

09/08/13

TIP PROJECT: B-4289

CONTRACT: C202817

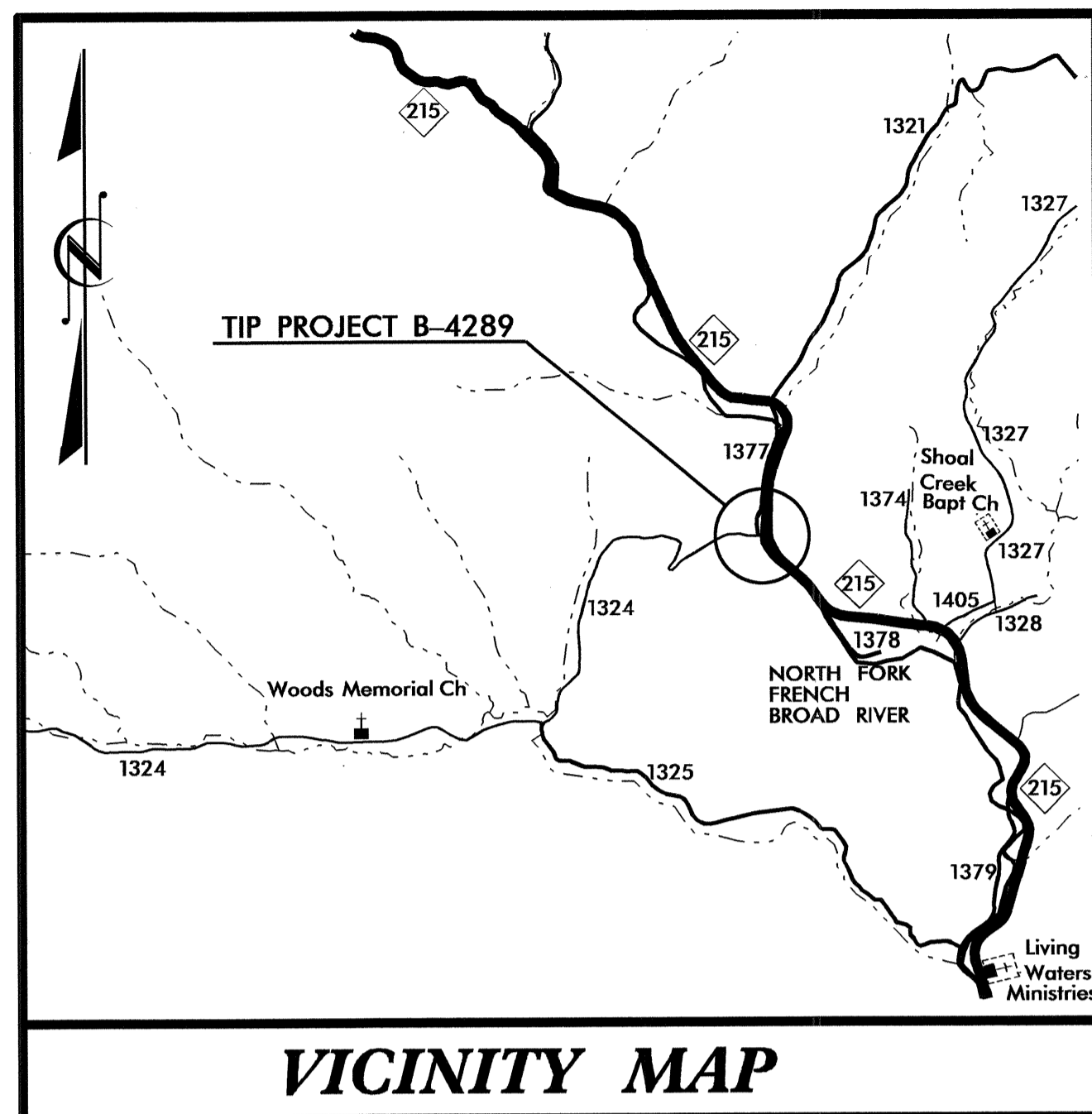
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSYLVANIA COUNTY

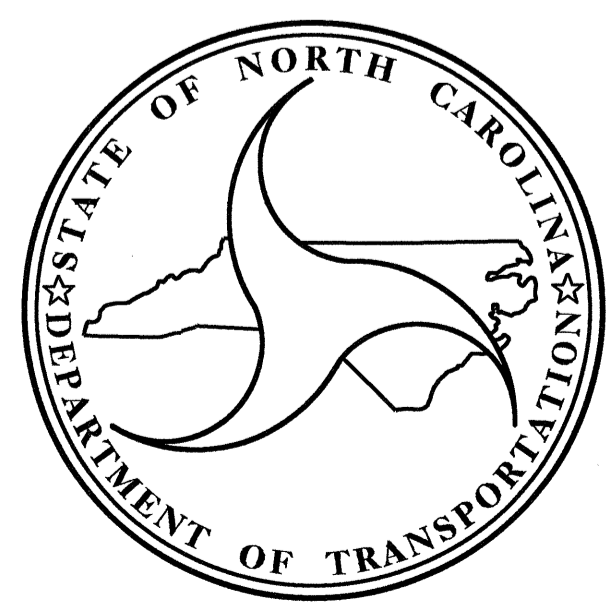
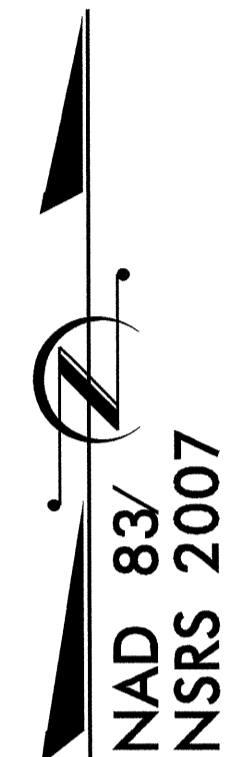
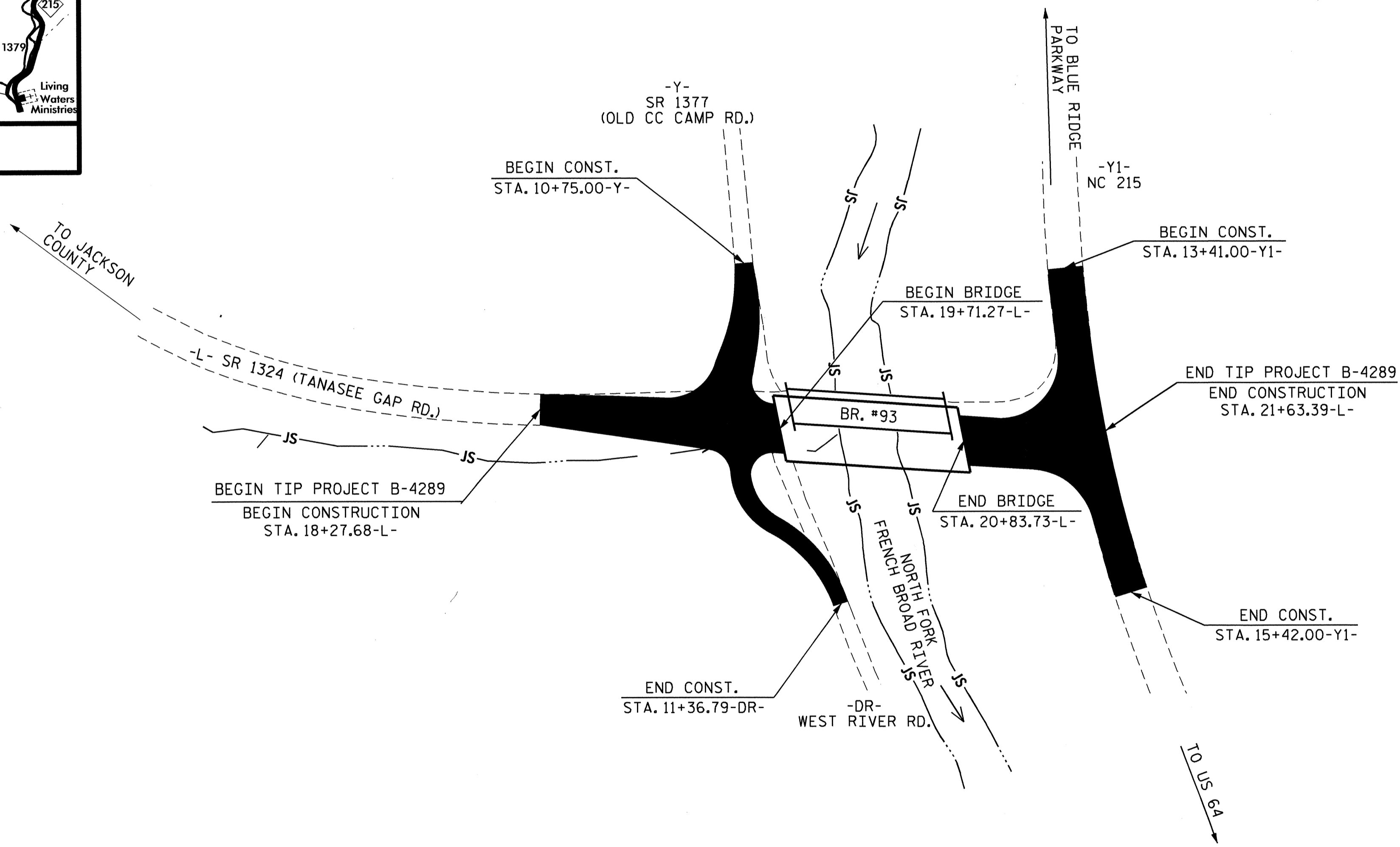
LOCATION: BRIDGE NO. 93 OVER NORTH FORK FRENCH BROAD RIVER ON SR 1324 (TANASEE GAP RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE & SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4289		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33628.1.1	BRZ-1324(2)	PE	
33628.2.1	BRZ-1324(2)	UTIL. & RAW	
33628.3.FD1	BRZ-1324(2)	CONST.	



STRUCTURE



DESIGN DATA

ADT 2013 = 765
 ADT 2033 = 1070
 DHV = 12 %
 D = 70 %
 T = 7 % *
 V = 45 MPH

* (TTST 2% + DUAL 5%)

CLASSIFICATION = RURAL LOCAL
 SUBREGIONAL TIER DESIGN

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4289 =	0.043 MILES
LENGTH STRUCTURE TIP PROJECT B-4289 =	0.021 MILES
TOTAL LENGTH TIP PROJECT B-4289 =	0.064 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
 NOVEMBER 19, 2013

Q. H. NGUYEN, PE
 PROJECT ENGINEER

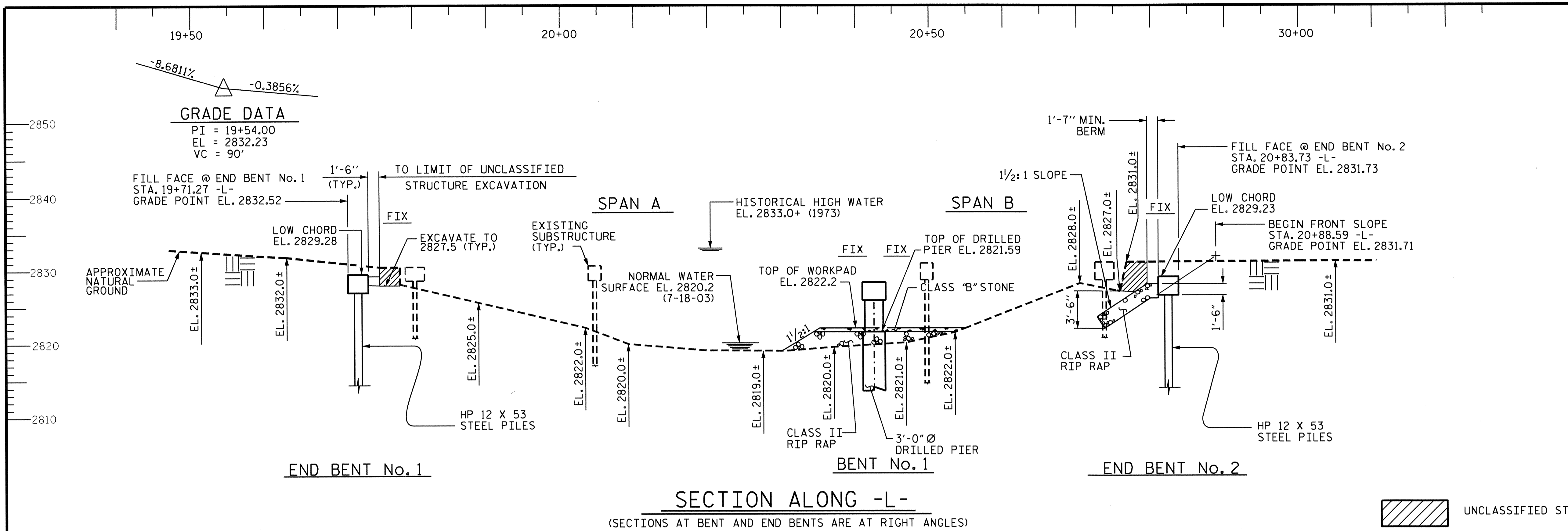
W. S. ARAFAT, PE
 PROJECT DESIGN ENGINEER

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

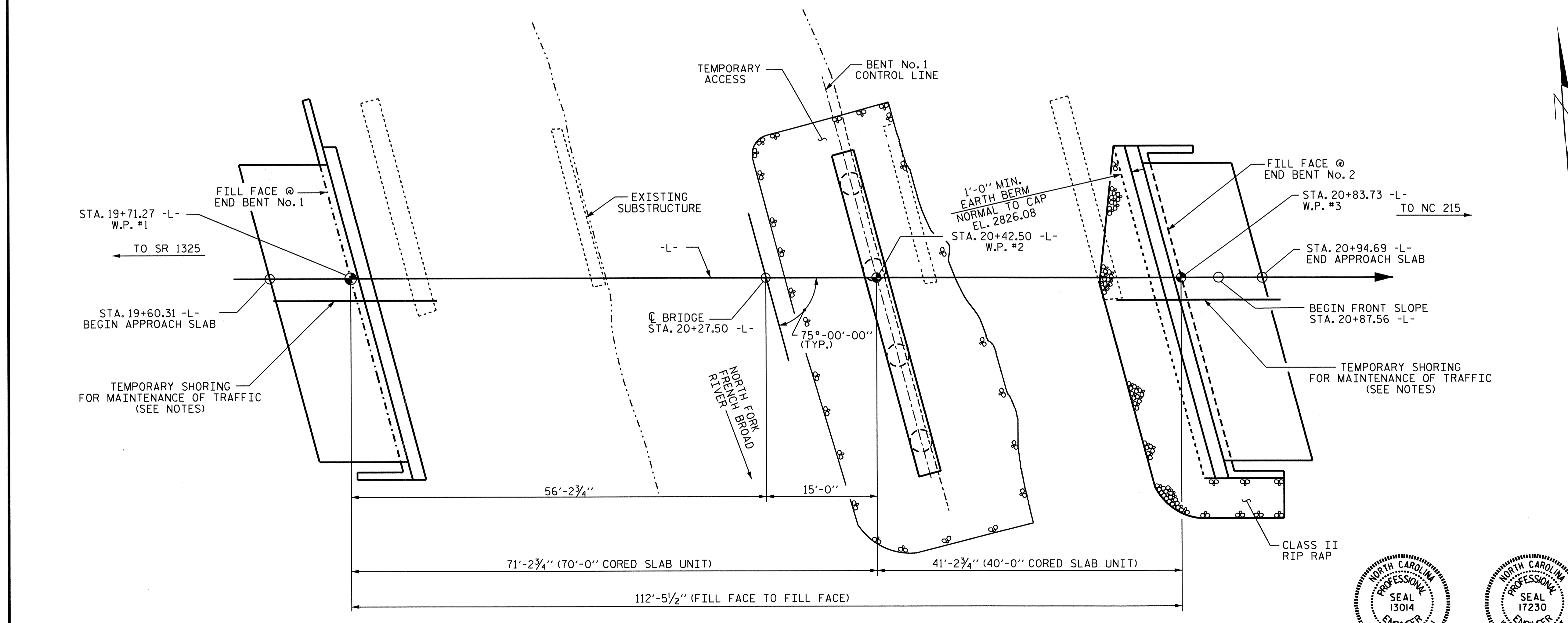
DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER

23-SEP-2013 10:47
 \$\$\$\$\$\$DGN\$\$\$\$\$\$\$\$\$
 damage



UNCLASSIFIED STRUCTURE EXCAVATION



PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 3 REPLACES BRIDGE No. 93

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1324
 OVER NORTH FORK FRENCH
 BROAD RIVER
 BETWEEN SR 1325 AND NC 215

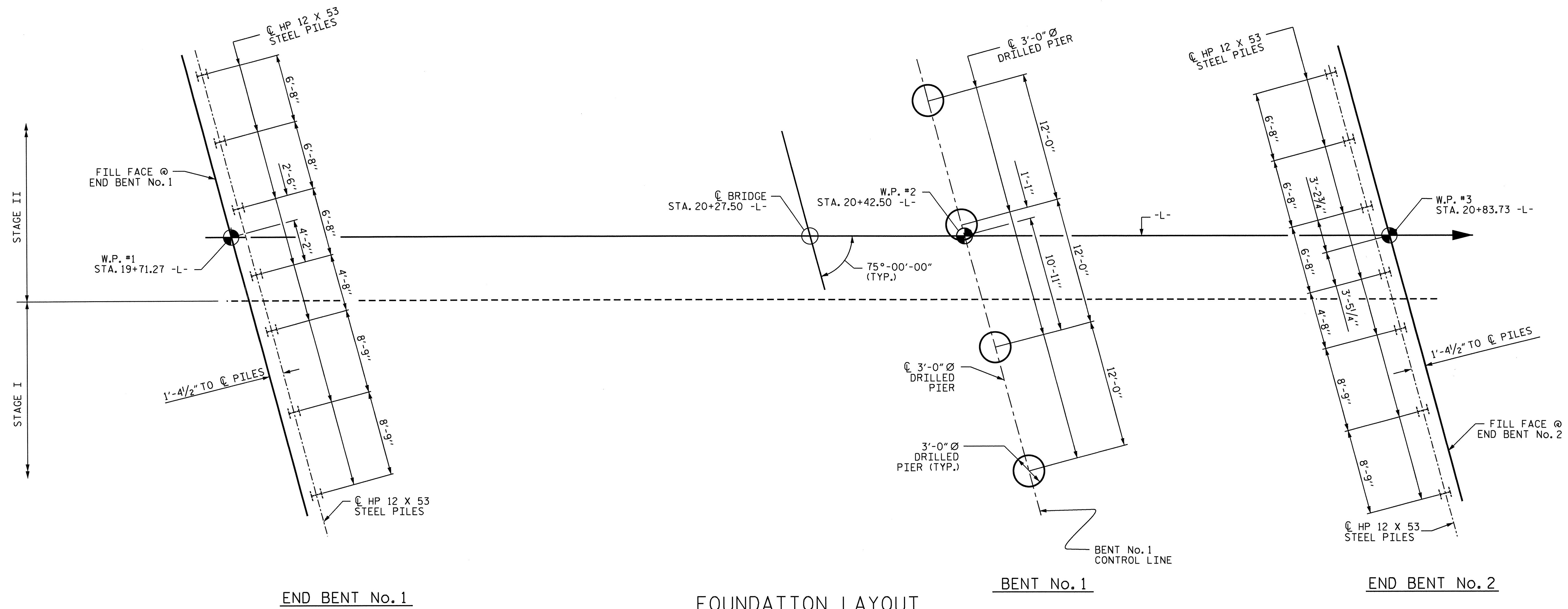
QUANG H. NGUYEN
 ENGINEER

WAEL S. ARAFA
 ENGINEER

Quang H. Nguyen 9-23-13 *Wael S. Arafa 9-23-13*

DRAWN BY: V.X. NGUYEN DATE: 7-13
 CHECKED BY: A. LEE DATE: 8-13

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



FOUNDATION LAYOUT

NOTES

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 320 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 80.0 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2812.8 FT (LT) AND 2818.0 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT NO.1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2791.0 FT (LT) AND 2811.5 FT (RT) AND SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 2805.5 FT (LT); 2813.5 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING HE LIFE OF THE STRUCTURE.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. 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.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 147 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.

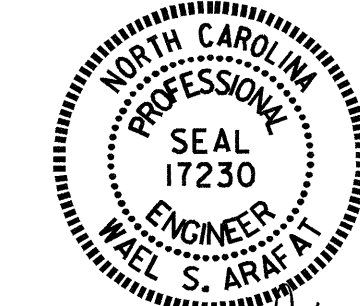
DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 105 TONS PER PILE.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : A. LEE DATE : 8-13
 DESIGN ENGINEER OF RECORD: HPK DATE : 8-13

19-SEP-2013 14:40
 R:\Structures\Plans\Final Plans\B-4289-SD-FL.dgn
 dahodge



Wael S. Arafat 9.23.13

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 1324
 OVER NORTH FORK FRENCH
 BROAD RIVER
 BETWEEN SR 1325 AND NC 215

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

B.M. #1 : 8" SPIKE IN BASE OF 12" POPLAR TREE, STA. 14+60.46 -L-, 31.09 FT. RIGHT, EL. 2877.67, NAVD 88

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

TEMPORARY SHORING WILL BE REQUIRED IN THE AREA INDICATED IN THE PLAN VIEW.

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

PORTIONS OF THE EXISTING END BENTS INTERFERING WITH THE TEMPORARY SHORING MAY BE REMOVED PRIOR TO INSTALLATION OF THE TEMPORARY SHORING AS DIRECTED BY THE ENGINEER.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, 1 @ 25'-6", 1 @ 45'-1" AND 1 @ 25'-8" WITH AN ASPHALT WEARING SURFACE ON 4" X 8" TIMBER DECK WITH STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 19'-2" ON TIMBER CAPS AT END BENTS AND BENTS WITH TIMBER POST AND SILLS AT VARIABLE SPACING AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND 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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

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 20+27.50 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+27.50 -L-.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

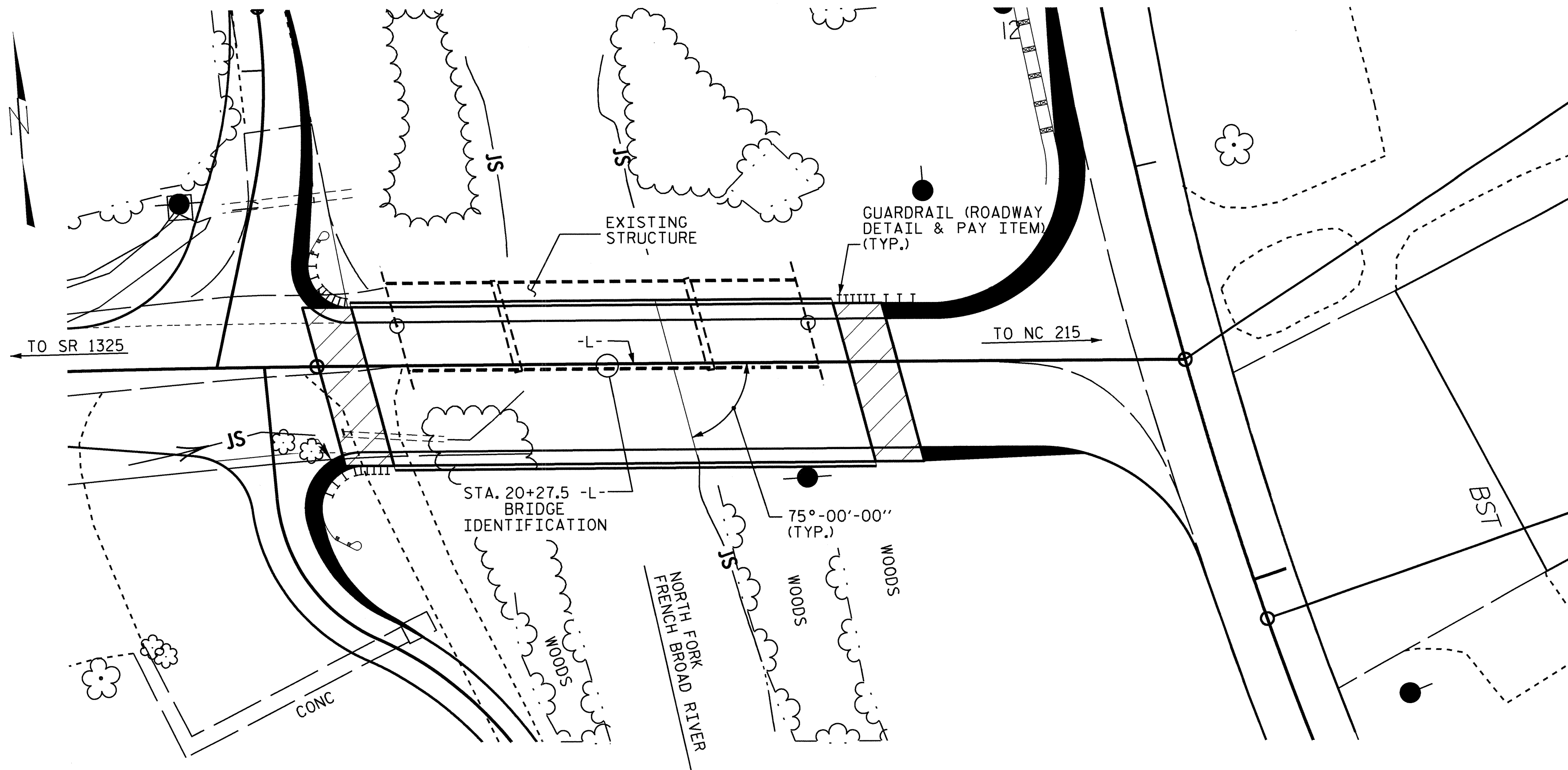
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE..... 2600 CFS.
 FREQUENCY OF DESIGN FLOOD..... 25 YR.
 DESIGN HIGH WATER ELEVATION..... 2826.6
 DRAINAGE AREA..... 13.94 SQ. MI.
 BASE DISCHARGE (Q100)..... 3900 CFS.
 BASE HIGH WATER ELEVATION..... 2828.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... 5700 CFS.
 FREQUENCY OF OVERTOPPING FLOOD..... 500 YRS.
 OVERTOPPING FLOOD ELEVATION..... 2831.0

TOTAL BILL OF MATERIAL

	CONST., MAINT. & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIER IN SOIL	3'-0" Ø DRILLED PIER NOT IN SOIL	PERM. STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REIN-FORCING STEEL	SPIRAL COLUMN REINFORC-ING STEEL	HP12 X 53 STEEL PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS. II (2'-0" THICK)	GEOTEX-TILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN.FT.	LIN.FT.	TONS	SO.YDS.	LUMP SUM	NO. LIN.FT.	NO. LIN.FT.	
SUPERSTRUCTURE											LUMP SUM				220.24			LUMP SUM	13 520.00	13 910.00	
END BENT NO. 1									LUMP SUM	18.5		2604		7 195							
BENT NO. 1			31.00	51.00	24.76					21.7		10333	1735								
END BENT NO. 2									LUMP SUM	17.5		2589		7 120		40	45				
TOTAL	LUMP SUM	LUMP SUM	31.00	51.00	24.76	4	4	1	LUMP SUM	57.7	LUMP SUM	15526	1735	14 315	220.24	40	45	LUMP SUM	13 520.00	13 910.00	

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1324
 OVER NORTH FORK FRENCH
 BROAD RIVER
 BETWEEN SR 1325 AND NC 215



Wael S. Hakeem
 9-25-13

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : A. LEE DATE : 8-13

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

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE								COMMENT NUMBER
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)		
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.04	--	1.75	0.268	1.17	A	EL	34.483	0.608	1.14	A	EL	3.448	0.80	0.268	1.04	A	EL	34.483		
	HL-93(0pr)	N/A		1.48	--	1.35	0.268	1.51	A	EL	34.483	0.608	1.48	A	EL	3.448	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.35	48.448	1.75	0.268	1.51	A	EL	34.483	0.608	1.43	A	EL	3.448	0.80	0.268	1.35	A	EL	34.483		
	HS-20(0pr)	36.000		1.86	66.831	1.35	0.268	1.96	A	EL	34.483	0.608	1.86	A	EL	3.448	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500		3.01	40.570	1.4	0.268	4.22	A	EL	34.483	0.608	4.26	A	EL	3.448	0.80	0.268	3.01	A	EL	34.483	
		SNGARBS2	20.000		2.25	45.068	1.4	0.268	3.16	A	EL	34.483	0.608	3.03	A	EL	3.448	0.80	0.268	2.25	A	EL	34.483	
		SNAGRIS2	22.000		2.14	47.077	1.4	0.268	3	A	EL	34.483	0.608	2.81	A	EL	3.448	0.80	0.268	2.14	A	EL	34.483	
		SNCOTTS3	27.250		1.5	40.763	1.4	0.268	2.1	A	EL	34.483	0.608	2.13	A	EL	3.448	0.80	0.268	1.50	A	EL	34.483	
		SNAGGRS4	34.925		1.26	43.844	1.4	0.268	1.76	A	EL	34.483	0.608	1.77	A	EL	3.448	0.80	0.268	1.26	A	EL	34.483	
		SNS5A	35.550		1.23	43.629	1.4	0.268	1.72	A	EL	34.483	0.608	1.79	A	EL	3.448	0.80	0.268	1.23	A	EL	34.483	
		SNS6A	39.950		1.13	45.073	1.4	0.268	1.58	A	EL	34.483	0.608	1.63	A	EL	3.448	0.80	0.268	1.13	A	EL	34.483	
	SNS7B	42.000		1.08	45.130	1.4	0.268	1.51	A	EL	34.483	0.608	1.6	A	EL	3.448	0.80	0.268	1.07	A	EL	34.483		
	TTST	TNAGRIT3	33.000		1.38	45.424	1.4	0.268	1.93	A	EL	34.483	0.608	1.94	A	EL	3.448	0.80	0.268	1.38	A	EL	34.483	
		TNT4A	33.075		1.38	45.748	1.4	0.268	1.94	A	EL	34.483	0.608	1.89	A	EL	3.448	0.80	0.268	1.38	A	EL	34.483	
		TNT6A	41.600		1.13	47.134	1.4	0.268	1.59	A	EL	34.483	0.608	1.71	A	EL	3.448	0.80	0.268	1.13	A	EL	34.483	
		TNT7A	42.000		1.14	47.873	1.4	0.268	1.6	A	EL	34.483	0.608	1.67	A	EL	3.448	0.80	0.268	1.14	A	EL	34.483	
		TNT7B	42.000		1.18	49.644	1.4	0.268	1.66	A	EL	34.483	0.608	1.56	A	EL	3.448	0.80	0.268	1.18	A	EL	34.483	
		TNAGRIT4	43.000		1.12	48.261	1.4	0.268	1.58	A	EL	34.483	0.608	1.51	A	EL	3.448	0.80	0.268	1.12	A	EL	34.483	
TNAGT5A		45.000		1.06	47.577	1.4	0.268	1.48	A	EL	34.483	0.608	1.51	A	EL	3.448	0.80	0.268	1.06	A	EL			
TNAGT5B	45.000	3	1.04	46.963	1.4	0.268	1.47	A	EL	34.483	0.608	1.44	A	EL	3.448	0.80	0.268	1.04	A	EL	34.483			

NOTES:

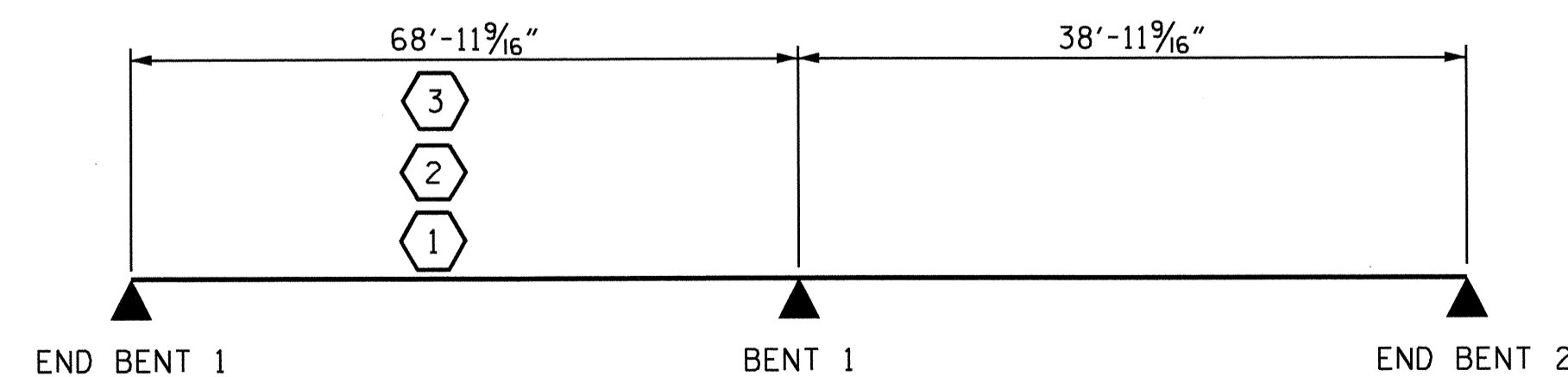
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

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-
-
-

#	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
SPAN DIMENSIONS SHOWN ARE C BEARING TO C BEARING

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

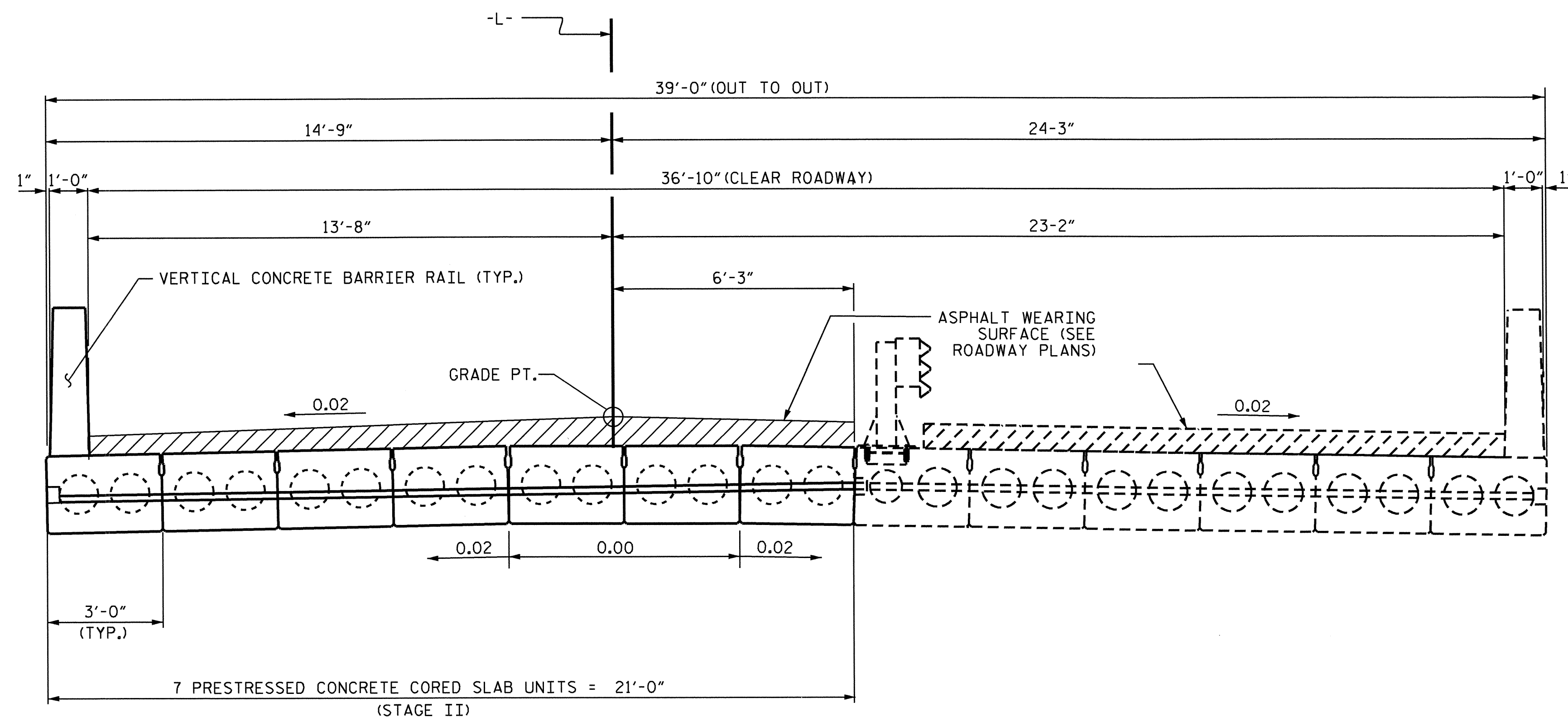
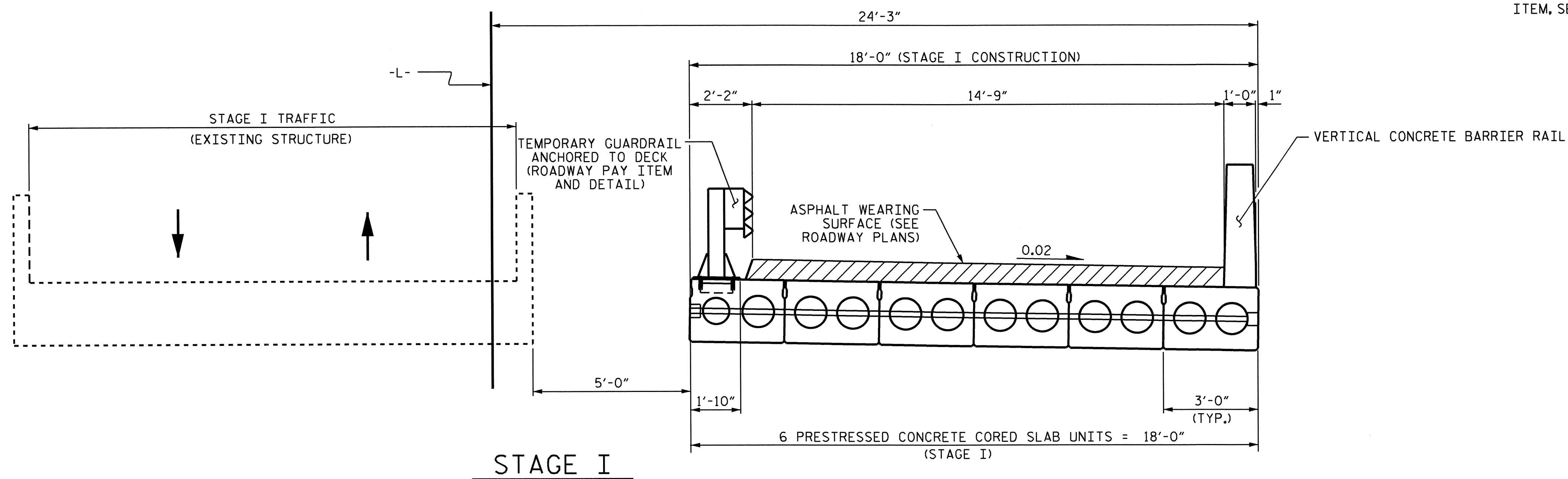
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR PRESTRESSED CORED SLAB UNITS (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-4					TOTAL SHEETS 34



ASSEMBLED BY : HPK DATE : 8-13
 CHECKED BY : D. HODGE DATE : 8-13
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

NOTES

FOR TEMPORARY GUARDRAIL DETAILS AND PAY ITEM, SEE ROADWAY PLANS.

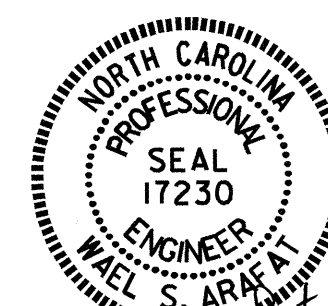


STAGING SEQUENCE

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

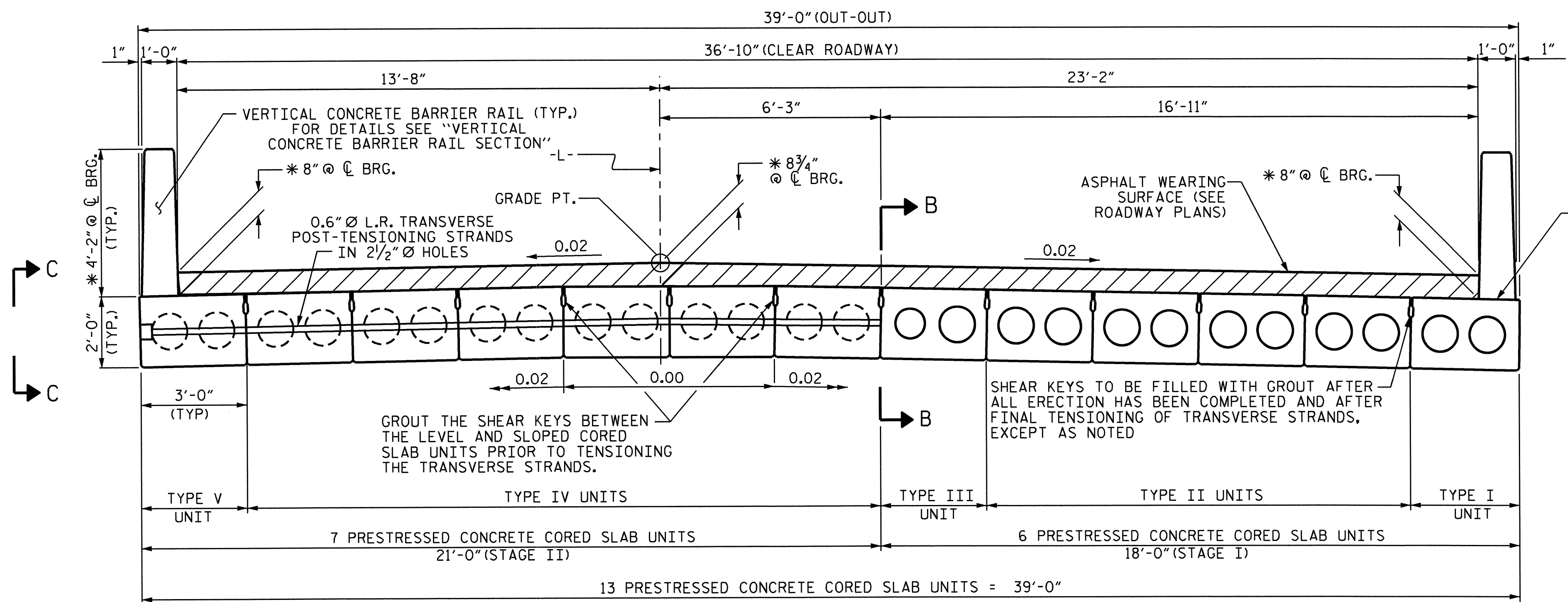
CONSTRUCTION STAGING



Wael S. Arafat
 9-23-13

DRAWN BY : HPK/VXN DATE : 6-13
 CHECKED BY : D. HODGE DATE : 7-13

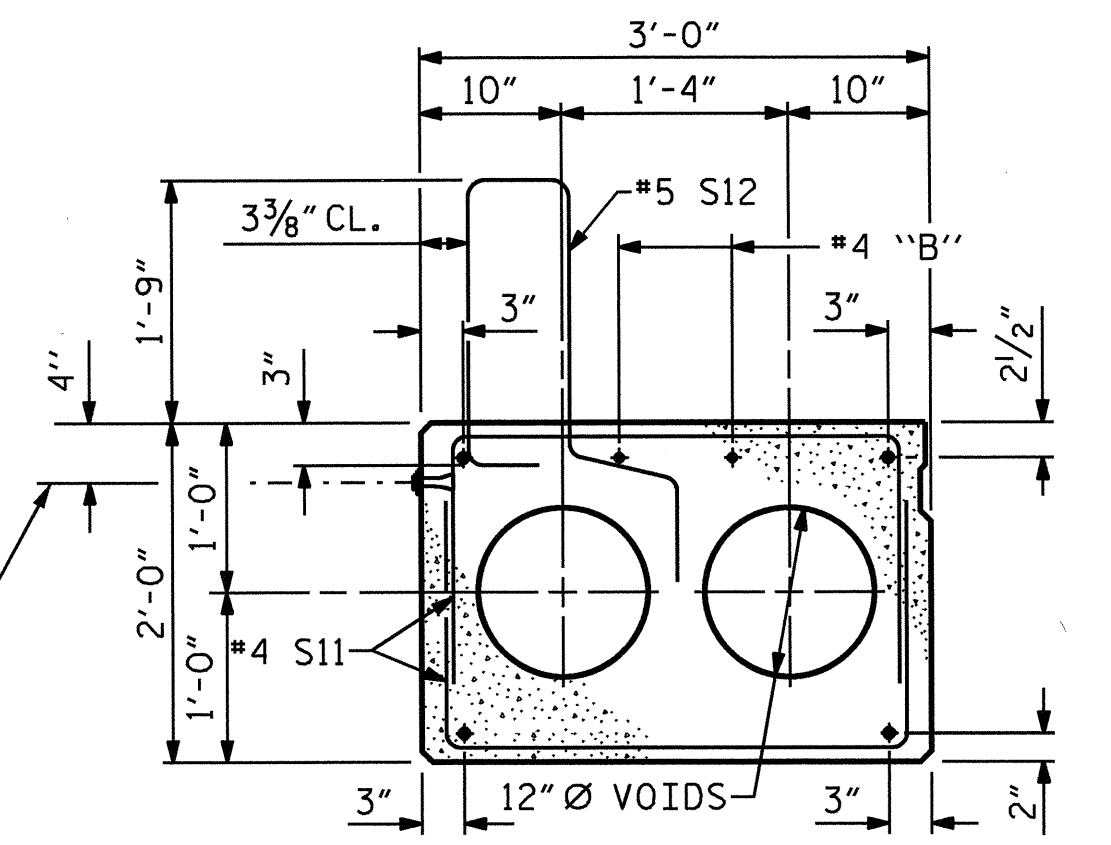
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			34



HALF SECTION AT INTERMEDIATE DIAPHRAGMS
 HALF SECTION THROUGH VOIDS

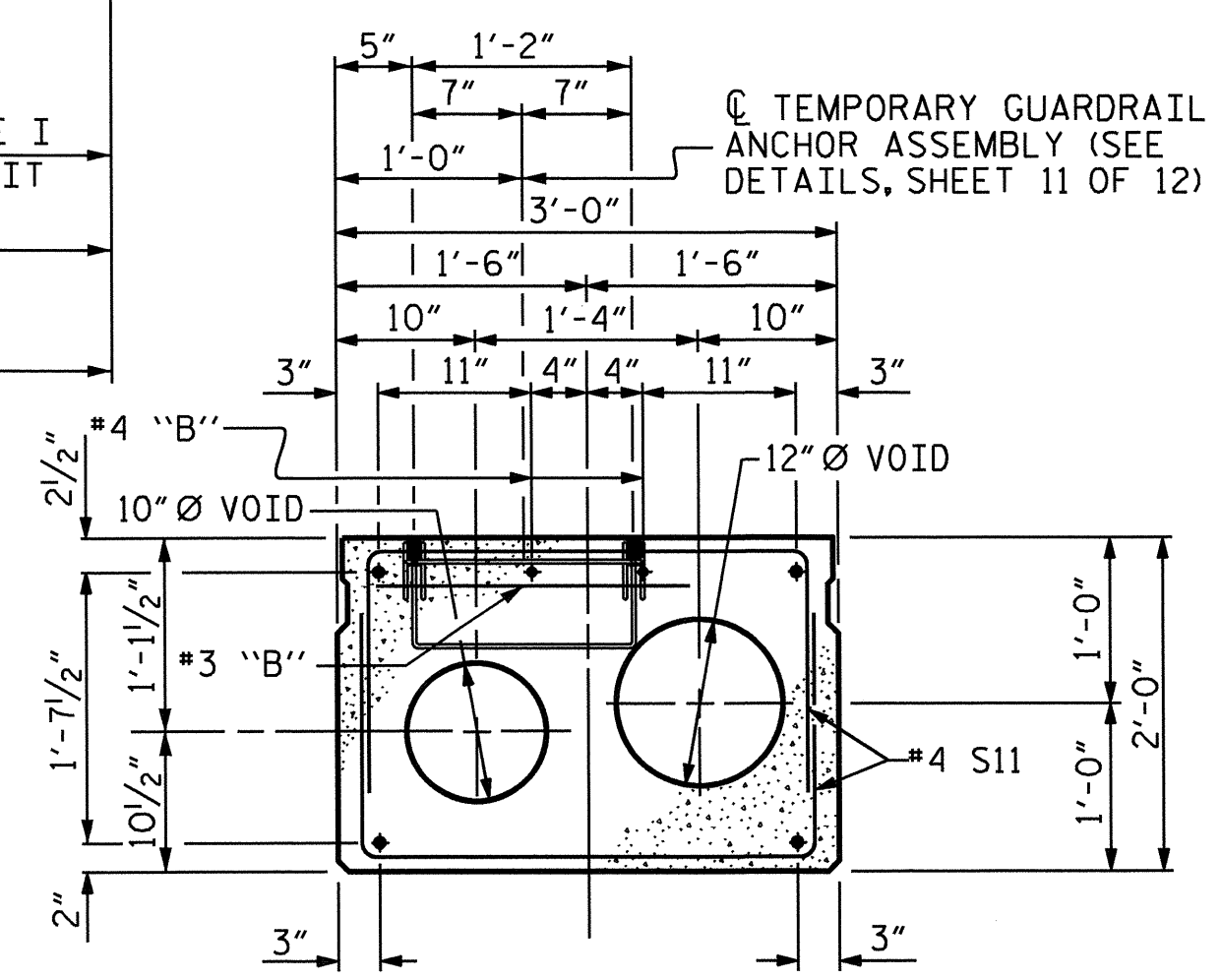
TYPICAL SECTION

* - 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.
 FOR VIEWS A-A, B-B, & C-C, SEE SHEET 2 OF 12



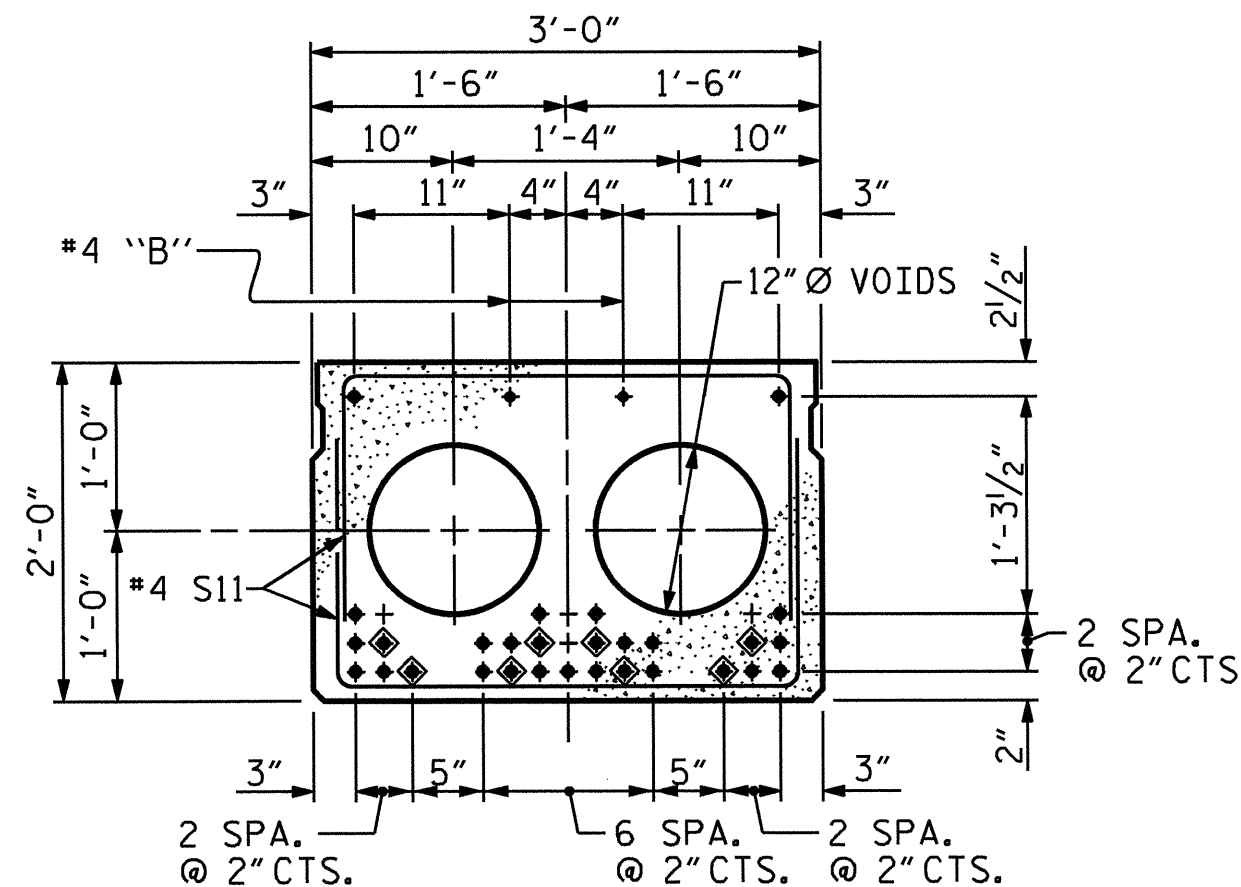
EXTERIOR SLAB SECTION

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



INTERIOR SLAB SECTION

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



INTERIOR SLAB SECTION (70' UNIT)

TYPE II & IV (29 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

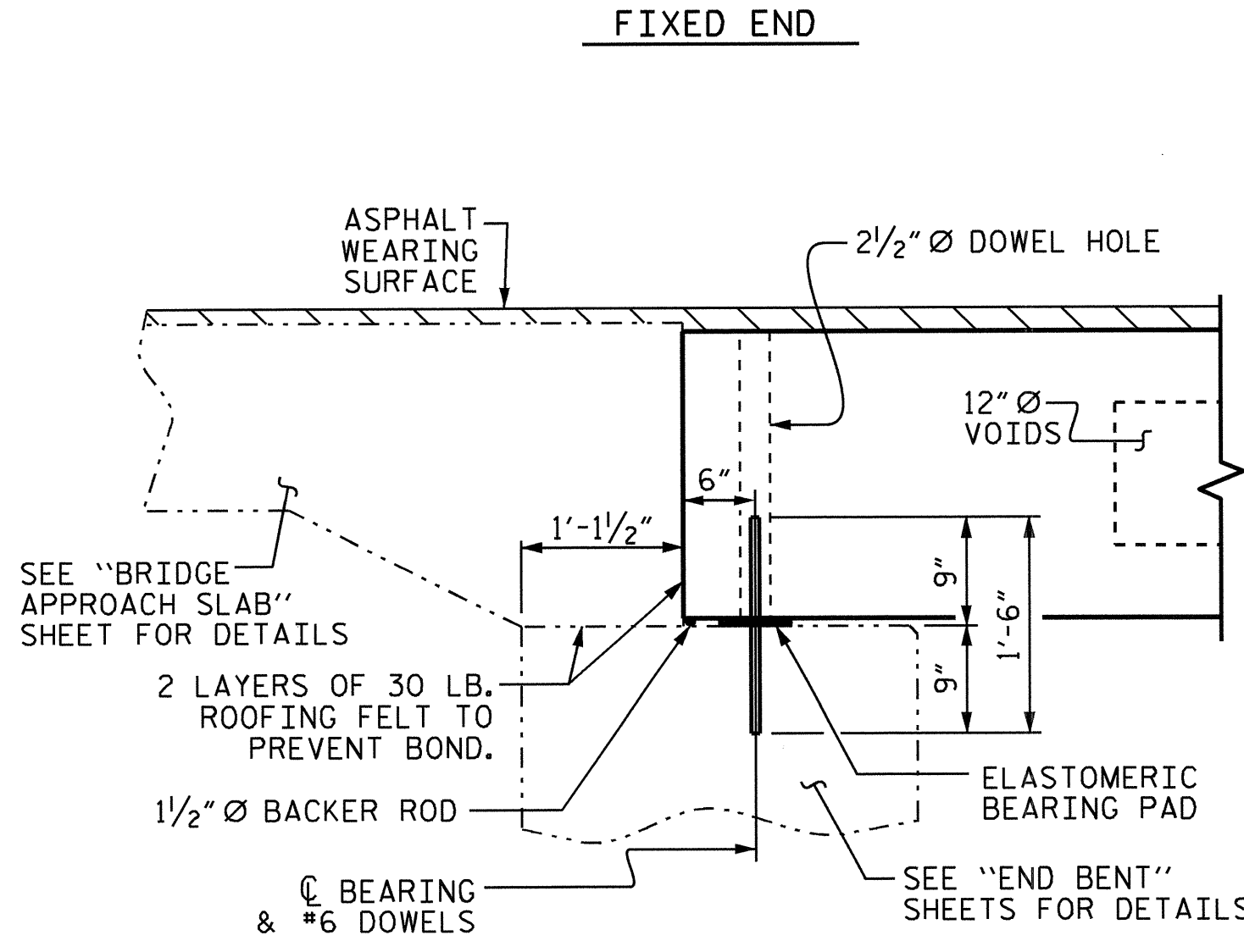
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

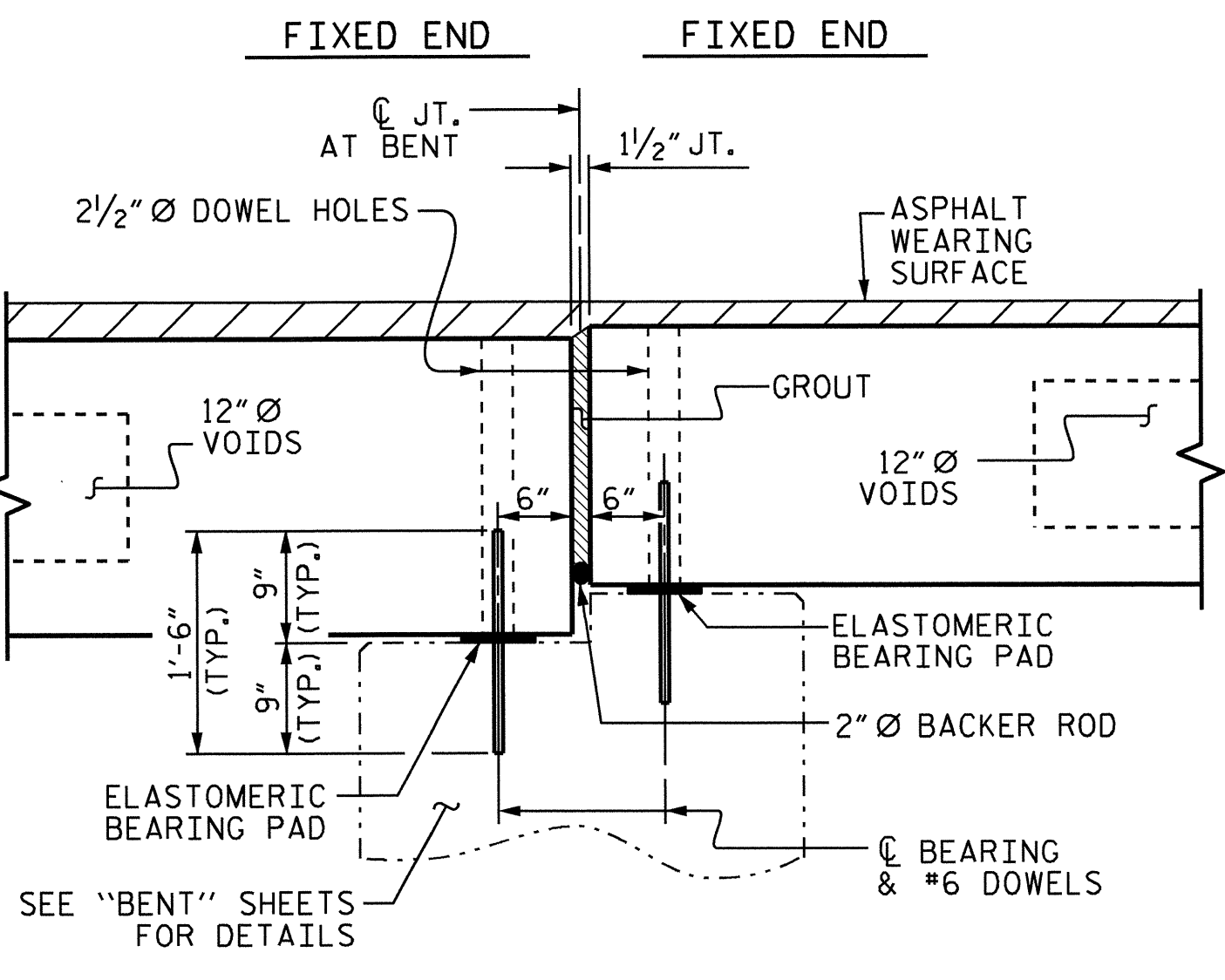
PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 12

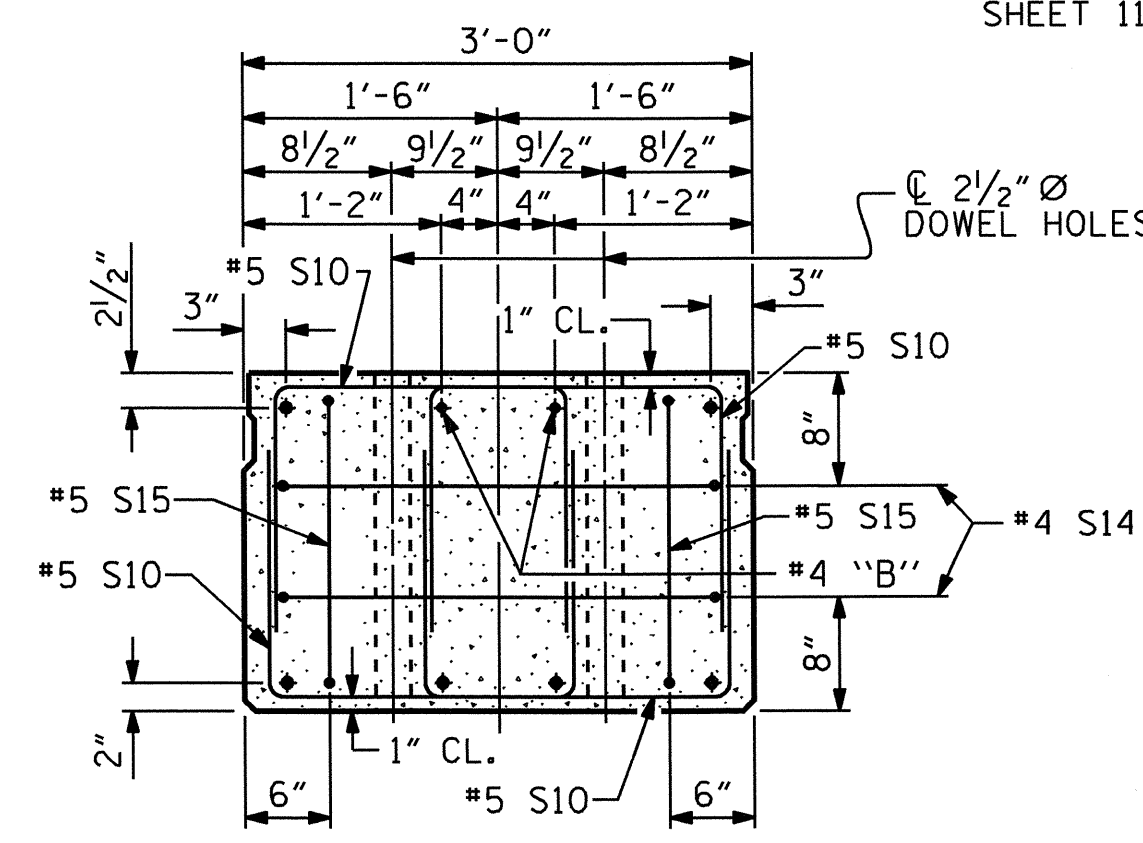
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 3'-0" X 2'-0"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 SPAN A



SECTION AT END BENT No. 1



SECTION AT BENT No. 1



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.

