

TIP PROJECT: B-4534

CONTRACT: C201876

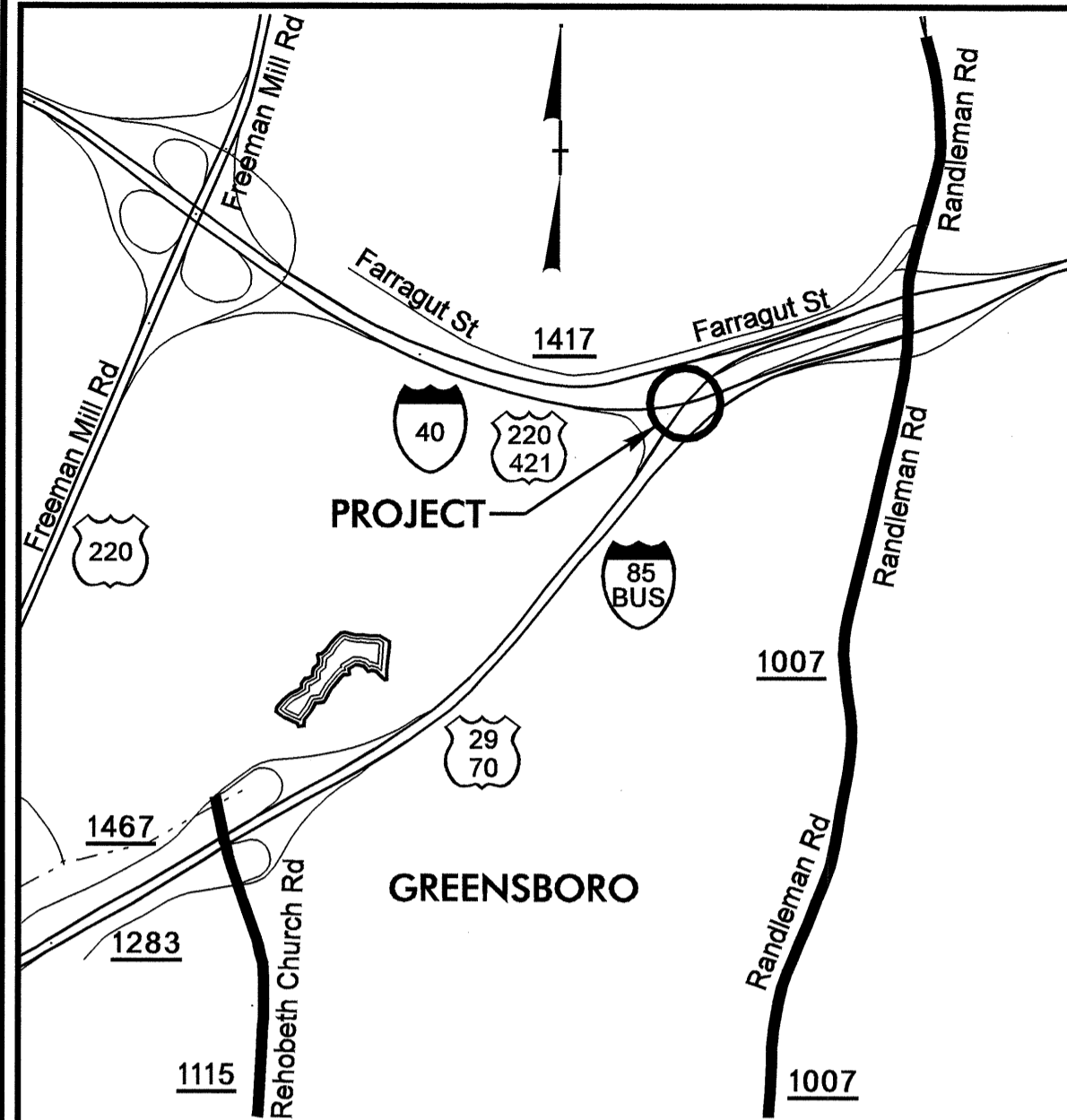
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

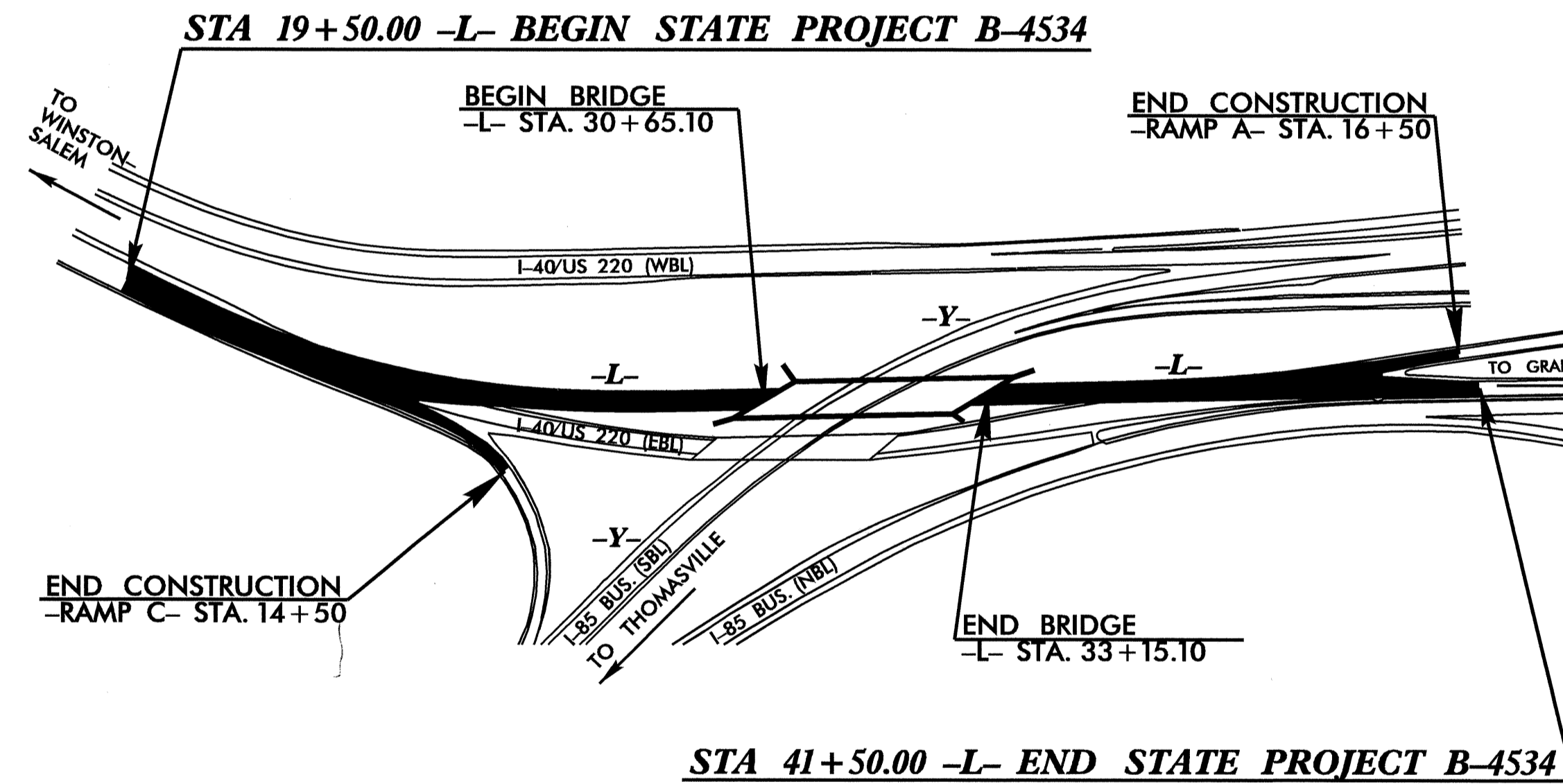
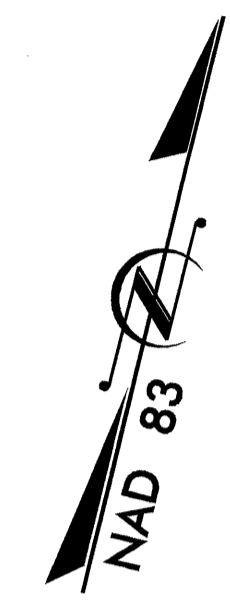
LOCATION: BRIDGE NO. 336 ON I-40 & US 220 EBL OVER I-85 SBL

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, STRUCTURE,
AND RETAINING WALL**

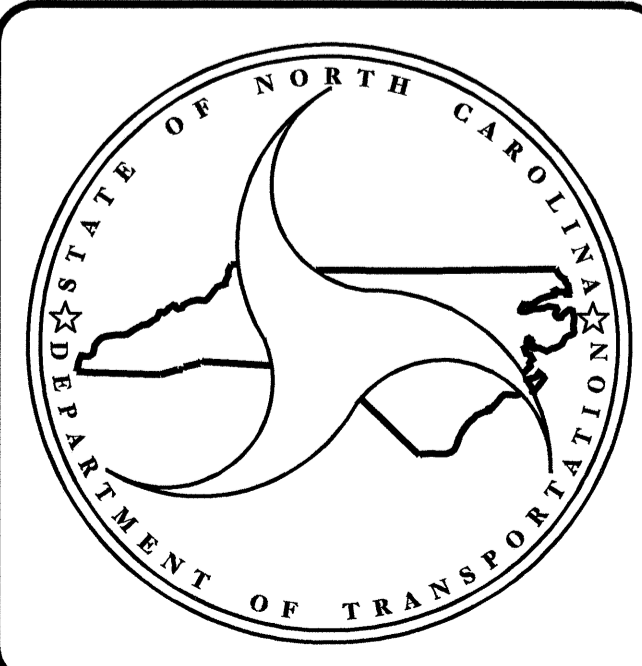
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4534		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
37698.1.1	BRNHS-40-3(103)219	P.E.	
37698.2.1	BRNHS-40-3(103)219	R/W, UTIL.	
37698.3.1	BRNHS-40-3(104)219	CONST.	



VICINITY MAP



STRUCTURE



DESIGN DATA	
ADT 2008 =	46400
ADT 2028 =	44800
DHV =	10 %
D =	55 %
T =	17 % *
V =	60 MPH
* (TTST 12% + DUAL 5%)	
POSTED SPEED =	55 MPH
FUNC. CLASS =	INTERSTATE

PROJECT LENGTH	
LENGTH OF ROADWAY TIP PROJECT B-4534	= 0.370 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4534	= 0.047 MILES
TOTAL LENGTH OF TIP PROJECT B-4534	= 0.417 MILES

Prepared In the Office of: DIVISION OF HIGHWAYS	
2006 STANDARD SPECIFICATIONS	
LETTING DATE: JULY 15, 2008	B. CHARLES HUNT, PE PROJECT ENGINEER
	VIPUL A. PATEL, PE PROJECT DESIGN ENGINEER

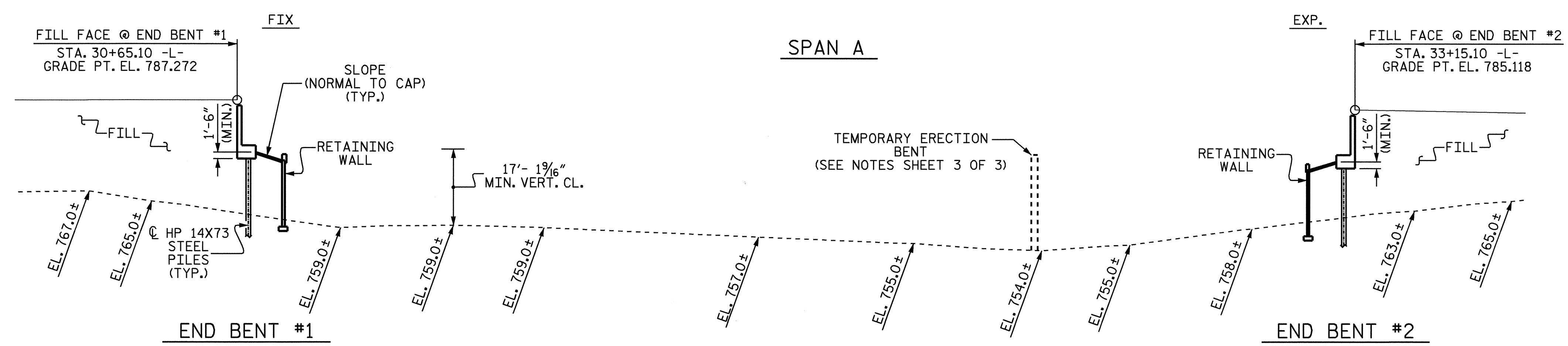
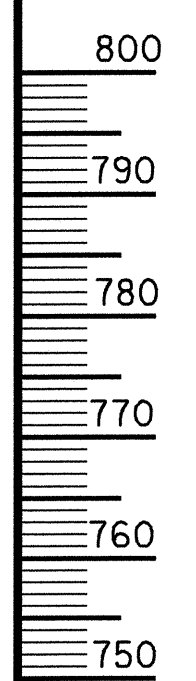
STRUCTURE DESIGN UNIT
1000 Birch Ridge Dr. Raleigh, NC, 27610

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA	
	P.E.
STATE DESIGN ENGINEER	
DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED DIVISION ADMINISTRATOR	DATE

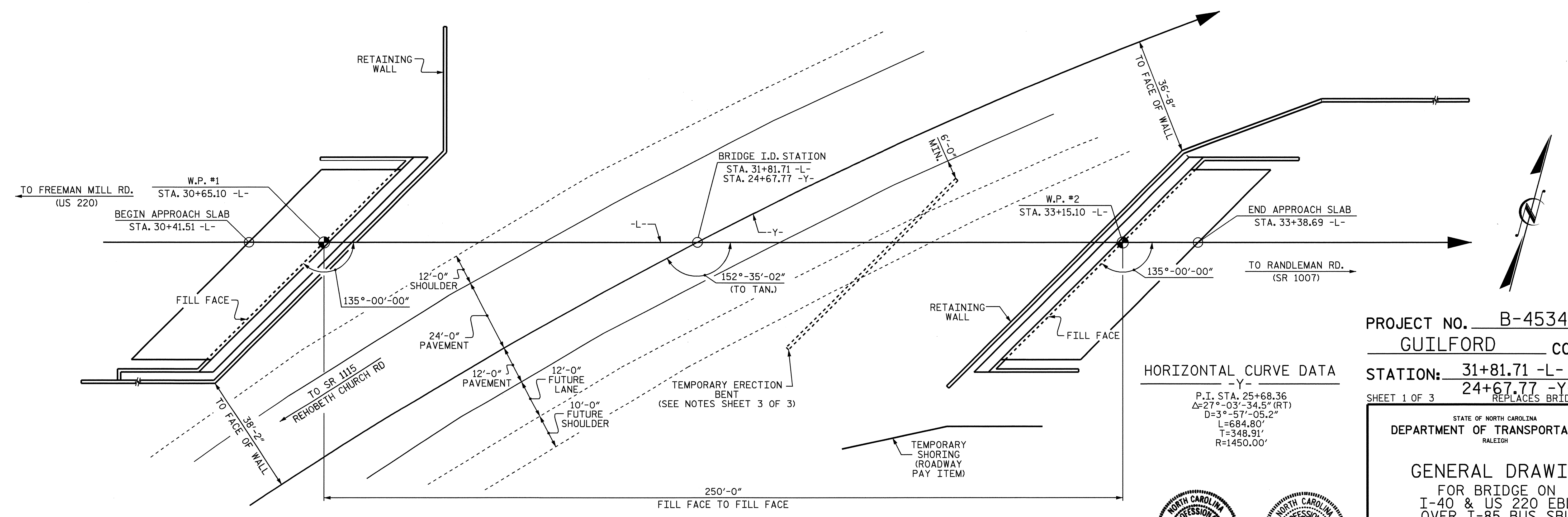
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scombrowski

30+50 31+00 31+50 32+00 32+50 33+00 33+50

+2.0350% Δ -2.4481%
 P.I. = 30+90.000
 E.L. = 791.080
 V.C. = 685'
GRADE DATA



SECTION ALONG -L-
 SECTION AT END BENTS TAKEN AT RIGHT ANGLES



PLAN
 PILES NOT SHOWN FOR CLARITY

HORIZONTAL CURVE DATA
 P.I. STA. 25+68.36
 $\Delta=27^{\circ}-03'-34.5''$ (RT)
 $D=3^{\circ}-57'-05.2''$
 $L=684.80'$
 $T=348.91'$
 $R=1450.00'$

PROJECT NO. B-4534
 GUILFORD COUNTY
 STATION: 31+81.71 -L-
24+67.77 -Y-
 SHEET 1 OF 3 REPLACES BRIDGE #336

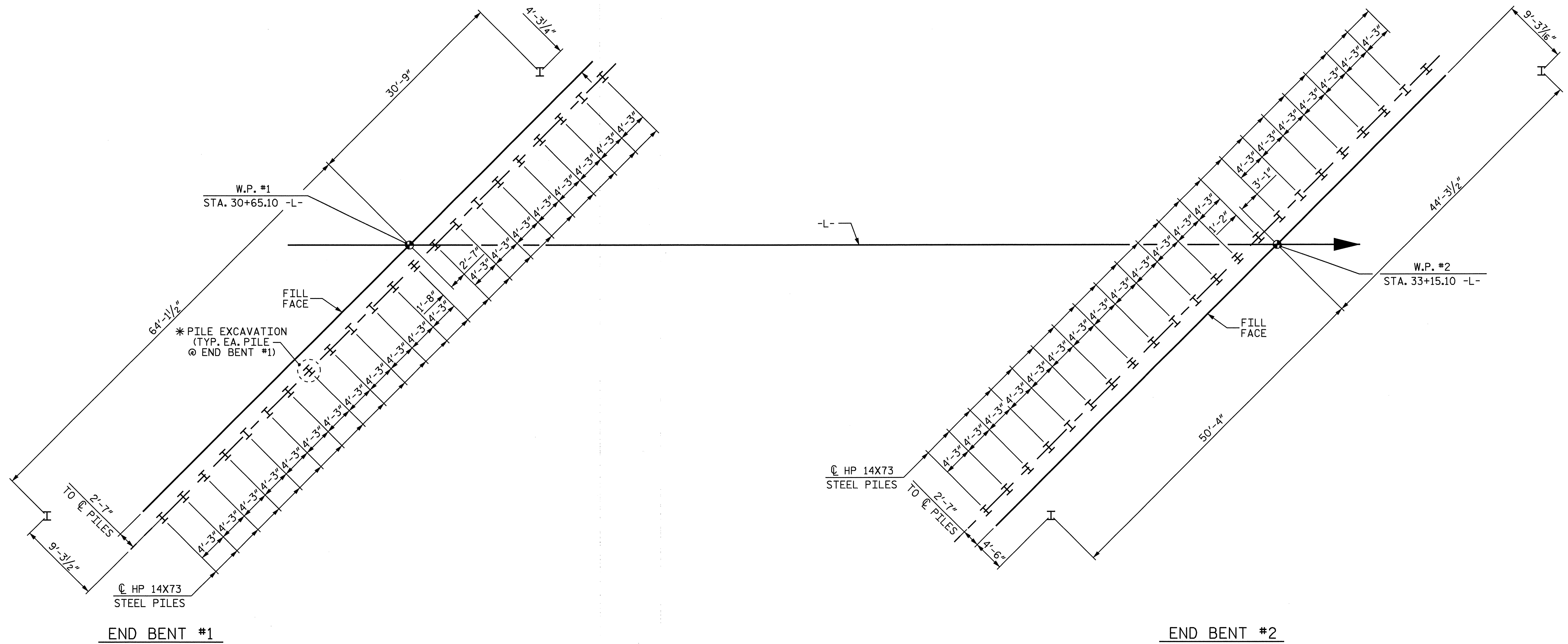
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON
 I-40 & US 220 EBL
 OVER I-85 BUS. SBL

DRAWN BY: S. DOMBROWSKI DATE: 1/08
 CHECKED BY: K.D. LAYNE DATE: 1/08

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 sdombrowski

Professional Engineer Seal
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 23371
 WILLIAM PATRICK
 6/5/08 6/5/06

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



FOUNDATION LAYOUT

ALL PILES ARE HP 14X73.
DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILES.

NOTES

- DRIVE PILES AT END BENT #1 AND END BENT #2 TO A REQUIRED BEARING CAPACITY OF 150 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT #1 AND END BENT #2 IS 75 TONS PER PILE.
- * PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT #1. EXCAVATE HOLES TO ELEVATION 754.000 ON THE LEFT SIDE AND ELEVATION 749.200 ON THE RIGHT SIDE. SEE PILE EXCAVATION SPECIAL PROVISION.
- DRIVE PILES AT END BENT #2 TO A TIP ELEVATION NO HIGHER THAN 741.000 ON THE LEFT SIDE AND 737.000 ON THE RIGHT SIDE.
- PILES SHOULD BE INSTALLED PRIOR TO CONSTRUCTION OF THE MSE RETAINING WALL AT BOTH END BENTS.

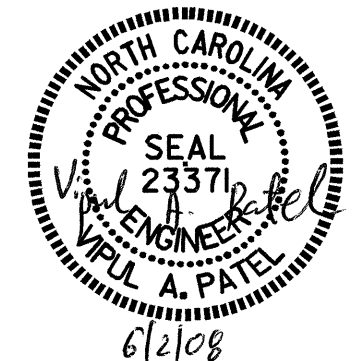
PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

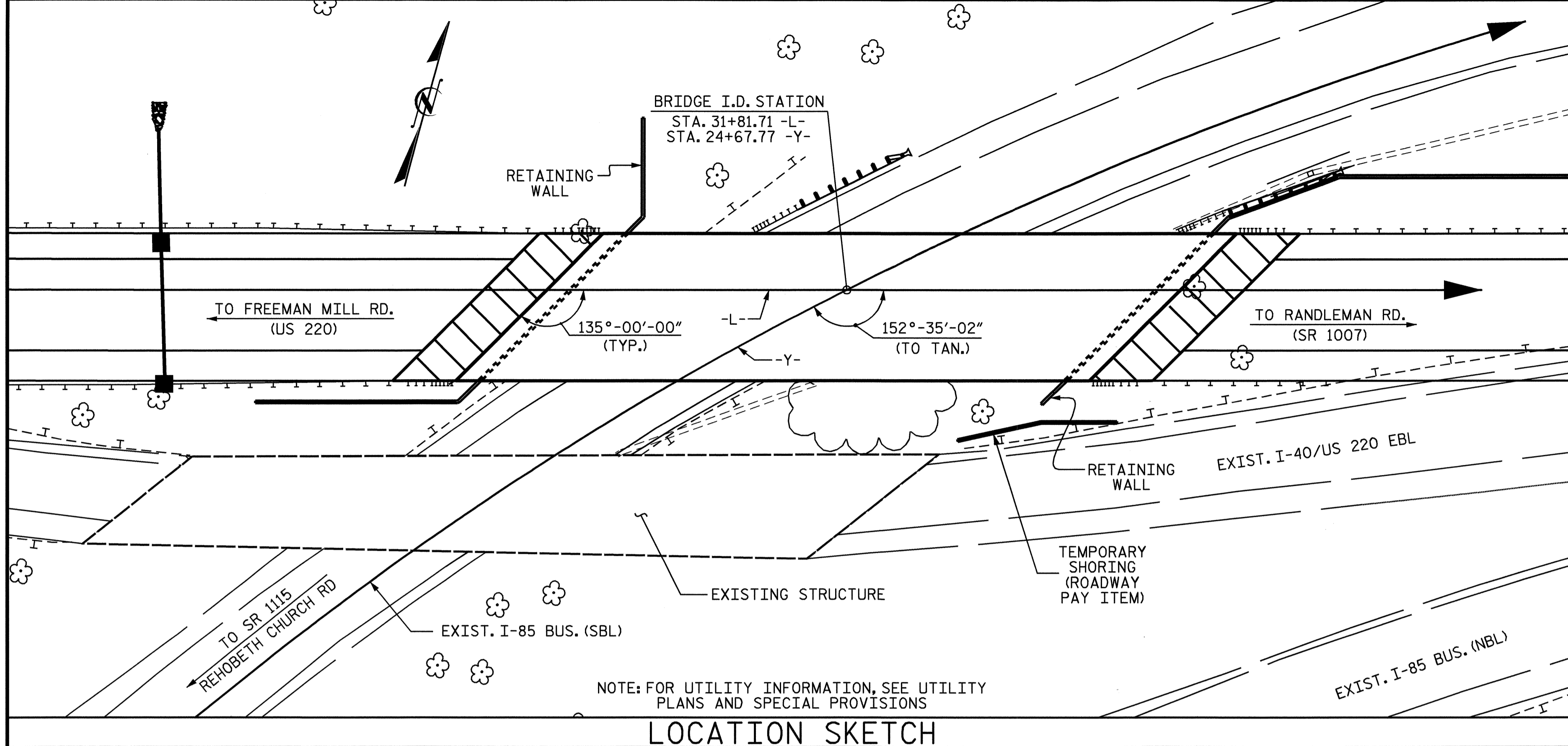
GENERAL DRAWING
 FOR BRIDGE ON
 I-40 & US 220 EBL
 OVER I-85 BUS. SBL

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



DRAWN BY : S. DOMBROWSKI DATE : 1/08
 CHECKED BY : K.D. LAYNE DATE : 1/08

BENCH MARK #2: R.R. SPIKE SET IN BASE OF 18" SYCAMORE @ STA. 31+14.75 -L-, 153.36' RT., EL. 779.470



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

LOCATION SKETCH

GIRDER ERECTION SEQUENCE

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. ONE EXTERIOR GIRDER AND ITS ADJACENT INTERIOR GIRDER SHALL BE ERECTED WITH ALL DIAPHRAGMS AND LATERAL BRACING BETWEEN THE GIRDERS IN PLACE AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDERS. THE REMAINING GIRDERS SHALL THEN BE ERECTED WITH DIAPHRAGMS CONNECTING THE GIRDER TO THE ADJACENT ERECTED GIRDER AND ALL BOLTS TIGHTENED BEFORE RELEASING THE GIRDER.

A MINIMUM OF ONE TEMPORARY BENT SHALL BE USED.

PLACEMENT OF TEMPORARY BENTS SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS.

TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL CROSSFRAMES AND LATERAL BRACING ARE IN PLACE AND HIGH STRENGTH BOLTS TIGHTENED.

TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS.

PLANS FOR TEMPORARY BENTS, ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

TEMPORARY BENTS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY ERECTION BENTS AND MAINTAIN PLUMBNESS OF THE GIRDER WEBS.

THE CONTRACTOR'S ERECTION PLAN SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE BRIDGE CROSSFRAMES.

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL (APPROX.)	HP 14X73 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	POT BEARINGS	EVAZOTE JOINT SEALS	
	LUMP SUM	LIN. FT.	LIN. FT.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			15,130	16,030		LUMP SUM		1,218,200		494.04		LUMP SUM	LUMP SUM	
END BENT #1		186	54			95.7		13,726		24	600	30			
END BENT #2		-	-			97.3		13,771		24	840	23			
TOTAL	LUMP SUM	186	54	15,130	16,030	193.0	LUMP SUM	27,497	1,218,200	48	1440	53	LUMP SUM	LUMP SUM	

DRAWN BY: S. DOMBROWSKI DATE: 1/08
 CHECKED BY: K.D. LAYNE DATE: 1/08

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NOTES:

ASSUMED LIVE LOAD = HS 20, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN COMPLETED.

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.

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 71'-8 3/4", 1 @ 100'-0 3/8", 1 @ 58'-7 1/8", & 1 @ 60'-3 7/8") OF STEEL I-BEAMS AND PLATE GIRDERS WITH A CLEAR ROADWAY WIDTH OF 38.0' ON REINFORCED CONCRETE CAPS AND COLUMNS AT BENTS #1 AND #2 AND REINFORCED CONCRETE CAPS ON STEEL PILES AT END BENTS #1 AND #2 AND BENT #3 AND LOCATED JUST SOUTH OF THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, 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.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

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

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 BAR SIZE USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH BAR SIZE 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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

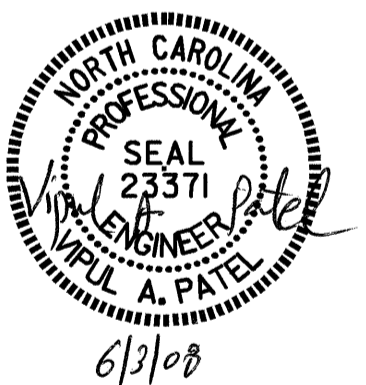
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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 STA. 31+81.71 -L-".

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.



PROJECT NO. B-4534

GUILFORD COUNTY

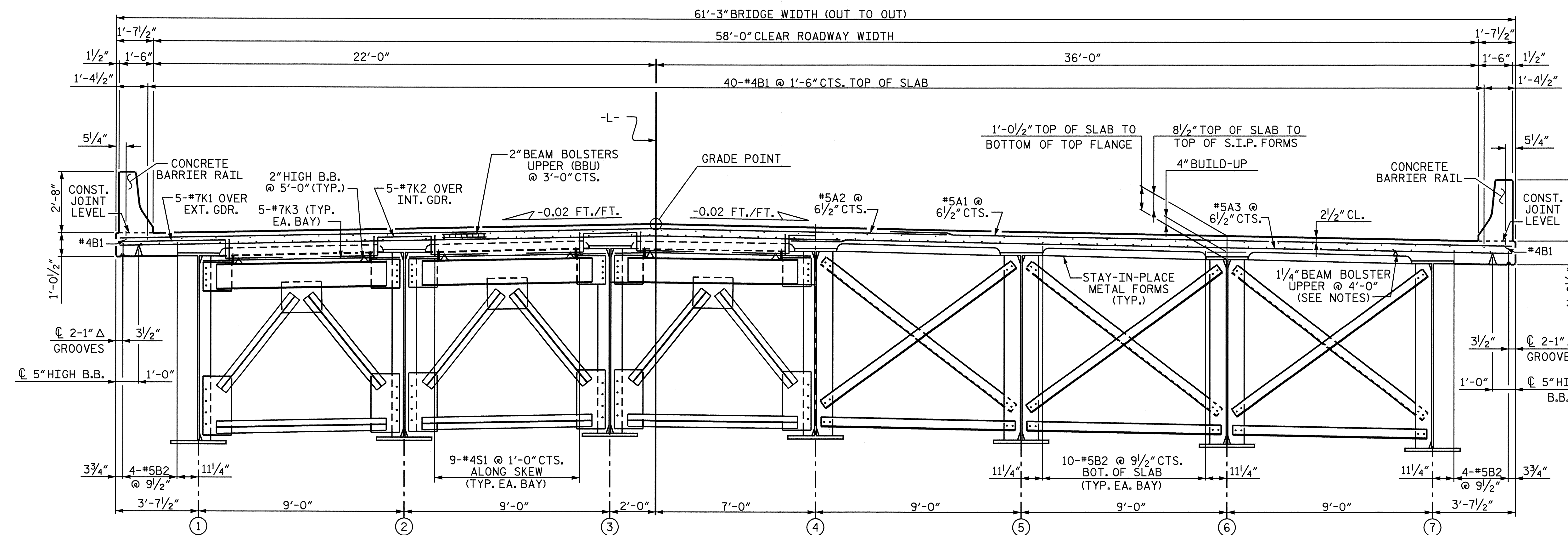
STATION: 31+81.71 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON
 I-40 & US 220 EBL
 OVER I-85 BUS. SBL

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



TYPICAL HALF SECTION AT END BENT DIAPHRAGM

TYPICAL HALF SECTION AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

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.

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

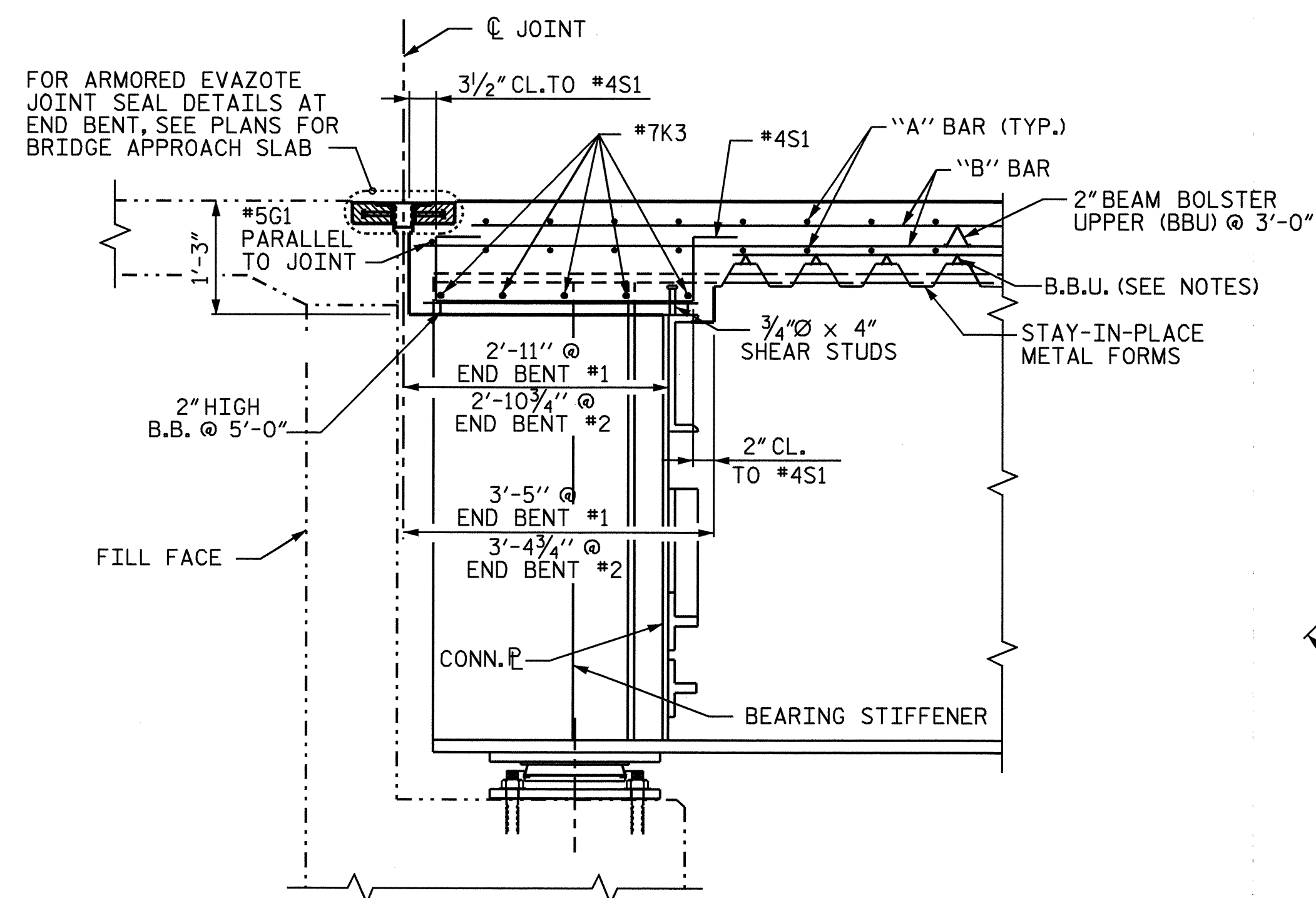
AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

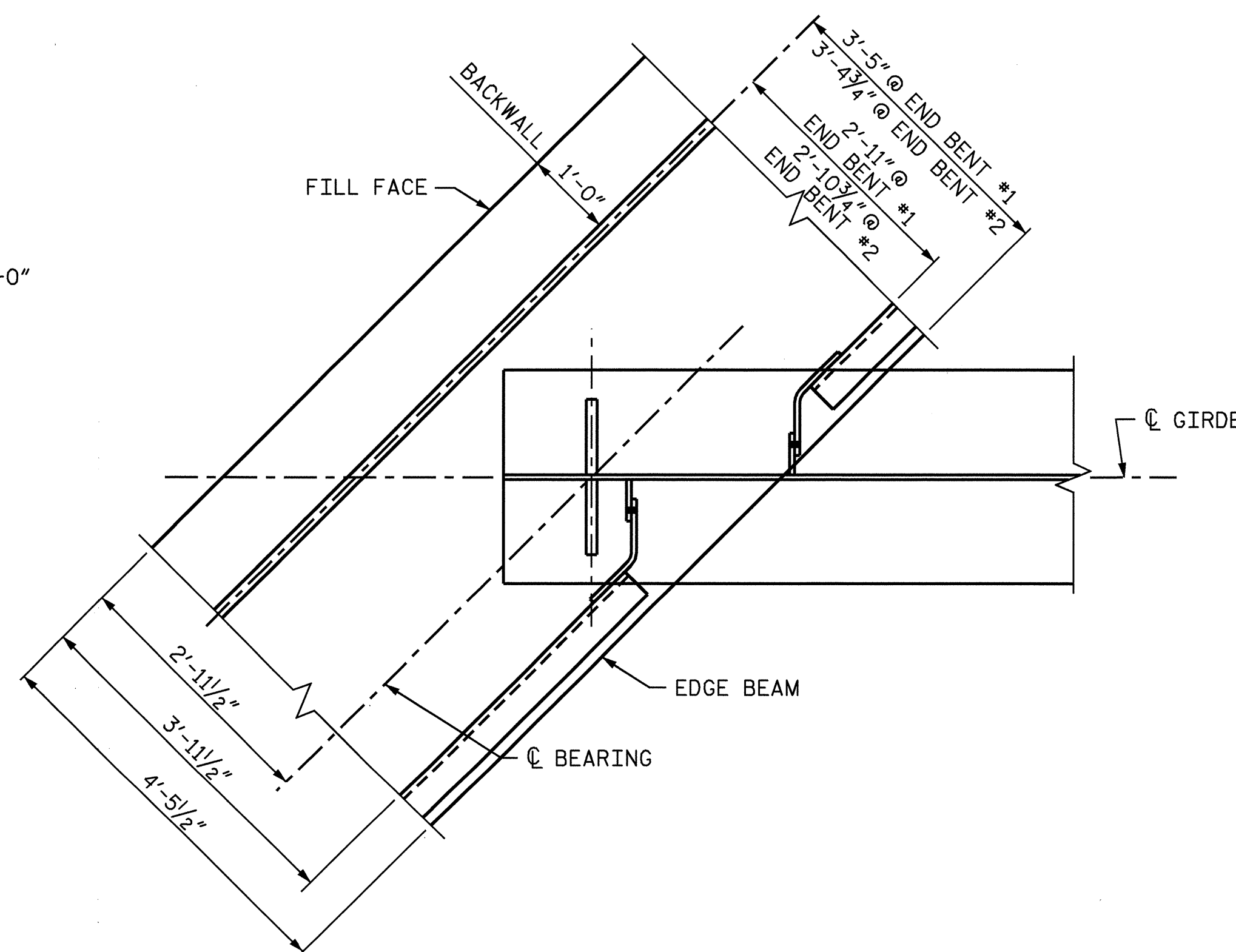
DIRECTION OF CASTING DECK CONCRETE SHALL BE FROM THE FIXED BEARING END TOWARD THE EXPANSION BEARING END OF THE SPAN.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR POT BEARINGS.



