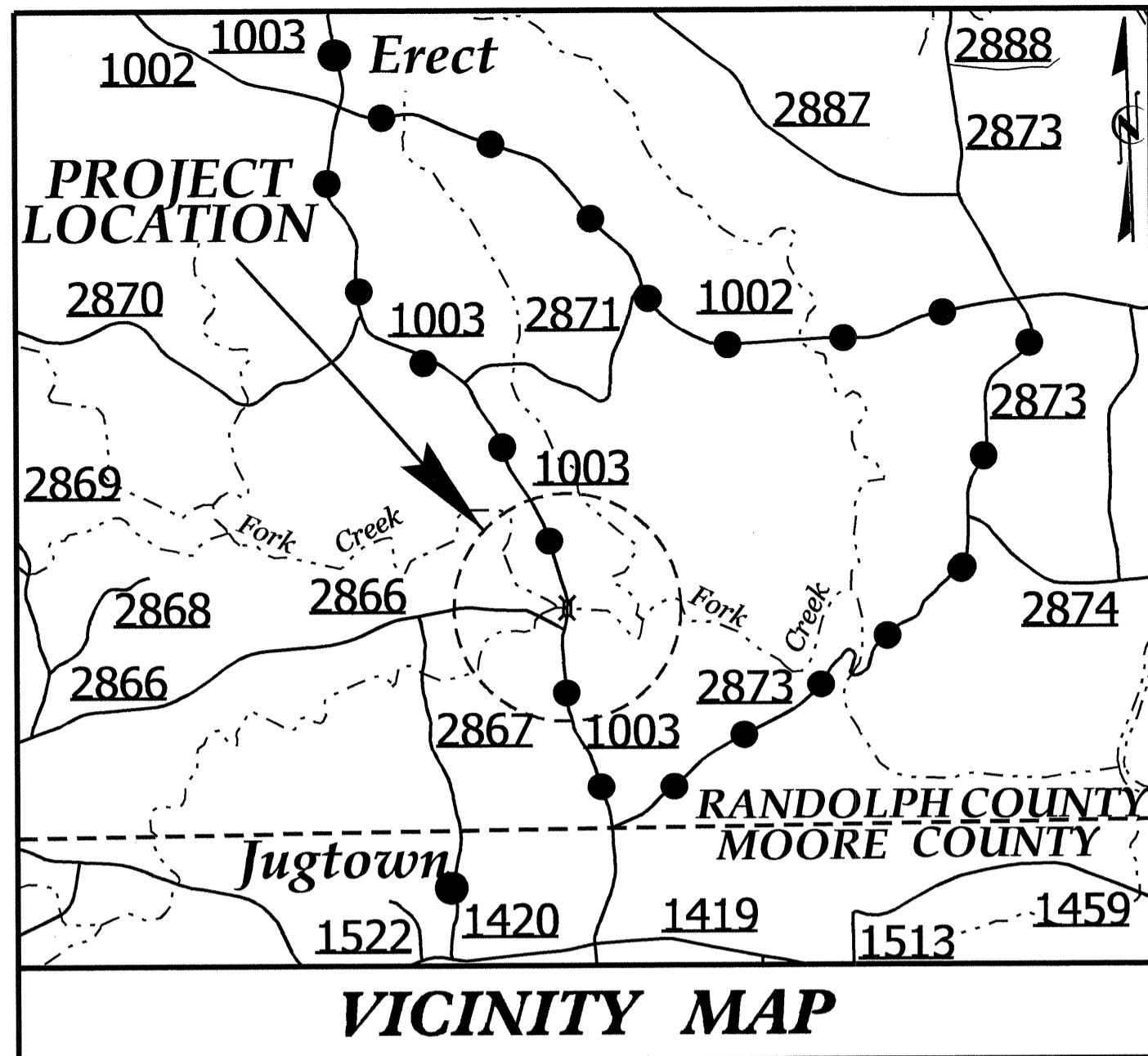


CONTRACT: C203410 TIP NO: B-4608



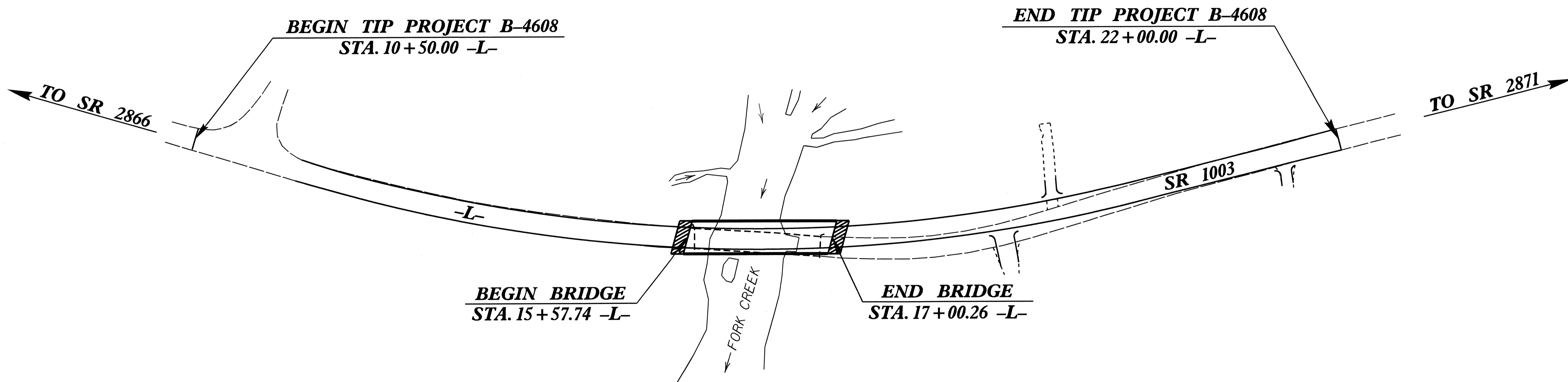
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

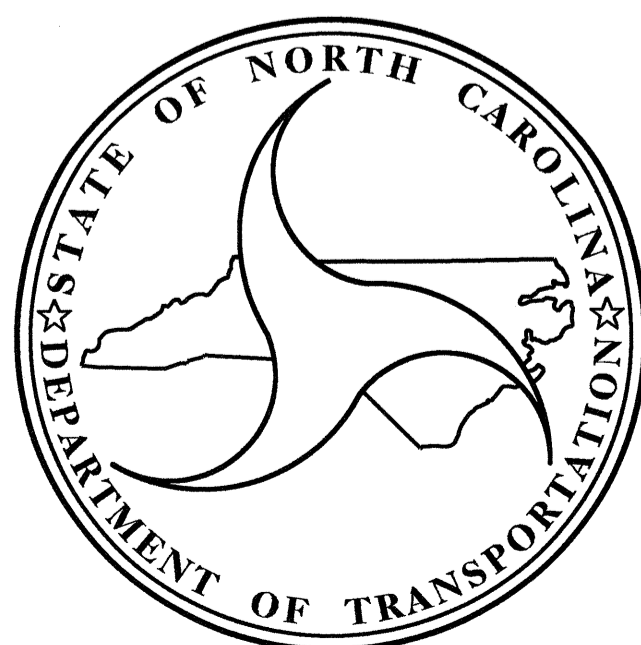
**LOCATION: BRIDGE No. 208 ON SR 1003 (ERECT ROAD)
OVER FORK CREEK**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4608		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
38433.1.2	BRZ-1003 (118)	P.E.	
38433.2.1	BRZ-1003 (118)	RIGHT OF WAY	
38433.2.U1	BRZ-1003 (118)	UTILITIES	
38433.3.FD1	BRZ-1003 (118)	CONST.	



STRUCTURE



DESIGN DATA
 ADT 2012 = 600
 ADT 2040 = 800
 DHV = 13 %
 D = 70 %
 T = 7 % *
 V = 50 MPH
 * TTST 1% DUAL 6%
 FUNC. CLASS : MINOR COLLECTOR
 SUBREGIONAL TIER

PROJECT LENGTH
 LENGTH ROADWAY TIP PROJECT B-4608 = 0.191 MI
 LENGTH STRUCTURE TIP PROJECT B-4608 = 0.027 MI
 TOTAL LENGTH TIP PROJECT B-4608 = 0.218 MI

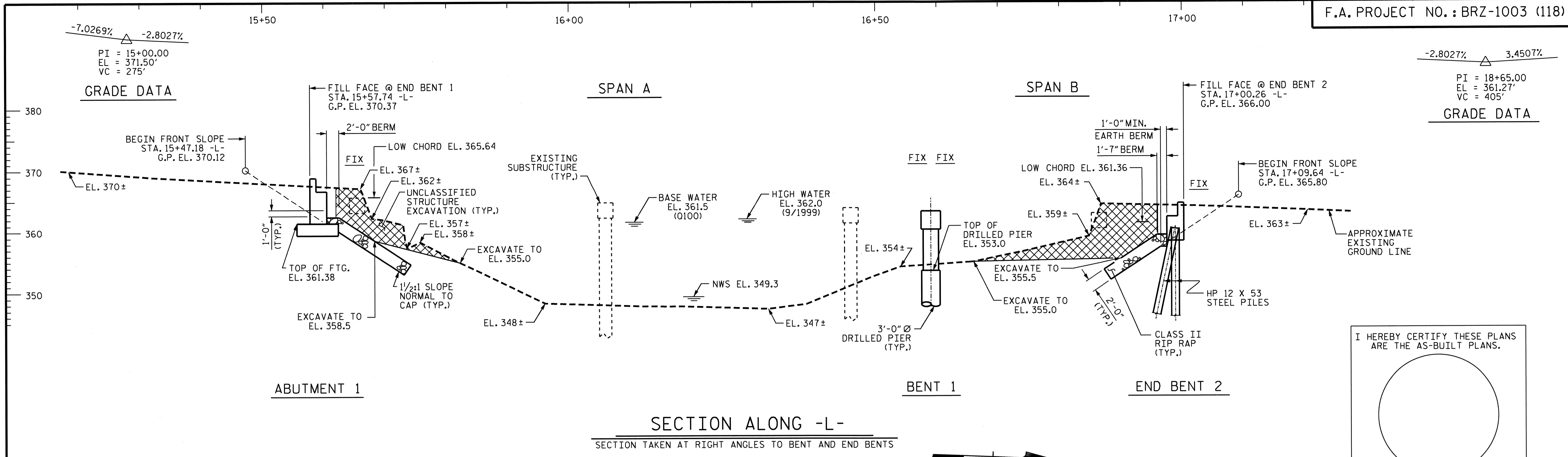
Prepared In the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE : JUNE 17, 2014

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

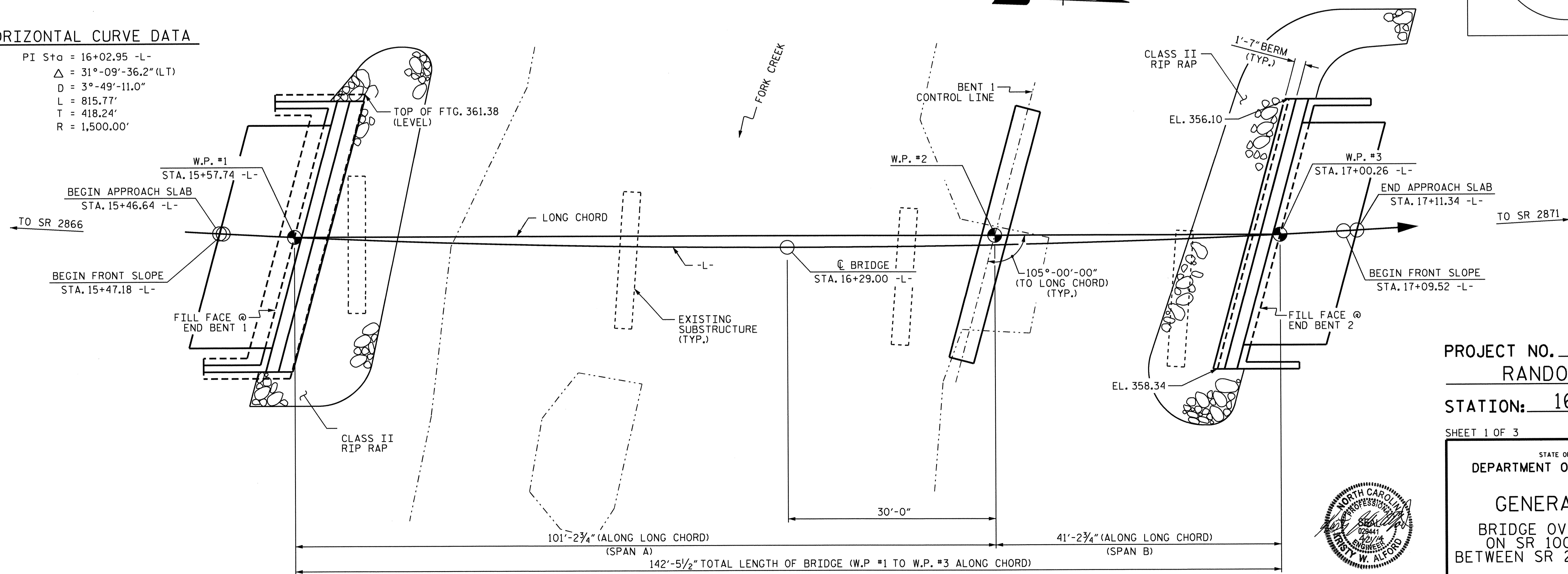
K. W. ALFORD, P.E.
 PROJECT DESIGN ENGINEER



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

HORIZONTAL CURVE DATA

PI Sta = 16+02.95 -L-
 Δ = 31°-09'-36.2" (LT)
 D = 3°-49'-11.0"
 L = 815.77'
 T = 418.24'
 R = 1,500.00'



PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

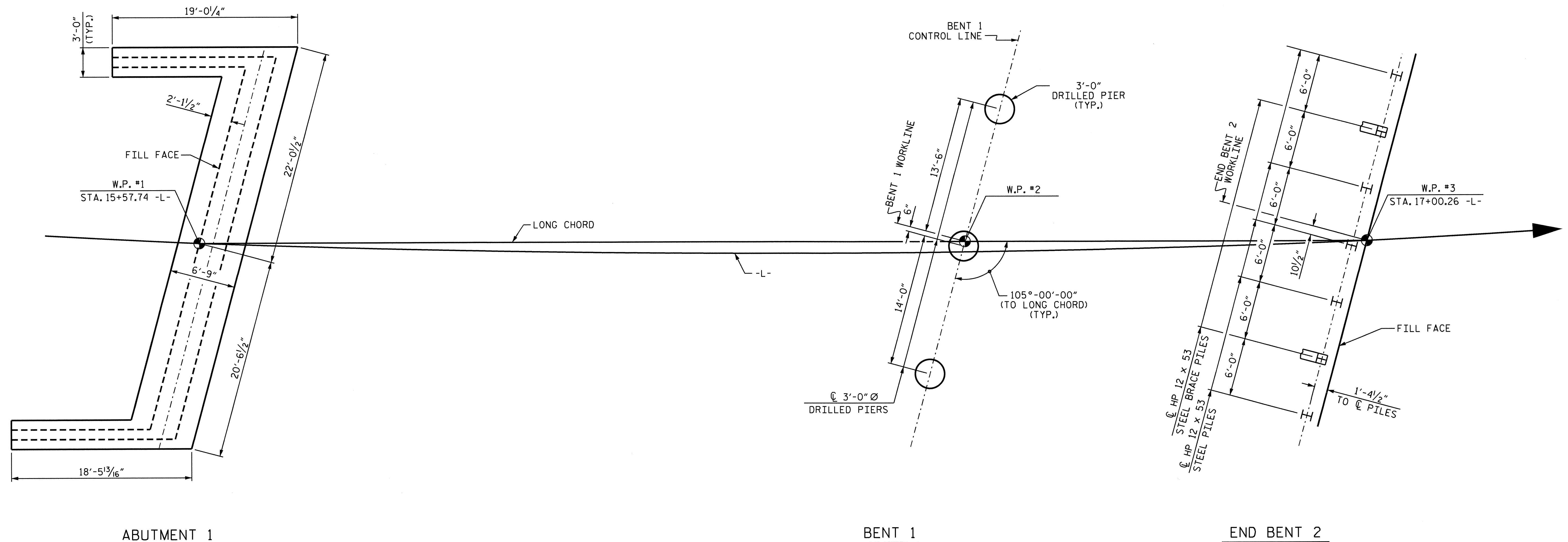
SHEET 1 OF 3 REPLACES BRIDGE NO. 208

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER FORK CREEK
 ON SR 1003 (ERECT RD.)
 BETWEEN SR 2866 AND SR 2871



DRAWN BY : Fr. LEA DATE : 7/16/13
 CHECKED BY : A.C. OUTLAW DATE : 8/15/13

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



FOUNDATION LAYOUT

END BENT BRACE PILES ARE BATTERED 3:12.
DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILE.

FOUNDATION NOTES

THE SPREAD FOOTING AT END BENT 1 IS DESIGNED FOR A FACTORED RESISTANCE OF 10 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 25 TSF JUST BEFORE PLACING CONCRETE.

KEY IN SPREAD FOOTINGS AT END BENT 1 AT LEAST 12 INCHES INTO ROCK WITH A MINIMUM THICKNESS AS SHOWN ON THE PLANS.

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 435 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 335 FT FOR LEFT PIER, 330 FT FOR CENTER AND RIGHT PIER, AND WITH REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 344 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT STEEL CASINGS BELOW ELEVATION 347 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-4608
RANDOLPH COUNTY
STATION: 16+29.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE OVER FORK CREEK
ON SR 1003 (ERECT RD.)
BETWEEN SR 2866 AND SR 2871



DRAWN BY : D. SHACKELFORD DATE : 02/2014
CHECKED BY : J.P. ADAMS DATE : 02/2014

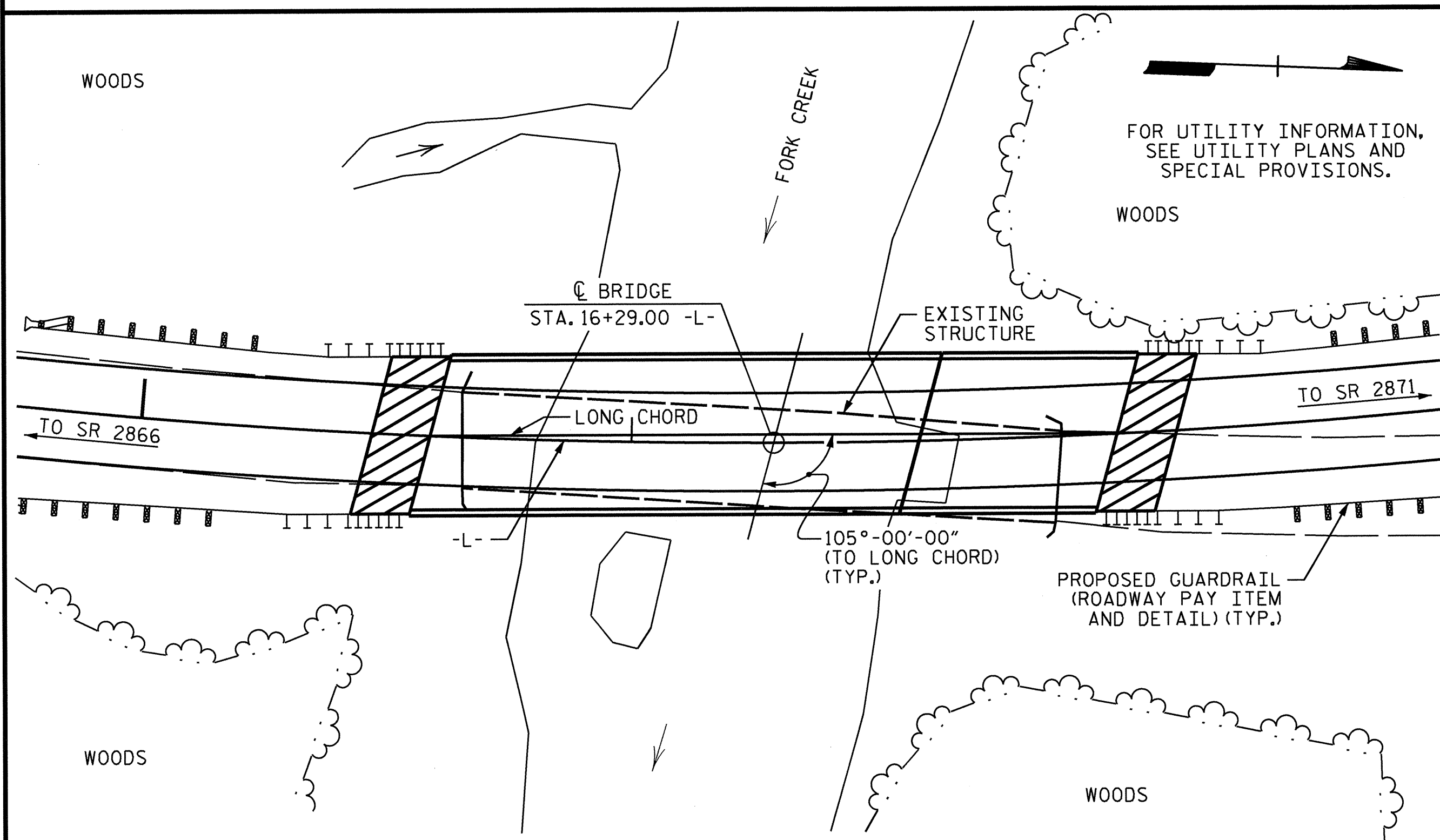
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kalford

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION FOR ABUTMENT	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 2'-11 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAMS		
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	EACH	LIN.FT.	LIN.FT.	TONS	SO.YDS.	LUMP SUM	NO.	LIN.FT.
SUPERSTRUCTURE											LUMP SUM					264.64	280.26				LUMP SUM	22	1540
ABUTMENT 1		LUMP SUM							LUMP SUM	61.1		8765							114	130			
BENT 1			18.0	46.0	18.0					18.2		8856	1502										
END BENT 2									LUMP SUM	29.9		4704		7	105.0	7			114	130			
TOTAL	LUMP SUM	LUMP SUM	18.0	46.0	18.0	1	1	1	LUMP SUM	109.2	LUMP SUM	22325	1502	7	105.0	7	264.64	280.26	228	260	LUMP SUM	22	1540

BM#2: RR SPIKE IN BASE OF PP. -L- STA. 18+40, 110' RIGHT, ELEV. 368.05



HYDRAULIC DATA

DESIGN DISCHARGE	= 4900 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 358.4
DRAINAGE AREA	= 38.51 SQ.MI.
BASE DISCHARGE (Q100)	= 7382 CFS
BASE HIGH WATER ELEVATION	= 361.5

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 9000+ CFS
FREQUENCY OF OVERTOPPING	= 500+ YR.
OVERTOPPING ELEVATION	= 364.7 *

* ROAD OVERTOPS AT STA. 18+44.02 -L-

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR 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 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 SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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 16+29.00 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 21 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.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, 1 SPAN @ 40'-7", 1 SPAN @ 40'-2", AND 1 SPAN @ 40'-7" WITH A TIMBER DECK ON STEEL GIRDERS, TIMBER JOISTS AND STEEL FLOOR BEAMS WITH A CLEAR ROADWAY WIDTH OF 19'-2" ON RC CAP ON RUBBLE MASONRY AT END BENT 1, RC CONCRETE CAP AT END BENT 2, AND TWO COLUMN RC POST AND BEAM AT INTERIOR BENTS 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, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

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.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE EFFECTS OF THE HORIZONTAL CURVE SHALL BE NEGLECTED IN THE CONSTRUCTION OF THIS BRIDGE. BRIDGE IS TO BE BUILT ALONG THE LONG CHORD BETWEEN THE WORK POINTS AT THE FILL FACE.

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE OVER FORK CREEK
 ON SR 1003 (ERECT RD.)
 BETWEEN SR 2866 AND SR 2871



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

DRAWN BY: Fr. LEA DATE: 7/16/13
 CHECKED BY: A.C. OUTLAW DATE: 8/5/13

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(Inv)	N/A	1	1.07	--	1.75	0.262	1.31	A	EL	49.224	0.570	1.26	A	EL	9.845	0.80	0.262	1.07	A	EL	49.224		
	HL-93(0pr)	N/A	--	1.64	--	1.35	0.262	1.69	A	EL	49.224	0.570	1.64	A	EL	9.845	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.49	53.7	1.75	0.262	1.82	A	EL	49.224	0.570	1.69	A	EL	9.845	0.80	0.262	1.49	A	EL	49.224		
	HS-20(0pr)	36.000	--	2.19	78.8	1.35	0.262	2.36	A	EL	49.224	0.570	2.19	A	EL	9.845	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.54	47.7	1.40	0.262	5.38	A	EL	49.224	0.570	5.19	A	EL	9.845	0.80	0.262	3.54	A	EL	49.224	
		SNGARBS2	20.000	--	2.56	51.2	1.40	0.262	3.90	A	EL	49.224	0.570	3.64	A	EL	9.845	0.80	0.262	2.56	A	EL	49.224	
		SNAGRIS2	22.000	--	2.40	52.7	1.40	0.262	3.65	A	EL	49.224	0.570	3.36	A	EL	9.845	0.80	0.262	2.40	A	EL	49.224	
		SNCOTTS3	27.250	--	1.76	47.9	1.40	0.262	2.68	A	EL	49.224	0.570	2.59	A	EL	9.845	0.80	0.262	1.76	A	EL	49.224	
		SNAGGRS4	34.925	--	1.44	50.3	1.40	0.262	2.19	A	EL	49.224	0.570	2.11	A	EL	9.845	0.80	0.262	1.44	A	EL	49.224	
		SNS5A	35.550	--	1.41	50.1	1.40	0.262	2.15	A	EL	49.224	0.570	2.12	A	EL	9.845	0.80	0.262	1.41	A	EL	49.224	
	TTST	SNS6A	39.950	--	1.28	51.2	1.40	0.262	1.95	A	EL	49.224	0.570	1.92	A	EL	9.845	0.80	0.262	1.28	A	EL	49.224	
		SNS7B	42.000	--	1.22	51.2	1.40	0.262	1.86	A	EL	49.224	0.570	1.87	A	EL	9.845	0.80	0.262	1.22	A	EL	49.224	
		TNAGRIT3	33.000	--	1.56	51.5	1.40	0.262	2.38	A	EL	49.224	0.570	2.29	A	EL	9.845	0.80	0.262	1.56	A	EL	49.224	
		TNT4A	33.075	--	1.56	51.7	1.40	0.262	2.38	A	EL	49.224	0.570	2.25	A	EL	9.845	0.80	0.262	1.56	A	EL	49.224	
		TNT6A	41.600	--	1.27	52.7	1.40	0.262	1.93	A	EL	49.224	0.570	1.96	A	EL	9.845	0.80	0.262	1.27	A	EL	49.224	
		TNT7A	42.000	--	1.27	53.3	1.40	0.262	1.93	A	EL	49.224	0.570	1.92	A	EL	9.845	0.80	0.262	1.27	A	EL	49.224	
		TNT7B	42.000	--	1.30	54.5	1.40	0.262	1.98	A	EL	49.224	0.570	1.84	A	EL	9.845	0.80	0.262	1.30	A	EL	49.224	
TNAGRIT4	43.000	--	1.25	53.5	1.40	0.262	1.90	A	EL	49.224	0.570	1.78	A	EL	9.845	0.80	0.262	1.25	A	EL	49.224			
TNAGT5A	45.000	--	1.18	53.0	1.40	0.262	1.80	A	EL	49.224	0.570	1.75	A	EL	9.845	0.80	0.262	1.18	A	EL	49.224			
TNAGT5B	45.000	3	1.17	52.6	1.40	0.262	1.78	A	EL	49.224	0.570	1.70	A	EL	9.845	0.80	0.262	1.17	A	EL	49.224			

LOAD FACTORS:

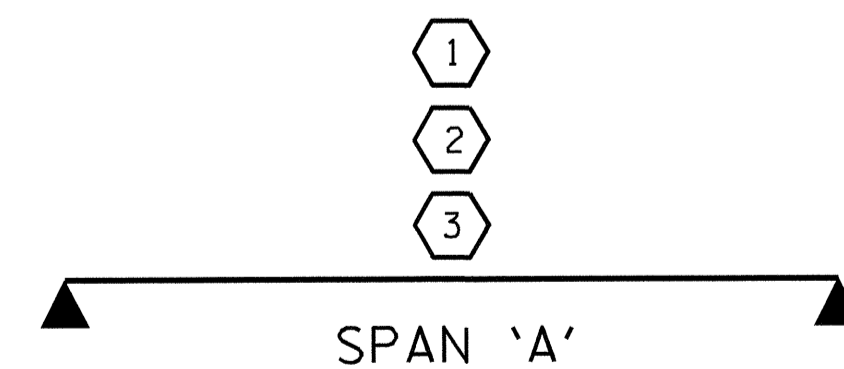
DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _W
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

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

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 100' BOX BEAM UNIT
 75° SKEW & 105° SKEW
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : A.C. OUTLAW DATE : 10/21/13
 CHECKED BY : J.P. ADAMS DATE : 2/2014
 DRAWN BY : TMG II/II
 CHECKED BY : AAC II/II

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

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	1.69	--	1.75	0.279	2.15	B	EL	19.224	0.597	2.12	B	EL	7.689	0.80	0.279	1.69	B	EL	19.224		
	HL-93(0pr)	N/A	--	2.74	--	1.35	0.279	2.79	B	EL	19.224	0.597	2.74	B	EL	7.689	N/A	--	--	--	--	--		
	HS-20(InV)	36.000	2	2.12	76.4	1.75	0.279	2.72	B	EL	19.224	0.597	2.43	B	EL	7.689	0.80	0.279	2.12	B	EL	19.224		
	HS-20(0pr)	36.000	--	3.15	113.3	1.35	0.279	3.52	B	EL	19.224	0.597	3.15	B	EL	7.689	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.92	52.9	1.40	0.279	6.23	B	EL	19.224	0.597	6.16	B	EL	7.689	0.80	0.279	3.92	B	EL	19.224	
		SNGARBS2	20.000	--	3.25	65.0	1.40	0.279	5.13	B	EL	15.379	0.597	4.69	B	EL	7.689	0.80	0.279	3.25	B	EL	19.224	
		SNAGRIS2	22.000	--	3.20	70.4	1.40	0.279	5.02	B	EL	15.379	0.597	4.48	B	EL	7.689	0.80	0.279	3.20	B	EL	15.379	
		SNCOTTS3	27.250	--	1.96	53.3	1.40	0.279	3.12	B	EL	19.224	0.597	3.10	B	EL	7.689	0.80	0.279	1.96	B	EL	19.224	
		SNAGGRS4	34.925	--	1.77	61.7	1.40	0.279	2.81	B	EL	19.224	0.597	2.80	B	EL	7.689	0.80	0.279	1.77	B	EL	19.224	
		SNS5A	35.550	--	1.72	61.1	1.40	0.279	2.73	B	EL	19.224	0.597	2.97	B	EL	7.689	0.80	0.279	1.72	B	EL	19.224	
		SNS6A	39.950	--	1.64	65.4	1.40	0.279	2.60	B	EL	19.224	0.597	2.82	B	EL	7.689	0.80	0.279	1.64	B	EL	19.224	
	SNS7B	42.000	3	1.56	65.6	1.40	0.279	2.48	B	EL	19.224	0.597	2.91	B	EL	7.689	0.80	0.279	1.56	B	EL	19.224		
	TTST	TNAGRIT3	33.000	--	2.01	66.5	1.40	0.279	3.21	B	EL	19.224	0.597	3.26	B	EL	7.689	0.80	0.279	2.01	B	EL	19.224	
		TNT4A	33.075	--	2.04	67.5	1.40	0.279	3.25	B	EL	19.224	0.597	3.07	B	EL	7.689	0.80	0.279	2.04	B	EL	19.224	
		TNT6A	41.600	--	1.73	72.1	1.40	0.279	2.76	B	EL	19.224	0.597	3.00	B	EL	7.689	0.80	0.279	1.73	B	EL	19.224	
		TNT7A	42.000	--	1.78	74.7	1.40	0.279	2.83	B	EL	19.224	0.597	2.82	B	EL	7.689	0.80	0.279	1.78	B	EL	19.224	
		TNT7B	42.000	--	1.81	76.1	1.40	0.279	2.88	B	EL	19.224	0.597	2.72	B	EL	7.689	0.80	0.279	1.81	B	EL	19.224	
		TNAGRIT4	43.000	--	1.77	76.1	1.40	0.279	2.81	B	EL	15.379	0.597	2.61	B	EL	7.689	0.80	0.279	1.77	B	EL	19.224	
TNAGT5A		45.000	--	1.64	73.7	1.40	0.279	2.60	B	EL	19.224	0.597	2.78	B	EL	7.689	0.80	0.279	1.64	B	EL	19.224		
TNAGT5B	45.000	--	1.59	71.5	1.40	0.279	2.53	B	EL	19.224	0.597	2.47	B	EL	7.689	0.80	0.279	1.59	B	EL	19.224			

LOAD FACTORS:

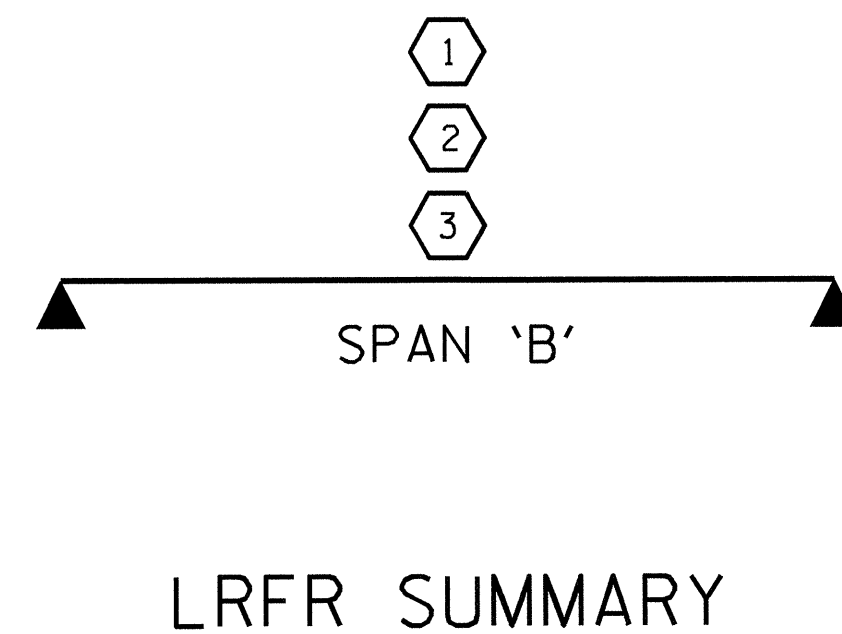
DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

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-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
LRFR SUMMARY FOR 40' BOX BEAM UNIT 75° SKEW & 105° SKEW (NON-INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-5					TOTAL SHEETS 27

ASSEMBLED BY : A.C. OUTLAW DATE : 10/21/13
 CHECKED BY : Fr. LEA DATE : 2/2014
 DRAWN BY : TMG II/II
 CHECKED BY : AAC II/II

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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5500 PSI.

ALL REINFORCING STEEL IN THE CONCRETE PARAPETS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

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

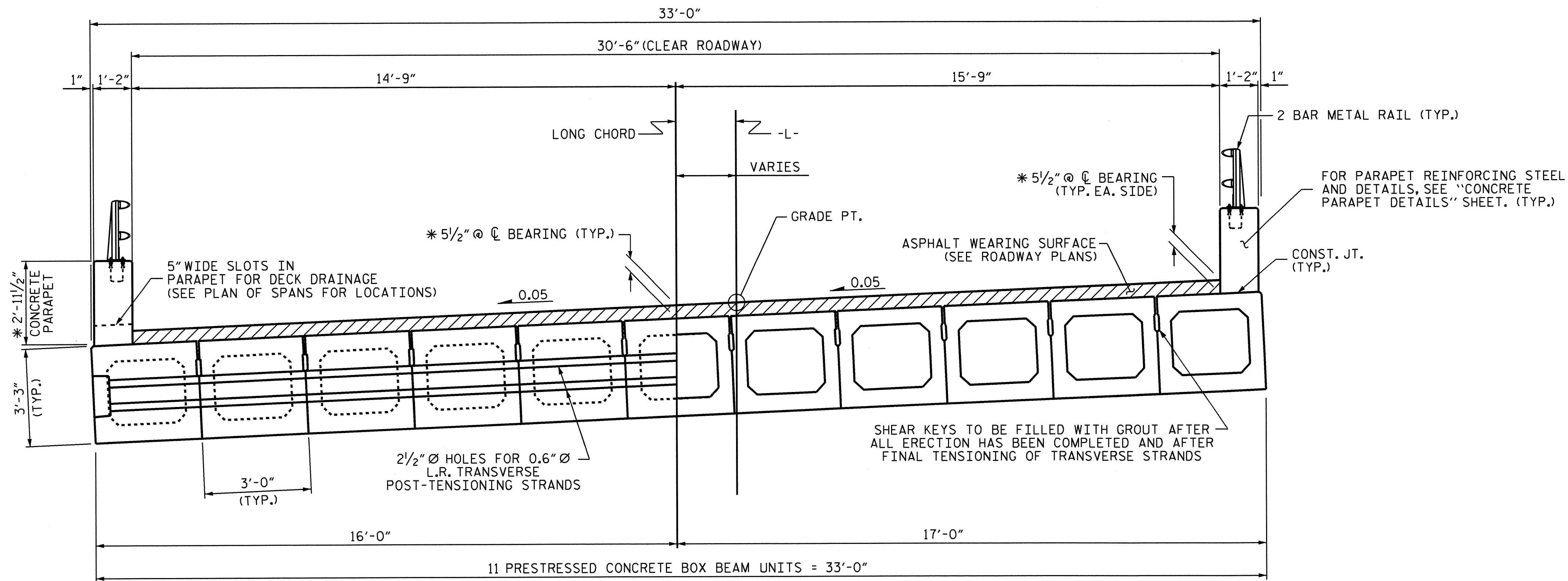
THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 6" X 5". THE HEIGHT OF THE BLOCKOUT IN THE PARAPET SHALL EXTEND FROM THE TOP OF THE BOX BEAM UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR BOX BEAM UNITS THAT REQUIRE DRAINS IN THE PARAPET.

FOR BEVEL AT END OF BOX BEAM DETAILS, SEE SHEET S-11.



HALF SECTION AT INTERMEDIATE DIAPHRAGMS

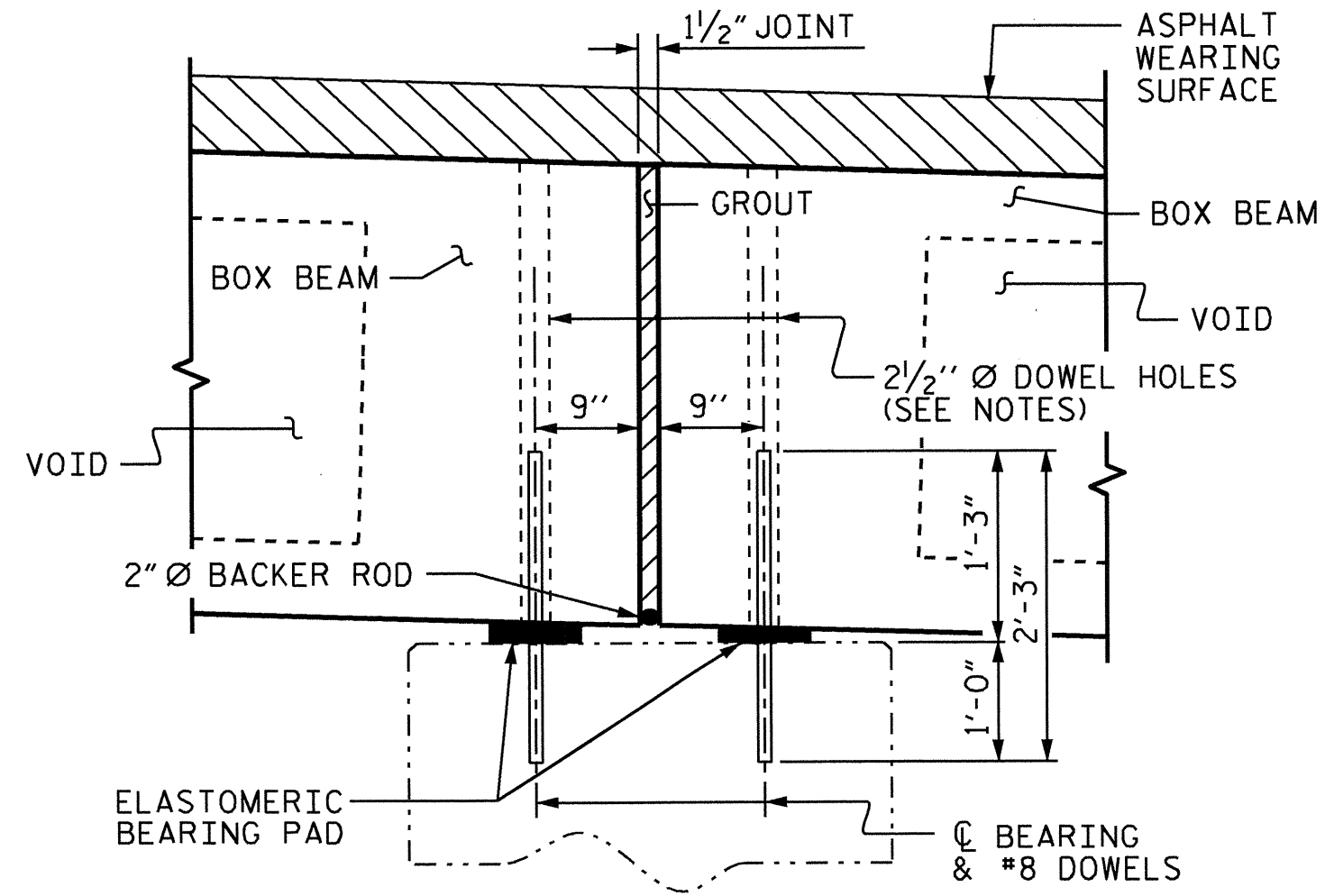
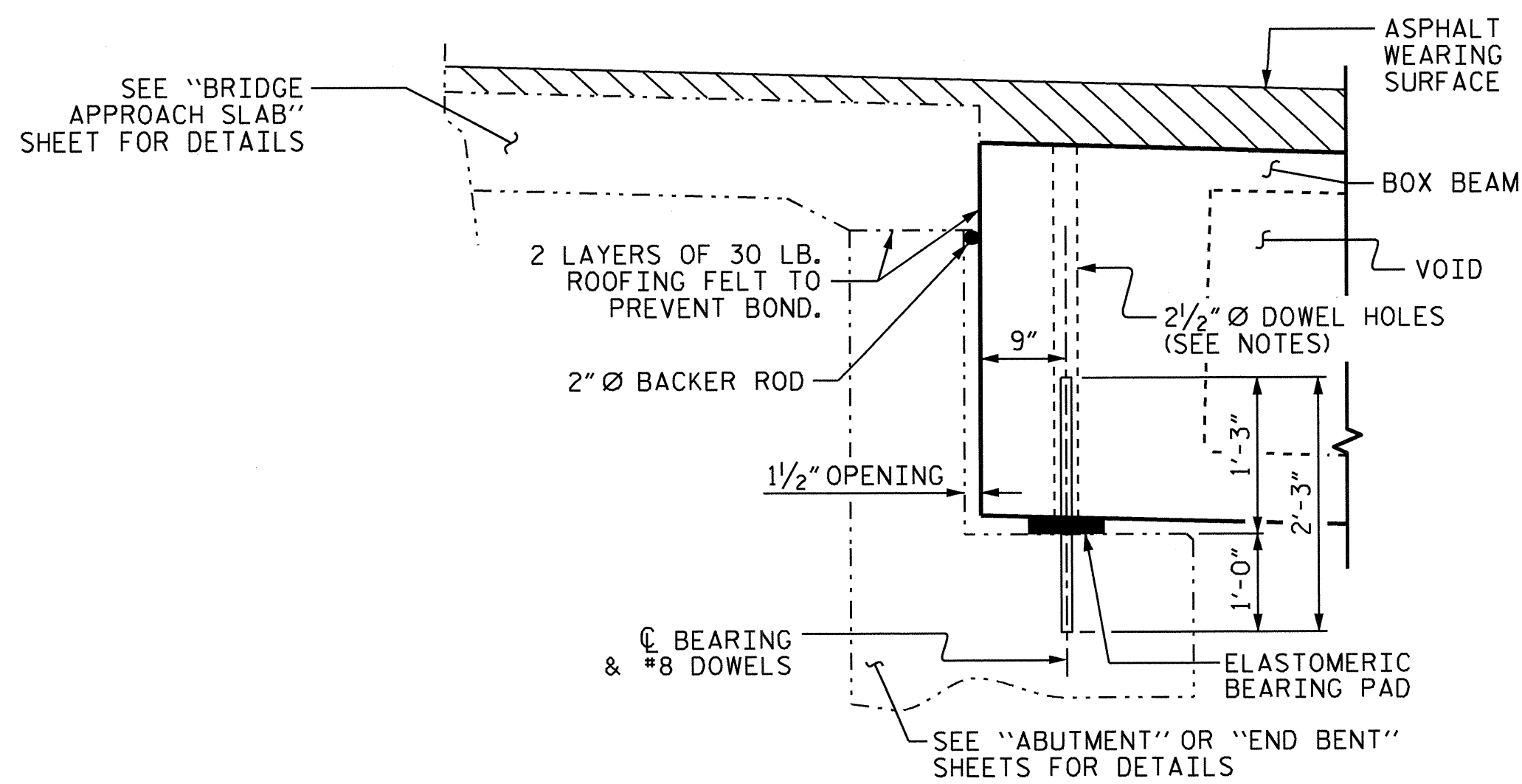
HALF SECTION THROUGH VOIDS

TYPICAL SECTION

* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "CONCRETE PARAPETS AND END POSTS" DETAIL SHEET S-15.

FIXED

FIXED



SECTION AT END BENTS

SECTION AT BENT

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

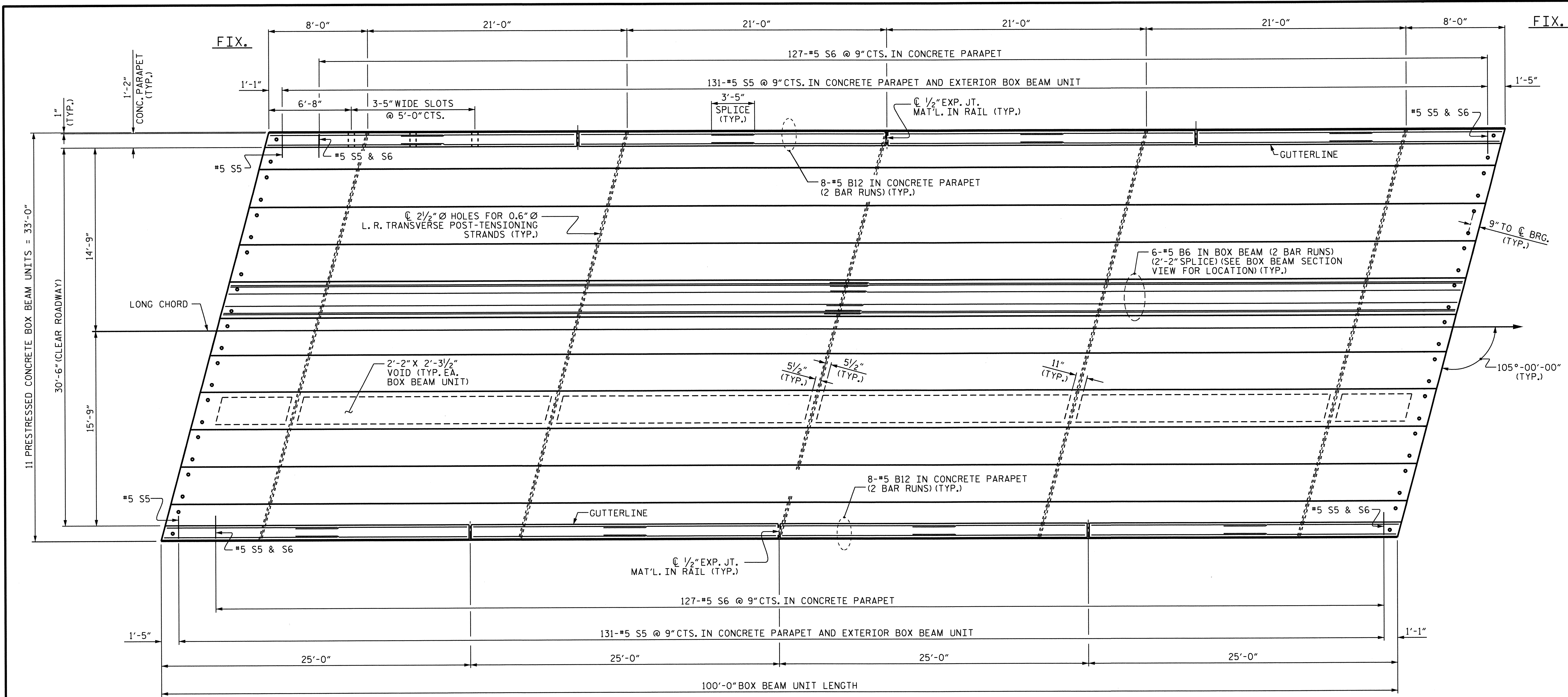
SHEET 1 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 3'-3"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

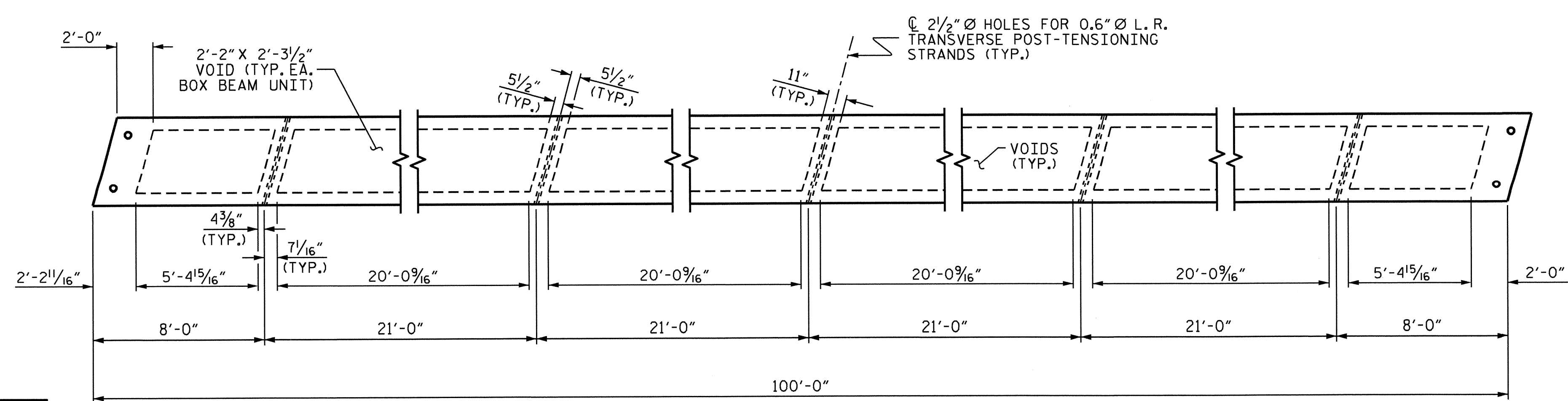


ASSEMBLED BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/10/13
 DRAWN BY : DGE 8/11
 CHECKED BY : TMG 11/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-6
2			4			27



PLAN OF SPAN A



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 2 OF 6

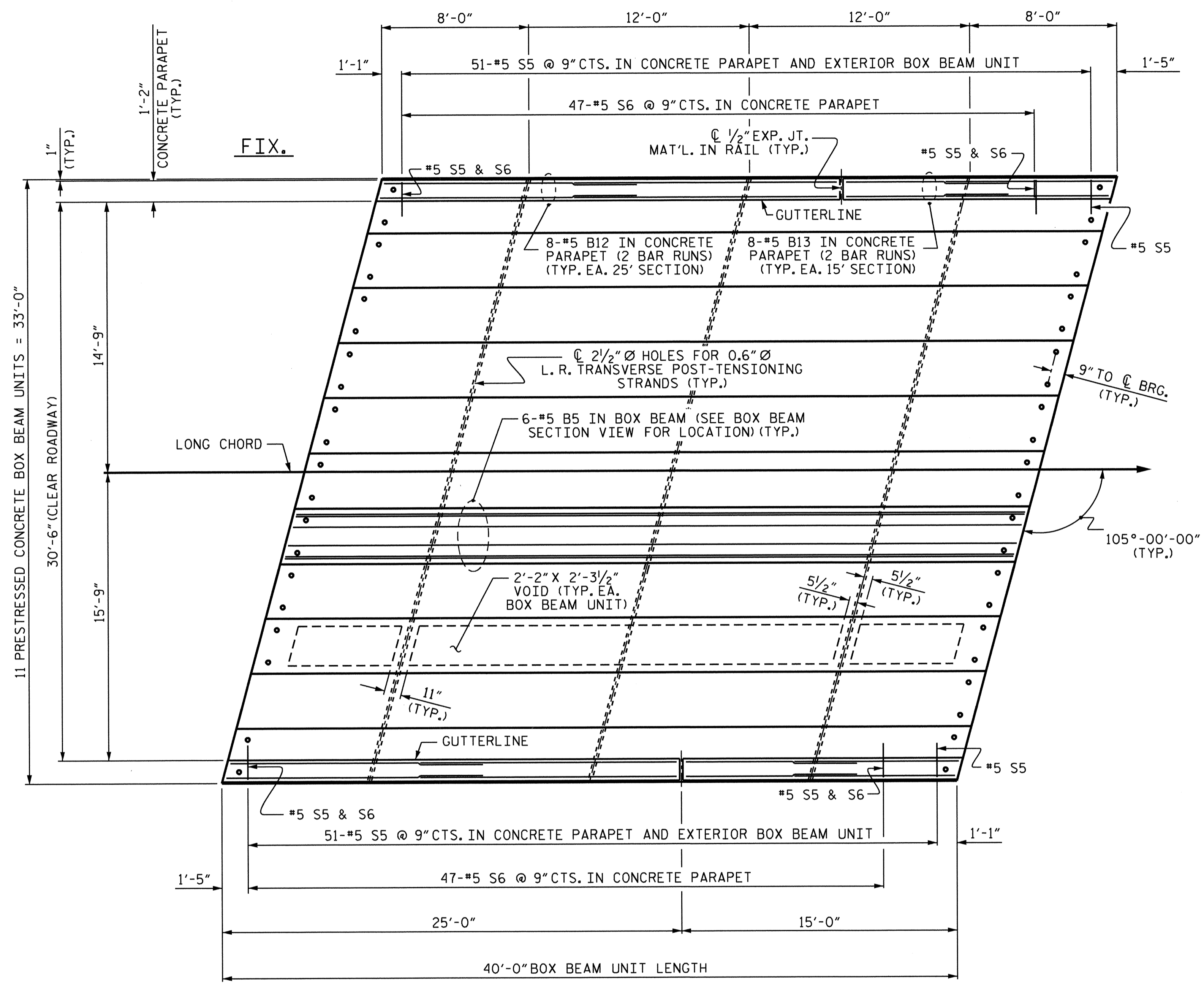
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 100' SPAN
 30'-6" CLEAR ROADWAY
 105° SKEW



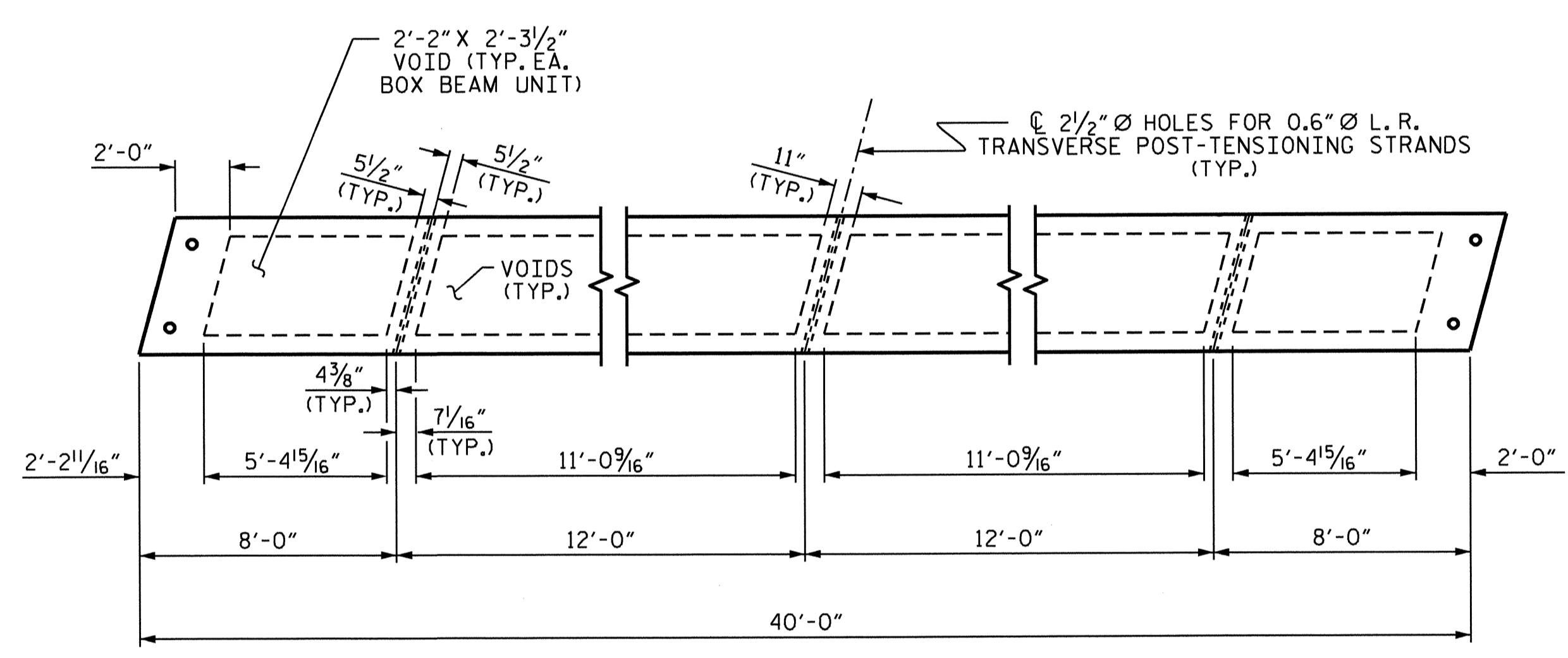
ASSEMBLED BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/10/13
 DRAWN BY : DGE 8/II
 CHECKED BY : TMG 11/II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			27



PLAN OF SPAN B

FIX.



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

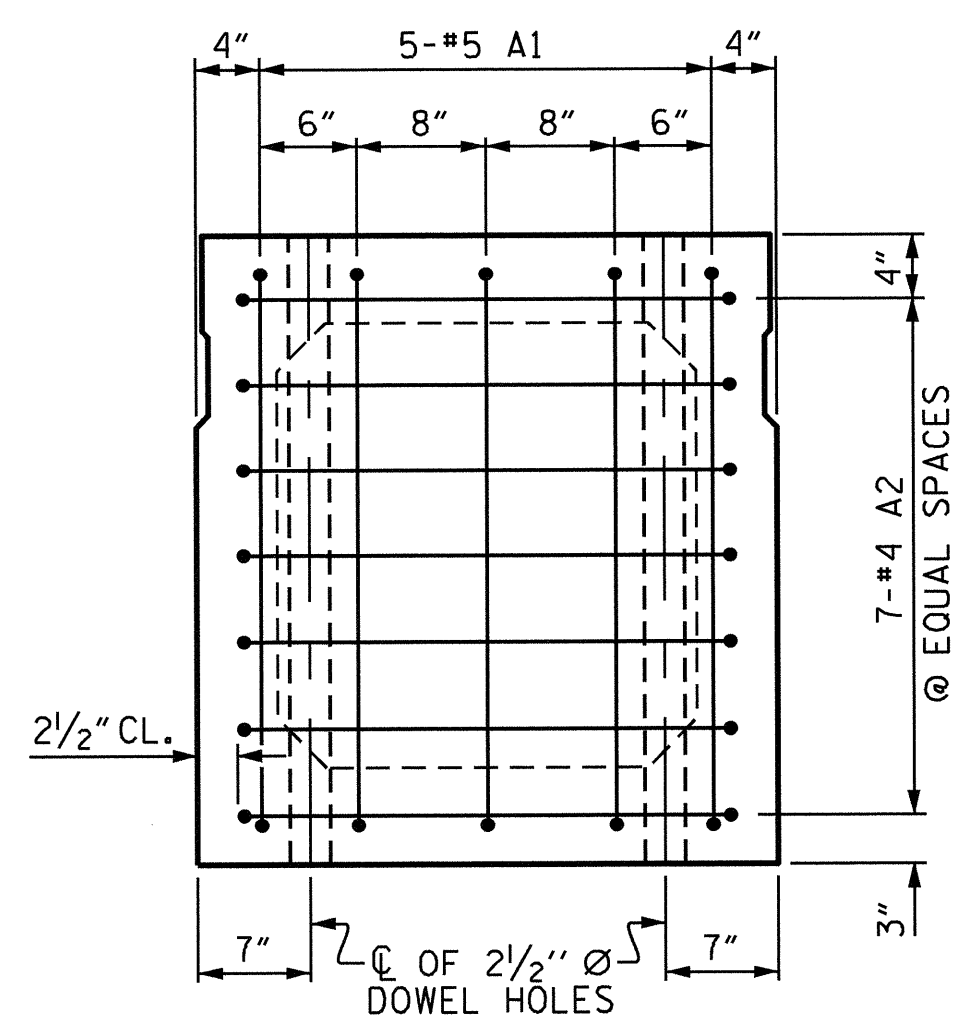
PLAN OF 40' SPAN
 30'-6" CLEAR ROADWAY
 105° SKEW



DRAWN BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/10/13
 ENG. OF RECORD : A.C. Outlaw DATE : 4/24/14

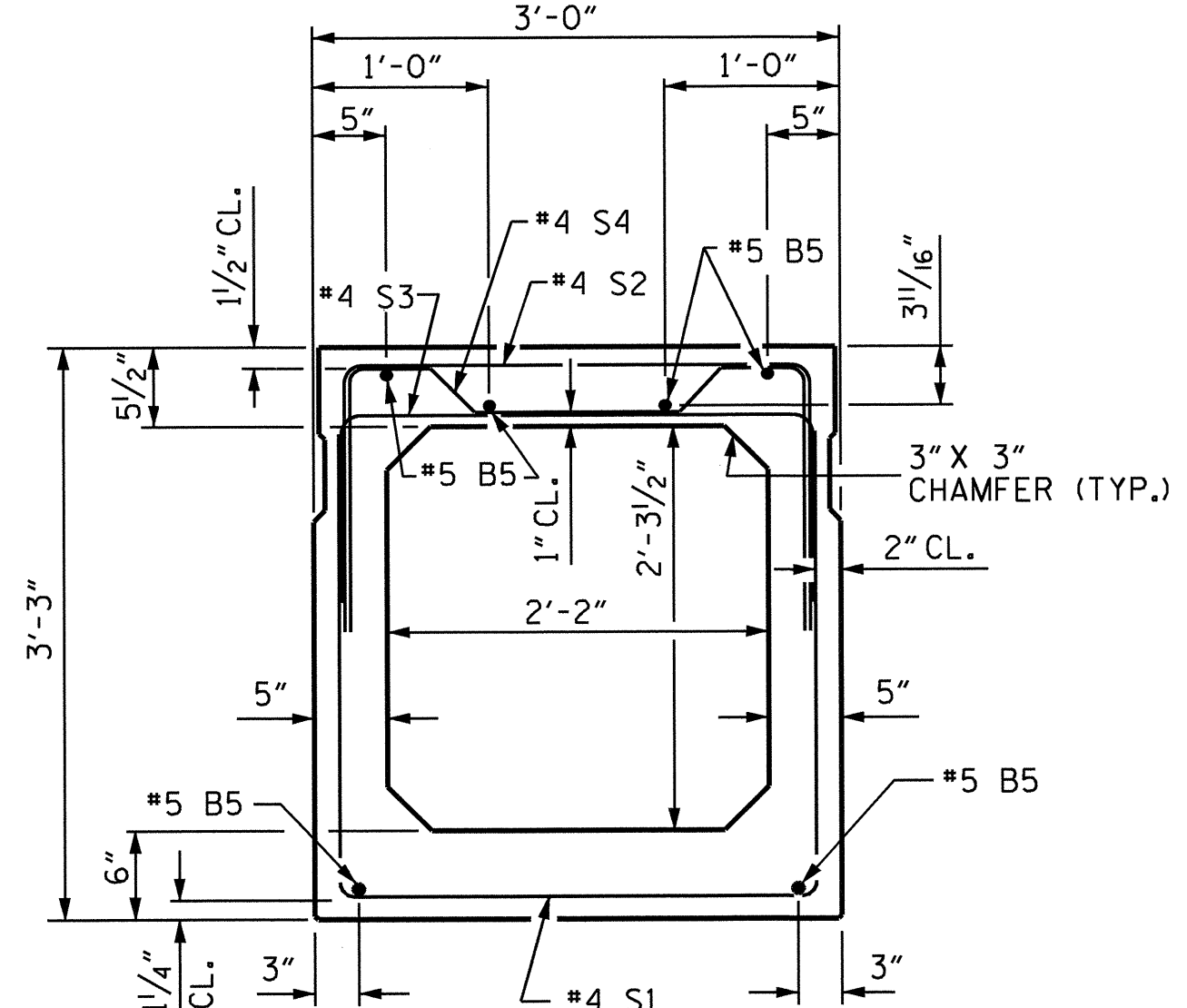
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			27

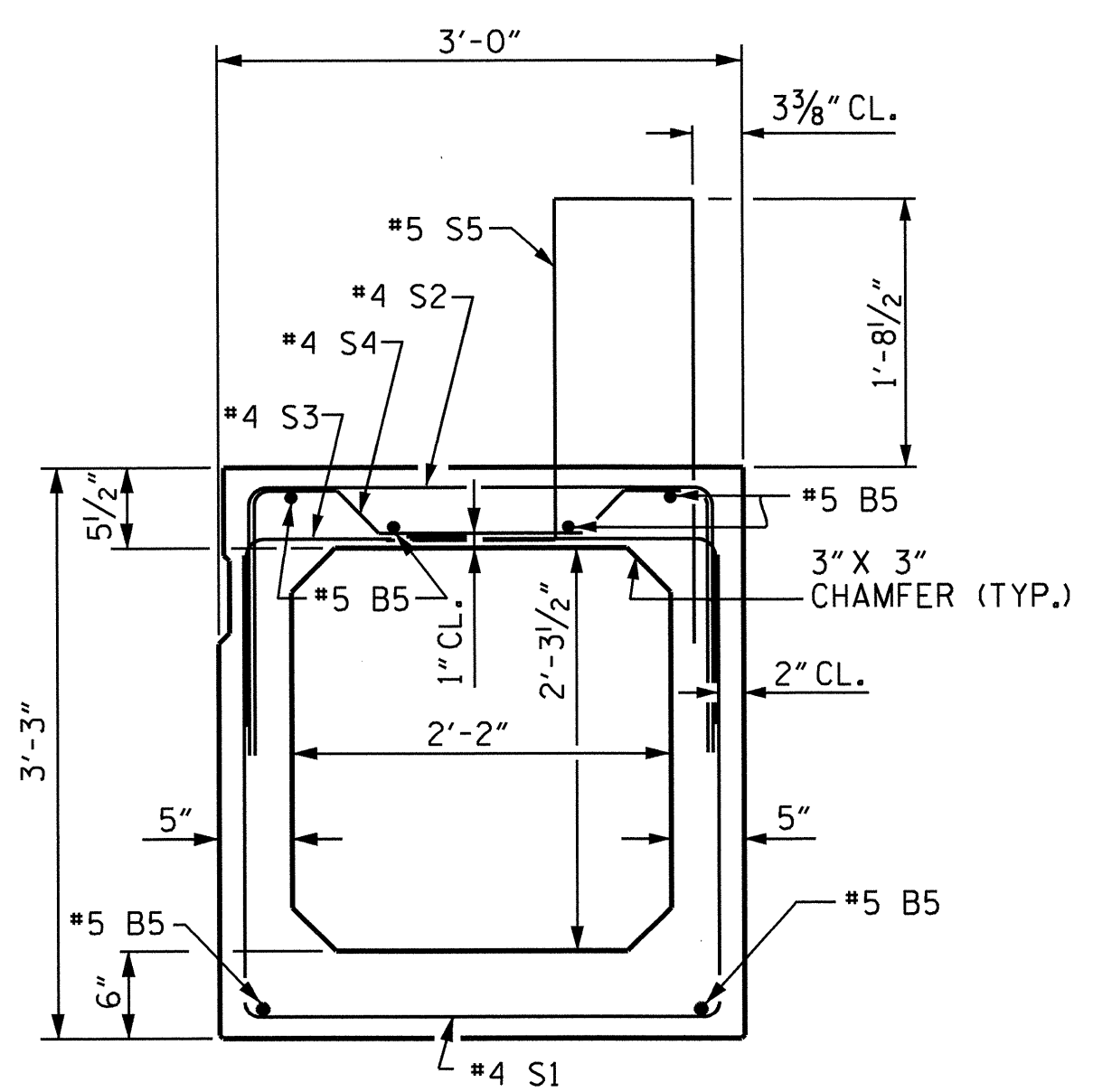


END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)

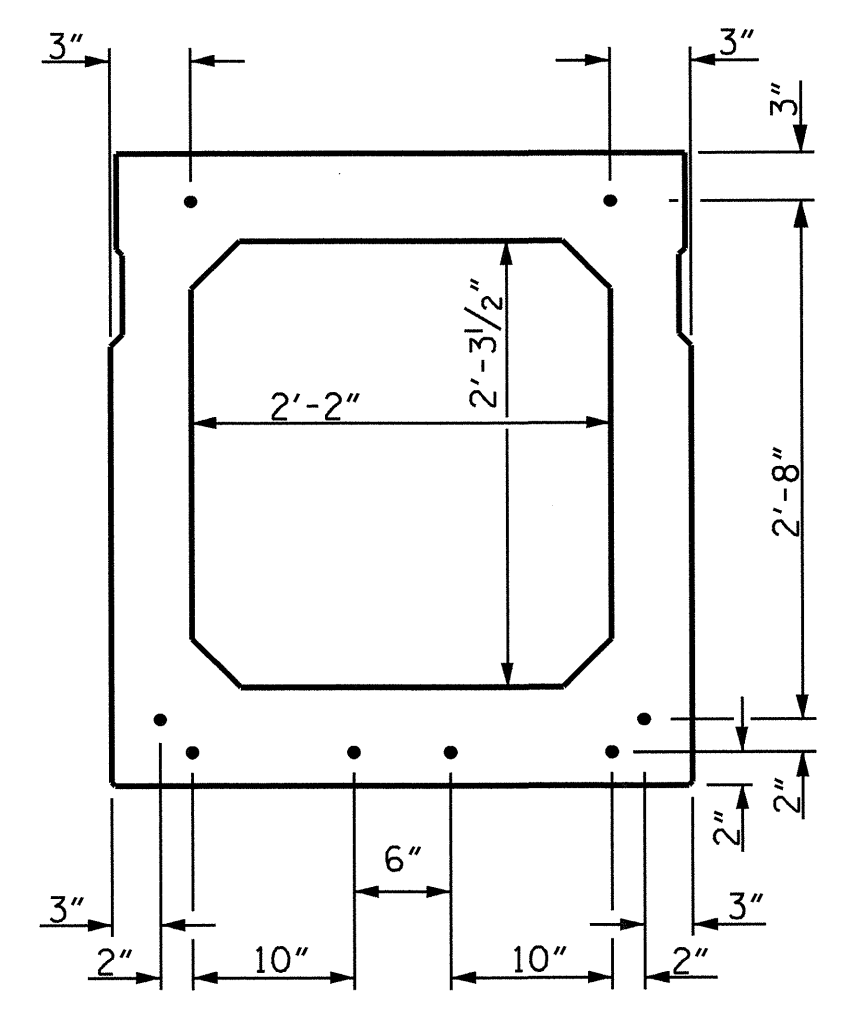


INTERIOR BOX BEAM SECTION (STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION (STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT

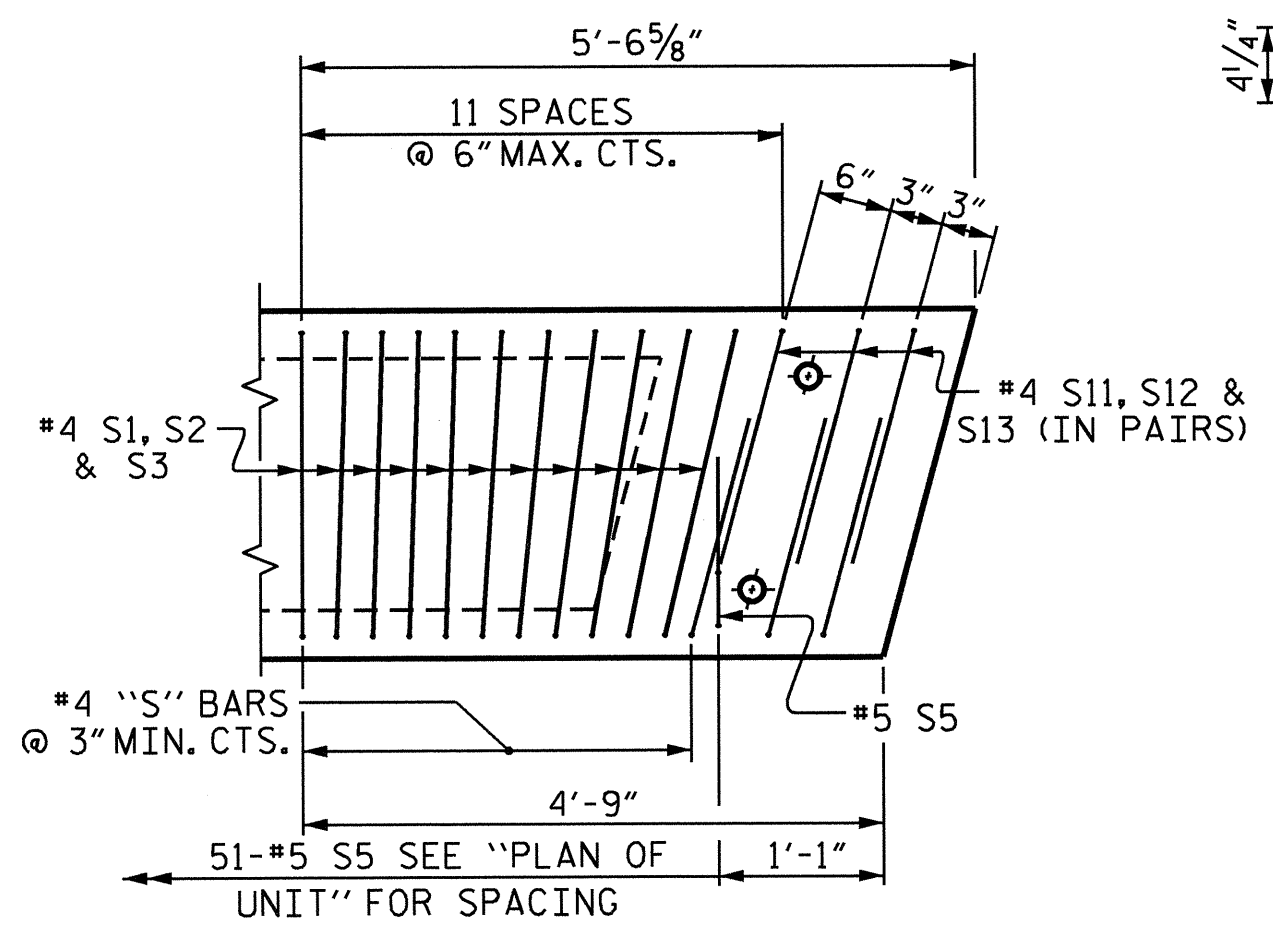


TYPICAL STRAND LOCATION (8 STRANDS REQUIRED)

DEBONDING LEGEND

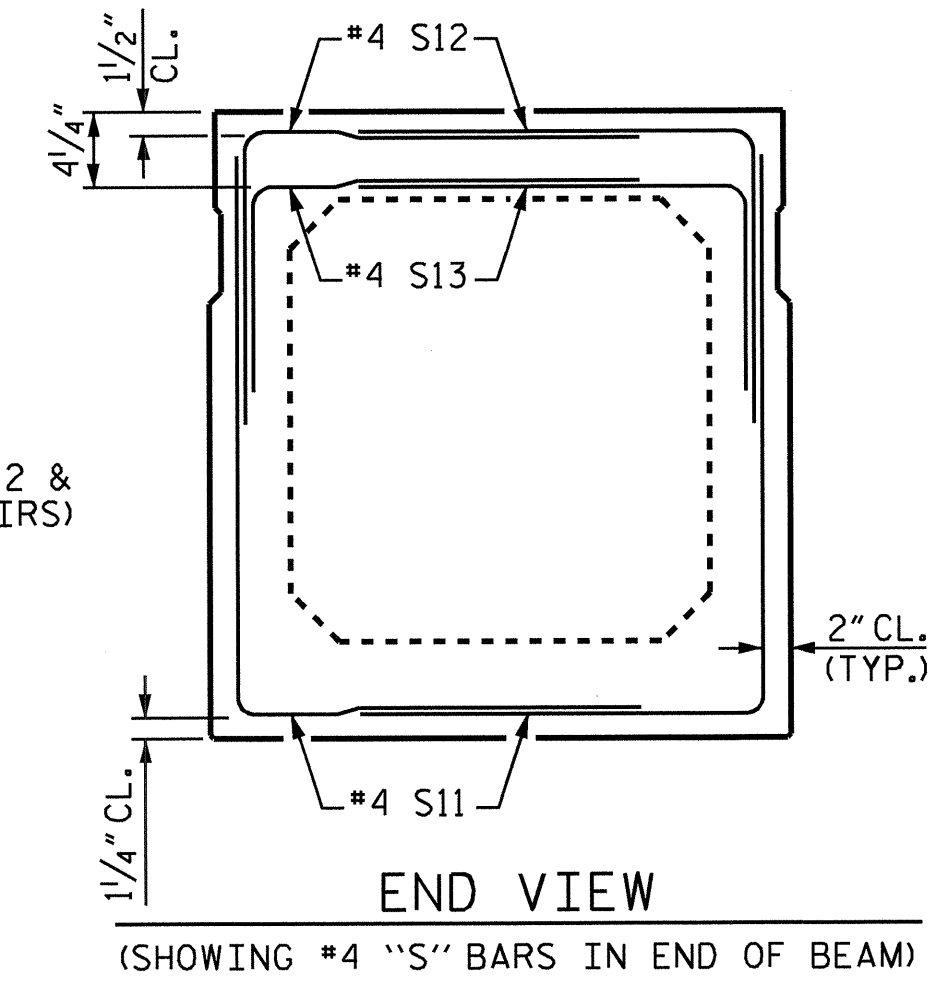
● FULLY BONDED STRANDS

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

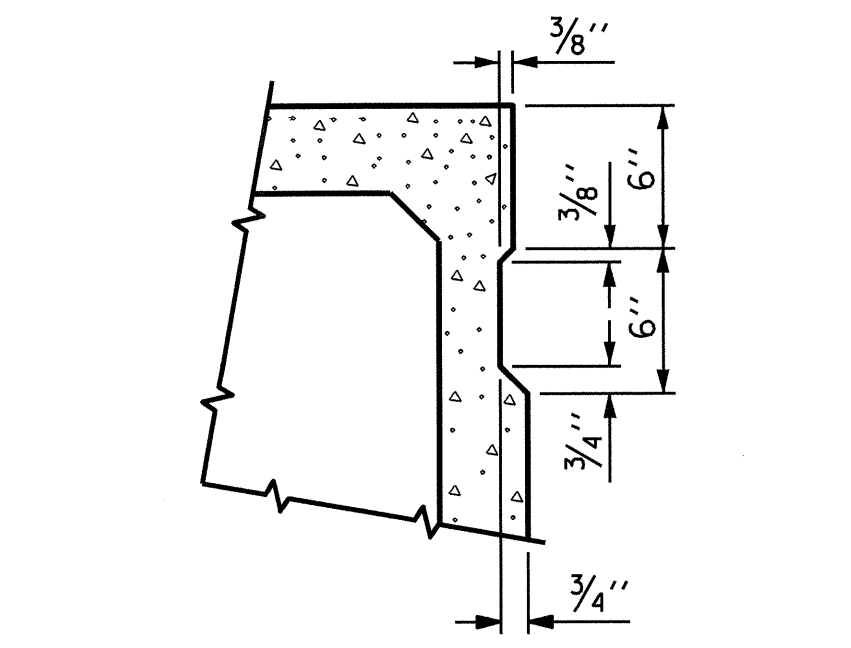


DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.

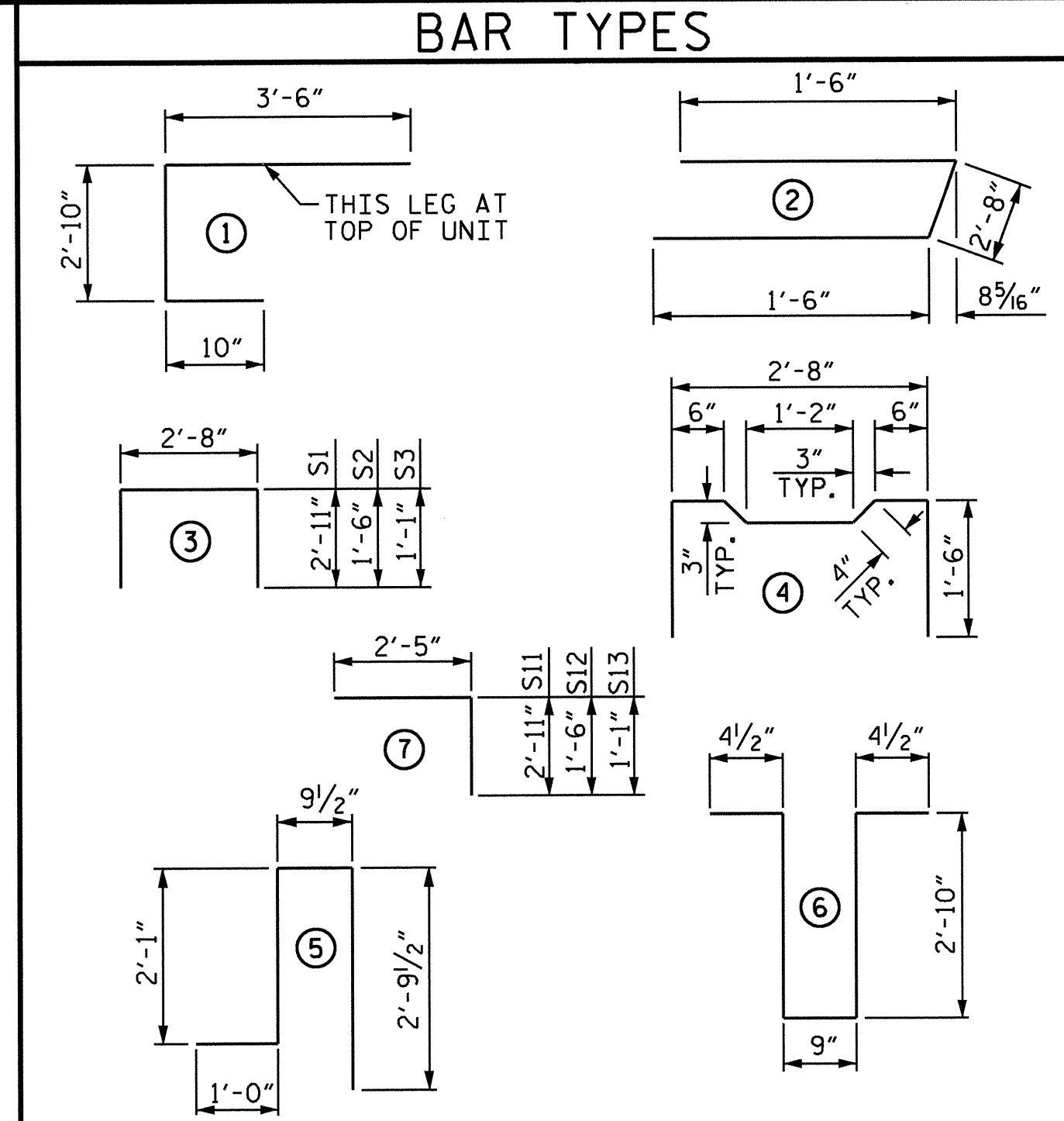


END VIEW (SHOWING #4 "S" BARS IN END OF BEAM)



SHEAR KEY DETAIL

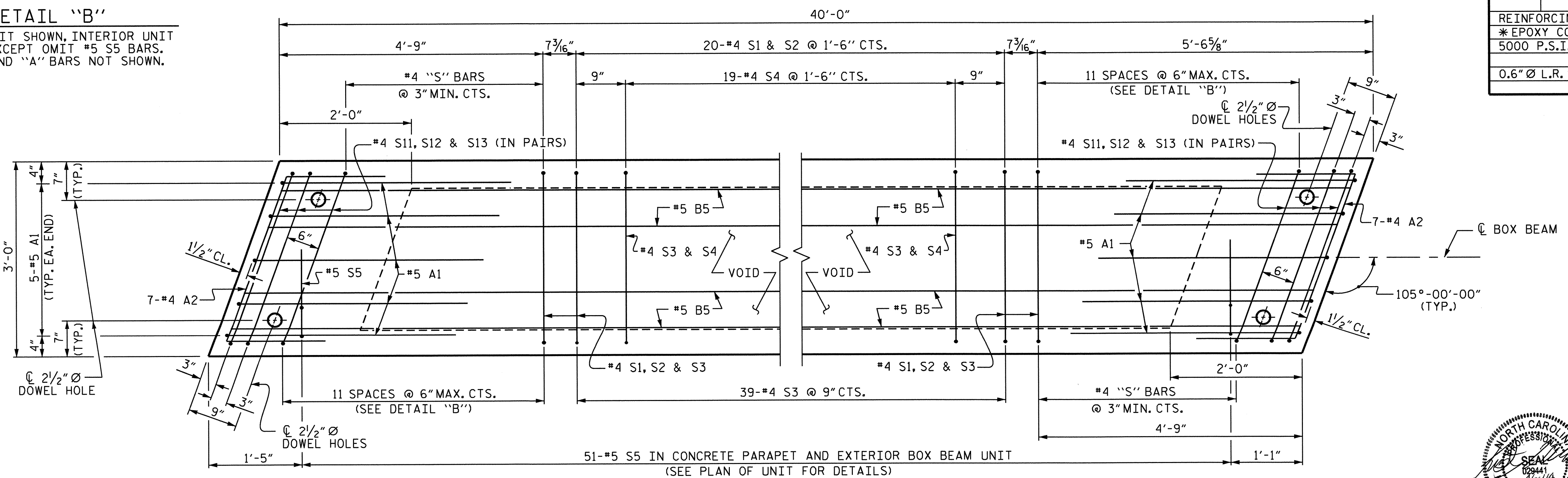
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
A1	#5	1	7'-2"	75	7'-2"	75
A2	#4	2	5'-8"	121	5'-8"	121
B5	#5	STR	39'-8"	248	39'-8"	248
K1	#4	6	7'-2"	43	7'-2"	43
K2	#4	STR	2'-7"	10	2'-7"	10
S1	#4	3	8'-6"	238	8'-6"	238
S2	#4	3	5'-8"	159	5'-8"	159
S3	#4	3	4'-10"	197	4'-10"	197
S4	#4	4	5'-10"	74	5'-10"	74
S11	#4	7	5'-4"	43	5'-4"	43
S12	#4	7	3'-11"	31	3'-11"	31
S13	#4	7	3'-6"	28	3'-6"	28
* S5	#5	5	6'-8"	355	--	--
REINFORCING STEEL			1267	LBS.	1267	LBS.
* EPOXY COATED REINF. STEEL			355	LBS.		
5000 P.S.I. CONCRETE			8.4	CU. YDS.	8.4	CU. YDS.
0.6" Ø L.R. STRANDS			No. 8		No. 8	



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF SPAN B. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

FOR BEVEL AT END OF GIRDER, SEE SHEET 6 OF 6.

DRAWN BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/10/13
 ENG. OF RECORD : A.C. Outlaw DATE : 4/21/14

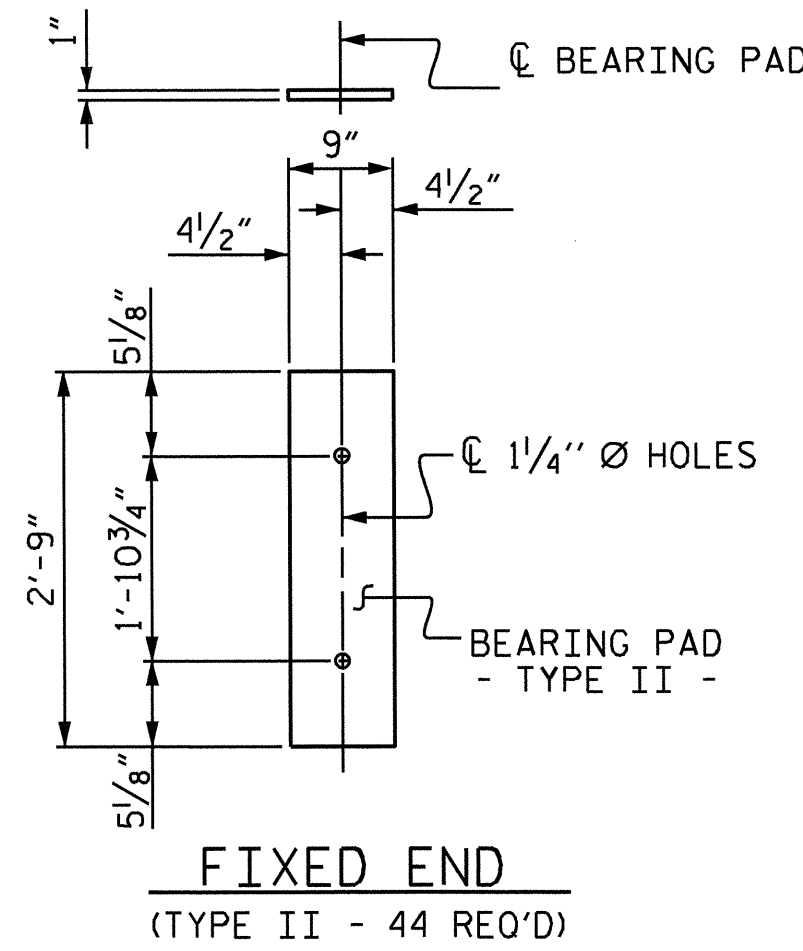
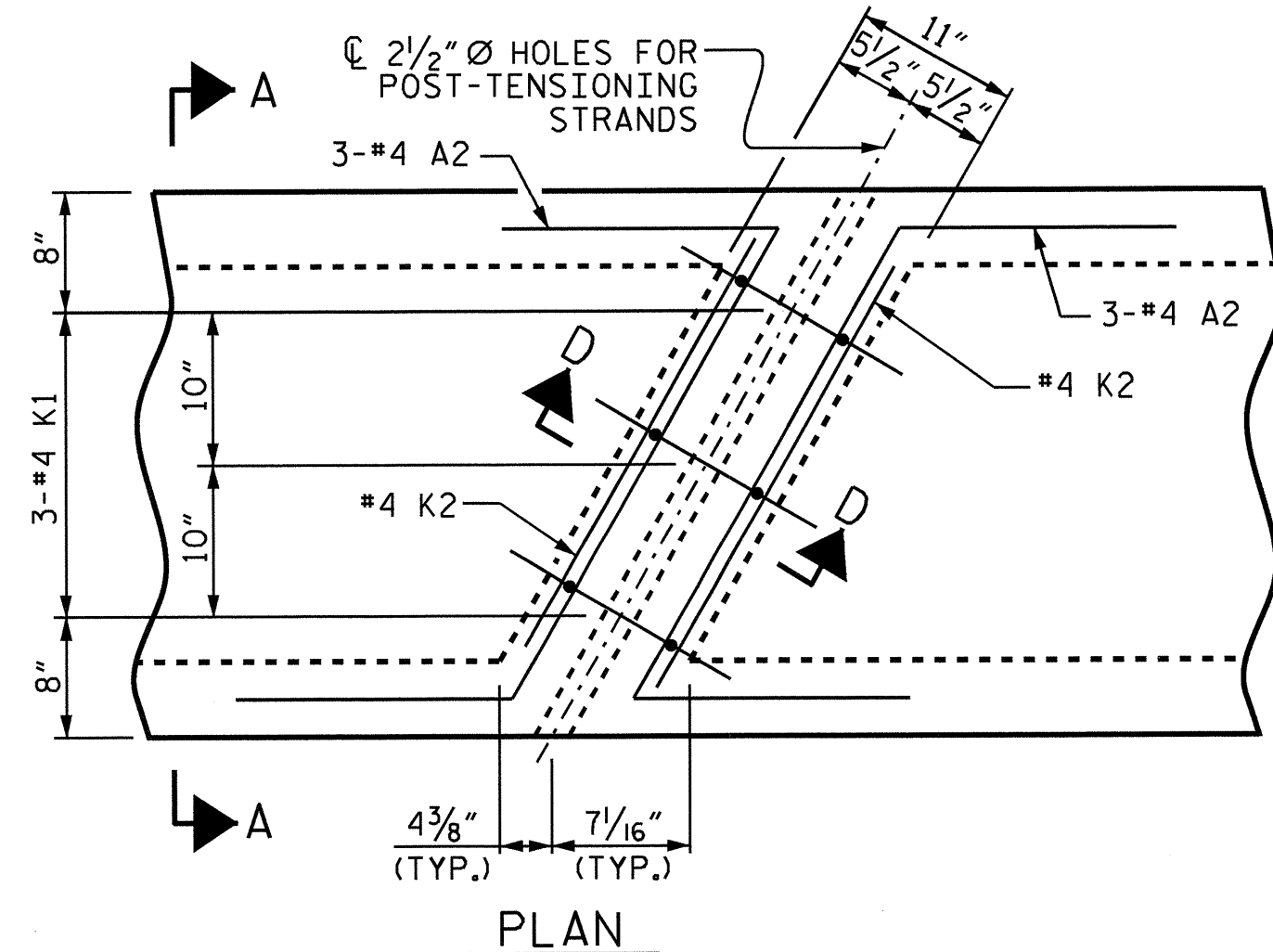
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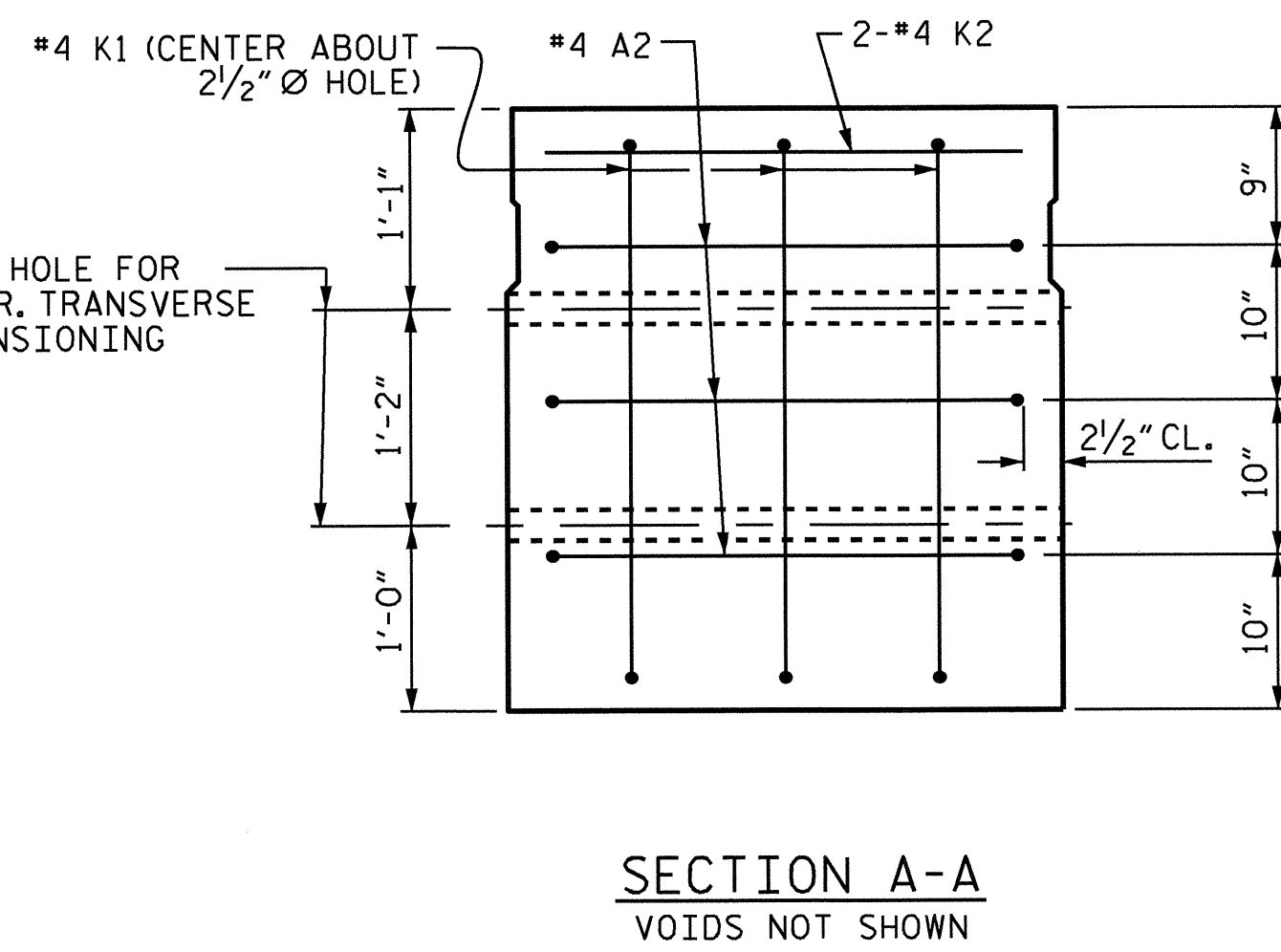
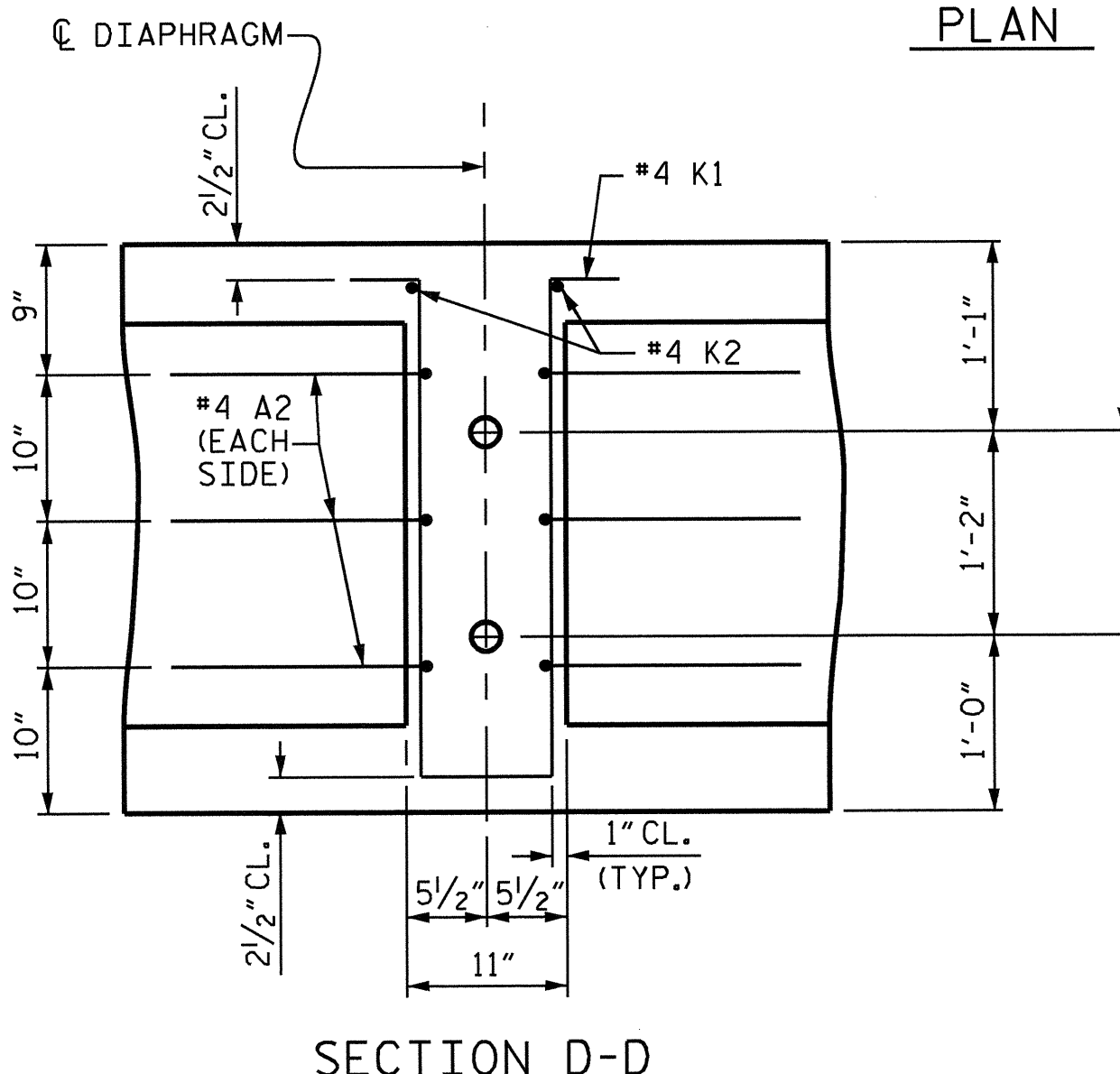
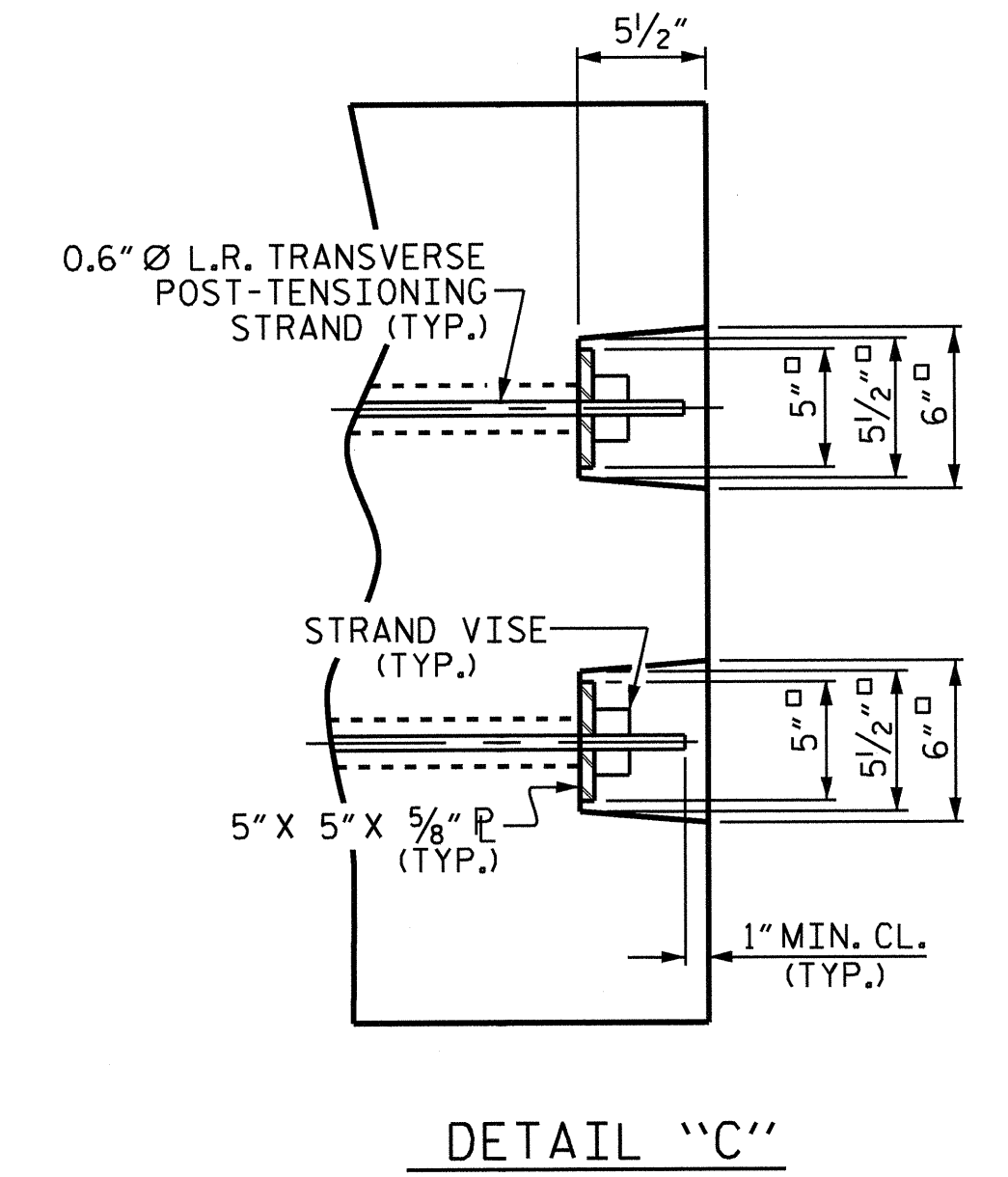
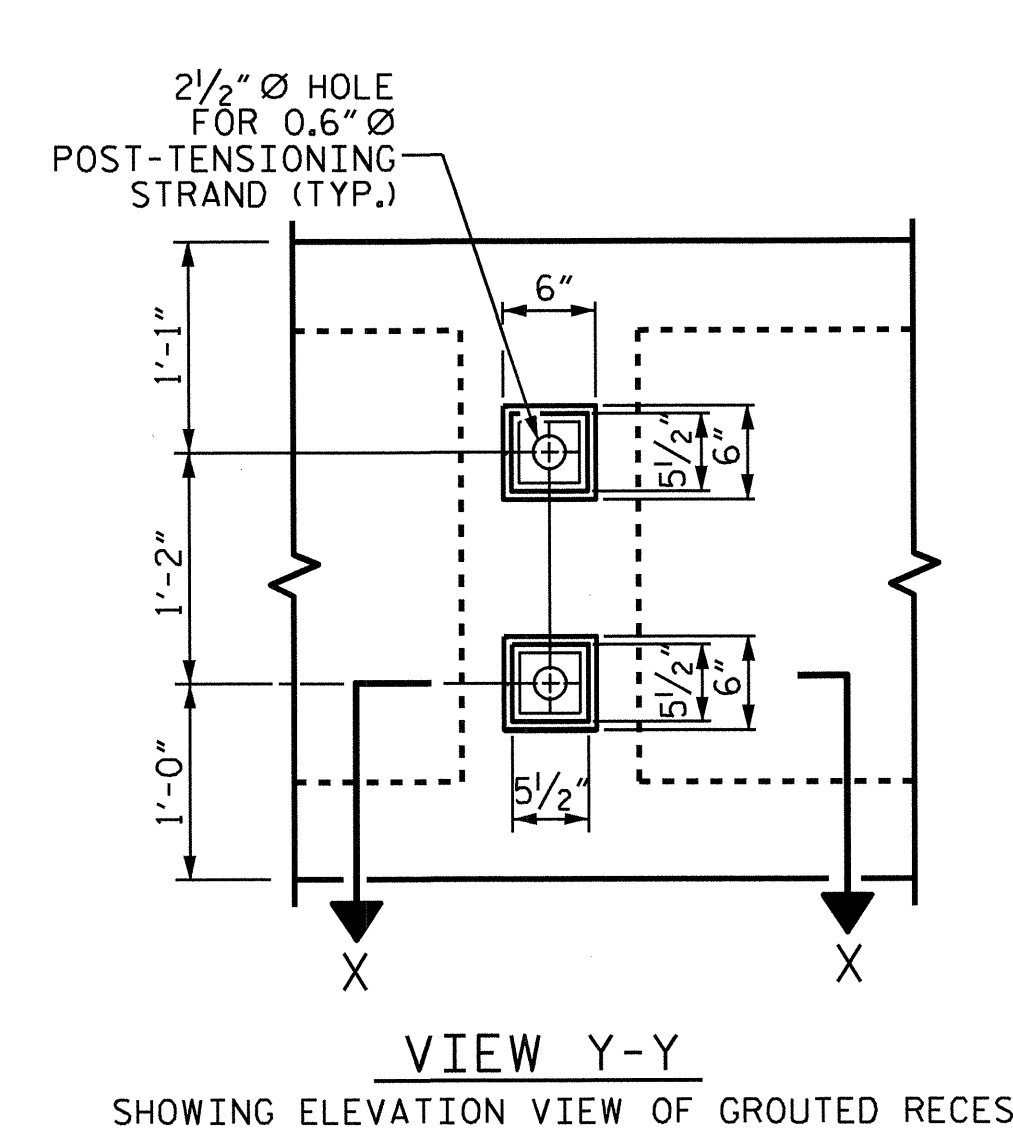
PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-
 SHEET 5 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT (40')					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

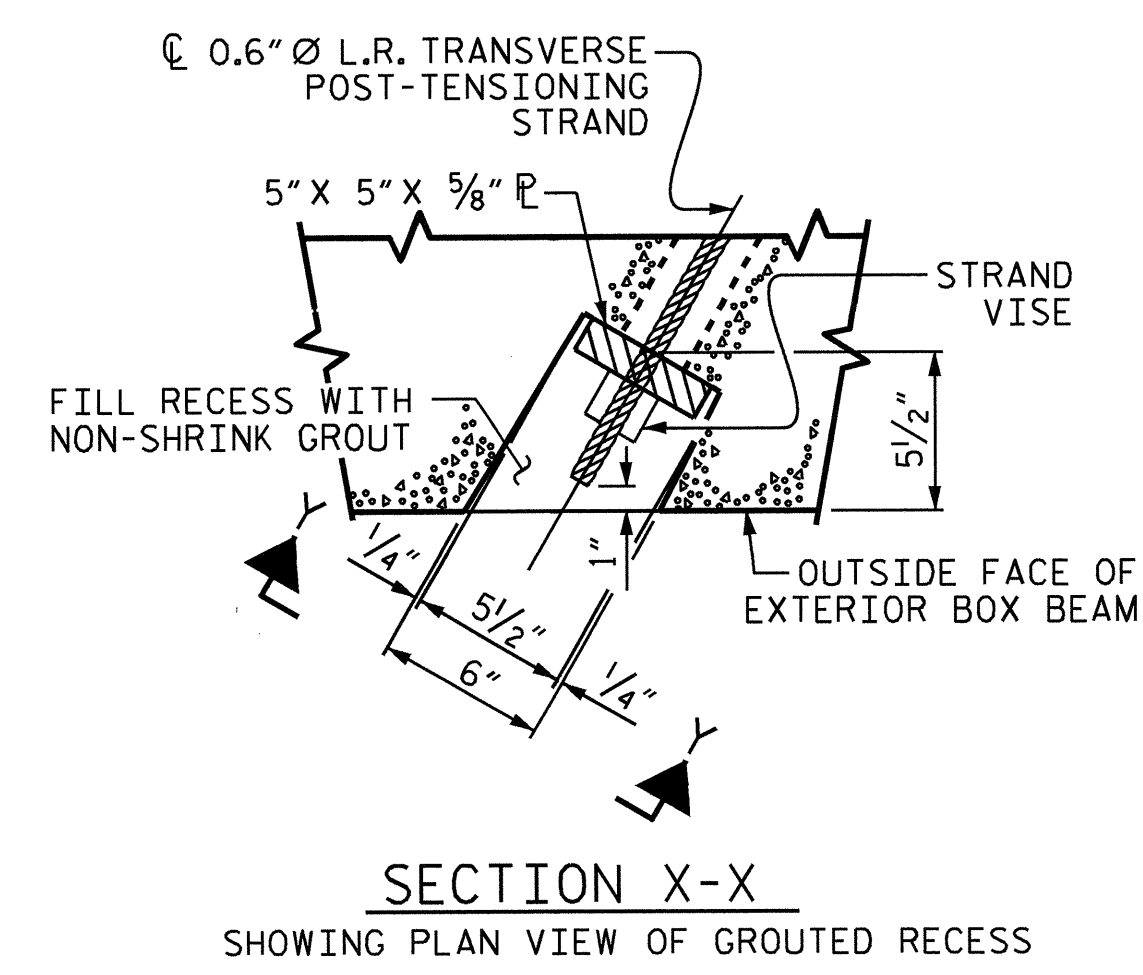
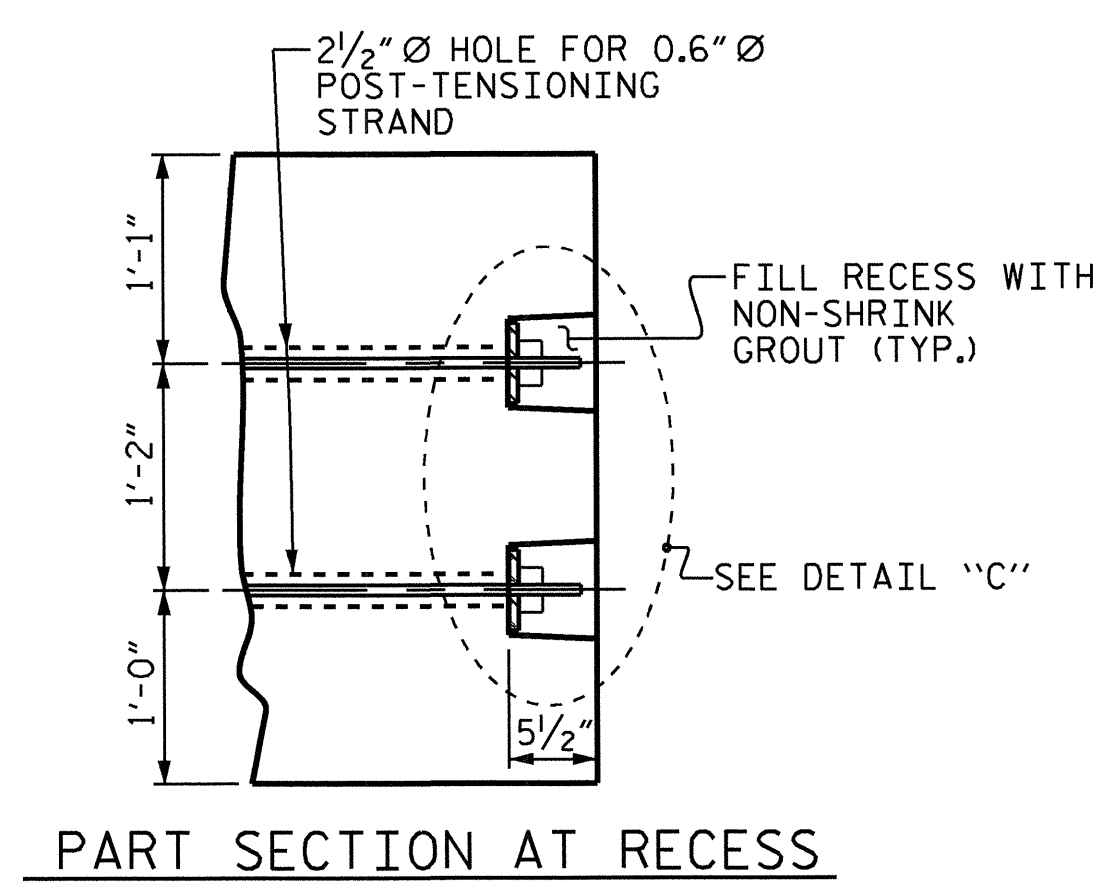
SHEET NO. S-10
TOTAL SHEETS 27



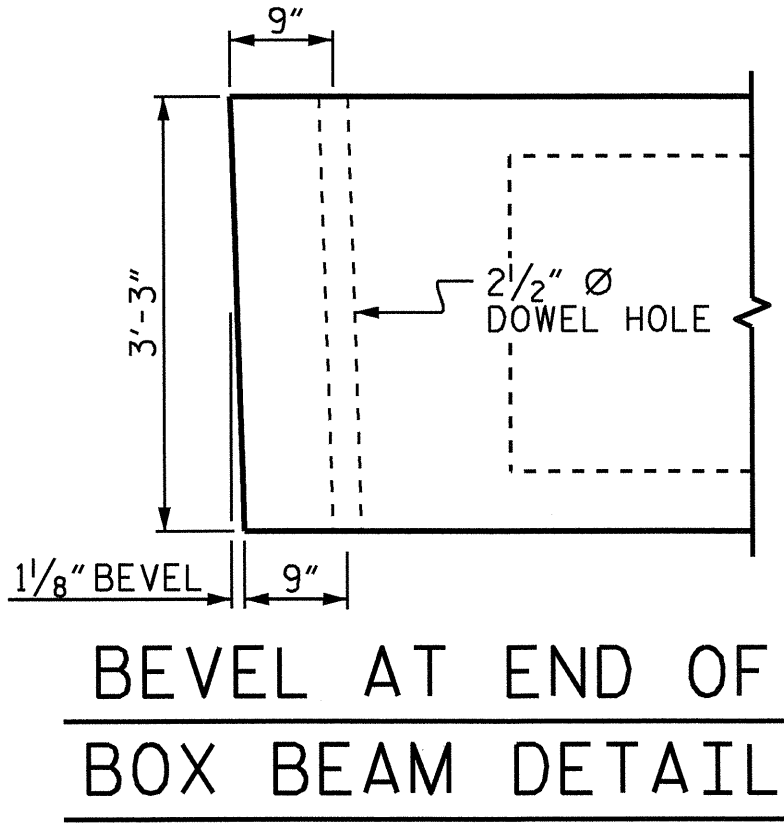
ELASTOMERIC BEARING DETAILS
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



DOUBLE DIAPHRAGM DETAILS
#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



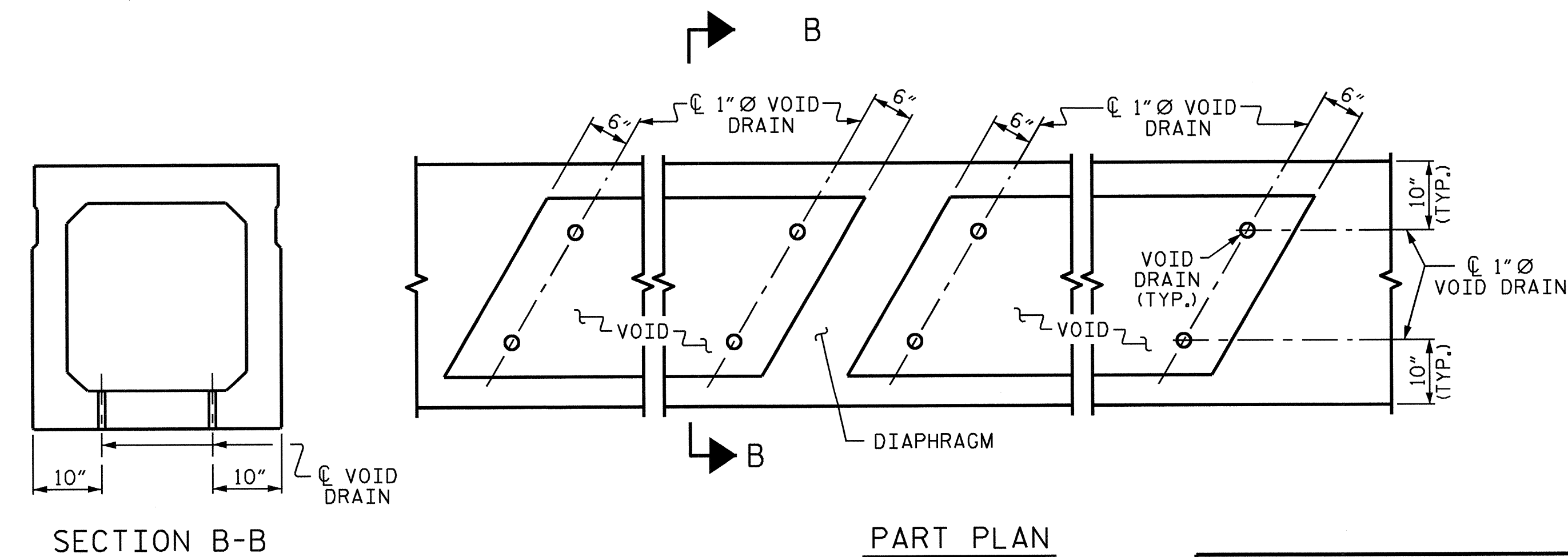
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM



DEAD LOAD DEFLECTION AND CAMBER			
	3'-0" x 3'-3"	100' UNITS	40' UNITS
0.6" Ø L.R. STRAND		SPAN A	SPAN B
CAMBER (SLAB ALONE IN PLACE)		3 1/2" ↑	1/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **		1" ↓	0" ↓
FINAL CAMBER		2 1/2" ↑	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
40' UNITS	5/16"	2'-11 1/16"
100' UNITS	1 1/2"	2'-7 1/2"



VOID DRAIN DETAILS
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11		1100'-0"

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	40'-0"	80'-0"
INTERIOR B.B.	9	40'-0"	360'-0"
TOTAL	11		440'-0"

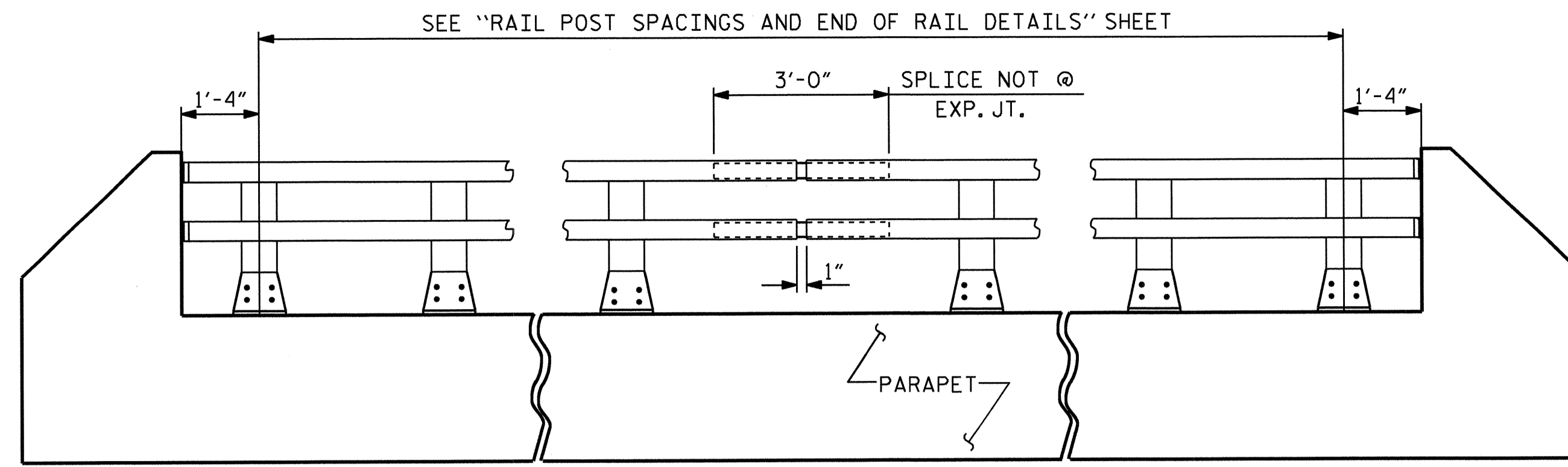
PROJECT NO. B-4608
RANDOLPH COUNTY
STATION: 16+29.00 -L-

SHEET 6 OF 6
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 3'-3"
PRESTRESSED CONCRETE
BOX BEAM UNIT



REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

ASSEMBLED BY: T. KIRSCHBAUM DATE: 4/3/13
CHECKED BY: A.C. OUTLAW DATE: 4/10/13
DRAWN BY: DGE II/II
CHECKED BY: TMC II/II



ELEVATION

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

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET S-14.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

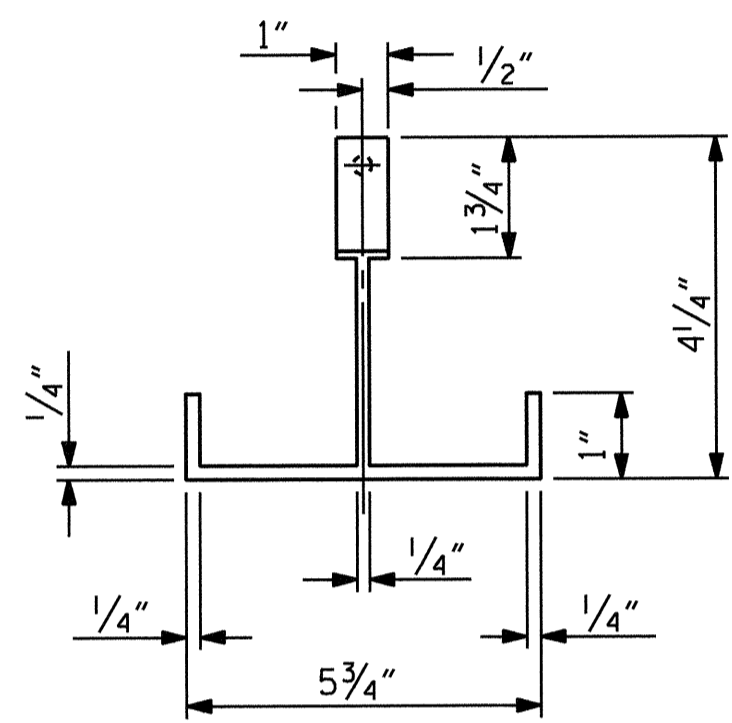
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

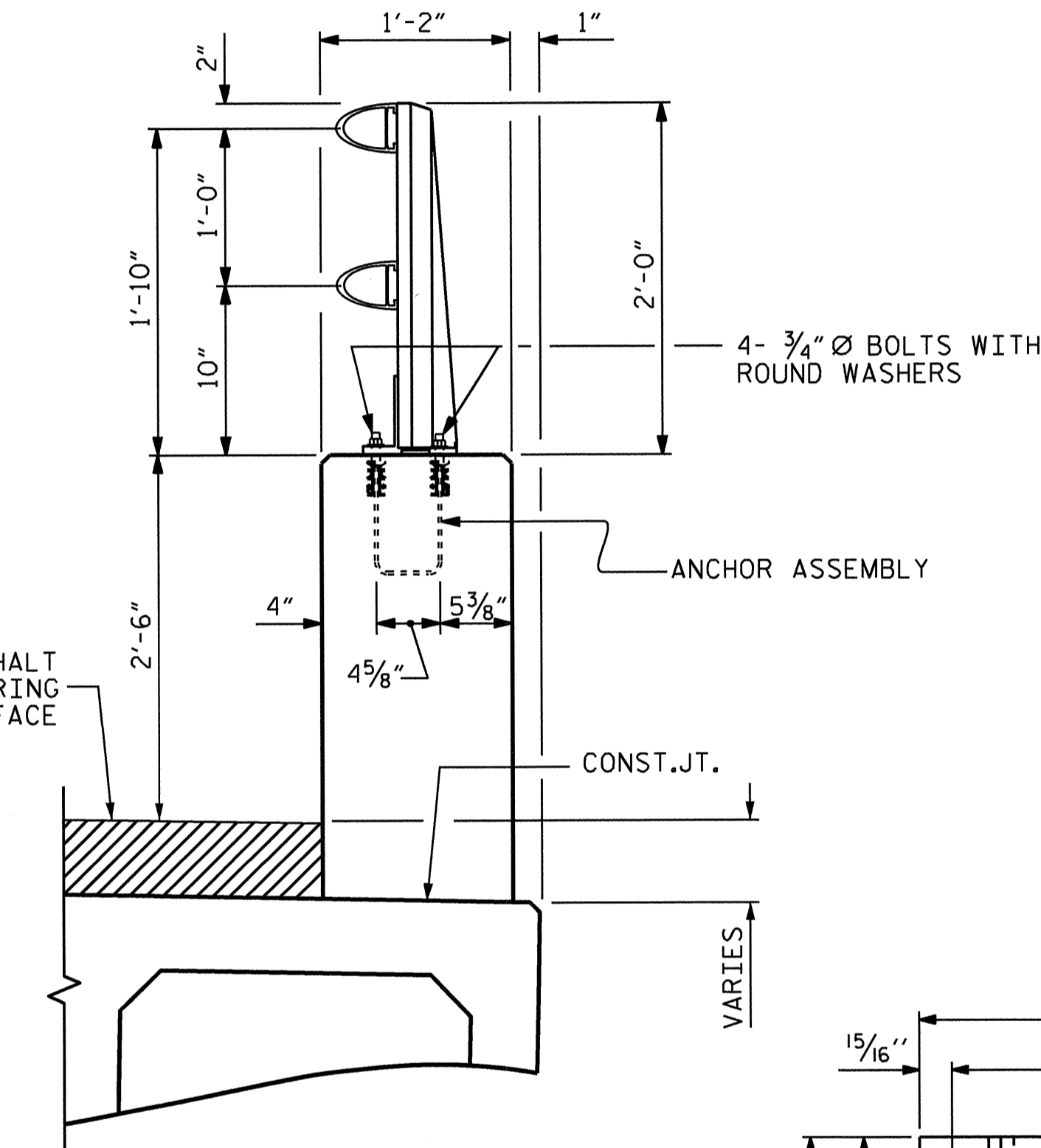
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

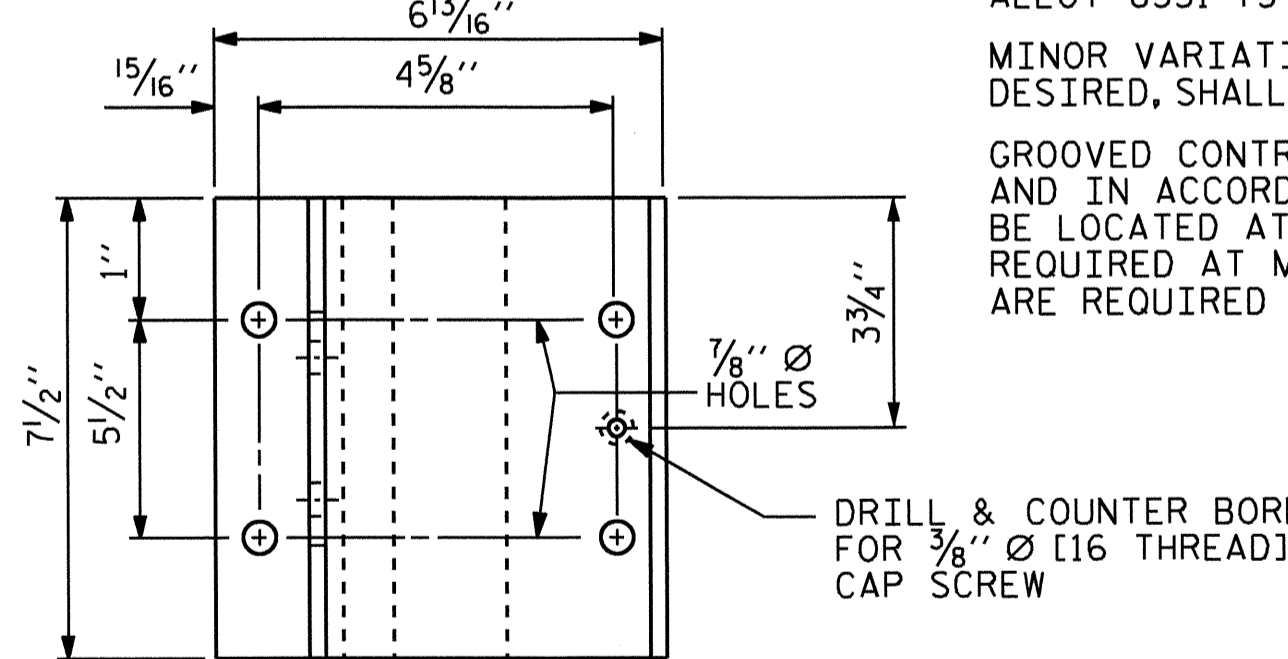
PAY LENGTH = 264.64 LIN. FT.



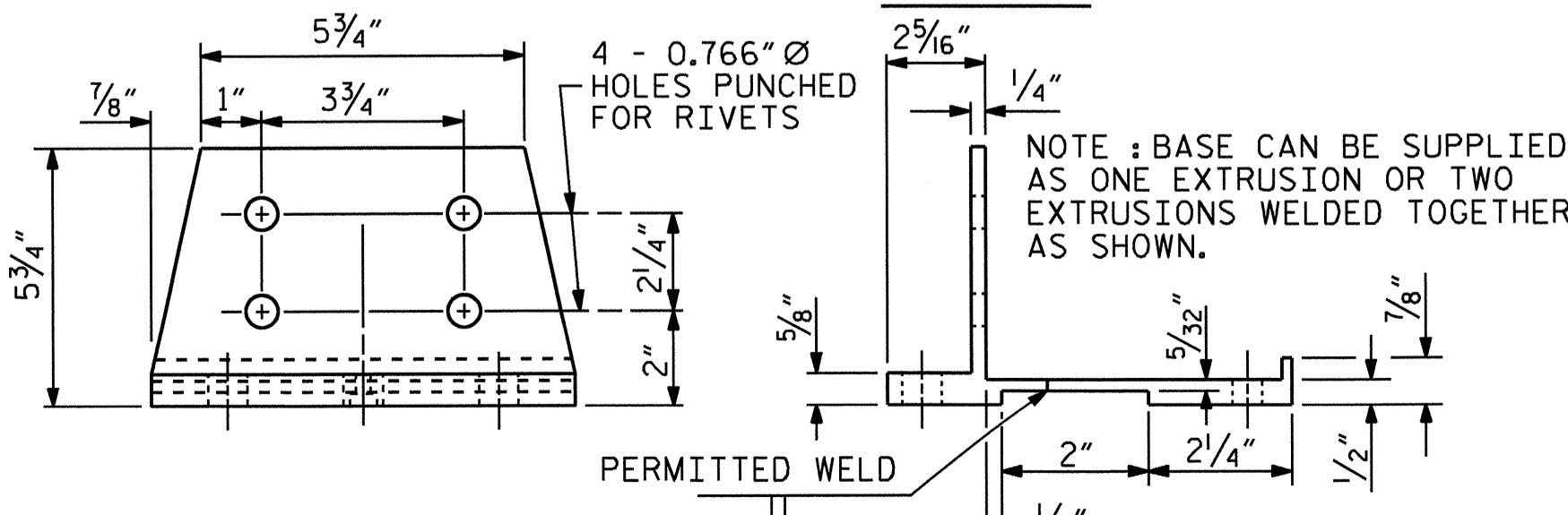
PLAN



SECTION THRU PARAPET AND RAIL



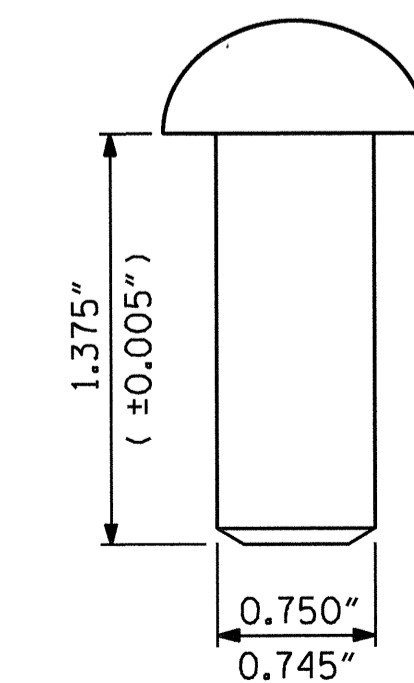
PLAN



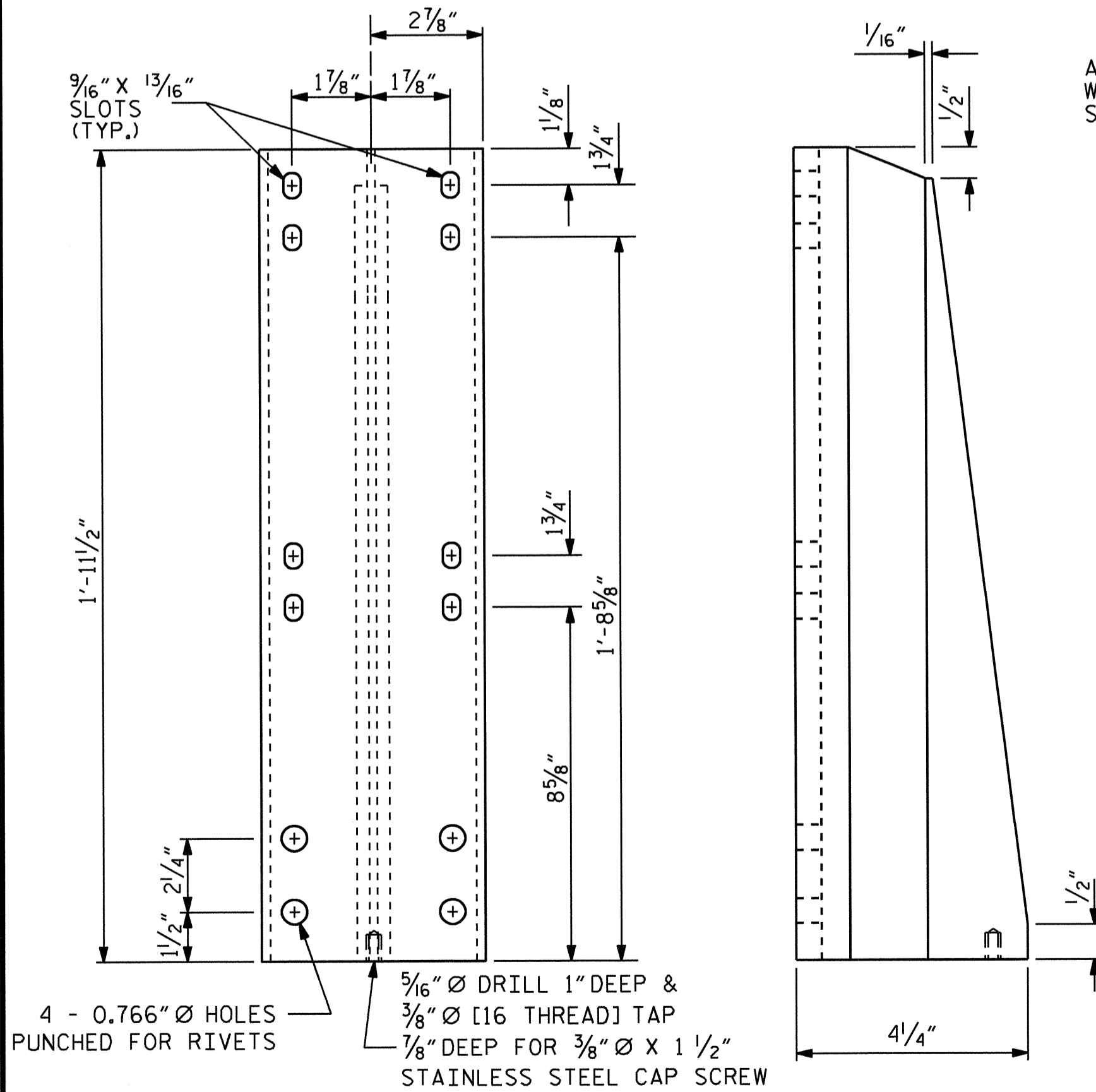
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

ASSEMBLED BY: T. KIRSCHBAUM DATE: 4/3/13
 CHECKED BY: A.C. OUTLAW DATE: 4/11/13
 DRAWN BY: EEM 6/94 REV. 5/1/06 TLA/GM
 CHECKED BY: RCW 6/94 REV. 10/1/11 MAA/GM
 REV. 6/13 MAA/GM

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 1 OF 2

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-12
2			4			27

STD. NO. BMR3

NOTES

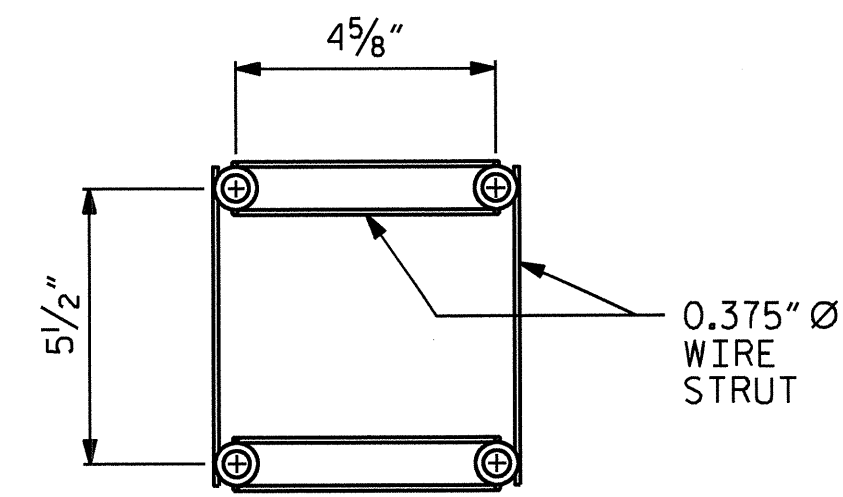
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

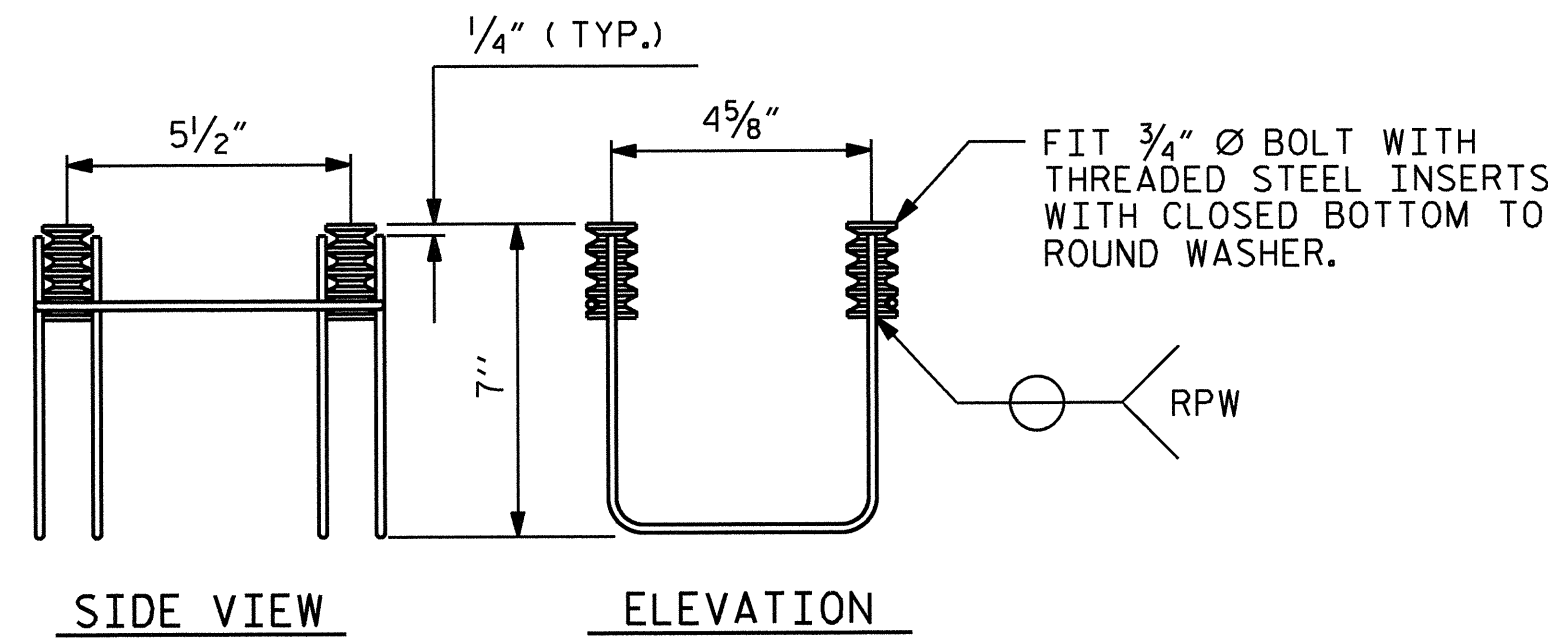
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



PLAN

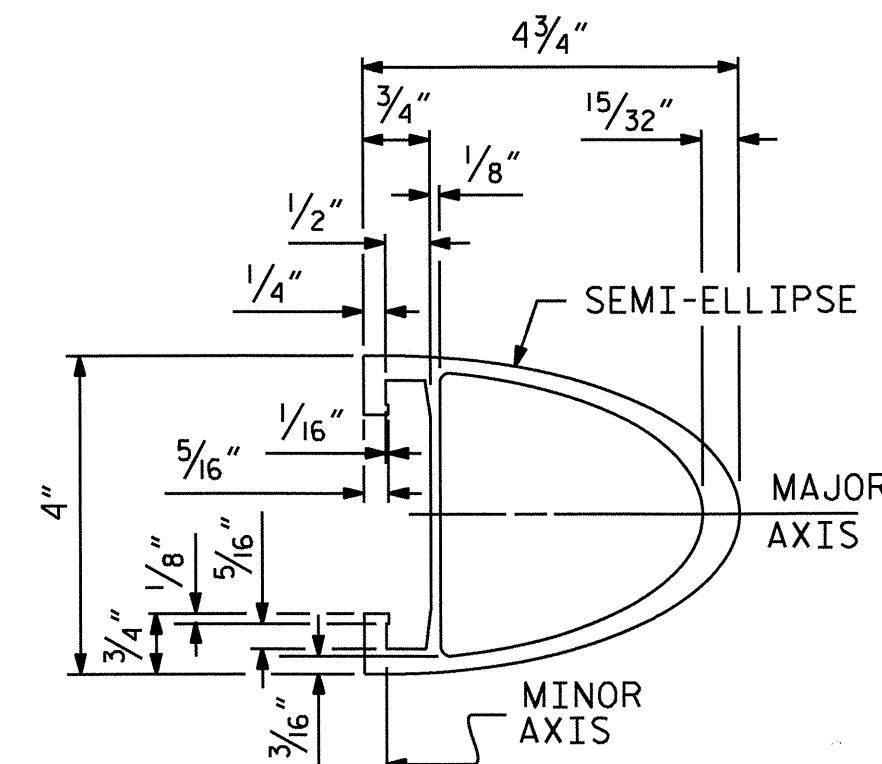


SIDE VIEW

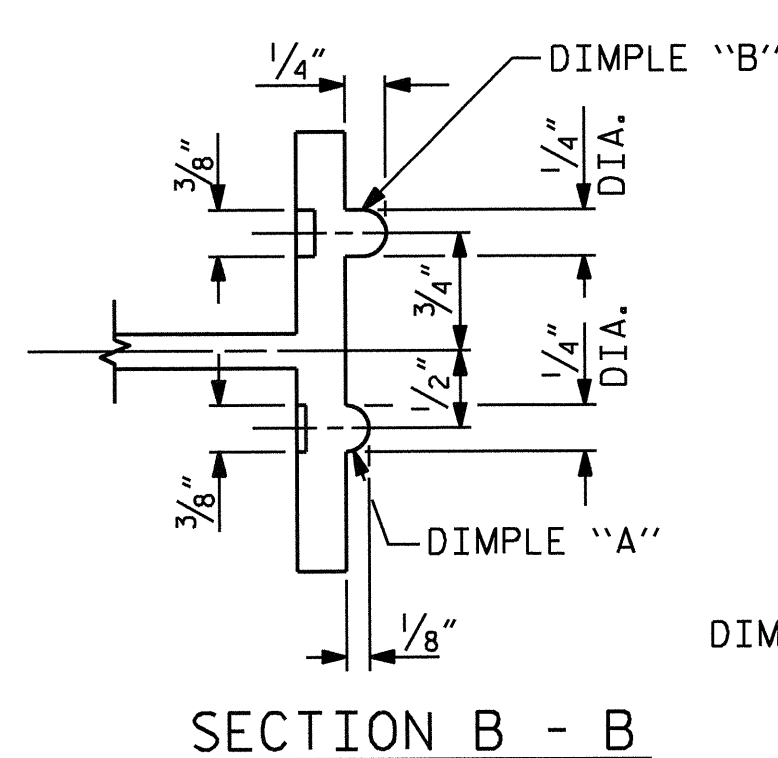
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

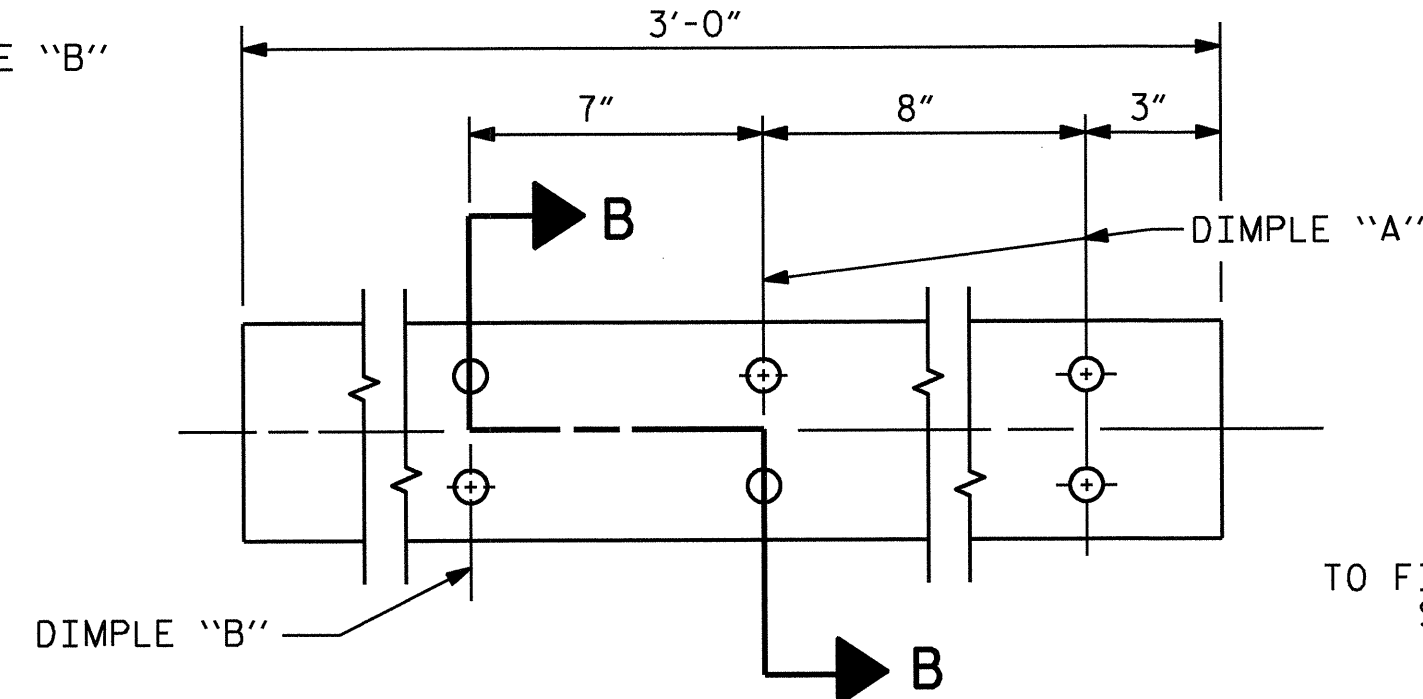
(46 ASSEMBLIES REQUIRED)



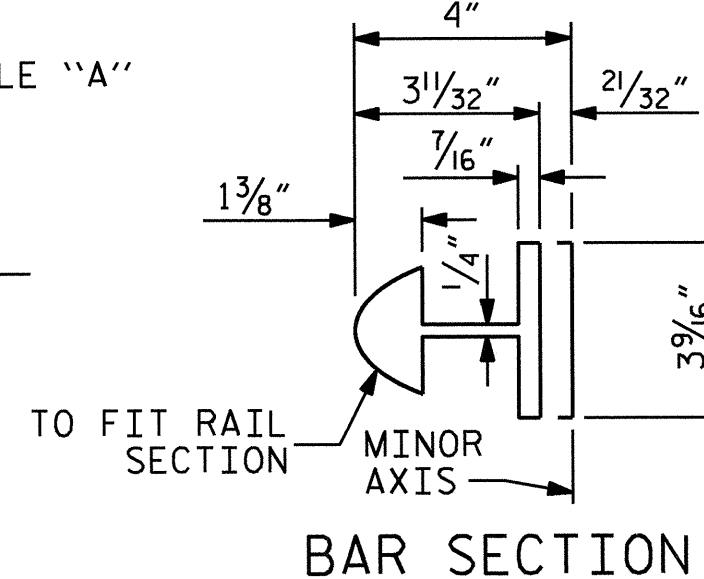
RAIL SECTION



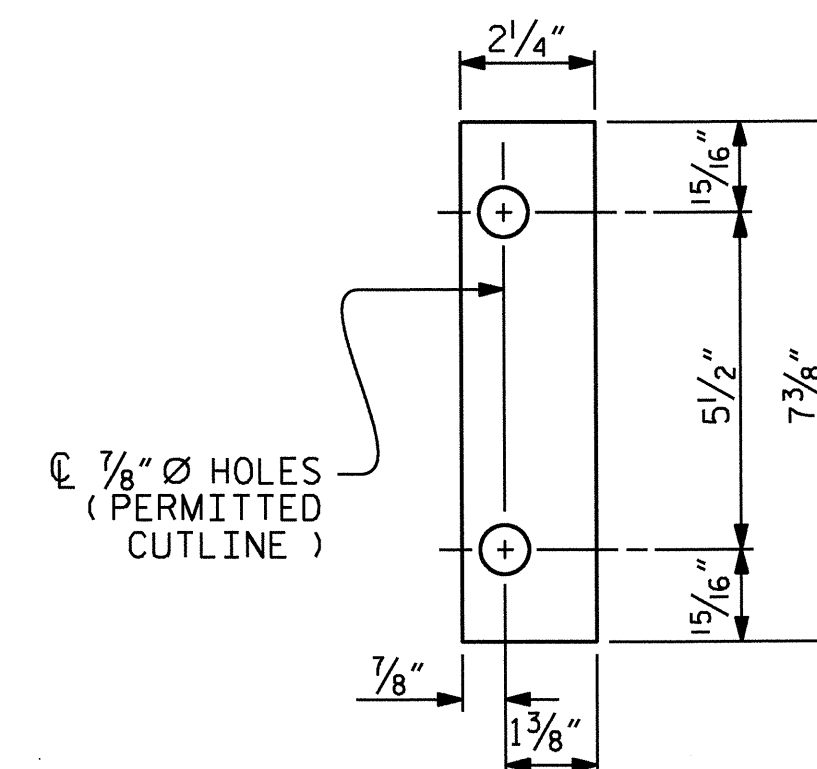
SECTION B - B



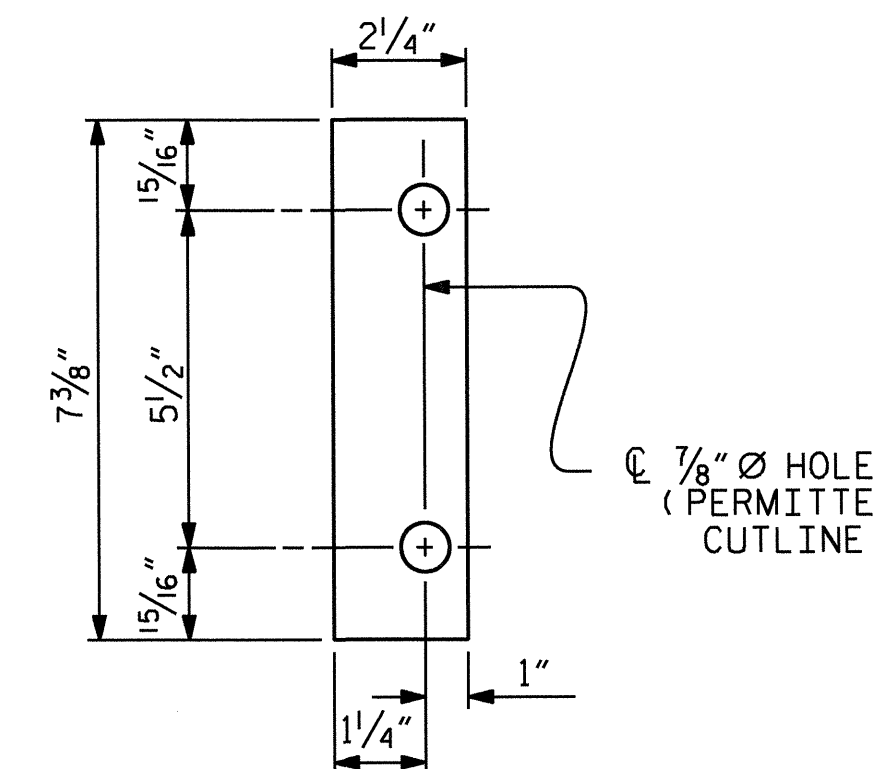
EXPANSION BAR DETAILS



BAR SECTION



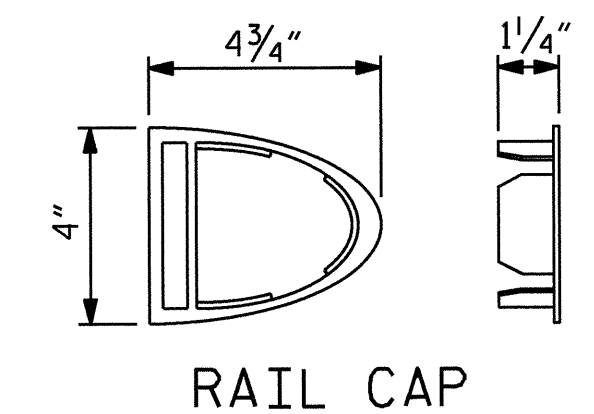
FRONT PLATE



REAR PLATE

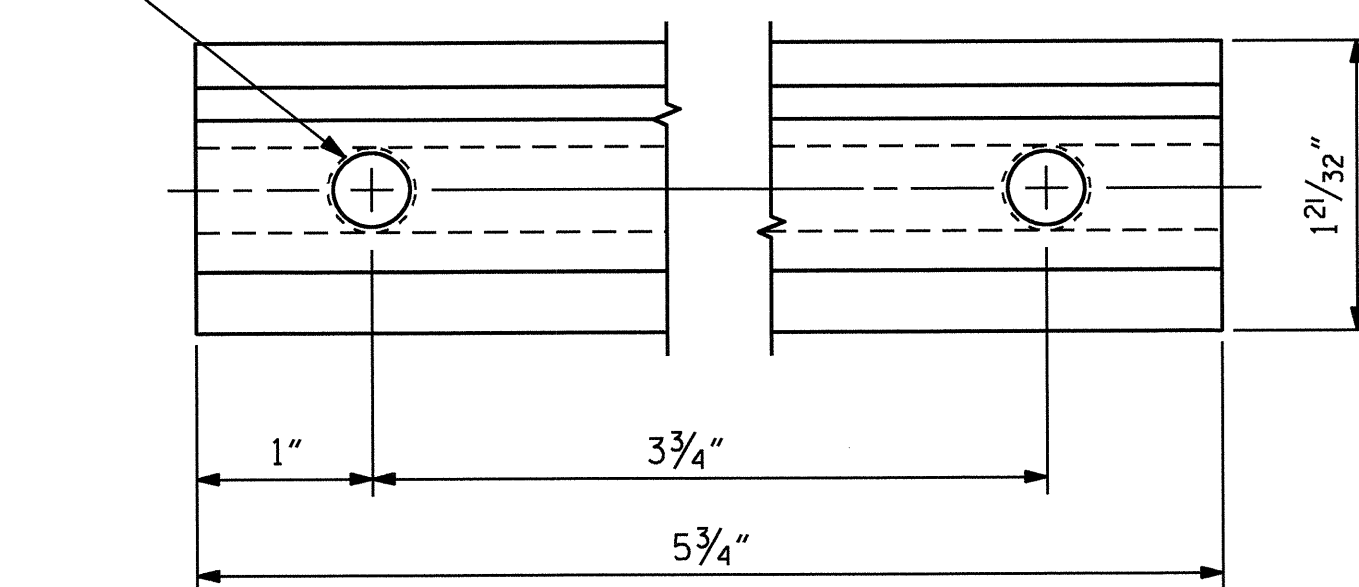
SHIM DETAILS

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



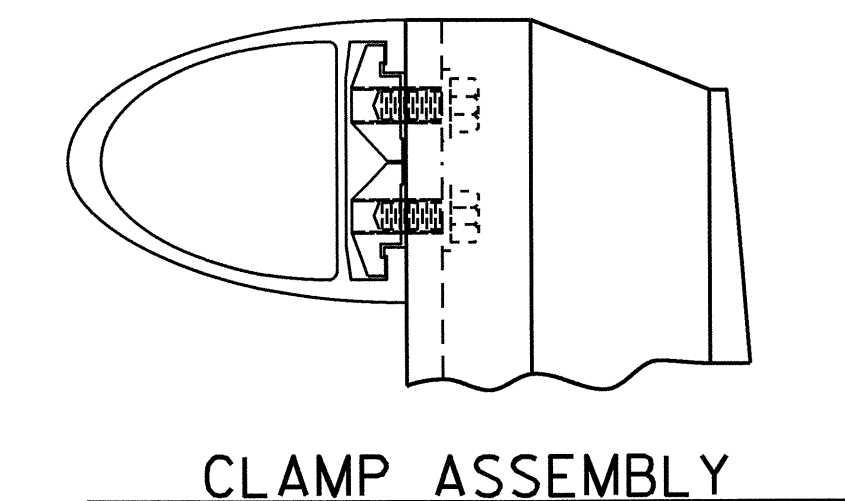
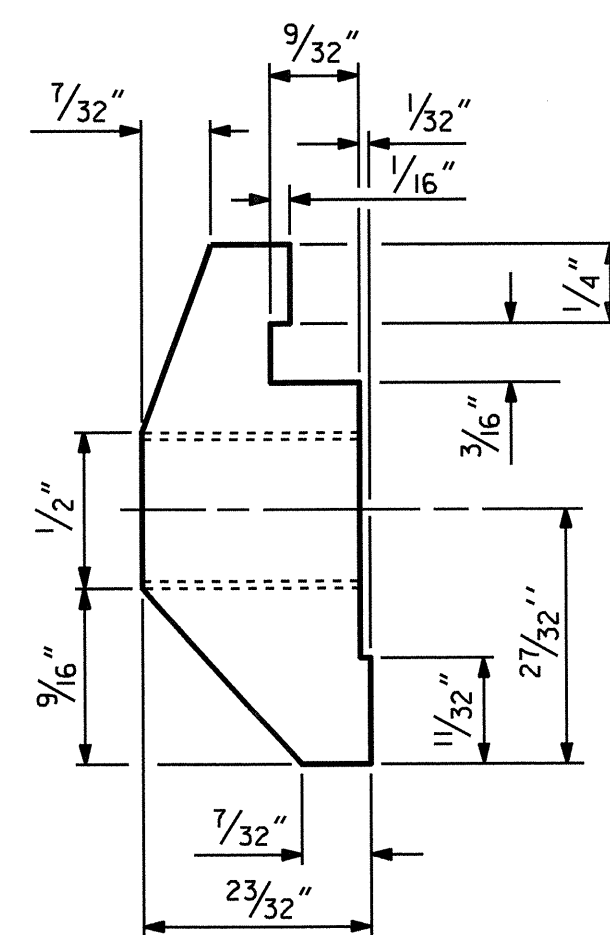
RAIL CAP

1/2" Ø [13 THREAD] HOLE FOR 1/2" Ø X 1" STAINLESS STEEL HEX HEAD CAP SCREW & 1/16" O.D., 1 7/32" I.D., 1/16" THICK WASHER (TYP.)



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

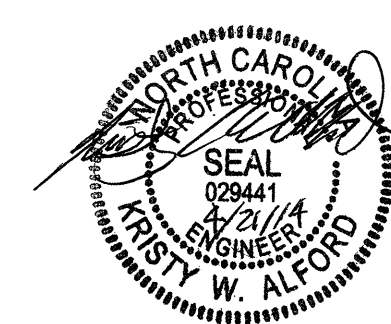
ASSEMBLED BY : T. KIRSCHBAUM	DATE : 4/3/13
CHECKED BY : A.C. OUTLAW	DATE : 4/11/13
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

07-MAR-2014 09:19
W:\Structures\Plans\Super_Draw\B4608_SD.BX.dgn
kalford

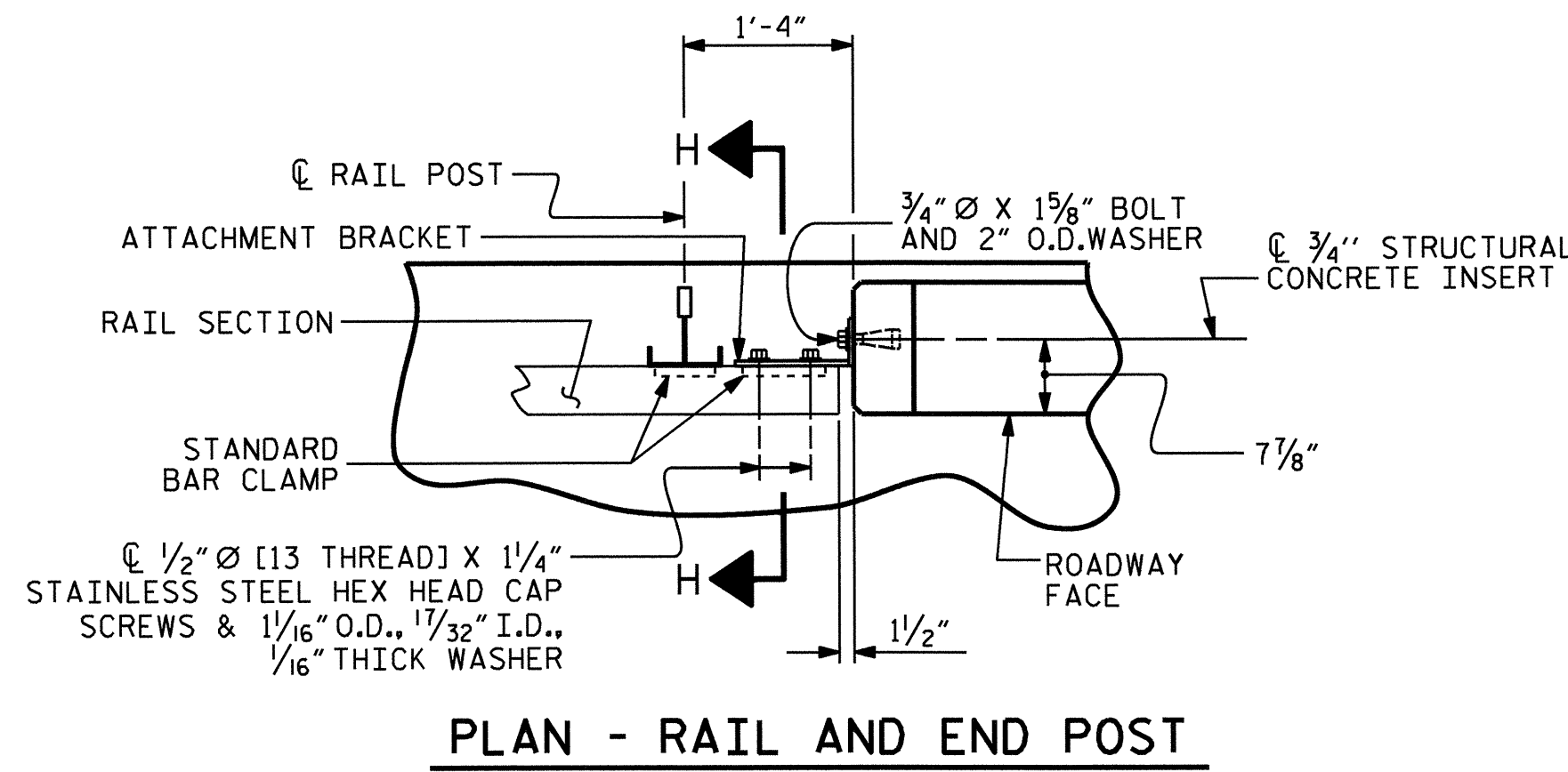
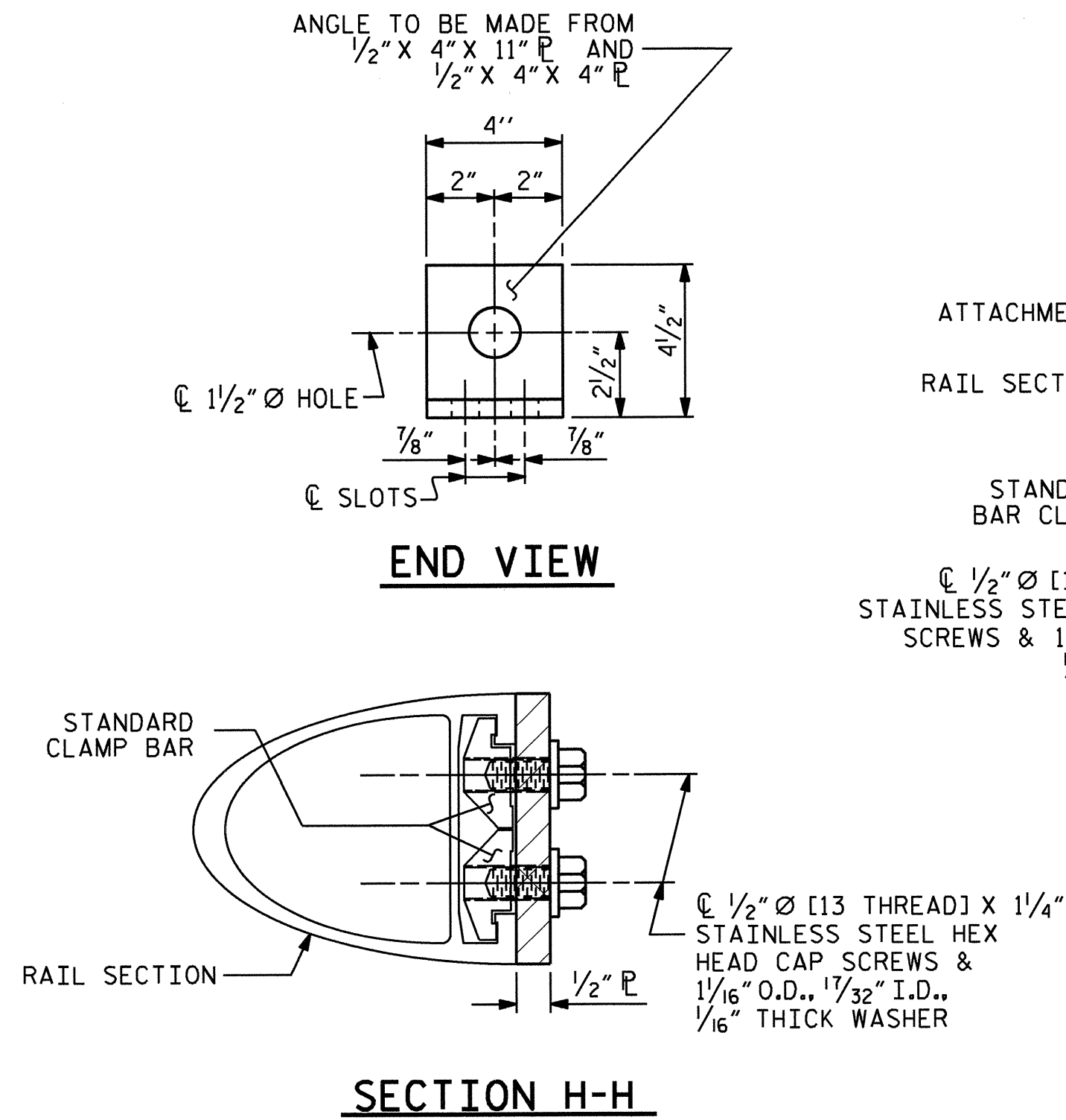
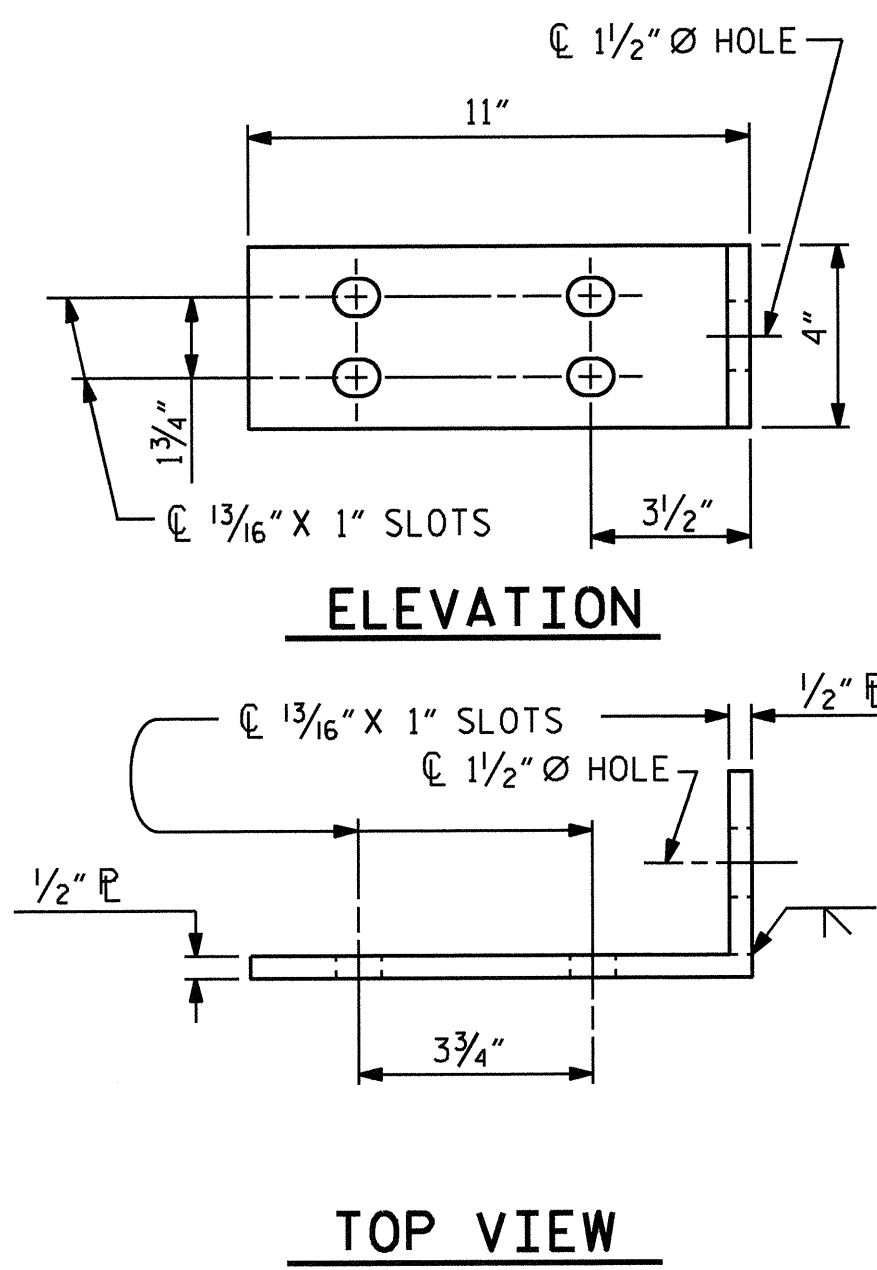
PROJECT NO. B-4608
RANDOLPH COUNTY
STATION: 16+29.00 -L-

SHEET 2 OF 2

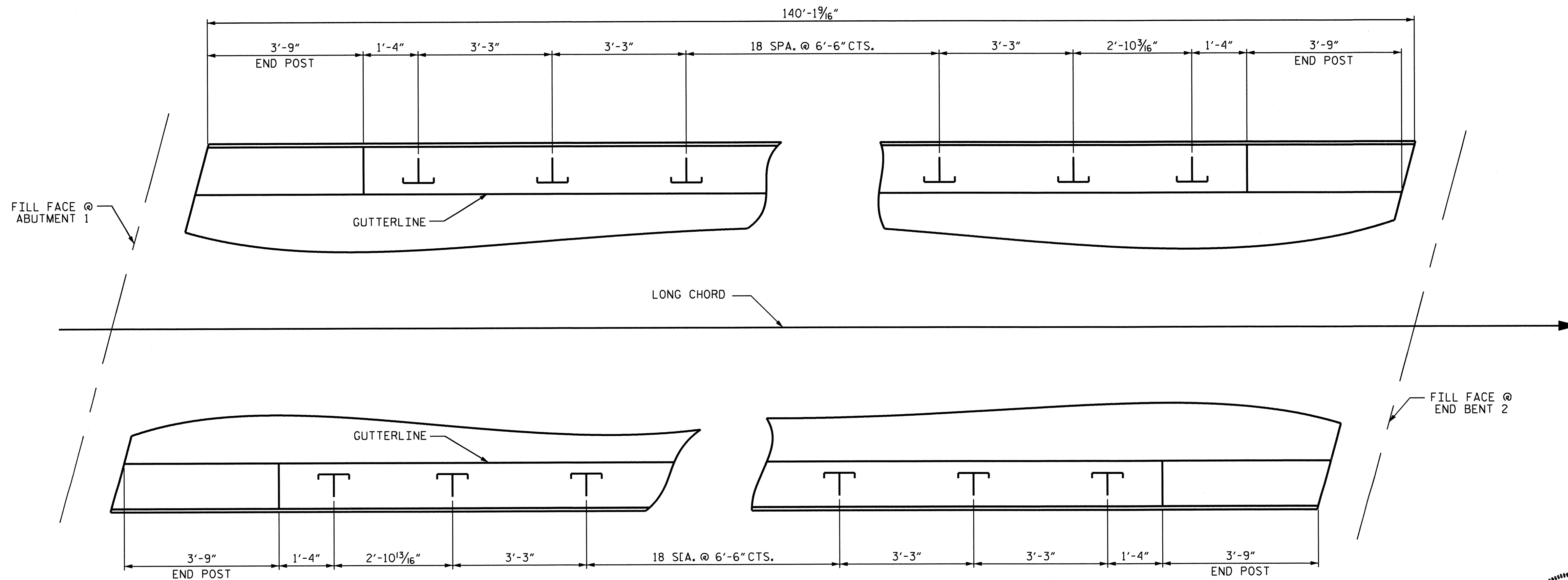
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-13					TOTAL SHEETS 27



STD. NO. BMR4



DETAILS FOR ATTACHING METAL RAIL TO END POST



NOTES
STRUCTURAL CONCRETE INSERT

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

NOTES
METAL RAIL TO END POST CONNECTION

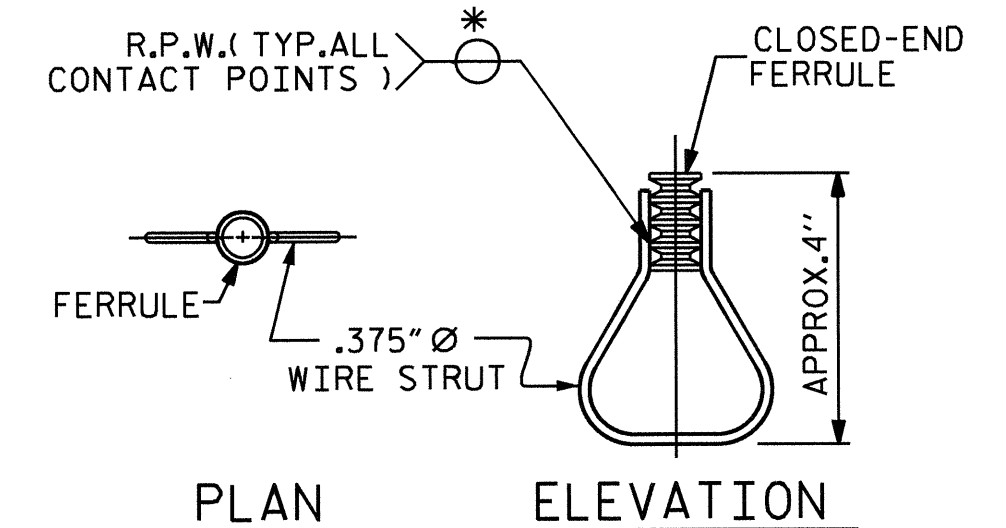
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø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

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

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

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

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

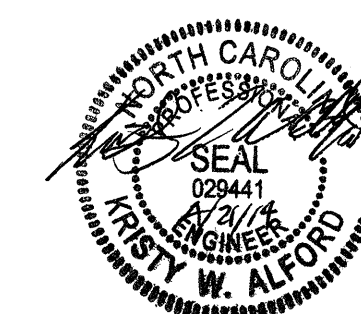


STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-

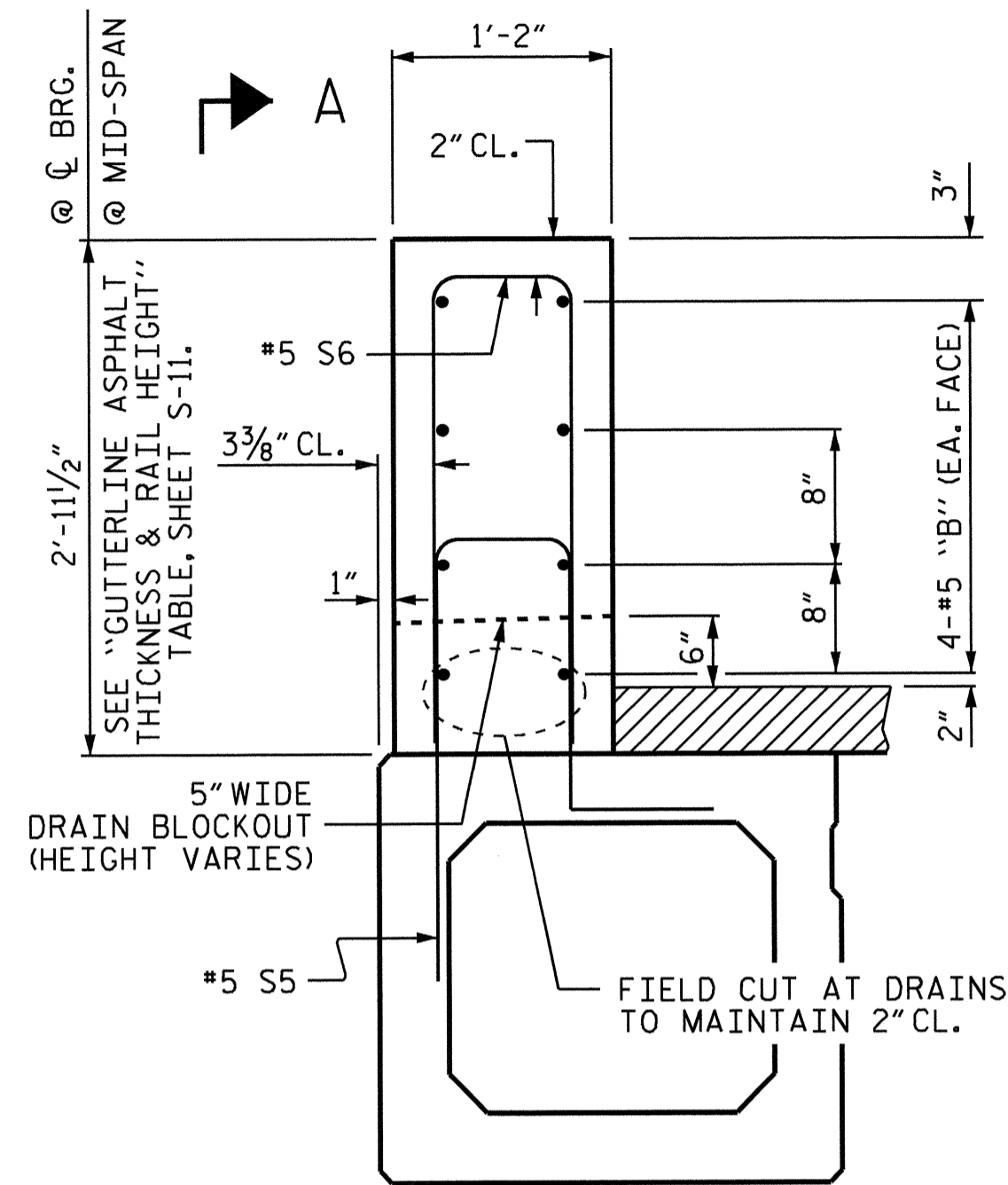
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS



ASSEMBLED BY : T. KIRSCHBAUM	DATE : 3/28/13
CHECKED BY : A.C. OUTLAW	DATE : 4/17/13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

PLAN OF RAIL POST SPACINGS

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

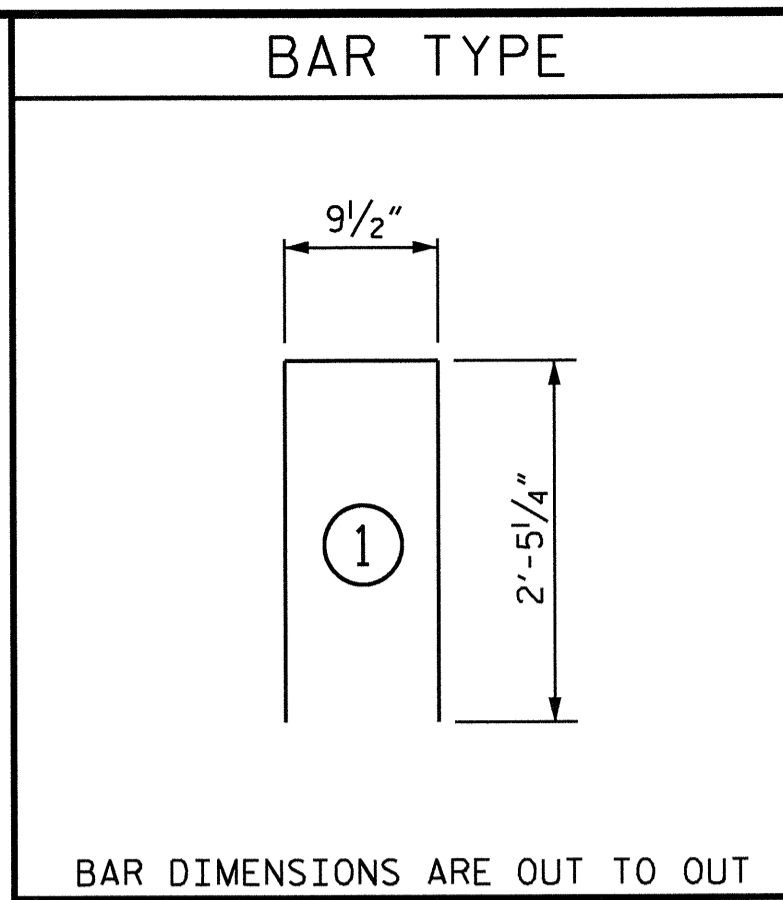


SECTION THRU PARAPET

NOTES

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

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

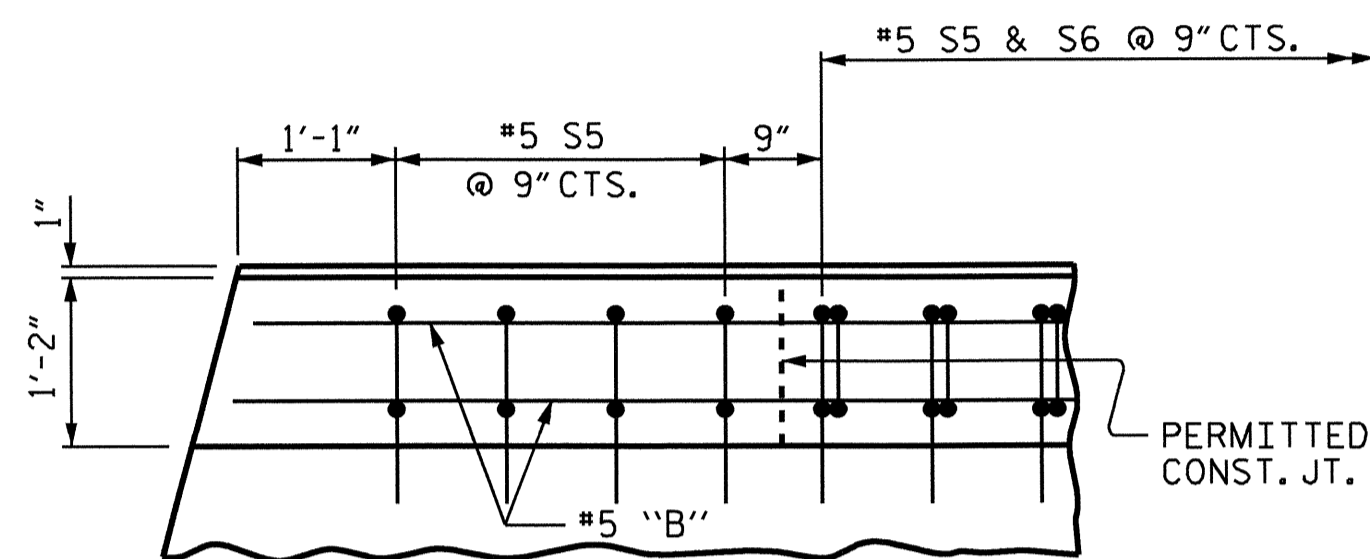


SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#5	3'-5"

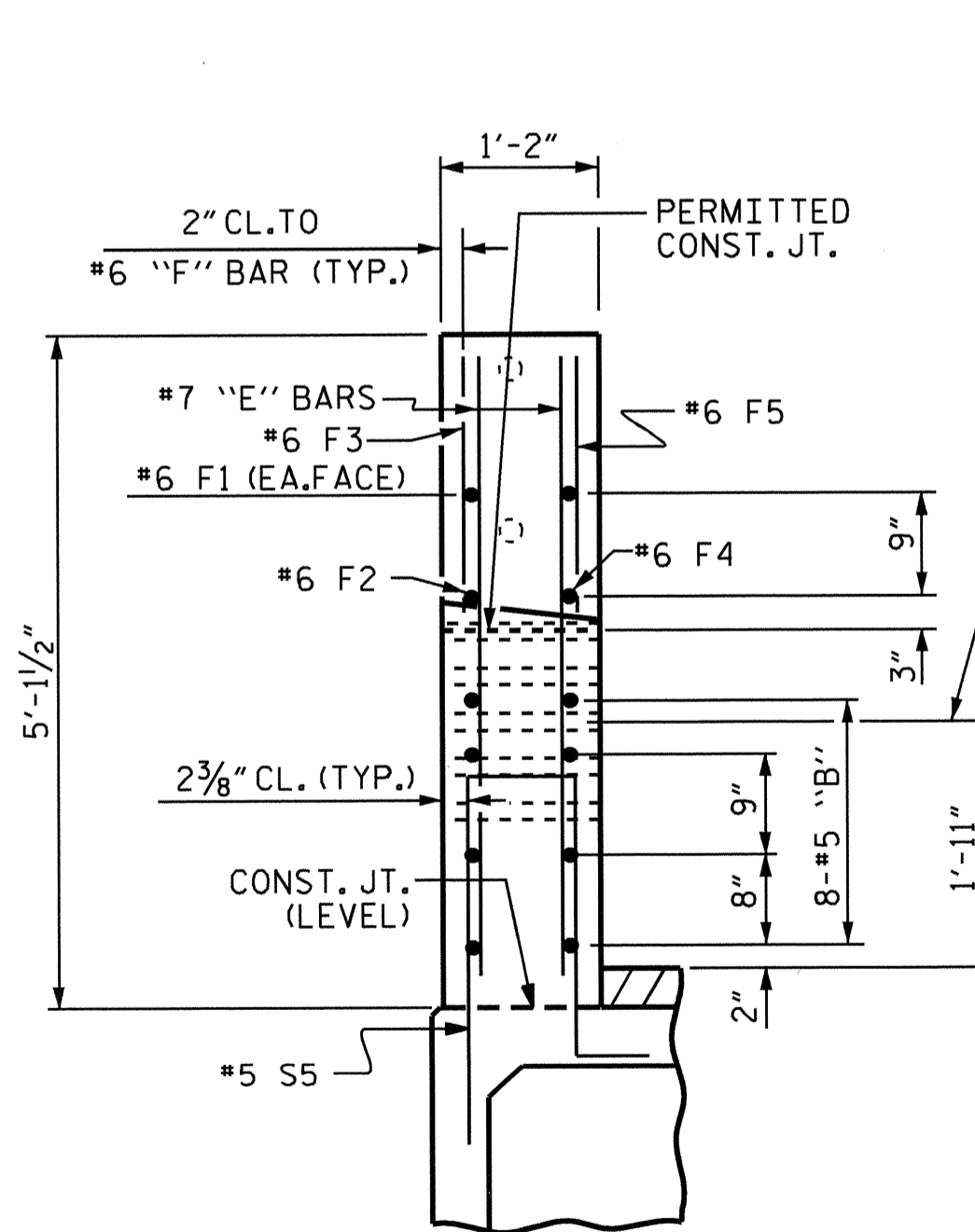
BILL OF MATERIAL					
2 PARAPETS & 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B12	160	#5	STR	14'-3"	2378
*B13	32	#5	STR	9'-3"	309
*E1	8	#7	STR	2'-10"	46
*E2	8	#7	STR	3'-4"	55
*E3	8	#7	STR	3'-10"	63
*E4	8	#7	STR	4'-4"	71
*E5	8	#7	STR	4'-8"	76
*F1	8	#6	STR	1'-10"	22
*F2	4	#6	STR	2'-11"	18
*F3	4	#6	STR	3'-7"	22
*F4	4	#6	STR	3'-1"	19
*F5	4	#6	STR	3'-9"	23
*S6	348	#5	1	5'-8"	2057
* EPOXY COATED REINFORCING STEEL LBS.				5159	
CLASS AA CONCRETE				CU.YDS.	35.2
TOTAL LIN. FT. OF CONCRETE PARAPET					280.26

NOTE: #5 S5 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR BOX BEAM SECTION.

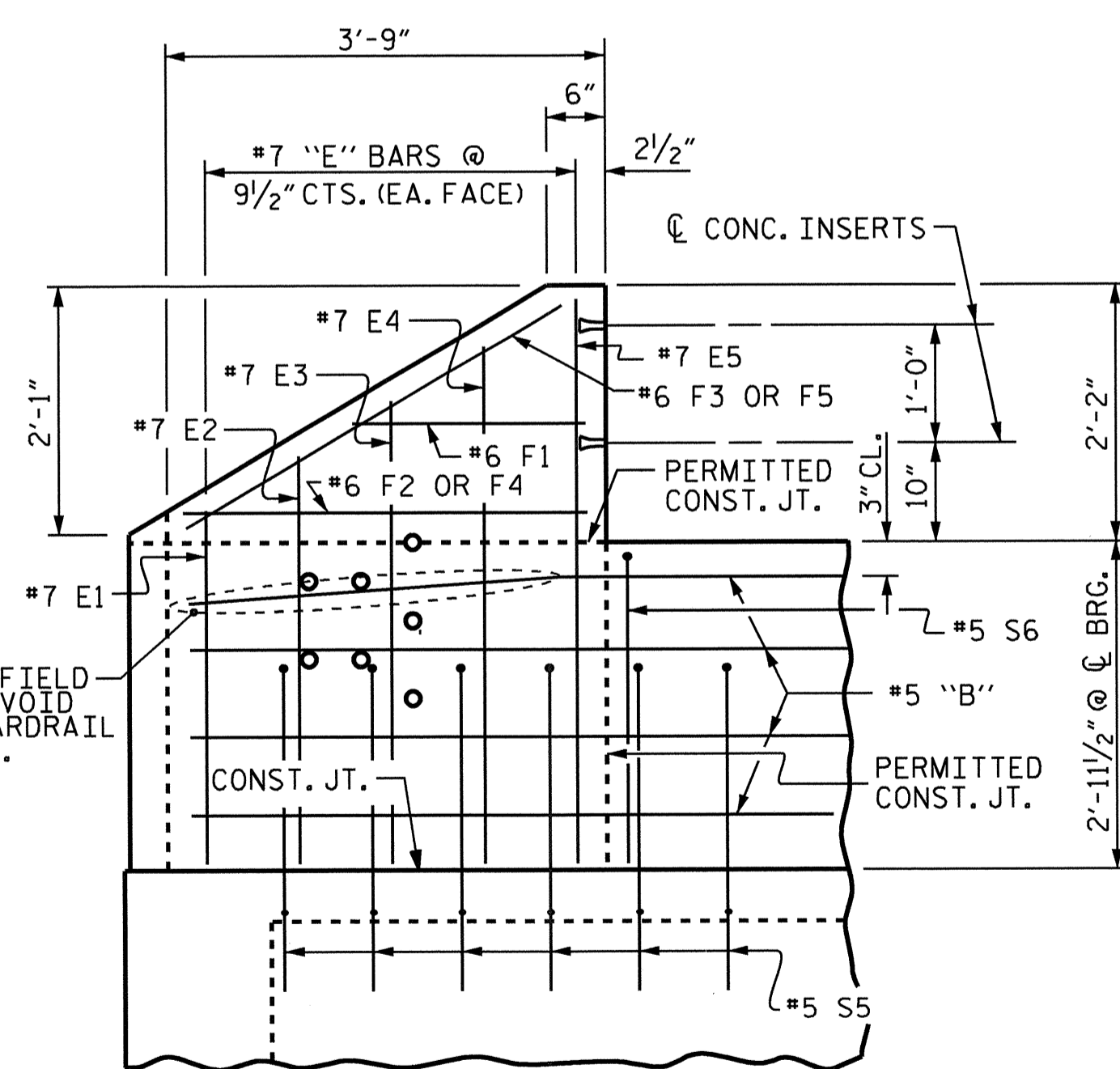


PLAN OF PARAPET

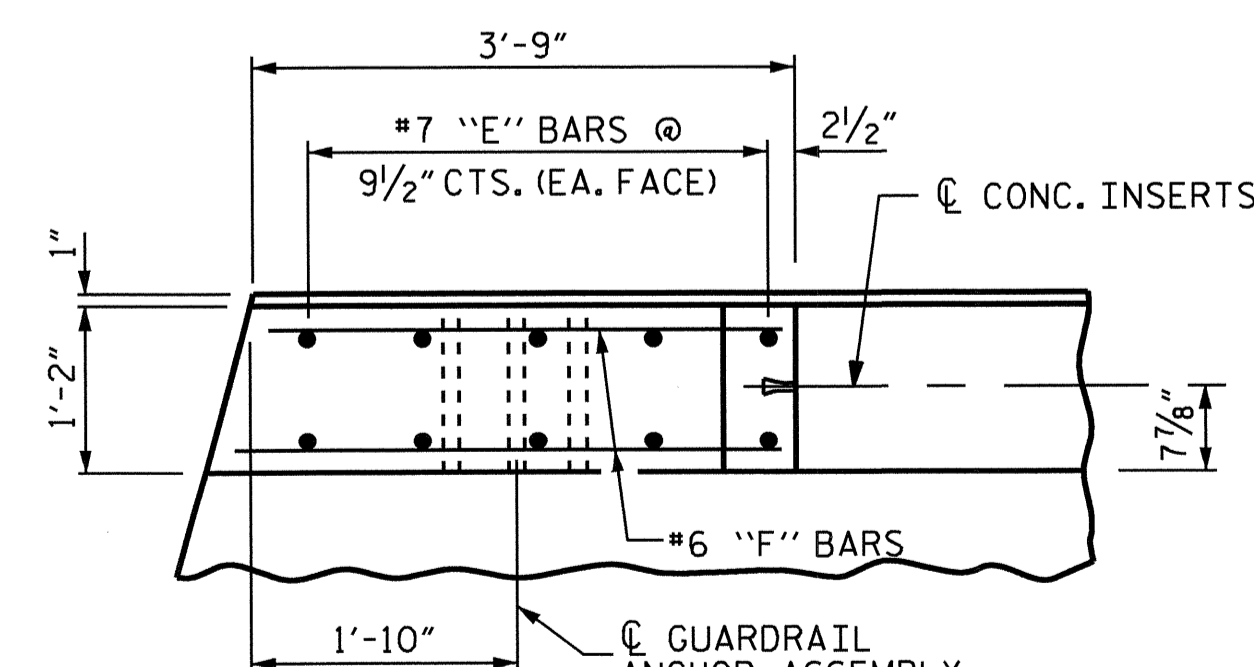
END BENT 1, LEFT SIDE SHOWN, FOR OTHER CORNERS, SEE "PLAN OF SPANS" SHEETS.



END VIEW



ELEVATION



PLAN OF END POST

END POST FOR TWO BAR RAIL

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONCRETE PARAPETS
 AND END POSTS



DRAWN BY: T. KIRSCHBAUM DATE: 4/2/13
 CHECKED BY: A.C. OUTLAW DATE: 4/17/13
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE: 4/21/14

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

NOTES

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

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

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

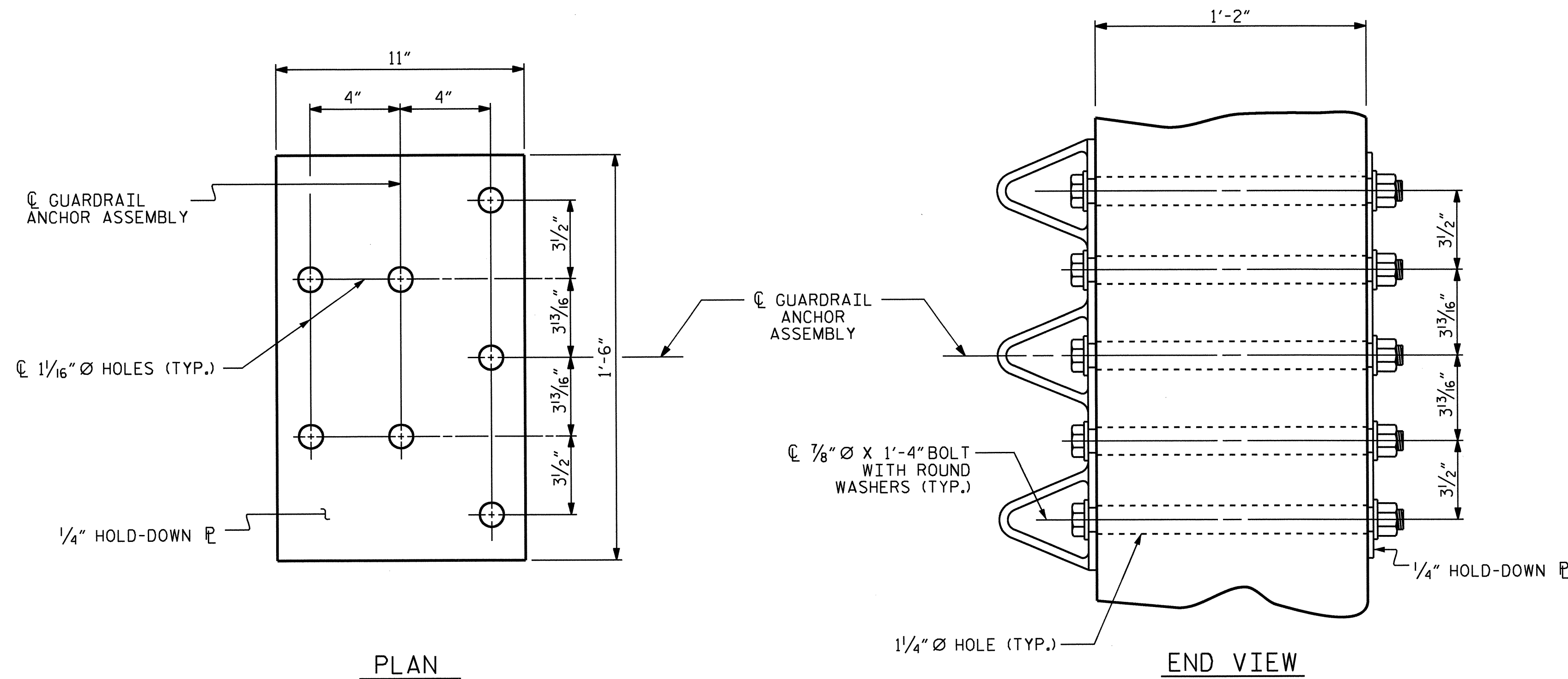
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

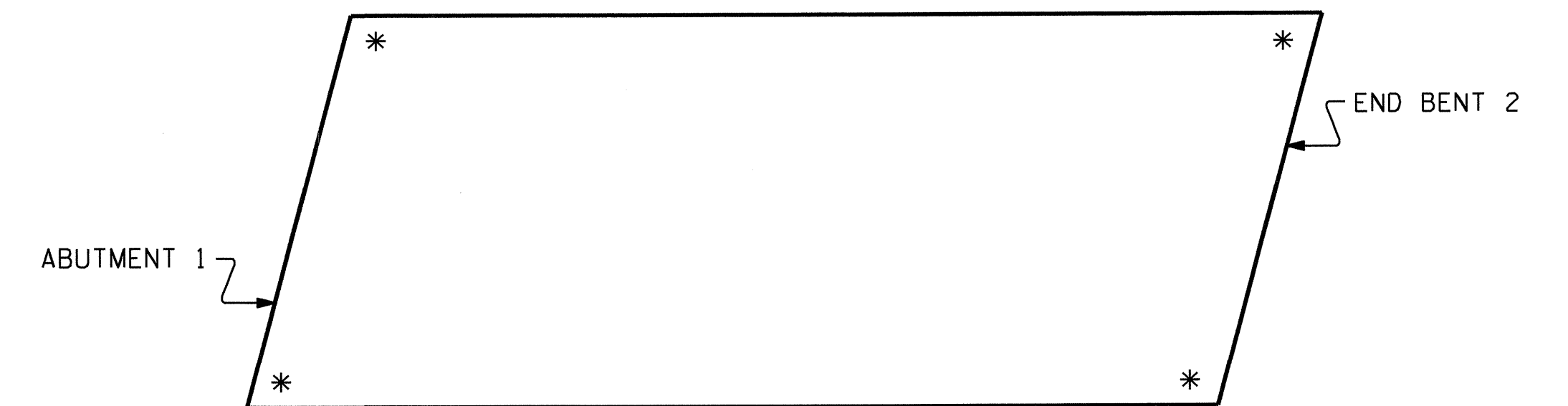
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

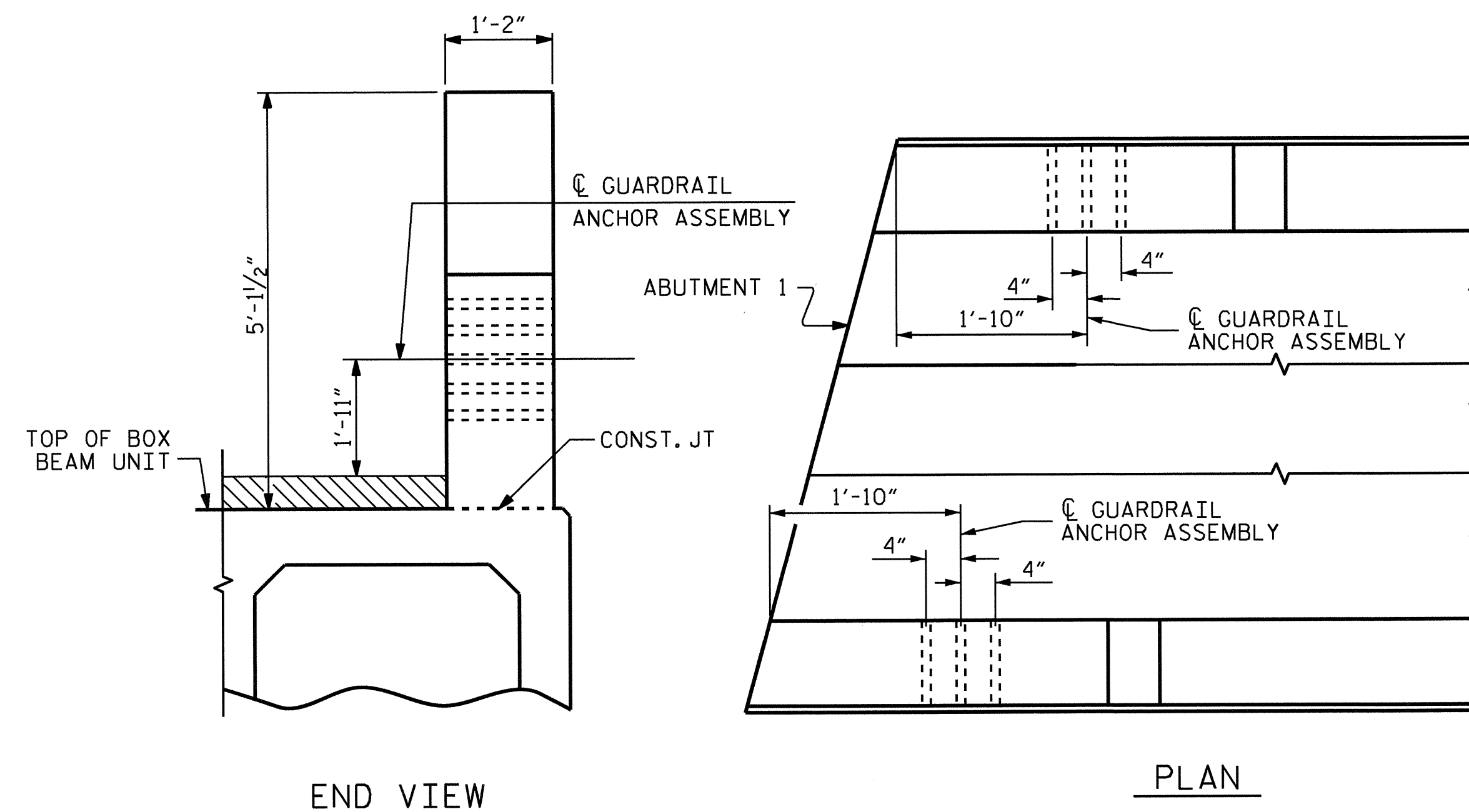
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ABUTMENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-



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

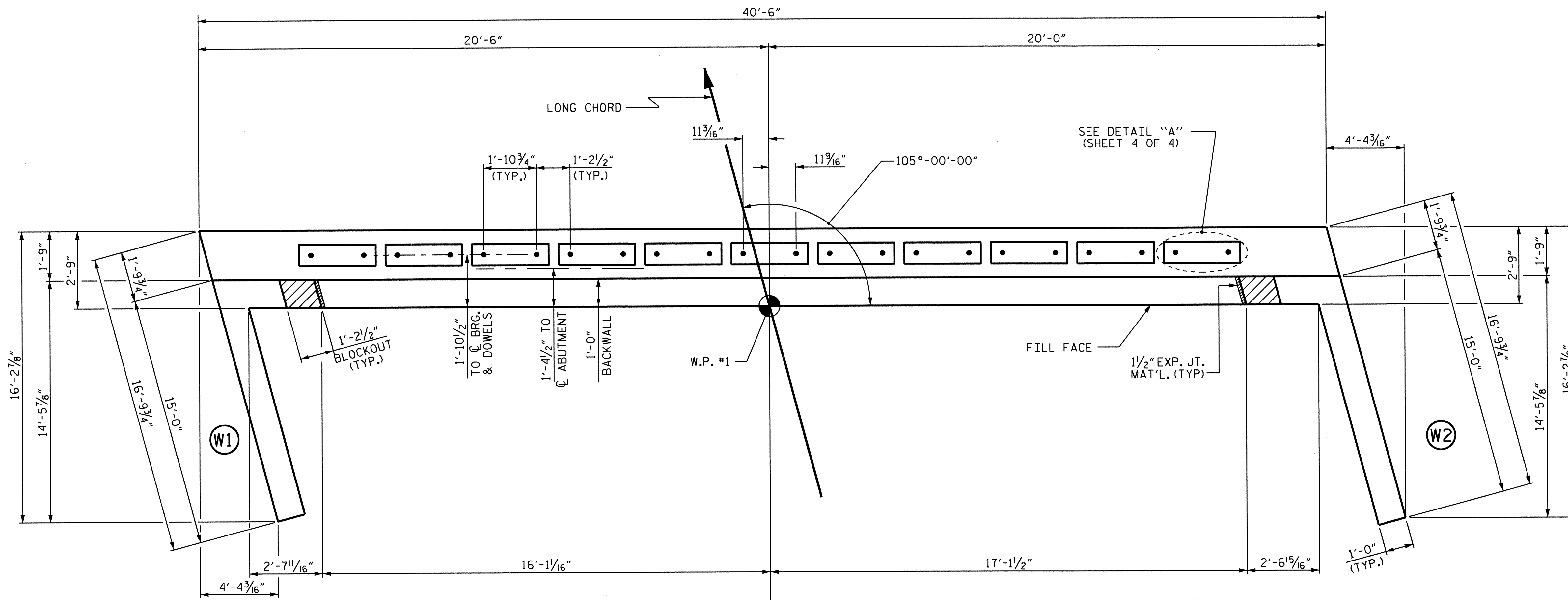
ASSEMBLED BY : T. KIRSCHBAUM	DATE : 4/1/13
CHECKED BY : A.C. OUTLAW	DATE : 4/11/13
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

REVISIONS						SHEET NO. 5-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

NOTES

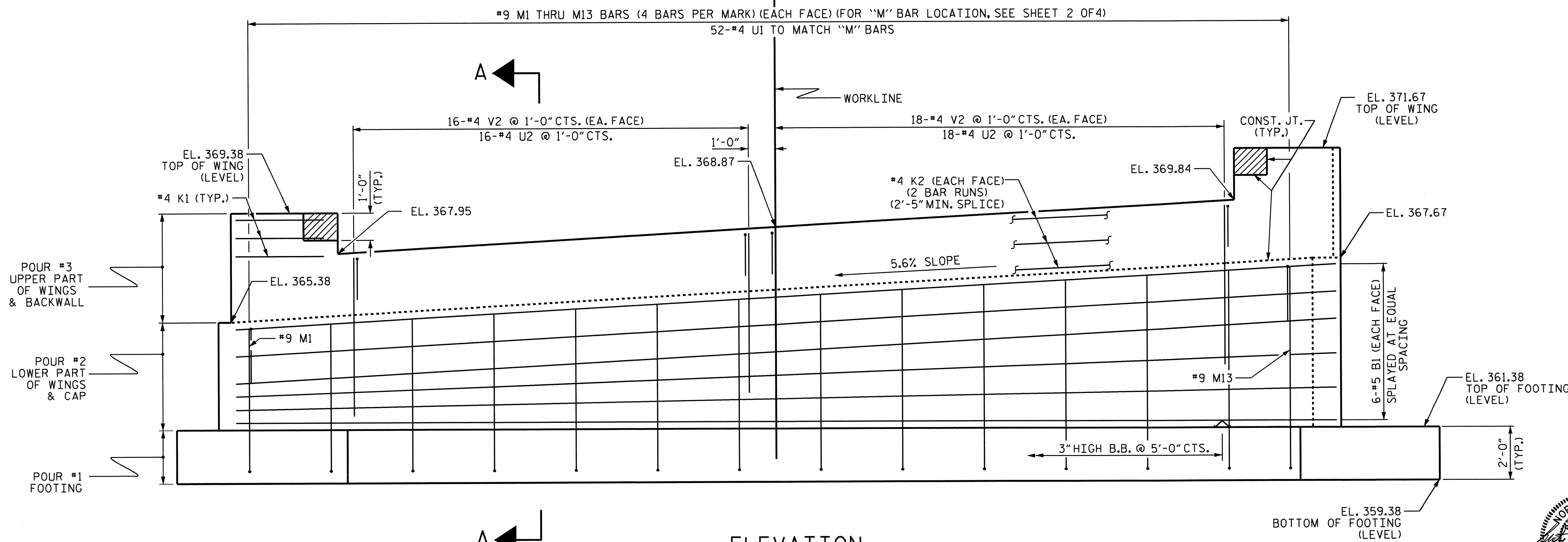
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

(FOOTING NOT SHOWN, SEE SHEET 2 OF 4)



ELEVATION

WINGS NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 4 OF 4. REINFORCING STEEL FOR FOOTING NOT SHOWN, SEE SHEET 2 OF 4.

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 1 OF 4

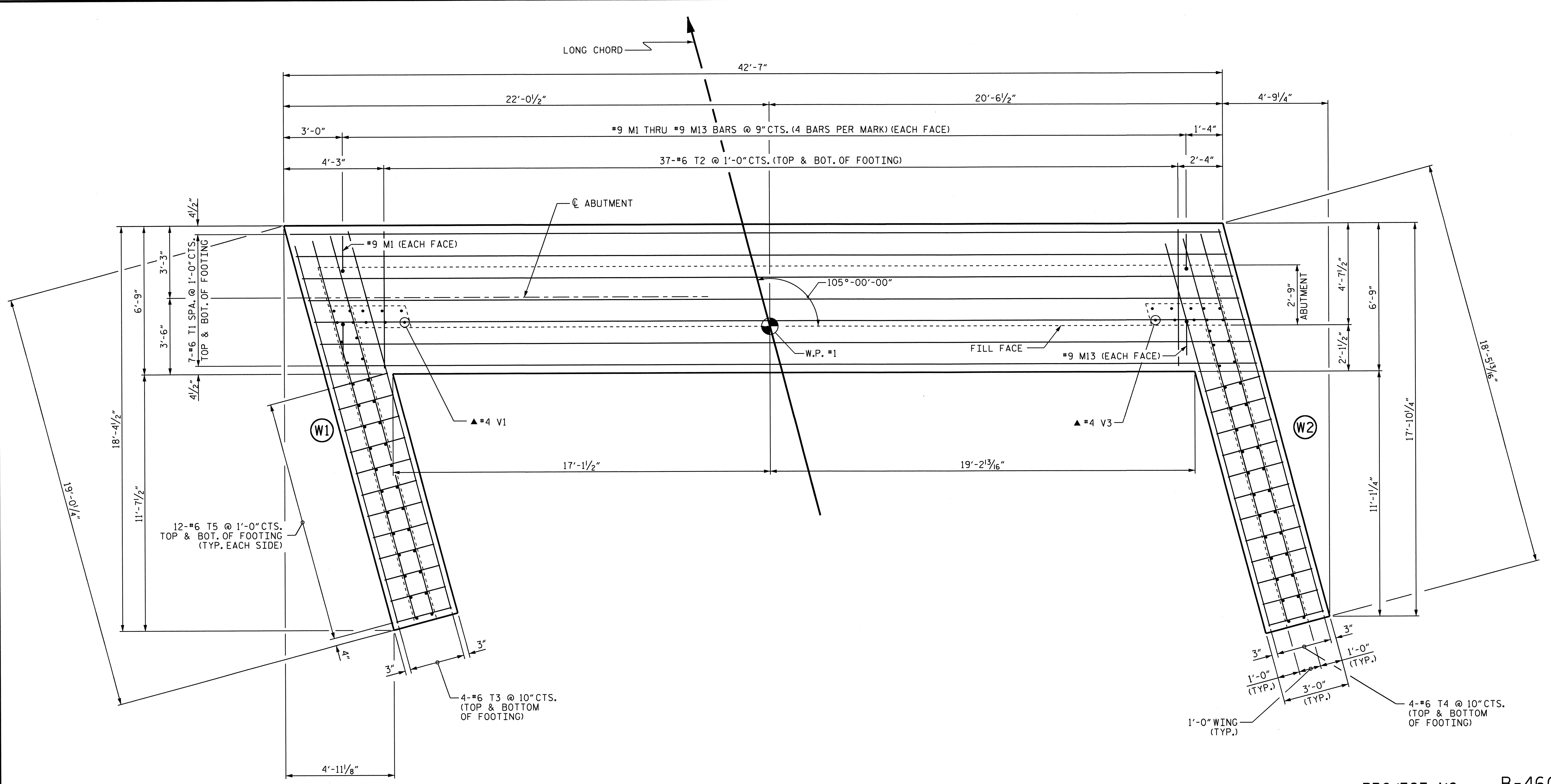
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 1



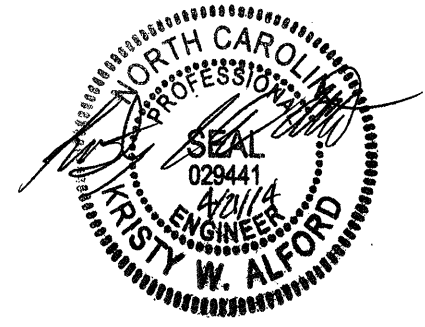
ASSEMBLED BY: Fr. LEA DATE: 9/2013
 CHECKED BY: A.C. OUTLAW DATE: 10/2013
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE: 4/21/14

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			27



PLAN OF FOOTING
 ▲ FOR "V" BAR LAYOUT, SEE WING DETAILS, SHEET 3 OF 4

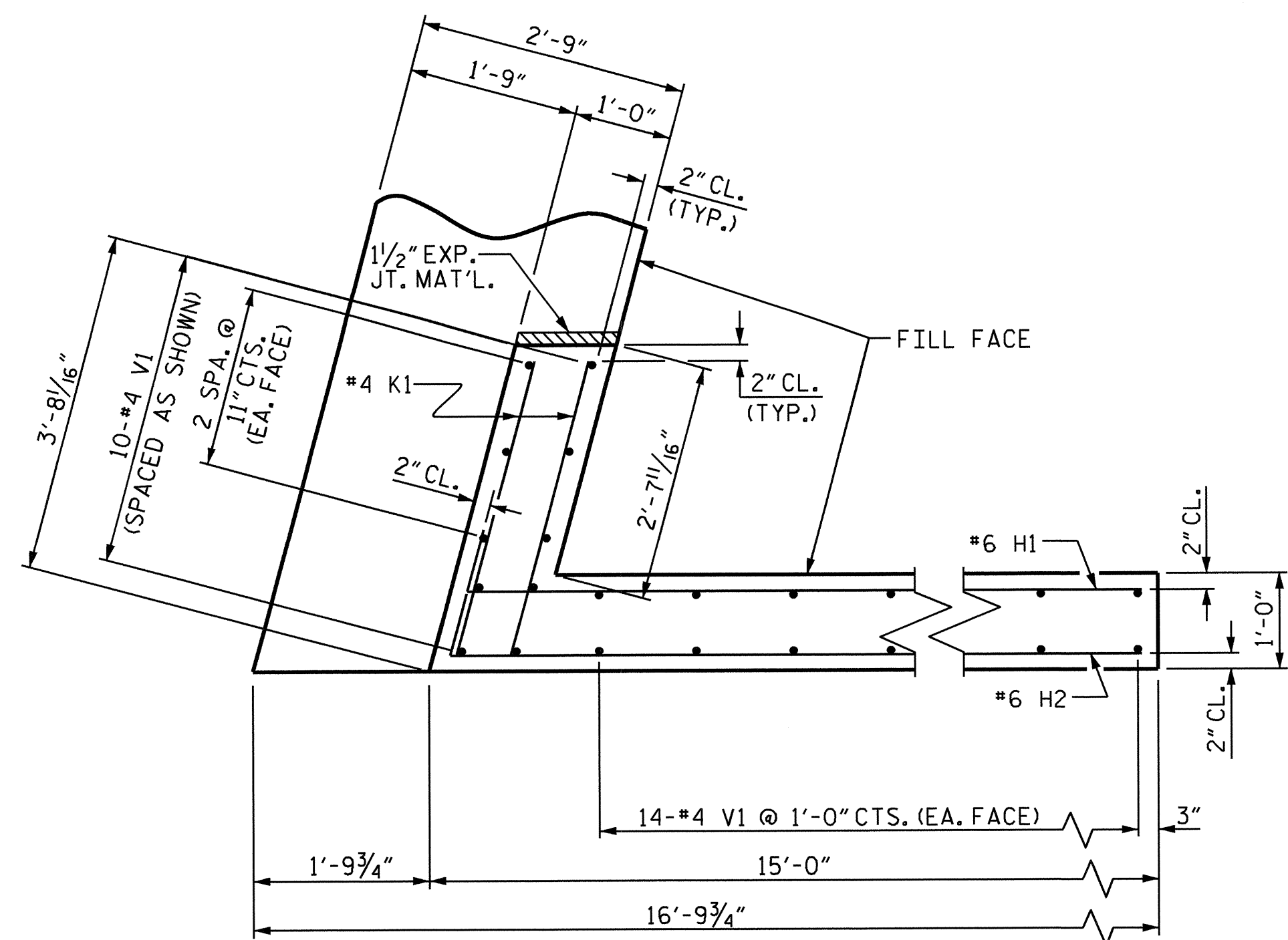
PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-
 SHEET 2 OF 4



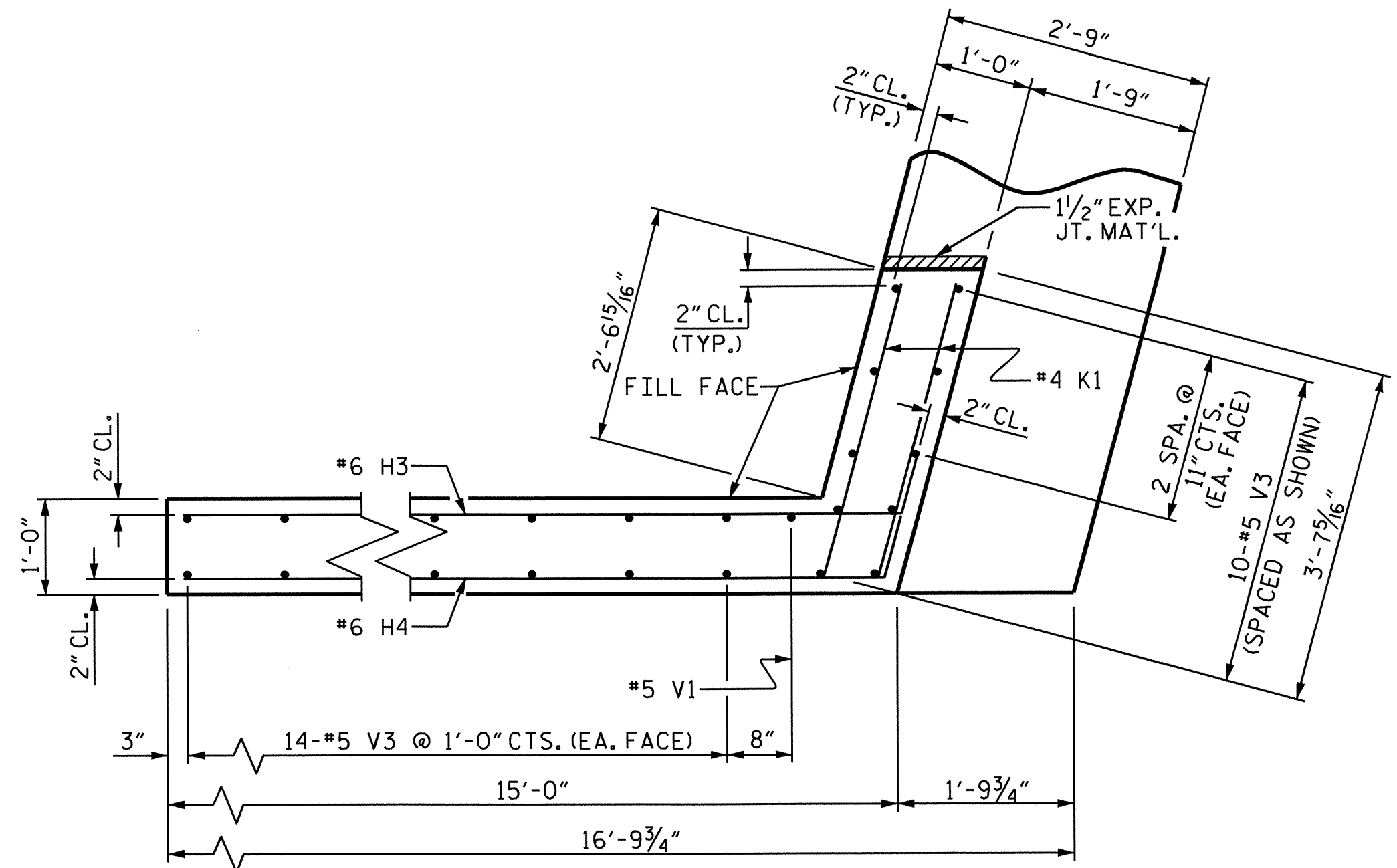
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 1
 FOOTING DETAILS

ASSEMBLED BY : Fr. LEA DATE : 8/2013
 CHECKED BY : A.C. OUTLAW DATE : 10/2013
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE : 4/21/14

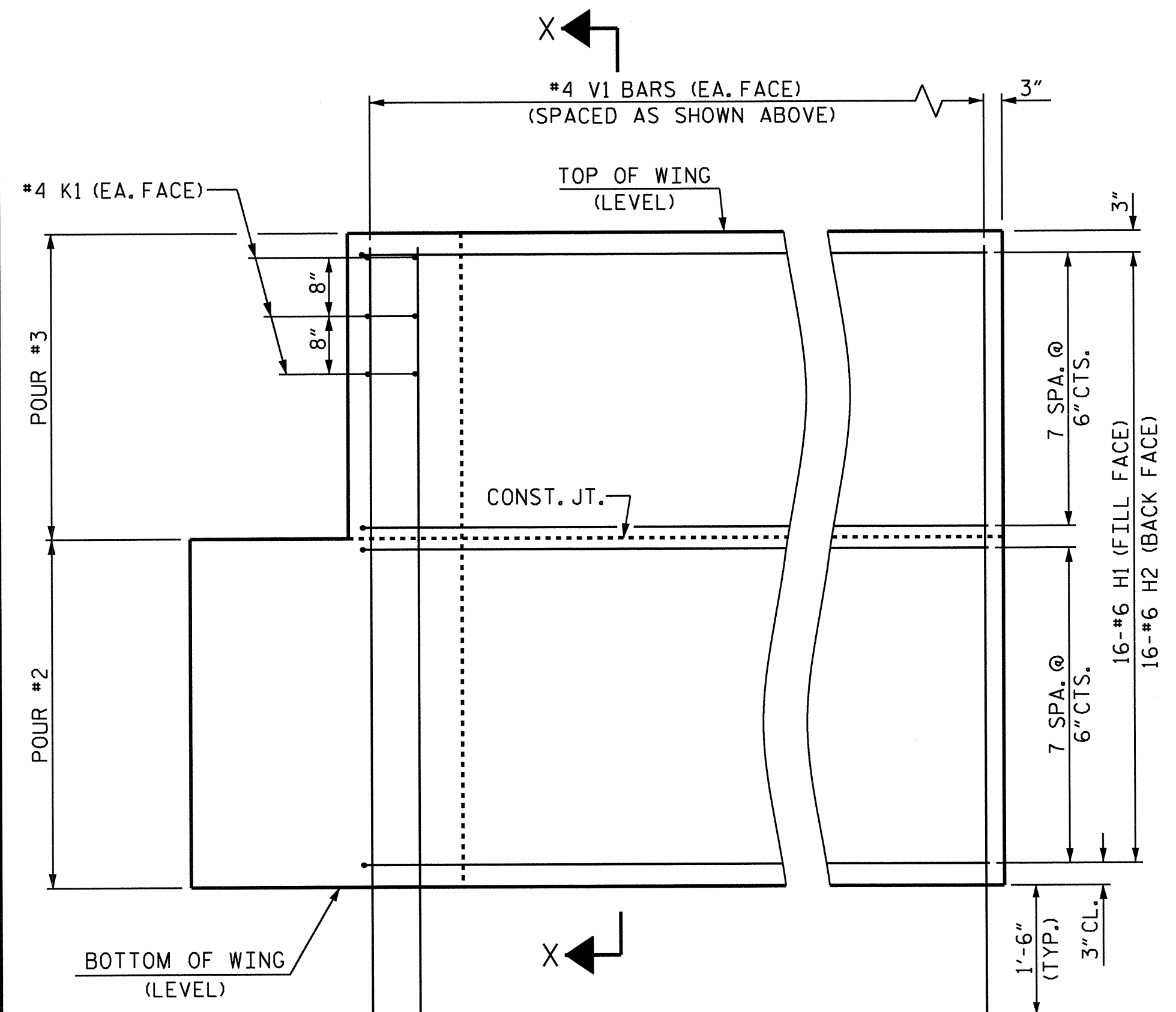
REVISIONS						SHEET NO. S-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			



PLAN OF WING (W1)

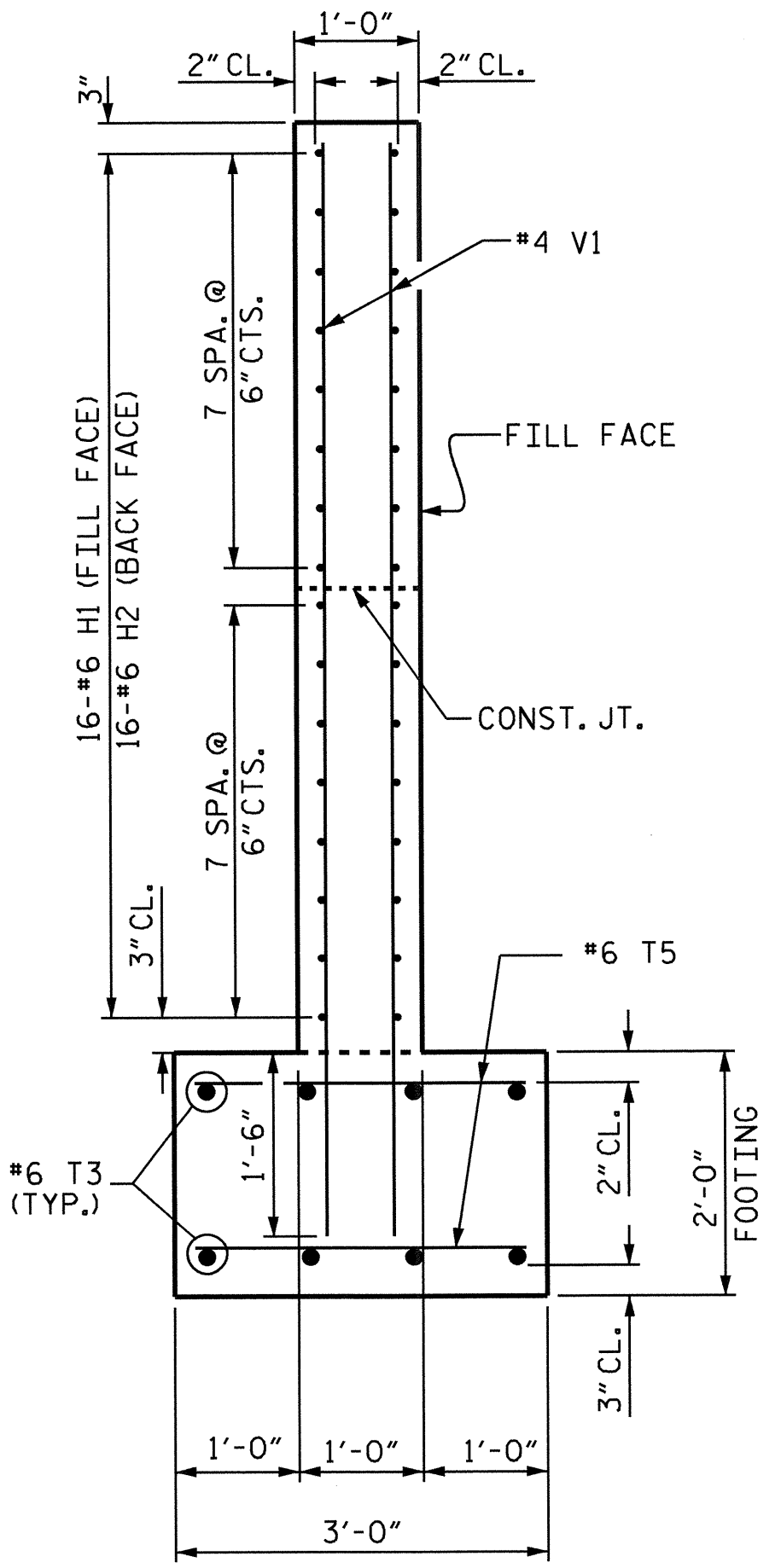


PLAN OF WING (W2)



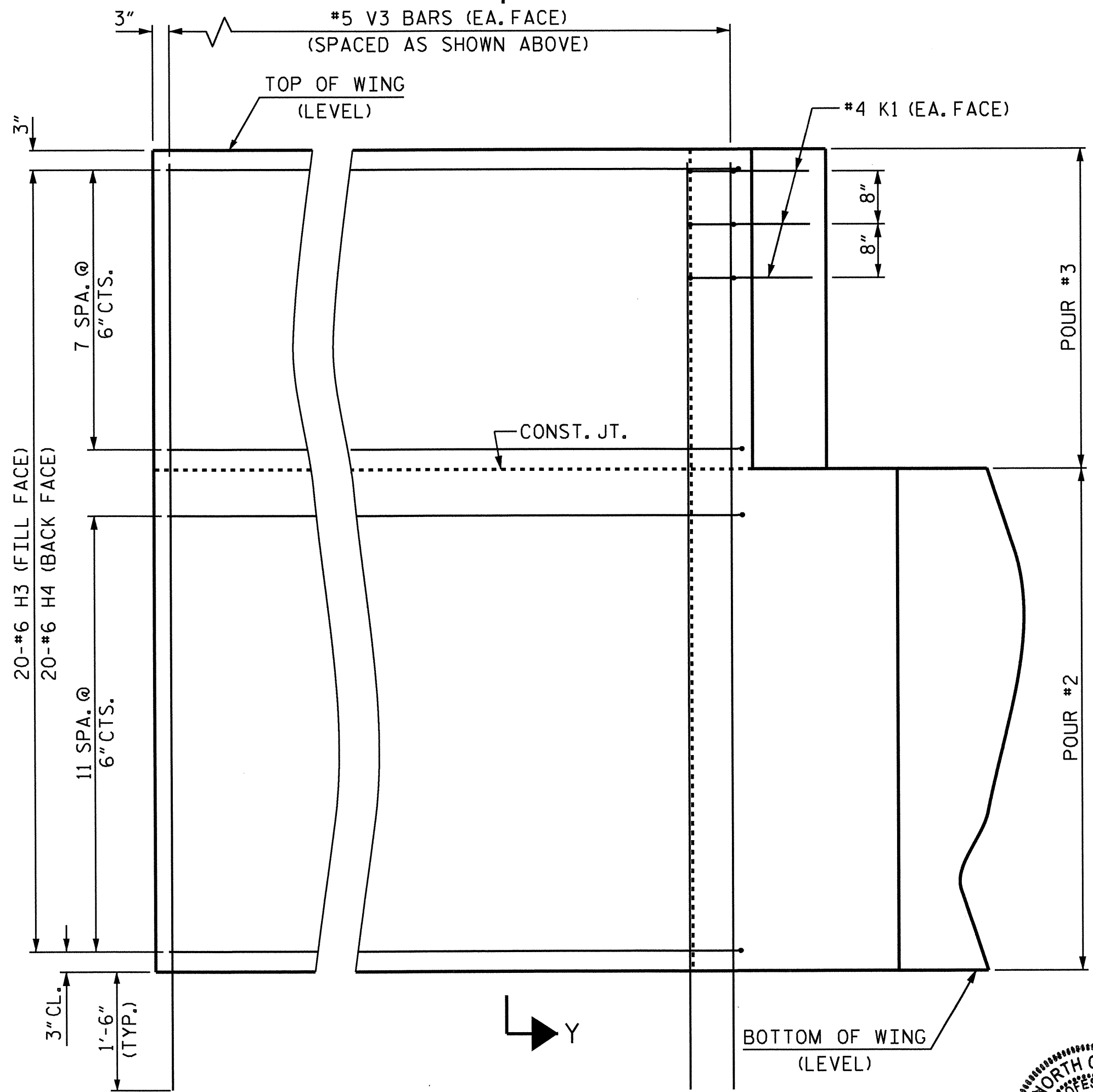
ELEVATION OF WING (W1)

FOOTING NOT SHOWN FOR CLARITY.



