

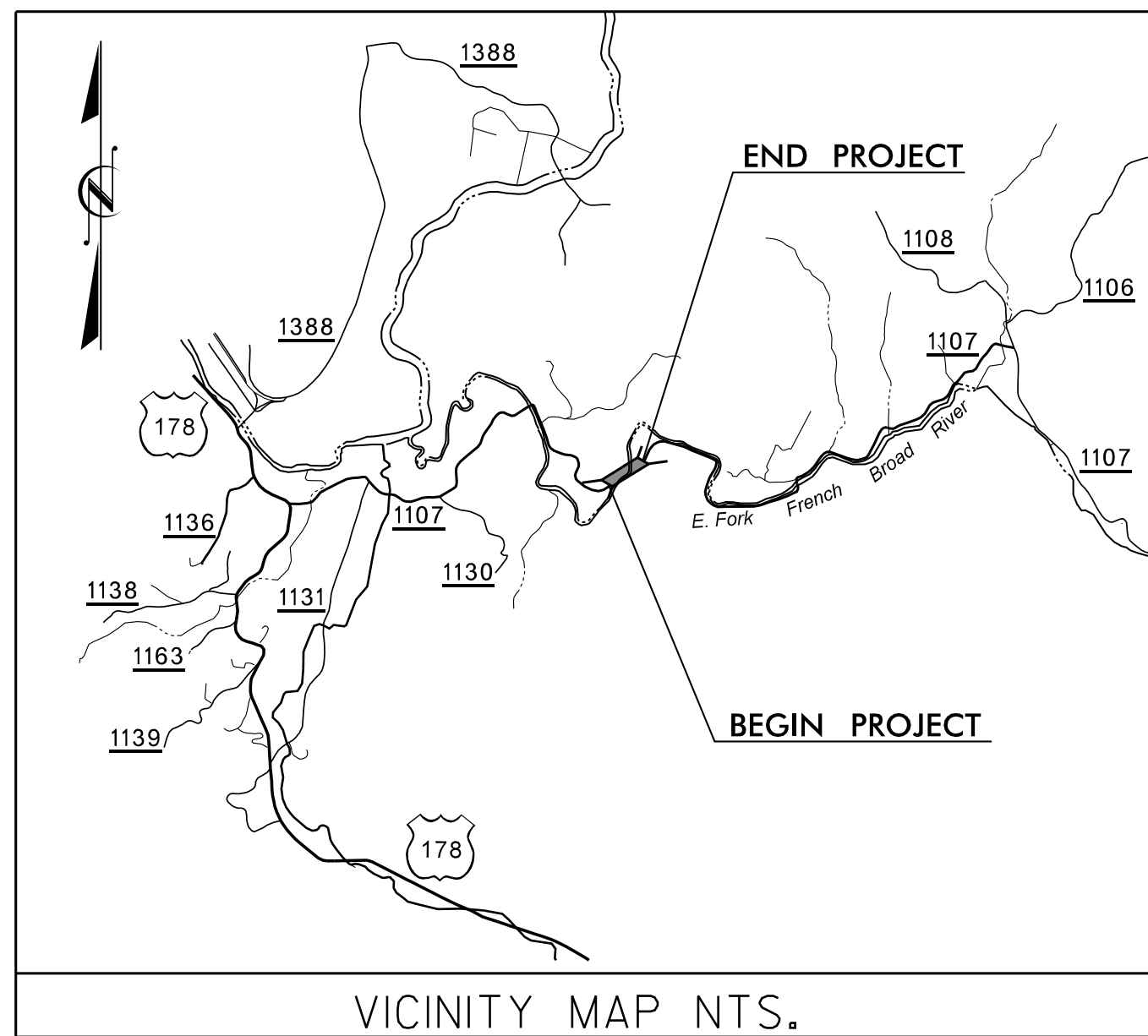
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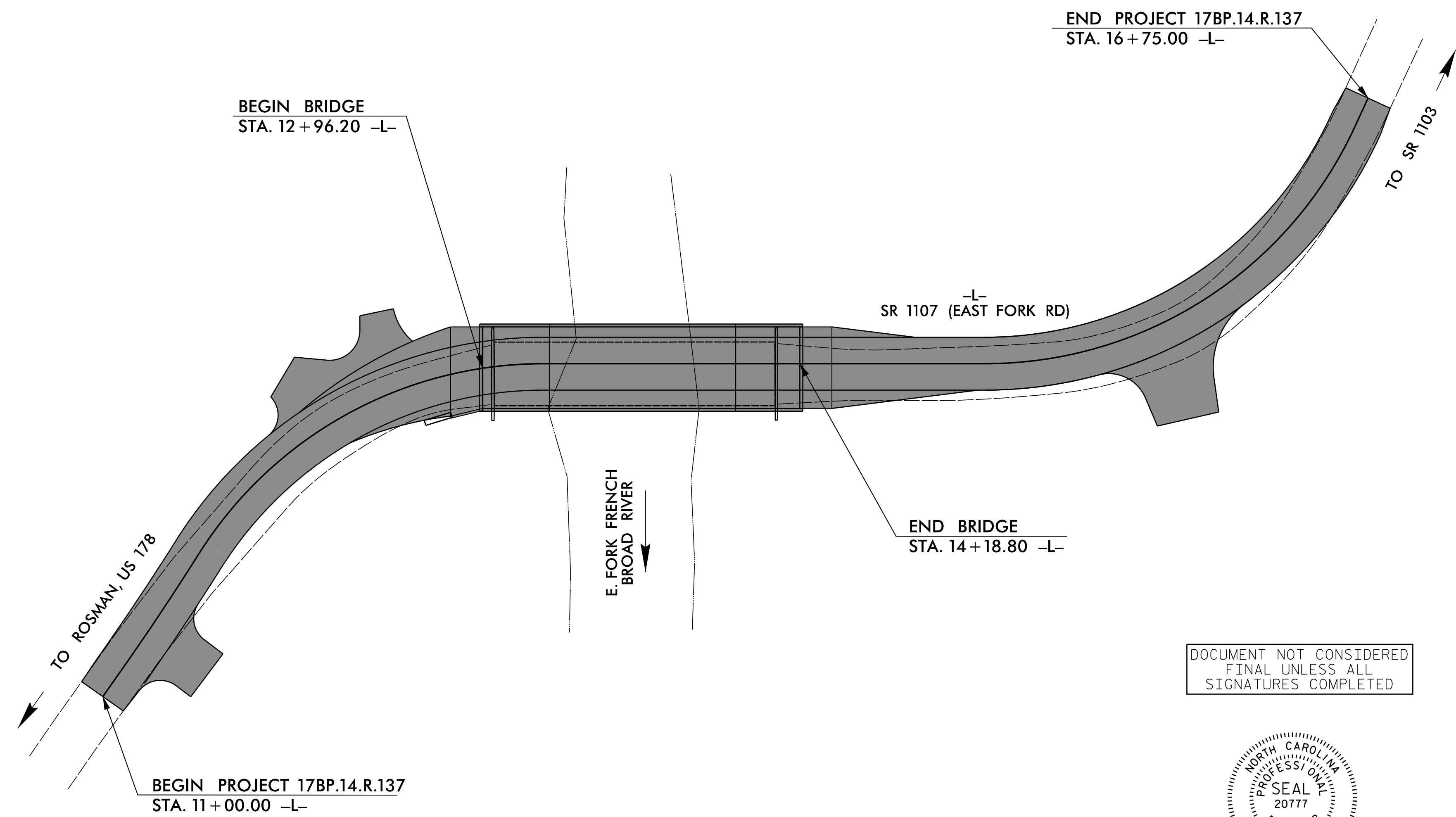
CONTRACT: DN00117 TIP NO:17BP.14.R.137

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.137	0	00
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45360.1.30	BRZ-1107(19)	PE	
45360.1.30	BRZ-1107(19)	R/W	
17BP.14.R.137		CONST.	



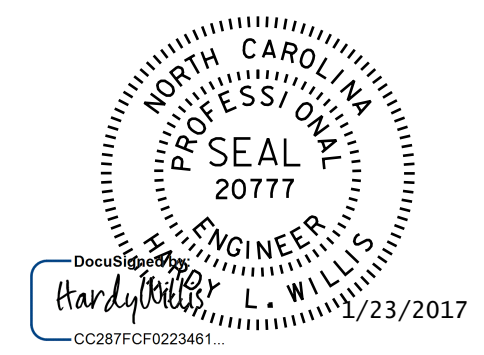
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
TRANSYLVANIA COUNTY

**BRIDGE NO. 86 OVER E. FORK FRENCH BROAD RIVER
ON SR 1107 (EAST FORK ROAD)**



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

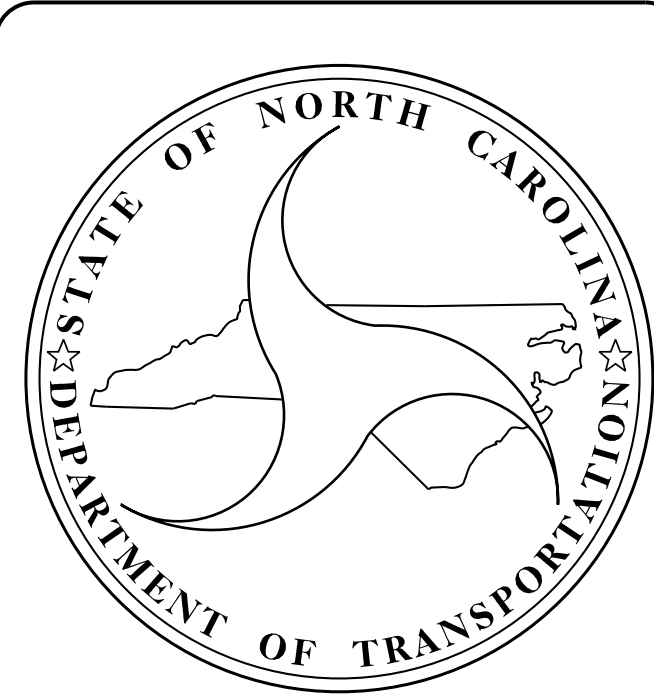


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Consulting Engineers

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828-253-2796

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 Boone, NC
 Atlanta, GA
 Tri-Cities, TN
 Knoxville, TN
 Spartanburg, SC
 Charleston, SC
 Middlesboro, KY
 704-357-0488
 828-355-9933
 770-627-3509

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DESIGN DATA

ADT 2011	=	440
ADT 2025	=	880
T	=	6%
V	=	35 MPH

FUNC CLASS=RURAL LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17BP14.R.137	=	0.086 MI.
LENGTH STRUCTURE TIP PROJECT 17BP14.R.137	=	0.023 MI.
TOTAL LENGTH TIP PROJECT 17BP14.R.137	=	0.109 MI.

Prepared in the Office of:
VAUGHN & MELTON
1318-F PATTON AVE.
ASHEVILLE, NC, 28806

FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE : FEBRUARY 14, 2017	HARDY WILLIS, PE PROJECT ENGINEER
	RYAN SHIPMAN, EI PROJECT DESIGN ENGINEER

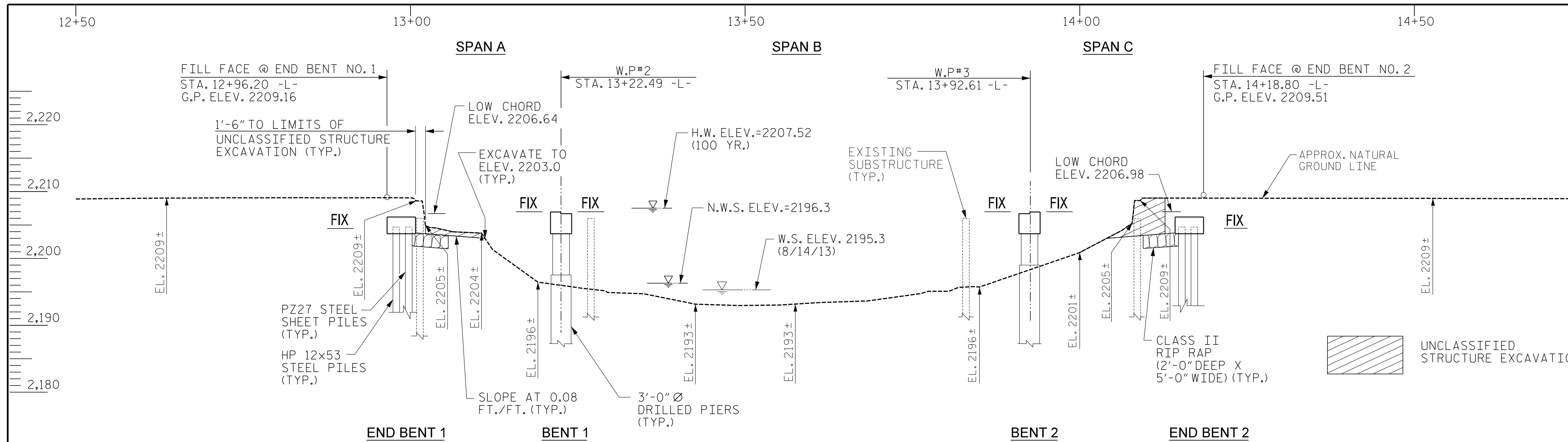
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

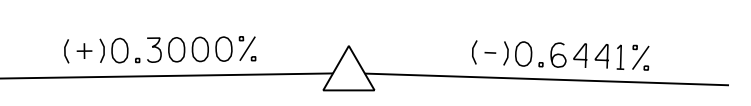
JOSH DEYTON, PE P.E.
STATE DESIGN ENGINEER

**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED _____
DIVISION ADMINISTRATOR DATE



PI = 14+25.00
 EL = 2,209.55'
 VC = 40'

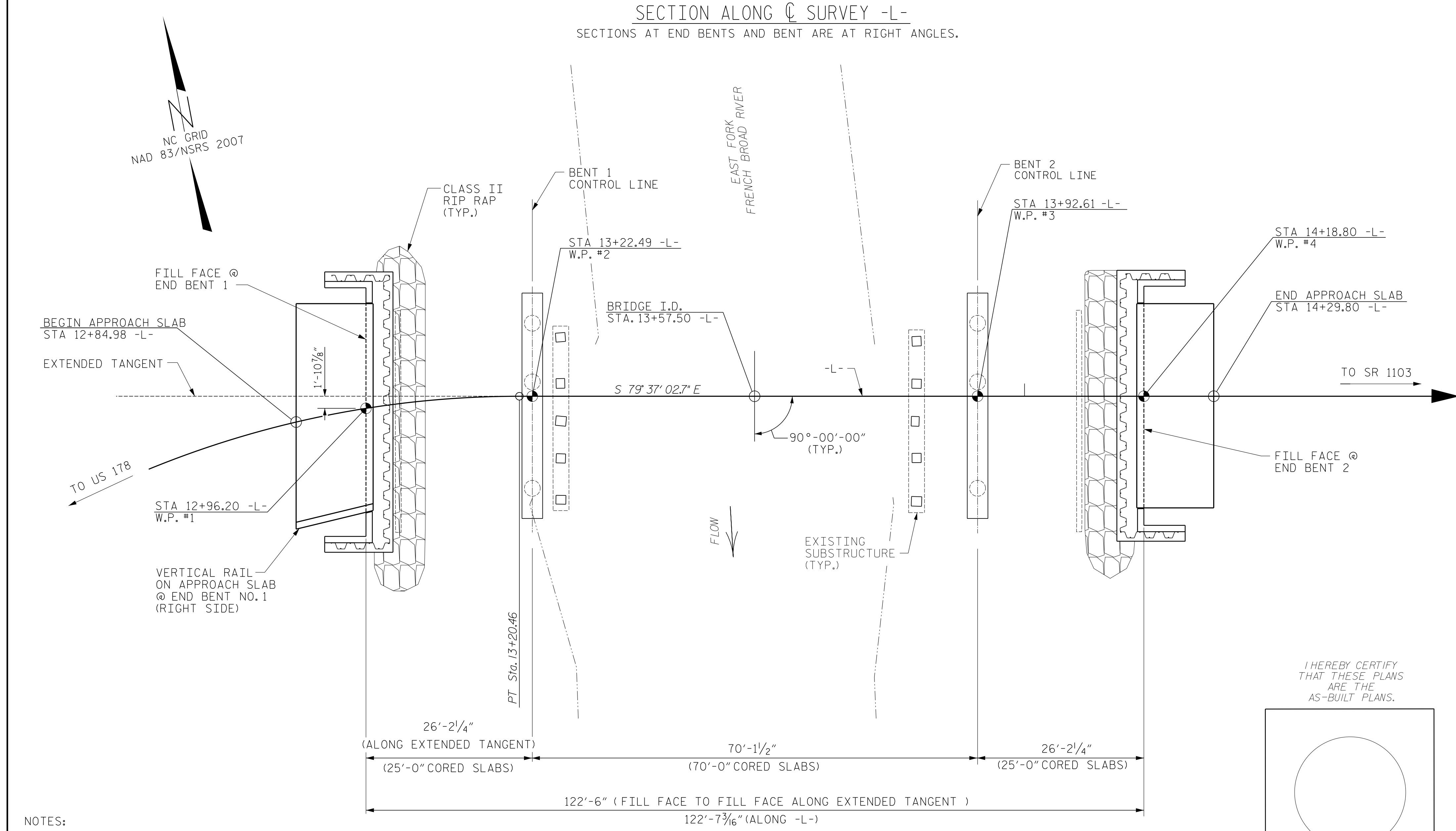


GRADE DATA -L-

SECTION ALONG C SURVEY -L-
 SECTIONS AT END BENTS AND BENT ARE AT RIGHT ANGLES.

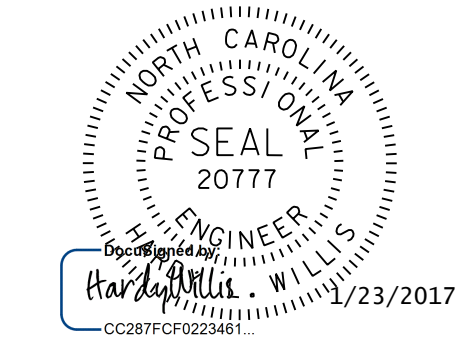
PI Sta 12+50.06
 $\Delta = 57^\circ 51' 20.5''$ (RT)
 $D = 37^\circ 12' 18.2''$
 $L = 155.50'$
 $T = 85.11'$
 $R = 154.00'$

HORIZONTAL CURVE DATA -L-



PLAN ALONG C SURVEY -L-

NOTES:
 END BENTS AND BENTS ARE PARALLEL.
 PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.
 CORED SLABS ARE PARALLEL TO C SURVEY -L-

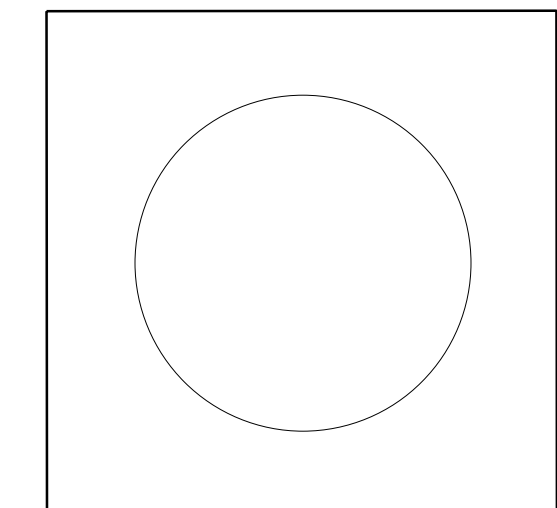


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 Middlesboro, Kentucky 606-248-6600
 Asheville, North Carolina 828-253-2796
 Spartanburg, South Carolina 864-574-4775

I HEREBY CERTIFY THAT THESE PLANS ARE THE AS-BUILT PLANS.



PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-
 SHEET 1 OF 2 REPLACES BRIDGE NO. 86

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

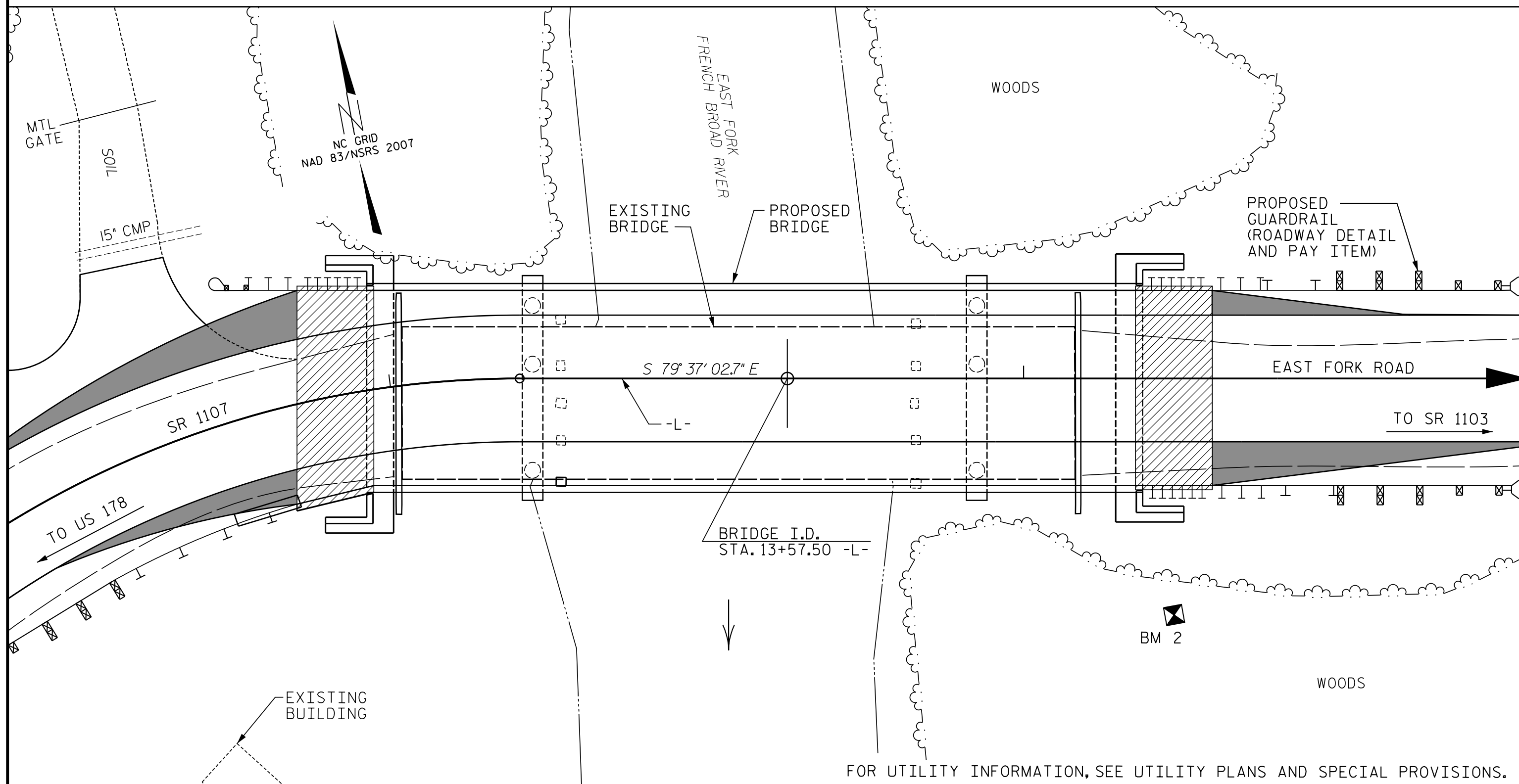
GENERAL DRAWING
 FOR BRIDGE ON SR 1107
 (EAST FORK RD.)
 OVER EAST FORK FRENCH BROAD RIVER
 BETWEEN US 178 AND SR 1103

REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1	12/14	3	
2	12/14	4	

DWN. BY: RWW/MAF DATE: 12/14
 CHKD. BY: HLW DATE: 12/14
 DES. EGR. OF RECORD: RTS DATE: 12/14

TOTAL SHEETS: 34

BM #2 - N 525115.8942, E 864951.9013, -L- STA 14+23.76, 37.37' RT., ELEV. 2208.08, NAIL IN BASE OF 30" OAK.



LOCATION SKETCH

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 THE EXISTING STRUCTURE, CONSISTING OF A THREE SPAN, 109-FOOT LONG TIMBER DECK ON STEEL I-BEAMS, 24'-8" CLEAR ROADWAY ON INTEGRAL END BENTS AND TWO BENTS WITH CONCRETE CAPS ON H-PILES, AND LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18- EVALUATING SCOUR AT BRIDGES".
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION, SEE SPECIAL PROVISIONS.
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT, EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
 ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

FOUNDATION RECOMMENDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 50 TONS PER PILE.
 DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 85 TONS PER PILE.
 STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 20,000 TO 25,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
 TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.
 FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
 DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 375 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 10 TSF.
 PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2,185.2 FT.(L) AND 2,183.0 FT.(R) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
 INSTALL PERMANENT STEEL CASINGS AT BENT NO. 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 2,189 FT.
 INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 2,168.0 FT (L) AND 2,162.0 FT (R) AND WITH A PENETRATION OF AT LEAST 17.2 FT (L) AND 15.9 FT (R) INTO WEATHERED ROCK.
 DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 370 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 15 TSF.
 PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2,188.8 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
 INSTALL PERMANENT STEEL CASINGS AT BENT NO. 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 2,193 FT.
 INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 2,172.0 FT AND WITH A PENETRATION OF AT LEAST 16.8 FT INTO WEATHERED ROCK.
 SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1 AND BENT NO. 2. THE REQUIRED N60 SPT VALUE IS 100 BLOWS IN THE FIRST FOOT OF THE DRIVE. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
 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 DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
 THE SCOUR CRITICAL ELEVATION FOR END BENT NO. 1 IS 2,196 FEET; FOR BENT NO. 1 IS 2,186 FEET; FOR BENT NO. 2 IS 2,190 FEET; AND FOR END BENT NO. 2 IS 2,196 FEET. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
 FOR STEEL SHEET PILES, SEE SECTION 1084 OF THE STANDARD SPECIFICATIONS.
 PZ 27 SHEETING IS TO BE DRIVEN IN FRONT (STREAM SIDE) OF THE HP 12 X 53 PILES AT END BENT NO. 1 AND END BENT NO. 2 AS SHOWN IN THE STRUCTURE PLANS.
 AT END BENT NO. 1 AND END BENT NO. 2, SHEET PILES SHOULD BE DRIVEN TO AN ELEVATION NO HIGHER THAN 2,193.0 FT.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+57.50."
 AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENTS AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

TOTAL BILL OF MATERIAL

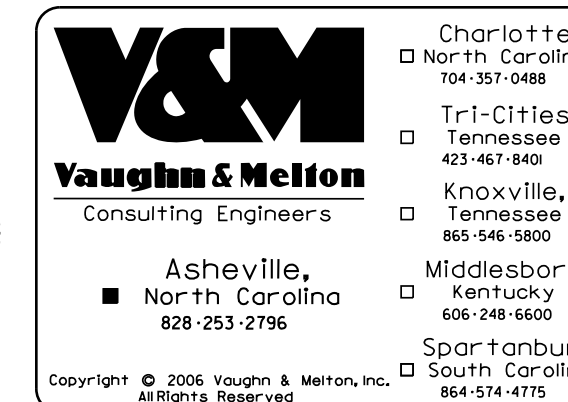
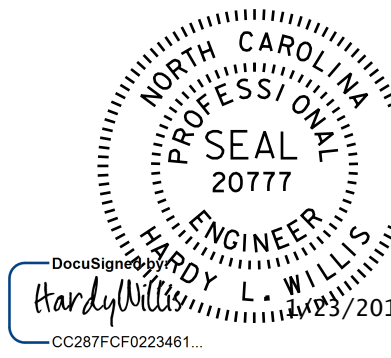
	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASINGS FOR 3'-0" DIA. DRILLED PIER	PDA TESTING	SID INSPECTIONS	SPT TESTING	CSL TESTING	CLASS A CONCRETE	UNCLASSIFIED STRUCTURE EXCAVATION	BRIDGE APPROACH SLABS
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LUMP SUM	EACH	EACH	EACH	CU. YARDS	LUMP SUM	LUMP SUM
SUPERSTRUCTURE											LUMP SUM
END BENT 1									22.3	LUMP SUM	
BENT 1		63.8	34.0	41.6			3		16.5		
BENT 2		45.0	36.0	31.2			3		15.8		
END BENT 2									21.6	LUMP SUM	
TOTAL	LUMP SUM	108.8	70.0	72.8	LUMP SUM	1	6	1	76.2	LUMP SUM	LUMP SUM

TOTAL BILL OF MATERIAL (Cont.)

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILE POINTS	PZ 27 STEEL SHEET PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS	3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS	ASBESTOS ASSESSMENT			
	LBS.	LBS.	NO.	LIN. FT.	EACH	SO. FT.	LIN. FT.	TONS	SO. YARDS	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.	LUMP SUM
SUPERSTRUCTURE							240.75			LUMP SUM	22	550.0	11	770.0	
END BENT 1	2,704		7	230.0	7	761.0		39	38						
BENT 1	10,501	2,024													
BENT 2	9,410	1,675													
END BENT 2	2,616		7	155.0	7	757.0		45	44						
TOTAL	25,231	3,699	14	385.0	14	1,518.0	240.75	84	82	LUMP SUM	22	550.0	11	770.0	LUMP SUM

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 4800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 2207.0	FT
BASE DISCHARGE	= 6980	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2207.52	FT
OVERTOPPING DISCHARGE	= 8200	CFS
OVERTOPPING FREQUENCY	= 100 (+)	YRS
OVERTOPPING ELEVATION	= 2209.2	FT
DRAINAGE AREA	= 24.7	SO MI
DATE OF SURVEY	= 8/14/13	
W.S. ELEVATION	= 2195.3'	FT
AT DATE OF SURVEY		



PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1107
 (EAST FORK RD.)
 OVER EAST FORK FRENCH BROAD RIVER
 BETWEEN US 178 AND SR 1103

REVISIONS

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

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 CHKD. BY: HLW
 DES. EGR. OF RECORD: RTS
 DATE: 12/14
 DATE: 12/14
 DATE: 12/14

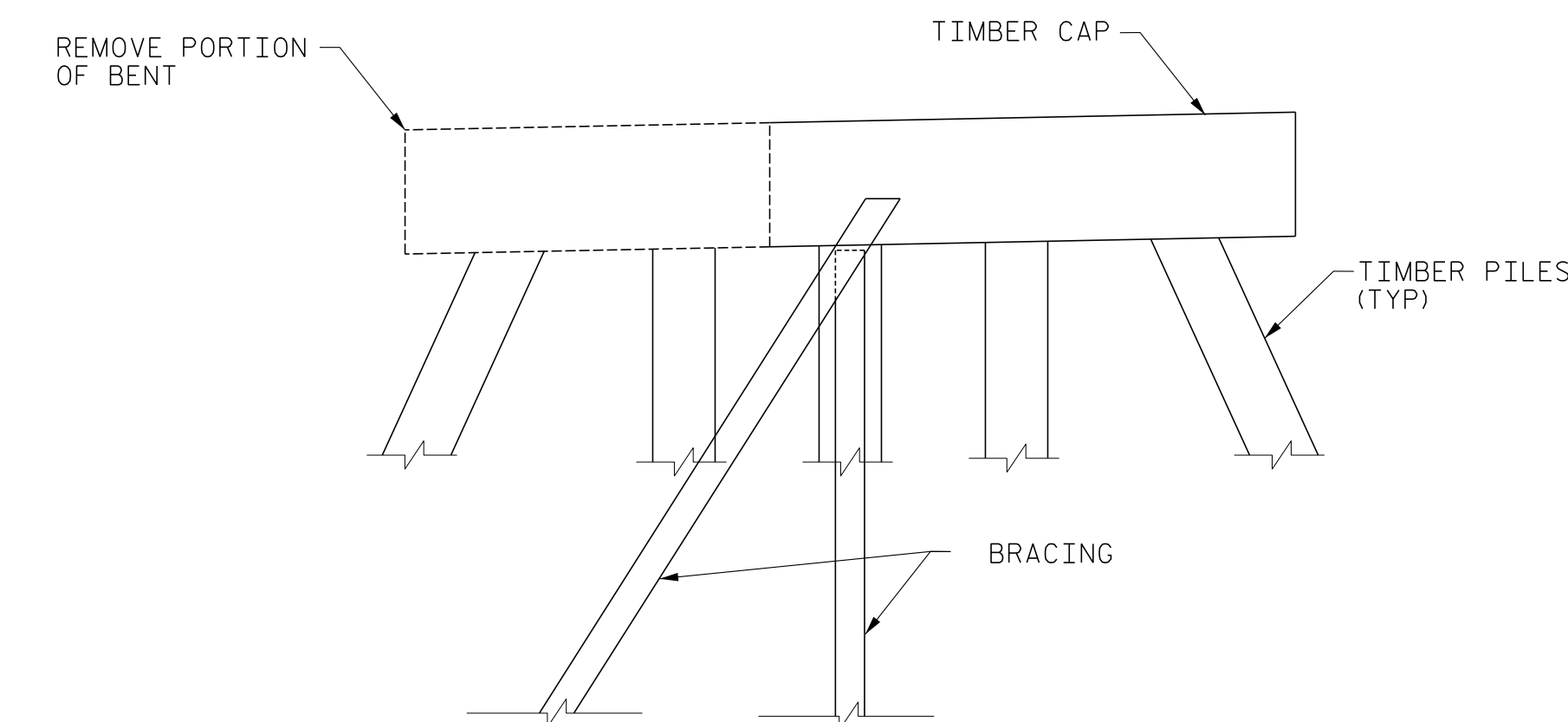
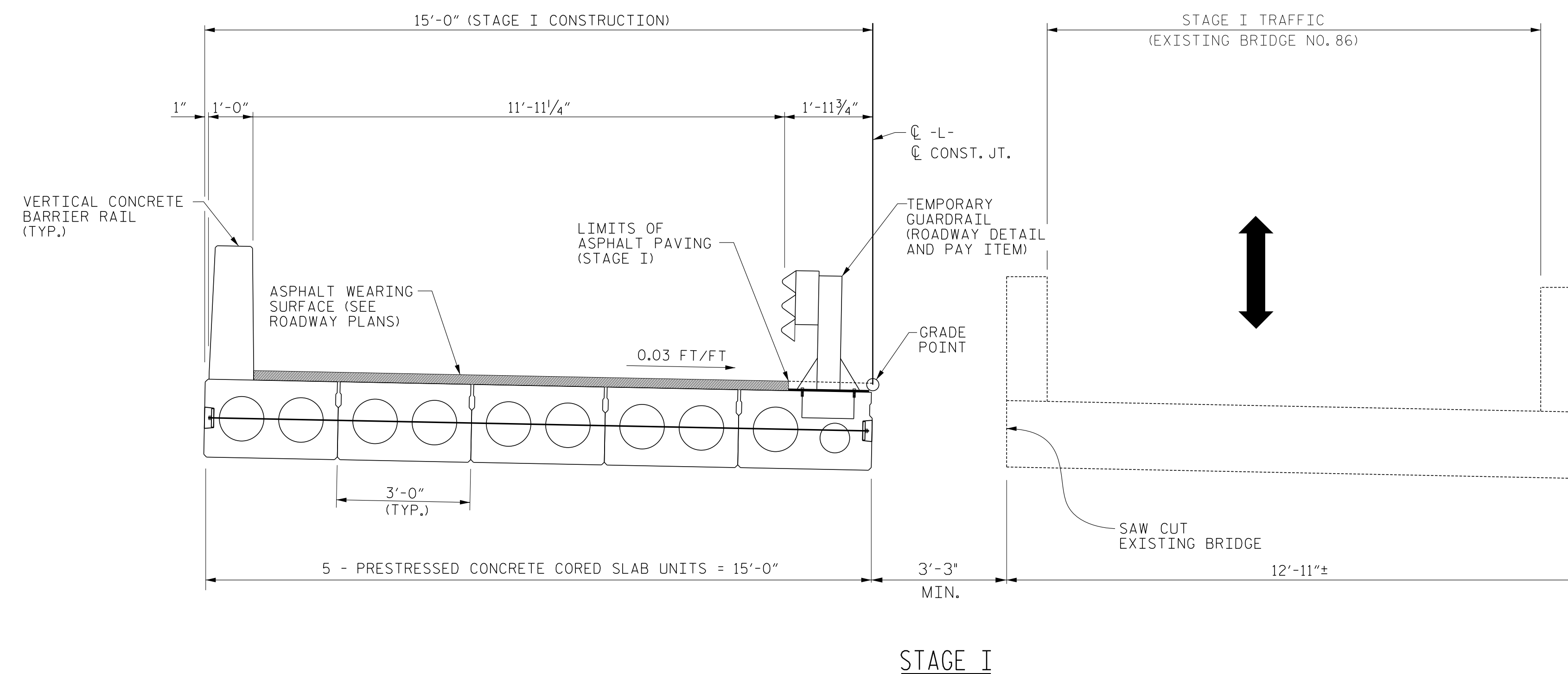
SHEET NO.
 S-2
 TOTAL SHEETS
 34

NOTES

FOR TEMPORARY GUARDRAIL DETAILS, SEE "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET.

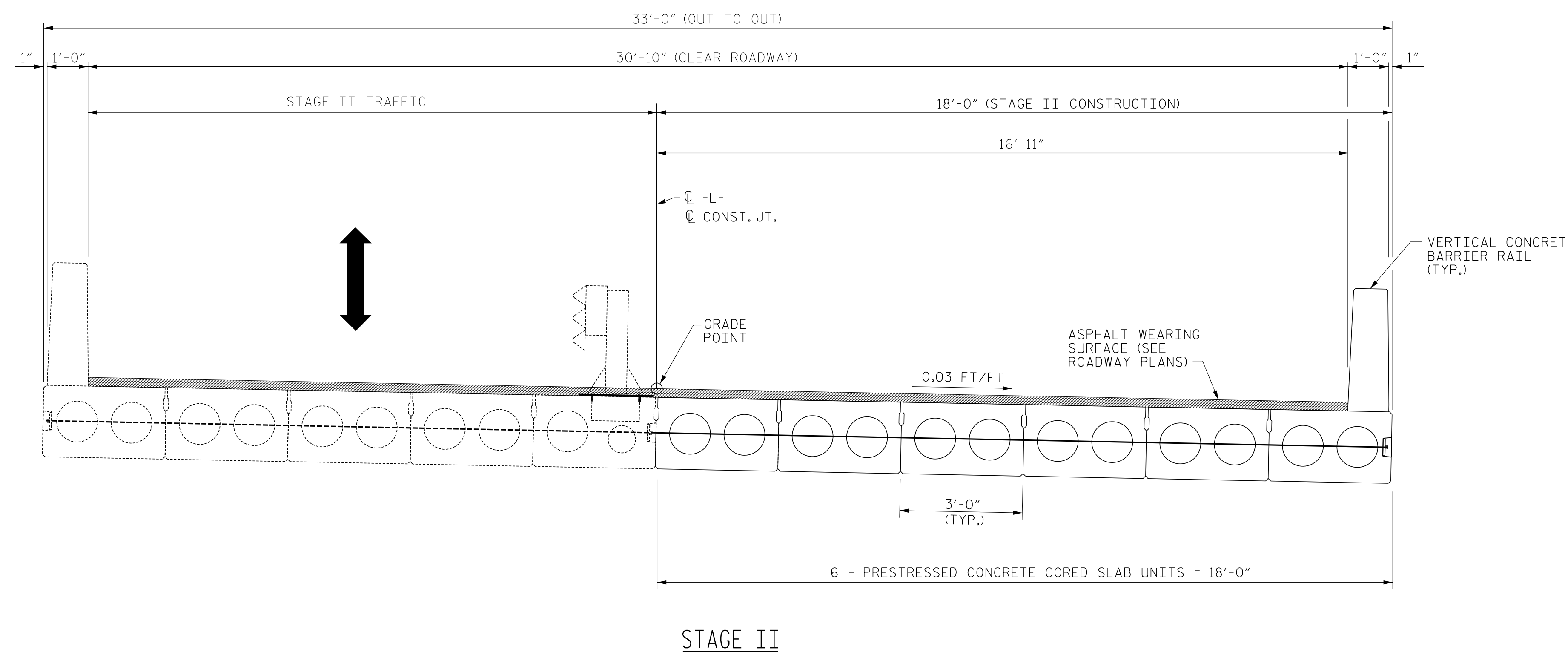
FOR PHASING OF TRAFFIC AND OTHER DETAILS, SEE TRAFFIC MANAGEMENT PLANS.

CONTRACTOR IS RESPONSIBLE FOR TEMPORARY GUARDRAILS, SUBMIT TO THE ENGINEER FOR APPROVAL.



EXISTING INTERIOR BENT DETAIL

AFTER CUTTING AND REMOVING THE LEFT HAND PORTION OF EACH EXISTING INTERIOR BENT FOR STAGE I CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING TO STABILIZE THE REMAINING BENT. PROVIDE BRACING PLANS AND LOAD STUDIES TO THE ENGINEER FOR APPROVAL BEFORE CUTTING.



STAGING SEQUENCE

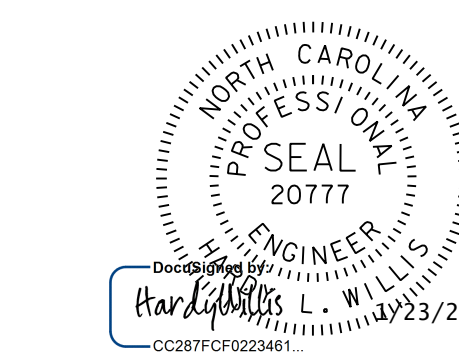
- 1) ADD BRACING TO THE EXISTING INTERIOR BENT.
- 2) SHIFT TRAFFIC TO THE RIGHT SIDE OF EXISTING BRIDGE.
- 3) SAW CUT AND REMOVE LEFT SIDE OF EXISTING BRIDGE.
- 4) CONSTRUCT STAGE I OF PROPOSED BRIDGE
- 5) SHIFT TRAFFIC TO STAGE I OF PROPOSED BRIDGE
- 6) REMOVE REMAINING PORTION OF EXISTING BRIDGE
- 7) CONSTRUCT STAGE II OF PROPOSED BRIDGE
- 8) OPEN PROPOSED BRIDGE TO FULL TRAFFIC.

STAGING SEQUENCE

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STAGING SEQUENCE



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DWN. BY: RWW/MAF DATE: 12/14
 CHKD. BY: HLW DATE: 12/14
 DES. EGR. OF RECORD: RTS DATE: 12/14

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

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(Inn)	N/A	1	1.018	--	1.75	0.284	2.53	25'	EL	12	0.591	1.02	25'	EL	1.2	0.80	0.284	2.34	25'	EL	12		
	HL-93(Opr)	N/A	--	1.319	--	1.35	0.284	3.29	25'	EL	12	0.591	1.32	25'	EL	1.2	N/A	--	--	--	--	--		
	HS-20(Inn)	36.000	2	1.178	42,397	1.75	0.284	3.76	25'	EL	12	0.591	1.18	25'	EL	1.2	0.80	0.284	3.46	25'	EL	12		
	HS-20(Opr)	36.000	--	1.527	54,959	1.35	0.284	4.87	25'	EL	12	0.591	1.53	25'	EL	1.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.728	36.833	1.4	0.284	6.83	25'	EL	12	0.591	2.73	25'	EL	1.2	0.80	0.284	5.04	25'	EL	12	
		SNGARBS2	20.000	--	2.186	43.718	1.4	0.284	6.39	25'	EL	12	0.591	2.19	25'	EL	1.2	0.80	0.284	4.72	25'	EL	12	
		SNAGRIS2	22.000	--	2.141	47.107	1.4	0.284	6.83	25'	EL	12	0.591	2.14	25'	EL	1.2	0.80	0.284	5.04	25'	EL	12	
		SNCOTTS3	27.250	--	1.385	37.731	1.4	0.284	3.57	25'	EL	12	0.591	1.38	25'	EL	1.2	0.80	0.284	2.64	25'	EL	12	
		SNAGGRS4	34.925	--	1.332	46.511	1.4	0.284	3.56	25'	EL	12	0.591	1.33	25'	EL	1.2	0.80	0.284	2.62	25'	EL	12	
		SNS5A	35.550	--	1.392	49.477	1.4	0.284	3.45	25'	EL	12	0.591	1.39	25'	EL	1.2	0.80	0.284	2.54	25'	EL	12	
	TTST	SNS6A	39.950	--	1.334	53.31	1.4	0.284	3.23	25'	EL	12	0.591	1.33	25'	EL	1.2	0.80	0.284	2.39	25'	EL	12	
		SNS7B	42.000	--	1.344	56.455	1.4	0.284	3.23	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.37	25'	EL	12	
		TNAGRIT3	33.000	--	1.634	53.934	1.4	0.284	4.55	25'	EL	12	0.591	1.63	25'	EL	1.2	0.80	0.284	3.36	25'	EL	12	
		TNT4A	33.075	--	1.483	49.049	1.4	0.284	3.95	25'	EL	12	0.591	1.48	25'	EL	1.2	0.80	0.284	2.92	25'	EL	12	
		TNT6A	41.600	--	1.398	58.138	1.4	0.284	3.71	25'	EL	12	0.591	1.4	25'	EL	1.2	0.80	0.284	2.74	25'	EL	12	
		TNT7A	42.000	--	1.391	58.419	1.4	0.284	3.84	25'	EL	12	0.591	1.39	25'	EL	1.2	0.80	0.284	2.83	25'	EL	12	
		TNT7B	42.000	--	1.343	56.385	1.4	0.284	3.46	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.55	25'	EL	12	
		TNAGRIT4	43.000	--	1.340	57.604	1.4	0.284	3.71	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.73	25'	EL	12	
TNAGT5A	45.000	--	1.367	61.501	1.4	0.284	3.71	25'	EL	12	0.591	1.37	25'	EL	1.2	0.80	0.284	2.73	25'	EL	12			
TNAGT5B	45.000	3	1.239	55.766	1.4	0.284	3.65	25'	EL	9.6	0.591	1.24	25'	EL	1.2	0.80	0.284	2.71	25'	EL	9.6			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{oc}	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)

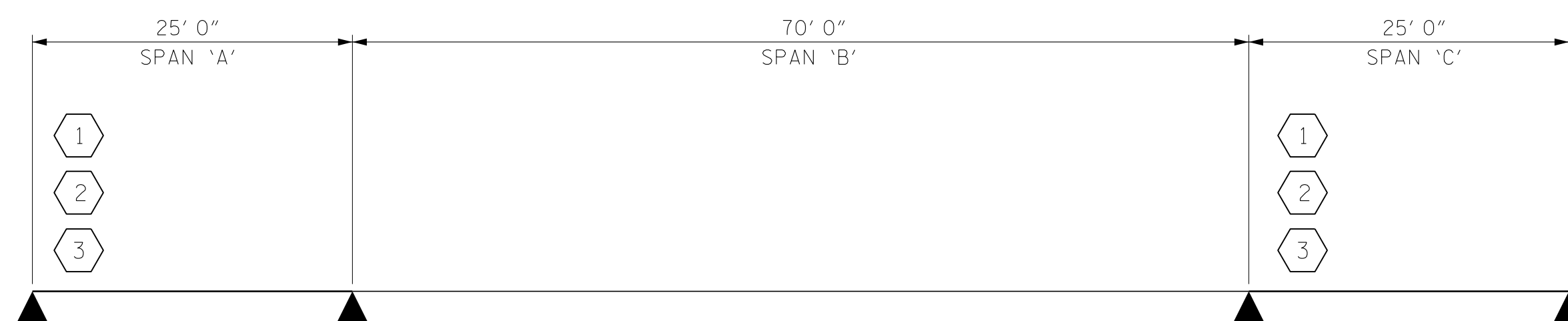
2 DESIGN LOAD RATING (HS-20)

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 SPANS 'A' AND 'C'

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR
25' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

DES. ENG. OF RECORD: RTS
ASSEMBLED BY: MAF DATE: 12/14
CHECKED BY: HLW DATE: 12/14

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

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	1.050	--	1.75	0.273	1.050	70'	EL	34.5	0.507	1.794	70'	EL	1.8	0.80	0.273	1.392	70'	EL	34.5		
	HL-93(0pr)	N/A	--	1.361	--	1.35	0.273	1.361	70'	EL	34.5	0.507	2.326	70'	EL	1.8	0.80	0.273	--	70'	EL	34.5		
	HS-20(Inv)	36.000	2	1.363	49.068	1.75	0.273	1.363	70'	EL	34.5	0.507	2.261	70'	EL	1.8	0.80	0.273	1.807	70'	EL	34.5		
	HS-20(0pr)	36.000	--	1.767	63.612	1.35	0.273	1.767	70'	EL	34.5	0.507	2.931	70'	EL	1.8	N/A	0.273	--	70'	EL	34.5		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.811	51.449	1.40	0.273	3.811	70'	EL	34.5	0.507	6.728	70'	EL	1.8	0.80	0.273	4.034	70'	EL	34.5	
		SNGARBS2	20.000	--	2.844	56.880	1.40	0.273	2.844	70'	EL	34.5	0.507	4.794	70'	EL	1.8	0.80	0.273	3.023	70'	EL	34.5	
		SNAGRIS2	22.000	--	2.702	59.444	1.40	0.273	2.702	70'	EL	34.5	0.507	4.442	70'	EL	1.8	0.80	0.273	2.873	70'	EL	34.5	
		SNCOTTS3	27.250	--	1.893	51.584	1.40	0.273	1.893	70'	EL	34.5	0.507	3.364	70'	EL	1.8	0.80	0.273	2.008	70'	EL	34.5	
		SNAGGRS4	34.925	--	1.590	55.531	1.40	0.273	1.590	70'	EL	34.5	0.507	2.786	70'	EL	1.8	0.80	0.273	1.685	70'	EL	34.5	
		SNS5A	35.550	--	1.552	55.174	1.40	0.273	1.552	70'	EL	34.5	0.507	2.820	70'	EL	1.8	0.80	0.273	1.647	70'	EL	34.5	
		SNS6A	39.950	--	1.436	57.368	1.40	0.273	1.436	70'	EL	34.5	0.507	2.597	70'	EL	1.8	0.80	0.273	1.524	70'	EL	34.5	
	SNS7B	42.000	--	1.360	57.120	1.40	0.273	1.360	70'	EL	34.5	0.507	2.523	70'	EL	1.8	0.80	0.273	1.442	70'	EL	34.5		
	TTST	TNAGRIT3	33.000	--	1.743	57.519	1.40	0.273	1.743	70'	EL	34.5	0.507	3.060	70'	EL	1.8	0.80	0.273	1.847	70'	EL	34.5	
		TNT4A	33.075	--	1.749	57.848	1.40	0.273	1.749	70'	EL	34.5	0.507	2.988	70'	EL	1.8	0.80	0.273	1.857	70'	EL	34.5	
		TNT6A	41.600	--	1.433	59.613	1.40	0.273	1.433	70'	EL	34.5	0.507	2.682	70'	EL	1.8	0.80	0.273	1.520	70'	EL	34.5	
		TNT7A	42.000	--	1.433	60.606	1.40	0.273	1.433	70'	EL	34.5	0.507	2.633	70'	EL	1.8	0.80	0.273	1.529	70'	EL	34.5	
		TNT7B	42.000	--	1.494	62.748	1.40	0.273	1.494	70'	EL	34.5	0.507	2.469	70'	EL	1.8	0.80	0.273	1.585	70'	EL	34.5	
		TNAGRIT4	43.000	--	1.419	61.017	1.40	0.273	1.419	70'	EL	34.5	0.507	2.387	70'	EL	1.8	0.80	0.273	1.418	70'	EL	34.5	
TNAGT5A		45.000	--	1.336	60.120	1.40	0.273	1.336	70'	EL	34.5	0.507	2.372	70'	EL	1.8	0.80	0.273	1.780	70'	EL	34.5		
TNAGT5B	45.000	3	1.321	59.445	1.40	0.273	1.321	70'	EL	34.5	0.507	2.274	70'	EL	1.8	0.80	0.273	1.400	70'	EL	34.5			

LOAD FACTORS:

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

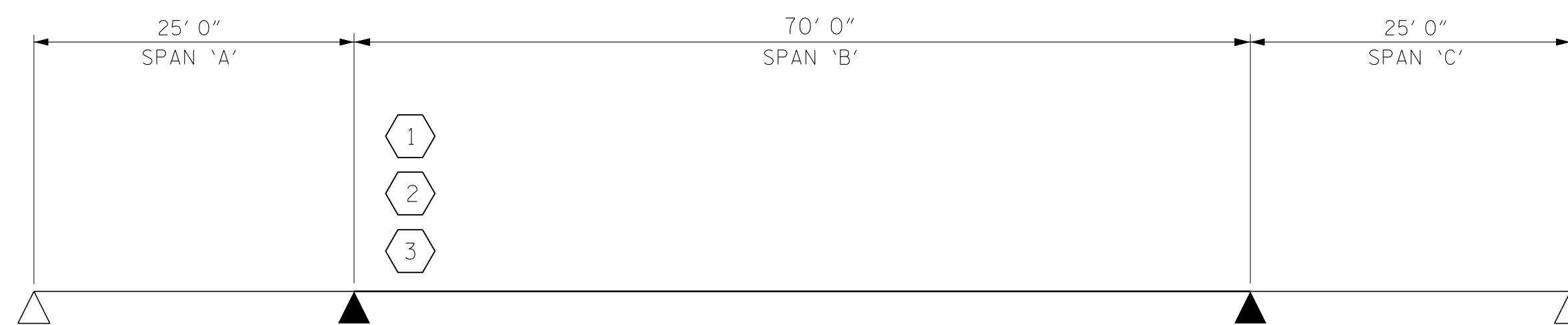
NOTES:

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. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-



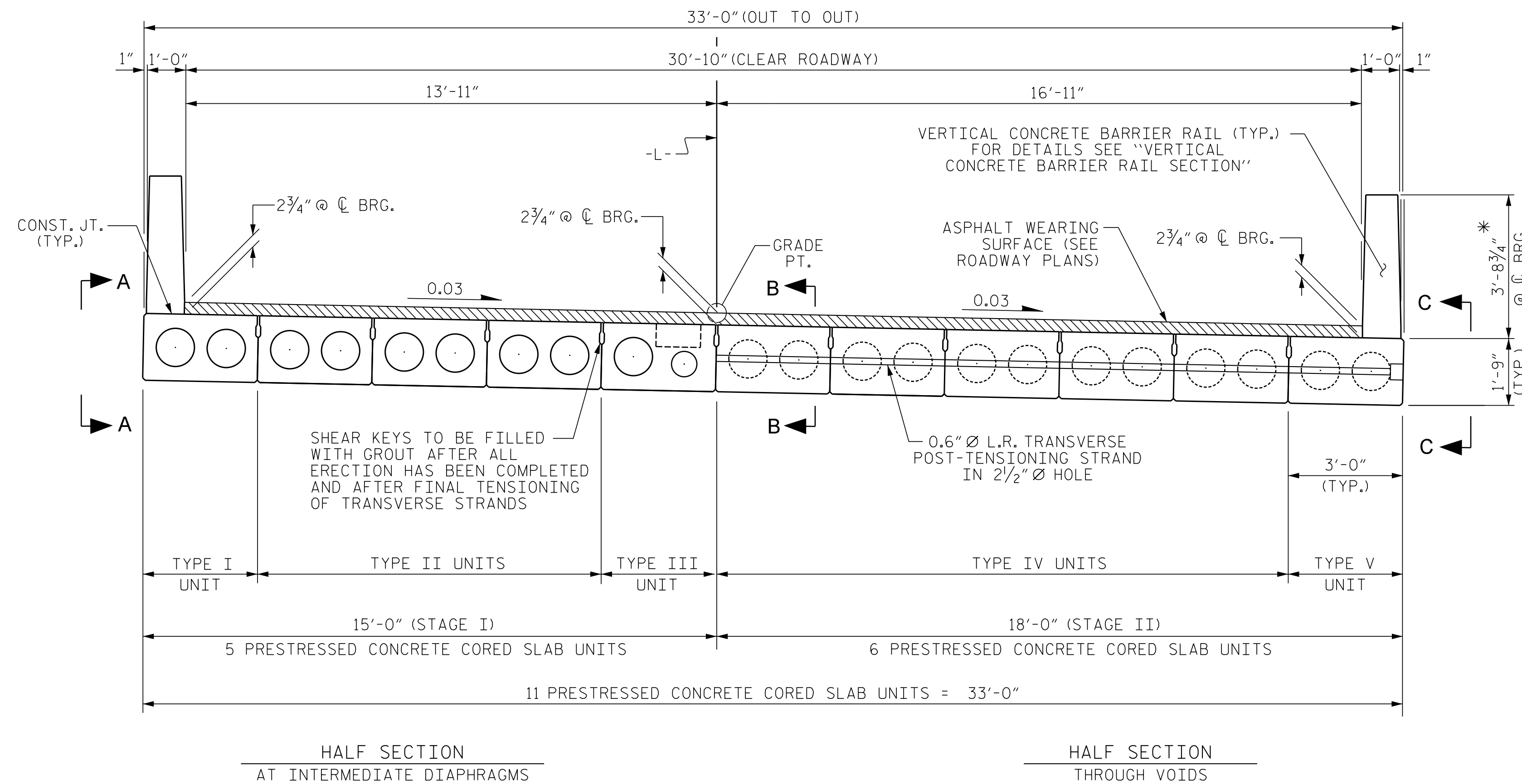
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR
70' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			34

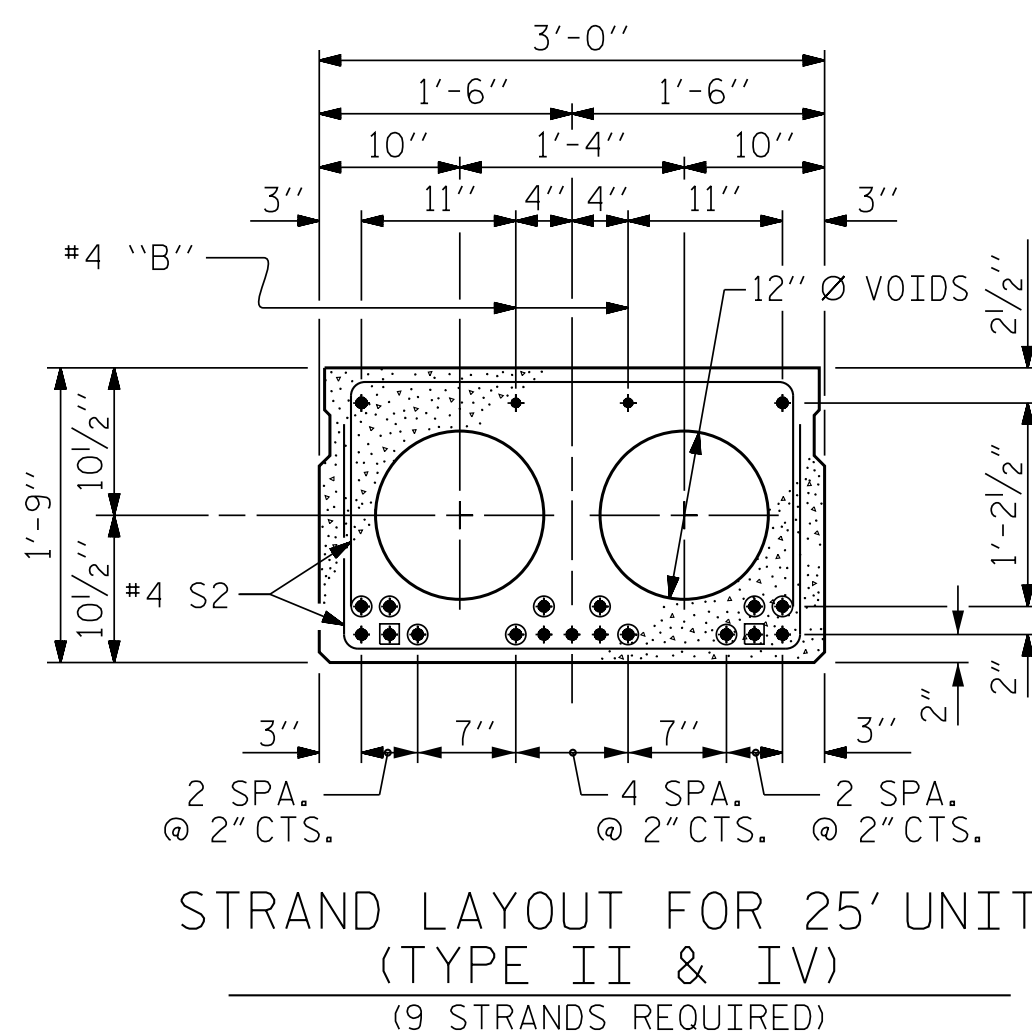
DES. ENG. OF RECORD: RTS
ASSEMBLED BY: MAF DATE: 12/14
CHECKED BY: HLW DATE: 12/14

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

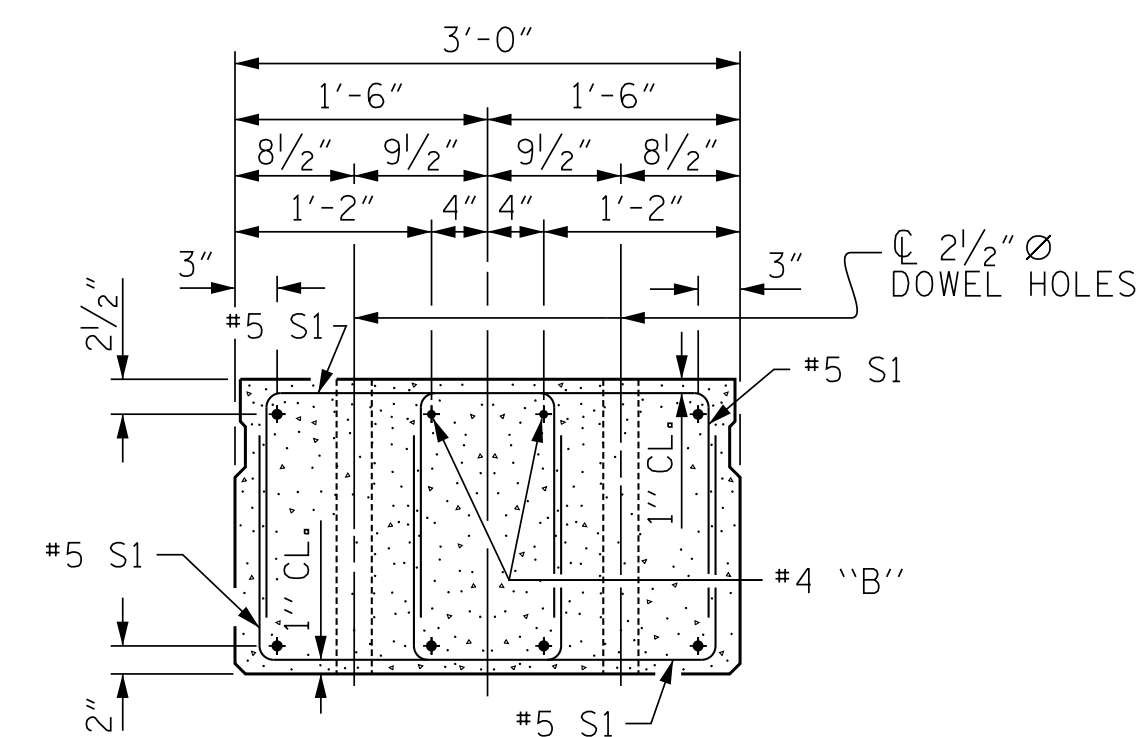


TYPICAL SECTION - SPANS 'A' & 'C'

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

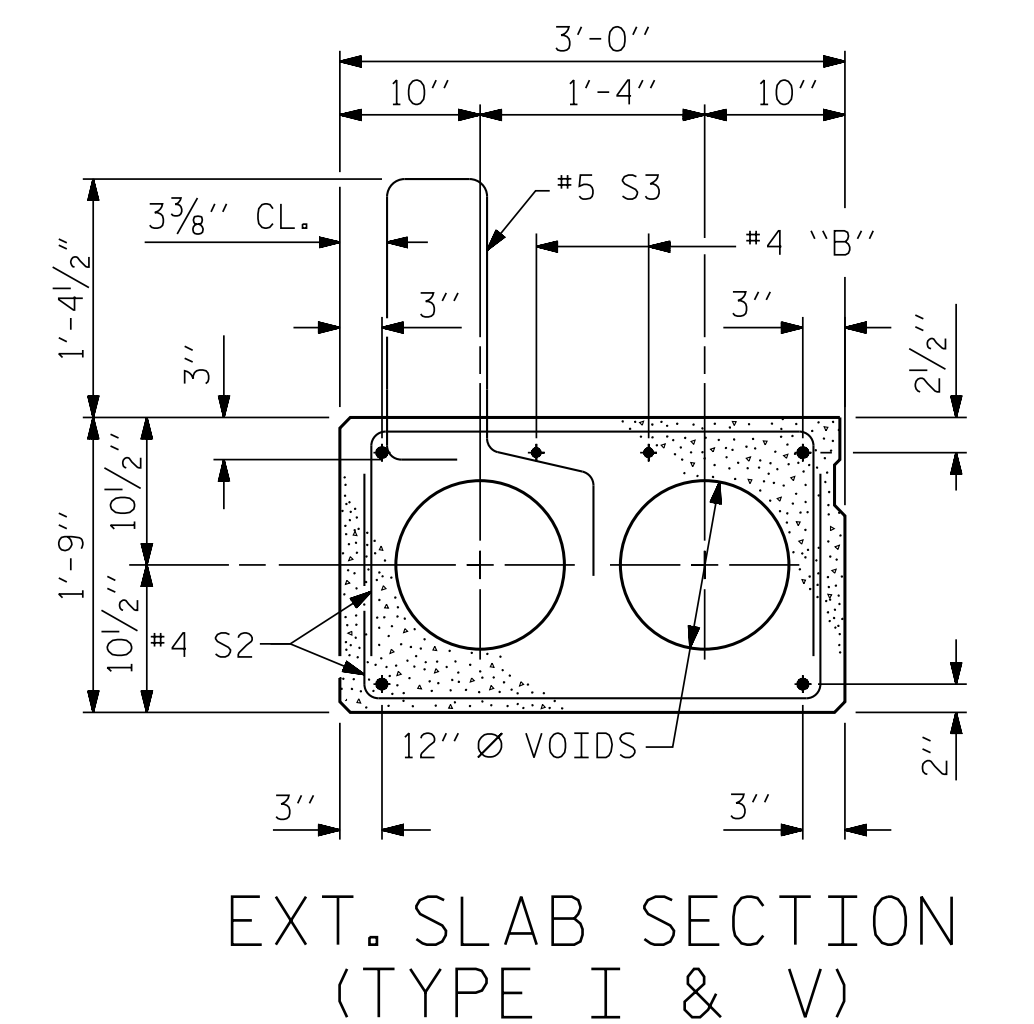


0.6" Ø LOW RELAXATION STRAND LAYOUT



END ELEVATION

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

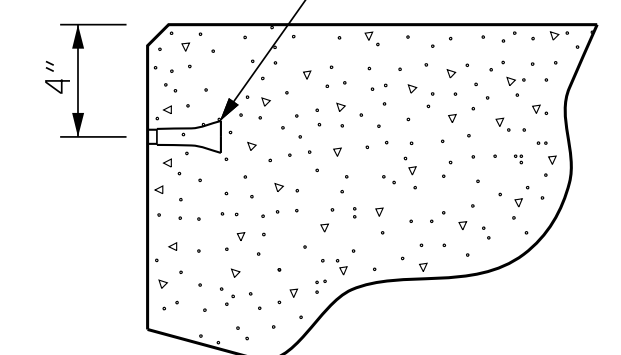


(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II & IV.)

