

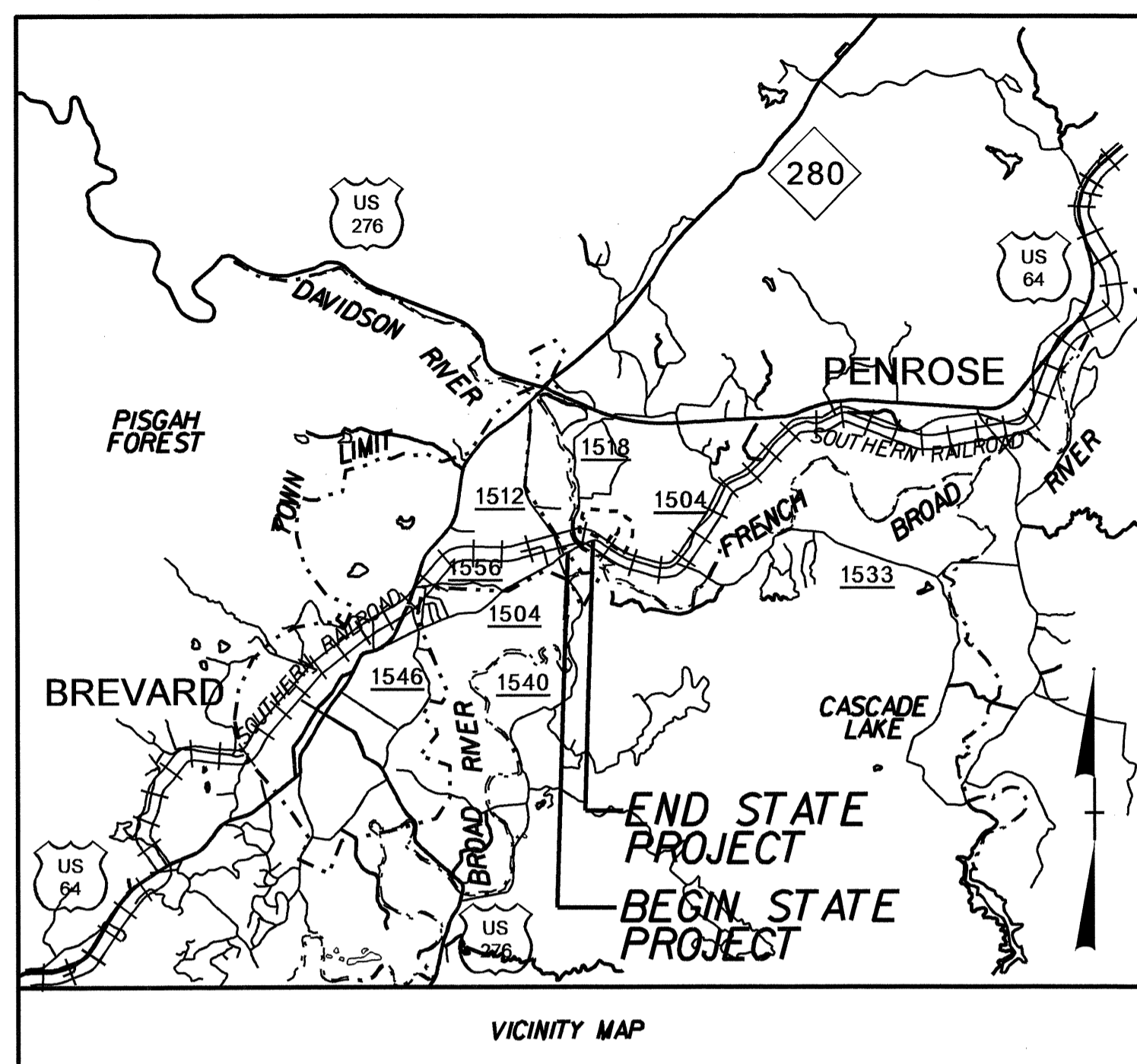
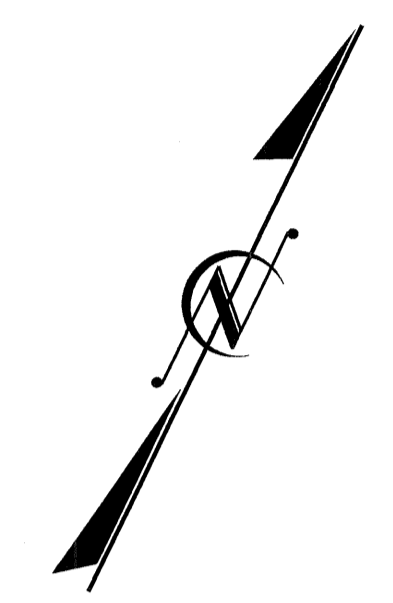
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4291		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33630.1.1	BRSTP-1504(7)	P.E.	
33630.2.1	BRSTP-1504(7)	RIGHT-OF-WAY	
33630.2.1	BRSTP-1504(7)	UTILITY	
33630.3.1	BRSTP-1504(7)	CONSTRUCTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

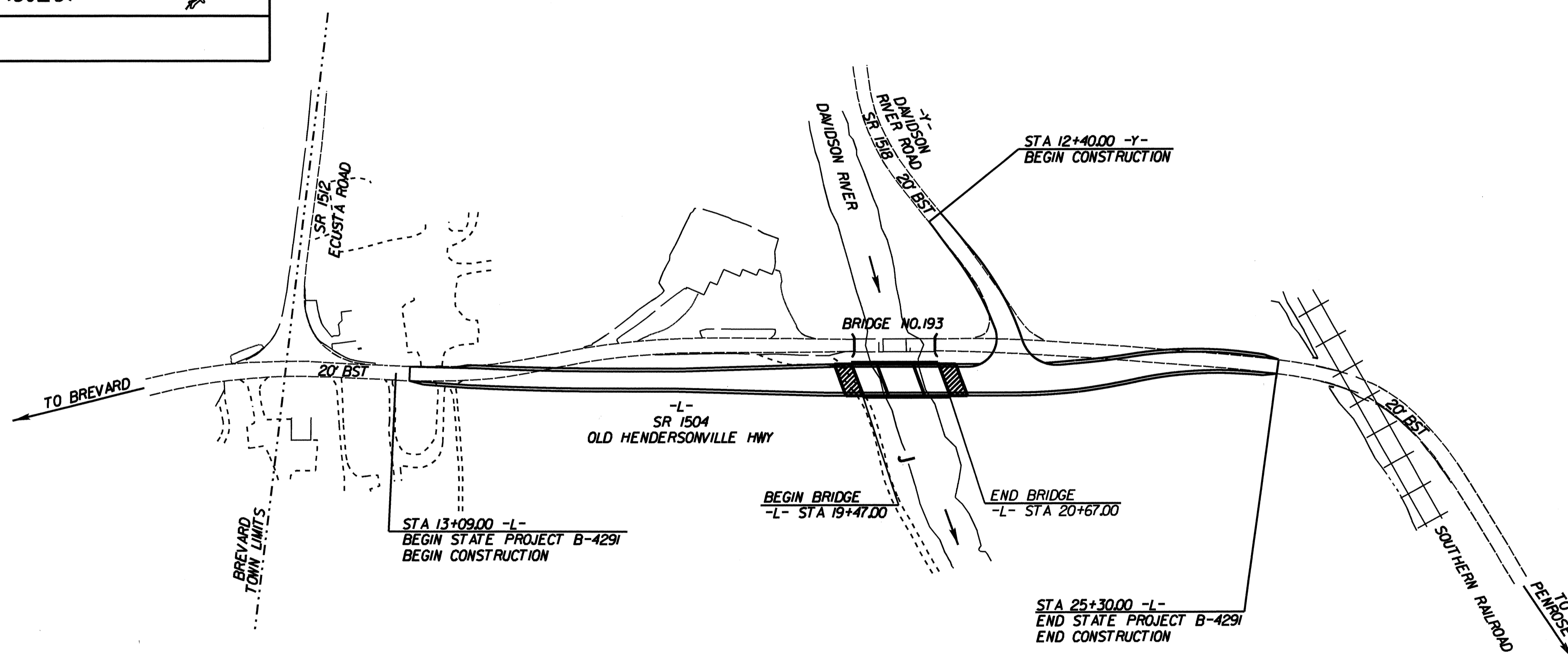
TRANSYLVANIA COUNTY

LOCATION: BRIDGE NO. 193 OVER DAVIDSON RIVER ON SR 1504

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



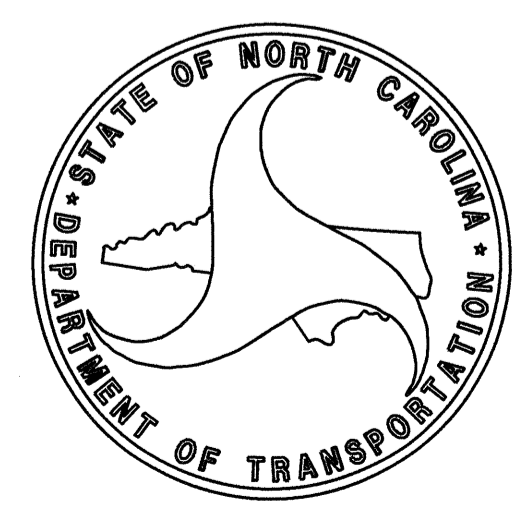
VICINITY MAP



STRUCTURE

TIP PROJECT: B-4291

CONTRACT: C202262



DESIGN DATA
 ADT 2008 = 8,000 VPD
 ADT 2030 = 12,900 VPD
 DHV = 10%
 D = 60%
 T = 5% *
 V = 40 mph
 FUNCTIONAL CLASSIFICATION:
 RURAL MAJOR COLLECTOR
 * (TTST 1% + DUAL 4%)

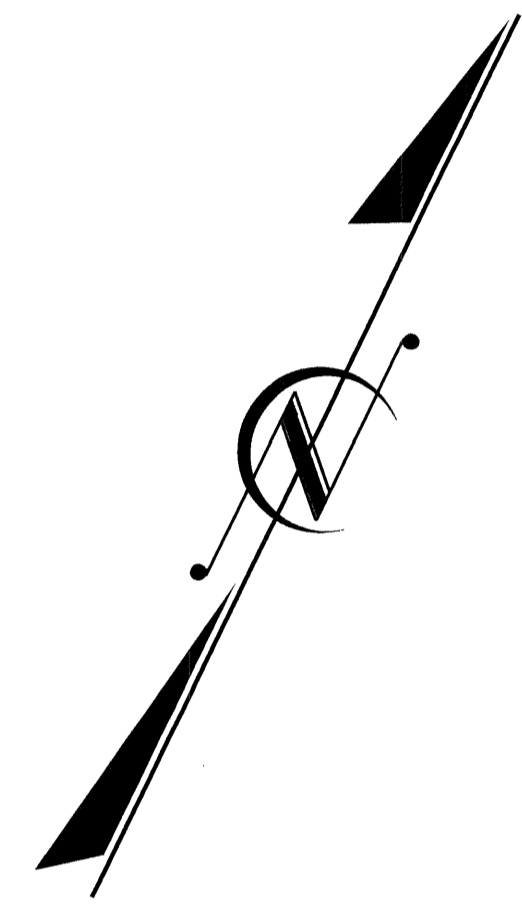
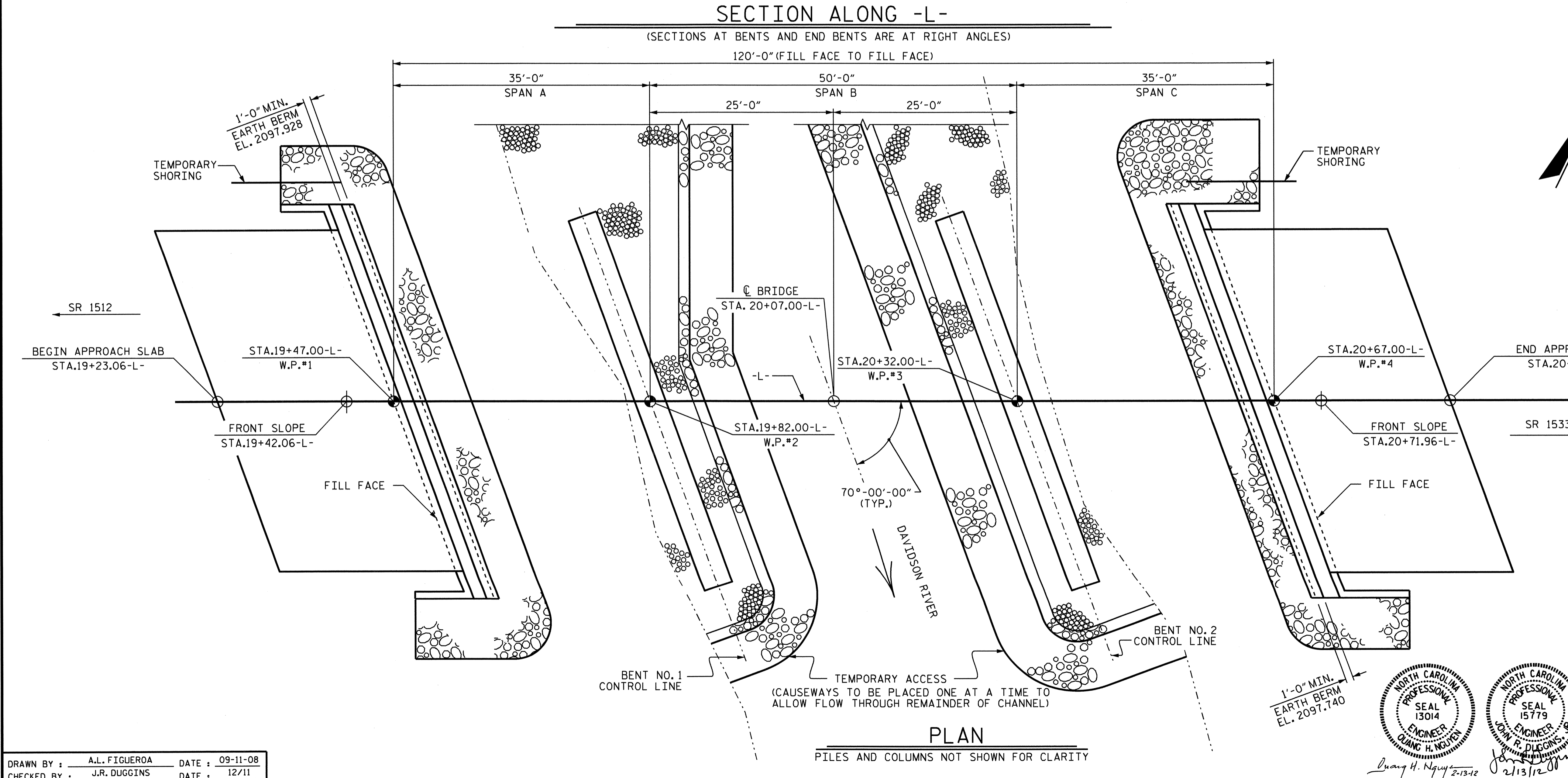
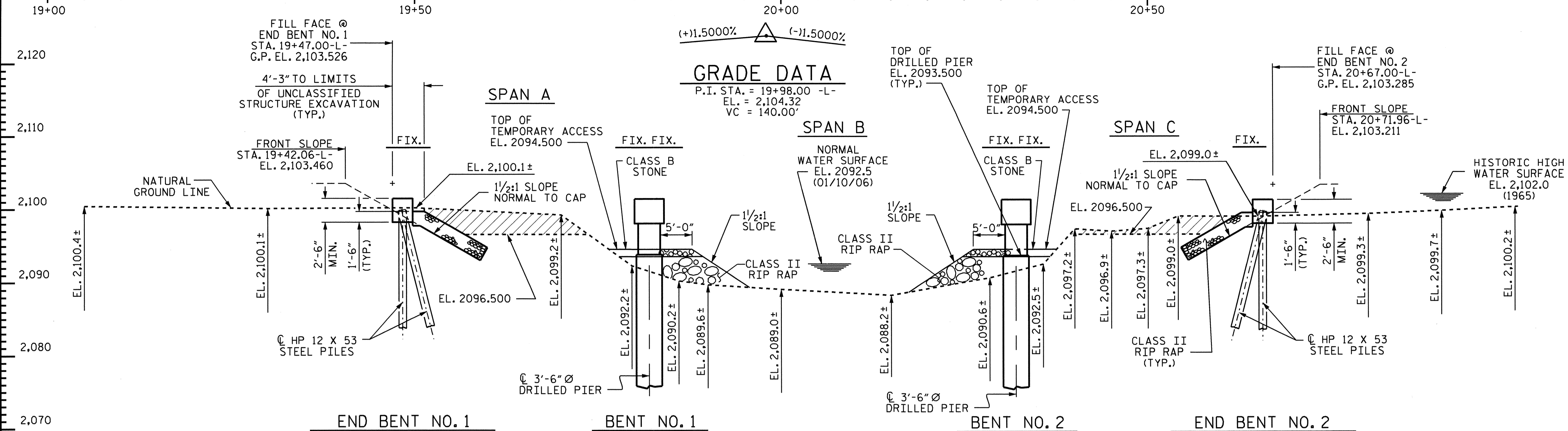
PROJECT LENGTH
 LENGTH OF ROADWAY TIP PROJECT B-4291 = 0.208 MILE
 LENGTH OF STRUCTURE TIP PROJECT B-4291 = 0.023 MILE
 TOTAL LENGTH OF TIP PROJECT B-4291 = 0.231 MILE

DIVISION OF HIGHWAYS
 2012 STANDARD SPECIFICATIONS
 LETTING DATE:
 APRIL 17, 2012
 Q.H. NGUYEN, P.E.
 PROJECT ENGINEER
 J. R. DUGGINS, JR., P.E.
 PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT
 1000 BIRCH RIDGE DRIVE
 RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA
 P.E.
 STATE HIGHWAY DESIGN ENGINEER
 DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 DIVISION ADMINISTRATOR DATE

\$FILEL\$
\$DATE\$



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

DRAWN BY: A.L. FIGUEROA DATE: 09-11-08
CHECKED BY: J.R. DUGGINS DATE: 12/11

13-FEB-2012 12:15
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jduggins

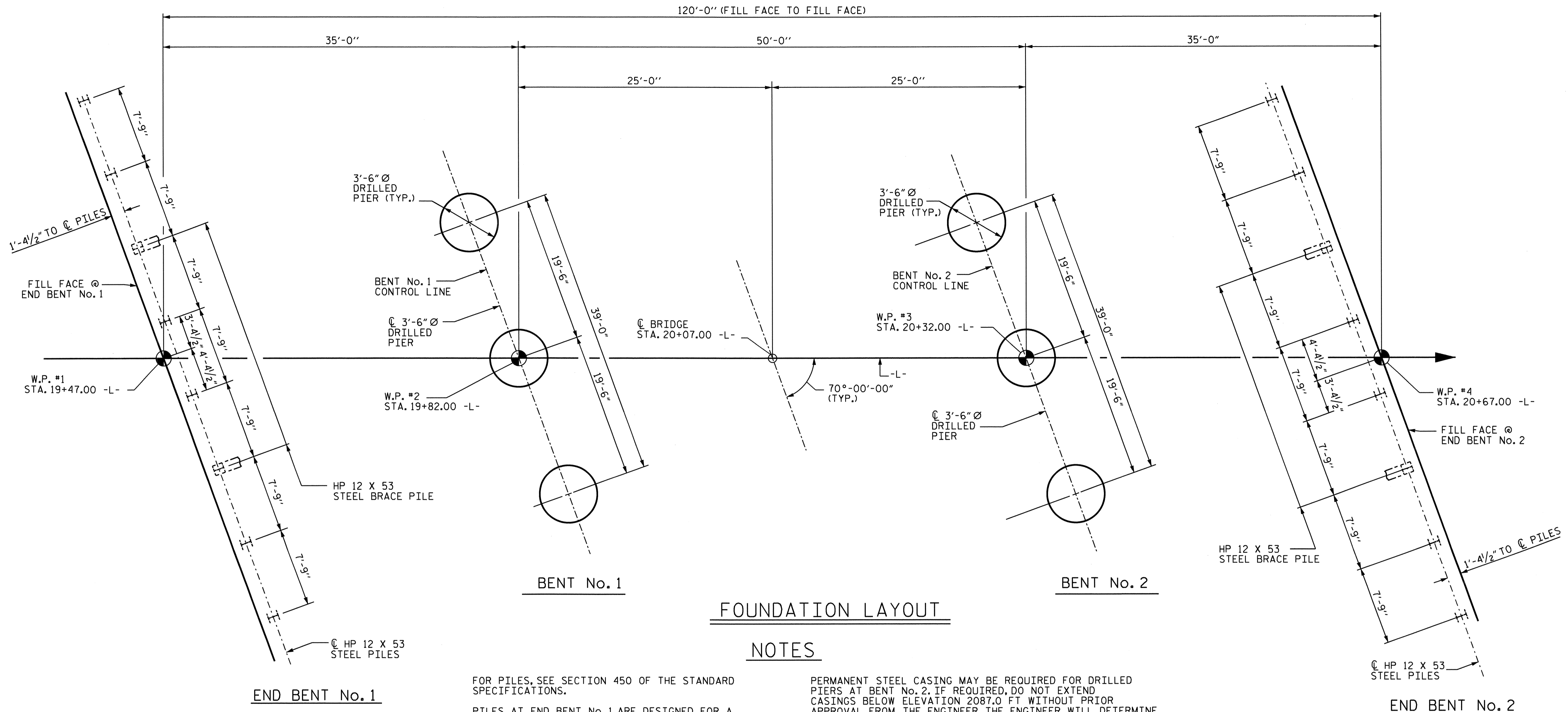
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 13014
QUANG H. NGUYEN

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 15779
JON R. DUGGINS, JR.

Quang H. Nguyen 2/13/12
Jon R. Duggins, Jr. 2/13/12

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
STATION: 20+07.00-L-
SHEET 1 OF 3 REPLACES BRIDGE NO. 193

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



FOUNDATION LAYOUT

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.

DRIVE PILES AT BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

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

DRILLED PIERS AT BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 350.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No.1. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 2087.0 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT BENT No.1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2079.0 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 7 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT No.1 IS ELEVATION 2084.5 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT No. 2 ARE DESIGNED FOR FACTORED RESISTANCE OF 350.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No.2. IF REQUIRED, DO NOT EXTEND CASINGS BELOW ELEVATION 2087.0 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL DRILLED PIERS AT BENT No.2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2078.0 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 7 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT No.2 IS ELEVATION 2085.0 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.

DRIVE PILES AT END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

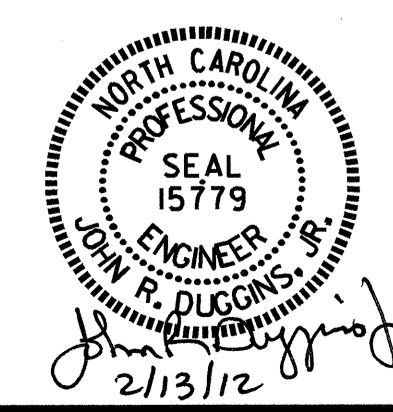
NOTE: DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF THE CAP.

DRAWN BY : M. POOLE DATE : 12/11
 CHECKED BY : J.R. DUGGINS DATE : 12/11

13-FEB-2012 12:13
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 jduggins

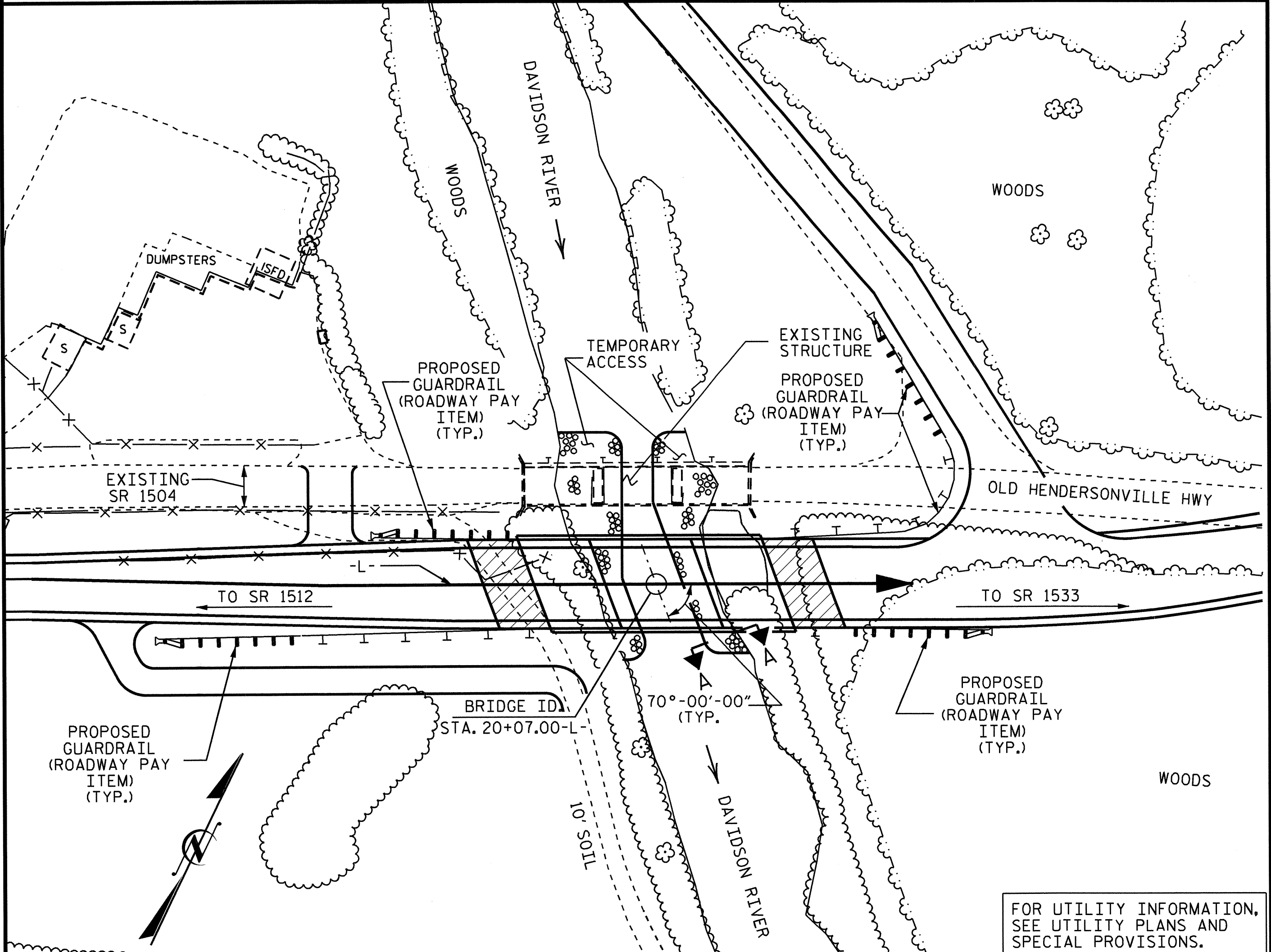
PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 1504
 OVER DAVIDSON RIVER
 BETWEEN SR 1512 AND SR 1533



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-2
2			4			30

BENCHMARK #5-NCGS BENCHMARK DISK (TRA 1) SET IN THE WHEEL GUARD AT THE NORTHWEST CORNER OF THE BRIDGE STA. 19+43.35 -L- (57.75' LT.) EL. 2104.52' NAVD 88



LOCATION SKETCH

HYDRAULIC DATA

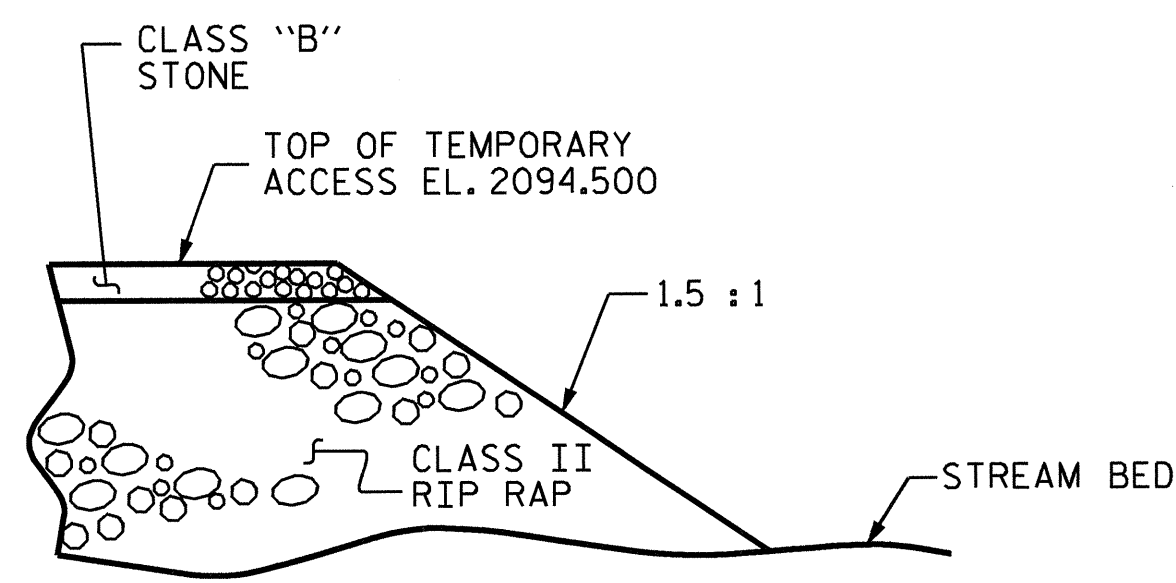
DESIGN DISCHARGE ----- = 7,265 C.F.S.
 FREQUENCY OF DESIGN FLOOD ----- = 25 YRS.
 DESIGN HIGH WATER ELEVATION ----- = 2101.7
 DRAINAGE AREA ----- = 47.1 SQ. MI.
 BASE DISCHARGE (Q100) ----- = 10,760 C.F.S.
 BASE HIGH WATER ELEVATION ----- = 2102.2

OVERTOPPING FLOOD DATA

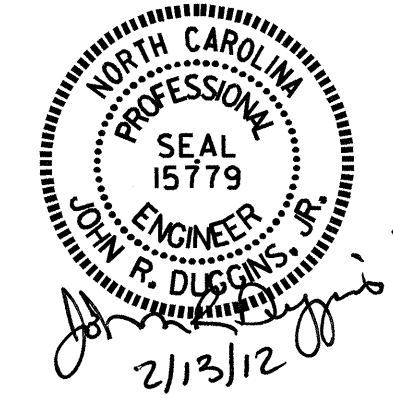
OVERTOPPING DISCHARGE ----- = 5,560 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD ----- = 10 YRS.
 OVERTOPPING FLOOD ELEVATION ----- = 2,100

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.
 THIS BRIDGE HAS BEEN DESIGN IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, 1 @ 37'-2", 1 @ 37'-6", 1 @ 37'-2", WITH 3 LINES OF 2'-7" REINFORCED CONCRETE DECK GIRDERS ON 7'-0" CENTERS, WITH A CLEAR ROADWAY WIDTH OF 18'-0" AND REINFORCED CONCRETE DECK ON REINFORCED CONCRETE ABUTMENTS AND BENTS, LOCATED 50' UPSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 32 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.
 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.
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPliced WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
 FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS", SEE SPECIAL PROVISIONS.
 AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+07.00-L-.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



SECTION A-A



TOTAL BILL OF MATERIAL

	CONST., MAINT. & REMOVAL OF TEMP. ACCESS AT STA. 20+07.00-L-	REMOVAL OF EXISTING STRUCTURE @ STA. 20+07.00-L-	REMOVAL OF EXISTING STRUCTURE @ STA. 15+73.31-L-	3'-6" Ø DRILLED PIER IN SOIL	3'-6" Ø DRILLED PIER NOT IN SOIL	PERM. STEEL CASING FOR 3'-6" Ø DRILLED PIER	S I D INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP12 X 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 2'-9 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEX-TILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		
	LUMP SUM	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	NO.	LIN.FT.
SUPERSTRUCTURE																219.30	235.48					48	1,877.33
END BENT NO. 1											19.4		2,659		8	120		102	113				
BENT NO. 1				28.50	21.00	19.50					30.9		7,396	1,343									
BENT NO. 2				22.50	27.00	19.50					31.1		7,396	1,343									
END BENT NO. 2											19.4		2,659		8	120		97	108				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	51.00	48.00	39.00	1	1	1	LUMP SUM	100.8	LUMP SUM	20,110	2,686	16	240	219.30	235.48	199	221	LUMP SUM	48	1877.33

DRAWN BY: S.W. PEARCE DATE: 10-11-11
 CHECKED BY: J.R. DUGGINS DATE: 12/11

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 jduggins

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR
 BRIDGE ON SR 1504
 OVER DAVIDSON RIVER
 BETWEEN SR 1512 AND SR 1533

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-3
2			4			TOTAL SHEETS 30

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.008	--	1.75	0.271	1.52	35'	EL	16.336	0.531	1.01	35'	I	16.34	0.80	0.271	1.21	35'	EL	16.336		
	HL-93(Opr)	N/A	--	1.306	--	1.35	0.271	1.97	35'	EL	16.336	0.531	1.31	35'	I	16.34	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.143	41.161	1.75	0.271	2.02	35'	EL	13.069	0.531	1.14	35'	I	16.34	0.80	0.271	1.63	35'	EL	13.069		
	HS-20(Opr)	36.000	--	1.482	53.356	1.35	0.271	2.62	35'	EL	13.069	0.531	1.48	35'	I	16.34	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.746	37.072	1.4	0.271	4.32	35'	EL	16.336	0.531	2.91	35'	I	16.34	0.80	0.271	2.75	35'	EL	16.336	
		SNGARBS2	20.000	--	2.210	44.204	1.4	0.271	3.68	35'	EL	13.069	0.531	2.21	35'	I	16.34	0.80	0.271	2.37	35'	EL	13.069	
		SNAGRIS2	22.000	--	2.112	46.457	1.4	0.271	3.67	35'	EL	13.069	0.531	2.11	35'	I	16.34	0.80	0.271	2.37	35'	EL	13.069	
		SNCOTTS3	27.250	--	1.375	37.482	1.4	0.271	2.16	35'	EL	16.336	0.531	1.47	35'	I	16.34	0.80	0.271	1.38	35'	EL	16.336	
		SNAGGRS4	34.925	--	1.284	44.840	1.4	0.271	2.02	35'	EL	16.336	0.531	1.32	35'	I	16.34	0.80	0.271	1.28	35'	EL	16.336	
		SNS5A	35.550	--	1.245	44.274	1.4	0.271	1.96	35'	EL	16.336	0.531	1.40	35'	I	16.34	0.80	0.271	1.25	35'	EL	16.336	
		SNS6A	39.950	--	1.197	47.803	1.4	0.271	1.88	35'	EL	16.336	0.531	1.31	35'	I	16.34	0.80	0.271	1.20	35'	EL	16.336	
	SNS7B	42.000	3	1.146	48.148	1.4	0.271	1.80	35'	EL	16.336	0.531	1.34	35'	I	16.34	0.80	0.271	1.15	35'	EL	16.336		
	TTST	TNAGRIT3	33.000	--	1.494	49.293	1.4	0.271	2.35	35'	EL	16.336	0.531	1.54	35'	I	16.34	0.80	0.271	1.49	35'	EL	16.336	
		TNT4A	33.075	--	1.444	47.772	1.4	0.271	2.32	35'	EL	16.336	0.531	1.44	35'	I	16.34	0.80	0.271	1.48	35'	EL	16.336	
		TNT6A	41.600	--	1.303	54.207	1.4	0.271	2.05	35'	EL	16.336	0.531	1.42	35'	I	16.34	0.80	0.271	1.30	35'	EL	16.336	
		TNT7A	42.000	--	1.317	55.326	1.4	0.271	2.12	35'	EL	16.336	0.531	1.32	35'	I	16.34	0.80	0.271	1.35	35'	EL	16.336	
		TNT7B	42.000	--	1.281	53.789	1.4	0.271	2.06	35'	EL	16.336	0.531	1.28	35'	I	16.34	0.80	0.271	1.31	35'	EL	16.336	
		TNAGRIT4	43.000	--	1.230	52.906	1.4	0.271	2.10	35'	EL	16.336	0.531	1.23	35'	I	16.34	0.80	0.271	1.33	35'	EL	16.336	
TNAGT5A		45.000	--	1.251	56.315	1.4	0.271	1.97	35'	EL	16.336	0.531	1.31	35'	I	16.34	0.80	0.271	1.25	35'	EL	16.336		
TNAGT5B	45.000	--	1.161	52.253	1.4	0.271	1.89	35'	EL	16.336	0.531	1.16	35'	I	16.34	0.80	0.271	1.20	35'	EL	16.336			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{dc}	γ _{ow}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

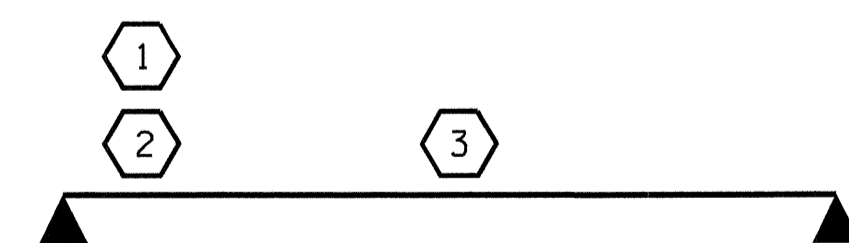
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

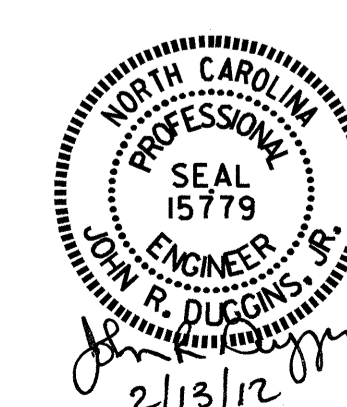


LRFR SUMMARY
FOR SPAN A & C

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07 -L-

ASSEMBLED BY : H. P. KIM DATE : 01/12
 CHECKED BY : J. R. DUGGINS DATE : 01/12
 DRAWN BY : CVC 6/10
 CHECKED BY : DNS 6/10

13-FEB-2012 12:12
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 jduggins



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 35' CORED SLAB UNIT
 70° SKEW
 (NON-INTERSTATE TRAFFIC)

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(InV)	N/A	1	1.039	--	1.75	0.270	1.04	50'	EL	24.401	0.527	1.06	50'	I	4.880	0.80	0.270	1.08	50'	EL	24.401		
	HL-93(0pr)	N/A	--	1.346	--	1.35	0.270	1.35	50'	EL	24.401	0.527	1.37	50'	I	4.880	N/A	--	--	--	--	--		
	HS-20(InV)	36.000	2	1.262	45.444	1.75	0.270	1.29	50'	EL	24.401	0.527	1.26	50'	I	4.880	0.80	0.270	1.33	50'	EL	24.401		
	HS-20(0pr)	36.000	--	1.636	58.909	1.35	0.270	1.67	50'	EL	24.401	0.527	1.64	50'	I	4.880	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	2.712	36.611	1.4	0.270	3.27	50'	EL	24.401	0.527	3.52	50'	I	4.880	0.80	0.270	2.71	50'	EL	24.401	
		SNGARBS2	20.000	--	2.143	42.867	1.4	0.270	2.58	50'	EL	24.401	0.527	2.58	50'	I	4.880	0.80	0.270	2.14	50'	EL	24.401	
		SNAGRIS2	22.000	--	2.086	45.884	1.4	0.270	2.52	50'	EL	24.401	0.527	2.42	50'	I	4.880	0.80	0.270	2.09	50'	EL	24.401	
		SNCOTTS3	27.250	--	1.353	36.866	1.4	0.270	1.63	50'	EL	24.401	0.527	1.77	50'	I	4.880	0.80	0.270	1.35	50'	EL	24.401	
		SNAGGRS4	34.925	--	1.177	41.098	1.4	0.270	1.42	50'	EL	24.401	0.527	1.52	50'	I	4.880	0.80	0.270	1.18	50'	EL	24.401	
		SNS5A	35.550	--	1.148	40.794	1.4	0.270	1.38	50'	EL	24.401	0.527	1.56	50'	I	4.880	0.80	0.270	1.15	50'	EL	24.401	
		SNS6A	39.950	--	1.073	42.875	1.4	0.270	1.29	50'	EL	24.401	0.527	1.45	50'	I	4.880	0.80	0.270	1.07	50'	EL	24.401	
	SNS7B	42.000	--	1.023	42.957	1.4	0.270	1.23	50'	EL	24.401	0.527	1.45	50'	I	4.880	0.80	0.201	1.02	50'	EL	24.401		
	TTST	TNAGRIT3	33.000	--	1.315	43.391	1.4	0.270	1.59	50'	EL	24.401	0.527	1.70	50'	I	4.880	0.80	0.270	1.31	50'	EL	24.401	
		TNT4A	33.075	--	1.326	43.872	1.4	0.270	1.60	50'	EL	24.401	0.527	1.64	50'	I	4.880	0.80	0.270	1.33	50'	EL	24.401	
		TNT6A	41.600	--	1.105	45.973	1.4	0.270	1.33	50'	EL	24.401	0.527	1.59	50'	I	4.880	0.80	0.270	1.11	50'	EL	24.401	
		TNT7A	42.000	--	1.122	47.122	1.4	0.270	1.35	50'	EL	24.401	0.527	1.47	50'	I	4.880	0.80	0.270	1.12	50'	EL	24.401	
		TNT7B	42.000	--	1.170	49.126	1.4	0.270	1.41	50'	EL	24.401	0.527	1.40	50'	I	4.880	0.80	0.270	1.17	50'	EL	24.401	
		TNAGRIT4	43.000	--	1.110	47.734	1.4	0.201	1.34	50'	EL	24.401	0.527	1.34	50'	I	4.880	0.80	0.270	1.11	50'	EL	24.401	
TNAGT5A		45.000	--	1.037	46.659	1.4	0.270	1.25	50'	EL	24.401	0.527	1.37	50'	I	4.880	0.80	0.270	1.04	50'	EL	24.401		
TNAGT5B	45.000	3	1.016	45.709	1.4	0.270	1.22	50'	EL	24.401	0.527	1.27	50'	I	4.880	0.80	0.270	1.02	50'	EL	24.401			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

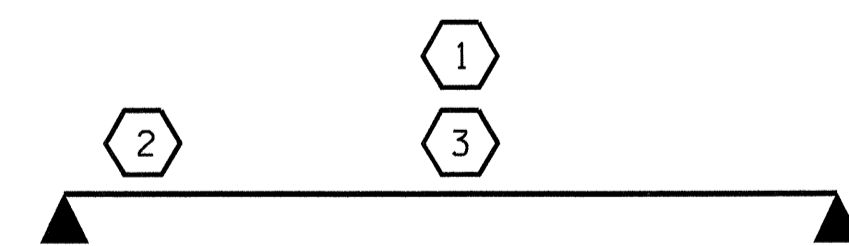
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

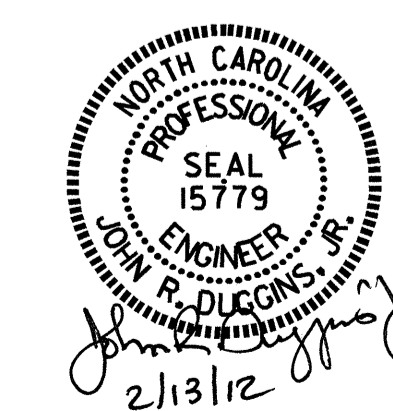
I - INTERIOR GIRDER
 EL - EXTERIOR LEFT GIRDER
 ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN B

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07 -L-

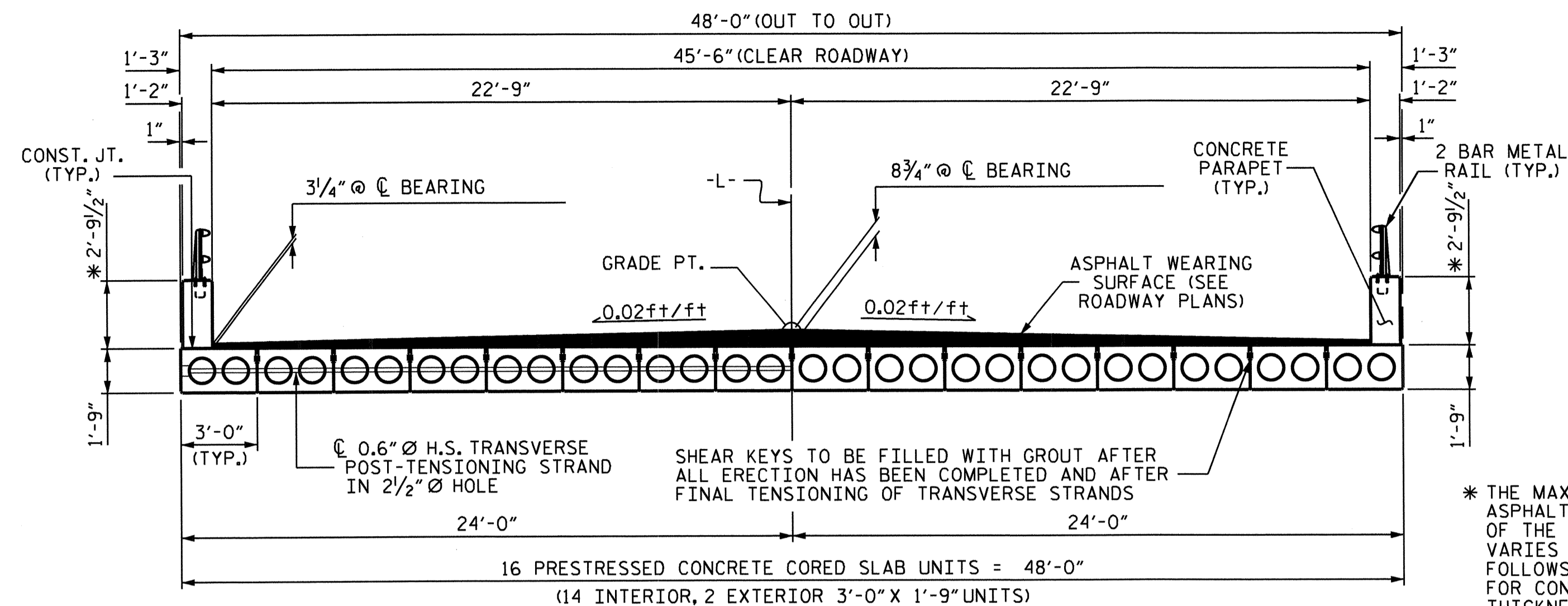
ASSEMBLED BY : H. P. KIM DATE : 01/12
 CHECKED BY : J. R. DUGGINS DATE : 01/12
 DRAWN BY : CVC 6/10
 CHECKED BY : DNS 6/10



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

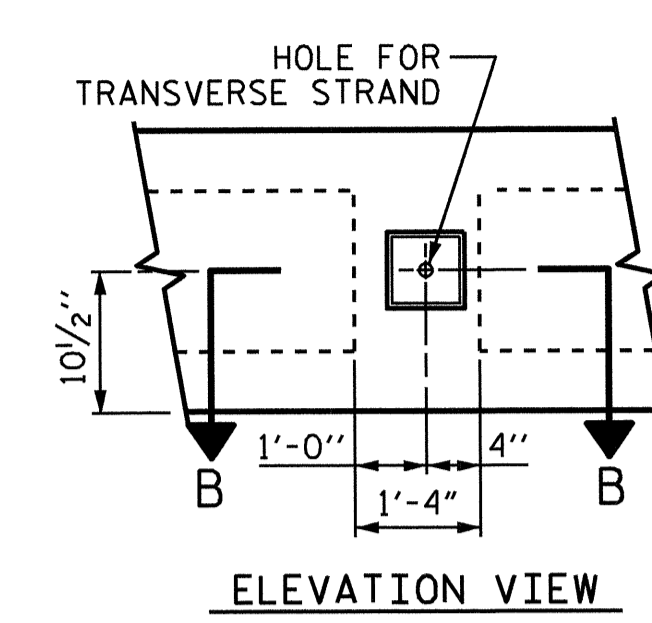
STANDARD
 LRFR SUMMARY FOR
 50' CORED SLAB UNIT
 70° SKEW
 (NON-INTERSTATE TRAFFIC)