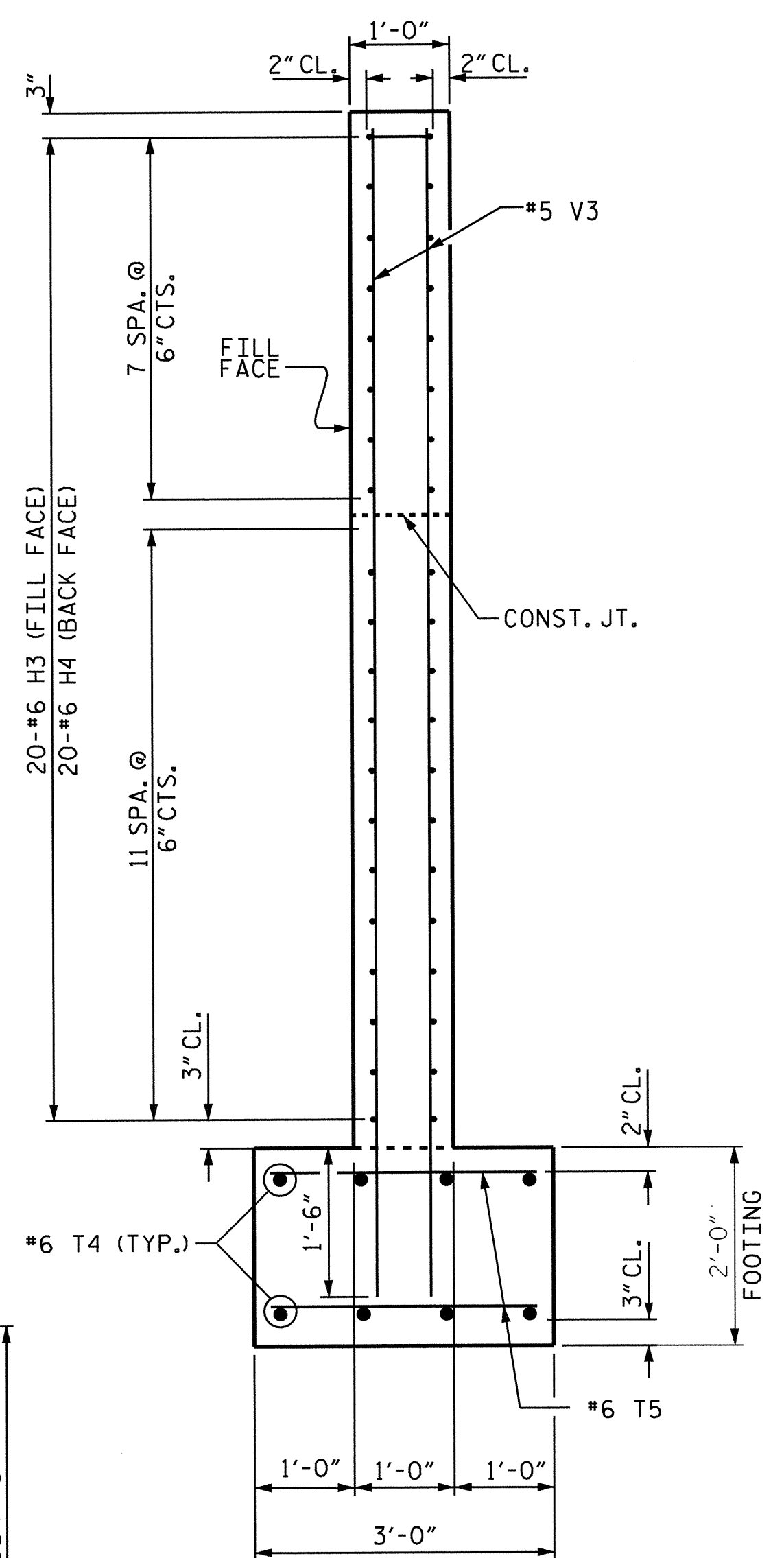
SECTION X-X

WING DETAILS



ELEVATION OF WING (W2)

FOOTING NOT SHOWN FOR CLARITY.



SECTION Y-Y

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

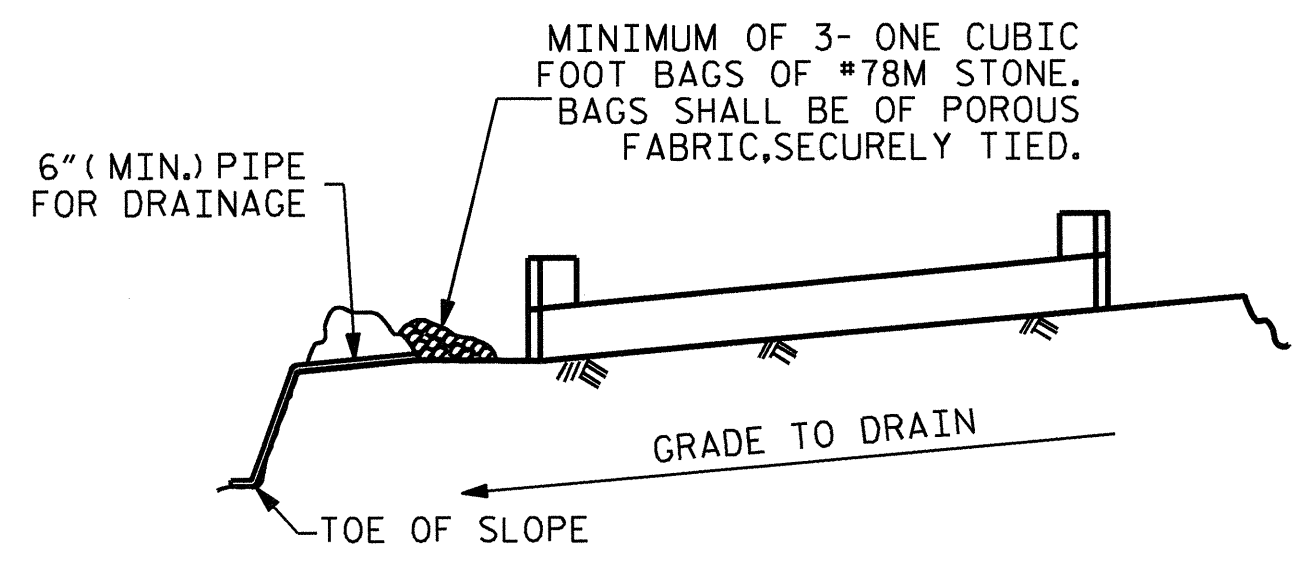
SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-19 TOTAL SHEETS 27
SUBSTRUCTURE ABUTMENT 1 WING DETAILS						
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			



ASSEMBLED BY: Fr. LEA DATE: 8/2013
 CHECKED BY: A.C. OUTLAW DATE: 10/2013
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE: 4/21/14

07-MAR-2014 09:17
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 Kalford

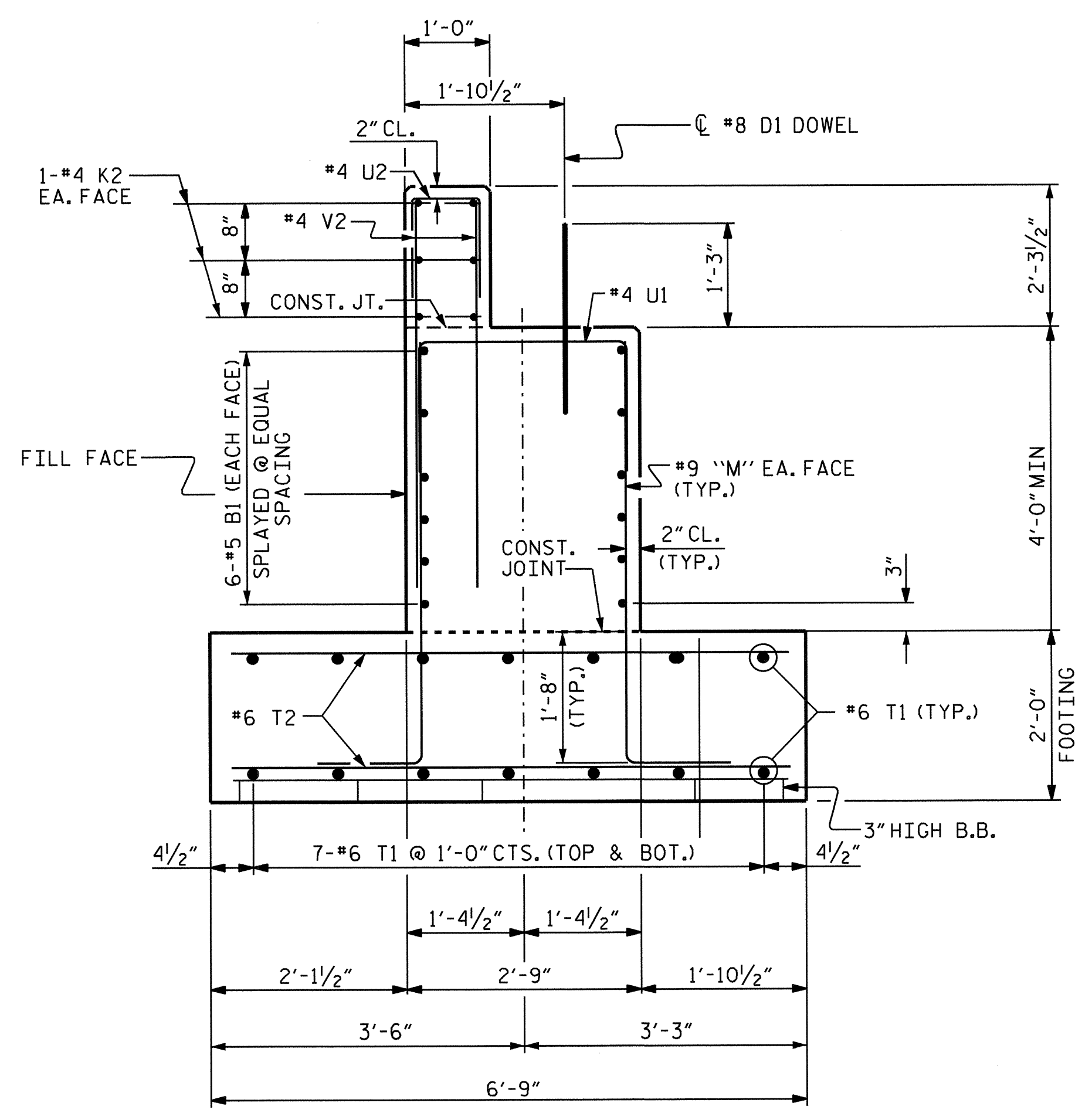
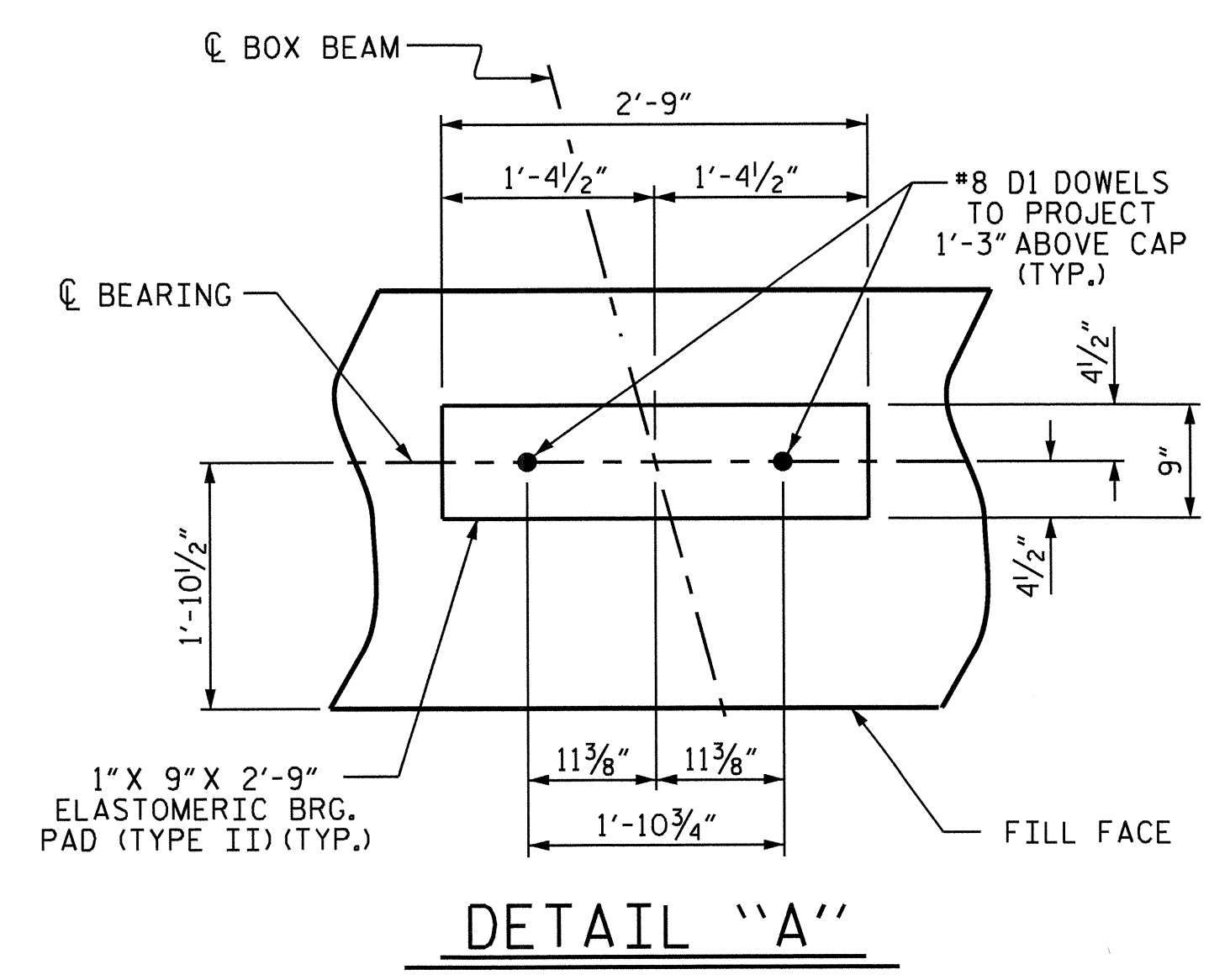


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

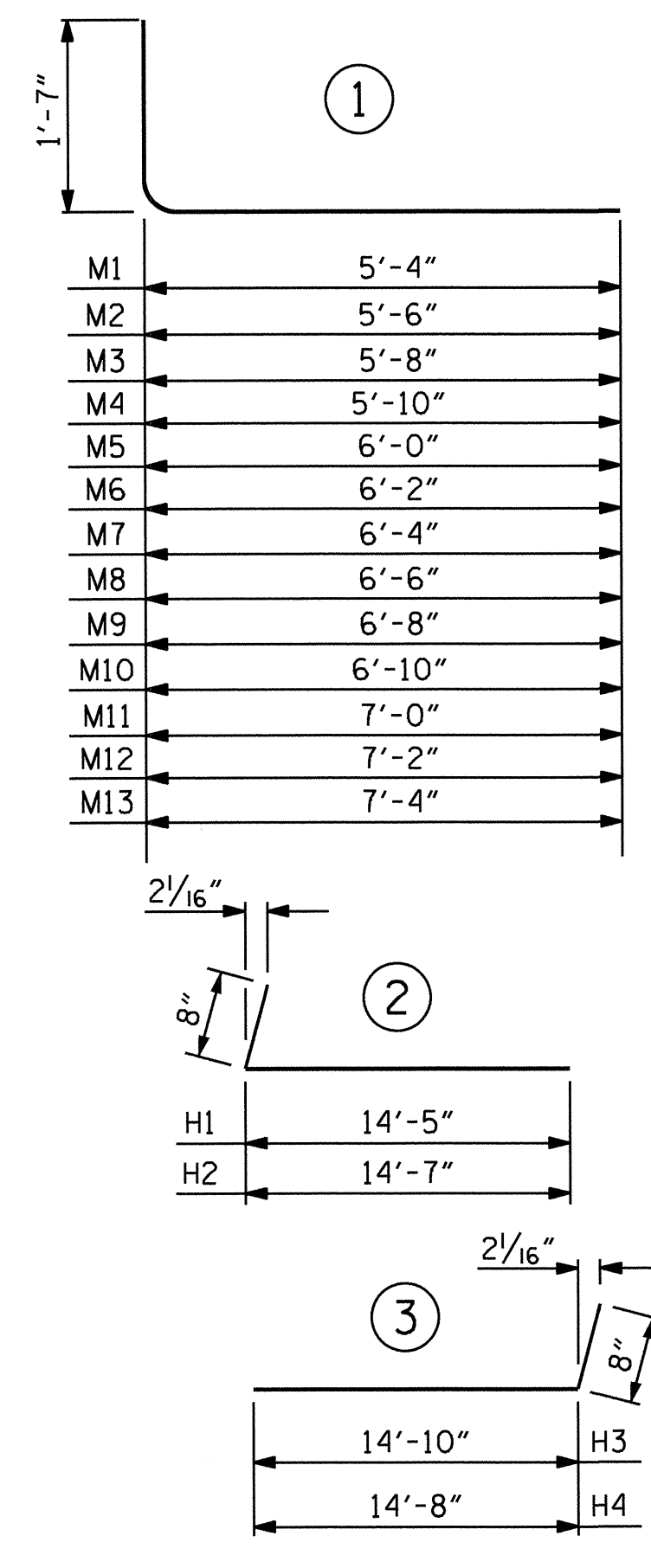
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ABUTMENT 1

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	12	#5	STR	40'-2"	503	T1	14	#6	STR	42'-2"	887
D1	22	#8	STR	2'-3"	132	T2	74	#6	STR	6'-5"	713
						T3	8	#6	STR	17'-9"	213
						T4	8	#6	STR	18'-0"	216
H1	16	#6	2	15'-1"	362	T5	48	#6	STR	2'-8"	192
H2	16	#6	2	15'-3"	366						
H3	20	#6	3	15'-6"	466	U1	52	#4	4	9'-5"	327
H4	20	#6	3	15'-4"	461	U2	34	#4	4	4'-8"	106
K1	12	#4	STR	3'-3"	26	V1	38	#4	STR	9'-3"	235
K2	12	#4	STR	21'-4"	171	V2	68	#4	STR	6'-4"	288
						V3	39	#4	STR	11'-7"	302
M1	8	#9	1	6'-11"	188						
M2	8	#9	1	7'-1"	193						
M3	8	#9	1	7'-3"	197						
M4	8	#9	1	7'-5"	202						
M5	8	#9	1	7'-7"	206						
M6	8	#9	1	7'-9"	211						
M7	8	#9	1	7'-11"	215						
M8	8	#9	1	8'-1"	220						
M9	8	#9	1	8'-3"	224						
M10	8	#9	1	8'-5"	229						
M11	8	#9	1	8'-7"	233						
M12	8	#9	1	8'-9"	238						
M13	8	#9	1	8'-11"	243						

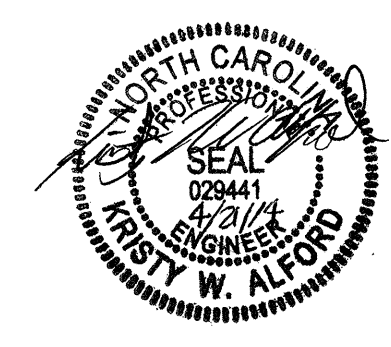
REINFORCING STEEL 8765 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ABUTMENT 1)

POUR #1	FOOTING	26.5 C.Y.
POUR #2	LOWER PART OF WINGS & ABUTMENT WALL	26.6 C.Y.
POUR #3	BACKWALL & UPPER PART OF WINGS	8.0 C.Y.
TOTAL CLASS A CONCRETE		61.1 C.Y.

ASSEMBLED BY: Fr. LEA DATE: 8/2013
 CHECKED BY: A.C. OUTLAW DATE: 10/2013
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE: 4/21/14

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PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 4 OF 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			27

NOTES

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

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

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

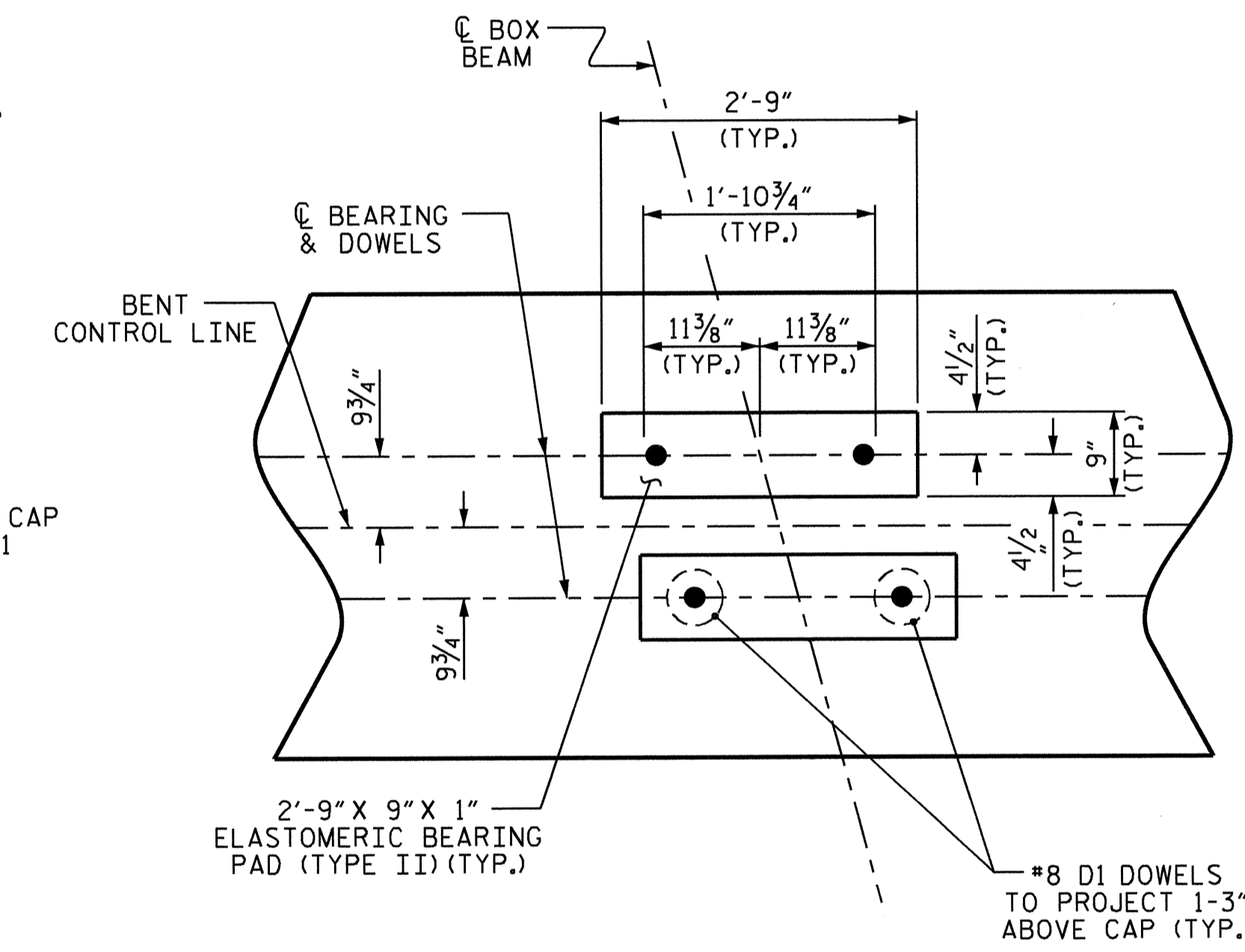
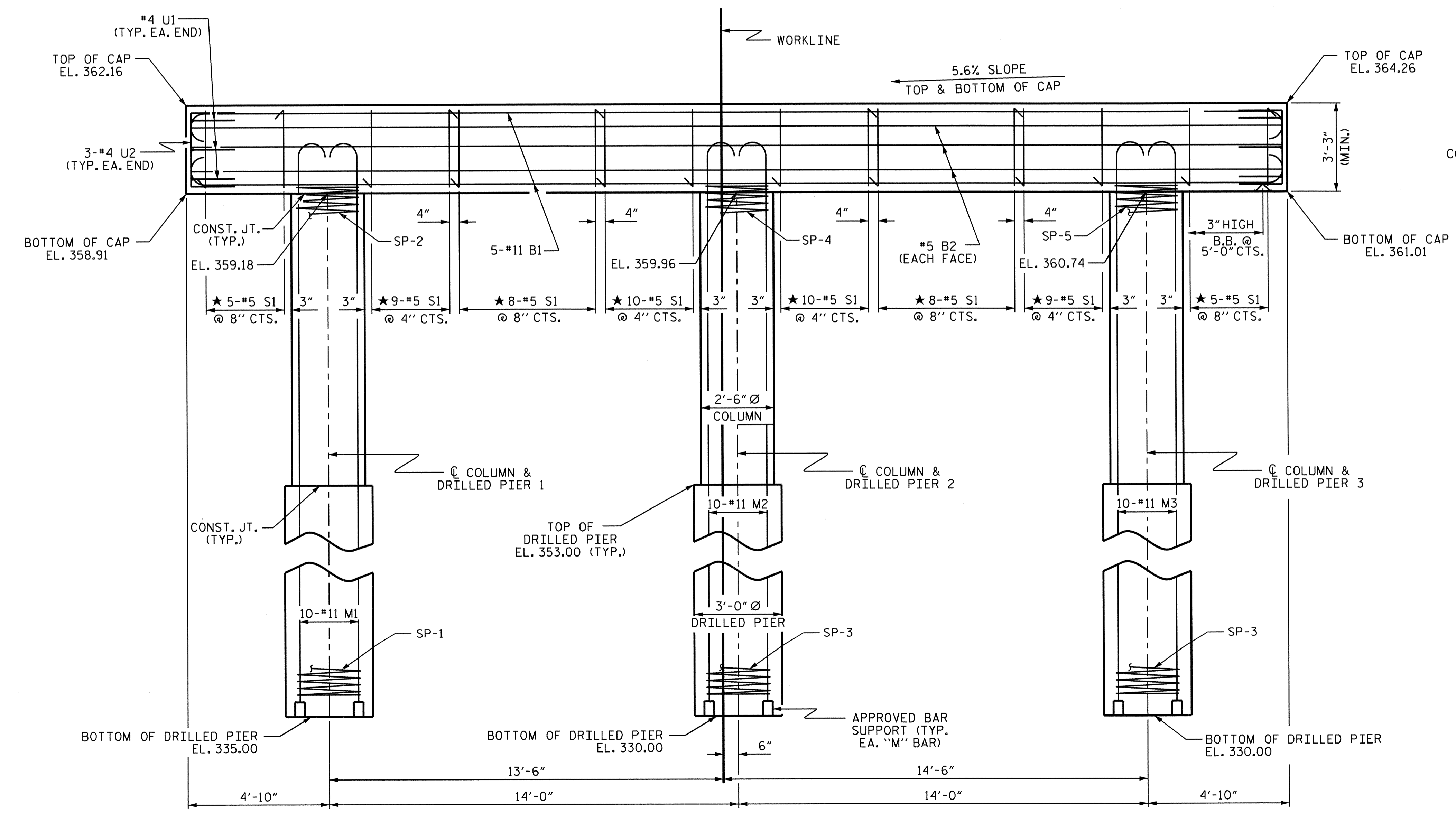
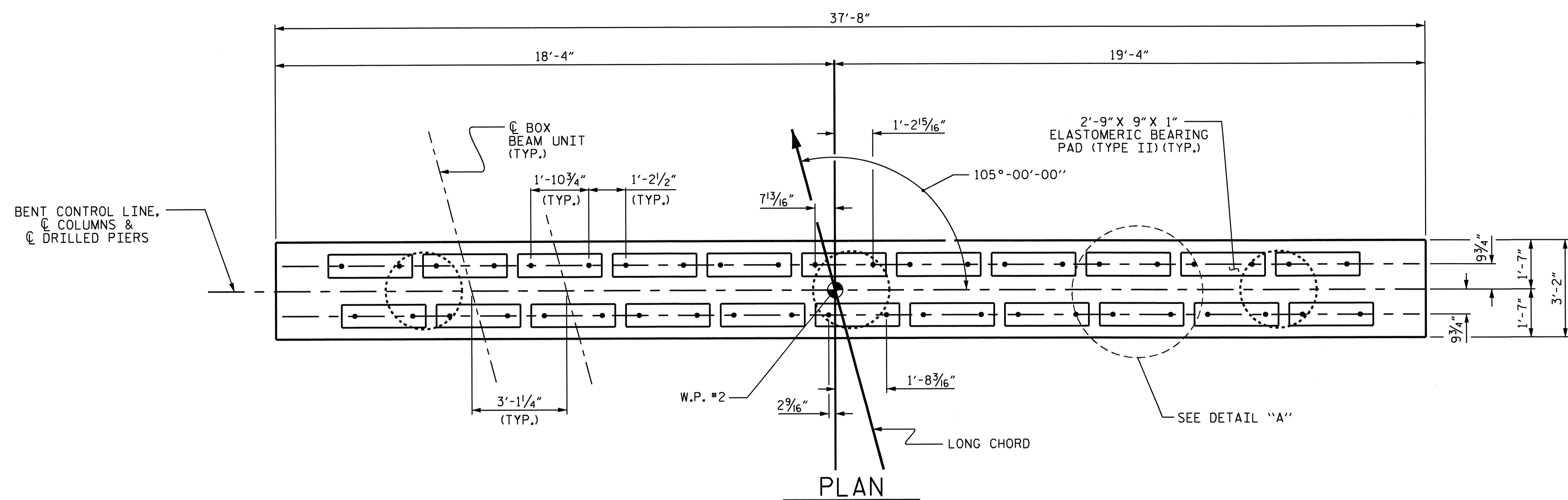
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

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

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

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



DETAIL "A"
 (DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

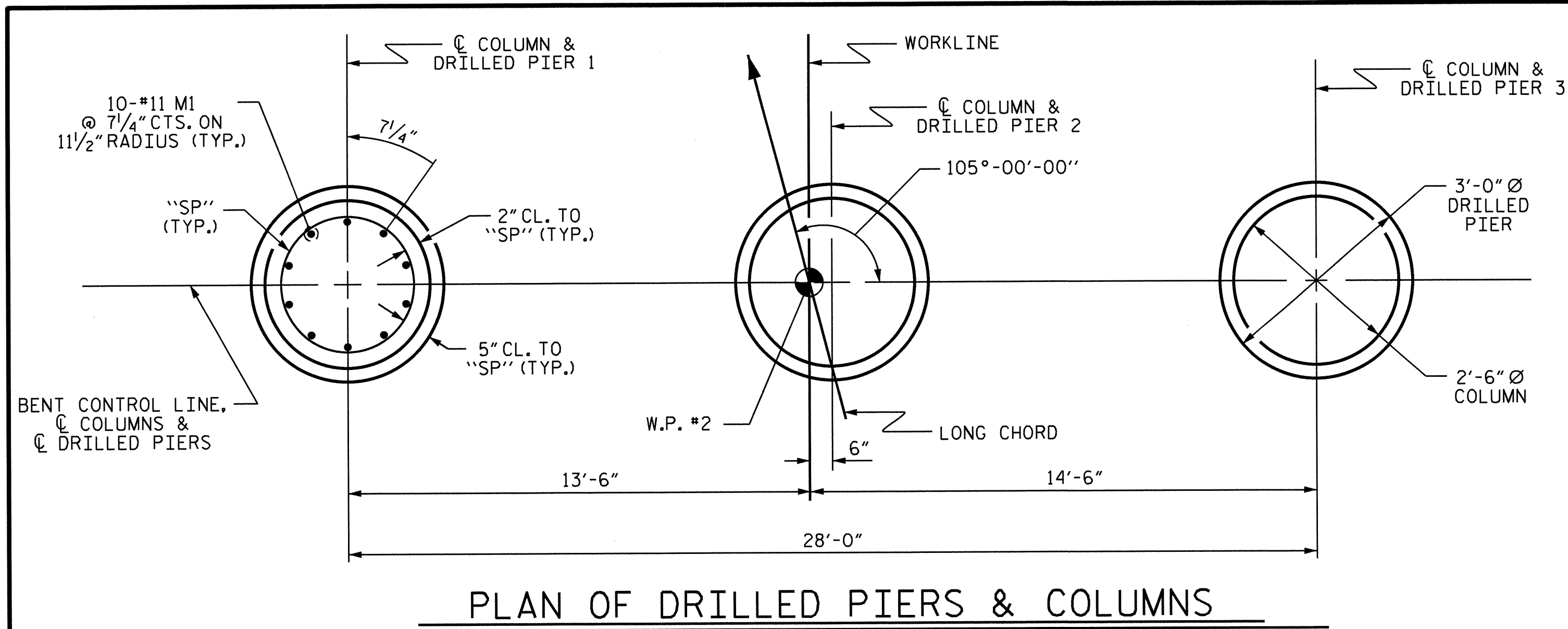
**SUBSTRUCTURE
 BENT 1**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			27

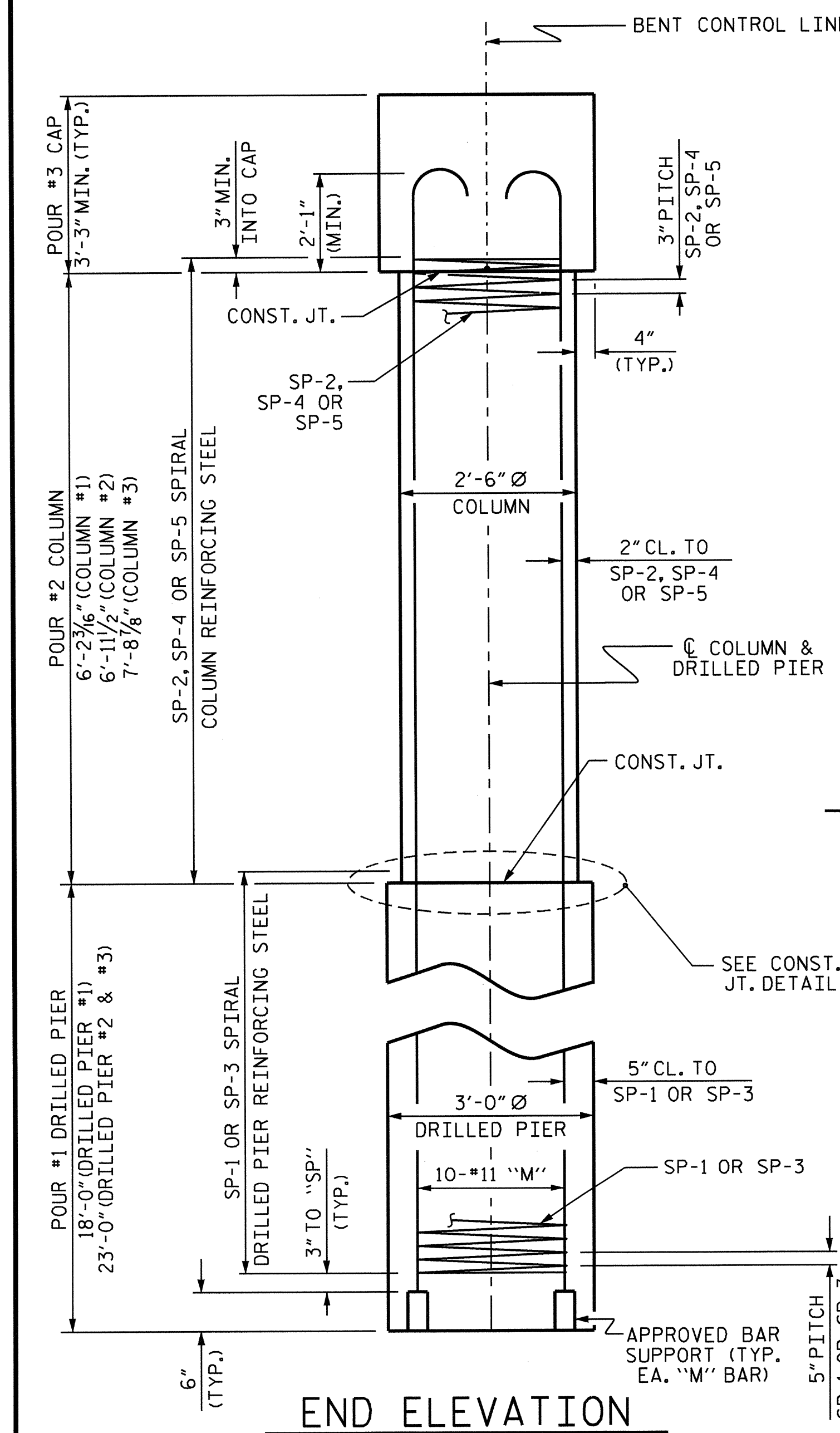


ASSEMBLED BY : Fr. LEA DATE : 6/2013
 CHECKED BY : A.C. OUTLAW DATE : 10/2013
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE : 4/21/14

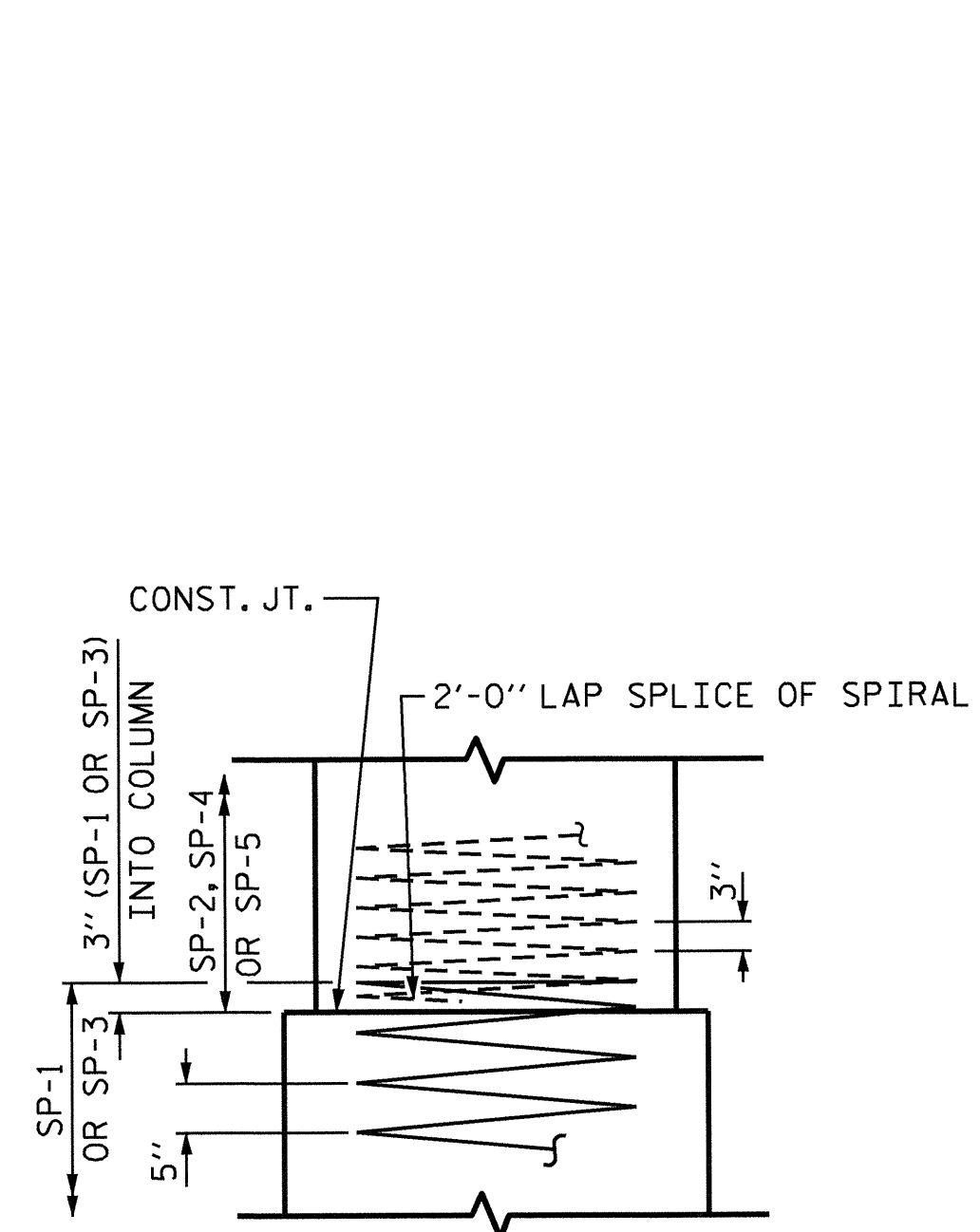
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



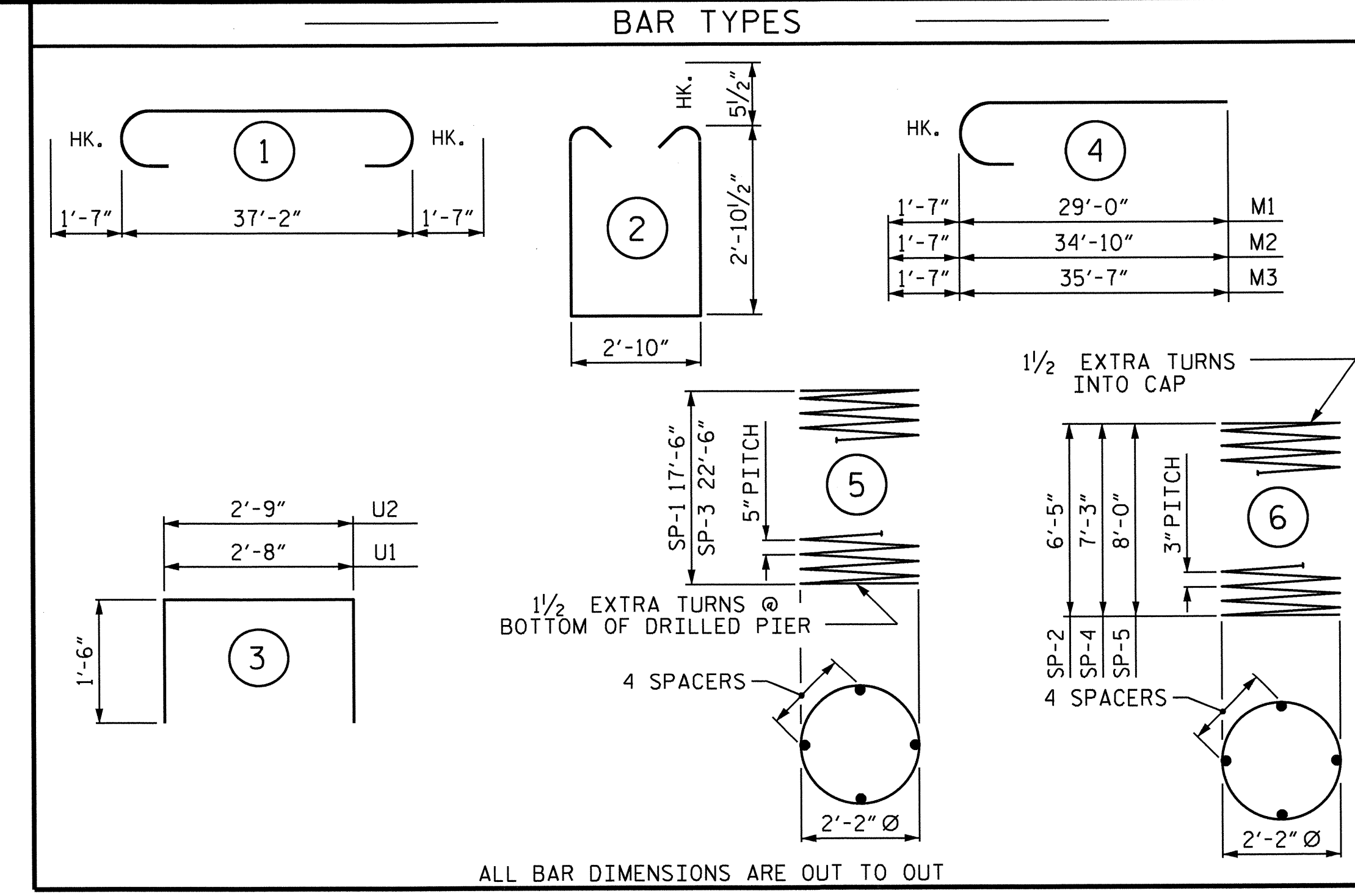
PLAN OF DRILLED PIERS & COLUMNS



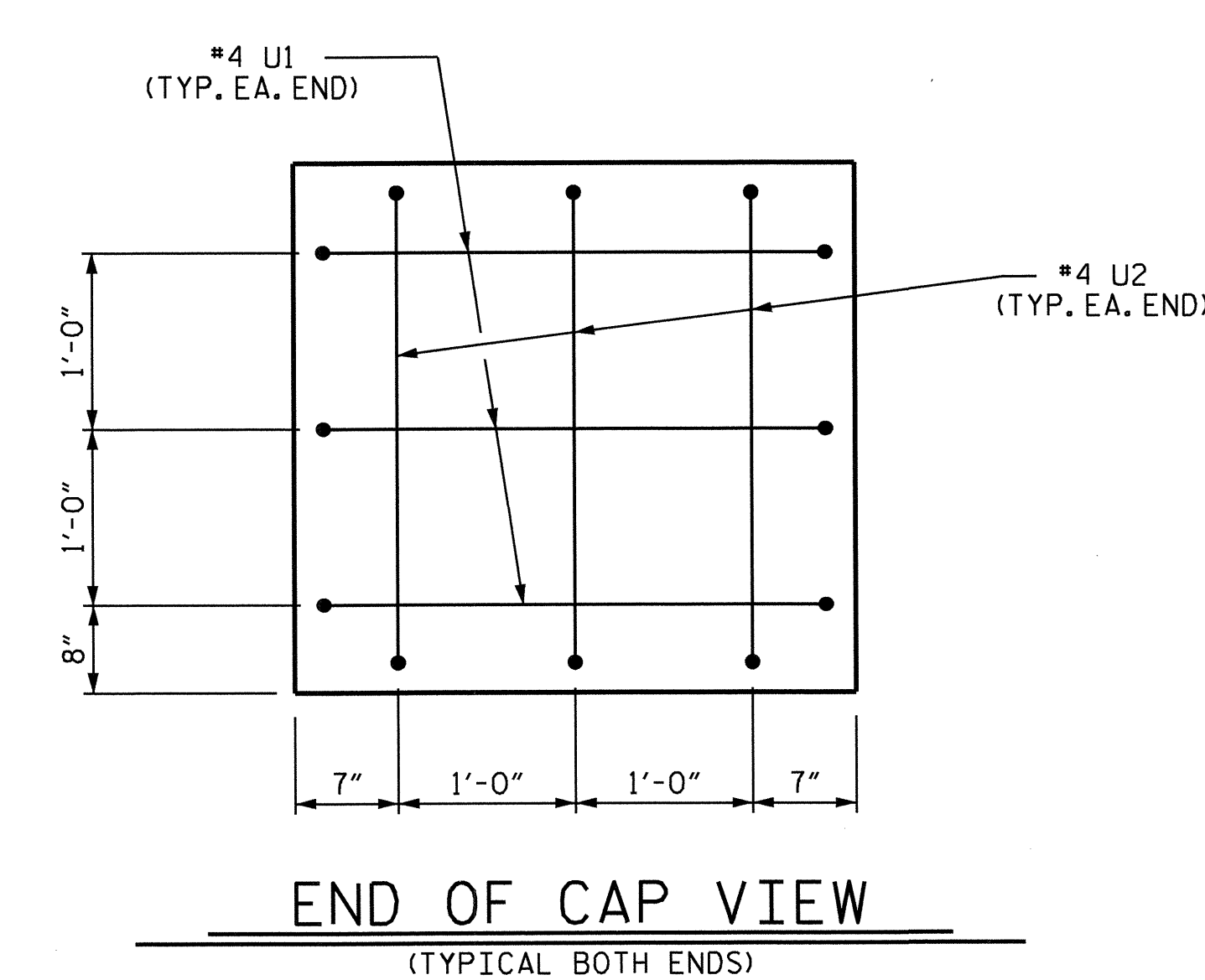
END ELEVATION



CONSTRUCTION JOINT DETAIL

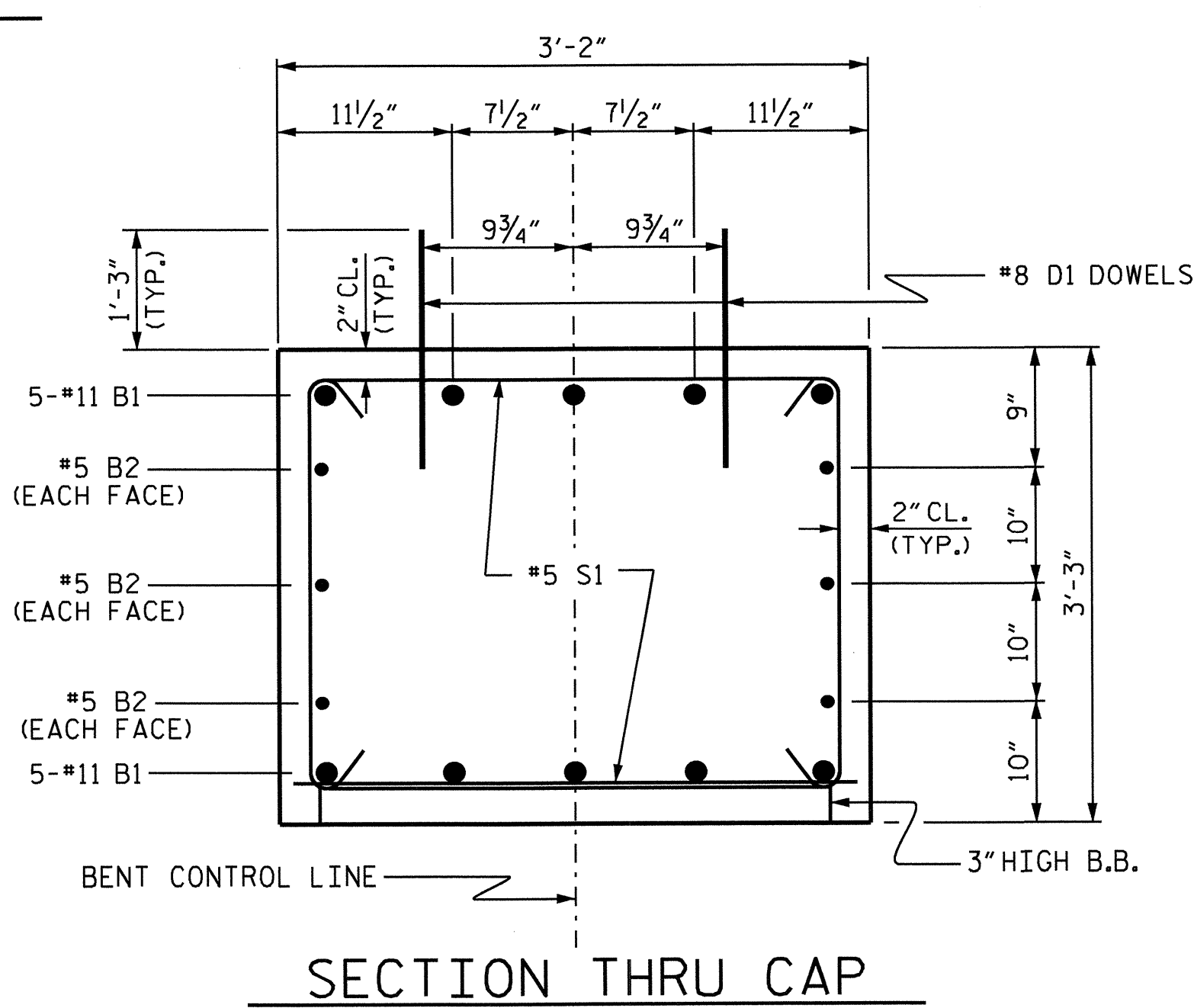


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

BILL OF MATERIAL FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	40'-4"	2143
B2	6	#5	STR	37'-4"	234
D1	44	#8	STR	2'-3"	264
M1	10	#11	4	30'-7"	1625
M2	10	#11	4	36'-5"	1935
M3	10	#11	4	37'-2"	1975
S1	64	#5	2	9'-6"	634
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-9"	23
REINFORCING STEEL (FOR ONE BENT)					8856 LBS
SP-1	1	*	5	292'-11"	306
SP-2	1	**	6	187'-1"	125
SP-3	2	*	5	372'-9"	778
SP-4	1	**	6	207'-2"	141
SP-5	1	**	6	227'-2"	152
SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT)					1502 LB
* THE SP-1 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2, SP-4 AND SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
POUR #2 (COLUMNS)					3.8 C.Y.
POUR #3 (CAP)					14.4 C.Y.
TOTAL CLASS A CONCRETE					18.2 C.Y.
DRILLED PIERS: (FOR ONE BENT)					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					16.8 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL					46 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL					18 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER					18 LIN. FT.
CSL TUBES					274 LIN. FT.

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

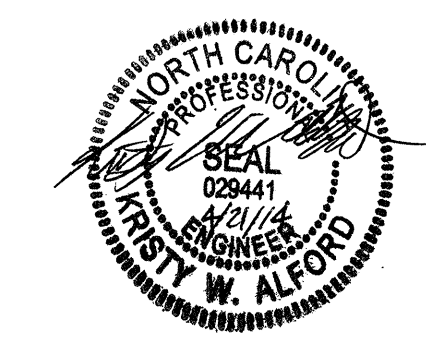
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 1

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

SHEET NO. S-22
 TOTAL SHEETS 27



ASSEMBLED BY: Fr. LEA DATE: 7/2013
 CHECKED BY: A.C. OUTLAW DATE: 10/2013
 DESIGN ENGINEER OF RECORD: A.C. Outlaw DATE: 4/21/14

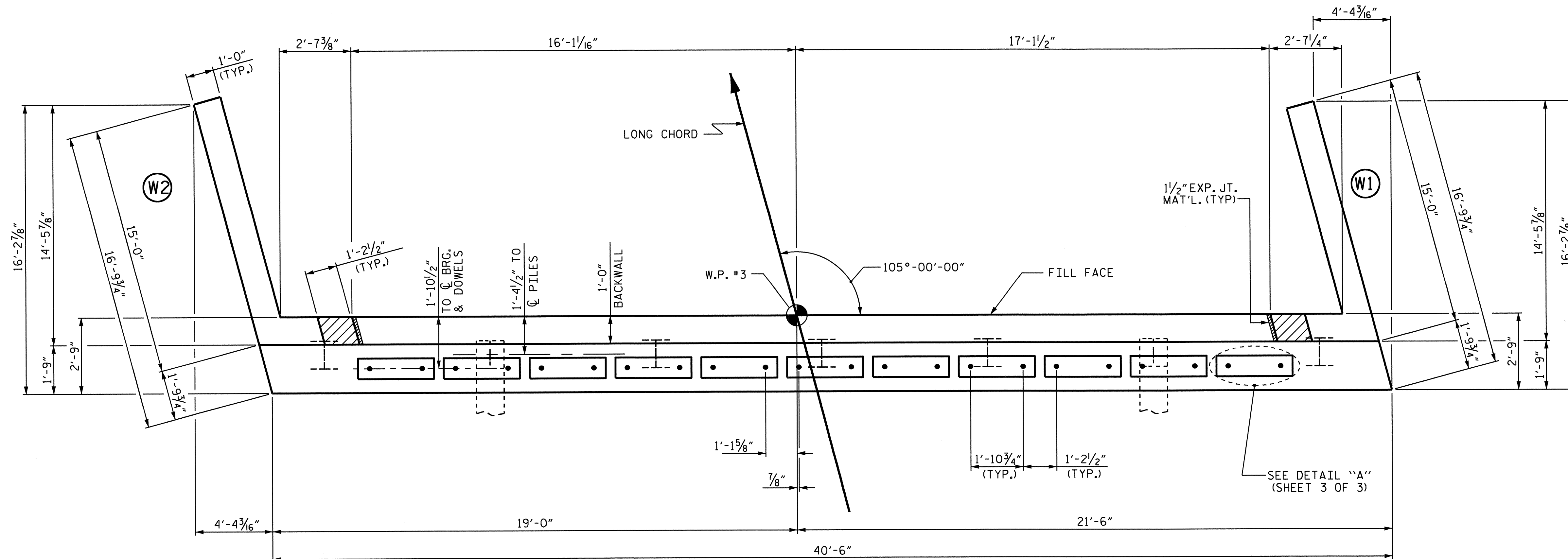
NOTES

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

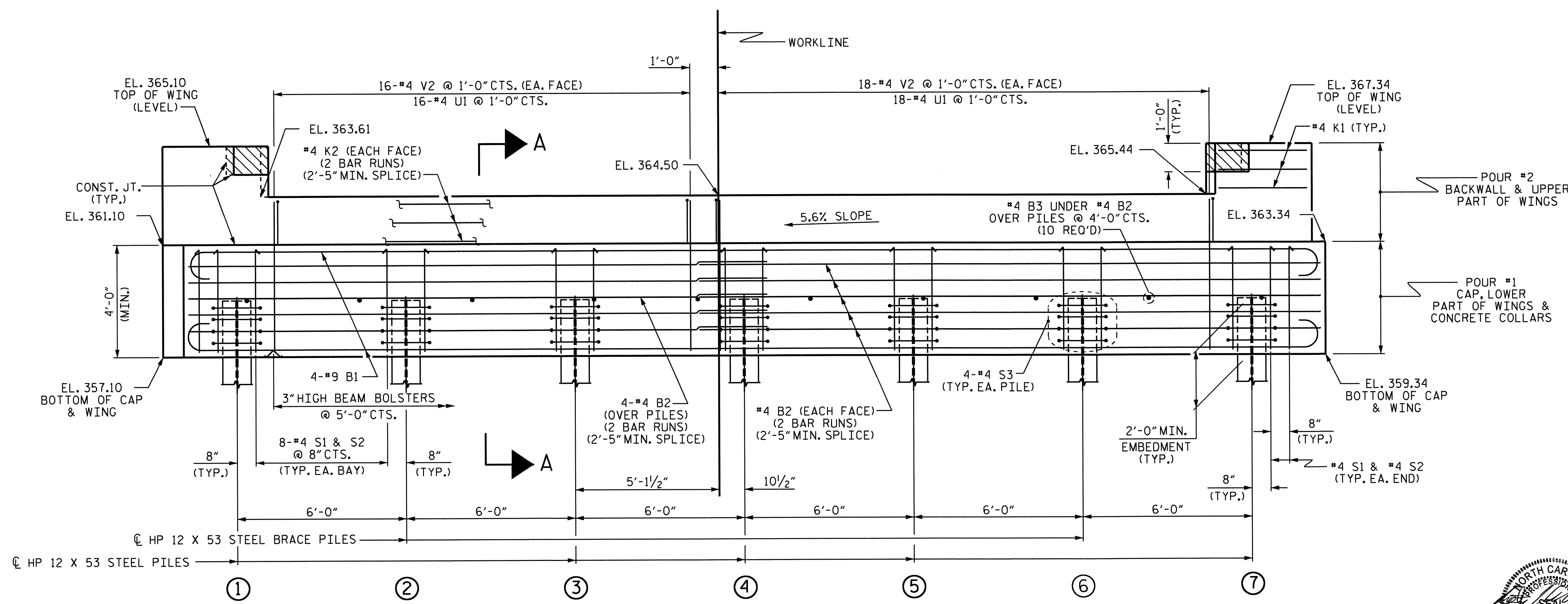
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN



ELEVATION

TOP OF PILE ELEVATIONS	
①	359.25
②	359.58
③	359.92
④	360.25
⑤	360.58
⑥	360.91
⑦	361.24

PROJECT NO. B-4608
RANDOLPH COUNTY
 STATION: 16+29.00 -L-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

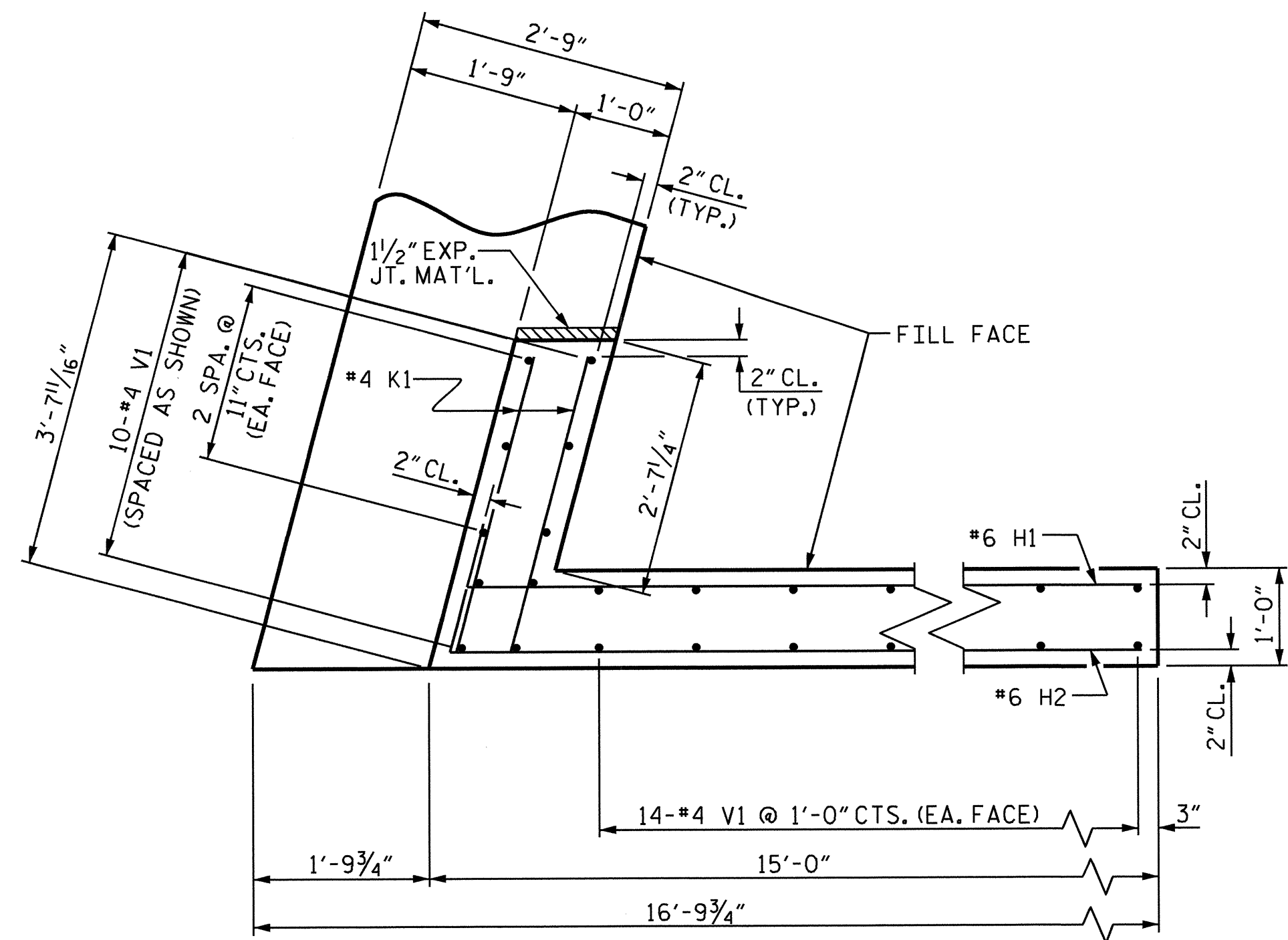
**SUBSTRUCTURE
 END BENT 2**



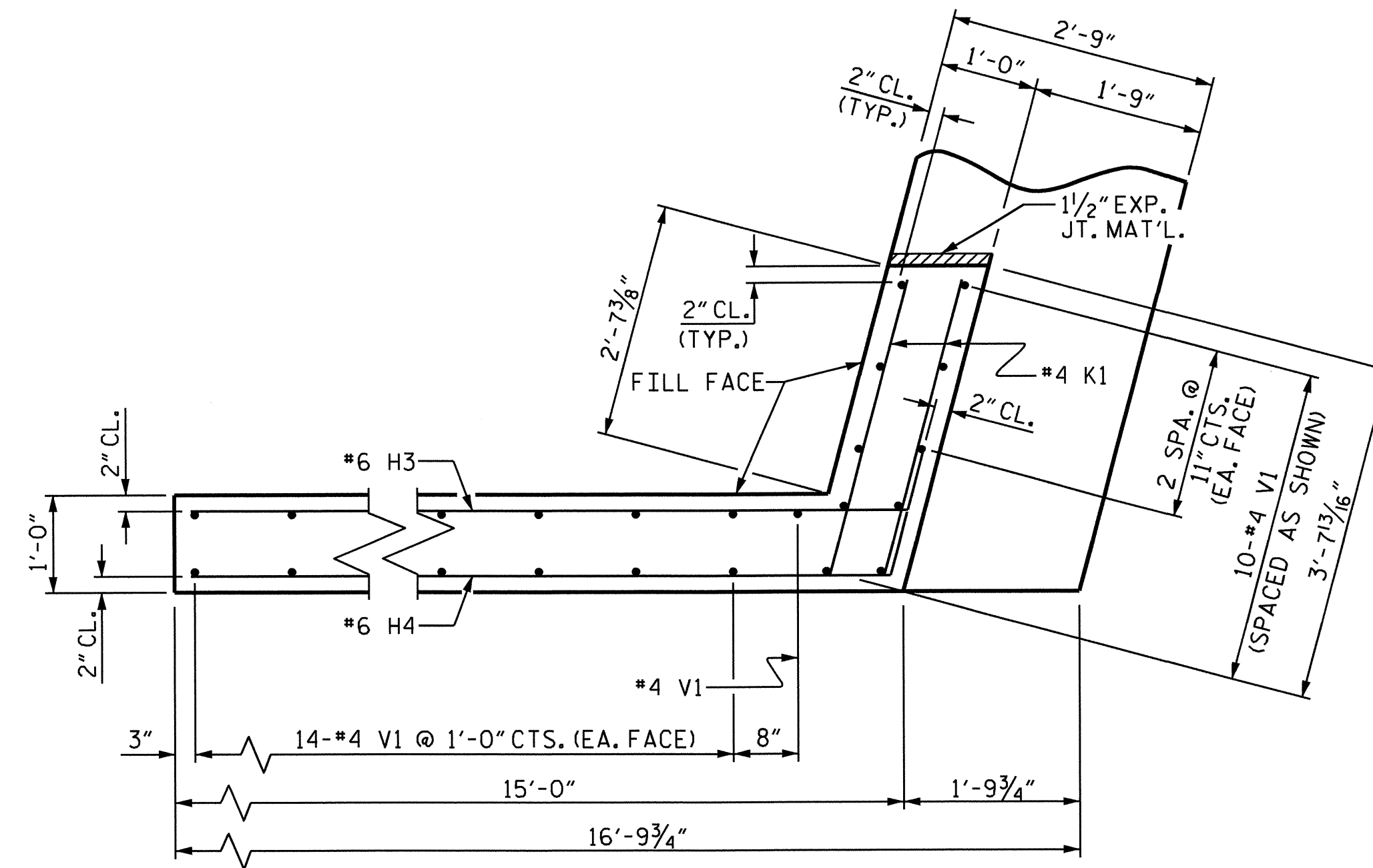
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			27

ASSEMBLED BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/18/13
 DRAWN BY : WJH 12/11
 CHECKED BY : AAC 12/11

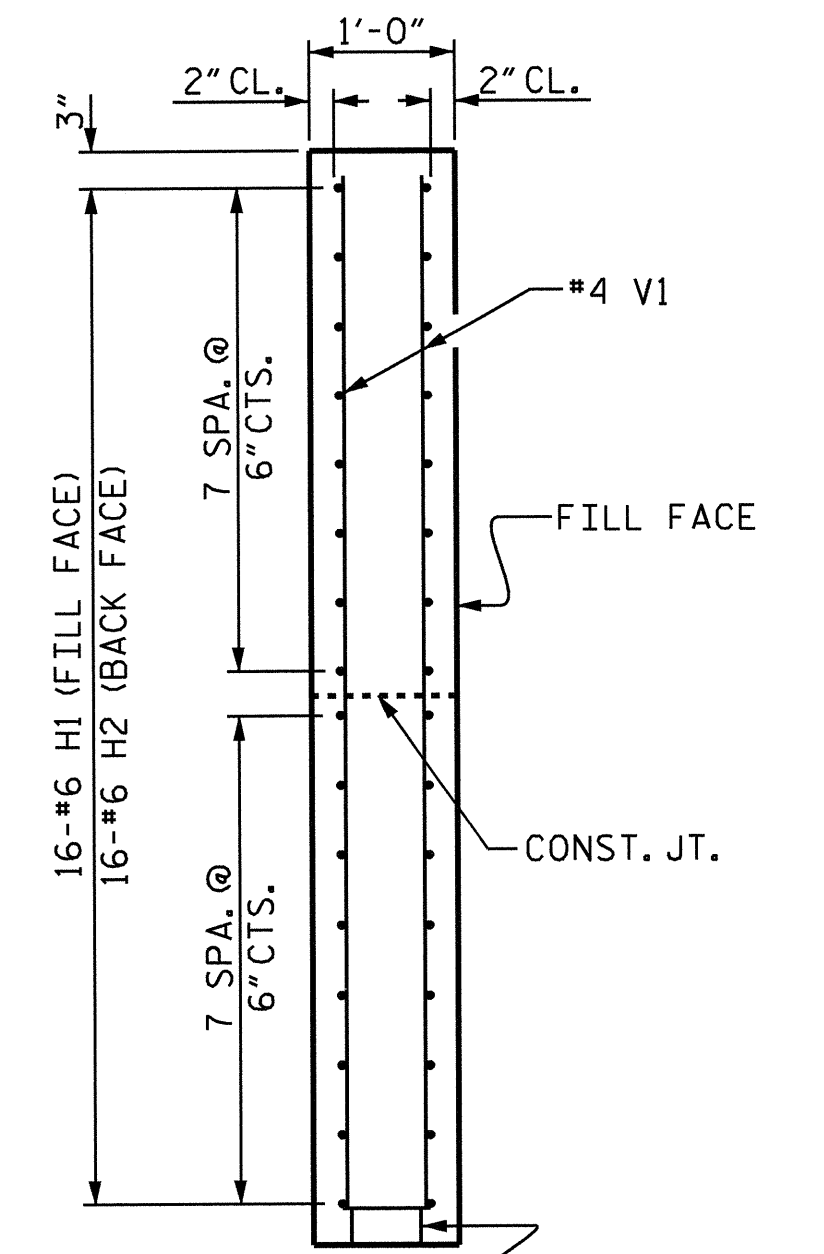
WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 3 OF 3.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.



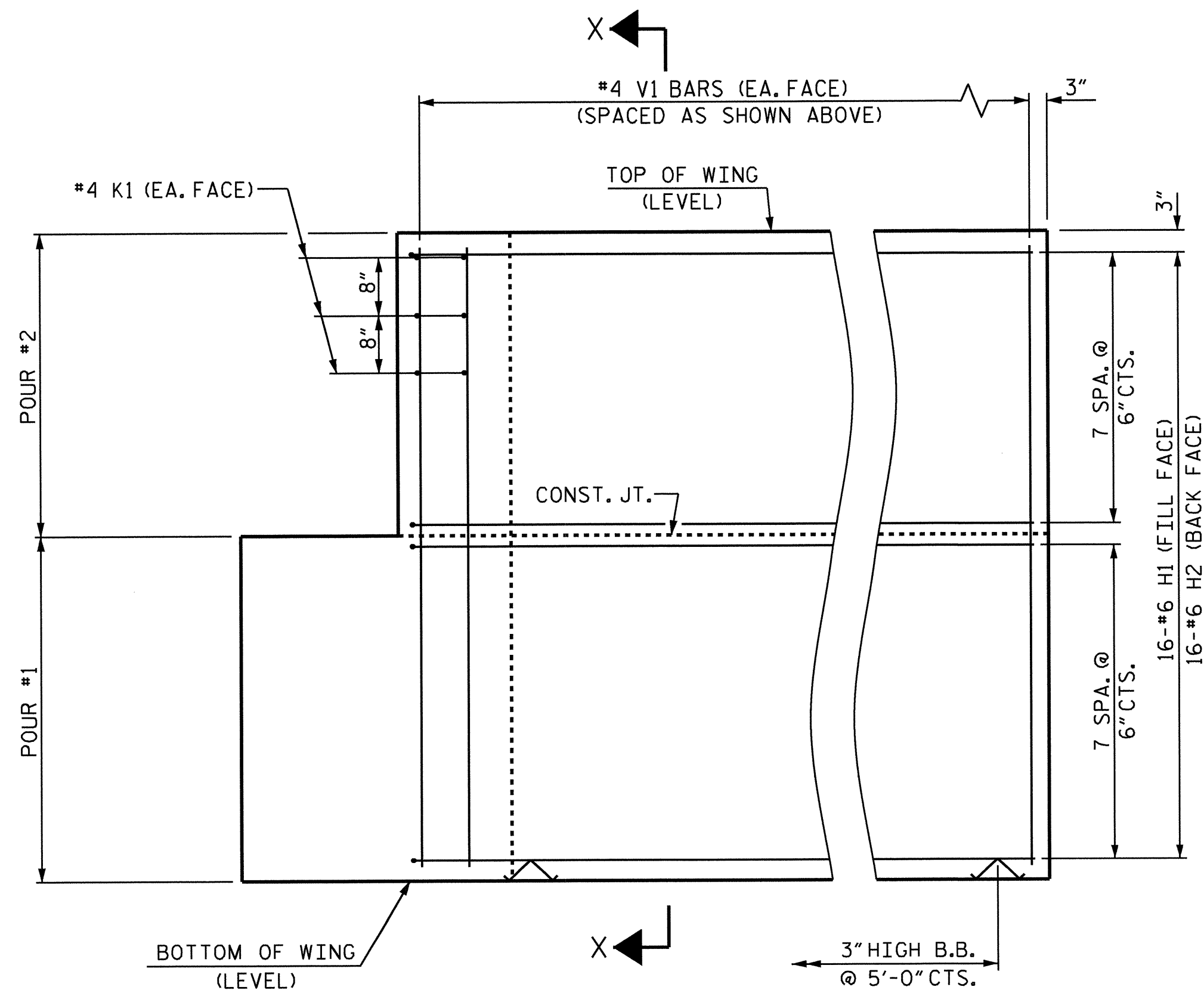
PLAN OF WING (W1)



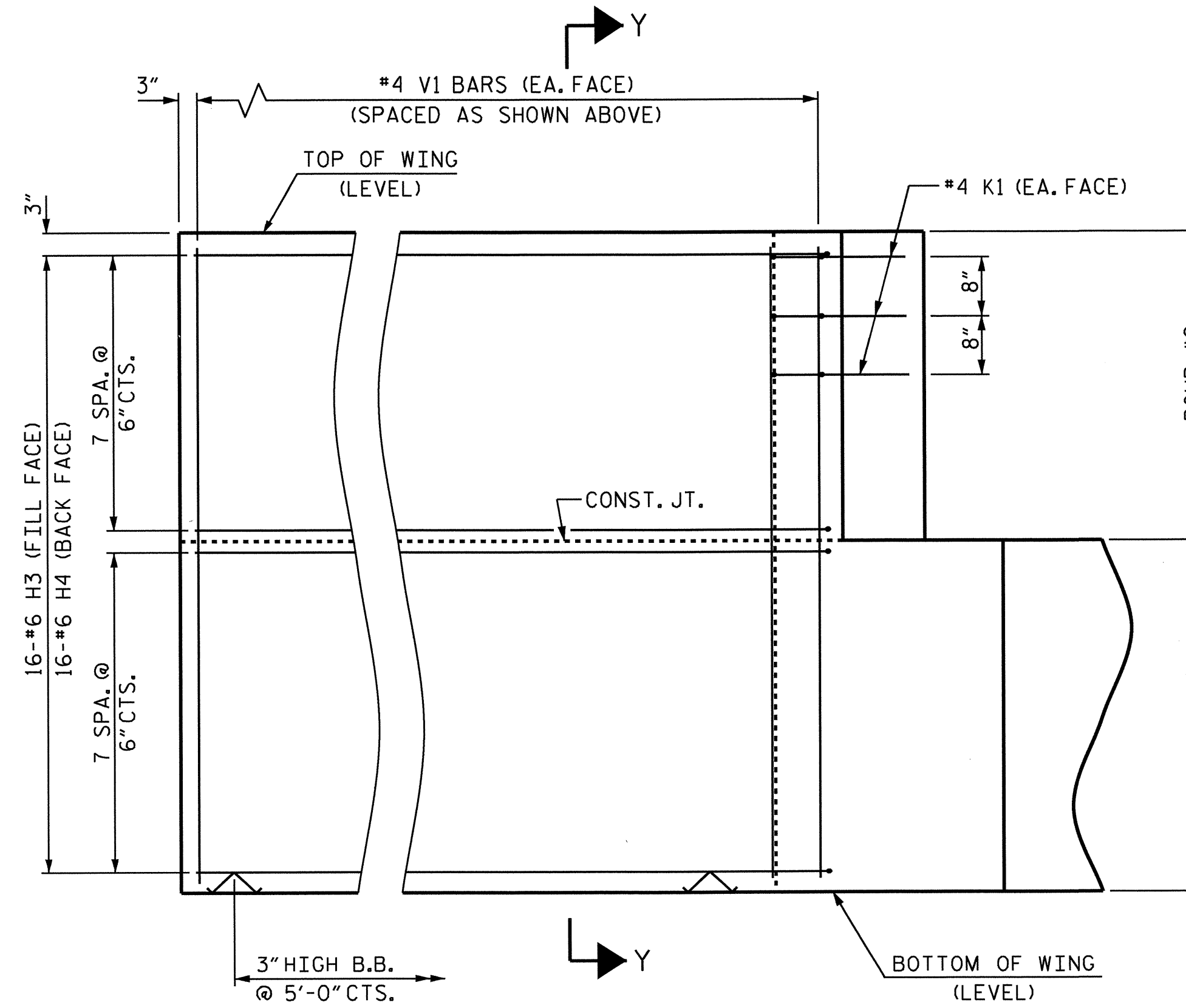
PLAN OF WING (W2)



SECTION X-X

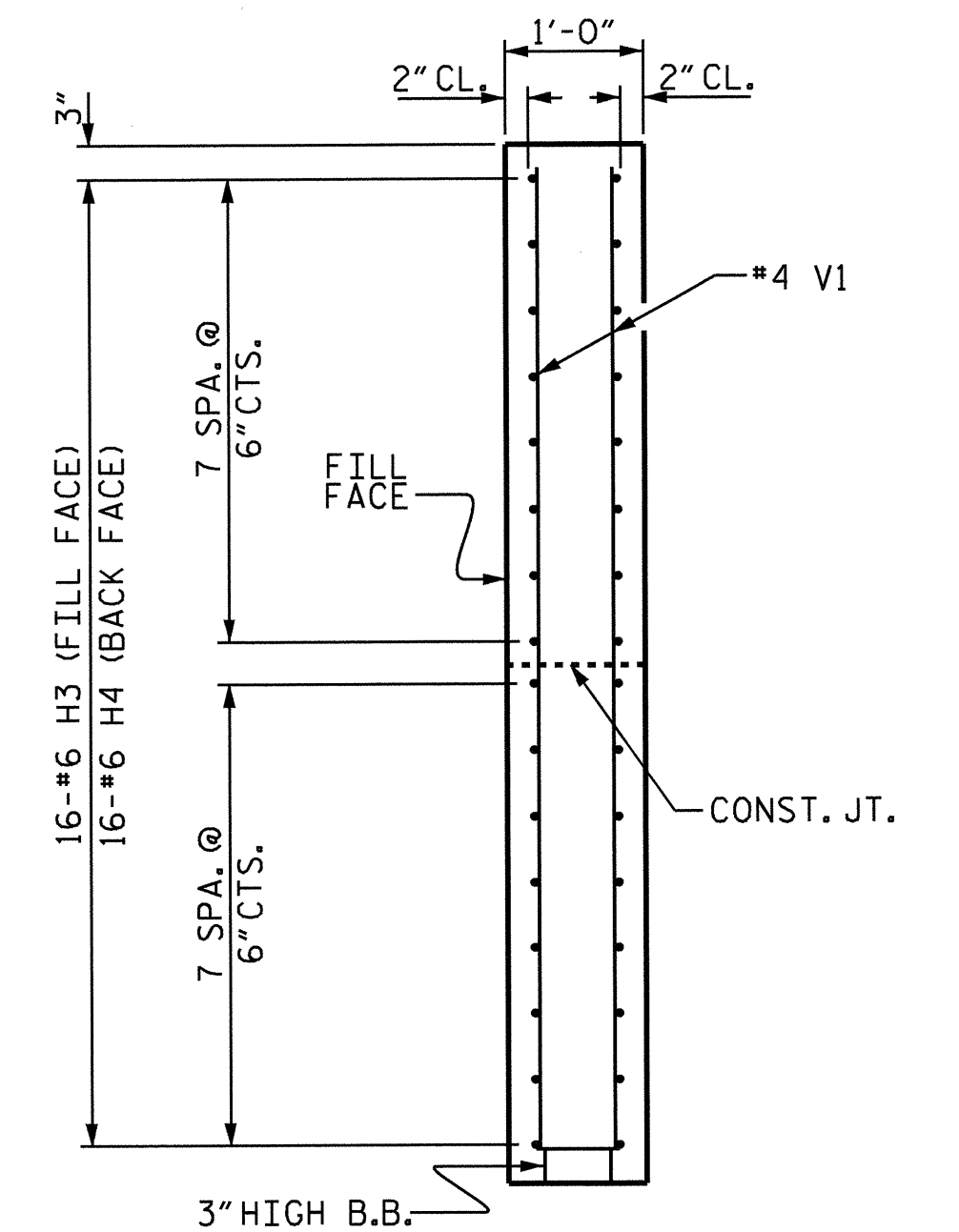


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS



SECTION Y-Y

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 2 OF 3

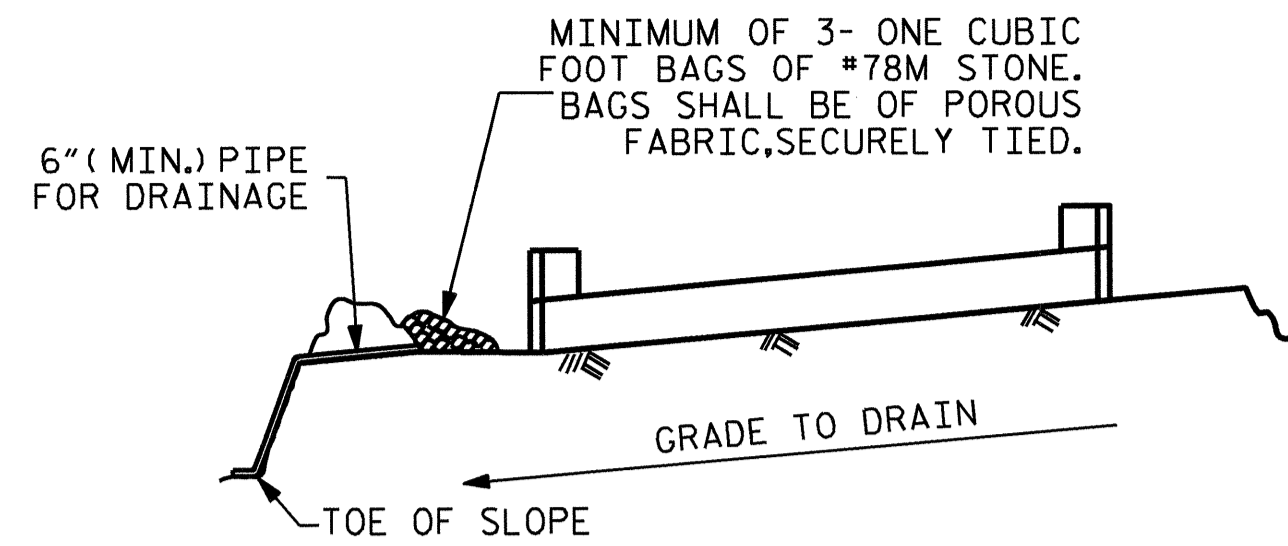


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2
 WING DETAILS

REVISIONS						SHEET NO. S-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

ASSEMBLED BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/18/13
 DRAWN BY : WJH 12/11
 CHECKED BY : AAC 12/11

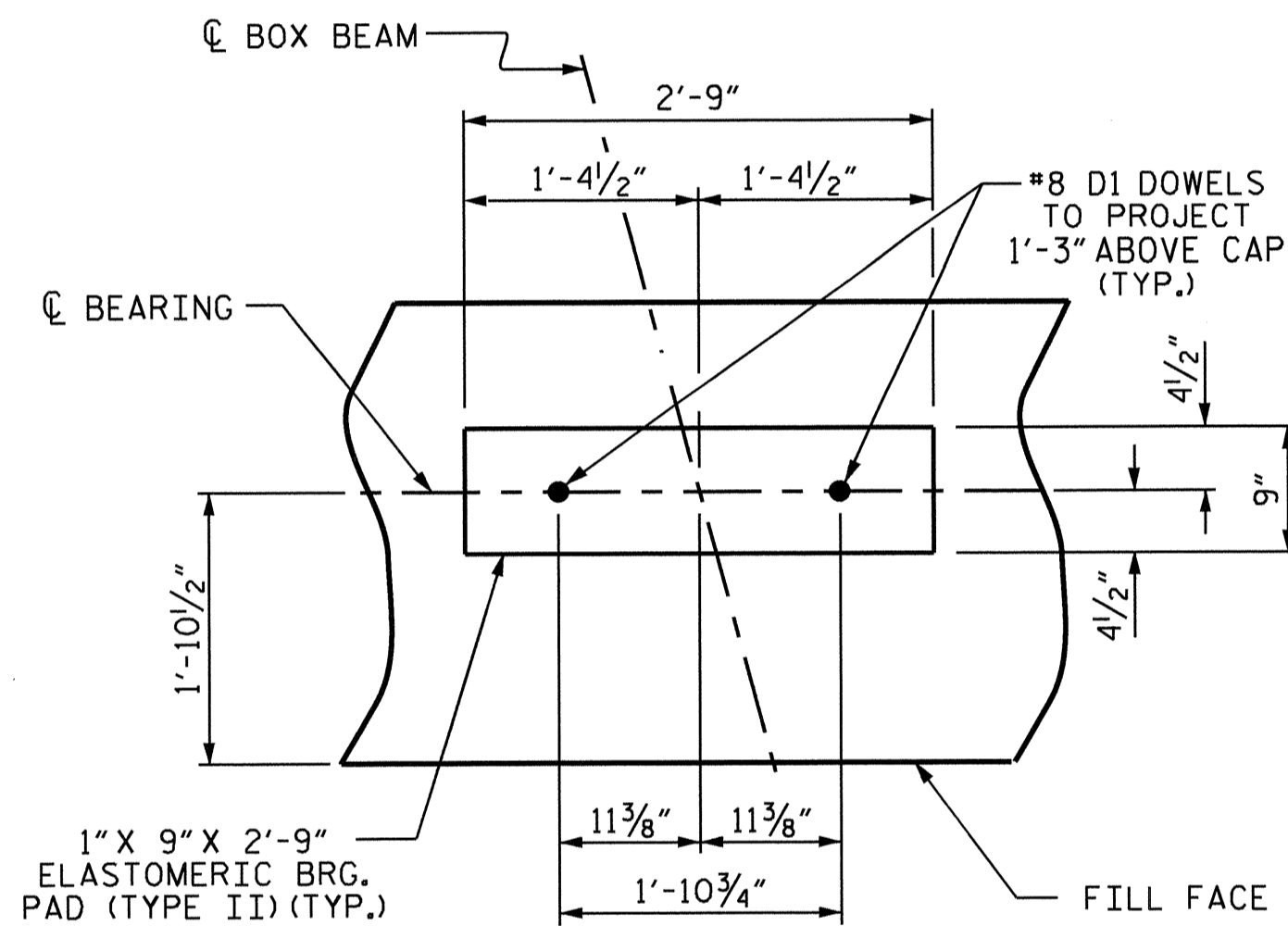


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

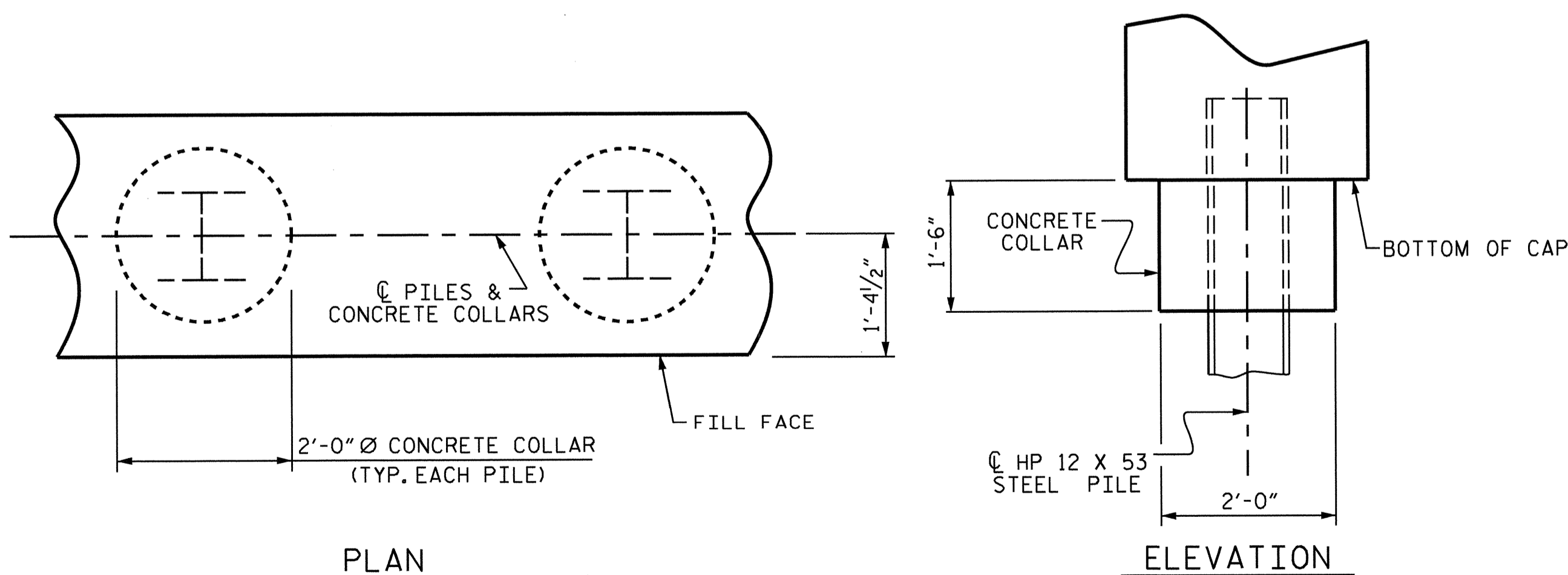
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



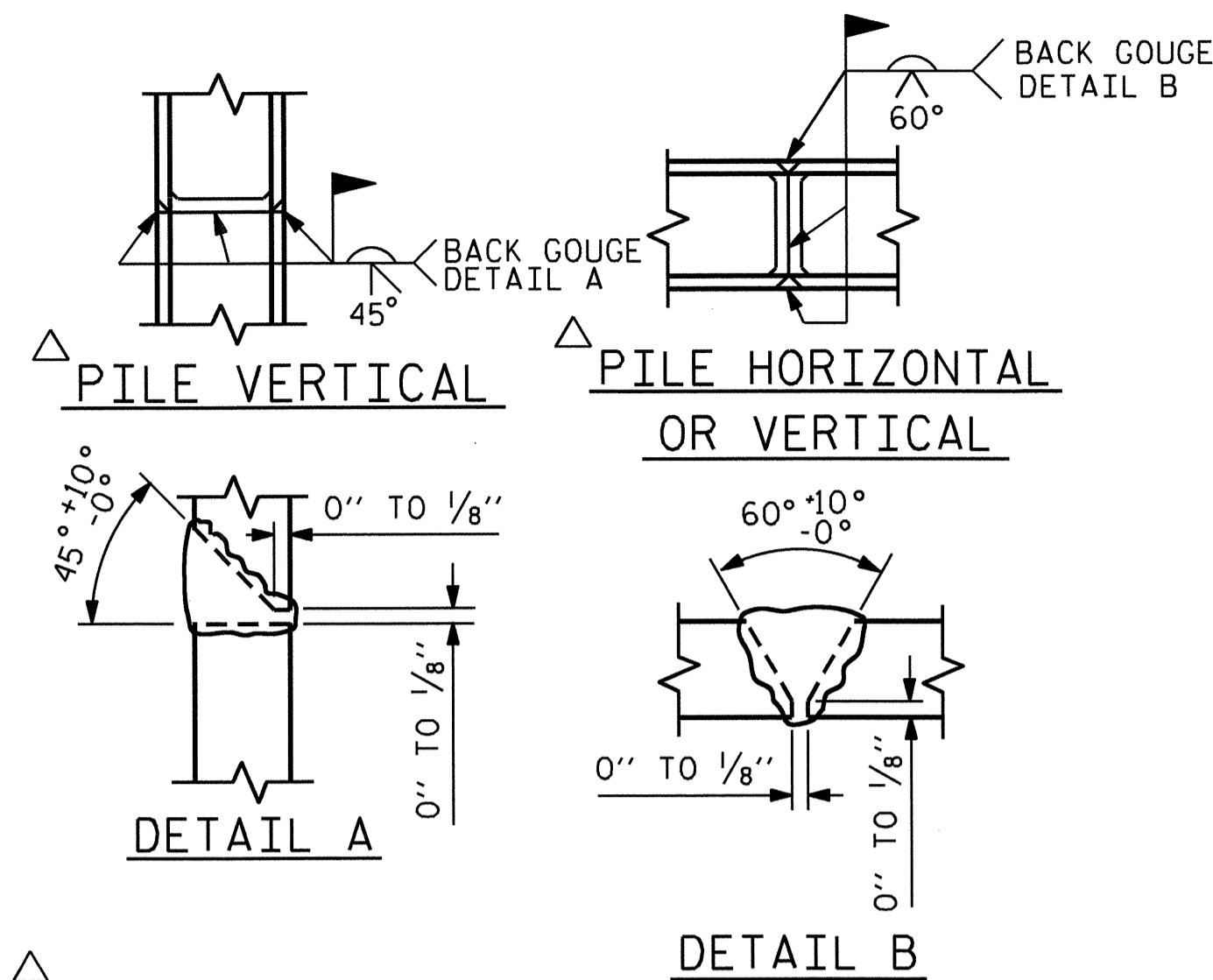
DETAIL "A"

(ABUTMENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

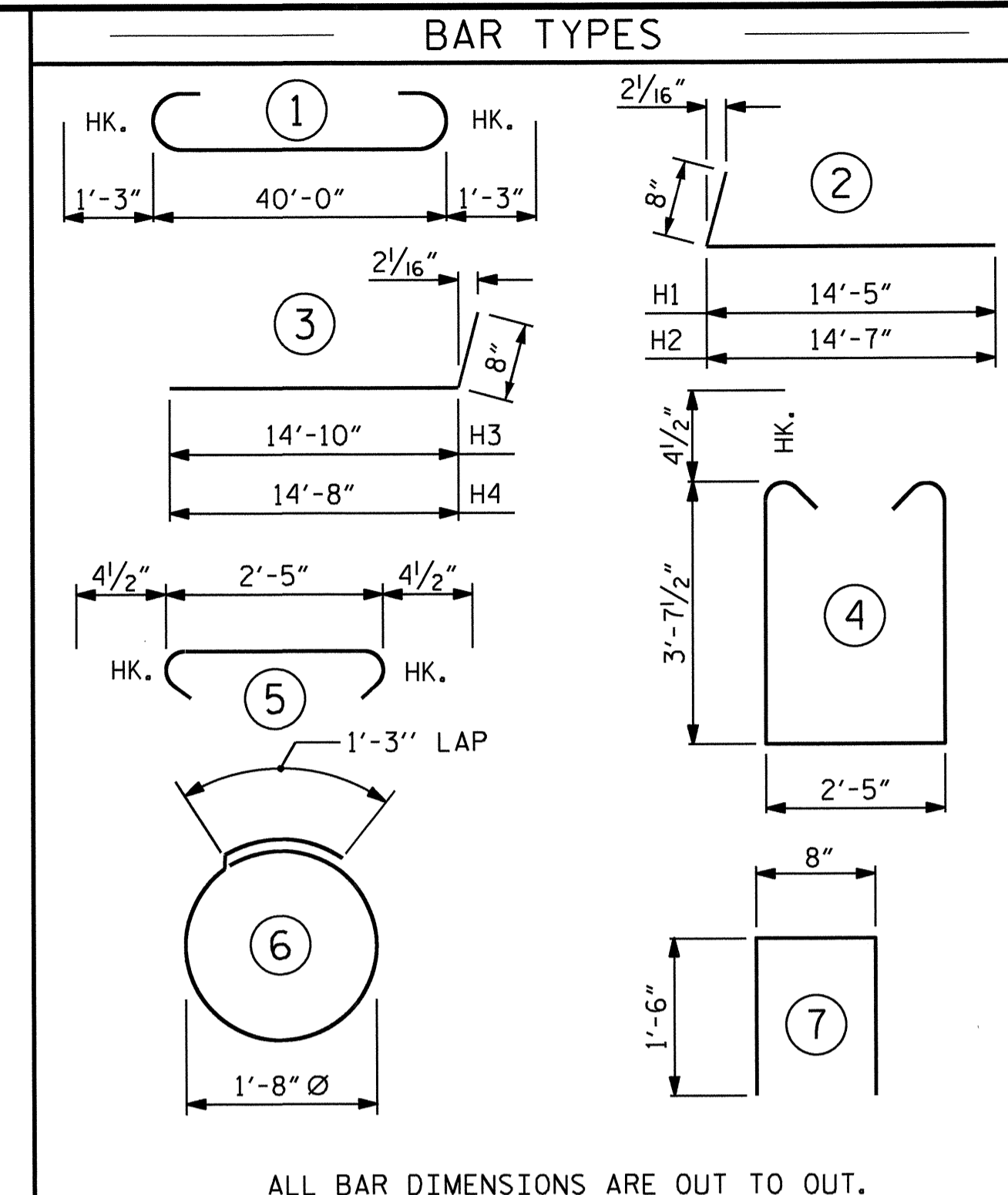


CORROSION PROTECTION FOR STEEL PILES DETAIL

(ABUTMENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT 2
 HP 12 X 53 STEEL PILES
 NO: 7 LIN. FT. = 105
 STEEL PILE POINTS 7 EA.

BILL OF MATERIAL

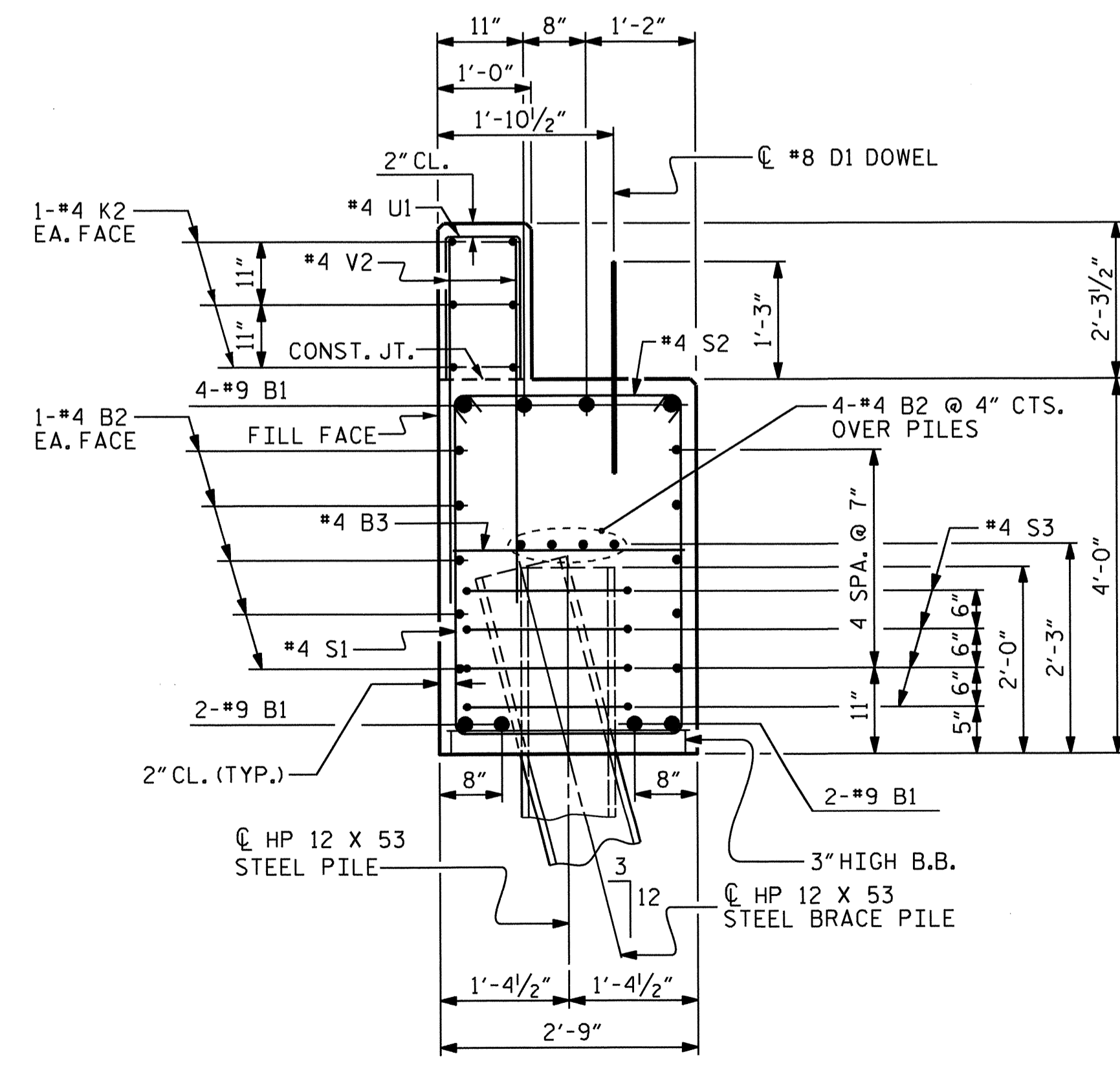
FOR END BENT 2

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#8		42'-6"	1156
B2	#4	STR	21'-4"	399
B3	#4	STR	2'-5"	16
D1	#8	STR	2'-3"	132
H1	#6		15'-1"	362
H2	#6		15'-3"	366
H3	#6		15'-6"	372
H4	#6		15'-4"	368
K1	#4	STR	3'-3"	26
K2	#4	STR	21'-4"	171
S1	#4		10'-5"	362
S2	#4		3'-2"	110
S3	#4		6'-6"	122
U1	#4		3'-8"	83
V1	#4	STR	7'-8"	394
V2	#4	STR	5'-10"	265

REINFORCING STEEL (FOR ONE END BENT) 4704 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	21.9 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	8.0 C.Y.
TOTAL CLASS A CONCRETE		29.9 C.Y.



SECTION A-A

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

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

SHEET 3 OF 3

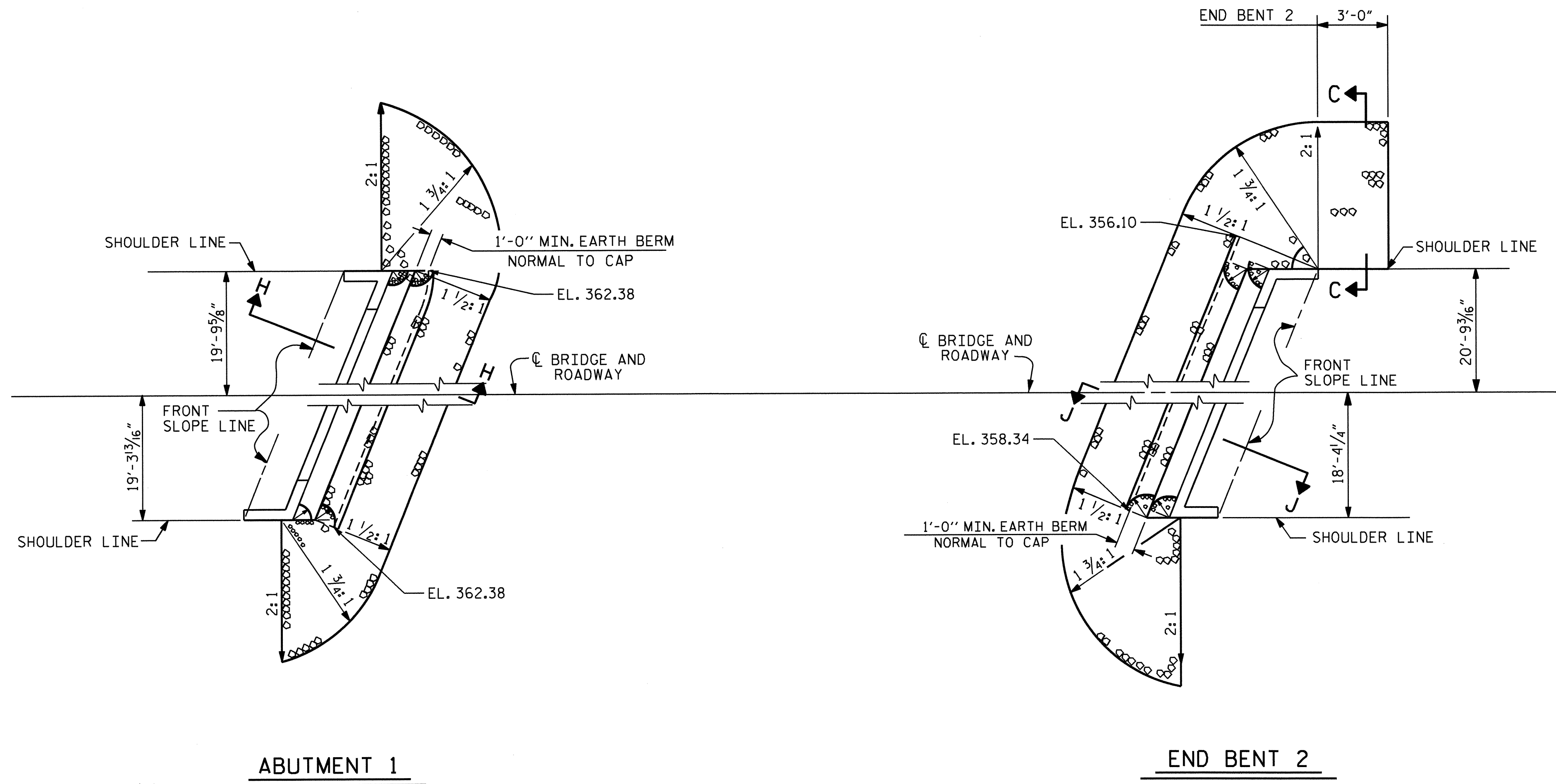
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS 27
2			4			

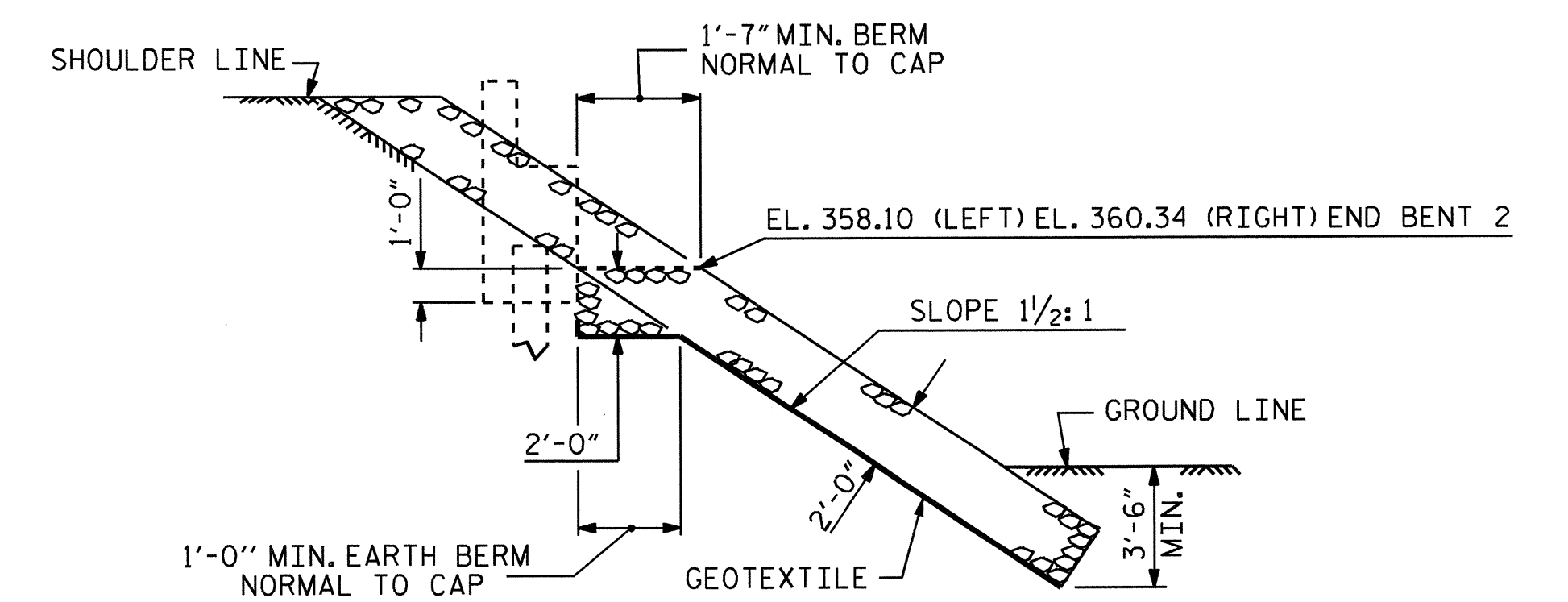
ASSEMBLED BY: T. KIRSCHBAUM DATE: 4/3/13
 CHECKED BY: A.C. OUTLAW DATE: 4/18/13
 DRAWN BY: WJH 12/11
 CHECKED BY: AAC 12/11

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

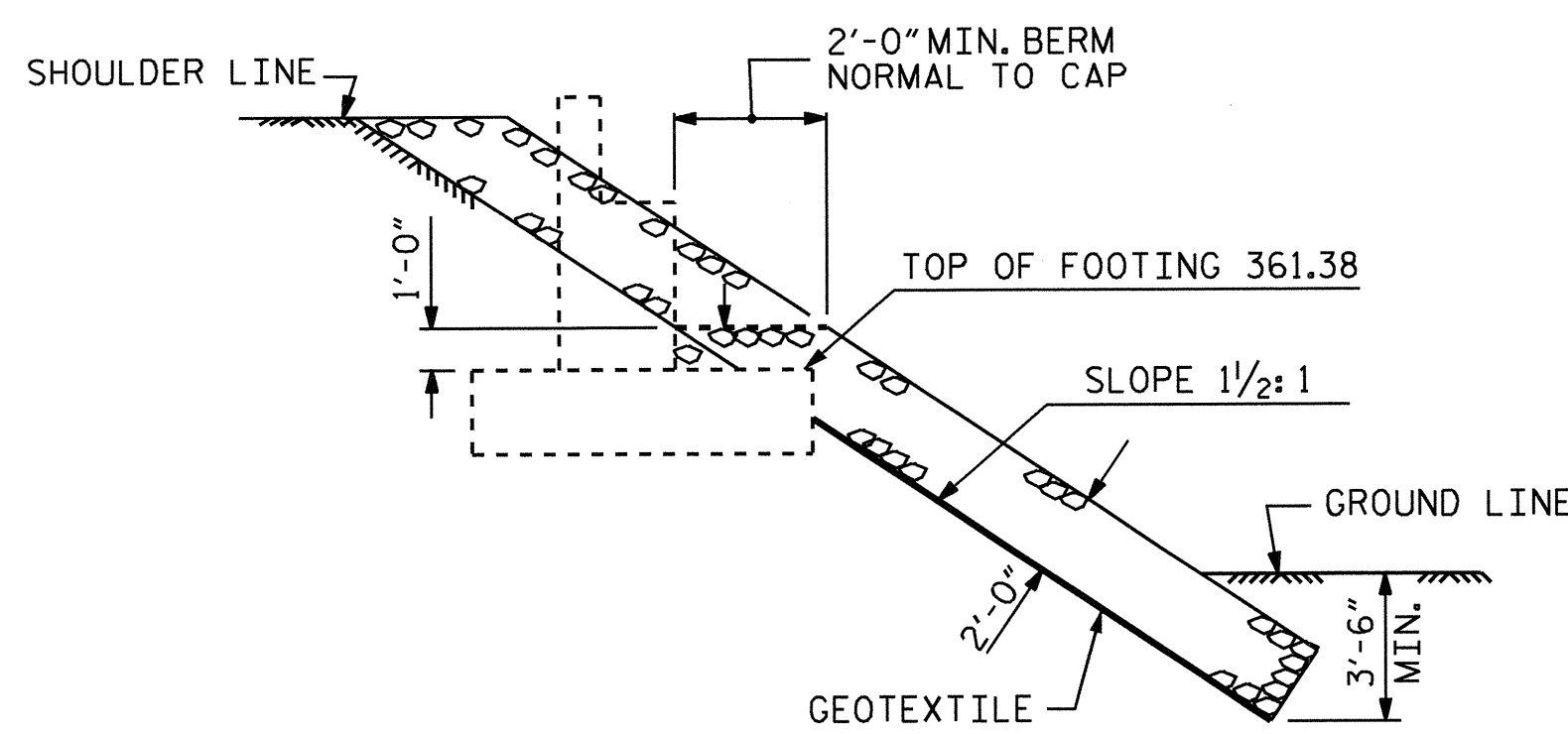


PLAN OF RIP RAP

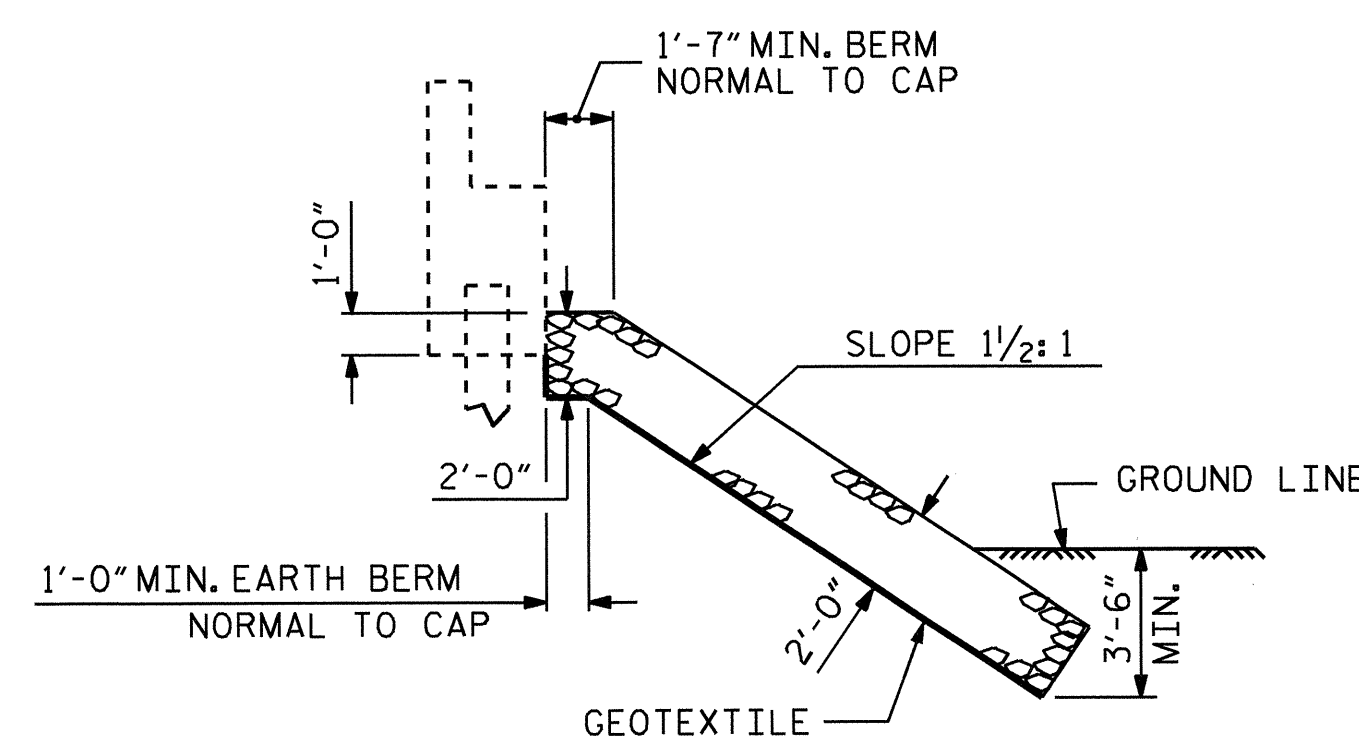
ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+29.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
ABUTMENT 1	114	130
END BENT 2	114	130



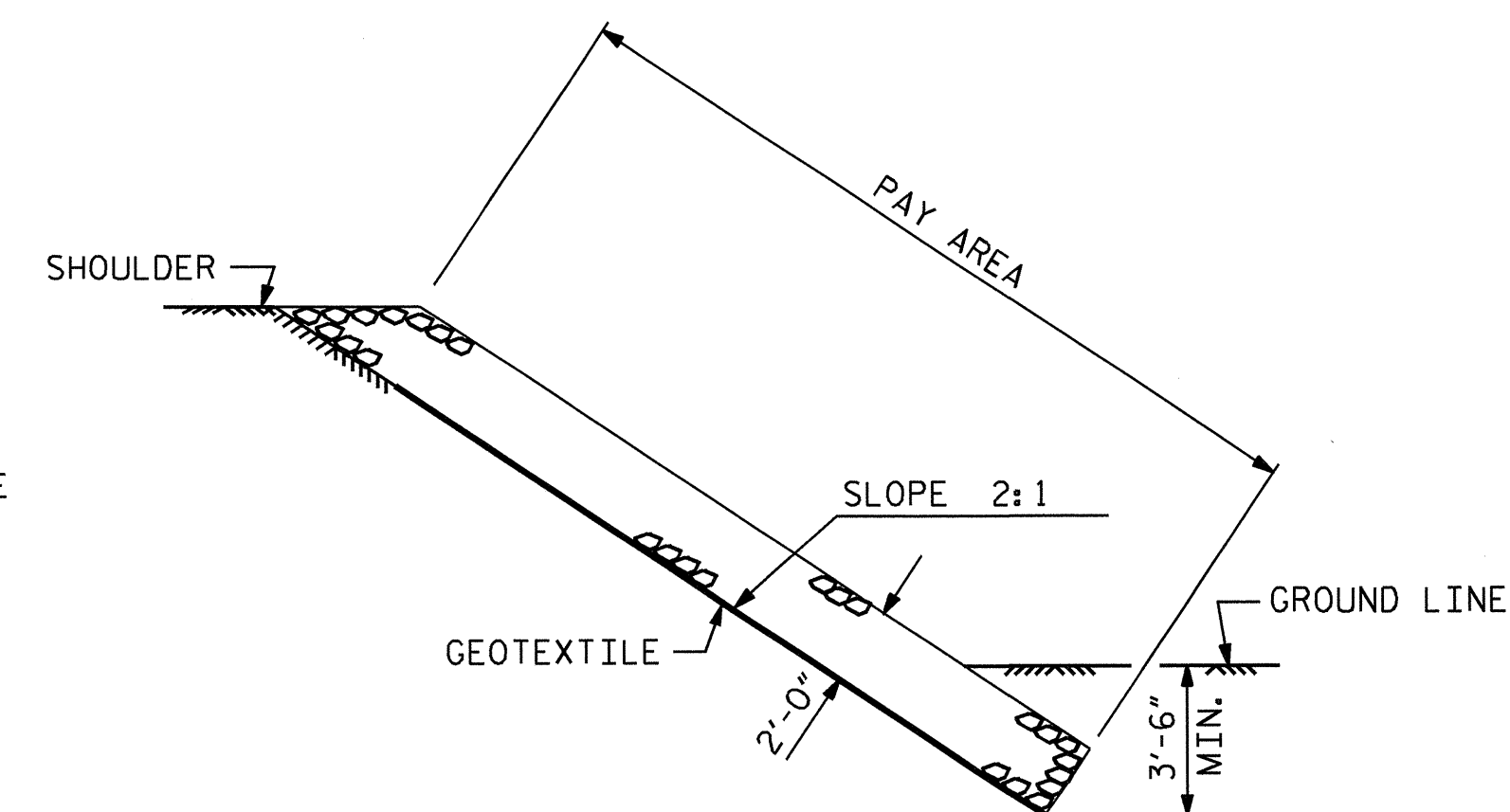
SECTION J-J



SECTION H-H



SECTION C-C
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4608
RANDOLPH COUNTY
STATION: 16+29.00 -L-

SHEET OF

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

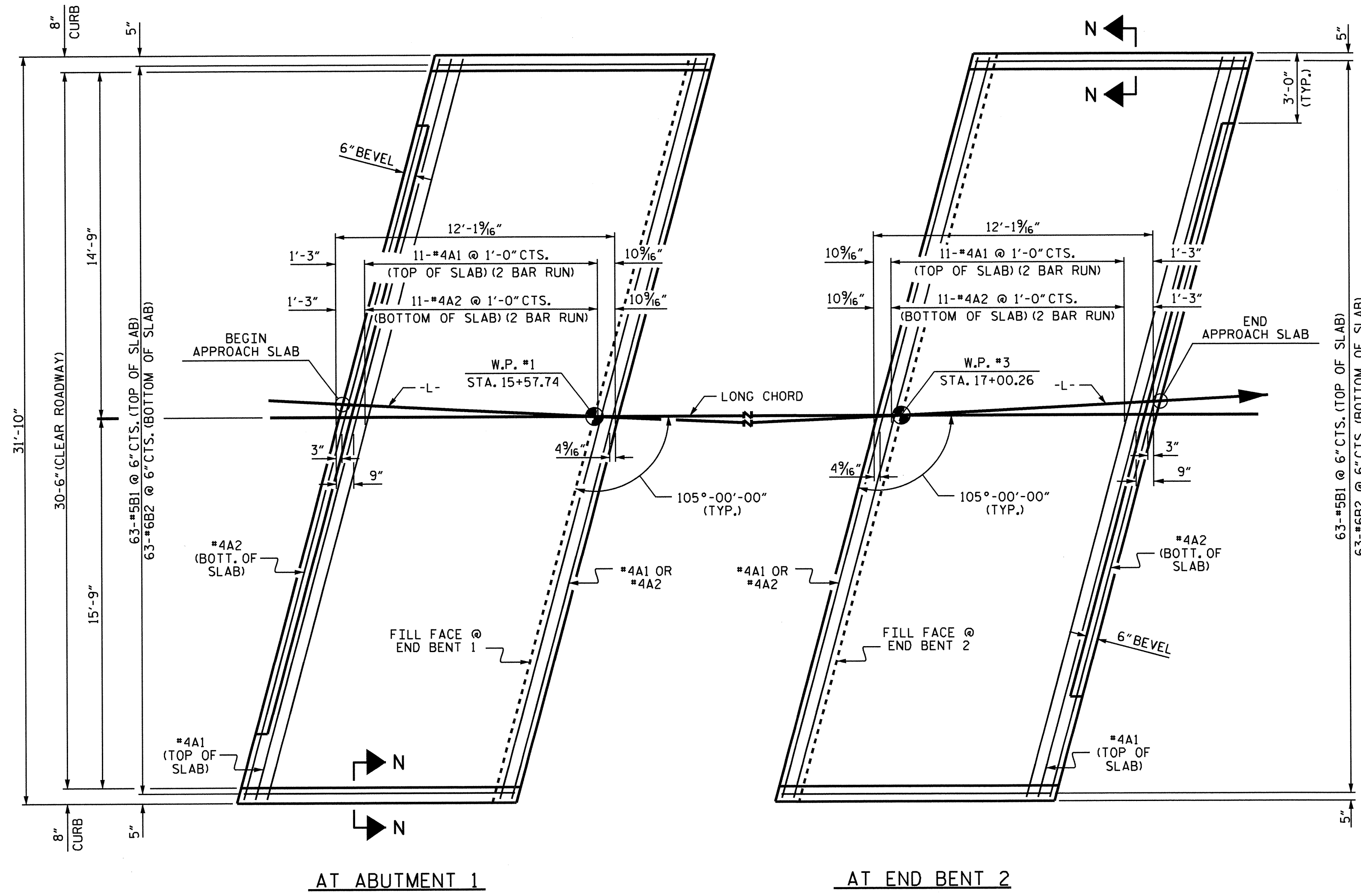


ASSEMBLED BY : Fr. LEA DATE : 5/2013
CHECKED BY : A.C. OUTLAW DATE : 5/2013
DRAWN BY : REK 1/84 REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84 REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

21-APR-2014 13:09
W:\Structures\Plans\Misc.draw\B4608.SD_RR.dgn
kalford

REVISIONS						SHEET NO. 5-26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 27
2			4			

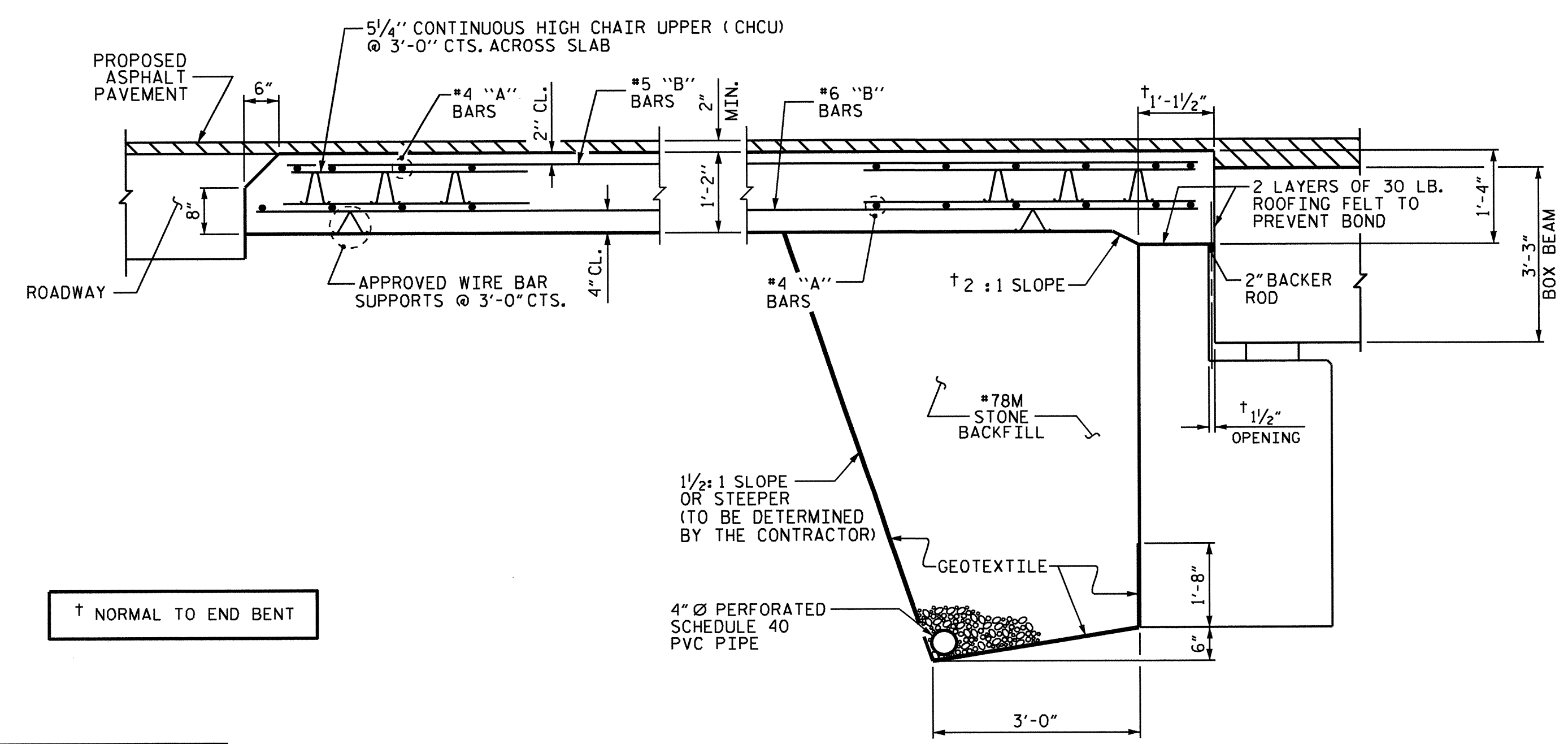
STD. NO. RR1 (Sh+ 3)



AT ABUTMENT 1 AT END BENT 2

PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

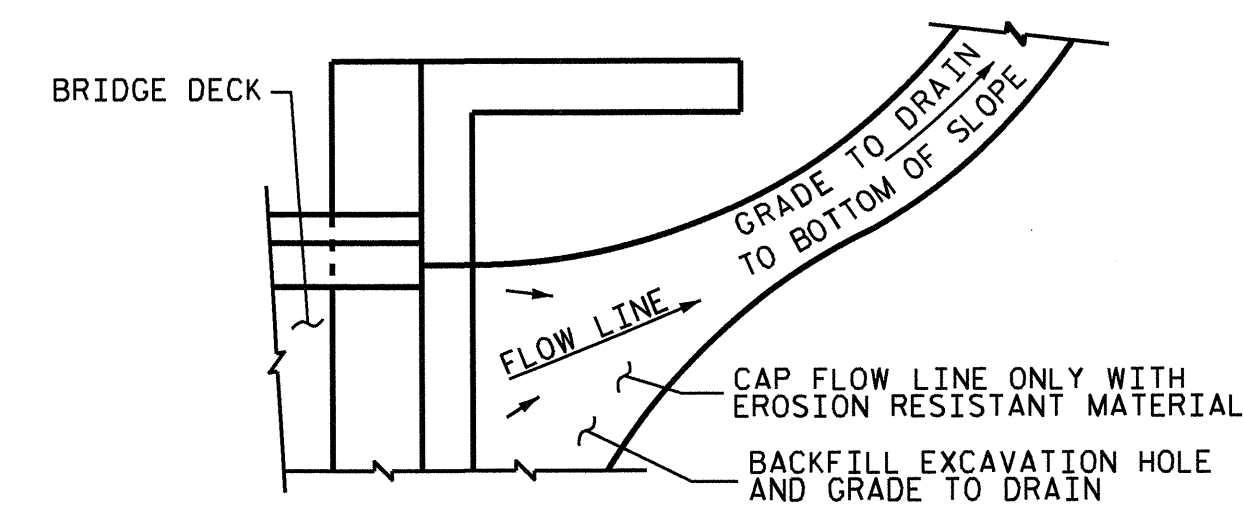
† NORMAL TO END BENT

ASSEMBLED BY : T. KIRSCHBAUM DATE : 4/3/13
 CHECKED BY : A.C. OUTLAW DATE : 4/18/13
 DRAWN BY : MAA 11/11
 CHECKED BY : AAC 11/11

21-APR-2014 13:08
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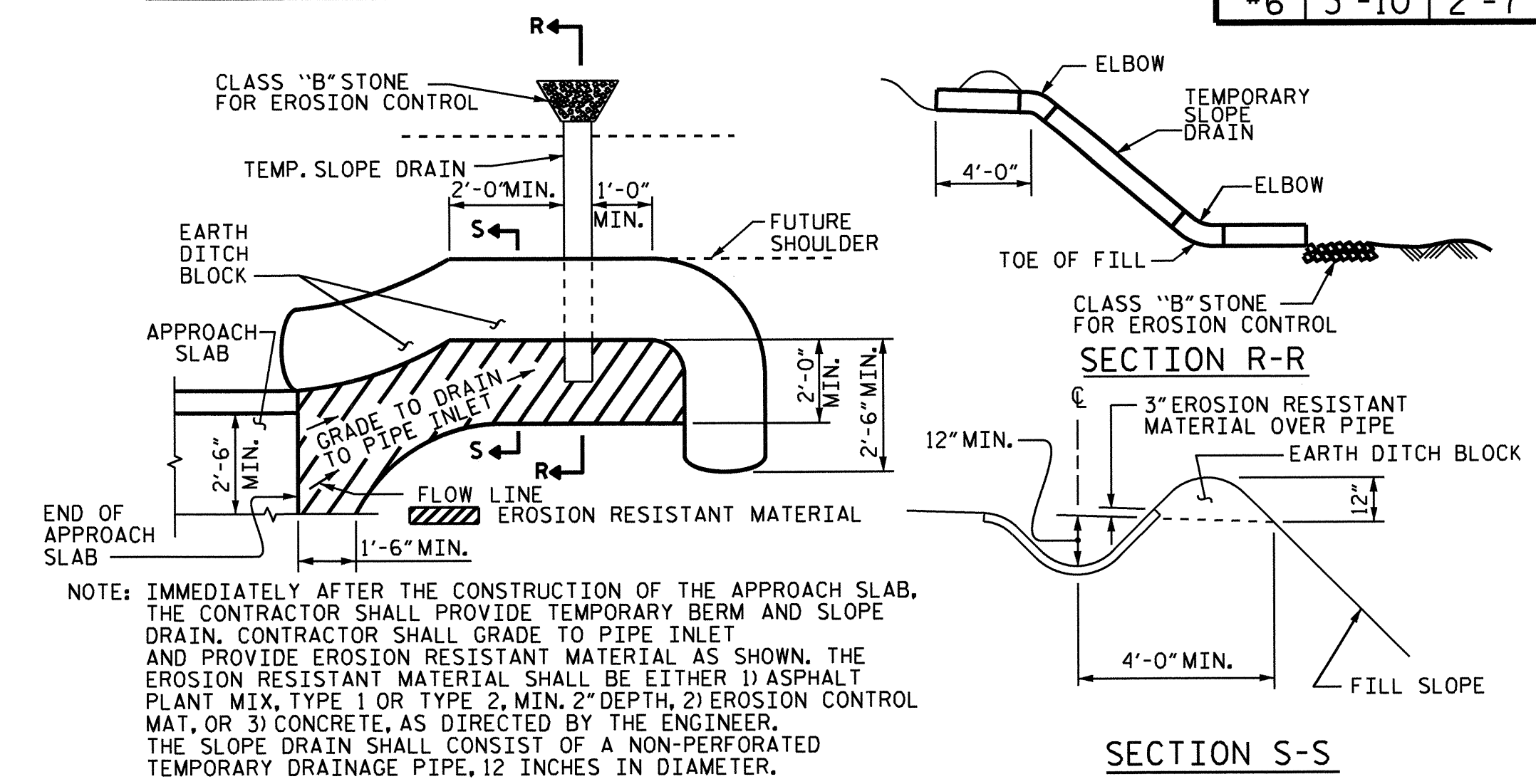
NOTES

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: 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.

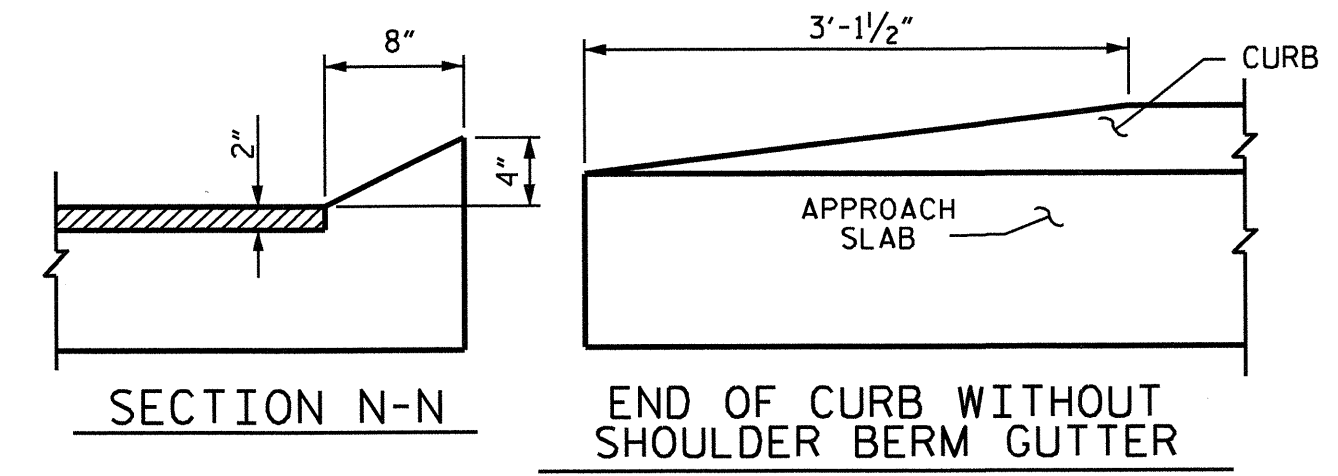
TEMPORARY DRAINAGE DETAIL



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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

BILL OF MATERIAL					
APPROACH SLAB AT ABUT. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	17'-4"	301
A2	26	#4	STR	17'-3"	300
*B1	63	#5	STR	11'-1"	728
B2	63	#6	STR	11'-7"	1096
REINFORCING STEEL				LBS.	1396
*EPOXY COATED REINFORCING STEEL				LBS.	1029
CLASS AA CONCRETE				C. Y.	17.0
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	17'-4"	301
A2	26	#4	STR	17'-3"	300
*B1	63	#5	STR	11'-1"	728
B2	63	#6	STR	11'-7"	1096
REINFORCING STEEL				LBS.	1396
*EPOXY COATED REINFORCING STEEL				LBS.	1029
CLASS AA CONCRETE				C. Y.	17.0

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

PROJECT NO. B-4608
 RANDOLPH COUNTY
 STATION: 16+29.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 BOX BEAM UNIT
 (SUB-REGIONAL TIER)
 105° SKEW

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

STD. NO. BAS-BB-33-105S

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