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

DEBONDING LEGEND

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW
SPANS 'A' & 'C'



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

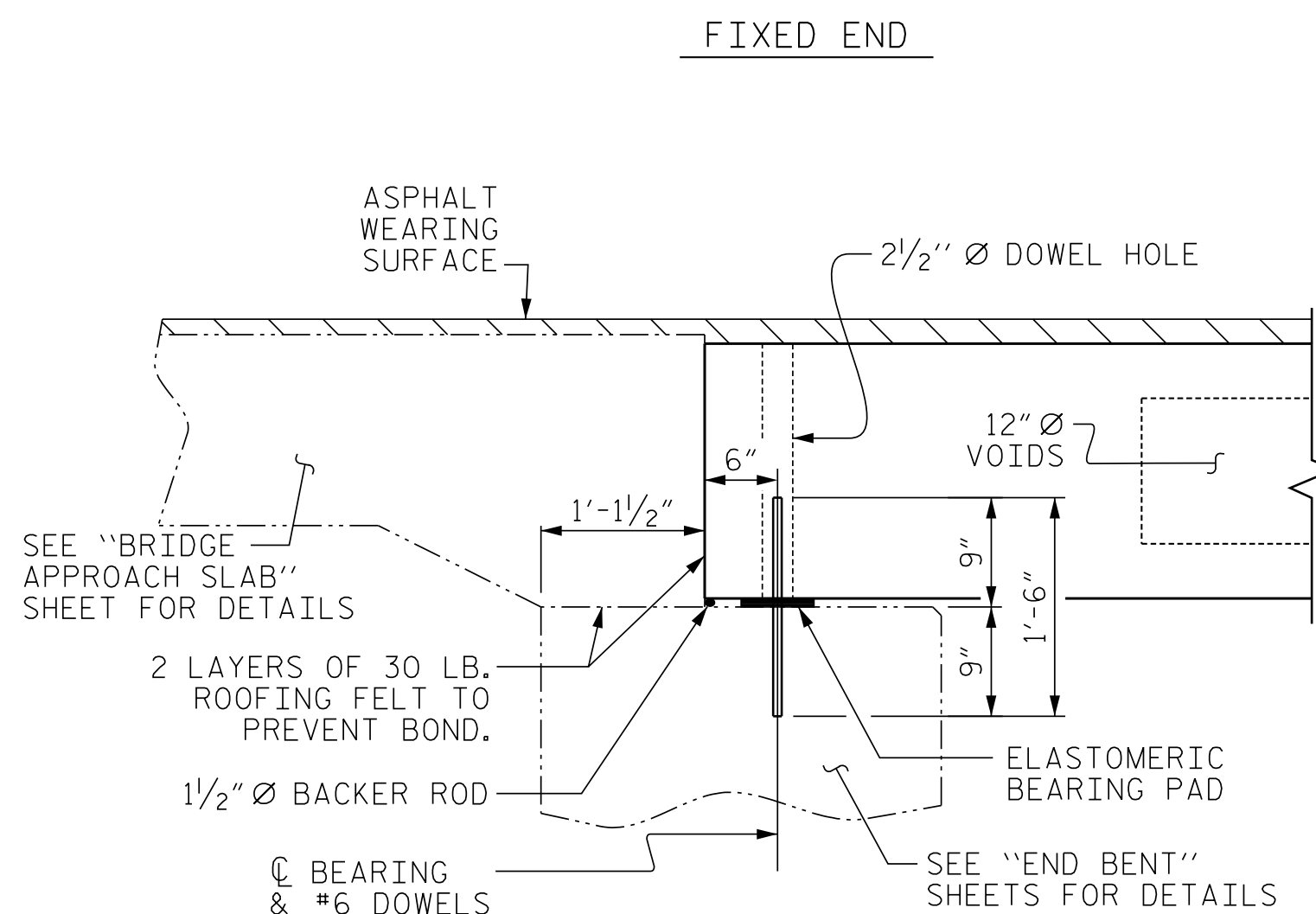
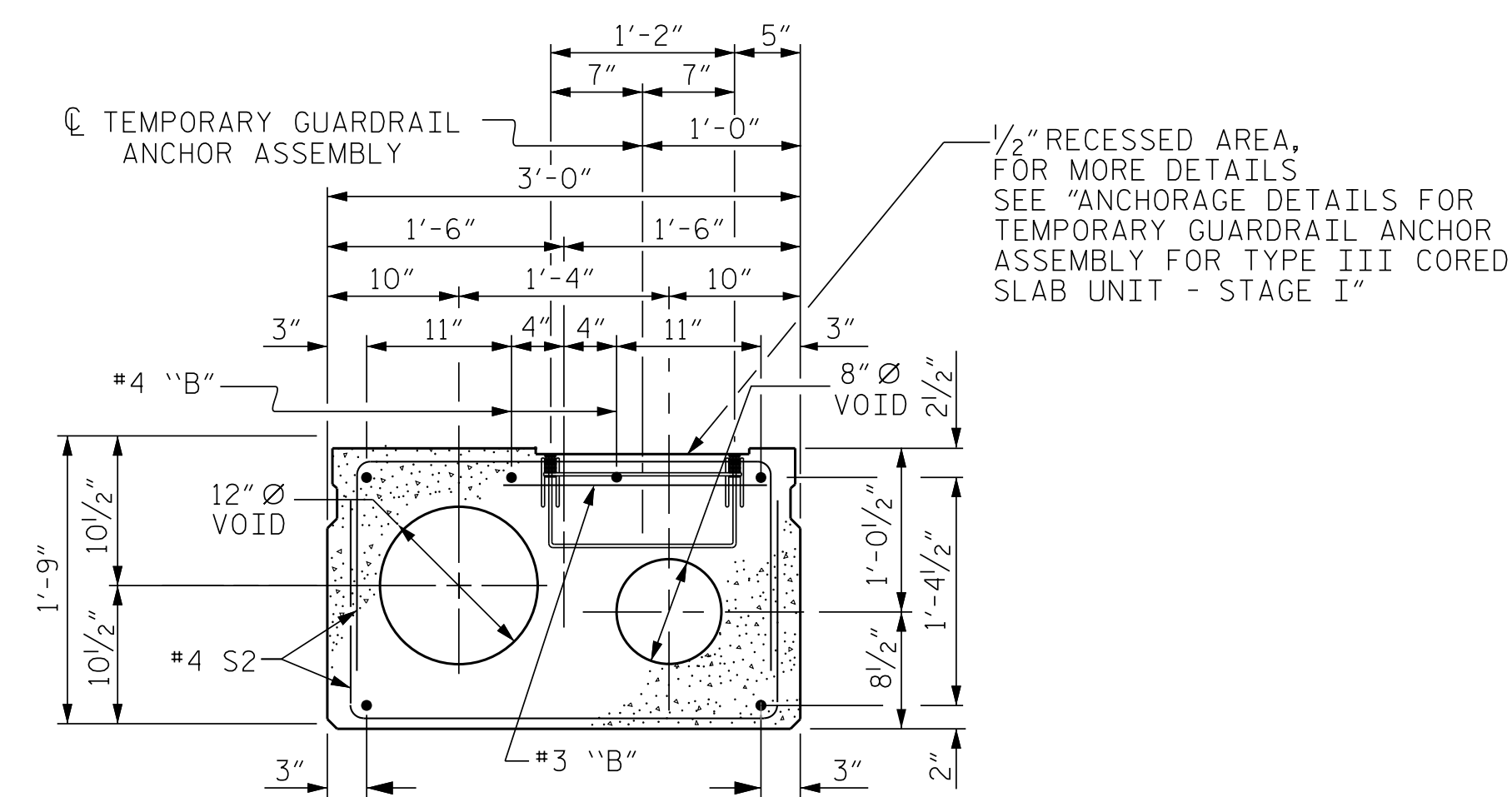
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			34

DES. ENG. OF RECORD: RTS

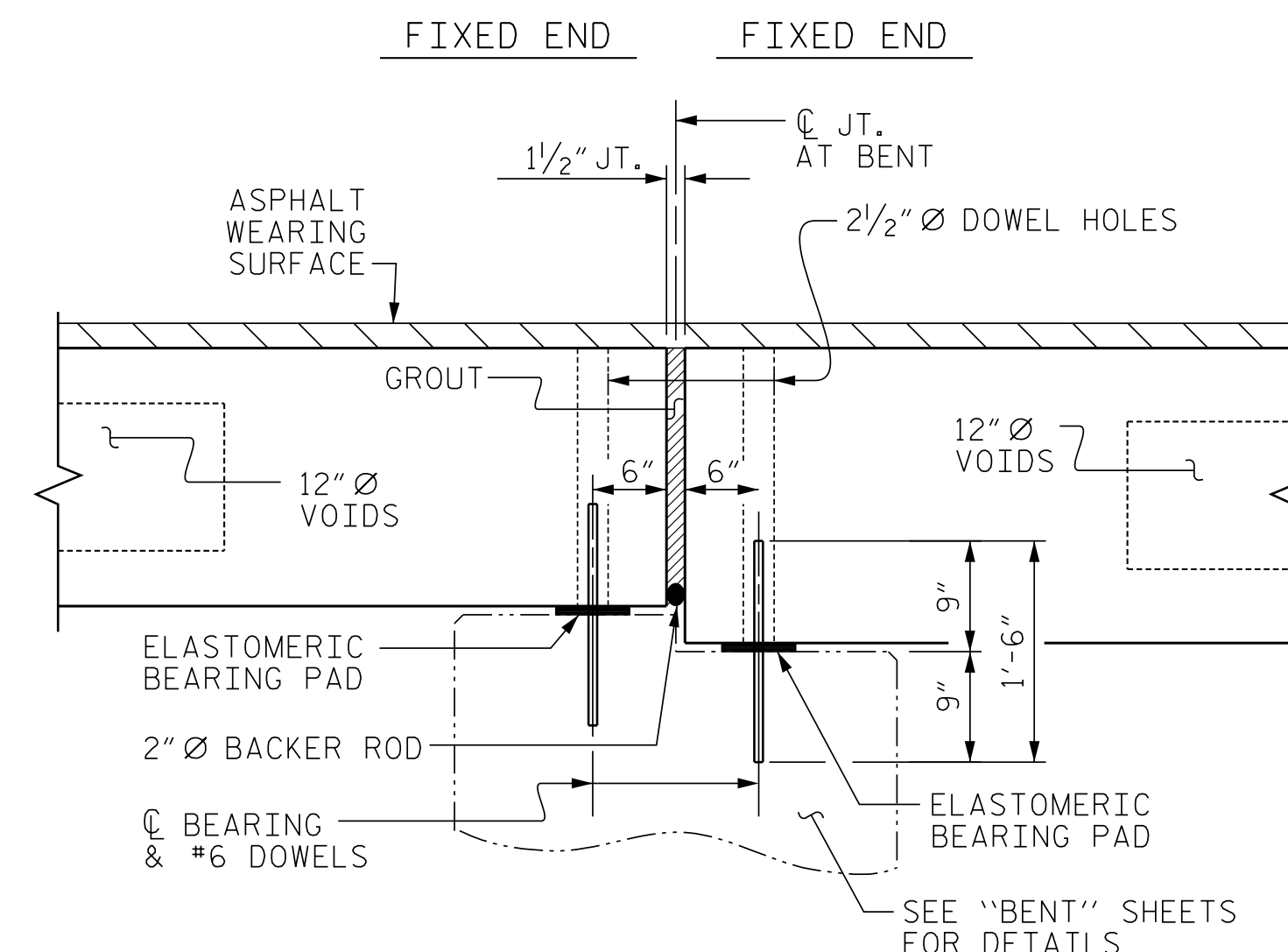
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE	5/09	REV. 12/11
CHECKED BY :	BCH	6/09	MAA/AAC

FOR PRESTRESSED STRAND LAYOUT, SEE "INTERIOR SLAB SECTION - TYPE II & IV"
FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY LOCATION, SEE SECTION OF ANCHOR ASSEMBLY LOCATION ON "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET.

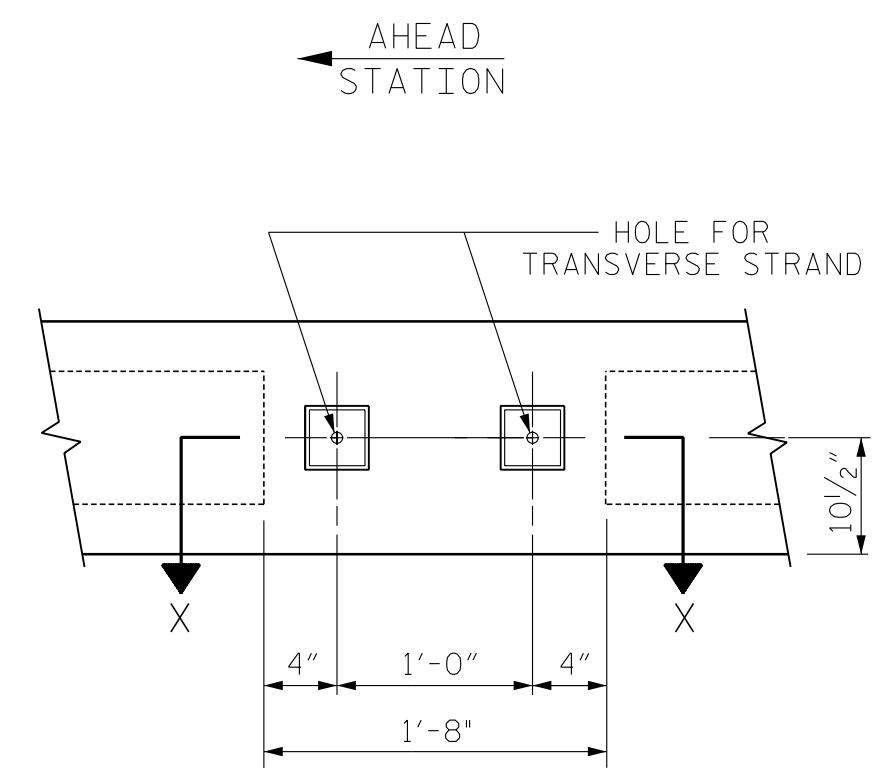
INTERIOR SLAB SECTION (TYPE III)



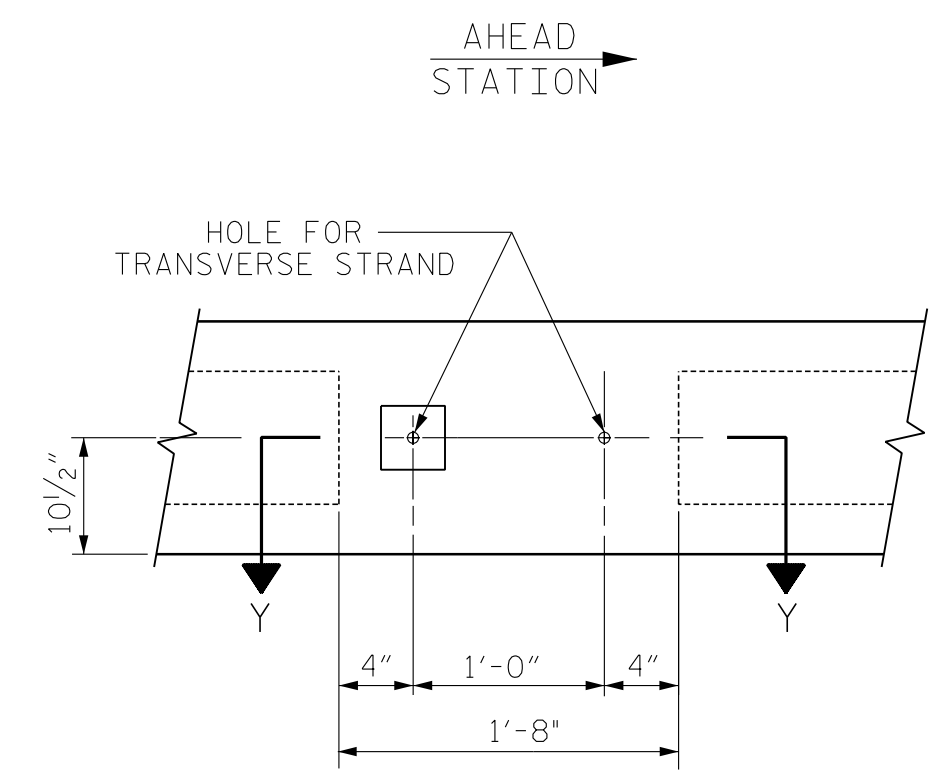
SECTION AT END BENT



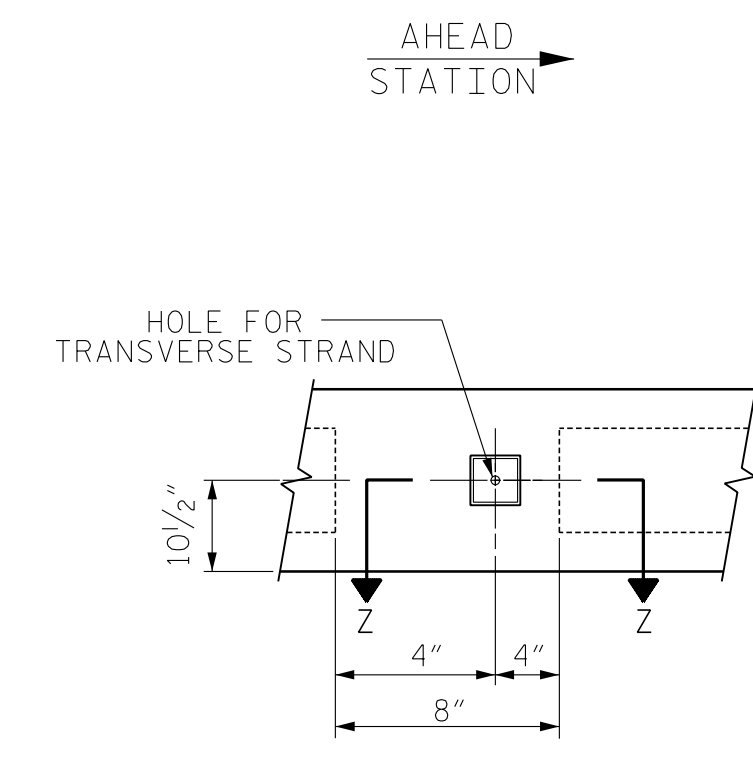
SECTION AT BENT



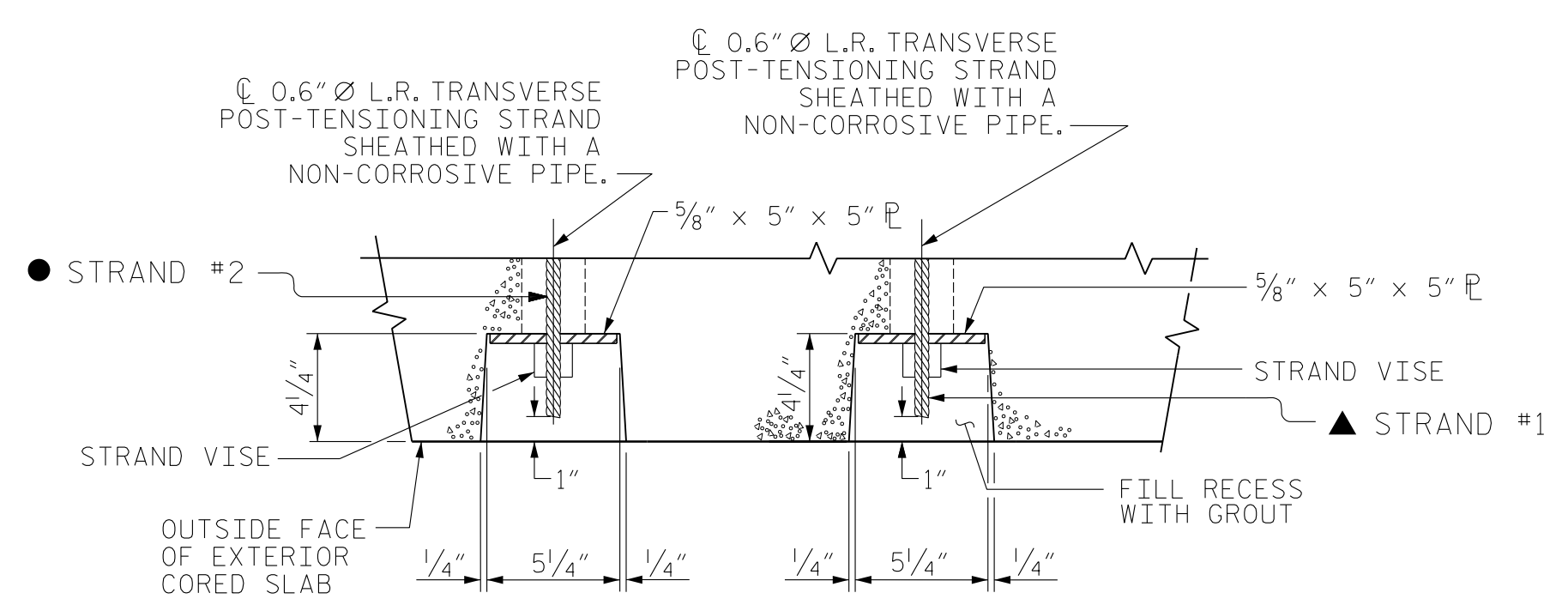
VIEW A-A
SEE SHEET 1 OF 5



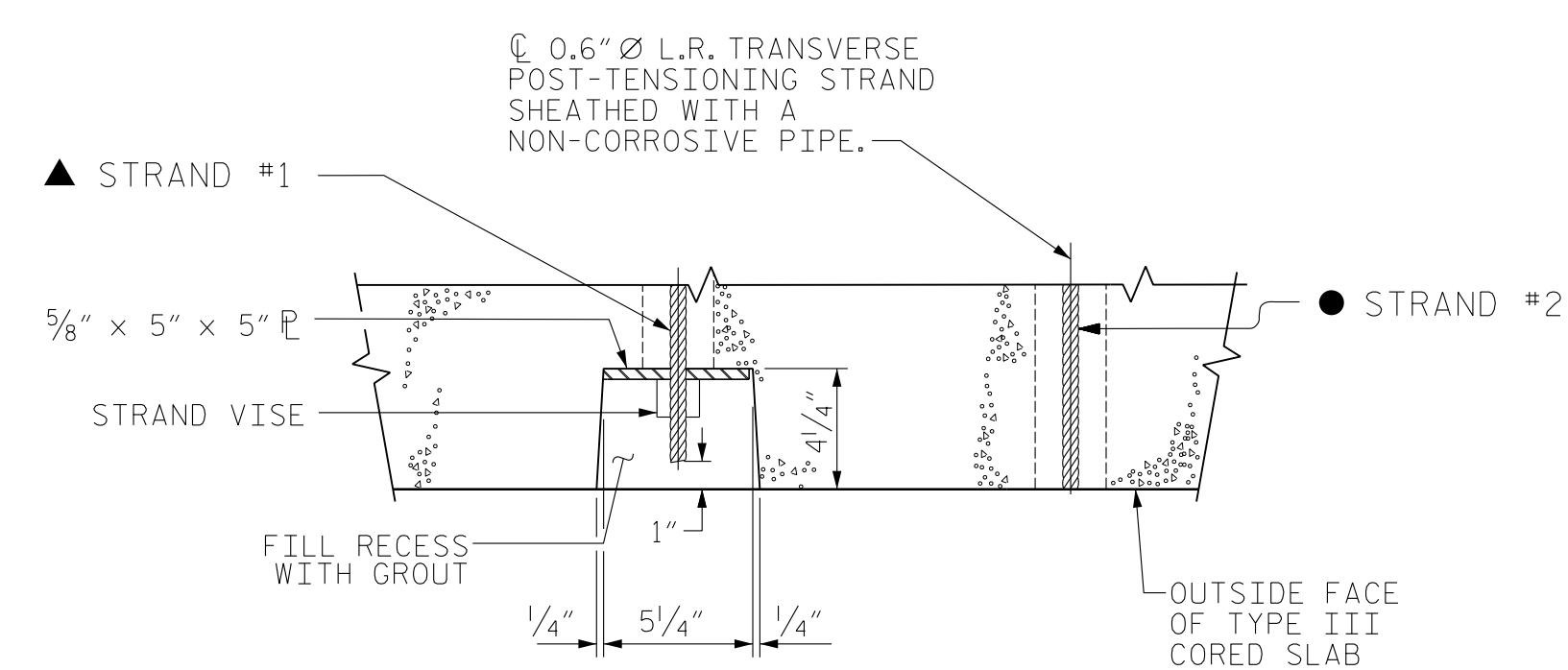
VIEW B-B
SEE SHEET 1 OF 5



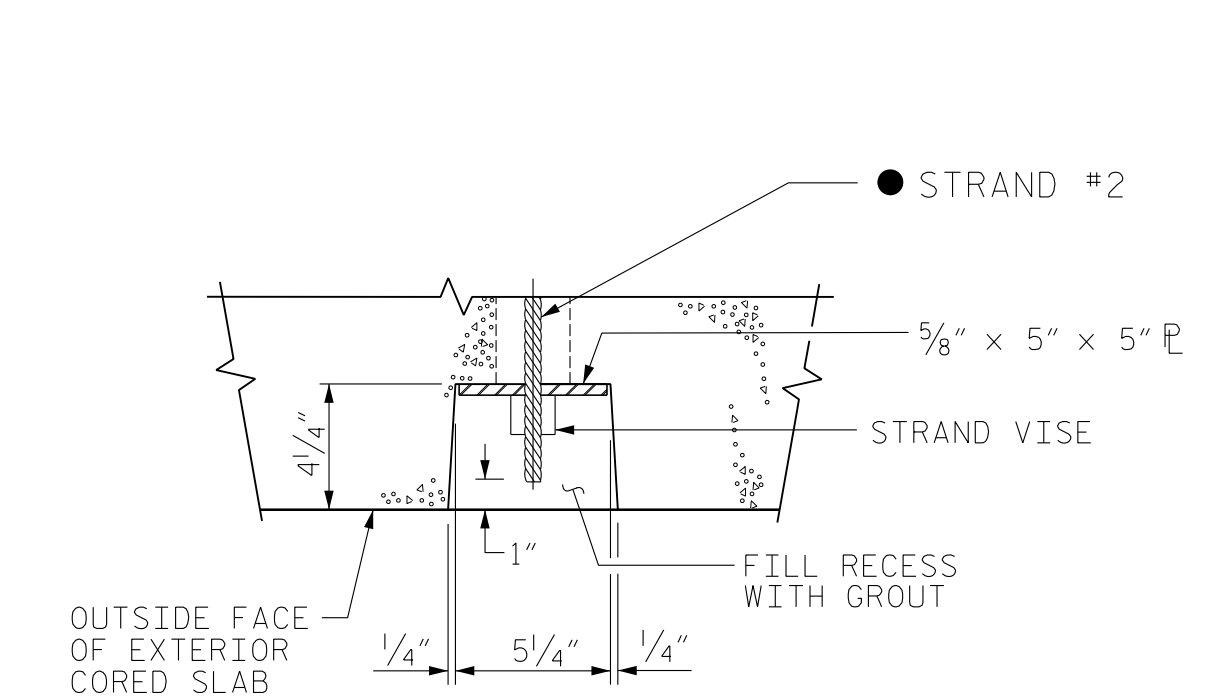
VIEW C-C
SEE SHEET 1 OF 5



SECTION X-X
(TYPE I UNIT)



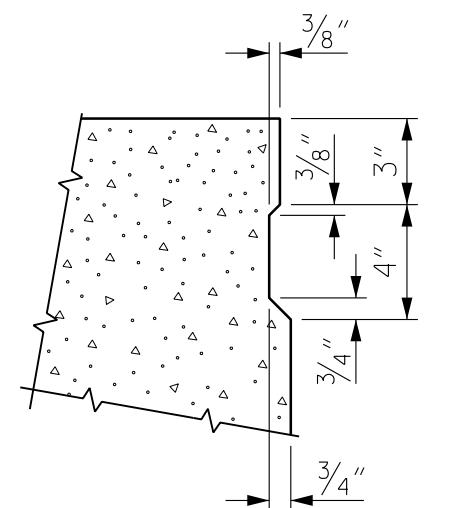
SECTION Y-Y
(TYPE III UNIT)



SECTION Z-Z
(TYPE V UNIT)

▲ STRAND #1 GOES THROUGH 5 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION). ● STRAND #2 GOES THROUGH ALL 11 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION).

GROUTED RECESS AT END OF POST-TENSIONED STRAND



SHEAR KEY DETAIL

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

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW
 SPANS 'A' & 'C'



V&M
Vaughan & Melton
 Consulting Engineers

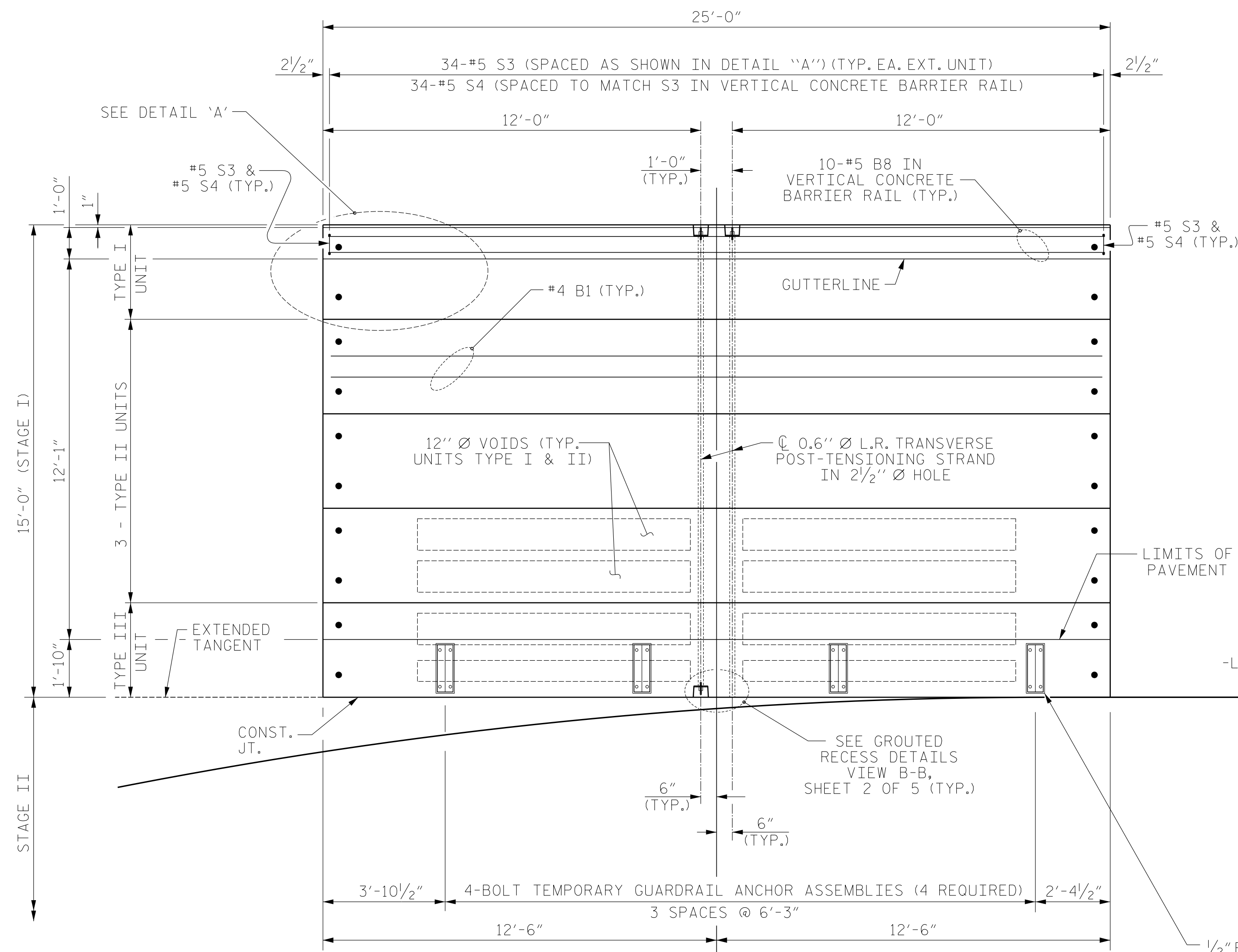
Charlotte, North Carolina 704-357-0488
 Tri-Cities, Tennessee 423-467-8401
 Knoxville, Tennessee 865-546-9800
 Asheville, North Carolina 828-253-2796
 Middlesboro, Kentucky 606-248-6600
 Spartanburg, South Carolina 864-574-4775

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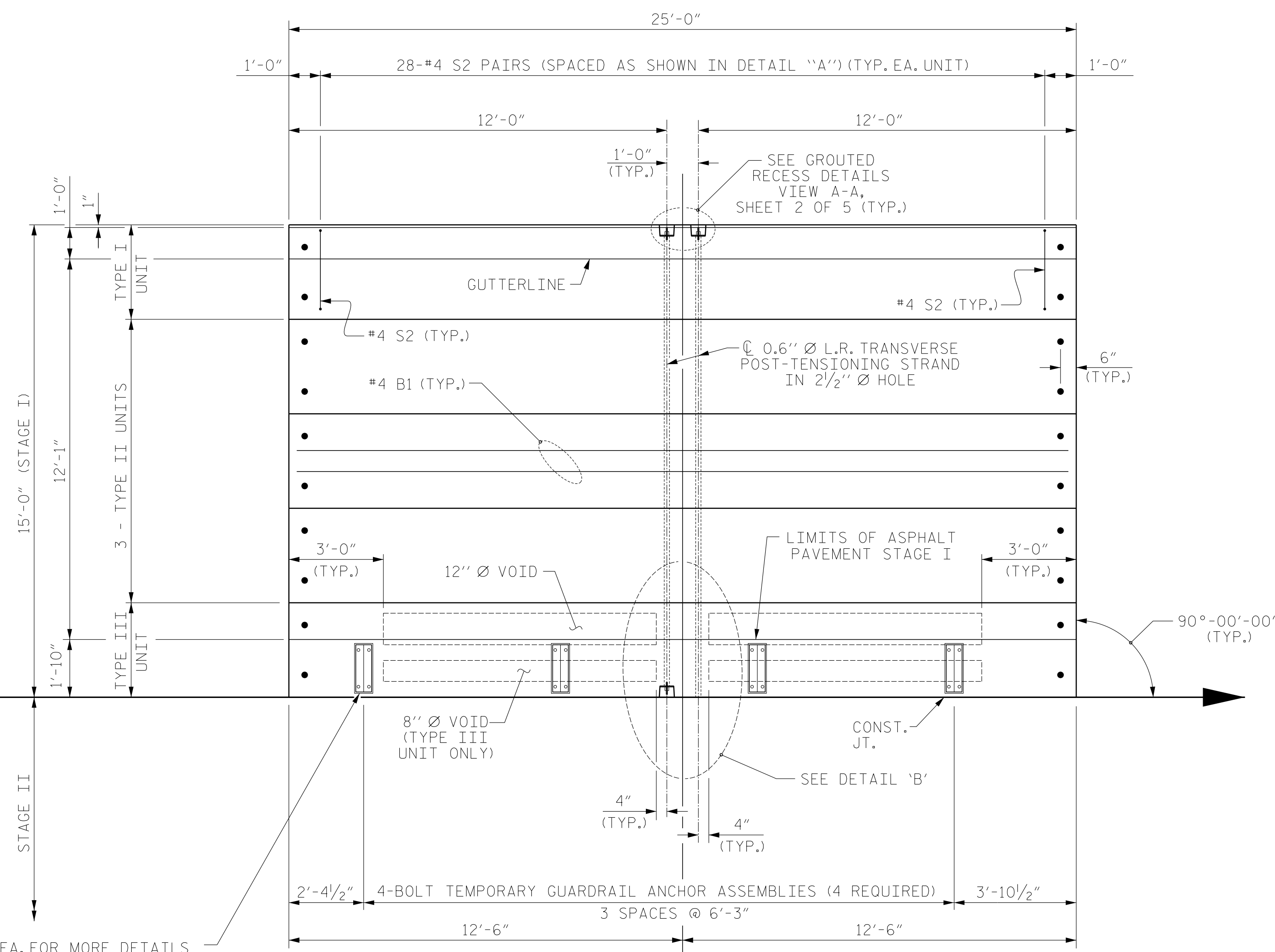
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: RWW/MAF DATE: 12/14
 CHKD. BY: HLW DATE: 12/14
 DES. EGR. OF RECORD: RTS DATE: 12/14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			34

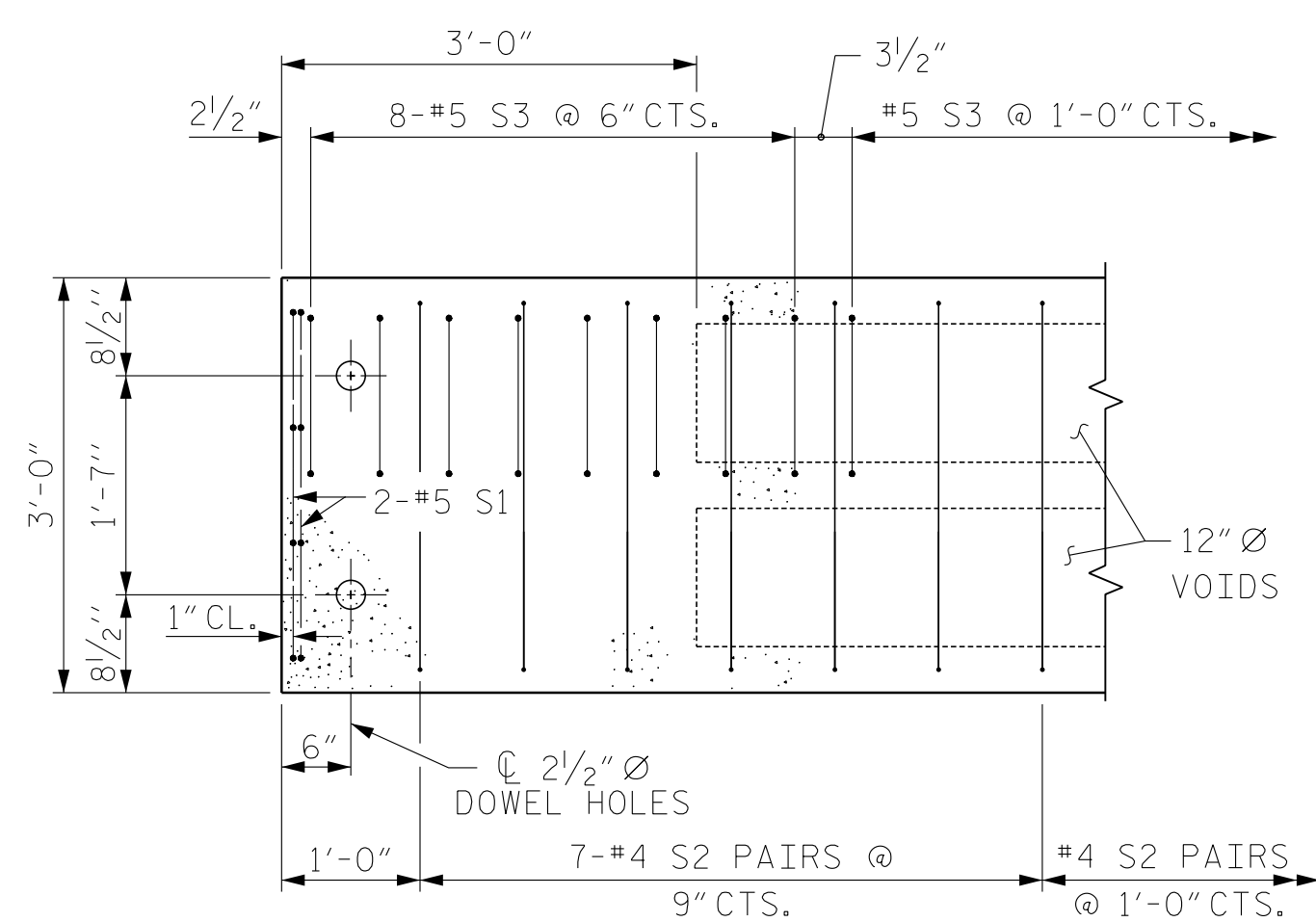


PLAN OF SPAN 'A'
(STAGE I)



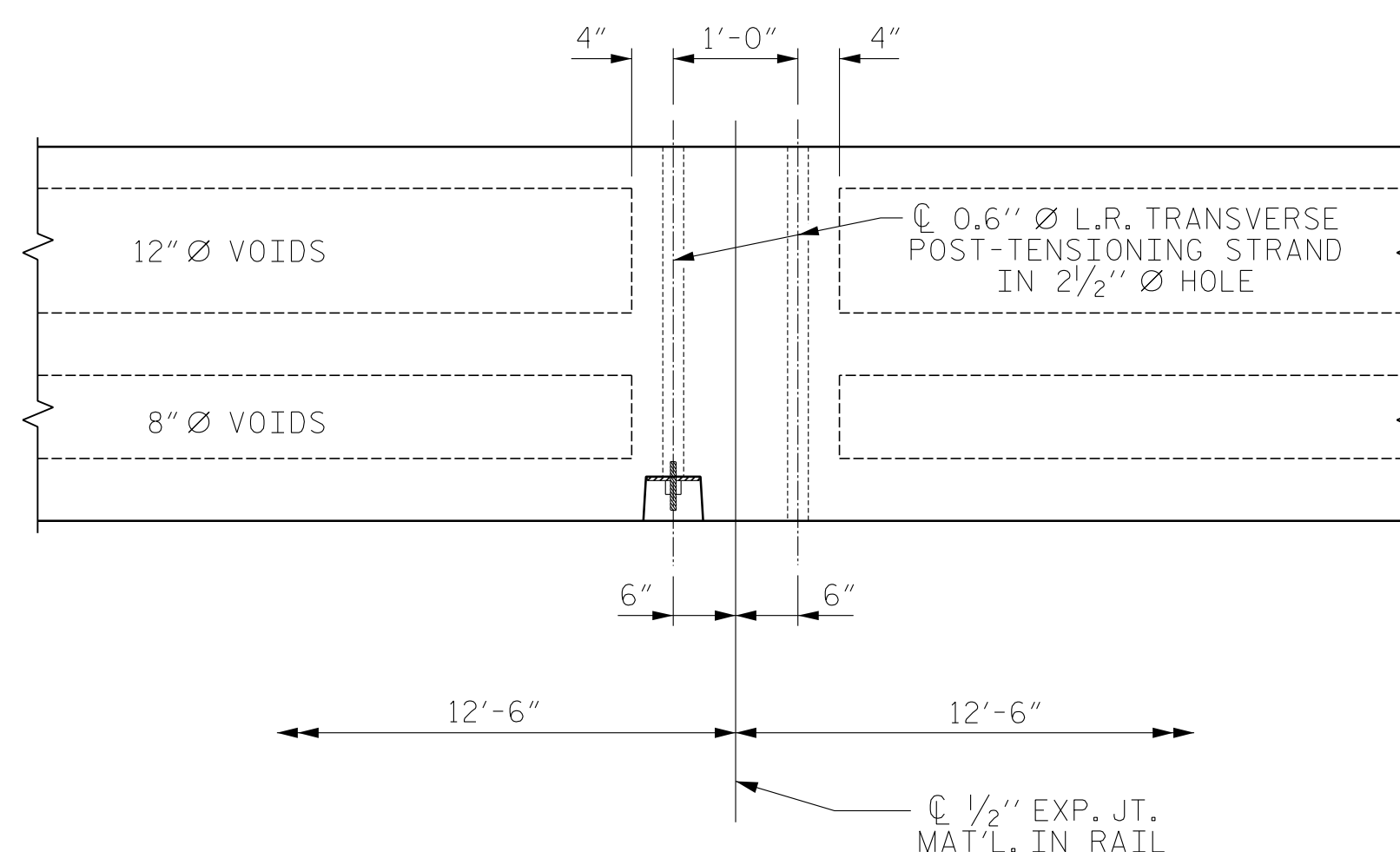
PLAN OF SPAN 'C'
(STAGE I)

NOTE: ALL DIMENSIONS AND REINFORCEMENT TYPICAL FOR SPAN 'A' AND SPAN 'C'.



DETAIL 'A'

(TYP. EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL 'B'

TYPICAL SPANS 'A' AND 'C'

DES. ENG. OF RECORD: RTS	DATE: 12/14
ASSEMBLED BY: MAF	DATE: 12/14
CHECKED BY: HLW	
DRAWN BY: DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY: BCH 3/09	

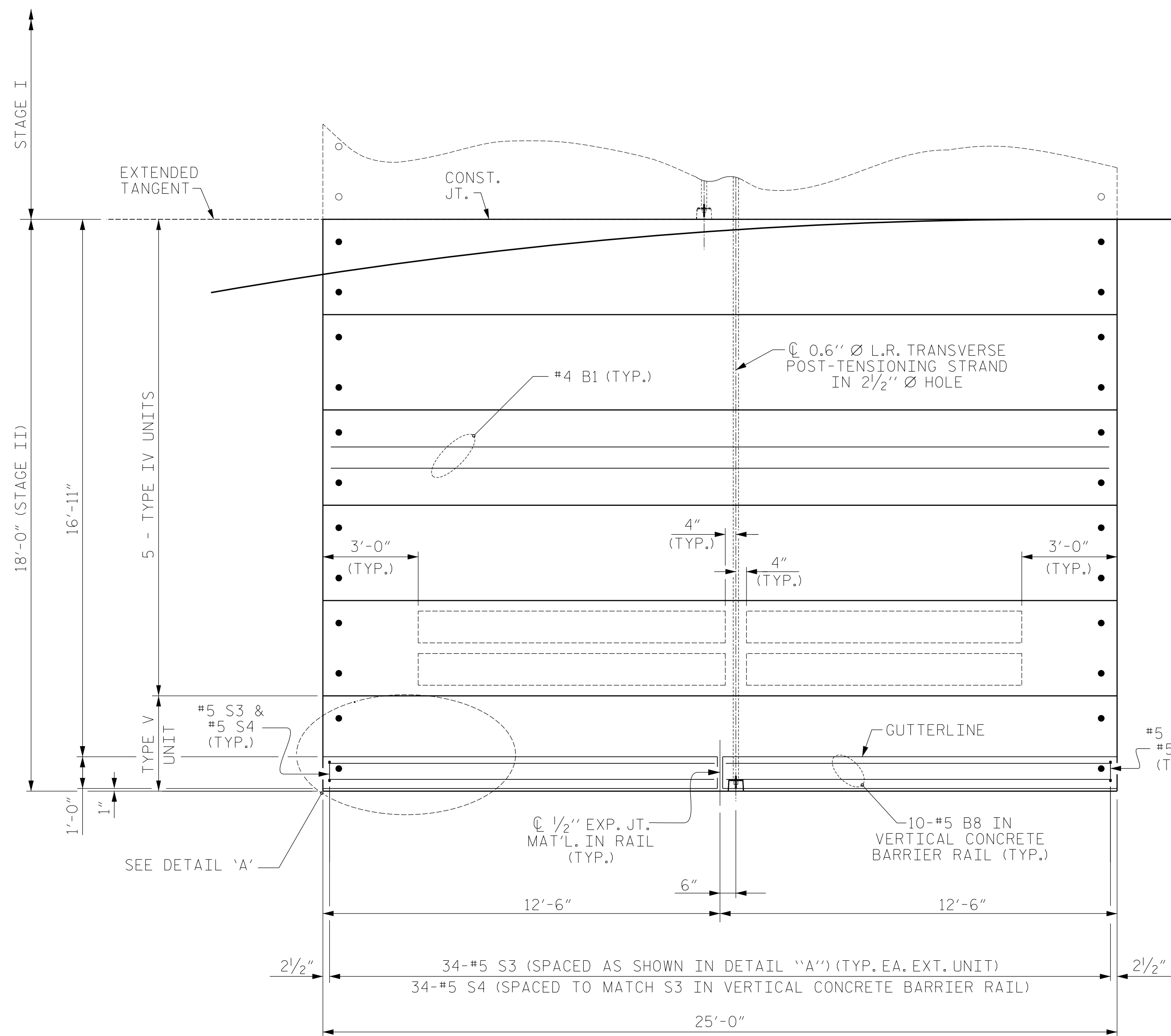


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

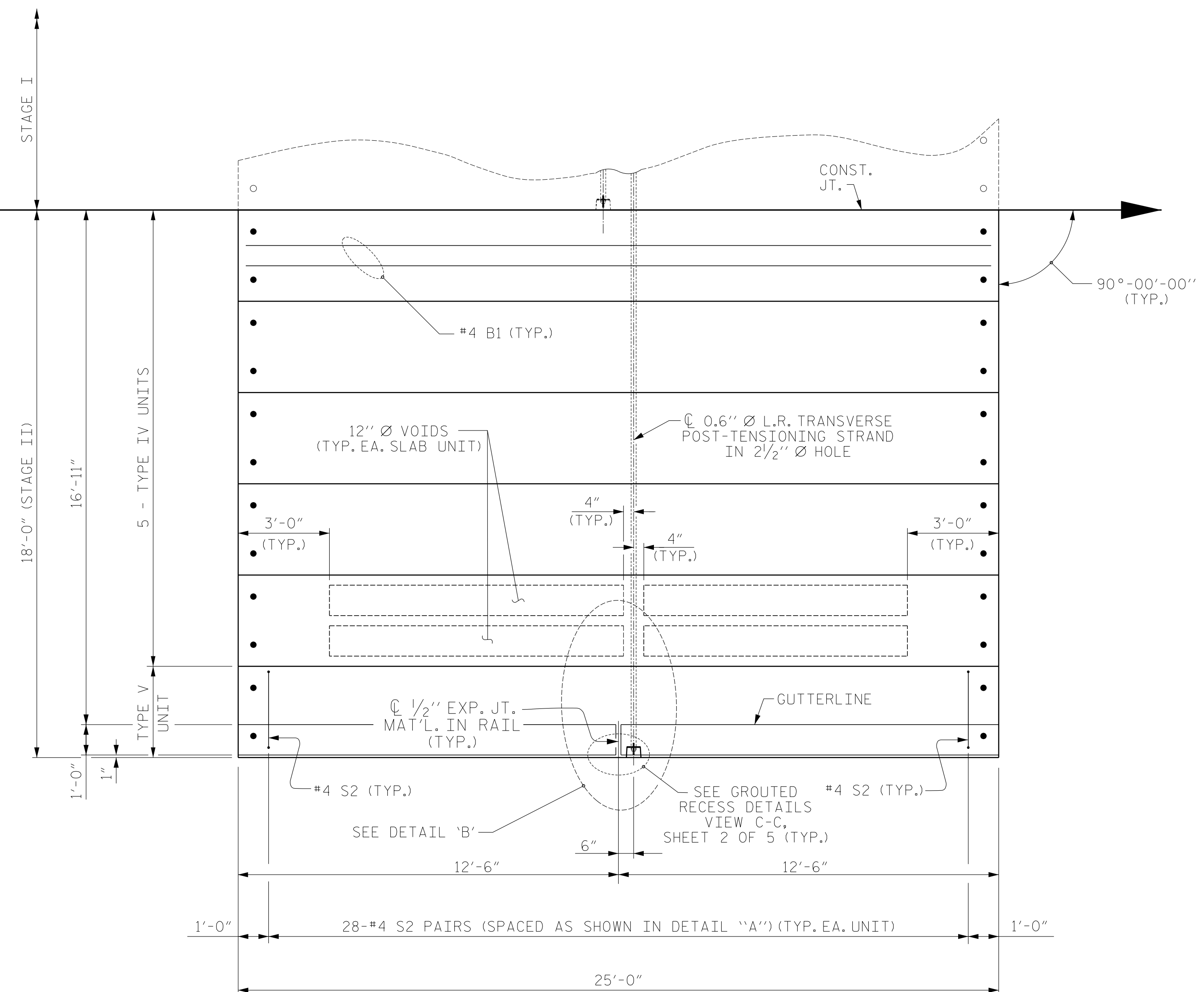
SHEET 3 OF 5
DEPARTMENT OF TRANSPORTATION
RALEIGH
PLAN OF 25' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
SPANS 'A' & 'C'
(STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			34

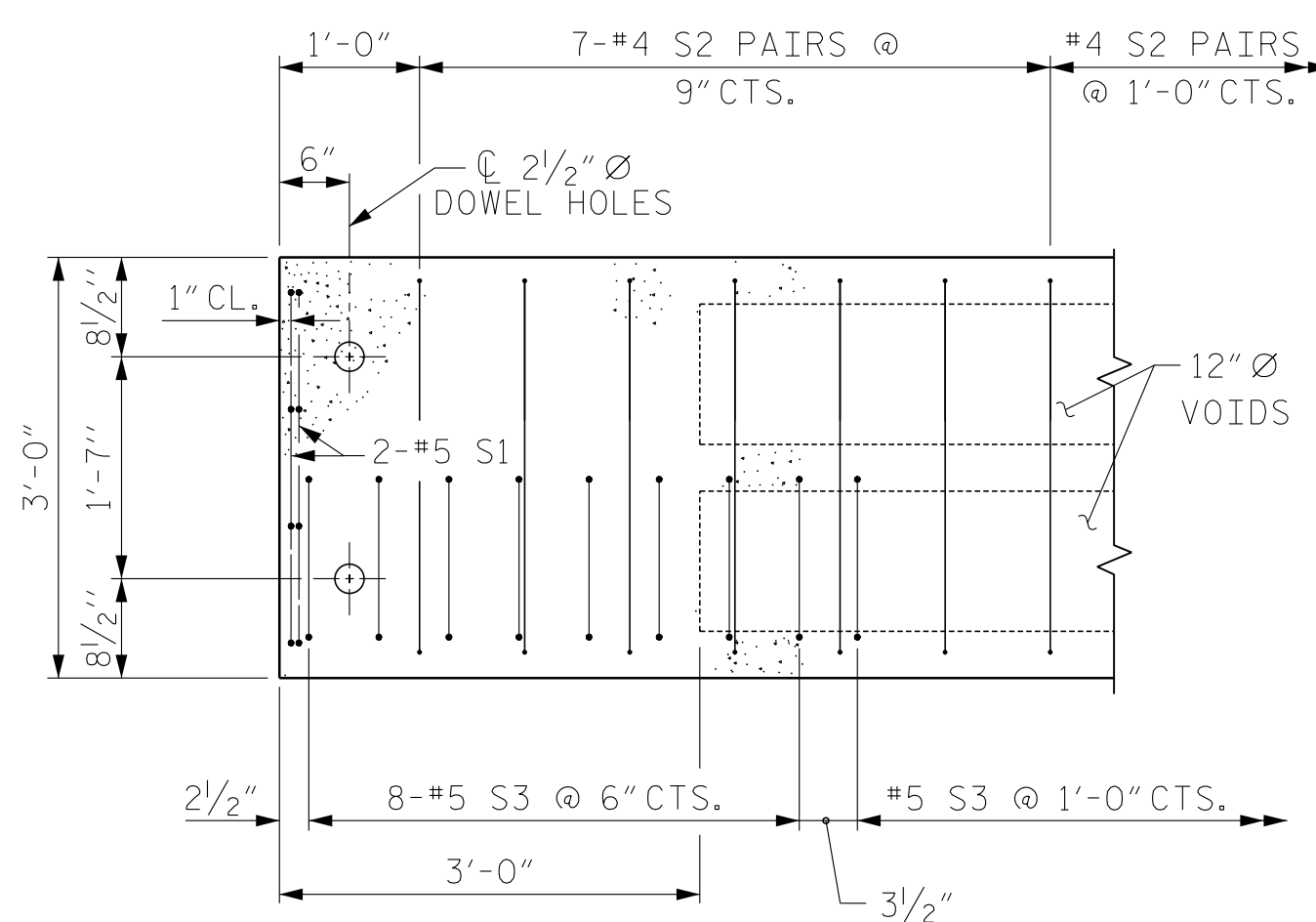


PLAN OF SPAN 'A'
(STAGE II)

NOTE: ALL DIMENSIONS AND REINFORCEMENT TYPICAL FOR SPAN 'A' AND SPAN 'C'.

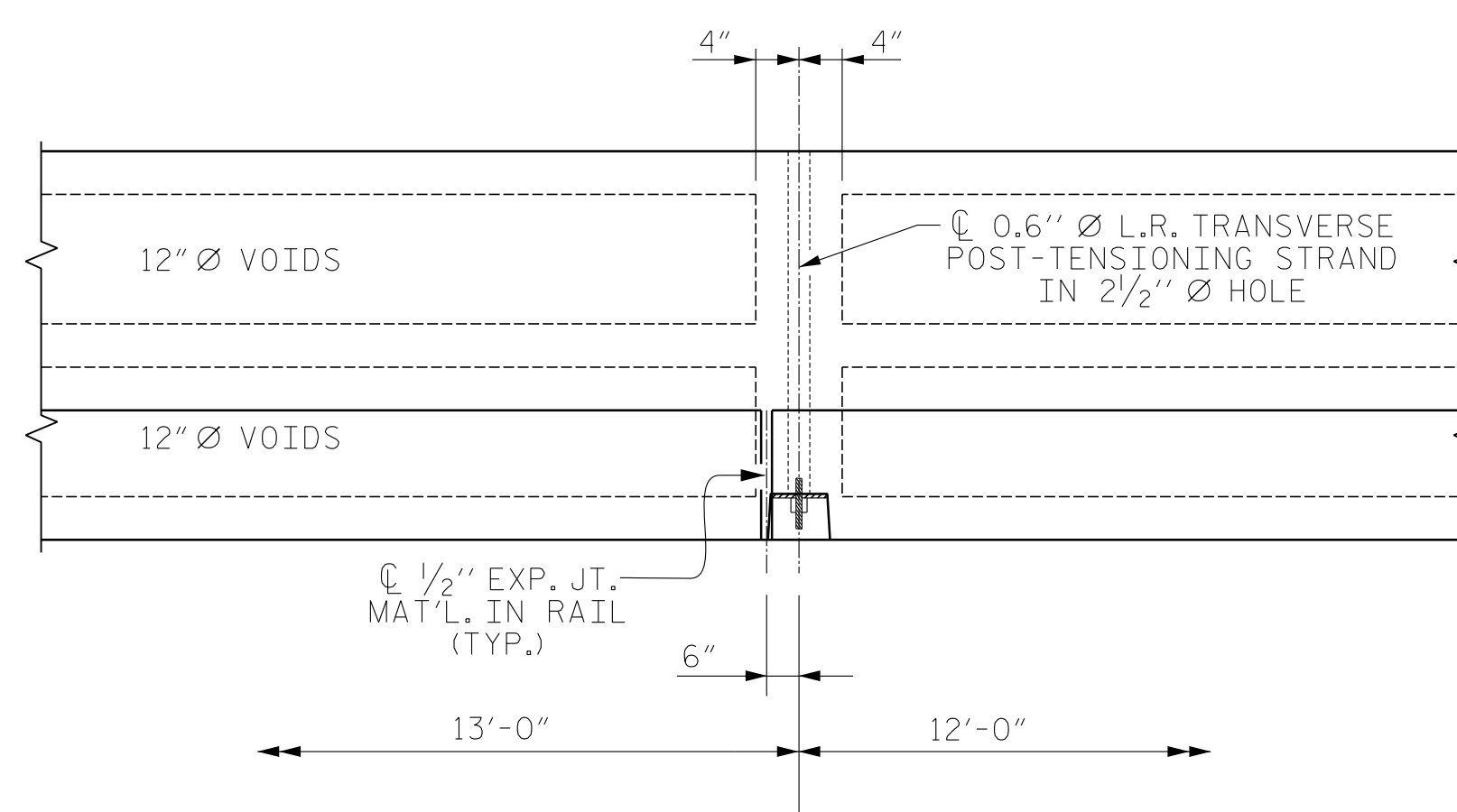


PLAN OF SPAN 'C'
(STAGE II)



DETAIL 'A'

(TYP. EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL 'B'

TYPICAL SPANS 'A' AND 'C'

DES. ENG. OF RECORD: RTS
ASSEMBLED BY: MAF DATE: 12/14
CHECKED BY: HLW DATE: 12/14
DRAWN BY: DGE 3/09 REV. 12/5/11 MAA/AAC
CHECKED BY: BCH 3/09



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

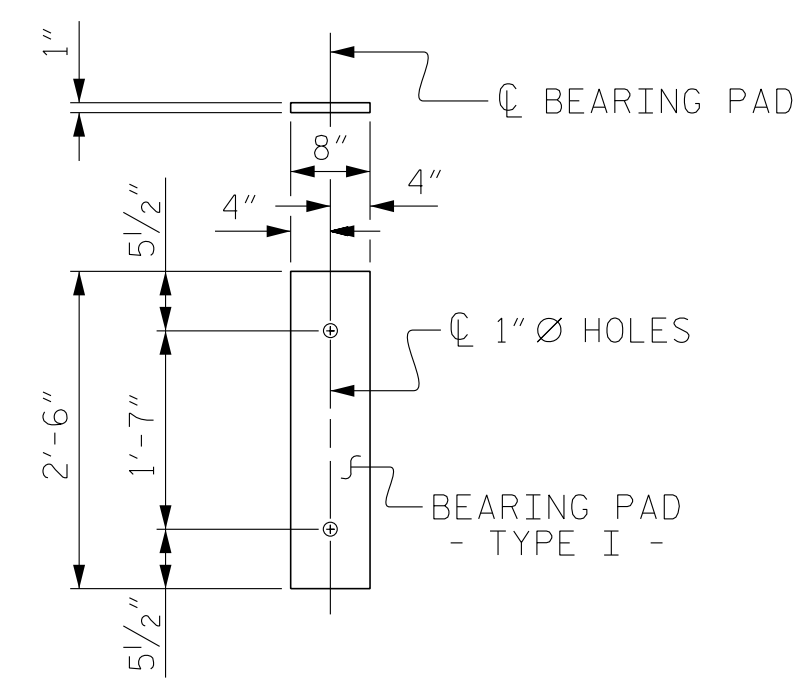
PROJECT NO. 17BP.14R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PLAN OF 25' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
SPANS 'A' & 'C'
(STAGE II)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			34

STD. NO. 21" PCS_33_90S_25L



FIXED END
(TYPE I - 44 REQ'D)
FOR SPANS 'A' & 'C' COMBINED.

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

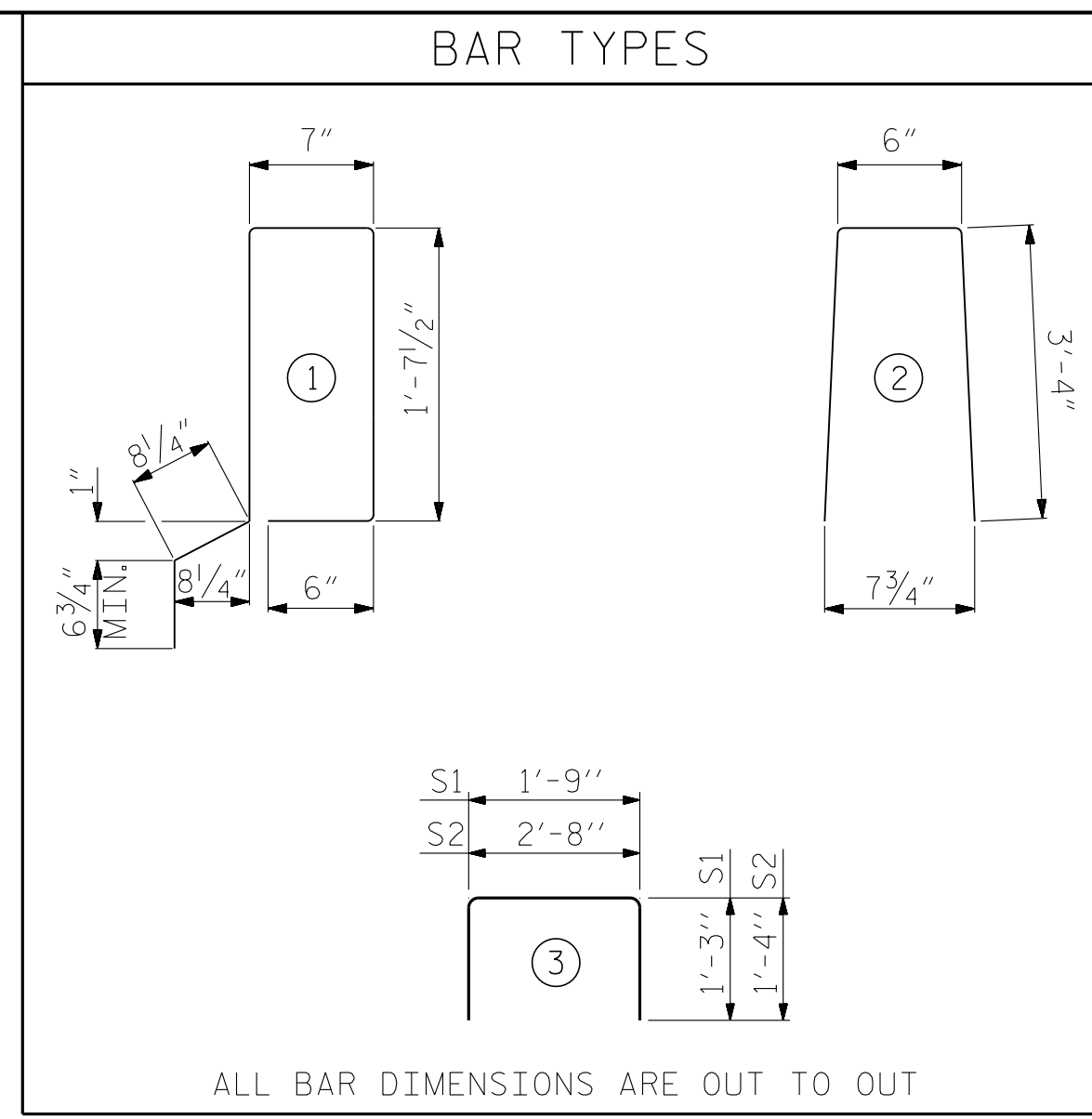
DEAD LOAD DEFLECTION AND CAMBER	
25' CORED SLAB UNIT	3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL †						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
25' UNIT						
* B8	20	40	#5	STR	24'-7"	1026
* S4	68	136	#5	2	7'-2"	1016
* EPOXY COATED REINFORCING STEEL						LBS. 2042
CLASS AA CONCRETE						CU.YDS. 12.8
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT. 100.50

† FOR SPANS 'A' & 'C' COMBINED.

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT							
		EXTERIOR UNIT		INTERIOR UNIT			
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-8"	33	24'-8"	33
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	54	#4	3	5'-4"	192	5'-4"	192
* S3	34	#5	1	5'-7"	198		
REINFORCING STEEL				LBS.	260		260
* EPOXY COATED REINFORCING STEEL				LBS.	198		
5000 P.S.I. CONCRETE				CU. YDS.	3.7		3.7
0.6" Ø L.R. STRANDS				No.	9		9



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

THE BACKER RODS 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 SIDWAYS. 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.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL 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 BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

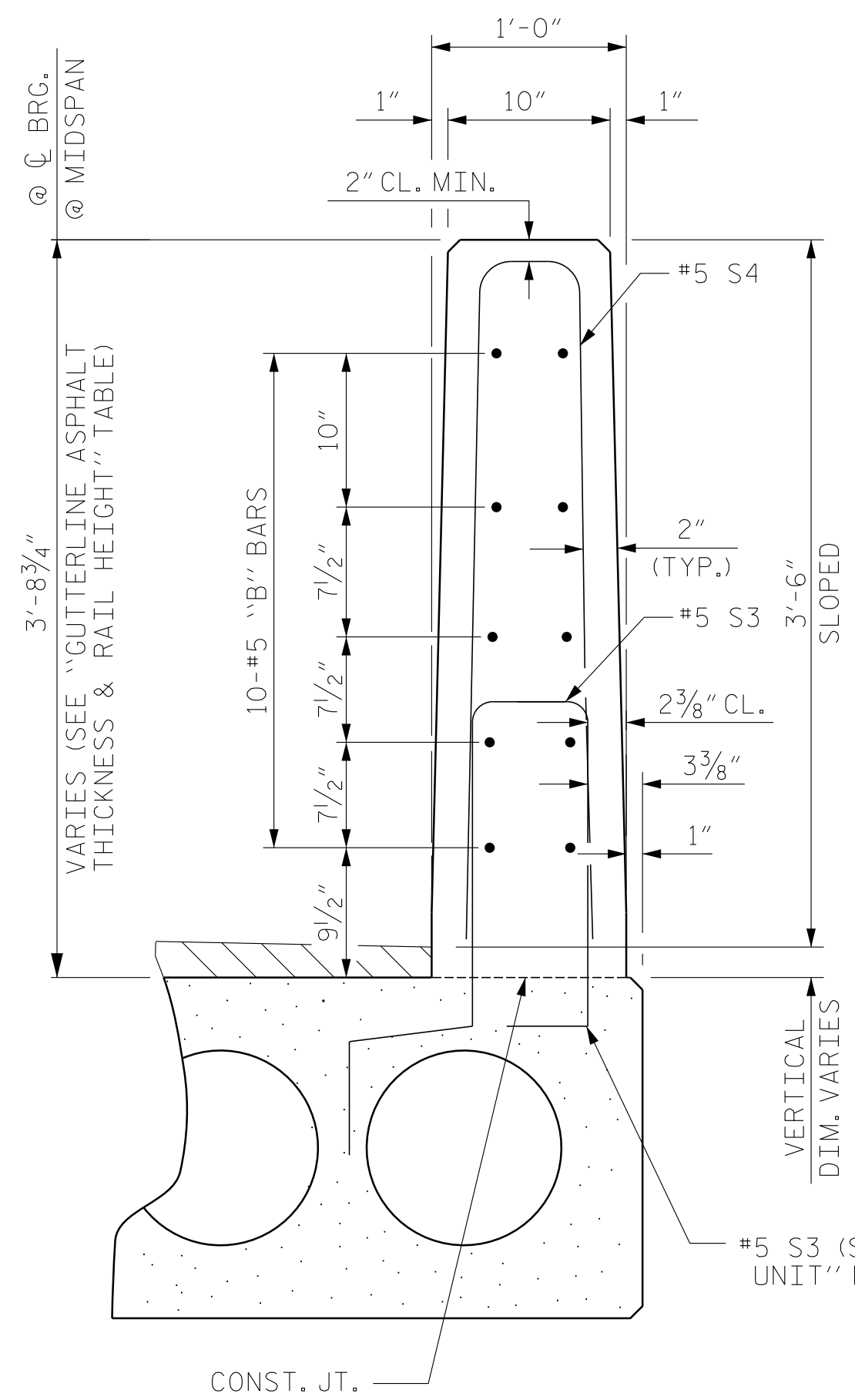
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
30'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
25' UNITS	2 5/8"	3'-8 5/8"

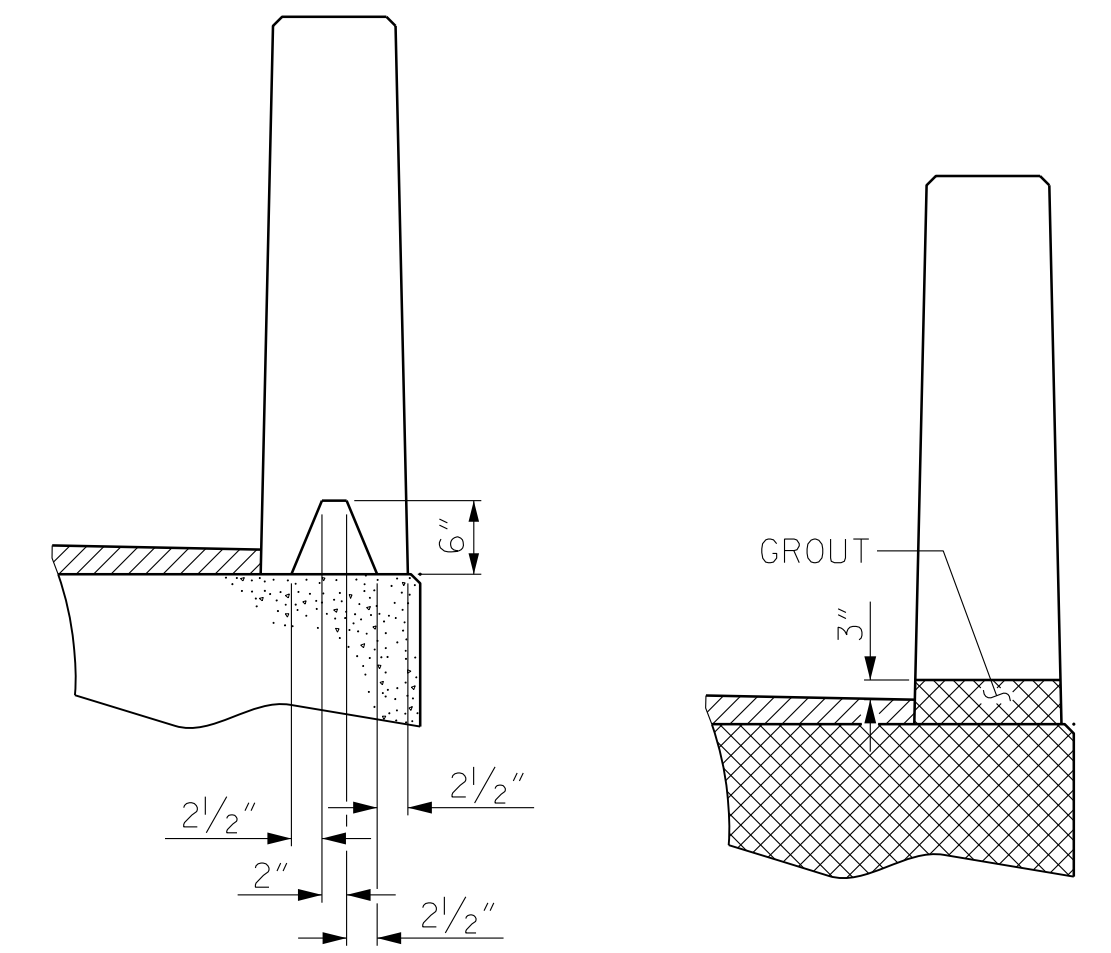
CORED SLABS REQUIRED			
25' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	4	25'-0"	100'-0"
INTERIOR C.S.	18	25'-0"	450'-0"
TOTAL	22		550'-0"

QUANTITIES FOR SPANS 'A' & 'C' COMBINED.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25' UNITS	4000

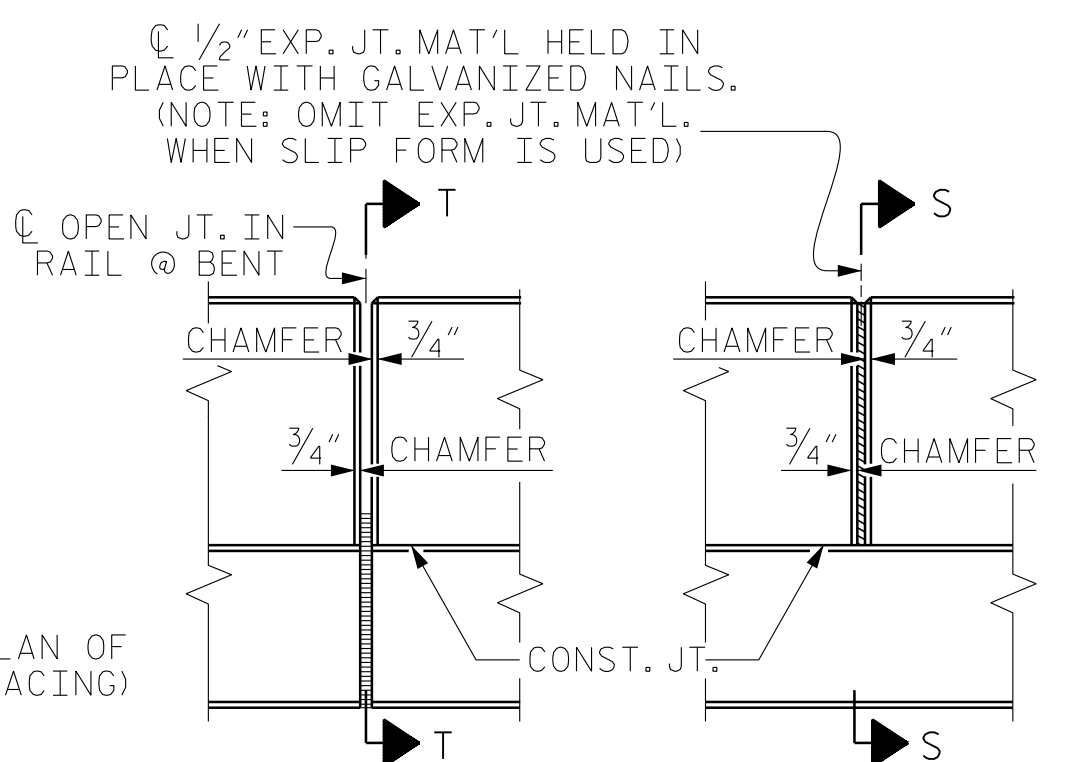


VERTICAL CONCRETE BARRIER RAIL SECTION

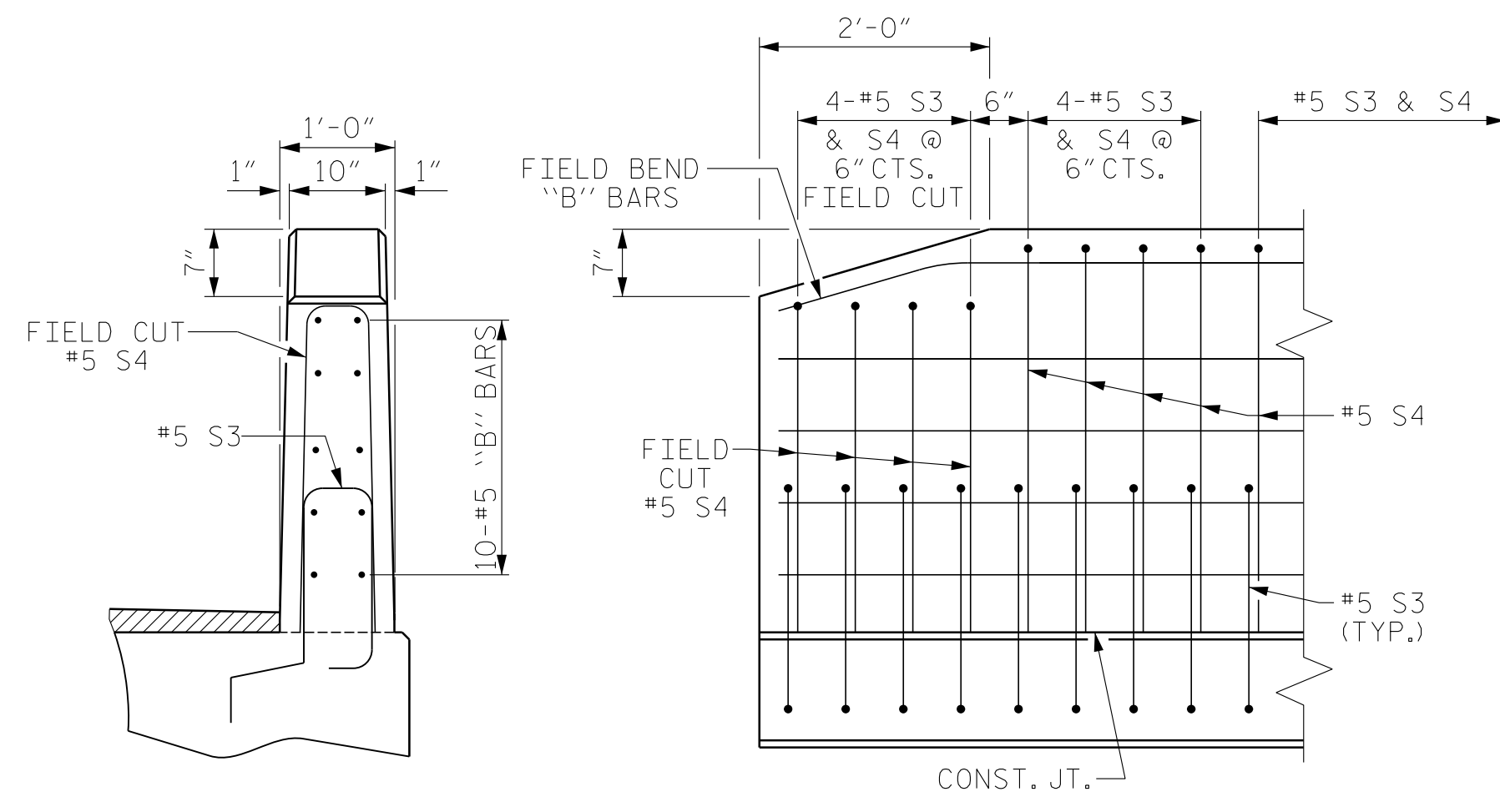


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



ELEVATION AT EXPANSION JOINTS



END VIEW

SIDE VIEW

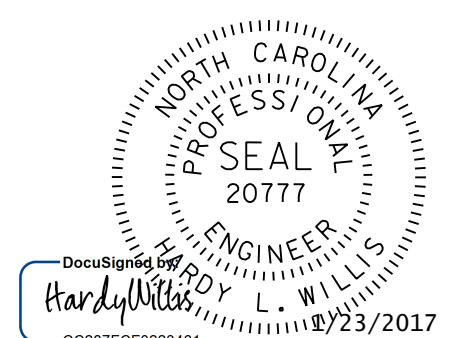
END OF RAIL DETAILS

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

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 5 OF 5

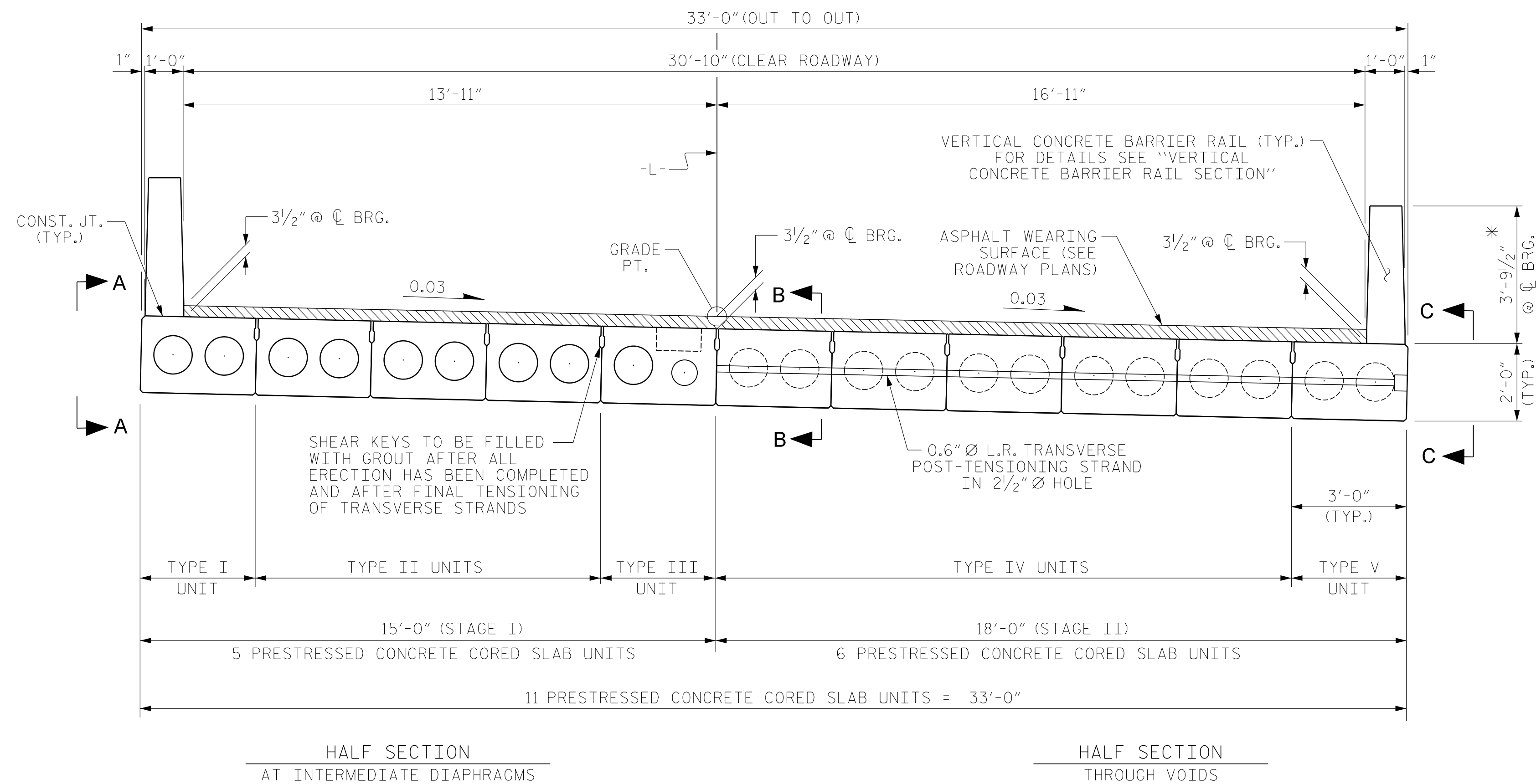
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW
SPANS 'A' & 'C'



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			34

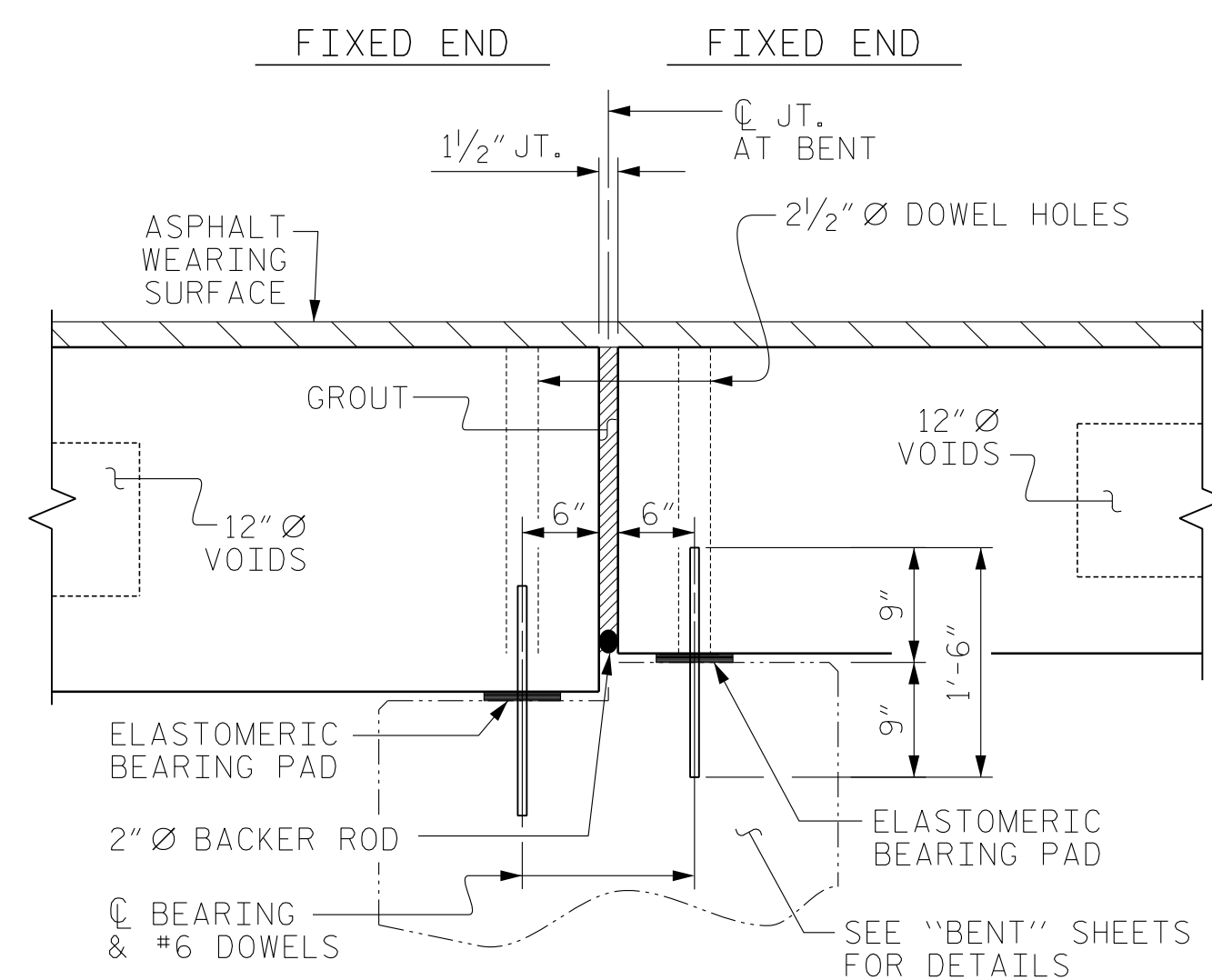
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES. ENG. OF RECORD: RTS			
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 5/09	REV. 12/11	MAA/AAC
CHECKED BY :	BCH 6/09		

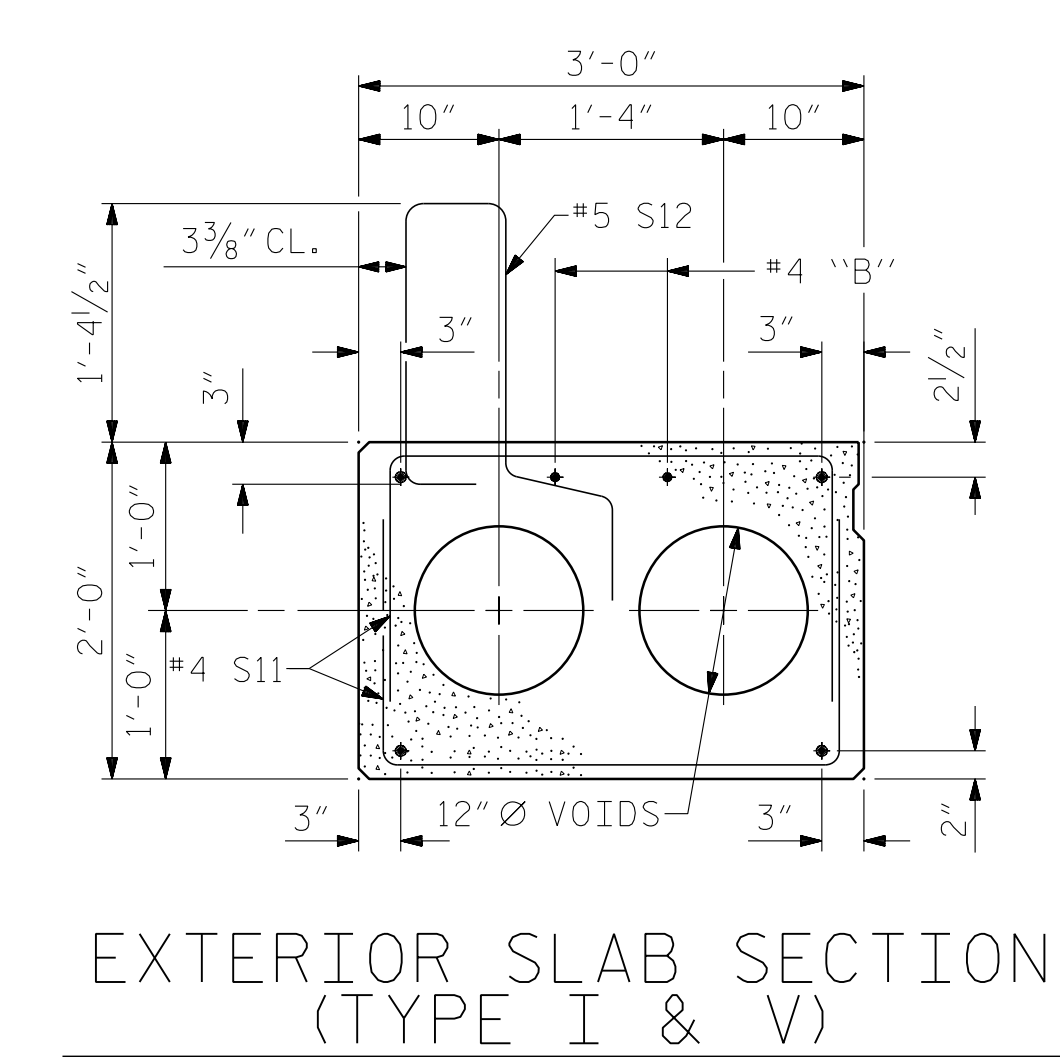


TYPICAL SECTION - SPAN 'B'

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

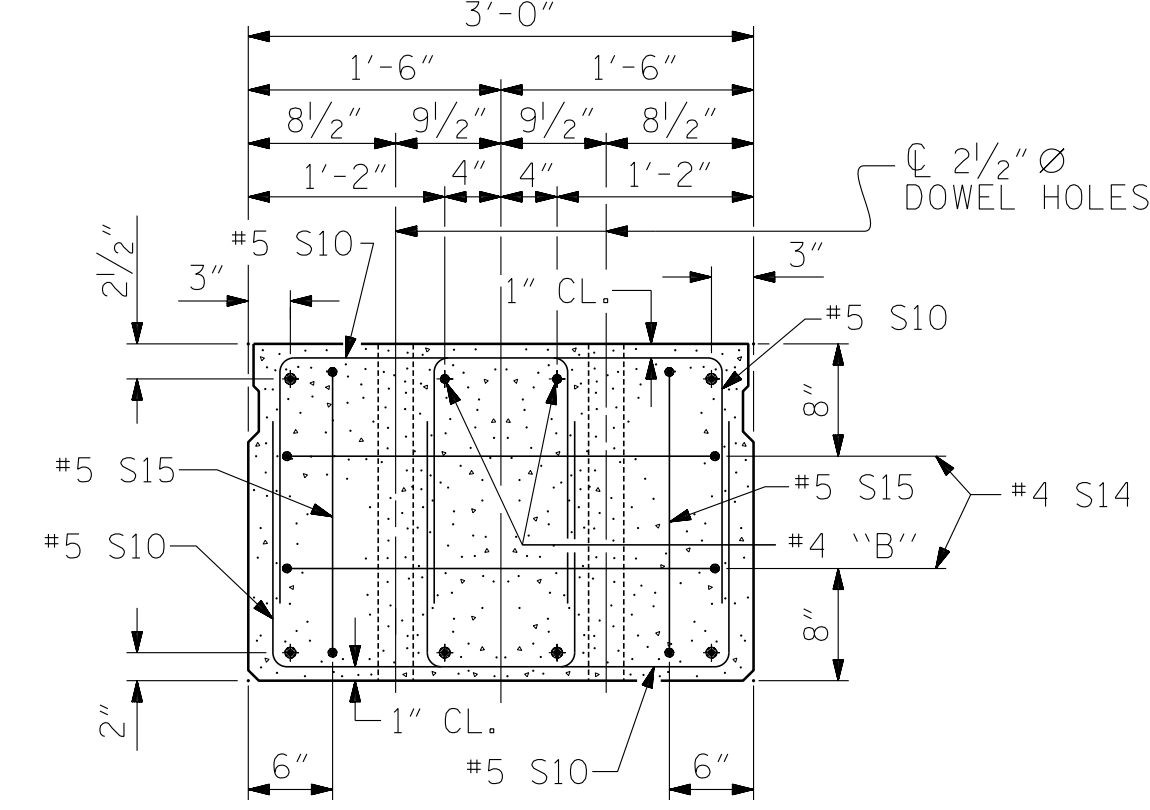


SECTION AT BENT



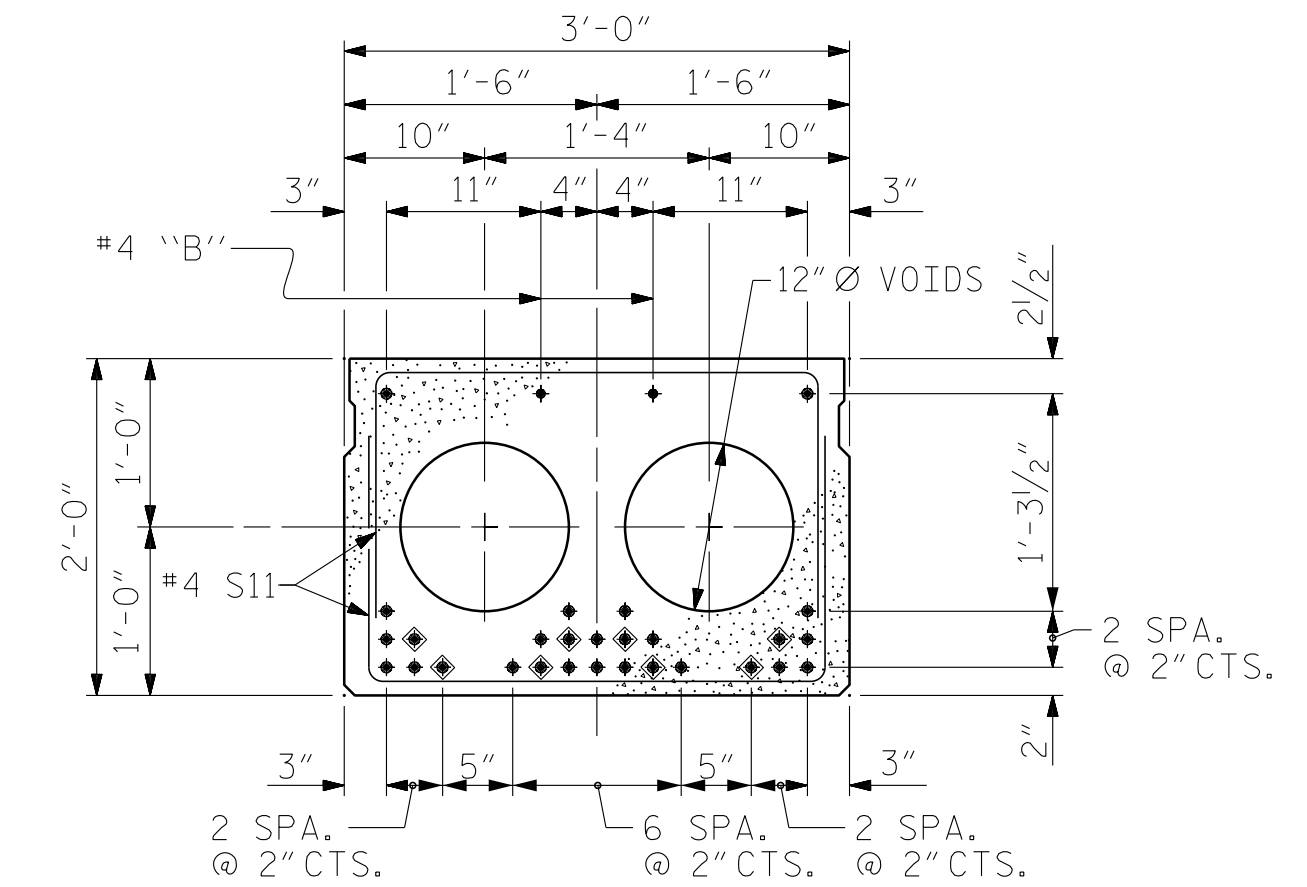
EXTERIOR SLAB SECTION (TYPE I & V)

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION - TYPE II & IV)



END ELEVATION

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



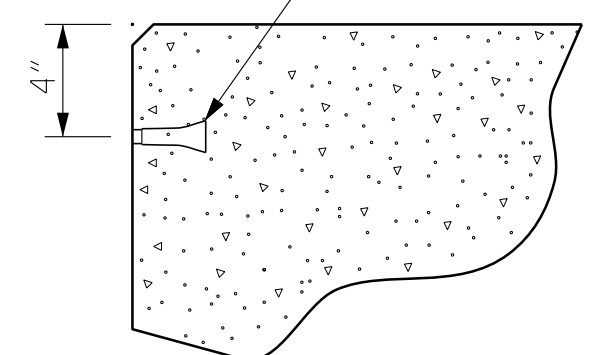
STRAND LAYOUT FOR 70' UNIT (TYPE II & IV)
(28 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

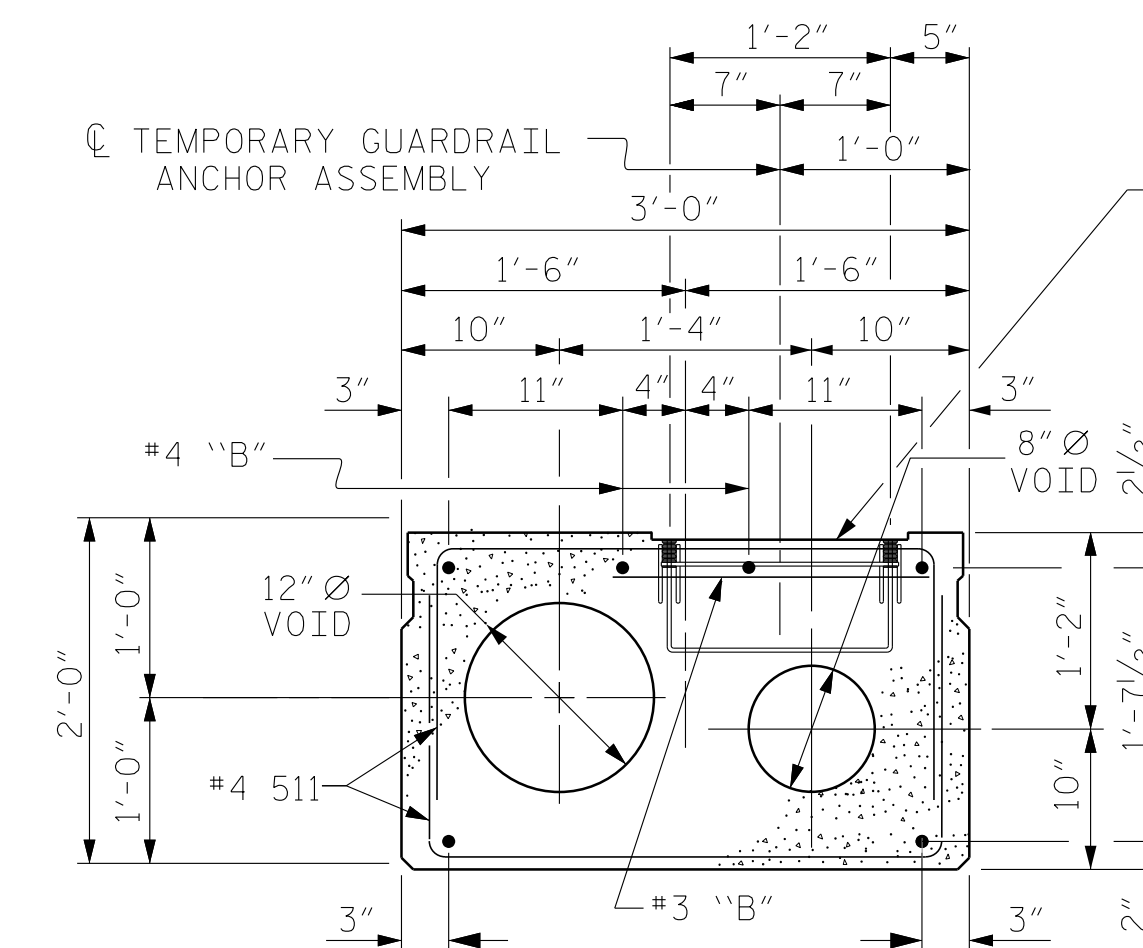
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL



INTERIOR SLAB SECTION (TYPE III)

(FOR PRESTRESSED STRAND LAYOUT, SEE "INTERIOR SLAB SECTION - TYPE I, II, IV & V")

FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY LOCATION, SEE SECTION OF ANCHOR ASSEMBLY LOCATION ON "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET.



PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 1 OF 5

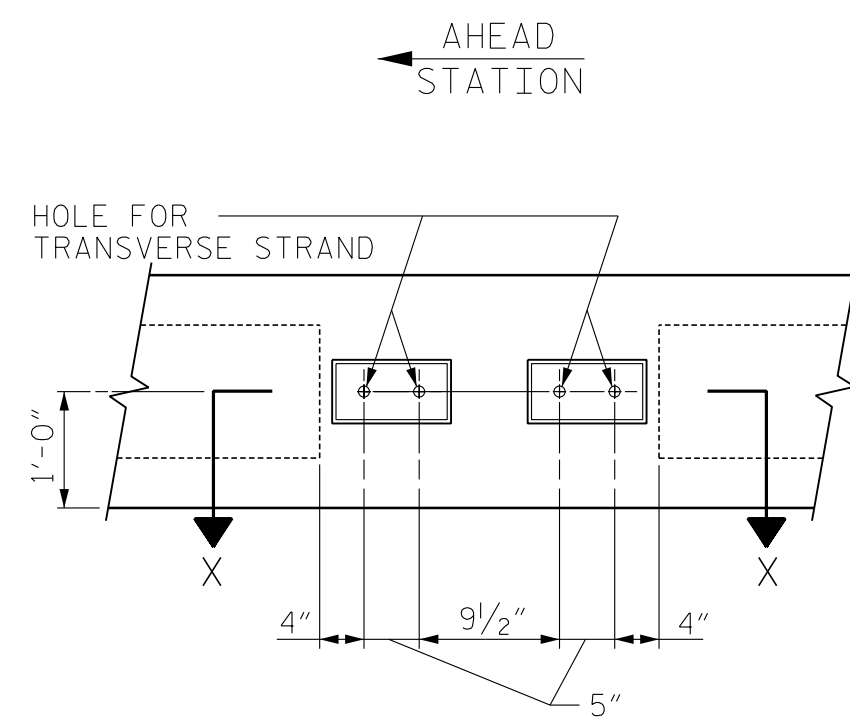
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-0"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW
 SPAN 'B'

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			34

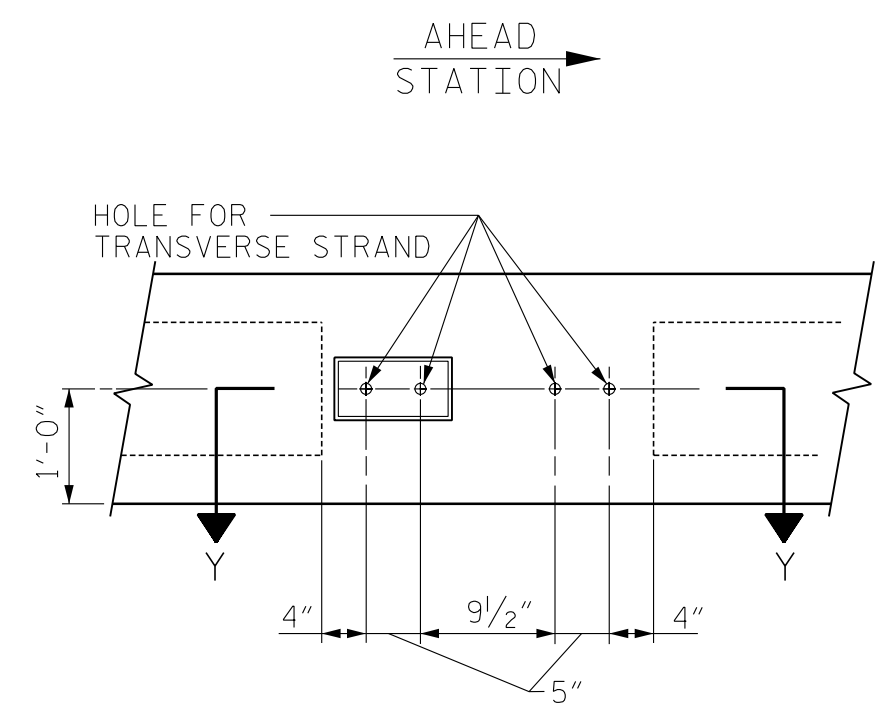
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STD. NO. 24PCS4-33-90S

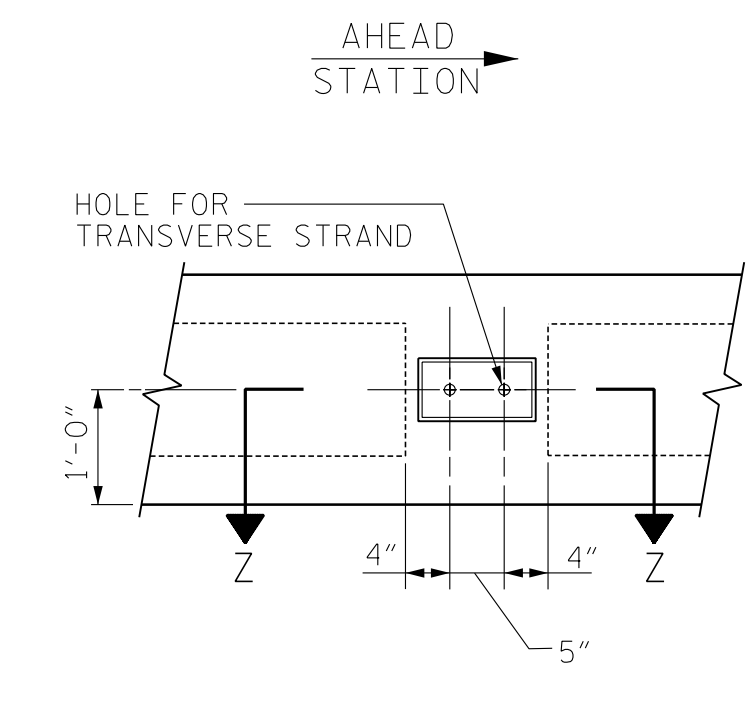
DES. ENG. OF RECORD: RTS			
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	MAA 6/10	REV. 12/11	MAA/AAC
CHECKED BY :	MKT 7/10		



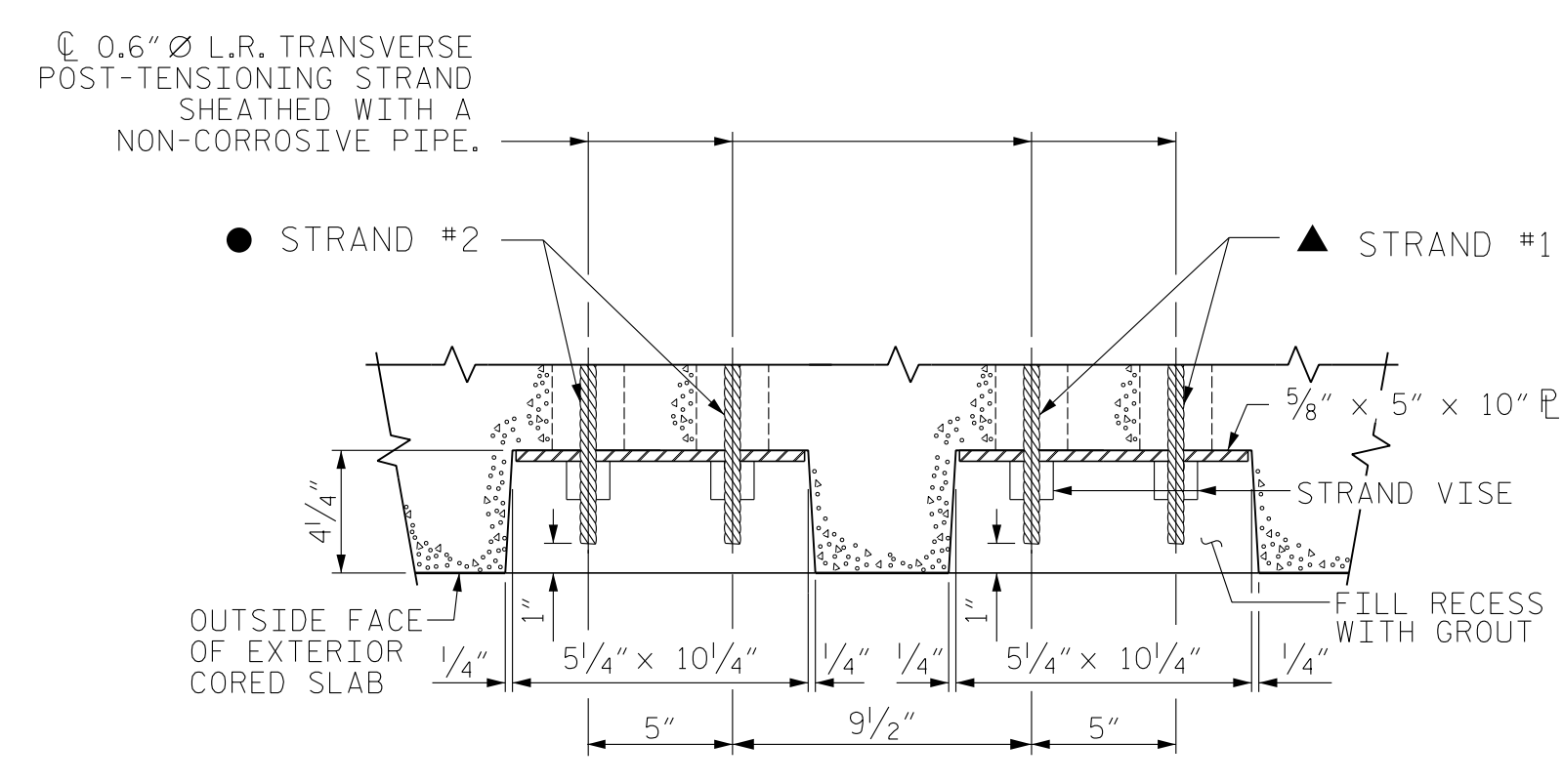
VIEW A-A
SEE SHEET 1 OF 5



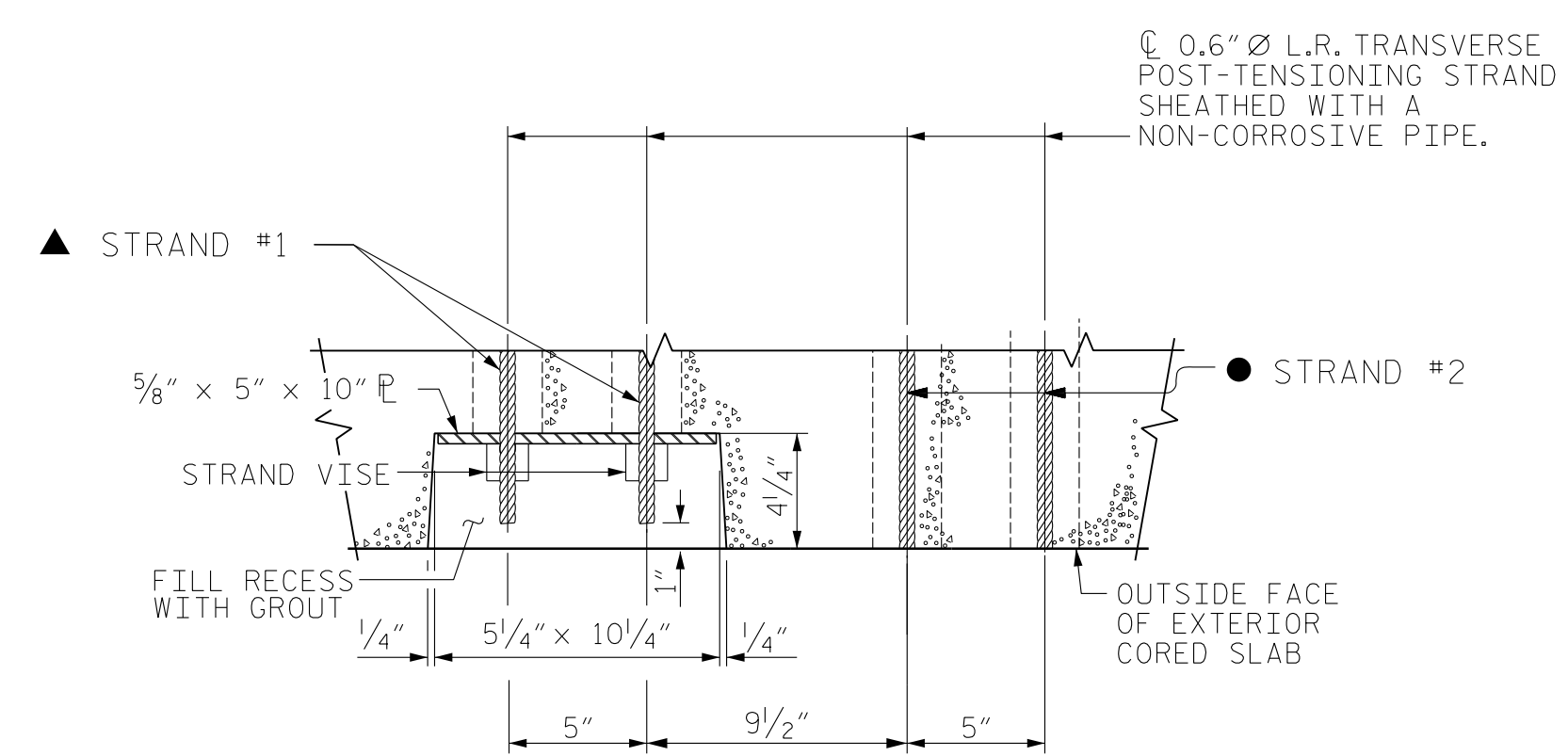
VIEW B-B
SEE SHEET 1 OF 5



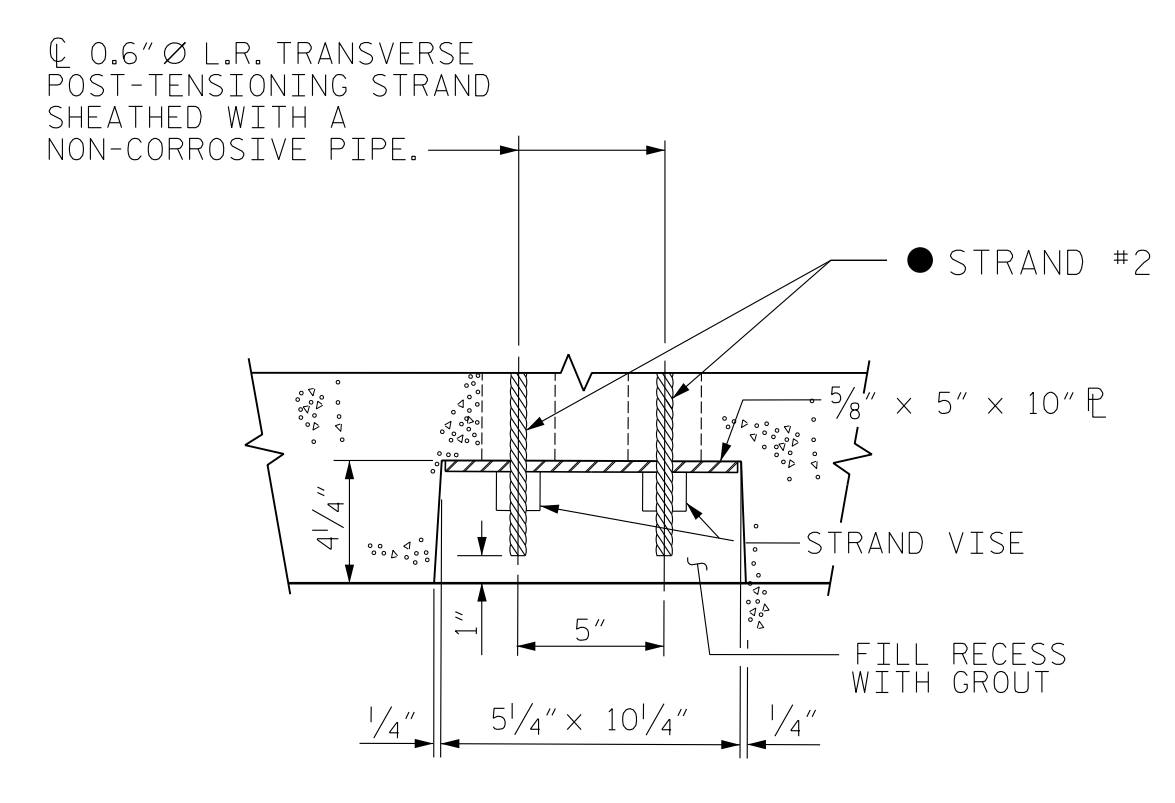
VIEW C-C
SEE SHEET 1 OF 5



SECTION X-X
(TYPE I UNIT)



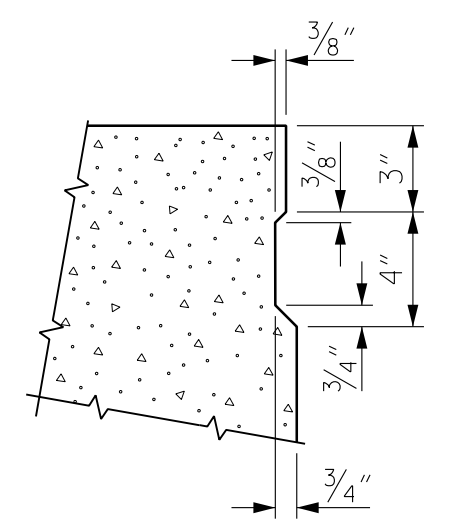
SECTION Y-Y
(TYPE III UNIT)



SECTION Z-Z
(TYPE V UNIT)

▲ STRANDS #1 GO THROUGH 5 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION).
● STRANDS #2 GO THROUGH ALL 11 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION).

GROUTED RECESS AT END OF POST-TENSIONED STRAND



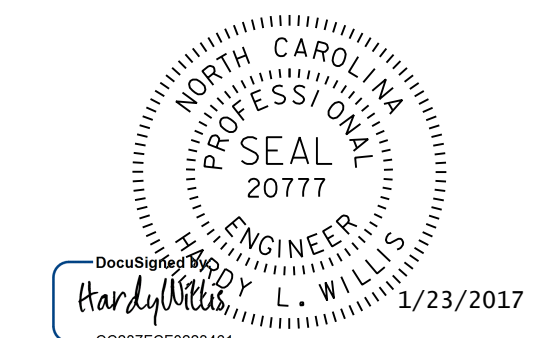
SHEAR KEY DETAIL

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

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW
SPAN 'B'



V&M
Vaughn & Melton
Consulting Engineers

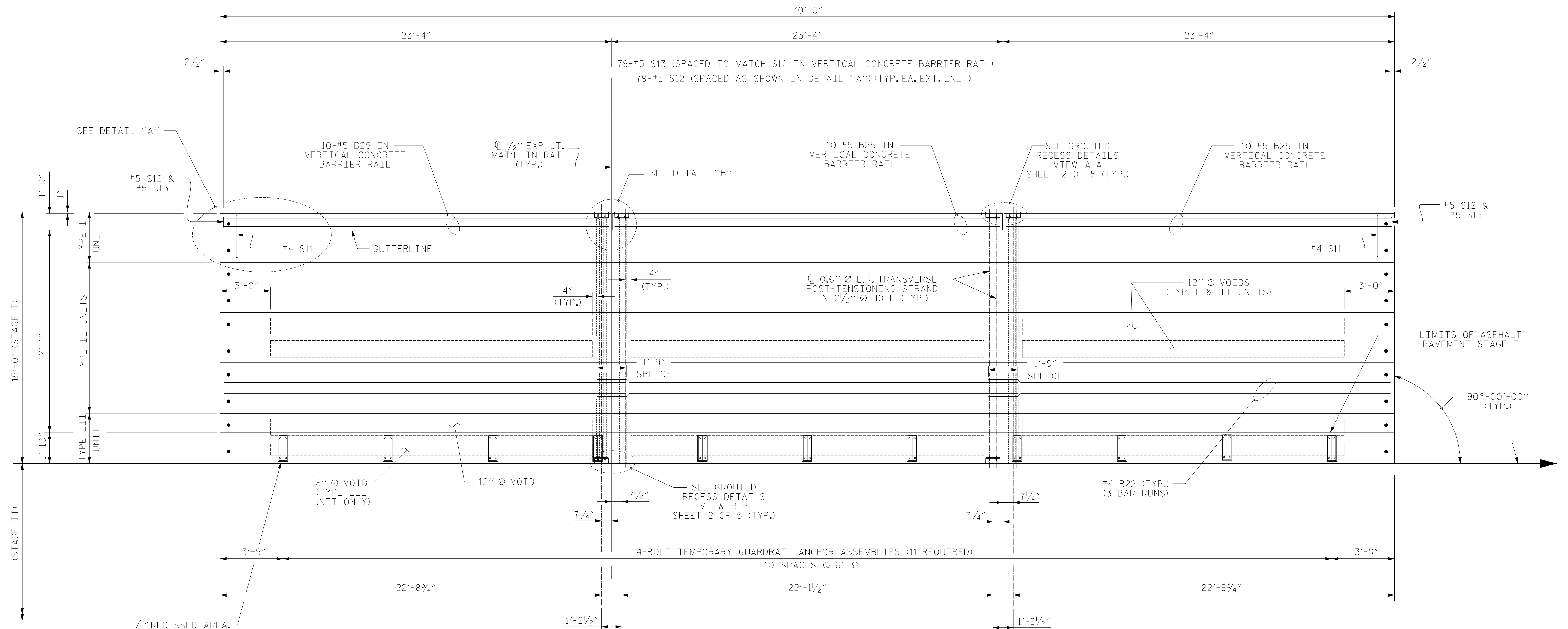
Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865-546-5800
Asheville, North Carolina 828-253-2796
Middlesboro, Kentucky 606-248-6600
Spartanburg, South Carolina 864-574-4775

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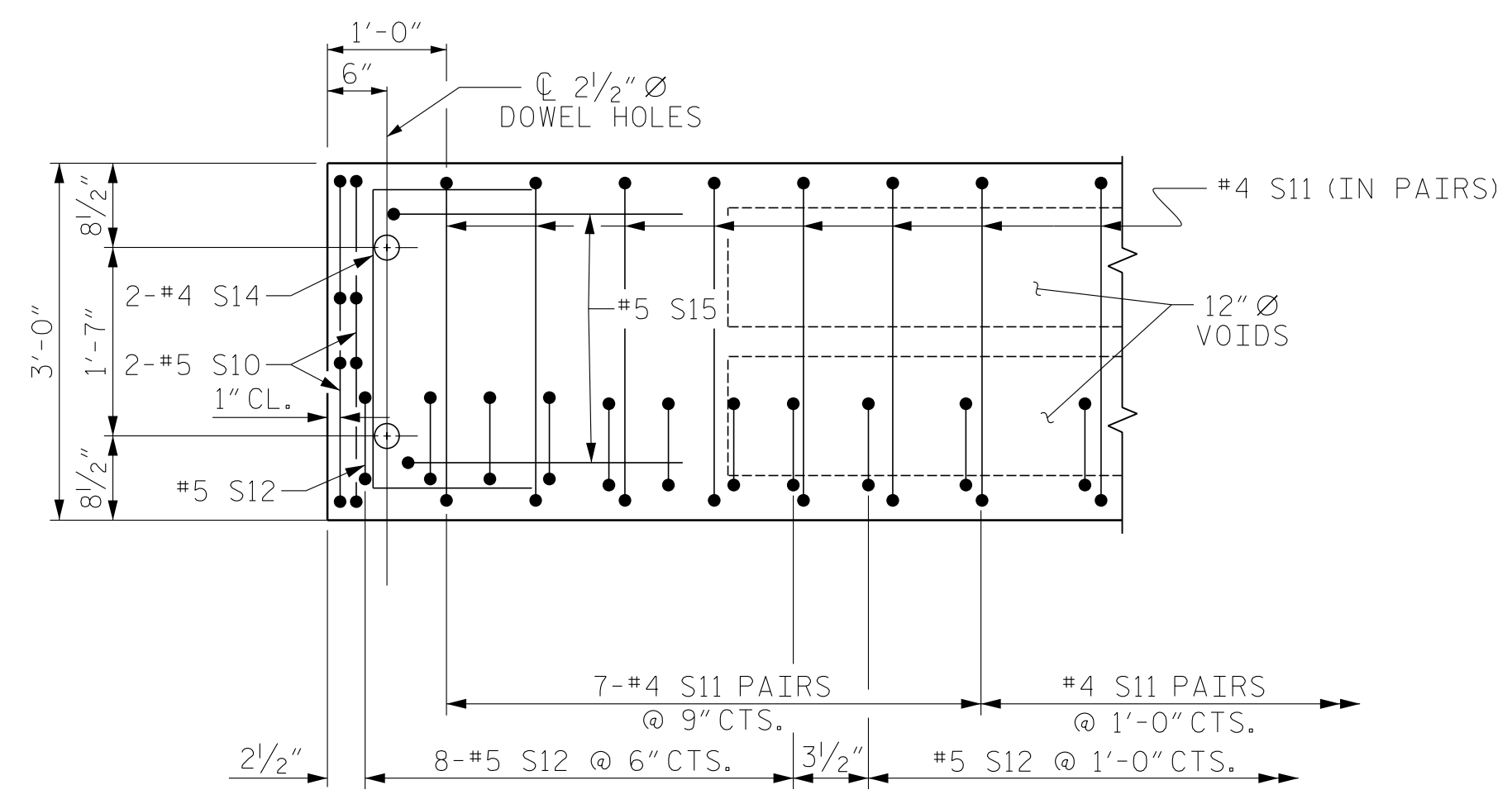
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWN. BY: RWW/MAF DATE: 12/14
CHKD. BY: HLW DATE: 12/14
DES. EGR. OF RECORD: RTS DATE: 12/14

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	
2			4			34	

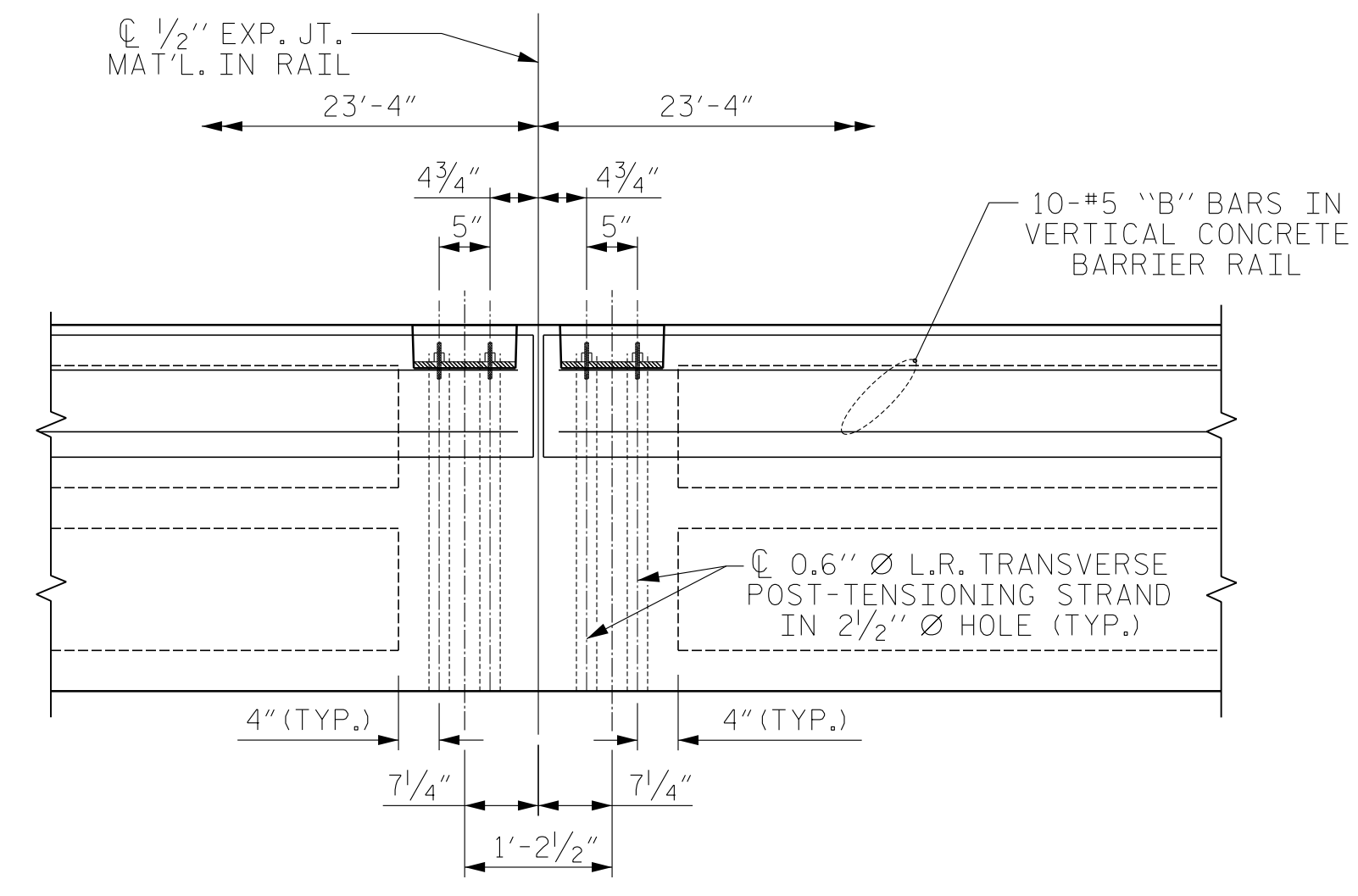


PLAN OF UNIT - SPAN "B"
(STAGE I)



DETAIL "A"

(TYP. EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

DES. ENG. OF RECORD: RTS

ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	MAA	6/10	REV. 12/5/11
CHECKED BY :	MKT	7/10	MAA/AAC



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

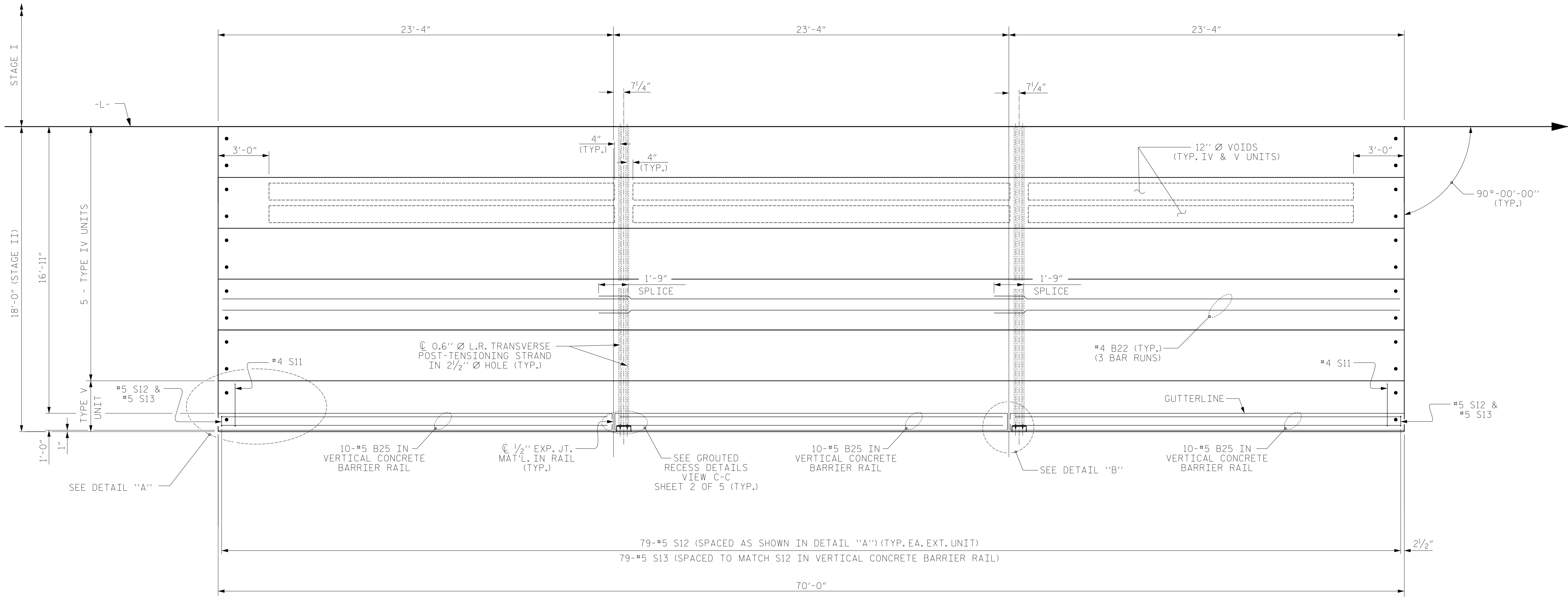
PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 3 OF 5

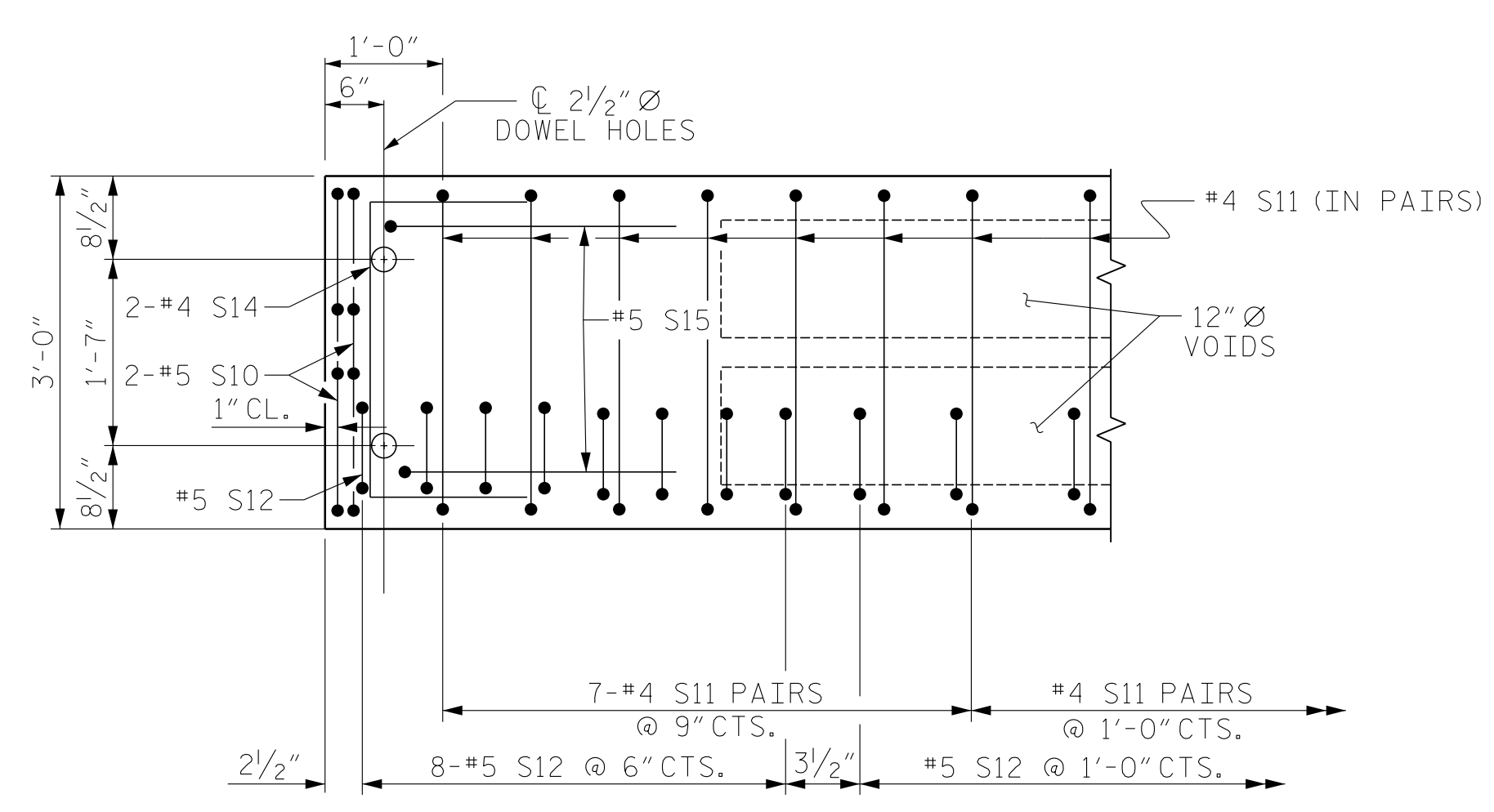
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
(SPAN 'B')
(STAGE I)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			34

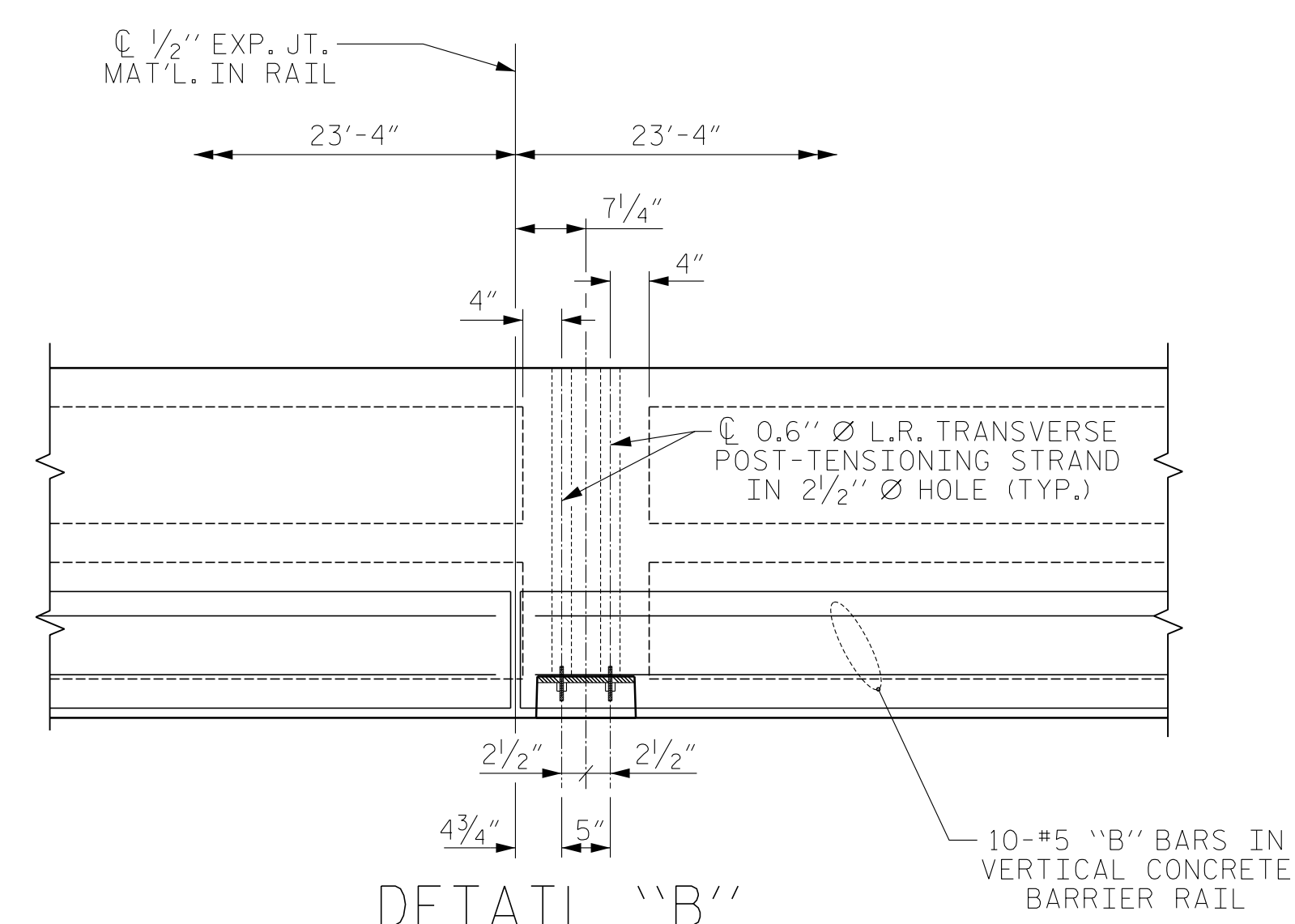


PLAN OF UNIT - SPAN "B"
(STAGE II)



DETAIL "A"

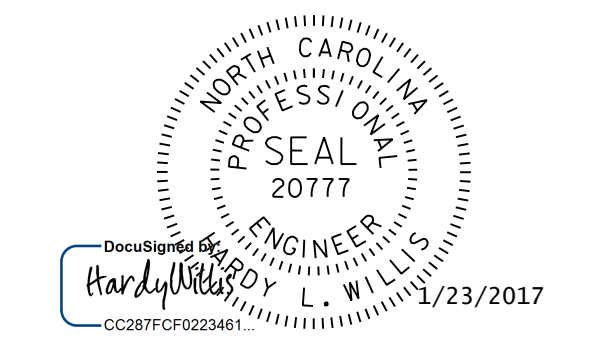
(TYP. EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR
UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY
TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND
2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

DES. ENG. OF RECORD: RTS			
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	MAA	6/10	REV. 12/5/11
CHECKED BY :	MKT	7/10	MAA/AAC

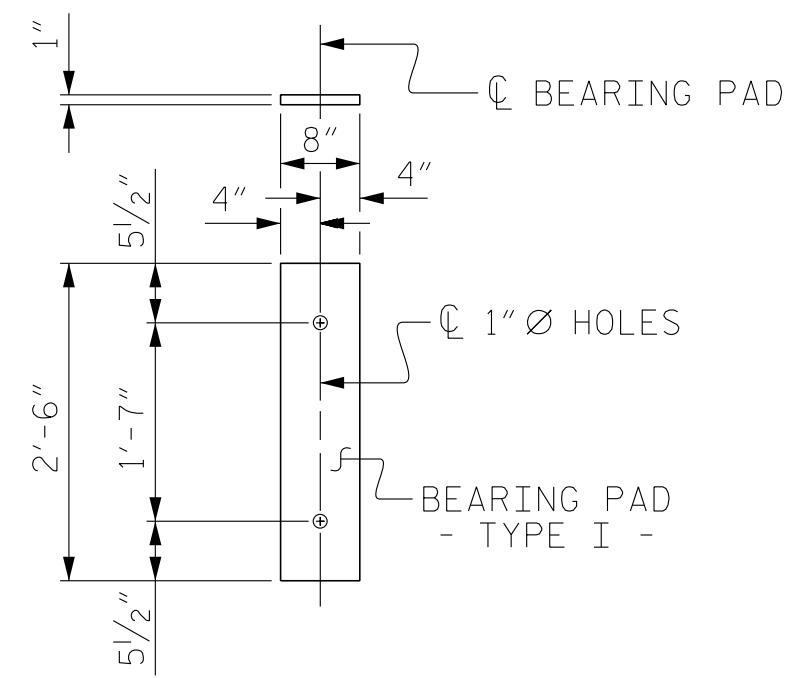


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 4 OF 5
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**PLAN OF 70' UNIT
30'-10" CLEAR ROADWAY
90° SKEW
(SPAN 'B')
(STAGE II)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			34



FIXED END
(TYPE I - 22 REQ'D)

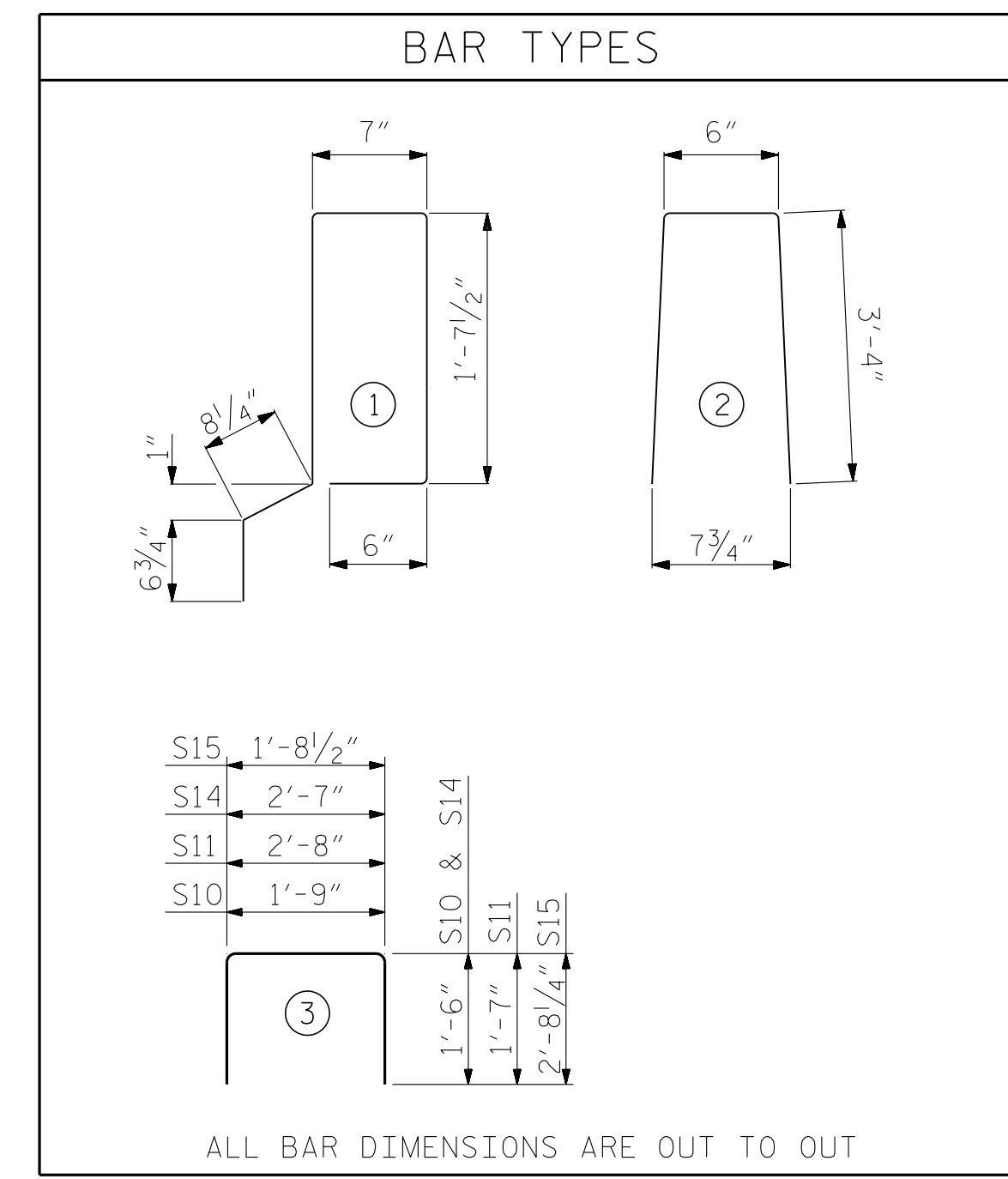
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	9	70'-0"	630'-0"
TOTAL	11		770'-0"

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	70' UNIT					
*B25	60	60	#5	STR	22'-11"	1434
*S13	158	158	#5	2	7'-2"	1181
*EPOXY COATED REINFORCING STEEL					LBS.	2615
CLASS AA CONCRETE					CU.YDS.	18.1
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	140.25

BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	144	#4	3	5'-10"	561	5'-10"	561
*S12	79	#5	1	5'-7"	460		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL					LBS.	744	744
*EPOXY COATED REINFORCING STEEL					LBS.	460	
8000 P.S.T. CONCRETE					CU. YDS.	11.8	11.8
0.6" Ø L.R. STRANDS					No.	28	28



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

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

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

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

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

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

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS 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 BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

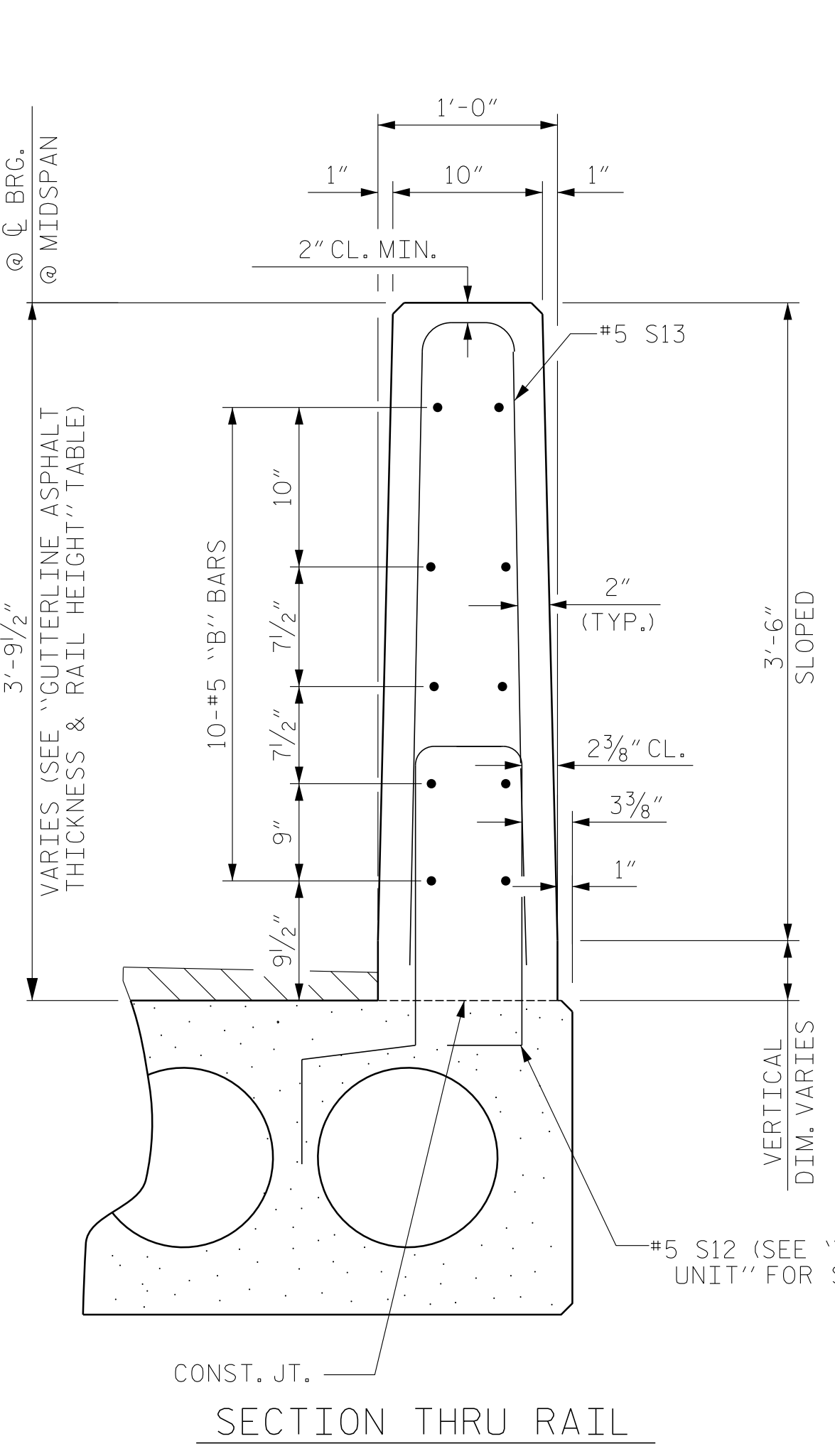
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
70' UNITS	2"	3'-8"

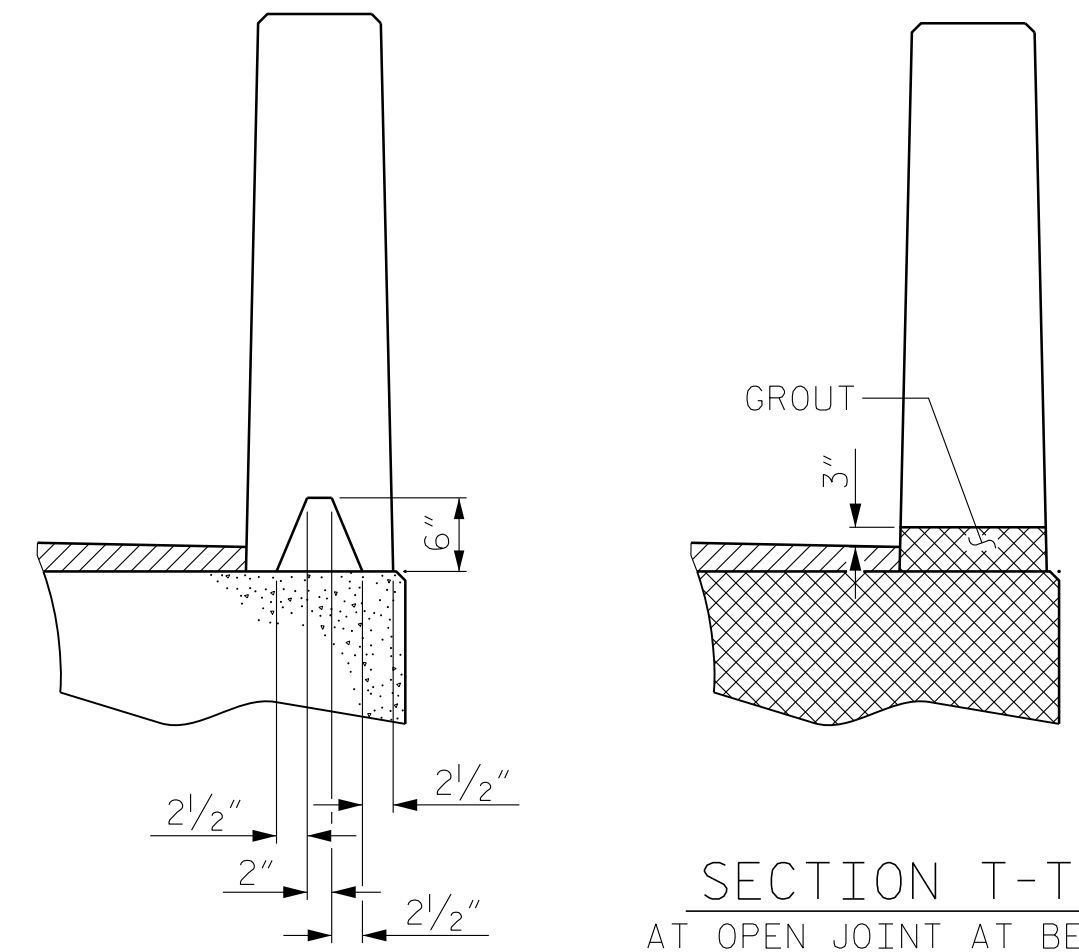
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
70' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↓
FINAL CAMBER	1 1/2" ↑

** INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH	
UNIT	PSI
70' UNITS	5700

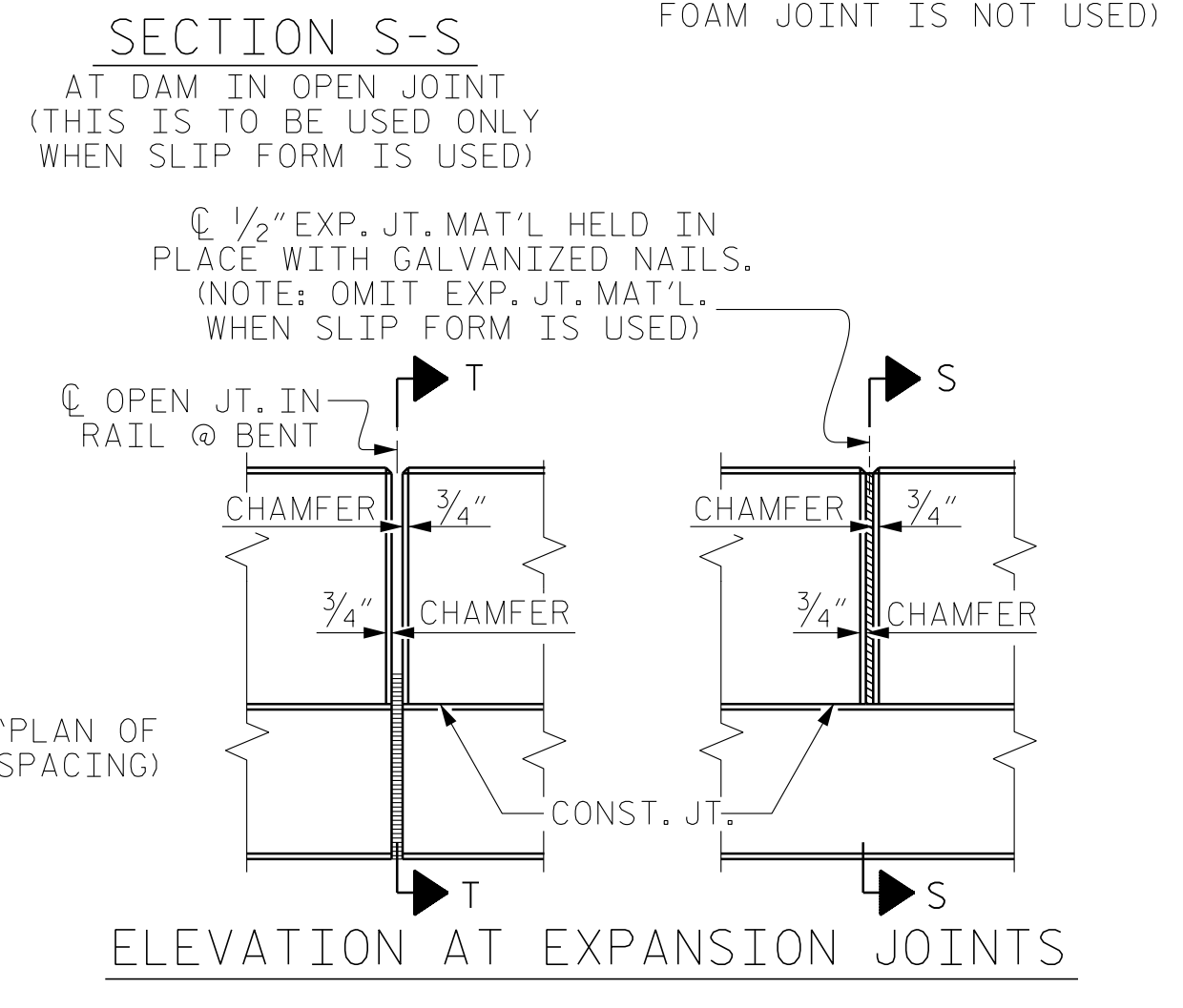


SECTION THRU RAIL



SECTION T-T

AT OPEN JOINT AT BENT (THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS

DES. ENG. OF RECORD: RTS	
ASSEMBLED BY: MAF	DATE: 12/14
CHECKED BY: HLW	DATE: 12/14
DRAWN BY: MAA	6/10
CHECKED BY: MKT	7/10
REV. 12/11	MAA/AAC

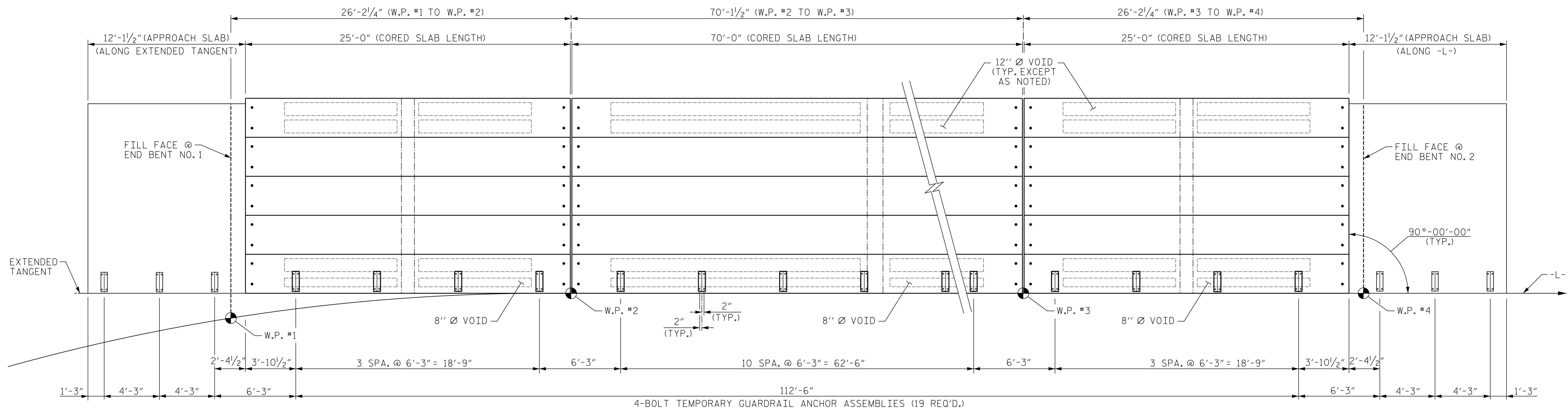
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT SPAN 'B'					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-15					TOTAL SHEETS 34

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

NOTES

THE TEMPORARY GUARDRAIL 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 1/2".
- B. 4 - 1" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- C. WIRE STRUTS SHOWN IN THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY DETAIL ARE THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI.

TEMPORARY GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO ENSURE FIT.

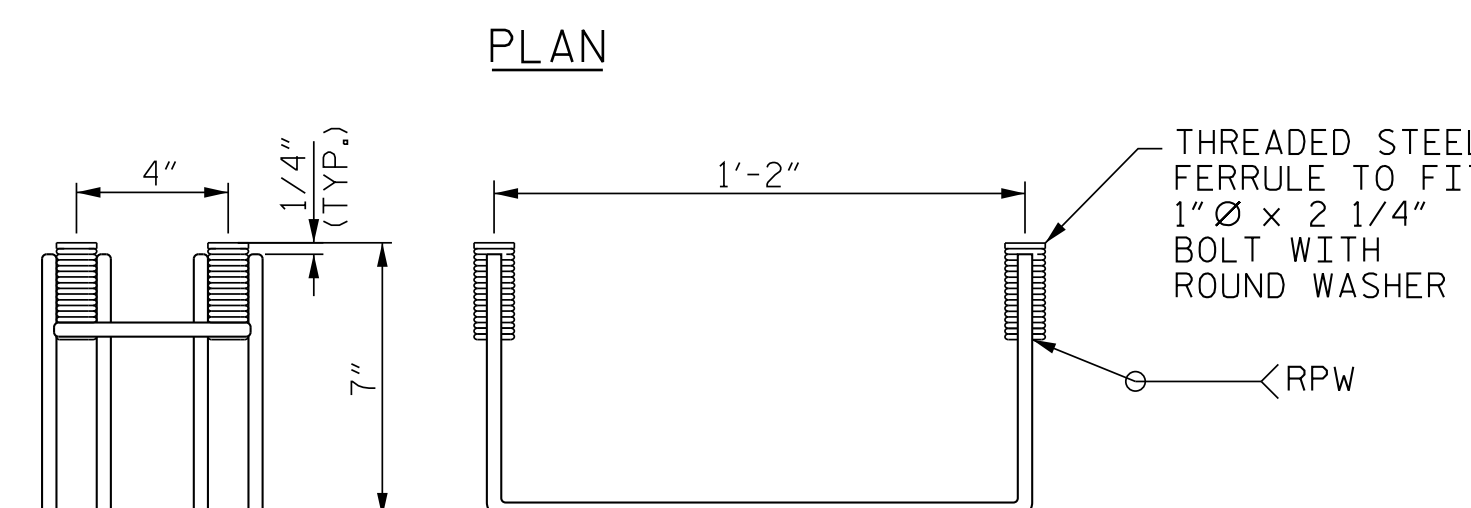
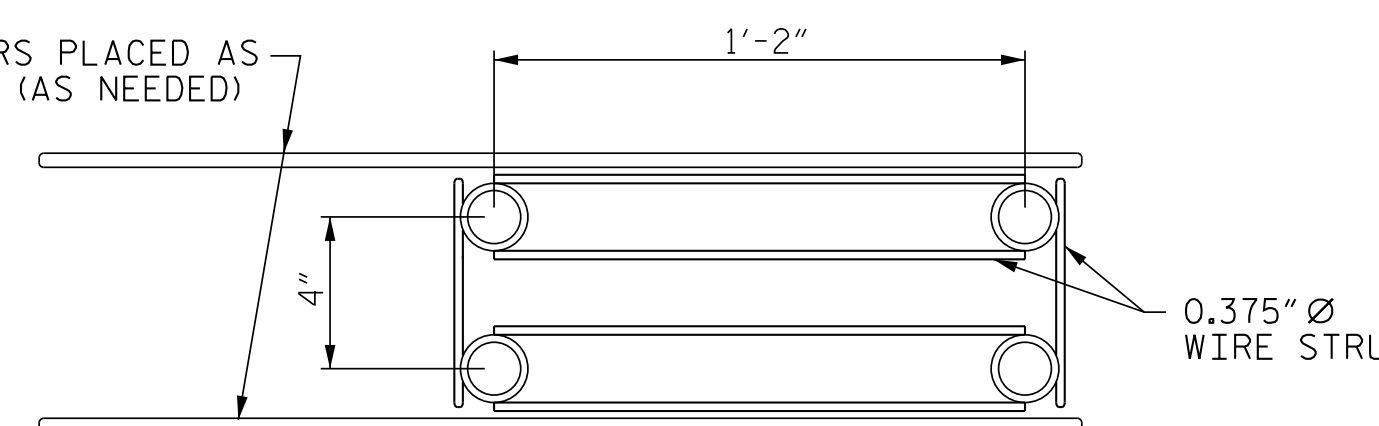
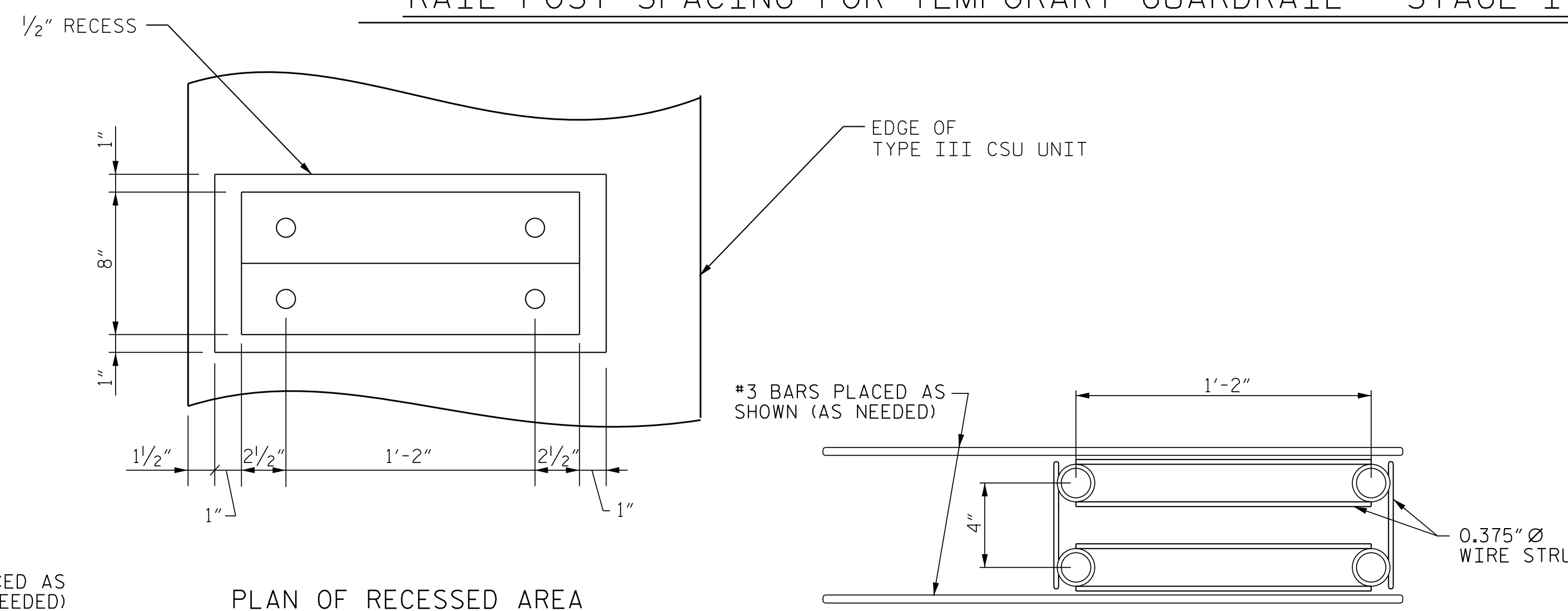
THE COST OF THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY COMPLETE IN PLACE SHALL BE INCLUDED, AS APPLICABLE, IN THE UNIT CONTRACT PRICE BID FOR 3'-0" X 1'-9" OR 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB OR LUMP SUM PRICE BID FOR APPROACH SLABS.

FERRULES SHALL BE PLUGGED DURING CASTING OF THE CORED SLAB UNITS OR POURING OF APPROACH SLAB AS RECOMMENDED BY THE MANUFACTURER.

ONCE THE TEMPORARY GUARDRAIL HAS BEEN REMOVED, THE 1/2" RECESS SHALL BE FILLED WITH GROUT.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR TEMPORARY GUARDRAIL, POST, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.



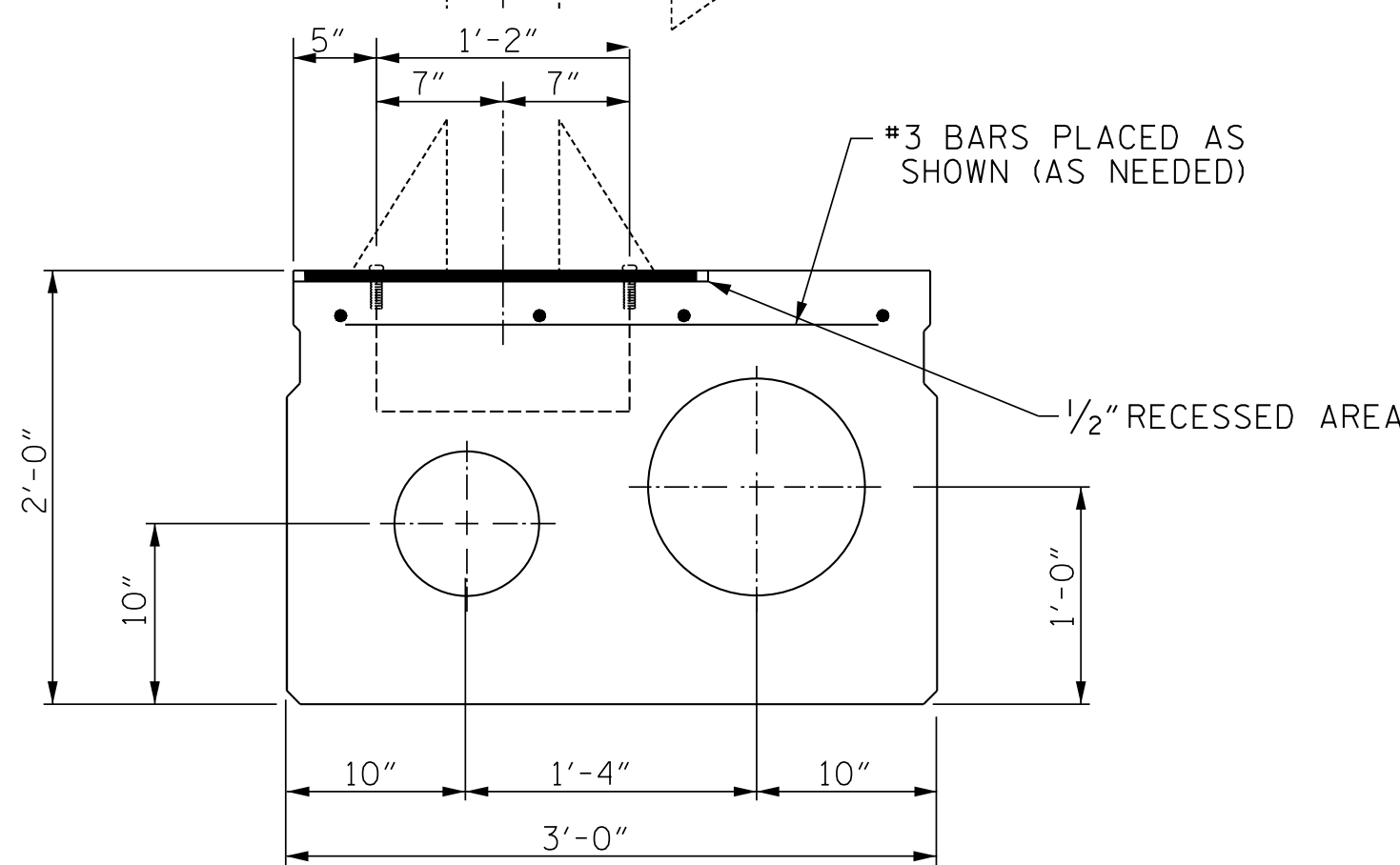
SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 2 1/2"

TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(19 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNITS)
(6 ASSEMBLIES REQUIRED IN THE APPROACH SLABS)

SECTION OF ANCHOR ASSEMBLY LOCATION



(TYPE III UNIT - STAGE I) (2'-0" SHOWN, 1'-9" CSU SIMILAR)
THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
ANCHORAGE DETAILS FOR
TEMPORARY GUARDRAIL
ANCHOR ASSEMBLY FOR
TYPE III CORED SLAB
UNIT - STAGE I



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DES. ENG. OF RECORD: RTS			
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 5/09	REV. 12/11	MAA/AAC
CHECKED BY :	BCH 6/09		

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-16
2			4			34

NOTES

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

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

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

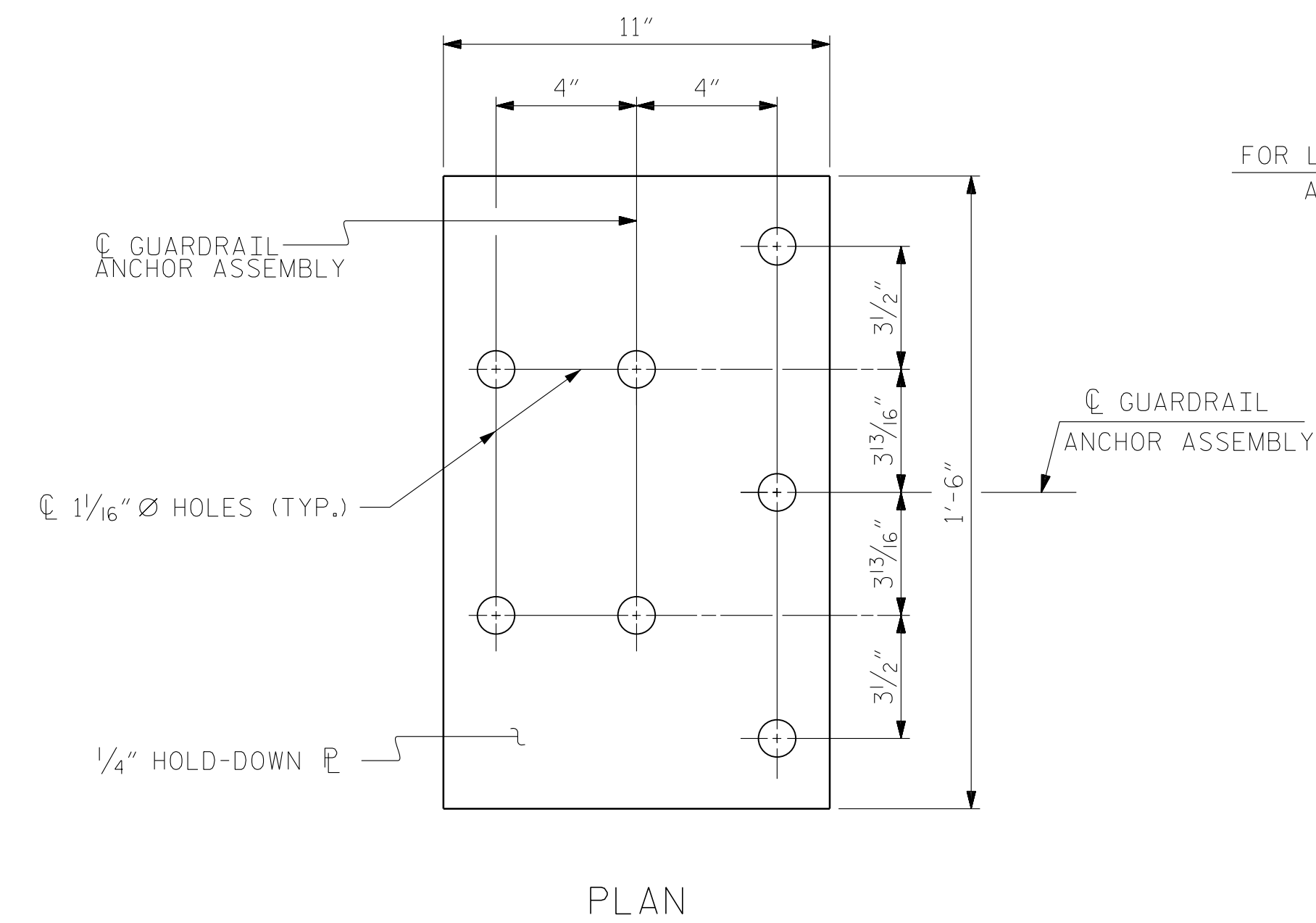
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

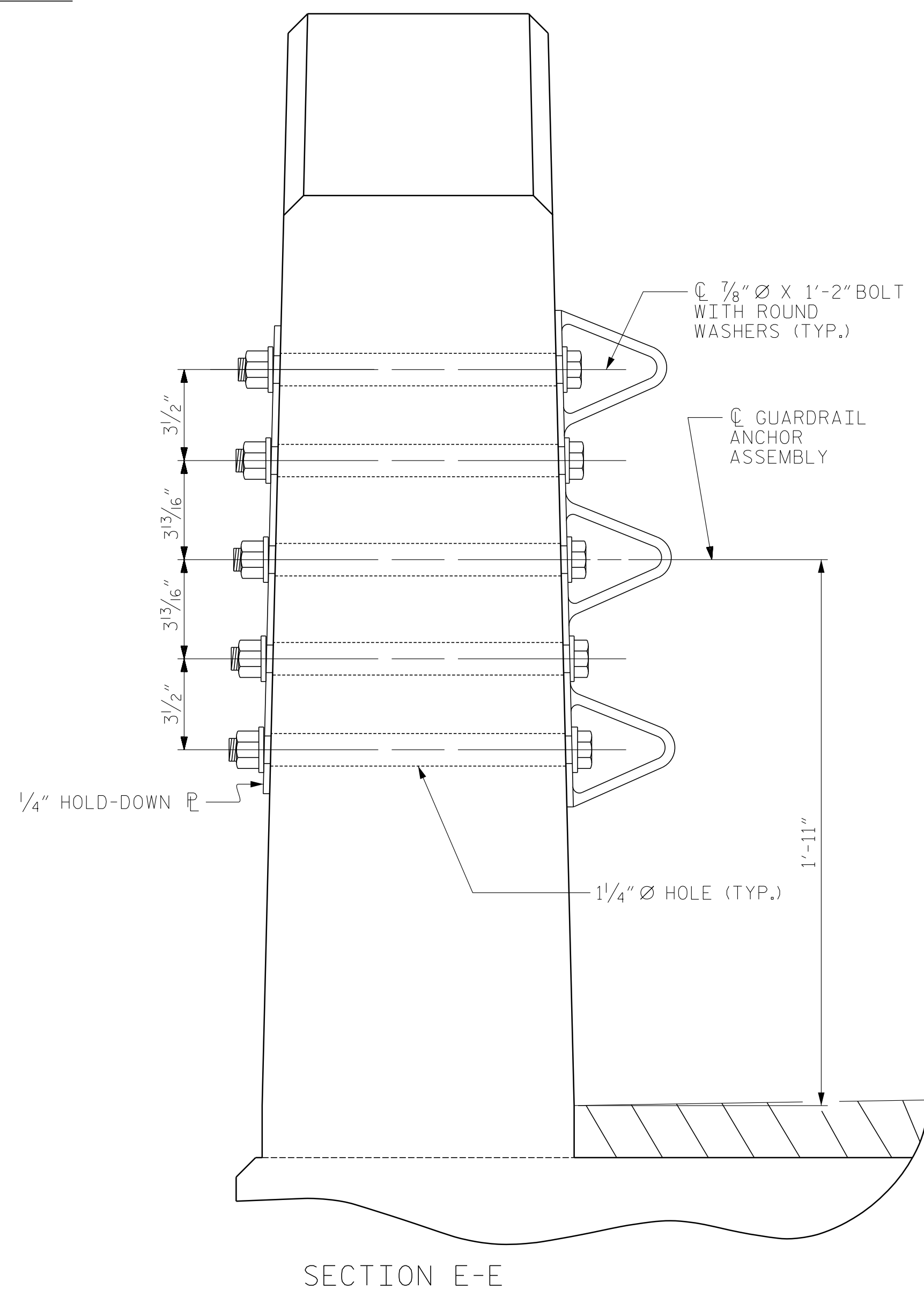
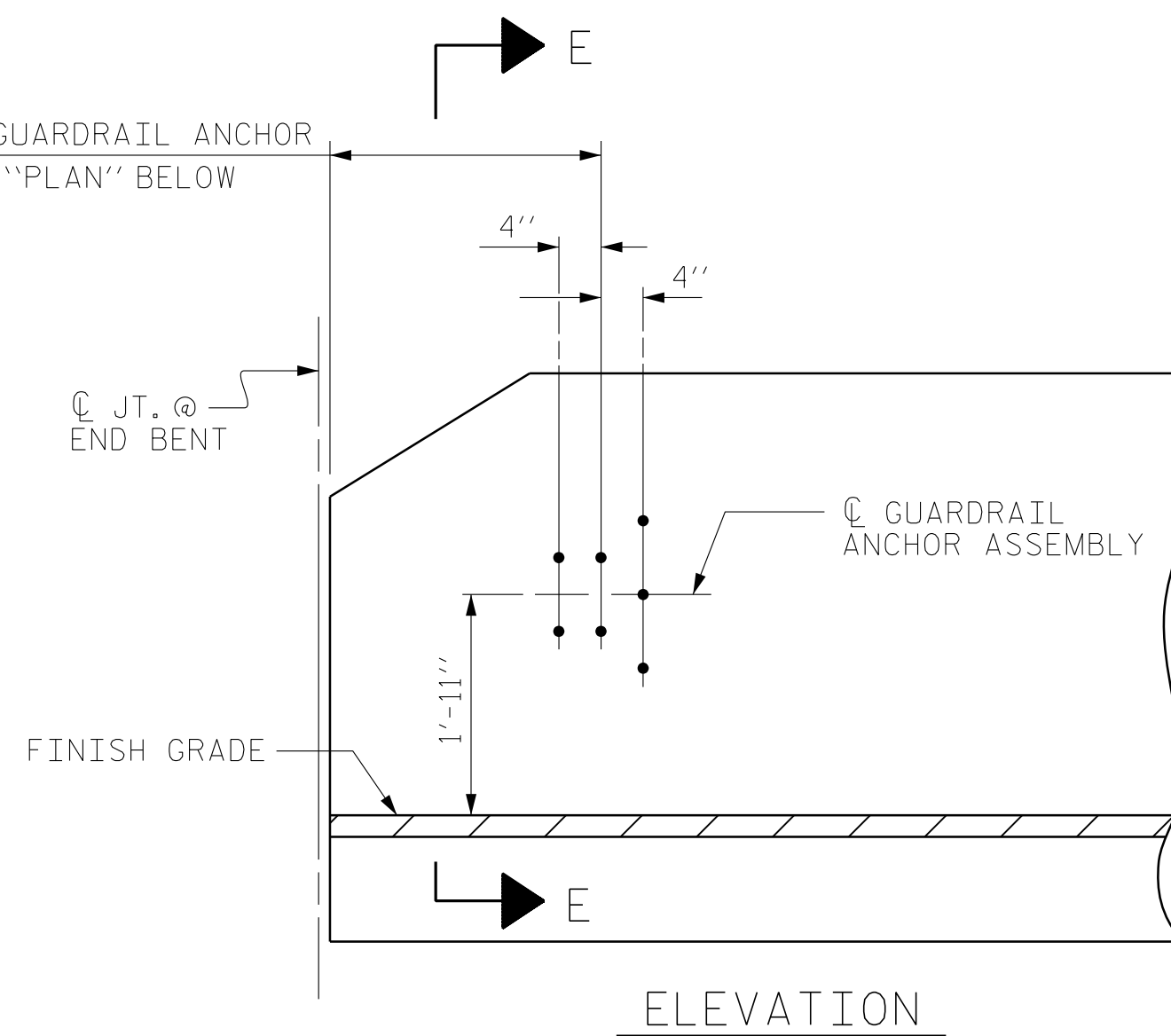
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

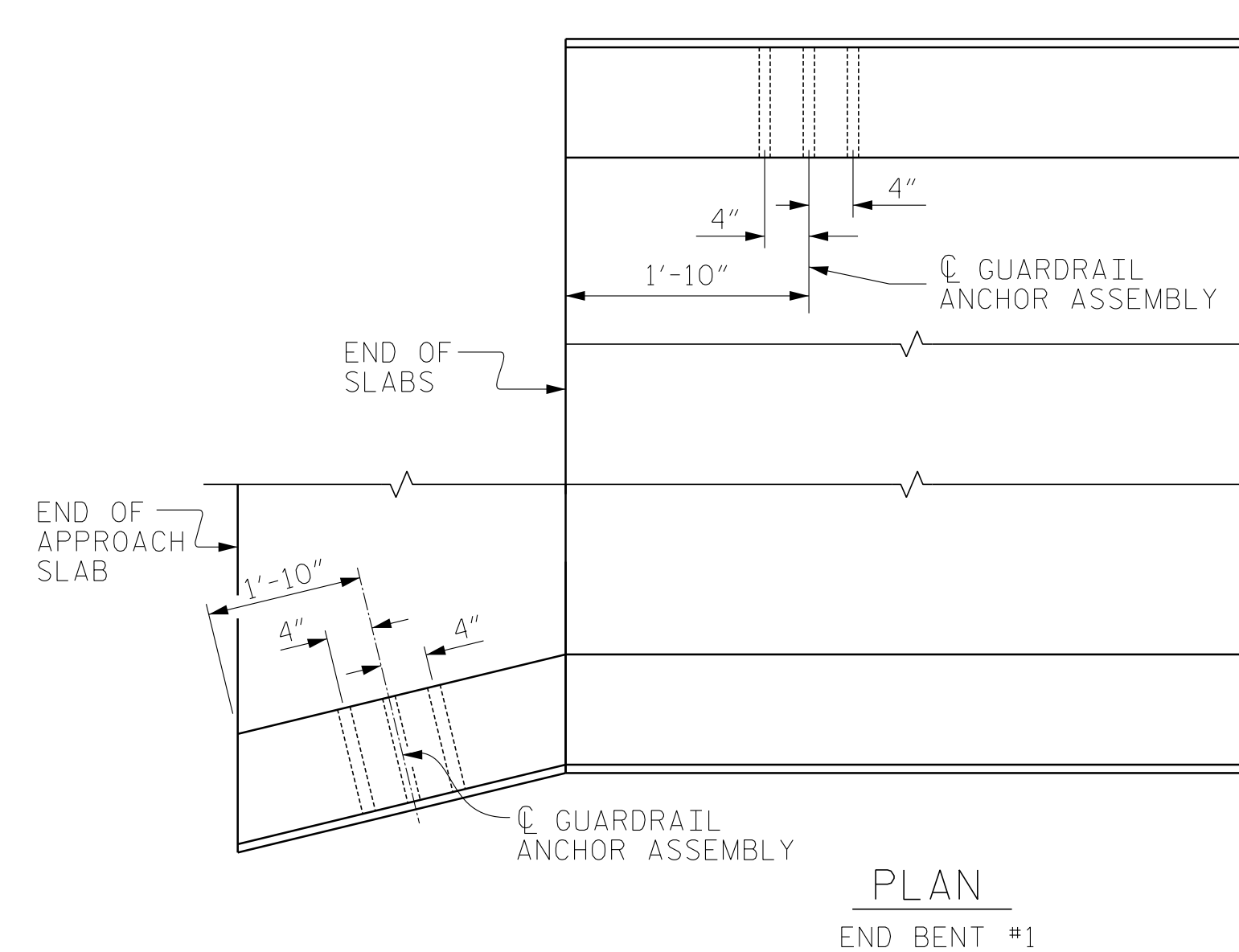
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



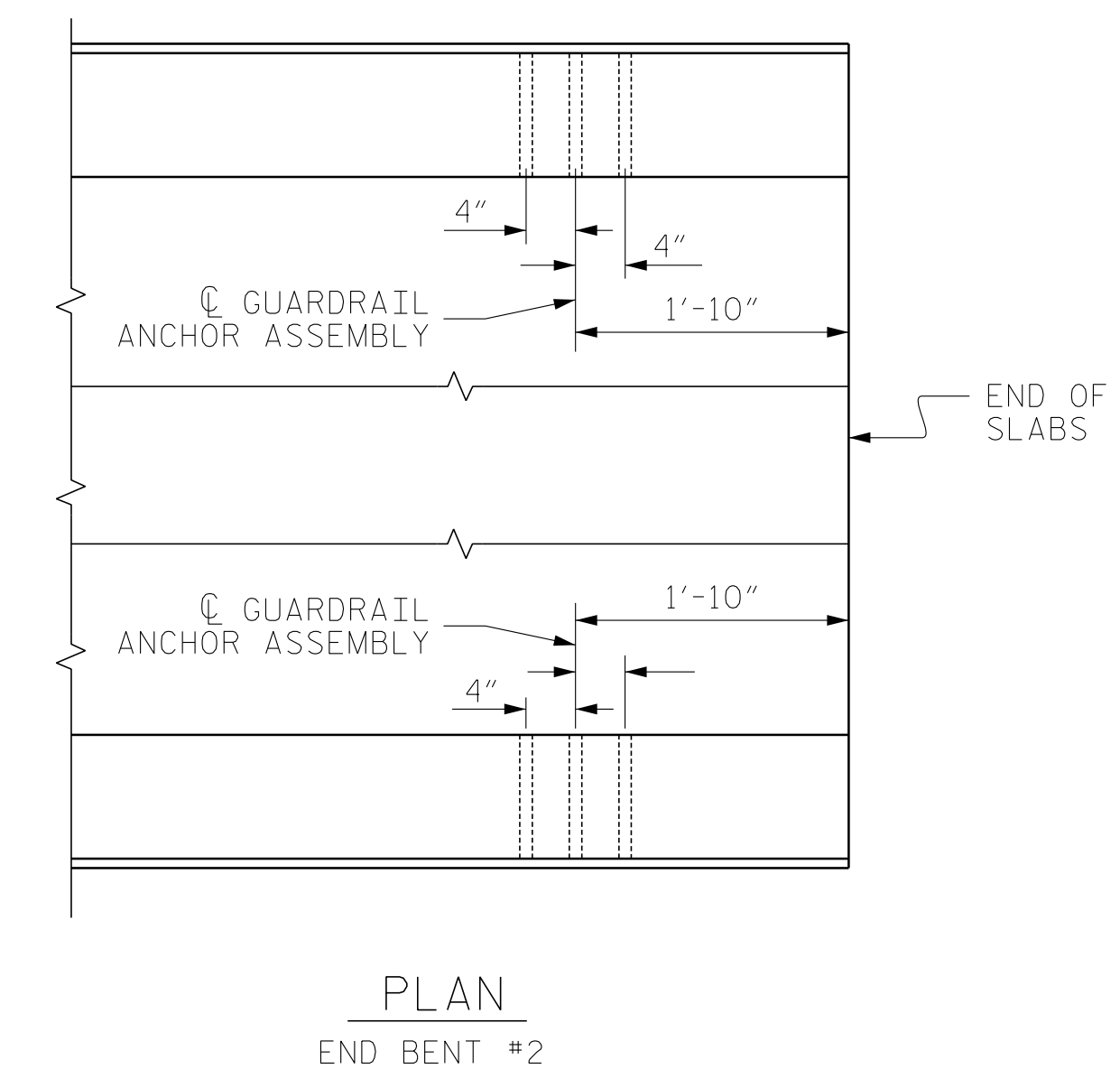
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

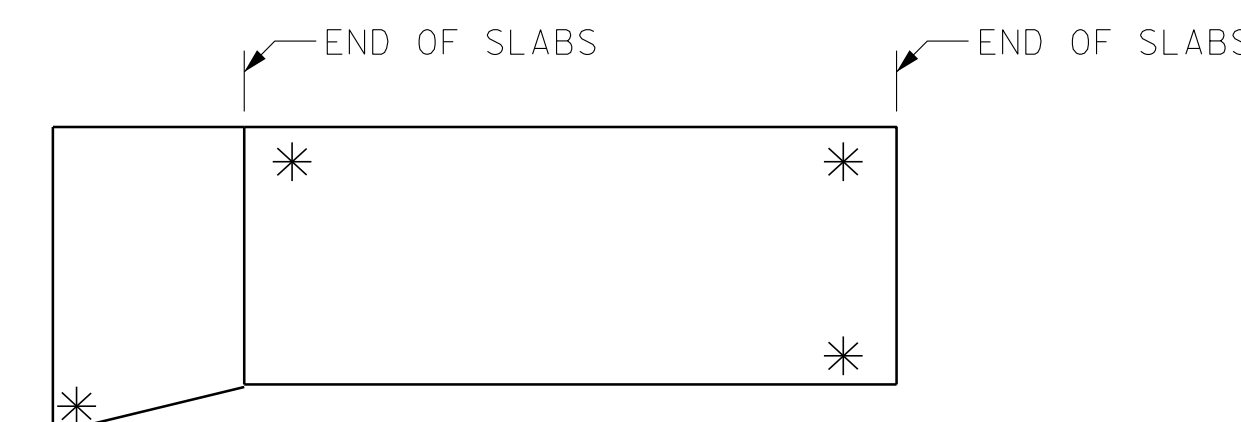


PLAN
END BENT #1



PLAN
END BENT #2

LOCATION OF ANCHORS FOR GUARDRAIL



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

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



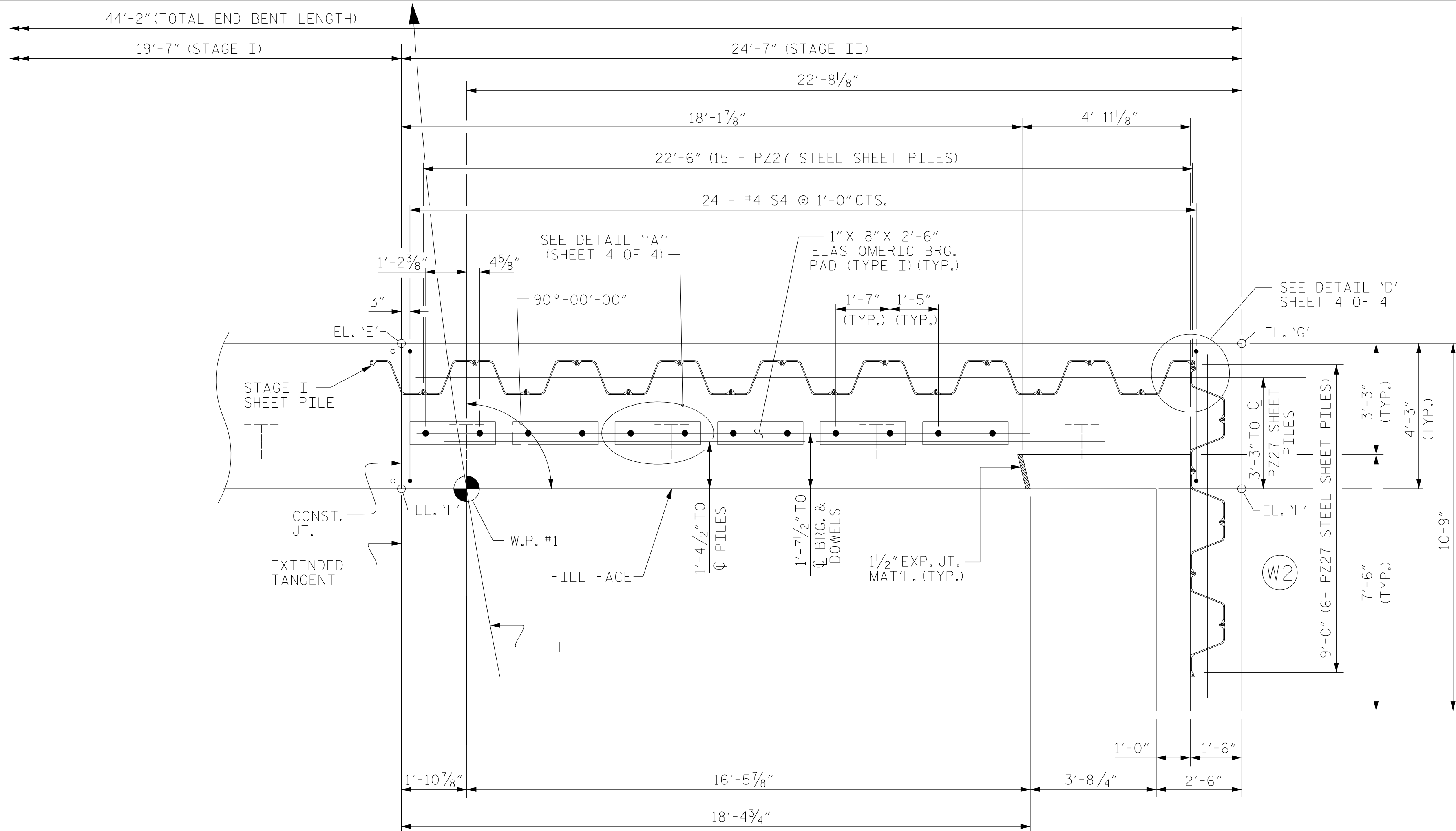
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			34

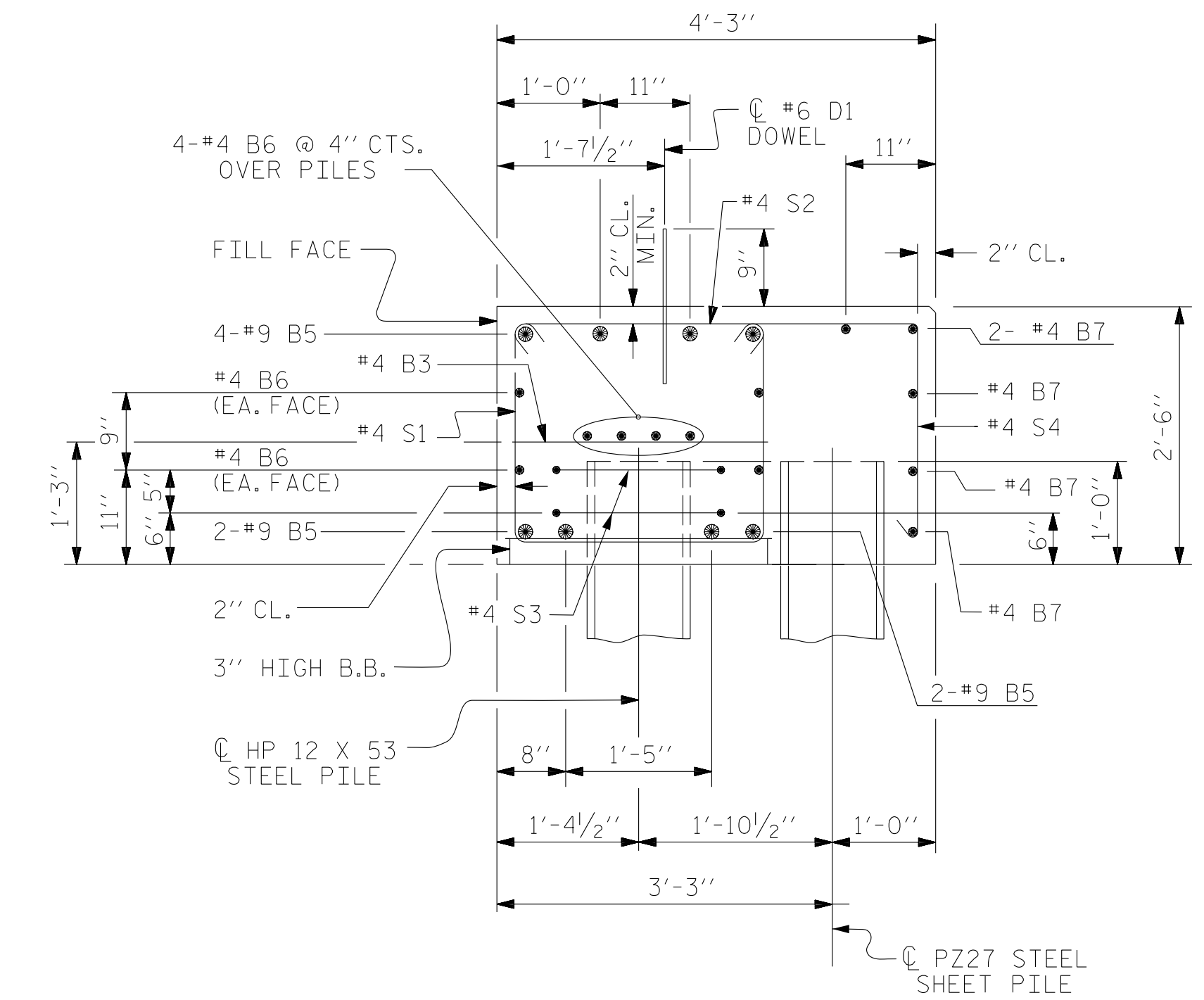
DES. ENG. OF RECORD: RTS					
ASSEMBLED BY : MAF	DATE : 12/14				
CHECKED BY : HLW	DATE : 12/14				
DRAWN BY : MAA 5/10	ADDED 5/6/10	MAA/GM			
CHECKED BY : GM 5/10	REV. 10/1/11	MAA/GM			
	REV. 12/5/11	MAA/GM			

NOTES

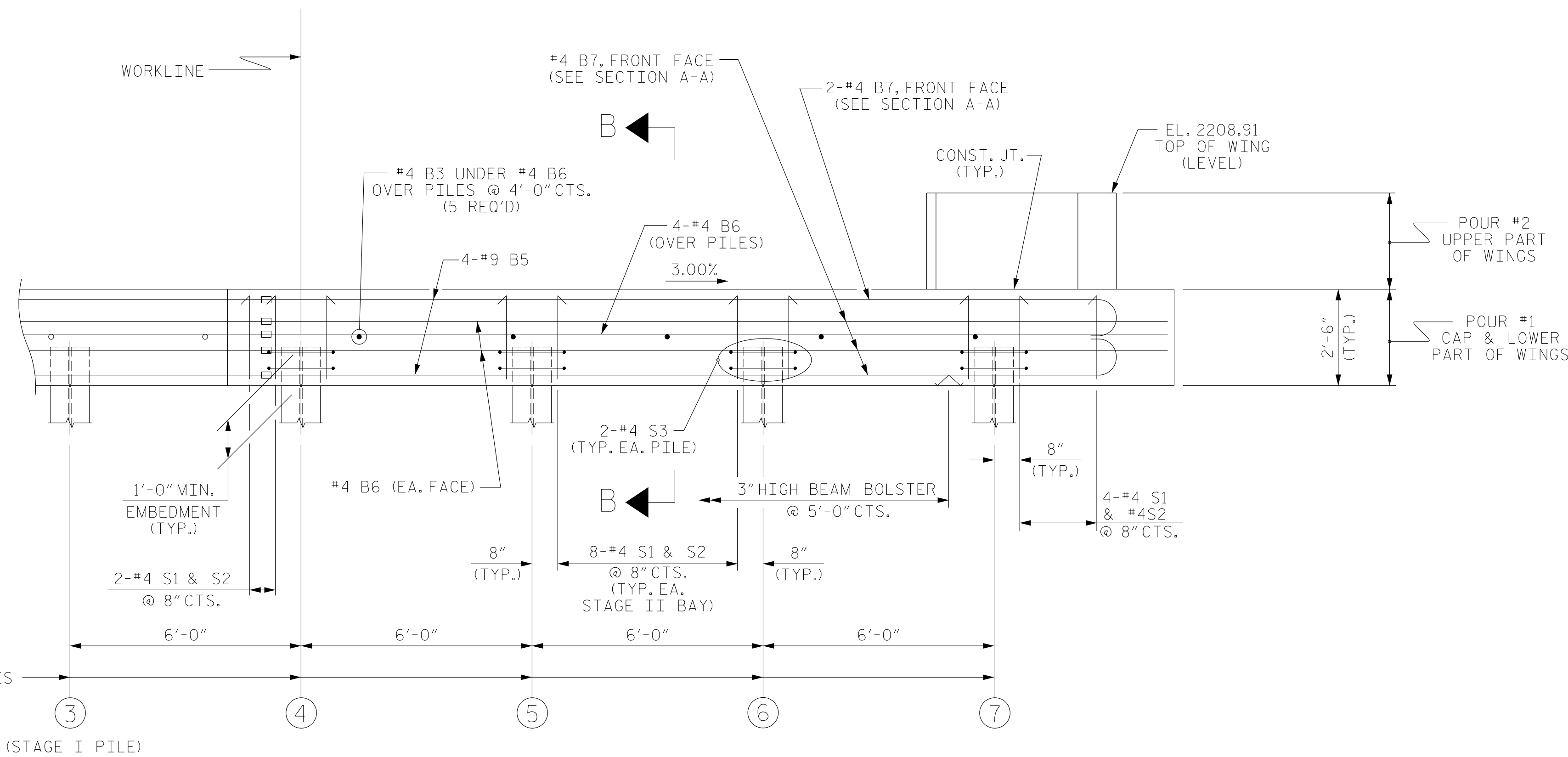
SEE NOTES, SHEET 1 OF 4.



PLAN



SECTION B-B



ELEVATION

	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
(E)	2207.16	2204.66
(F)	2207.15	2204.65
(G)	2206.42	2203.92
(H)	2206.41	2203.91

	TOP OF PILE ELEVATIONS
(4)	2205.60
(5)	2205.42
(6)	2205.24
(7)	2205.06

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT No. 1
 (STAGE II)

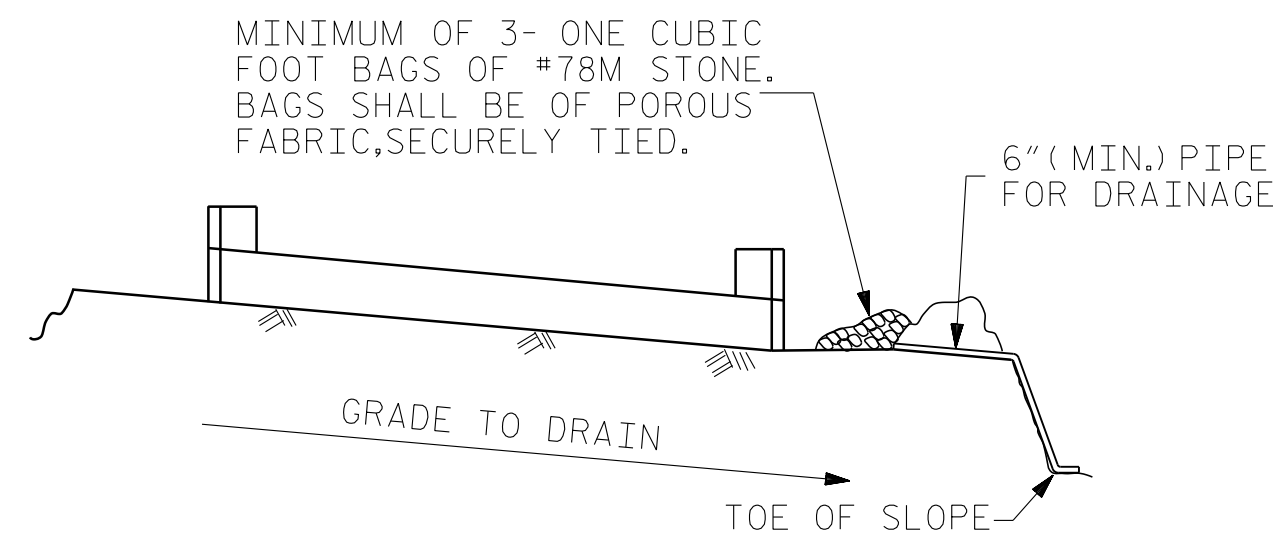


DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : DGE 02/10	
CHECKED BY : MKT 02/10	

WINGS NOT SHOWN FOR CLARITY.
 SHEET PILES NOT SHOWN FOR CLARITY.
 FOR SHEET PILE CONNECTION DETAILS, SEE SHEET 4 OF 4.

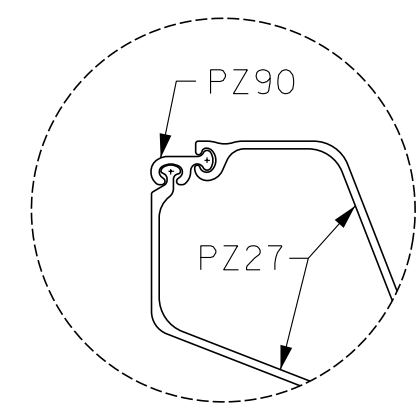


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

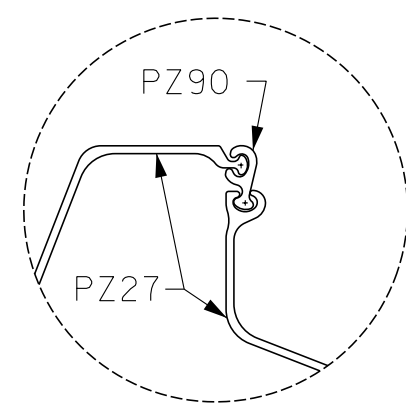
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

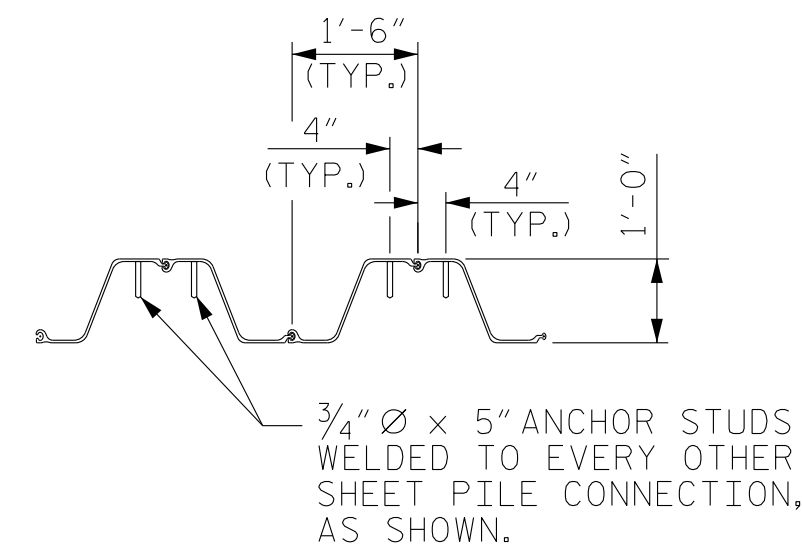
TEMPORARY DRAINAGE AT END BENT



DETAIL 'C'

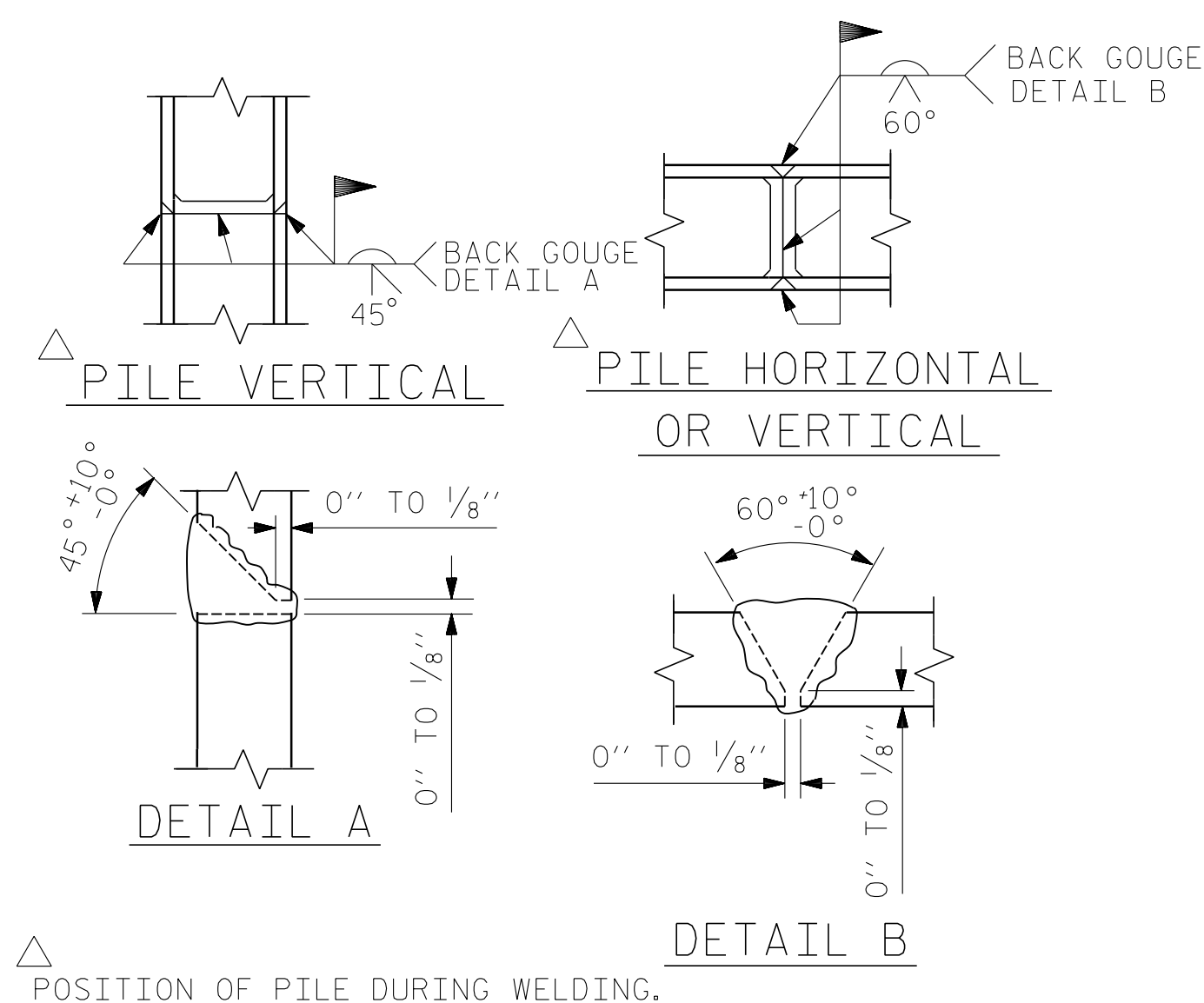


DETAIL 'D'

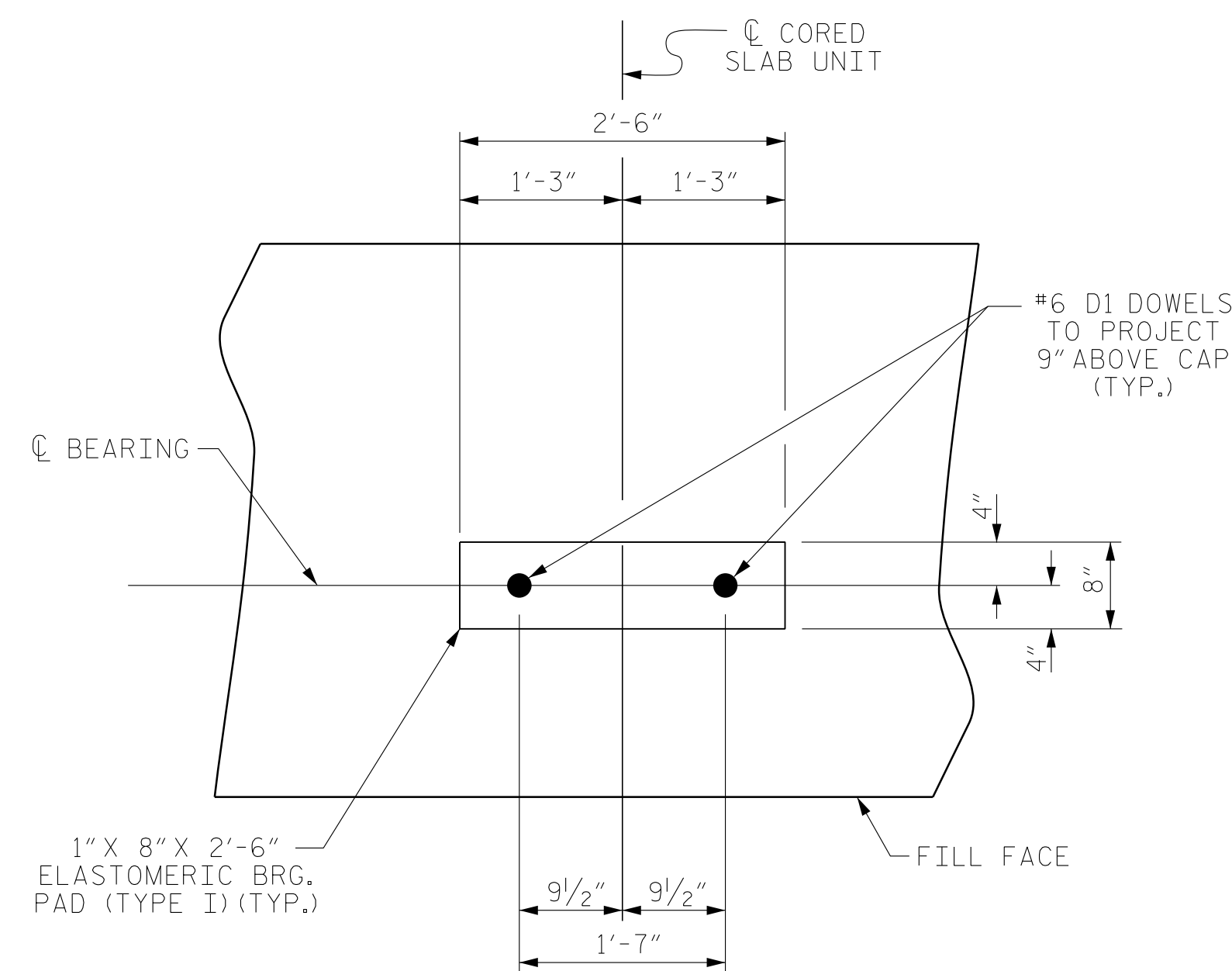


ANCHOR STUD DETAIL

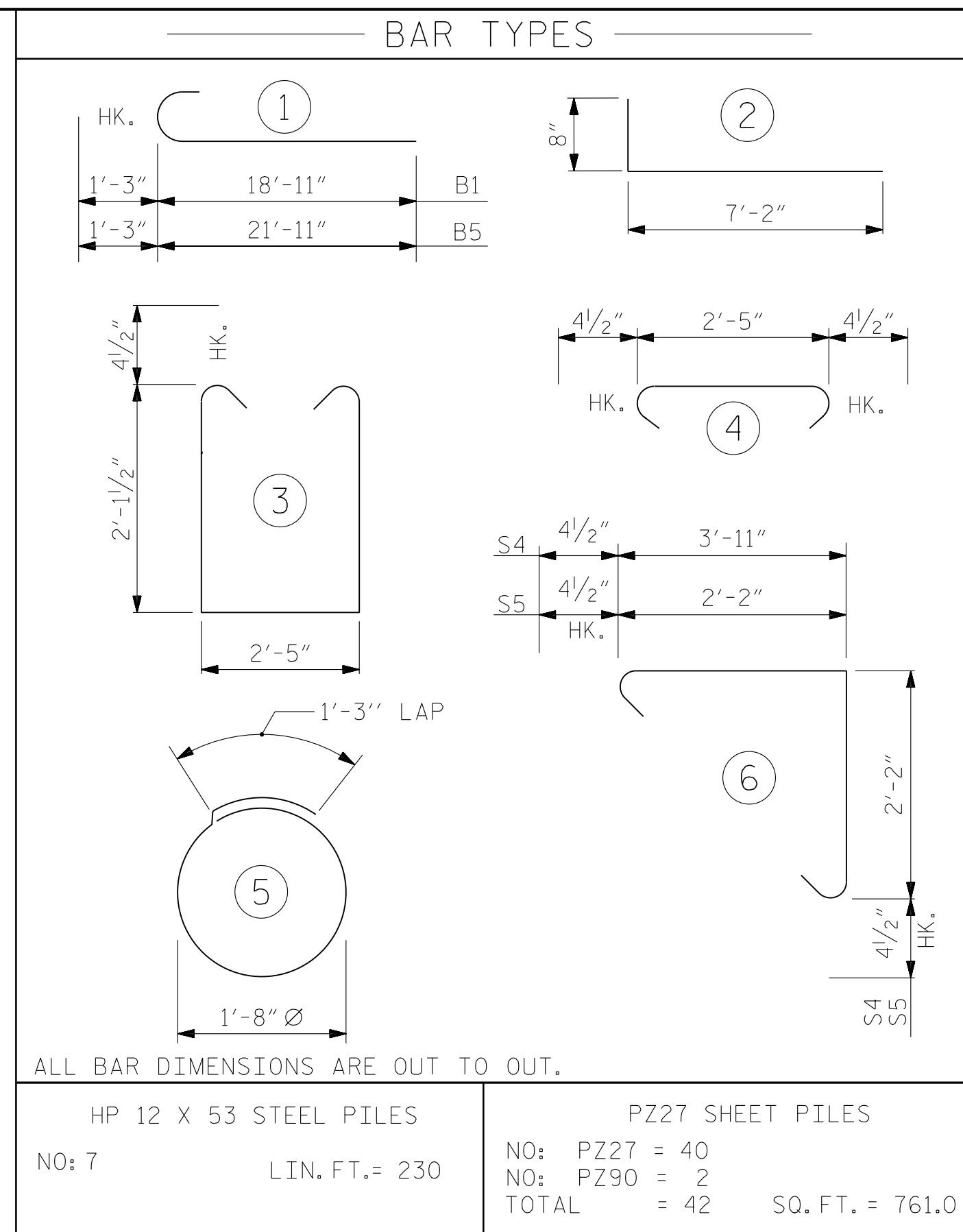
SHEET PILE CONNECTION DETAILS



PILE SPLICE DETAILS



DETAIL "A"



BILL OF MATERIAL

FOR END BENT NO. 1 (STAGE I)						FOR END BENT NO. 1 (STAGE II)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	20'-2"	549	B3	5	#4	STR	2'-5"	8
B2	8	#4	STR	18'-11"	101	B5	8	#9	1	23'-2"	630
B3	5	#4	STR	2'-5"	8	B6	8	#4	STR	21'-11"	117
B4	5	#4	STR	20'-5"	68	B7	5	#4	STR	23'-5"	78
B8	5	#4	STR	10'-5"	35	B8	5	#4	STR	10'-5"	35
D1	10	#6	STR	1'-6"	23	D1	12	#6	STR	1'-6"	27
H1	12	#4	2	7'-10"	63	H1	12	#4	2	7'-10"	63
K1	6	#4	STR	3'-0"	12	K2	6	#4	STR	4'-4"	17
S1	24	#4	3	7'-5"	119	S1	30	#4	3	7'-5"	149
S2	24	#4	4	3'-2"	51	S2	30	#4	4	3'-2"	63
S3	6	#4	5	6'-6"	26	S3	8	#4	5	6'-6"	35
S4	19	#4	6	6'-10"	87	S4	24	#4	6	6'-10"	110
S5	11	#4	6	5'-1"	37	S5	11	#4	6	5'-1"	37
V1	24	#4	STR	4'-8"	75	V1	26	#4	STR	4'-8"	81
REINFORCING STEEL (STAGE I)						REINFORCING STEEL (STAGE II)					
1254 LBS.						1450 LBS.					
CLASS A CONCRETE BREAKDOWN (STAGE I)						CLASS A CONCRETE BREAKDOWN (STAGE II)					
POUR #1 CAP & LOWER PART OF WINGS 9.2 C.Y.						POUR #1 CAP & LOWER PART OF WINGS 11.2 C.Y.					
POUR #2 UPPER PART OF WINGS 0.9 C.Y.						POUR #2 UPPER PART OF WINGS 1.0 C.Y.					
TOTAL CLASS A CONCRETE 10.1 C.Y.						TOTAL CLASS A CONCRETE 12.2 C.Y.					

TOTAL BILL OF MATERIAL FOR END BENT NO. 1

CLASS A CONCRETE	REINFORCING STEEL	HP 12X53 STEEL PILES	HP 12X53 STEEL PILE POINTS	PZ27 STEEL SHEET PILES
CU. YDS.	LBS.	LIN. FT.	EACH	SQ. FT.
22.3	2,704	230.0	7	761

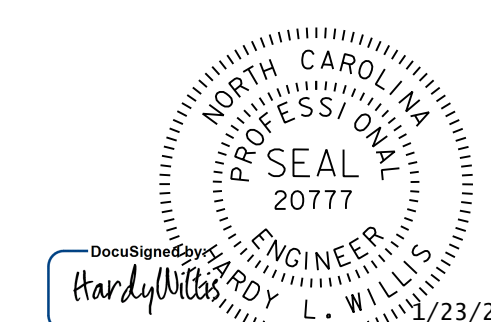
PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT No. 1
 DETAILS



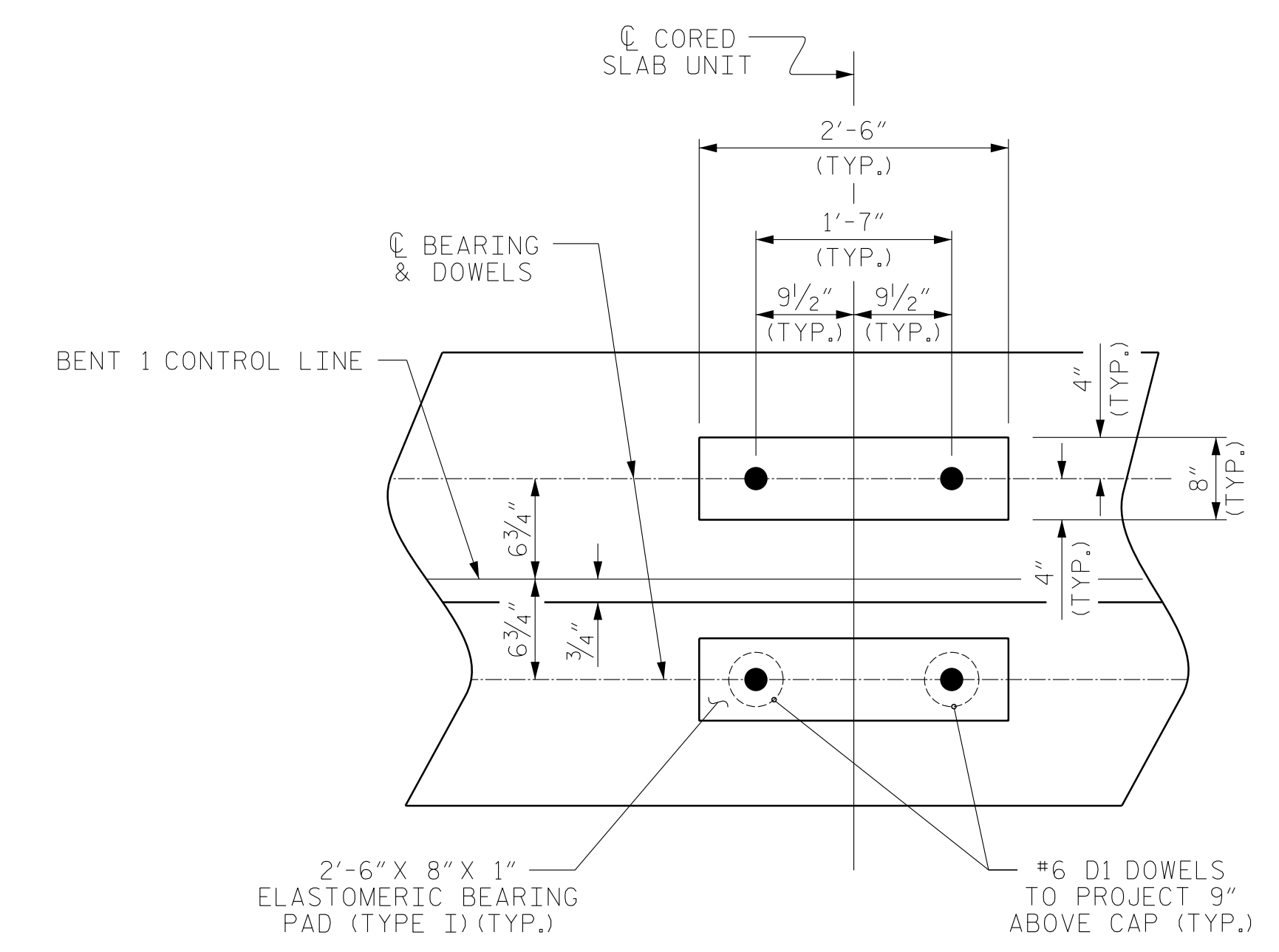
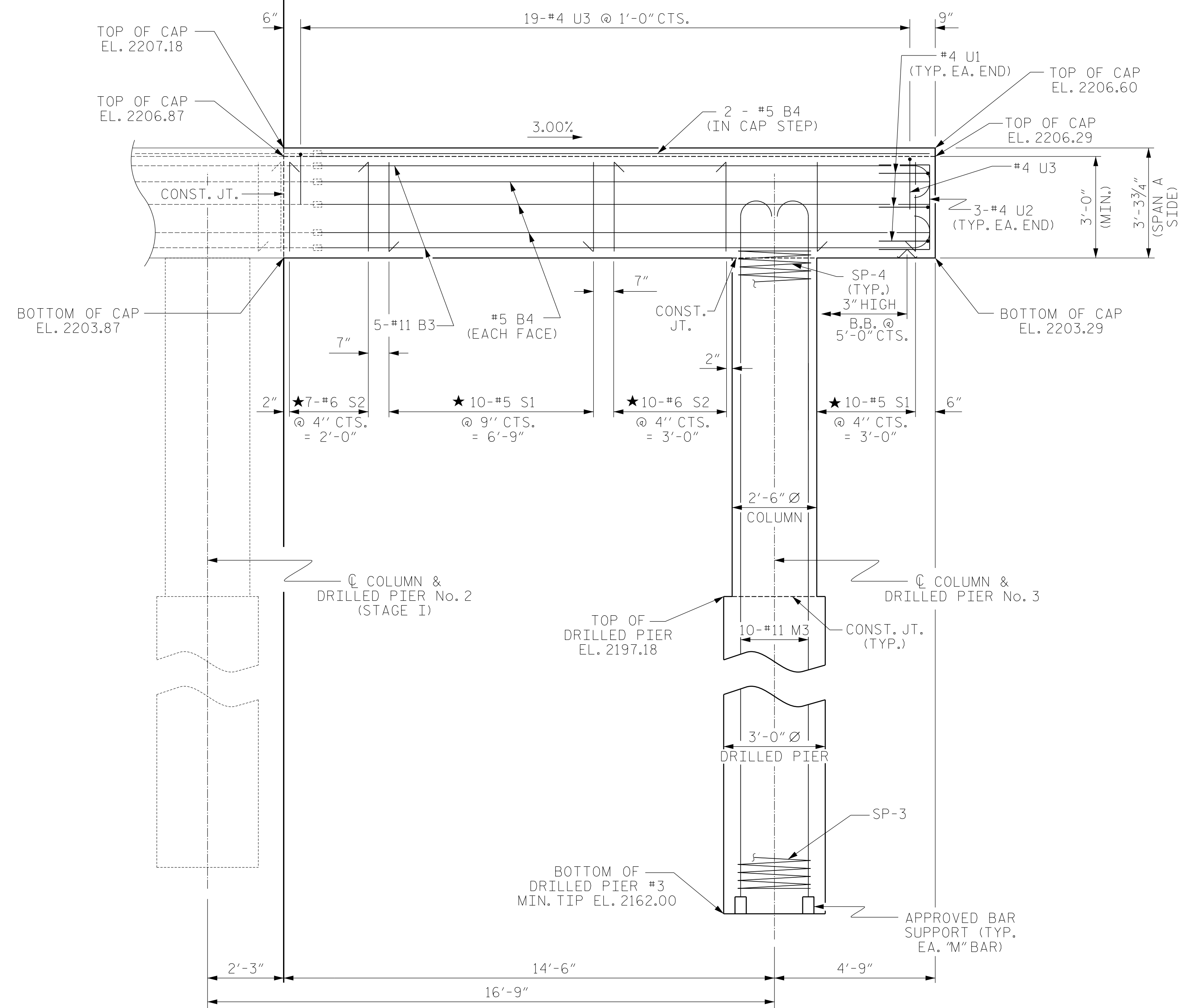
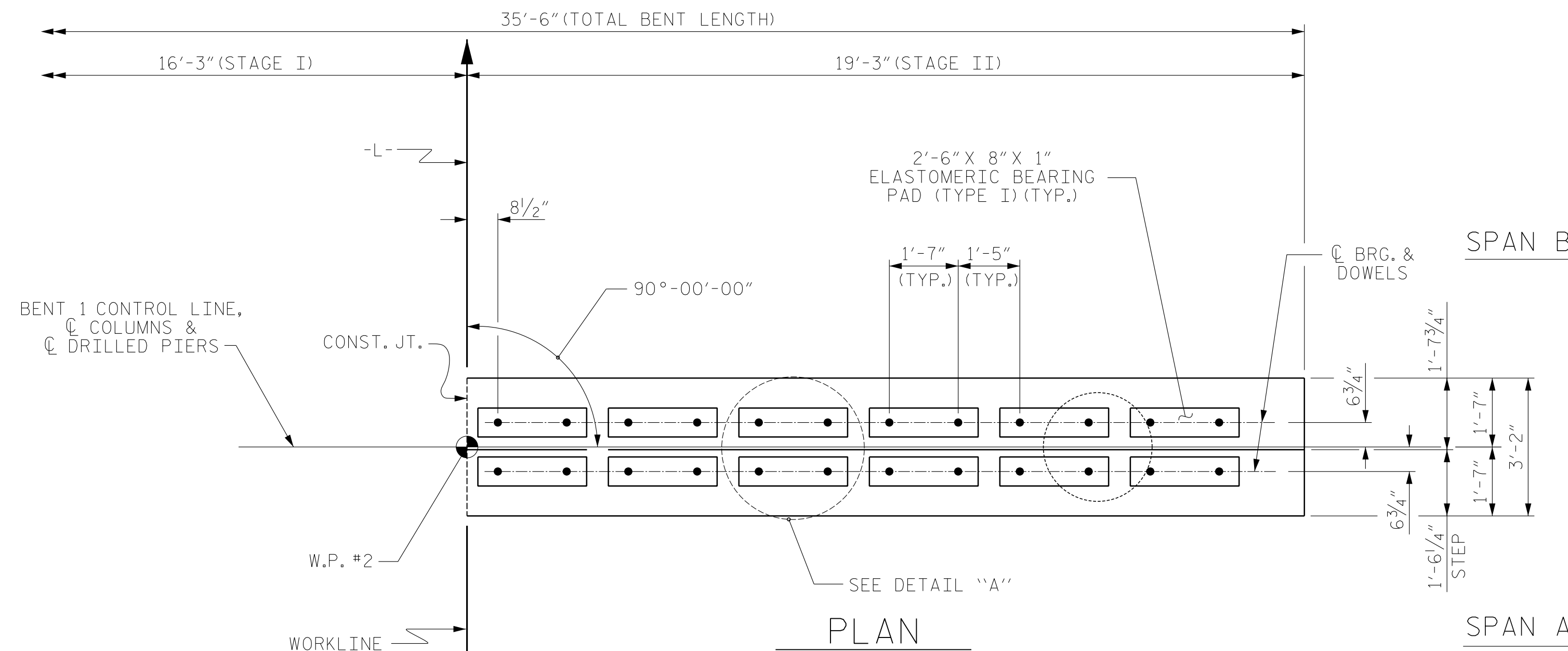
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 02/10		
CHECKED BY :	MKT 02/10		

NOTES

SEE SHEET 1 OF 3 FOR NOTES.



DETAIL "A"
 (DIMENSIONS ARE TYPICAL EACH BEARING)

TABLE OF DIMENSIONS

COLUMN NO.	COLUMN HEIGHT	DRILLED PIER MIN. HEIGHT
3	6'-3"	35'-2 3/16"

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 1
 (STAGE II)

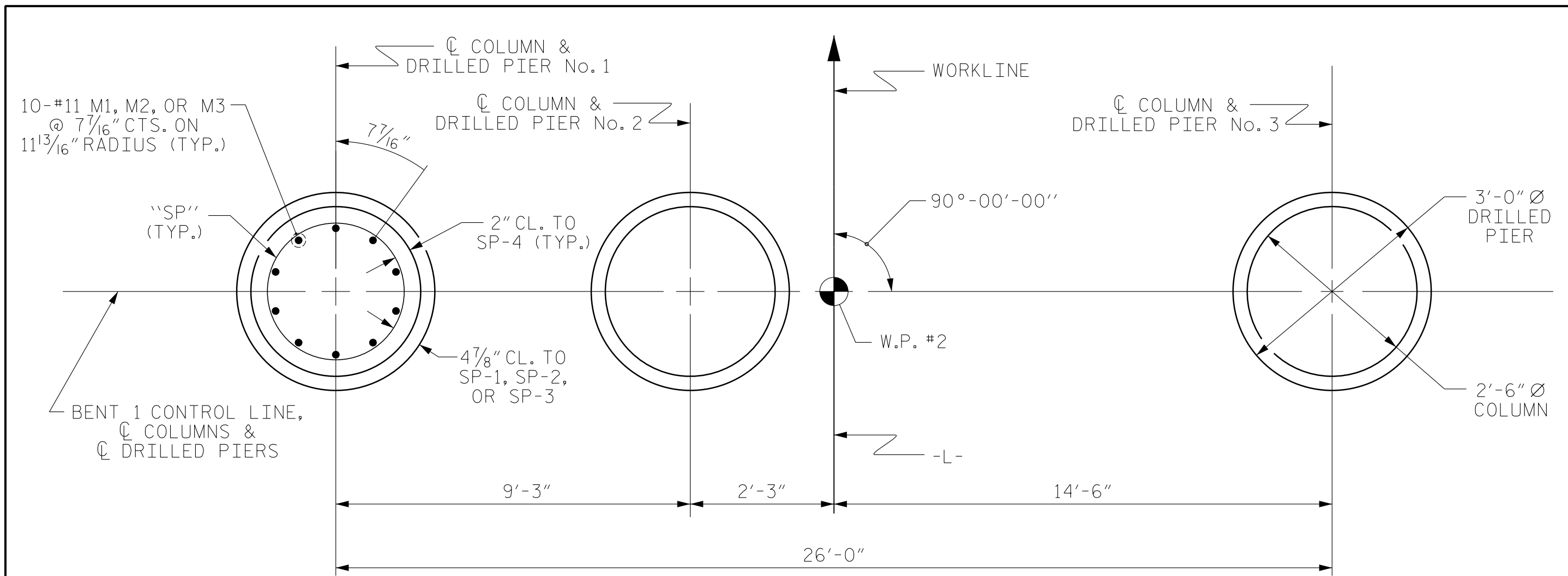


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

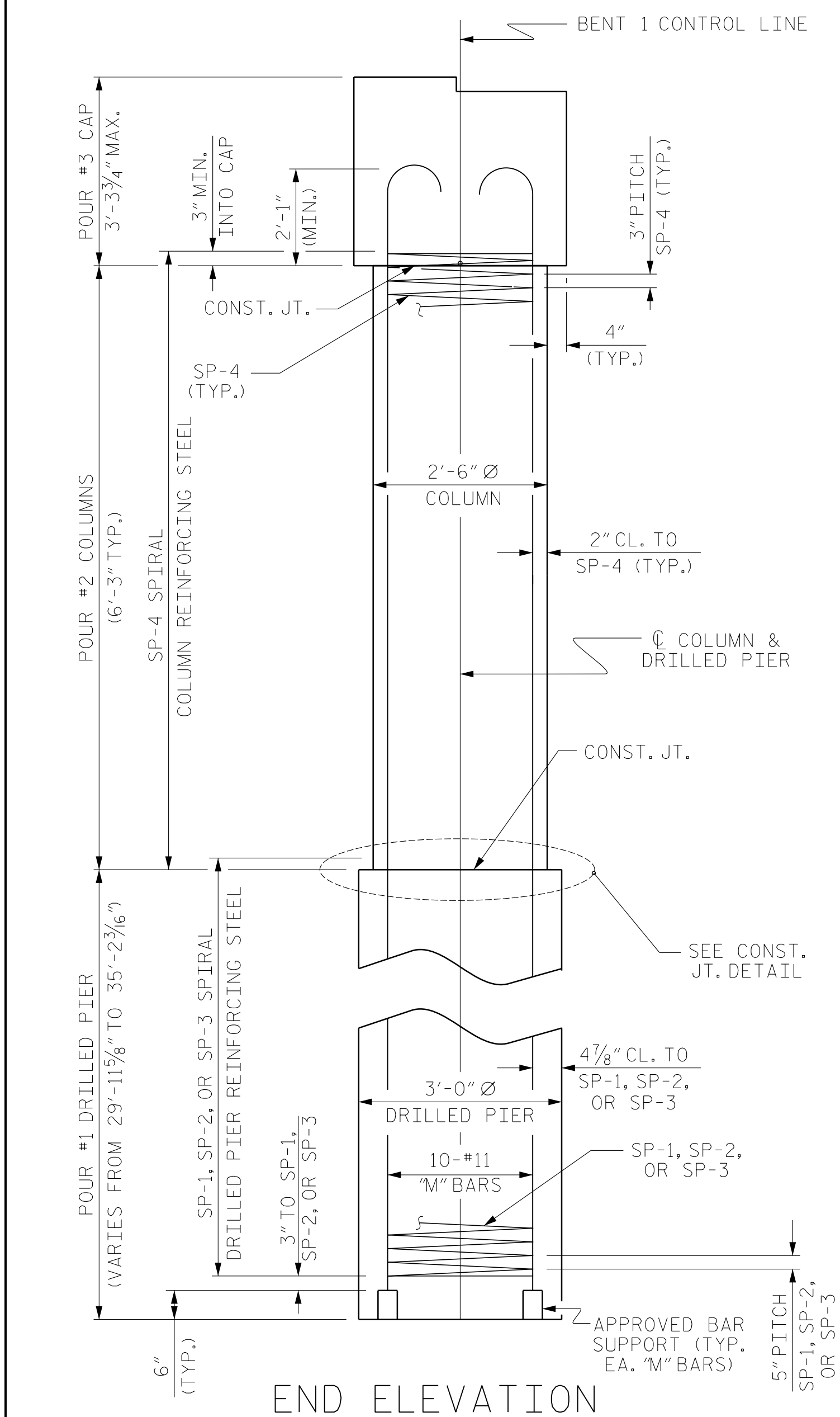
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 34
2			4			

ASSEMBLED BY : MAF DATE : 12/14
 CHECKED BY : HLW DATE : 12/14
 DRAWN BY : DGE 03/10
 CHECKED BY : MKT 03/10

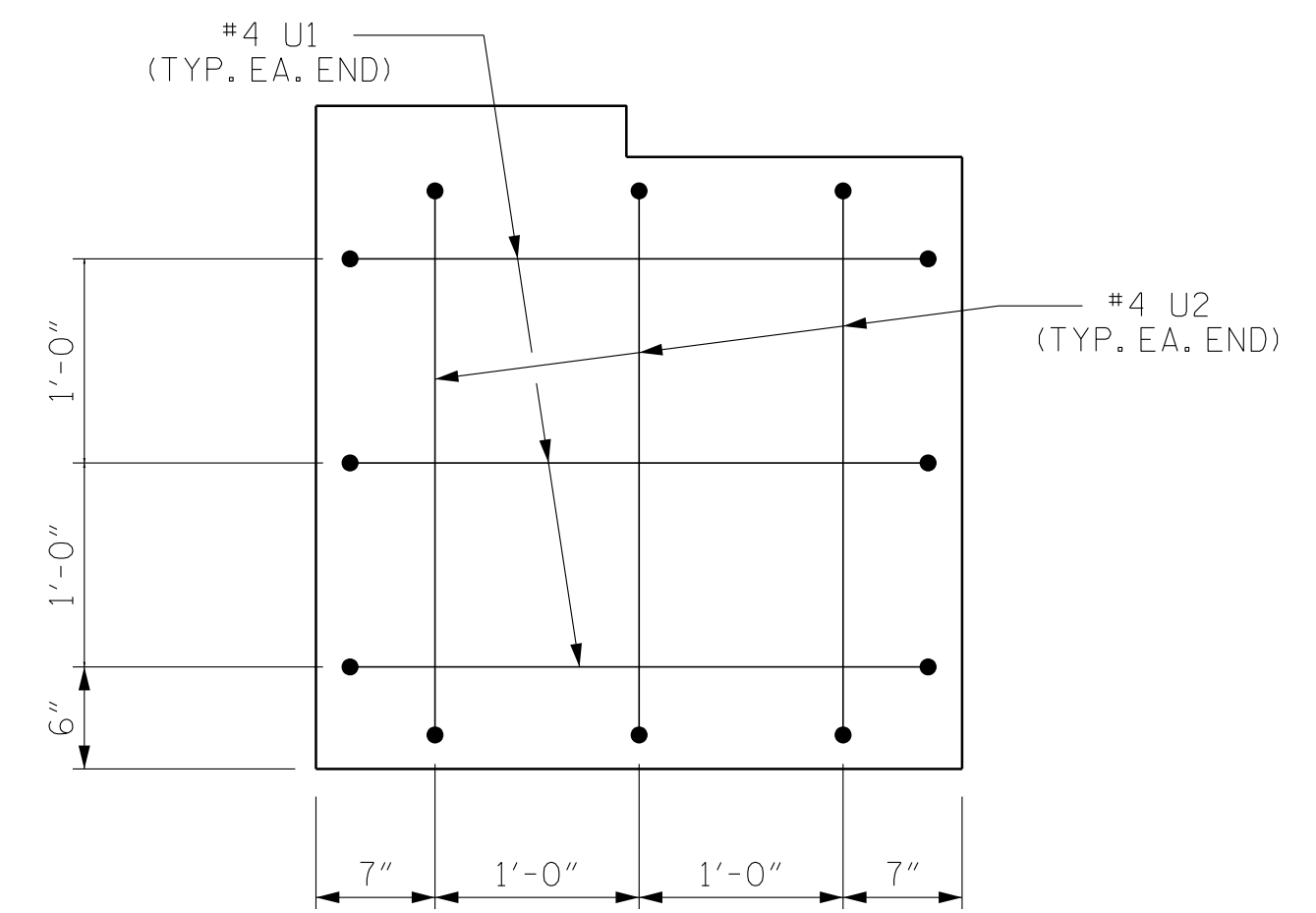
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



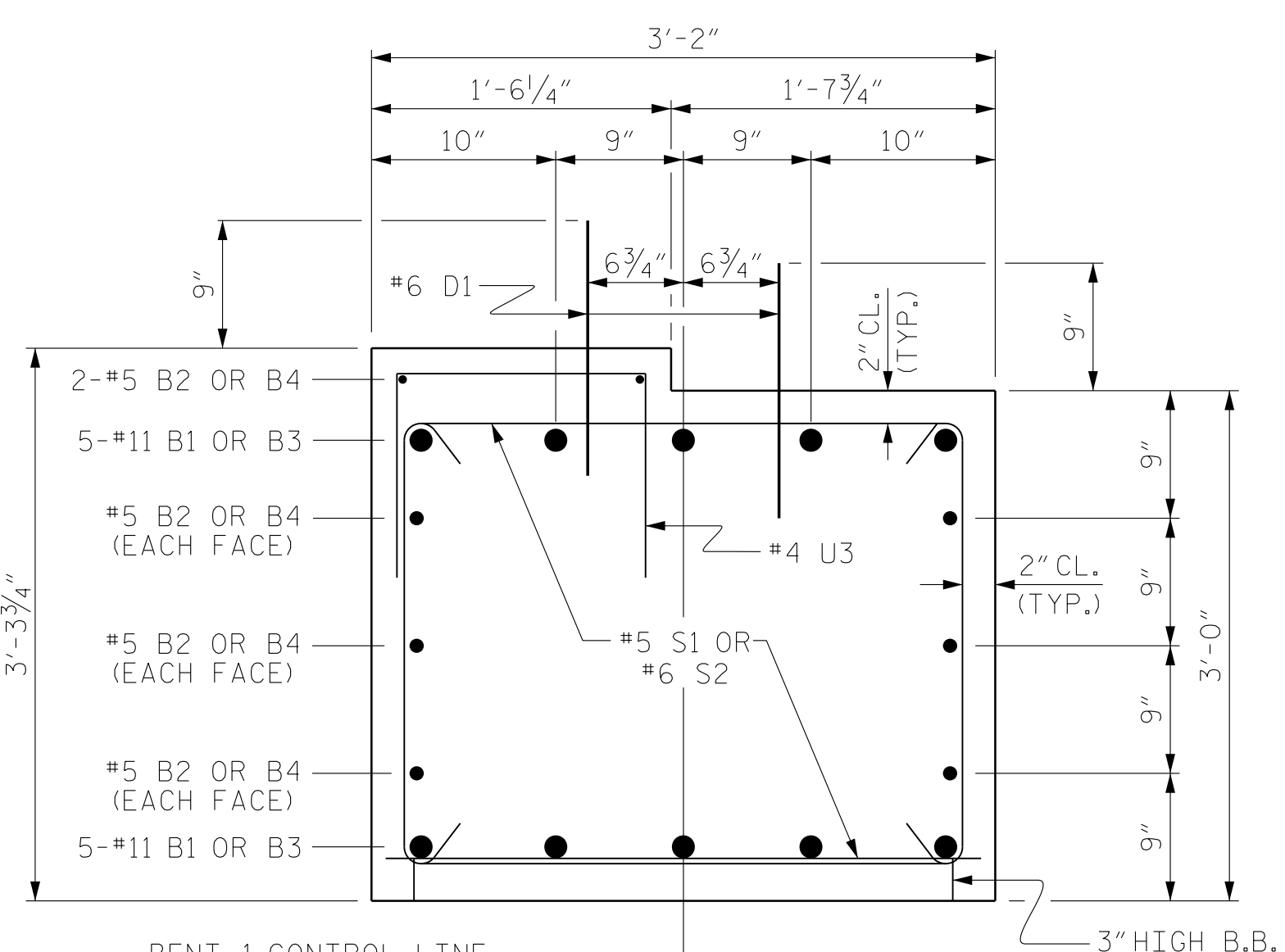
PLAN OF DRILLED PIERS & COLUMNS



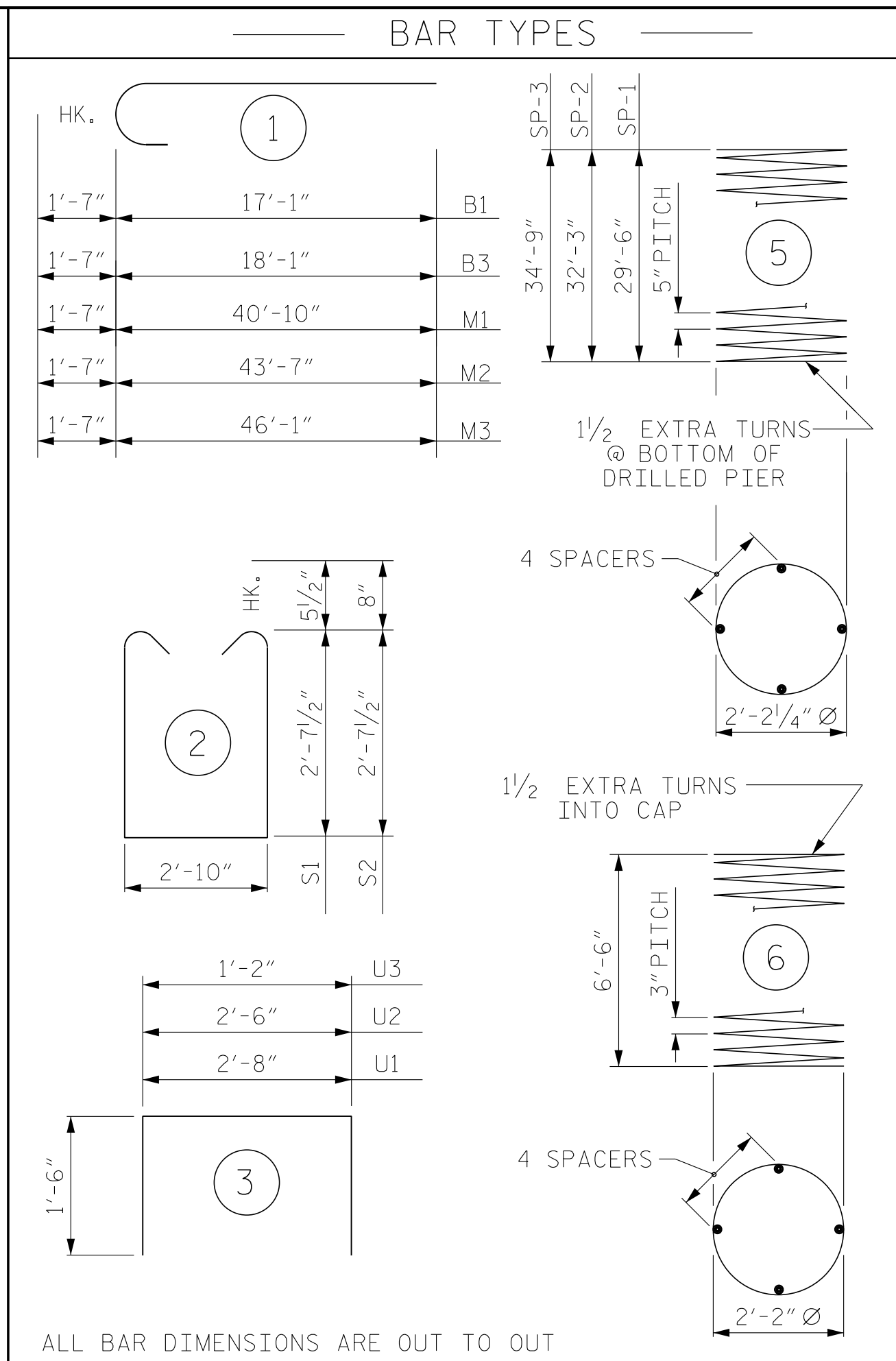
END ELEVATION



END OF CAP VIEW
(TYPICAL BOTH ENDS)

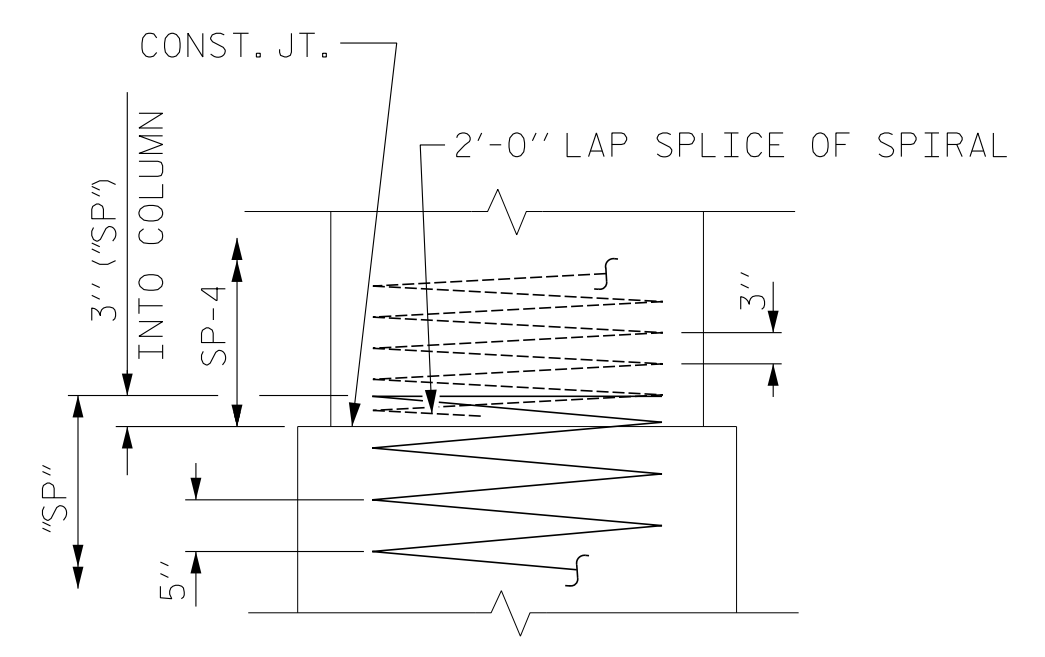


SECTION THRU CAP



ALL BAR DIMENSIONS ARE OUT TO OUT

CONSTRUCTION JOINT DETAIL



BILL OF MATERIAL											
FOR BENT NO. 1 (STAGE I)					FOR BENT NO. 1 (STAGE II)						
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	10	#11	1	18'-8"	992	B3	10	#11	1	19'-8"	1045
B2	8	#5	STR	17'-1"	143	B4	8	#5	STR	18'-1"	151
D1	20	#6	STR	1'-6"	45	D1	24	#6	STR	1'-6"	54
M1	10	#11	1	42'-5"	2254	M3	10	#11	1	47'-8"	2533
M2	10	#11	1	45'-2"	2400						
S1	29	#5	2	9'-0"	272	S1	20	#5	2	9'-0"	188
S2	3	#6	2	9'-5"	42	S2	17	#6	2	9'-5"	240
U1	3	#4	3	5'-8"	11	U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11	U2	3	#4	3	5'-6"	11
U3	16	#4	3	4'-2"	45	U3	19	#4	3	4'-2"	53
REINFORCING STEEL (STAGE I) 6215 LBS.					REINFORCING STEEL (STAGE II) 4286 LBS.						
SP-1	1	*	5	486'-0"	507	SP-3	1	*	5	571'-4"	596
SP-2	1	*	5	530'-5"	553	SP-4	1	**	6	183'-9"	123
SP-4	2	**	6	183'-9"	245						
SPIRAL COLUMN REINFORCING STEEL (STAGE I) 1305 LBS.					SPIRAL COLUMN REINFORCING STEEL (STAGE II) 719 LBS.						
* THE SP-1 & SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					* THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR						
** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR						
CLASS A CONCRETE BREAKDOWN (STAGE I)					CLASS A CONCRETE BREAKDOWN (STAGE II)						
POUR #2 (COLUMNS) 2.3 C.Y.					POUR #2 (COLUMNS) 1.1 C.Y.						
POUR #3 (CAP) 6.0 C.Y.					POUR #3 (CAP) 7.1 C.Y.						
TOTAL CLASS A CONCRETE (STAGE I) 8.3 C.Y.					TOTAL CLASS A CONCRETE (STAGE II) 8.2 C.Y.						
DRILLED PIERS: (STAGE I)					DRILLED PIERS: (STAGE II)						
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 16.4 C.Y.					DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) 9.2 C.Y.						

TOTAL BILL OF MATERIAL FOR BENT NO. 1						
3'-0" Ø DRILLED PIER IN SOIL	3'-0" Ø DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASINGS FOR 3'-0" Ø DRILLED PIER	CLASS A CONC.	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	CSL TUBES
LIN. FT.	LIN. FT.	LIN. FT.	C.Y.	LBS.	LBS.	LIN. FT.
63.8	34.0	41.6	16.5	10,501	2,024	409.4

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
SUBSTRUCTURE BENT No. 1 DETAILS						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-24
2			4			TOTAL SHEETS 34

Professional Engineer Seal for L. WILLIAMS, No. 20777, dated 12/23/2017. Includes text: 'DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED'.

ASSEMBLED BY: MAF DATE: 12/14
 CHECKED BY: HLW DATE: 12/14
 DRAWN BY: DGE 03/10
 CHECKED BY: MKT 03/10

NOTES

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

HOOKS ON "V" 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."

★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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

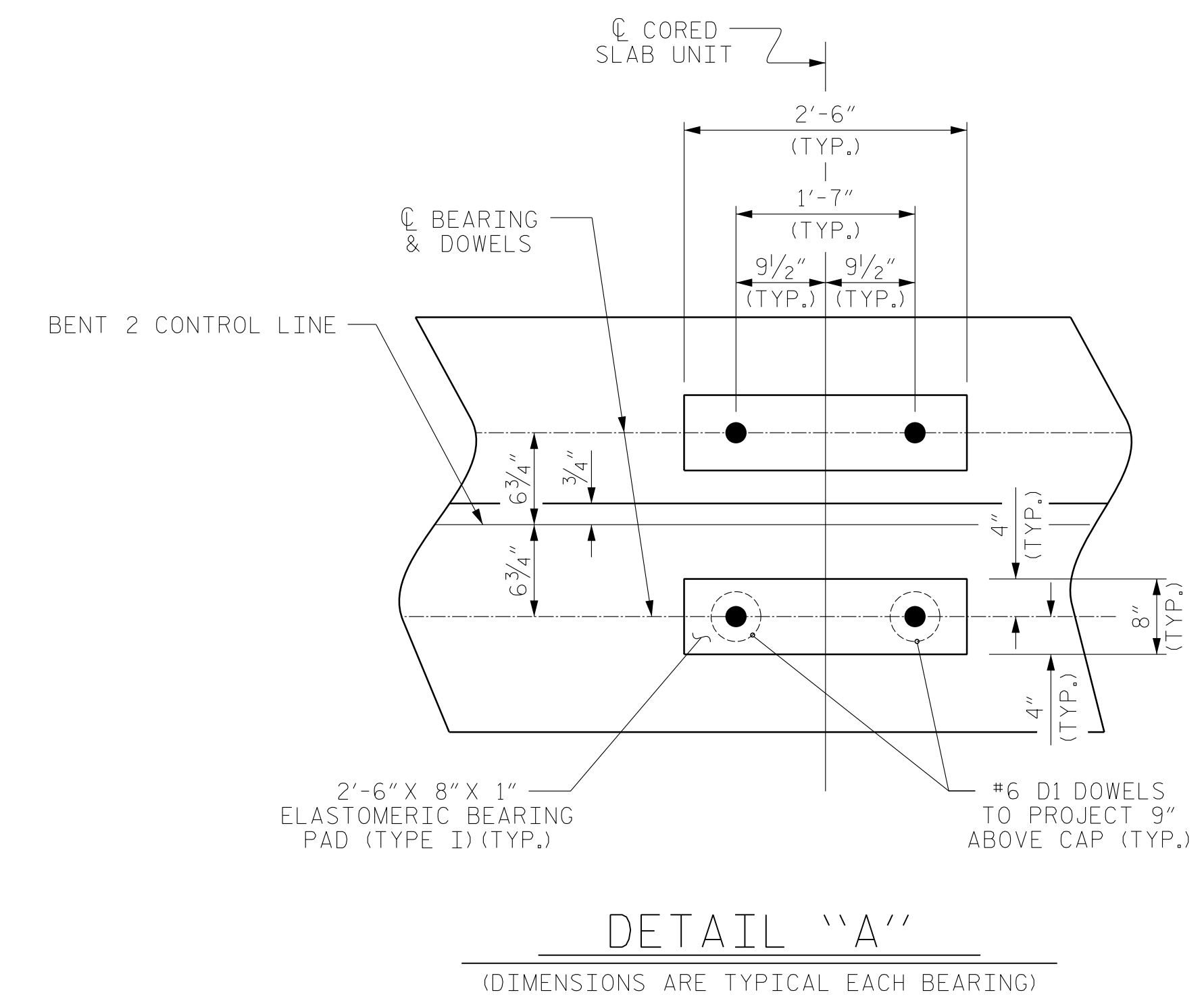
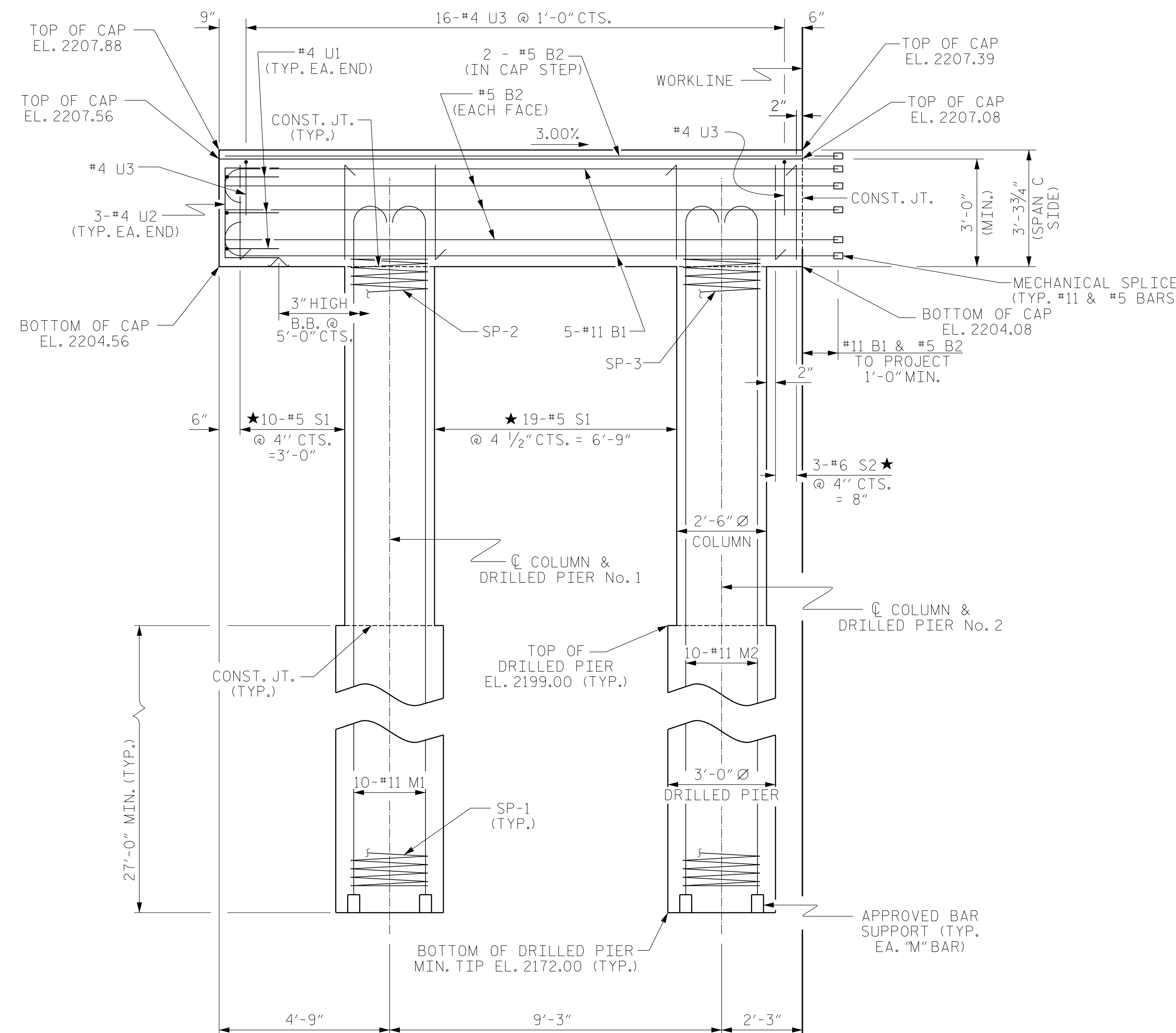
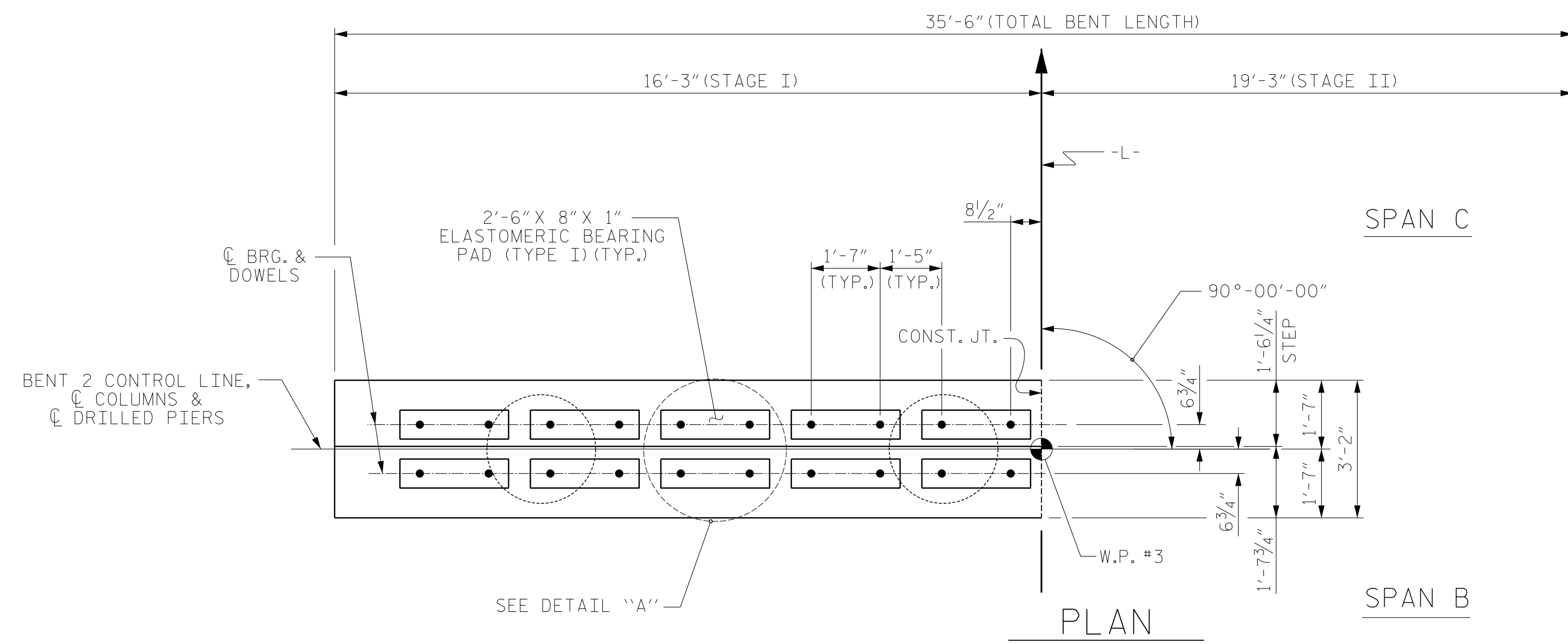


TABLE OF DIMENSIONS

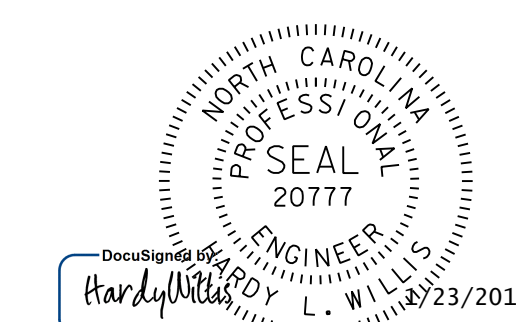
COLUMN NO.	COLUMN HEIGHT
1	5'-5"
2	5'-1 1/16"

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2
 (STAGE I)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

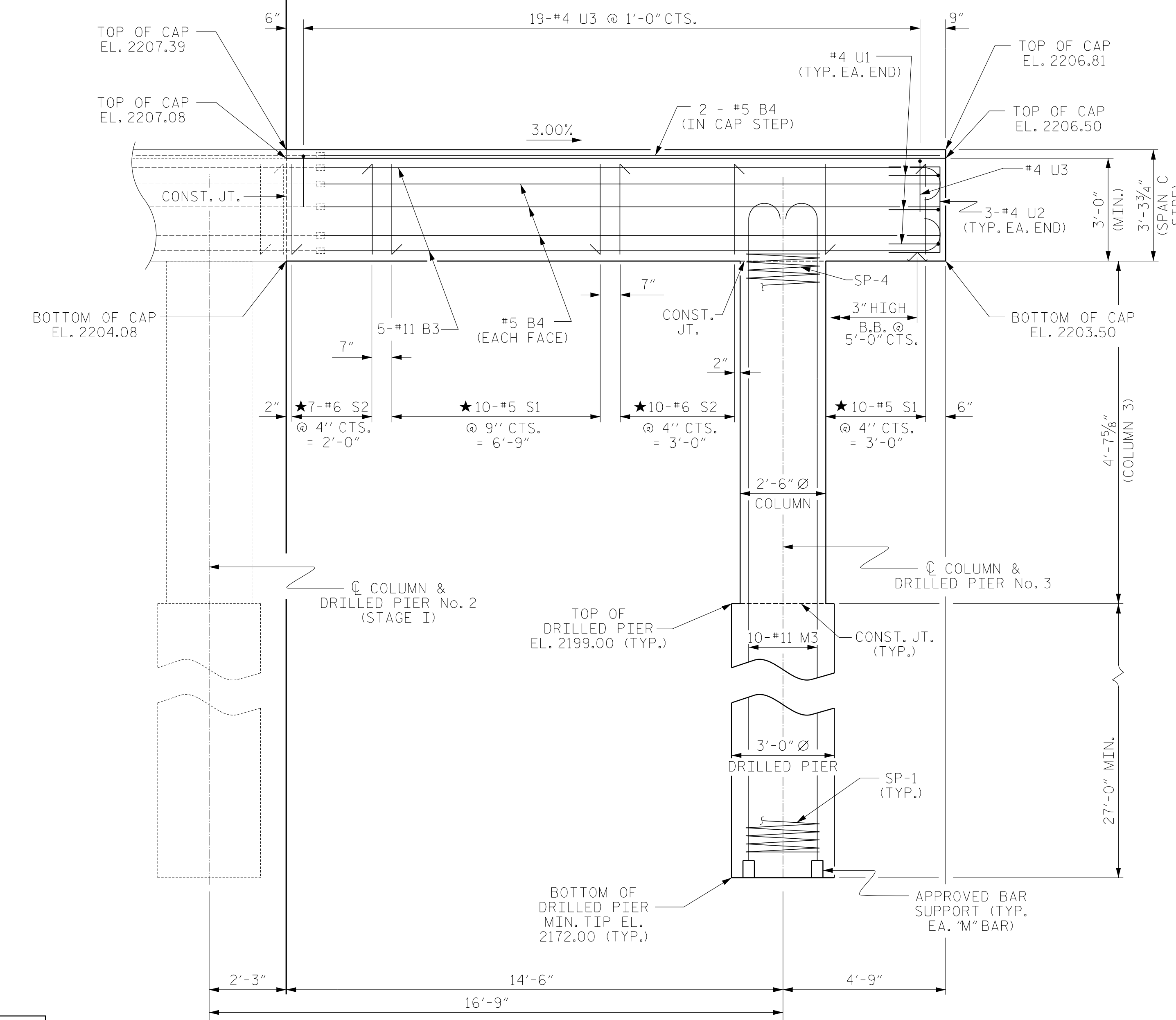
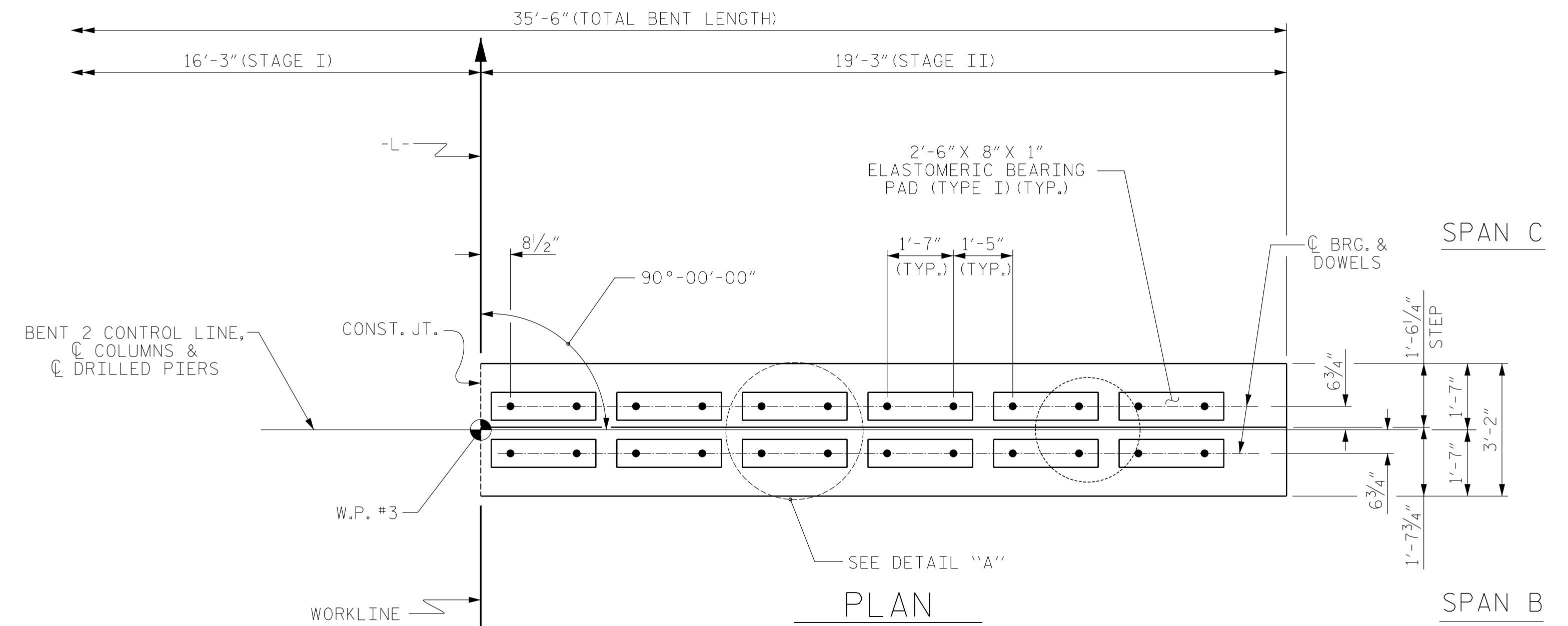
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			34

ASSEMBLED BY : MAF DATE : 12/14
 CHECKED BY : HLW DATE : 12/14
 DRAWN BY : DGE 03/10
 CHECKED BY : MKT 03/10

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

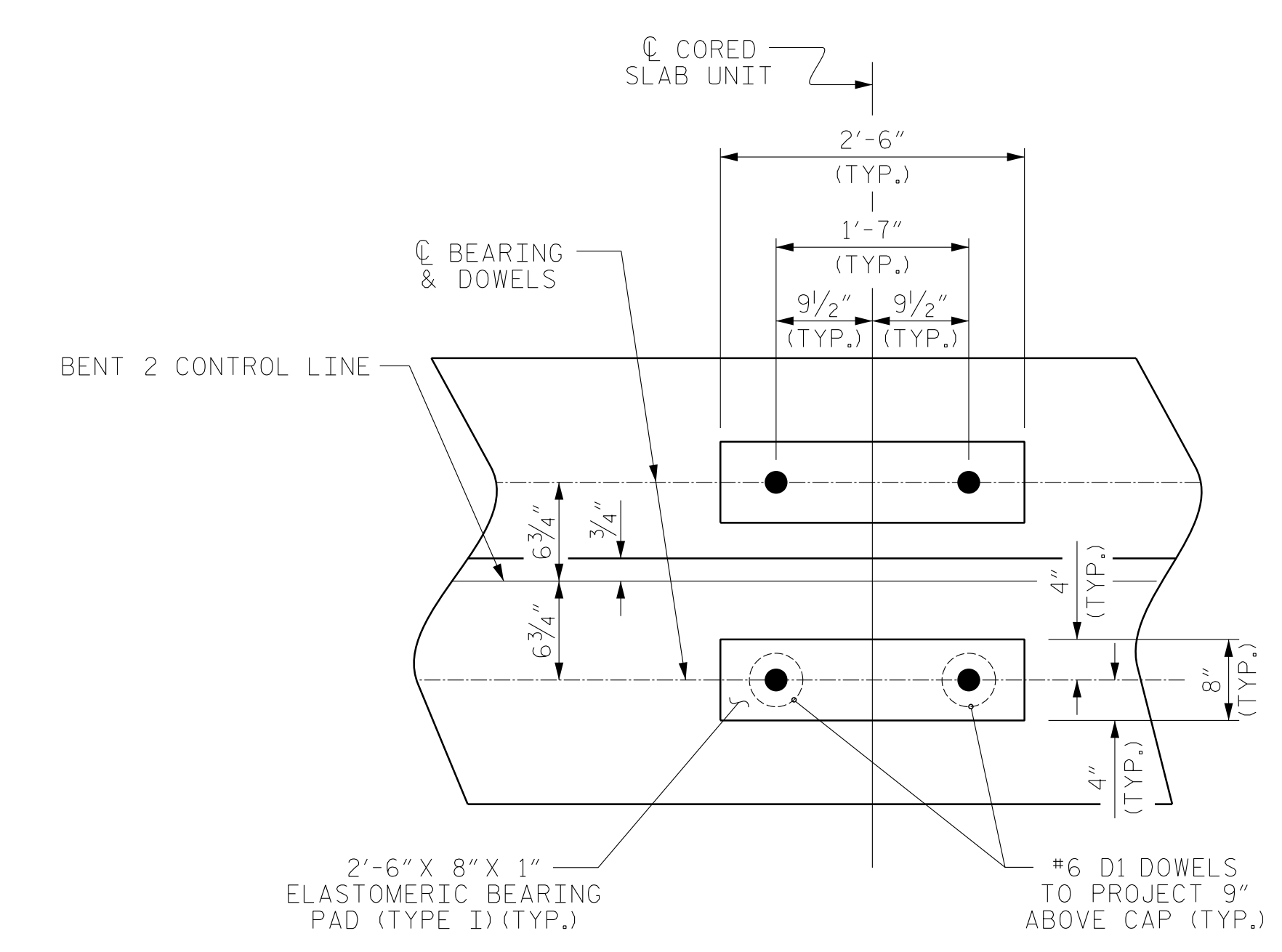
NOTES

SEE SHEET 1 OF 3 FOR NOTES.



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

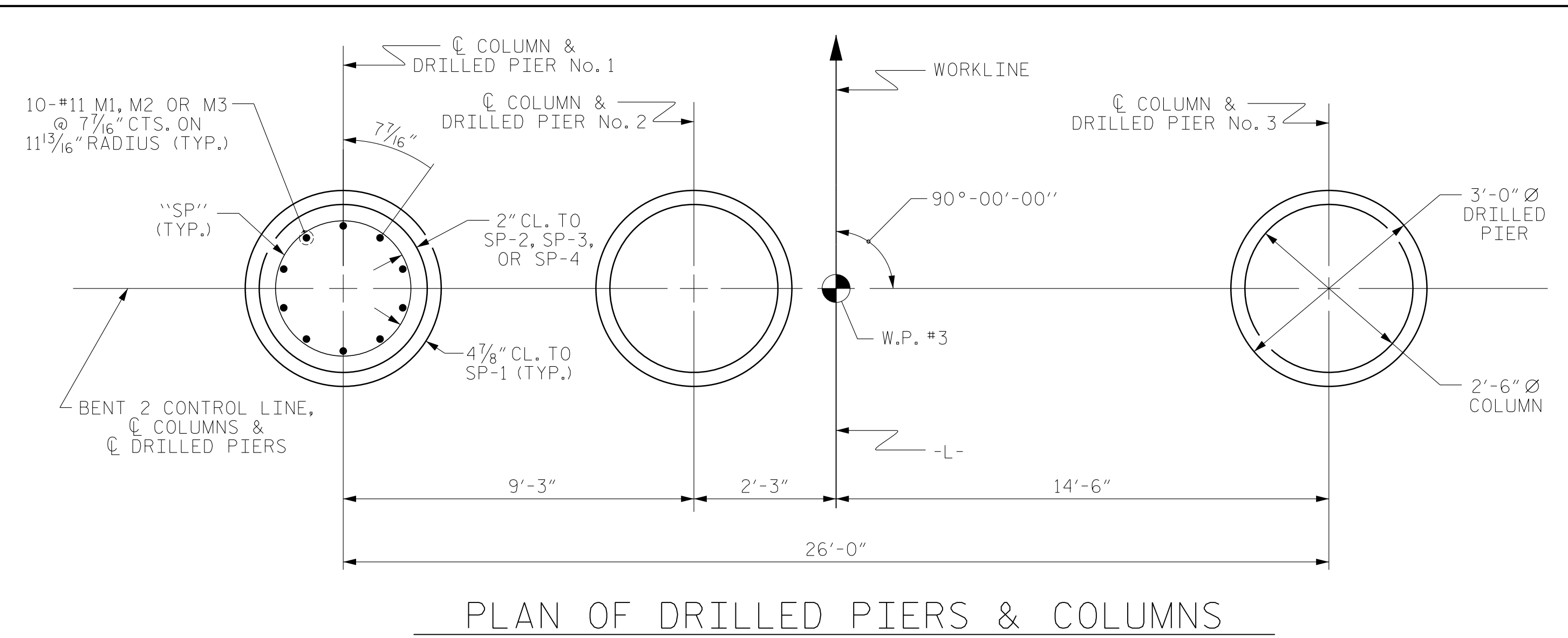
SUBSTRUCTURE
 BENT No. 2
 (STAGE II)



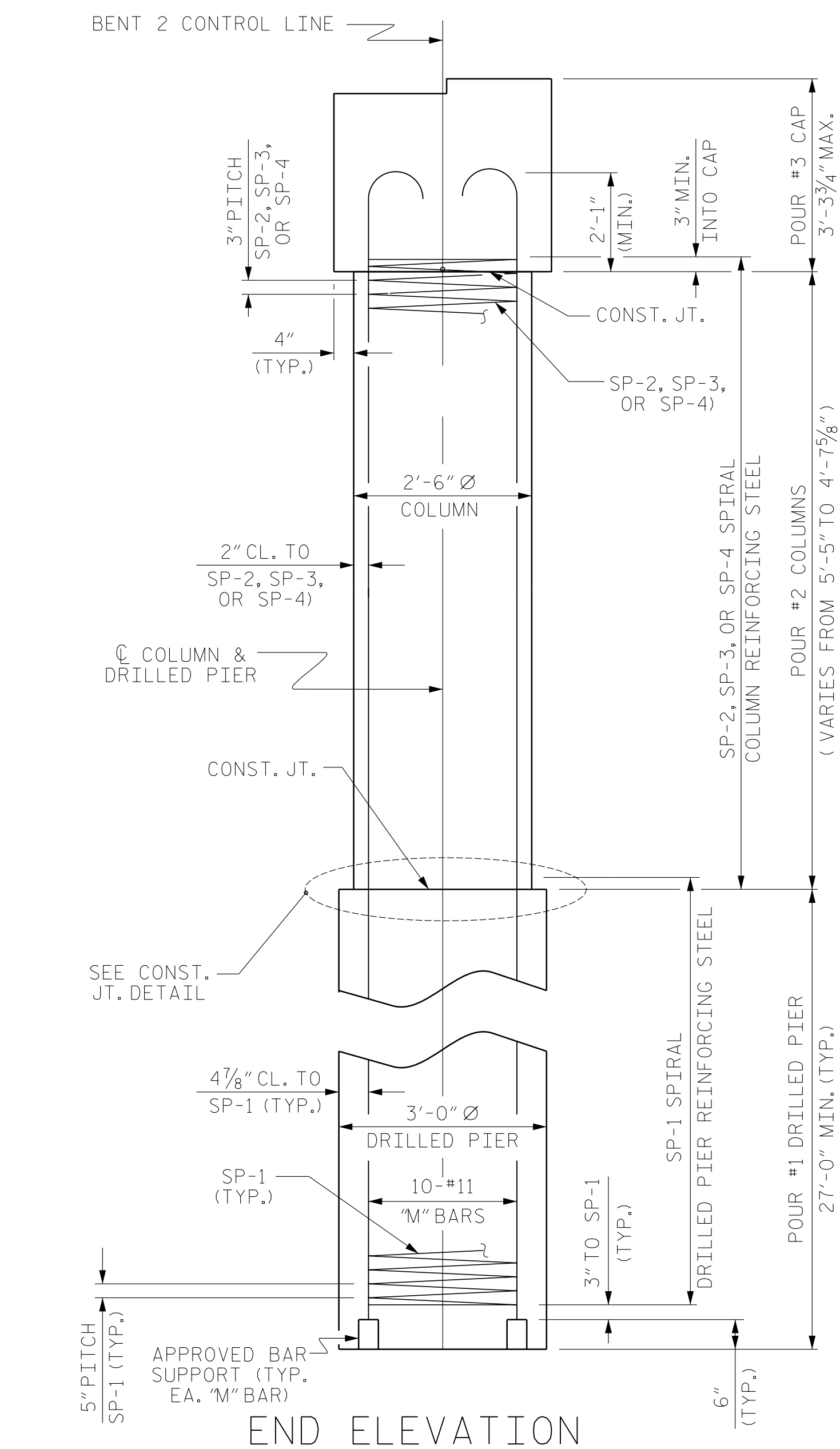
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			34

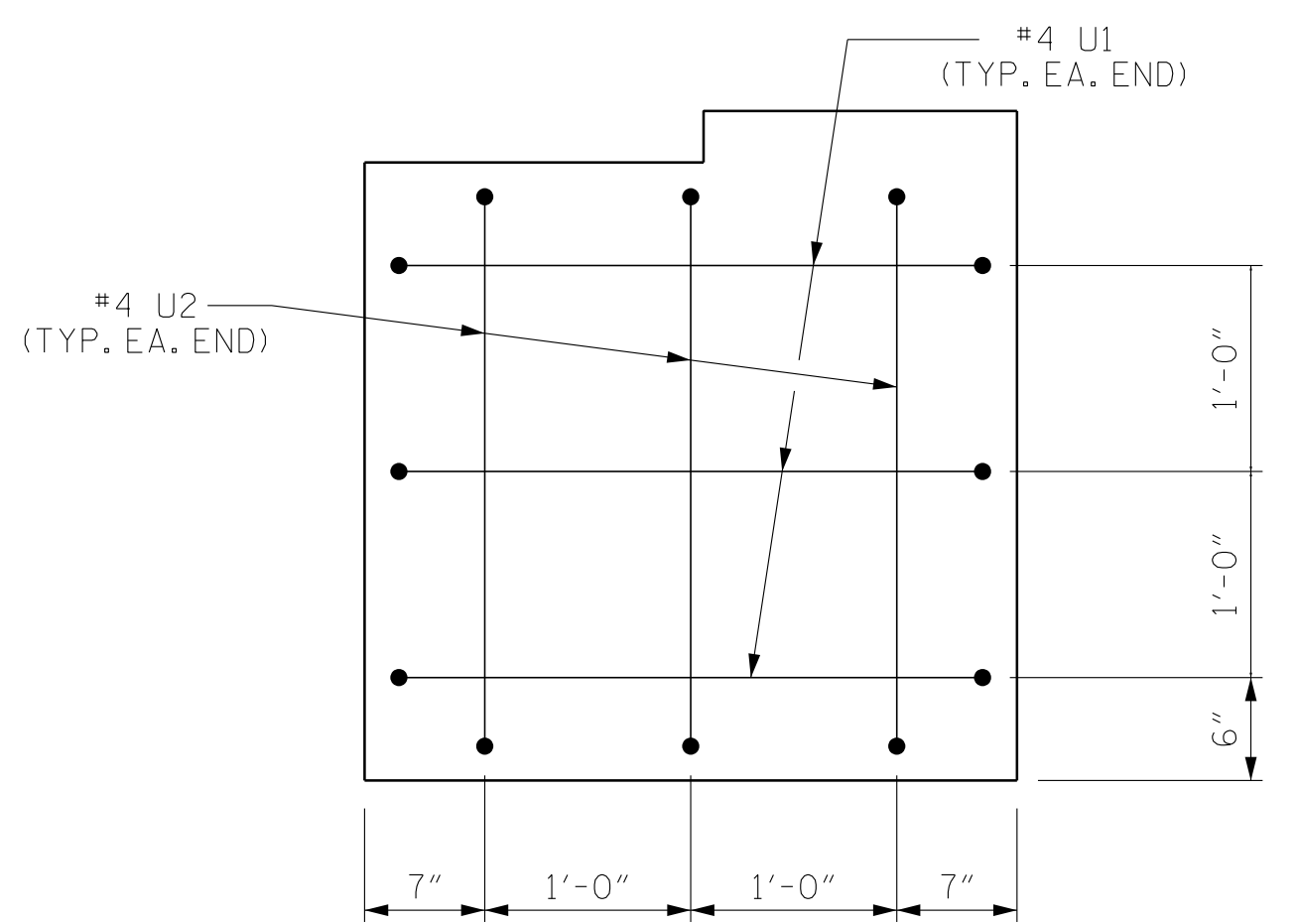
ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : DGE 03/10	
CHECKED BY : MKT 03/10	



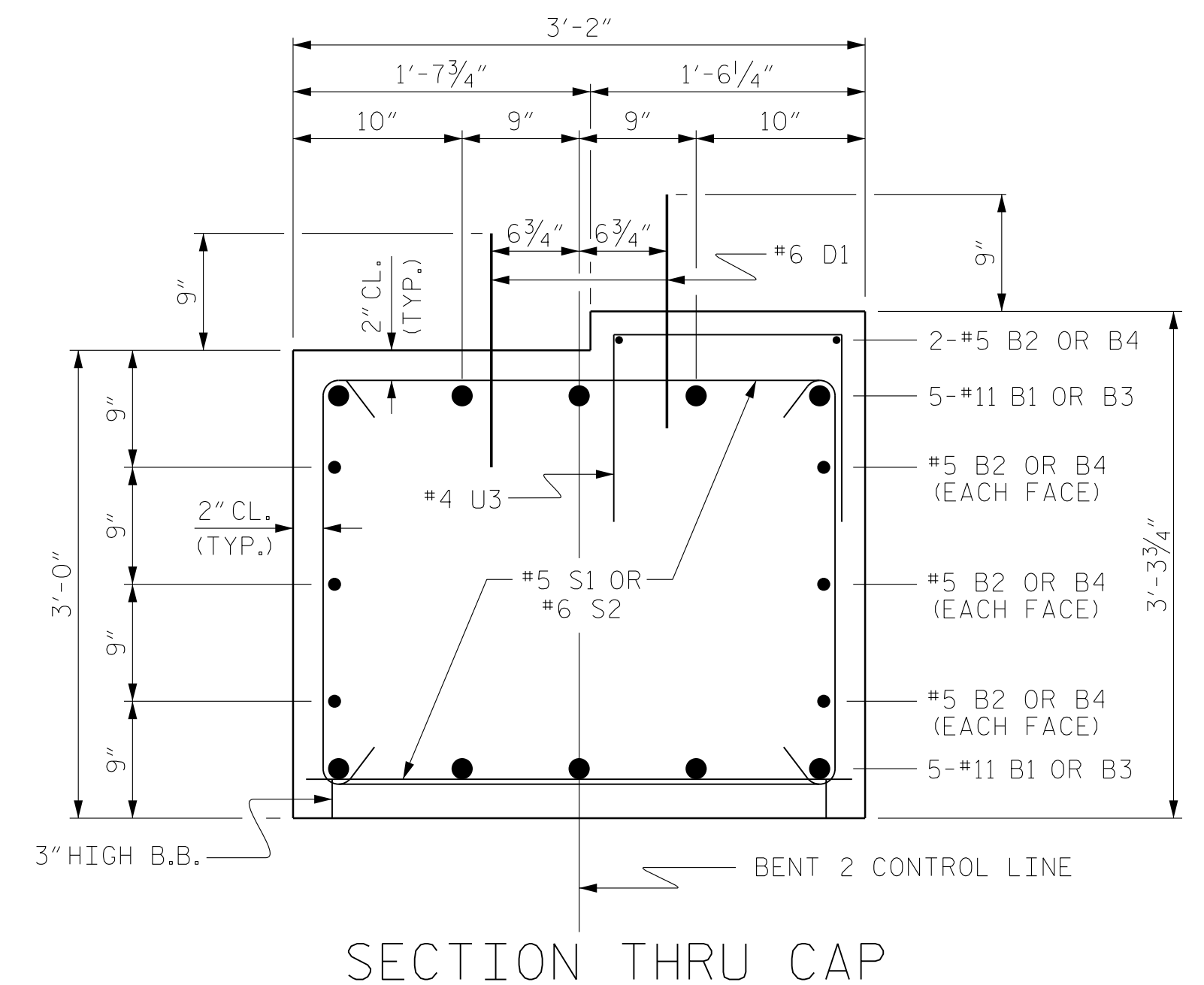
PLAN OF DRILLED PIERS & COLUMNS



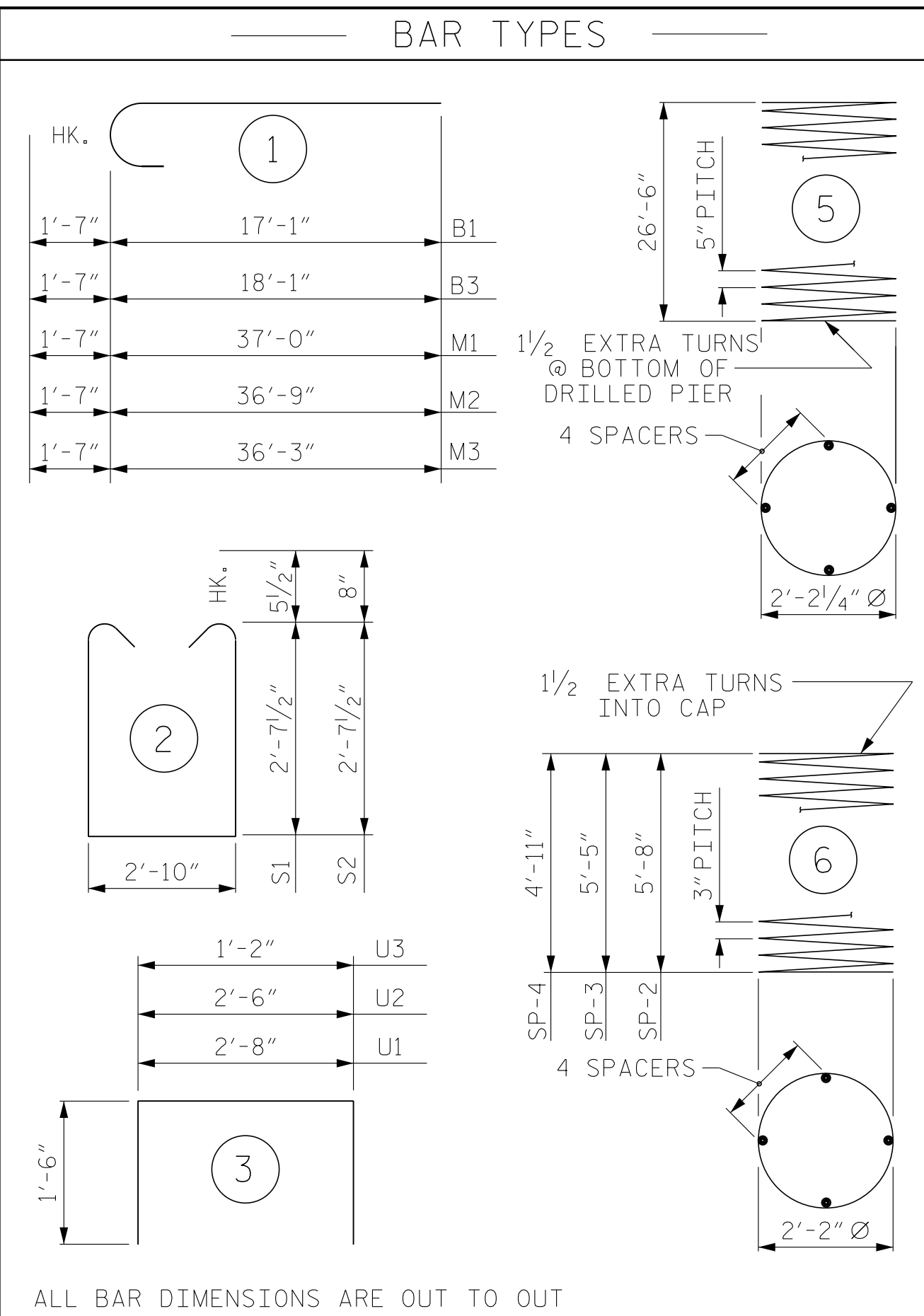
END ELEVATION



END OF CAP VIEW
(TYPICAL BOTH ENDS)



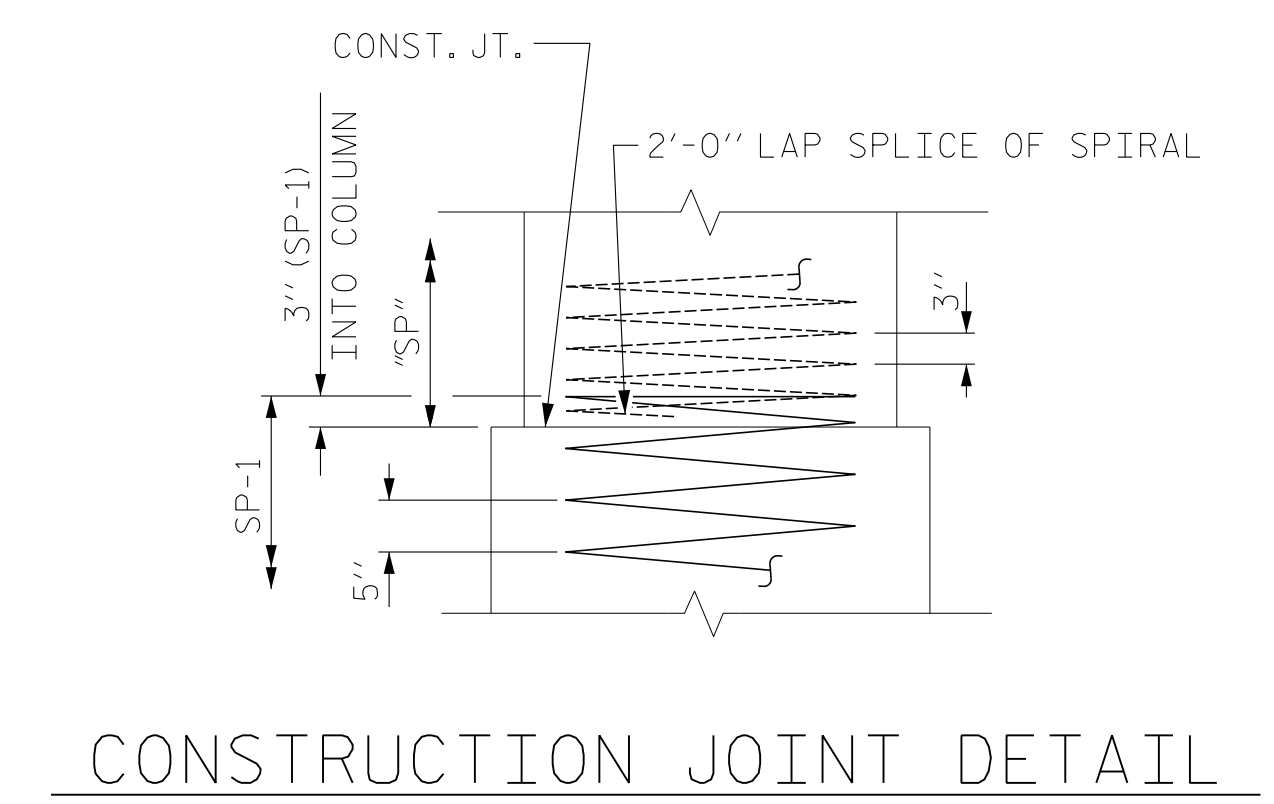
SECTION THRU CAP



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL											
FOR BENT NO. 2 (STAGE I)					FOR BENT NO. 2 (STAGE II)						
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	18'-8"	992	B3	10	#11	1	19'-8"	1045
B2	8	#5	STR	17'-1"	143	B4	8	#5	STR	18'-1"	151
D1	20	#6	STR	1'-6"	45	D1	24	#6	STR	1'-6"	54
M1	10	#11	1	38'-7"	2049	M3	10	#11	1	37'-10"	2010
M2	10	#11	1	38'-4"	2037						
S1	29	#5	2	9'-0"	272	S1	20	#5	2	9'-0"	188
S2	3	#6	2	9'-5"	42	S2	17	#6	2	9'-5"	240
U1	3	#4	3	5'-8"	11	U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11	U2	3	#4	3	5'-6"	11
U3	16	#4	3	4'-2"	45	U3	19	#4	3	4'-2"	53
REINFORCING STEEL (STAGE I)					5647 LBS.	REINFORCING STEEL (STAGE II)					3763 LBS.
SP-1	2	*	5	437'-8"	913	SP-1	1	*	5	437'-8"	456
SP-2	1	**	6	161'-9"	108	SP-4	1	**	6	141'-0"	94
SP-3	1	**	6	155'-0"	104						
SPIRAL COLUMN REINFORCING STEEL (STAGE I)					1125	SPIRAL COLUMN REINFORCING STEEL (STAGE II)					550
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR						* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR						** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN (STAGE I)						CLASS A CONCRETE BREAKDOWN (STAGE II)					
POUR #2 (COLUMNS)					1.9 C.Y.	POUR #2 (COLUMNS)					0.8 C.Y.
POUR #3 (CAP)					6.0 C.Y.	POUR #3 (CAP)					7.1 C.Y.
TOTAL CLASS A CONCRETE					7.9 C.Y.	TOTAL CLASS A CONCRETE					7.9 C.Y.
DRILLED PIERS: (STAGE I)						DRILLED PIERS: (STAGE II)					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					14.1 C.Y.	DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					7.1 C.Y.

TOTAL BILL OF MATERIAL FOR BENT NO. 2						
3'-0" Ø DRILLED PIER IN SOIL	3'-0" Ø DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASINGS FOR 3'-0" Ø DRILLED PIER	CLASS A CONC.	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	CSL TUBES
LIN. FT.	LIN. FT.	LIN. FT.	C.Y.	LBS.	LBS.	LIN. FT.
45.0	36.0	31.2	15.8	9,410	1,675	342.0



CONSTRUCTION JOINT DETAIL



PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS 34
2			4			

ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 03/10		
CHECKED BY :	MKT 03/10		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

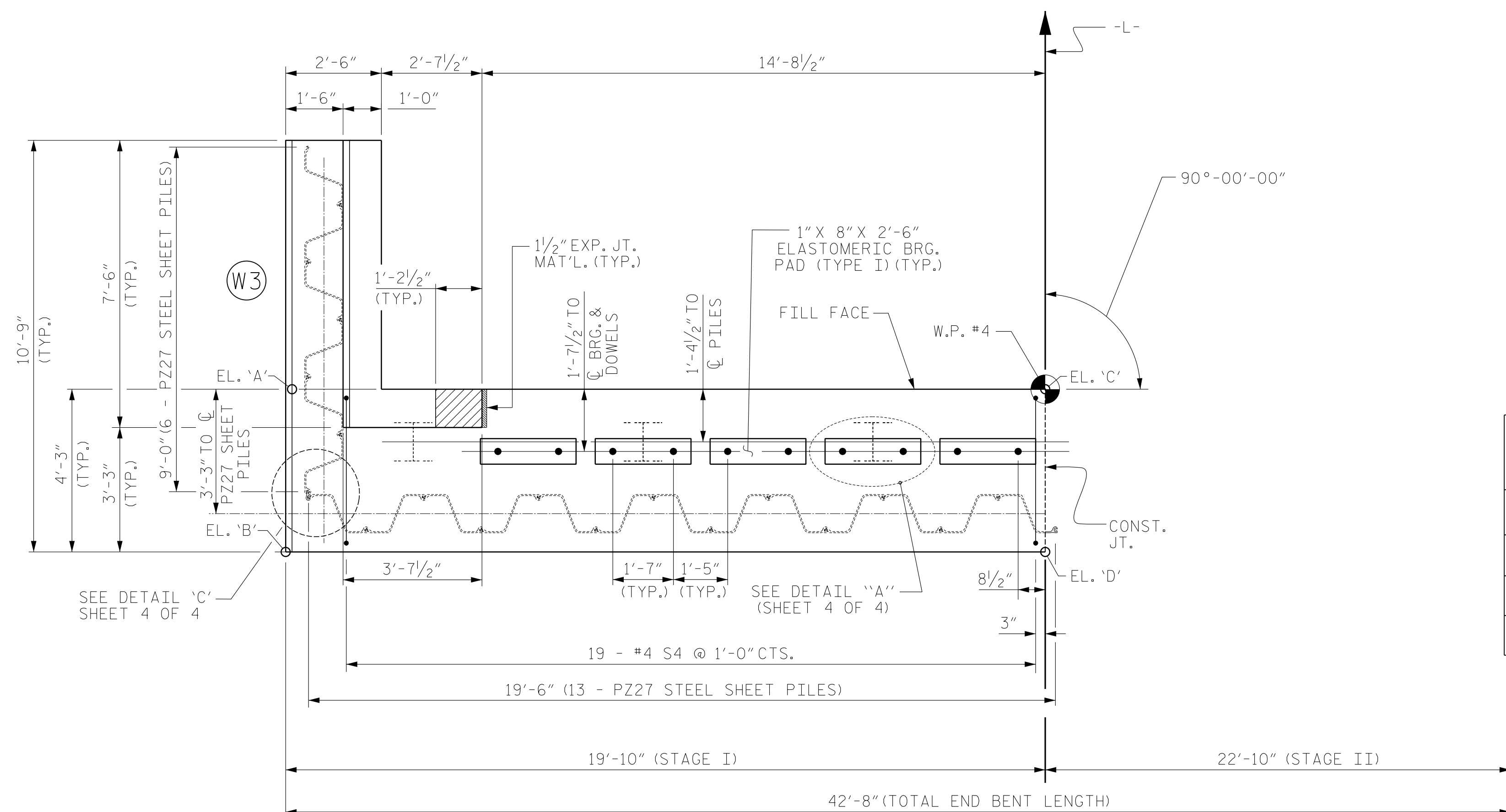
NOTES

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

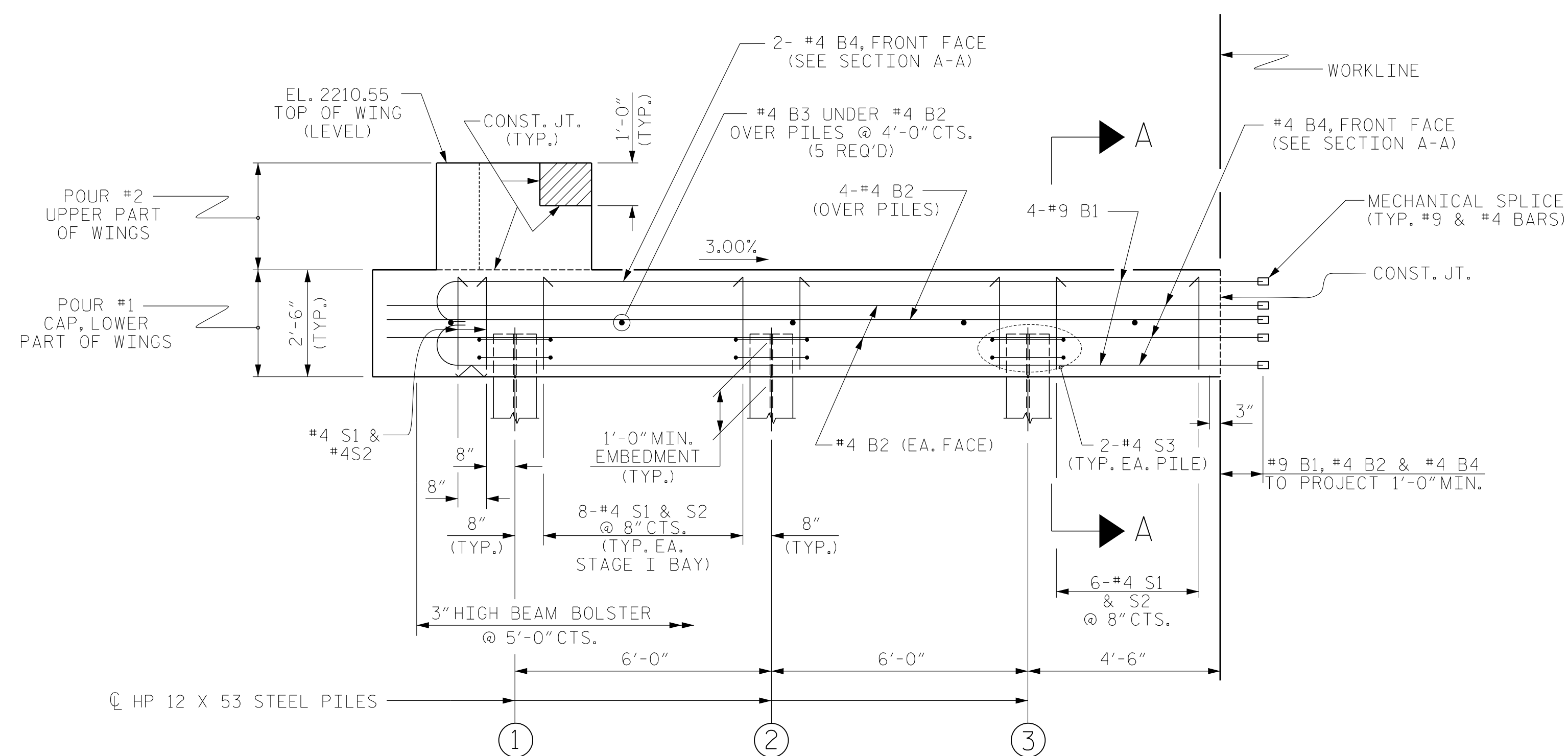
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

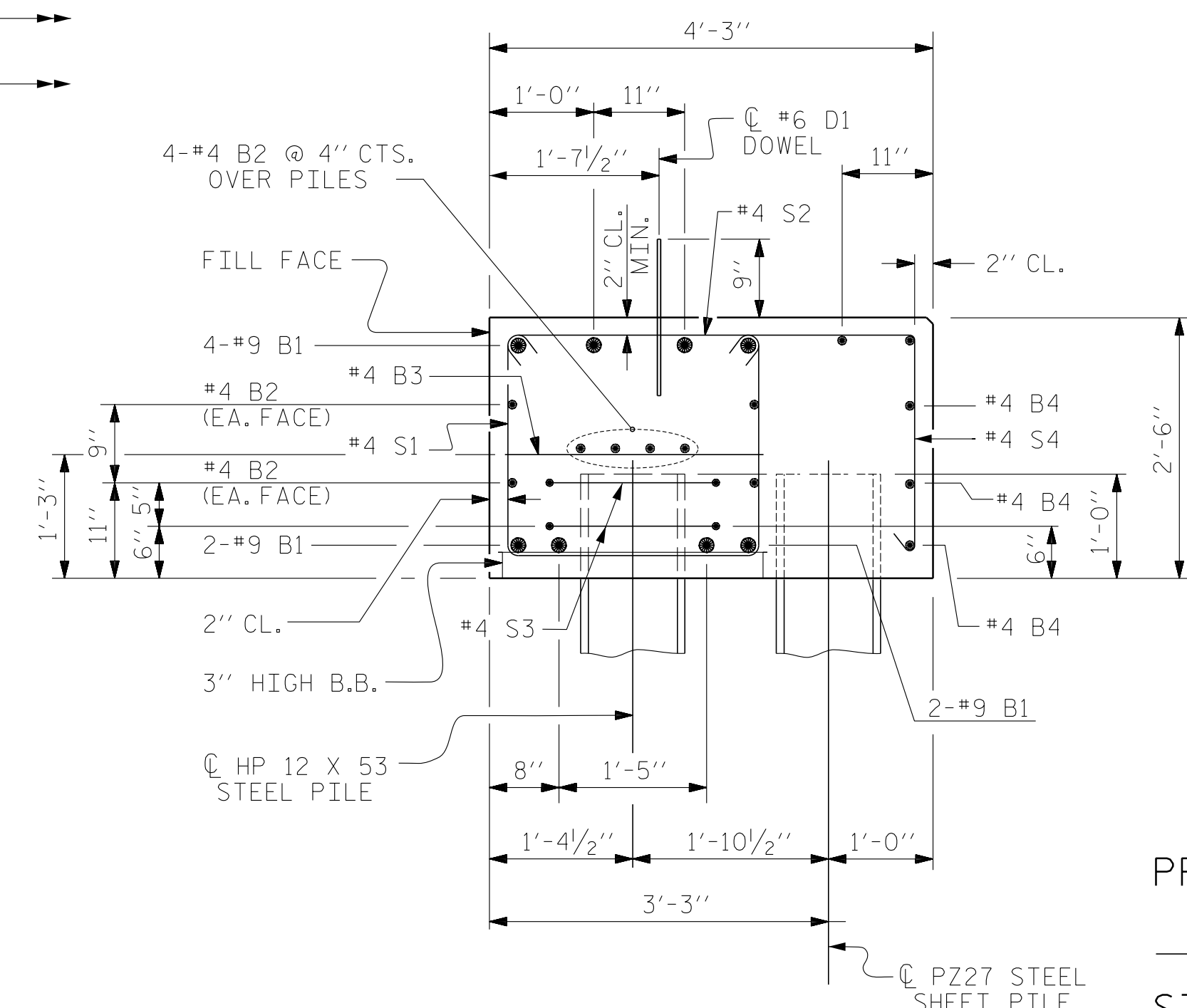


ELEVATION

WINGS NOT SHOWN FOR CLARITY.
SHEET PILES NOT SHOWN FOR CLARITY.
FOR SHEET PILE CONNECTION DETAILS, SEE SHEET 4 OF 4.

	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
(A)	2208.05	2205.55
(B)	2208.04	2205.54
(C)	2207.45	2204.95
(D)	2207.44	2204.94

	TOP OF PILE ELEVATIONS
(1)	2206.44
(2)	2206.26
(3)	2206.08



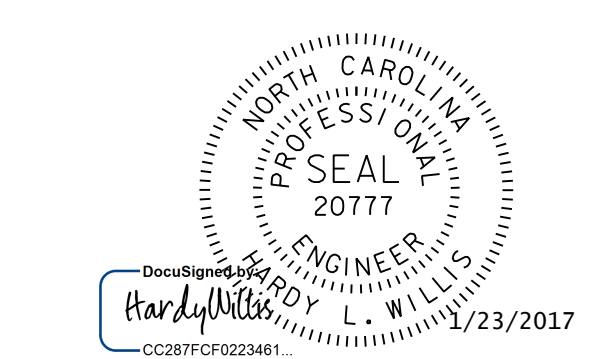
SECTION A-A

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

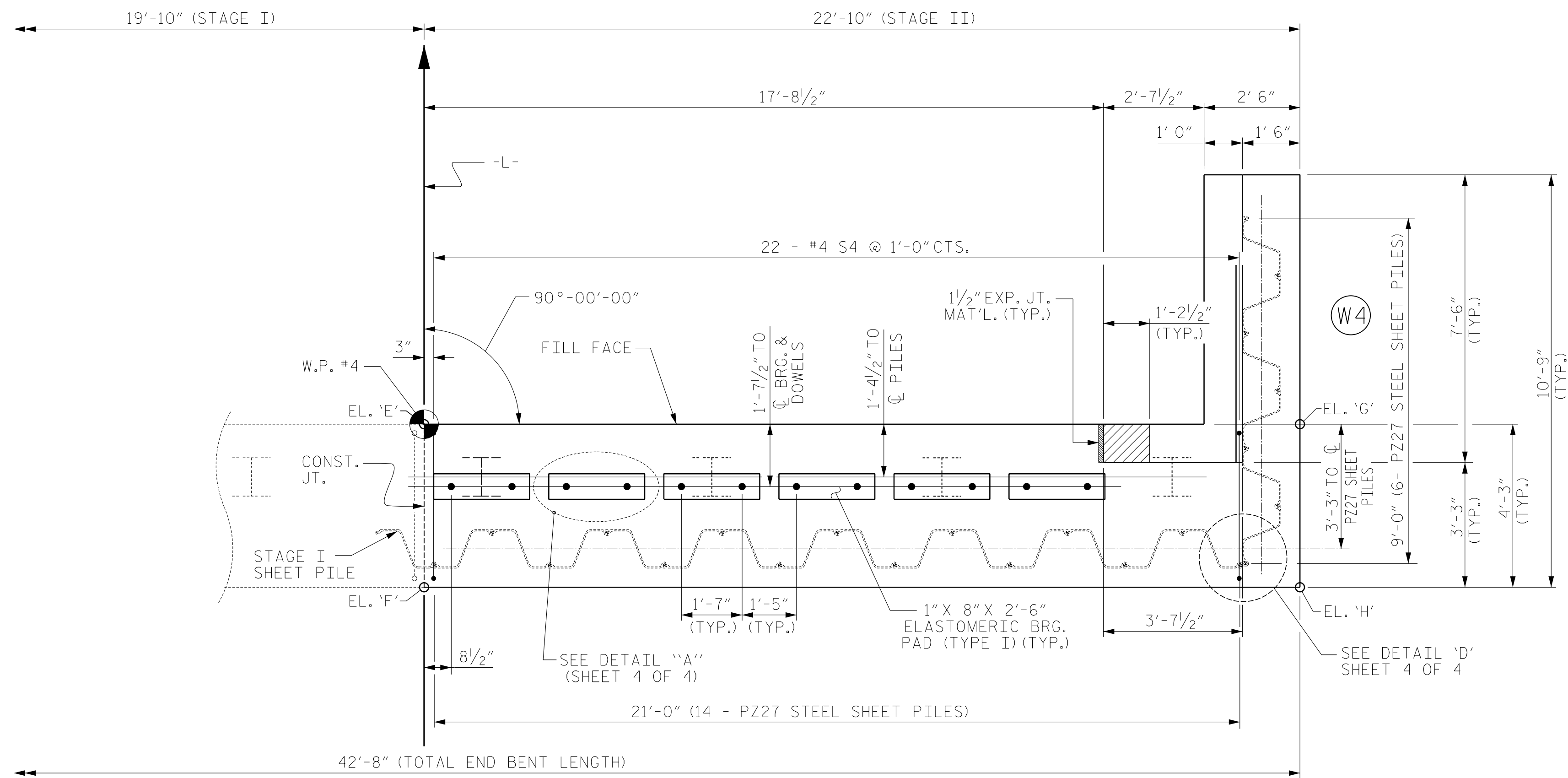
SUBSTRUCTURE
END BENT No. 2
(STAGE I)



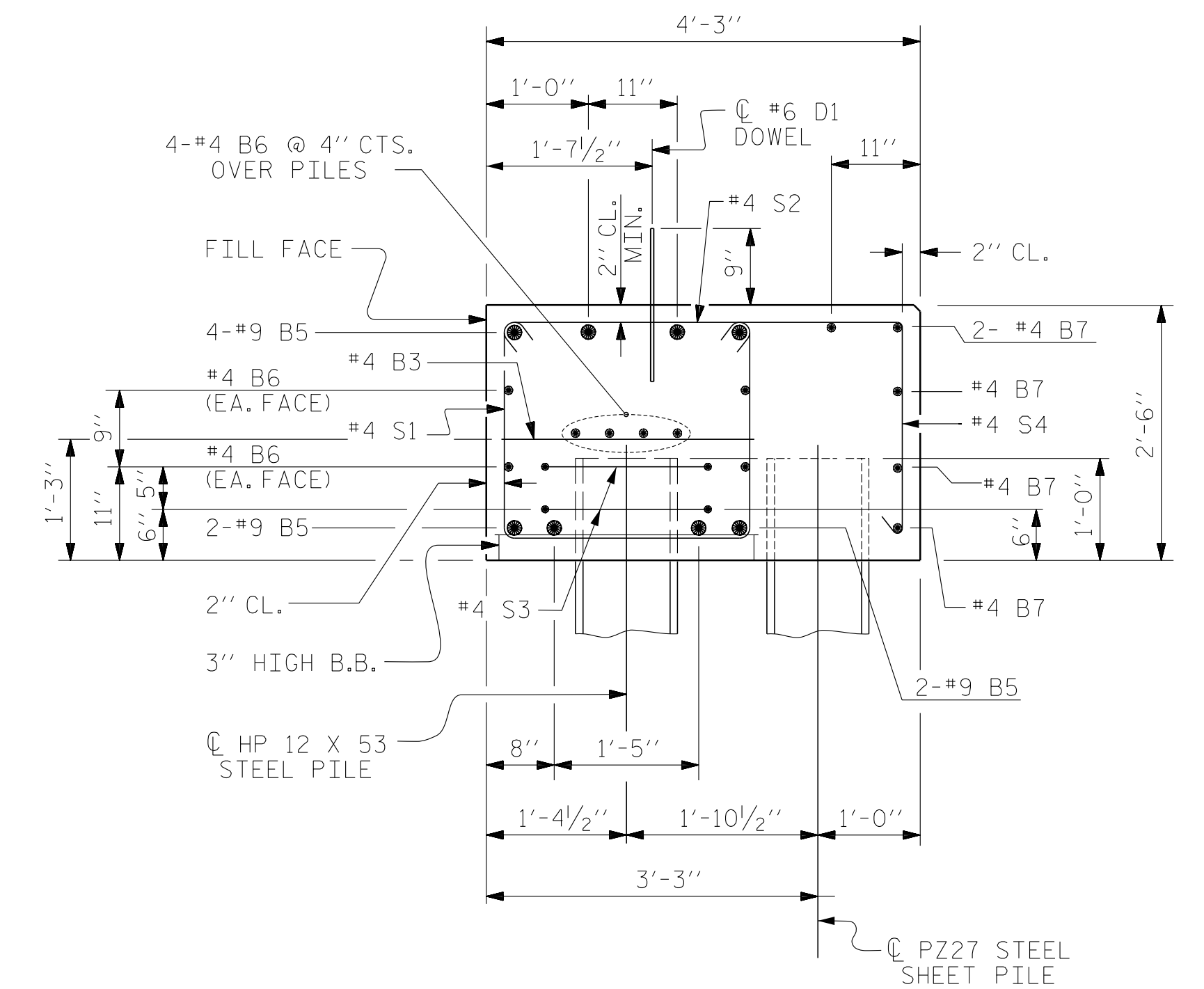
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 34
2			4			

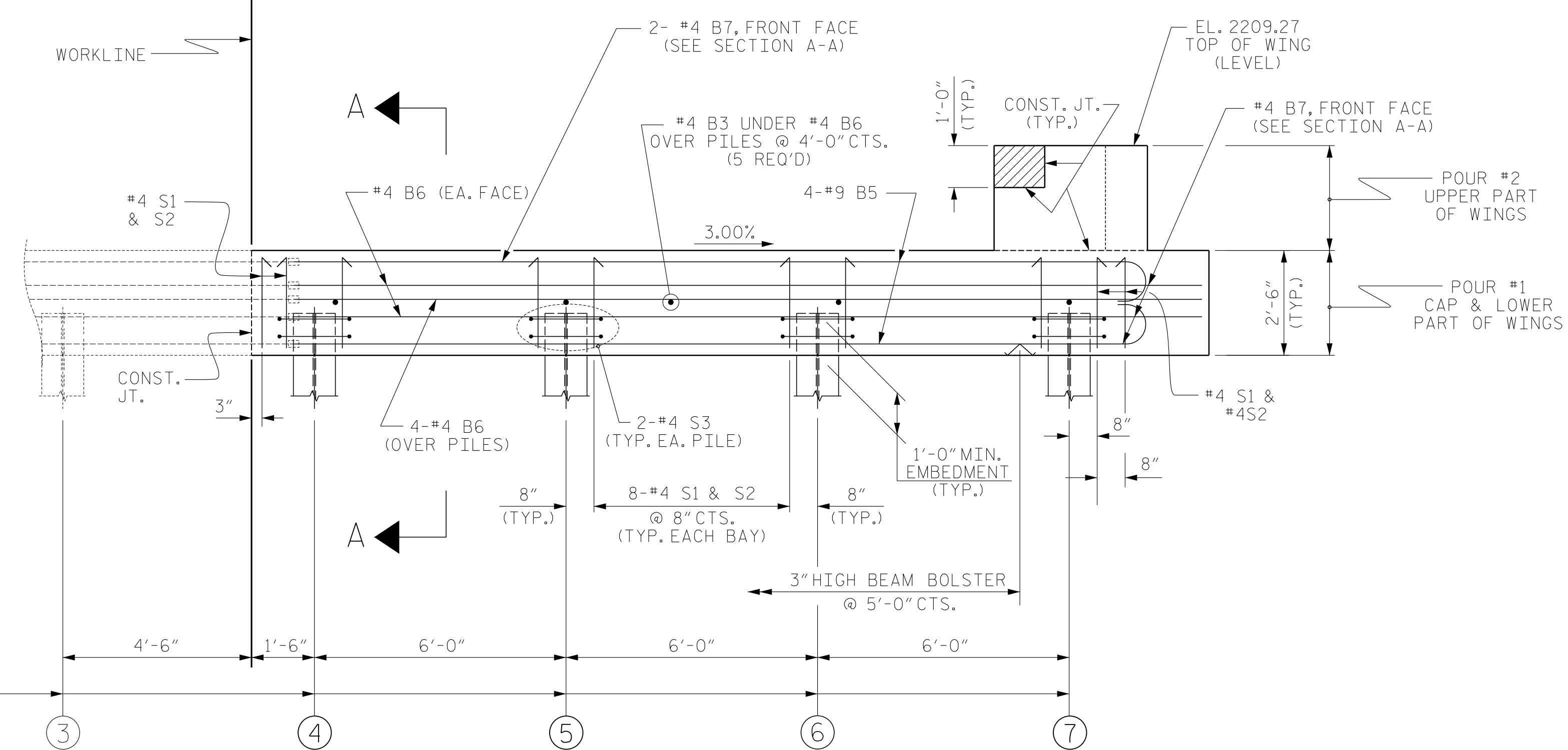
ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : DGE 02/10	
CHECKED BY : MKT 02/10	



PLAN



SECTION A-A



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
SHEET PILES NOT SHOWN FOR CLARITY.
FOR SHEET PILE CONNECTION DETAILS, SEE SHEET 4 OF 4.

NOTES

SEE NOTES, SHEET 1 OF 4.

	TOP OF CAP ELEVATIONS	BOTTOM OF CAP ELEVATIONS
(E)	2207.45	2204.95
(F)	2207.44	2204.94
(G)	2206.77	2204.27
(H)	2206.76	2204.26

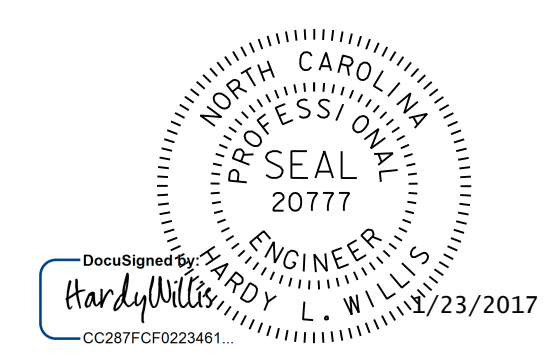
	TOP OF PILE ELEVATIONS
(4)	2205.90
(5)	2205.72
(6)	2205.54
(7)	2205.36

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

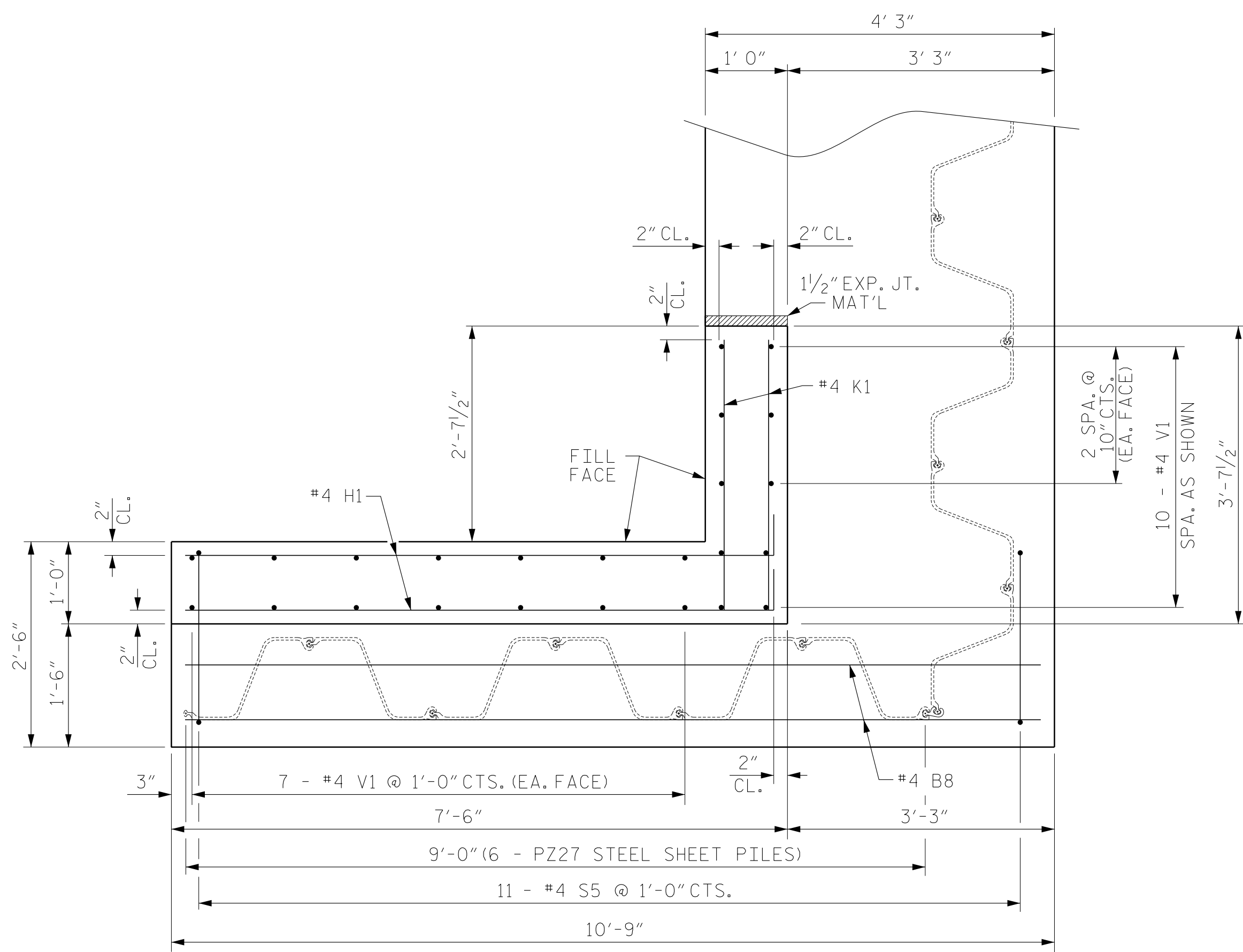
SUBSTRUCTURE
 END BENT No. 2
 (STAGE II)



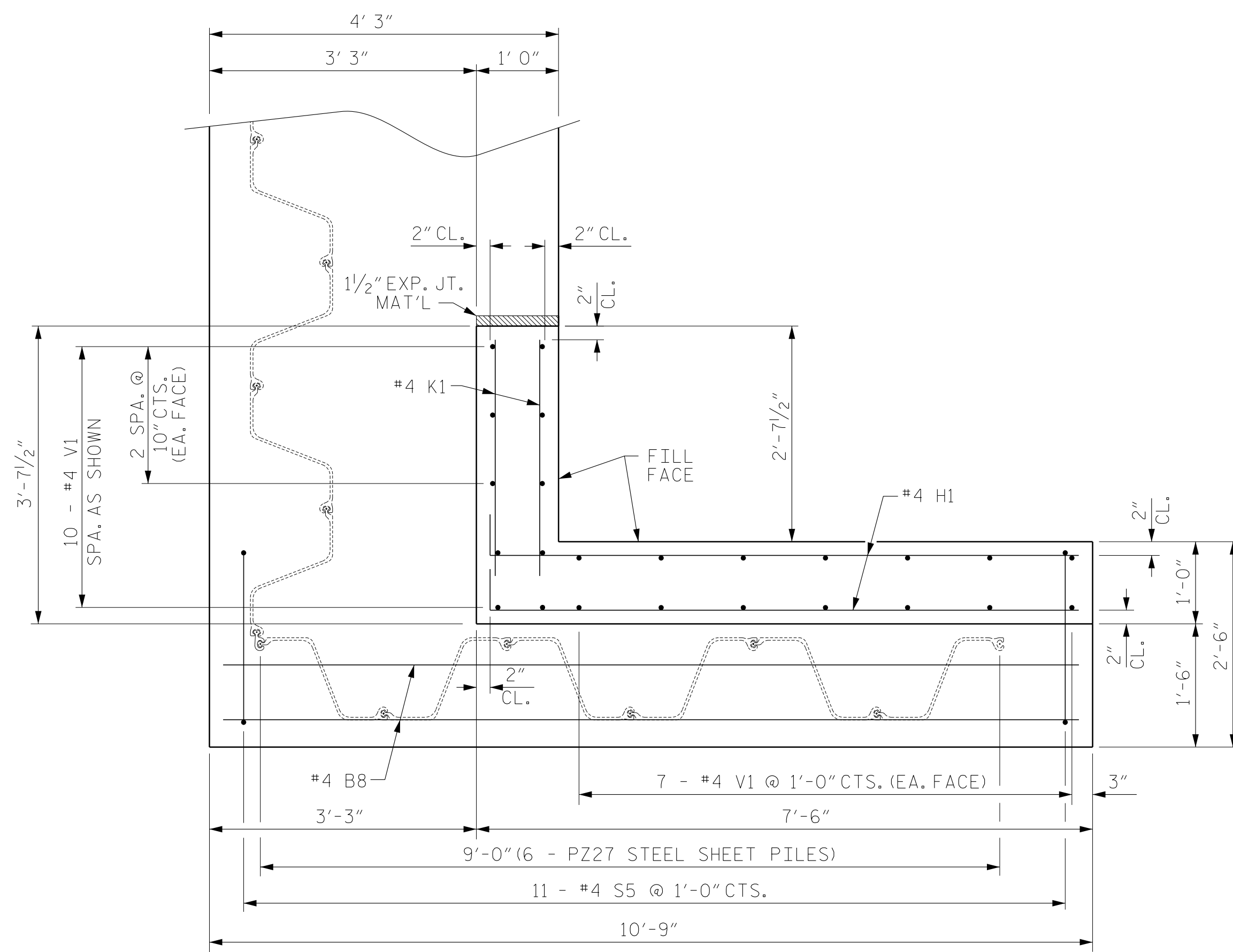
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			34

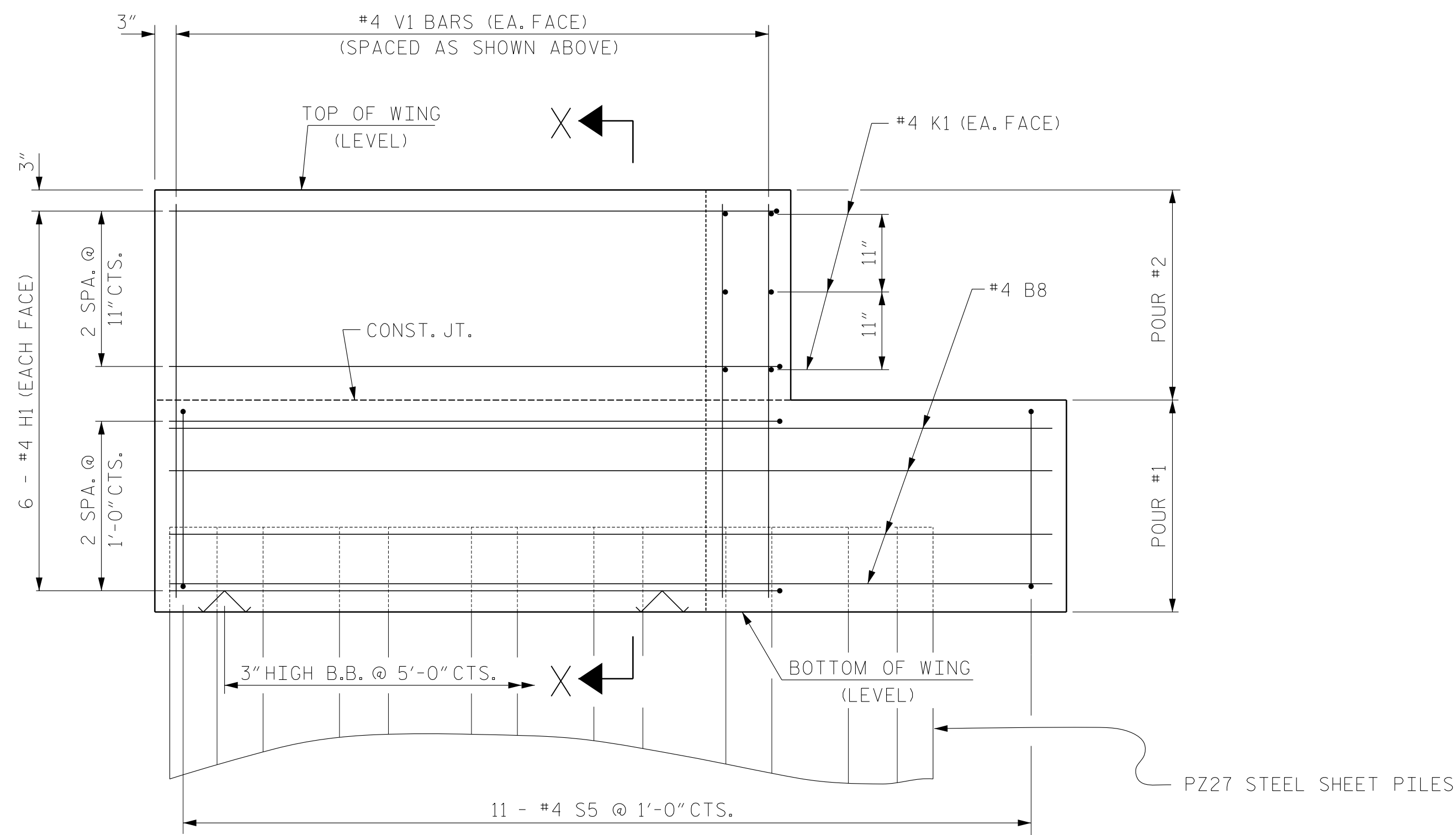
ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : DGE 02/10	
CHECKED BY : MKT 02/10	



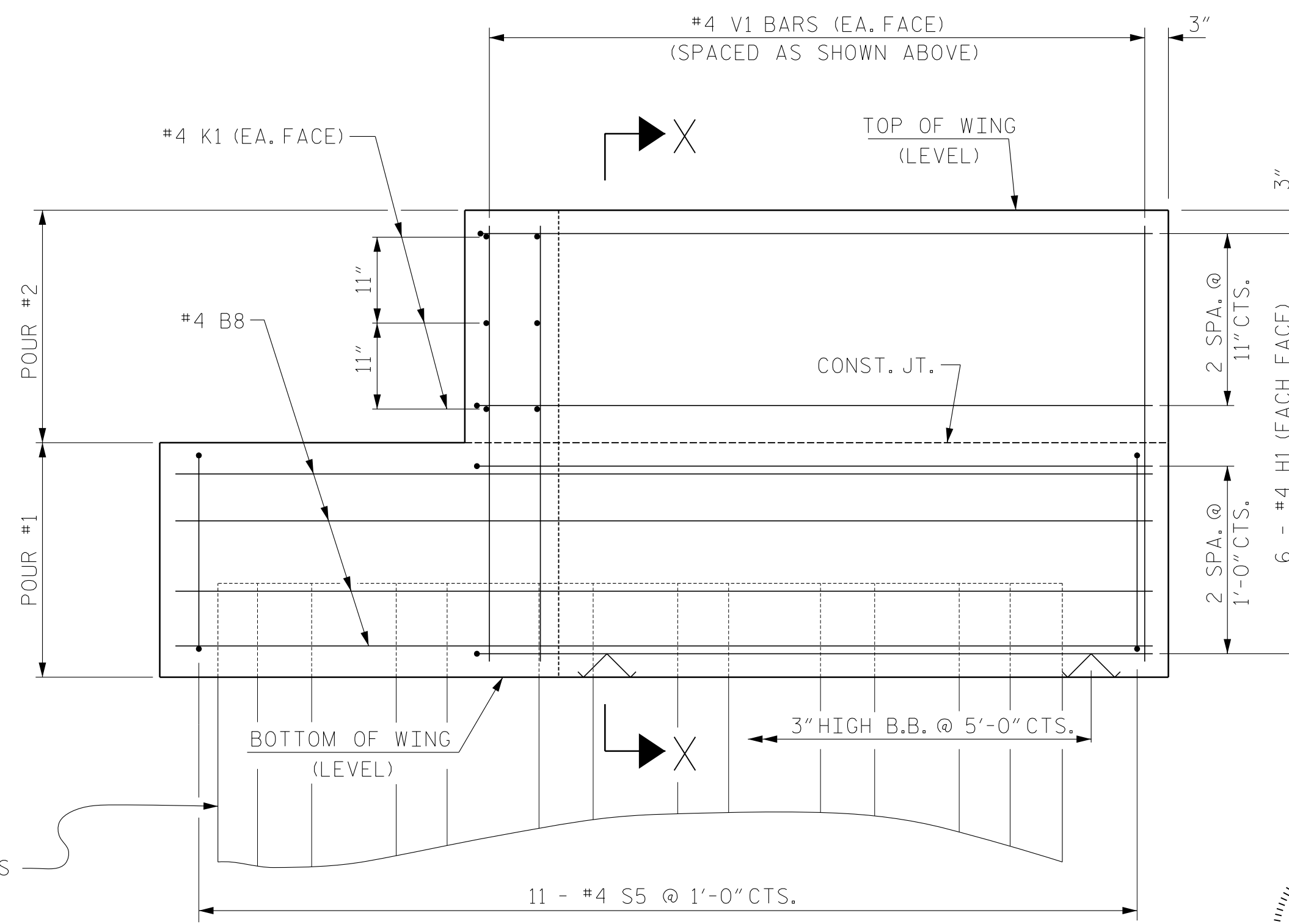
PLAN OF WING (W3)



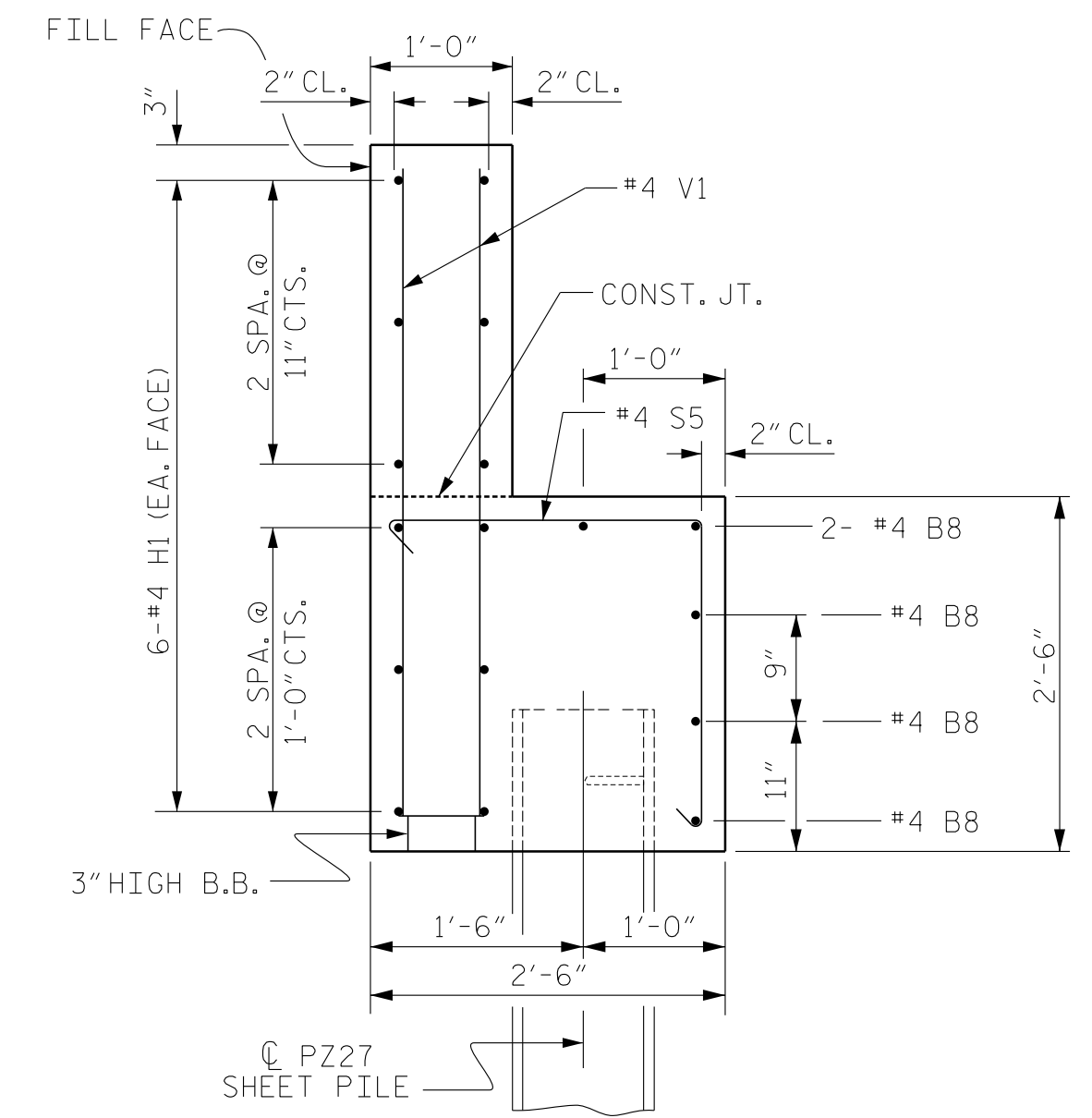
PLAN OF WING (W4)



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION X-X

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT NO. 2
 WING DETAILS

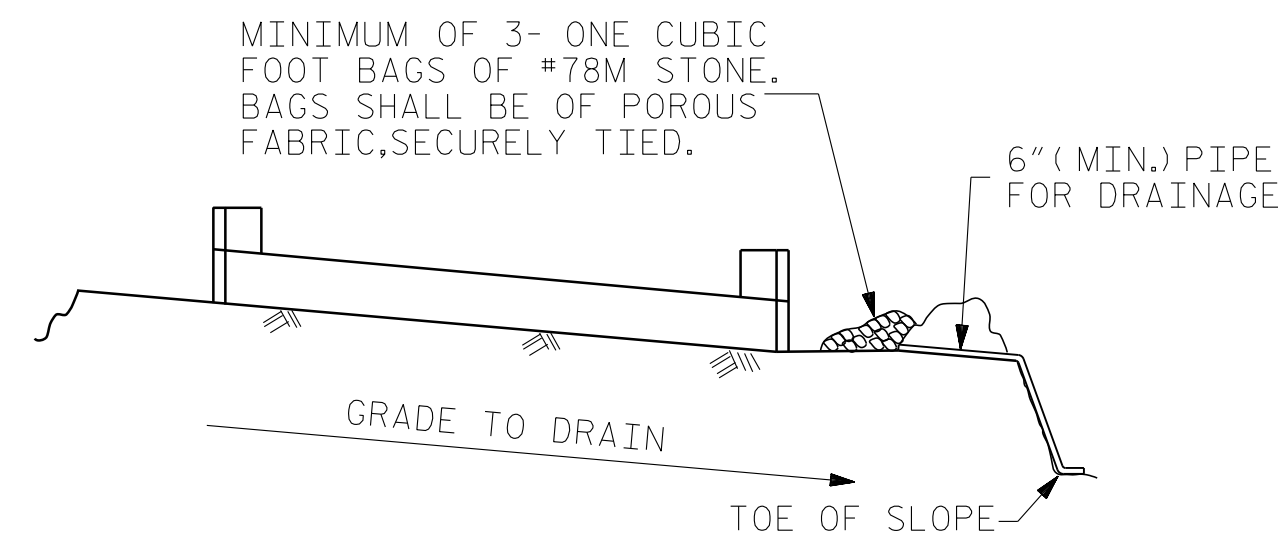


DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30	
1			3			TOTAL SHEETS	
2			4			34	

ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 02/10		
CHECKED BY :	MKT 02/10		

WING DETAILS

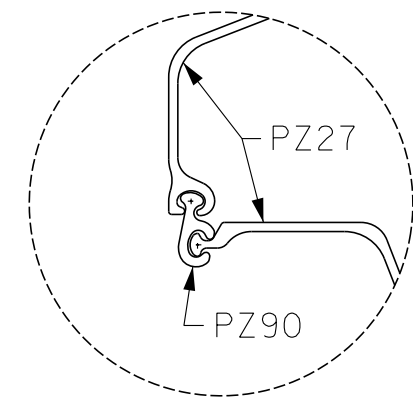


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

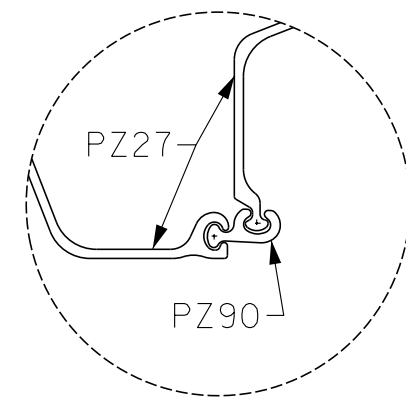
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

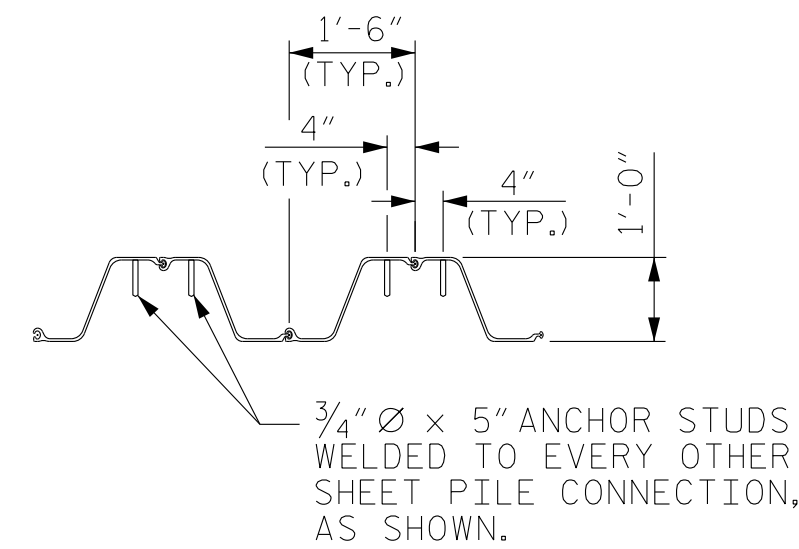
TEMPORARY DRAINAGE AT END BENT



DETAIL 'C'

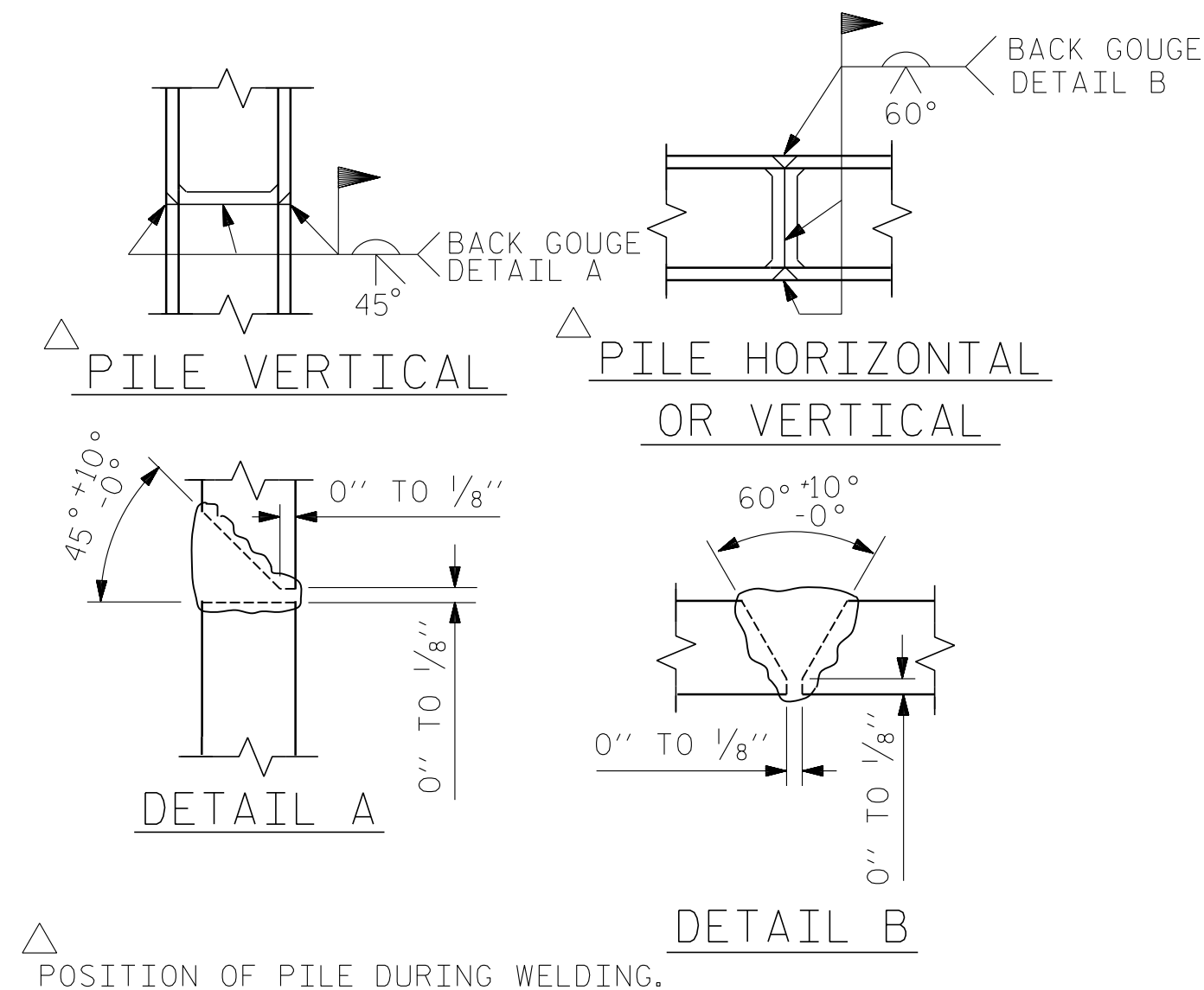


DETAIL 'D'



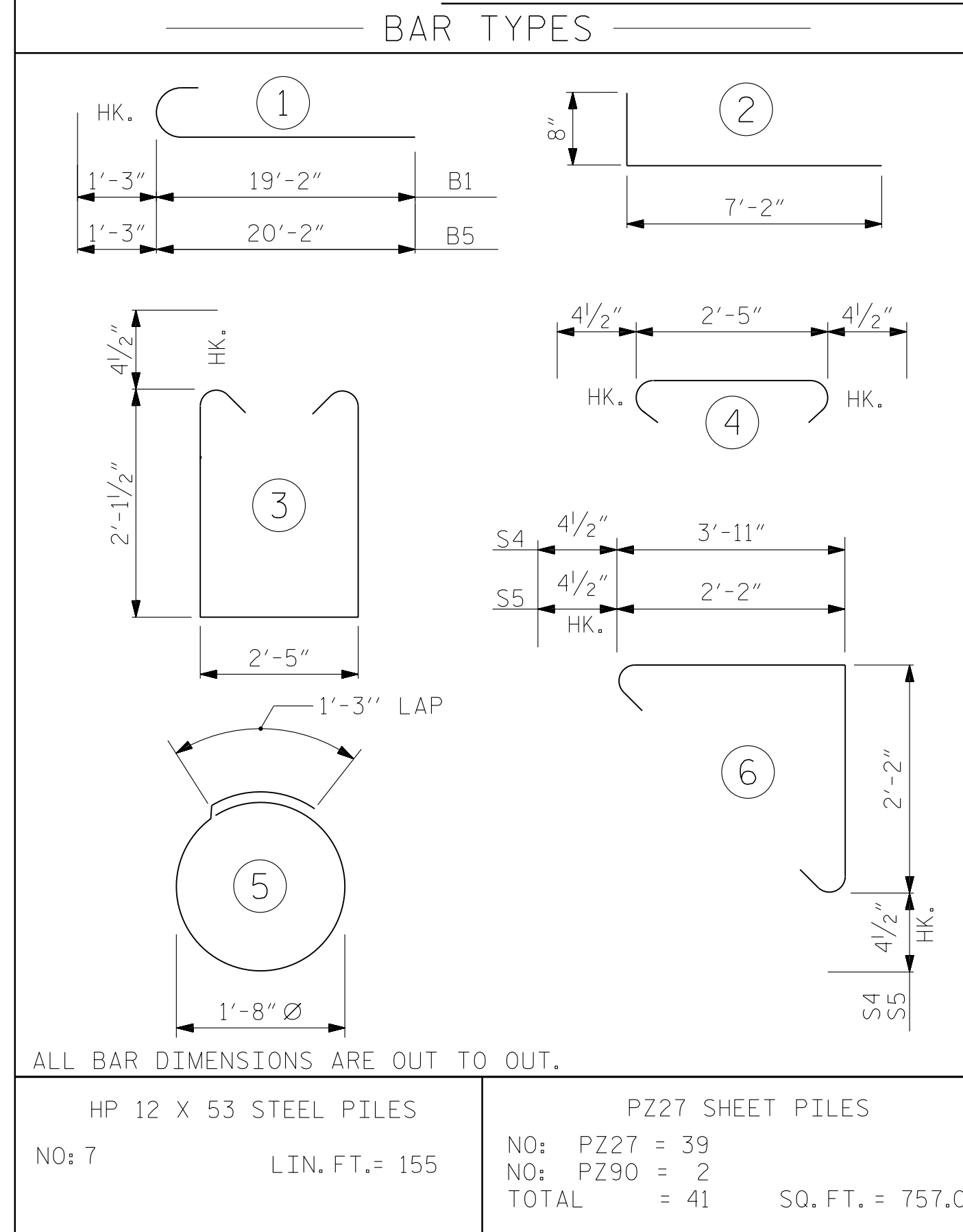
ANCHOR STUD DETAIL

SHEET PILE CONNECTION DETAILS



PILE SPLICE DETAILS

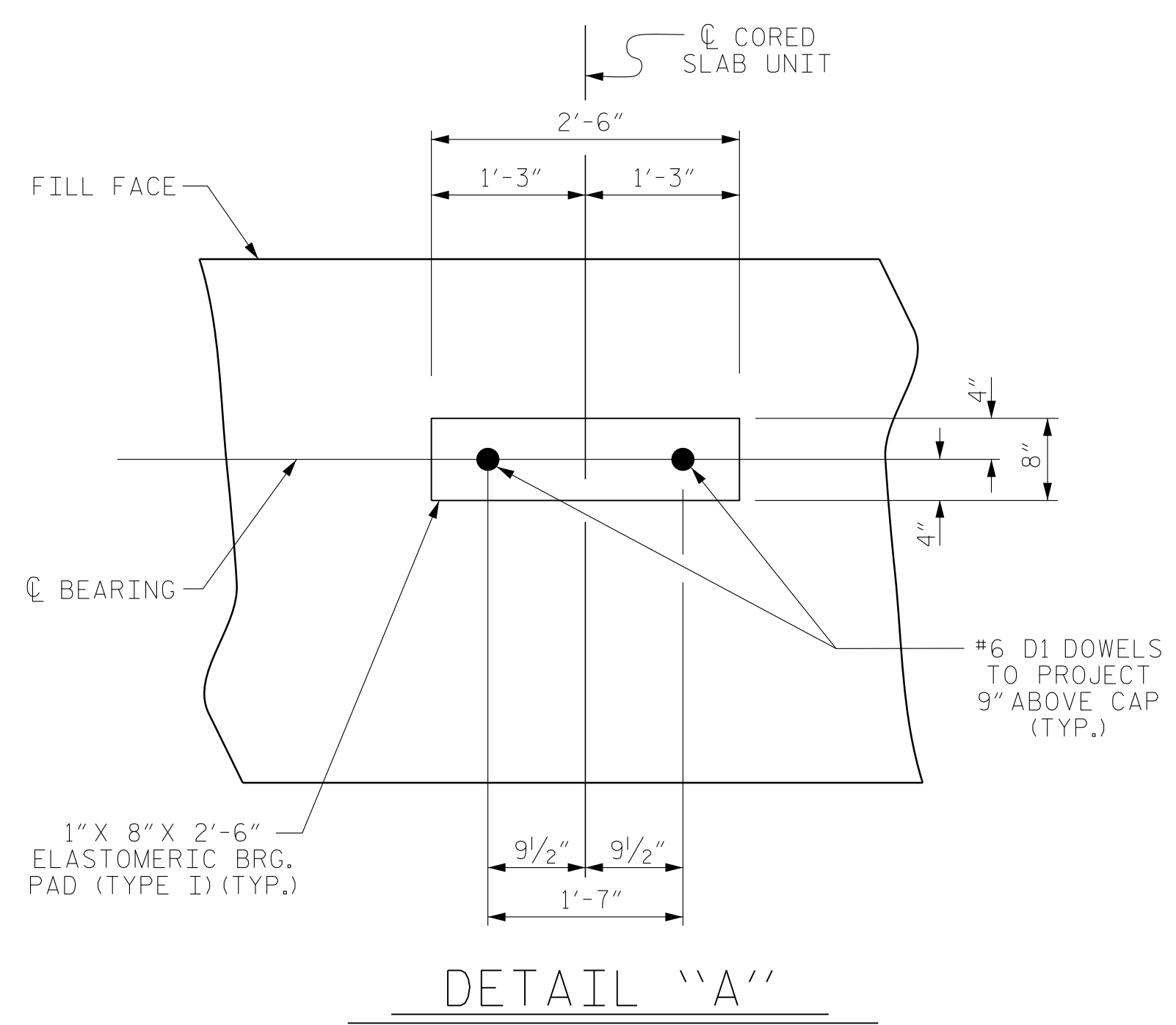
ASSEMBLED BY :	MAF	DATE :	12/14
CHECKED BY :	HLW	DATE :	12/14
DRAWN BY :	DGE 02/10		
CHECKED BY :	MKT 02/10		



HP 12 X 53 STEEL PILES NO: 7 LIN. FT. = 155	PZ27 SHEET PILES NO: PZ27 = 39 NO: PZ90 = 2 TOTAL = 41 SQ. FT. = 757.0
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BILL OF MATERIAL											
FOR END BENT NO. 2 (STAGE I)						FOR END BENT NO. 2 (STAGE II)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	20'-5"	555	B3	5	#4	STR	2'-5"	8
B2	8	#4	STR	19'-2"	102	B5	8	#9	1	21'-5"	583
B3	5	#4	STR	2'-5"	8	B6	8	#4	STR	20'-2"	107
B4	5	#4	STR	20'-8"	69	B7	5	#4	STR	21'-8"	72
B8	5	#4	STR	10'-5"	35	B8	5	#4	STR	10'-5"	35
D1	10	#6	STR	1'-6"	23	D1	12	#6	STR	1'-6"	27
H1	12	#4	2	7'-10"	63	H1	12	#4	2	7'-10"	63
K1	6	#4	STR	3'-3"	13	K1	6	#4	STR	3'-3"	13
S1	24	#4	3	7'-5"	119	S1	28	#4	3	7'-5"	139
S2	24	#4	4	3'-2"	51	S2	28	#4	4	3'-2"	59
S3	6	#4	5	6'-6"	26	S3	8	#4	5	6'-6"	35
S4	19	#4	6	6'-10"	87	S4	22	#4	6	6'-10"	100
S5	11	#4	6	5'-1"	37	S5	11	#4	6	5'-1"	37
V1	24	#4	STR	4'-8"	75	V1	24	#4	STR	4'-8"	75
REINFORCING STEEL (STAGE I)						REINFORCING STEEL (STAGE II)					
1263 LBS.						1353 LBS.					
CLASS A CONCRETE BREAKDOWN (STAGE I)						CLASS A CONCRETE BREAKDOWN (STAGE II)					
POUR #1 CAP & LOWER PART OF WINGS 9.3 C.Y.						POUR #1 CAP & LOWER PART OF WINGS 10.5 C.Y.					
POUR #2 UPPER PART OF WINGS 0.9 C.Y.						POUR #2 UPPER PART OF WINGS 0.9 C.Y.					
TOTAL CLASS A CONCRETE 10.2 C.Y.						TOTAL CLASS A CONCRETE 11.4 C.Y.					

TOTAL BILL OF MATERIAL FOR END BENT NO. 2				
CLASS A CONCRETE	REINFORCING STEEL	HP 12X53 STEEL PILES	HP 12X53 STEEL PILE POINTS	PZ27 STEEL SHEET PILES
CU. YDS.	LBS.	LIN. FT.	EACH	SQ. FT.
21.6	2616	155	7	757



DETAIL 'A'

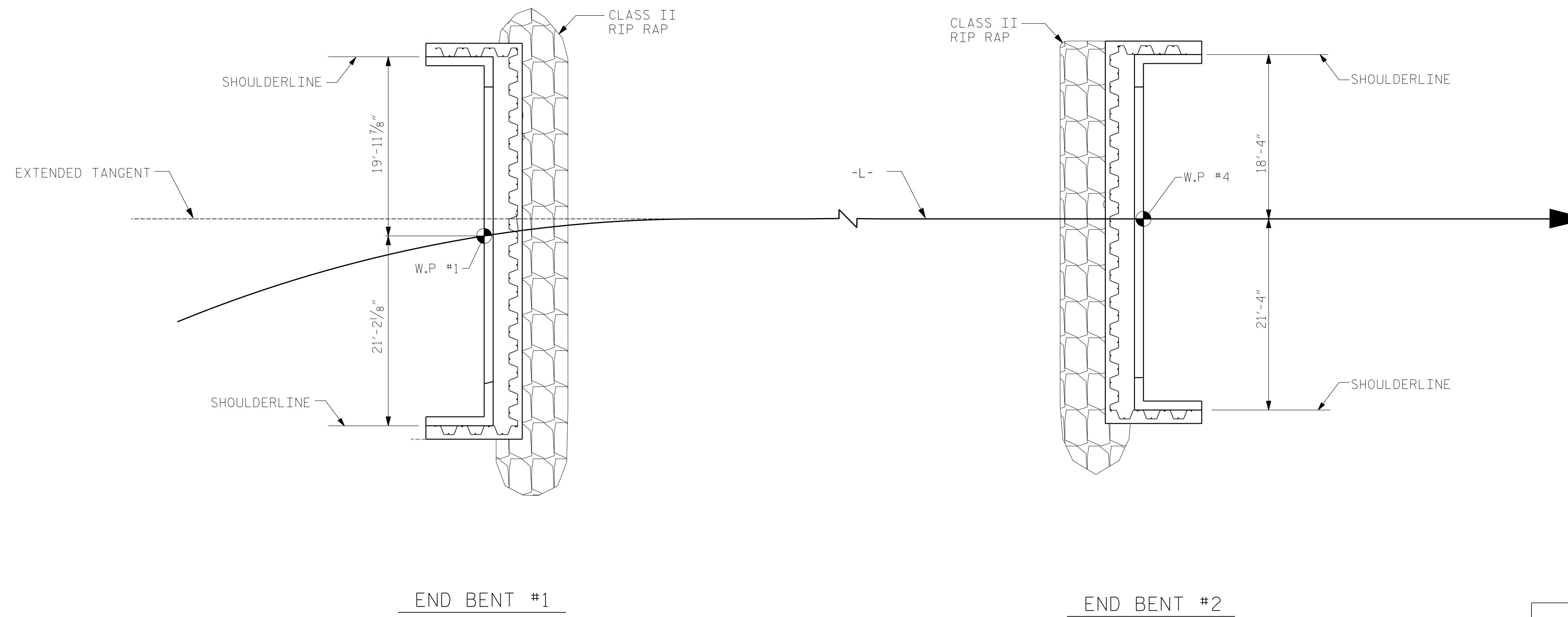
PROJECT NO. 17BP.14R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT No. 2 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-31					
TOTAL SHEETS 34					

Professional Engineer Seal for Roy L. Willis, No. 20777, State of North Carolina. Includes text: 'DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED'.

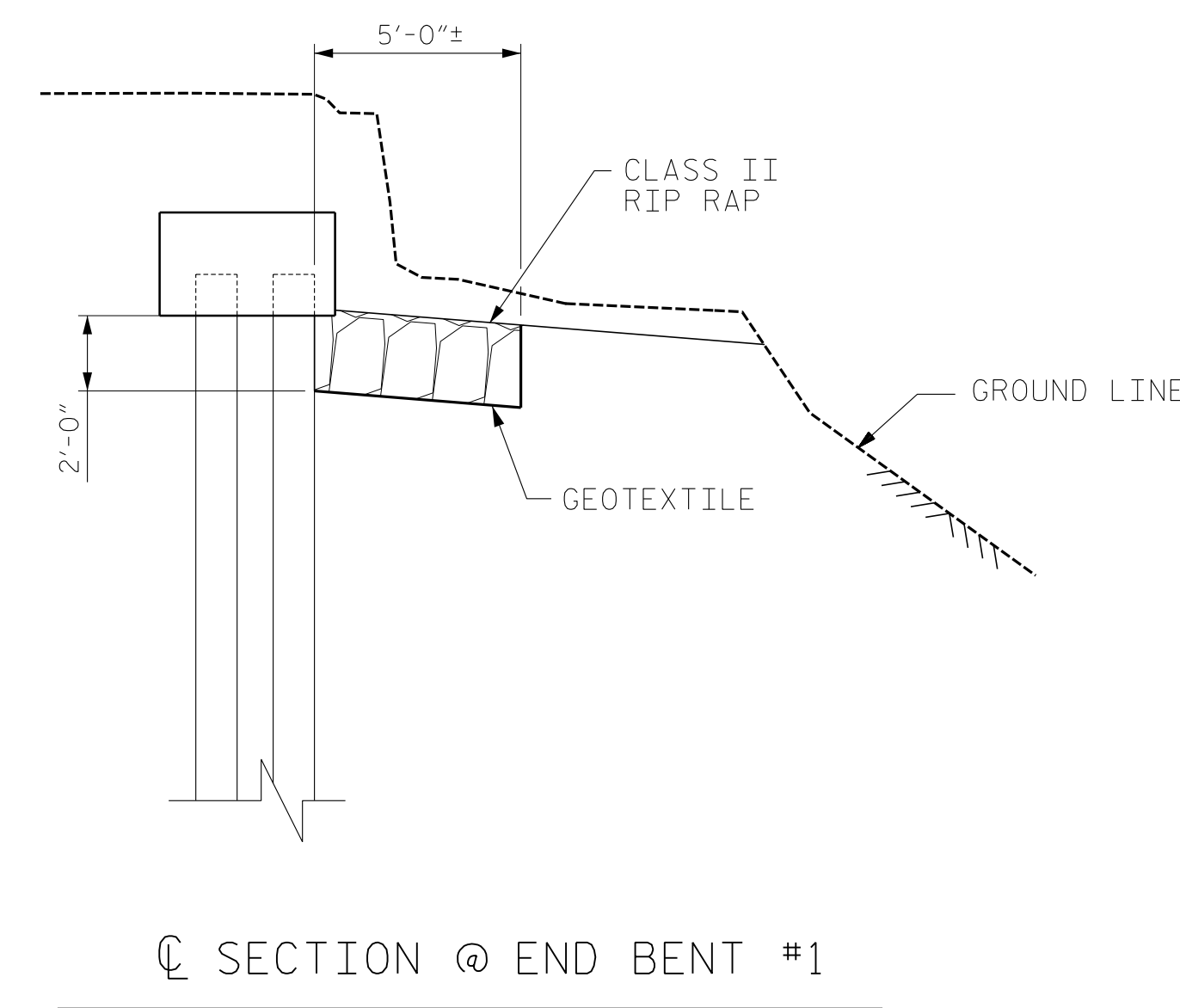
NOTES :

PLACE RIP RAP IN FRONT OF END BENTS.

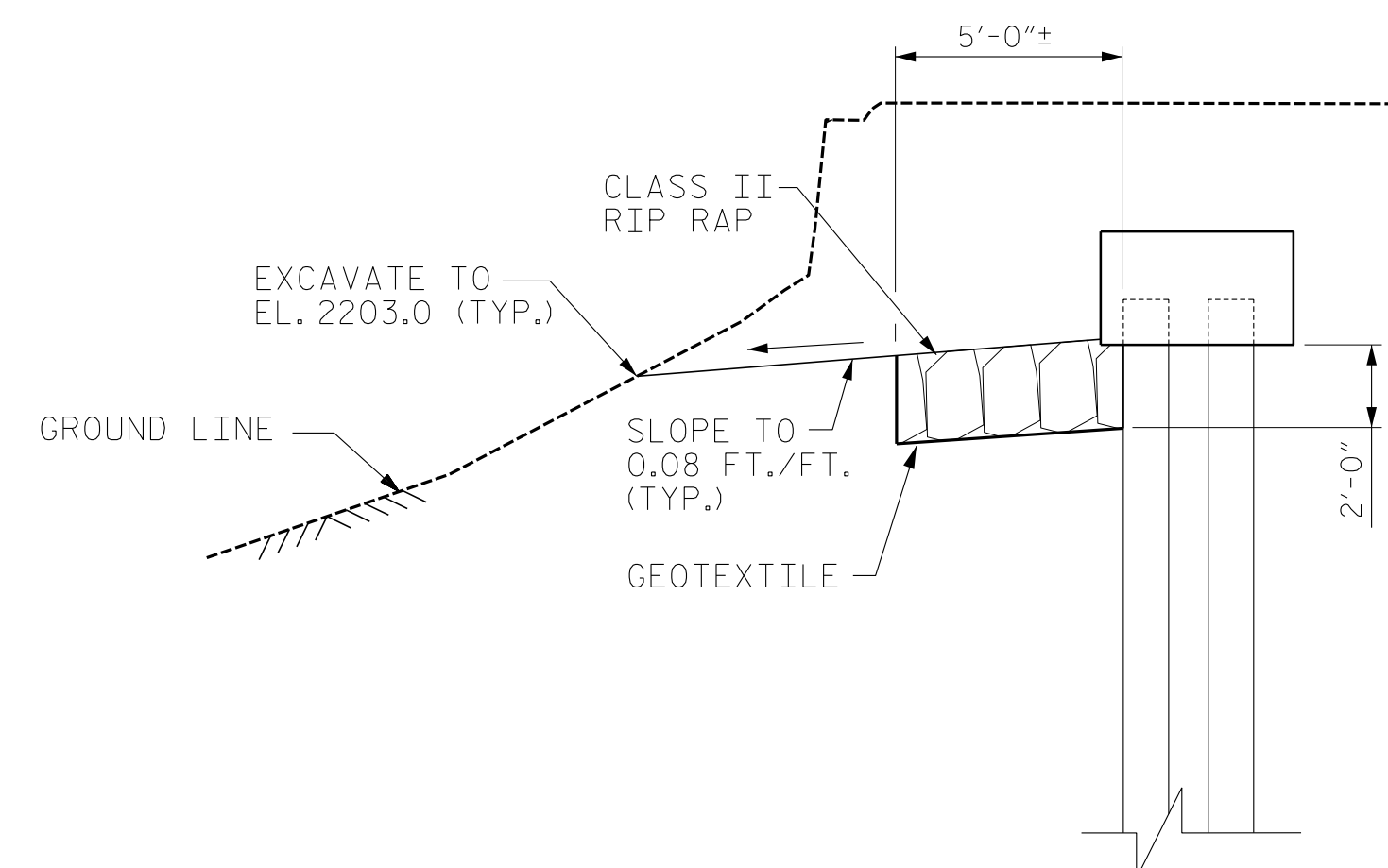


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+57.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	39	38
END BENT 2	45	44



SECTION @ END BENT #1



SECTION @ END BENT #2

PROJECT NO. 17BP.14.R.137
 TRANSYLVANIA COUNTY
 STATION: 13+57.50 -L-



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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

NOTES

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

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

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

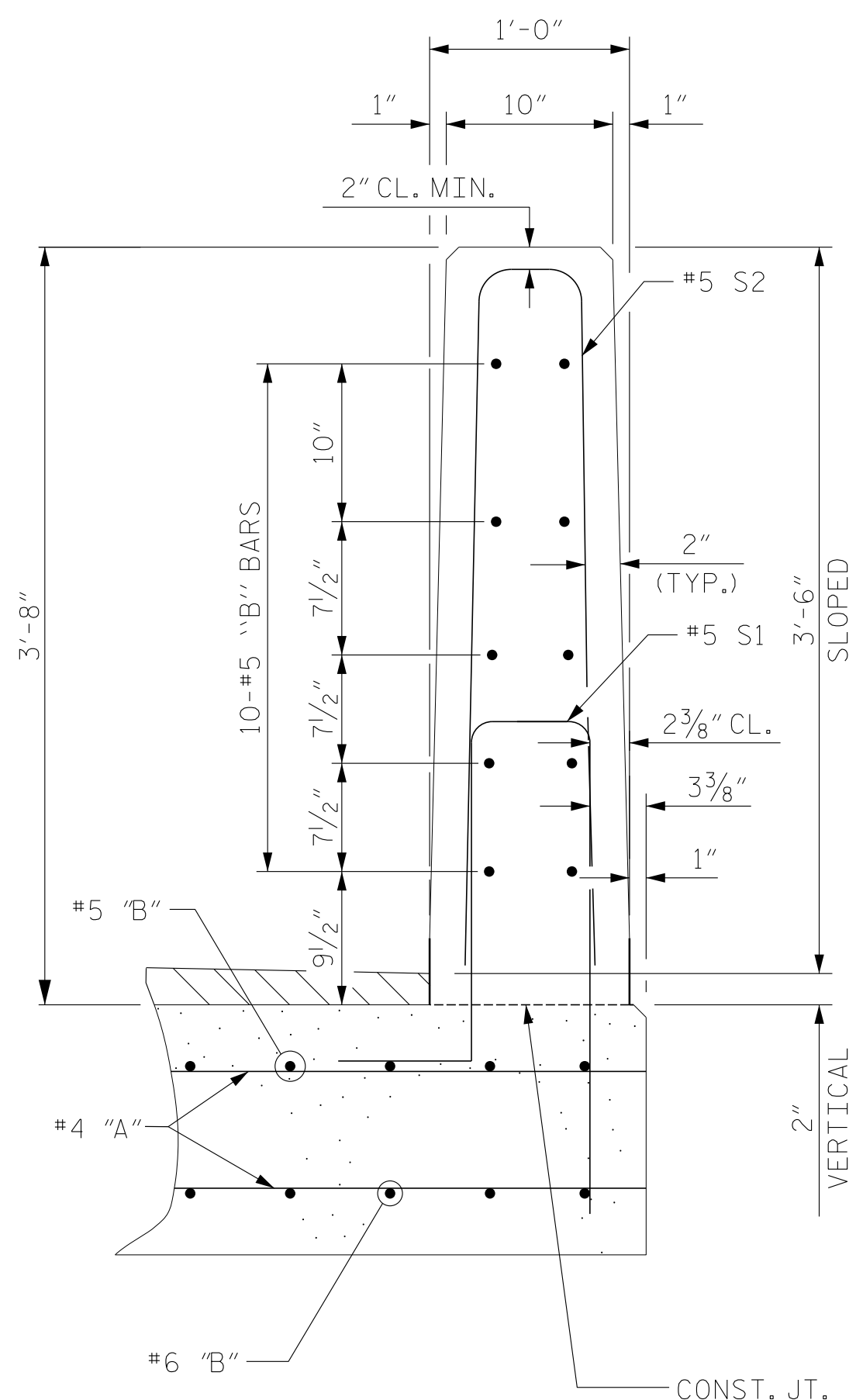
#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

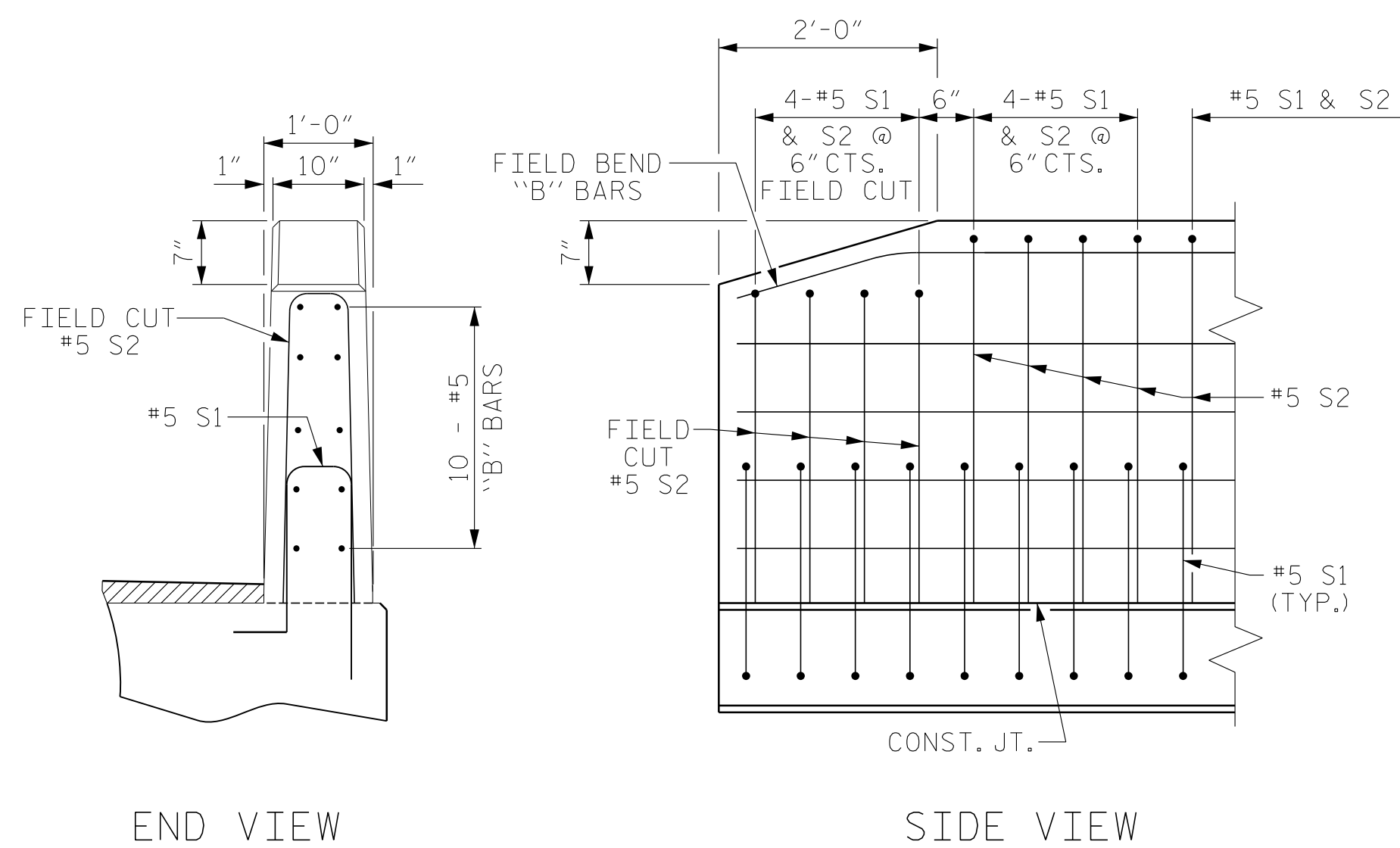
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

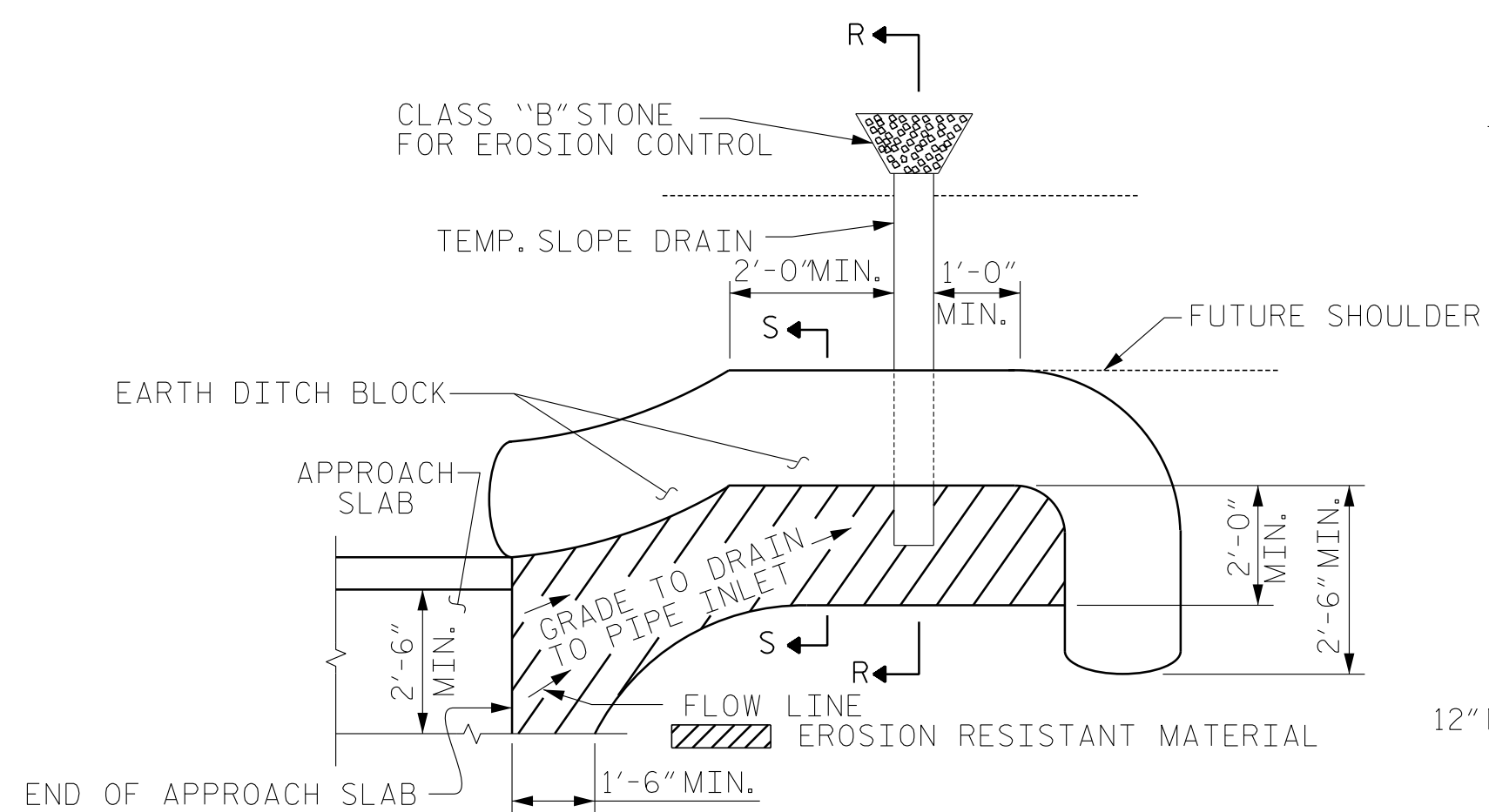
THE COST OF VERTICAL CONCRETE BARRIER RAILS ON APPROACH SLABS SHALL BE INCLUDED IN LUMP SUM CONTRACT PRICE BID FOR "BRIDGE APPROACH SLABS".



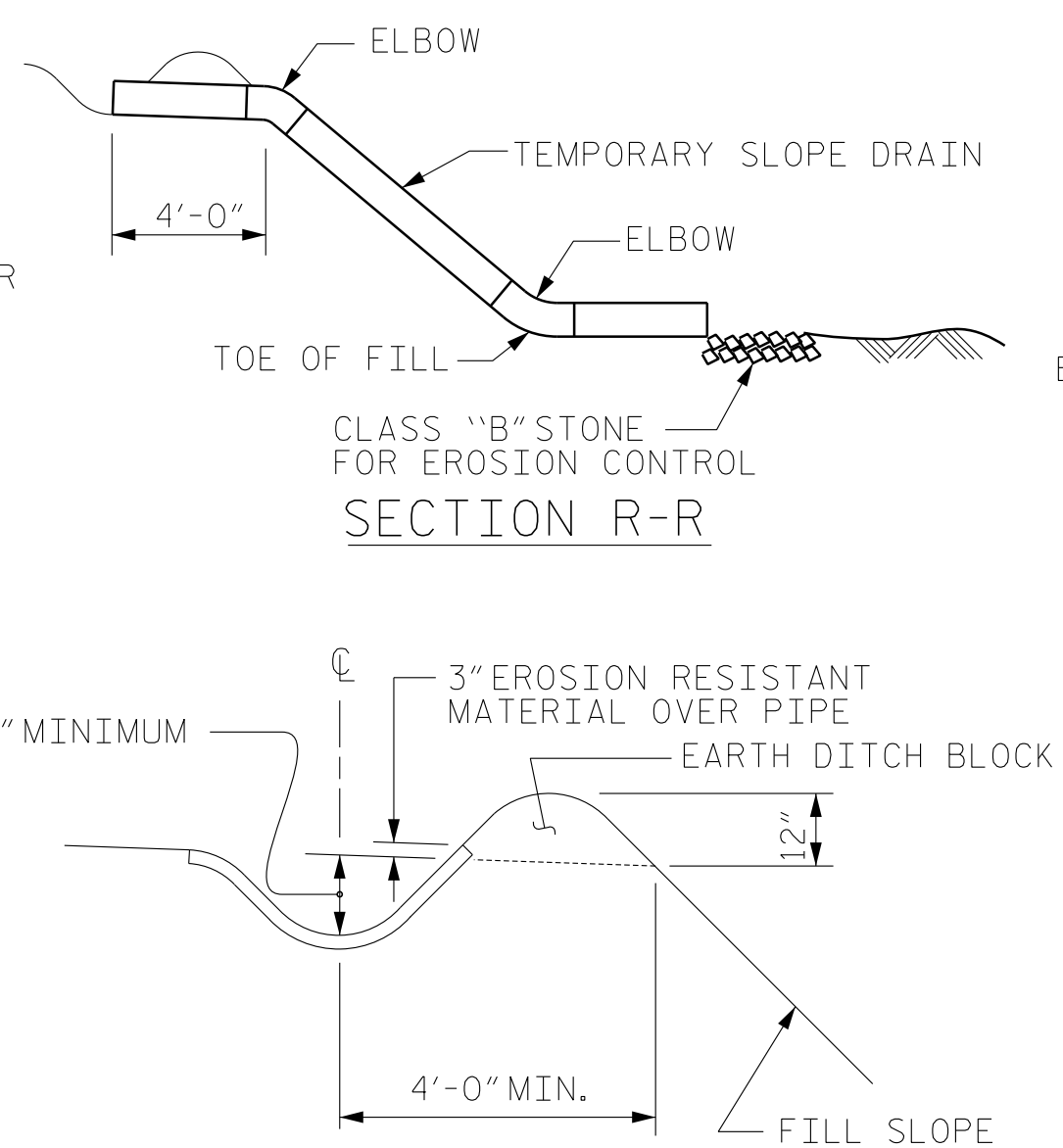
SECTION M-M
VERTICAL CONCRETE BARRIER RAIL SECTION



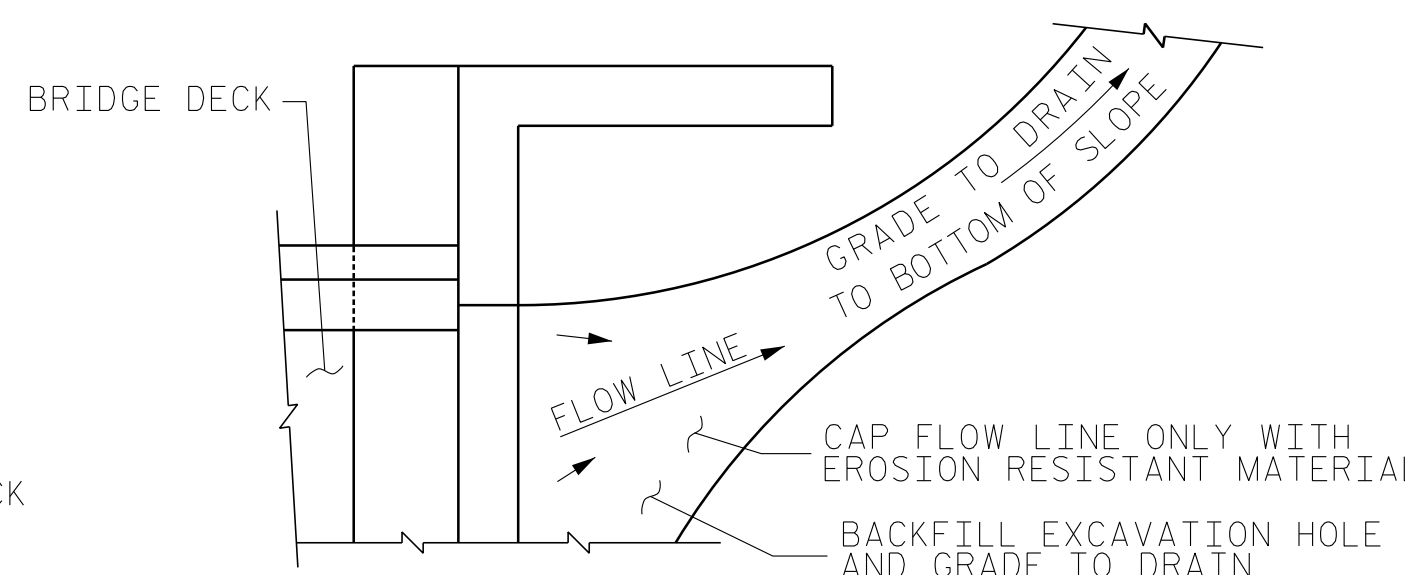
END OF RAIL DETAILS



PLAN VIEW



SECTION S-S



TEMPORARY DRAINAGE DETAIL

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.

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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

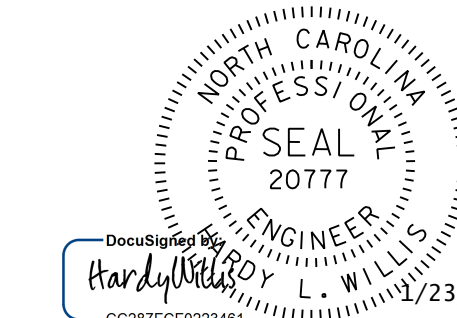
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. 17BP.14.R.137
TRANSYLVANIA COUNTY
STATION: 13+57.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BRIDGE APPROACH
SLAB DETAILS



ASSEMBLED BY : MAF	DATE : 12/14
CHECKED BY : HLW	DATE : 12/14
DRAWN BY : FCJ 11/88	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

