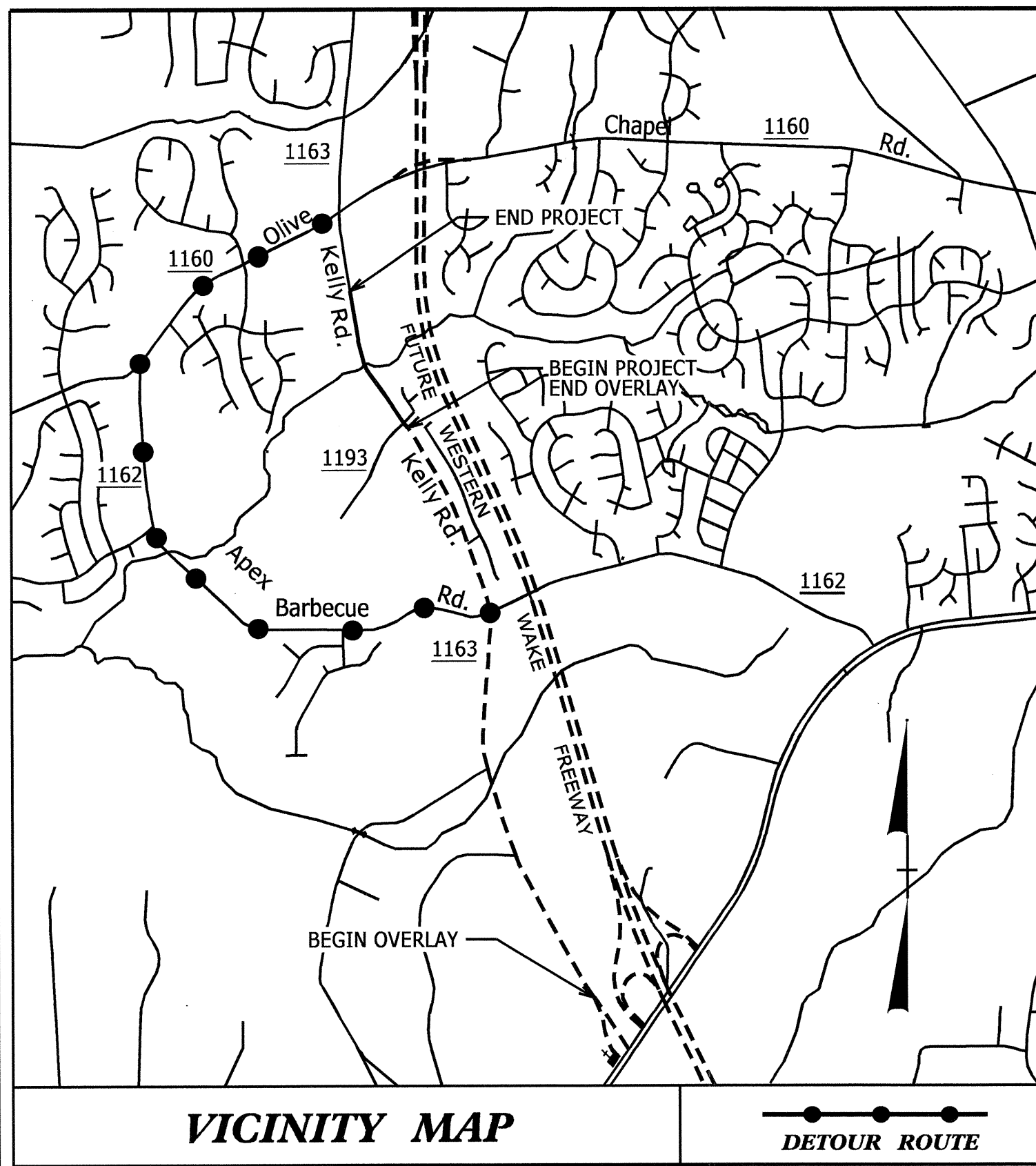


CONTRACT: C202573 TIP PROJECT: B-4991

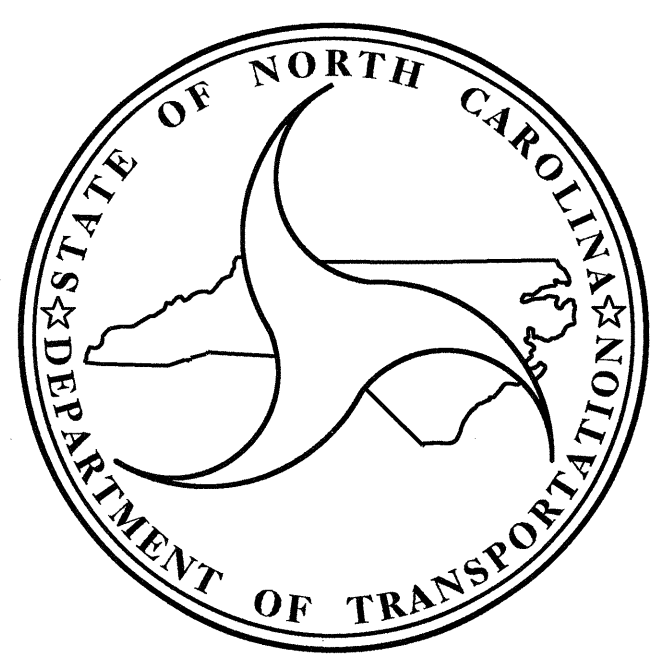
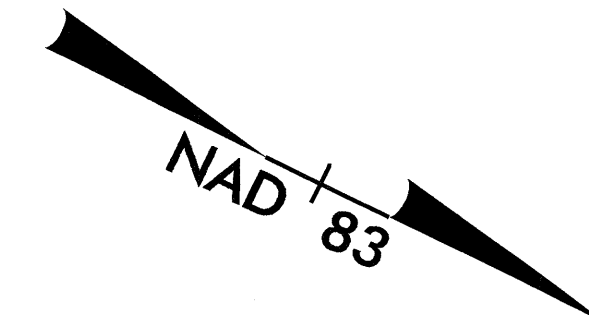
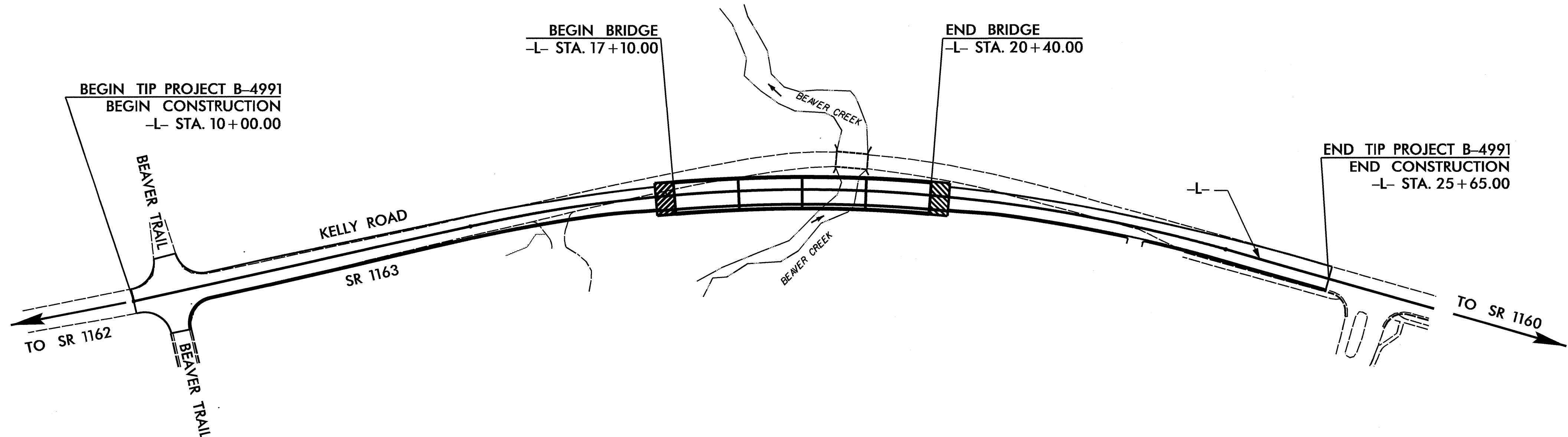


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

**LOCATION: BRIDGE NO. 359 OVER BEAVER CREEK
ON SR 1163 (KELLY ROAD)**
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4991		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40890.1.1	BRZ-1163(7)	P.E.	
40890.2.1	BRZ-1163(7)	RW	
40890.3.FD1	BRZ-1163(7)	CONST.	

STRUCTURE



DESIGN DATA

ADT 2003 =	6,500
ADT 2030 =	20,000
DHV =	3 %
D =	%
T =	6 % *
V =	50 MPH
* DUAL % + TTST %	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4991 =	0.233 MI.
LENGTH STRUCTURES TIP PROJECT B-4991 =	0.063 MI.
TOTAL LENGTH TIP PROJECT B-4991 =	0.296 MI.

Prepared In the Office of:
DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE:
FEBRUARY 18, 2014

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

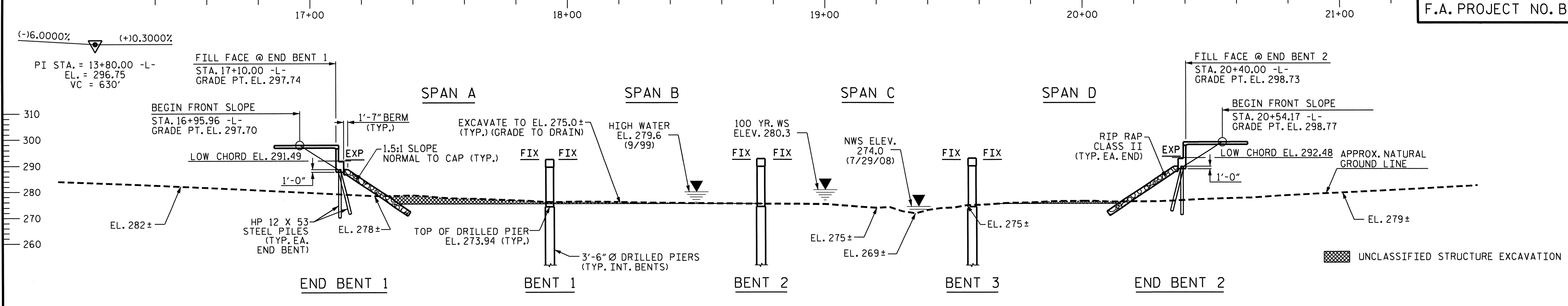
K. W. ALFORD, P.E.
PROJECT DESIGN ENGINEER

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER
P.E.
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

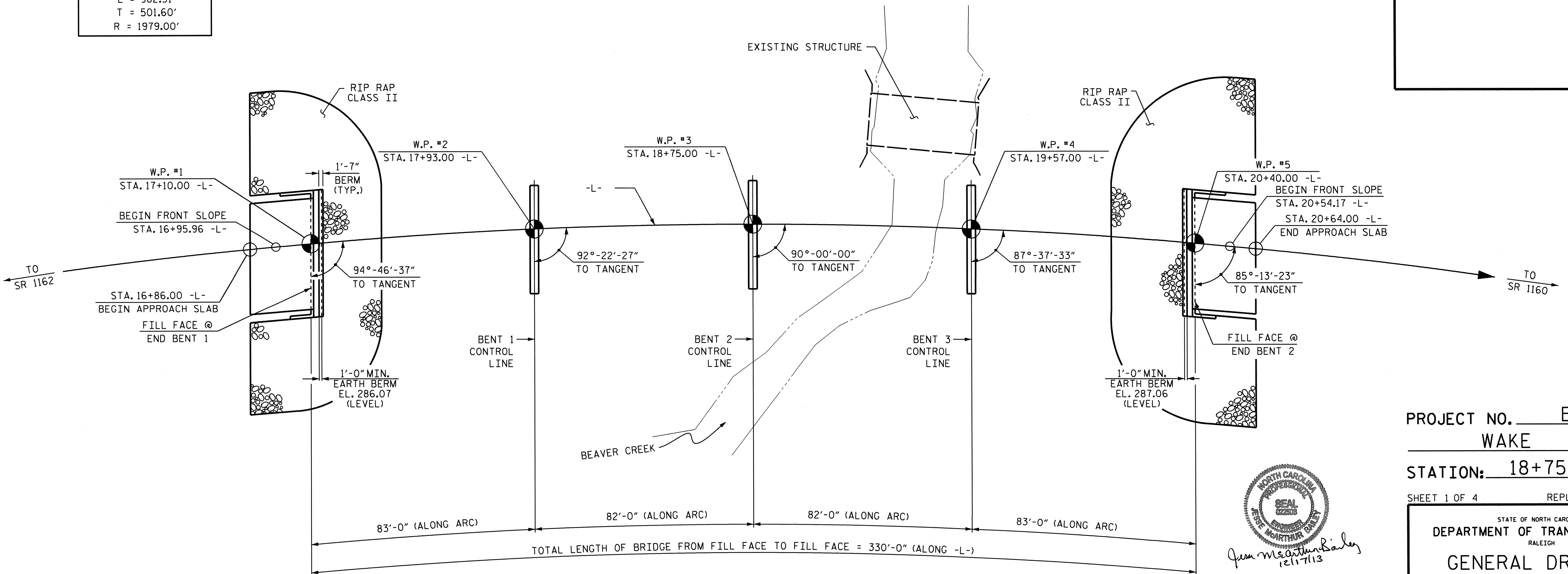
APPROVED
DIVISION ADMINISTRATOR _____ DATE _____



-L- CURVE DATA

PI STA. = 19+45.85
$\Delta = 28^{\circ}-26'-43.4''$ (RT.)
D = 2^{\circ}-53'-42.7''
L = 982.51'
T = 501.60'
R = 1979.00'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



DRAWN BY: William J. Parker DATE: 01/09/13
 CHECKED BY: A.C. OUTLAW DATE: 1/28/13

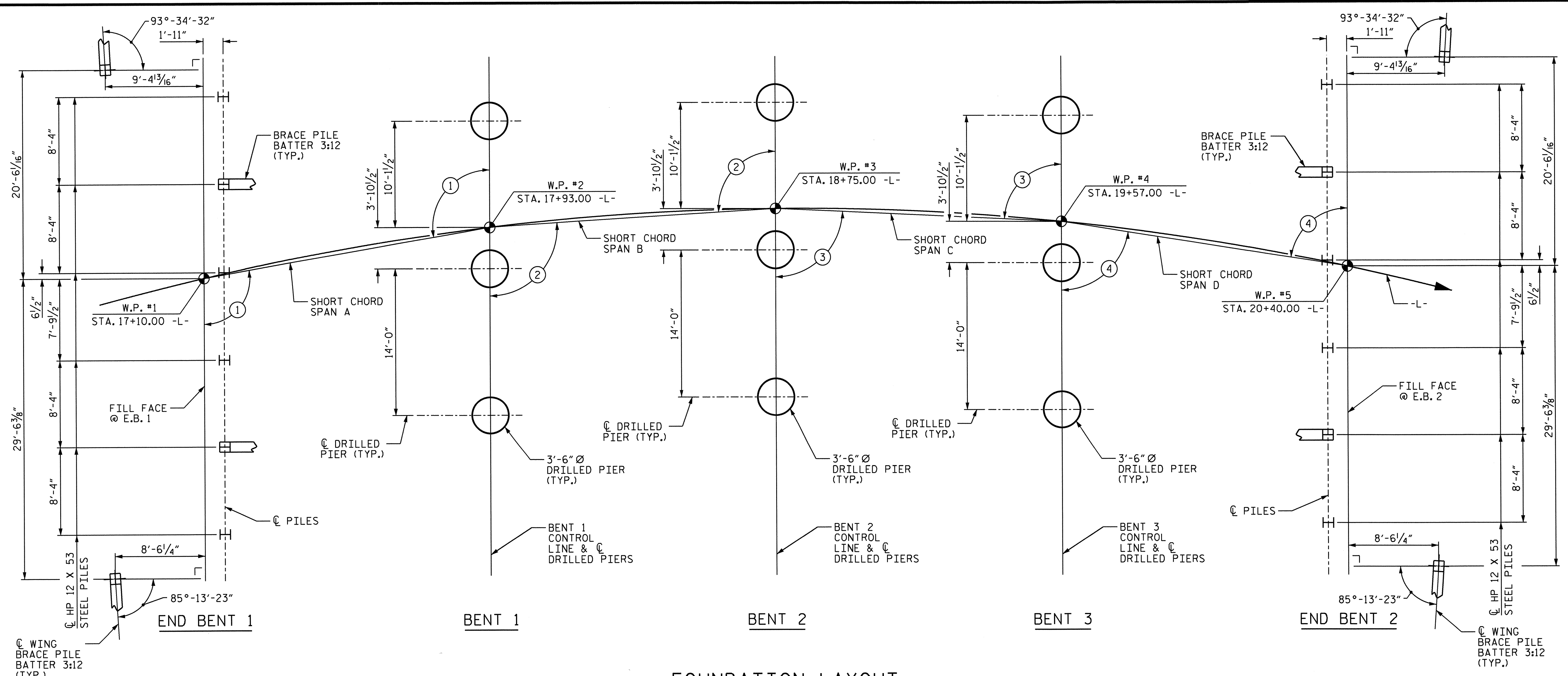


PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-
 SHEET 1 OF 4 REPLACES BRIDGE #359

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1163
 (KELLY RD.) OVER BEAVER CREEK
 BETWEEN SR 1162 AND SR 1160

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			48



ANGLE TO SHORT CHORD

- ① 93°-34'-32"
- ② 91°-11'-13"
- ③ 88°-48'-47"
- ④ 86°-25'-28"

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT THE BOTTOM OF THE CAP)

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.

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

DRILLED PIERS AT BENT 1 THROUGH BENT 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 380 TONS PER PIER EACH. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 264 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 262 FT (LEFT), 264 FT (CENTER), AND 264 FT (RIGHT), WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 3. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 258 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT 1 THROUGH BENT 3 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 266 FT FOR BENT 1, ELEVATION 264 FT FOR BENT 2, AND ELEVATION 262.4 FT FOR BENT 3, RESPECTIVELY.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 252 FT (LEFT), 252 FT (CENTER), AND 254 FT (RIGHT), RESPECTIVELY, AND WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 250 FT (LEFT), 254 FT (CENTER), AND 254 FT (RIGHT), RESPECTIVELY, AND WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT 3 TO A TIP ELEVATION NO HIGHER THAN 251 FT (LEFT), 251 FT (CENTER), AND 249 FT (RIGHT), RESPECTIVELY, AND WITH THE REQUIRED TIP RESISTANCE.

SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT TESTING.

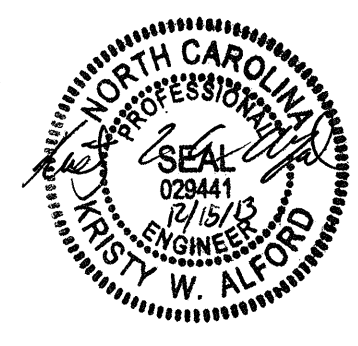
SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

DRILLED PIER EXCAVATIONS AT BENT 1 (LEFT) AND (CENTER), BENT 2 (LEFT), AND BENT 3 (RIGHT), RESPECTIVELY, WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.

THE SCOUR CRITICAL ELEVATION FOR BENT 1, BENT 2, AND BENT 3 ARE ELEVATION 264 FT, 262 FT, AND 260 FT, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

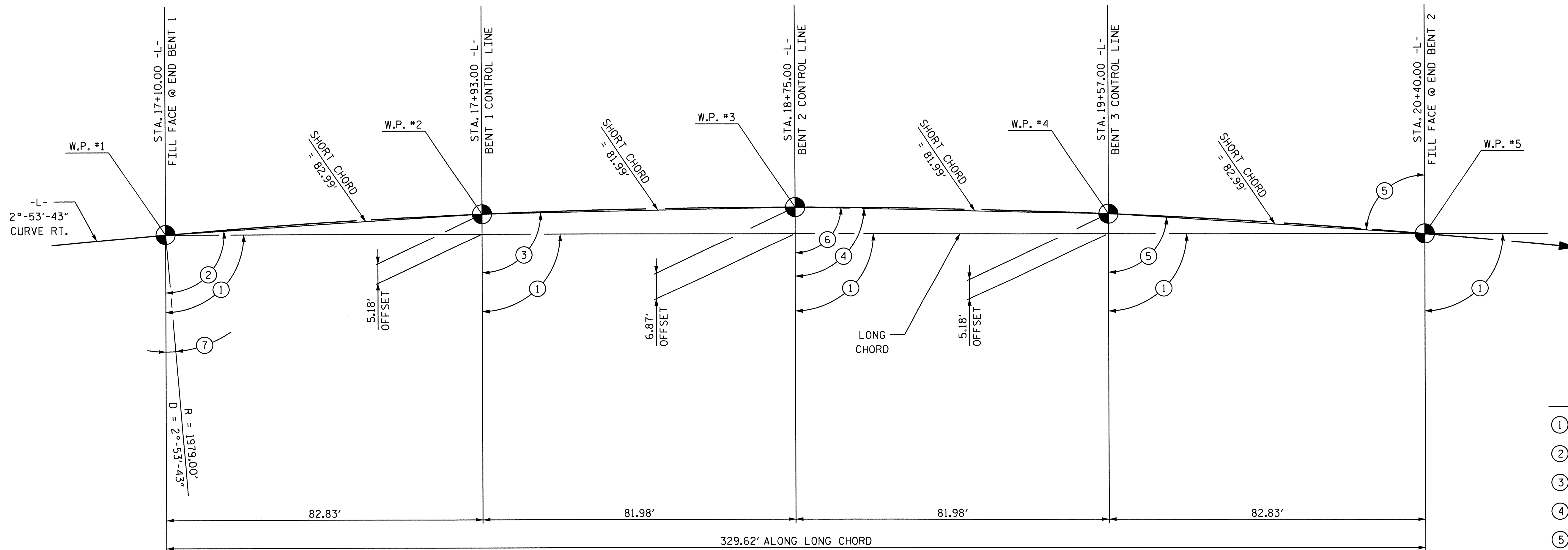
DRAWN BY : William J. Parker DATE : 01/09/13
 CHECKED BY : A.C. OUTLAW DATE : 1/28/13



PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 2 OF 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			48



LONG CHORD LAYOUT

NOTE: ALL BENTS ARE PARALLEL AND PERPENDICULAR TO LONG CHORD.

GENERAL DRAWING 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 SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

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 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.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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 18+75.00".

THE EXISTING STRUCTURE CONSISTING OF 2- 20'-3" SPANS OF TIMBER DECK ON A STEEL GIRDER FLOOR BEAM SYSTEM WITH A CLEAR ROADWAY OF 19.1' ON TIMBER CAP END BENTS WITH TIMBER POSTS AND CONCRETE SILLS AND AN INTERIOR BENT OF STEEL CAP WITH H PILES AND LOCATED 10' DOWNSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

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.

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 ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

ANGLES

- ① 90°-00'-00"
- ② 93°-34'-32"
- ③ 91°-11'-13"
- ④ 88°-48'-47"
- ⑤ 86°-25'-28"
- ⑥ 90°-00'-00" TANGENT TO CURVE
- ⑦ 4°-46'-37"

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 1163
 (KELLY RD.) OVER BEAVER CREEK
 BETWEEN SR 1162 AND SR 1160



DRAWN BY : William J. Parker DATE : 01/09/13
 CHECKED BY : A.C. OUTLAW DATE : 1/28/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			48

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIER	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	TWO BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 3'-3/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS		
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SO.FT.	SO.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	LIN.FT.	TONS	SO.YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE									13415	11271		LUMP SUM			16	1298.91			320.19	347.67	327.69		LUMP SUM	LUMP SUM	
END BENT 1											47.8		5819			6	150				605	675			
BENT 1		42.0	22.0	29.8									11174	2288											
BENT 2		32.0	32.0	31.8									11212	2298											
BENT 3		44.0	27.0	47.8									11612	2459											
END BENT 2											47.8		5819			6	150				670	745			
TOTAL	LUMP SUM	118.0	81.0	109.4	1	3	1	LUMP SUM	13415	11271	197.6	LUMP SUM	45636	7045	16	1298.91	12	300	320.19	347.67	327.69	1275	1420	LUMP SUM	LUMP SUM

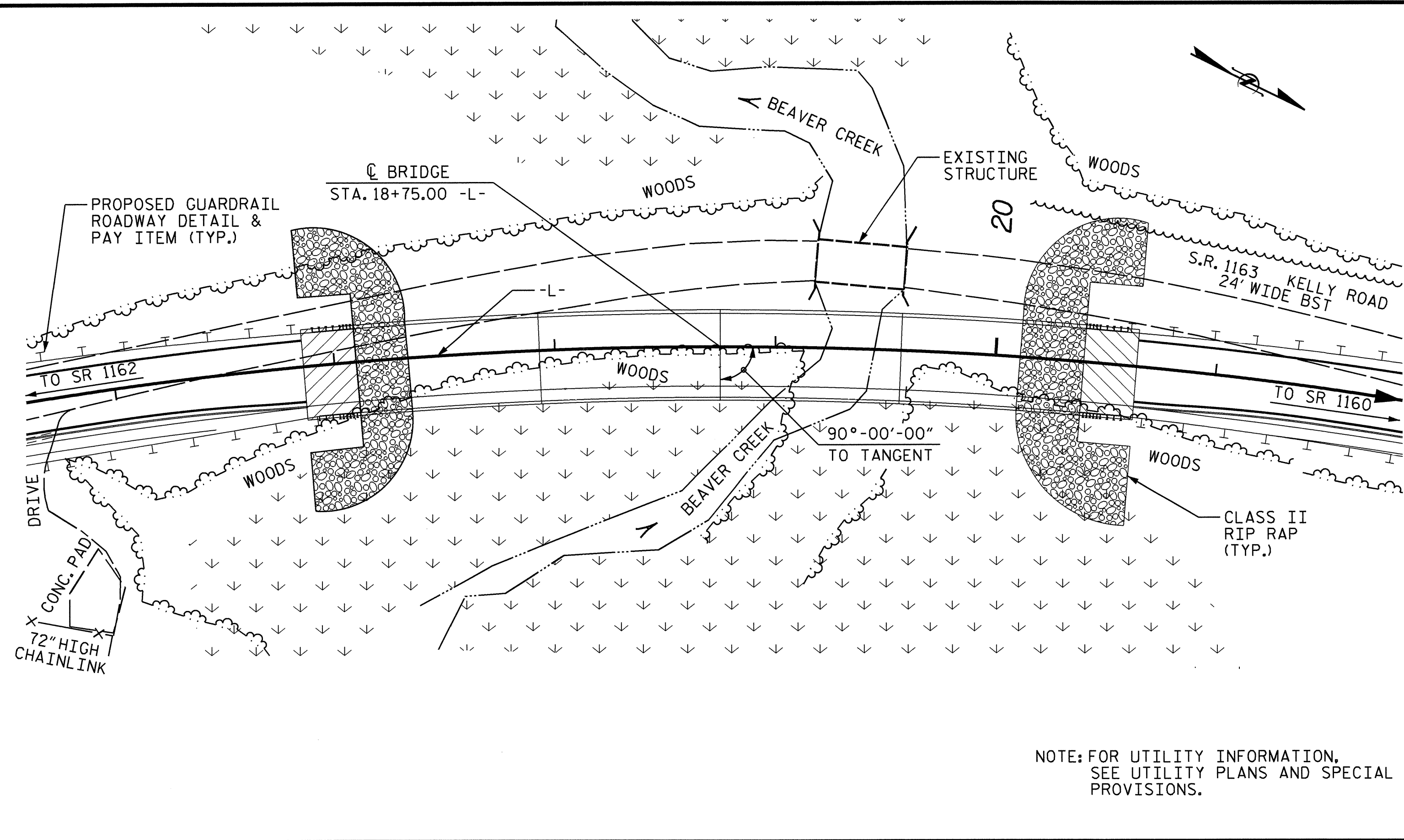
HYDRAULIC DATA

DESIGN DISCHARGE = 3360 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YR.
 DESIGN HIGHWATER ELEV. = 279.80 FT.
 DRAINAGE AREA = 5.8 SQ. MI.
 BASIC DISCHARGE (0100) = 3980 CFS
 BASIC HIGHWATER ELEV. = 280.30 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 62200 CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YR.
 OVERTOPPING FLOOD ELEV. = 298.00 FT.

B.M. - MONUMENT "GPS-7" WITH NORTHING = 722,206.11 FEET, EASTING = 2,030,837.98 FEET (NAD83 / 2001), ELEVATION = 350.21 FEET



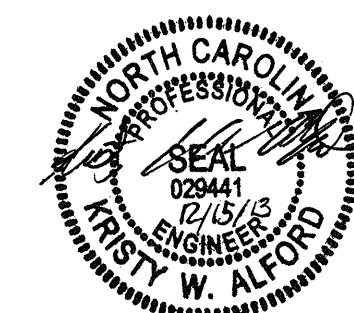
NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1163
 (KELLY RD.) OVER BEAVER CREEK
 BETWEEN SR 1162 AND SR 1160



DRAWN BY: William F. Parker DATE: 01/09/13
 CHECKED BY: A.C. OUTLAW DATE: 1/28/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			48

LOAD FACTORS:

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

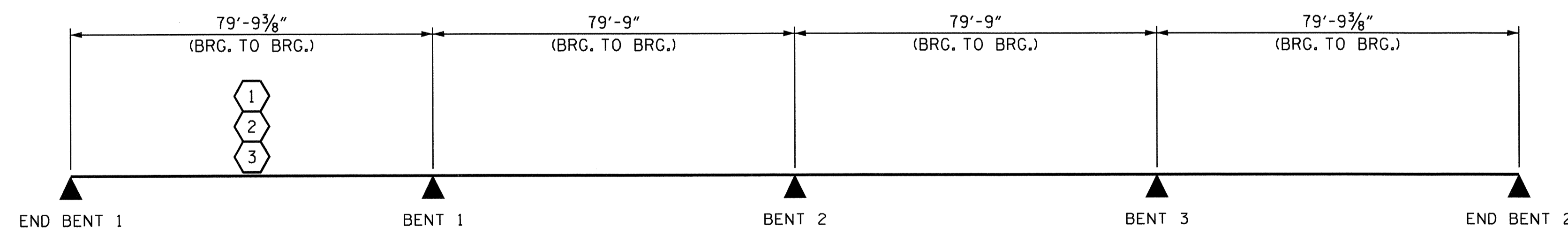
LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.04	--	1.75	0.915	1.67	A	EL	39.89	1.054	1.12	A	I	15.957	0.800	1.054	1.04	A	I	39.892		
	HL-93(0pr)	N/A	--	1.46	--	1.35	0.915	2.16	A	EL	39.89	1.054	1.45	A	I	15.957	N/A	--	--	--	--	--		
	HS-20(Inv)	36,000	2	1.38	49.6	1.75	0.915	2.22	A	EL	39.89	1.054	1.39	A	I	15.957	0.800	0.883	1.38	A	I	39.892		
	HS-20(0pr)	36,000	--	1.81	65.0	1.35	0.915	2.87	A	EL	39.89	1.054	1.81	A	I	15.957	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	3.17	42.7	1.40	0.915	6.36	A	EL	39.89	1.054	4.13	A	I	15.957	0.800	0.883	3.17	A	I	39.892	
		SNGARBS2	20,000	--	2.34	46.7	1.40	0.915	4.70	A	EL	39.89	1.054	2.94	A	I	15.957	0.800	0.883	2.34	A	I	39.892	
		SNAGRIS2	22,000	--	2.2	48.4	1.40	0.915	4.43	A	EL	39.89	1.054	2.73	A	I	15.957	0.800	0.883	2.20	A	I	39.892	
		SNCOTTS3	27,250	--	1.58	42.9	1.40	0.915	3.17	A	EL	39.89	1.054	2.06	A	I	15.957	0.800	0.883	1.58	A	I	39.892	
		SNAGGRS4	34,925	--	1.31	45.6	1.40	0.915	2.63	A	EL	39.89	1.054	1.71	A	I	15.957	0.800	0.883	1.31	A	I	39.892	
		SNS5A	35,550	--	1.28	45.4	1.40	0.915	2.57	A	EL	39.89	1.054	1.74	A	I	15.957	0.800	0.883	1.28	A	I	39.892	
		SNS6A	39,950	--	1.17	46.7	1.40	0.915	2.35	A	EL	39.89	1.054	1.59	A	I	15.957	0.800	0.883	1.17	A	I	39.892	
	SNS7B	42,000	--	1.11	46.7	1.40	0.915	2.24	A	EL	39.89	1.054	1.56	A	I	15.957	0.800	0.883	1.11	A	I	39.892		
	TTST	TNAGRIT3	33,000	--	1.43	47.0	1.40	0.915	2.86	A	EL	39.89	1.054	1.89	A	I	15.957	0.800	0.883	1.43	A	I	39.892	
		TNT4A	33,075	--	1.43	47.3	1.40	0.915	2.88	A	EL	39.89	1.054	1.84	A	I	15.957	0.800	0.883	1.43	A	I	39.892	
		TNT6A	41,600	--	1.17	48.5	1.40	0.915	2.34	A	EL	39.89	1.054	1.66	A	I	15.957	0.800	0.883	1.17	A	I	39.892	
		TNT7A	42,000	--	1.17	49.1	1.40	0.915	2.35	A	EL	39.89	1.054	1.63	A	I	15.957	0.800	0.883	1.17	A	I	39.892	
		TNT7B	42,000	--	1.21	50.6	1.40	0.915	2.42	A	EL	39.89	1.054	1.52	A	I	15.957	0.800	0.883	1.21	A	I	39.892	
		TNAGRIT4	43,000	--	1.15	49.4	1.40	0.915	2.31	A	EL	39.89	1.054	1.47	A	I	15.957	0.800	0.883	1.15	A	I	39.892	
TNAGT5A		45,000	--	1.09	48.9	1.40	0.915	2.18	A	EL	39.89	1.054	1.47	A	I	15.957	0.800	0.883	1.09	A	I	39.892		
TNAGT5B	45,000	3	1.08	48.3	1.40	0.915	2.16	A	EL	39.89	1.054	1.40	A	I	15.957	0.800	0.883	1.08	A	I	39.892			

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	



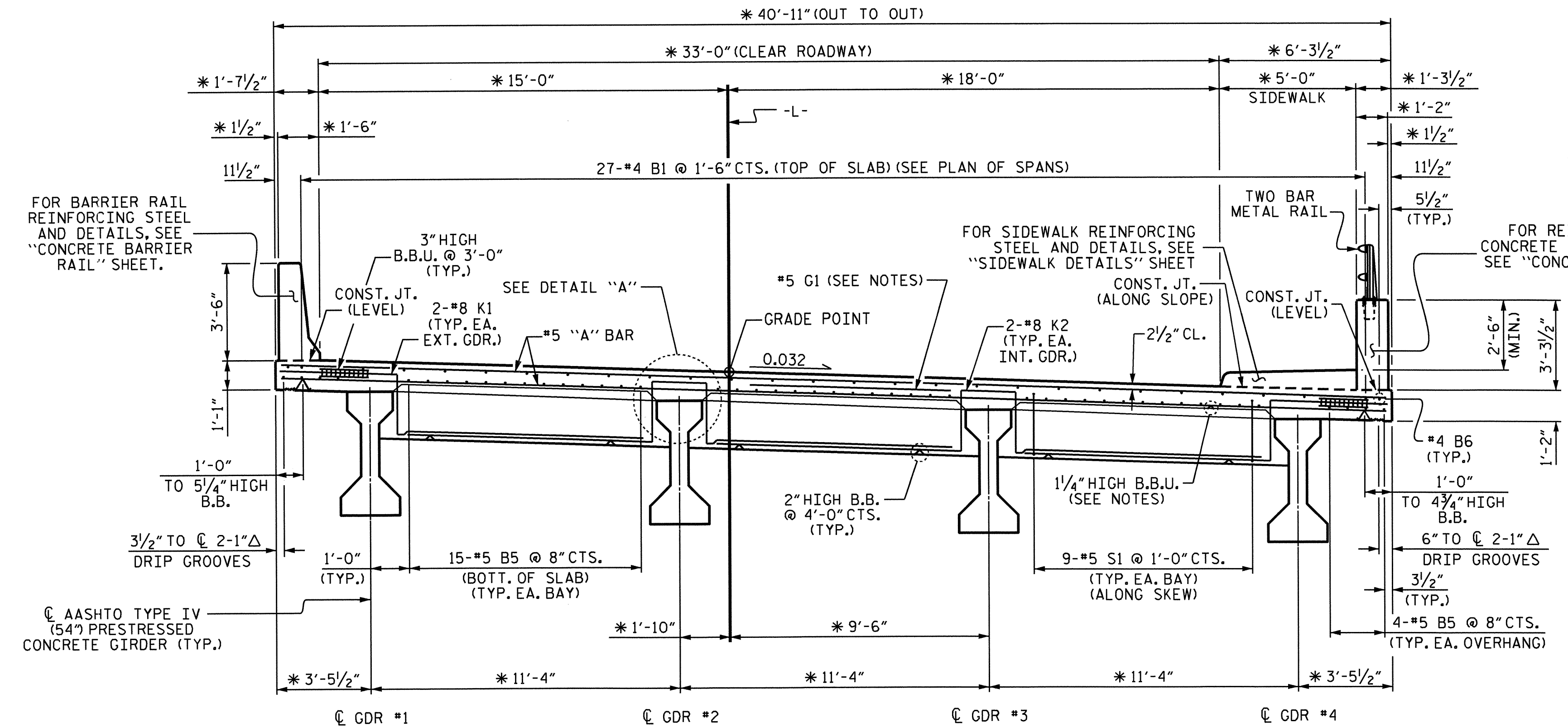
PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-



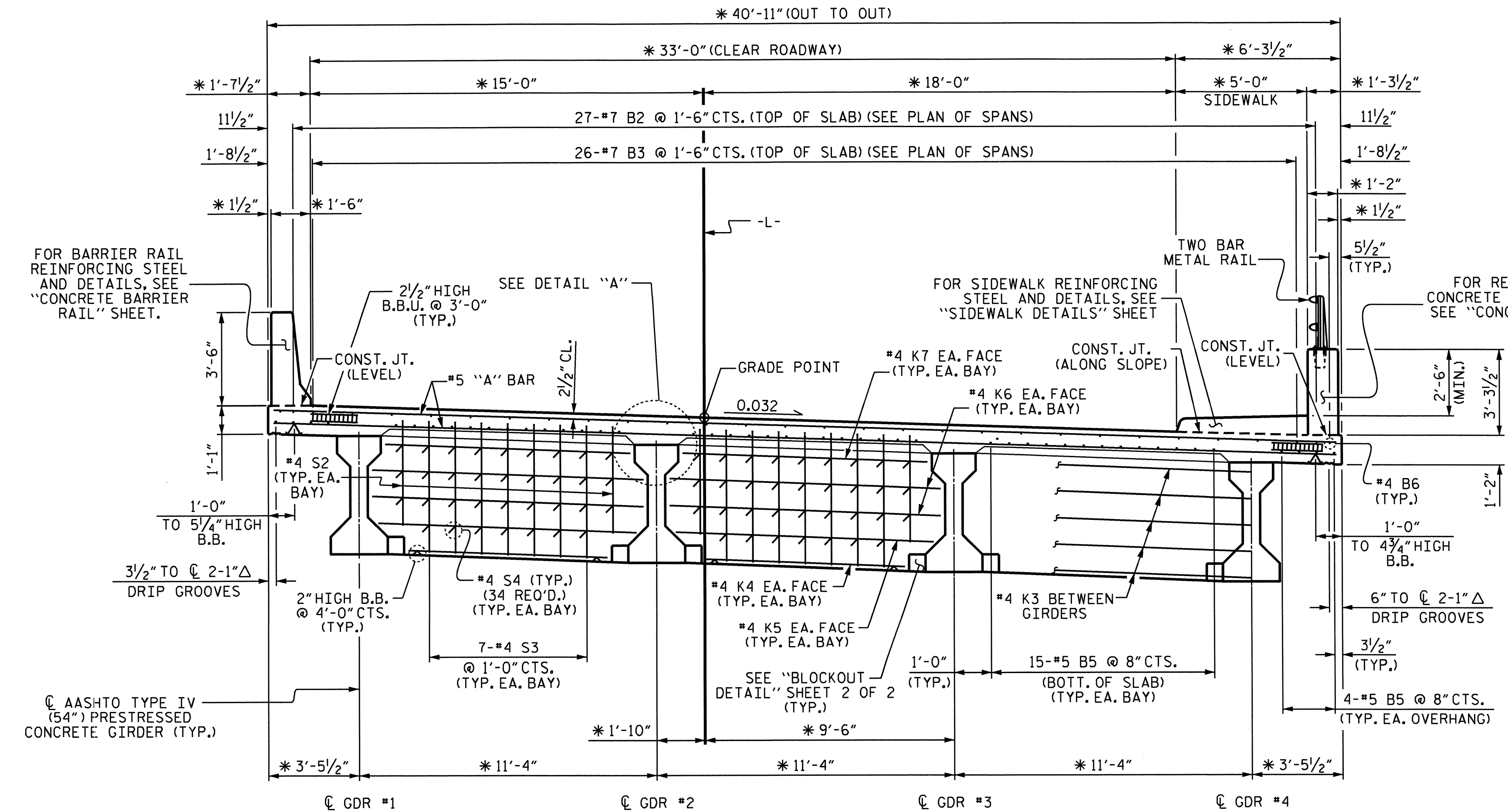
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS 48
2			4			

ASSEMBLED BY : A.C. OUTLAW DATE : 11/15/12
 CHECKED BY : Fr. LEA DATE : 11/12
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/11 MAA/GM



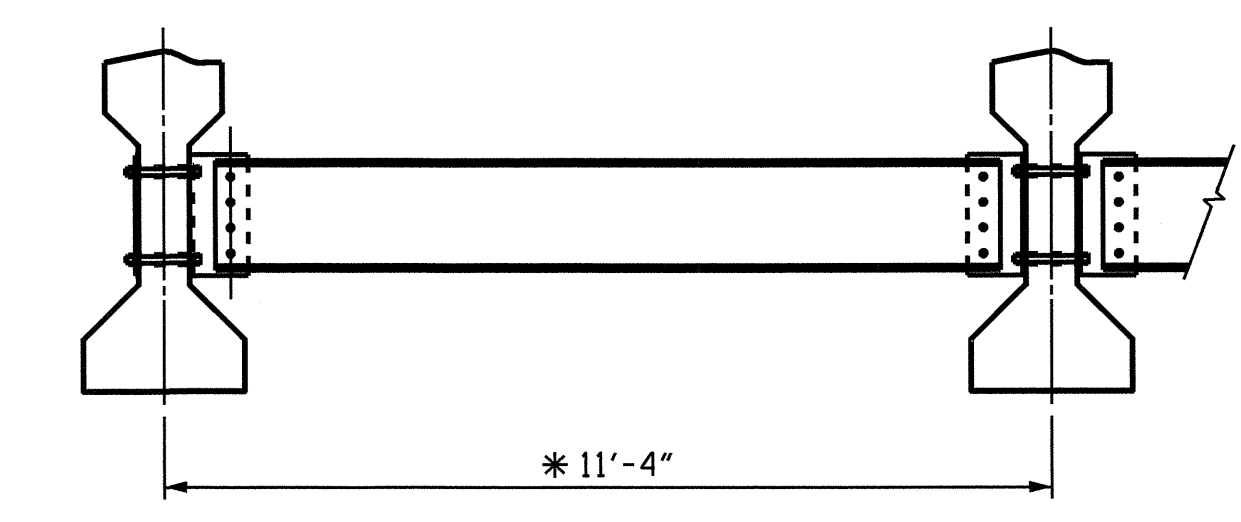
TYPICAL SECTION @ END BENT DIAPHRAGMS
* DIMENSIONS RADIAL THROUGH WORKPOINT



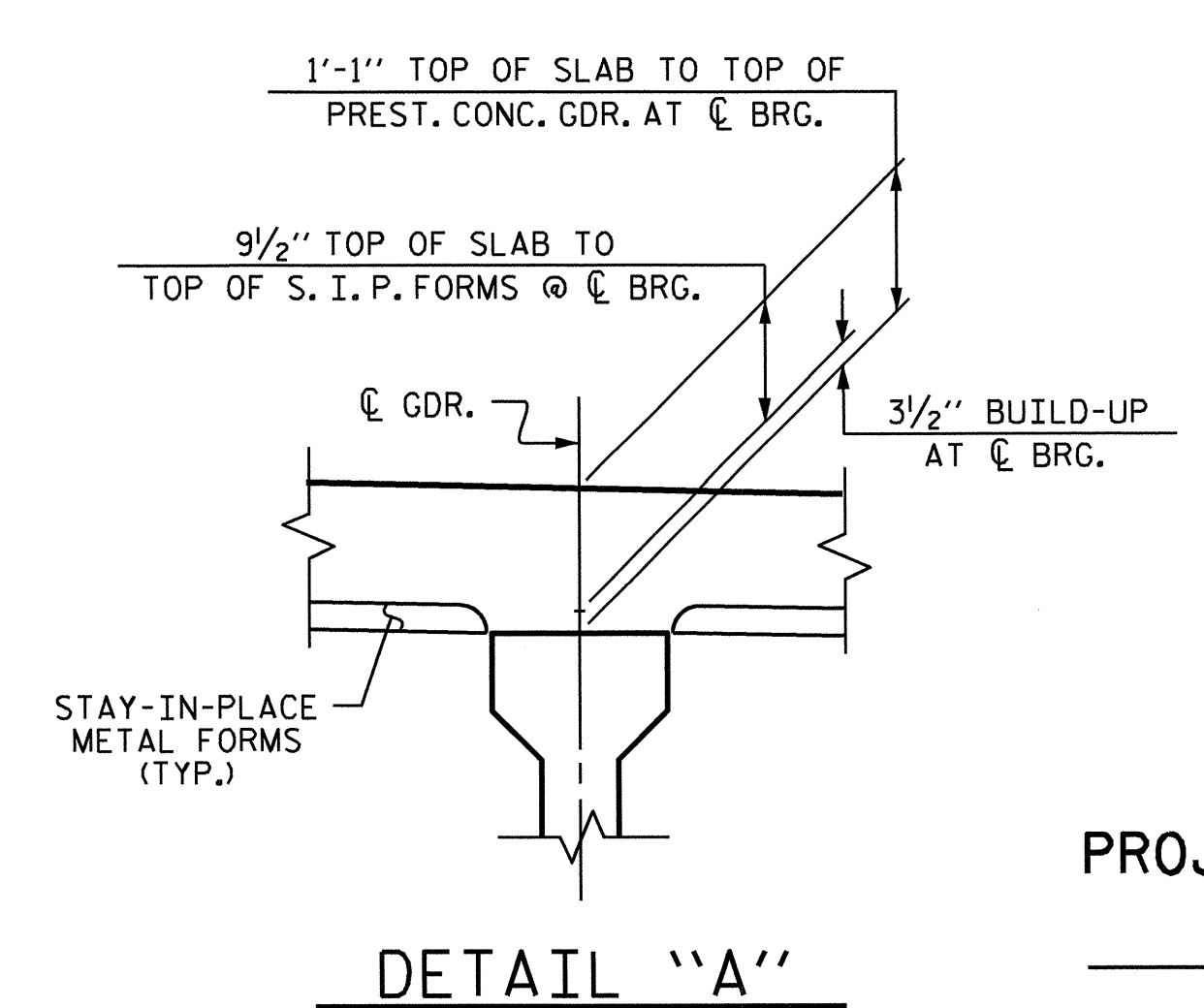
TYPICAL SECTION @ BENT DIAPHRAGMS
* DIMENSIONS RADIAL THROUGH WORKPOINT

NOTES

- PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.



PART SECTION @ INTERMEDIATE DIAPHRAGM
* RADIAL DIMENSION
(FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.)

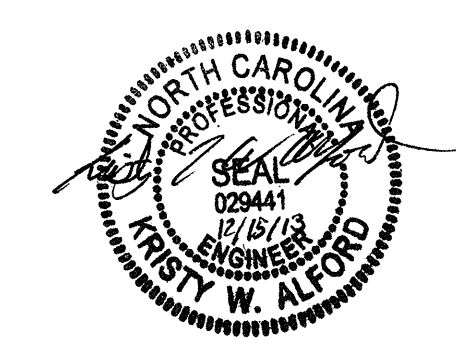


DETAIL "A"

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

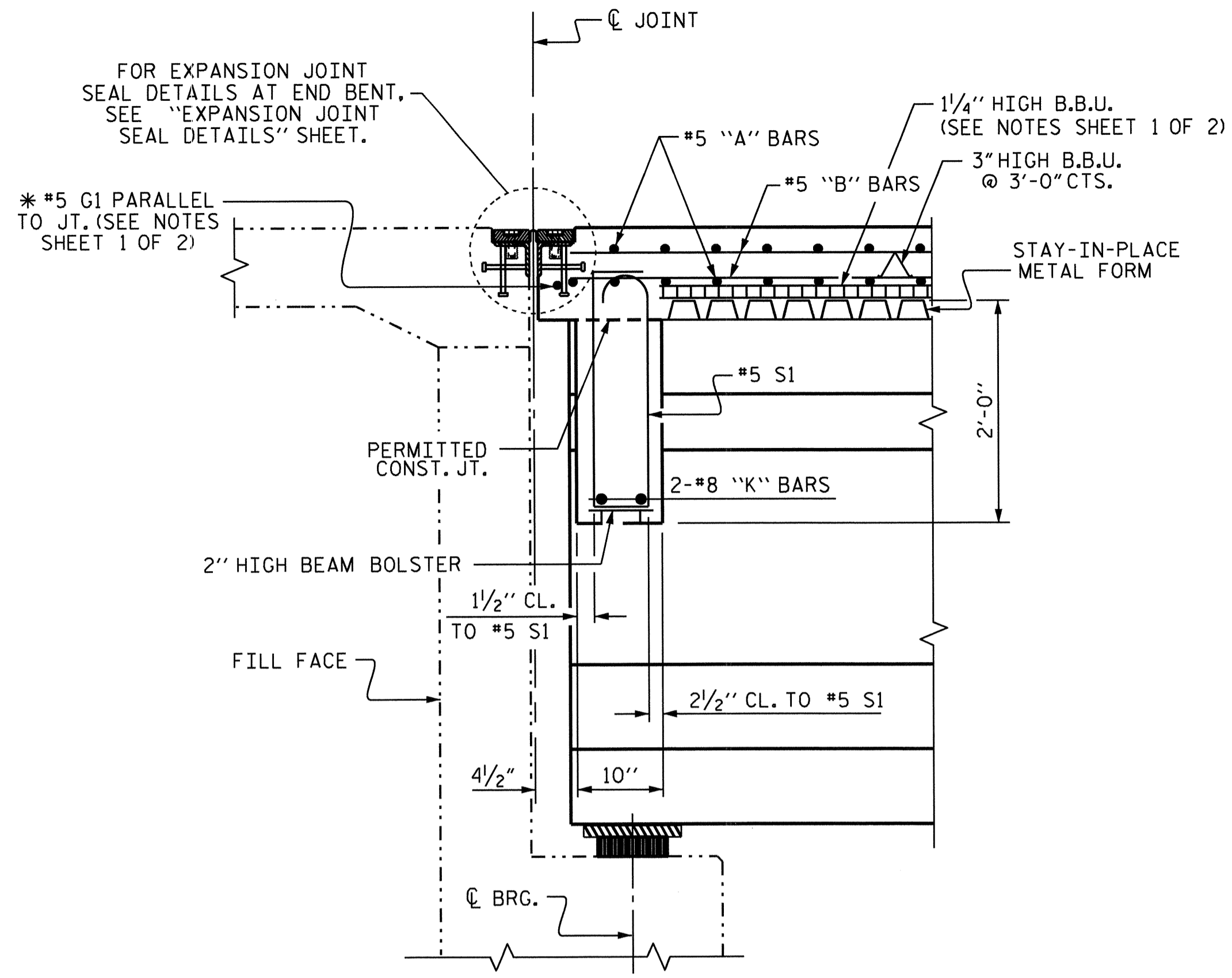
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION

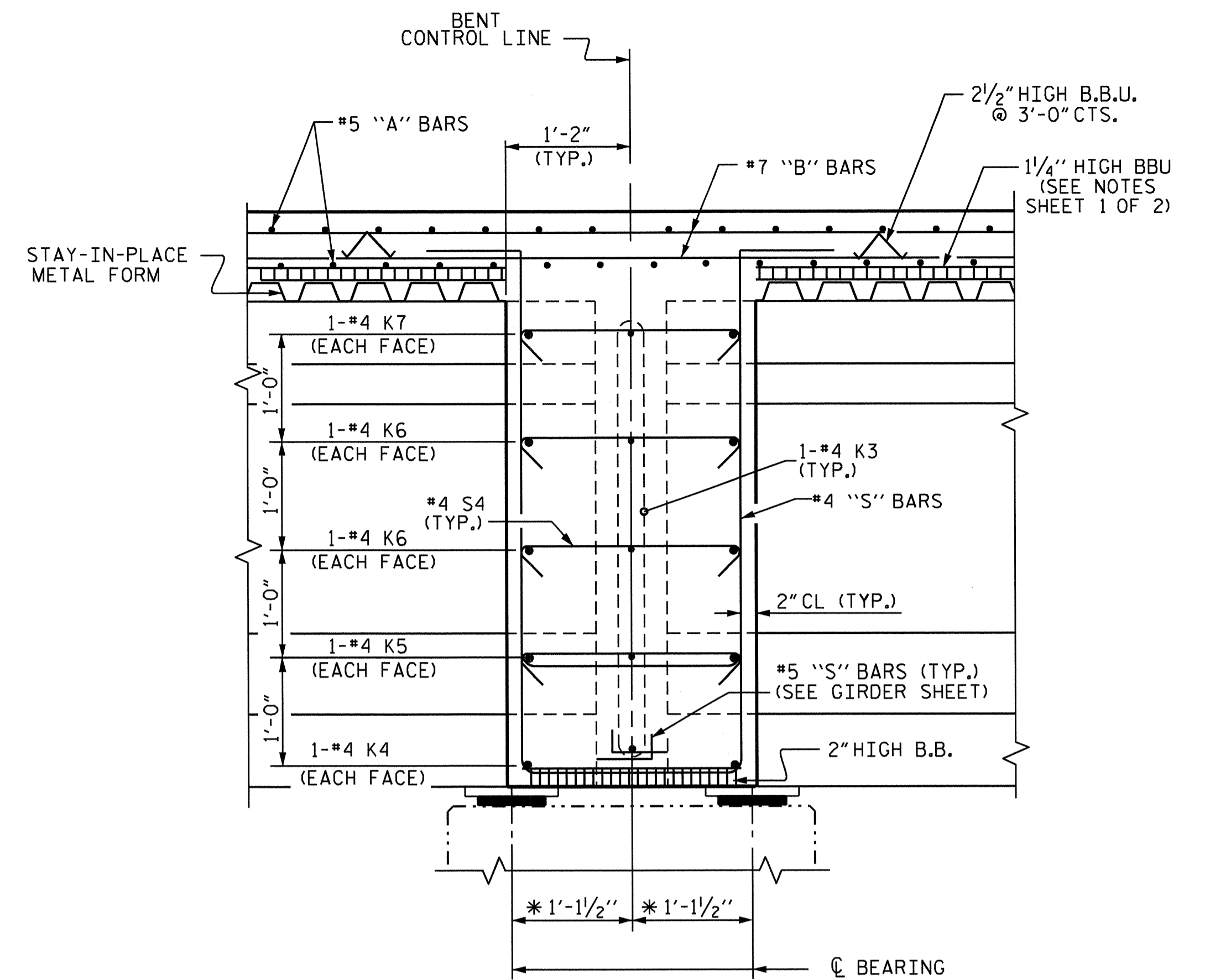


DRAWN BY : S. H. SOCKWELL DATE : 11/15/12
CHECKED BY : J. L. LAMBERT DATE : 12/12
DESIGN ENGINEER OF RECORD : A. C. OUTLAW DATE : 9/10/13

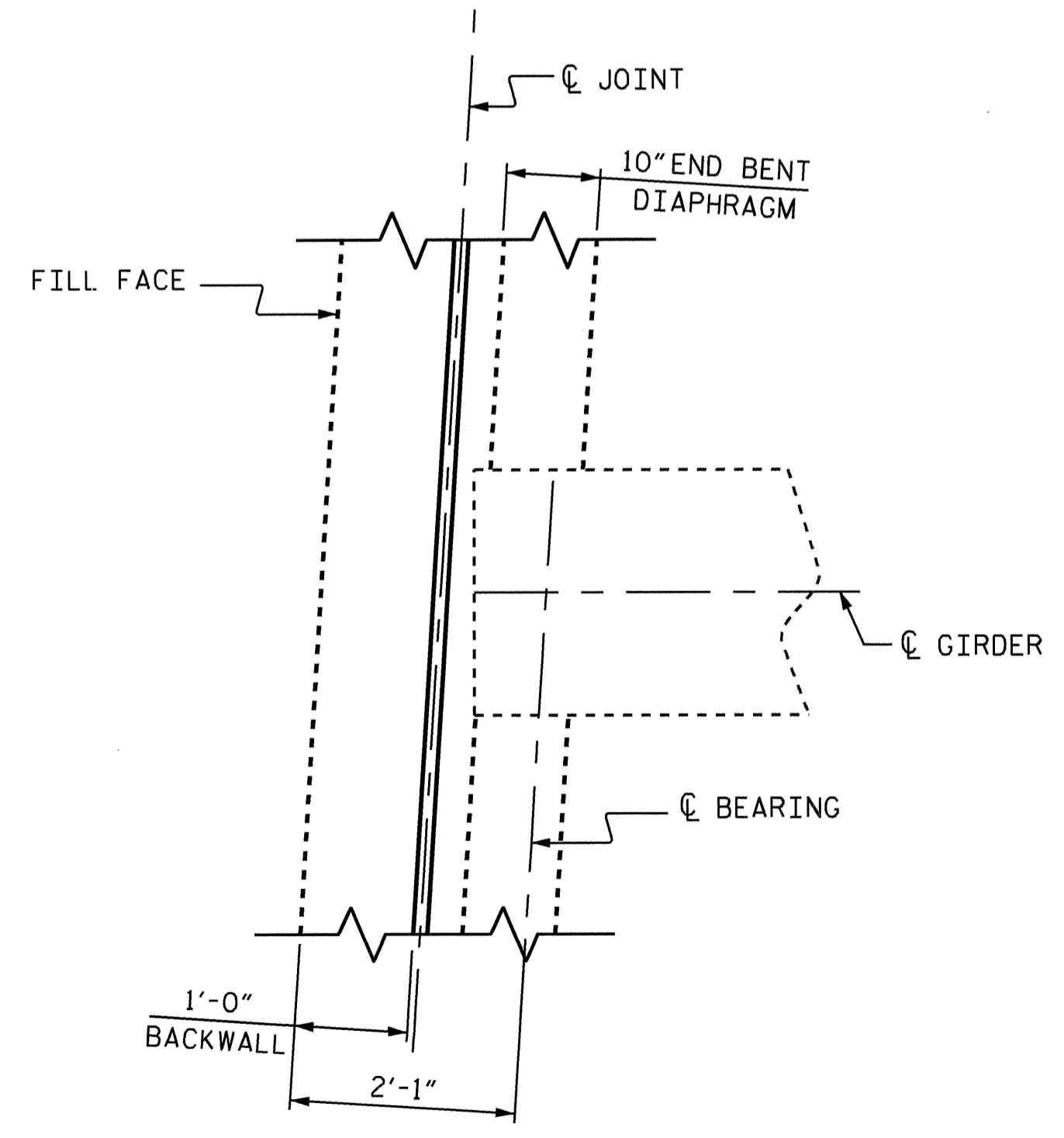
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			48



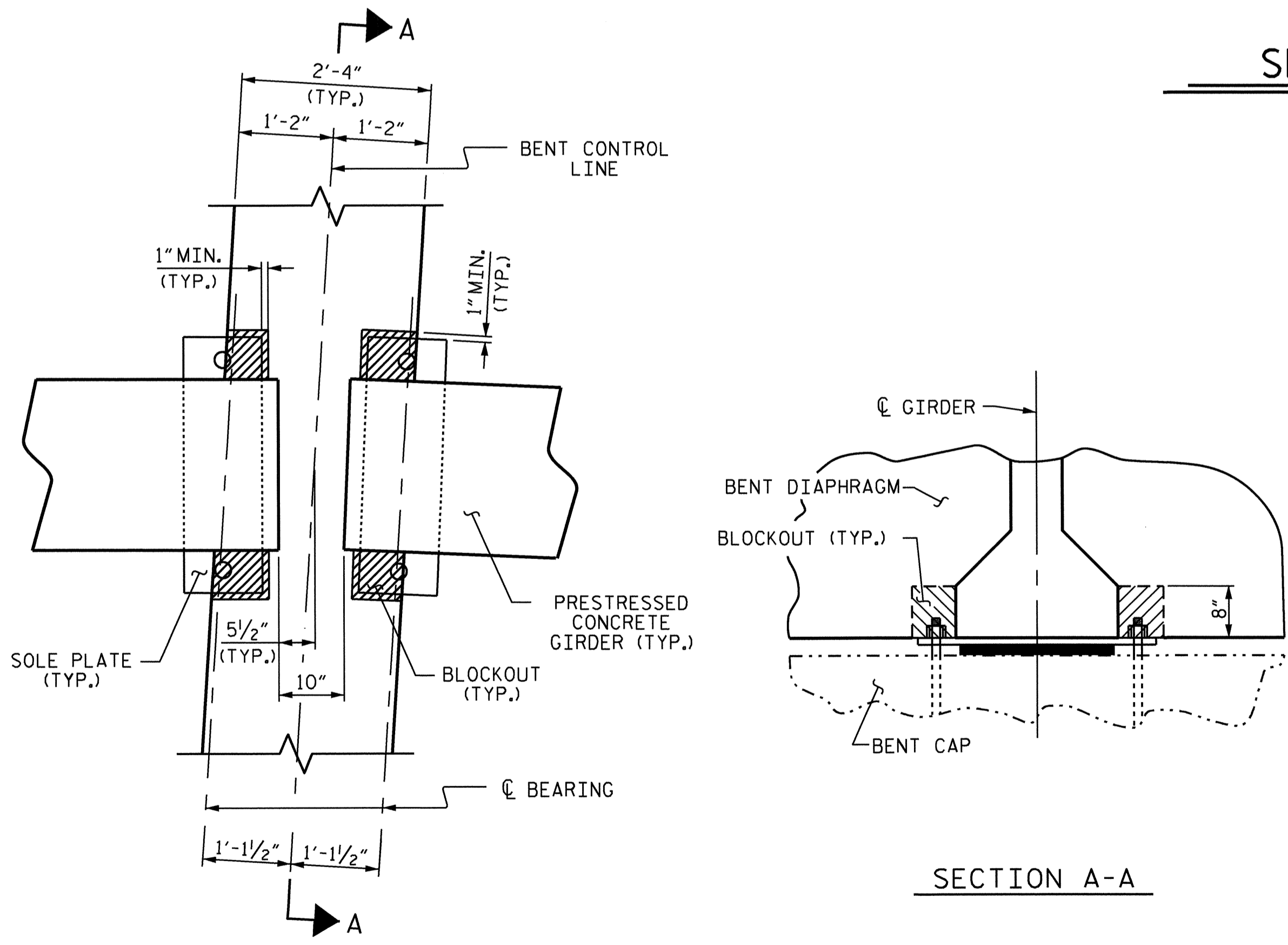
SECTION @ END BENT DIAPHRAGM



SECTION @ BENT DIAPHRAGM
* MEASURED ALONG C GIRDER



END BENT DIAPHRAGM



PLAN
BENT DIAPHRAGM BLOCK-OUT DETAIL



PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

DRAWN BY : S. H. SOCKWELL DATE : 11/15/12
 CHECKED BY : J. L. LAMBERT DATE : 12/12
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE : 9/10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			48

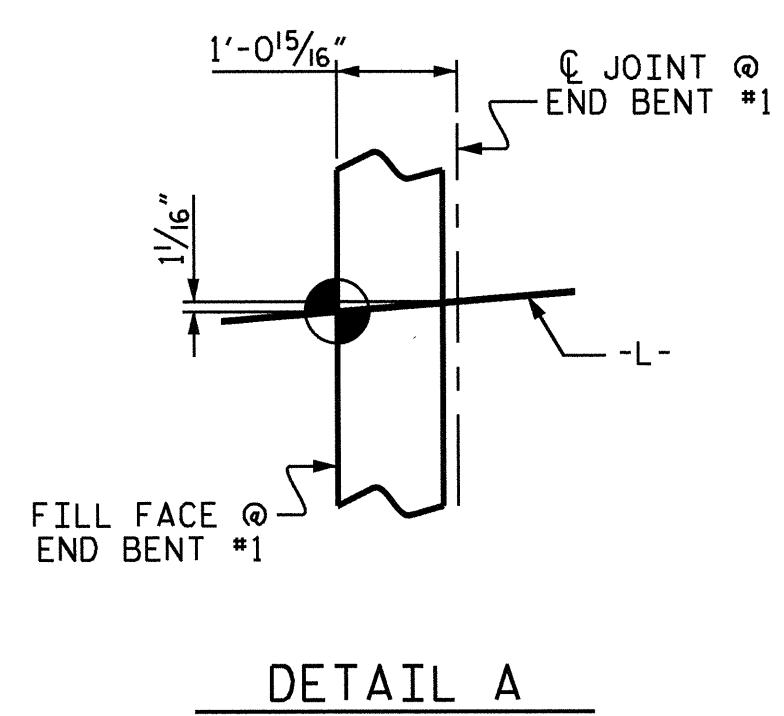
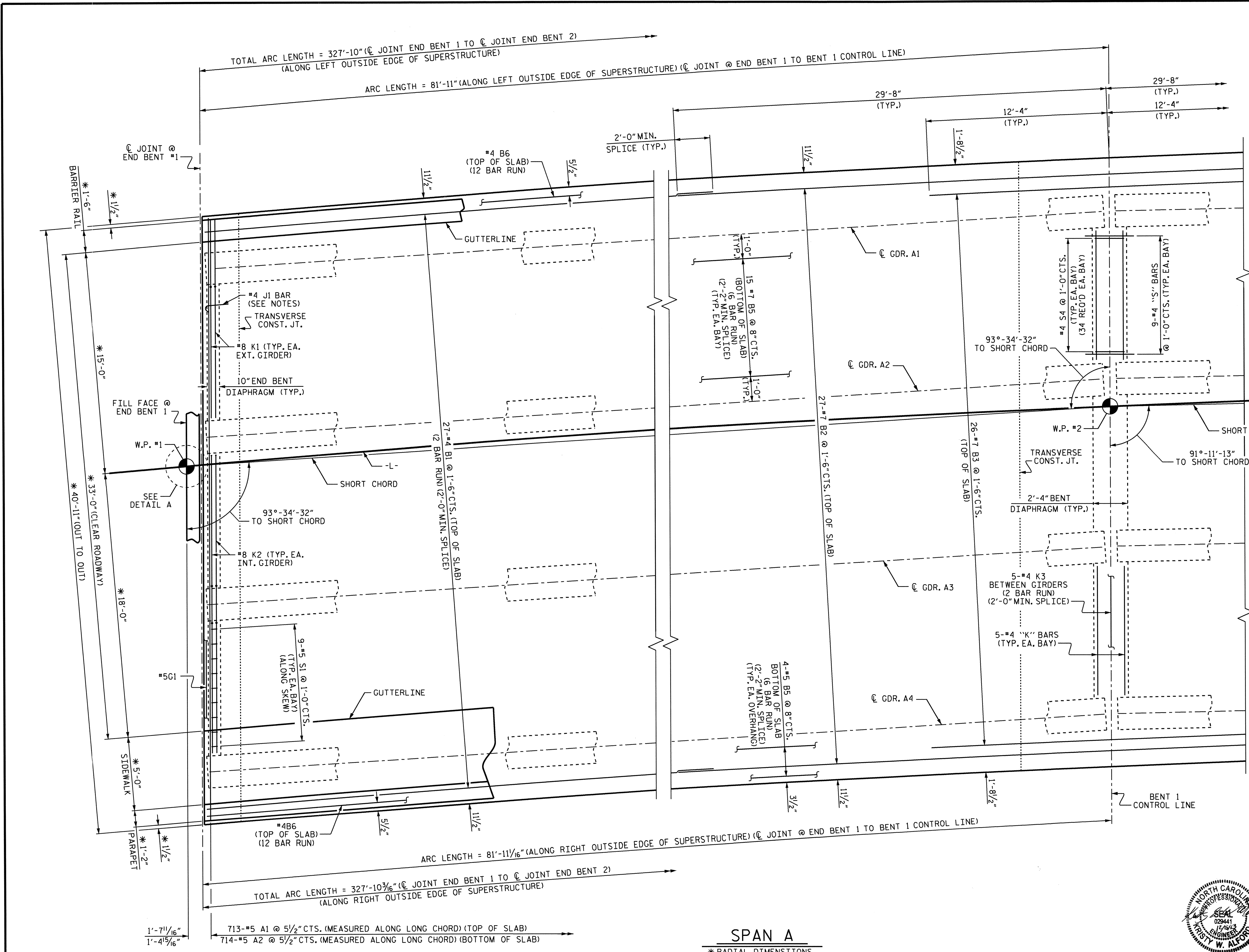
10-SEP-2013 08:19
 S:\DPC2\KRISTY\B-4991\Super_Draw\B-4991.S0.T5.dgn
 KalFord

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR PLACEMENT OF #4 J1 BARS, SEE "EXPANSION JOINT DETAILS" SHEET.

FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.



SPAN A
 * RADIAL DIMENSIONS

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN A

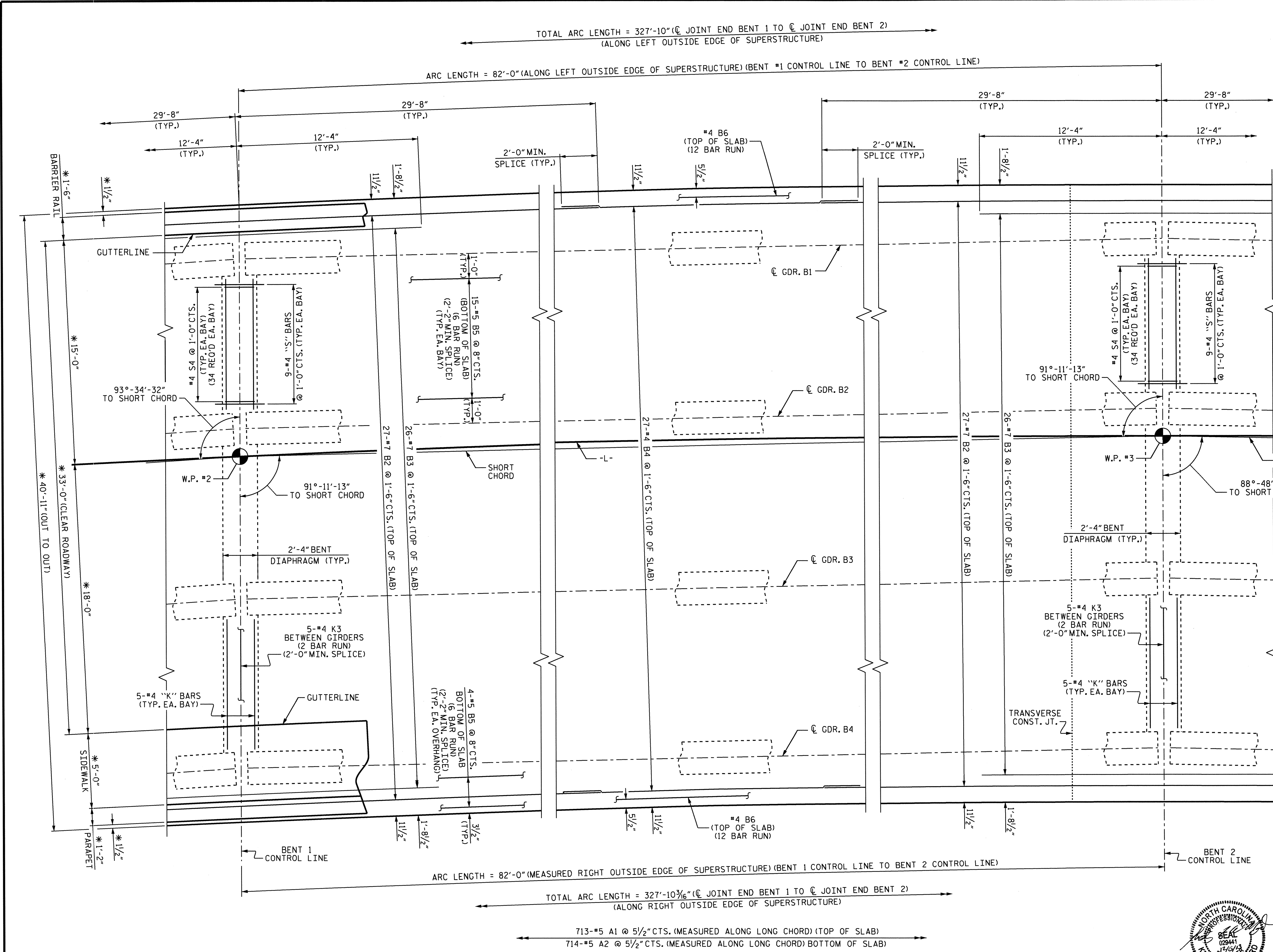


DRAWN BY : S. H. SOCKWELL DATE : 11/16/12
 CHECKED BY : J. L. LAMBERT DATE : 11/20/12
 DESIGN ENGINEER OF RECORD : A. C. QUILAW DATE : 12/16/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-8
2			4			TOTAL SHEETS 48

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.
 FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.



PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			9
2			4			48

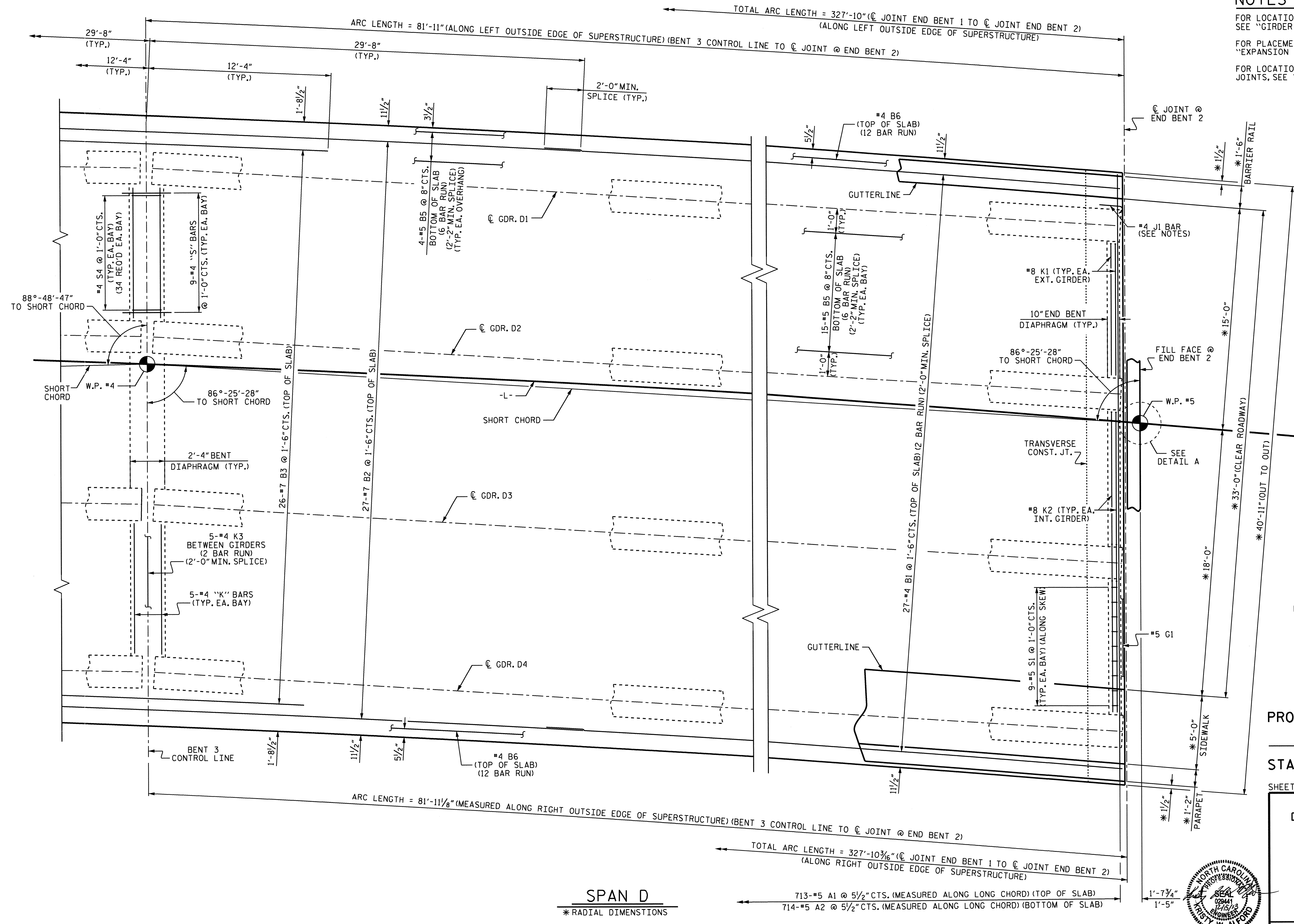


DRAWN BY: S. H. SOCKWELL DATE: 11/16/12
 CHECKED BY: J. L. LAMBERT DATE: 11/20/12
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE: 12/10/13

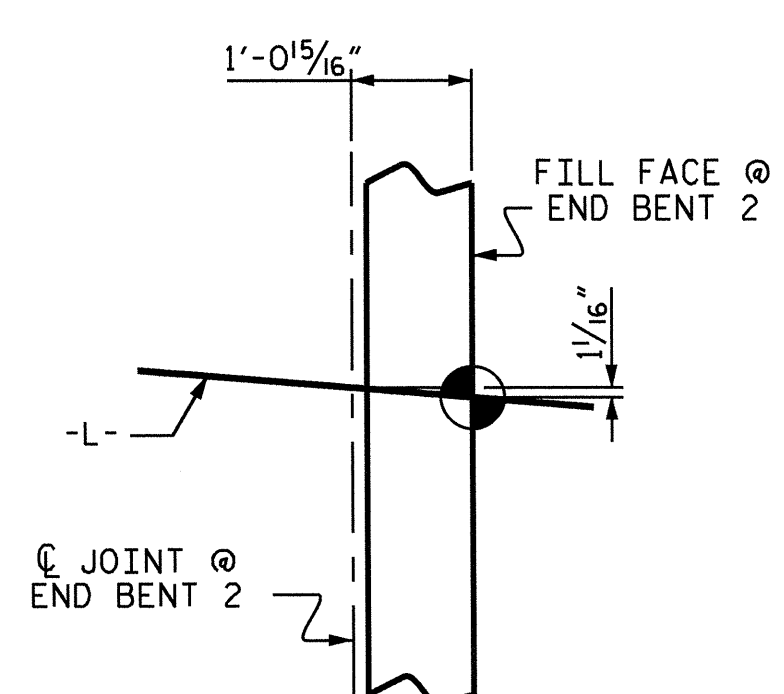
SPAN B
 * RADIAL DIMENSIONS

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.
 FOR PLACEMENT OF #4 J1 BARS, SEE "EXPANSION JOINT DETAILS" SHEET.
 FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.



SPAN D
*RADIAL DIMENSTIONS

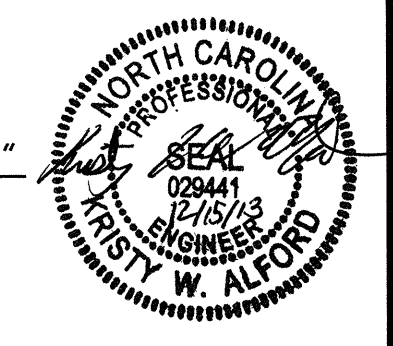


PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

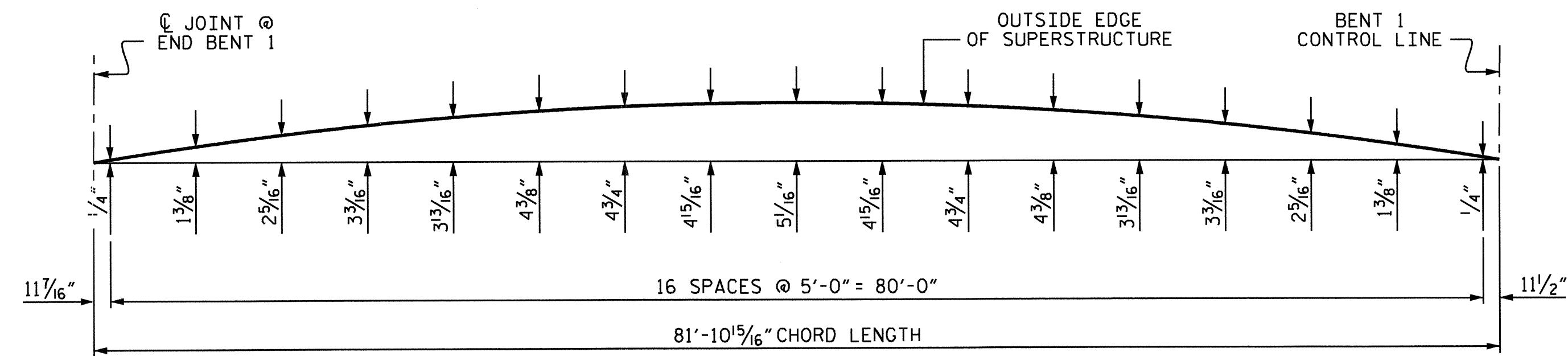
PLAN OF SPAN D



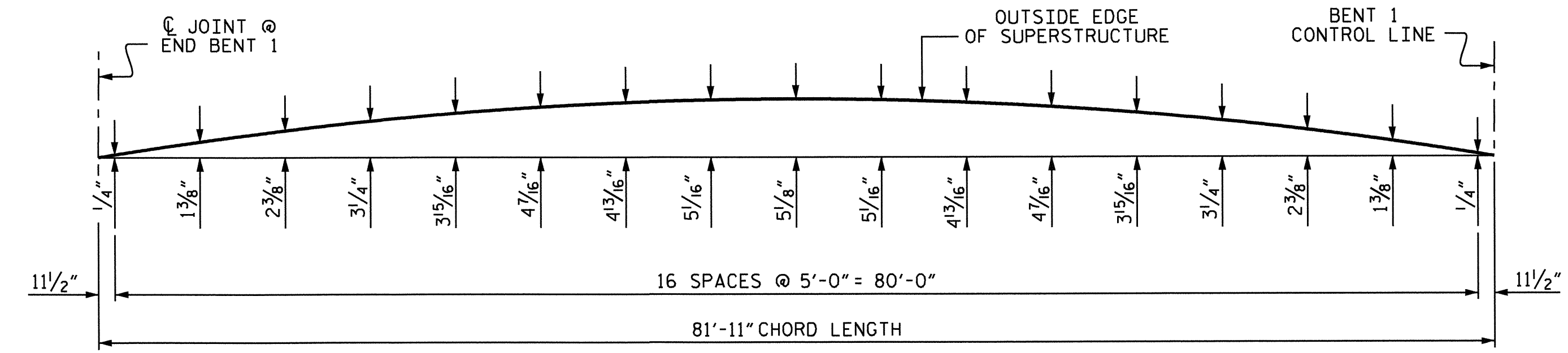
DRAWN BY: S. H. SOCKWELL DATE: 11/16/12
 CHECKED BY: J. L. LAMBERT DATE: 11/20/12
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE: 9/10/13

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-11
1			3			TOTAL SHEETS
2			4			48

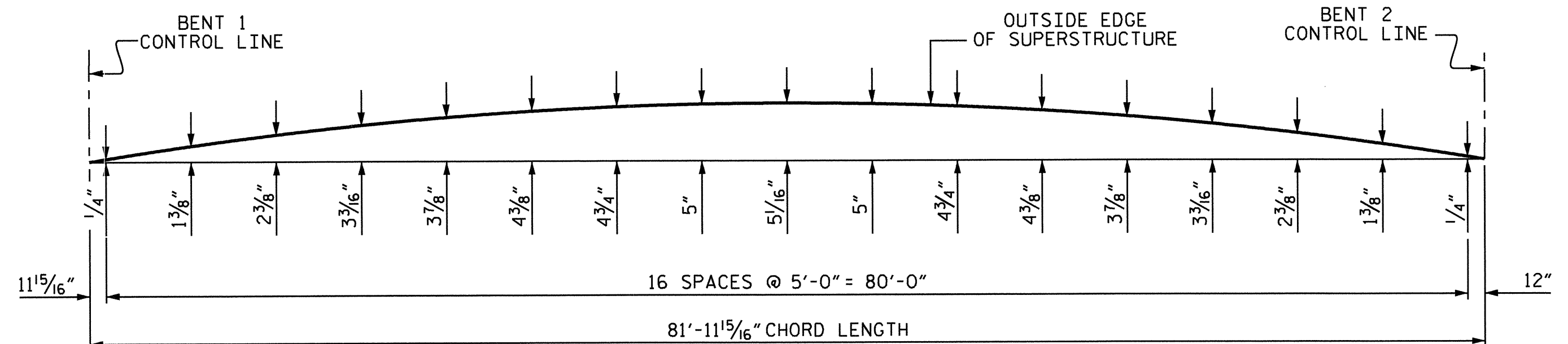
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 kaiford



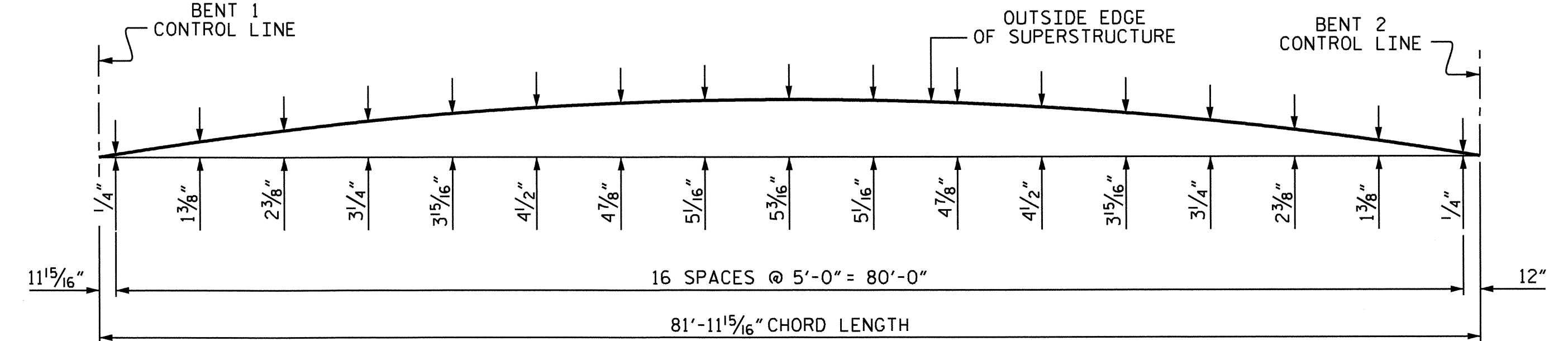
LEFT SIDE (SPAN A)



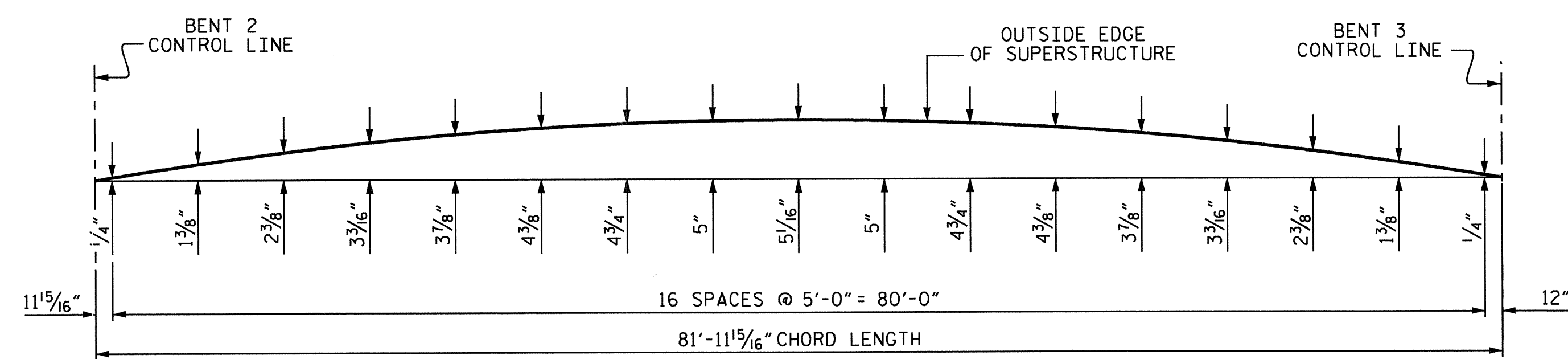
RIGHT SIDE (SPAN A)



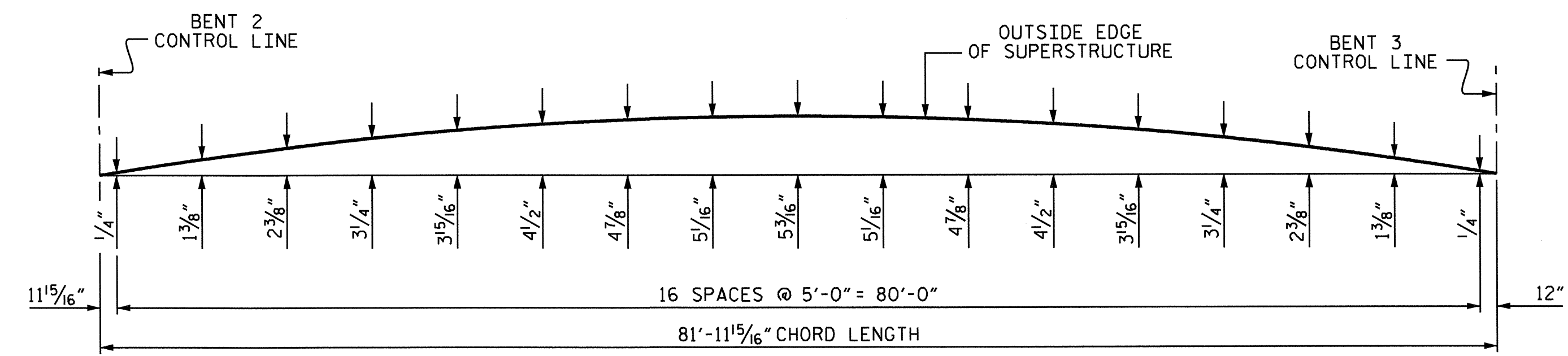
LEFT SIDE (SPAN B)



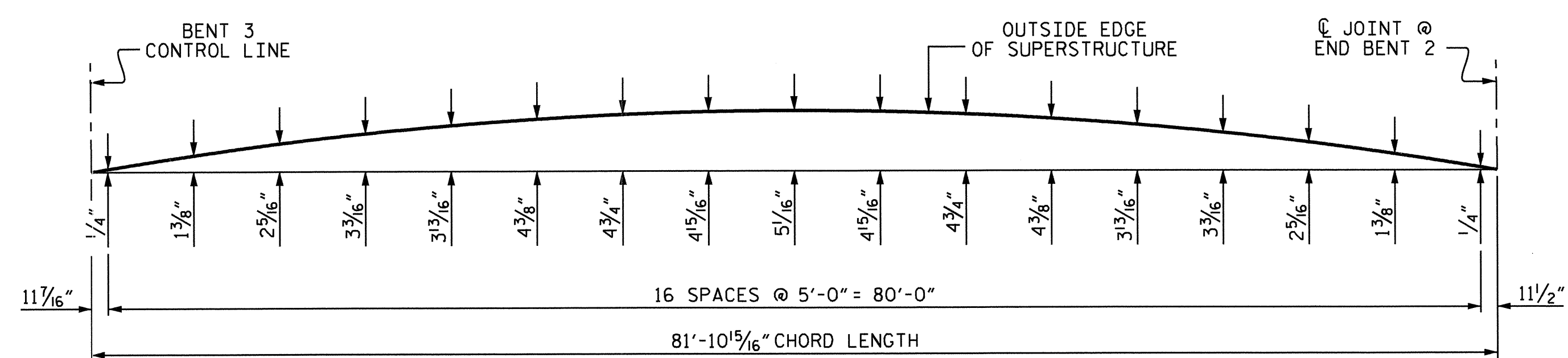
RIGHT SIDE (SPAN B)



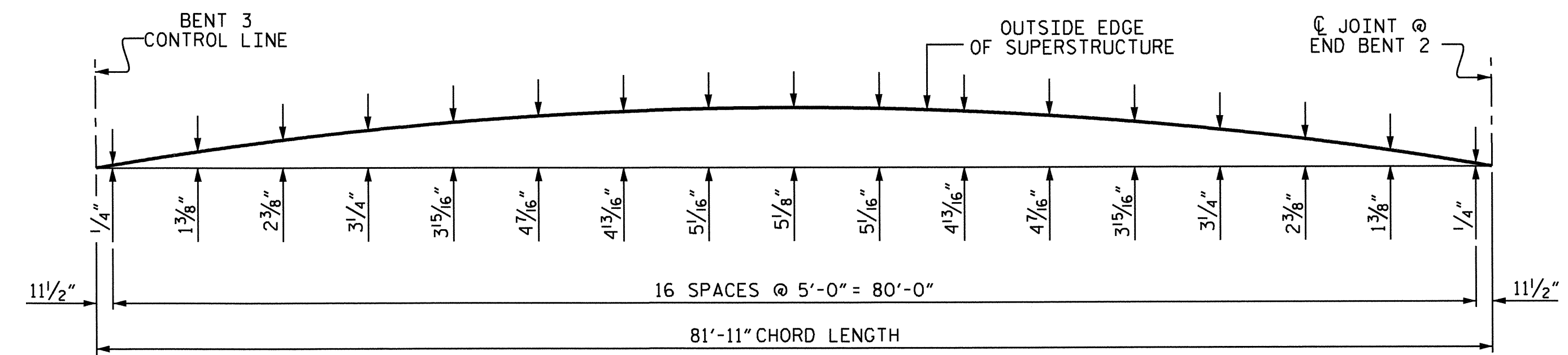
LEFT SIDE (SPAN C)



RIGHT SIDE (SPAN C)



LEFT SIDE (SPAN D)



RIGHT SIDE (SPAN D)

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

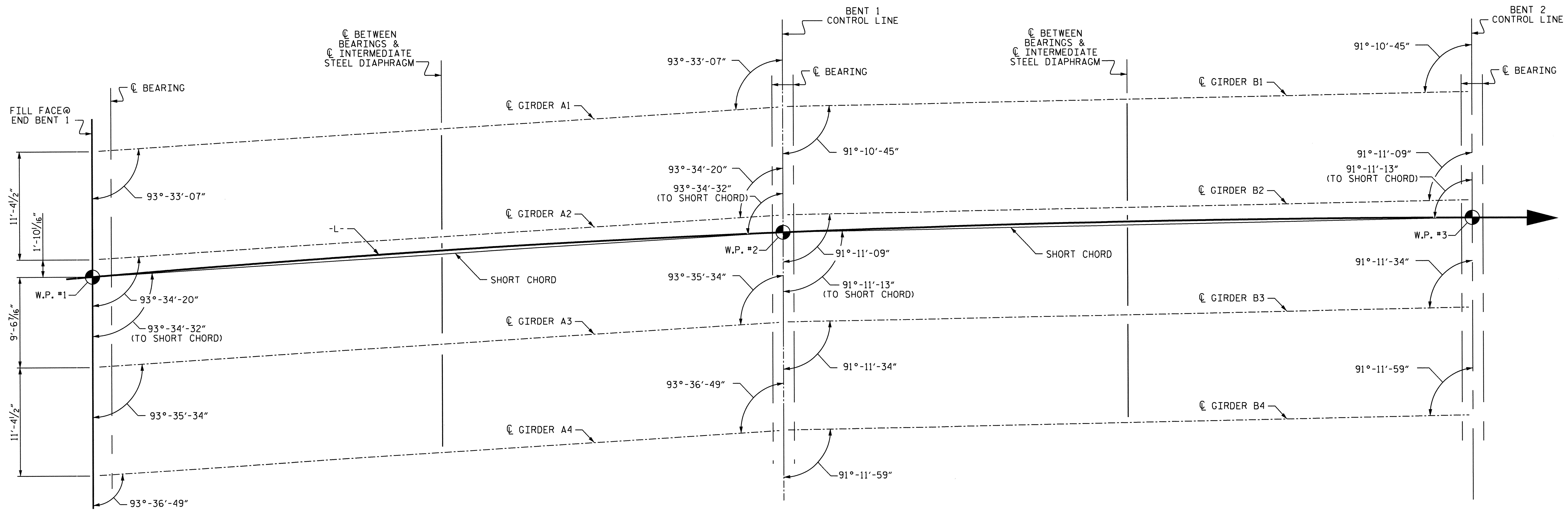
ARC OFFSETS



DRAWN BY : S. H. SOCKWELL DATE : 11/2012
 CHECKED BY : J. L. LAMBERT DATE : 12/2012
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE : 9/10/13

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-12 TOTAL SHEETS 48
SUPERSTRUCTURE ARC OFFSETS						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

10-SEP-2013 08:17
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EXP.
P1,E4

SPAN A

FIX.
P2,E4

FIX.
P2,E4

SPAN B

FIX.
P2,E4

FIX.
P2,E4

GIRDER LAYOUT

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

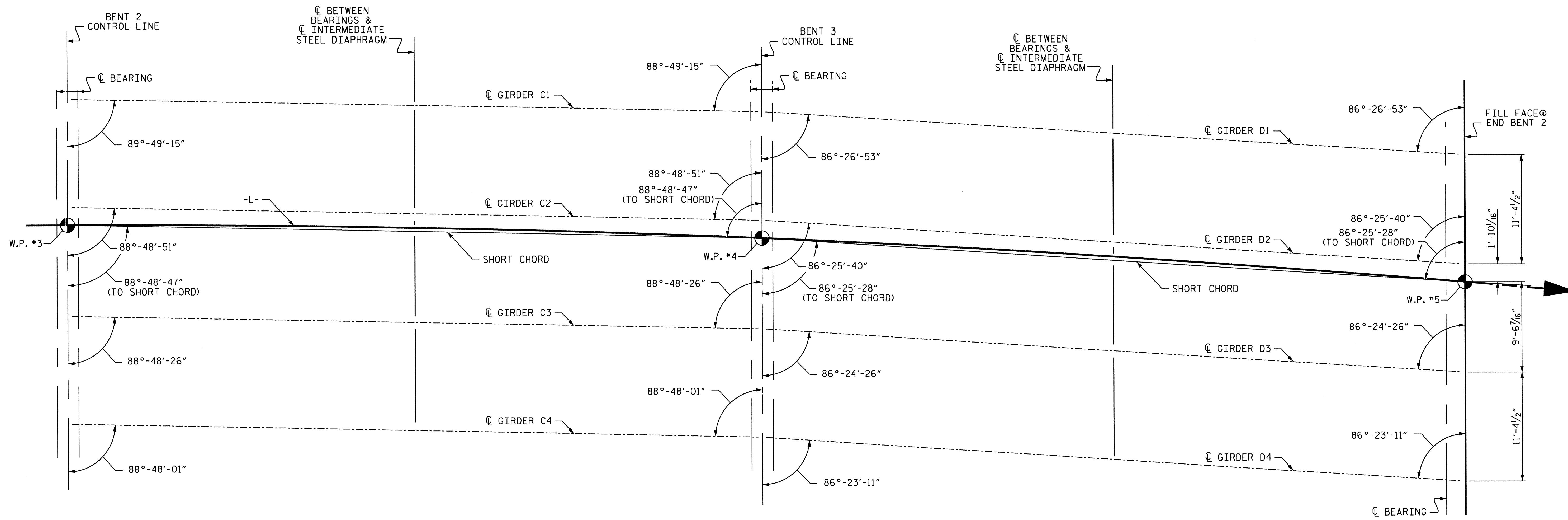
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER LAYOUT
 SPAN A & B



DRAWN BY : S.H. SOCKWELL DATE : 11/2012
 CHECKED BY : J.L. LAMBERT DATE : 12/2012
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE : 9/10/13

10-SEP-2013 08:17
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 kaiford

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-13
2			4			48



FIX. P2,E4 FIX. P2,E4

SPAN C

FIX. P2,E4 FIX. P2,E4

SPAN D

EXP. P1,E4

GIRDER LAYOUT

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 2 OF 2

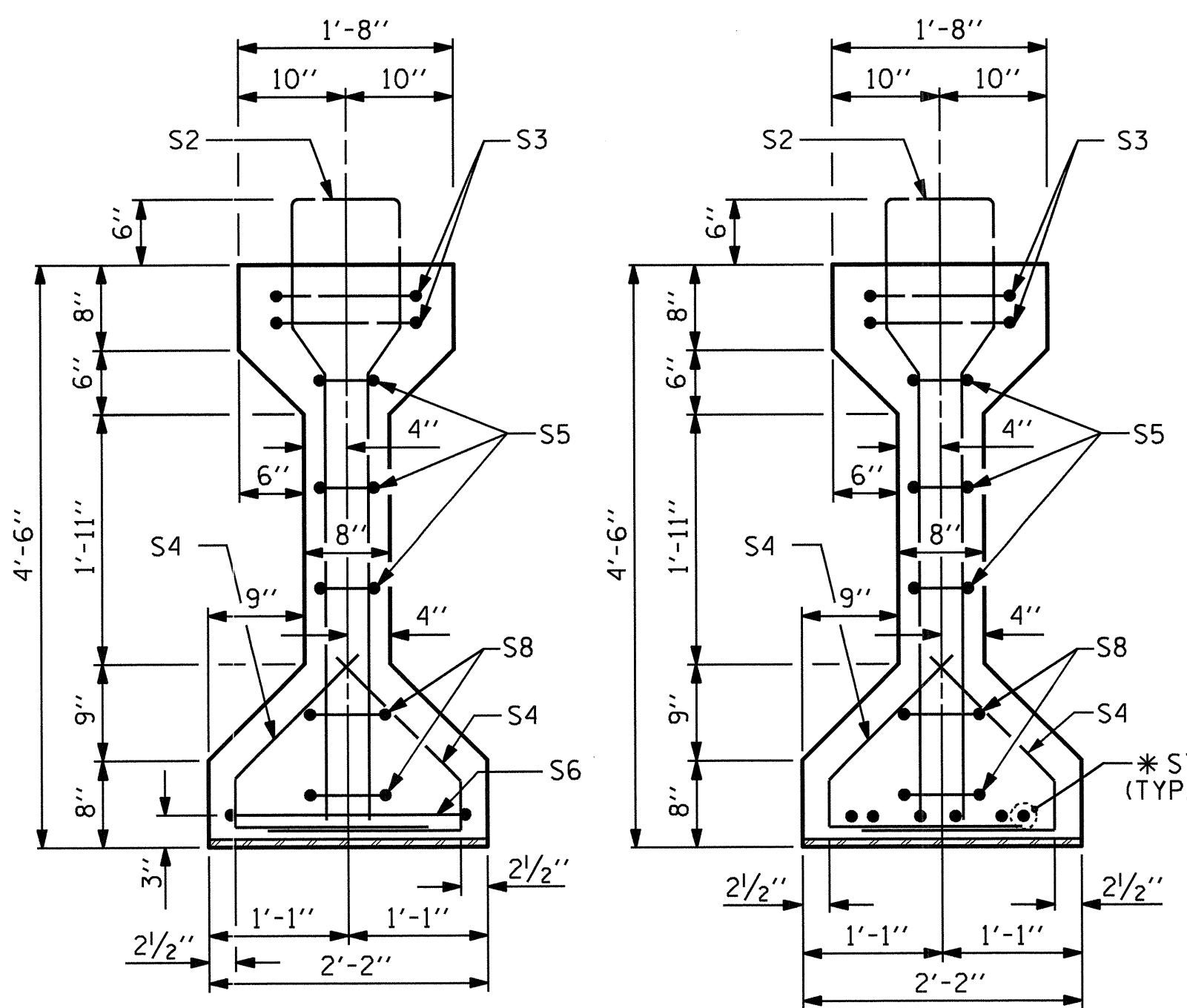
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER LAYOUT
 SPAN C & D



DRAWN BY: S. H. SOCKWELL DATE: 11/2012
 CHECKED BY: J. L. LAMBERT DATE: 12/2012
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE: 9/10/13

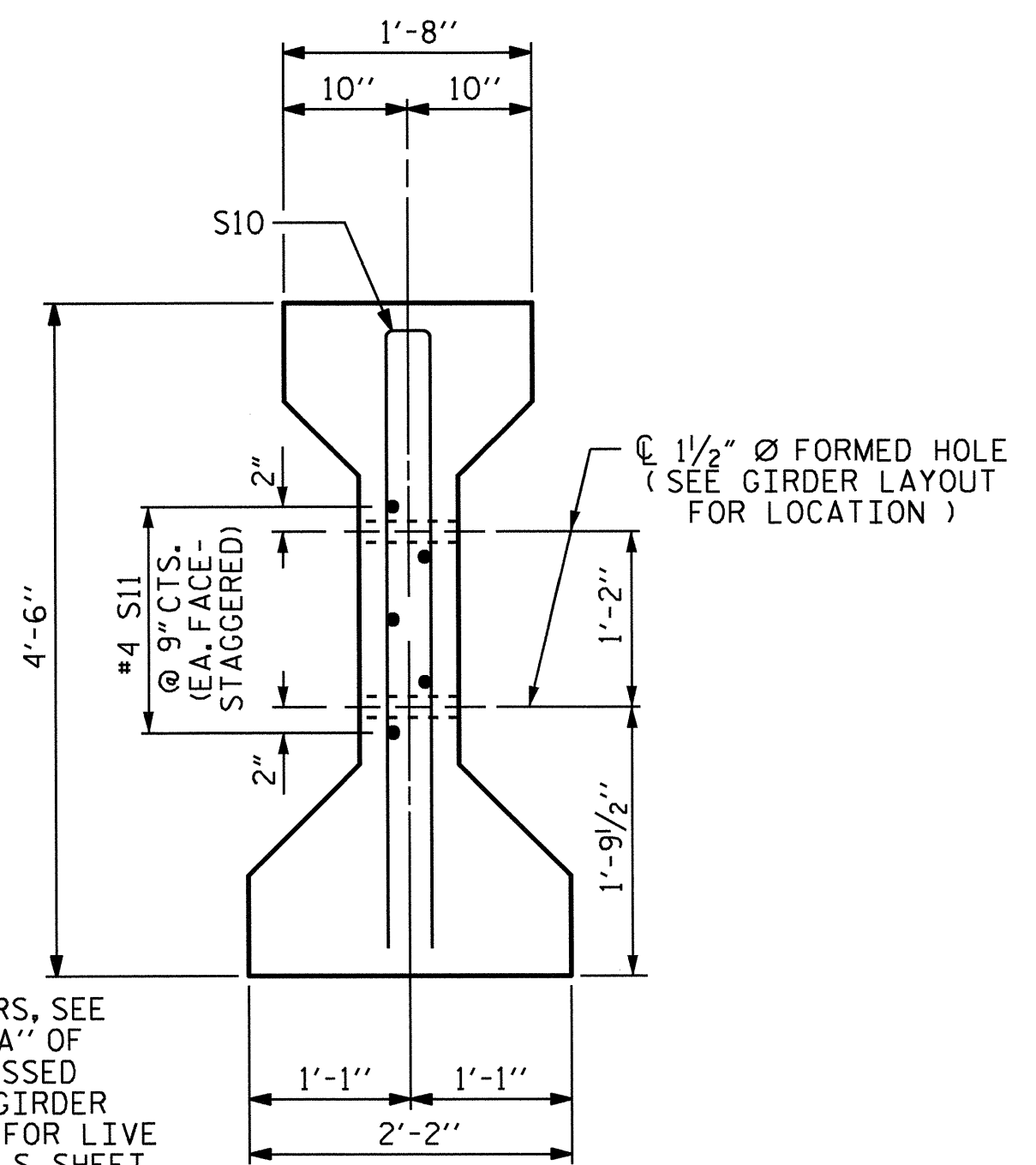
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-14
1			3			TOTAL SHEETS
2			4			48



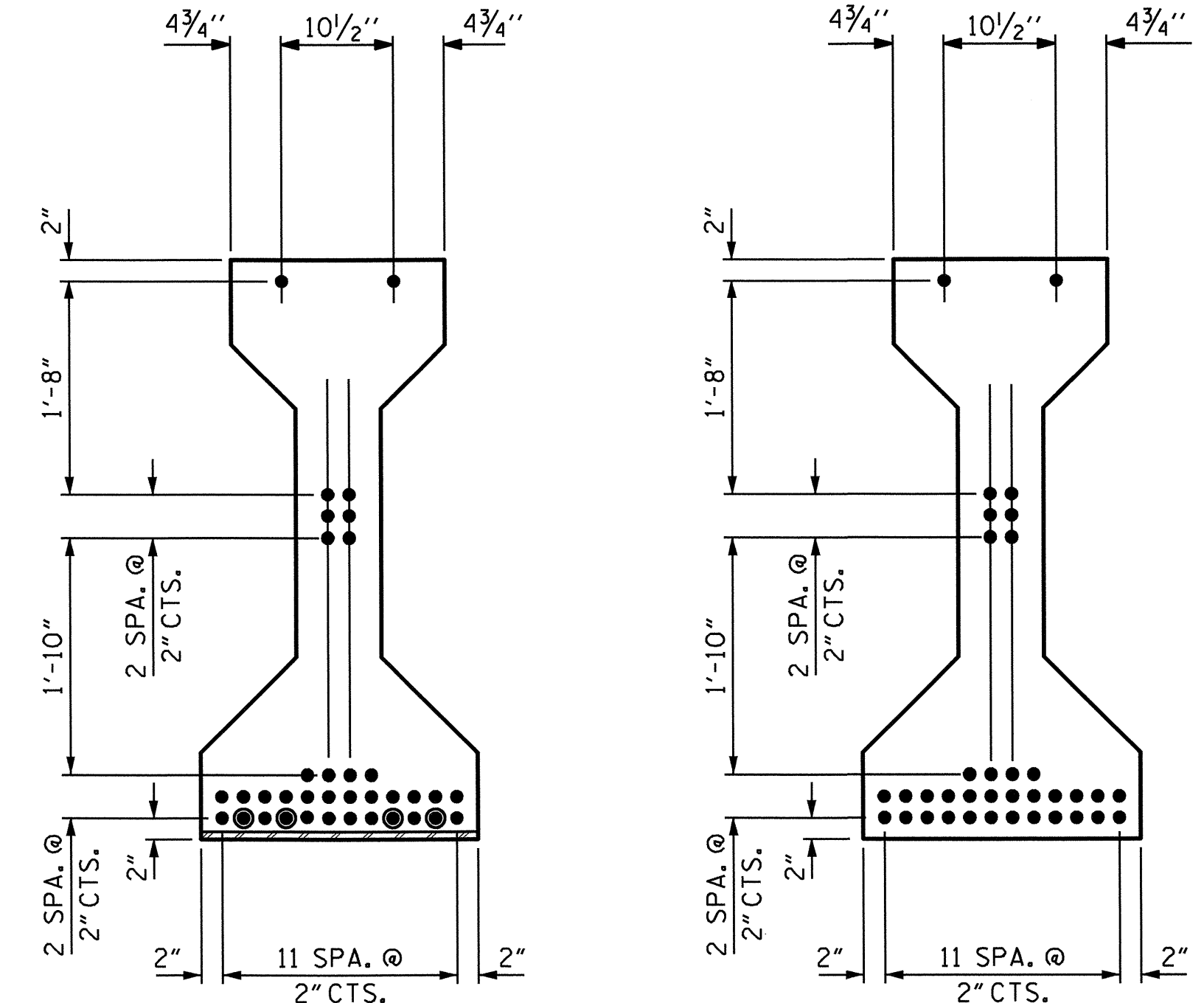
SECTION A-A

SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)

* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

BOND SHALL BE BROKEN ON THESE STRANDS FOR A
DISTANCE OF 12'-0" FROM END OF PRESTRESSED CONCRETE
GIRDER. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

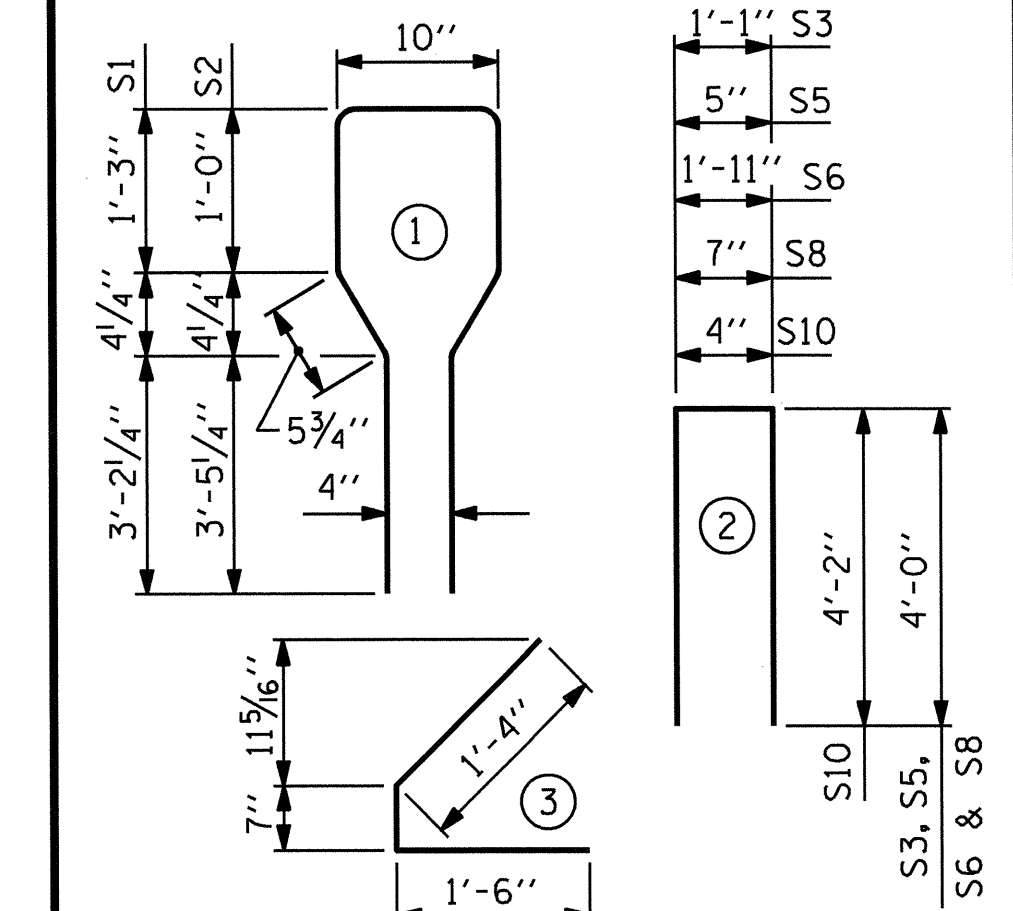
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	70	#4	1	10'-8"	499
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	80	#4	3	3'-5"	183
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

* NOTE: S7 BARS SHALL BE BENT BEFORE
SHIPMENT. HEAT BENDING SHALL
NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

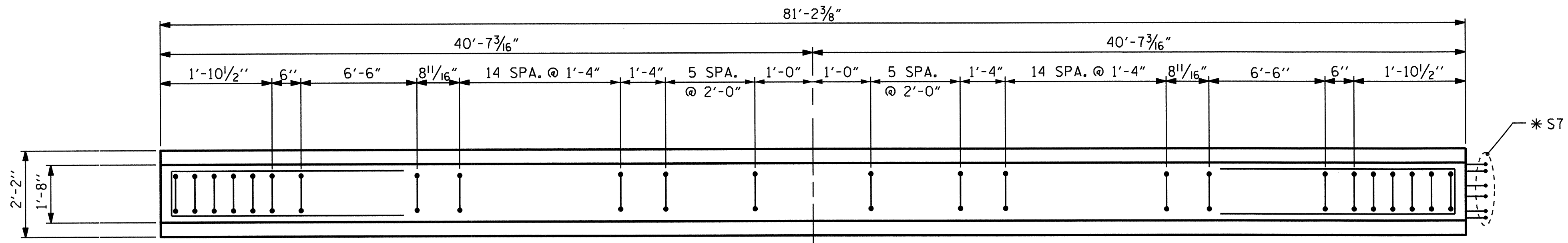


QUANTITIES FOR ONE GIRDER

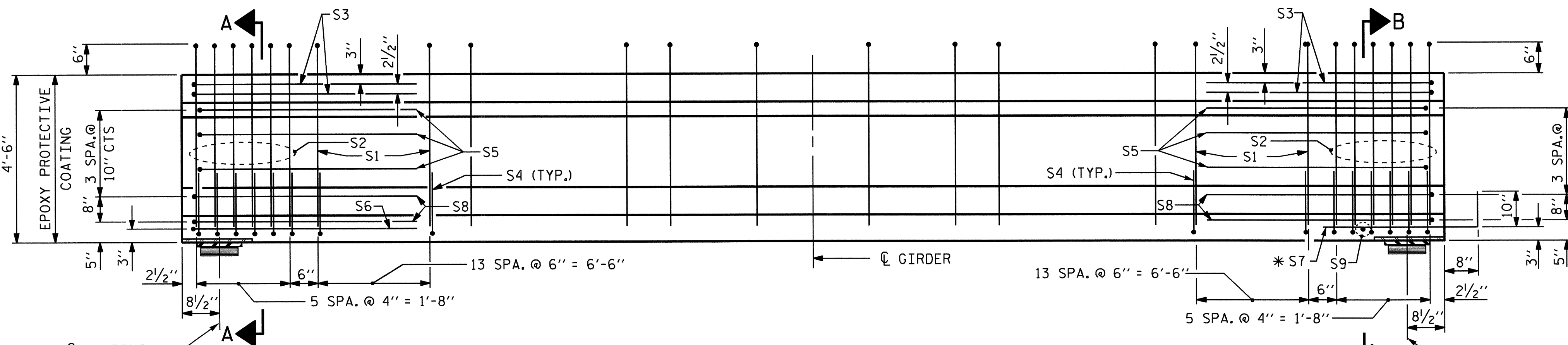
REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
1027	16.5	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	81'-2 3/8"	649.58

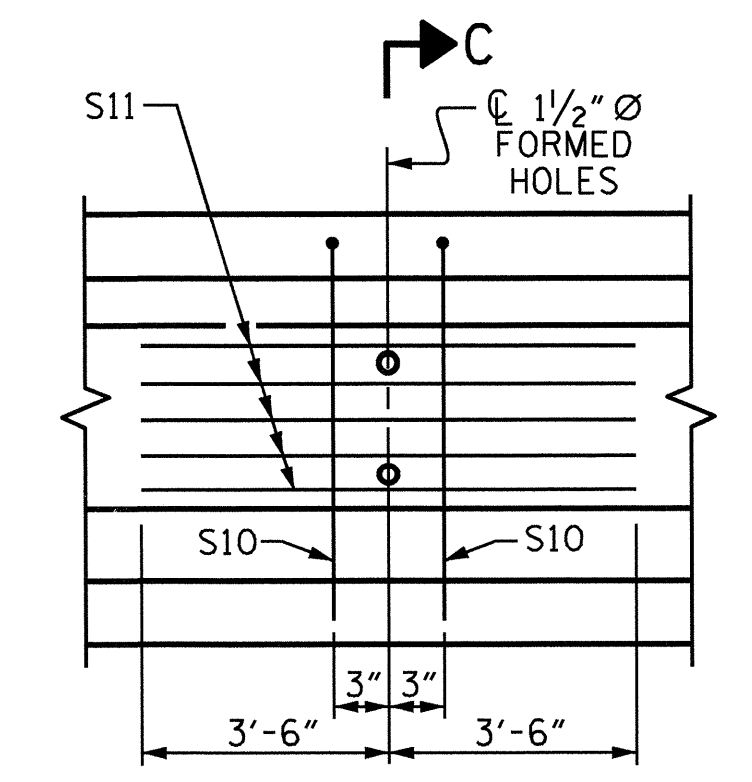


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

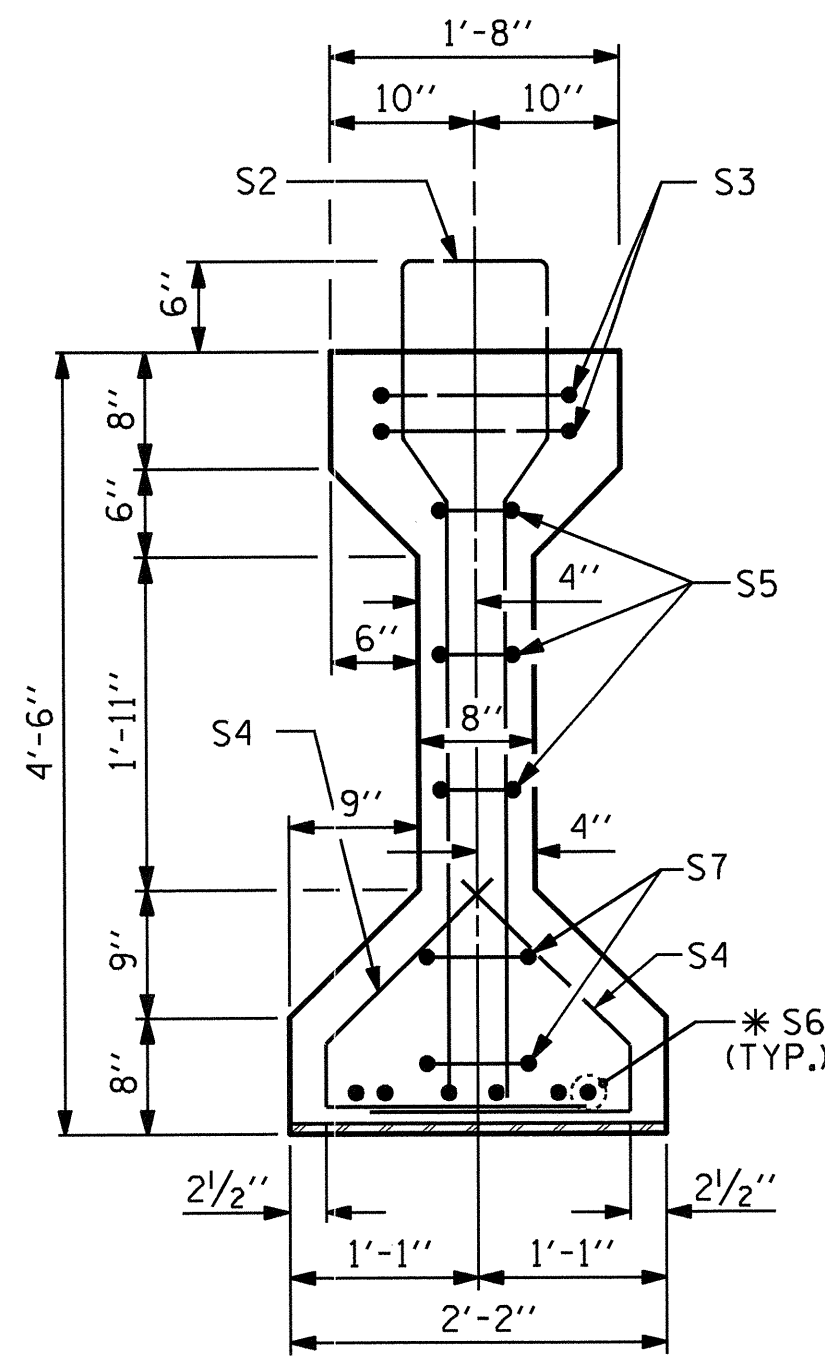
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL

ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 11/2012
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/11/06R TLA/GM
	REV. 10/1/11 MAA/GM

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

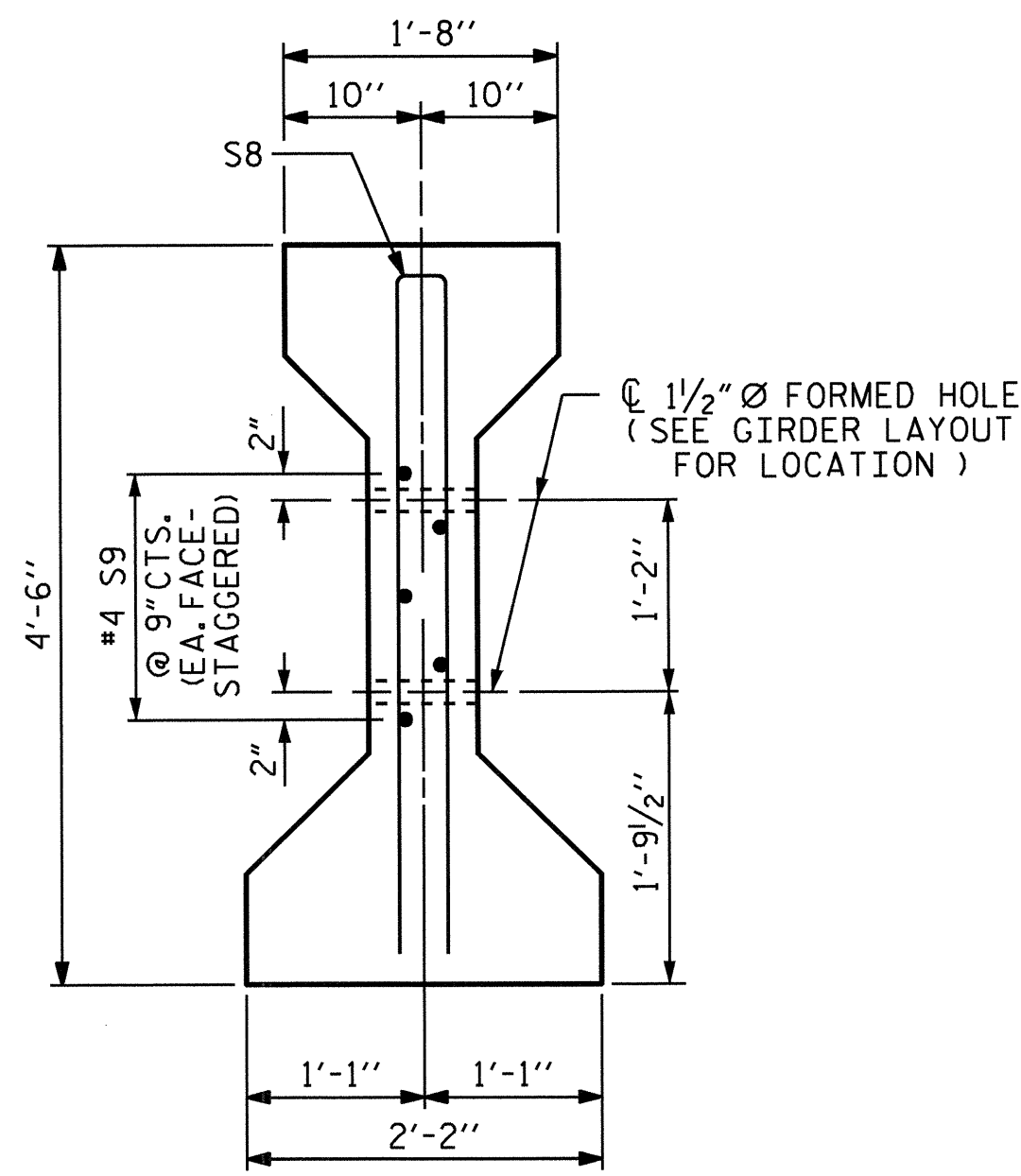
SHEET 1 OF 4
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
(SPAN A & SPAN D)

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

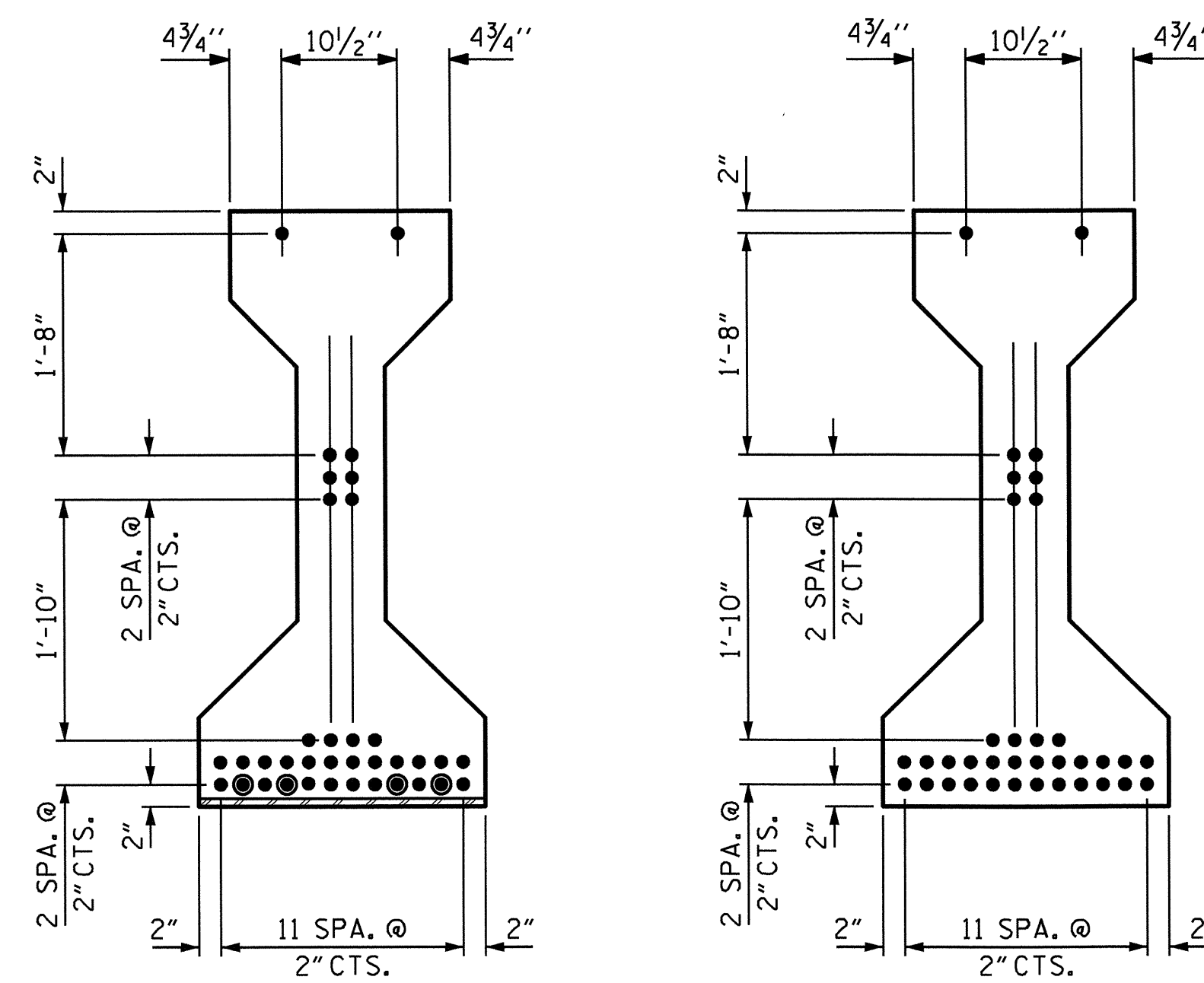


SECTION A-A

* FOR S6 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



SECTION B-B
(S1 BARS NOT SHOWN)

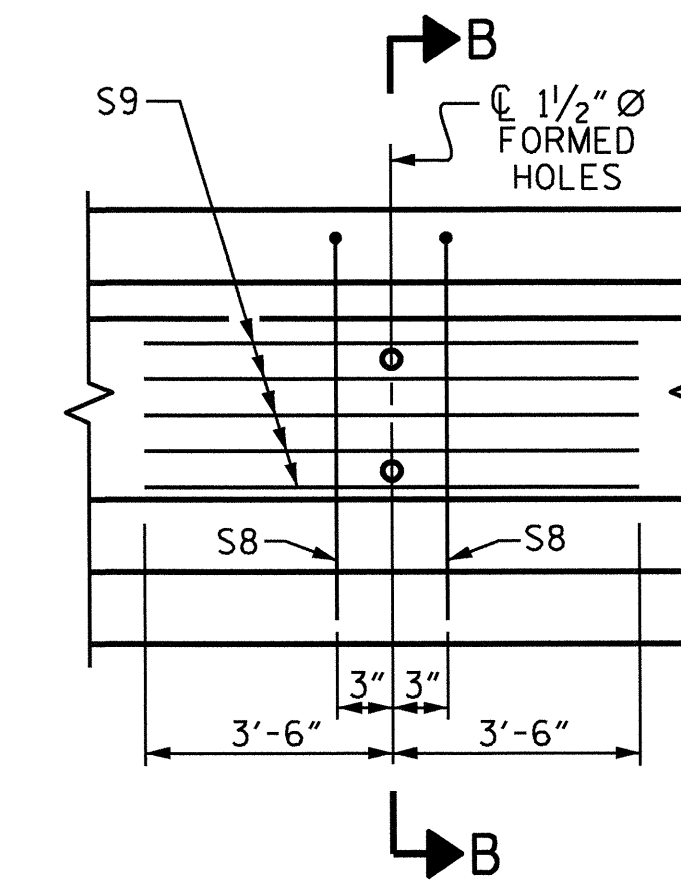


AT END OF GIRDER

AT C. OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

● BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF PRESTRESSED CONCRETE GIRDER. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL

0.6" Ø L. R. GRADE 270 STRANDS

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

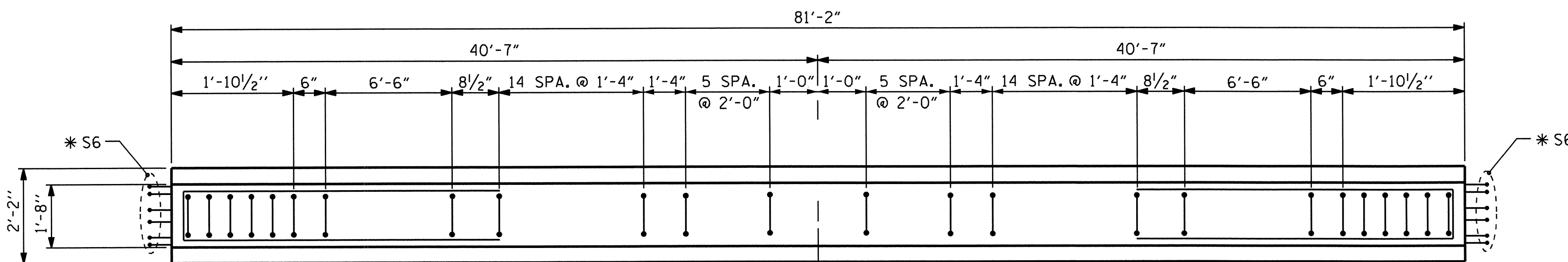
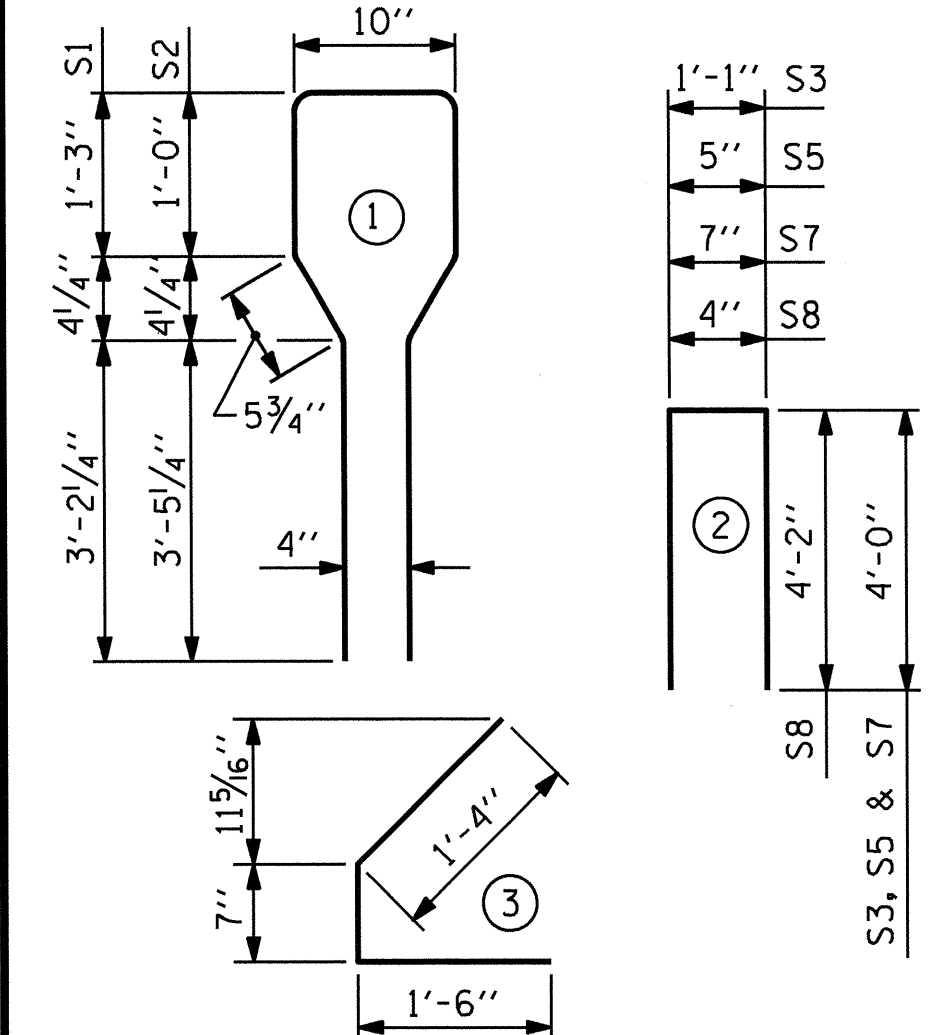
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	70	#4	1	10'-8"	499
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	80	#4	3	3'-5"	183
S5	6	#4	2	8'-5"	34
*S6	12	#5	STR	3'-8"	46
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S9	5	#4	STR	7'-0"	23
S10	2	#3	STR	1'-10"	1

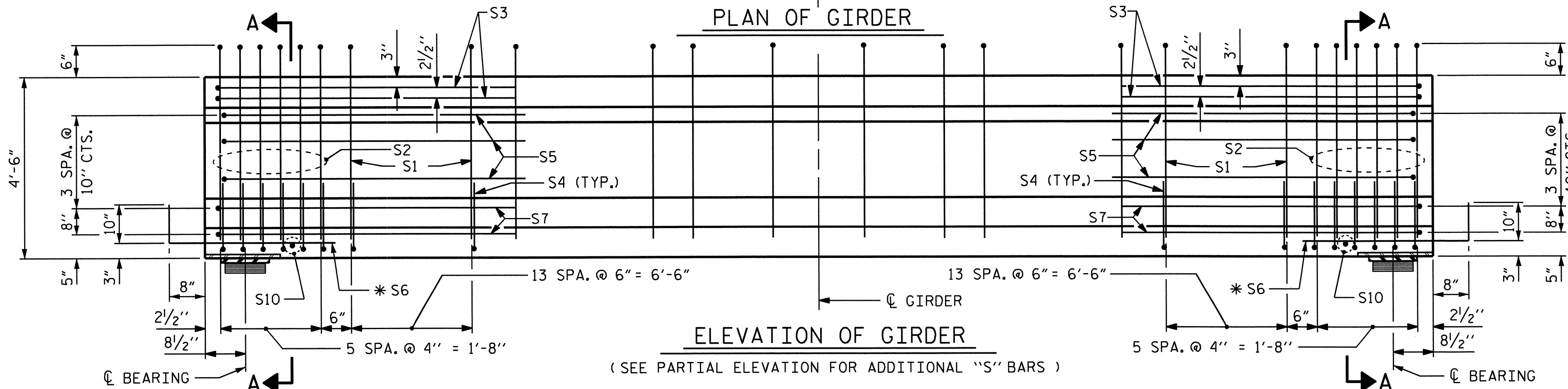
* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
1043	16.5	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	81'-2"	649.33

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
(CONTINUOUS FOR LIVE LOAD)
(SPAN B & SPAN C)



ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 11/2012
DRAWN BY : JMB 12/87	REV. 8/16/99RR RWW/LES
CHECKED BY : ARB 12/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			48

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																	
0.6" Ø LOW RELAXATION	SPAN A & SPAN D											SPAN A & SPAN D											SPAN A & SPAN D										
	GIRDER 1											GIRDER 2 & GIRDER 3											GIRDER 4										
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	0	.073	.139	.190	.223	.234	.223	.190	.139	.073	0	0	.073	.139	.190	.223	.234	.223	.190	.139	.073	0	0	.073	.139	.190	.223	.234	.223	.190	.139	.073	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0	.031	.058	.080	.094	.098	.094	.080	.058	.031	0	0	.035	.066	.091	.106	.112	.106	.091	.066	.035	0	0	.030	.058	.079	.092	.097	.092	.079	.058	.030	0
FINAL CAMBER	0	1/2"	5/16"	15/16"	15/16"	15/8"	15/16"	15/16"	15/16"	1/2"	0	0	7/16"	7/8"	13/16"	13/8"	17/16"	13/8"	13/16"	7/8"	7/16"	0	0	1/2"	1"	15/16"	15/16"	15/8"	15/16"	15/16"	1"	1/2"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																																	
0.6" Ø LOW RELAXATION	SPAN B & SPAN C											SPAN B & SPAN C											SPAN B & SPAN C										
	GIRDER 1											GIRDER 2 & GIRDER 3											GIRDER 4										
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9
CAMBER (GIRDER ALONE IN PLACE)	0	.073	.139	.190	.222	.234	.222	.190	.139	.073	0	0	.073	.139	.190	.222	.234	.222	.190	.139	.073	0	0	.073	.139	.190	.222	.234	.222	.190	.139	.073	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0	.031	.058	.080	.093	.098	.093	.080	.058	.031	0	0	.035	.066	.091	.106	.112	.106	.091	.066	.035	0	0	.030	.058	.079	.092	.097	.092	.079	.058	.030	0
FINAL CAMBER	0	1/2"	5/16"	15/16"	15/16"	15/8"	15/16"	15/16"	15/16"	1/2"	0	0	7/16"	7/8"	13/16"	13/8"	17/16"	13/8"	13/16"	7/8"	7/16"	0	0	1/2"	1"	15/16"	15/16"	15/8"	15/16"	15/16"	1"	1/2"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

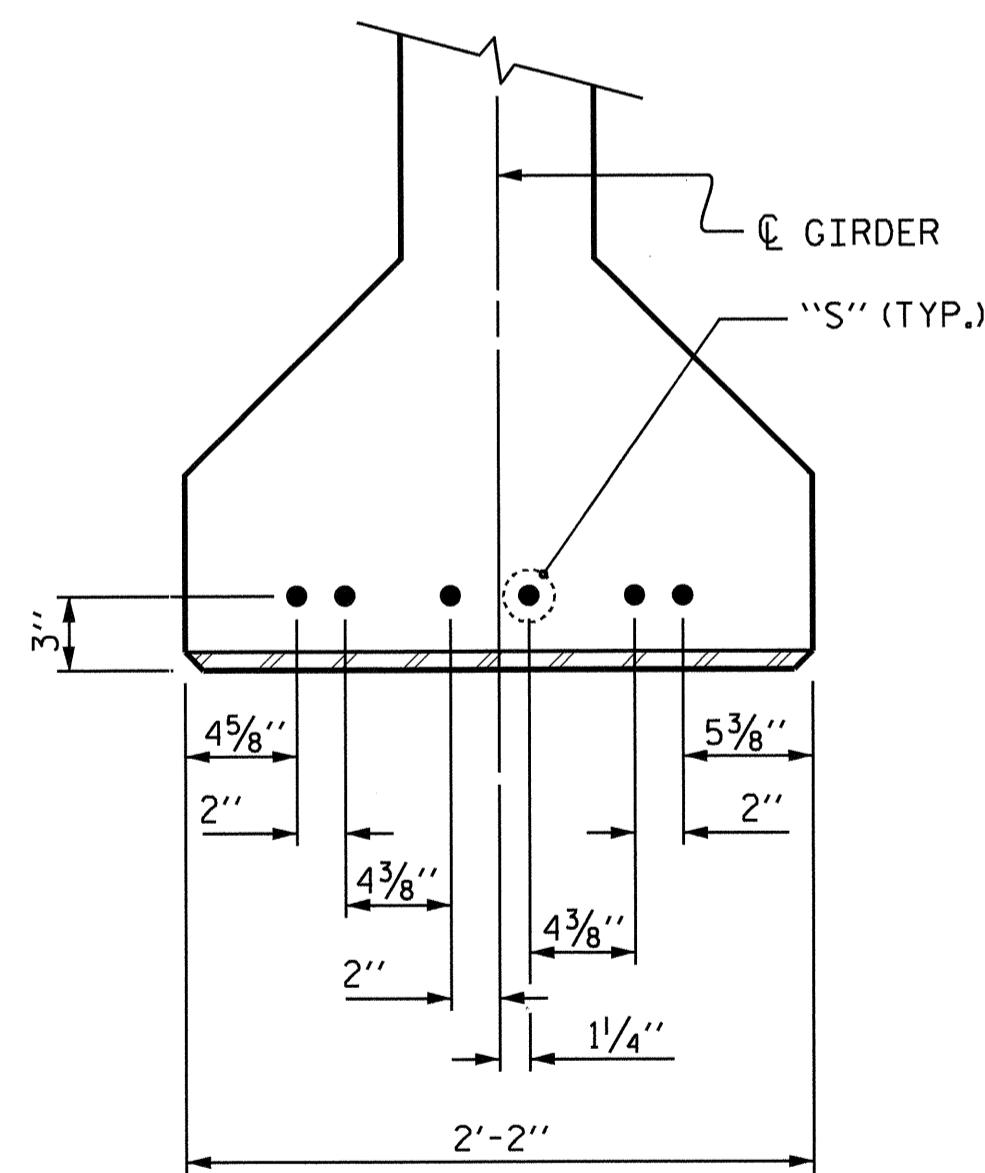
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

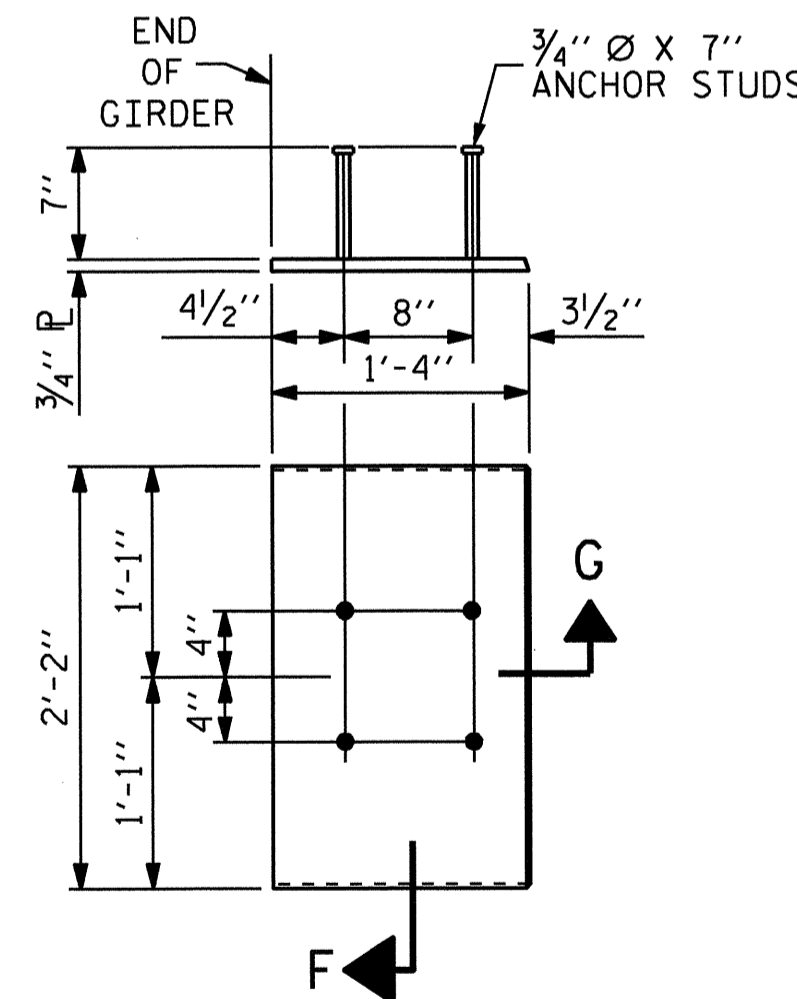
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5500 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

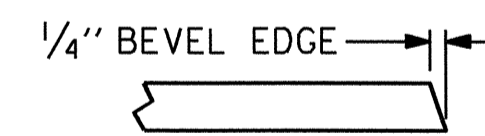


DETAIL "A"

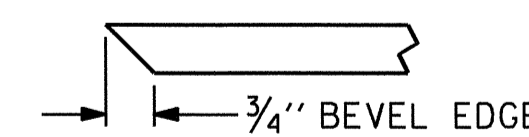


EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION "G"



SECTION "F"

(SEE NOTES)

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS



ASSEMBLED BY : S. H. SOCKWELL DATE : 11/2012
 CHECKED BY : J. L. LAMBERT DATE : 11/2012
 DRAWN BY : ELR 11/91 REV. 7/10/01RR LES/RDR
 CHECKED BY : GRP 11/91 REV. 5/1/06 TLA/GM
 REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			48

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

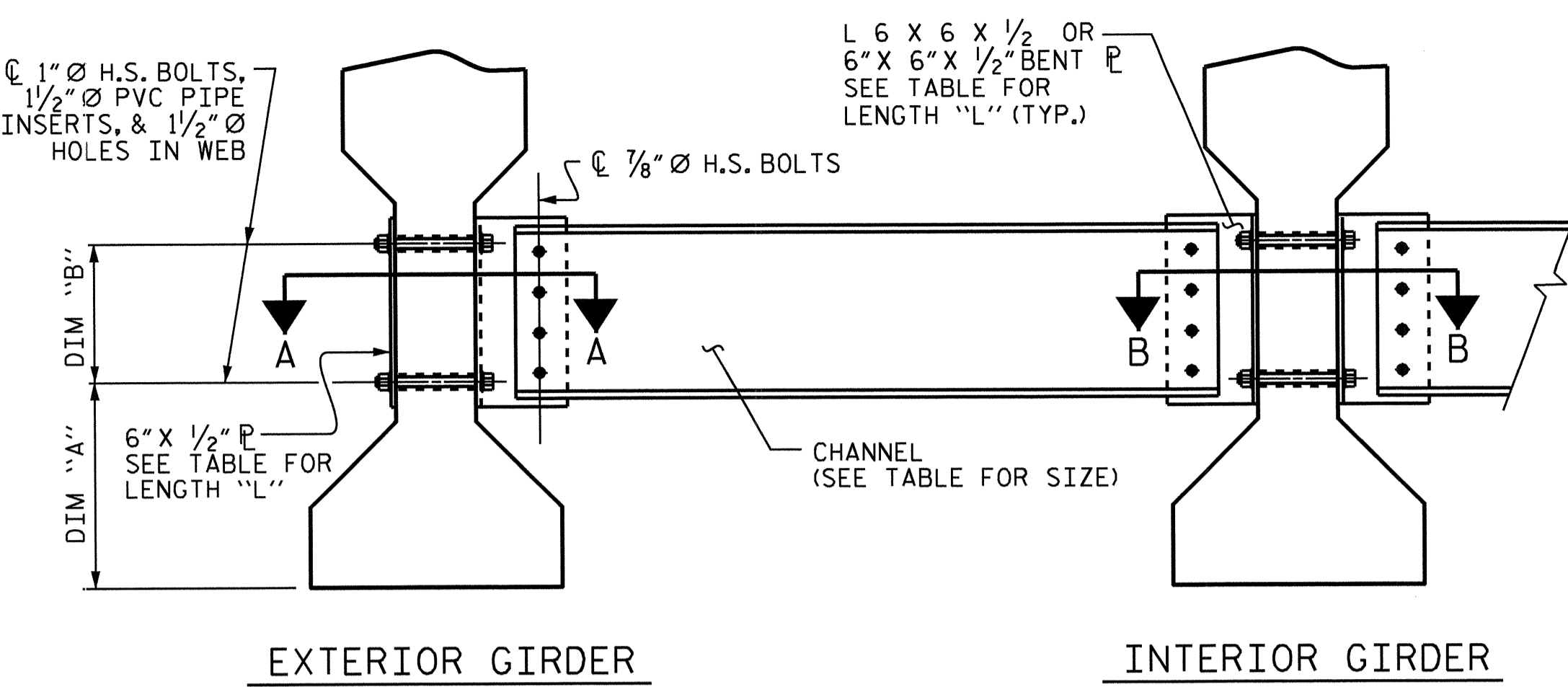
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

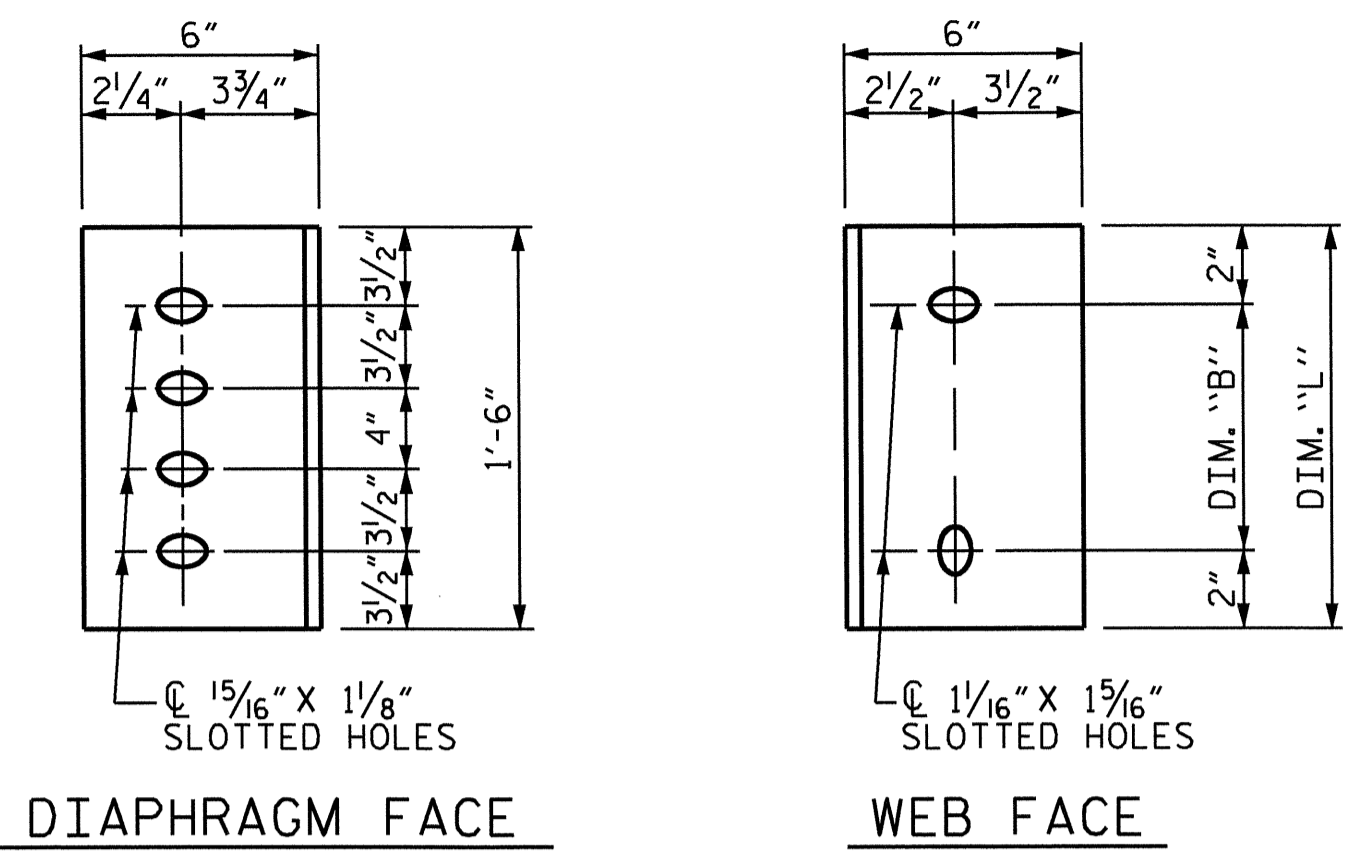
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

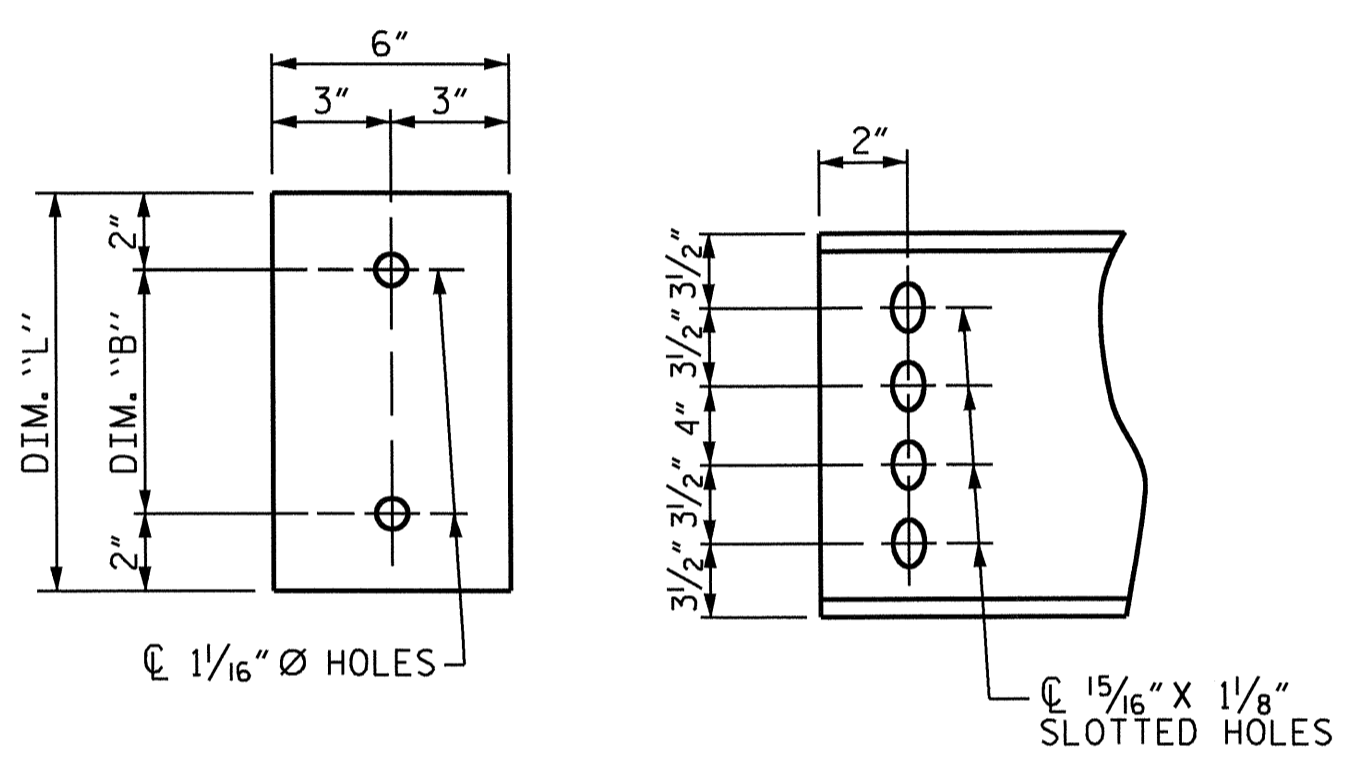
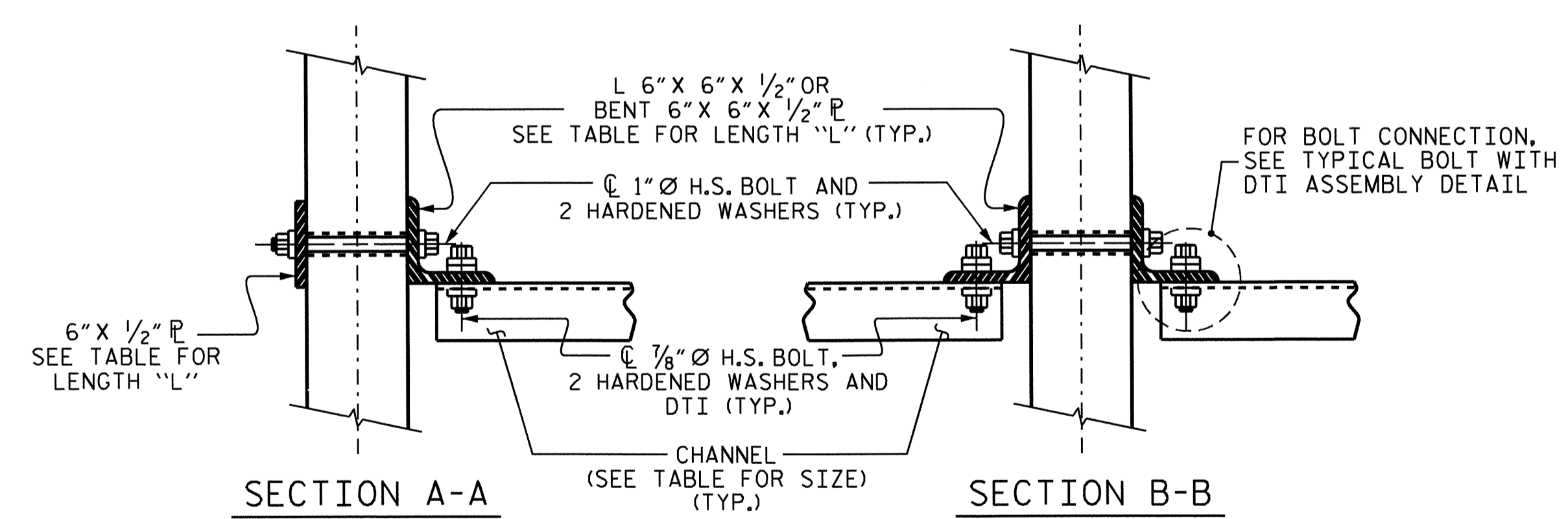
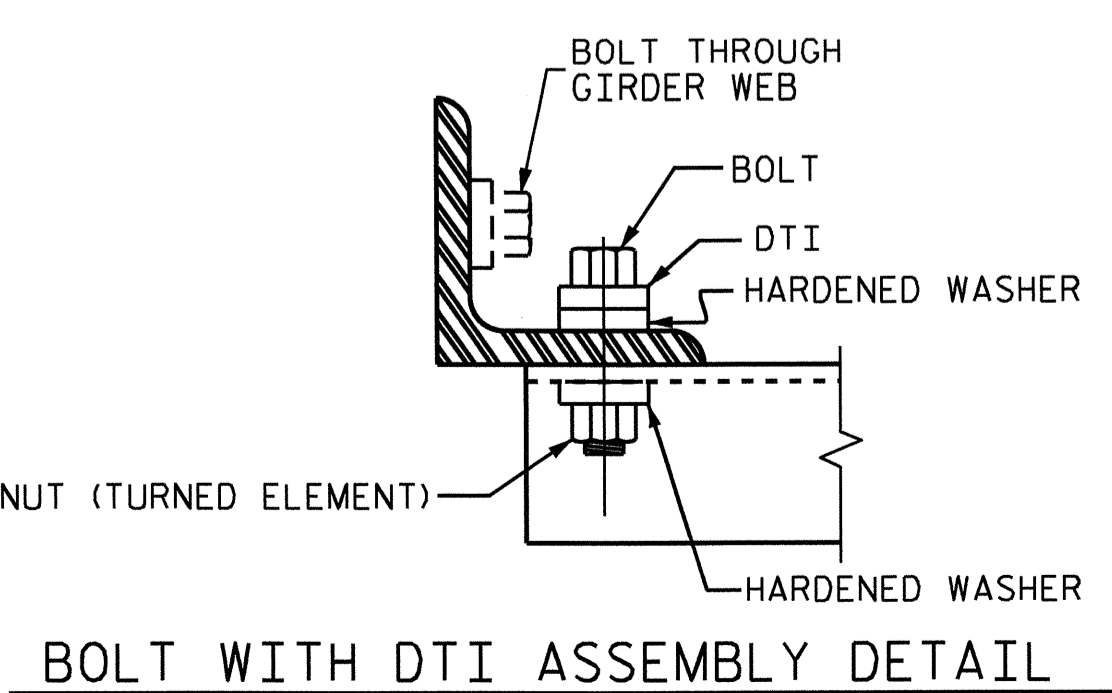


PLATE DETAILS CHANNEL END



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE IV
 PRESTRESSED CONCRETE
 GIRDERS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			48

ASSEMBLED BY : S. H. SOCKWELL DATE : 11/2012
 CHECKED BY : J. L. LAMBERT DATE : 11/2012
 DRAWN BY : TLA 6/05
 CHECKED BY : VC 6/05
 ADDED 10/21/05
 REV. 5/1/06RRR KMM/GM
 REV. 10/1/11 MAA/GM

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

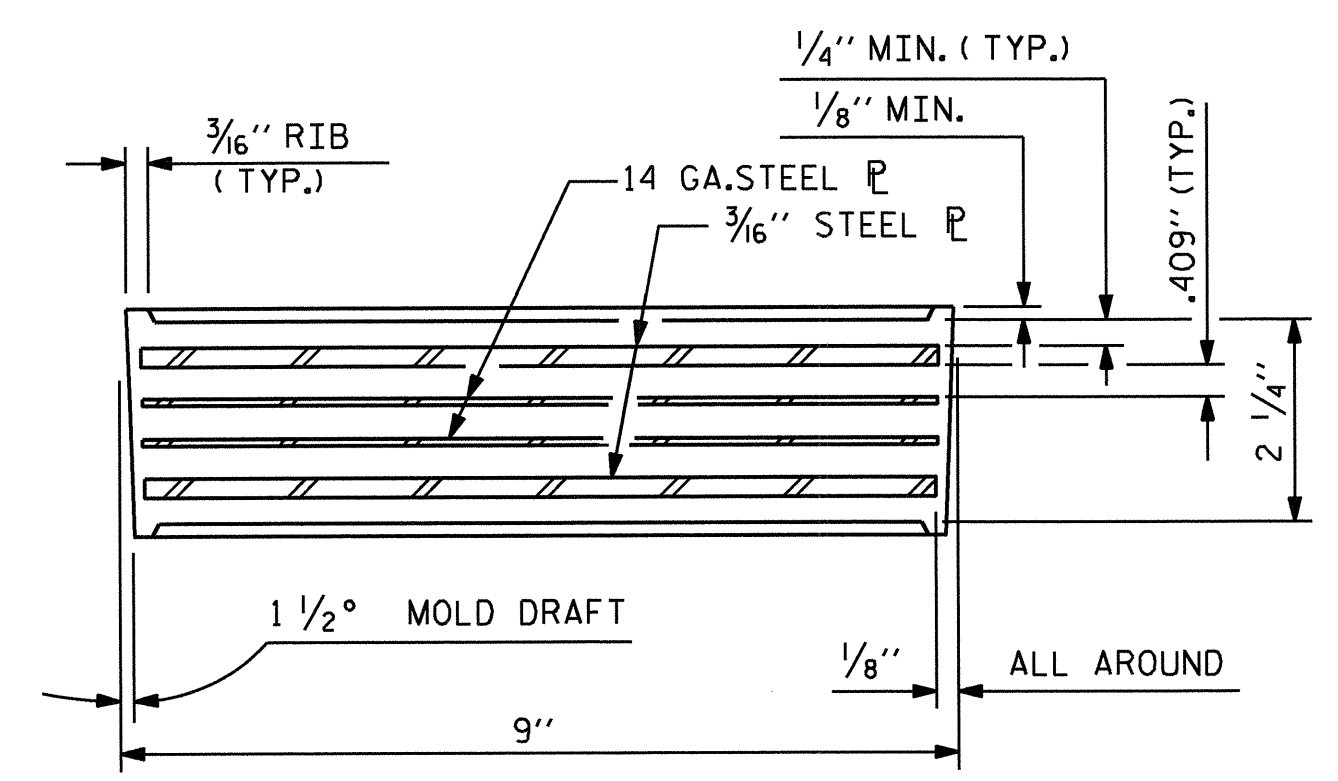
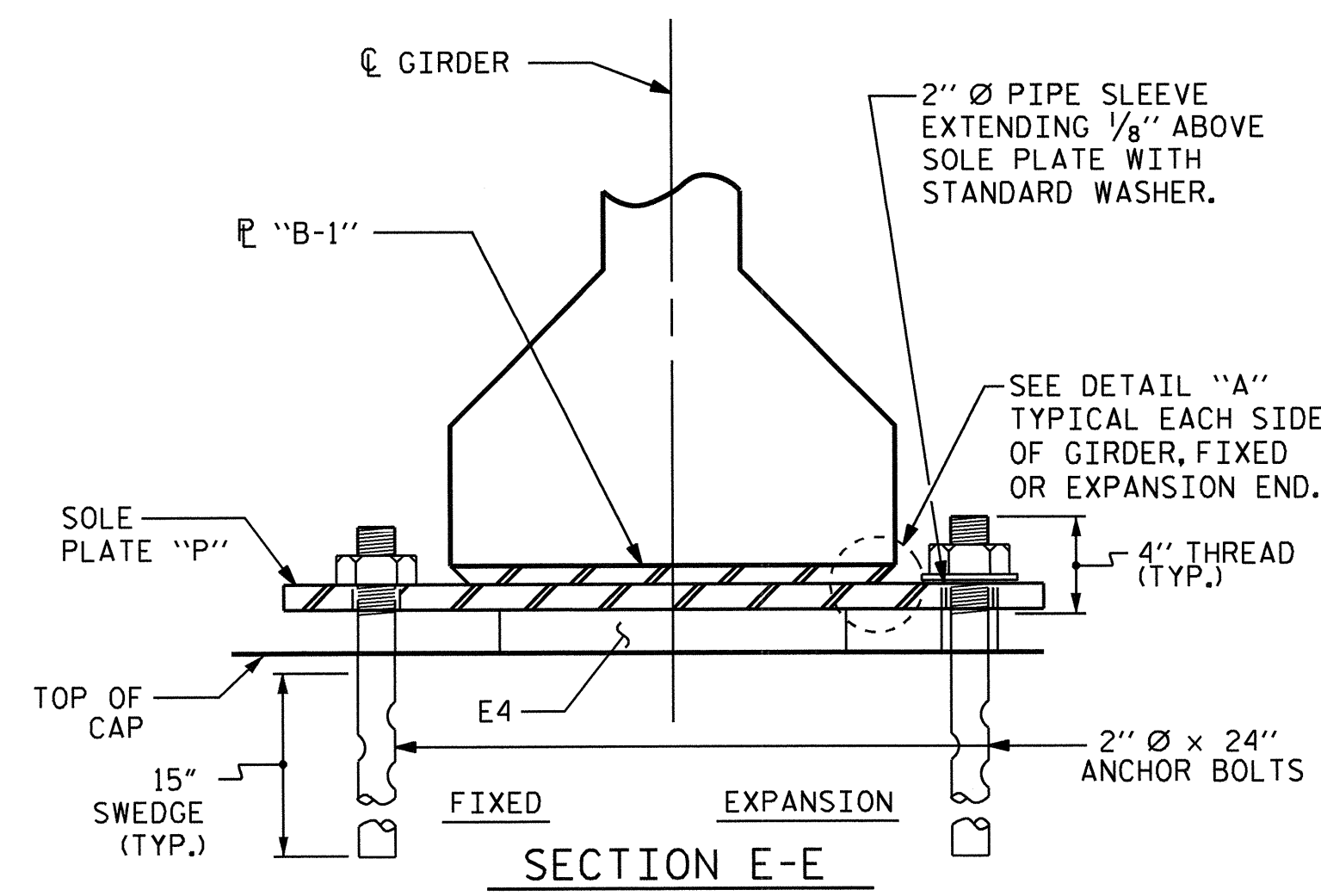
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

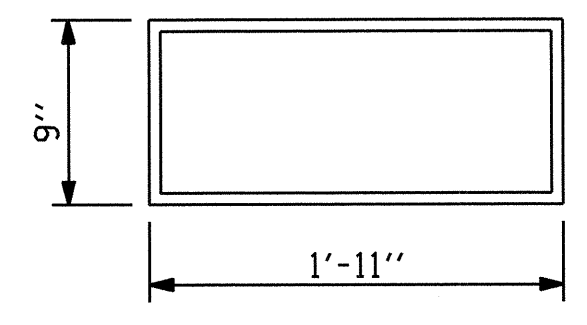
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

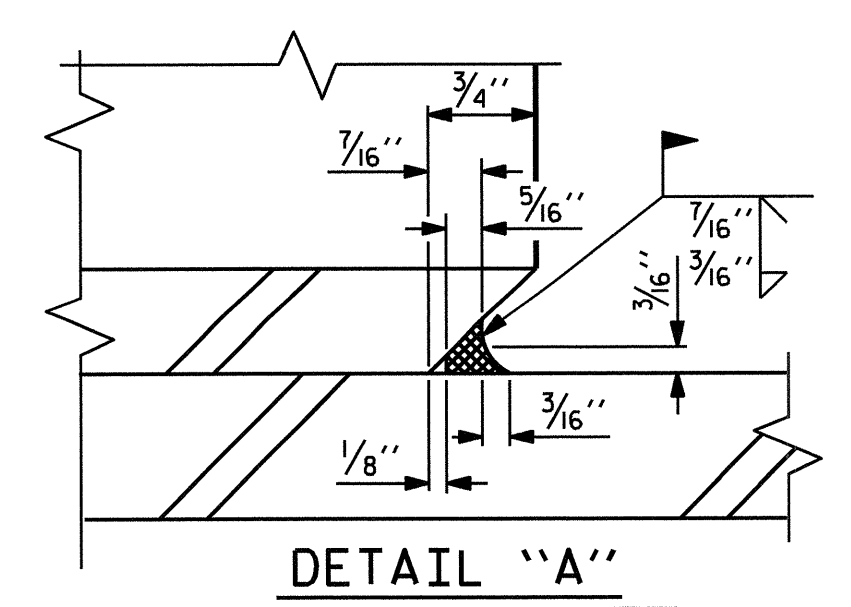
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



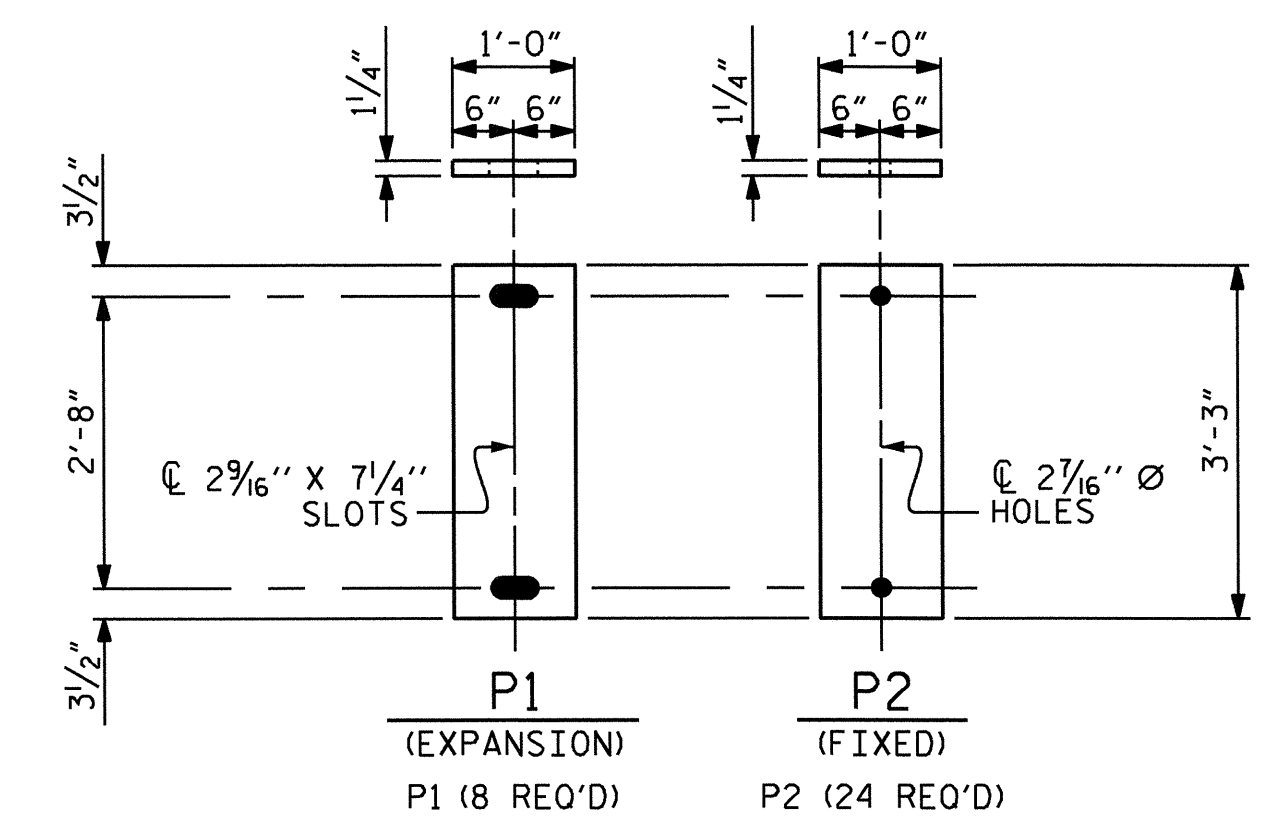
TYPICAL SECTION OF ELASTOMERIC BEARINGS



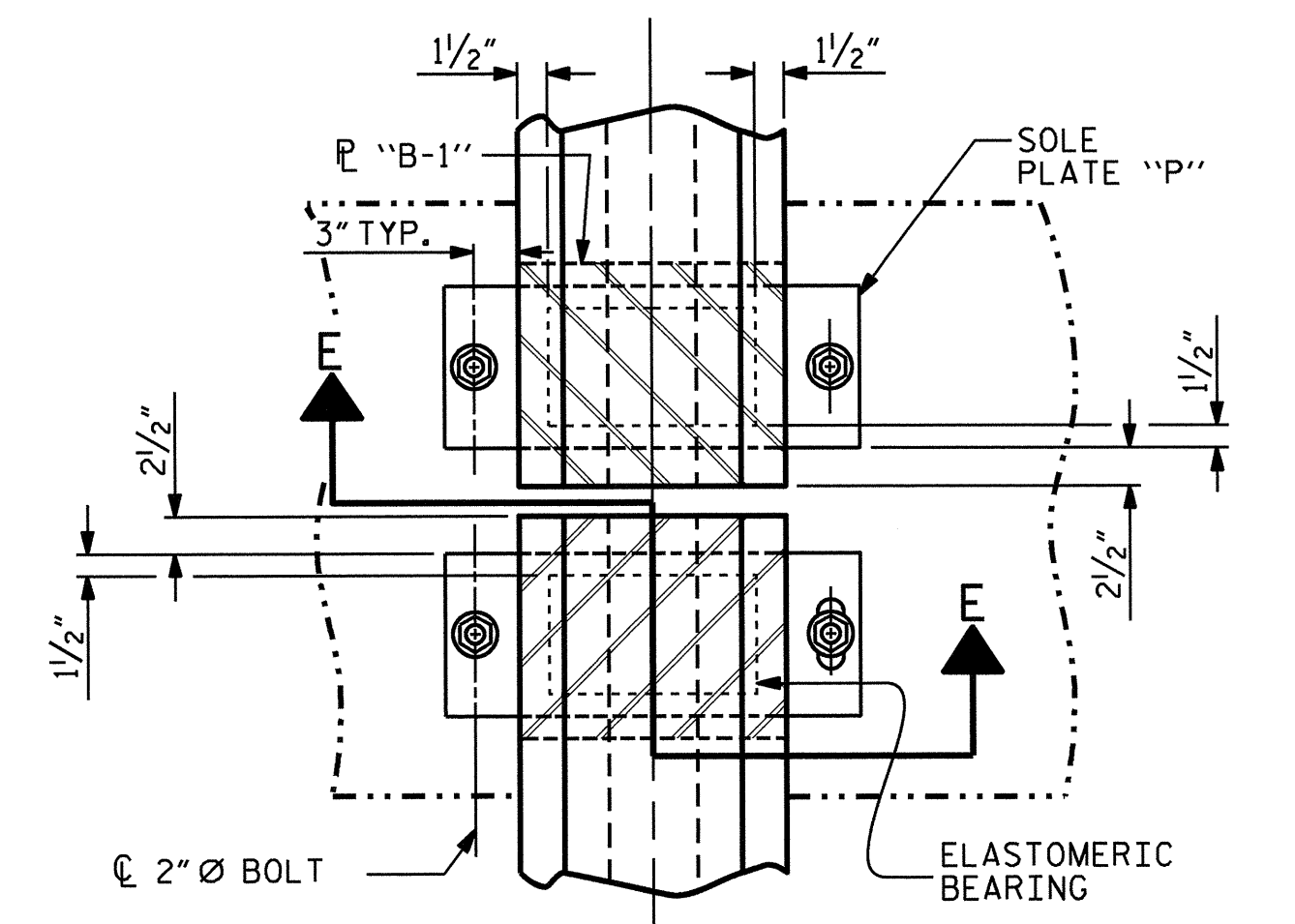
E4 (32 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



DETAIL "A"



SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT) TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

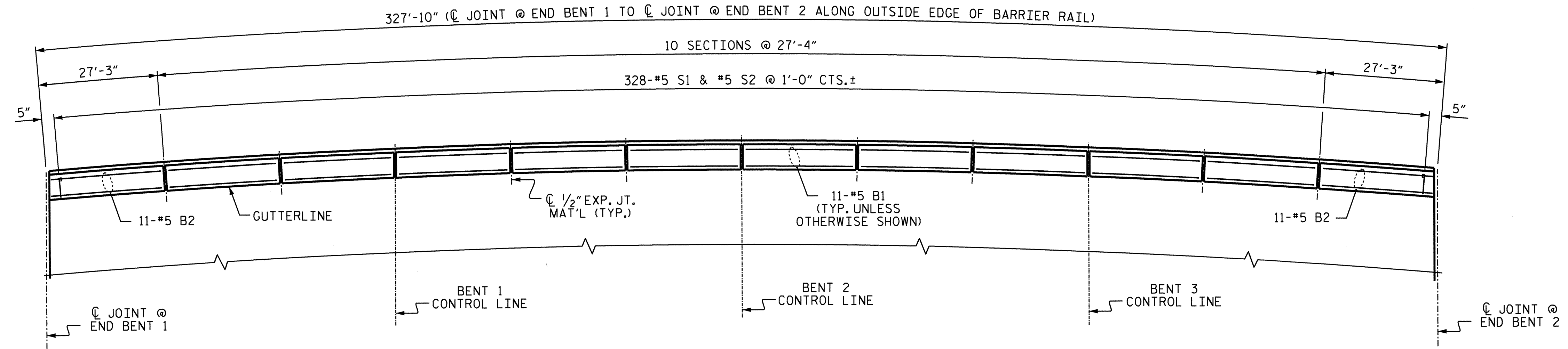
PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-



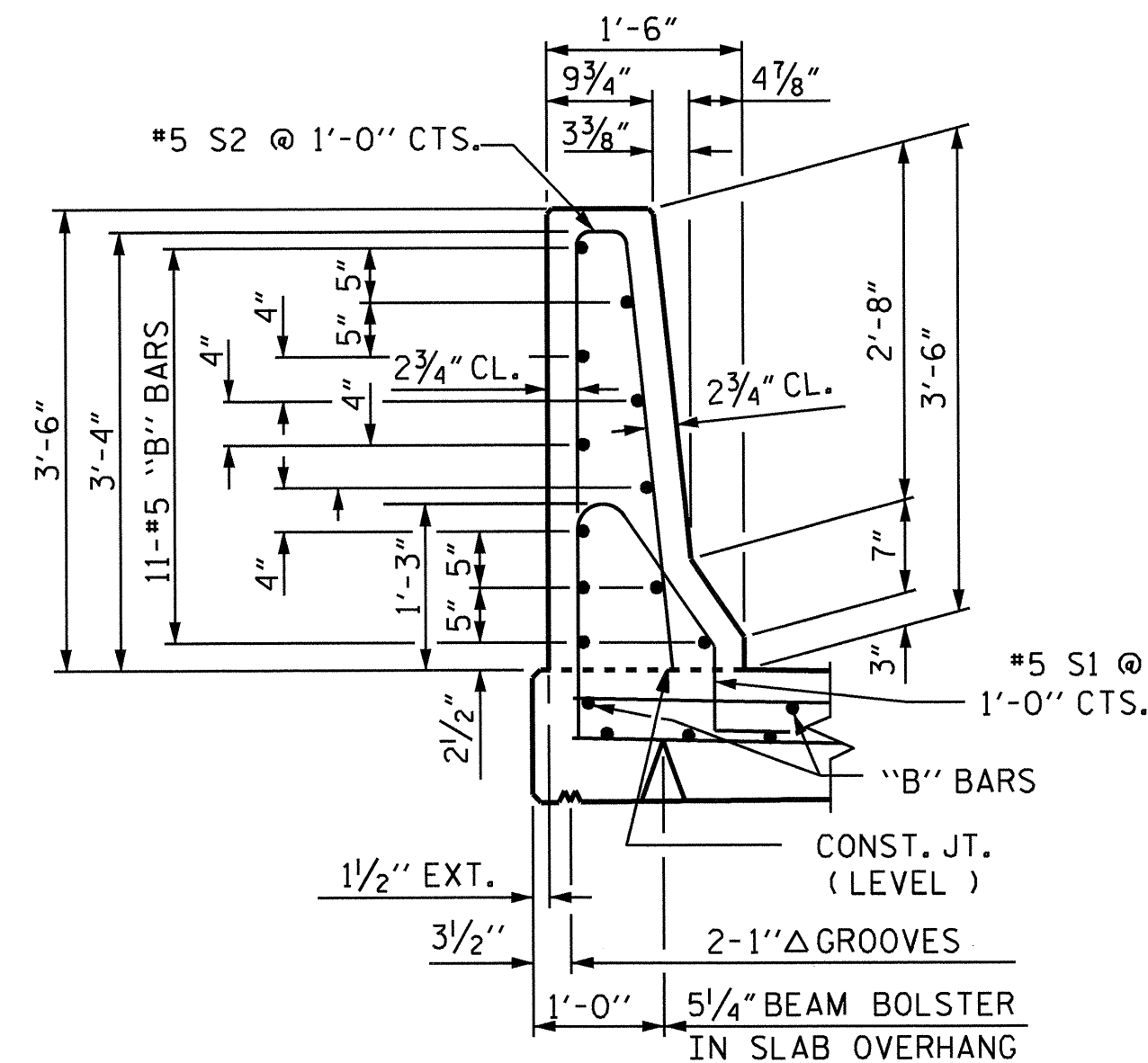
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 ELASTOMERIC BEARING
 DETAILS
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE

REVISIONS						SHEET NO. S-19
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 48
2			4			

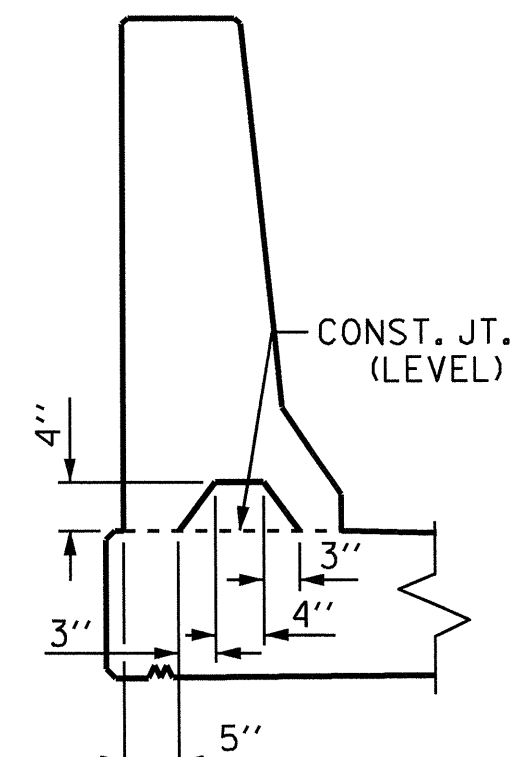
ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 11/2012
DRAWN BY : EEM 2/97	REV. 5/1/06 TLA/GM
CHECKED BY : VAP 2/97	REV. 10/11/11 MAA/GM
	REV. 10/24/12 AAC/MAA



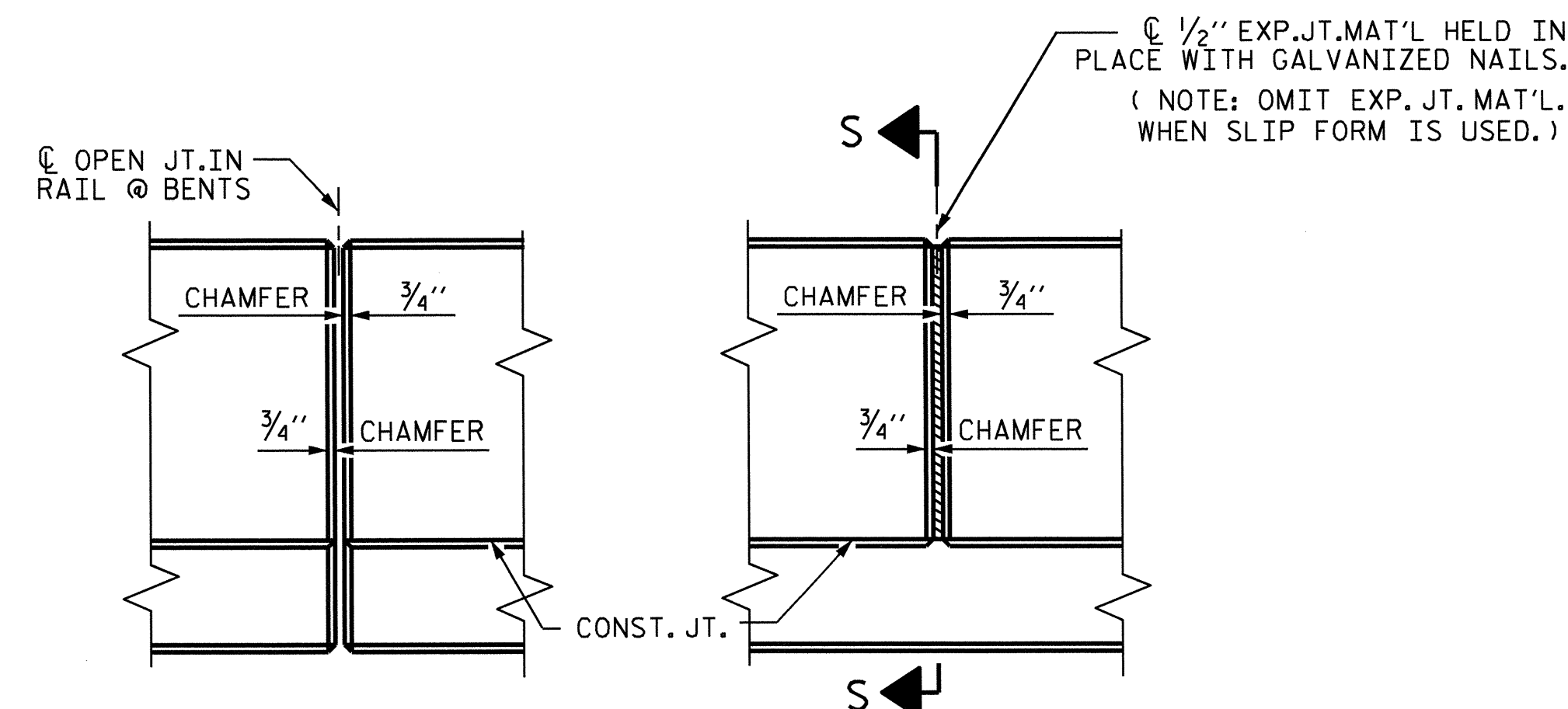
PLAN OF BARRIER RAIL



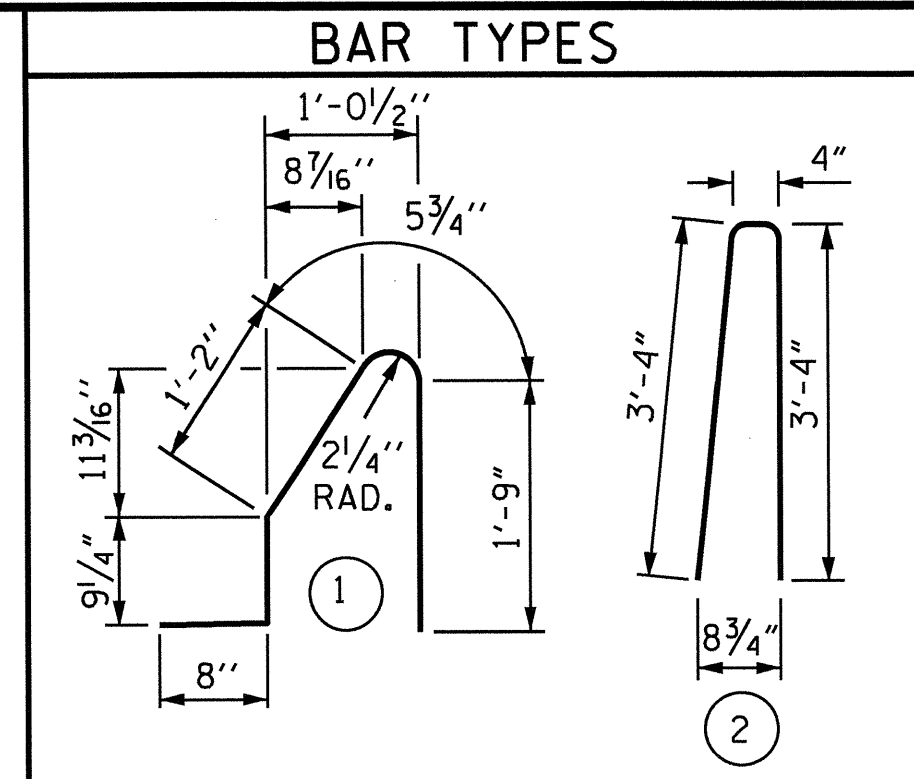
SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	110	#5	STR	26'-11"	3088
* B2	22	#5	STR	26'-9"	614
* S1	328	#5	1	4'-10"	1653
* S2	328	#5	2	7'-0"	2395

* EPOXY COATED REINFORCING STEEL 7750 LBS.
CLASS AA CONCRETE 44.6 CU. YDS.
CONCRETE BARRIER RAIL 327.67 LIN. FT.

NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

FOR END OF RAIL DETAILS AND BARRIER RAIL ON APPROACH SLAB DETAILS AND QUANTITIES, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET 3 OF 3.

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00-L-

SHEET 1 OF 2

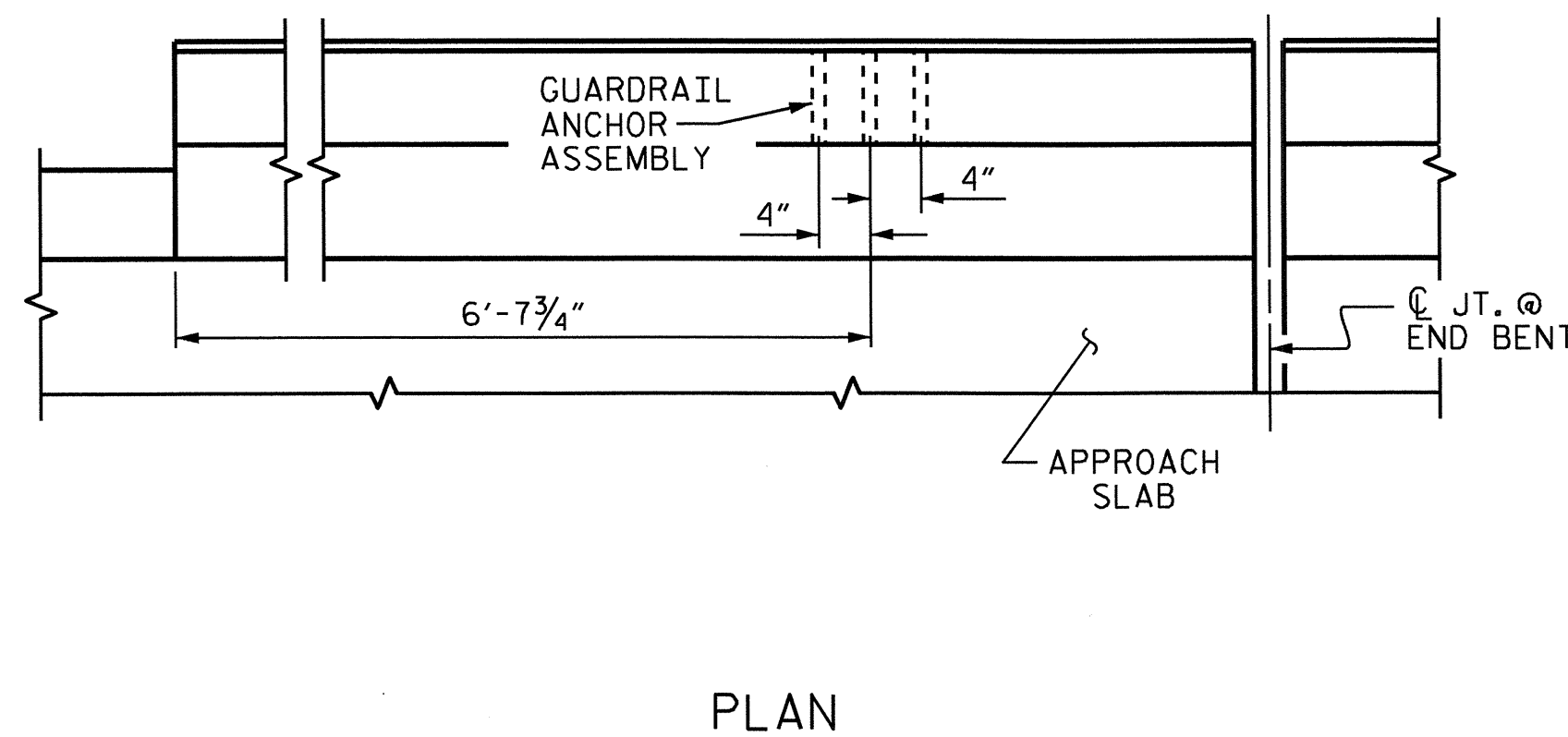
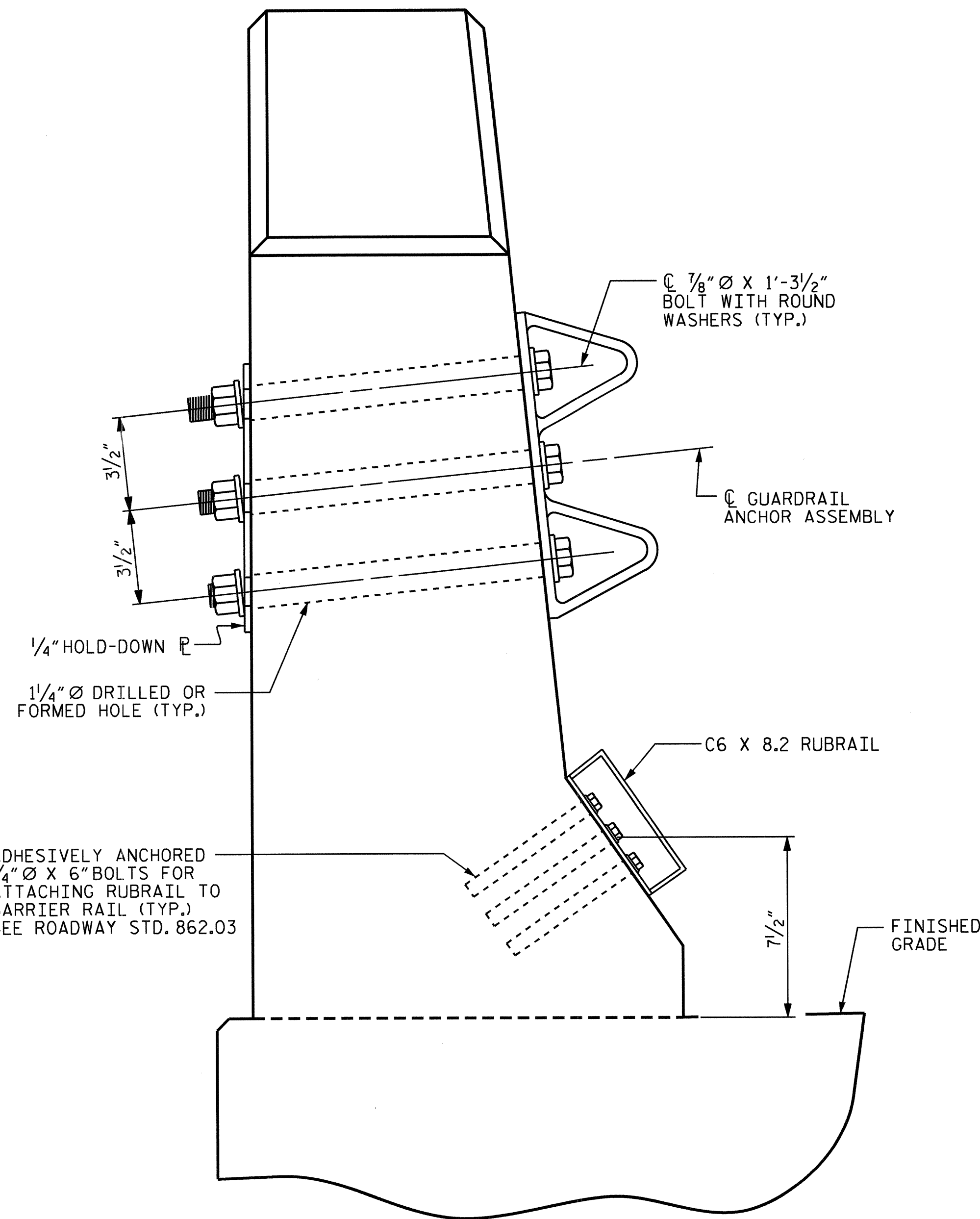
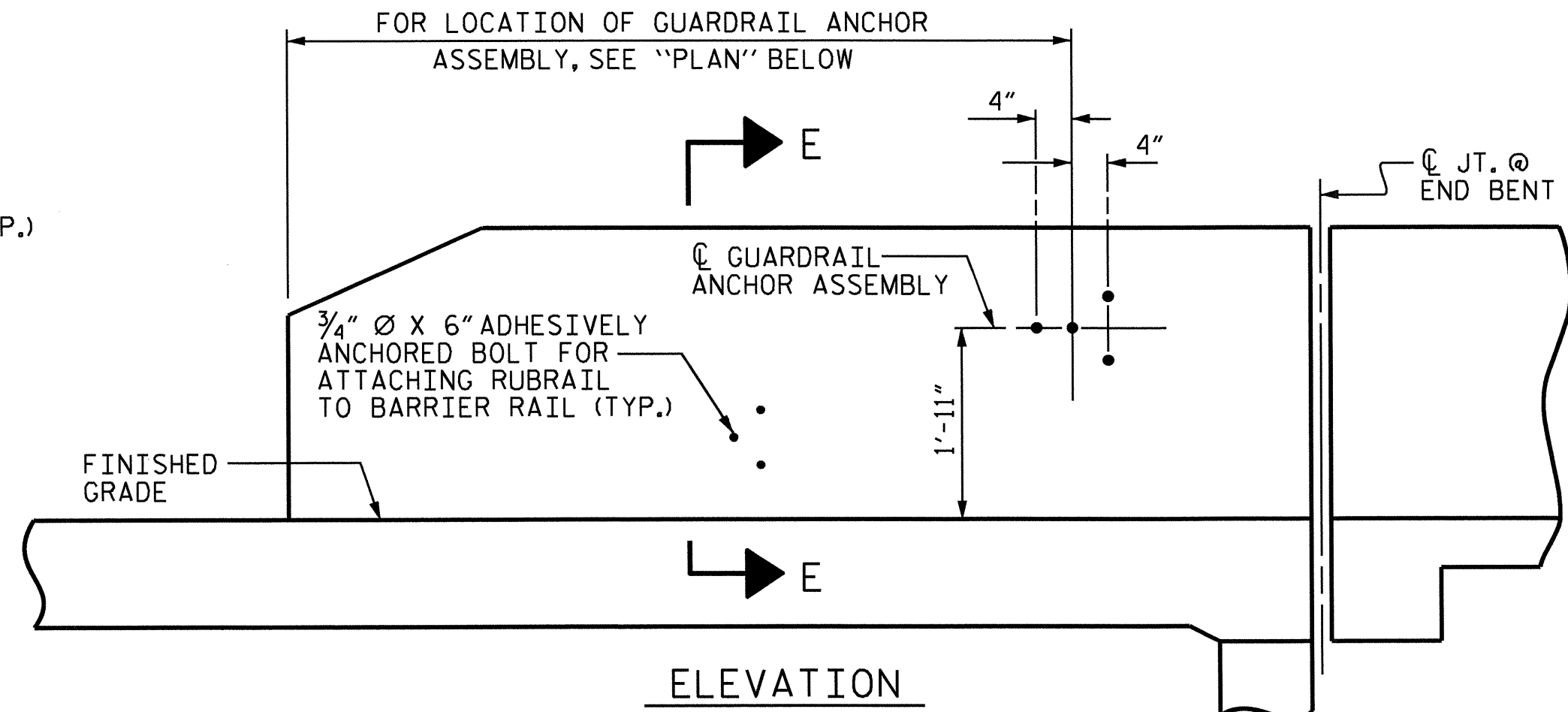
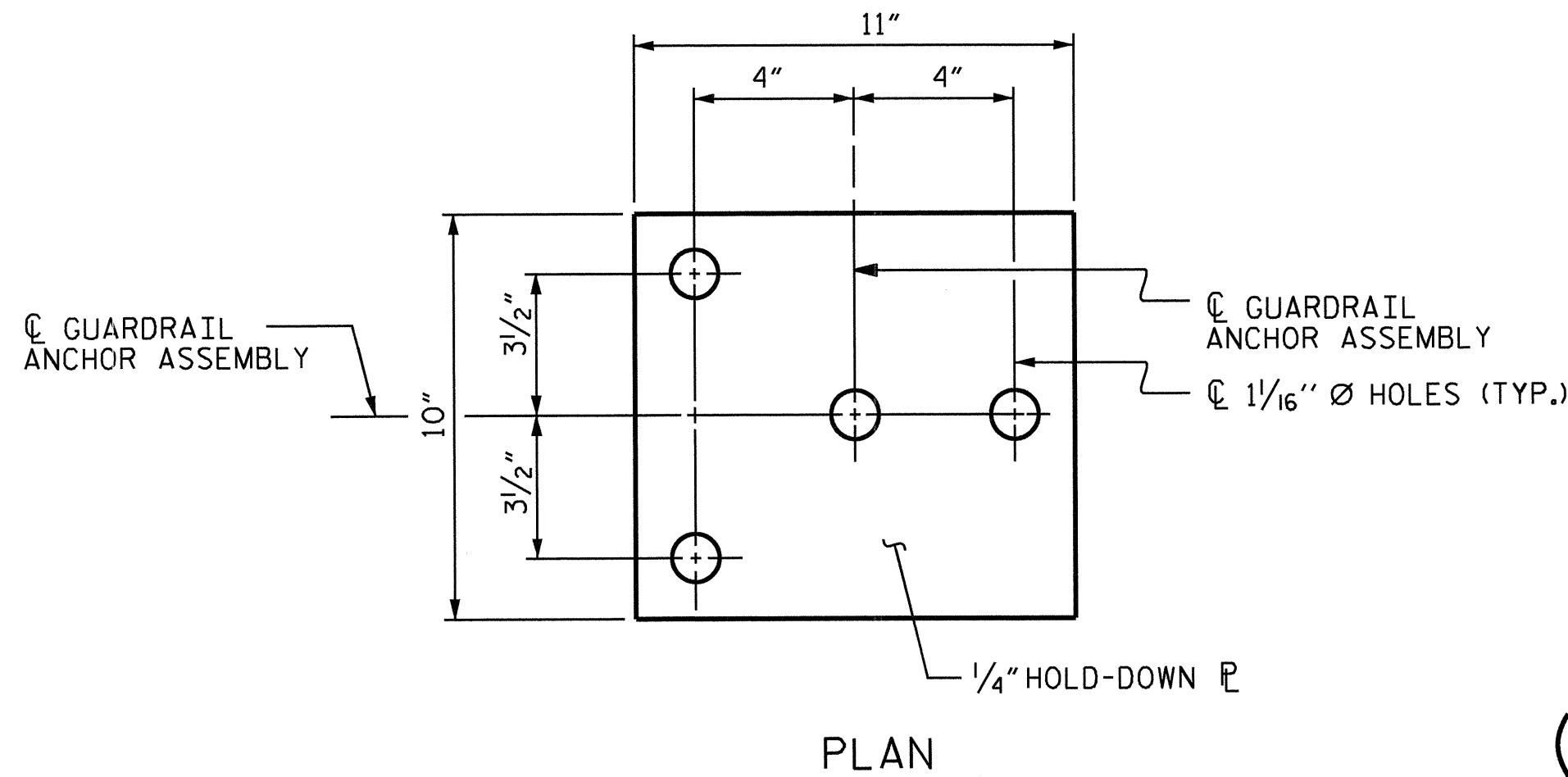
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS 48
2			4			

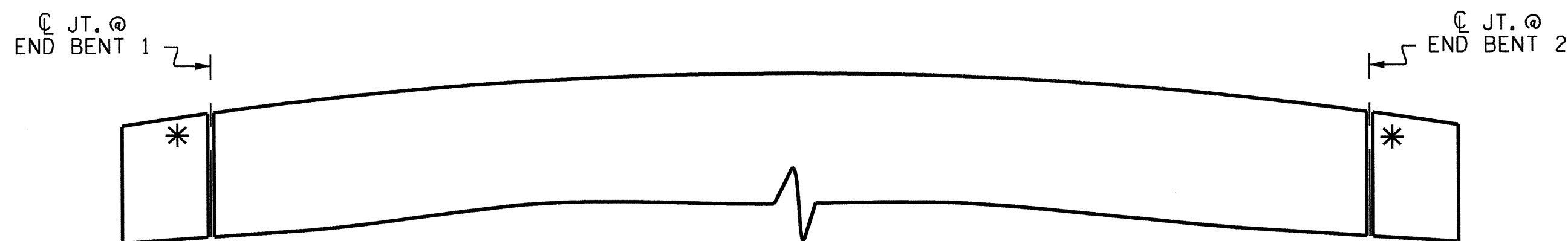


ASSEMBLED BY : S. H. SOCKWELL DATE : 11/2012
CHECKED BY : J. L. LAMBERT DATE : 12/2012
DRAWN BY : ARB 5/87 REV. 10/1/11 MAA/GM
CHECKED BY : SJD 9/87 REV. 7/12 MAA/GM
REV. 10/12 MAA/GM



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

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

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 CONCRETE BARRIER RAIL.

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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00-L-

SHEET 2 OF 2

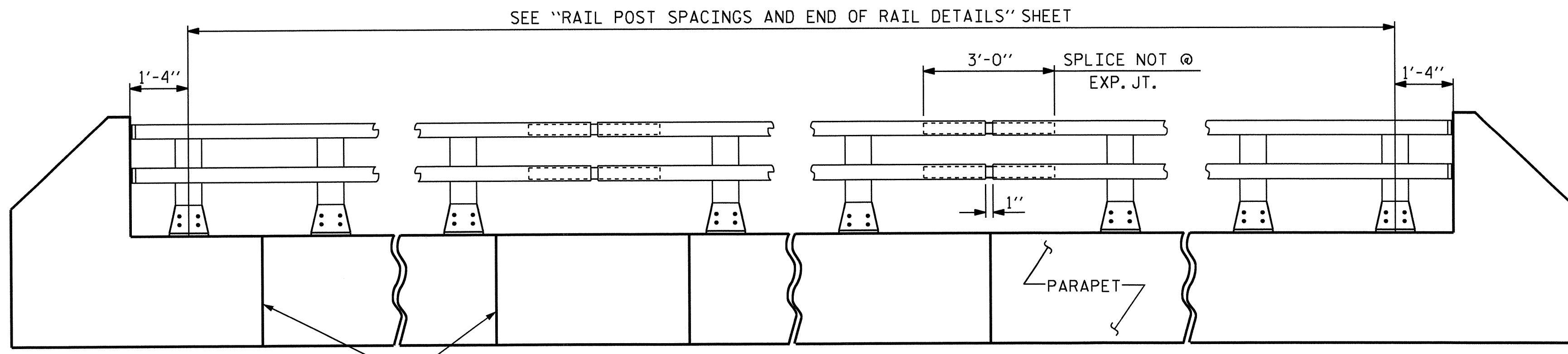
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

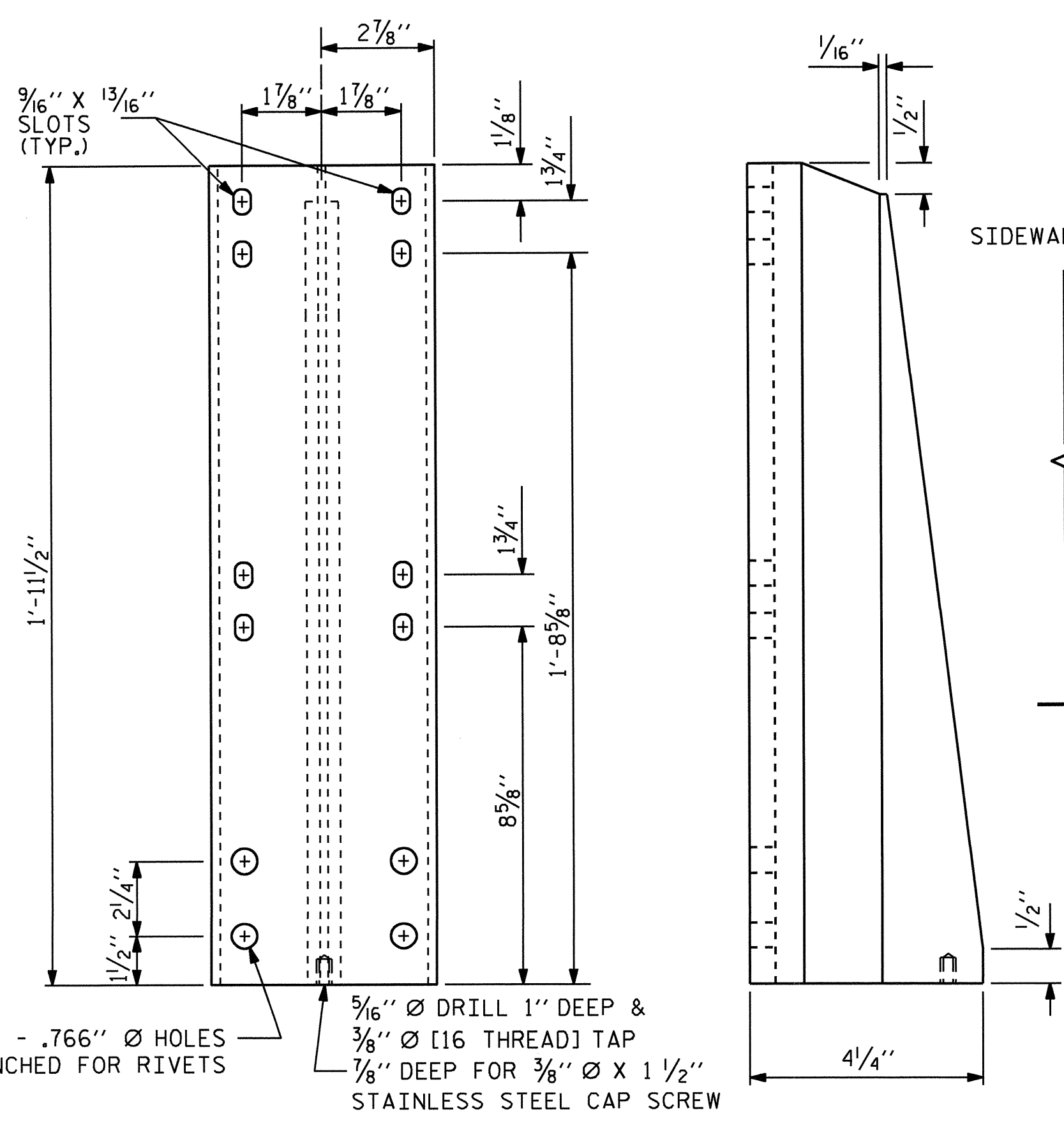
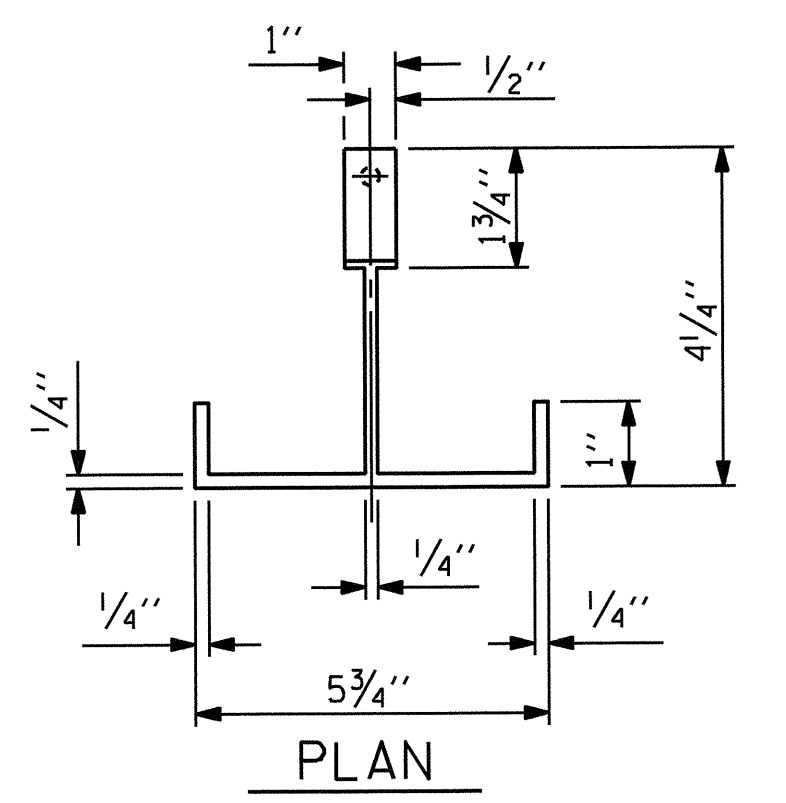


ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 10/12 MAA/GM

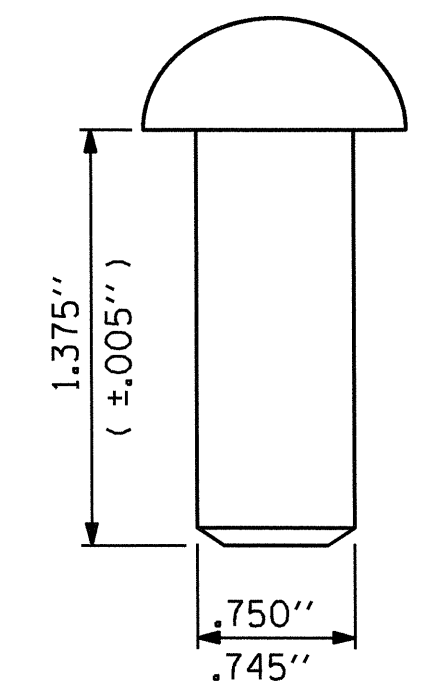
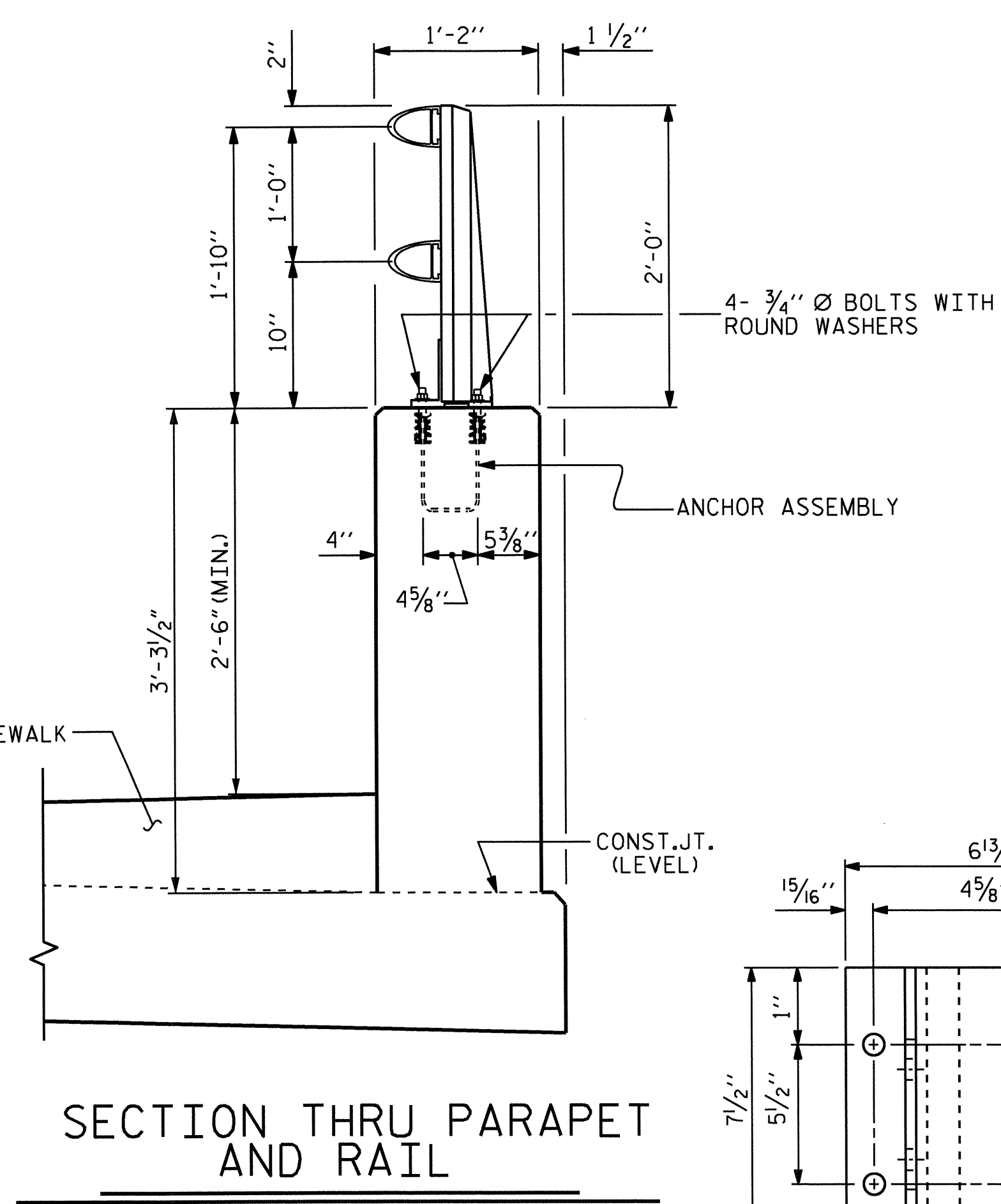
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			48



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



DETAILS OF POST

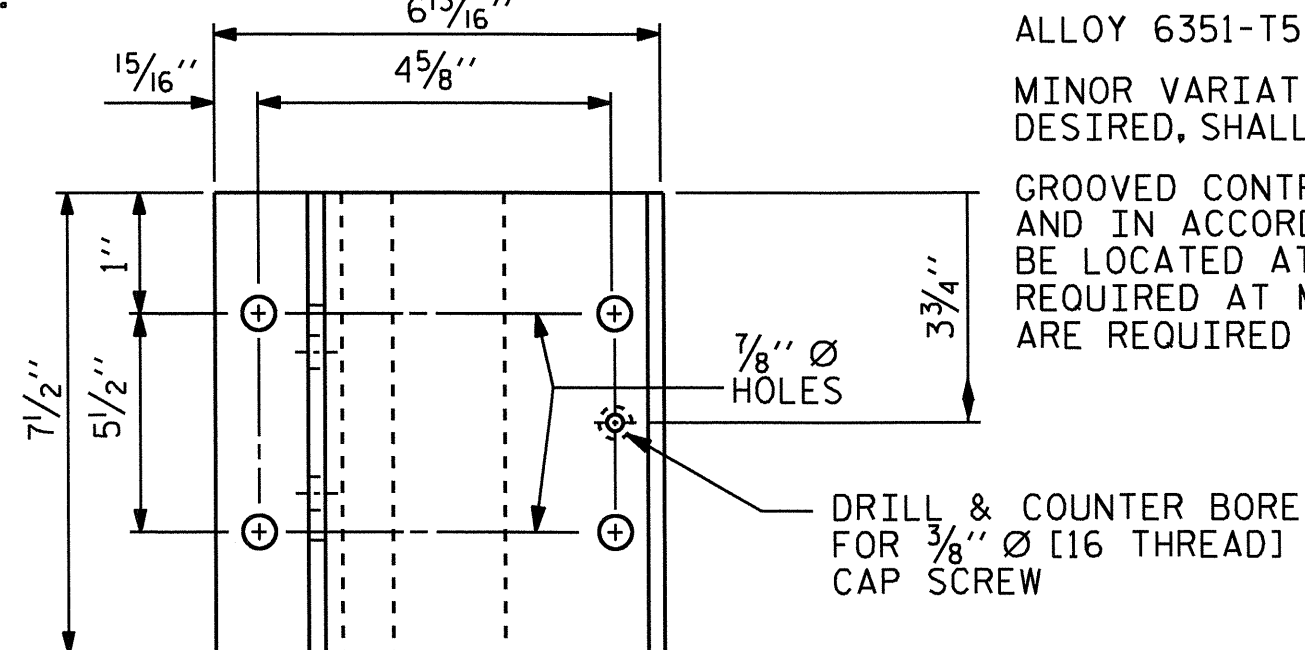


4 - 3/4" Ø BOLTS WITH ROUND WASHERS

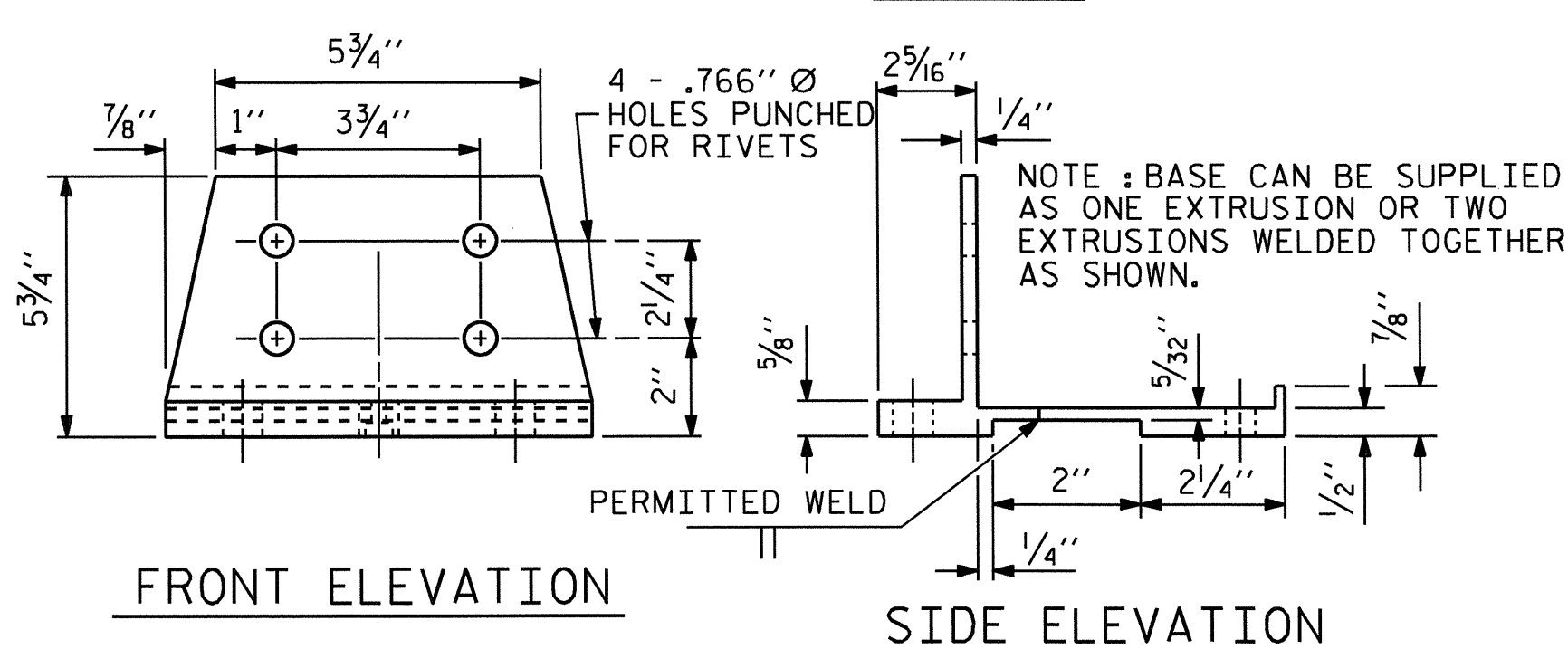
ANCHOR ASSEMBLY

CONST. JT. (LEVEL)

SIDEWALK



DRILL & COUNTER BORE FOR 3/8" Ø [16 THREAD] CAP SCREW



POST BASE DETAILS

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 3 OF 5.

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 = 320.19 LIN. FT.

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 1 OF 5

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			48

ASSEMBLED BY: S. H. SOCKWELL DATE: 11/2012
 CHECKED BY: J. L. LAMBERT DATE: 12/2012
 DRAWN BY: EEM 6/94 REV. 5/7/03R RWW/JTE
 CHECKED BY: RCW 6/94 REV. 5/1/06 TLA/GM
 REV. 10/1/11 MAA/GM

NOTES

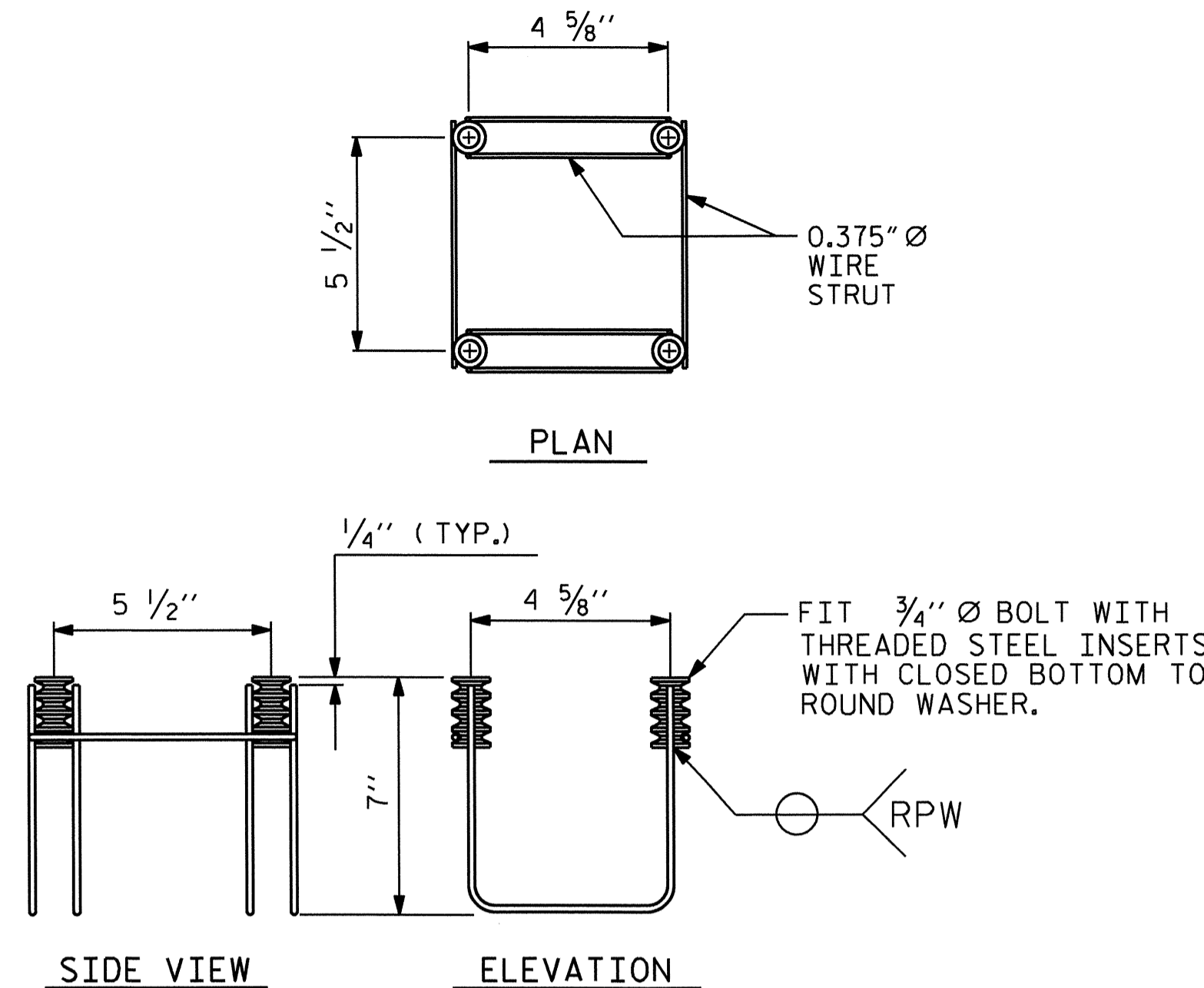
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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.

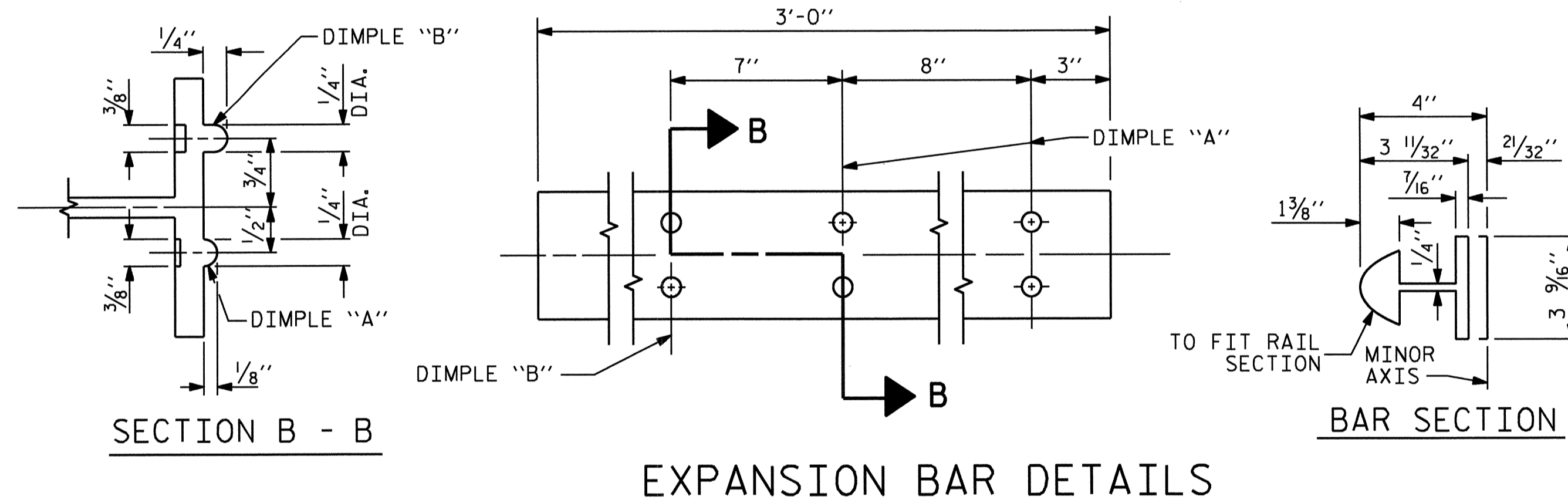
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.

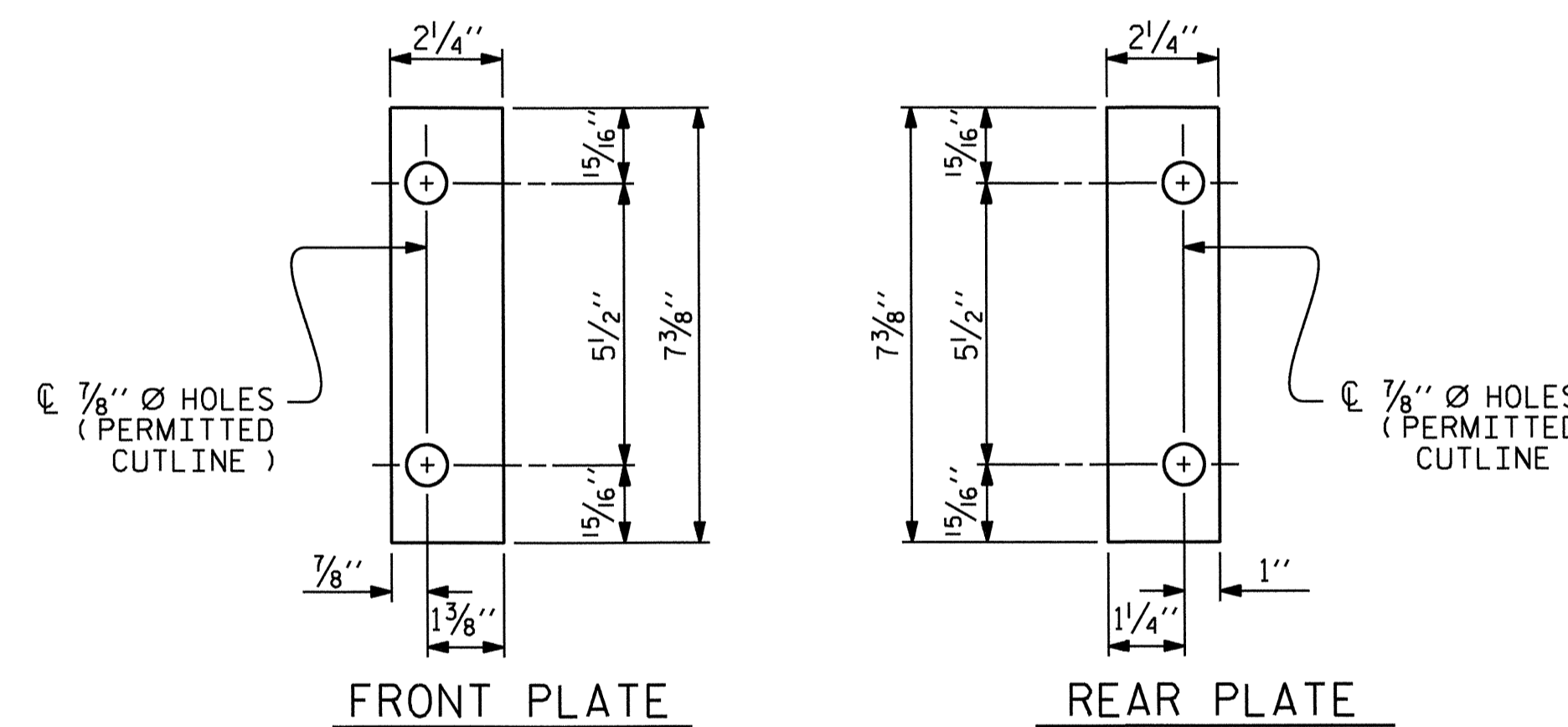


4-BOLT METAL RAIL ANCHOR ASSEMBLY

(52 ASSEMBLIES REQUIRED)



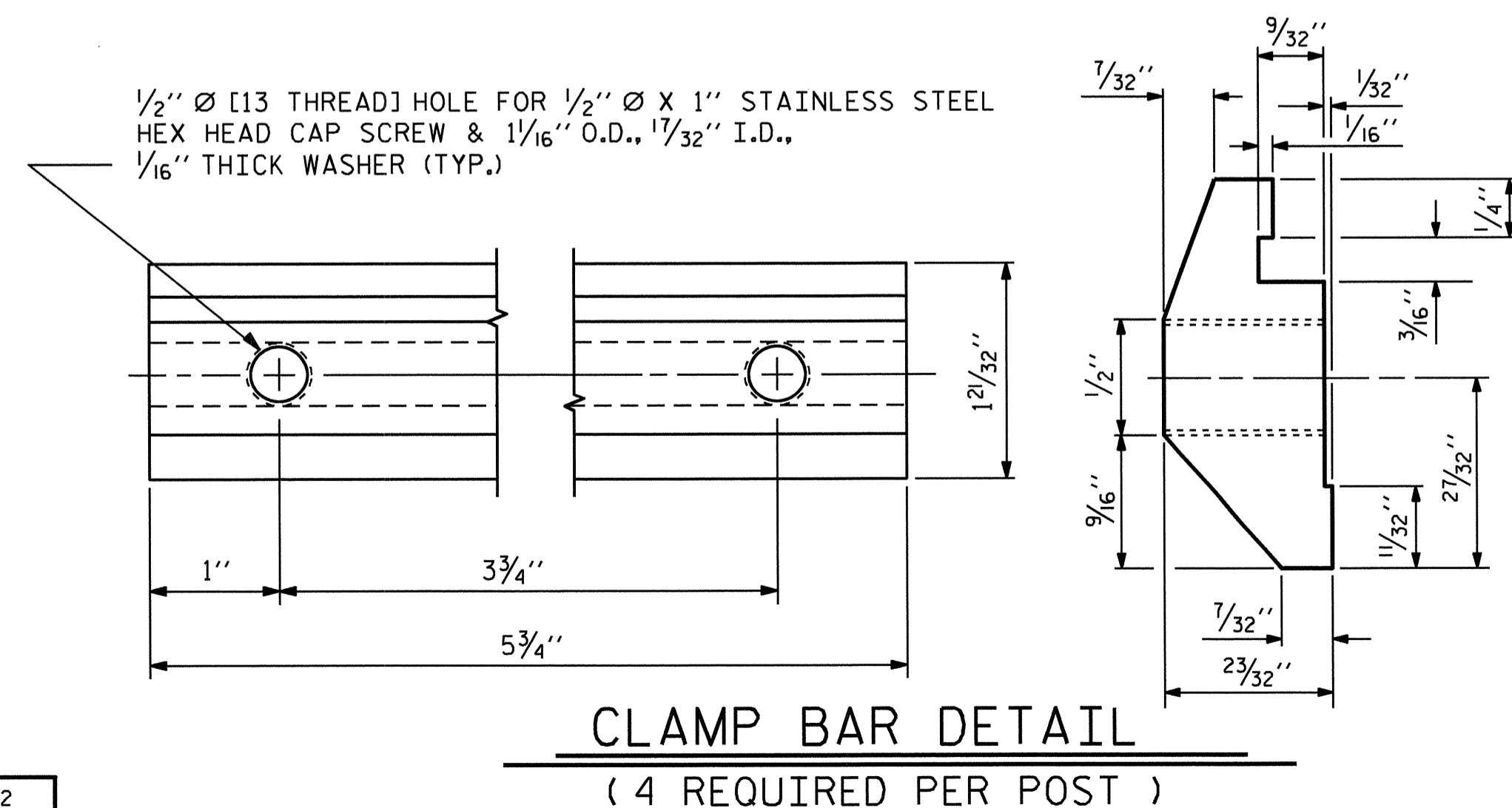
EXPANSION BAR DETAILS



SHIM DETAILS

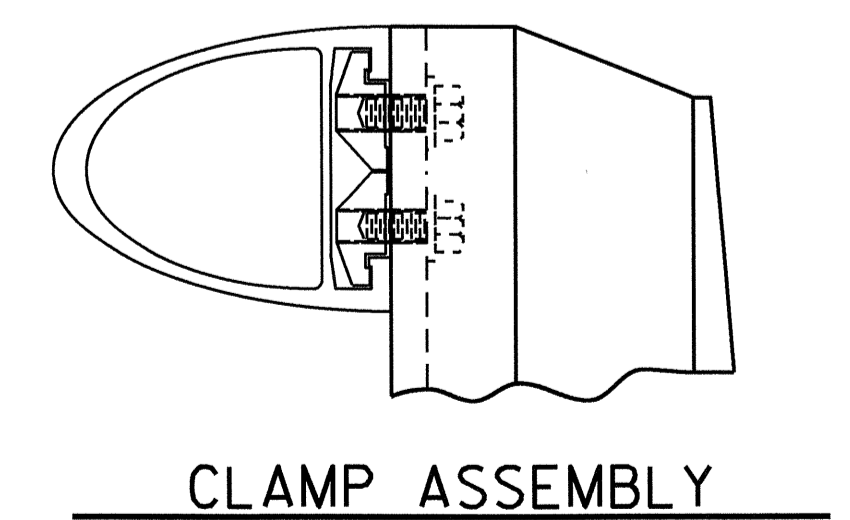
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

RAIL SECTION

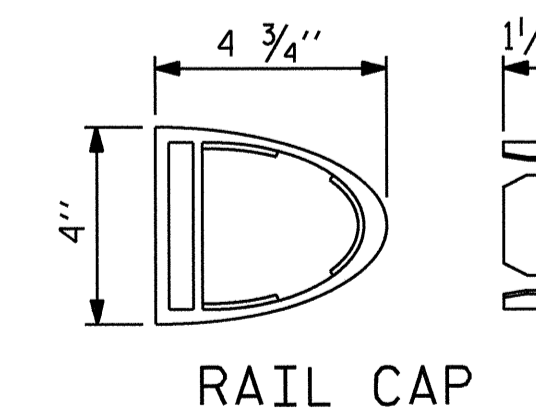


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

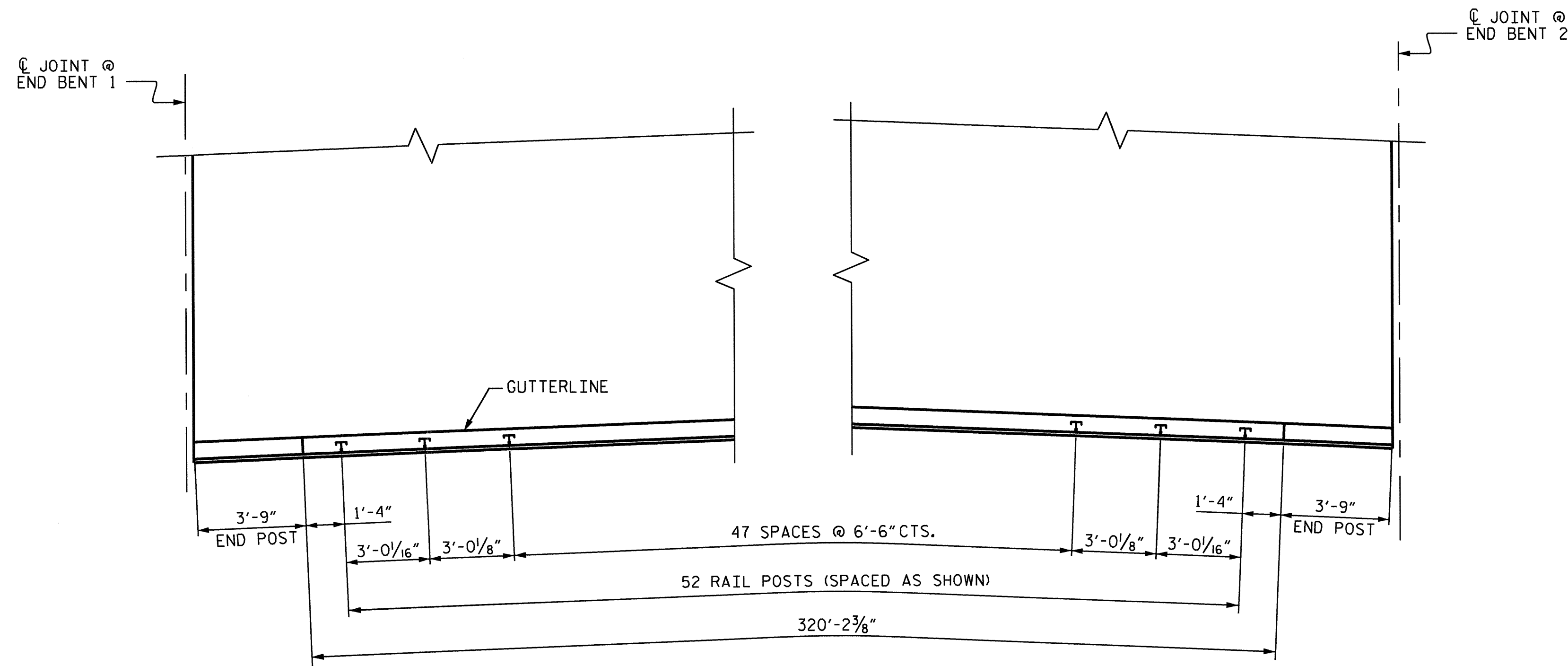
SHEET 2 OF 5

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



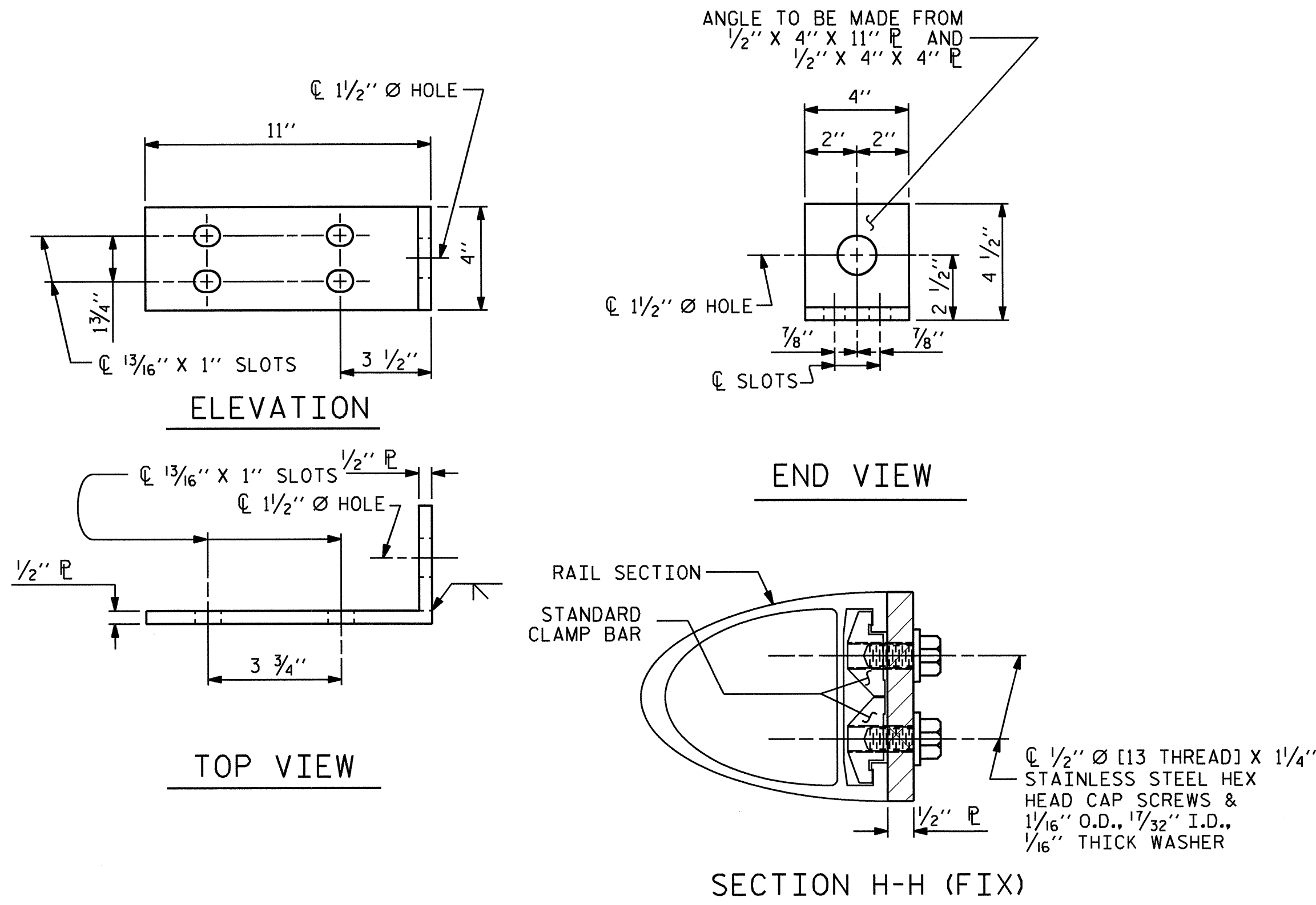
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 48
2			4			

ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RCW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

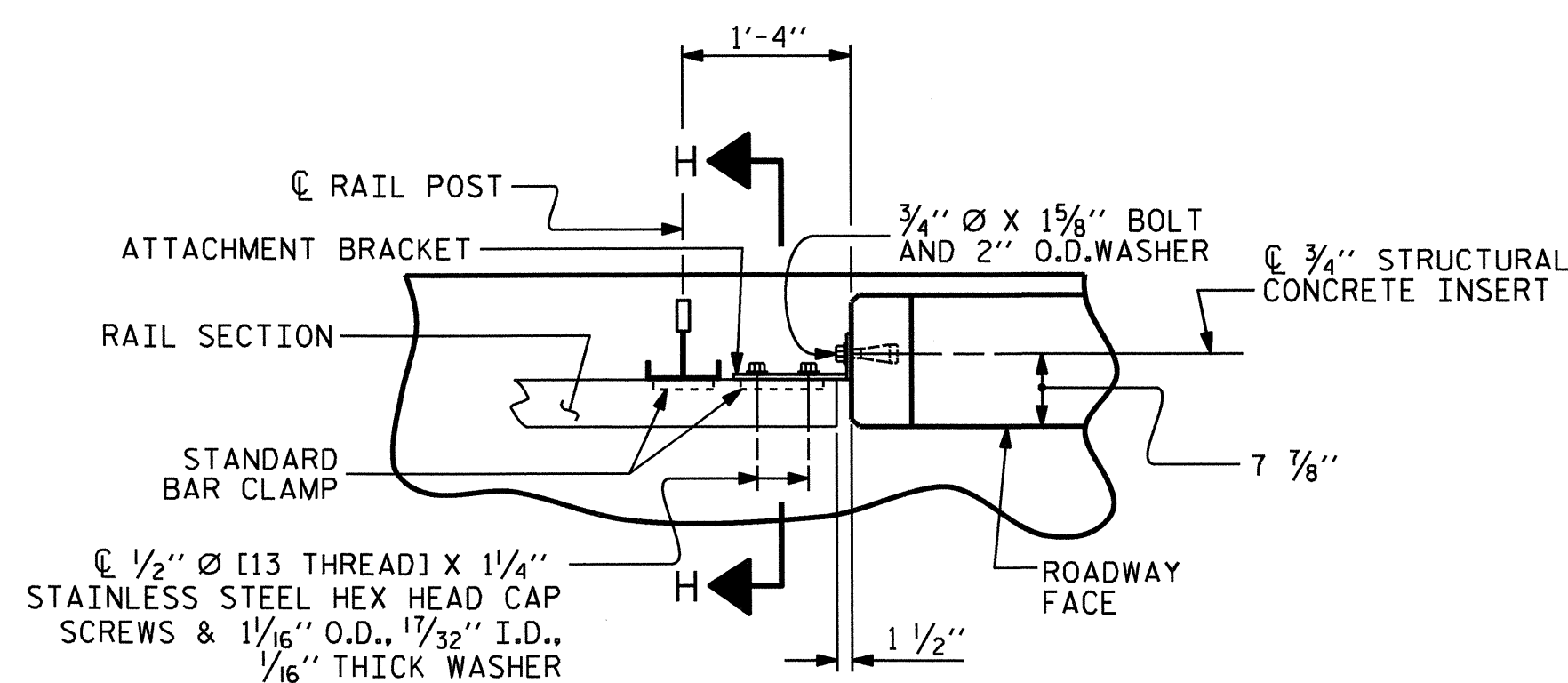


PLAN OF RAIL POST SPACINGS

ALL DIMENSIONS ARE TAKEN ALONG THE OUTSIDE EDGE OF PARAPET



DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST

NOTES

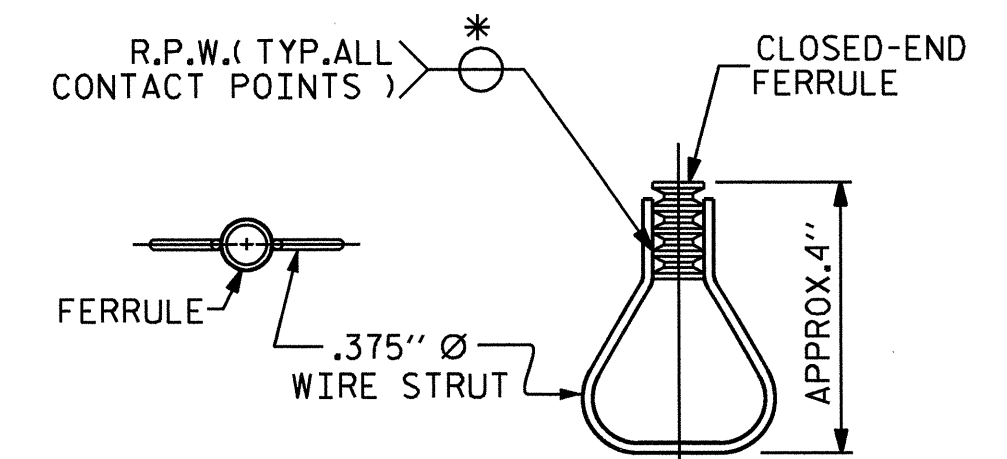
STRUCTURAL CONCRETE INSERT

- 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 1/2".
 - 1 - 3/4" 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" 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" x 1/2" 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" x 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" 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" x 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" x 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" x 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" x 1 5/8" BOLT SHALL APPLY TO THE 3/4" x 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION STRUCTURAL CONCRETE INSERT

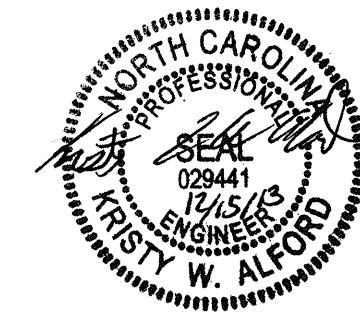
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 3 OF 5

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

REVISIONS						SHEET NO. S-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 48
2			4			



ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
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

BILL OF MATERIAL

FOR CONCRETE PARAPET AND TWO END POSTS

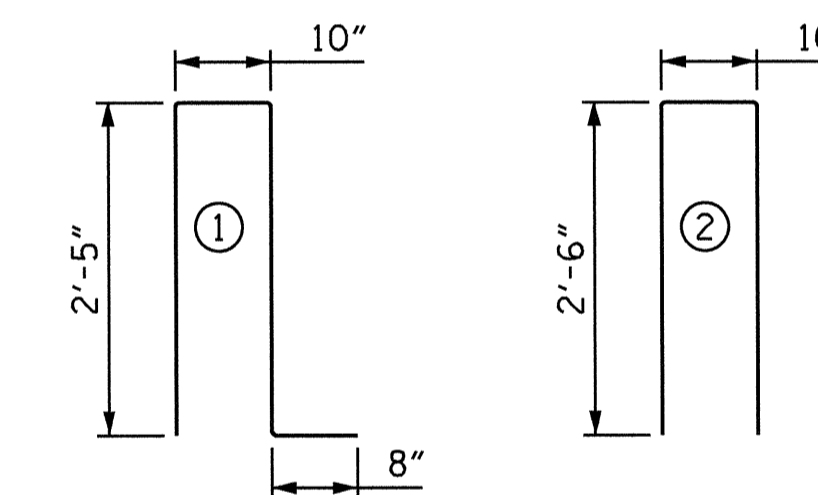
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	#5	STR.	26'-10"	3358
*E1	#7	STR.	3'-2"	26
*E2	#7	STR.	3'-8"	30
*E3	#7	STR.	4'-2"	34
*E4	#7	STR.	4'-8"	38
*E5	#7	STR.	5'-1"	42
*F1	#5	STR.	1'-9"	11
*F2	#6	STR.	2'-11"	18
*F3	#6	STR.	3'-4"	20
*S1	#5	1	6'-4"	2120
*S2	#5	STR.	3'-9"	63
*S3	#5	2	5'-10"	1953

*EPOXY COATED REINFORCING STEEL 7713 LBS.

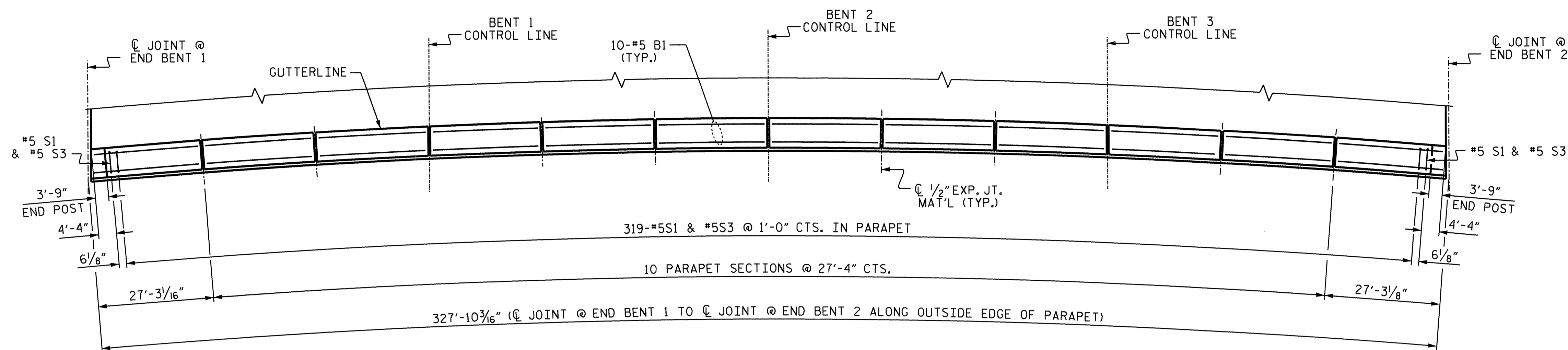
CLASS AA CONCRETE 48.1 CU. YDS.

1'-2" X 3'-3/2" CONCRETE PARAPET 327.69 LIN. FT.

BAR TYPE

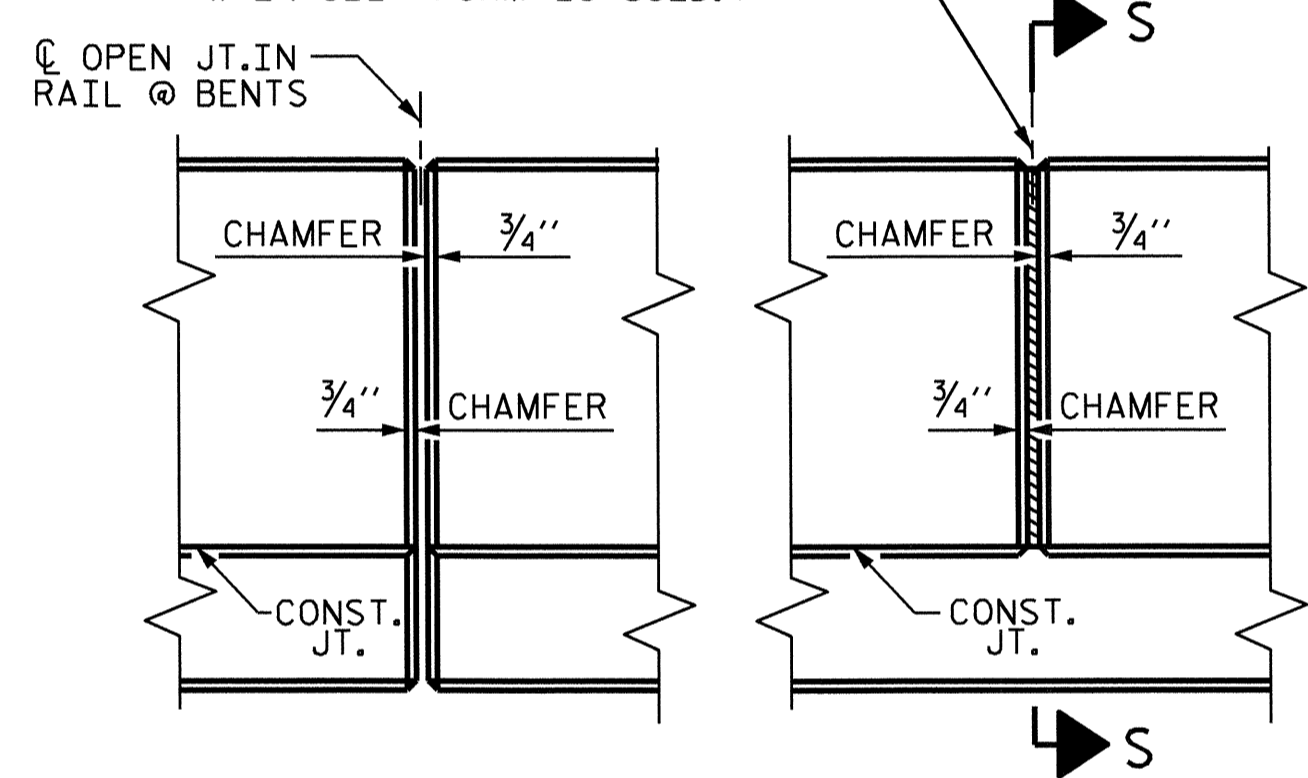


BAR DIMENSIONS ARE OUT TO OUT

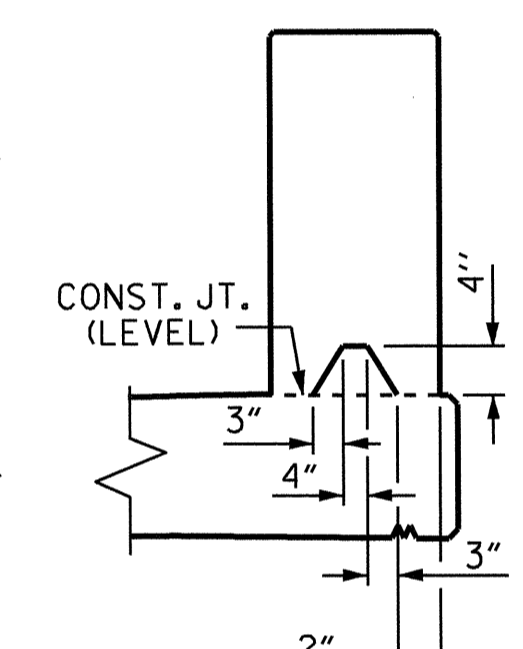


PLAN OF PARAPET

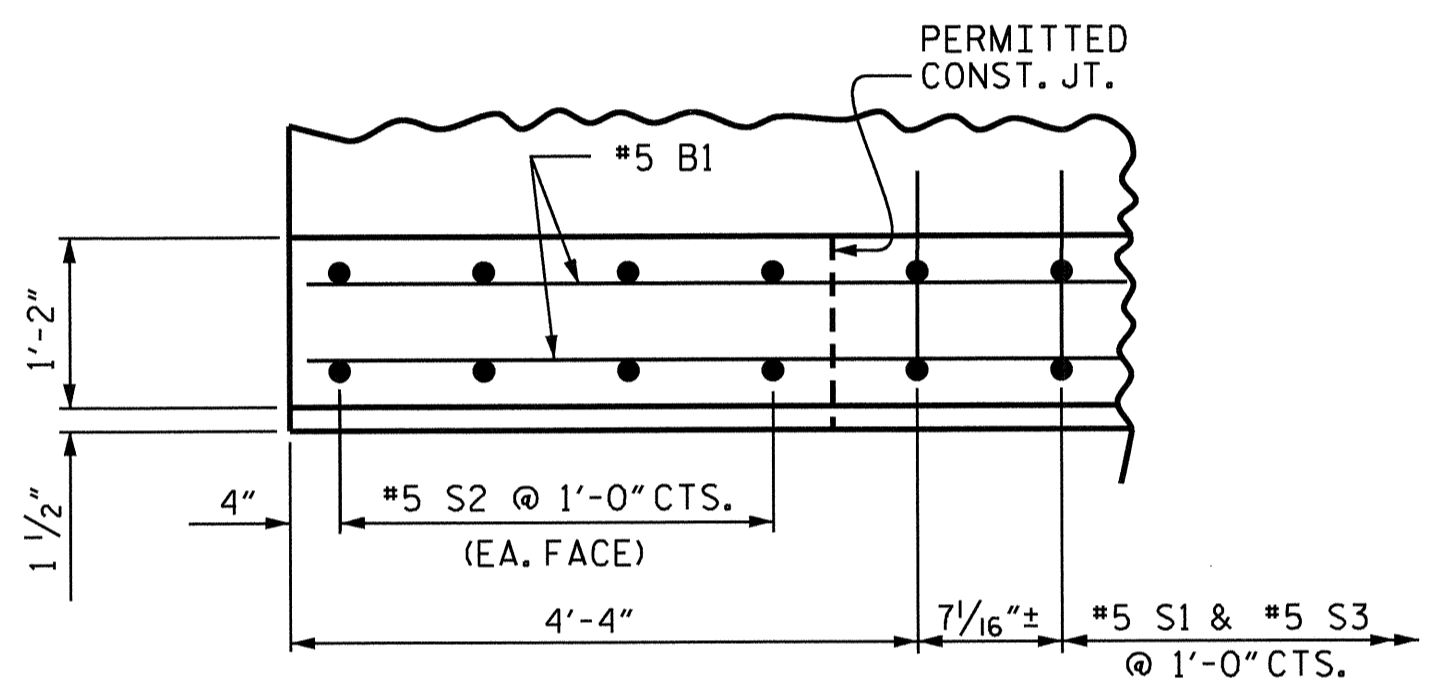
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



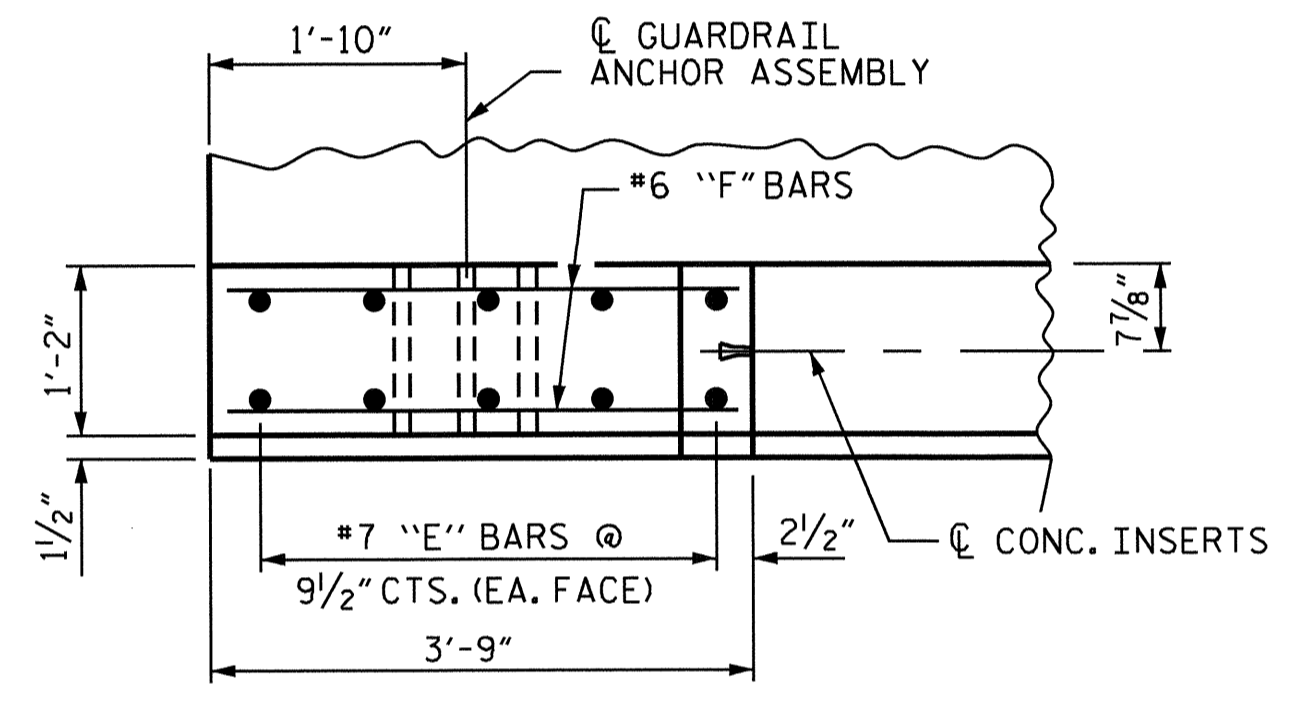
ELEVATION AT EXPANSION JOINTS BARRIER RAIL DETAILS



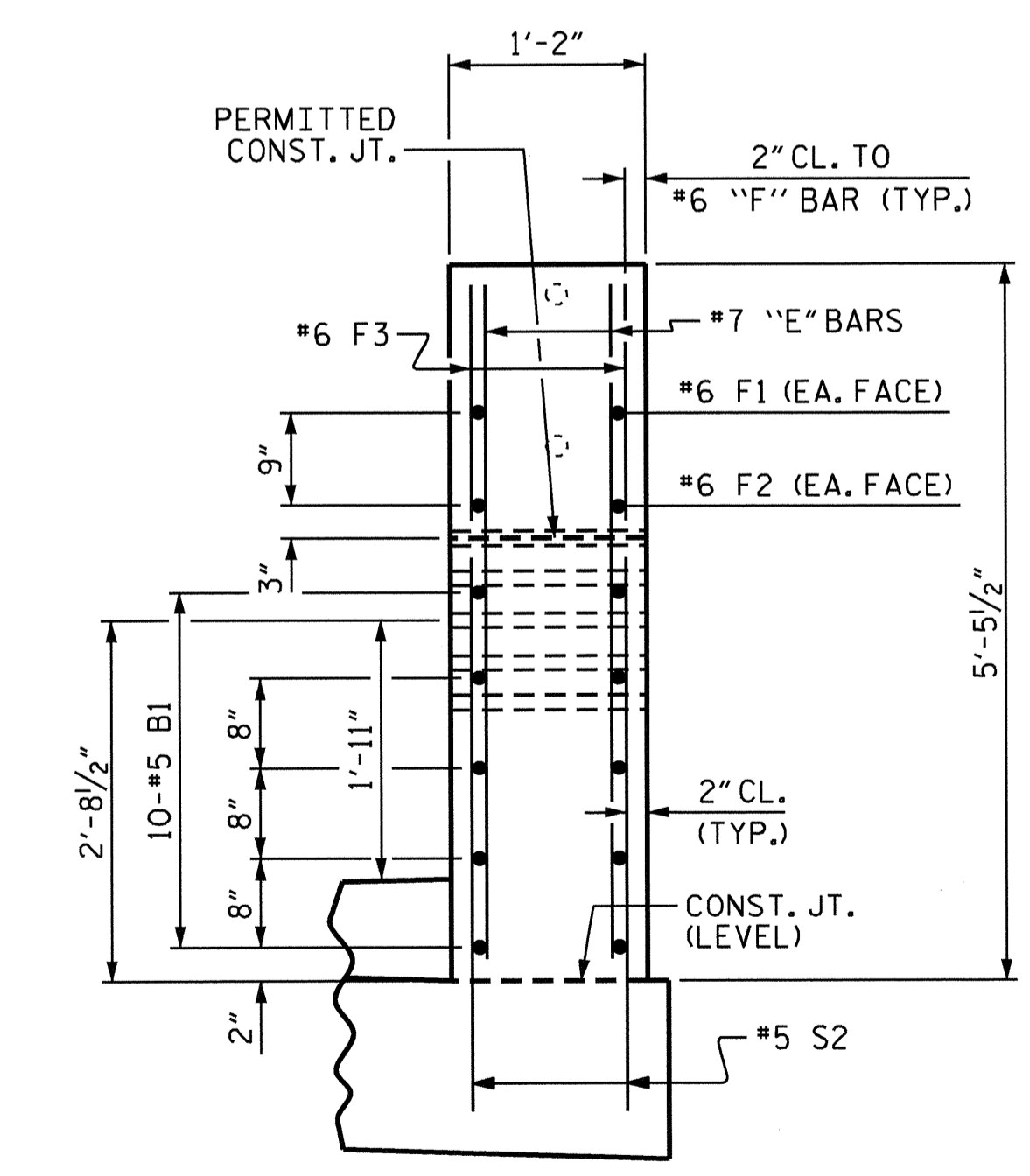
SECTION S-S AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



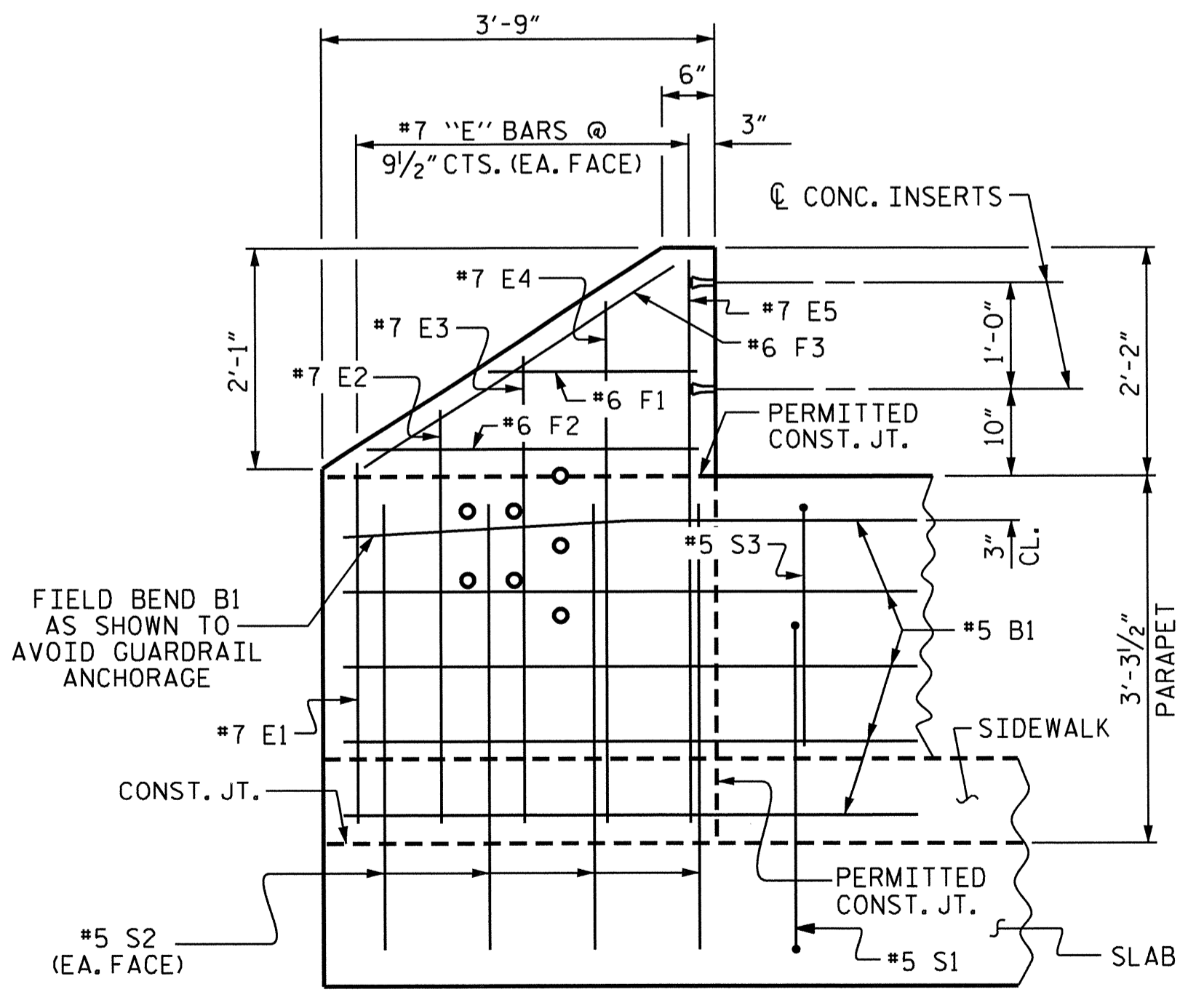
PLAN OF PARAPET



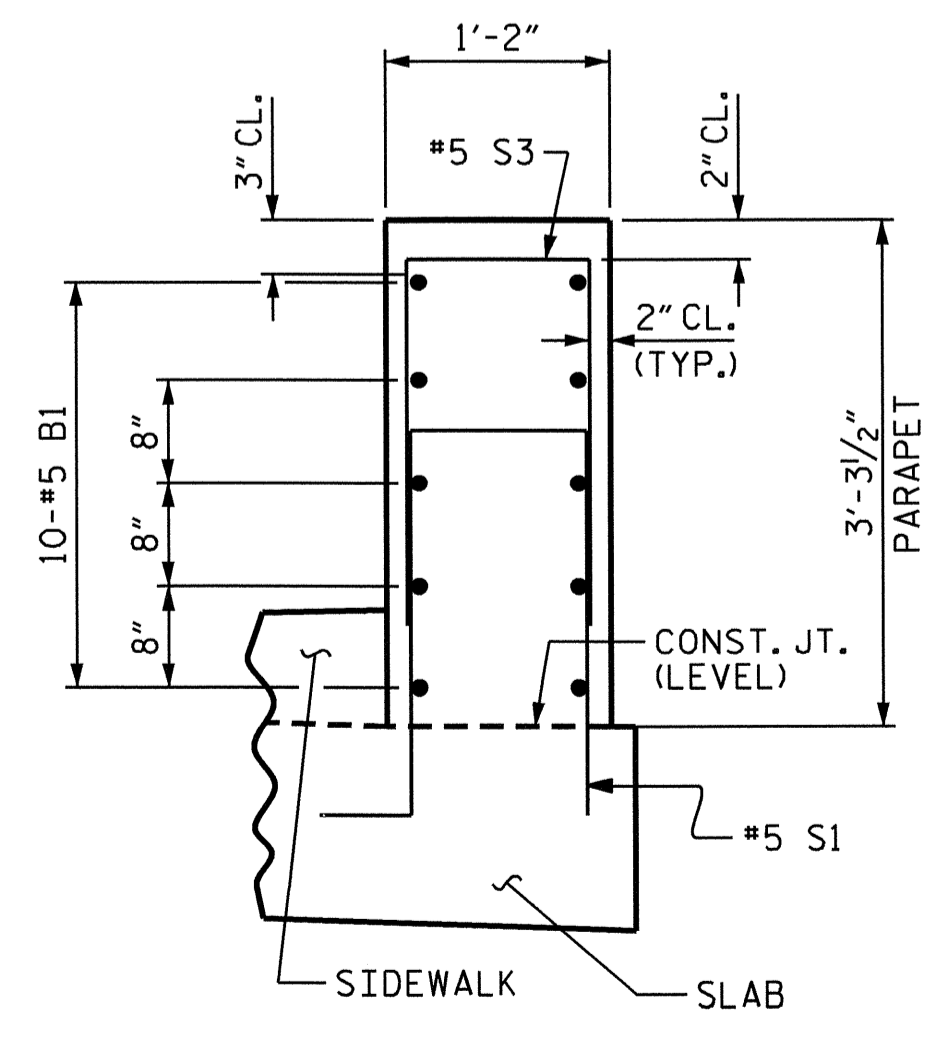
PLAN OF END POST



END VIEW



ELEVATION



SECTION THROUGH PARAPET

NOTES

THE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

THE #5 S1 & #5 S3 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAIL" SHEET.

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.



PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE PARAPET
 & END POST
 DETAILS

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

S-25
TOTAL SHEETS
48

DRAWN BY: S.H. SOCKWELL DATE: 11/2012
 CHECKED BY: JL Lamber DATE: 12/2012
 DESIGN ENGINEER OF RECORD: A. C. OUTLAW DATE: 12/16/13

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.

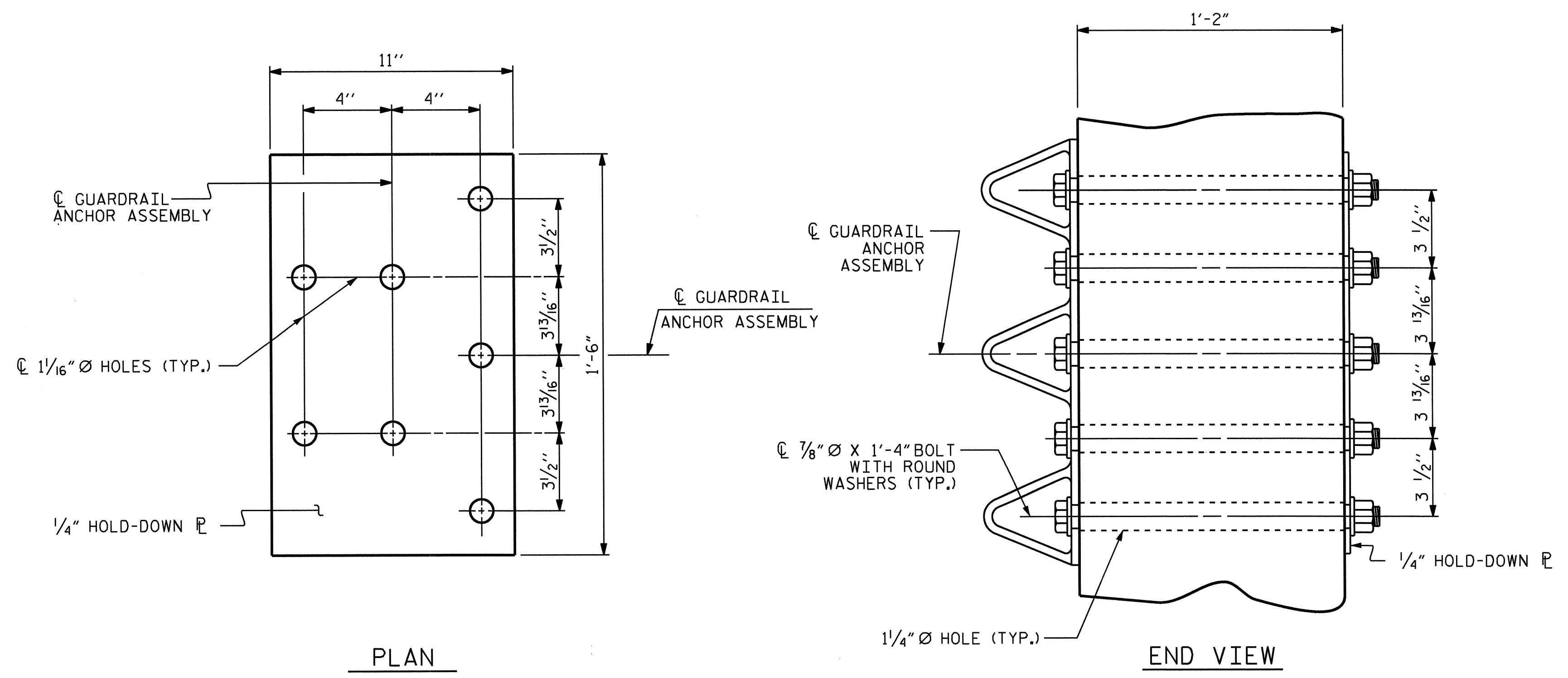
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

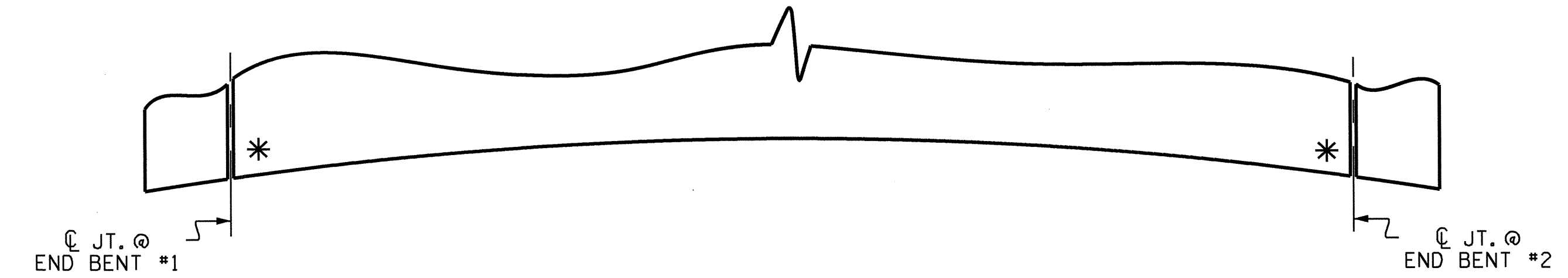
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

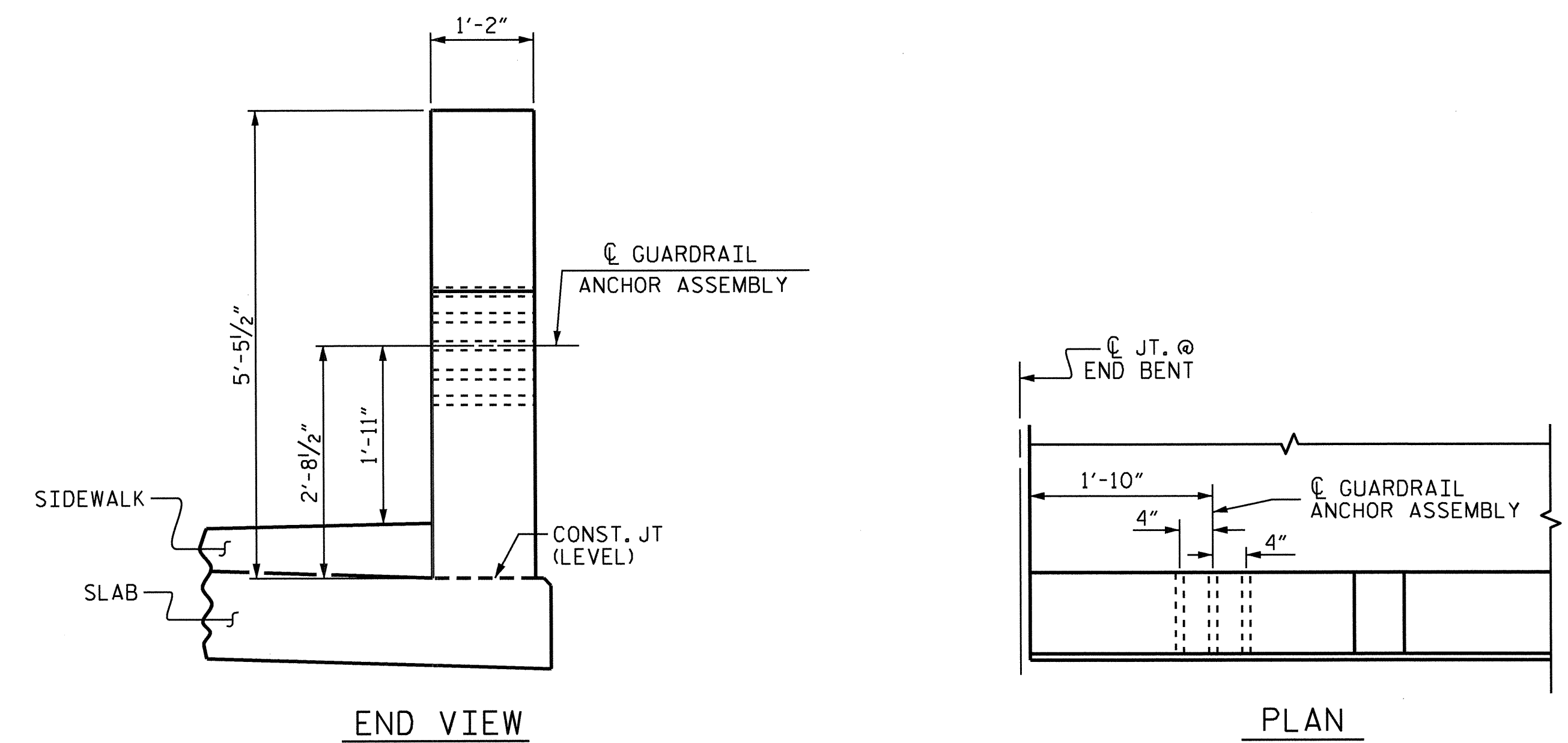


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

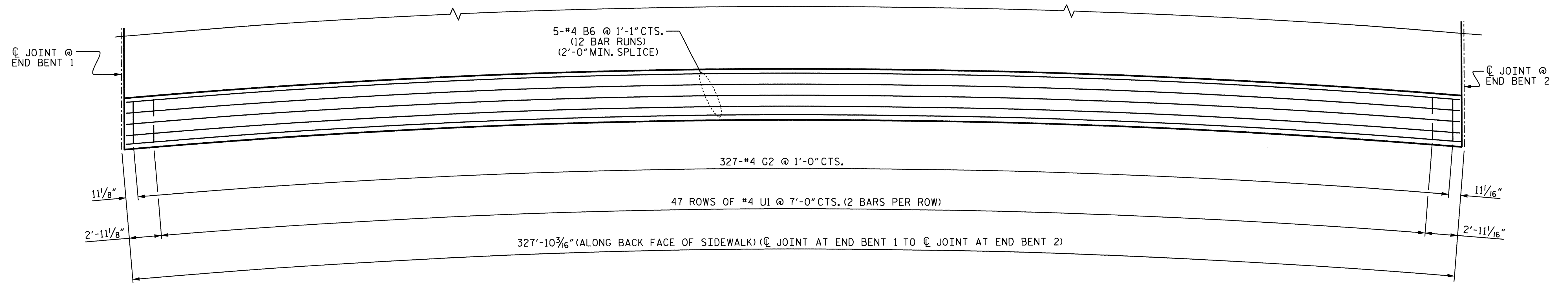
ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

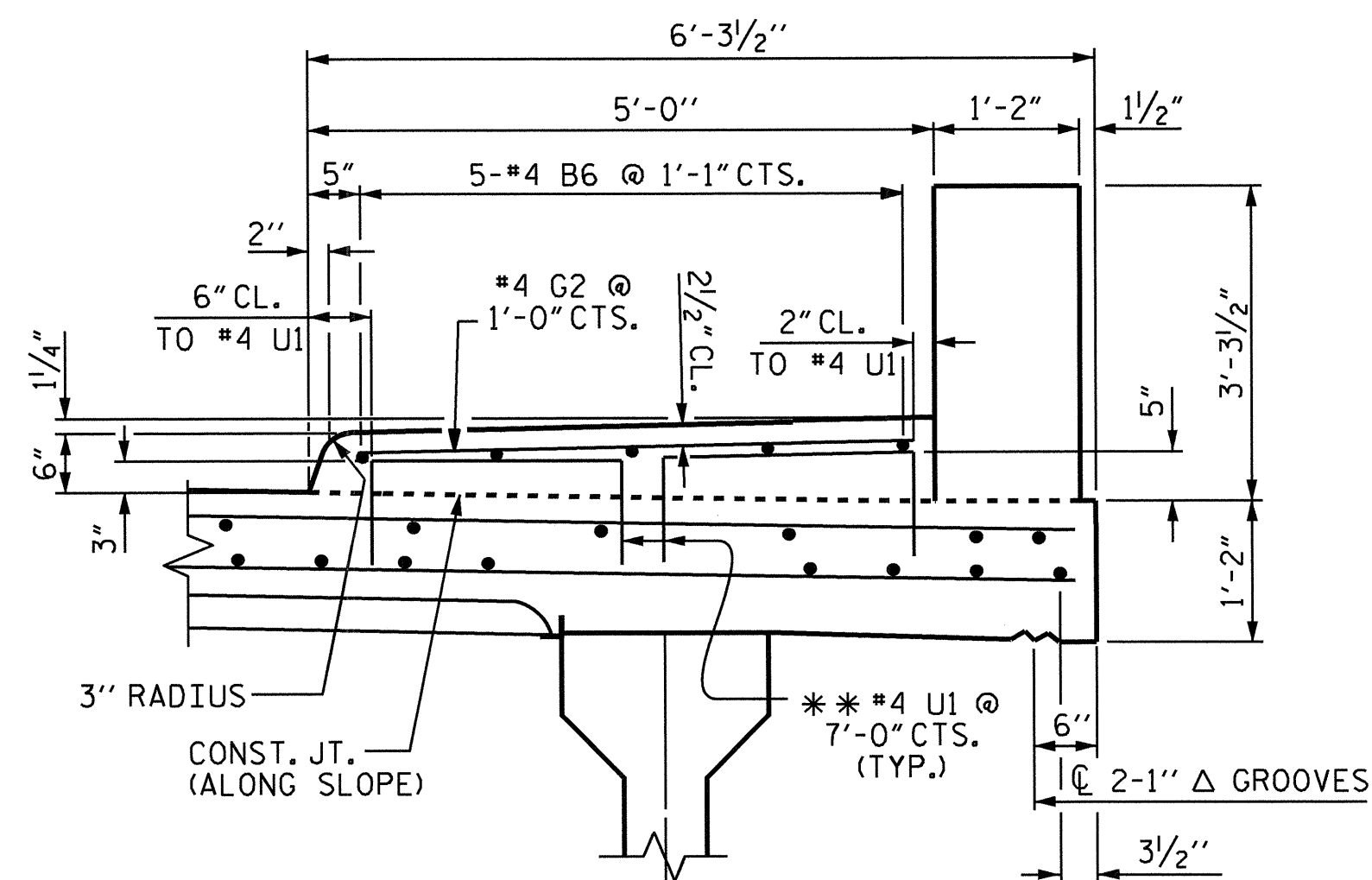
SHEET 5 OF 5

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD					
GUARDRAIL ANCHORAGE					
DETAILS					
FOR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-26
TOTAL SHEETS					48





PLAN OF SIDEWALK



SECTION THRU SIDEWALK

** #4 U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES

THE SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".

FOR SIDEWALK QUANTITIES, SEE SUPERSTRUCTURE BILL OF MATERIAL SHEET.

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

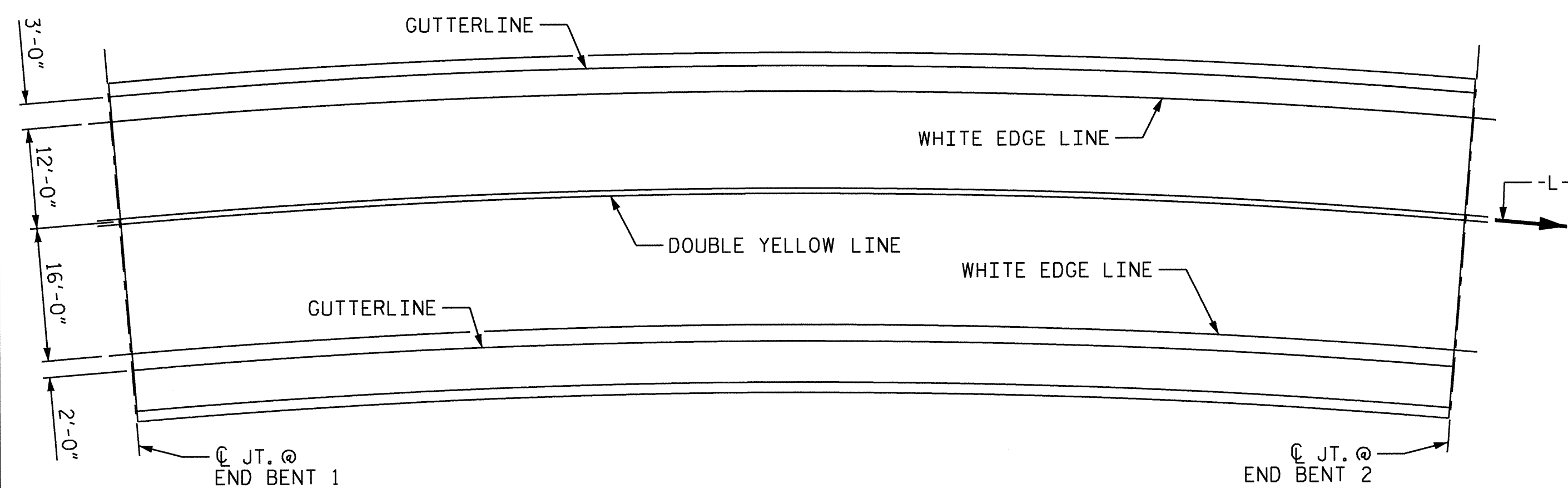
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SIDEWALK DETAILS



DRAWN BY : S.H. SOCKWELL DATE : 11/2012
 CHECKED BY : J.L. LAMBERT DATE : 12/2012
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE : 12/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			48



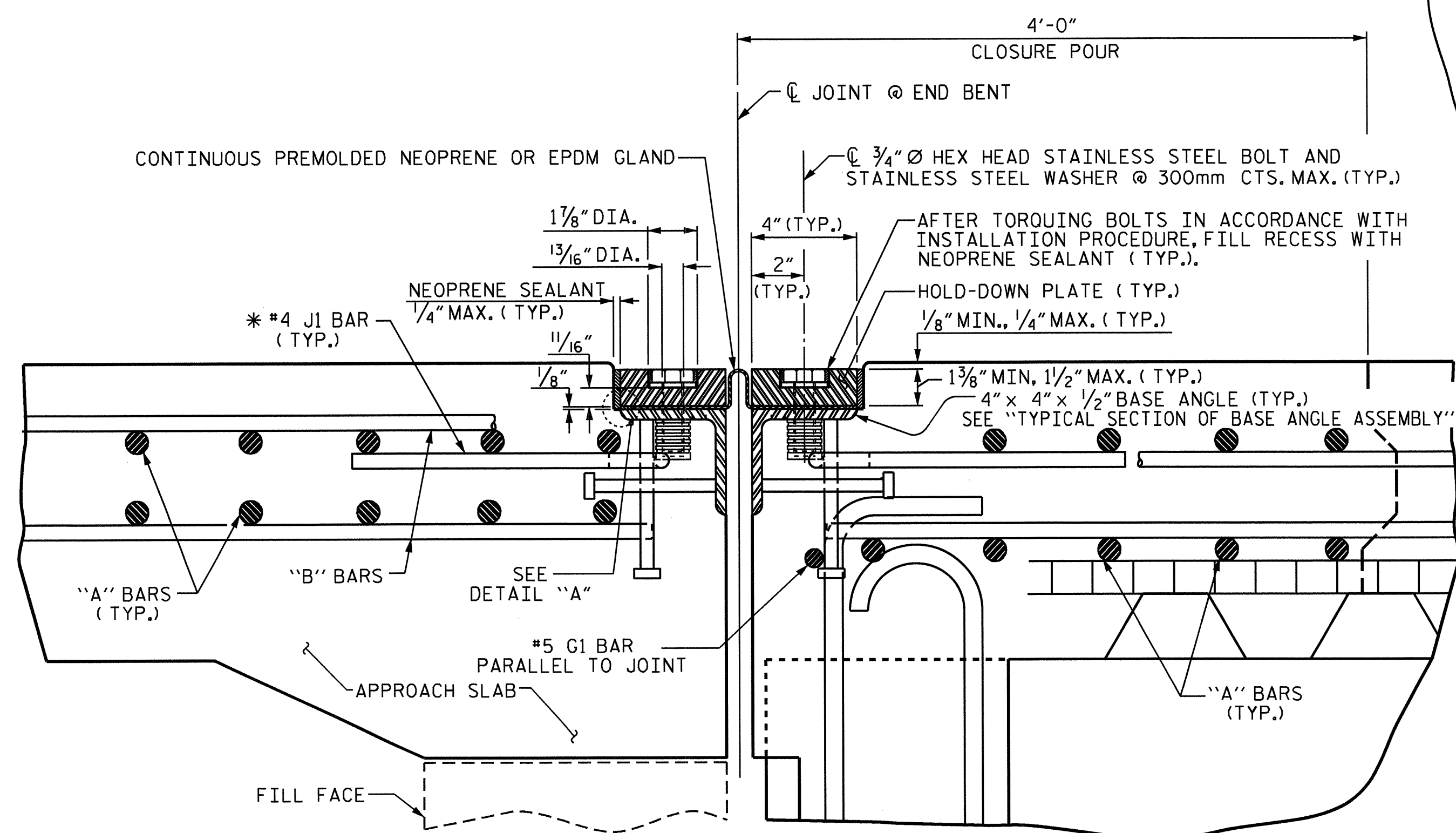
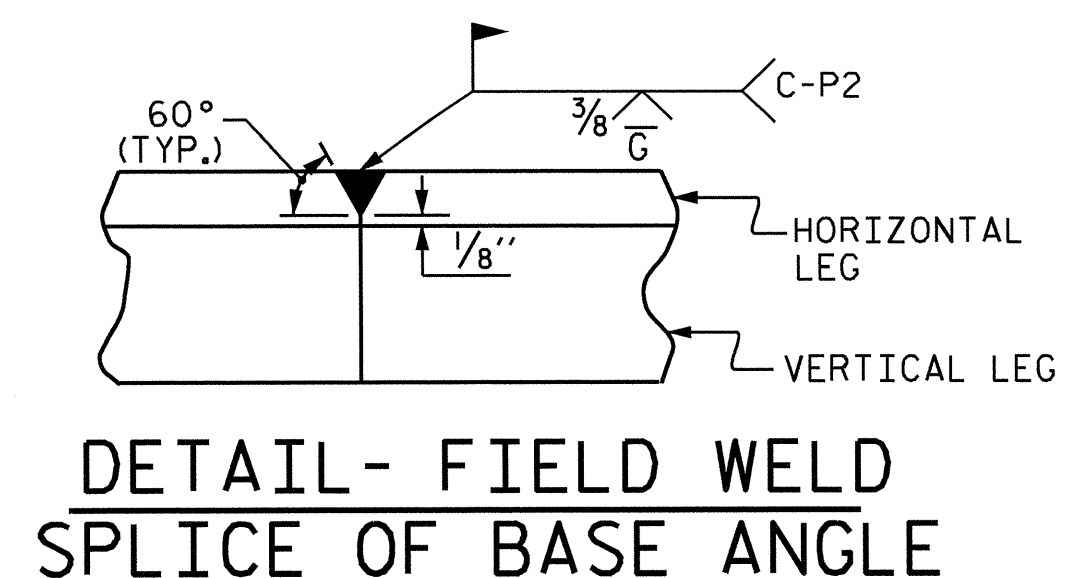
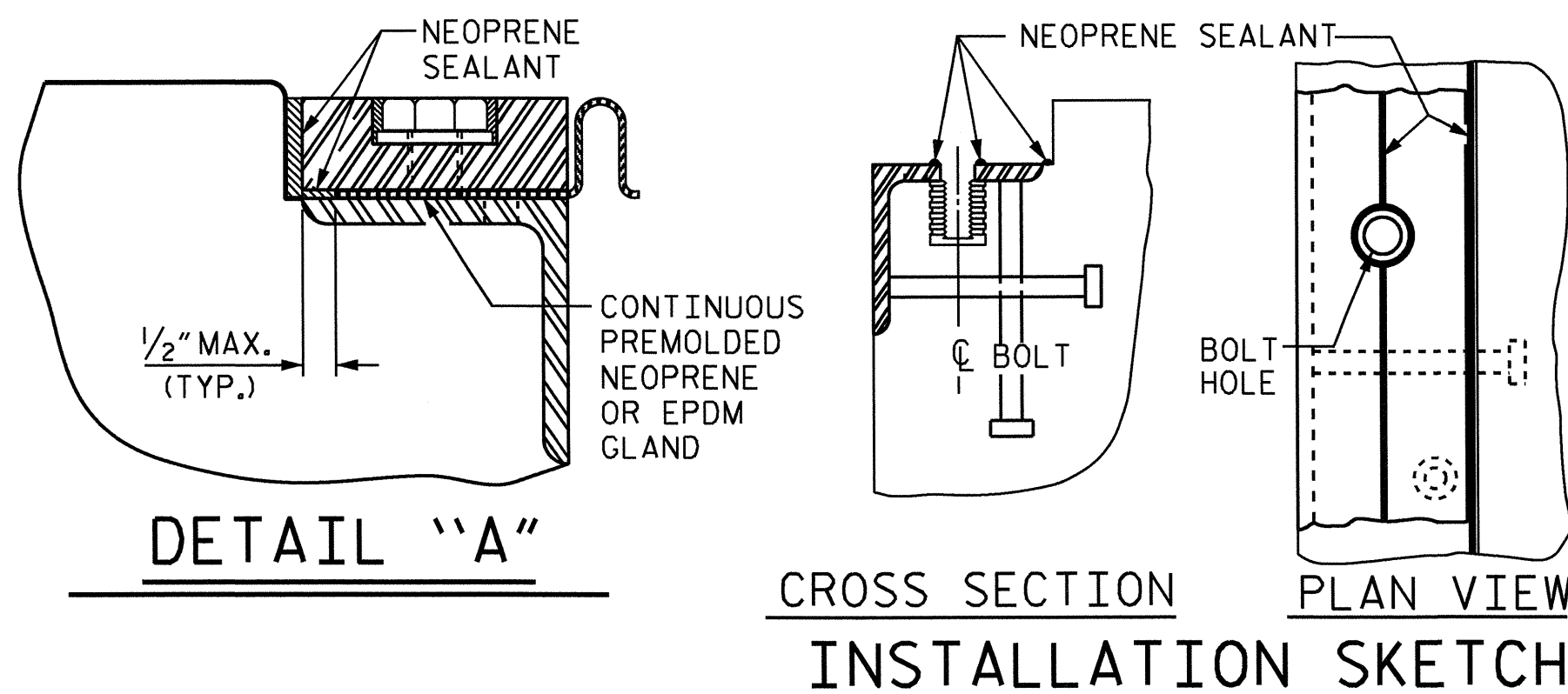
PAVEMENT MARKING ALIGNMENT

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE, THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A REMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

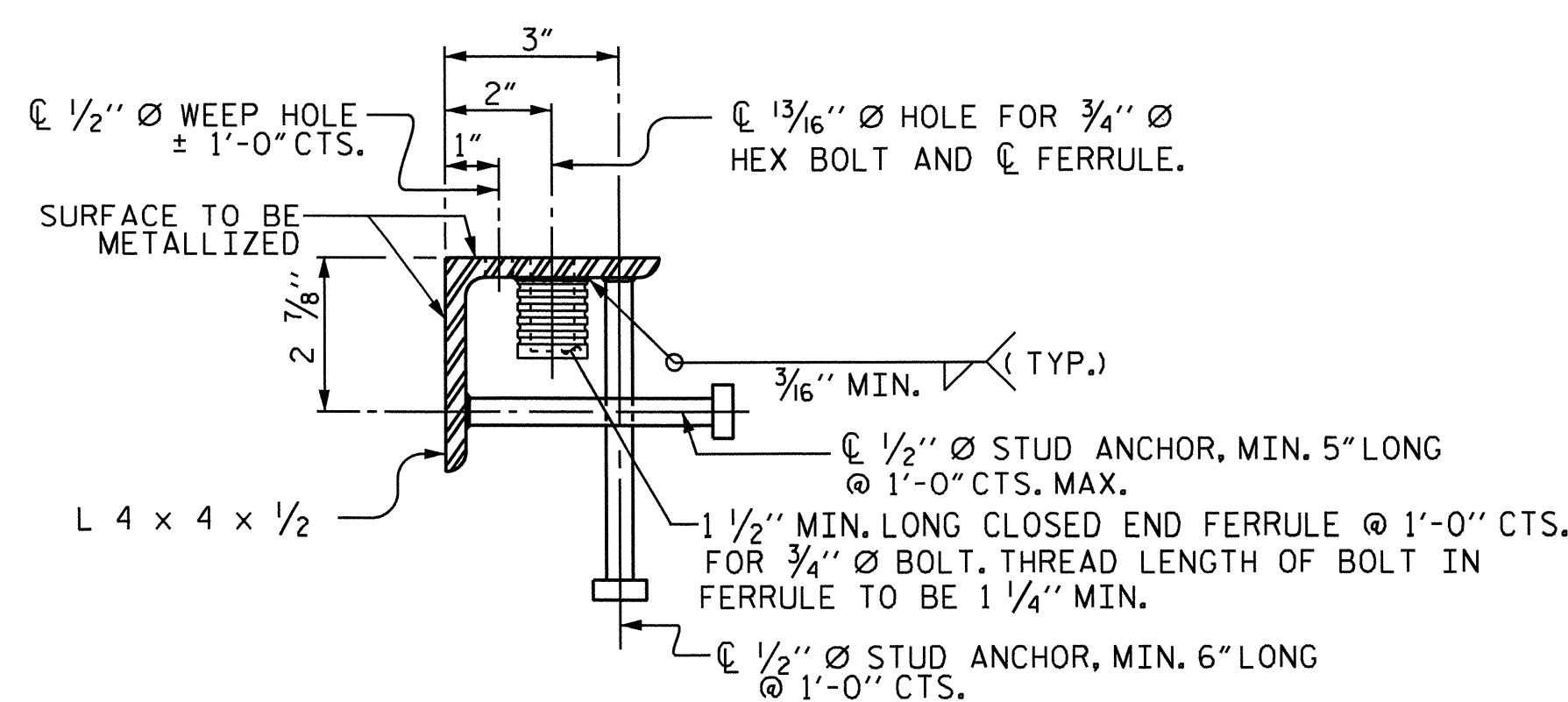


EXPANSION JOINT DETAILS

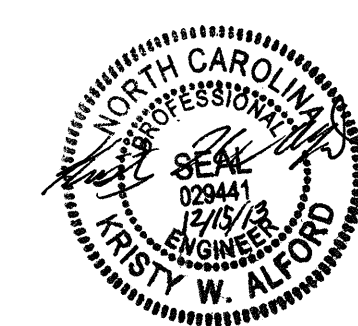
SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

* THE QUANTITY OF #4 JI BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. JI BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF JI BARS SPECIFIED, ADDITIONAL JI BARS WILL NOT BE REQUIRED.

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	94°-46'-37"	1 1/16"	2 1/16"	1 13/16"	1 5/16"
2	85°-13'-23"	1 1/16"	2 1/16"	1 13/16"	1 5/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



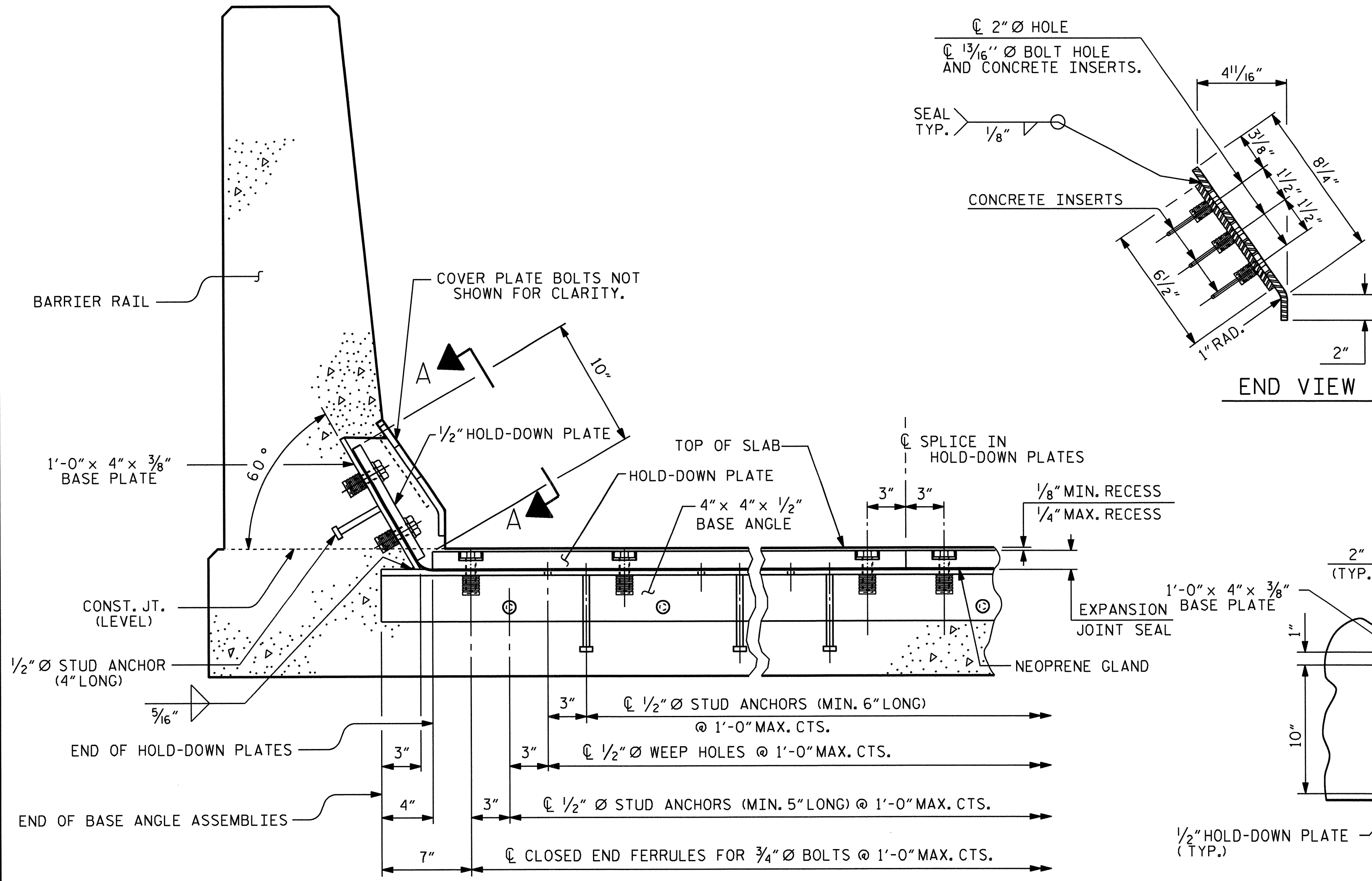
PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 1 OF 4

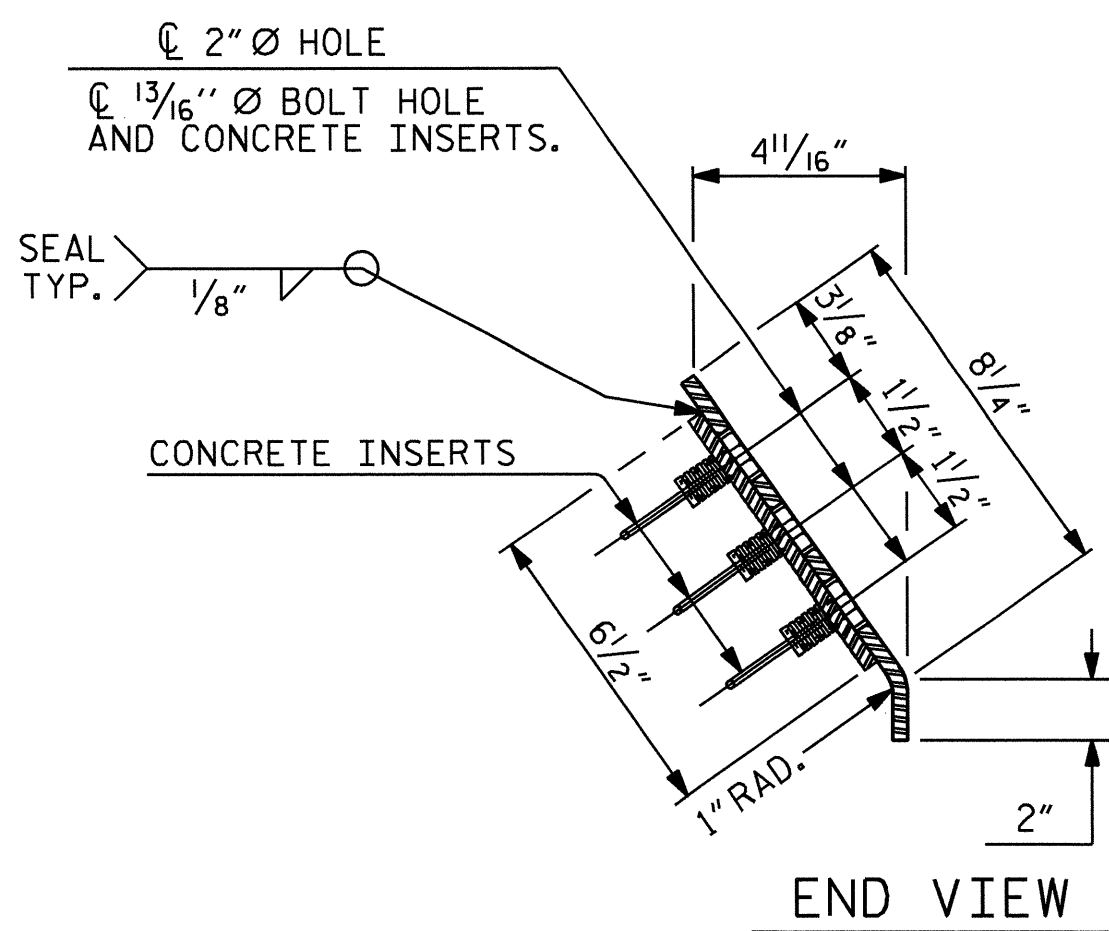
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS

ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

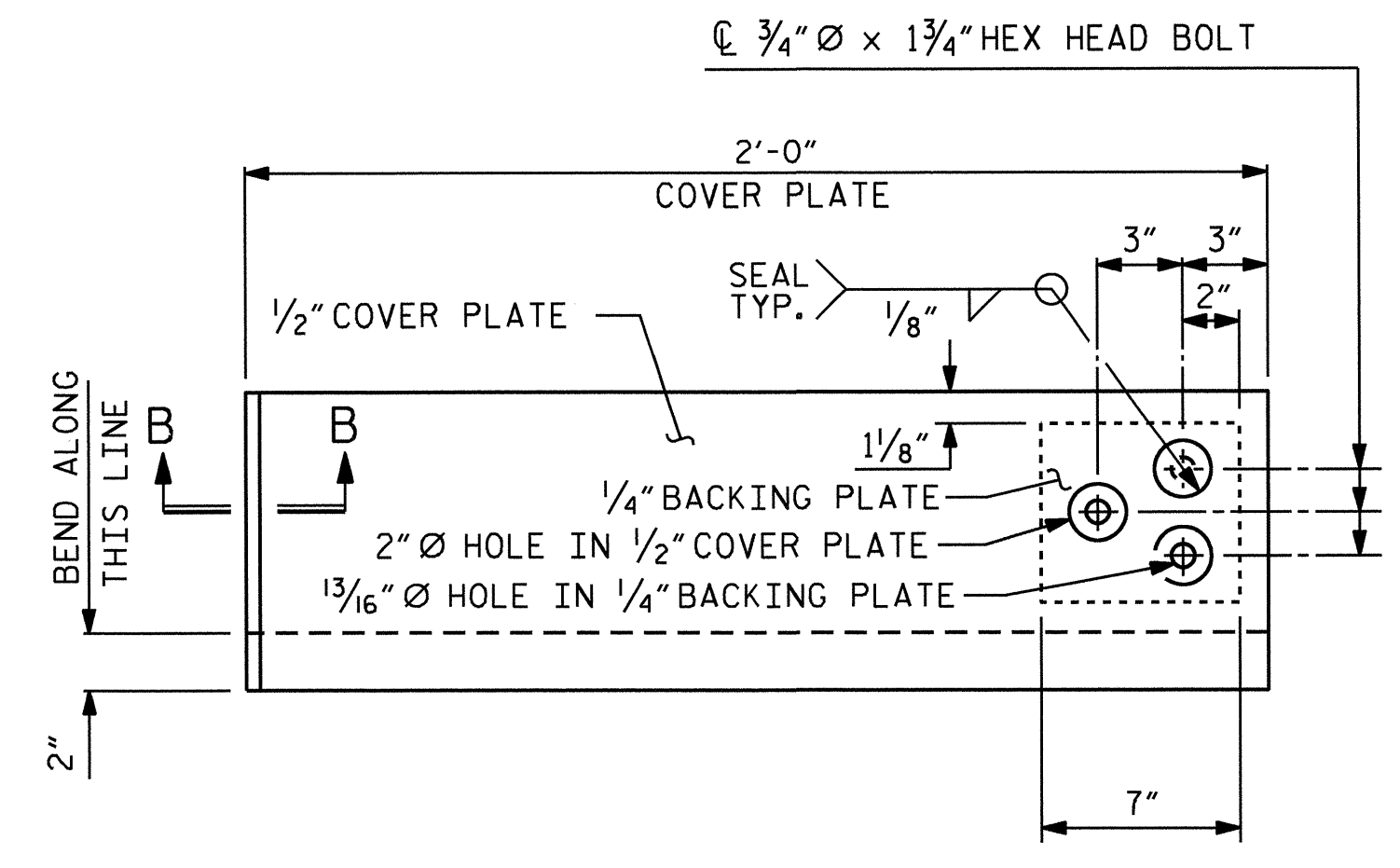
REVISIONS						SHEET NO. S-28
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 48
2			4			



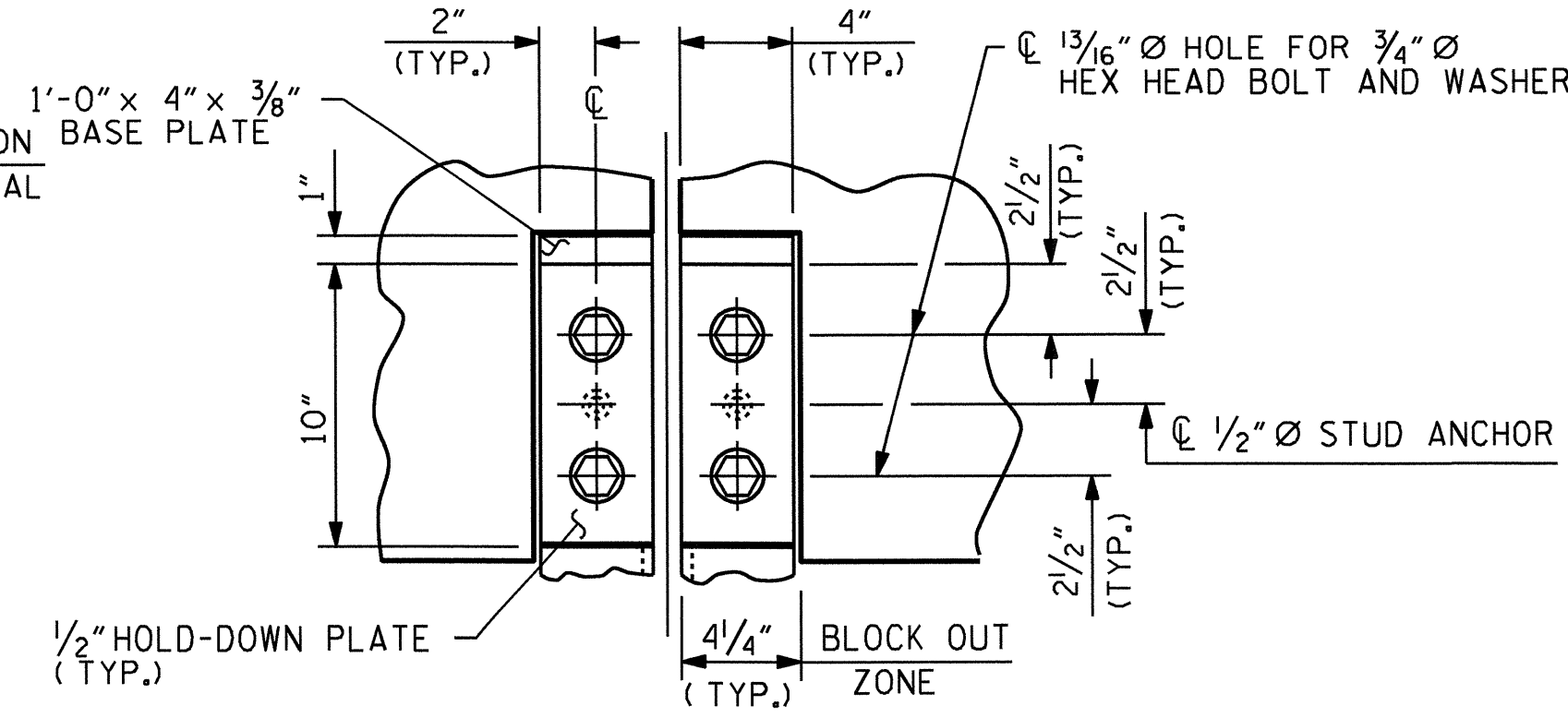
SECTION THRU RAIL NORMAL TO JOINT



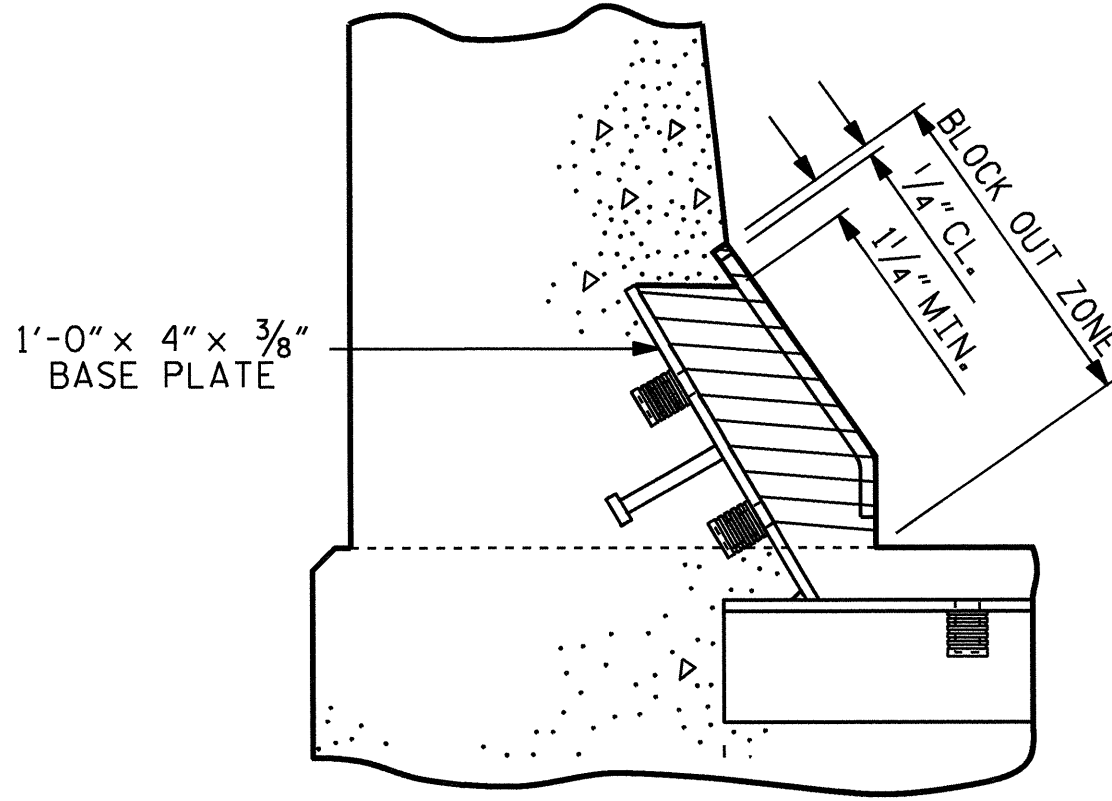
END VIEW



**TYPE II - ELEVATION VIEW
COVER PLATE DETAILS**

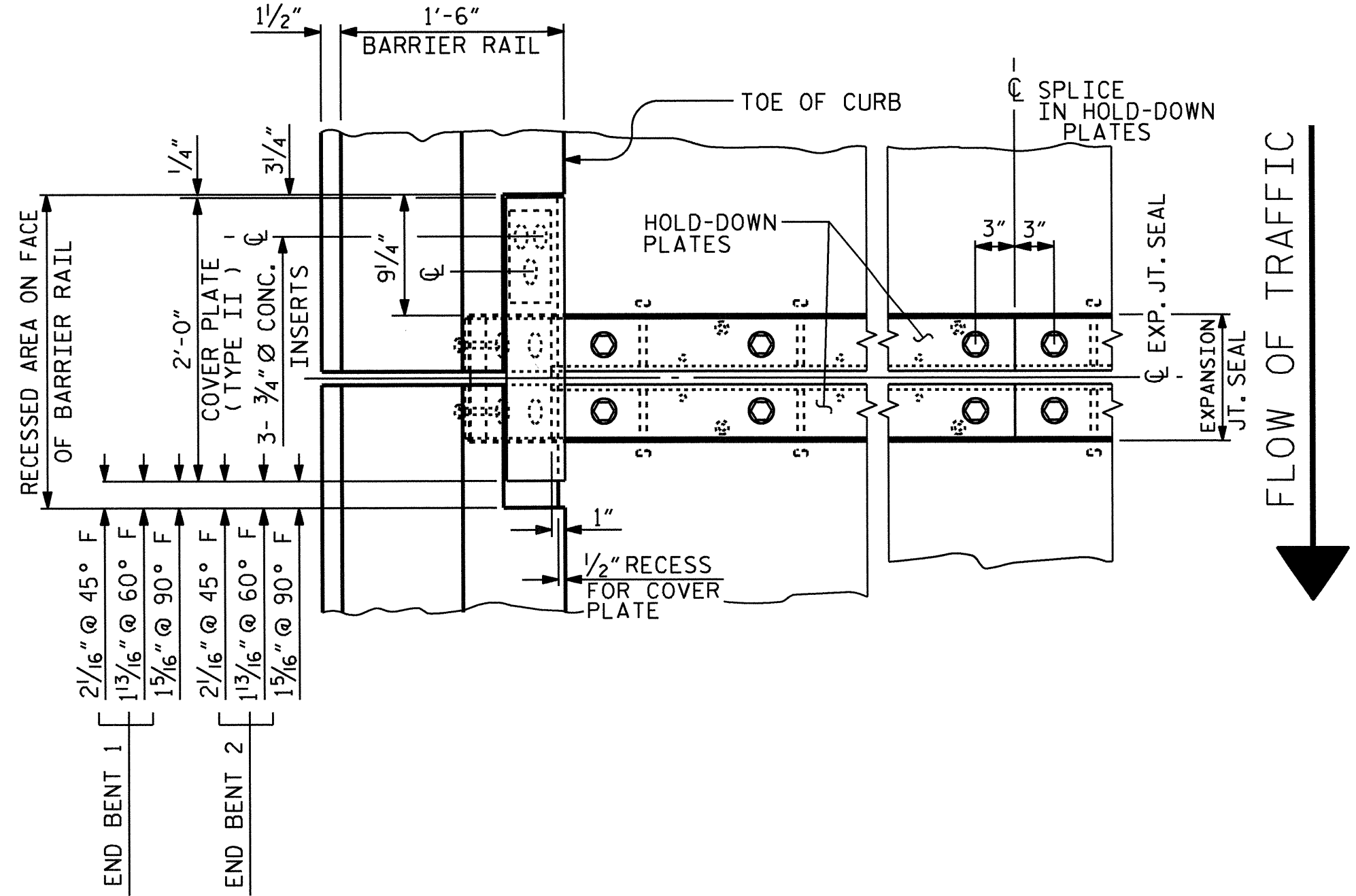


SECTION A - A



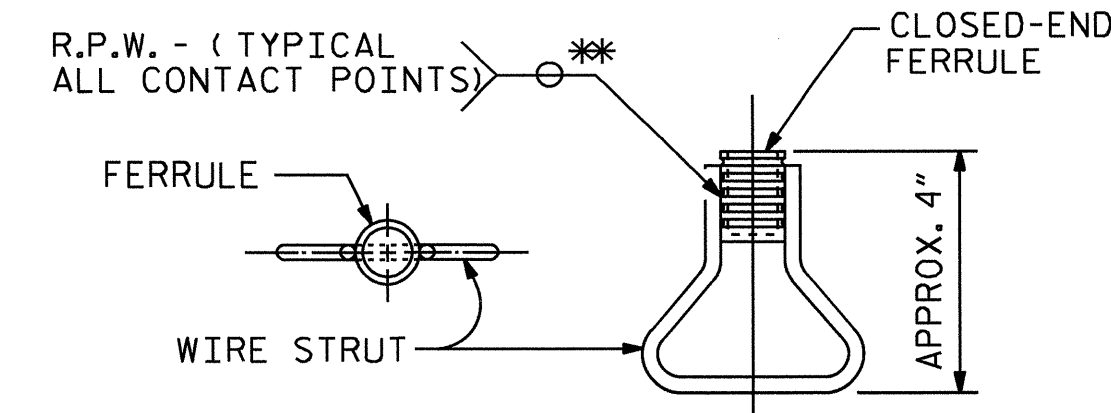
BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL

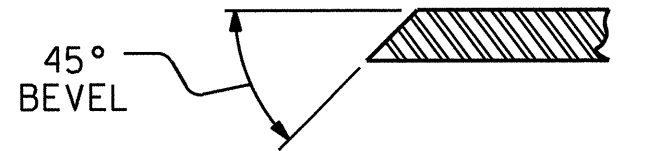
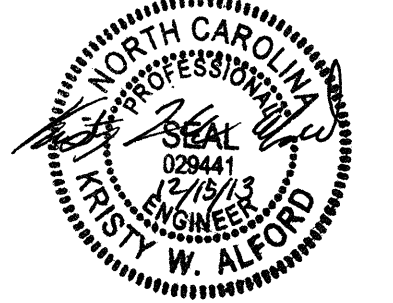
LEFT SIDE



PLAN ELEVATION

CONCRETE INSERT

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



SECTION B - B

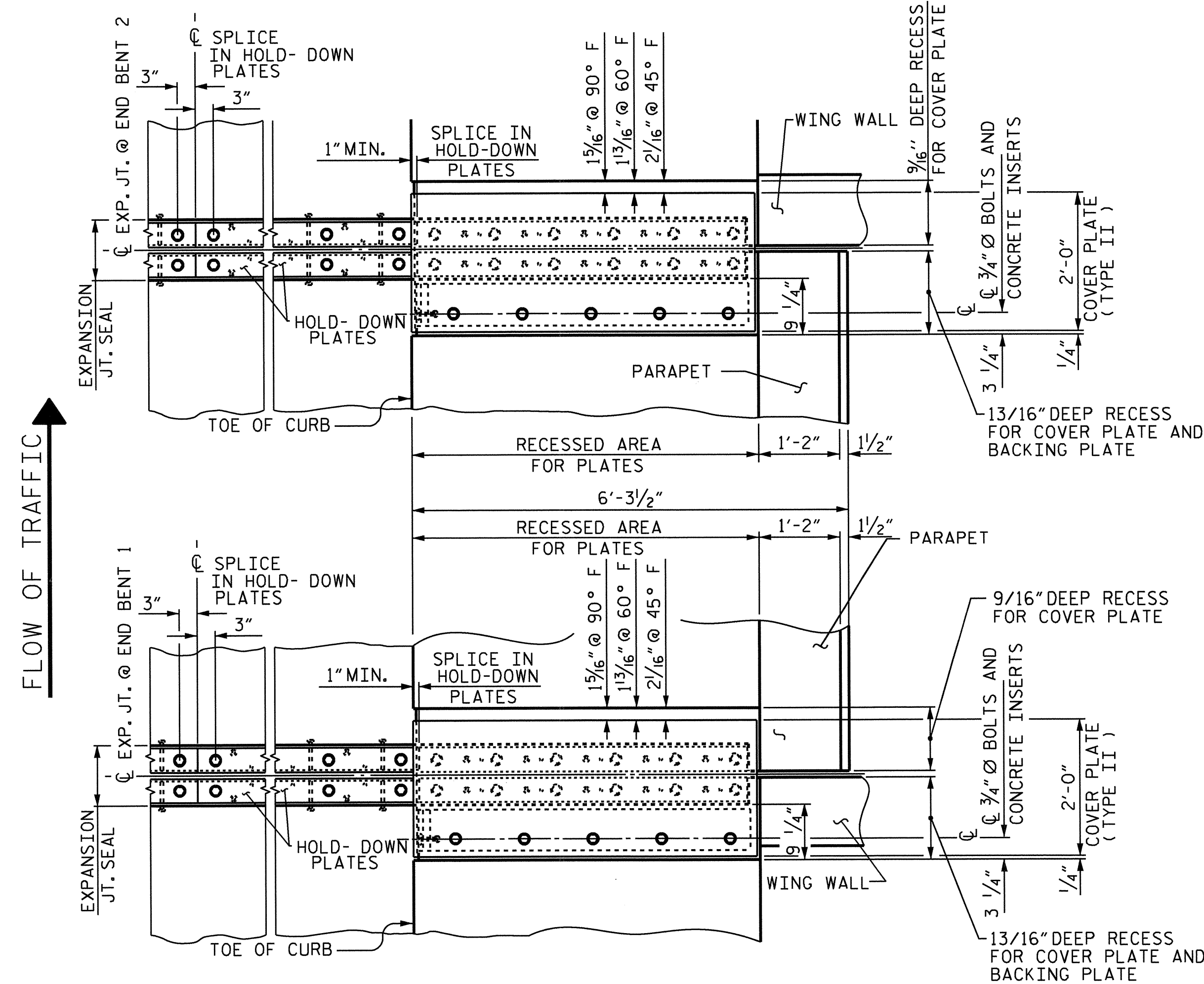
PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR BARRIER RAIL

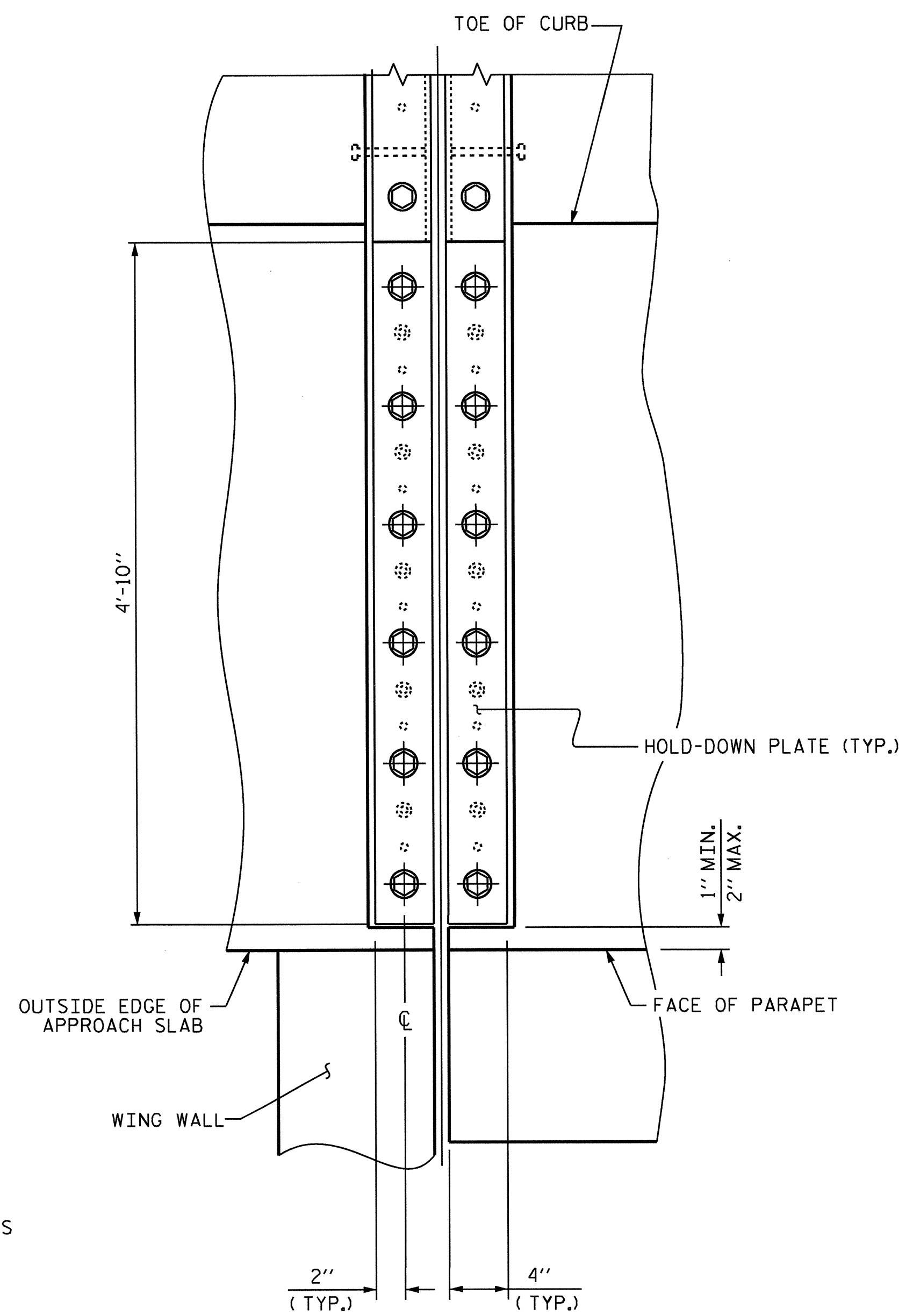
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			48

ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : REK 9/87	REV. 10/1/11
CHECKED BY : CRK 10/87	REV. 7/12
	REV. 10/12



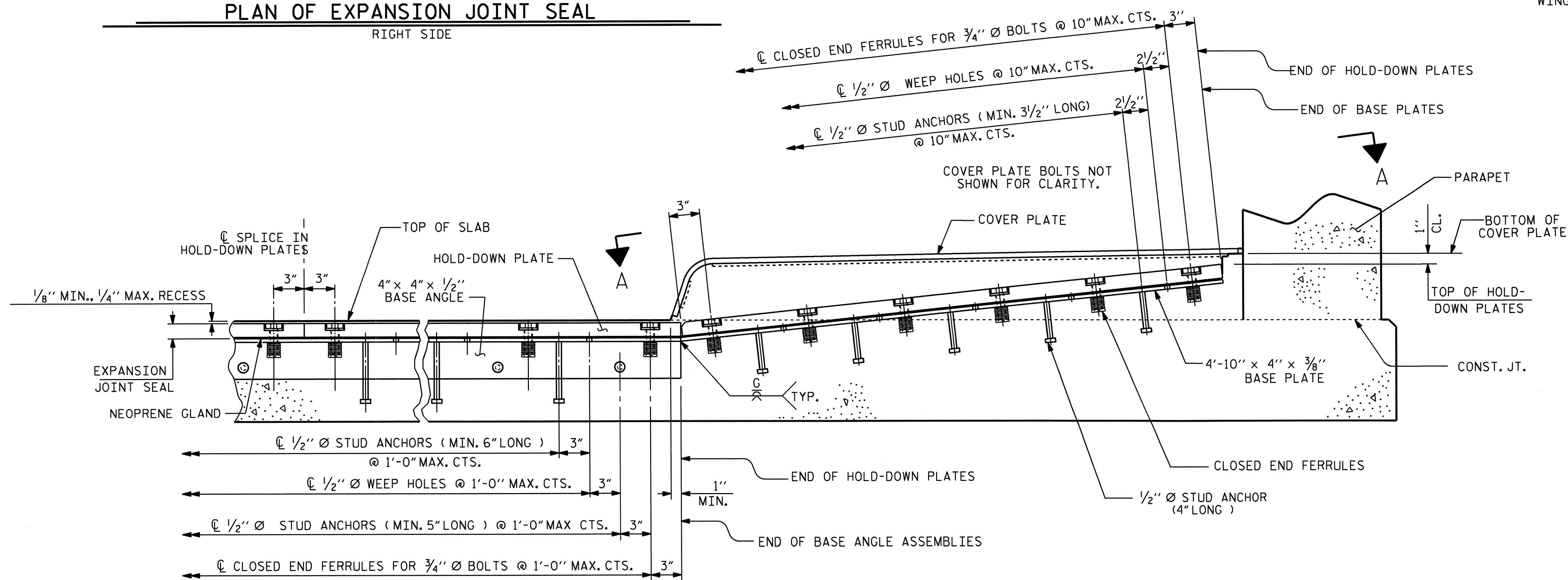
PLAN OF EXPANSION JOINT SEAL

RIGHT SIDE



SECTION A - A

(END BENT 1 SHOWN, END BENT 2 SIMILAR.)

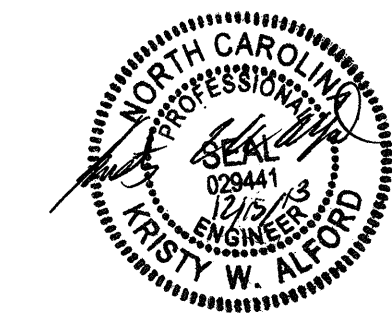


SECTION THRU SIDEWALK NORMAL TO JOINT

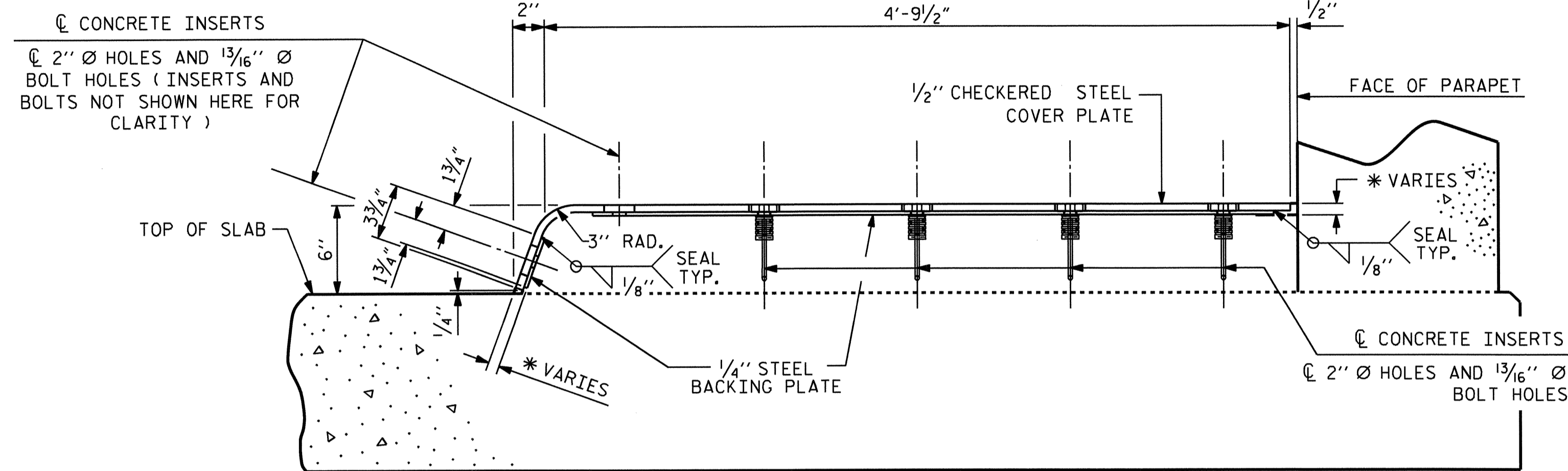
PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD EXPANSION JOINT SEAL DETAILS FOR SIDEWALK					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-30
					TOTAL SHEETS 48

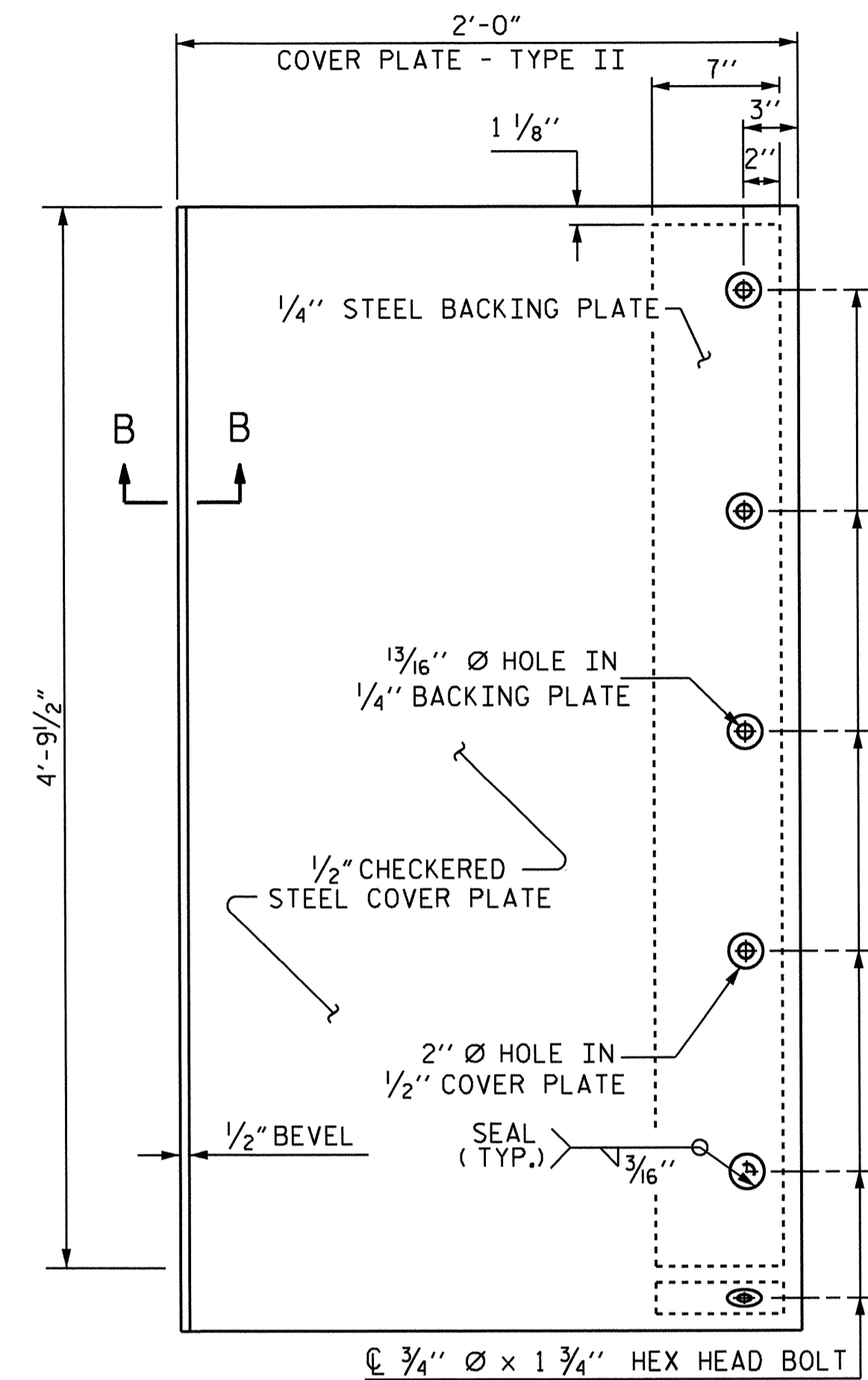


ASSEMBLED BY : S. H. SOCKWELL	DATE : 11/2012
CHECKED BY : J. L. LAMBERT	DATE : 12/2012
DRAWN BY : REK 10/87	REV. 2/6/97 EEM/RGW
CHECKED BY : CRK 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



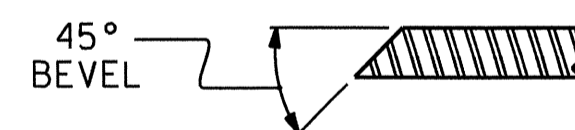
END VIEW
(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:
 13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

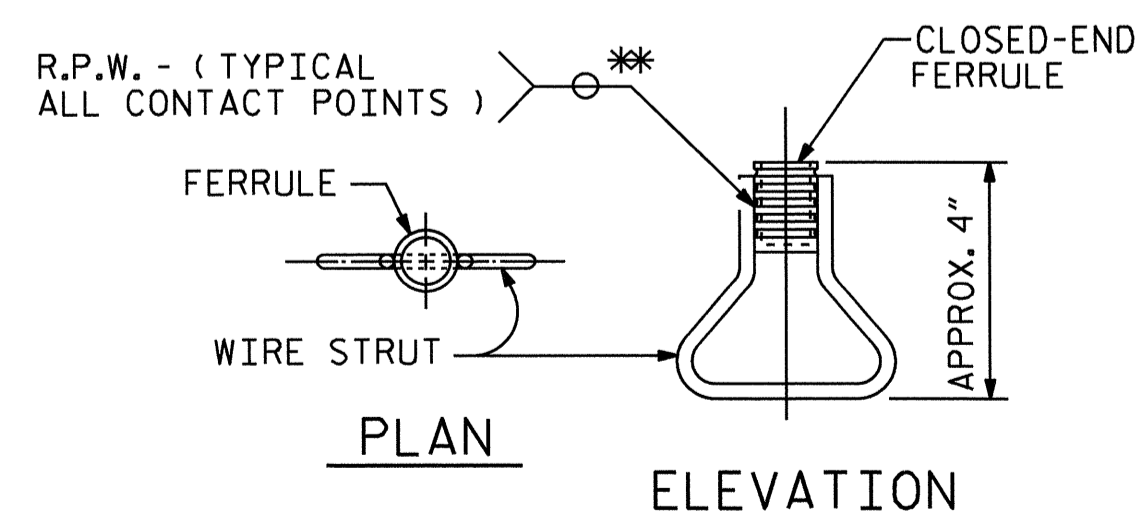


TYPE II - PLAN VIEW

COVER PLATE DETAILS



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 4 OF 4

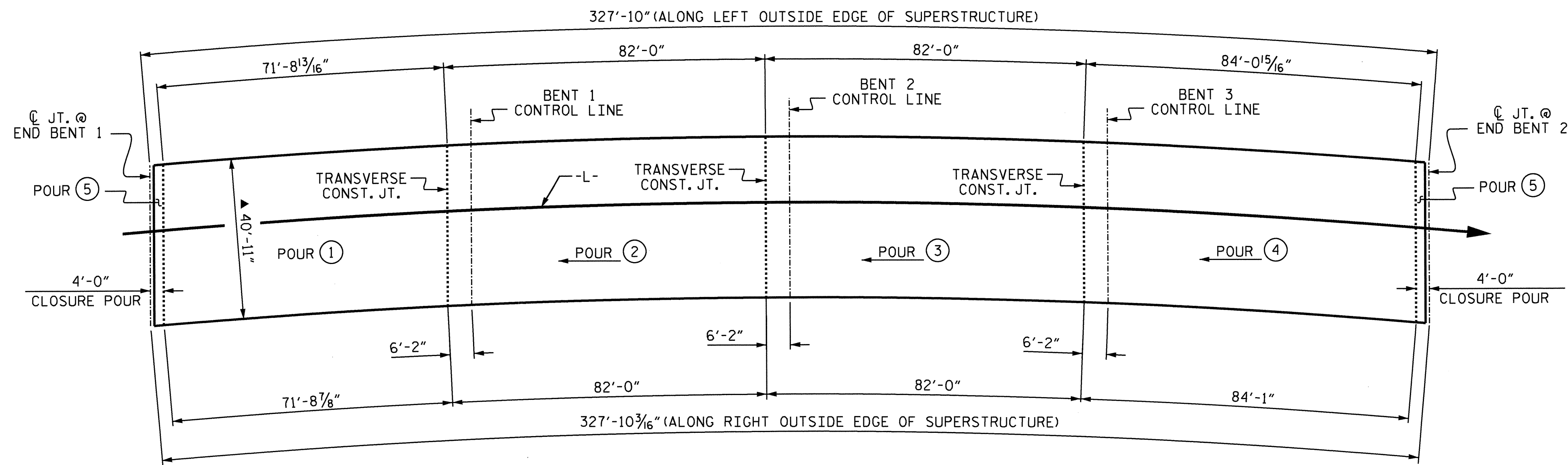
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR SIDEWALK



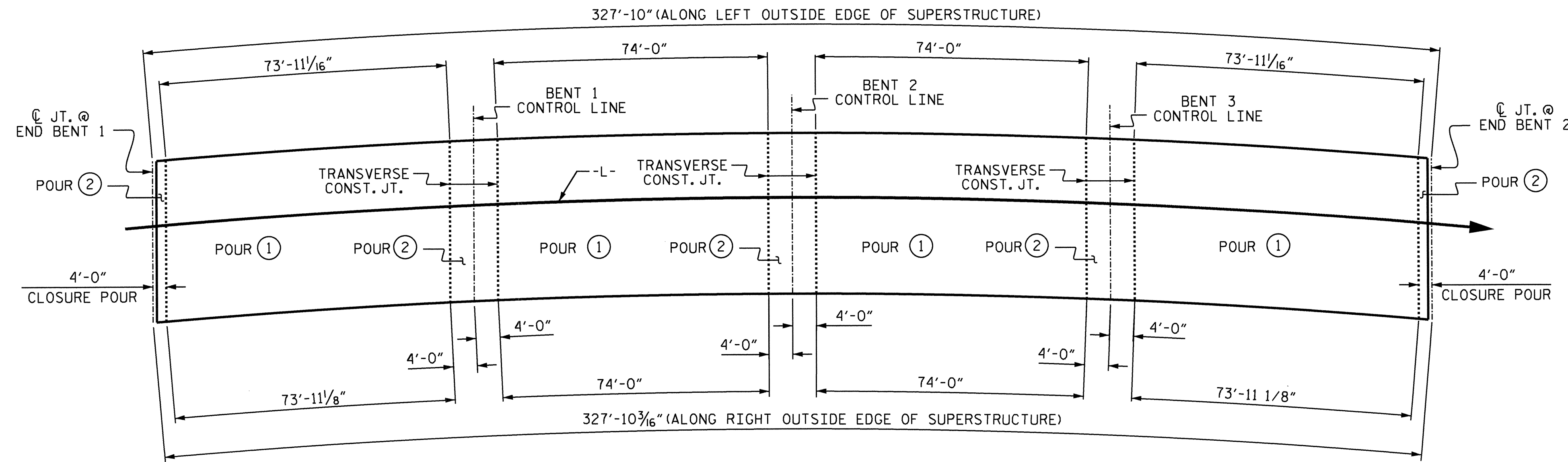
ASSEMBLED BY : P. K. NEWTON	DATE : 4/2/13
CHECKED BY : K. W. ALFORD	DATE : 4/2/13
DRAWN BY : REK 10/87	REV. 10/17/00 RWW/LES
CHECKED BY : CRK 1/88	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			48



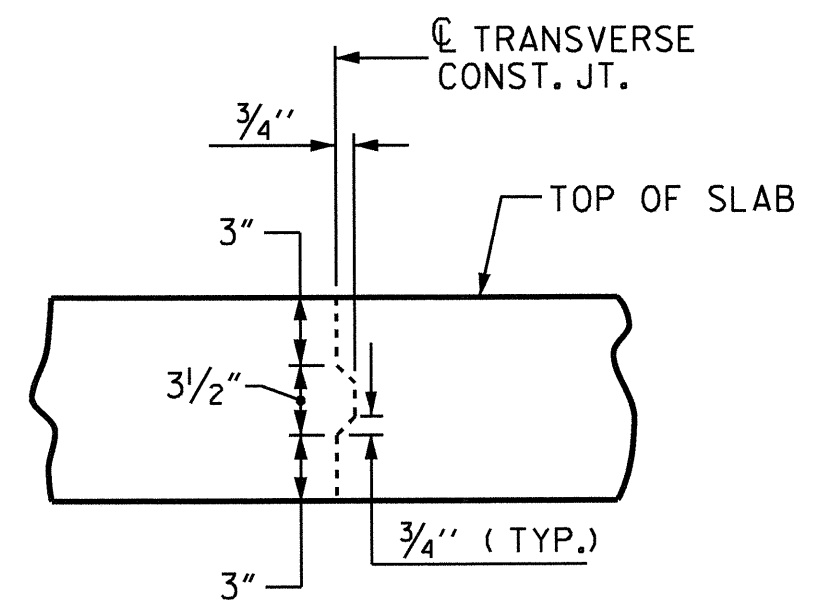
POURING SEQUENCE
AND LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 13,415)

▲ RADIAL DIMENSIONS



OPTIONAL POURING SEQUENCE

POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN.
LONGITUDINAL REINFORCING STEEL SHALL BE
CONTINUOUS THRU JOINT

BILL OF MATERIAL

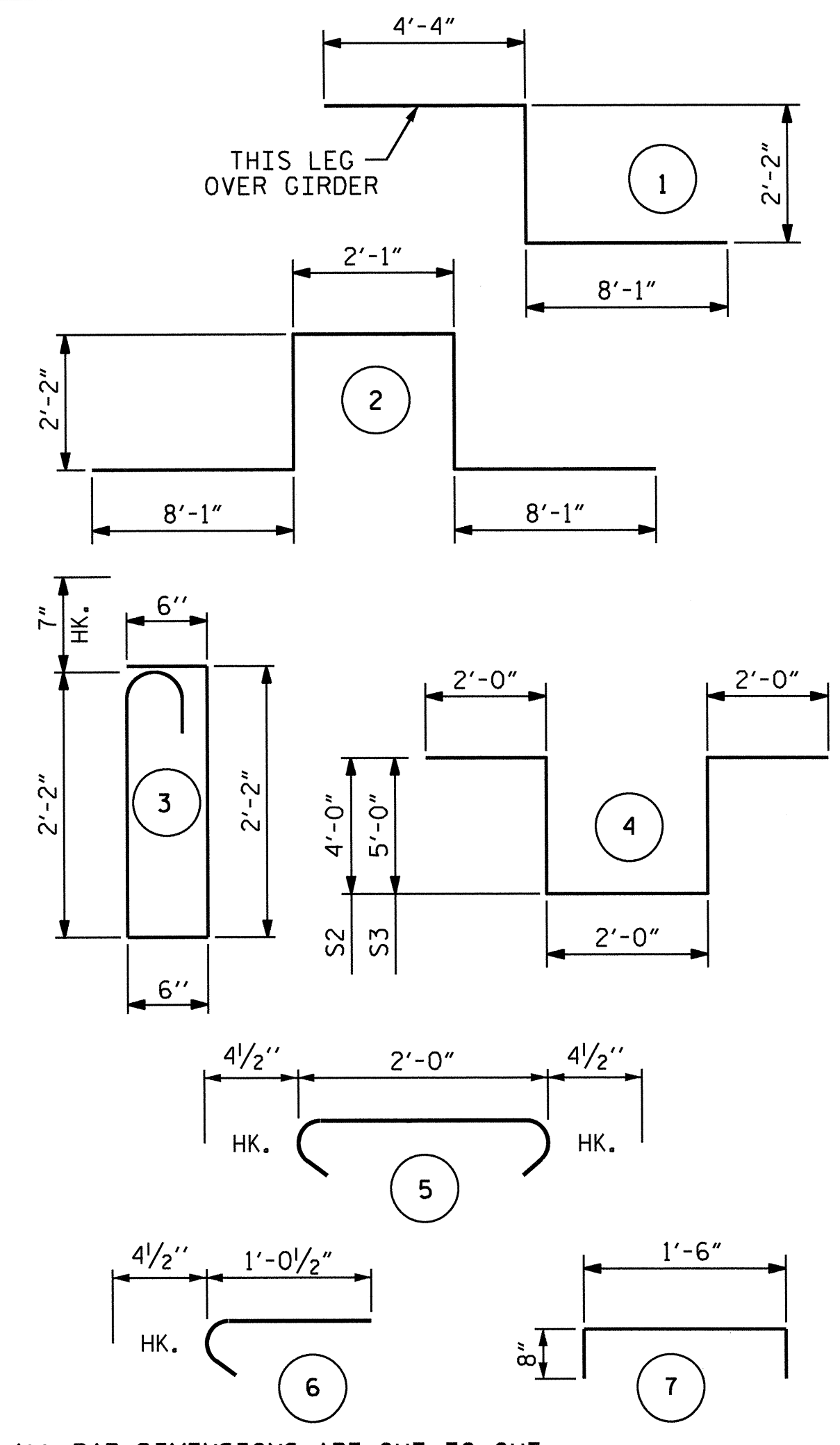
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	713	#5	STR	40'-7"	30180
A2	714	#5	STR	40'-8"	30222
* B1	108	#4	STR	28'-1"	2026
* B2	81	#7	STR	59'-4"	9823
* B3	78	#7	STR	24'-8"	3933
* B4	54	#4	STR	26'-9"	965
B5	318	#5	STR	56'-5"	18712
* B6	84	#4	STR	29'-2"	1637
* G1	2	#5	STR	40'-7"	85
* G2	327	#4	STR	4'-5"	965
* J1	66	#4	6	1'-5"	62
* K1	8	#8	1	14'-7"	312
* K2	8	#8	2	22'-7"	482
K3	30	#4	STR	18'-0"	361
K4	18	#4	STR	7'-8"	92
K5	18	#4	STR	9'-7"	115
K6	36	#4	STR	10'-4"	248
K7	18	#4	STR	9'-4"	112
* S1	54	#5	3	5'-11"	333
S2	18	#4	4	14'-0"	168
S3	63	#4	4	16'-0"	673
S4	306	#4	5	2'-9"	562
* U1	94	#4	7	2'-10"	178

REINFORCING STEEL = 51265 LBS
* EPOXY COATED REINF. STEEL = 50981 LBS

GROOVING BRIDGE FLOORS

APPROACH SLABS	1450 SQ.FT.
BRIDGE DECK	9821 SQ.FT.
TOTAL	11271 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	102.6		
POUR 2	129.8		
POUR 3	129.8		
POUR 4	132.8		
POUR 5	15.0		
SIDEWALK	37.7		
TOTALS**	547.7	50967	51265

** QUANTITIES FOR BARRIER RAIL & PARAPET ARE NOT INCLUDED

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

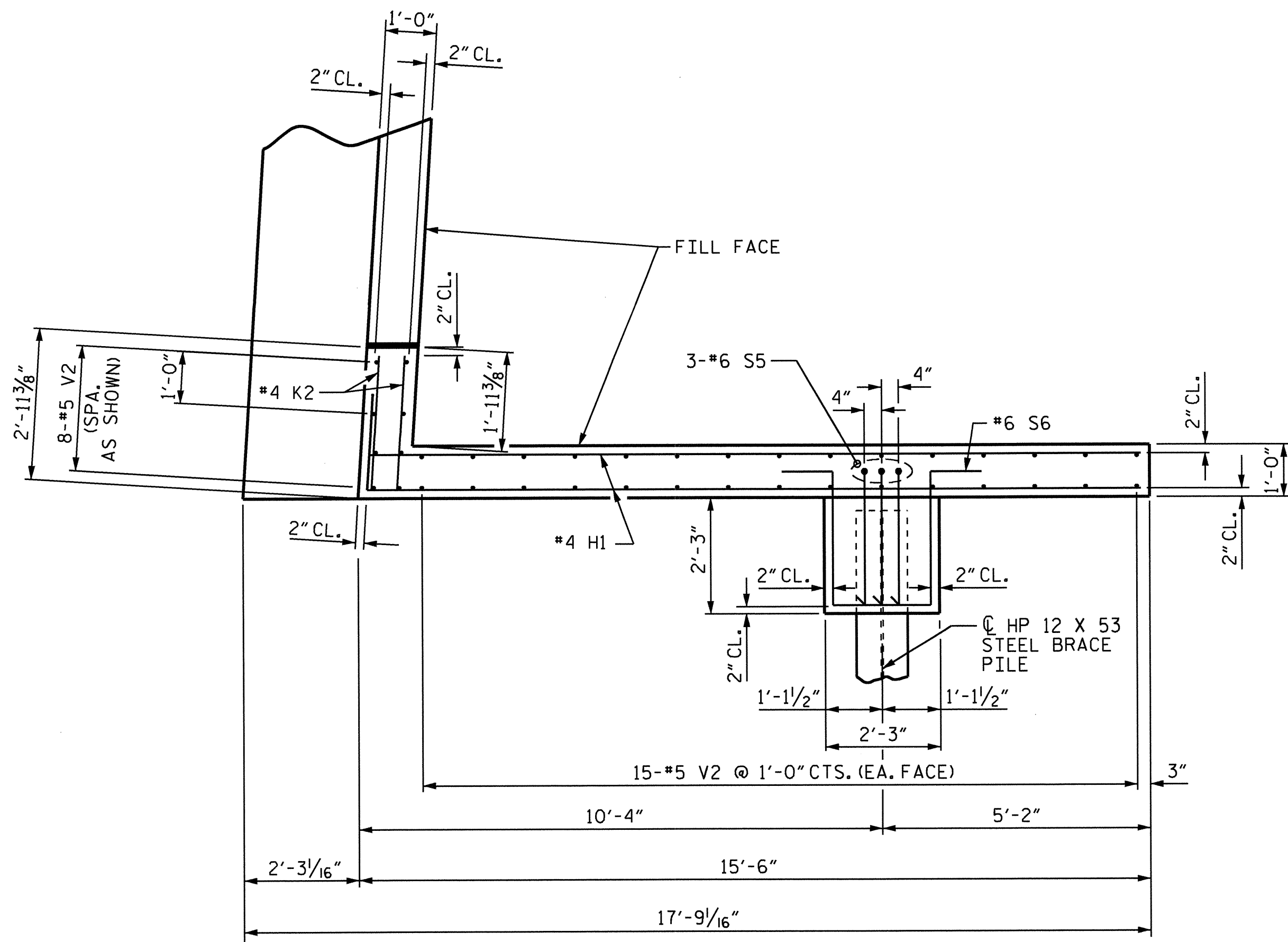
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



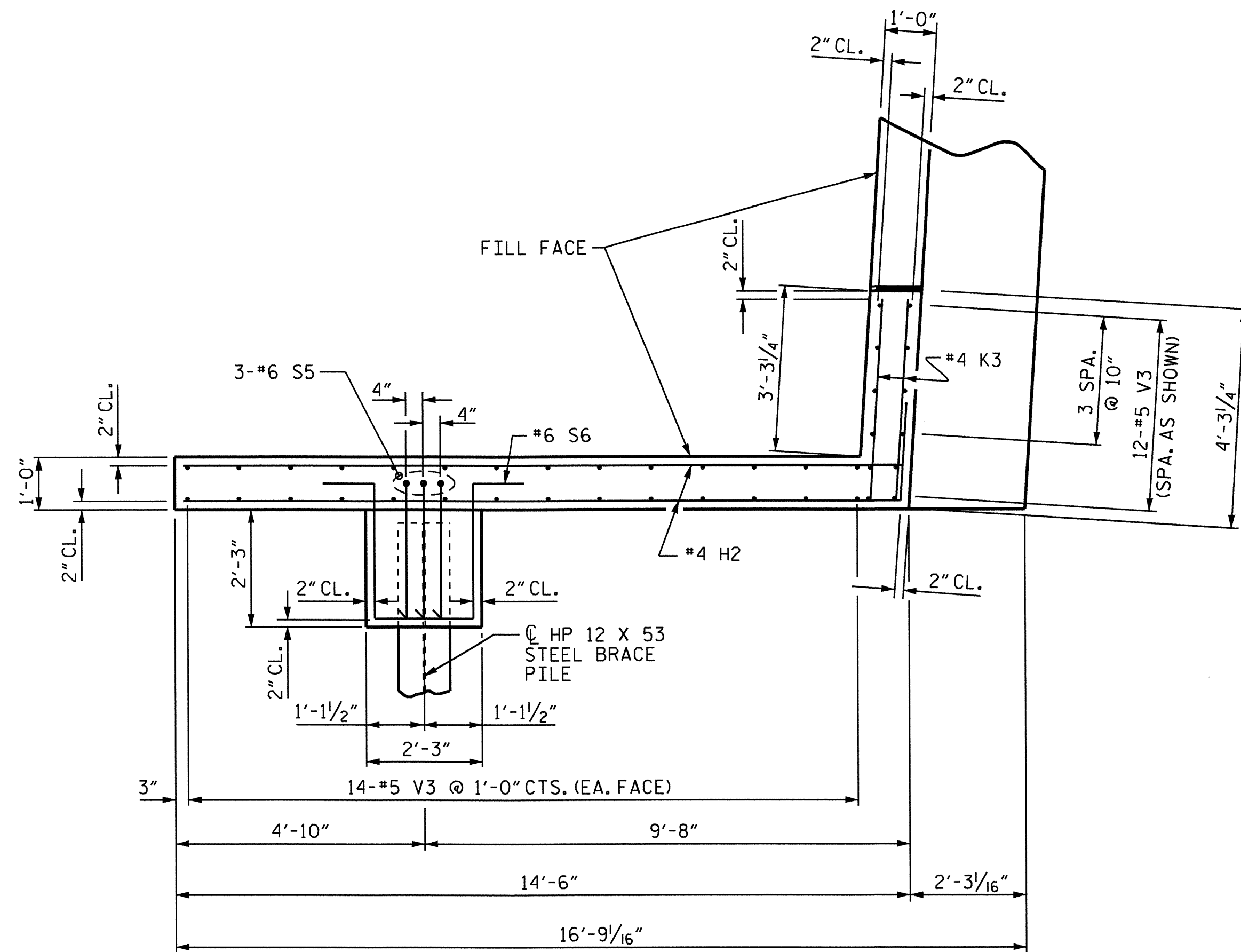
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS 48
2			4			

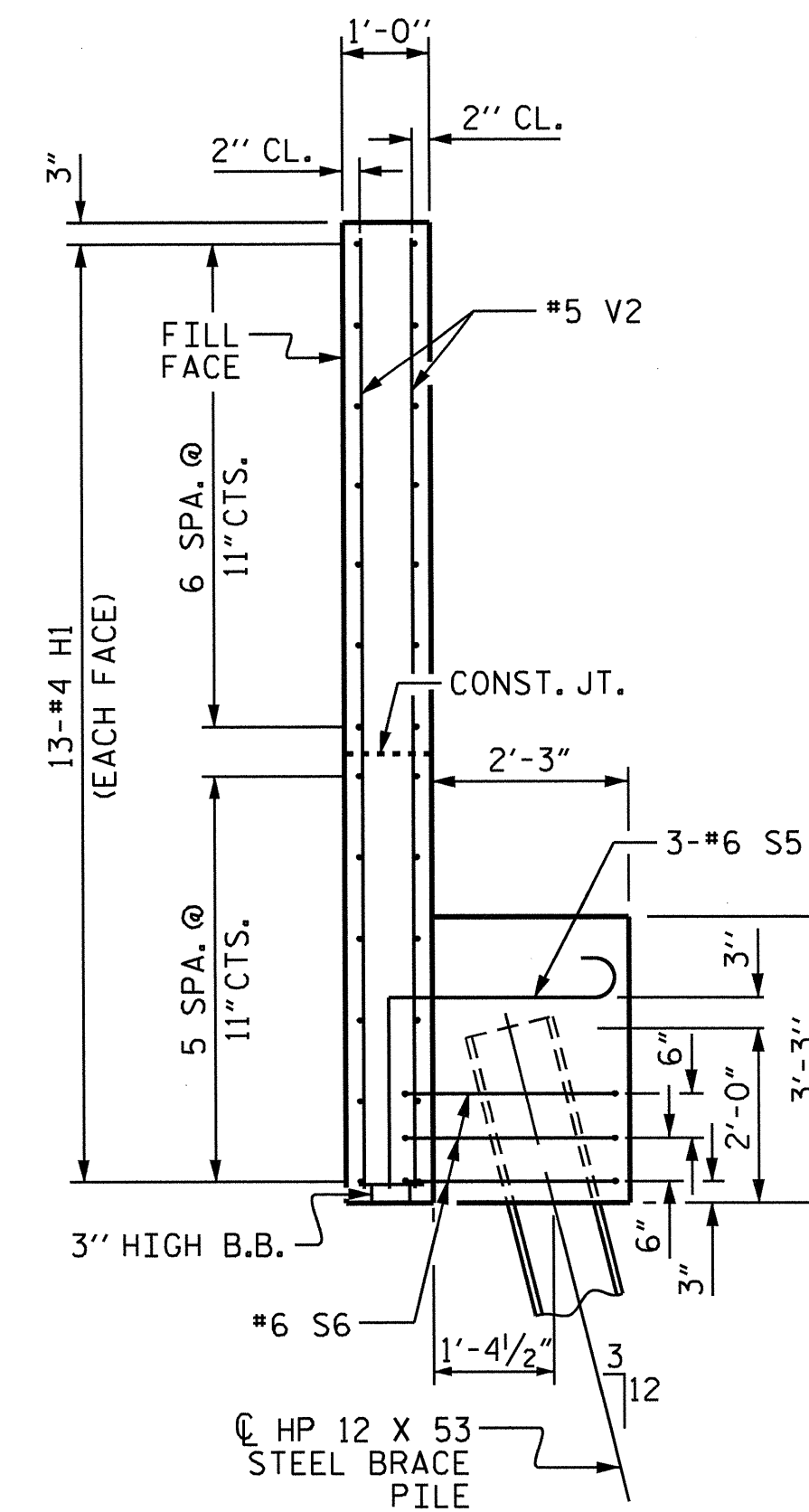
ASSEMBLED BY : S.H. SOCKWELL	DATE : 11/16/2012
CHECKED BY : JL Lamber†	DATE : 12/12
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



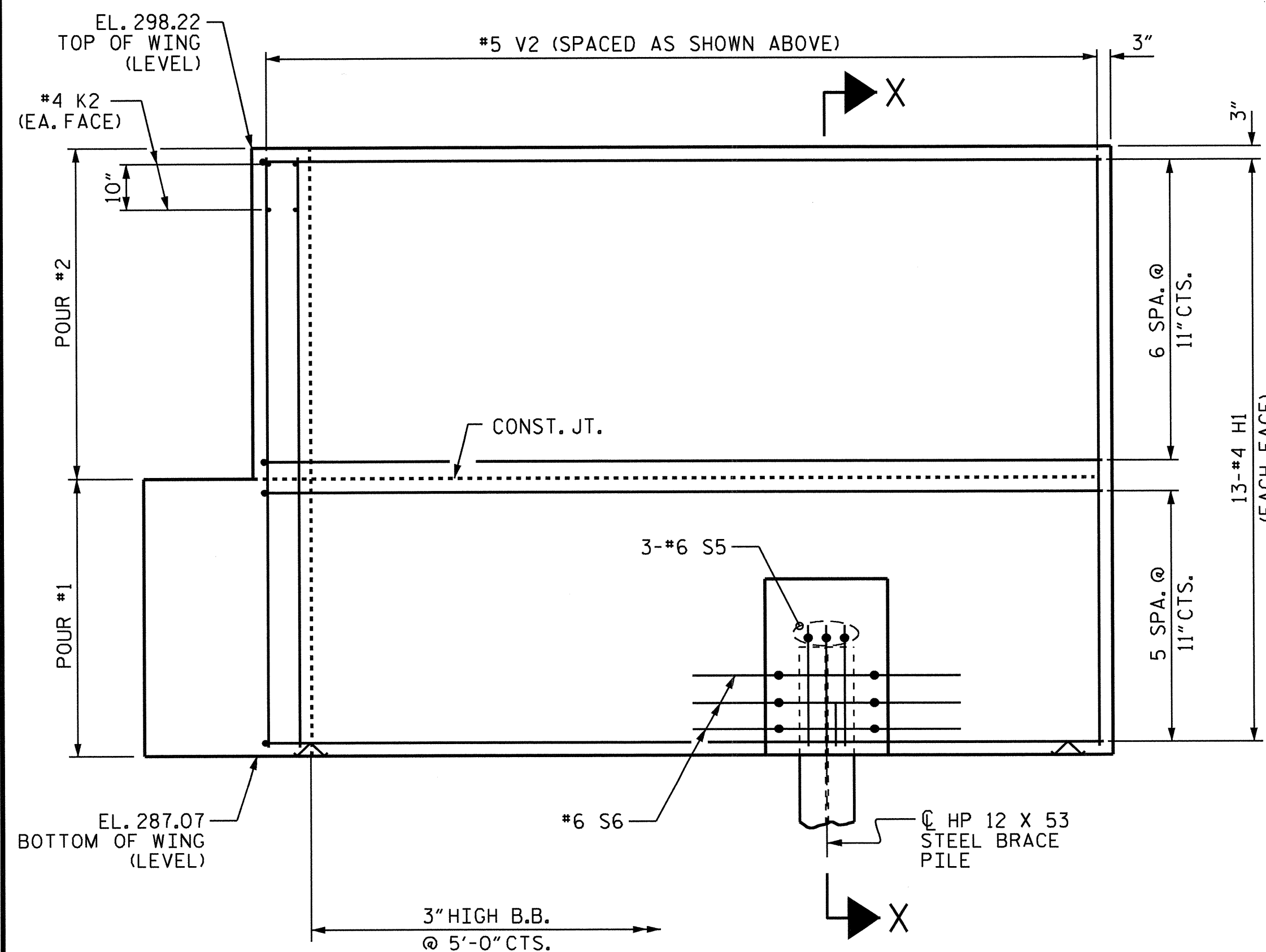
PLAN OF WING (W1)



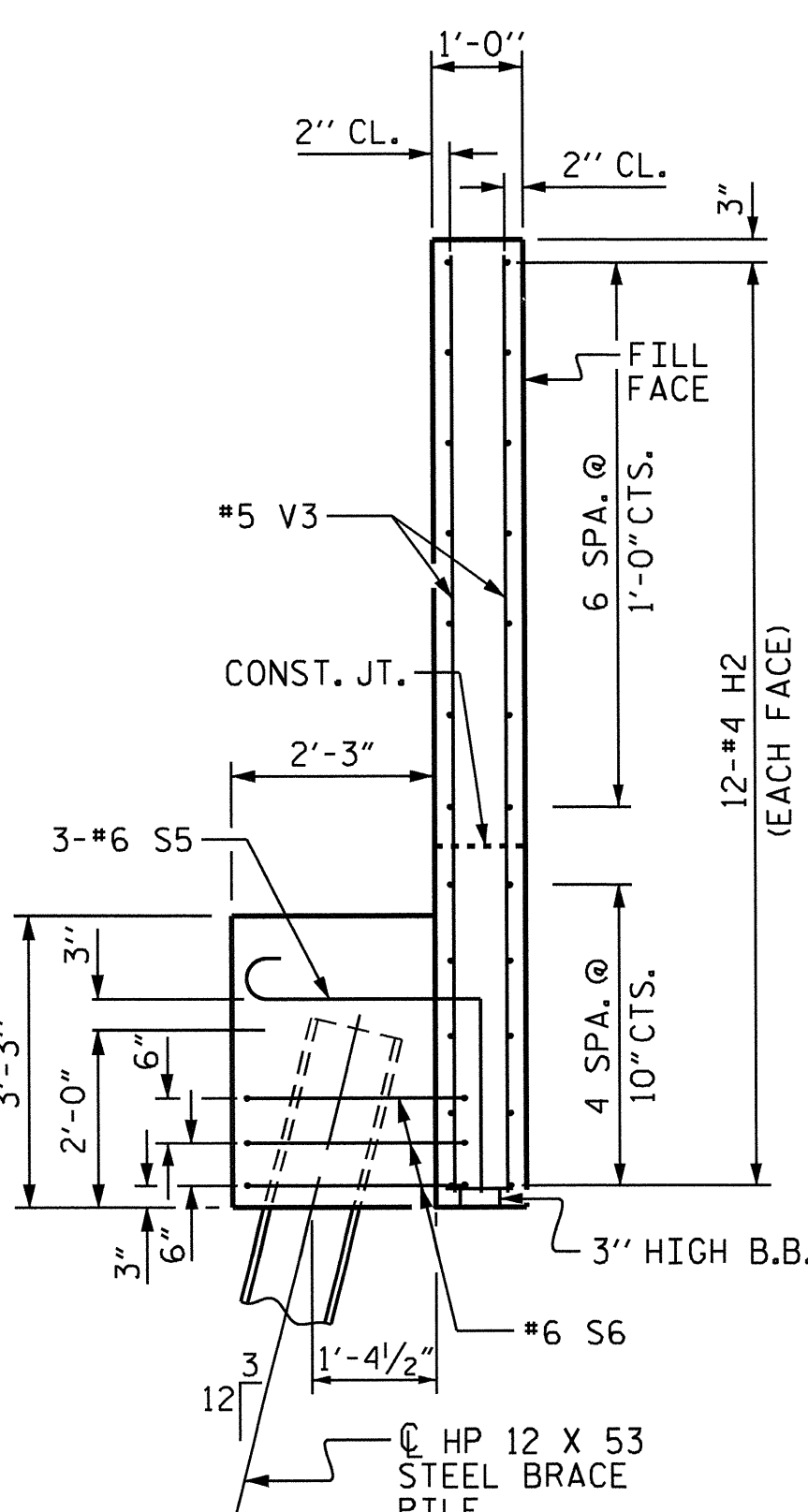
PLAN OF WING (W2)



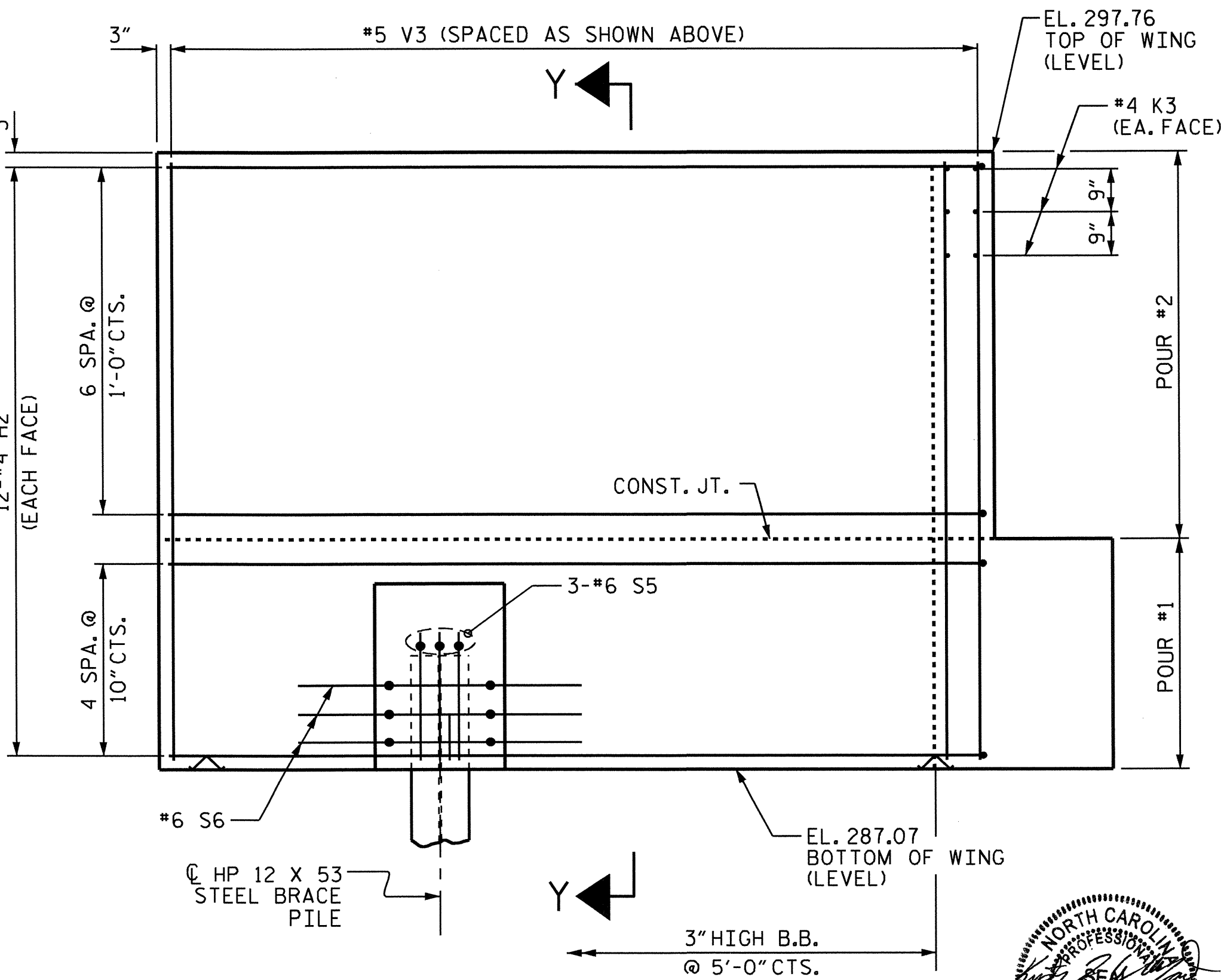
SECTION X-X



ELEVATION OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W2)

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1



DRAWN BY: Fr. Leo DATE: 4/29/13
 CHECKED BY: P. K. NEWTON DATE: 5/23/13
 DESIGN ENGINEER OF RECORD: Fr. Leo DATE: 12/19/13

18-NOV-2013 09:02
 S:\DPG2\KRISTY\B-4991\Sub.Draw\B-4991.SD.E.dgn
 file

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34	
1			3			TOTAL SHEETS 48	
2			4				

NOTES

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

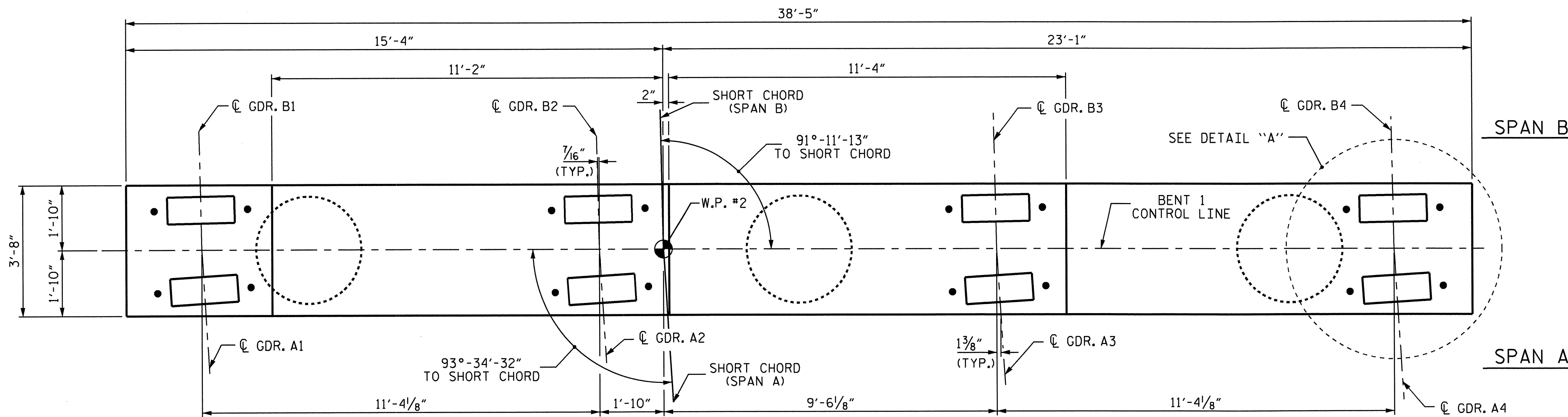
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

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

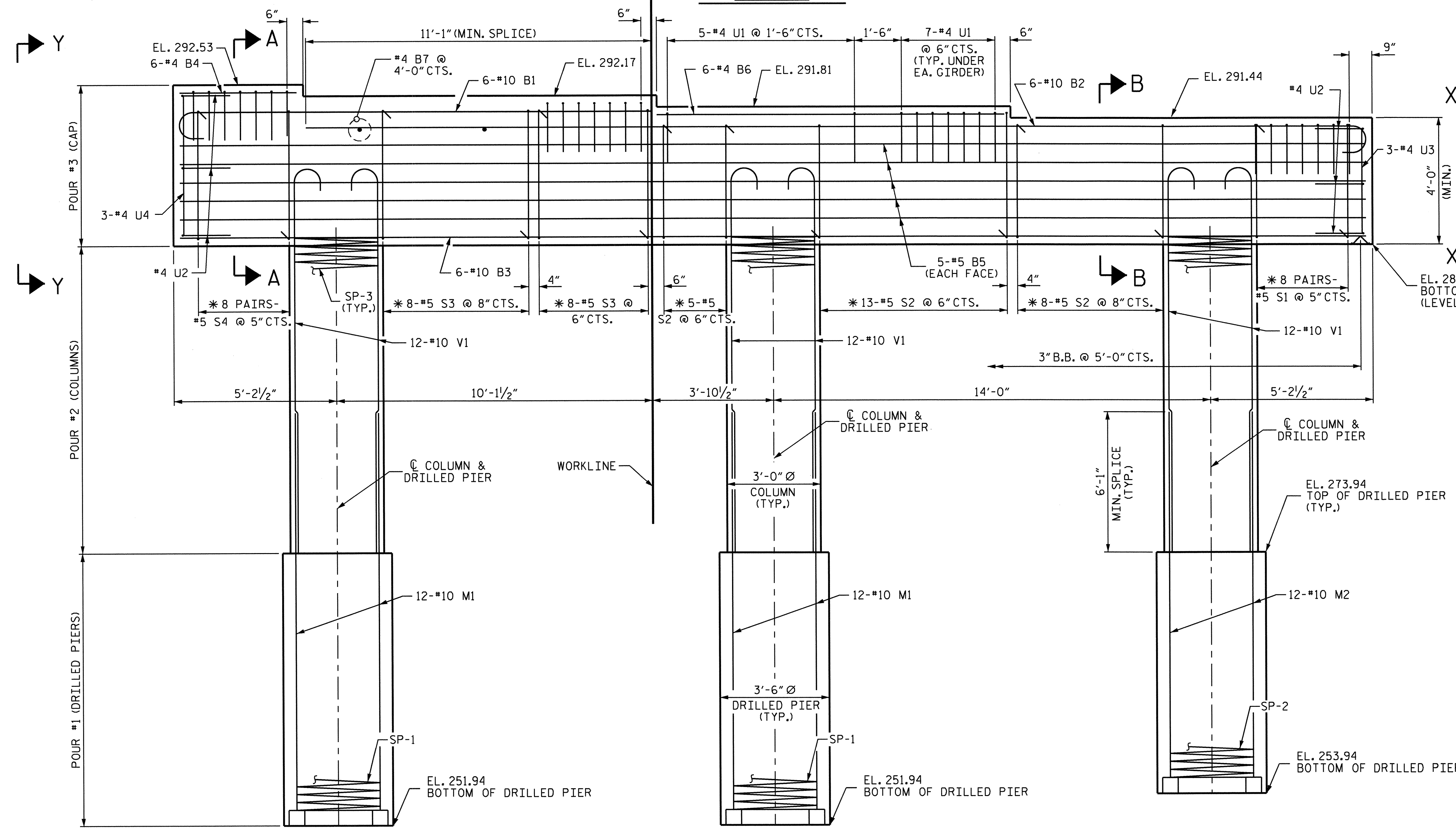
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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.

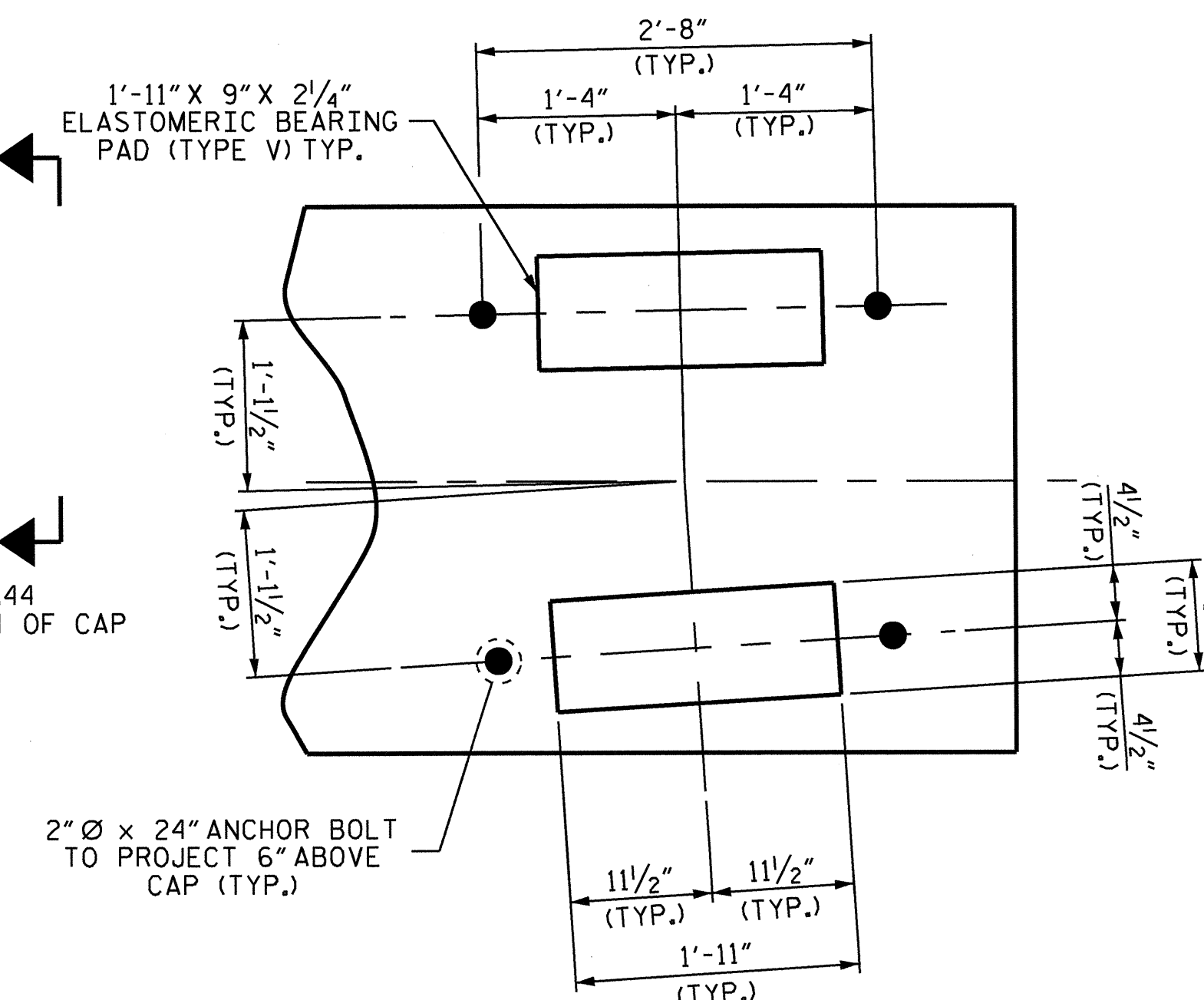
* INVERT ALTERNATE STIRRUPS AS SHOWN.



PLAN



ELEVATION



DETAIL "A"

(TYP. EA. GIRDER)

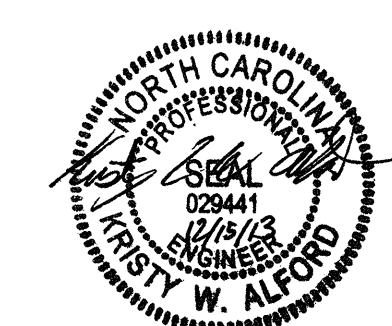
PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

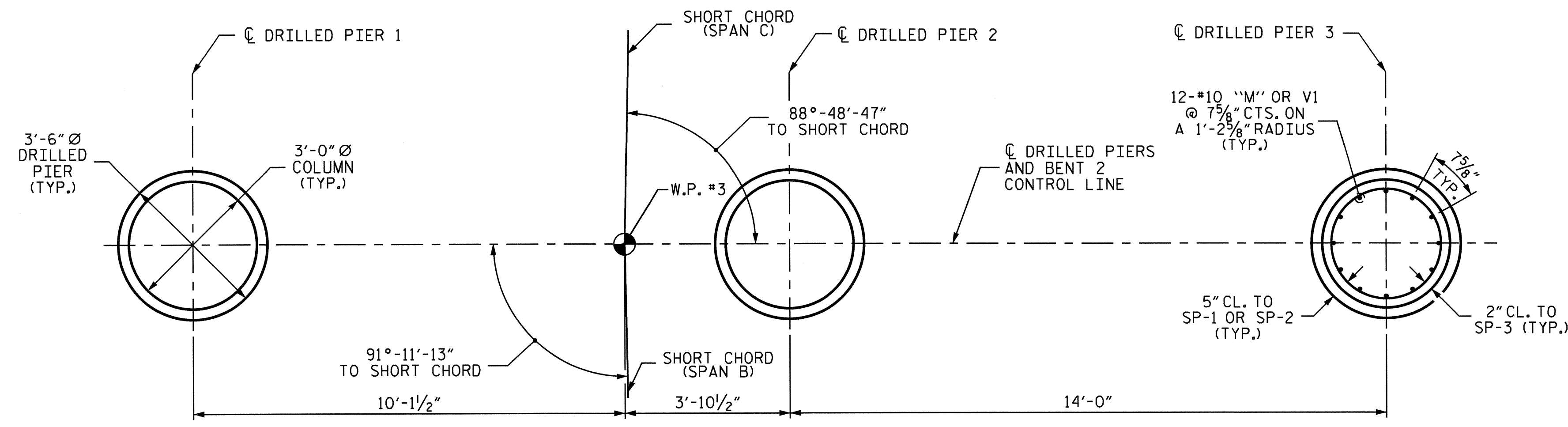
SUBSTRUCTURE

BENT 1

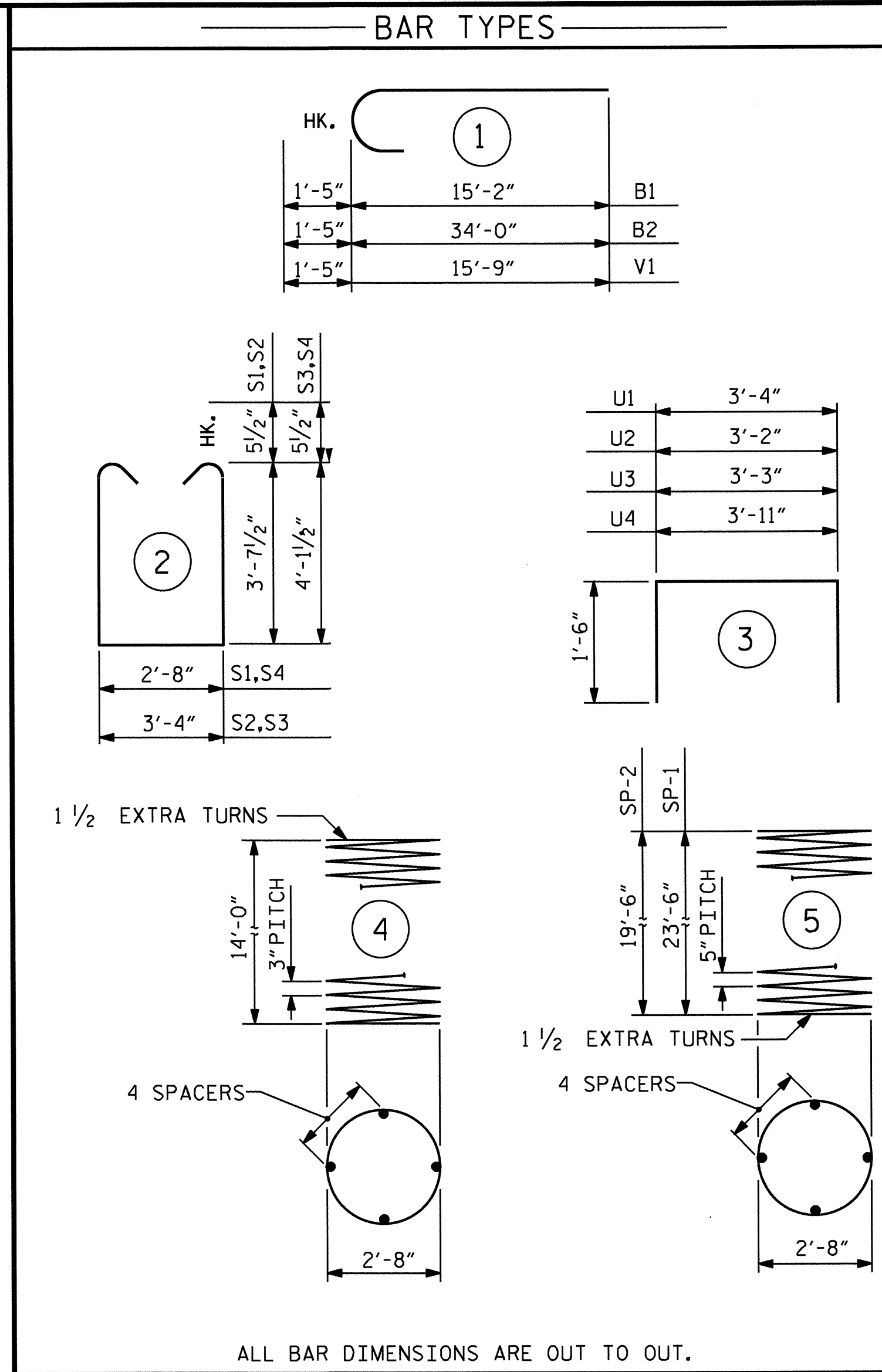


DRAWN BY: A.C. OUTLAW DATE: 1/29/13
 CHECKED BY: P. K. NEWTON DATE: 2/18/13
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE: 8/21/13

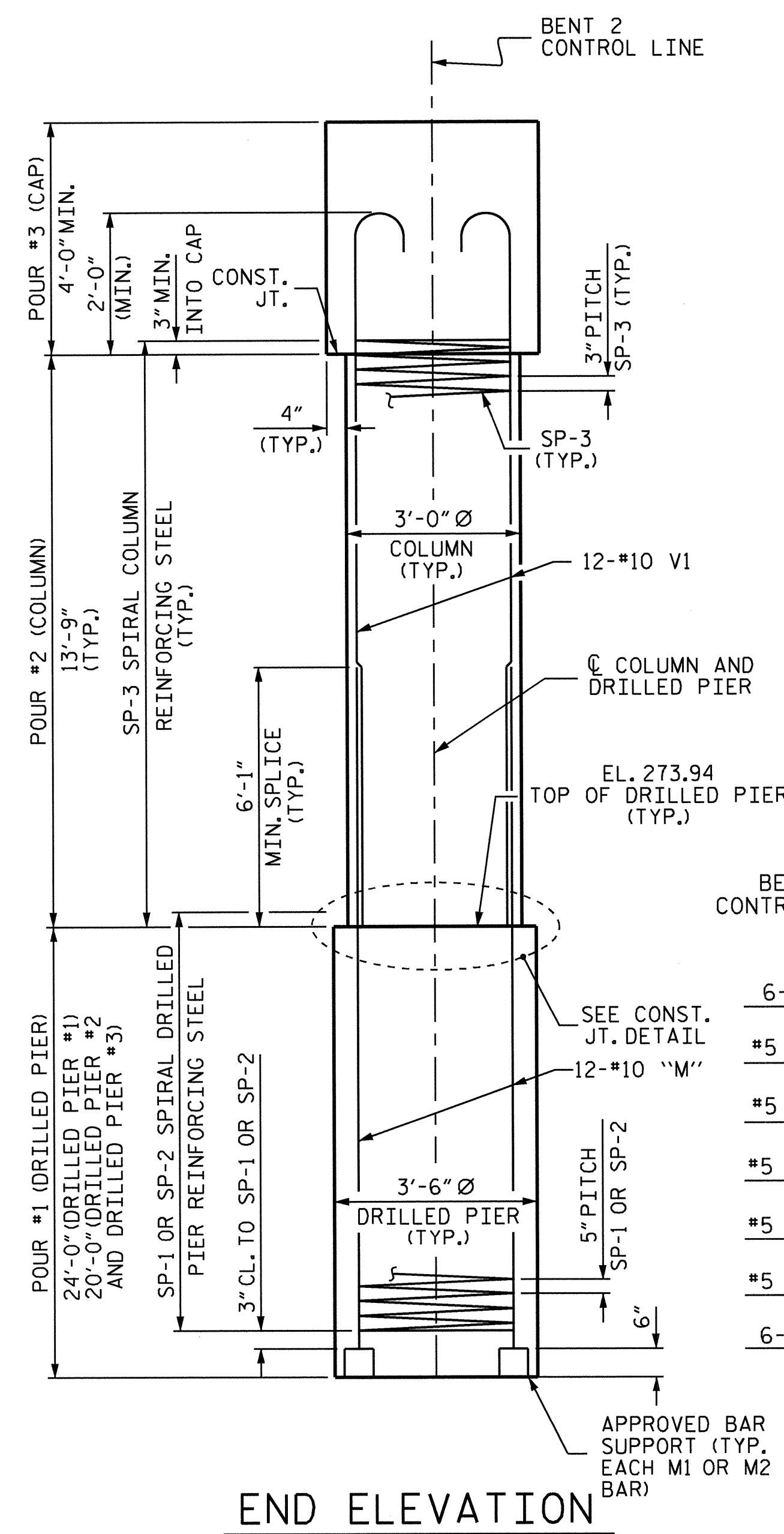
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			48



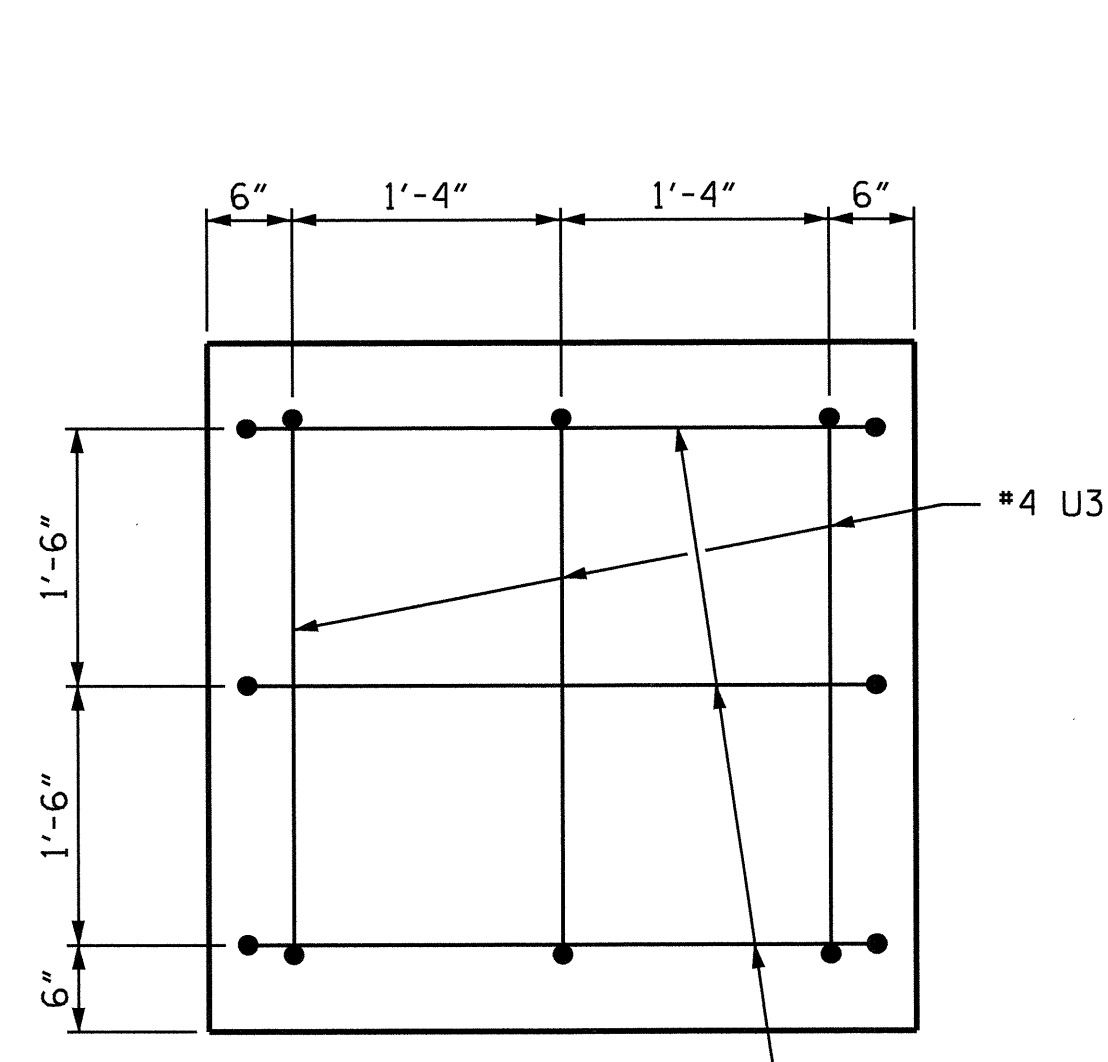
PLAN OF DRILLED PIERS AND COLUMNS



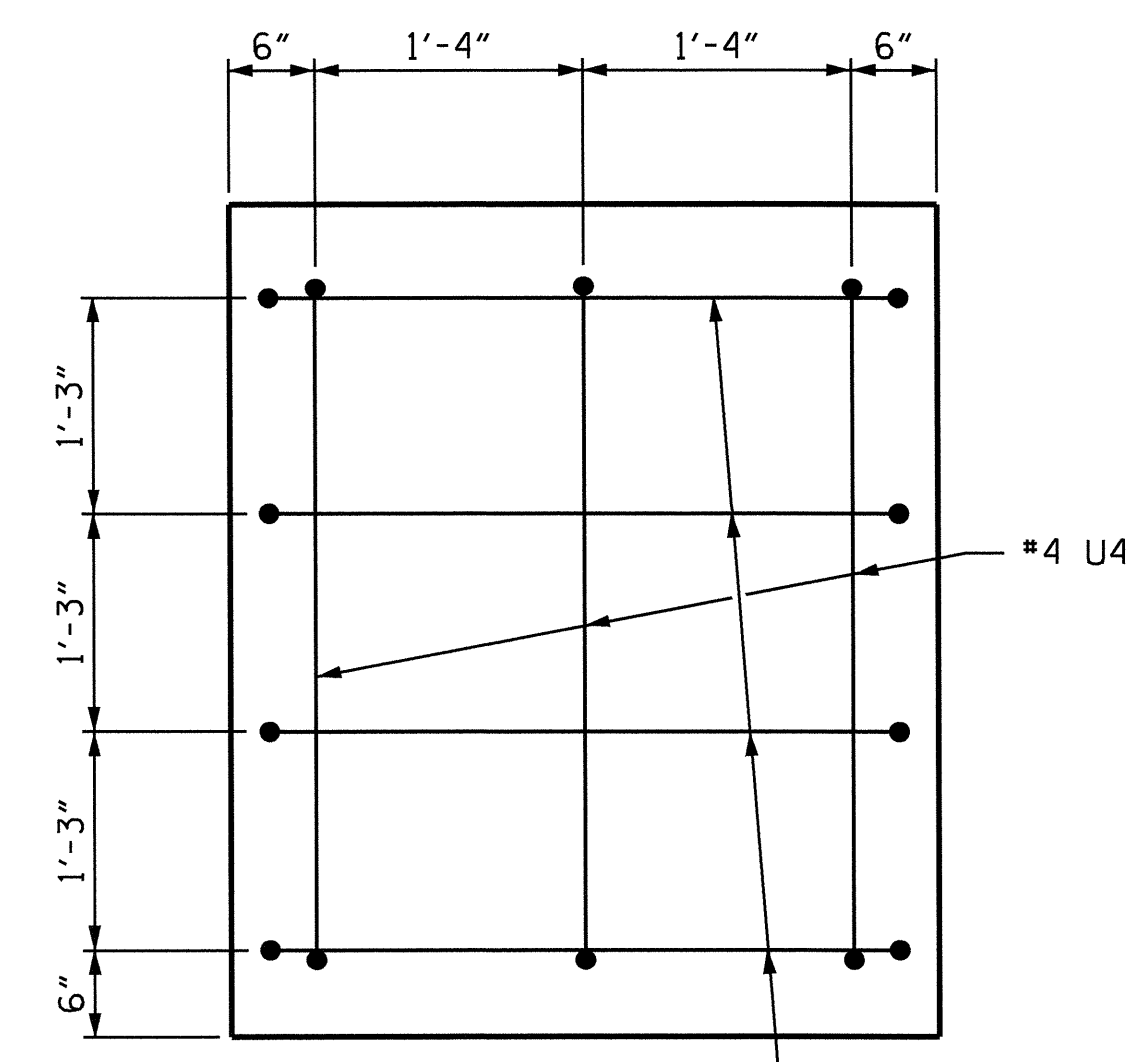
ALL BAR DIMENSIONS ARE OUT TO OUT.



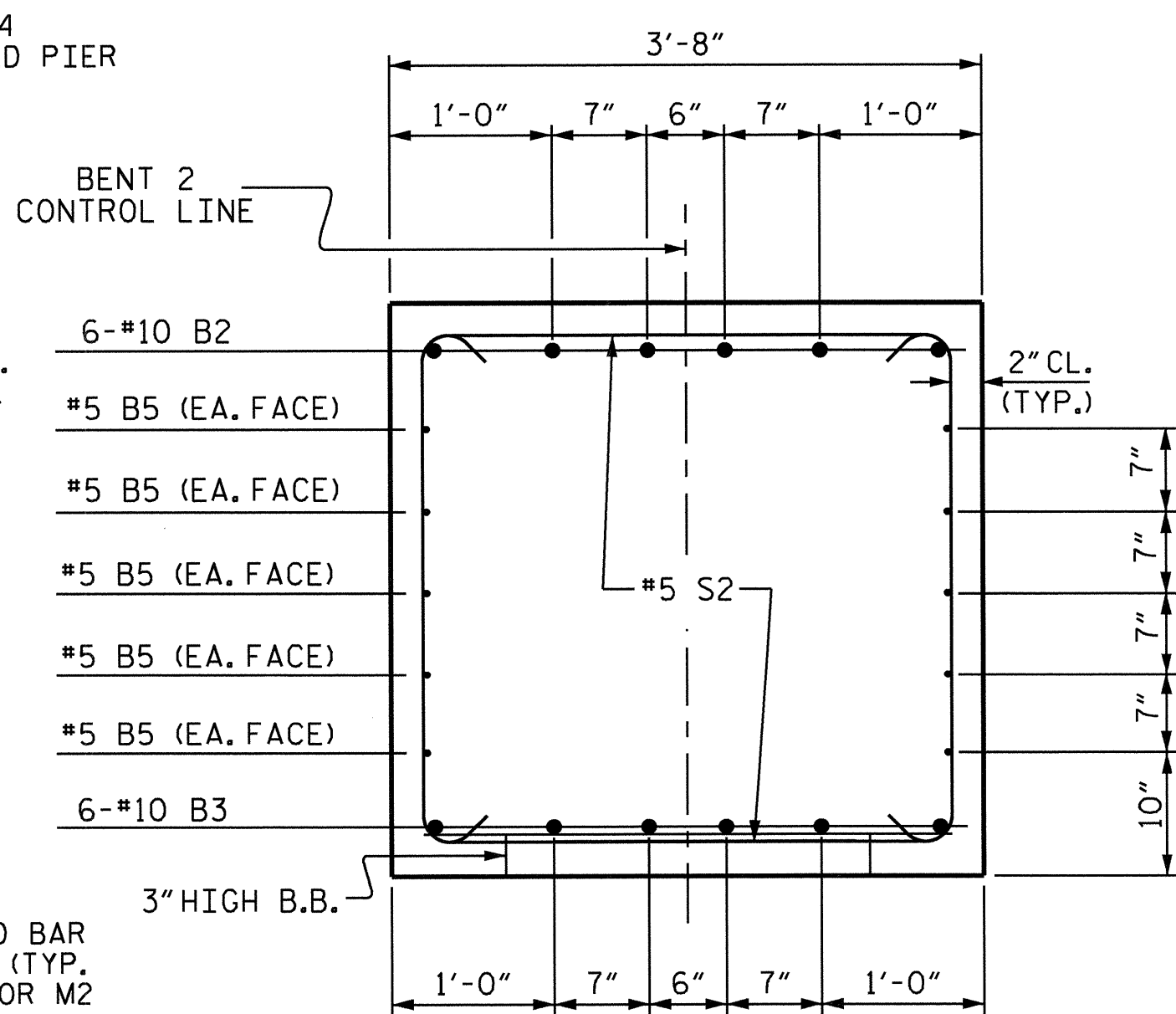
END ELEVATION



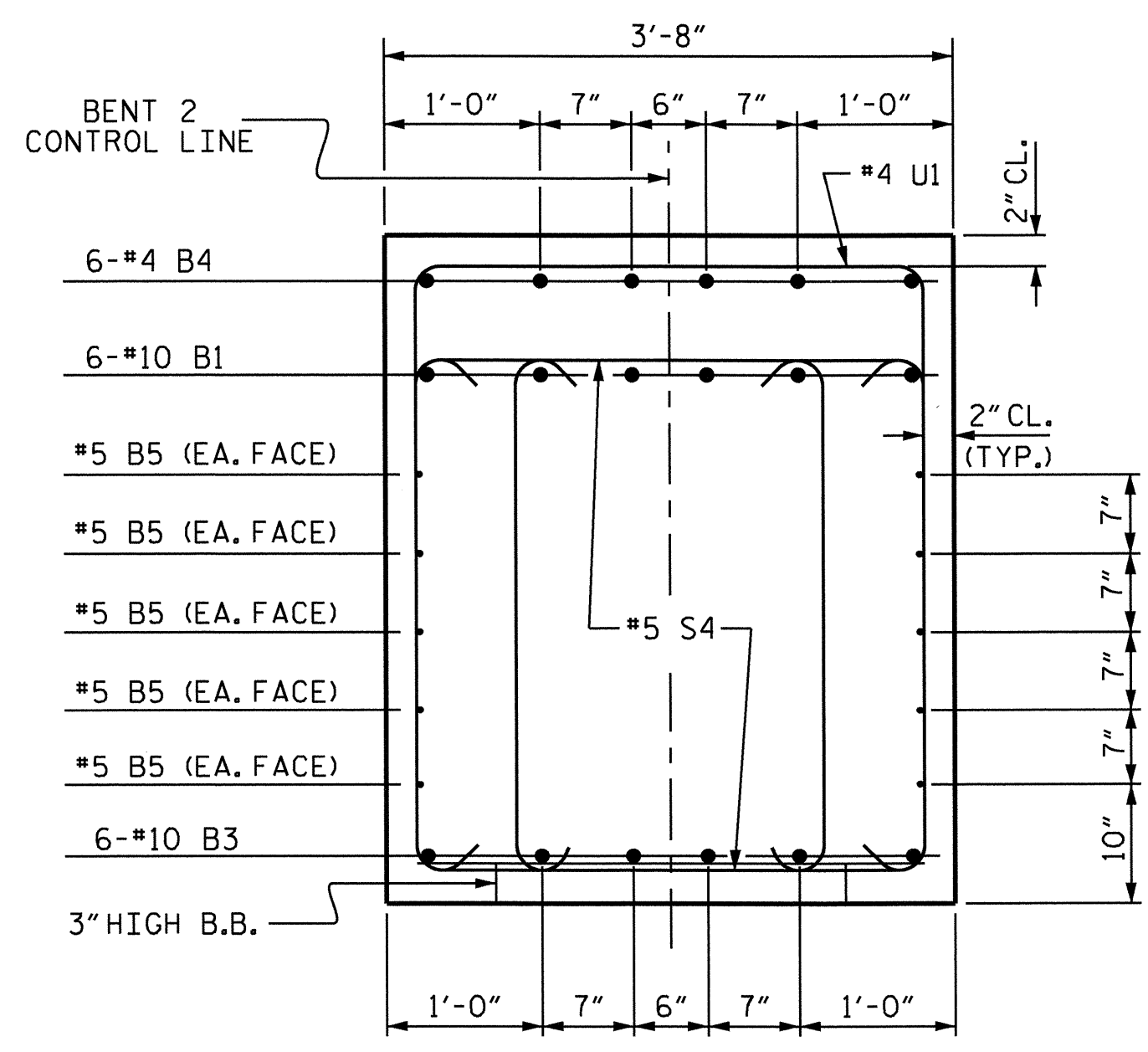
VIEW X-X



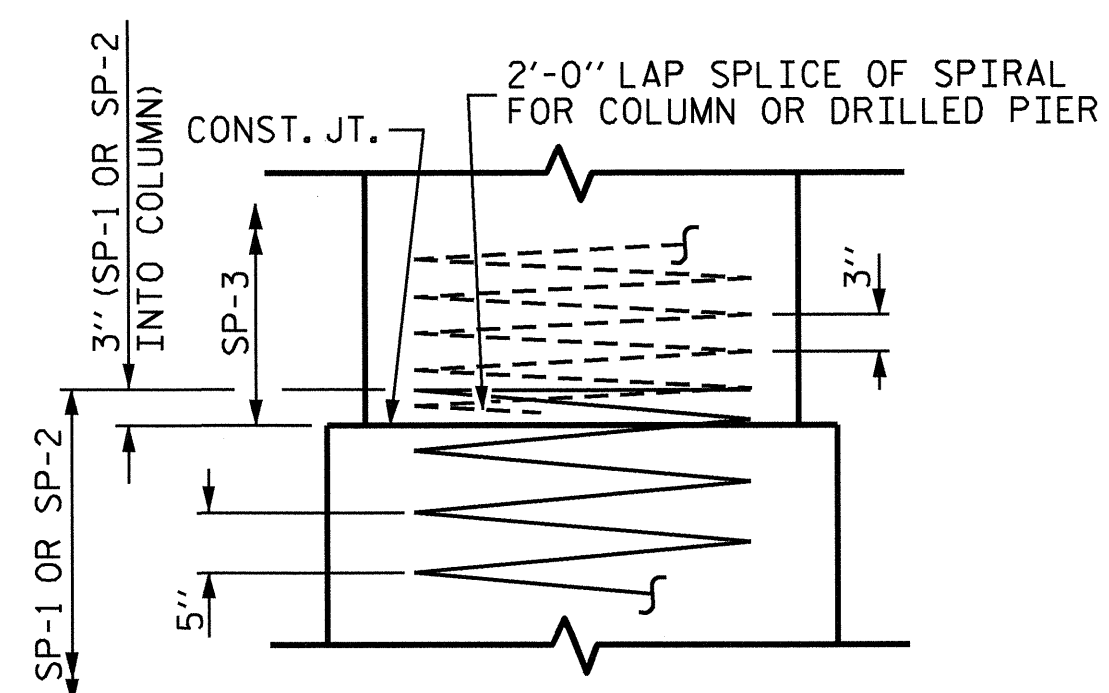
VIEW Y-Y



SECTION B-B



SECTION A-A



CONSTRUCTION JOINT DETAIL

BILL OF MATERIAL

BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	10	1	16'-7"	428
B2	6	10	1	35'-5"	914
B3	6	10	STR	38'-0"	981
B4	6	4	STR	3'-10"	15
B5	10	5	STR	38'-0"	396
B6	6	4	STR	11'-2"	47
B7	2	4	STR	3'-4"	4
M1	12	10	STR	32'-10"	1695
M2	24	10	STR	28'-10"	2978
S1	16	5	2	10'-10"	181
S2	26	5	2	11'-6"	312
S3	16	5	2	12'-4"	209
S4	16	5	2	11'-10"	197
U1	33	4	3	6'-4"	140
U2	7	4	3	6'-2"	29
U3	3	4	3	6'-3"	13
U4	3	4	3	6'-11"	14
V1	36	10	1	17'-2"	2659
REINFORCING STEEL					11212 LBS.
SP-1	1	*	5	477'-0"	498
SP-2	2	*	5	403'-0"	841
SP-3	3	**	4	478'-6"	959
SPIRAL COLUMN REINFORCING STEEL					2298 LBS.
*THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
**THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMN)				10.8 C.Y.	
POUR #3				23.2 C.Y.	
TOTAL CLASS A CONCRETE				34.0 C.Y.	
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				22.9 C.Y.	
3'-6" Ø DRILLED PIER IN SOIL				32.0 LIN. FT.	
3'-6" Ø DRILLED PIER NOT IN SOIL				32.0 LIN. FT.	
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS				31.8 LIN. FT.	
CSL TUBES				274.0 LIN. FT.	

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

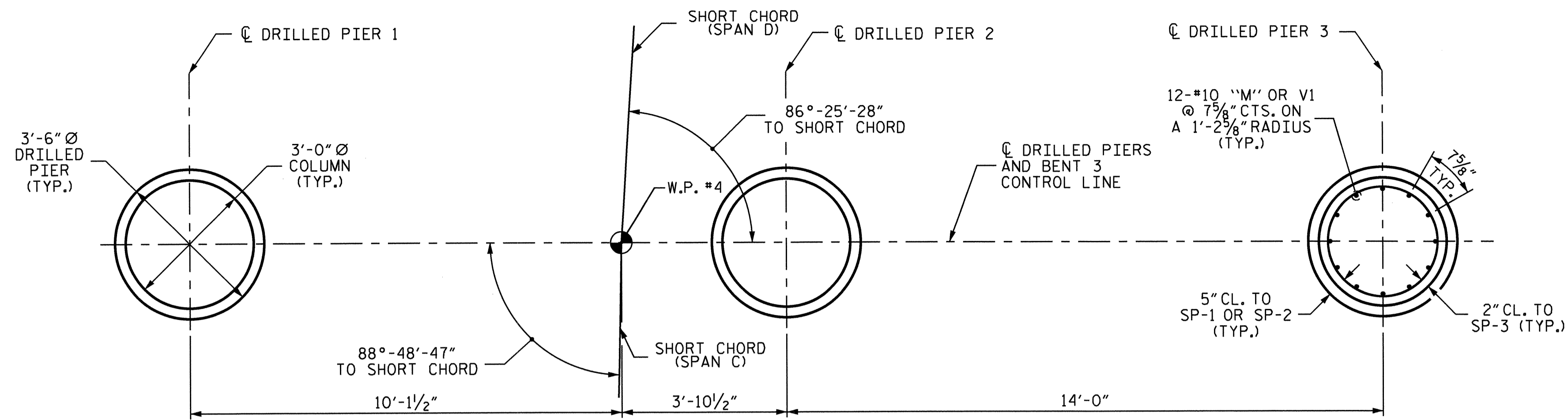
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

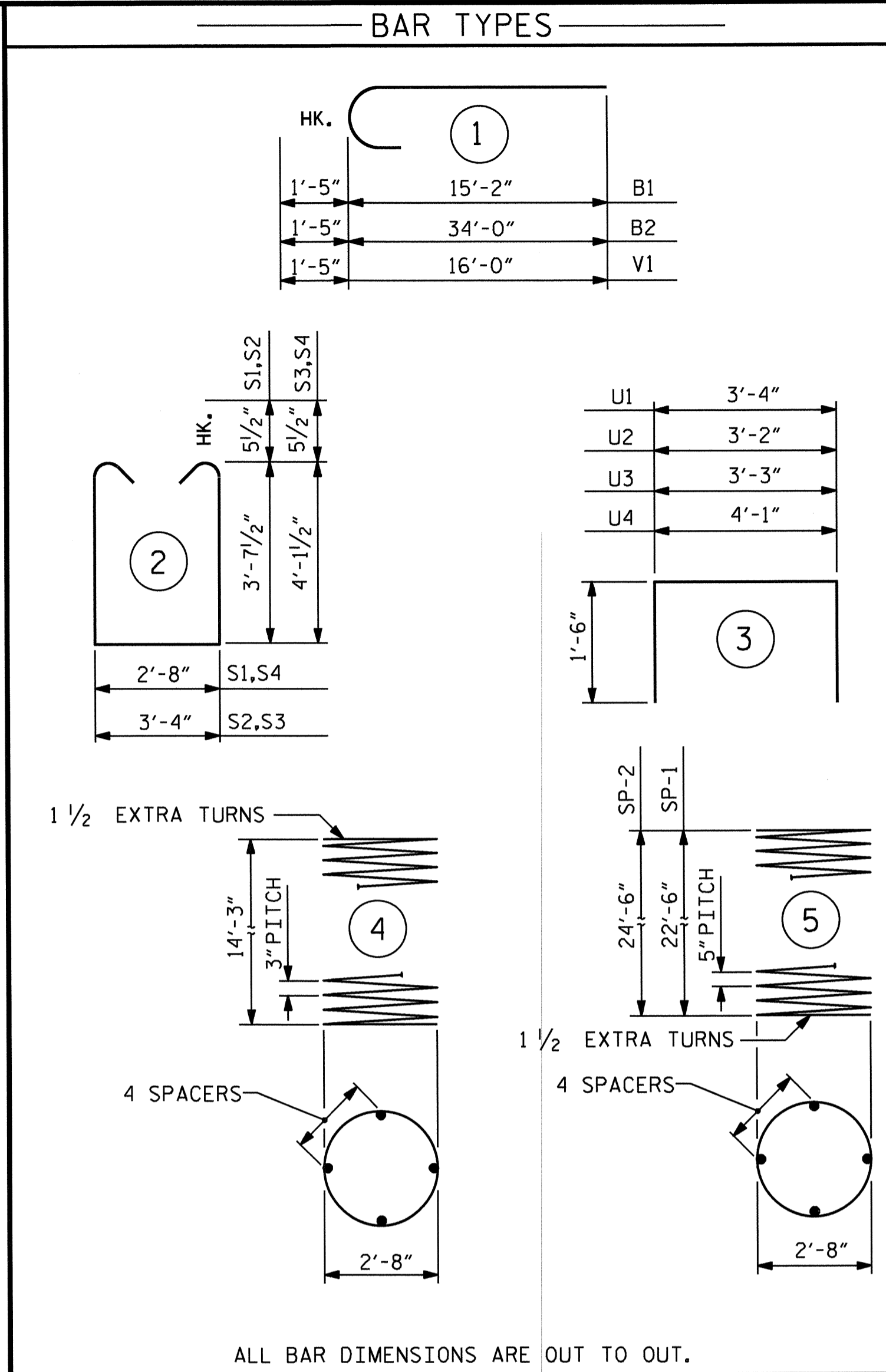


DRAWN BY: A.C. OUTLAW DATE: 1/30/13
 CHECKED BY: P. K. NEWTON DATE: 2/19/13
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE: 8/21/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-39
2			4			48



PLAN OF DRILLED PIERS AND COLUMNS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 3

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	10	1	16'-7"	428
B2	6	10	1	35'-5"	914
B3	6	10	STR	38'-0"	981
B4	6	4	STR	3'-10"	15
B5	10	5	STR	38'-0"	396
B6	6	4	STR	11'-2"	47
B7	2	4	STR	3'-4"	4
M1	24	10	STR	31'-10"	3287
M2	12	10	STR	33'-10"	1747
S1	16	5	2	10'-10"	181
S2	26	5	2	11'-6"	312
S3	16	5	2	12'-4"	209
S4	16	5	2	11'-8"	197
U1	33	4	3	6'-4"	140
U2	7	4	3	6'-2"	29
U3	3	4	3	6'-3"	13
U4	3	4	3	6'-11"	14
V1	36	10	1	17'-5"	2698

REINFORCING STEEL 11612 LBS.

SP-1	2	*	5	460'-7"	961
SP-2	1	*	5	501'-8"	523
SP-3	3	**	4	486'-9"	975

SPIRAL COLUMN REINFORCING STEEL 2459 LBS.

*THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

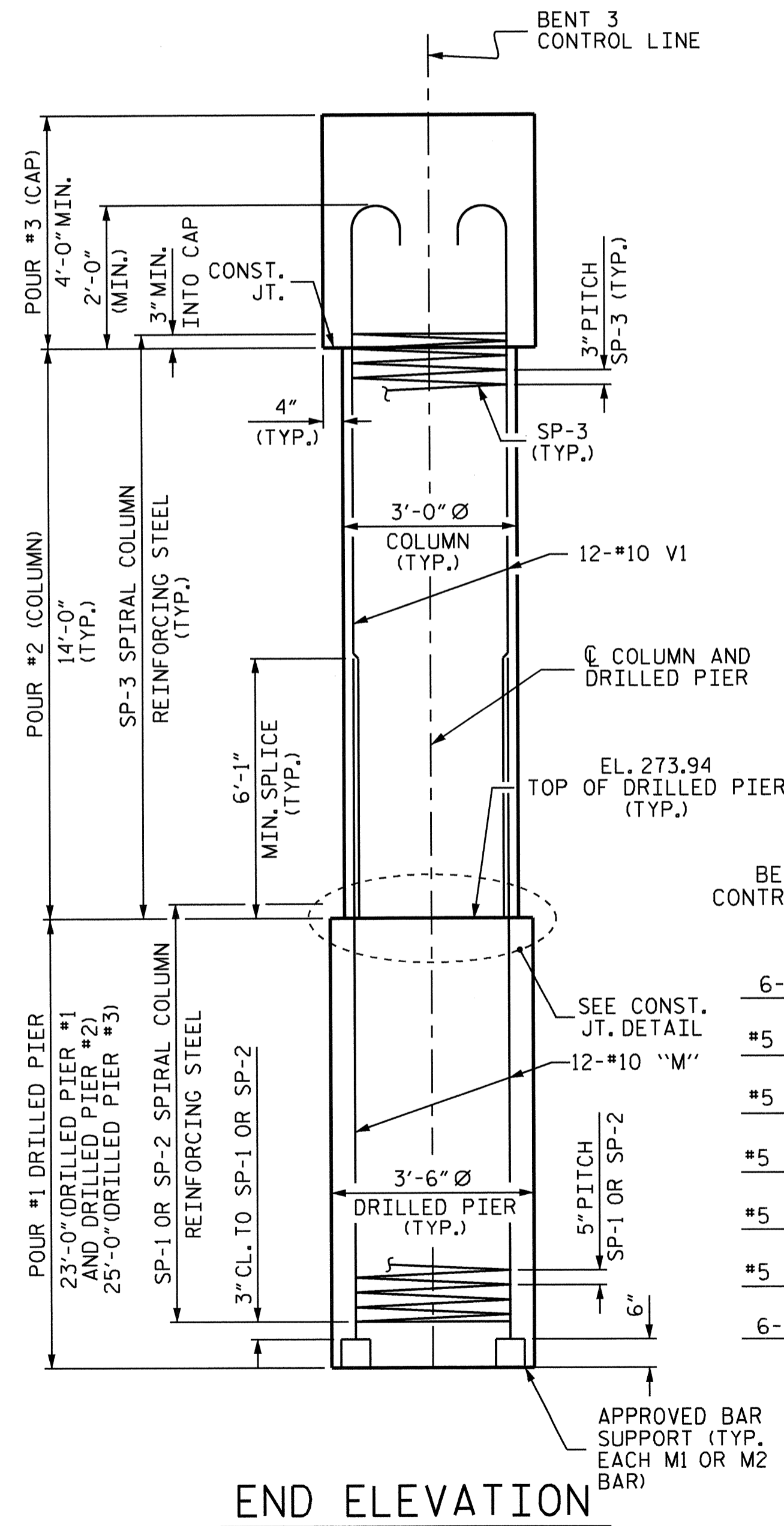
**THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

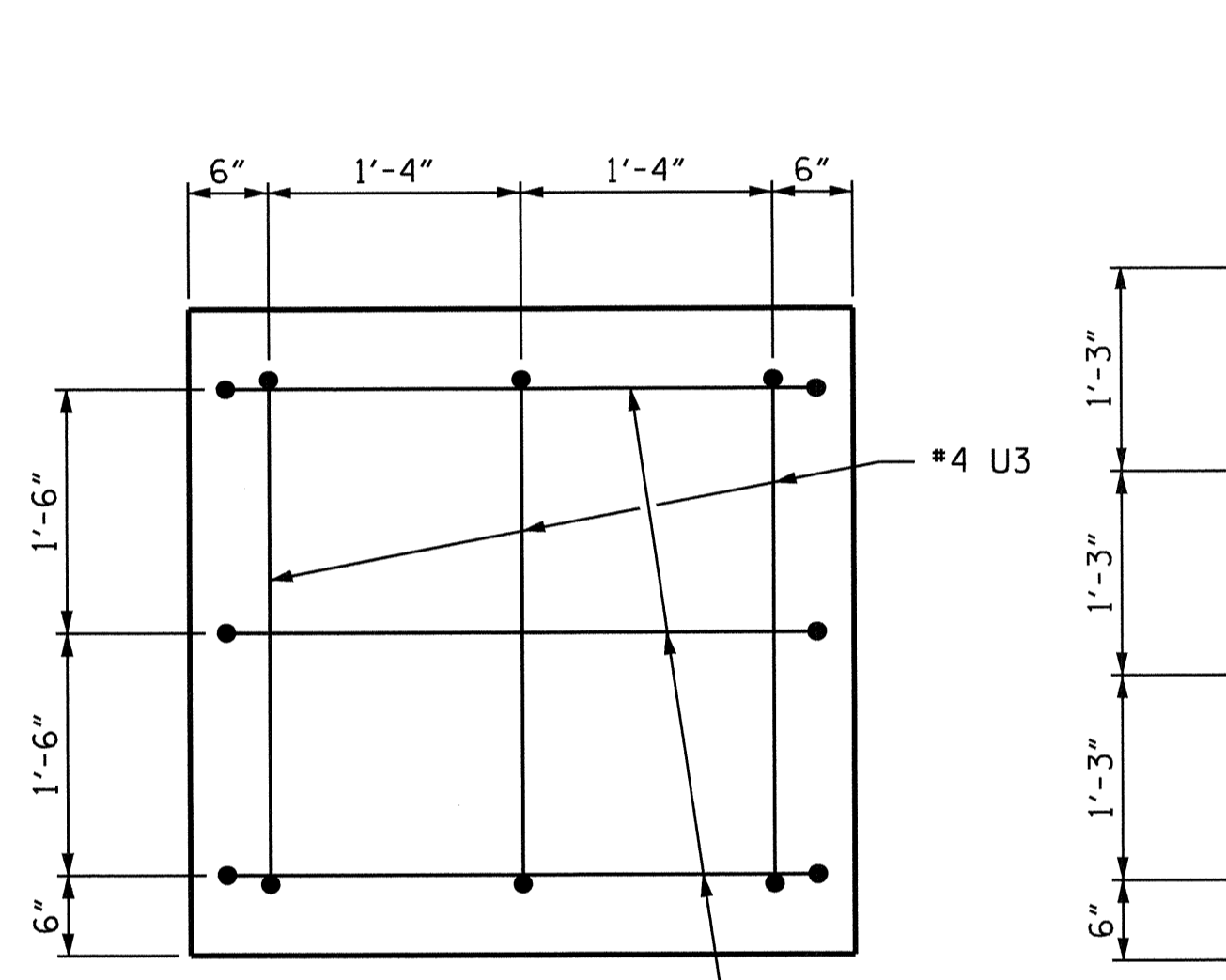
POUR #2	11.0	C.Y.
POUR #3	23.2	C.Y.
TOTAL CLASS A CONCRETE	34.2	C.Y.

DRILLED PIERS:

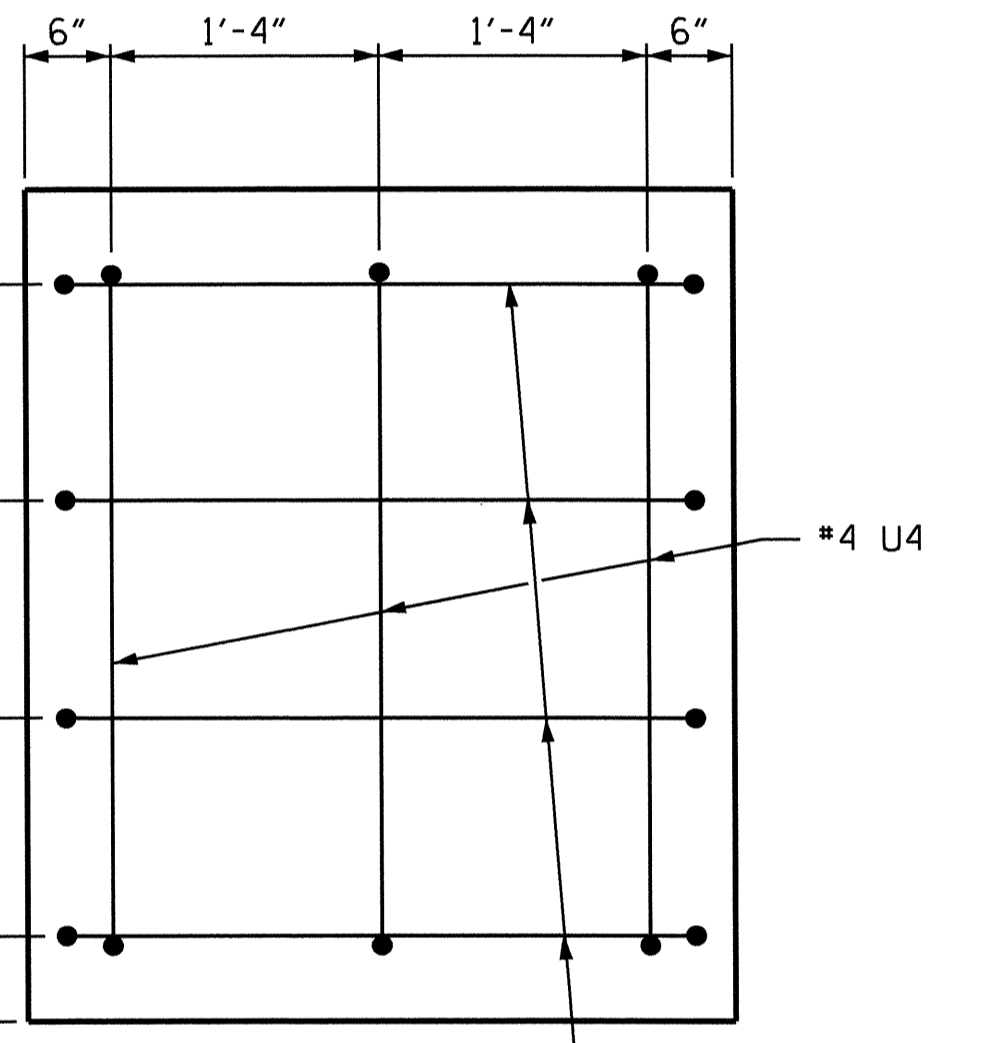
DRILLED PIER CONCRETE		
POUR #1 (DRILLED PIERS)	25.3	C.Y.
3'-6" Ø DRILLED PIER IN SOIL	44	LIN. FT.
3'-6" Ø DRILLED PIER NOT IN SOIL	27	LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	47.8	LIN. FT.
CSL TUBES	302	LIN. FT.



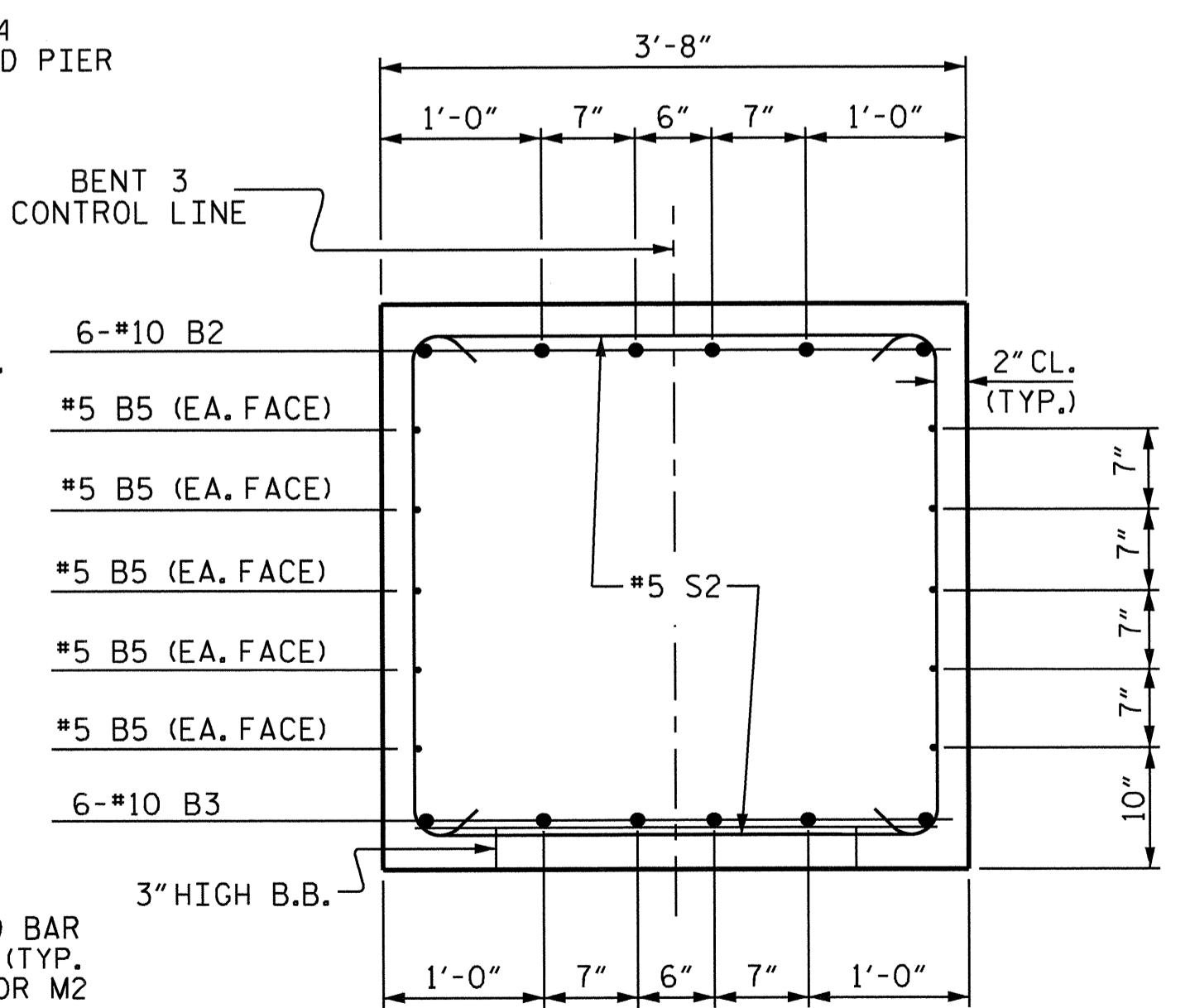
END ELEVATION



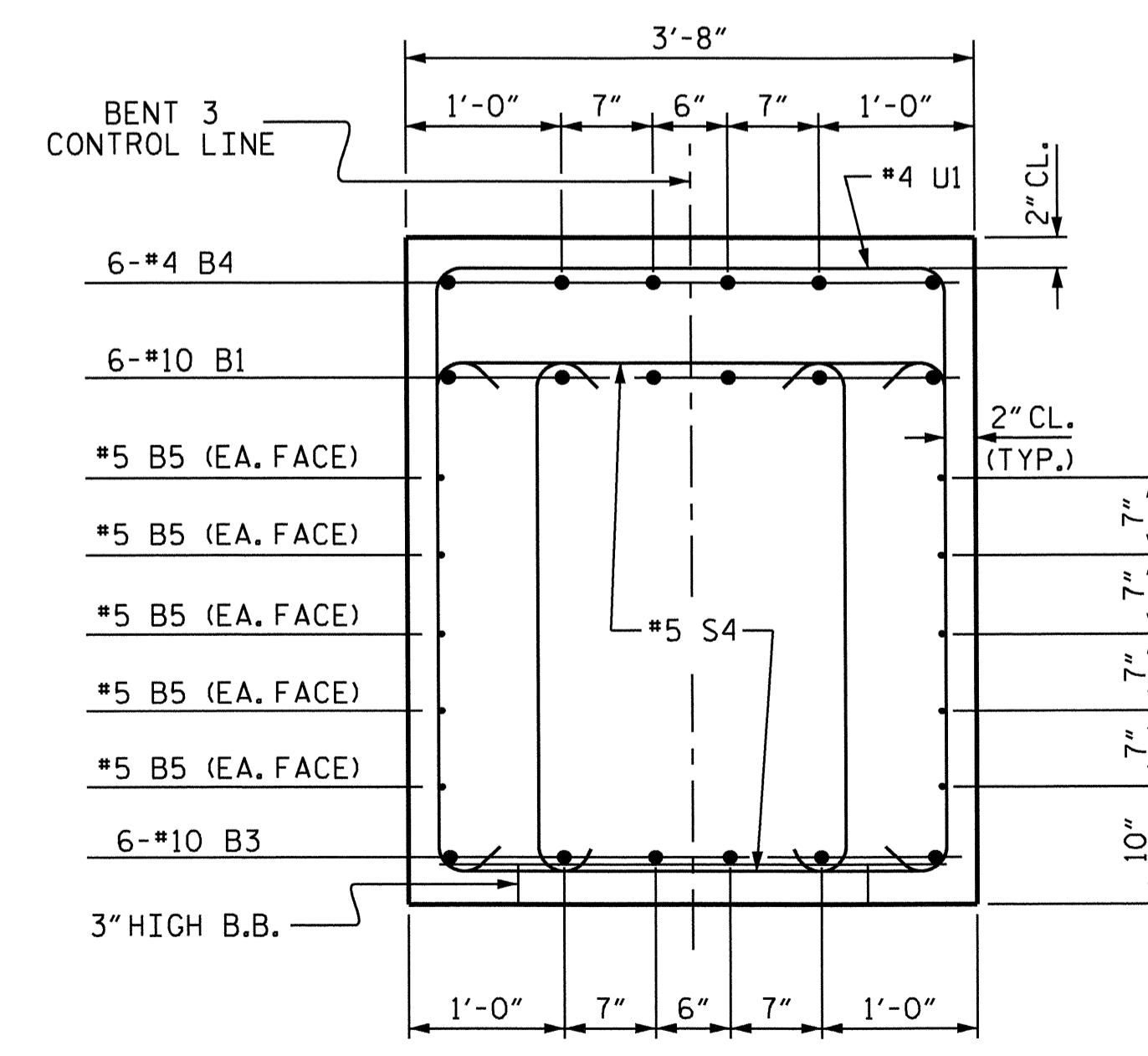
VIEW X-X



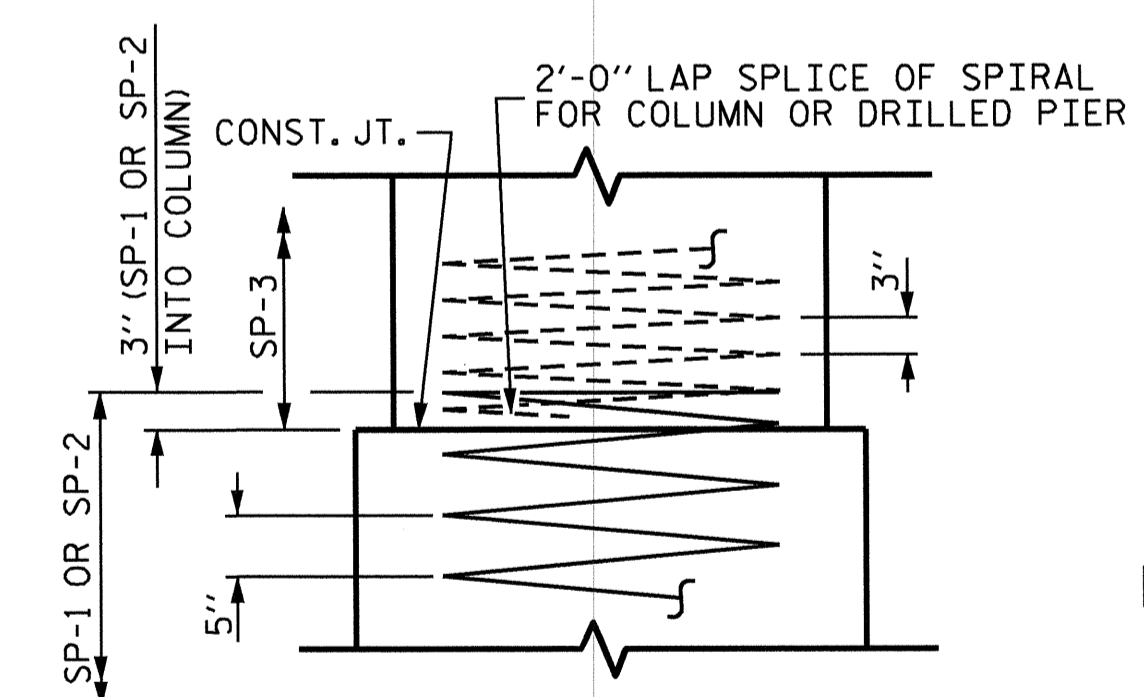
VIEW Y-Y



SECTION B-B



SECTION A-A



CONSTRUCTION JOINT DETAIL



PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

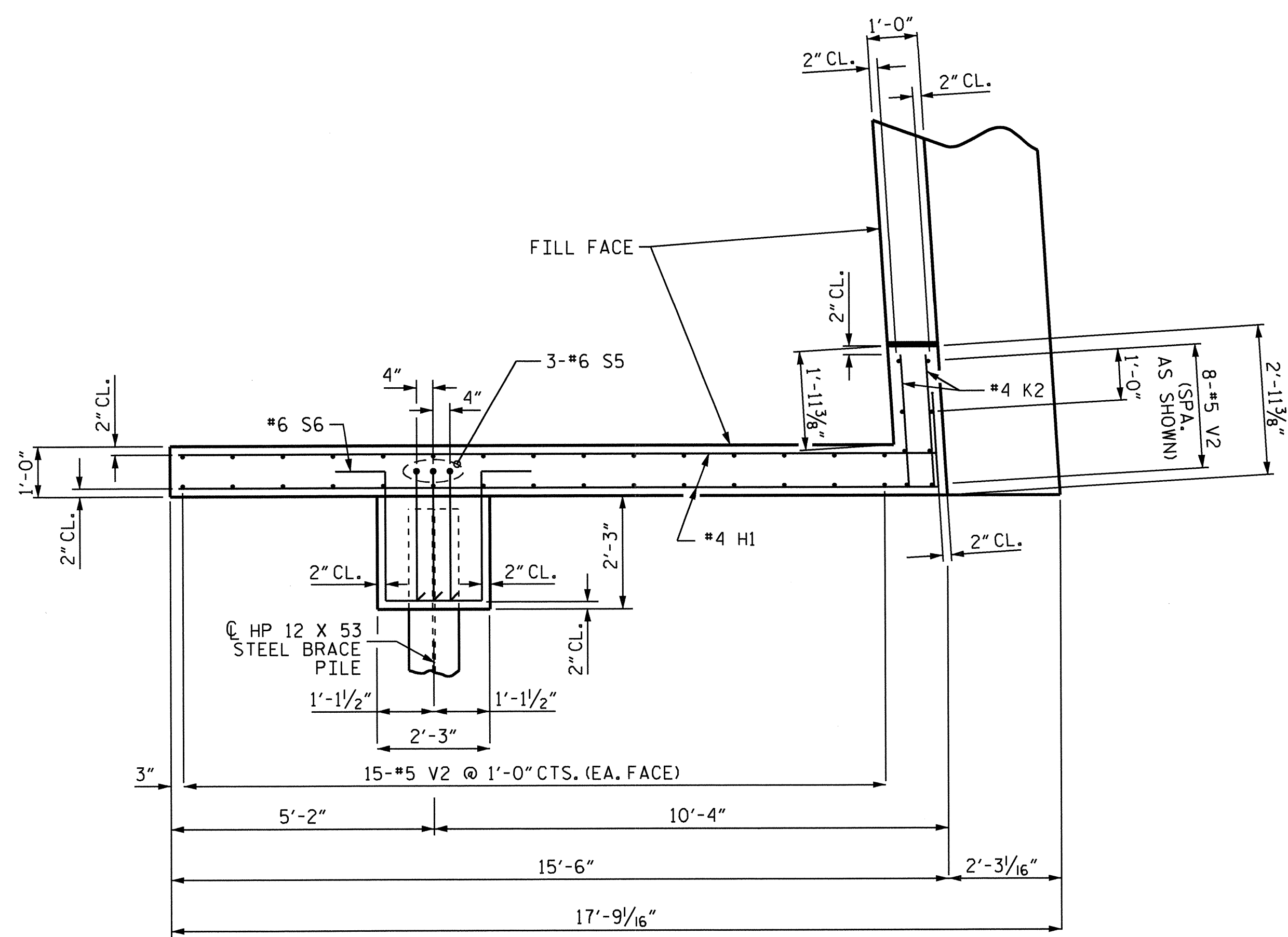
SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

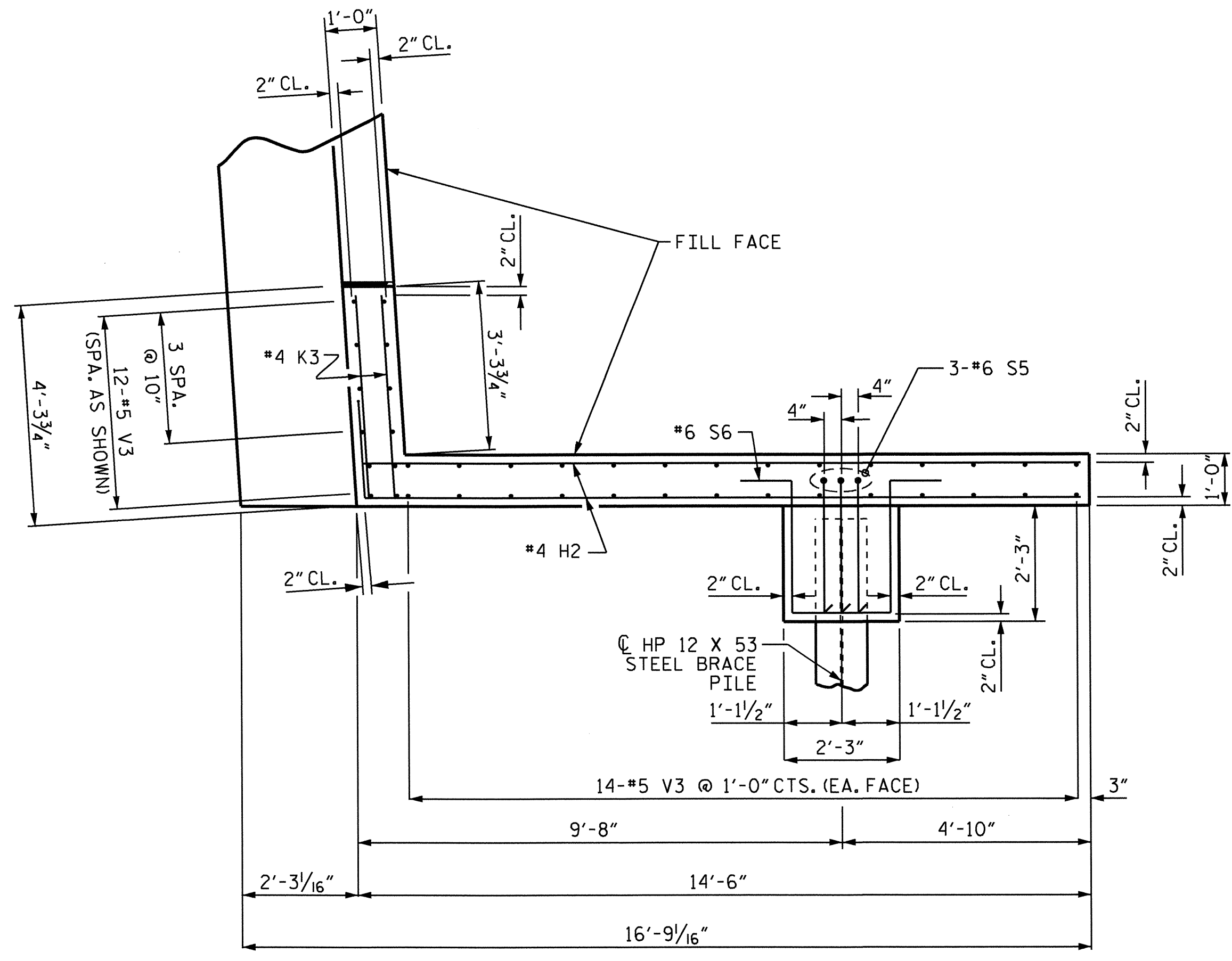
SUBSTRUCTURE
 BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			48

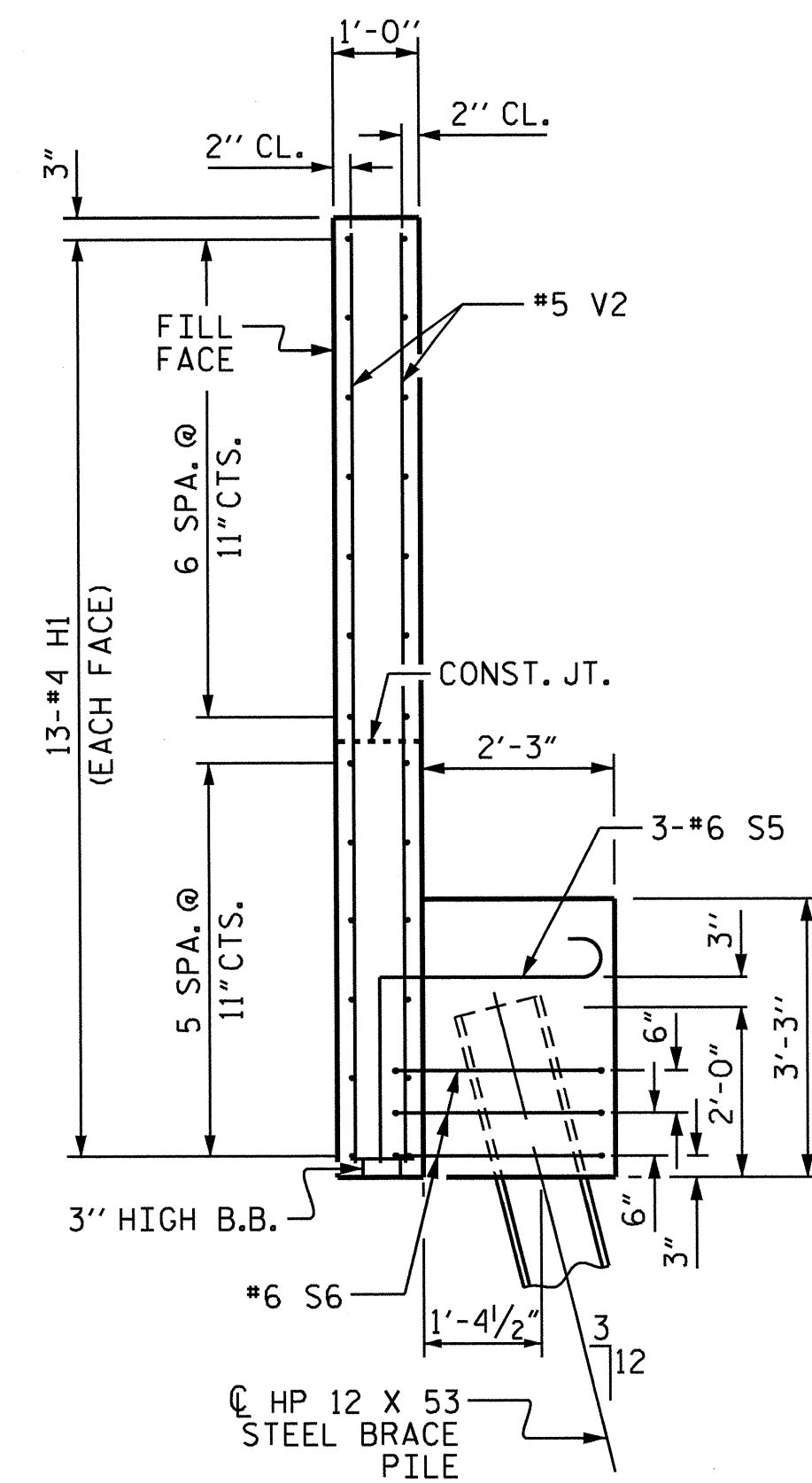
DRAWN BY: A.C. OUTLAW DATE: 1/31/13
 CHECKED BY: P. K. NEWTON DATE: 2/20/13
 DESIGN ENGINEER OF RECORD: A.C. OUTLAW DATE: 8/21/13



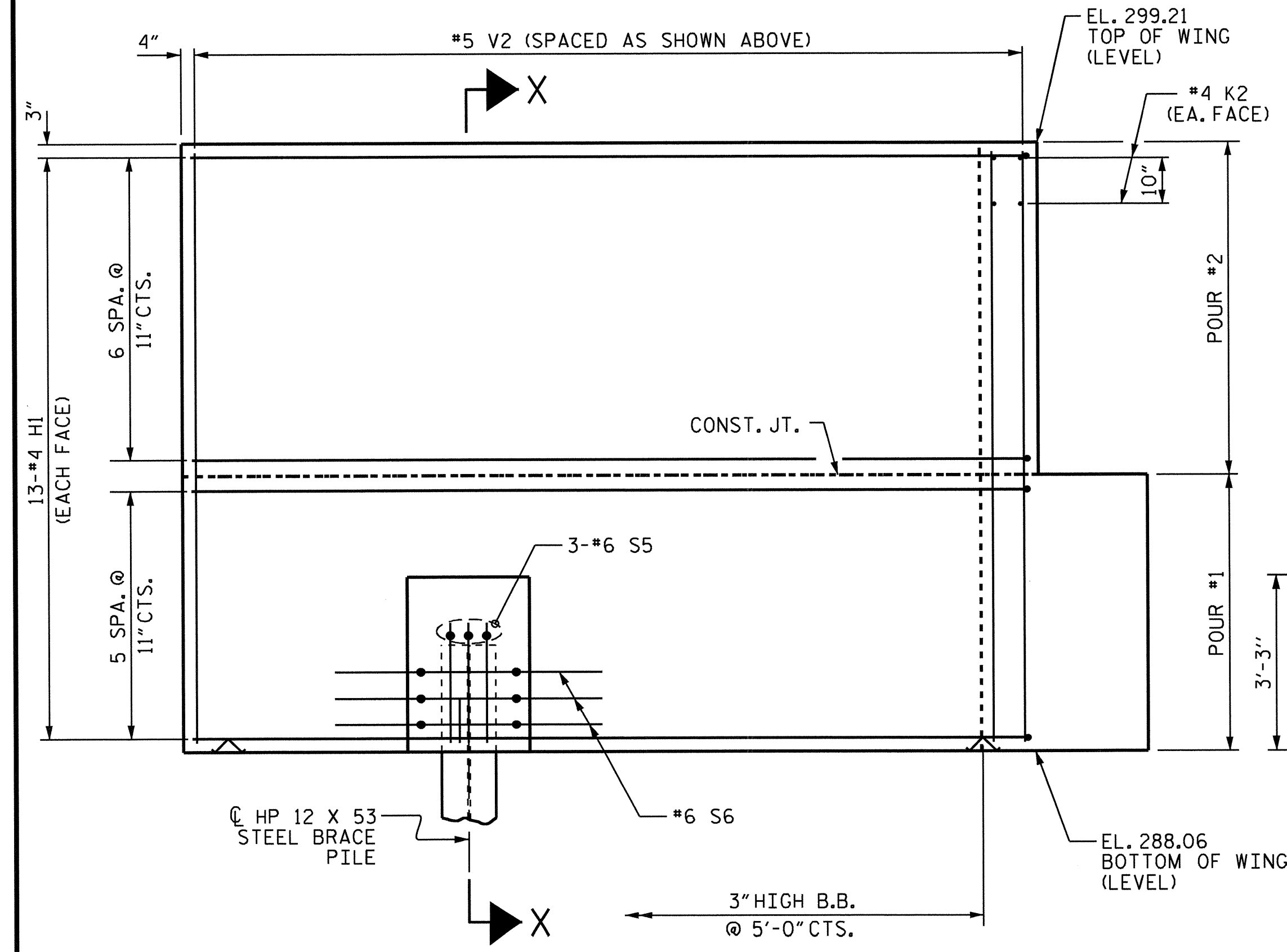
PLAN OF WING (W1)



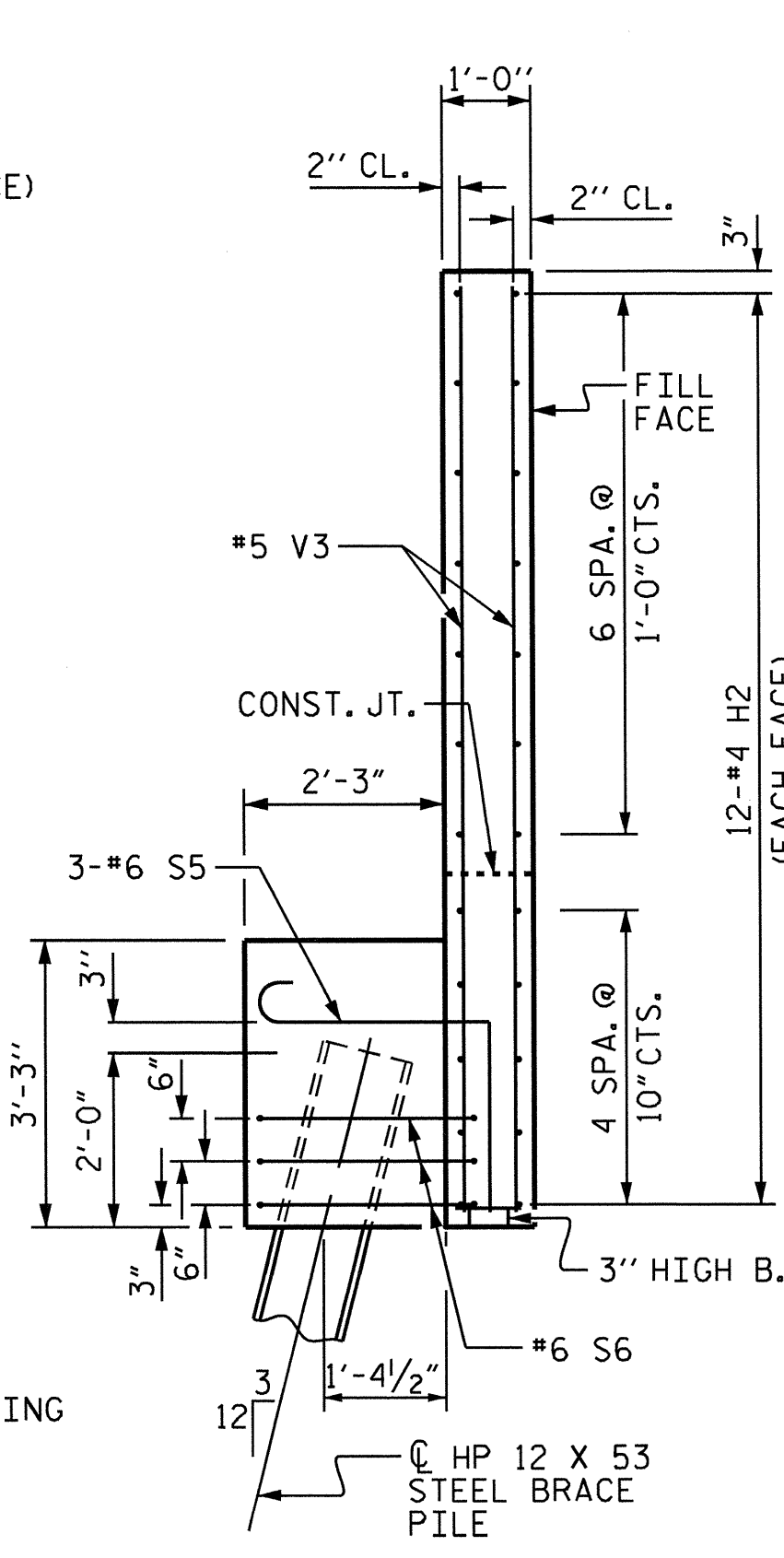
PLAN OF WING (W2)



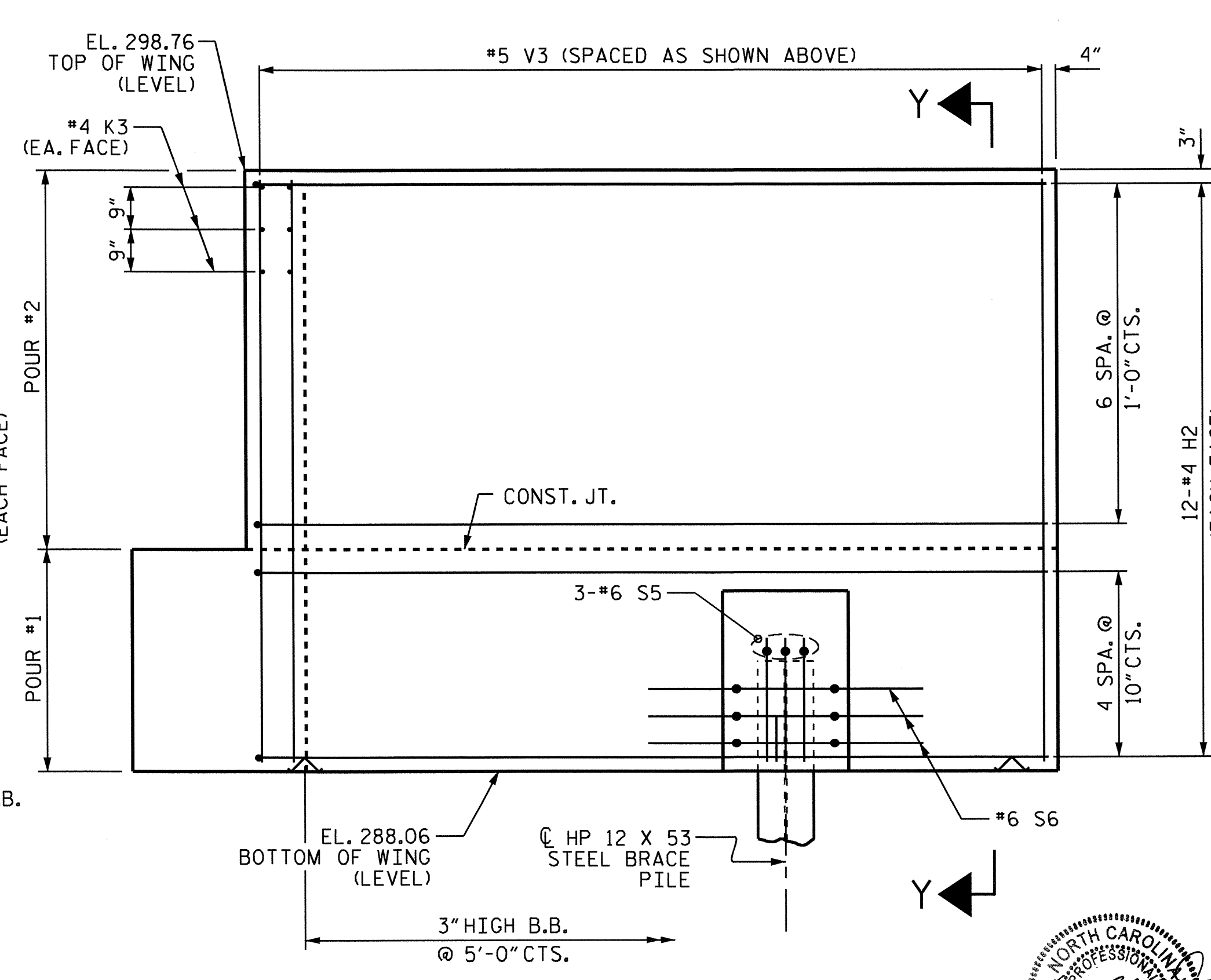
SECTION X-X



ELEVATION OF WING (W1)



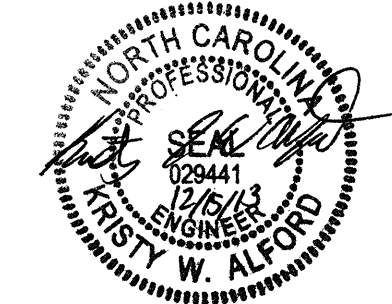
SECTION Y-Y



ELEVATION OF WING (W2)

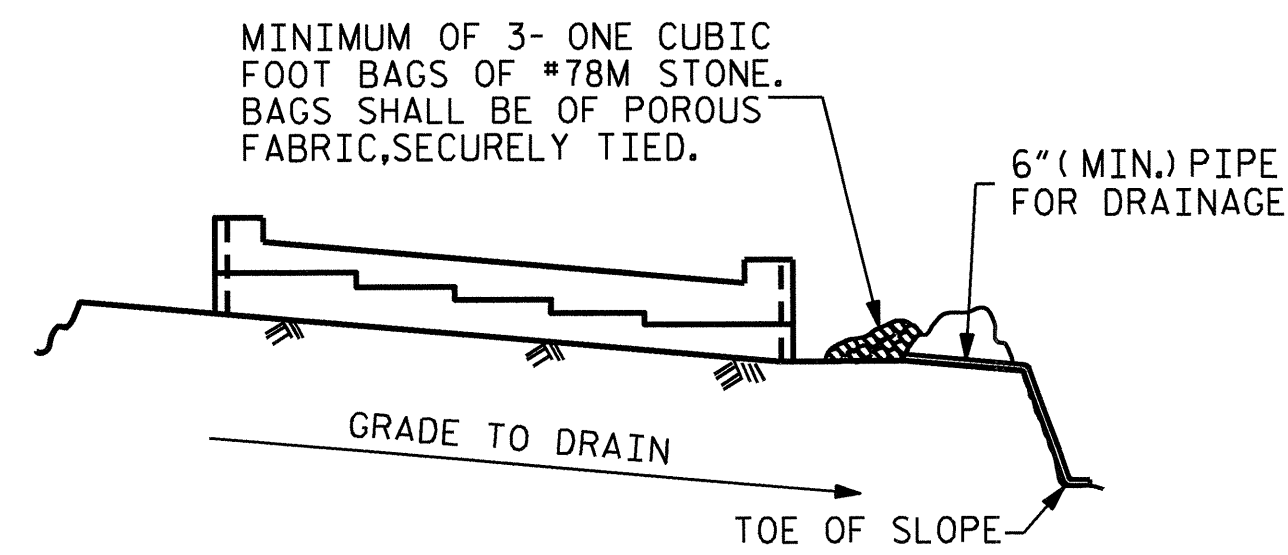
PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-
 SHEET 2 OF 3

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



DRAWN BY: Fr. Lea DATE: 4/29/13
 CHECKED BY: P. K. NEWTON DATE: 5/23/13
 DESIGN ENGINEER OF RECORD: Fr. Lea DATE: 12/19/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			48

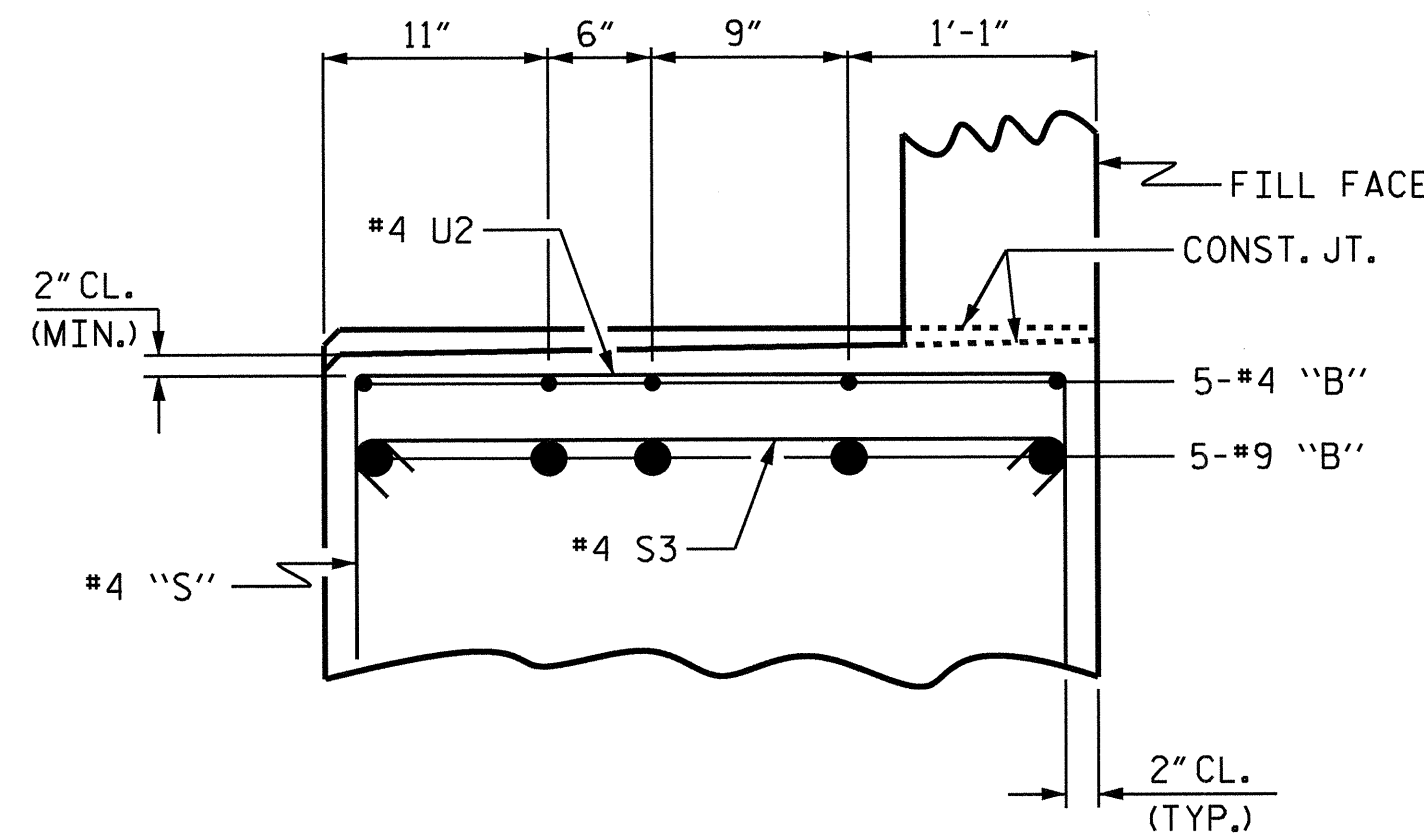


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

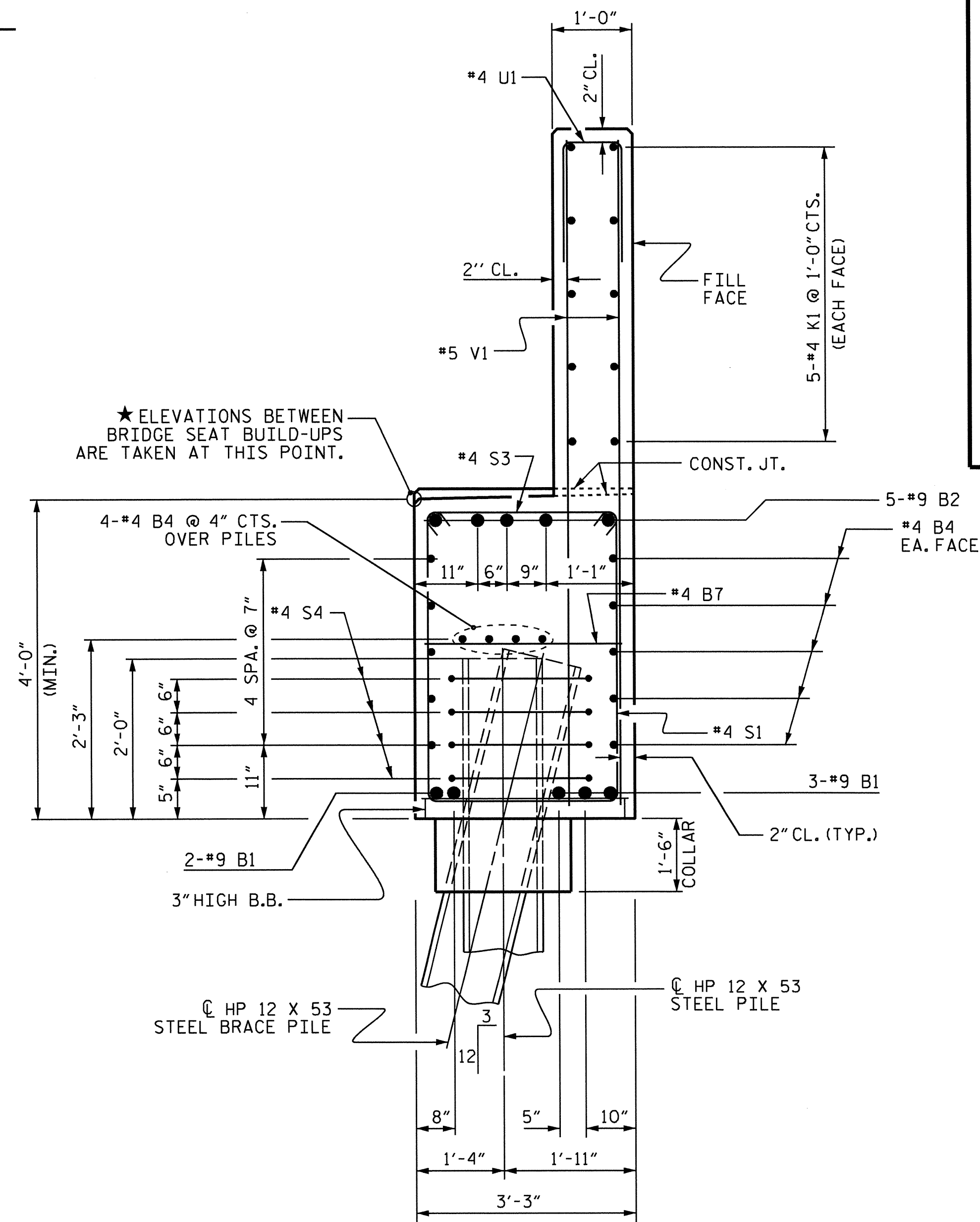
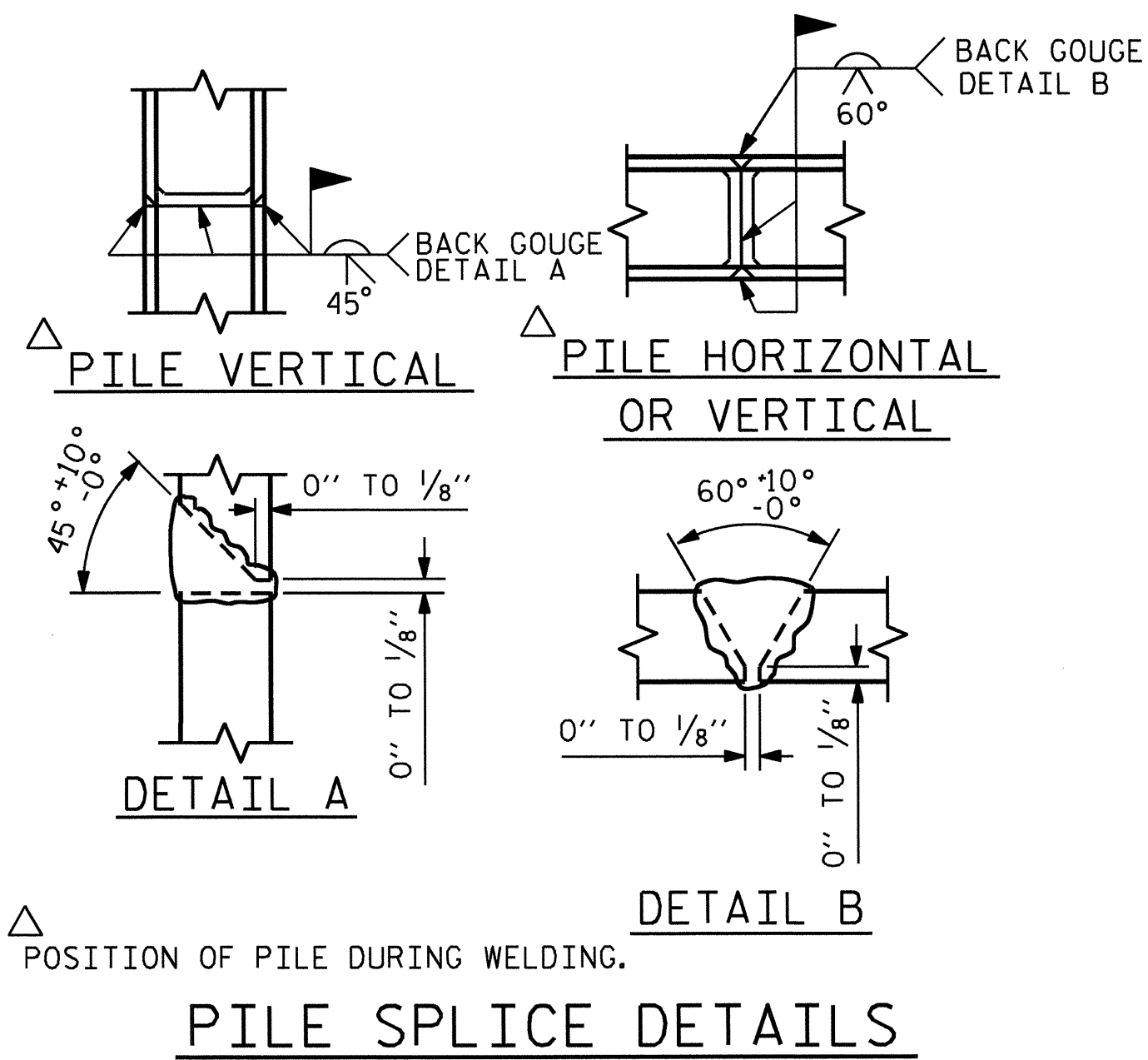
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

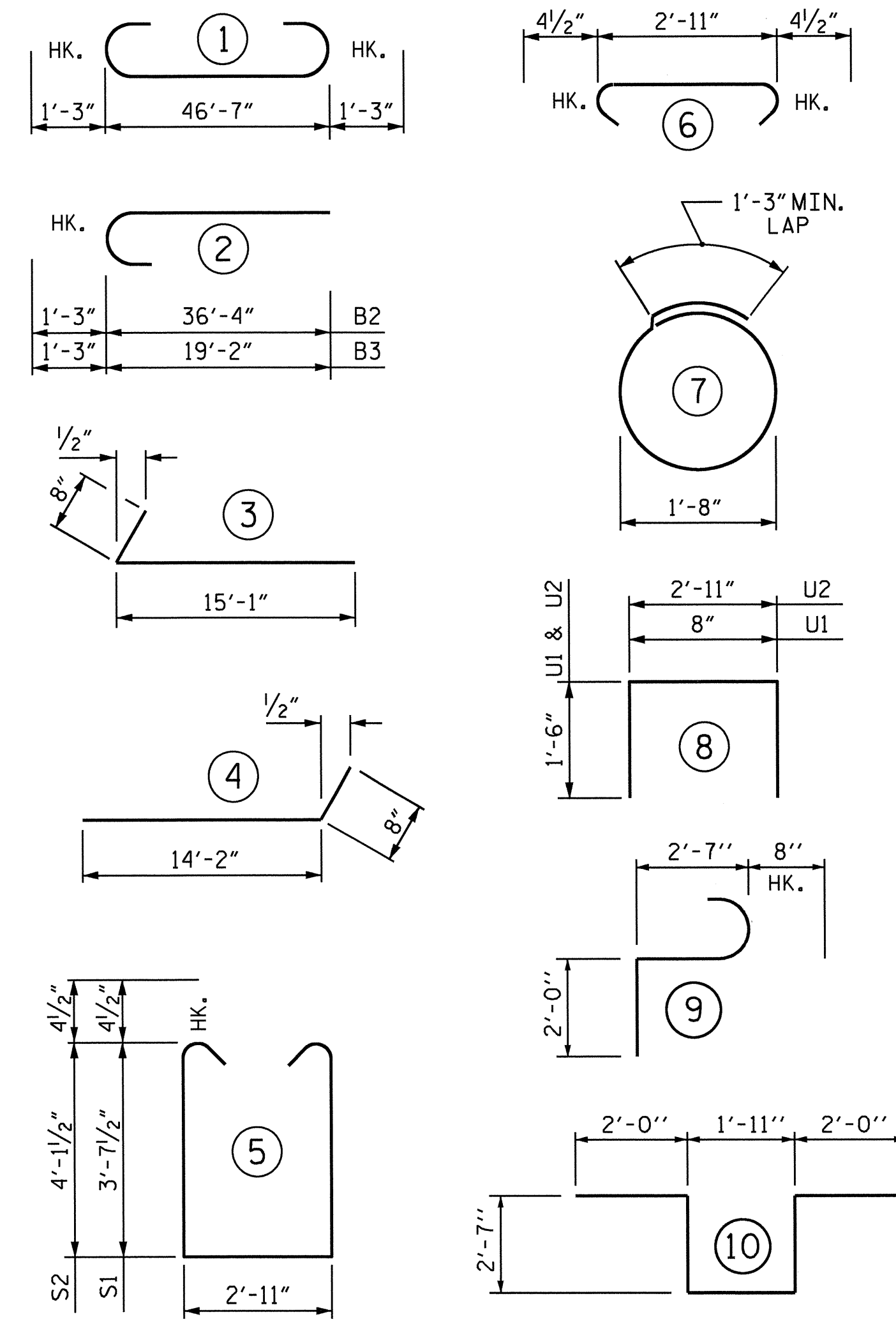


PARTIAL SECTION B-B



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	1	49'-1"	834
B2	5	#9	2	37'-7"	639
B3	5	#9	2	20'-5"	347
B4	28	#4	STR	24'-8"	461
B5	5	#4	STR	11'-3"	38
B6	5	#4	STR	7'-10"	26
B7	14	#4	STR	2'-11"	23
B8	5	#4	STR	3'-4"	11
H1	26	#4	3	15'-9"	274
H2	24	#4	4	14'-10"	238
K1	20	#4	STR	24'-8"	330
K2	4	#4	STR	2'-7"	7
K3	6	#4	STR	3'-10"	15
S1	35	#4	5	10'-11"	255
S2	26	#4	5	11'-11"	207
S3	61	#4	6	3'-8"	149
S4	24	#4	7	6'-6"	104
S5	6	#6	9	5'-3"	47
S6	6	#6	10	11'-1"	100
U1	40	#4	8	3'-8"	98
U2	17	#4	8	5'-11"	67
V1	80	#5	STR	8'-3"	688
V2	38	#5	STR	10'-9"	426
V3	40	#5	STR	10'-4"	431

REINFORCING STEEL 5819 LBS.

CLASS A CONCRETE

POUR #1 (CAP, LOWER WINGS & COLLARS)	32.5 C.Y.
POUR #2 (UPPER WINGS & BACKWALL)	15.3 C.Y.
TOTAL =	47.8 C.Y.

HP 12 X 53 STEEL PILES

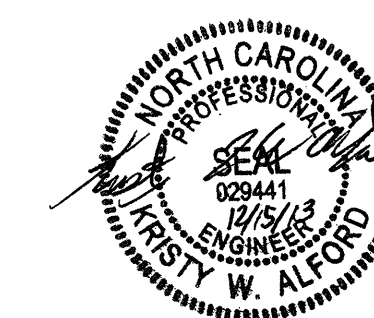
No. = 6 150 LIN. FT.

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

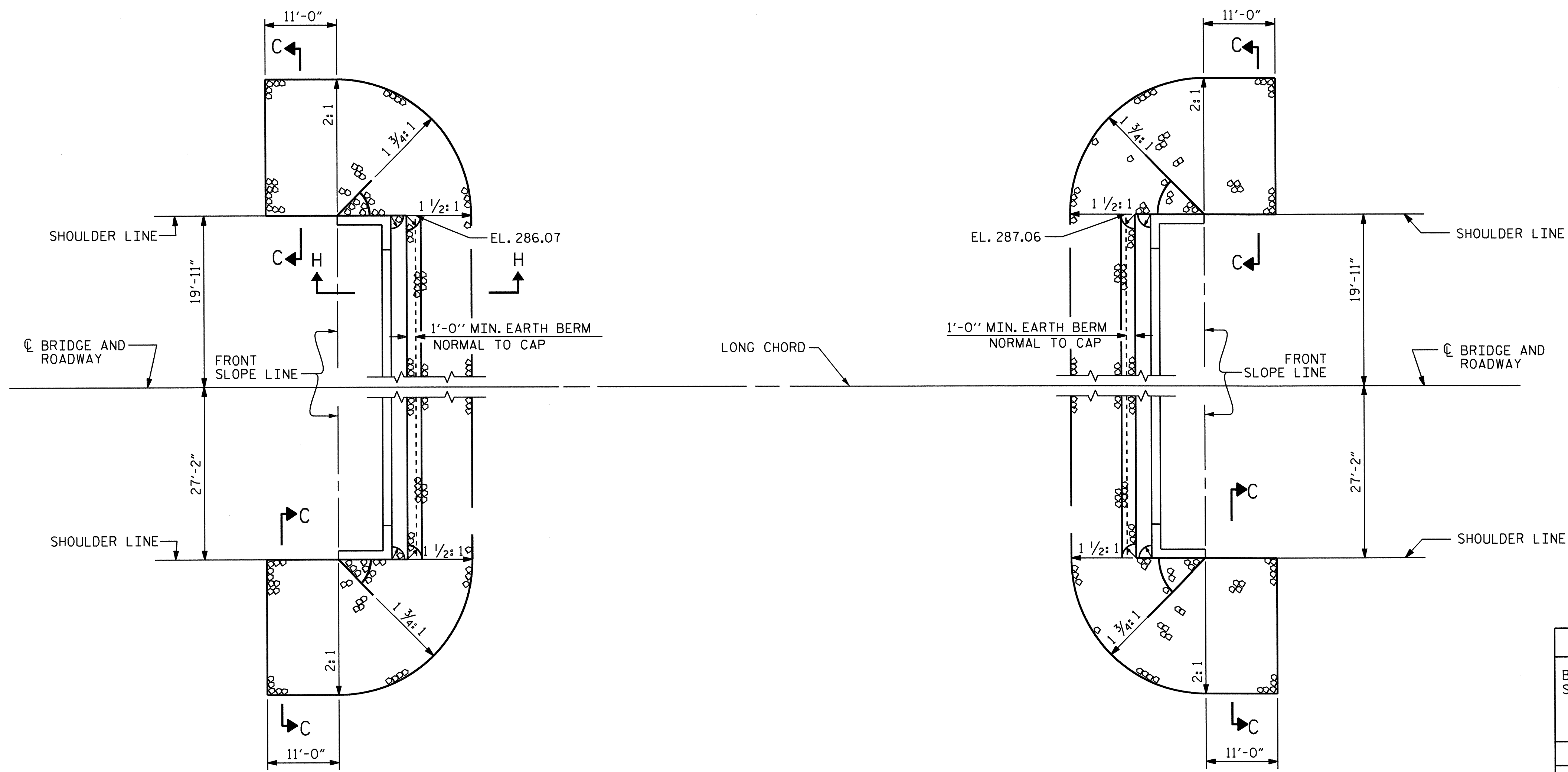
SUBSTRUCTURE
END BENT 2



DRAWN BY: Fr. Leo DATE: 5/6/13
CHECKED BY: P. K. NEWTON DATE: 5/23/13
DESIGN ENGINEER OF RECORD: Fr. Leo DATE: 12/19/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS 48
2			4			

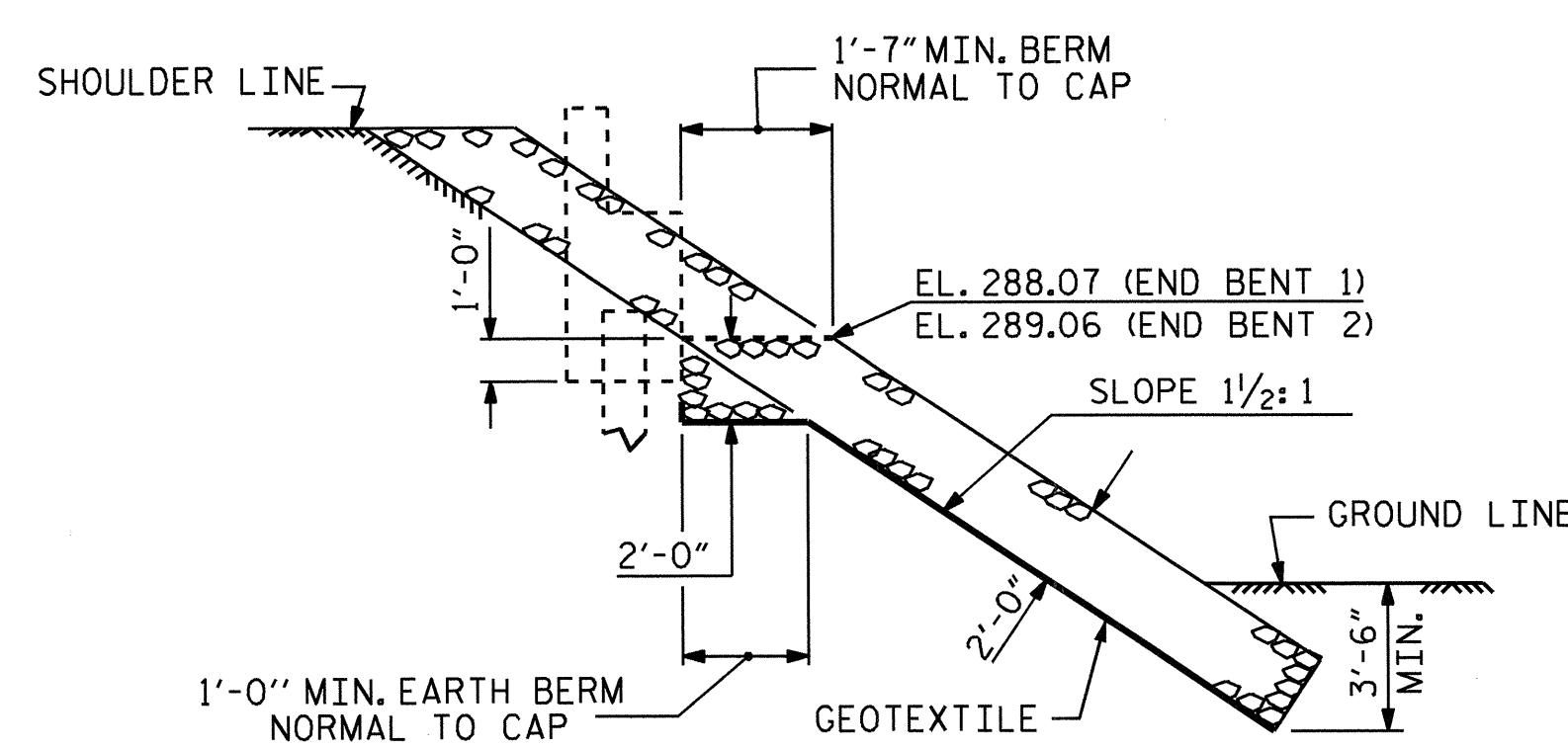
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



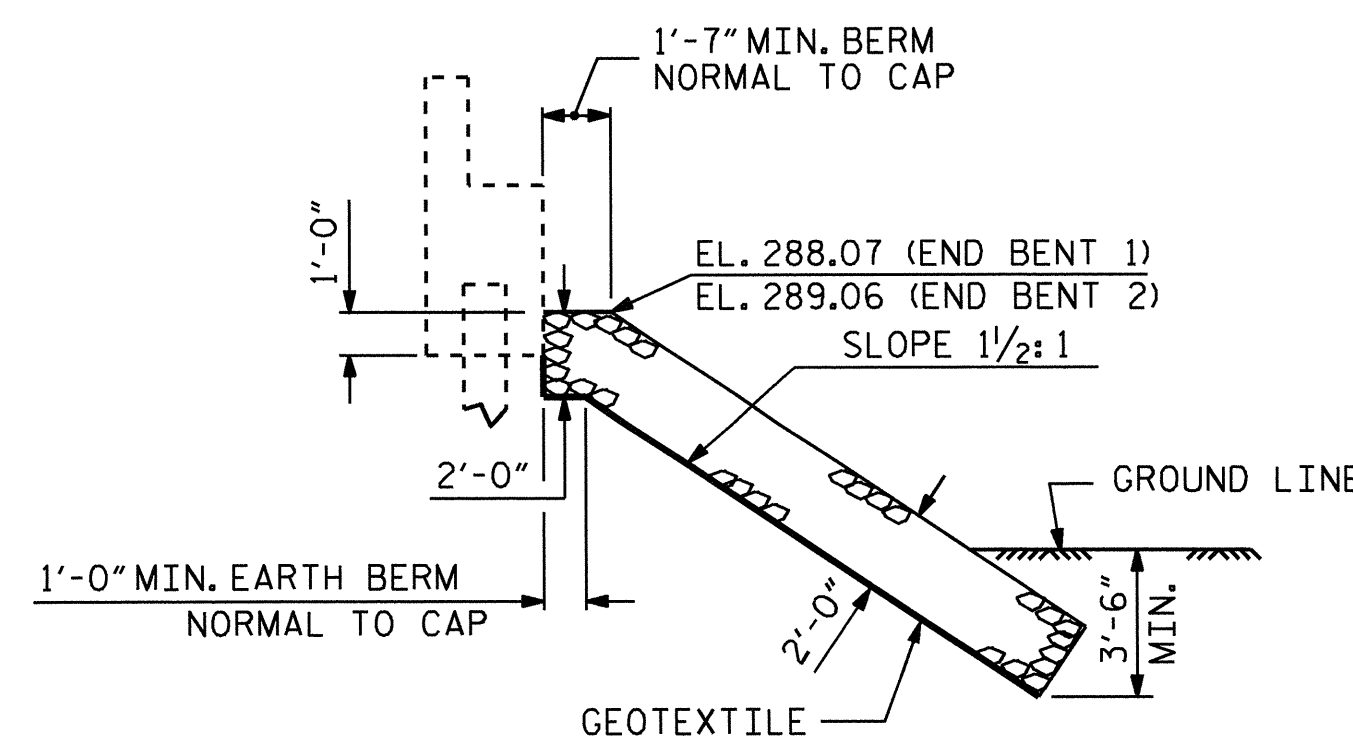
END BENT 1

BERM RIP RAPPED

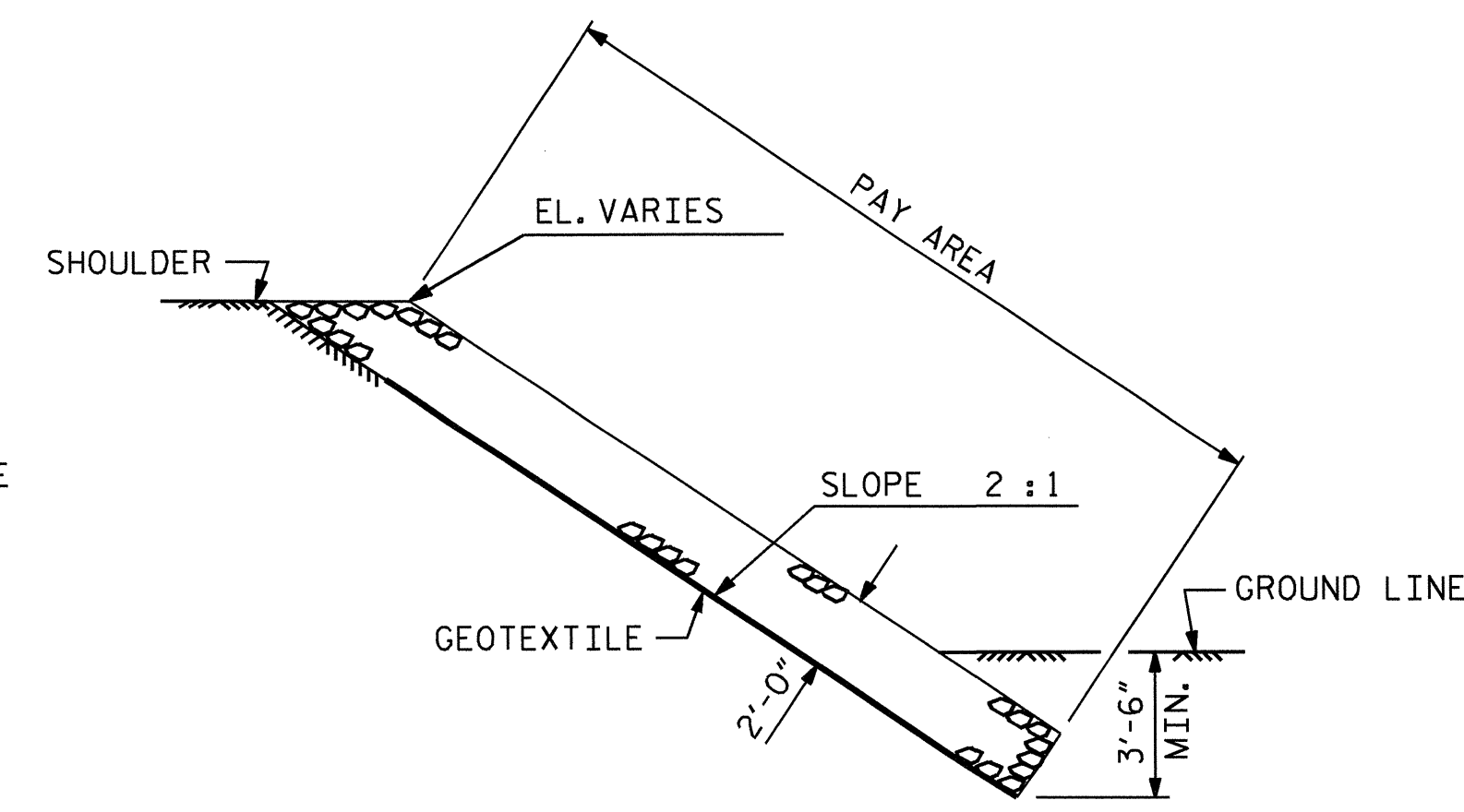
ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+75.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	605	675
END BENT 2	670	745



SECTION H-H



SECTION C-C
BERM RIP RAPPED



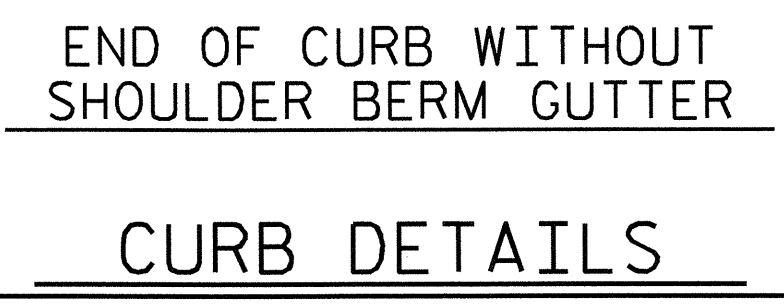
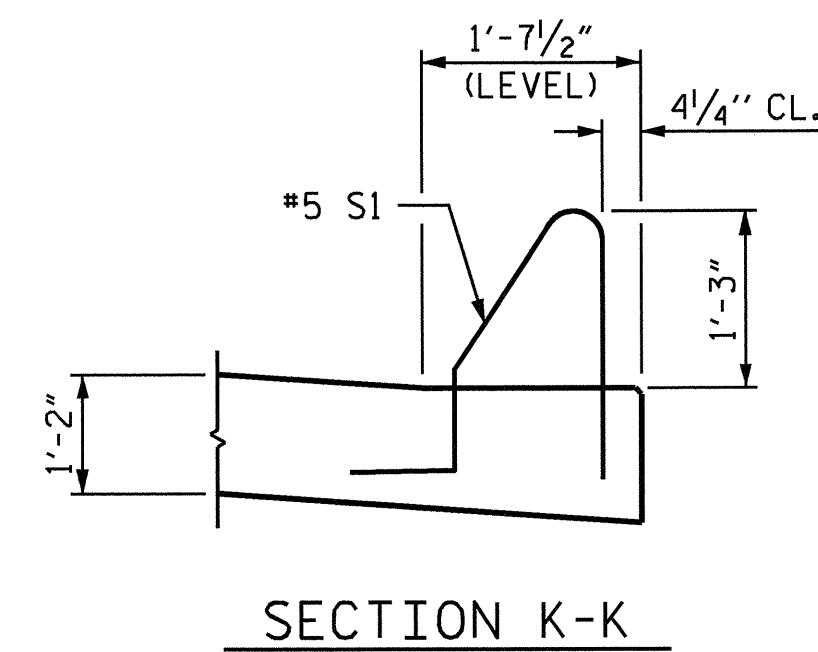
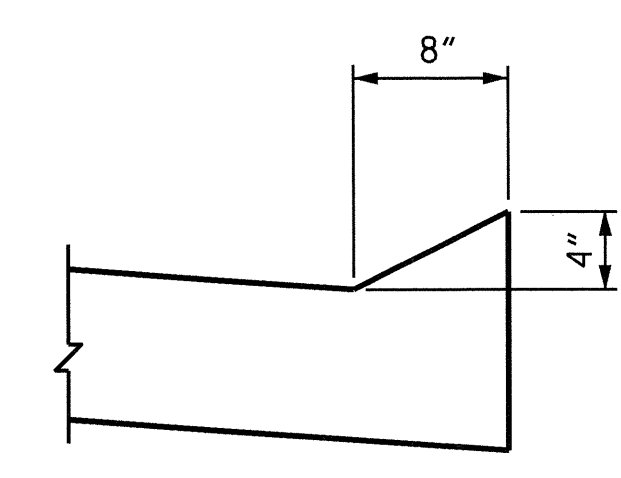
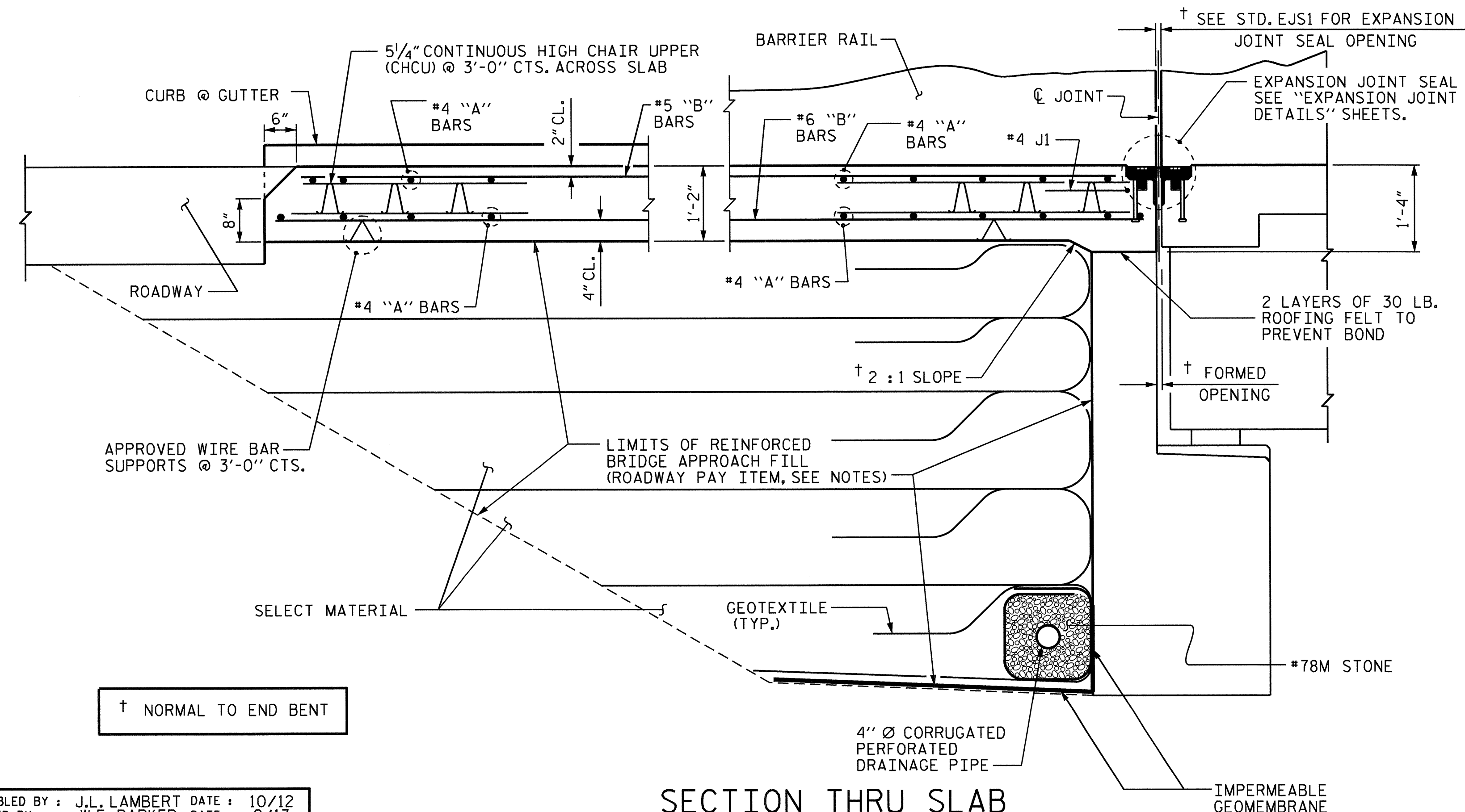
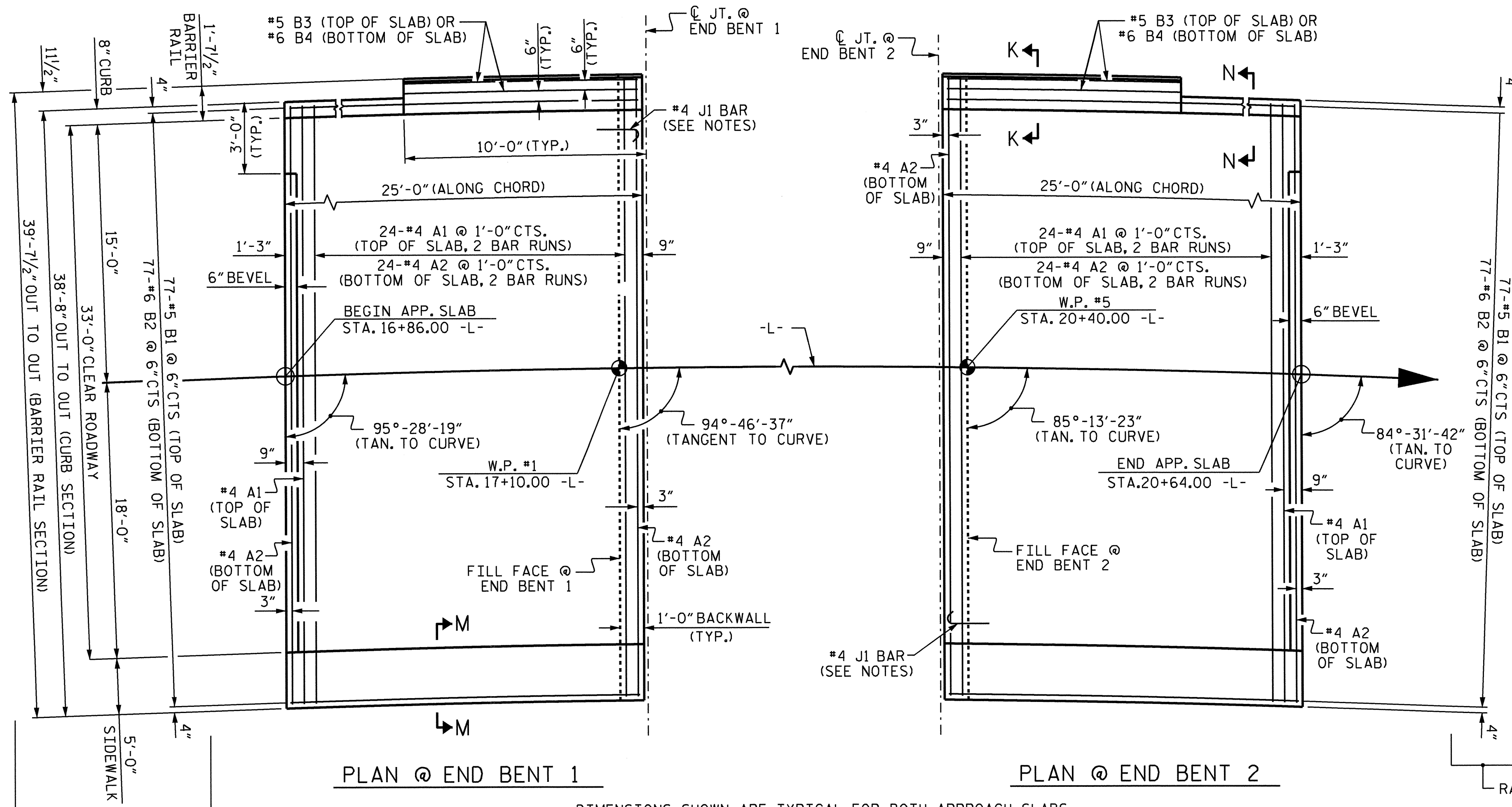
SECTION C-C

PROJECT NO. B-4991
WAKE COUNTY
STATION: 18+75.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD = RIP RAP DETAILS =					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-45
TOTAL SHEETS					48



ASSEMBLED BY : Fr. Leo DATE : 5/9/13
CHECKED BY : J.P. Adams DATE : 8/2013
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



NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

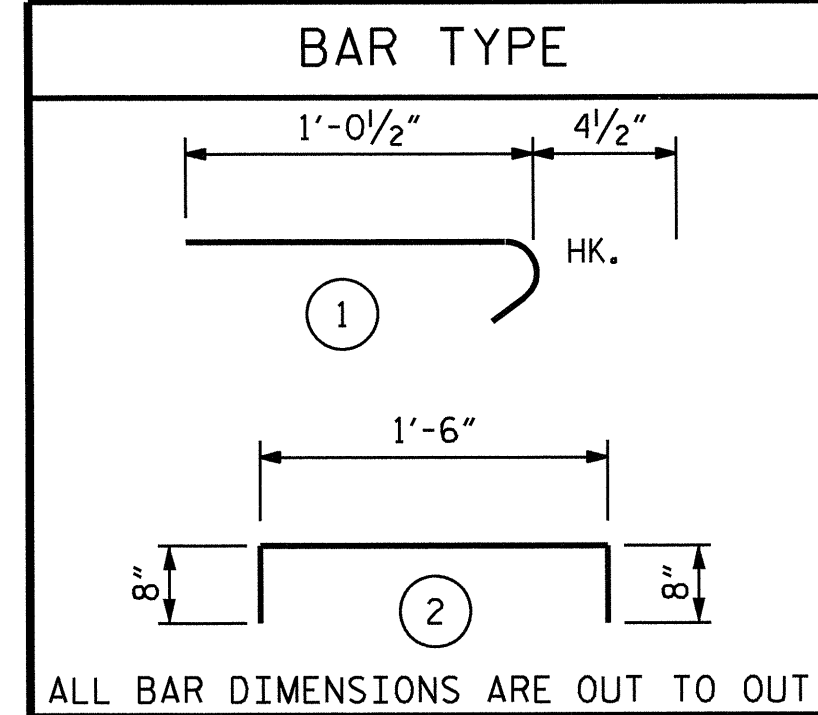
FOR EXPANSION JOINT SEAL DETAILS, SEE "EXPANSION JOINT SEAL" SHEETS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CTS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

FOR SIDEWALK DETAILS, SEE SHEET 2 OF 3.

FOR BARRIER RAIL DETAILS, SEE SHEET 3 OF 3.



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	50	#4	STR	20'-8"	690	
A2	52	#4	STR	20'-7"	715	
*B1	77	#5	STR	24'-2"	1941	
B2	77	#6	STR	24'-8"	2853	
*B3	2	#5	STR	9'-8"	20	
B4	2	#6	STR	9'-8"	29	
*B5	4	#4	STR	24'-6"	65	
*G1	24	#4	STR	4'-5"	71	
*J1	33	#4	1	1'-5"	31	
*U1	8	#4	2	2'-10"	15	
REINFORCING STEEL **					LBS.	3597
*EPOXY COATED REINFORCING STEEL **					LBS.	2833
CLASS AA CONCRETE **					C. Y.	45.3

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	50	#4	STR	20'-8"	690	
A2	52	#4	STR	20'-7"	715	
*B1	77	#5	STR	24'-2"	1941	
B2	77	#6	STR	24'-8"	2853	
*B3	2	#5	STR	9'-8"	20	
B4	2	#6	STR	9'-8"	29	
*B5	4	#4	STR	24'-6"	65	
*G1	24	#4	STR	4'-5"	71	
*J1	33	#4	1	1'-5"	31	
*U1	8	#4	2	2'-10"	15	
REINFORCING STEEL **					LBS.	3597
*EPOXY COATED REINFORCING STEEL **					LBS.	2833
CLASS AA CONCRETE **					C. Y.	45.3

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

PROJECT NO. B-4991
 WAKE COUNTY
 STATION: 18+75.00 -L-

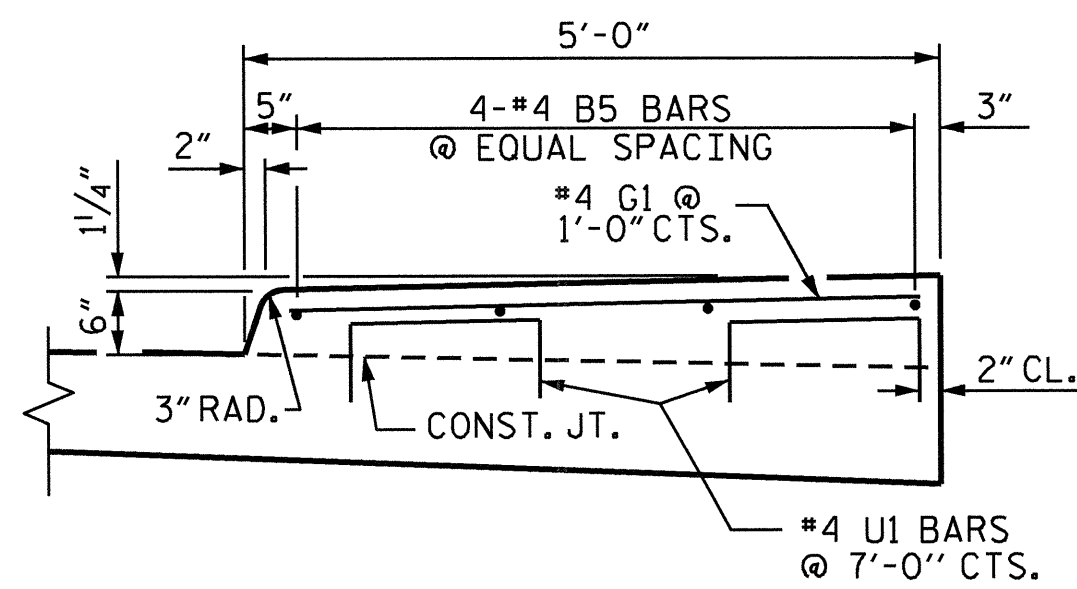
SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

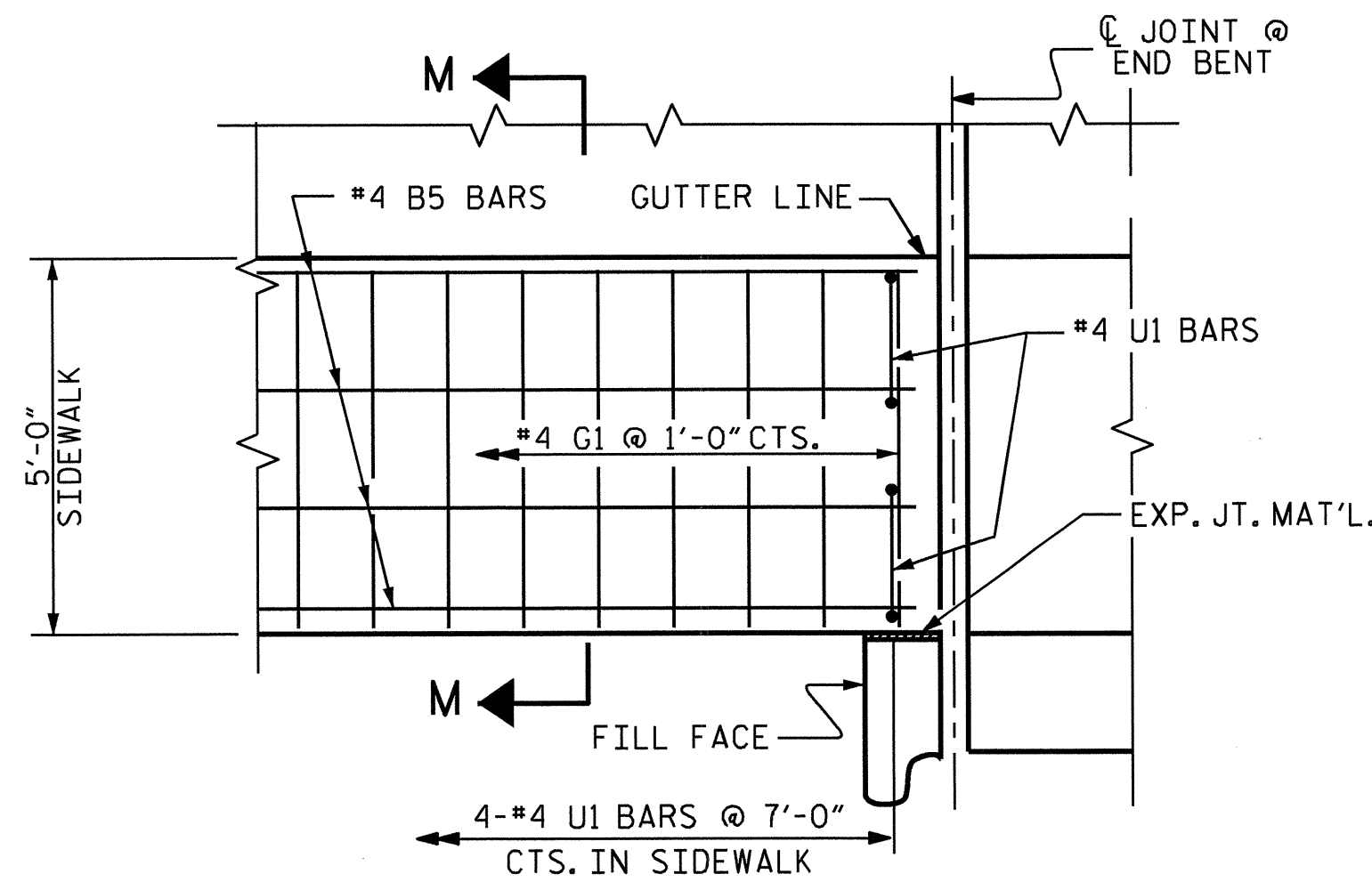
STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO. S-46
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 48
2			4			

ASSEMBLED BY : J.L. LAMBERT DATE : 10/12
 CHECKED BY : W.F. PARKER DATE : 2/13
 DRAWN BY : EEM 3/95 REV. 5/7/03R RWW/JTE
 CHECKED BY : VAP 3/95 REV. 5/1/06RR KMM/GM
 REV. 10/1/11 MAA/GM

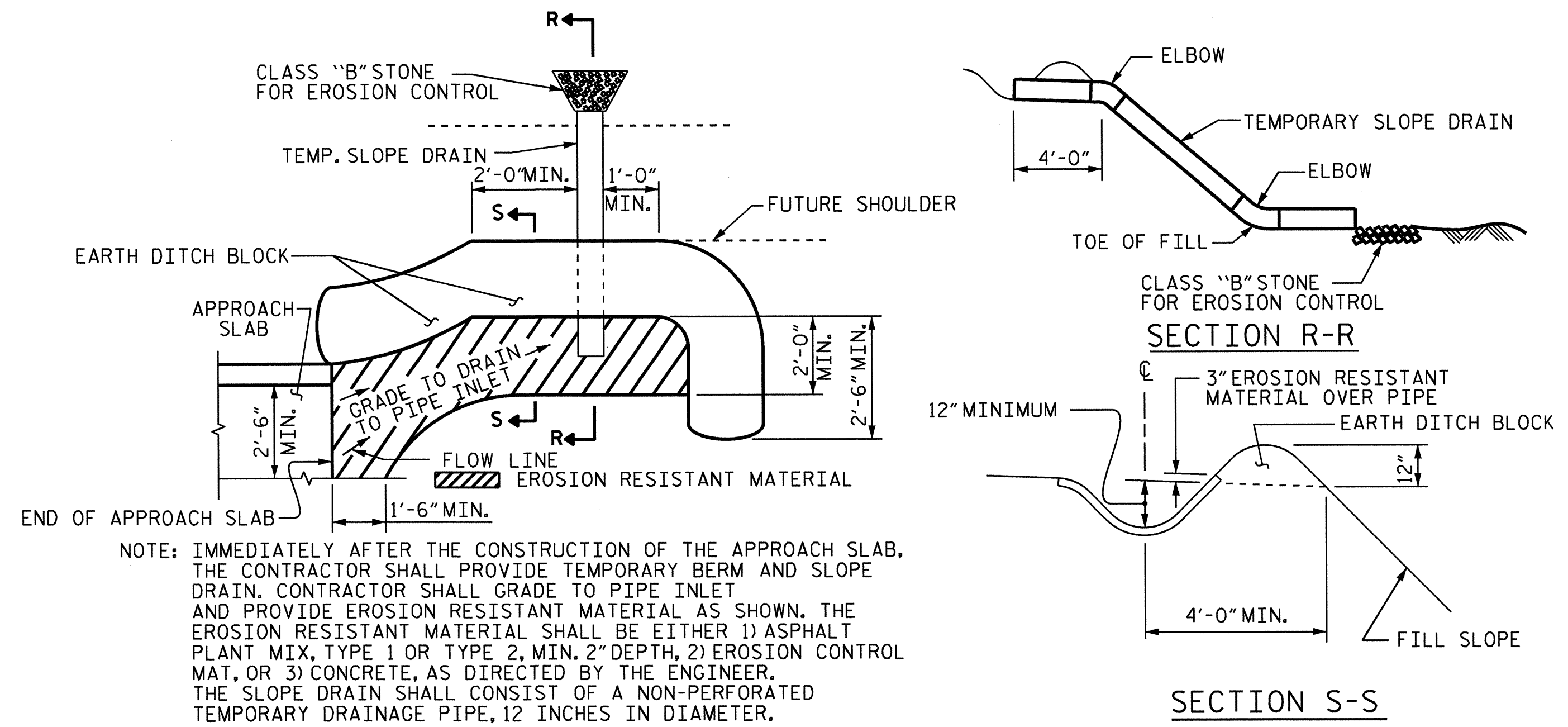


SECTION M-M



PLAN

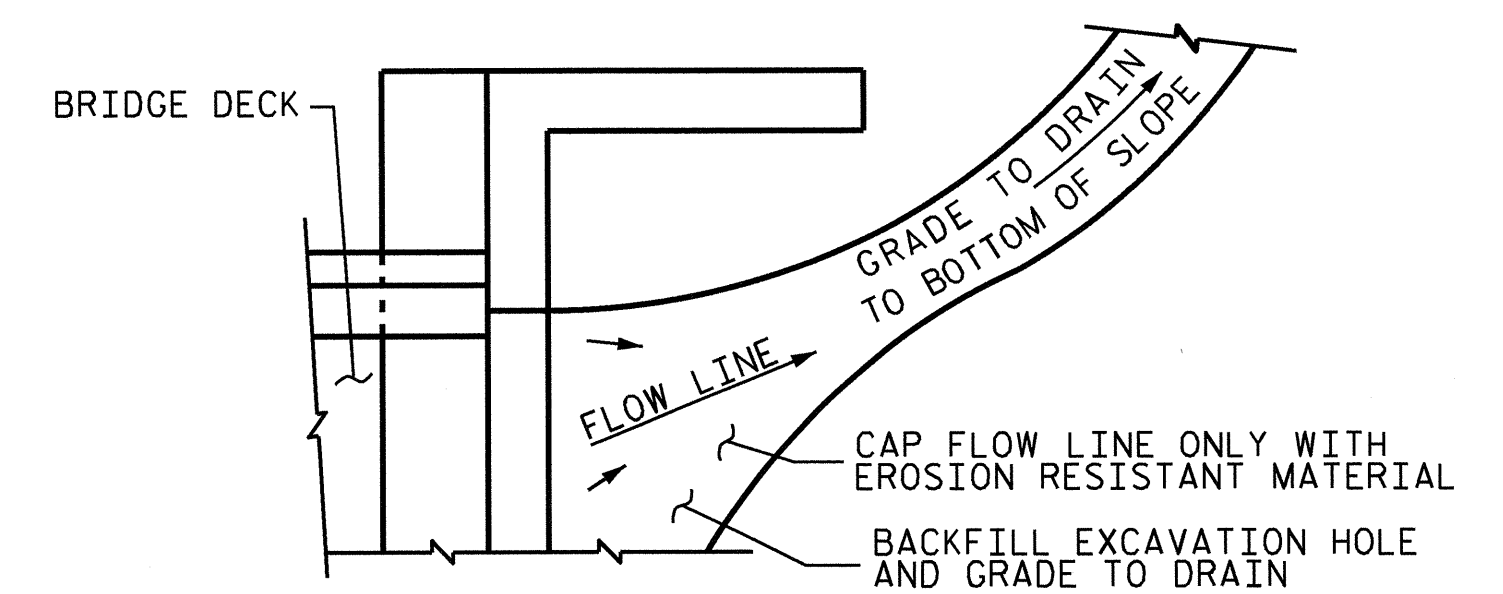
DETAILS OF SIDEWALK ON APPROACH SLAB



PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



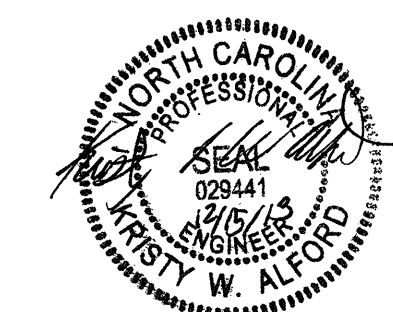
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

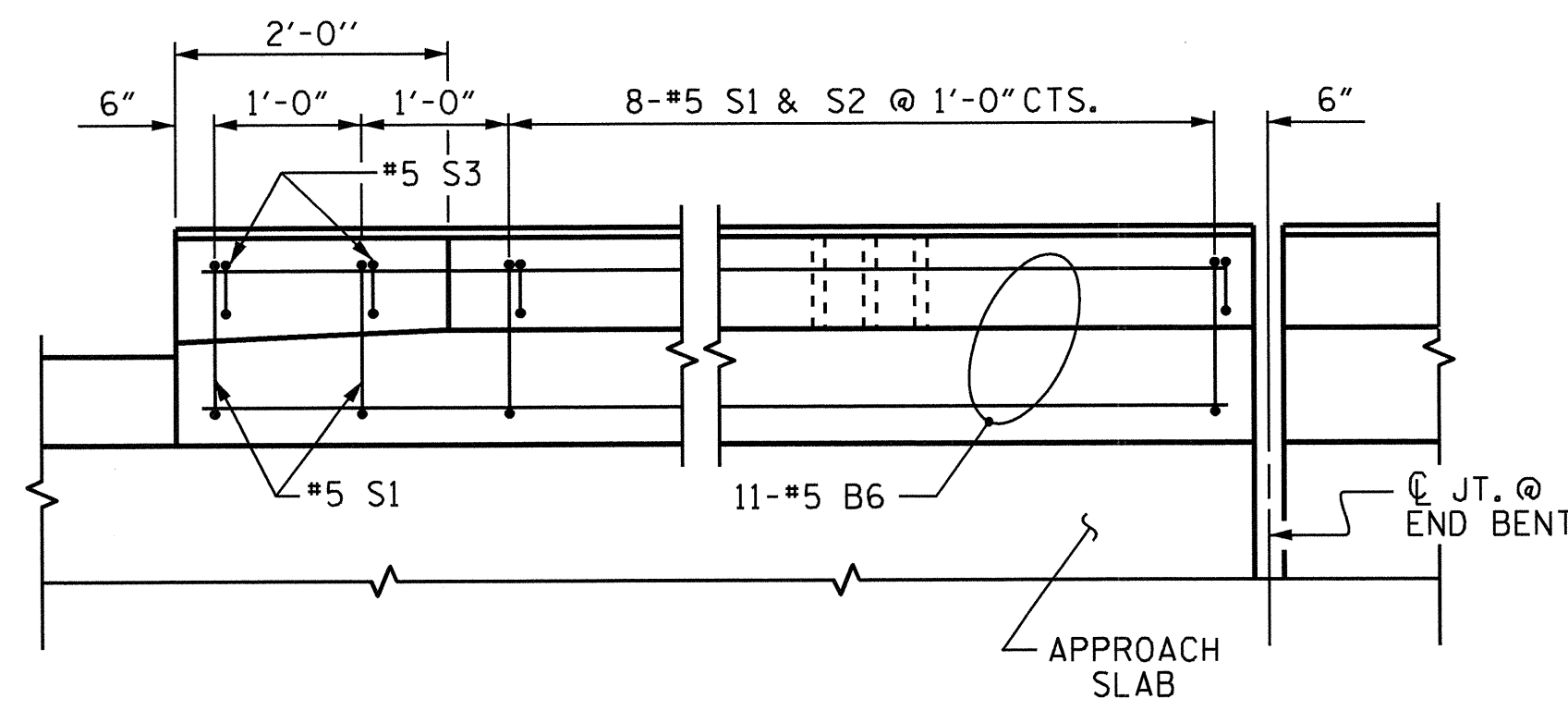
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH
 SLAB DETAILS

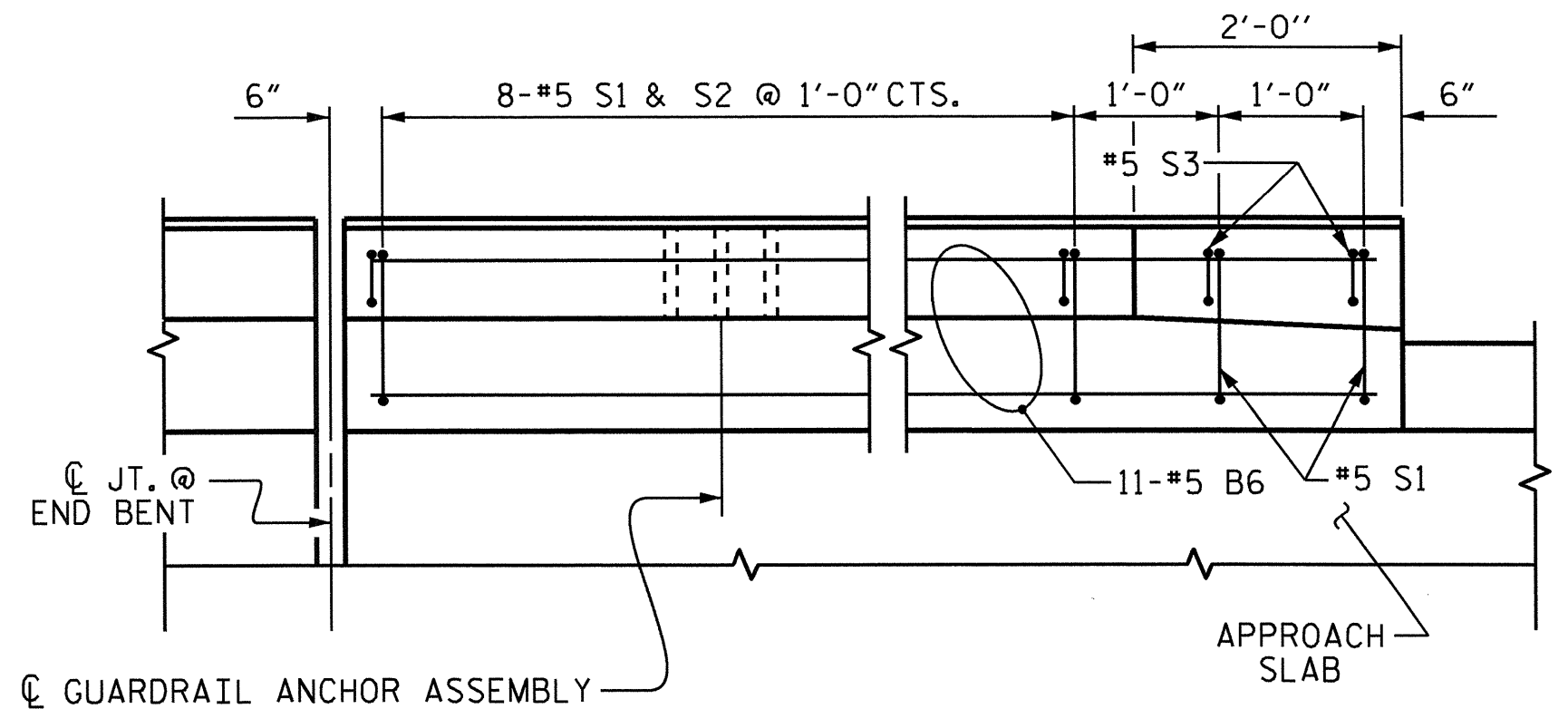


ASSEMBLED BY : J.L. LAMBERT DATE : 10/12
 CHECKED BY : Fr. LEA DATE : 6/26/13
 DRAWN BY : FCJ 11/88 REV. 5/7/03 RWW/JTE
 CHECKED BY : ARB 11/88 REV. 5/11/06RRR MAA/KMM
 REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47	
1			3			TOTAL SHEETS	
2			4			48	



END BENT 1



END BENT 2

PLAN OF BARRIER RAIL

NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

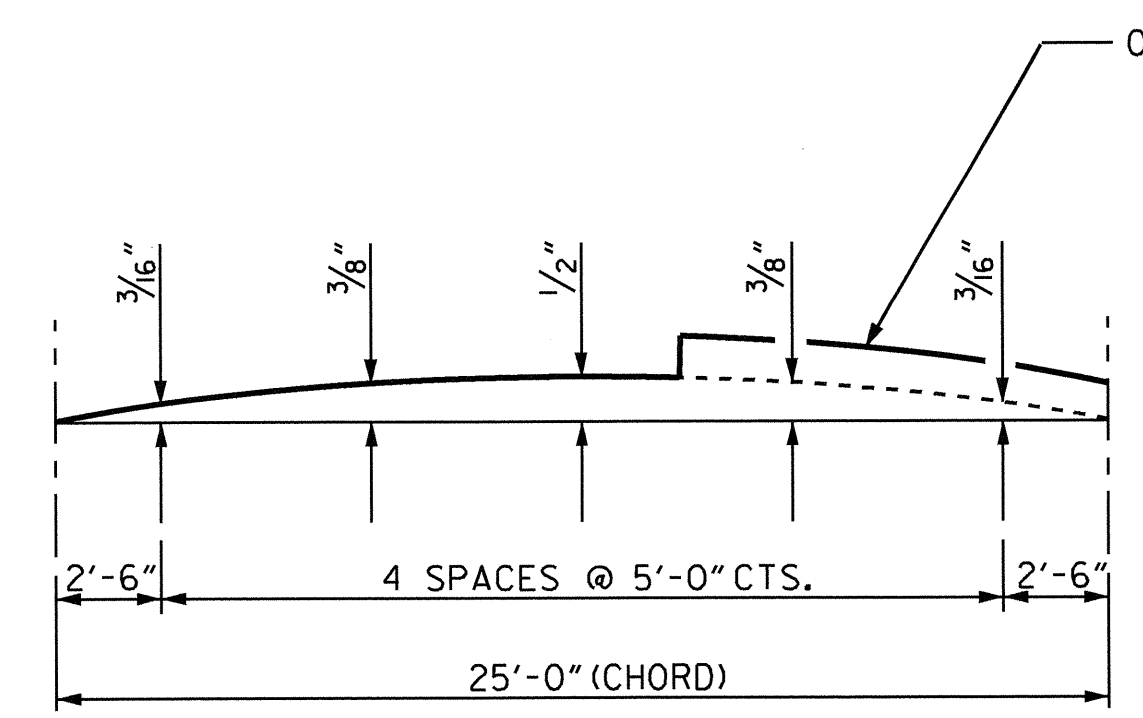
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

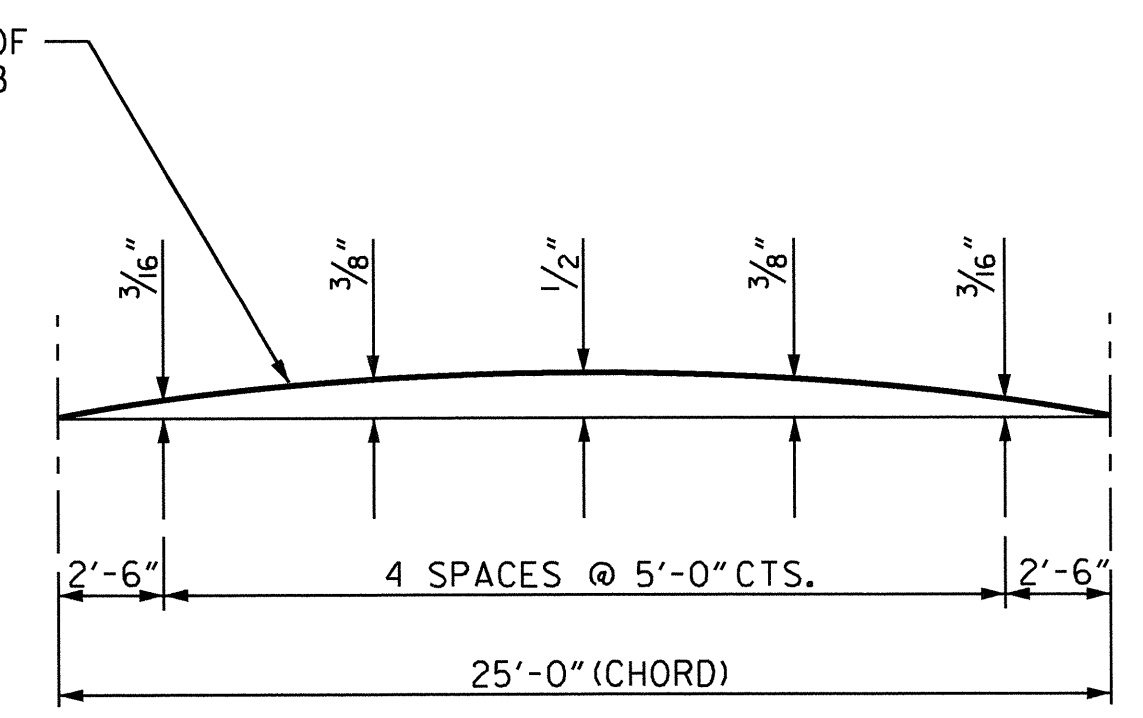
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B6	22	#5	STR	9'-8"	222
* S1	20	#5	1	5'-1"	106
* S2	16	#5	2	7'-0"	117
* S3	4	#5	2	5'-6"	23

* EPOXY COATED REINFORCING STEEL LBS. 468
 CLASS AA CONCRETE C. Y. 2.8
 CONCRETE BARRIER RAIL 20 LIN. FT.



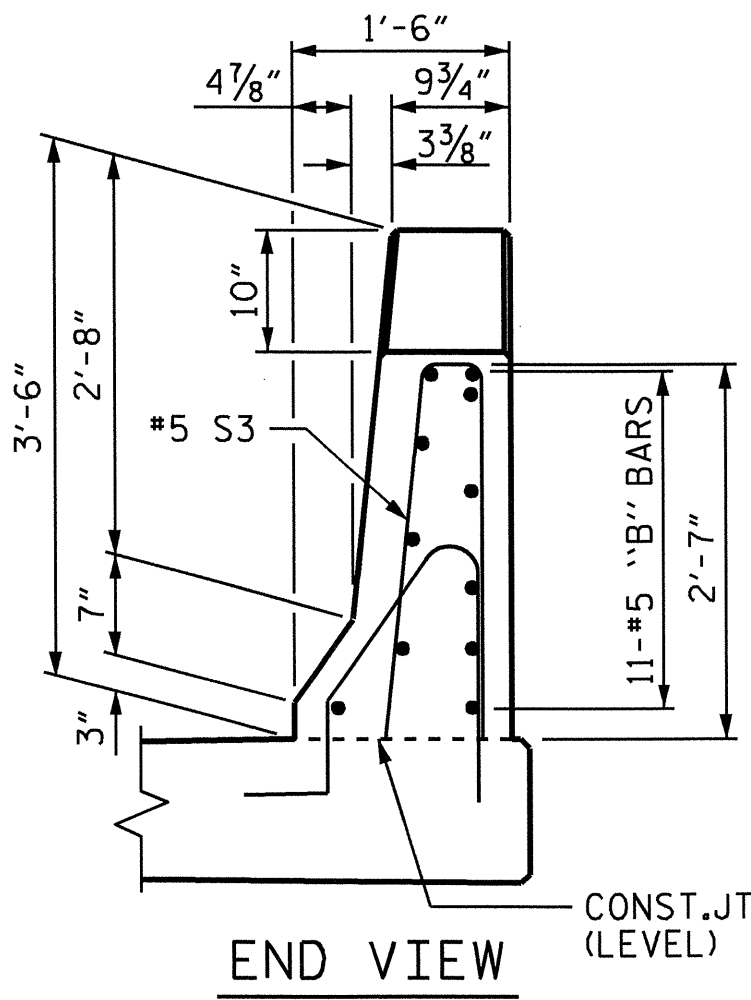
ARC OFFSET - LEFT SIDE



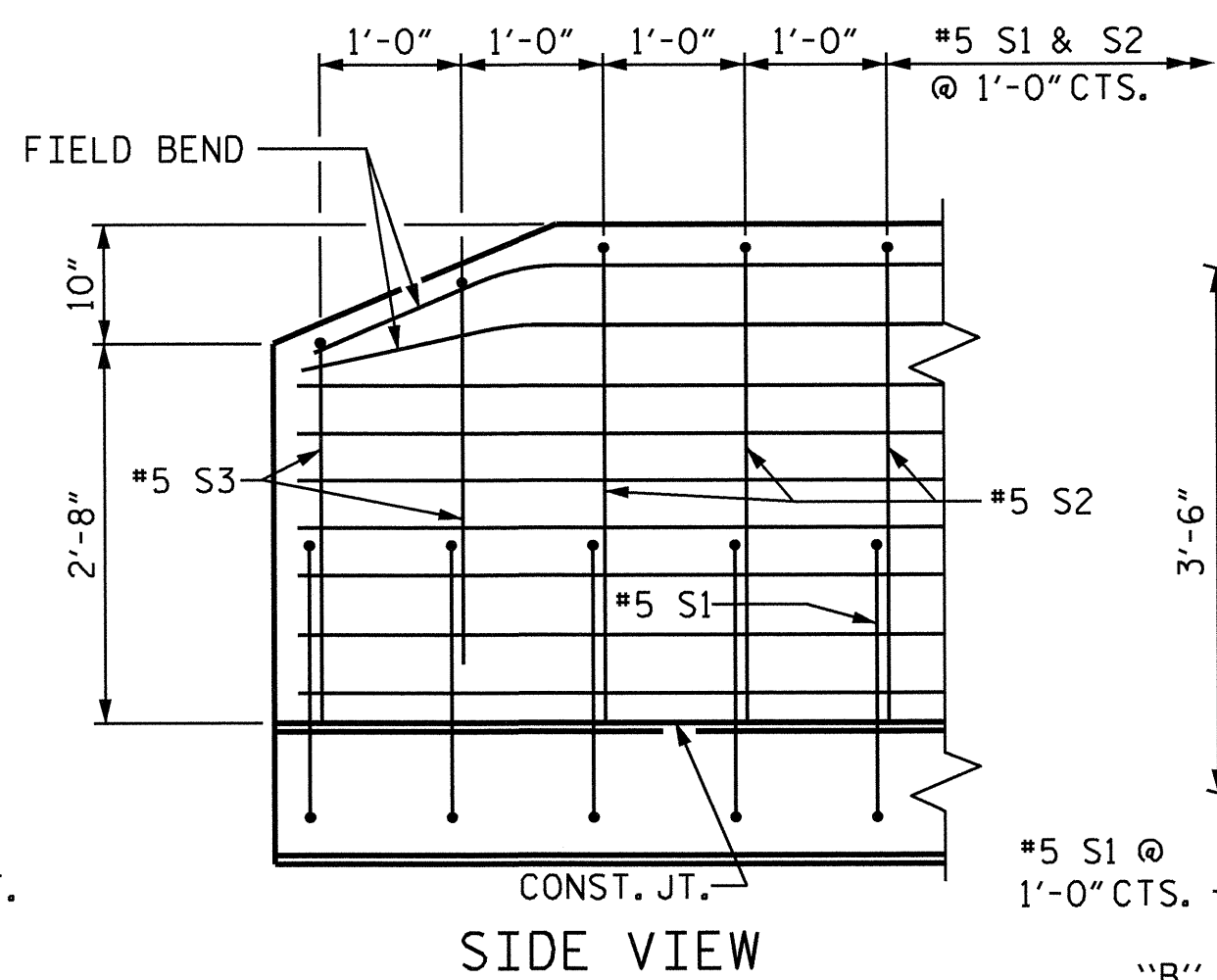
ARC OFFSET - RIGHT SIDE

APPROACH SLAB @ END BENT 1

ARC OFFSETS ARE TAKEN ALONG SHORT CHORD TO OUTSIDE EDGE OF APPROACH SLAB

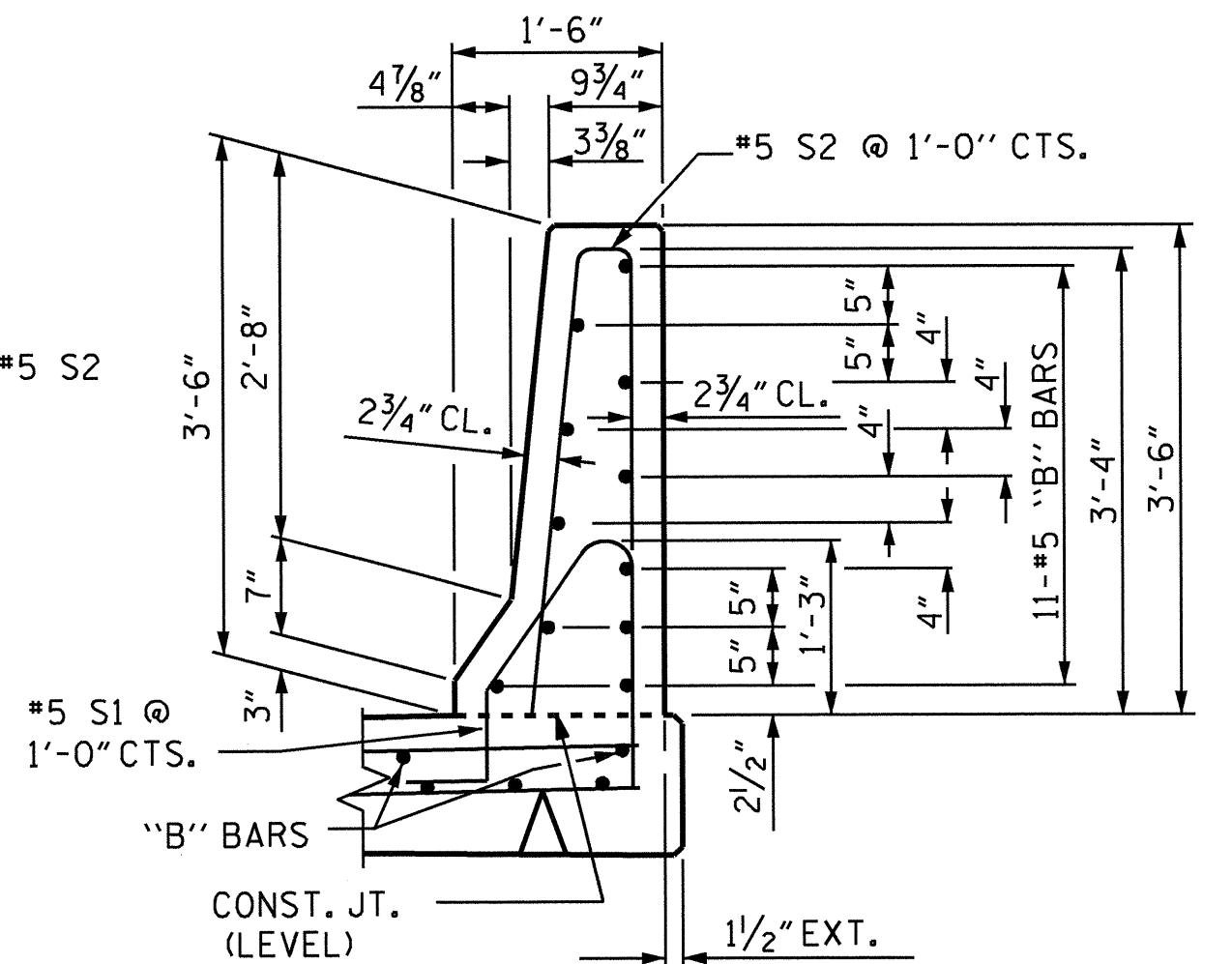


END VIEW

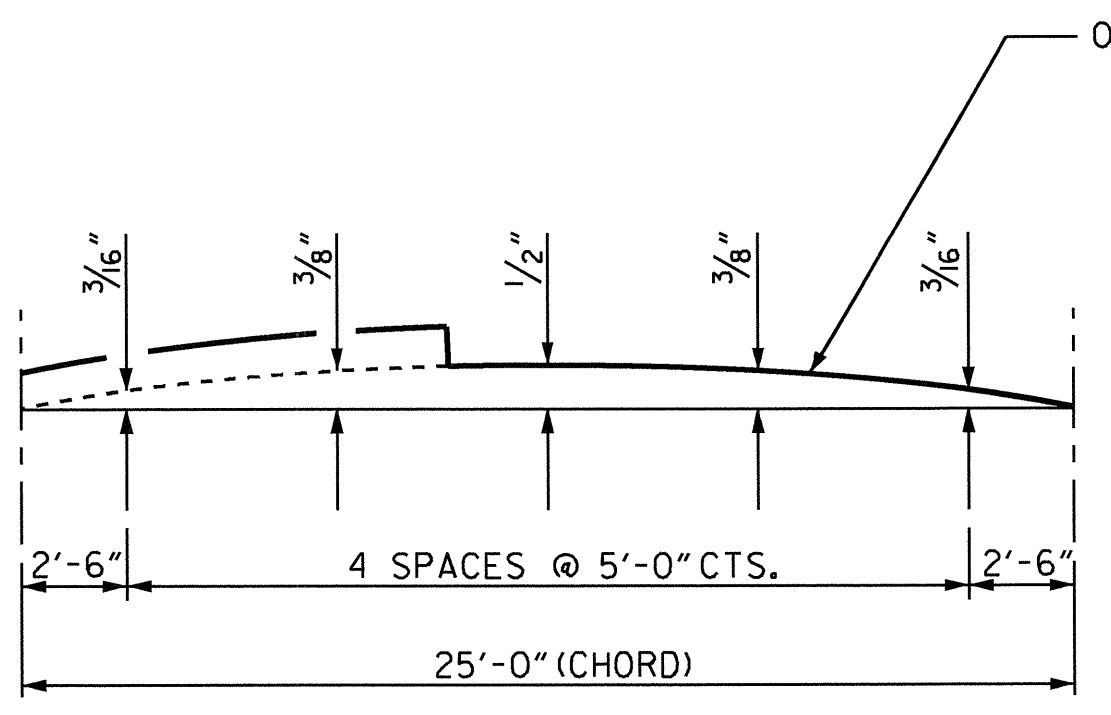


SIDE VIEW

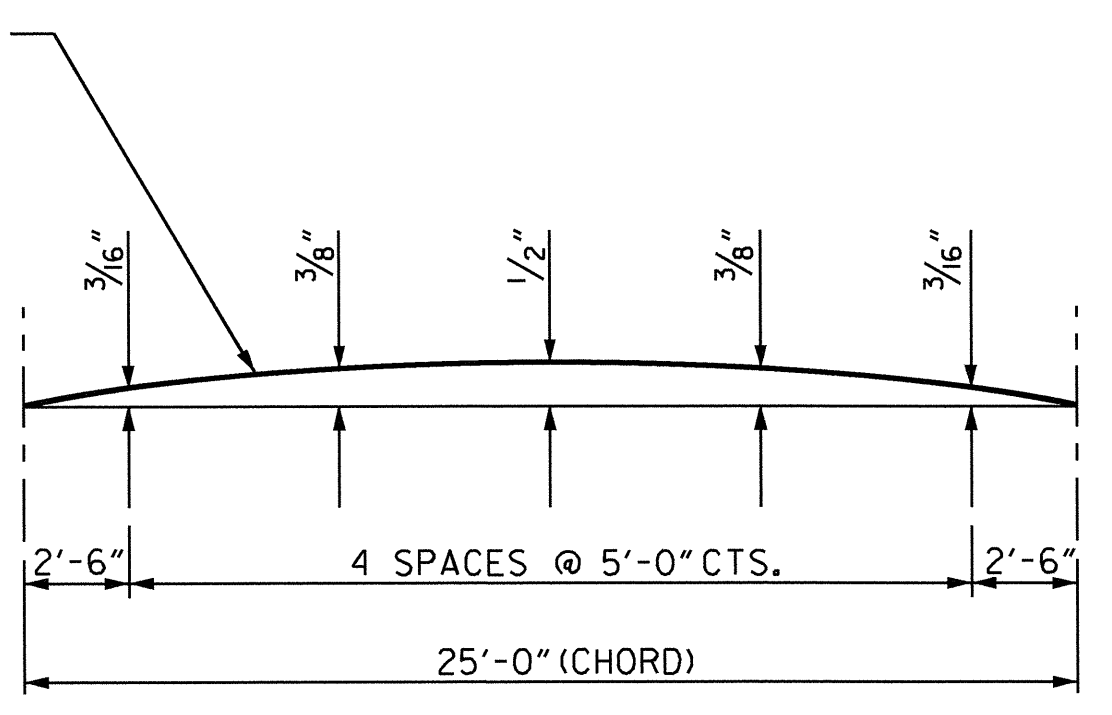
END OF RAIL DETAILS



SECTION THRU RAIL



ARC OFFSET - LEFT SIDE



ARC OFFSET - RIGHT SIDE

APPROACH SLAB @ END BENT 2

ARC OFFSETS ARE TAKEN ALONG SHORT CHORD TO OUTSIDE EDGE OF APPROACH SLAB

PROJECT NO. B-4991
WAKE COUNTY
 STATION: 18+75.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH
 SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS 48
2			4			



ASSEMBLED BY : J.L. LAMBERT DATE : 10/12
 CHECKED BY : K.W. ALFORD DATE : 9/13
 DRAWN BY : FCJ 11/88 REV. 5/7/03 RWW/JTE
 CHECKED BY : ARB 11/88 REV. 5/1/06 RRR MAA/KMM
 REV. 10/1/11 MAA/GM



Signature: Scott A. Hadden, Date: 1/22/13

NOTES:

FOR STANDARD SEGMENTAL GRAVITY RETAINING WALLS, SEE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

DO NOT ATTACH FENCES OR HANDRAILS TO STANDARD SEGMENTAL GRAVITY WALLS.

DO NOT USE STANDARD SEGMENTAL GRAVITY WALLS FOR INTERSTATE HIGHWAY OR RAILROAD PROJECTS.

DO NOT USE STANDARD SEGMENTAL GRAVITY WALLS WHEN SURCHARGE LOADS WILL BE WITHIN 5'-6" OF THE BACK OF SRW CAP UNITS.

DO NOT USE STANDARD SEGMENTAL GRAVITY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW WALLS.

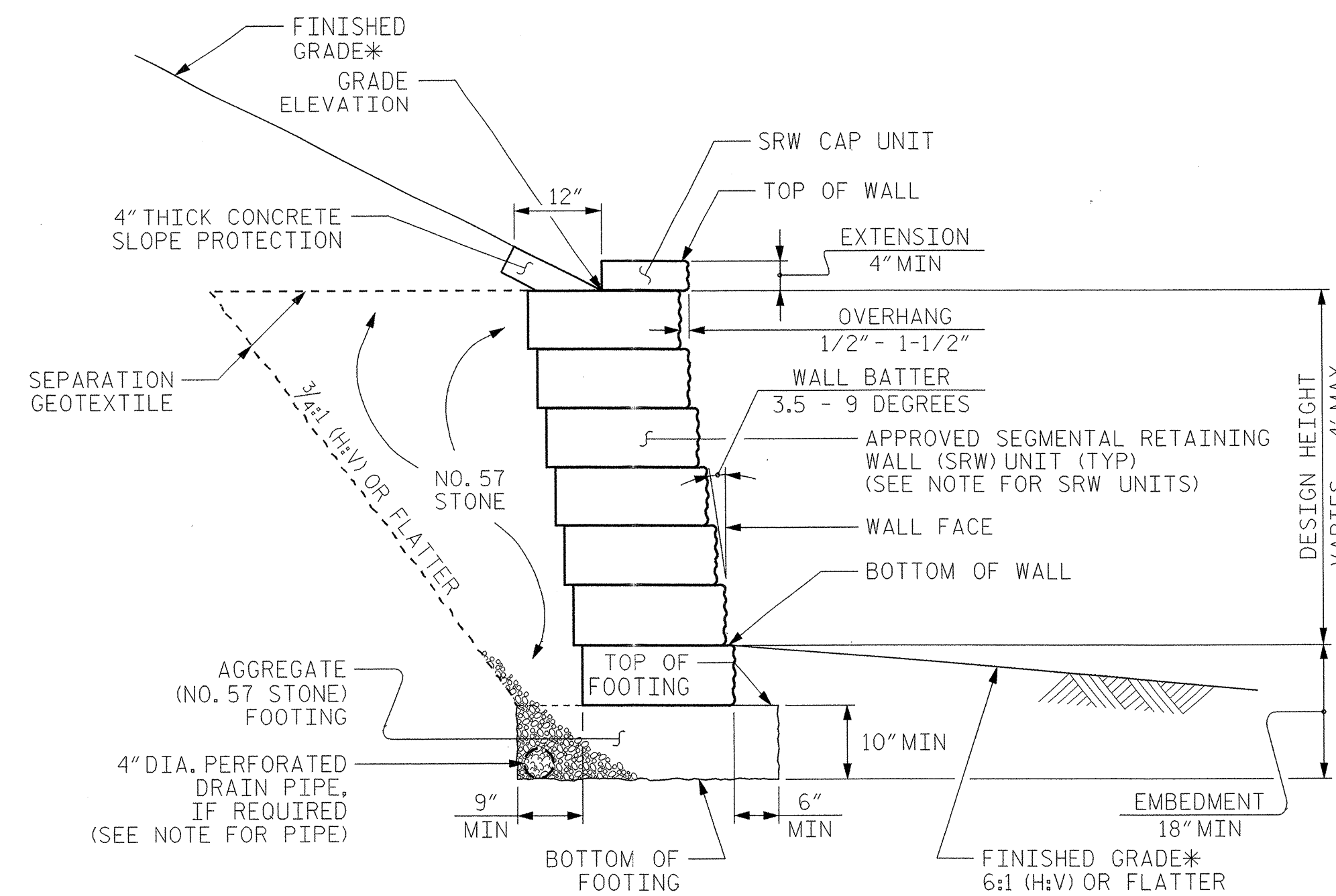
SEGMENTAL RETAINING WALL (SRW) UNITS ARE APPROVED FOR EITHER 2' OR 4' MAXIMUM DESIGN HEIGHTS. FOR DETAILS AND DIMENSIONS OF APPROVED SRW UNITS AND MAXIMUM DESIGN HEIGHTS, SEE connect.ncdot.gov/resources/Geological/Pages/Products.aspx

DO NOT MIX APPROVED SRW UNITS FROM DIFFERENT VENDORS ON THE SAME STANDARD SEGMENTAL GRAVITY WALL. USE THE SAME SIZE APPROVED SRW UNITS FOR EACH WALL SECTION.

BEFORE BEGINNING STANDARD SEGMENTAL GRAVITY WALL CONSTRUCTION, SURVEY WALL LOCATIONS AND SUBMIT WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. FOR WALL ENVELOPES, INCLUDE BOTTOM OF WALL, EXISTING GROUND AND GRADE ELEVATIONS AND OTHER ELEVATIONS AS NEEDED AT INTERVALS OF 25' OR LESS ALONG WALLS. DO NOT START WALL CONSTRUCTION UNTIL WALL ENVELOPES ARE ACCEPTED.

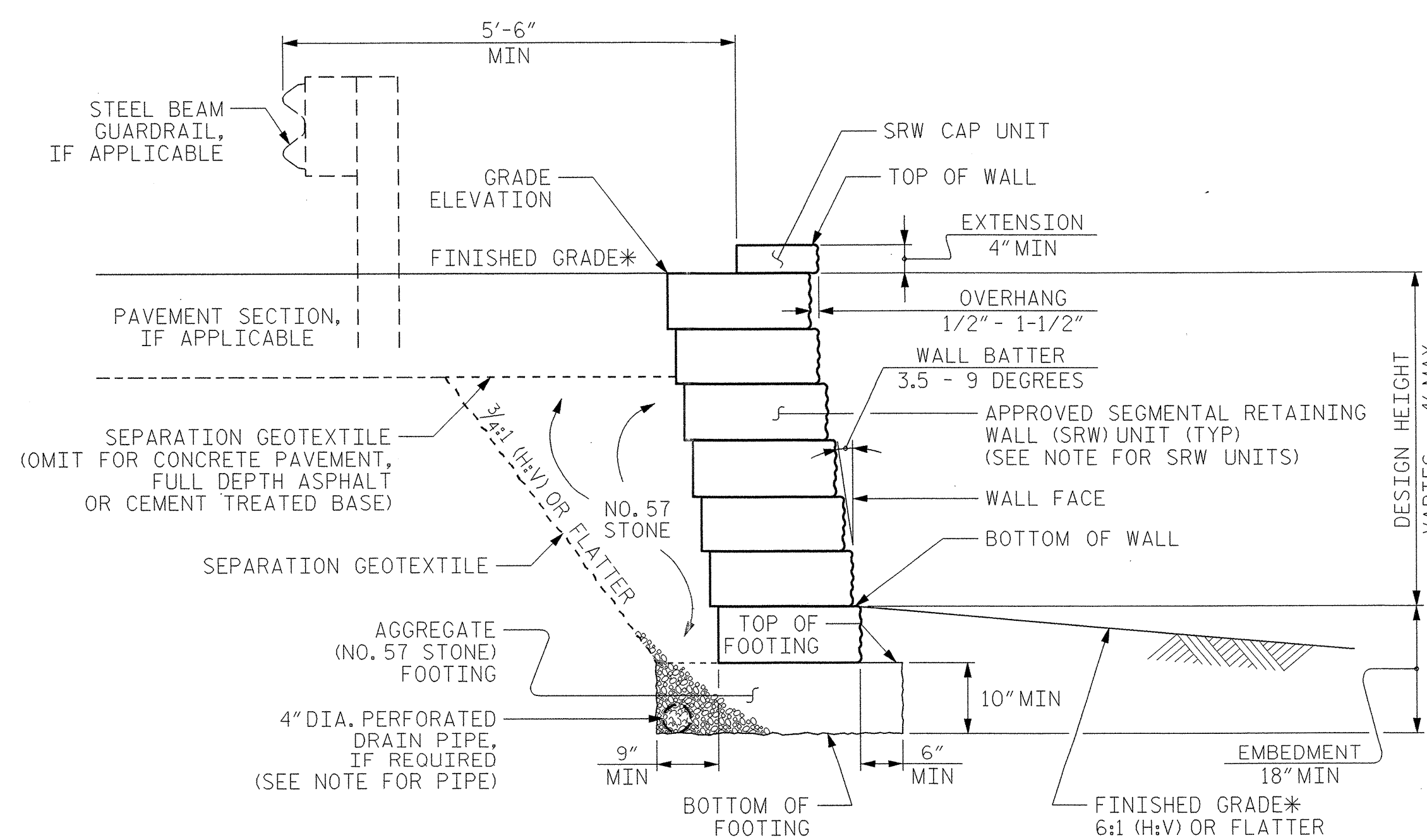
A DRAIN PIPE IS REQUIRED IF GROUNDWATER IS ABOVE BOTTOM OF FOOTINGS.

DO NOT PLACE NO.57 STONE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.



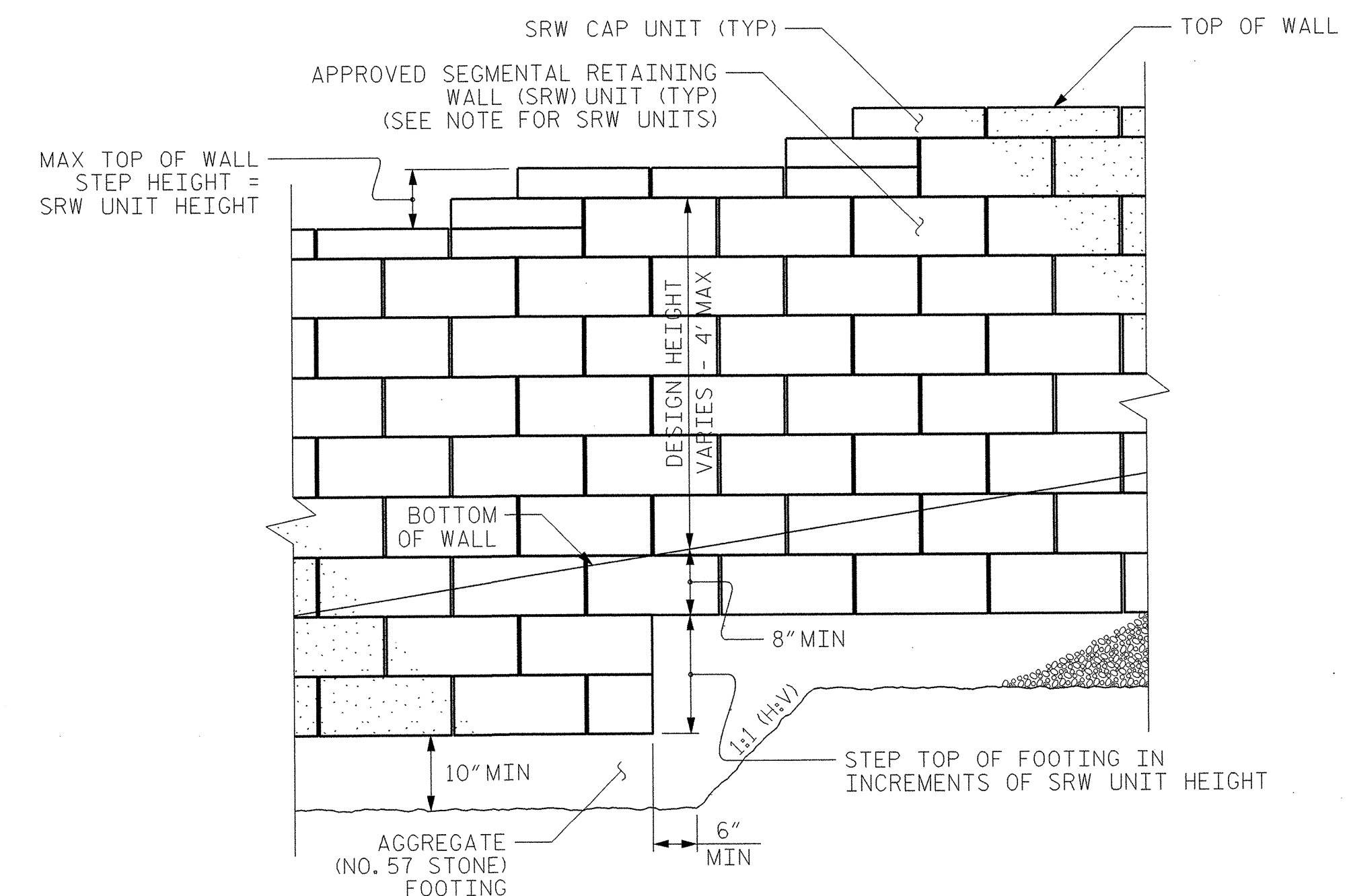
STANDARD SEGMENTAL GRAVITY WALL WITH SLOPE

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



STANDARD SEGMENTAL GRAVITY WALL WITHOUT SLOPE

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



STANDARD SEGMENTAL GRAVITY WALL - PARTIAL ELEVATION

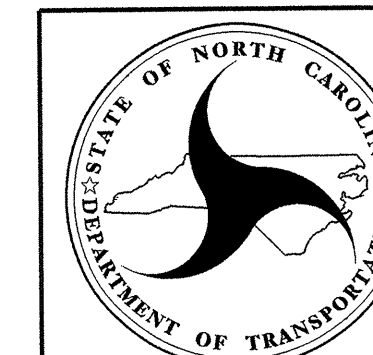
PROJECT NO.: B-4991

WAKE COUNTY

STATION: 18+75.00-L-

SHEET 1 OF 1

STANDARD DRAWING NO. 453.02



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SEGMENTAL GRAVITY RETAINING WALL

DATE: 11-19-13

SHEET NO. W-1
TOTAL SHEETS 1

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 WITH 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