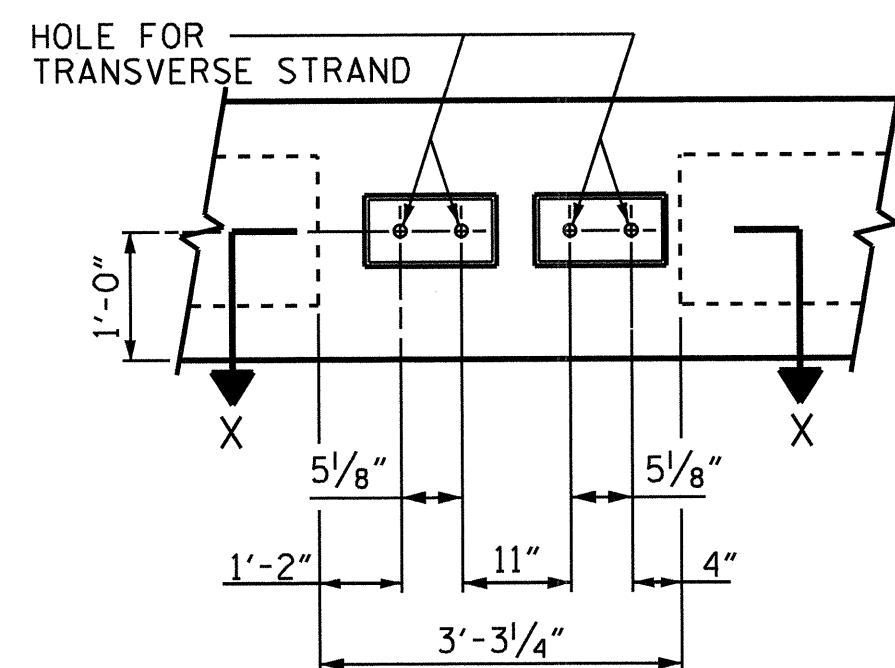
SHEAR KEY DETAIL

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



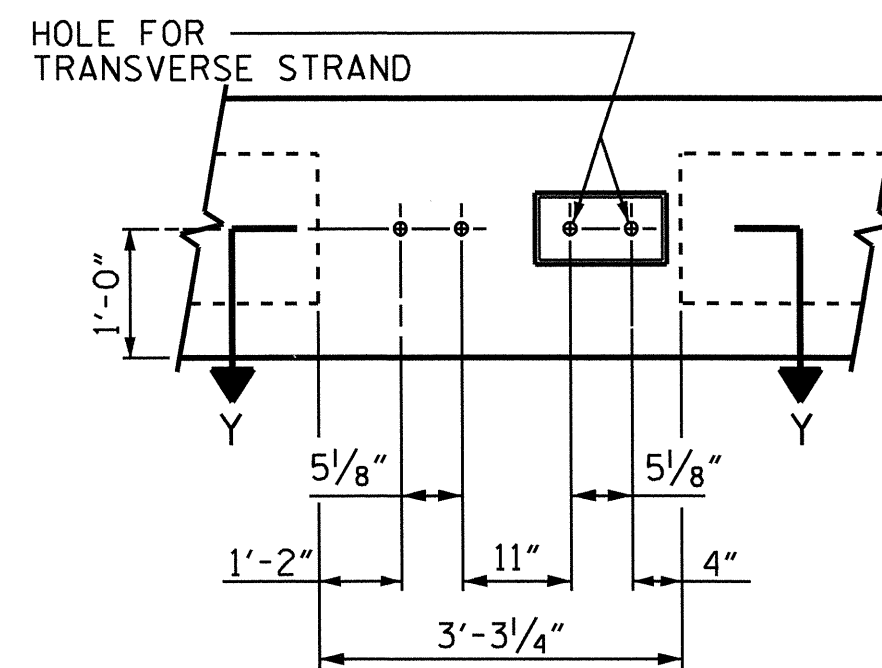
DRAWN BY: HPK/VXN DATE: 6-13
 CHECKED BY: D. HODGE DATE: 7-13
 DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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



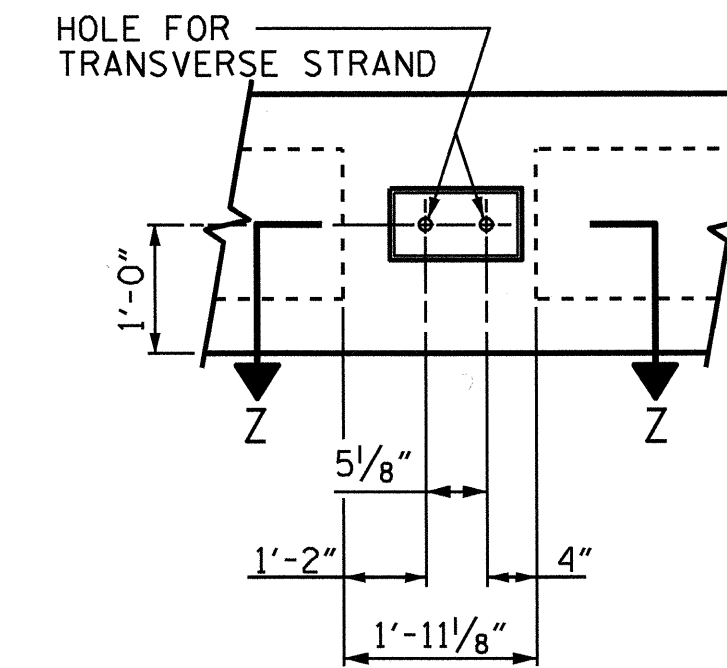
VIEW A-A

(SEE TYPICAL SECTION, SHEET 1 OF 12)



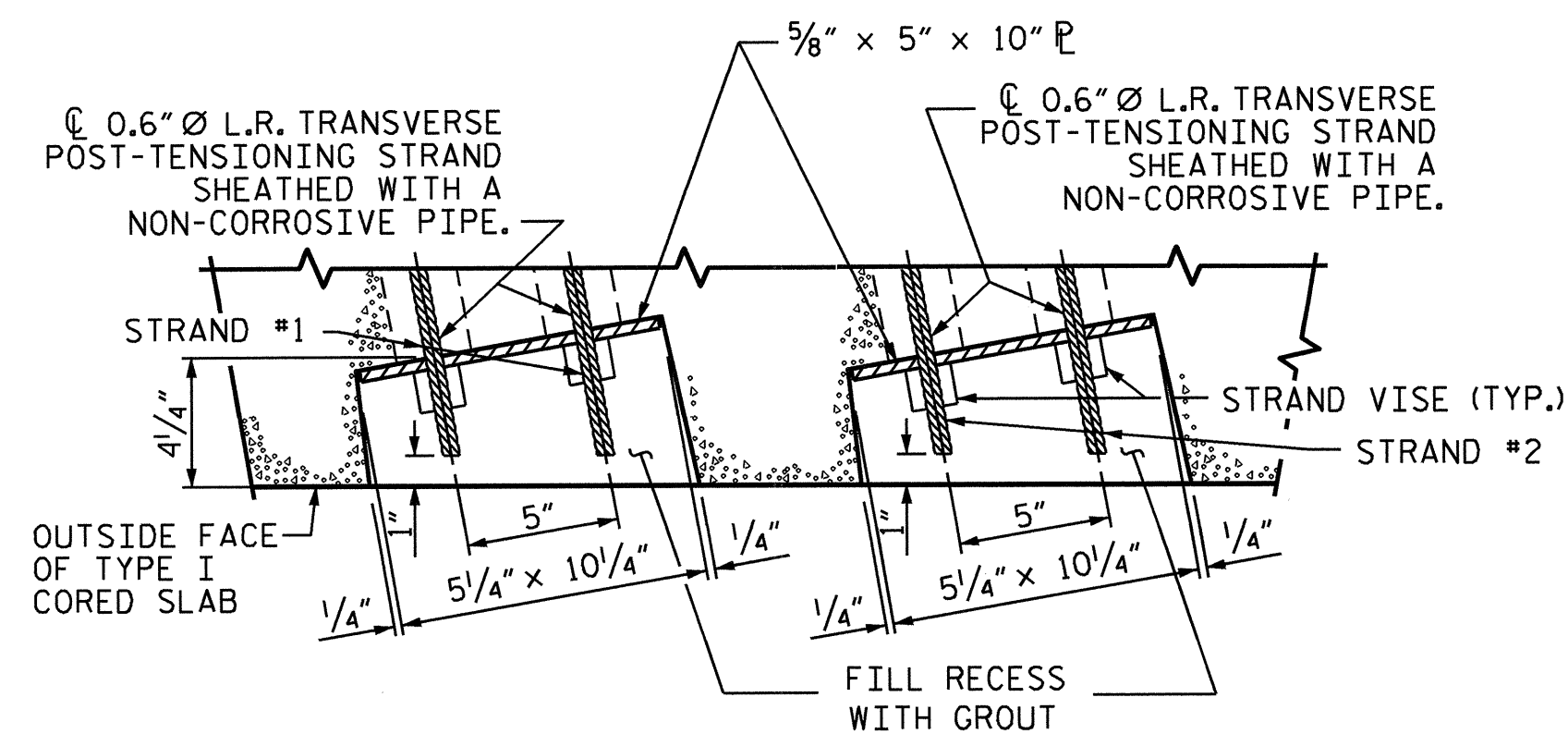
VIEW B-B

(SEE TYPICAL SECTION, SHEET 1 OF 12)

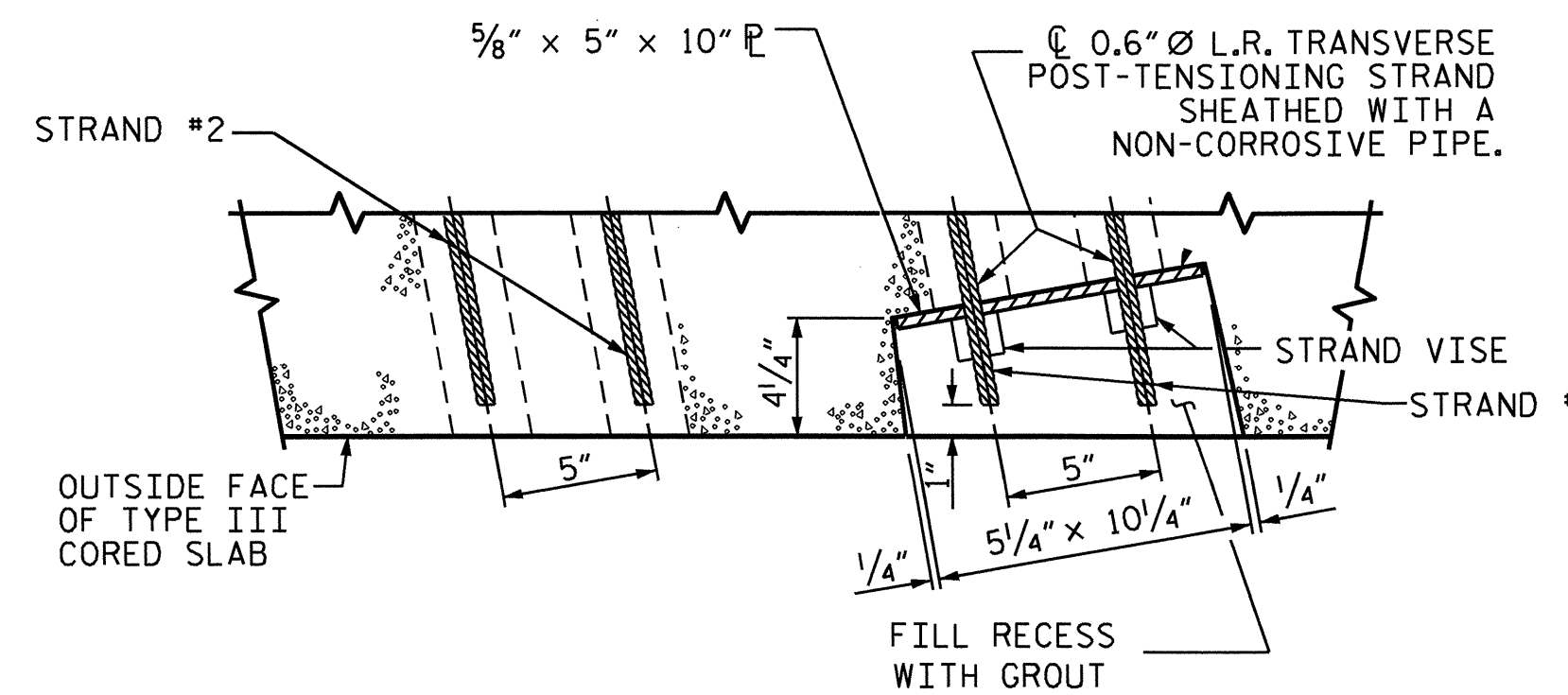


VIEW C-C

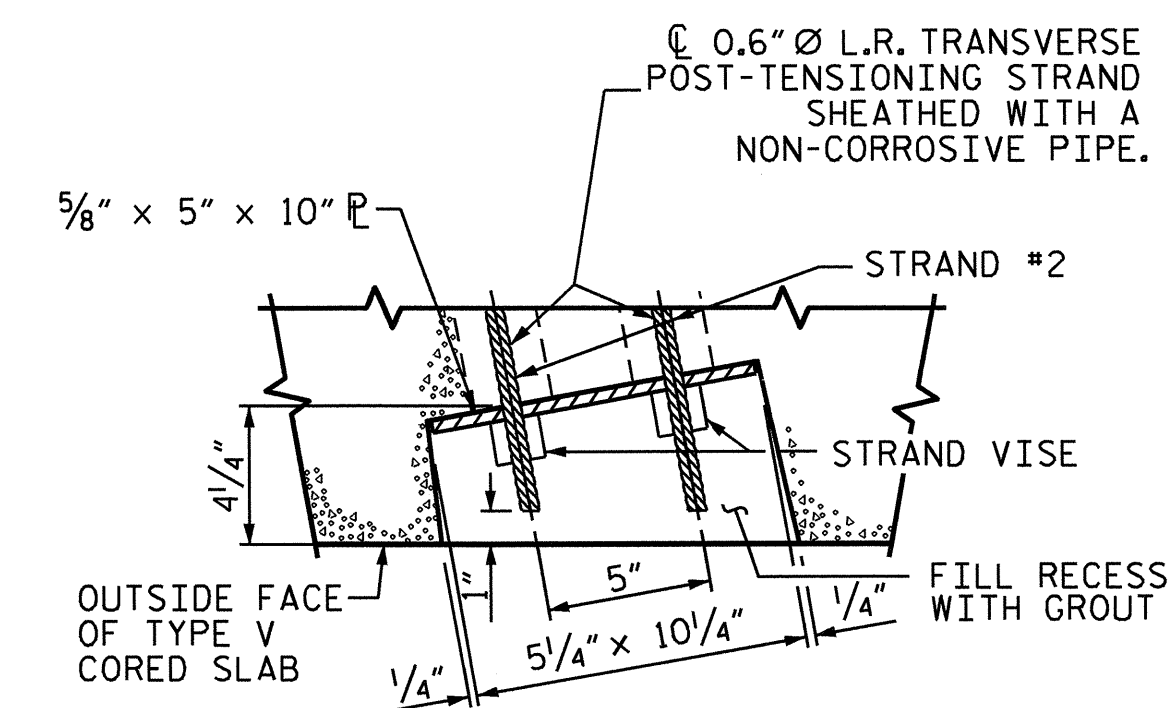
(SEE TYPICAL SECTION, SHEET 1 OF 12)



SECTION X-X
(TYPE I UNIT)



SECTION Y-Y
(TYPE III UNIT)



SECTION Z-Z
(TYPE V UNIT)

STRAND #1 GOES THRU 6 CORED SLAB UNITS DURING STAGE I CONSTRUCTION
 STRAND #2 GOES THRU ALL 13 CORED SLAB UNITS DURING STAGE II CONSTRUCTION

GROUTED RECESS AT END OF POST-TENSIONED STRAND

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

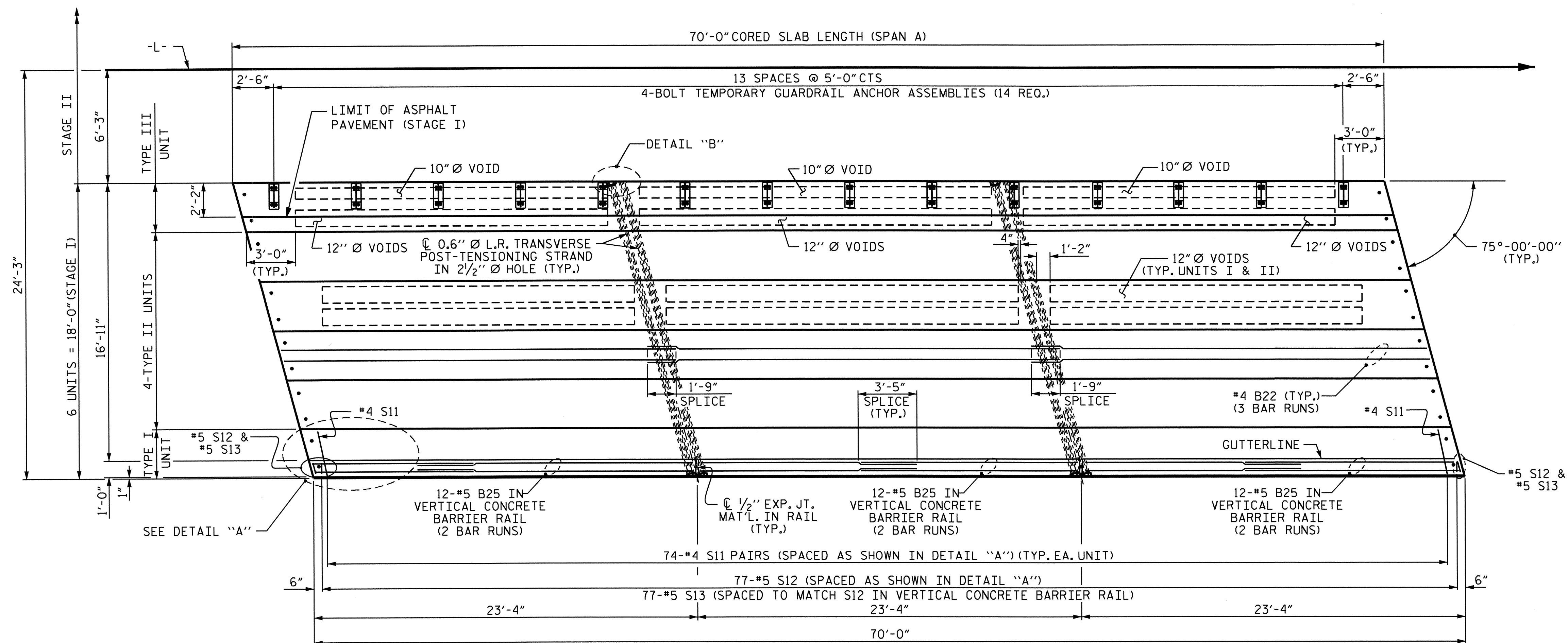
SHEET 2 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 3'-0" X 2'-0"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (SPAN A)

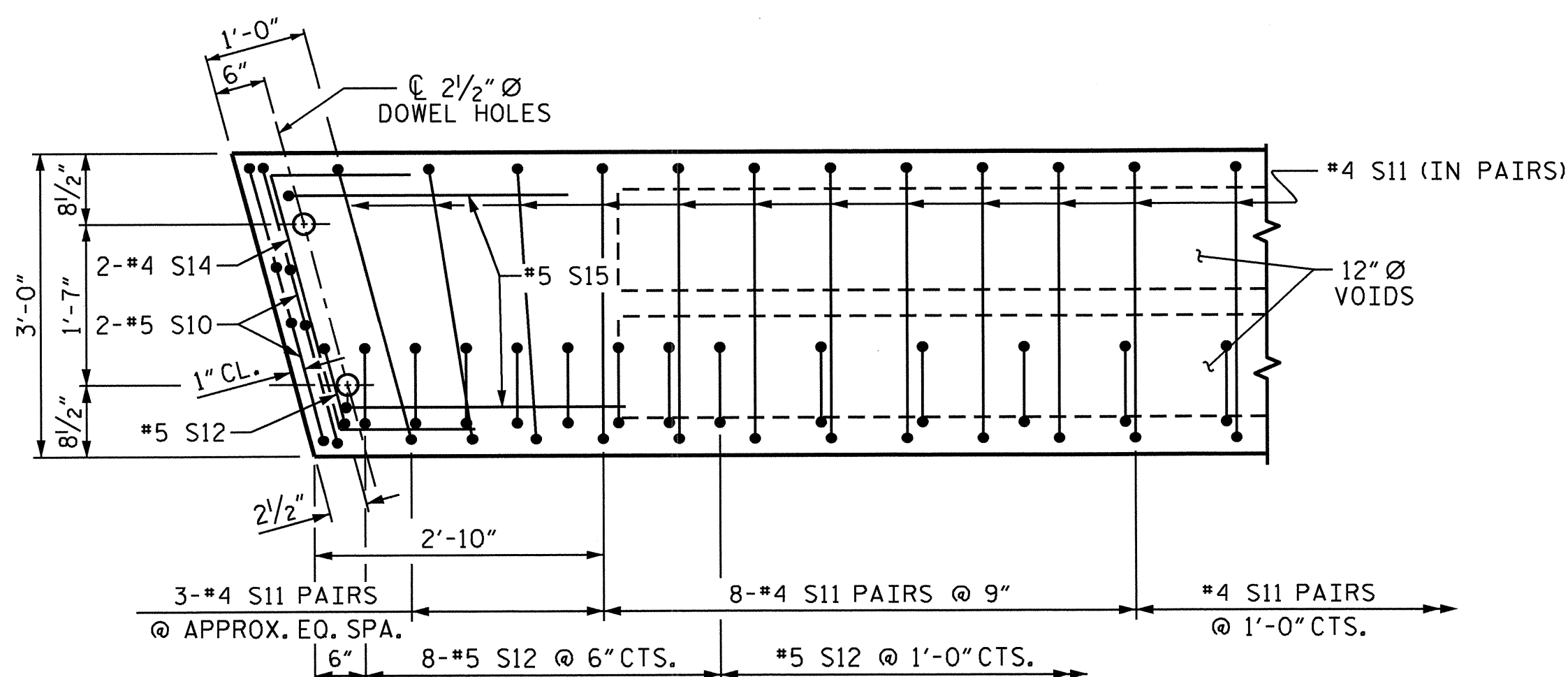


DRAWN BY: HPK/VXN DATE: 6-13
 CHECKED BY: D. HODGE DATE: 7-13
 DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
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2			4			34

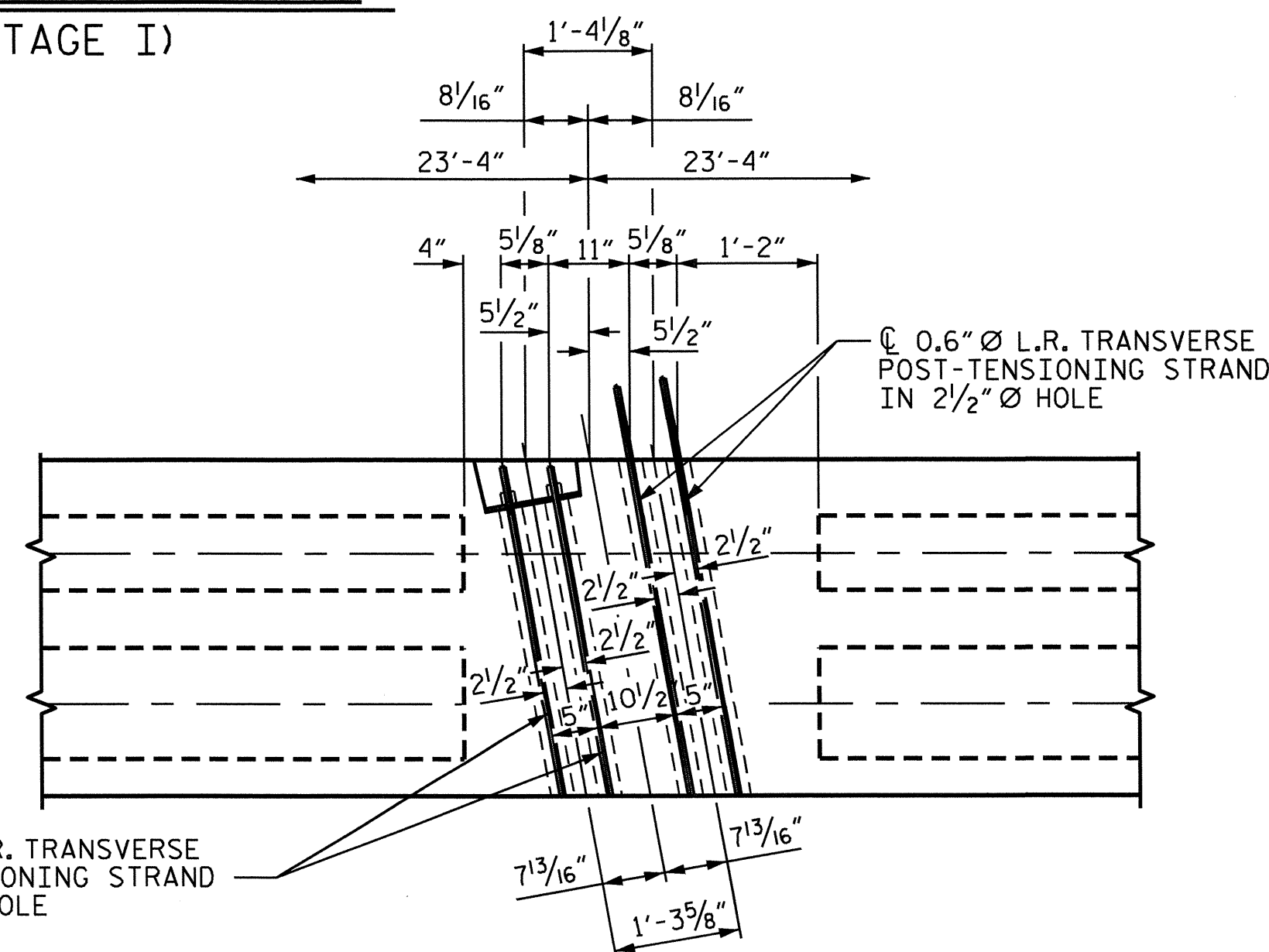


PLAN OF SPAN A
(STAGE I)



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

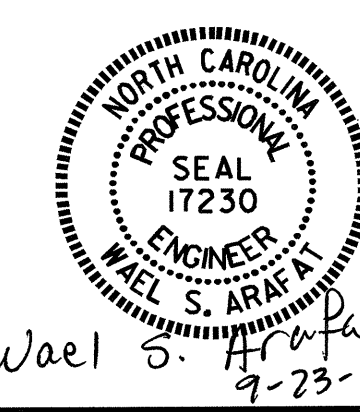
#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES.

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

SHEET 3 OF 12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

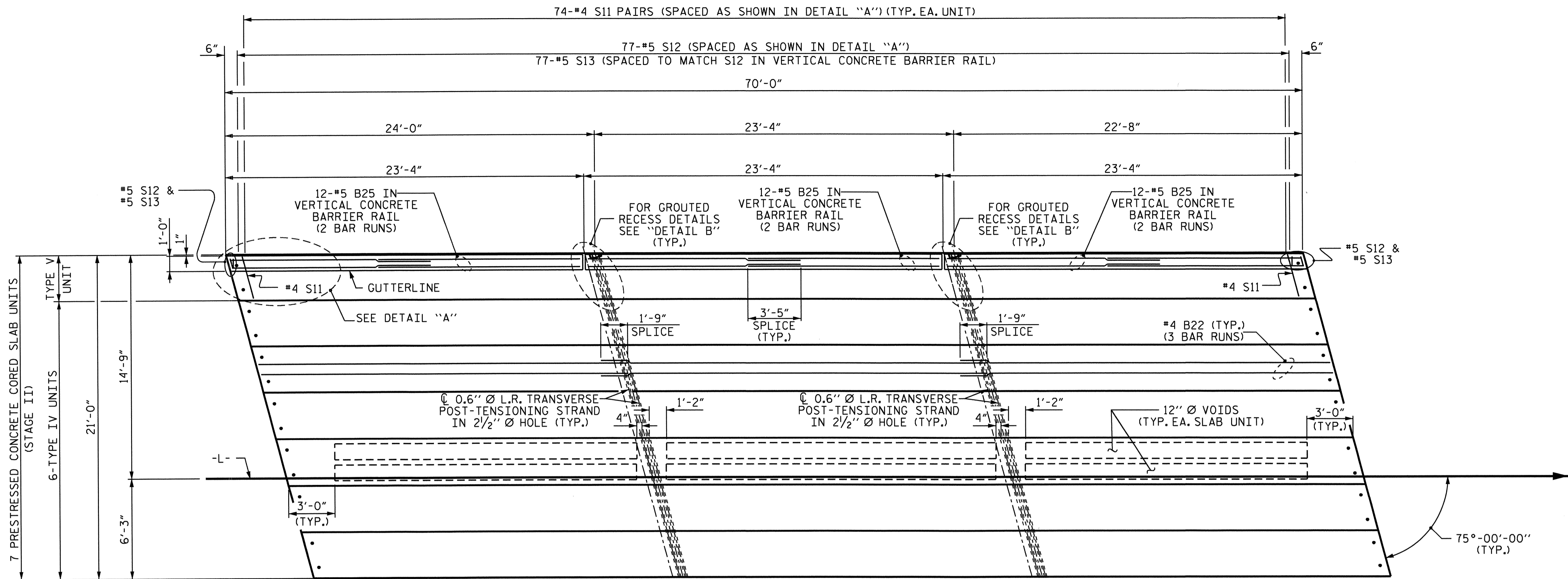
PLAN OF 70' UNIT
75° SKEW
SPAN A
(STAGE I)



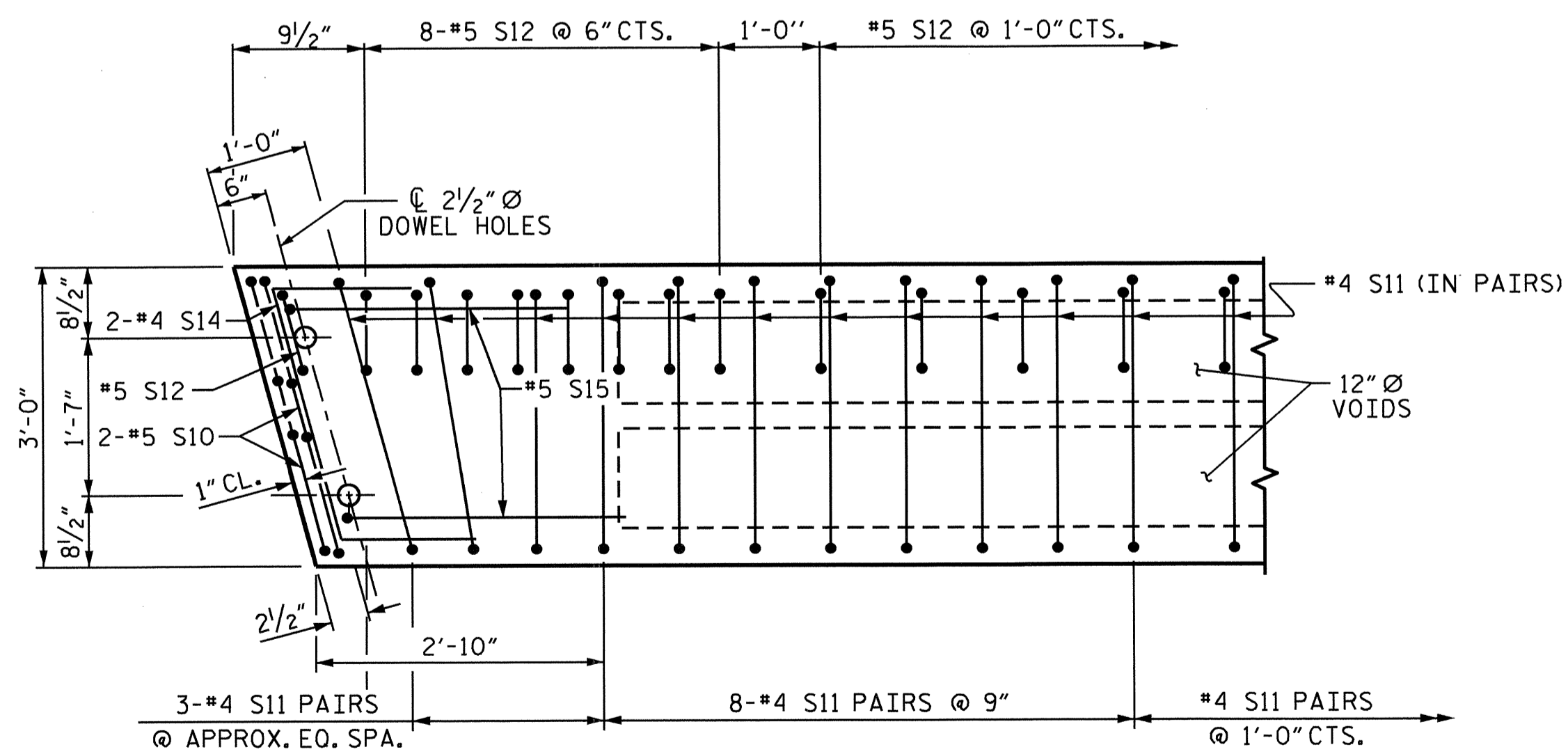
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CHECKED BY: D. HODGE DATE: 7-13
DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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

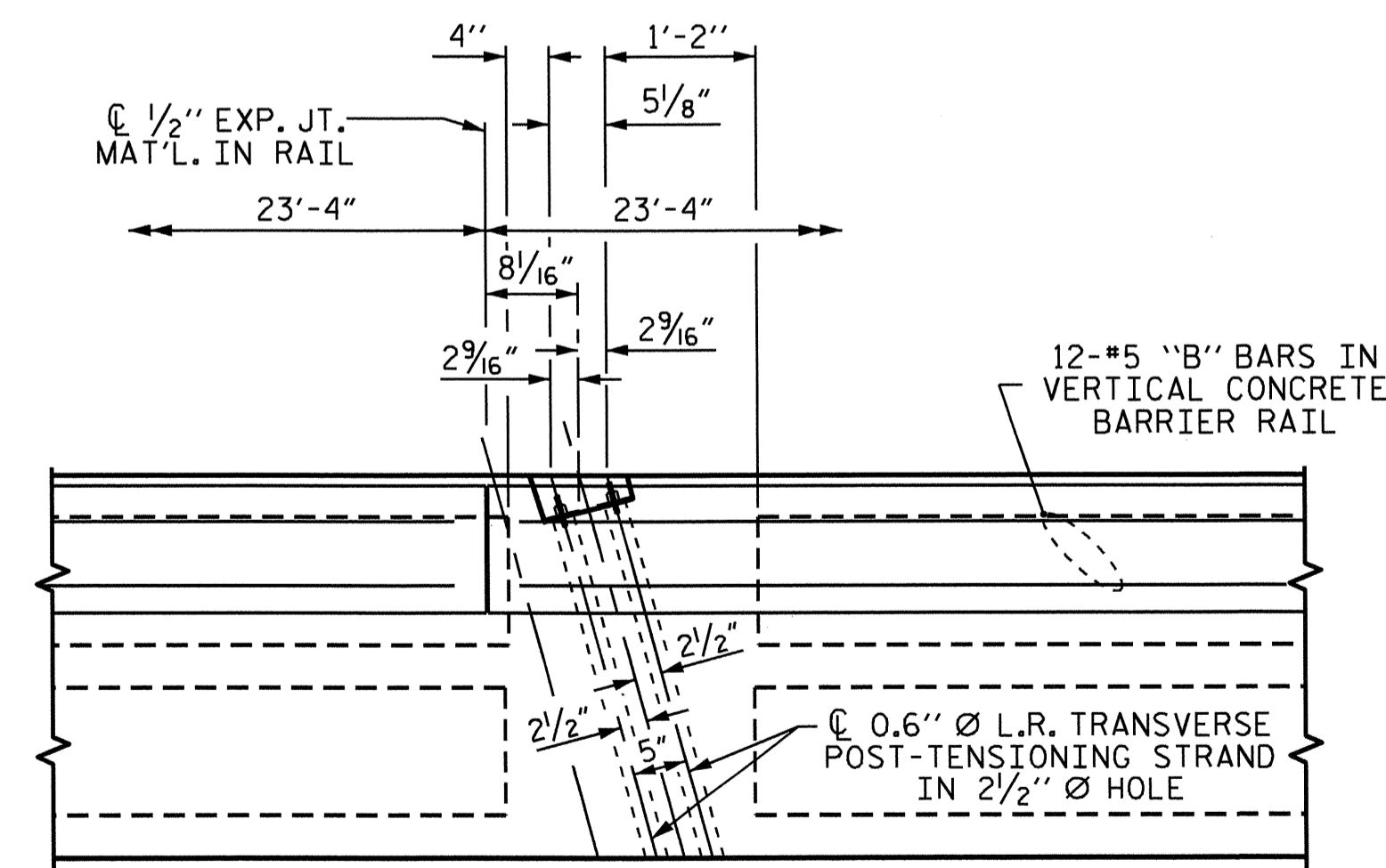


PLAN OF SPAN A
(STAGE II)



DETAIL "A"

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

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 4 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

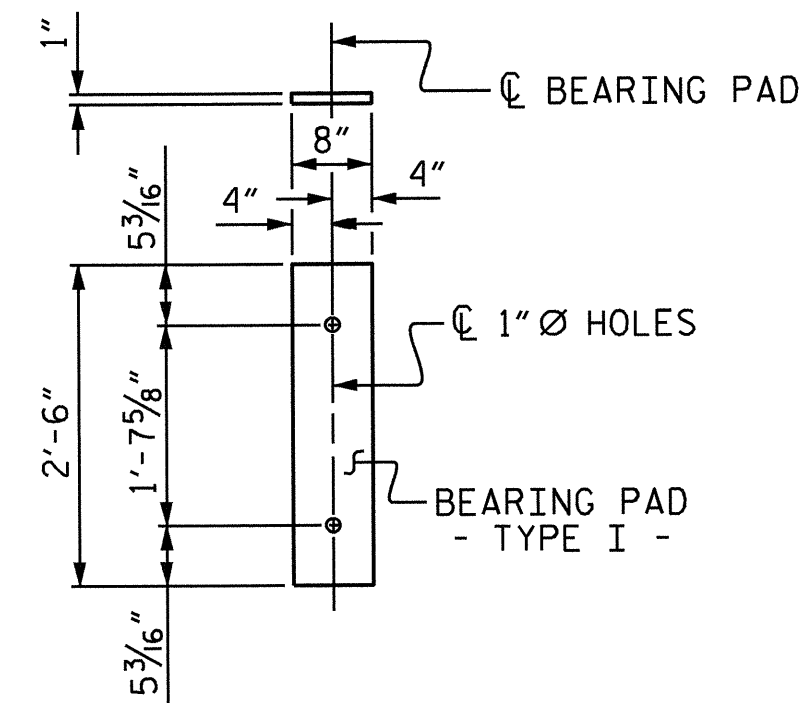
PLAN OF 70' UNIT
 75° SKEW
 SPAN A
 (STAGE II)



DRAWN BY: HPK / VXN DATE: 6-13
 CHECKED BY: D. HODGE DATE: 7-13
 DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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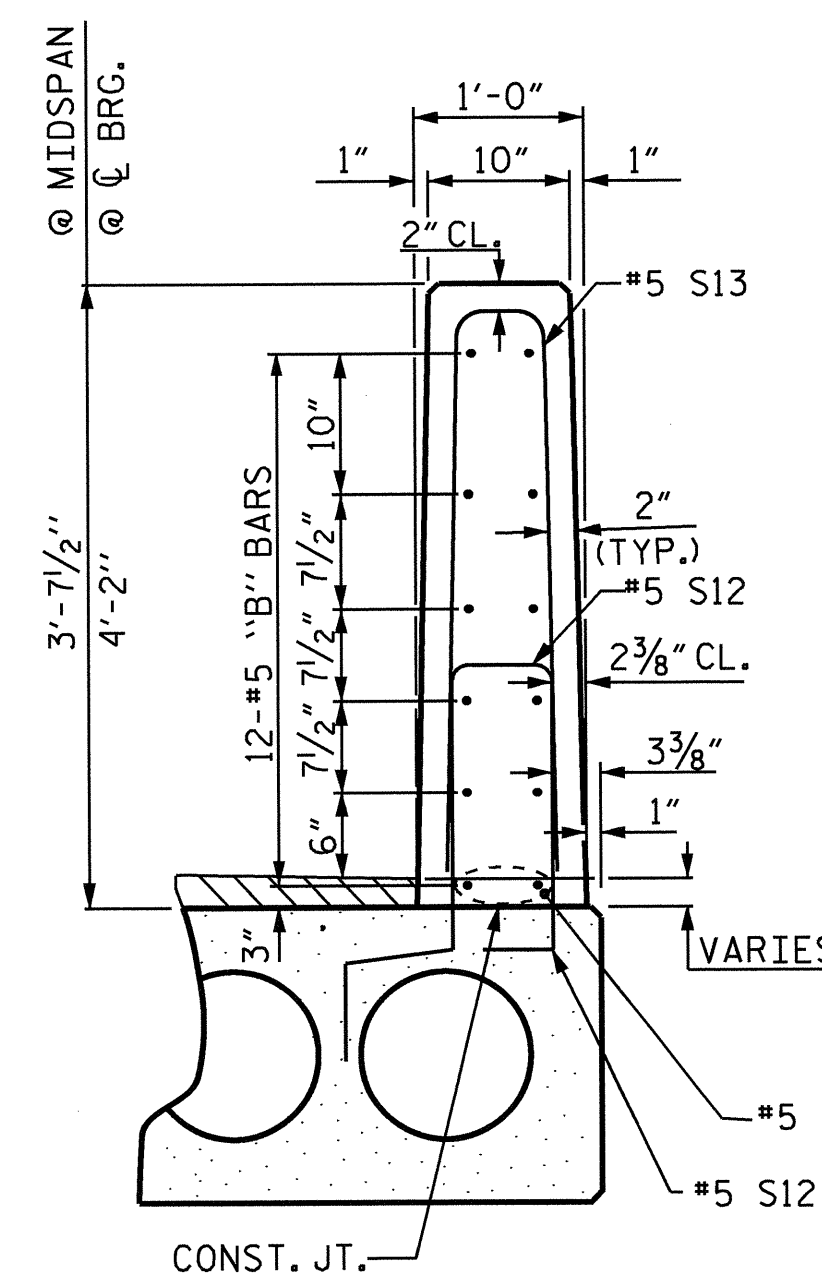
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1			3			TOTAL SHEETS
2			4			34



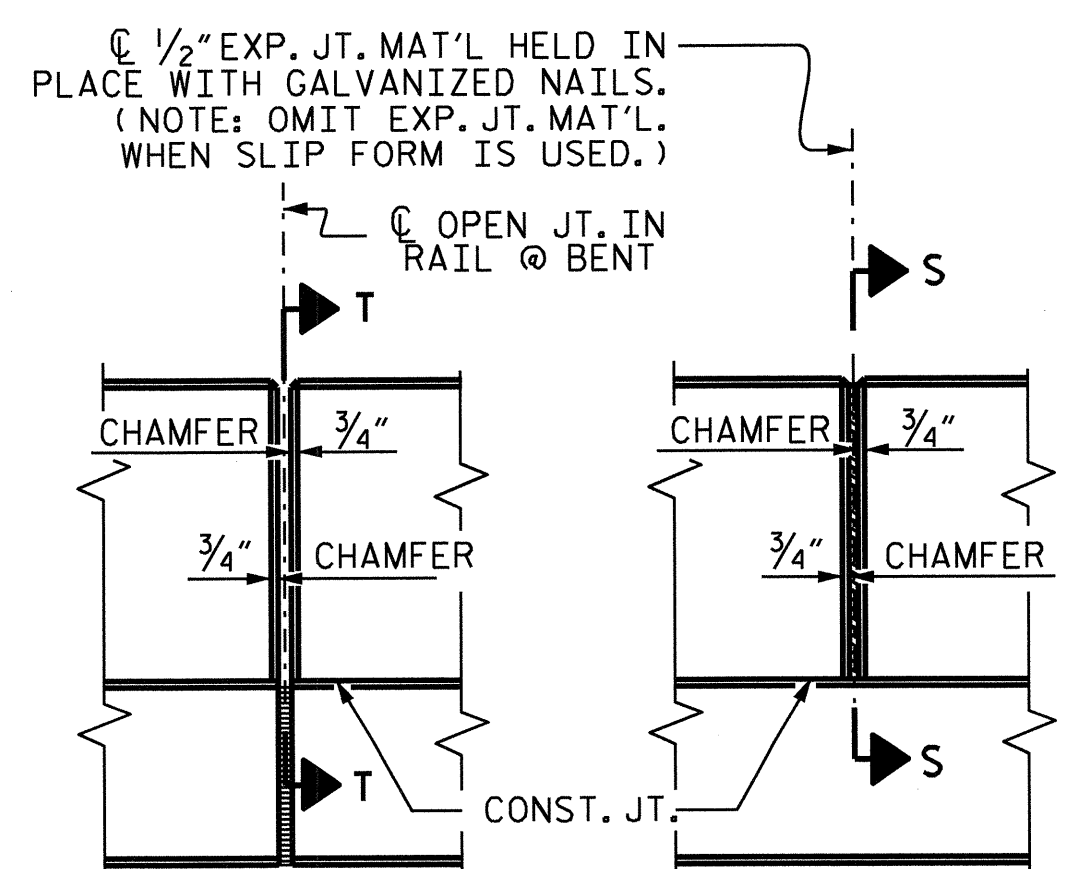
FIXED END
(TYPE I - 12 REQ'D, STAGE I)
(TYPE I - 14 REQ'D, STAGE II)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



SECTION THRU RAIL

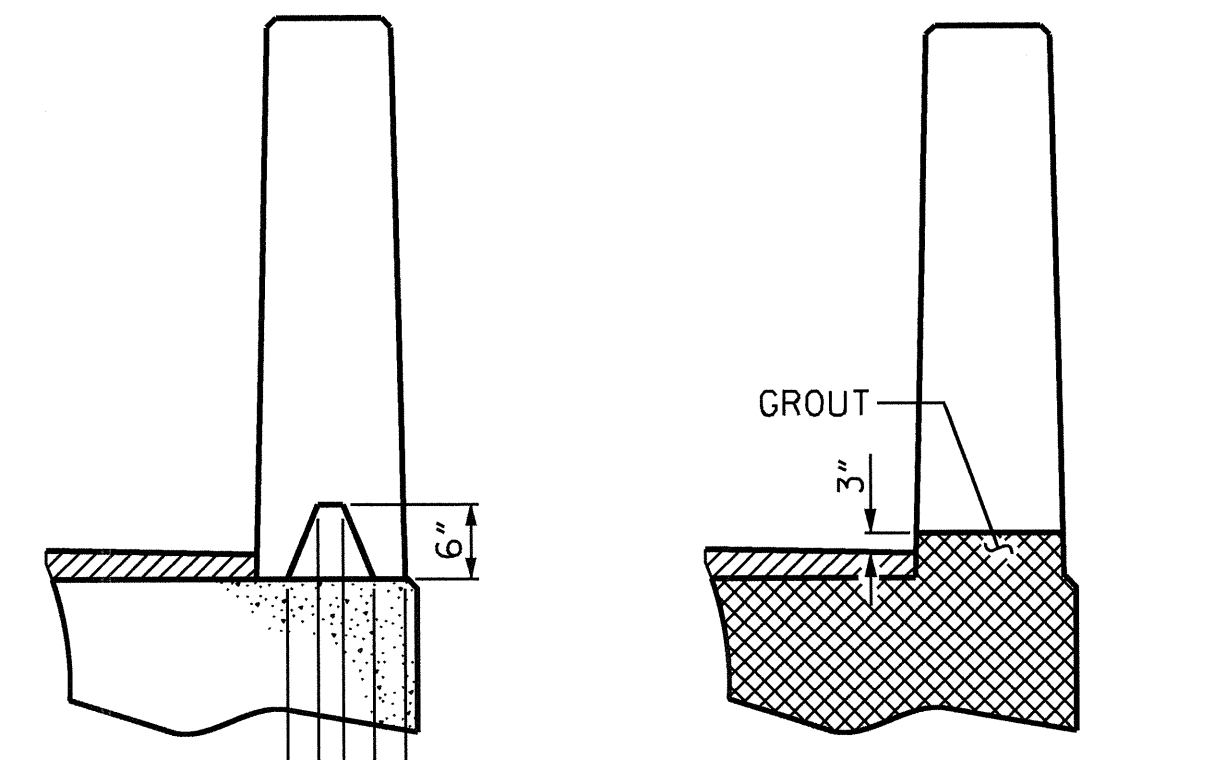


ELEVATION AT EXPANSION JOINTS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL							
STAGE I							
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B25	72	72	#5	STR	13'-8"	1026	
*S13	79	79	#5	2	7'-2"	591	
* EPOXY COATED REINFORCING STEEL						LBS.	1617
CLASS AA CONCRETE						CU.YDS.	9.6
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT.	70.06
STAGE II							
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B25	72	72	#5	STR	13'-8"	1026	
*S13	79	79	#5	2	7'-2"	591	
* EPOXY COATED REINFORCING STEEL						LBS.	1617
CLASS AA CONCRETE						CU.YDS.	9.6
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT.	70.06

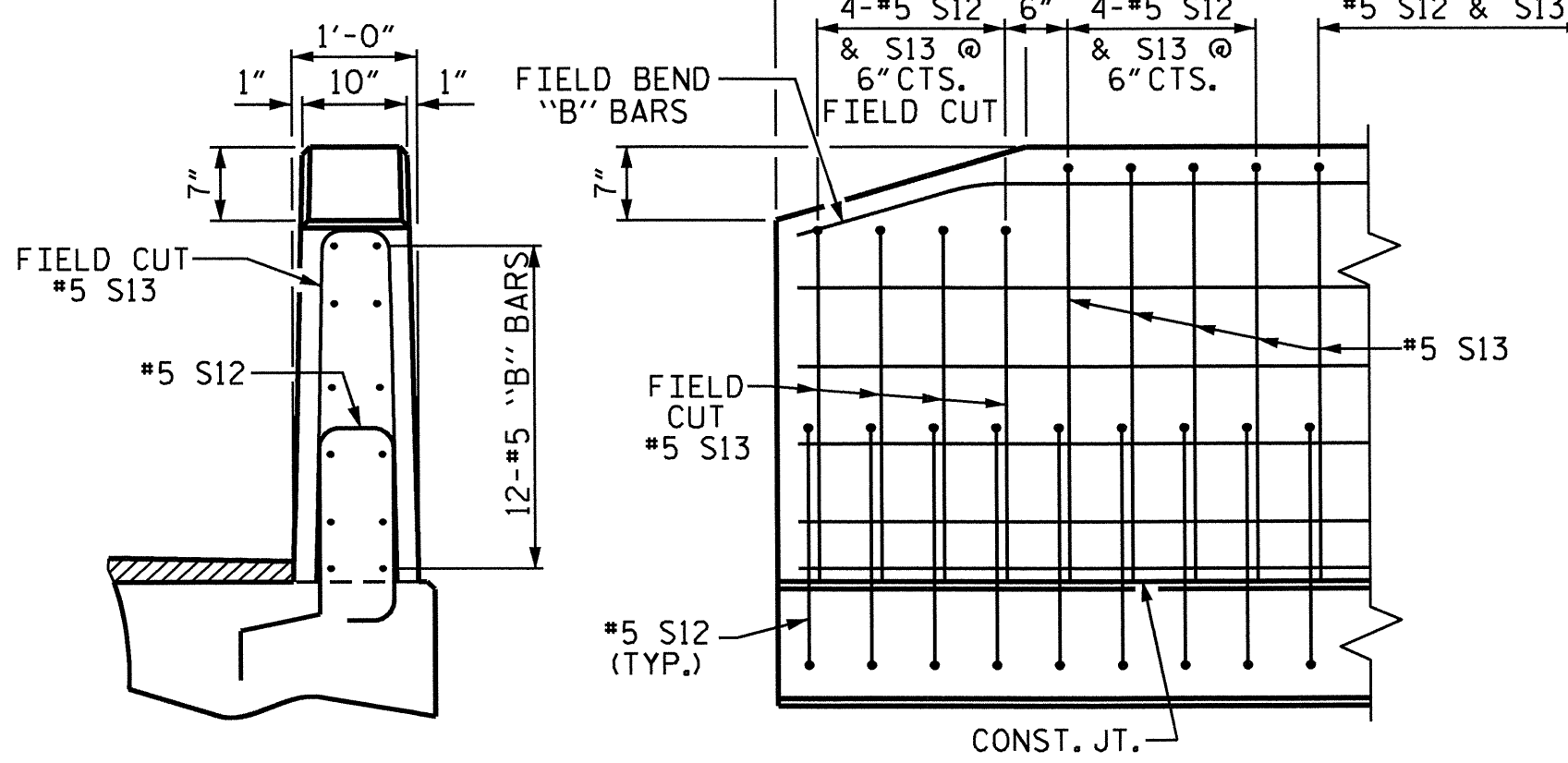
BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT											
		STAGE I				STAGE II					
		TYPE I UNIT		TYPE II & III UNIT		TYPE IV UNIT		TYPE V UNIT			
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-10"	40	4'-10"	40	4'-10"	40	4'-10"	40
S11	148	#4	3	5'-10"	577	5'-10"	577	5'-10"	577	5'-10"	577
*S12	79	#5	1	6'-4"	522	6'-4"	522	6'-4"	522	6'-4"	522
S14	4	#4	4	5'-8"	15	5'-8"	15	5'-8"	15	5'-8"	15
S15	4	#5	3	7'-1"	30	7'-1"	30	7'-1"	30	7'-1"	30
REINFORCING STEEL					LBS.	760	760	760	760	760	760
* EPOXY COATED REINFORCING STEEL					LBS.	522	522	522	522	522	522
7500 P.S.I. CONCRETE					CU. YDS.	12.1	12.1	12.1	12.1	12.1	12.1
0.6" Ø L.R. STRANDS					No.	29	29	29	29	29	29

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT	
ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
1 1/2"	3'-7 1/2"



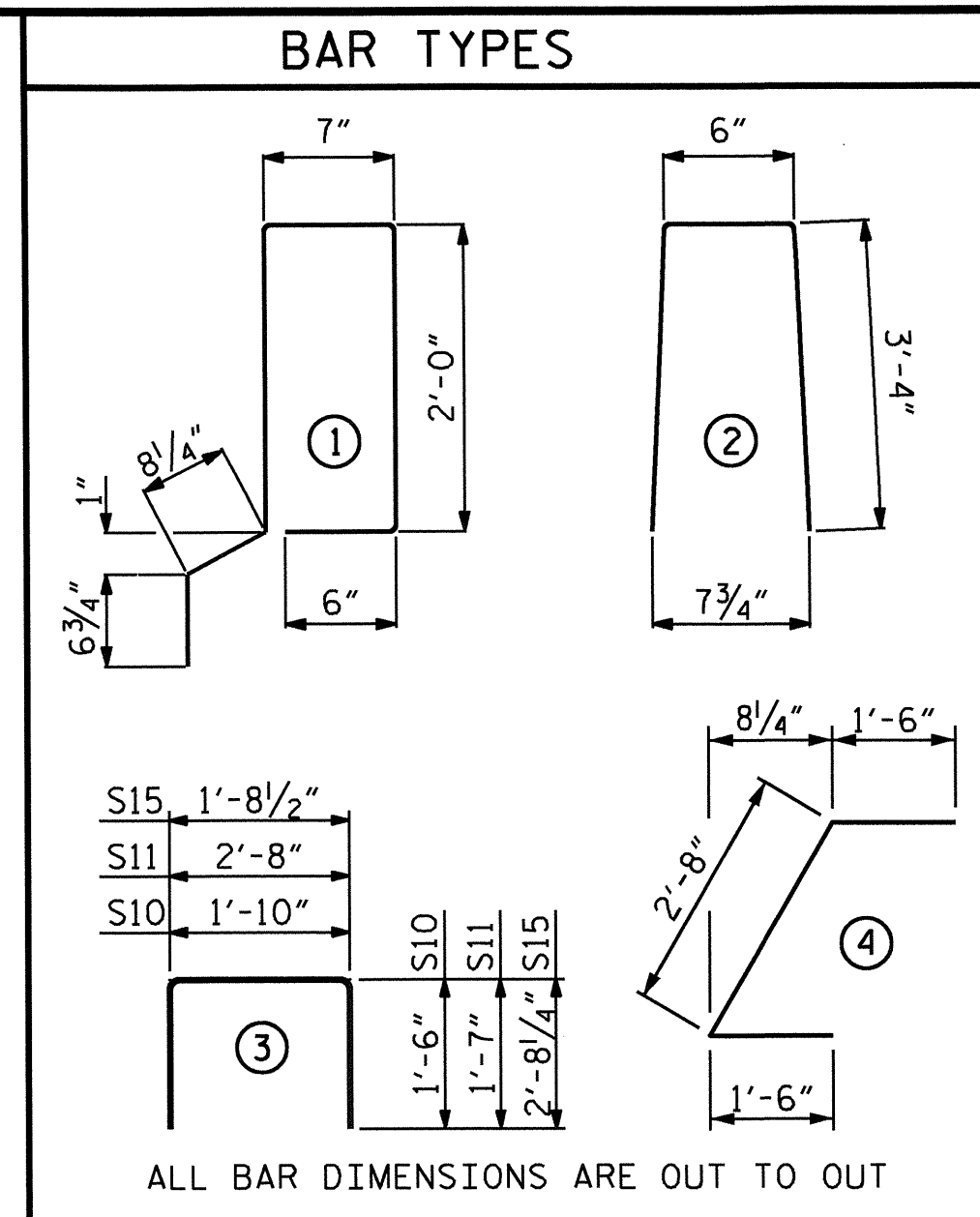
SECTION T-T
AT OPEN JOINT AT BENT (THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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



END VIEW SIDE VIEW

END OF RAIL DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

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

CORED SLABS REQUIRED			
		NUMBER	LENGTH/TOTAL LENGTH
STAGE I	EXTERIOR C.S.	1	70'-0" / 70'-0"
	INTERIOR C.S.	5	70'-0" / 350'-0"
STAGE II	EXTERIOR C.S.	1	70'-0" / 70'-0"
	INTERIOR C.S.	6	70'-0" / 420'-0"
TOTAL		13	910'-0"

DEAD LOAD DEFLECTION AND CAMBER	
70' CORED SLAB UNIT	3'-0" x 2'-0" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	4 1/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1 5/16" ↓
FINAL CAMBER	3 1/2" ↑

** INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH	
UNIT	PSI
70' UNITS	6000

NOTES

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

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

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

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

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

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

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

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.

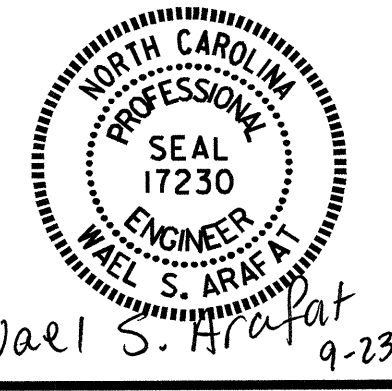
THE 3/4" Ø BOLTS, WASHERS AND CONCRETE INSERTS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

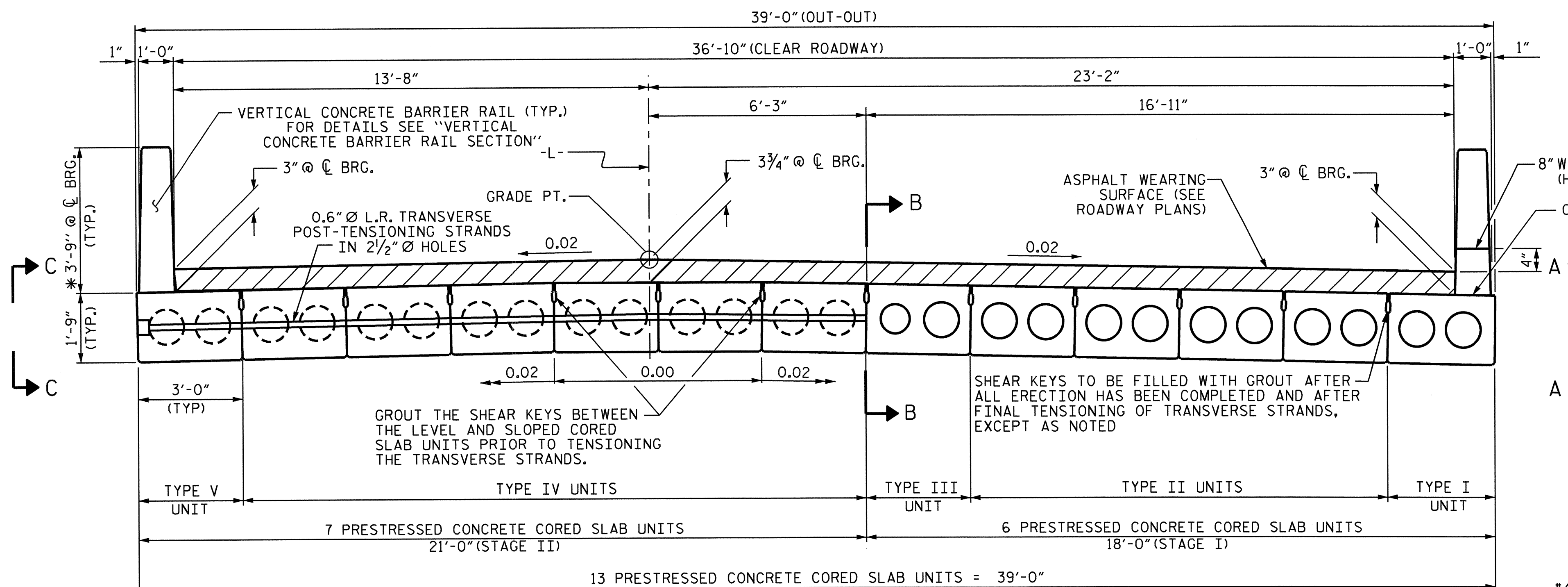


PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

SHEET 5 OF 12
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT
(SPAN A)

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

DRAWN BY: HPK/VXN DATE: 6-13
CHECKED BY: D. HODGE DATE: 7-13
DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

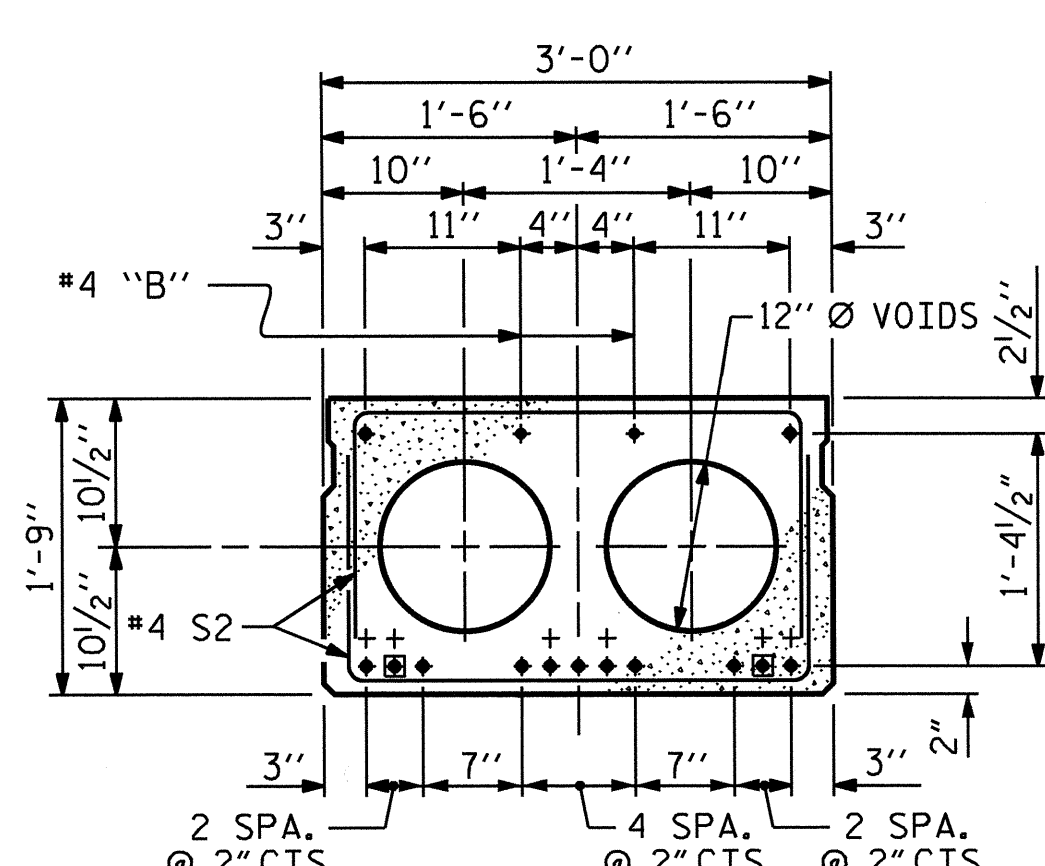


HALF SECTION AT INTERMEDIATE DIAPHRAGMS

HALF SECTION THROUGH VOIDS

TYPICAL SECTION

* - 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.
FOR VIEWS A-A, B-B, & C-C, SEE SHEET 7 OF 12

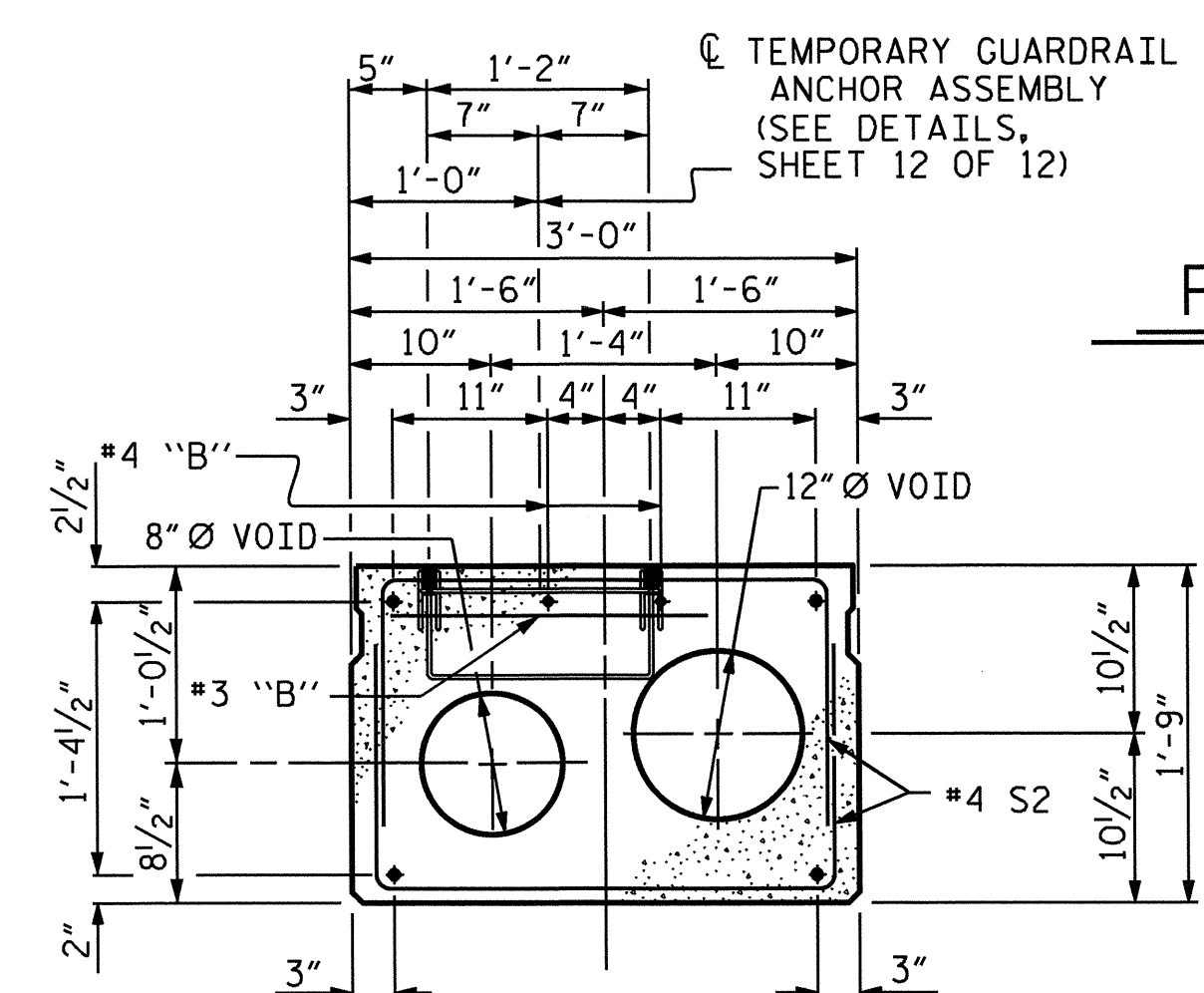


INTERIOR SLAB SECTION (TYPE II & IV) (13 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

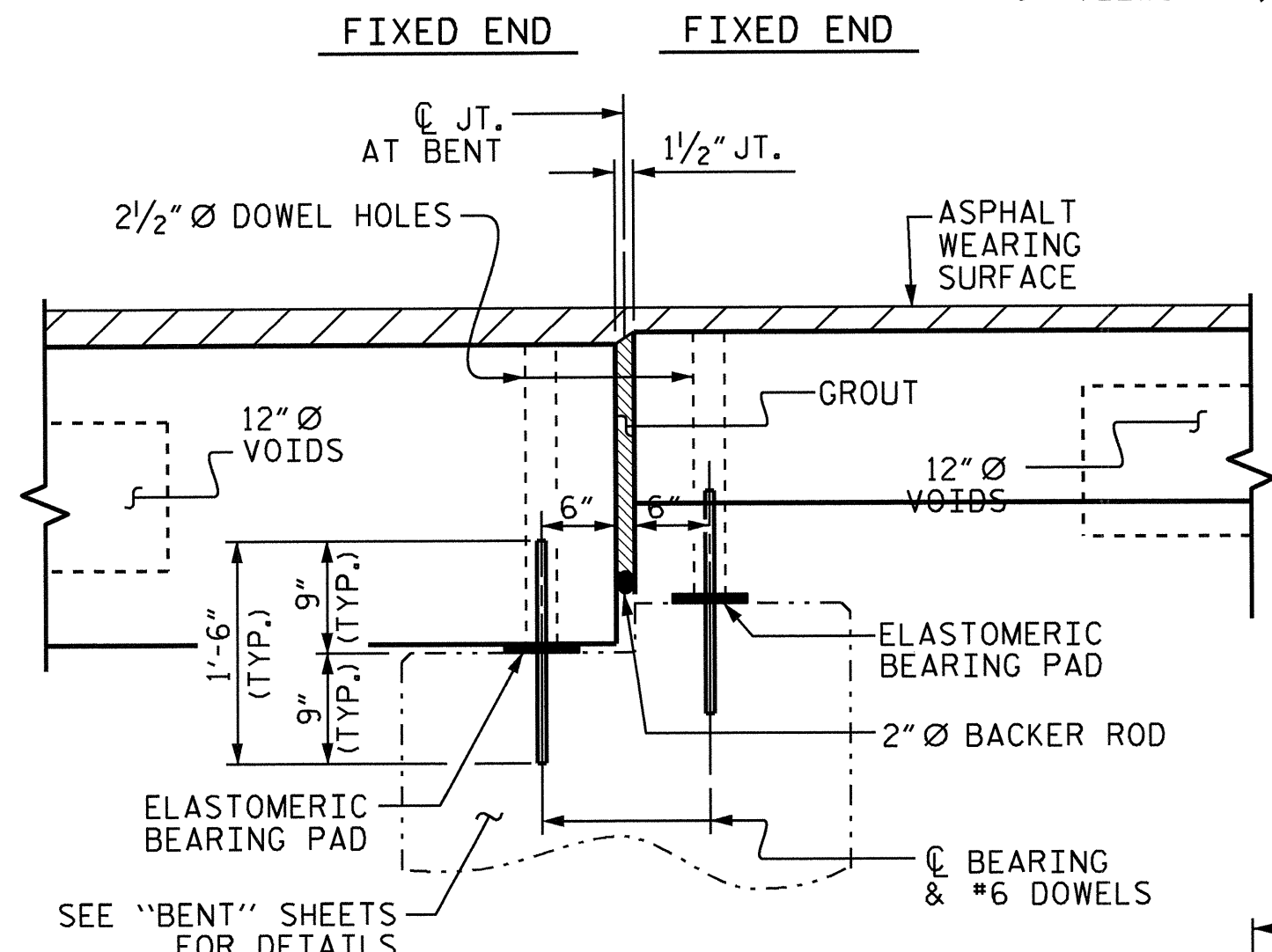
■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

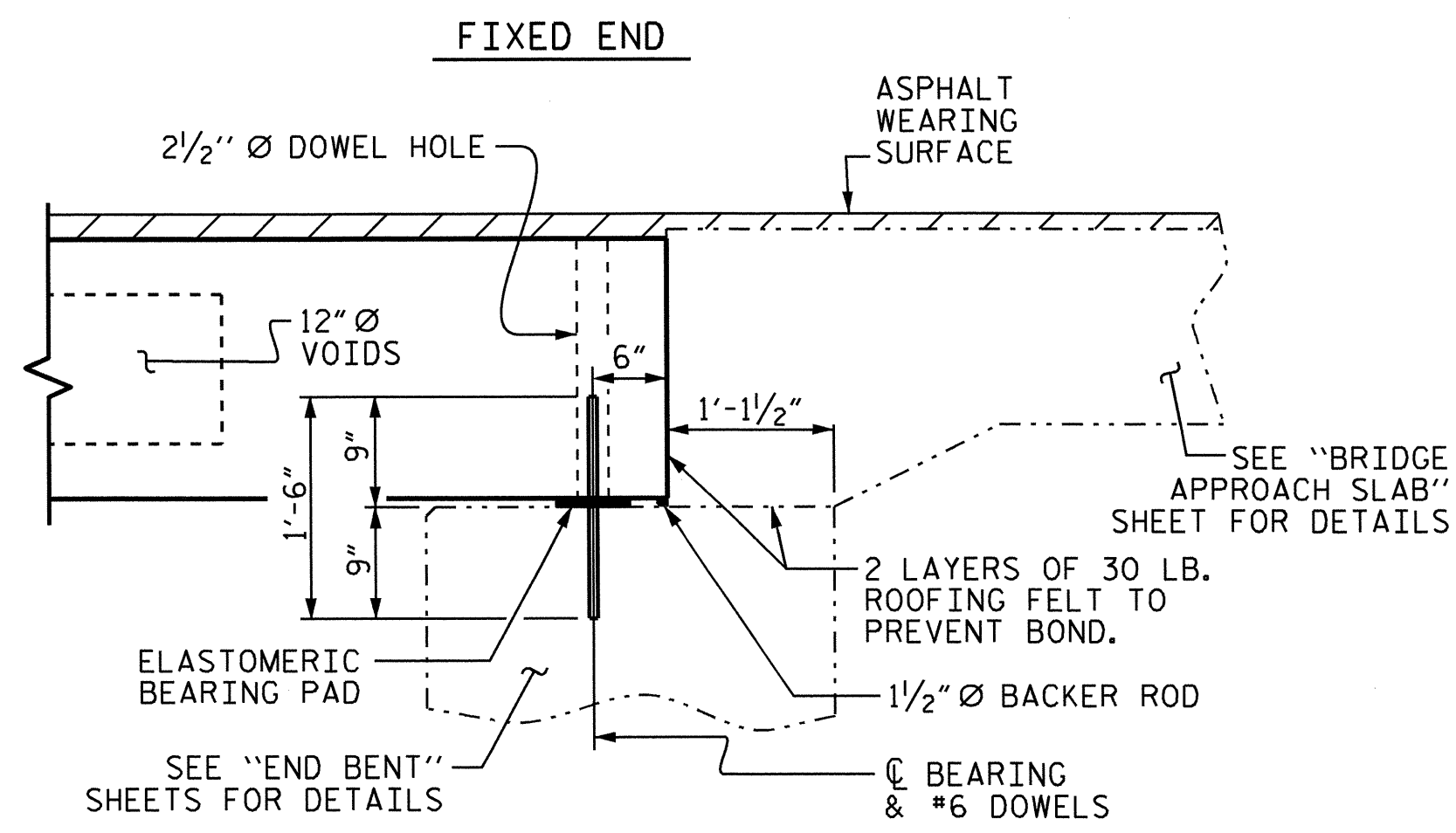


INTERIOR SLAB SECTION

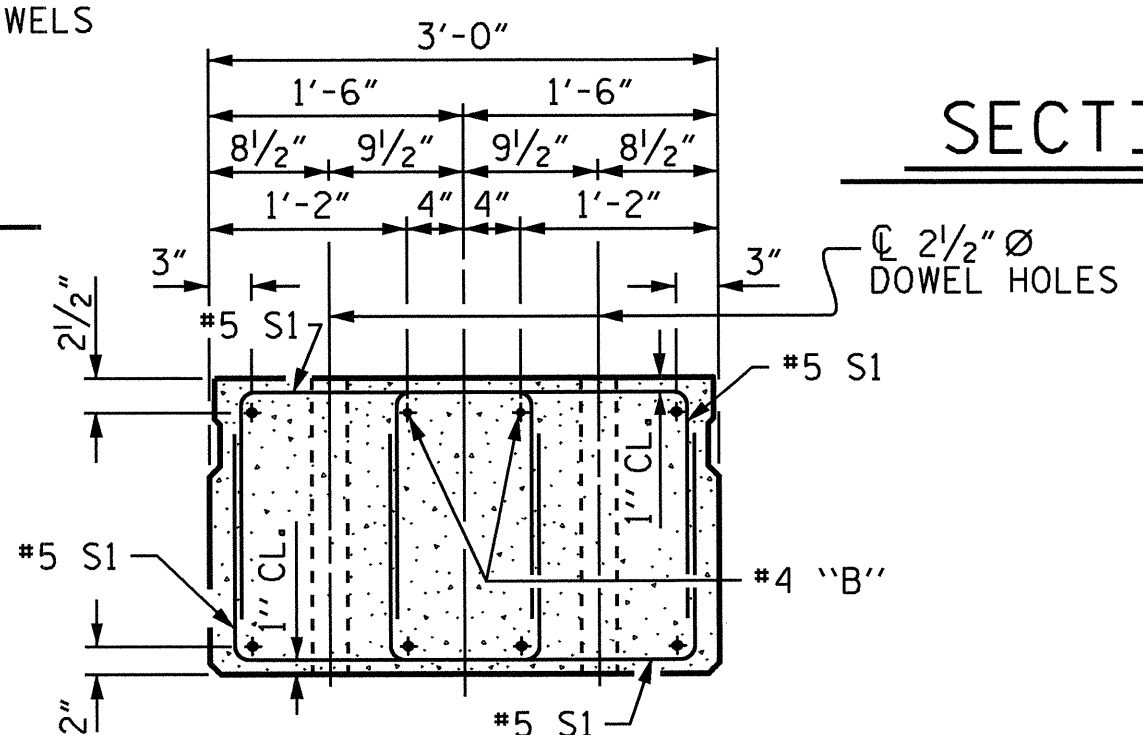
TYPE III (FOR PRESTRESSED STRAND LAYOUT, SEE "INTERIOR SLAB SECTION - TYPE II & IV")
FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY LOCATION, SEE SECTION OF ANCHOR ASSEMBLY LOCATION ON "ANCHORAGE DETAILS FOR TEMPORARY GUARDRAIL ANCHOR ASSEMBLY FOR TYPE III CORED SLAB UNIT" SHEET 12 OF 12.



SECTION AT BENT No. 1

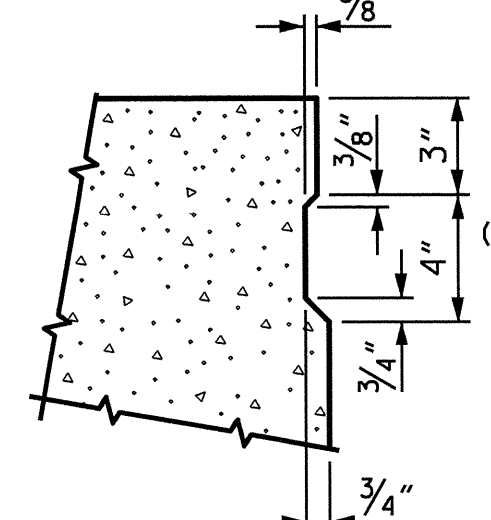


SECTION AT END BENT No. 2



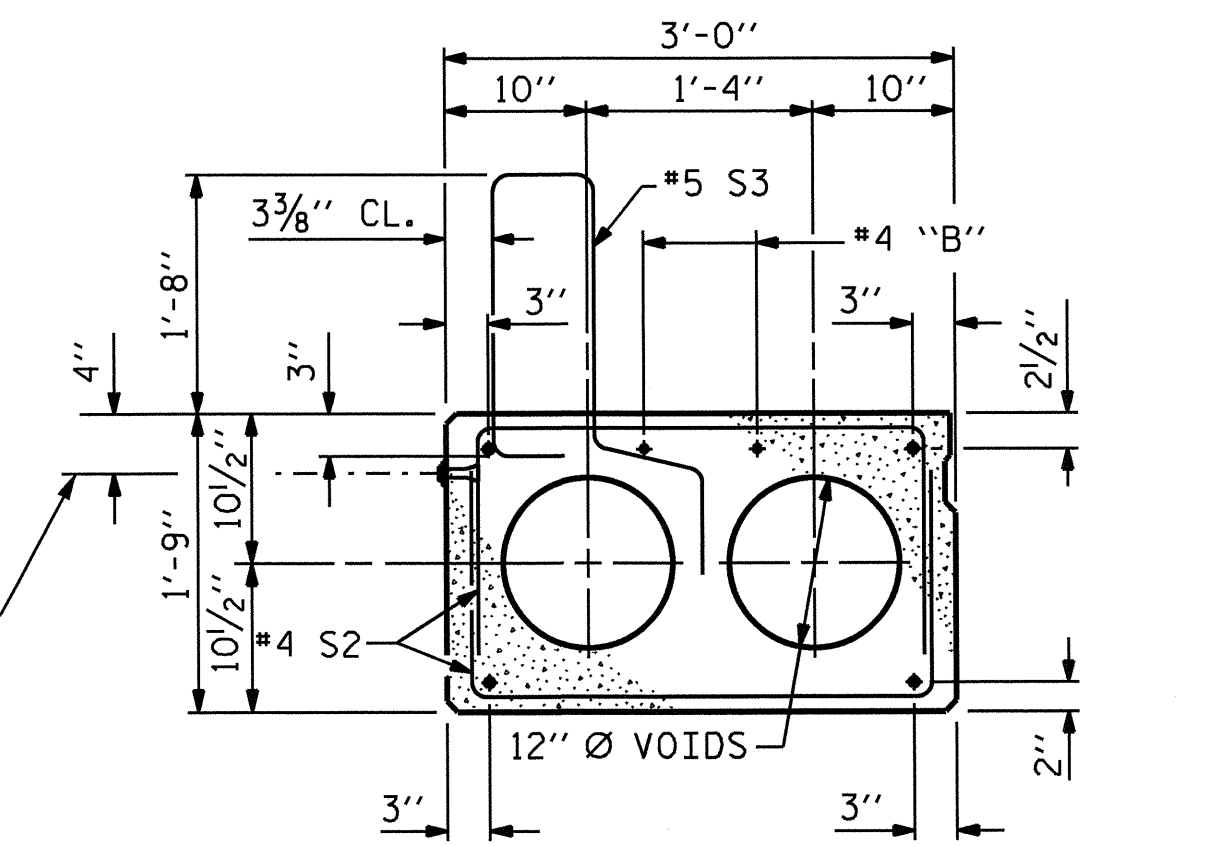
END ELEVATION

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.



SHEAR KEY DETAIL

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



EXTERIOR SLAB SECTION

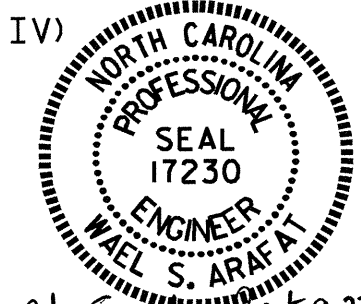
(TYPE I & TYPE V)
FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION (TYPE II & IV)

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

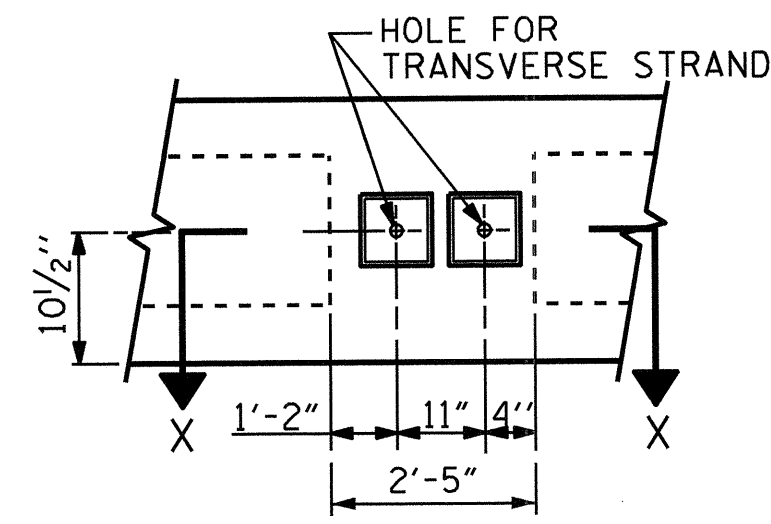
SHEET 6 OF 12

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

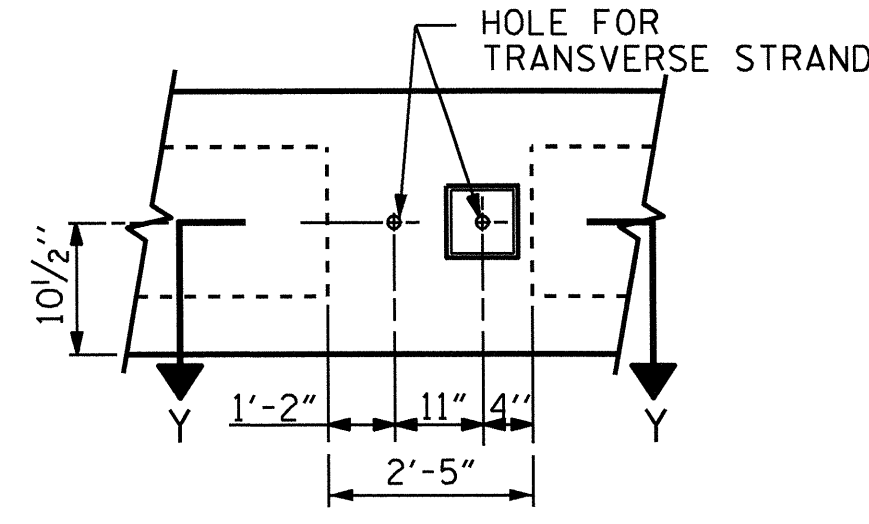
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			34



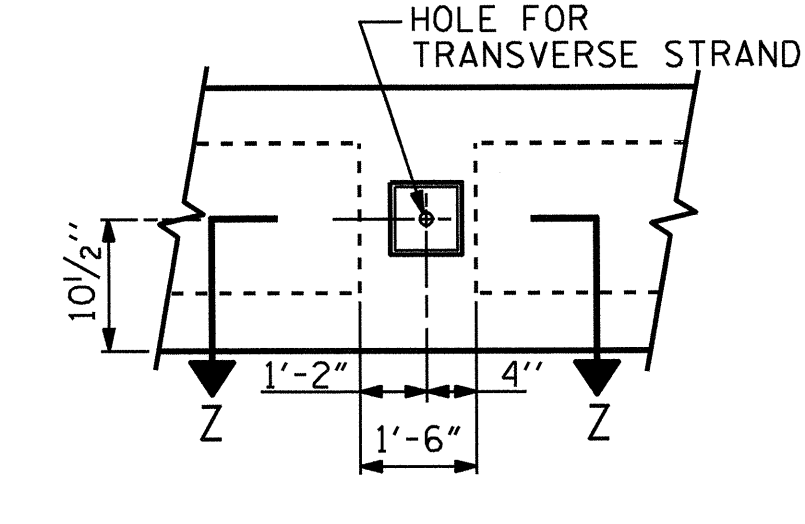
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CHECKED BY: D. HODGE DATE: 7-13
DESIGN ENGINEER OF RECORD: HPK DATE: 8-13



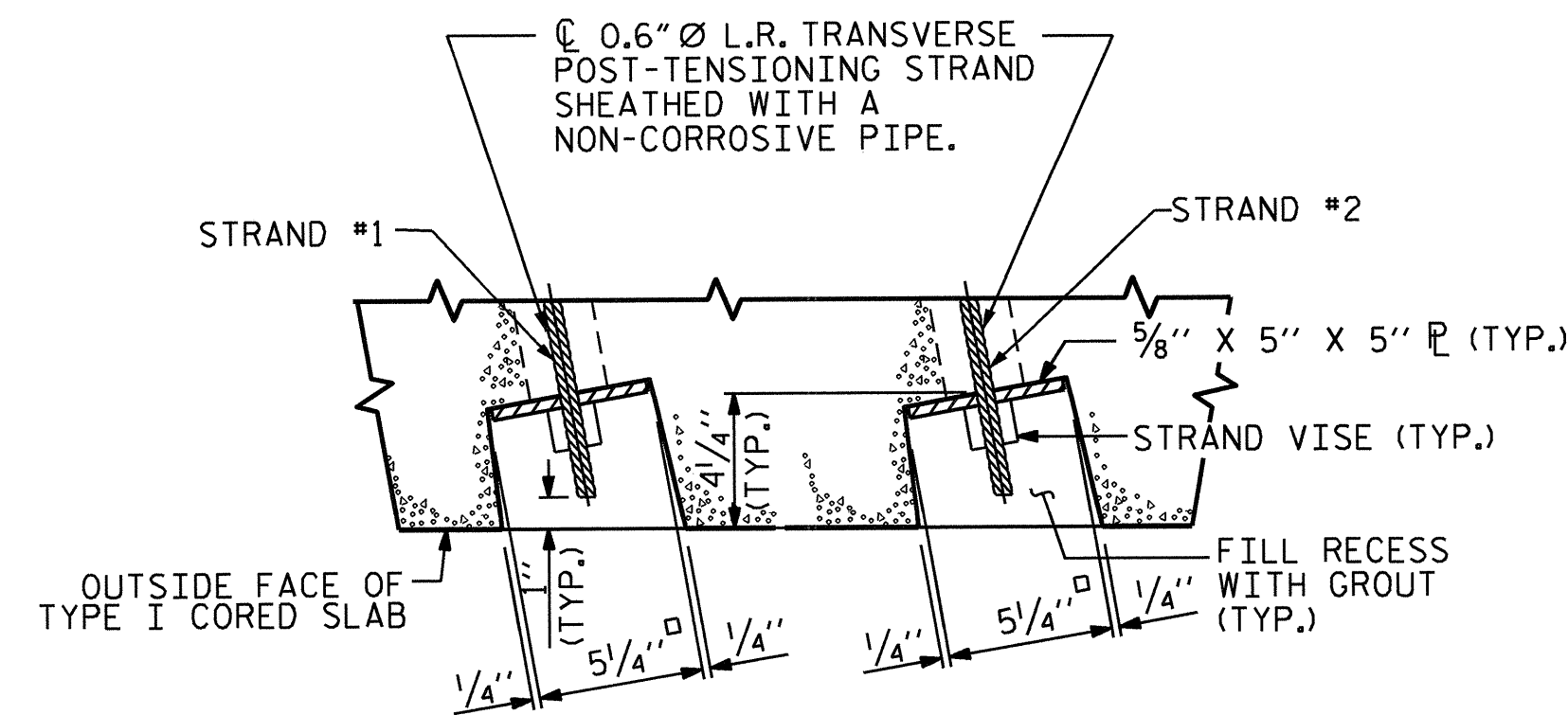
VIEW A-A
(SEE TYPICAL SECTION, SHEET 6 OF 12)



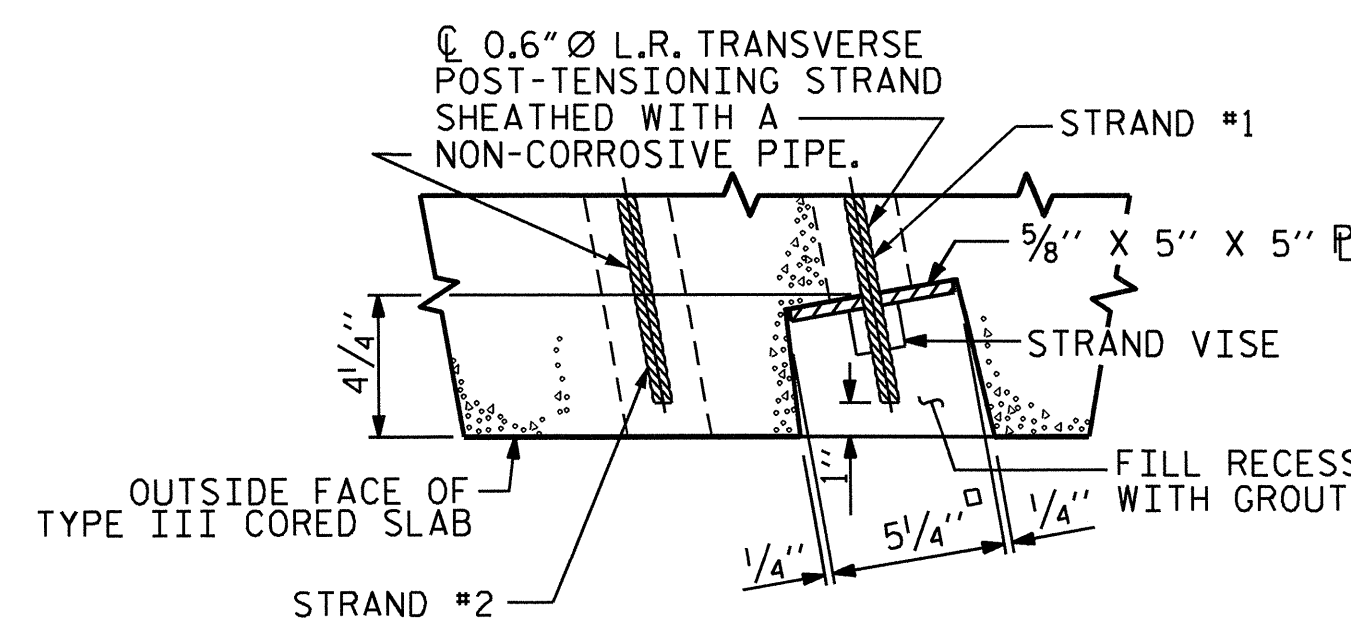
VIEW B-B
(SEE TYPICAL SECTION, SHEET 6 OF 12)



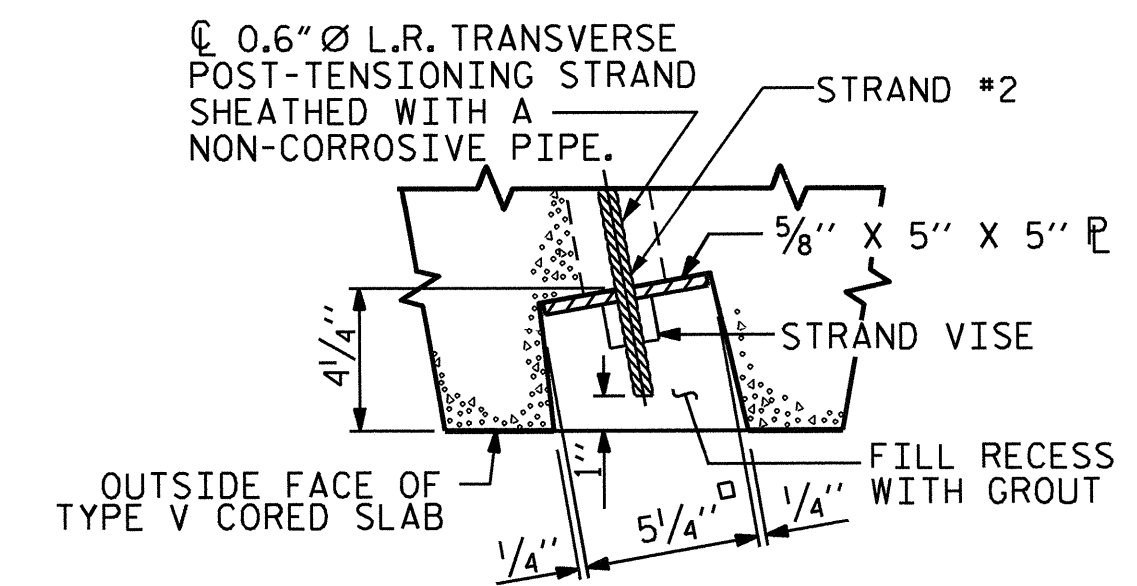
VIEW C-C
(SEE TYPICAL SECTION, SHEET 6 OF 12)



SECTION X-X
(TYPE I UNIT)



SECTION Y-Y
(TYPE III UNIT)



SECTION Z-Z
(TYPE V UNIT)

STRAND #1 GOES THRU 6 CORED SLAB UNITS DURING STAGE I CONSTRUCTION
STRAND #2 GOES THRU ALL 13 CORED SLAB UNITS DURING STAGE II CONSTRUCTION

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

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

SHEET 7 OF 12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

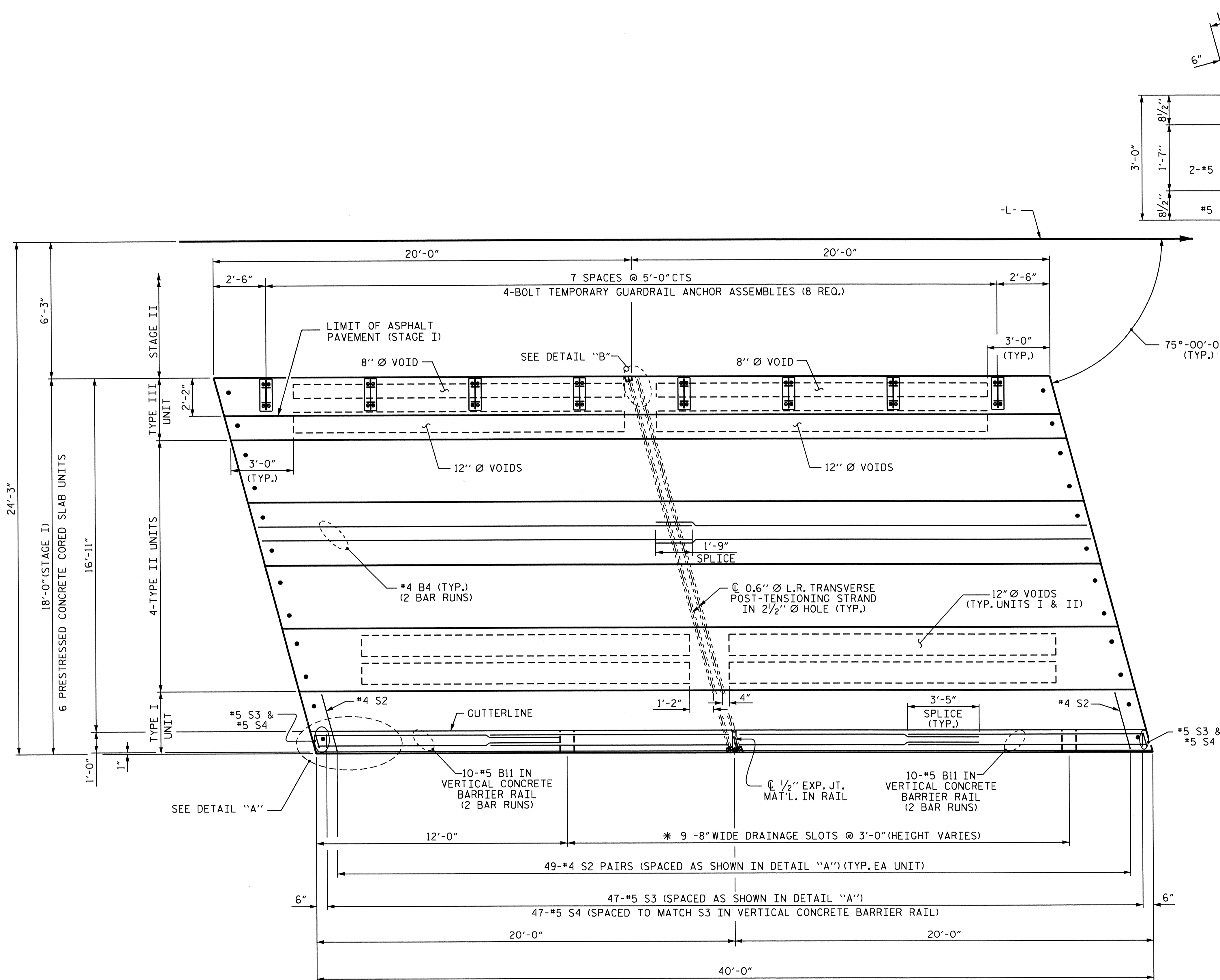
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
(SPAN B)



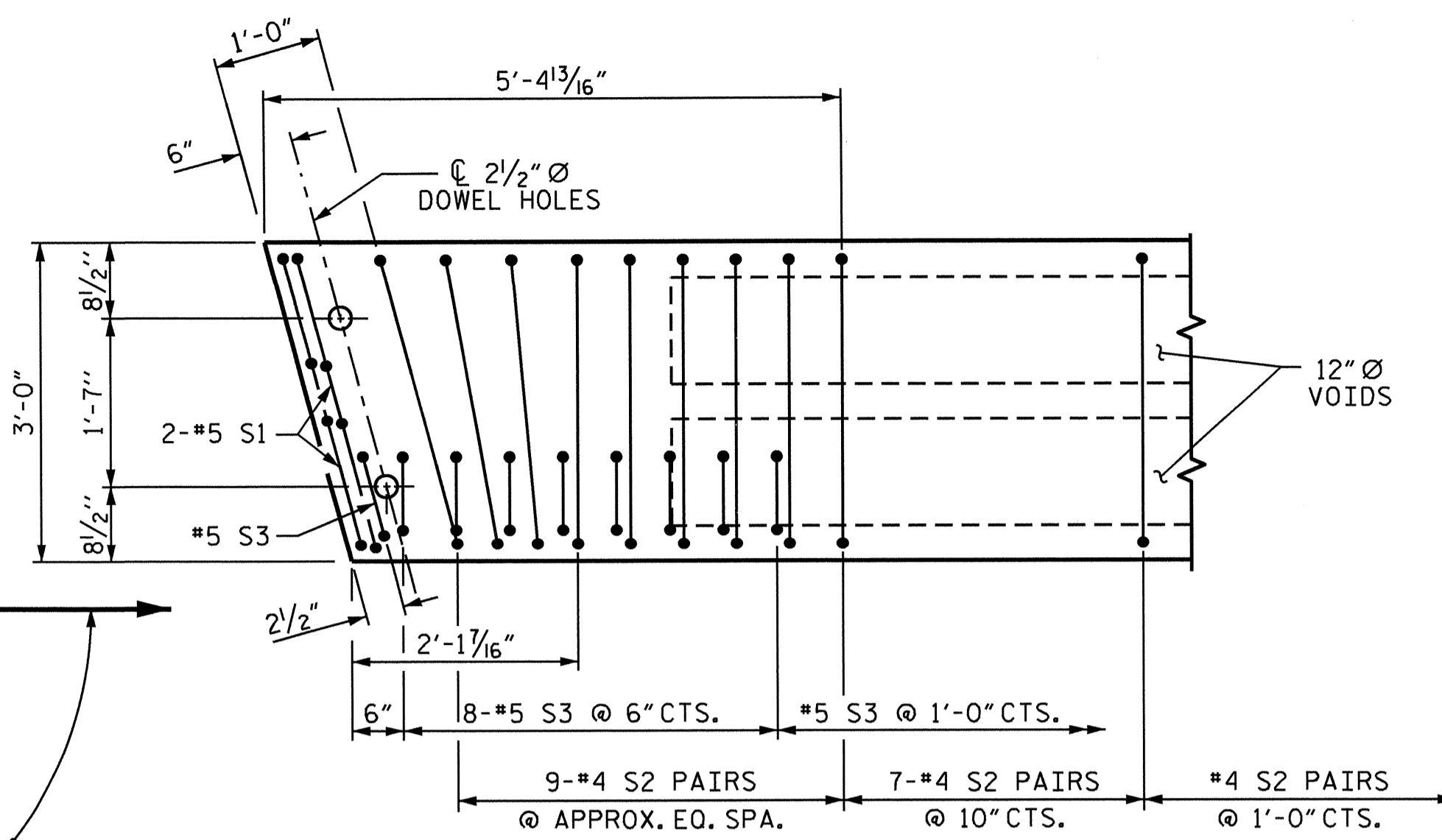
Wael S. Arafa
9-23-13

DRAWN BY: HPK/VXN DATE: 6-13
CHECKED BY: D. HODGE DATE: 7-13
DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	
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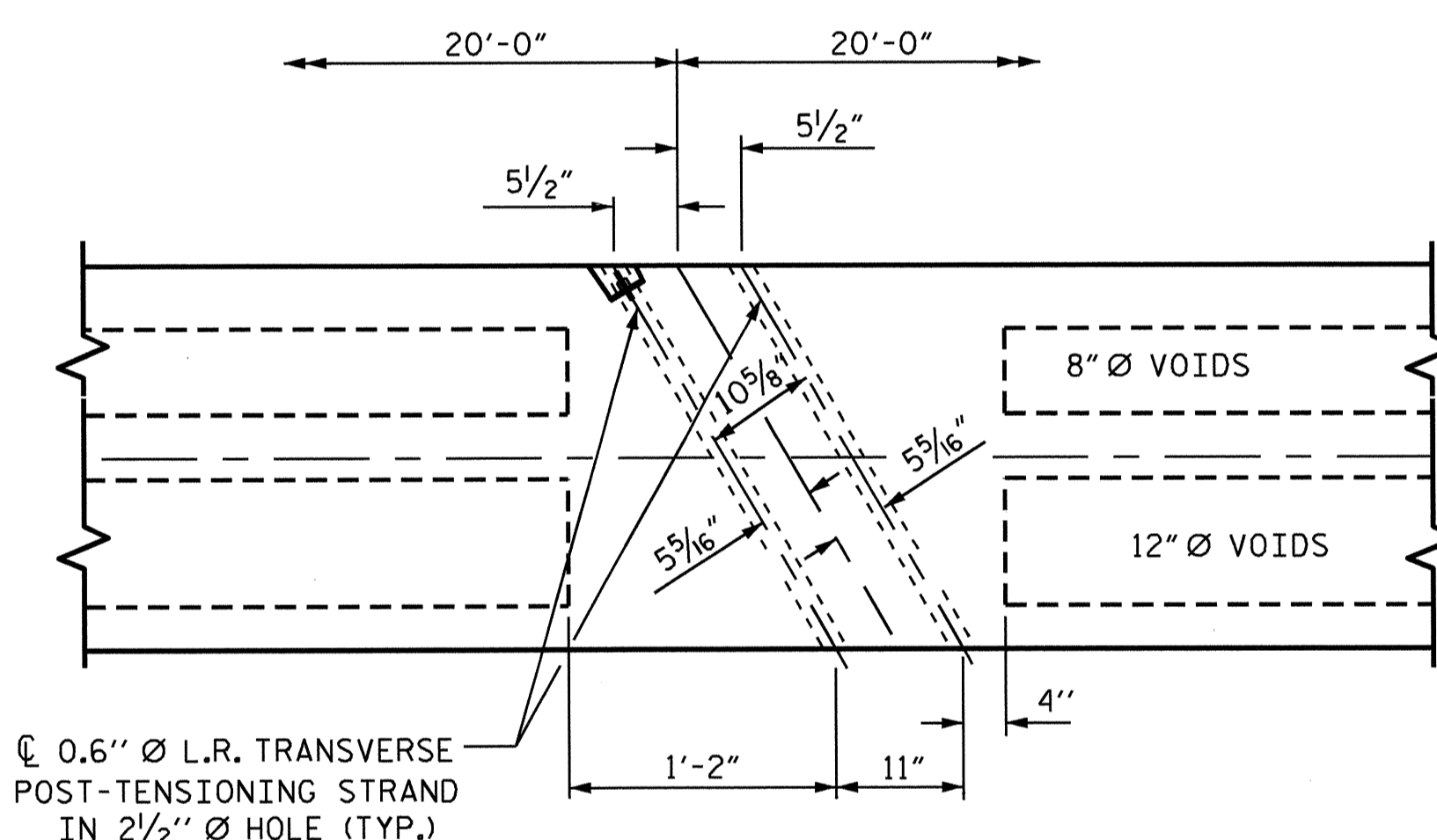


PLAN OF SPAN B



DETAIL "A"

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



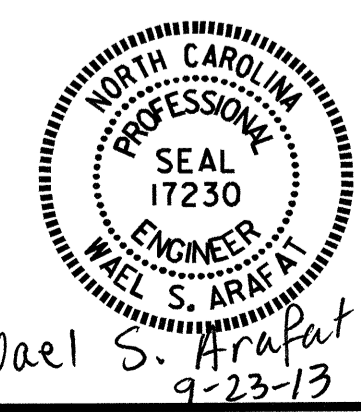
DETAIL "B"

* #4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2 1/2" TRANSVERSE POST-TENSIONING STRAND HOLES.

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

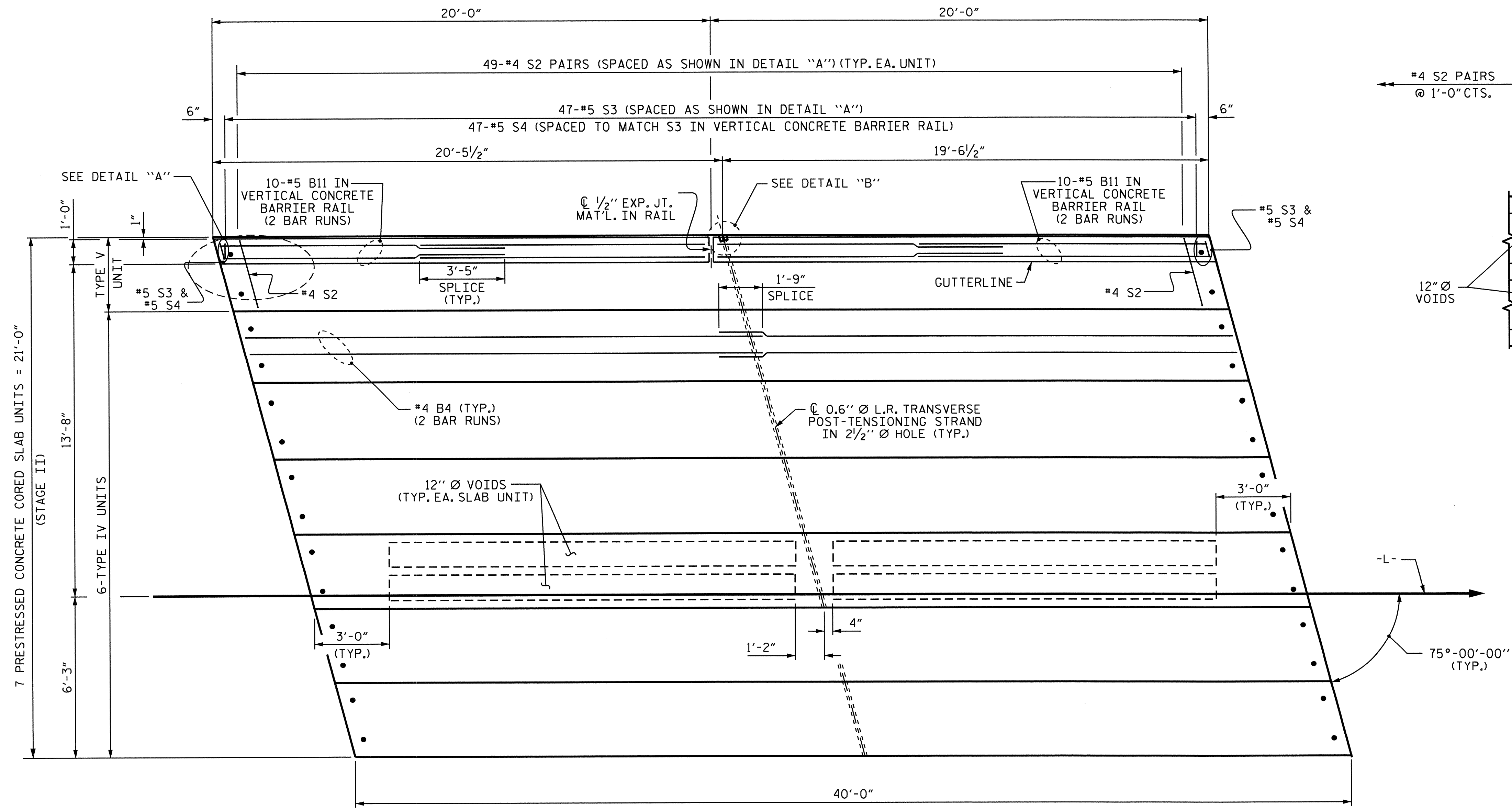
SHEET 8 OF 12

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 40' UNIT
 75° SKEW
 SPAN B
 (STAGE I)

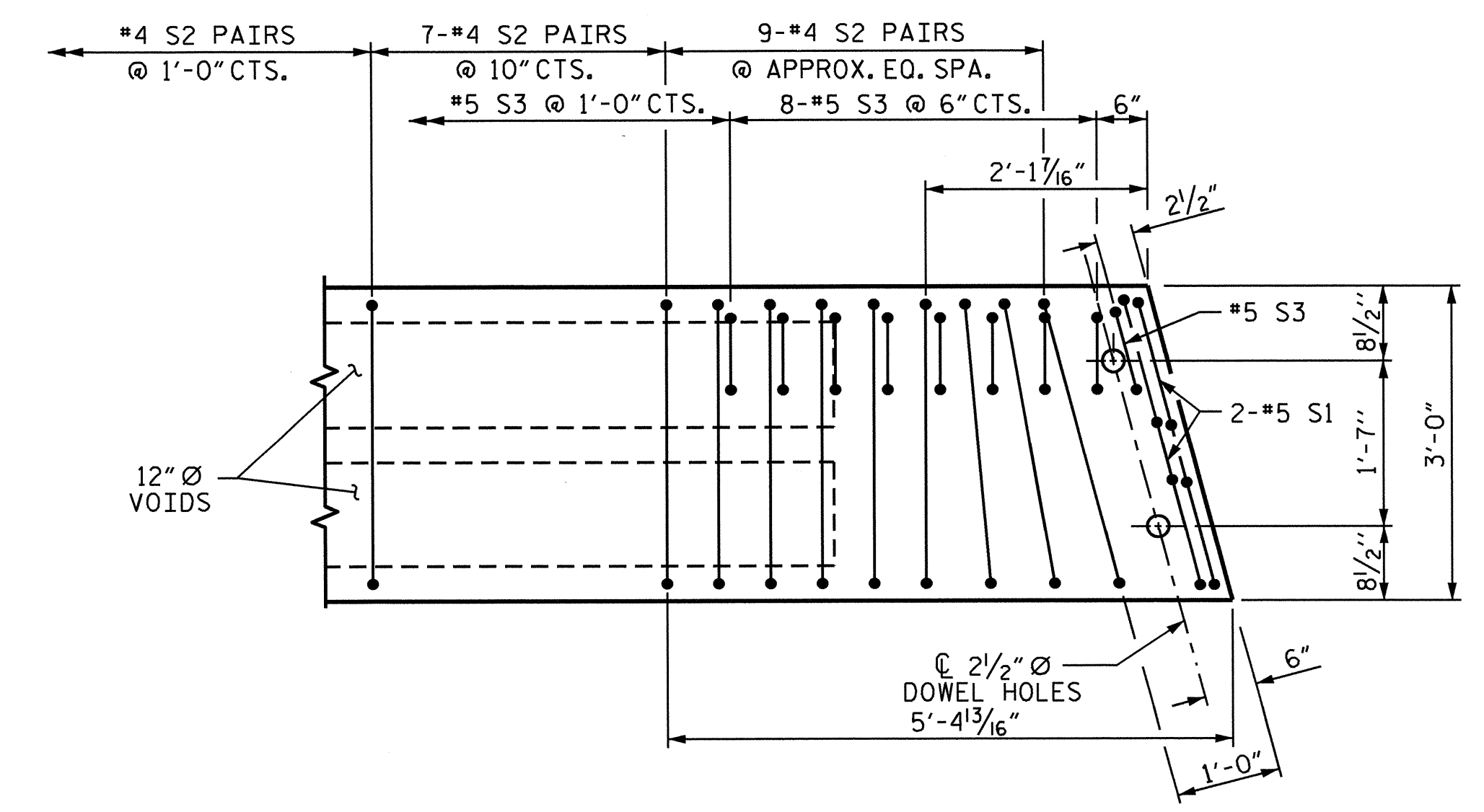


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 CHECKED BY : D. HODGE DATE : 7-13
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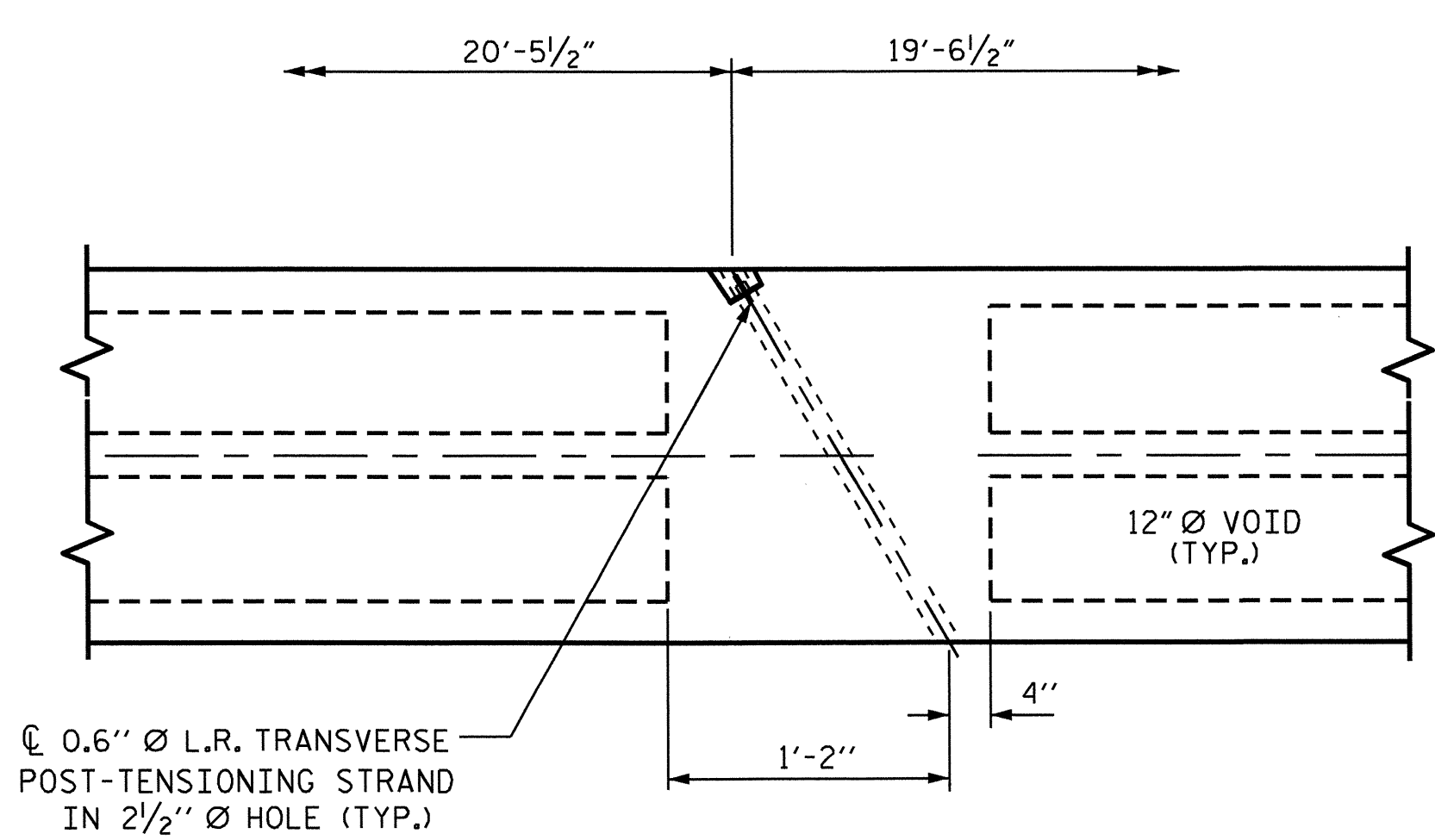


PLAN OF SPAN B



DETAIL "A"

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



DETAIL "B"

*4 S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES.

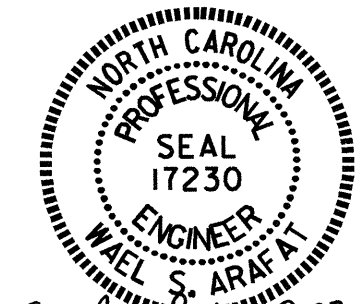
PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 9 OF 12

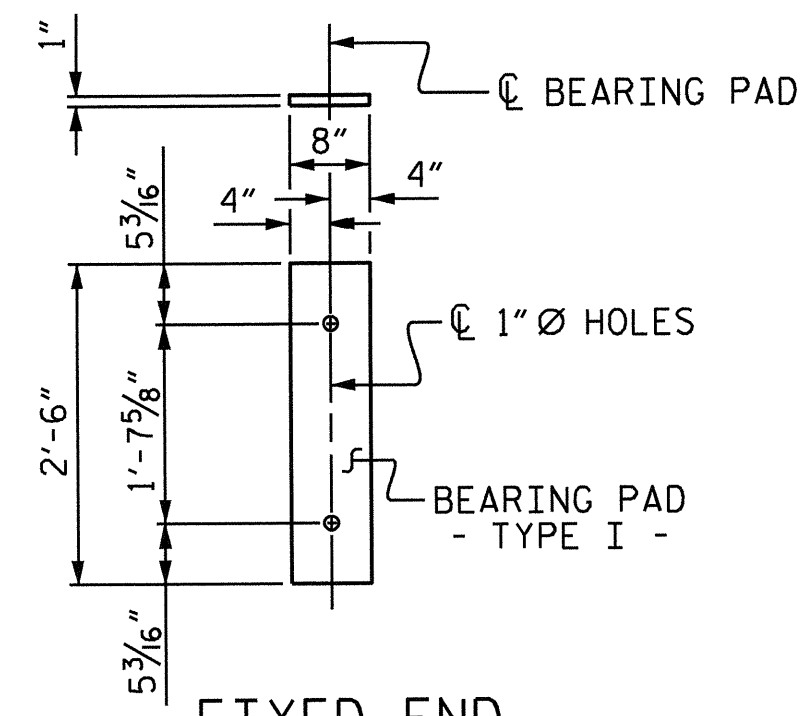
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**PLAN OF 40' UNIT
 75° SKEW
 SPAN B
 (STAGE II)**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
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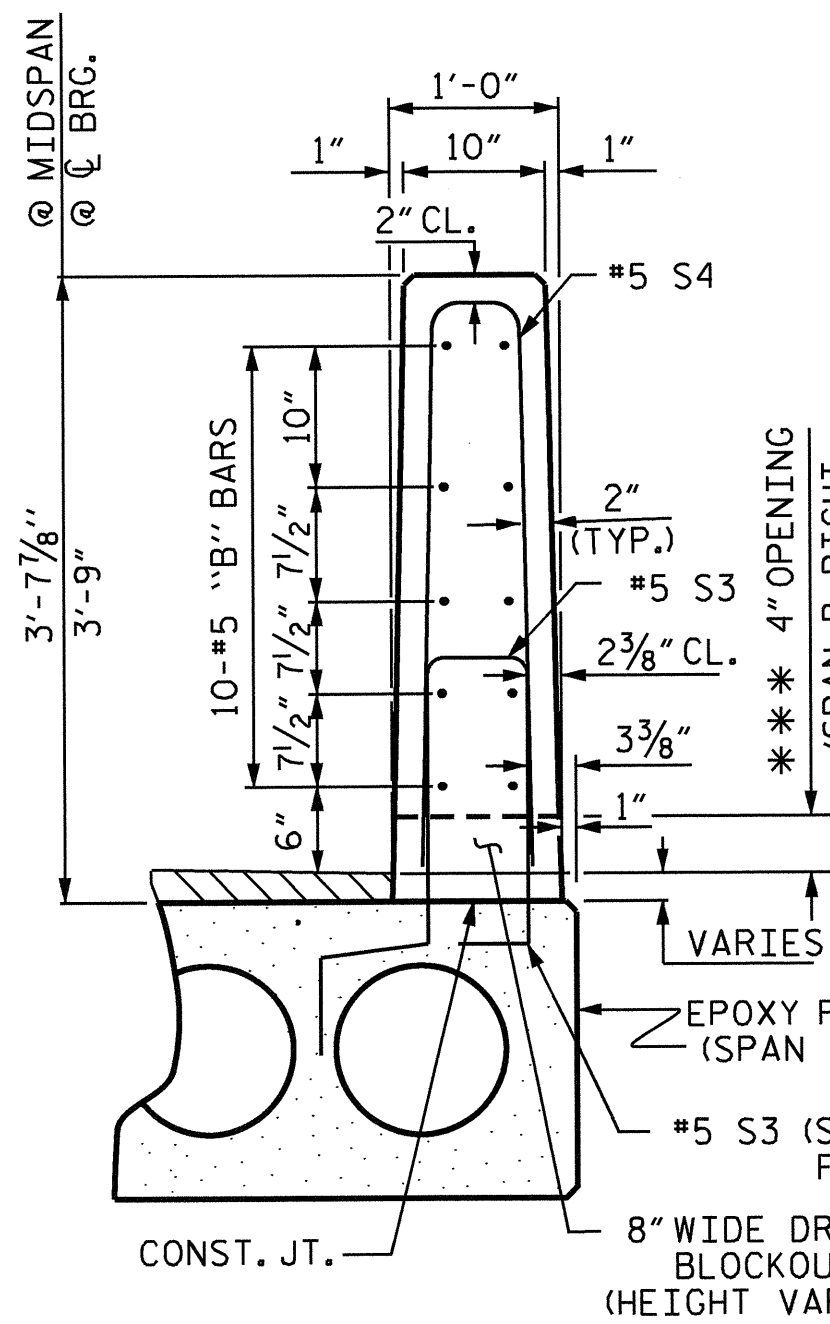
Mel S. Arant 9-23-13



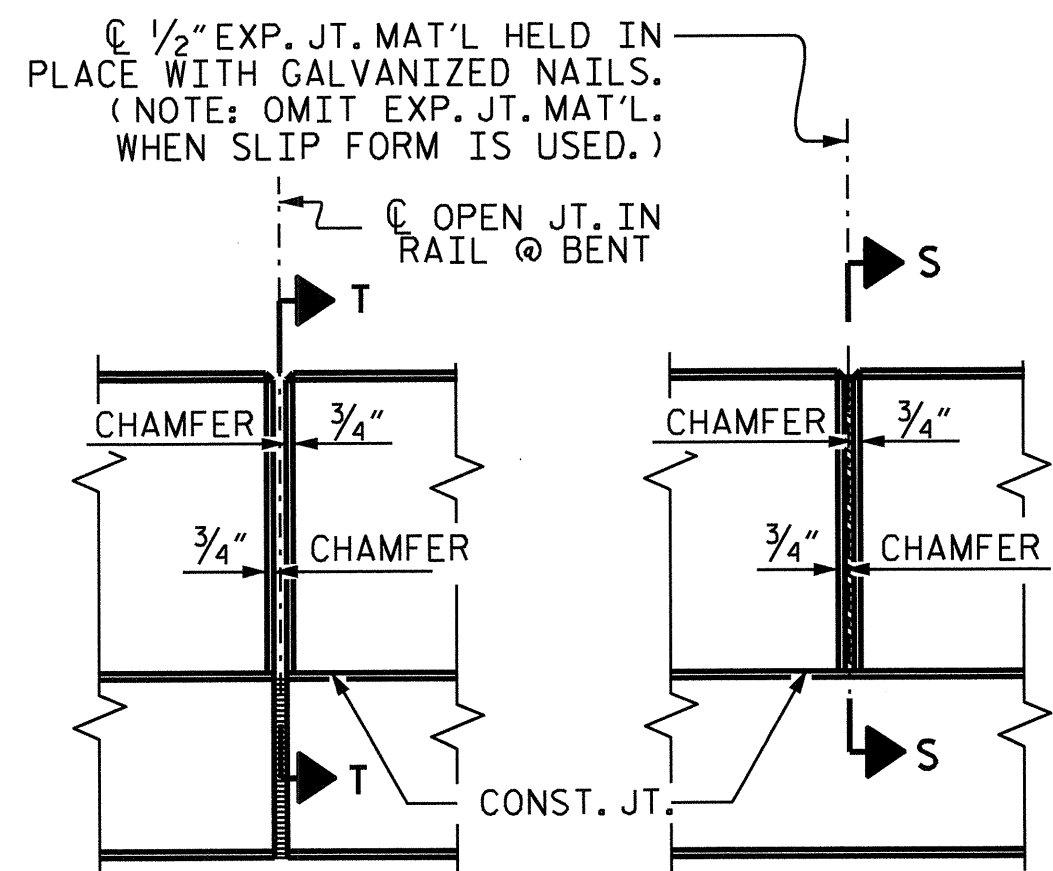
FIXED END
(TYPE I - 12' REO'D, STAGE I)
(TYPE I - 14' REO'D, STAGE II)

ELASTOMERIC BEARING DETAILS

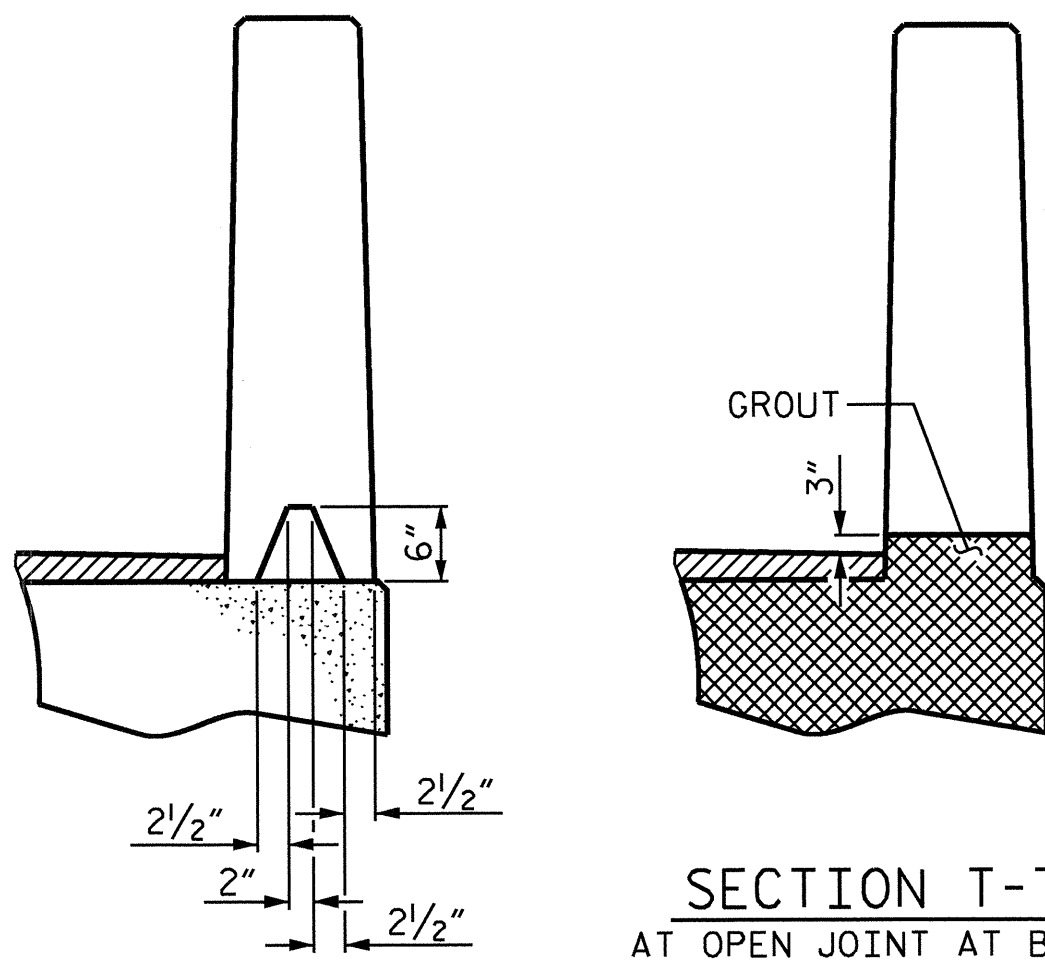
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



SECTION THRU RAIL

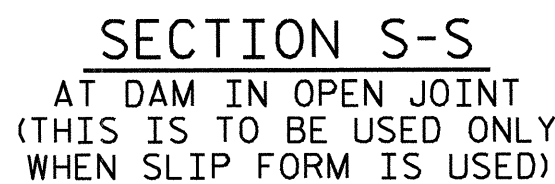


ELEVATION AT EXPANSION JOINTS



SECTION T-T

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



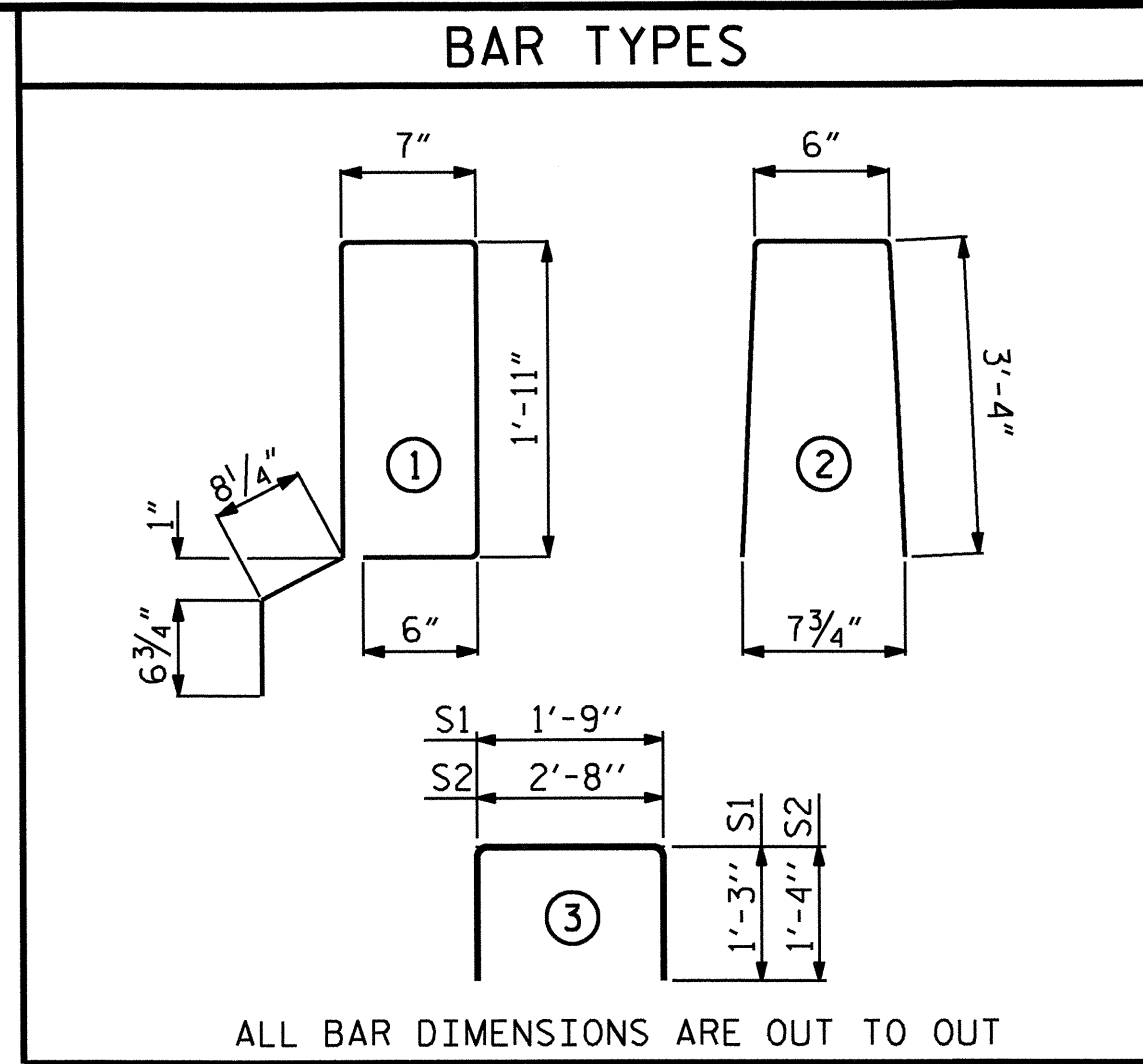
SECTION S-S
AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
STAGE I						
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
* B11	40	40	#5	STR	11'-8"	487
* S4	49	49	#5	2	7'-2"	366
* EPOXY COATED REINFORCING STEEL						LBS. 853
CLASS AA CONCRETE						CU.YDS. 5.3
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT. 40.06
STAGE II						
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
* B11	40	40	#5	STR	11'-8"	487
* S4	49	49	#5	2	7'-2"	366
* EPOXY COATED REINFORCING STEEL						LBS. 853
CLASS AA CONCRETE						CU.YDS. 5.3
TOTAL VERTICAL CONCRETE BARRIER RAIL						LN. FT. 40.06

BILL OF MATERIAL FOR ONE 40' CORED SLAB UNIT											
STAGE I						STAGE II					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	TYPE I UNIT	TYPE II & III UNIT	TYPE IV	TYPE V	WEIGHT	
B4	4	#4	STR	20'-9"	55	20'-9"	55	20'-9"	55	55	
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	35	
S2	98	#4	3	5'-4"	349	5'-4"	349	5'-4"	349	349	
* S3	49	#5	1	6'-2"	315					6'-2"	315
REINFORCING STEEL					LBS. 439					439	439
* EPOXY COATED REINFORCING STEEL					LBS. 315						315
5000 P.S.I. CONCRETE					CU. YDS. 5.8					5.8	5.8
0.6" Ø L.R. STRANDS					No. 13					13	13

*** THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.



ALL BAR DIMENSIONS ARE OUT TO OUT

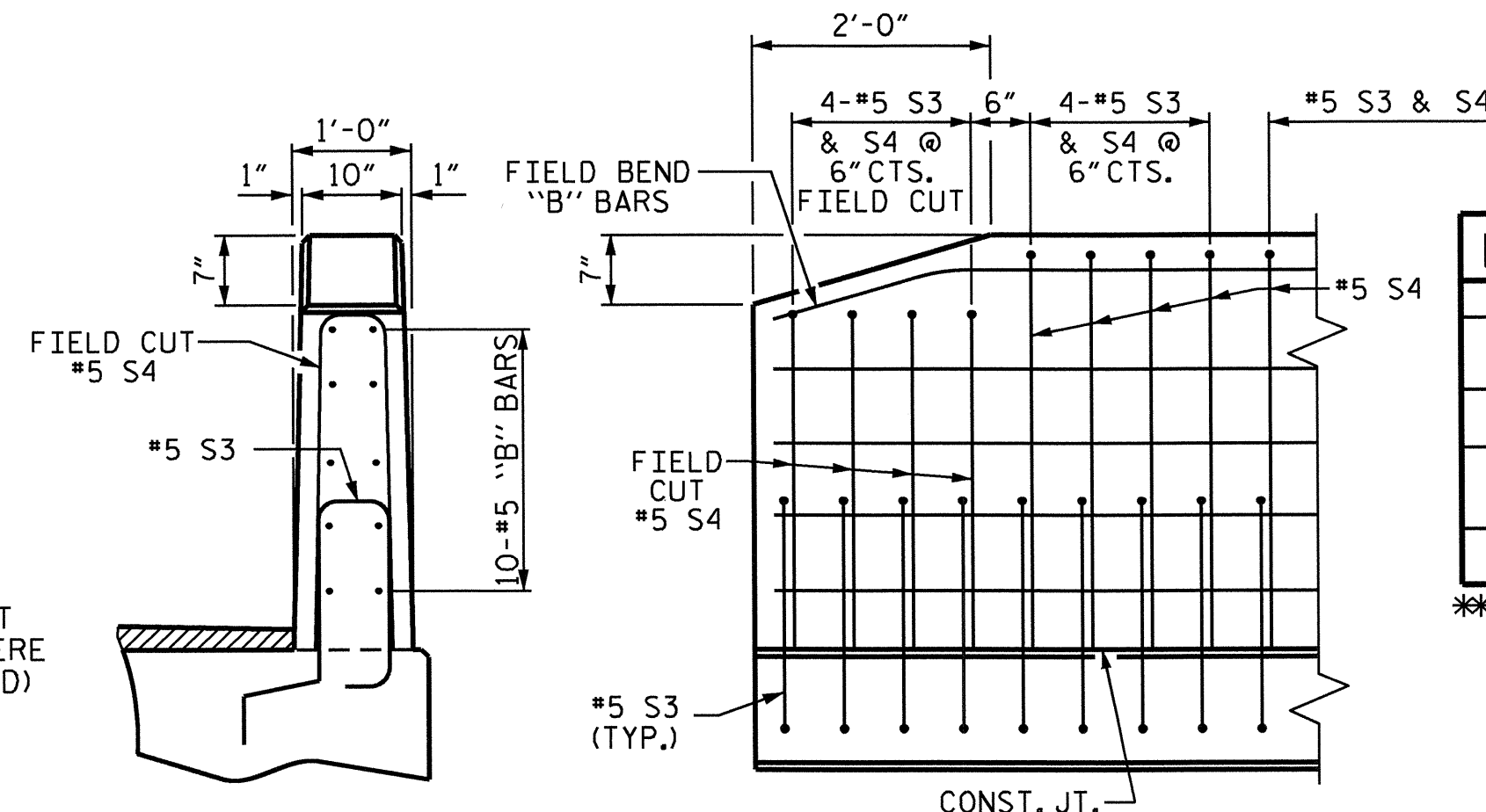
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT	
ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
1 7/8"	3'-7 7/8"

GRADE 270 STRANDS

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

CORED SLABS REQUIRED				
		NUMBER	LENGTH	TOTAL LENGTH
STAGE I	EXTERIOR C.S.	1	40'-0"	40'-0"
	INTERIOR C.S.	5	40'-0"	200'-0"
STAGE II	EXTERIOR C.S.	1	40'-0"	40'-0"
	INTERIOR C.S.	6	40'-0"	240'-0"
TOTAL		13		520'-0"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
40' UNIT	4000



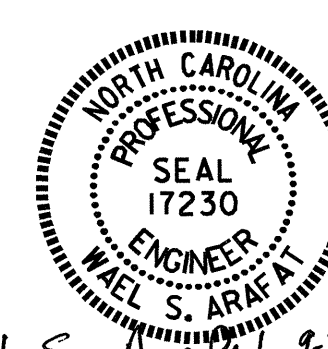
END VIEW

SIDE VIEW

END OF RAIL DETAILS

DEAD LOAD DEFLECTION AND CAMBER	
40' CORED SLAB UNIT	3'-0" x 1'-9" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE



NOTES

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

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

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

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

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

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

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

THE #4 S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

A 2" MIN. CLEARANCE TO REINFORCEMENT SHALL BE MAINTAINED FROM THE DRAINAGE SLOT. THE CONTRACTOR MAY FIELD CUT ANY "B" BARS IN THE VERTICAL FACE CONCRETE BARRIER RAIL THAT CONFLICT WITH THE SLOT DRAINS.

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

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

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

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

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

SHEET 10 OF 12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
(SPAN B)

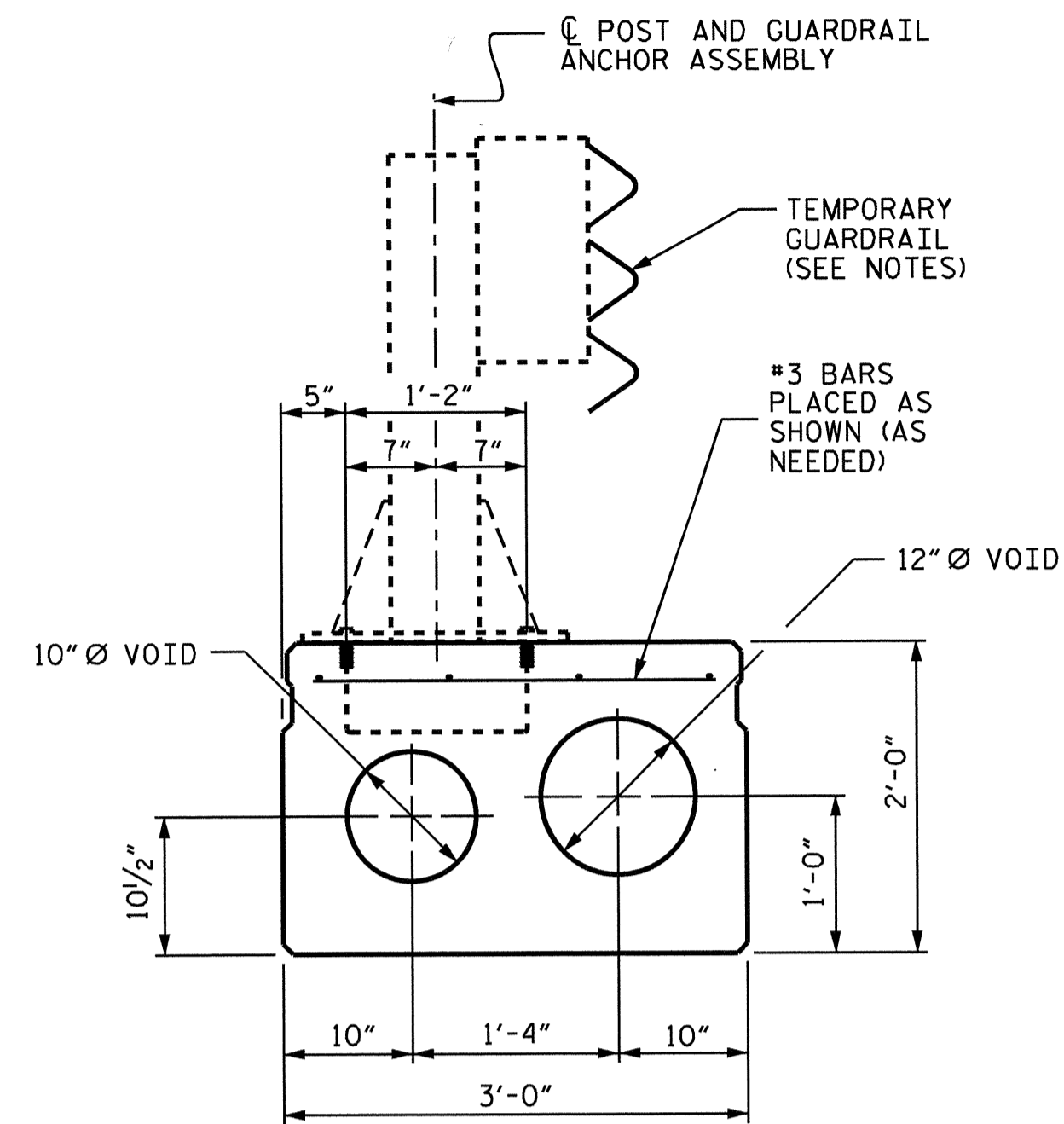
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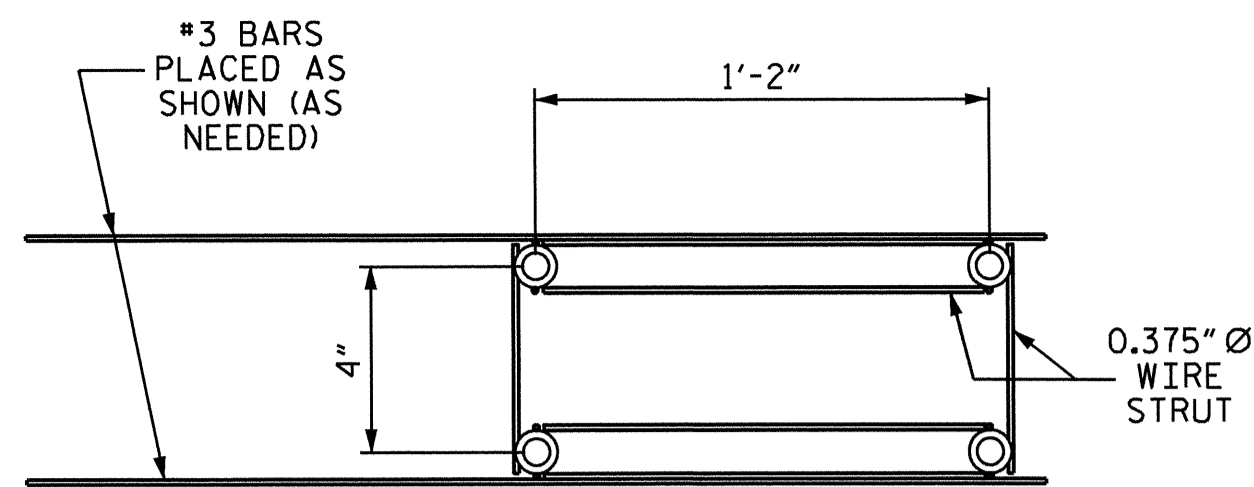
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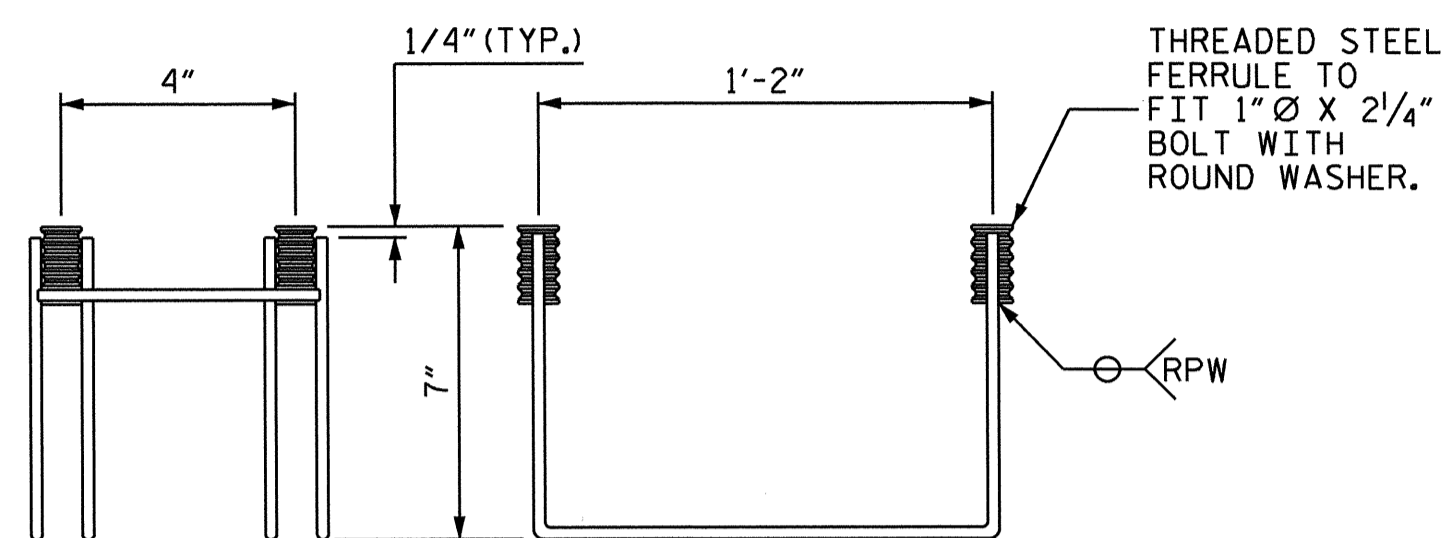


SECTION OF ANCHOR ASSEMBLY LOCATION

(TYPE III UNIT OF STAGE I)
 THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.



PLAN



SIDE VIEW

ELEVATION

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

TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(14 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNIT)
 (3 ASSEMBLIES REQUIRED IN THE APPROACH SLAB)

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" 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" 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.

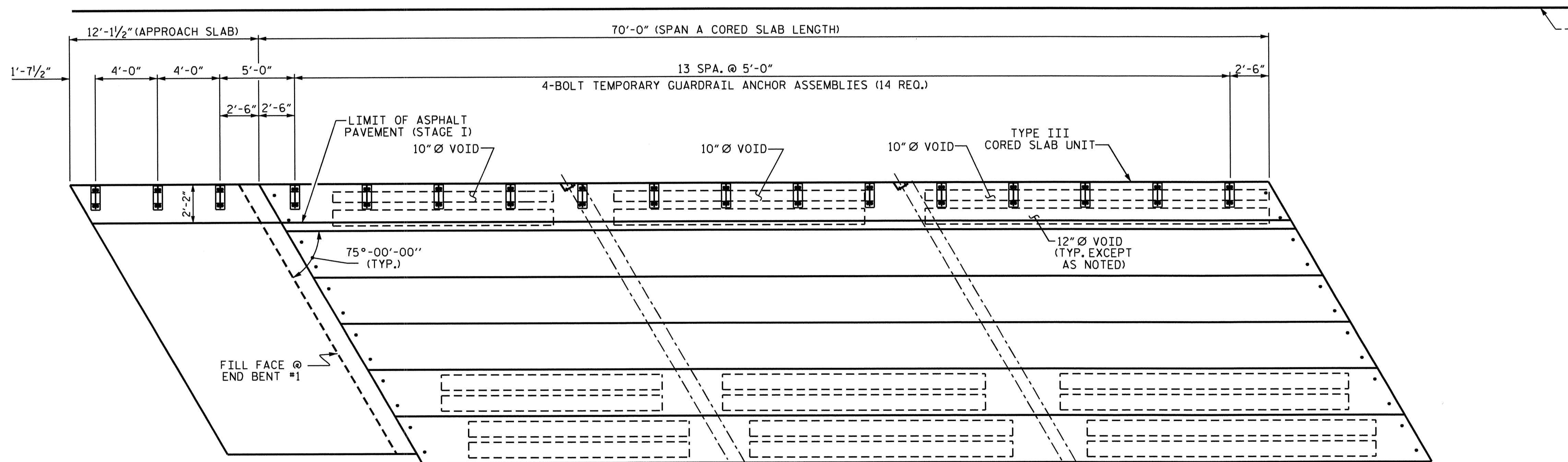
TEMPORARY GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

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 2'-0" PRESTRESSED CONCRETE CORED SLAB OR LUMP SUM PRICE BID FOR APPROACH SLABS.

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

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.



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 11 OF 12



Wael S. Arafat
 9-23-13

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 ANCHORAGE DETAILS FOR
 TEMPORARY GUARDRAIL
 ANCHOR ASSEMBLY FOR
 TYPE III CORED SLAB
 UNIT (SPAN A) (STAGE I)

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NOTES

- THE TEMPORARY GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2 1/2".
 - 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.
 - 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.

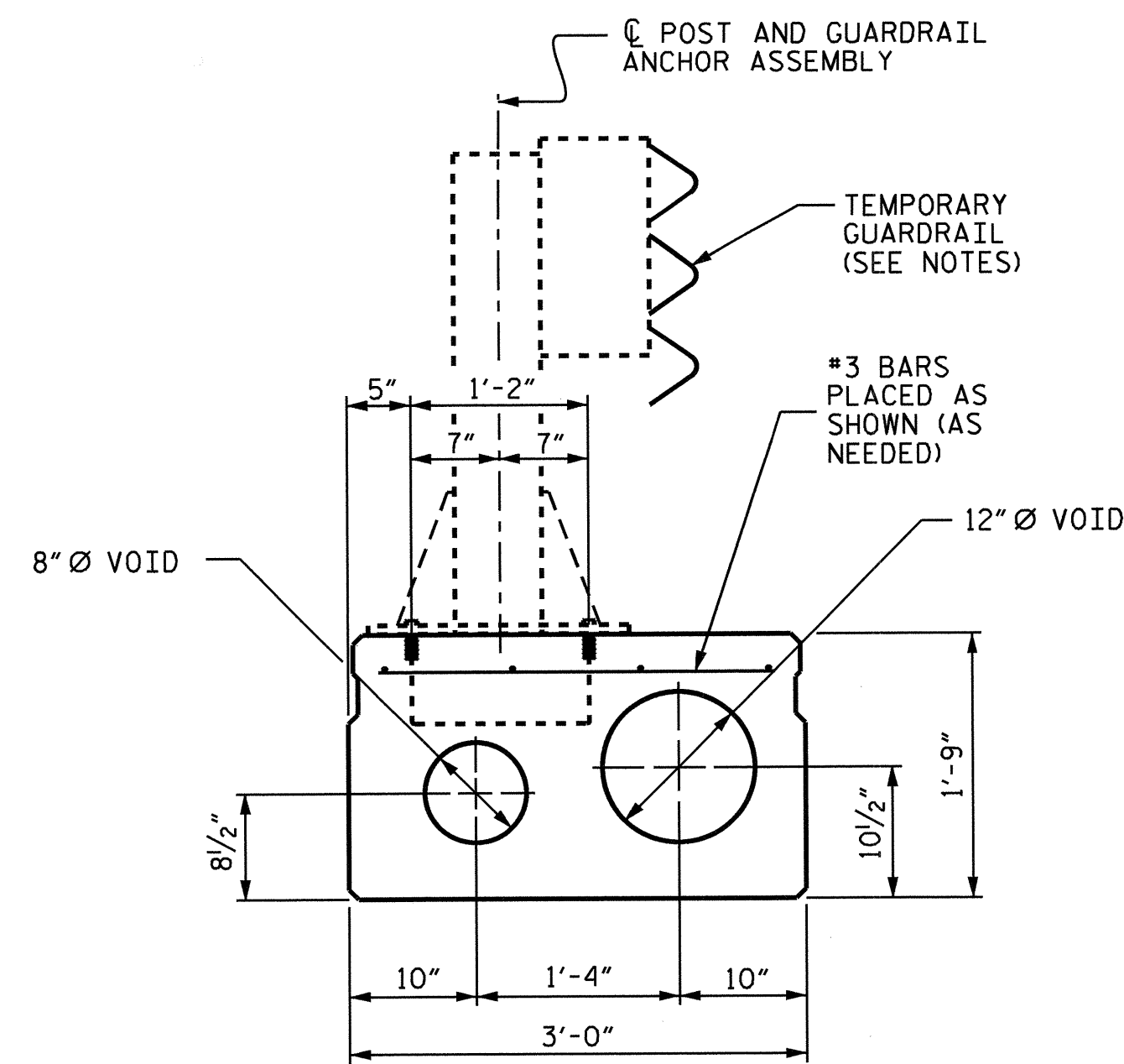
TEMPORARY GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

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 2'-0" PRESTRESSED CONCRETE CORED SLAB OR LUMP SUMP PRICE BID FOR APPROACH SLABS.

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

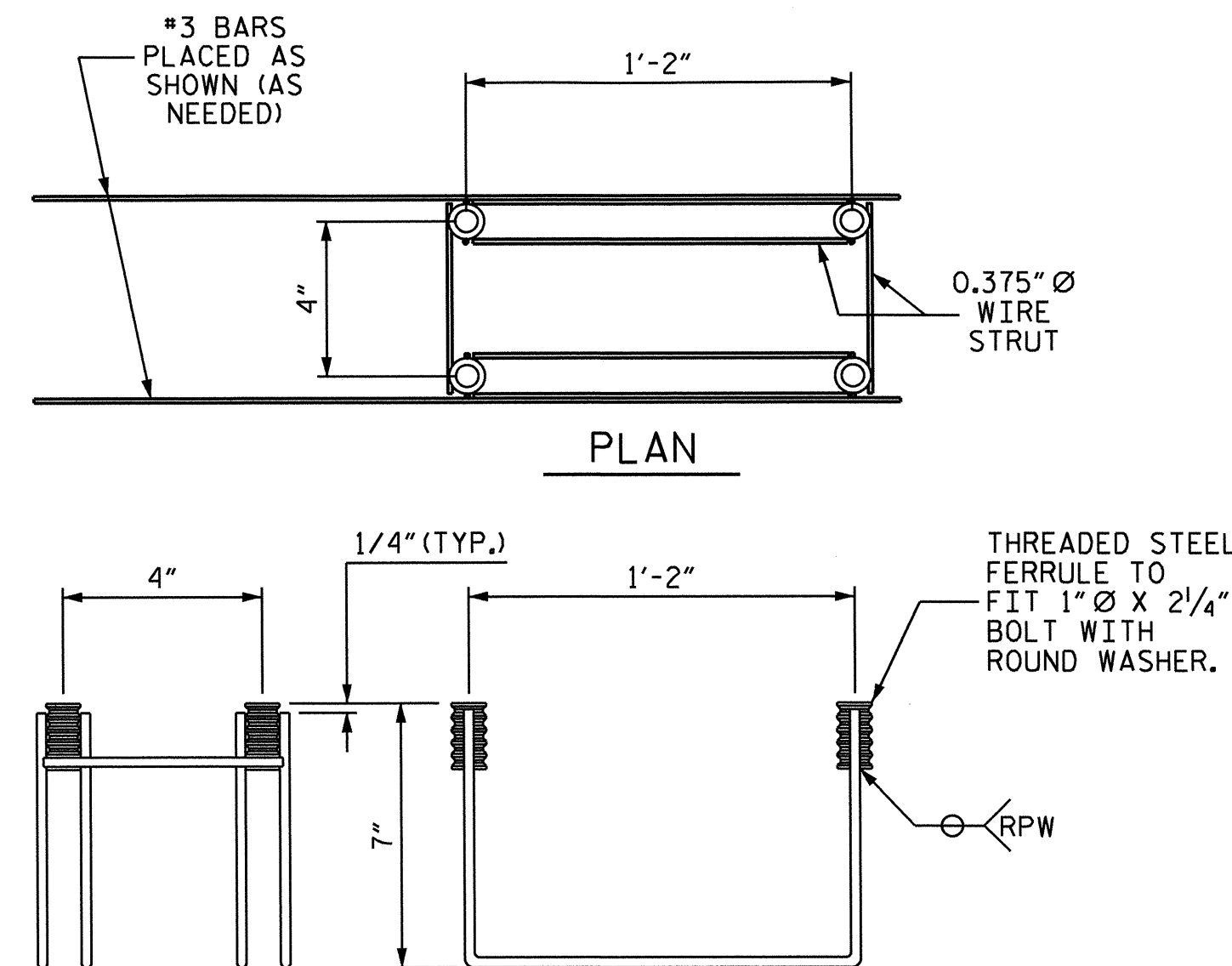
AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

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



SECTION OF ANCHOR ASSEMBLY LOCATION

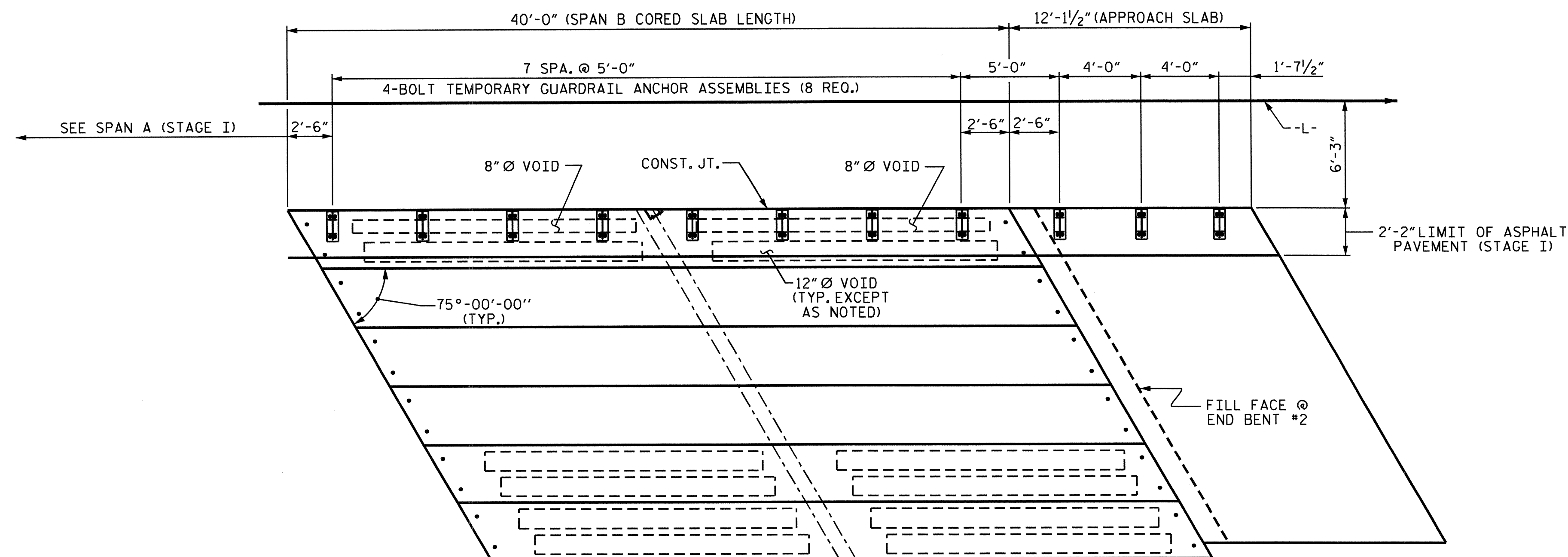
(TYPE III UNIT OF STAGE I)
THE #3 BARS ARE INCIDENTAL AND THEIR COST SHALL BE INCLUDED IN THE PRICE BID FOR THE PRESTRESSED CONCRETE CORED SLABS.



TEMPORARY GUARDRAIL ANCHOR ASSEMBLY

(8 ASSEMBLIES REQUIRED IN THE TYPE III CORED SLAB UNIT)
(3 ASSEMBLIES REQUIRED IN THE APPROACH SLAB)

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



RAIL POST SPACING FOR TEMPORARY GUARDRAIL - STAGE I

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

SHEET 12 OF 12

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

Wael S. Arafat
9-23-13



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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.)

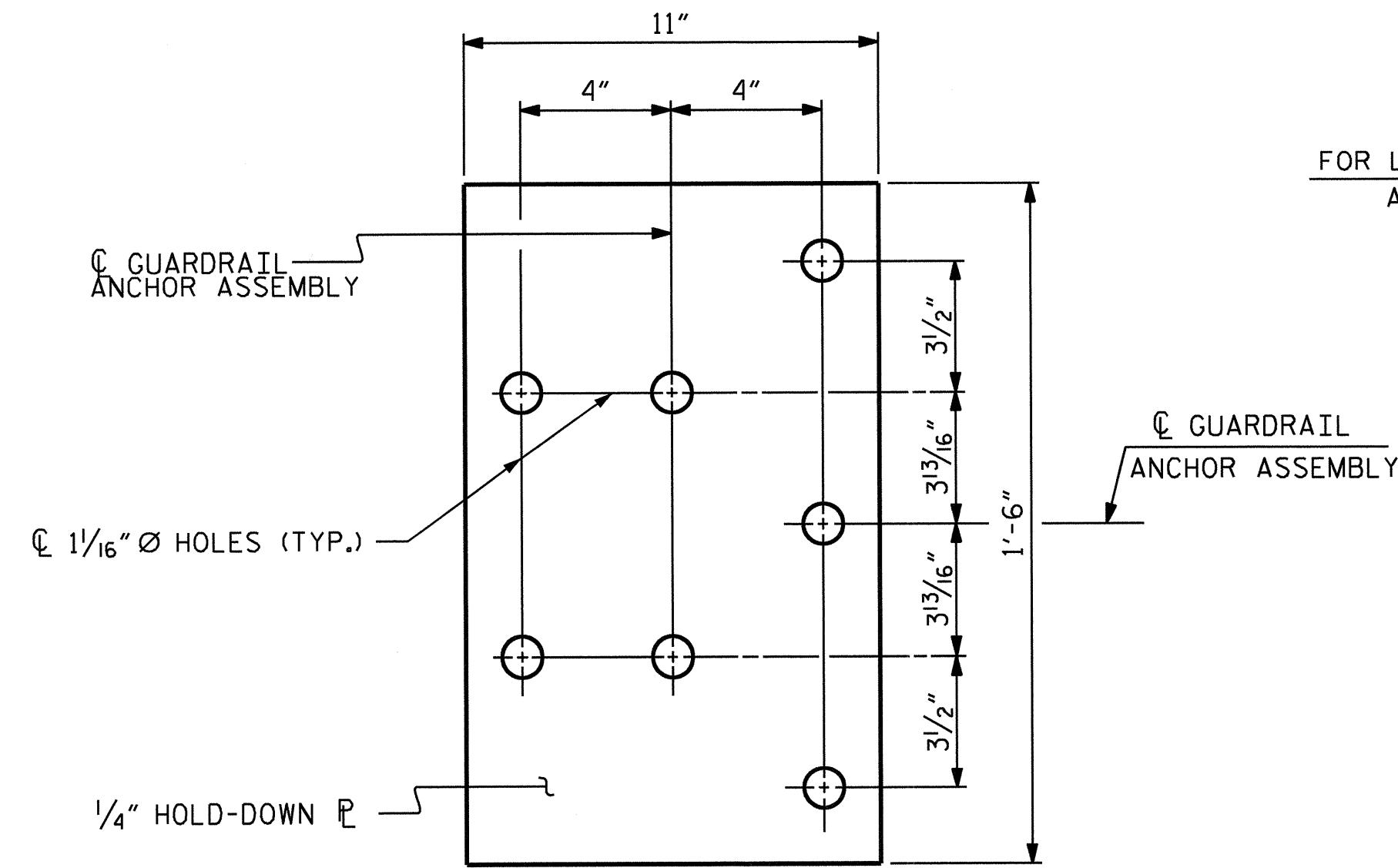
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

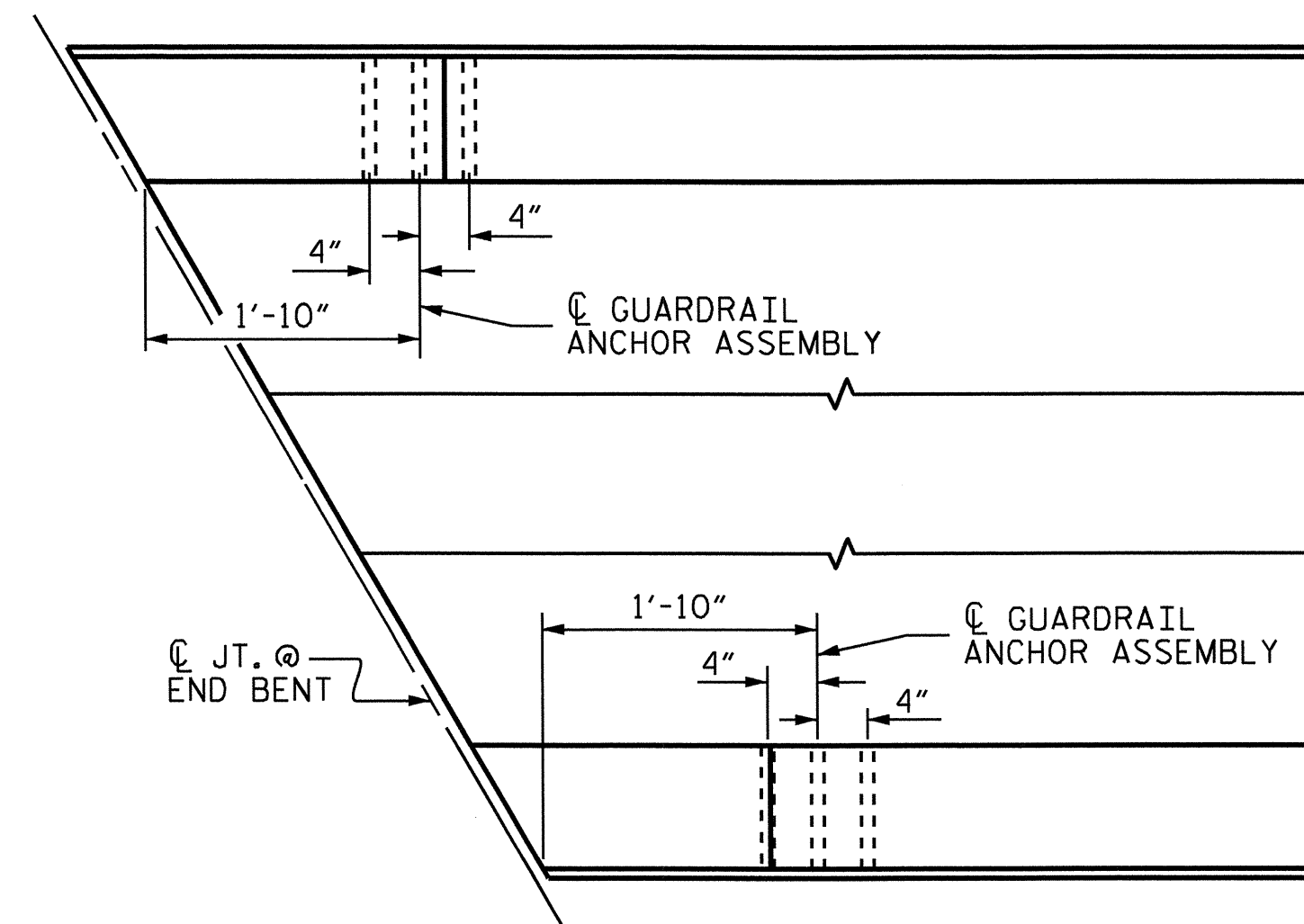
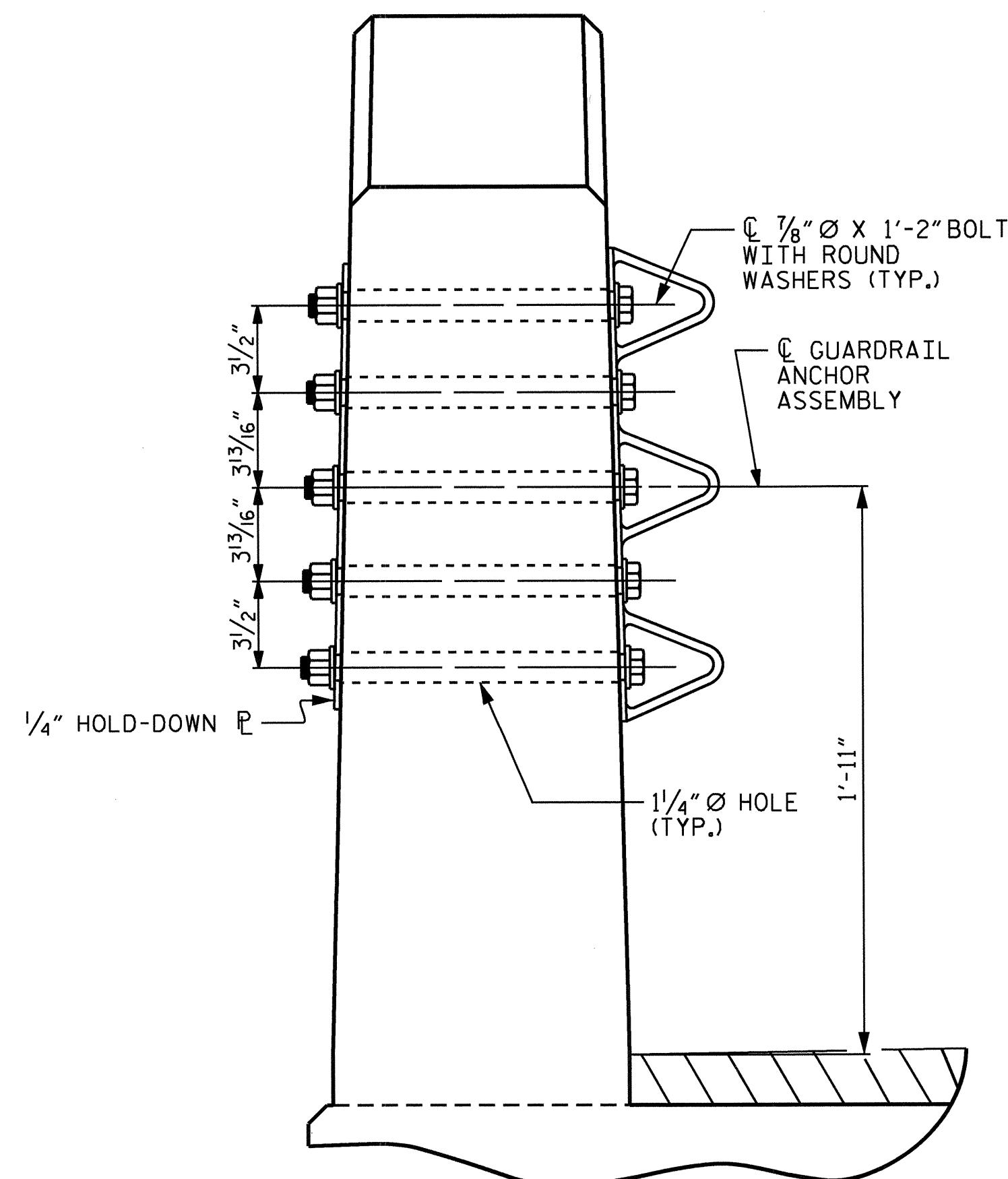
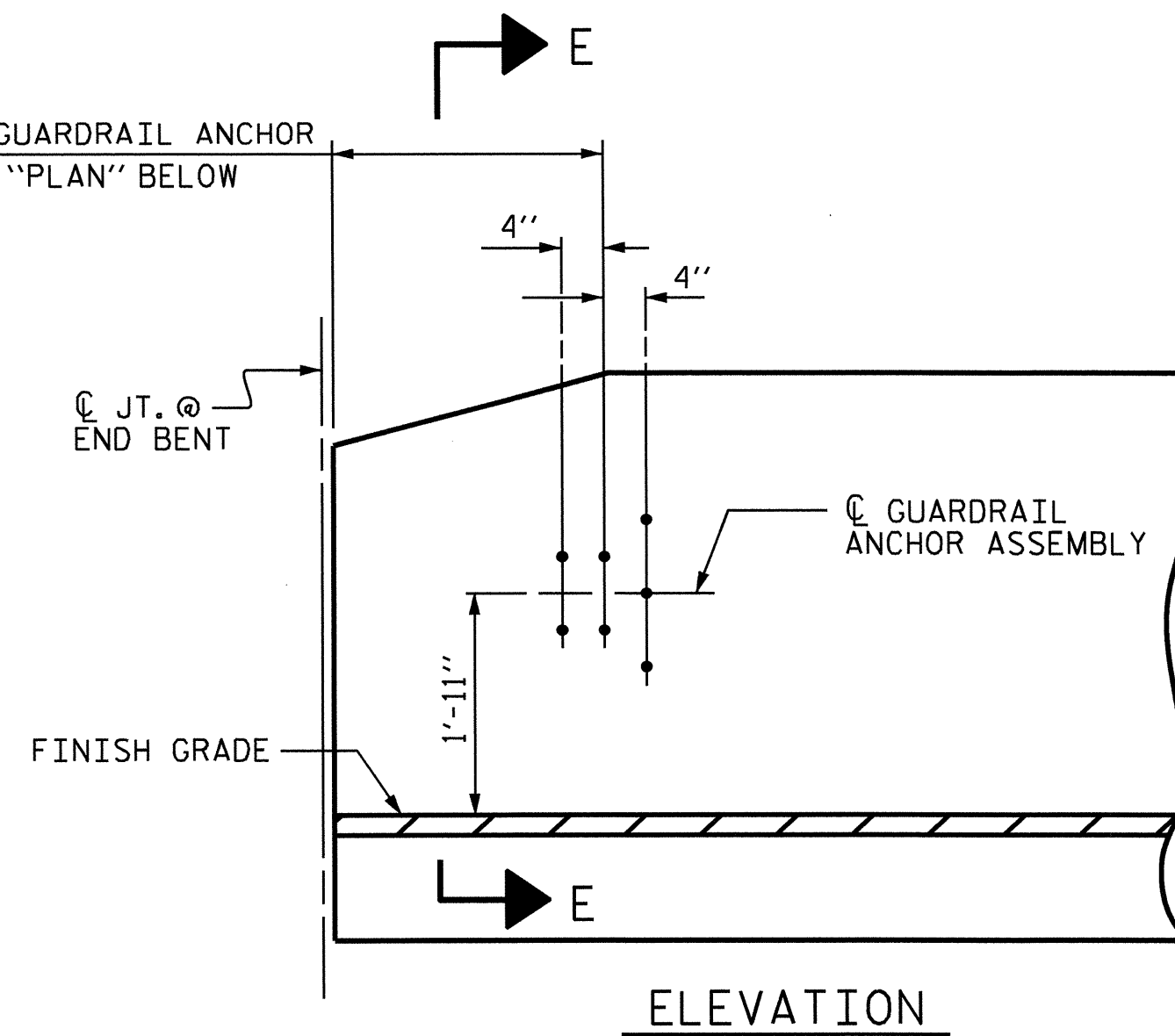
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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.

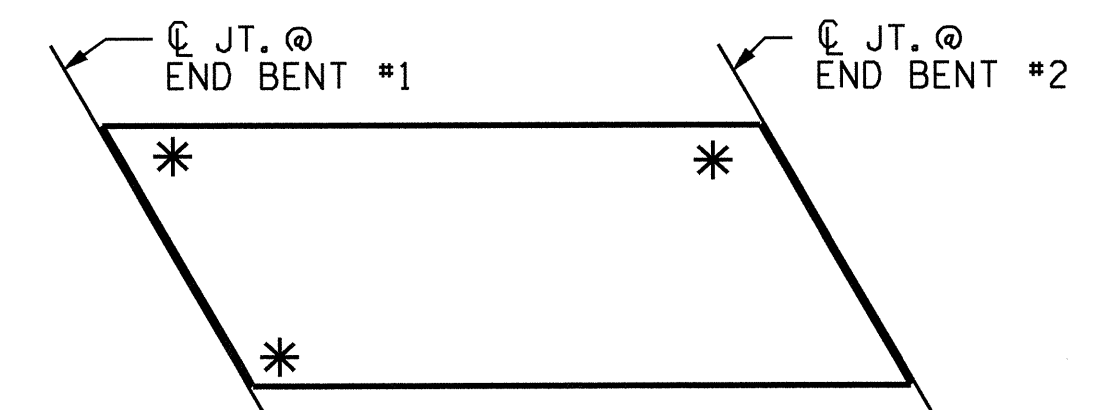


FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
STATION: 20+27.50 -L-

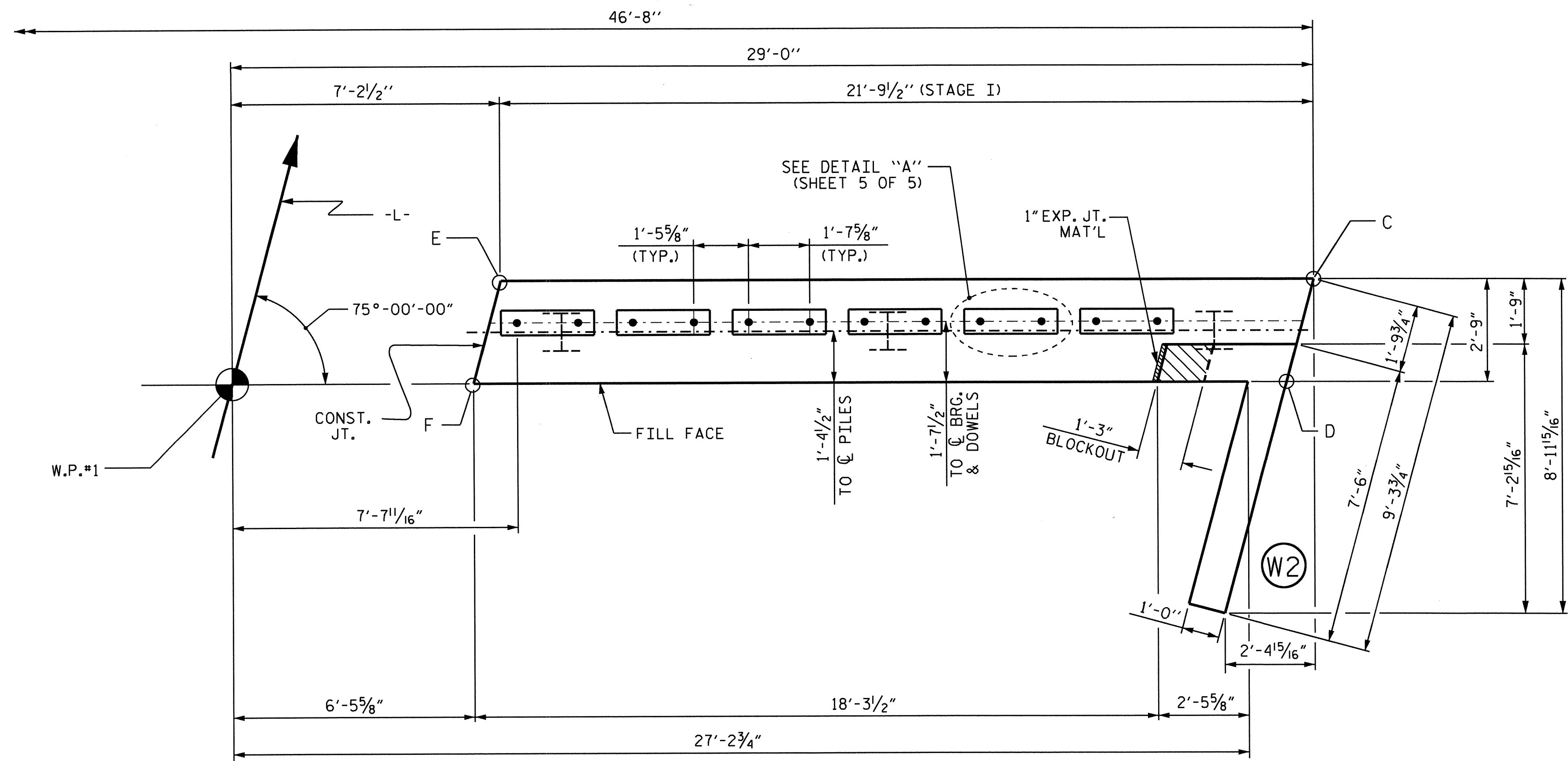
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
FOR VERTICAL CONCRETE
BARRIER RAIL



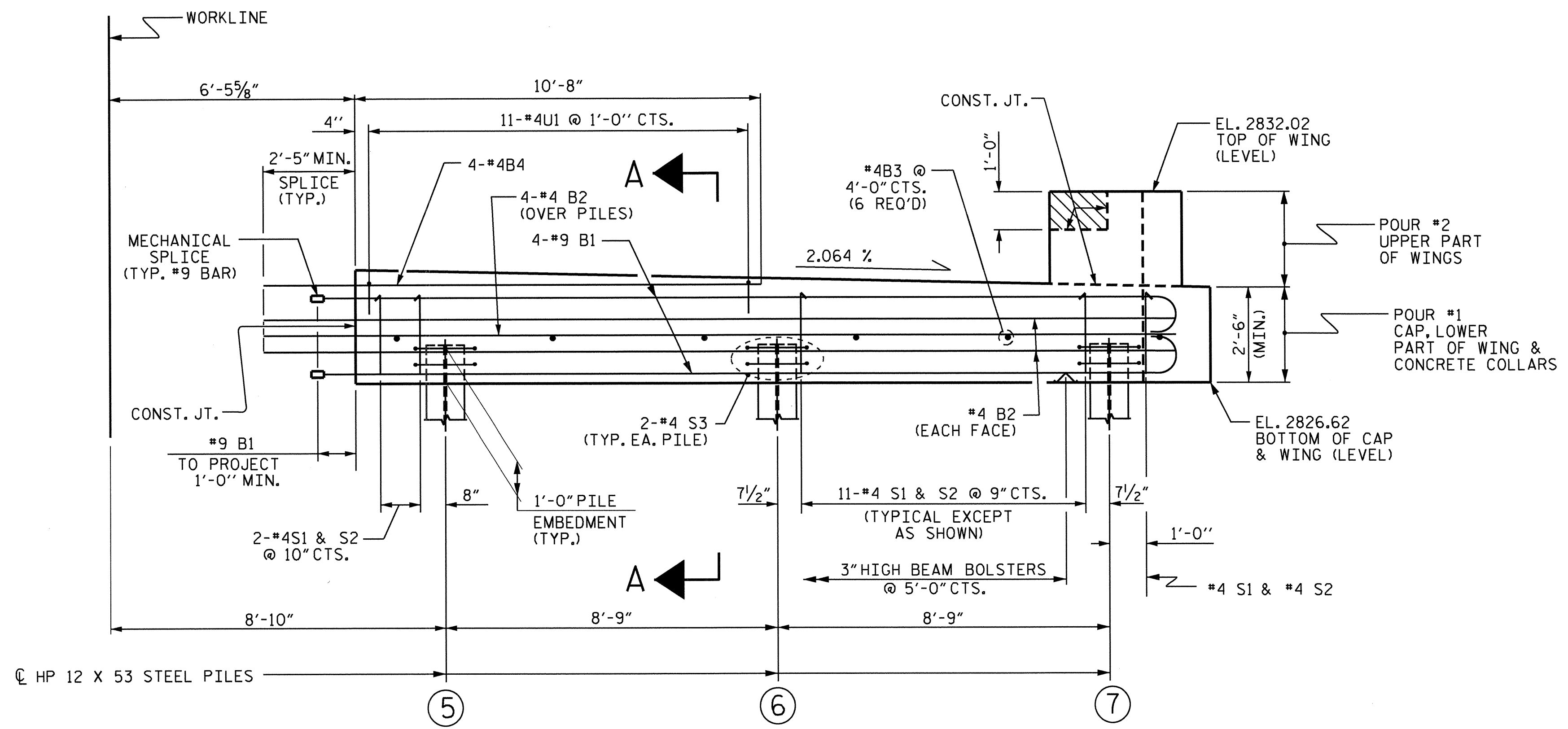
Wael S. Arafat
9-23-13

ASSEMBLED BY :	HPK / VXN	DATE :	6/13
CHECKED BY :	D. HODGE	DATE :	7/13
DRAWN BY :	MAA 5/10	REV. 10/1/11	MAA/GM
CHECKED BY :	GM 5/10	REV. 12/5/11	MAA/GM
		REV. 6/13	MAA/GM

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



PLAN



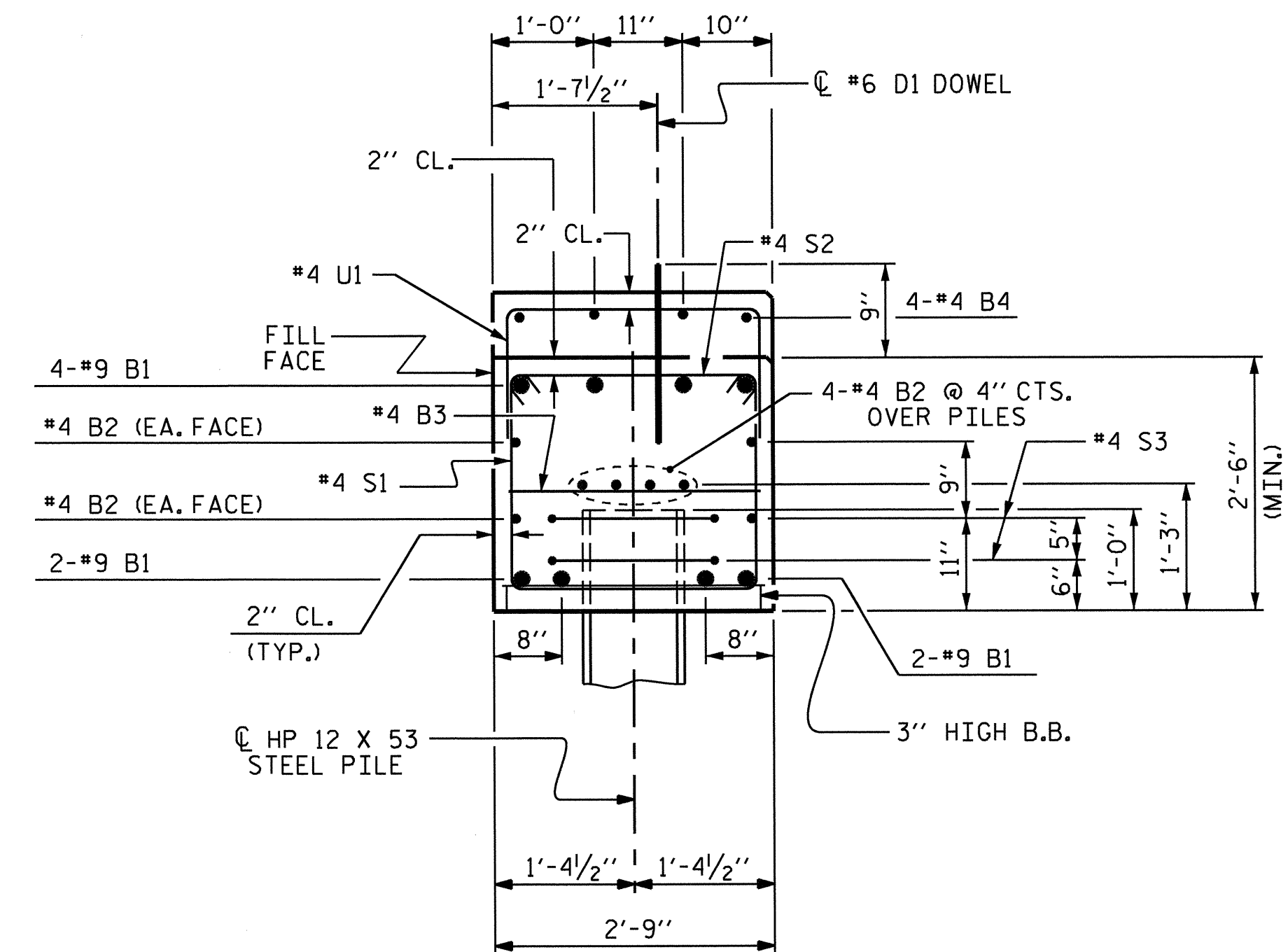
ELEVATION

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5.

	TOP OF CAP ELEVATIONS
Ⓒ	2829.12
Ⓓ	2829.13
Ⓔ	2829.57
Ⓕ	2829.58

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 5 OF 5.



SECTION A-A

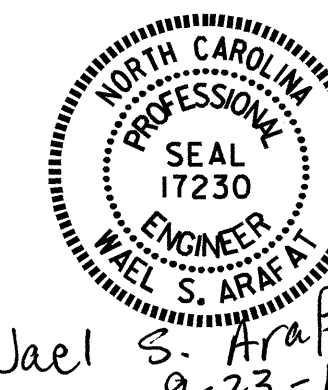
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5)

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 STAGE I

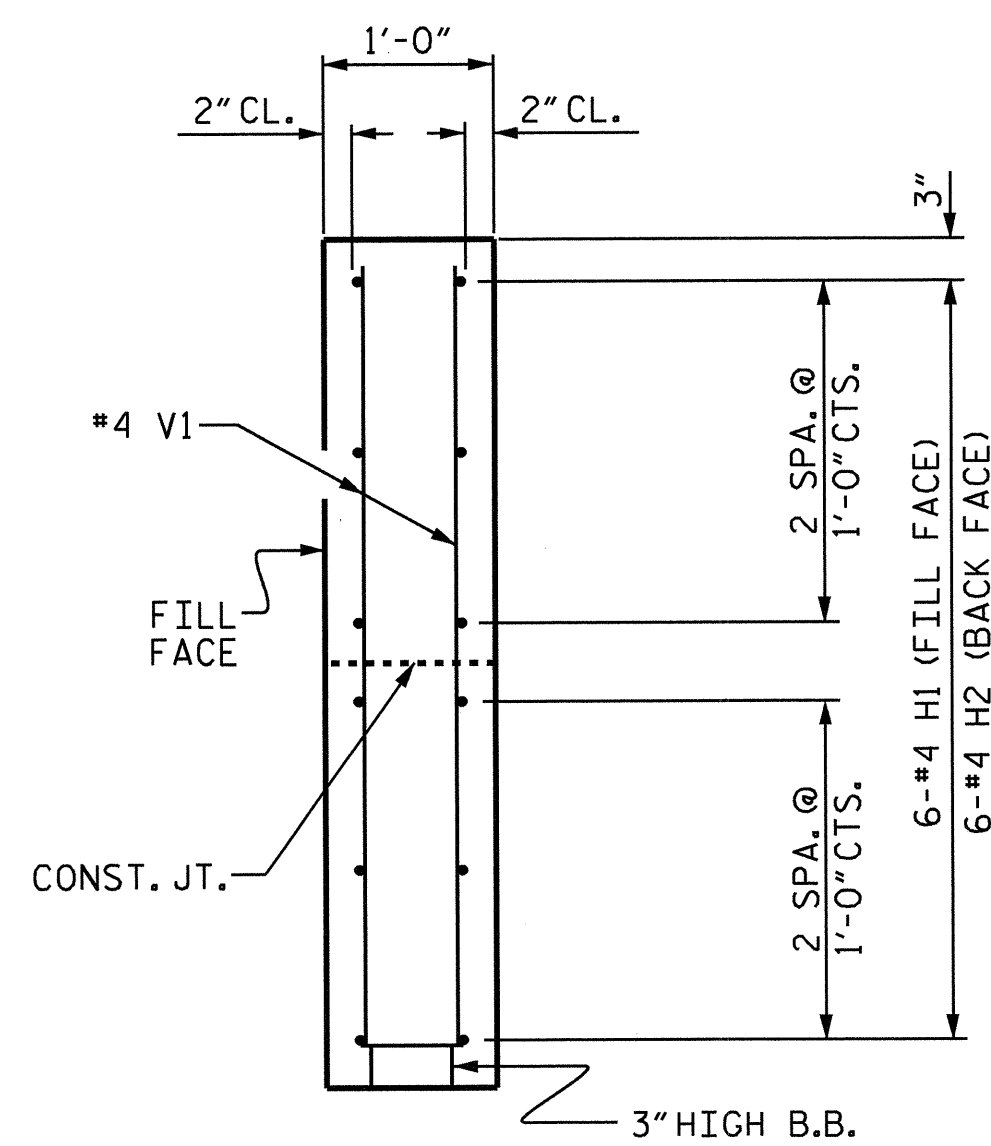


DRAWN BY: V.X. NGUYEN DATE: 7-13
 CHECKED BY: D. HODGE DATE: 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE: 8-13

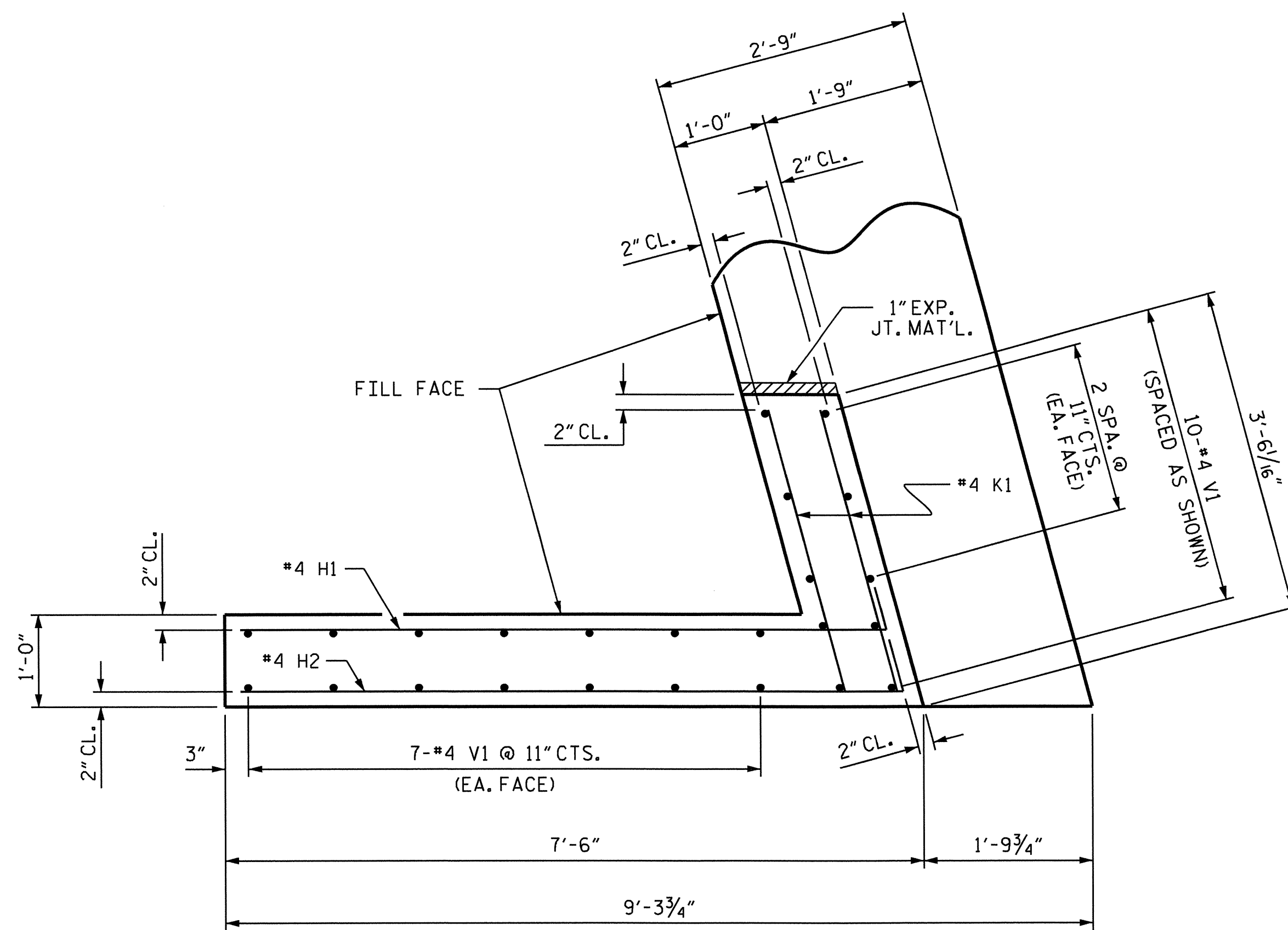
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 dahodge

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

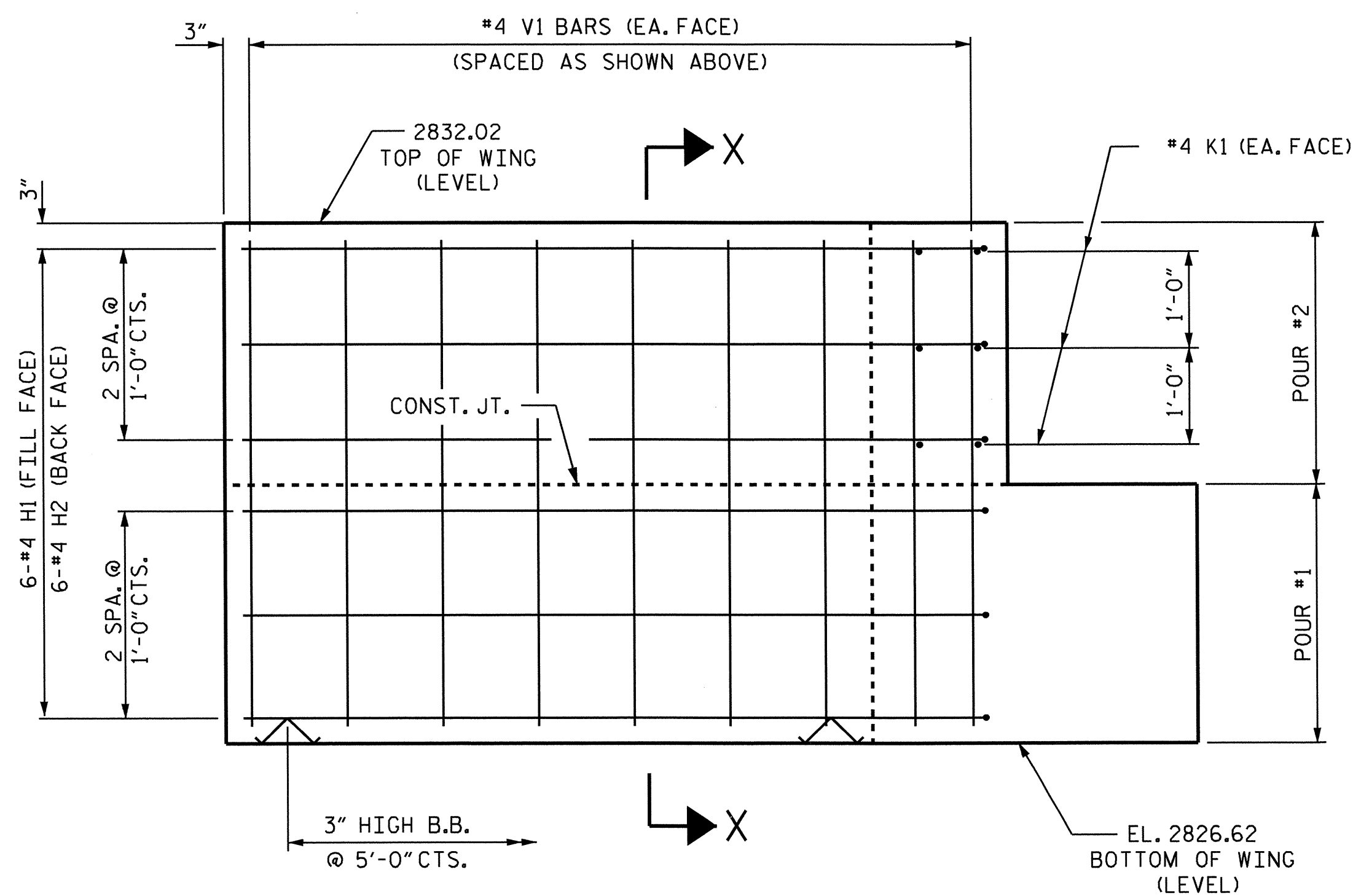
Wael S. Arafat
 9-23-13



SECTION X-X



PLAN OF WING (W2)



ELEVATION OF WING (W2)

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD : H.P. KIM DATE : 8-13

19-SEP-2013 14:52
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 9-23-13



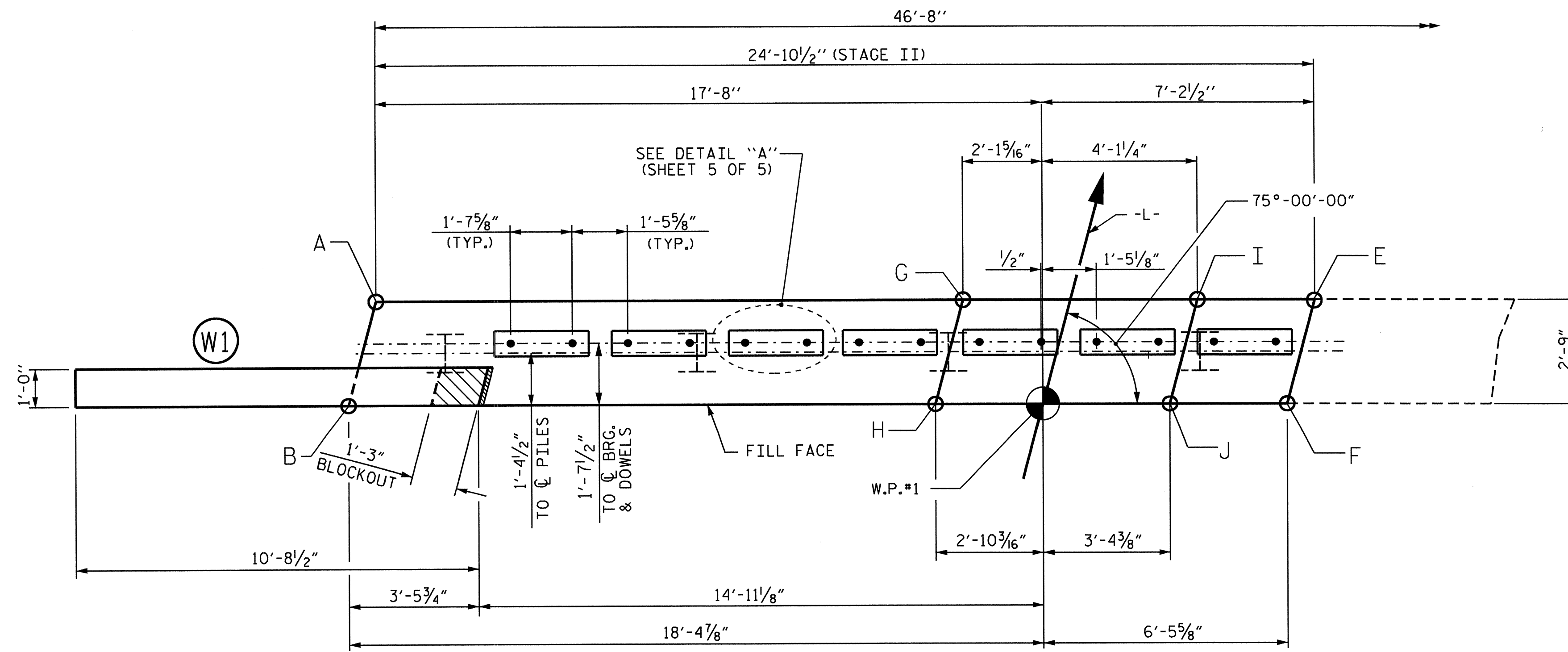
PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

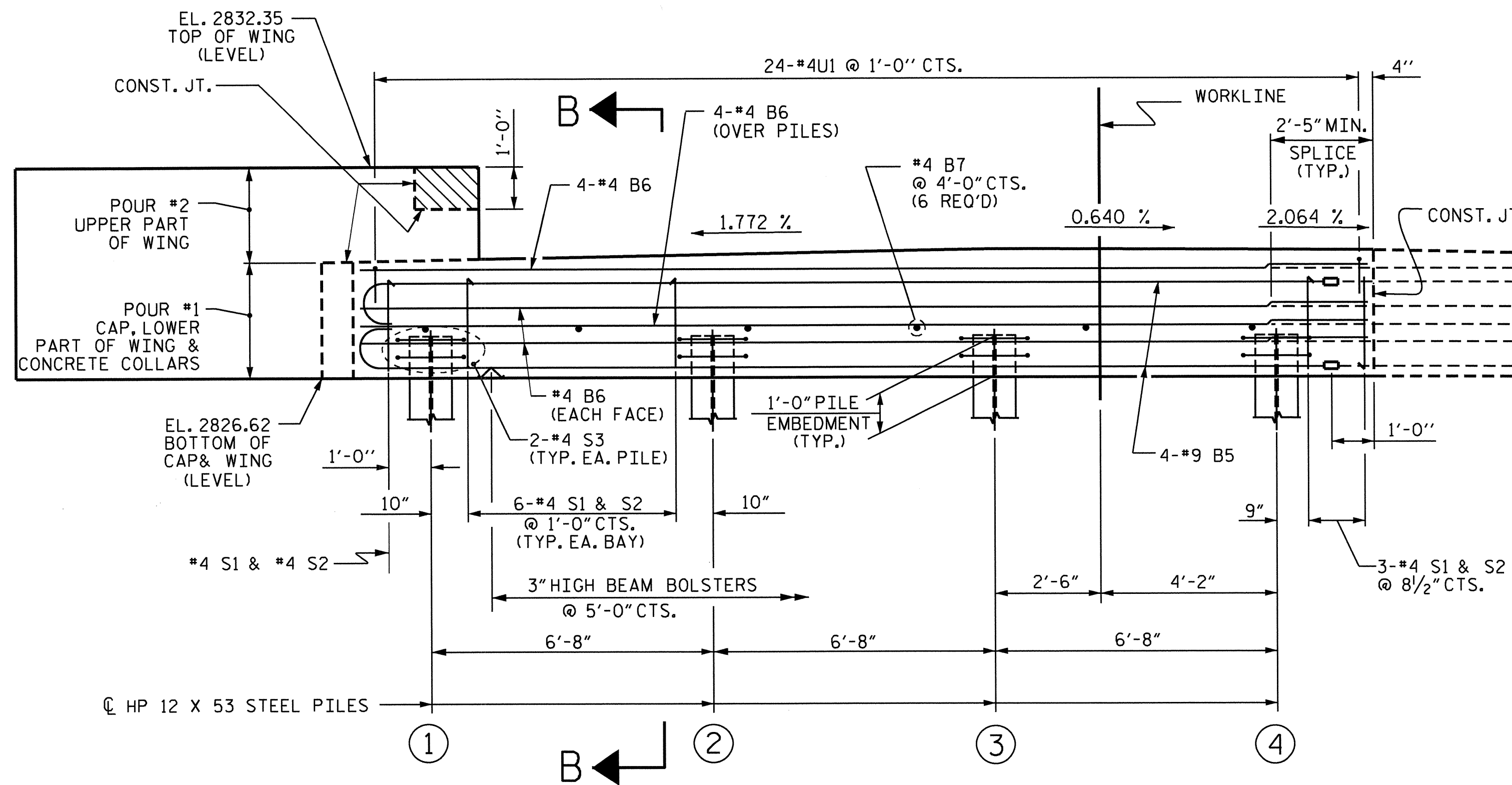
SUBSTRUCTURE
 END BENT No. 1
 WING DETAILS
 STAGE I

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS 34	
2			4				



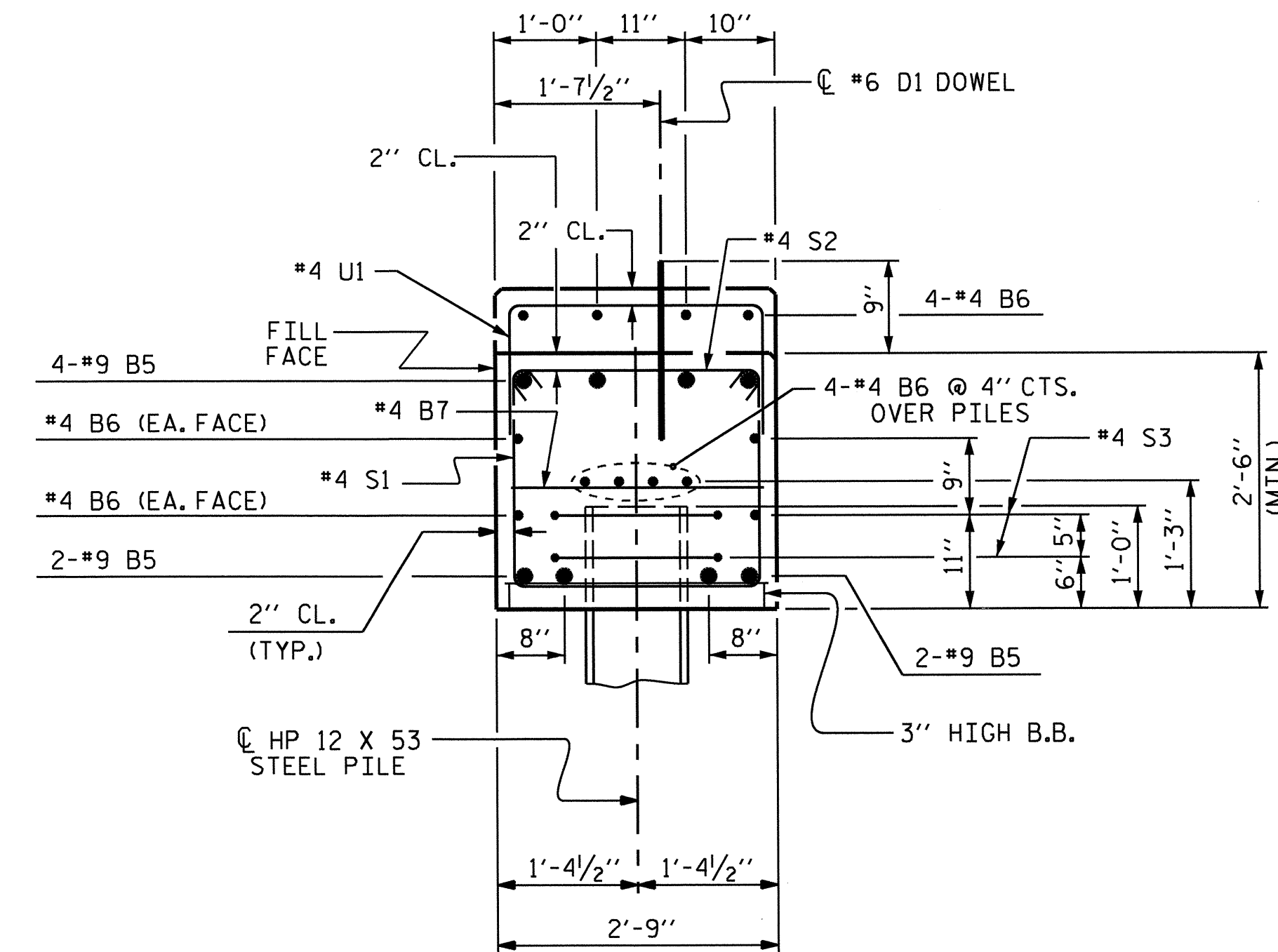
PLAN

	TOP OF CAP ELEVATIONS
(A)	2829.40
(B)	2829.41
(E)	2829.57
(F)	2829.58
(G)	2829.68
(H)	2829.68
(I)	2829.63
(J)	2829.64



ELEVATION

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 6 OF 6.



SECTION B-B

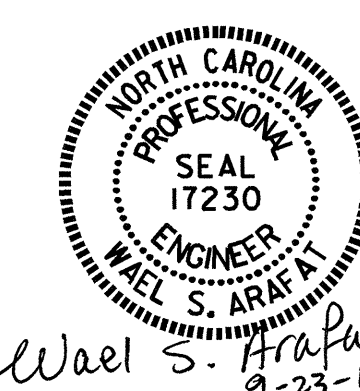
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5)

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

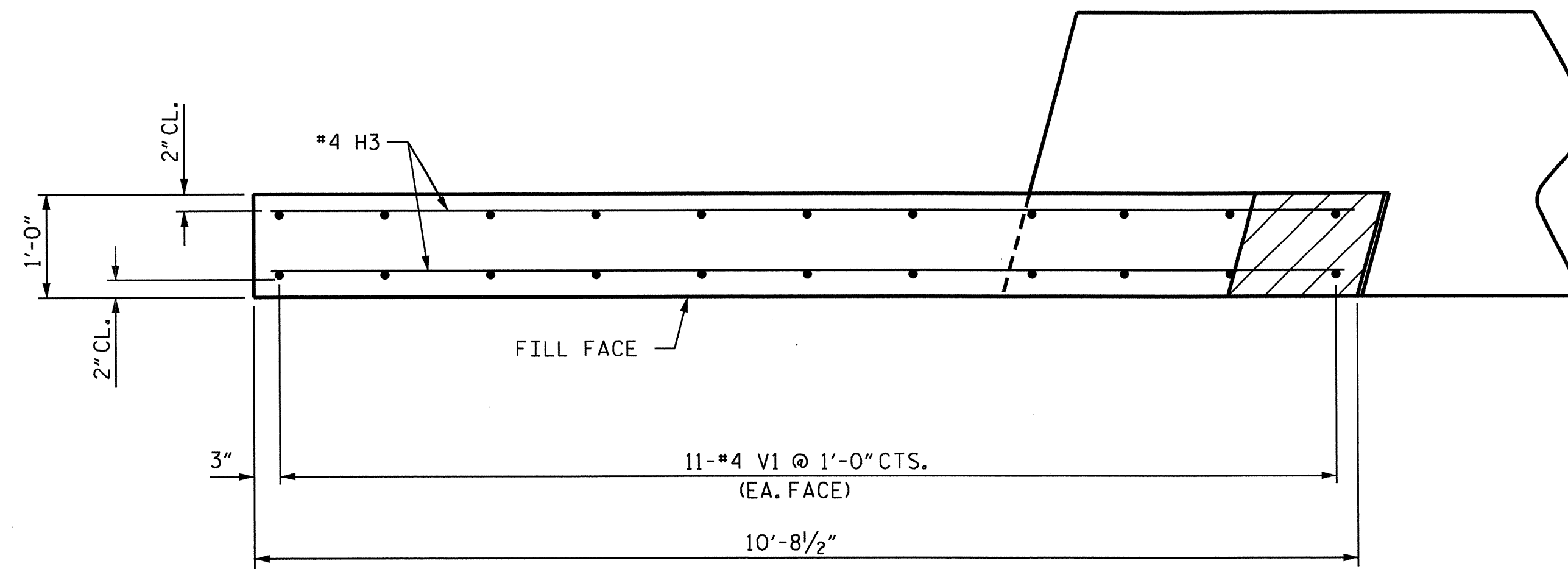
SUBSTRUCTURE
 END BENT No. 1
 STAGE II



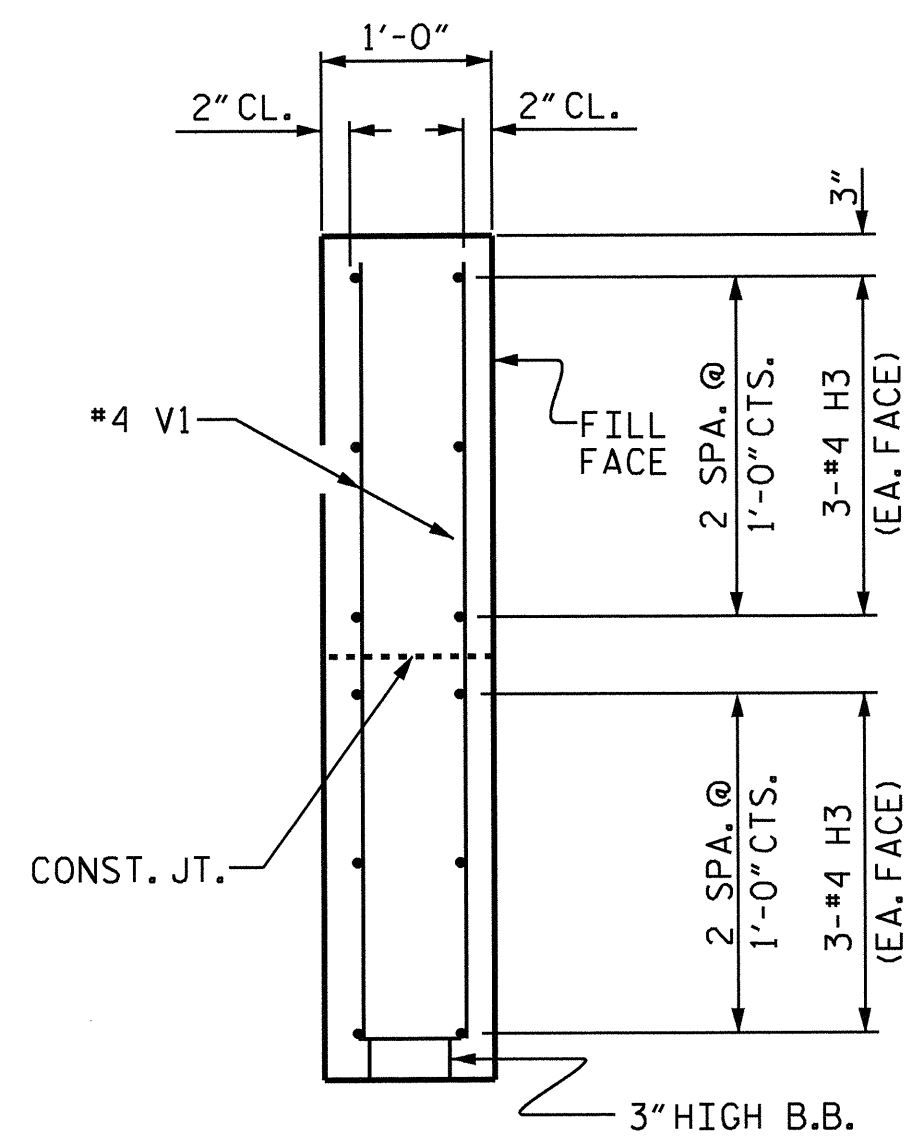
DRAWN BY: V.X. NGUYEN DATE: 7-13
 CHECKED BY: D. HODGE DATE: 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE: 8-13

19-SEP-2013 14:52
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 dahodge

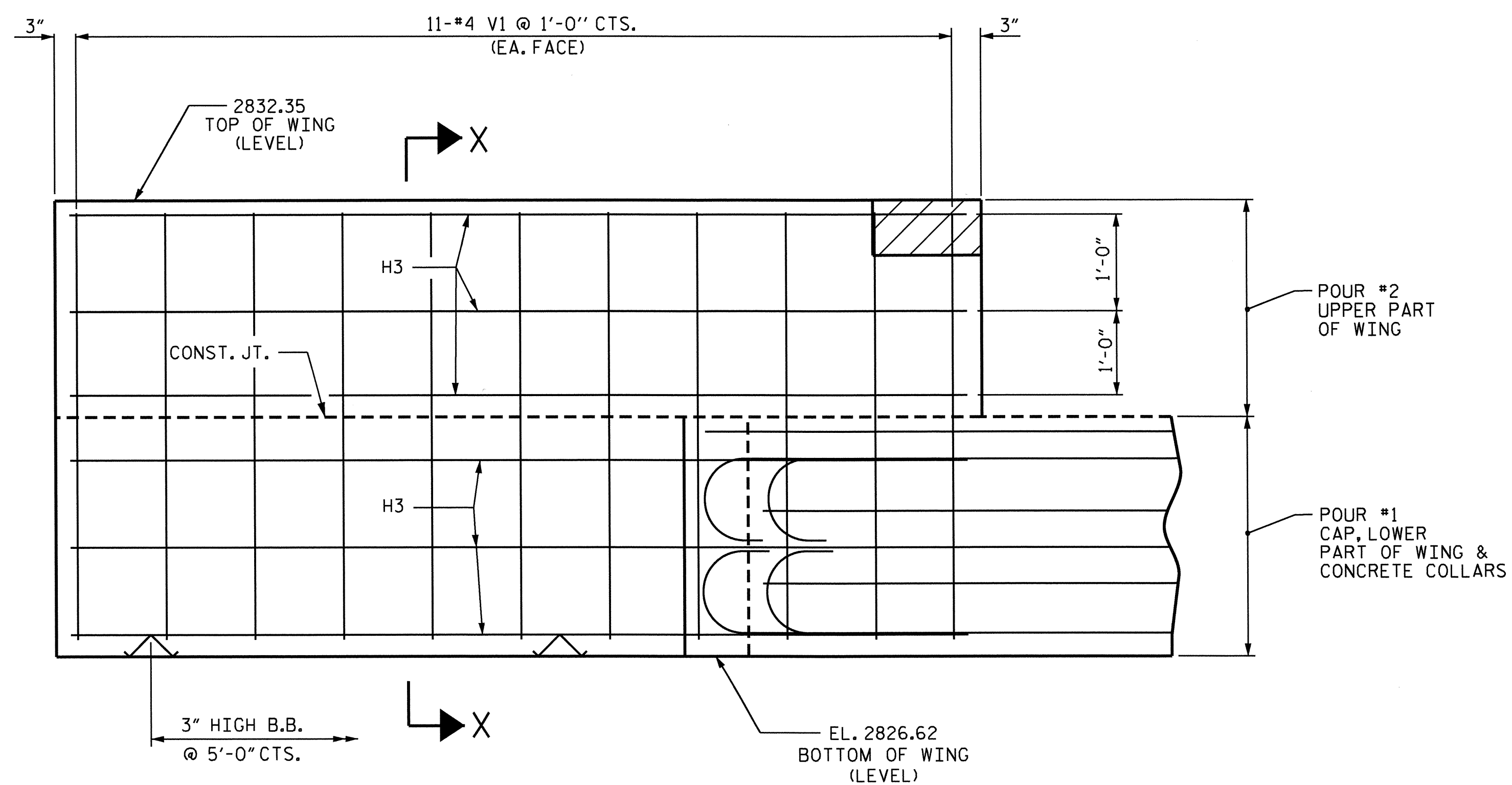
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			34



PLAN OF WING (W1)



SECTION X-X



ELEVATION OF WING (W1)

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 WING DETAILS
 STAGE II

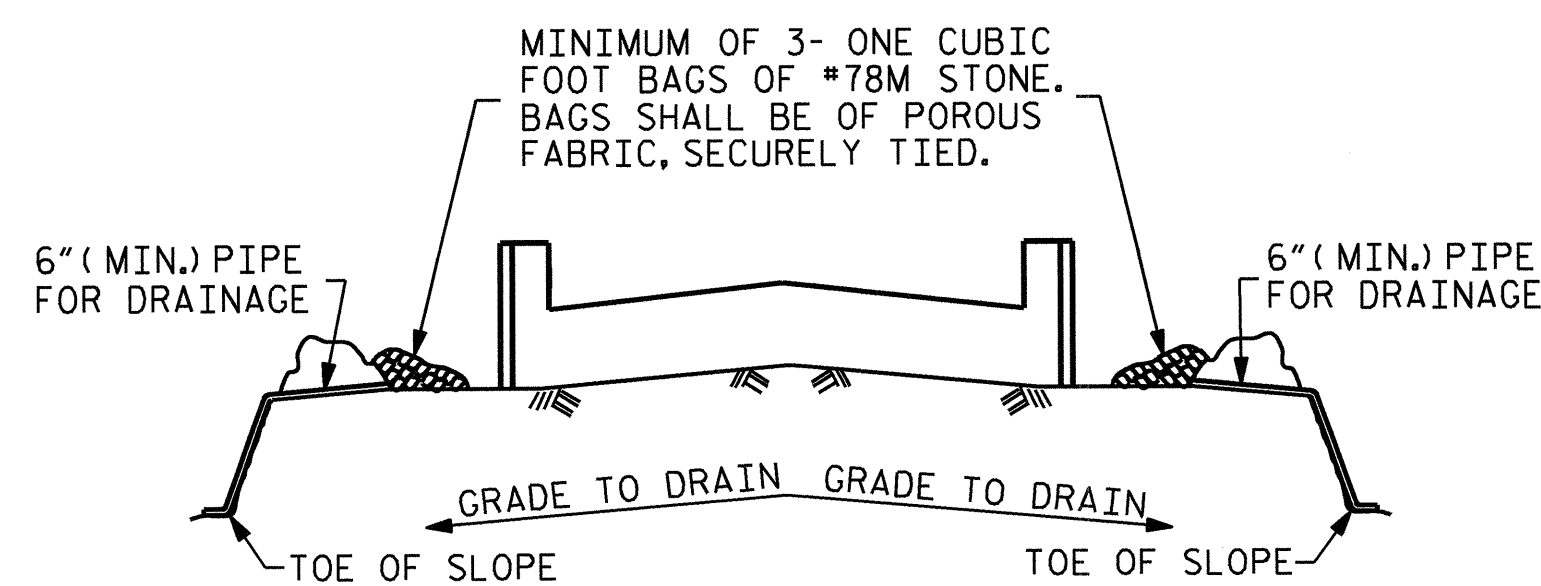


Wael S. Arafat
 9-23-13

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE : 8-13

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-22	
2			4			34	



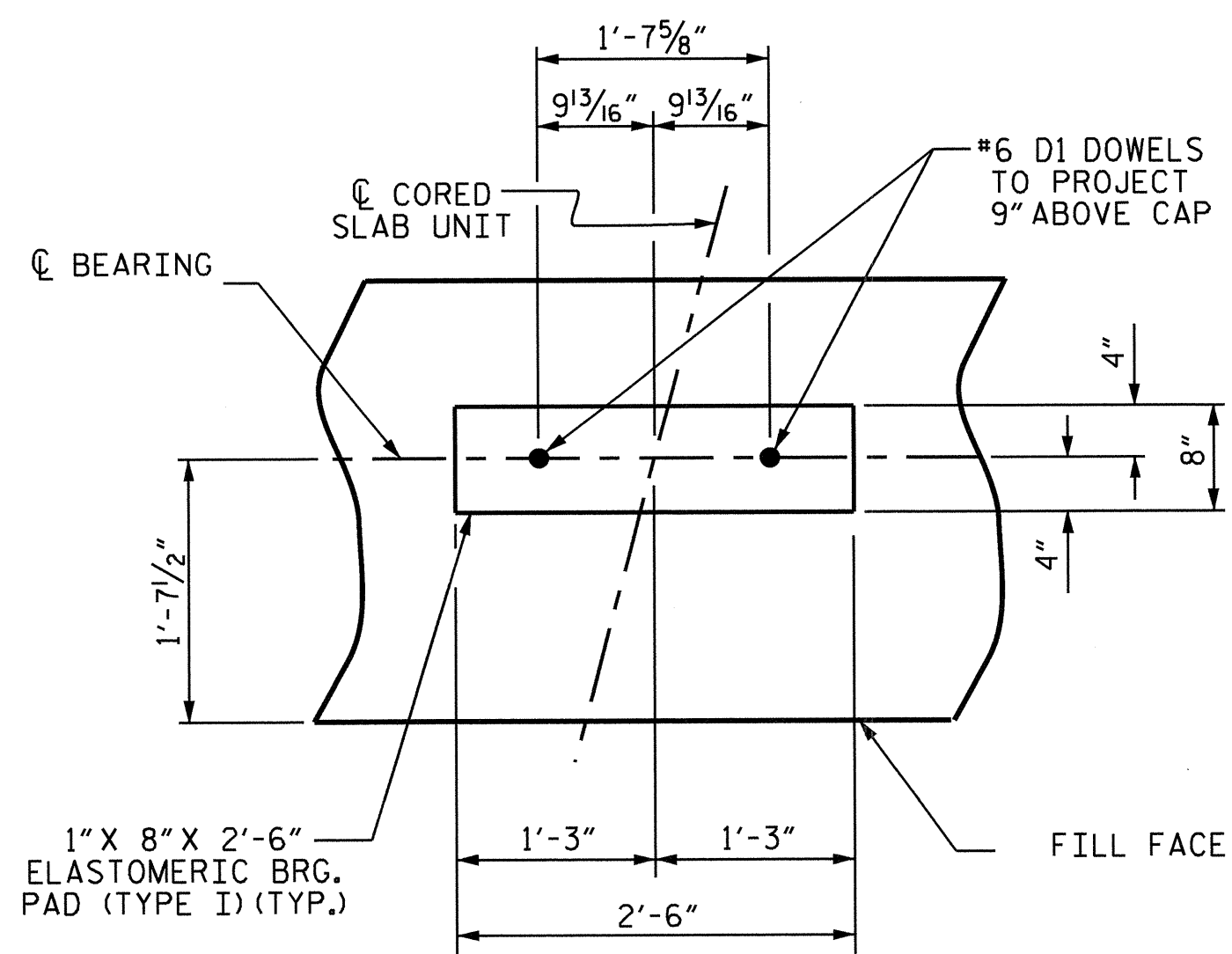
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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.

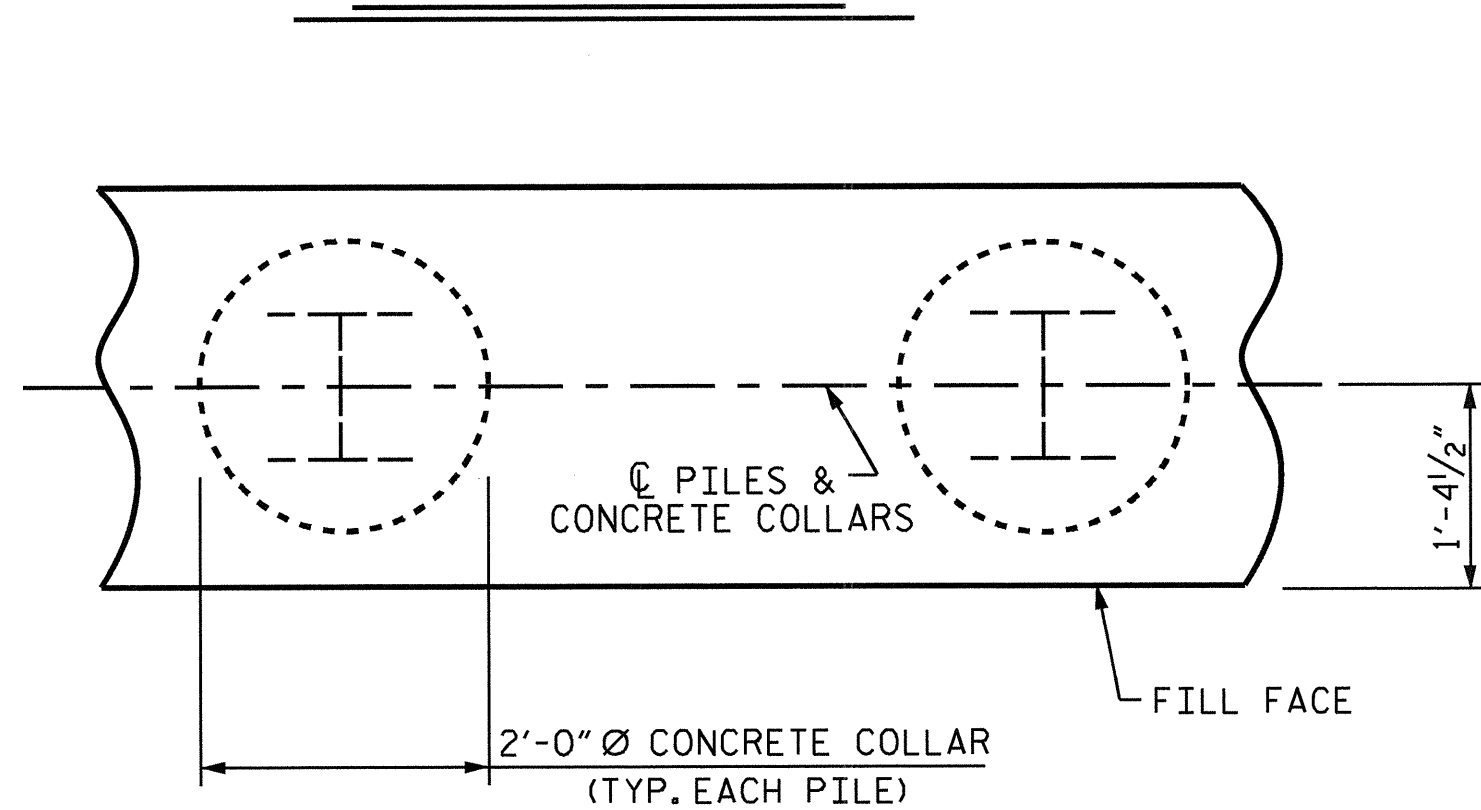
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

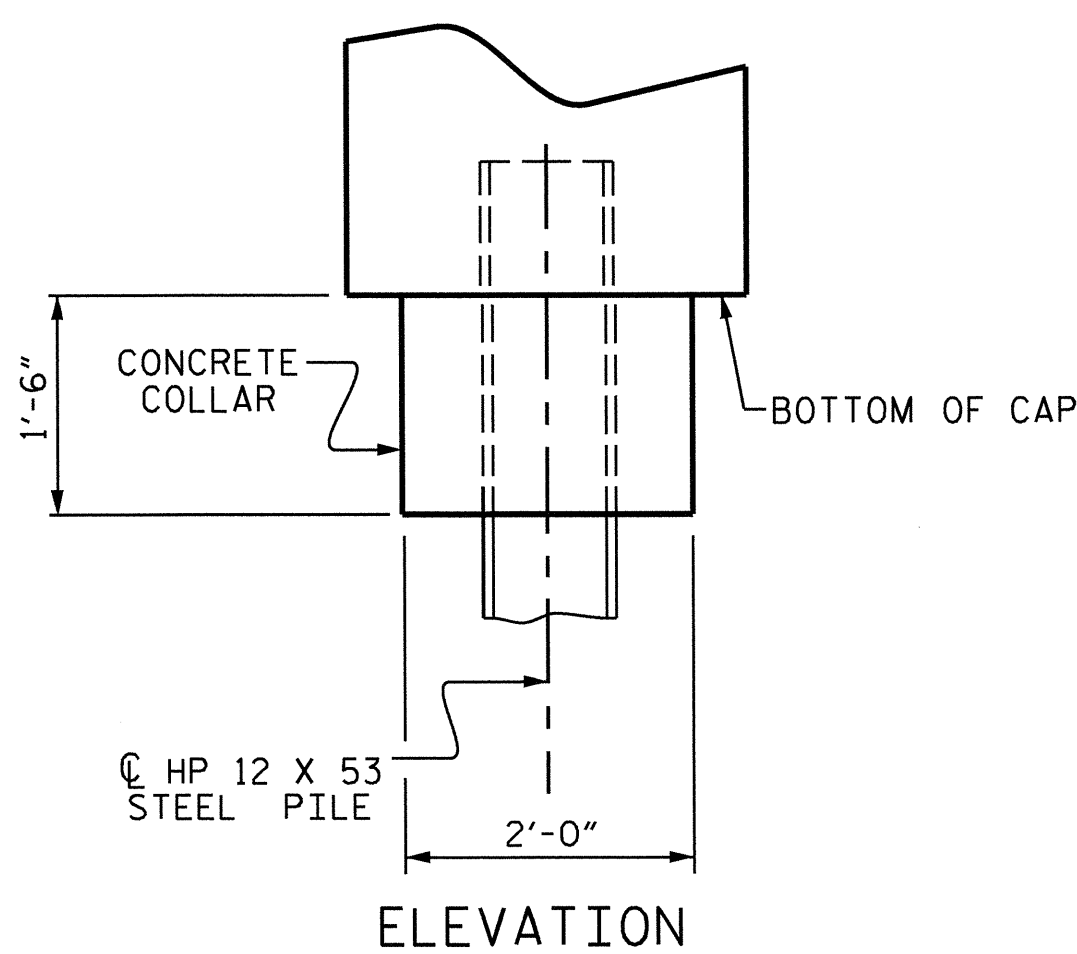
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"



PLAN



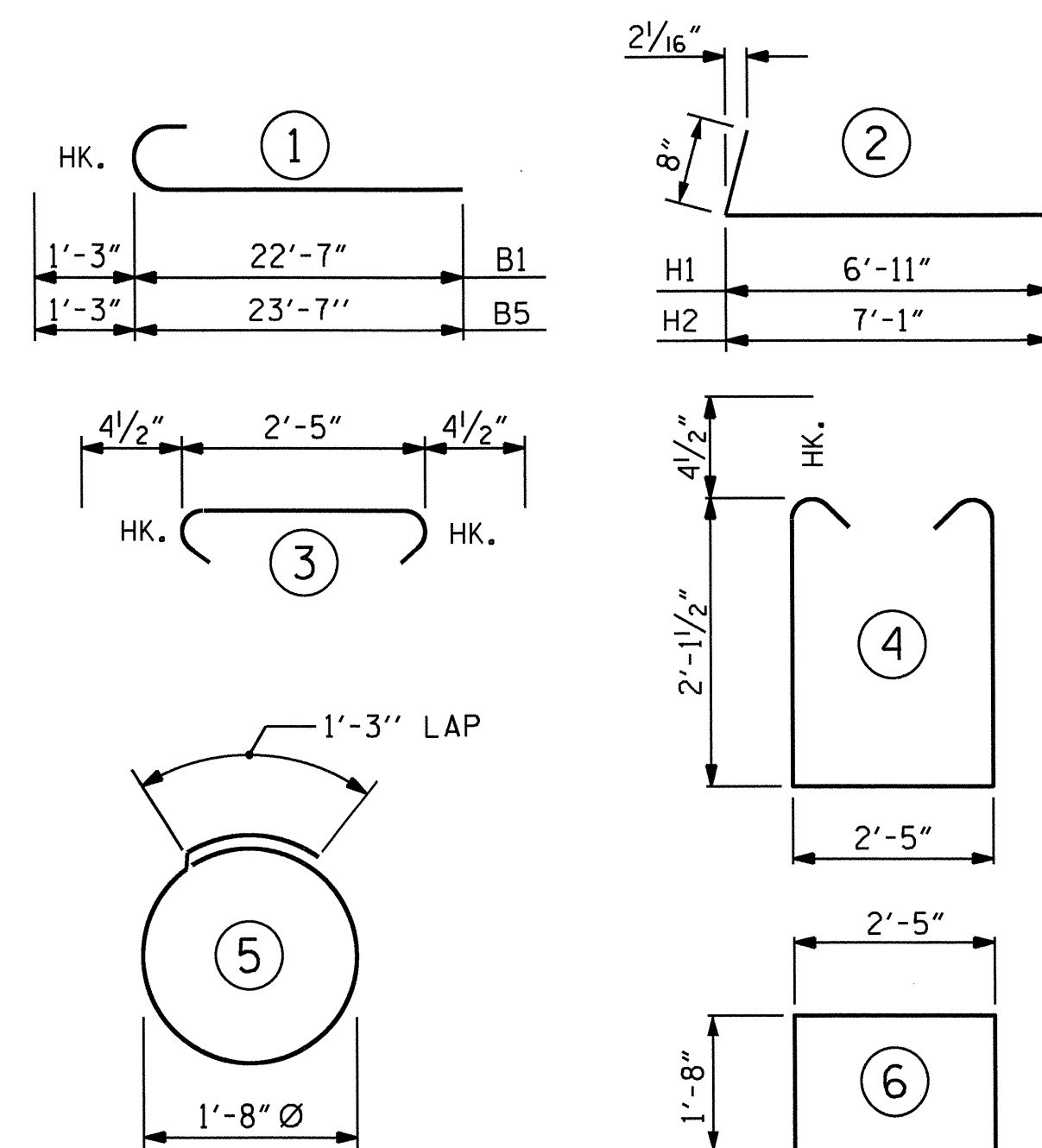
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD : H.P. KIM DATE : 8-13

25-SEP-2013 13:35
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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL BILL OF MATERIAL

	CLASS A CONCRETE	REINFORCING STEEL	HP 12 X 53 STEEL PILES	
	CU. YDS.	LBS.	No.	LIN. FT.
END BT. #1 - STAGE I	8.3	1247	3	75
END BT. #1 - STAGE II	10.2	1357	4	120
TOTAL	18.5	2604	7	195

BILL OF MATERIAL

END BENT #1 - STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	23'-10"	648
B2	8	#4	STR	24'-2"	129
B3	6	#4	STR	2'-5"	10
B4	4	#4	STR	13'-3"	35
D1	12	#6	STR	1'-6"	27
H1	6	#4	2	7'-7"	30
H2	6	#4	2	7'-9"	31
K1	6	#4	STR	3'-1"	12
S1	25	#4	4	7'-5"	124
S2	25	#4	3	3'-2"	53
S3	6	#4	5	6'-6"	26
U1	11	#4	6	5'-9"	42
V1	24	#4	STR	5'-0"	80

REINFORCING STEEL 1247 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WING & COLLARS 7.2 C.Y.

POUR #2 UPPER PART OF WING 1.1 C.Y.

TOTAL CLASS A CONCRETE 8.3 C.Y.

END BENT #1 - (STAGE I)

HP 12 X 53 STEEL PILES NO: 3 LIN. FT.= 75

BILL OF MATERIAL

END BENT #1 - STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	8	#9	1	24'-10"	675
B6	12	#4	STR	24'-6"	196
B7	6	#4	STR	2'-5"	10
D1	14	#6	STR	1'-6"	32
H3	12	#4	STR	10'-4"	83
S1	22	#4	4	7'-5"	109
S2	22	#4	3	3'-2"	47
S3	8	#4	5	6'-6"	35
U1	24	#4	6	5'-9"	92
V1	22	#4	STR	5'-4"	78

REINFORCING STEEL 1357 LBS.

CLASS A CONCRETE BREAKDOWN

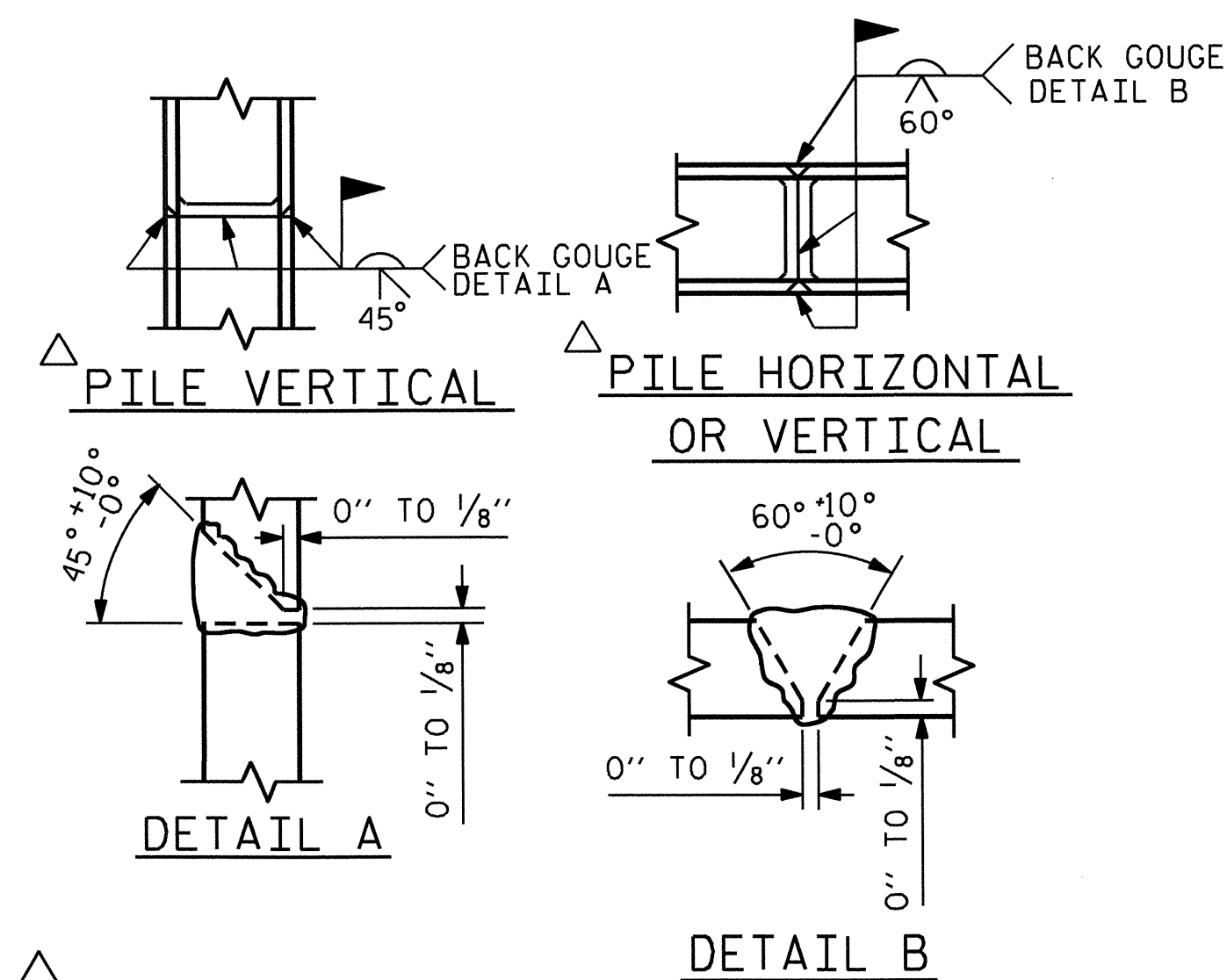
POUR #1 CAP, LOWER PART OF WING & COLLARS 9.0 C.Y.

POUR #2 UPPER PART OF WING 1.2 C.Y.

TOTAL CLASS A CONCRETE 10.2 C.Y.

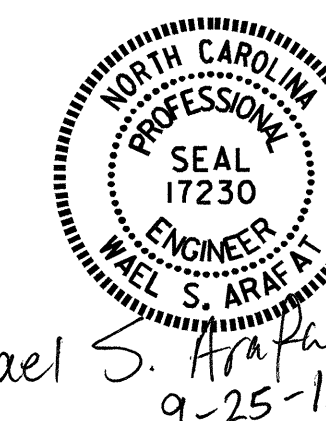
END BENT #1 - (STAGE II)

HP 12 X 53 STEEL PILES NO: 4 LIN. FT.= 120



POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1
 DETAILS
 STAGES I & II

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			5-23
2			4			34

Wael S. Arif
 9-25-13

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.

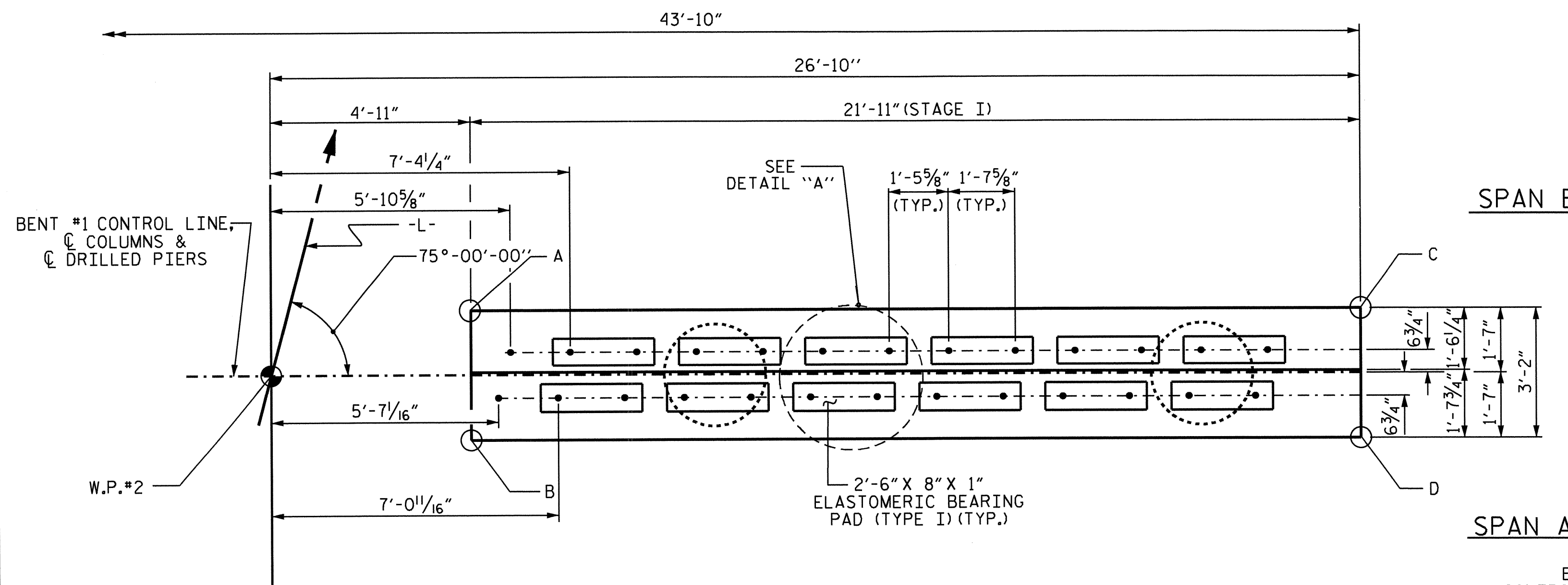
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

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

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.

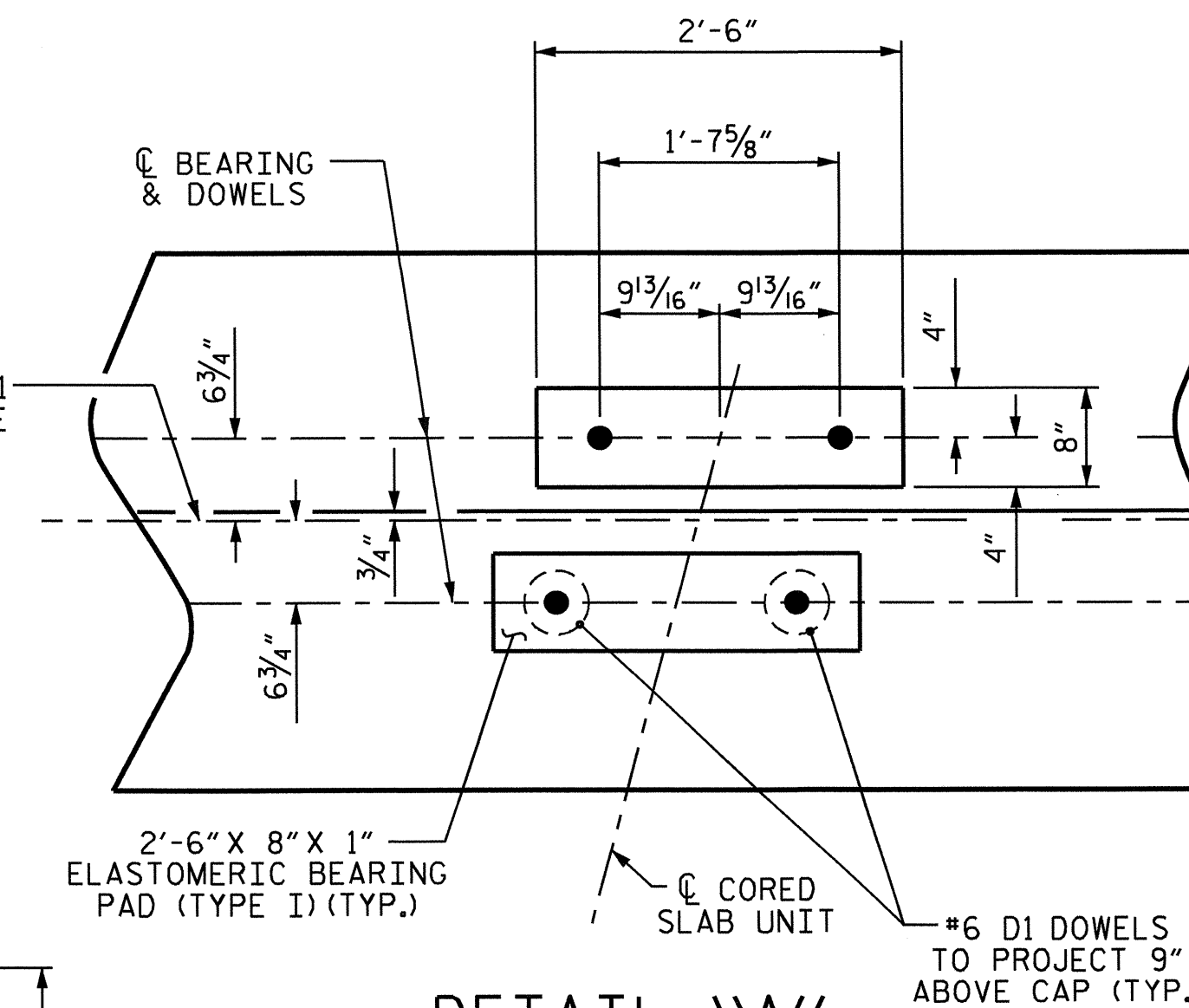
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



PLAN

SPAN B

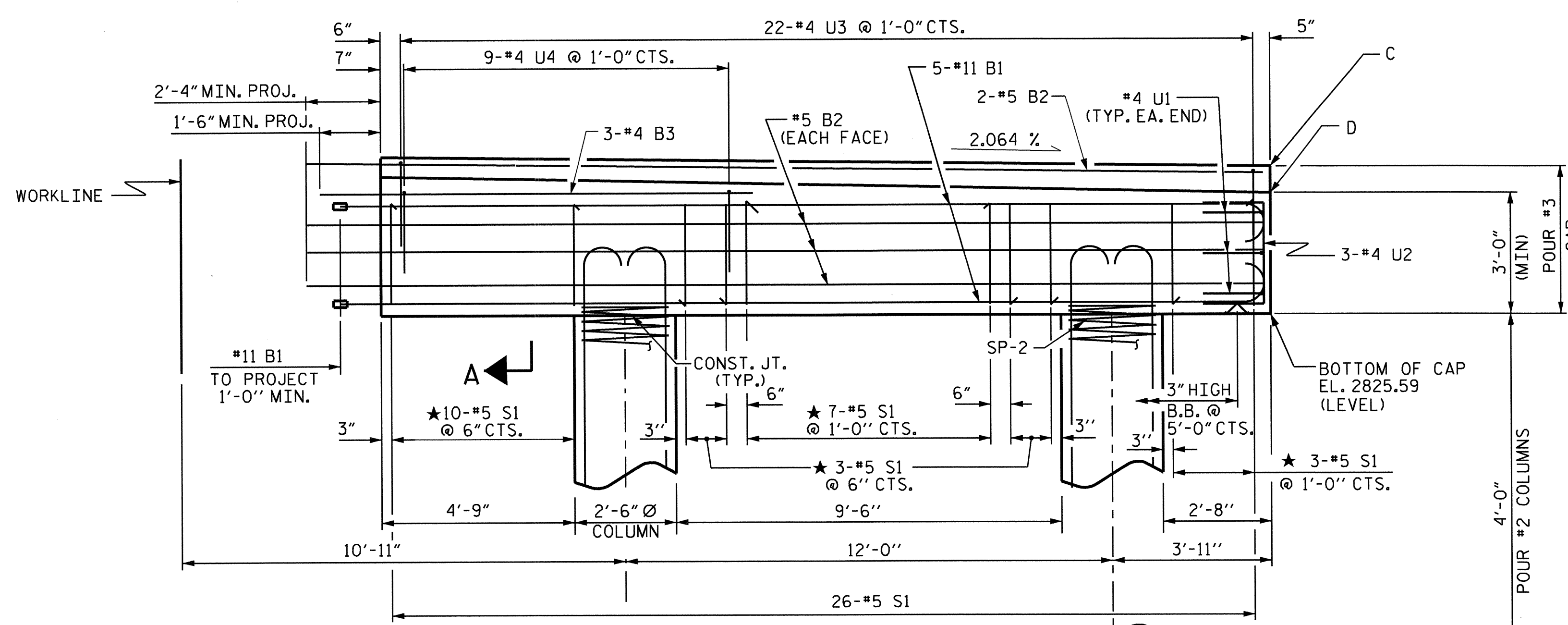
SPAN A



DETAIL "A"

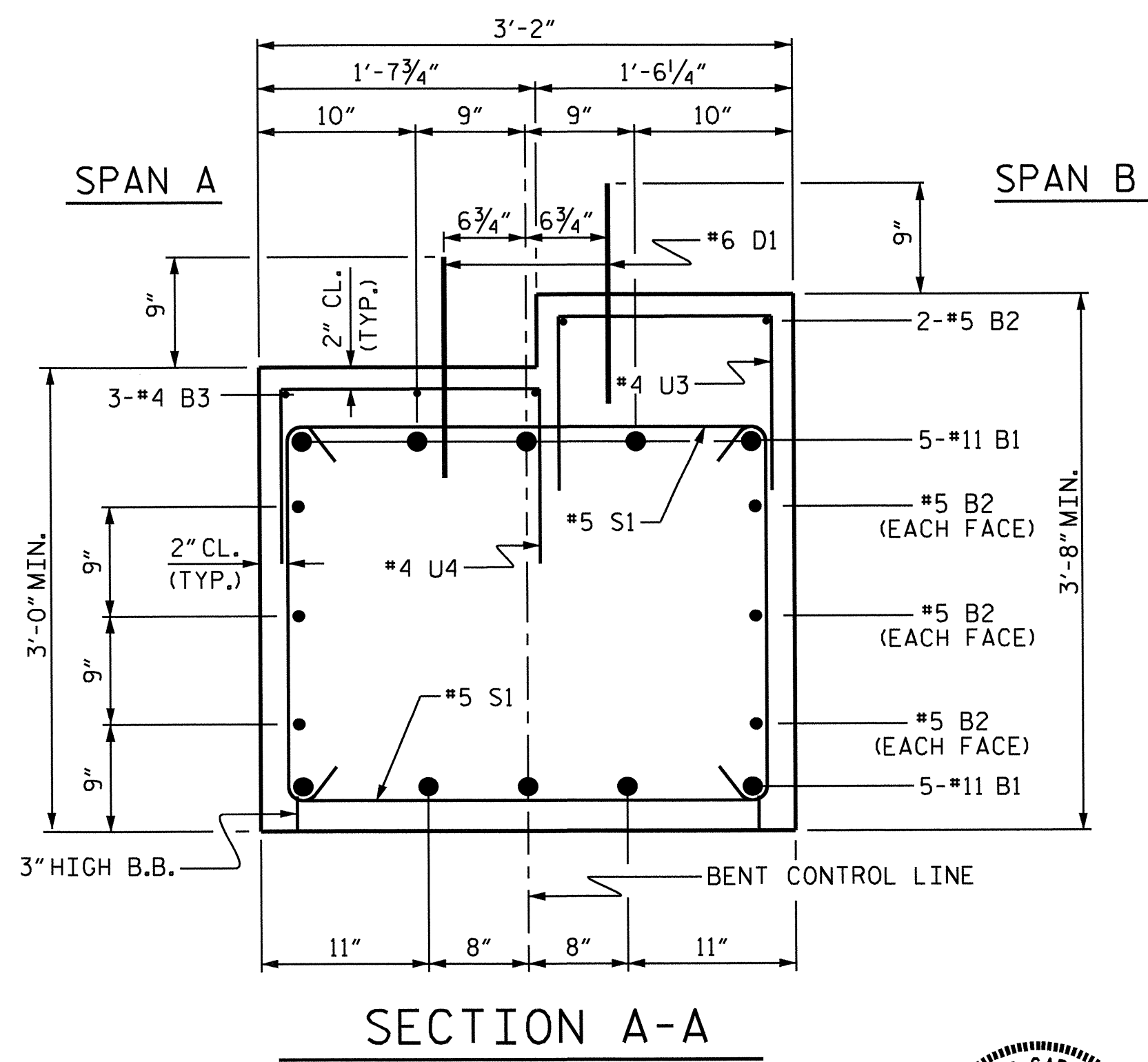
(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF CAP ELEVATIONS	
A	2829.72
B	2829.04
C	2829.26
D	2828.59



ELEVATION

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



SECTION A-A

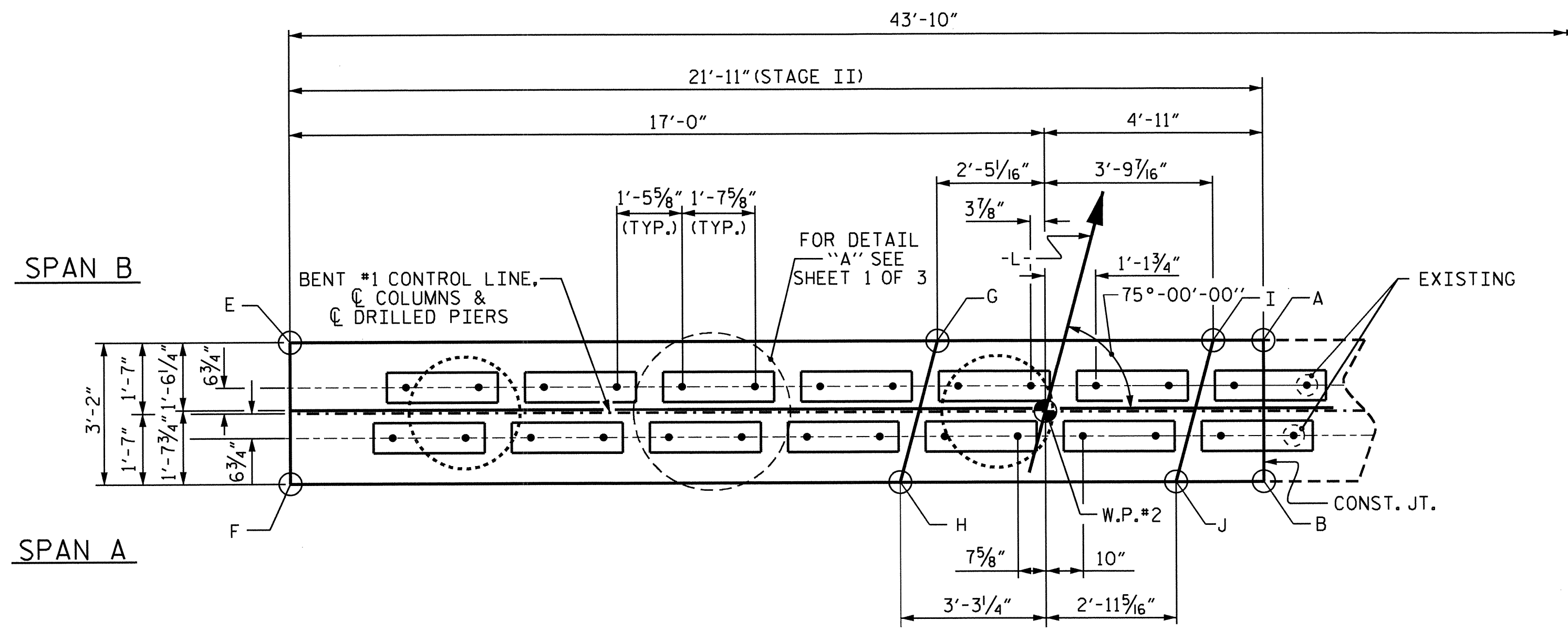
PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 (STAGE I)



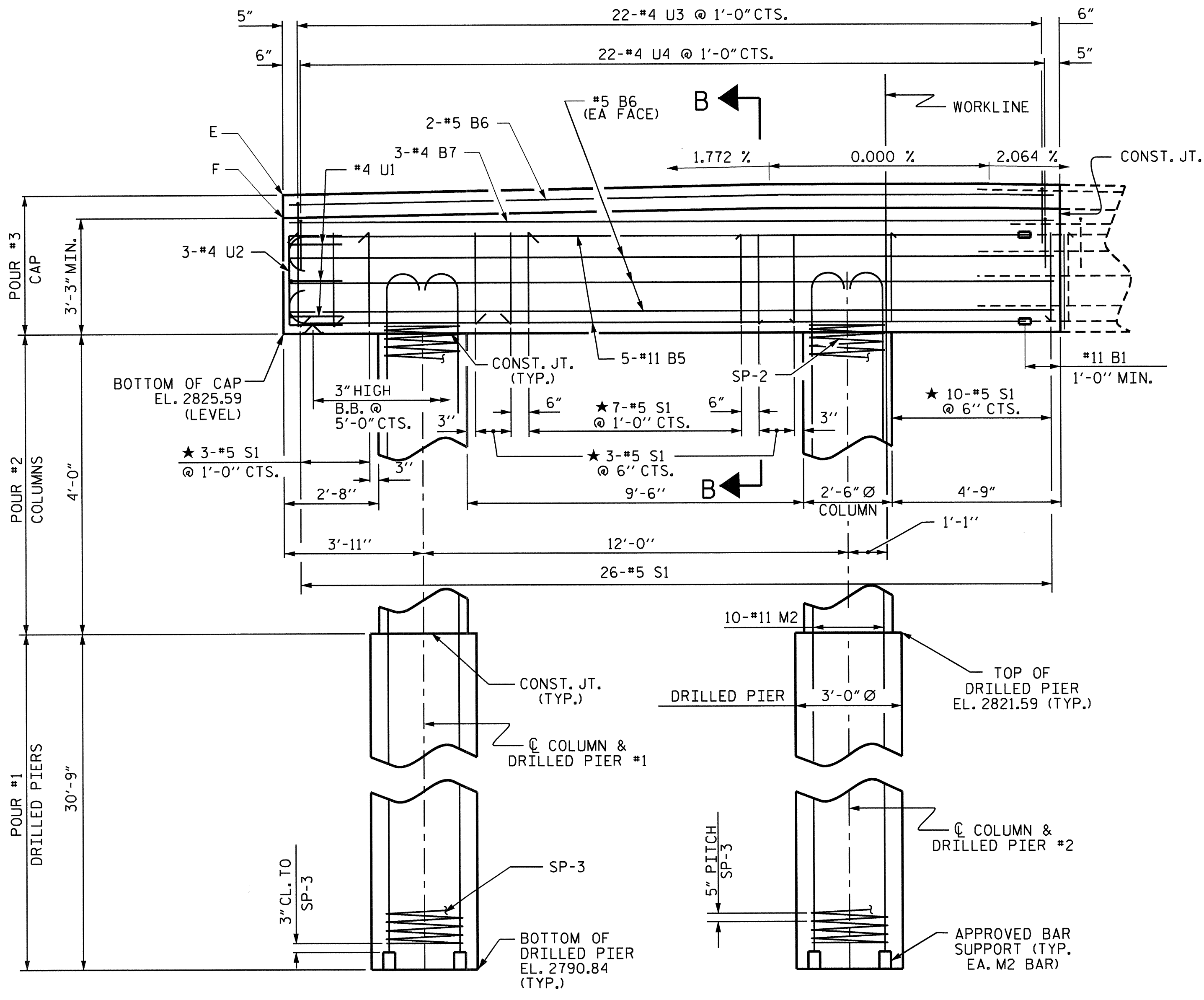
DRAWN BY: HPK/VXN DATE: 7-13
 CHECKED BY: D. HODGE DATE: 8-13
 DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	
2			4			34	



PLAN

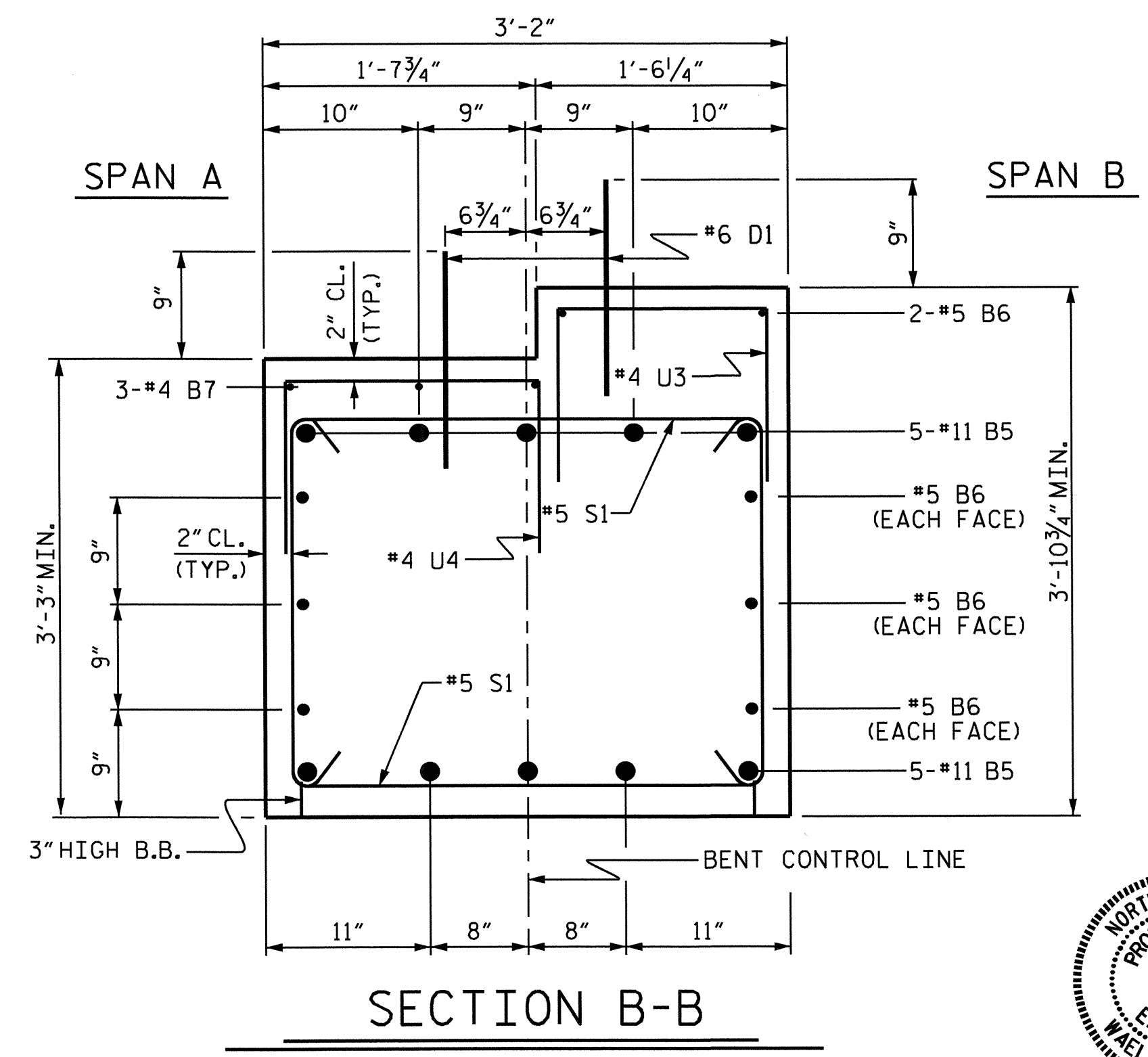
TOP OF CAP ELEVATIONS	
A	2829.72
B	2829.04
E	2829.49
F	2828.84
G	2829.74
H	2829.08
I	2829.74
J	2829.08



ELEVATION

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

★ INVERT ALTERNATE STIRRUPS.



SECTION B-B

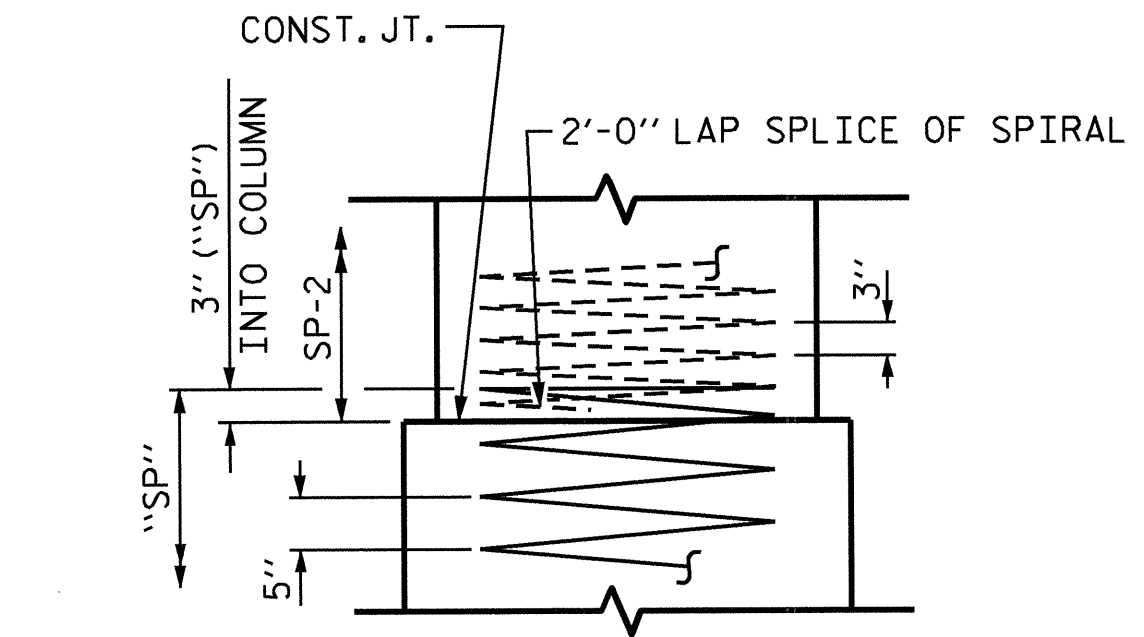
PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 (STAGE II)

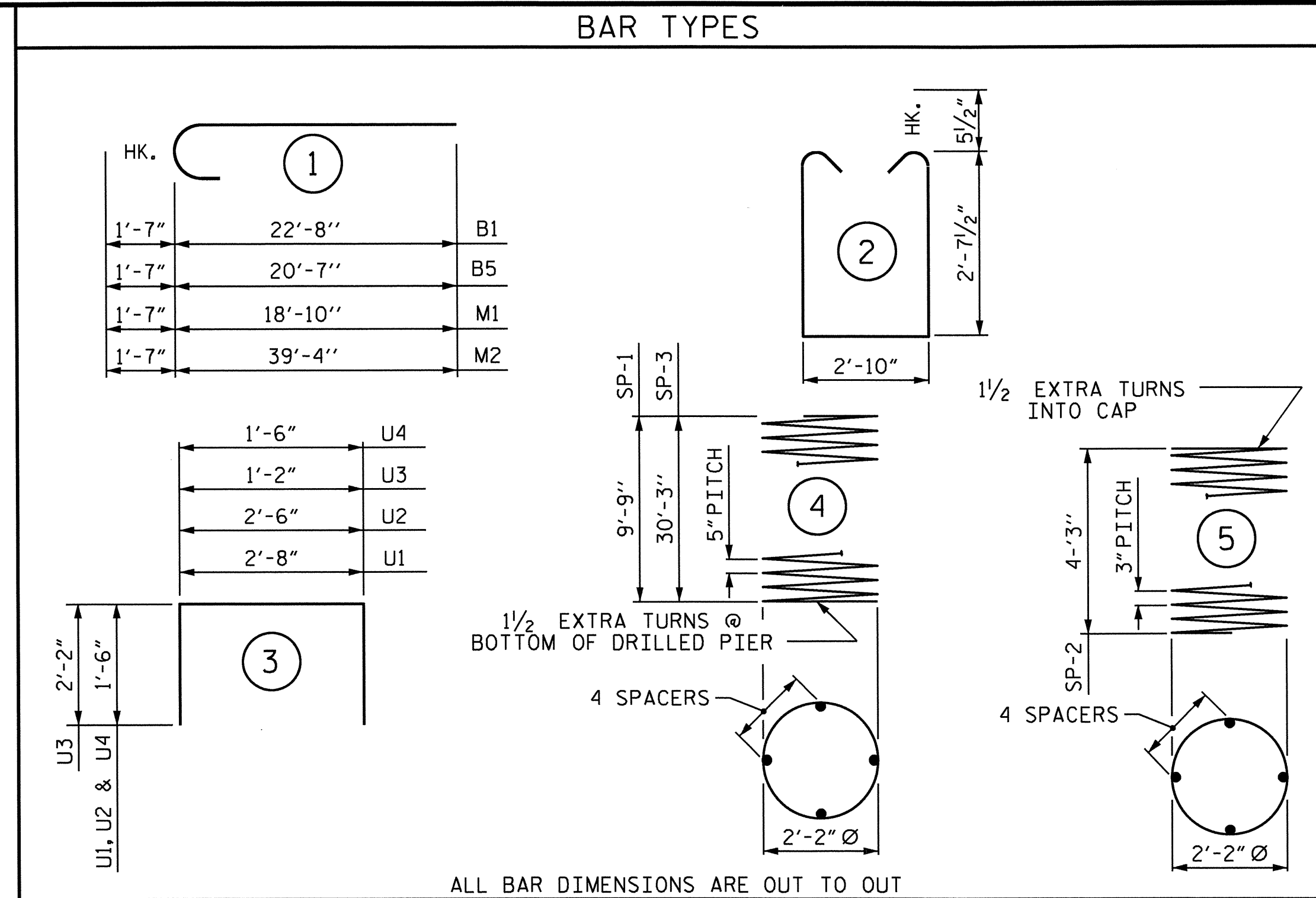


DRAWN BY : HPK/VXN DATE : 7-13
 CHECKED BY : D.HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD: HPK DATE : 8-13

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



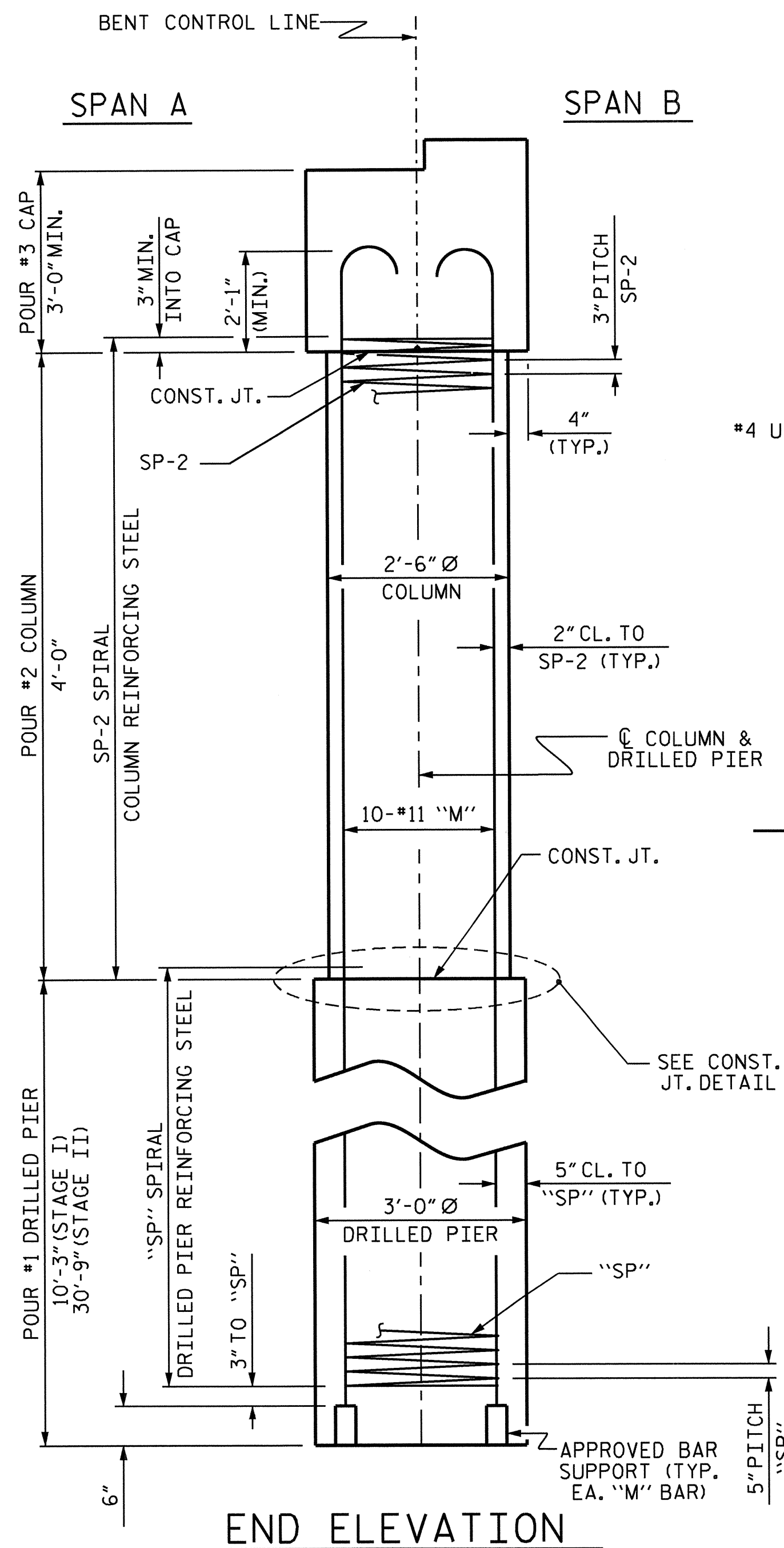
CONSTRUCTION JOINT DETAIL



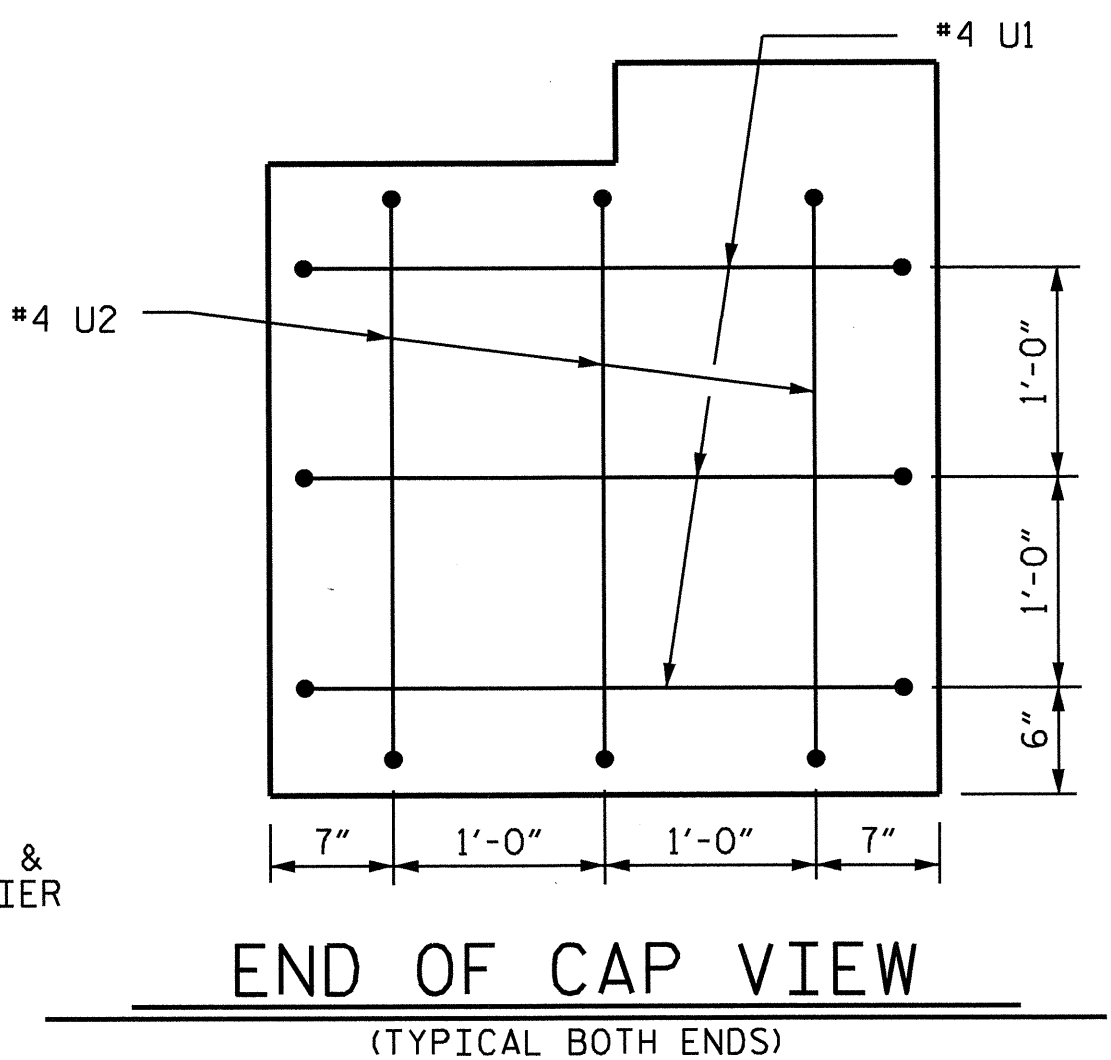
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
FOR BENT #1 - STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	24'-3"	1288
B2	8	#5	STR	24'-1"	201
B3	3	#4	STR	10'-8"	21
D1	26	#6	STR	1'-6"	59
M1	20	#11	1	20'-5"	2169
S1	26	#5	2	9'-0"	244
U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11
U3	22	#4	3	5'-6"	81
U4	9	#4	3	4'-6"	27
REINFORCING STEEL					4112 LBS.
SP-1	2	*	4	167'-3"	349
SP-2	2	**	5	127'-0"	170
SPIRAL COLUMN REINFORCING STEEL					519 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					

FOR BENT #1 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	10	#11	1	22'-2"	1178
B6	8	#5	STR	21'-7"	180
B7	3	#4	STR	21'-7"	43
D1	26	#6	STR	1'-6"	59
M2	20	#11	1	40'-11"	4348
S1	26	#5	2	9'-0"	244
U1	3	#4	3	5'-8"	11
U2	3	#4	3	5'-6"	11
U3	22	#4	3	5'-6"	81
U4	22	#4	3	4'-6"	66
REINFORCING STEEL					6221 LBS.
SP-3	2	*	4	501'-8"	1046
SP-2	2	**	5	127'-0"	170
SPIRAL COLUMN REINFORCING STEEL					1216 LBS.
* THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					



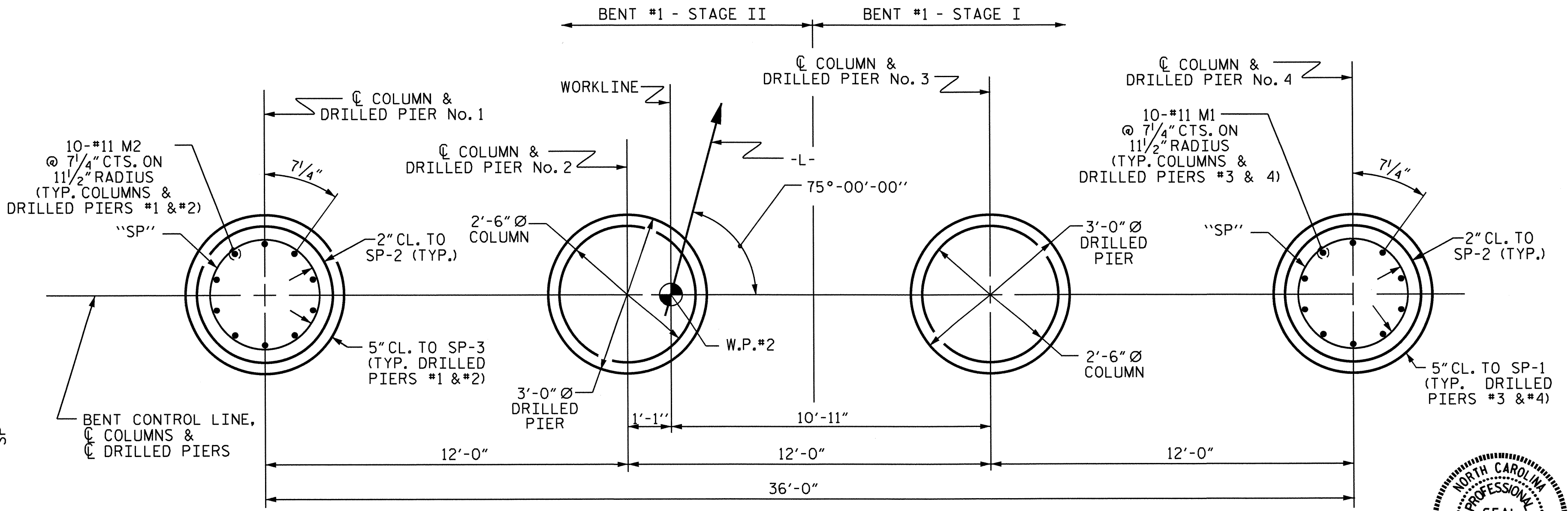
END ELEVATION



END OF CAP VIEW (TYPICAL BOTH ENDS)

TOTAL BILL OF MATERIAL				
	STAGE I	STAGE II	TOTAL	
DRILLED PIER CONCRETE	CU. YDS.	5.4	16.2	21.6
3'-0" Ø DRILLED PIER IN SOIL	LIN. FT.	7.50	23.50	31.00
3'-0" Ø DRILLED PIER NOT IN SOIL	LIN. FT.	13.00	38.00	51.00
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	LIN. FT.	7.18	17.58	24.76
CSL TUBES	LIN. FT.	94.00	258.00	352.00
CLASS A CONCRETE	CU. YDS.	10.6	11.1	21.7
REINFORCING STEEL	LBS.	4112	6221	10333
SPIRAL COLUMN REINFORCING STEEL	LBS.	519	1216	1735

CLASS A CONCRETE BREAKDOWN (STAGE I)		CLASS A CONCRETE BREAKDOWN (STAGE II)	
POUR #2 (COLUMNS)	1.5 C.Y.	POUR #2 (COLUMNS)	1.5 C.Y.
POUR #3 (CAP)	9.1 C.Y.	POUR #3 (CAP)	9.6 C.Y.
TOTAL CLASS A CONCRETE 10.6 C.Y.		TOTAL CLASS A CONCRETE 11.1 C.Y.	
DRILLED PIERS (STAGE I)		DRILLED PIERS (STAGE II)	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	5.4 C.Y.	DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	16.2 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	13.00 LIN. FT.	3'-0" Ø DRILLED PIER NOT IN SOIL	38.00 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	7.50 LIN. FT.	3'-0" Ø DRILLED PIER IN SOIL	23.50 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	7.18 LIN. FT.	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	17.58 LIN. FT.
CSL TUBES	94.00 LIN. FT.	CSL TUBES	258.00 LIN. FT.



PLAN OF DRILLED PIERS & COLUMNS

DRAWN BY: HPK/VXN DATE: 7-13
 CHECKED BY: D. HODGE DATE: 8-13
 DESIGN ENGINEER OF RECORD: HPK DATE: 8-13

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PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 3 OF 3
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 STAGE I & II

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

Wael S. Hrafat
 9-23-13

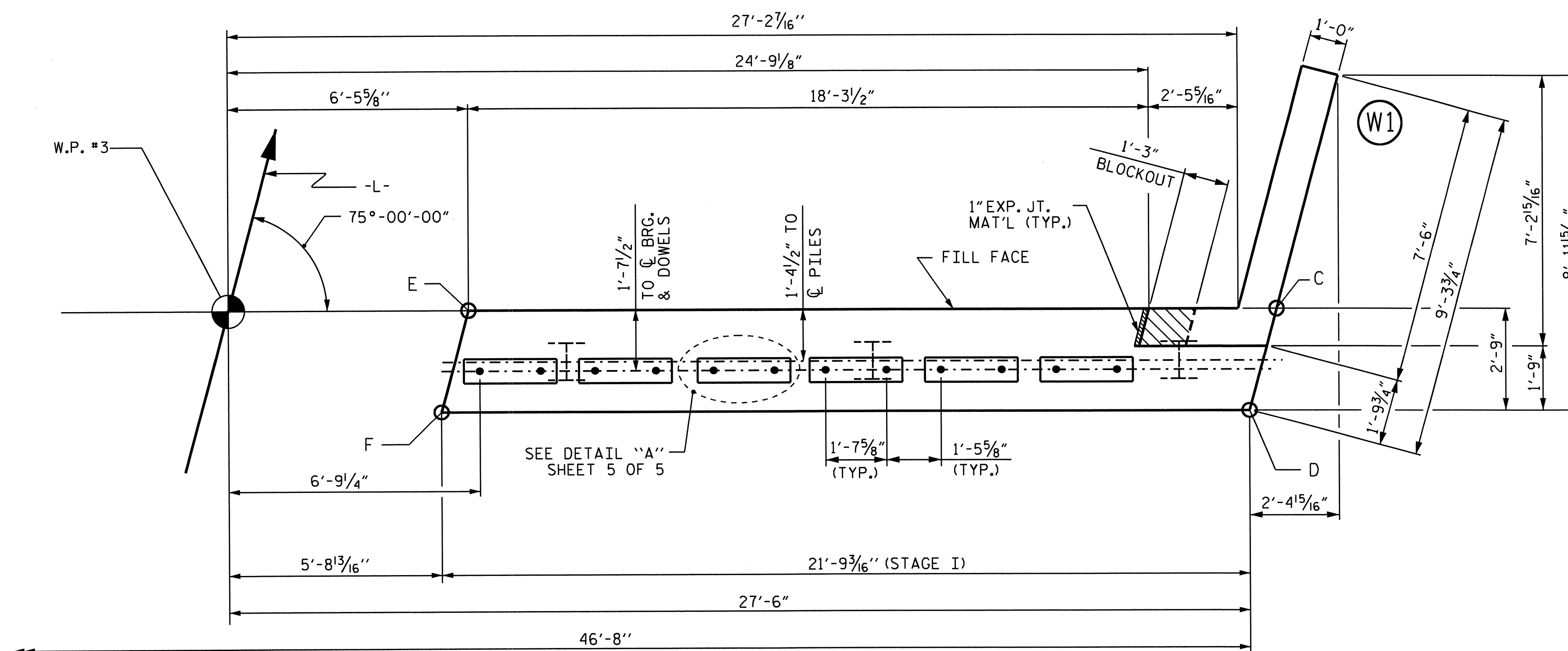
NOTES

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

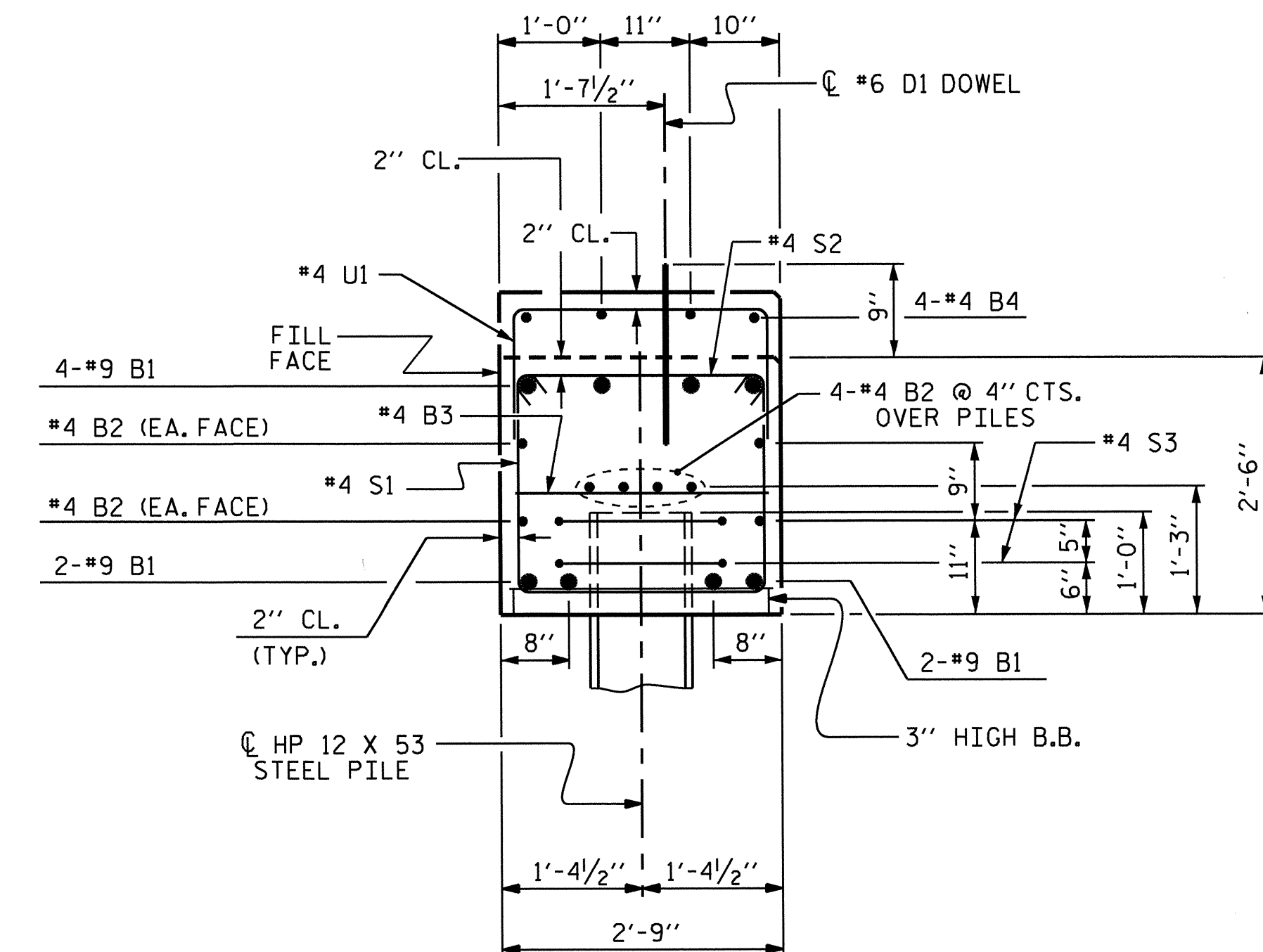
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 5 OF 5.

	TOP OF CAP ELEVATIONS
(C)	2829.08
(D)	2829.08
(E)	2829.52
(F)	2829.52

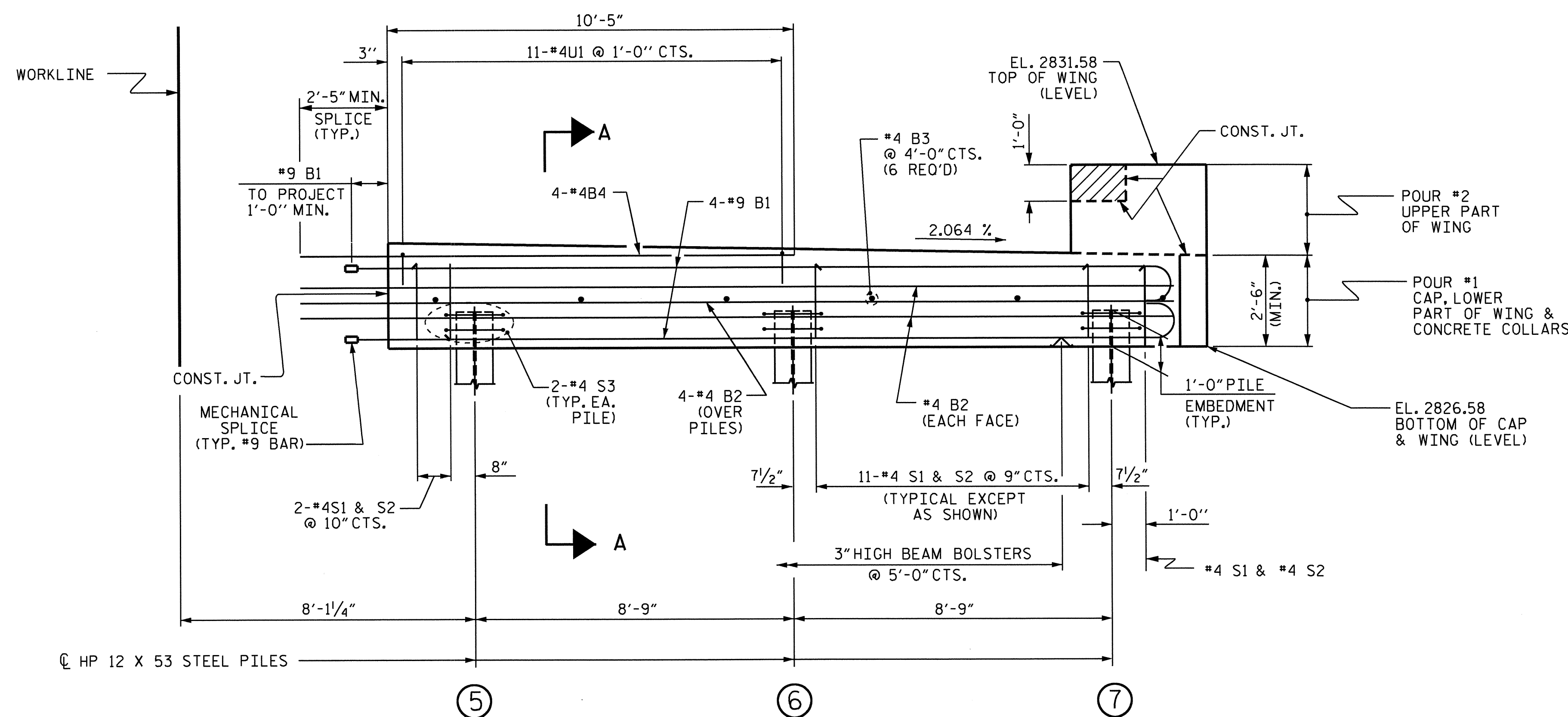


PLAN



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5)



ELEVATION

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5.

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

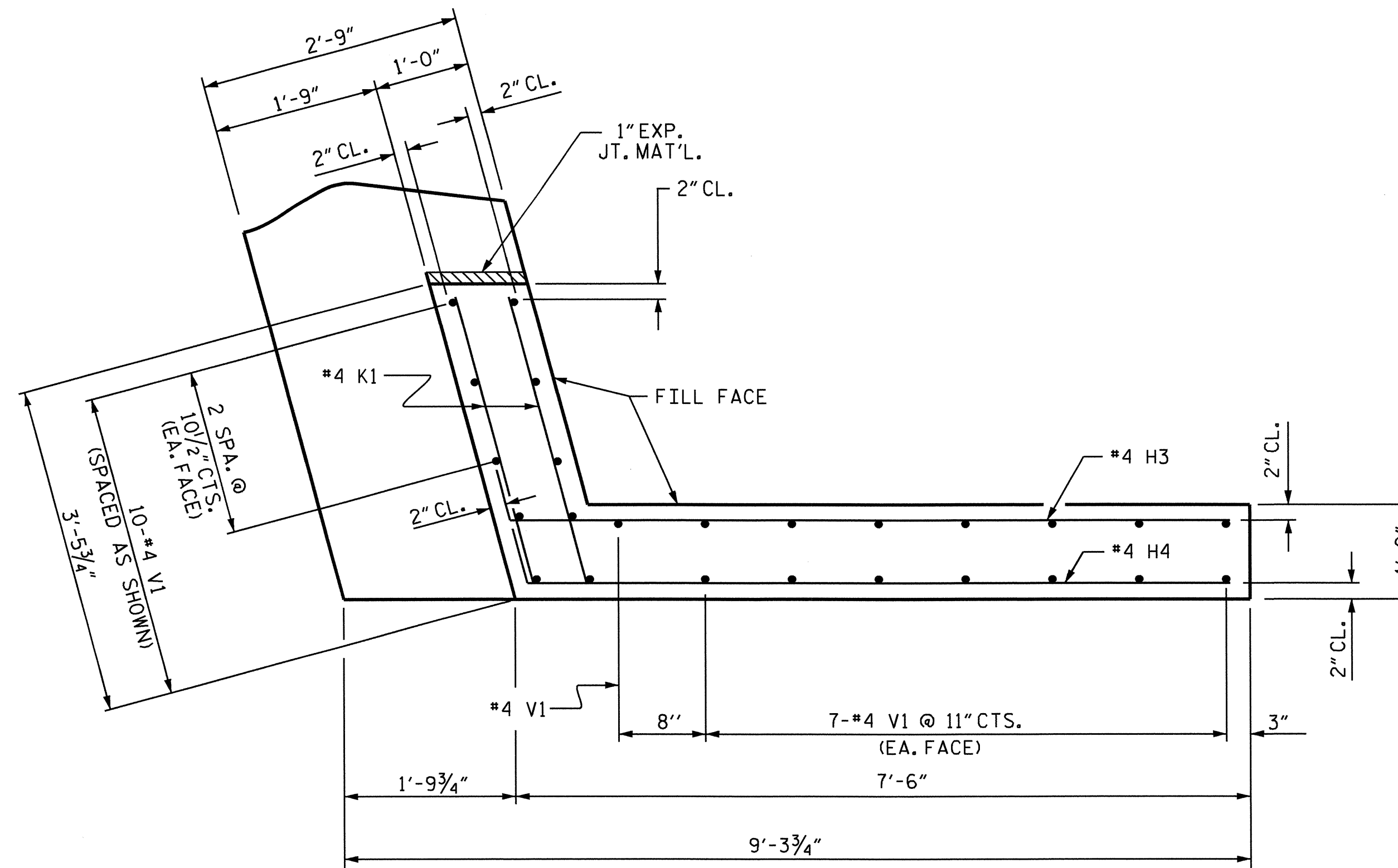
SUBSTRUCTURE
 END BENT No. 2
 STAGE I



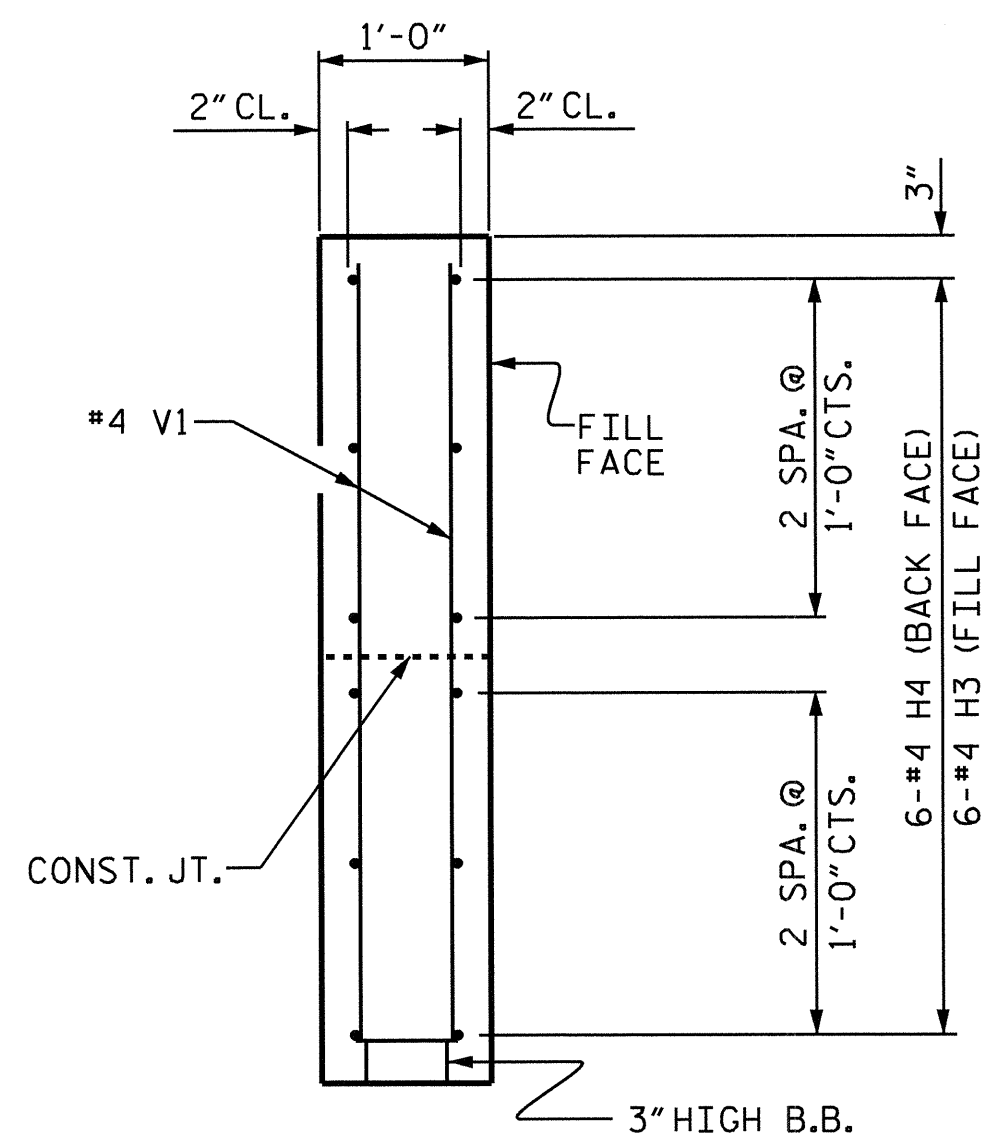
Wael S. Arafa
 9-23-13

REVISIONS						TOTAL SHEETS
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2			4			

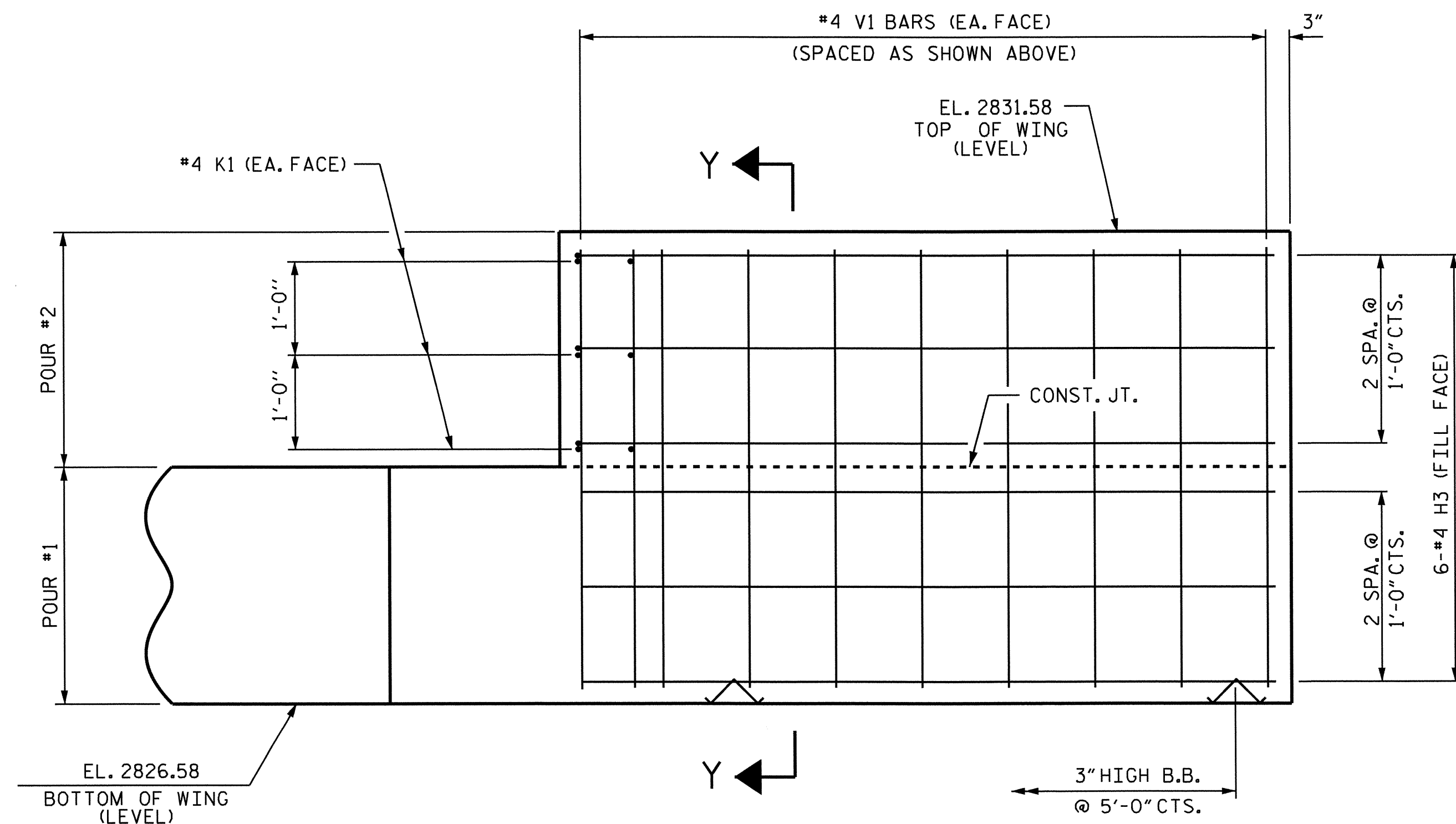
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 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE : 8-13



PLAN OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W1)

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

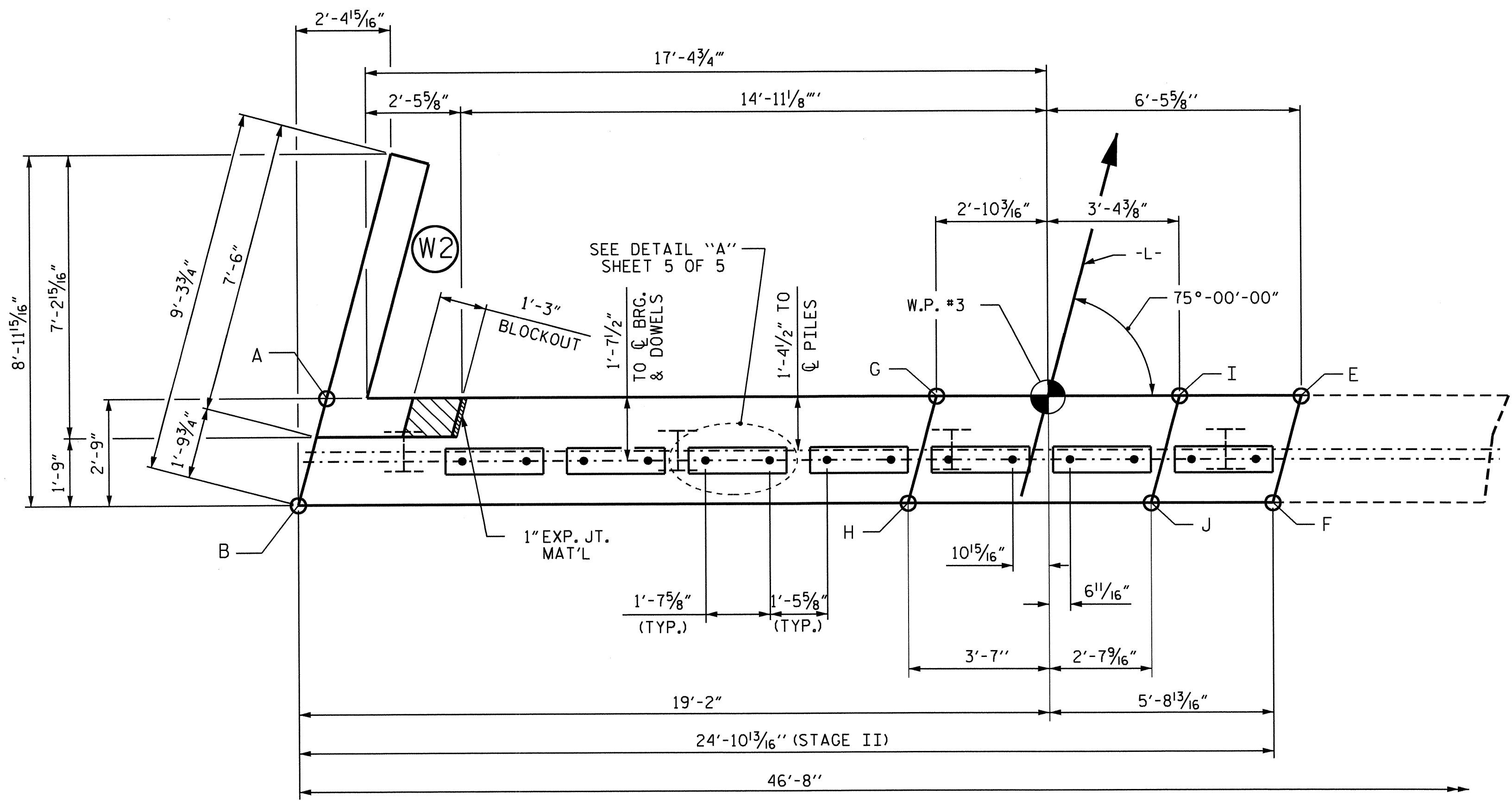
SUBSTRUCTURE
 END BENT No. 2
 WING DETAILS
 STAGE I



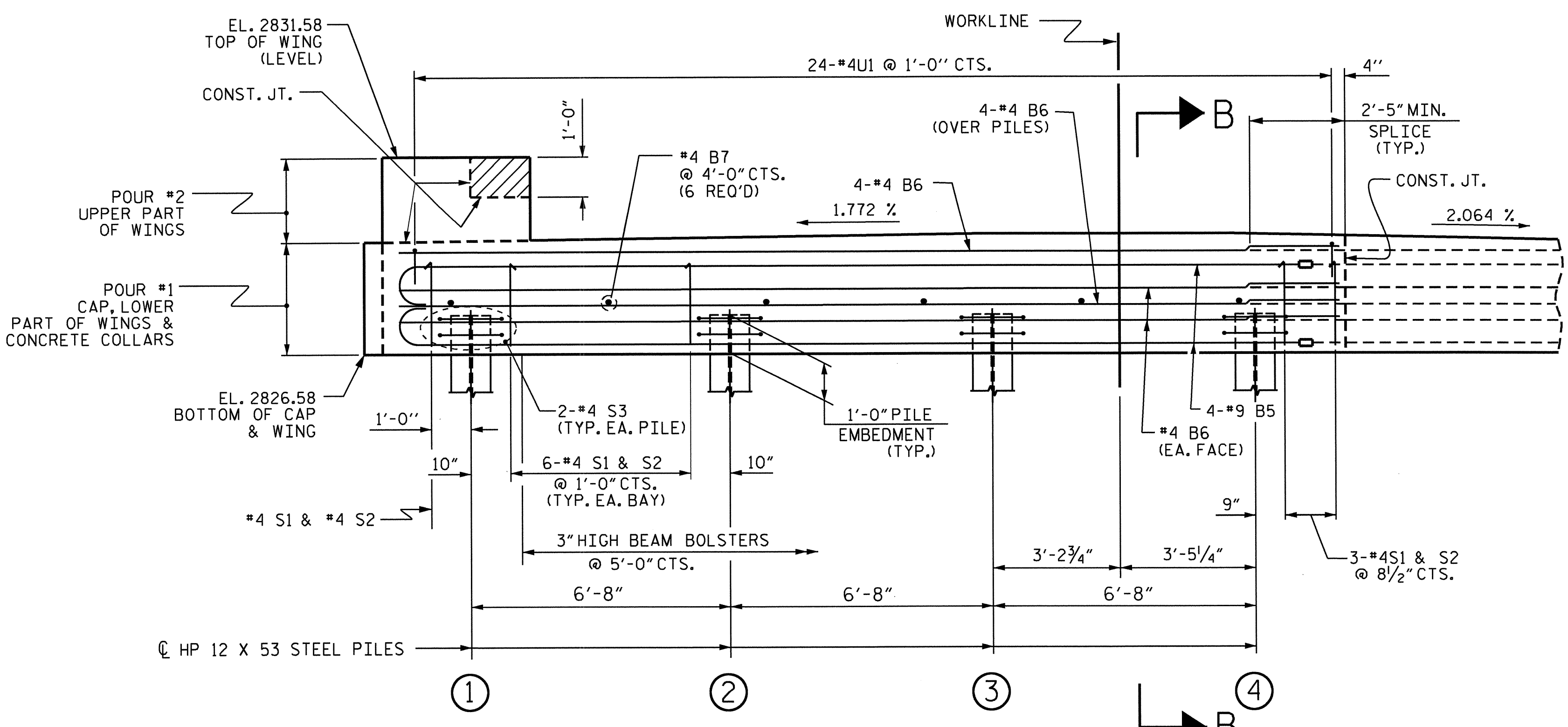
Wael S. Arafa
 9-23-13

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE : 8-13

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



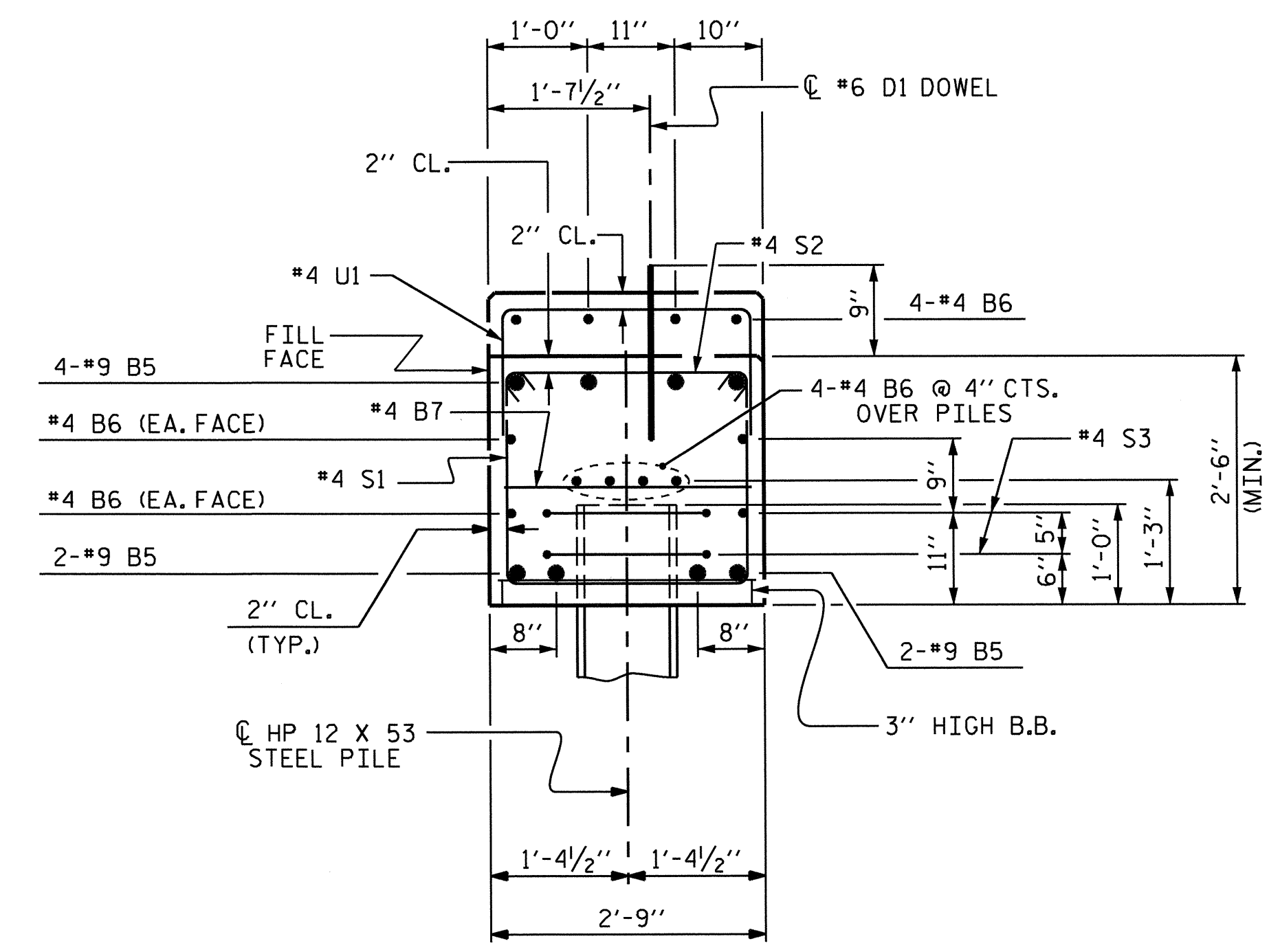
PLAN



ELEVATION

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5.

	TOP OF CAP ELEVATIONS
(A)	2829.32
(B)	2829.32
(C)	2829.60
(H)	2829.60
(I)	2829.59
(J)	2829.59
(E)	2829.52
(F)	2829.52



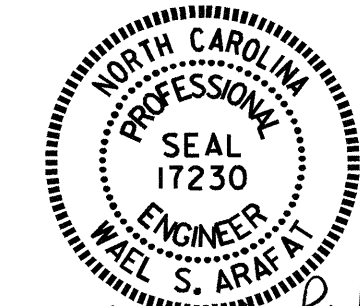
SECTION B-B

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 5)

PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

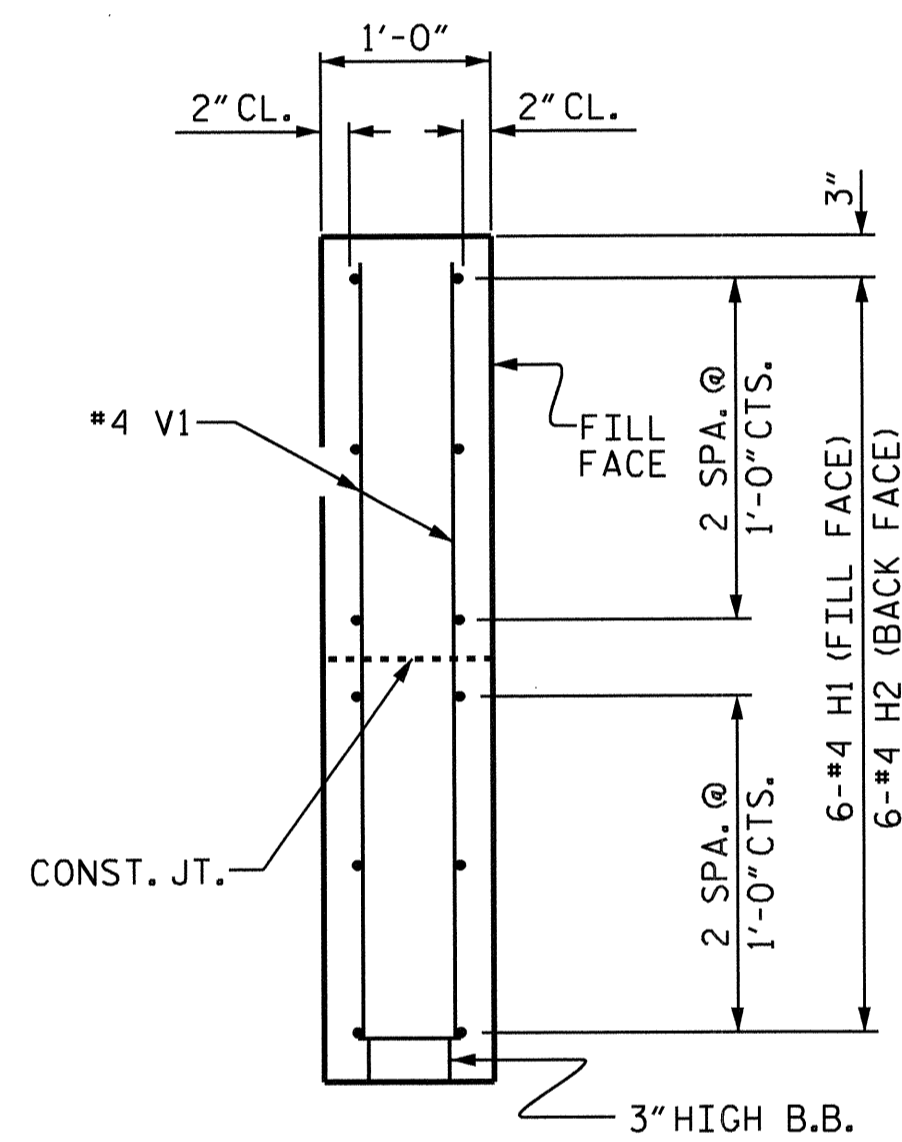
SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-29
SUBSTRUCTURE END BENT No. 2 STAGE II						TOTAL SHEETS 34
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

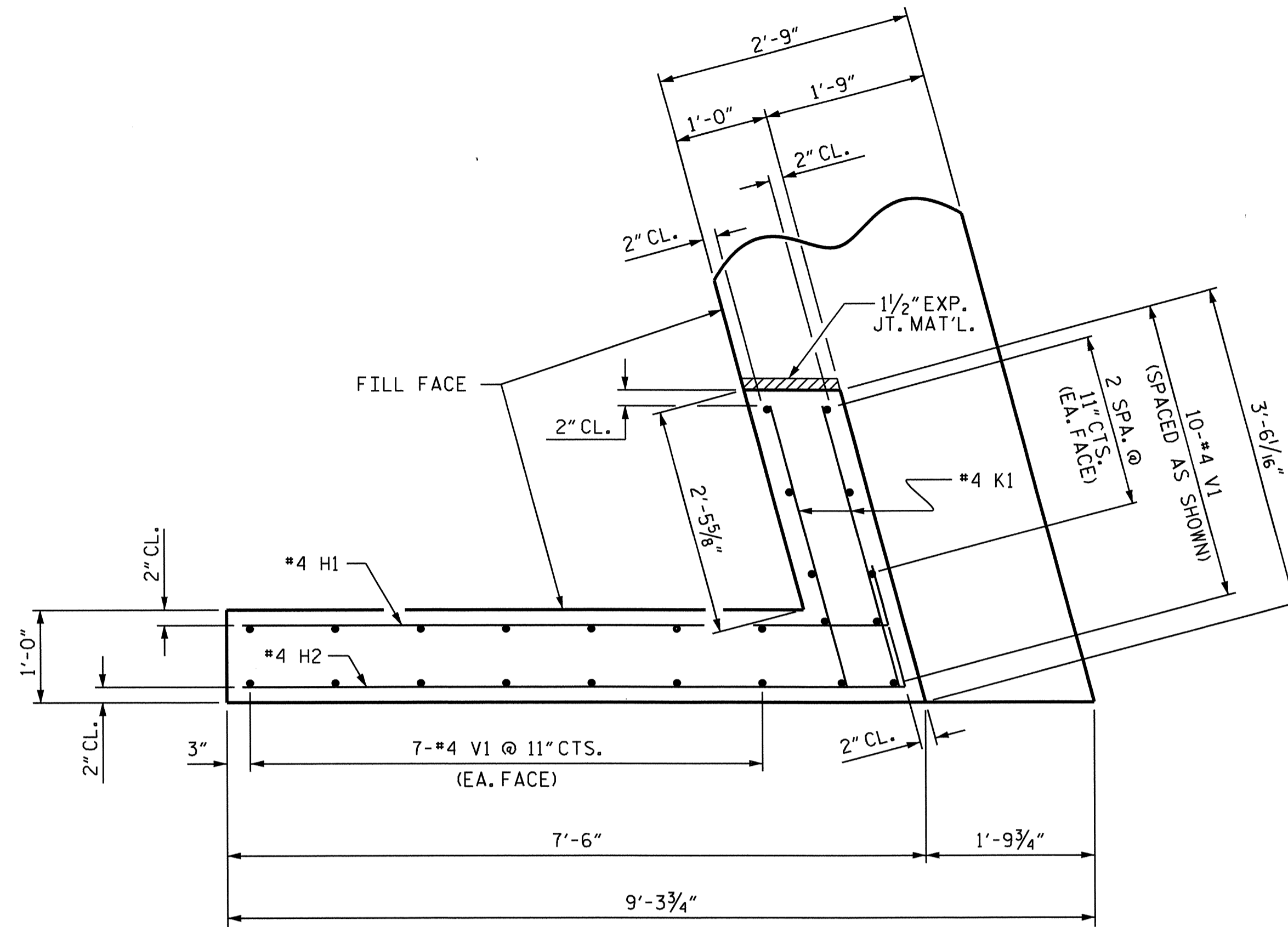


Wael S. Arafa
 9.23.13

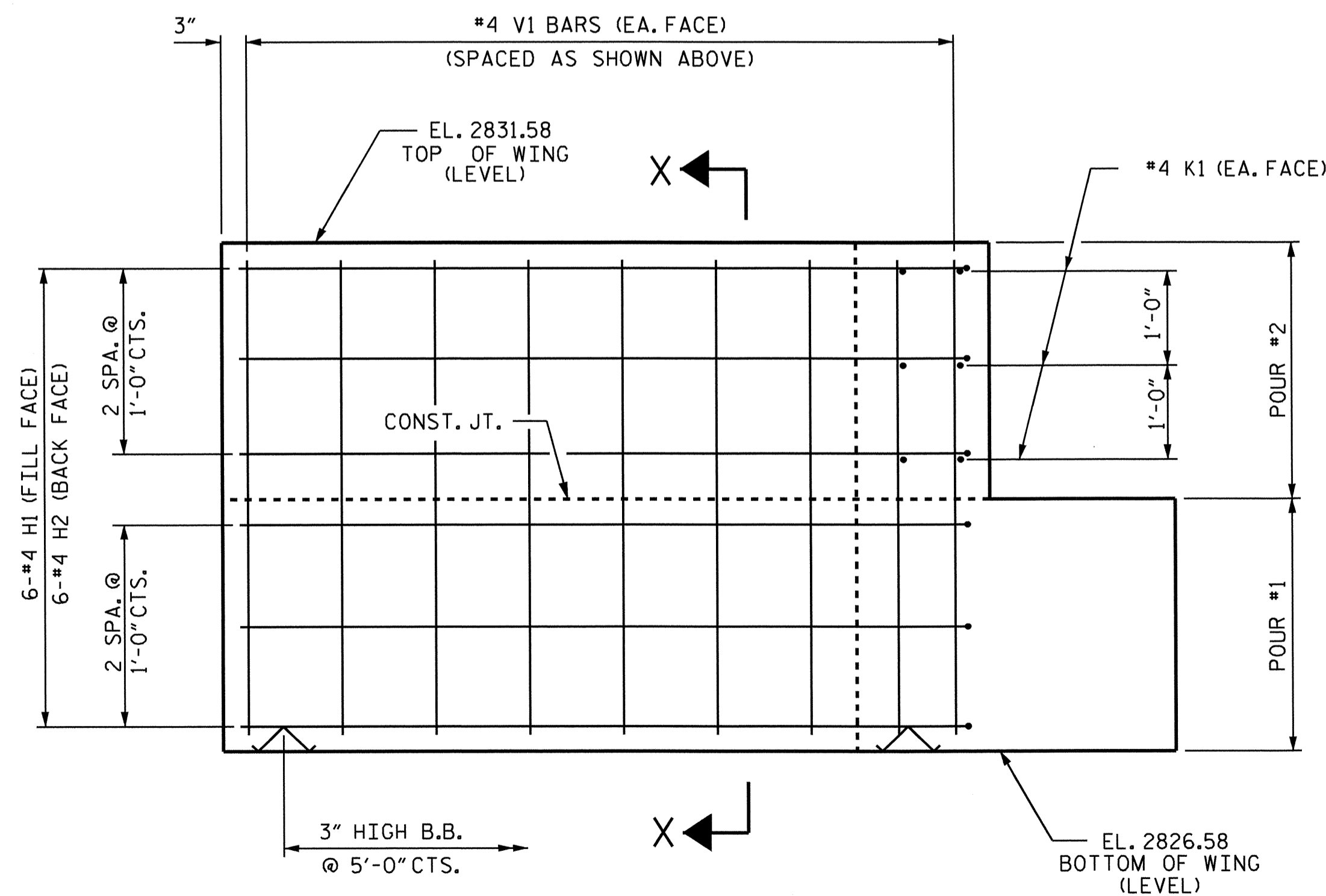
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 CHECKED BY: D. HODGE DATE: 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE: 8-13



SECTION X-X



PLAN OF WING (W2)



ELEVATION OF WING (W2)

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2
 WING DETAILS
 STAGE II

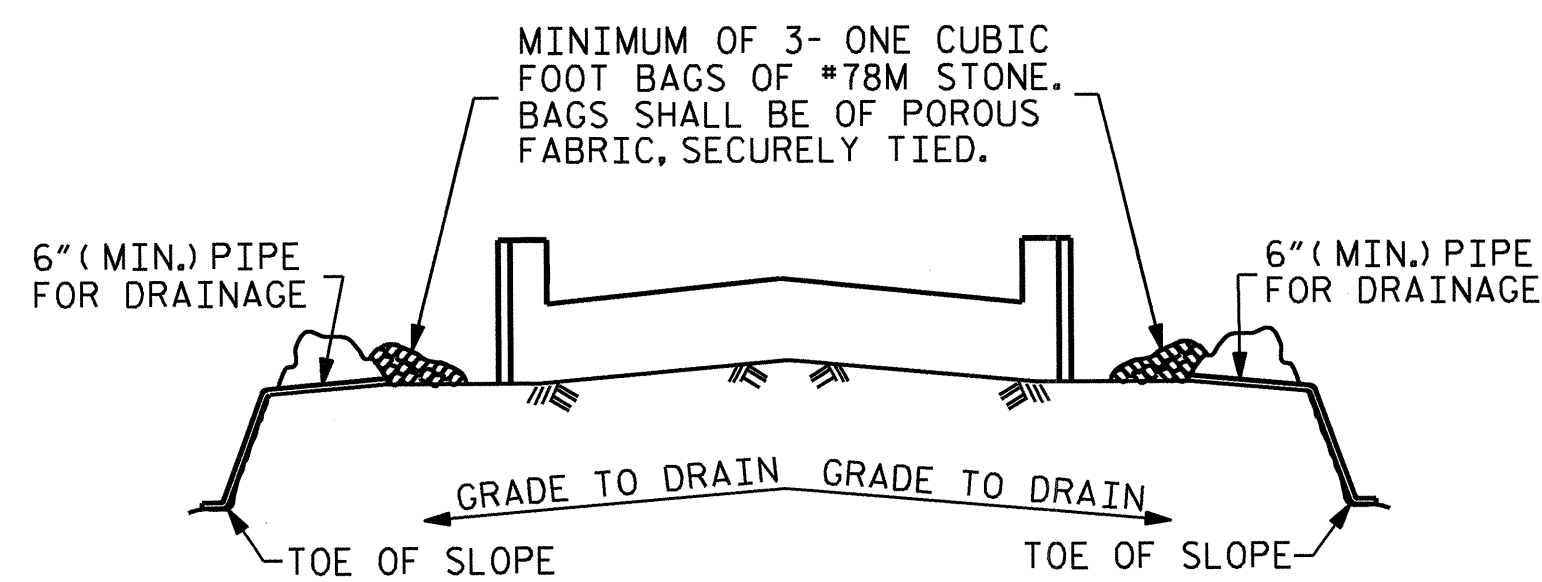


Wael S. Arafa
 9-23-13

DRAWN BY : V.X. NGUYEN DATE : 7-13
 CHECKED BY : D. HODGE DATE : 8-13
 DESIGN ENGINEER OF RECORD: H.P. KIM DATE : 8-13

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REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS	
2			4			34	

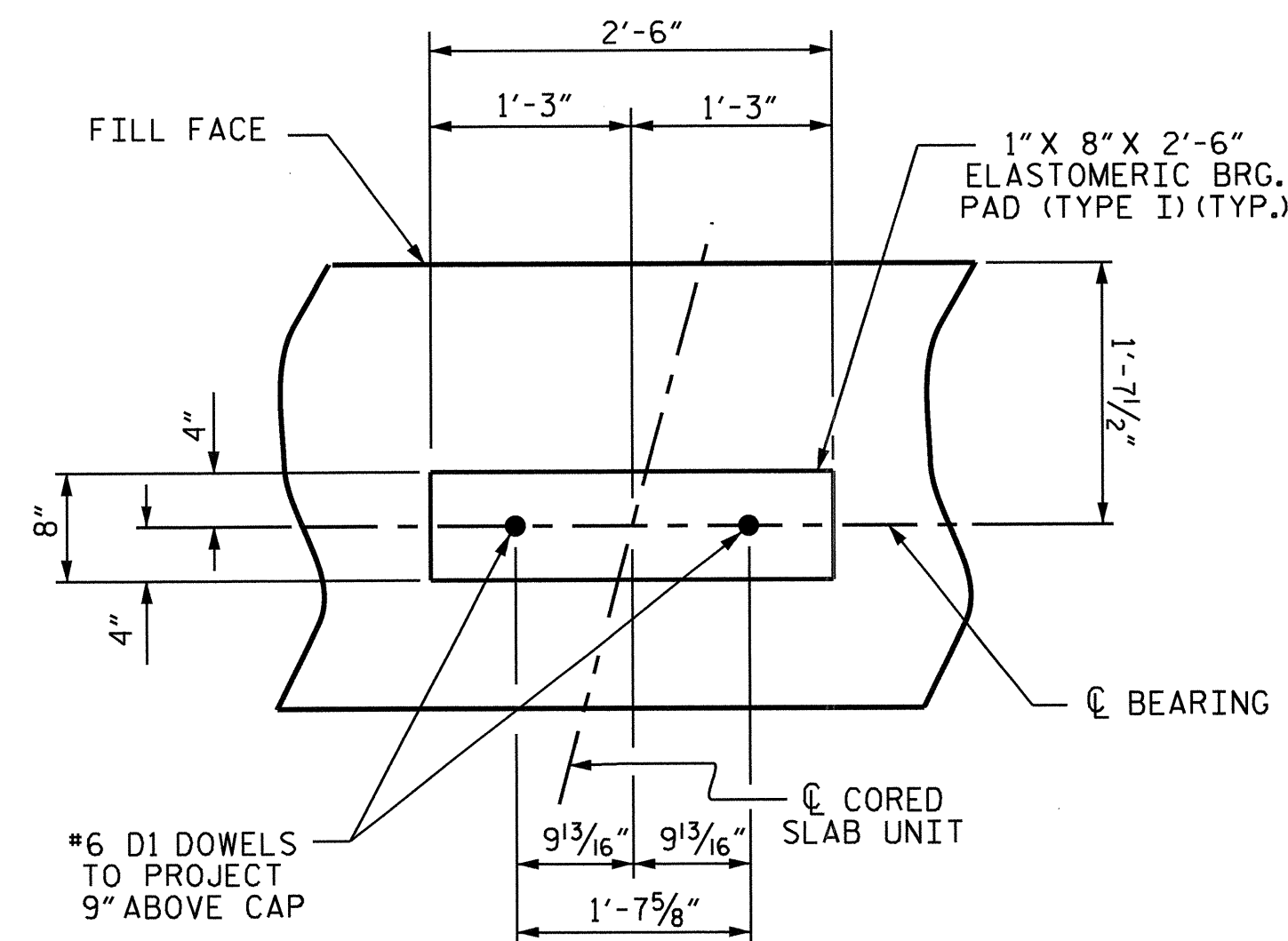


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

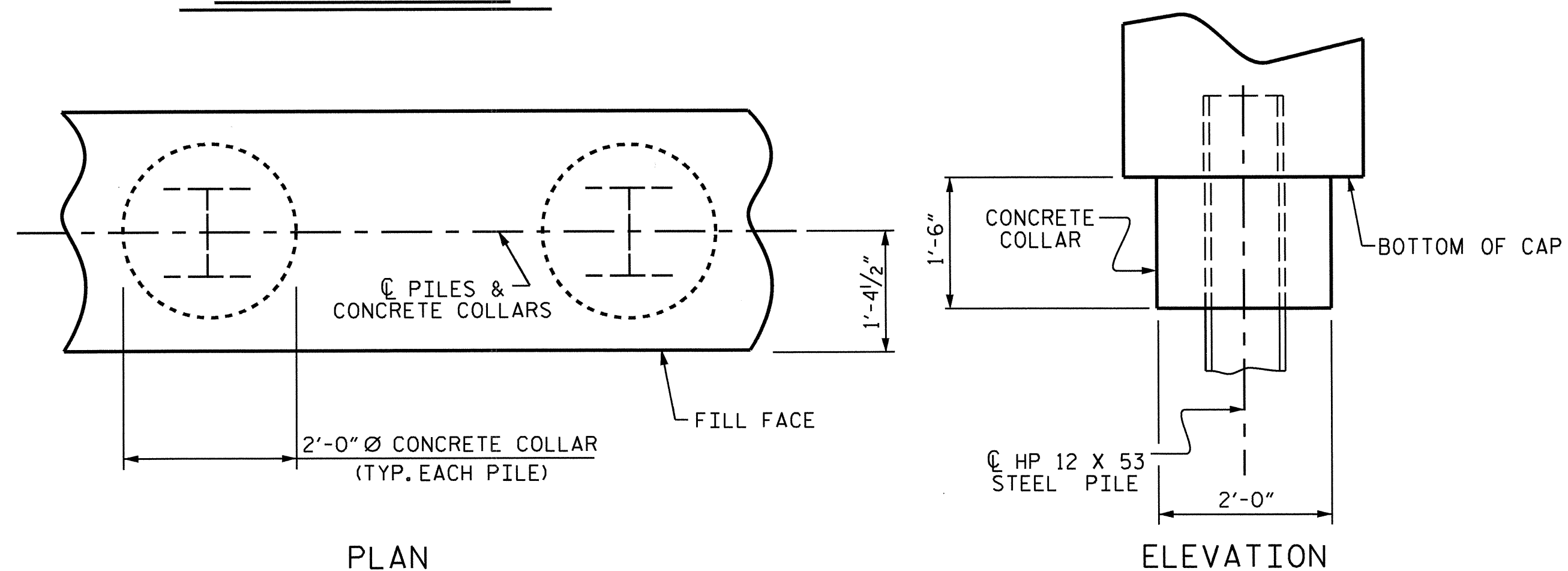
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

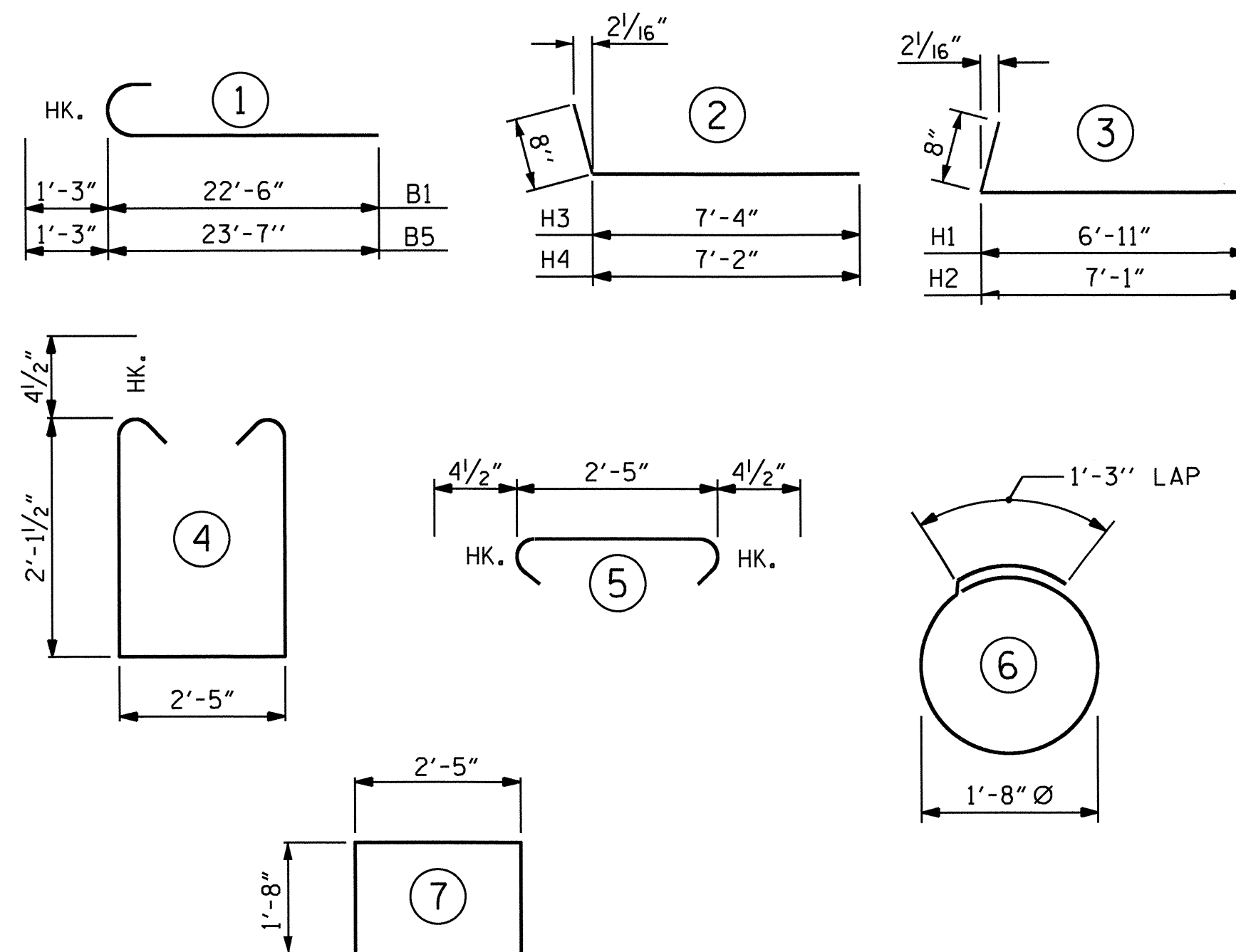


DETAIL "A"



CORROSION PROTECTION FOR STEEL PILES DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL BILL OF MATERIAL

	CLASS A CONCRETE	REINFORCING STEEL	HP 12 X 53 STEEL PILES	
	CU. YDS.	LBS.	No.	LIN. FT.
END BT. #2 - STAGE I	8.2	1245	3	60
END BT. #2 - STAGE II	9.3	1344	4	60
TOTAL	17.5	2589	7	120

BILL OF MATERIAL

END BENT No. 2 - STAGE I

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	23'-10"	648
B2	8	#4	STR	24'-2"	129
B3	6	#4	STR	2'-5"	10
B4	4	#4	STR	12'-10"	34
D1	12	#6	STR	1'-6"	27
H1	6	#4	3	7'-7"	30
H3	6	#4	2	8'-0"	32
H4	6	#4	2	7'-10"	31
K1	6	#4	STR	3'-1"	12
S1	25	#4	4	7'-5"	124
S2	25	#4	5	3'-2"	53
S3	6	#4	6	6'-6"	26
U1	11	#4	7	5'-9"	42
V1	25	#4	STR	4'-7"	77

REINFORCING STEEL 1245 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WING & COLLARS 7.2 C.Y.

POUR #2 UPPER PART OF WING 1.0 C.Y.

TOTAL CLASS A CONCRETE 8.2 C.Y.

BILL OF MATERIAL

END BENT No. 2 - STAGE II

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	8	#9	1	24'-10"	675
B6	12	#4	STR	24'-8"	198
B7	6	#4	STR	2'-5"	10
D1	14	#6	STR	1'-6"	32
H1	6	#4	3	7'-7"	30
H2	6	#4	3	7'-9"	31
K1	6	#4	STR	3'-1"	12
S1	22	#4	4	7'-5"	109
S2	22	#4	5	3'-2"	47
S3	8	#4	6	6'-6"	35
U1	24	#4	7	5'-9"	92
V1	24	#4	STR	4'-7"	73

REINFORCING STEEL 1344 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WING & COLLARS 8.5 C.Y.

POUR #2 UPPER PART OF WING 0.8 C.Y.

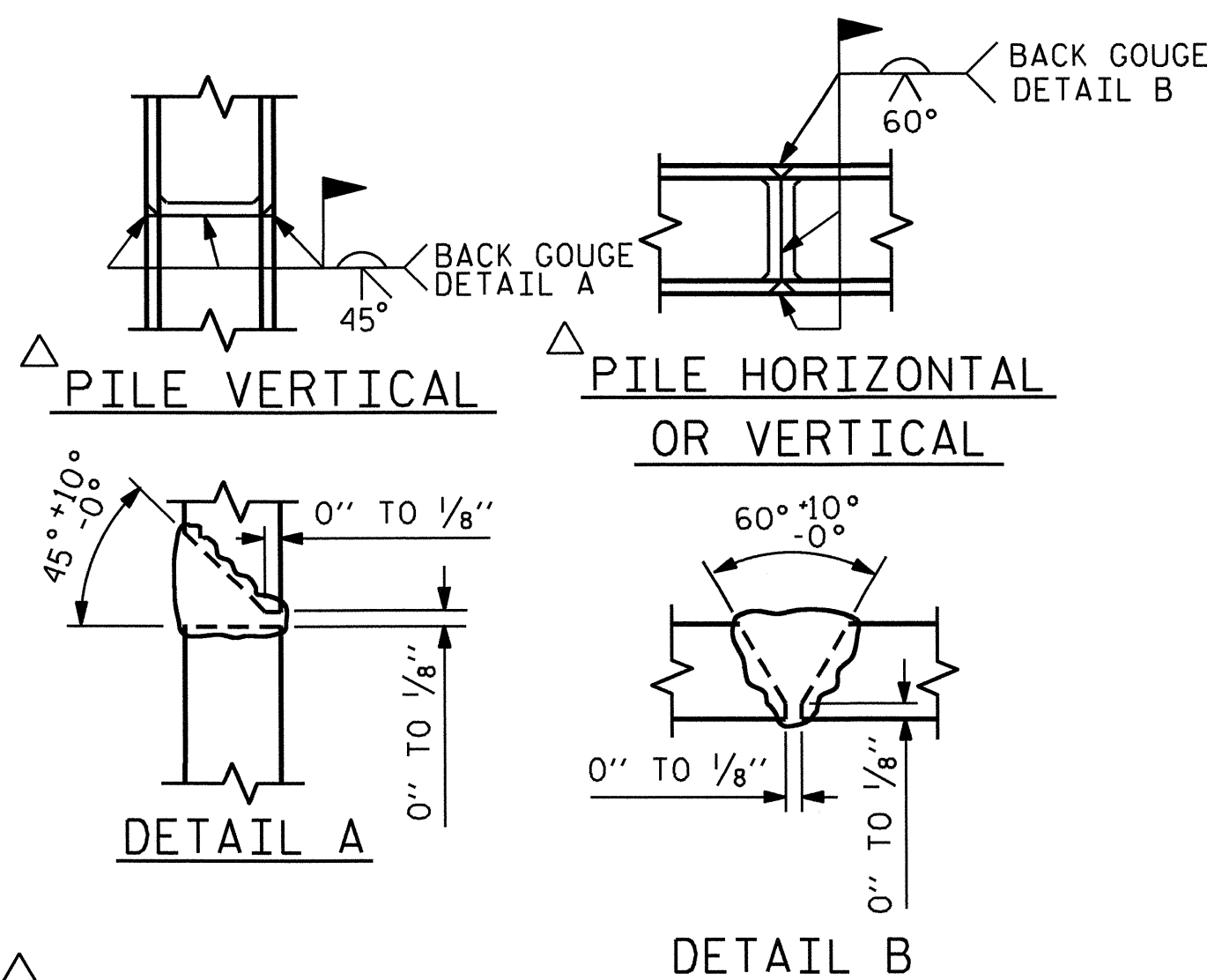
TOTAL CLASS A CONCRETE 9.3 C.Y.

END BENT No. 2 - STAGE I

HP 12 X 53 STEEL PILES	NO: 3	LIN. FT. = 60
------------------------	-------	---------------

END BENT No. 2 - STAGE II

HP 12 X 53 STEEL PILES	NO: 4	LIN. FT. = 60
------------------------	-------	---------------



PILE SPLICE DETAILS

PROJECT NO. B-4289

TRANSYLVANIA COUNTY

STATION: 20+27.50 -L-

SHEET 5 OF 5

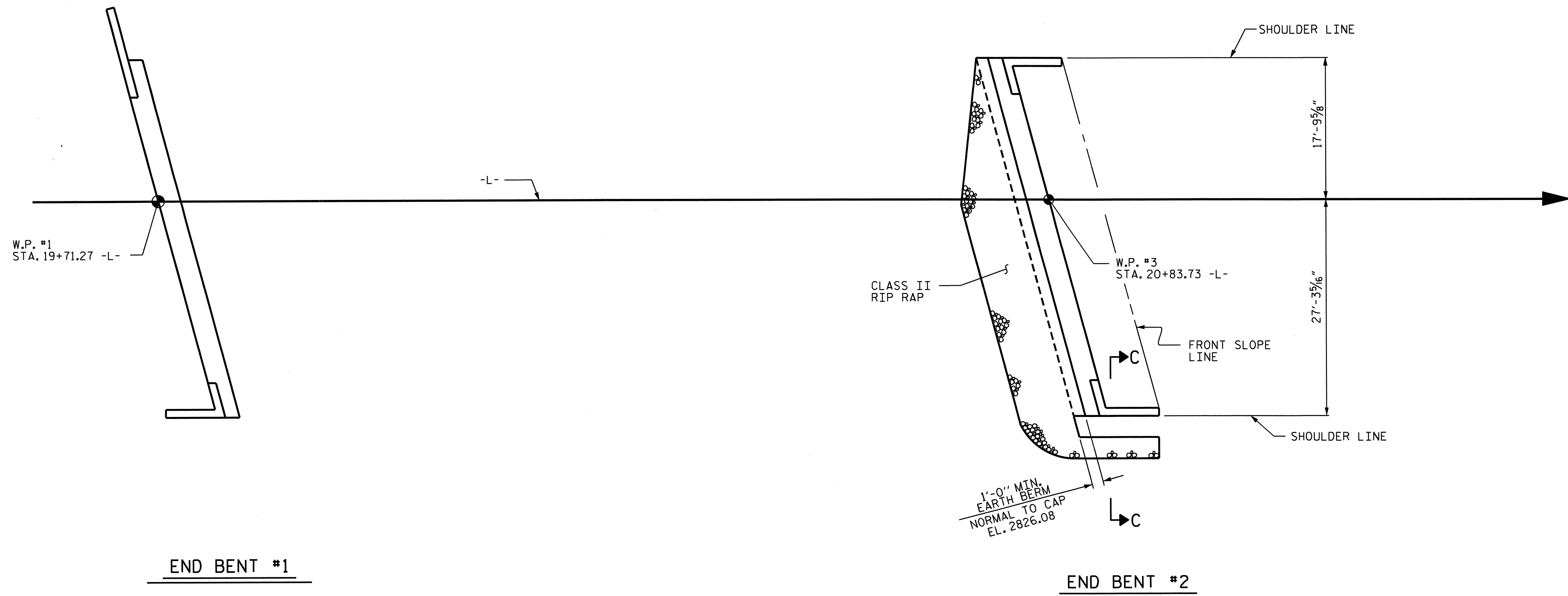
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
DETAILS
STAGES I & II

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT 9-23-13

DRAWN BY: V.X. NGUYEN DATE: 7-13
CHECKED BY: D. HODGE DATE: 8-13
DESIGN ENGINEER OF RECORD: H.P. KIM DATE: 8-13

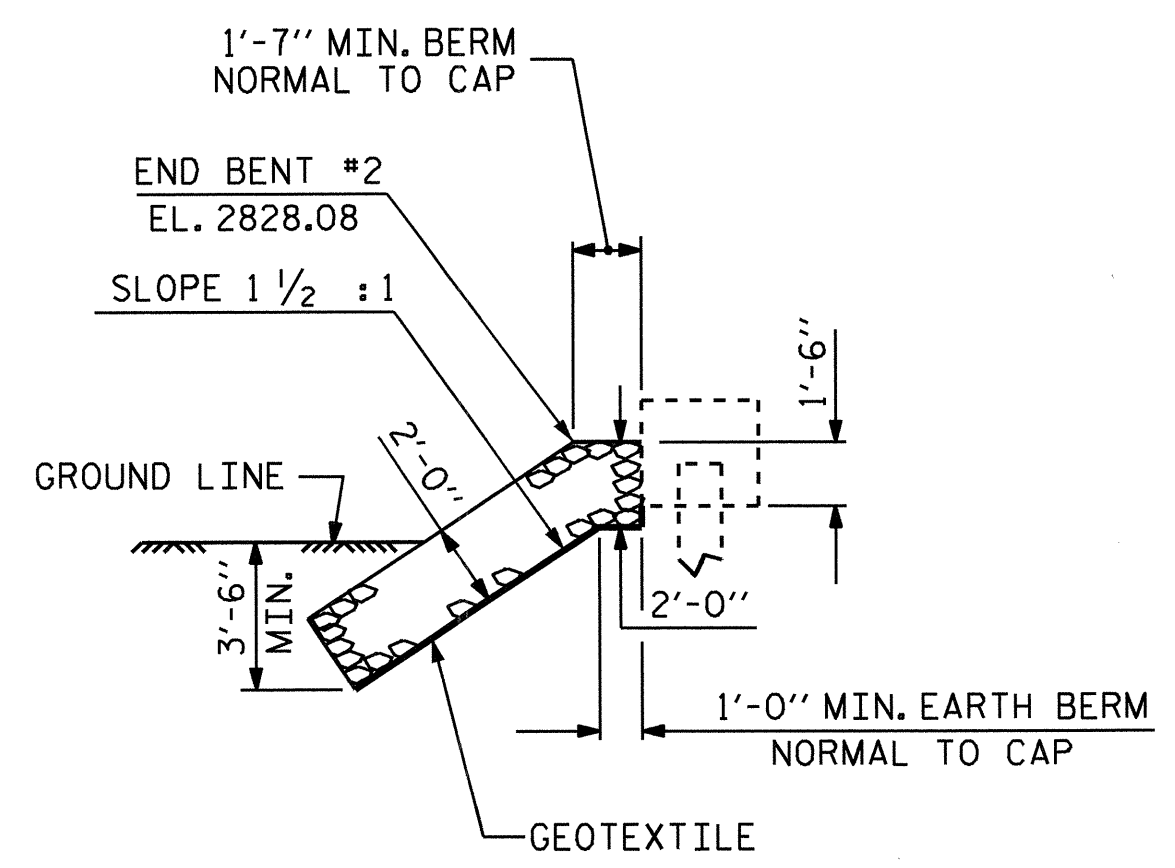


END BENT #1

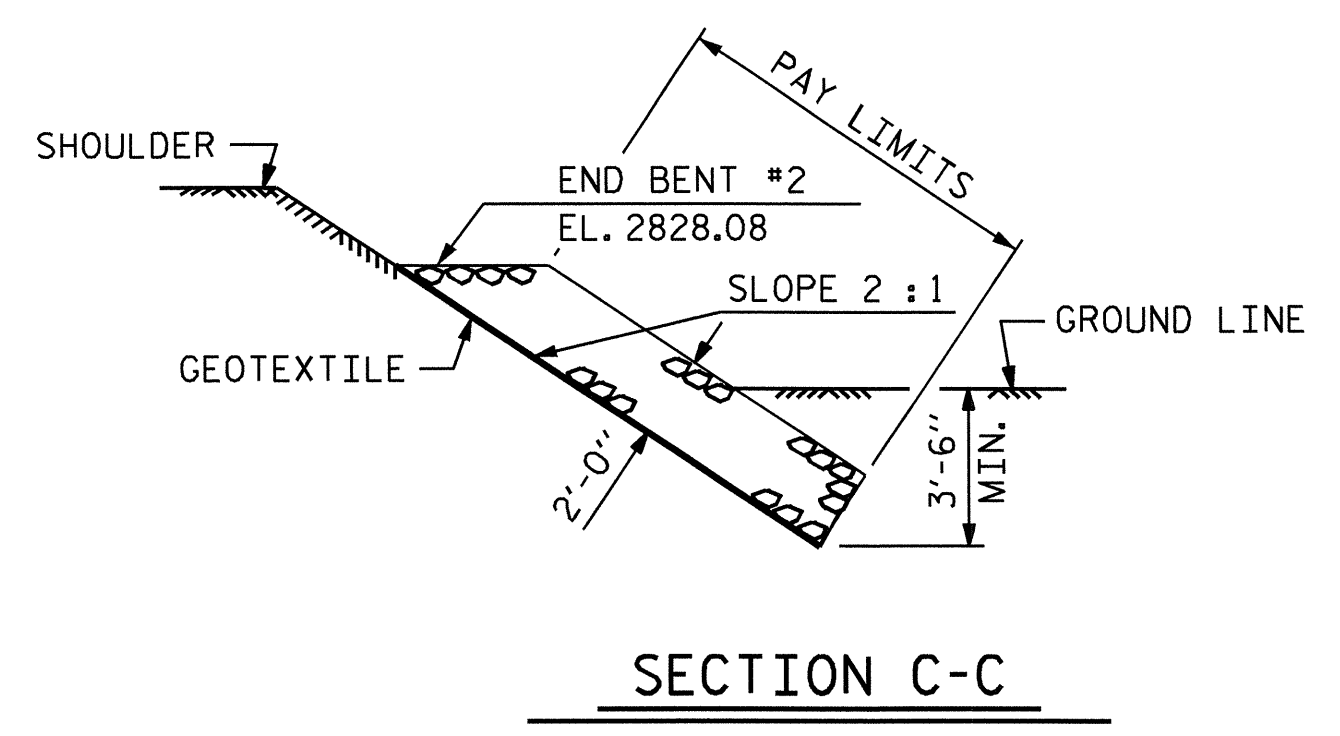
END BENT #2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+27.50-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	0	0
END BENT 2	40	45
TOTAL	40	45

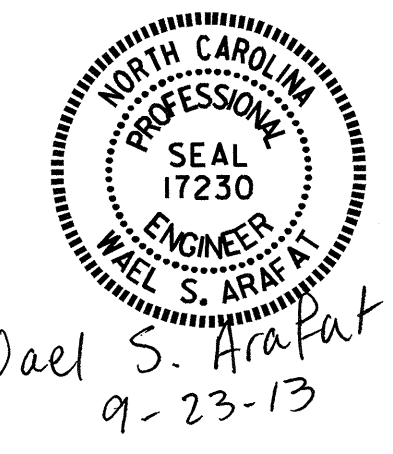


SECTION BERM RIP RAPPED @ END BENT #2



SECTION C-C

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-



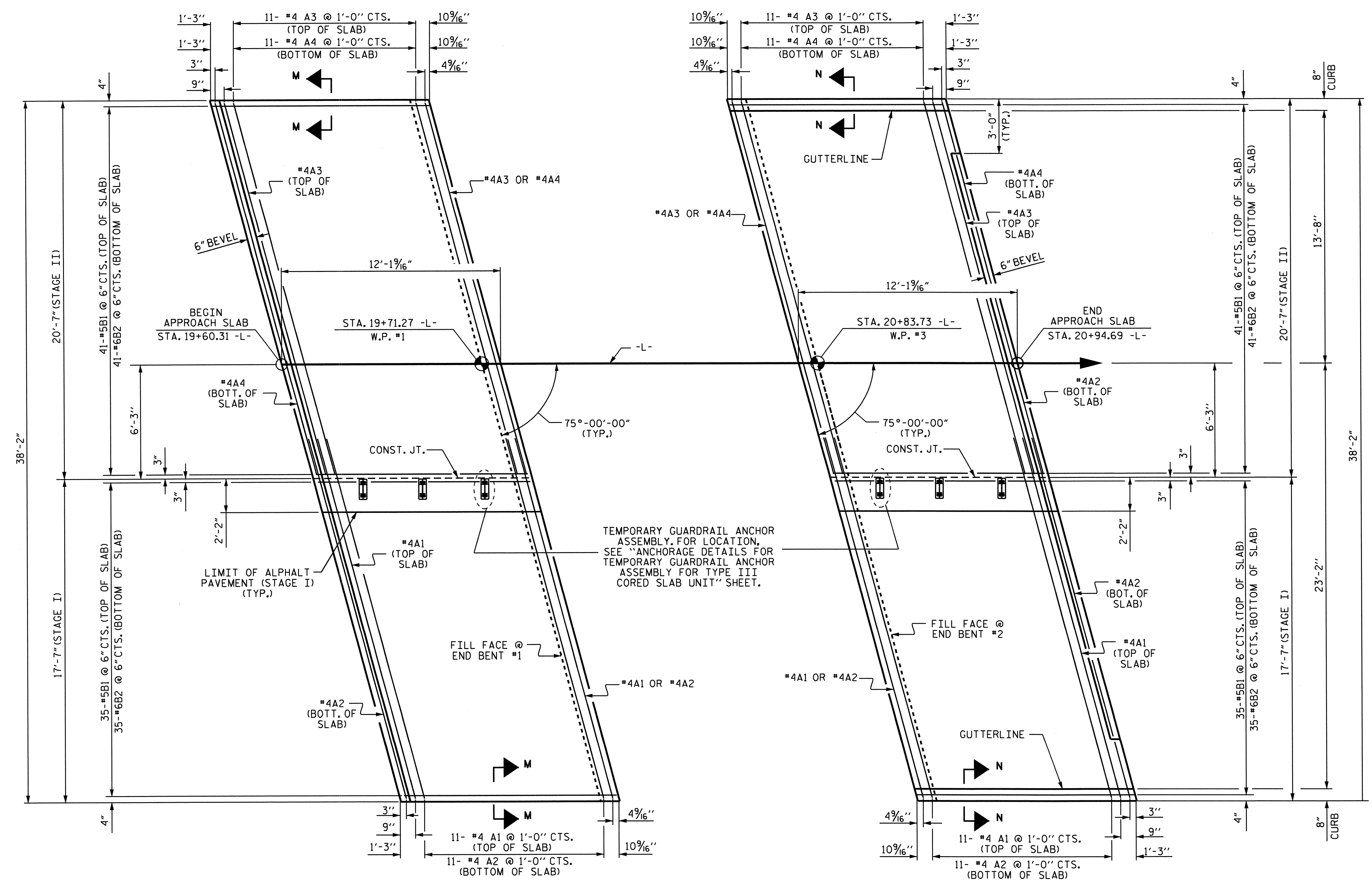
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 = RIP RAP DETAILS =

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

ASSEMBLED BY : V.X. NGUYEN DATE : 6/28/2013
 CHECKED BY : H. T. BARBOUR DATE : 8-13
 DRAWN BY : REK 1/84 REV. 10/17/00 RWW/LES
 CHECKED BY : RDU 1/84 REV. 5/1/06R TLA/GM
 REV. 10/1/11 MAA/GM

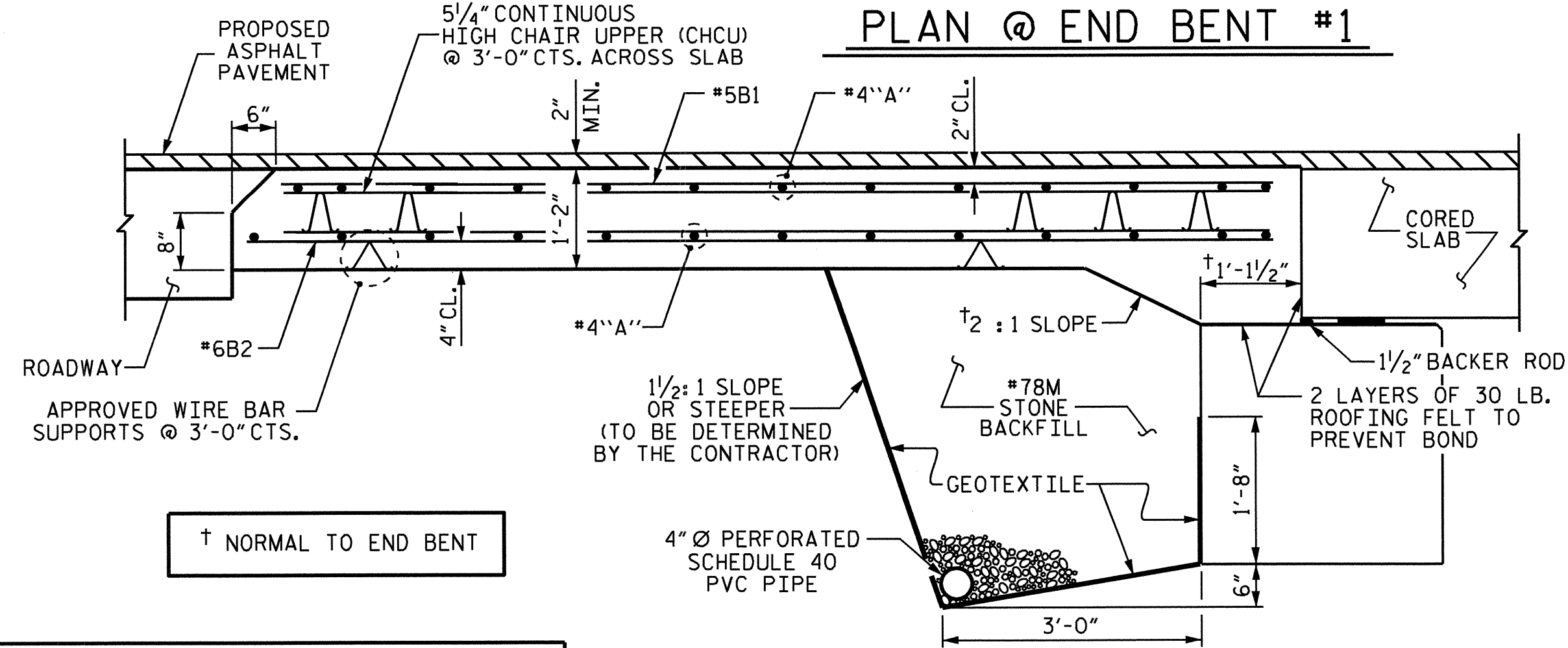
BILL OF MATERIAL											
APPROACH SLAB AT EB #1 (STAGE I)						APPROACH SLAB AT EB #2 (STAGE I)					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	20'-2"	175	*A1	13	#4	STR	20'-2"	175
A2	13	#4	STR	19'-11"	173	A2	13	#4	STR	19'-11"	173
*B1	35	#5	STR	11'-1"	405	*B1	35	#5	STR	11'-1"	405
B2	35	#6	STR	11'-7"	609	B2	35	#6	STR	11'-7"	609
REINFORCING STEEL				LBS.	782	REINFORCING STEEL				LBS.	782
*EPOXY COATED REINFORCING STEEL				LBS.	580	*EPOXY COATED REINFORCING STEEL				LBS.	580
CLASS AA CONCRETE				C. Y.	11.5	CLASS AA CONCRETE				C. Y.	10.1
APPROACH SLAB AT EB #1 (STAGE II)						APPROACH SLAB AT EB #2 (STAGE II)					
*A3	13	#4	STR	21'-0"	182	*A3	13	#4	STR	21'-0"	182
A4	13	#4	STR	21'-0"	182	A4	13	#4	STR	21'-0"	182
*B1	41	#5	STR	11'-1"	474	*B1	41	#5	STR	11'-1"	474
B2	41	#6	STR	11'-7"	713	B2	41	#6	STR	11'-7"	713
REINFORCING STEEL				LBS.	895	REINFORCING STEEL				LBS.	895
*EPOXY COATED REINFORCING STEEL				LBS.	656	*EPOXY COATED REINFORCING STEEL				LBS.	656
CLASS AA CONCRETE				C. Y.	13.4	CLASS AA CONCRETE				C. Y.	11.8

SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

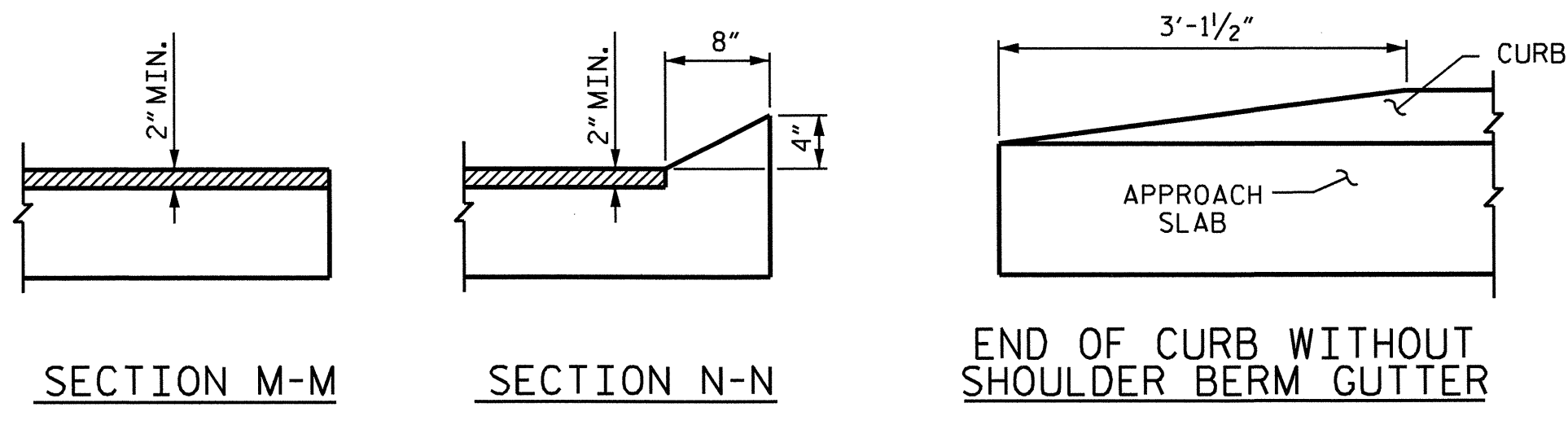


PLAN @ END BENT #1

PLAN @ END BENT #2



SECTION THRU SLAB



CURB DETAILS

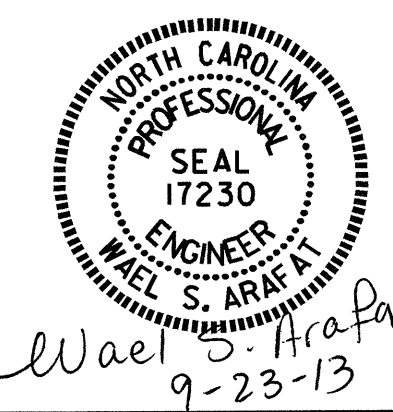
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PROJECT NO. B-4289
 TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 1 OF 2

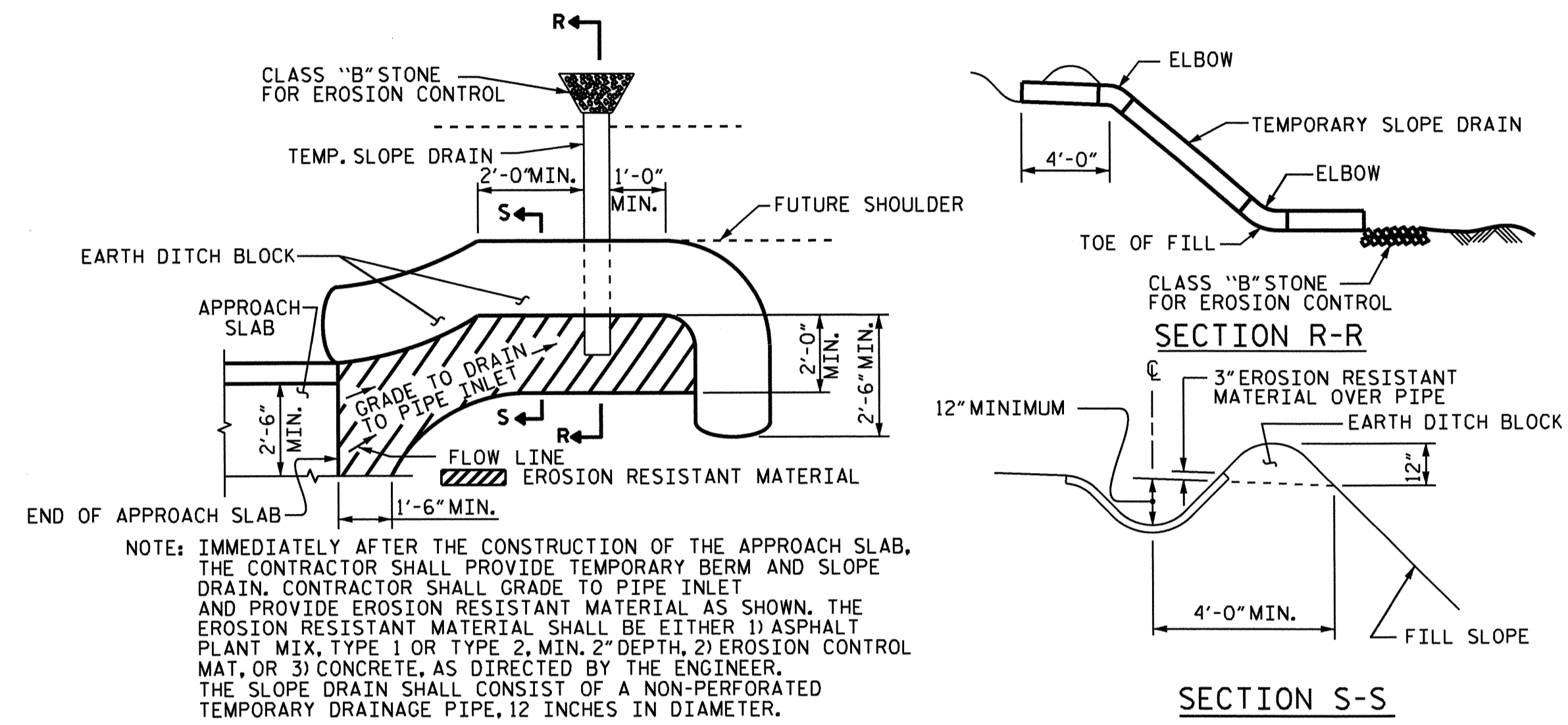
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (SUB-REGIONAL TIER)
 75° SKEW



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33	
1			3			TOTAL SHEETS	34
2			4				

NOTES

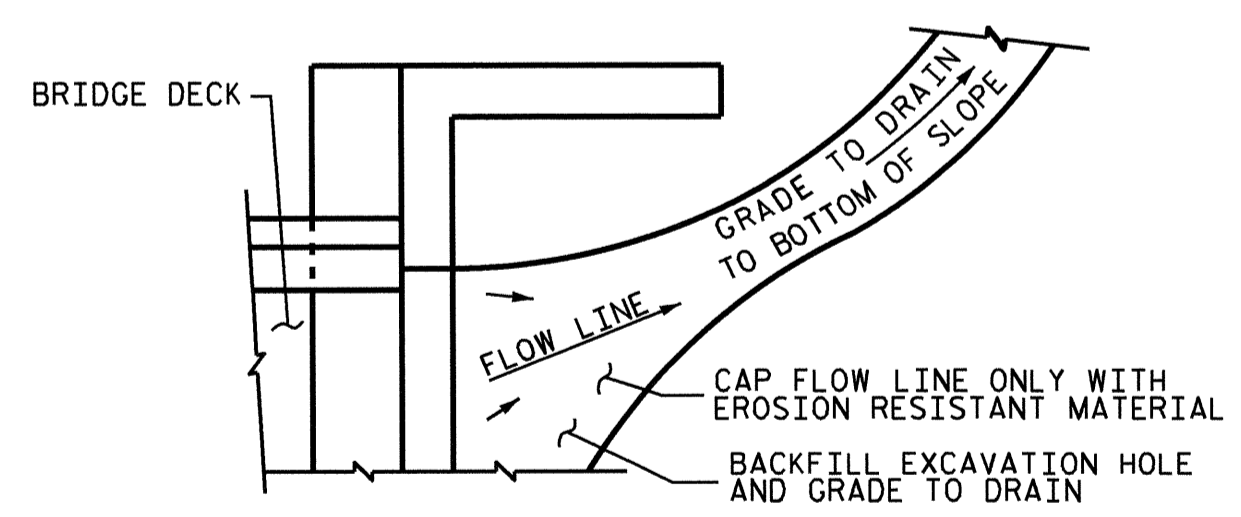
- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- #78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 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.



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



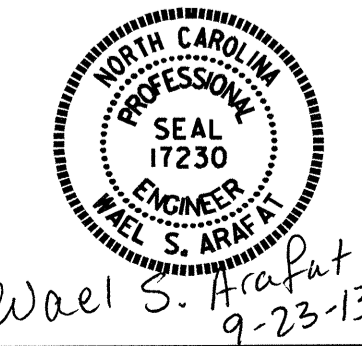
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4289
TRANSYLVANIA COUNTY
 STATION: 20+27.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-34
					TOTAL SHEETS 34



ASSEMBLED BY : V. NGUYEN	DATE : 8/2/13
CHECKED BY : H. T. BARBOUR	DATE : 8/9/13
DRAWN BY : SHS/MAA 5-09	REV. 12-11 MAA/AAC
CHECKED BY : BCH 5-09	

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

REINFORCING STEEL:

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

STRUCTURAL STEEL:

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

HANDRAILS AND POSTS:

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN