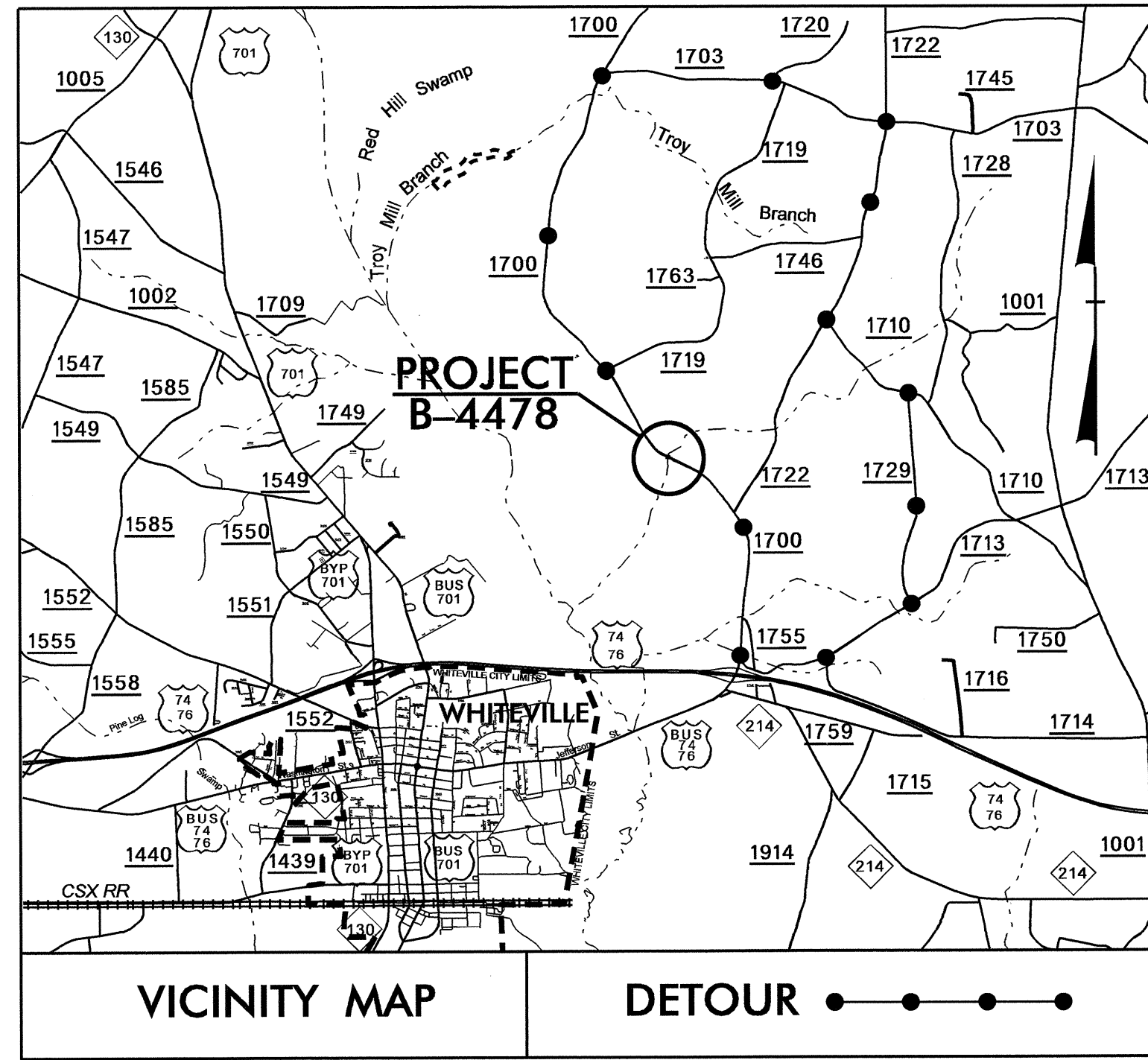


CONTRACT: C203293 TIP NO: B-4478



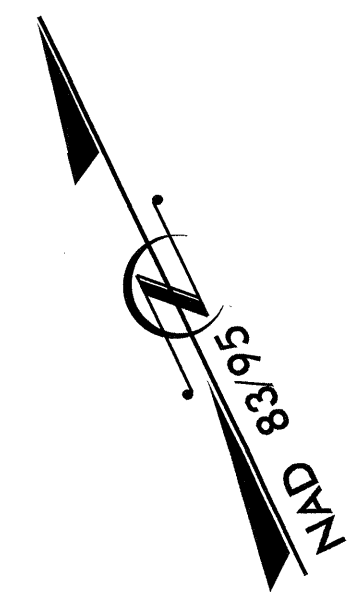
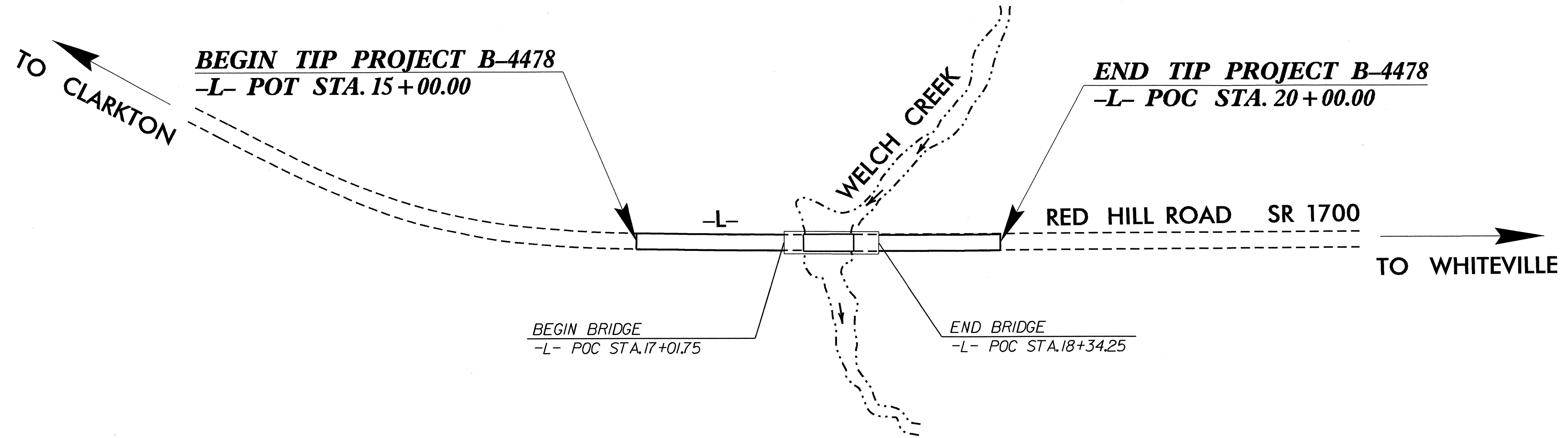
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

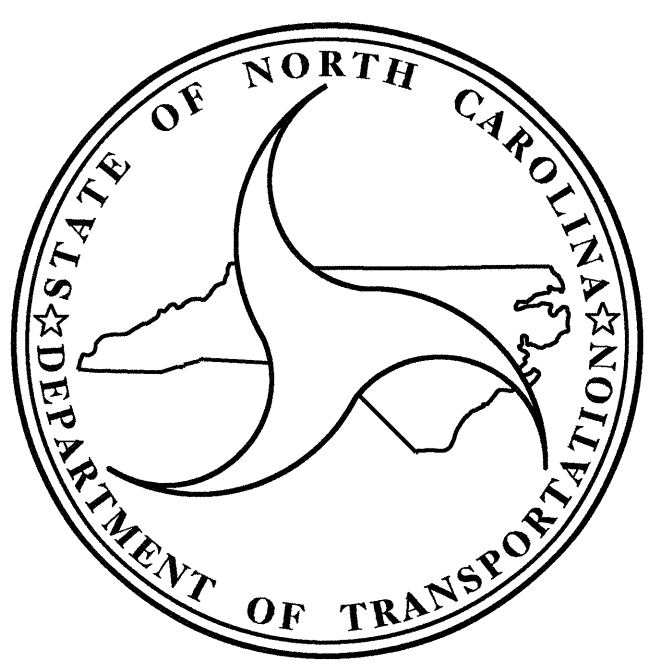
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4478		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38383.1.1	BRZ-1700(9)	P.E.	
38383.2.1	BRZ-1700(9)	R/W & UTIL.	
38383.3.FD1	BRZ-1700(9)	CONST.	

LOCATION: BRIDGE NO.216 OVER WELCH CREEK ON SR 1700

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



STRUCTURES



DESIGN DATA

ADT 2014 = 2,370
 ADT 2034 = 3,410
 K = 13%
 V = 60 MPH
 D = 55%
 T = 5%
 * (TTST 2% DUAL 3%)
 CLASS = LOCAL
 SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY OF TIP PROJECT B-4478: 0.070 MILES

LENGTH STRUCTURE OF TIP PROJECT B-4478: 0.025 MILES

TOTAL LENGTH OF TIP PROJECT B-4478: 0.095 MILES

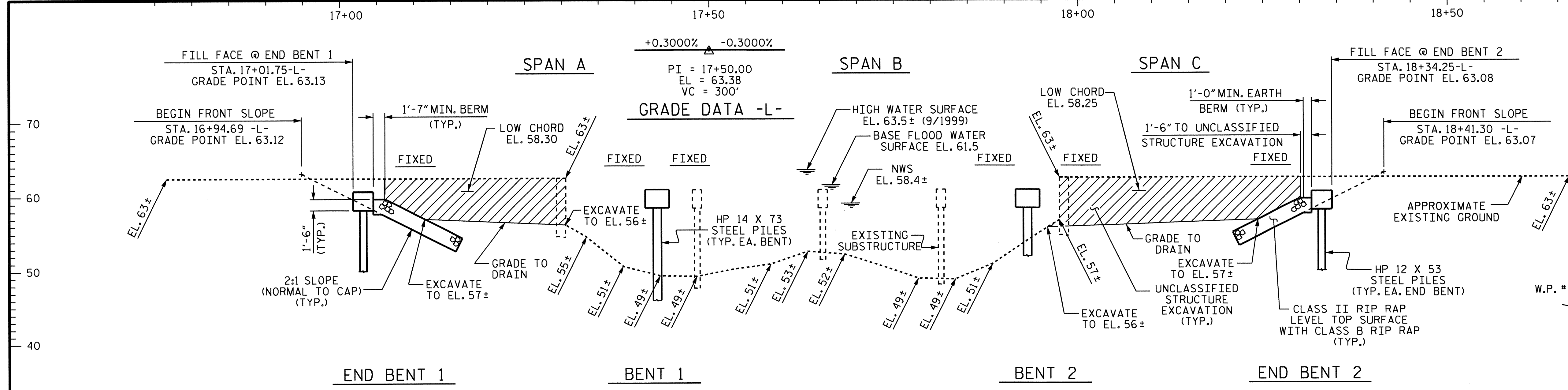
Prepared In the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

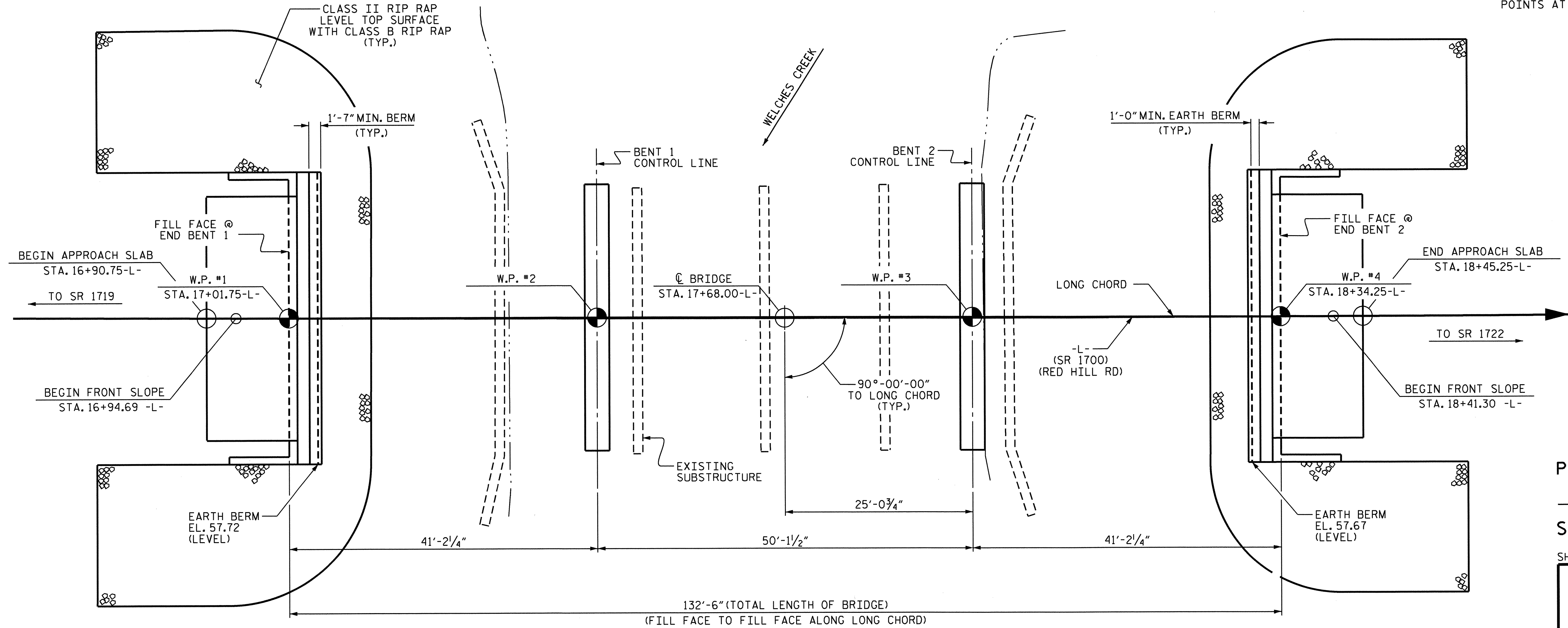
LETTING DATE : JANUARY 21, 2014

J.M. BAILEY, P.E.
PROJECT ENGINEER

K.W. ALFORD, P.E.
PROJECT DESIGN ENGINEER



NOTE: THE EFFECTS OF THE HORIZONTAL CURVE SHALL BE NEGLECTED IN THE CONSTRUCTION OF THIS BRIDGE. THE BRIDGE SHALL BE BUILT ALONG THE LONG CHORD BETWEEN THE WORK POINTS AT THE FILL FACES.



PROJECT NO. B-4478
COLUMBUS COUNTY
STATION: 17+68.00-L-

SHEET 1 OF 2 REPLACES BRIDGE #216

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
WELCHES CREEK ON SR 1700
BETWEEN SR 1719 AND SR 1722

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

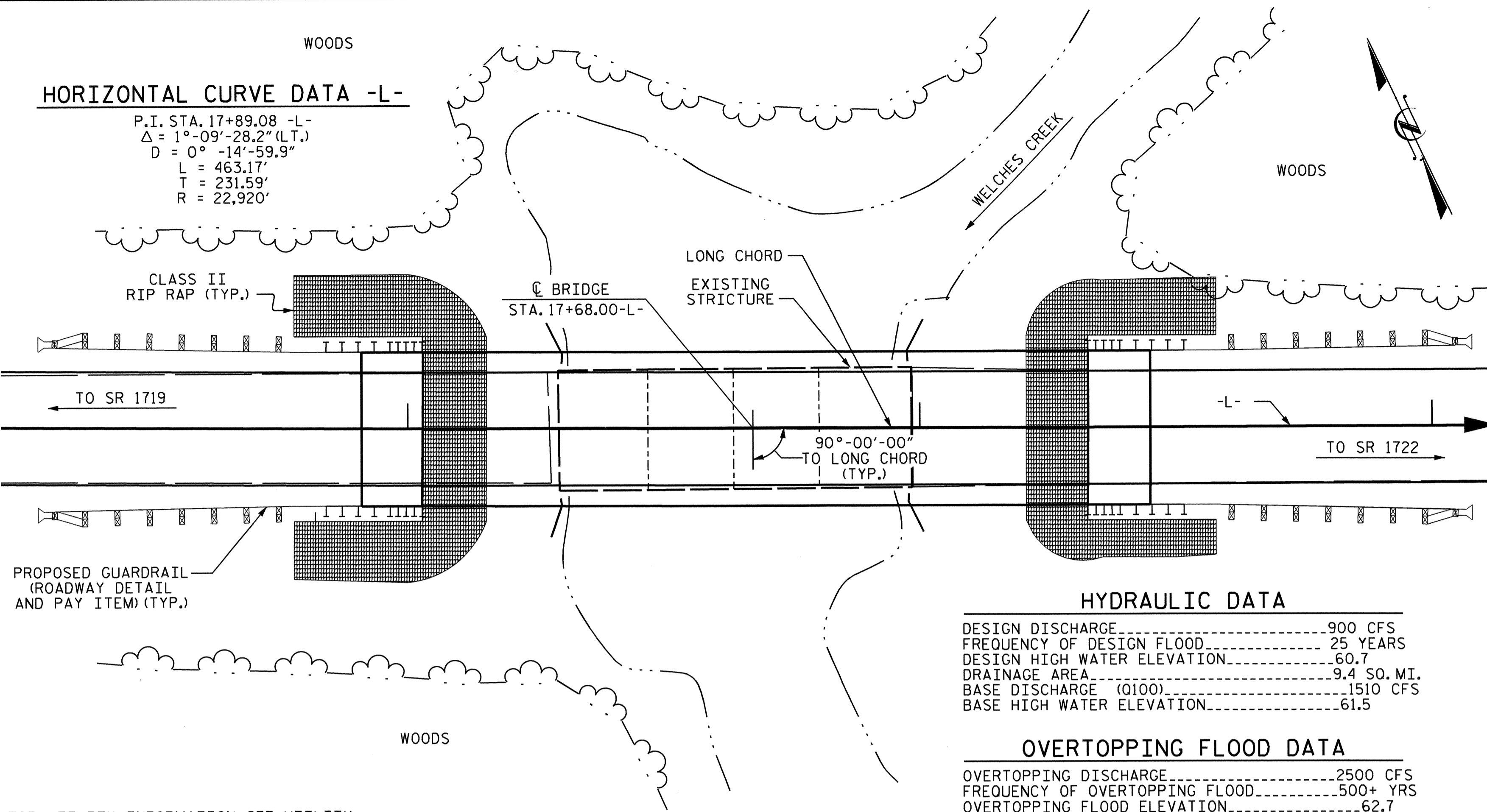
DRAWN BY: S.H. SOCKWELL DATE: 03/01/12
CHECKED BY: A.C. OUTLAW DATE: 03/13/12



BENCH MARK: RR SPIKE IN BASE OF 24" Ø OAK TREE, 59.34' RIGHT OF STA. 22+57.51-L-, EL. 62.080 NAVD 88

HORIZONTAL CURVE DATA -L-

P.I. STA. 17+89.08 -L-
 $\Delta = 1^\circ-09'-28.2''$ (LT.)
 $D = 0^\circ-14'-59.9''$
 $L = 463.17'$
 $T = 231.59'$
 $R = 22,920'$



HYDRAULIC DATA

DESIGN DISCHARGE.....900 CFS
 FREQUENCY OF DESIGN FLOOD.....25 YEARS
 DESIGN HIGH WATER ELEVATION.....60.7
 DRAINAGE AREA.....9.4 SQ. MI.
 BASE DISCHARGE (Q100).....1510 CFS
 BASE HIGH WATER ELEVATION.....61.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE.....2500 CFS
 FREQUENCY OF OVERTOPPING FLOOD.....500+ YRS
 OVERTOPPING FLOOD ELEVATION.....62.7

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS, 1 SPAN @ 18'-6", 2 SPANS @ 16'-8", AND 1 SPAN @ 18'-0" WITH A REINFORCED CONCRETE DECK ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 23.4' ON REINFORCED CONCRETE CAP WITH TIMBER PILE BENTS AND END BENTS AND TIMBER CRUTCH BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT. ± EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

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 17+68.00 -L-."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

PILES AT BENT NO.1 AND BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT BENT NO.1 AND BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR.

INSTALL PILES AT BENT NO.1 AND BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 25 FT.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO.1 AND BENT NO.2 ARE ELEVATION 43 FT AND 48 FT., RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR INTERIOR BENTS, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		HP 14 X 73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		
							NO.	LIN.FT.	NO.	LIN.FT.							EACH	LIN.FT.	TONS
	LUMP SUM	E.A.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.													
SUPERSTRUCTURE					LUMP SUM							260.75						LUMP SUM	33 1430
END BENT NO. 1			LUMP SUM	14.3		2127	7	315			4		42	169	190				
BENT NO. 1				10.8		2162			8	520	4								
BENT NO. 2				10.8		2162			8	520	4								
END BENT NO. 2			LUMP SUM	14.3		2127	7	315			4		49	194	220				
TOTAL	LUMP SUM	1	LUMP SUM	50.2	LUMP SUM	8578	14	630	16	1040	16	260.75	91	363	410	LUMP SUM	33	1430	

PROJECT NO. B-4478
 COLUMBUS COUNTY
 STATION: 17+68.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 WELCHES CREEK ON SR 1700
 BETWEEN SR 1719 AND SR 1722



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-2
1			3			TOTAL SHEETS
2			4			19

DRAWN BY : Fr. Leo DATE : 5/13/13
 CHECKED BY : P.K. NEWTON DATE : 5/21/13

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(In)	N/A	1	1.319	--	1.75	0.278	1.76	40'	EL	19.5	0.549	1.32	40'	EL	1.95	0.80	0.278	1.55	40'	EL	19.5		
	HL-93(0pr)	N/A	--	1.709	--	1.35	0.278	2.28	40'	EL	19.5	0.549	1.71	40'	EL	1.95	N/A	--	--	--	--	--		
	HS-20(In)	36.000	2	1.540	55.449	1.75	0.278	2.21	40'	EL	19.5	0.549	1.54	40'	EL	1.95	0.80	0.278	1.94	40'	EL	19.5		
	HS-20(0pr)	36.000	--	1.997	71.878	1.35	0.278	2.86	40'	EL	19.5	0.549	2	40'	EL	1.95	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.606	48.687	1.4	0.278	5.1	40'	EL	19.5	0.549	4.13	40'	EL	1.95	0.80	0.278	3.61	40'	EL	19.5	
		SNGARBS2	20.000	--	2.964	59.289	1.4	0.278	4.19	40'	EL	15.6	0.549	3.07	40'	EL	1.95	0.80	0.278	2.96	40'	EL	19.5	
		SNAGRIS2	22.000	--	2.906	63.929	1.4	0.278	4.09	40'	EL	15.6	0.549	2.91	40'	EL	1.95	0.80	0.278	2.92	40'	EL	15.6	
		SNCOTTS3	27.250	--	1.803	49.125	1.4	0.278	2.55	40'	EL	19.5	0.549	2.07	40'	EL	1.95	0.80	0.278	1.80	40'	EL	19.5	
		SNAGGRS4	34.925	--	1.623	56.667	1.4	0.278	2.29	40'	EL	19.5	0.549	1.82	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
		SNS5A	35.550	--	1.578	56.107	1.4	0.278	2.23	40'	EL	19.5	0.549	1.9	40'	EL	1.95	0.80	0.278	1.58	40'	EL	19.5	
		SNS6A	39.950	--	1.502	59.992	1.4	0.278	2.12	40'	EL	19.5	0.549	1.77	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5	
	SNS7B	42.000	3	1.432	60.149	1.4	0.278	2.02	40'	EL	19.5	0.549	1.81	40'	EL	1.95	0.80	0.278	1.43	40'	EL	19.5		
	TTST	TNAGRIT3	33.000	--	1.848	60.976	1.4	0.278	2.61	40'	EL	19.5	0.549	2.08	40'	EL	1.95	0.80	0.278	1.85	40'	EL	19.5	
		TNT4A	33.075	--	1.872	61.901	1.4	0.278	2.65	40'	EL	19.5	0.549	1.98	40'	EL	1.95	0.80	0.278	1.87	40'	EL	19.5	
		TNT6A	41.600	--	1.587	66.032	1.4	0.278	2.24	40'	EL	19.5	0.549	1.94	40'	EL	1.95	0.80	0.278	1.59	40'	EL	19.5	
		TNT7A	42.000	--	1.627	68.354	1.4	0.278	2.3	40'	EL	19.5	0.549	1.79	40'	EL	1.95	0.80	0.278	1.63	40'	EL	19.5	
		TNT7B	42.000	--	1.664	69.888	1.4	0.278	2.35	40'	EL	19.5	0.549	1.72	40'	EL	1.95	0.80	0.278	1.66	40'	EL	19.5	
		TNAGRIT4	43.000	--	1.619	69.61	1.4	0.278	2.28	40'	EL	15.6	0.549	1.65	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
TNAGT5A		45.000	--	1.498	67.412	1.4	0.278	2.12	40'	EL	19.5	0.549	1.71	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5		
TNAGT5B	45.000	--	1.455	65.486	1.4	0.278	2.06	40'	EL	19.5	0.549	1.56	40'	EL	1.95	0.80	0.278	1.46	40'	EL	19.5			

LOAD FACTORS:

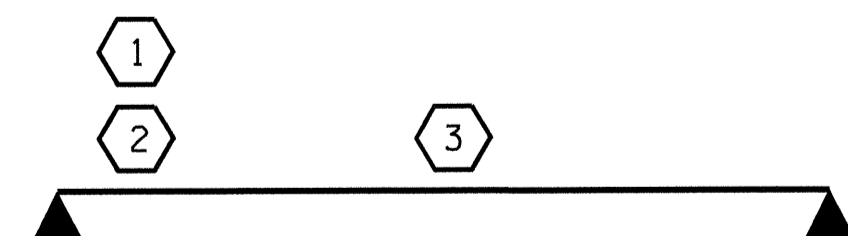
DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{dc}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY
FOR SPAN 'A' OR SPAN 'C'

PROJECT NO. B-4478
COLUMBUS COUNTY
STATION: 17+68.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

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



ASSEMBLED BY : A.C. OUTLAW DATE : 2/10/12
CHECKED BY : N. C. BOGER DATE : 7/30/12
DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.394	--	1.75	0.276	1.57	50'	EL	24.5	0.531	1.39	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5		
	HL-93(0pr)	N/A	--	1.807	--	1.35	0.276	2.03	50'	EL	24.5	0.531	1.81	50'	EL	2.45	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.667	60.007	1.75	0.276	1.95	50'	EL	24.5	0.531	1.67	50'	EL	2.45	0.80	0.276	1.79	50'	EL	24.5		
	HS-20(0pr)	36.000	--	2.161	77.787	1.35	0.276	2.52	50'	EL	24.5	0.531	2.16	50'	EL	2.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.635	49.079	1.4	0.276	4.95	50'	EL	24.5	0.531	4.7	50'	EL	2.45	0.80	0.276	3.64	50'	EL	24.5	
		SNGARBS2	20.000	--	2.871	57.42	1.4	0.276	3.91	50'	EL	24.5	0.531	3.42	50'	EL	2.45	0.80	0.276	2.87	50'	EL	24.5	
		SNAGRIS2	22.000	--	2.778	61.109	1.4	0.276	3.78	50'	EL	19.6	0.531	3.21	50'	EL	2.45	0.80	0.276	2.78	50'	EL	24.5	
		SNCOTTS3	27.250	--	1.814	49.418	1.4	0.276	2.47	50'	EL	24.5	0.531	2.36	50'	EL	2.45	0.80	0.276	1.81	50'	EL	24.5	
		SNAGGRS4	34.925	--	1.577	55.063	1.4	0.276	2.15	50'	EL	24.5	0.531	2.01	50'	EL	2.45	0.80	0.276	1.58	50'	EL	24.5	
		SNS5A	35.550	--	1.537	54.657	1.4	0.276	2.09	50'	EL	24.5	0.531	2.07	50'	EL	2.45	0.80	0.276	1.54	50'	EL	24.5	
		SNS6A	39.950	--	1.438	57.43	1.4	0.276	1.96	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
	SNS7B	42.000	--	1.370	57.54	1.4	0.276	1.87	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.37	50'	EL	24.5		
	TTST	TNAGRIT3	33.000	--	1.761	58.118	1.4	0.276	2.4	50'	EL	24.5	0.531	2.25	50'	EL	2.45	0.80	0.276	1.76	50'	EL	24.5	
		TNT4A	33.075	--	1.777	58.759	1.4	0.276	2.42	50'	EL	24.5	0.531	2.17	50'	EL	2.45	0.80	0.276	1.78	50'	EL	24.5	
		TNT6A	41.600	--	1.480	61.558	1.4	0.276	2.01	50'	EL	24.5	0.531	2.08	50'	EL	2.45	0.80	0.276	1.48	50'	EL	24.5	
		TNT7A	42.000	--	1.502	63.087	1.4	0.276	2.05	50'	EL	24.5	0.531	1.94	50'	EL	2.45	0.80	0.276	1.50	50'	EL	24.5	
		TNT7B	42.000	--	1.566	65.773	1.4	0.276	2.13	50'	EL	24.5	0.531	1.84	50'	EL	2.45	0.80	0.276	1.57	50'	EL	24.5	
		TNAGRIT4	43.000	--	1.486	63.902	1.4	0.276	2.02	50'	EL	24.5	0.531	1.77	50'	EL	2.45	0.80	0.276	1.49	50'	EL	24.5	
TNAGT5A		45.000	--	1.388	62.47	1.4	0.276	1.89	50'	EL	24.5	0.531	1.8	50'	EL	2.45	0.80	0.276	1.39	50'	EL	24.5		
TNAGT5B	45.000	3	1.360	61.206	1.4	0.276	1.85	50'	EL	24.5	0.531	1.68	50'	EL	2.45	0.80	0.276	1.36	50'	EL	24.5			

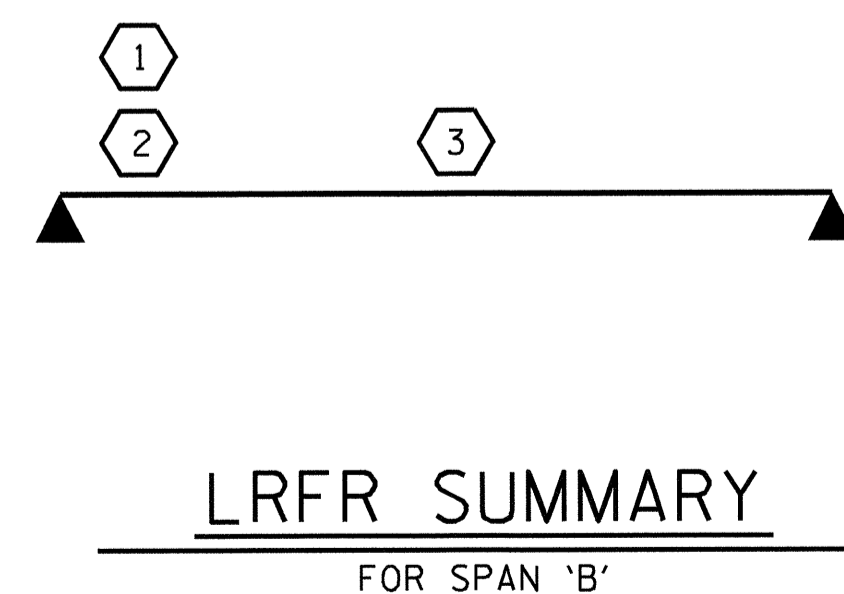
LOAD FACTORS:

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

NOTES:

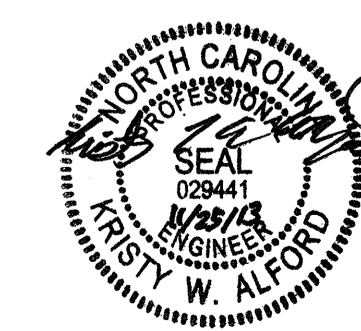
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

#	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	



PROJECT NO. B-4478
COLUMBUS COUNTY
STATION: 17+68.00 -L-

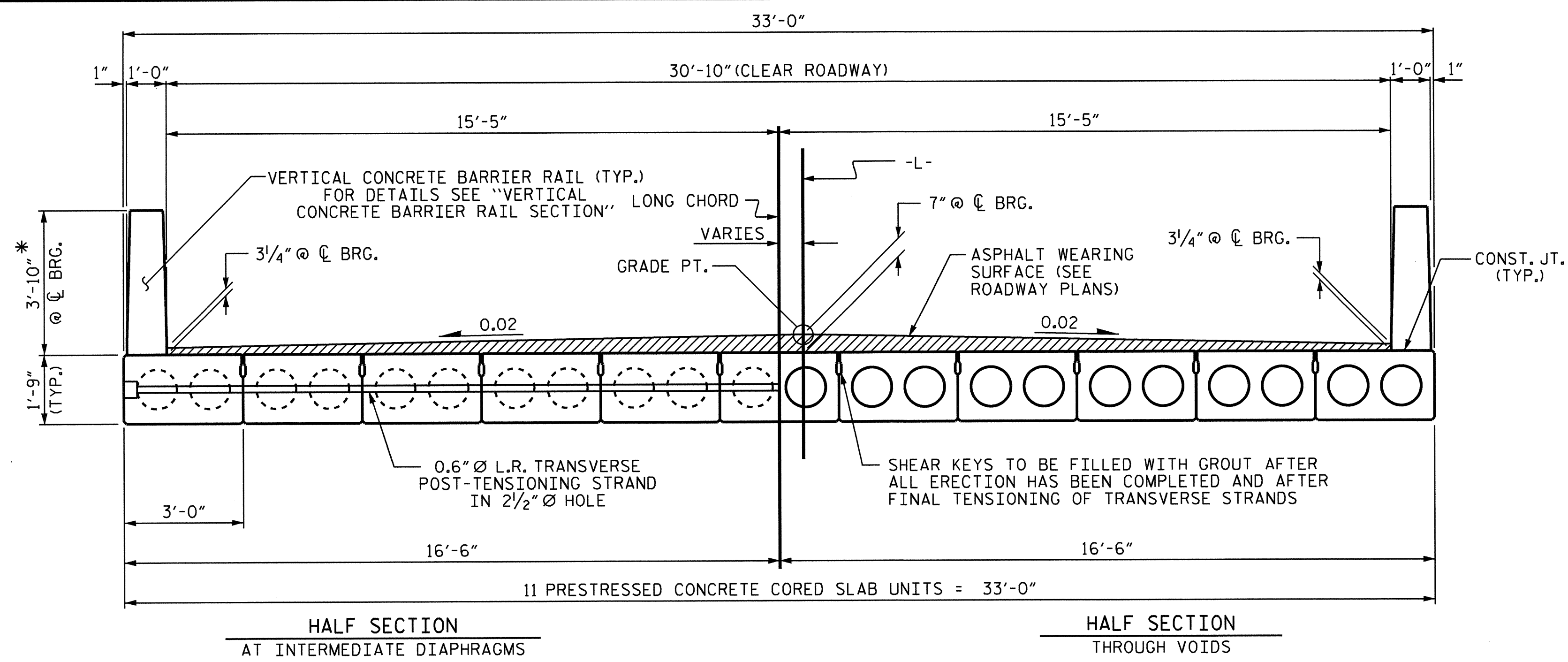
SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
50' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

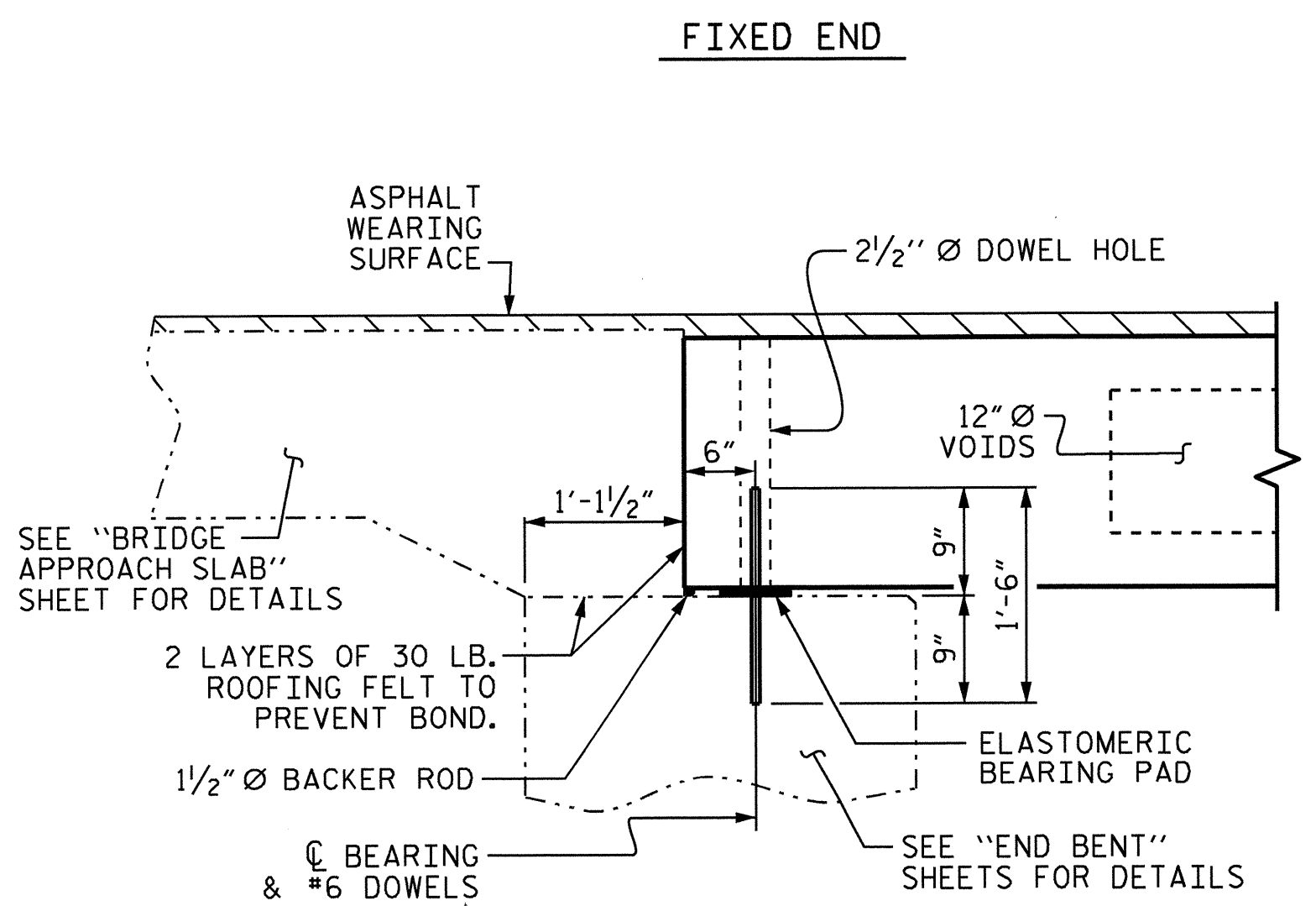
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : A.C. OUTLAW DATE : 2/10/12
CHECKED BY : N. C. BOGER DATE : 7/30/12
DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

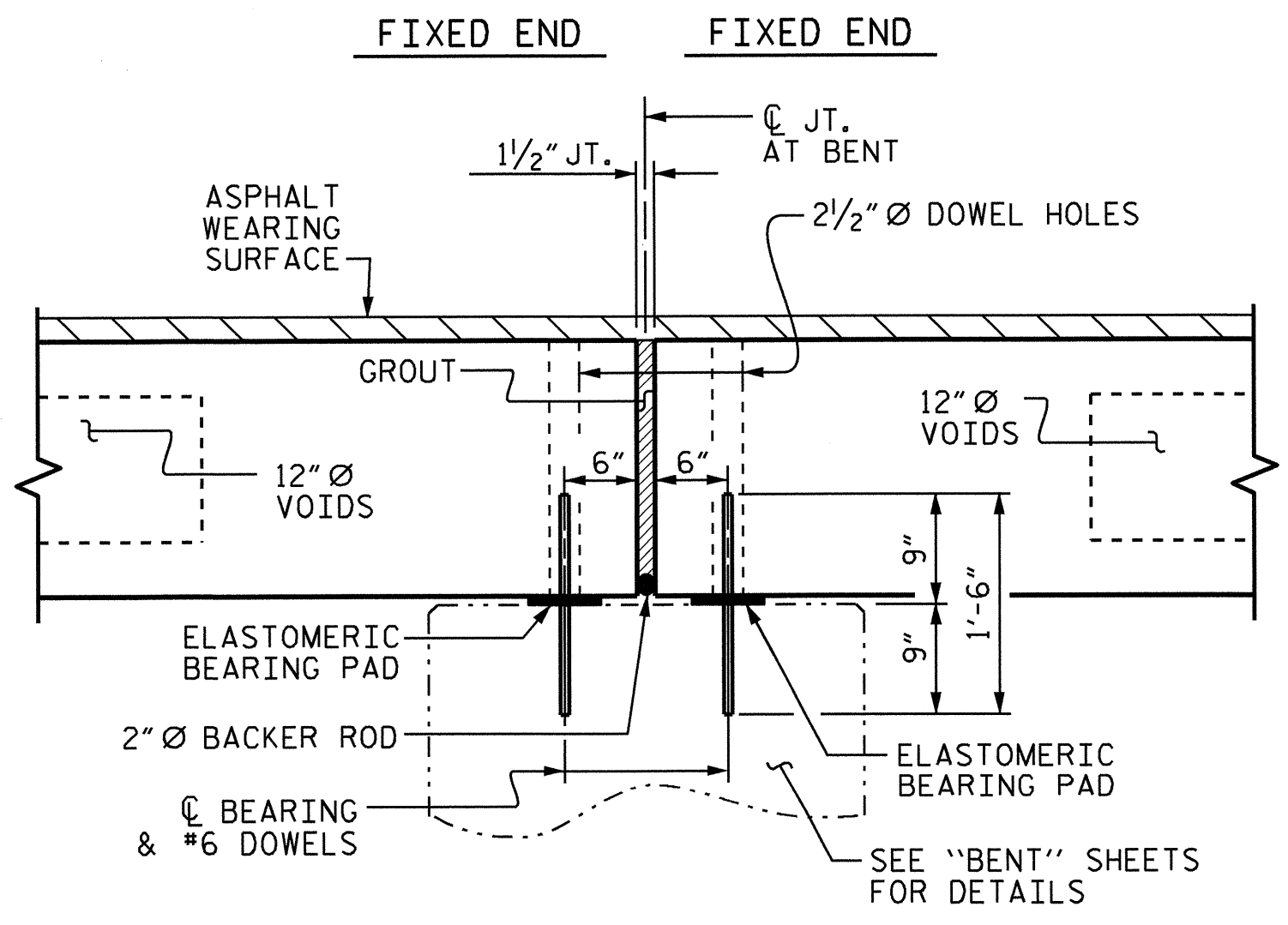


TYPICAL SECTION

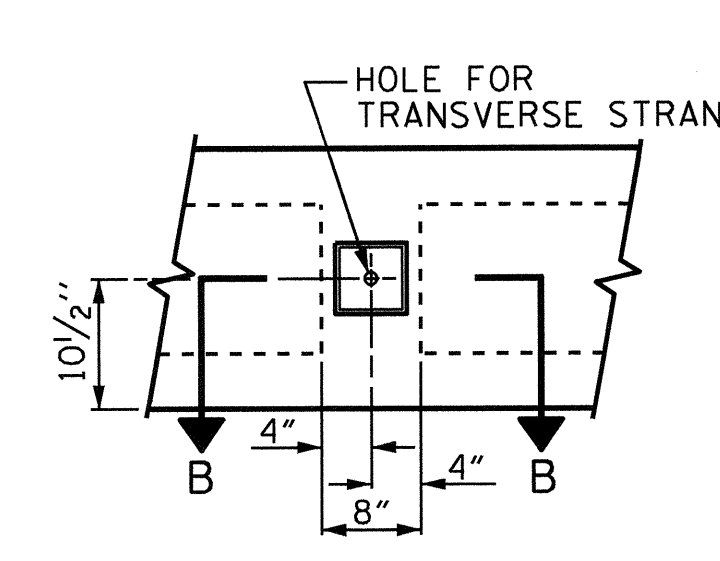
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



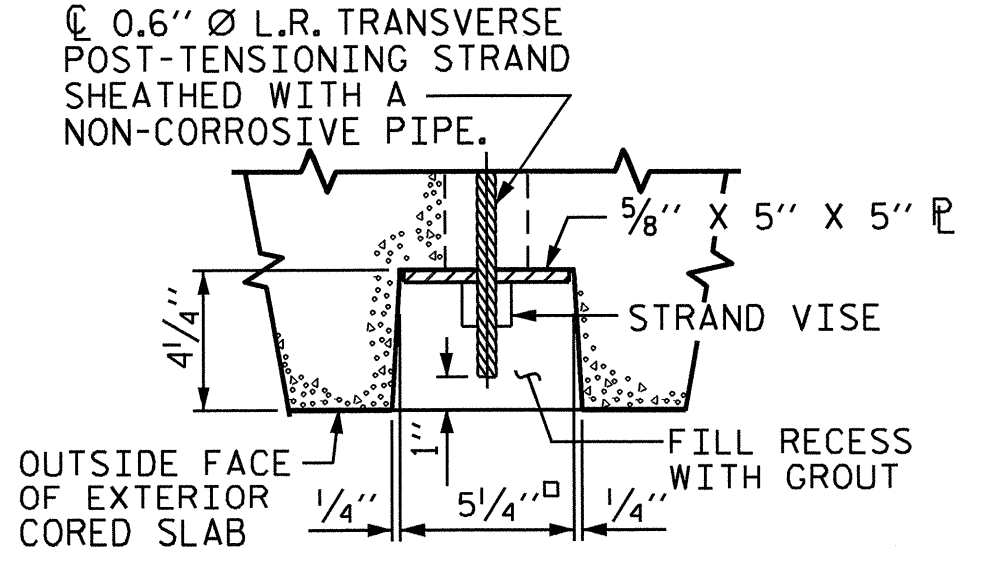
SECTION AT END BENT



SECTION AT BENT

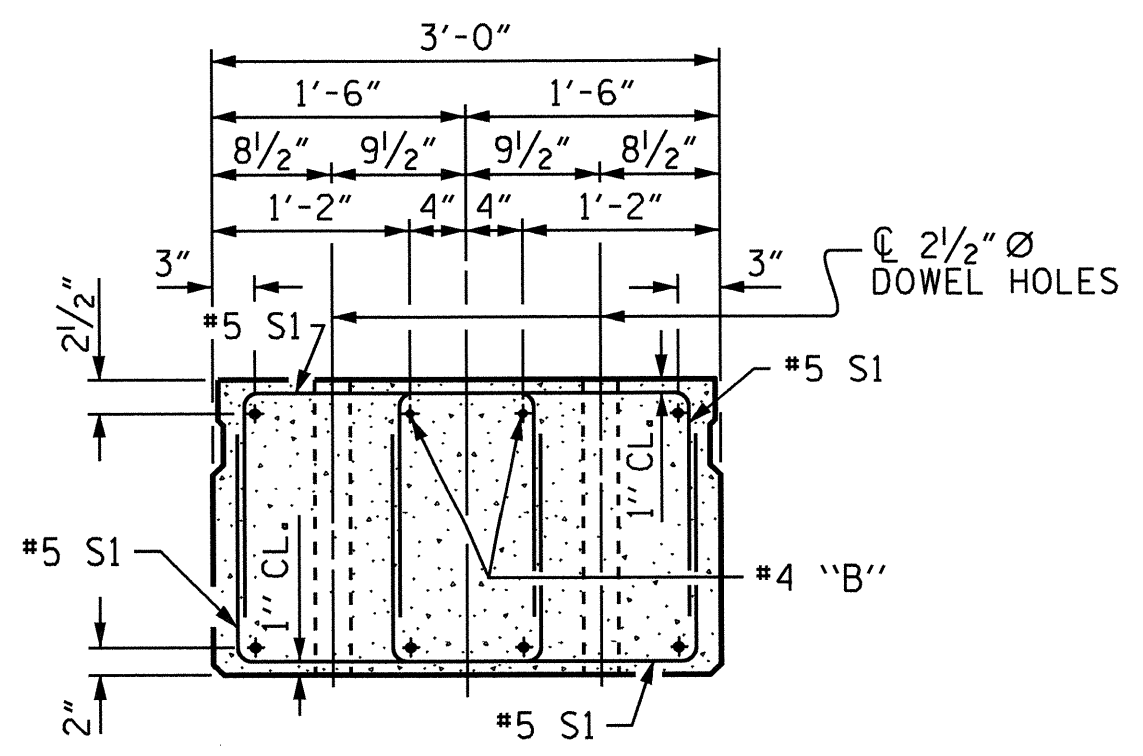


ELEVATION VIEW



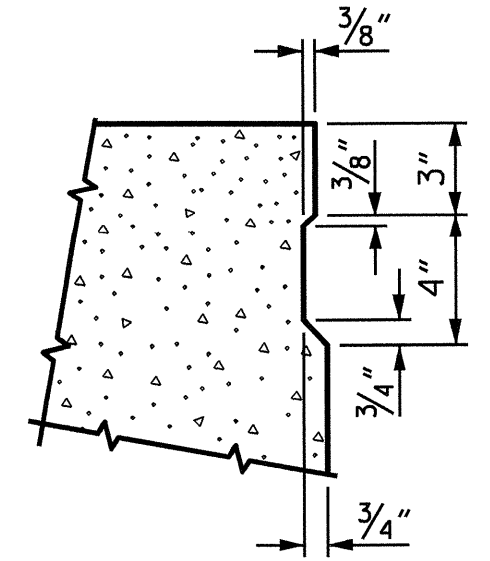
SECTION B-B

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



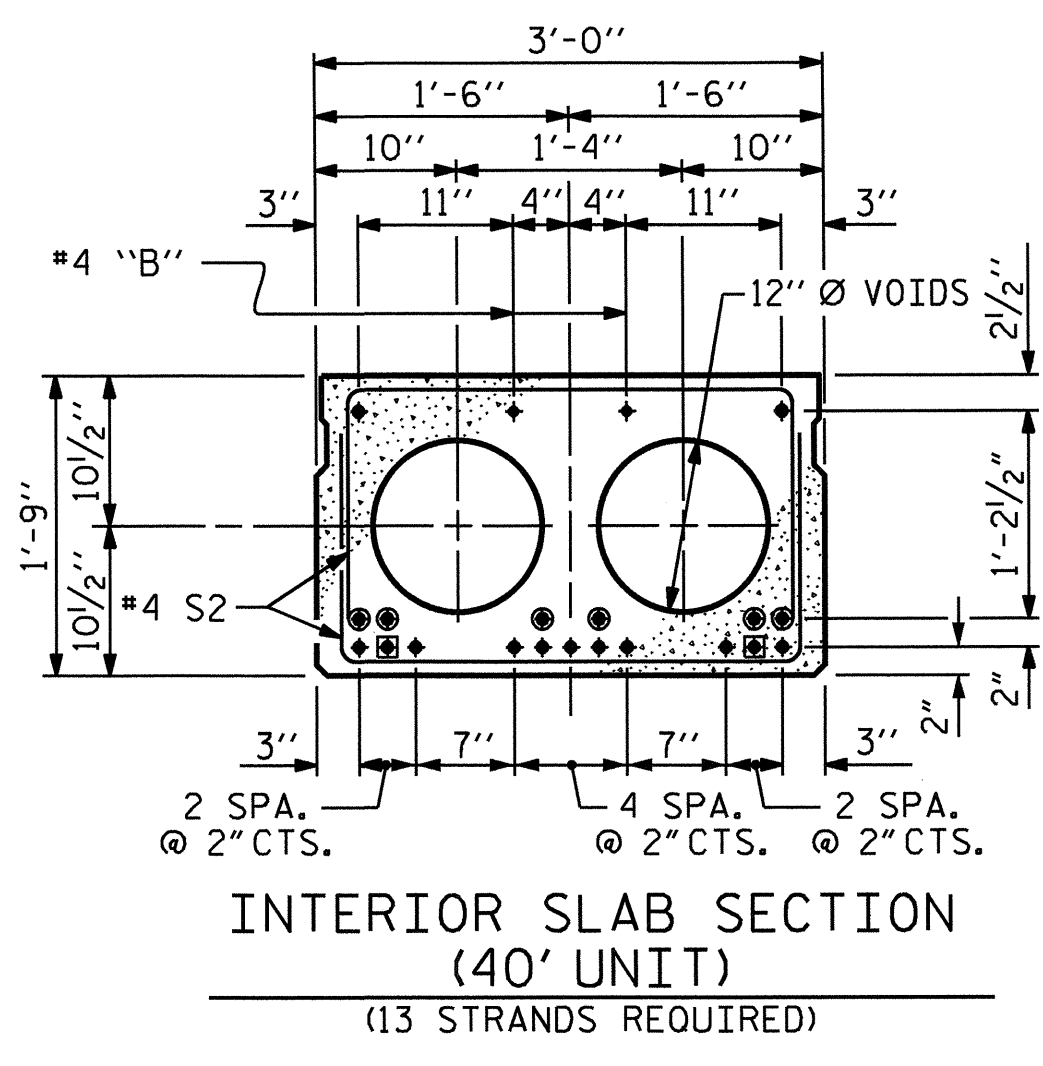
END ELEVATION

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.

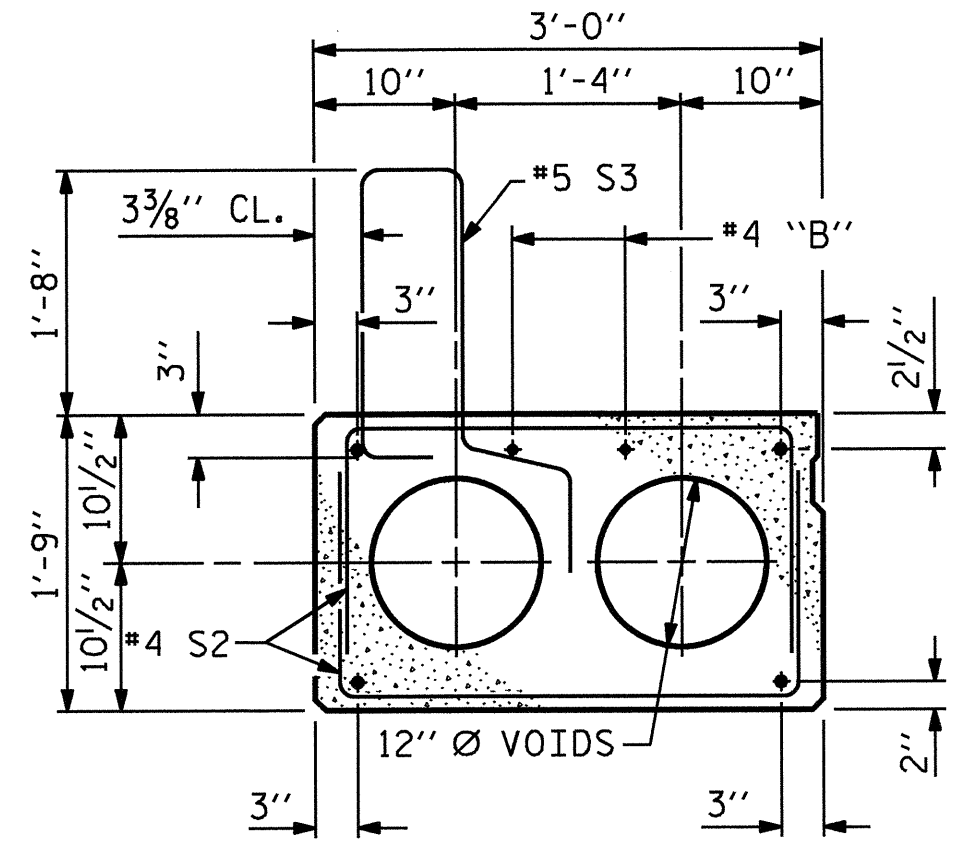


SHEAR KEY DETAIL

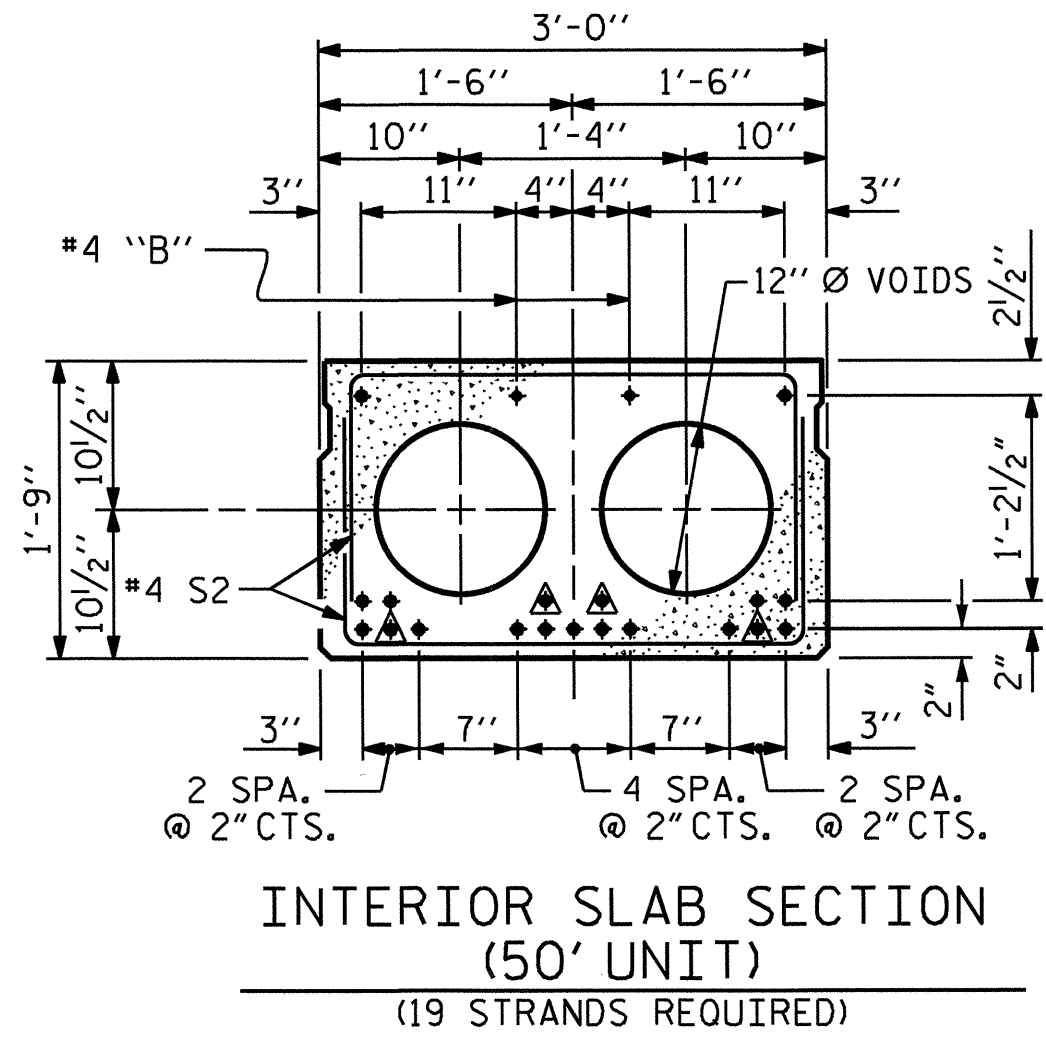
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



INTERIOR SLAB SECTION (40' UNIT) (13 STRANDS REQUIRED)



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



INTERIOR SLAB SECTION (50' UNIT) (19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

- DEBONDING LEGEND
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 - BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 - OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. B-4478
COLUMBUS COUNTY
STATION: 17+68.00 -L-

SHEET 1 OF 4

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

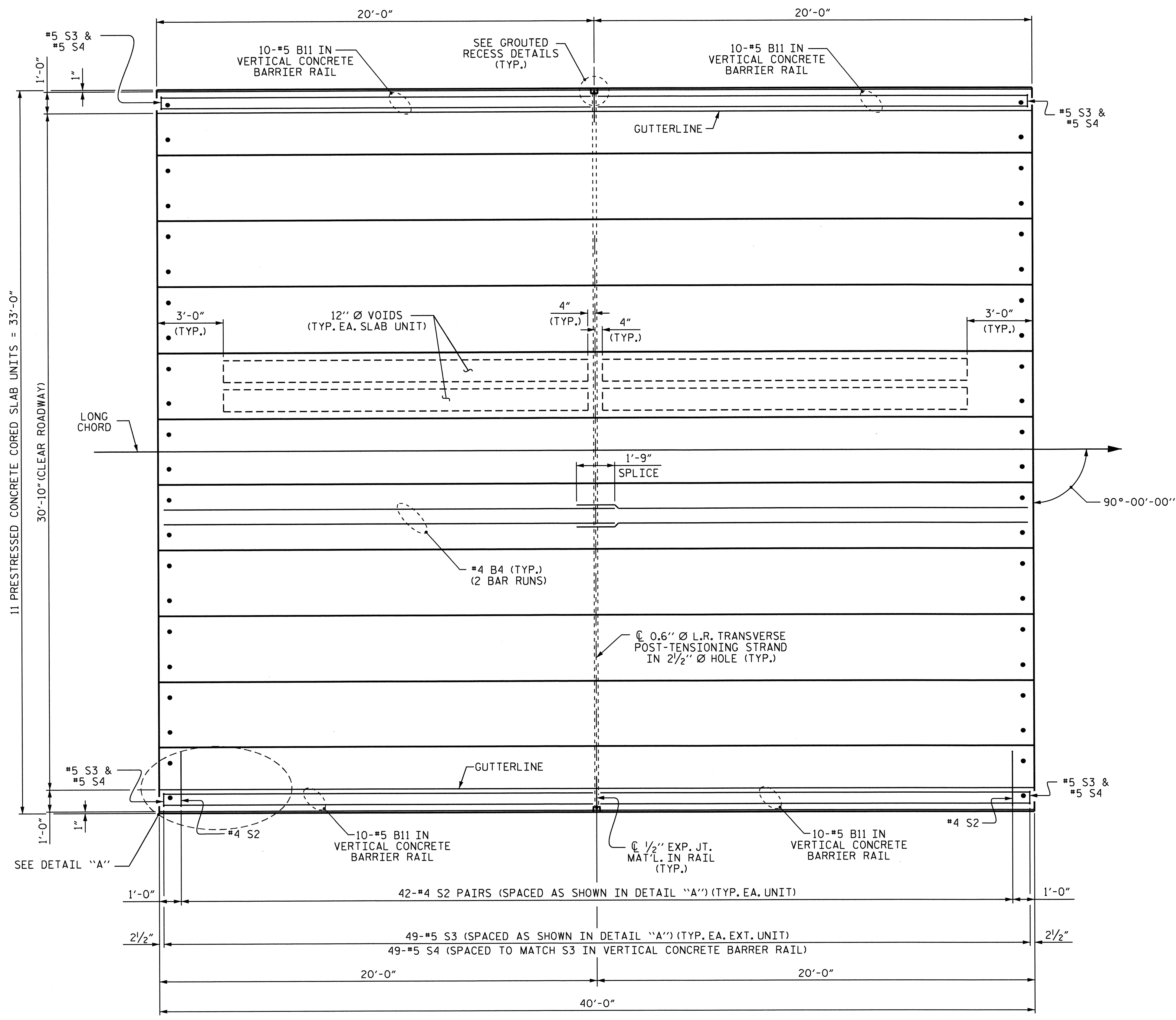


ASSEMBLED BY: A.C. OUTLAW DATE: 2/10/12
CHECKED BY: N.C. BOGER DATE: 7/30/12
DRAWN BY: DGE 5/09 REV. 12/11 MAA/AAC
CHECKED BY: BCH 6/09

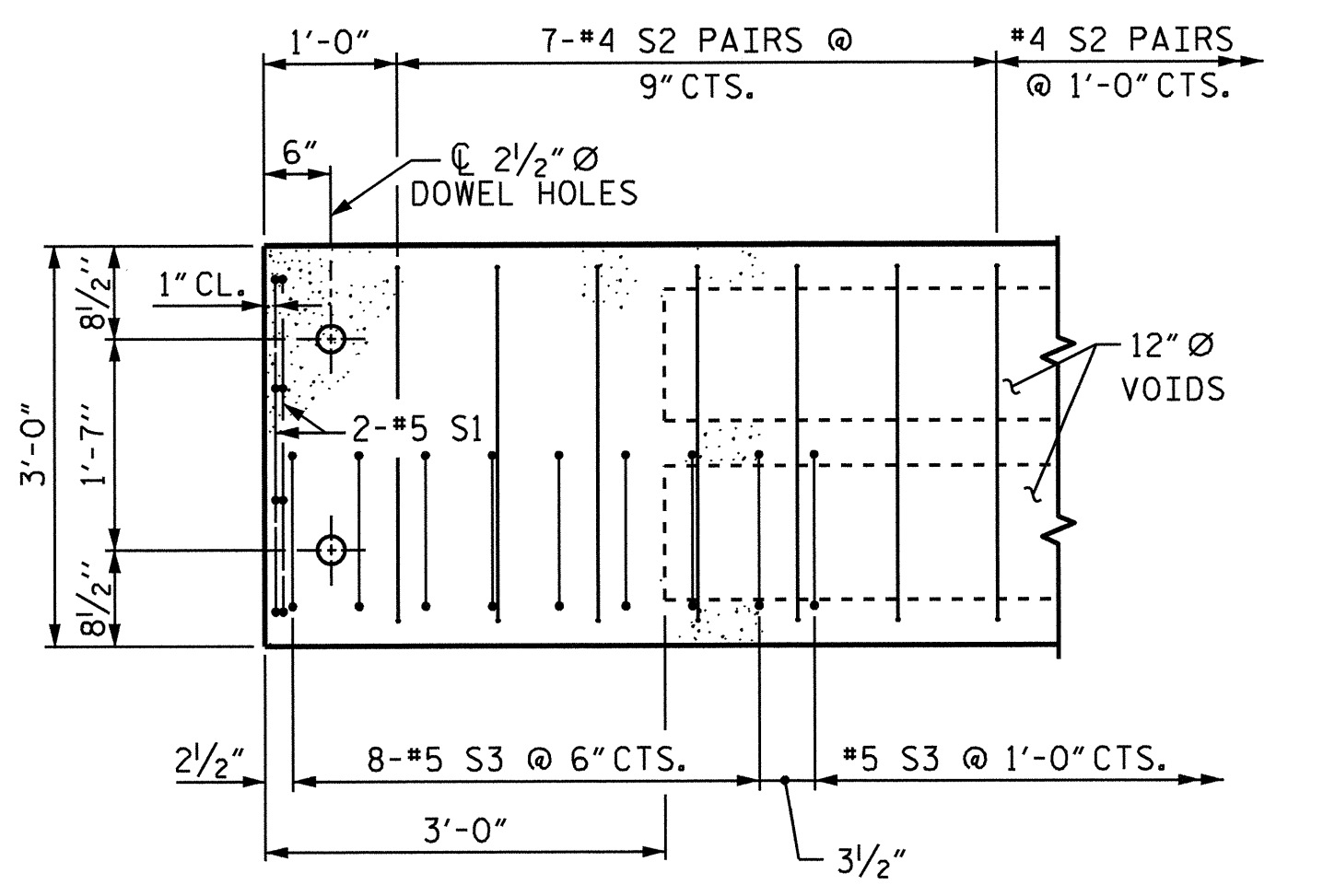
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 19

STD. NO. 21" PCS2-33-90S

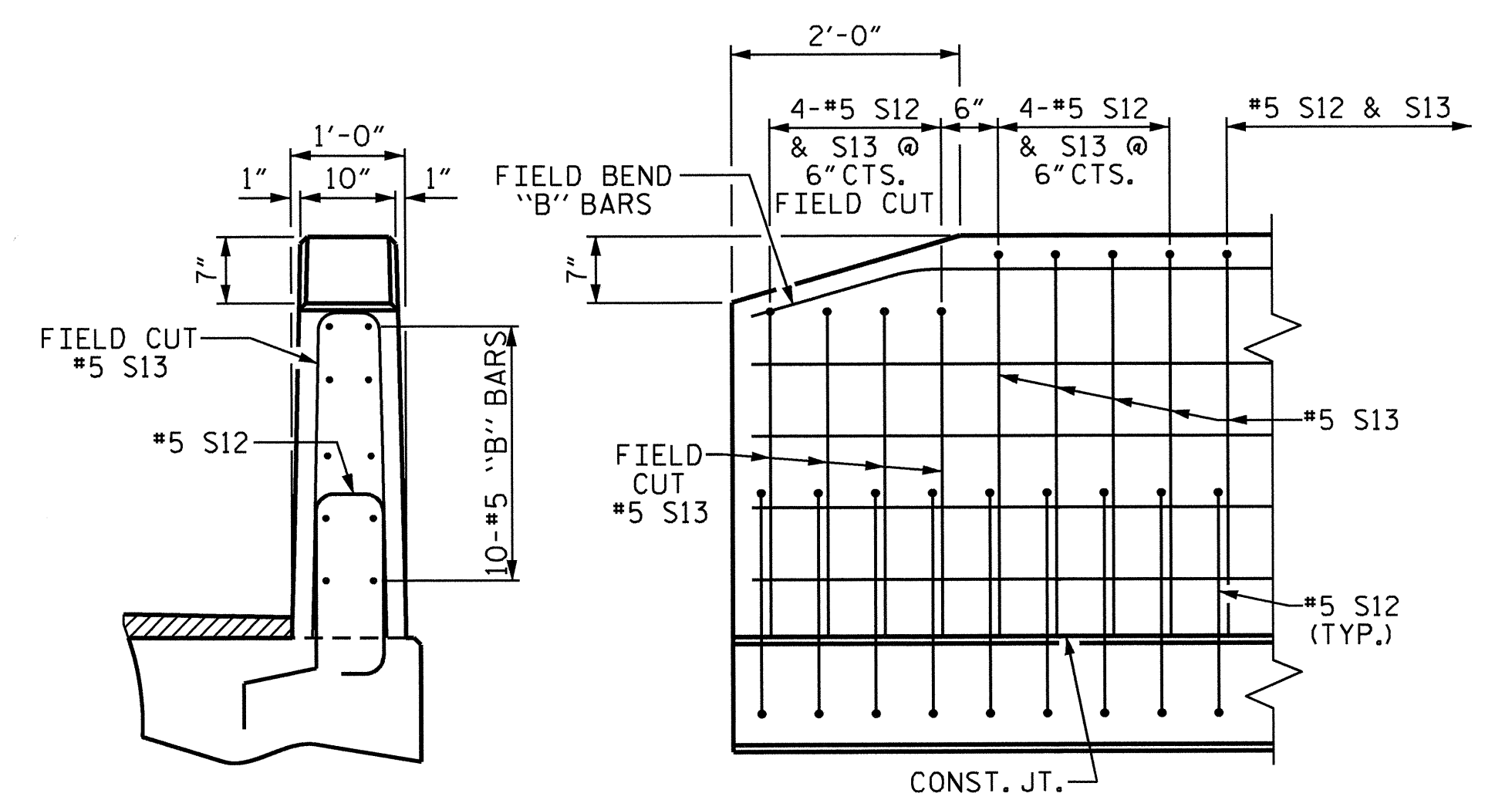


PLAN OF SPAN A OR C



DETAIL "A"

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



END VIEW

SIDE VIEW

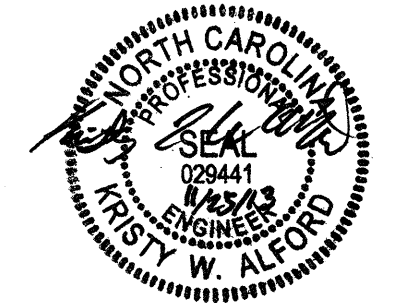
END OF RAIL DETAILS

PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 2 OF 4

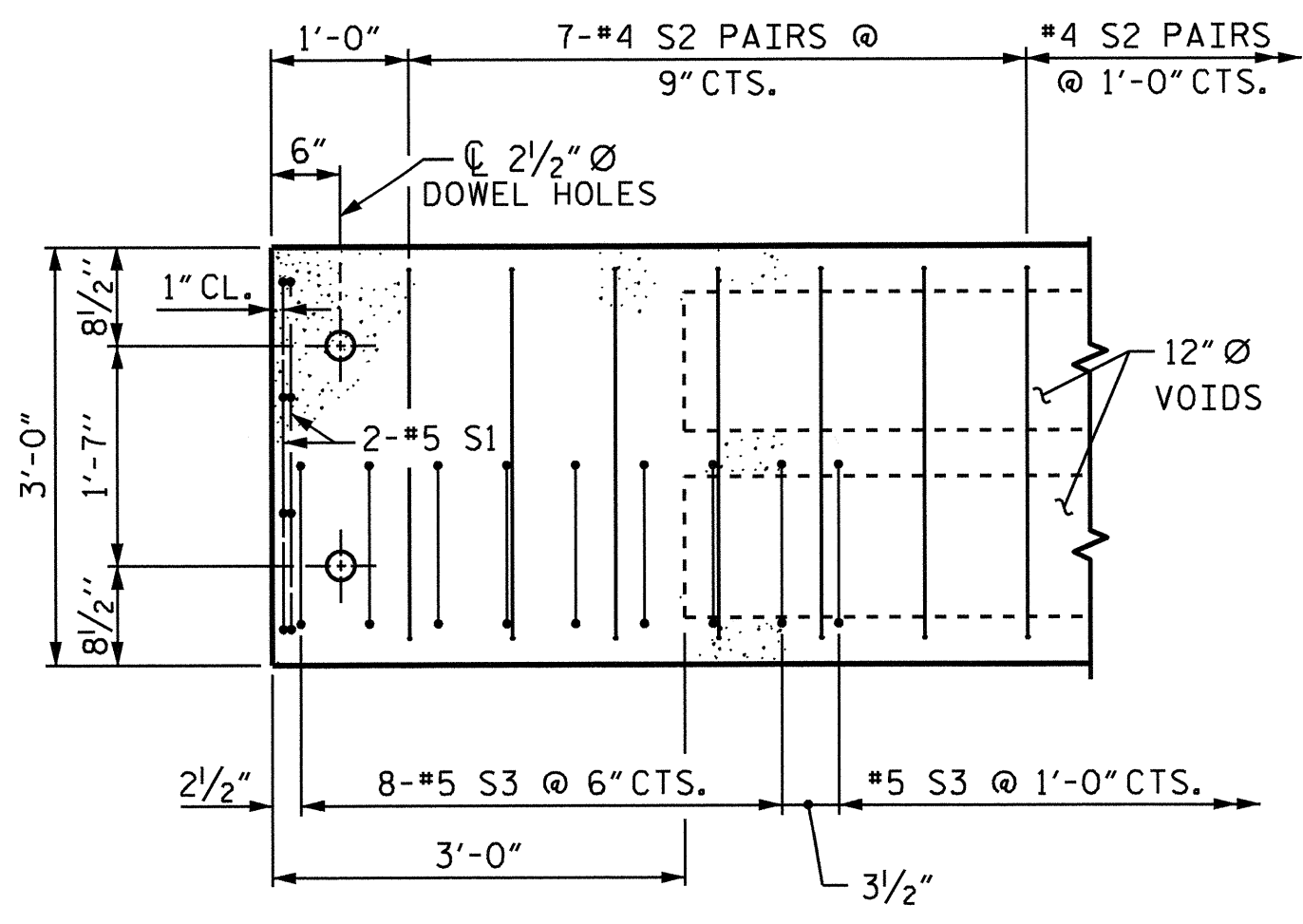
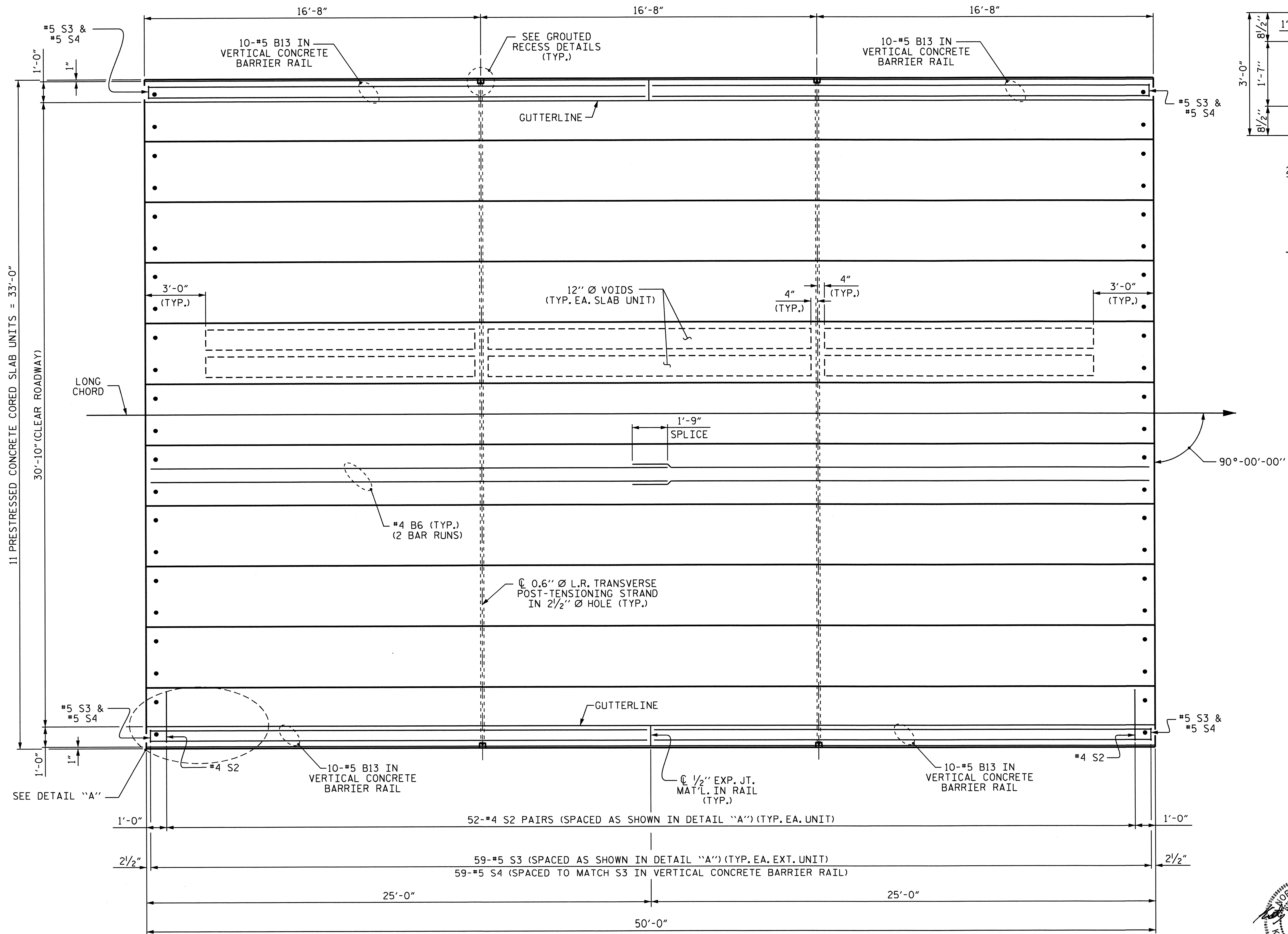
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 40' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW



ASSEMBLED BY : A.C. OUTLAW DATE : 2/13/12
 CHECKED BY : N. C. BOGER DATE : 7/30/12
 DRAWN BY : DGE 3/09 REV. 12/5/11 MAA/AAC
 CHECKED BY : BCH 3/09

REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			



DETAIL "A"

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

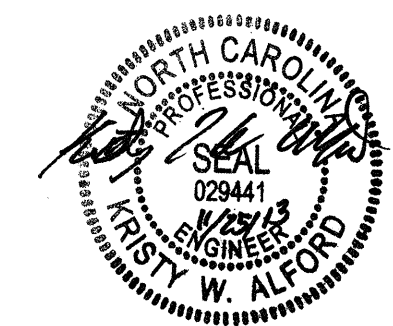
SEE SHEET 2 OF 4 FOR END OF RAIL DETAILS.

PLAN OF SPAN B

PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 50' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW



ASSEMBLED BY : A.C. OUTLAW	DATE : 1/13/12
CHECKED BY : N.C. BOGER	DATE : 7/30/12
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			19

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.)

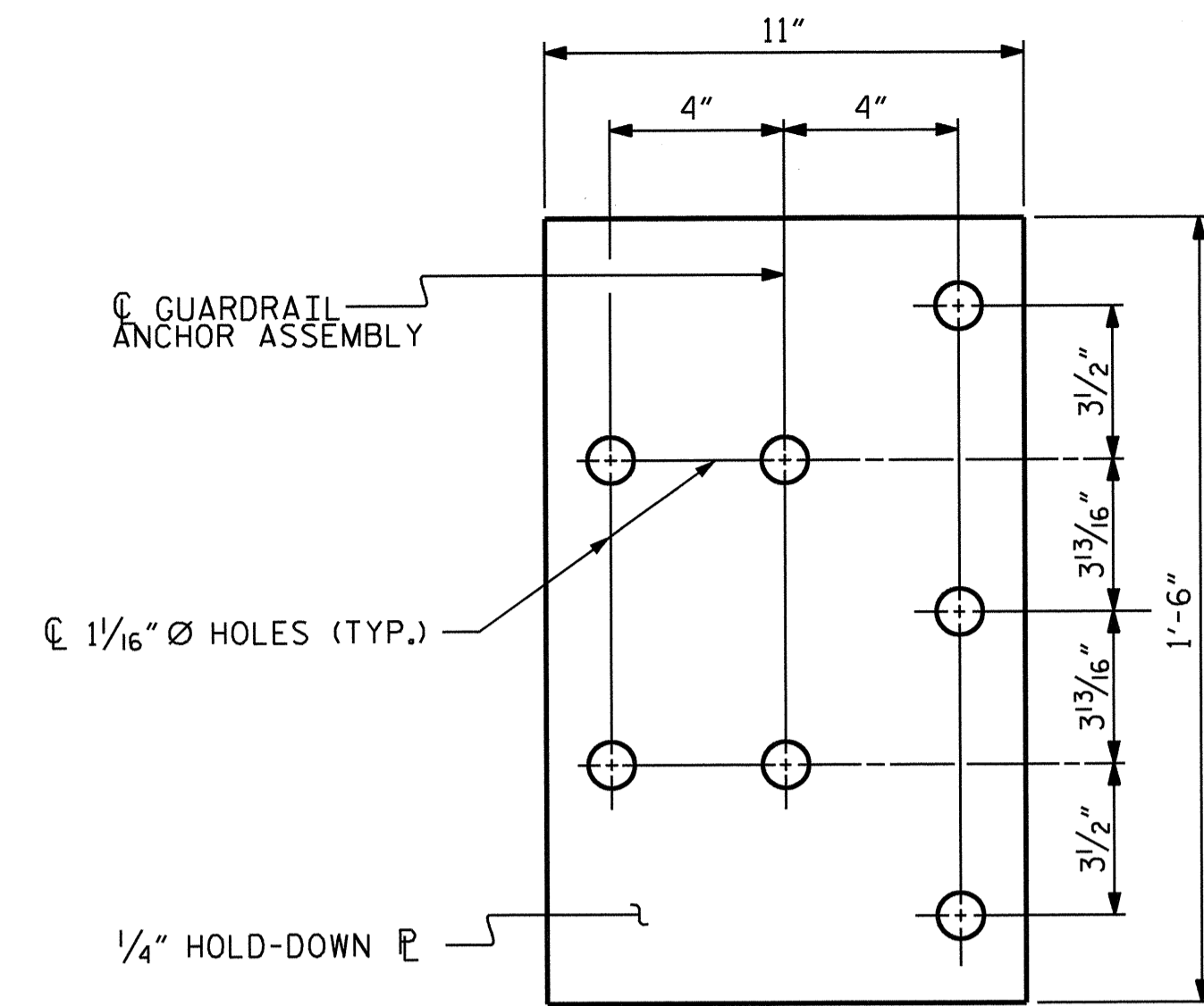
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

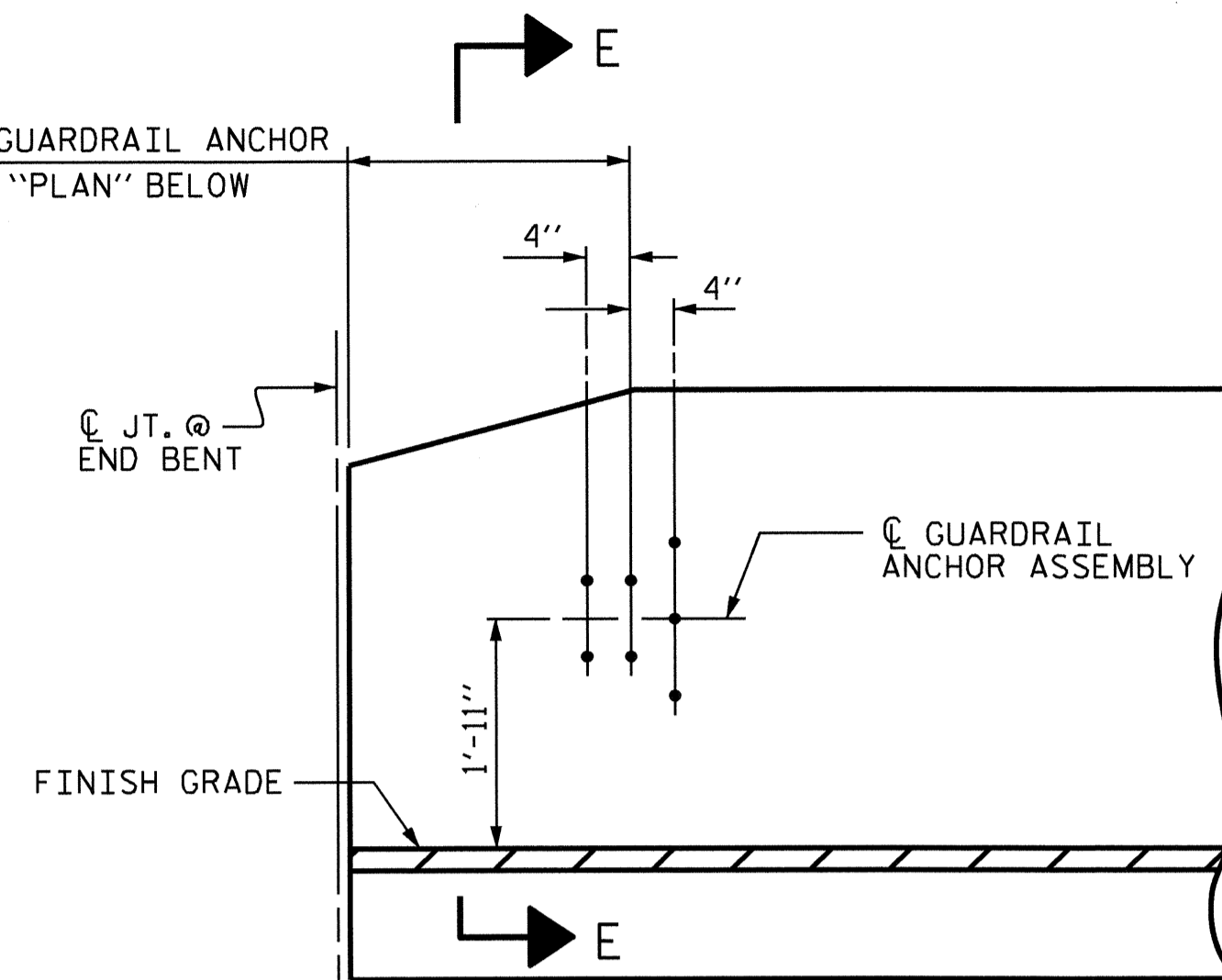
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

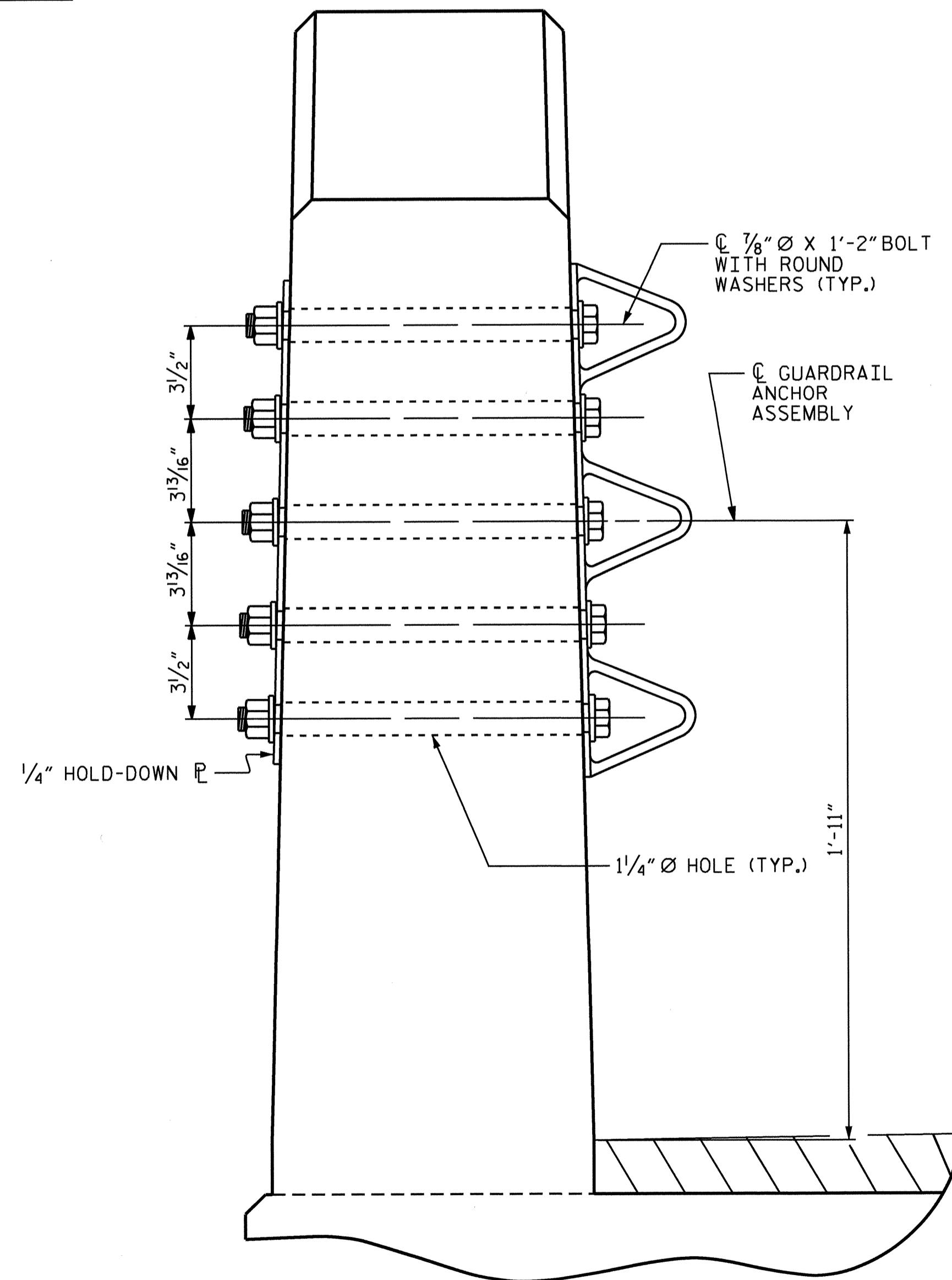


PLAN

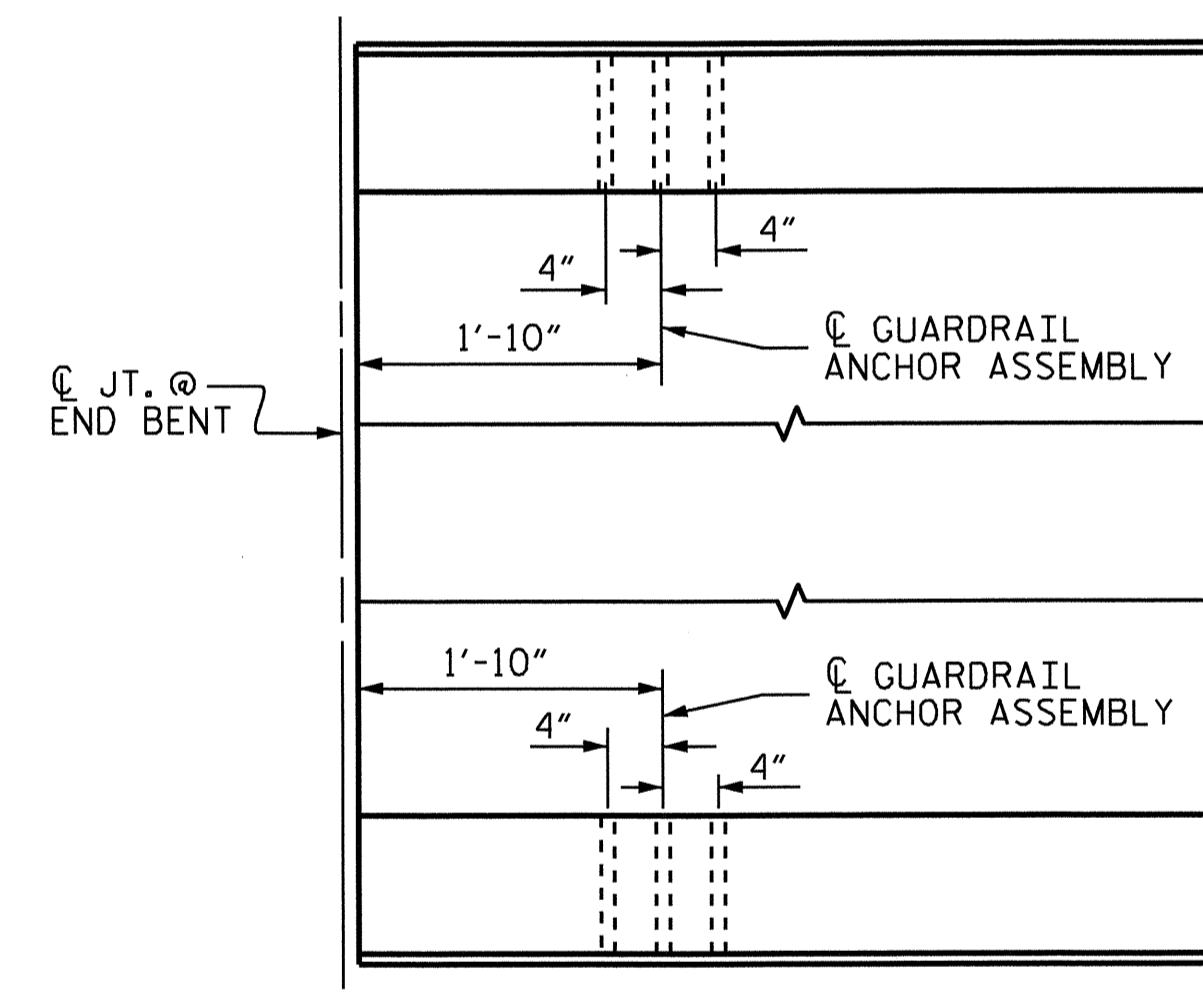
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



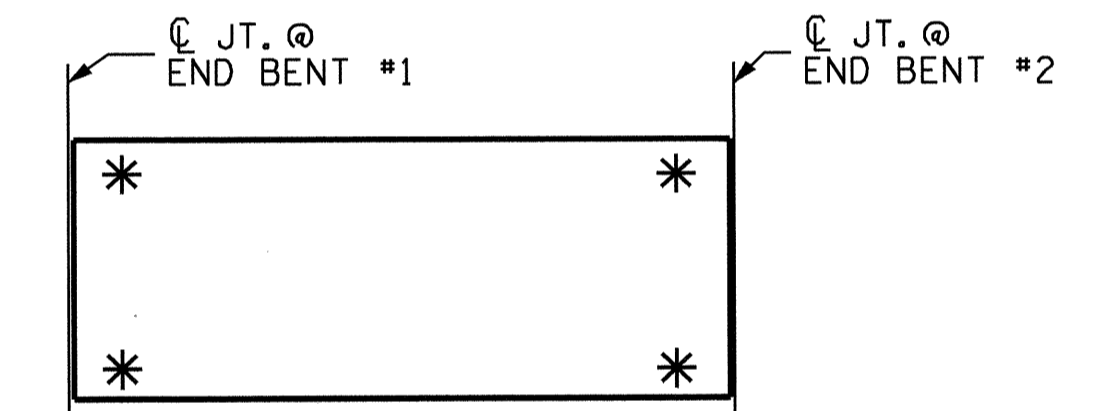
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

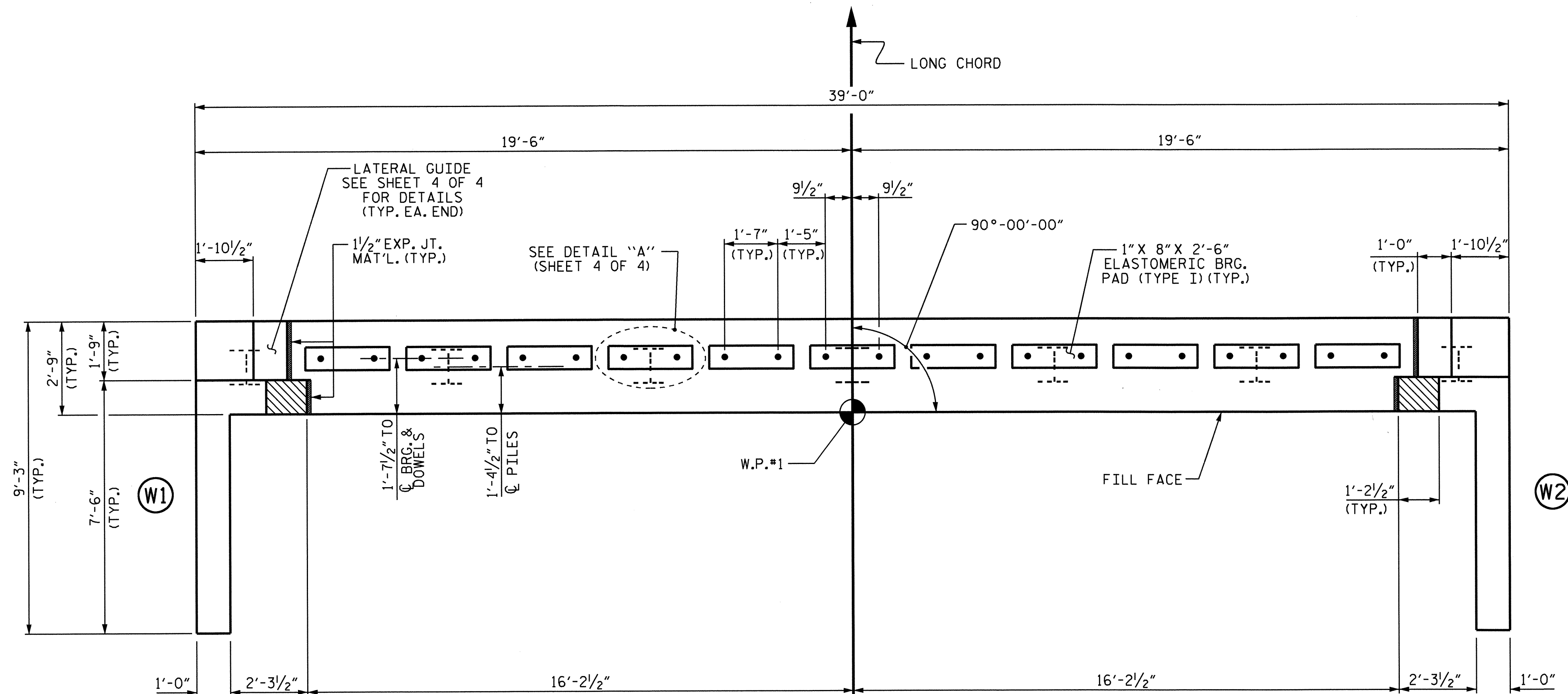
PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

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

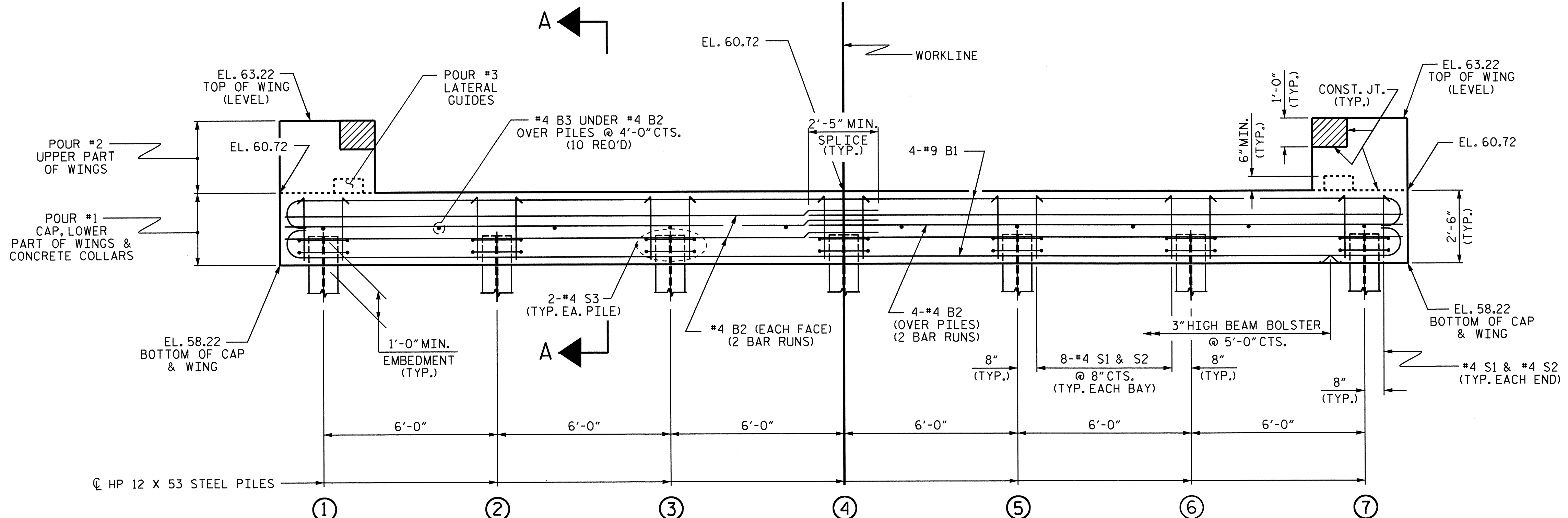


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : A.C. OUTLAW DATE : 2/10/12
 CHECKED BY : K. W. ALFORD DATE : 9/27/13
 DRAWN BY : MAA 5/10 ADDED 5/6/10 MAA/GM
 CHECKED BY : GM 5/10 REV. 10/1/11 MAA/GM
 REV. 12/5/11 MAA/GM



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
- FOR WING DETAILS, SEE SHEET 3 OF 4.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1



ASSEMBLED BY : D. G. ELY DATE : 8/22/12
 CHECKED BY : A.C. OUTLAW DATE : 8/28/12
 DRAWN BY : DGE 02/10
 CHECKED BY : MKT 02/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			19

NOTES

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

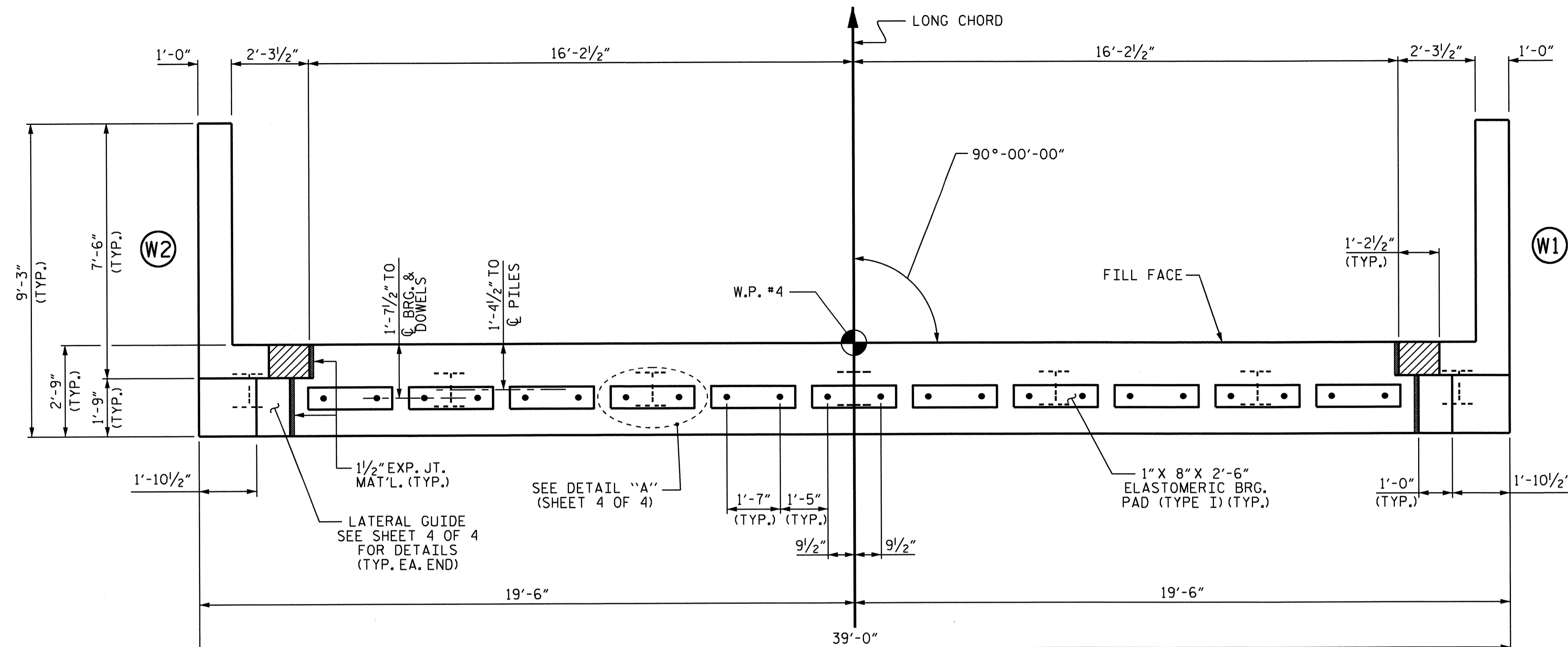
THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

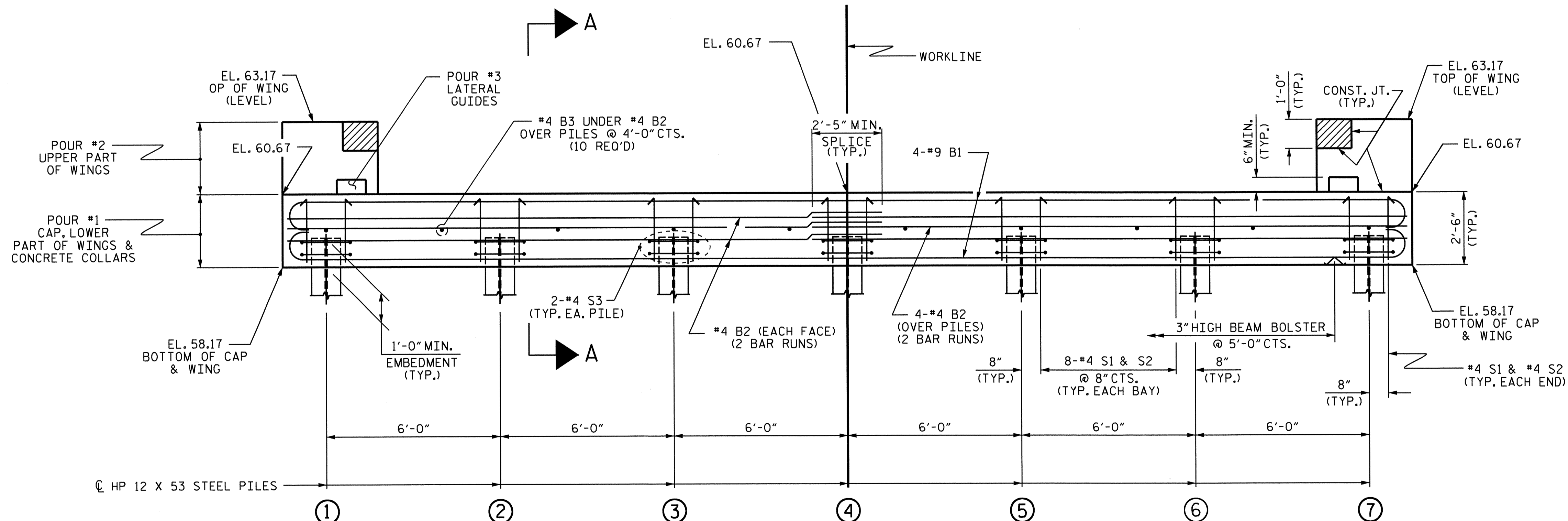
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

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



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 2 OF 4

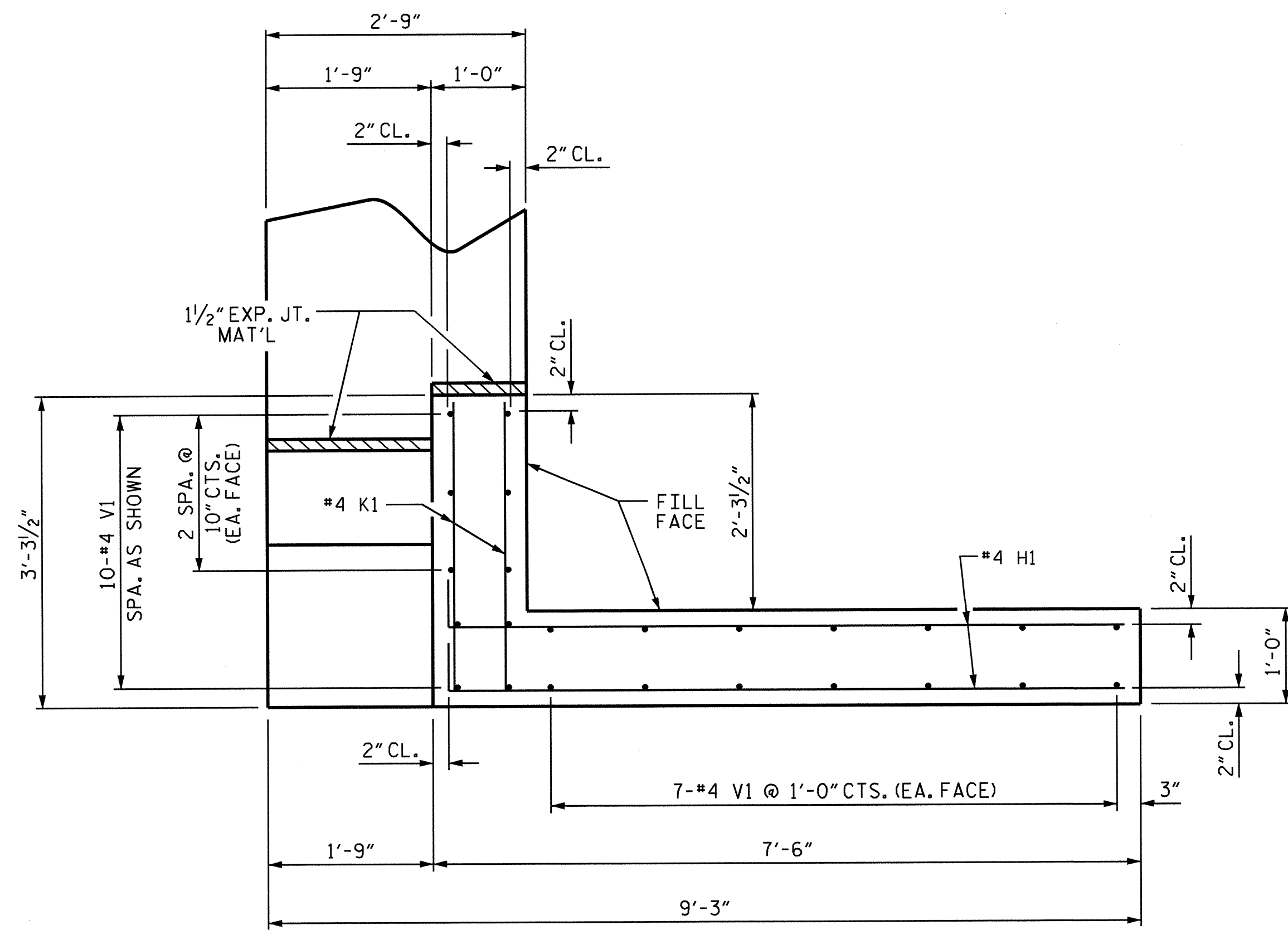
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2

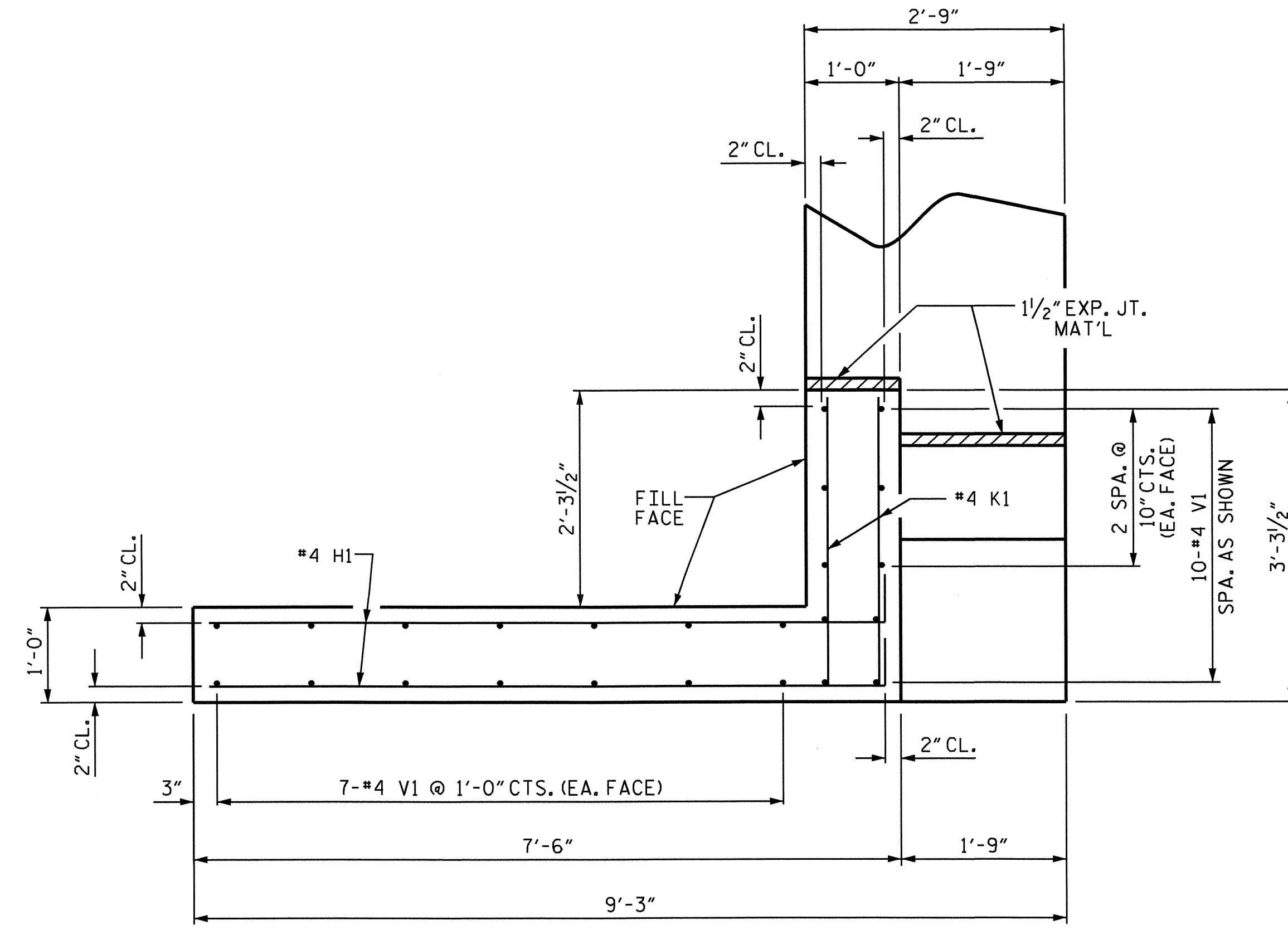


ASSEMBLED BY : D. G. ELY DATE : 8/22/12
 CHECKED BY : A. C. OUTLAW DATE : 8/28/12
 DRAWN BY : DCE 02/10
 CHECKED BY : MKT 02/10

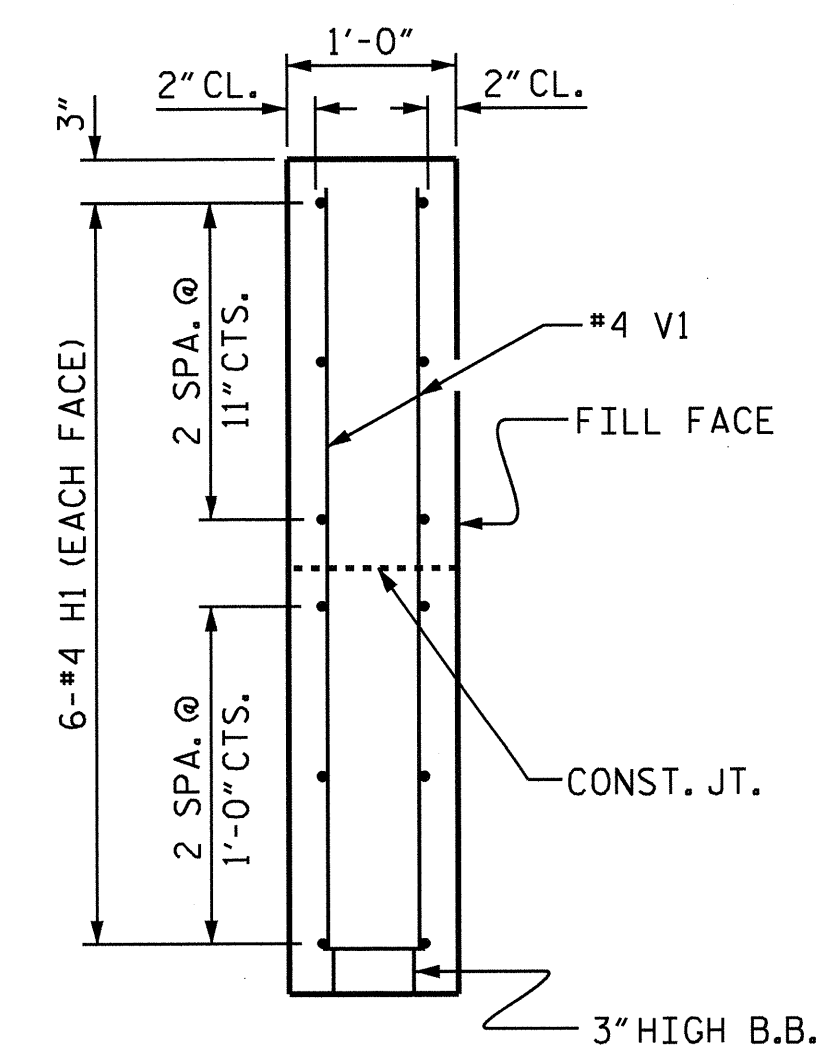
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-11
1			3			TOTAL SHEETS
2			4			19



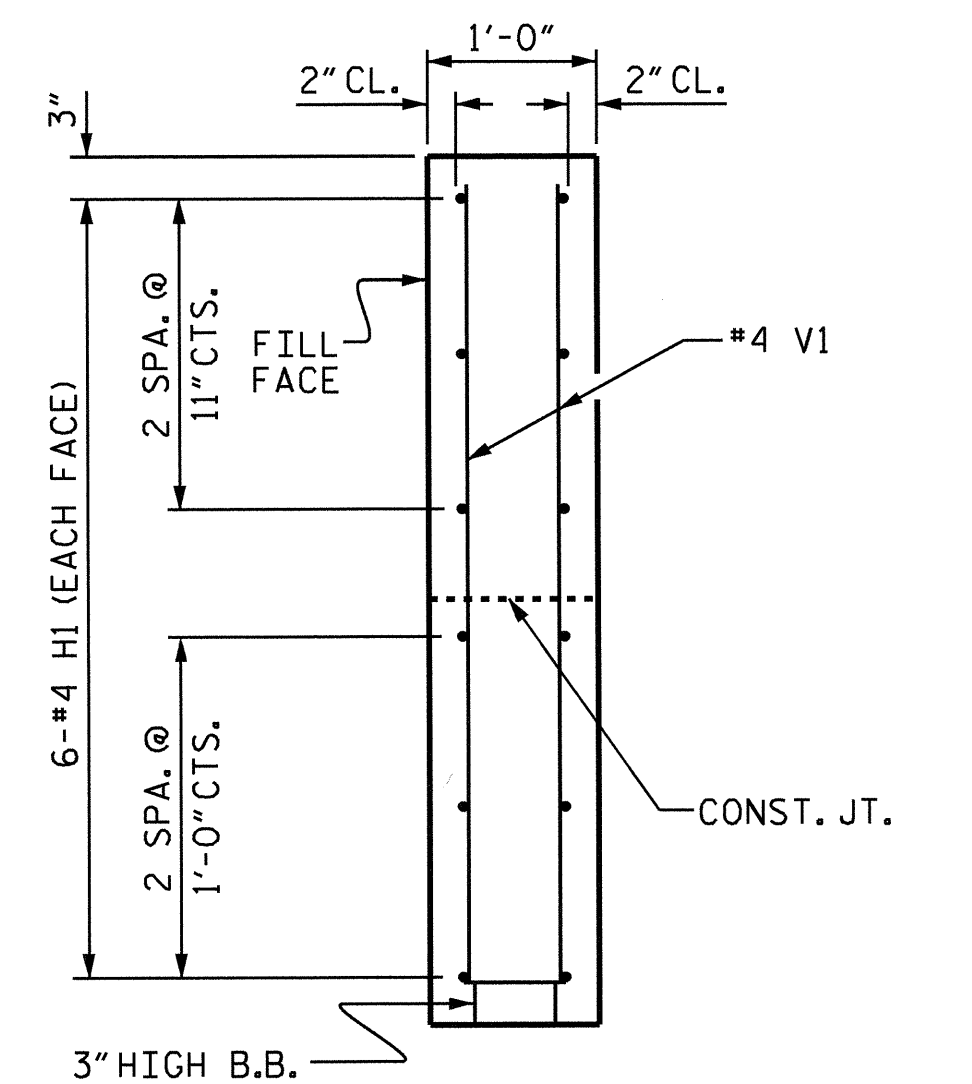
PLAN OF WING (W1)



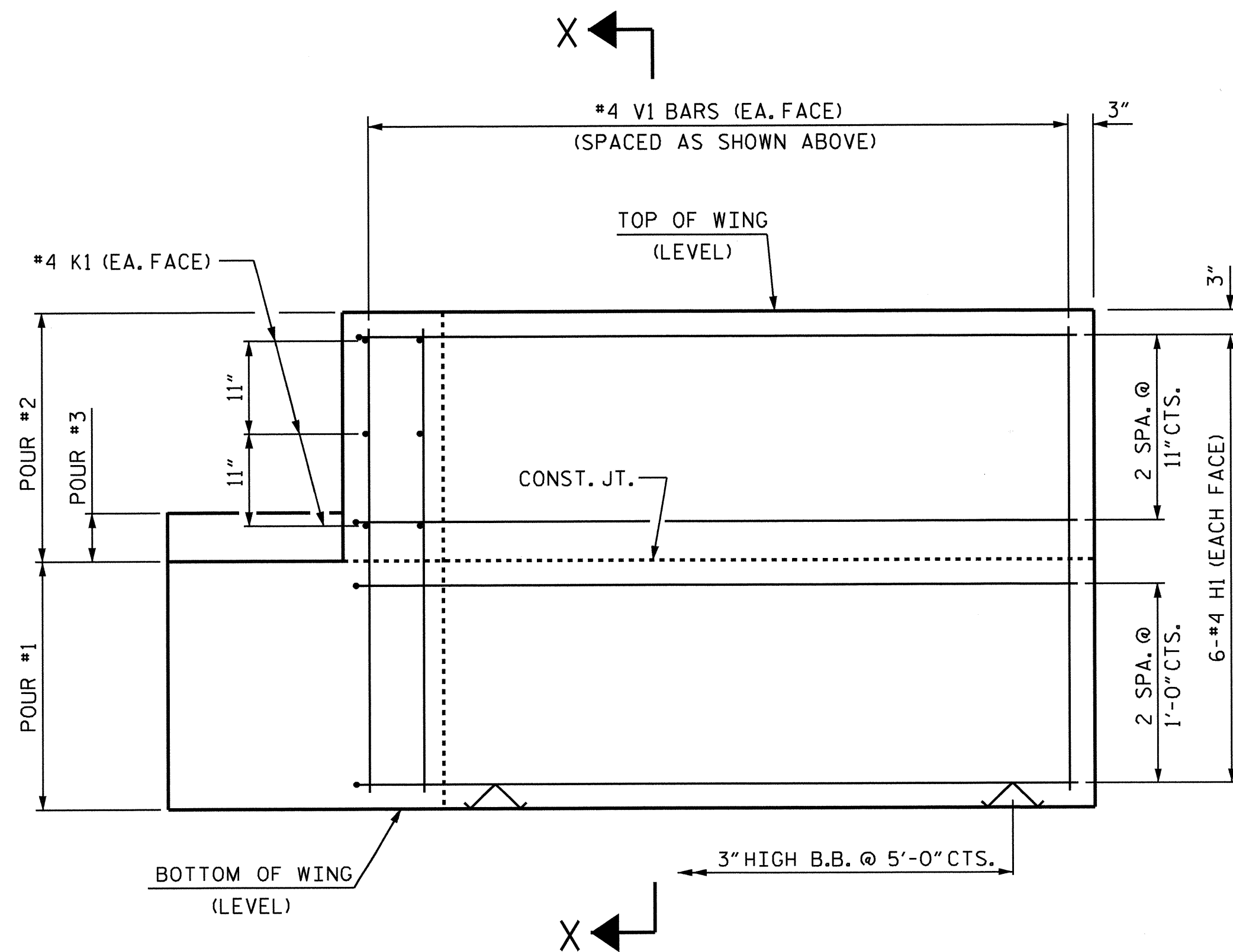
PLAN OF WING (W2)



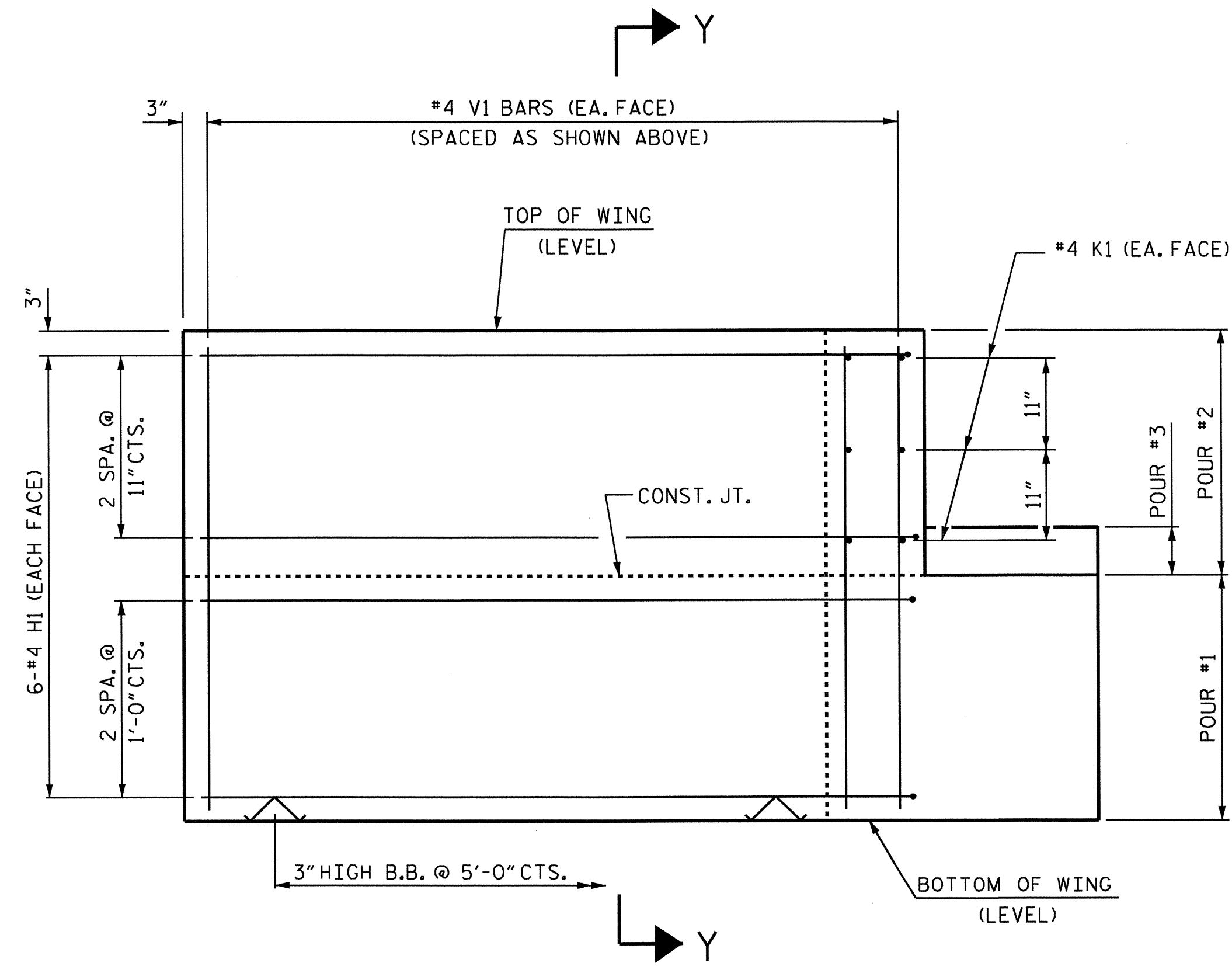
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : D. G. ELY DATE : 8/22/12
 CHECKED BY : A.C. OUTLAW DATE : 8/28/12
 DRAWN BY : DGE 02/10
 CHECKED BY : MKT 02/10

15-OCT-2013 08:51
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PROJECT NO. B-4478
 COLUMBUS COUNTY
 STATION: 17+68.00 -L-

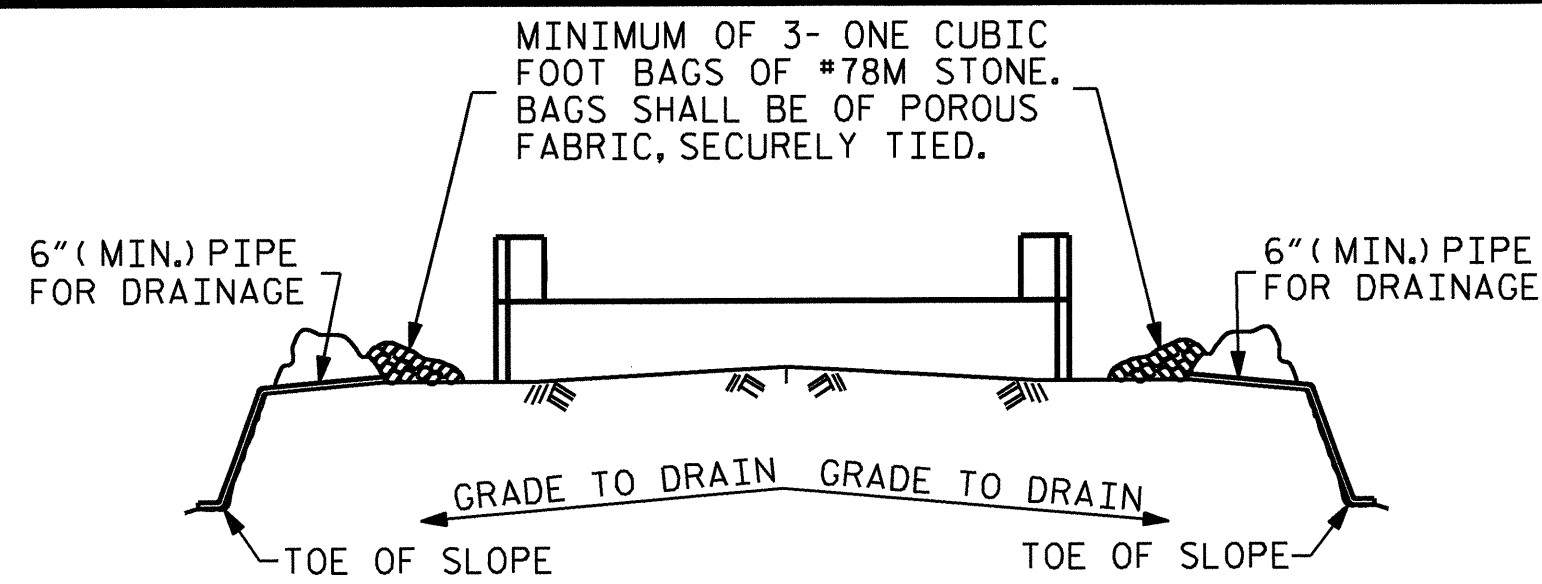
SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT
 WING DETAILS

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			

STD. NO. EB_33_90S

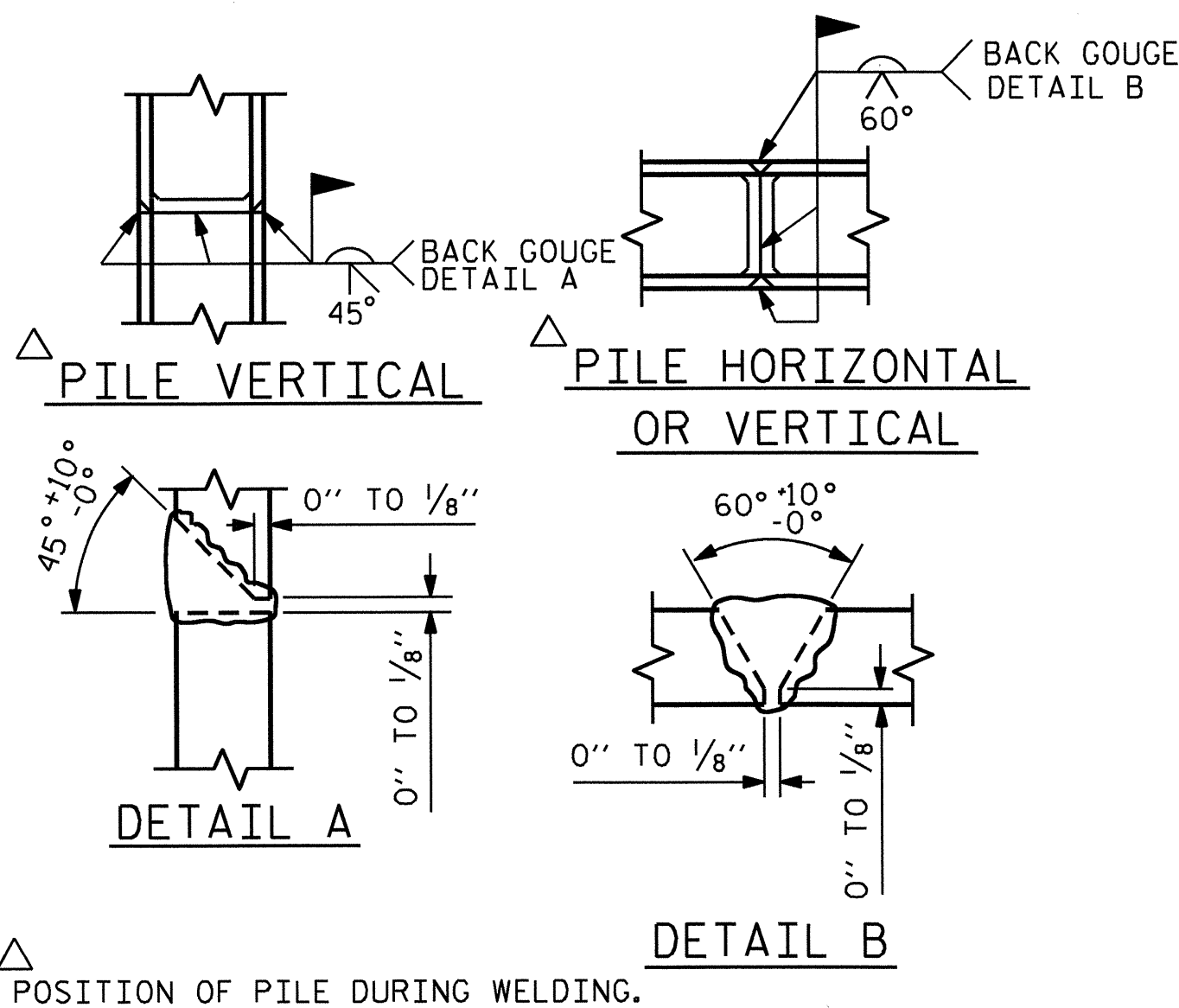


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



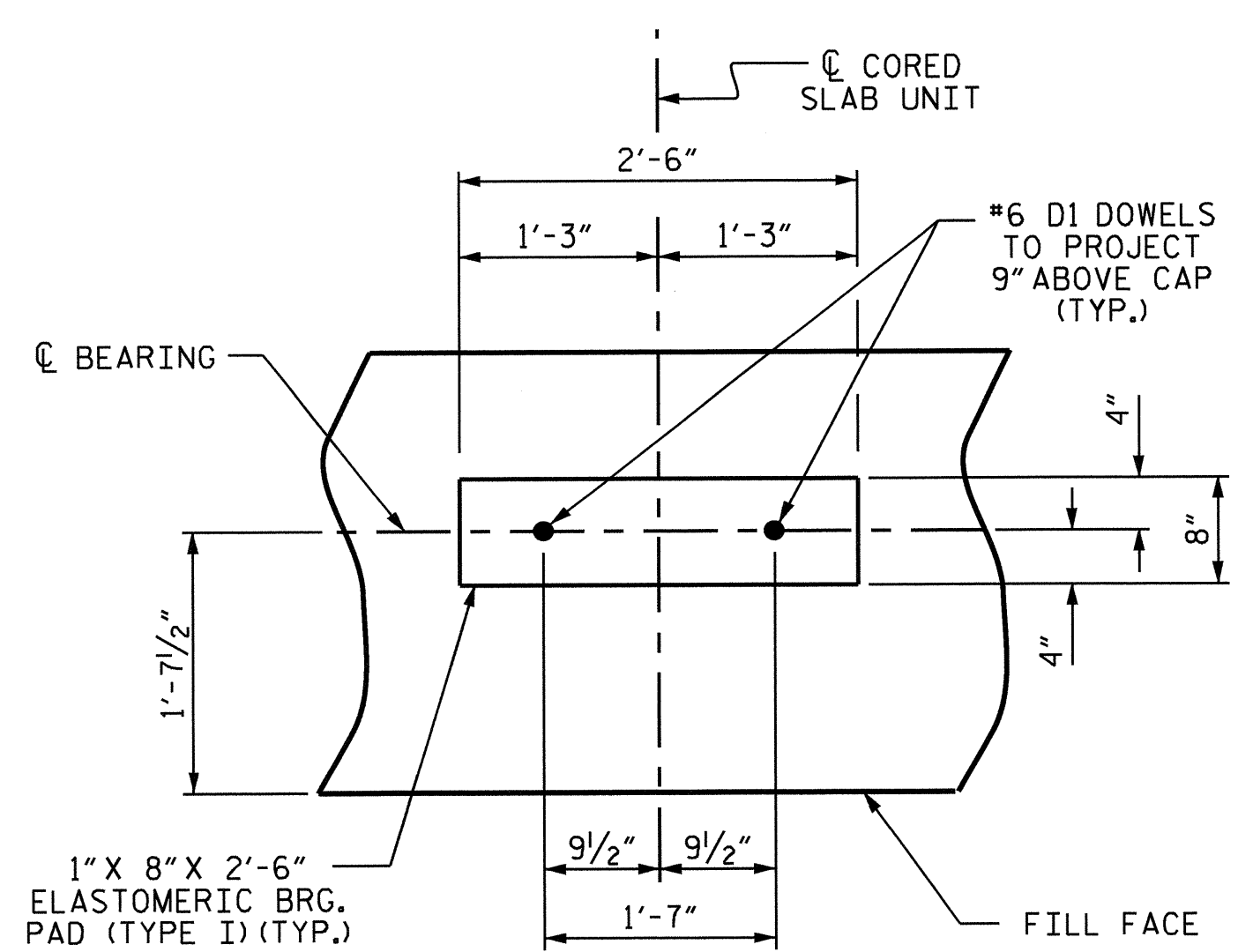
PILE SPLICE DETAILS

BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	16	#4	STR	20'-7"	220
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	50	#4	3	7'-5"	248
S2	50	#4	4	3'-2"	106
S3	14	#4	5	6'-6"	61
S4	4	#4	6	4'-5"	12
V1	48	#4	STR	4'-8"	150
REINFORCING STEEL (FOR ONE END BENT)					2127 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1	CAP, LOWER PART OF WINGS & COLLARS			12.4 C.Y.	
POUR #2	UPPER PART OF WINGS			1.8 C.Y.	
POUR #3	LATERAL GUIDES			0.1 C.Y.	
TOTAL CLASS A CONCRETE				14.3 C.Y.	

BAR TYPES	
①	④
②	⑤
③	⑥

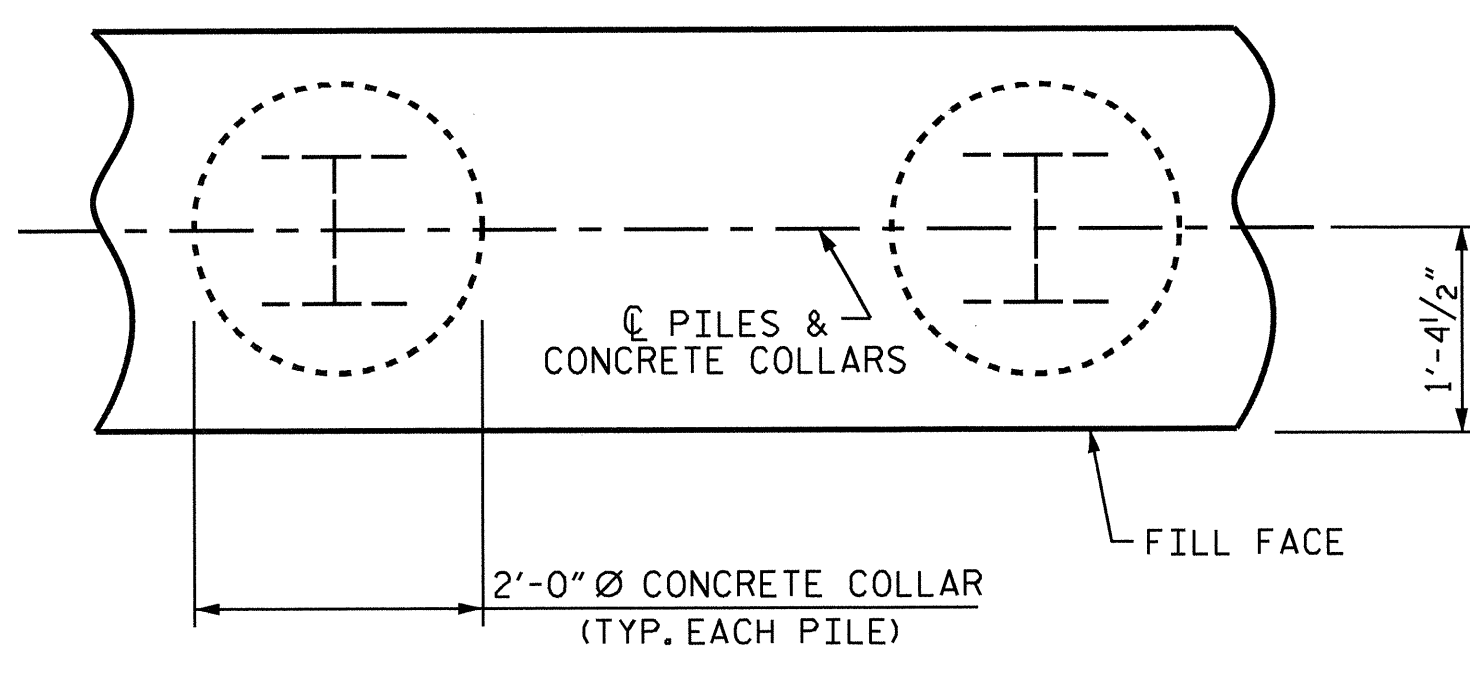
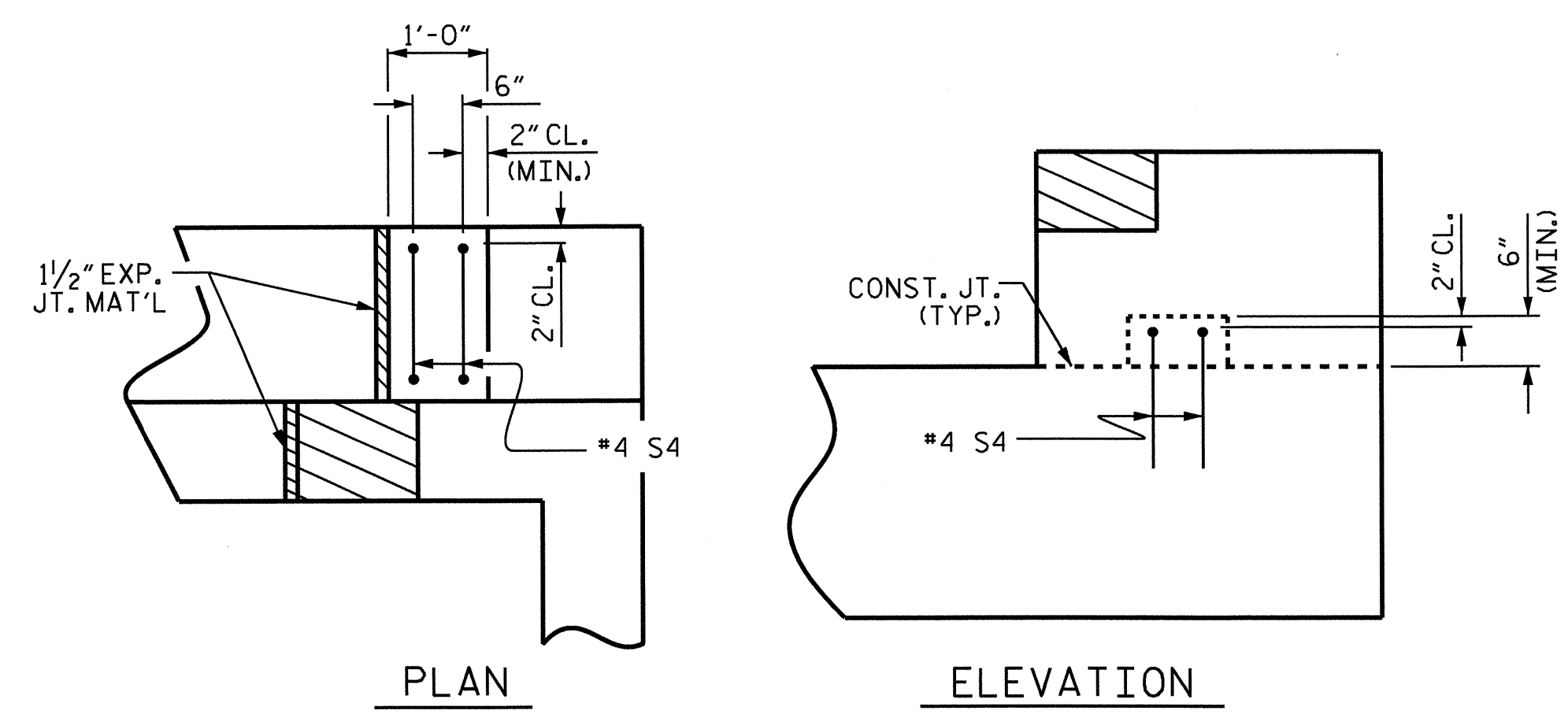
ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 7 LIN. FT. = 315	NO: 7 LIN. FT. = 315
PILE REDRIVES (PER EACH) 4	PILE REDRIVES (PER EACH) 4



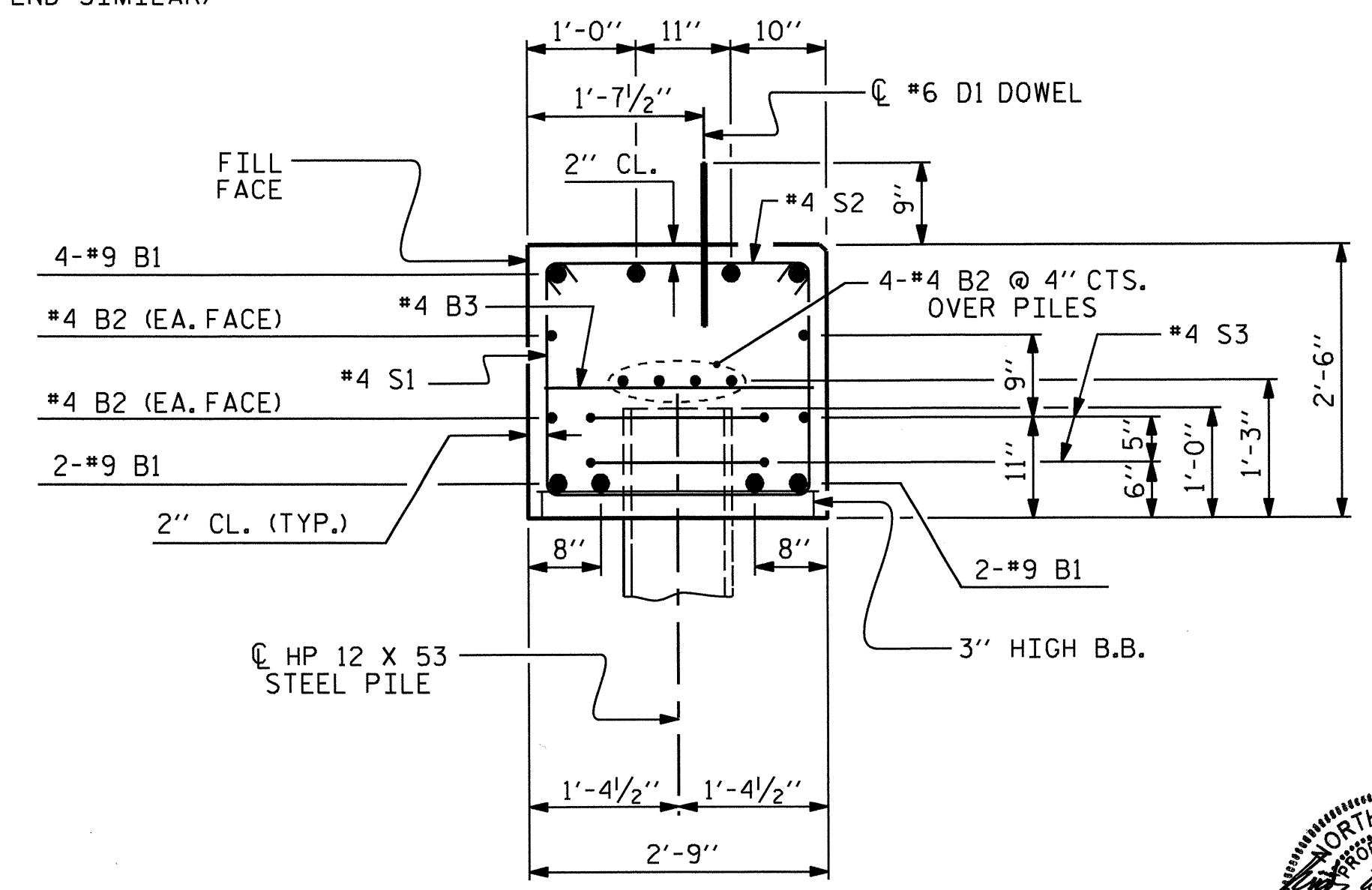
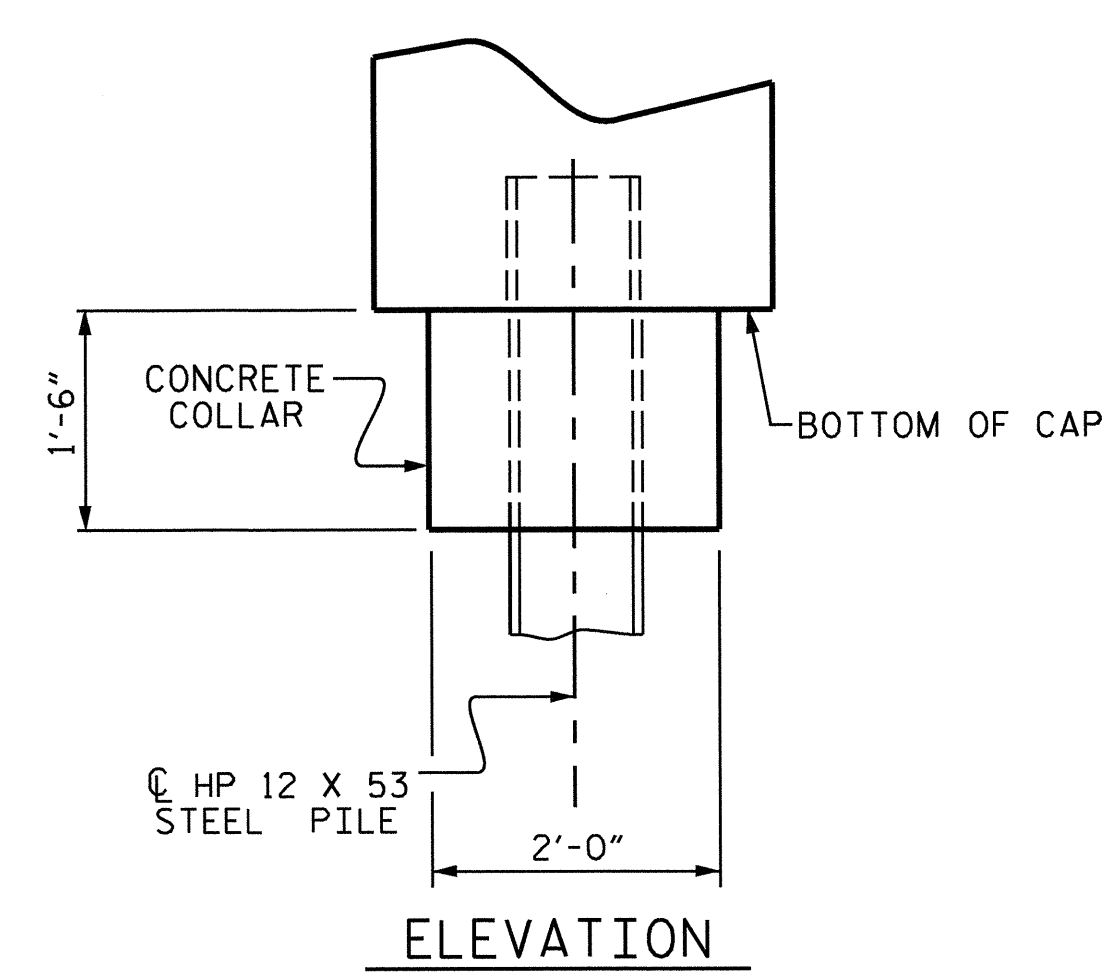
DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

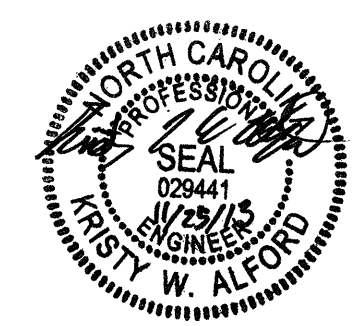


CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



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



PROJECT NO. B-4478
 COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

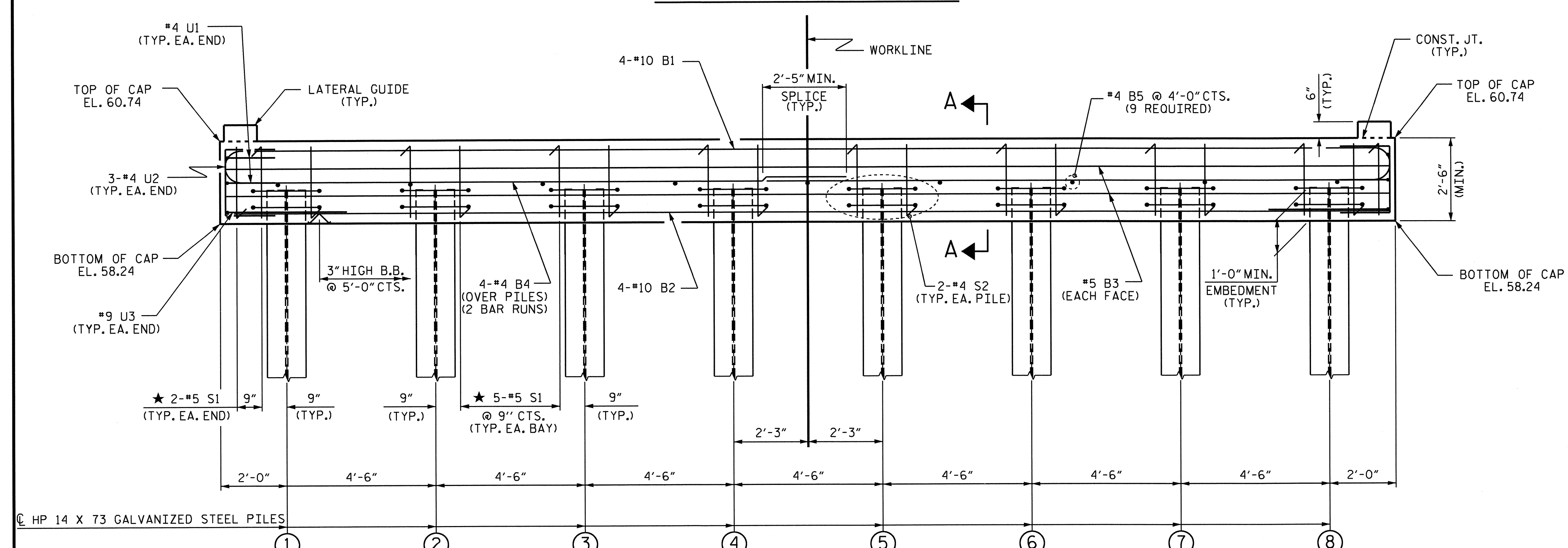
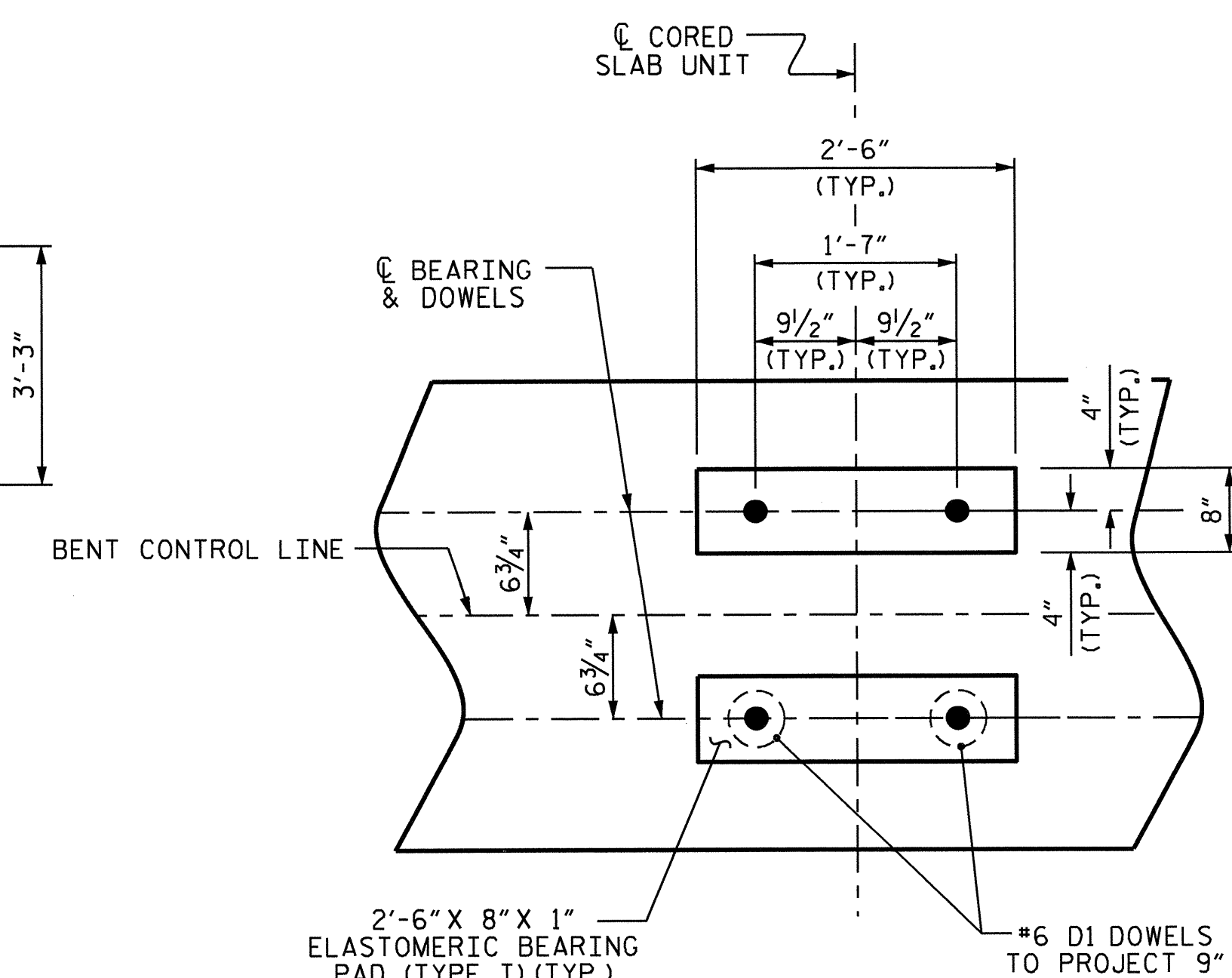
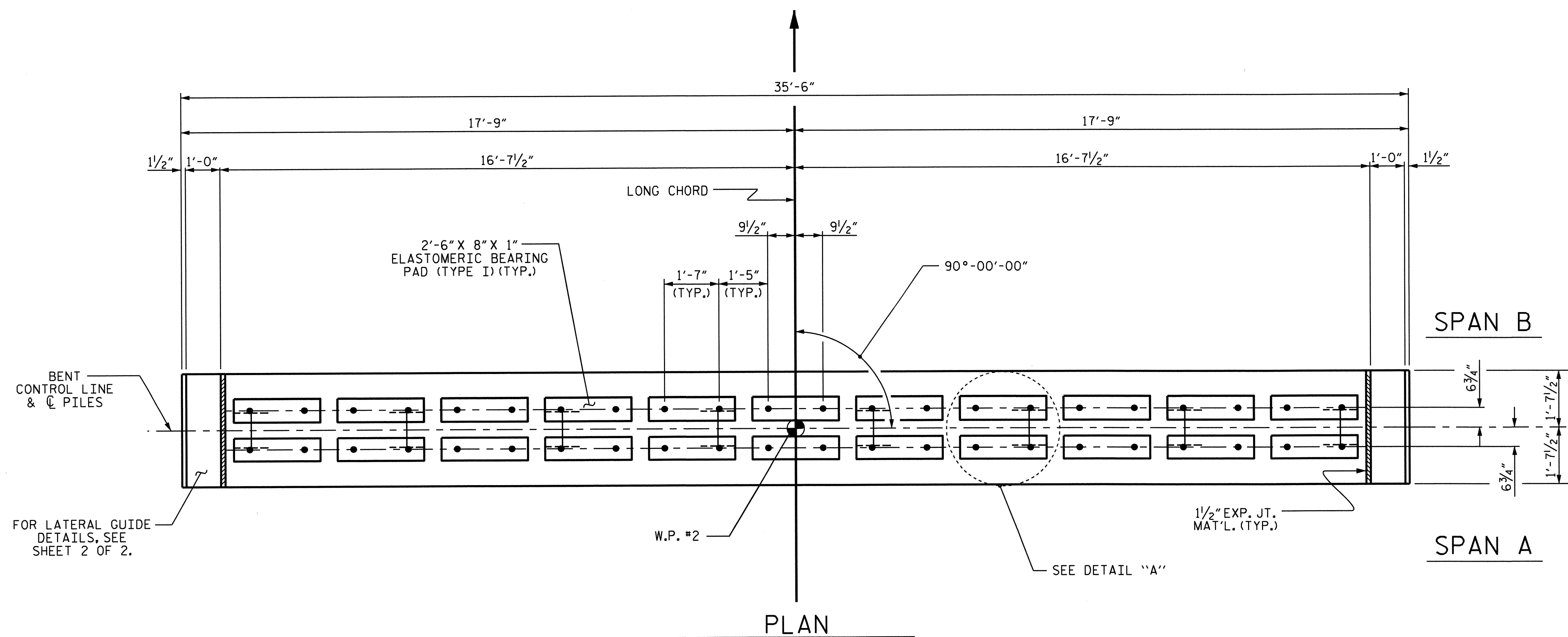
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 19

ASSEMBLED BY : D. G. ELY DATE : 8/22/12
 CHECKED BY : A.C. OUTLAW DATE : 8/28/12
 DRAWN BY : DGE 02/10
 CHECKED BY : MKT 02/10

NOTES

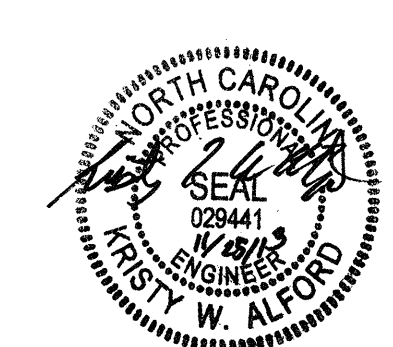
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 52 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

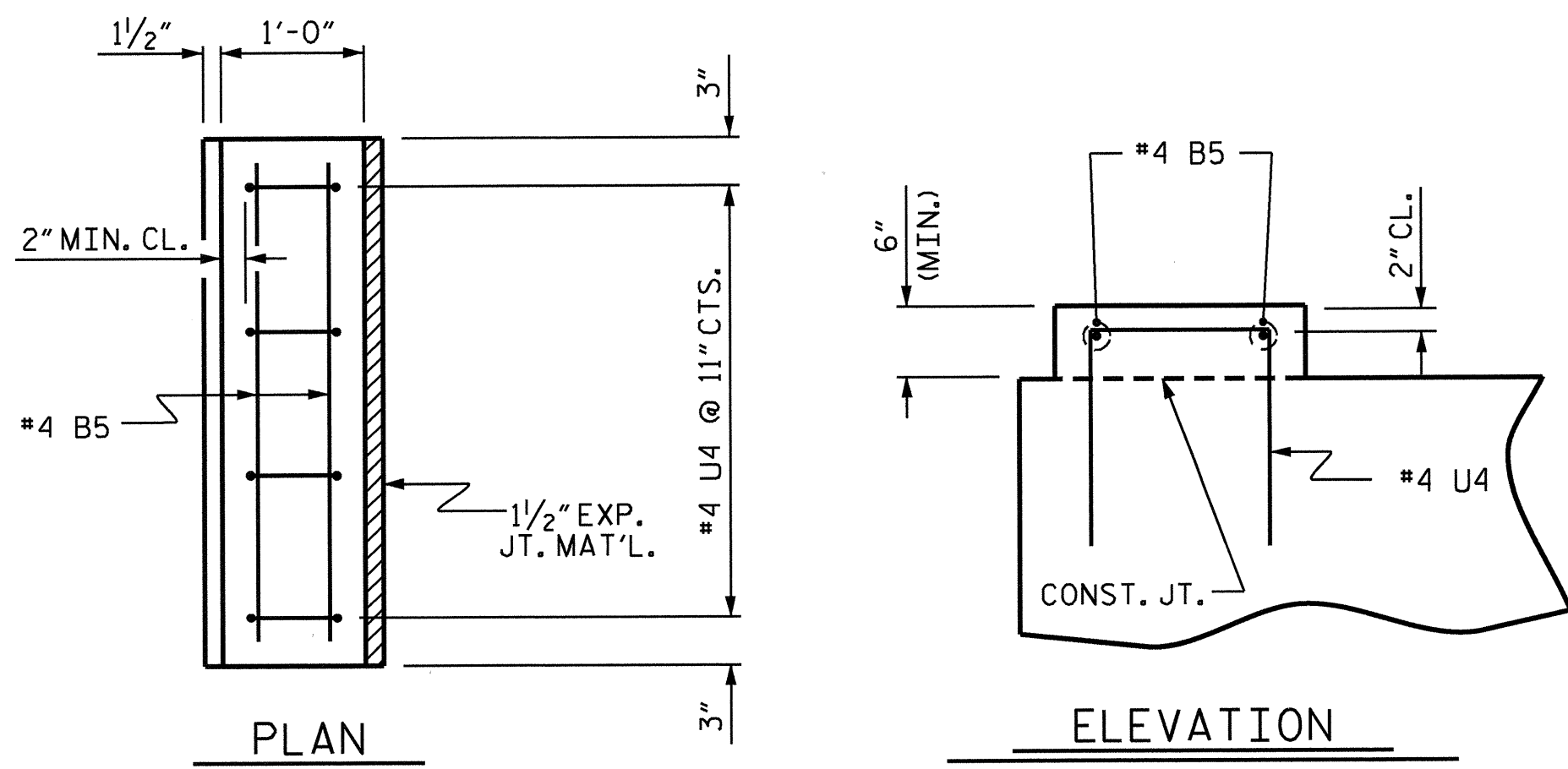
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-14
					TOTAL SHEETS 19

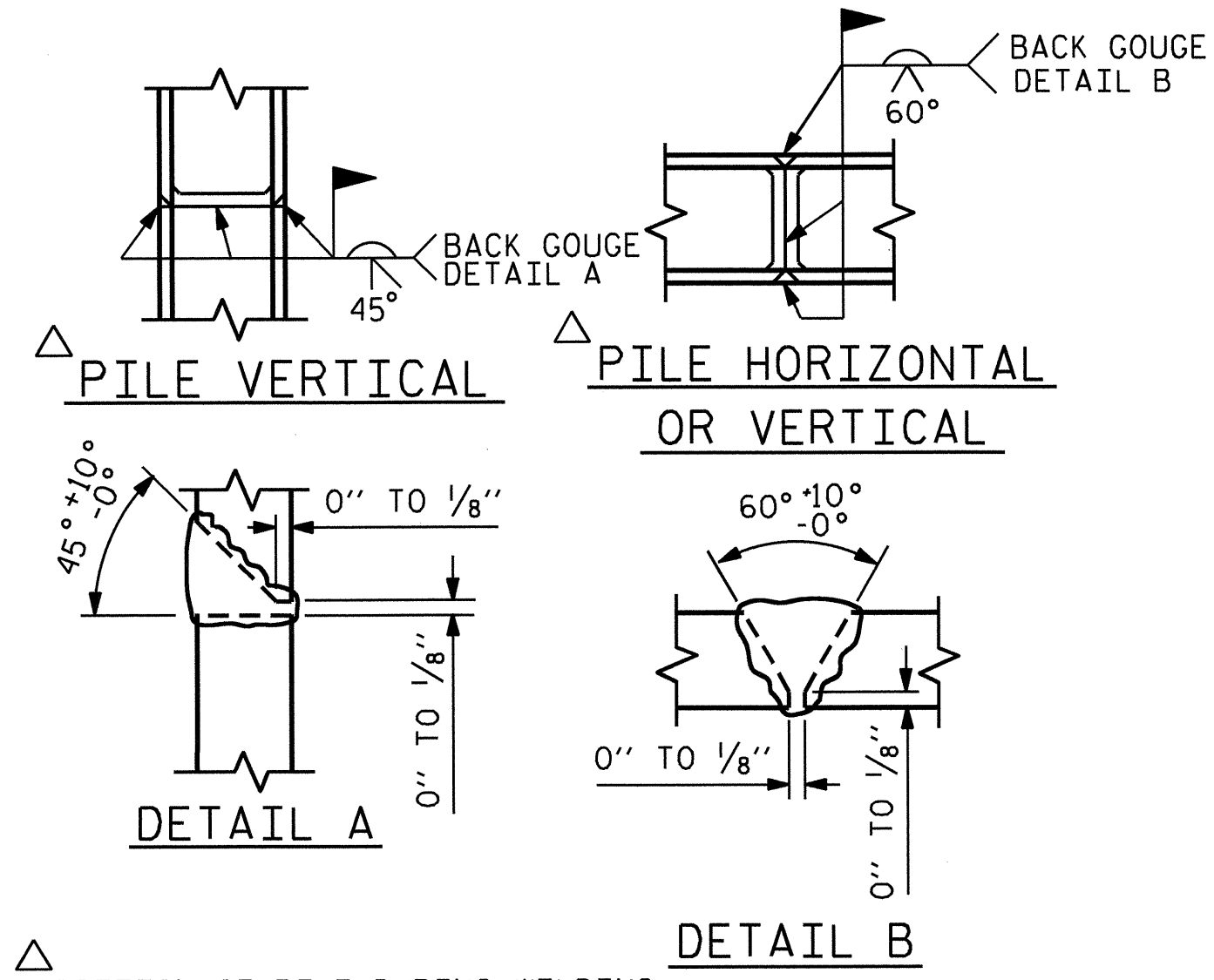


ASSEMBLED BY : A.C. OUTLAW DATE : 8/28/12
 CHECKED BY : S.B. WANCE DATE : 8/29/12
 DRAWN BY : DCE 05/10
 CHECKED BY : MKT 05/10

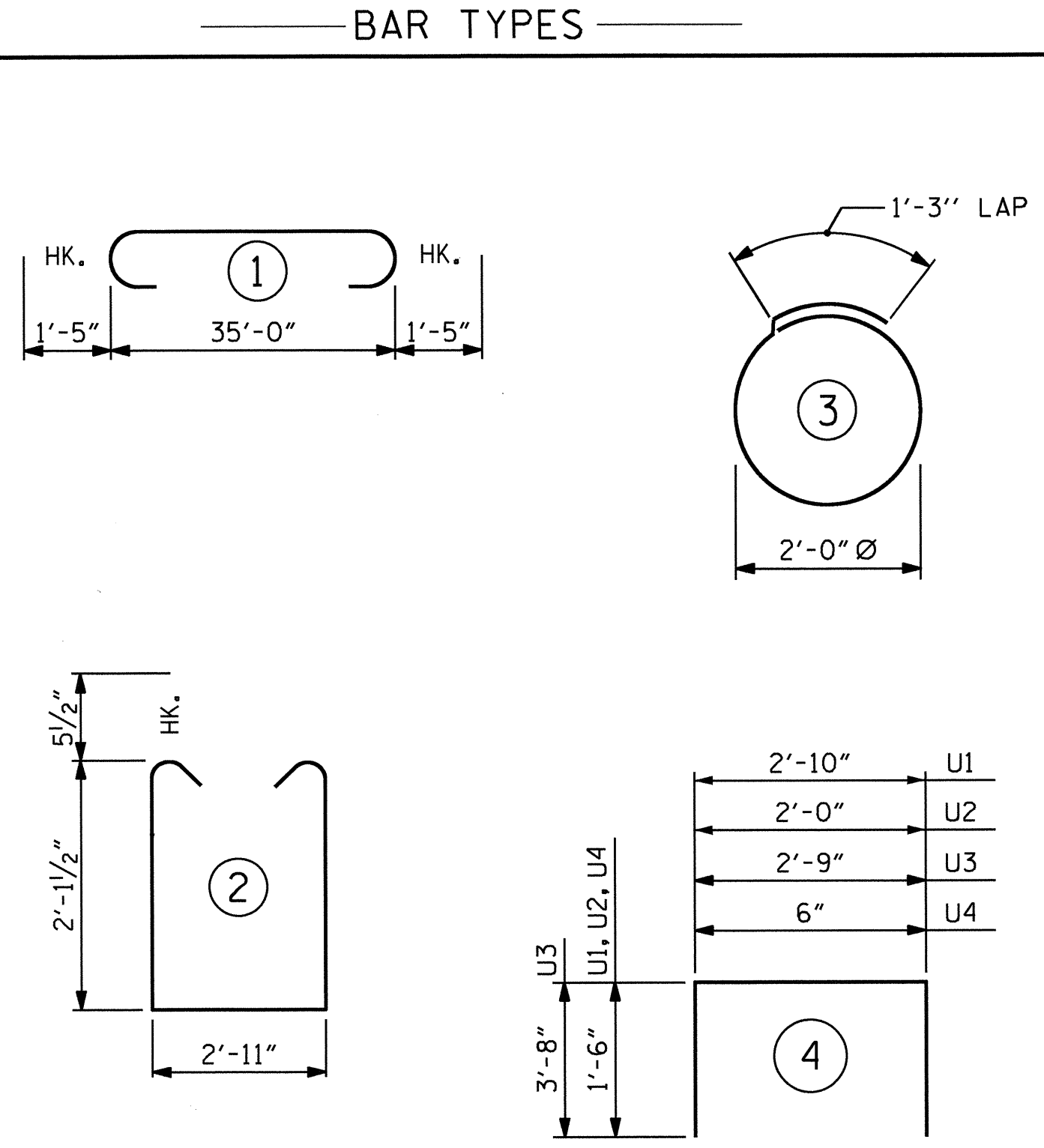
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 Kalford



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

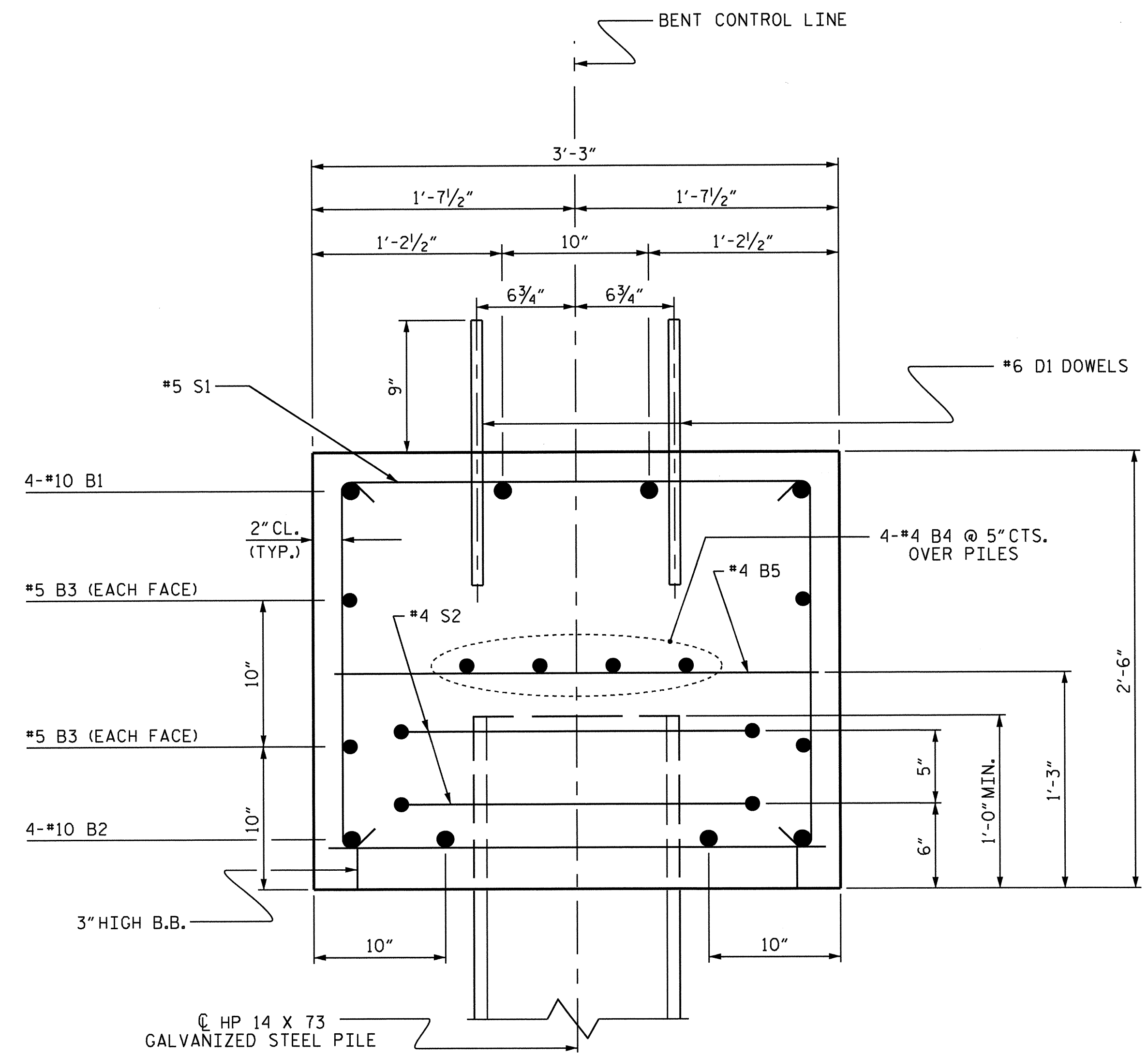


PILE SPLICE DETAILS
POSITION OF PILE DURING WELDING.

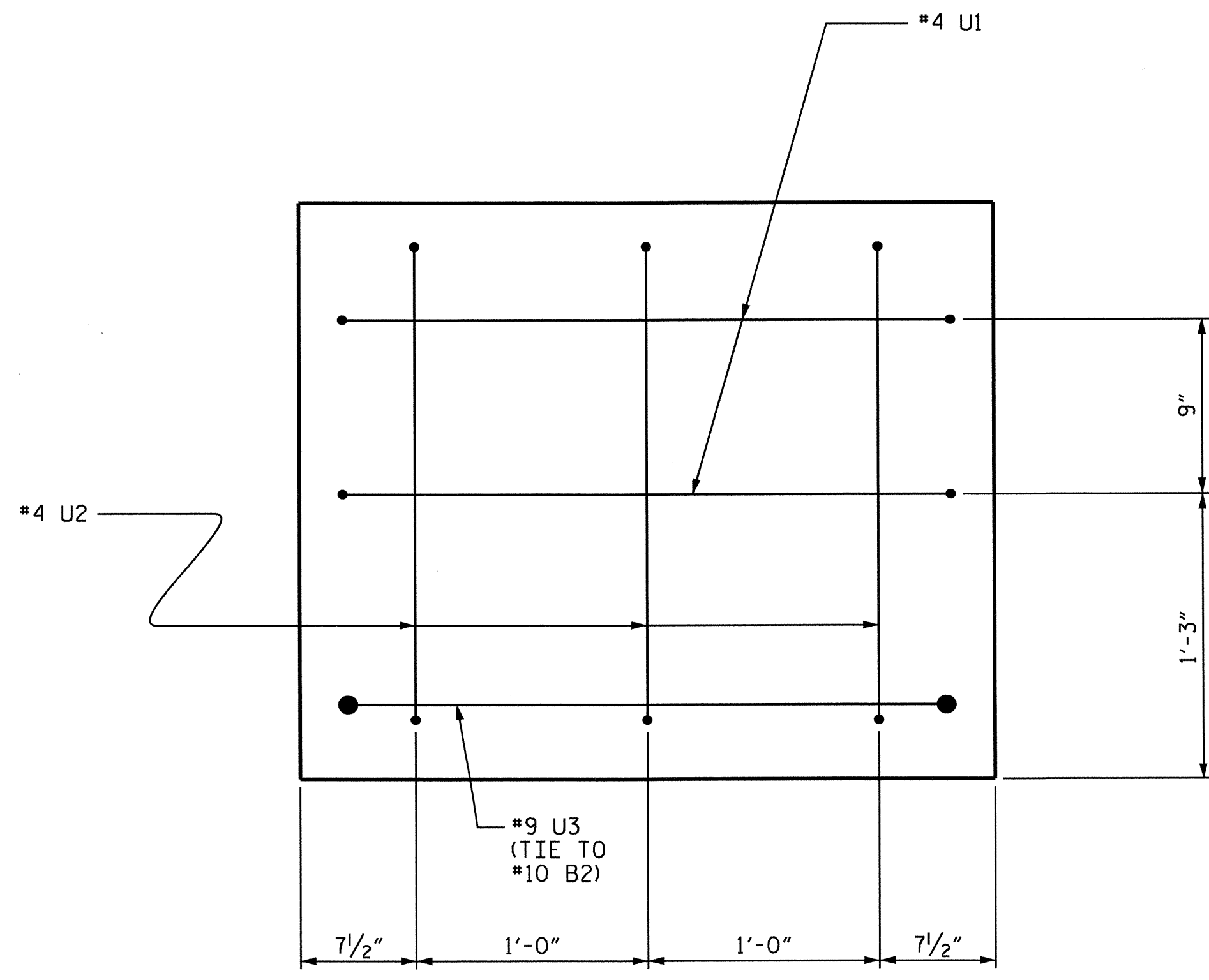


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	13	#4	STR	2'-11"	25
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
U4	8	#4	4	3'-6"	19
REINFORCING STEEL (FOR ONE BENT)				2162 LBS	
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
POUR #1 (CAP)				10.7 C.Y.	
POUR #2 (LATERAL GUIDES)				0.1 C.Y.	
TOTAL CLASS A CONCRETE				10.8 C.Y.	
HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)					
No. 8				LIN. FT. 520	
PILE REDRIVES				4 EACH	



SECTION A-A



END OF CAP VIEW
(TYPICAL BOTH ENDS)

DRAWN BY : A.C. OUTLAW DATE : 8/28/12
 CHECKED BY : S.B. WANCE DATE : 8/29/12
 DRAWN BY : DGE 05/10
 CHECKED BY : MKT 05/10

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 Kalford



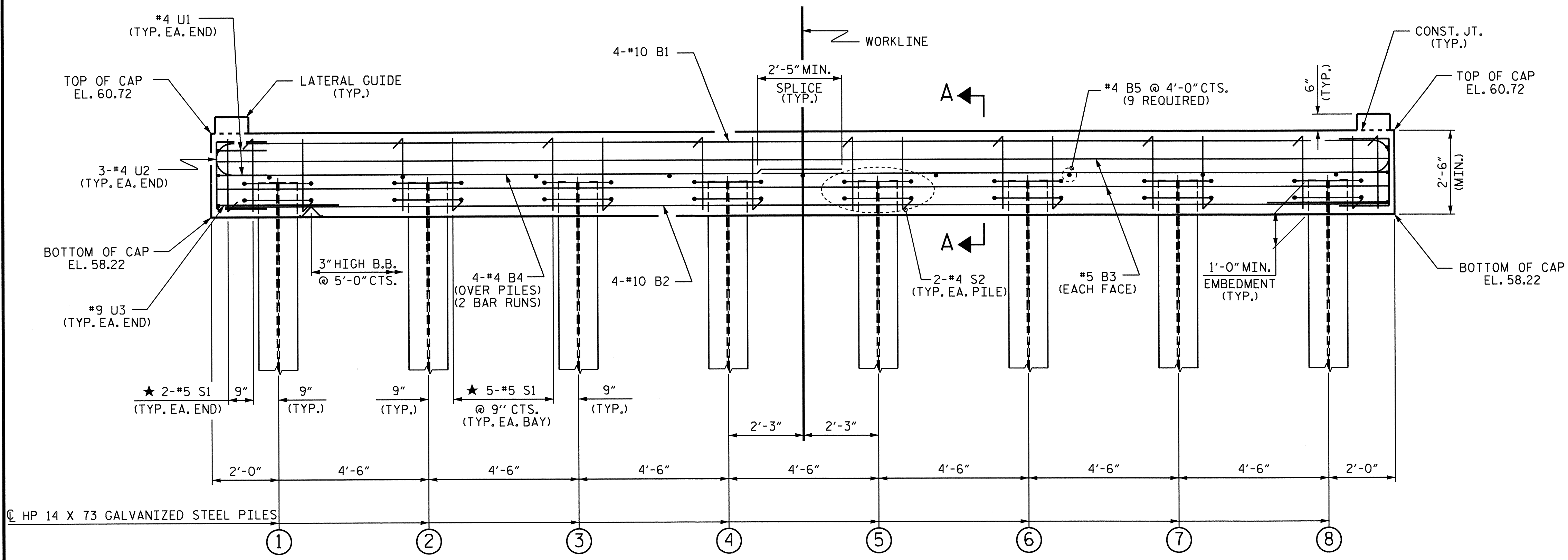
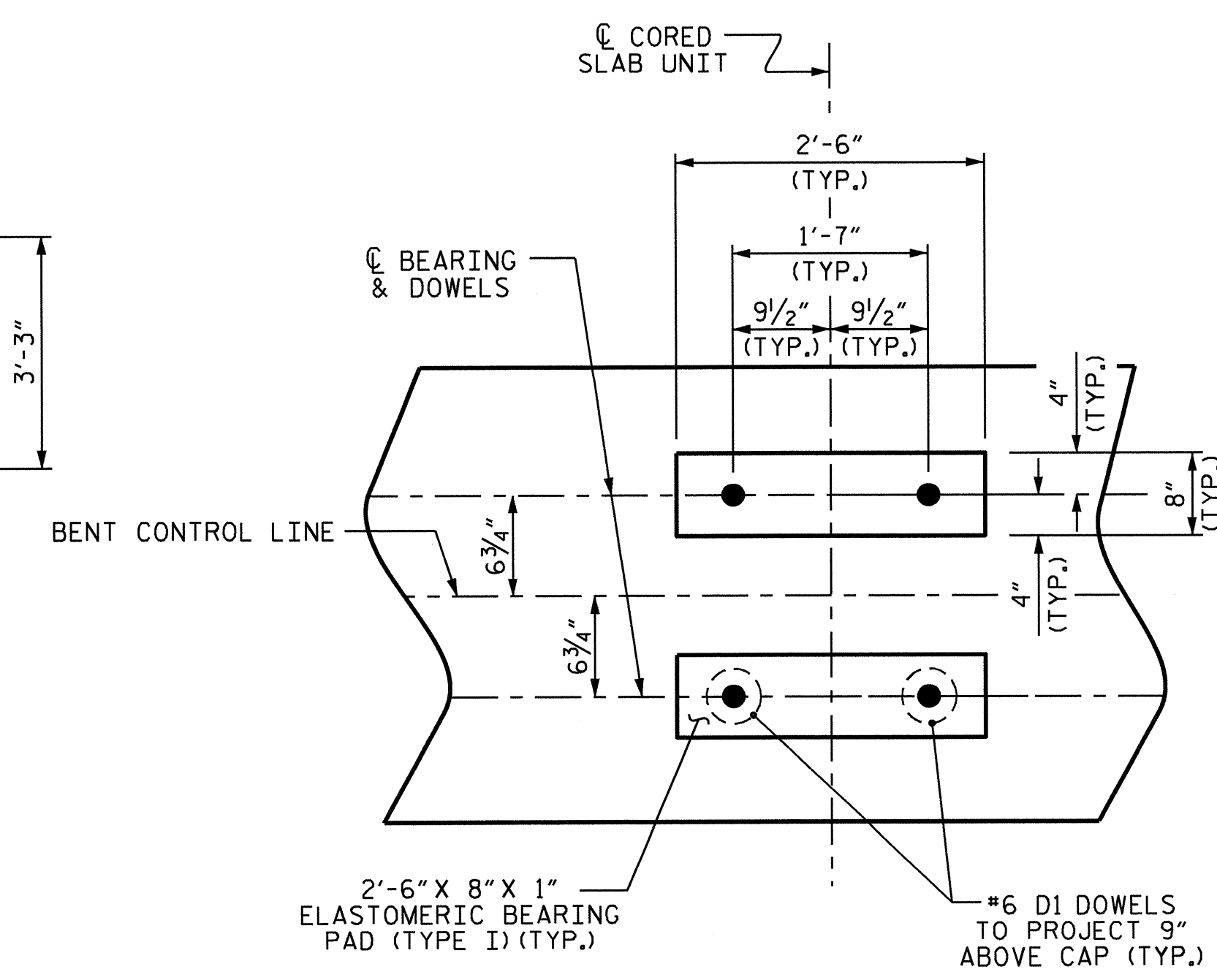
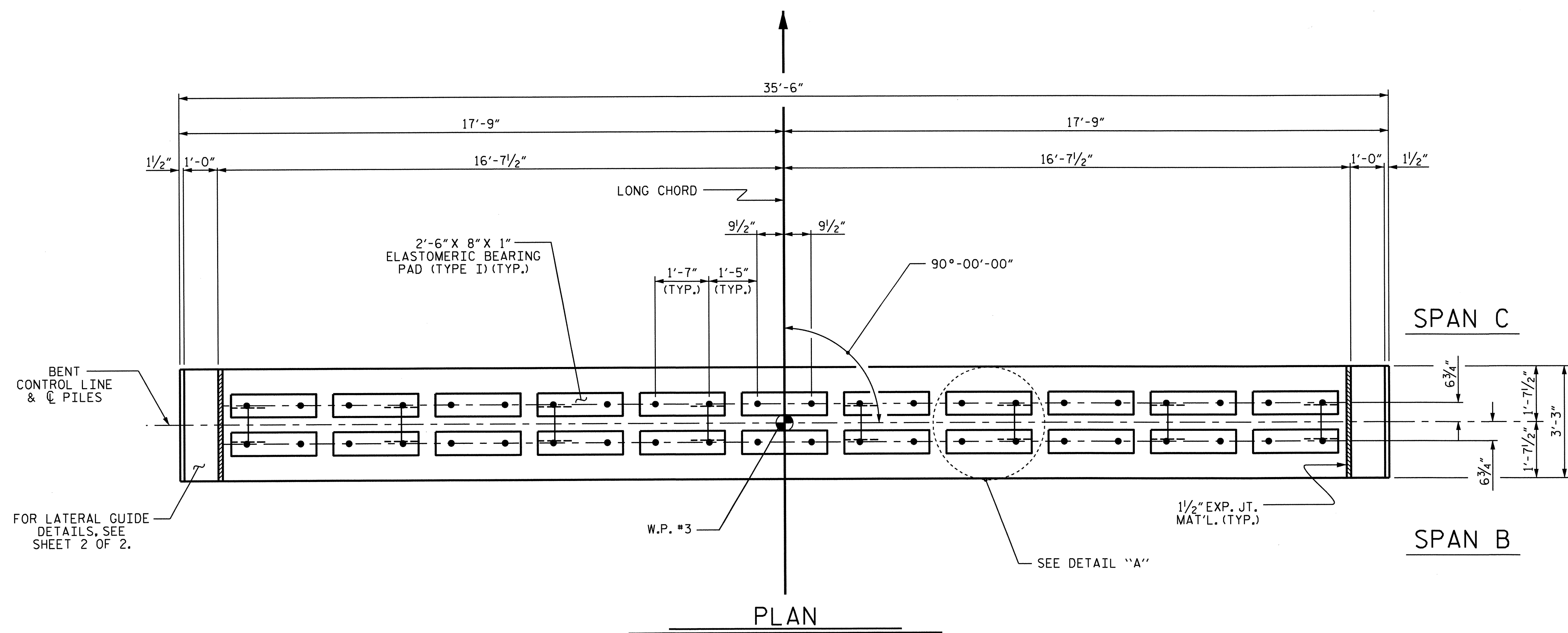
PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

SHEET 2 OF 2

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 47 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

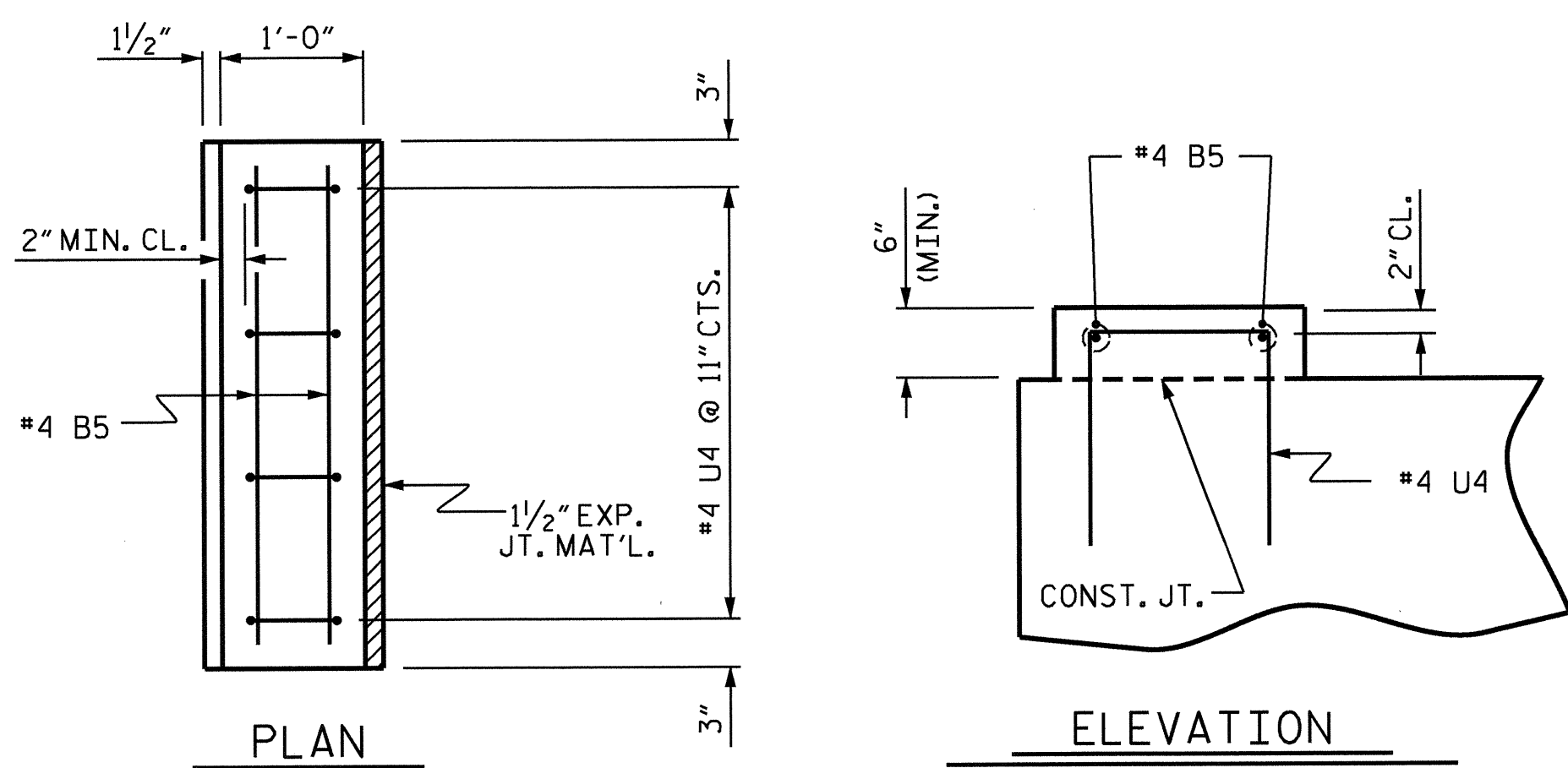


PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-
 SHEET 1 OF 2

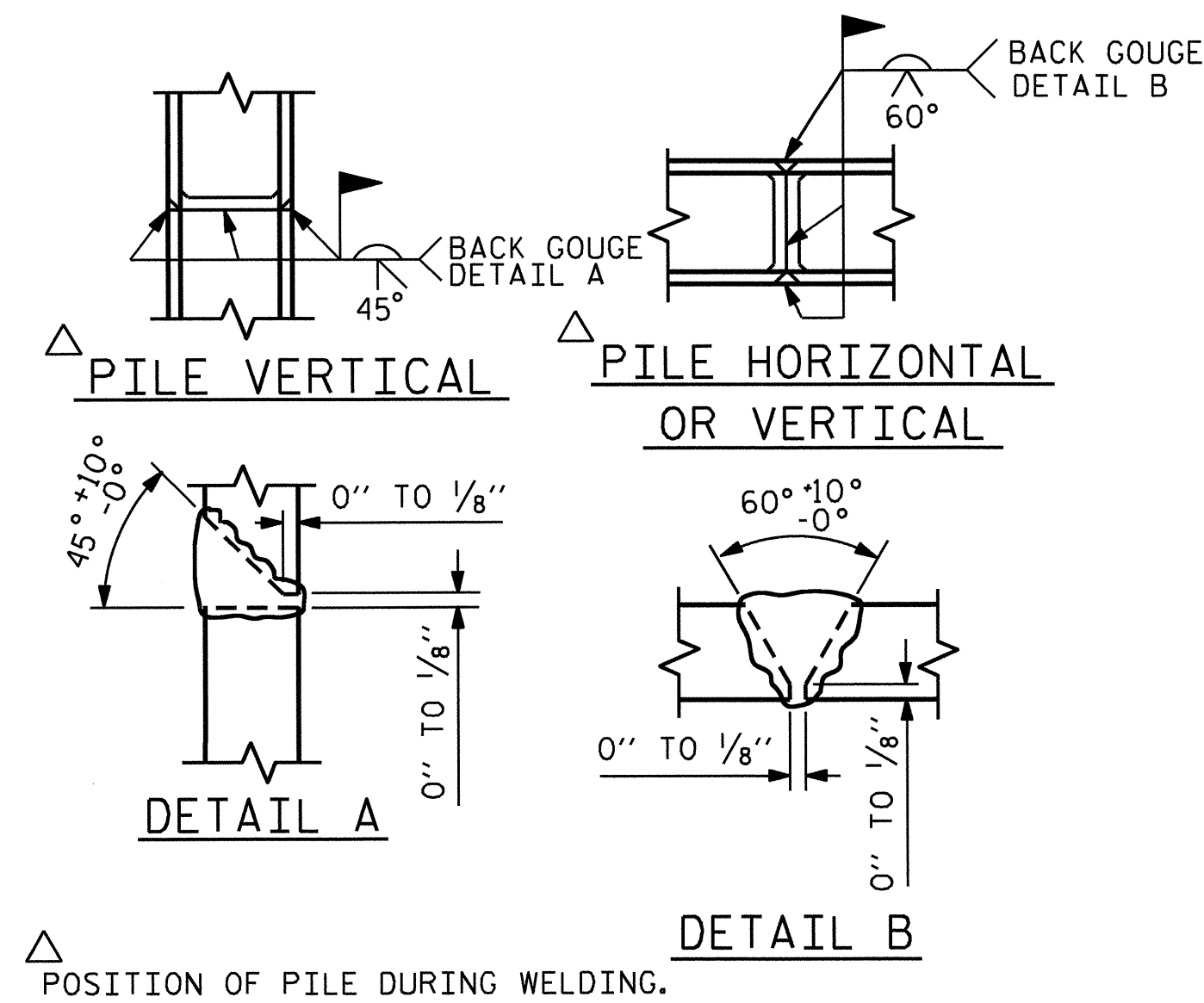


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 2					
SHEET NO. S-16					
TOTAL SHEETS 19					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

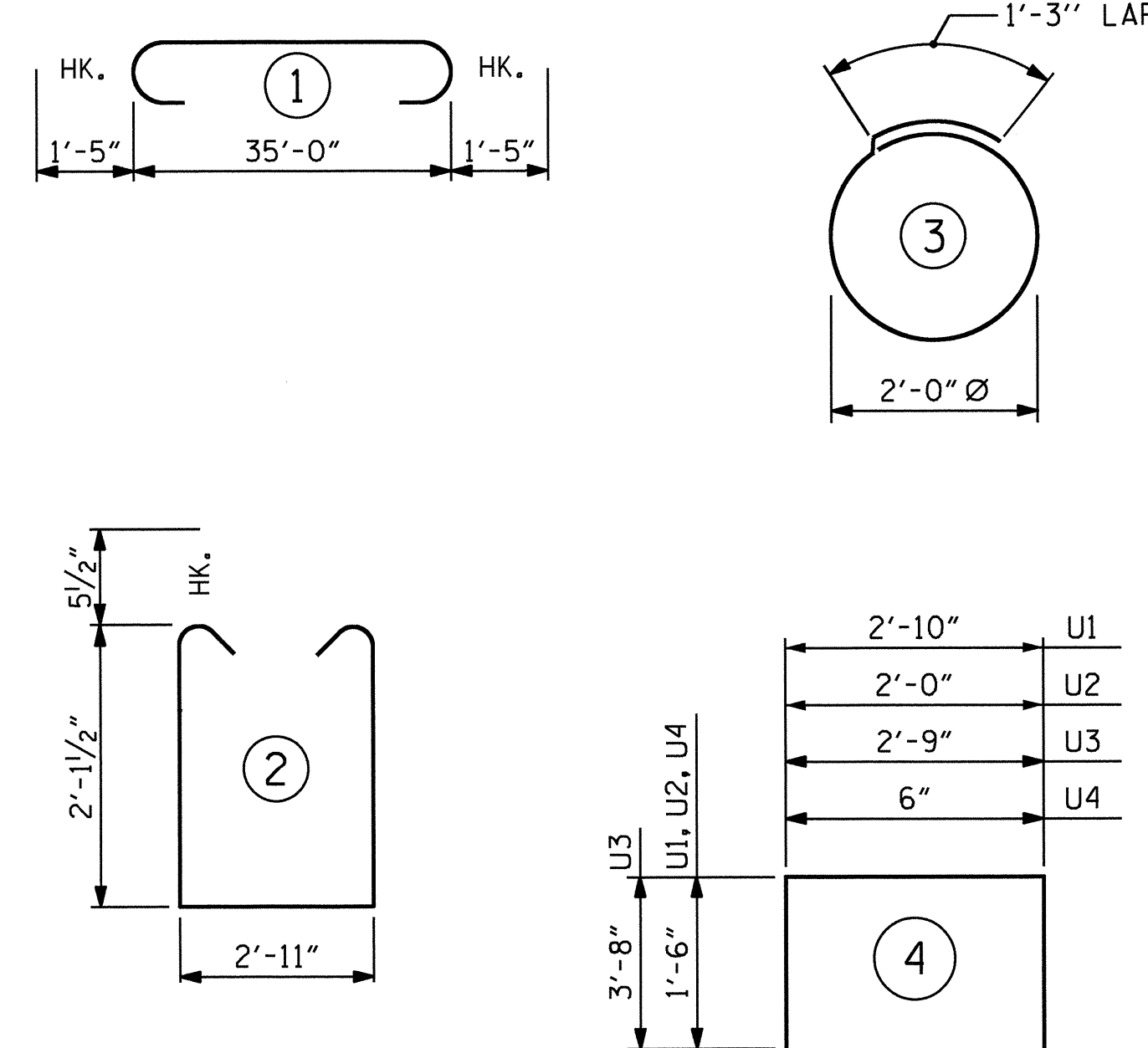
ASSEMBLED BY : A.C. OUTLAW DATE : 8/28/12
 CHECKED BY : S.B. WANCE DATE : 8/29/12
 DRAWN BY : DCE 05/10
 CHECKED BY : MKT 05/10



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

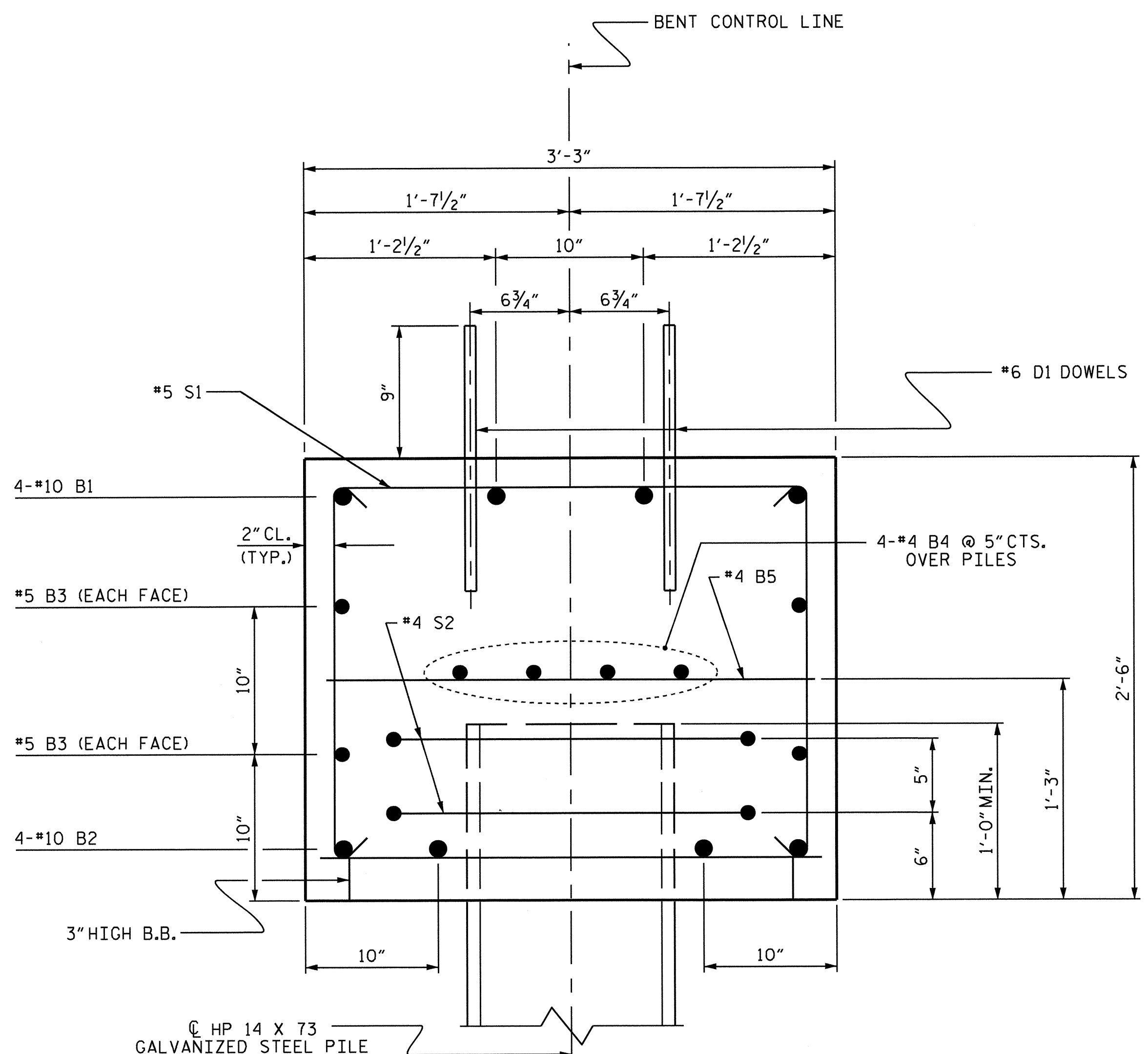


PILE SPLICE DETAILS

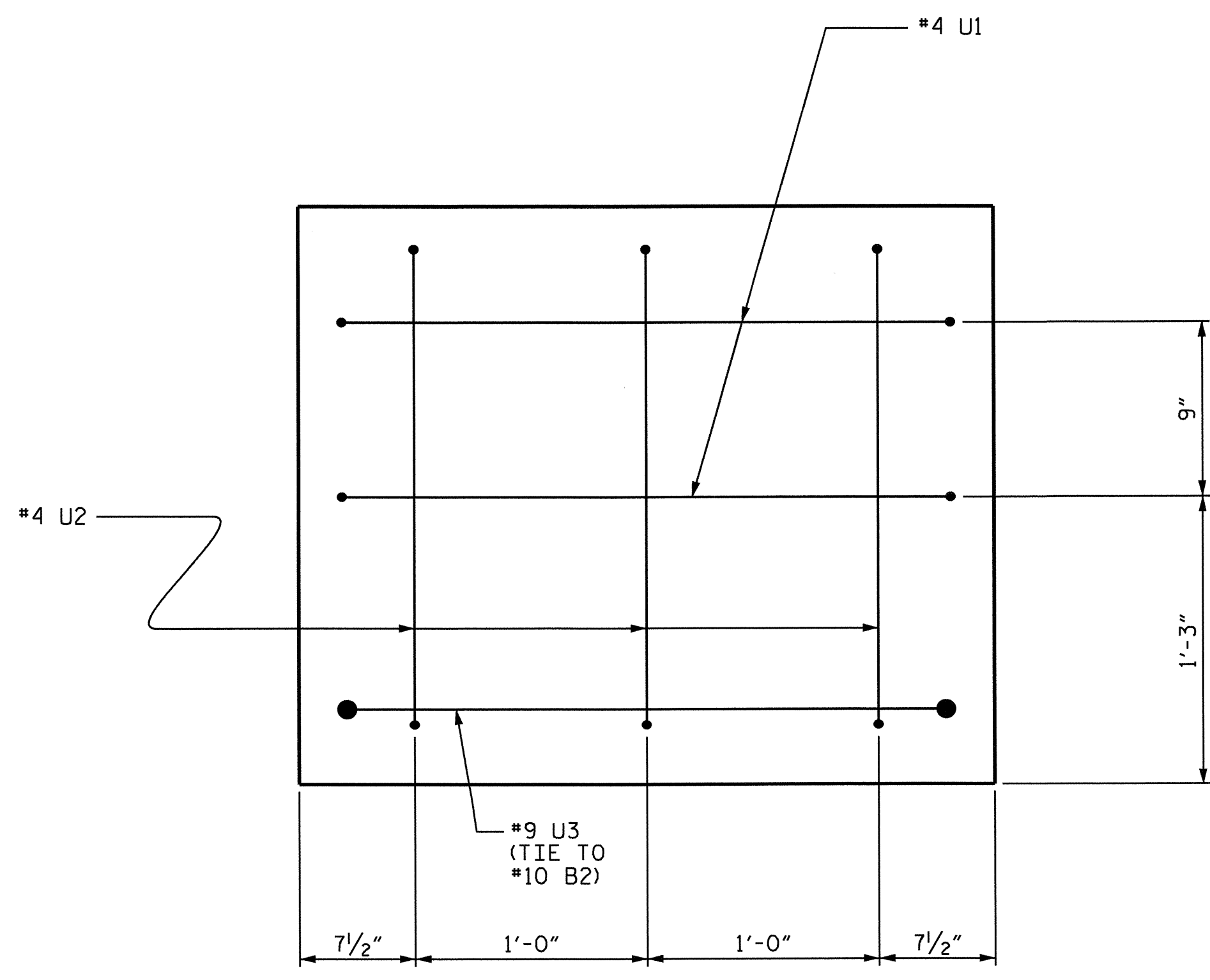


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	37'-10"	651
B2	4	#10	STR	35'-2"	605
B3	4	#5	STR	35'-2"	147
B4	8	#4	STR	18'-10"	101
B5	13	#4	STR	2'-11"	25
D1	44	#6	STR	1'-6"	99
S1	39	#5	2	8'-1"	329
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
U4	8	#4	4	3'-6"	19
REINFORCING STEEL (FOR ONE BENT)					2162 LBS
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
POUR #1 (CAP)					10.7 C.Y.
POUR #2 (LATERAL GUIDES)					0.1 C.Y.
TOTAL CLASS A CONCRETE					10.8 C.Y.
HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)					
No. 8					LIN. FT. 520
PILE REDRIVES					4 EACH



SECTION A-A



END OF CAP VIEW
(TYPICAL BOTH ENDS)

DRAWN BY : A.C. OUTLAW DATE : 8/28/12
 CHECKED BY : S.B. WANCE DATE : 8/29/12
 DRAWN BY : DGE 05/10
 CHECKED BY : MKT 05/10

15-OCT-2013 08:49
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 Kalford



PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

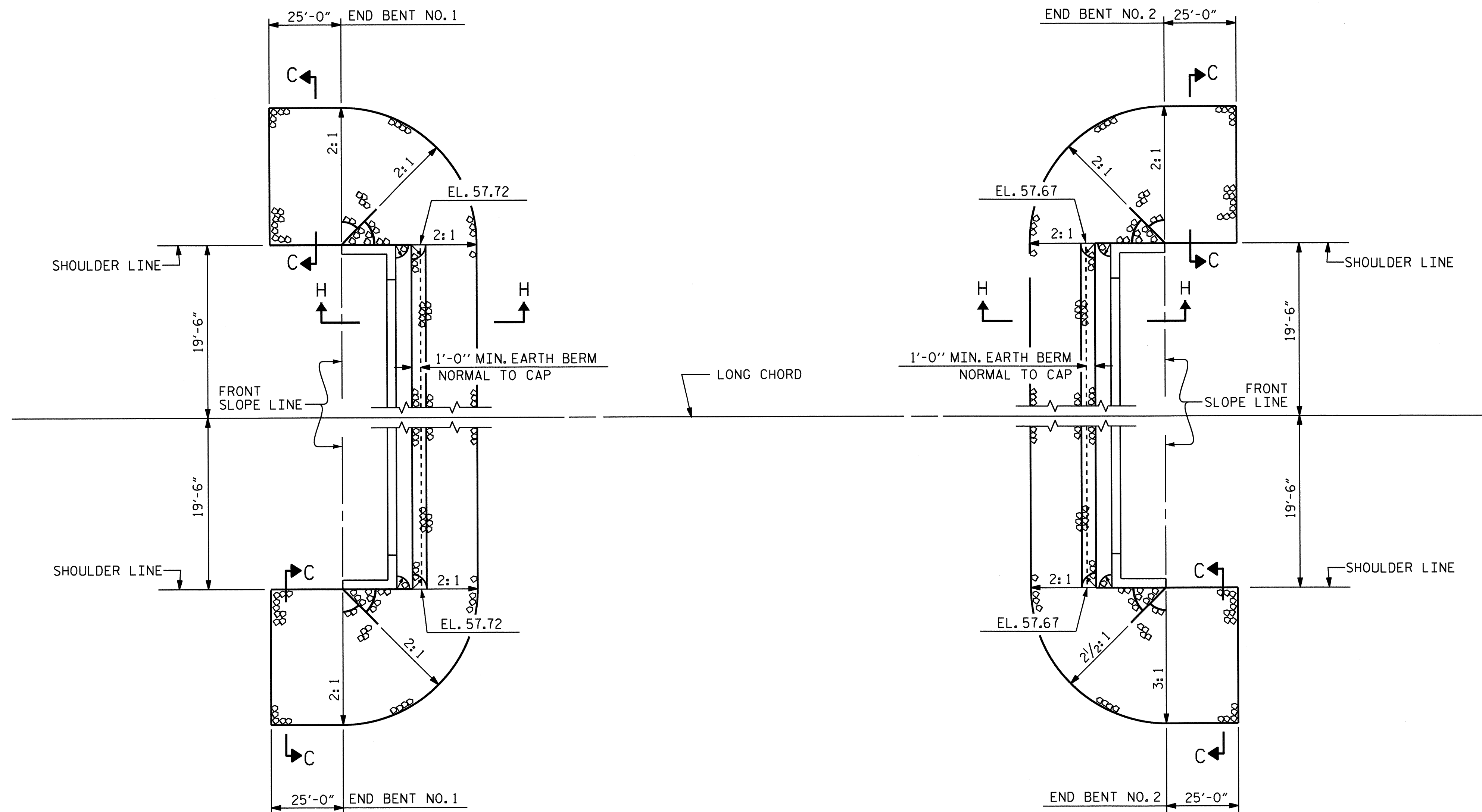
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			19

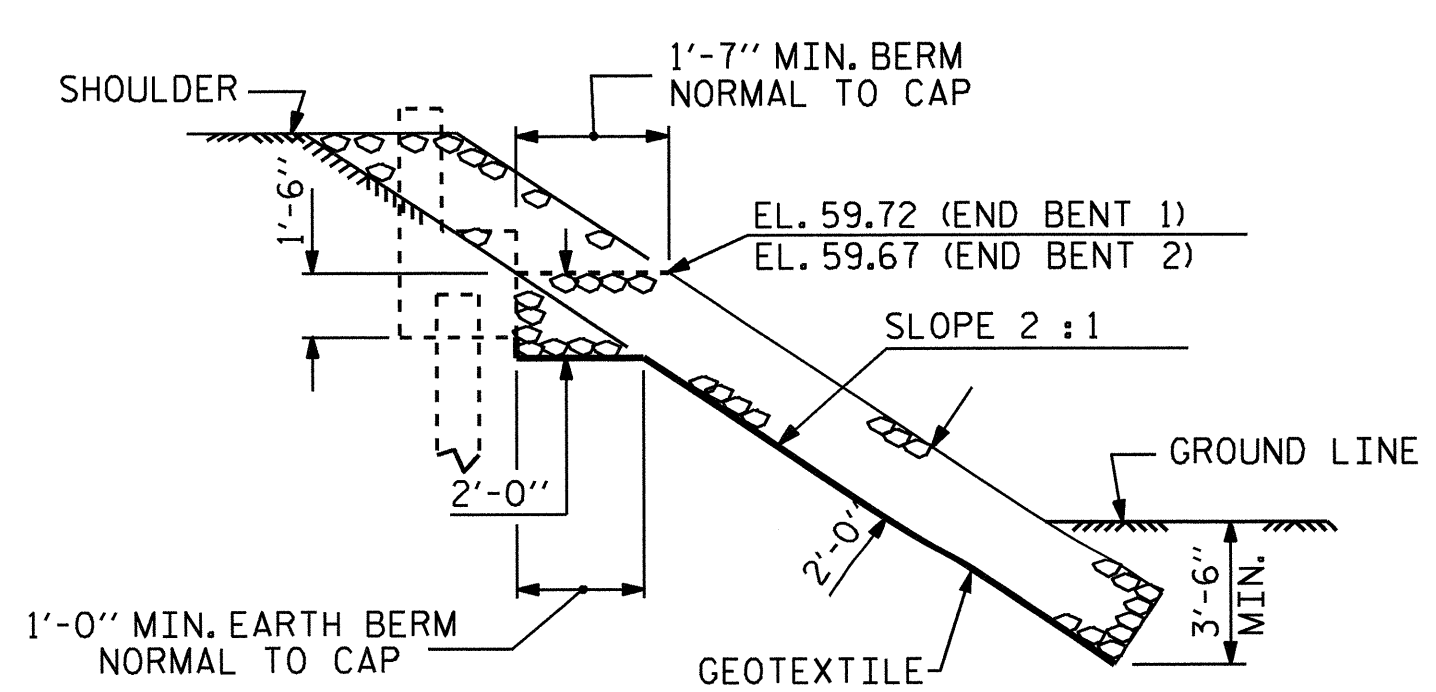
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



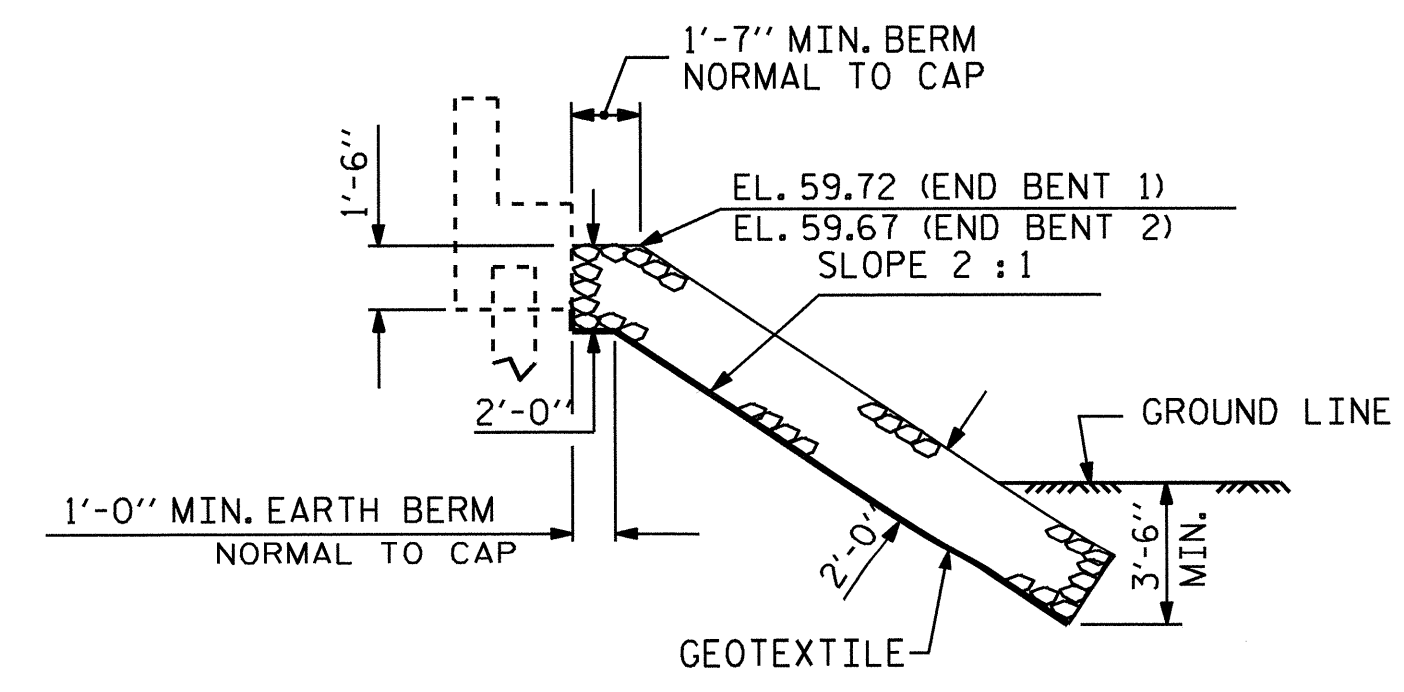
END BENT 1

END BENT 2

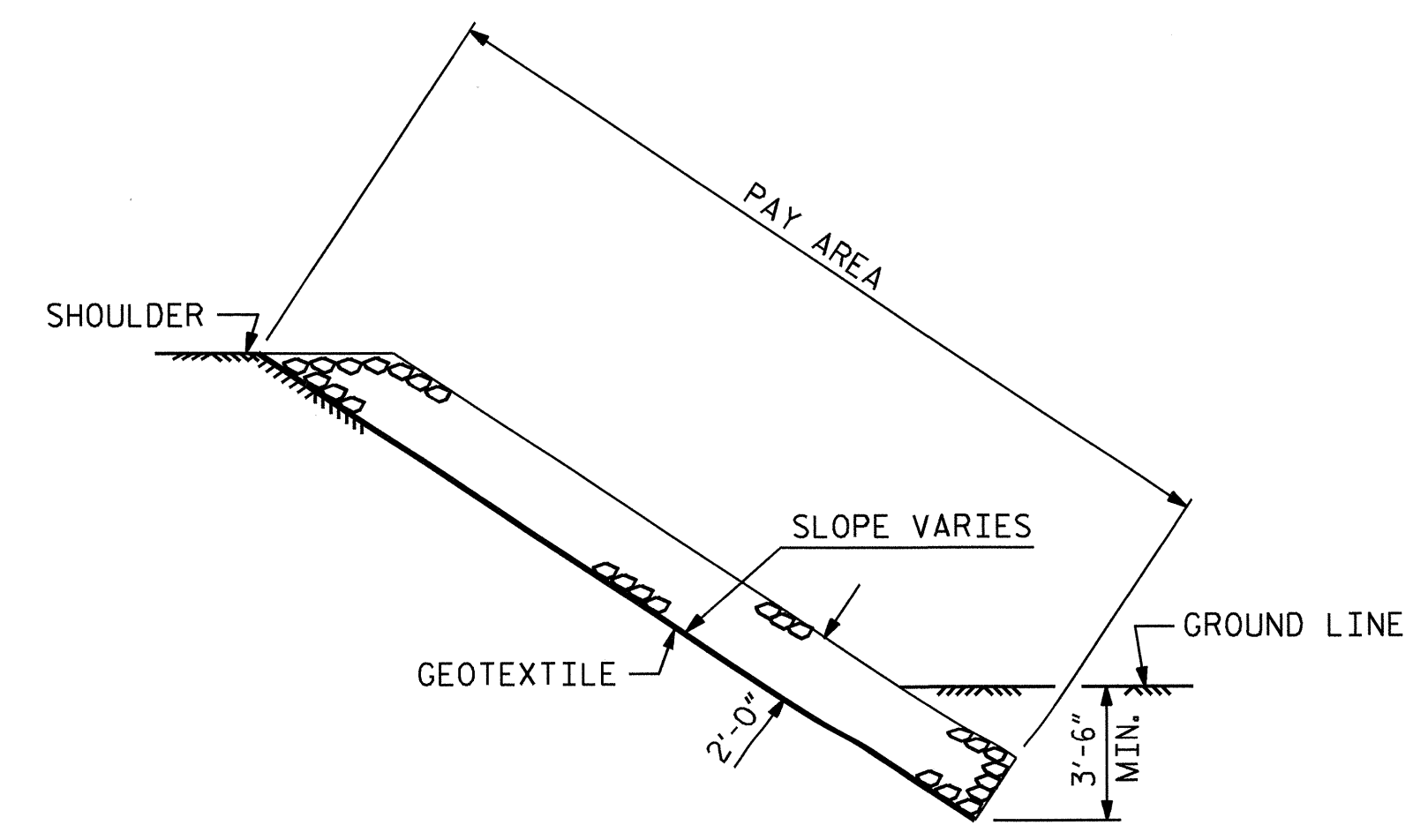
ESTIMATED QUANTITIES			
BRIDGE @ STA. 17+68.00 -L-	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	TONS	SQUARE YARDS
END BENT 1	42	169	190
END BENT 2	49	194	220



SECTION H-H



SECTION C-C
BERM RIP RAPPED



SECTION C-C

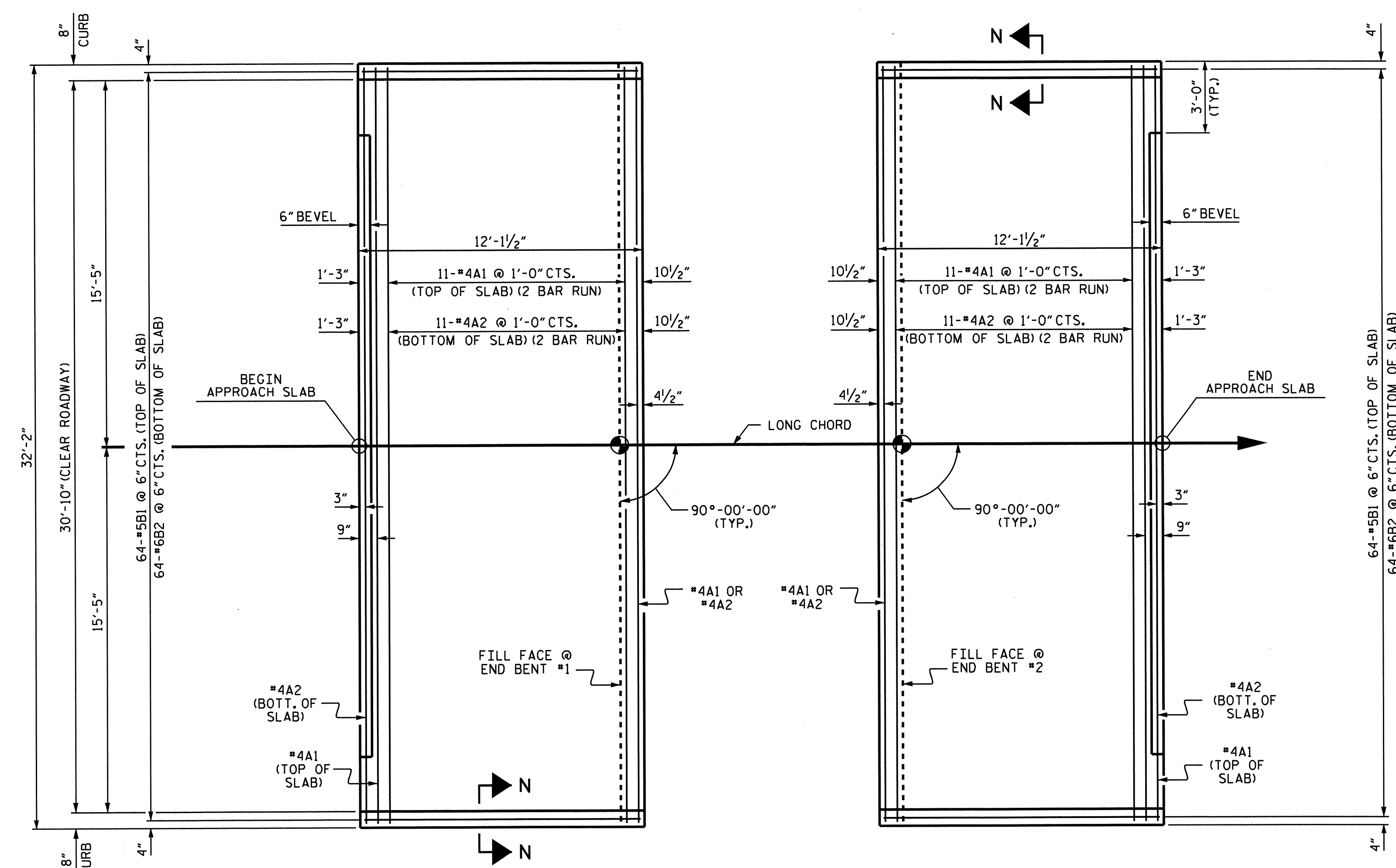
PROJECT NO. B-4478
COLUMBUS COUNTY
STATION: 17+68.00 -L-

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



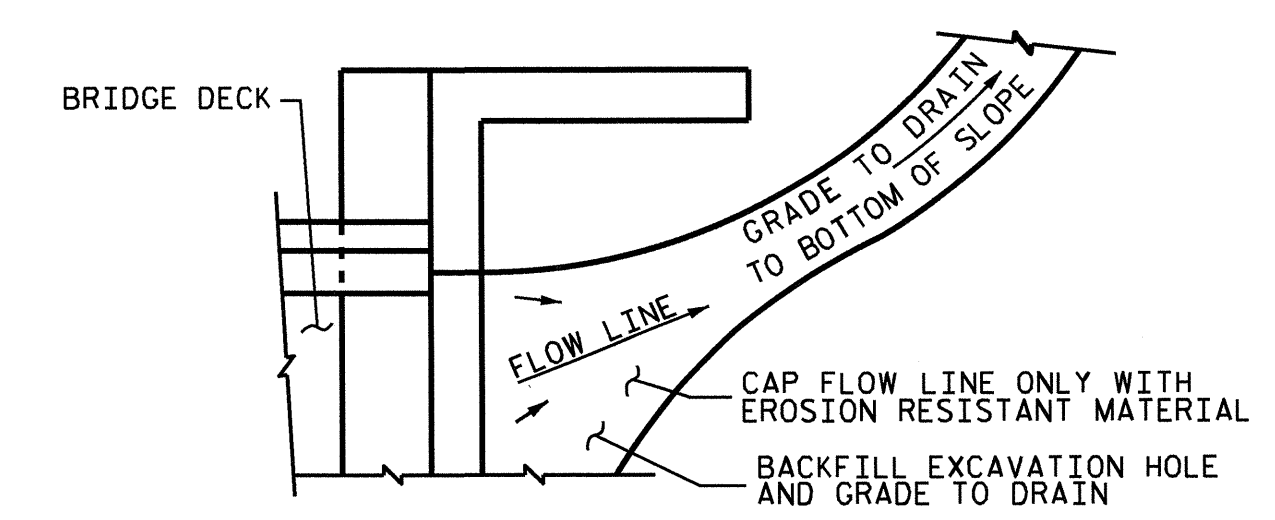
ASSEMBLED BY : A.C. OUTLAW DATE : 2/10/12
CHECKED BY : K. W. ALFORD DATE : 9/13
DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES
CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES
REV. 5/1/06R TLA/GM

REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			



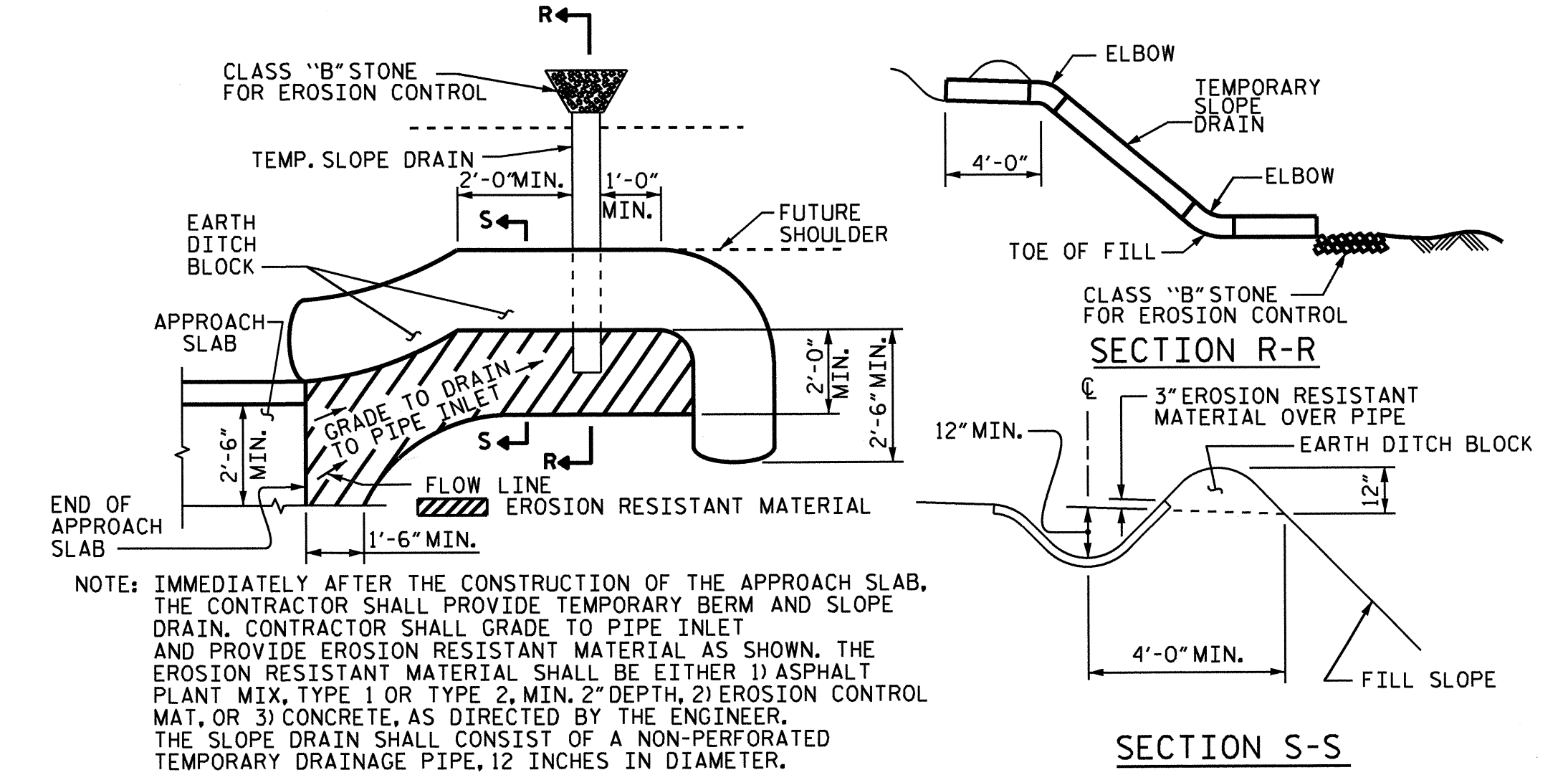
PLAN @ END BENT #1 **PLAN @ END BENT #2**
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES
 FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
 APPROACH SLAB GROOVING IS NOT REQUIRED.



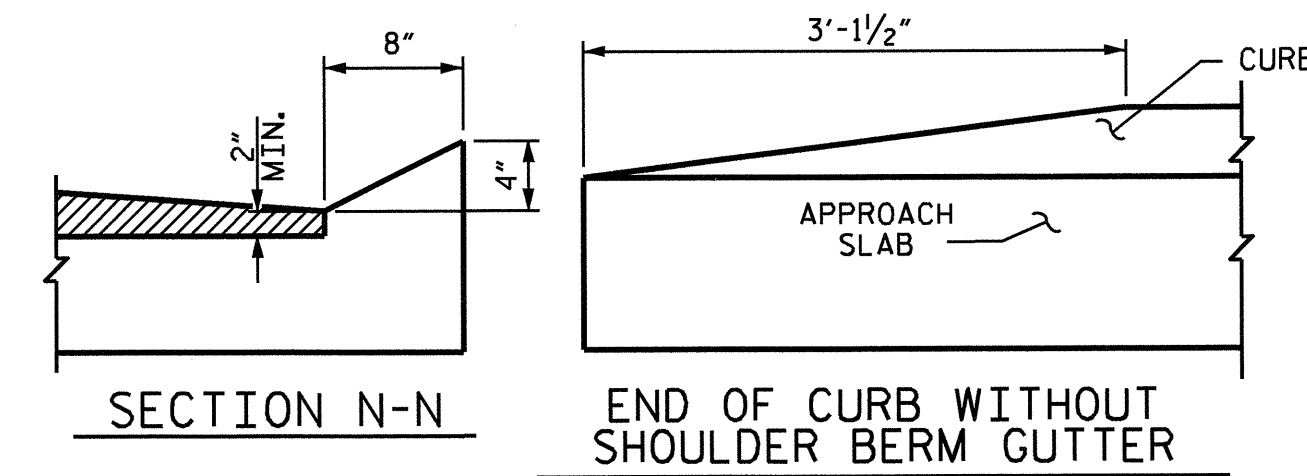
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

PLAN VIEW
TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



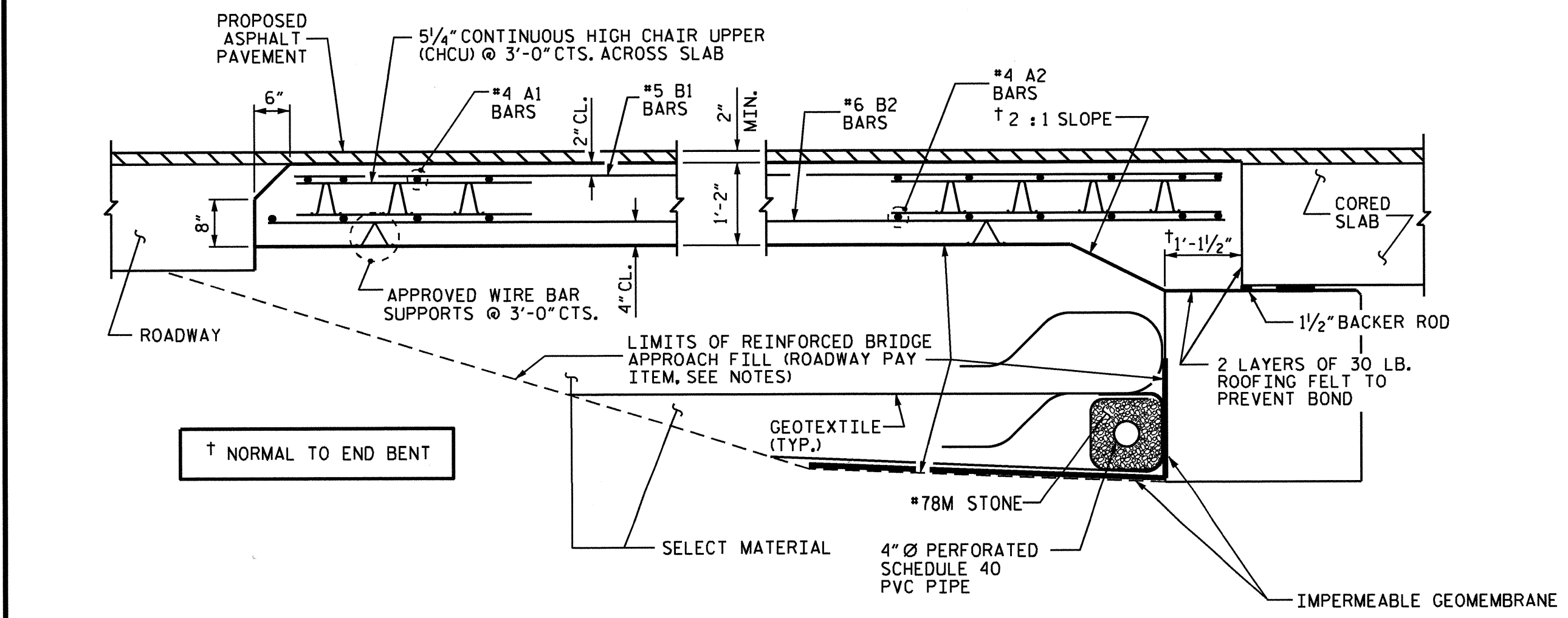
CURB DETAILS

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



BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	16'-11"	294	
A2	26	#4	STR	16'-9"	291	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1412
* EPOXY COATED REINFORCING STEEL					LBS.	1039
CLASS AA CONCRETE					C. Y.	18.6

APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	16'-11"	294	
A2	26	#4	STR	16'-9"	291	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1412
* EPOXY COATED REINFORCING STEEL					LBS.	1039
CLASS AA CONCRETE					C. Y.	18.6



SECTION THRU SLAB

ASSEMBLED BY : A.C. OUTLAW DATE : 12/10/12
 CHECKED BY : K. W. ALFORD DATE : 9/13
 DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC
 CHECKED BY : BCH 5-09

PROJECT NO. B-4478
COLUMBUS COUNTY
 STATION: 17+68.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB CORED SLAB UNIT (SUB-REGIONAL TIER) 90° SKEW					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 19

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. FINS 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.

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