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

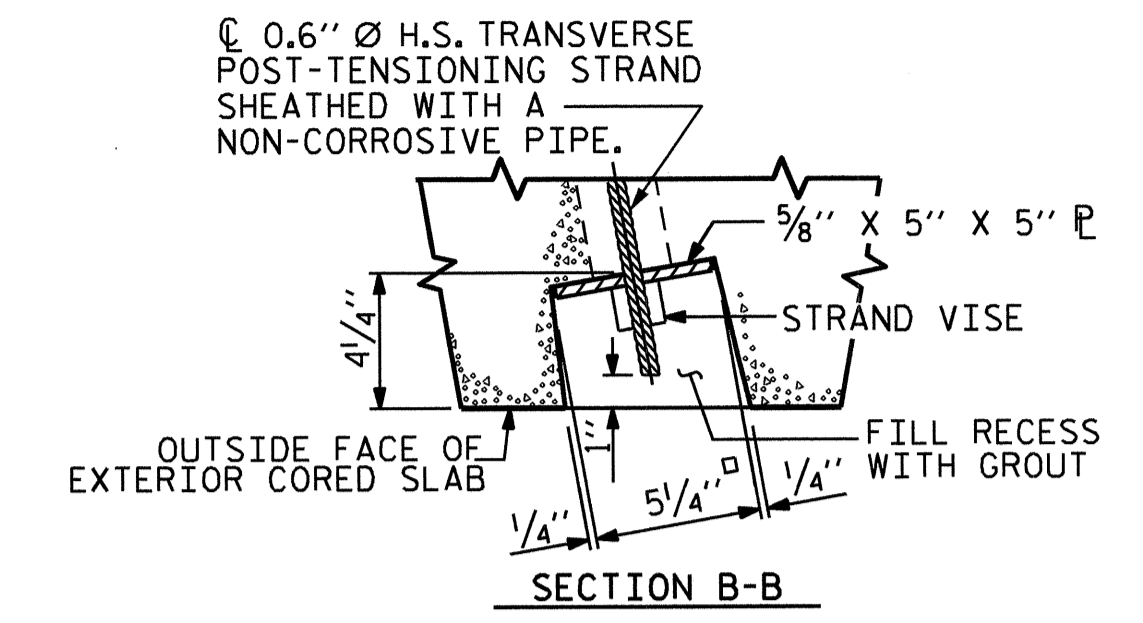


HALF SECTION @ POST TENSIONING LOCATION HALF SECTION @ BENT & END BENT

TYPICAL SECTION



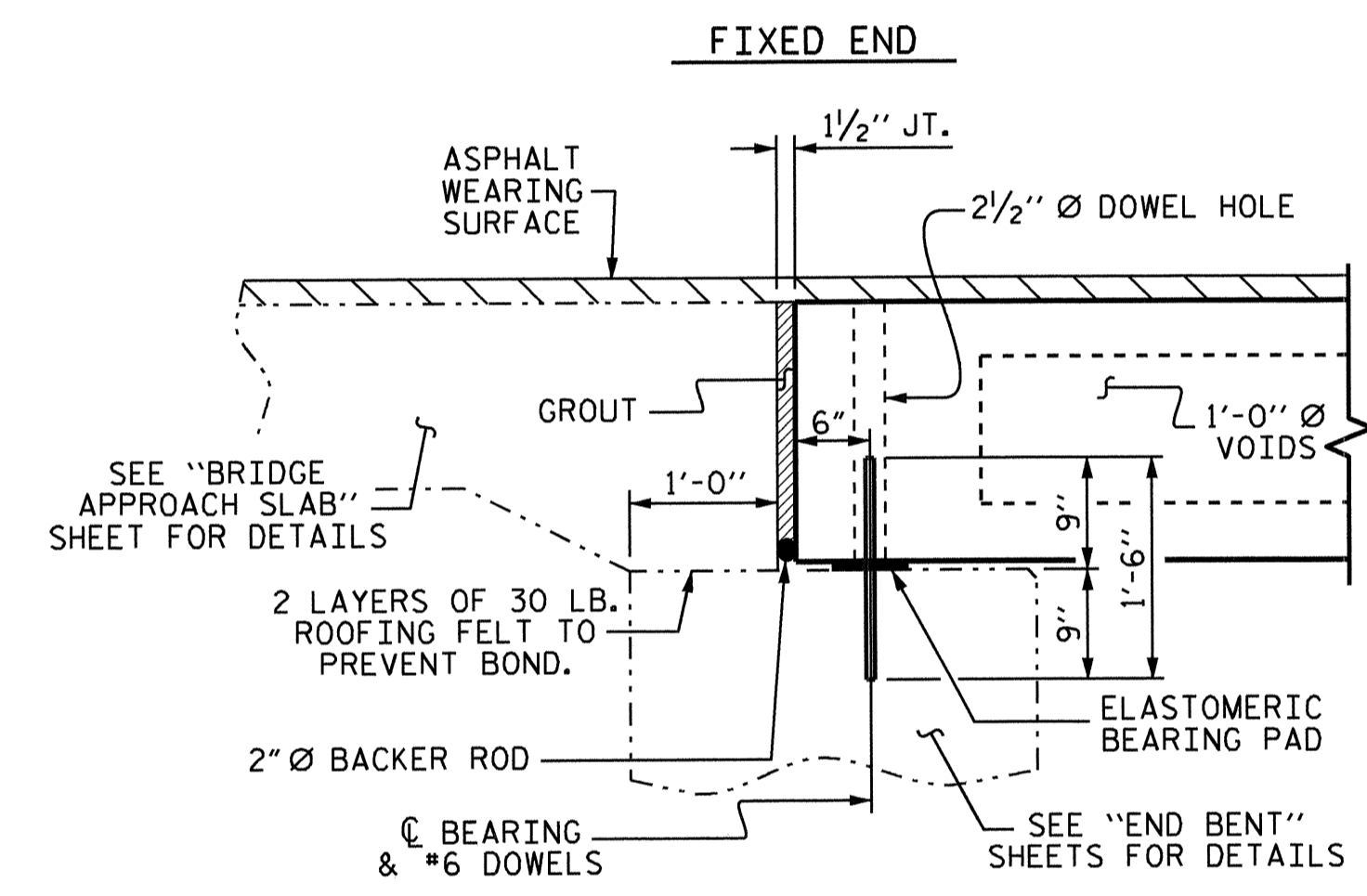
ELEVATION VIEW



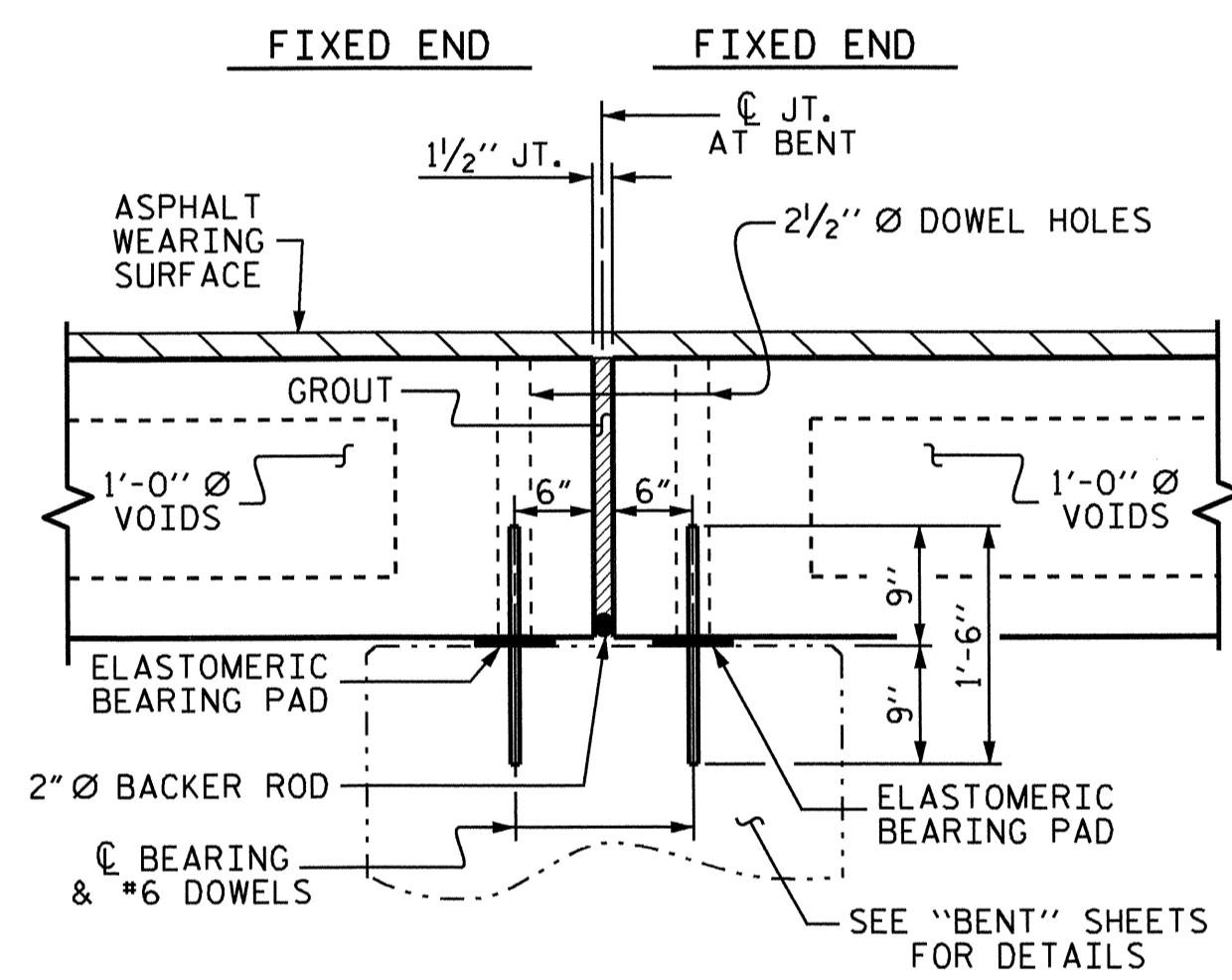
SECTION B-B

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

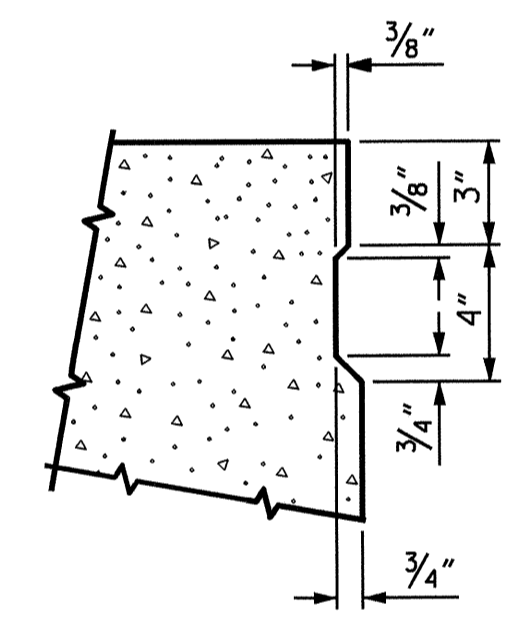
* THE MAXIMUM CONCRETE PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE CONCRETE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE CONCRETE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR CONCRETE PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT" TABLE, SHEET 7 OF 7.



SECTION AT END BENT

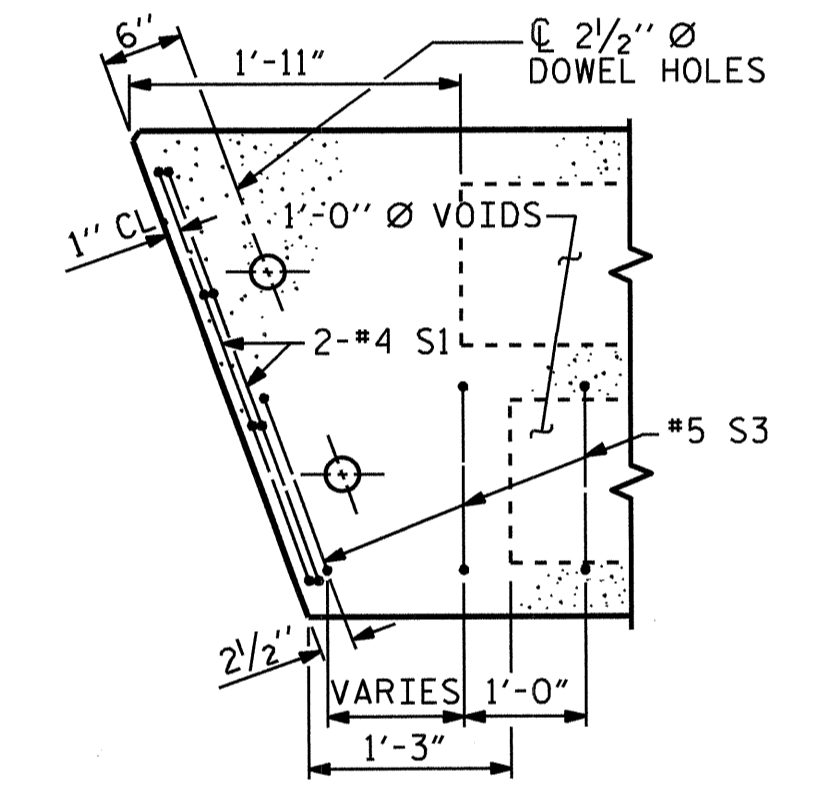


SECTION AT BENT



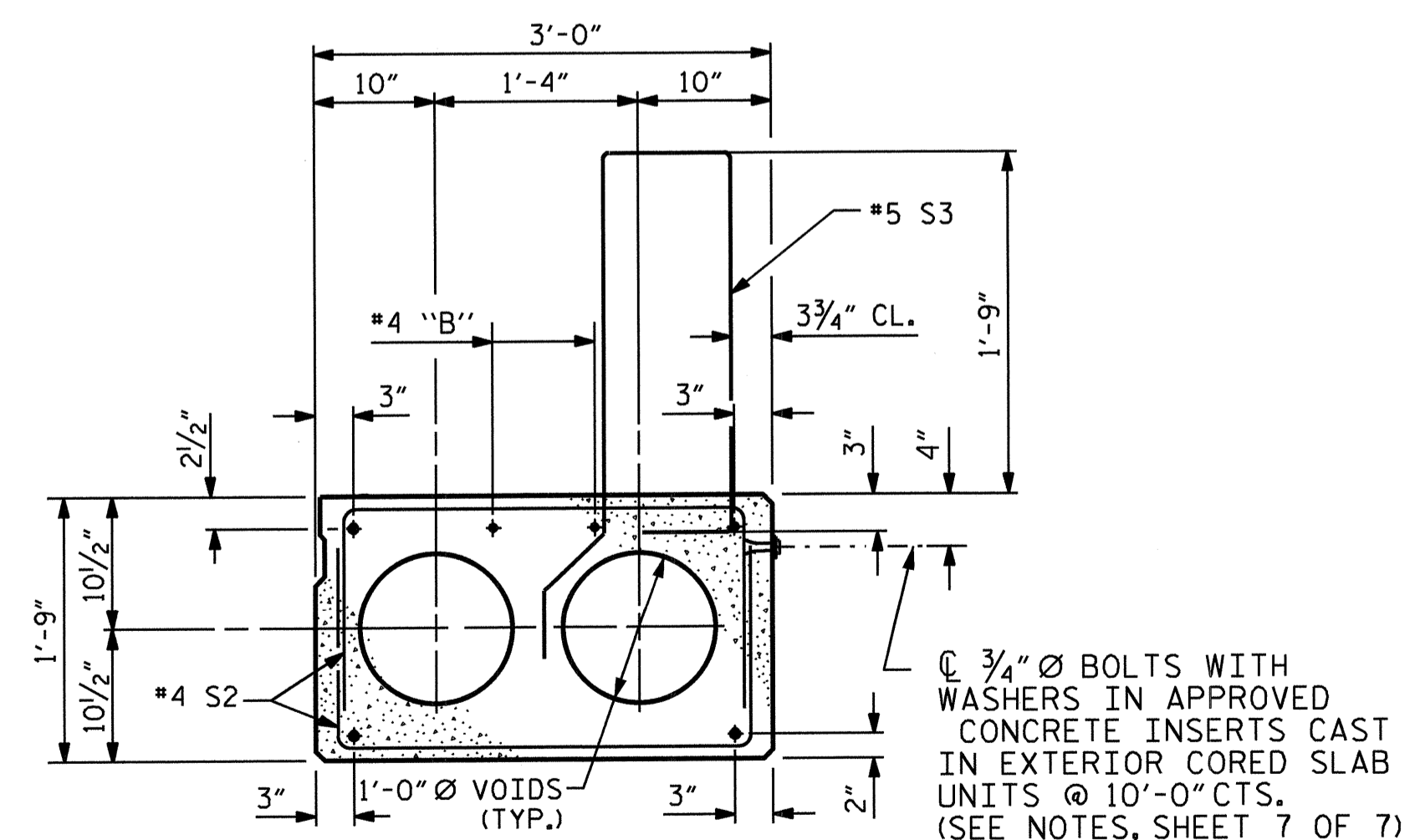
SHEAR KEY DETAIL

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



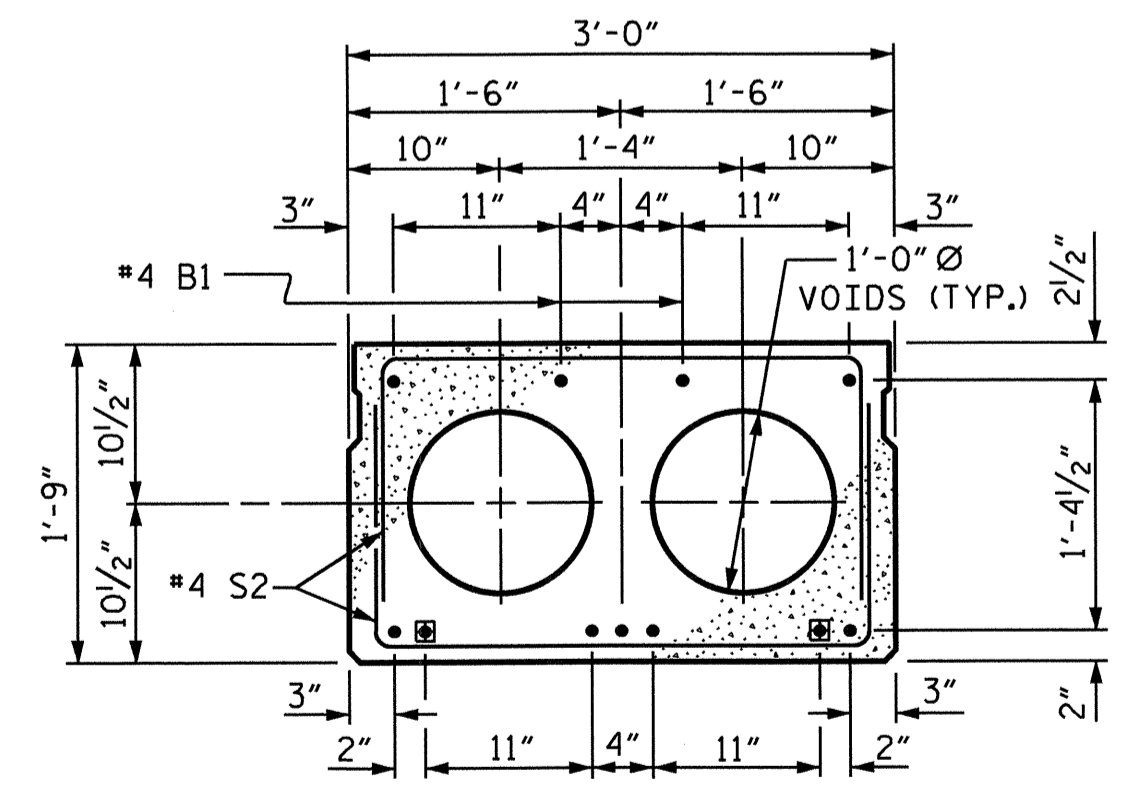
PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS FOR DIM. A, SEE PLAN OF SPAN



EXTERIOR SLAB SECTION

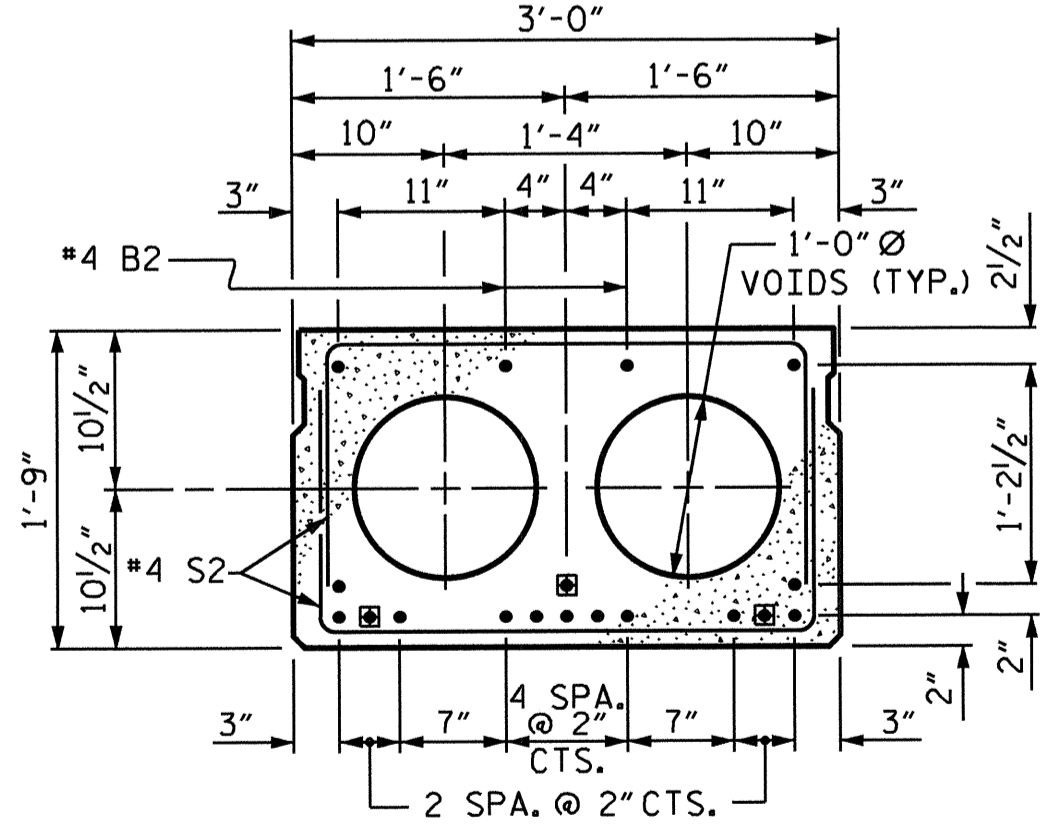
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION SPAN A & C

9-0.6" Ø LOW RELAXATION STRAND LAYOUT

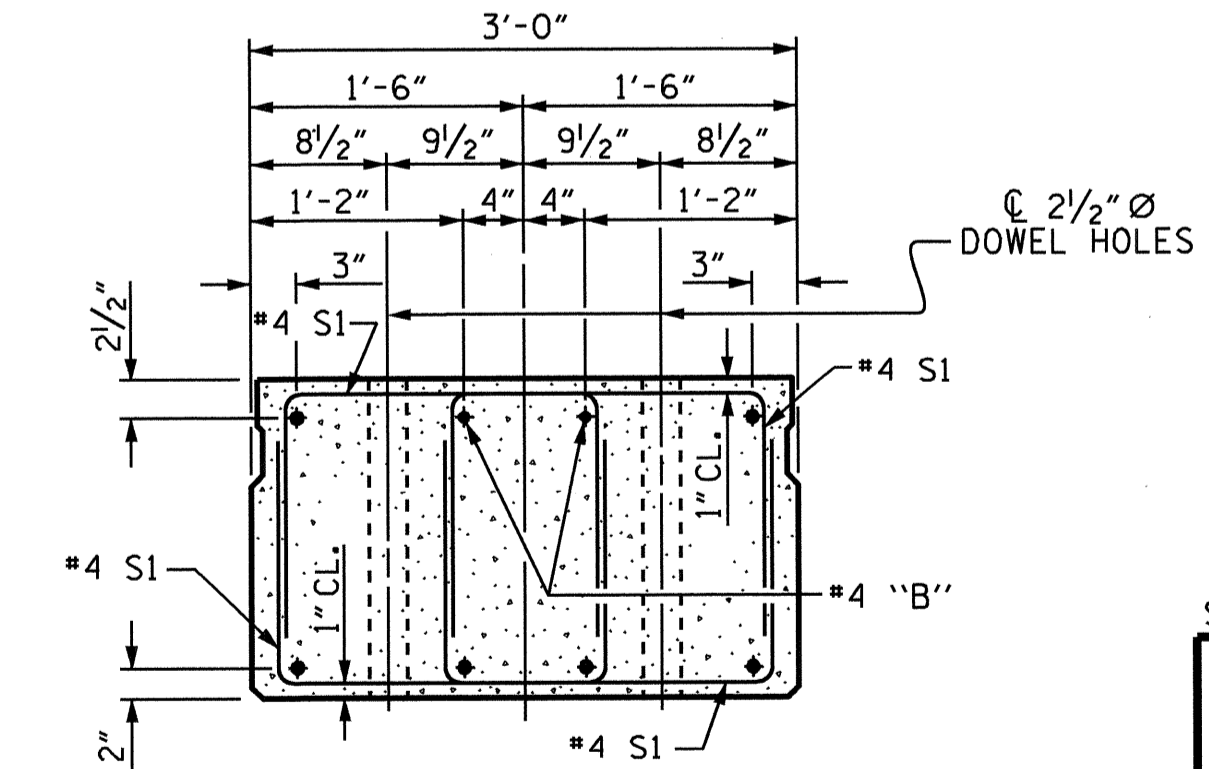
BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



INTERIOR SLAB SECTION SPAN B

16-0.6" Ø LOW RELAXATION STRAND LAYOUT

BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



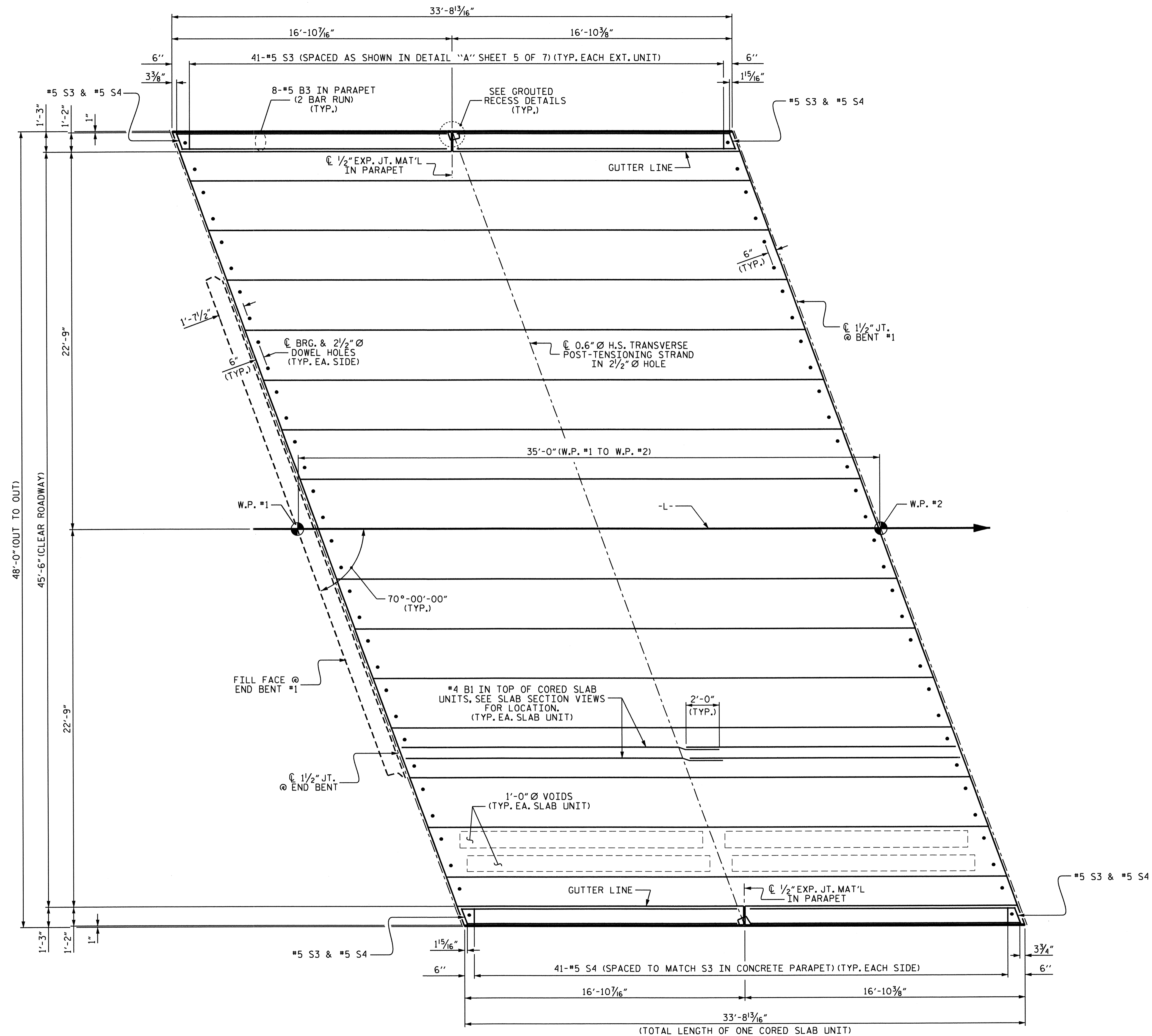
END ELEVATION

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

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-
 SHEET 1 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S-6	
3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 30

DRAWN BY: A. SORSENGINH DATE: 1/26/10
 CHECKED BY: M. POOLE DATE: 1/20/10



PLAN OF SPAN A

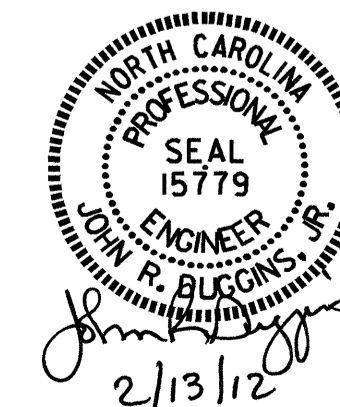
FOR #5 B3 & #5 S4, SEE "CONCRETE PARAPET DETAILS" SHEET.

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

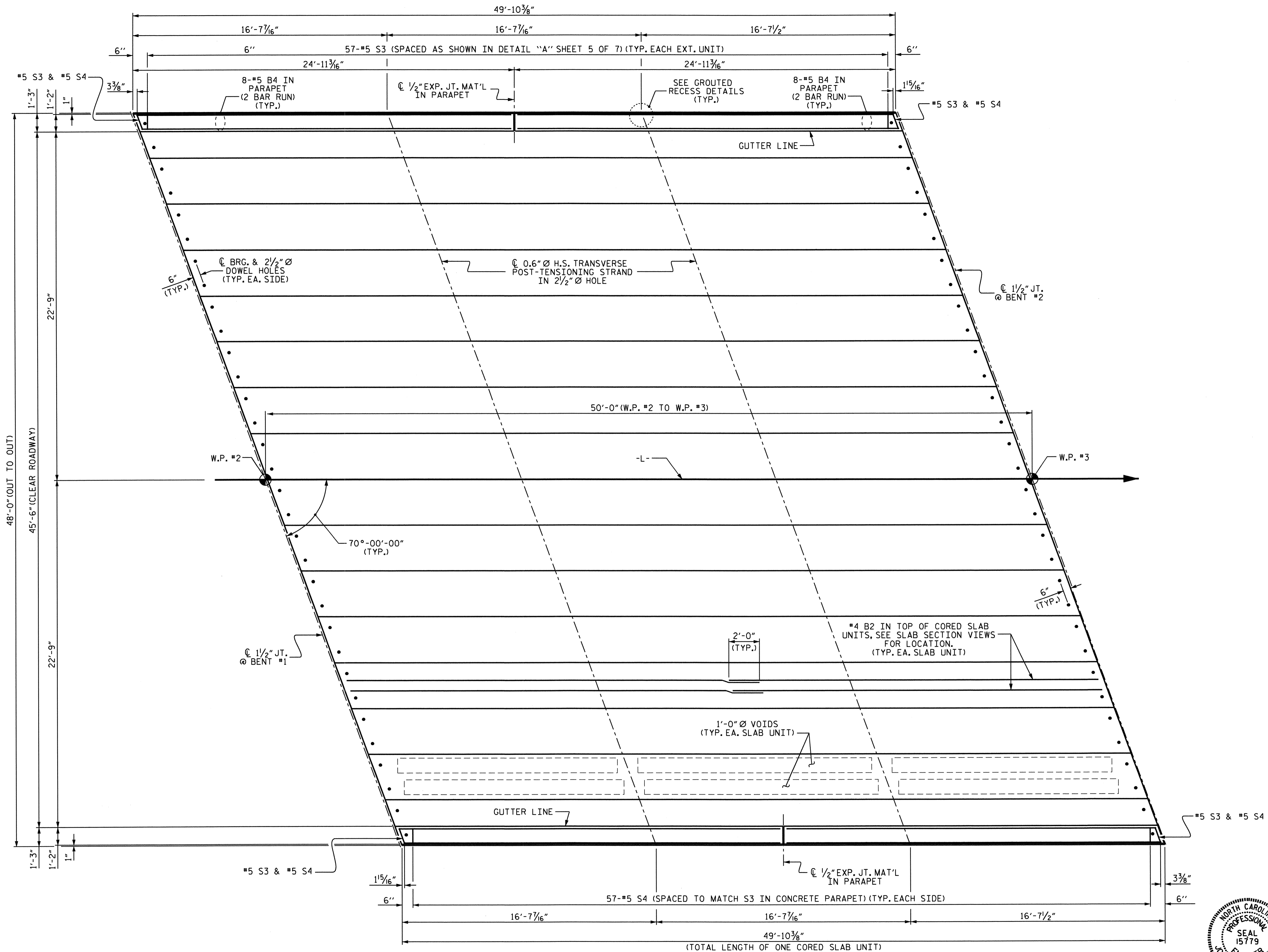
SUPERSTRUCTURE PLAN OF SPAN A



DRAWN BY : A. SORSENGINH DATE : 1/26/10
 CHECKED BY : M. POOLE DATE : 1/20/10

13-FEB-2012 12:08
 R:\Structures\B4291\Final Plans\B-4291.sd.s*.dgn
 jduggins

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-7
2			4			30



PLAN OF SPAN B

FOR #5 B4 & #5 S4, SEE
"CONCRETE PARAPET DETAILS" SHEET.

DRAWN BY : A. SORSENGINH DATE : 1/26/10
 CHECKED BY : M. POOLE DATE : 1/20/10

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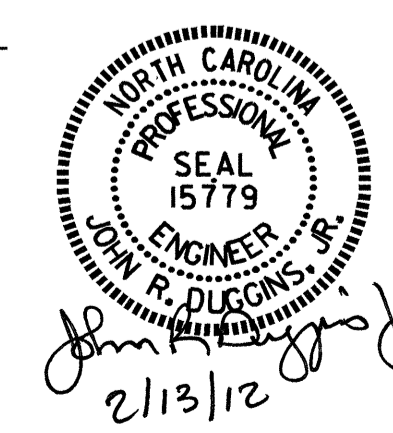
PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

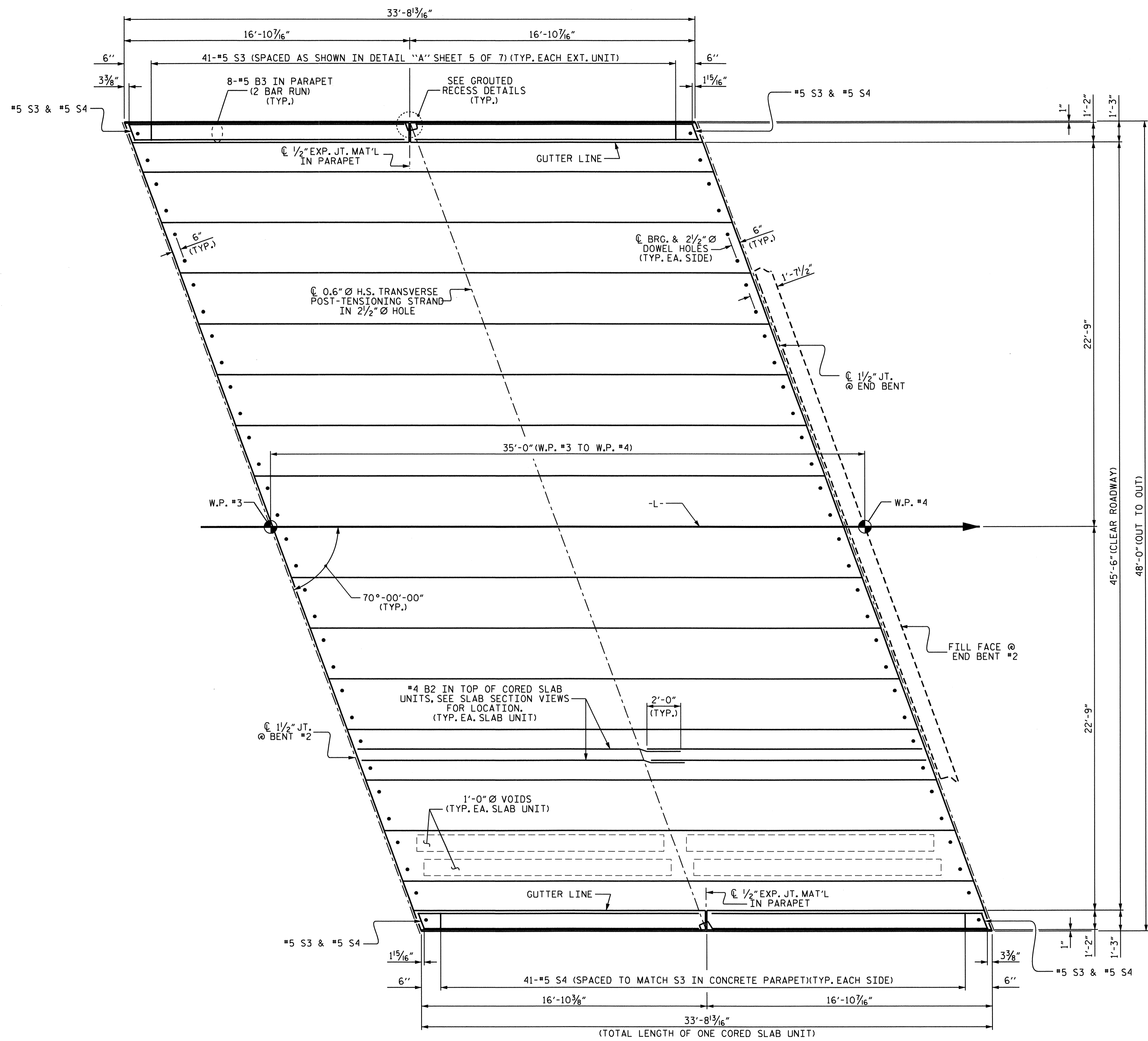
SHEET 3 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPAN B**

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





PLAN OF SPAN C

FOR #5 B3 & #5 S4, SEE
"CONCRETE PARAPET DETAILS" SHEET.

DRAWN BY : A. SORSENGINH DATE : 1/26/10
 CHECKED BY : M. POOLE DATE : 1/2010

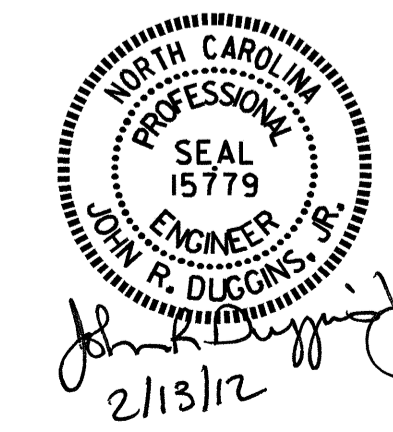
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 jduggins

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

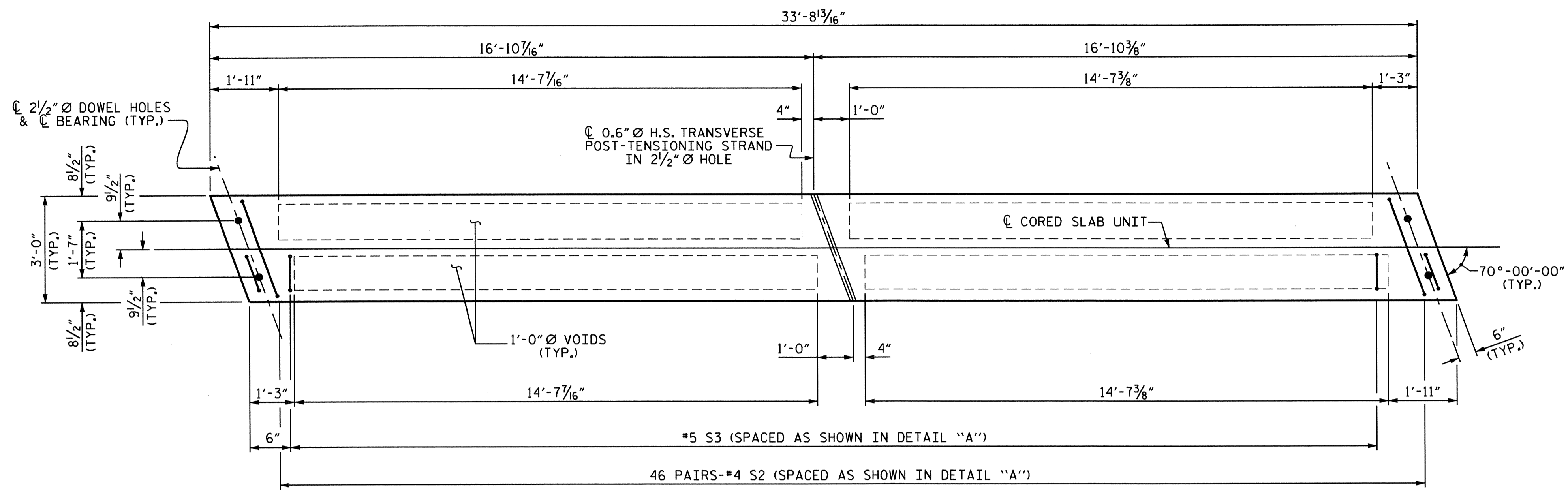
SHEET 4 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

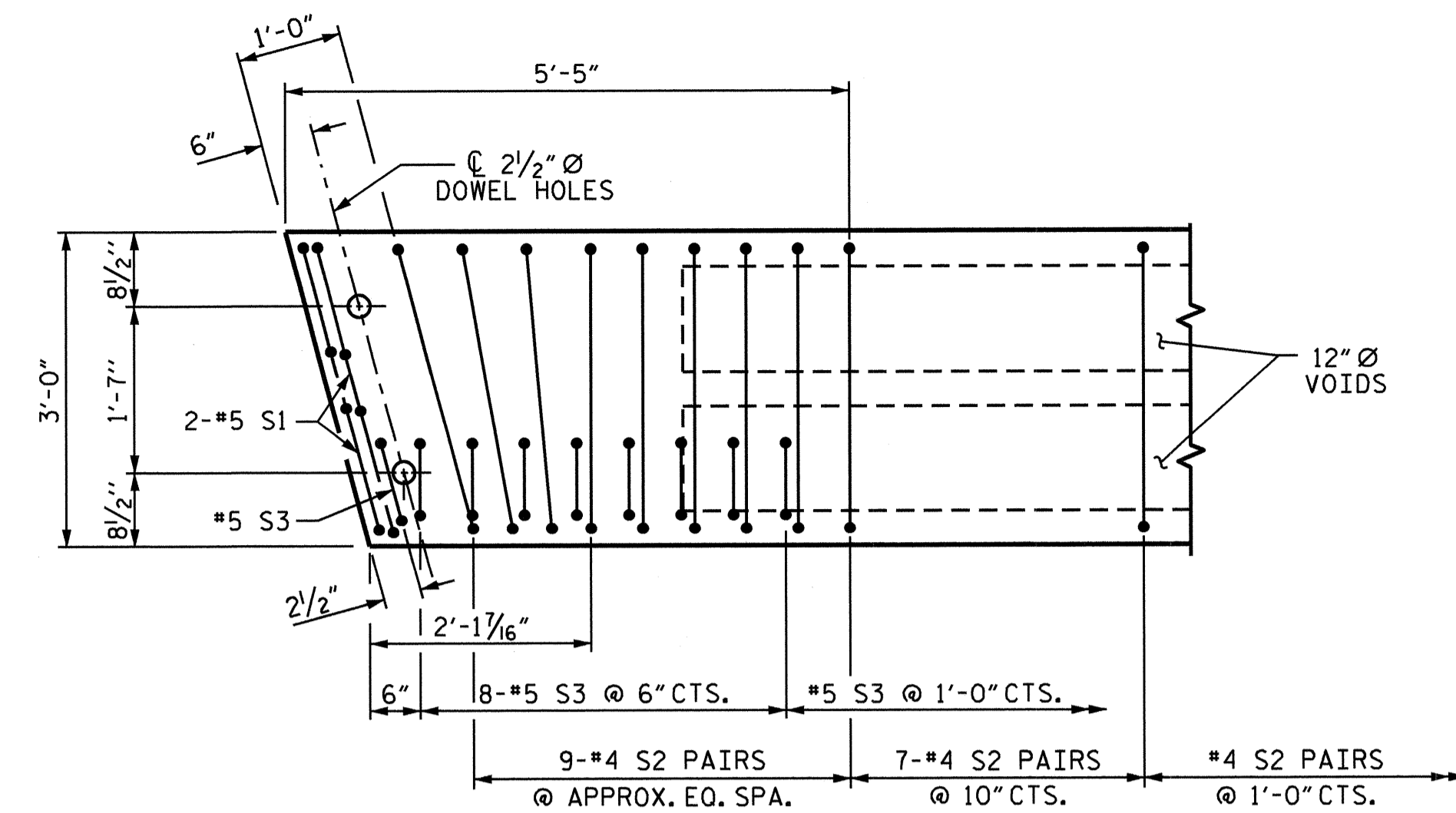
**SUPERSTRUCTURE
 PLAN OF SPAN C**



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-9
2			4			TOTAL SHEETS 30

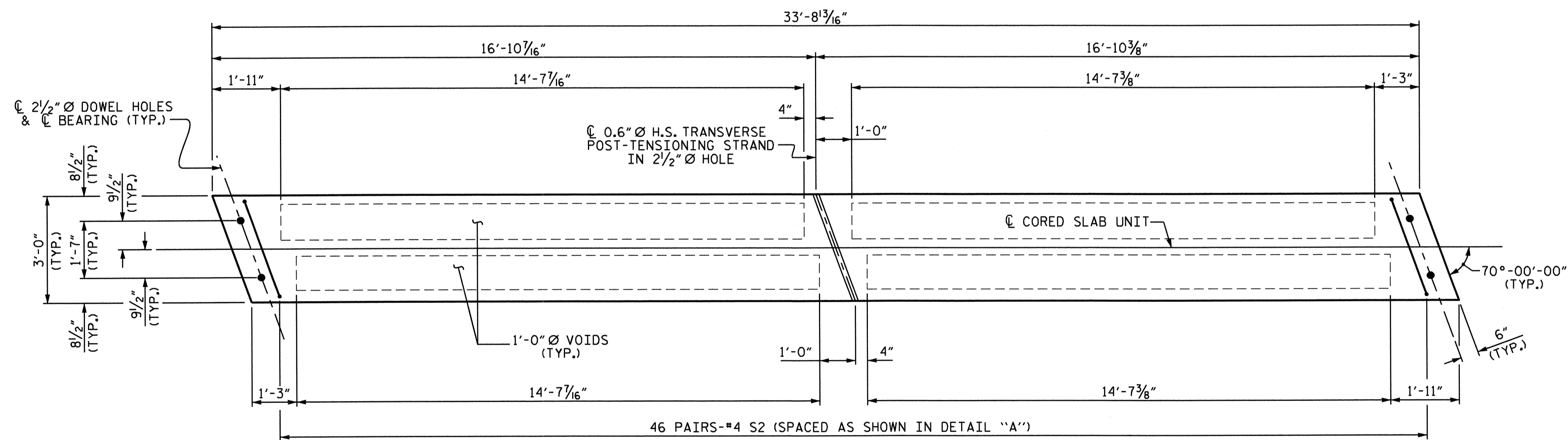


PLAN OF EXTERIOR SLAB - SPAN A & C



DETAIL "A"

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



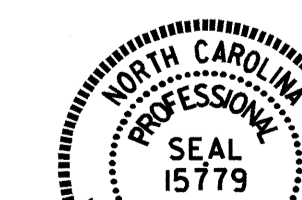
PLAN OF INTERIOR SLAB - SPAN A & C

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 DETAILS

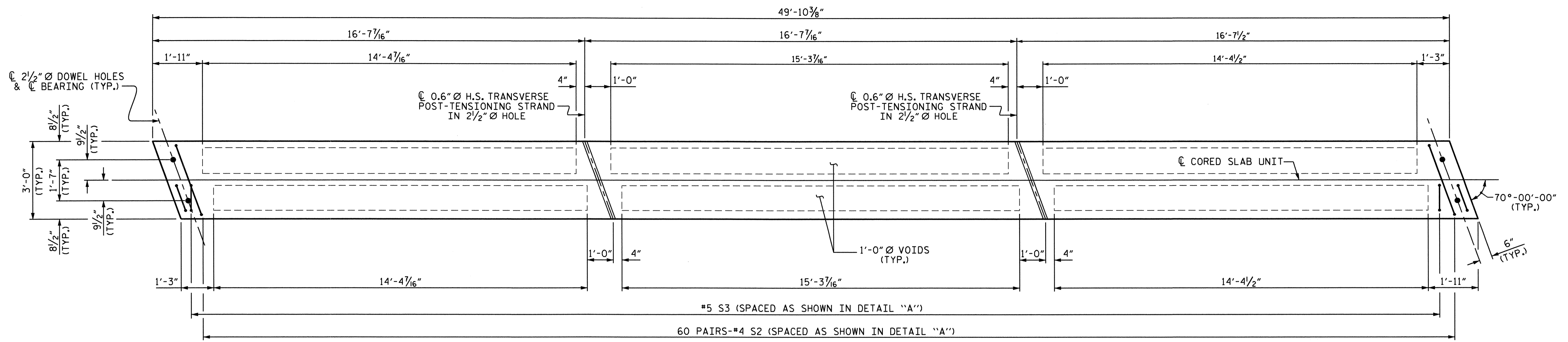


2/13/12

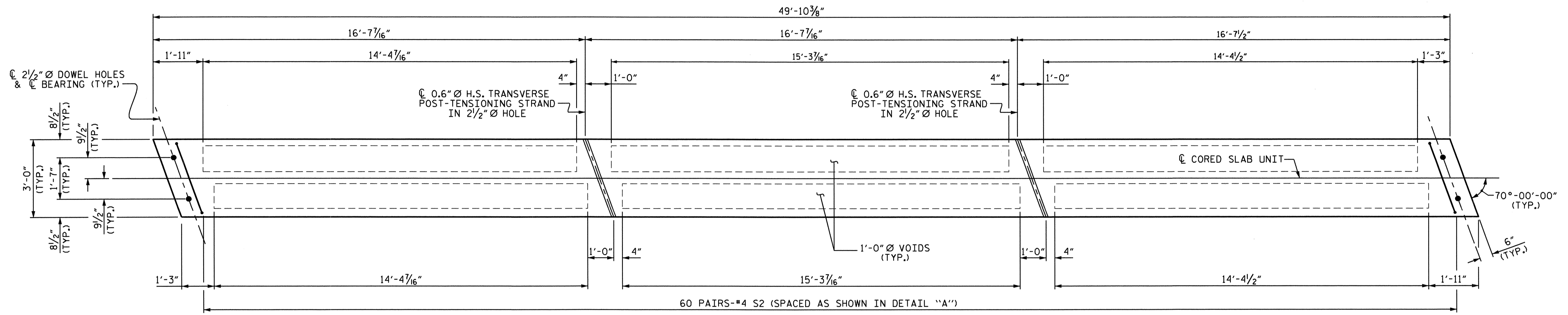
DRAWN BY: A. SORSENGINH DATE: 1/26/10
 CHECKED BY: M. POOLE DATE: 1/20/10

13-FEB-2012 12:06
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 jduggins

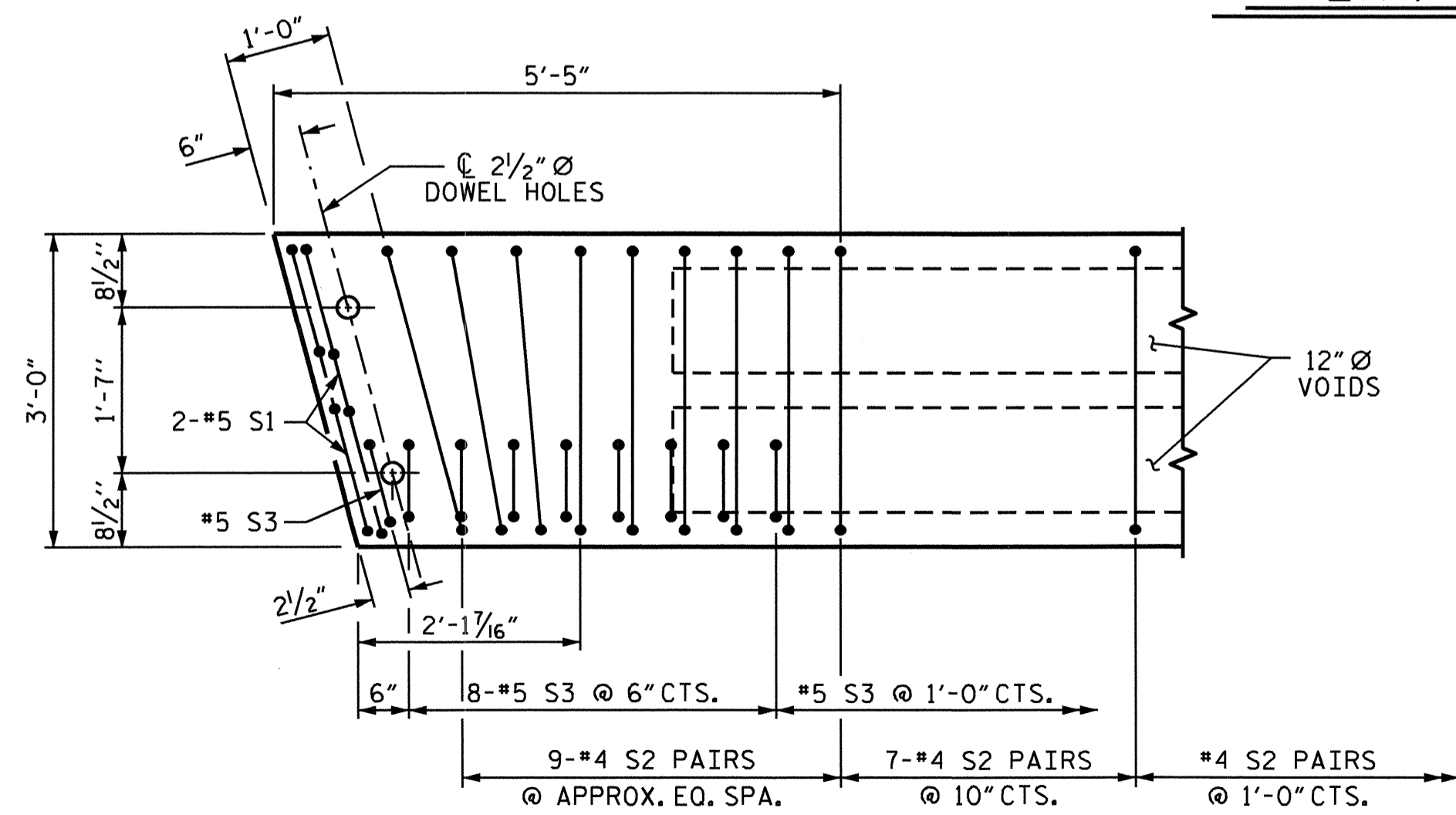
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			30



PLAN OF EXTERIOR SLAB - SPAN B



PLAN OF INTERIOR SLAB - SPAN B



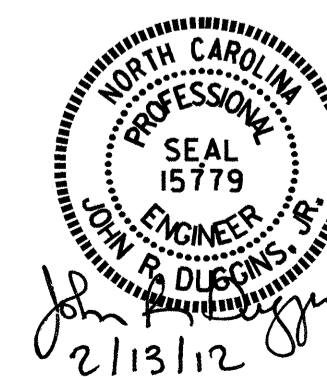
DETAIL "A"

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

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 6 OF 7

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



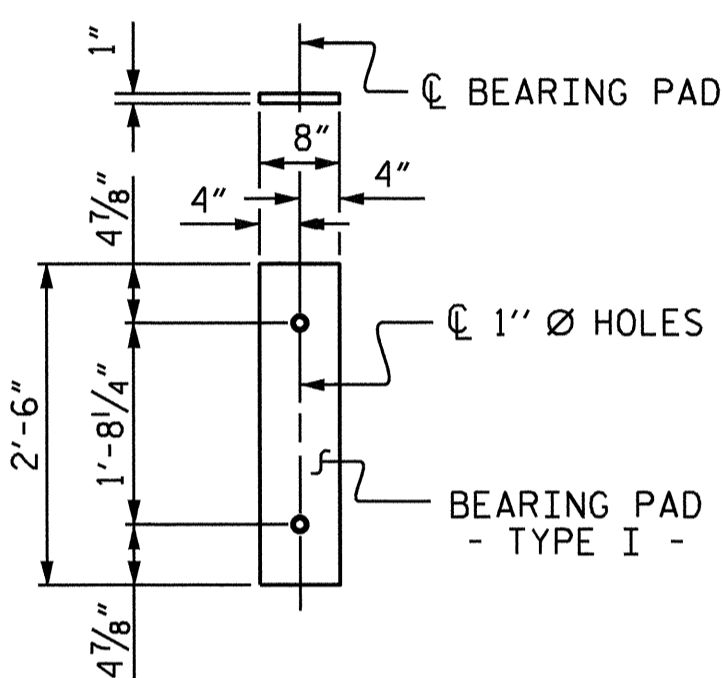
REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 30
2			4			

DRAWN BY : A. SORSENGINH DATE : 1/26/10
 CHECKED BY : M. POOLE DATE : 1/20/10

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

DEAD LOAD DEFLECTION AND CAMBER		
	SPANS A & C	SPAN B
CAMBER (SLAB ALONE IN PLACE)	1/16"	2/16"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1/16"	1/16"
FINAL CAMBER	3/8"	1 5/8"

** INCLUDES FUTURE WEARING SURFACE



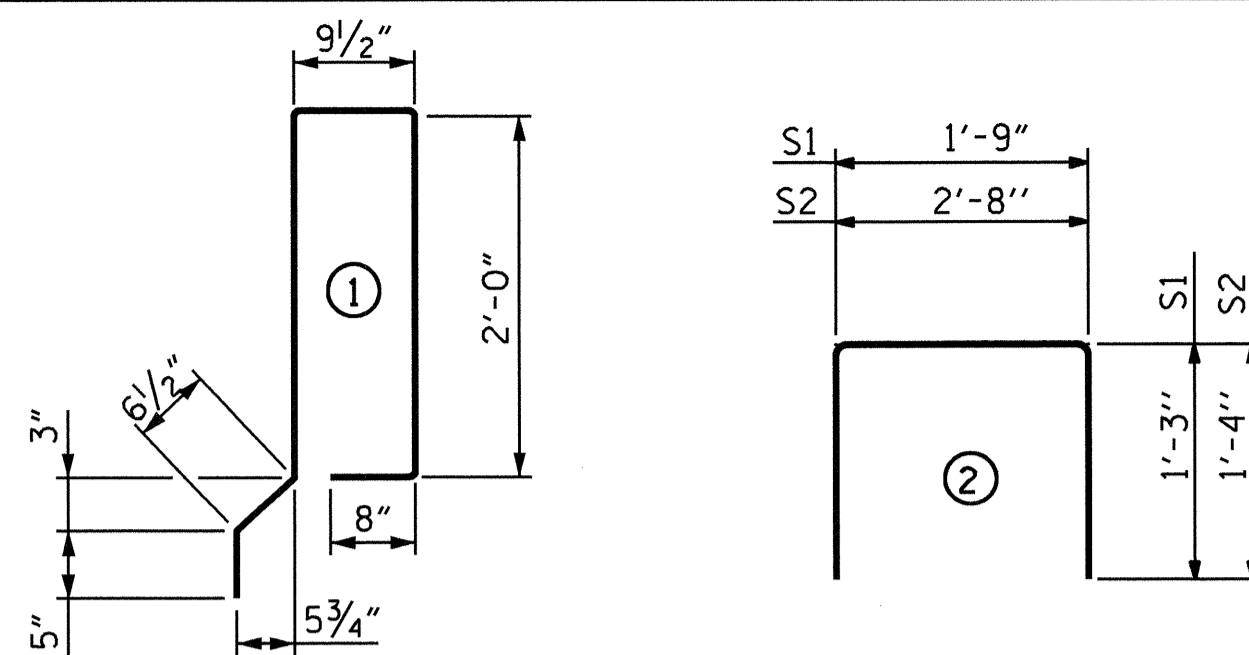
FIXED END
(TYPE I - '96 REQ' D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
45'-6" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS @ MID SPAN	RAIL HEIGHT
SPANS A & C	2 7/8"	2'-9 1/8"
SPAN B	1 5/8"	2'-7 7/8"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

	EXTERIOR UNIT				INTERIOR UNIT				
	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	
SPANS A & C	B1	4	#4	STR	17'-9"	47	17'-9"	47	
	S1	8	#5	2	4'-3"	35	4'-3"	35	
	S2	92	#4	2	5'-4"	328	5'-4"	328	
	* S3	43	#5	1	6'-5"	288			
	REINFORCING STEEL			LBS.		410		410	
	* EPOXY COATED REINFORCING STEEL			LBS.		288			
	5,000 P.S.I. CONCRETE			CU. YDS.		4.8		4.8	
	0.6" Ø L.R. STRANDS			No.		9		9	
	SPAN B	B2	4	#4	STR	25'-10"	69	25'-10"	69
		S1	8	#5	2	4'-3"	35	4'-3"	35
S2		120	#4	2	5'-4"	428	5'-4"	428	
* S3		59	#5	1	6'-5"	395			
REINFORCING STEEL				LBS.		532		532	
* EPOXY COATED REINFORCING STEEL				LBS.		395			
5,000 P.S.I. CONCRETE				CU. YDS.		7.1		7.0	
0.6" Ø L.R. STRANDS				No.		16		16	

CORED SLABS REQUIRED

SPAN A			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	33'-8 13/16"	67'-5 5/8"
INTERIOR C.S.	14	33'-8 13/16"	472'-3 3/8"
SUBTOTAL	16		539'-9"
SPAN B			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	49'-10 3/8"	99'-8 3/4"
INTERIOR C.S.	14	49'-10 3/8"	698'-1 1/4"
SUBTOTAL	16		797'-10"
SPAN C			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	33'-8 13/16"	67'-5 5/8"
INTERIOR C.S.	14	33'-8 13/16"	472'-3 3/8"
SUBTOTAL	16		539'-9"
TOTAL	48		1877'-4"

NOTES

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

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

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT.

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

CONCRETE INSERTS SHALL HAVE A MINIMUM WORKING LOAD SHEAR CAPACITY OF 2.5 KIPS.

THE 3/4" Ø BOLTS, WASHERS AND CONCRETE INSERTS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

THE BOLTS, WASHERS AND CONCRETE INSERTS ARE PROVIDED AS AN OPTION FOR THE CONTRACTOR TO ATTACH MATERIALS TO PREVENT DEBRIS FROM DROPPING INTO THE WATER DURING CONSTRUCTION OF THE CONCRETE PARAPETS.

UPON COMPLETION OF THE BRIDGE CONSTRUCTION, THE 3/4" Ø BOLTS, AND WASHERS SHALL BE REMOVED AND THE CONCRETE INSERTS SHALL BE GROUTED.

THE COST OF THE 3/4" Ø BOLTS, WASHERS, AND INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

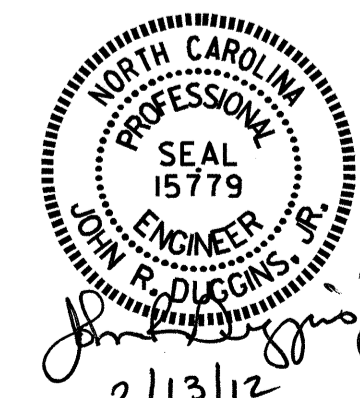
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

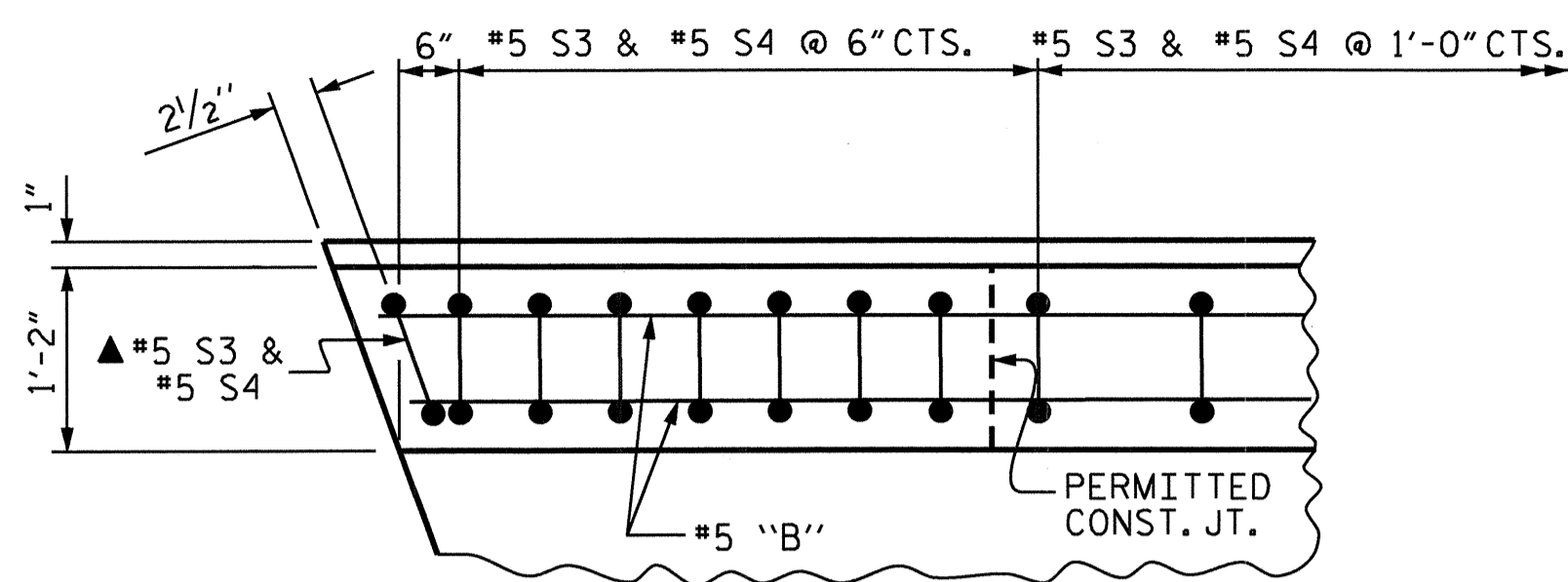
3'-0" X 1'-9"
 PRESTRESSED
 CONCRETE CORED
 SLAB UNIT



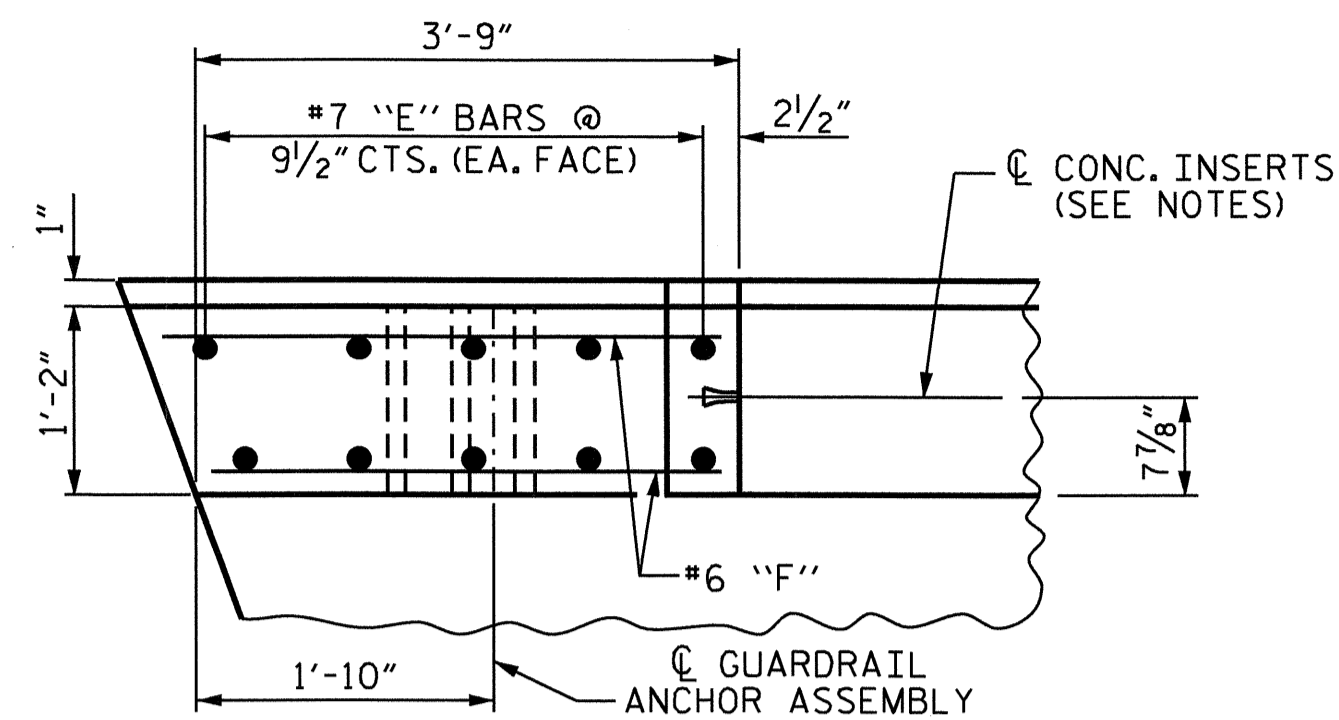
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 30
2			4			

STD. NO. PCS3

ASSEMBLED BY : A. SORSENGINH	DATE : 1-26-10
CHECKED BY : M. POOLE	DATE : 1/2010
DRAWN BY : WJH 4/89	REV. 10/17/00 RWW/LES
CHECKED BY : FCJ 5/89	REV. 7/10/01 RWW/LES
	REV. 5/7/03 RWW/JTE



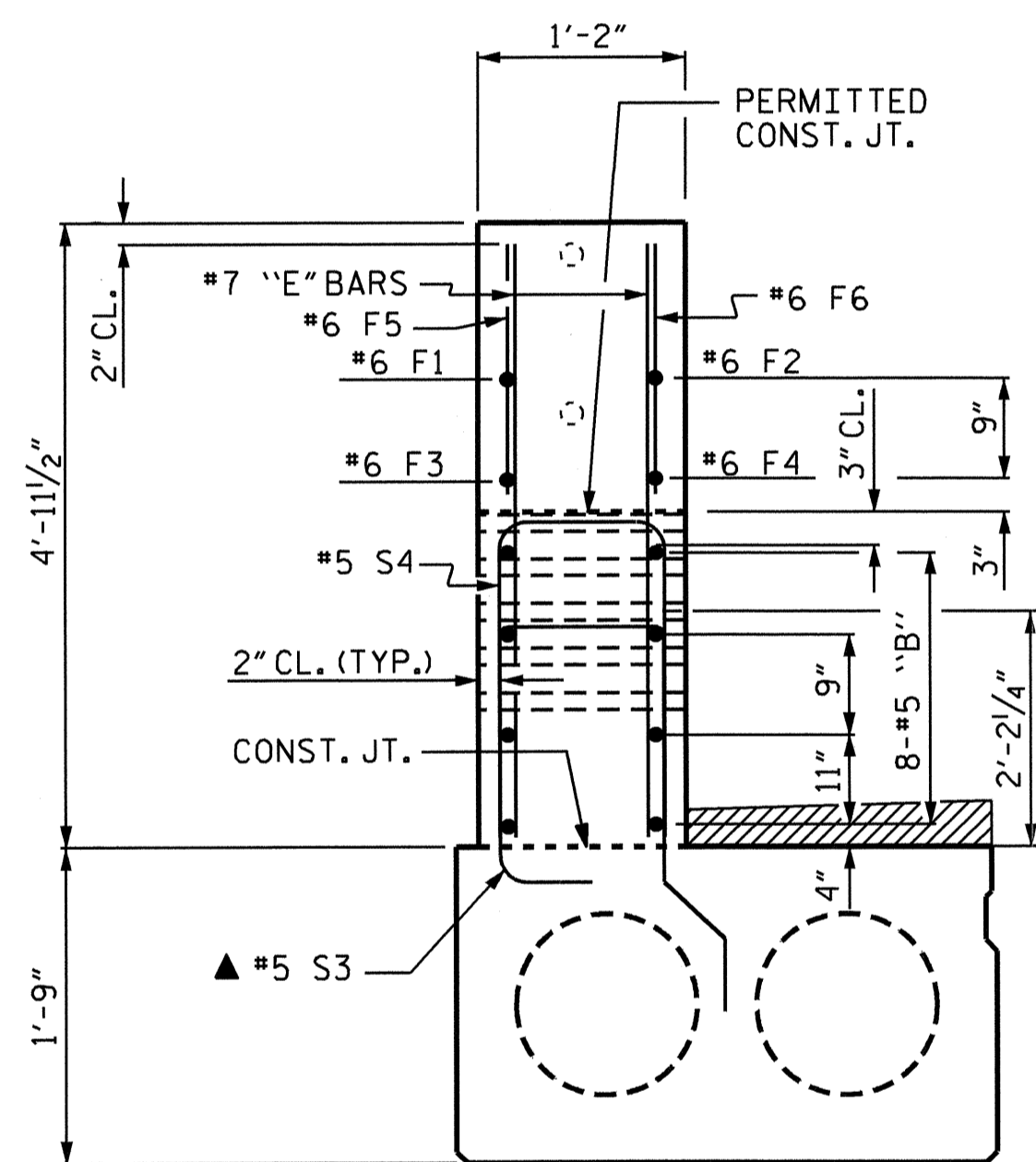
PLAN OF PARAPET



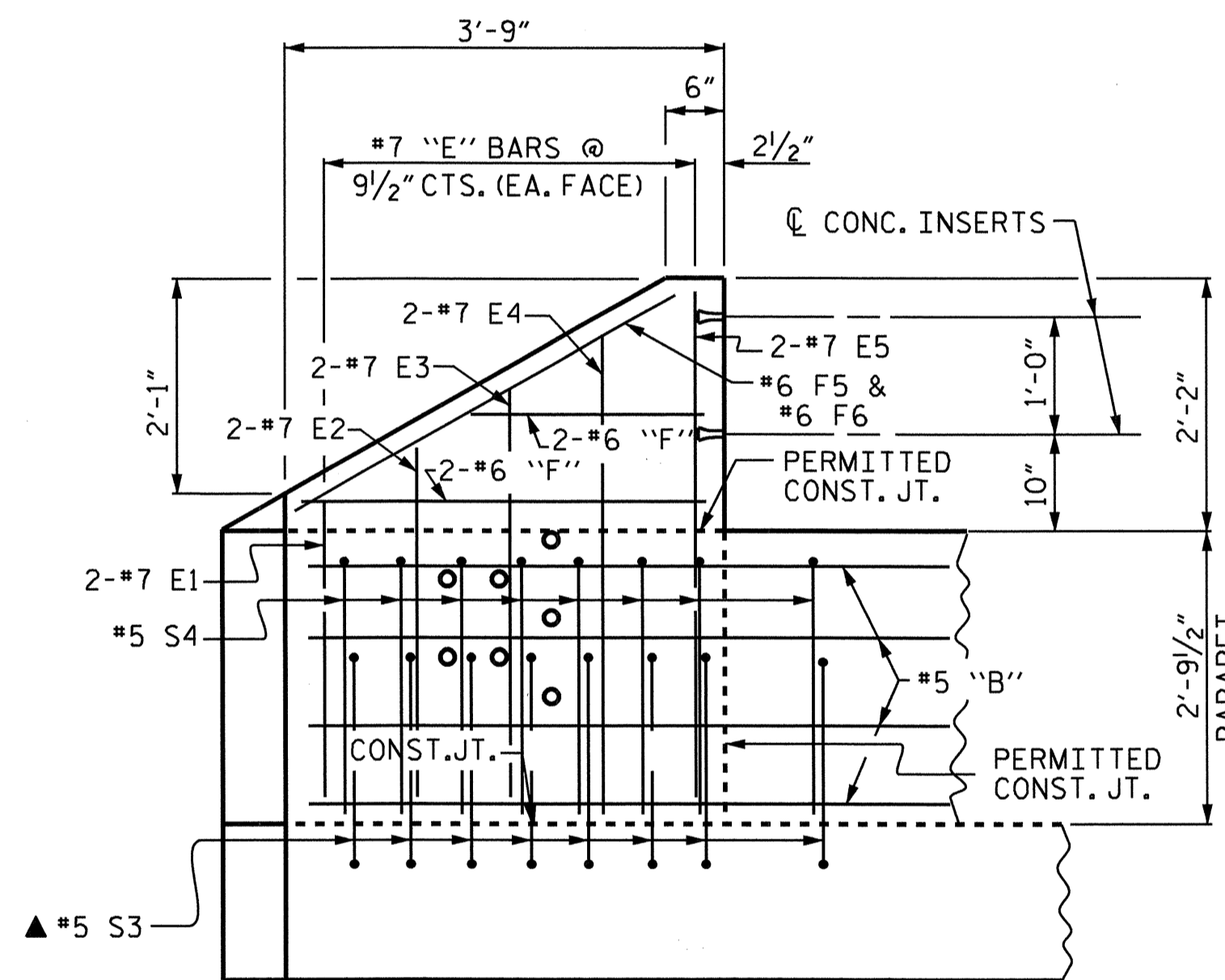
PLAN OF END POST

BAR	BARS PER SPAN			TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A	SPAN B	SPAN C					
* B3	64		64	128	#5	STR	10'-2"	1357
* B4		64		64	#5	STR	14'-2"	946
* E1	4		4	8	#7	STR	2'-9"	45
* E2	4		4	8	#7	STR	3'-3"	53
* E3	4		4	8	#7	STR	3'-9"	61
* E4	4		4	8	#7	STR	4'-3"	69
* E5	4		4	8	#7	STR	4'-7"	75
* F1	2		2	4	#6	STR	2'-1"	13
* F2	2		2	4	#6	STR	1'-10"	11
* F3	2		2	4	#6	STR	3'-3"	20
* F4	2		2	4	#6	STR	3'-0"	18
* F5	2		2	4	#6	STR	4'-3"	26
* F6	2		2	4	#6	STR	3'-11"	24
* S4	86	118	86	290	#5	1	5'-9"	1739
* EPOXY COATED REINF. STEEL							LBS.	4457
CLASS AA CONCRETE							CU. YDS.	29.4
TOTAL LIN. FT. OF CONCRETE PARAPET								235.48

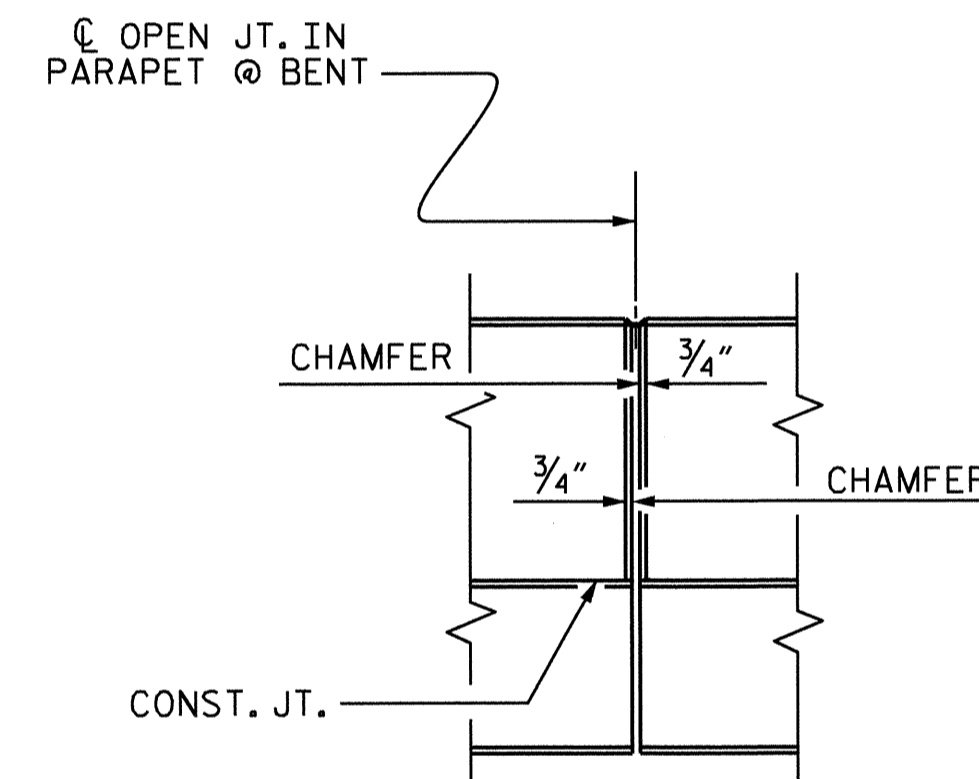
ALL BAR DIMENSIONS ARE OUT TO OUT.



END VIEW



ELEVATION



ELEVATION AT EXPANSION JOINTS

PARAPET DETAILS

PARAPET AND END POST FOR TWO BAR RAIL

NOTES

▲ FOR #5 S3 BARS, SEE SHEET 7 OF 7.

FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEETS.

ALL DIMENSIONS ARE TAKEN ALONG OUTSIDE EDGE OF PARAPET.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

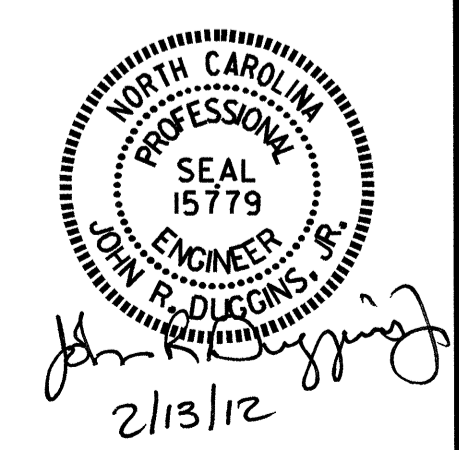
THE REINFORCING STEEL & CONCRETE IN THE END POSTS ARE INCLUDED IN THE UNIT PRICE BID FOR THE CONCRETE PARAPET.

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 CONCRETE PARAPET
 DETAILS

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



DRAWN BY : A. SORSENGINH DATE : 1/26/10
 CHECKED BY : M. POOLE DATE : 1/20/10

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 BMR 2.

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 AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

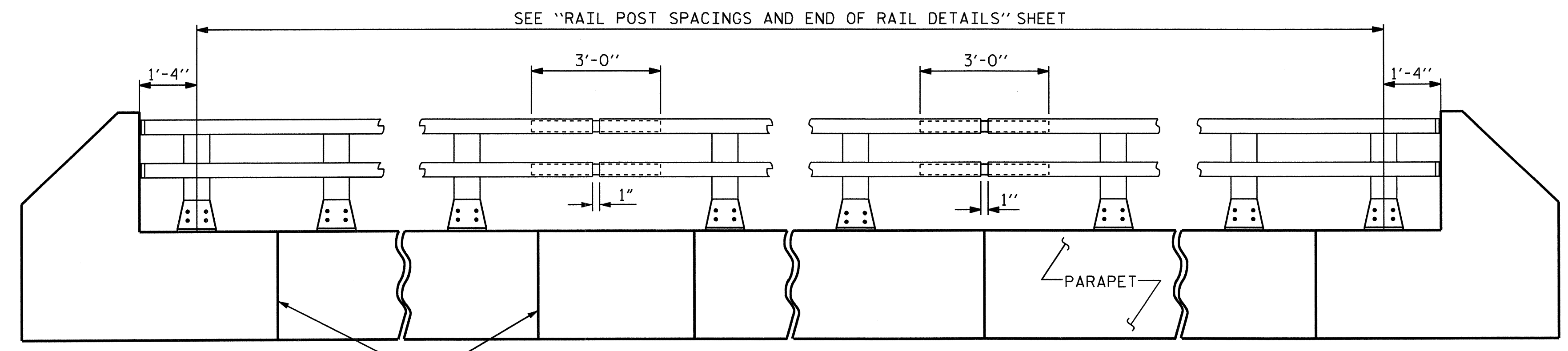
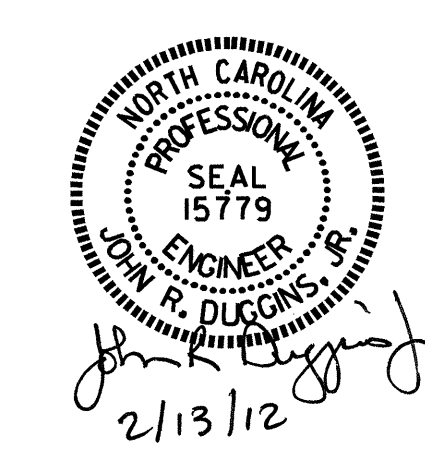
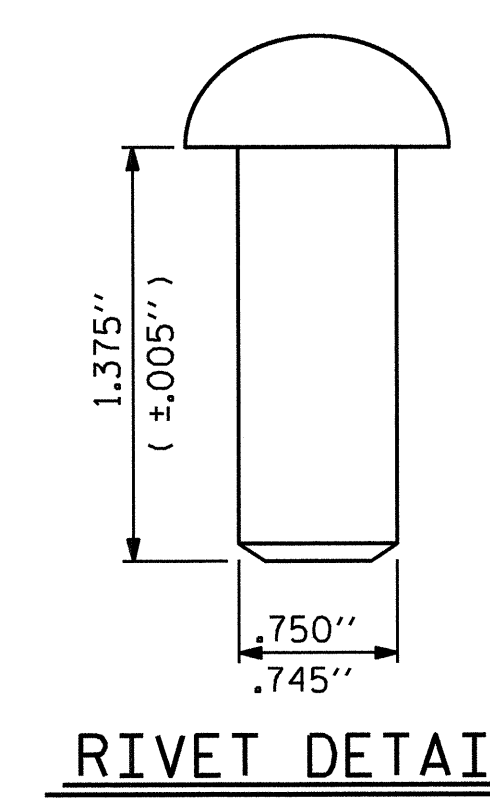
PAY LENGTH = 219.30 LIN. FT.

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
STATION: 20+07.00 -L-

SHEET 1 OF 2

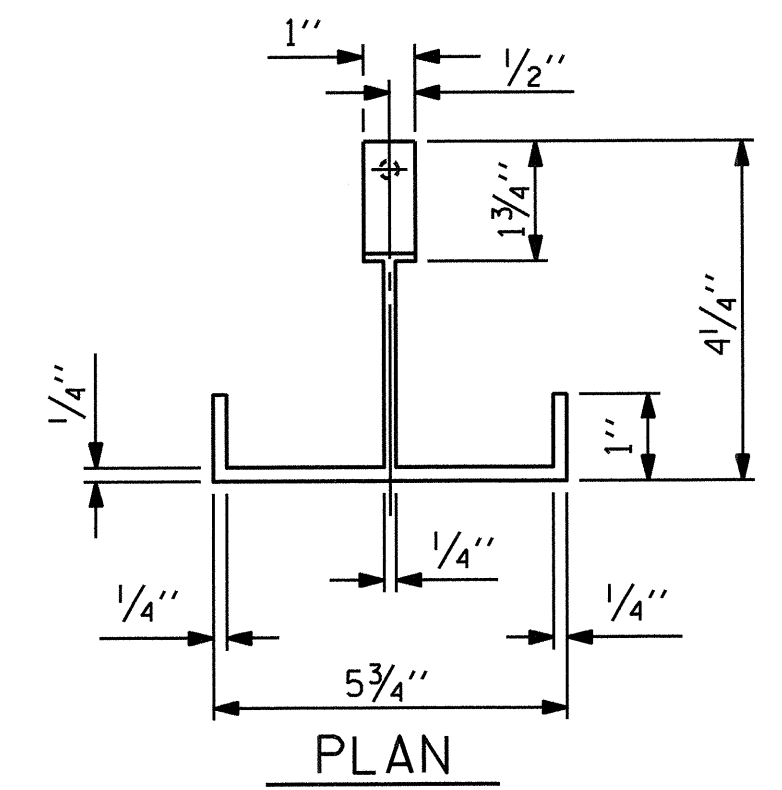
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL

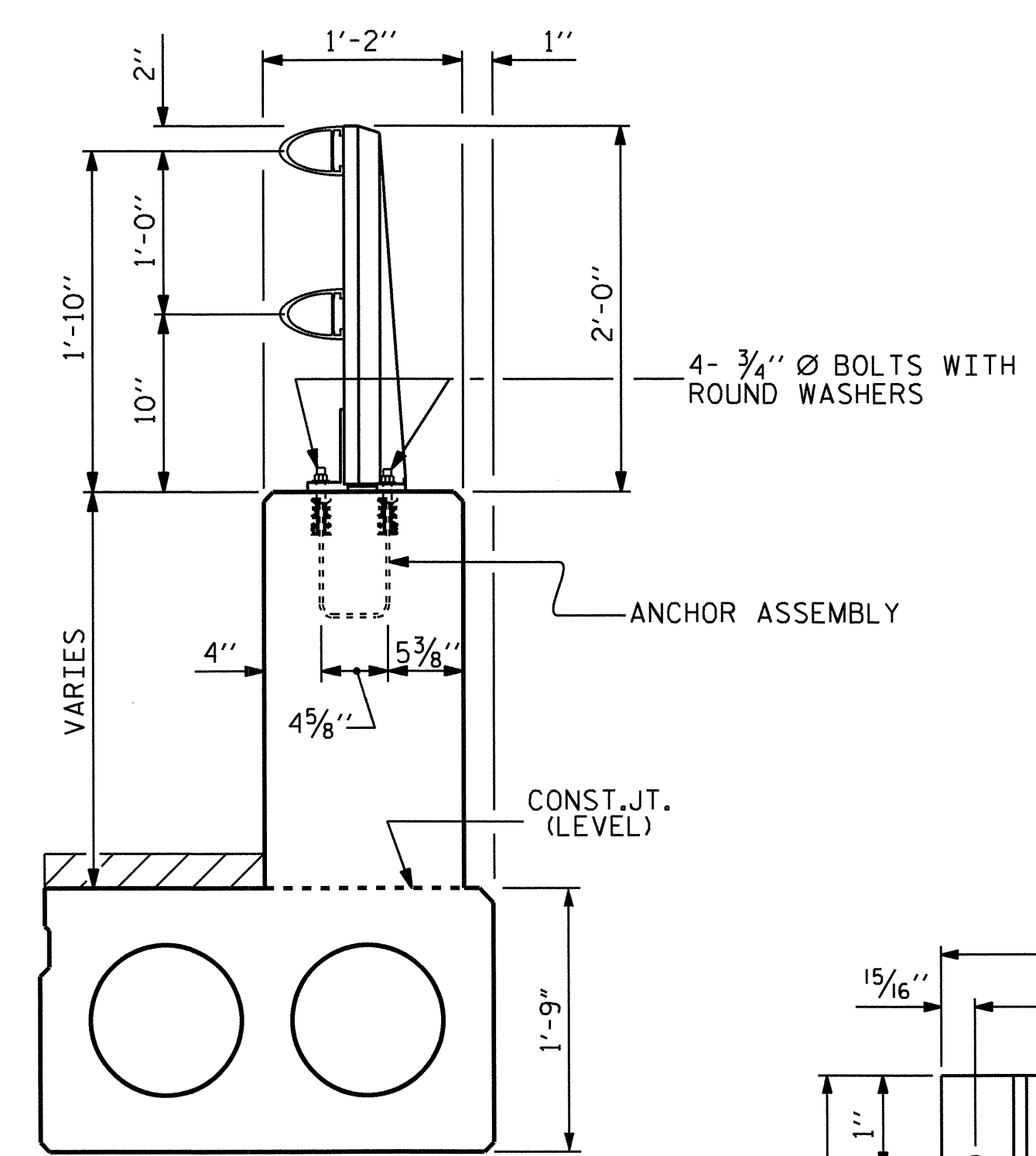


ELEVATION

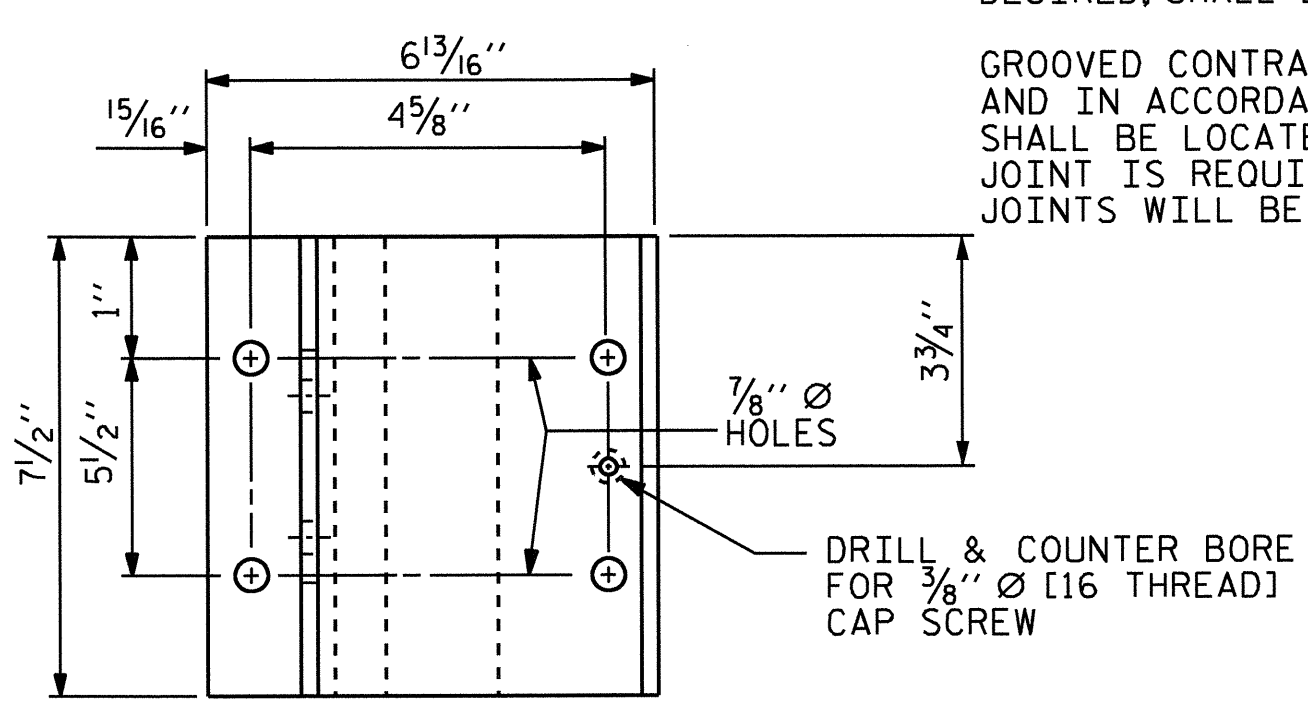
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET



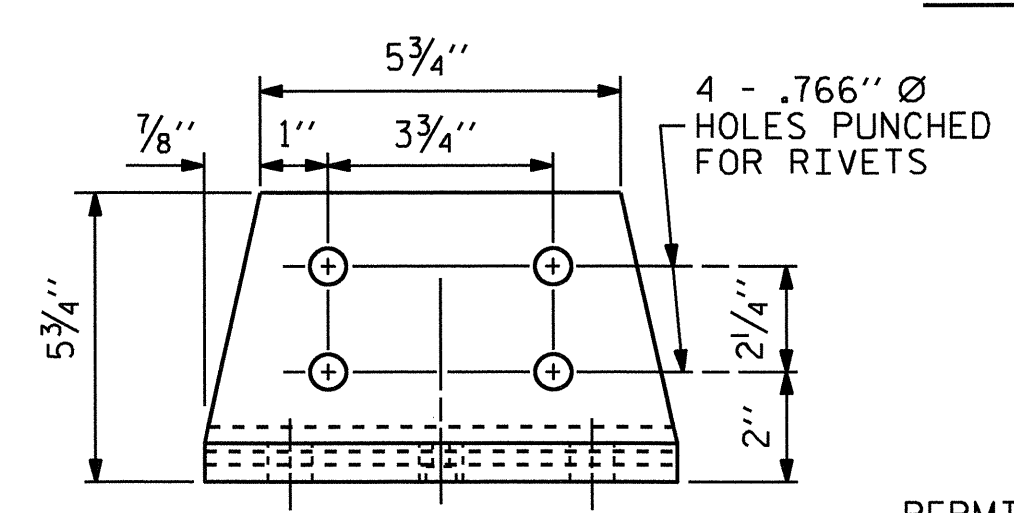
PLAN



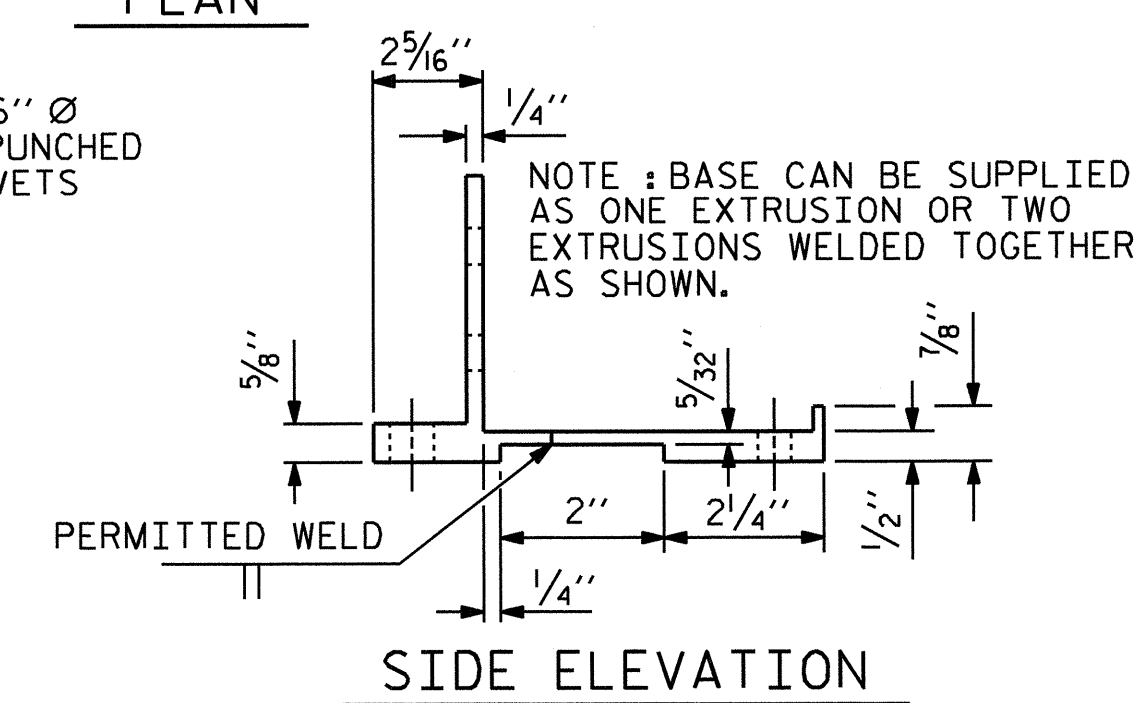
SECTION THRU PARAPET AND RAIL



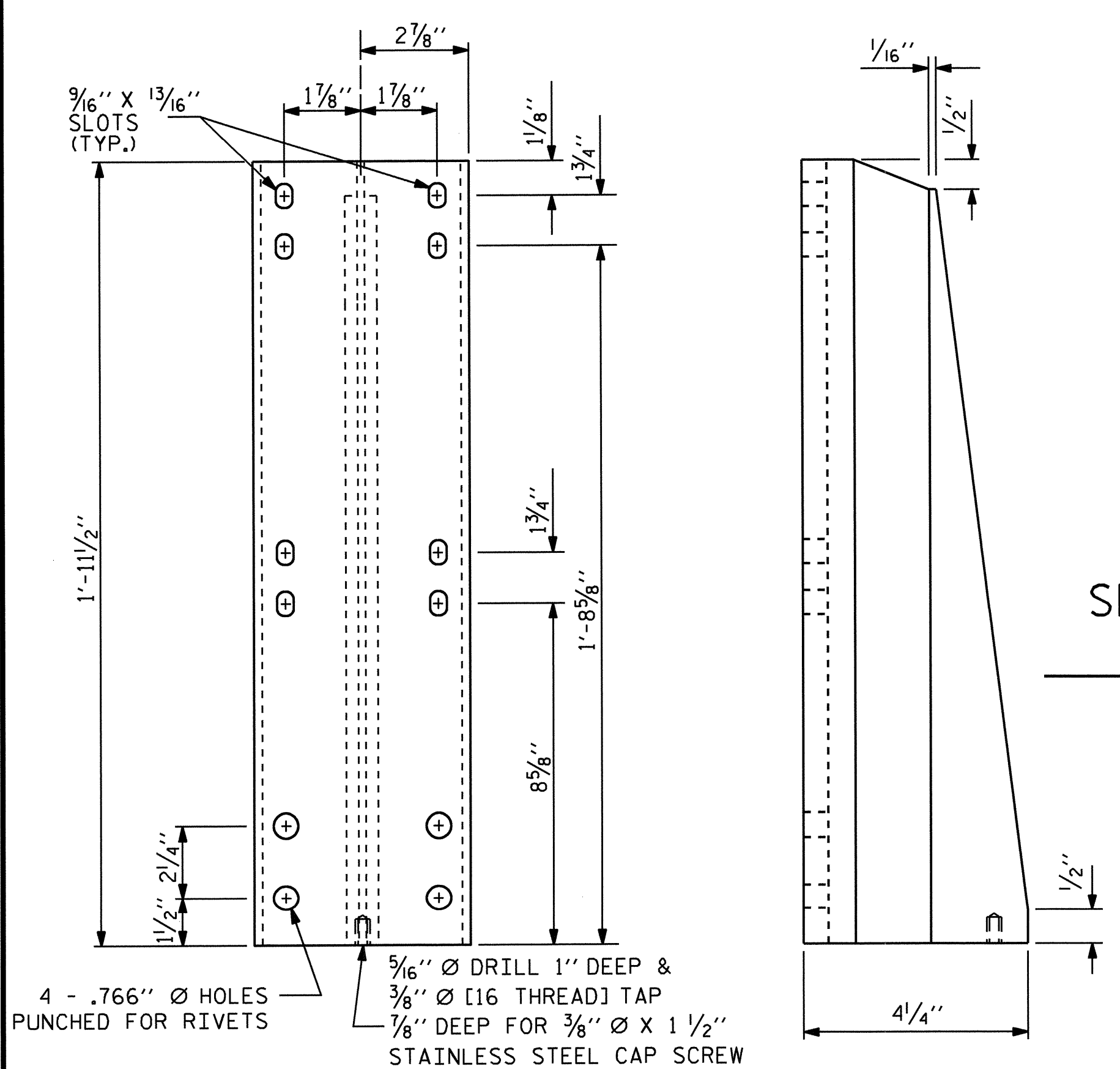
PLAN



FRONT ELEVATION



SIDE ELEVATION



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

ASSEMBLED BY :	A. SORSENGINH	DATE :	1/26/10
CHECKED BY :	M. POOLE	DATE :	1/2010
DRAWN BY :	EEM 6/94	REV. 5/7/03R	RWW/JTE
CHECKED BY :	RCW 6/94	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM

POST BASE DETAILS

REVISIONS					SHEET NO. S-14
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 30
2			4		

NOTES

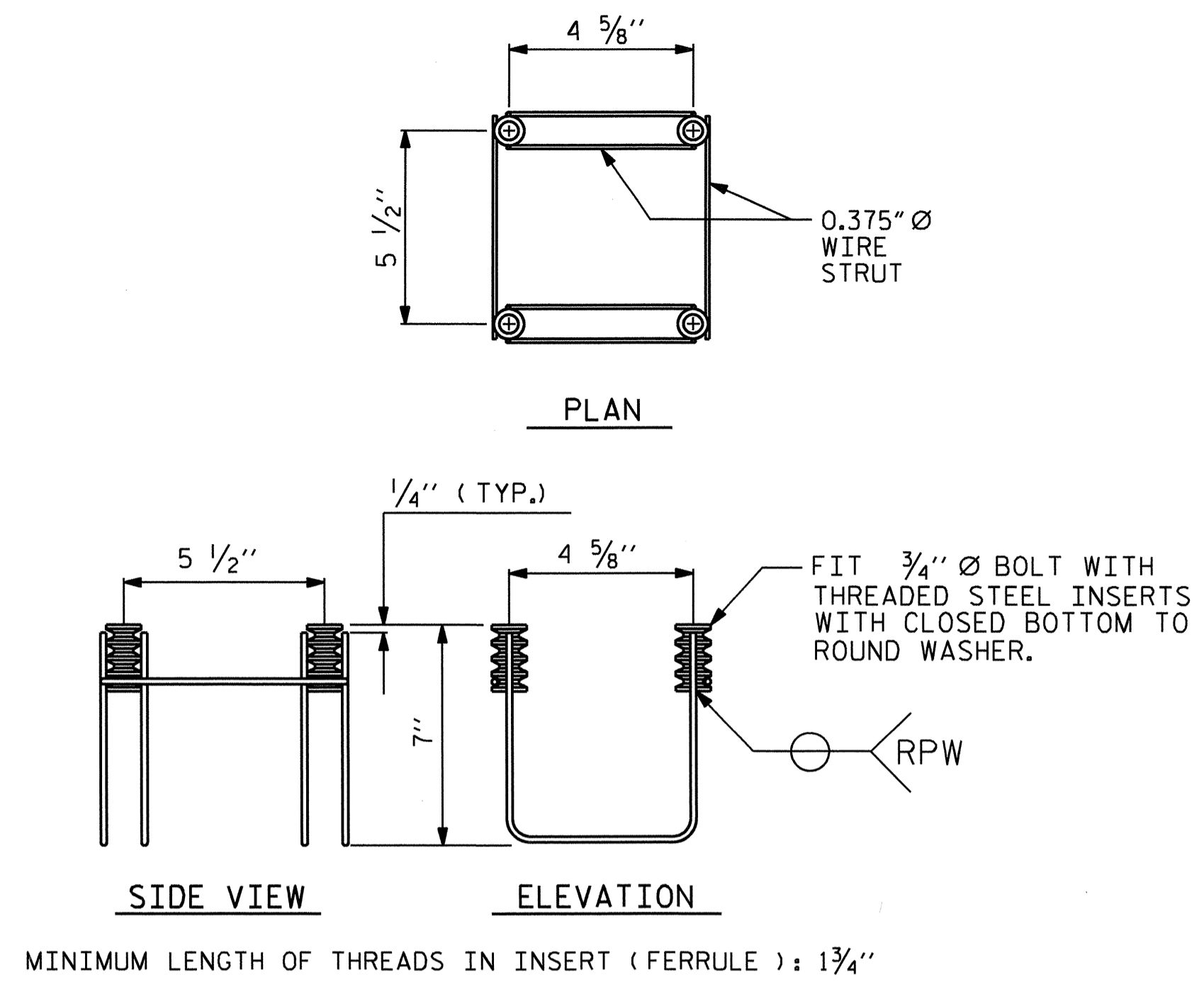
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

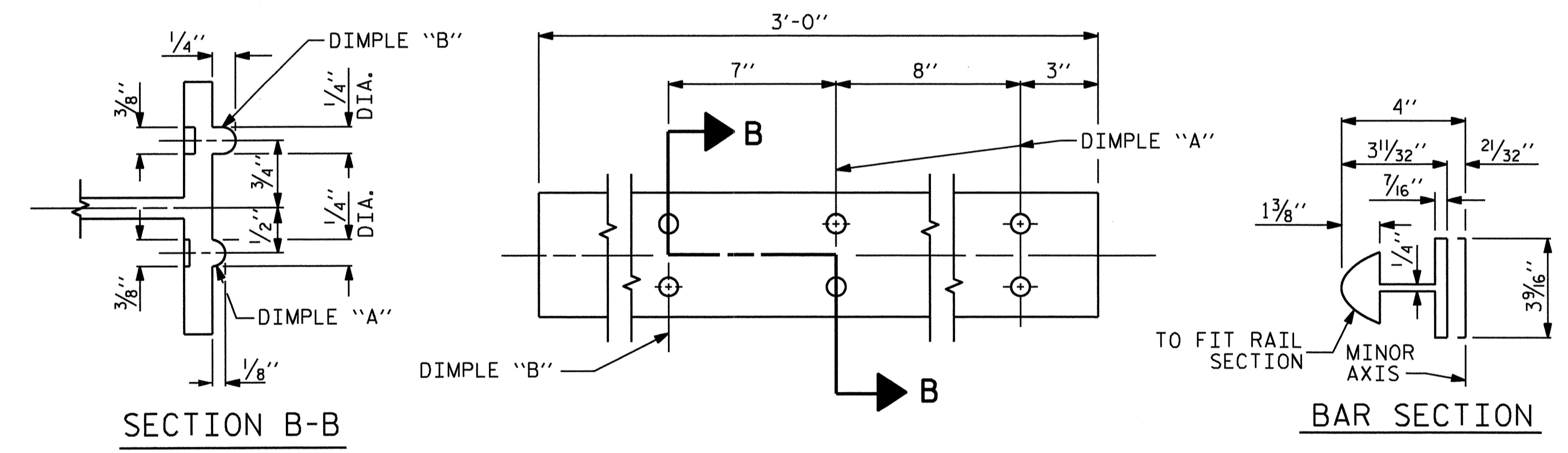
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



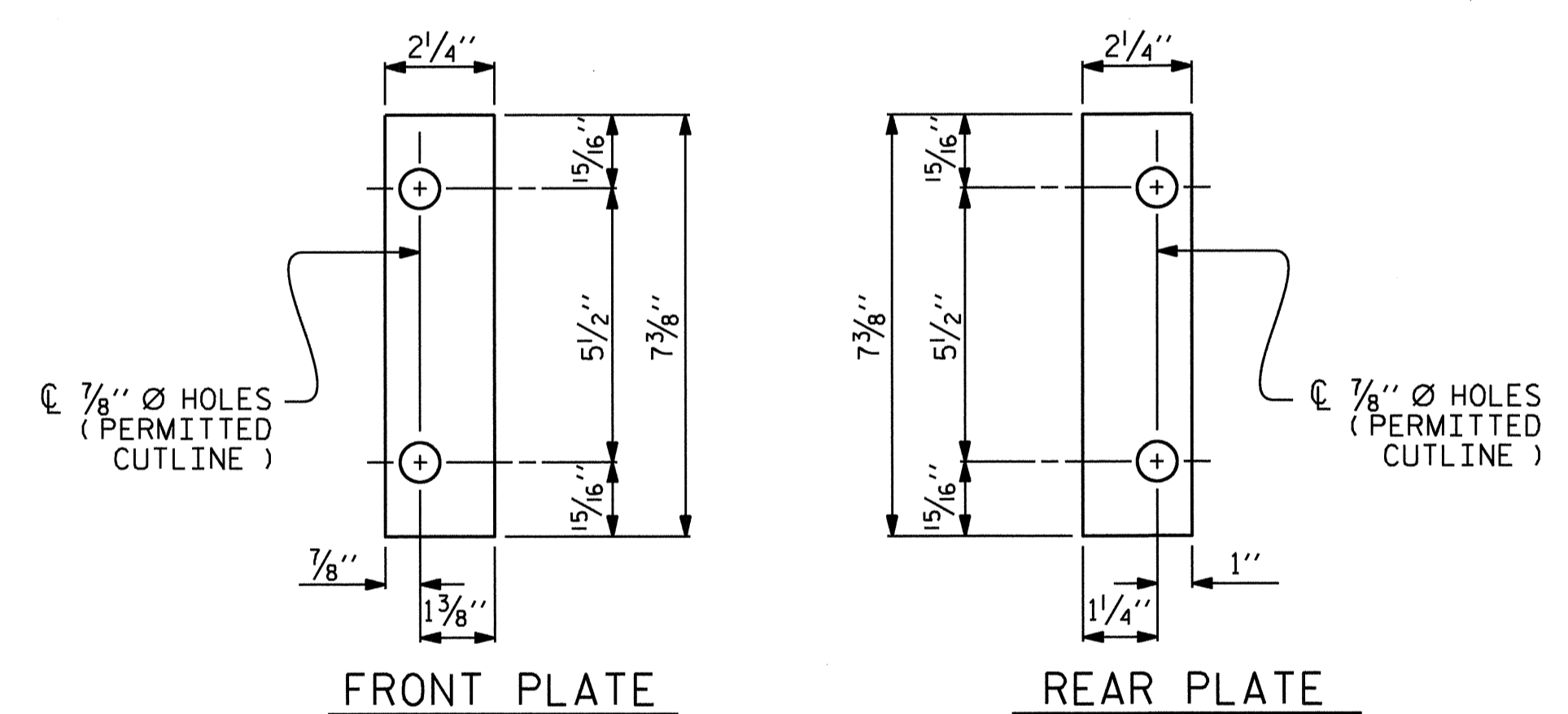
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

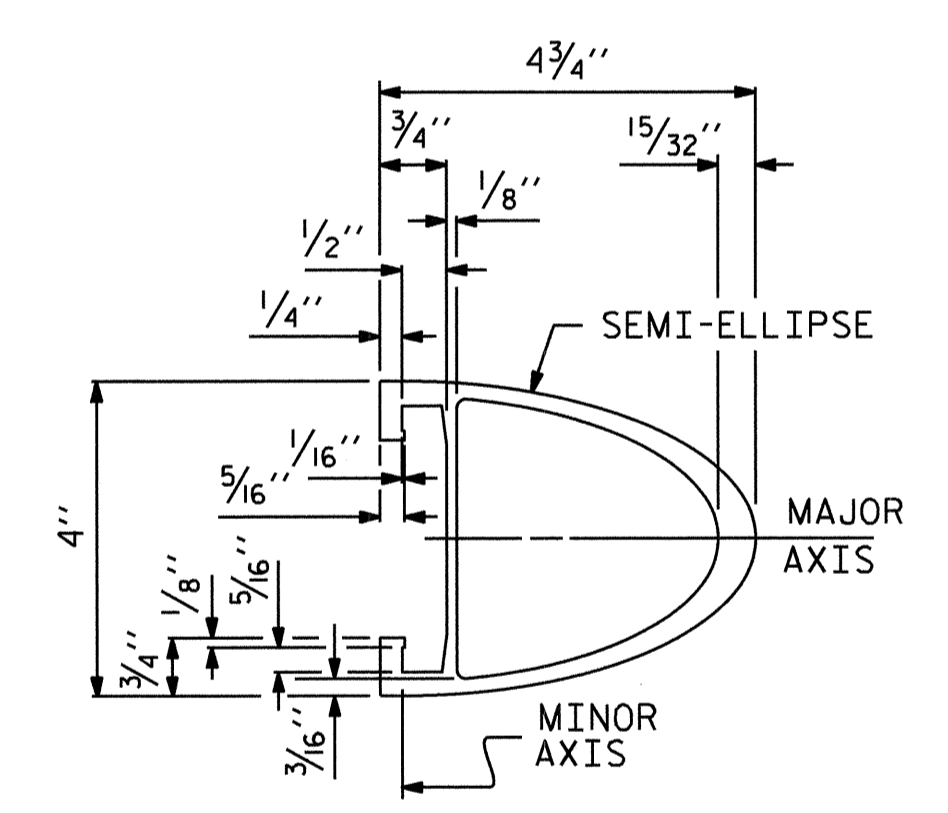
(42 ASSEMBLIES REQUIRED)



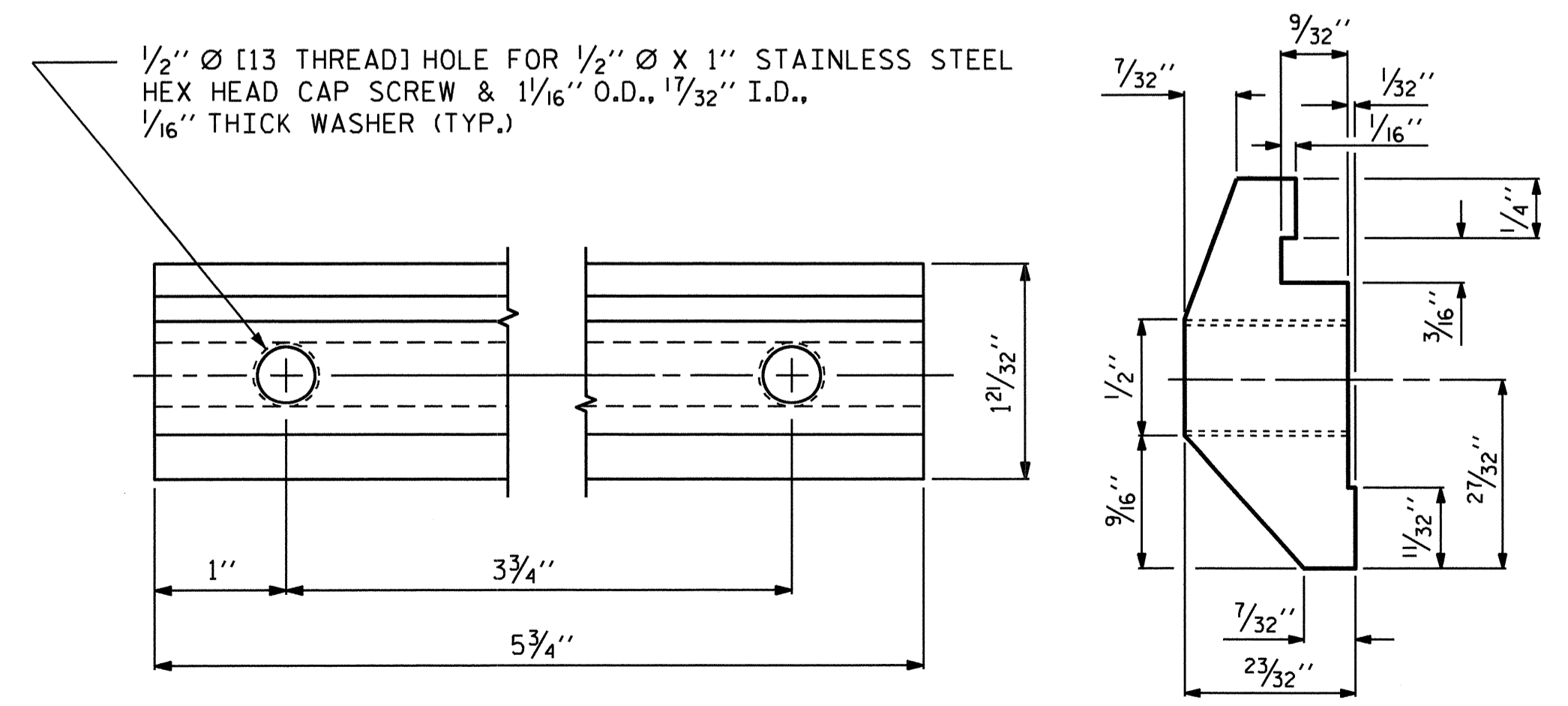
EXPANSION BAR DETAILS



SHIM DETAILS

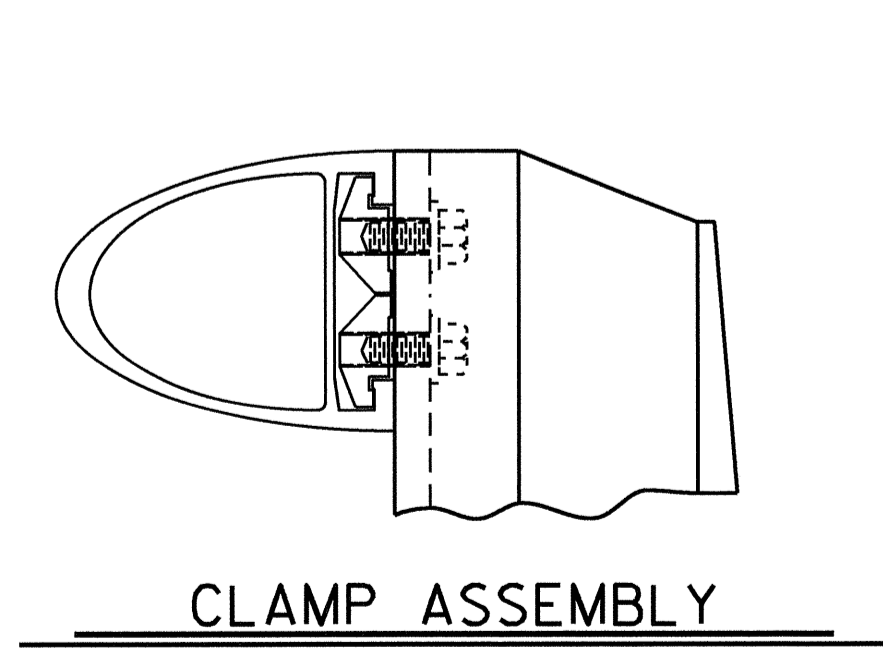


RAIL SECTION

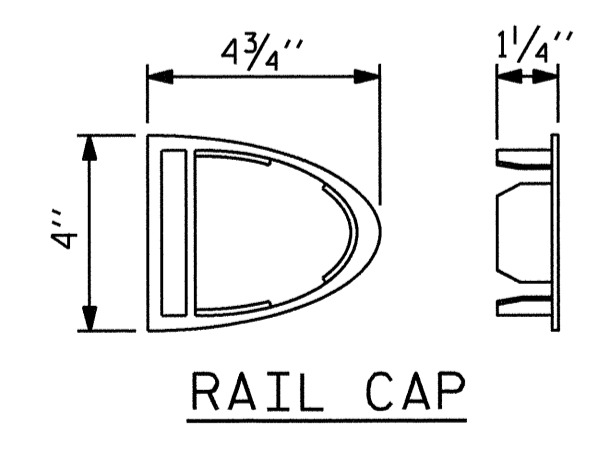


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

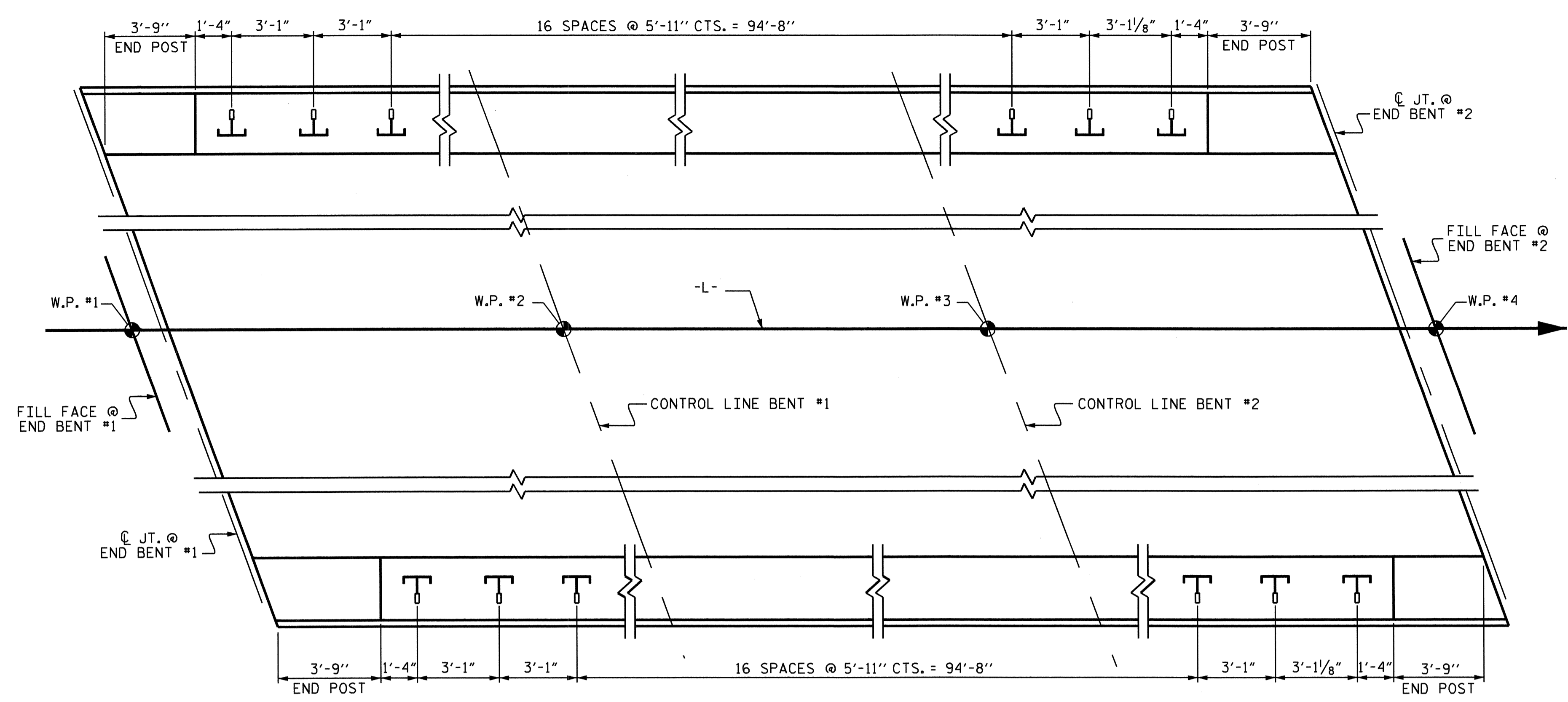
PROJECT NO. B-4291
TRANSYLVANIA COUNTY
STATION: 20+07.00 -L-

SHEET 2 OF 2

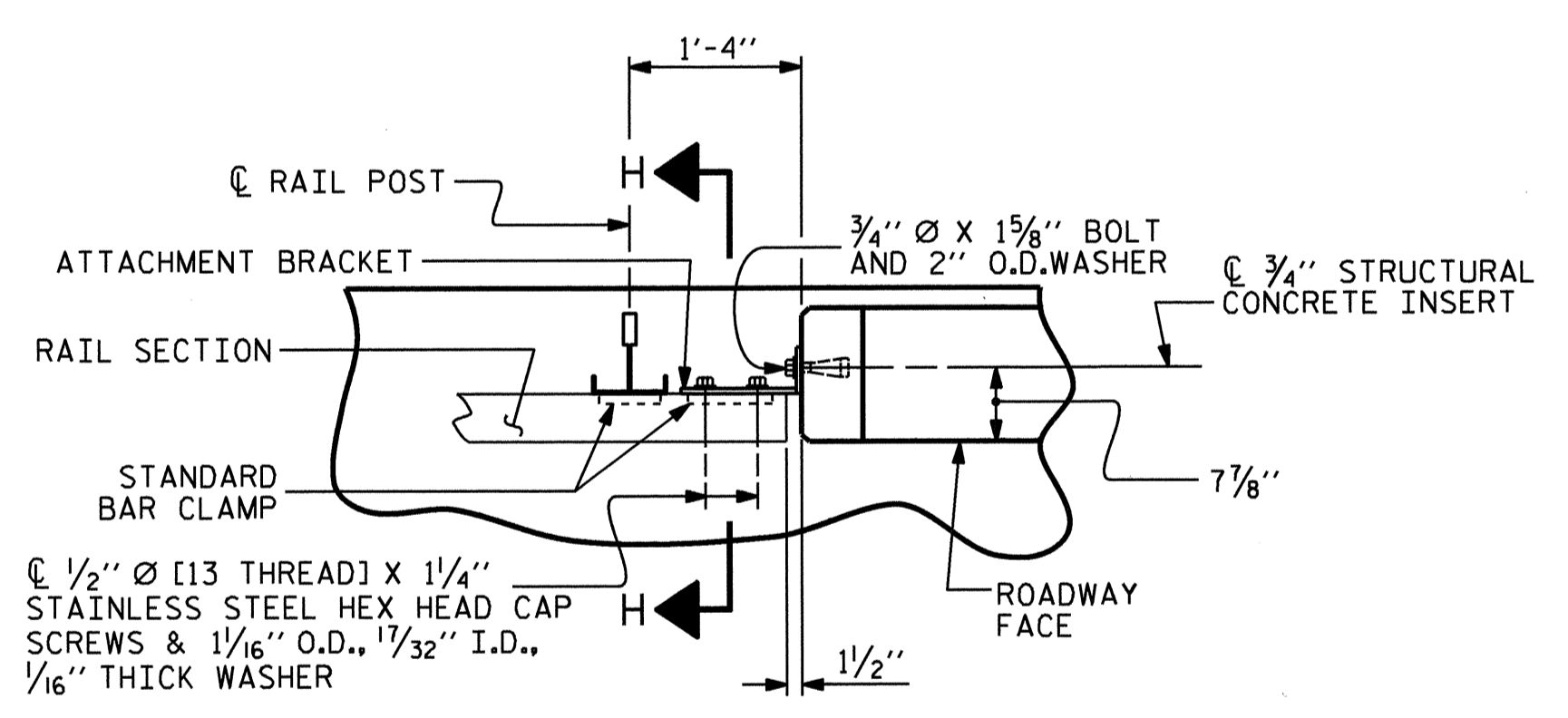
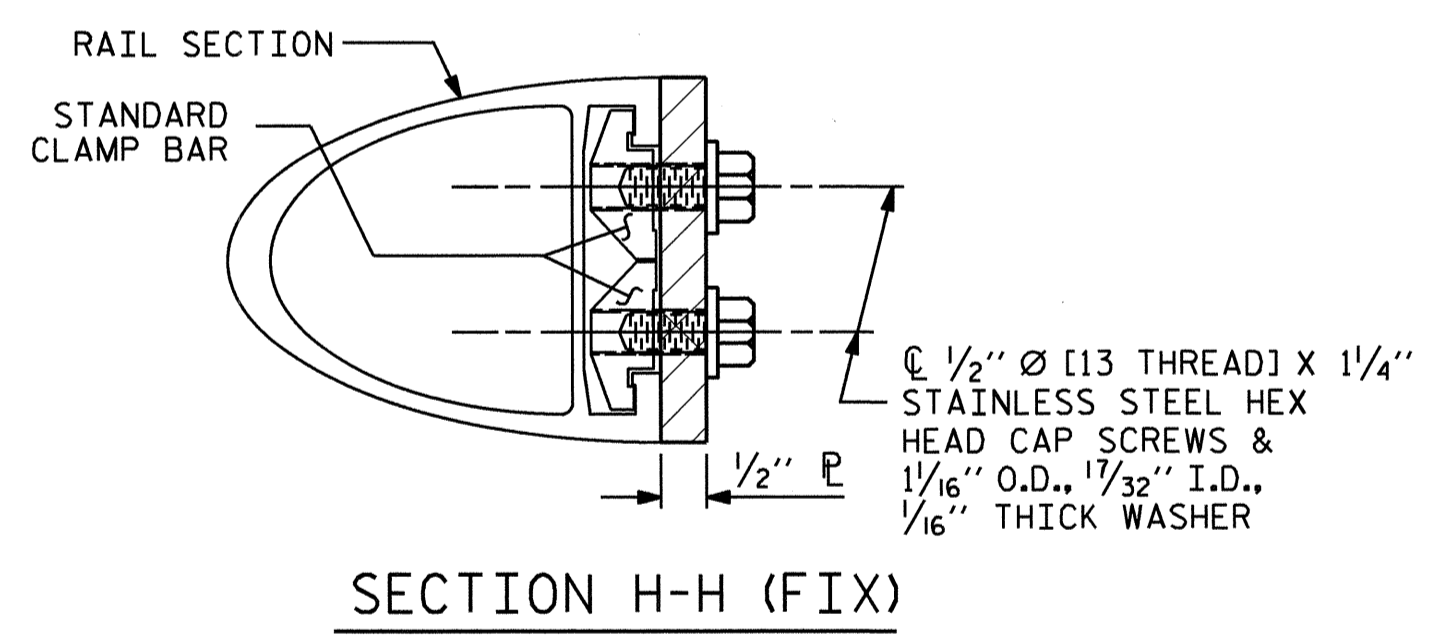
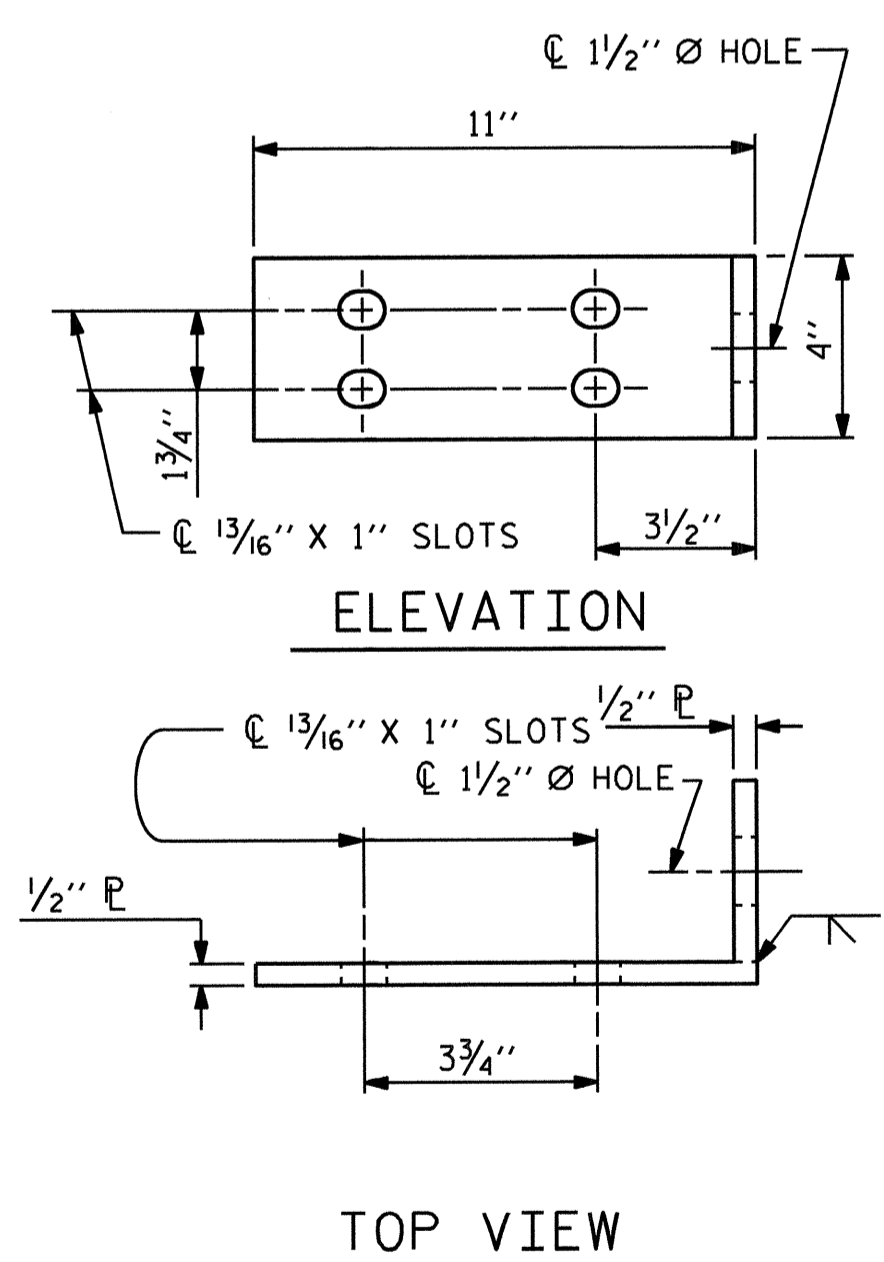
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
2 BAR METAL RAIL				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
TOTAL SHEETS				30

NORTH CAROLINA PROFESSIONAL SEAL 15779
ENGINEER
JOHN R. DUGGINS
2/13/12

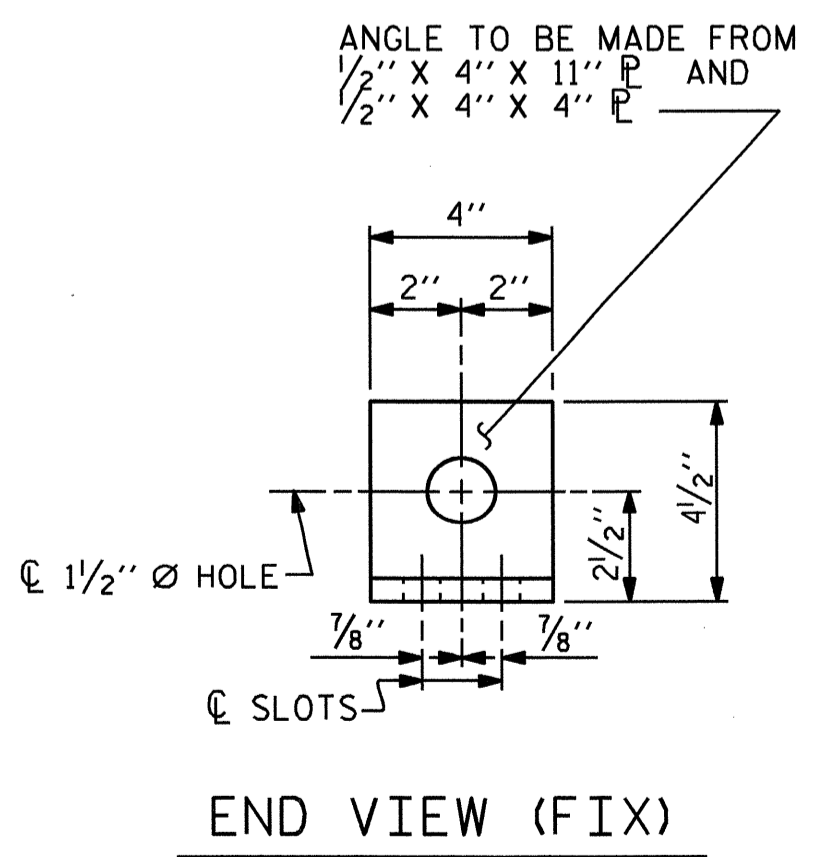
ASSEMBLED BY :	A. SORSENGINH	DATE :	1/26/10
CHECKED BY :	M. POOLE	DATE :	1/2010
DRAWN BY :	EEM 6/94	REV. 2/6/97	EEM/RGW
CHECKED BY :	RGW 6/94	REV. 8/16/99	MAB/LES
		REV. 10/17/00	LES/RDR



PLAN OF RAIL POST SPACINGS



PLAN - RAIL AND END POST



END VIEW (FIX)

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 1 1/2".
 - B. 1 - 3/4" Ø X 1 1/8" 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 1/8" 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

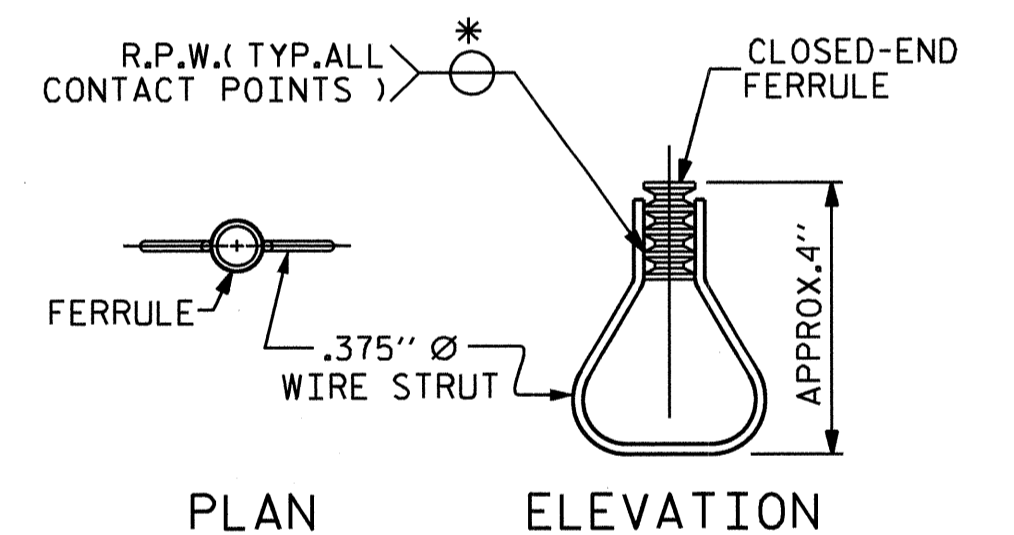
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" 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 1/8" 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 1/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



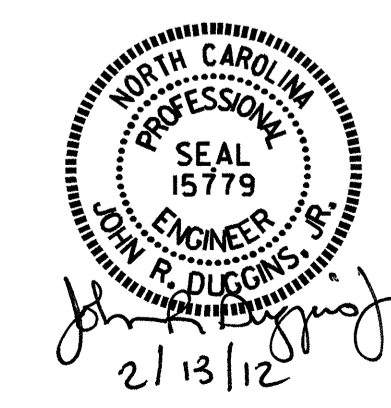
**PLAN ELEVATION
STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
STATION: 20+07.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**RAIL POST SPACINGS
AND
END OF RAIL DETAILS**



ASSEMBLED BY :	A. SORSENGINH	DATE :	1/26/10
CHECKED BY :	M. POOLE	DATE :	1/2010
DRAWN BY :	FCJ	REV. 5/7/03	RWW/JTE
CHECKED BY :	CRK	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM

DETAILS FOR ATTACHING METAL RAIL TO END POST

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

TOTAL SHEETS: 30

NOTES

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

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

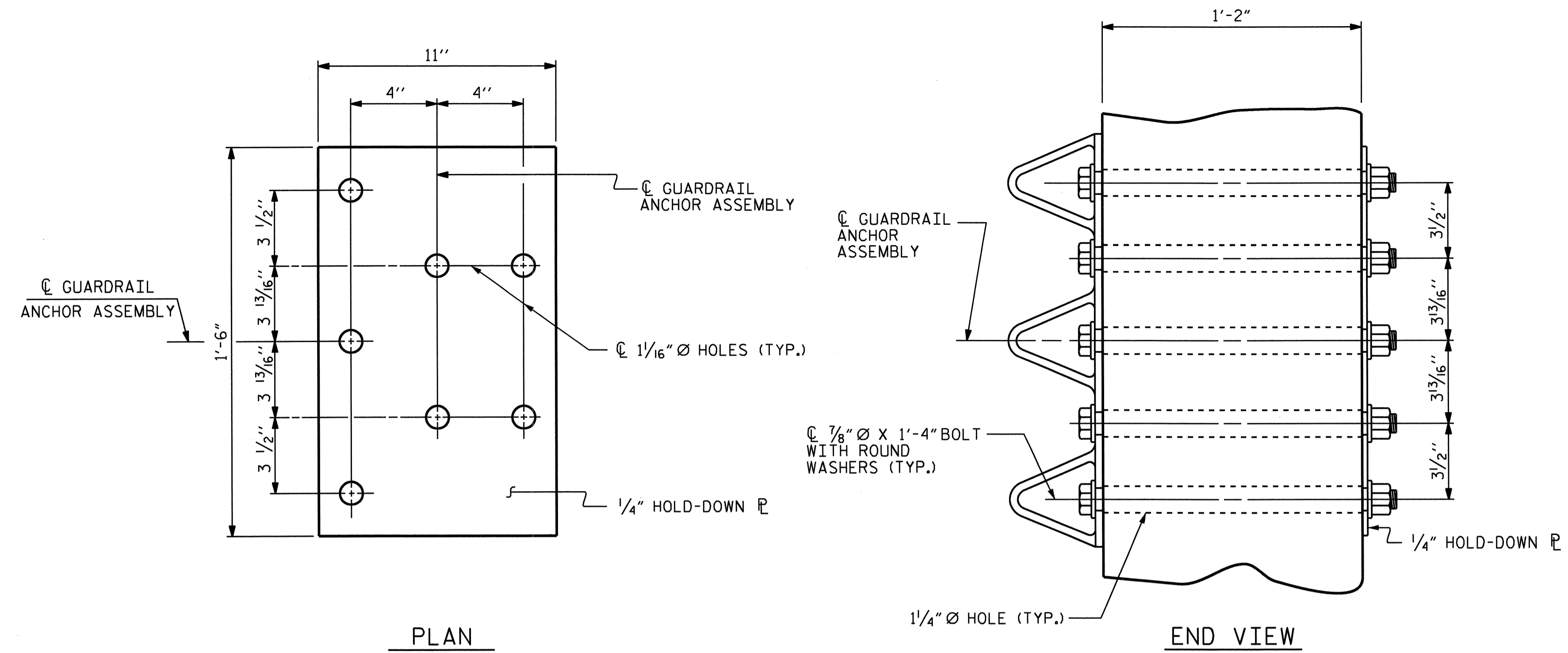
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

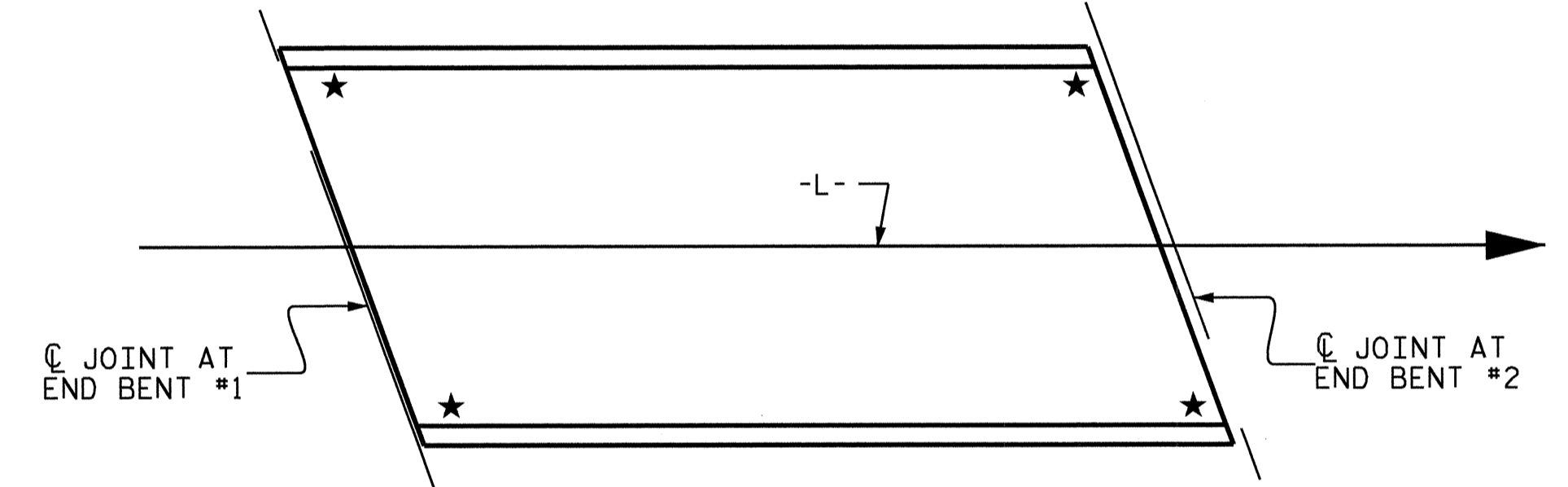
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

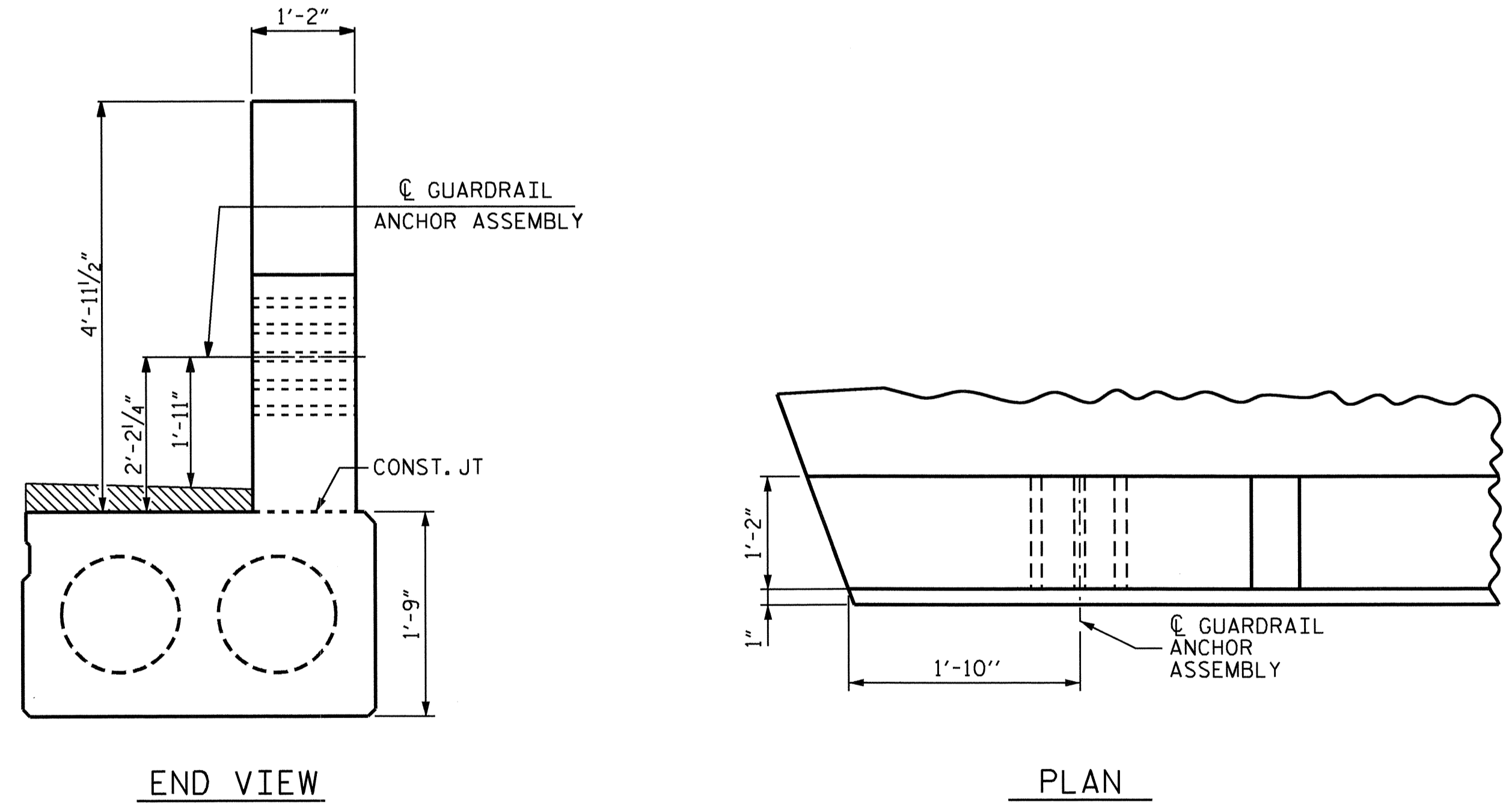
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT
★ LOCATION OF GUARDRAIL ATTACHMENT



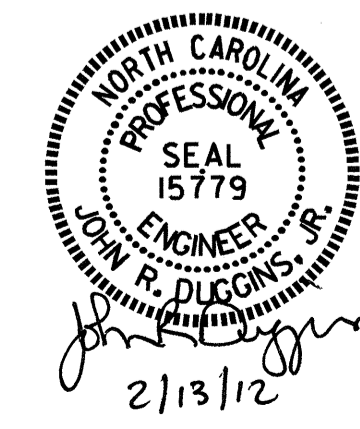
LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
STATION: 20+07.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE
DETAILS
FOR METAL RAILS

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



ASSEMBLED BY : A. SORSENGINH	DATE : 1/26/10
CHECKED BY : M. POOLE	DATE : 1/20/10
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

NOTES

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

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

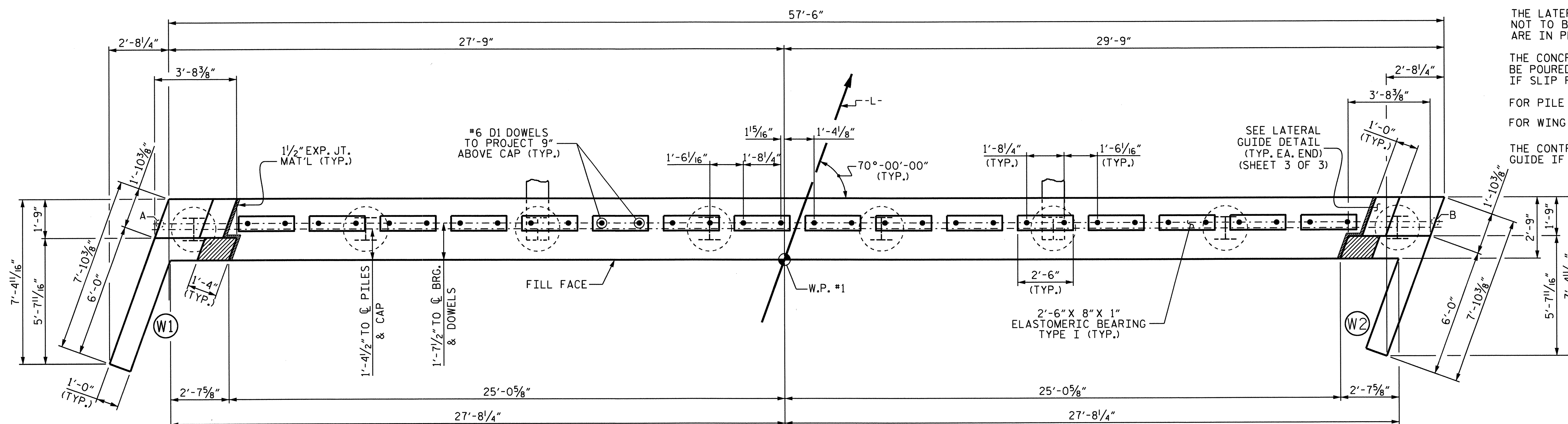
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

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

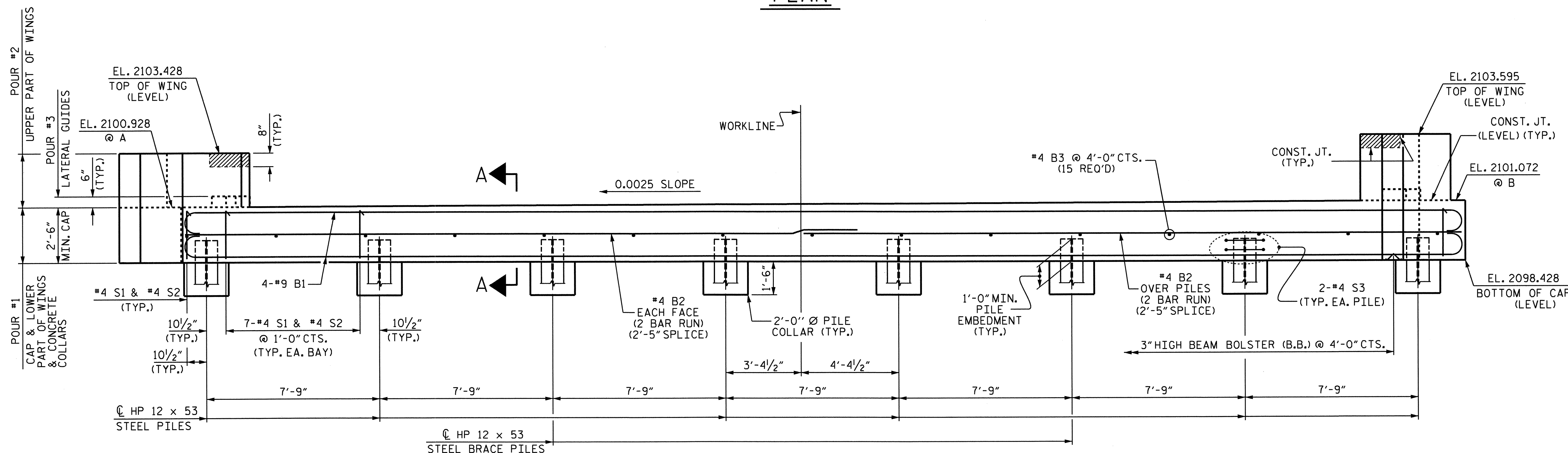
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

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



PLAN



ELEVATION

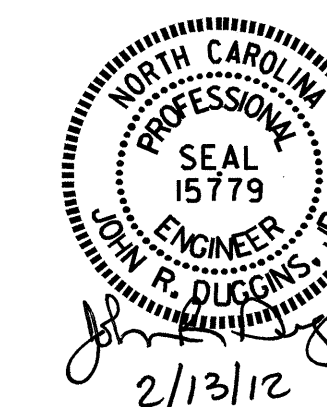
FOR SECTION A-A, SEE SHEET 3 OF 3

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

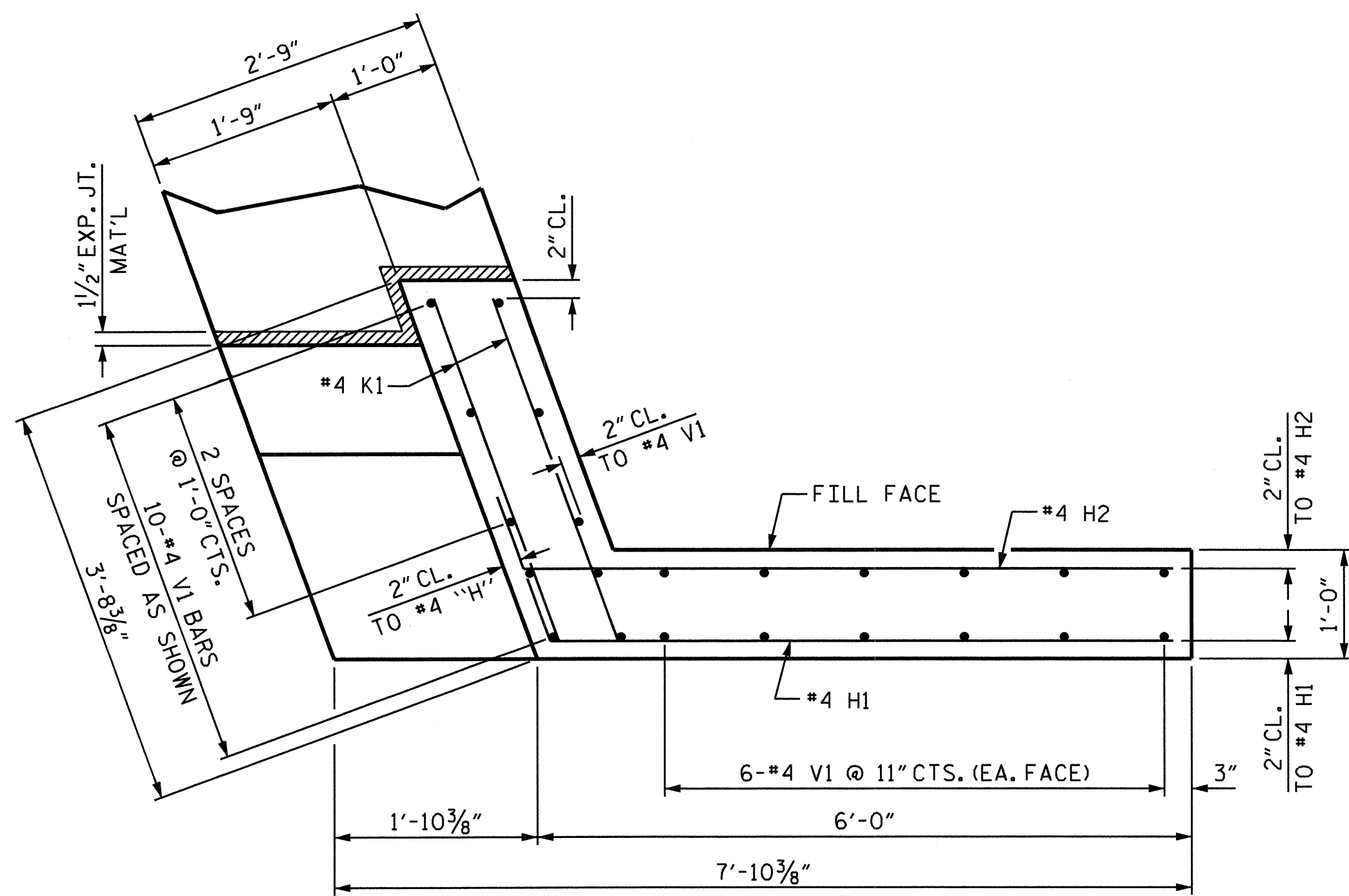
**SUBSTRUCTURE
 END BENT #1**



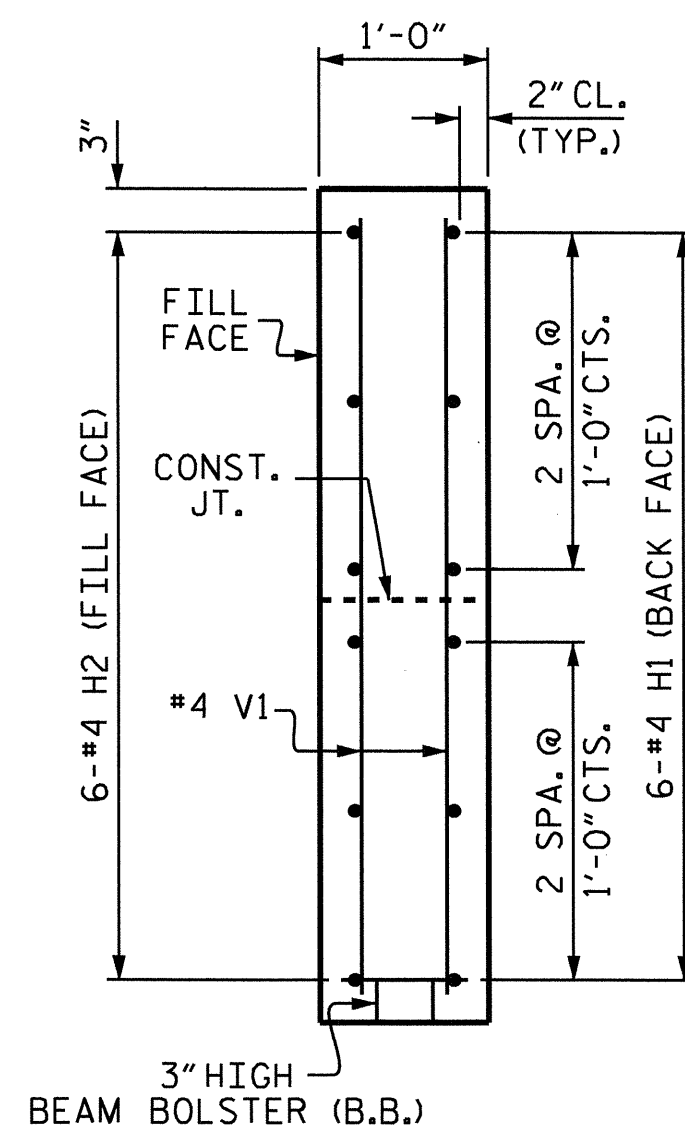
DRAWN BY: A. SORSENGINH DATE: 9/23/10
 CHECKED BY: H. KIM DATE: 2/12/11

13-FEB-2012 11:53
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 jduggins

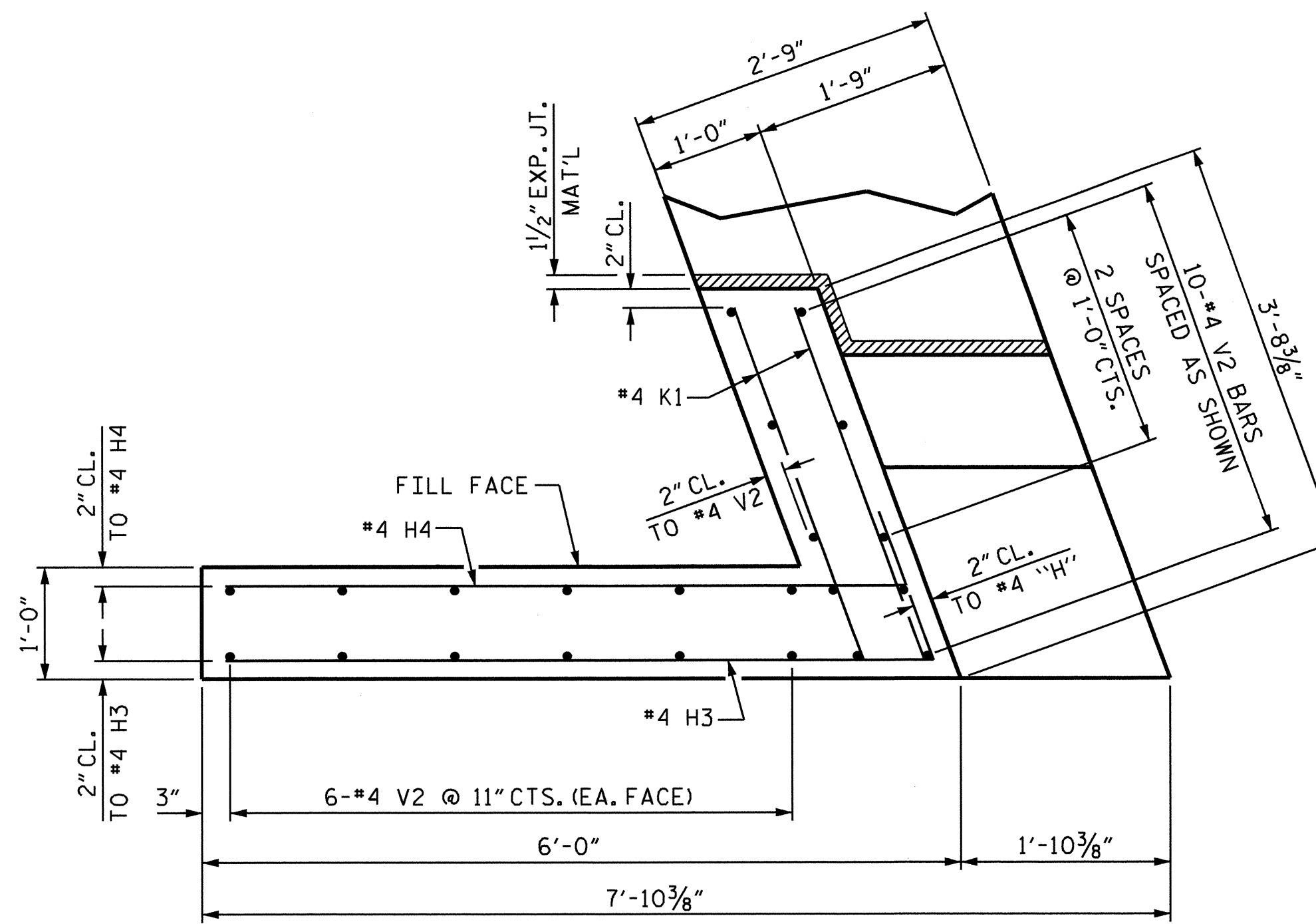
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			30



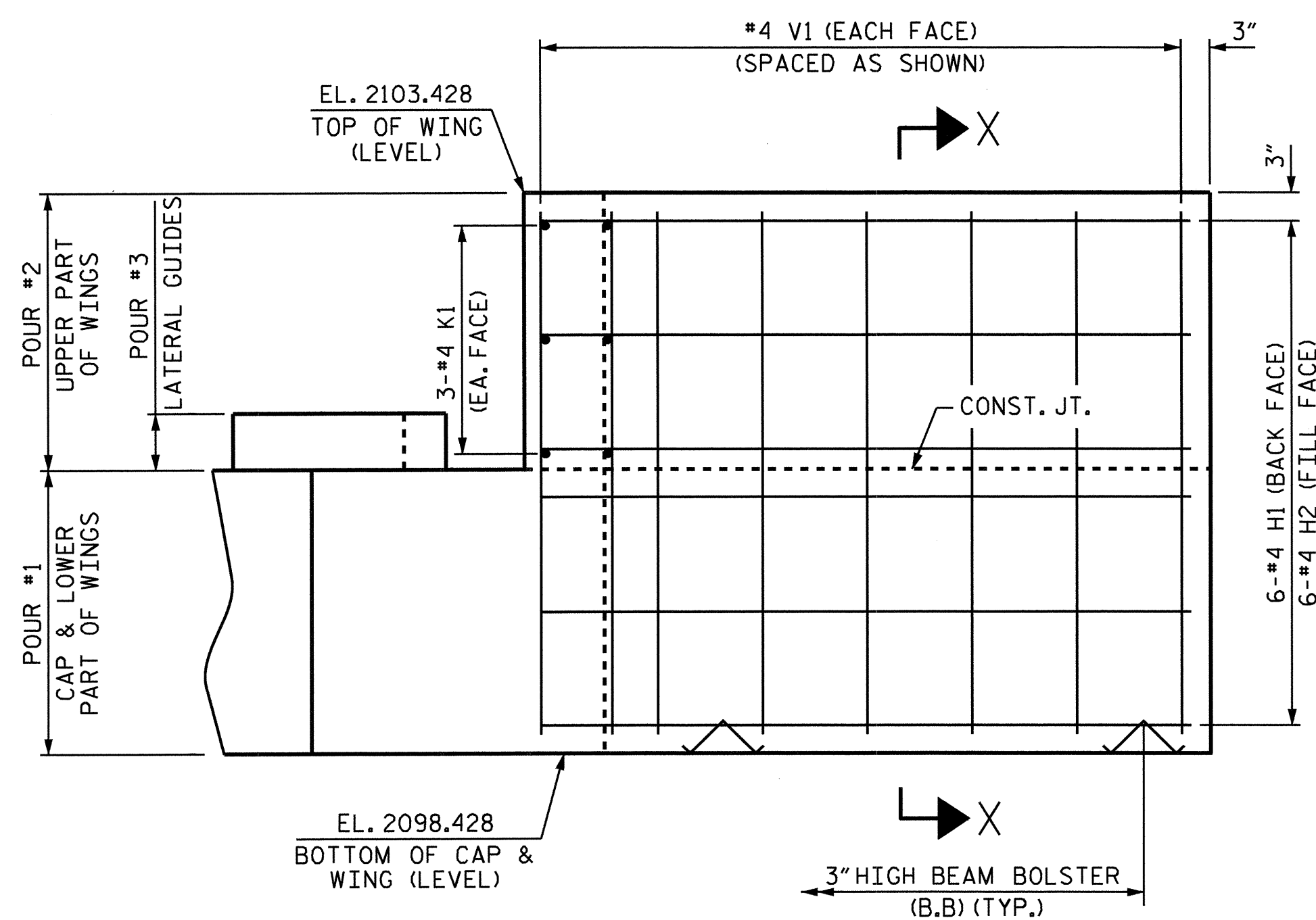
PLAN OF LEFT WING (W1)



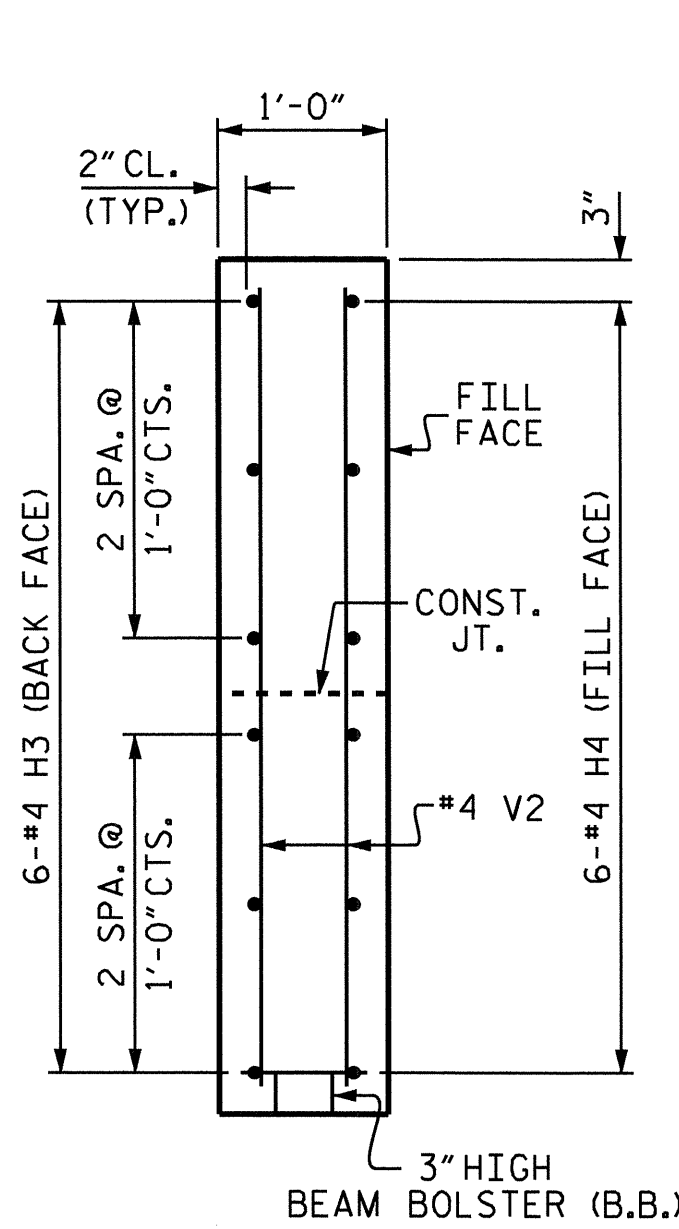
SECTION X-X



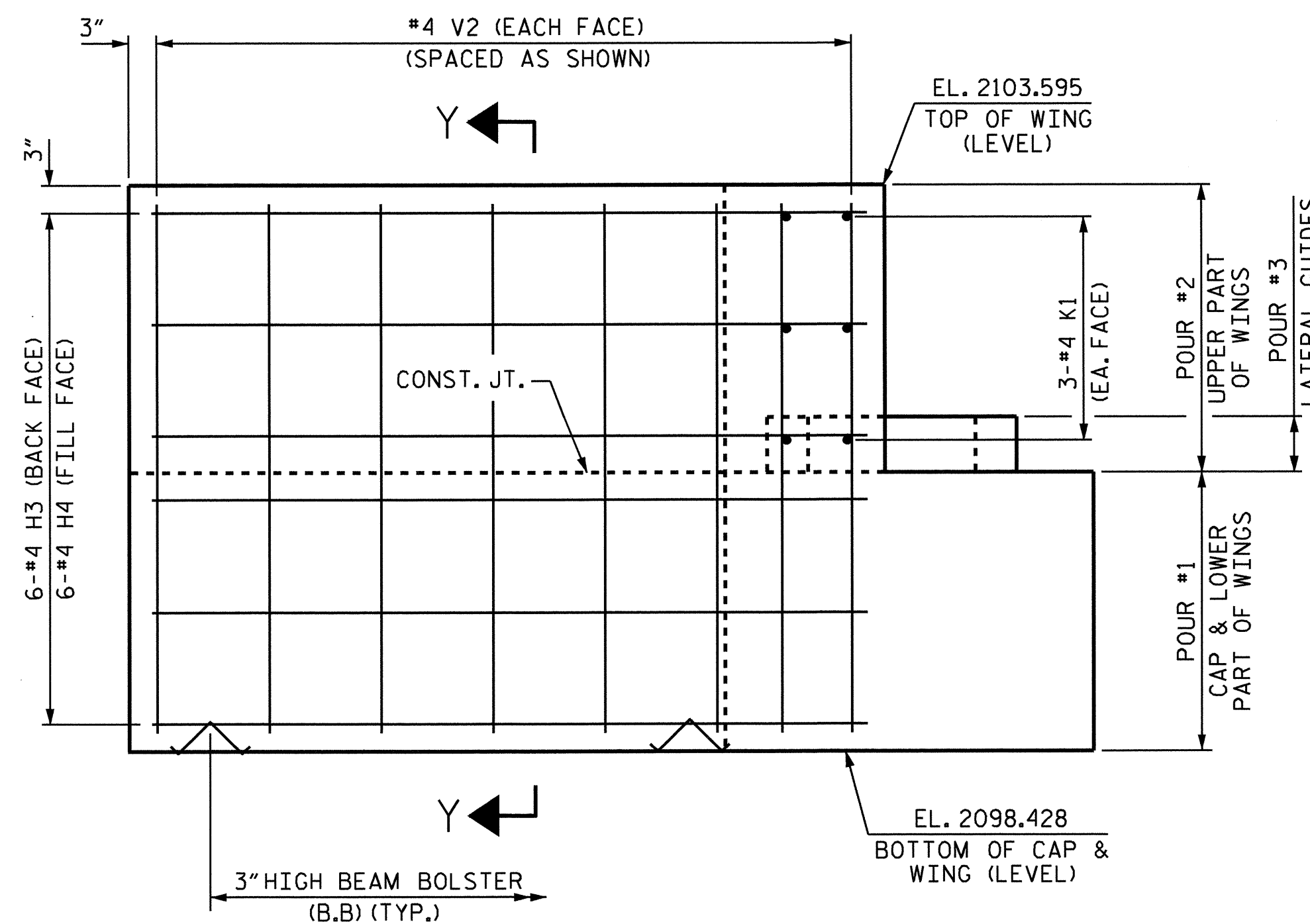
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



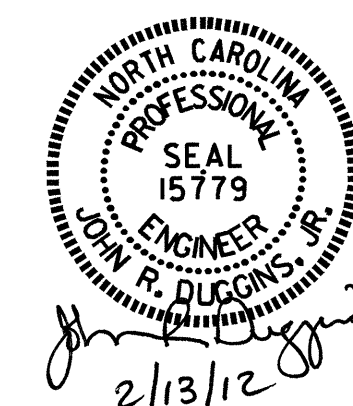
SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

DRAWN BY: A. SORSENGINH DATE: 9/24/10
 CHECKED BY: H. KIM DATE: 2/17/11

13-FEB-2012 11:52
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 jduggins



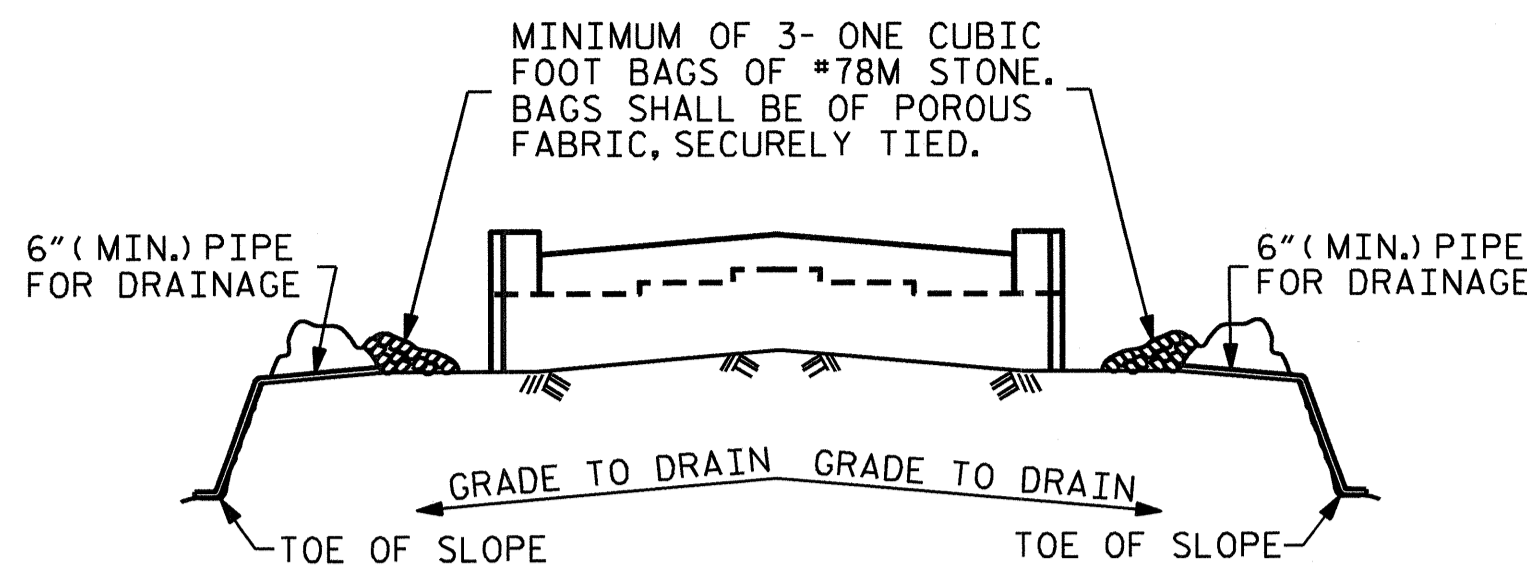
PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-19
2			4			TOTAL SHEETS 30

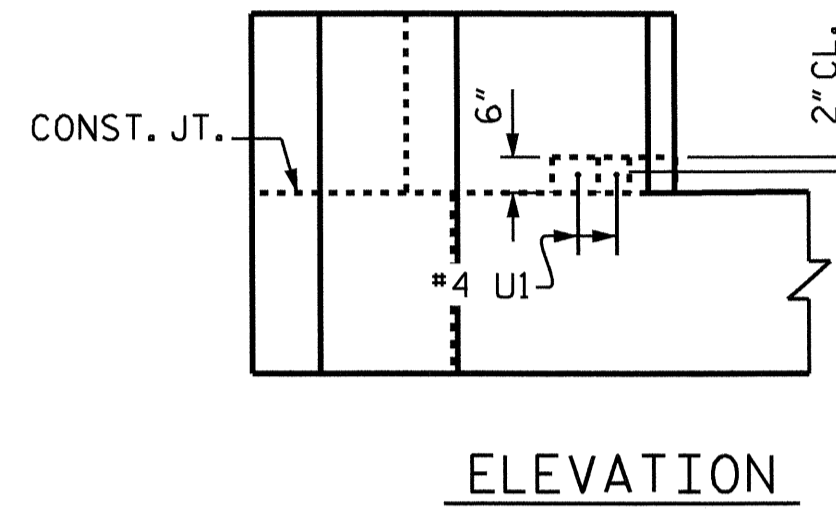
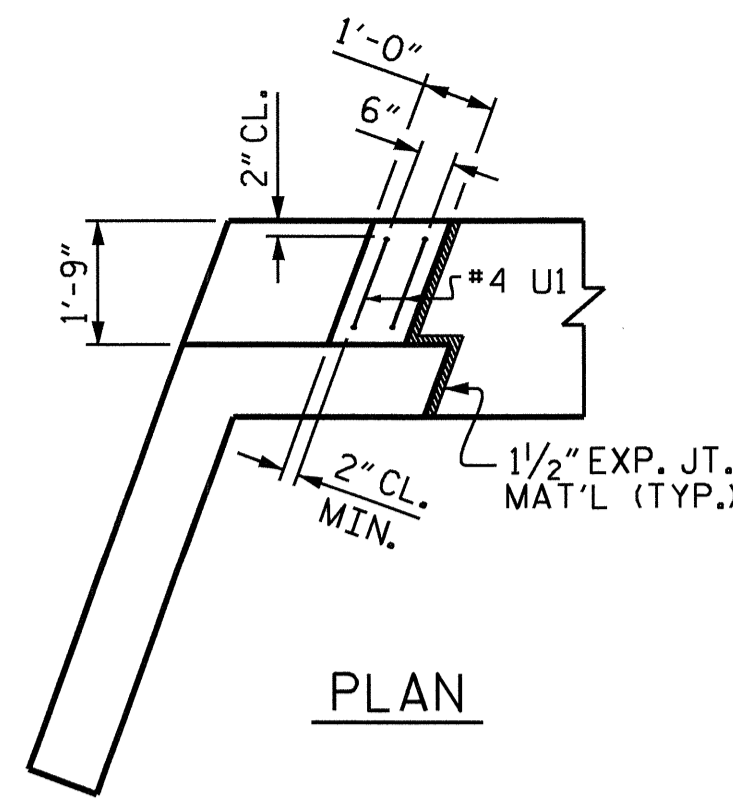


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

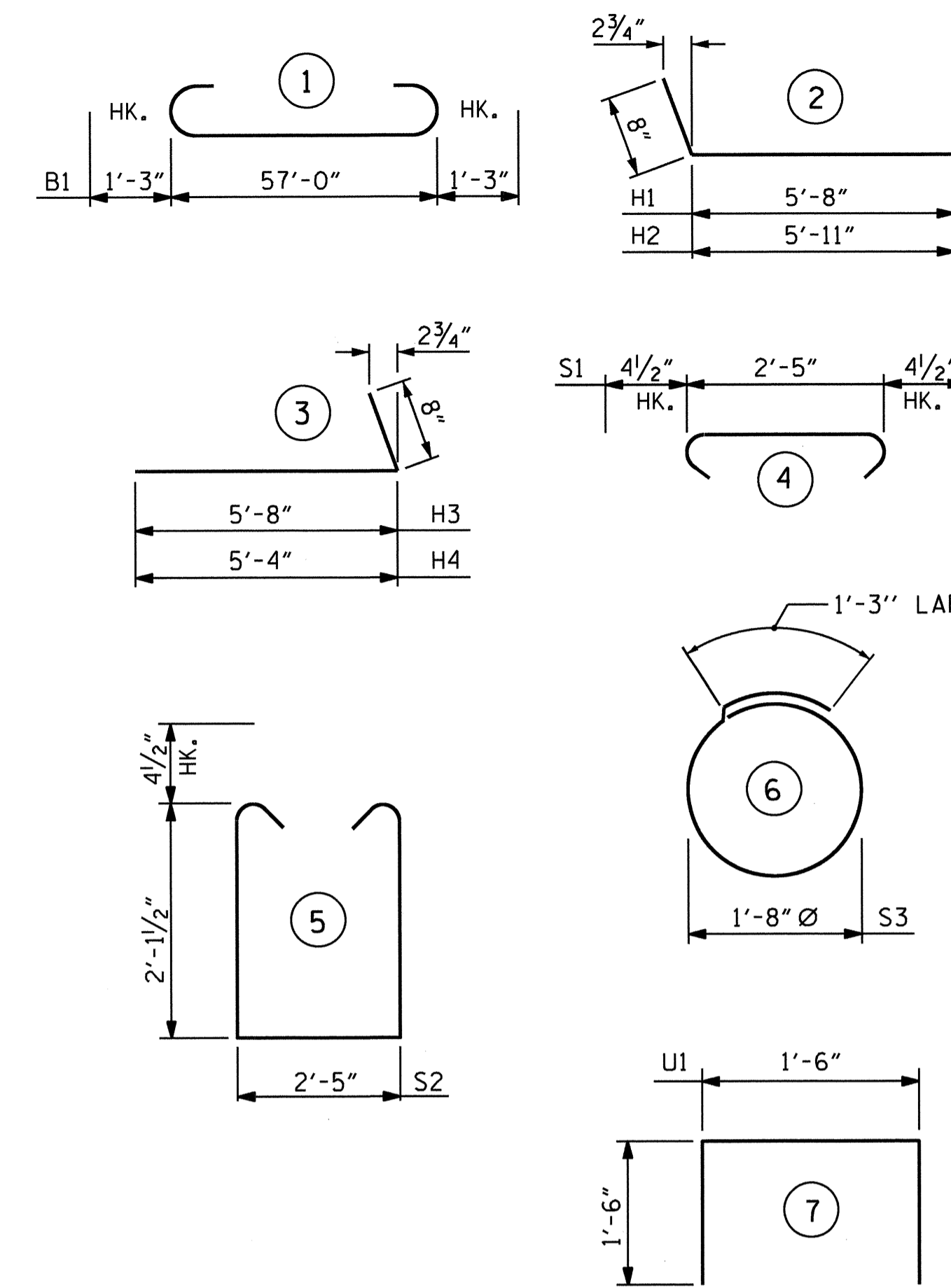
TEMPORARY DRAINAGE AT END BENT



LATERAL GUIDE

(EACH END SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

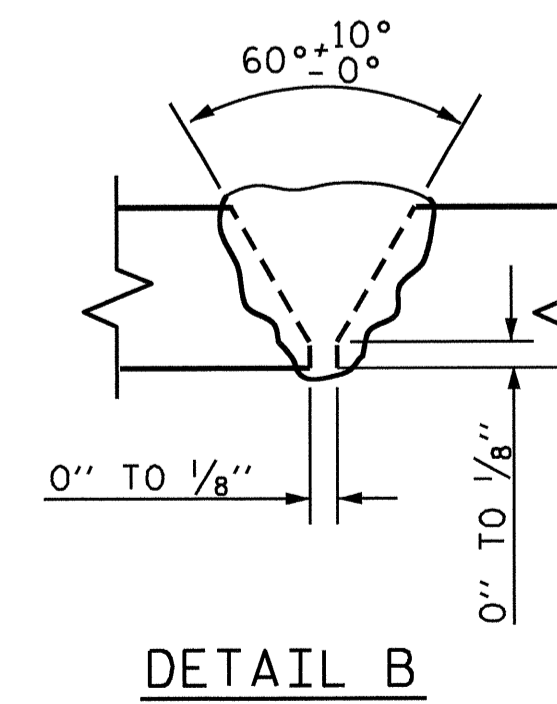
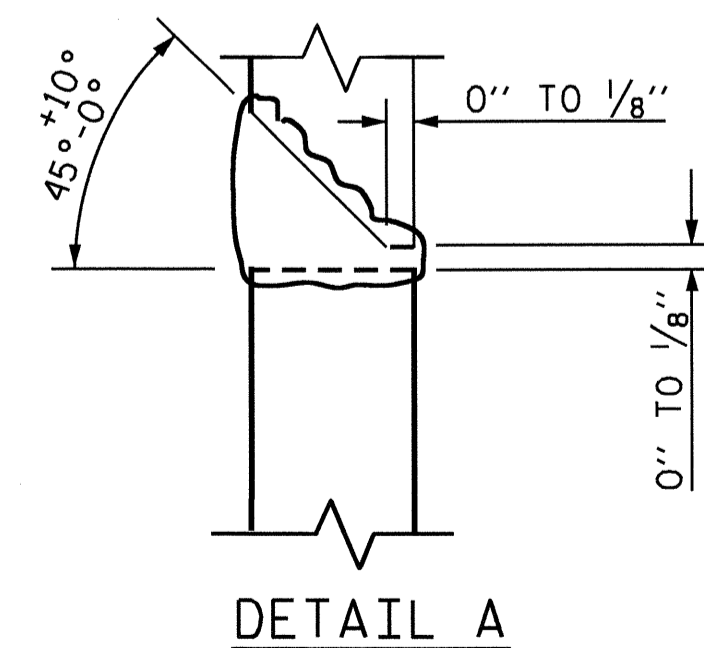
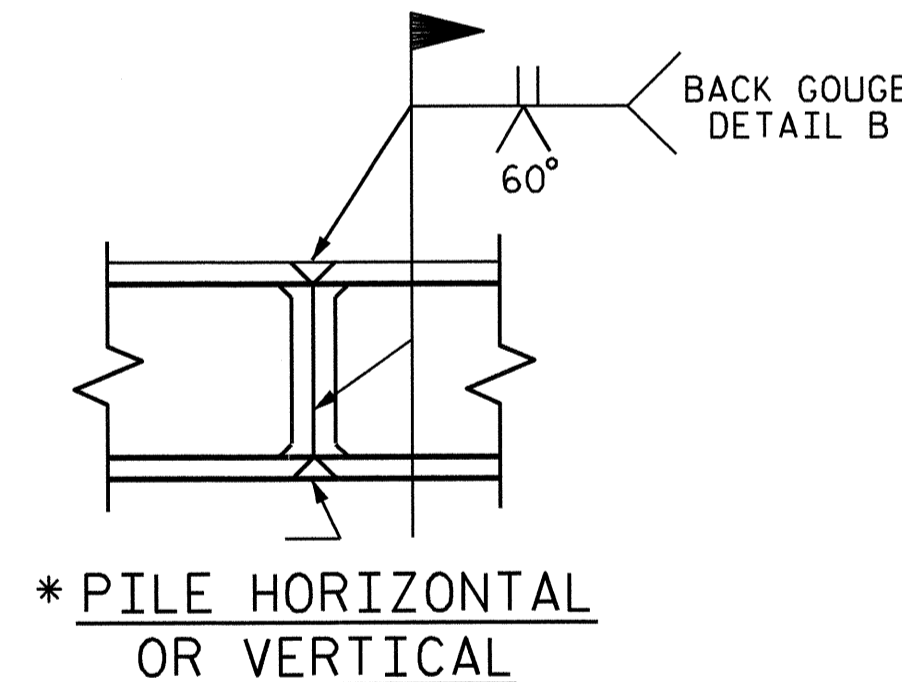
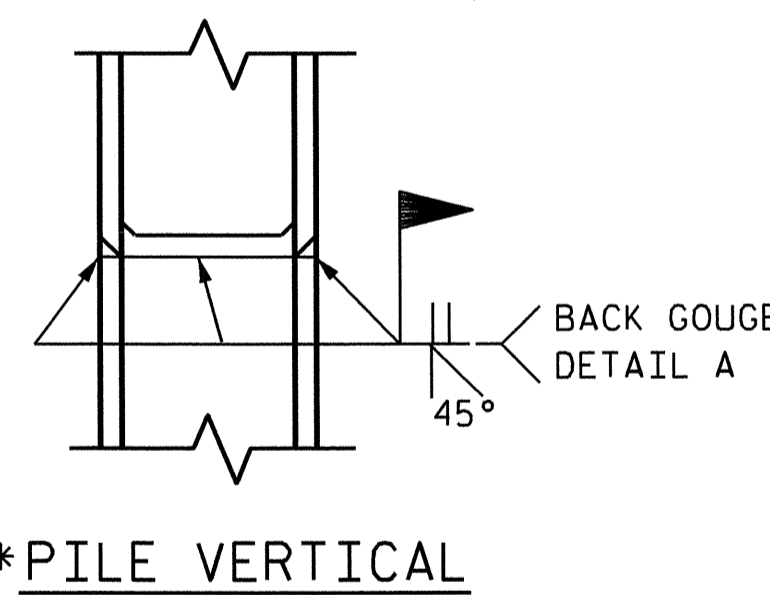
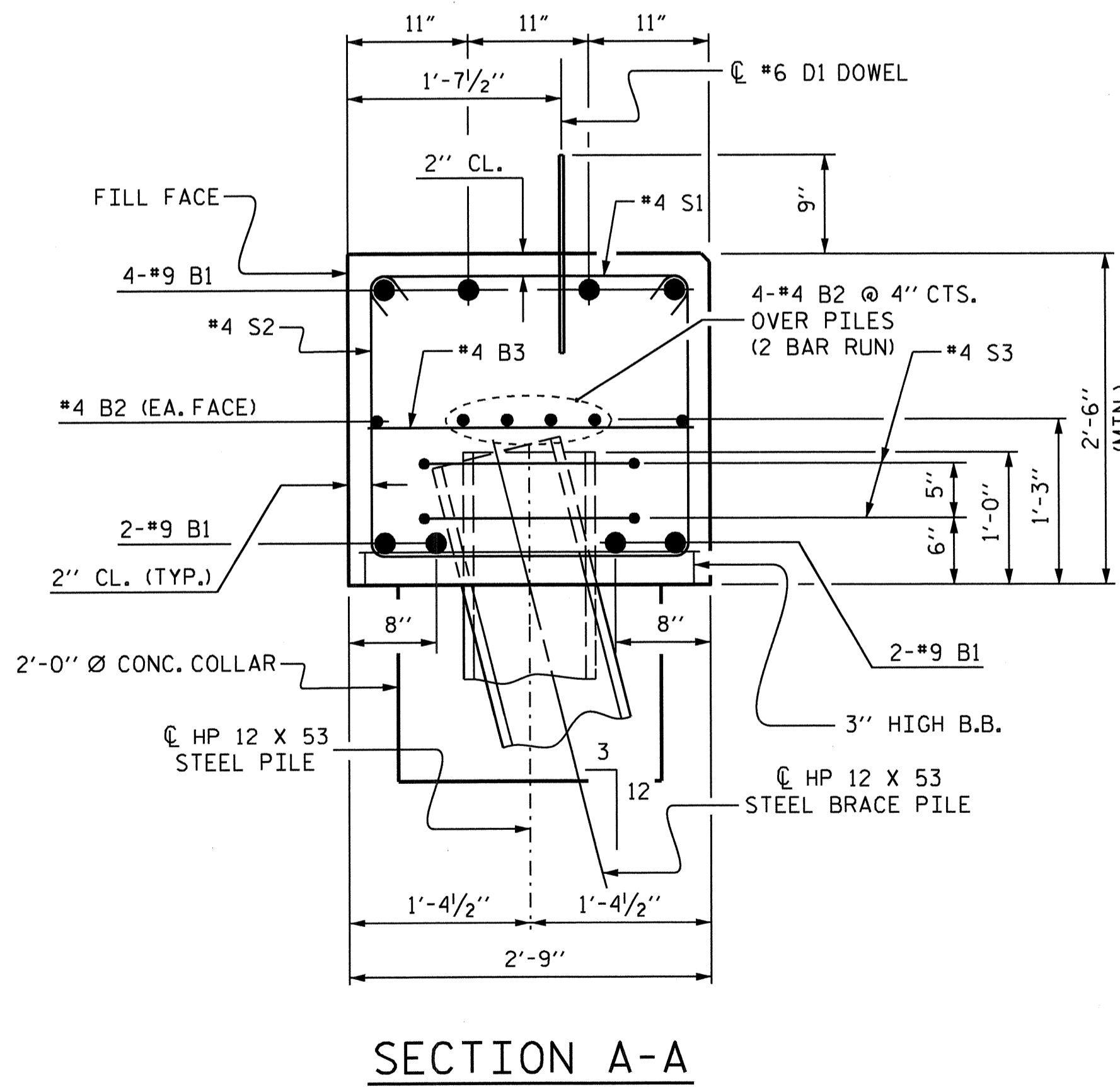
BILL OF MATERIAL

END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	59'-6"	1618
B2	12	#4	STR.	29'-10"	239
B3	15	#4	STR.	2'-5"	24
D1	32	#6	STR.	1'-6"	72
H1	6	#4	2	6'-4"	25
H2	6	#4	2	6'-7"	26
H3	6	#4	3	6'-4"	25
H4	6	#4	3	6'-0"	24
K1	12	#4	STR.	3'-4"	27
S1	51	#4	4	3'-2"	108
S2	51	#4	5	7'-5"	253
S3	16	#4	6	6'-6"	69
U1	4	#4	7	4'-6"	12
V1	22	#4	STR.	4'-7"	67
V2	22	#4	STR.	4'-9"	70

REINFORCING STEEL = 2659 LBS

CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP & LOWER PART OF WINGS & COLLARS	C.Y. 17.7
POUR #2 UPPER PART OF WINGS	C.Y. 1.6
POUR #3 LATERAL GUIDES	C.Y. 0.1
TOTAL CLASS A CONCRETE	C.Y. 19.4

HP 12 X 53 STEEL PILES NO. 8 LIN. FT. 120



PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

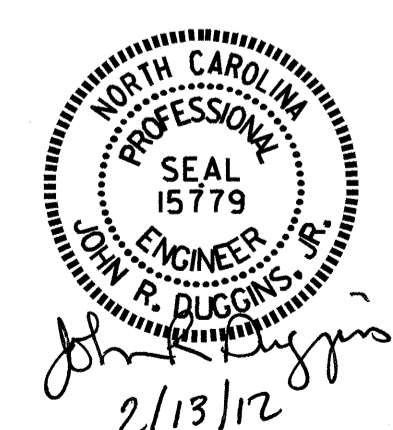
PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-20
1			3			TOTAL SHEETS 30
2			4			



DRAWN BY: A. SORSENGINH DATE: 9/24/10
 CHECKED BY: H. KIM DATE: 2/17/11

13-FEB-2012 14:25
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 jduggins

NC005

NOTES

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

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

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

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

DRILLED PIERS SHALL BE TERMINATED ONE FOOT +/- ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

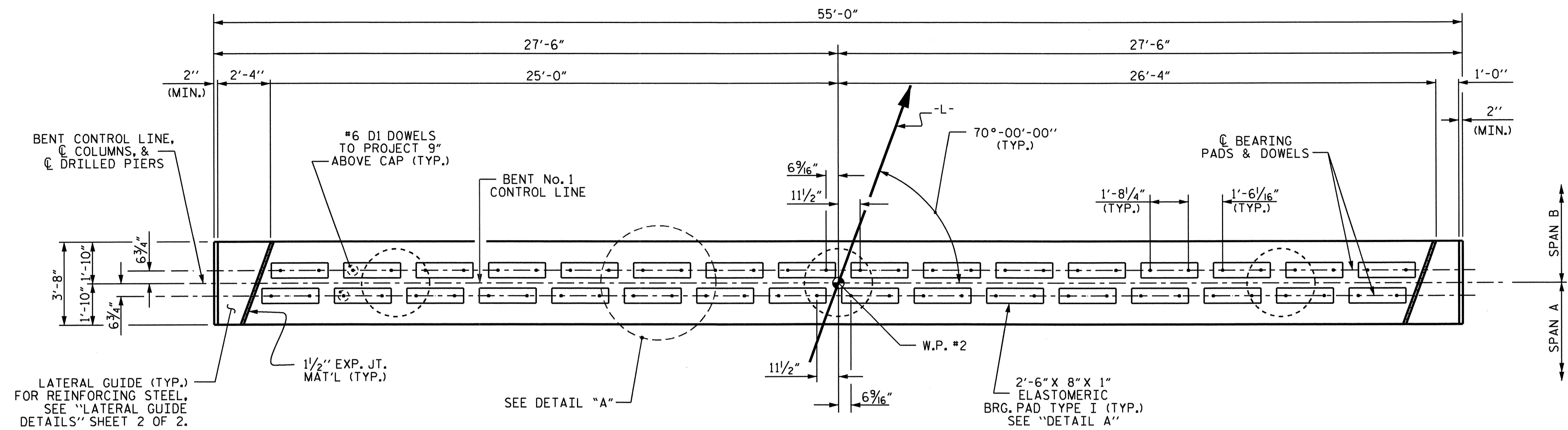
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

"U" BARS IN THE END CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR "B" BARS.

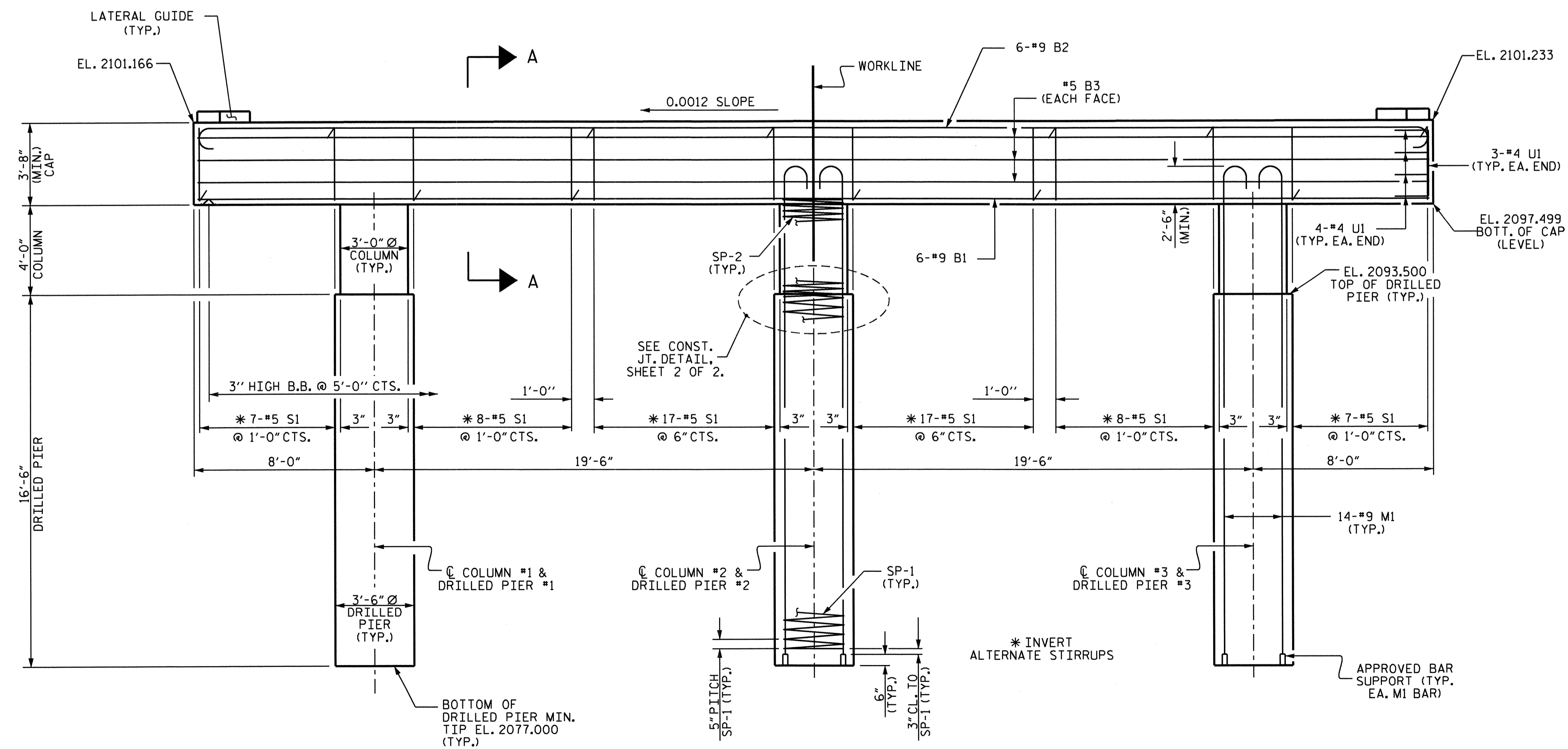
2" MINIMUM CONCRETE COVER FROM THE END OF CAP IS REQUIRED FOR ALL "U" BARS.

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

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

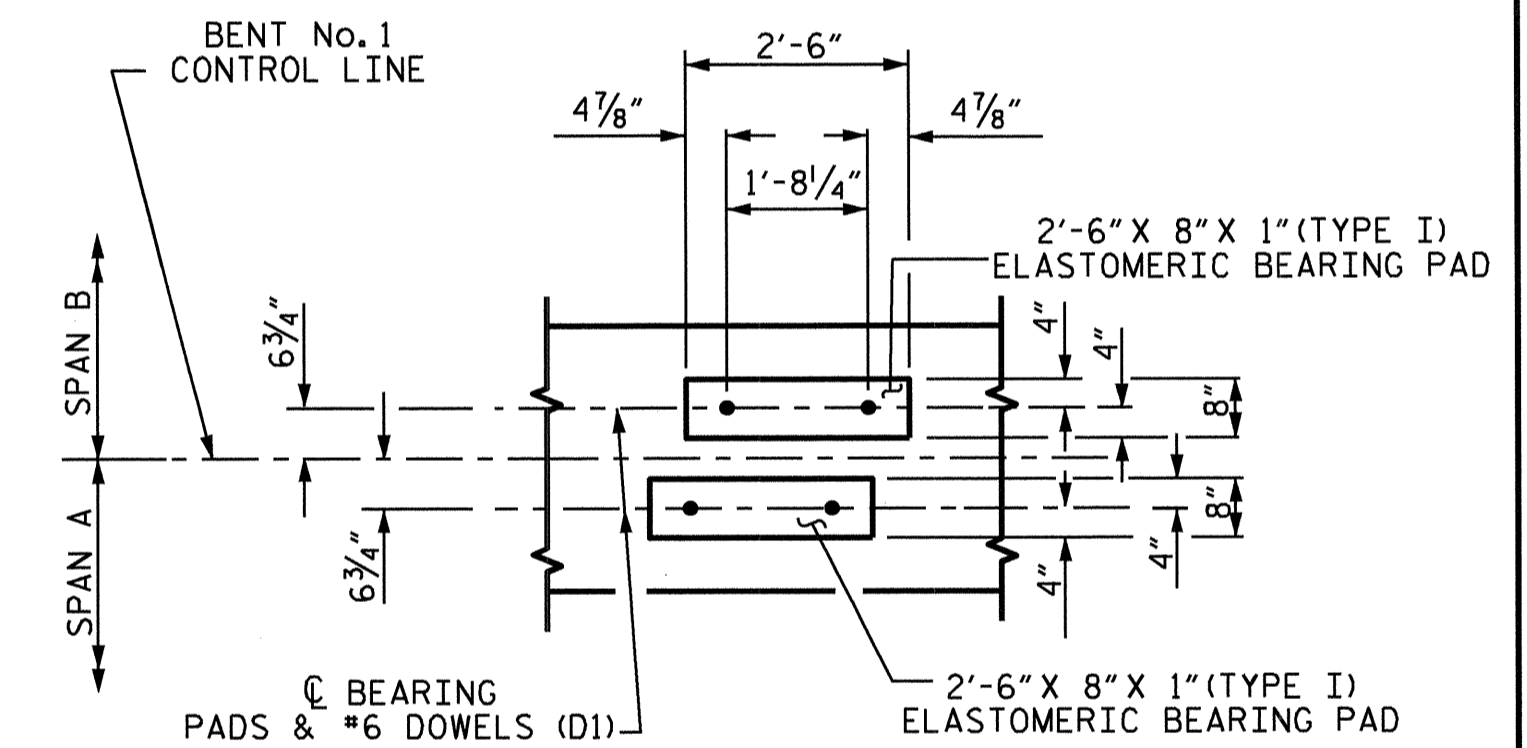


PLAN



ELEVATION

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER



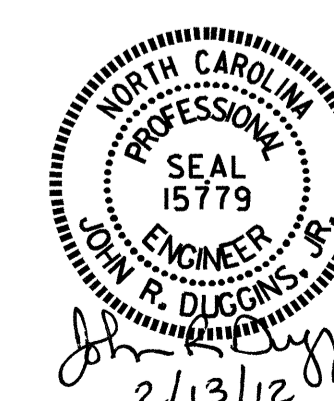
DETAIL "A"

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 1

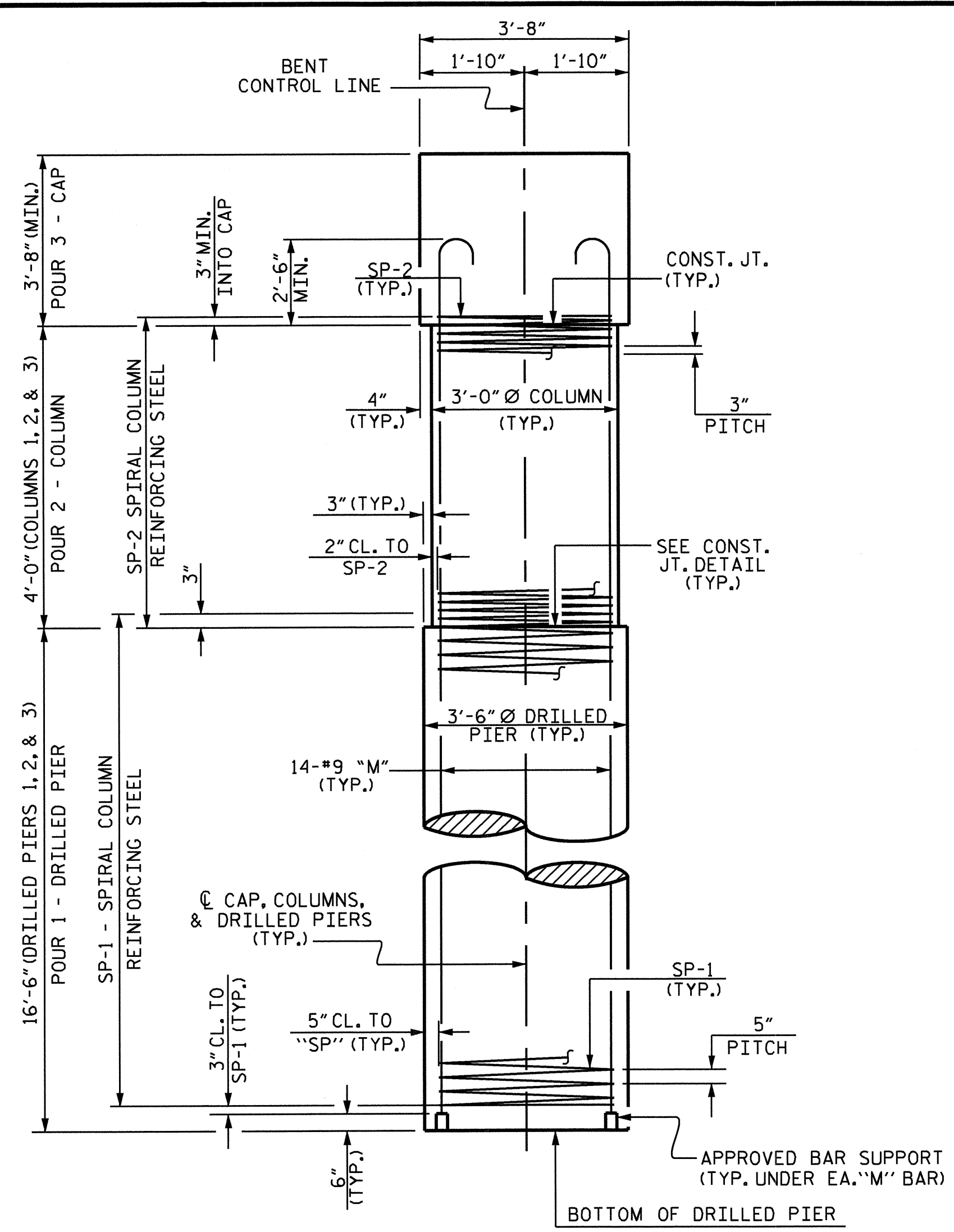


DRAWN BY: J. L. LAMBERT DATE: 2/2011
 CHECKED BY: M. POOLE DATE: 3/2011

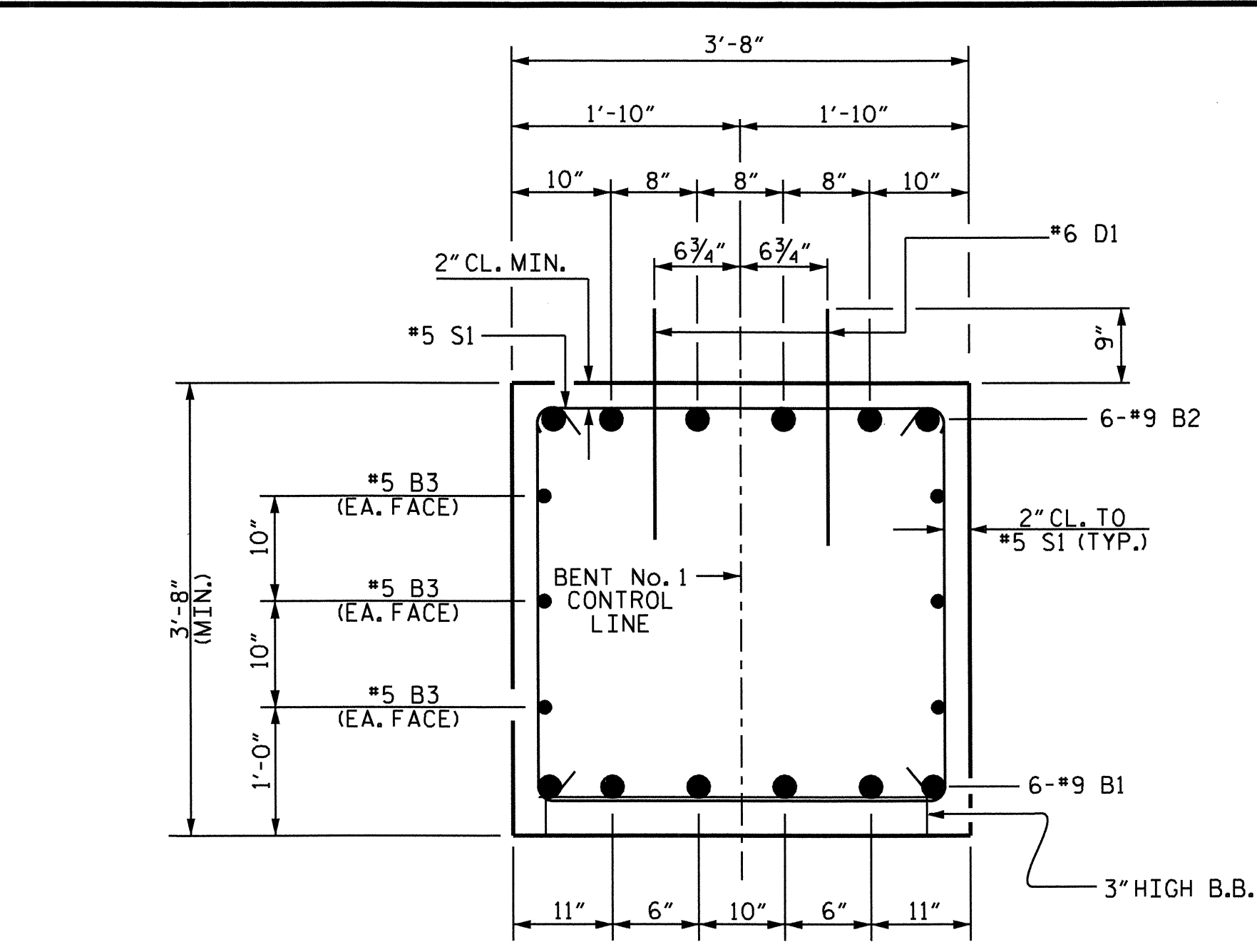
*****SYSTEM*****
 *****DCN*****
 *****USERNAME*****

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-21
2			4			30

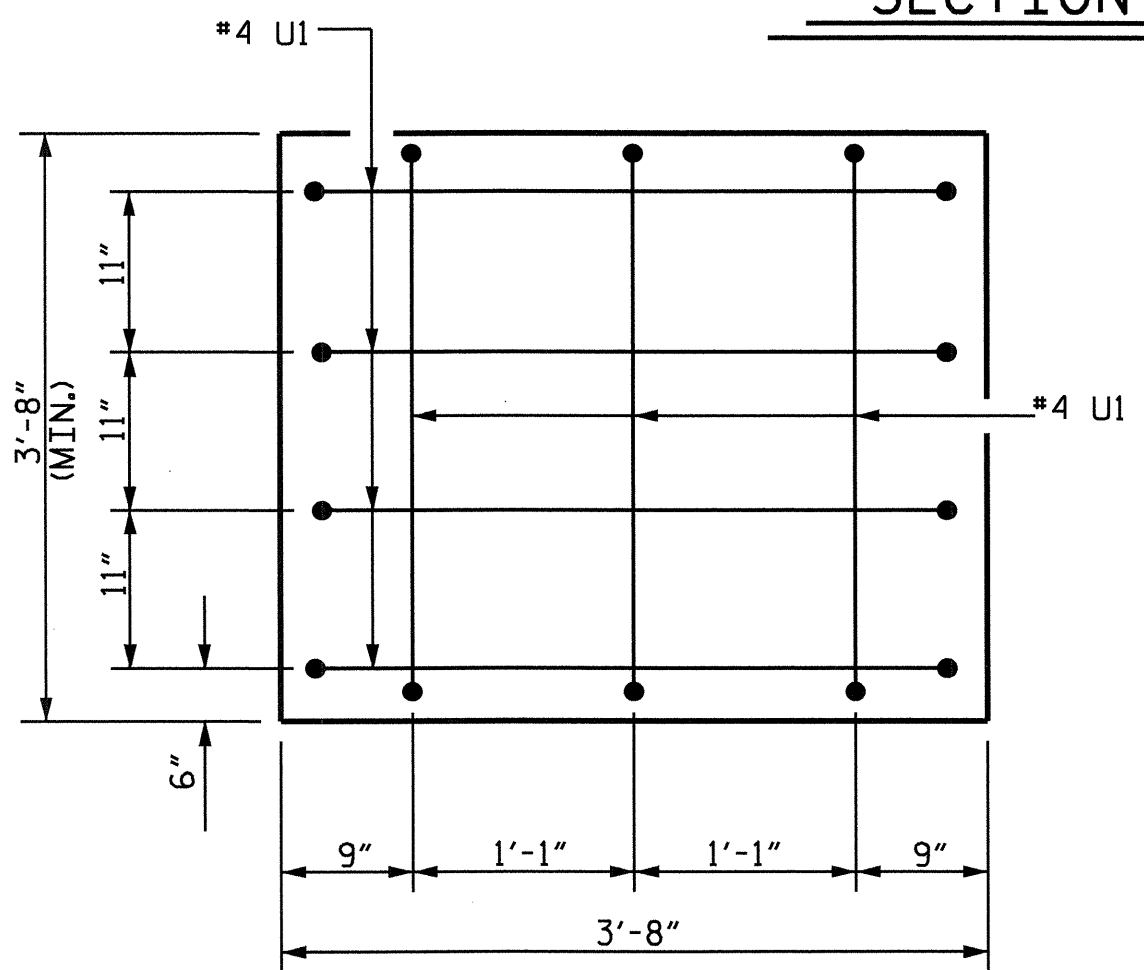
NC006



END ELEVATION

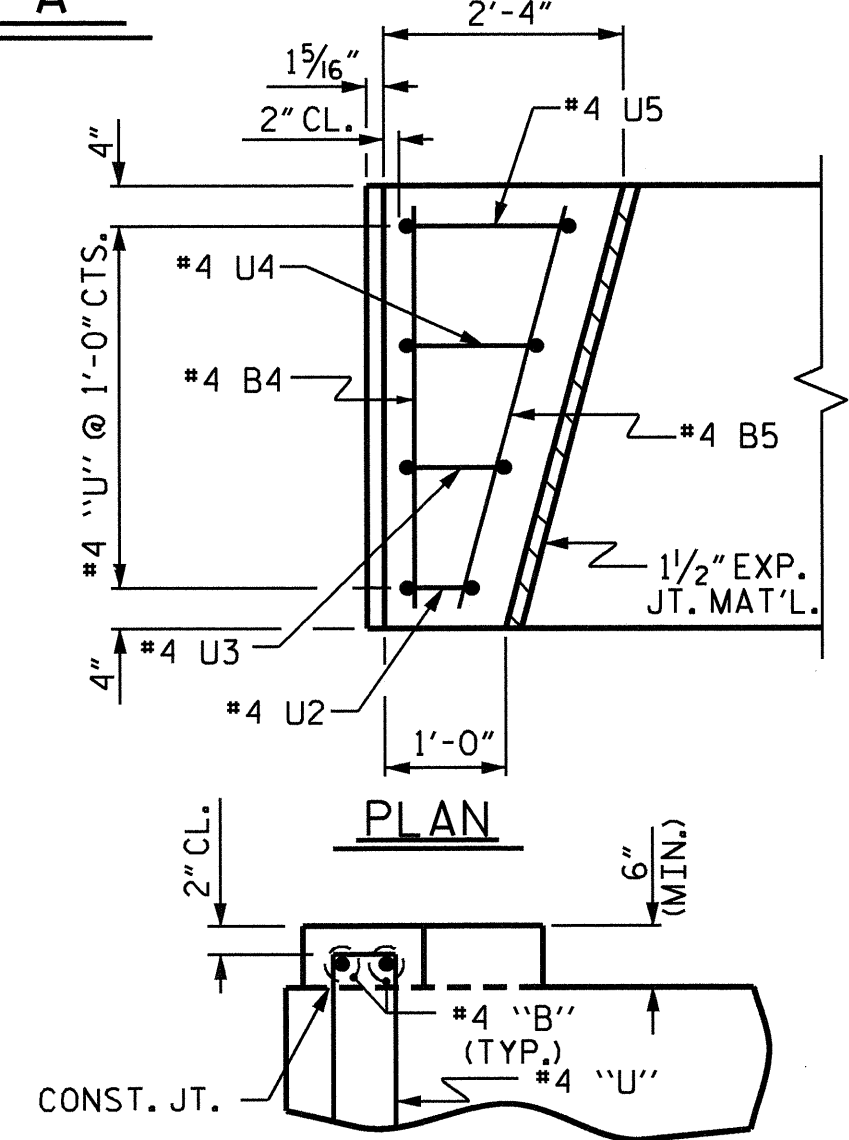


SECTION A-A



END VIEW

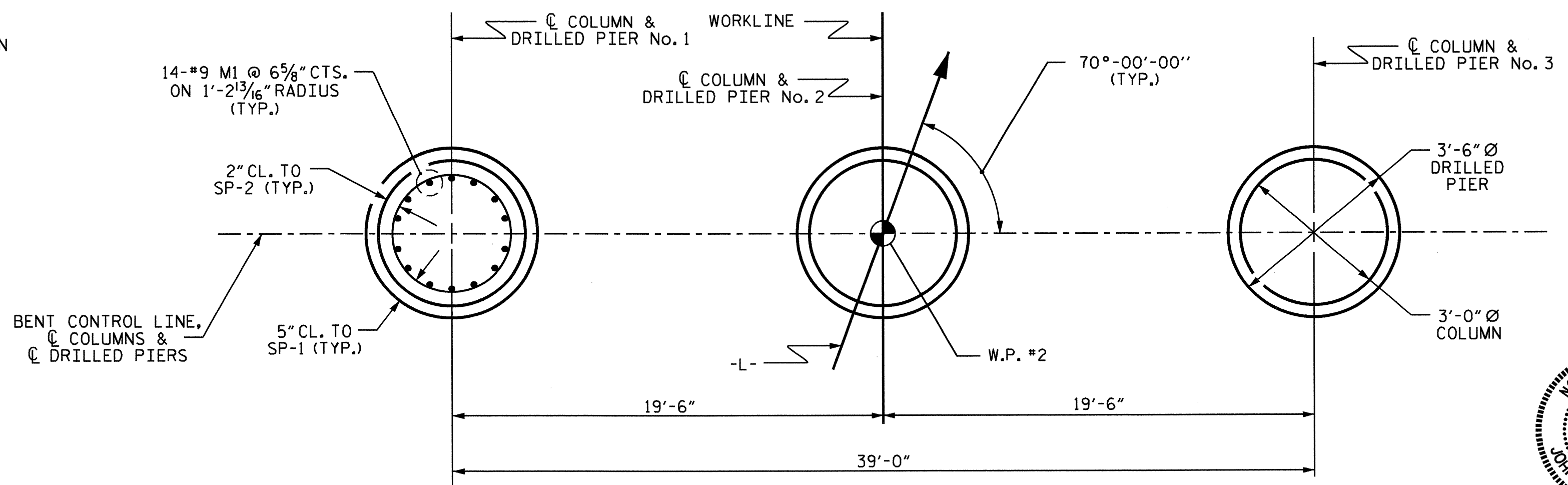
(TYPICAL EACH END)



ELEVATION

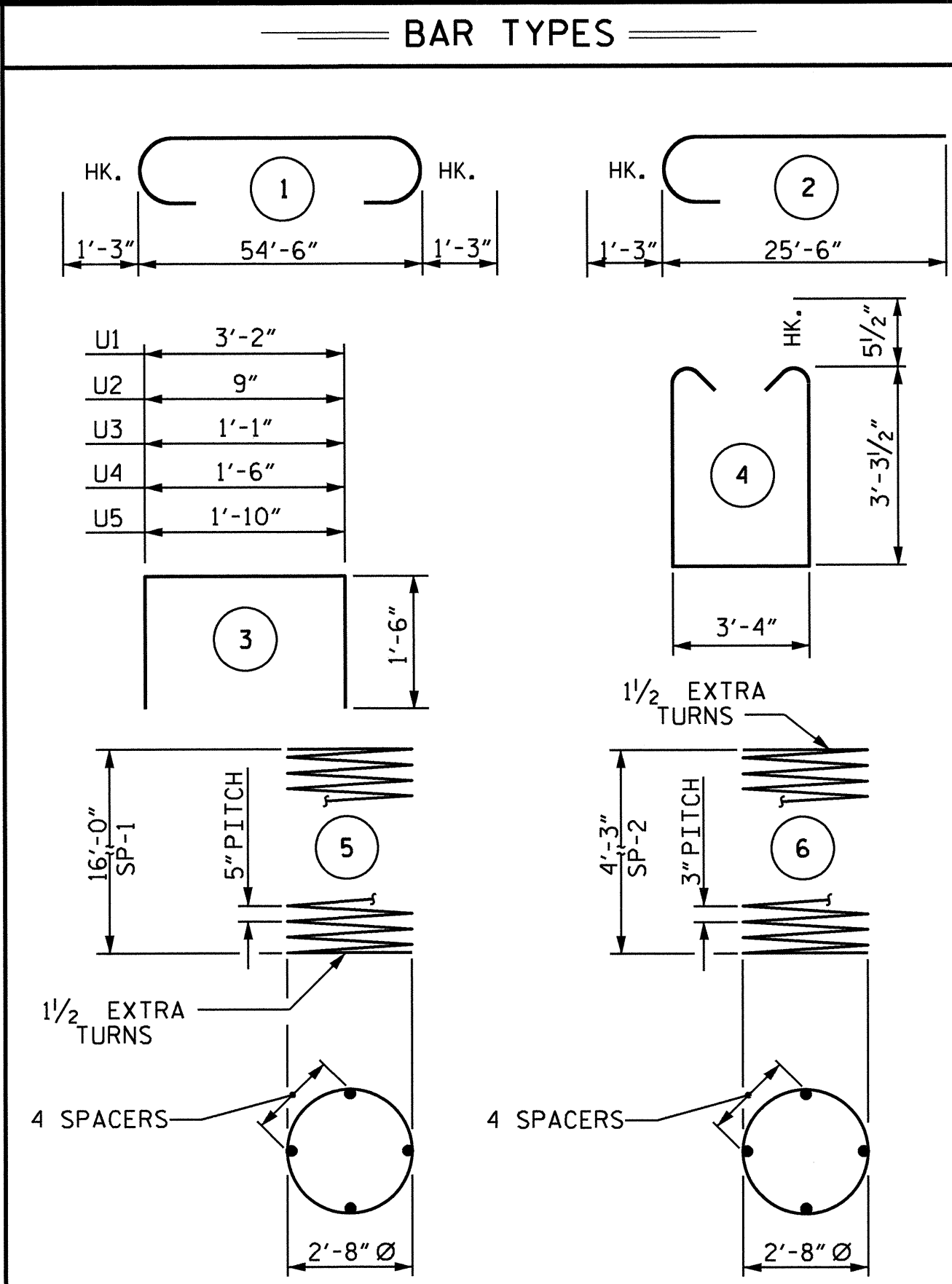
LATERAL GUIDE DETAILS

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)



PLAN OF DRILLED PIERS & COLUMNS

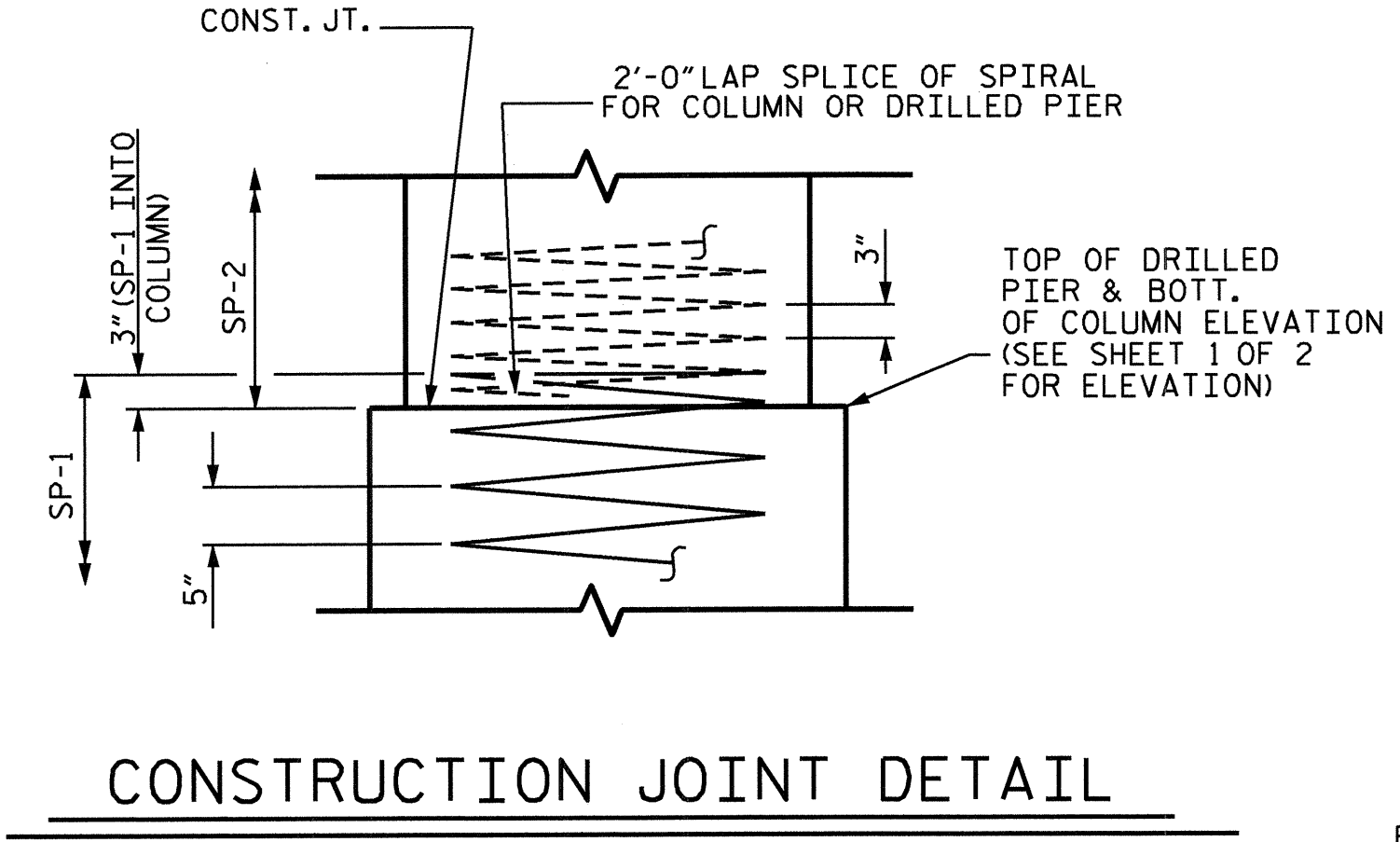
(REINFORCING STEEL IS TYPICAL FOR EACH COLUMN & DRILLED PIER)



BAR TYPES

BILL OF MATERIAL						
BENT No. 1						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	6	9	STR	54'-8"	1115	
B2	6	9	1	57'-0"	1163	
B3	6	5	STR	54'-8"	342	
B4	2	4	STR	3'-4"	4	
B5	2	4	STR	3'-6"	5	
D1	64	6	STR	1'-6"	144	
M1	42	9	2	26'-9"	3820	
S1	64	5	4	10'-10"	723	
U1	14	4	3	6'-2"	58	
U2	2	4	3	3'-9"	5	
U3	2	4	3	4'-1"	5	
U4	2	4	3	4'-6"	6	
U5	2	4	3	4'-10"	6	
REINFORCING STEEL				7396	LBS	
SP-1	3	***	5	329'-0"	1029	
SP-2	3	**	6	156'-10"	314	
SPIRAL COLUMN REINFORCING STEEL				1343	LBS.	
CLASS A CONCRETE BREAKDOWN						
POUR 2 (COLUMNS)				3.1	C.Y.	
POUR 3 (CAP)				27.6	C.Y.	
POUR 4 (LATERAL GUIDES)				0.2	C.Y.	
TOTAL CLASS A CONCRETE				30.9	C.Y.	
DRILLED PIER QUANTITIES						
DRILLED PIER CONCRETE BREAKDOWN						
POUR 1 (DRILLED PIERS)				17.6	C.Y.	
3'-6" Ø DRILLED PIERS NOT IN SOIL				21.00	LIN. FT.	
3'-6" Ø DRILLED PIERS IN SOIL				28.50	LIN. FT.	
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER				19.50	LIN. FT.	
CSL TUBES				216	LIN. FT.	

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



CONSTRUCTION JOINT DETAIL

DRAWN BY : J. LAMBERT DATE : 2/2011
 CHECKED BY : M. POOLE DATE : 3/2011

13-FEB-2012 11:56
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 jduggins

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT No. 1



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

NOTES

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

HOOKS ON "M1" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

DRILLED PIERS SHALL BE TERMINATED ONE FOOT +/- ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

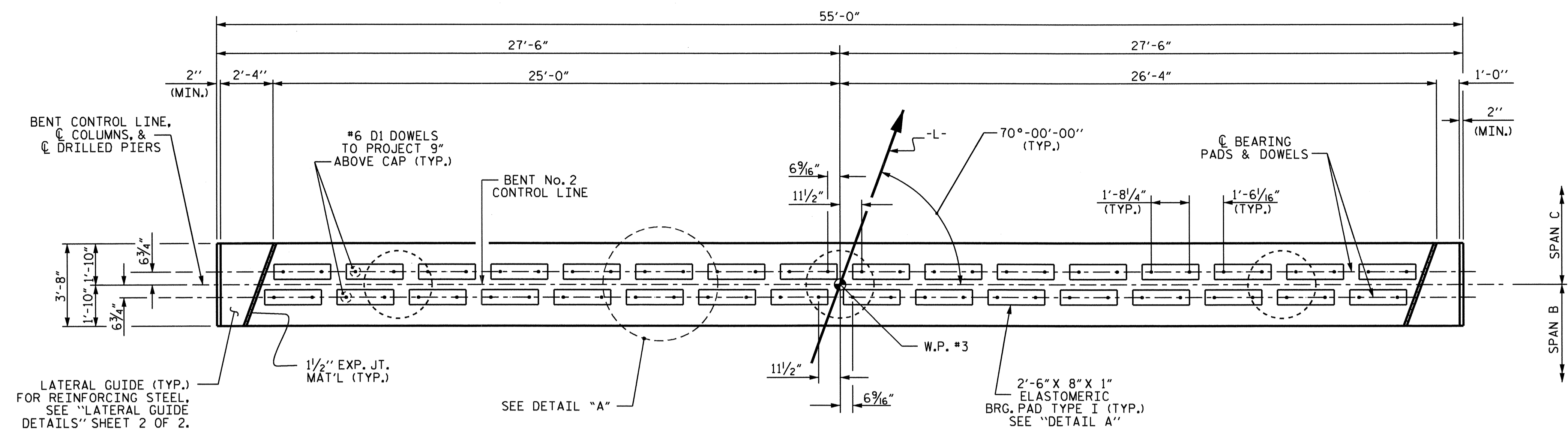
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

"U" BARS IN THE END CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR "B" BARS.

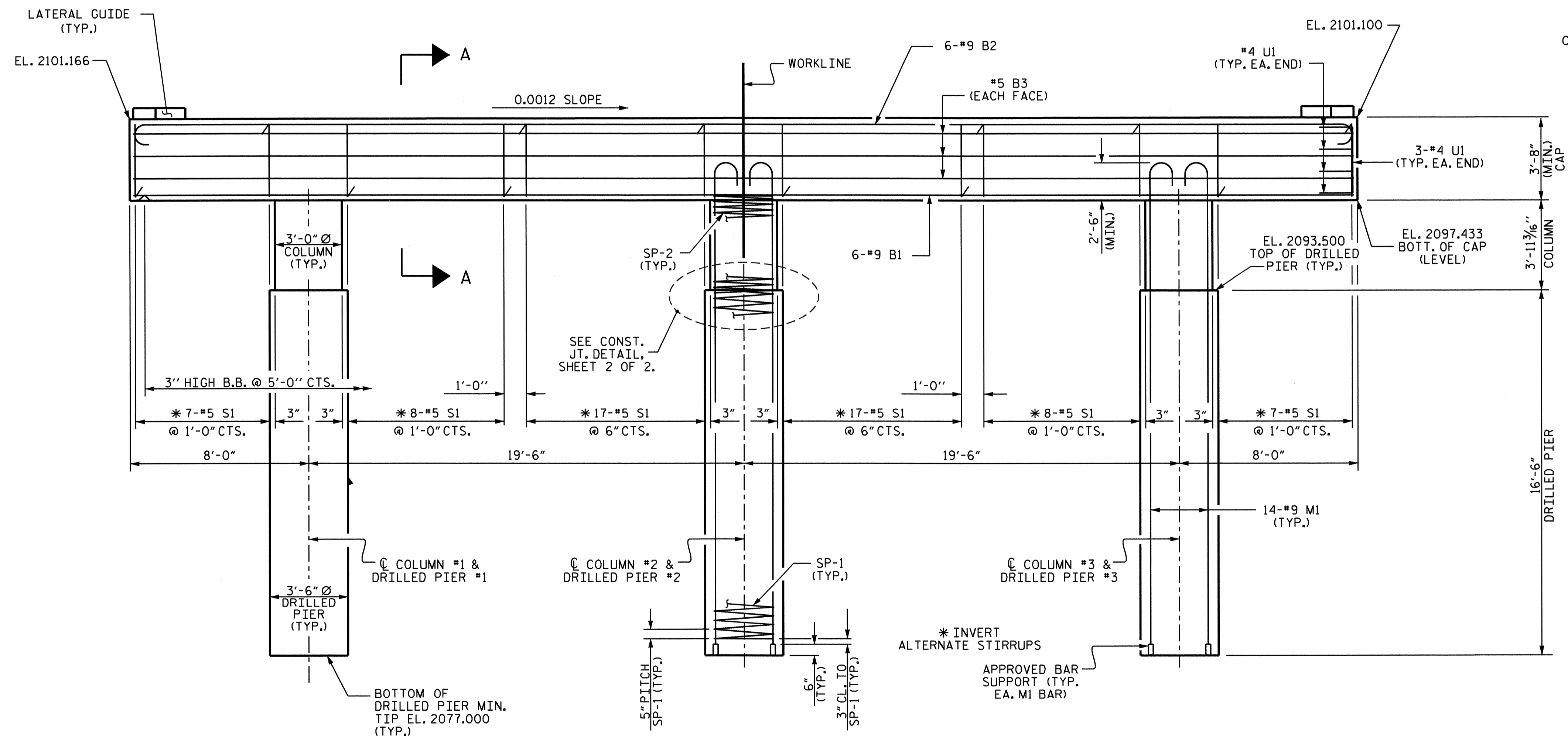
2" MINIMUM CONCRETE COVER FROM THE END OF CAP IS REQUIRED FOR ALL "U" BARS.

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

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

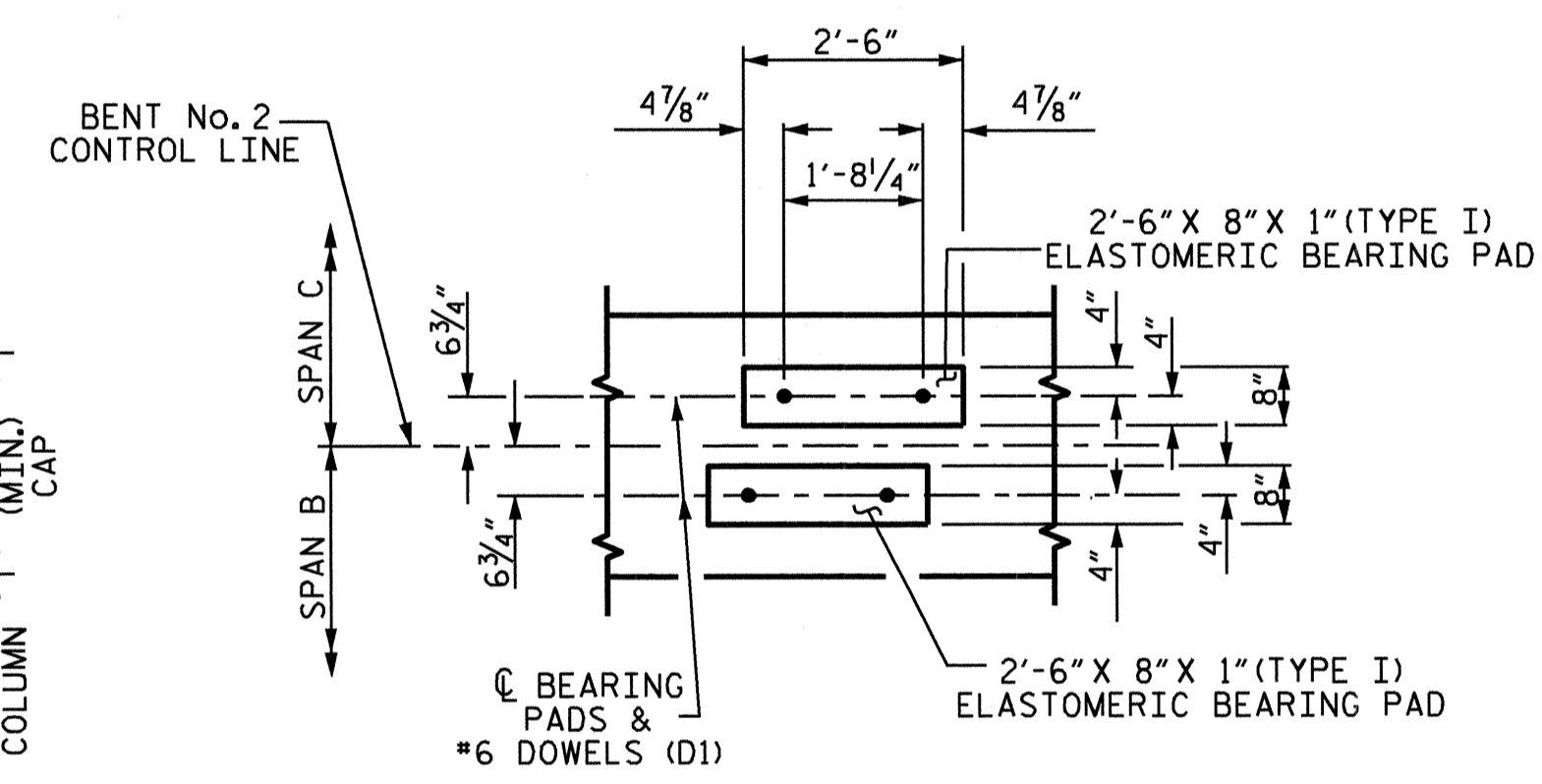


PLAN



ELEVATION

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER



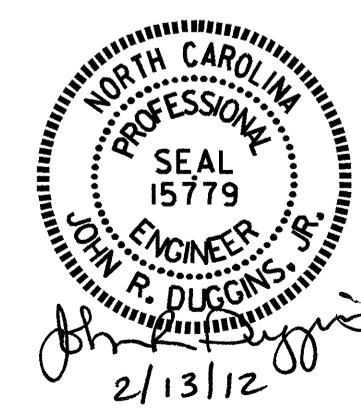
DETAIL "A"

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2

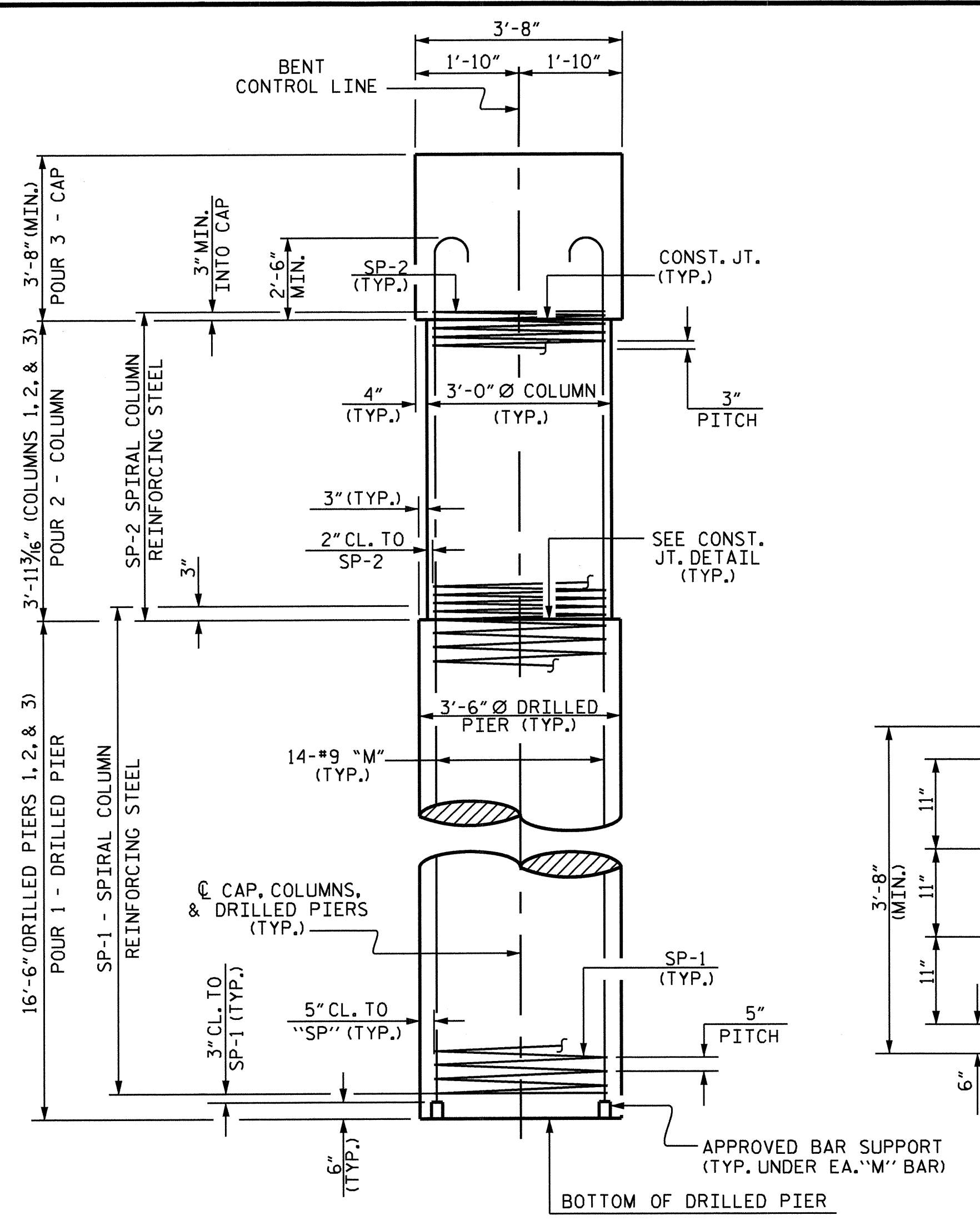


REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 30
2			4			

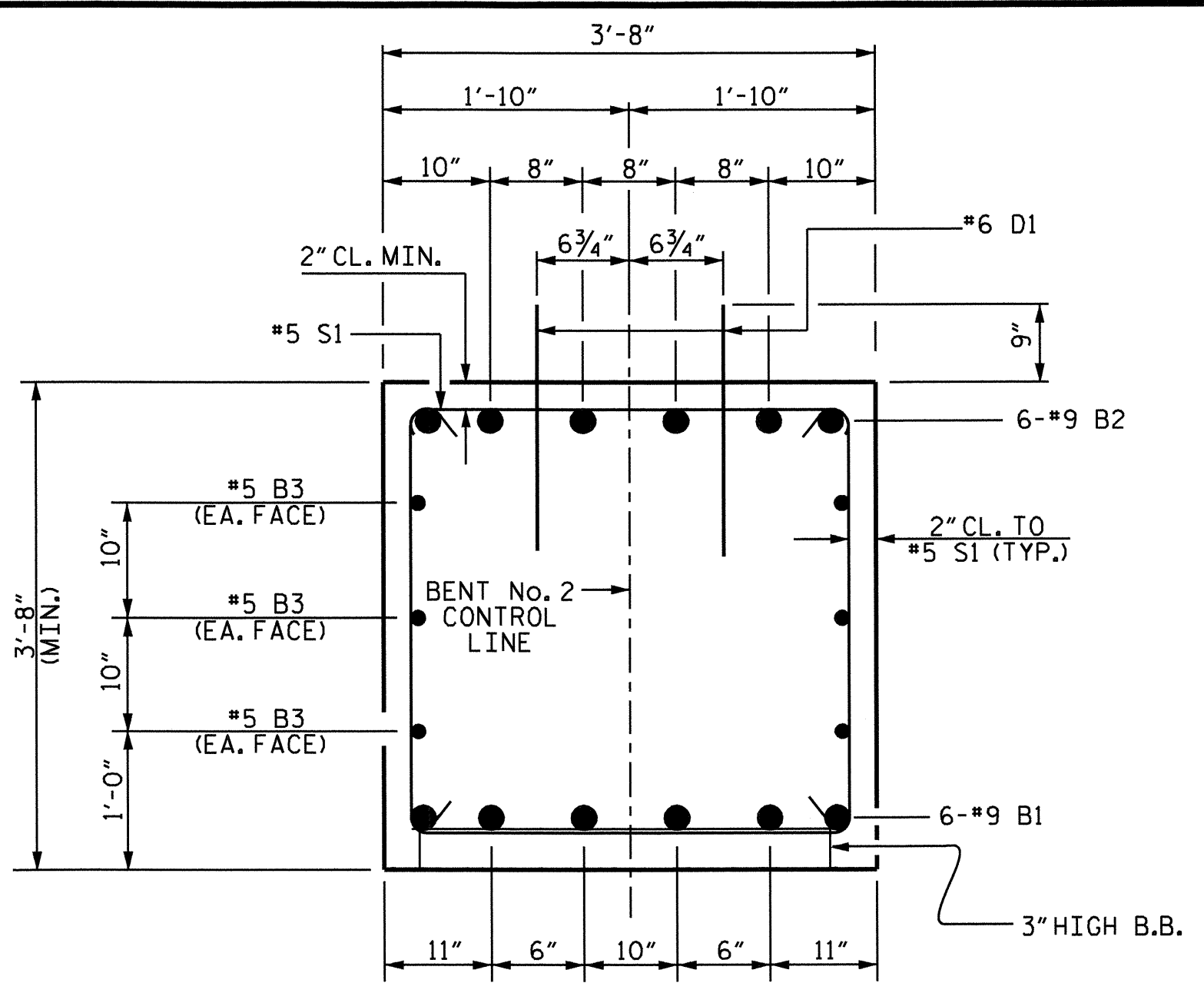
DRAWN BY: J. L. LAMBERT DATE: 2/2011
 CHECKED BY: M. POOLE DATE: 3/2011

*****SYSTEM*****
 *****DCN*****
 *****USERNAME*****

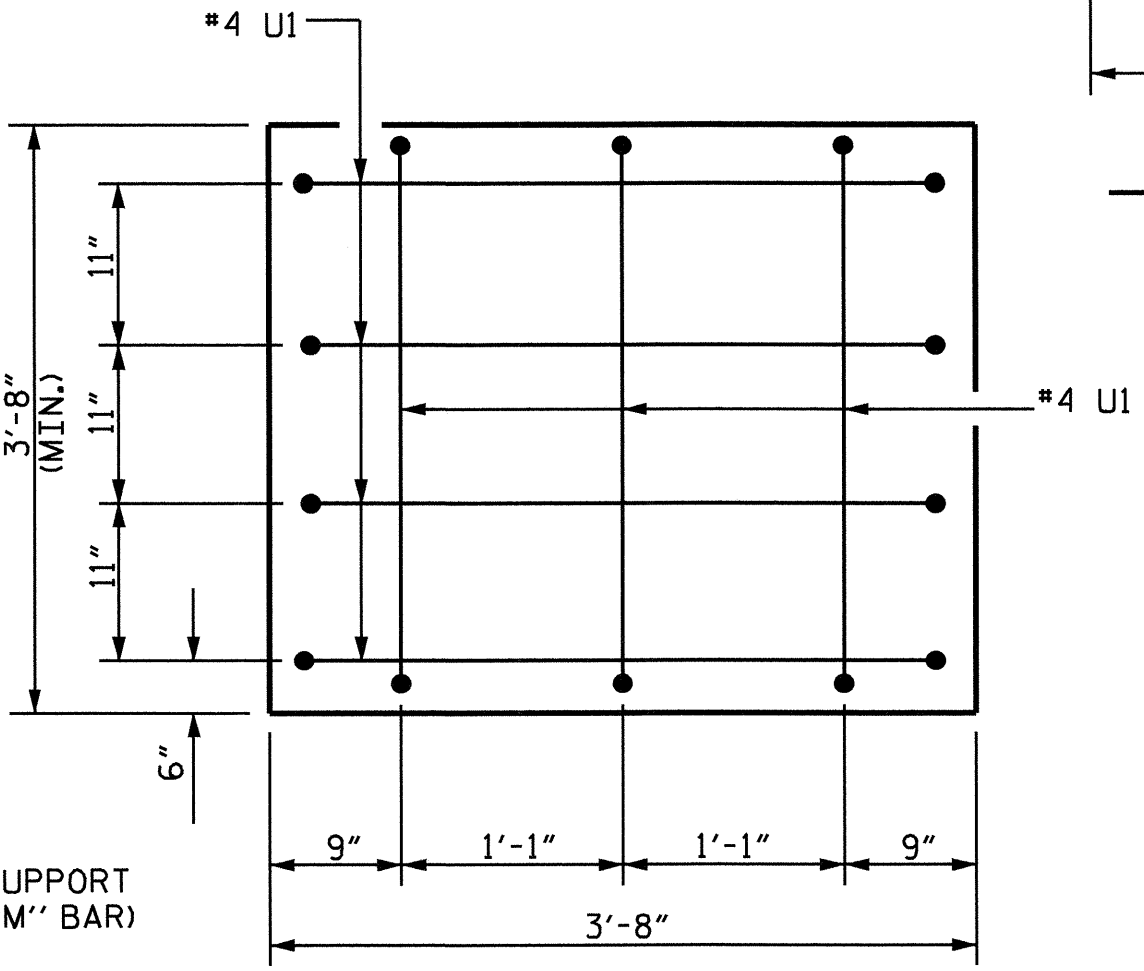
NC006



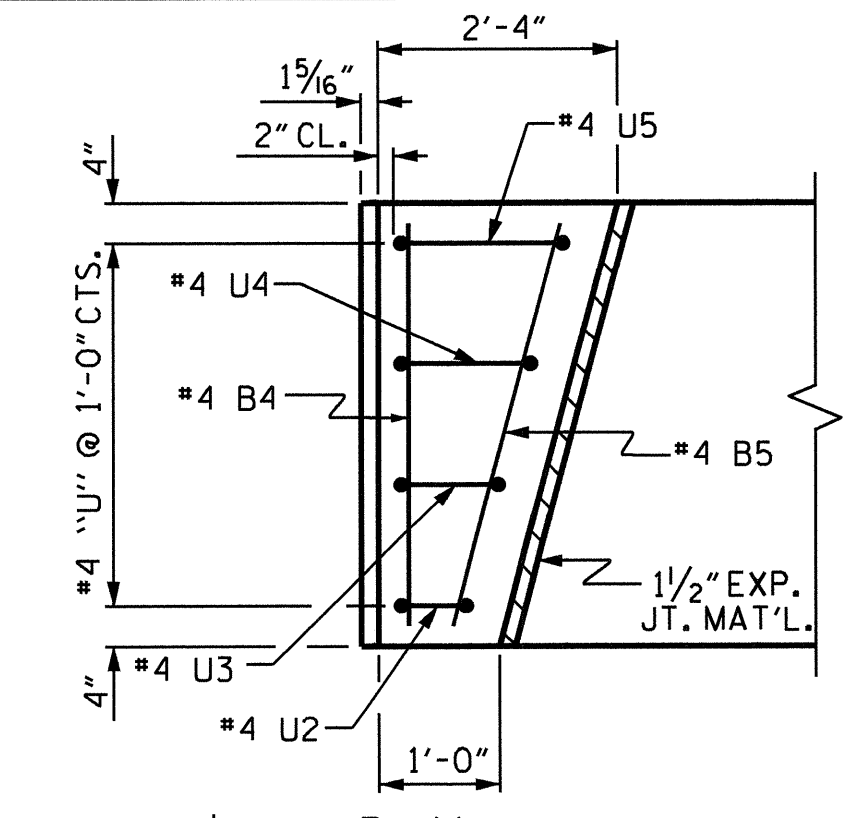
END ELEVATION



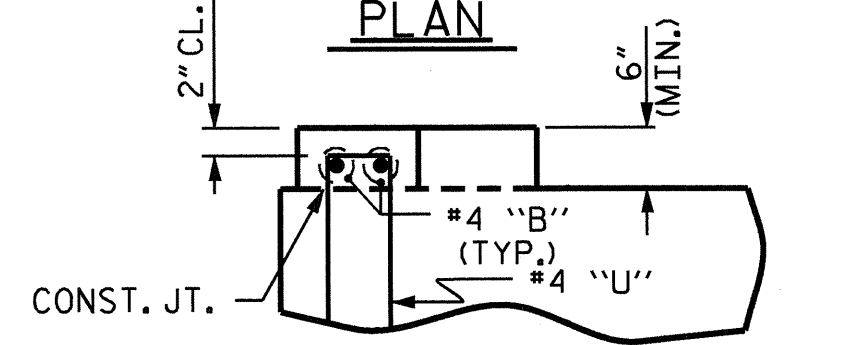
SECTION A-A



END VIEW
(TYPICAL EACH END)

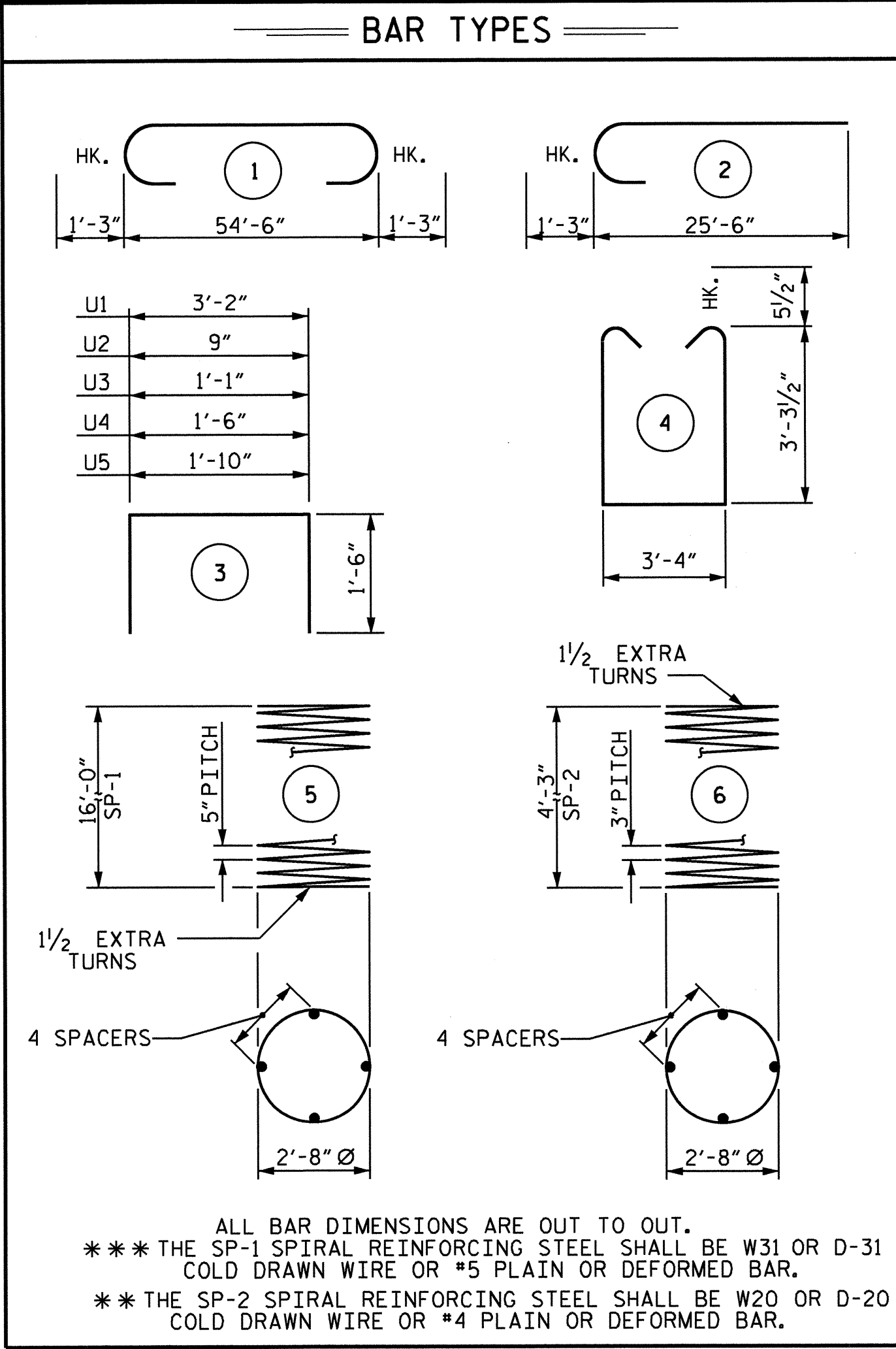


PLAN



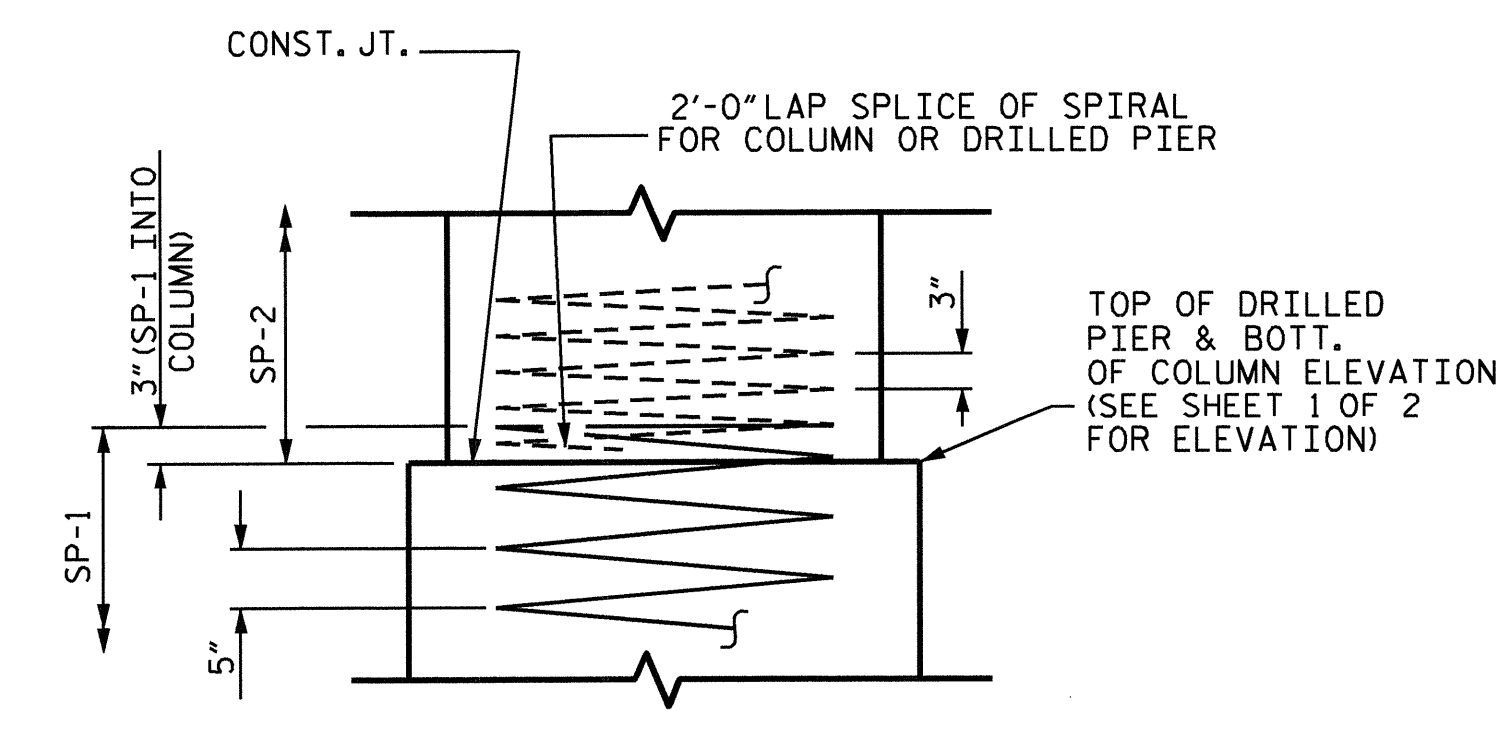
ELEVATION

LATERAL GUIDE DETAILS
(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

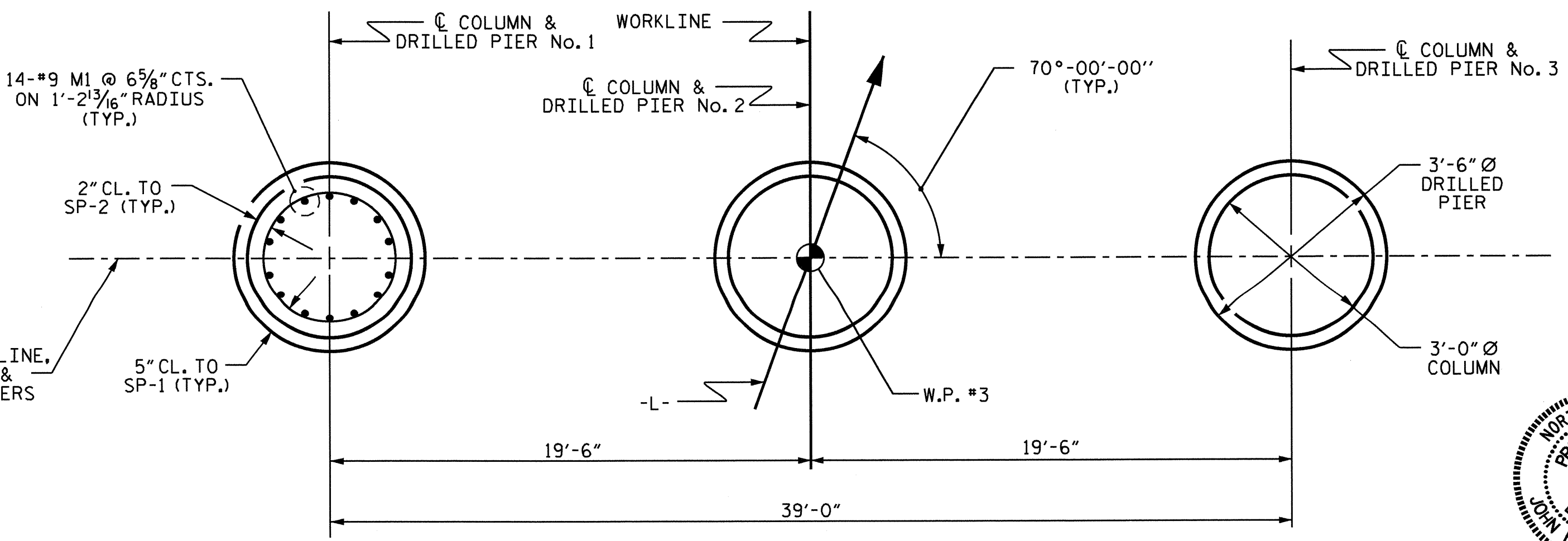


BAR TYPES

BILL OF MATERIAL					
BENT No. 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	9	STR	54'-8"	1115
B2	6	9	1	57'-0"	1163
B3	6	5	STR	54'-8"	342
B4	2	4	STR	3'-4"	4
B5	2	4	STR	3'-6"	5
D1	64	6	STR	1'-6"	144
M1	42	9	2	26'-9"	3820
S1	64	5	4	10'-10"	723
U1	14	4	3	6'-2"	58
U2	2	4	3	3'-9"	5
U3	2	4	3	4'-1"	5
U4	2	4	3	4'-6"	6
U5	2	4	3	4'-10"	6
REINFORCING STEEL				7396 LBS	
SP-1	3	***	5	329'-0"	1029
SP-2	3	**	6	156'-10"	314
SPIRAL COLUMN REINFORCING STEEL				1343 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)				3.0 C.Y.	
POUR 3 (CAP)				27.9 C.Y.	
POUR 4 (LATERAL GUIDES)				0.2 C.Y.	
TOTAL CLASS A CONCRETE				31.1 C.Y.	
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE BREAKDOWN					
POUR 1 (DRILLED PIERS)				17.6 C.Y.	
3'-6" Ø DRILLED PIERS NOT IN SOIL				27.00 LIN. FT.	
3'-6" Ø DRILLED PIERS IN SOIL				22.50 LIN. FT.	
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER				19.50 LIN. FT.	
CSL TUBES				216 LIN. FT.	



CONSTRUCTION JOINT DETAIL

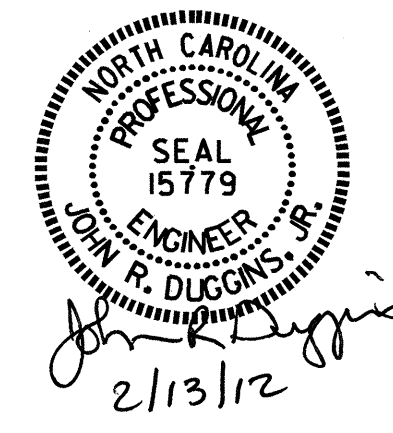


PLAN OF DRILLED PIERS & COLUMNS
(REINFORCING STEEL IS TYPICAL FOR EACH COLUMN & DRILLED PIER)

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-24
2			4			TOTAL SHEETS 30

DRAWN BY: J. LAMBERT DATE: 2/2011
 CHECKED BY: M. POOLE DATE: 3/2011

NOTES

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

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

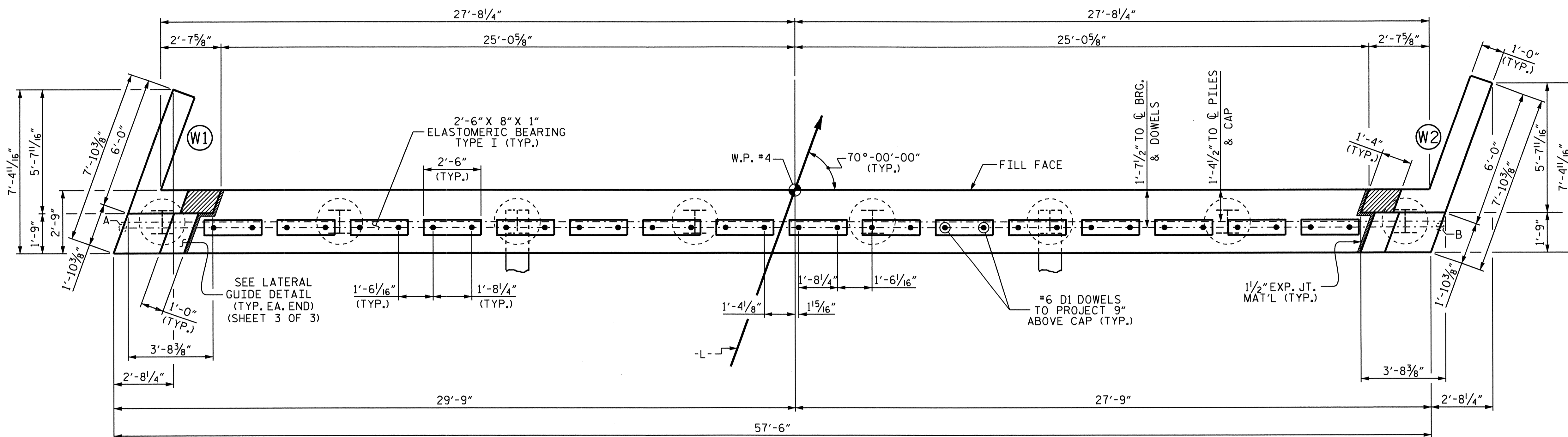
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

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

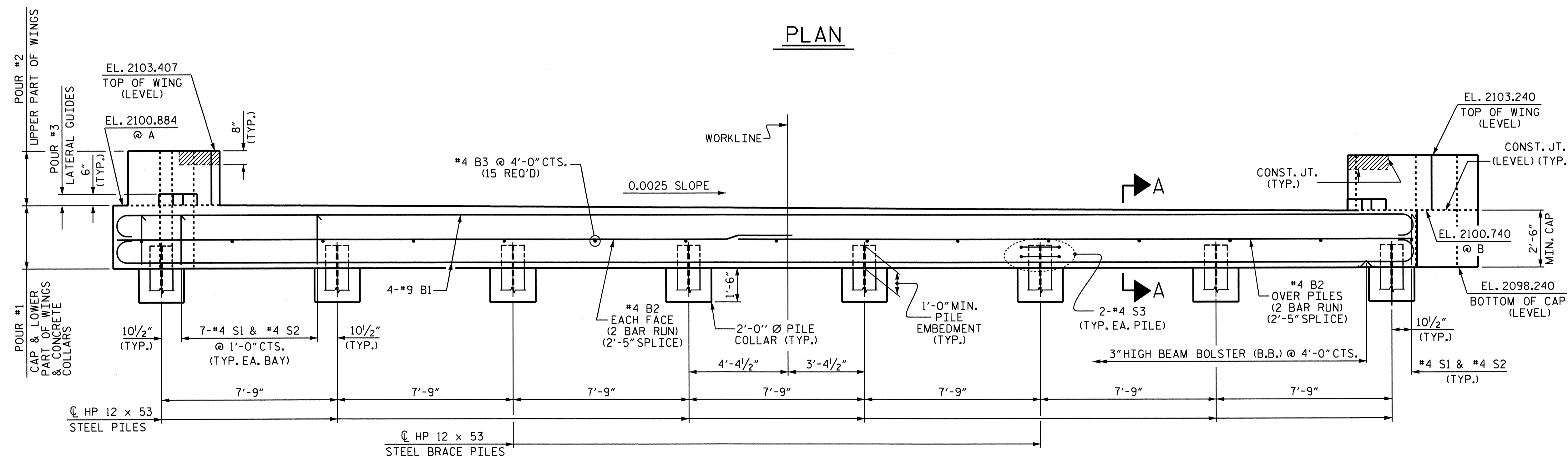
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

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



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

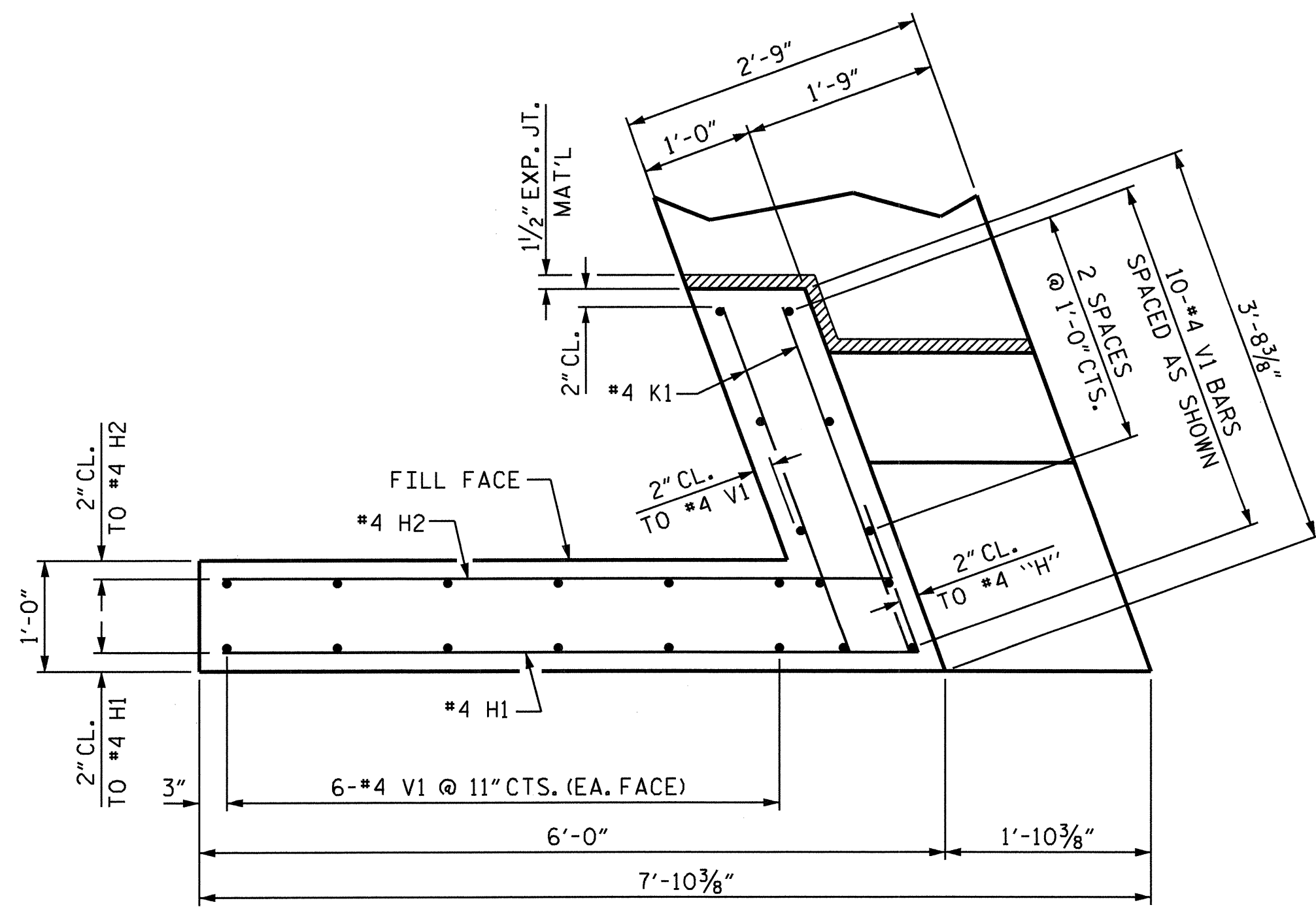
SUBSTRUCTURE
 END BENT #2



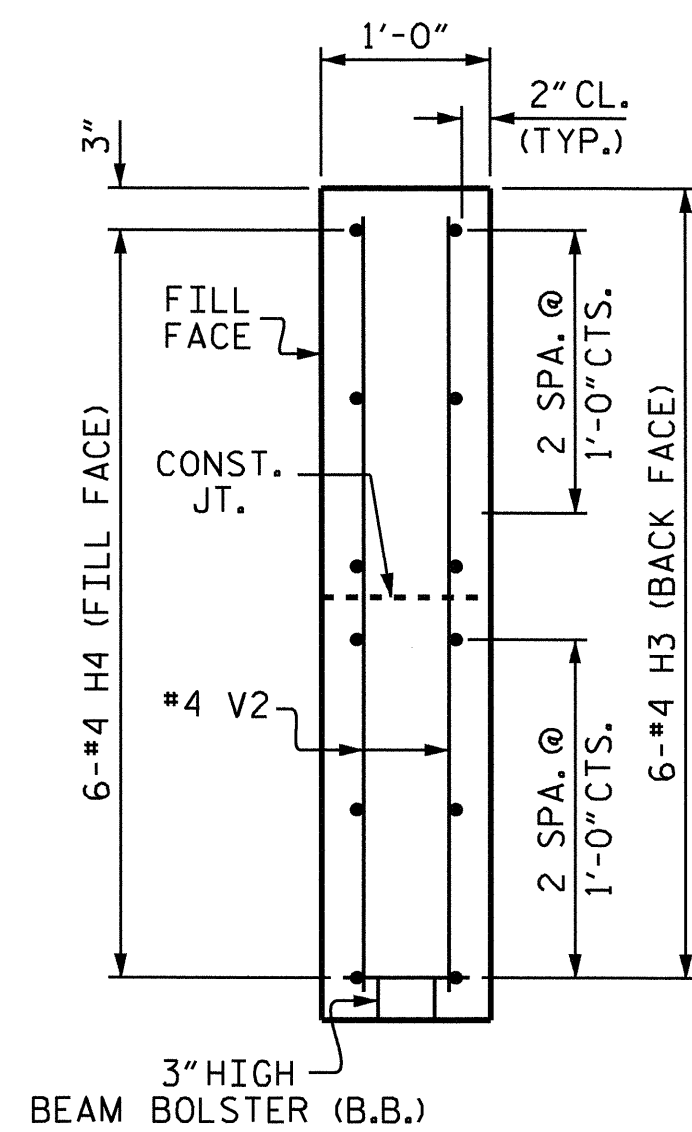
DRAWN BY: A. SORSENGINH DATE: 9/24/10
 CHECKED BY: H. KIM DATE: 2/12/11

13-FEB-2012 11:39
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 jduggins

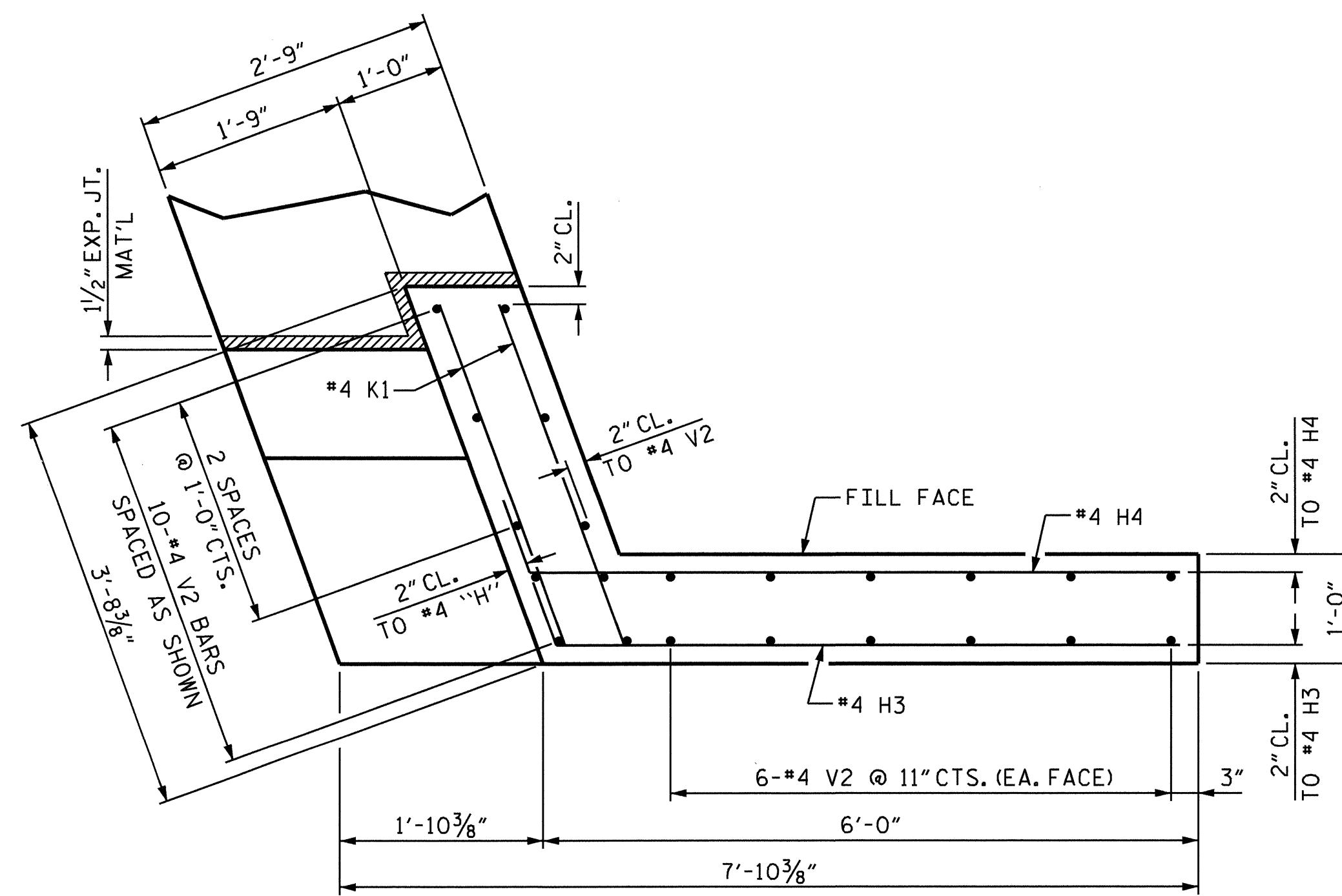
REVISIONS						SHEET NO. S-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			



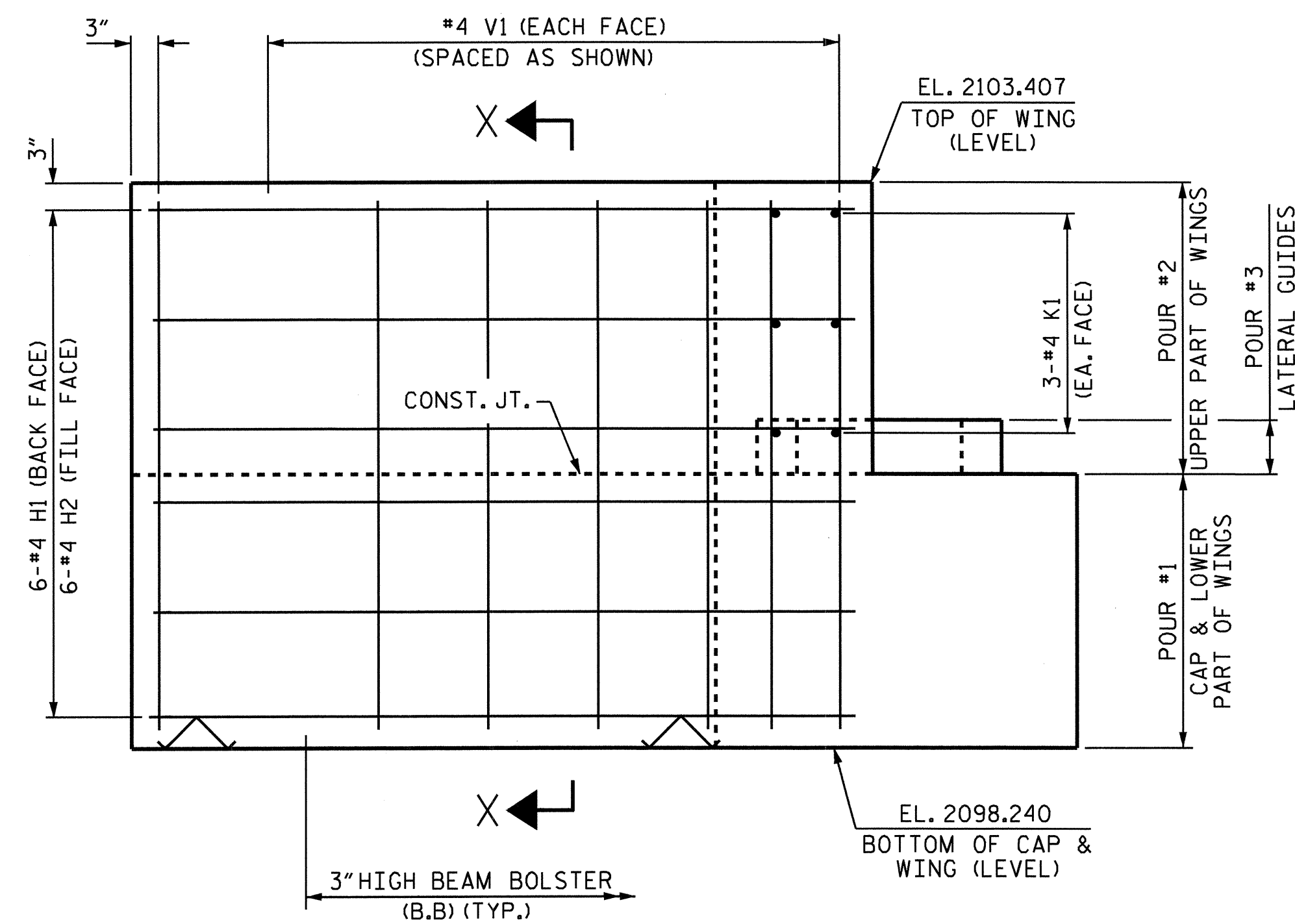
PLAN OF LEFT WING (W1)



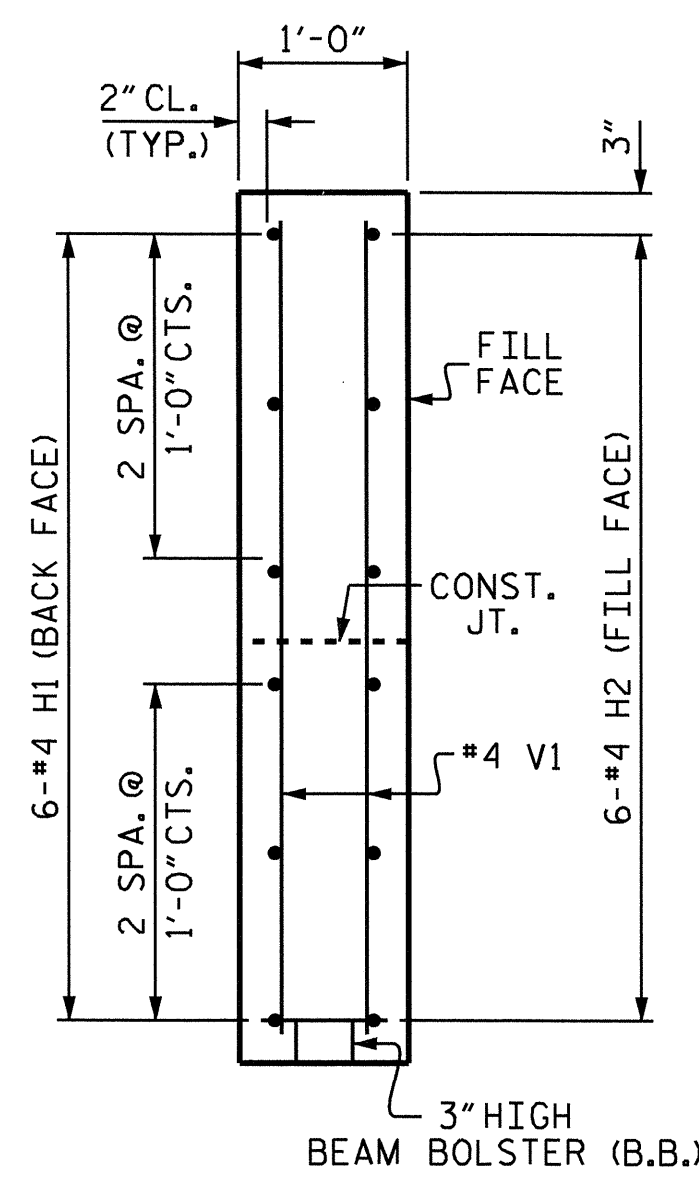
SECTION Y-Y



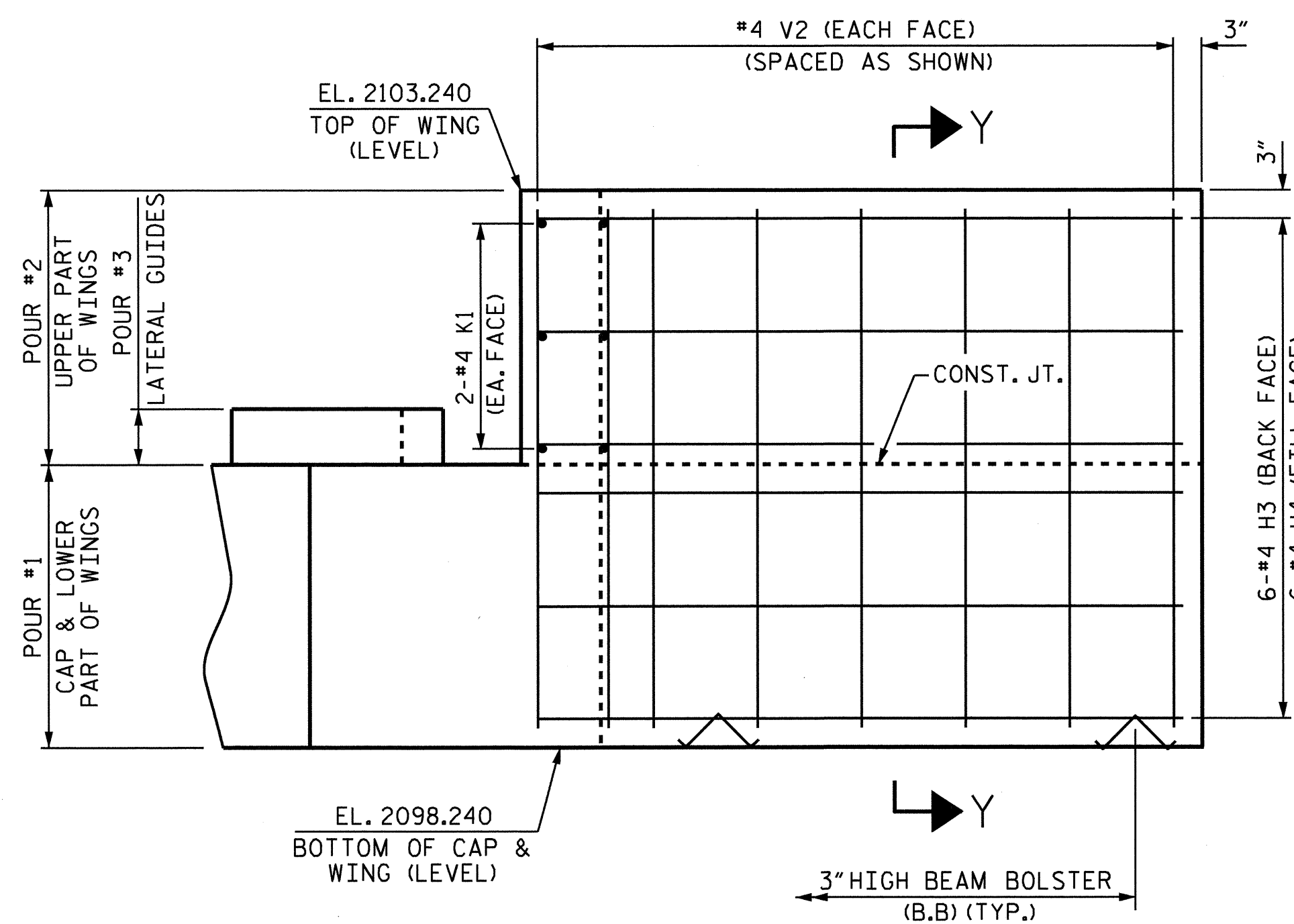
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION X-X



ELEVATION OF RIGHT WING (W2)

PROJECT NO. B-4291
 TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2

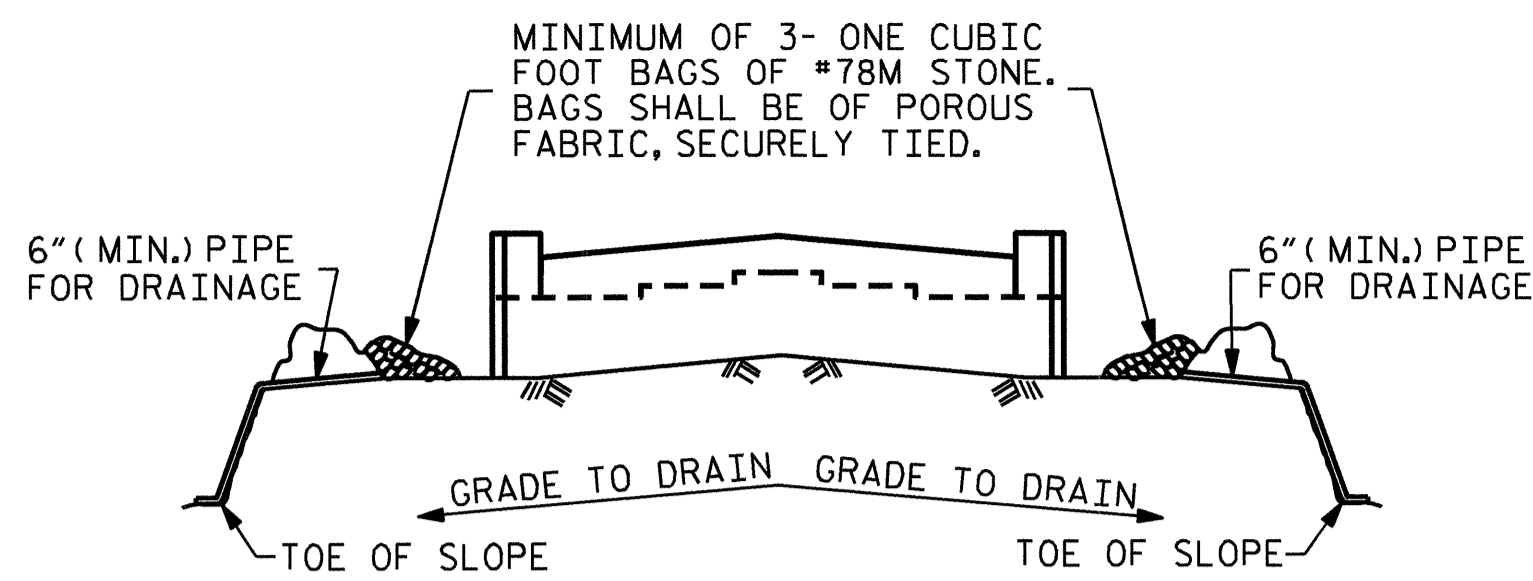


John R. Duggins
 2/13/12

DRAWN BY: A. SORSENGINH DATE: 9/24/10
 CHECKED BY: H. KIM DATE: 2/17/11

13-FEB-2012 11:38
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 jduggins

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTALS
2			4			30

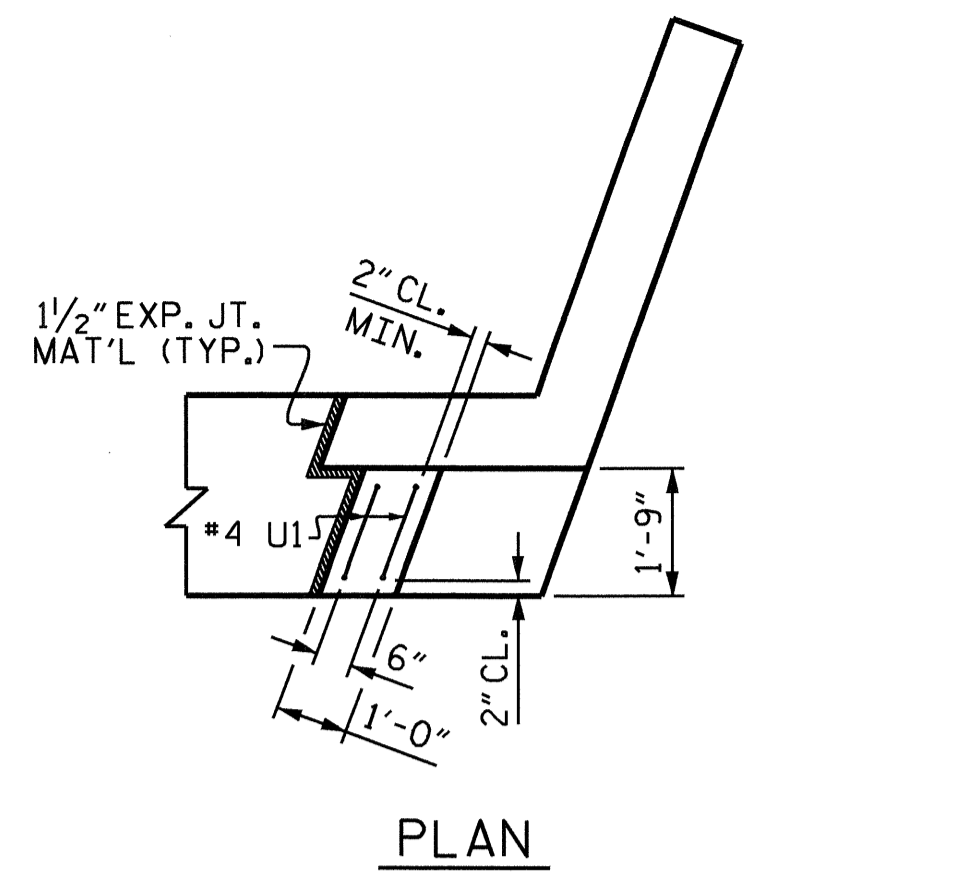


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

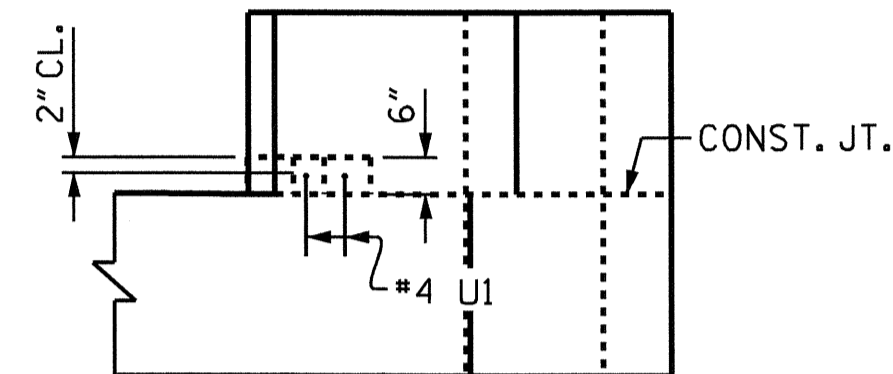
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



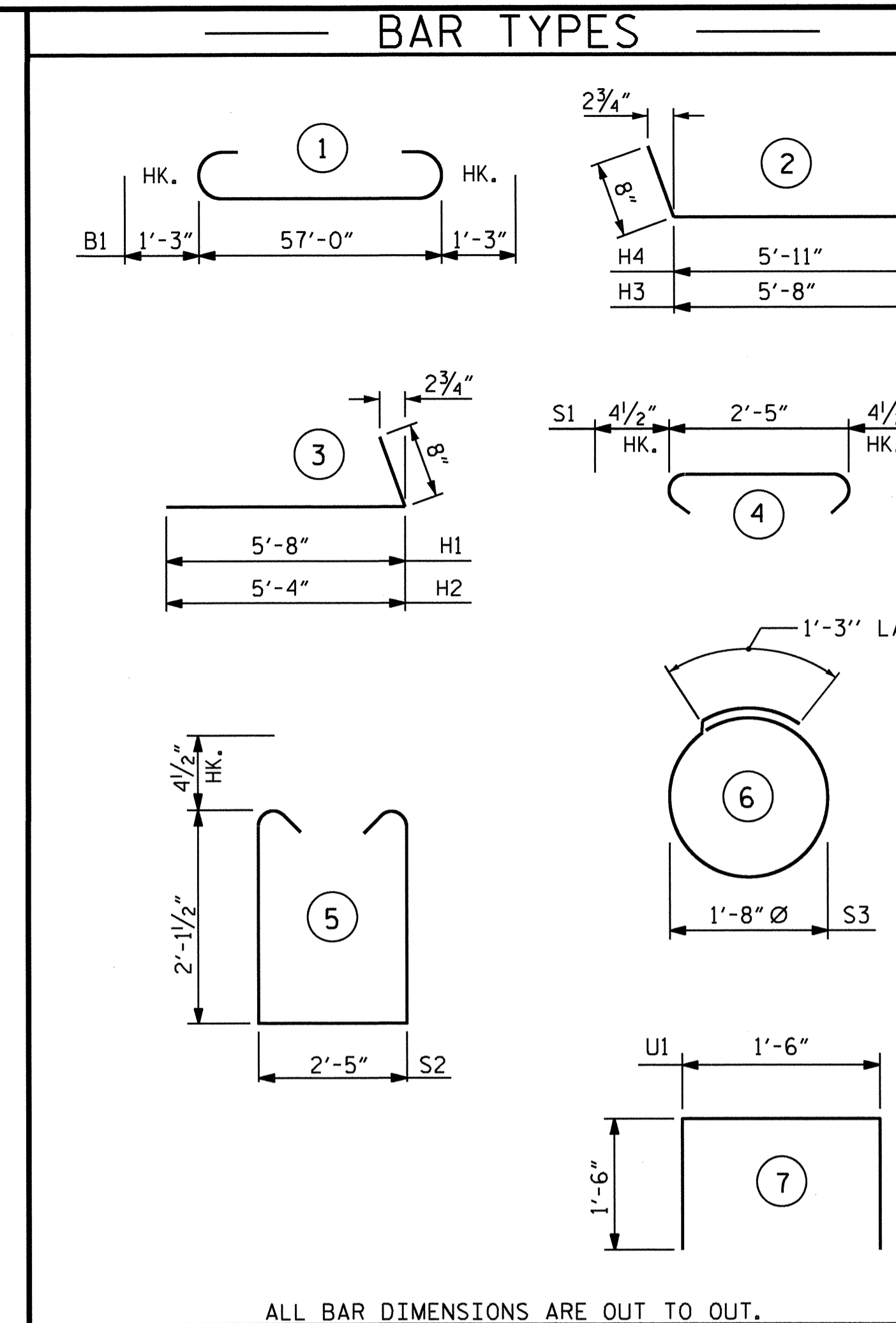
PLAN



ELEVATION

LATERAL GUIDE

(EACH END SIMILAR)



ALL BAR DIMENSIONS ARE OUT TO OUT.

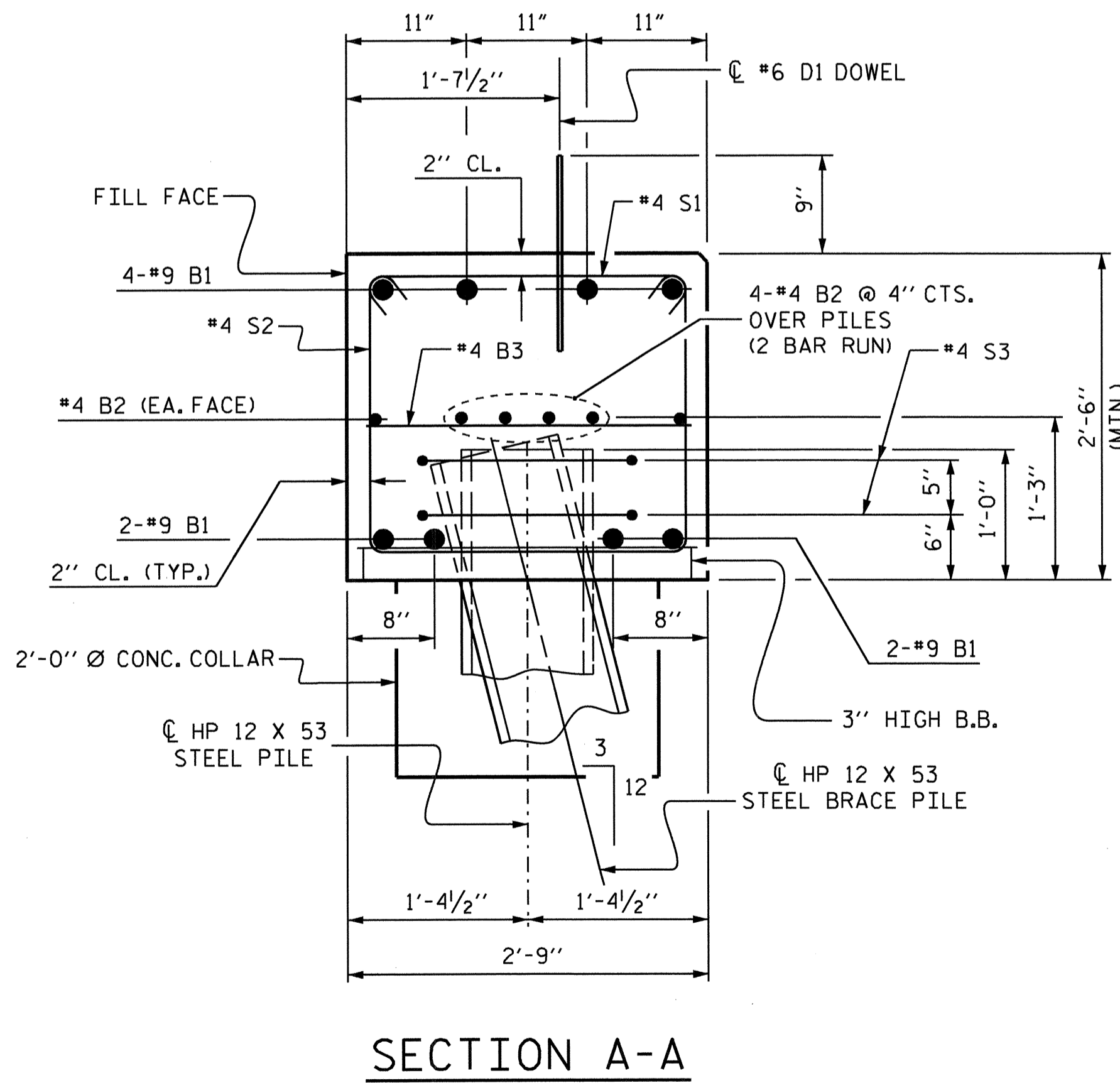
BILL OF MATERIAL

END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	59'-6"	1618
B2	12	#4	STR.	29'-10"	239
B3	15	#4	STR.	2'-5"	24
D1	32	#6	STR.	1'-6"	72
H1	6	#4	3	6'-4"	25
H2	6	#4	3	6'-0"	24
H3	6	#4	2	6'-4"	25
H4	6	#4	2	6'-7"	26
K1	12	#4	STR.	3'-4"	27
S1	51	#4	4	3'-2"	108
S2	51	#4	5	7'-5"	253
S3	16	#4	6	6'-6"	69
U1	4	#4	7	4'-6"	12
V1	22	#4	STR.	4'-9"	70
V2	22	#4	STR.	4'-7"	67

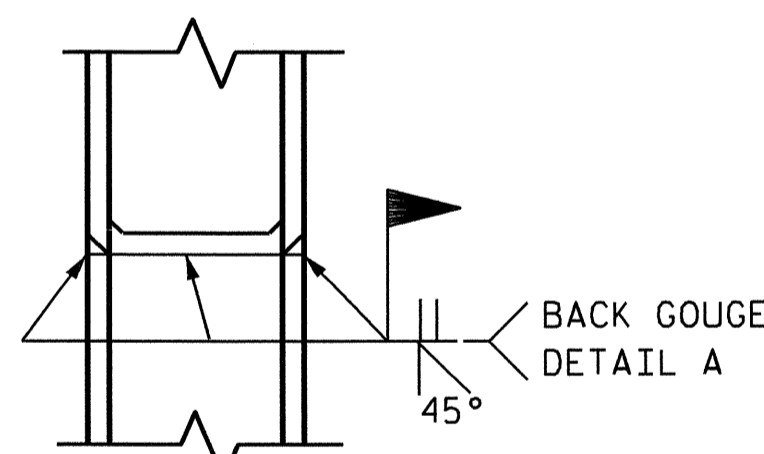
REINFORCING STEEL = 2659 LBS

CLASS A CONCRETE BREAKDOWN		
POUR #1 CAP & LOWER PART OF WINGS & COLLARS	C.Y.	17.7
POUR #2 UPPER PART OF WINGS	C.Y.	1.6
POUR #3 LATERAL GUIDES	C.Y.	0.1
TOTAL CLASS A CONCRETE	C.Y.	19.4

HP 12 X 53 STEEL PILES NO. 8 LIN. FT. 120

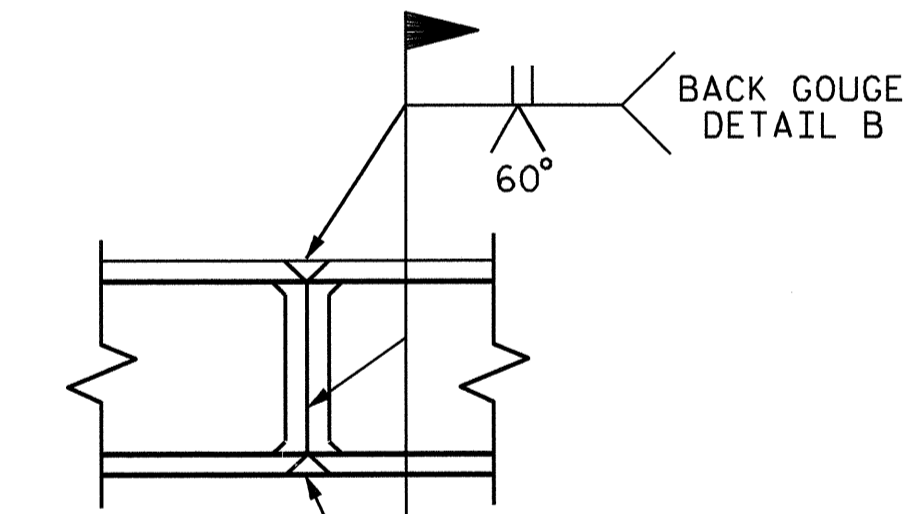


SECTION A-A



*PILE VERTICAL

DETAIL A



*PILE HORIZONTAL OR VERTICAL

DETAIL B

PILE SPLICE DETAILS

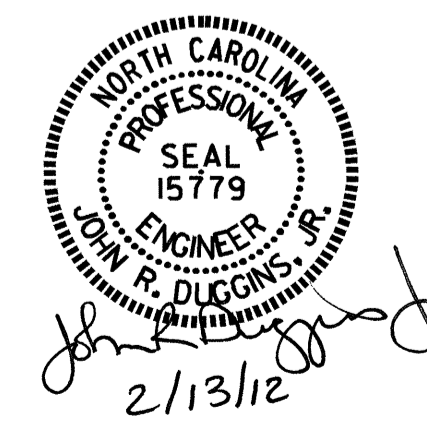
* POSITION OF PILE DURING WELDING.

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2

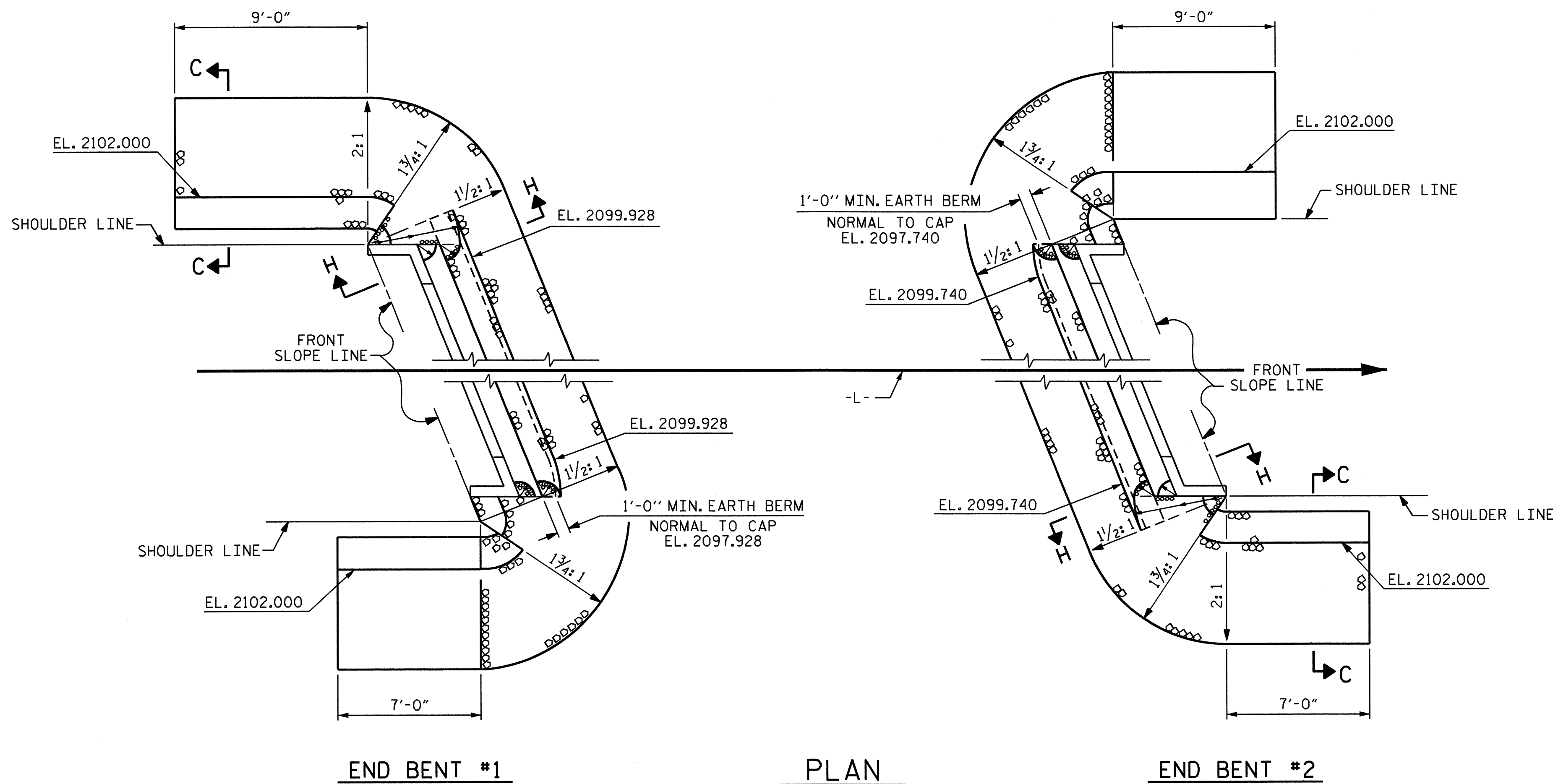


DRAWN BY: A. SORSENGINH DATE: 9/24/10
 CHECKED BY: H. KIM DATE: 2/17/11

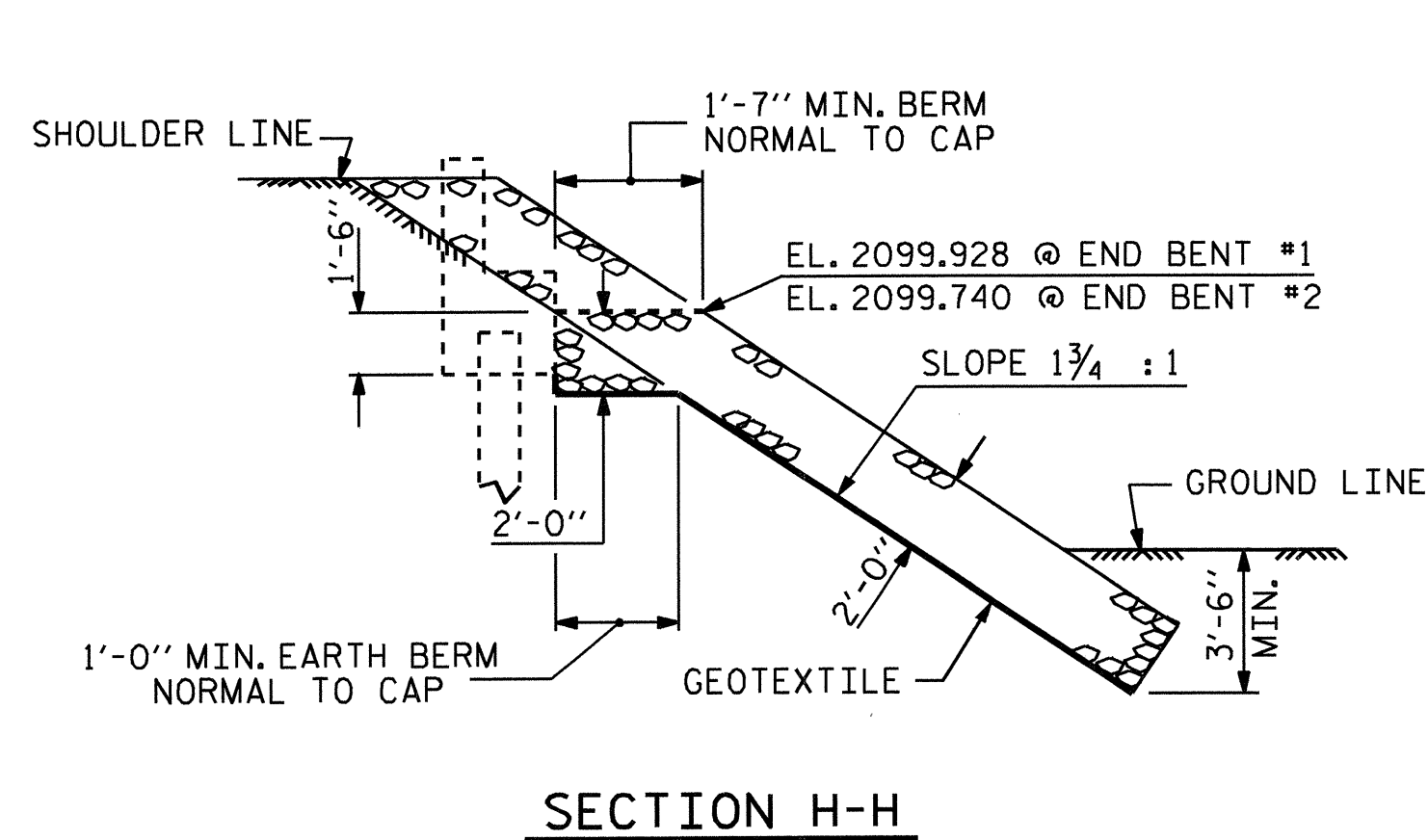
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 jduggins

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 30

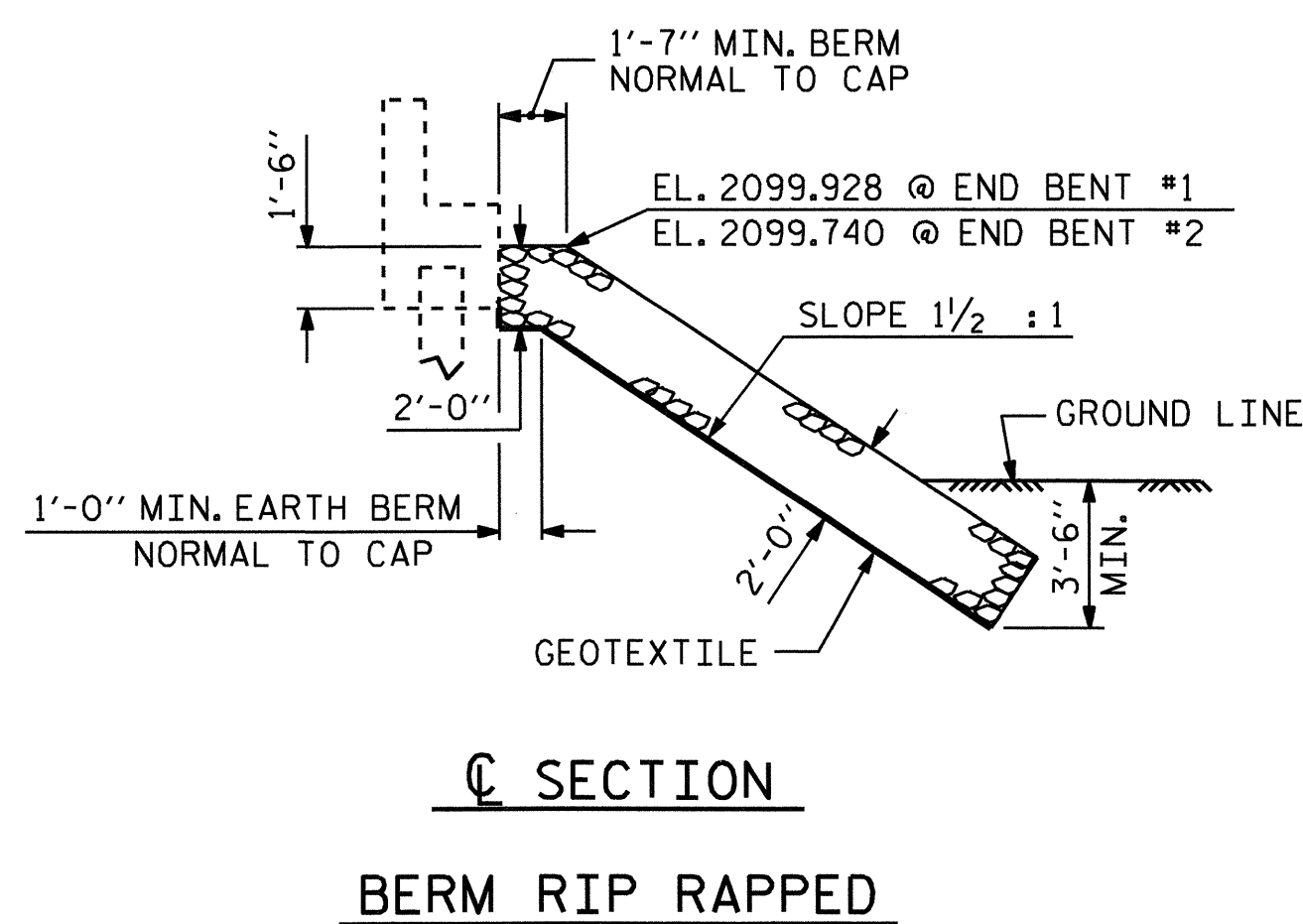
NC006



ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+07.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	102	113
END BENT 2	97	108
TOTAL	199	221

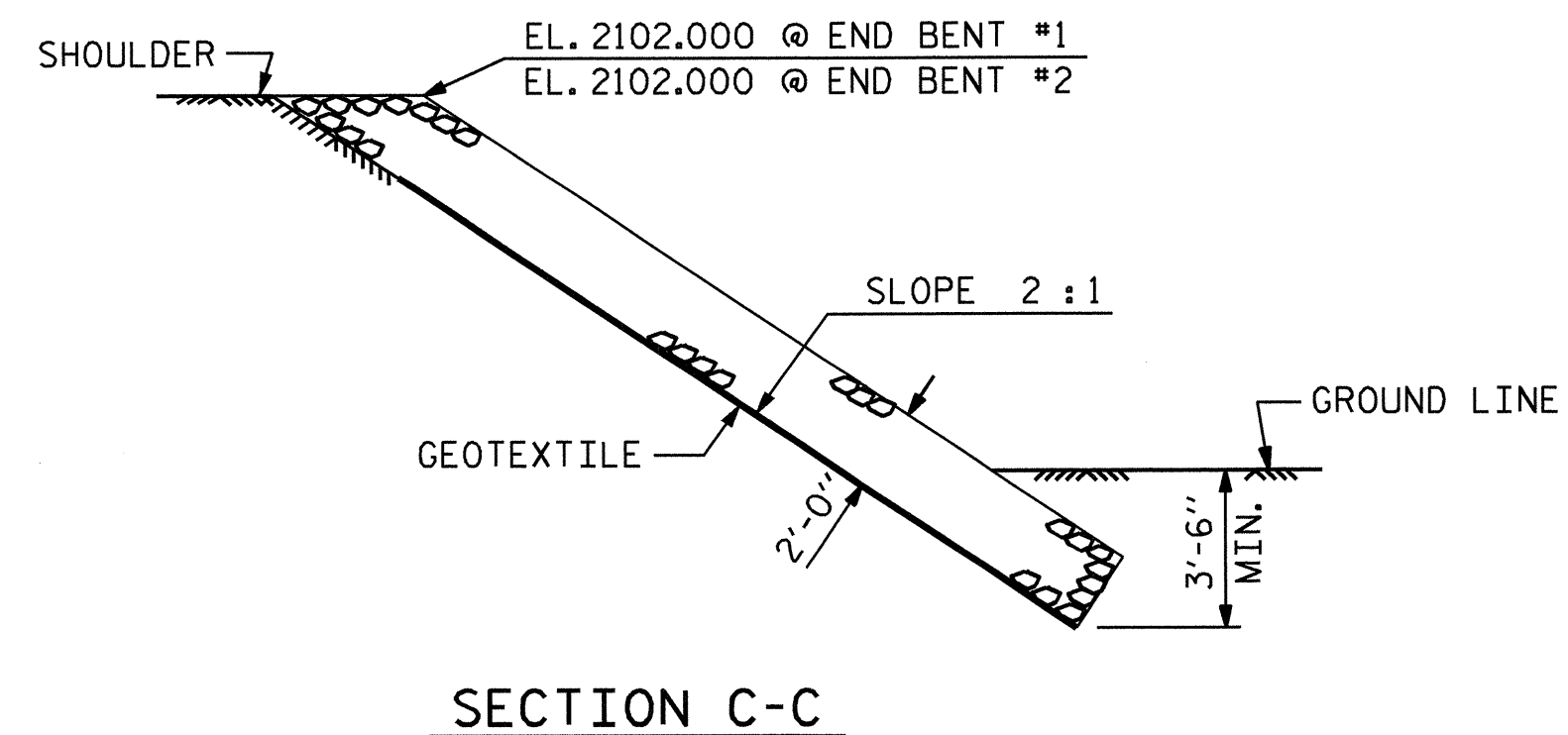


SECTION H-H



SECTION C-C

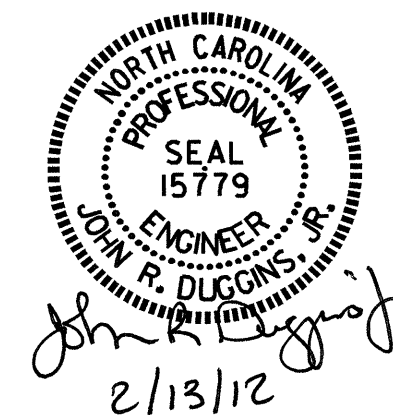
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

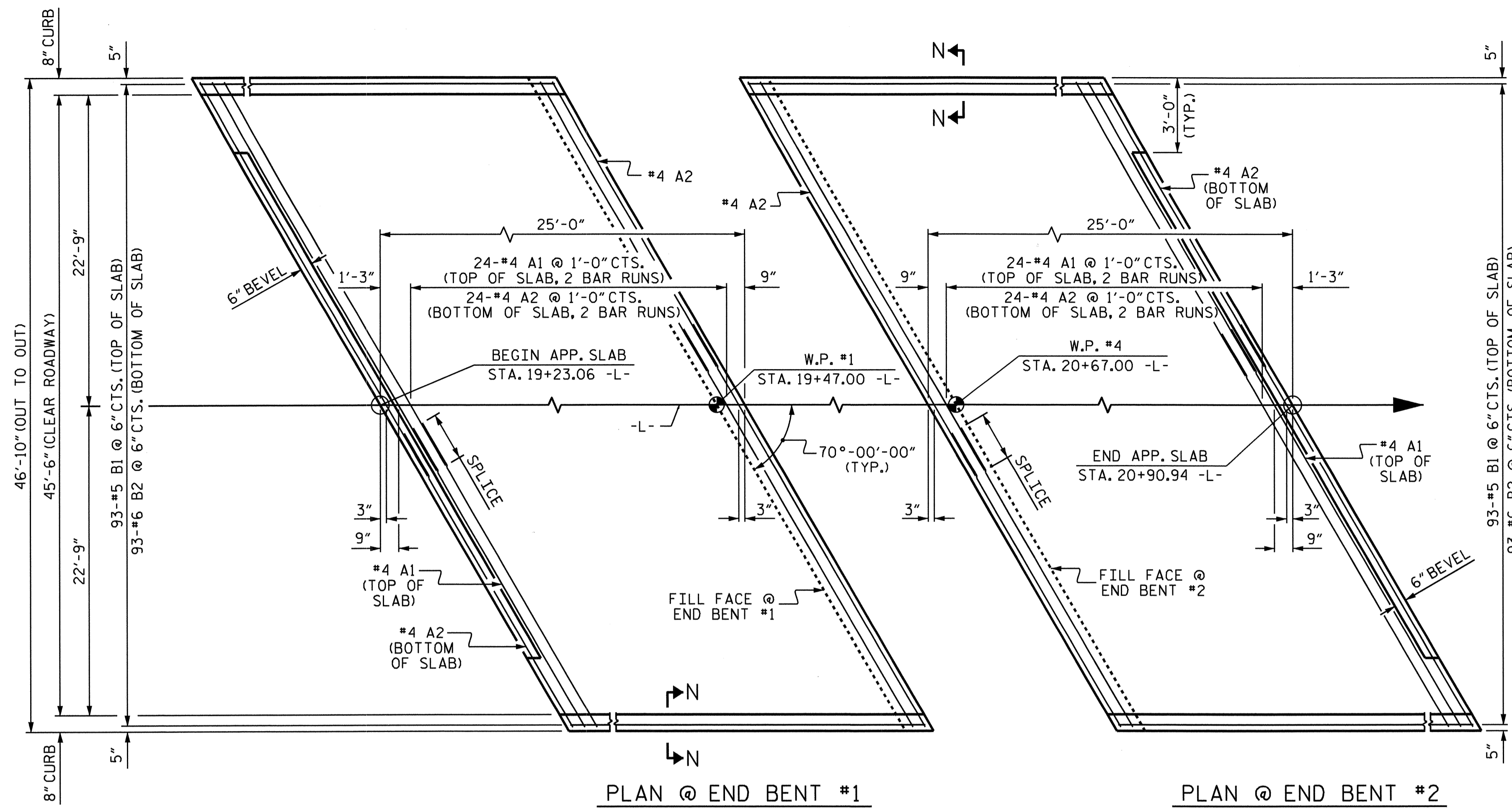
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
—RIP RAP DETAILS—					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



ASSEMBLED BY : A. SORSENGIH	DATE : 4/10
CHECKED BY : M. POOLE	DATE : 4/10
DRAWN BY : REK 1/84	REV. 8/16/99 RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

13-FEB-2012 11:36
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 jduggins

STD. NO. RR1



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

NOTES

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

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

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

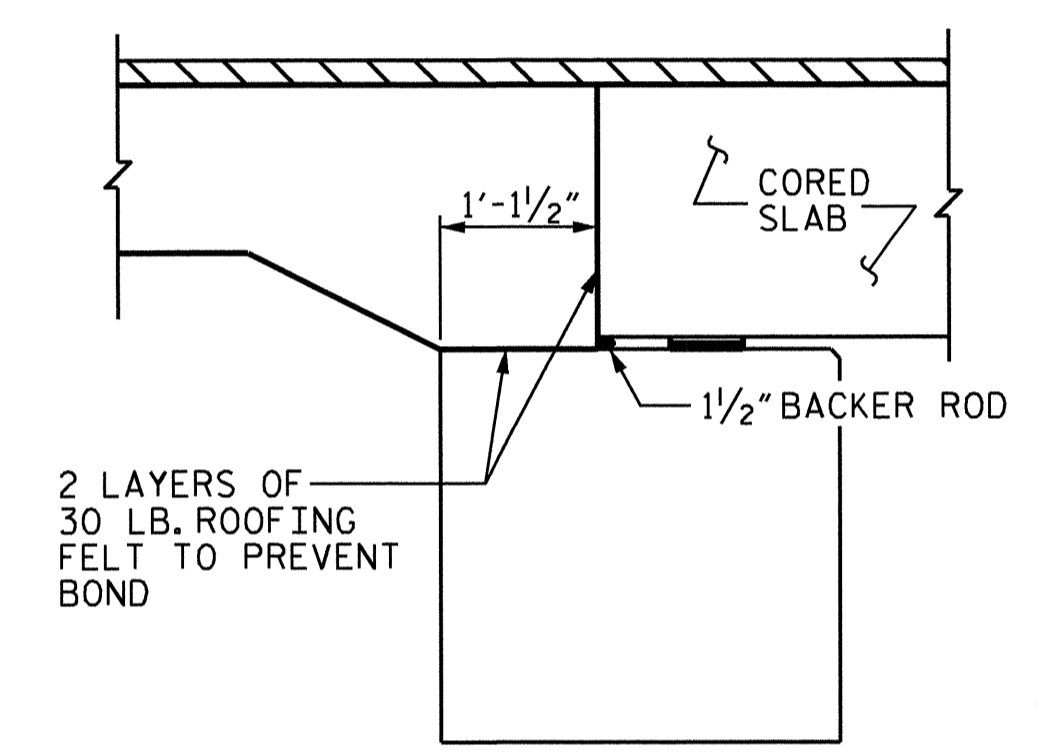
THE JOINT AT THE END BENT SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

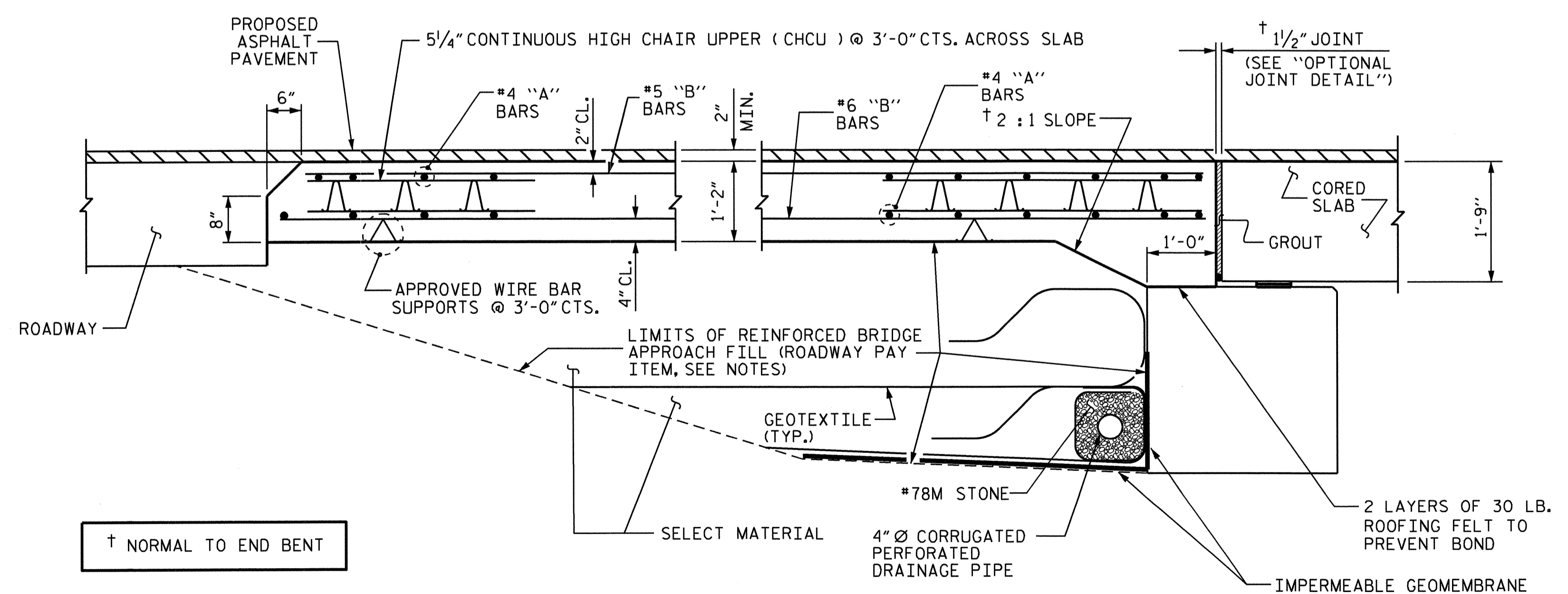
THE CONTRACTOR HAS THE OPTION TO OMIT GROUT BETWEEN THE APPROACH SLAB AND THE CORED SLAB UNITS AND POUR THE APPROACH SLAB DIRECTLY AGAINST THE CORED SLAB UNITS. SEE "OPTIONAL JOINT DETAIL".

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	25'-9"	860
A2	52	#4	STR	25'-8"	892
*B1	93	#5	STR	24'-1"	2336
B2	93	#6	STR	24'-7"	3434
REINFORCING STEEL				LBS.	4326
*EPOXY COATED REINFORCING STEEL				LBS.	3196
CLASS AA CONCRETE				C. Y.	46.4
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	25'-9"	860
A2	52	#4	STR	25'-8"	892
*B1	93	#5	STR	24'-1"	2336
B2	93	#6	STR	24'-7"	3434
REINFORCING STEEL				LBS.	4326
*EPOXY COATED REINFORCING STEEL				LBS.	3196
CLASS AA CONCRETE				C. Y.	46.4

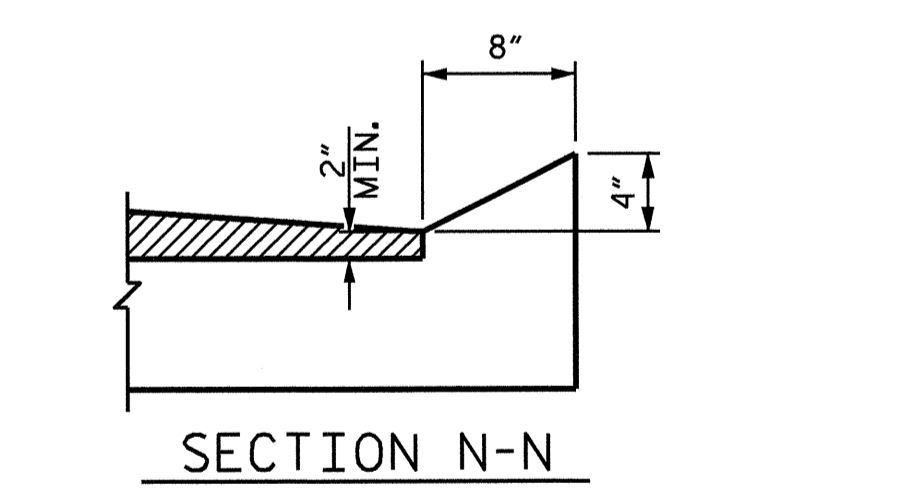
SPLICE LENGTH CHART	
BAR	SPLICE LENGTH
A1	2'-0"
A2	1'-9"



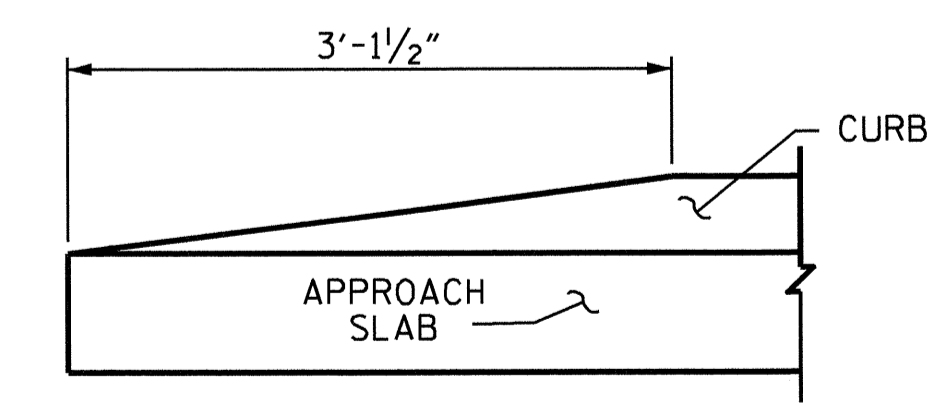
OPTIONAL JOINT DETAIL



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

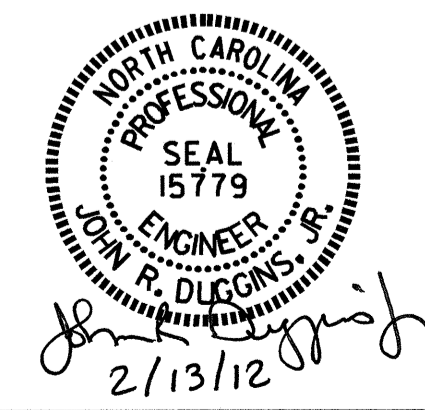
CURB DETAILS

PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

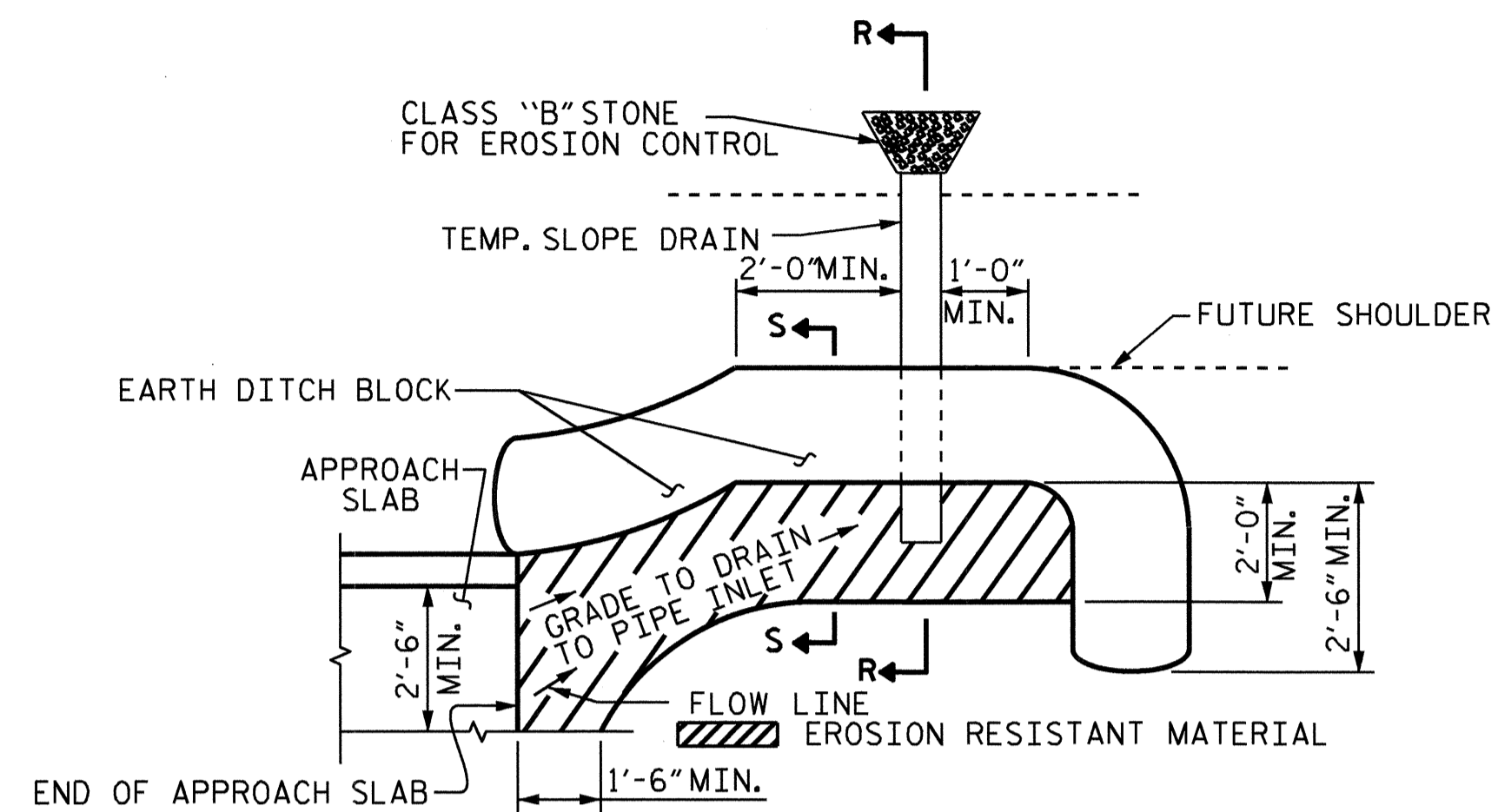
SHEET 1 OF 2

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

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			5-29
2			4			30

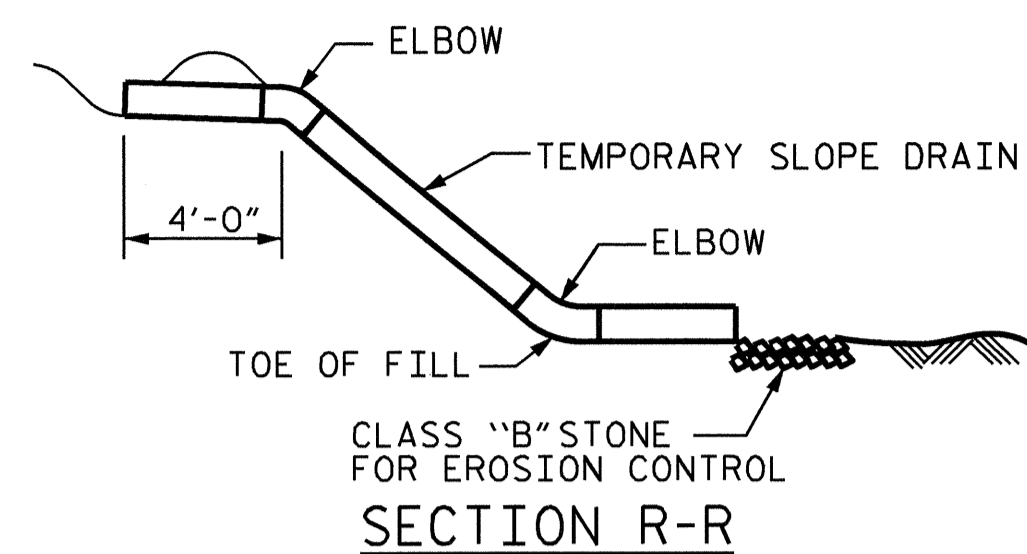


ASSEMBLED BY : A. SORSENGINH	DATE : 9/11/08
CHECKED BY : M. POOLE	DATE : 3/10
DRAWN BY : FCJ	REV. 7/10/01 LES/RDR
CHECKED BY : EGA	REV. 5/7/03R RWW/JTE
	REV. 5/1/06R KMM/GM

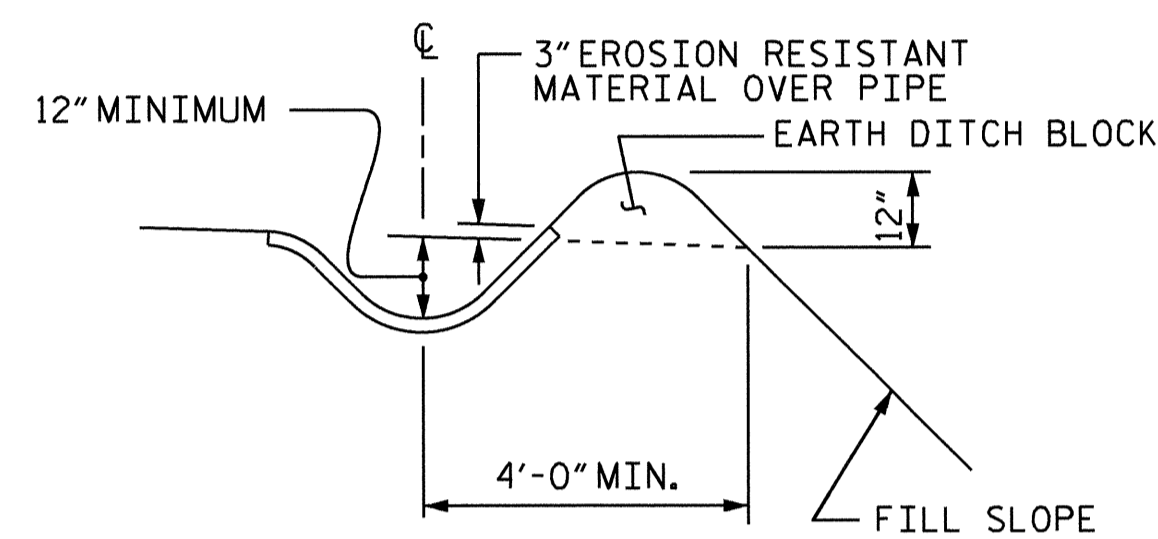


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



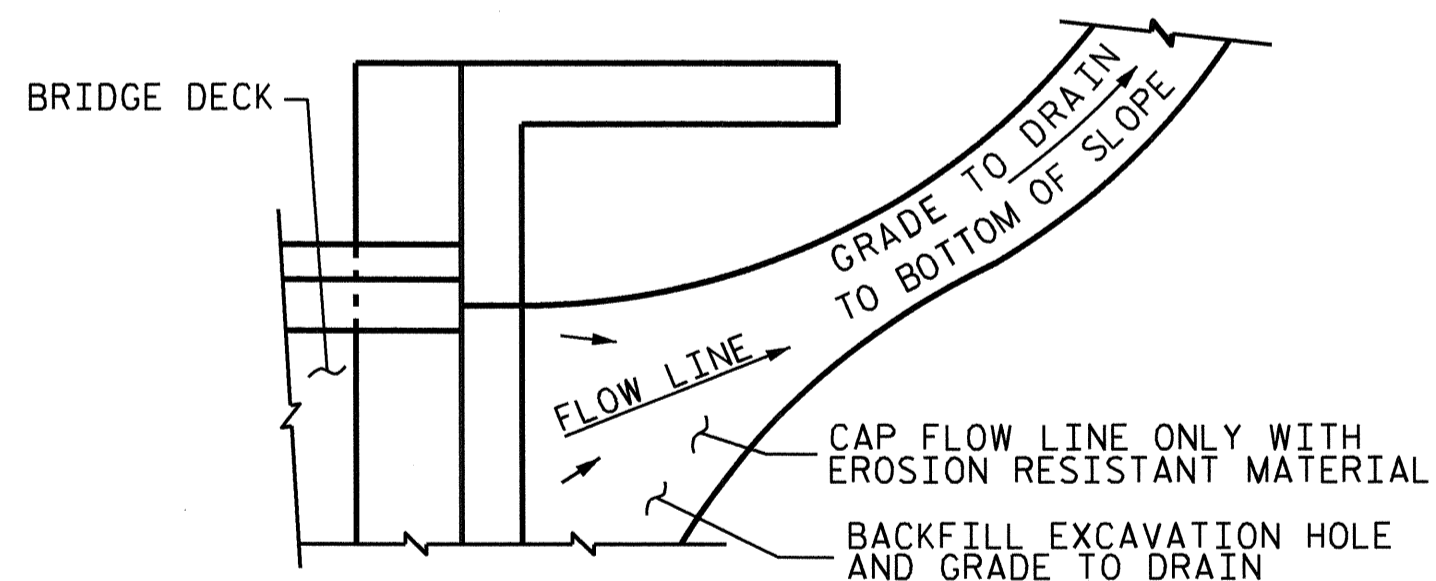
SECTION R-R



SECTION S-S

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

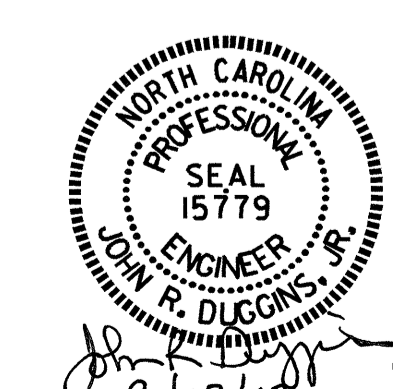
PROJECT NO. B-4291
TRANSYLVANIA COUNTY
 STATION: 20+07.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY :	A. SORSENGINH	DATE :	9/11/2008
CHECKED BY :	M. POOLE	DATE :	3/10
DRAWN BY :	FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY :	ARB 11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM



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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN