	I	40.70	0.80	0.82	1.07	B	I	33.92		
	HL-93(OPr)	N/A	--	1.530	--	1.35	0.731	1.53	A	I	26.07	0.82	1.64	B	I	40.70	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.670	60.120	1.75	0.731	1.74	A	I	26.07	0.82	1.67	B	I	40.70	0.80	0.689	1.68	B	I	33.92		
	HS-20(OPr)	36.000	--	2.160	77.760	1.35	0.731	2.25	A	I	26.07	0.82	2.16	B	I	40.70	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.560	48.060	1.40	0.731	4.51	A	I	26.07	0.82	4.57	B	I	40.70	0.80	0.731	3.56	A	I	26.07	
		SNGARBS2	20.000	--	2.780	55.600	1.40	0.731	3.52	A	I	26.07	0.82	3.37	B	I	40.70	0.80	0.731	2.78	A	I	26.07	
		SNAGRIS2	22.000	--	2.670	58.740	1.40	0.731	3.40	A	I	20.86	0.82	3.17	B	I	40.70	0.80	0.689	2.67	B	I	33.92	
		SNCOTTS3	27.250	--	1.770	48.233	1.40	0.731	2.25	A	I	26.07	0.82	2.29	B	I	40.70	0.80	0.731	1.77	A	I	26.07	
		SNAGGRS4	34.925	--	1.530	53.435	1.40	0.731	1.94	A	I	26.07	0.82	1.99	B	I	40.70	0.80	0.731	1.53	A	I	26.07	
		SNS5A	35.550	--	1.490	52.970	1.40	0.731	1.89	A	I	26.07	0.82	2.06	B	I	40.70	0.80	0.731	1.49	A	I	26.07	
		SNS6A	39.950	--	1.390	55.531	1.40	0.731	1.76	A	I	26.07	0.82	1.91	B	I	40.70	0.80	0.731	1.39	A	I	26.07	
	SNS7B	42.000	--	1.330	55.860	1.40	0.731	1.68	A	I	26.07	0.82	1.93	B	I	40.70	0.80	0.731	1.33	A	I	26.07		
	TTST	TNAGRIT3	33.000	--	1.700	56.100	1.40	0.731	2.16	A	I	26.07	0.82	2.25	B	I	40.70	0.80	0.731	1.70	A	I	26.07	
		TNT4A	33.075	--	1.720	56.889	1.40	0.731	2.18	A	I	26.07	0.82	2.15	B	I	27.13	0.80	0.731	1.72	A	I	26.07	
		TNT6A	41.600	--	1.410	58.656	1.40	0.731	1.81	A	I	26.07	0.82	2.16	B	I	40.70	0.80	0.689	1.41	B	I	33.92	
		TNT7A	42.000	--	1.420	59.640	1.40	0.731	1.83	A	I	26.07	0.82	2.06	B	I	27.13	0.80	0.689	1.42	B	I	33.92	
		TNT7B	42.000	--	1.480	62.160	1.40	0.731	1.91	A	I	26.07	0.82	1.85	B	I	40.70	0.80	0.689	1.48	B	I	33.92	
		TNAGRIT4	43.000	--	1.400	60.200	1.40	0.731	1.81	A	I	26.07	0.82	1.78	B	I	40.70	0.80	0.689	1.40	B	I	33.92	
TNAGT5A		45.000	--	1.320	59.400	1.40	0.731	1.69	A	I	26.07	0.82	1.82	B	I	40.70	0.80	0.689	1.32	B	I	33.92		
TNAGT5B	45.000	3	1.300	58.500	1.40	0.731	1.66	A	I	26.07	0.82	1.68	B	I	40.70	0.80	0.689	1.30	B	I	33.92			

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.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

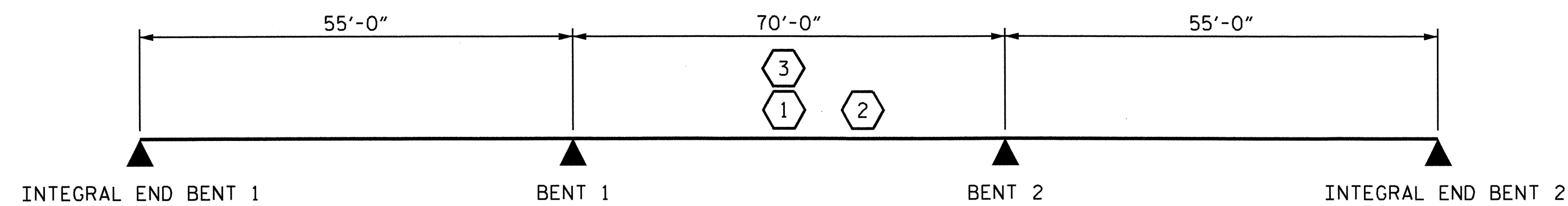
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

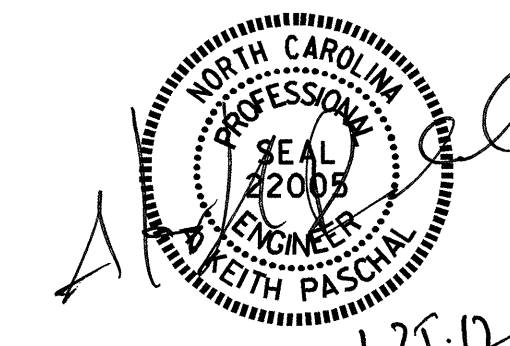


LRFR SUMMARY

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

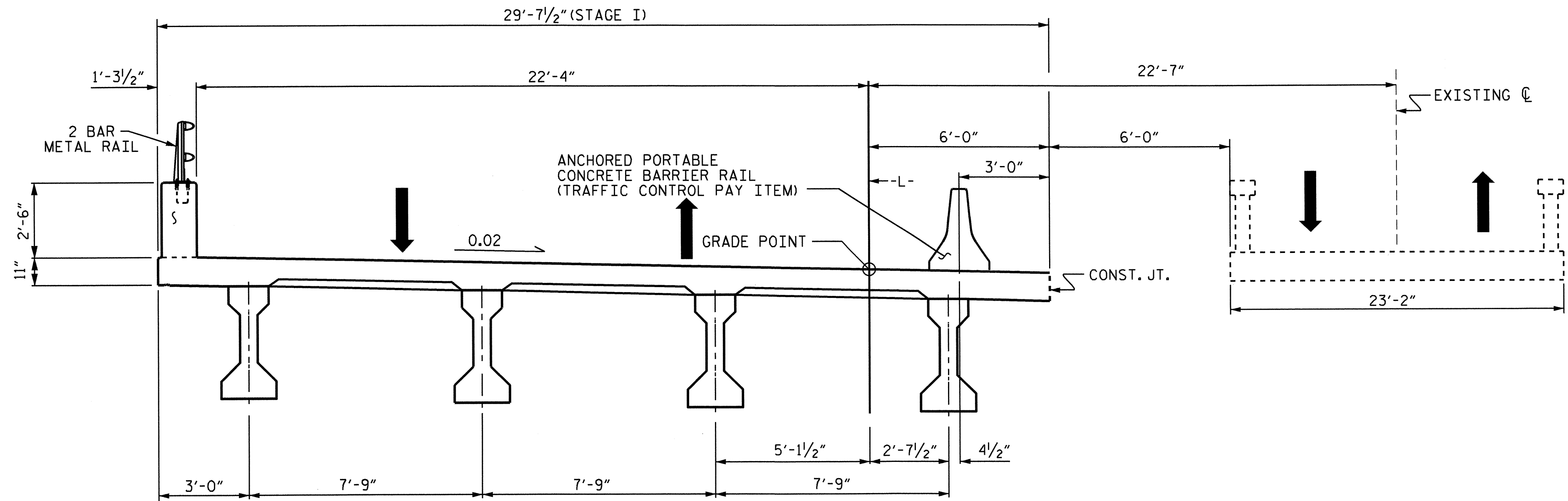


ASSEMBLED BY : B.N.BARODAWAL DATE : 11-14-11  
CHECKED BY : O.PUIGSERVER DATE : 12-13-11  
DRAWN BY : MAA 1/08 REV. 11/12/08R MAA/GM  
CHECKED BY : GM/DI 2/08

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

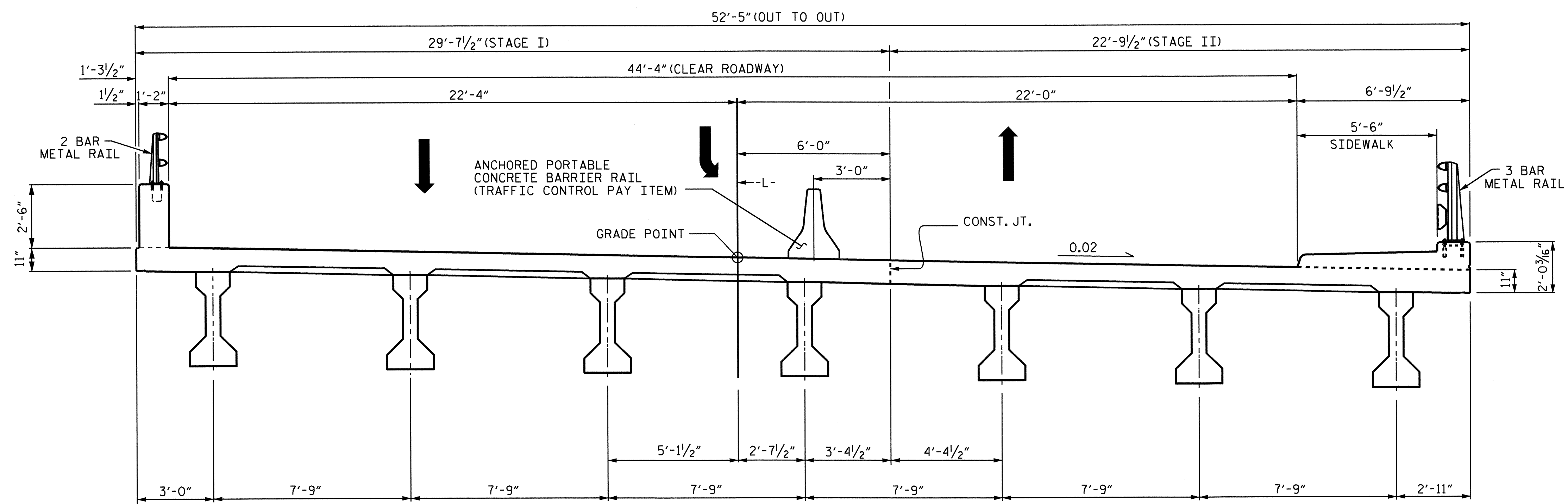
**NOTES**

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER RAIL.  
FOR TRAFFIC PHASING, SEE TRAFFIC CONTROL PLANS.



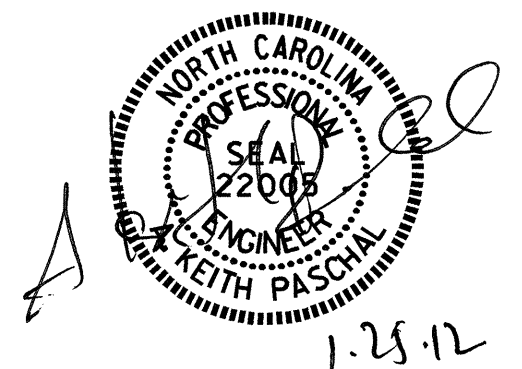
EXISTING BRIDGE

STAGE I CONSTRUCTION



STAGE II CONSTRUCTION

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

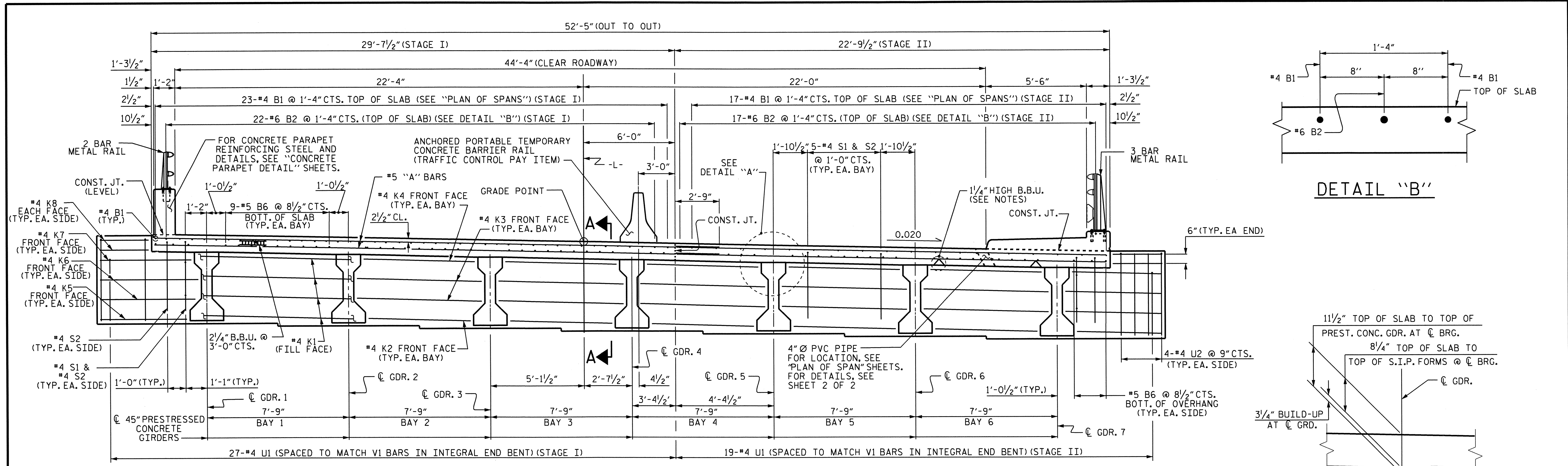


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-5
<b>CONSTRUCTION SEQUENCE</b>						TOTAL SHEETS 45
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

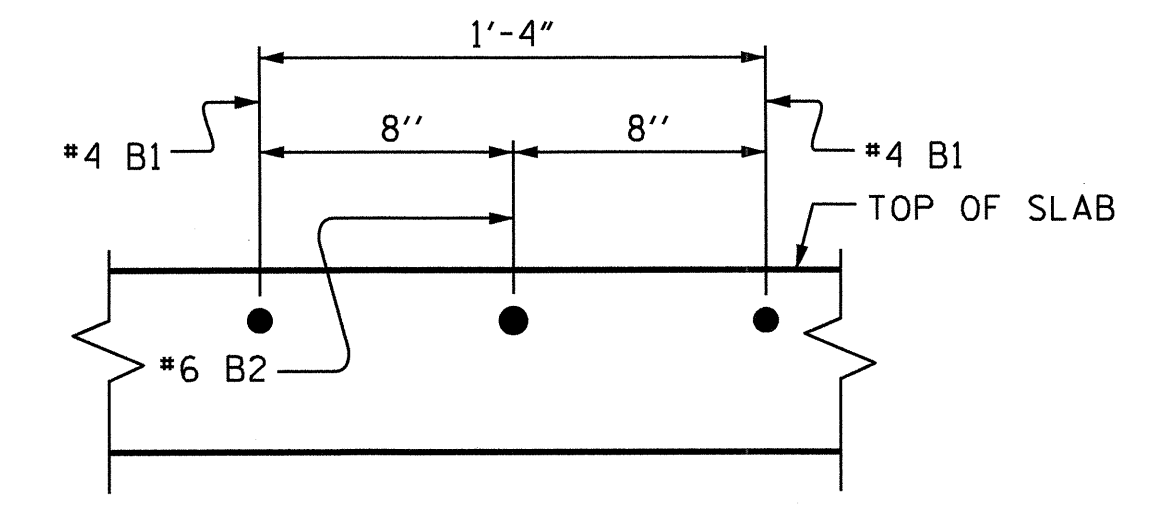
DRAWN BY : B. N. BARODAWALA DATE : 11-14-11  
CHECKED BY : A. K. PASCHAL DATE : 12-5-11

24-JAN-2012 14:35  
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bbarodawa

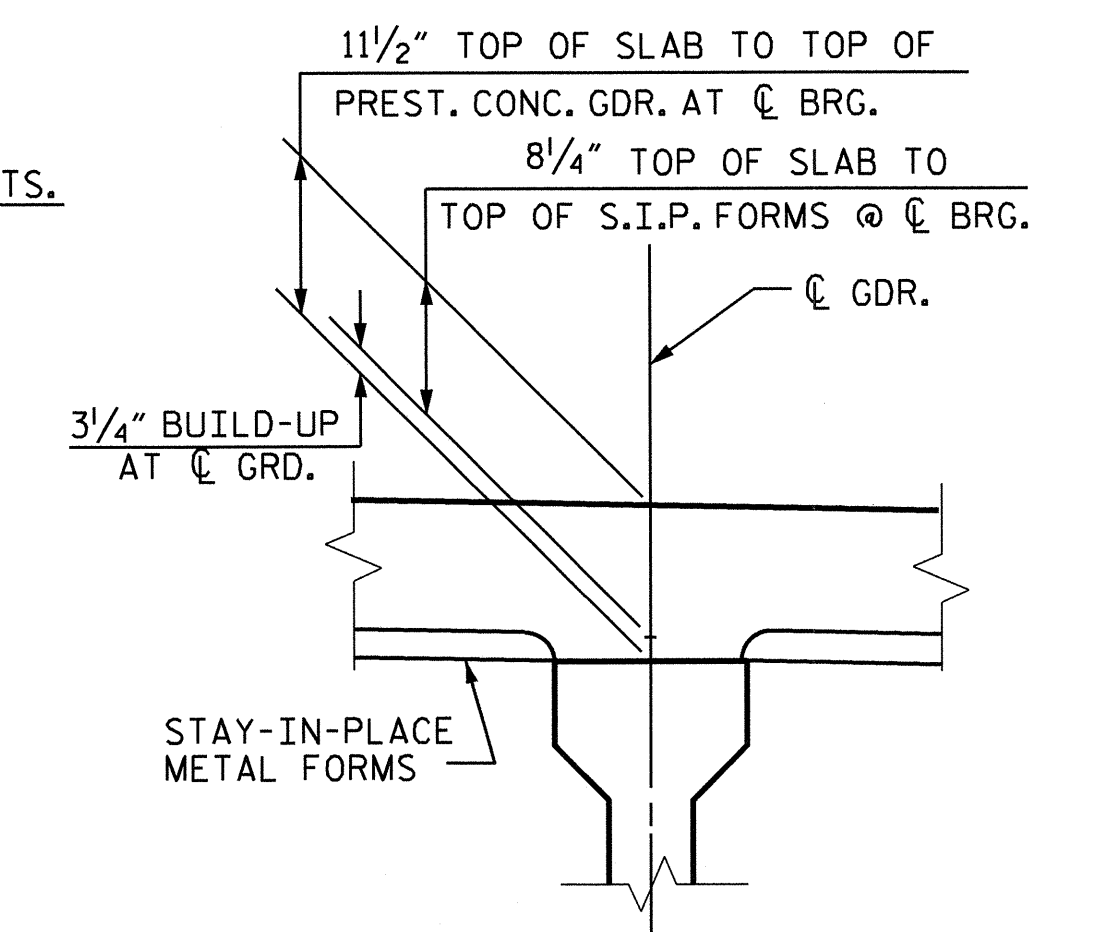




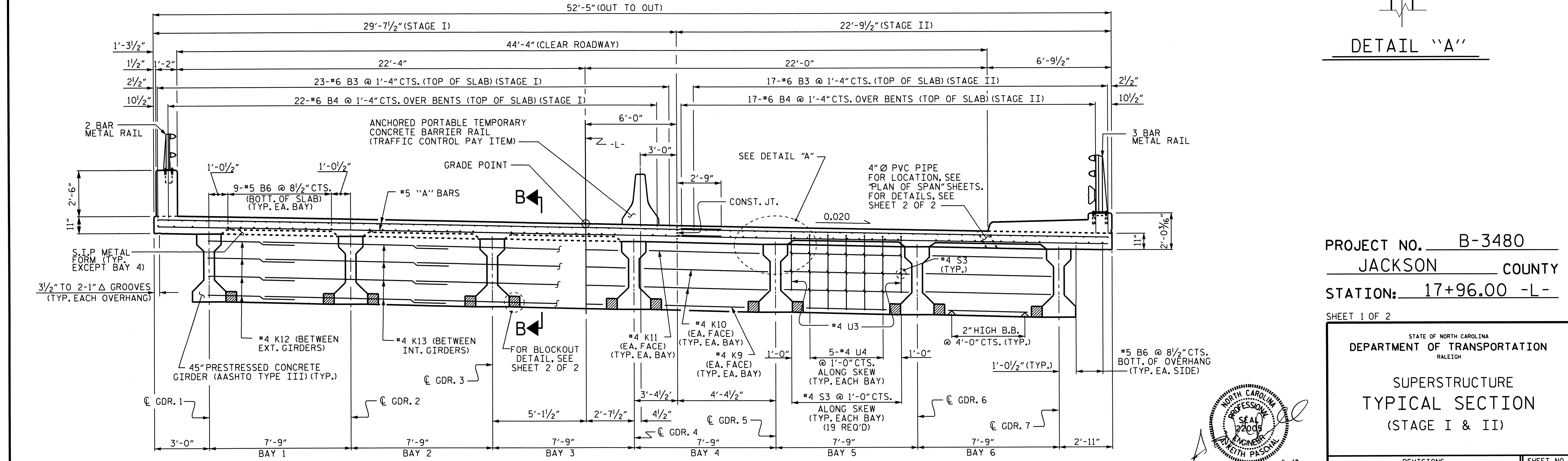
TYPICAL SECTION @ INTEGRAL END BENT



DETAIL "B"



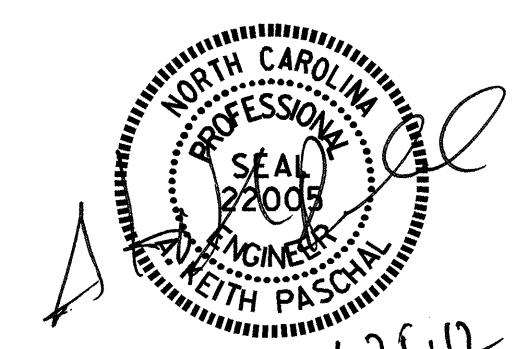
DETAIL "A"



TYPICAL SECTION @ BENT DIAPHRAGM

PROJECT NO. B-3480  
 JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (STAGE I & II)



DRAWN BY: B. N. BARODAWALA DATE: 2/3/11  
 CHECKED BY: J. D. HAWK DATE: 8/10/11

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

**NOTES:**

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

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

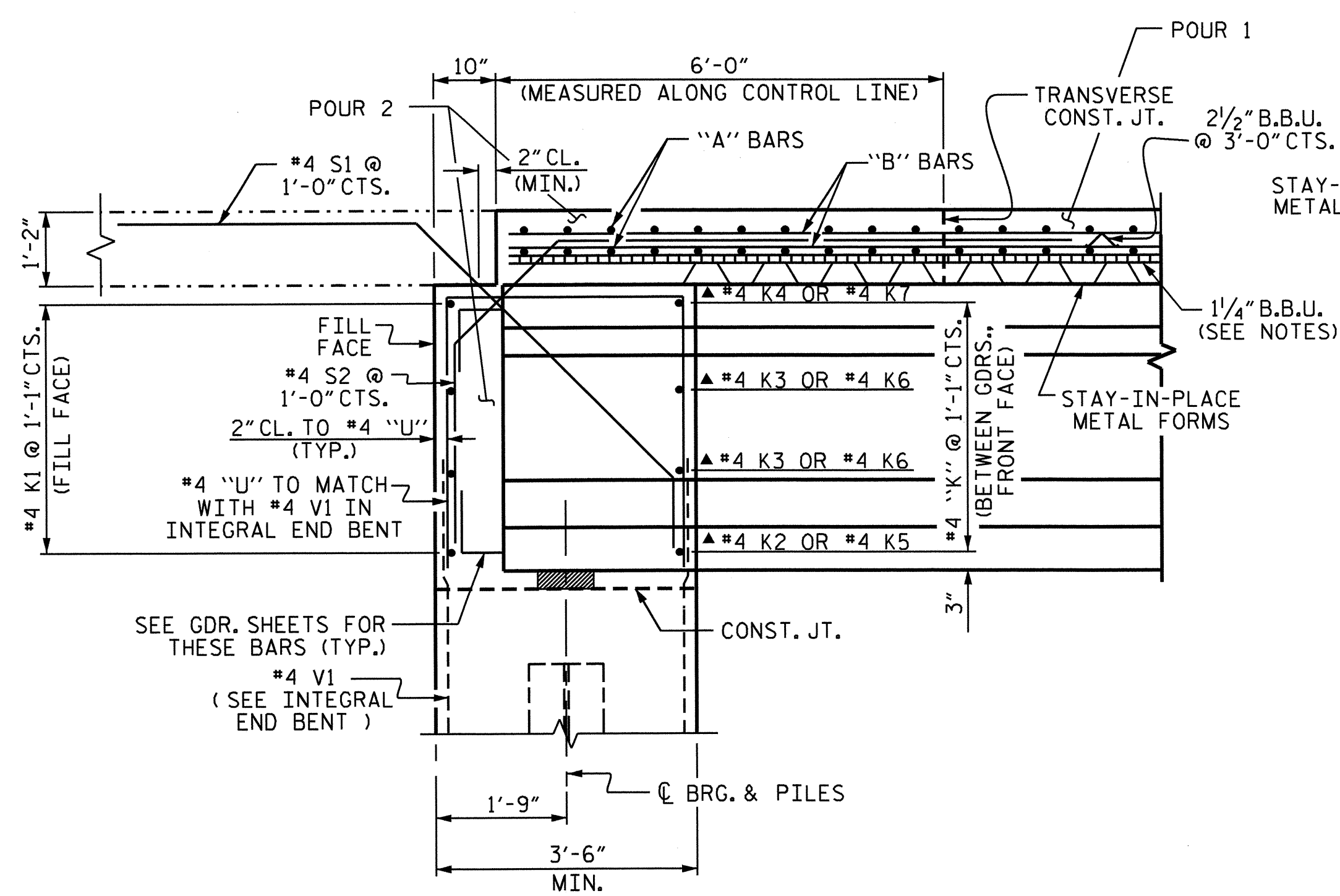
PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER" SHEET 3 OF 4.

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

FOR LOCATION OF DECK DRAINS, SEE PLAN OF SPANS.

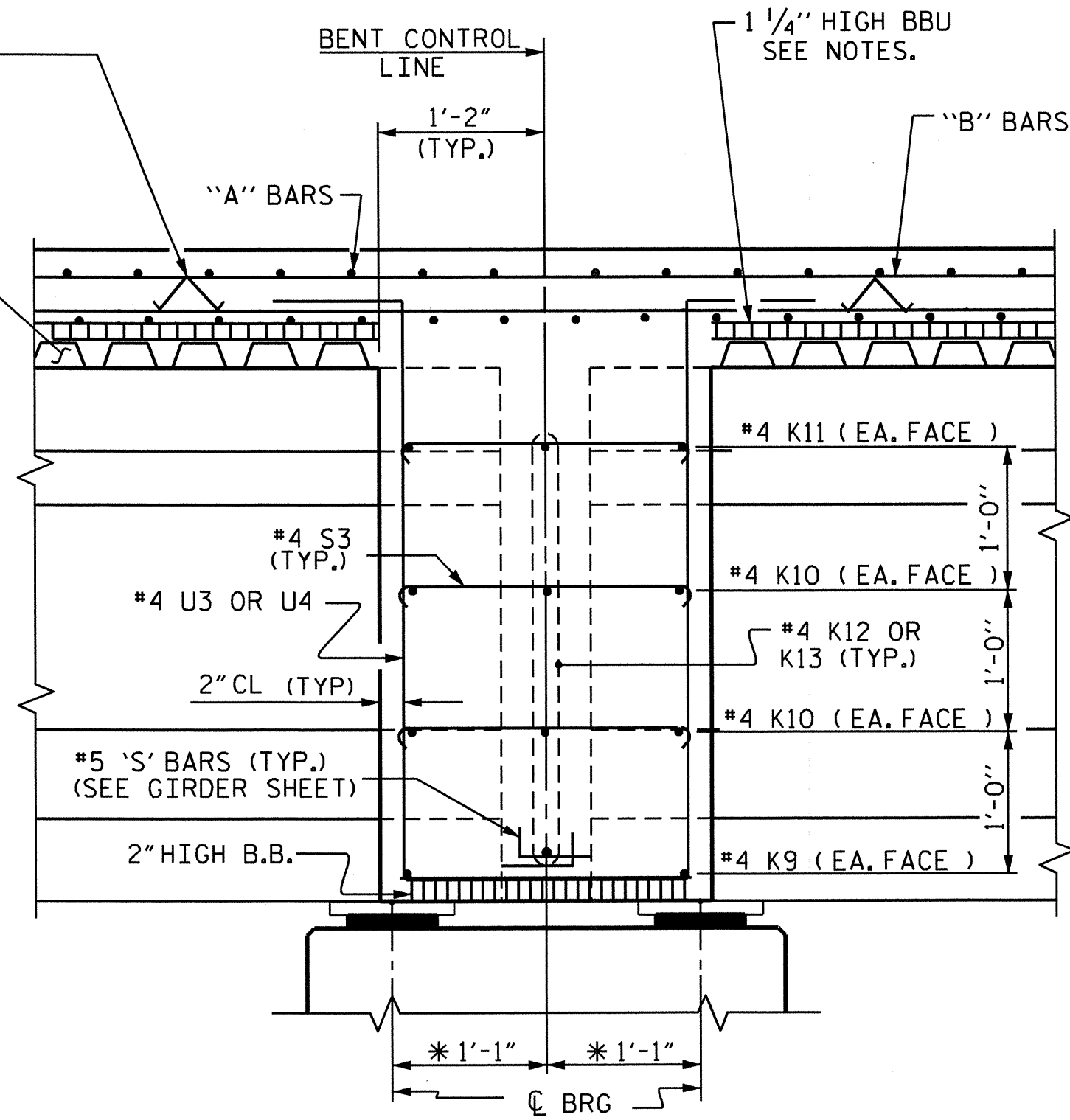
SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.



**SECTION A-A**

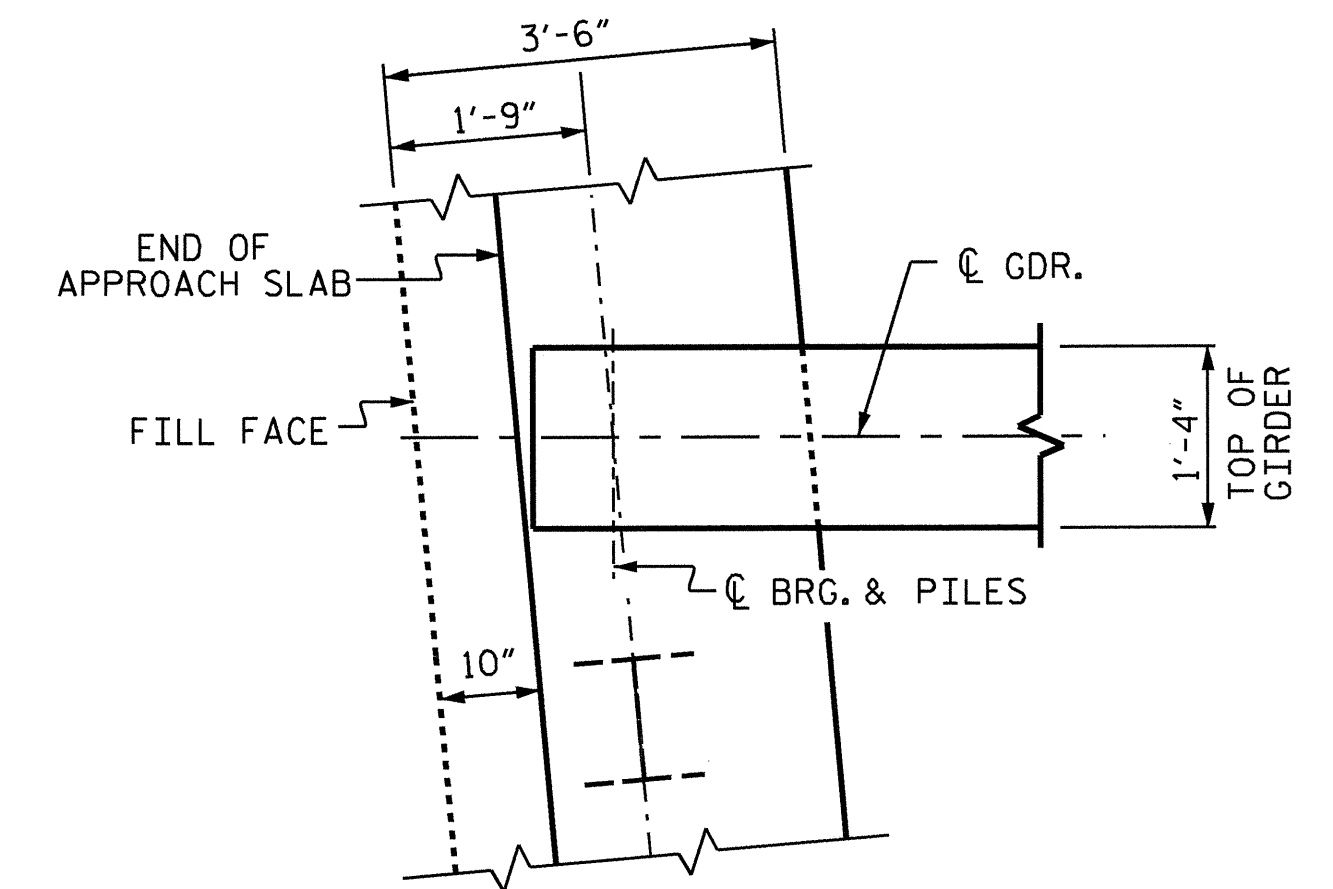
(AT INTEGRAL END BENT)

▲ (#4 K2 THRU #4 K4 TYP. EA. BAY / #4 K5 THRU #4 K7 TYP. BOTH SIDES)

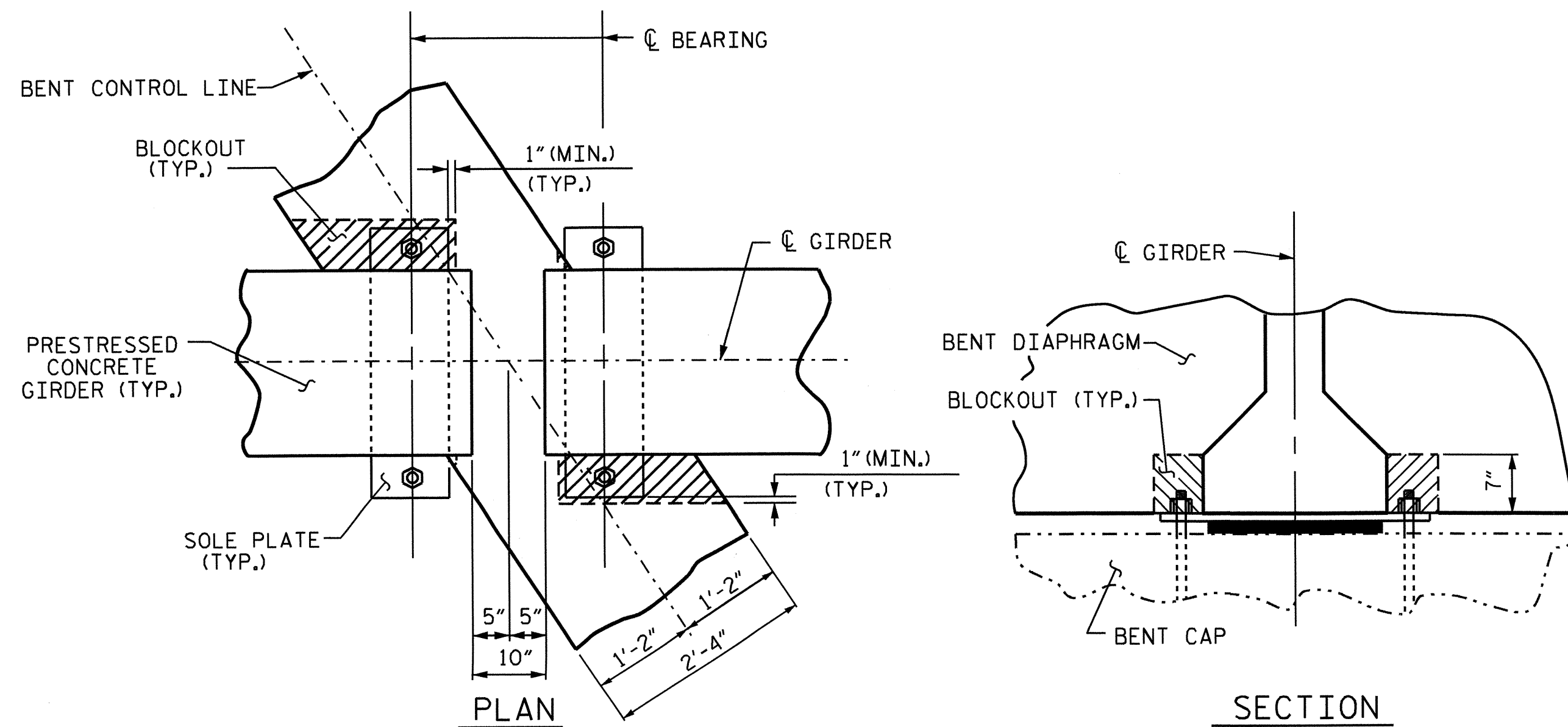


**SECTION B-B**

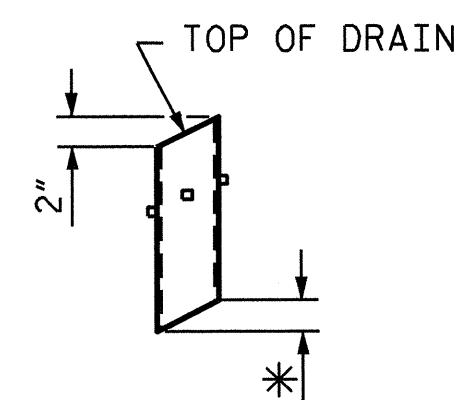
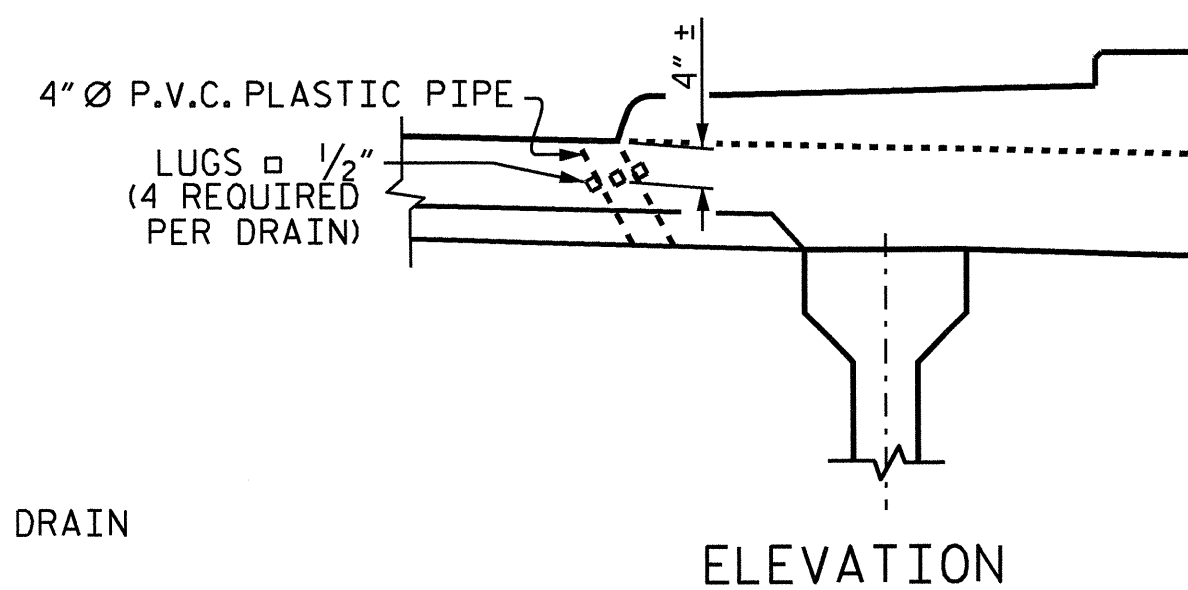
\* MEASURED ALONG C GIRDER



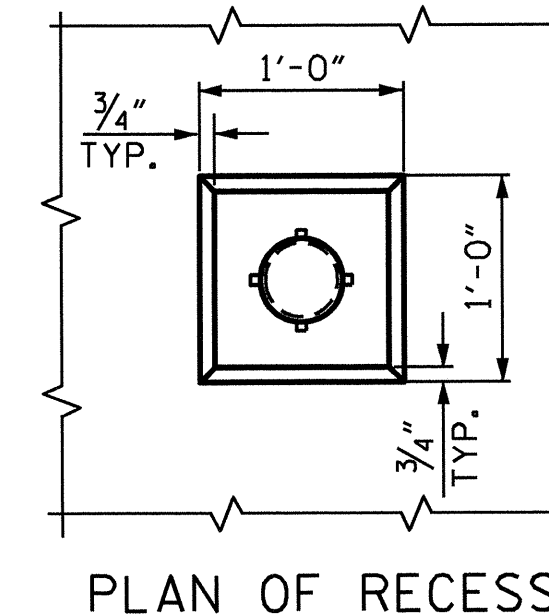
**PLAN OF GIRDER AT INTEGRAL END BENT**



**BENT DIAPHRAGM BLOCK-OUT DETAIL**



**PIPE DETAIL**  
(22 DRAINS REQUIRED)



**PLAN OF RECESS**

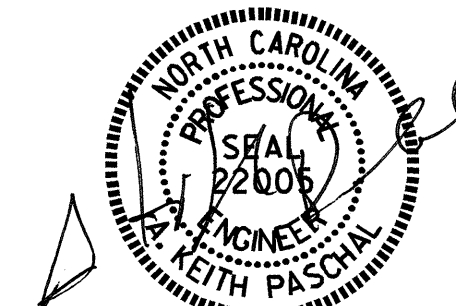
**NOTES**

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.

4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

THE 4" PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

**DRAIN DETAILS**



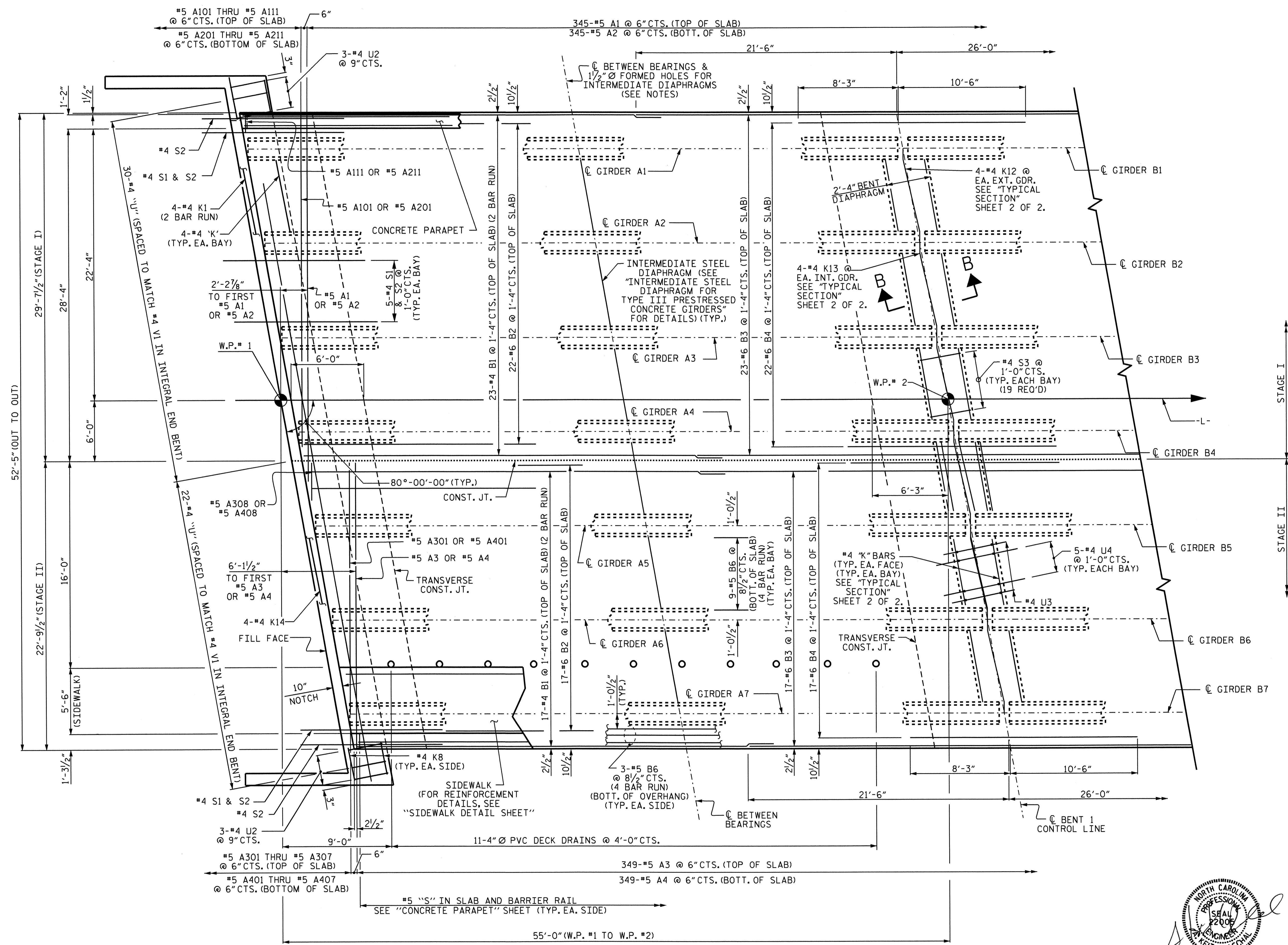
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION DETAILS (STAGE I & II)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-7 TOTAL SHEETS 45

DRAWN BY : B. N. BARODAWALA DATE : 2/05/11  
 CHECKED BY : J. D. HAWK DATE : 9/09/11





DRAWN BY : B. N. BARODAWALA DATE : 2-15-11  
 CHECKED BY : J. D. HAWK DATE : 9-10-11

24-JAN-2012 14:34  
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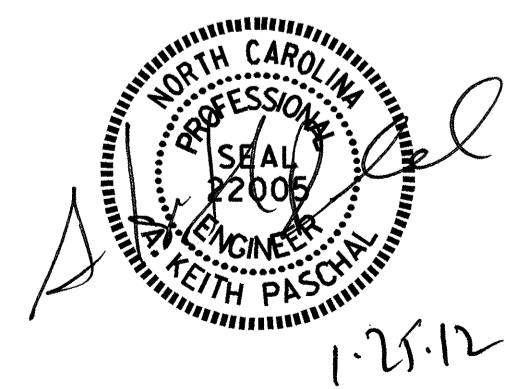
PLAN OF SPAN A

PROJECT NO. B-3480  
 JACKSON COUNTY  
 STATION: 17+96.00 -L-

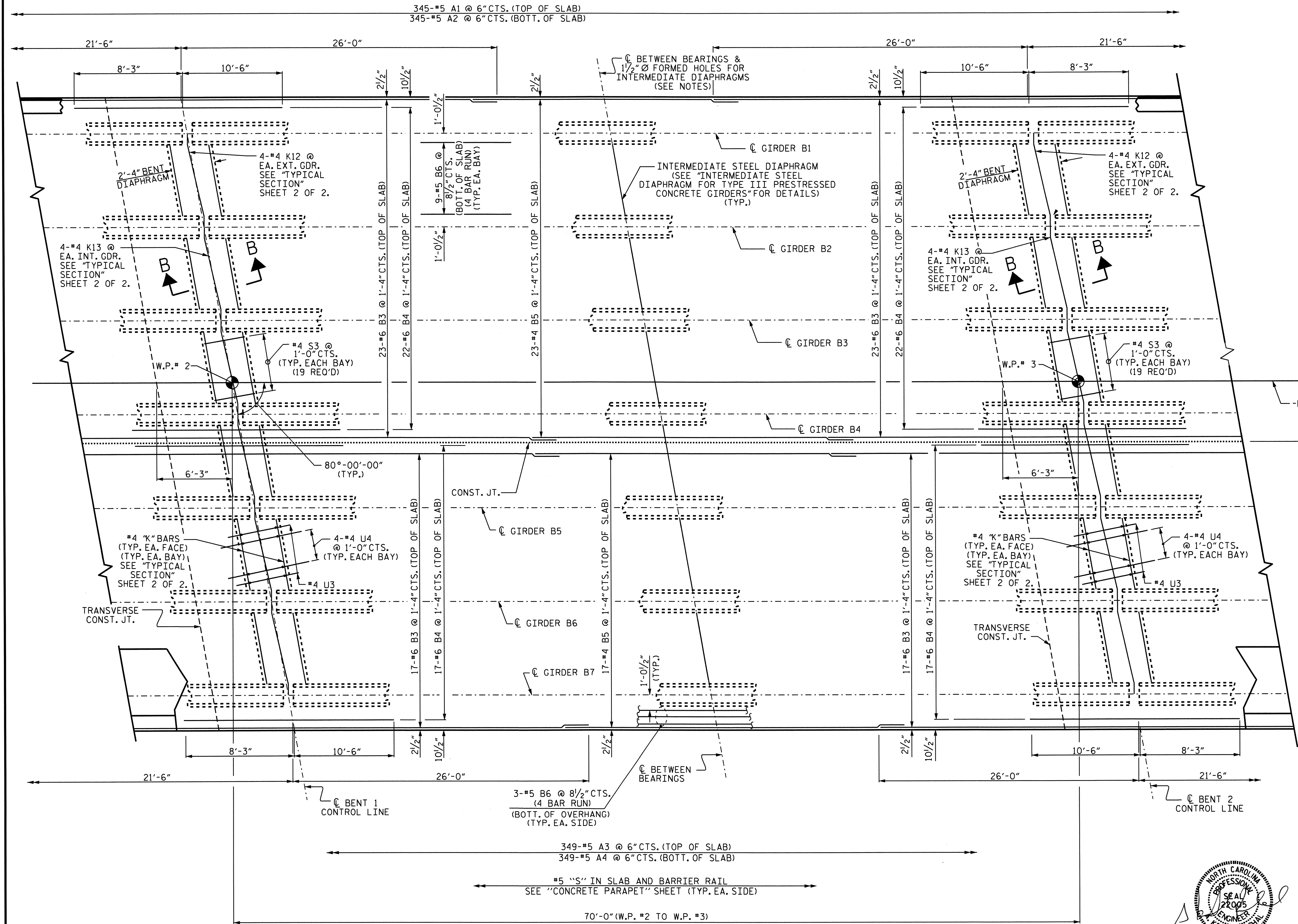
SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 PLAN OF SPAN A  
 (STAGE I & II)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS 45
2			4			



**PLAN OF SPAN B**

DRAWN BY : B. N. BARODAWALA DATE : 2-15-11  
 CHECKED BY : J. D. HAWK DATE : 9-10-11

25-JAN-2012 14:44  
 R:\Structures\Final Plans\B3480.sd.PS.dgn  
 KPASCHAL

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 2 OF 5

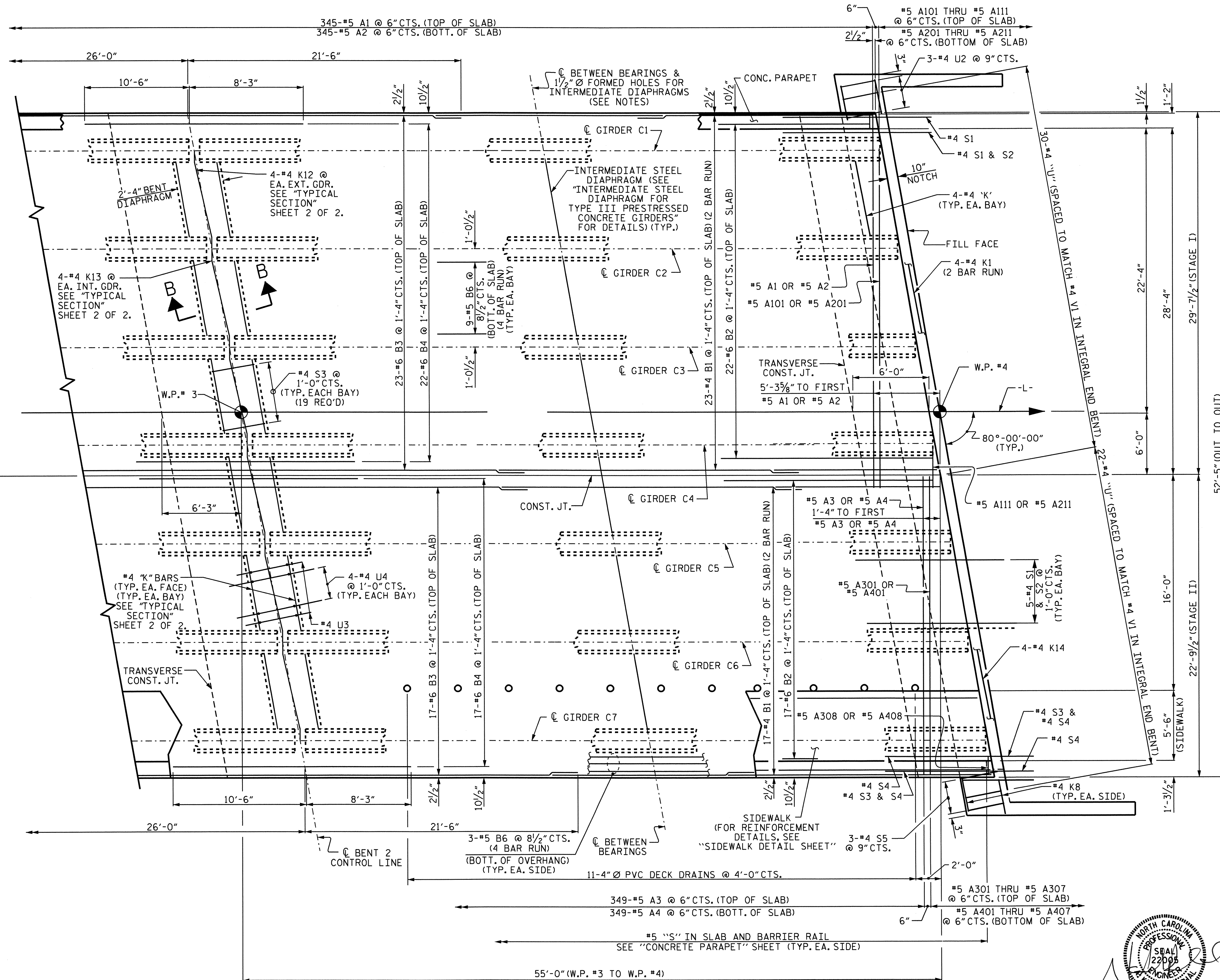
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 PLAN OF SPAN B  
 (STAGE I & II)**



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





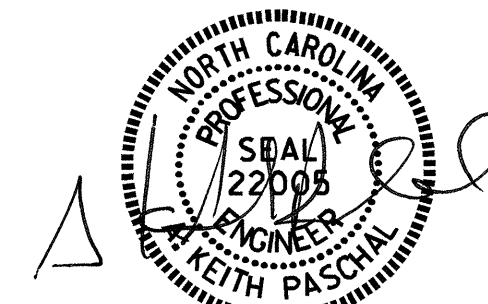
**PLAN OF SPAN C**

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

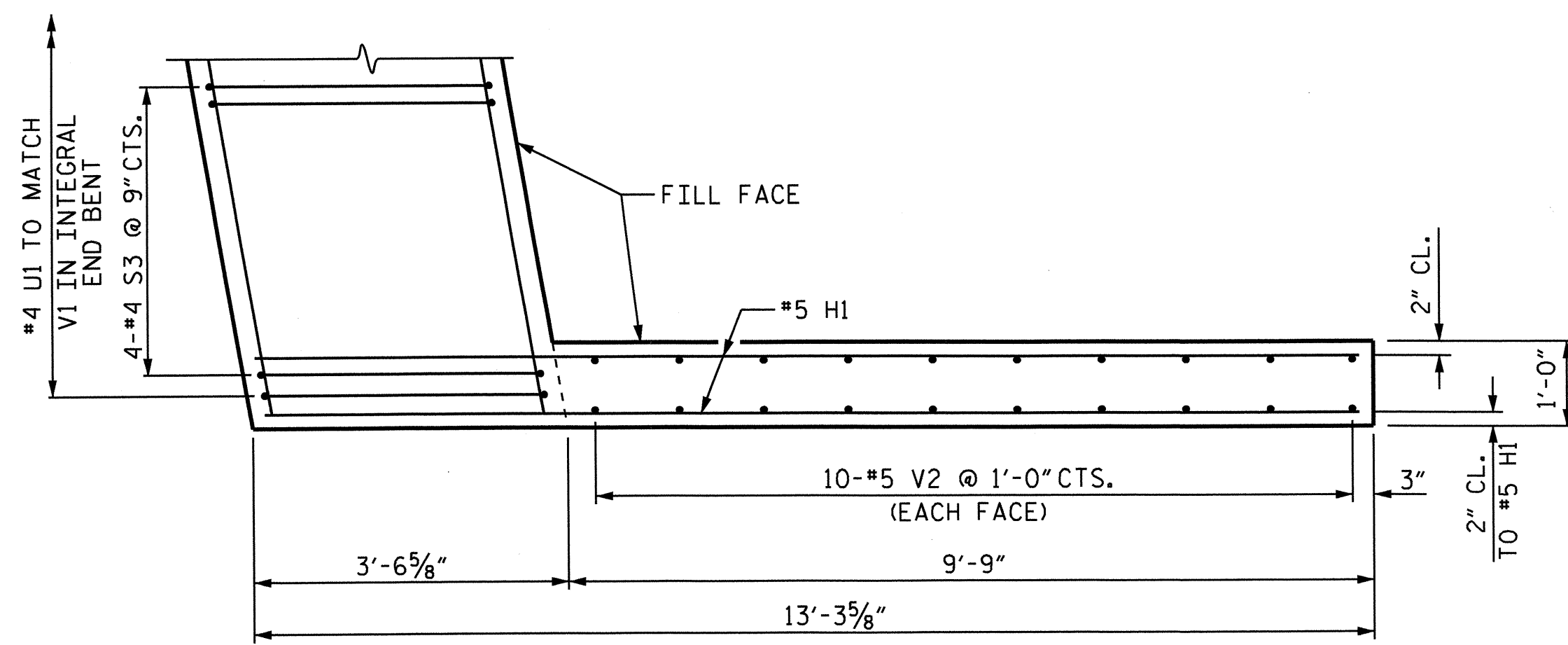
**SUBSTRUCTURE  
 PLAN OF SPAN C  
 (STAGE I & II)**



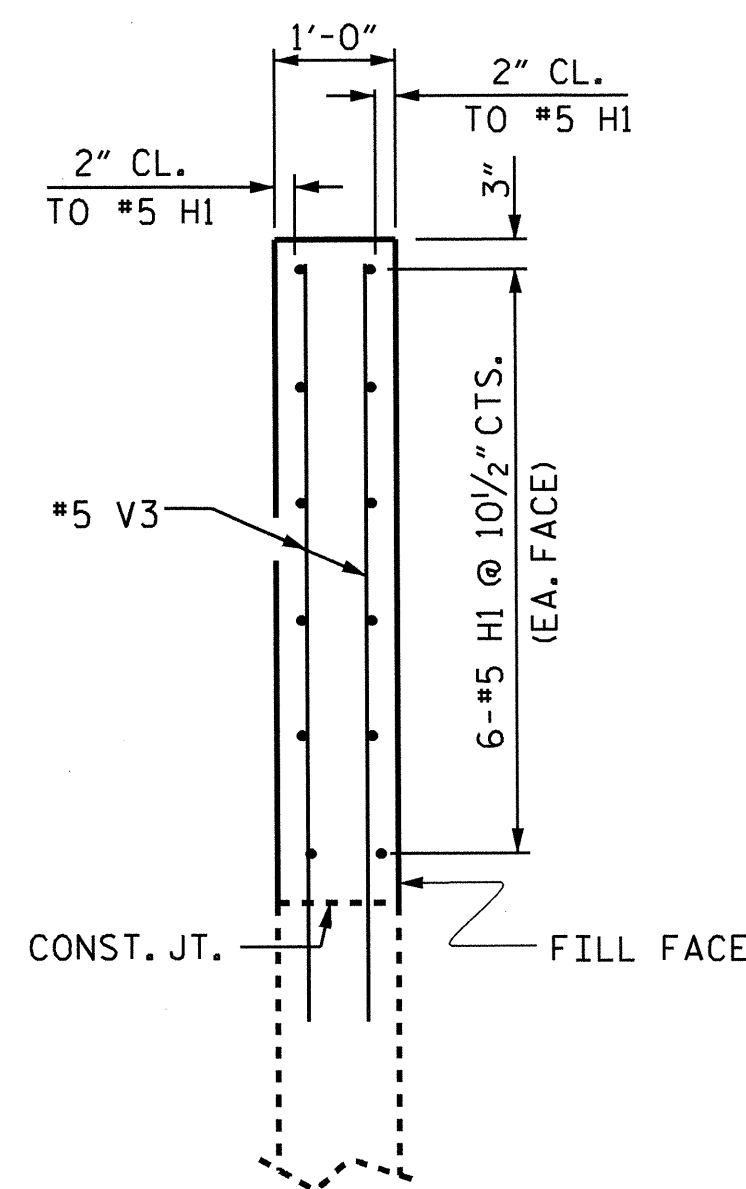
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
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DRAWN BY : B. N. BARODAWALA DATE : 2-15-11  
 CHECKED BY : J. D. HAWK DATE : 9-10-11

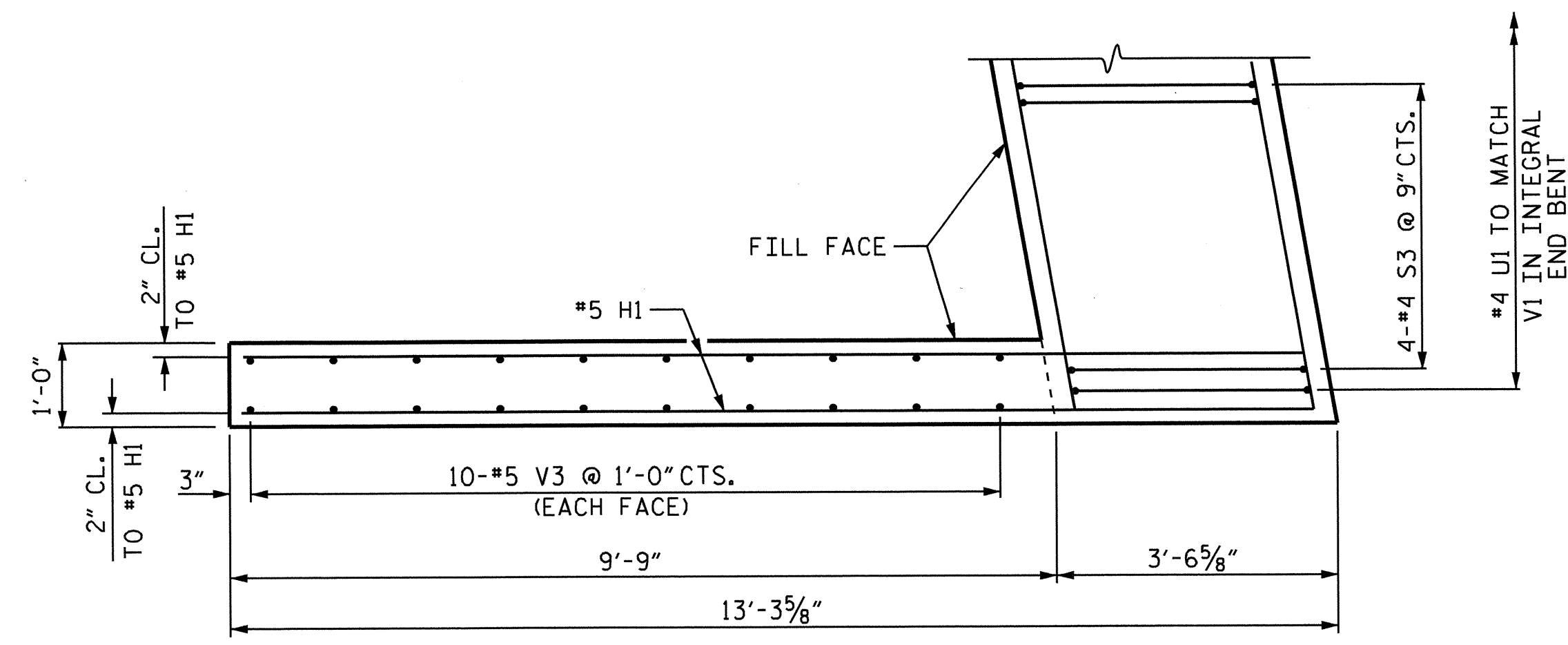
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 KPASCHAL



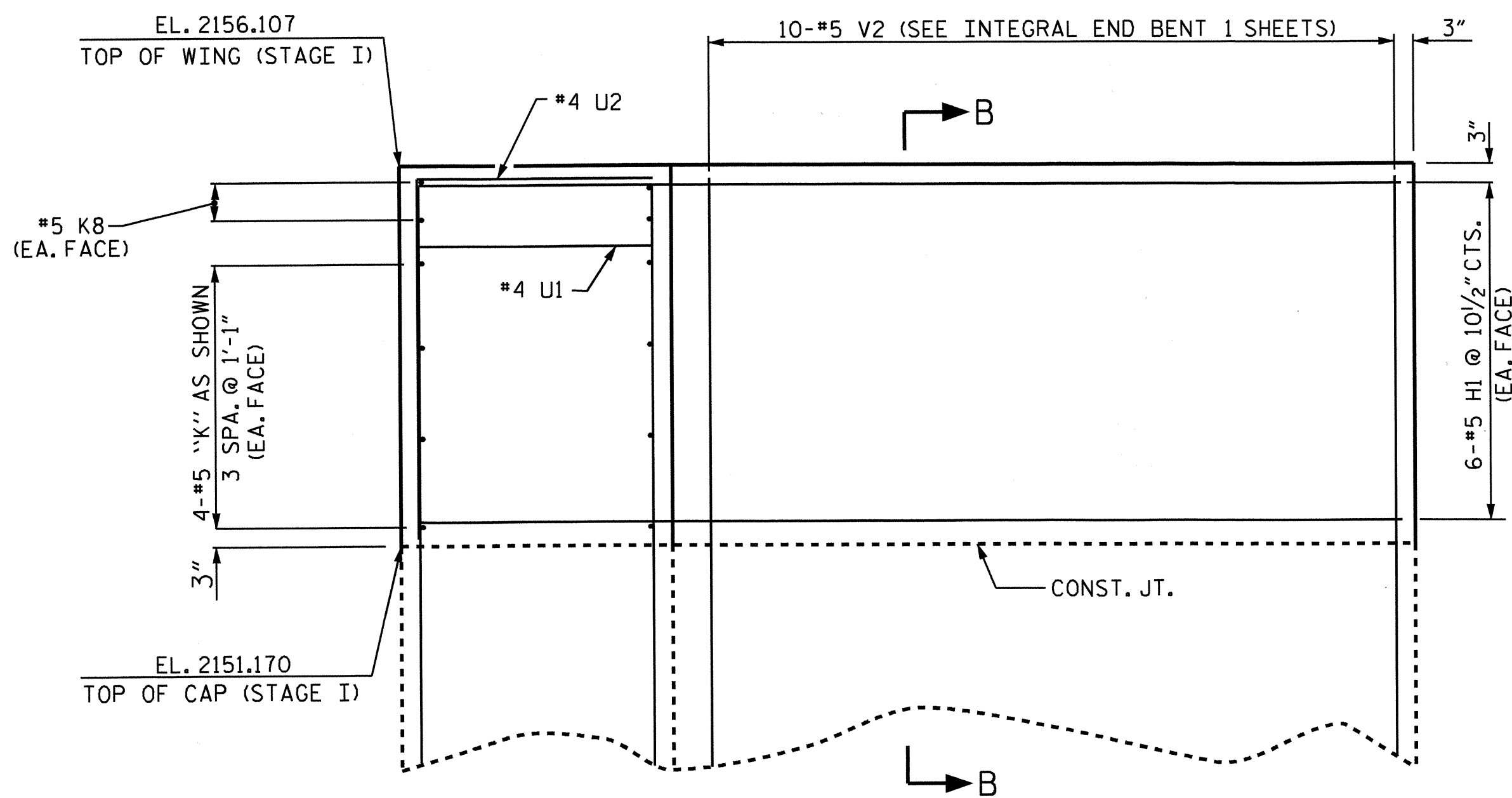
PLAN (W1)  
(STAGE I)



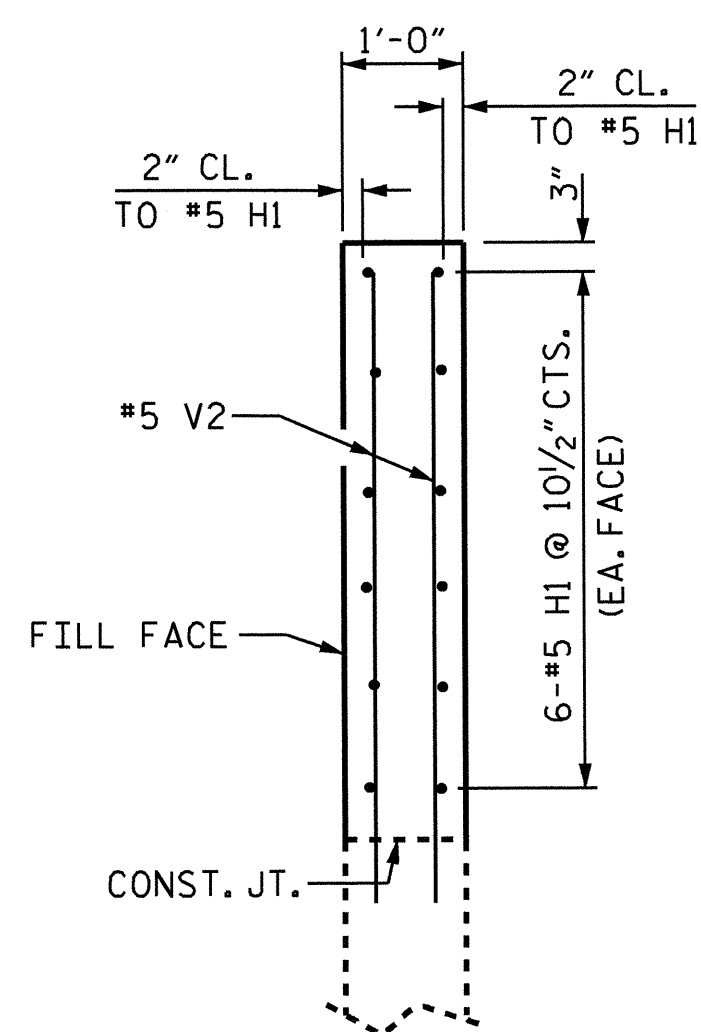
SECTION C-C



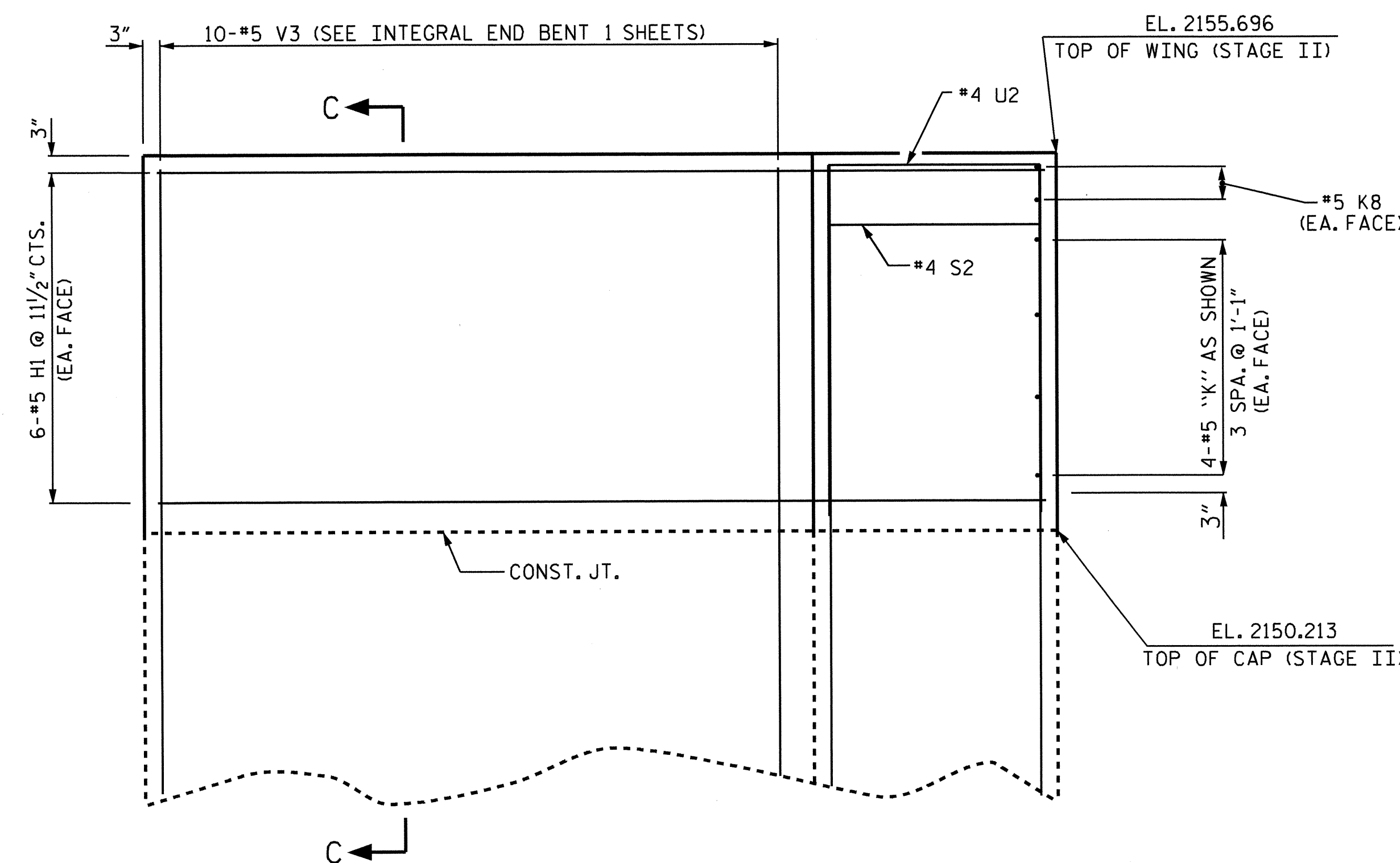
PLAN (W2)  
(STAGE II)



ELEVATION (W1)  
(STAGE I)



SECTION B-B

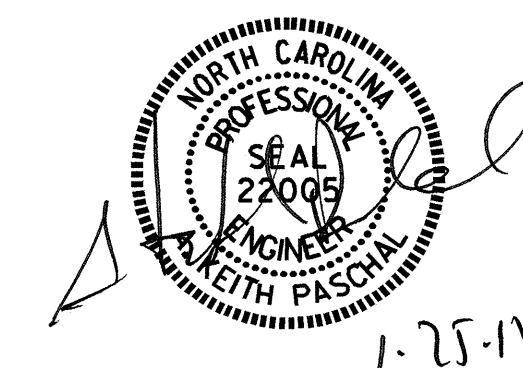


ELEVATION (W2)  
(STAGE II)

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 4 OF 5

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



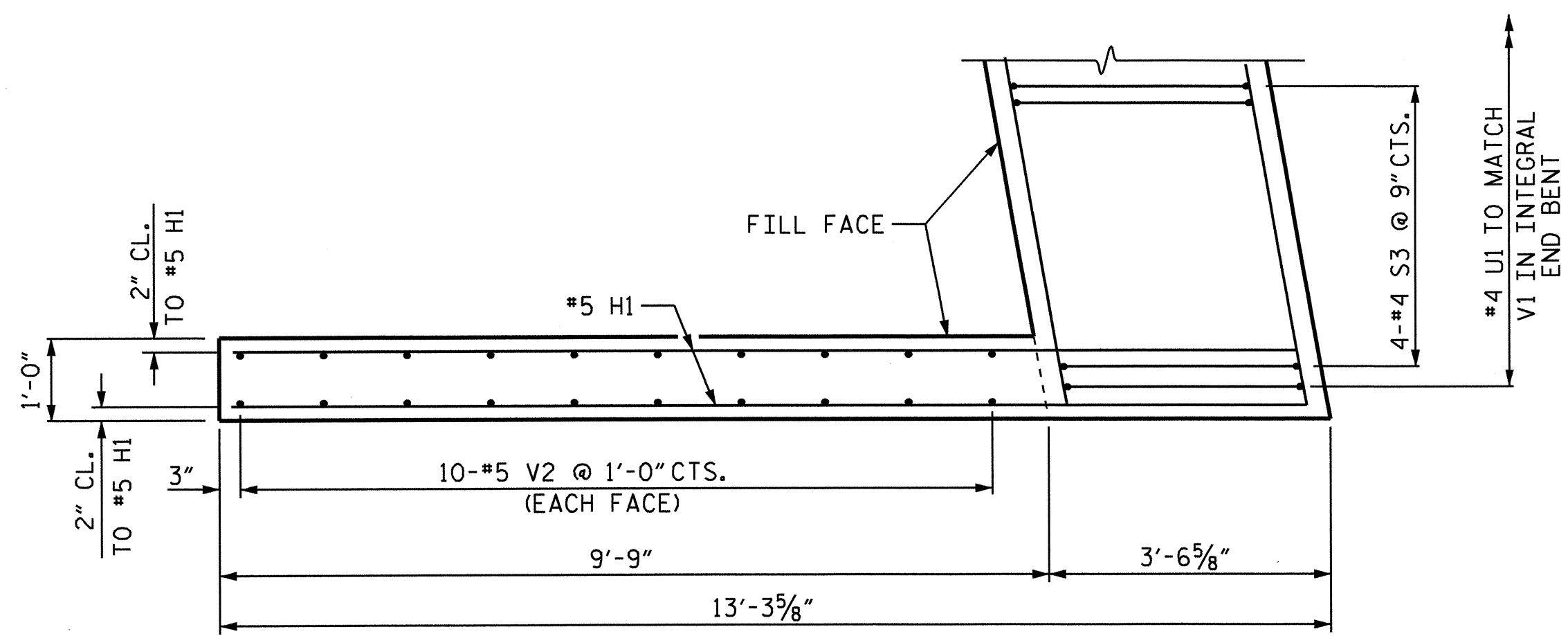
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN  
 DETAILS  
 (STAGE I & II)

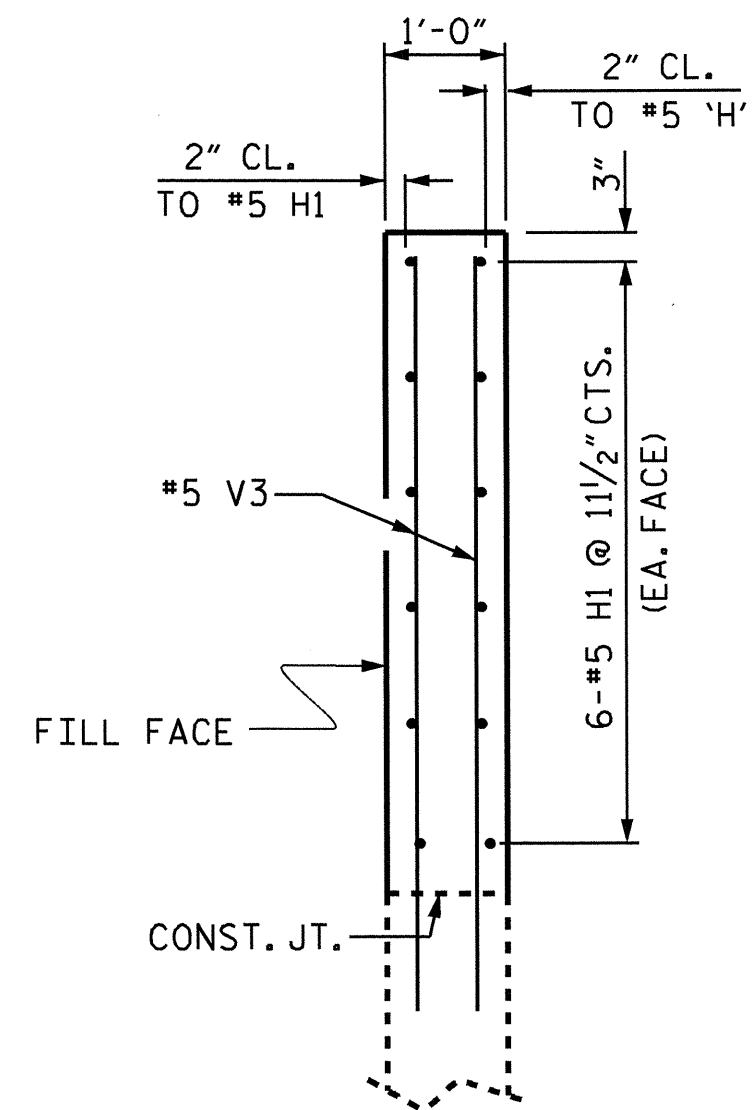
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			45

DRAWN BY : B. N. BARODAWALA DATE : 9-01-11  
 CHECKED BY : J. D. HAWK DATE : 10-25-11

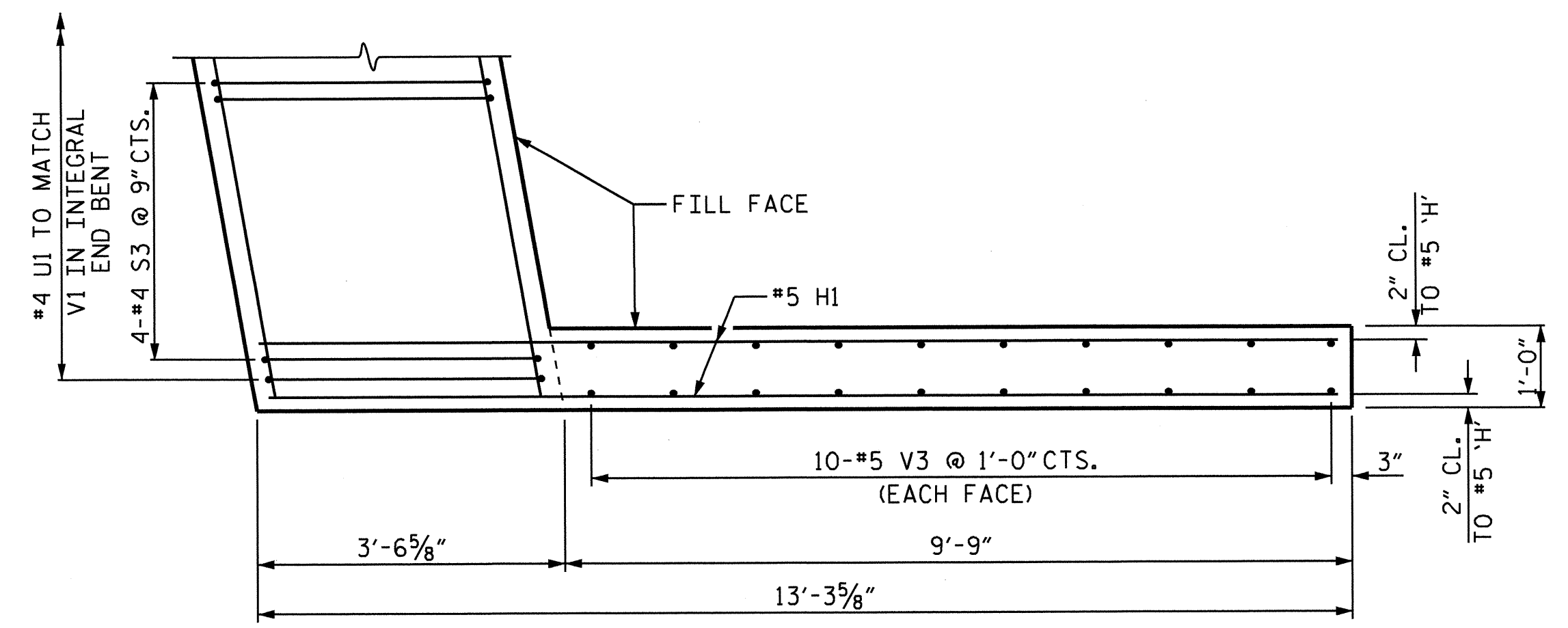




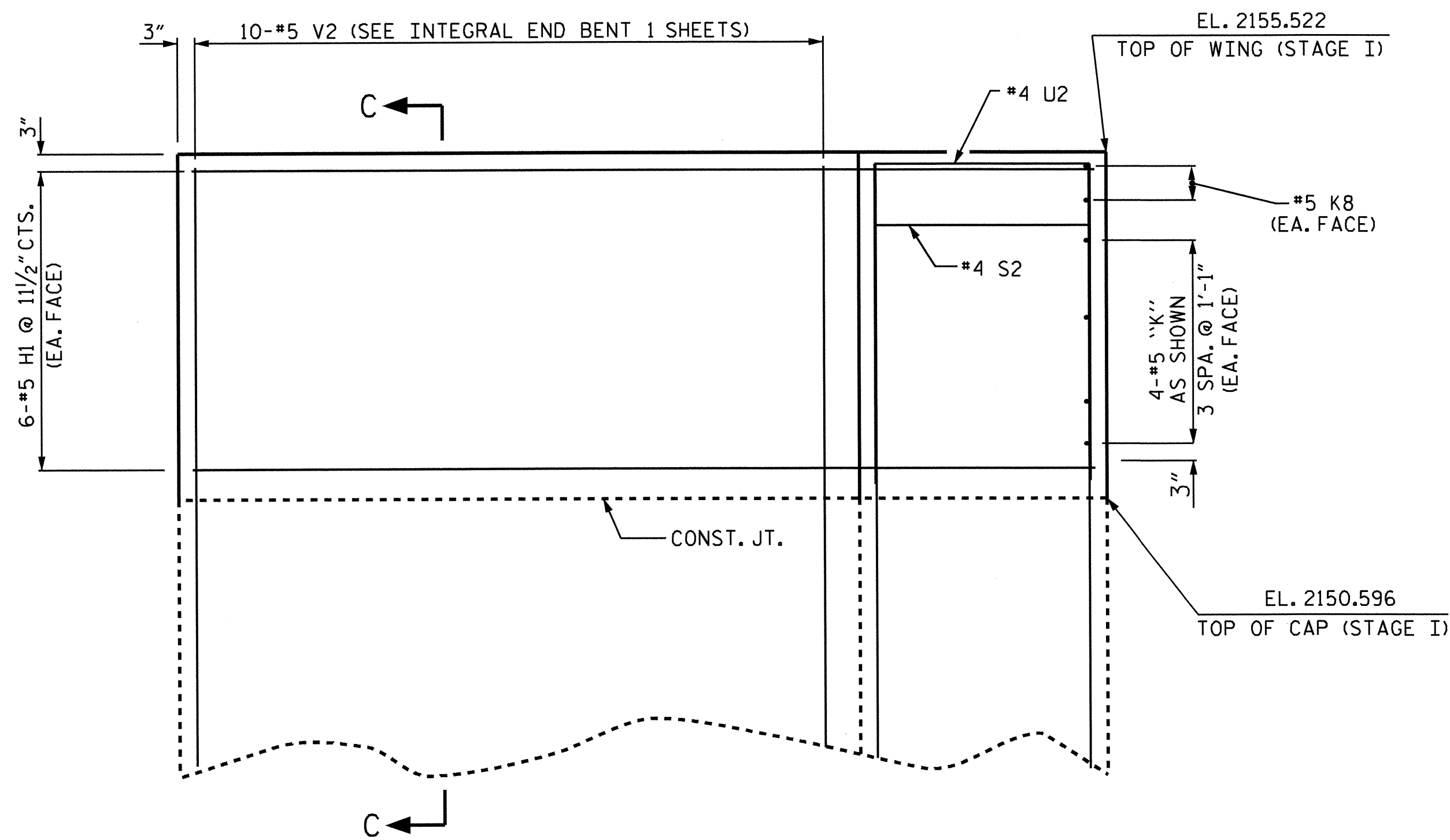
PLAN (W1)  
(STAGE I)



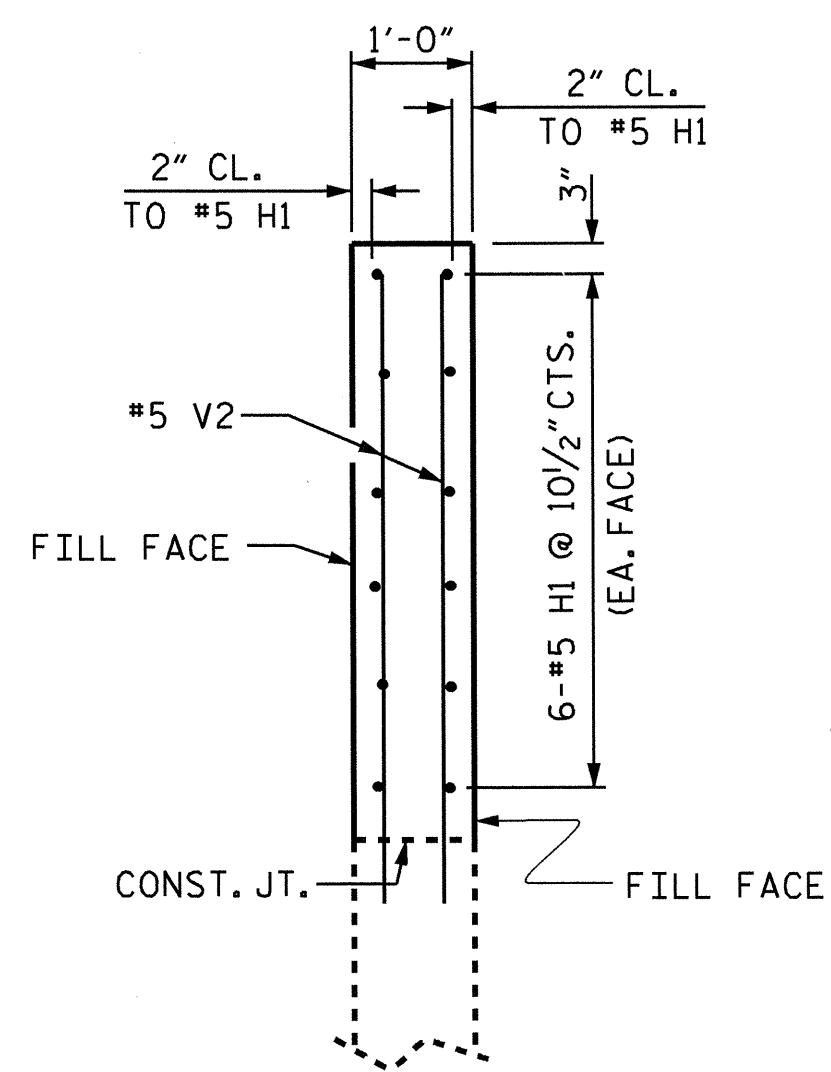
SECTION B-B



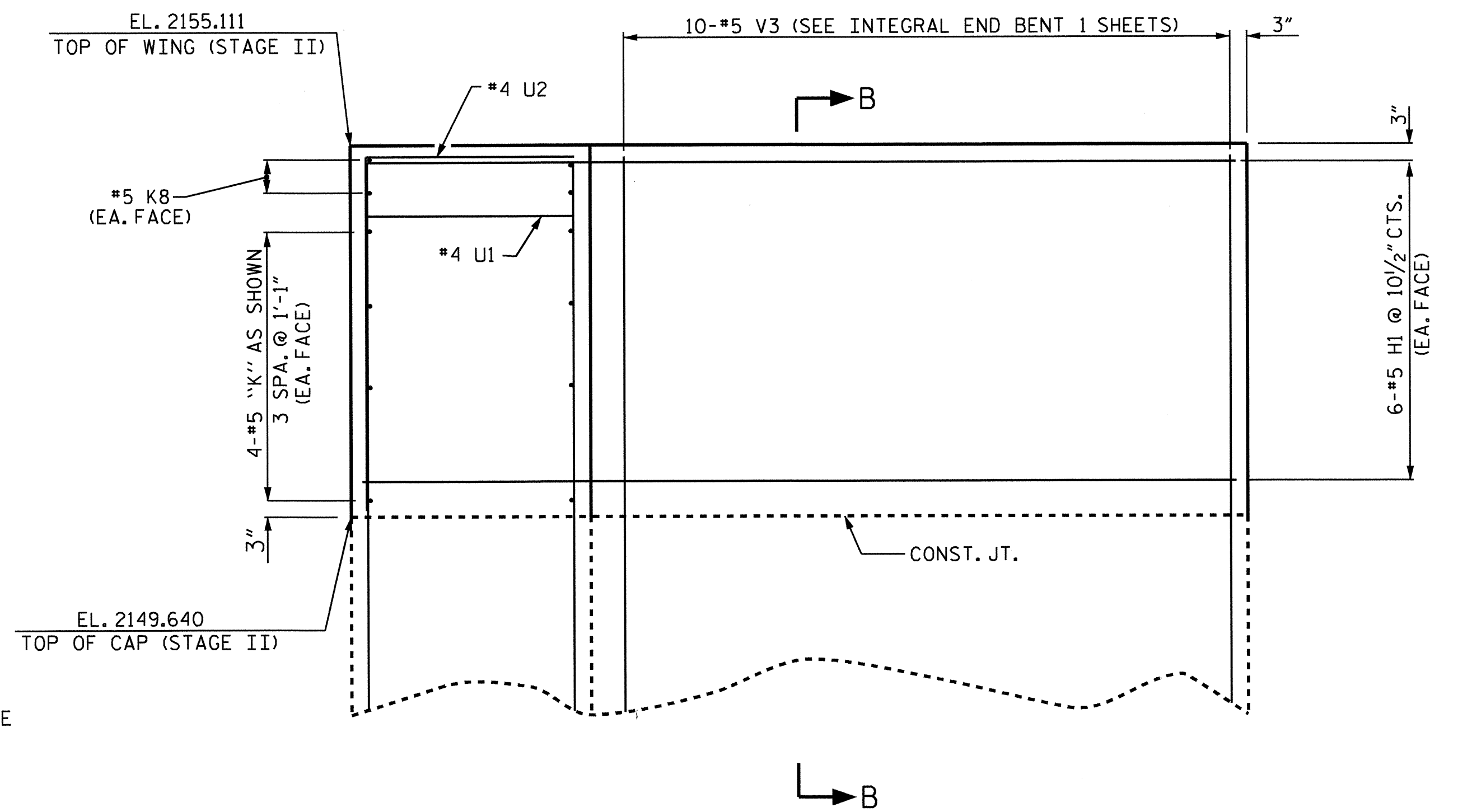
PLAN (W2)  
(STAGE II)



ELEVATION (W1)  
(STAGE I)



SECTION C-C



ELEVATION (W2)  
(STAGE II)

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPAN  
DETAILS  
(STAGE I & II)

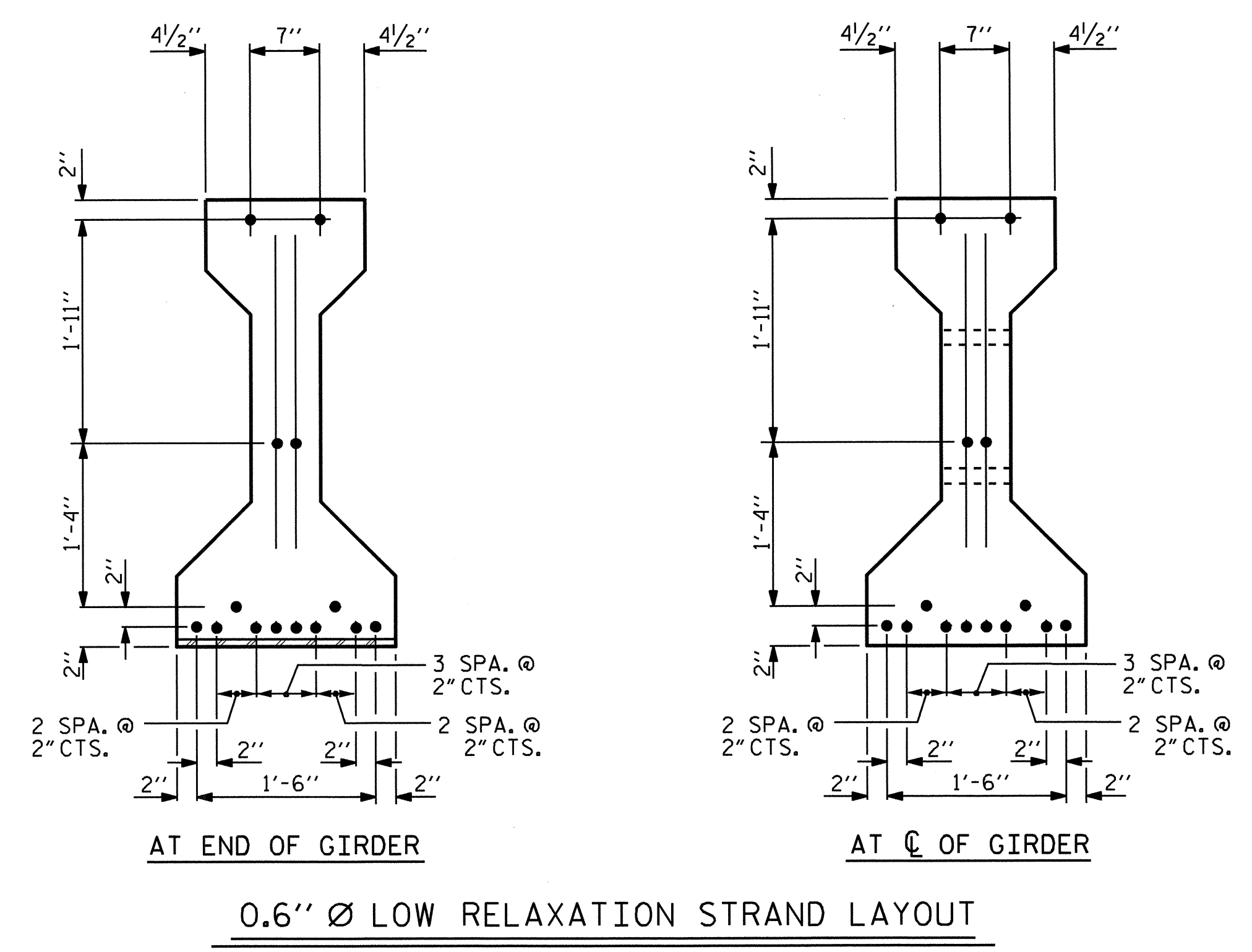
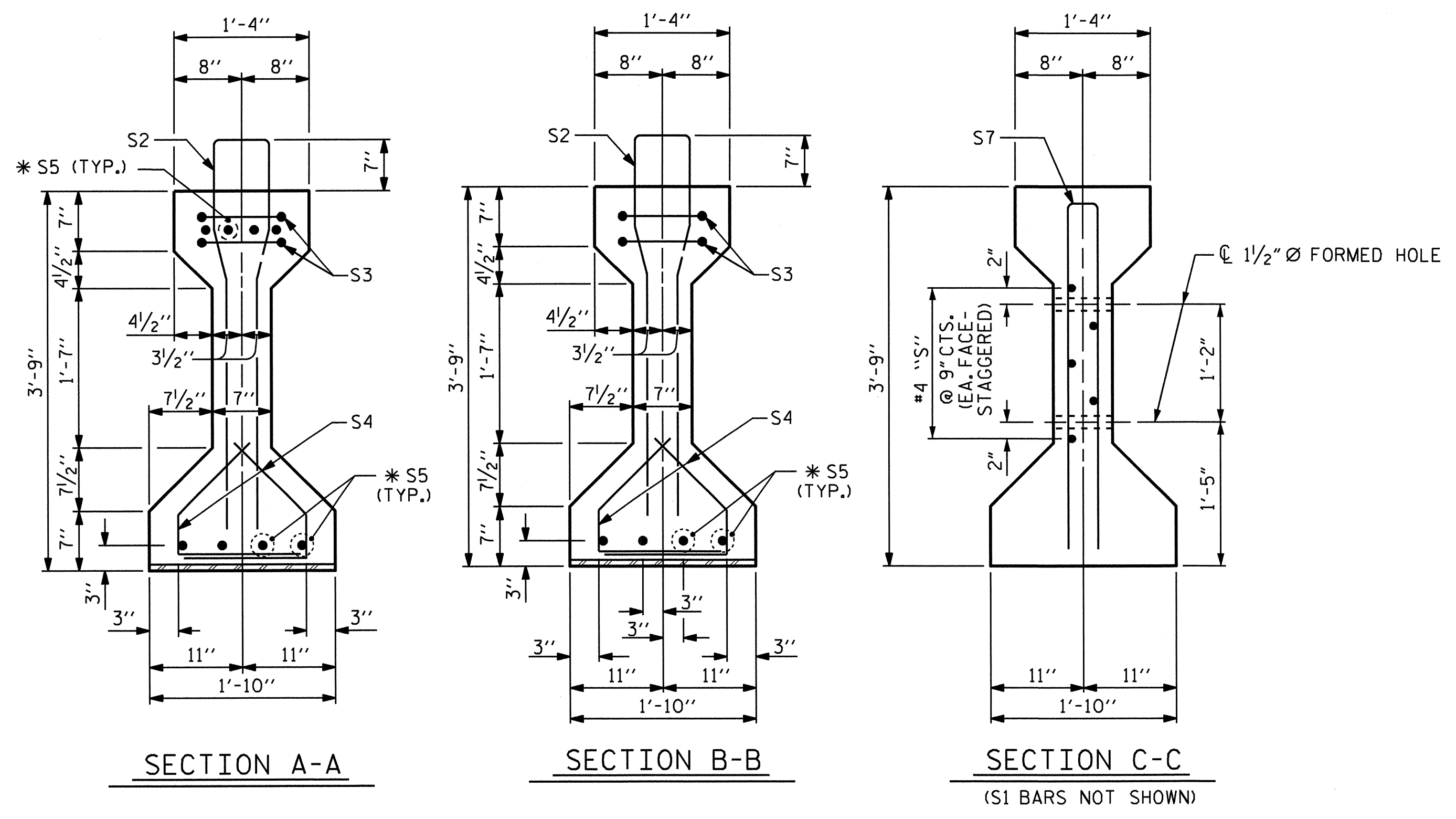


UPPER WINGS AT INTEGRAL END BENT 2  
FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT" SHEETS.

DRAWN BY: B. N. BARODAWALA DATE: 9-01-11  
CHECKED BY: J. D. HAWK DATE: 10-25-11

13-DEC-2011 09:58  
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL	45
2			4			SHEETS	

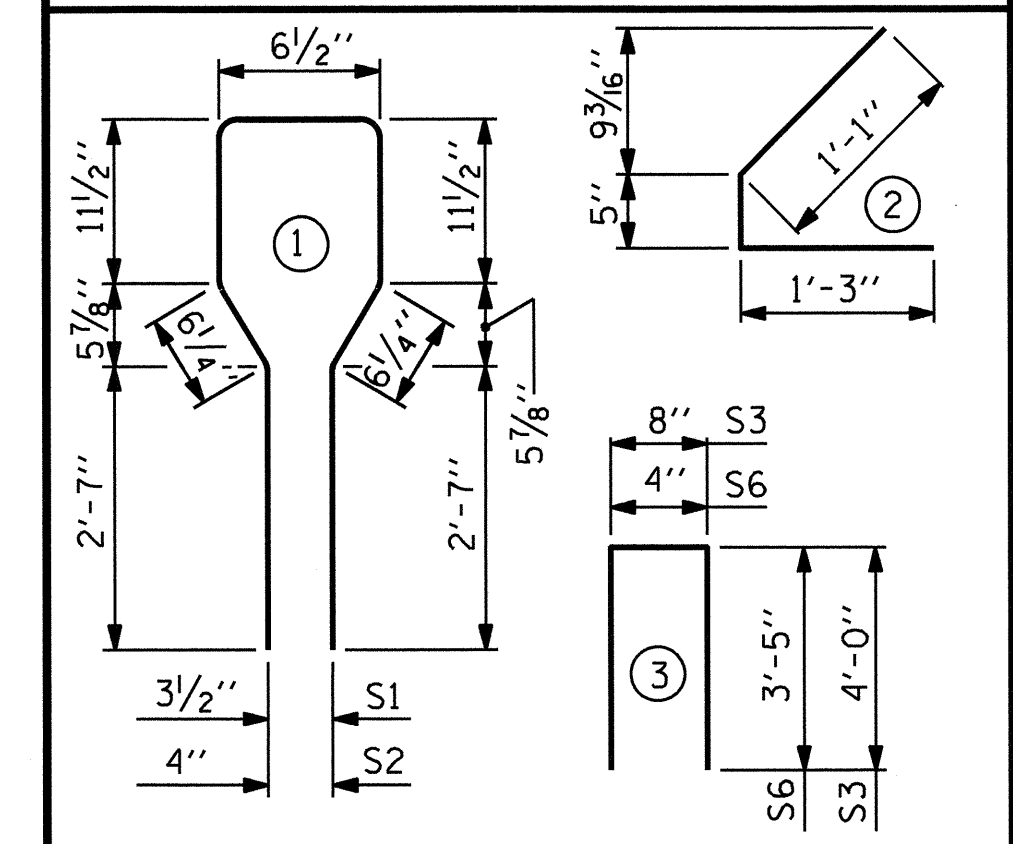


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	8'-8"	371
S2	12	#6	1	8'-8"	156
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
*S5	12	#5	STR	3'-8"	46
S6	2	#5	3	7'-2"	15
S7	5	#4	STR	7'-0"	23
S8	1	#3	STR	1'-0"	1

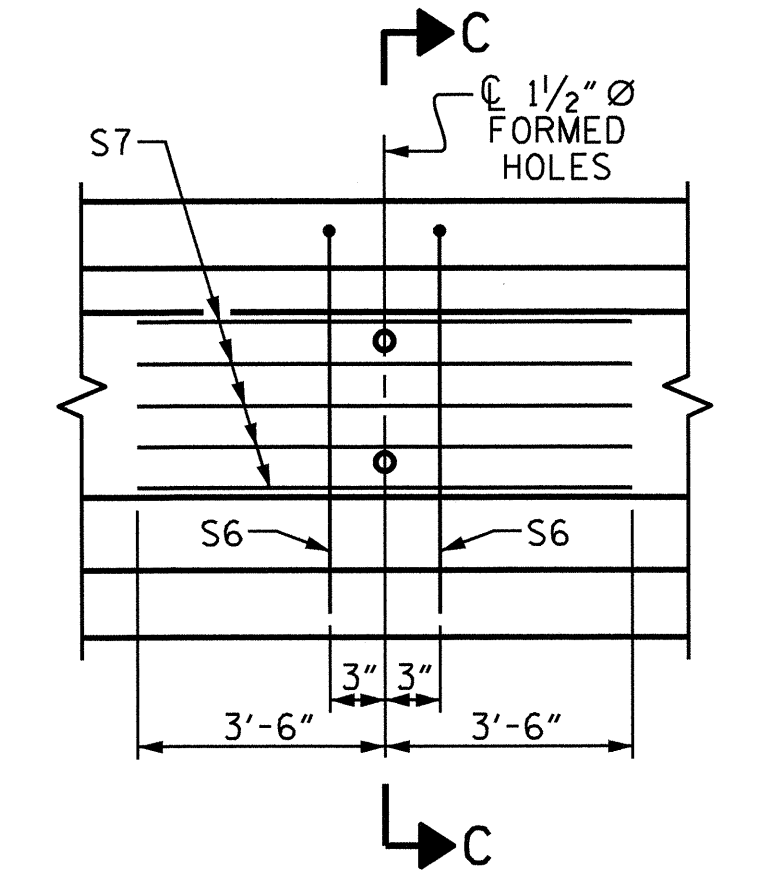
\* NOTE: S5 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**

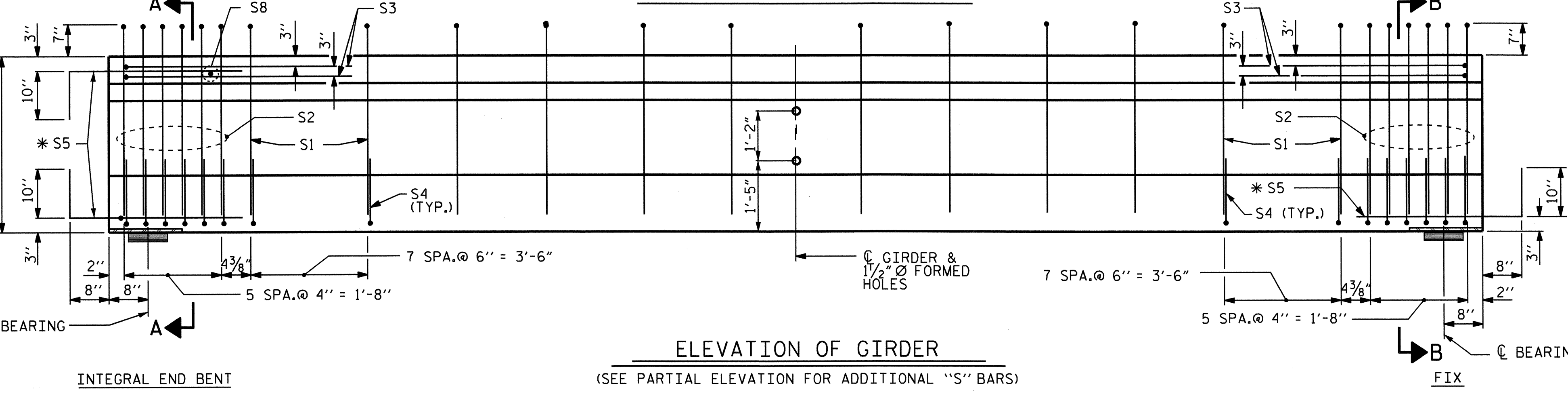
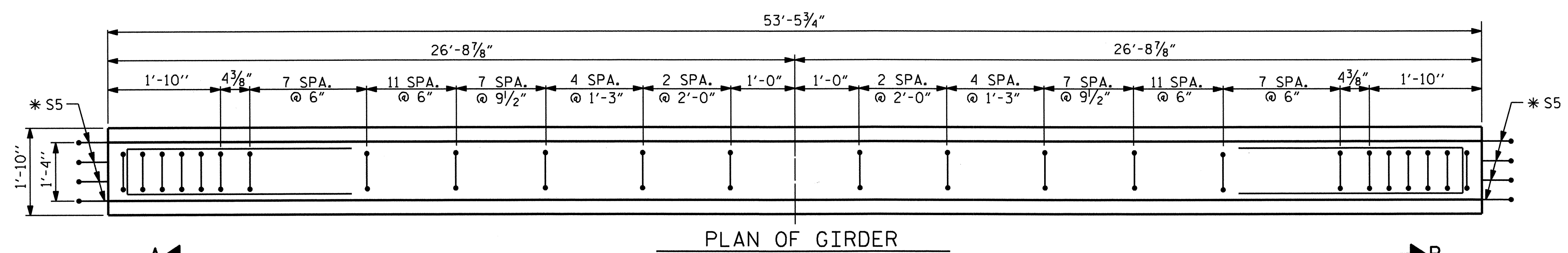


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
ALL GIRDERS	738	7.7	14

GIRDERS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A STAGE I	4	53'-5 3/4"	213'-11"
SPAN A STAGE II	3	53'-5 3/4"	160'-5 1/4"
SPAN C STAGE I	4	53'-5 3/4"	213'-11"
SPAN C STAGE II	3	53'-5 3/4"	160'-5 1/4"
			TOTAL LENGTH 748'-8 1/2"

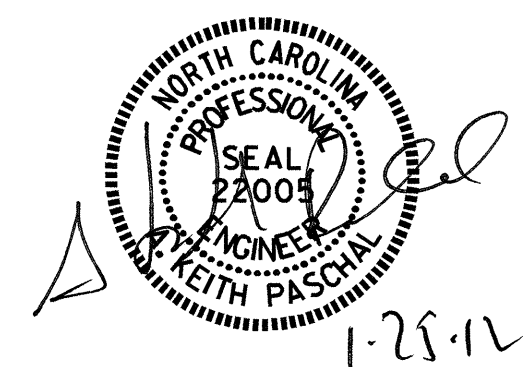


**PARTIAL ELEVATION**  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. A1 THRU A4, A5 THRU A7, C1 THRU C4 AND C5 THRU C7.



ASSEMBLED BY : J. G. KHARVA DATE : 03-08-11  
 CHECKED BY : J. D. HAWK DATE : 10-10-11  
 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

13-DEC-2011 09:58  
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 bbarodowala



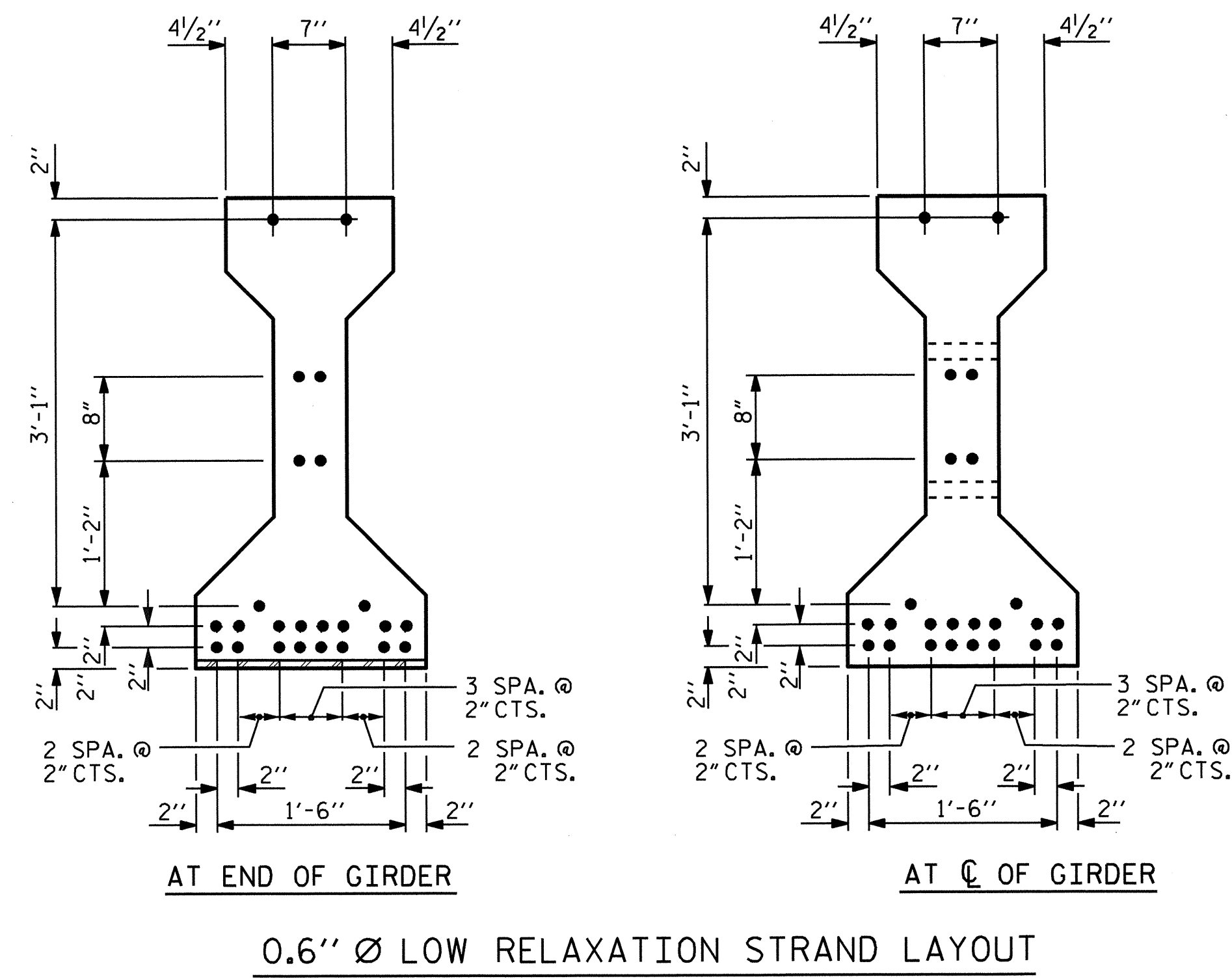
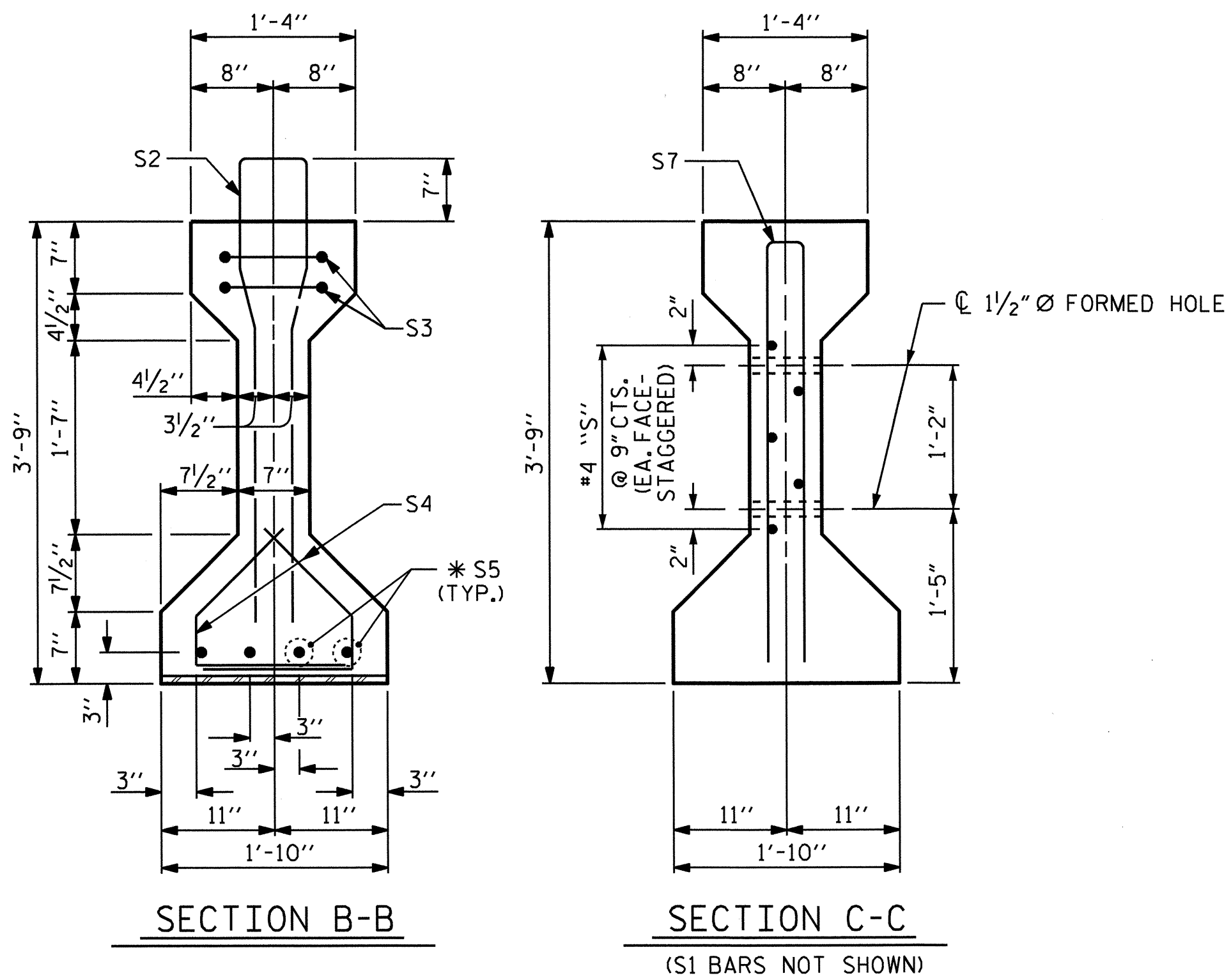
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00-L-  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 SPAN A & C  
 (STAGE I AND STAGE II)

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

STD. NO. PCG5



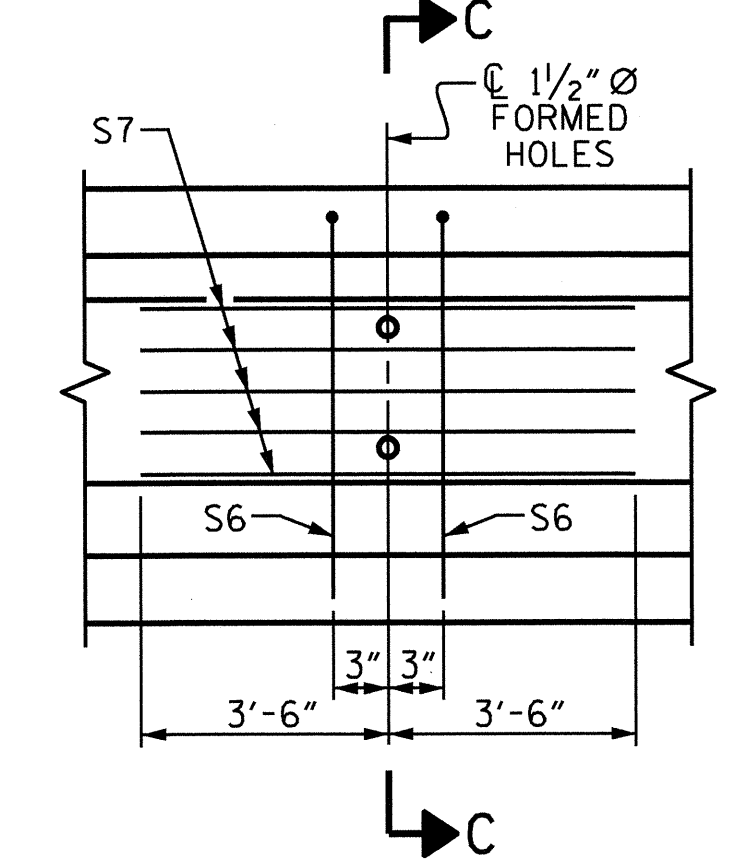
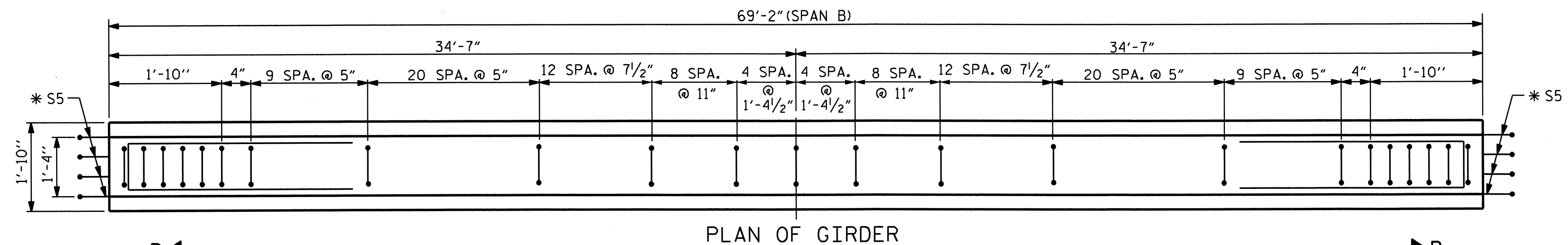
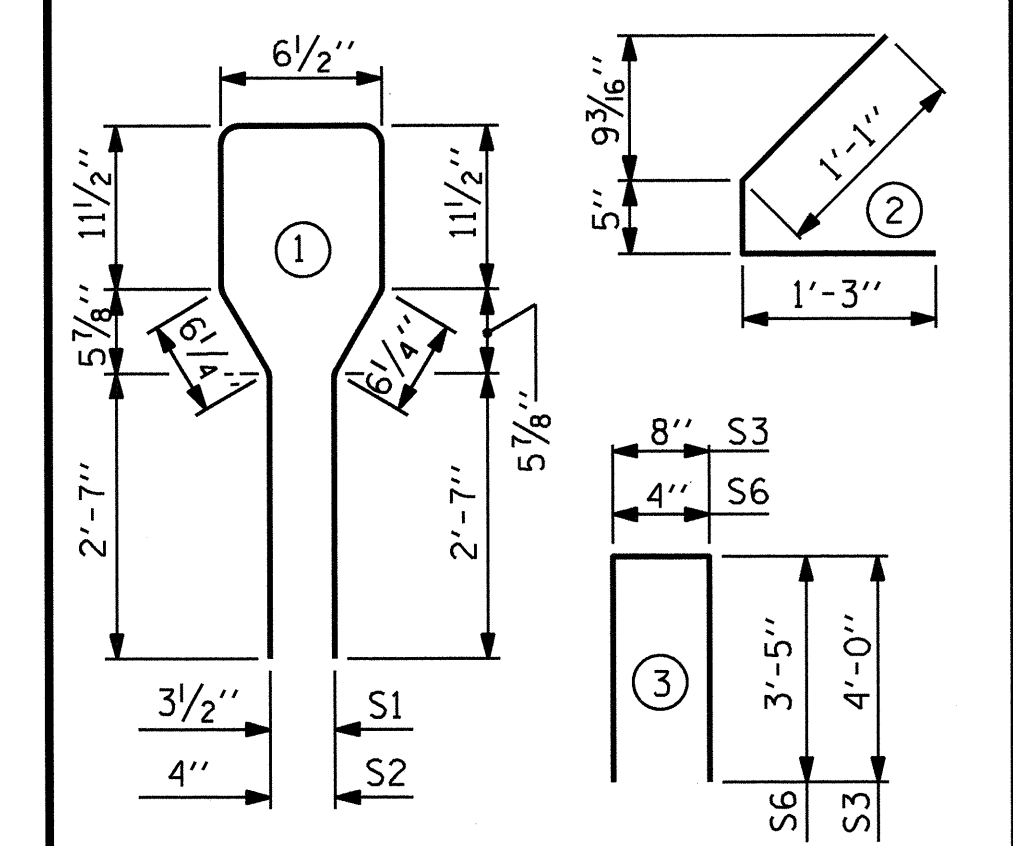


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

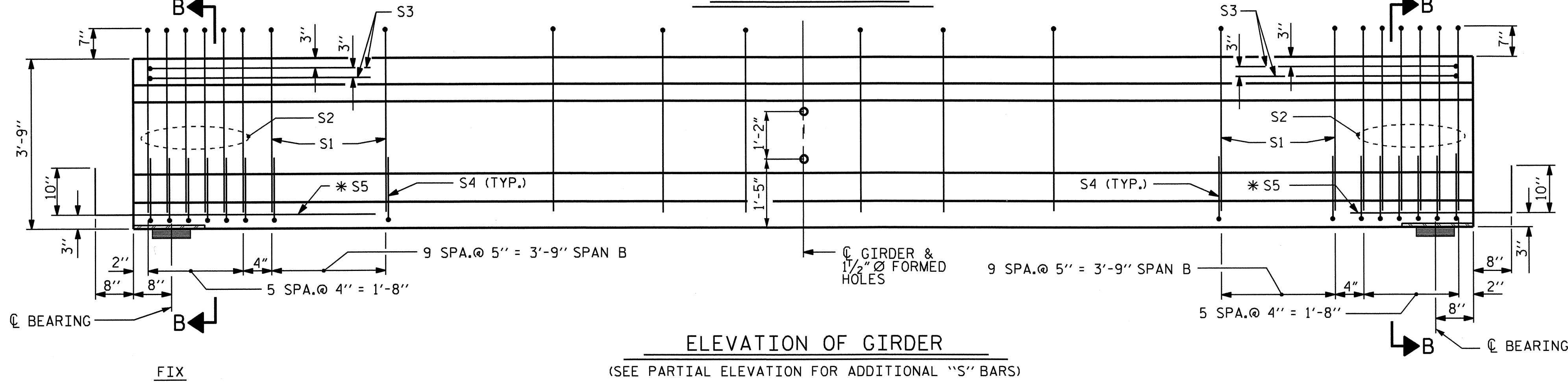
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	107	#4	1	8'-8"	619
S2	12	#6	1	8'-8"	156
S3	4	#4	3	8'-8"	23
S4	64	#4	2	2'-9"	118
*S5	8	#5	STR	3'-8"	31
S6	2	#5	3	7'-2"	15
S7	5	#4	STR	7'-0"	23

\* NOTE: S5 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 Nos. B1 THRU B4, AND B5 THRU B7.

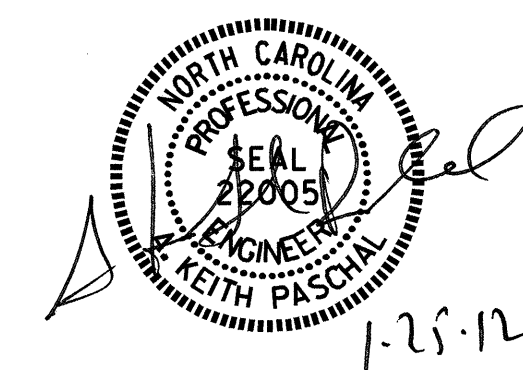


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	7000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
ALL GIRDERS	985	10.0	24

GIRDERS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
STAGE I	4	69'-2"	276'-8"
STAGE II	3	69'-2"	207'-6"
		TOTAL LENGTH	484'-2"

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00-L-  
 SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 SPAN B  
 (STAGE I AND STAGE II)



ASSEMBLED BY : J. G. KHARVA	DATE : 03-08-11
CHECKED BY : J. D. HAWK	DATE : 10-10-11
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

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

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES 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 PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

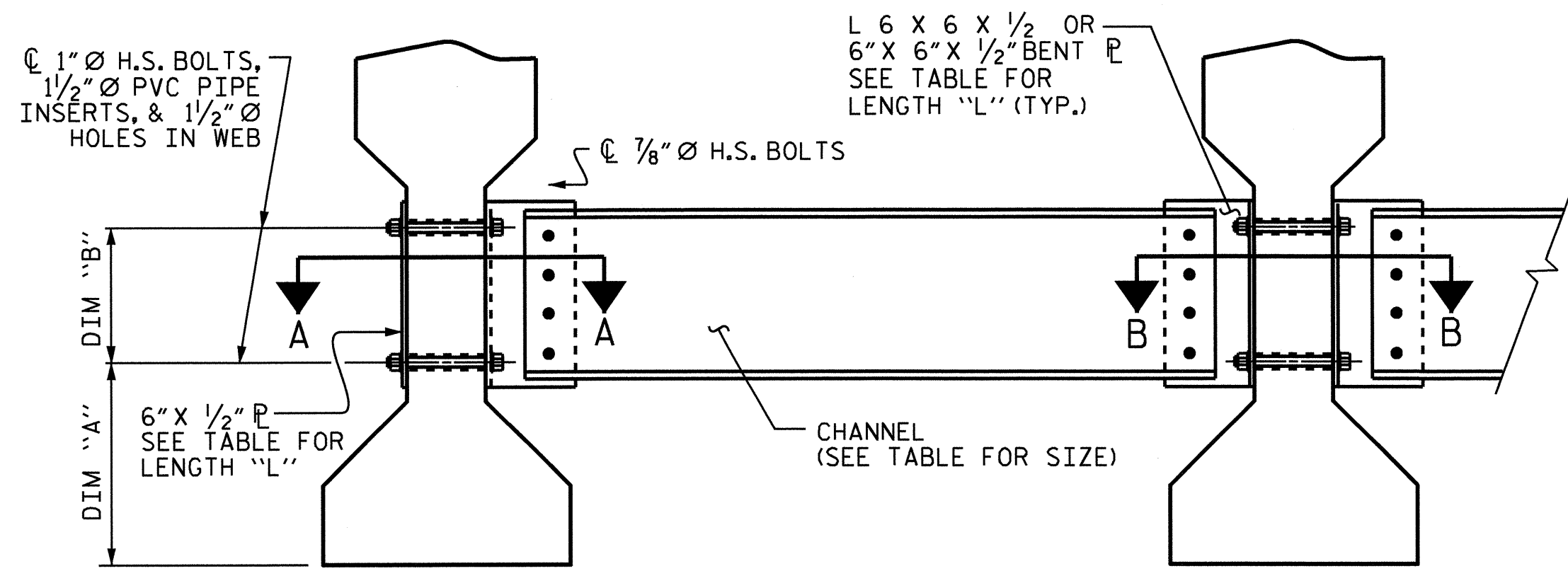
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

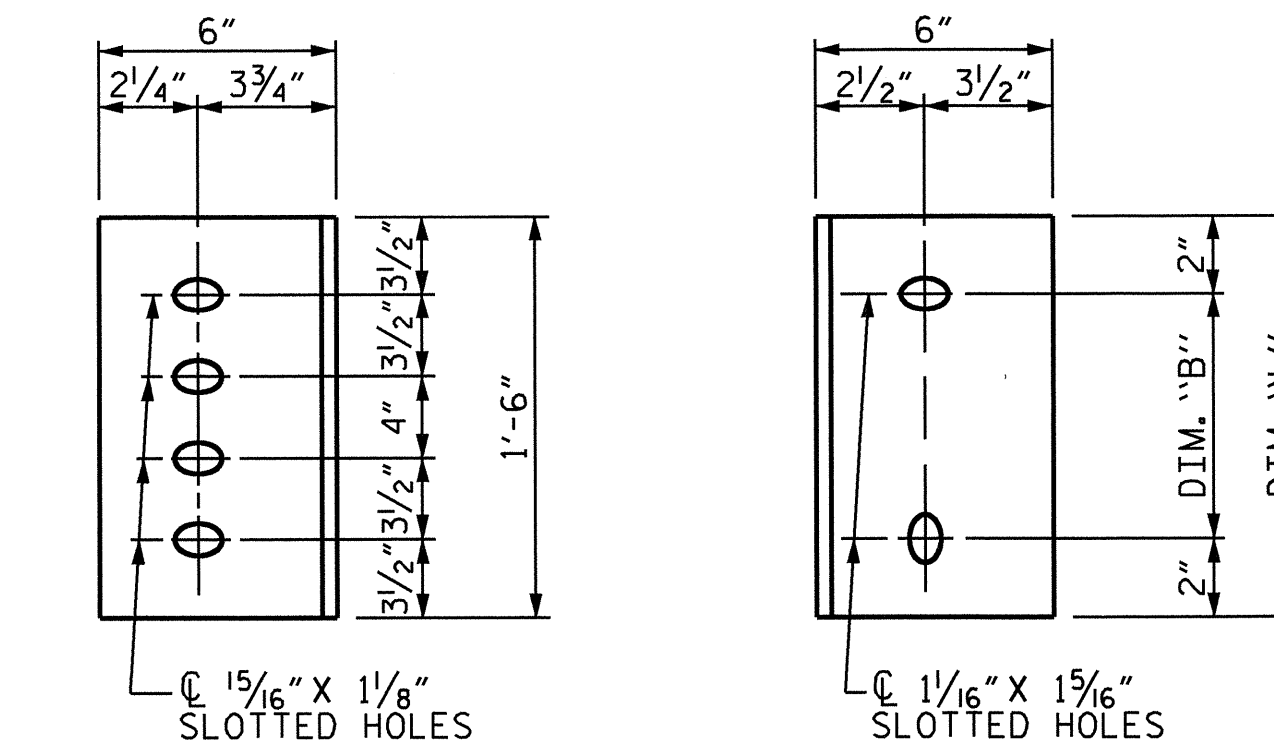
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

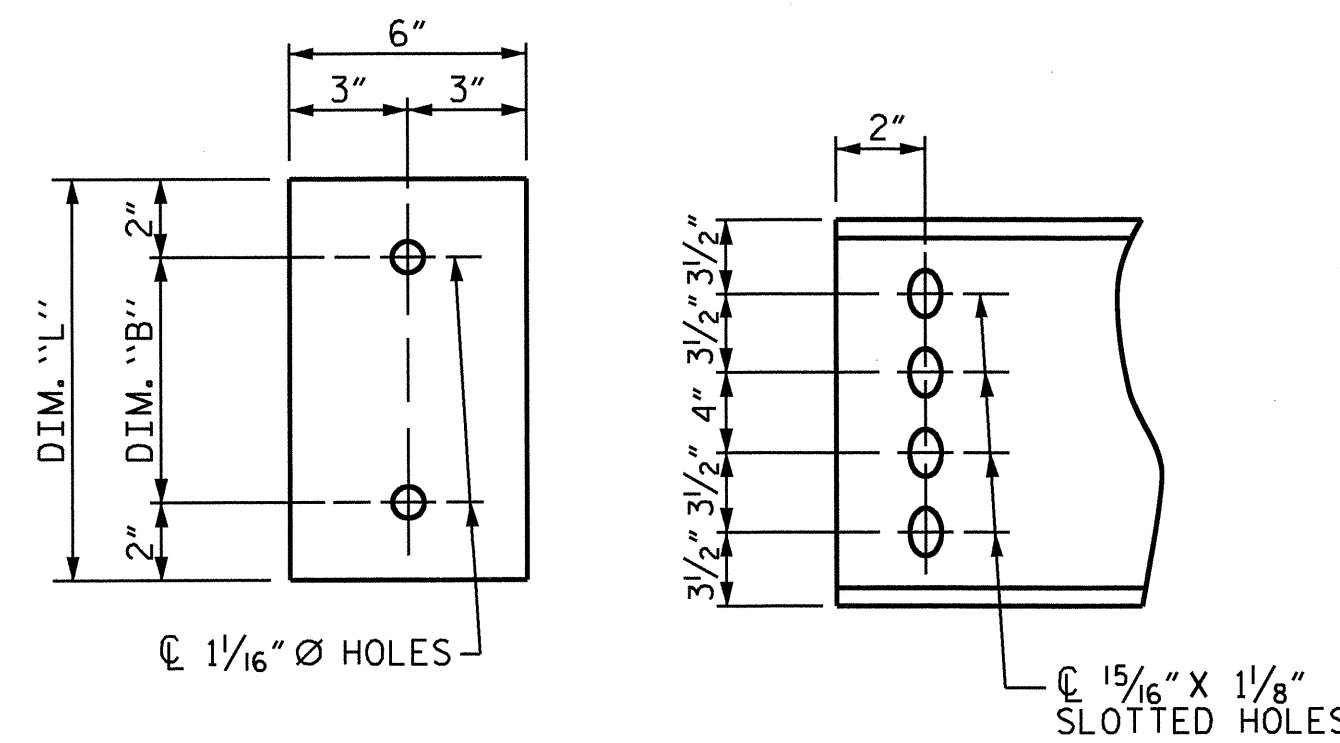
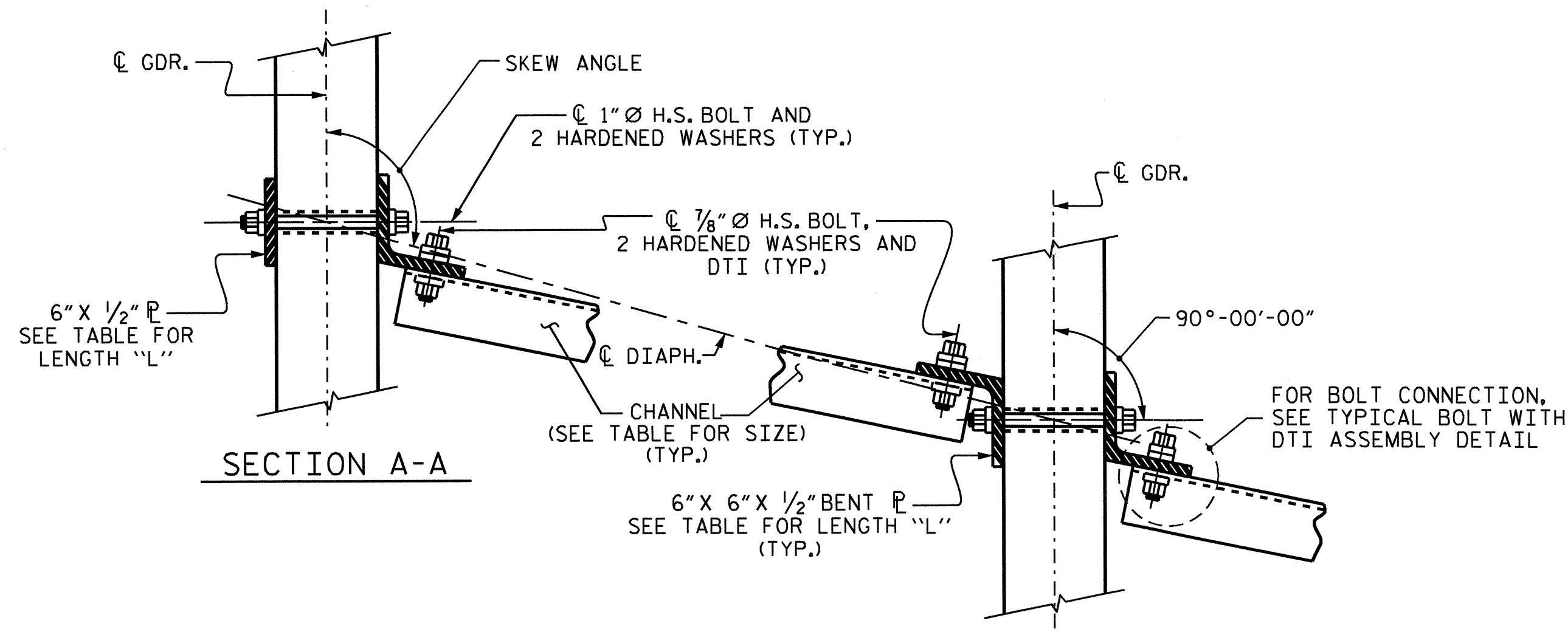


PLATE DETAILS

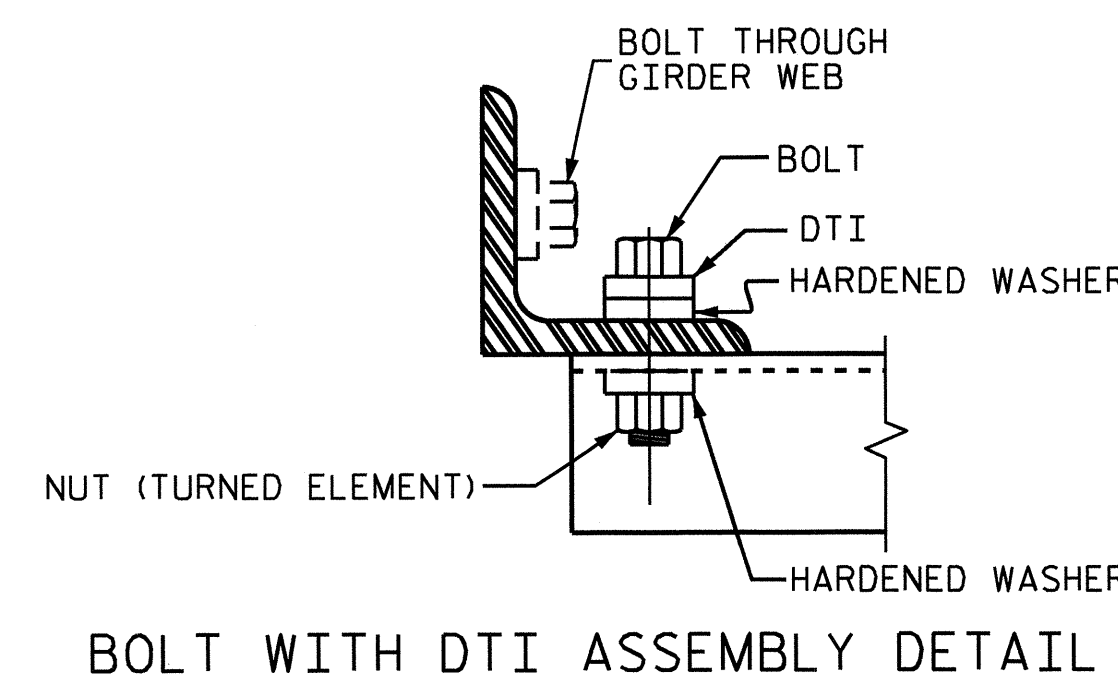
CHANNEL END



SECTION A-A

SECTION B-B

CONNECTION DETAILS



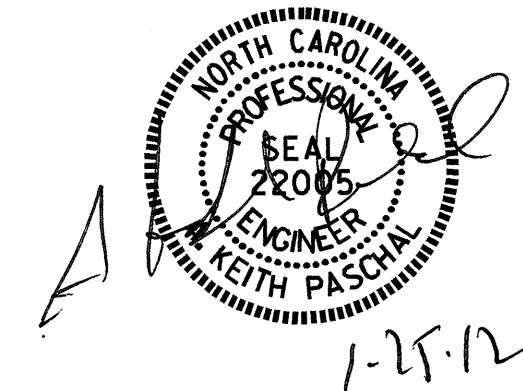
BOLT WITH DTI ASSEMBLY DETAIL

TABLE

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

PROJECT NO. B-3480  
 JACKSON COUNTY  
 STATION: 17+96.00-L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.	
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS						S-15	
REVISIONS						TOTAL SHEETS	
NO.	BY:	DATE:	NO.	BY:	DATE:	45	
1			3				
2			4				

ASSEMBLED BY: B.N.BARODAWALA DATE: 11-15-11  
 CHECKED BY: A. K. PASCHAL DATE: 11-15-11  
 DRAWN BY: TLA 6/05  
 CHECKED BY: VC 6/05  
 ADDED 10/21/05  
 REV. 5/1/06RRR KMM/GM  
 REV. 10/1/11 MAA/GM

13-DEC-2011 09:58  
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 bbarodawala

STD. NO. PCC10



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.

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.

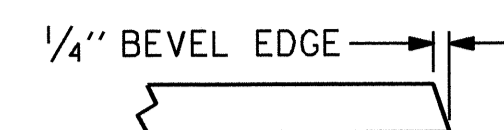
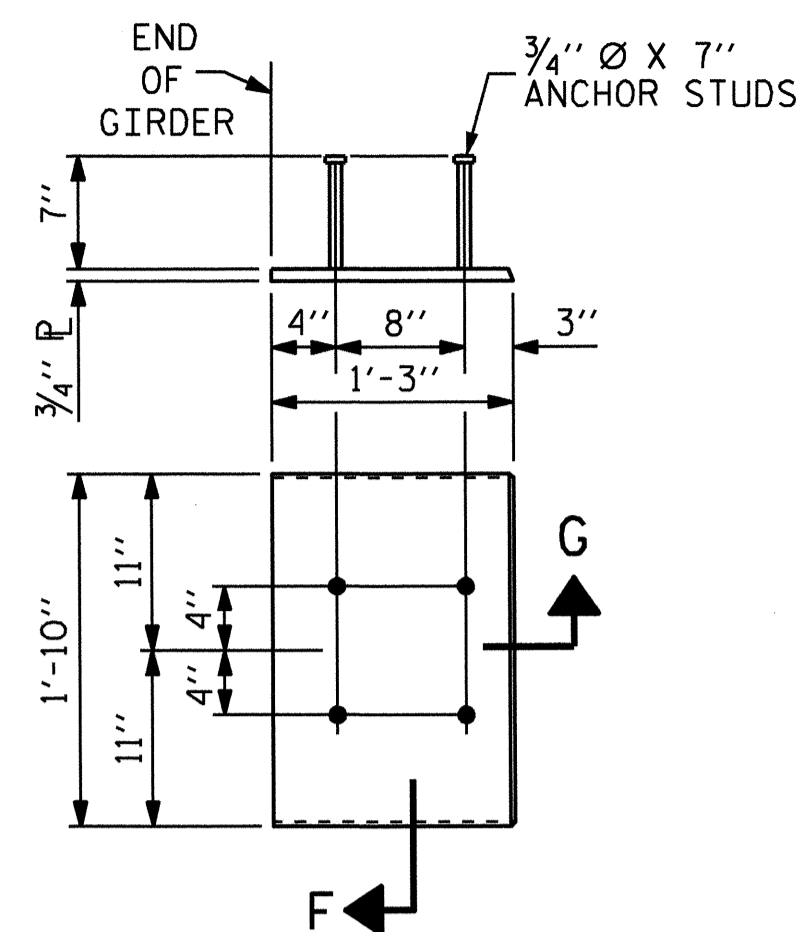
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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.

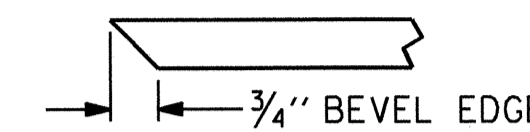
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI. SPAN A & C (STAGE I & STAGE II) AND 5600 PSI SPAN B (STAGE I & STAGE II)

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

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



SECTION "G"



SECTION "F"

(SEE NOTES)

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

(2 REQ'D PER GIRDER)

0.6" Ø LOW RELAXATION	DEAD LOAD DEFLECTION TABLE FOR GIRDERS (SPAN A & C-STAGE I)																																	
	GIRDER 1										GIRDERS 2 & 3										GIRDER 4													
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	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	.018	.036	.049	.057	.060	.057	.049	.036	.018	0	0	.019	.036	.049	.057	.060	.057	.049	.036	.019	0	0	.019	.036	.049	.057	.060	.057	.049	.036	.019	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.008	.015	.020	.023	.024	.023	.020	.015	.008	0	0	.008	.016	.021	.025	.026	.025	.021	.016	.008	0	0	.007	.012	.017	.020	.021	.020	.017	.012	.007	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	7/16"	7/16"	3/8"	1/4"	1/8"	0	0	1/8"	1/4"	5/16"	3/8"	7/16"	3/8"	5/16"	1/4"	1/8"	0	0	1/8"	5/16"	3/8"	7/16"	1/2"	7/16"	3/8"	5/16"	1/8"	0	

0.6" Ø LOW RELAXATION	DEAD LOAD DEFLECTION TABLE FOR GIRDERS (SPAN A & C-STAGE-II)																																	
	GIRDER 5										GIRDER 6										GIRDER 7													
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	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	.019	.036	.049	.057	.060	.057	.049	.036	.019	0	0	.019	.036	.049	.057	.060	.057	.049	.036	.019	0	0	.019	.036	.049	.057	.060	.057	.049	.036	.019	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.007	.014	.019	.023	.024	.023	.019	.014	.007	0	0	.009	.017	.023	.027	.028	.027	.023	.017	.009	0	0	.008	.015	.021	.025	.026	.025	.021	.015	.008	0
FINAL CAMBER	↑	0	1/8"	1/4"	3/8"	7/16"	7/16"	3/8"	1/4"	1/8"	0	0	1/8"	1/4"	5/16"	3/8"	3/8"	5/16"	1/4"	1/8"	0	0	1/8"	1/4"	5/16"	3/8"	7/16"	3/8"	5/16"	1/4"	1/8"	0		

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

0.6" Ø LOW RELAXATION	DEAD LOAD DEFLECTION TABLE FOR GIRDERS (SPAN B-STAGE I)																																	
	GIRDER 1										GIRDERS 2 & 3										GIRDER 4													
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	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	.052	.098	.135	.158	.166	.158	.135	.098	.052	0	0	.052	.098	.135	.158	.166	.158	.135	.098	.052	0	0	.052	.098	.135	.158	.166	.158	.135	.098	.052	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.020	.037	.051	.059	.062	.059	.051	.037	.020	0	0	.021	.039	.054	.063	.066	.063	.054	.039	.021	0	0	.017	.031	.043	.050	.053	.050	.043	.031	.017	0
FINAL CAMBER	↑	0	3/8"	3/4"	1"	1 1/16"	1 1/4"	1 3/16"	1"	3/4"	3/8"	0	0	3/8"	1 1/16"	1"	1 1/8"	1 3/16"	1 1/8"	1"	1 1/16"	3/8"	0	0	7/16"	1 3/16"	1 1/8"	1 1/16"	1 3/8"	1 1/16"	1 1/8"	1 3/16"	7/16"	0

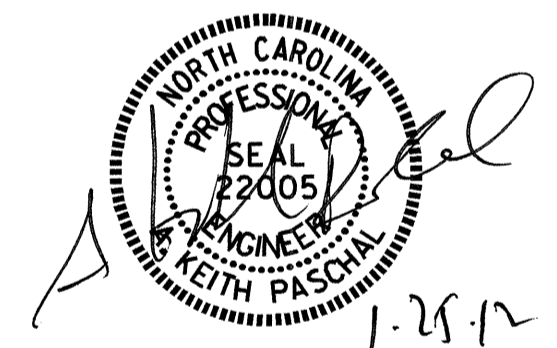
0.6" Ø LOW RELAXATION	DEAD LOAD DEFLECTION TABLE FOR GIRDERS (SPAN B-STAGE-II)																																	
	GIRDER 5										GIRDER 6										GIRDER 7													
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER ( GIRDER ALONE IN PLACE )	↑	0	.052	.098	.135	.158	.166	.158	.135	.098	.052	0	0	.052	.098	.135	.158	.166	.158	.135	.098	.052	0	0	.052	.098	.135	.158	.166	.158	.135	.098	.052	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	.019	.036	.049	.057	.060	.057	.049	.036	.019	0	0	.022	.042	.058	.068	.071	.068	.058	.042	.022	0	0	.021	.039	.053	.063	.066	.063	.053	.039	.021	0
FINAL CAMBER	↑	0	3/8"	3/4"	1 1/16"	1 3/16"	1 1/4"	1 3/16"	1 1/16"	3/4"	3/8"	0	0	3/8"	1 1/16"	1 5/16"	1 1/16"	1 1/8"	1 1/16"	1 5/16"	1 1/16"	3/8"	0	0	3/8"	1 1/16"	1"	1 1/8"	1 3/16"	1 1/8"	1"	1 1/16"	3/8"	0

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

ASSEMBLED BY : J. G. KHARVA DATE : 03-08-11  
CHECKED BY : J. D. HAWK DATE : 10-10-11  
DRAWN BY : ELR 11/91  
CHECKED BY : GRP 11/91

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

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PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00-L-  
SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-16	
STANDARD PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS						TOTAL SHEETS 45	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

STD. NO. PCC11

**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.

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

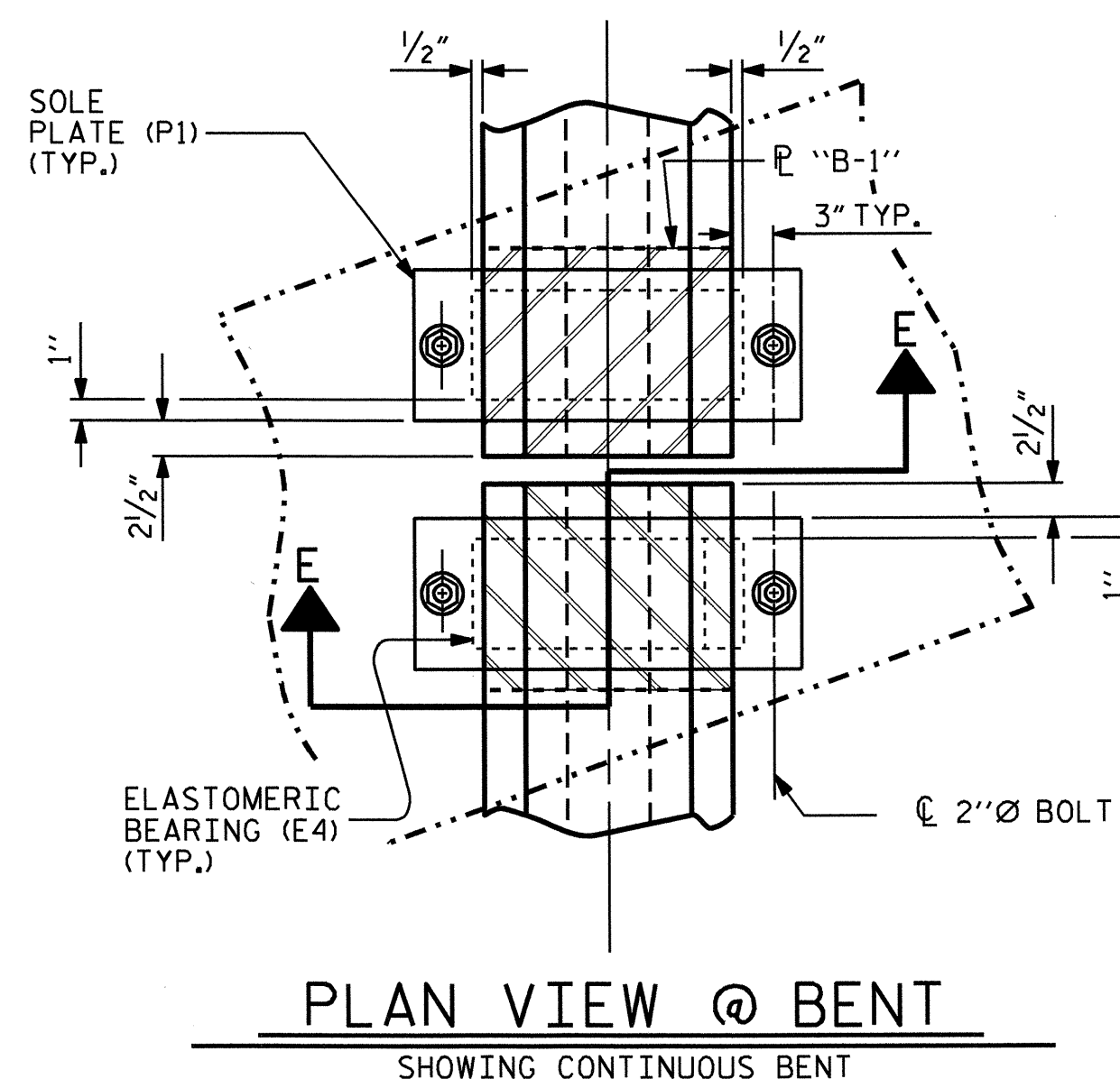
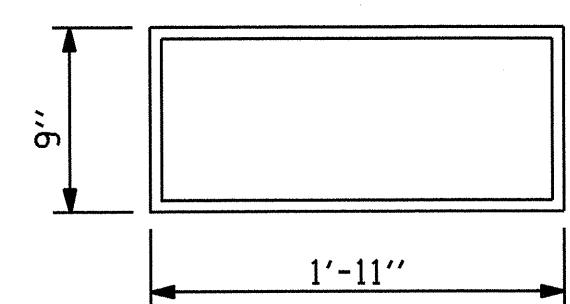
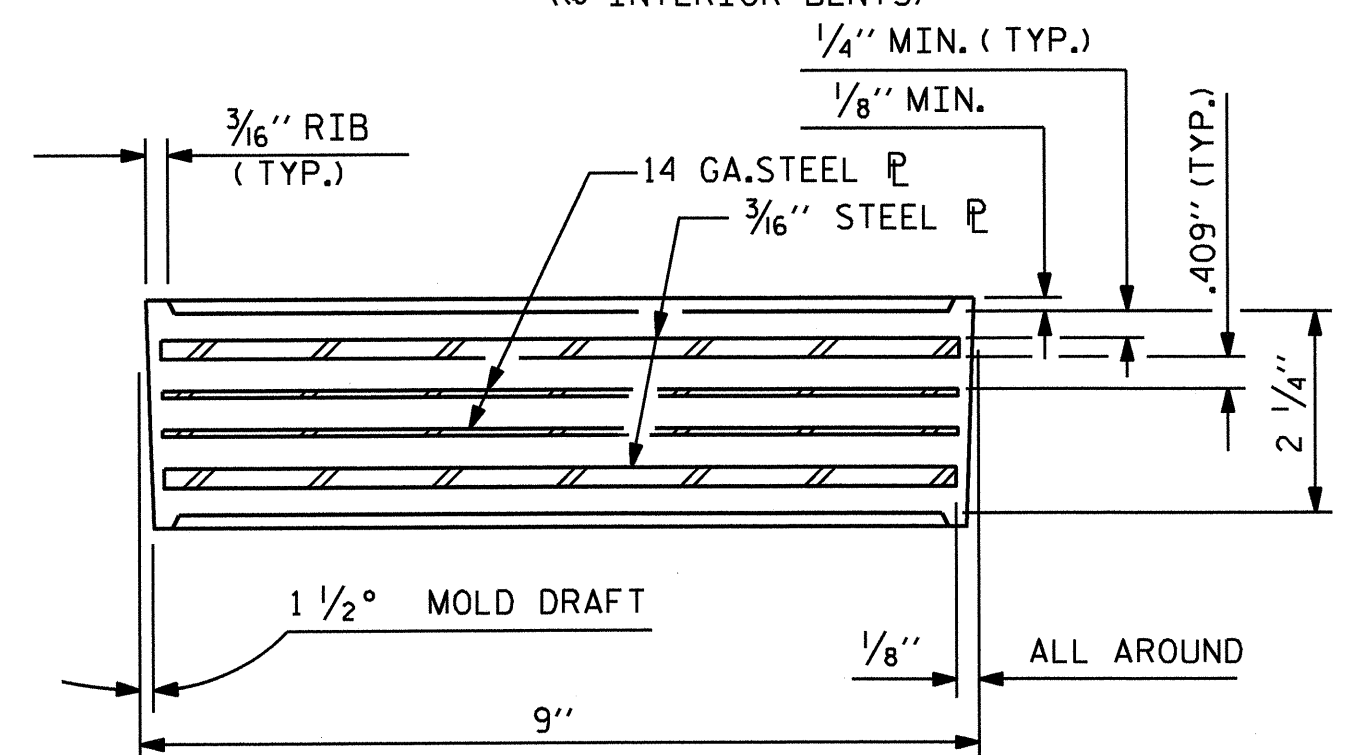
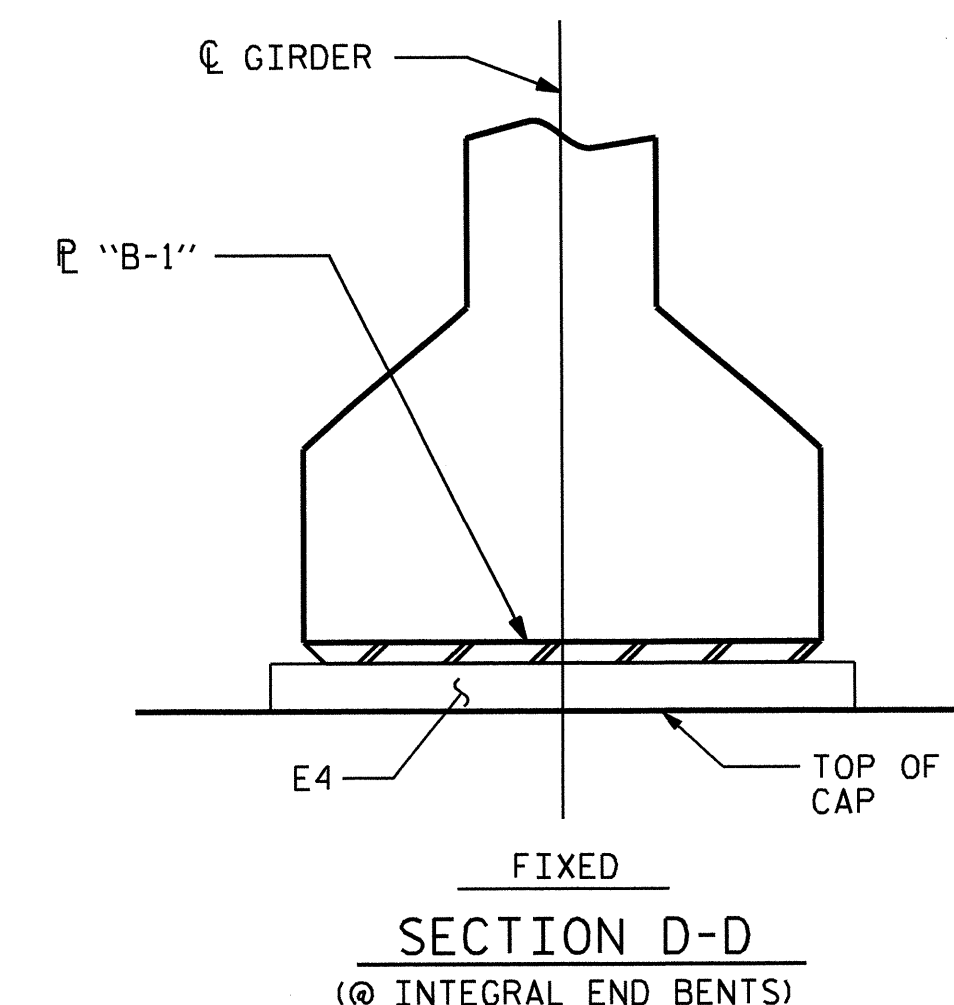
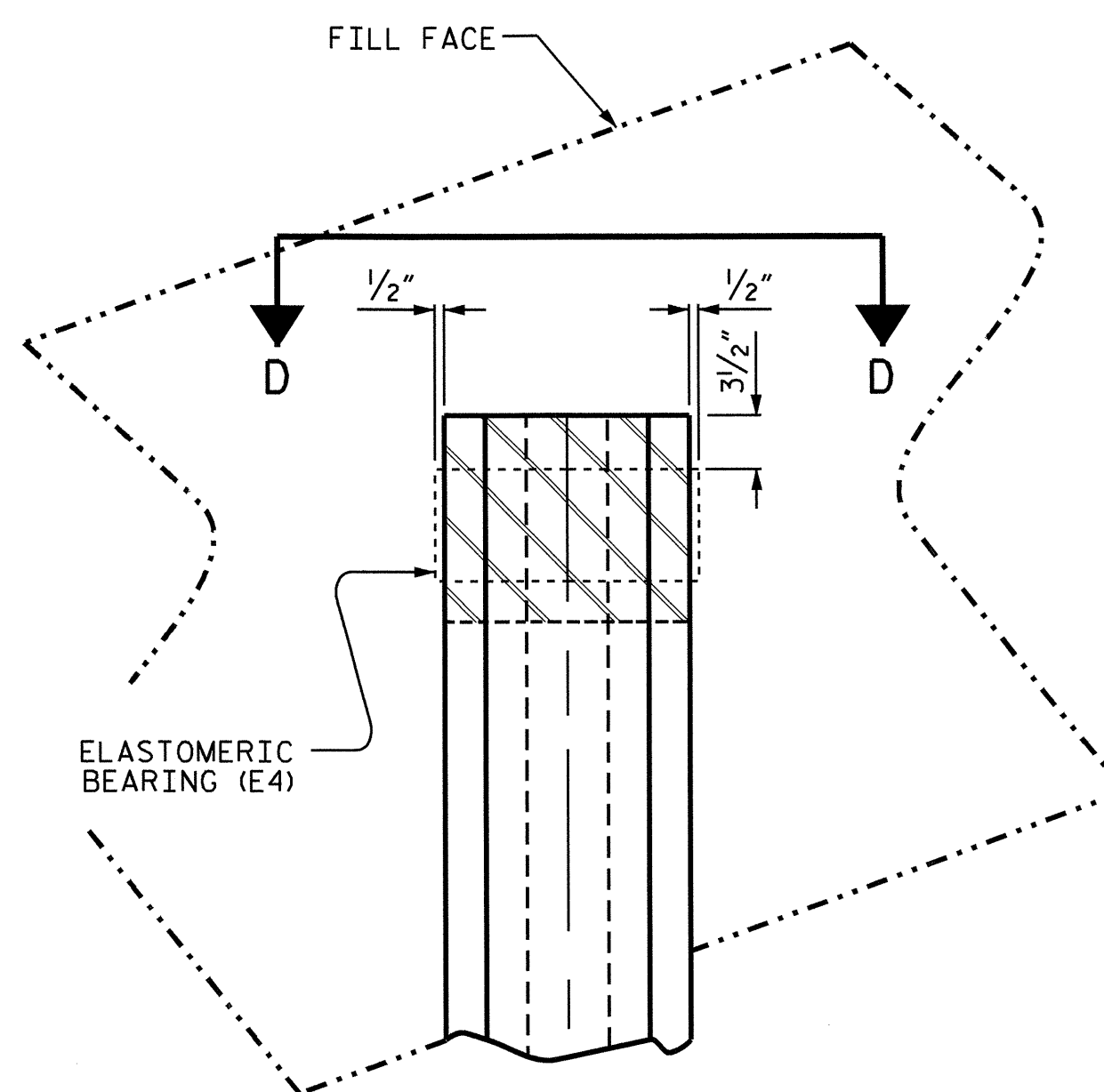
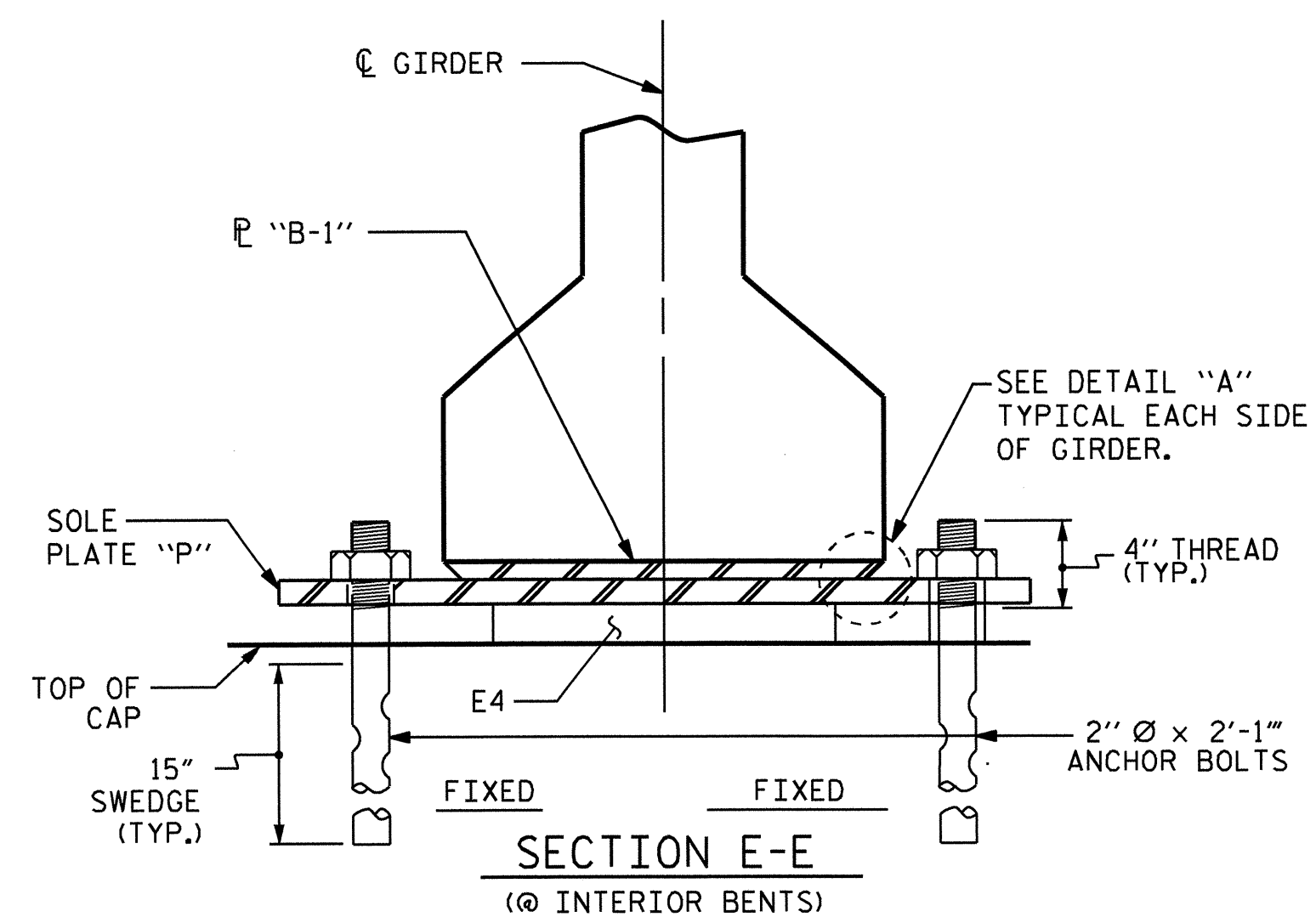
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

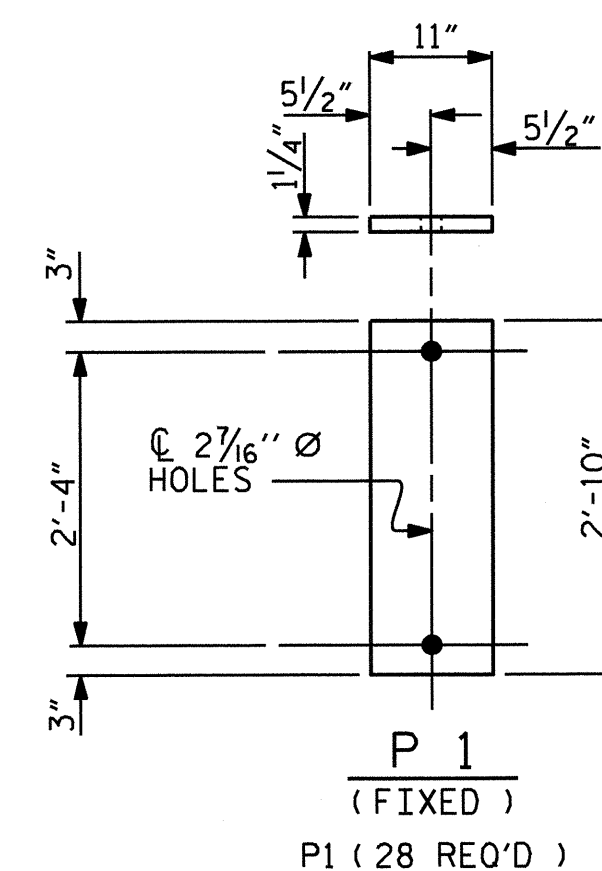
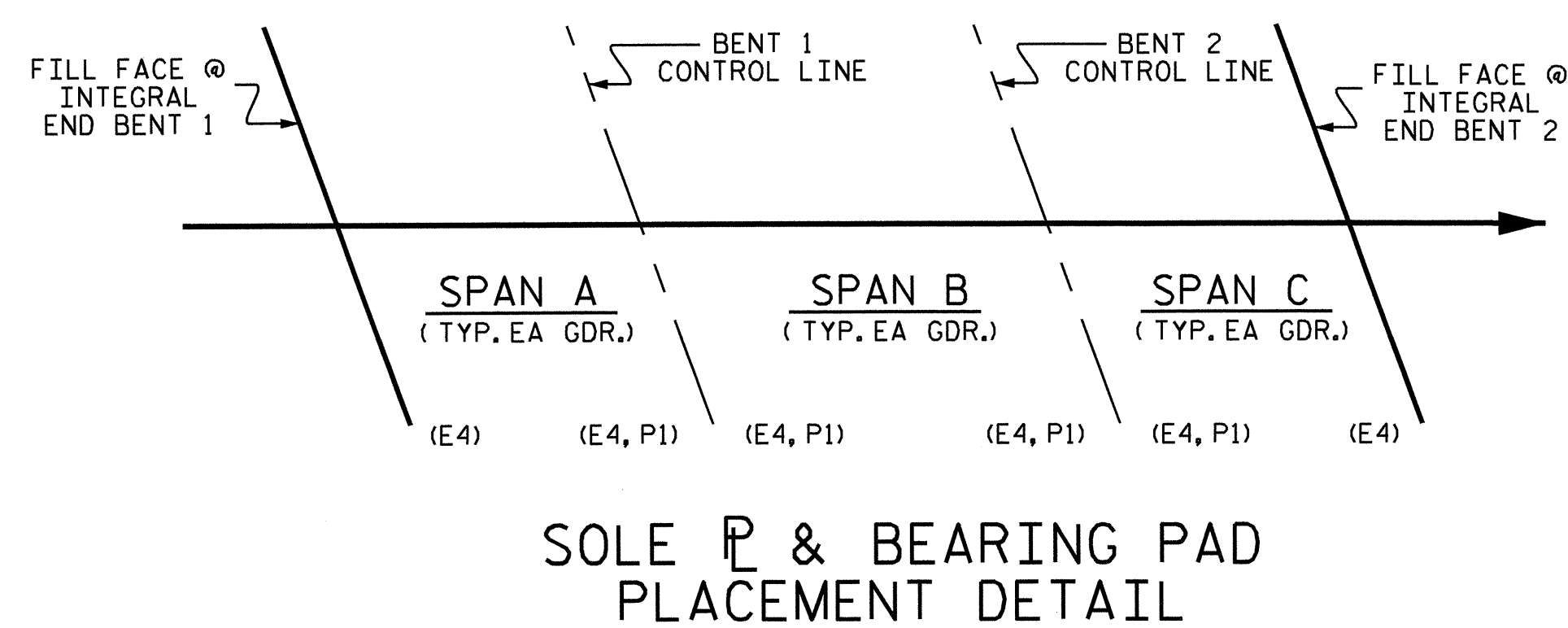
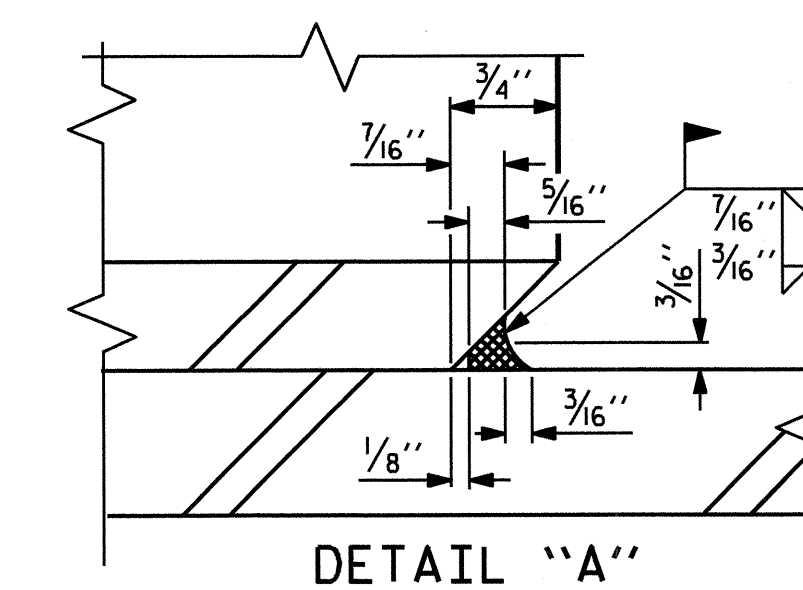
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

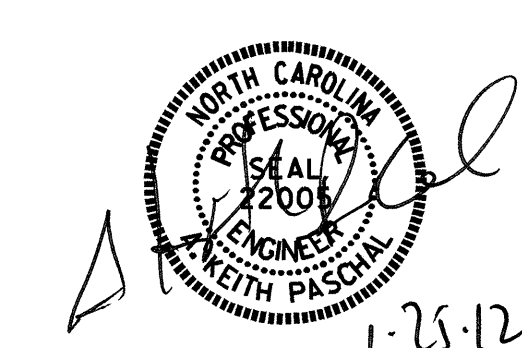


— LOAD RATINGS —	
	MAX. D.L. + L.L.
TYPE V	180 K



PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

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



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

ASSEMBLED BY : B. N. BARODAWAL DATE : 03-18-11  
CHECKED BY : J. D. HAWK DATE : 09-15-11  
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 STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

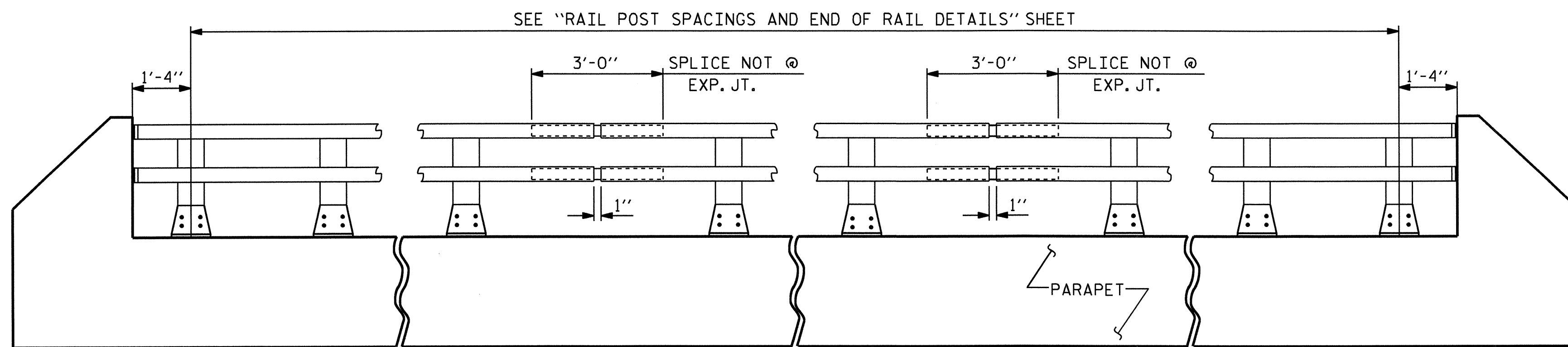
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

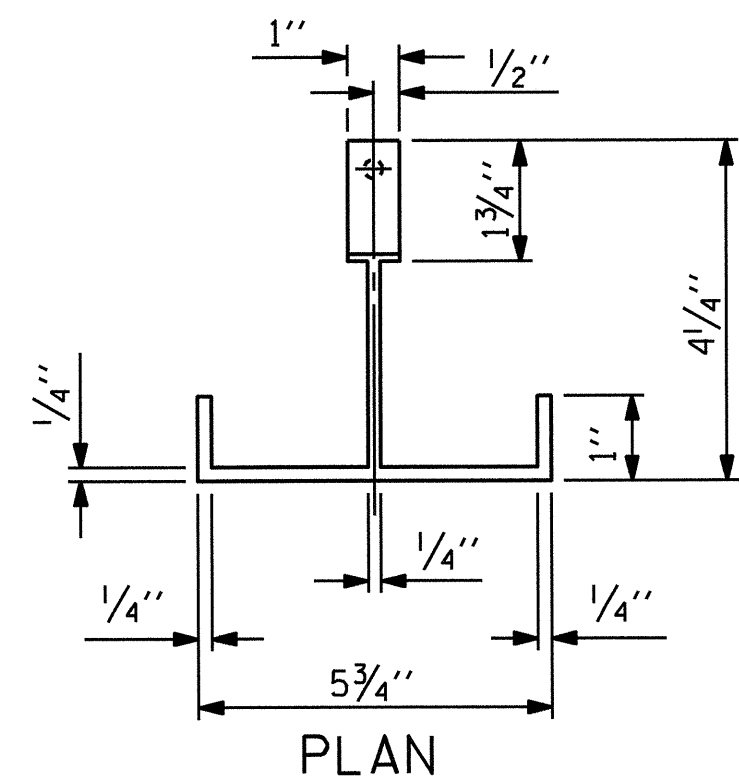
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR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

PAY LENGTH = 170.60 LIN. FT.

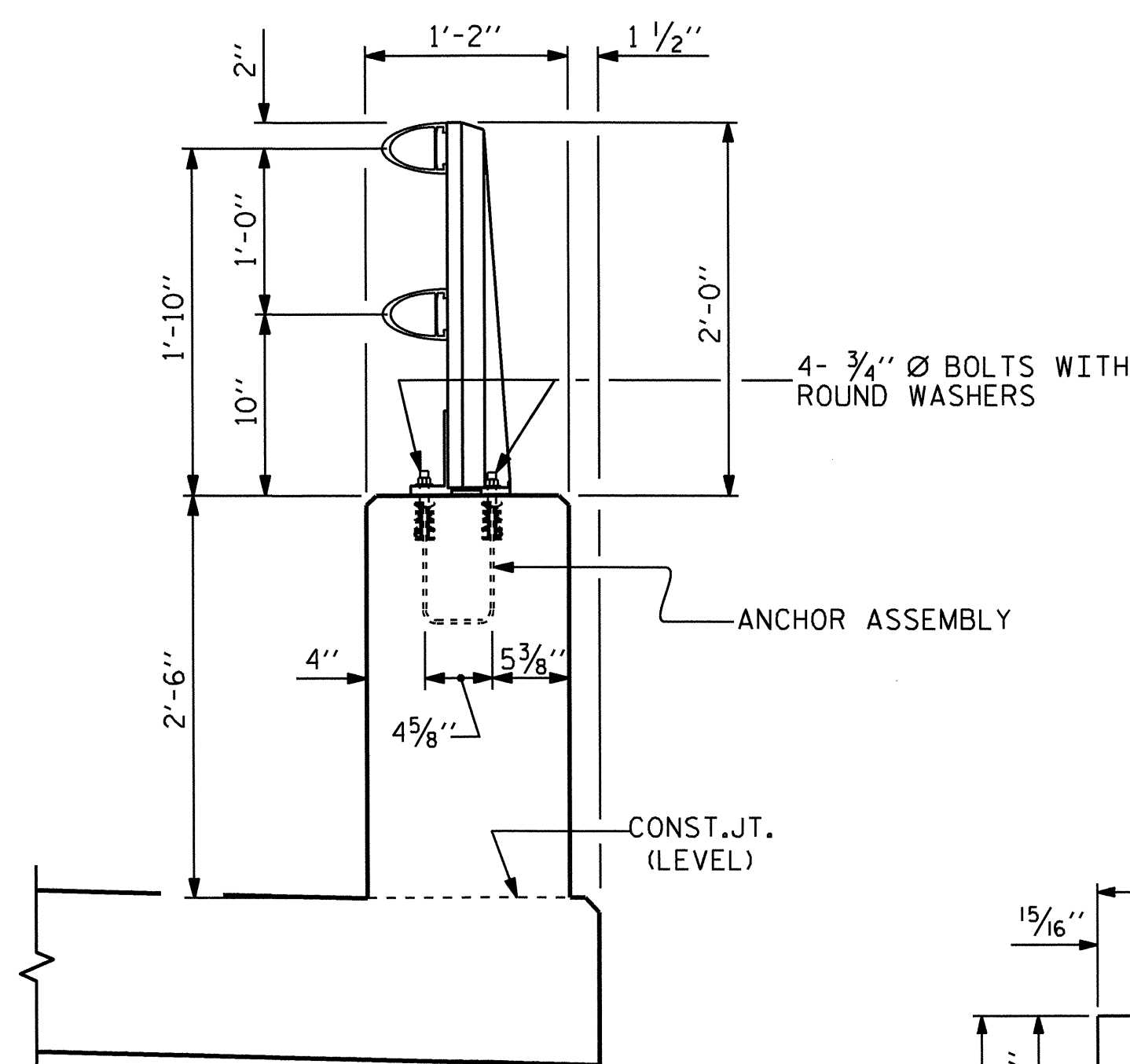


**ELEVATION**

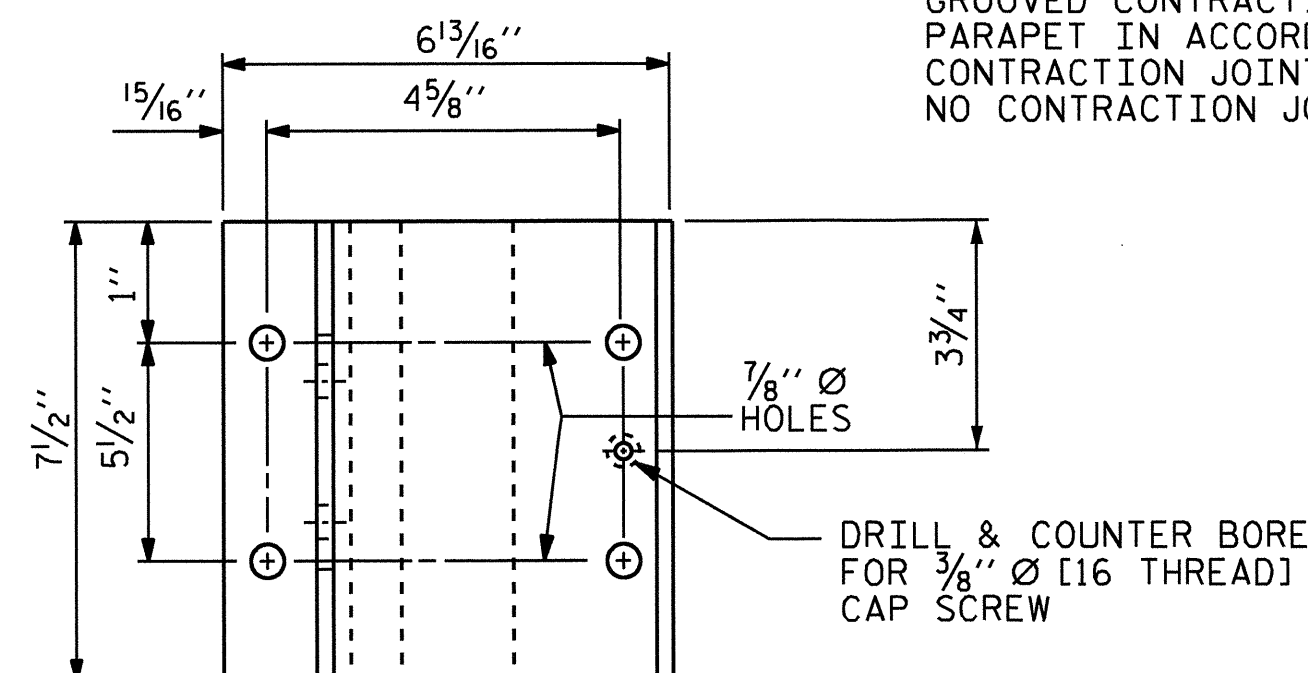
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



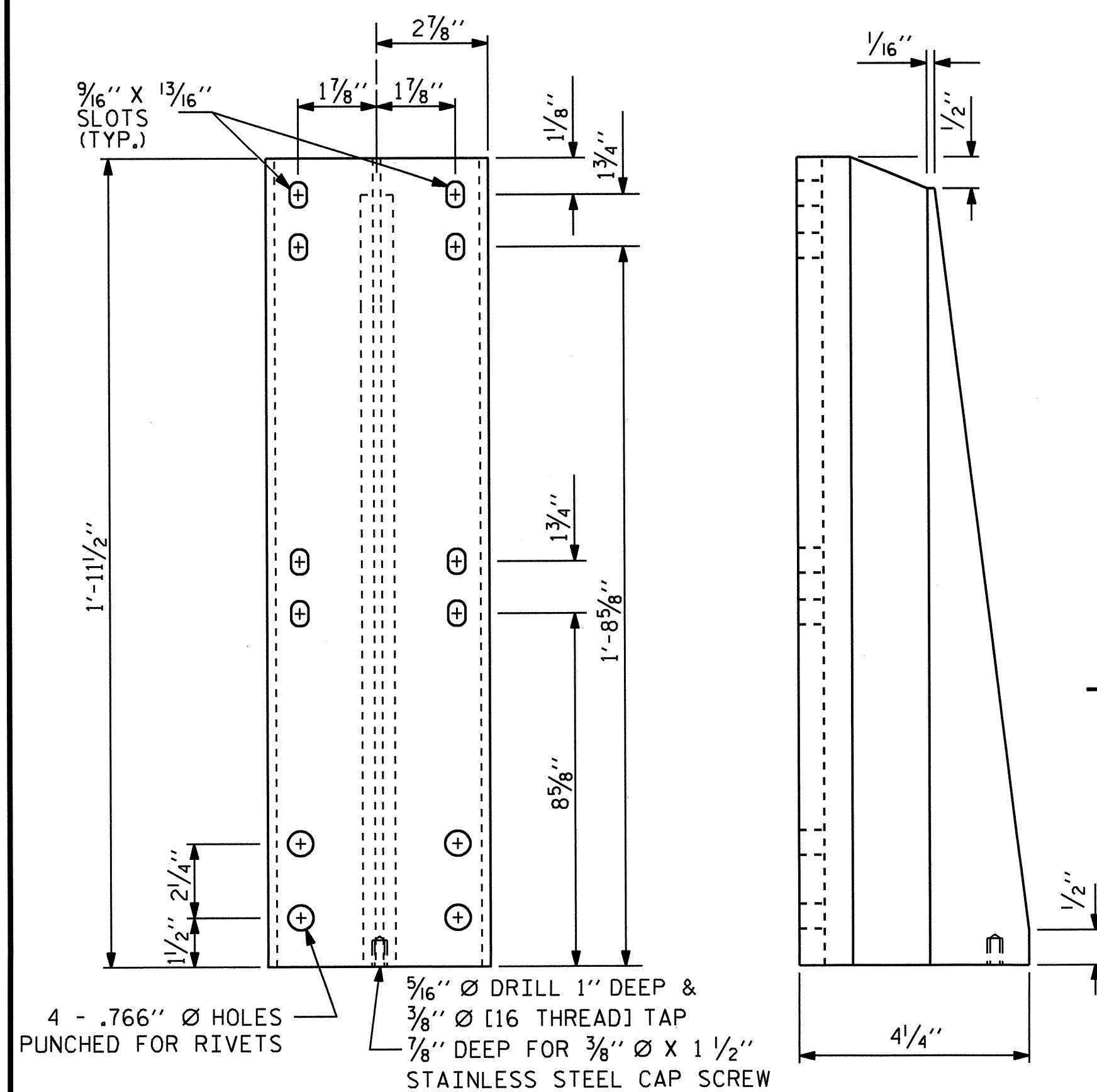
**PLAN**



**SECTION THRU PARAPET AND RAIL**



**PLAN**



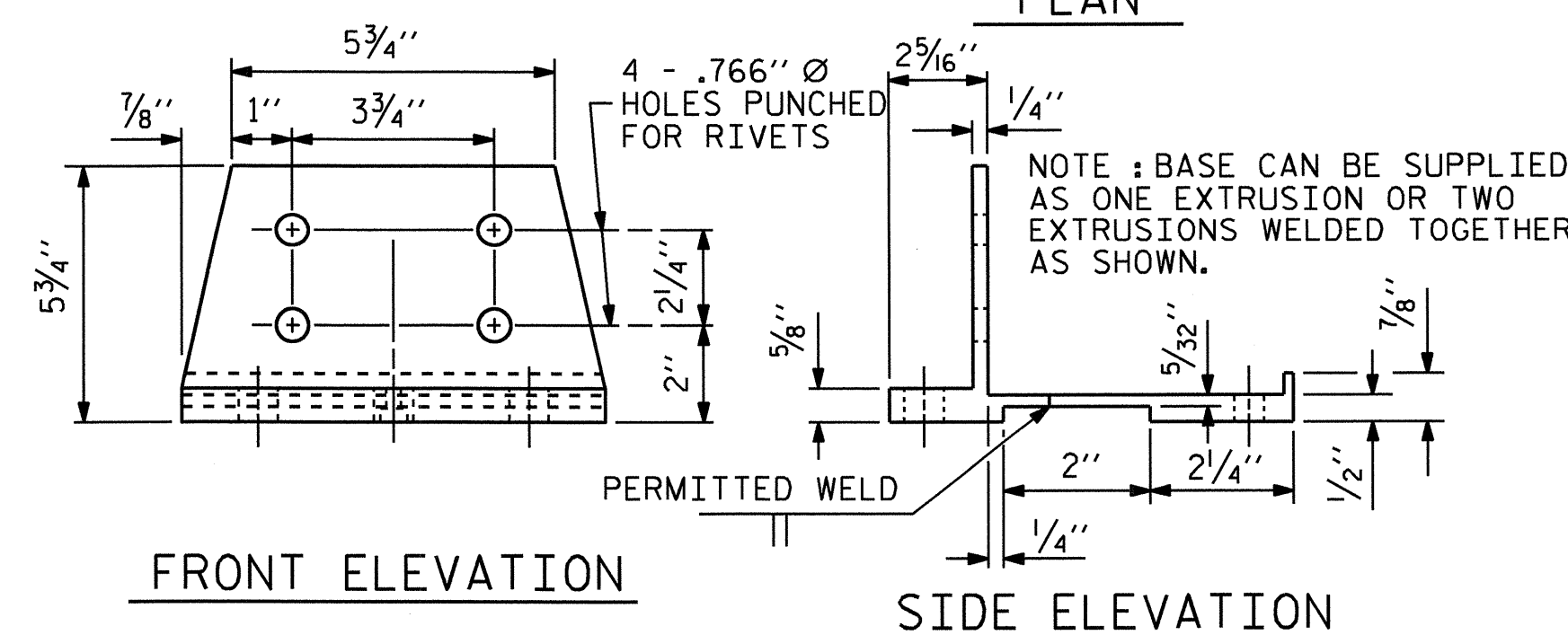
**FRONT ELEVATION**

**SIDE ELEVATION**

**DETAILS OF POST**

ASSEMBLED BY: B. N. BARODAWAL DATE: 2-10-11  
 CHECKED BY: J. D. HAWK DATE: 9-15-11  
 DRAWN BY: EEM 6/94  
 CHECKED BY: RGW 6/94

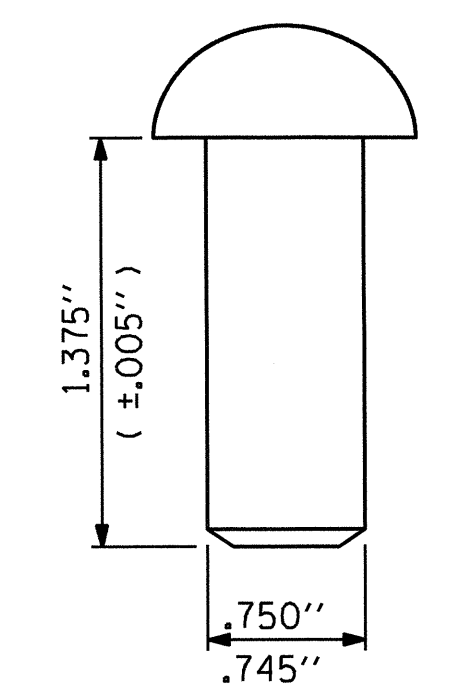
REV. 5/7/03R RWW/JTE  
 REV. 5/1/06 TLA/GM  
 REV. 10/1/11 MAA/GM



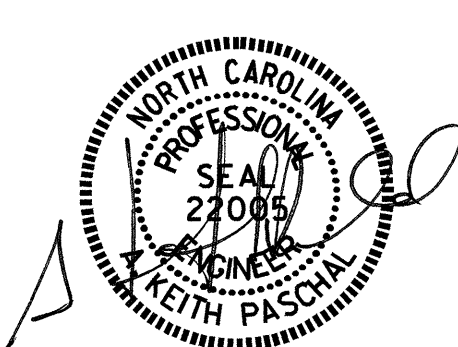
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**RIVET DETAIL**



PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-18
STANDARD						TOTAL SHEETS 45
2 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. BMR3

NOTES

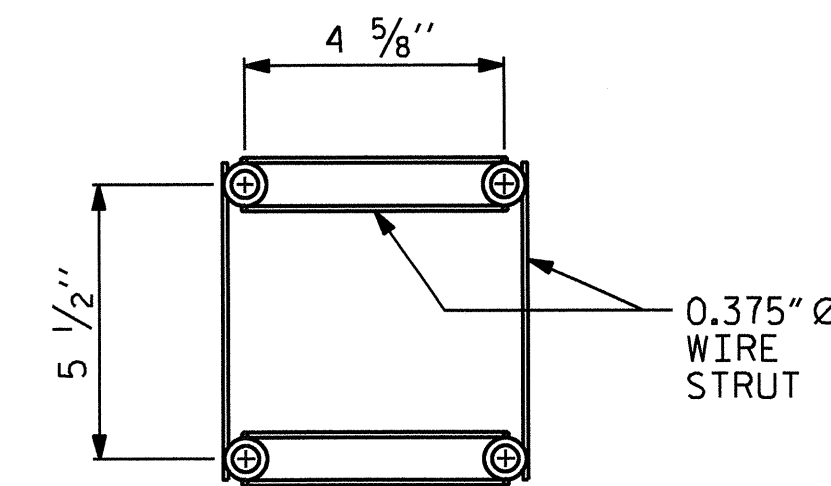
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

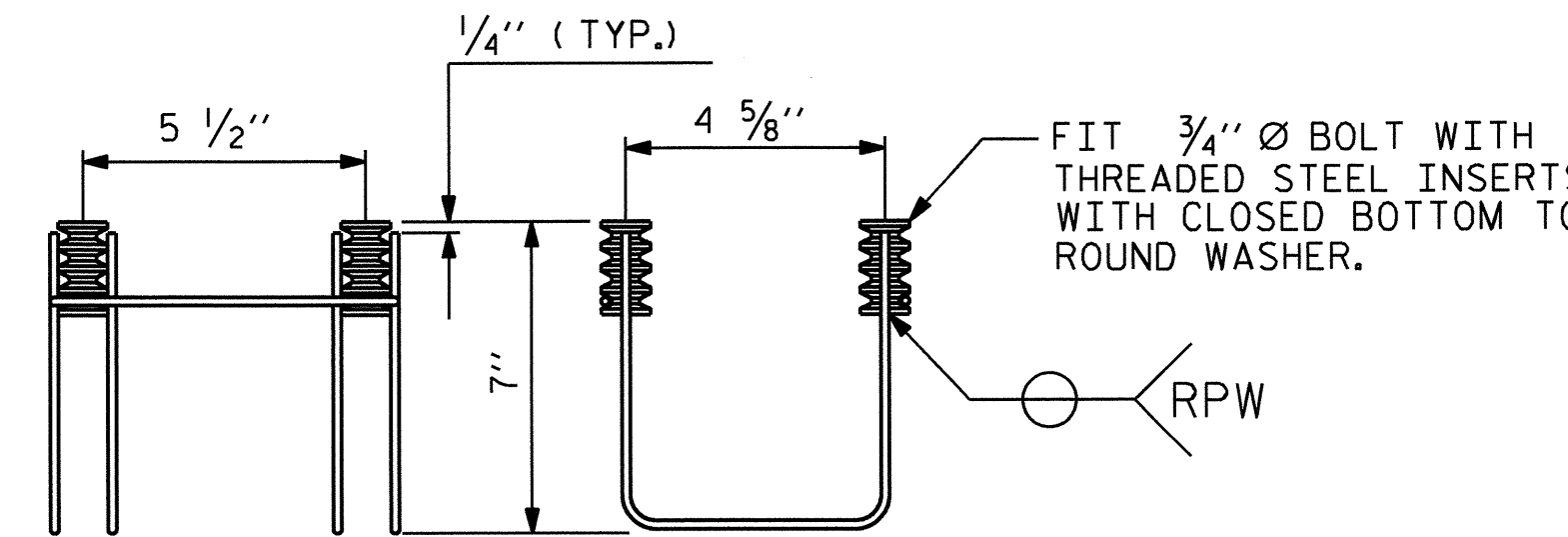
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

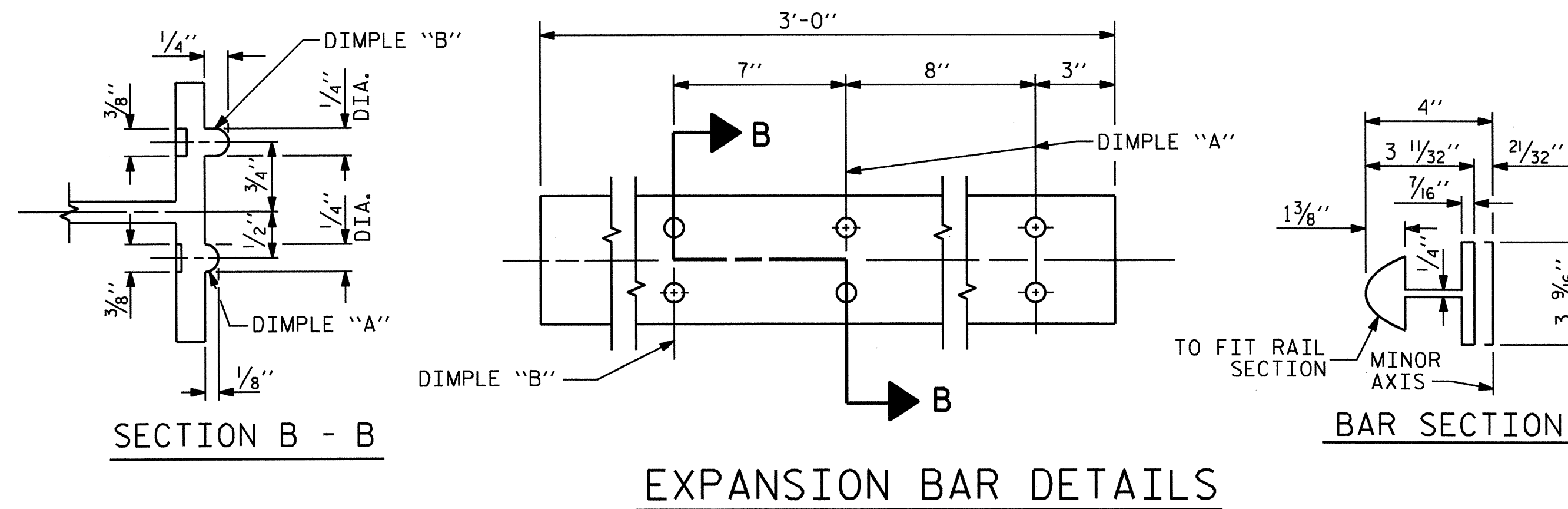


SIDE VIEW

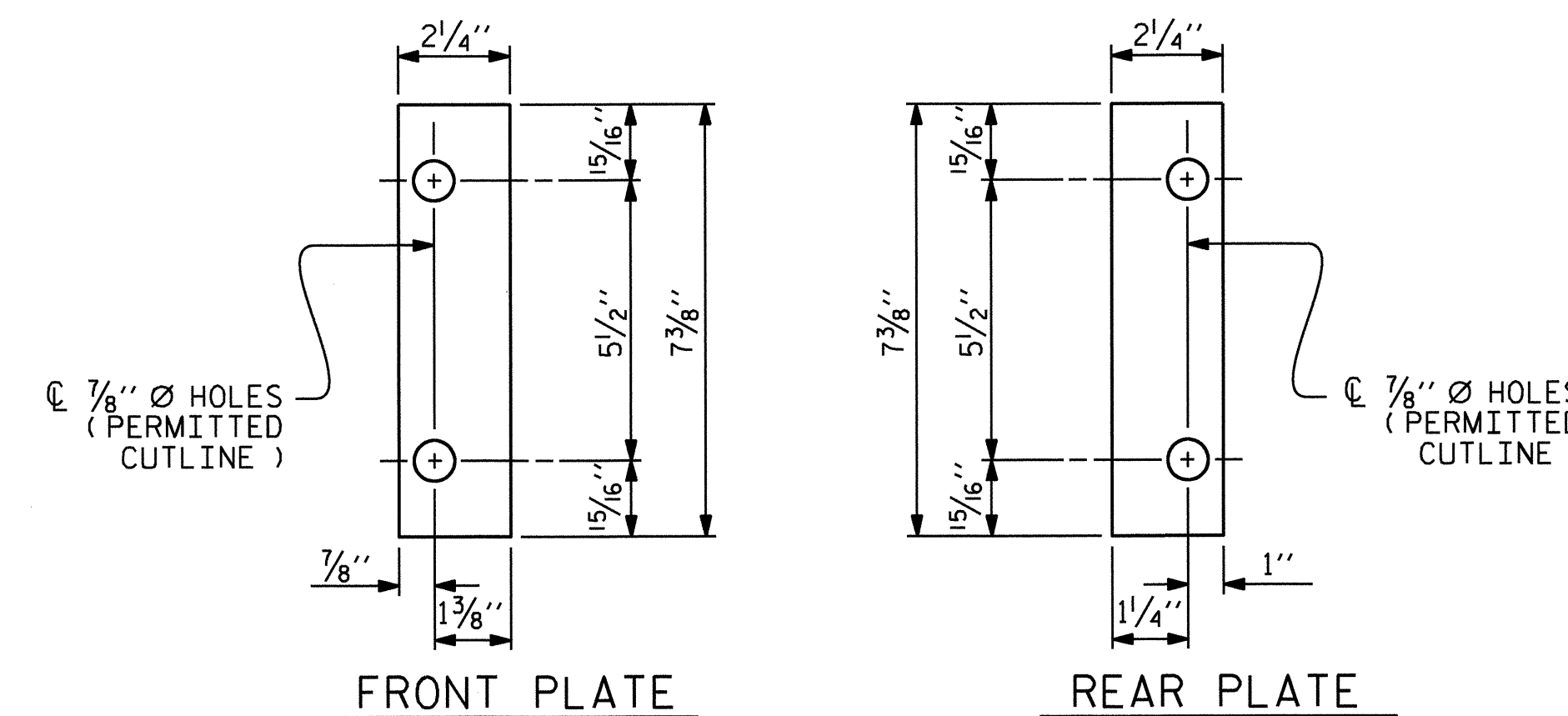
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

( 29 ASSEMBLIES REQUIRED )



EXPANSION BAR DETAILS

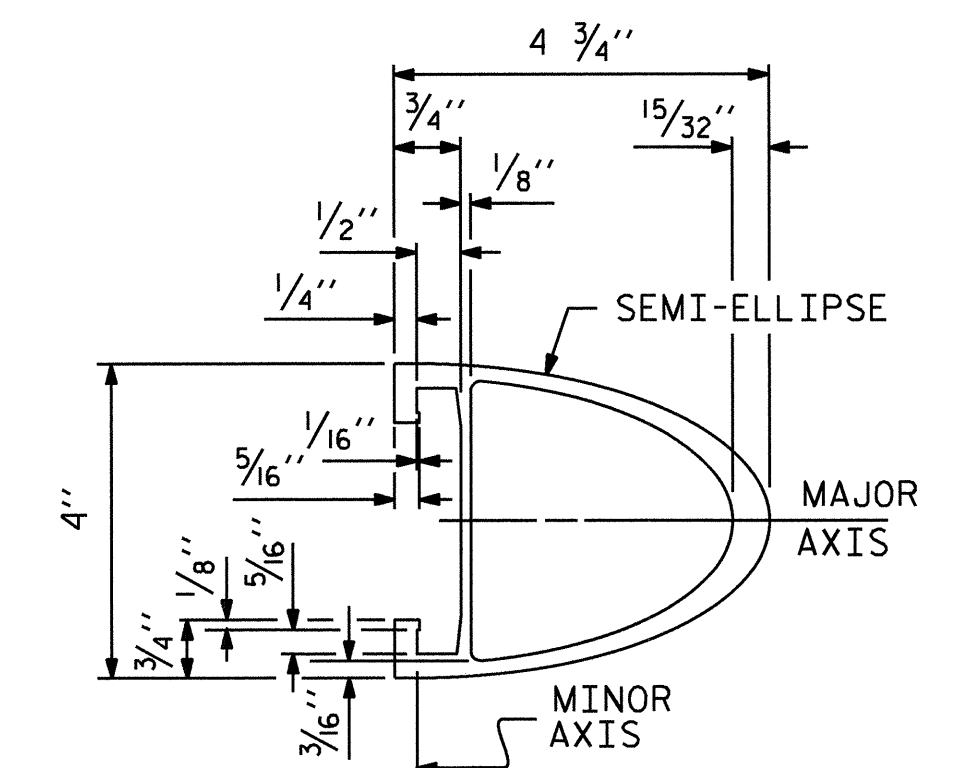


FRONT PLATE

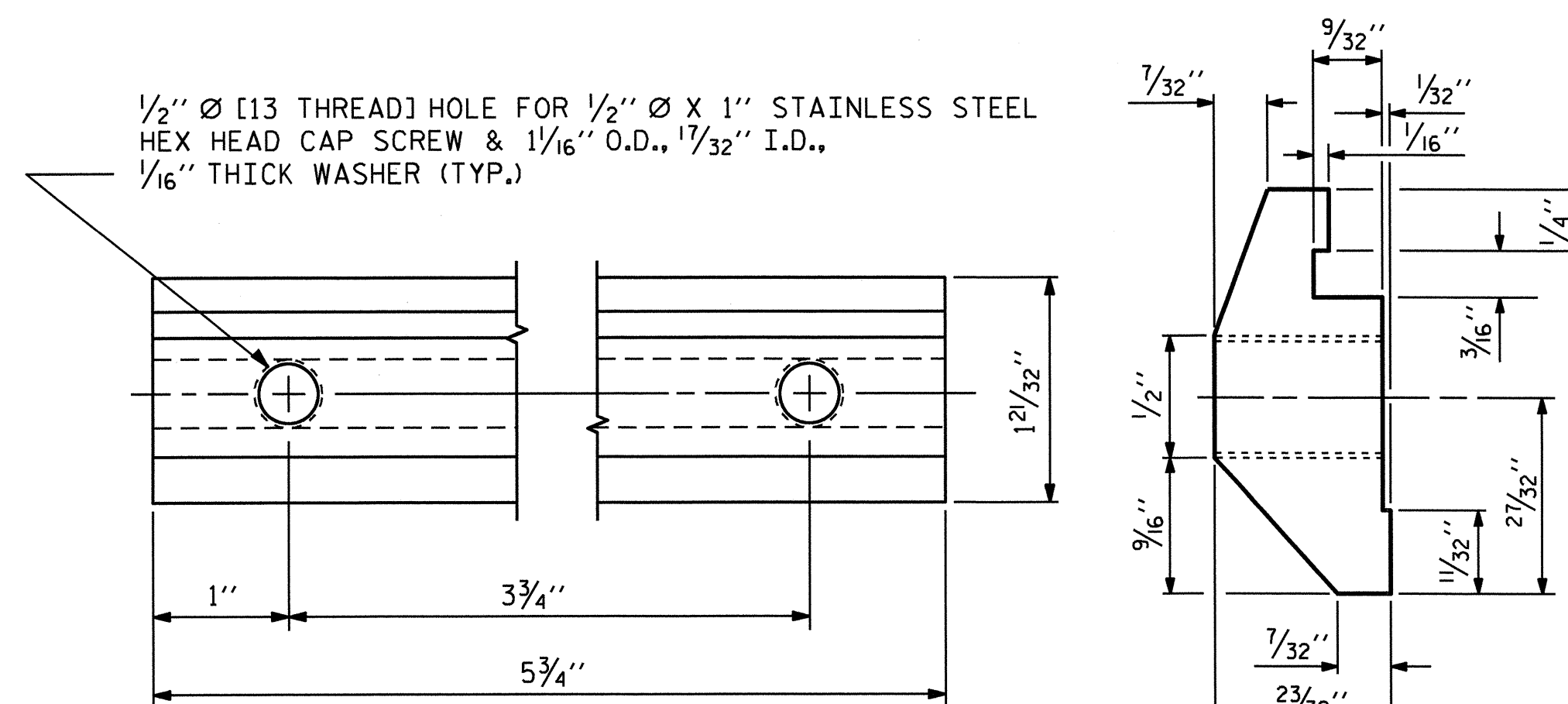
REAR PLATE

SHIM DETAILS

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

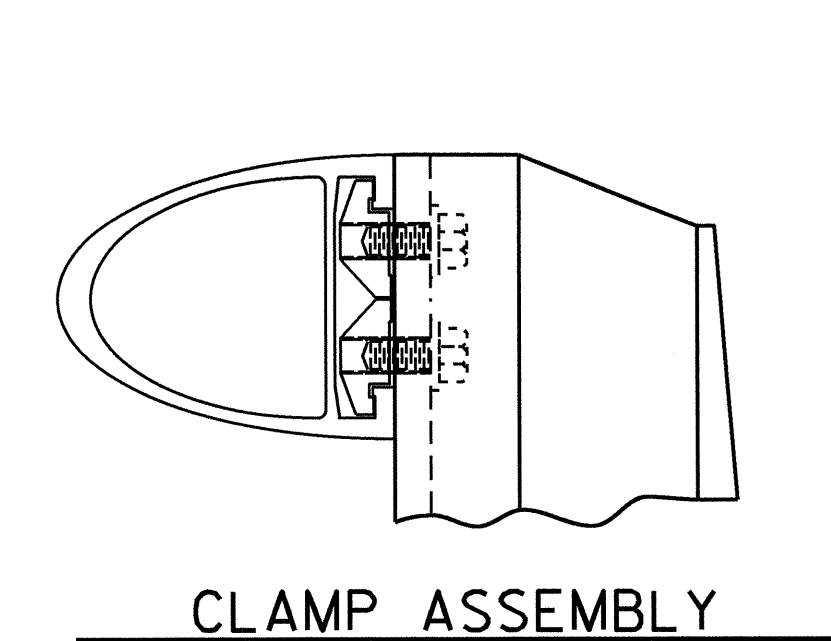


RAIL SECTION

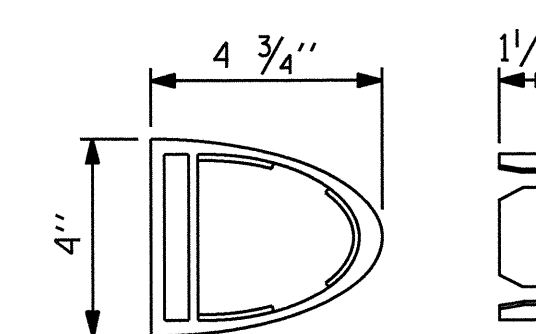


CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

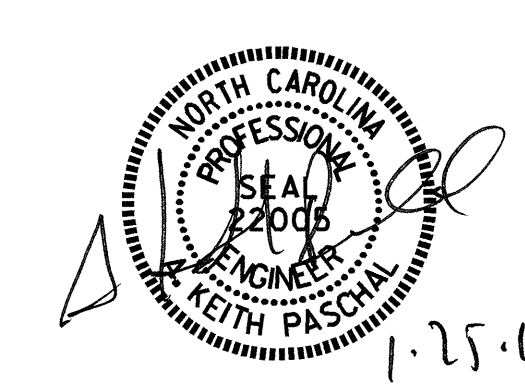


RAIL CAP

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-19
STANDARD						TOTAL SHEETS 45
2 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



ASSEMBLED BY : B. N. BARODAWAL DATE : 2-10-11  
 CHECKED BY : J. D. HAWK DATE : 9-15-11  
 DRAWN BY : EEM 6/94  
 CHECKED BY : RGW 6/94

REV. 8/16/99 MAB/LES  
 REV. 5/1/06R KMM/GM  
 REV. 10/1/11 MAA/GM



NOTES

STRUCTURAL CONCRETE INSERT

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

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

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

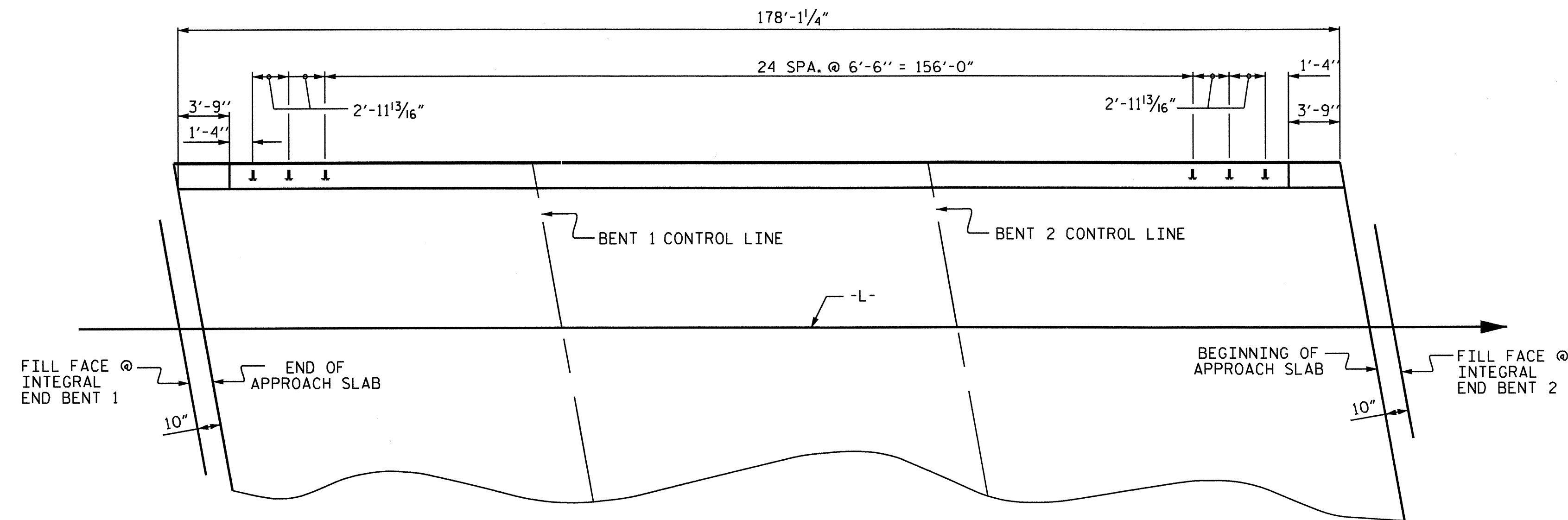
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE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

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

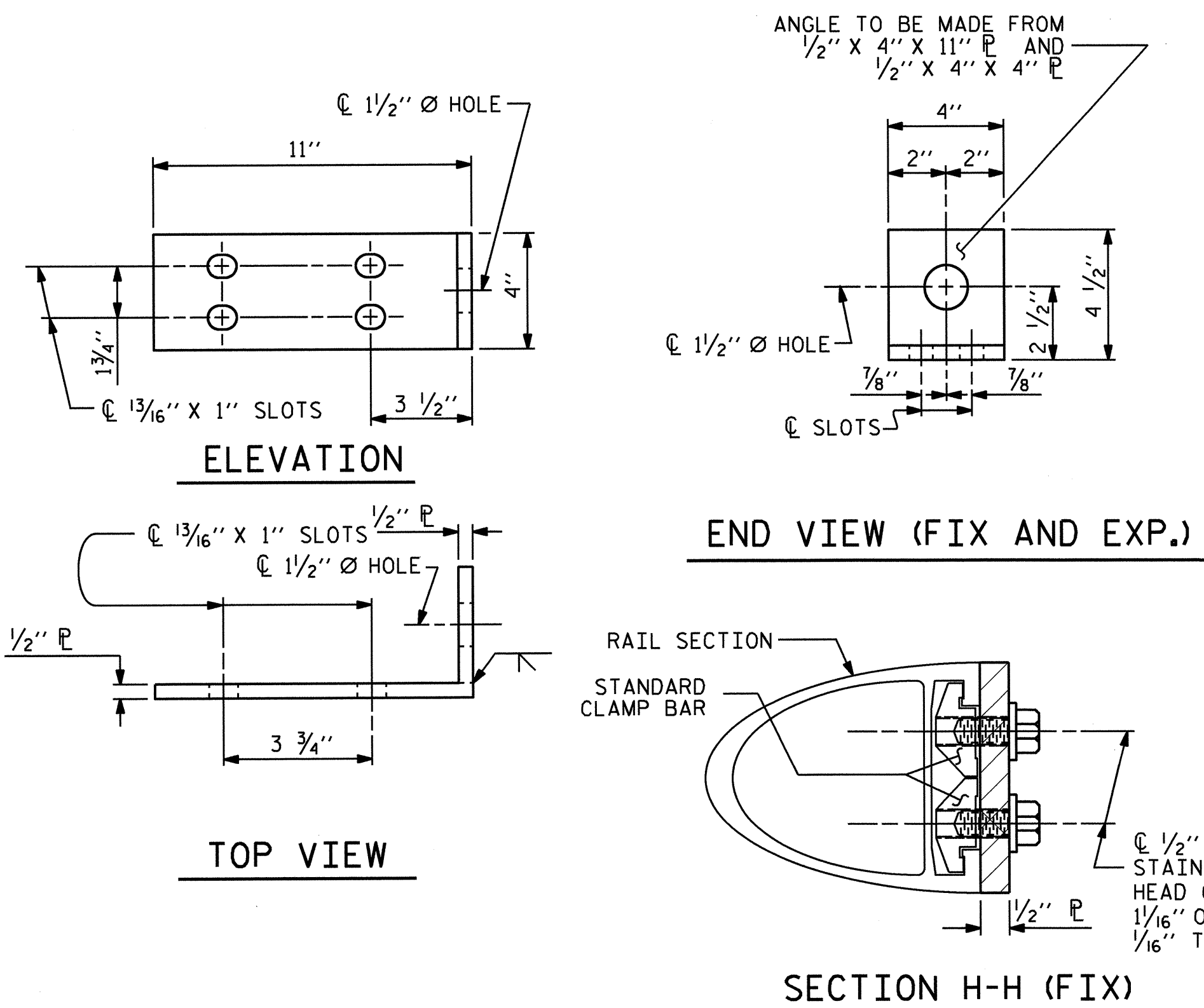
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

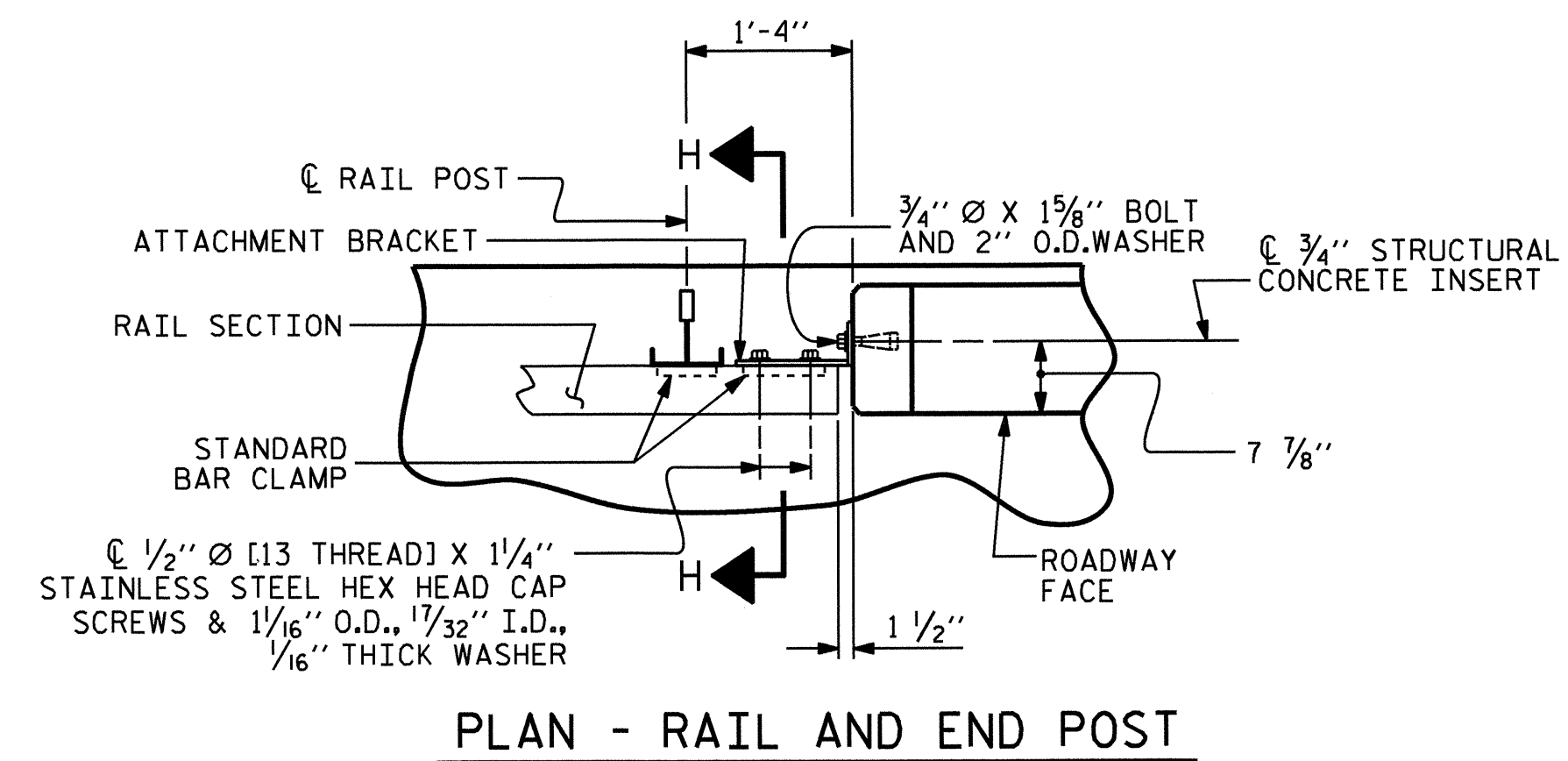
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



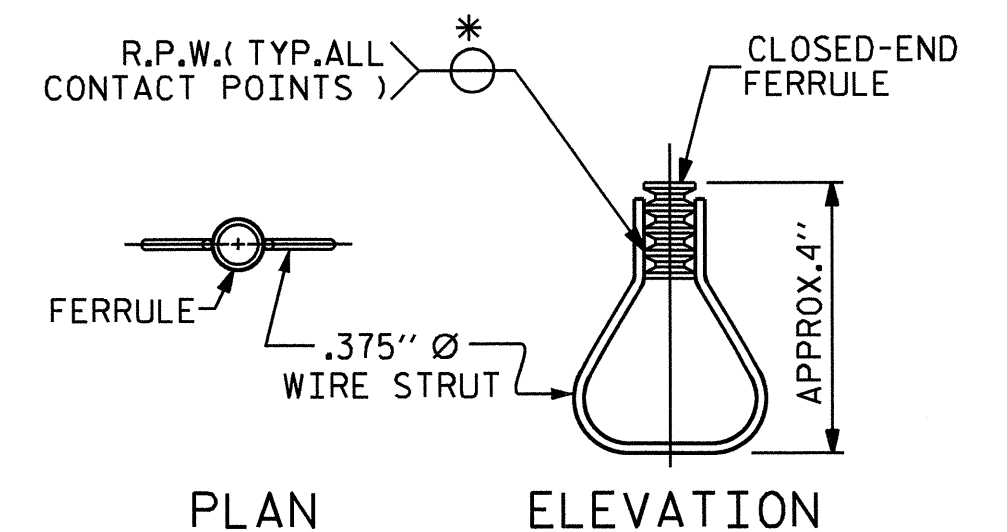
PLAN OF RAIL POST SPACINGS



DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST



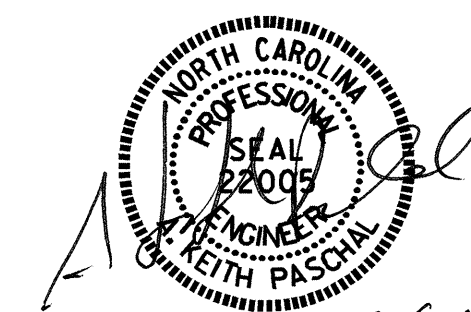
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-3480  
 JACKSON COUNTY  
 STATION: 17+96.00 -L-

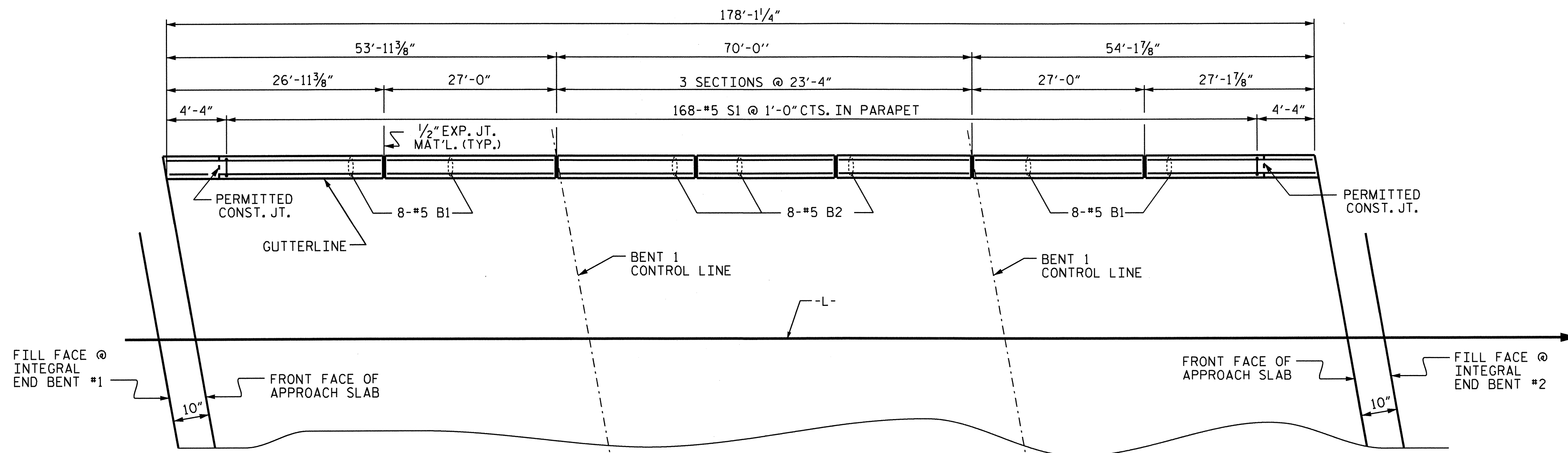
SHEET 3 OF 4

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



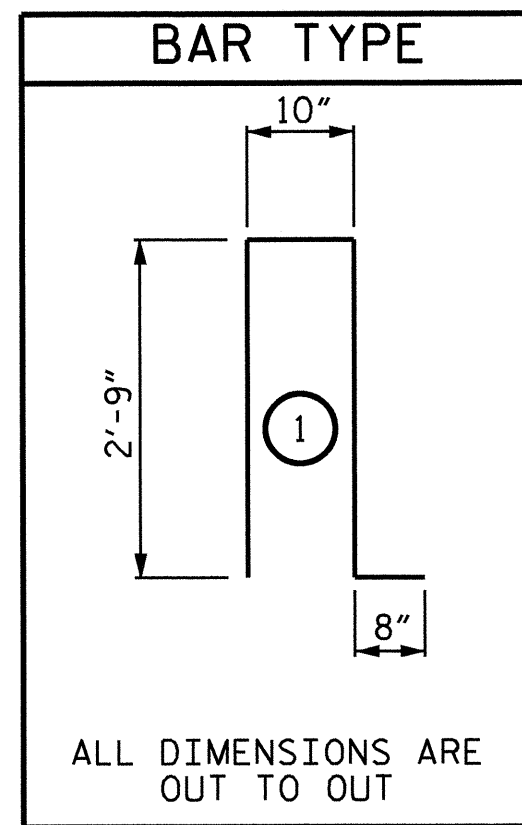
ASSEMBLED BY : B. N. BARODAWAL	DATE : 2-10-11
CHECKED BY : J. D. HAWK	DATE : 9-15-11
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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



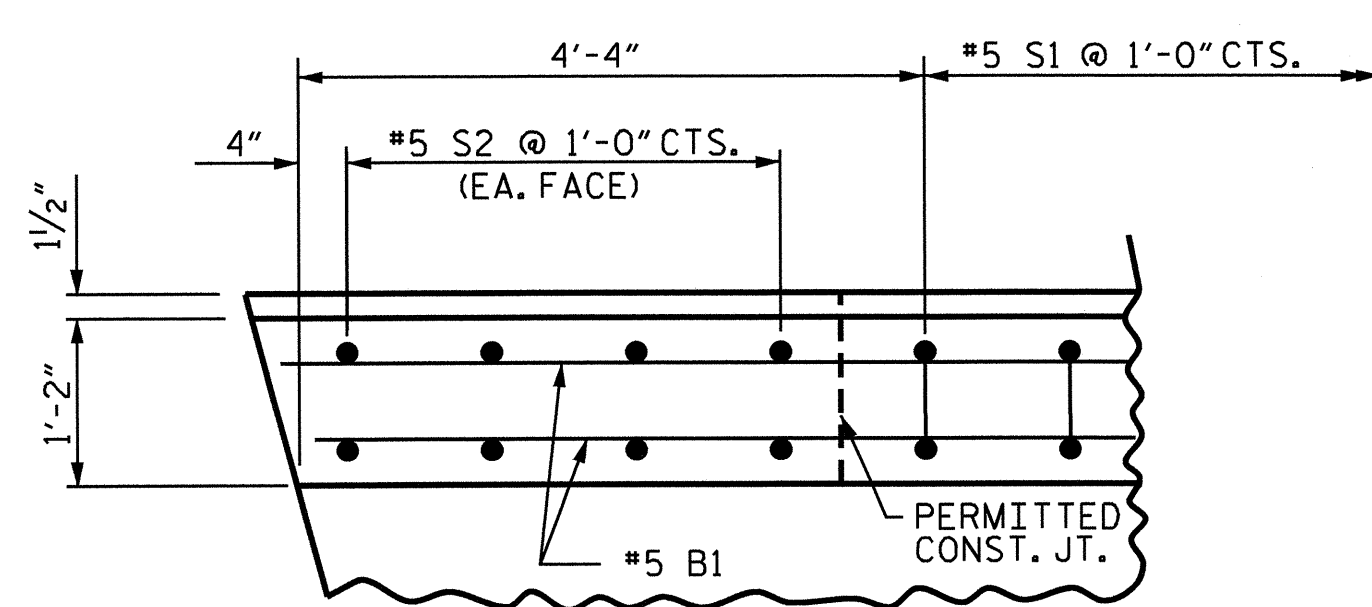
PLAN OF PARAPET

BILL OF MATERIAL FOR PARAPET AND TWO END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	32	#5	STR	26'-7"	887
* B2	24	#5	STR	22'-11"	574
* S1	168	#5	1	7'-0"	1227
* S2	16	#5	STR	3'-0"	50
* E1	4	#7	STR	2'-7"	21
* E2	4	#7	STR	3'-1"	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	2'-0"	12
* F2	2	#6	STR	3'-5"	10
* F3	2	#6	STR	4'-4"	13
* F4	2	#6	STR	4'-1"	12
* F5	2	#6	STR	3'-8"	11
* EPOXY COATED REINFORCING STEEL 2939 LBS.					
CLASS AA CONCRETE				18.8 CU. YDS.	
CONCRETE PARAPET				178.10 LIN. FT.	

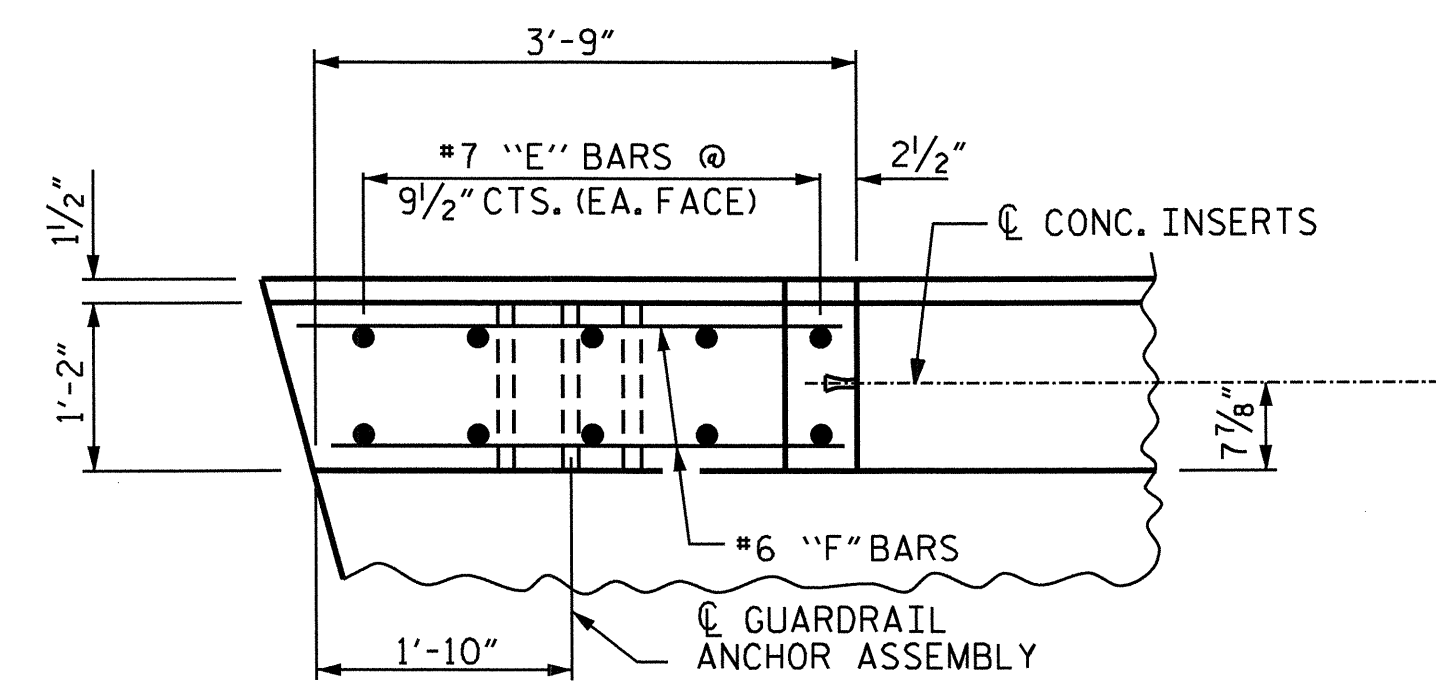


ALL DIMENSIONS ARE OUT TO OUT

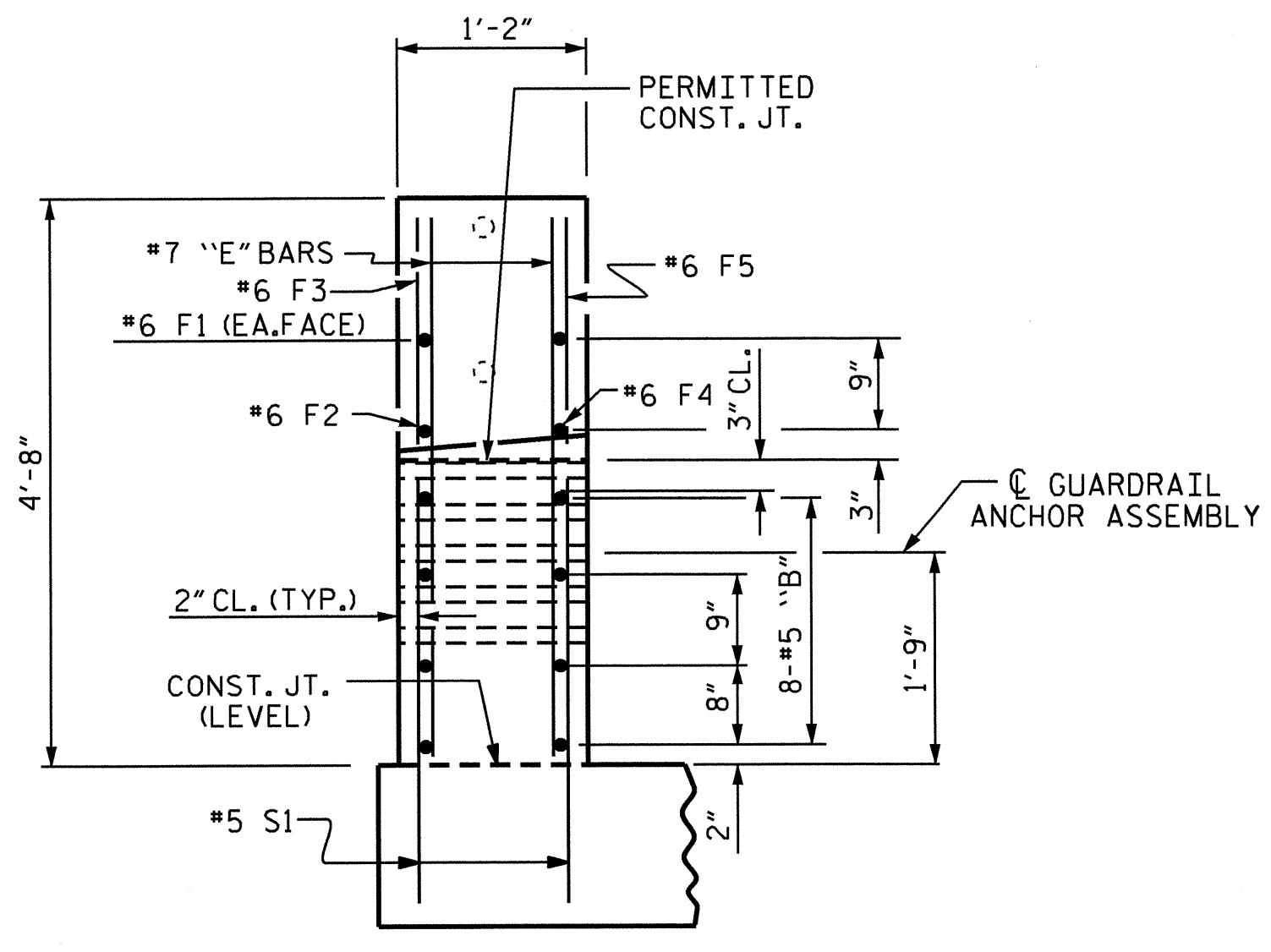
**NOTES:**  
 ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.  
 FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE 'RAIL POST SPACINGS AND END OF RAIL DETAILS' SHEETS 2 OF 4 AND 3 OF 4.  
 GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED 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 FT. IN LENGTH.



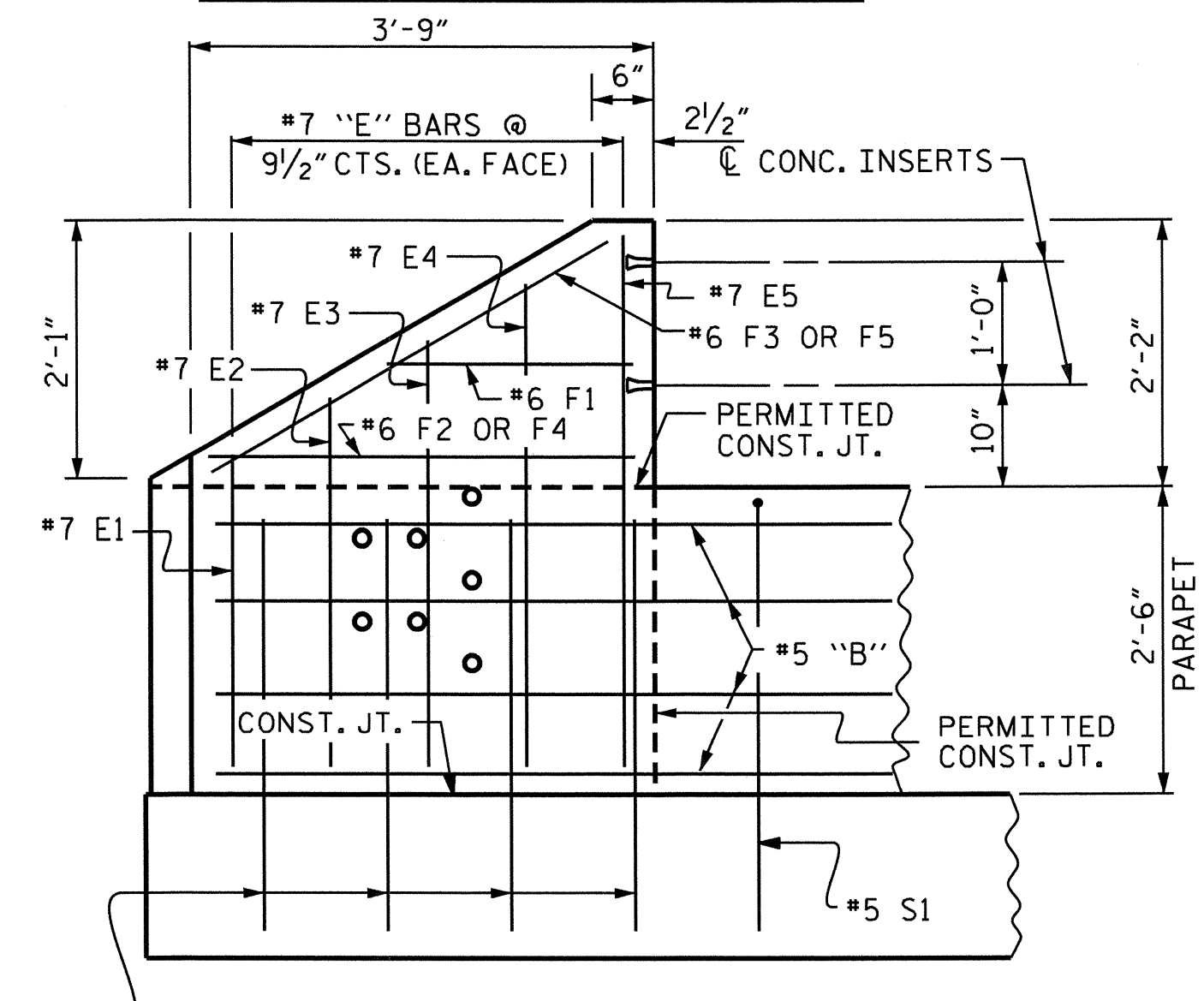
PLAN OF PARAPET



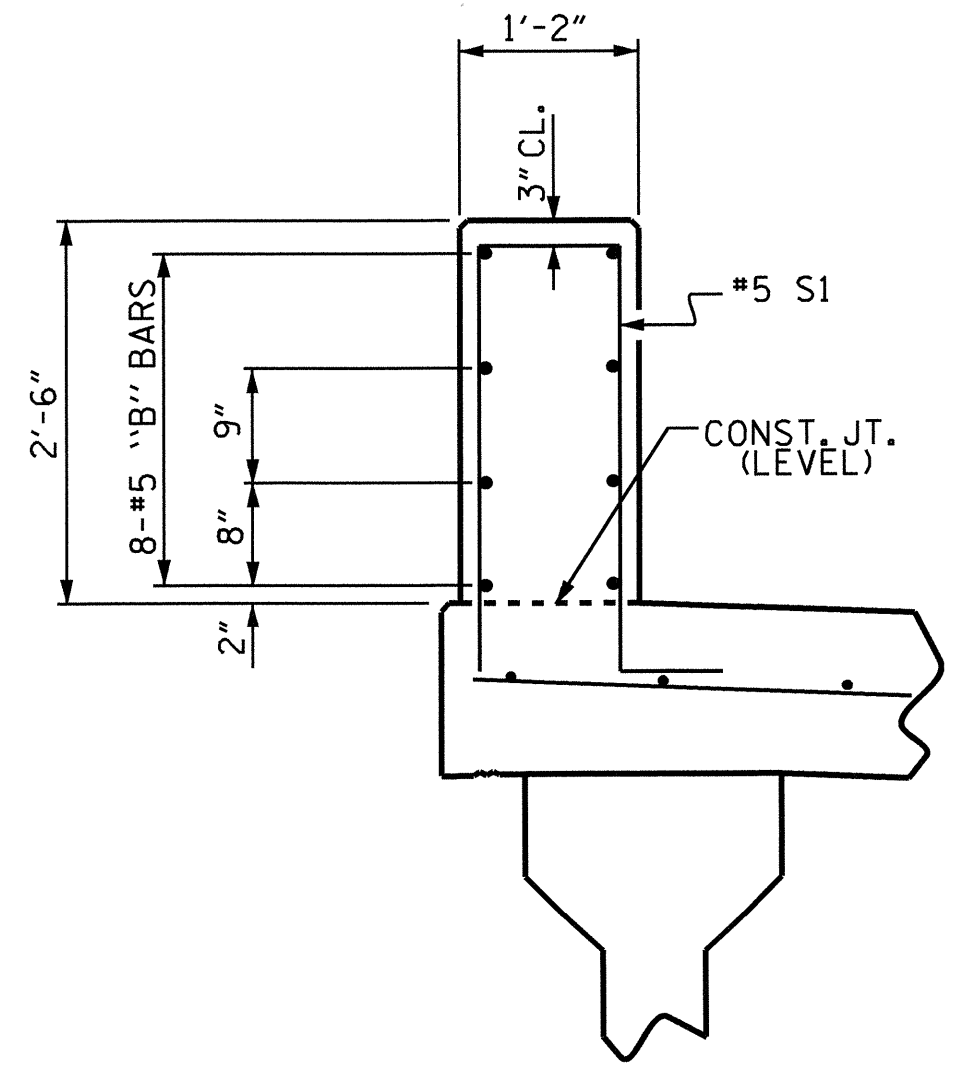
PLAN OF END POST



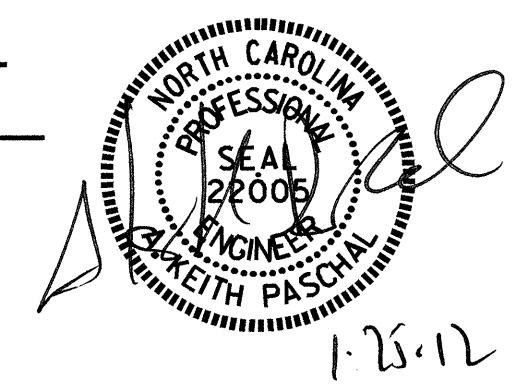
END VIEW



ELEVATION



SECTION THRU PARAPET



PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE CONCRETE PARAPET FOR 2 BAR METAL RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-21
					TOTAL SHEETS 45

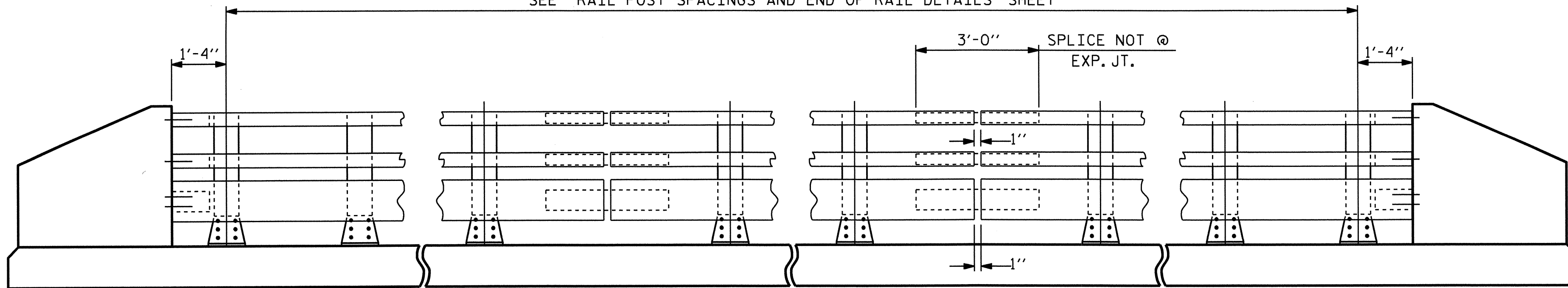
DRAWN BY : B. N. BARODAWALA DATE : 2-10-11  
 CHECKED BY : J. D. HAWK DATE : 9-15-11

PARAPET AND END POST FOR TWO BAR METAL RAIL

25-JAN-2012 08:32  
 W:\Structures\Final Plans\B3480.sd.2MR.dgn  
 bbarodawala

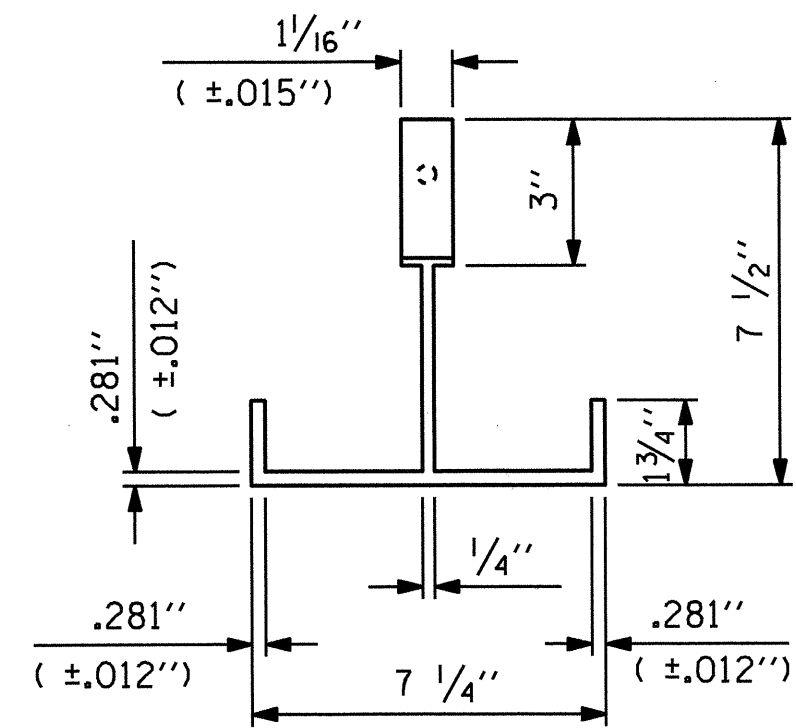


SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET

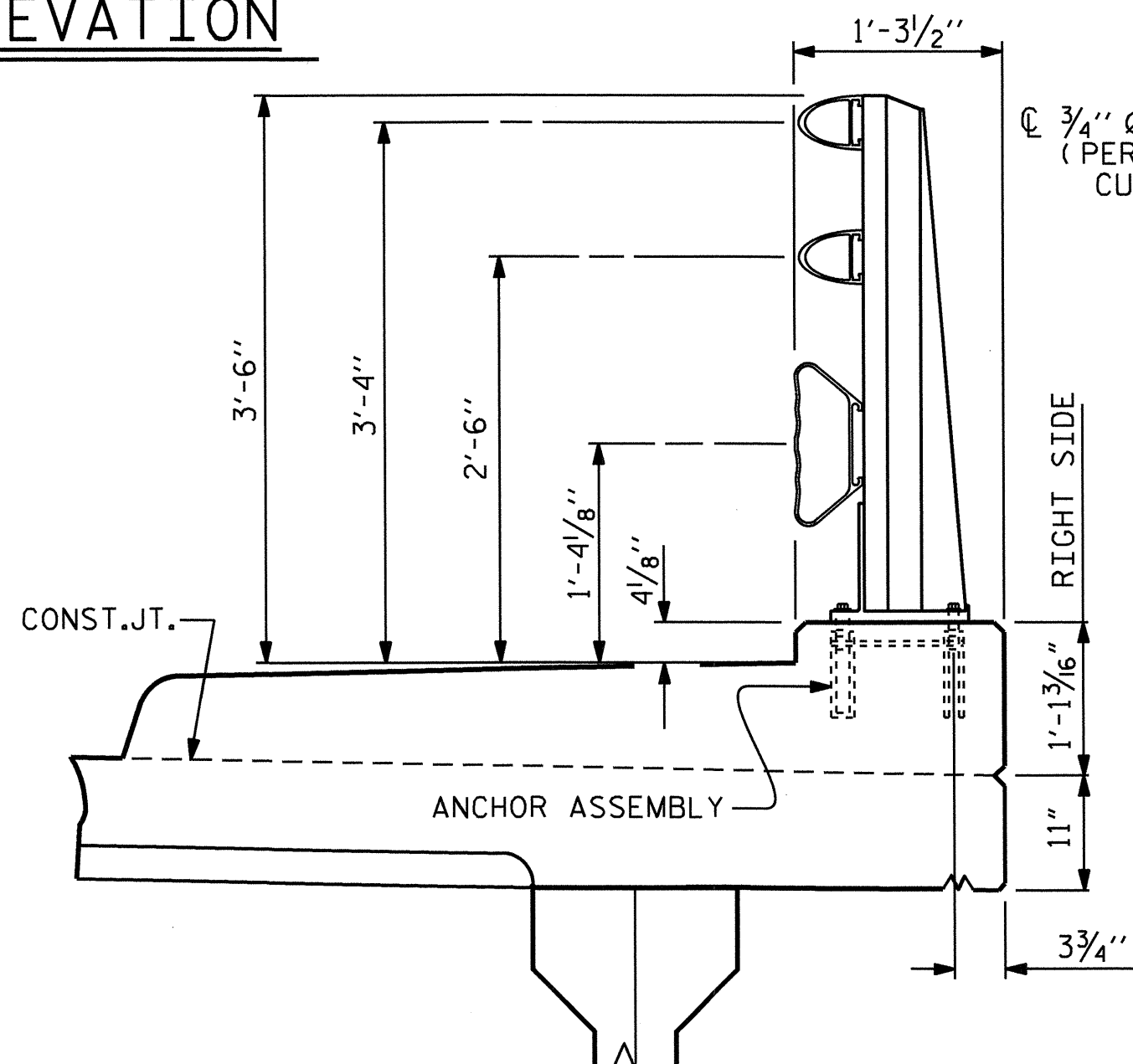


ELEVATION

NOTE:  
FOR ATTACHMENT OF METAL RAIL TO END  
POST, SEE STANDARD NO. BMR7.

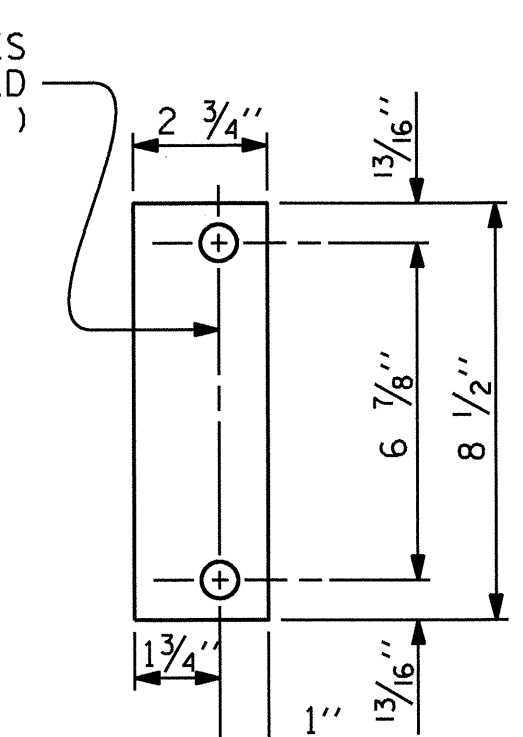


PLAN

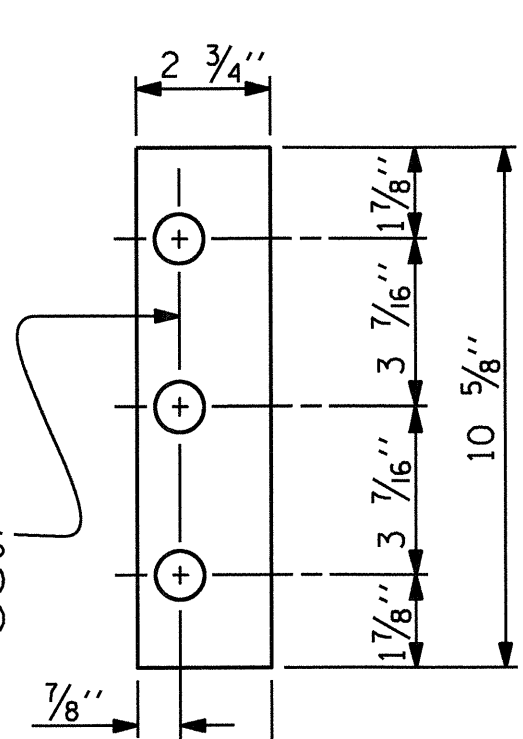


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL"  
STD.No.BMR6

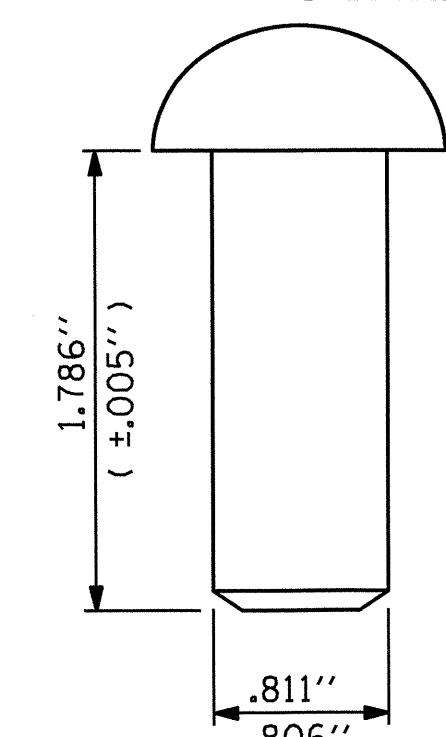


REAR PLATE

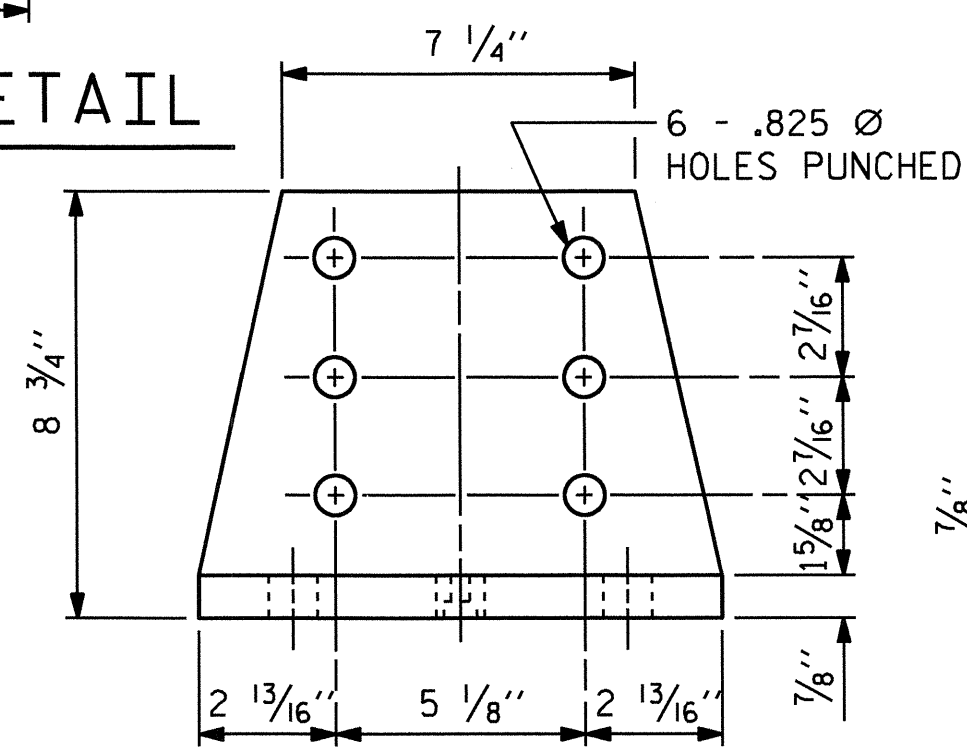


FRONT PLATE  
SHIM DETAILS

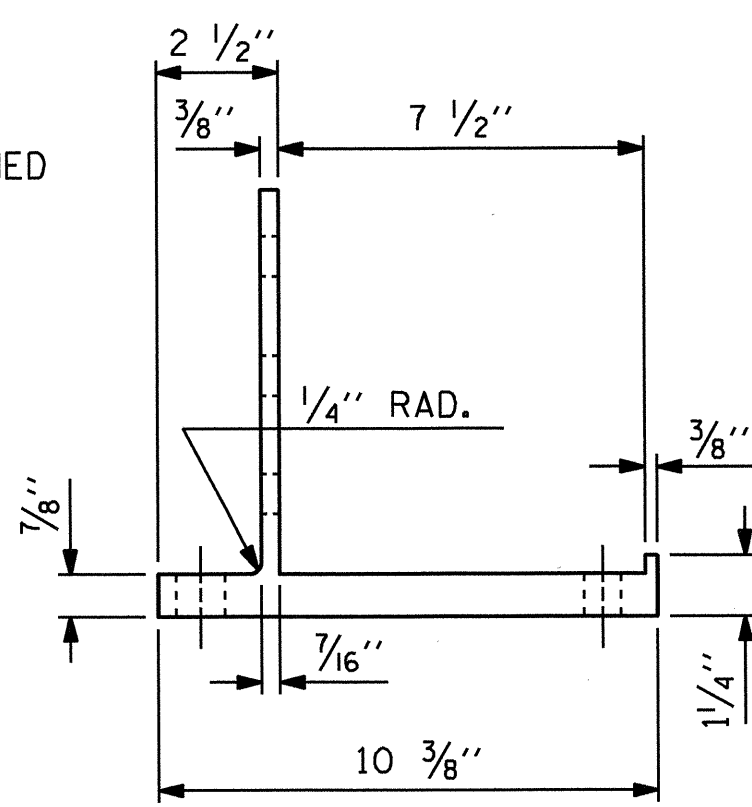
NOTE:  
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR  
SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



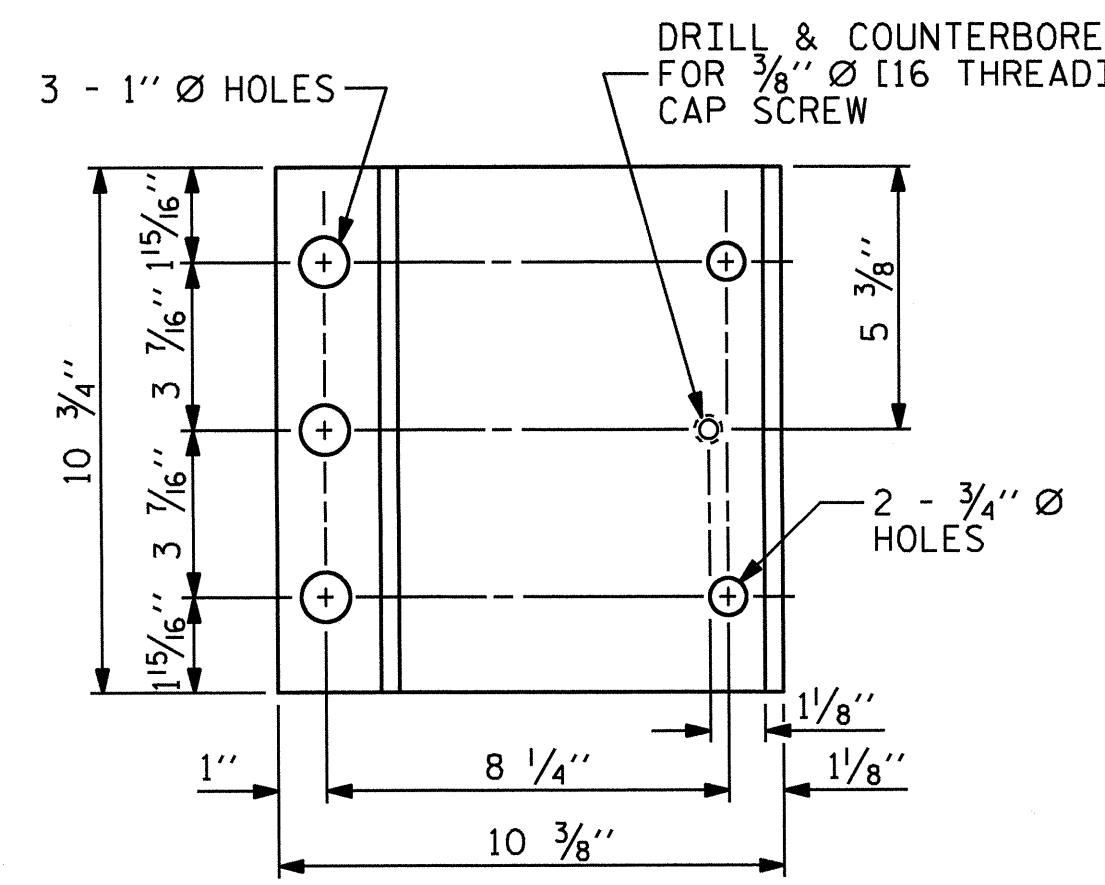
RIVET DETAIL



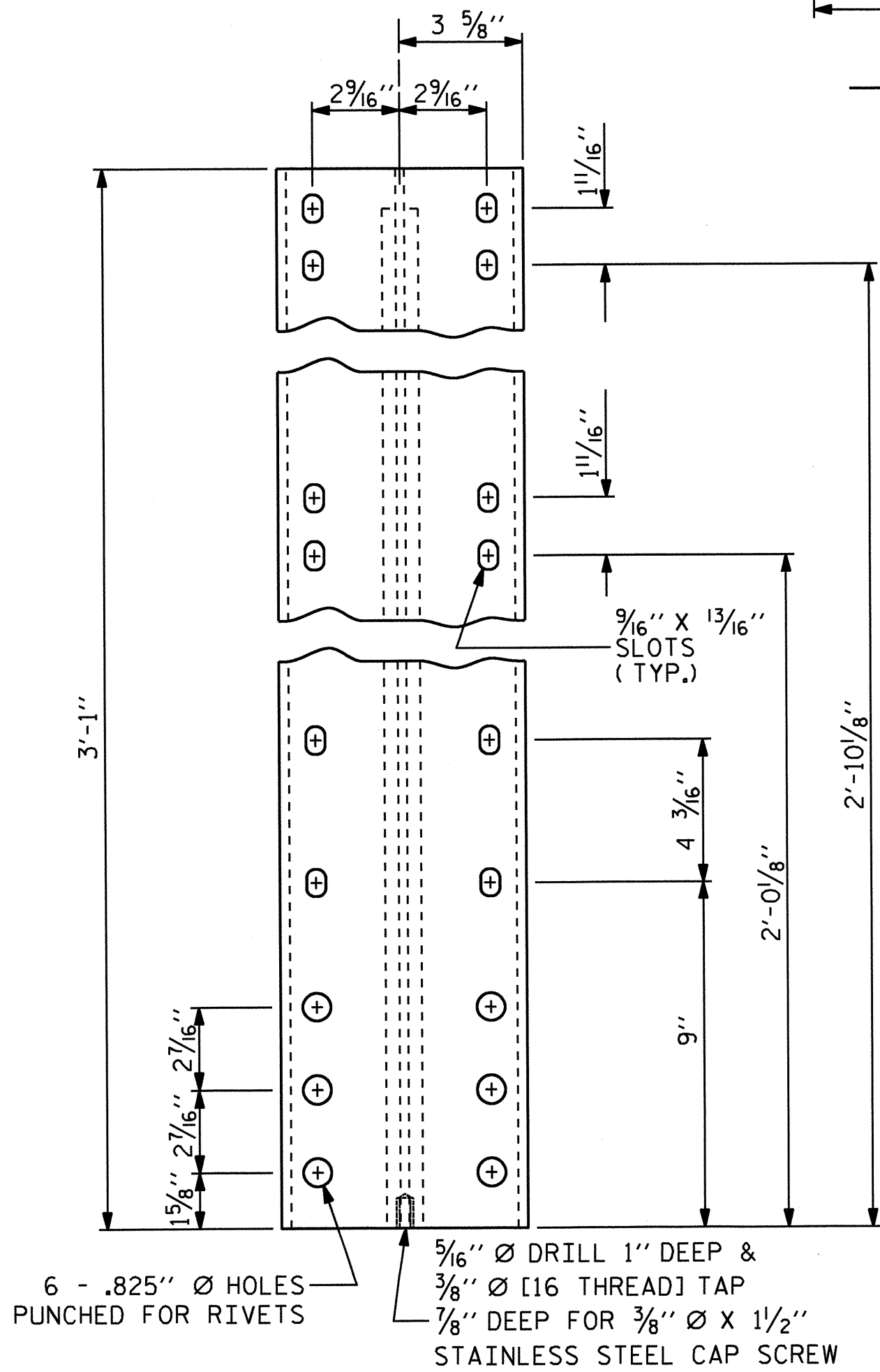
FRONT ELEVATION



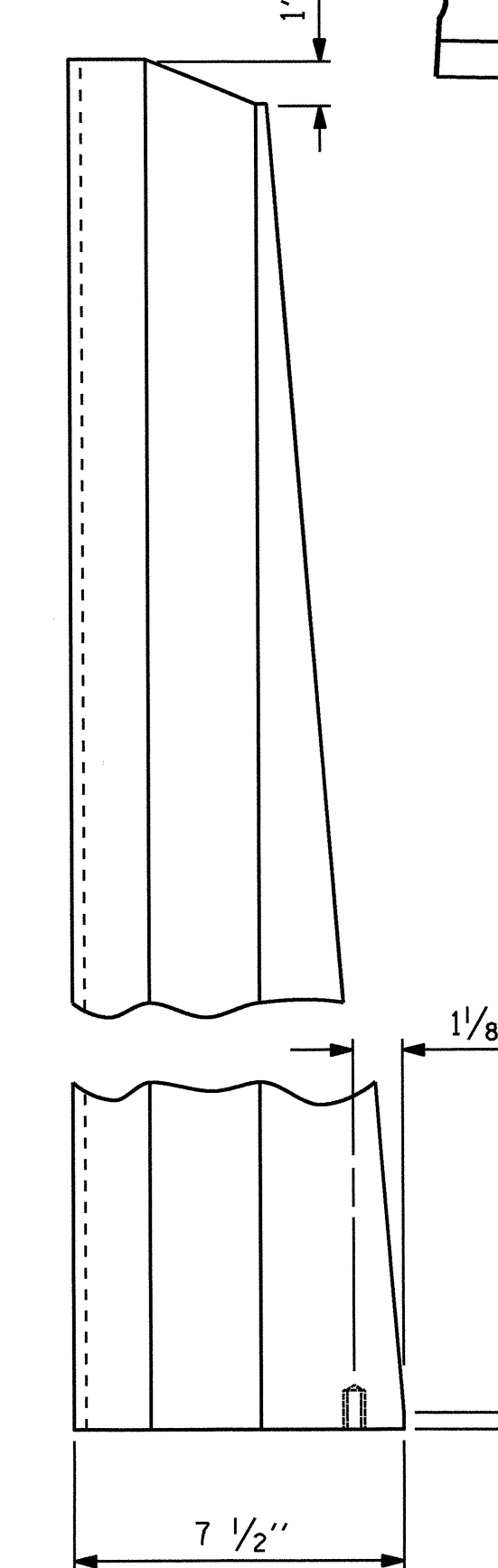
SIDE ELEVATION  
POST BASE DETAILS



PLAN



FRONT ELEVATION



SIDE ELEVATION

DETAILS OF POST

PAY LENGTH = 170.60 LIN.FT.

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 B221 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. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT 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.

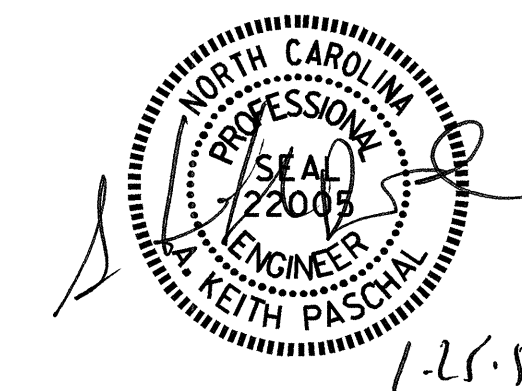
CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE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



PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

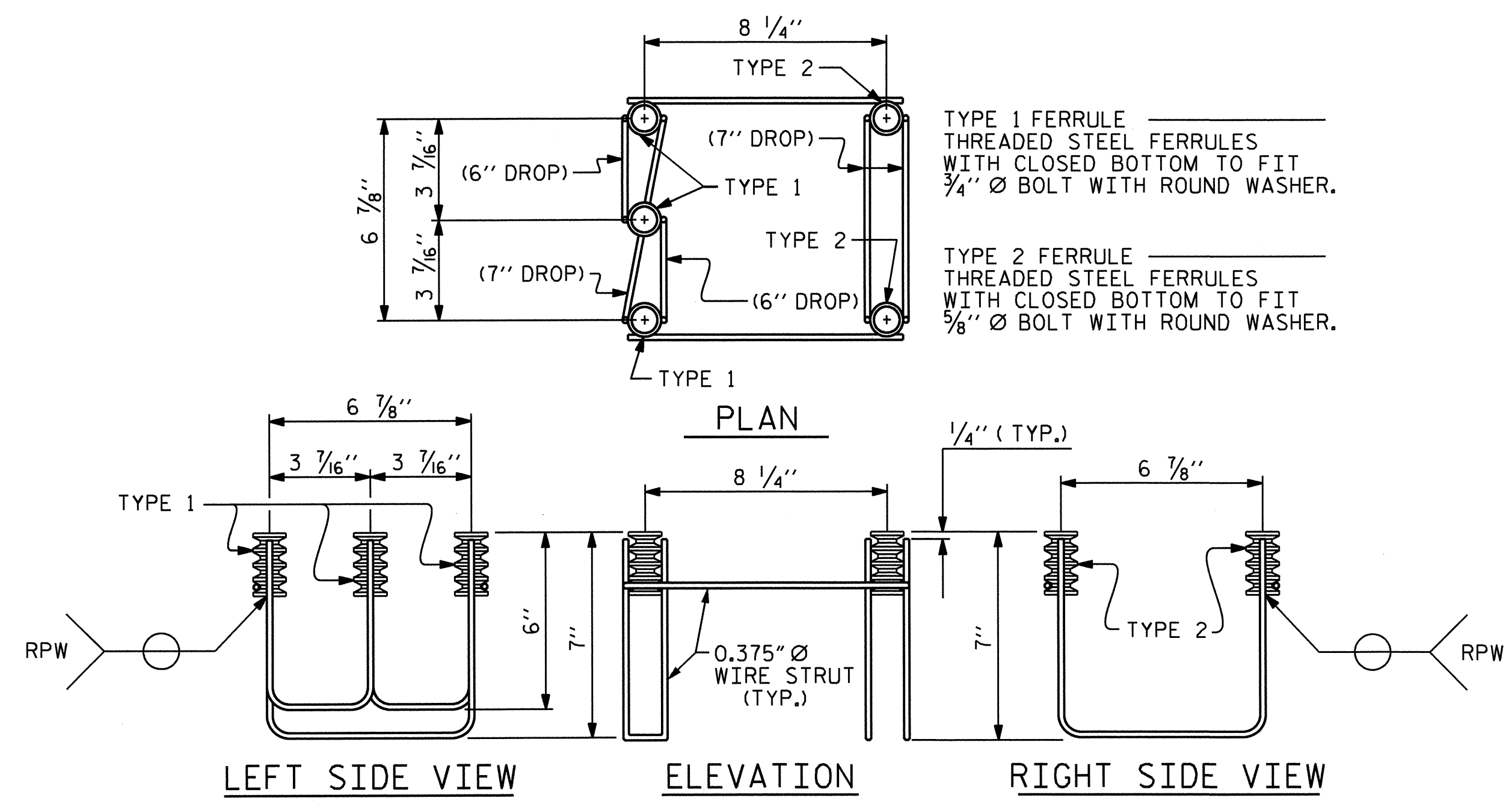
SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
3 BAR METAL RAIL

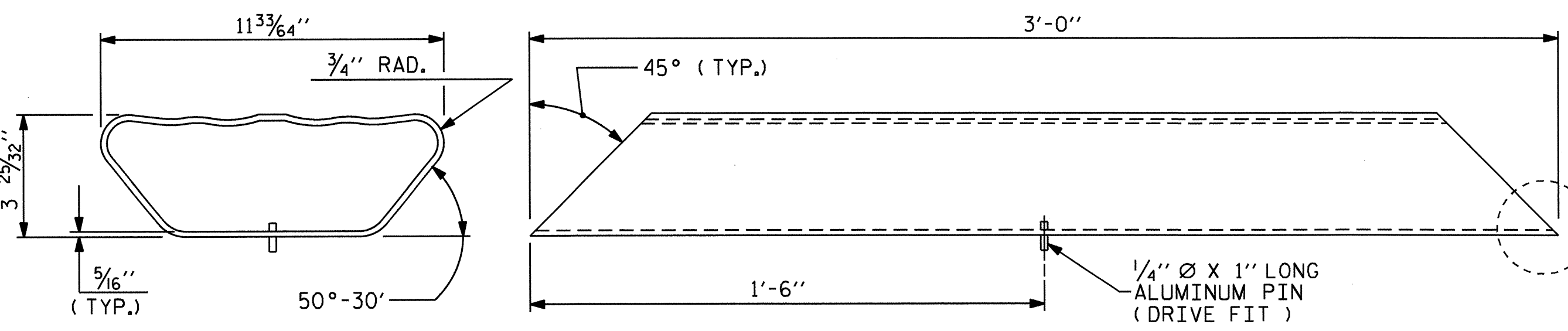
ASSEMBLED BY : B.N.BARODAWALA	DATE : 01/08/11
CHECKED BY : J. D. HAWK	DATE : 09/15/11
DRAWN BY : JMB	1/88
CHECKED BY : GGH	1/88
REV. 10/17/00	RWW/LES
REV. 5/7/03	RWW/JTE
REV. 5/17/06	TLA/GM

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

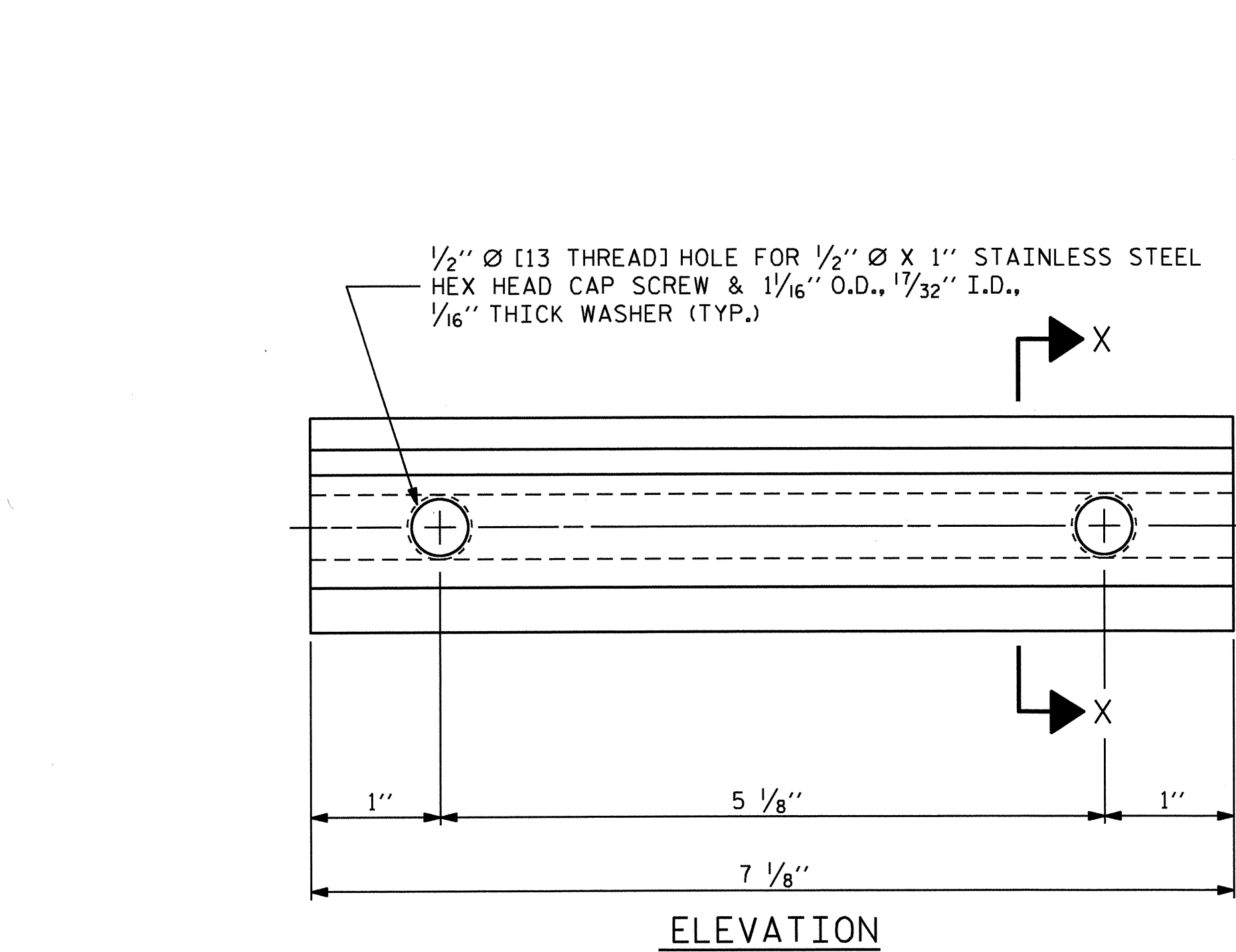


**5-BOLT METAL RAIL ANCHOR ASSEMBLY**

( 29 ASSEMBLIES REQUIRED )



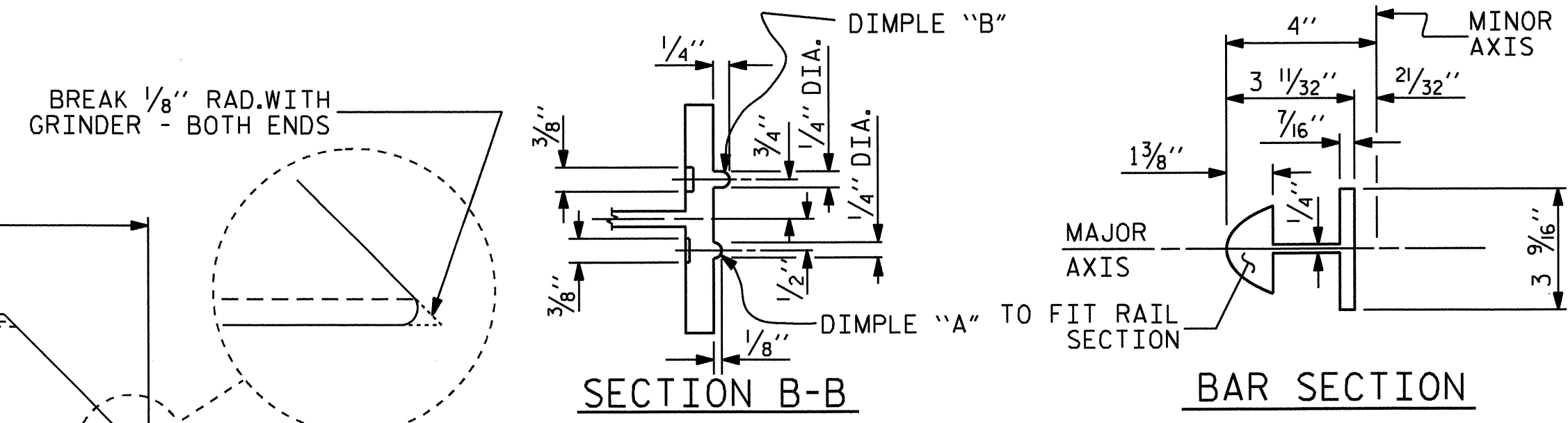
**BOTTOM RAIL EXPANSION BAR**



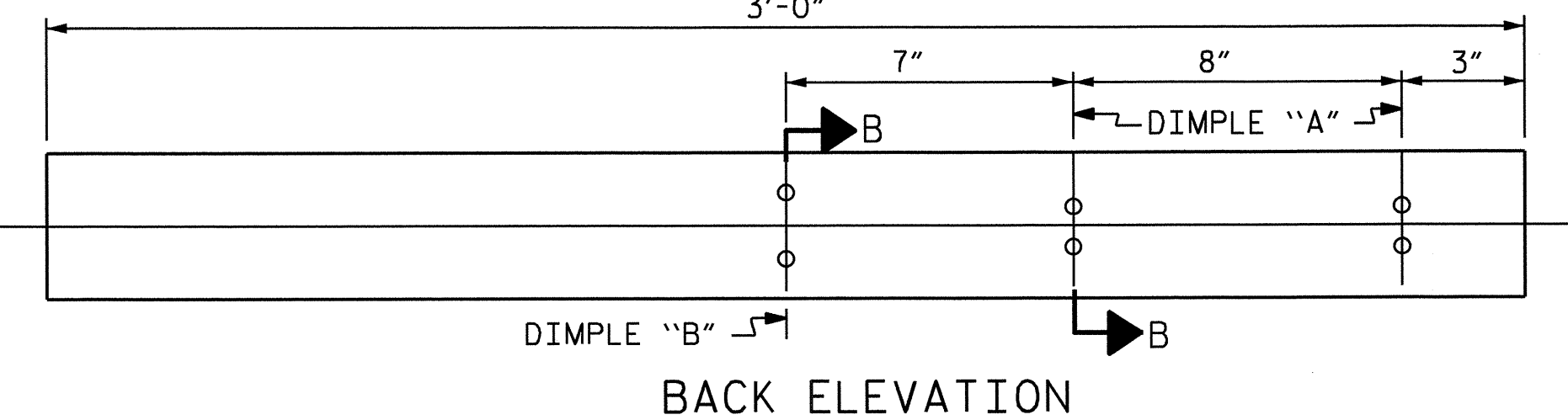
**CLAMP BAR DETAIL**

( 6 REQUIRED PER POST )

- NOTES**  
STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 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 AND 1 1/4" FOR 5/8" FERRULES.
  - 3 - 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.
  - 2 - 5/8" Ø X 2 1/4" 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 5/8" Ø X 2 1/4" 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.
  - WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
  - THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
  - 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.
  - BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

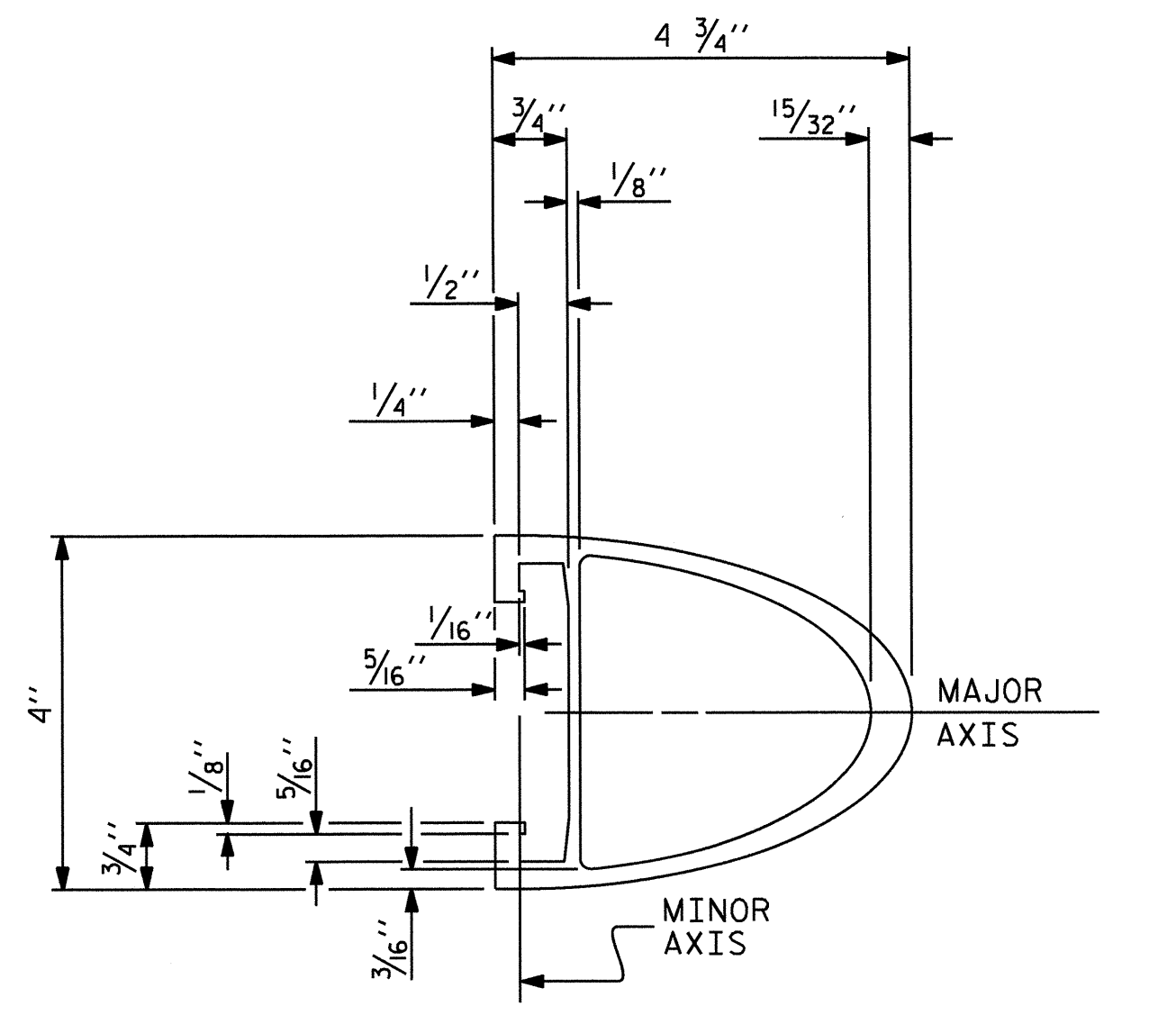


**SECTION B-B**      **BAR SECTION**

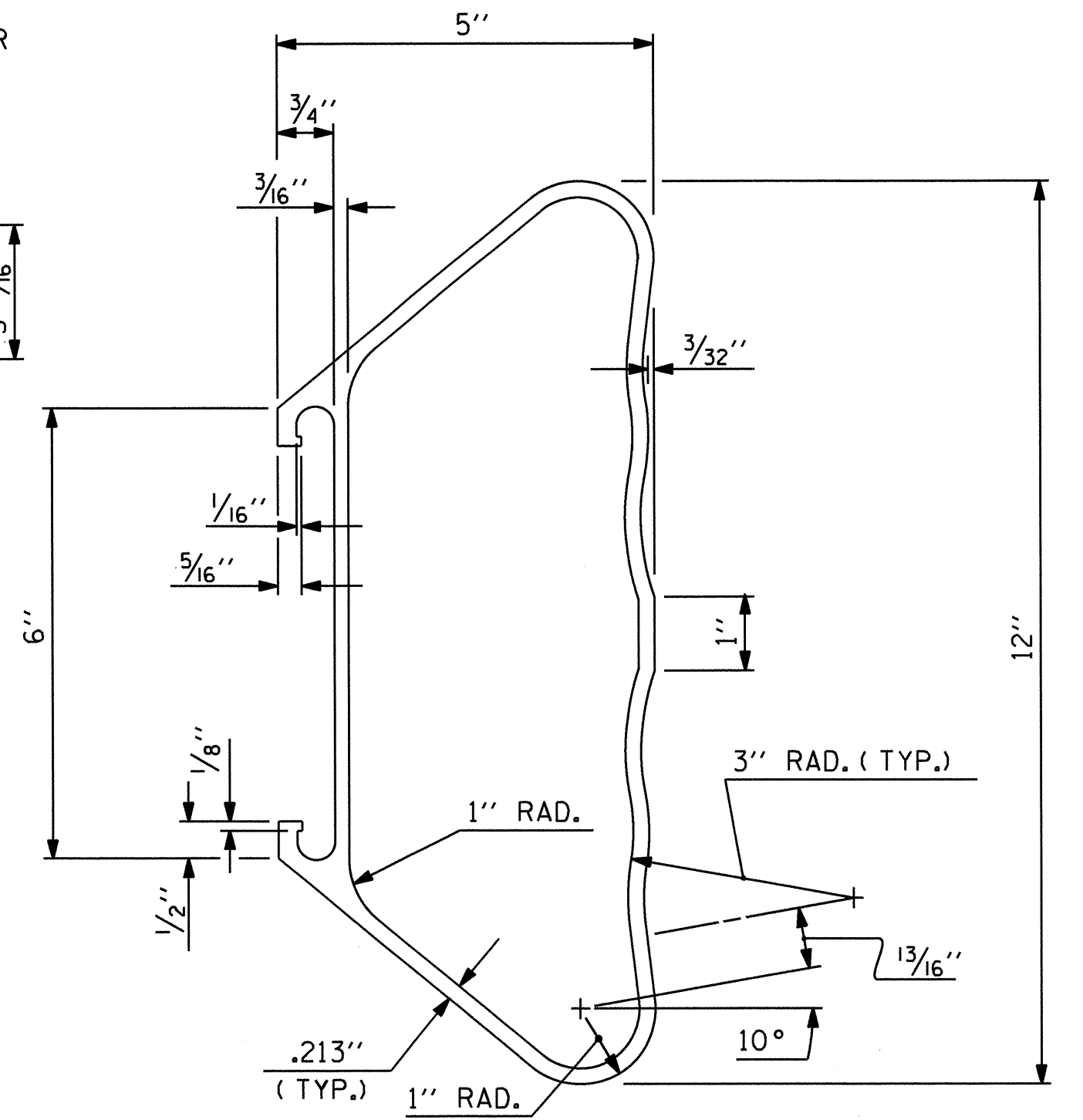


**BACK ELEVATION**

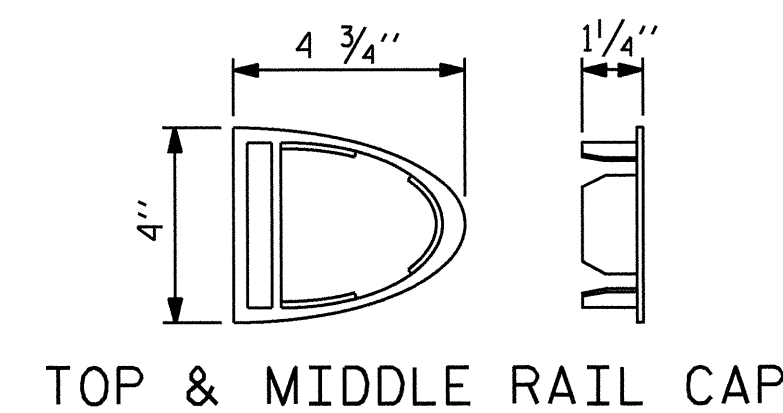
**TOP & MIDDLE RAIL EXPANSION BAR**



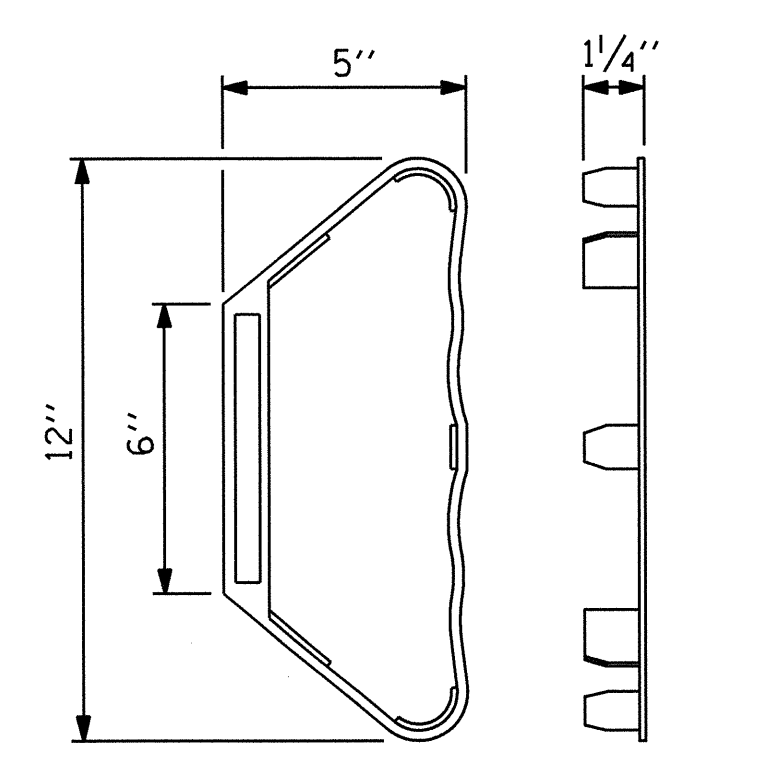
**TOP & MIDDLE RAIL SECTION**



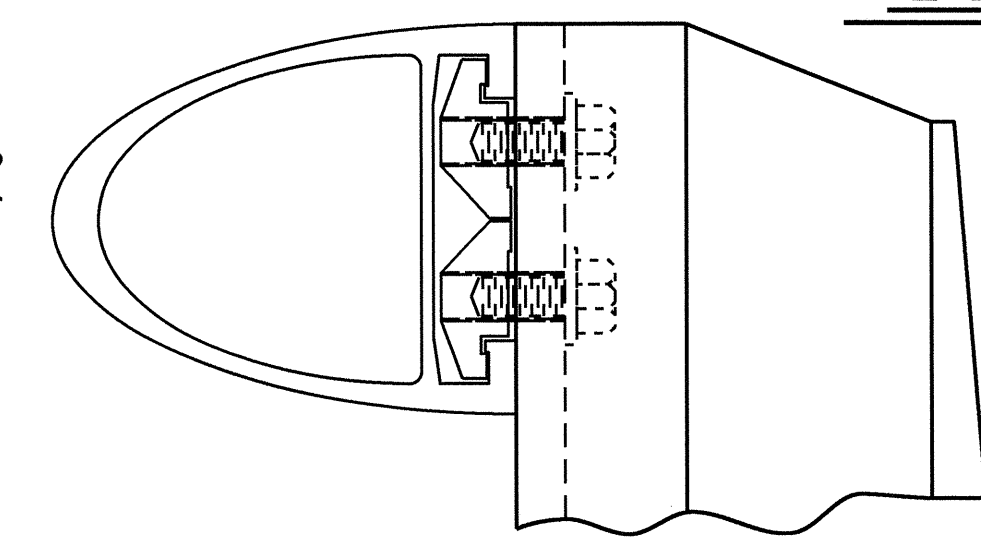
**BOTTOM RAIL SECTION**



**TOP & MIDDLE RAIL CAP**

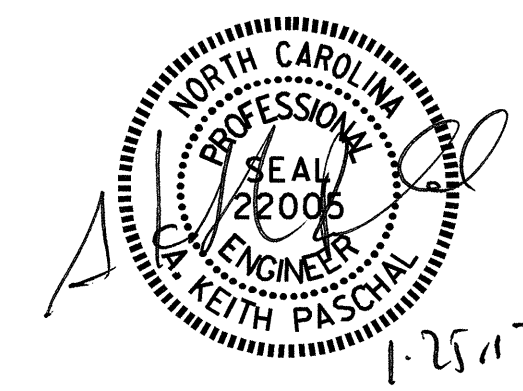


**BOTTOM RAIL CAP**



**CLAMP ASSEMBLY**

TOP RAIL SHOWN  
(MIDDLE & BOTTOM RAIL ARE SIMILAR)



PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 2 OF 4  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23	
1			3			TOTAL SHEETS	45
2			4				

ASSEMBLED BY : B.N.BARODAWAL DATE : 01/08/11  
 CHECKED BY : J. D. HAWK DATE : 09/15/11  
 DRAWN BY : JMB 1/88 REV. 7/10/01 RWW/LES  
 CHECKED BY : GGH 1/88 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM



NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
- D. STANDARD CLAMP BARS (STD. No. BMR6).

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 3 BAR METAL RAIL.

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.

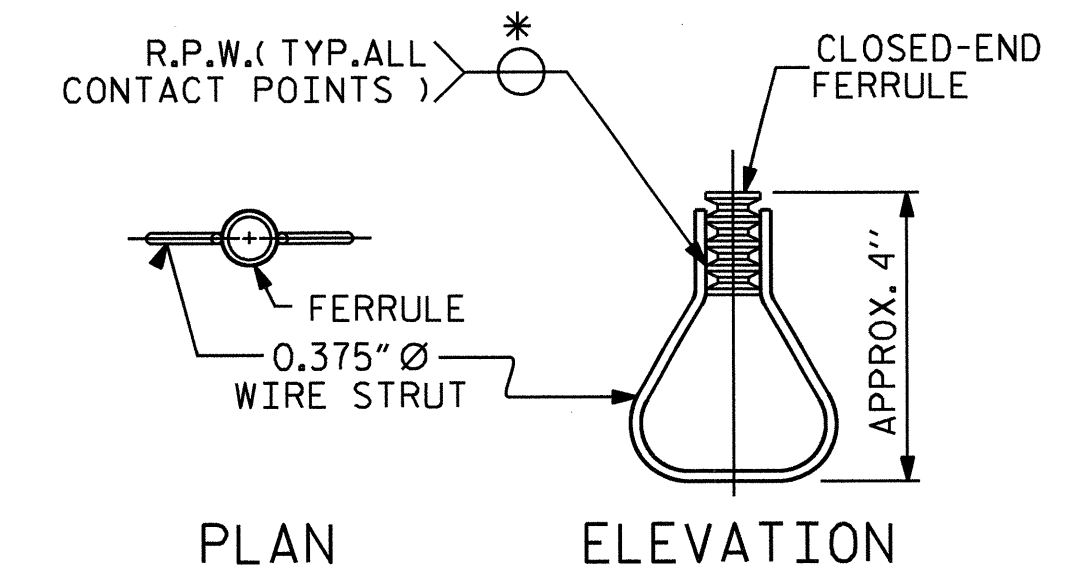
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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

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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



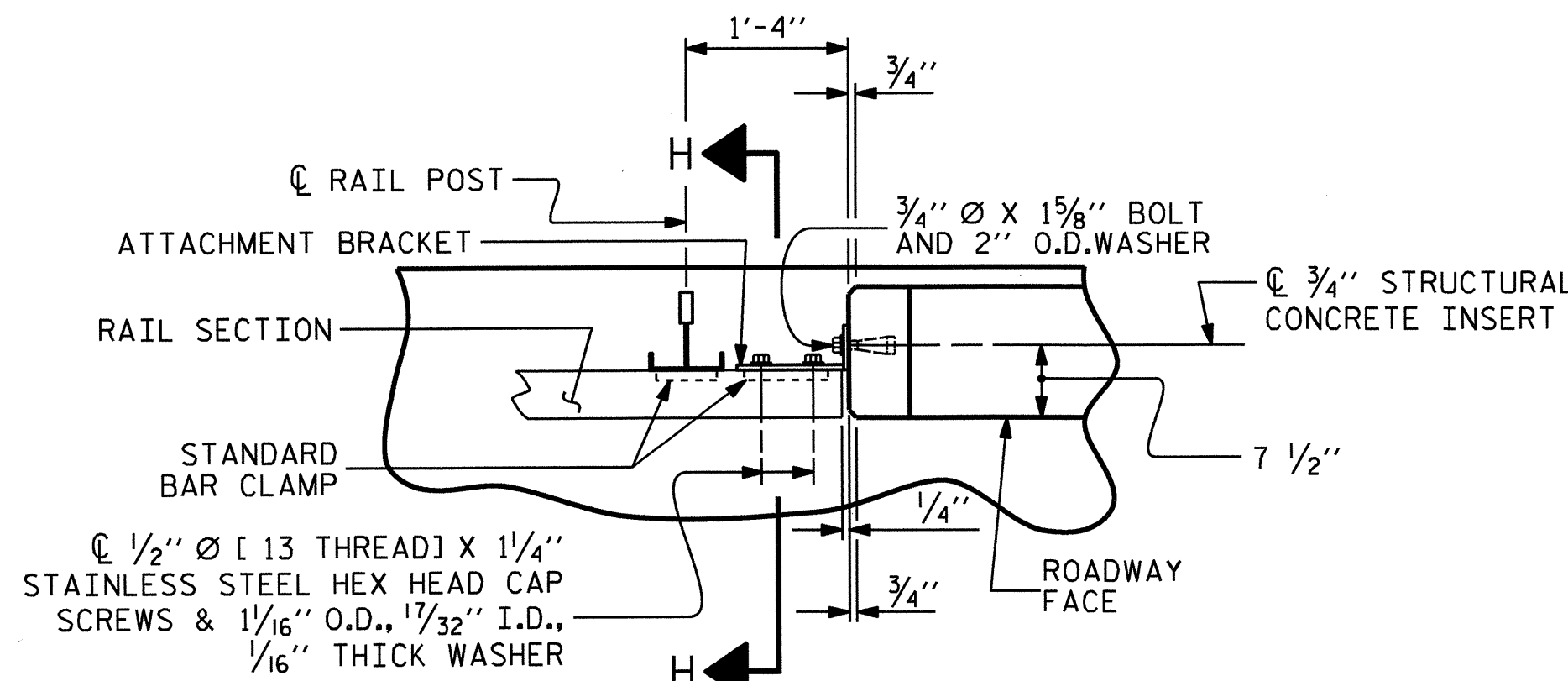
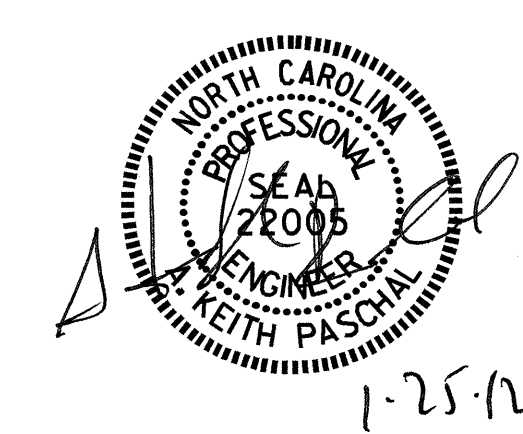
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-3480  
JACKSON COUNTY  
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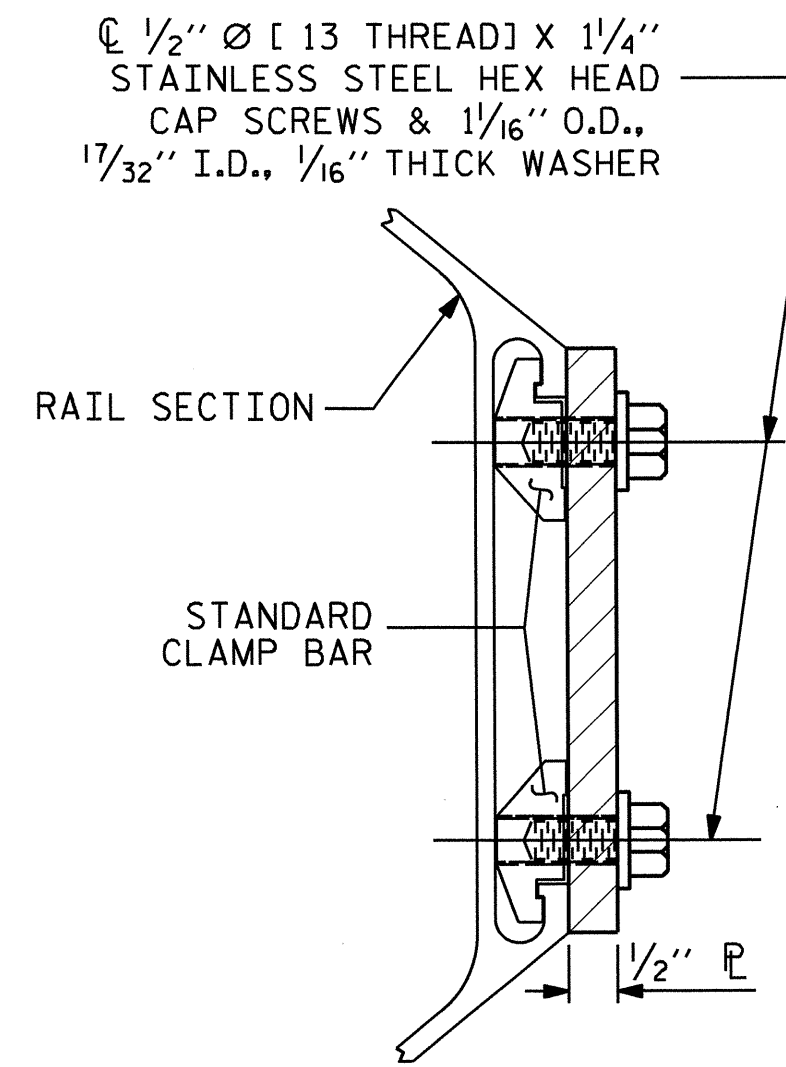
SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-24
					TOTAL SHEETS 45



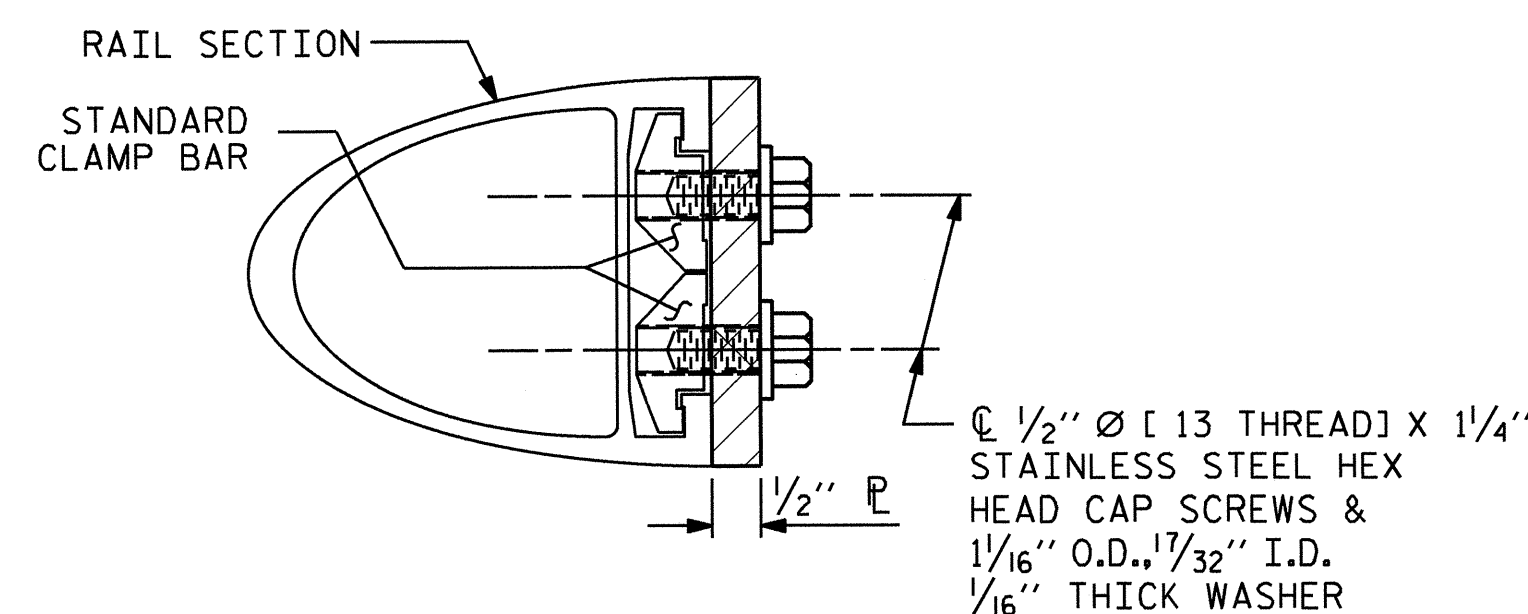
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



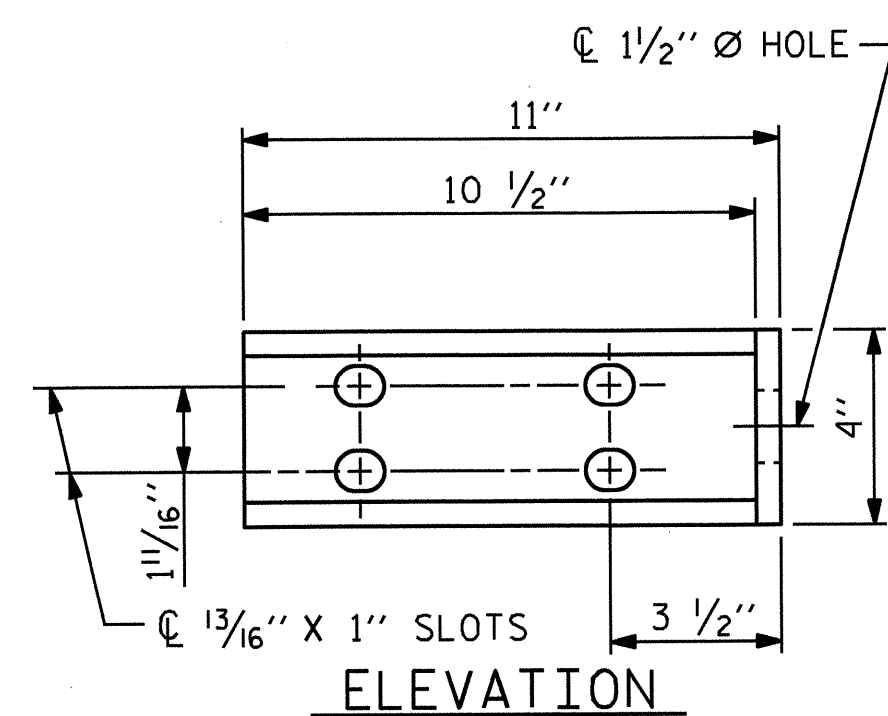
SECTION H-H

(FOR BOTTOM RAIL)

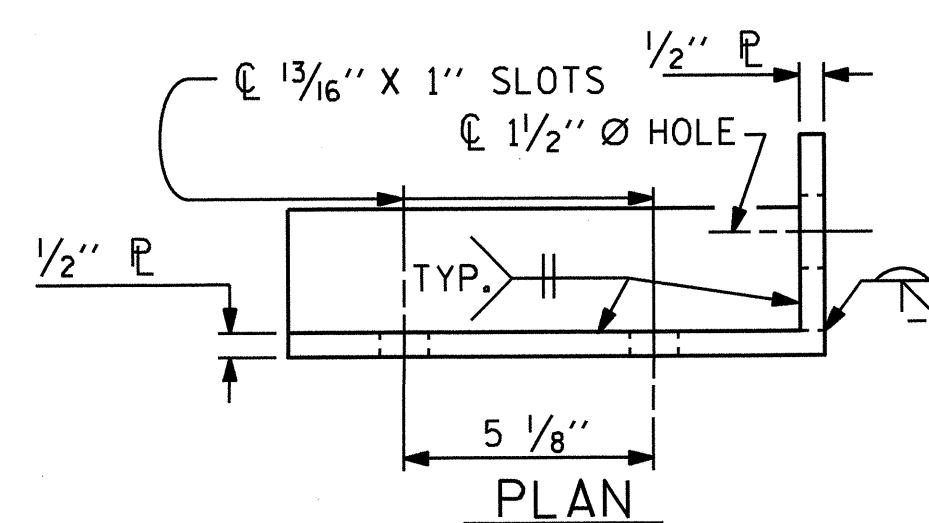


SECTION H-H

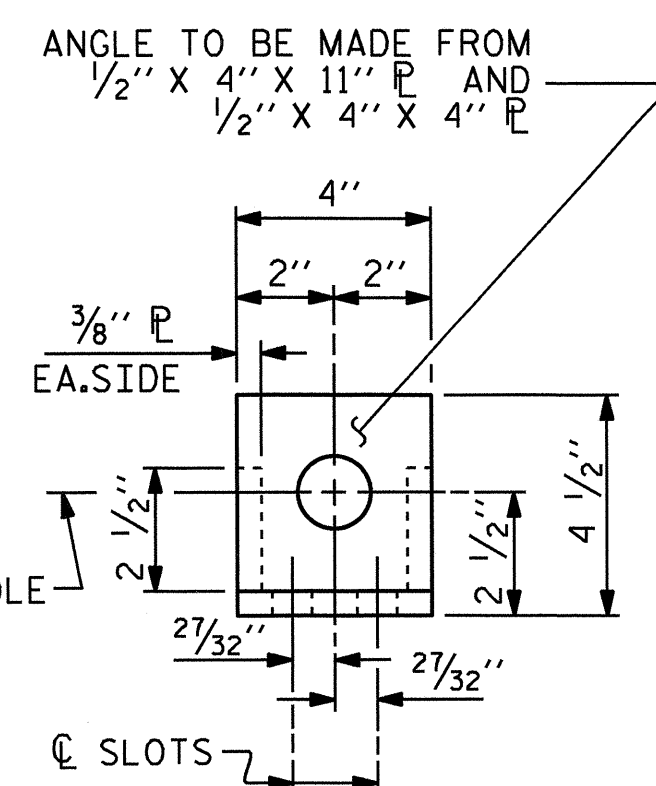
(FOR TOP & MIDDLE RAIL)



ELEVATION



PLAN

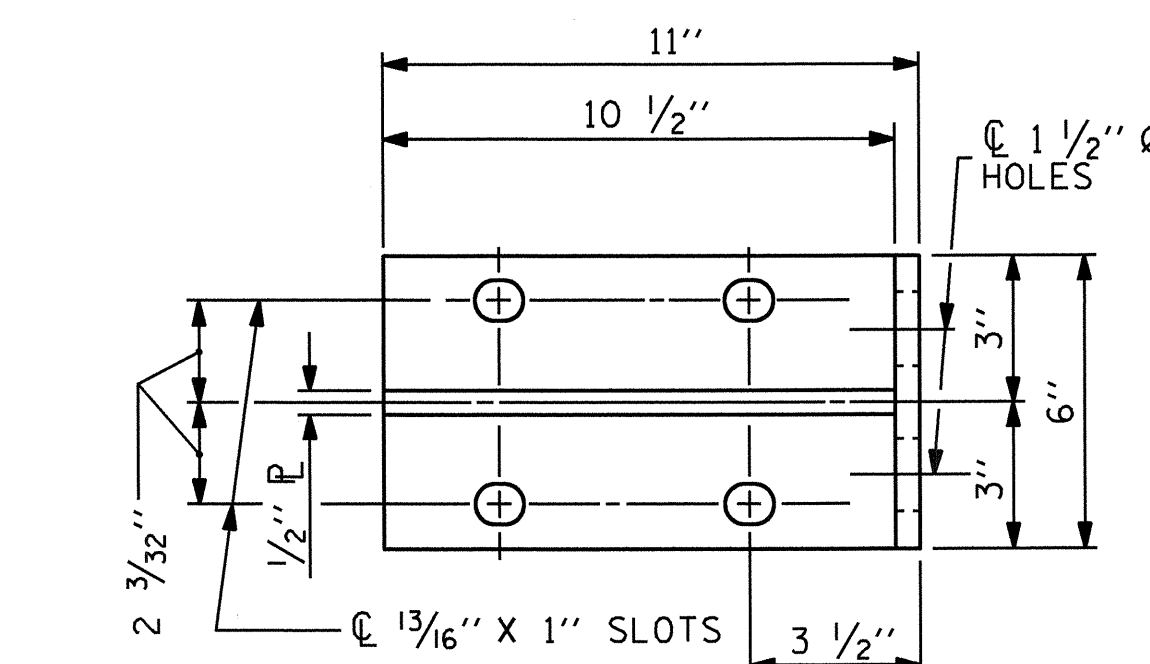


END VIEW

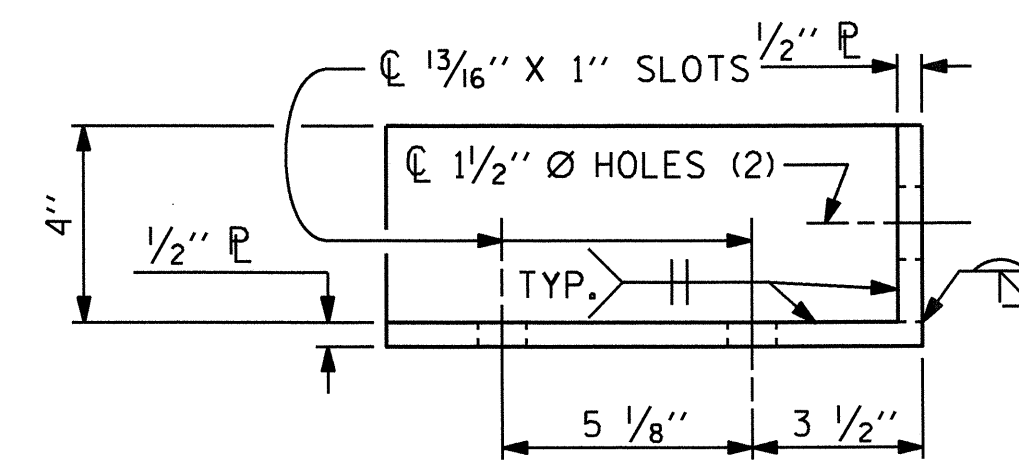
(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



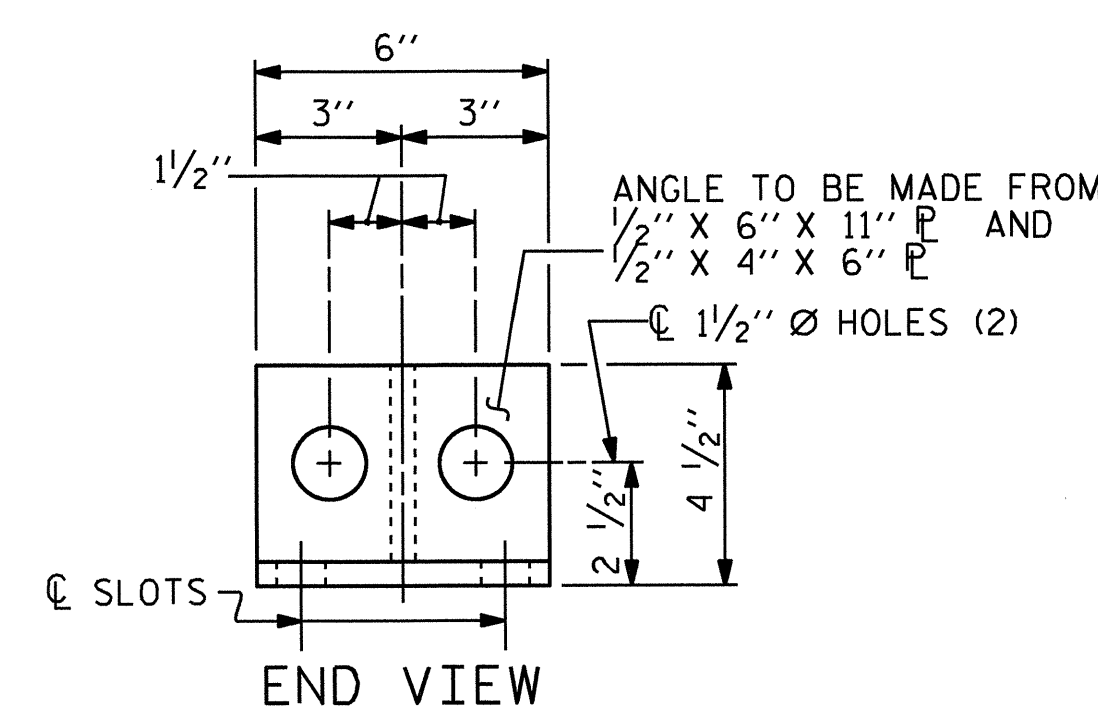
ELEVATION



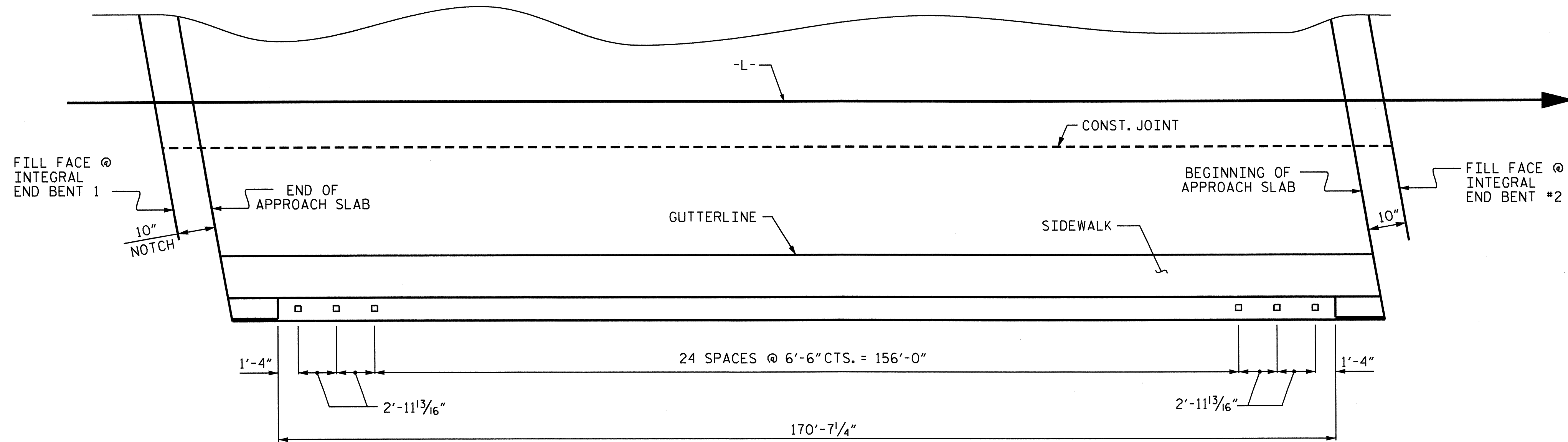
PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW



**PLAN OF RAIL POST SPACING**

**NOTES**

FOR DETAIL OF GUARDRAIL ANCHOR ASSEMBLY, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METALS RAILS" SHEET.

FOR DETAILS OF CONCRETE INSERT, SEE "3 BAR METAL RAIL" SHEET 3 OF 4.

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

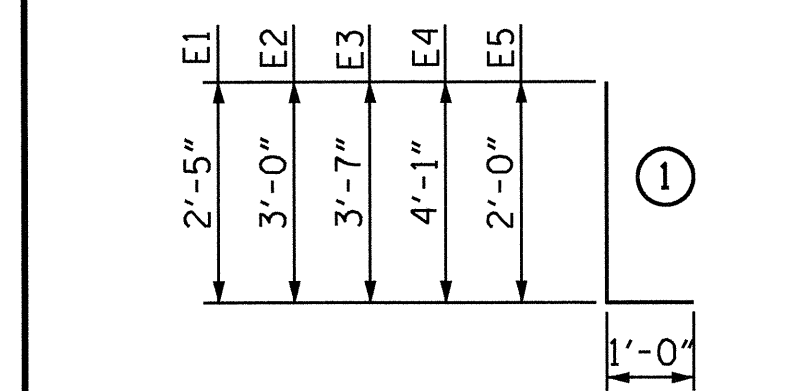
NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE CONCRETE END POSTS AS THIS IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE 3 BAR METAL RAIL.

**BILL OF MATERIAL**  
ONE END POST (2 REQ'D.)

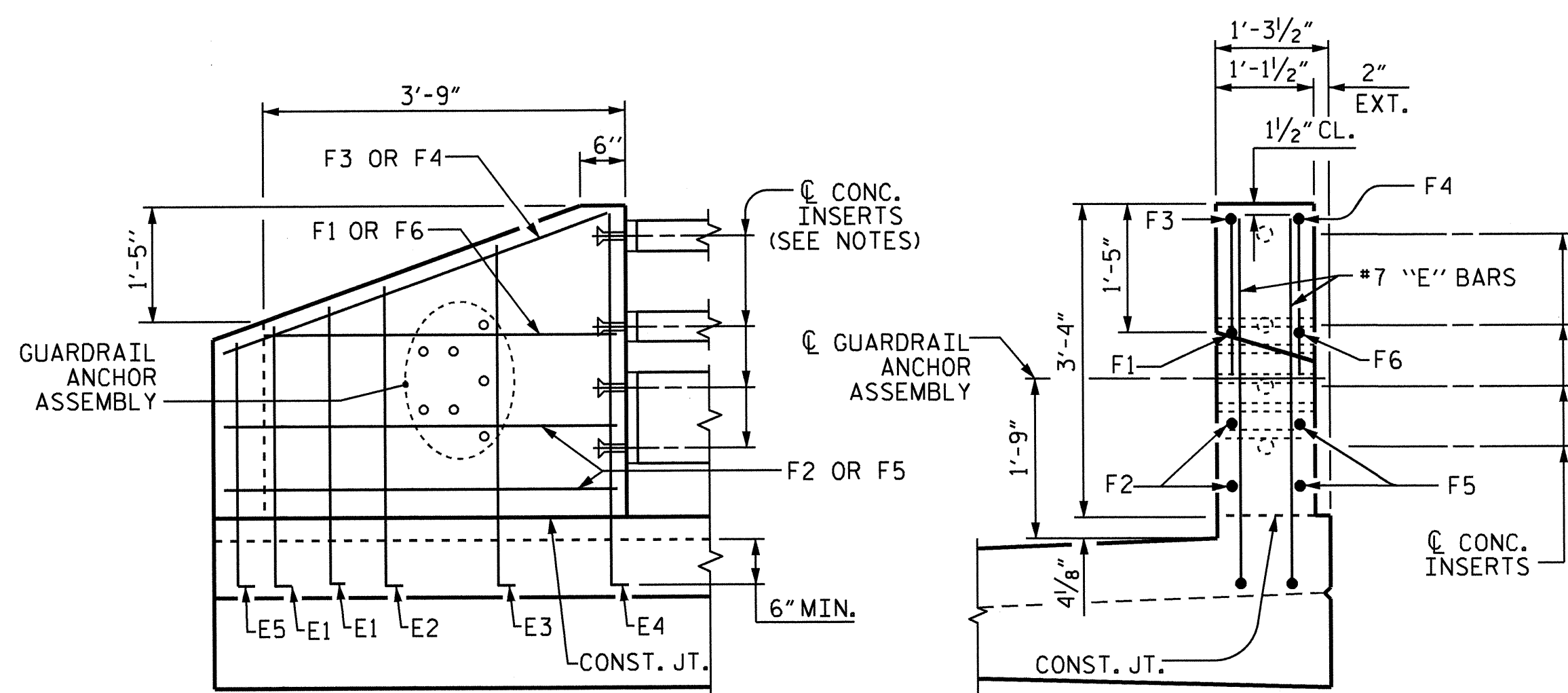
BILL FOR ONE END POST					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
E1	2	#7	1	3'-5"	14
E2	2	#7	1	4'-0"	16
E3	2	#7	1	4'-7"	19
E4	2	#7	1	5'-1"	21
E5	1	#7	1	3'-0"	6
F1	1	#6	STR	3'-1"	5
F2	2	#6	STR	3'-5"	10
F3	1	#6	STR	3'-4"	5
F4	1	#6	STR	3'-10"	6
F5	2	#6	STR	3'-11"	12
F6	1	#6	STR	3'-7"	5

\* EPOXY COATED REINFORCING STEEL = 119 LBS.  
CLASS AA CONCRETE = 0.4 CU. YDS.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

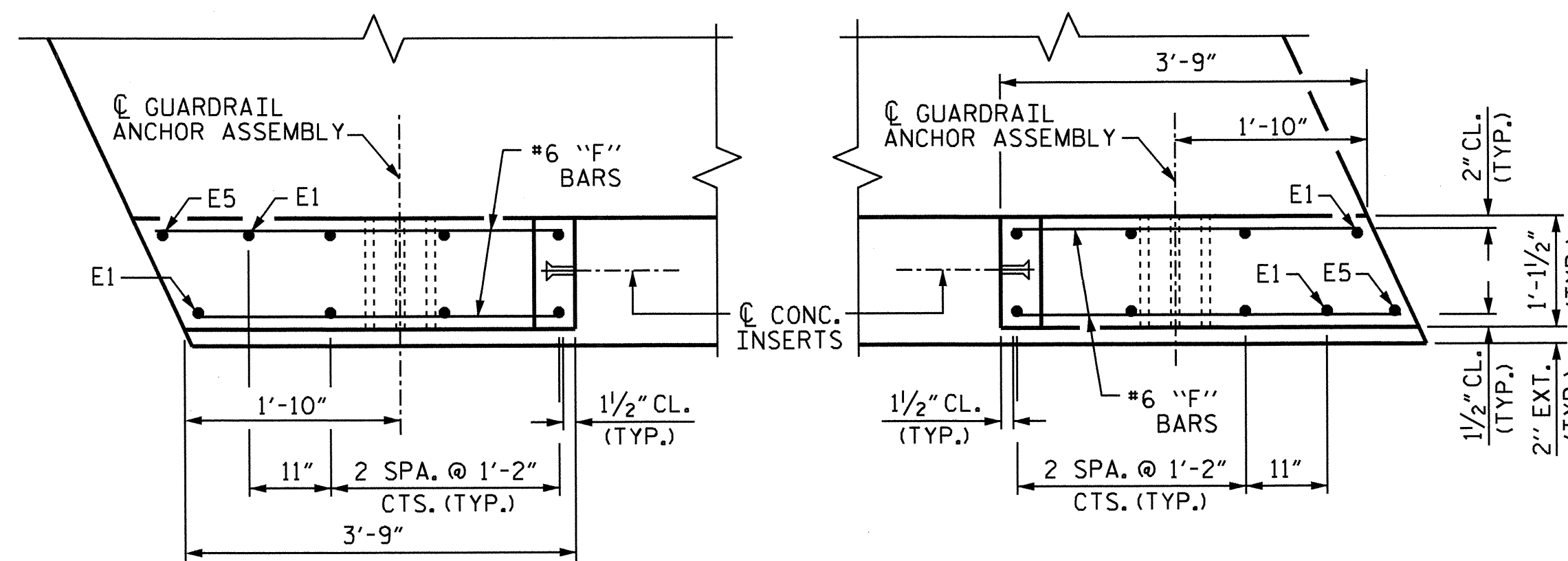


**ELEVATION**

END BENT 1 RIGHT SIDE SHOWN,  
END BENT 2 SIMILAR

**END VIEW**

END BENT 1 RIGHT SIDE SHOWN,  
END BENT 2 SIMILAR



**PLAN**

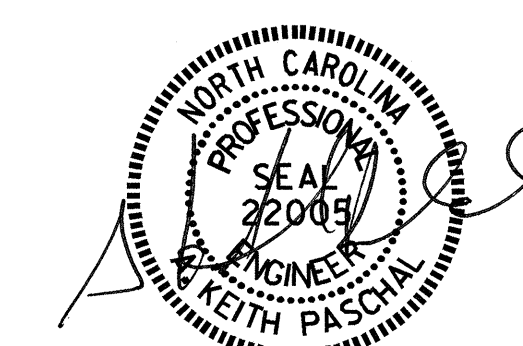
**END POST DETAILS**

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
RAIL POST SPACINGS  
AND  
END OF RAIL DETAILS



DRAWN BY: B. N. BARODAWALA DATE: 3/08/11  
CHECKED BY: J. D. HAWK DATE: 9/15/11

25-JAN-2012 09:28  
W:\Structures\Final Plans\B3480.sd.3MR.dgn  
bbarodawala

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



NOTES

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

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

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

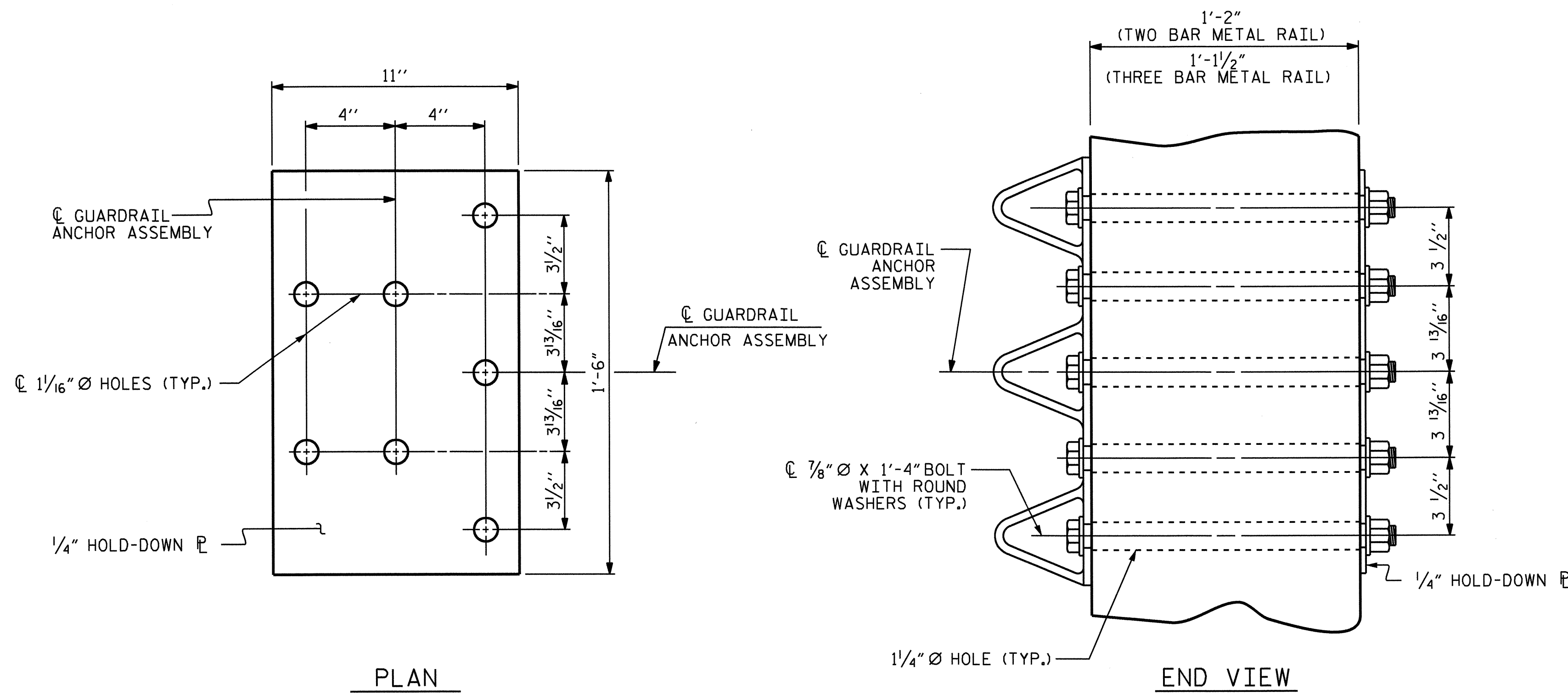
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

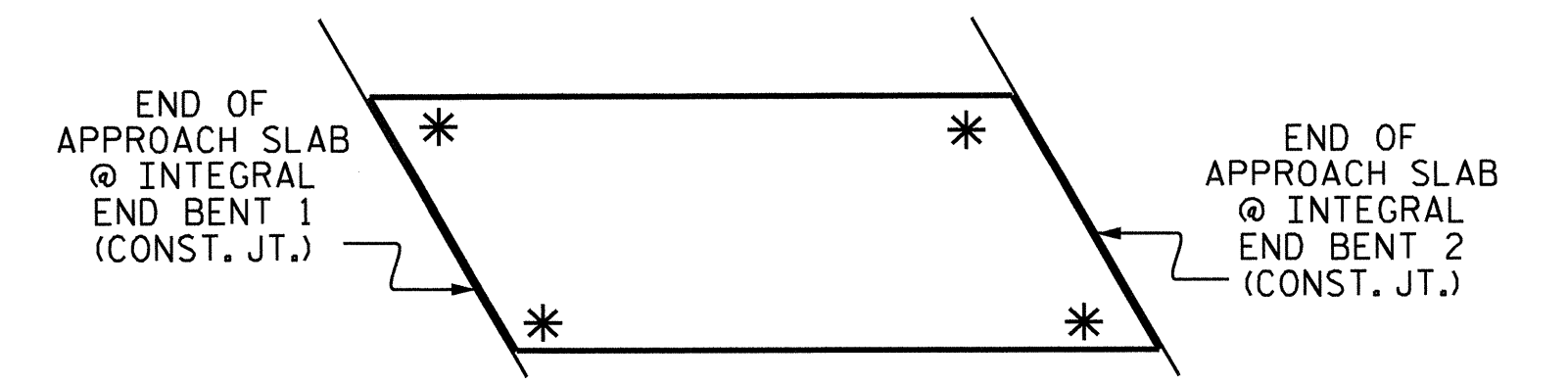
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

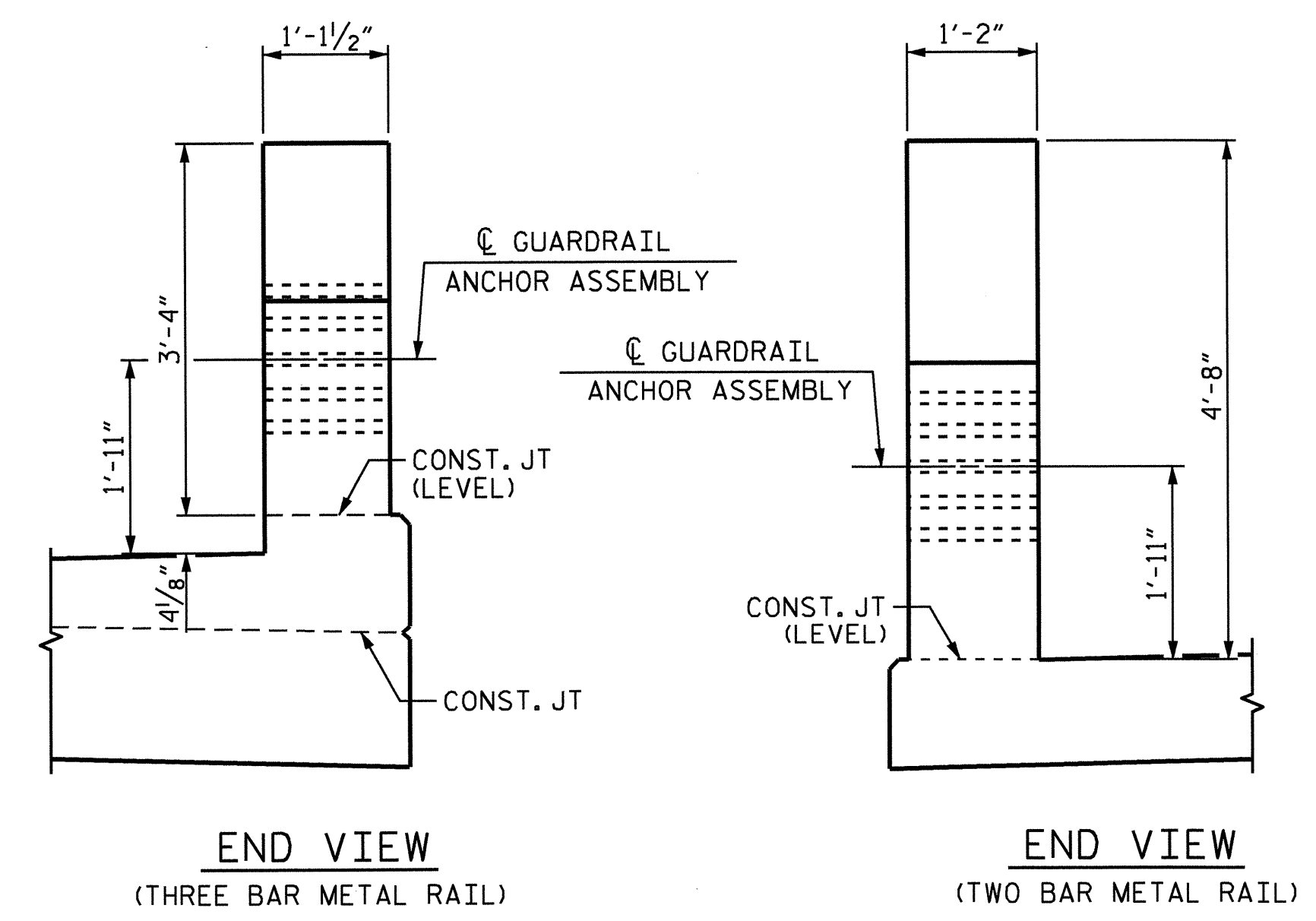
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



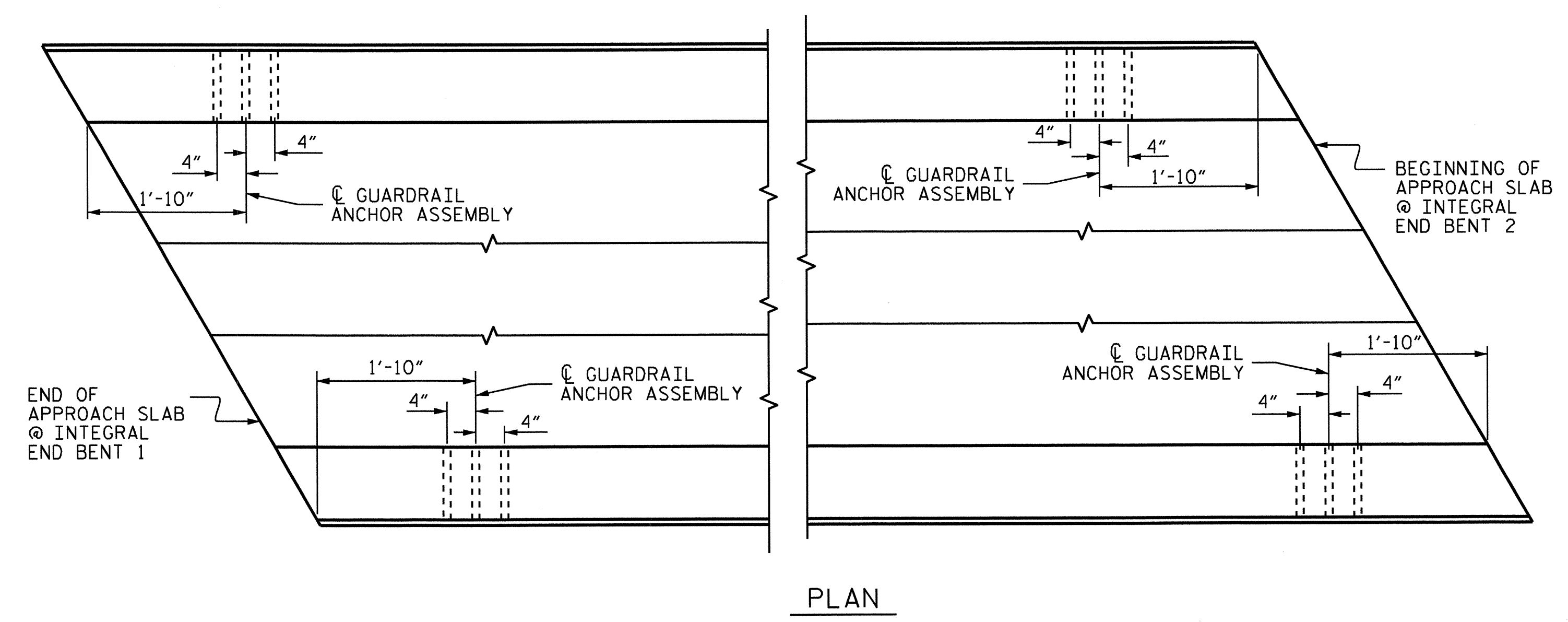
PLAN  
END VIEW  
**GUARDRAIL ANCHOR ASSEMBLY DETAILS**



**SKETCH SHOWING POINTS OF ATTACHMENT**  
\* LOCATION OF GUARDRAIL ATTACHMENT

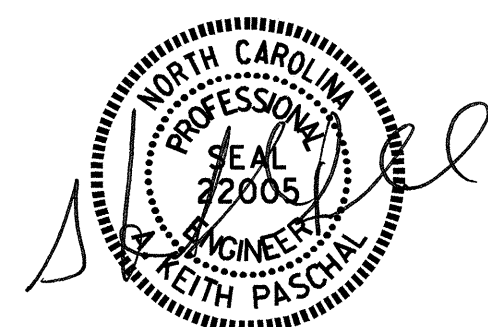


**LOCATION OF GUARDRAIL ANCHOR AT END POST**



PLAN

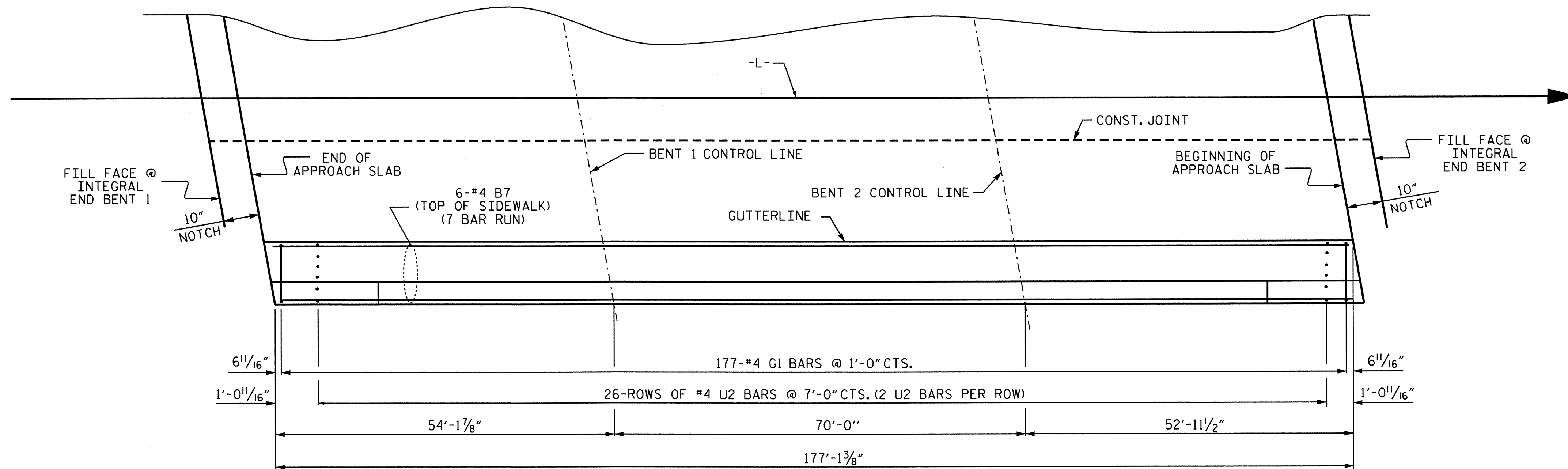
PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-



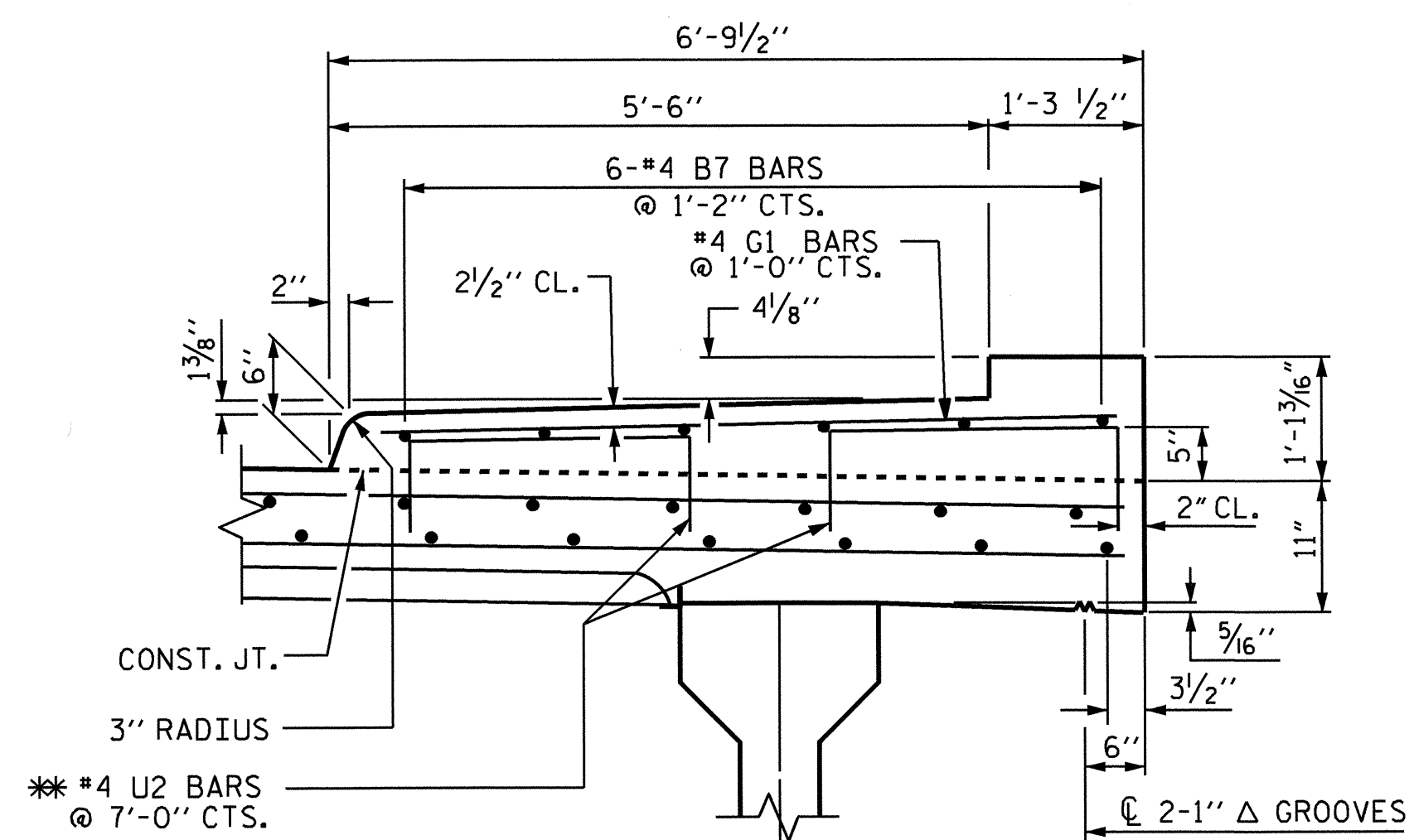
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
DETAILS  
FOR METAL RAILS

ASSEMBLED BY: B. N. BARODAWALA DATE: 11-15-11  
CHECKED BY: A. K. PASCHAL DATE: 12-6-11  
DRAWN BY: MAA 5/10  
CHECKED BY: GM 5/10

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-26	
1			3			TOTAL SHEETS	
2			4			45	



PLAN OF SIDEWALK



SECTION THRU SIDEWALK

\*\* U2 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES

FOR END POST DETAILS AND REINFORCING STEEL, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEETS.

THE SIDEWALK IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL IN SIDEWALKS SHALL BE EPOXY COATED.

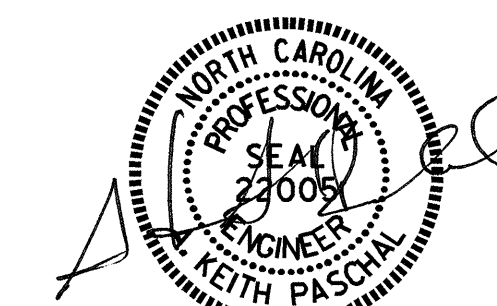
SIDEWALK REINFORCING STEEL AND CONCRETE ON BRIDGE SHALL BE INCLUDED IN THE PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".

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

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 SIDEWALK DETAILS



1-25-12

DRAWN BY : B. N. BARODAWALA DATE : 1-8-11  
 CHECKED BY : J. D. HAWK DATE : 9-15-11

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





NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

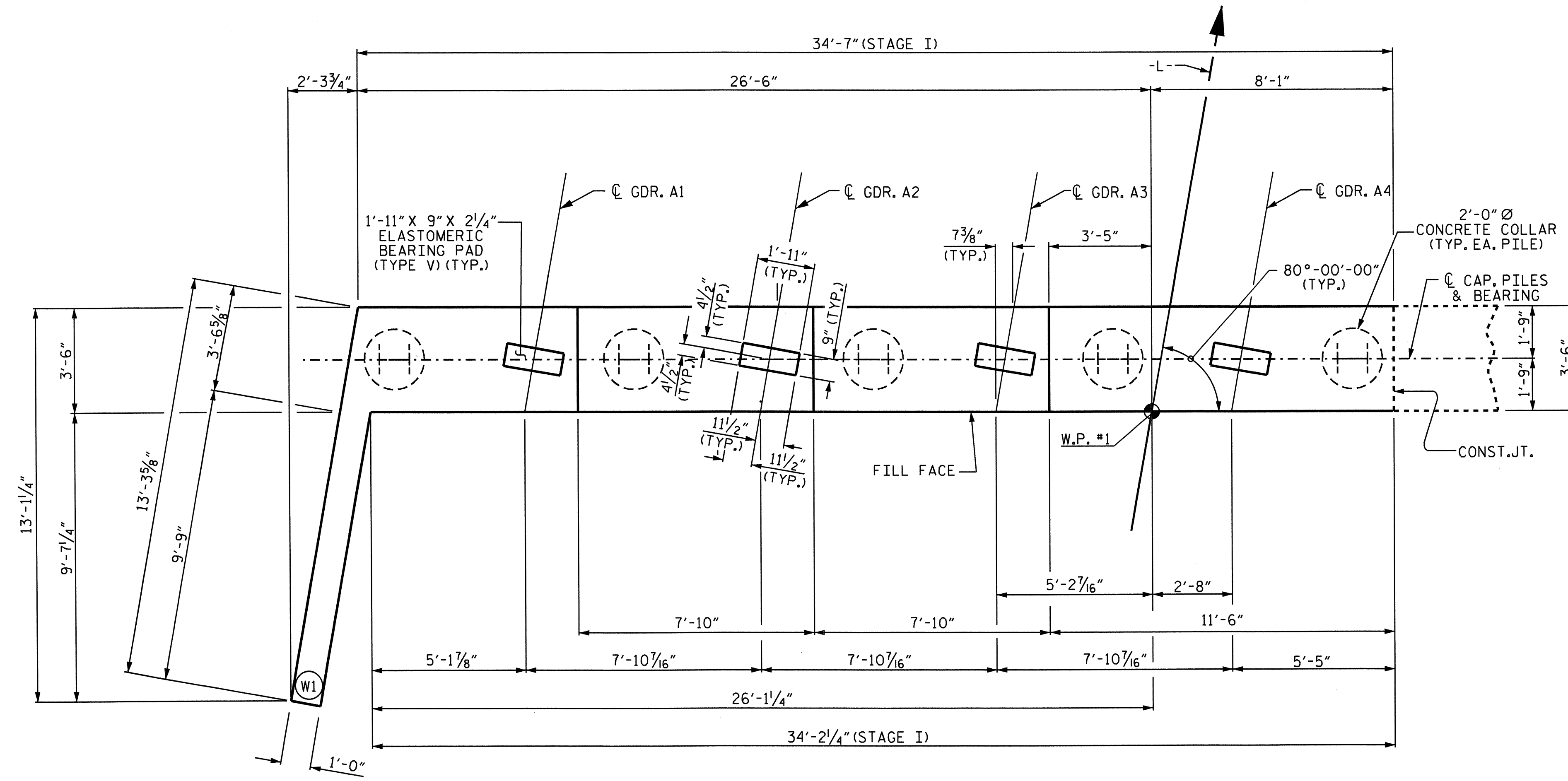
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED. FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

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

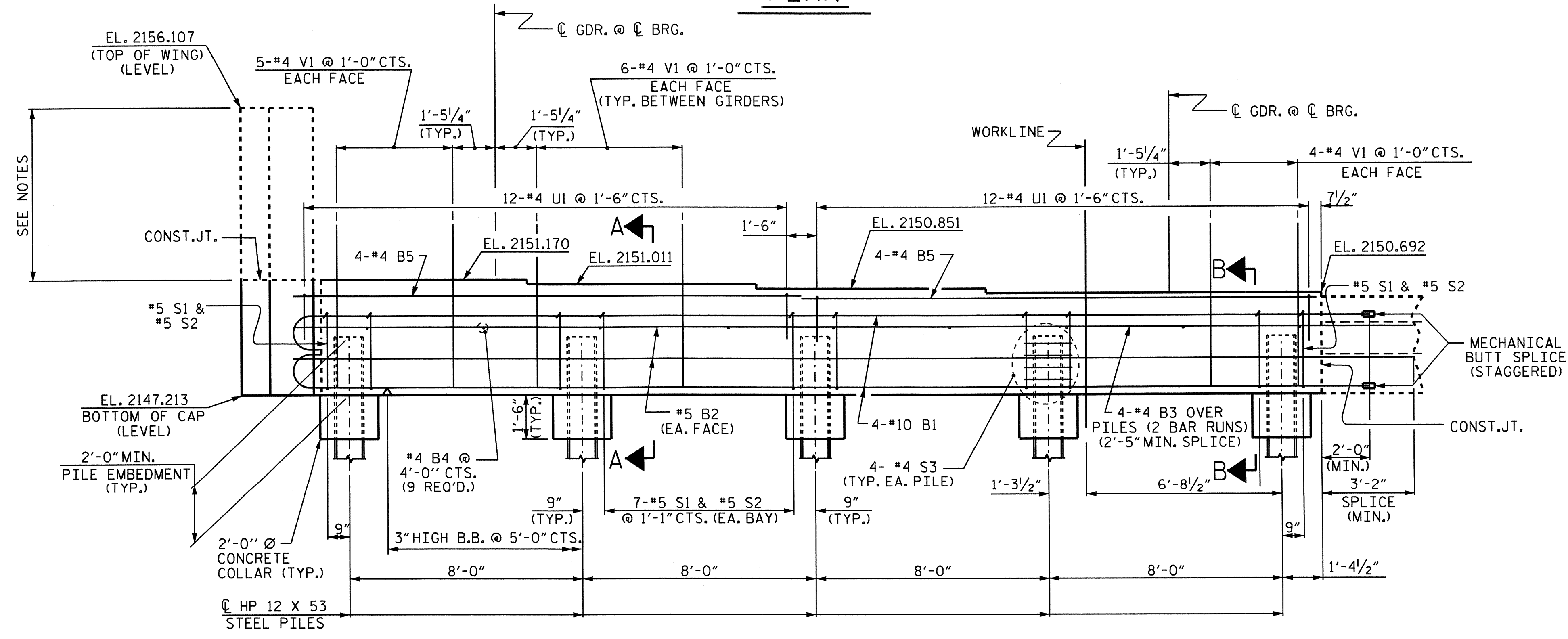
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT WING DETAILS.

FOR MECHANICAL BUTT SPLICING OF REINFORCING STEEL, SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE OUTSIDE 4" AND THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



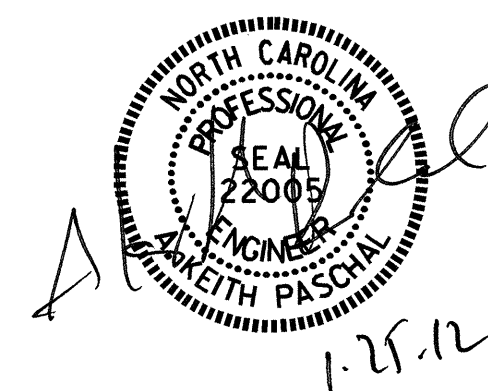
PLAN



ELEVATION

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 1 OF 4

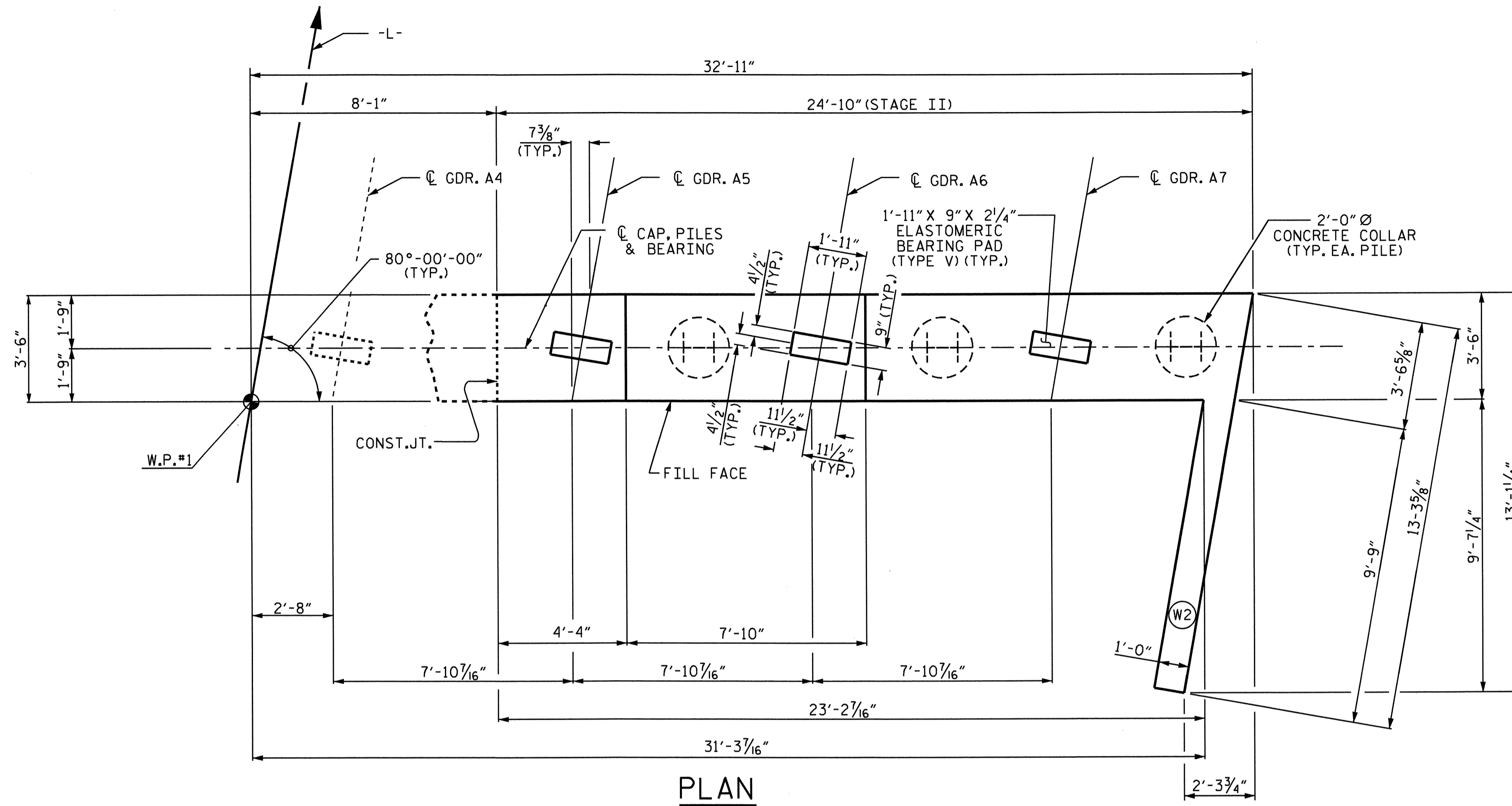
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 1  
 (STAGE I)



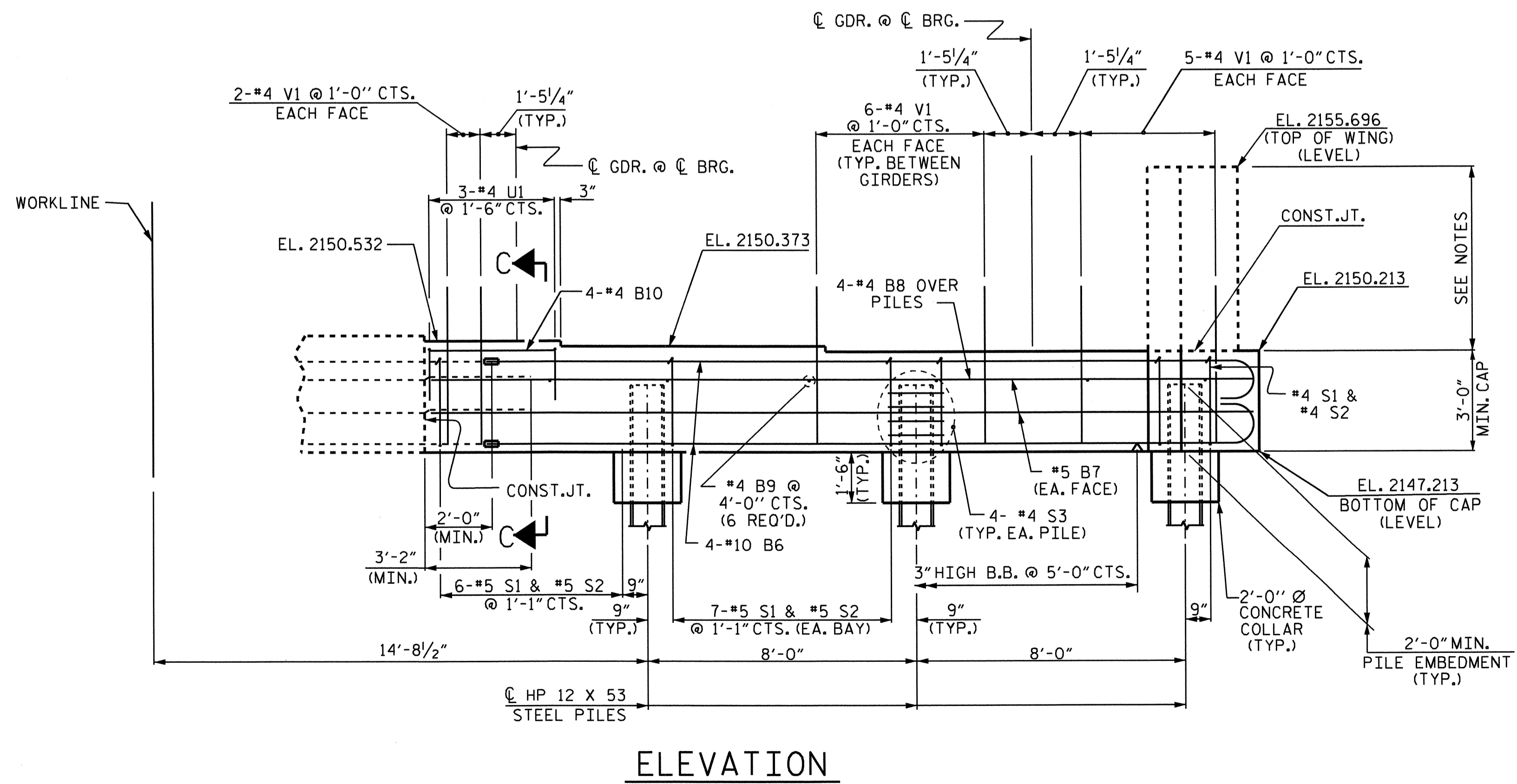
DRAWN BY : J. G. KHARVA DATE : 04/05/11  
 CHECKED BY : B. N. BARODAWALA DATE : 09/09/11

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





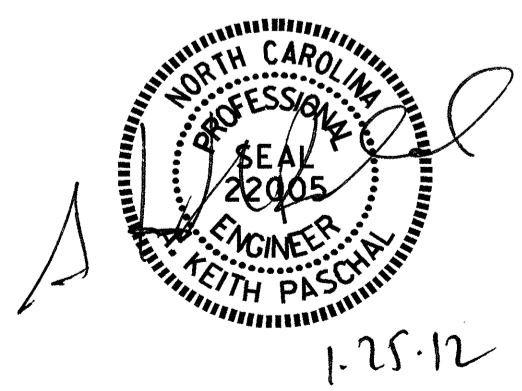
PLAN



ELEVATION

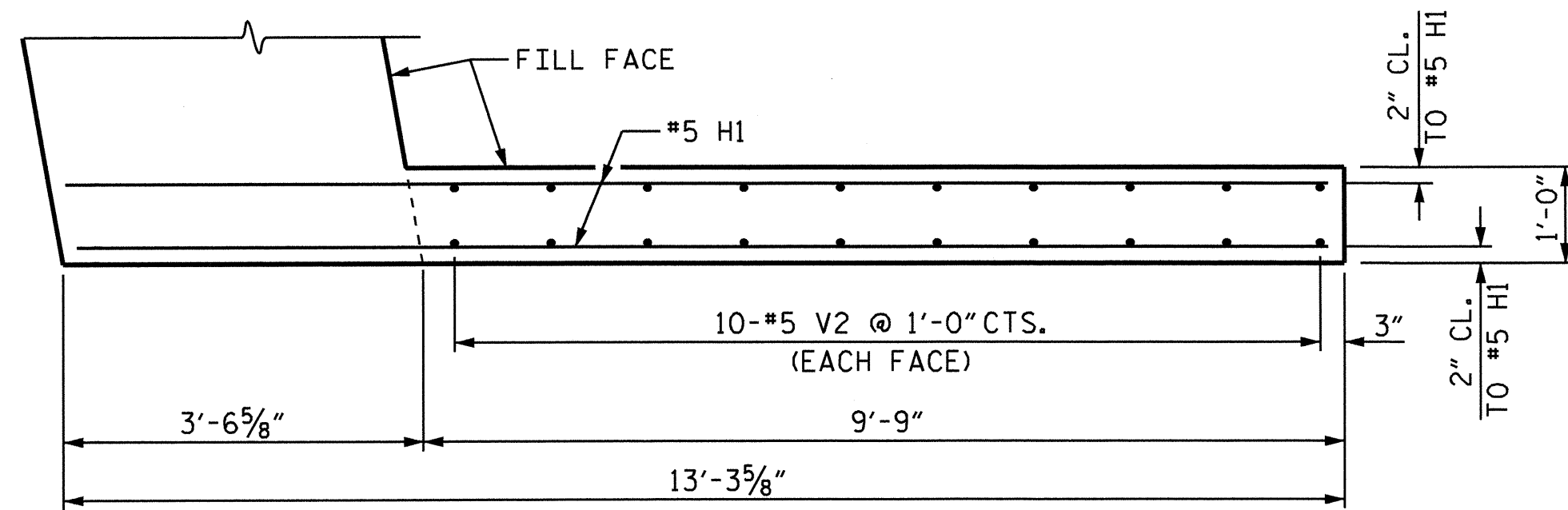
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT 1 (STAGE II)					
REVISIONS					
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1			3		
2			4		
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					TOTAL SHEETS 45

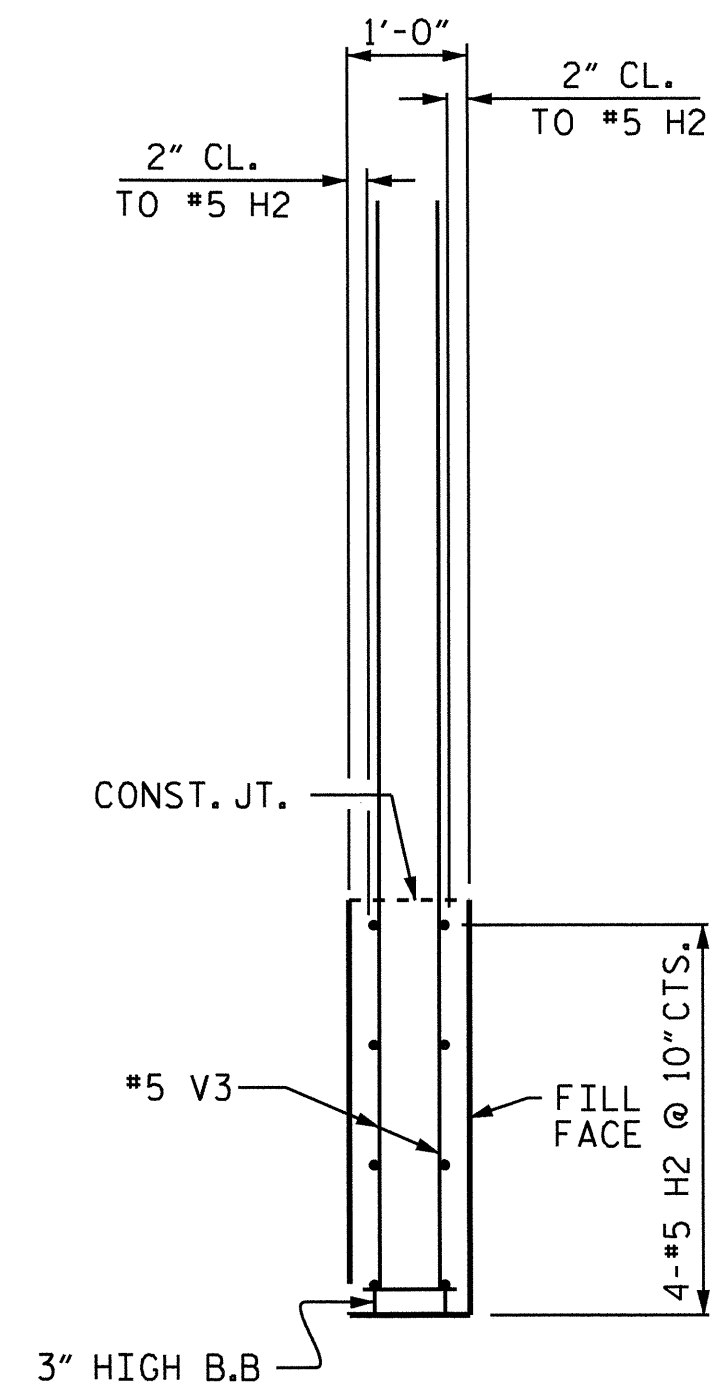


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 CHECKED BY : B. N. BARODAWALA DATE : 09/09/11

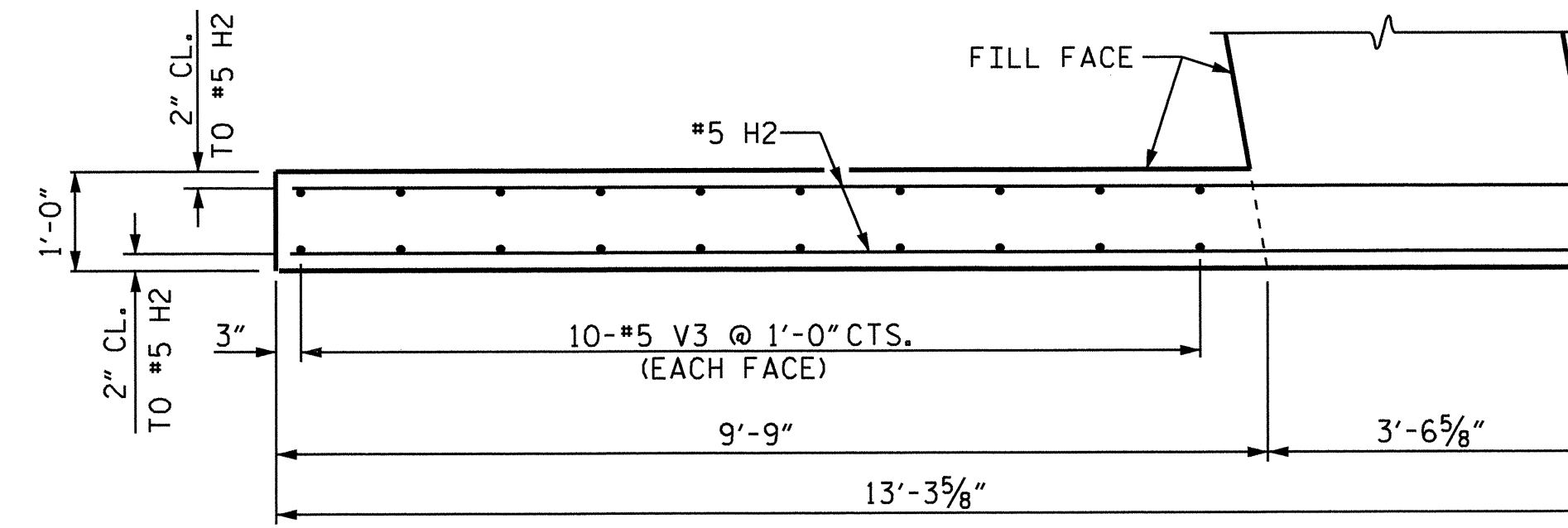
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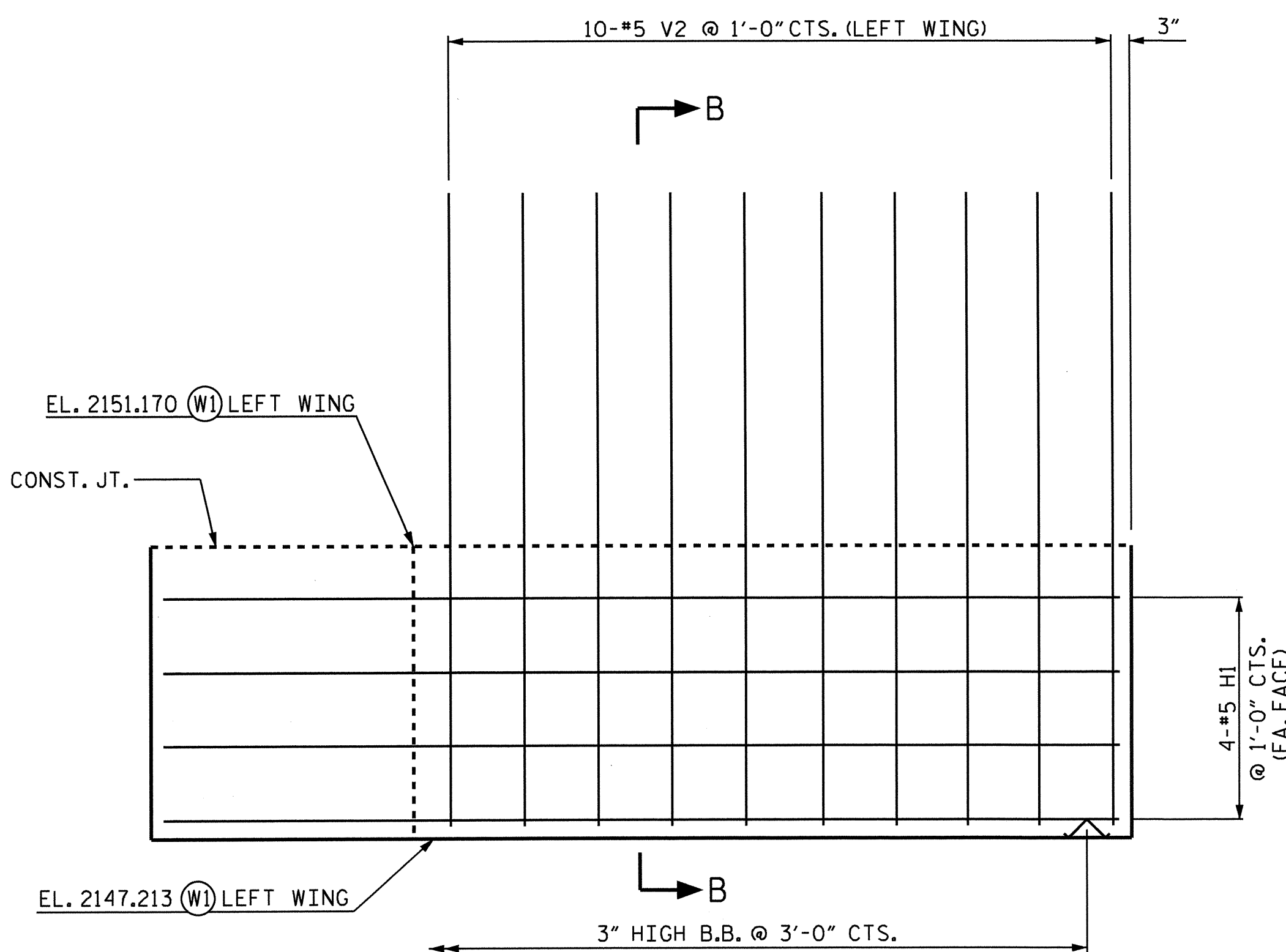
PLAN (W1)  
LEFT WING (STAGE I)



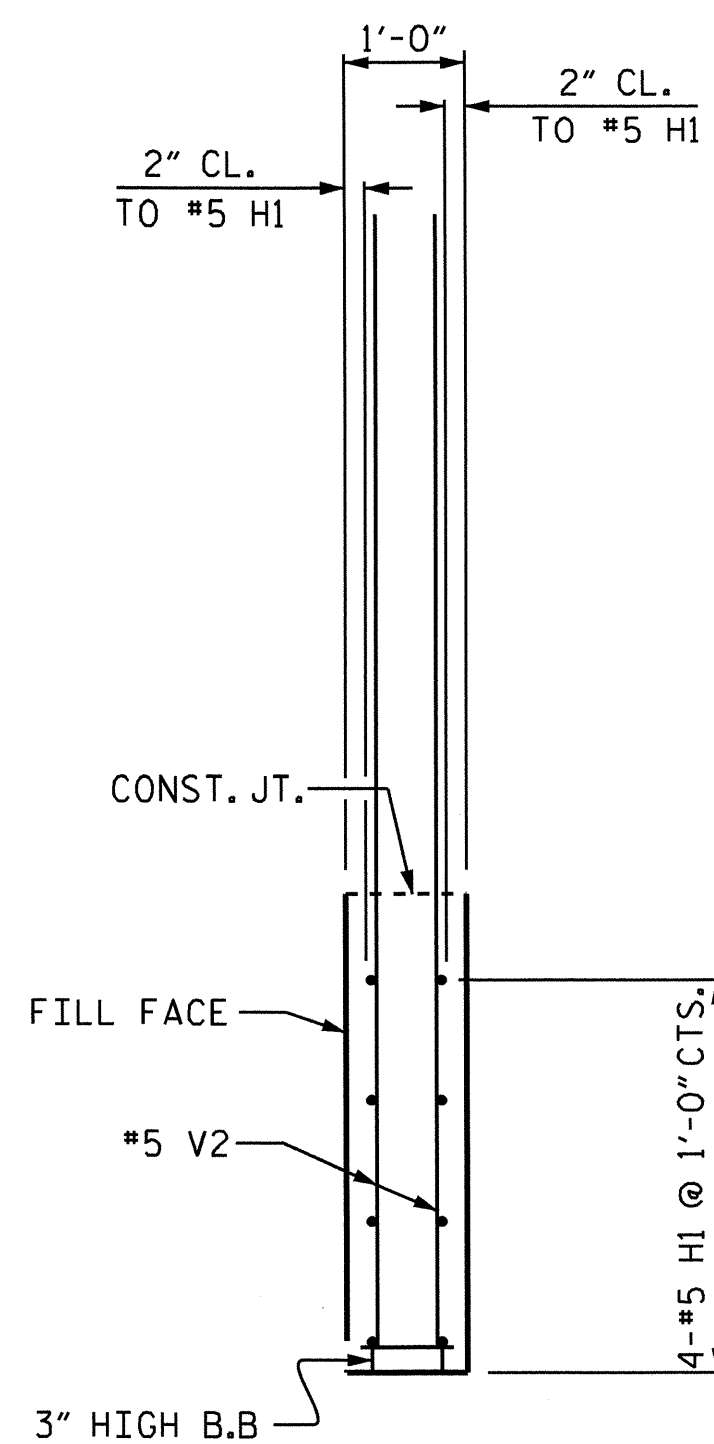
SECTION C-C  
RIGHT WING (STAGE II)



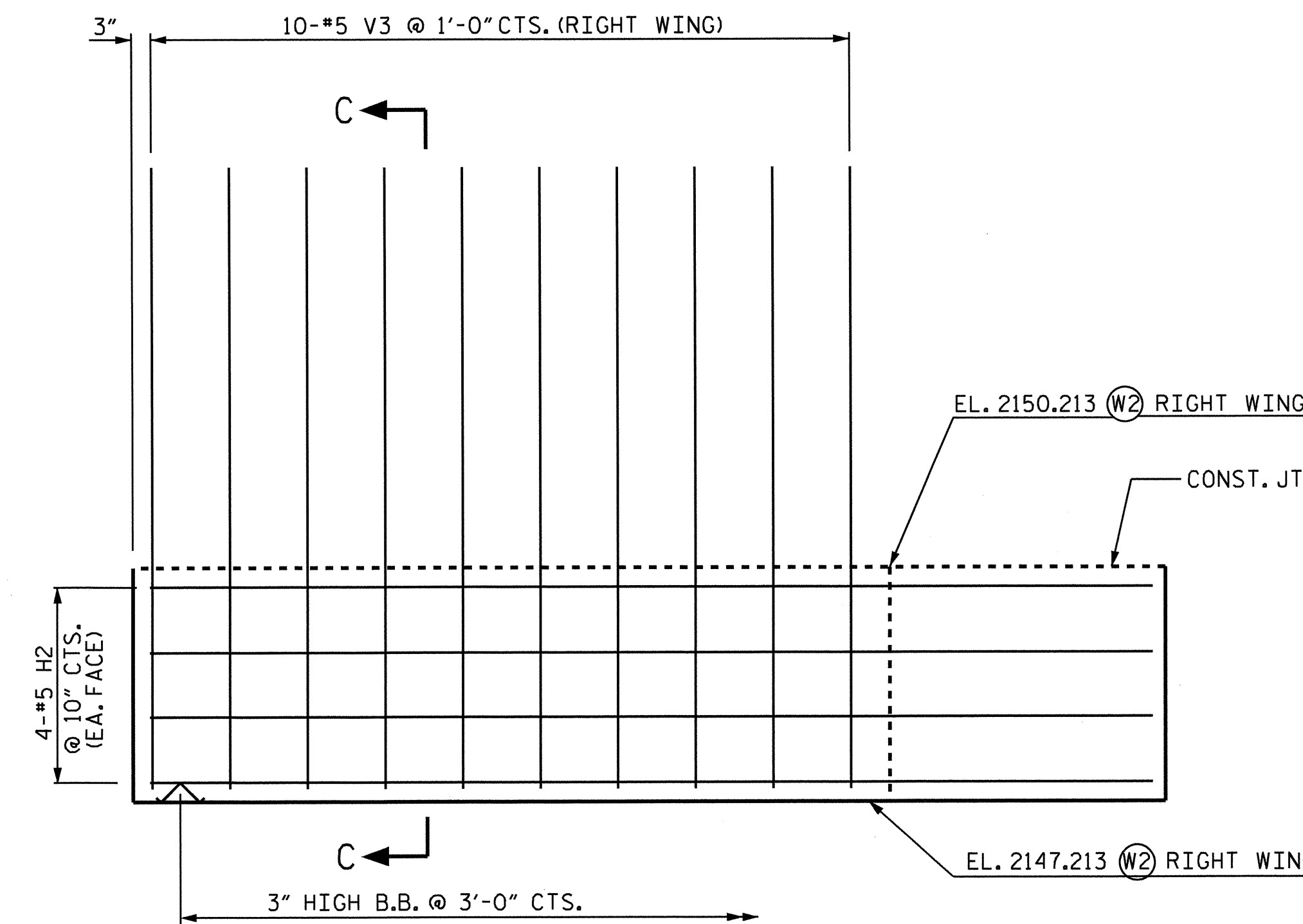
PLAN (W2)  
RIGHT WING (STAGE II)



ELEVATION (W1)  
LEFT WING (STAGE I)



SECTION B-B  
LEFT WING (STAGE I)



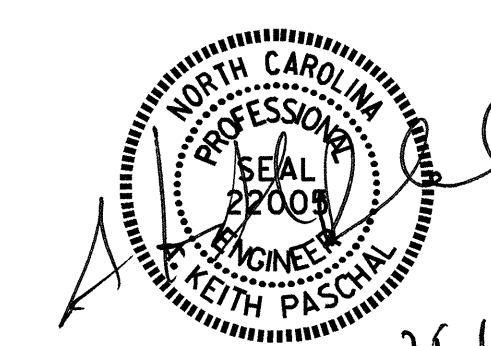
ELEVATION (W2)  
RIGHT WING (STAGE II)

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
INTEGRAL END BENT 1  
(STAGE I & II)

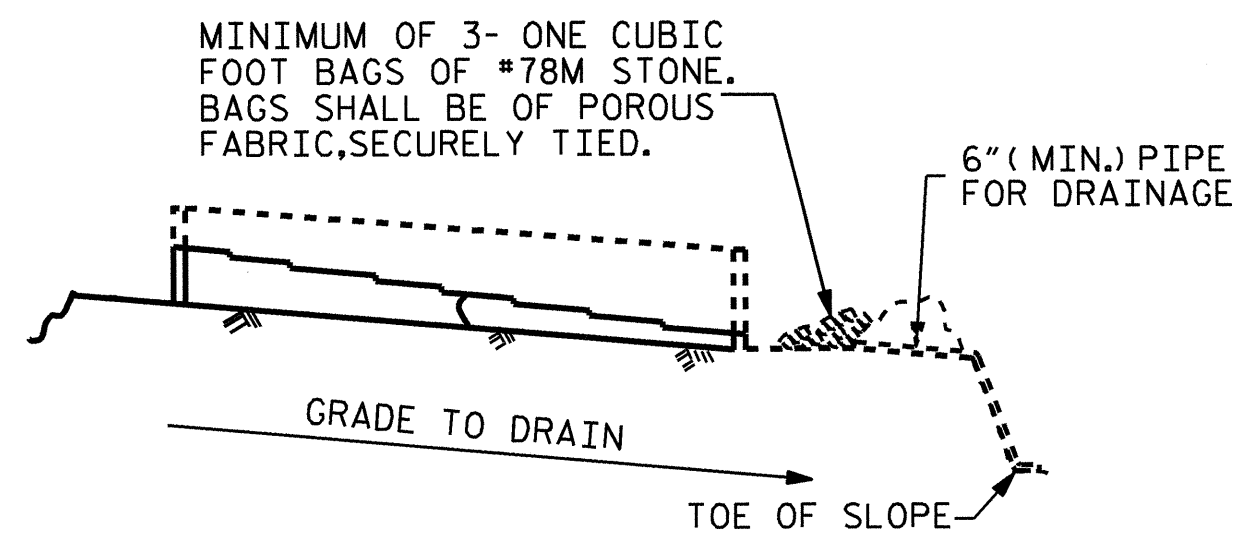


DRAWN BY : J. G. KHARVA DATE : 4/6/11  
CHECKED BY : B. N. BARODAWALA DATE : 9/9/11

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31	
1			3			TOTAL	45
2			4			SHEETS	



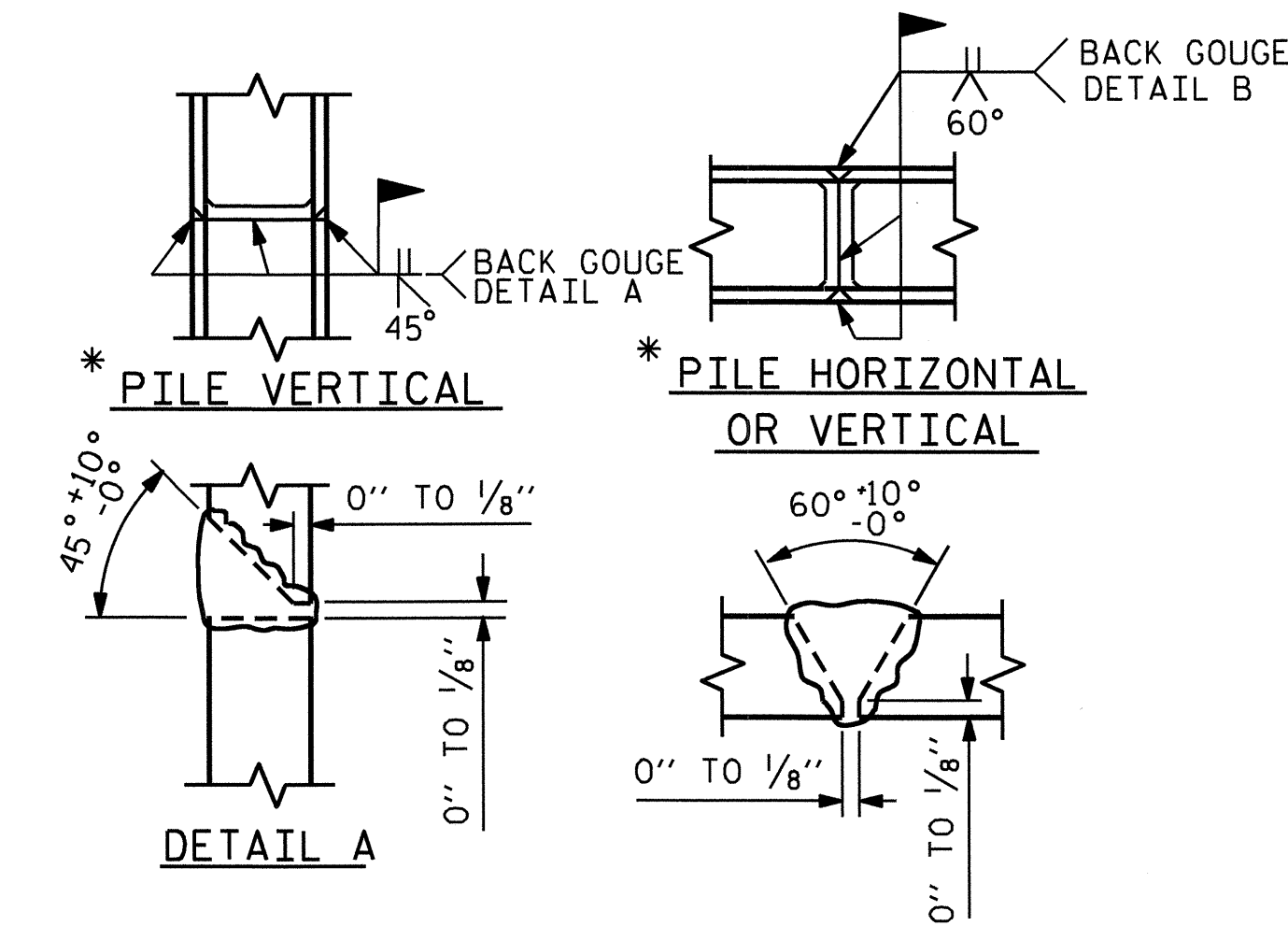


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

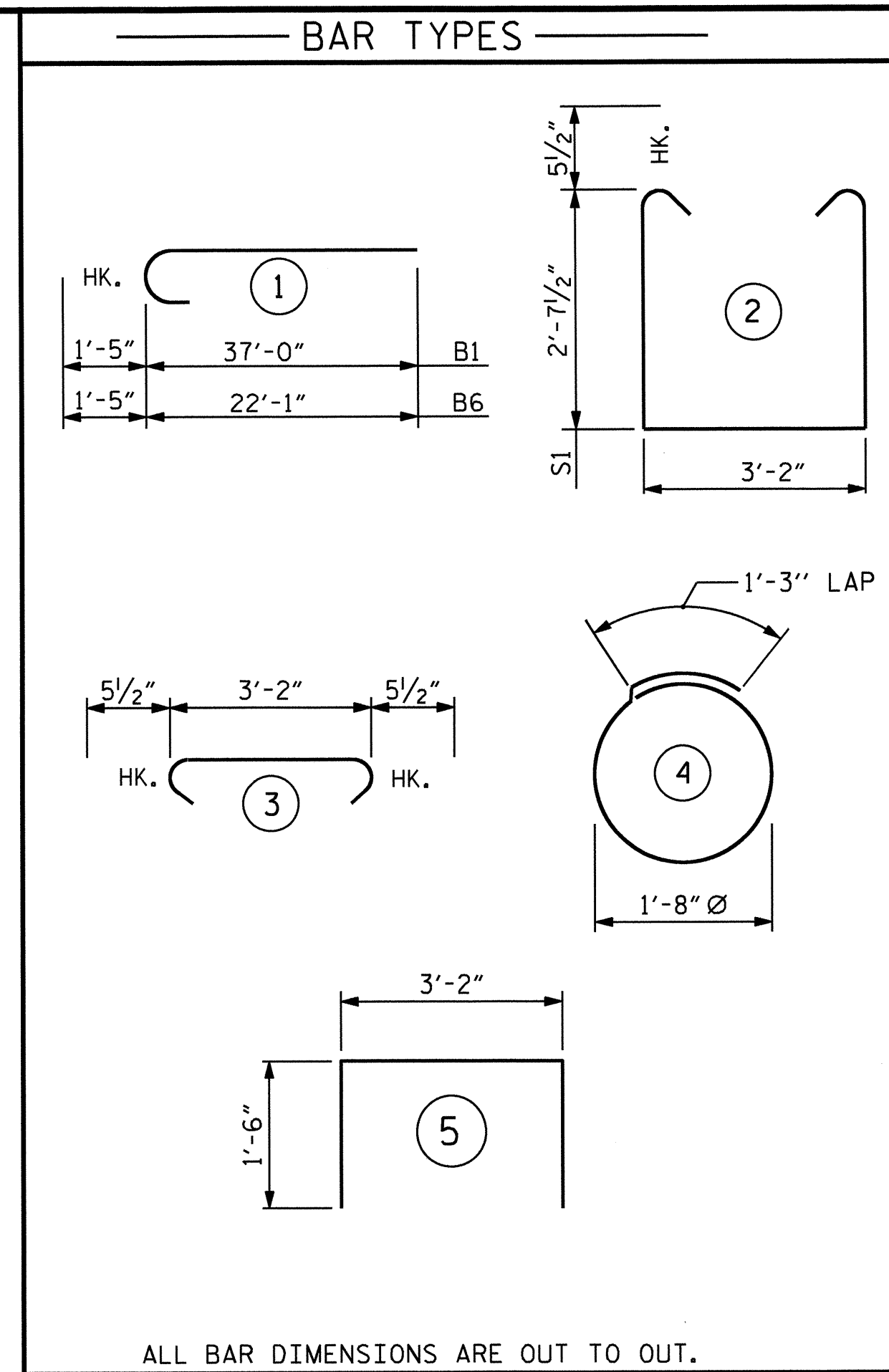
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



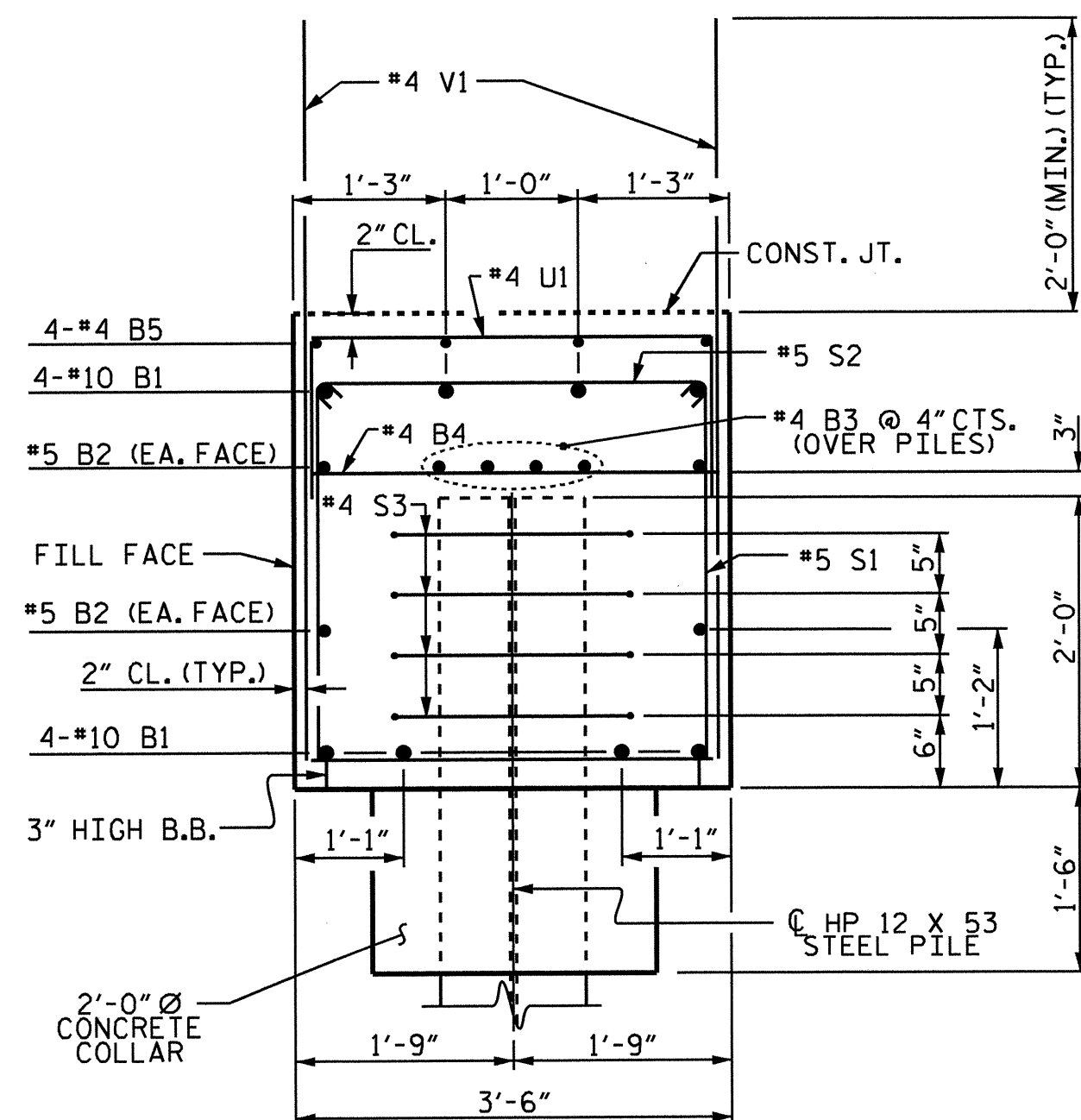
\* POSITION OF PILE DURING WELDING. DETAIL B

### PILE SPLICE DETAILS

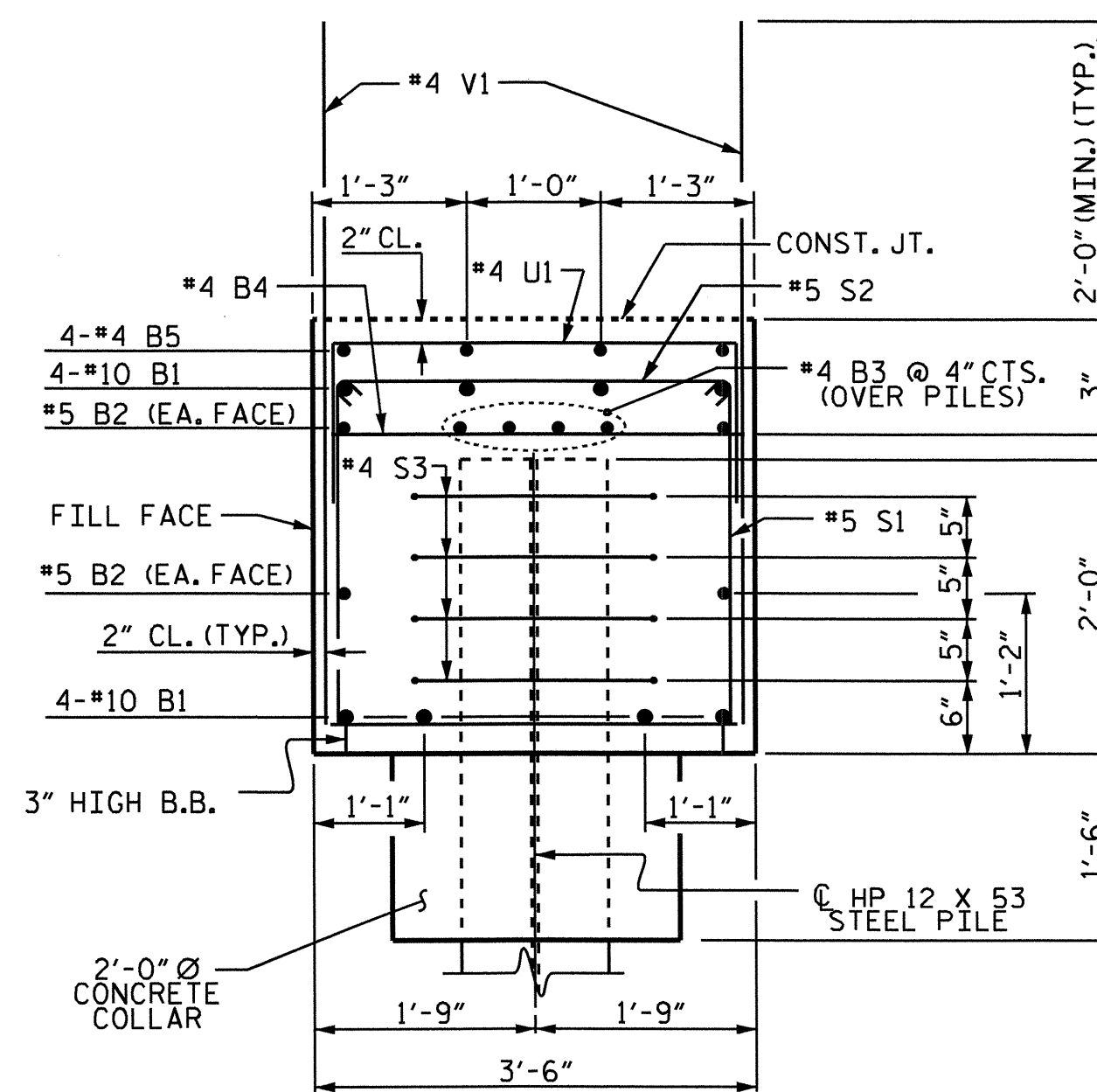


ALL BAR DIMENSIONS ARE OUT TO OUT.

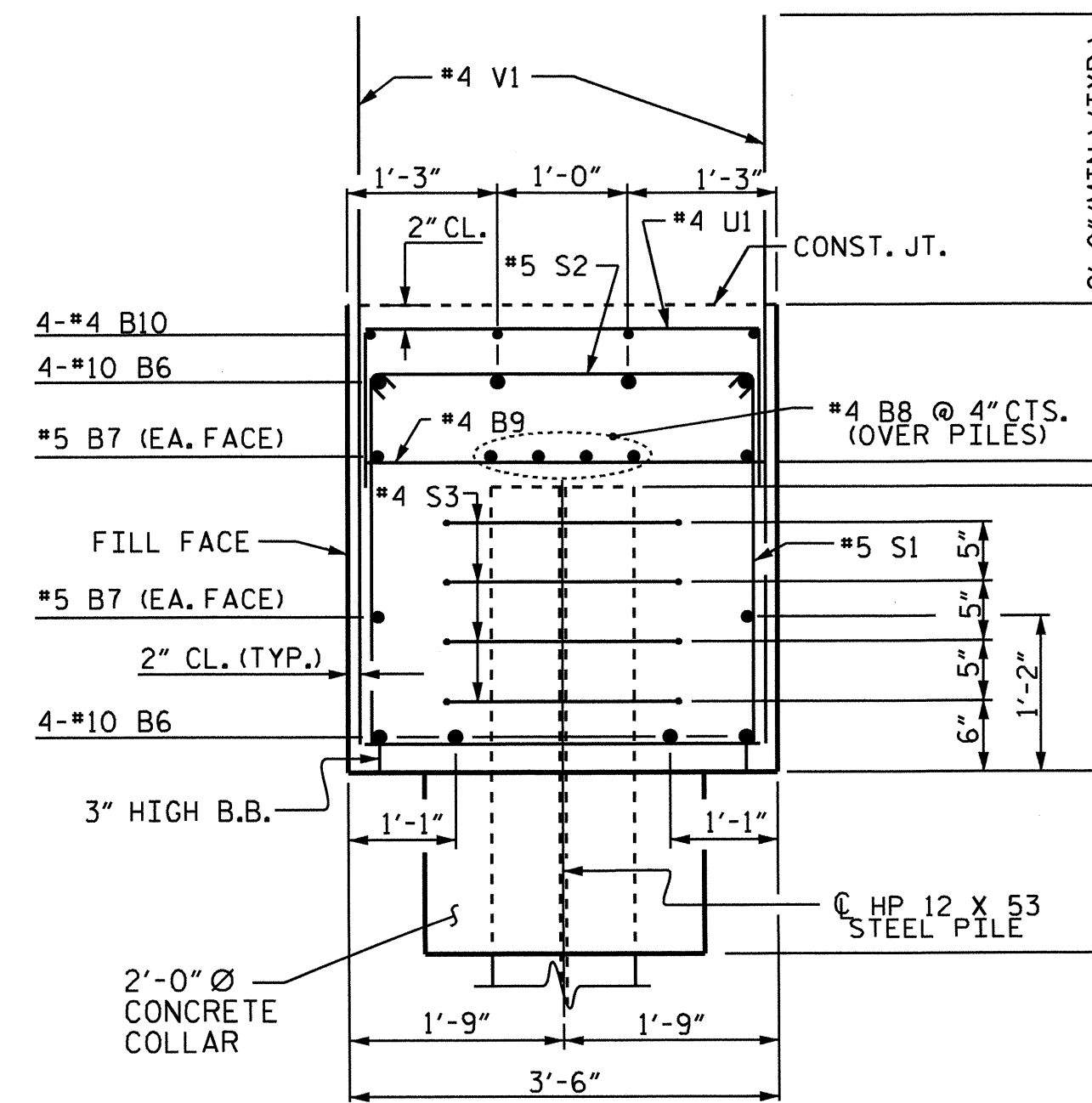
BILL OF MATERIAL					BILL OF MATERIAL						
INTEGRAL END BENT 1 (STAGE I)					INTEGRAL END BENT 1 (STAGE II)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	38'-5"	1322	B6	8	#10	1	23'-6"	809
B2	4	#5	STR	38'-2"	159	B7	4	#5	STR	23'-11"	100
B3	8	#4	STR	19'-11"	106	B8	4	#4	STR	23'-11"	64
B4	9	#4	STR	3'-2"	19	B9	6	#4	STR	3'-2"	13
B5	8	#4	1	17'-8"	94	B10	4	#4	STR	4'-0"	11
H1	8	#5	STR	13'-0"	108	H2	8	#5	STR	12'-10"	107
S1	30	#5	2	9'-4"	292	S1	21	#5	2	9'-4"	204
S2	30	#5	3	4'-1"	128	S2	21	#5	3	4'-1"	89
S3	20	#4	3	6'-6"	87	S3	12	#4	3	6'-6"	52
U1	24	#4	5	6'-2"	99	U1	3	#4	5	6'-2"	12
V1	54	#4	STR	5'-9"	207	V1	38	#4	STR	5'-9"	146
V2	20	#5	STR	8'-5"	176	V3	20	#5	STR	8'-0"	167
REINFORCING STEEL = 2797 LBS					REINFORCING STEEL = 1774 LBS						
CLASS A CONCRETE (CAP, CONCRETE COLLAR AND LOWER PART OF WINGS) 19.0 CU.YDS.					CLASS A CONCRETE (CAP, CONCRETE COLLAR AND LOWER PART OF WINGS) 11.4 CU.YDS.						
HP 12 x 53 STEEL PILES NO. 5 300 FT.					HP 12 x 53 STEEL PILES NO. 3 180 FT.						
<b>SUMMARY FOR STAGE I &amp; STAGE II</b>											
REINFORCING STEEL = 4571 LBS					REINFORCING STEEL = 4571 LBS						
CLASS A CONCRETE = 30.4 CU.YDS.					CLASS A CONCRETE = 30.4 CU.YDS.						
HP 12 x 53 STEEL PILES NO. 8 = 480 FT.					HP 12 x 53 STEEL PILES NO. 8 = 480 FT.						



SECTION A-A  
(STAGE I)

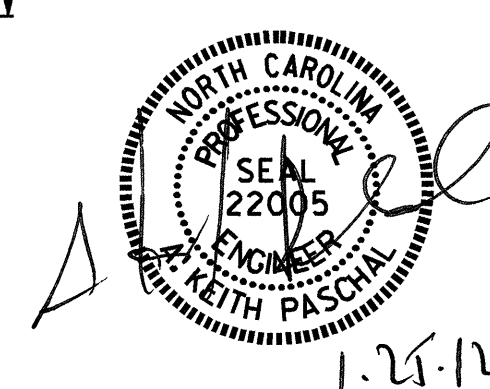


SECTION B-B  
(STAGE I)



SECTION C-C  
(STAGE II)

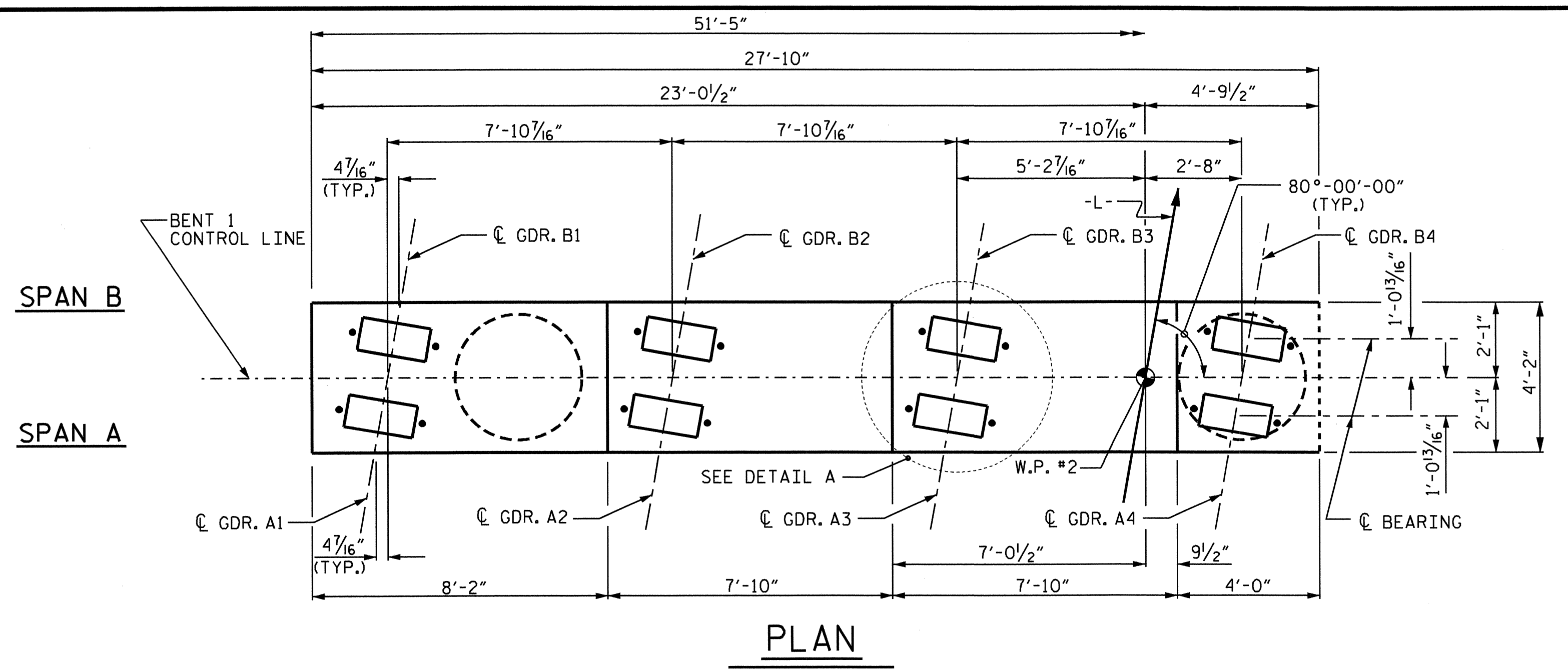
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 4 OF 4



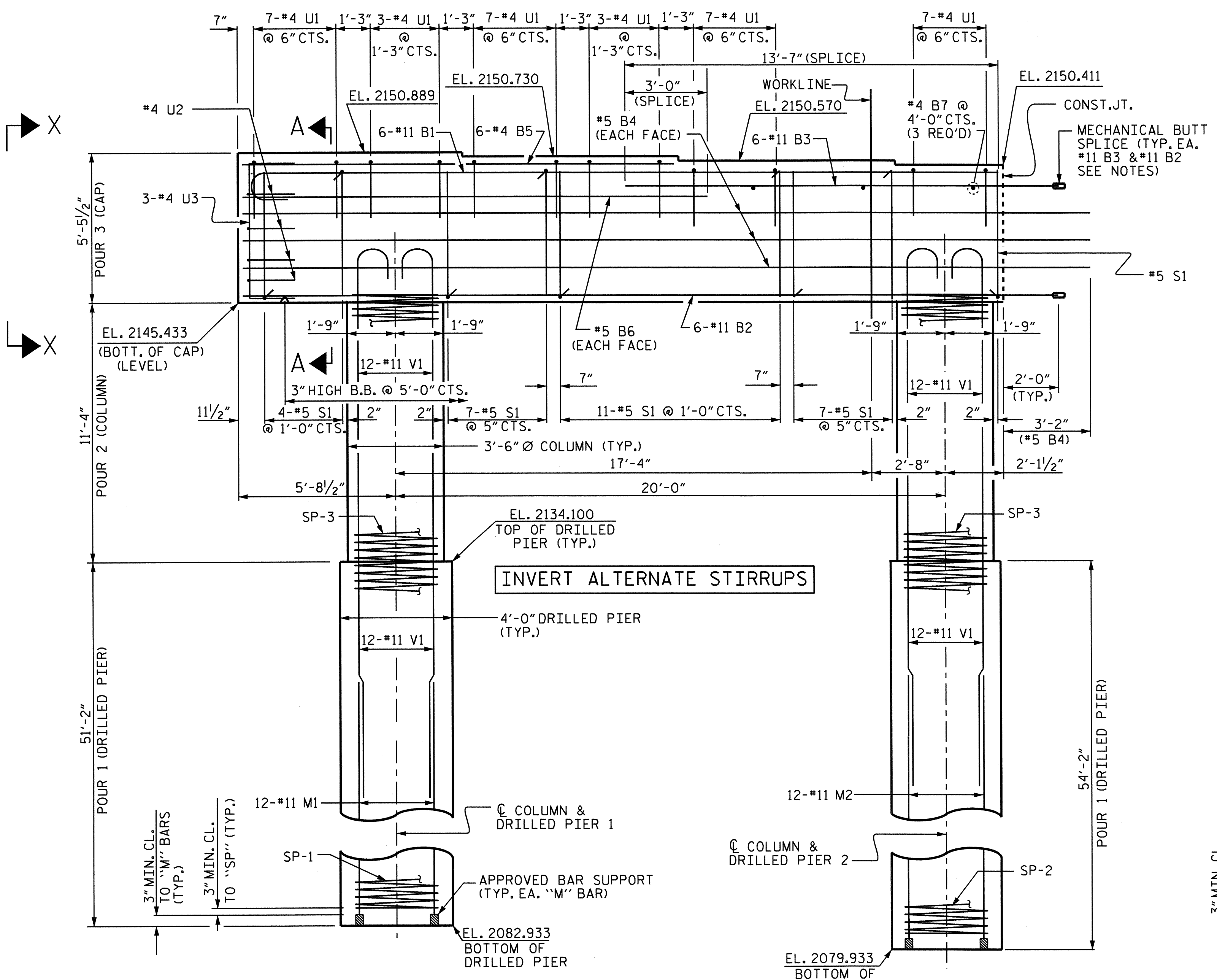
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 1  
 (STAGE I & II)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32	
1			3			TOTAL SHEETS	45
2			4				

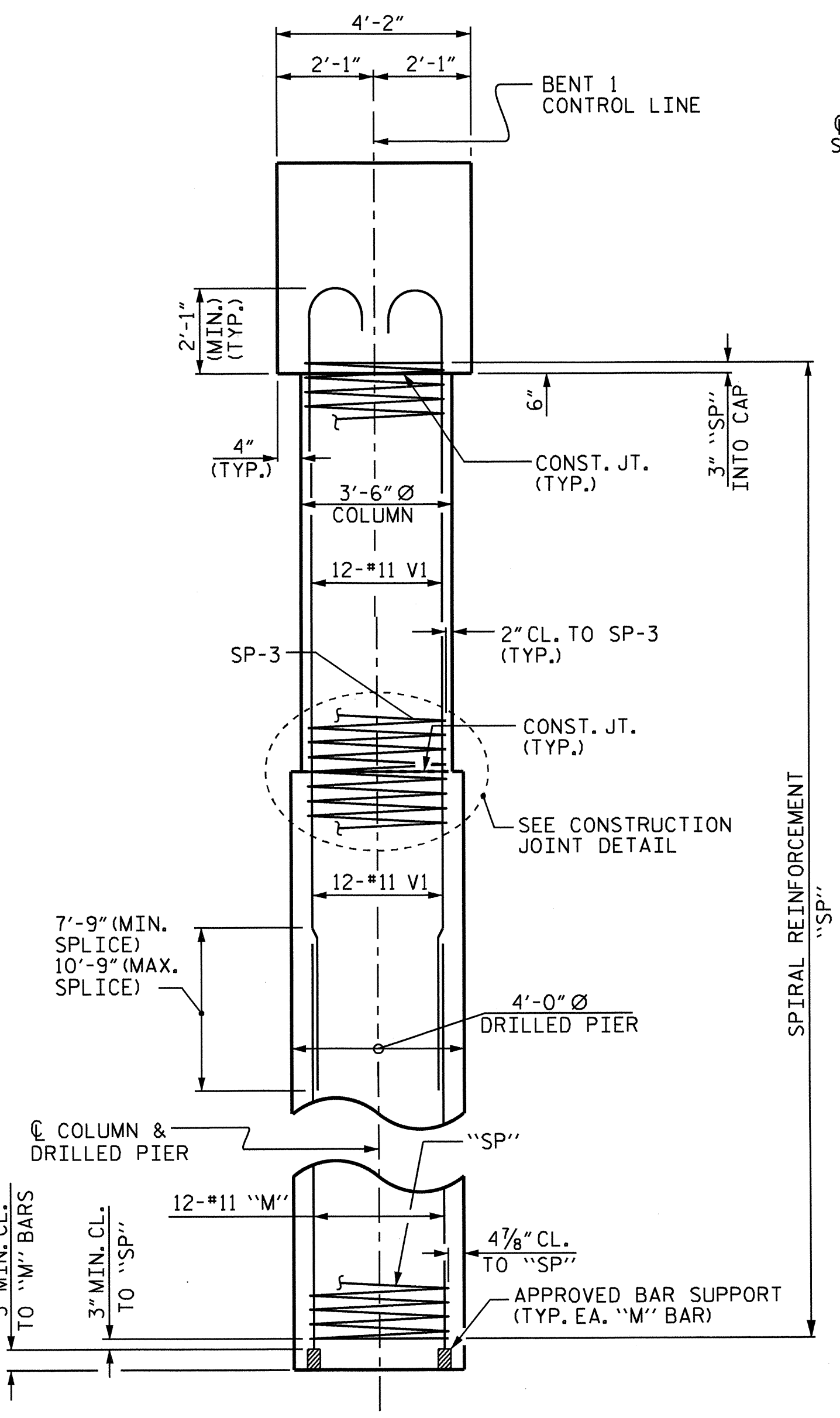
DRAWN BY: J. G. KHARVA DATE: 4/6/11  
 CHECKED BY: B. N. BARODAWALA DATE: 9/9/11



PLAN



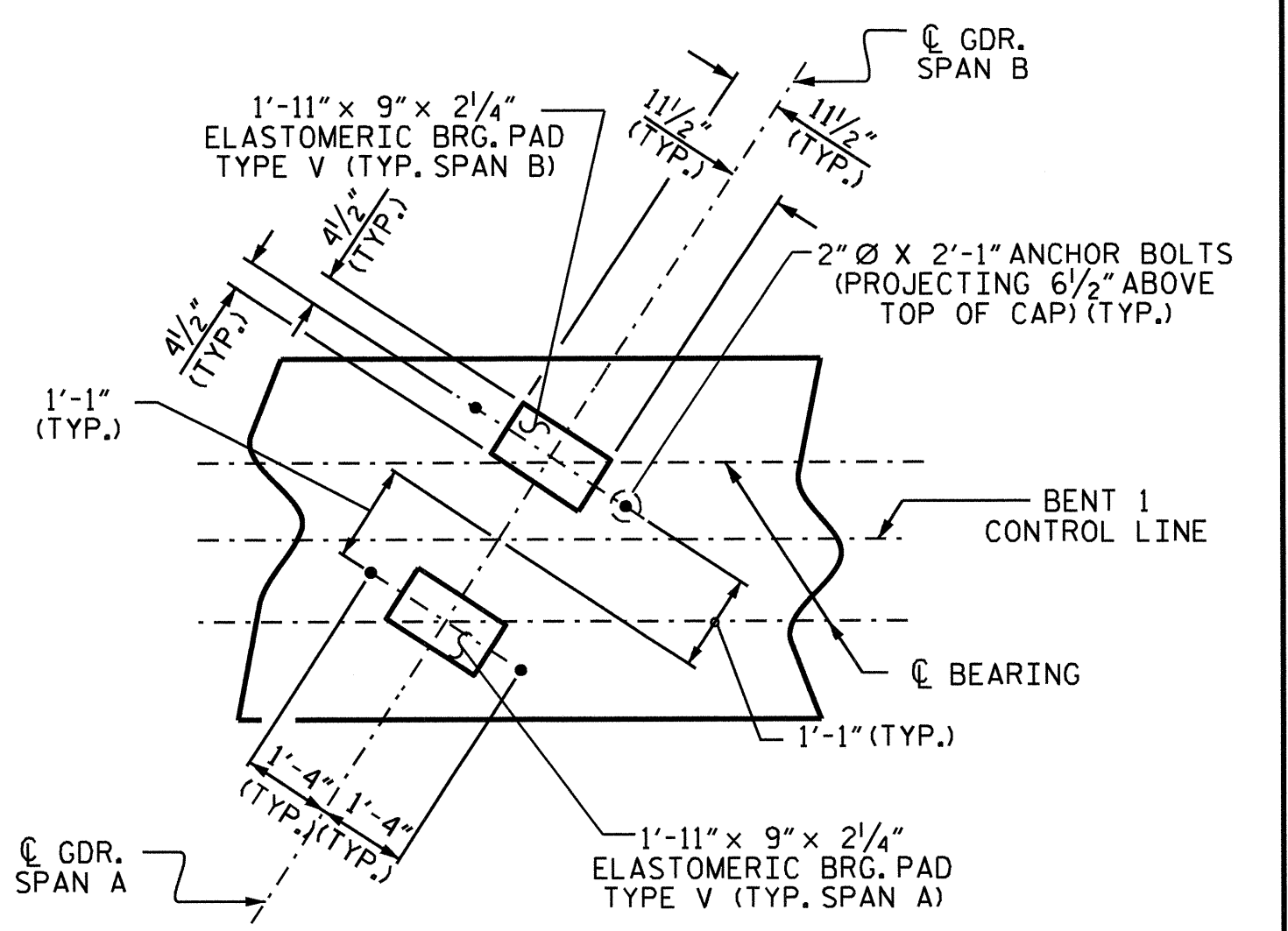
ELEVATION



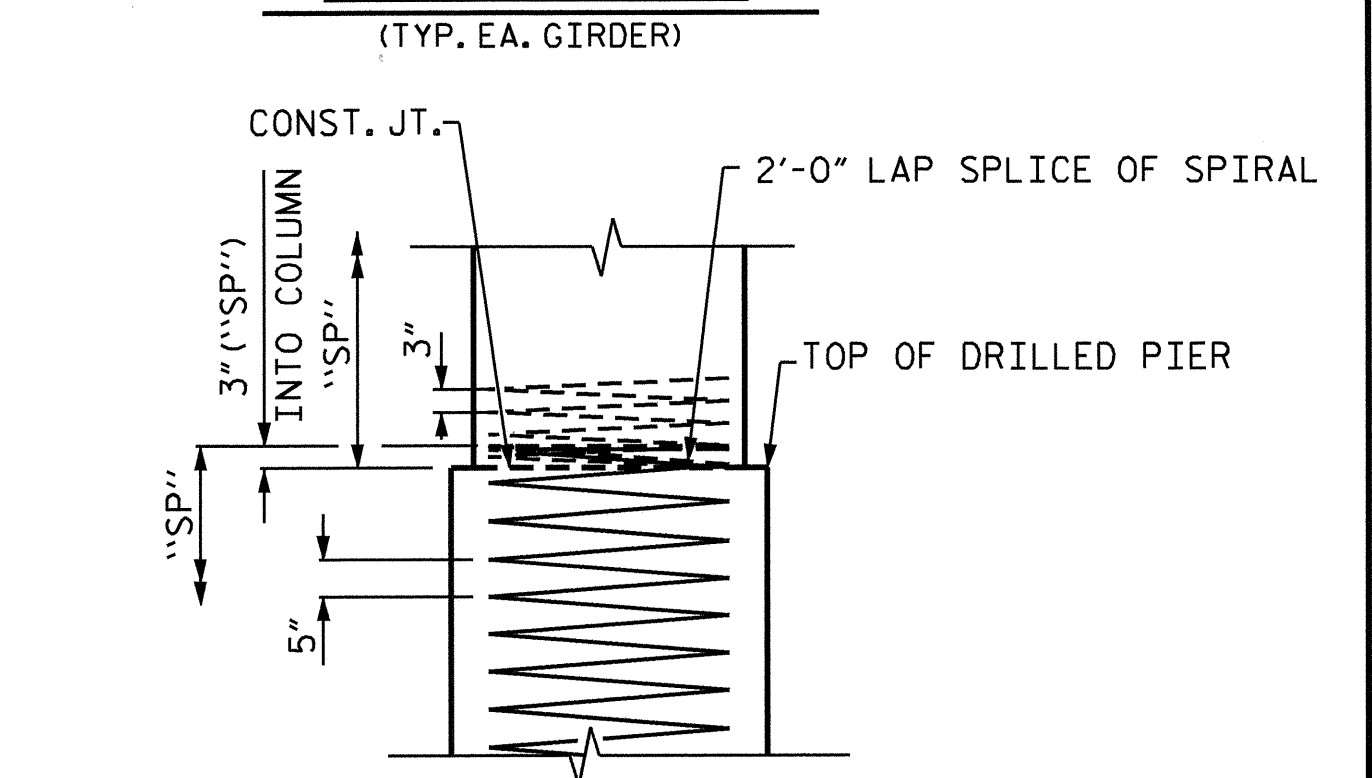
END ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON VI 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.  
 NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.  
 FOR MECHANICAL BUTT SPlicing OF REINFORCING STEEL. SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.



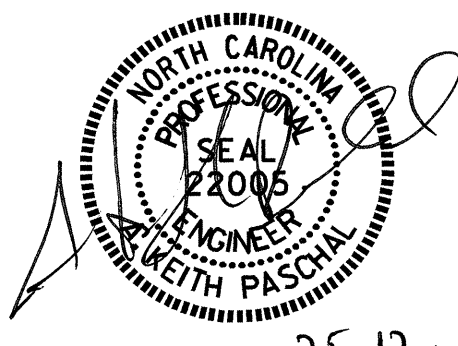
DETAIL A



CONSTRUCTION JOINT DETAIL

PROJECT NO. B-3480  
 JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 (STAGE I)



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS 45	
2			4				

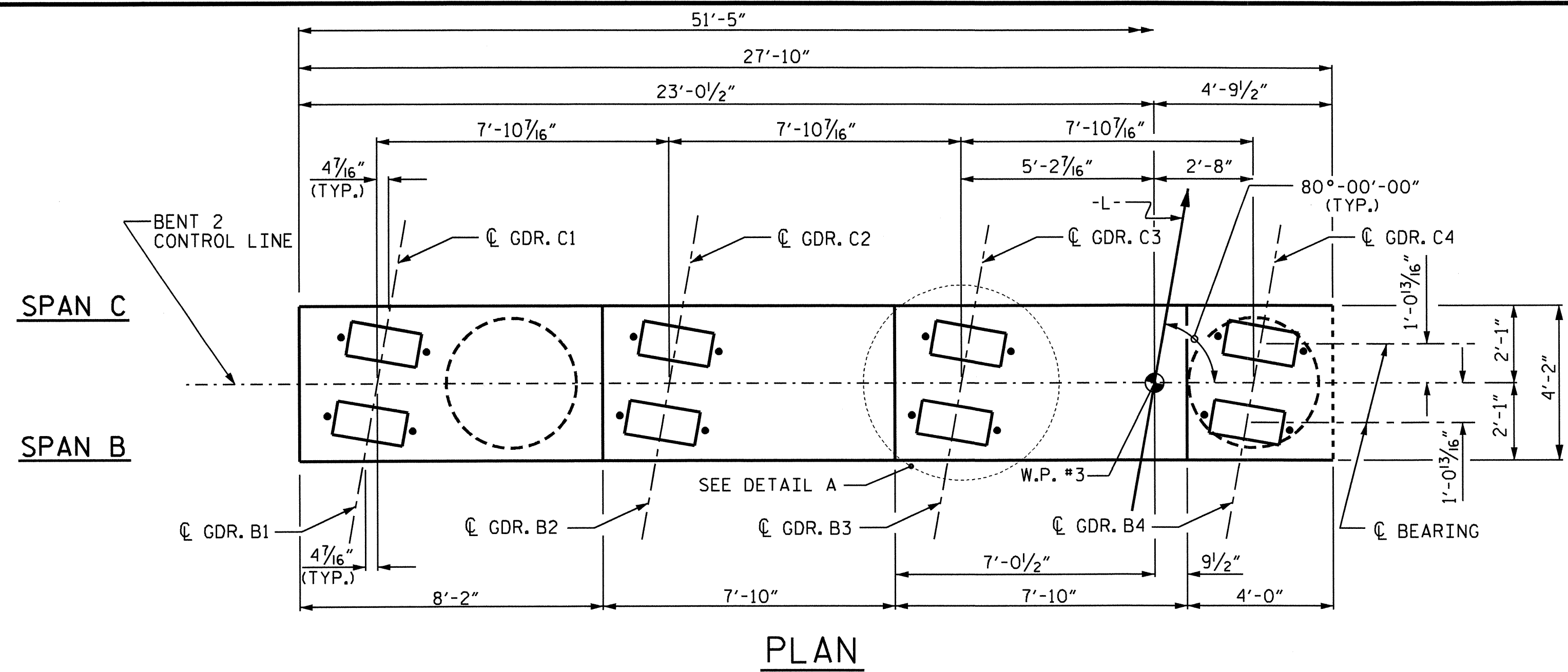
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 CHECKED BY : J. MYA DATE : 07-28-11



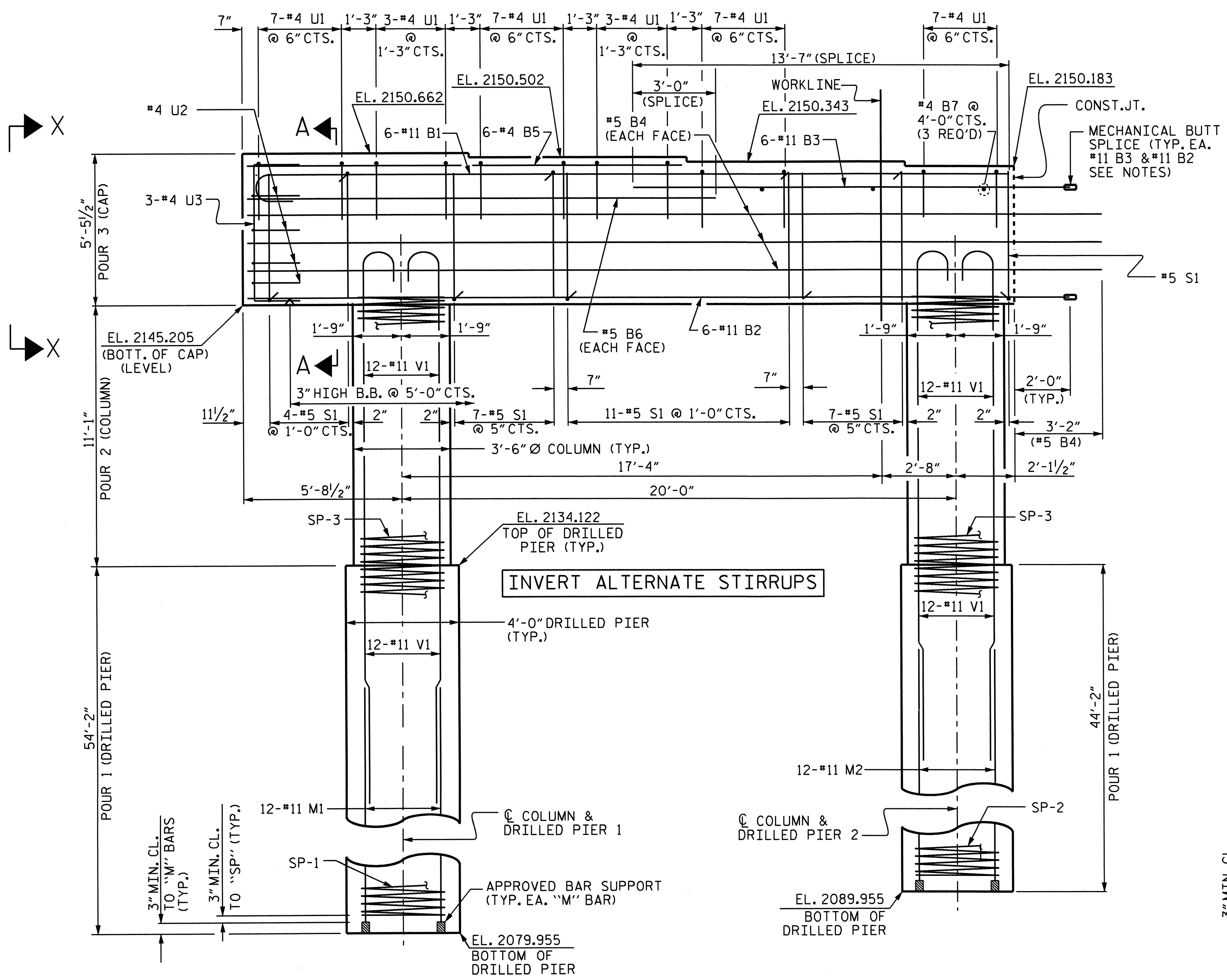




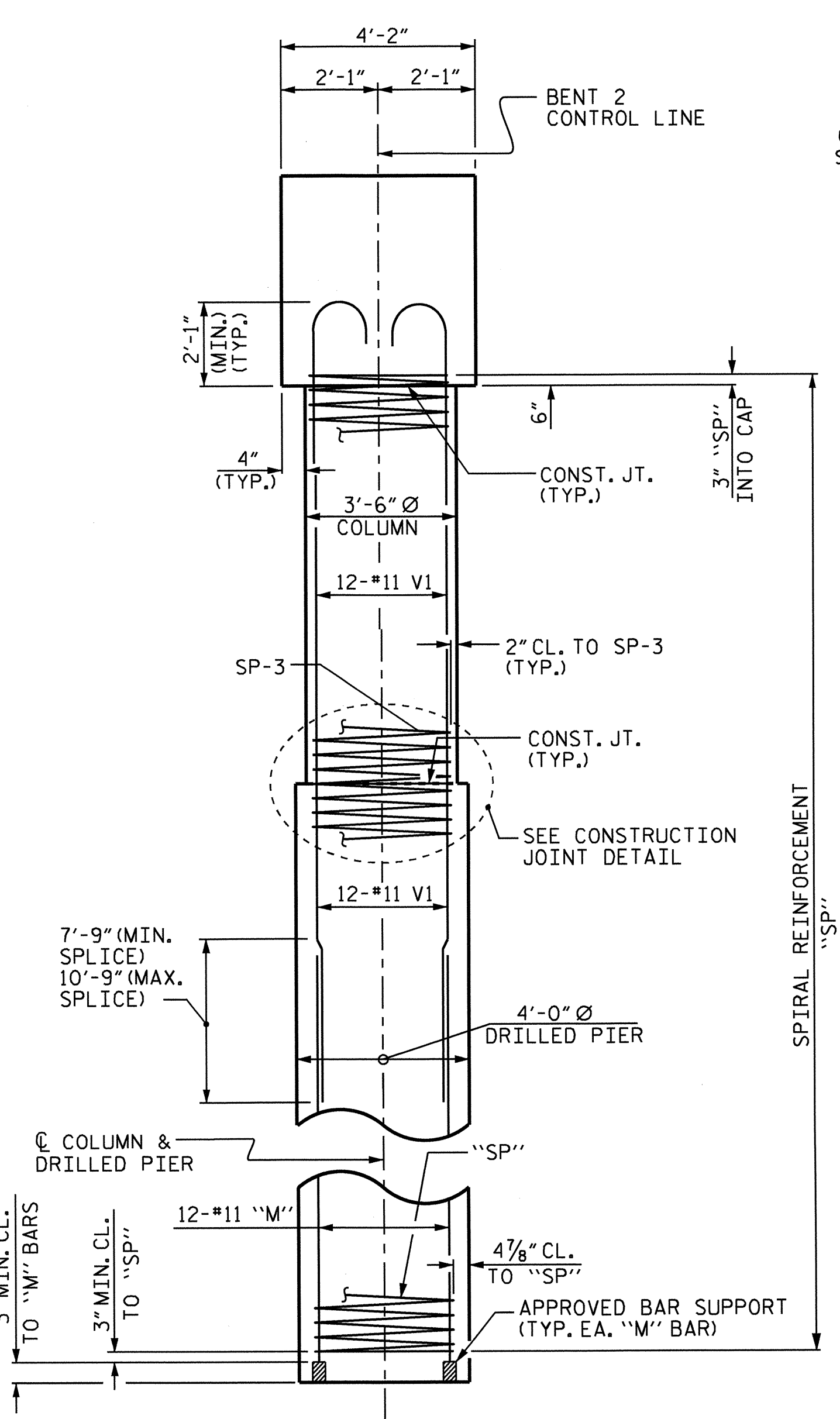




PLAN



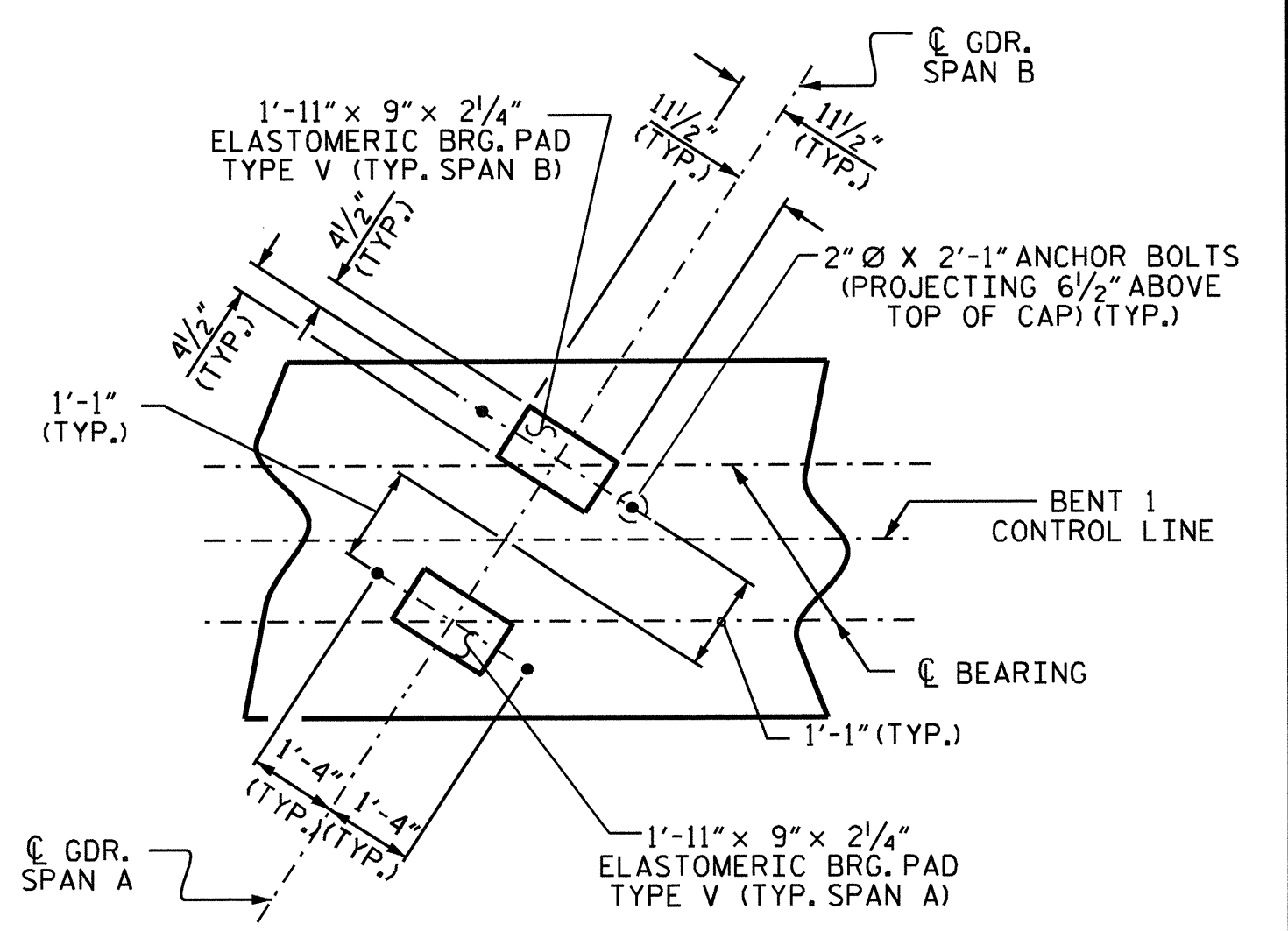
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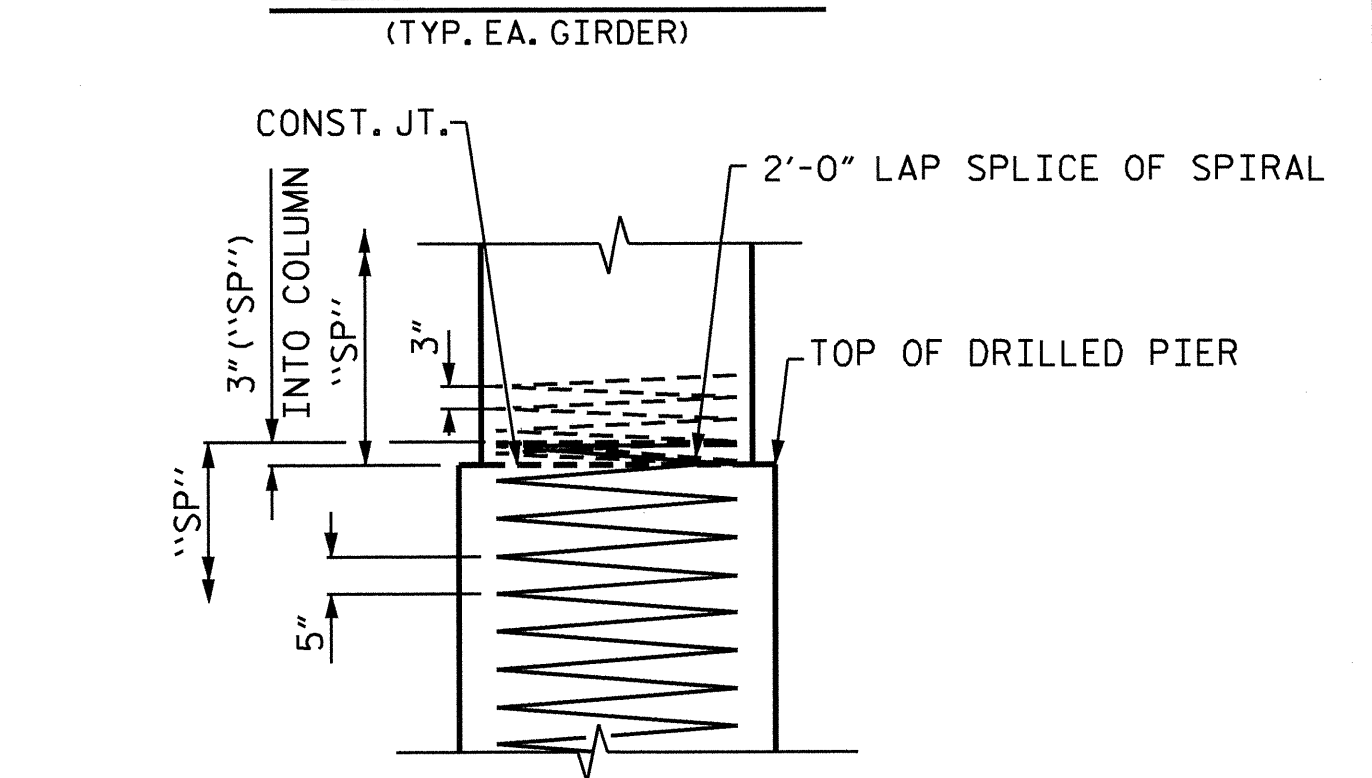
END ELEVATION

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.  
 NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.  
 FOR MECHANICAL BUTT SPLICING OF REINFORCING STEEL. SEE SECTION 425-5 OF THE STANDARD SPECIFICATIONS.



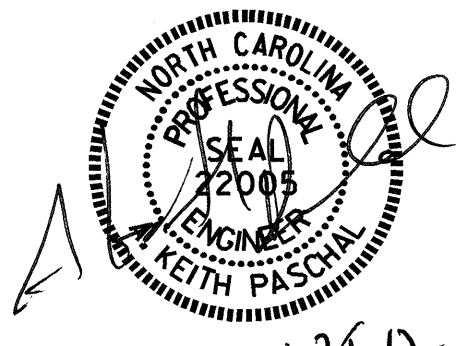
DETAIL A



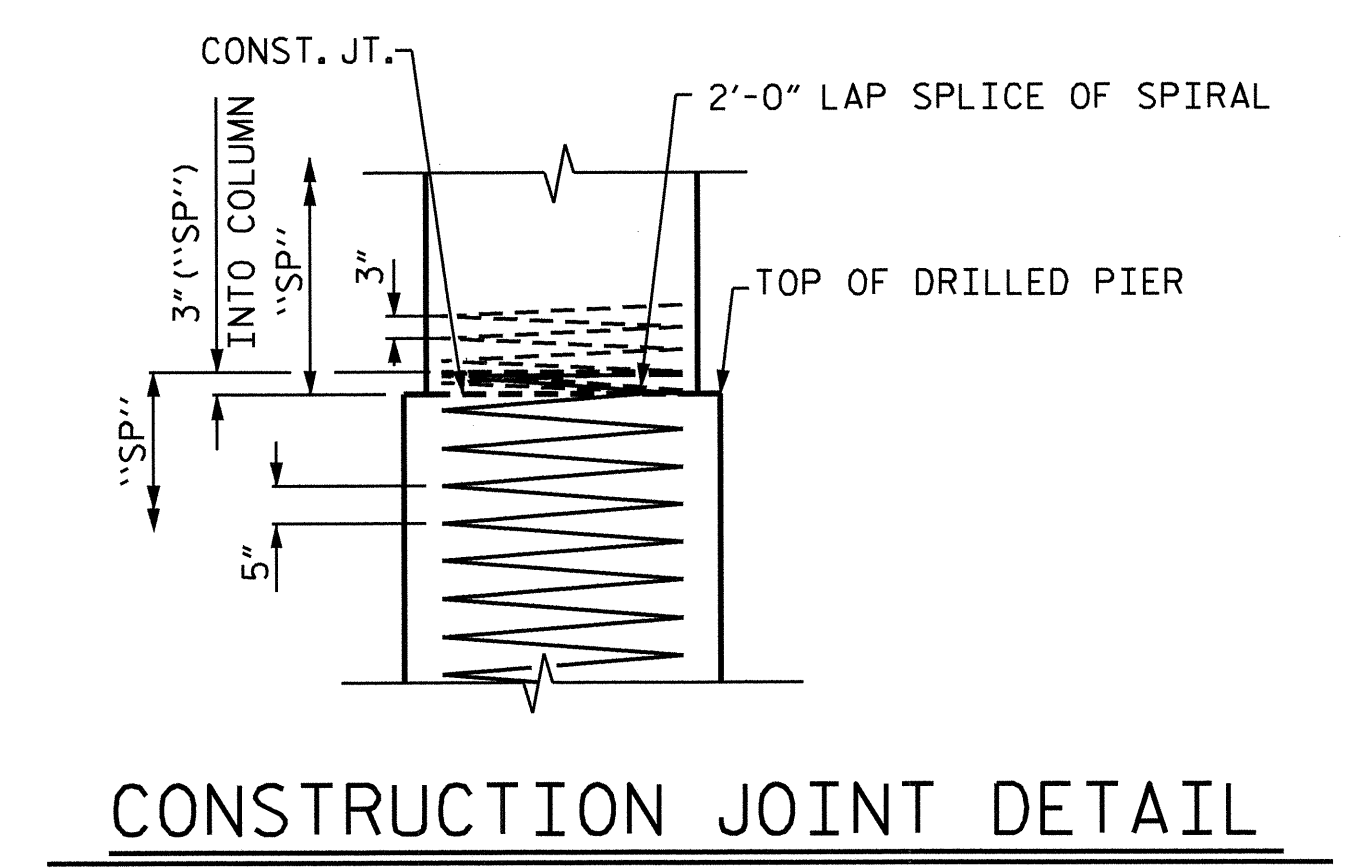
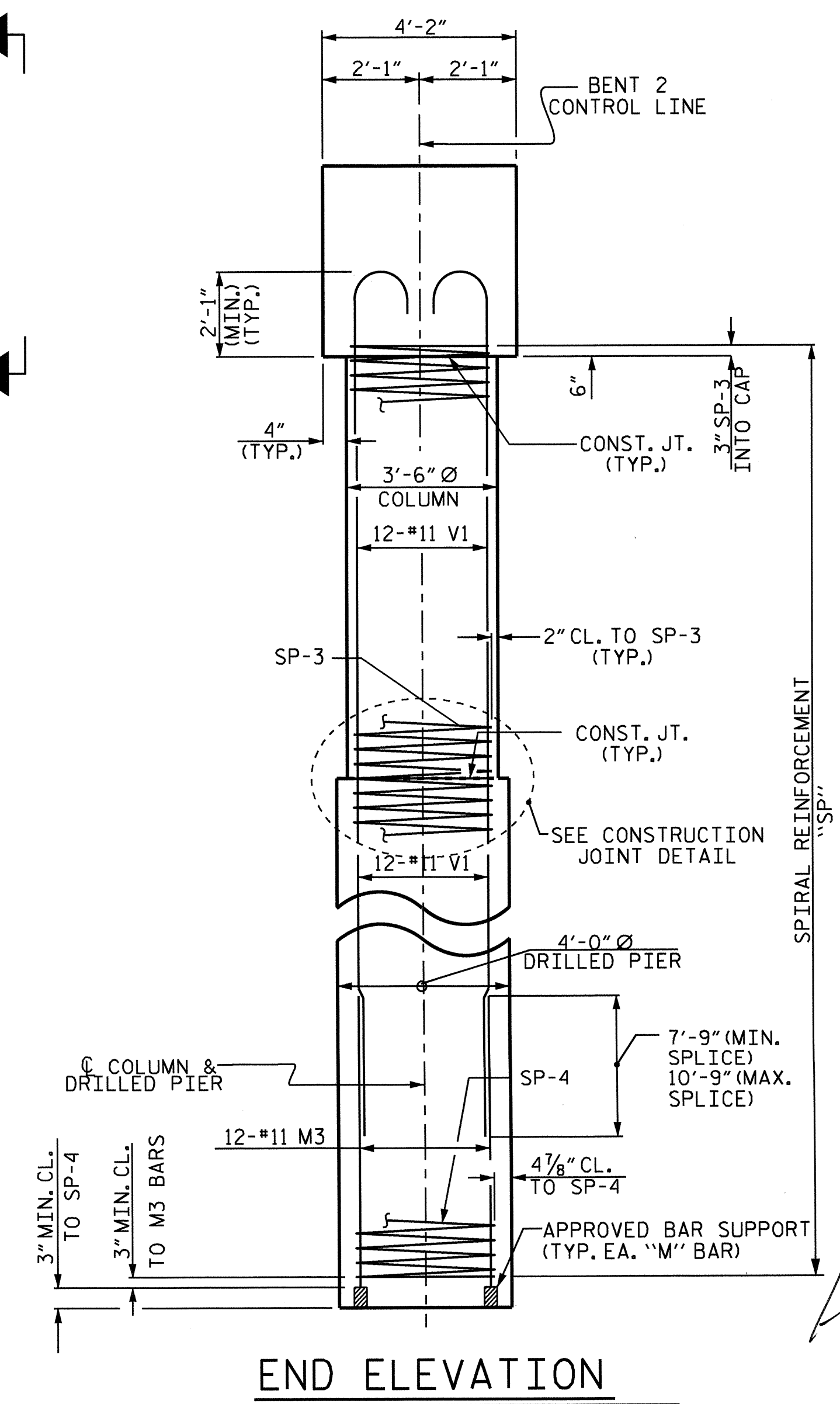
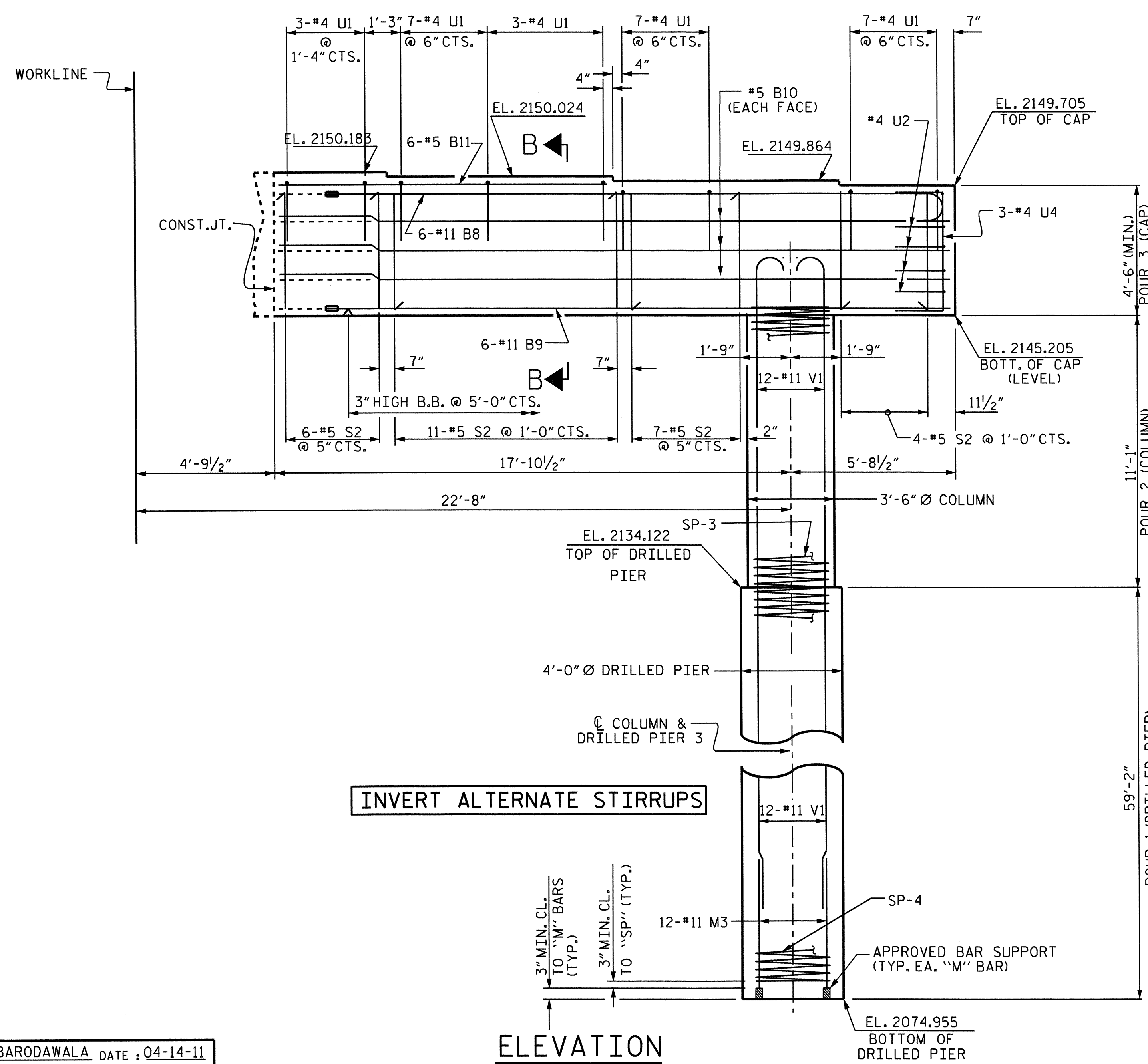
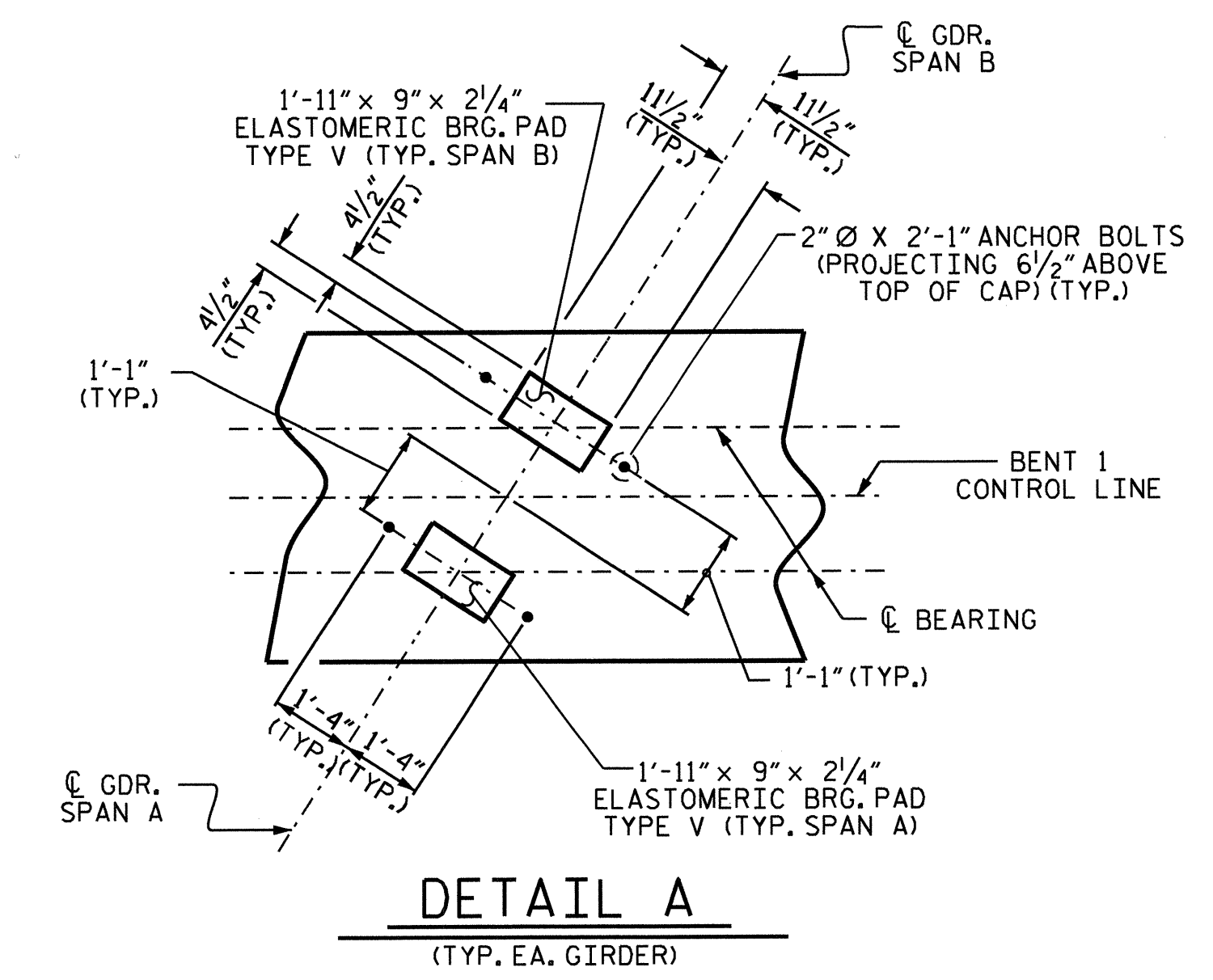
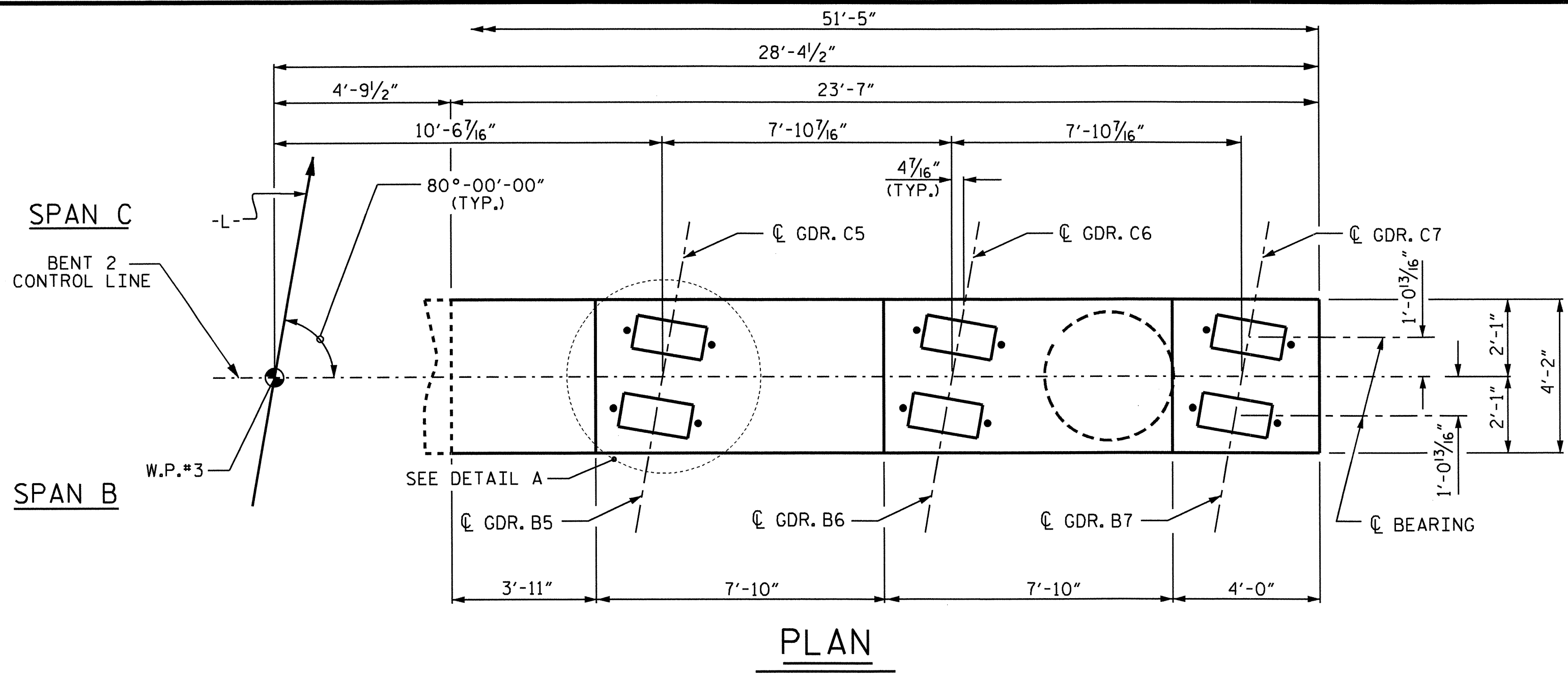
CONSTRUCTION JOINT DETAIL

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (STAGE I)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
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					TOTAL SHEETS 45



DRAWN BY : B. N. BARODAWALA DATE : 04-14-11  
 CHECKED BY : J. MYA DATE : 07-28-11

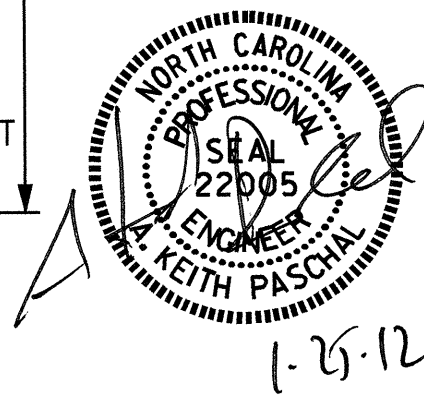


PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2 (STAGE II)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-37					TOTAL SHEETS 45

DRAWN BY: B. N. BARODAWALA DATE: 04-14-11  
 CHECKED BY: J. MYA DATE: 07-28-11

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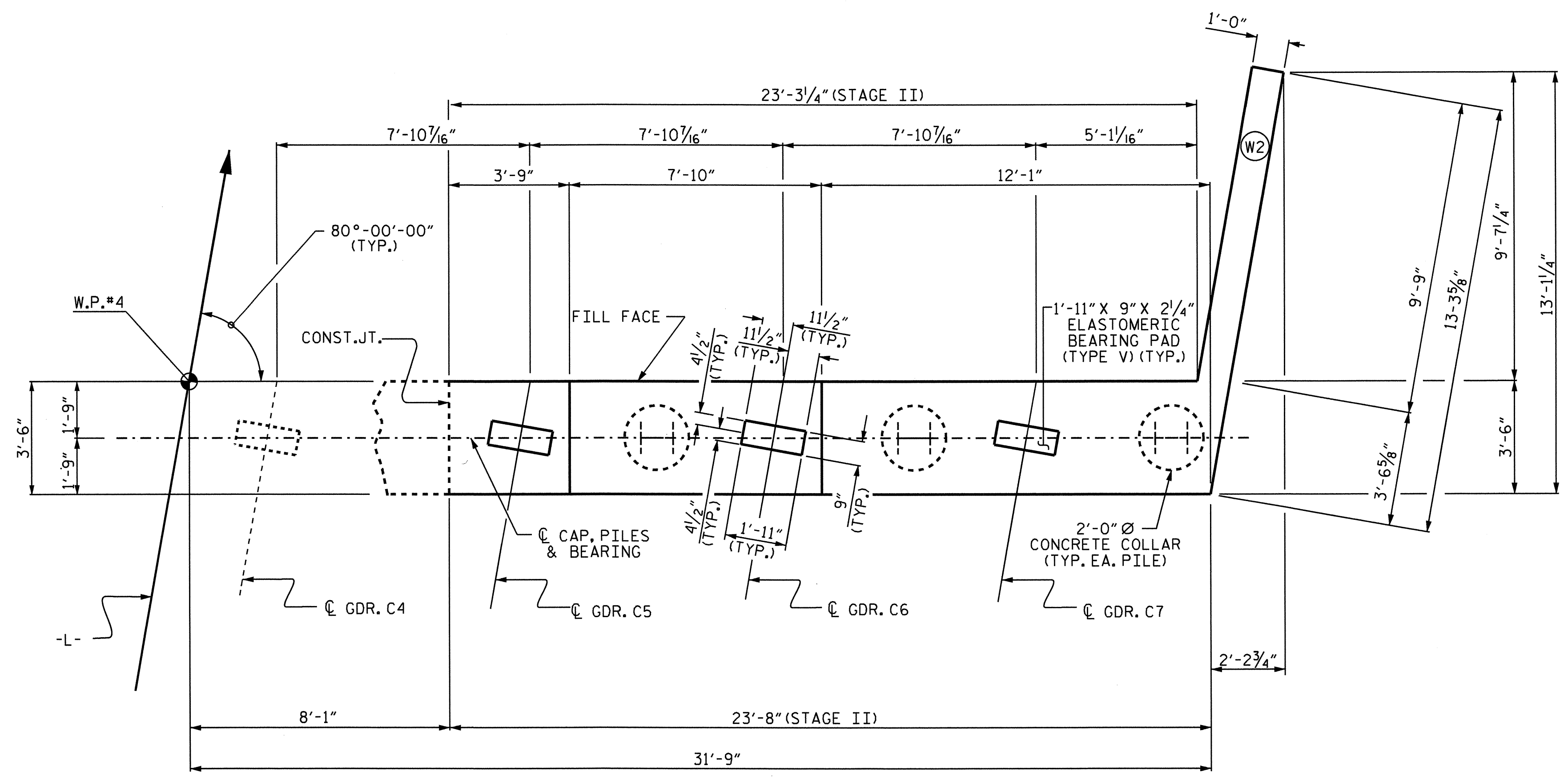




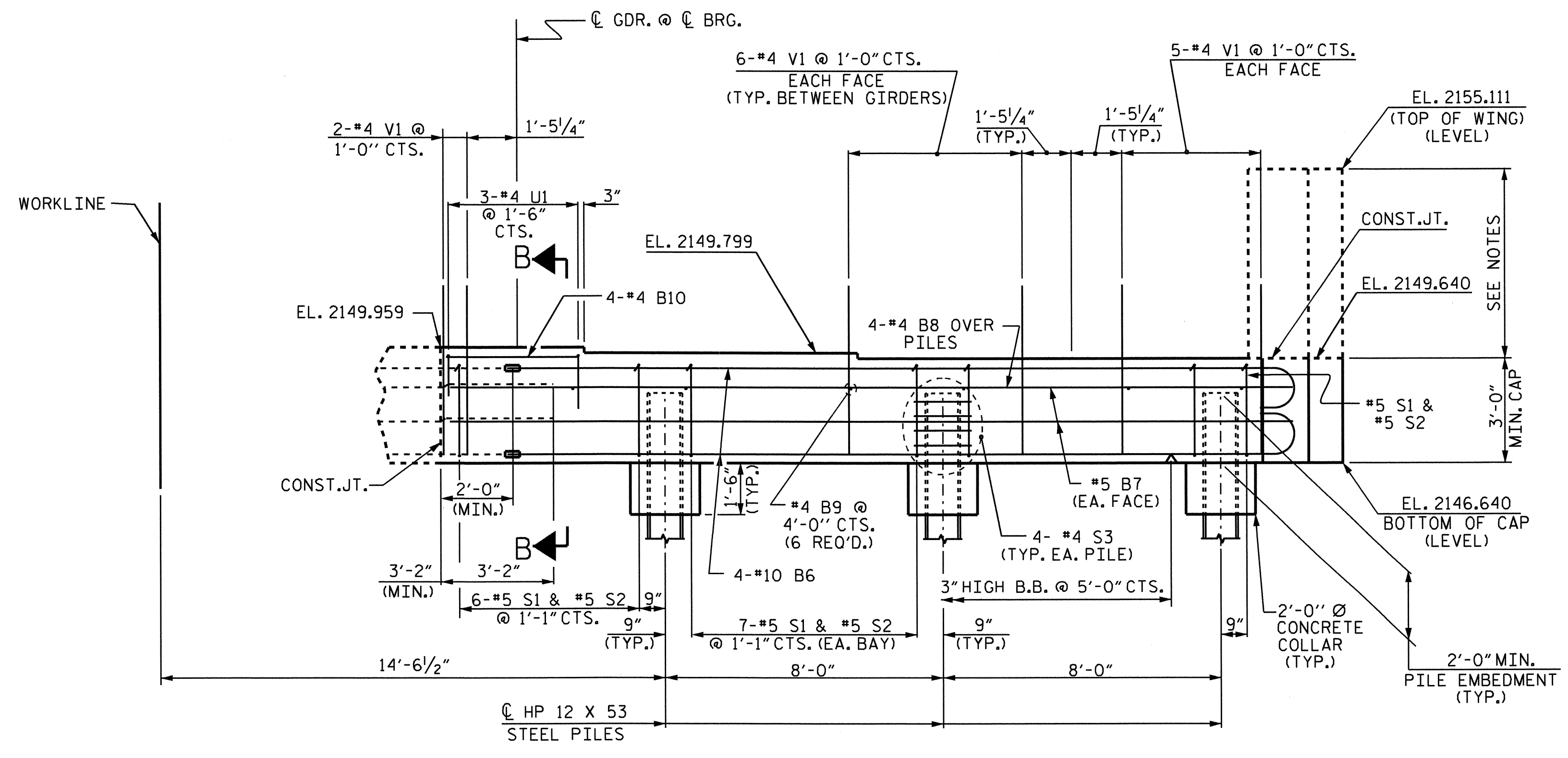








PLAN



ELEVATION

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 2 OF 4

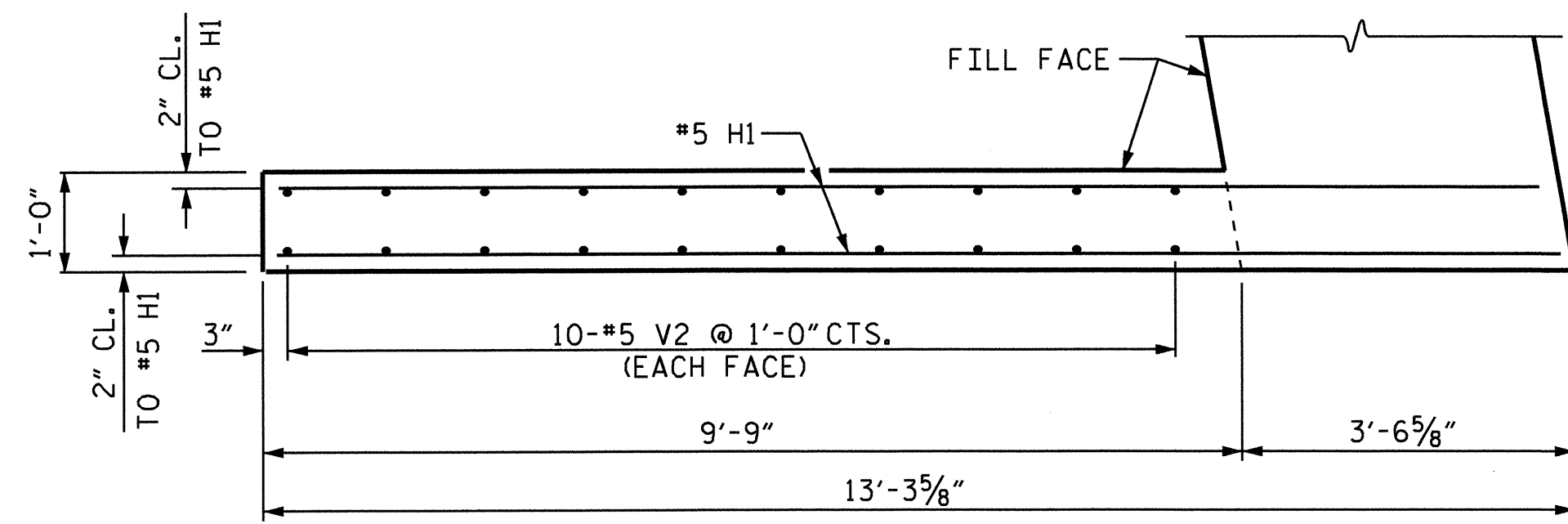
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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 2  
 (STAGE II)



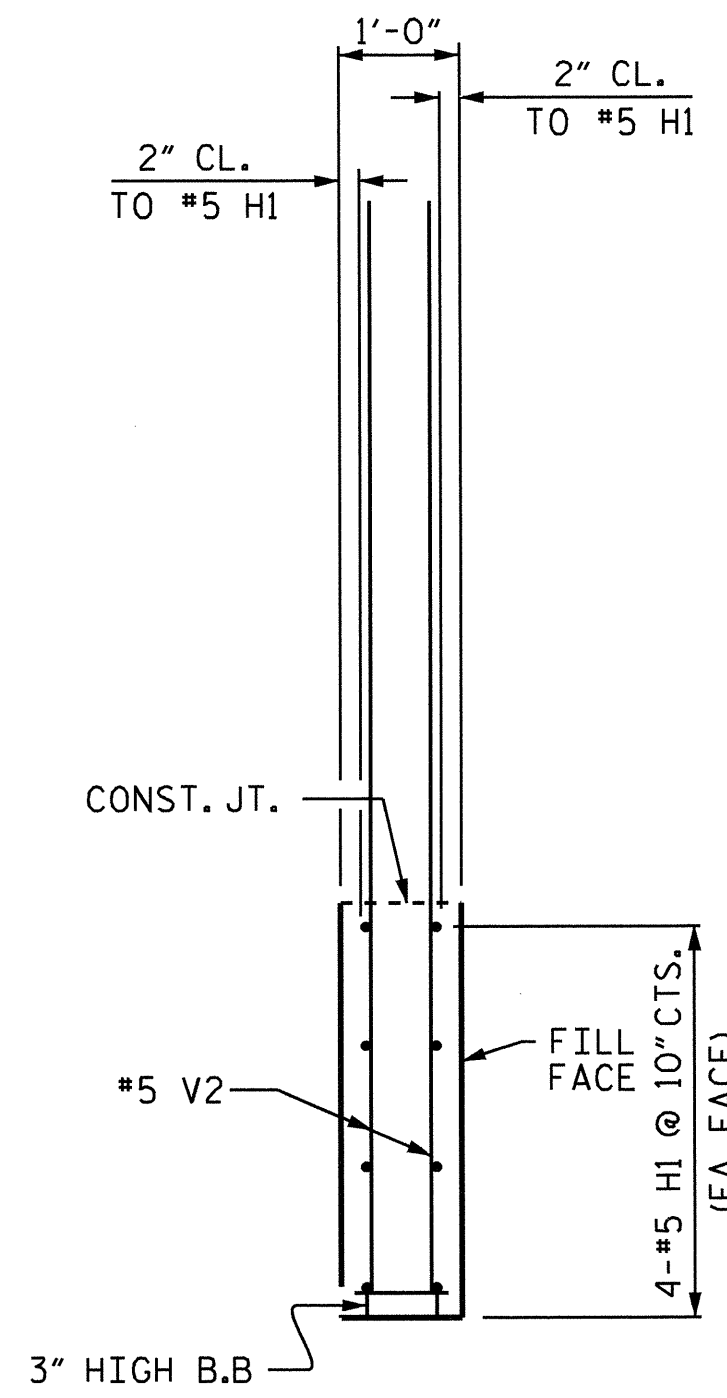
DRAWN BY : J. G. KHARVA DATE : 04/05/11  
 CHECKED BY : B. N. BARODAWALA DATE : 09/09/11

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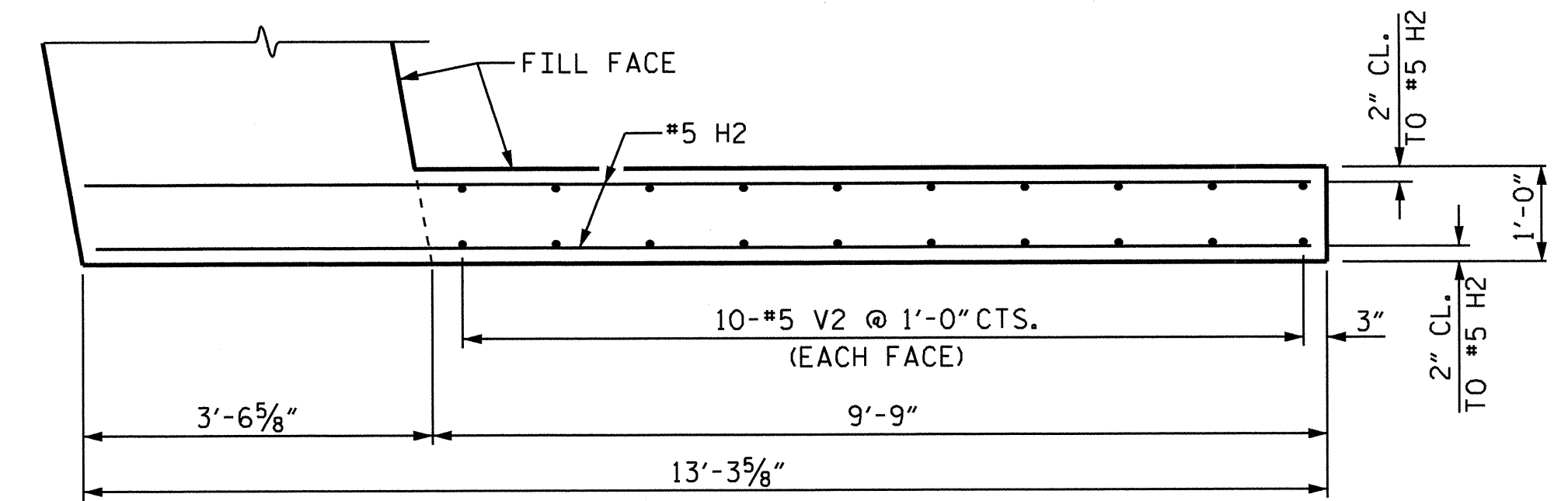
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40	
1			3			TOTAL	45
2			4			SHEETS	



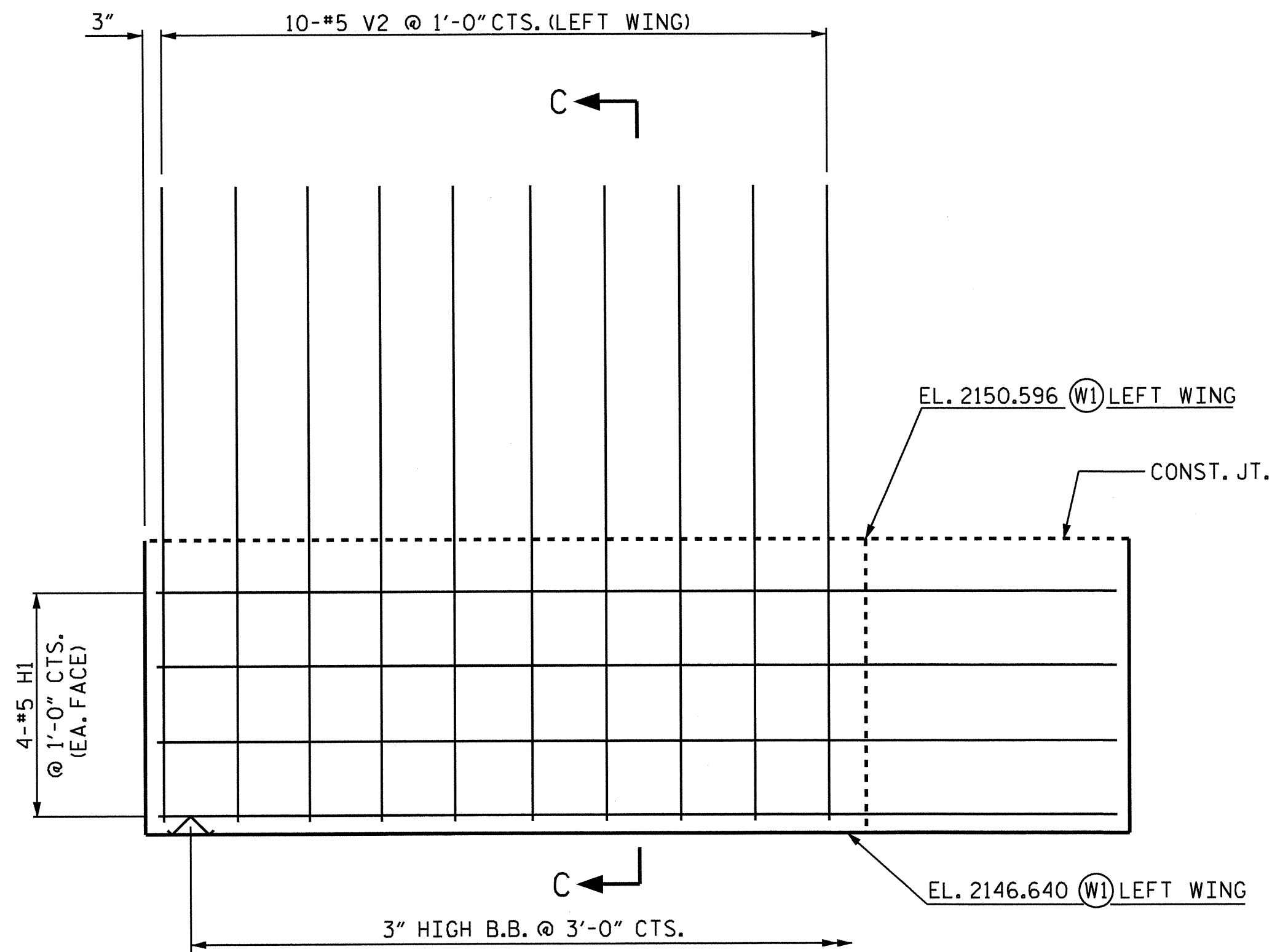
**PLAN (W1)**  
LEFT WING (STAGE I)



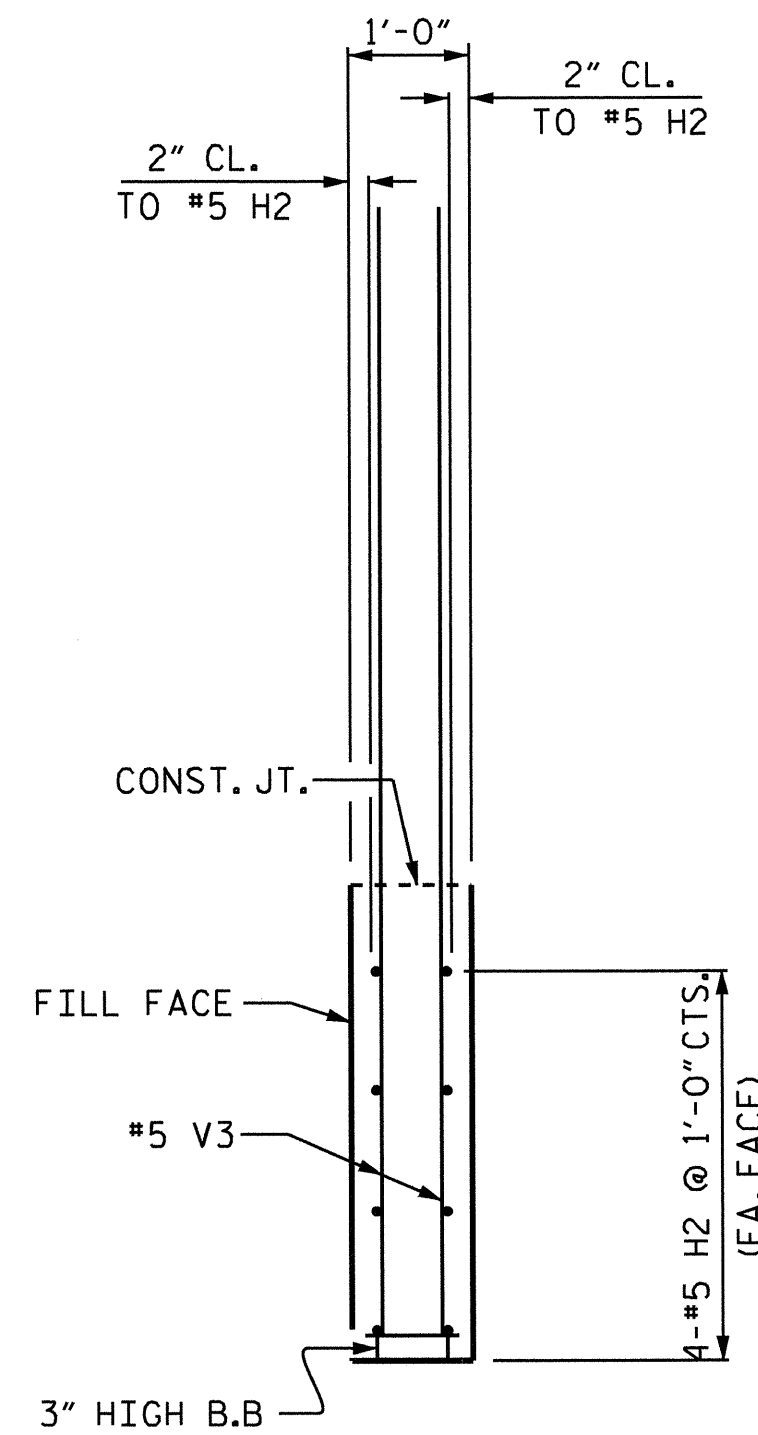
**SECTION C-C**  
RIGHT WING (STAGE II)



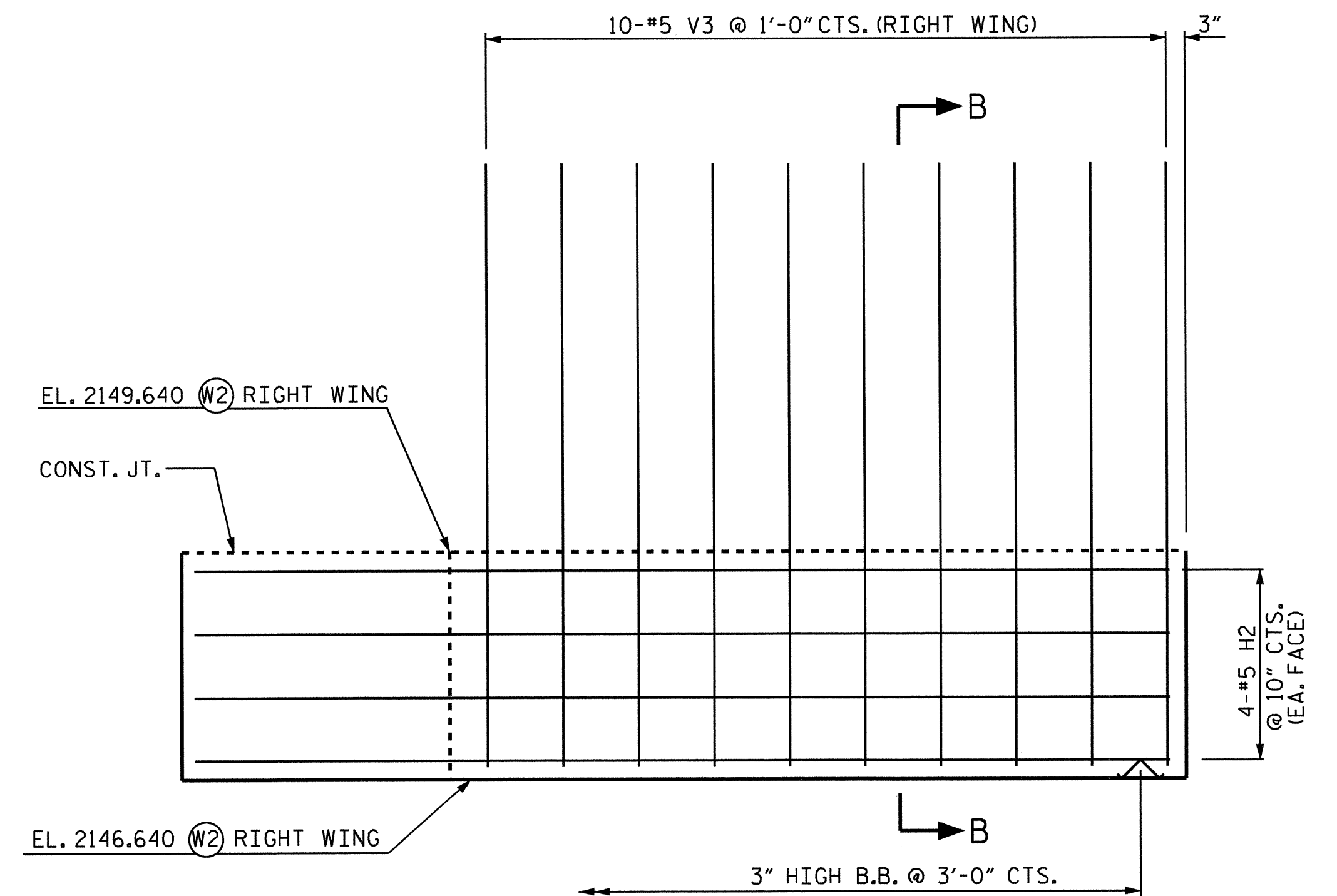
**PLAN (W2)**  
RIGHT WING (STAGE II)



**ELEVATION (W1)**  
LEFT WING (STAGE I)



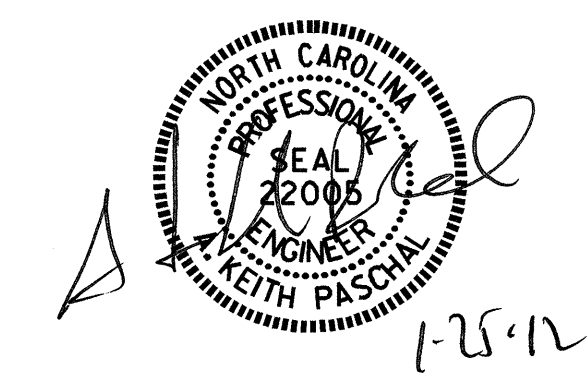
**SECTION B-B**  
LEFT WING (STAGE I)



**ELEVATION (W2)**  
RIGHT WING (STAGE II)

PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 3 OF 4



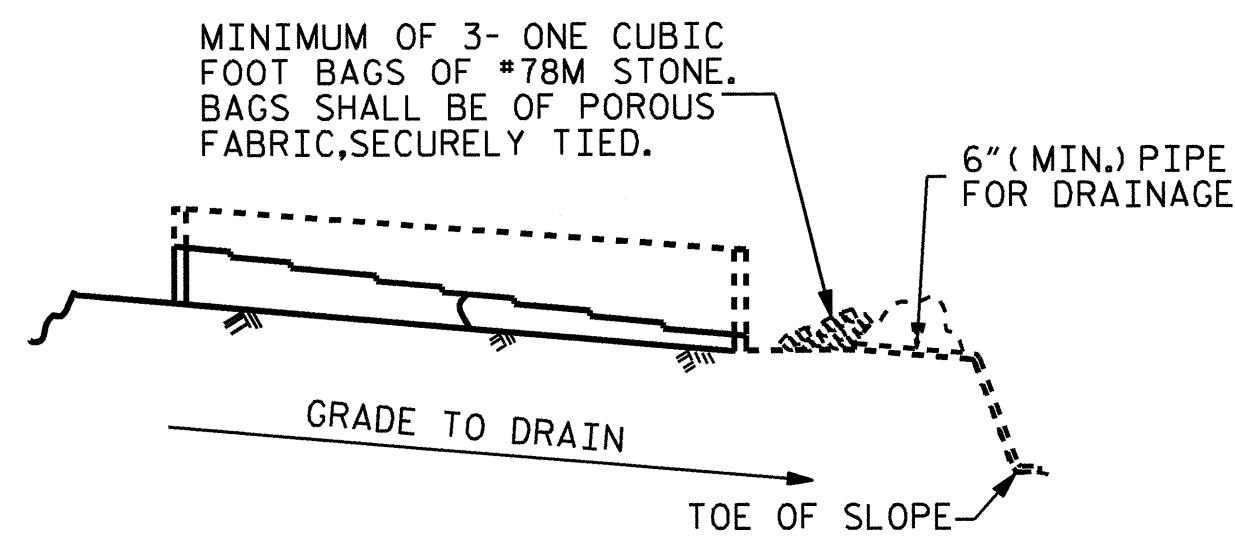
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 INTEGRAL END BENT 2  
 (STAGE I & STAGE II)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41	
1			3			TOTAL SHEETS	45
2			4				

DRAWN BY : J. G. KHARVA DATE : 4/8/11  
 CHECKED BY : B. N. BARODAWALA DATE : 9/9/11

25-JAN-2012 08:46  
 W:\Structures\Final Plans\B3480.sd,EBI&2.dgn  
 bbarodawala



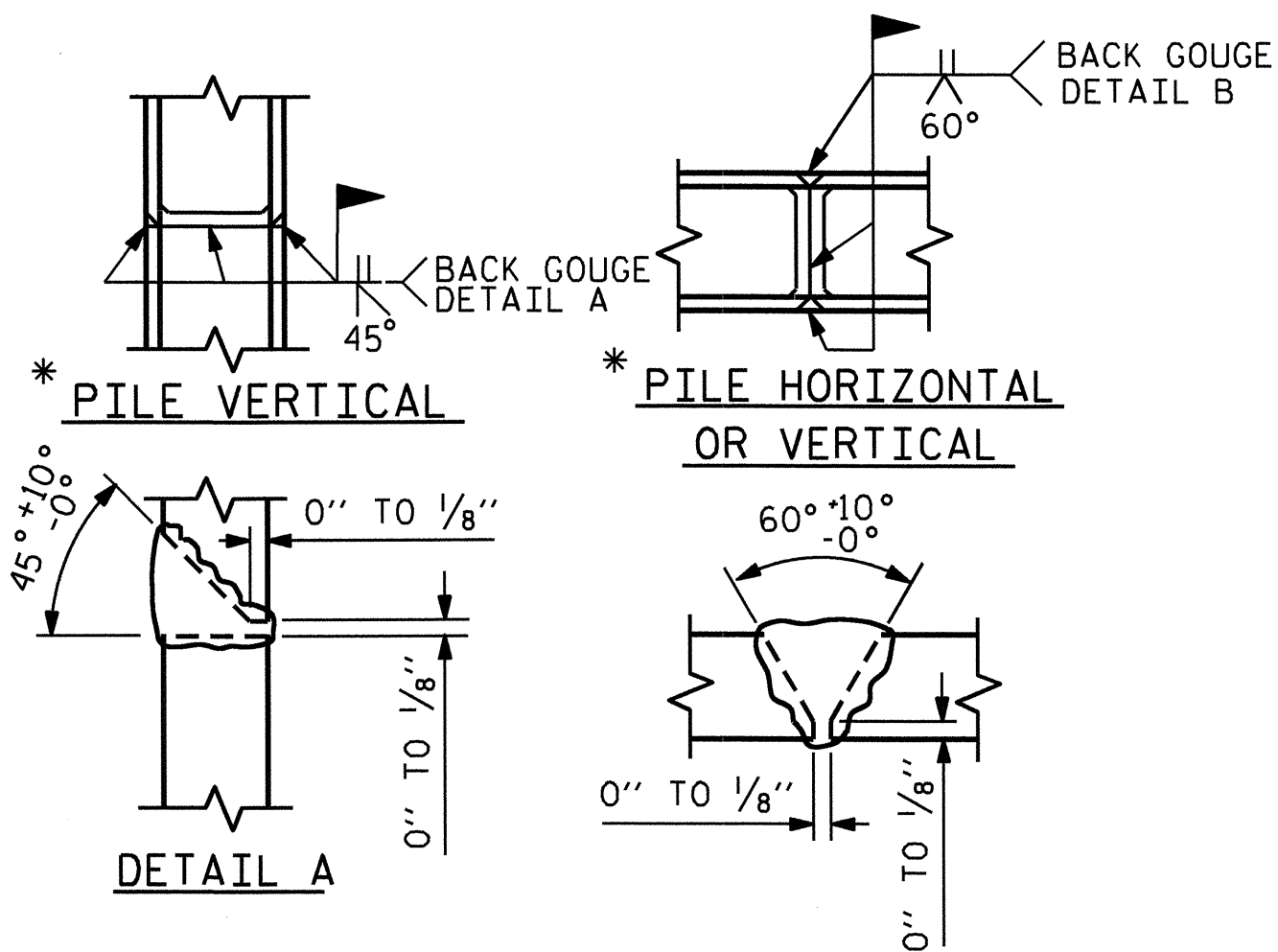


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

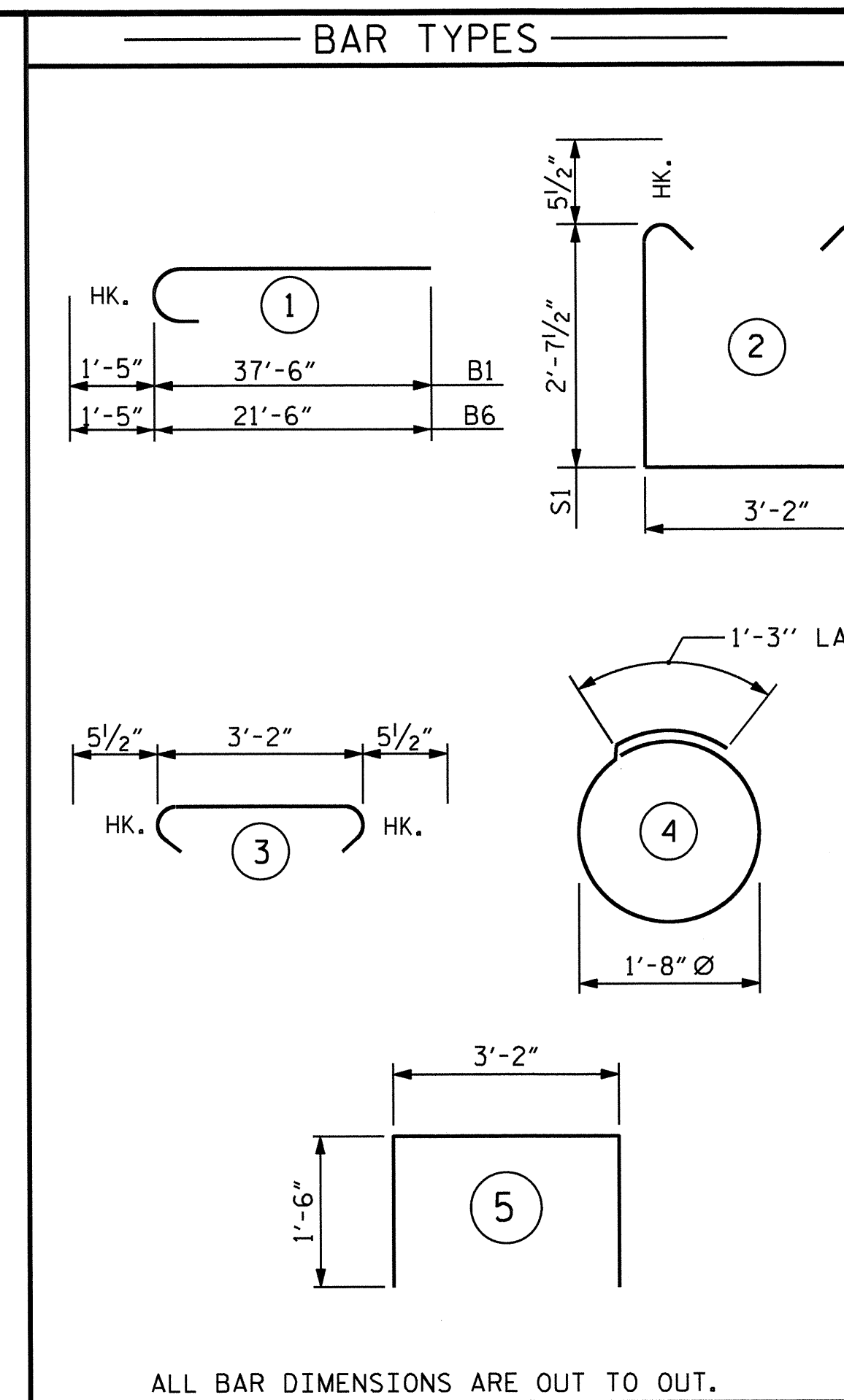
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

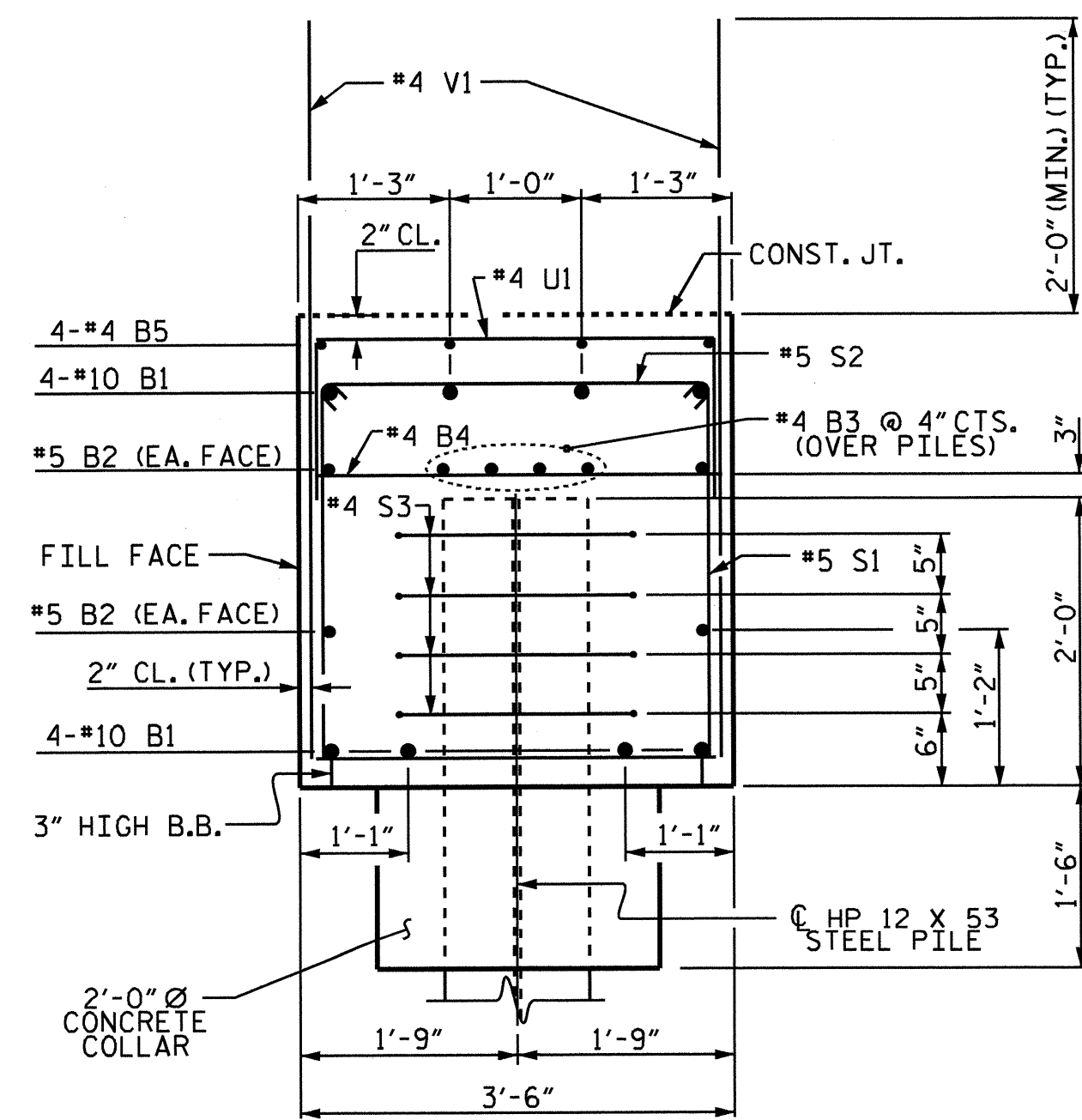
**TEMPORARY DRAINAGE AT END BENT**



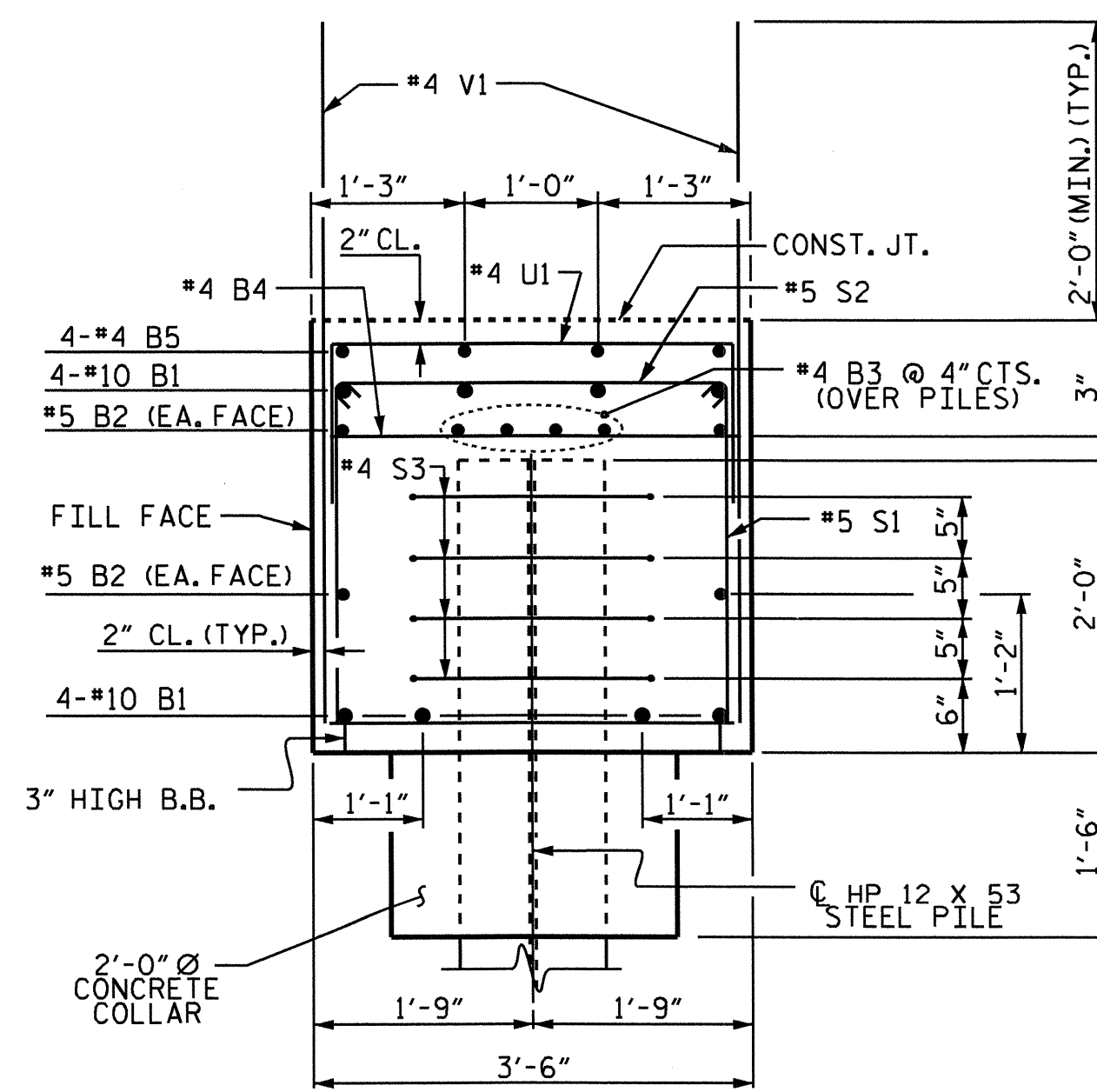
**PILE SPLICE DETAILS**



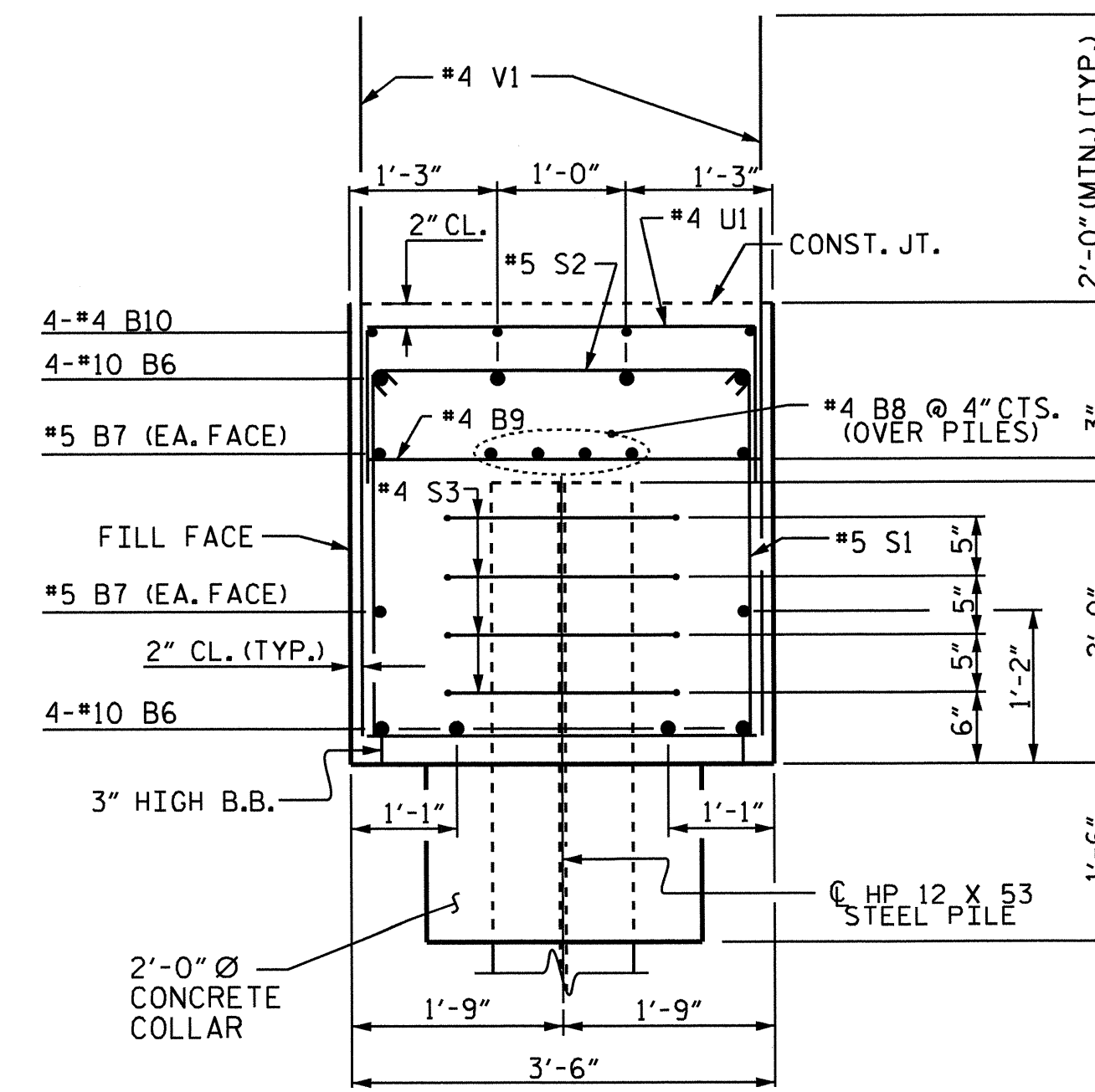
BILL OF MATERIAL						BILL OF MATERIAL					
INTEGRAL END BENT 2 (STAGE I)						INTEGRAL END BENT 2 (STAGE II)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	38'-11"	1340	B6	8	#10	1	22'-11"	789
B2	4	#5	STR	38'-9"	162	B7	4	#5	STR	23'-4"	97
B3	8	#4	STR	20'-3"	108	B8	4	#4	STR	23'-4"	62
B4	9	#4	STR	3'-2"	19	B9	6	#4	STR	3'-2"	13
B5	8	#4	1	17'-8"	94	B10	4	#4	STR	3'-10"	10
H1	8	#5	STR	12'-10"	107	H2	8	#5	STR	13'-0"	108
S1	30	#5	2	9'-4"	292	S1	21	#5	2	9'-4"	204
S2	30	#5	3	4'-1"	128	S2	21	#5	3	4'-1"	89
S3	20	#4	3	6'-6"	87	S3	12	#4	3	6'-6"	52
U1	24	#4	5	6'-2"	99	U1	3	#4	5	6'-2"	12
V1	54	#4	STR	5'-9"	207	V1	38	#4	STR	5'-9"	146
V2	20	#5	STR	8'-5"	176	V3	20	#5	STR	8'-0"	167
REINFORCING STEEL = 2819 LBS						REINFORCING STEEL = 1749 LBS					
CLASS A CONCRETE						CLASS A CONCRETE					
(CAP, CONCRETE COLLAR AND LOWER PART OF WINGS) 19.0 CU.YDS.						(CAP, CONCRETE COLLAR AND LOWER PART OF WINGS) 11.4 CU.YDS.					
HP 12 x 53 STEEL PILES NO. 5 275 FT.						HP 12 x 53 STEEL PILES NO. 3 165 FT.					
<b>SUMMARY FOR STAGE I &amp; STAGE II</b>											
REINFORCING STEEL = 4568 LBS						REINFORCING STEEL = 4568 LBS					
CLASS A CONCRETE = 30.4 CU.YDS.						CLASS A CONCRETE = 30.4 CU.YDS.					
HP 12 x 53 STEEL PILES NO. 8 = 440 FT.						HP 12 x 53 STEEL PILES NO. 8 = 440 FT.					



**SECTION A-A (STAGE I)**



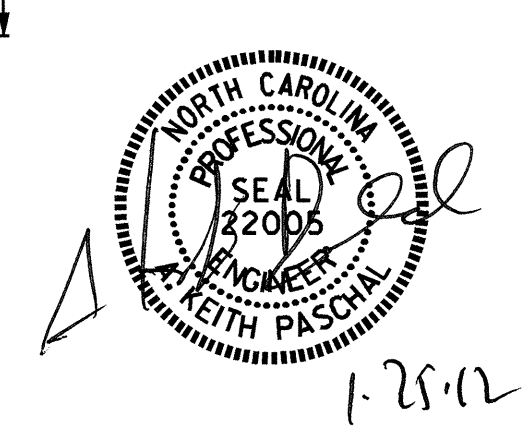
**SECTION B-B (STAGE I)**



**SECTION C-C (STAGE II)**

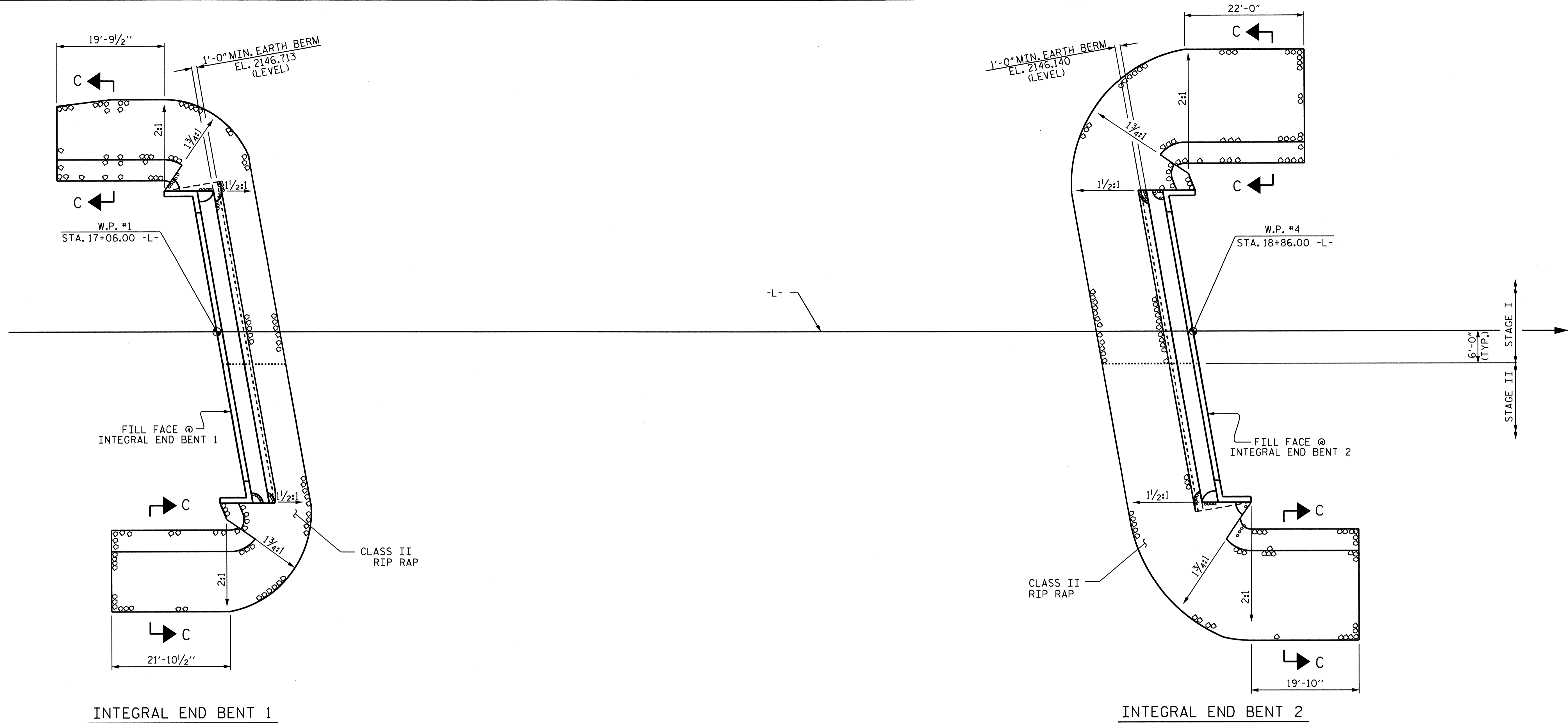
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT 2 (STAGE I & II)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 45

DRAWN BY: J. G. KHARVA DATE: 4/6/11  
 CHECKED BY: B. N. BARODAWALA DATE: 9/9/11



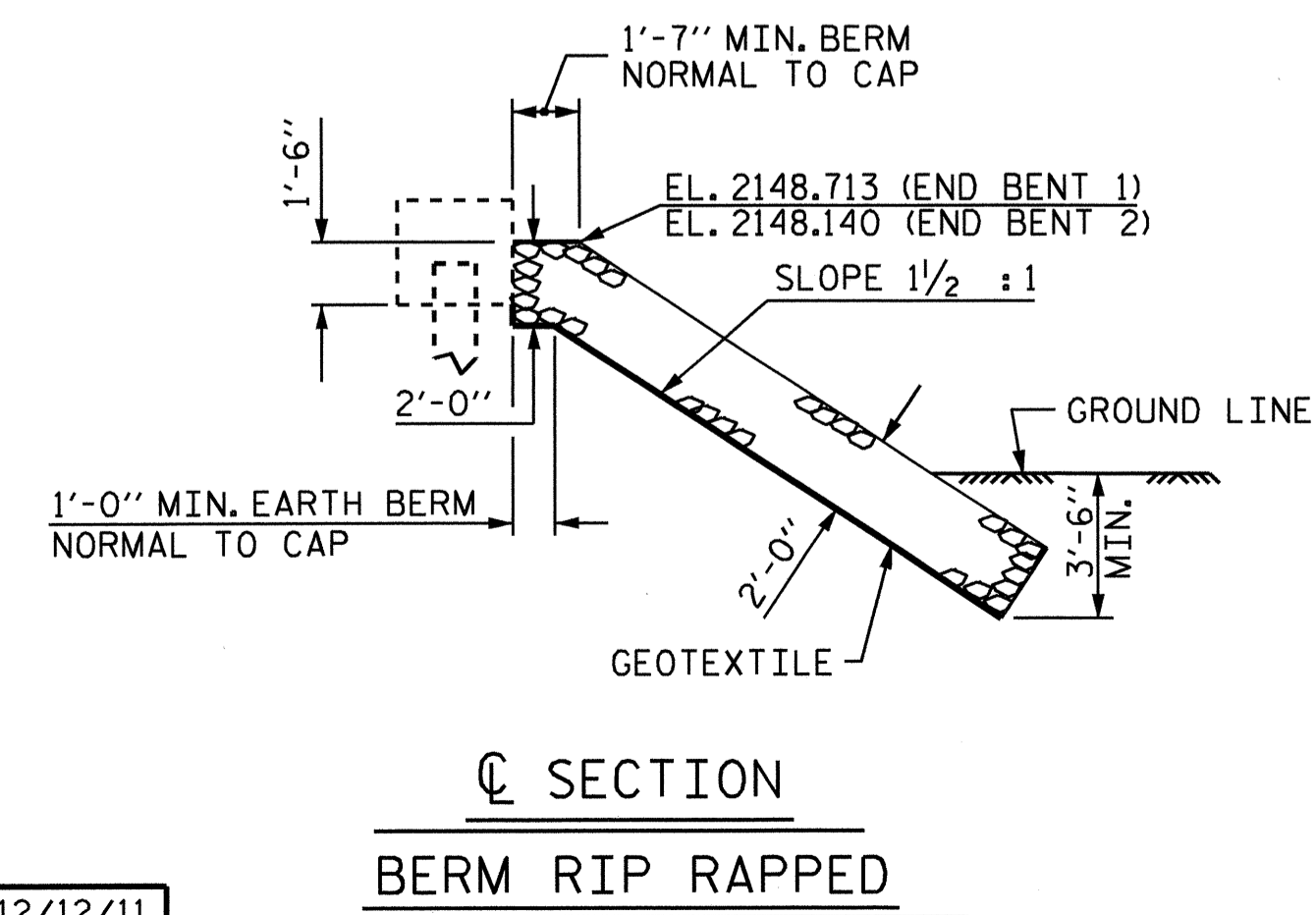
INTEGRAL END BENT 1

INTEGRAL END BENT 2

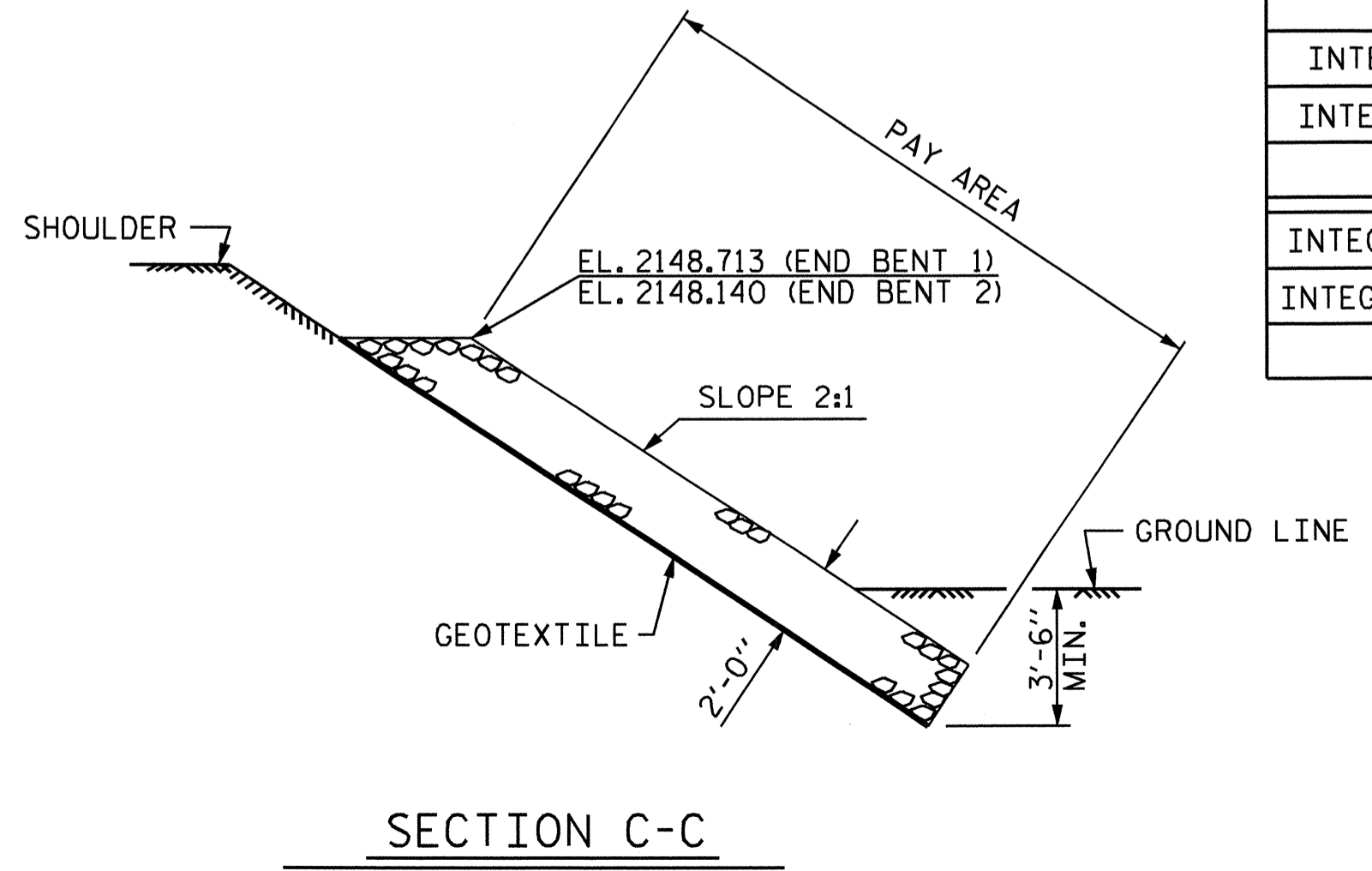
PLAN OF RIP RAP

SUMMARY QUANTITIES		
BRIDGE @ STA. 17+96.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1 (STAGE I)	83	92
INTEGRAL END BENT 2 (STAGE I)	150	166
TOTAL (STAGE I)	233	258
INTEGRAL END BENT 1 (STAGE II)	84	93
INTEGRAL END BENT 2 (STAGE II)	134	149
TOTAL (STAGE II)	218	242

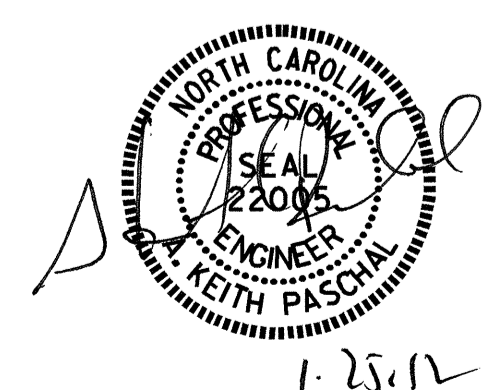
PROJECT NO. B-3480  
JACKSON COUNTY  
 STATION: 17+96.00 -L-



SECTION C-C  
 BERM RIP RAPPED



SECTION C-C



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY: B. L. GREEN DATE: 12/12/11  
 CHECKED BY: A. K. PASCHAL DATE: 12/13/11

13-DEC-2011 11:09  
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 bbarodawala



BILL OF MATERIAL FOR ONE APPROACH SLAB (2 REQ'D)

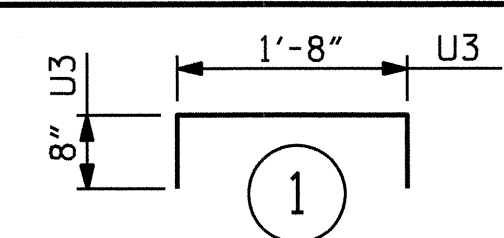
STAGE I (2 REQ'D)						STAGE II (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	16'-9"	582	* A3	26	#4	STR	21'-6"	373
A2	52	#4	STR	16'-6"	573	A4	26	#4	STR	21'-6"	373
* B1	58	#5	STR	24'-4"	1472	* B1	43	#5	STR	24'-4"	1091
B2	58	#6	STR	24'-8"	2149	B2	43	#6	STR	24'-8"	1593
						* B3	4	#4	STR	24'-8"	66
						* G1	25	#4	STR	5'-2"	86
						* U3	8	#4	I	3'-0"	16
REINFORCING STEEL					LBS. 2722	REINFORCING STEEL					LBS. 1966
* EPOXY COATED REINFORCING STEEL					LBS. 2054	* EPOXY COATED REINFORCING STEEL					LBS. 1632
CLASS AA CONCRETE						CLASS AA CONCRETE					
POUR #1 - SLAB					C. Y. 31.3	POUR #1 - SLAB & SIDEWALK					C. Y. 26.2
TOTAL					C. Y. 31.3	TOTAL					C. Y. 26.2

TOTAL BILL OF MATERIAL

REINFORCING STEEL	4688	LBS.
* EPOXY COATED REINFORCING STEEL	3686	LBS.
CLASS AA CONCRETE	57.5	LBS.

SPLICE CHART

A1, A3	#4	2'-0"
A2, A4	#4	1'-9"



NOTES

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

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

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

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

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

SHEET 1 OF 2

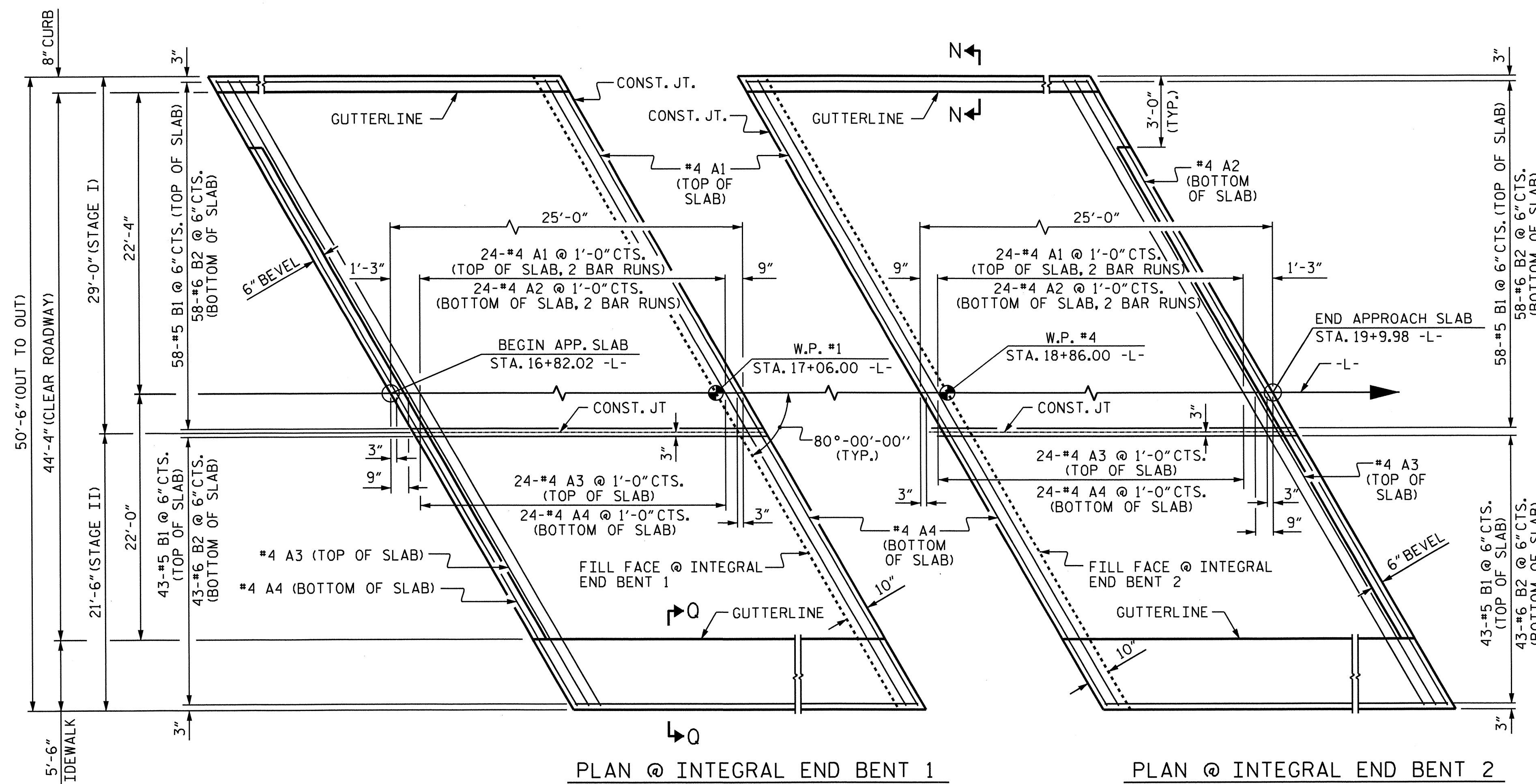
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44	
1			3			TOTAL SHEETS 45	
2			4				

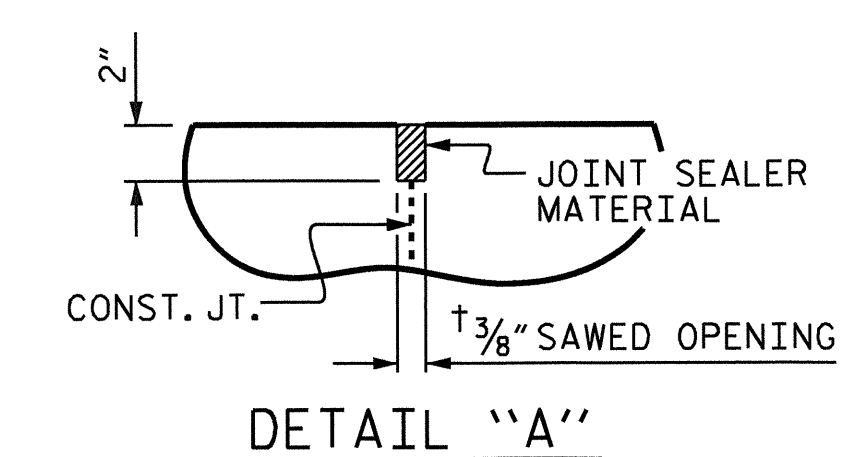


1-25-12

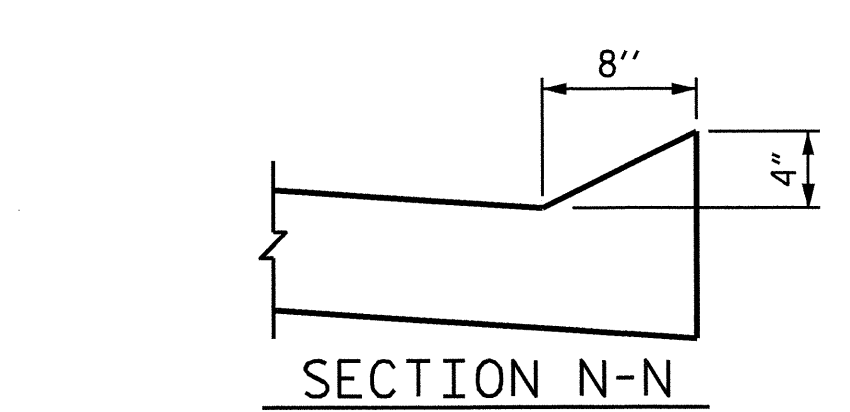
STD. NO. BAS11 (SHT 12)



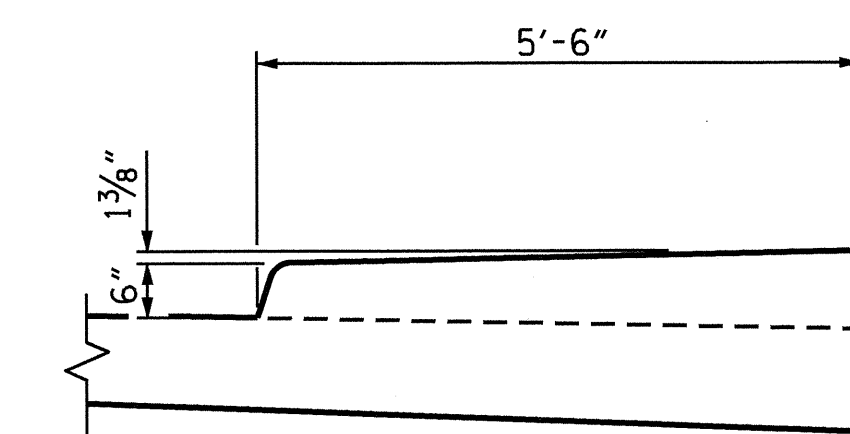
PLAN @ INTEGRAL END BENT 1  
PLAN @ INTEGRAL END BENT 2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



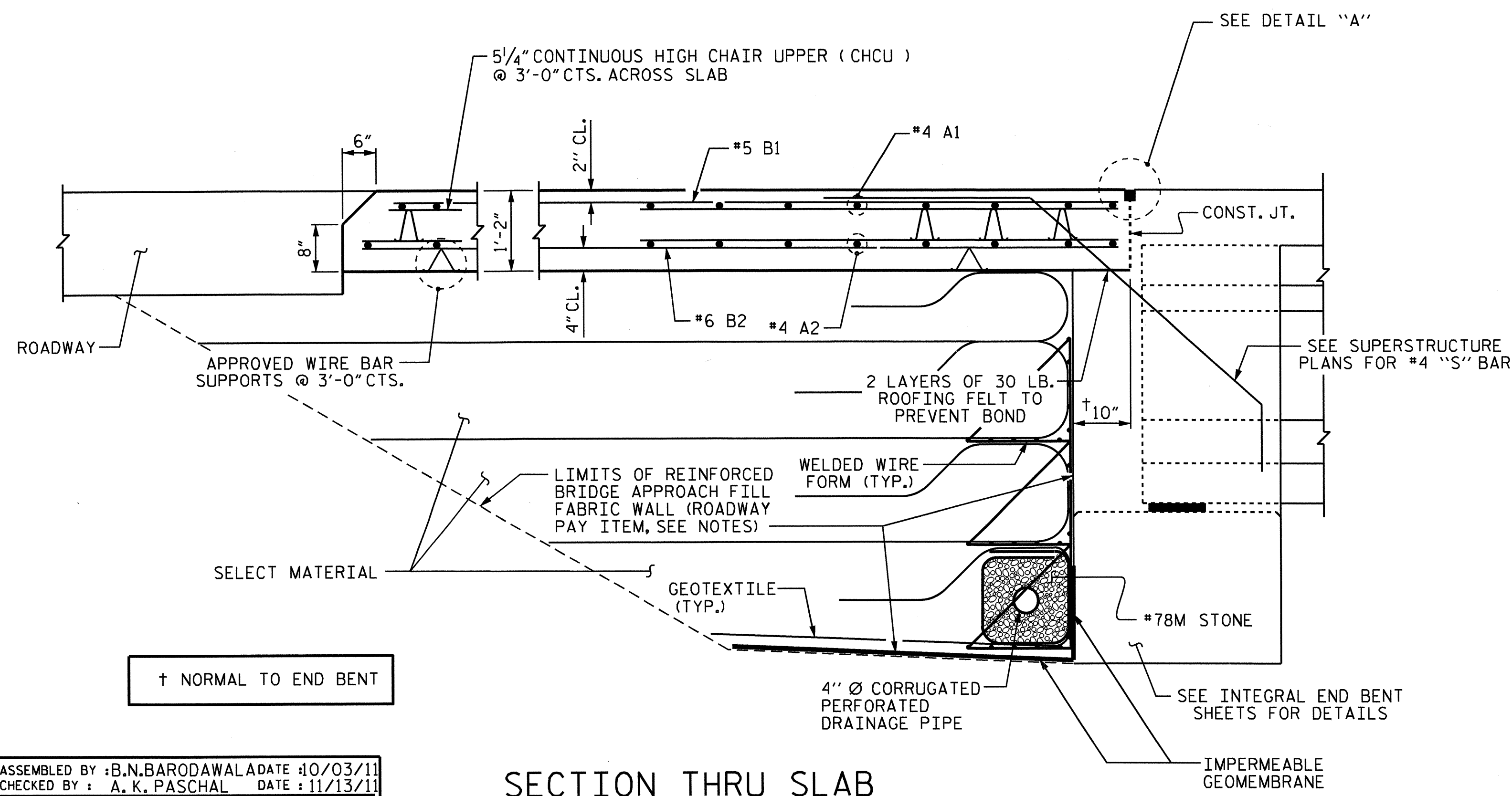
DETAIL "A"



SECTION N-N

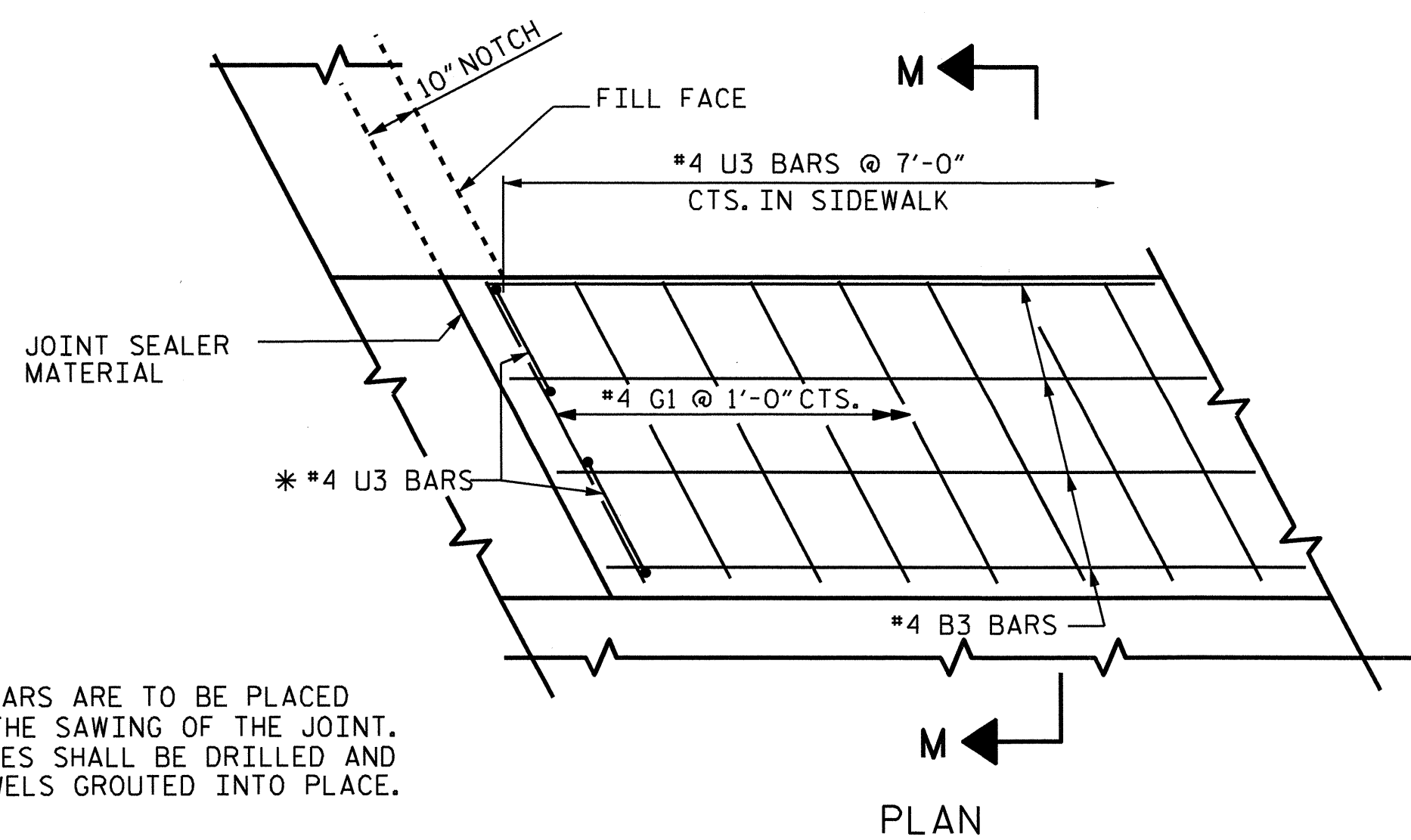


SECTION Q-Q



SECTION THRU SLAB

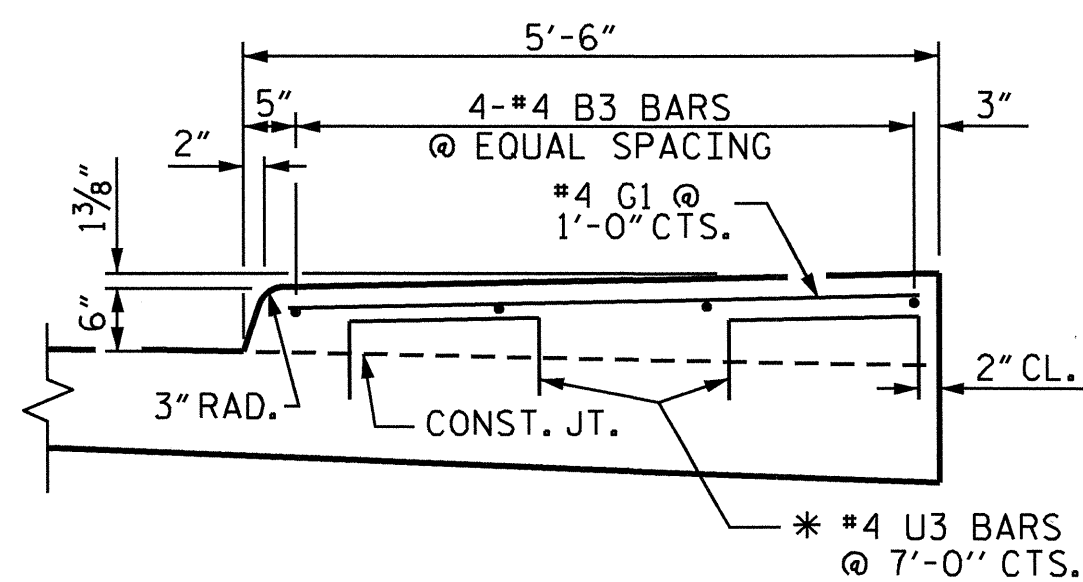
ASSEMBLED BY: B.N. BARODAWAL DATE: 10/03/11  
CHECKED BY: A. K. PASCHAL DATE: 11/13/11  
DRAWN BY: TLA 10/05  
CHECKED BY: GM 5/06  
ADDED 5/1/06RR KMM/GM  
REV. 10/1/11 MAA/GM



\* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

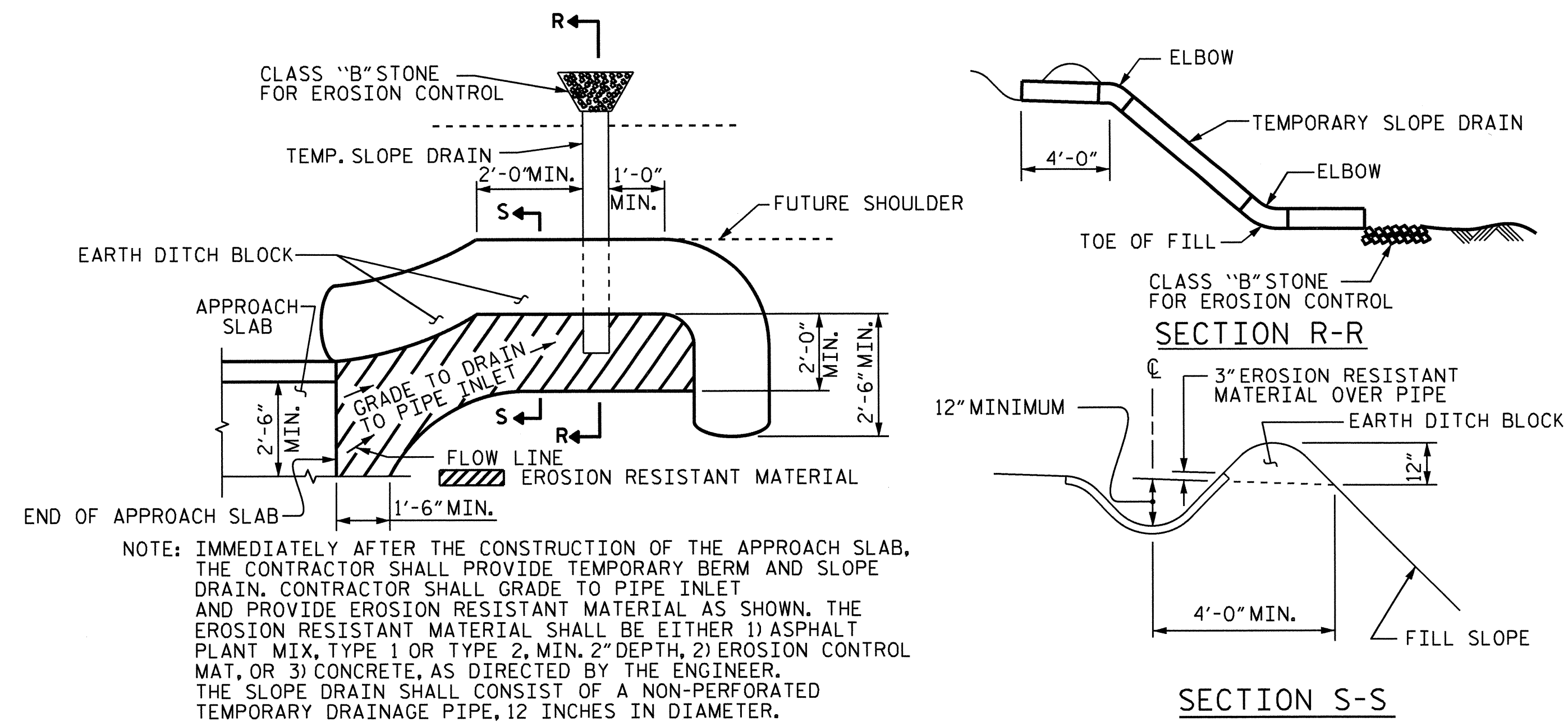
PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB



SECTION M-M

SIDEWALK DETAILS

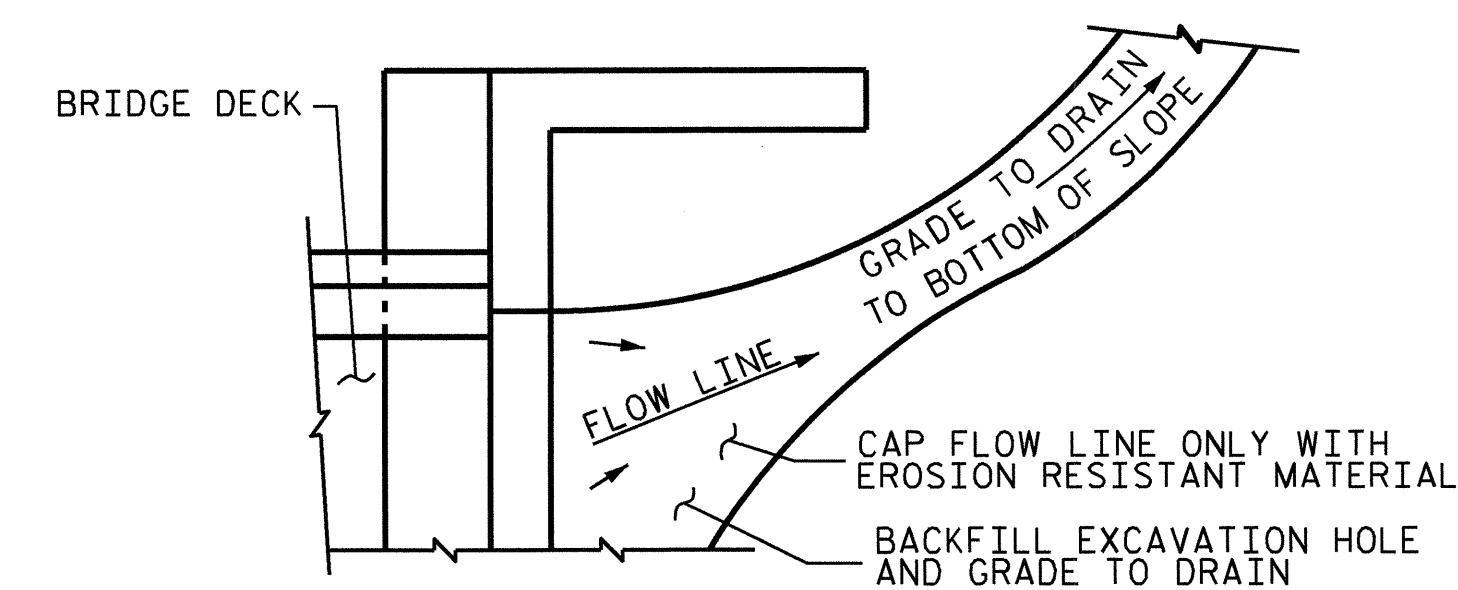


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



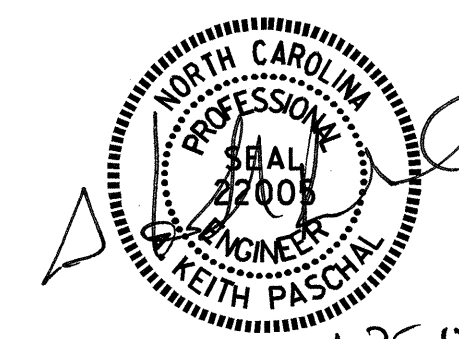
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-3480  
JACKSON COUNTY  
STATION: 17+96.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-45
STANDARD BRIDGE APPROACH SLAB DETAILS						TOTAL SHEETS 45
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



ASSEMBLED BY : B.N.BARODAWAL	DATE : 11-10-11
CHECKED BY : A. K. PASCHAL	DATE : 12-6-10
DRAWN BY : FCJ	11/88
CHECKED BY : ARB	11/88
REV. 5/7/03	RWW/JTE
REV. 5/1/06RRR	MAA/KMM
REV. 10/1/11	MAA/GM



## 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. FINISHES 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

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