SECTION AT END BENTS



PART PLAN OF END BENT #1 DIAPHRAGM

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

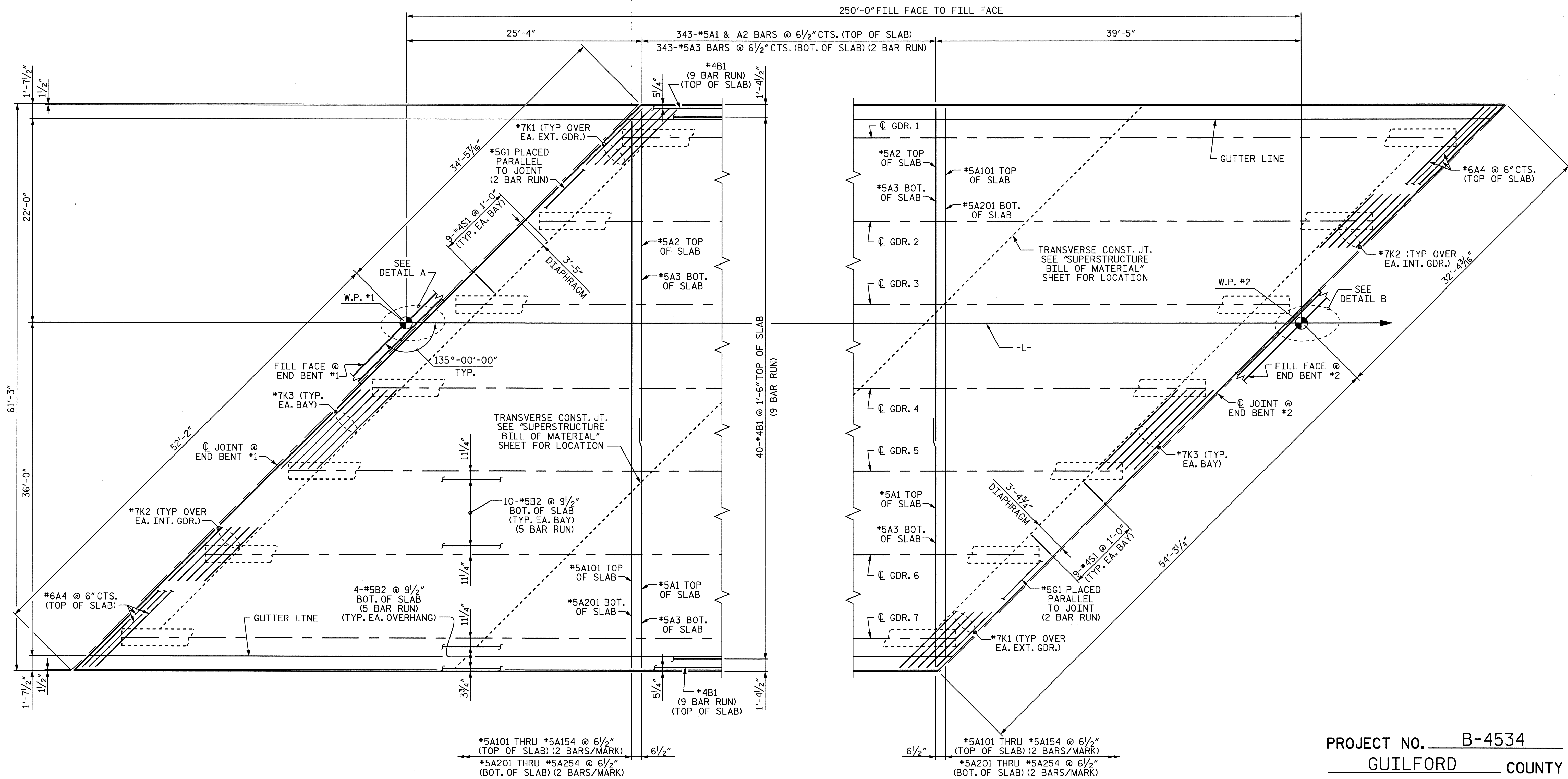
SUPERSTRUCTURE
 TYPICAL SECTION



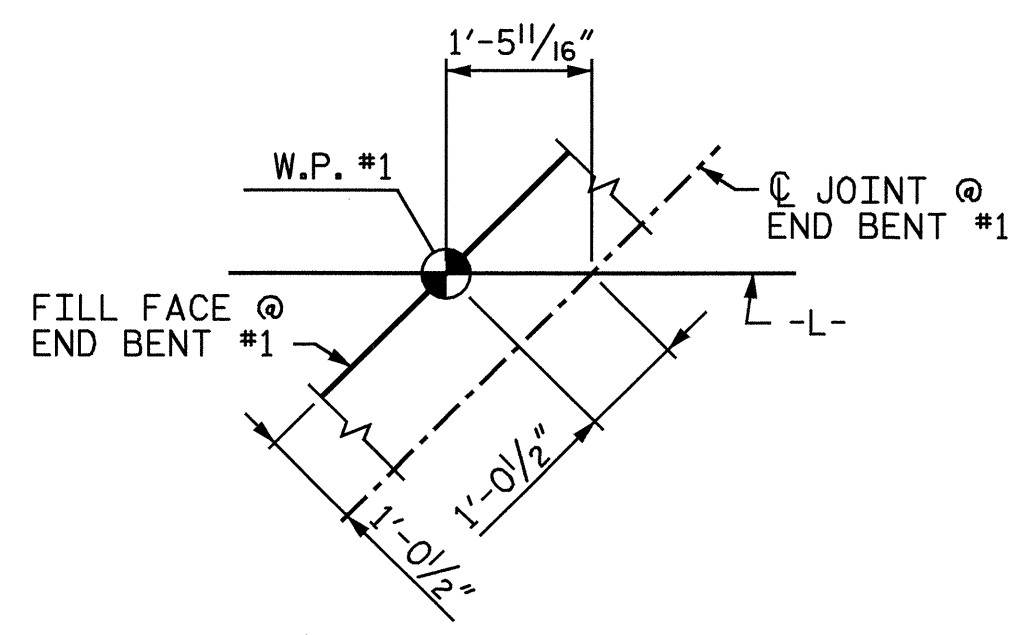
6/2/08

DRAWN BY: KEITH D. LAYNE DATE: 05/07
 CHECKED BY: H. A. L. DATE: 11/07

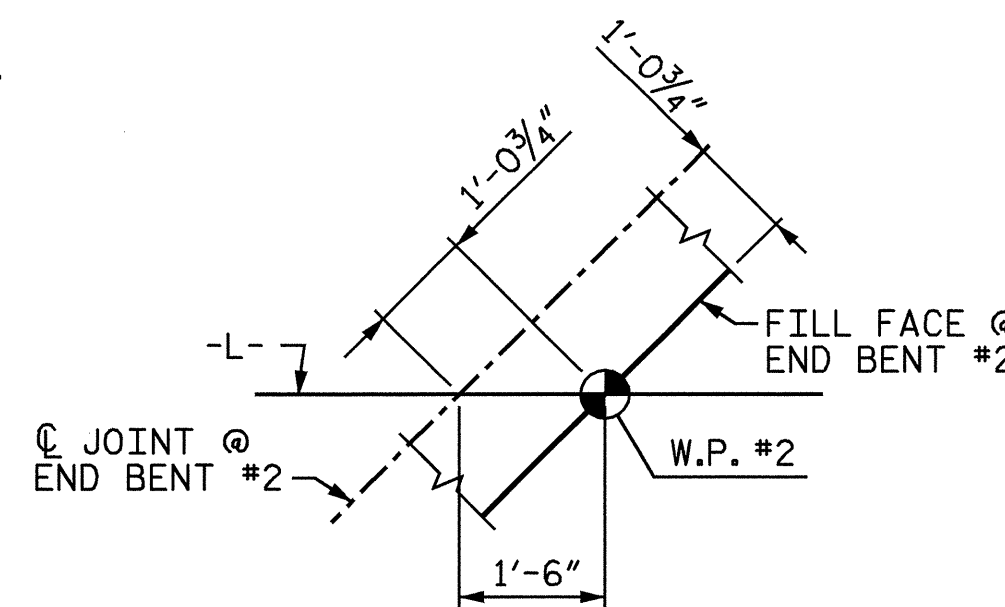
REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



PLAN OF SPAN



DETAIL A



DETAIL B

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

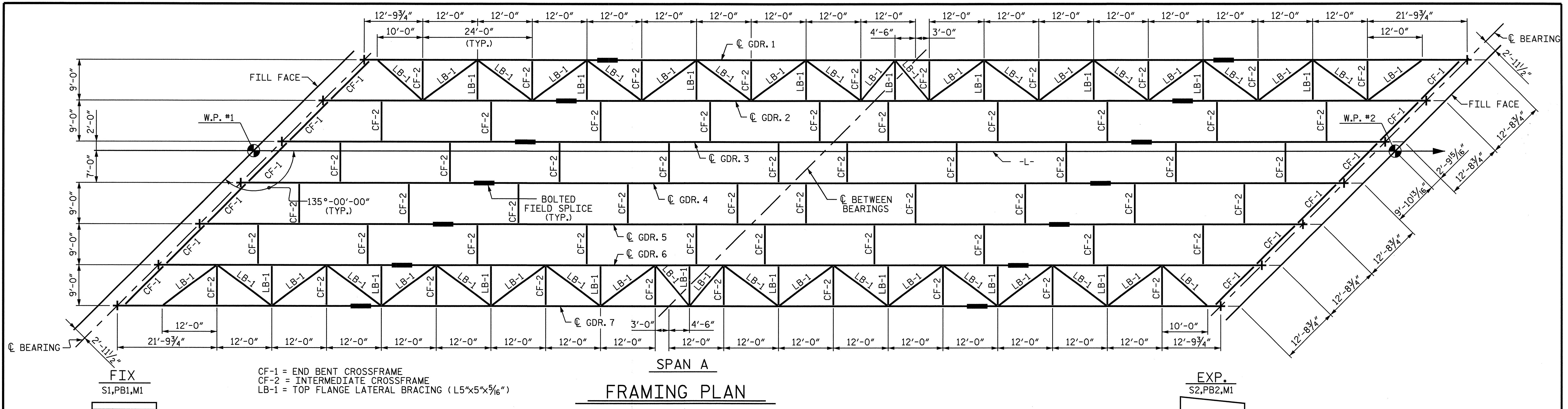
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPAN



DRAWN BY: K. D. LAYNE DATE: 05/07
 CHECKED BY: H. A. L. DATE: 11/07

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			



DEAD LOAD DEFLECTION TABLE FOR EXTERIOR GIRDERS #1 AND #7

THIRTIETH POINTS	0	0.033	0.067	0.100	0.133	0.167	0.200	0.233	0.267	0.300	0.333	0.367	0.400	0.433	0.467	0.500	0.533	0.567	0.600	0.633	0.667	0.700	0.733	0.767	0.800	0.833	0.867	0.900	0.933	0.967	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.048	-0.097	-0.145	-0.187	-0.228	-0.270	-0.301	-0.331	-0.362	-0.381	-0.401	-0.420	-0.427	-0.433	-0.440	-0.433	-0.427	-0.420	-0.401	-0.381	-0.362	-0.331	-0.301	-0.270	-0.228	-0.187	-0.145	-0.097	-0.048	0
* DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.065	-0.129	-0.194	-0.250	-0.307	-0.363	-0.404	-0.445	-0.486	-0.512	-0.538	-0.564	-0.573	-0.582	-0.591	-0.582	-0.573	-0.564	-0.538	-0.512	-0.486	-0.445	-0.404	-0.363	-0.307	-0.250	-0.194	-0.129	-0.065	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.014	-0.021	-0.027	-0.033	-0.039	-0.043	-0.048	-0.052	-0.055	-0.058	-0.061	-0.062	-0.063	-0.064	-0.063	-0.062	-0.061	-0.058	-0.055	-0.052	-0.048	-0.043	-0.039	-0.033	-0.027	-0.021	-0.014	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.120	-0.240	-0.360	-0.464	-0.568	-0.672	-0.748	-0.824	-0.900	-0.948	-0.997	-1.045	-1.062	-1.078	-1.095	-1.078	-1.062	-1.045	-0.997	-0.948	-0.900	-0.824	-0.748	-0.672	-0.568	-0.464	-0.360	-0.240	-0.120	0
VERTICAL CURVE ORDINATE	0	+0.062	0.119	0.172	0.221	0.265	0.306	0.342	0.374	0.401	0.425	0.444	0.459	0.469	0.476	0.478	0.476	0.469	0.459	0.444	0.425	0.401	0.374	0.342	0.306	0.265	0.221	0.172	0.119	0.062	0
REQUIRED CAMBER (IN.)	0	2 3/16	4 5/16	6 3/8	8 1/4	10	11 3/4	13 1/16	14 3/8	15 5/8	16 1/2	17 5/16	18 1/16	18 3/8	18 5/8	18 7/8	18 5/8	18 3/8	18 1/16	17 5/16	16 1/2	15 5/8	14 3/8	13 1/16	11 3/4	10	8 1/4	6 3/8	4 5/16	2 3/16	0

DEAD LOAD DEFLECTION TABLE FOR INTERIOR GIRDERS #2 AND #6

THIRTIETH POINTS	0	0.033	0.067	0.100	0.133	0.167	0.200	0.233	0.267	0.300	0.333	0.367	0.400	0.433	0.467	0.500	0.533	0.567	0.600	0.633	0.667	0.700	0.733	0.767	0.800	0.833	0.867	0.900	0.933	0.967	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.053	-0.106	-0.159	-0.204	-0.250	-0.295	-0.328	-0.362	-0.395	-0.416	-0.437	-0.458	-0.465	-0.473	-0.480	-0.473	-0.465	-0.458	-0.437	-0.416	-0.395	-0.362	-0.328	-0.295	-0.250	-0.204	-0.159	-0.106	-0.053	0
* DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.063	-0.127	-0.190	-0.245	-0.300	-0.355	-0.395	-0.435	-0.475	-0.500	-0.526	-0.551	-0.560	-0.569	-0.578	-0.569	-0.560	-0.551	-0.526	-0.500	-0.475	-0.435	-0.395	-0.355	-0.300	-0.245	-0.190	-0.127	-0.063	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.014	-0.021	-0.027	-0.032	-0.038	-0.043	-0.047	-0.052	-0.055	-0.057	-0.060	-0.061	-0.062	-0.063	-0.062	-0.061	-0.060	-0.057	-0.055	-0.052	-0.047	-0.043	-0.038	-0.032	-0.027	-0.021	-0.014	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.123	-0.247	-0.370	-0.476	-0.582	-0.688	-0.766	-0.844	-0.922	-0.971	-1.020	-1.069	-1.086	-1.104	-1.121	-1.104	-1.086	-1.069	-1.020	-0.971	-0.922	-0.844	-0.766	-0.688	-0.582	-0.476	-0.370	-0.247	-0.123	0
VERTICAL CURVE ORDINATE	0	0.062	0.119	0.172	0.221	0.265	0.306	0.342	0.374	0.401	0.425	0.444	0.459	0.469	0.476	0.478	0.476	0.469	0.459	0.444	0.425	0.401	0.374	0.342	0.306	0.265	0.221	0.172	0.119	0.062	0
REQUIRED CAMBER (IN.)	0	2 1/4	4 3/8	6 1/2	8 3/8	10 3/16	11 5/16	13 5/16	14 5/8	15 7/8	16 3/4	17 5/16	18 5/16	18 11/16	18 5/16	19 3/16	18 5/16	18 11/16	18 5/16	17 5/16	16 3/4	15 7/8	14 5/8	13 5/16	11 5/16	10 3/16	8 3/8	6 1/2	4 3/8	2 1/4	0

DEAD LOAD DEFLECTION TABLE FOR INTERIOR GIRDERS #3, #4, AND #5

THIRTIETH POINTS	0	0.033	0.067	0.100	0.133	0.167	0.200	0.233	0.267	0.300	0.333	0.367	0.400	0.433	0.467	0.500	0.533	0.567	0.600	0.633	0.667	0.700	0.733	0.767	0.800	0.833	0.867	0.900	0.933	0.967	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.053	-0.106	-0.159	-0.204	-0.250	-0.295	-0.328	-0.362	-0.395	-0.416	-0.437	-0.458	-0.465	-0.473	-0.480	-0.473	-0.465	-0.458	-0.437	-0.416	-0.395	-0.362	-0.328	-0.295	-0.250	-0.204	-0.159	-0.106	-0.053	0
* DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.062	-0.123	-0.185	-0.239	-0.293	-0.347	-0.386	-0.426	-0.465	-0.490	-0.514	-0.539	-0.548	-0.556	-0.565	-0.556	-0.548	-0.539	-0.514	-0.490	-0.465	-0.426	-0.386	-0.347	-0.293	-0.239	-0.185	-0.123	-0.062	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.014	-0.021	-0.027	-0.032	-0.038	-0.043	-0.047	-0.052	-0.055	-0.057	-0.060	-0.061	-0.062	-0.063	-0.062	-0.061	-0.060	-0.057	-0.055	-0.052	-0.047	-0.043	-0.038	-0.032	-0.027	-0.021	-0.014	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.122	-0.243	-0.365	-0.470	-0.575	-0.680	-0.757	-0.835	-0.912	-0.961	-1.008	-1.057	-1.074	-1.091	-1.108	-1.091	-1.074	-1.057	-1.008	-0.961	-0.912	-0.835	-0.757	-0.680	-0.575	-0.470	-0.365	-0.243	-0.122	0
VERTICAL CURVE ORDINATE	0	0.062	0.119	0.172	0.221	0.265	0.306	0.342	0.374	0.401	0.425	0.444	0.459	0.469	0.476	0.478	0.476	0.469	0.459	0.444	0.425	0.401	0.374	0.342	0.306	0.265	0.221	0.172	0.119	0.062	0
REQUIRED CAMBER (IN.)	0	2 3/16	4 3/8	6 1/16	8 5/16	10 1/16	11 13/16	13 3/16	14 1/2	15 3/4	16 5/8	17 1/16	18 3/16	18 1/2	18 13/16	19 1/16	18 3/16	18 1/2	18 3/16	17 1/16	16 5/8	15 3/4	14 1/2	13 3/16	11 13/16	10 1/16	8 5/16	6 1/16	4 3/8	2 3/16	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

ALL VALUES ARE SHOWN IN FEET, EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES.

SIGN CONVENTION FOR DEAD LOAD DEFLECTION



DRAWN BY: KEITH D. LAYNE DATE: 05/07
CHECKED BY: H. A. L. DATE: 11/07

30-MAY-2008 08:56
R:\Structures\Plans\B-4534.ed.FP.01.dgn
sdombrowski



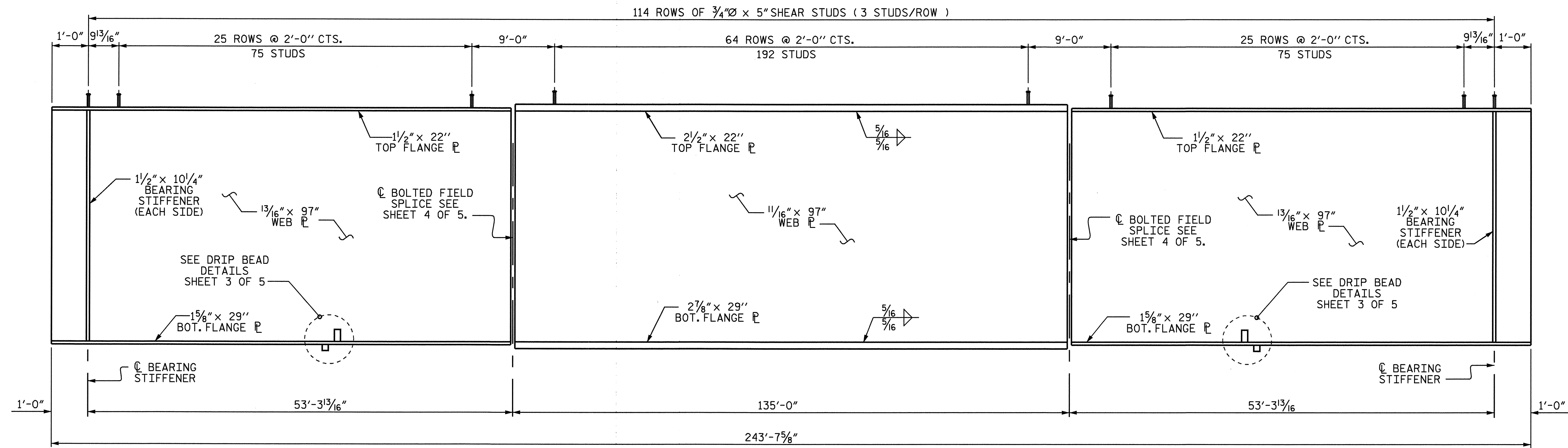
PROJECT NO. B-4534
GUILFORD COUNTY
STATION: 31+81.71 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

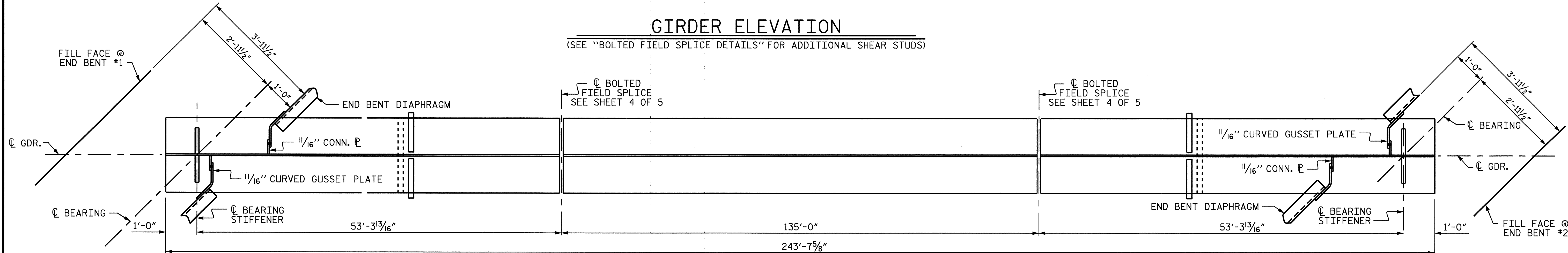
**SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTALS
2			4			24

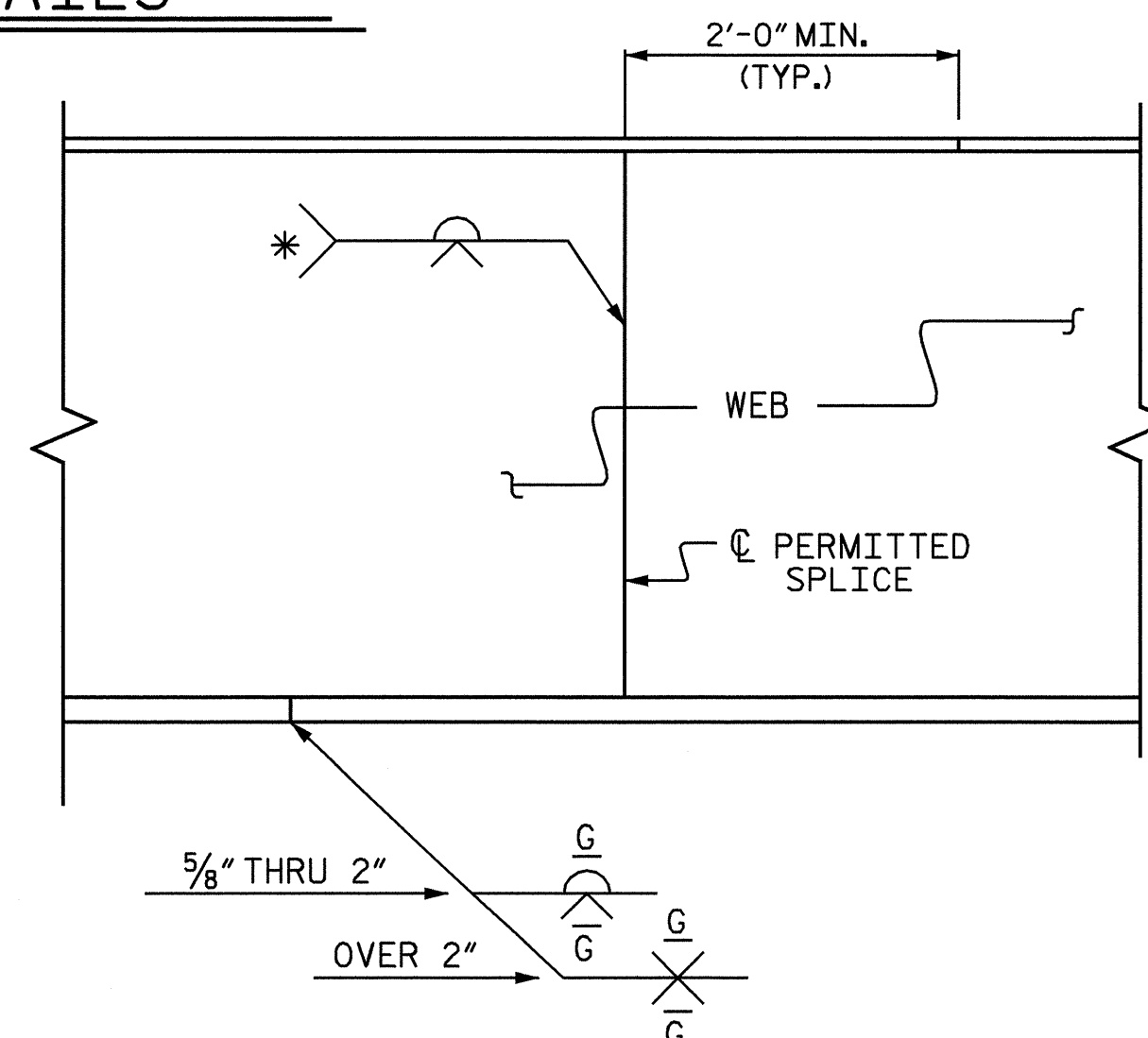
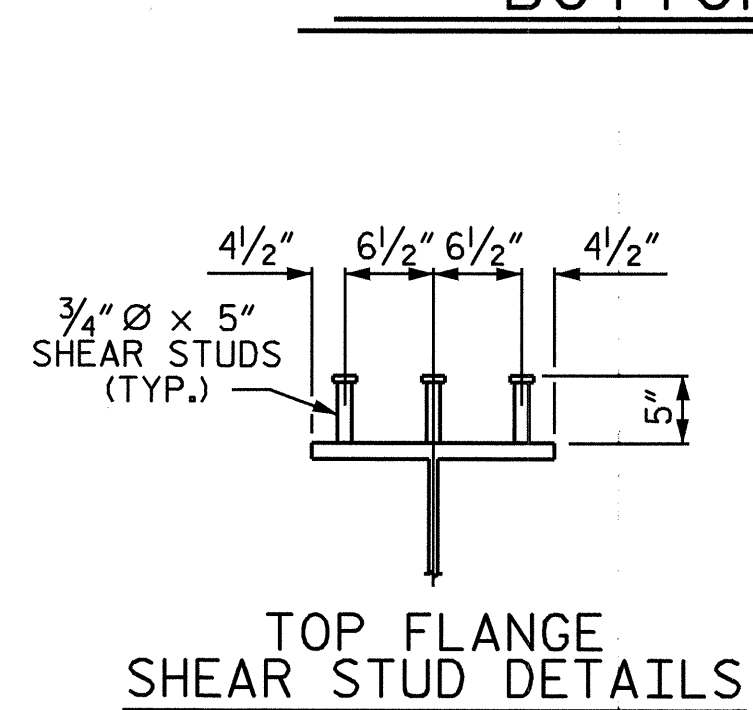
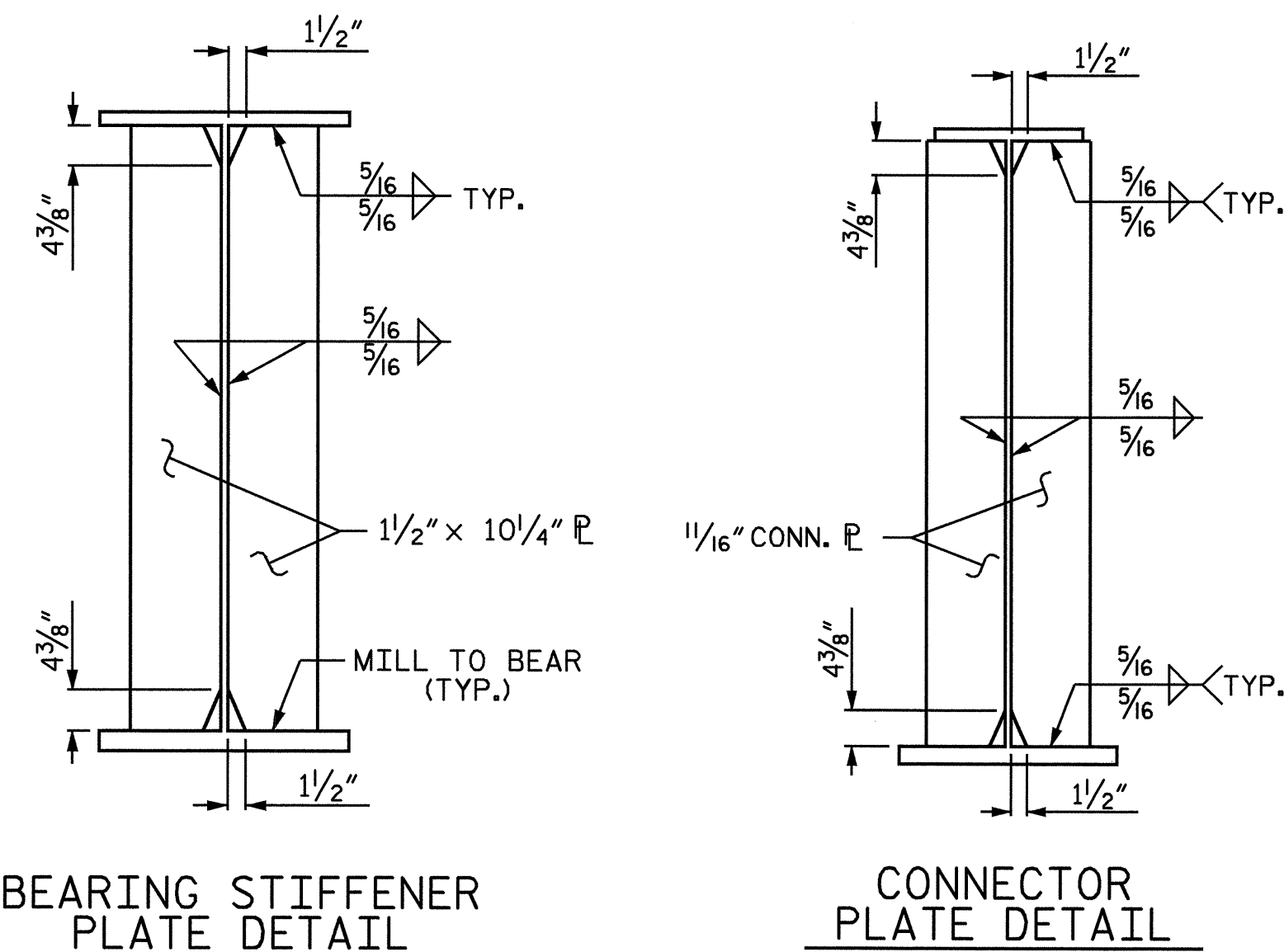


GIRDER ELEVATION

(SEE "BOLTED FIELD SPLICE DETAILS" FOR ADDITIONAL SHEAR STUDS)



BOTTOM FLANGE DETAILS



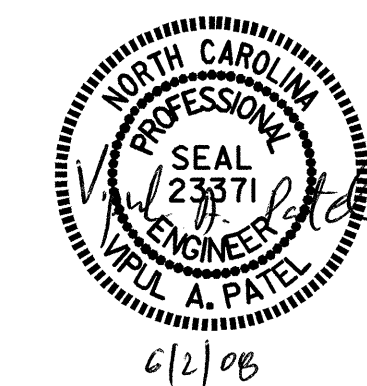
TYPICAL FLANGE AND WEB BUTT JOINT
* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

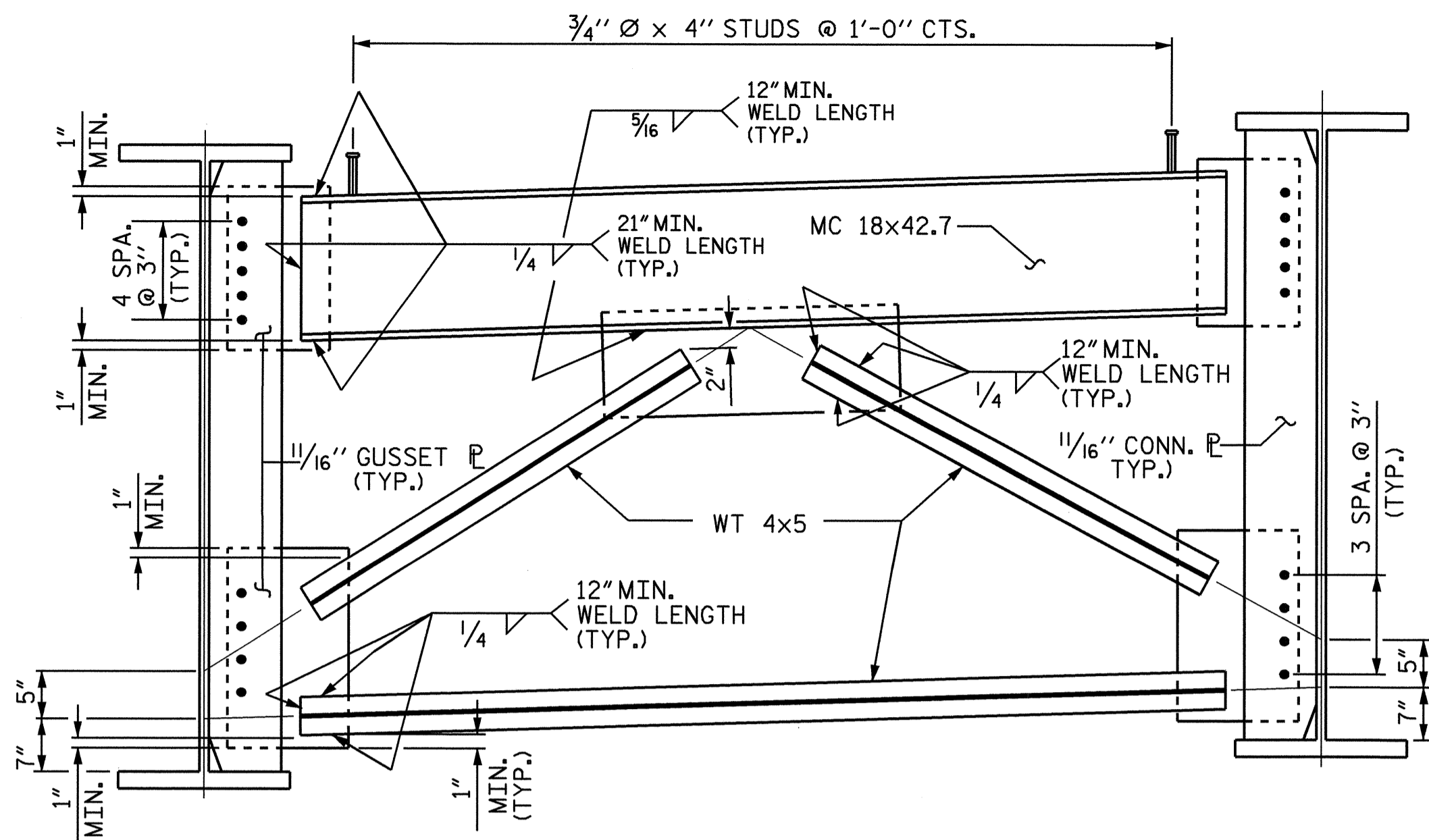
**SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS**



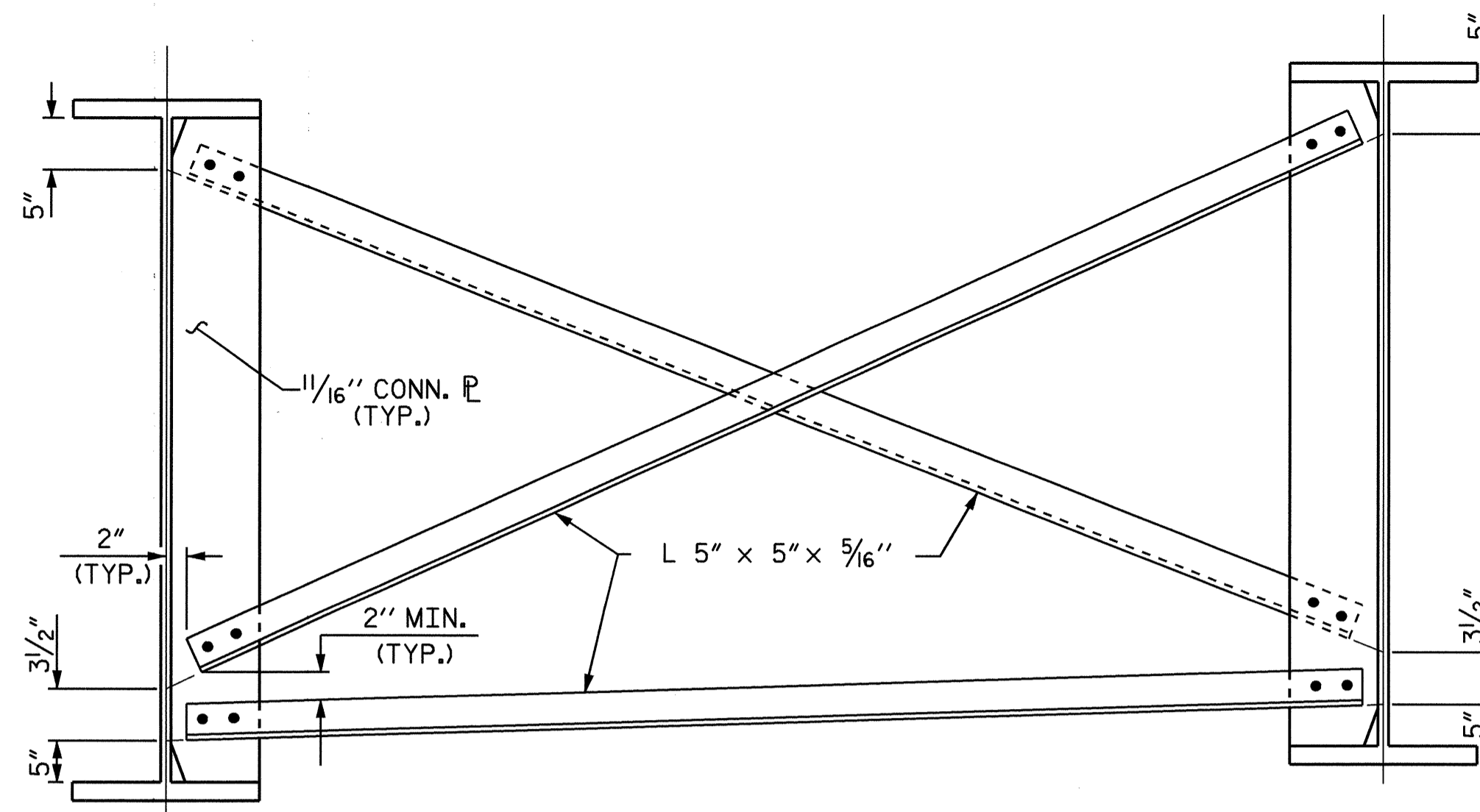
DRAWN BY : KEITH D. LAYNE DATE : 6/28/07
 CHECKED BY : H. A. L. DATE : 11/07

30-MAY-2008 08:56
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 sdombrowski

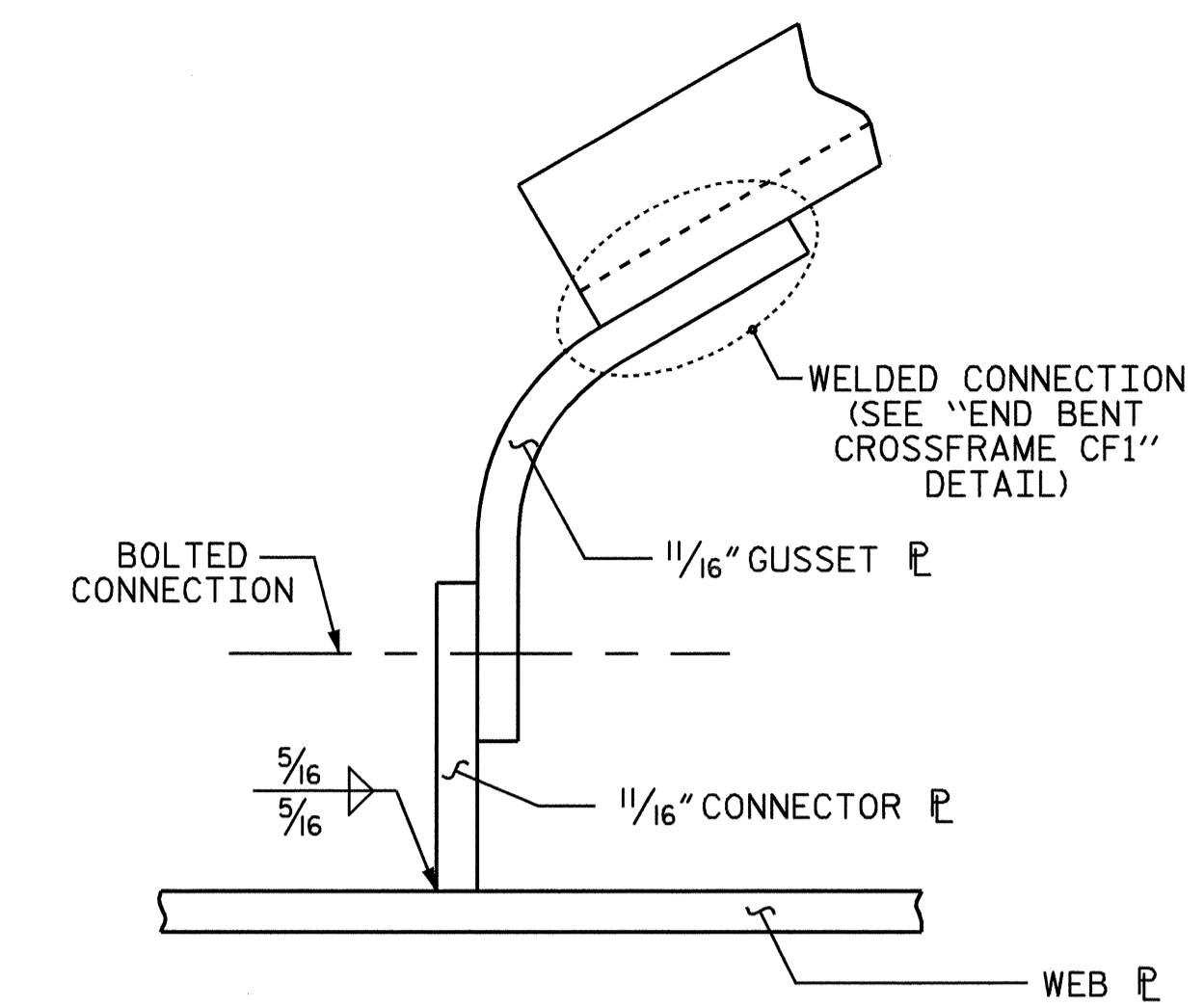
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			24



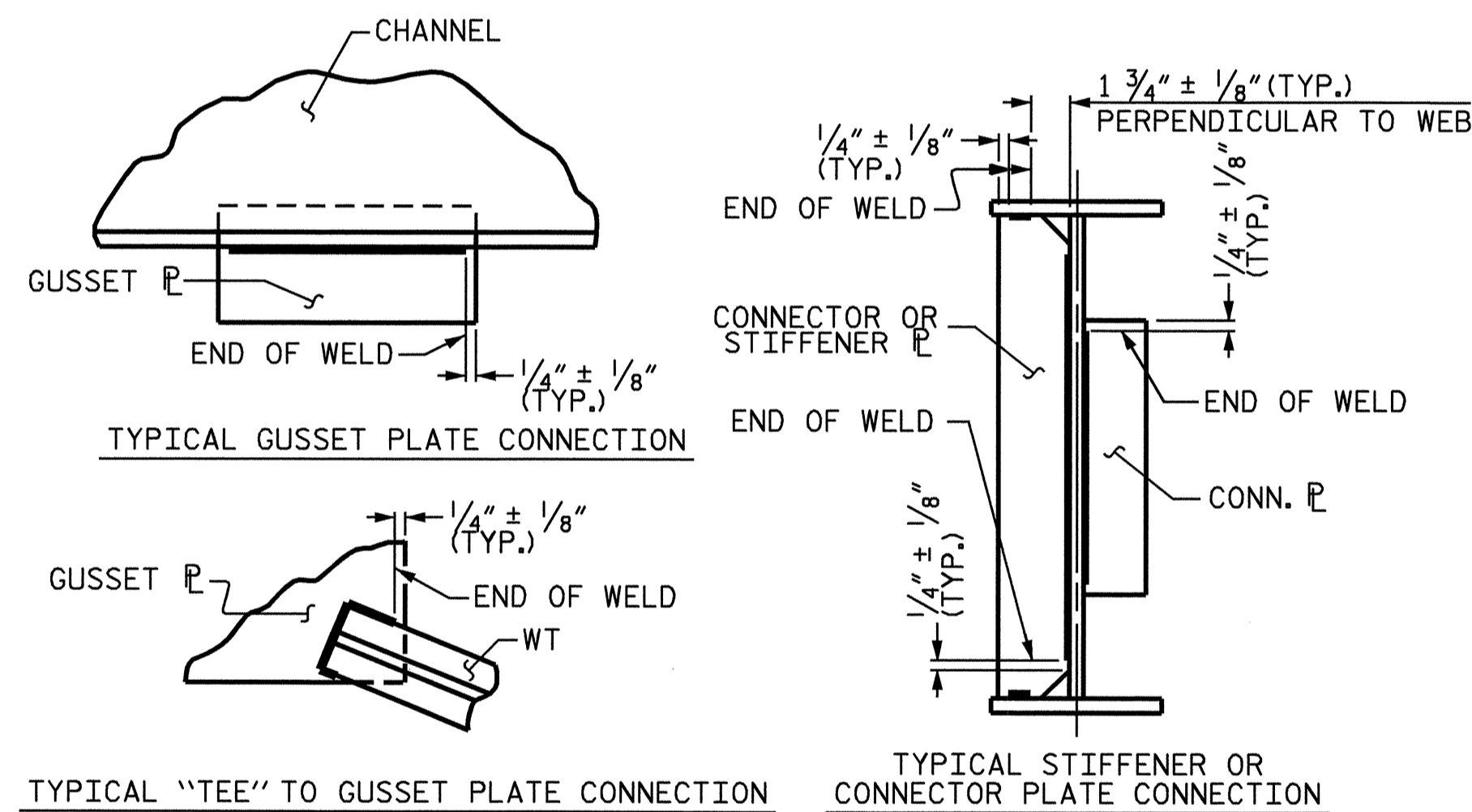
END BENT CROSSFRAME (CF-1)



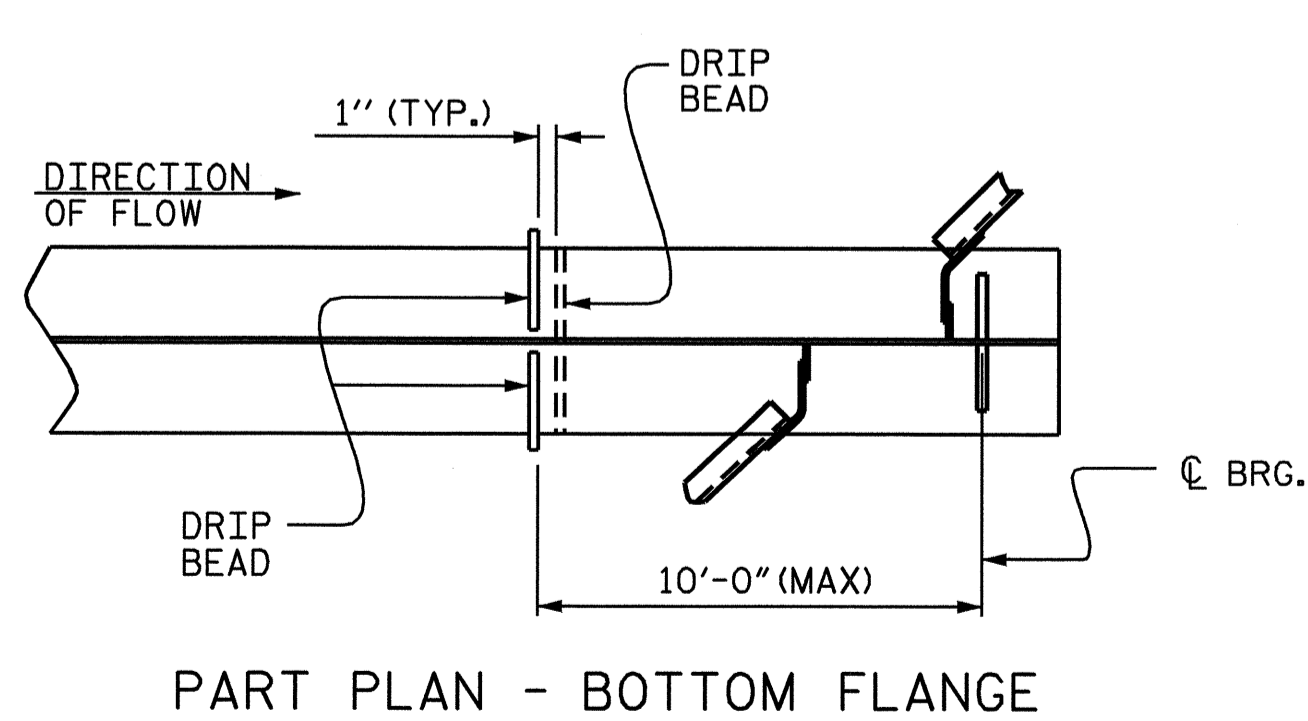
INTERMEDIATE CROSSFRAME (CF-2)



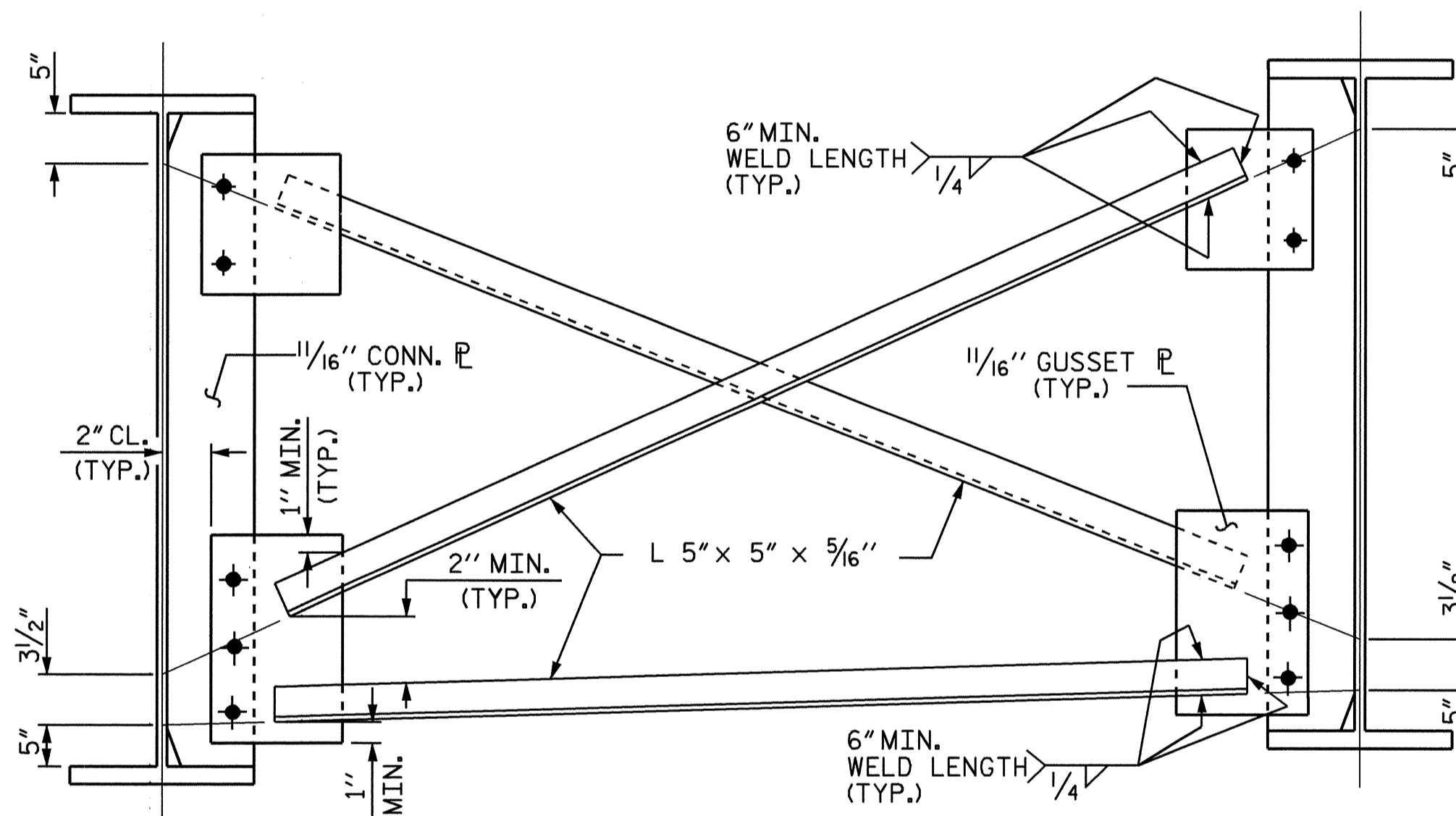
WELD DETAIL FOR CURVED GUSSET PLATE



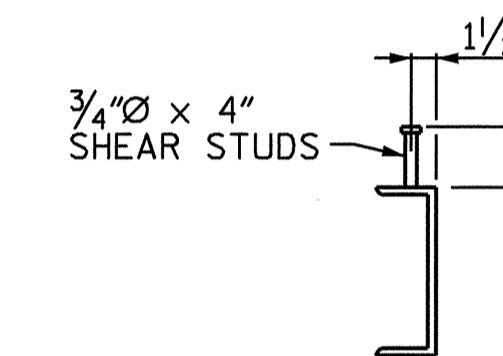
WELD TERMINATION DETAILS



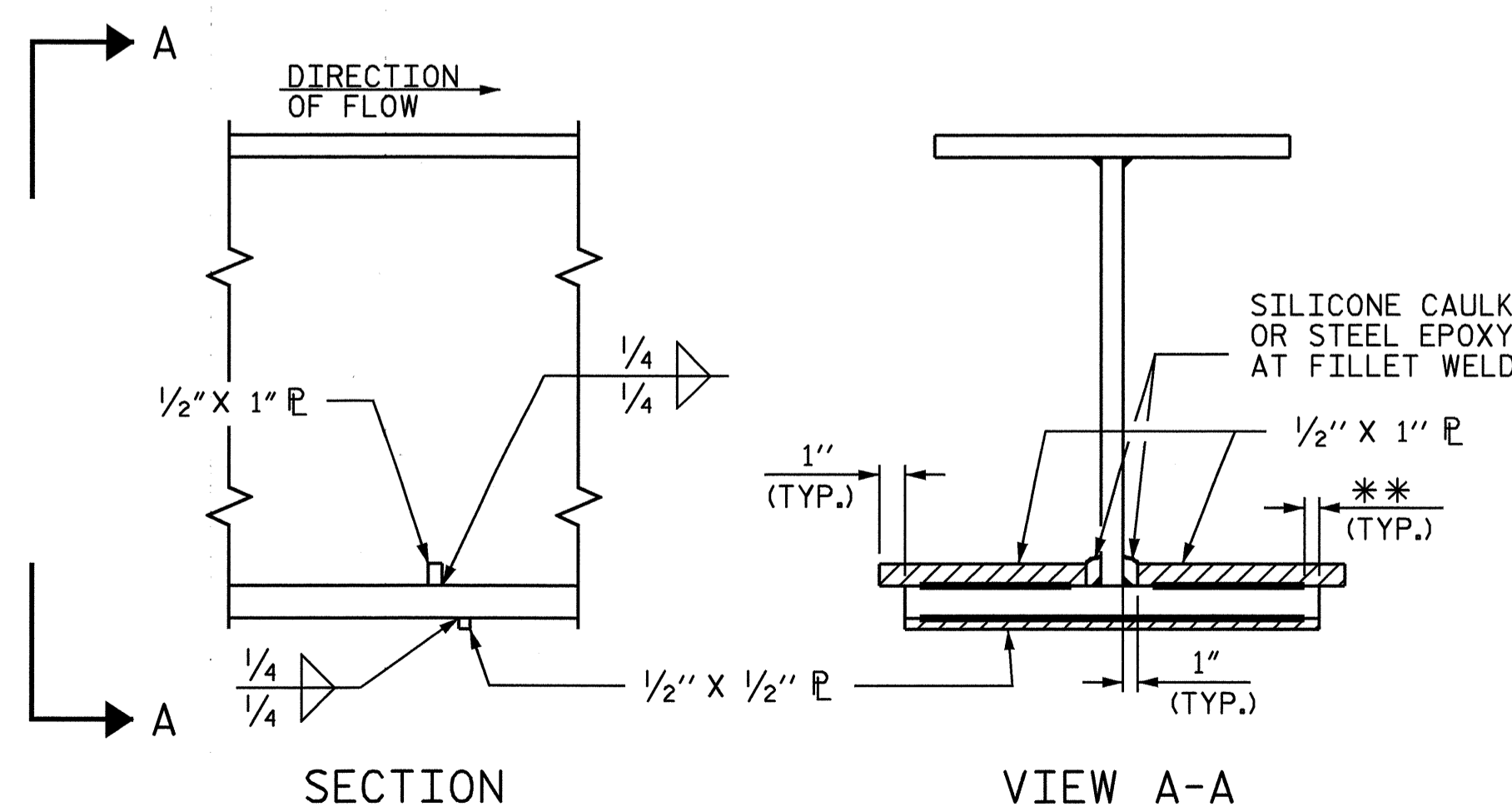
PART PLAN - BOTTOM FLANGE



OPTIONAL INTERMEDIATE CROSSFRAME (CF-2)



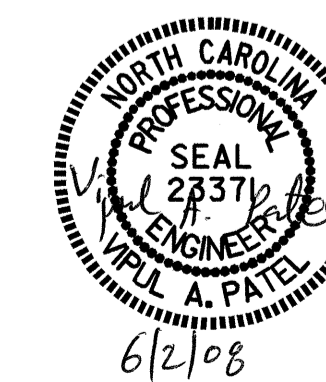
END BENT CROSSFRAME SHEAR STUD DETAILS



DRIP BEAD DETAILS

DRAWN BY: KEITH D. LAYNE DATE: 7/28/03
 CHECKED BY: H. A. L. DATE: 11/07

30-MAY-2008 08:56
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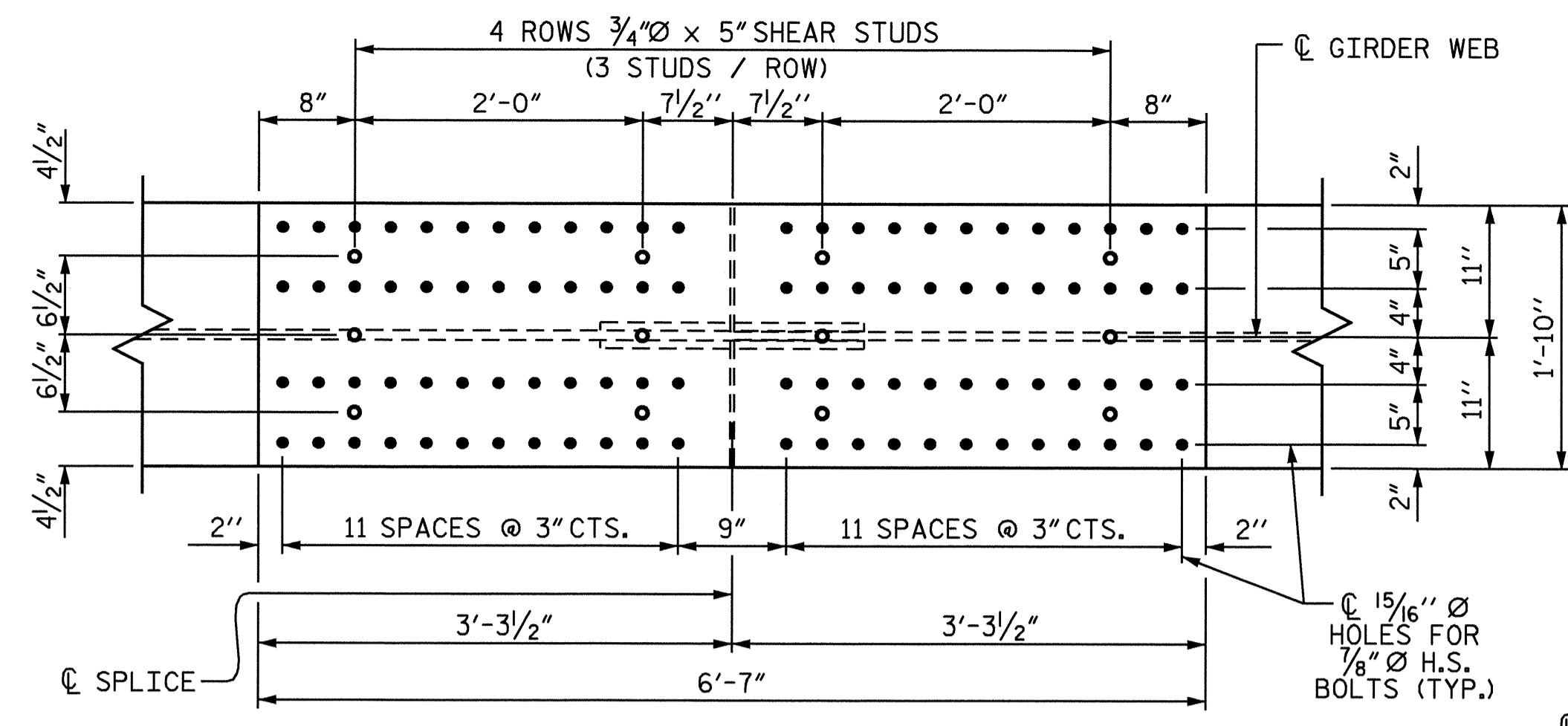
PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 3 OF 5

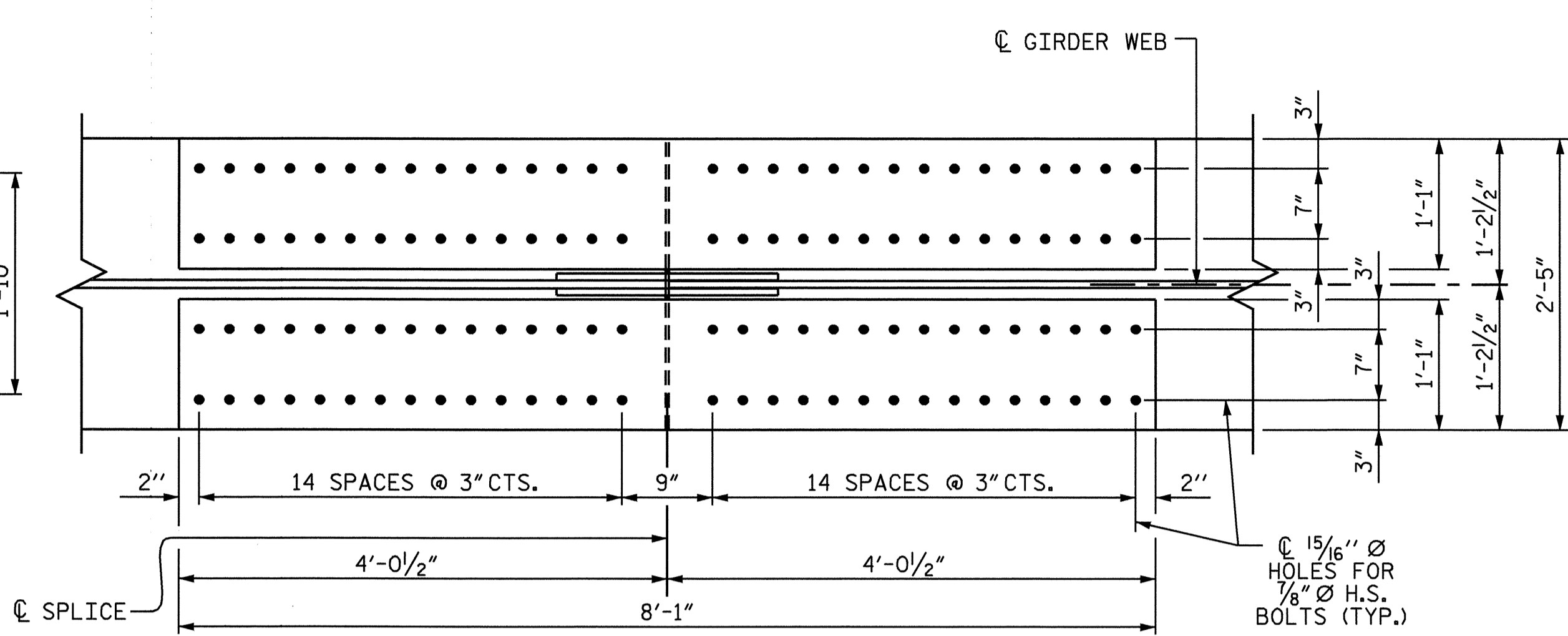
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

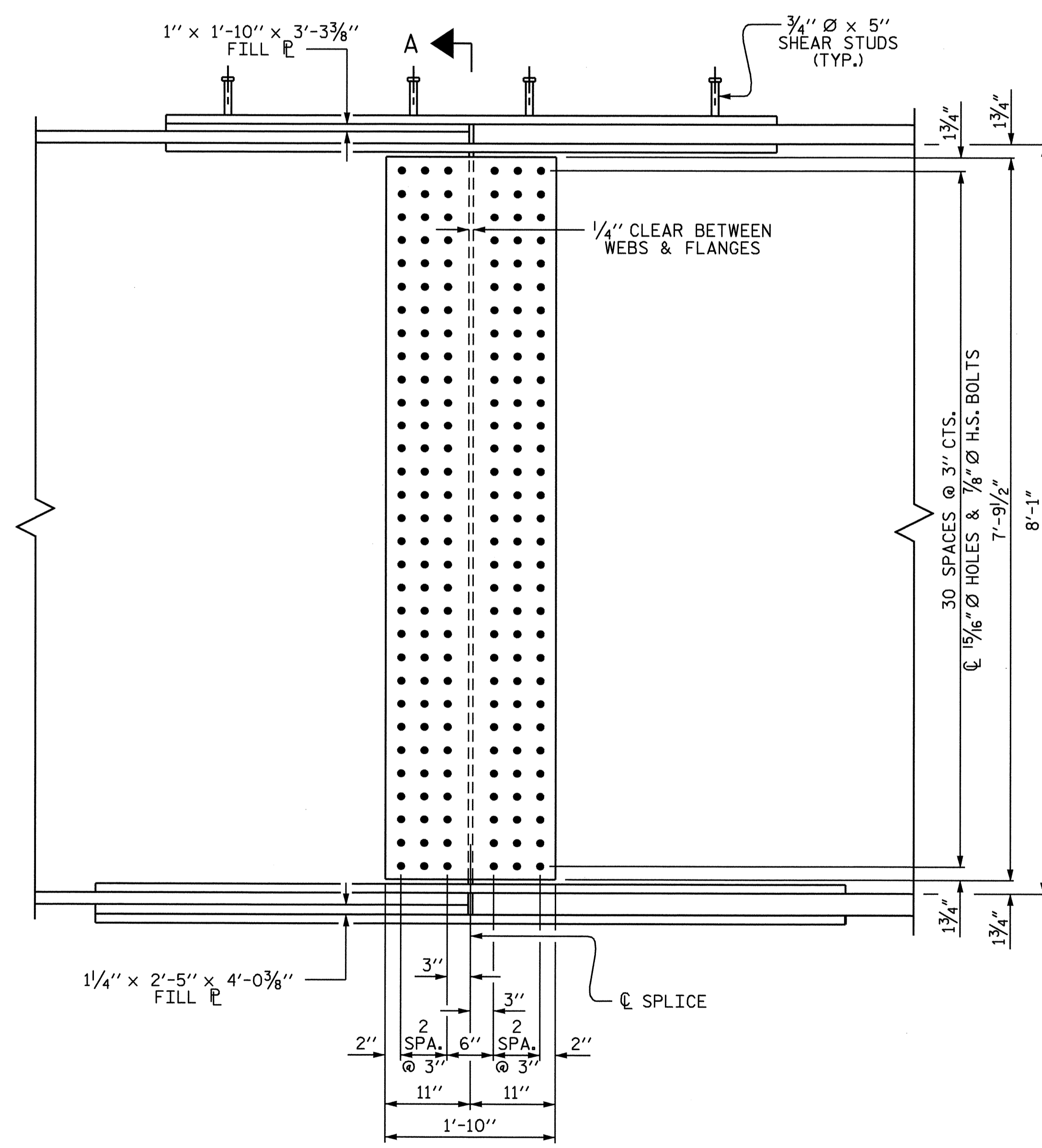
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			24



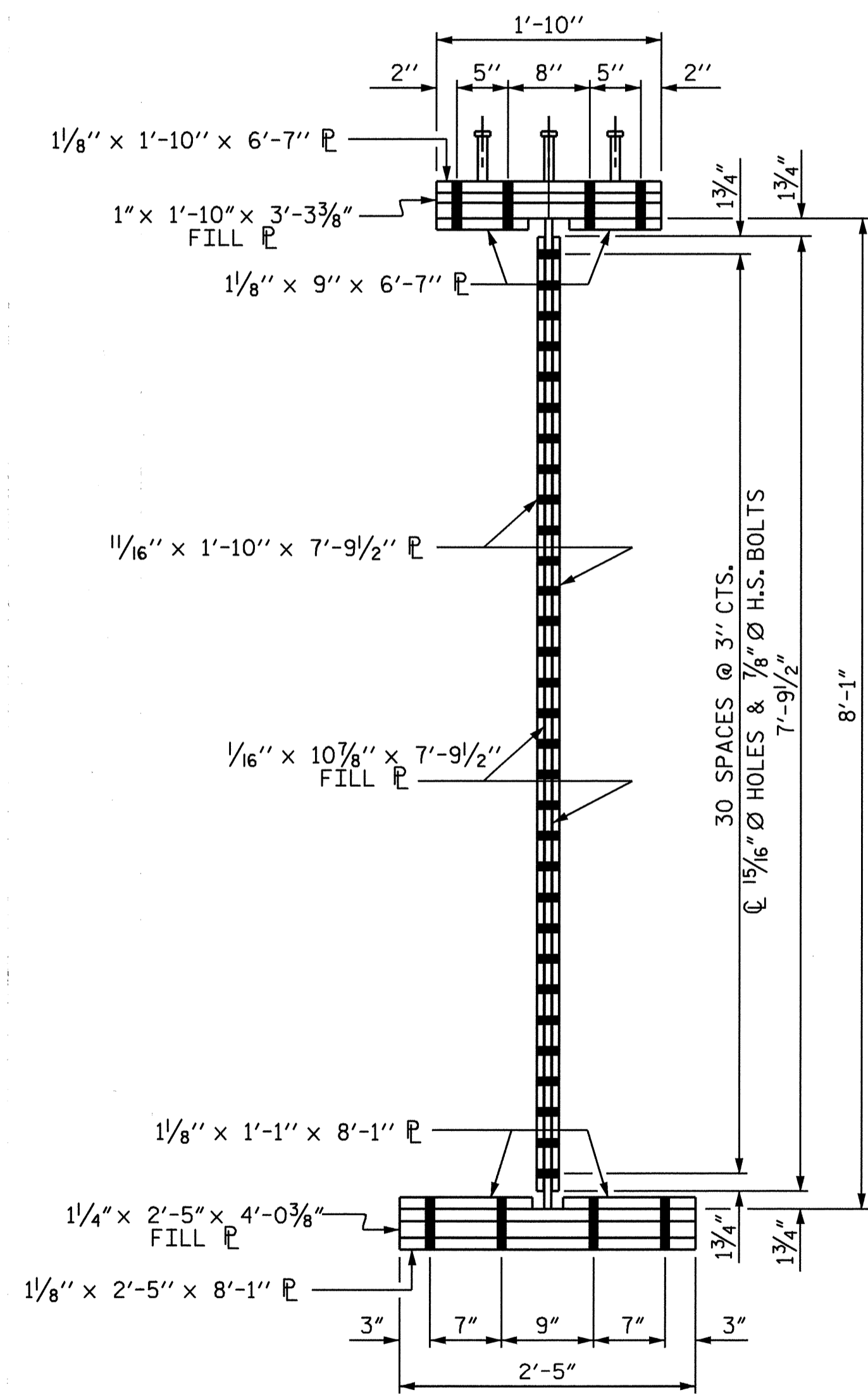
PLAN (TOP OF FLANGE)



PLAN (TOP OF BOTTOM FLANGE)



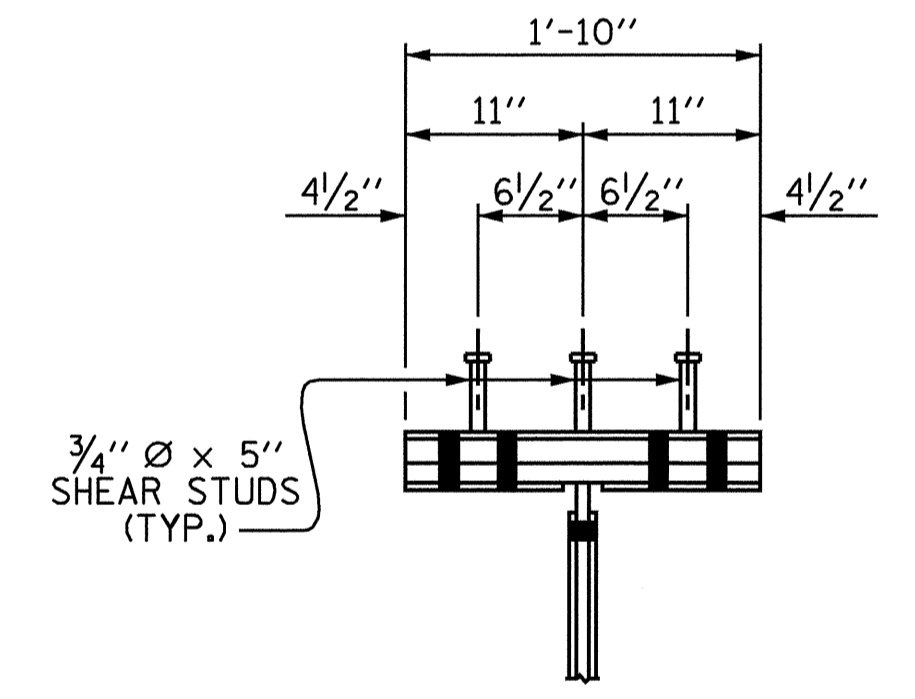
ELEVATION



SECTION A-A

NOTES

- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
- ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
- BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
- END OF GIRDERS SHALL BE PLUMB.
- STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.
- SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.
- TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.
- A CHARTY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES, AND WEB SPLICE PLATES FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.
- FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.



SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

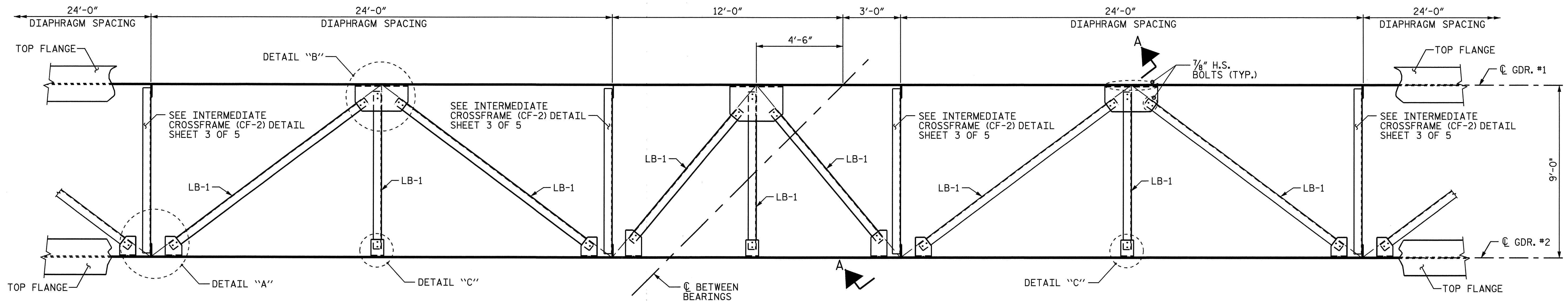
PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-
 SHEET 4 OF 5



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-9
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS						
REVISIONS						TOTAL SHEETS 24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

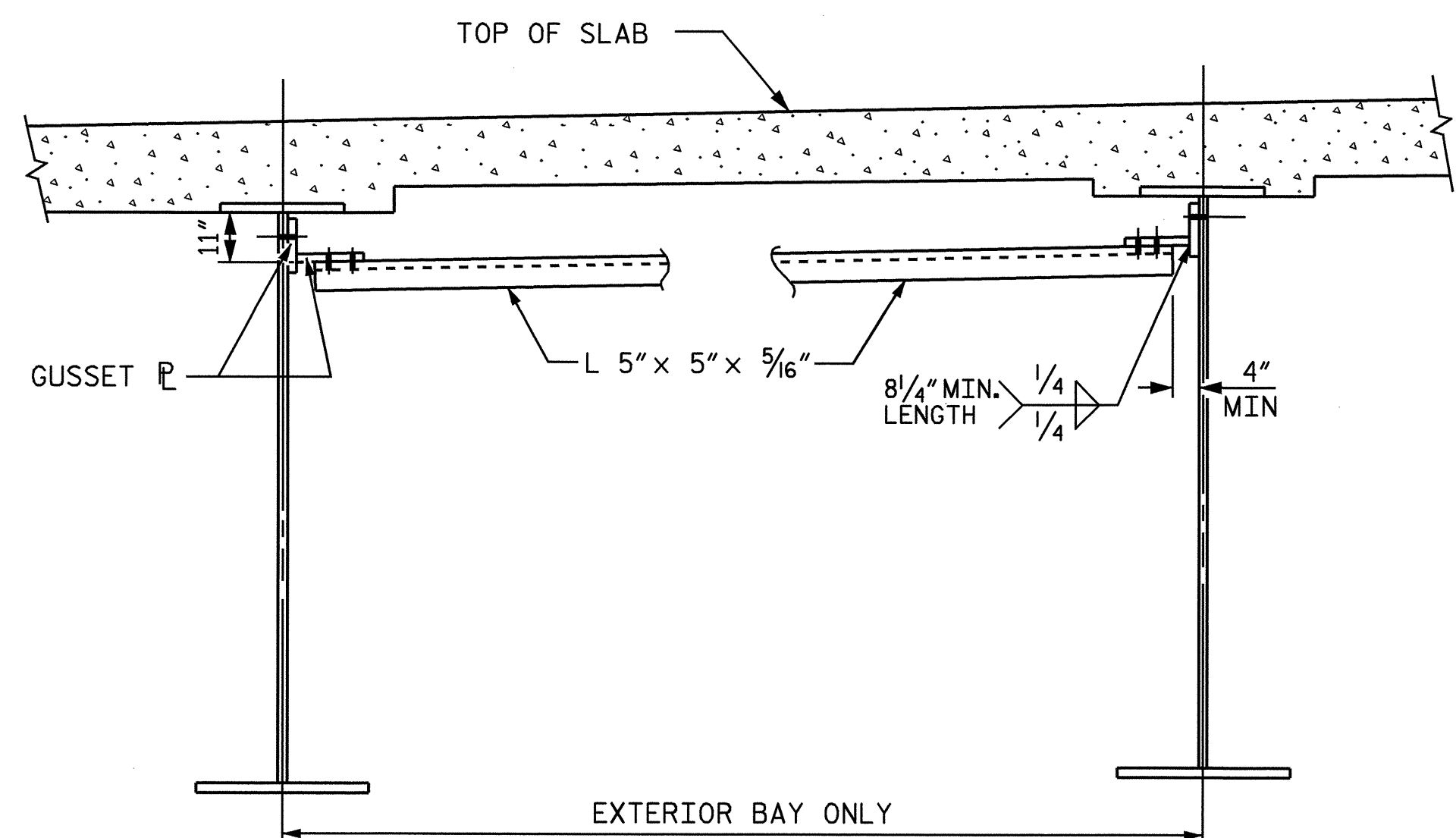
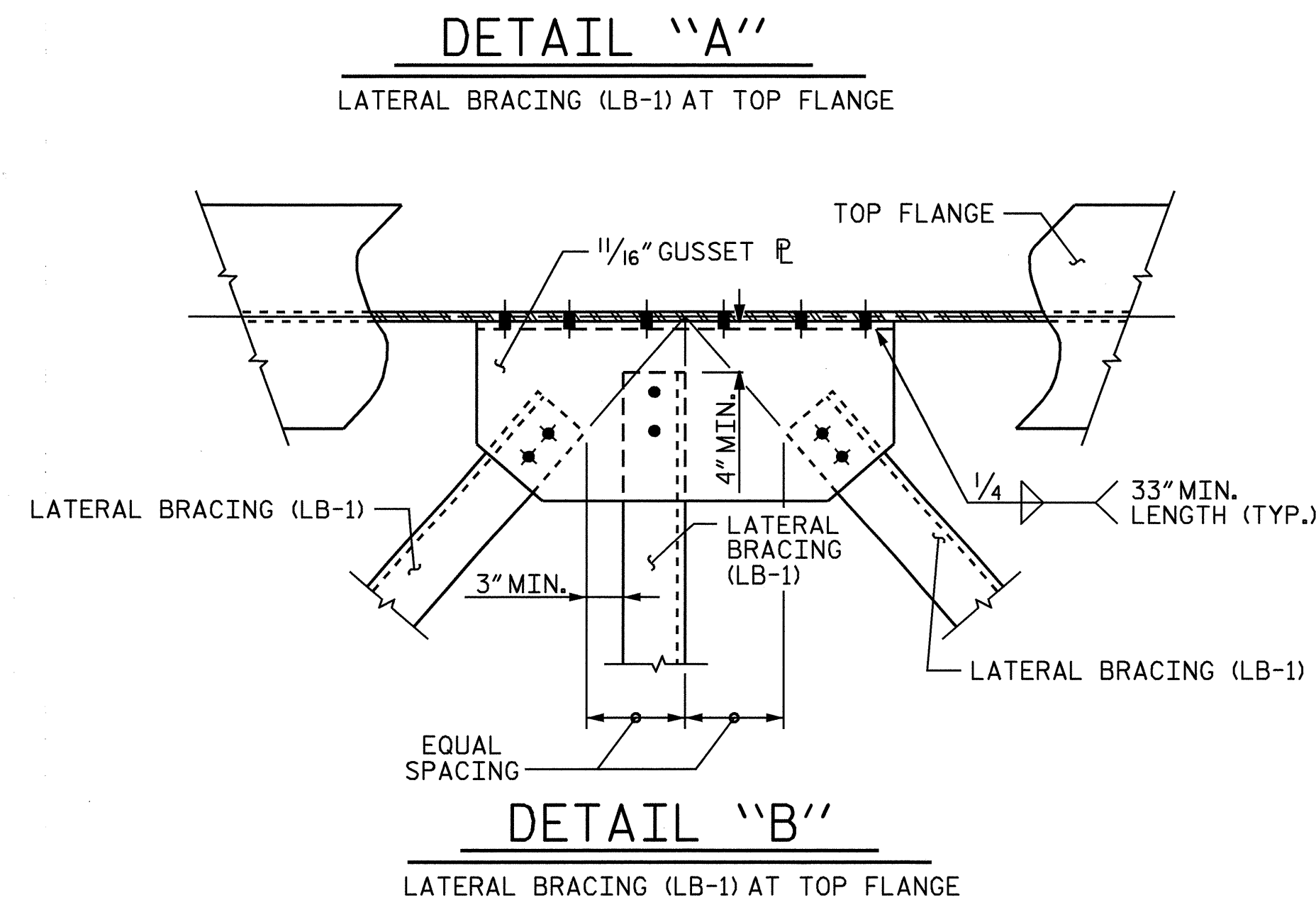
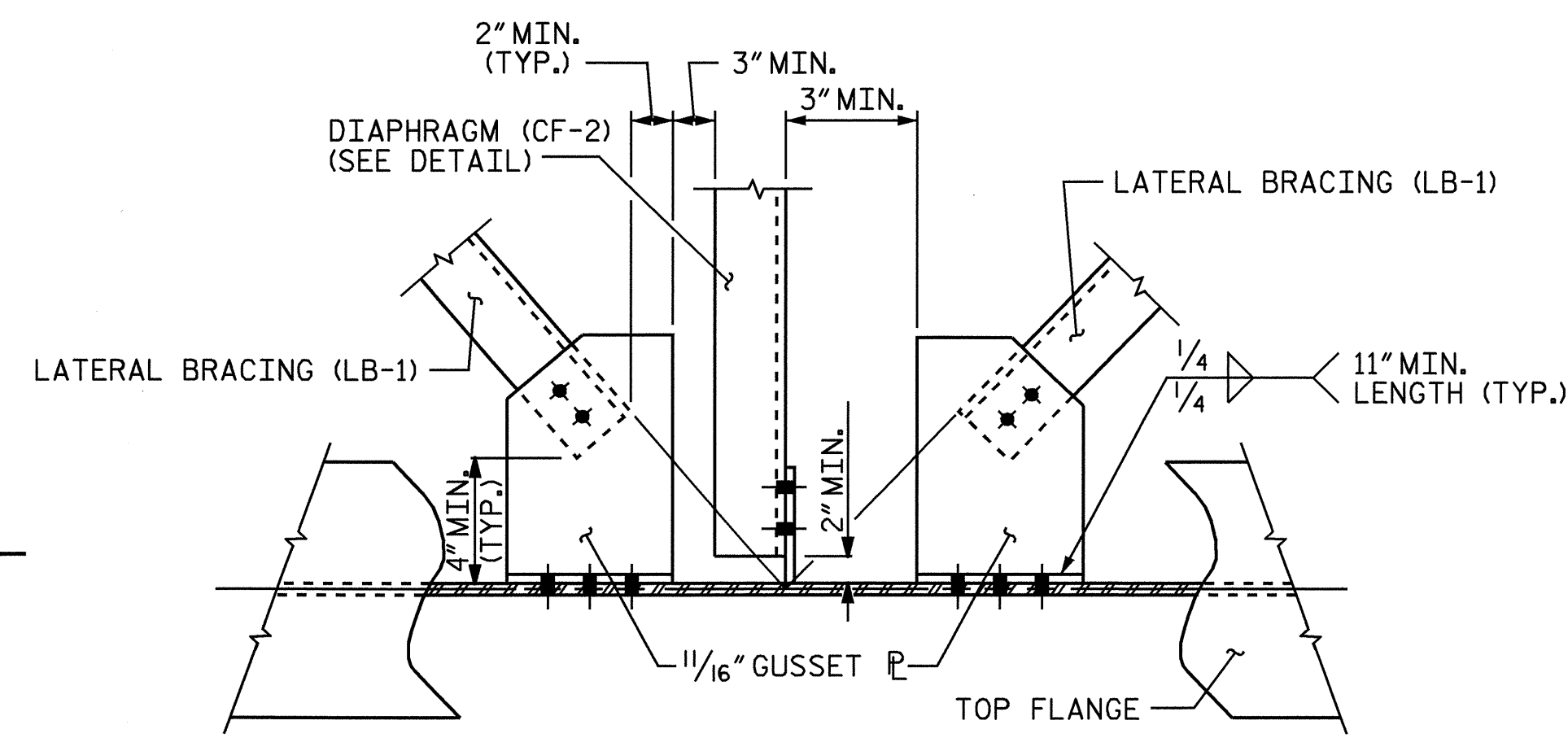
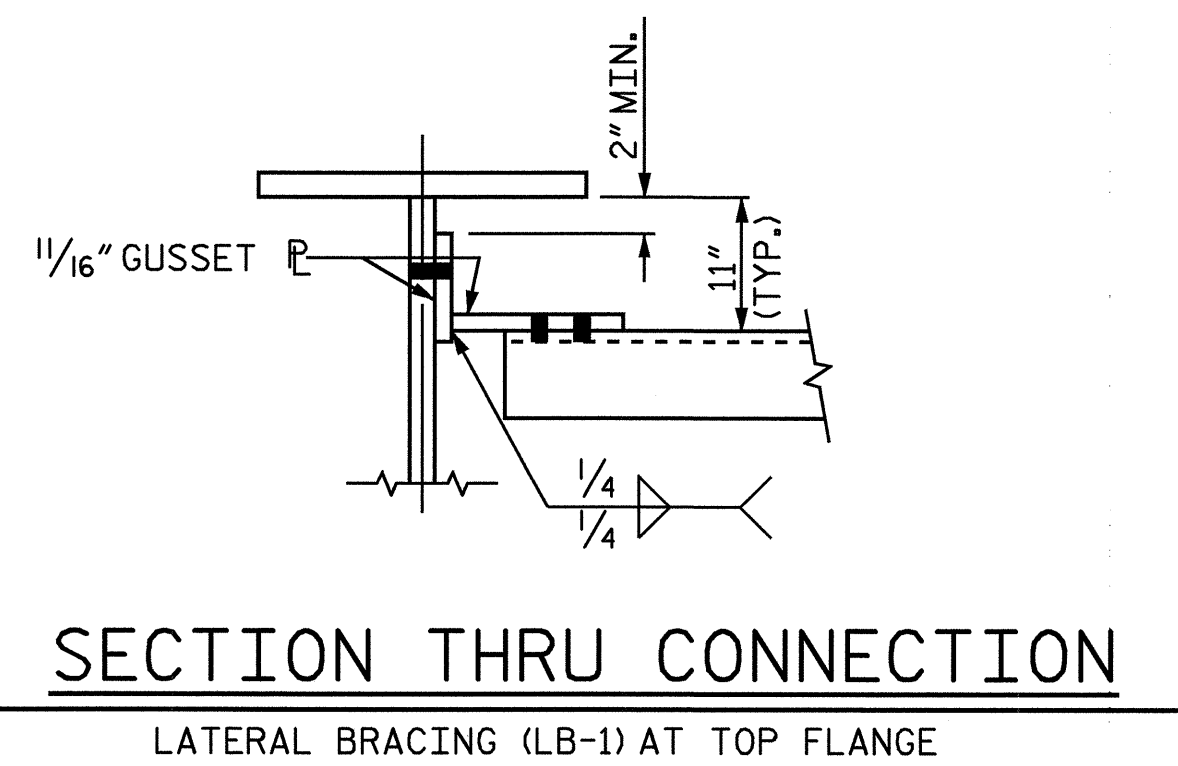
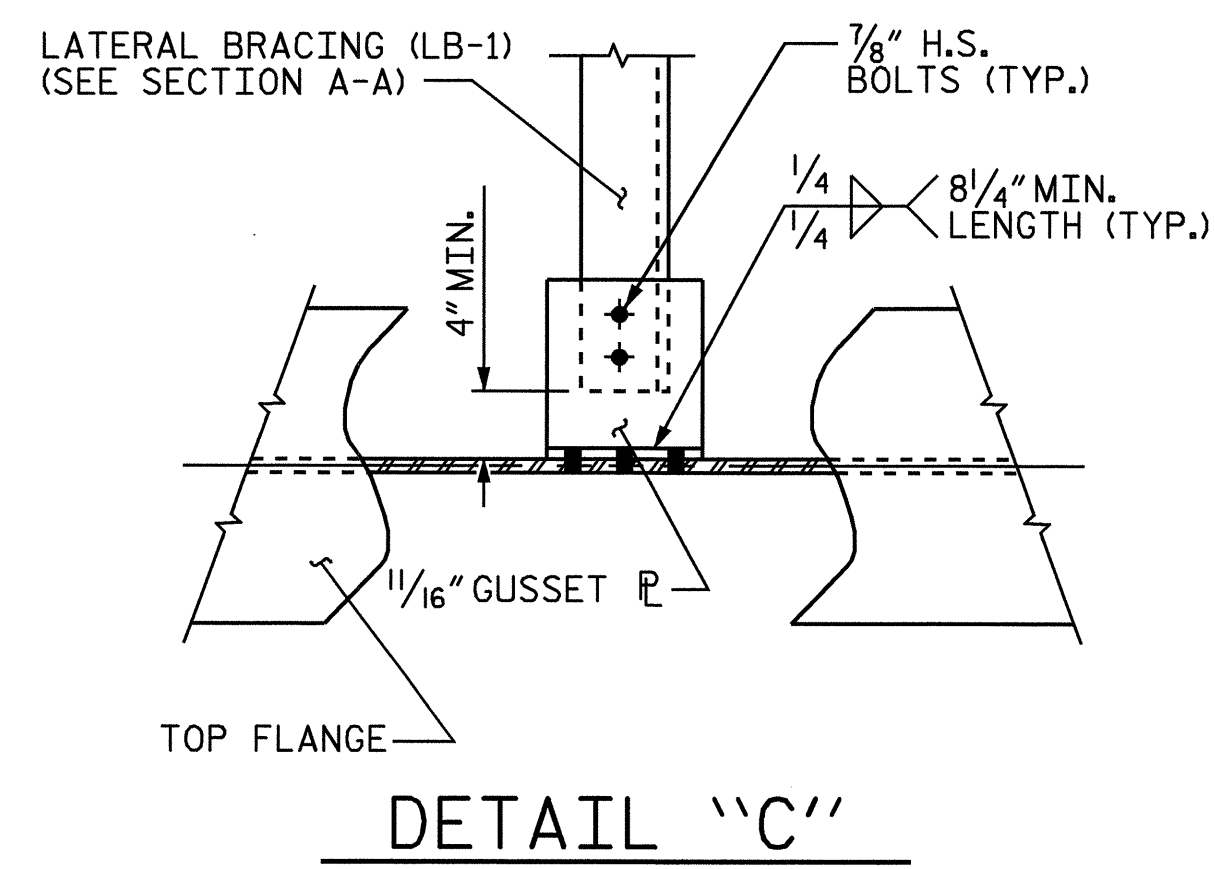
DRAWN BY: KEITH D. LAYNE DATE: 6/28/07
 CHECKED BY: H. A. L. DATE: 11/07

BOLTED FIELD SPLICE DETAILS
 (TYPICAL EACH FIELD SPLICE)



PART PLAN - TOP FLANGE LATERAL BRACING (LB-1)

GIRDER #1 AND GIRDER #2 SHOWN, GIRDER #6 AND GIRDER #7 SIMILAR.
 ALL GUSSET P'S ARE 1/16" THICK UNLESS OTHERWISE NOTED.



SECTION A-A
 (LATERAL BRACING AT TOP FLANGE)

NOTES

THE TOP FLANGE LATERAL BRACING DETAILED IS PROVIDED TO ASSIST IN LIMITING GIRDER DISPLACEMENT DUE TO WIND FORCES DURING ERECTION. IT SHALL BE INSTALLED IMMEDIATELY AFTER ERECTION OF EACH PAIR OF GIRDER SECTIONS AT THE END BENTS. THE DEPARTMENT ASSUMES NO LIABILITY IN THE ERECTION OR STABILIZATION OF THE GIRDERS.

ALL BOLTED CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

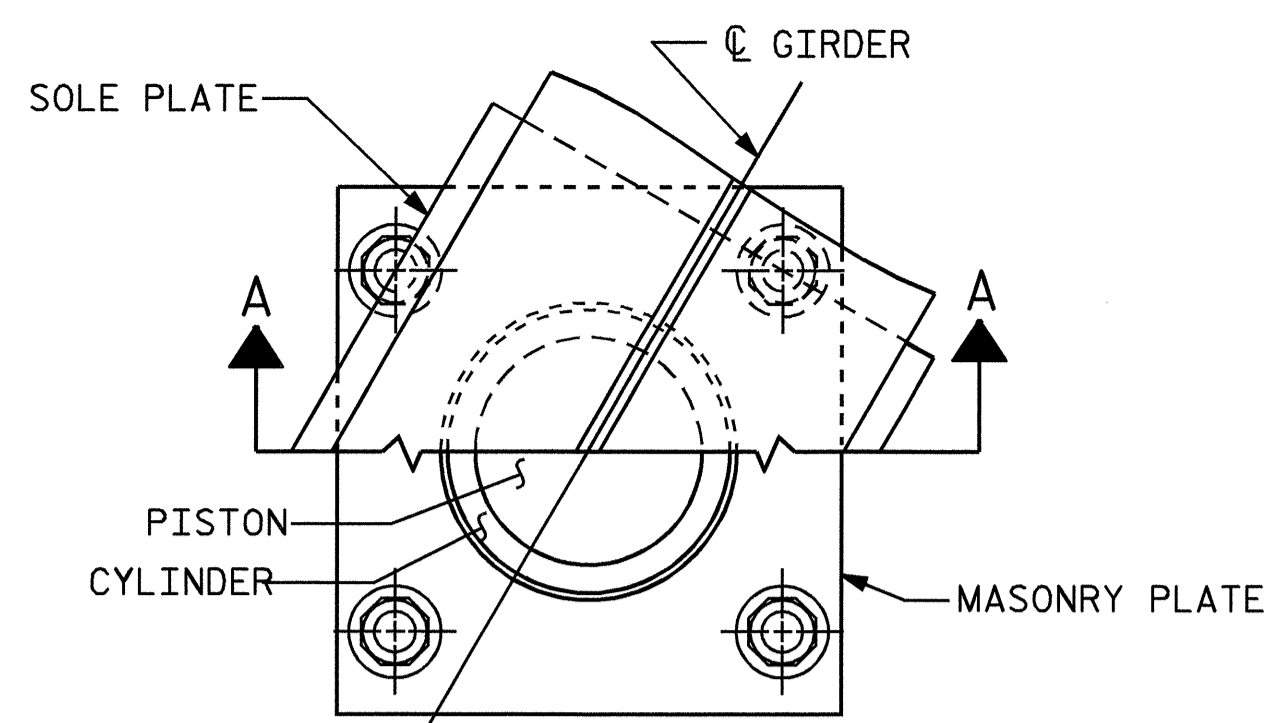
SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS



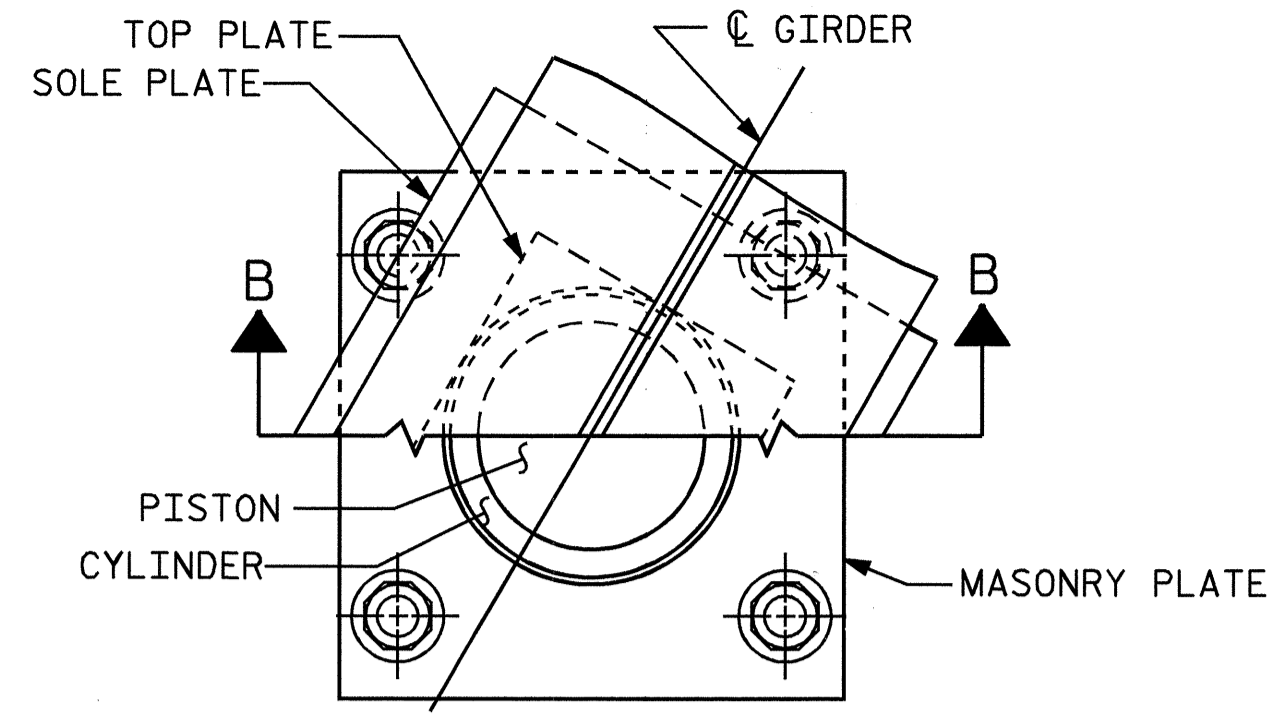
DRAWN BY: KEITH D. LAYNE DATE: 7/11/07
 CHECKED BY: H. A. L. DATE: 11/07

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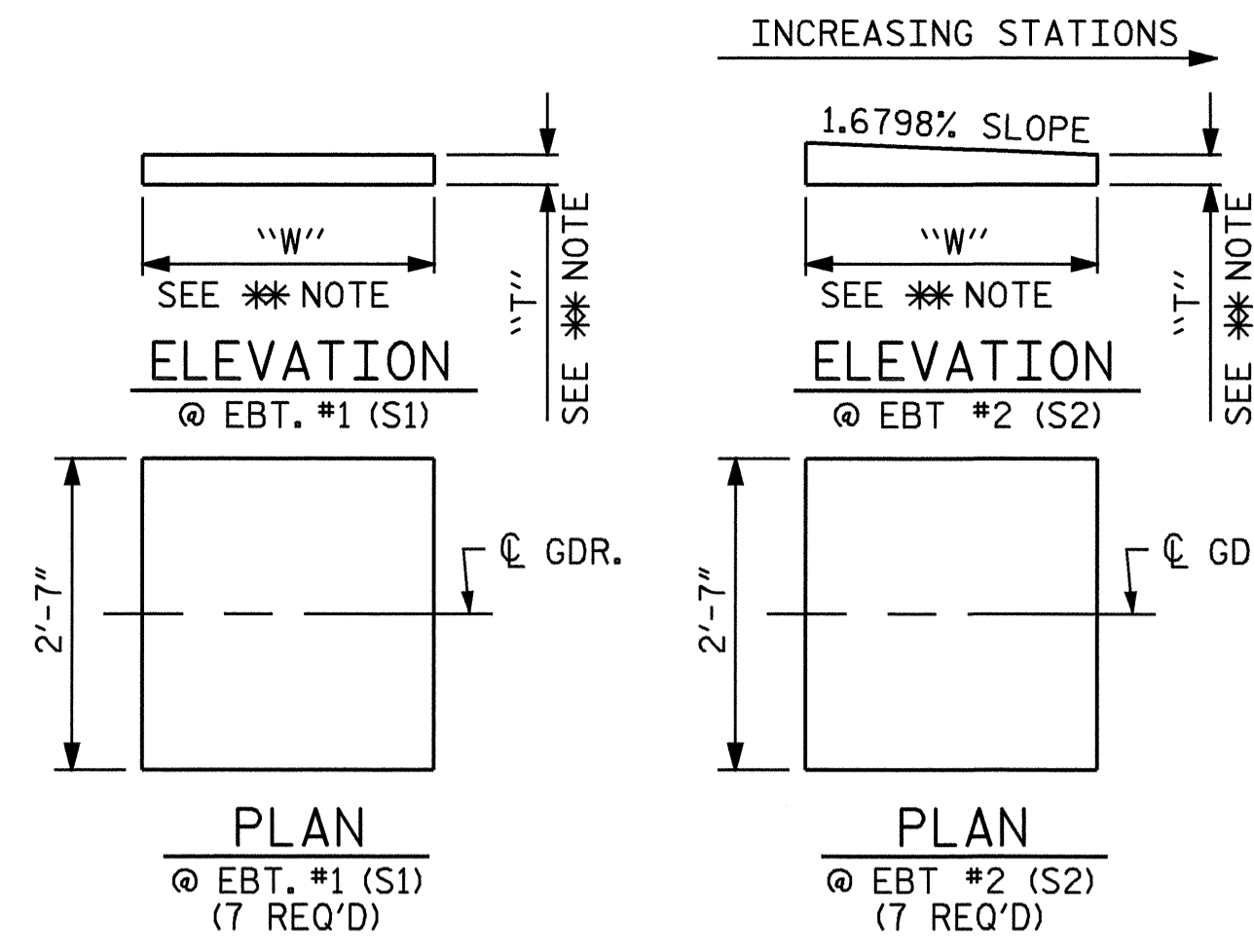
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			24



CUT-AWAY PLAN



CUT-AWAY PLAN



SOLE PLATE DETAILS

* NOTE: DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT IN SPAN A, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED. THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

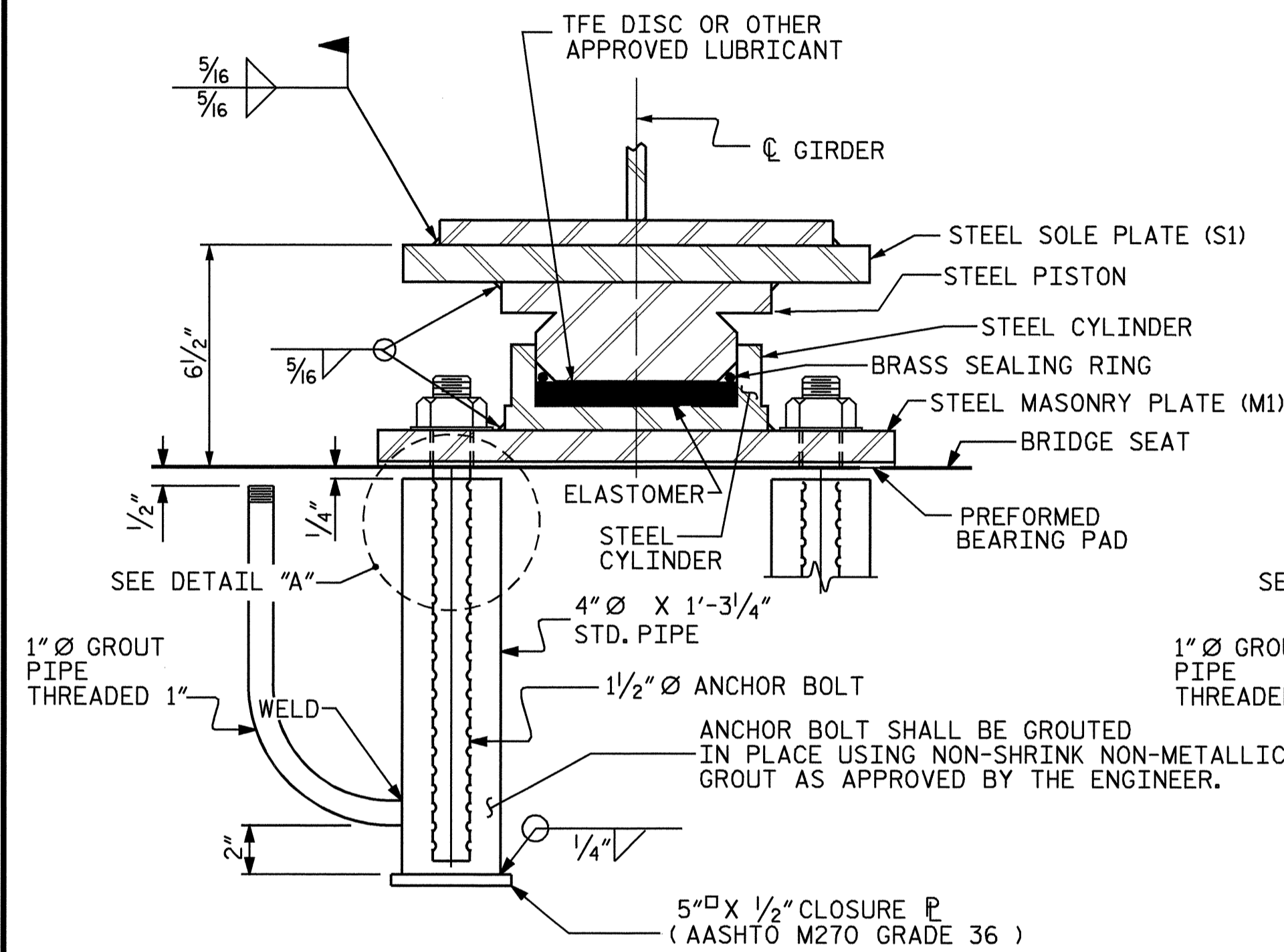
SOLE PLATES SHOULD BE WELDED TO BEAM FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

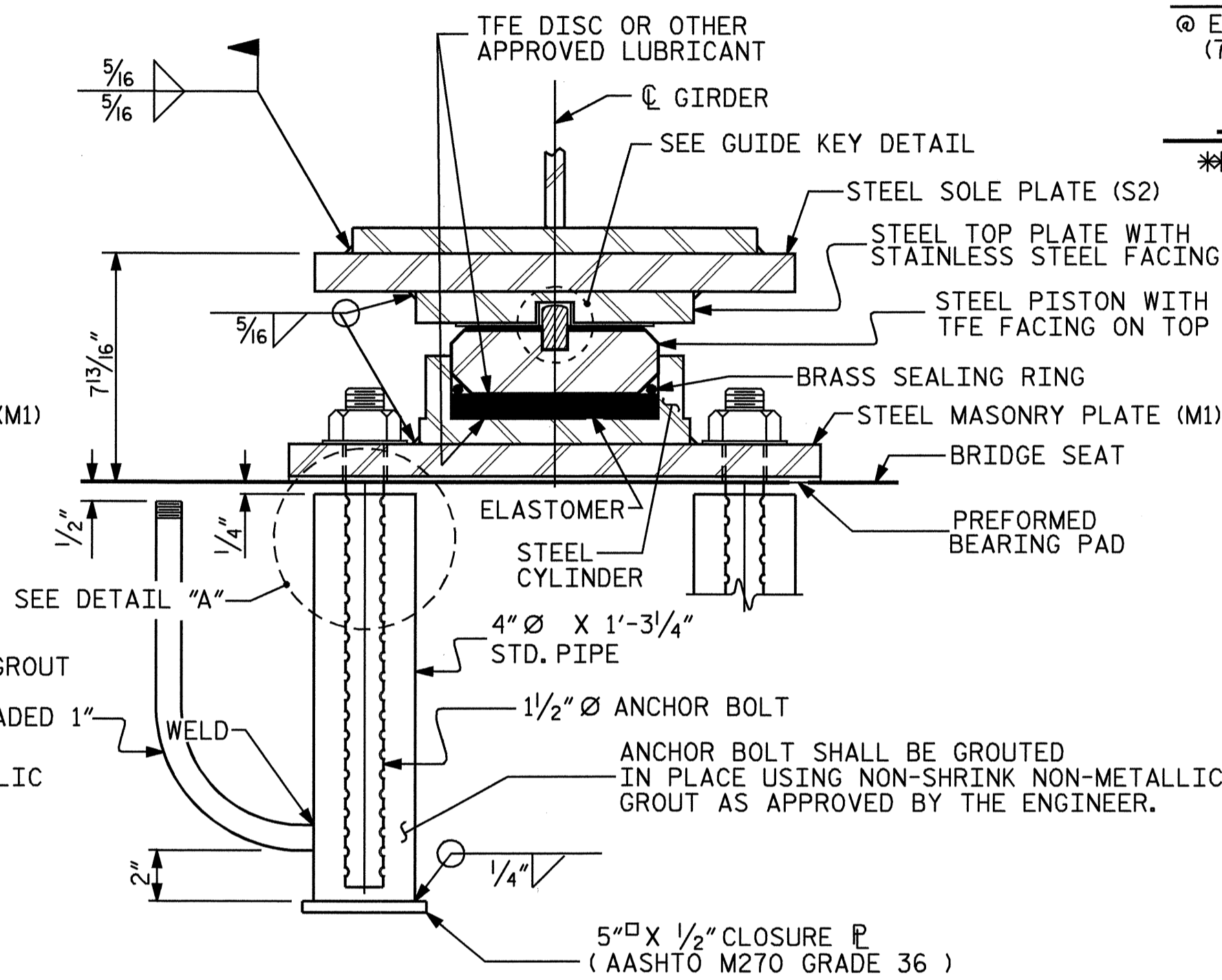
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2". SEE SPECIAL PROVISION FOR POT BEARINGS.

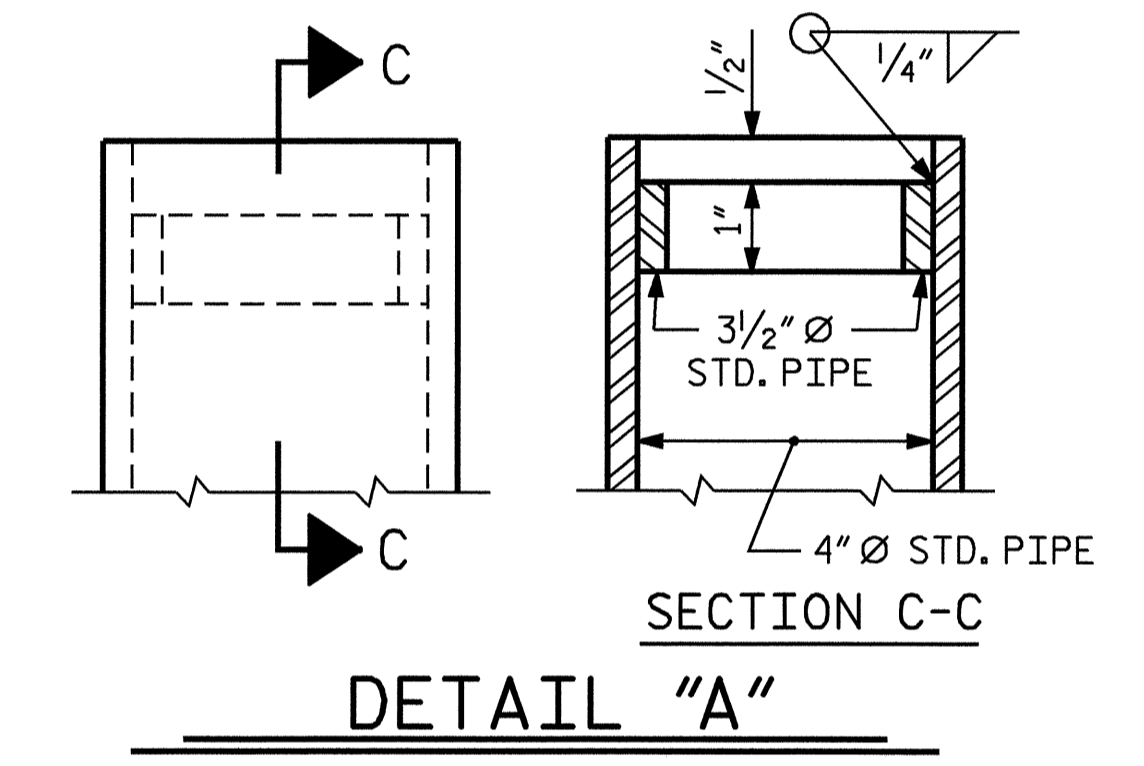
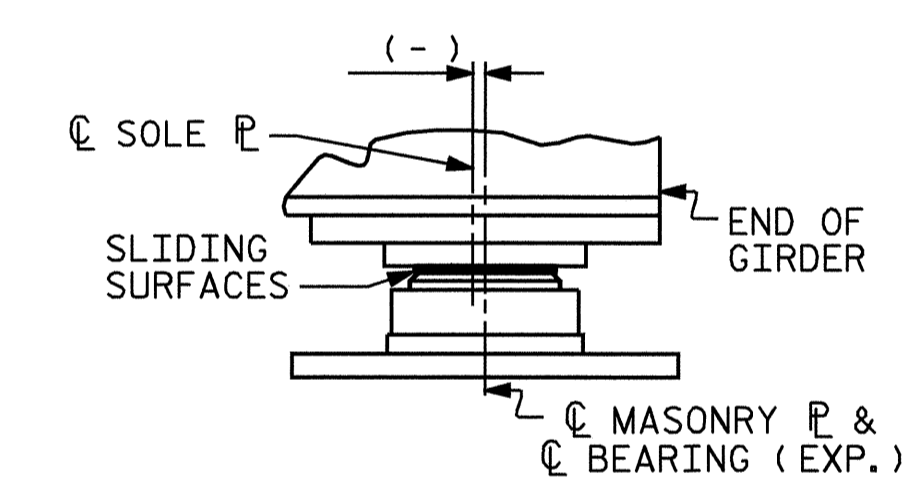


SECTION A-A
PB1, FIXED
(7 REQ'D.)

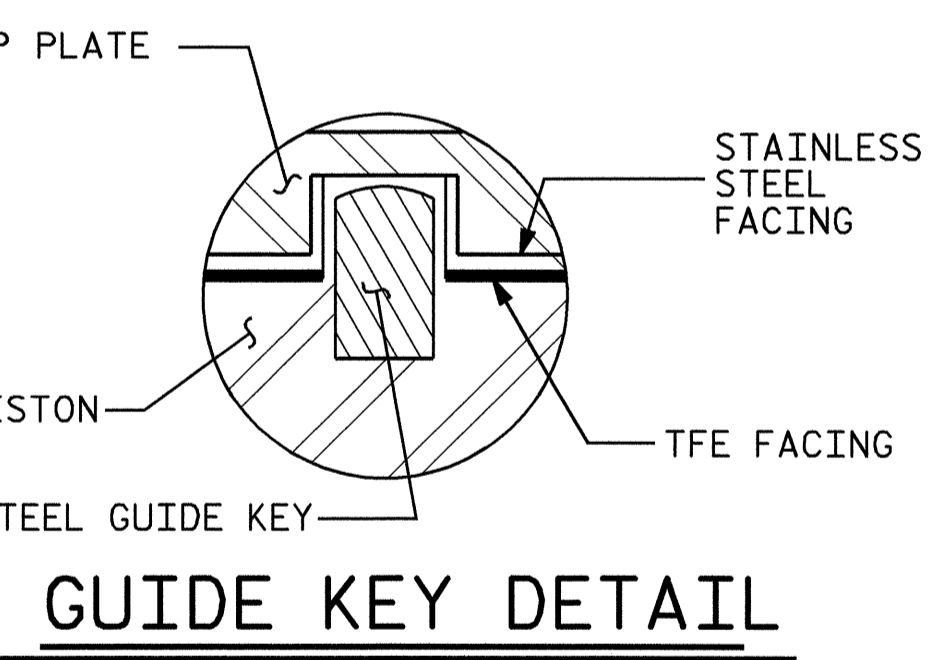


SECTION B-B
PB2, EXP.
(7 REQ'D.)

POT BEARING DETAILS



DETAIL "A"



GUIDE KEY DETAIL

TABLE FOR PLATE SETTING DATA
(EXPANSION POT BEARINGS)

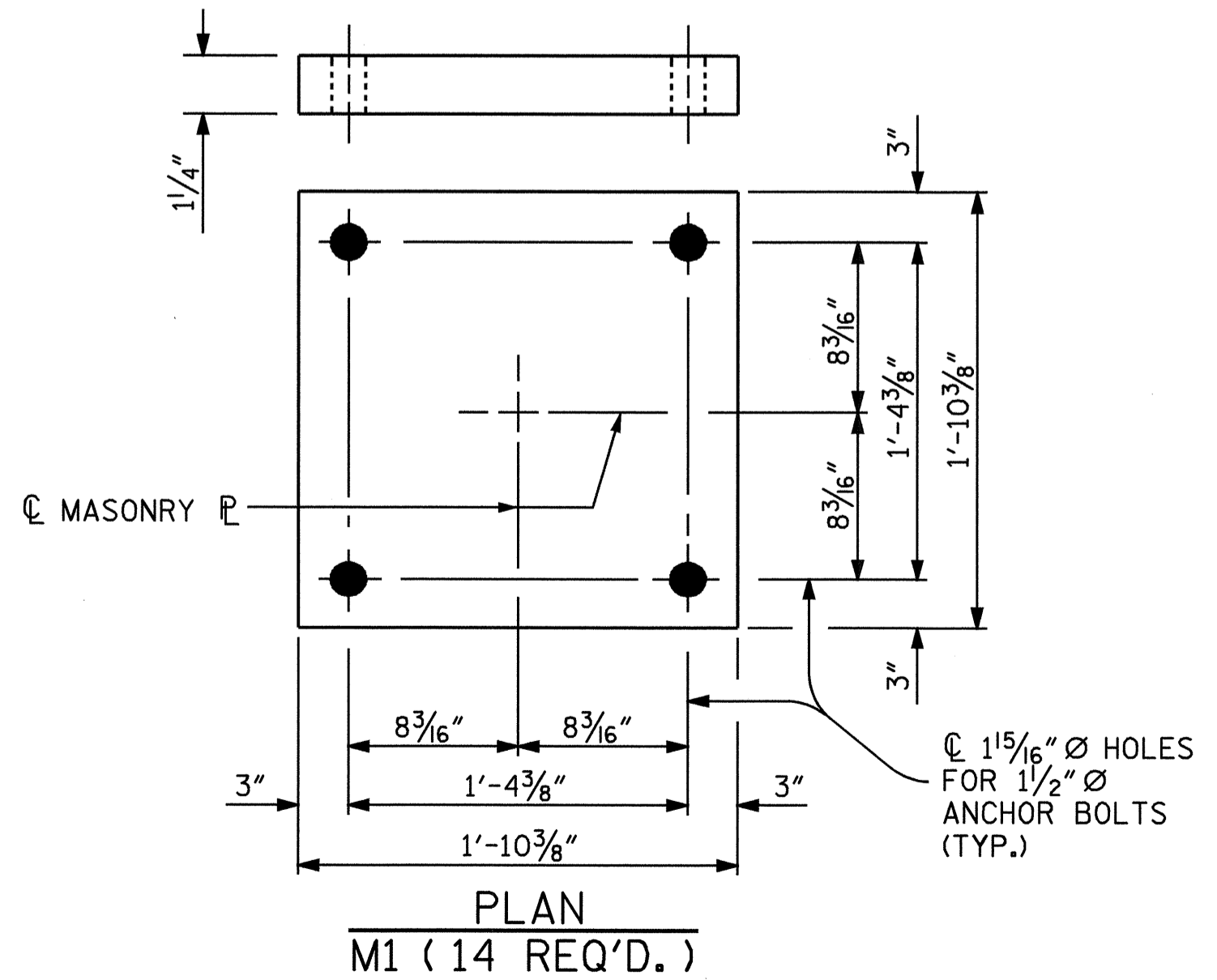
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	*
@ EBT.#2	-9/16"	0	9/16"	2"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL

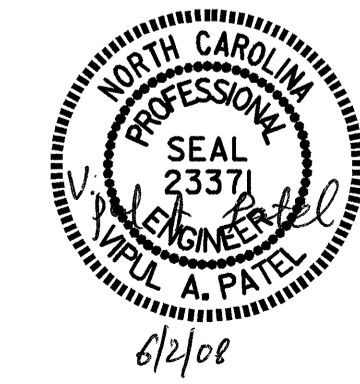
TABLE FOR LOADS AND MOVEMENTS

BEARING	LOCATION	VERTICAL LOAD (KIPS)			LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD	LIVE	TOTAL		
PB1 (FIXED)	@ EBT. #1	276.09	105.67	381.76	55.2	0
PB2 (EXP.)	@ EBT. #2	276.09	105.67	381.76	55.2	1 3/4"



MASONRY PLATE DETAILS

ASSEMBLED BY : KEITH D. LAYNE DATE : 07/06/07
 CHECKED BY : H. A. L. DATE : 11/07
 DRAWN BY : RWW 8/99 REV. 7/10/01 LES/RDR
 CHECKED BY : LES 8/99 REV. 5/7/03 RWW/JTE
 REV. 5/1/06 TLA/GM



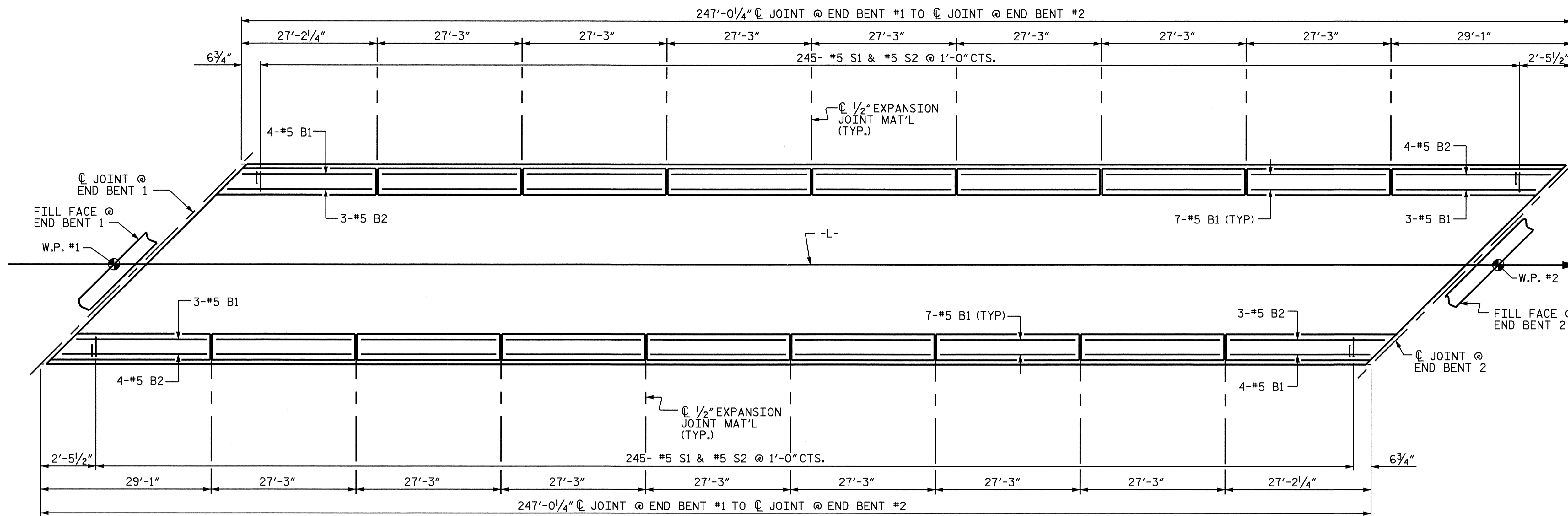
PROJECT NO. B-4534
 GUILFORD COUNTY
 STATION: 31+81.71 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 POT BEARING
 DETAILS

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 24
2			4			

STD. NO. PB1



PLAN OF BARRIER RAIL
DISTANCES MEASURED ALONG OUTSIDE EDGE OF BRIDGE

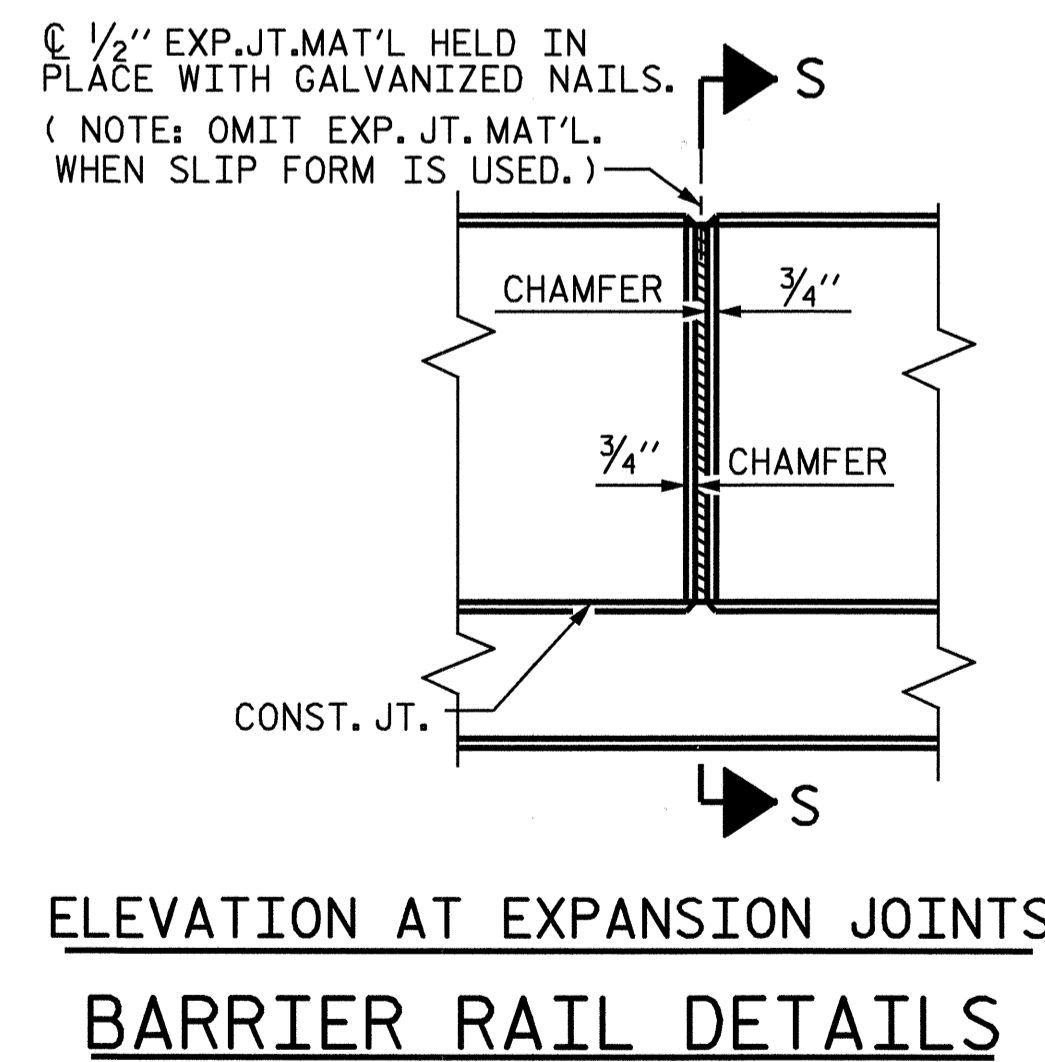
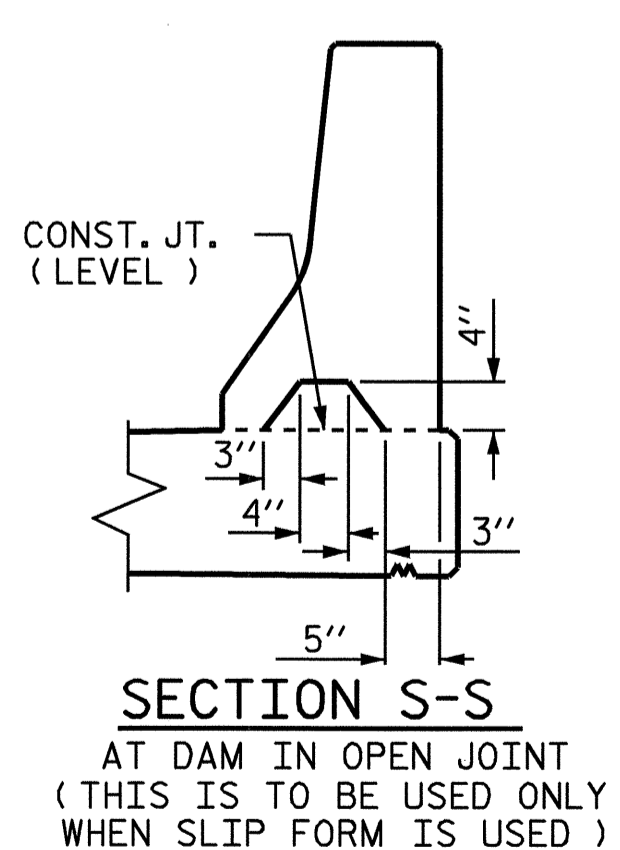
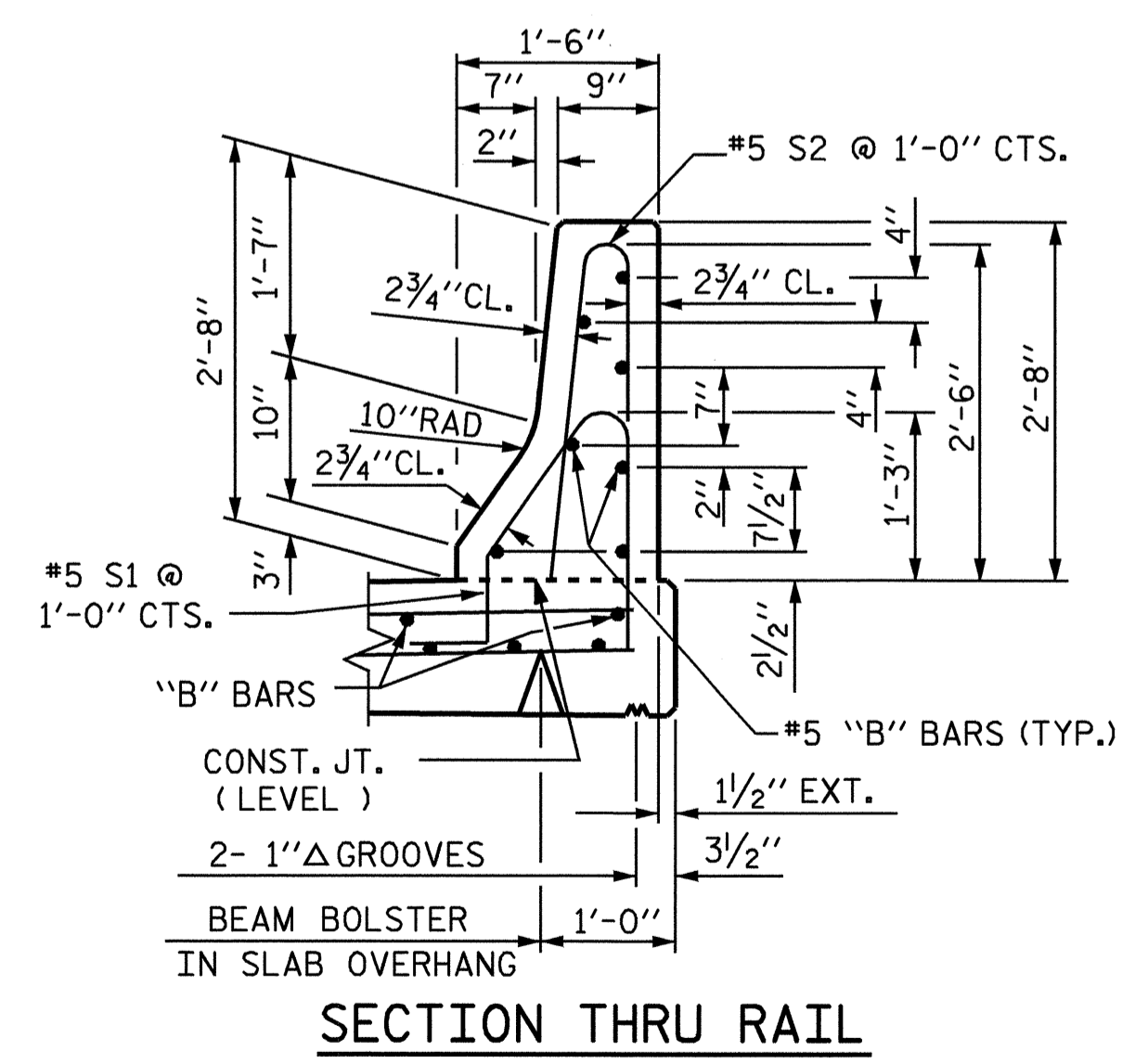
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	112	#5	STR.	26'-9"	3,125
* B2	14	#5	STR.	27'-6"	402
* S1	490	#5	1	4'-9"	2,428
* S2	490	#5	2	5'-2"	2,641

* EPOXY COATED REINFORCING STEEL 8,596 LBS.
CLASS AA CONCRETE 49.4 CU. YDS.
CONCRETE BARRIER RAIL 494.04 LIN. FT.



NOTES

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

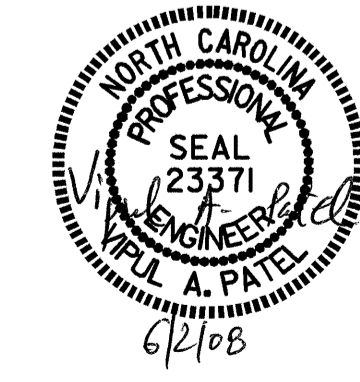
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

VERTICAL 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.

ASSEMBLED BY : KEITH D. LAYNE DATE : 07/06/07
CHECKED BY : H. A. L. DATE : 11/07

DRAWN BY : ARB 5/87 RWW/LES
CHECKED BY : SJD 9/87 REV. 5/7/03R RWW/JTE
REV. 5/1/06 TLA/GM

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PROJECT NO. B-4534
GUILFORD COUNTY
STATION: 31+81.71 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**STANDARD
CONCRETE
BARRIER RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL
2			4			24

STD. NO. CBR1

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 1/8" 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.)

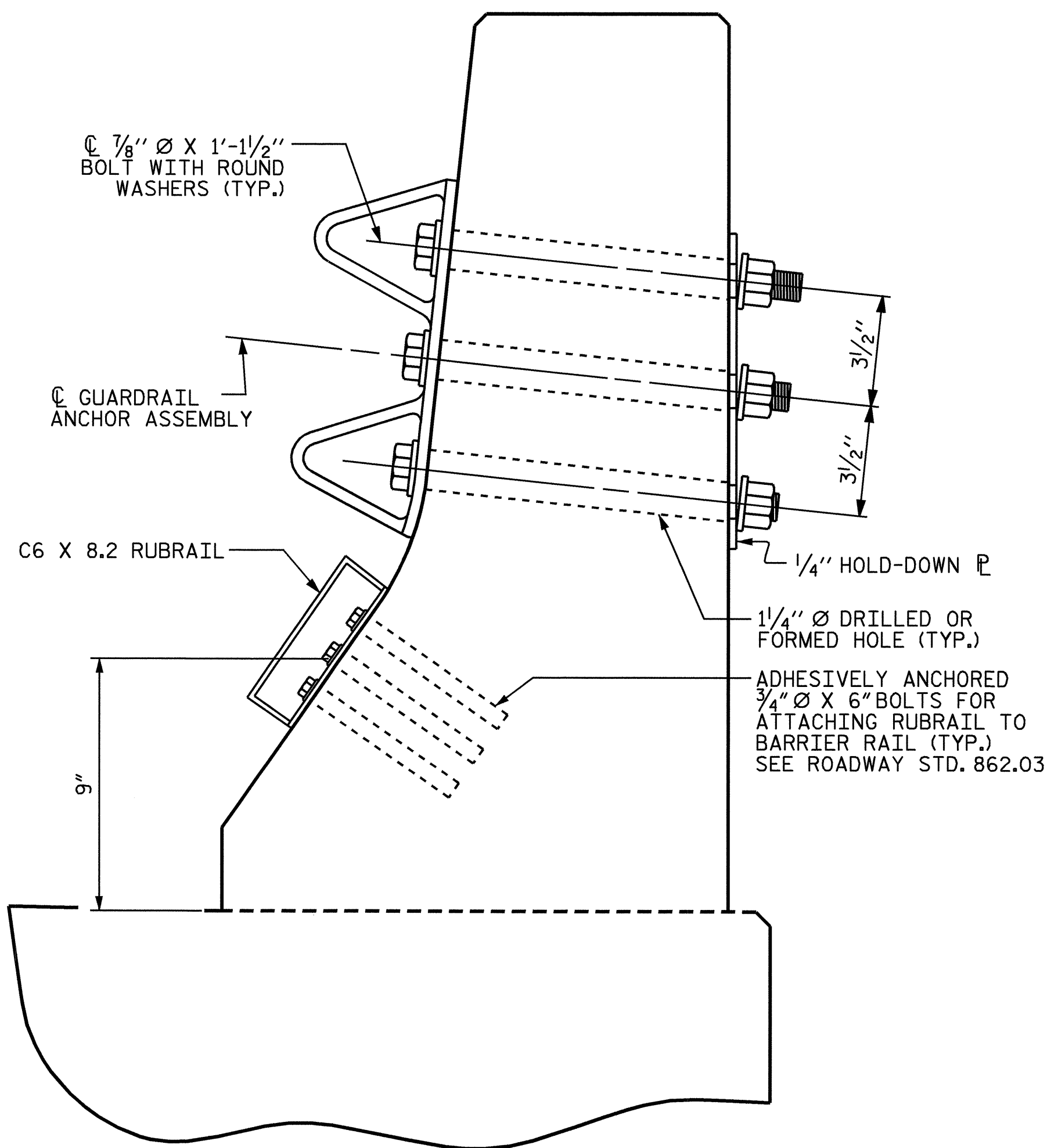
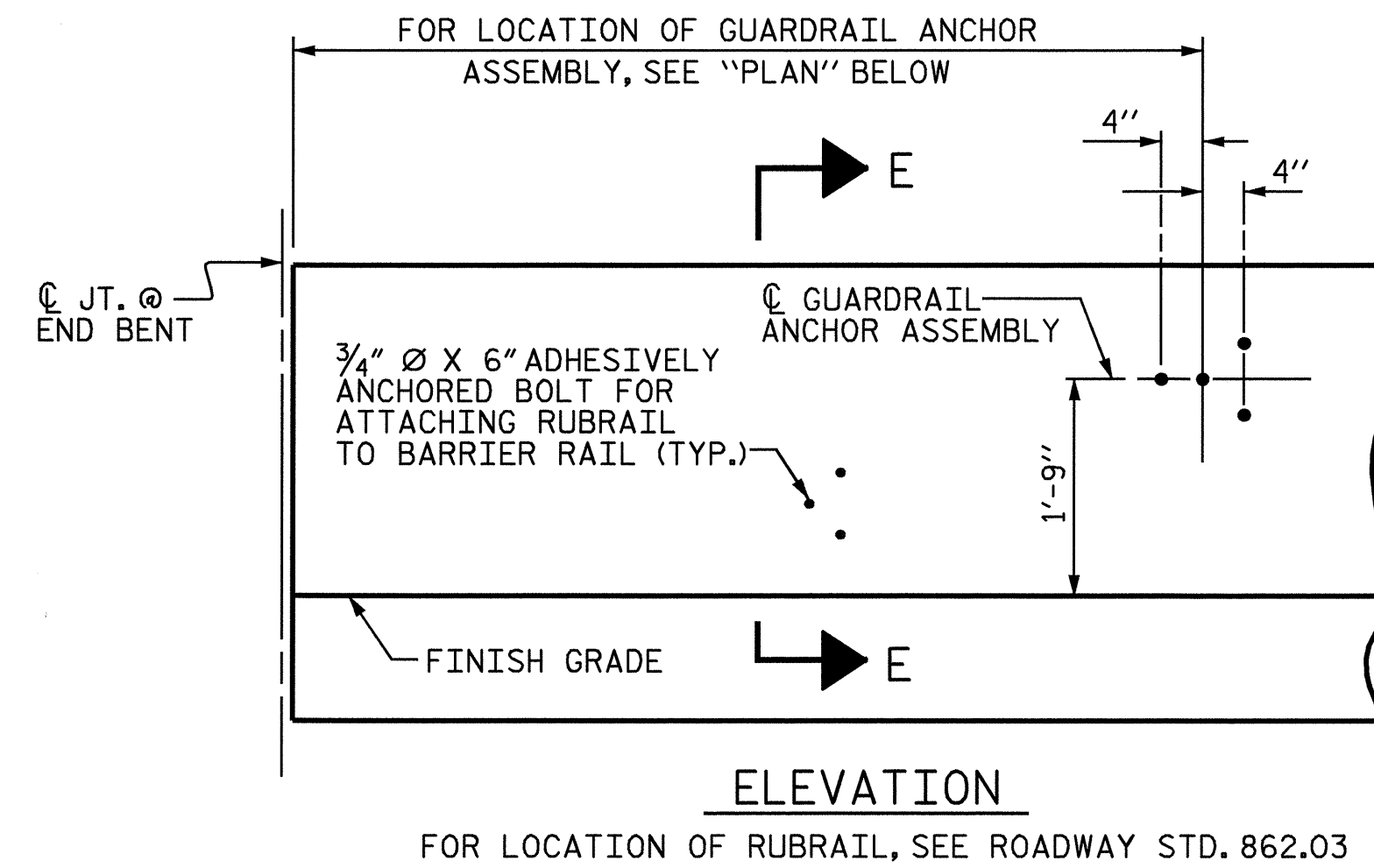
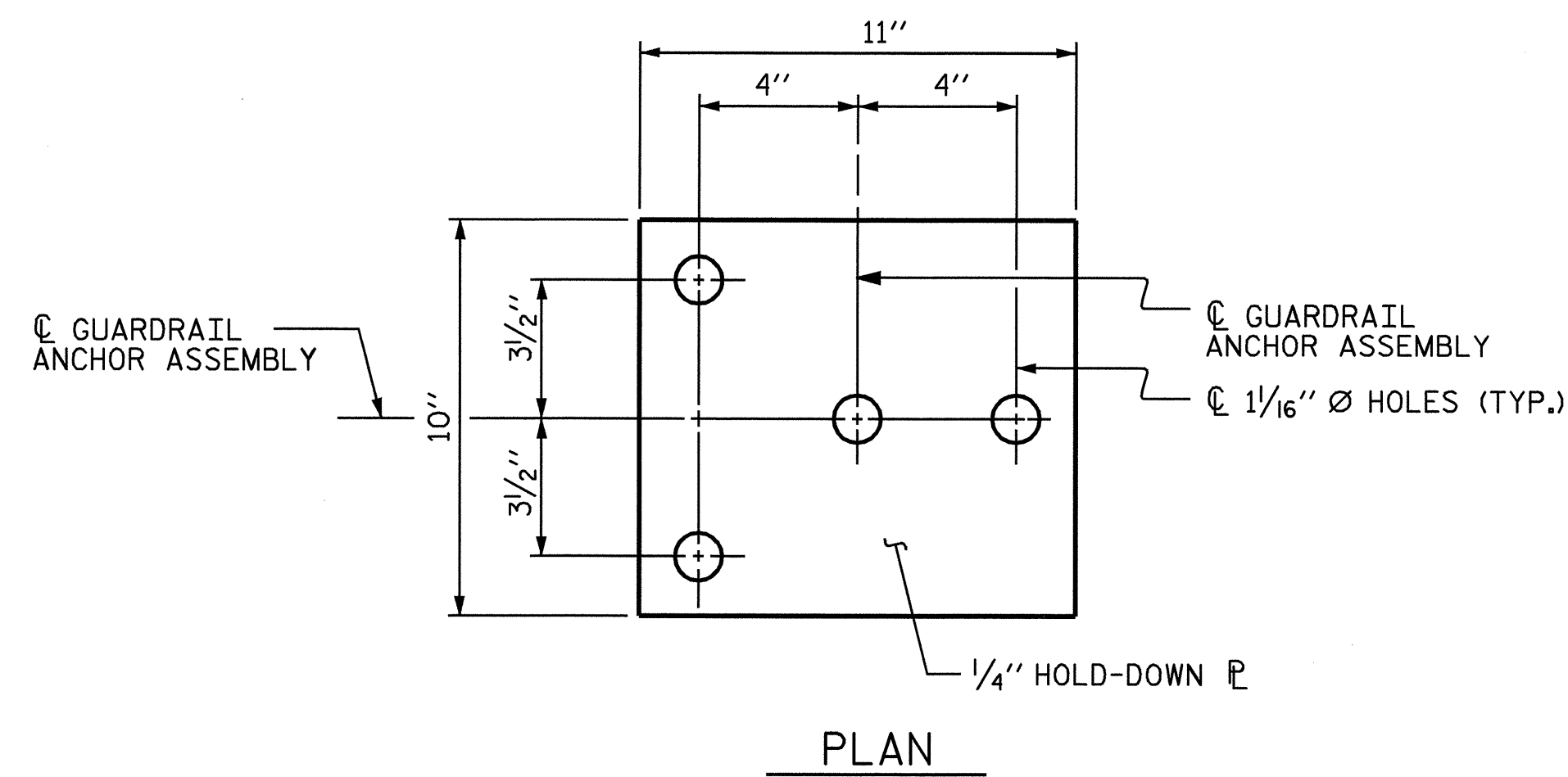
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

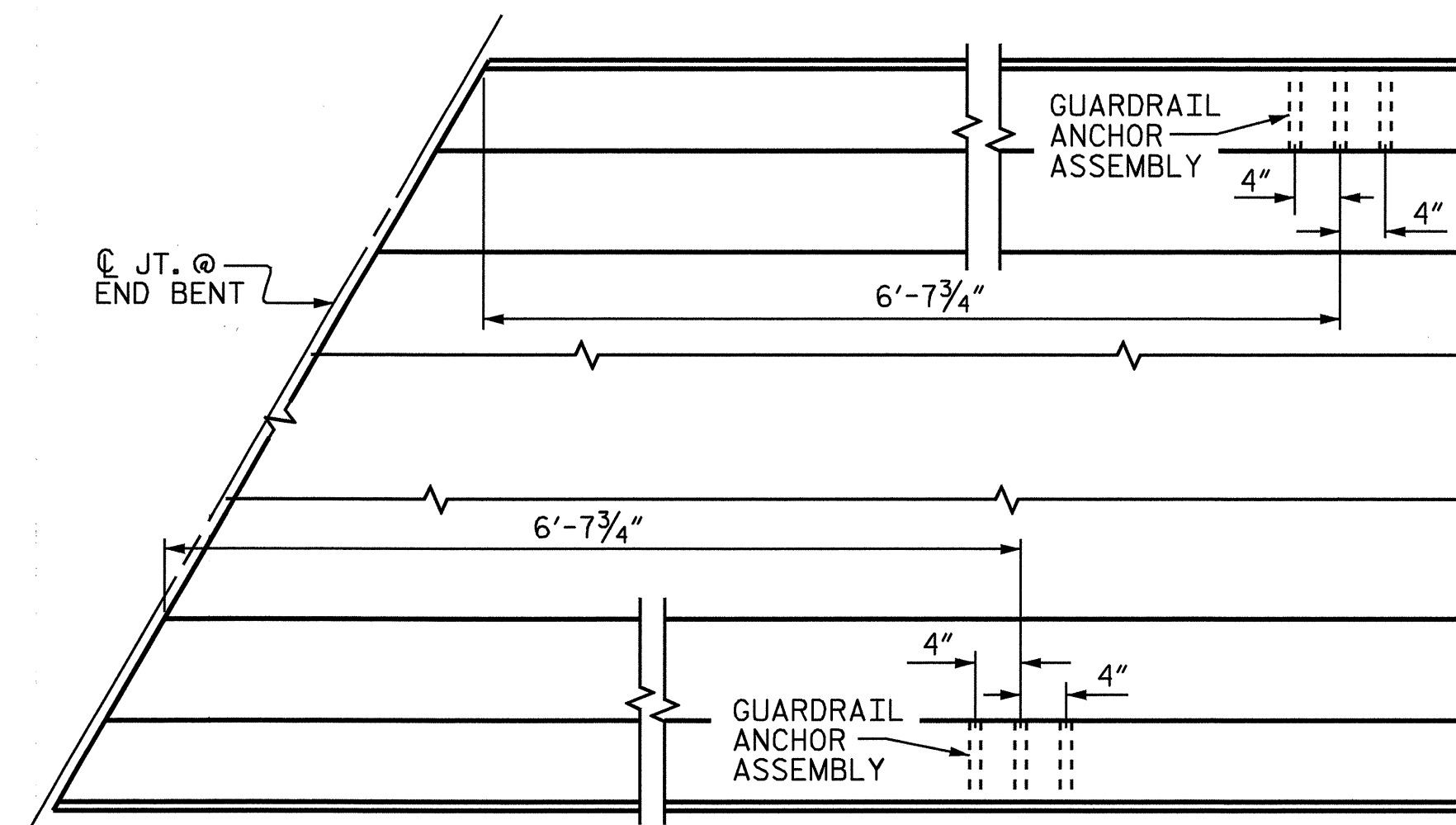
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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 SPECIAL PROVISIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E-E

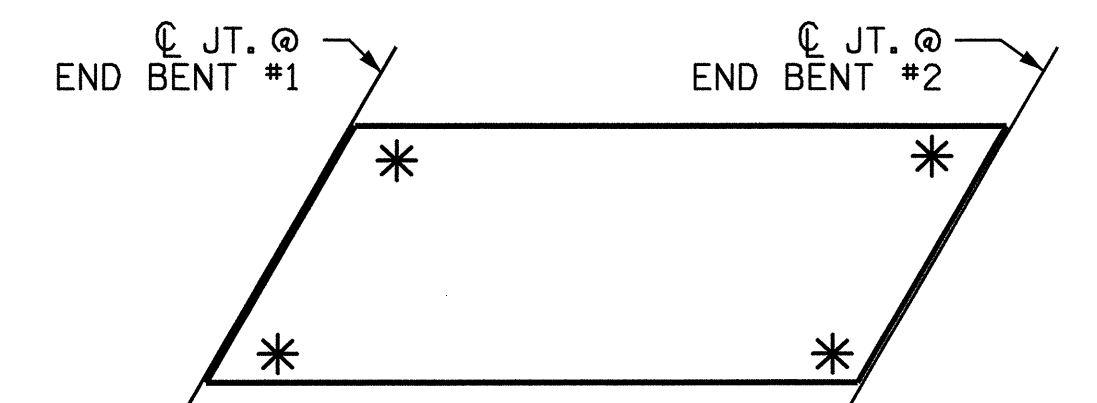
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

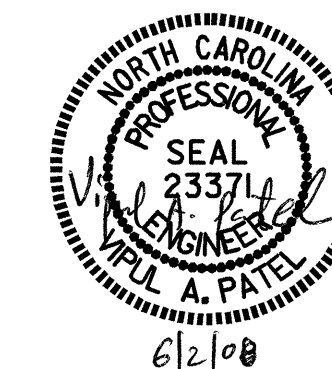
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-



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

ASSEMBLED BY :	KEITH D. LAYNE	DATE :	07/06/07
CHECKED BY :	H. A. L.	DATE :	11/07
DRAWN BY :	TLA 5/06	ADDED	5/1/06R KMM/GM
CHECKED BY :	GM 5/06		

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 sdombrowski

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

STD. NO. GRA2

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED. THE 1/2" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

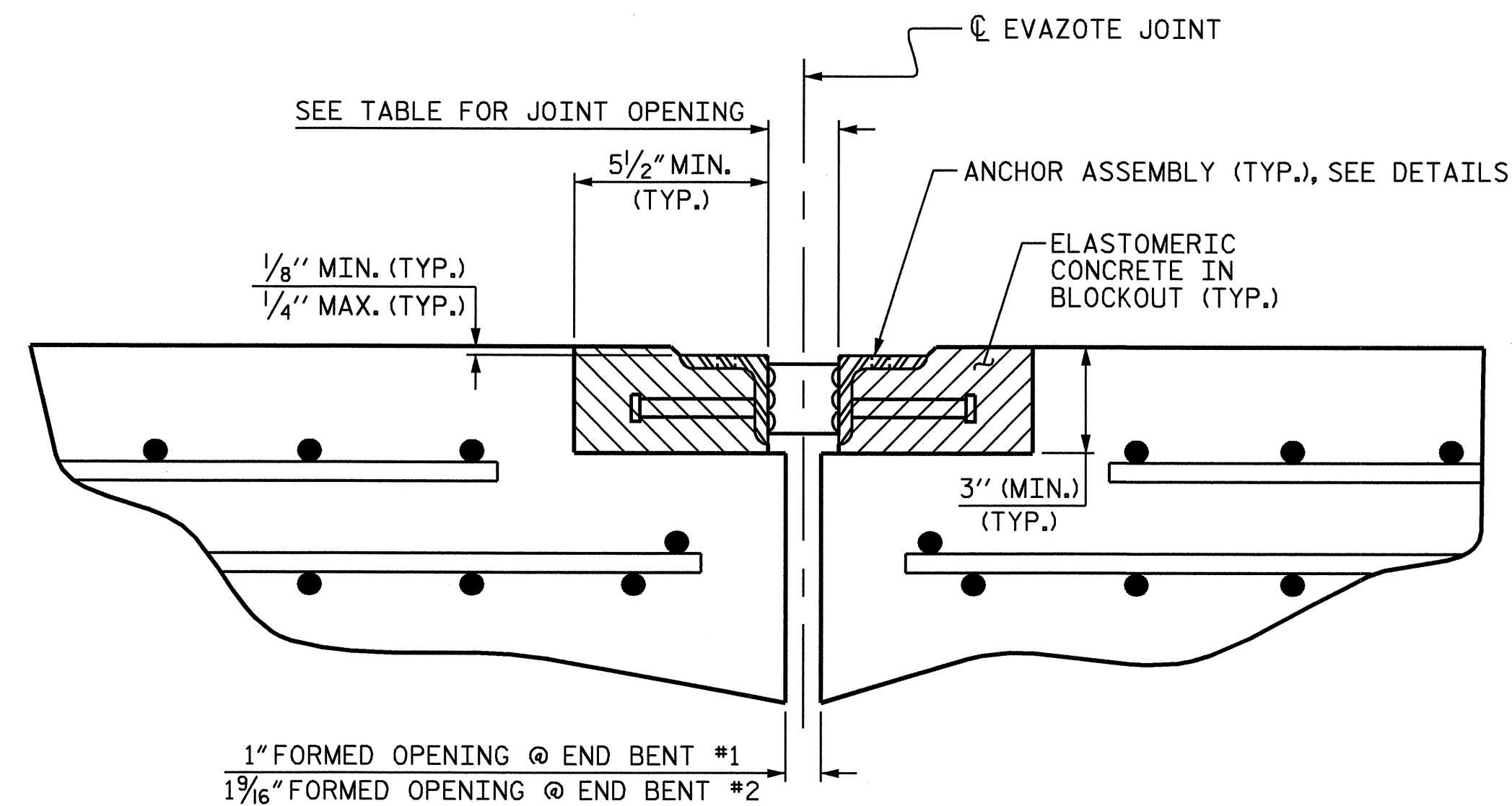
ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS THAN 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELLED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR 3/8" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELLING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

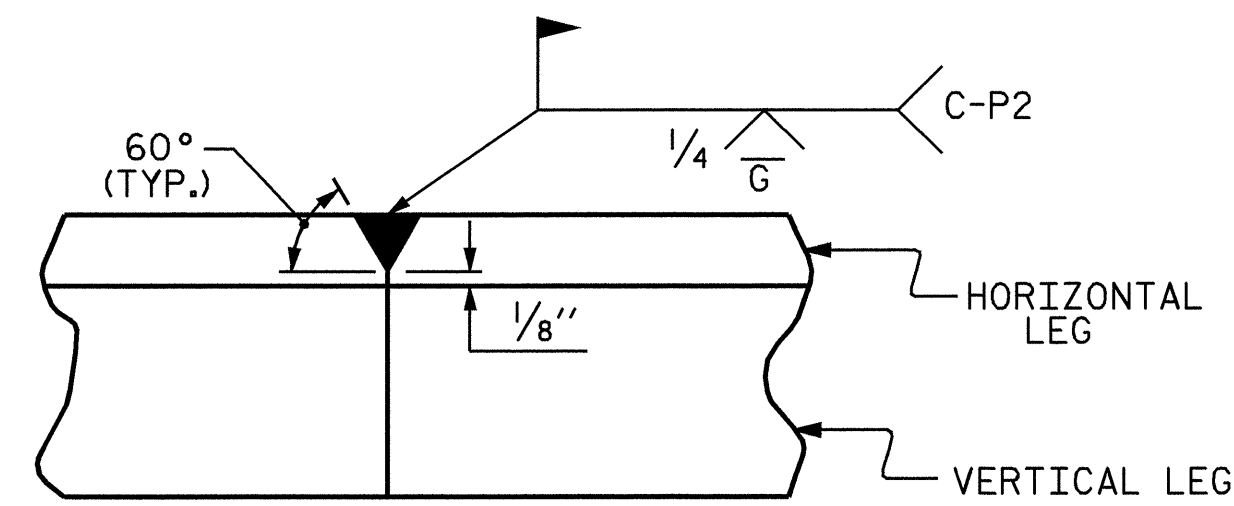
SEE SPECIAL PROVISIONS FOR EVAZOTE JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

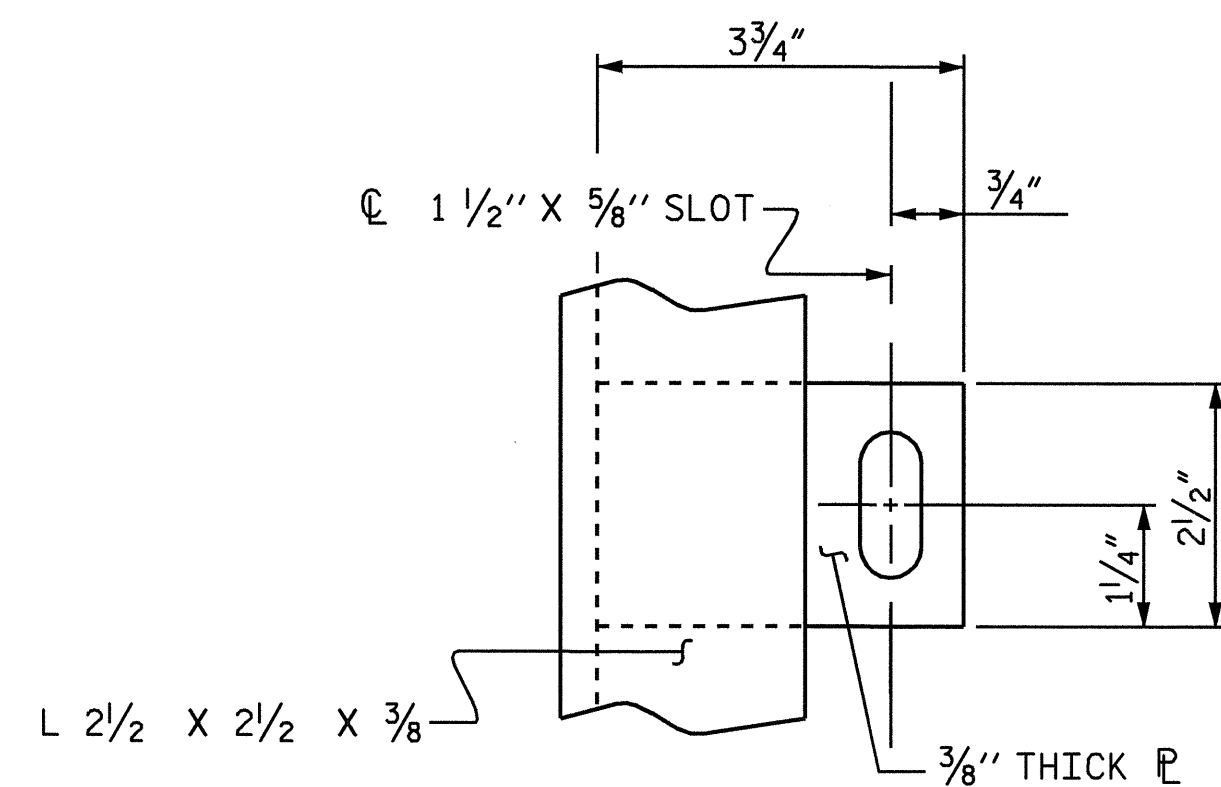


ARMORED JOINT DETAILS

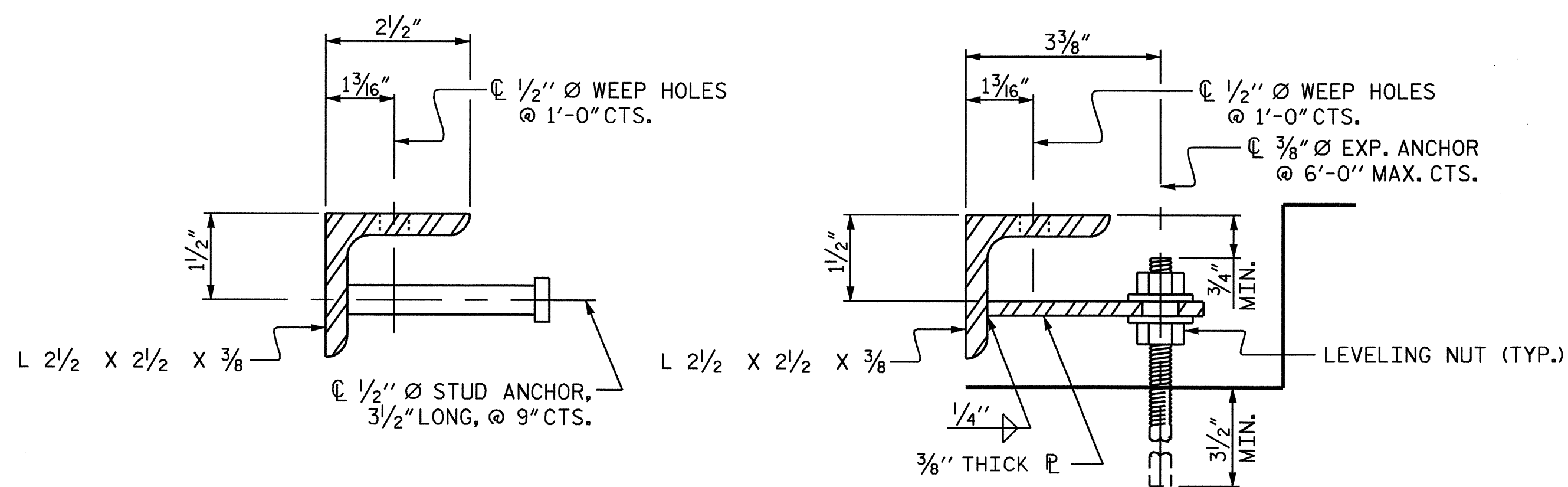
SECTION NORMAL TO JOINT AT BENT



DETAIL- FIELD WELD SPLICE OF ANGLE



PLAN VIEW OF TAB



SECTION VIEW OF STUD

SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	135°	2 1/2"	-	1 7/8"	1 7/8"	1 7/8"
2	135°	3 1/16"	1 3/4"	2 3/4"	2 1/2"	2"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.

END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)	TOTAL LENGTH OF ANGLE (FT)
1	18.8	164'-0"
2	18.8	164'-0"

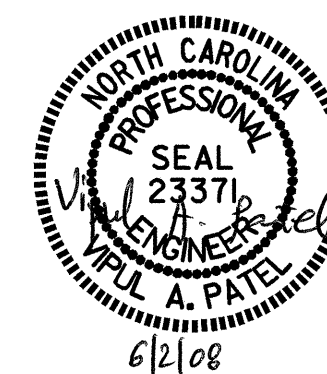
* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 ARMORED EVAZOTE
 JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 24
2			4			

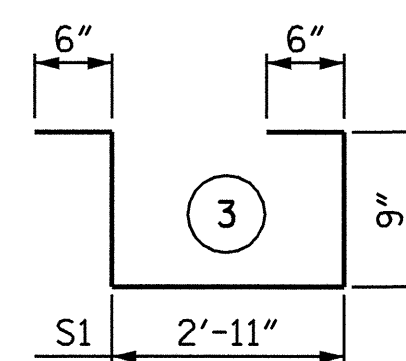
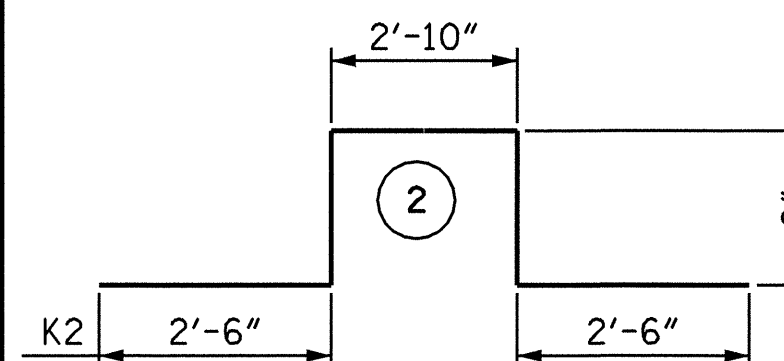
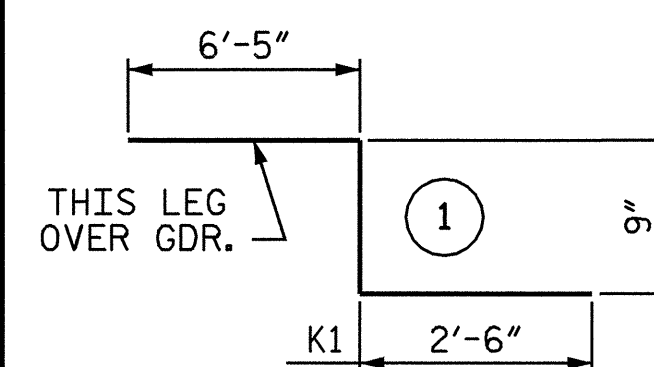


ASSEMBLED BY : S. DOMBROWSKI DATE : 03/17/08
 CHECKED BY : V. PATEL DATE : 03/17/08
 DRAWN BY : EEM 1/96 REV. 7/10/01 LES/RDR
 CHECKED BY : RGW 1/96 REV. 5/7/03RR RWW/JTE
 REV. 5/1/06 TLA/GM

REINFORCING BAR SCHEDULE

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT				
*A1	343	#5	STR.	27- 3	9,749	*A136	4	#5	STR.	22- 0	92	A217	4	#5	STR.	42- 7	178	*B1	378	#4	STR.	29- 4	7,407
*A2	343	#5	STR.	36- 3	12,968	*A137	4	#5	STR.	20-11	87	A218	4	#5	STR.	41- 6	173	B2	340	#5	STR.	51- 3	18,174
*A4	6	#6	STR.	24- 3	219	*A138	4	#5	STR.	19-10	83	A219	4	#5	STR.	40- 5	169	*G1	4	#5	STR.	44- 4	185
*A101	4	#5	STR.	59-11	250	*A139	4	#5	STR.	18- 9	78	A220	4	#5	STR.	39- 4	164	*K1	20	#7	1	9- 8	395
*A102	4	#5	STR.	58-10	245	*A140	4	#5	STR.	17- 8	74	A221	4	#5	STR.	38- 3	160	*K2	50	#7	2	9- 4	954
*A103	4	#5	STR.	57- 9	241	*A141	4	#5	STR.	16- 7	69	A222	4	#5	STR.	37- 2	155	*K3	60	#7	STR.	12- 1	1482
*A104	4	#5	STR.	56- 8	236	*A142	4	#5	STR.	15- 6	65	A223	4	#5	STR.	36- 1	151	*S1	108	#4	3	5- 5	391
*A105	4	#5	STR.	55- 7	232	*A143	4	#5	STR.	14- 5	60	A224	4	#5	STR.	35- 0	146	REINFORCING STEEL (Lbs) =					47,922
*A106	4	#5	STR.	54- 6	227	*A144	4	#5	STR.	13- 4	56	A225	4	#5	STR.	33-11	142	*EPOXY COATED					40,781
*A107	4	#5	STR.	53- 5	223	*A145	4	#5	STR.	12- 3	51	A226	4	#5	STR.	32-10	137	REINFORCING STEEL (Lbs) =					
*A108	4	#5	STR.	52- 4	218	*A146	4	#5	STR.	11- 2	47	A227	4	#5	STR.	31- 9	132						
*A109	4	#5	STR.	51- 3	214	*A147	4	#5	STR.	10- 1	42	A228	4	#5	STR.	30- 8	128						
*A110	4	#5	STR.	50- 2	209	*A148	4	#5	STR.	9- 0	38	A229	4	#5	STR.	29- 7	123						
*A111	4	#5	STR.	49- 1	205	*A149	4	#5	STR.	7-11	33	A230	4	#5	STR.	28- 6	119						
*A112	4	#5	STR.	48- 0	200	*A150	4	#5	STR.	6-10	29	A231	4	#5	STR.	27- 5	114						
*A113	4	#5	STR.	46-11	196	*A151	4	#5	STR.	5- 9	24	A232	4	#5	STR.	26- 4	110						
*A114	4	#5	STR.	45-10	191	*A152	4	#5	STR.	4- 8	19	A233	4	#5	STR.	25- 3	105						
*A115	4	#5	STR.	44- 9	187	*A153	4	#5	STR.	3- 7	15	A234	4	#5	STR.	24- 2	101						
*A116	4	#5	STR.	43- 8	182	*A154	4	#5	STR.	2- 6	10	A235	4	#5	STR.	23- 1	96						
*A117	4	#5	STR.	42- 7	178	A3	686	#5	STR.	31- 9	22,717	A236	4	#5	STR.	22- 0	92						
*A118	4	#5	STR.	41- 6	173							A237	4	#5	STR.	20-11	87						
*A119	4	#5	STR.	40- 5	169	A201	4	#5	STR.	59-11	250	A238	4	#5	STR.	19-10	83						
*A120	4	#5	STR.	39- 4	164	A202	4	#5	STR.	58-10	245	A239	4	#5	STR.	18- 9	78						
*A121	4	#5	STR.	38- 3	160	A203	4	#5	STR.	57- 9	241	A240	4	#5	STR.	17- 8	74						
*A122	4	#5	STR.	37- 2	155	A204	4	#5	STR.	56- 8	236	A241	4	#5	STR.	16- 7	69						
*A123	4	#5	STR.	36- 1	151	A205	4	#5	STR.	55- 7	232	A242	4	#5	STR.	15- 6	65						
*A124	4	#5	STR.	35- 0	146	A206	4	#5	STR.	54- 6	227	A243	4	#5	STR.	14- 5	60						
*A125	4	#5	STR.	33-11	142	A207	4	#5	STR.	53- 5	223	A244	4	#5	STR.	13- 4	56						
*A126	4	#5	STR.	32-10	137	A208	4	#5	STR.	52- 4	218	A245	4	#5	STR.	12- 3	51						
*A127	4	#5	STR.	31- 9	132	A209	4	#5	STR.	51- 3	214	A246	4	#5	STR.	11- 2	47						
*A128	4	#5	STR.	30- 8	128	A210	4	#5	STR.	50- 2	209	A247	4	#5	STR.	10- 1	42						
*A129	4	#5	STR.	29- 7	123	A211	4	#5	STR.	49- 1	205	A248	4	#5	STR.	9- 0	38						
*A130	4	#5	STR.	28- 6	119	A212	4	#5	STR.	48- 0	200	A249	4	#5	STR.	7-11	33						
*A131	4	#5	STR.	27- 5	114	A213	4	#5	STR.	46-11	196	A250	4	#5	STR.	6-10	29						
*A132	4	#5	STR.	26- 4	110	A214	4	#5	STR.	45-10	191	A251	4	#5	STR.	5- 9	24						
*A133	4	#5	STR.	25- 3	105	A215	4	#5	STR.	44- 9	187	A252	4	#5	STR.	4- 8	19						
*A134	4	#5	STR.	24- 2	101	A216	4	#5	STR.	43- 8	182	A253	4	#5	STR.	3- 7	15						
*A135	4	#5	STR.	23- 1	96							A254	4	#5	STR.	2- 6	10						

BAR TYPES



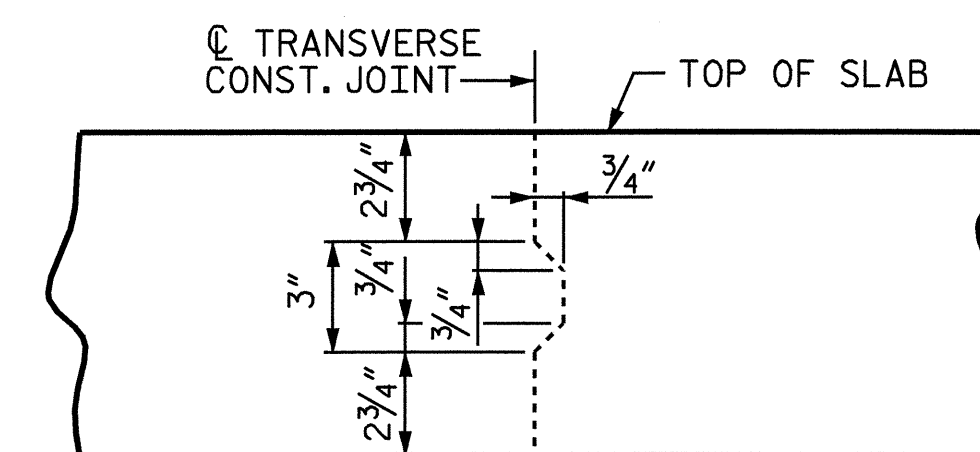
ALL BAR DIMENSIONS ARE OUT TO OUT.
QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

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"			

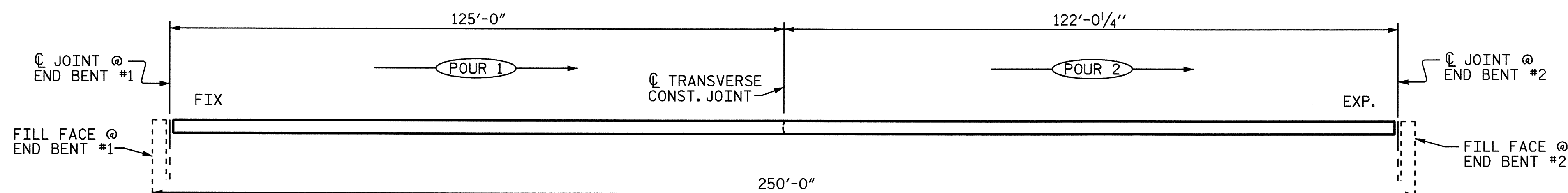
GROOVING BRIDGE FLOORS

BRIDGE DECK =	13,481 Sq. Ft.
APPROACH SLABS =	2,549 Sq. Ft.
TOTAL =	16,030 Sq. Ft.



TRANSVERSE CONST. JOINT DETAIL

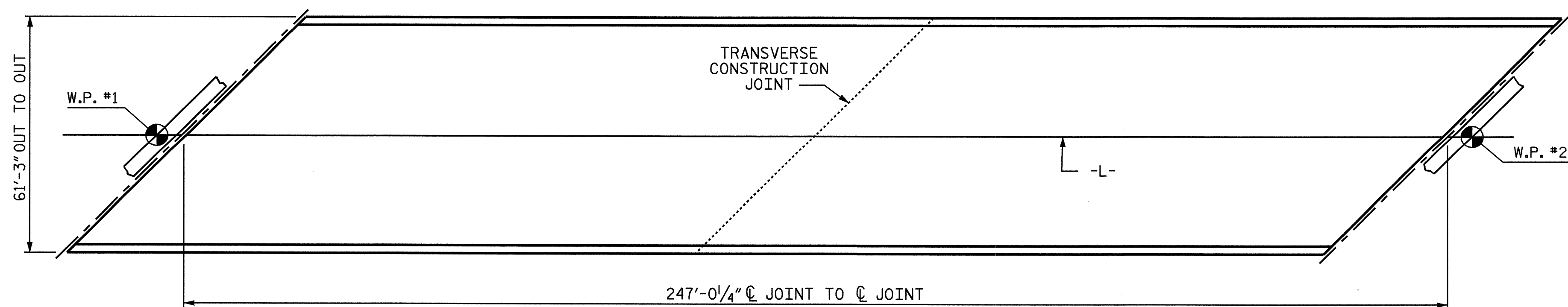
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.



CLASS AA CONCRETE

POUR #1 =	249.1 Cu. Yds.
POUR #2 =	243.3 Cu. Yds.
TOTAL =	492.4 Cu. Yds.

LAYOUT FOR POURING SEQUENCE OF REINFORCED CONCRETE DECK SLAB



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

AREA OF CONCRETE DECK SLAB = 15,130 Sq. Ft.

DRAWN BY: K. D. LAYNE DATE: 05/07
CHECKED BY: H. A. L. DATE: 11/07

30-MAY-2008 08:56
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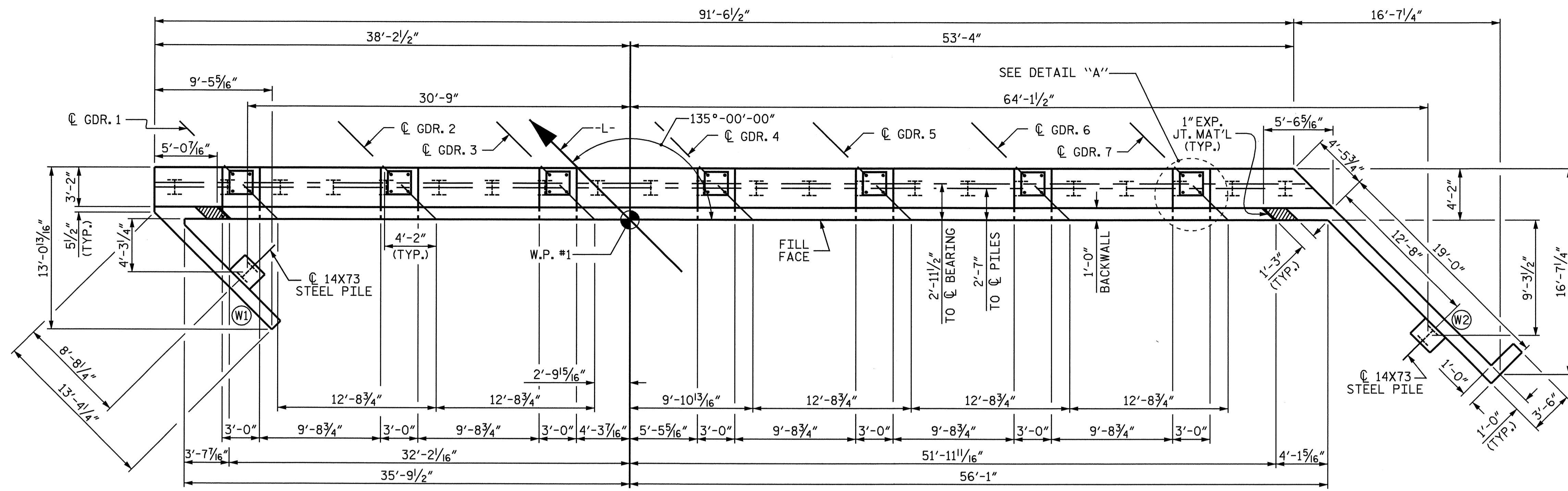


PROJECT NO. B-4534
GUILFORD COUNTY
STATION: 31+81.71 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

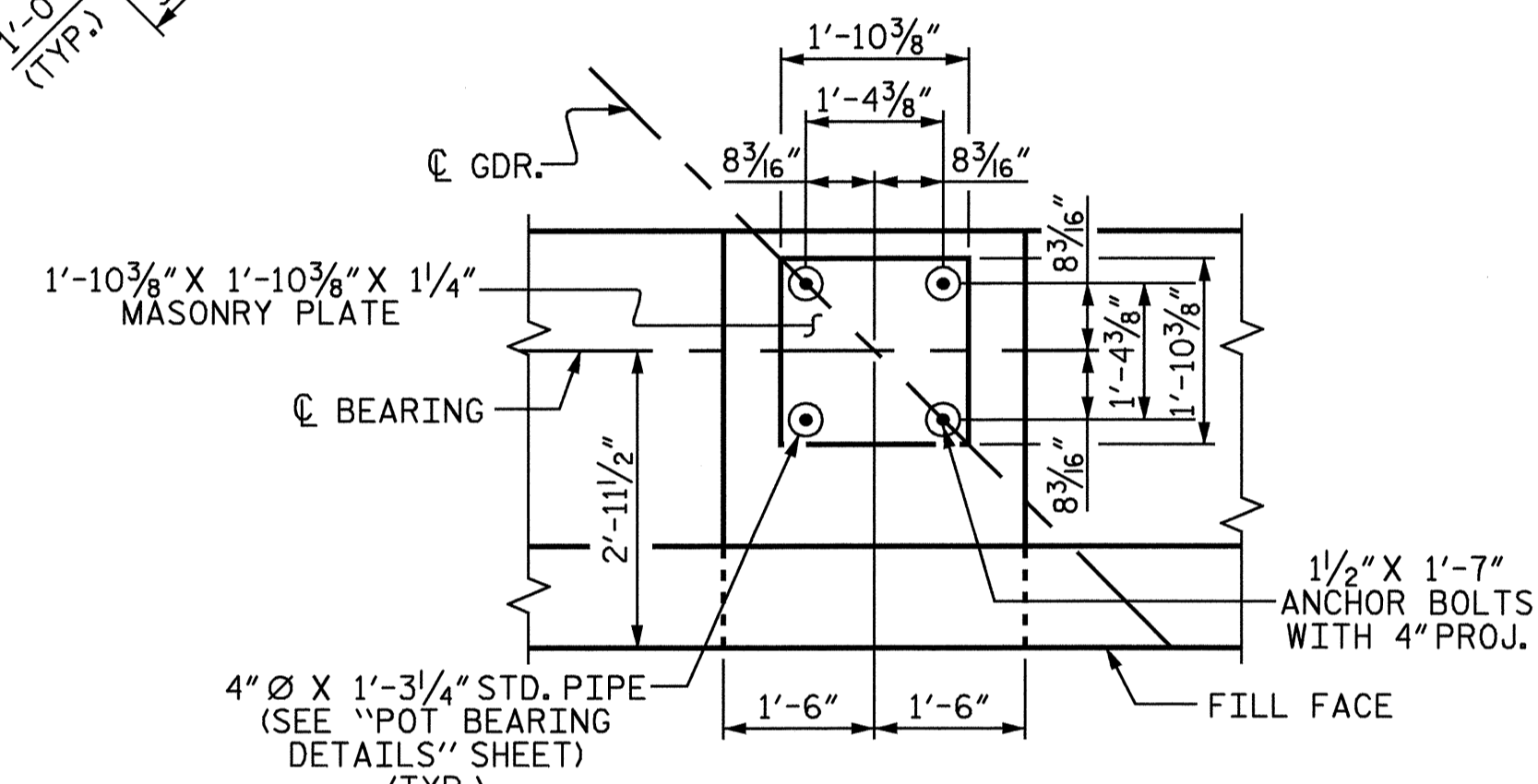
REVISIONS						SHEET NO. S-15
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 24
2			4			



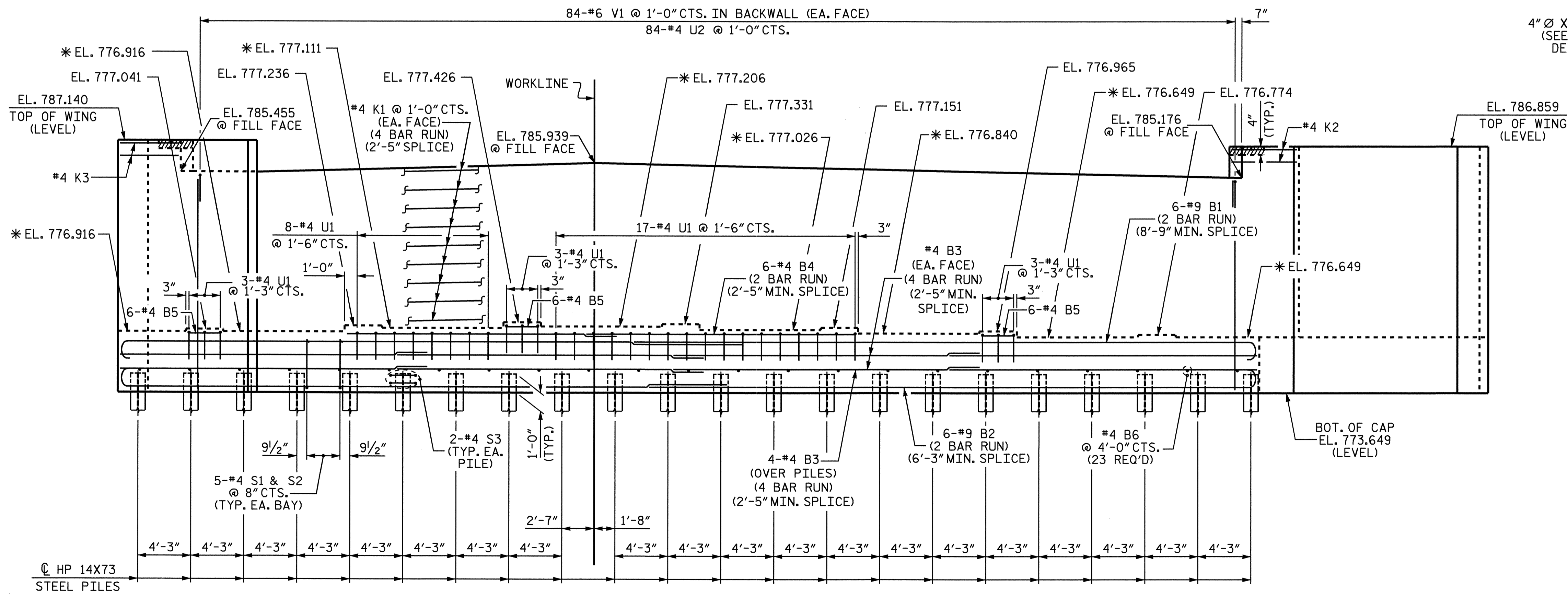
PLAN

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT #1. EXCAVATE HOLES TO ELEVATION 754.000 ON THE LEFT SIDE AND ELEVATION 749.200 ON THE RIGHT SIDE. SEE PILE EXCAVATION SPECIAL PROVISIONS.



DETAIL "A"



ELEVATION

(WING BRACE PILES NOT SHOWN FOR CLARITY)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SHEET 3 OF 3.

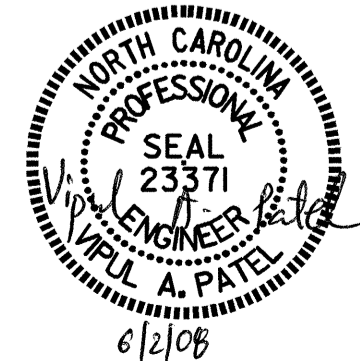
PROJECT NO. **B-4534**
GUILFORD COUNTY
 STATION: **31+81.71 -L-**

SHEET 1 OF 3

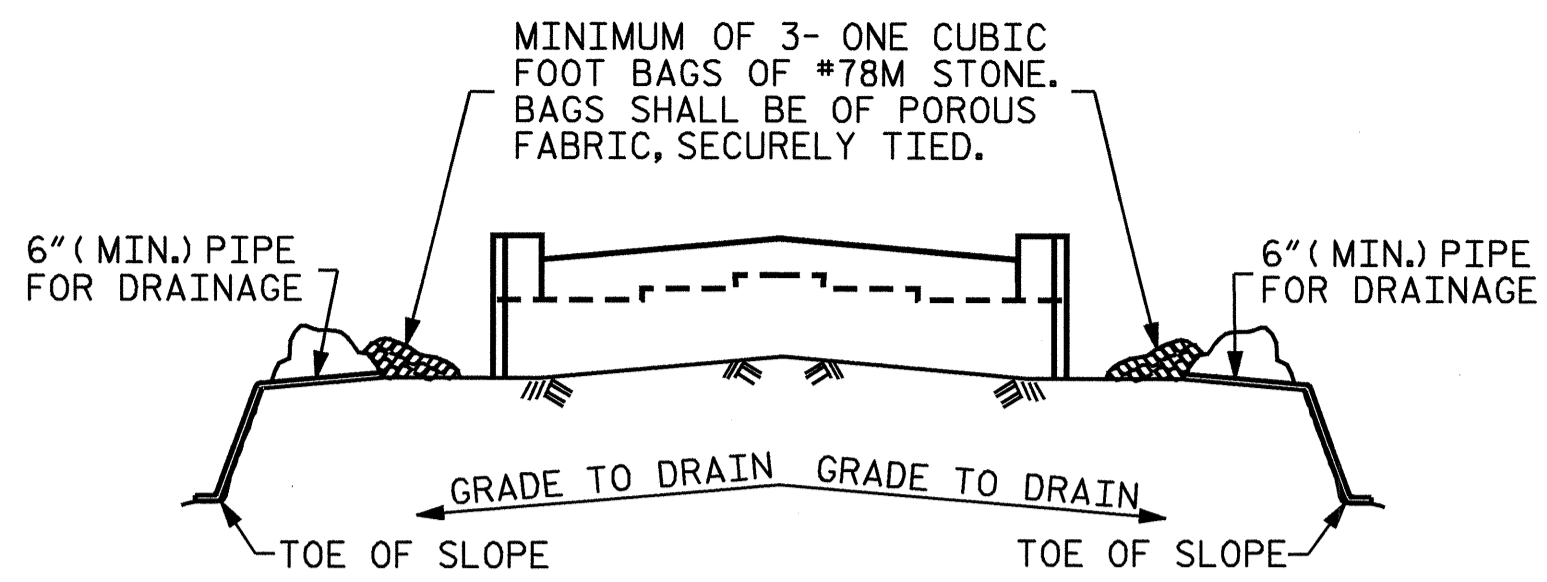
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
END BENT #1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16	
1			3			TOTAL SHEETS	24
2			4				



DRAWN BY : **S. DOMBROWSKI** DATE : **11/07**
 CHECKED BY : **K.D. LAYNE** DATE : **12/07**

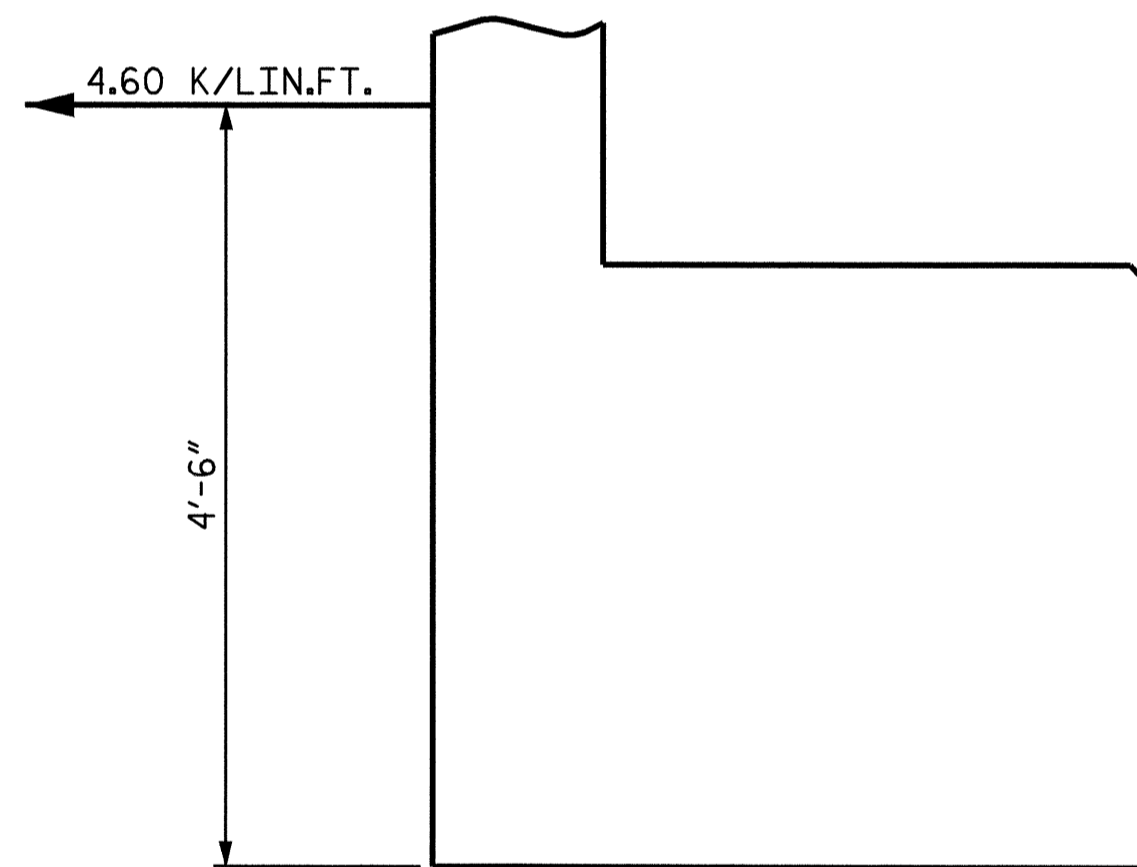


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



GALVANIZED REINFORCING STRAP LOAD DETAIL

GALVANIZED REINFORCING STRAP NOTES

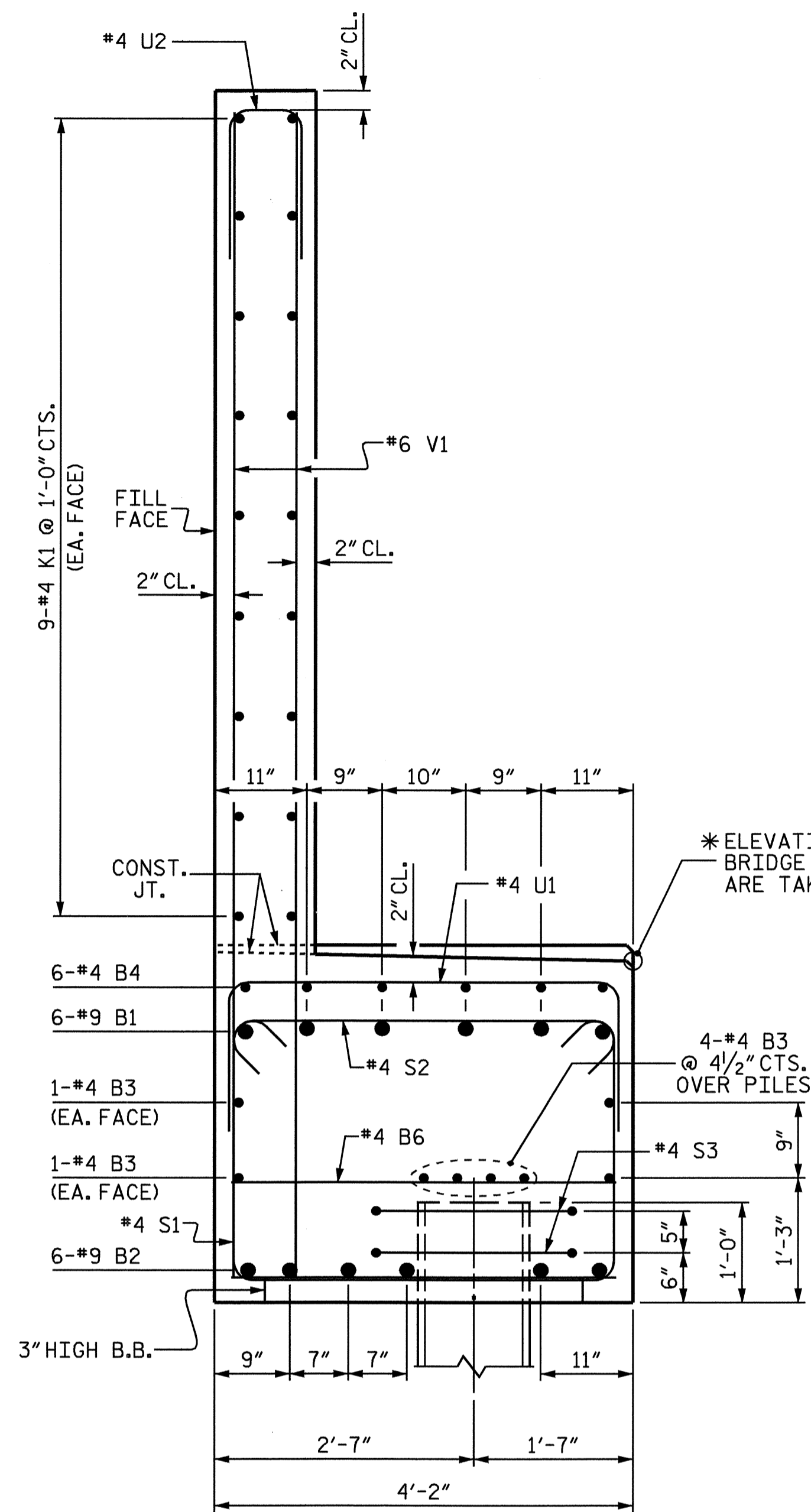
GALVANIZED REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE "MECHANICALLY STABILIZED EARTH RETAINING WALL" SPECIAL PROVISIONS.

PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

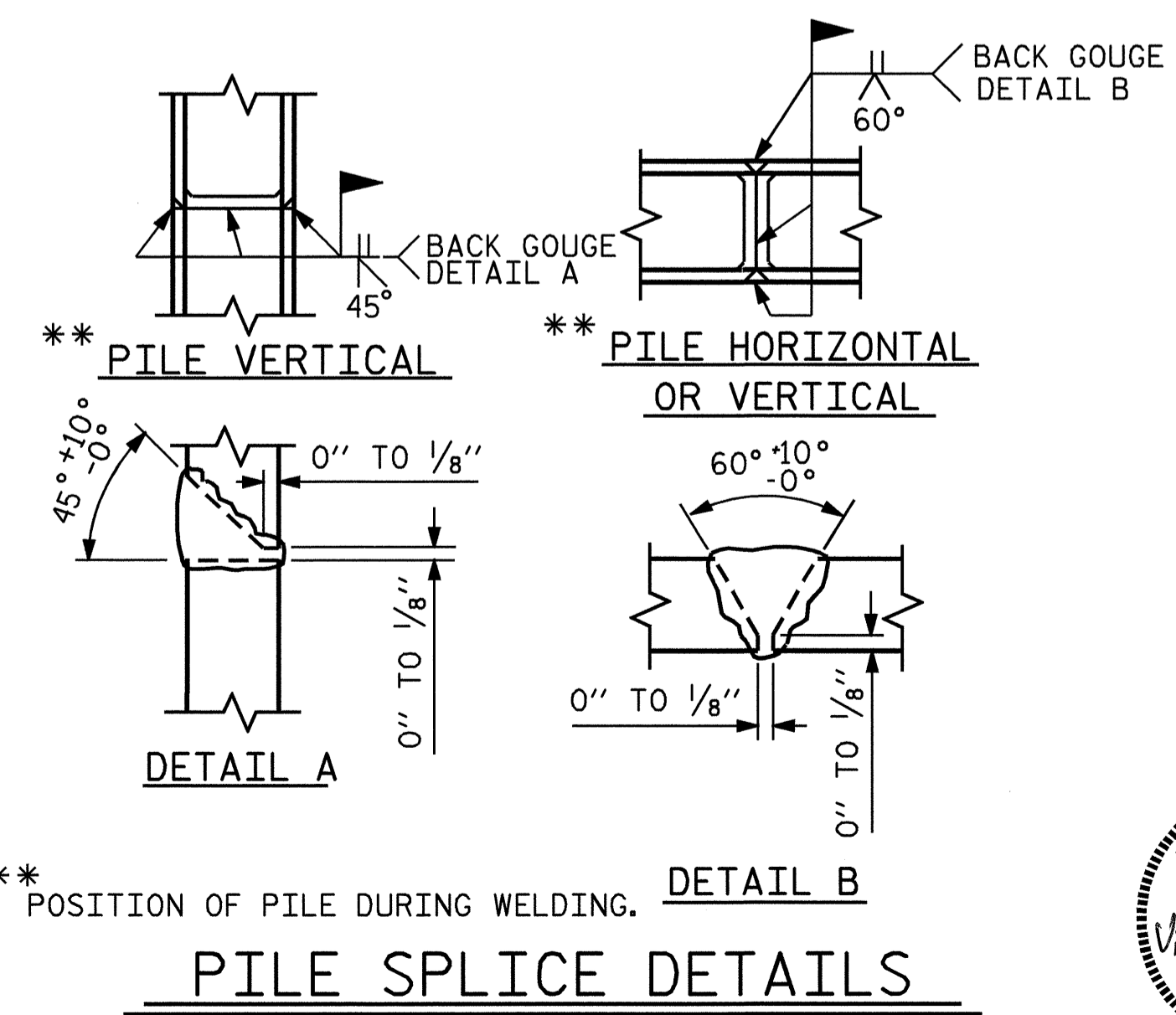
THE GALVANIZED REINFORCING STRAPS SHALL BE DESIGNED WITH THE FOLLOWING SOIL PARAMETERS:
 FRICTION ANGLE = 34 DEGREES
 COHESION c = 0.0
 UNIT WEIGHT OF SOIL = 110 PCF

FOR CONFLICTS WITH PILES IN THE END BENT WINGS, SEE PLAN VIEW AND FOUNDATION LAYOUT SHEETS.



SECTION THRU CAP

BAR TYPES						BILL OF MATERIAL						
						END BENT #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT							
B1	12	#9	1	53'-2"	2169							
B2	12	#9	1	51'-11"	2118							
B3	32	#4	STR.	25'-7"	547							
B4	12	#4	STR.	21'-8"	174							
B5	18	#4	STR.	2'-8"	32							
B6	23	#4	STR.	3'-10"	59							
H1	15	#5	2	14'-0"	219							
H2	15	#5	2	13'-4"	209							
H3	15	#5	3	21'-2"	331							
H4	15	#5	3	23'-1"	361							
K1	72	#4	STR.	25'-8"	1234							
K2	4	#4	STR.	5'-1"	14							
K3	4	#4	STR.	4'-10"	13							
S1	105	#4	4	9'-10"	690							
S2	105	#4	5	4'-7"	321							
S3	44	#4	6	7'-6"	220							
S4	6	#6	7	3'-11"	35							
S5	2	#6	8	9'-5"	28							
U1	34	#4	9	6'-10"	155							
U2	84	#4	9	3'-8"	206							
V1	168	#6	STR.	11'-2"	2818							
V2	37	#6	STR.	13'-2"	732							
V3	54	#6	STR.	12'-10"	1041							
REINFORCING STEEL					Lbs.	13,726						
CLASS "A" CONCRETE												
POUR #1: CAP & LOWER WINGS												
					Cu. Yds.	51.9						
POUR #2: UPPER WINGS												
					Cu. Yds.	43.8						
TOTAL						Cu. Yds.	95.7					
HP 14x73 STEEL PILES												
No. 24					Lin. Ft.	600.0						
PILE EXCAVATION IN SOIL												
					Lin. Ft.	186.0						
PILE EXCAVATION NOT IN SOIL												
					Lin. Ft.	54.0						



PROJECT NO. B-4534
 GUILFORD COUNTY
 STATION: 31+81.71 -L-

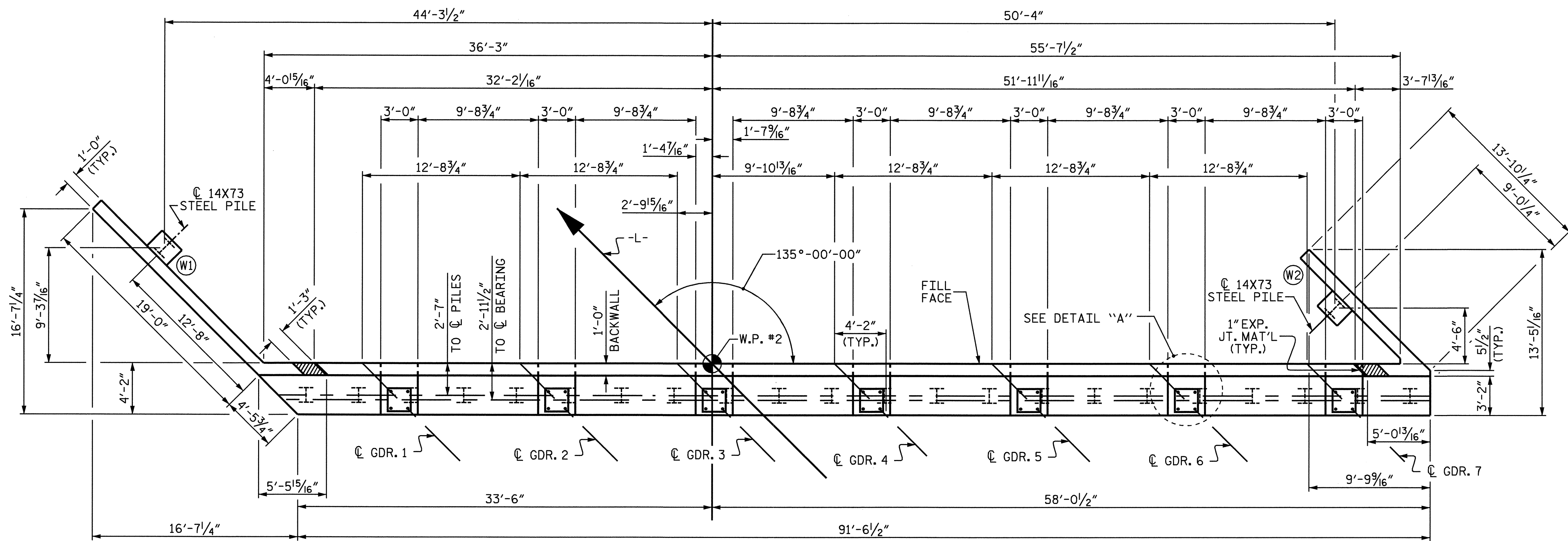
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 24
2			4			

DRAWN BY: S. DOMBROWSKI DATE: 11/07
 CHECKED BY: K.D. LAYNE DATE: 12/07



NOTES

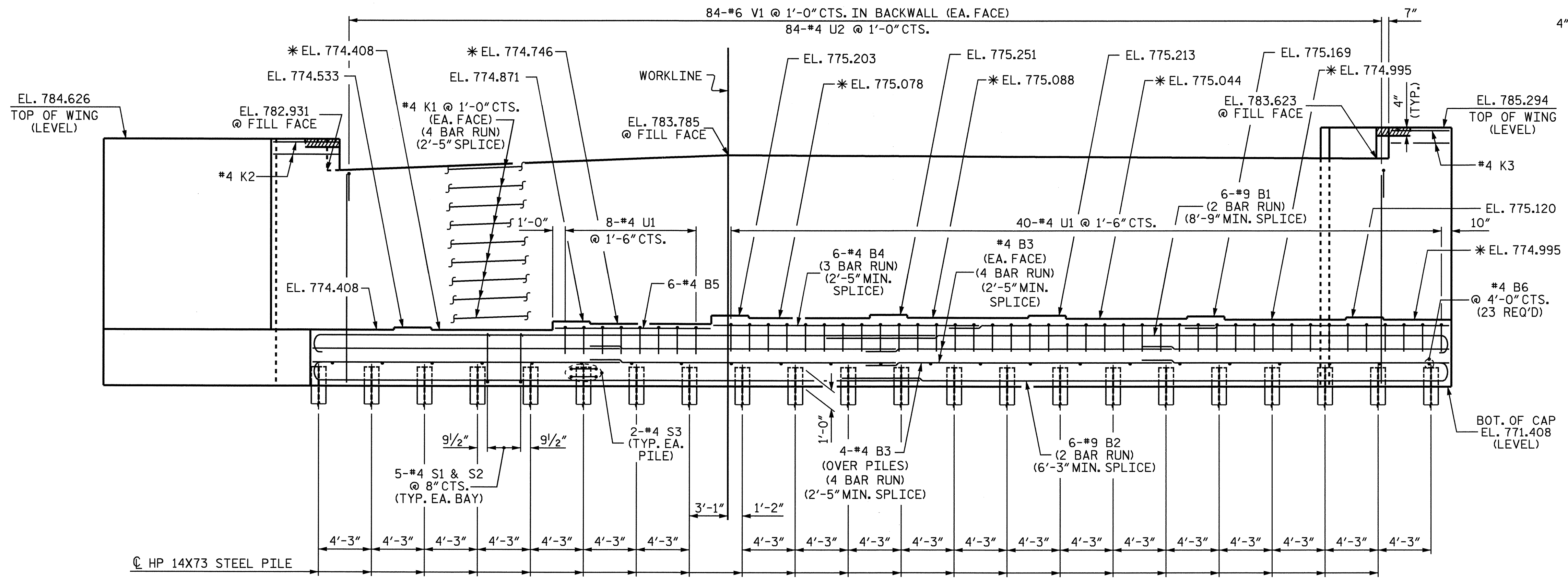
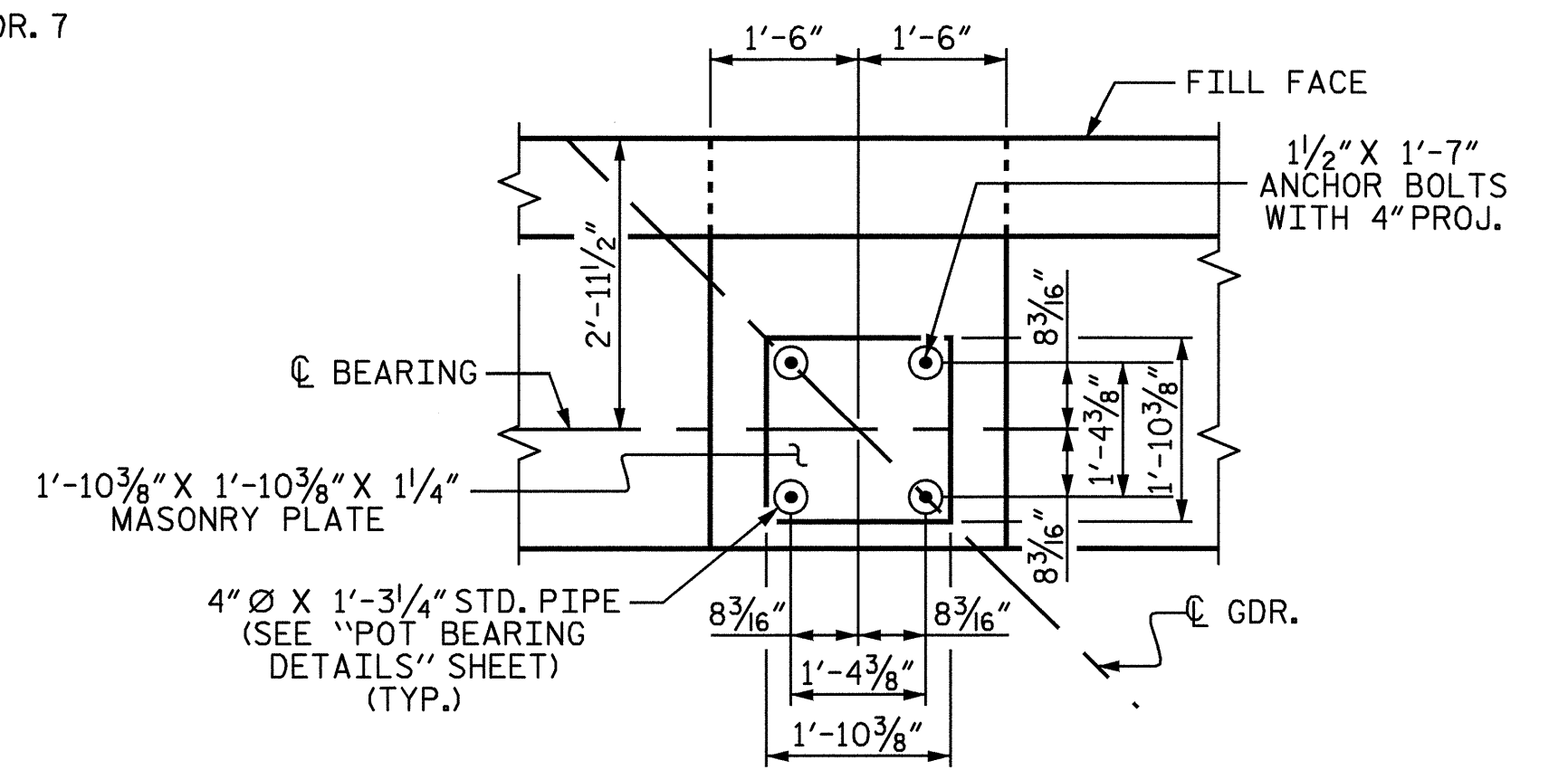
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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



* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SHEET 3 OF 3.

PROJECT NO. B-4534
 GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

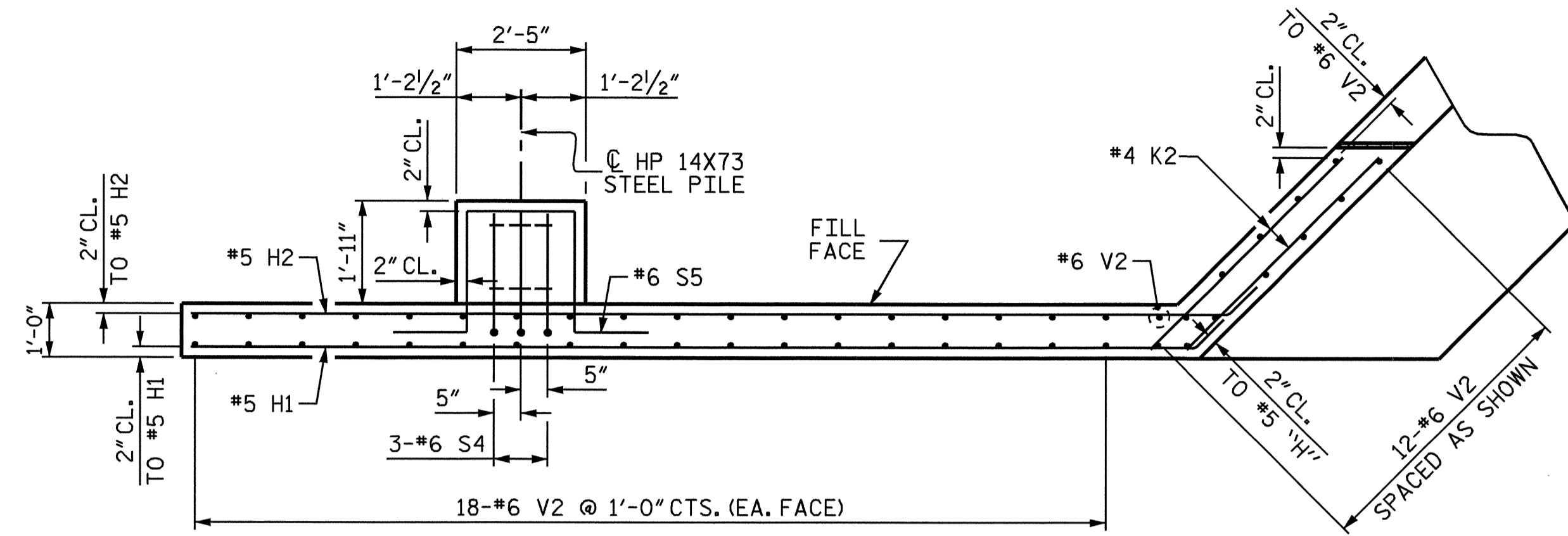
SUBSTRUCTURE
 END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			24

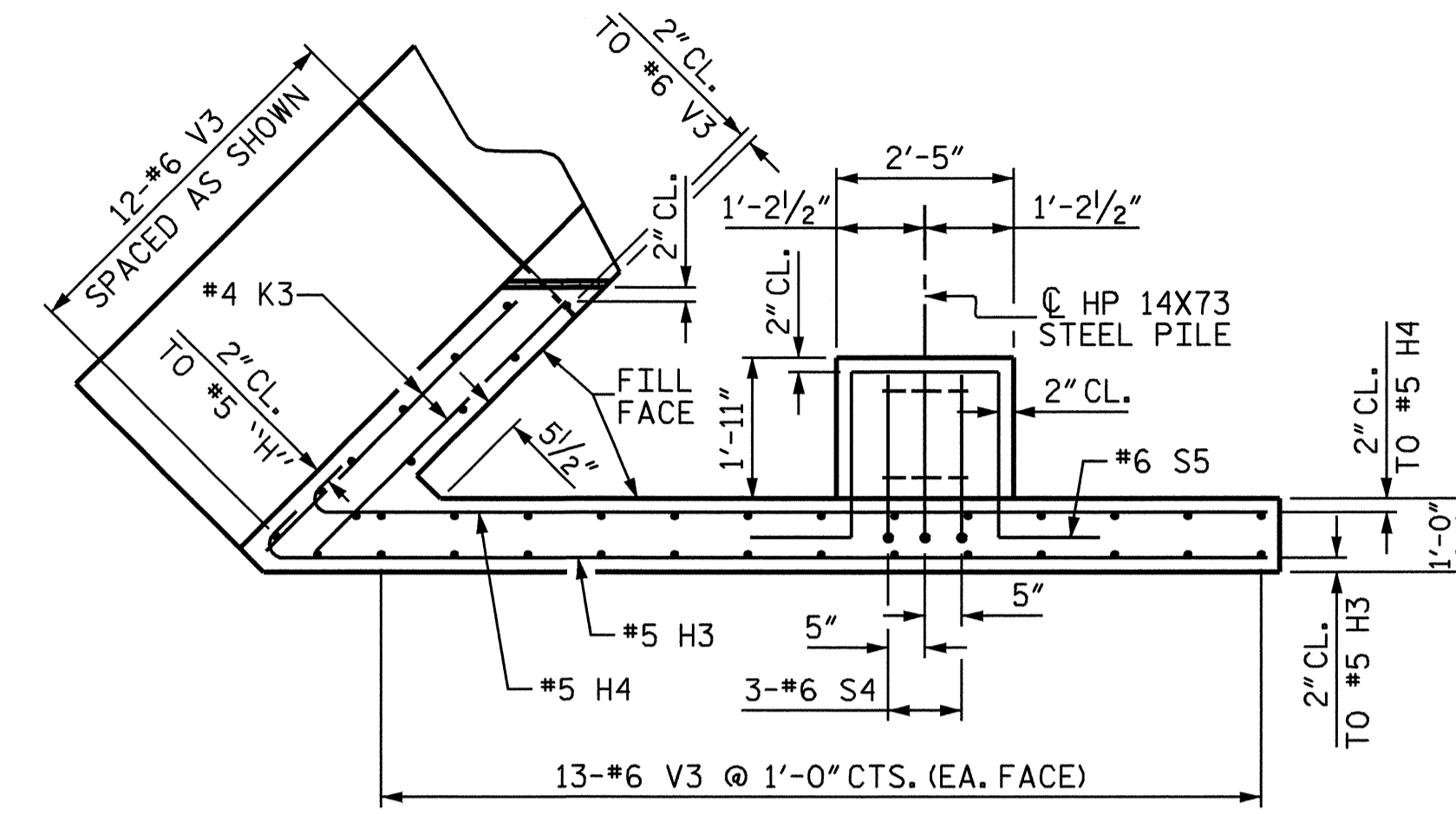
DRAWN BY: S. DOMBROWSKI DATE: 11/07
 CHECKED BY: K.D. LAYNE DATE: 12/07

30-MAY-2008 08:55
 R:\Structures\Plans\B-4534.ed.Ebts.dgn
 sdombrowski

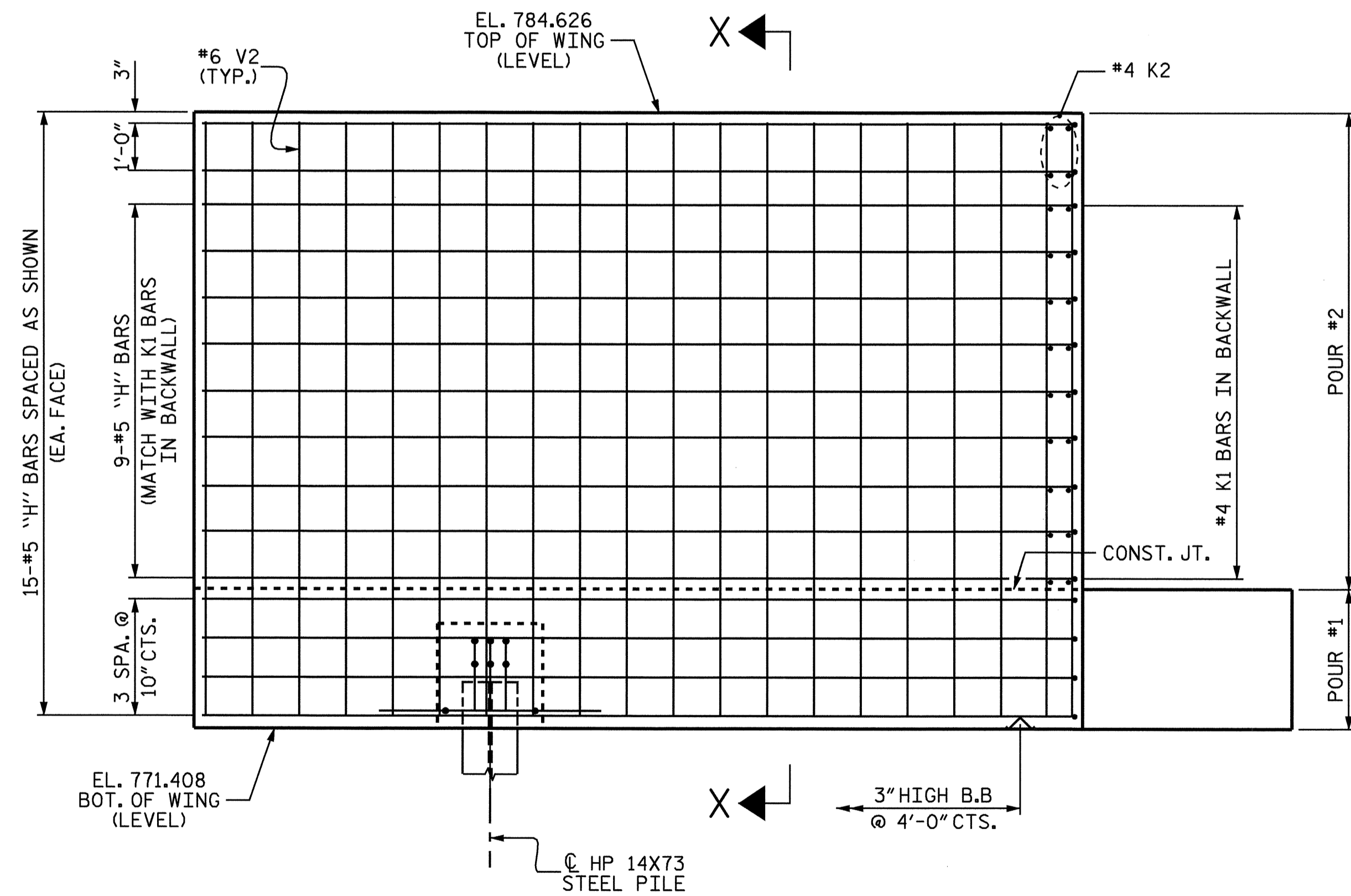




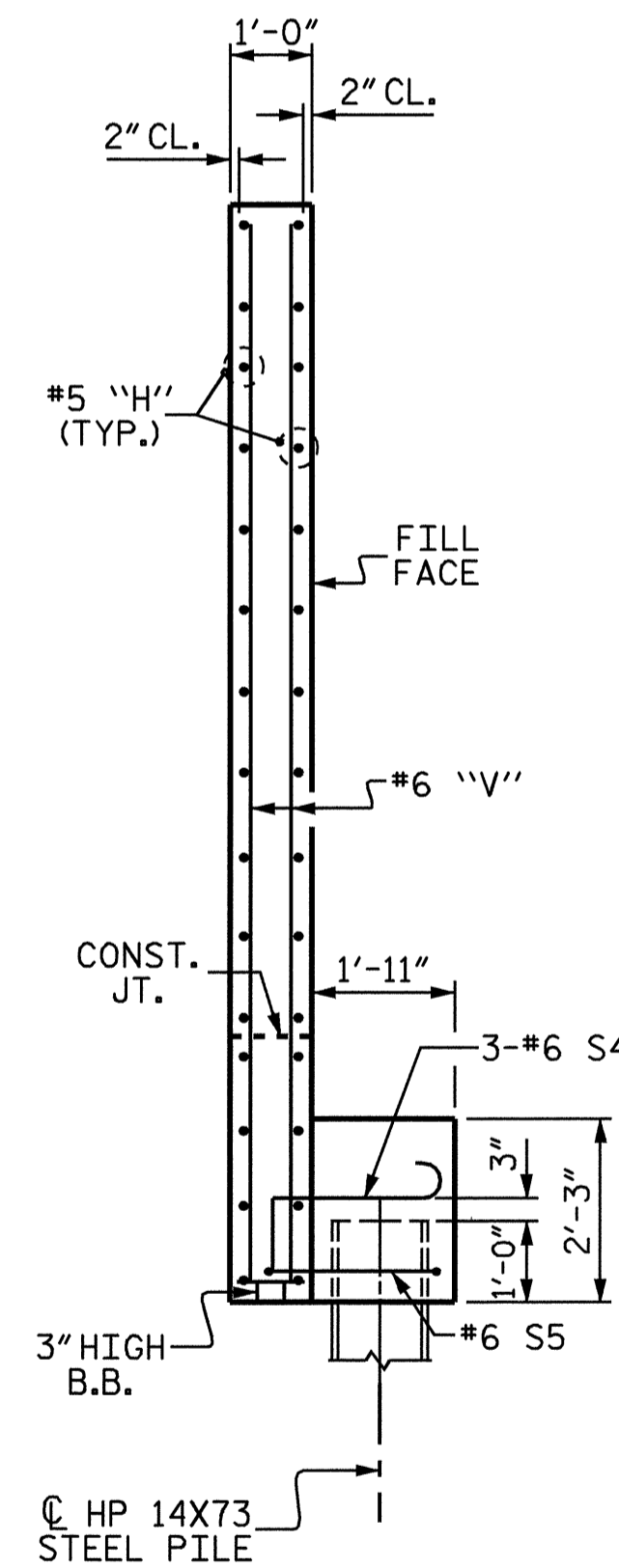
PLAN OF WING - W1



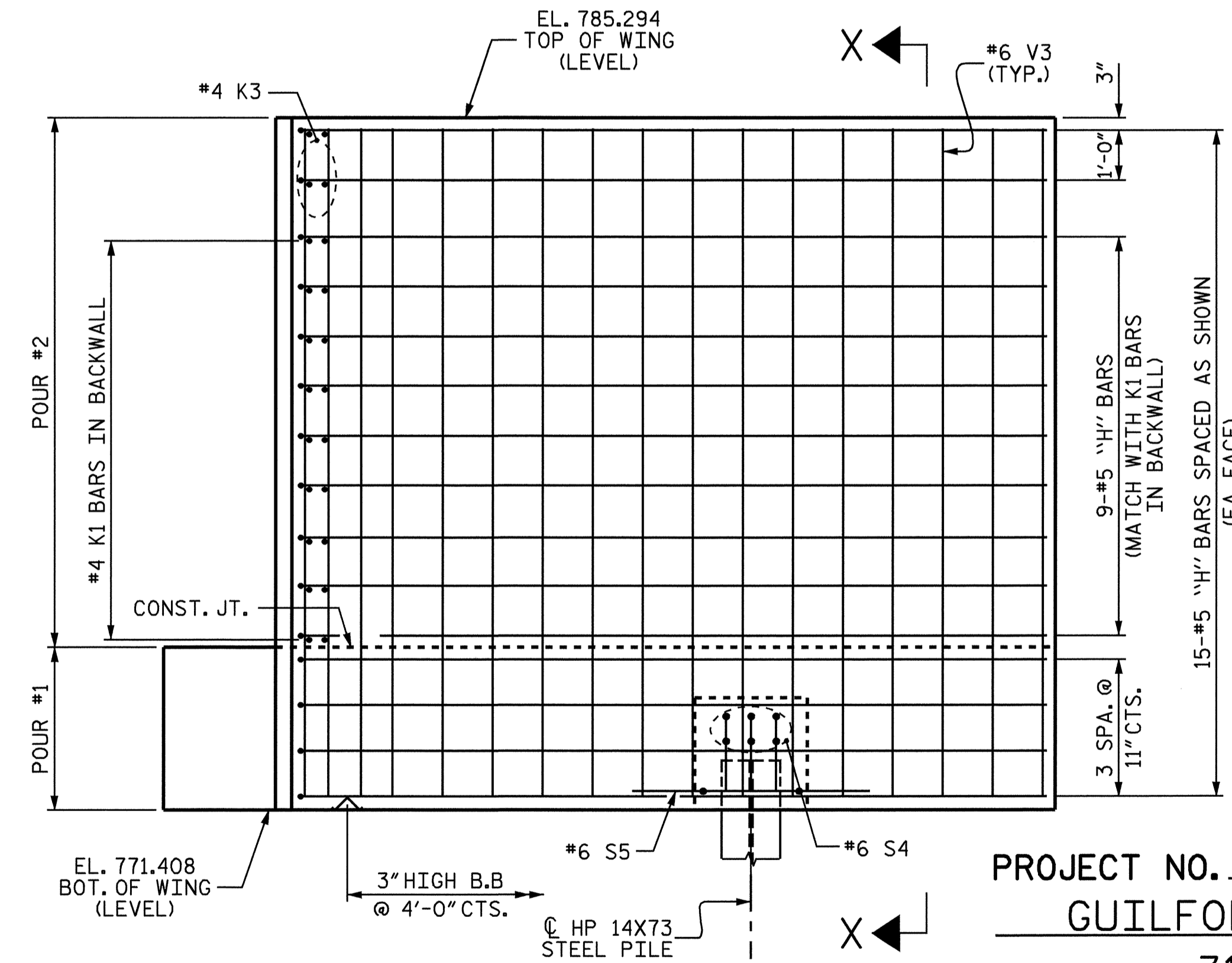
PLAN OF WING - W2



ELEVATION OF WING - W1



SECTION X-X



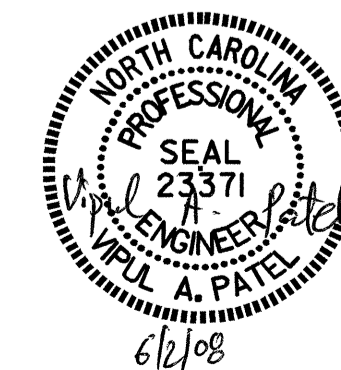
ELEVATION OF WING - W2

PROJECT NO. B-4534
 GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

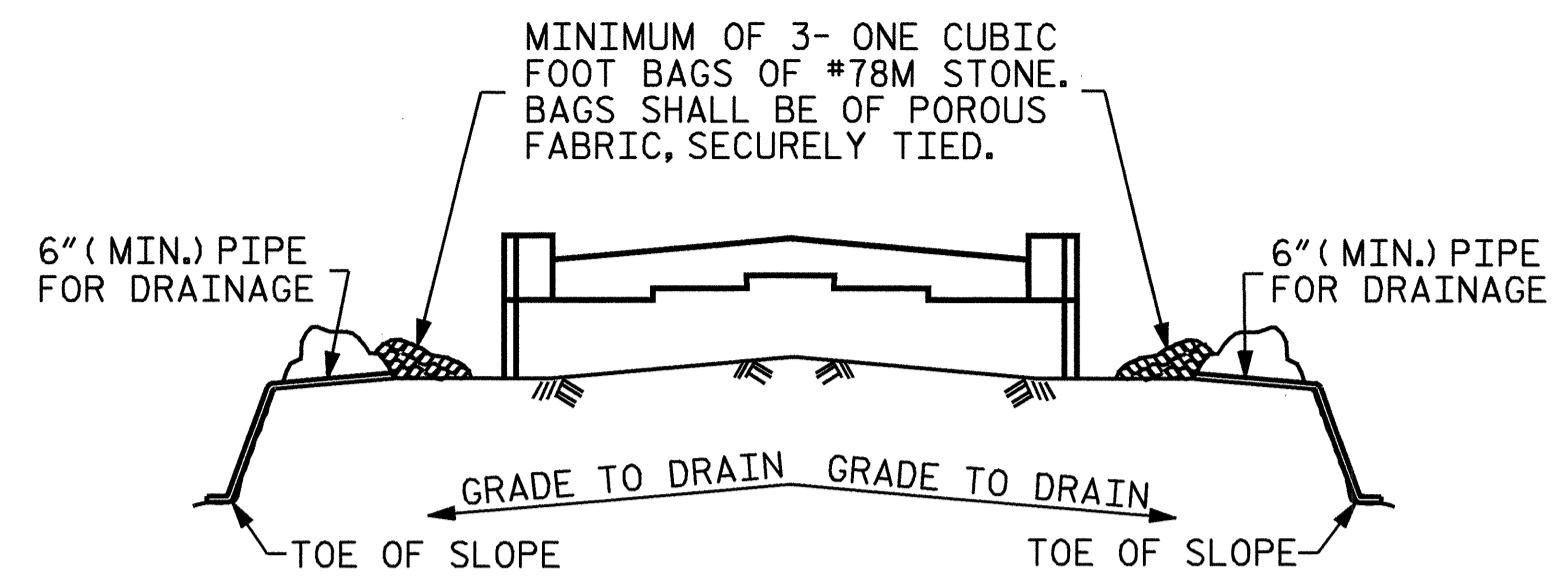
SUBSTRUCTURE
 END BENT #2



DRAWN BY : S. DOMBROWSKI DATE : 11/07
 CHECKED BY : K.D. LAYNE DATE : 12/07

30-MAY-2008 08:55
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 sdombrowski

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			24

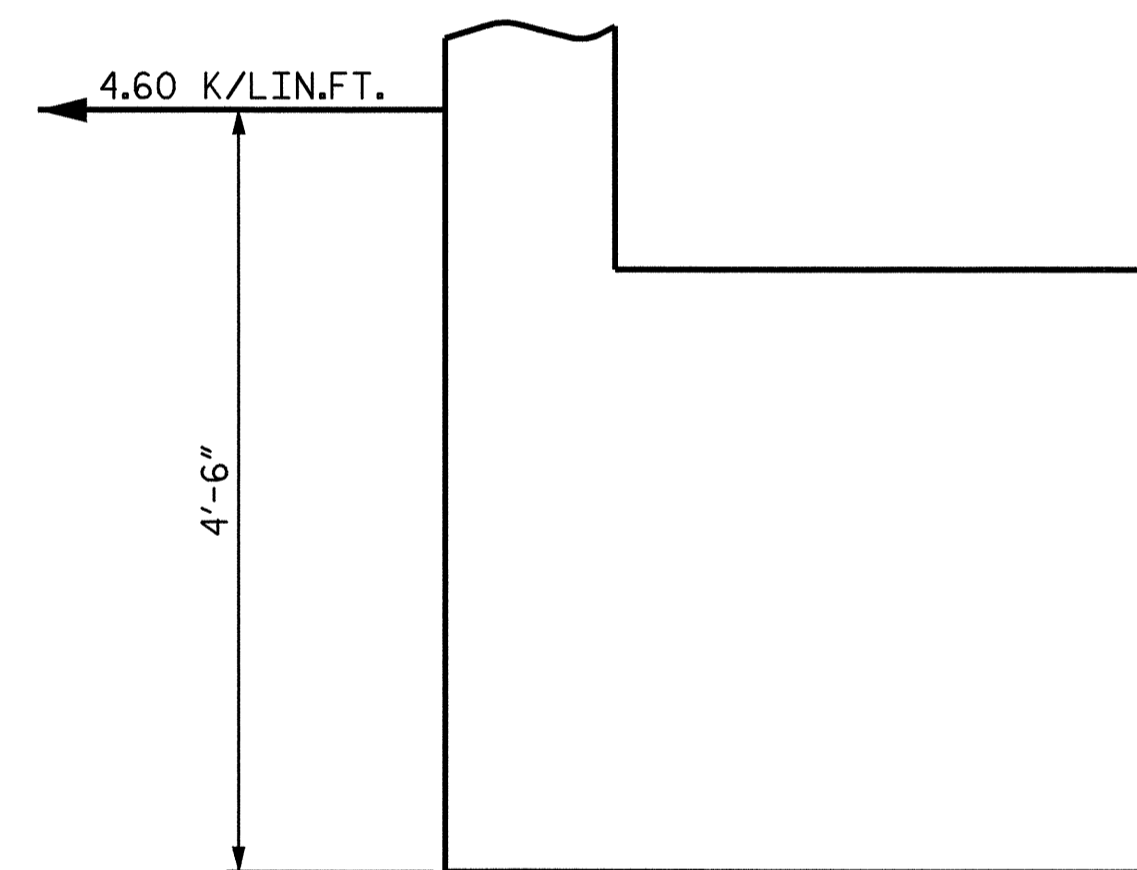


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TEMPORARY DRAINAGE AT END BENT



GALVANIZED REINFORCING STRAP LOAD DETAIL

GALVANIZED REINFORCING STRAP NOTES

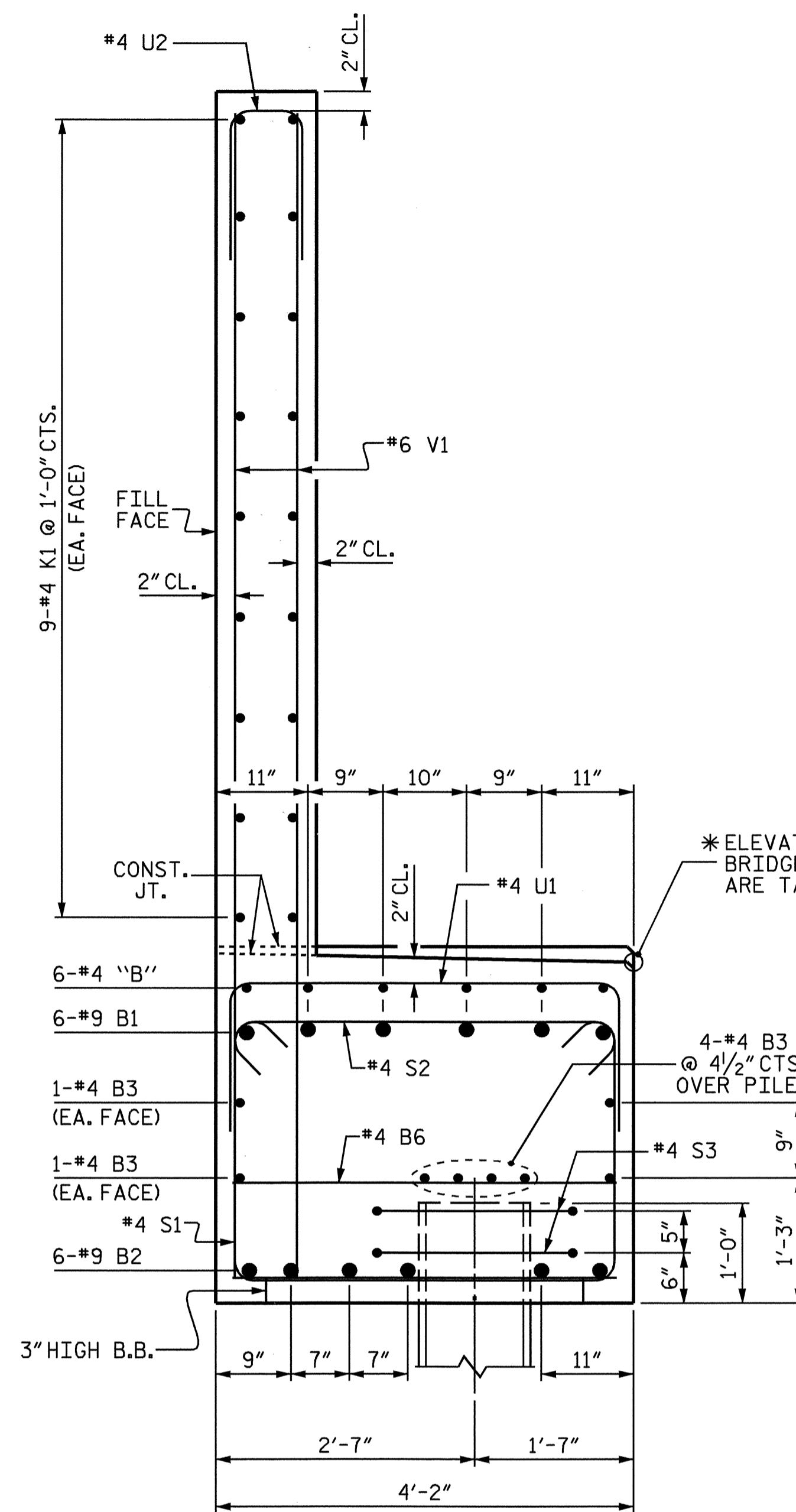
GALVANIZED REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE "MECHANICALLY STABILIZED EARTH RETAINING WALL" SPECIAL PROVISIONS.

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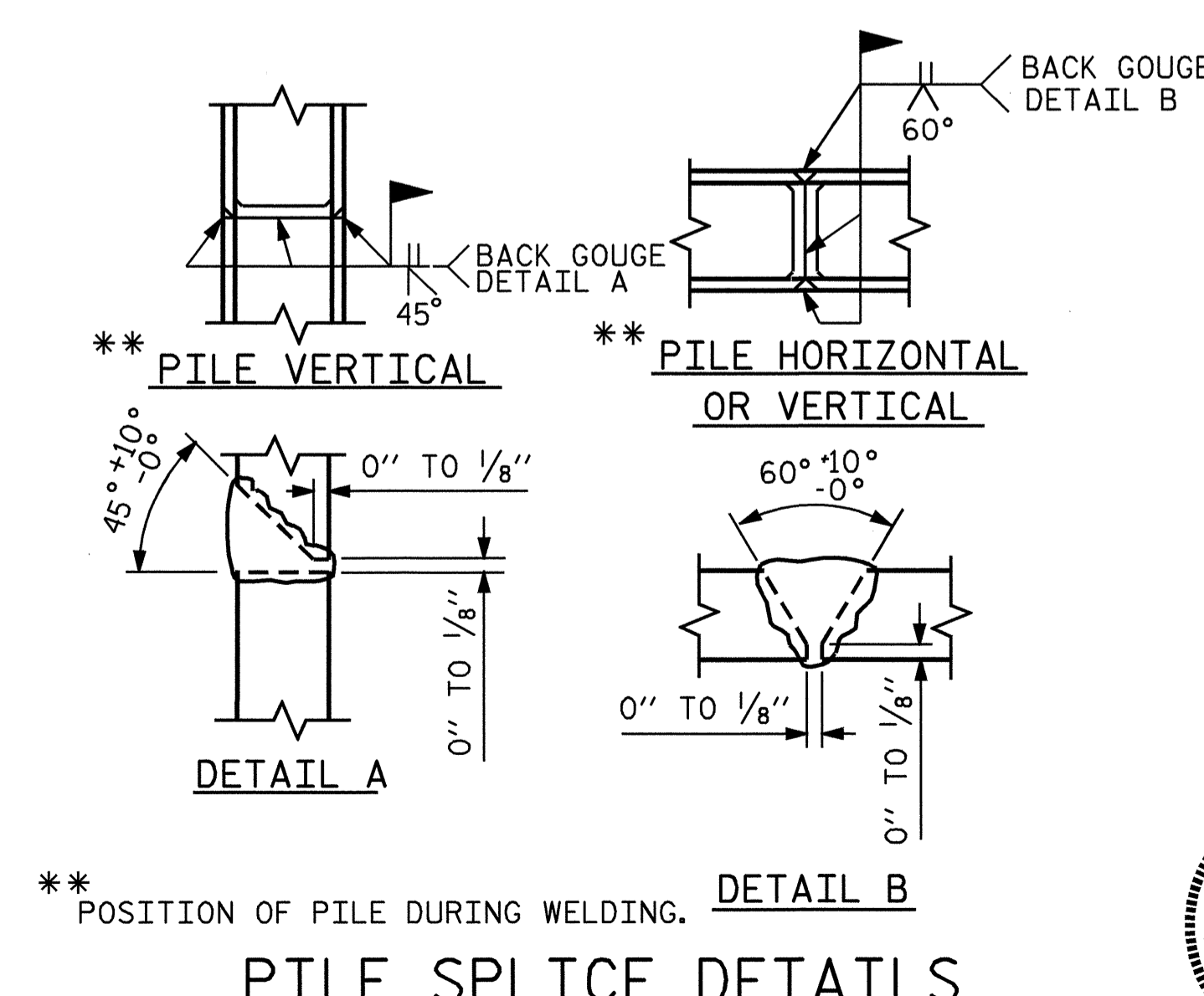
THE GALVANIZED REINFORCING STRAPS SHALL BE DESIGNED WITH THE FOLLOWING SOIL PARAMETERS:
 FRICTION ANGLE = 34 DEGREES
 COHESION c = 0.0
 UNIT WEIGHT OF SOIL = 110 PCF

FOR CONFLICTS WITH PILES IN THE END BENT WINGS, SEE PLAN VIEW AND FOUNDATION LAYOUT SHEETS.



SECTION THRU CAP

BAR TYPES		BILL OF MATERIAL				
		END BENT #2				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	#9	1	53'-2"	2169		
B2	#9	1	51'-11"	2118		
B3	#4	STR.	25'-7"	547		
B4	#4	STR.	21'-4"	257		
B5	#4	STR.	12'-6"	50		
B6	#4	STR.	3'-10"	59		
H1	#5	2	19'-4"	302		
H2	#5	2	20'-0"	313		
H3	#5	3	14'-6"	227		
H4	#5	3	14'-0"	219		
K1	#4	STR.	25'-7"	1230		
K2	#4	STR.	5'-1"	14		
K3	#4	STR.	4'-10"	13		
S1	#4	4	9'-10"	690		
S2	#4	5	4'-7"	321		
S3	#4	6	7'-6"	220		
S4	#6	7	3'-11"	35		
S5	#6	8	9'-5"	28		
U1	#4	9	6'-10"	219		
U2	#4	9	3'-8"	206		
V1	#6	STR.	11'-2"	2818		
V2	#6	STR.	12'-10"	945		
V3	#6	STR.	13'-6"	771		
REINFORCING STEEL				Lbs.	13,771	
CLASS "A" CONCRETE						
POUR #1: CAP & LOWER WINGS						
				Cu. Yds.	54.4	
POUR #2: UPPER WINGS						
				Cu. Yds.	42.9	
TOTAL				Cu. Yds.	97.3	
HP 14x73 STEEL PILES						
				No. 24	Ln. Ft. 840.0	



PROJECT NO. B-4534

GUILFORD COUNTY

STATION: 31+81.71 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2

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

TOTAL SHEETS 24

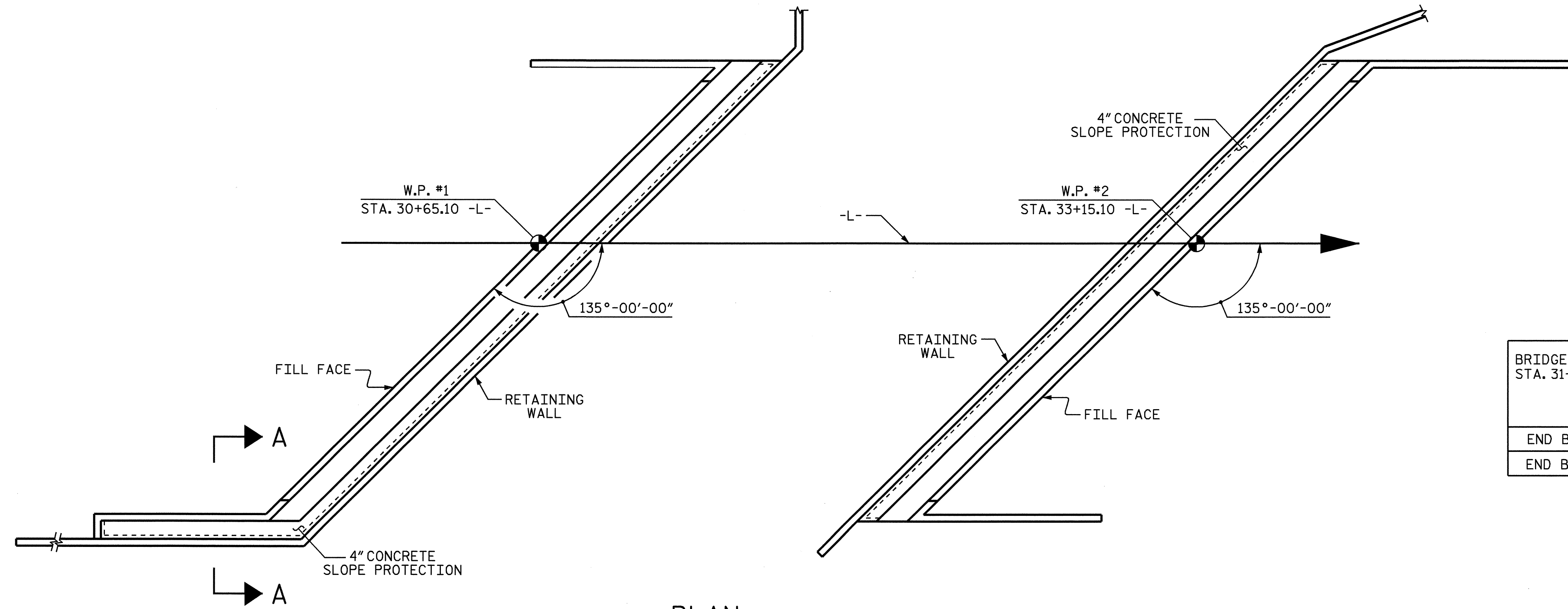
DRAWN BY: S. DOMBROWSKI DATE: 11/07

CHECKED BY: K.D. LAYNE DATE: 12/07

NOTES

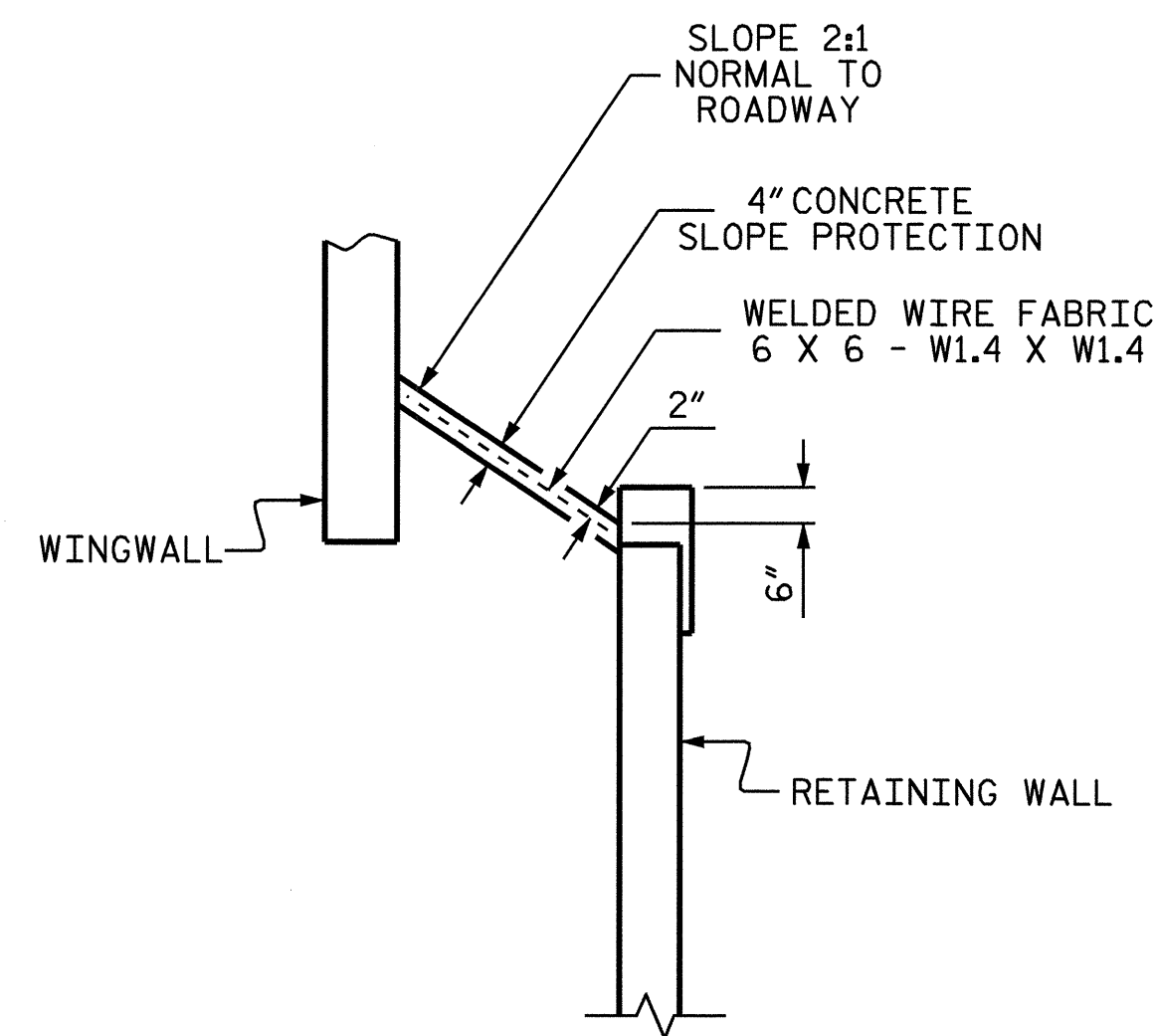
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

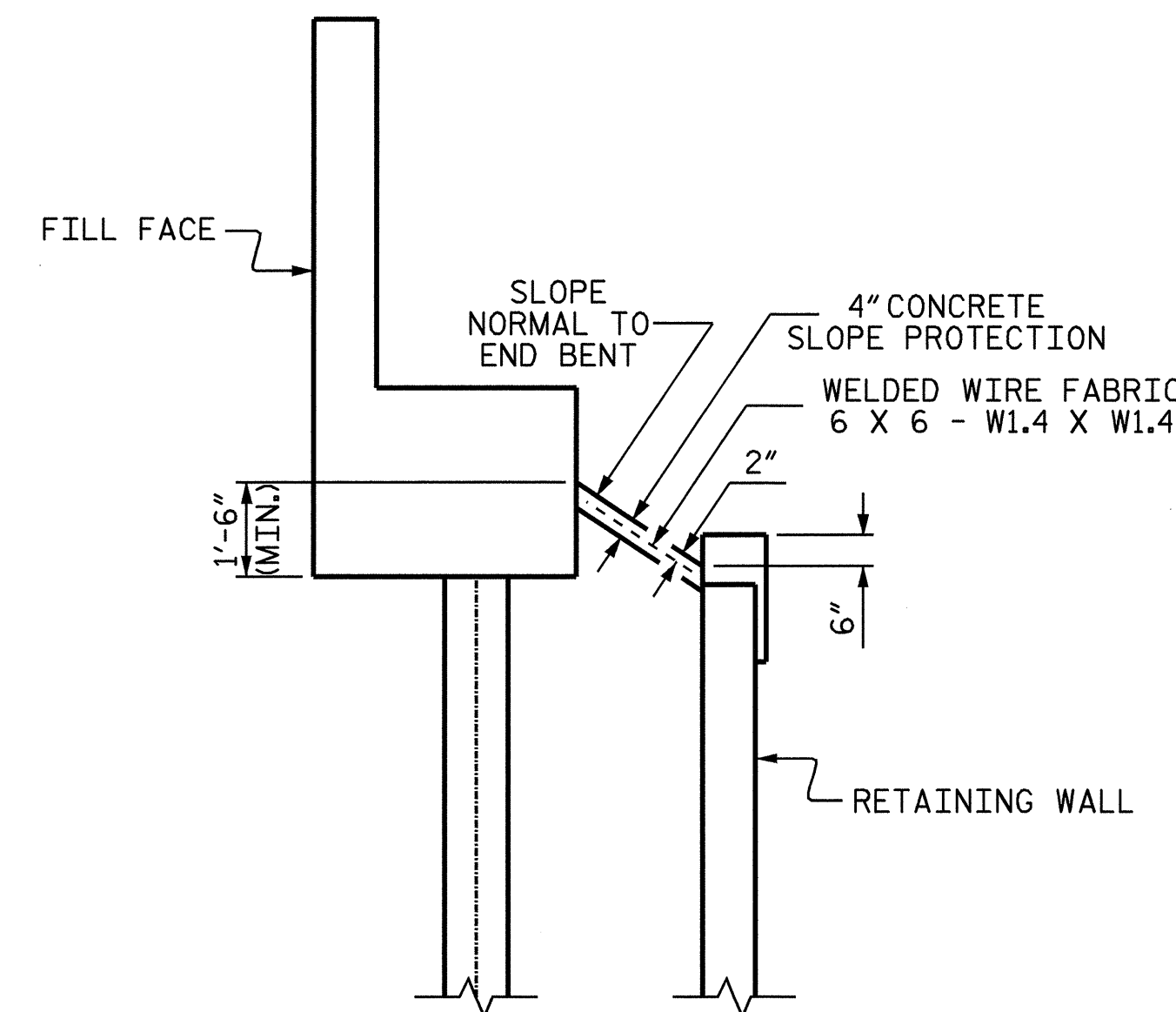


PLAN

BRIDGE @ STA. 31+81.71 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 20 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	30	130
END BENT #2	23	100



SECTION A-A



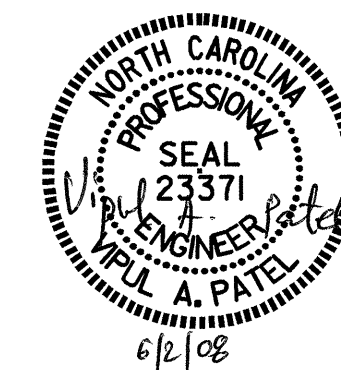
SECTION ALONG C ROADWAY

PROJECT NO. B-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

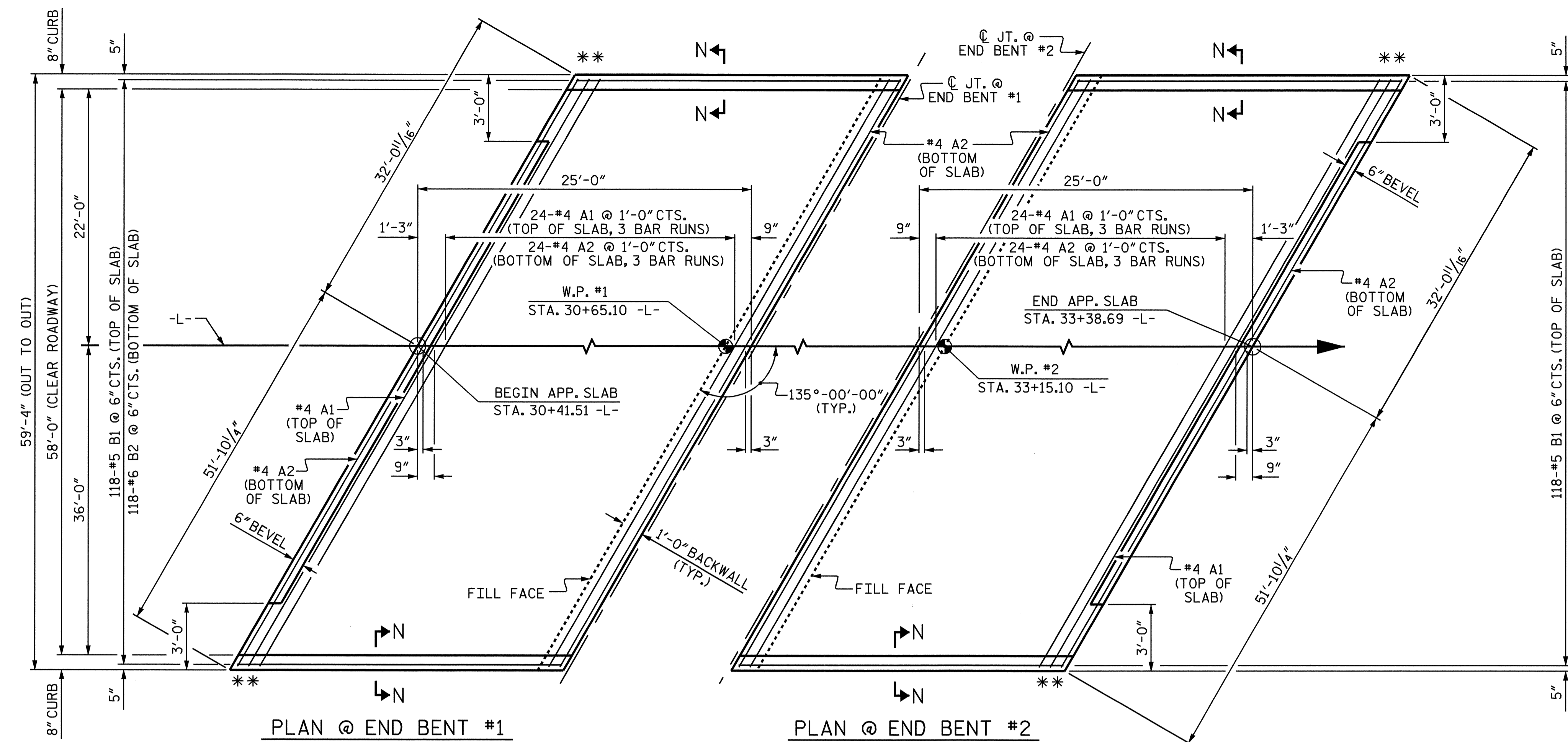
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS 24
2			4			



DRAWN BY : S. DOMBROWSKI DATE : 2/08
 CHECKED BY : V.A. PATEL DATE : 2/08



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

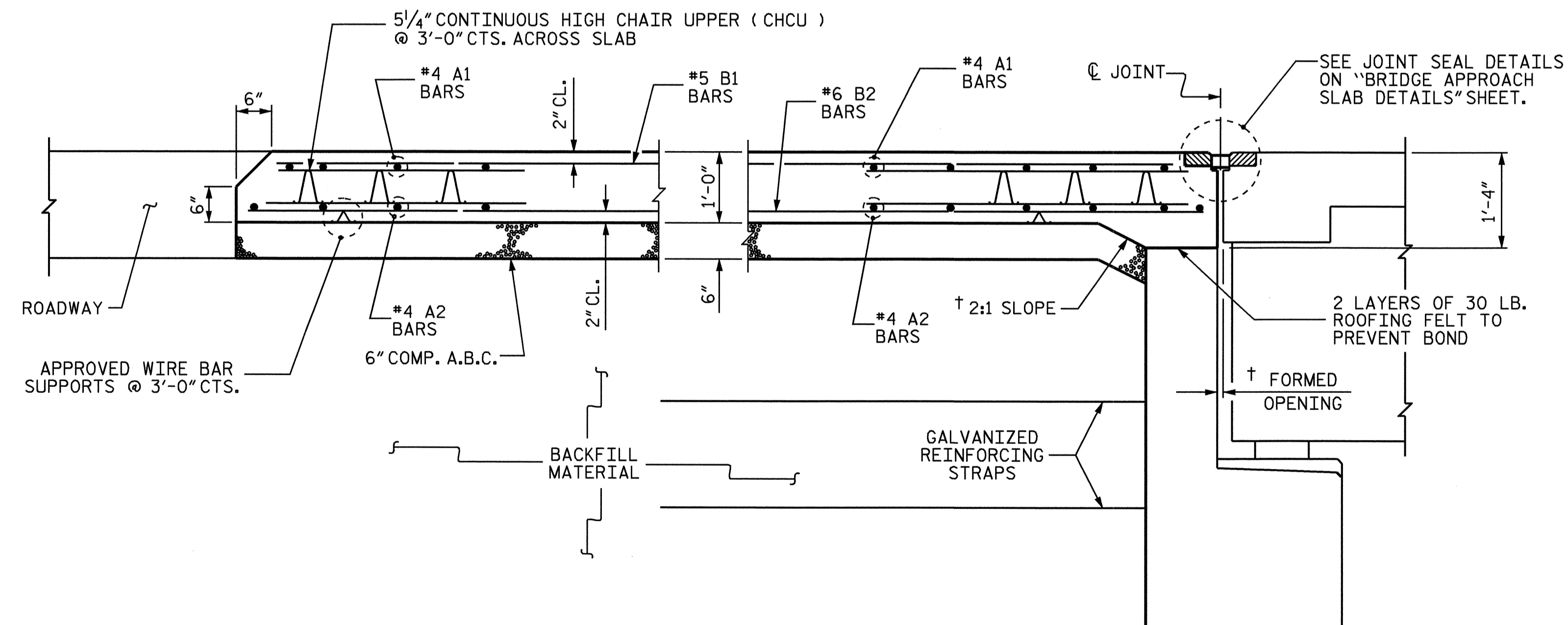
PLAN @ END BENT #2

SPLICE CHART	
*#4 A1	2'-0"
#4 A2	1'-9"

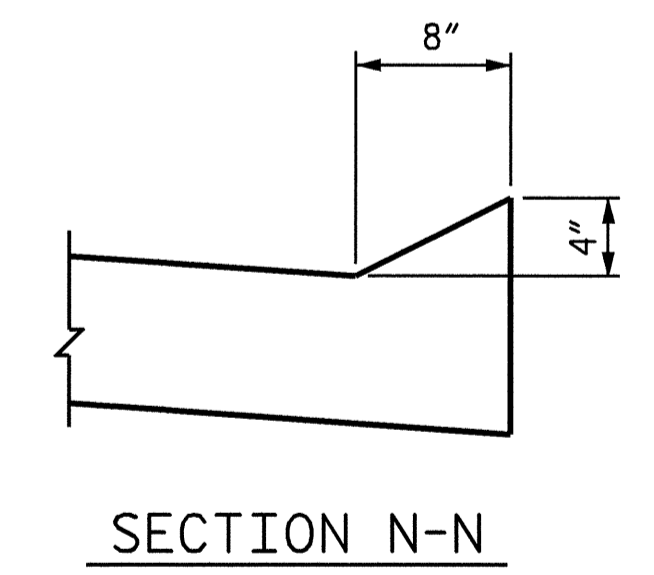
BILL OF MATERIAL					
FOR ONE APPROACH SLAB (2 REQUIRED)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	29'-2"	1461
A2	78	#4	STR	29'-0"	1511
*B1	118	#5	STR	23'-3"	2861
B2	118	#6	STR	24'-6"	4342
REINFORCING STEEL				LBS.	5853
*EPOXY COATED REINFORCING STEEL				LBS.	4322
CLASS AA CONCRETE				C. Y.	55.5

NOTES

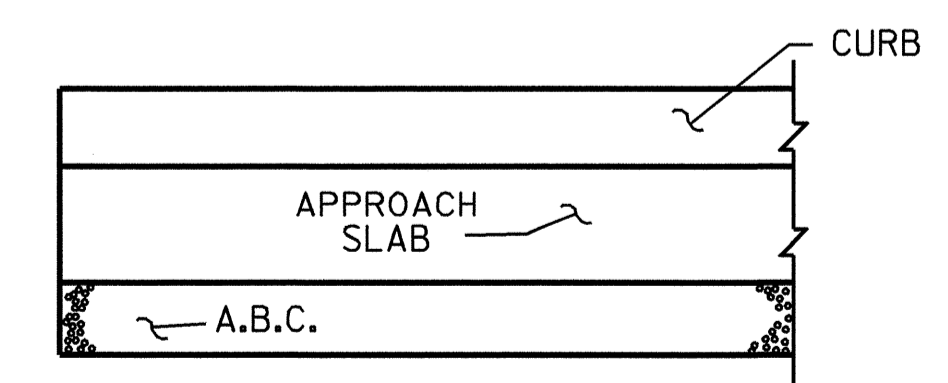
- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2" AT END BENT #1 AND 3 1/6" AT END BENT #2.
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.
- FOR BACKFILL MATERIAL, SEE MSE RETAINING WALL SPECIAL PROVISIONS.



SECTION THRU SLAB



SECTION N-N

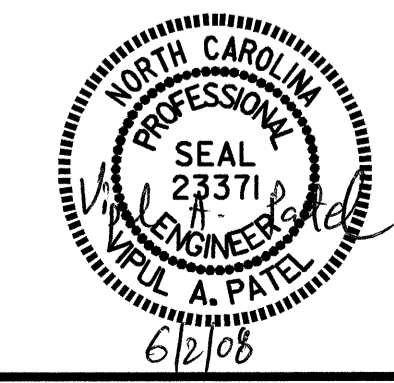


CURB DETAIL

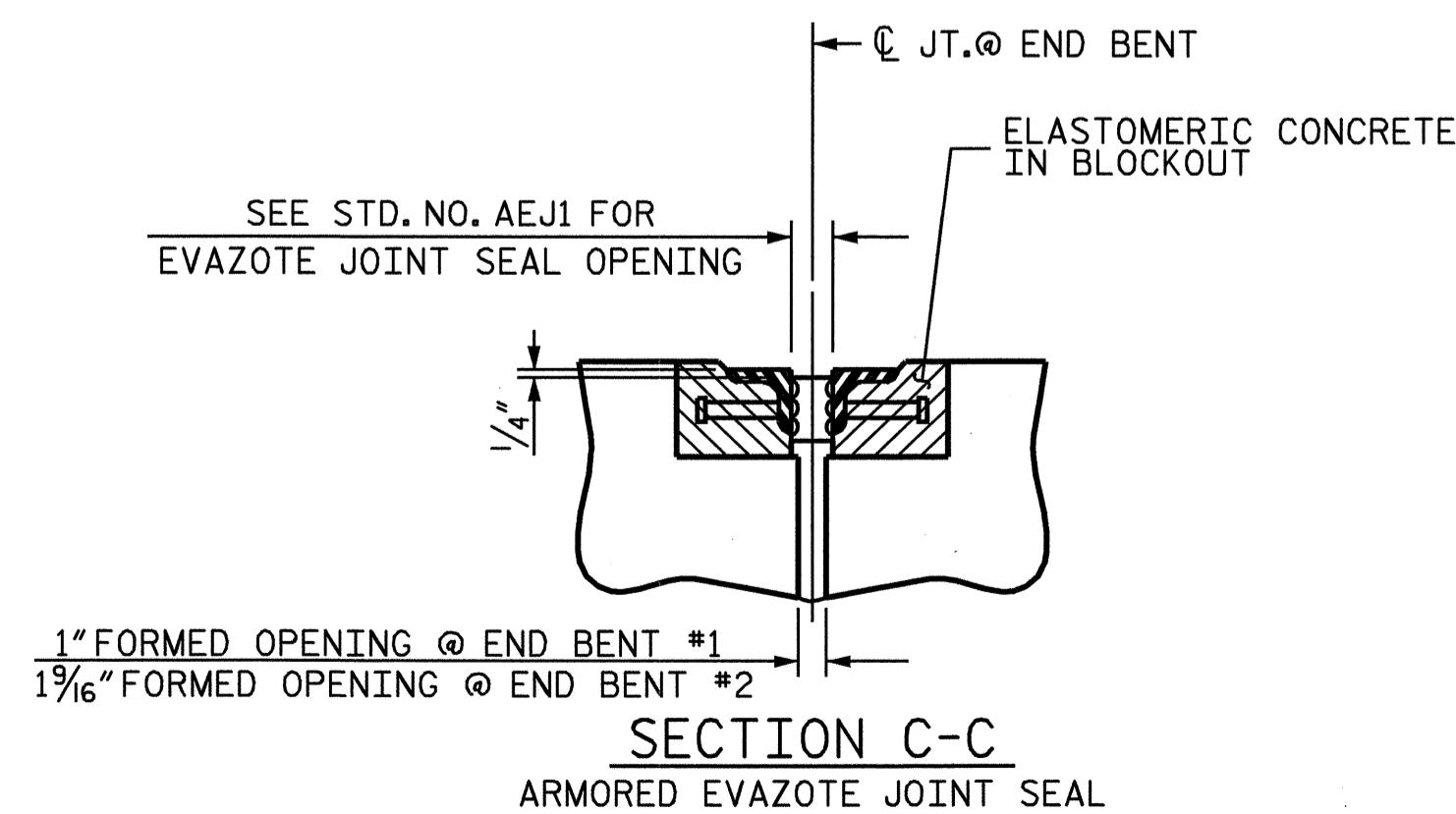
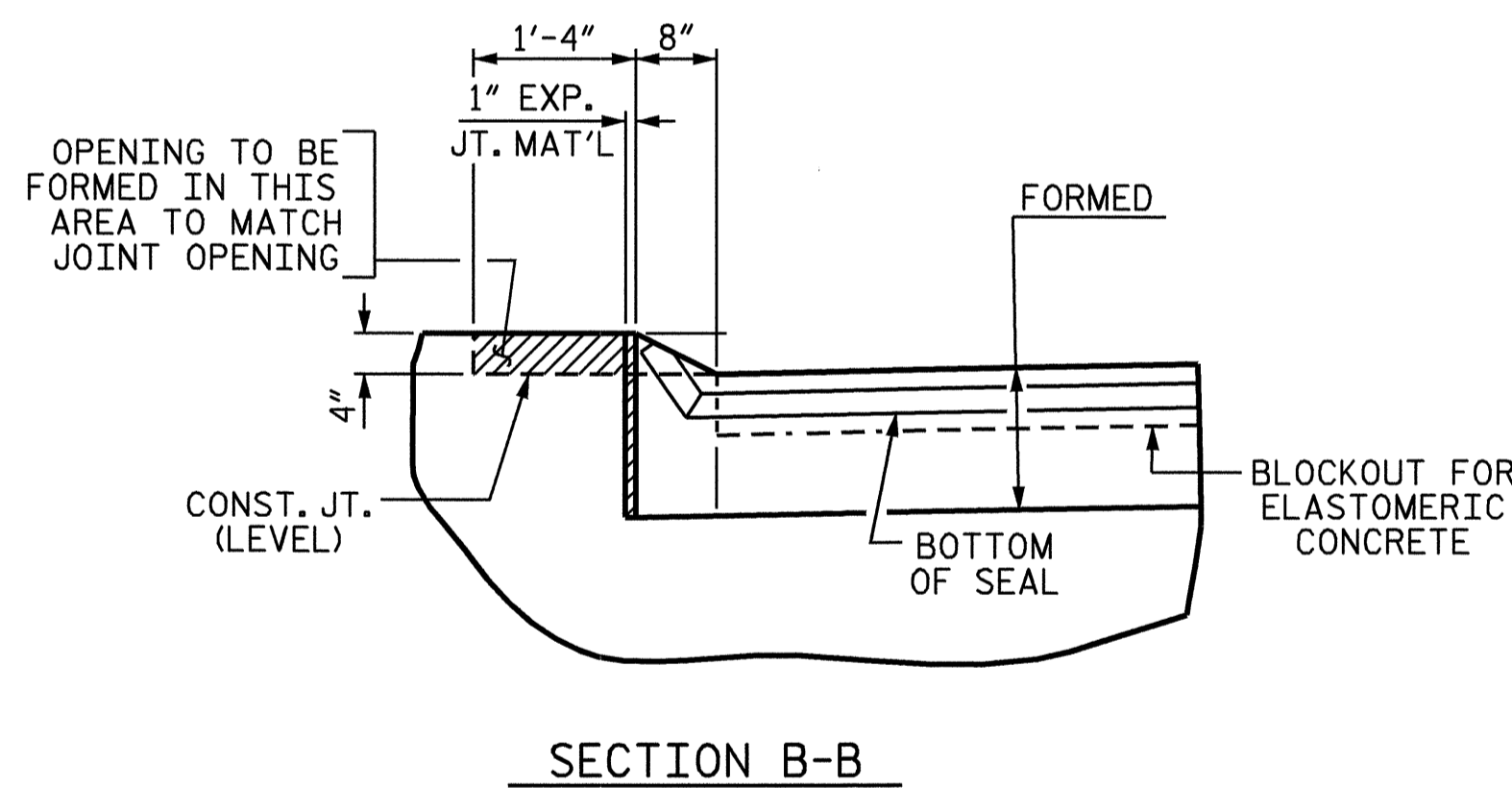
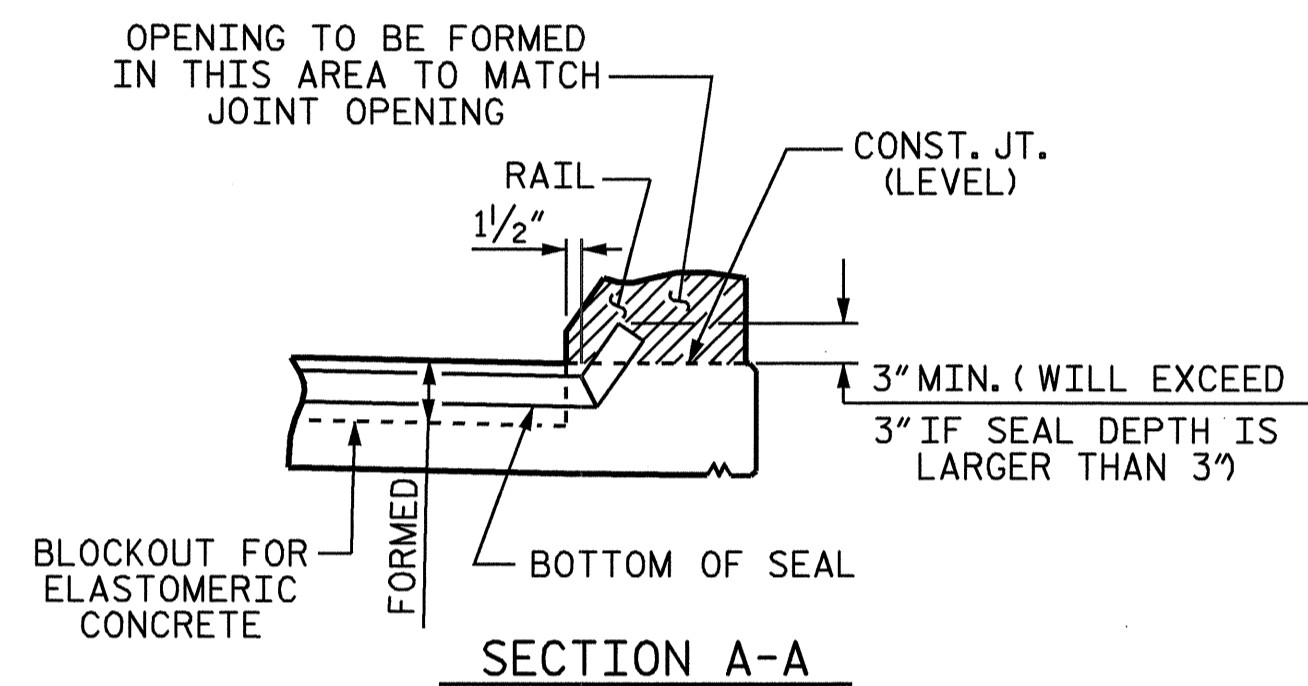
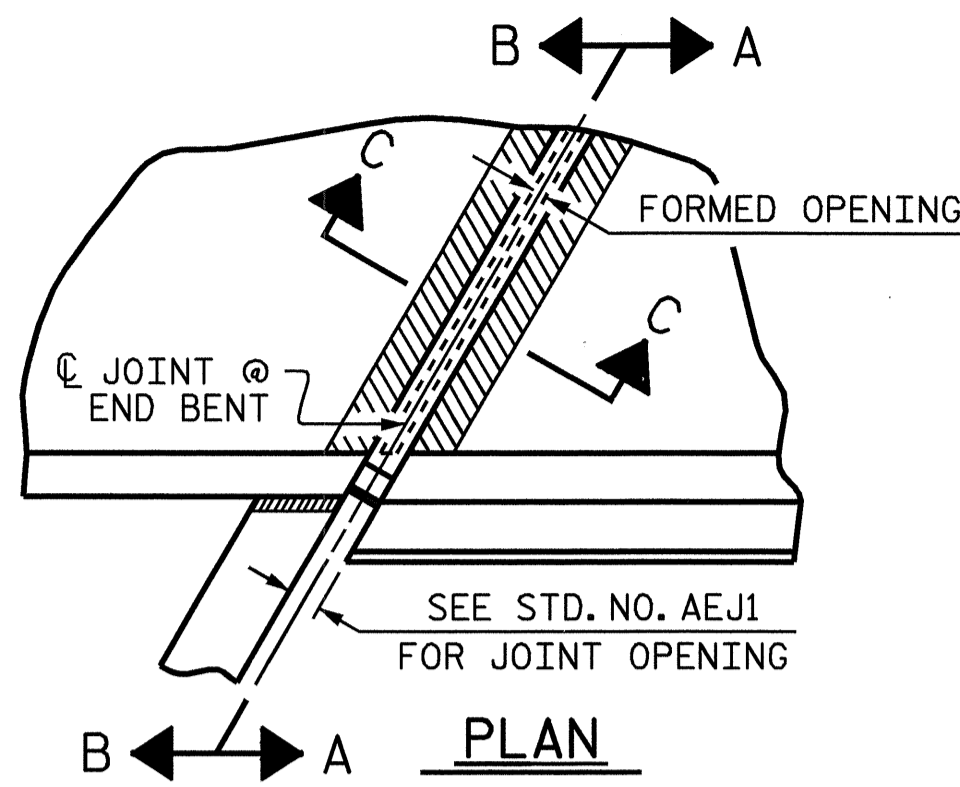
PROJECT NO. B-4534
GUILFORD COUNTY
STATION: 31+81.71 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-23
					TOTAL SHEETS 24

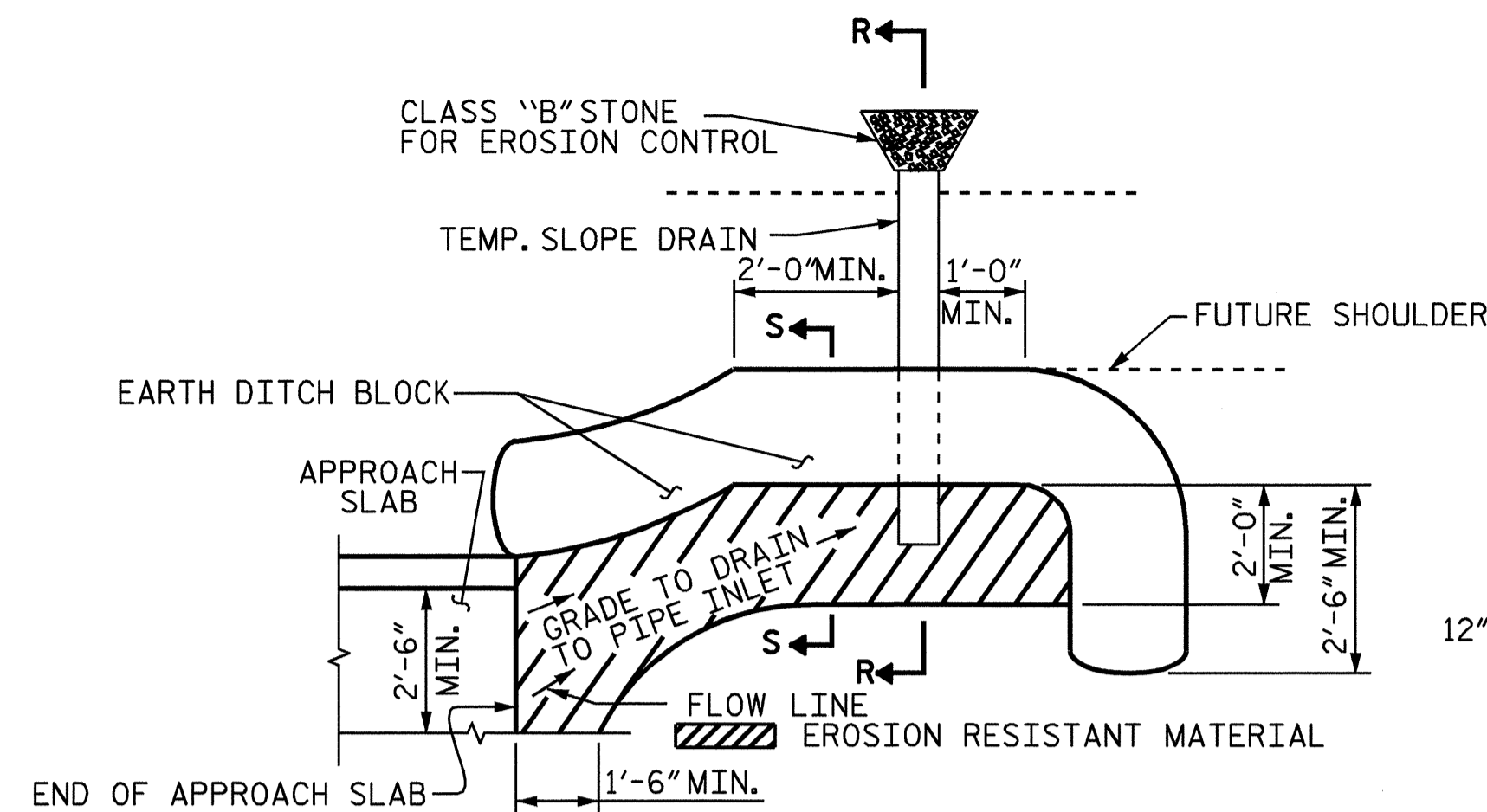


ASSEMBLED BY : S. DOMBROWSKI	DATE : 03/17/08
CHECKED BY : V. PATEL	DATE : 03/17/08
DRAWN BY : EEM 3/95	REV. 7/10/01 LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R RHW/JTE
	REV. 5/1/06R KMM/GM



JOINT SEAL DETAILS @ END BENT

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

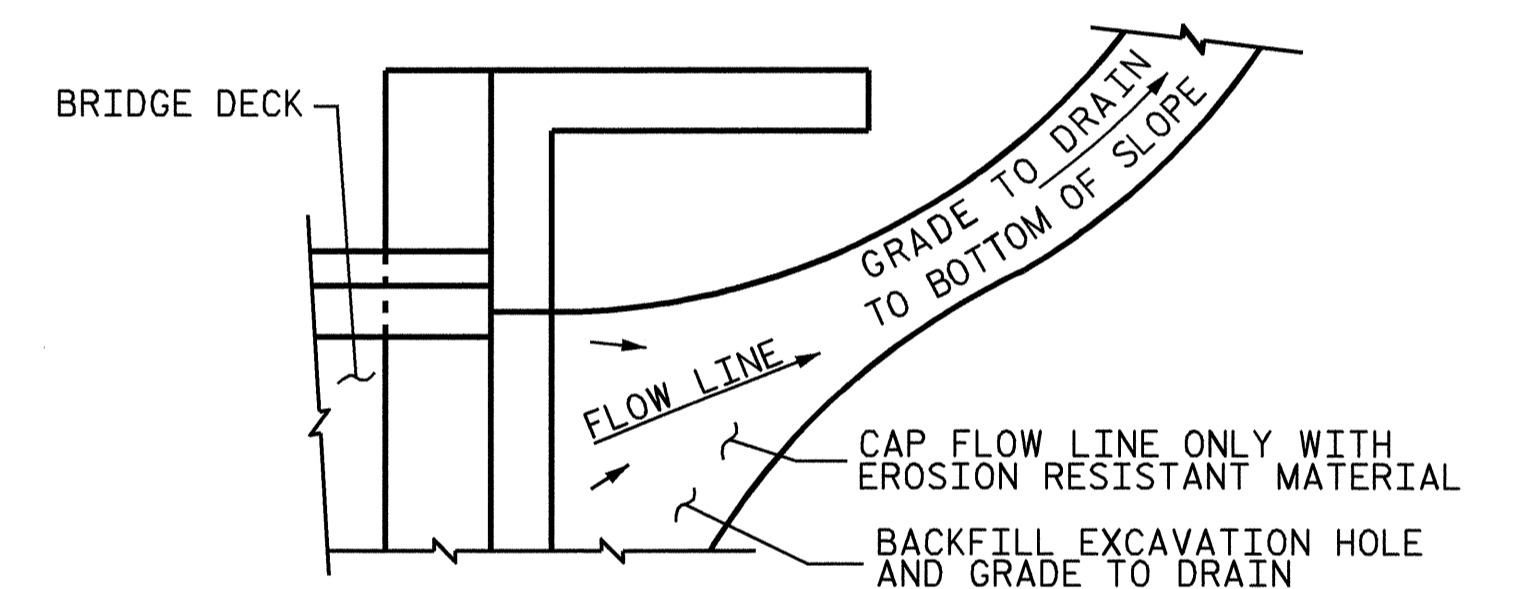
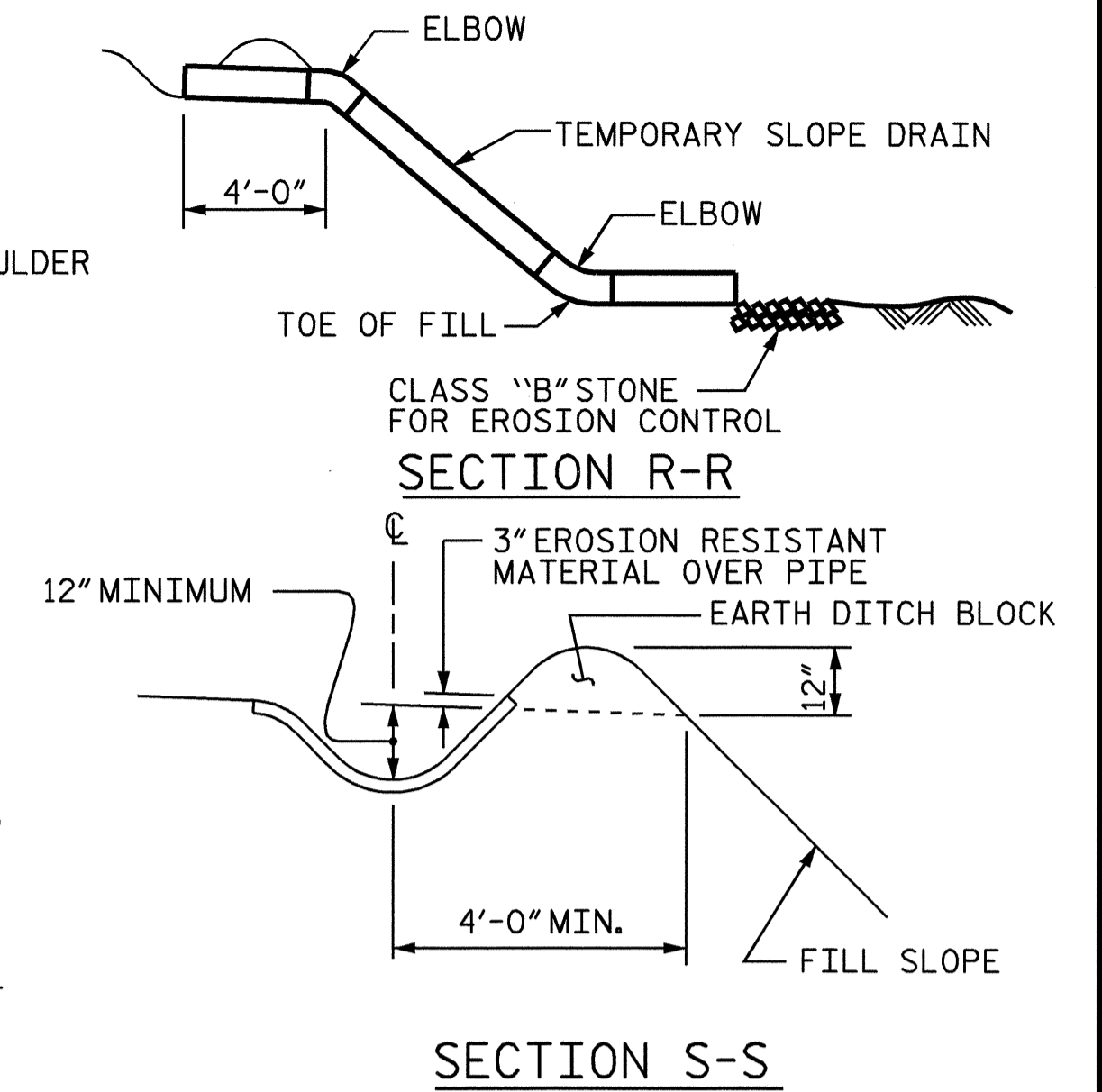


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



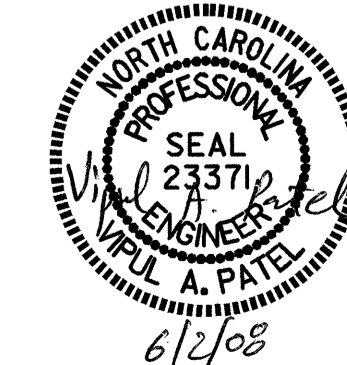
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT 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-4534
GUILFORD COUNTY
 STATION: 31+81.71 -L-

SHEET 2 OF 2

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



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

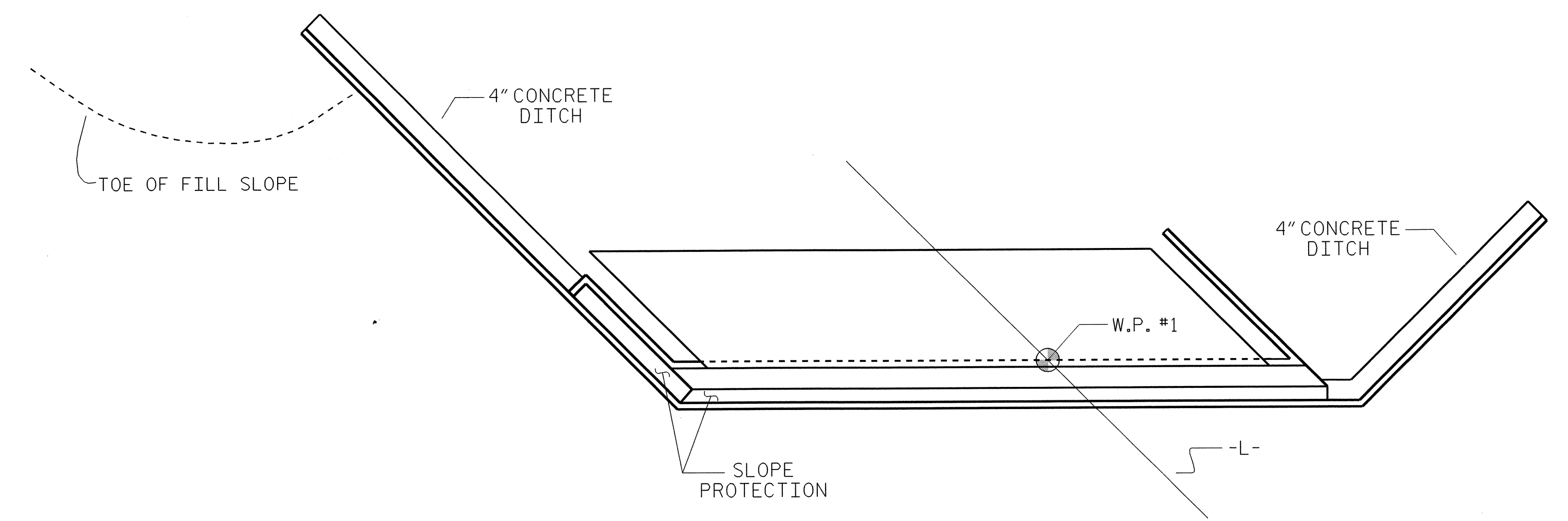
ASSEMBLED BY : S. DOMBROWSKI	DATE : 03/17/08
CHECKED BY : V. PATEL	DATE : 03/17/08
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/1/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

GEOTECHNICAL ENGINEER

ENGINEER

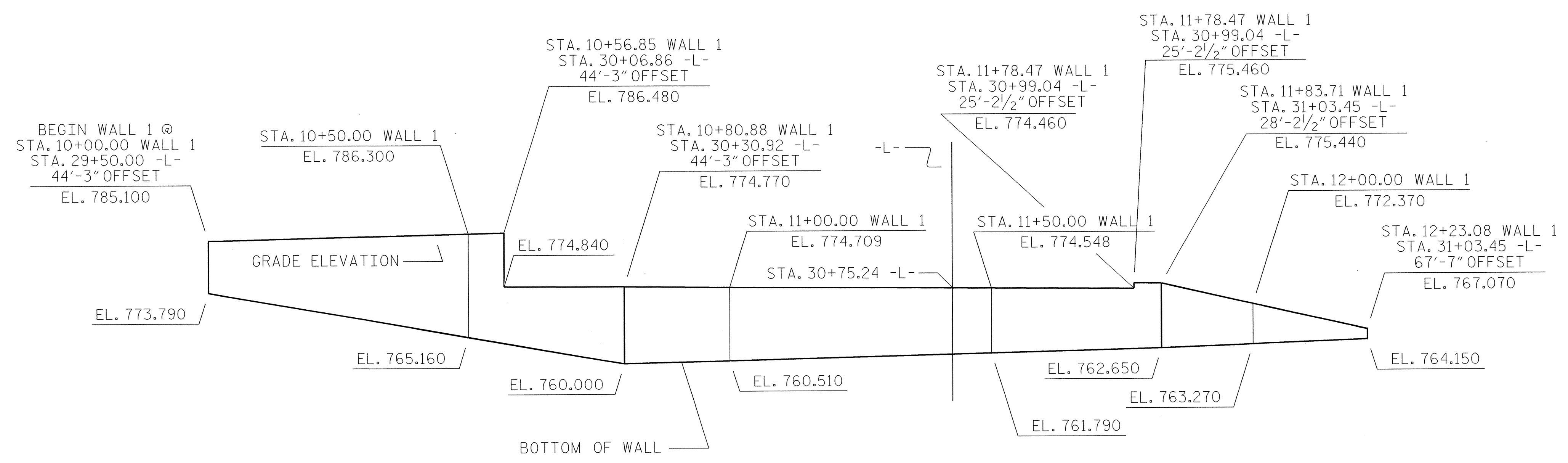
SEAL
029413
CHARLES ARTHUR GOLF
22 APR 2008

SIGNATURE DATE SIGNATURE DATE



WALL NO.	ESTIMATED AVERAGE AREA (SQ. FT.)
1	2784.0

PLAN
N.T.S.



ELEVATION

WALL 1 @ END BENT #1
VIEW DOWN STATION
WALL UNFOLDED
N.T.S.

PROJECT NO.: B-4534
GUILFORD COUNTY
STATION: 30+75.24 -L-
SHEET 1 OF 3

GEOTECHNICAL ENGINEERING UNIT

- EASTERN REGIONAL OFFICE
- WESTERN REGIONAL OFFICE
- CONTRACT OFFICE

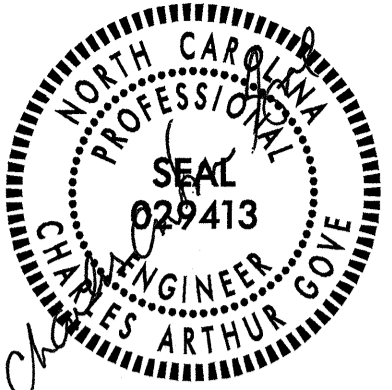
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL NO. 1

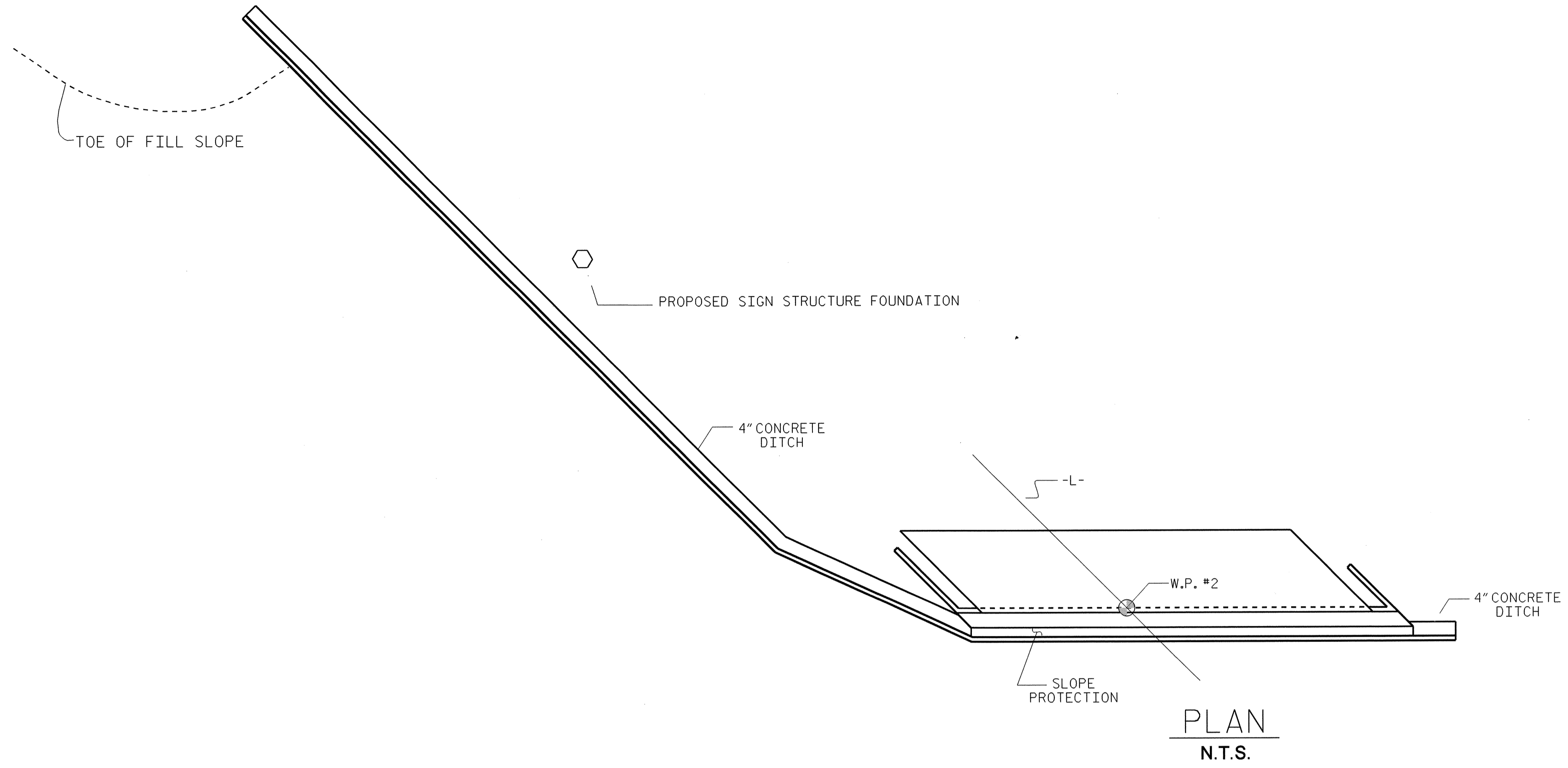
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			3

PREPARED BY: JRM	DATE: 4/08
REVIEWED BY: CAG	DATE: 4/08

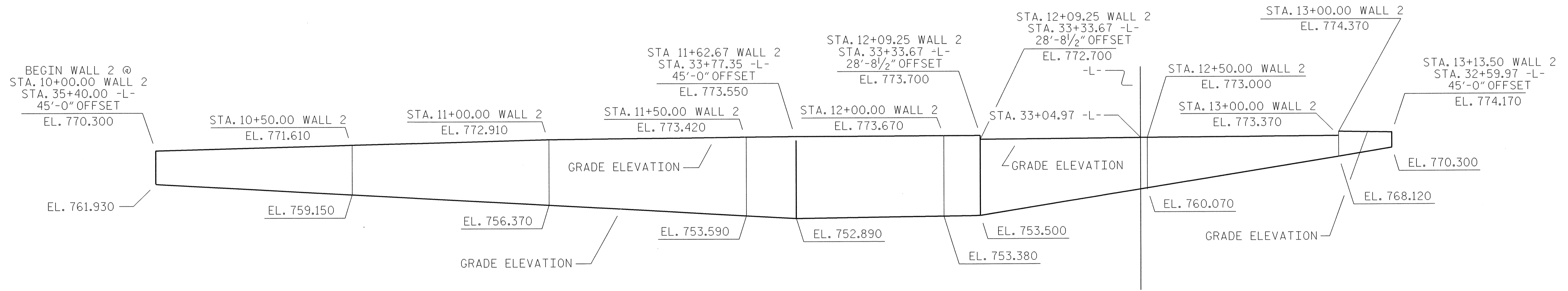
GEC226158 4/22/2008 b-4534_rwall1&2_mscapr08_mawang GE-Oce34bond

GEOTECHNICAL ENGINEER
 ENGINEER

 22 APR 2008
 SIGNATURE DATE SIGNATURE DATE

WALL NO.	ESTIMATED AVERAGE AREA (SQ. FT.)
2	4317.0



PLAN
N.T.S.



ELEVATION

WALL 2 @ END BENT #2
 VIEW UP STATION
 WALL UNFOLDED
 N.T.S.

PROJECT NO.: B-4534
 GUILFORD COUNTY
 STATION: 33+04.97 -L-
 SHEET 2 OF 3

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL NO. 2

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

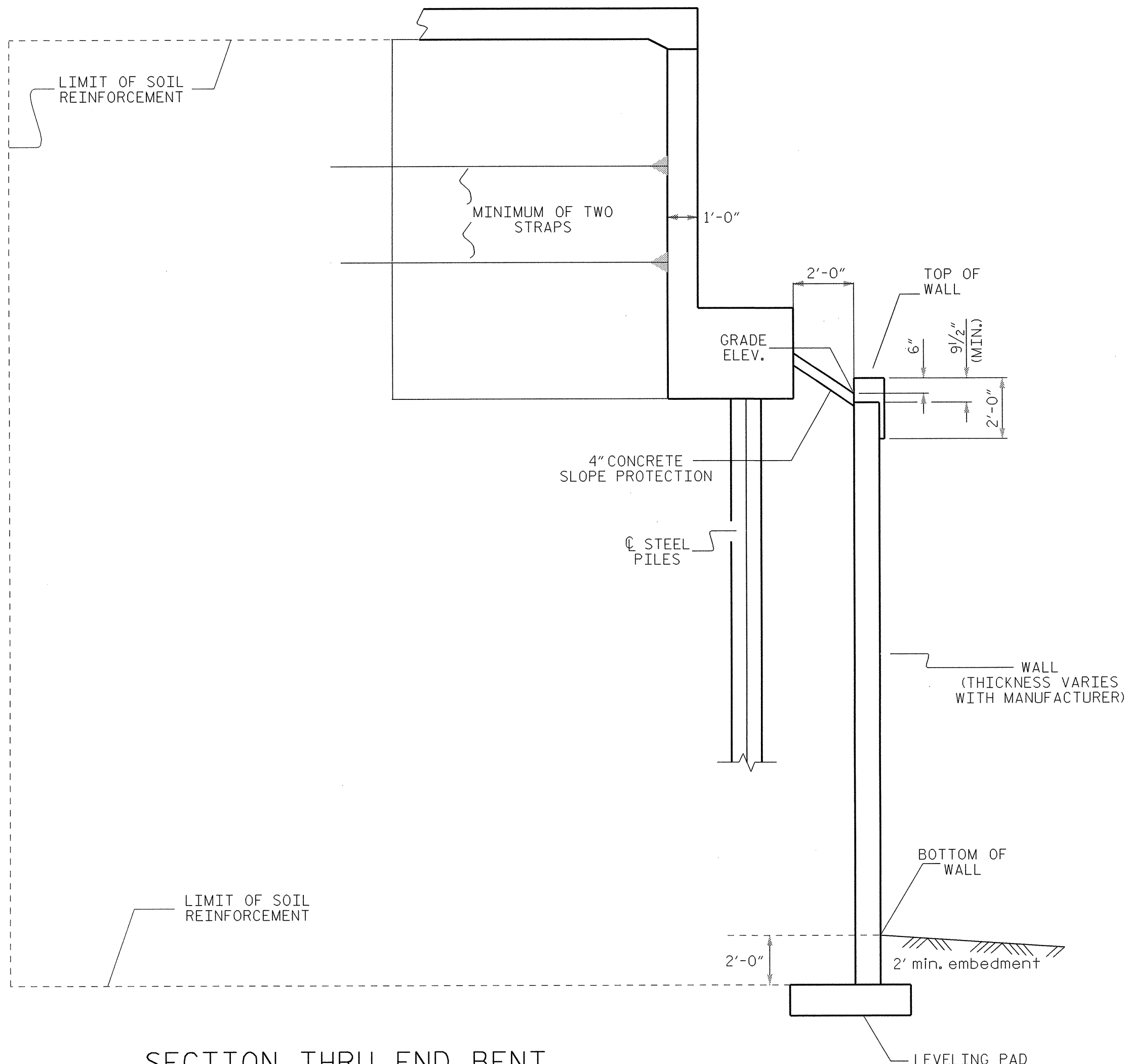
PREPARED BY: JRM	DATE: 4/08
REVIEWED BY: CAG	DATE: 4/08

ENGINEER

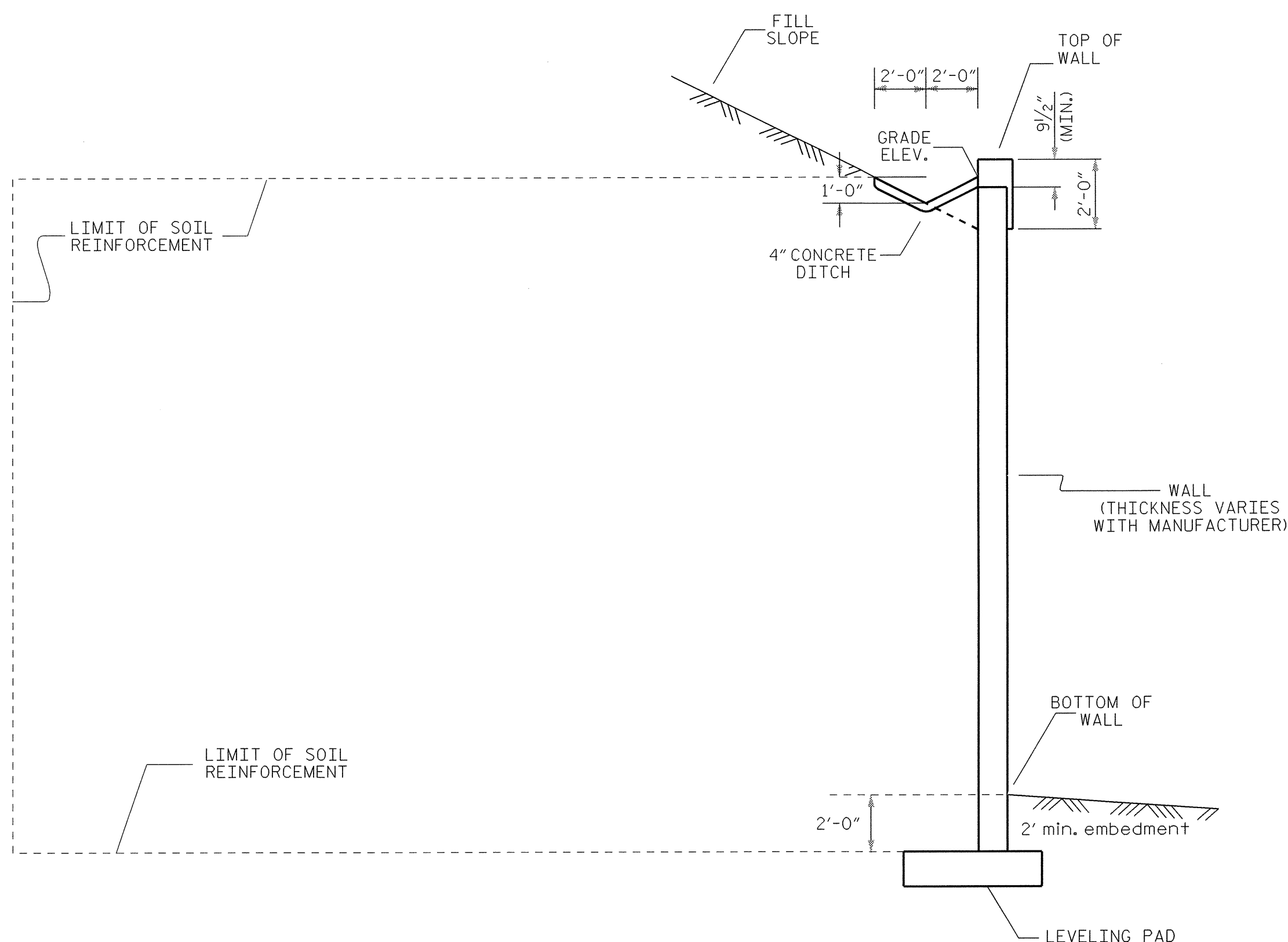
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL
029413
ENGINEER
CHUCK ARTHUR GOLE

22 APRIL 2006
SIGNATURE DATE



SECTION THRU END BENT



TYPICAL WALL SECTION

MSE RETAINING WALL NOTES ON PLANS

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS SPECIAL PROVISION.

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

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

DO NOT USE STANDARD SIZE NO.2S OR 2MS FOR WALL BACKFILL FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2.

DO NOT USE AN MSE WALL SYSTEM WITH SEGMENTAL RETAINING WALL UNITS FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2, SURVEY ALL EXISTING GROUND ELEVATIONS SHOWN ON THE PLANS AND SUBMIT A REVISED WALL ENVELOPE FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THIS ENVELOPE IS ACCEPTED.

CAST-IN-PLACE CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2.

A PLAIN SURFACE FINISH IS REQUIRED ON THE FRONT FACE OF THE PRECAST CONCRETE PANELS FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2.

DESIGN RETAINING WALL NO.1 AND RETAINING WALL NO.2 FOR A WALL HEIGHT EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).

DESIGN RETAINING WALL NO.1 AND RETAINING WALL NO.2 FOR THE FOLLOWING:

- 1) MINIMUM SERVICE LIFE = 100 YEARS
- 2) ALLOWABLE BEARING CAPACITY = 6200 PSF
- 3) WALL BACKFILL MATERIAL PARAMETERS:

MATERIAL STANDARD SIZE NO. (IN ACCORDANCE WITH SECTIONS 1005 AND 1014 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
57, 67 AND 78M	110	34	0

4) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
RETAINED AND RANDOM BACKFILL	120	32	0
FOUNDATION	120	32	0

DESIGN RETAINING WALL NO.1 AND RETAINING WALL NO.2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR THE SPECIFIED SERVICE LOAD AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT NO.1 LOCATED AT STATION 30+65J0 -L-. MAINTAIN A MINIMUM CLEARANCE OF 3" BETWEEN THE HARDWARE AND REINFORCING STEEL IN THE CAP

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR THE SPECIFIED SERVICE LOAD AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT NO.2 LOCATED AT STATION 33+15J0 -L-. MAINTAIN A MINIMUM CLEARANCE OF 3" BETWEEN THE HARDWARE AND REINFORCING STEEL IN THE CAP.

A MINIMUM OF TWO LAYERS OF MSE STRAPS ARE REQUIRED BEHIND END BENT NO.1 AND END BENT NO.2 BACKWALLS. THE MSE STRAPS ARE REQUIRED TO RESIST A SERVICE LOAD NO LESS THAN 46 KIPS PER LINEAR FOOT APPLIED TO THE END BENT CAP 54 INCHES FROM THE BOTTOM OF THE CAP.

FOUNDATIONS FOR OVERHEAD SIGNS WILL BE LOCATED BEHIND RETAINING WALL NO.2 AND MAY INTERFERE WITH REINFORCEMENT. FOR WALL CONSTRUCTION, SUBMIT WORKING DRAWINGS AND DESIGN CALCULATIONS WITH THE MSE WALL DESIGN SUBMITTAL IN ACCORDANCE THESE PROPOSED FOUNDATIONS. NO SEPARATE PAYMENT WILL BE MADE FOR WALL CONSTRUCTION TO ACCOMMODATE THESE PROPOSED OVERHEAD SIGNS FOUNDATIONS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE RETAINING WALL.

EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, GUARDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 30+65J0 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 33+15J0 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DO NOT PLACE LEVELING PAD CONCRETE, WALL BACKFILL OR FIRST REINFORCEMENT LAYER FOR RETAINING WALL NO.1 AND RETAINING WALL NO.2 UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

TEMPORARY SHORING IS REQUIRED FOR THE MAINTENANCE OF TRAFFIC IN ACCORDANCE WITH THE TEMPORARY SHORING SPECIAL PROVISION AND MAY IMPACT CONSTRUCTION OF RETAINING WALL NO.2. SEE ROADWAY, STRUCTURE OR TRAFFIC CONTROL PLANS FOR THE PROPOSED TEMPORARY SHORING. FOR WALL CONSTRUCTION, SUBMIT WORKING DRAWINGS AND DESIGN CALCULATIONS WITH THE MSE WALL DESIGN SUBMITTAL IN ACCORDANCE WITH THE PROPOSED TEMPORARY SHORING. NO SEPARATE PAYMENT WILL BE MADE FOR WALL CONSTRUCTION TO ACCOMMODATE TEMPORARY SHORING. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE COST OF THE RETAINING WALL.

A MINIMUM PANEL EMBEDMENT OF TWO FEET BELOW THE GRADE LINE IS REQUIRED.

DO NOT BEGIN CONSTRUCTION OF MSE RETAINING WALL NO.1 OR MSE RETAINING WALL NO.2 UNTIL END BENT PILES HAVE BEEN DRIVEN.

SEE FOUNDATION DETAILS IN STRUCTURE PLANS FOR LAYOUT OF REINFORCEMENT AROUND BRIDGE PILES.

PROJECT NO.: B-4534
GUILFORD COUNTY
STATION: WALL 1 : 30+75.24, WALL 2 : 33+04.97

SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL
DETAIL

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

PREPARED BY: JRM DATE: 4/08
REVIEWED BY: CAG DATE: 4/08

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 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.
PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.
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. FINISHES AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN