

09/08/09

TIP PROJECT: B-4307

CONTRACT: C202124

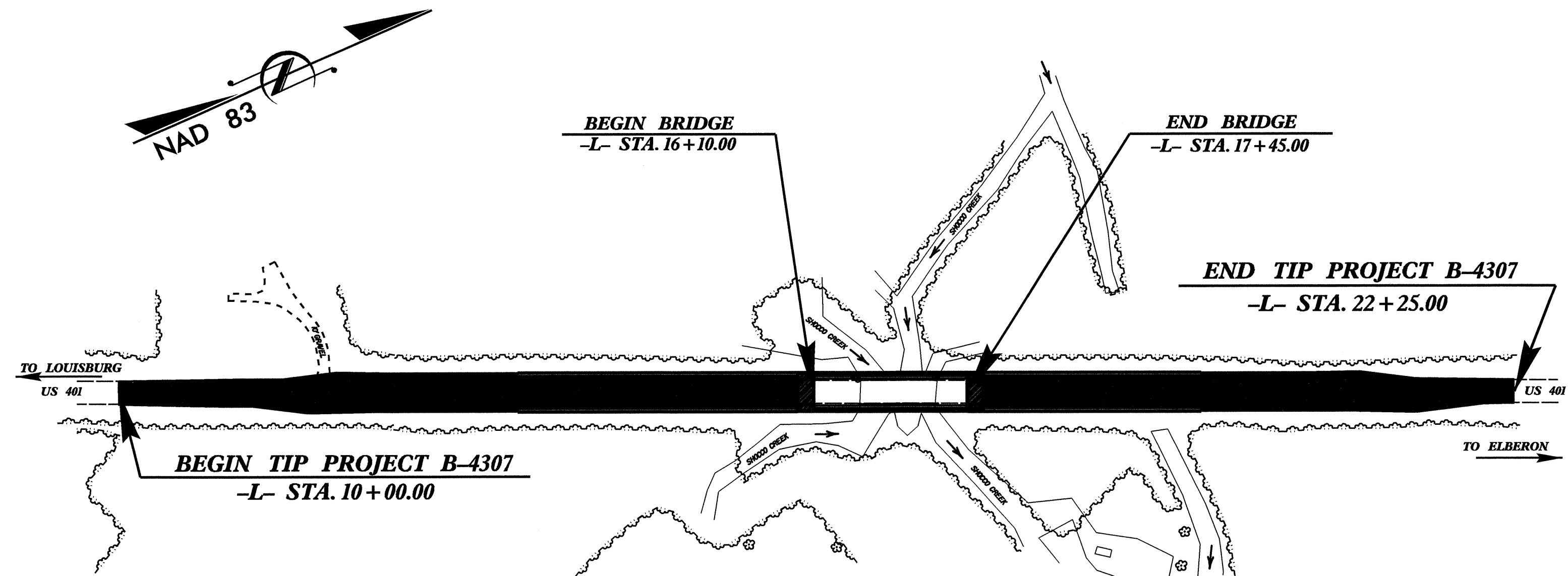
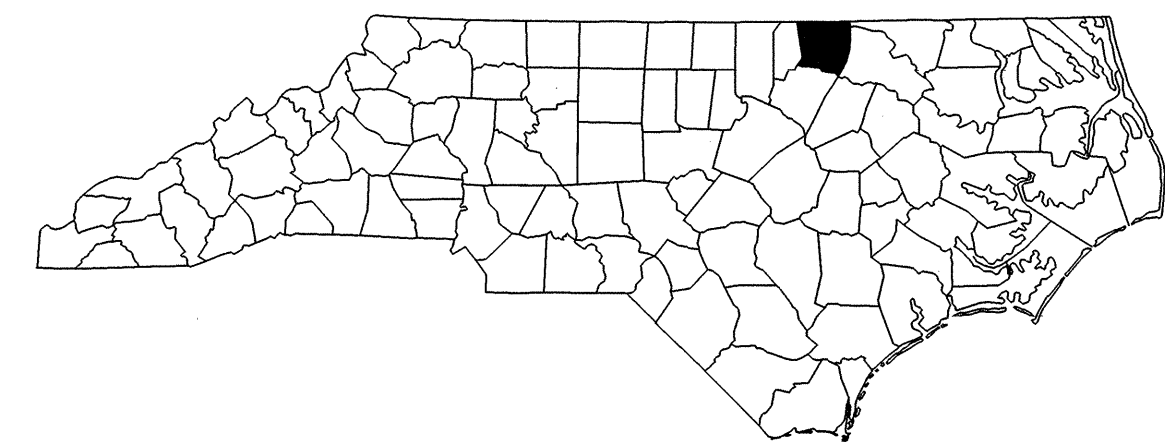
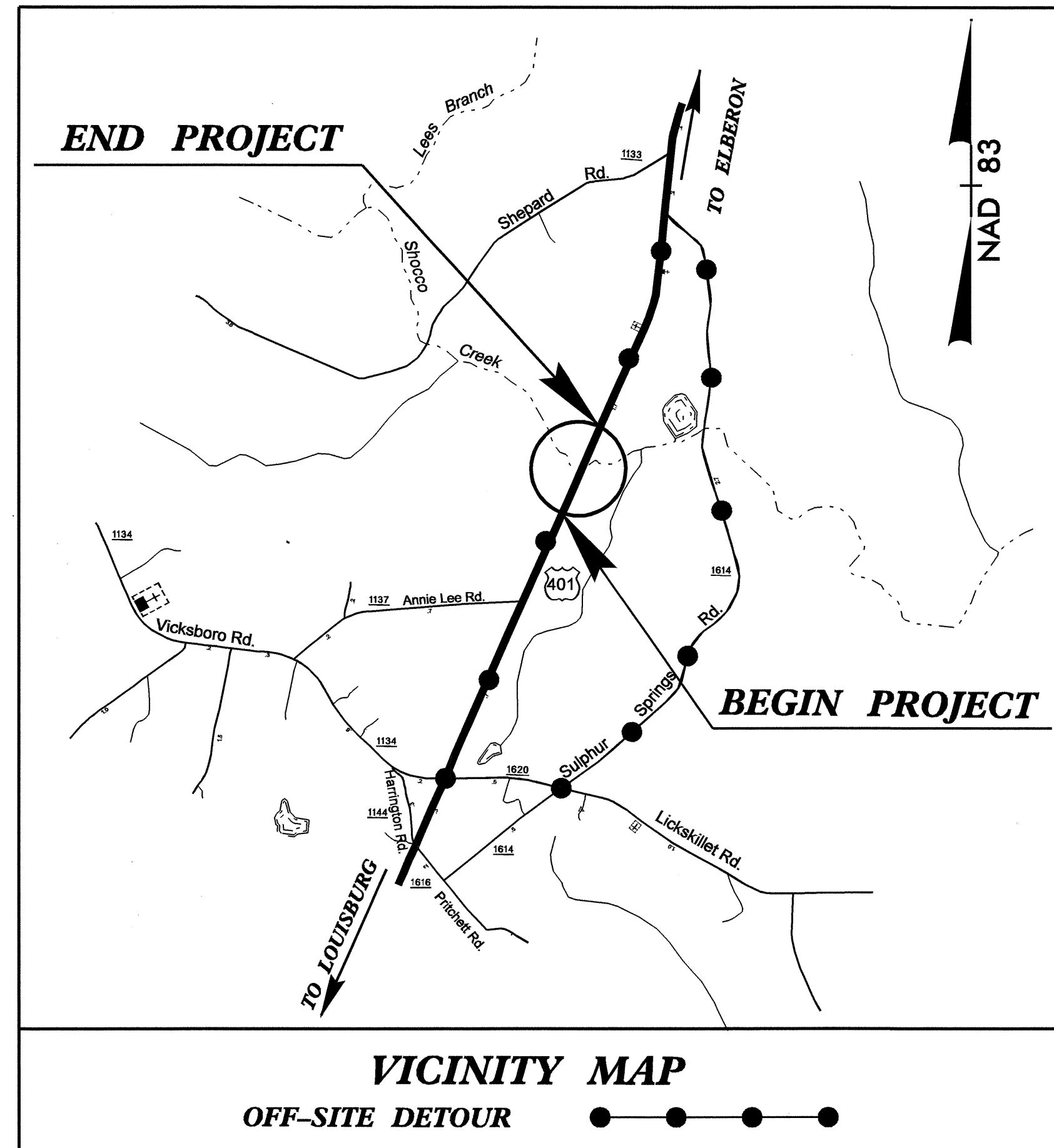
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**WARREN COUNTY**

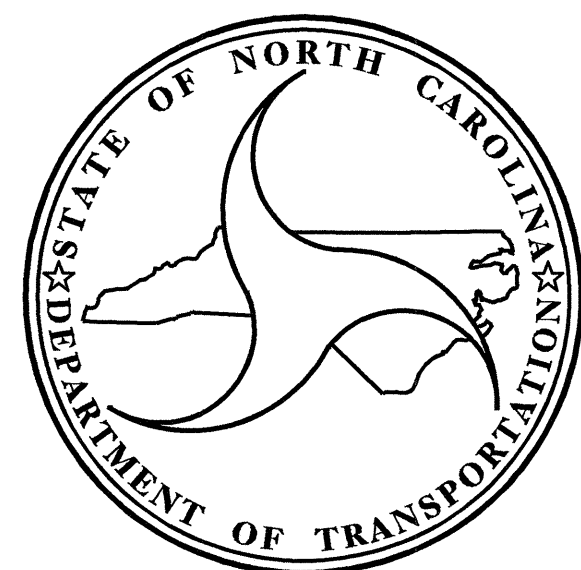
LOCATION: BRIDGE NO. 4 OVER SHOCCO CREEK AND  
AND APPROACHES ON US 401

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4307		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33644.1.1	BRSTP-401(145)	P.E.	
33644.2.1	BRSTP-401(145)	RW & UTIL.	
33644.3.1	BRSTP-401(145)	CONST.	



**STRUCTURE**



**DESIGN DATA**

ADT 2008 = 2200  
ADT 2030 = 3800  
DHV = 10 %  
D = 60 %  
T = 5 % \*  
\*\*V = 60 MPH  
\* (TTST 2% + DUAL 3%)  
FUNC. CLASS. =  
RURAL COLLECTOR

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4307 = 0.206 MILE  
LENGTH STRUCTURE TIP PROJECT B-4307 = 0.026 MILE  
TOTAL LENGTH TIP PROJECT B-4307 = 0.232 MILE

\*\* DESIGN EXCEPTION FOR VERTICAL ALIGNMENT AND VERTICAL STOPPING SIGHT DISTANCE REQUIRED.

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**

2006 STANDARD SPECIFICATIONS

LETTING DATE:  
JUNE 16, 2009

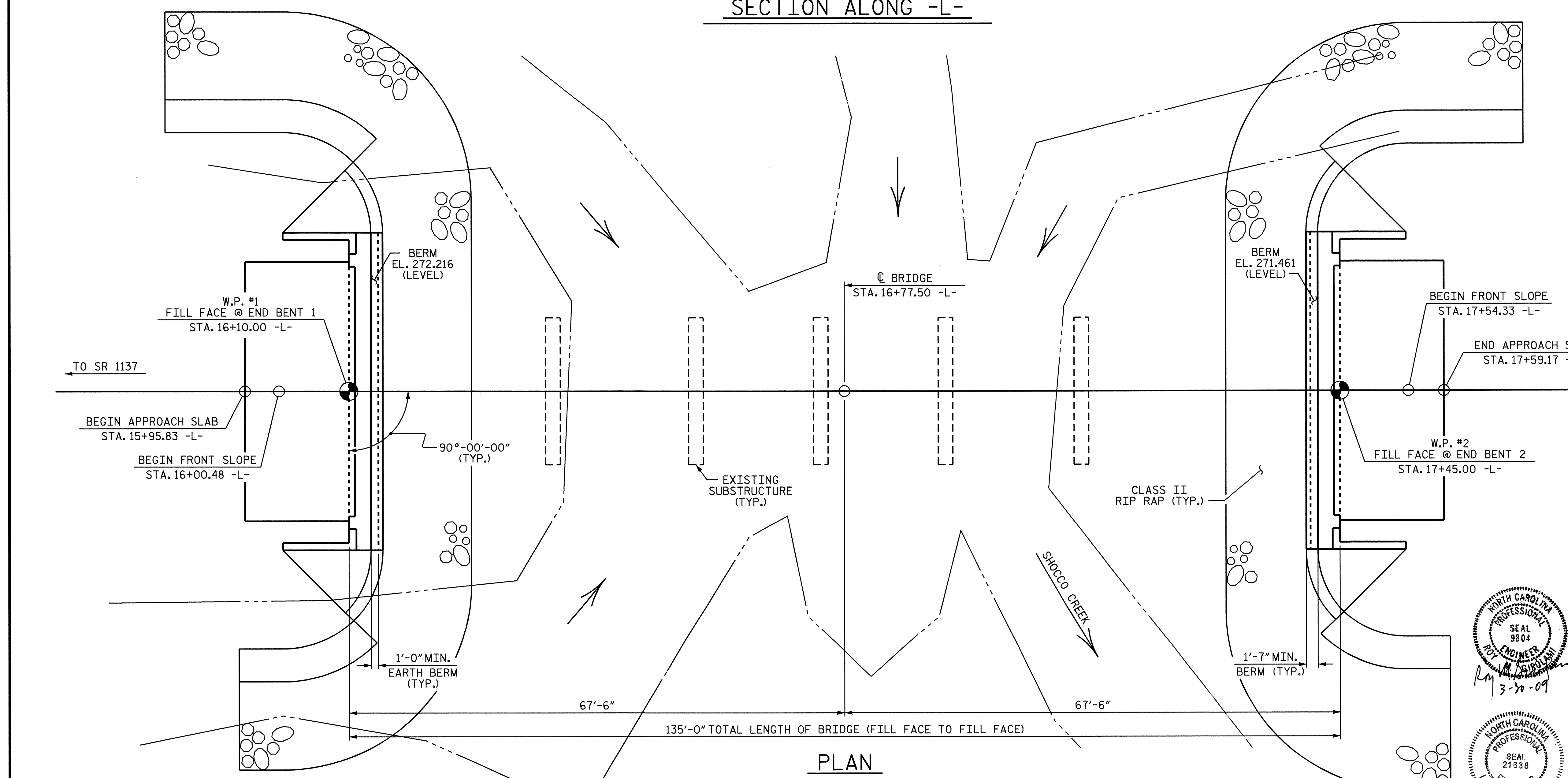
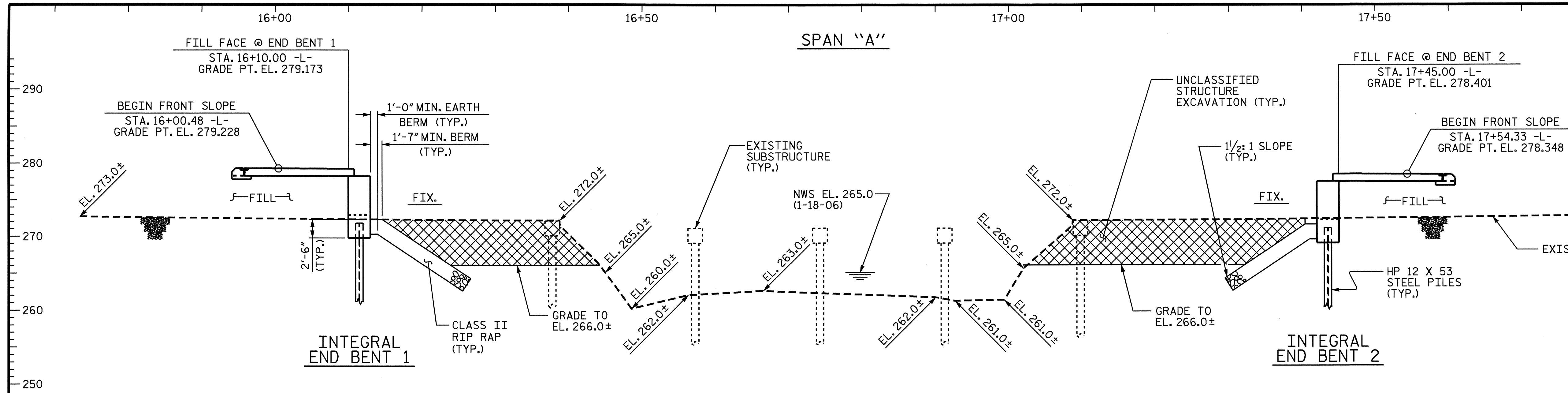
ROY M. GIROLAMI, P.E.  
PROJECT ENGINEER

LAURA E. SUTTON, P.E.  
PROJECT DESIGN ENGINEER

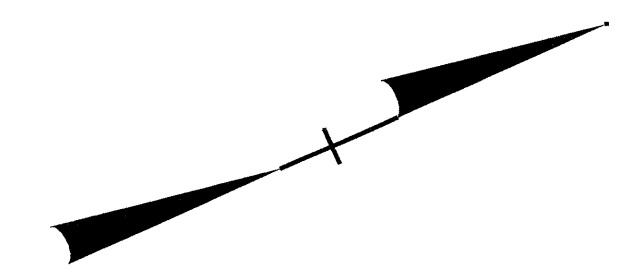
**STRUCTURE DESIGN UNIT**  
1000 BIRCH RIDGE DR.  
RALEIGH, NC 27610

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

P.E.  
STATE HIGHWAY DESIGN ENGINEER



-0.5719%    +5.1245%  
 PI STA. 19+76.00 -L-  
 EL. = 277.08'  
 VC = 450'  
 GRADE DATA -L-



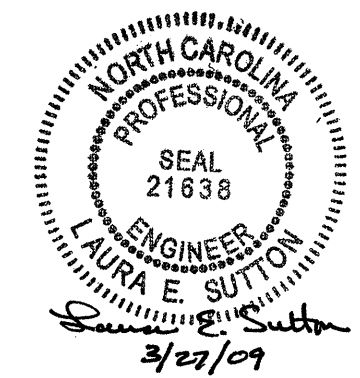
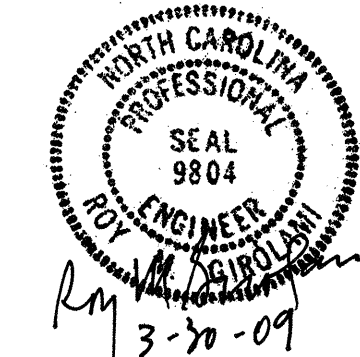
PROJECT NO. B-4307  
 WARREN COUNTY  
 STATION: 16+77.50 -L-

SHEET 1 OF 3    REPLACES BRIDGE NO. 4

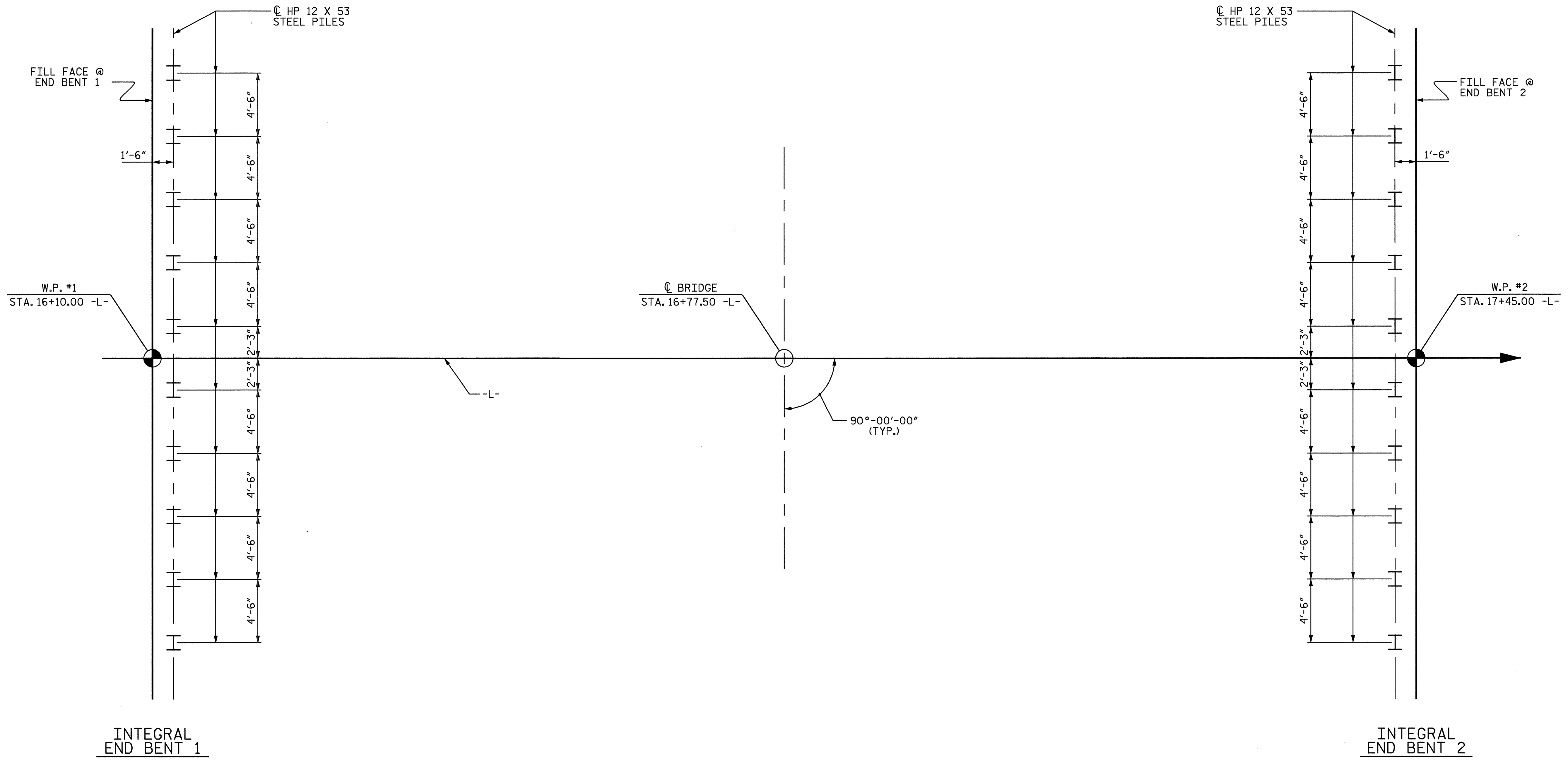
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 BRIDGE OVER SHOCCO CREEK  
 ON US 401 BETWEEN  
 SR 1137 AND SR 1133

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

DRAWN BY: L. E. SUTTON DATE: 12/11/08  
 CHECKED BY: A. S. CALLAWAY DATE: 12/15/08



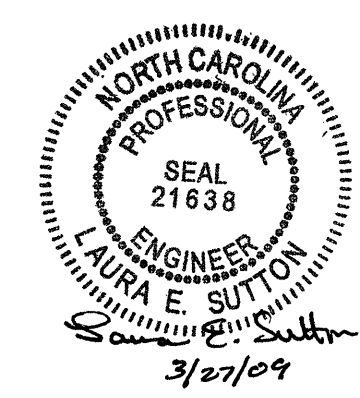
**PLAN**  
 (FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW)



**FOUNDATION LAYOUT**  
 DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE  
 AT THE BOTTOM OF THE CAP.

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-  
 SHEET 2 OF 3

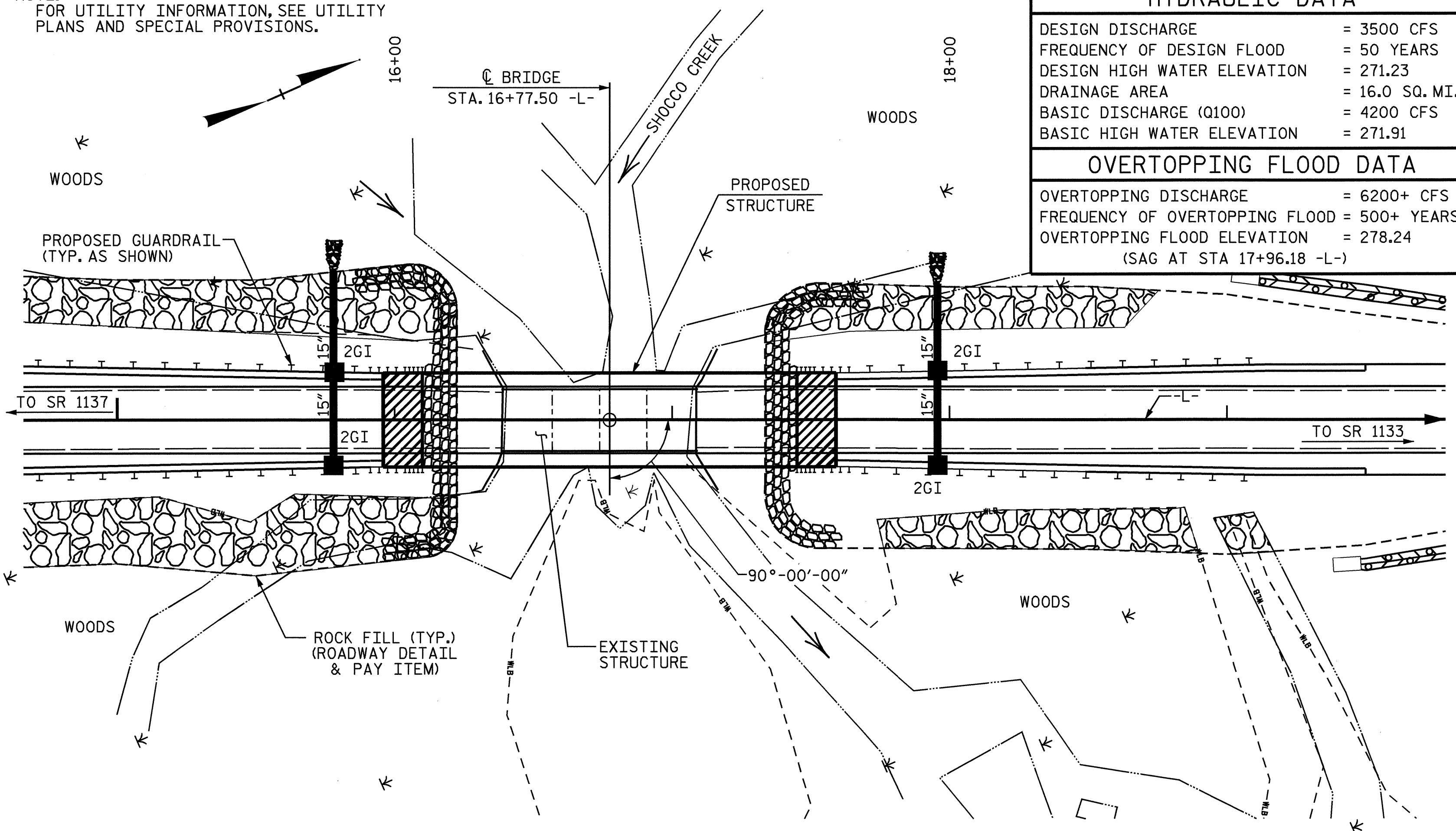
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 BRIDGE OVER SHOCCO CREEK  
 ON US 401 BETWEEN  
 SR 1137 AND SR 1133



DRAWN BY : L. E. SUTTON DATE : 12/10/08  
 CHECKED BY : A. S. CALLAWAY DATE : 12/15/08

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

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



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 3500 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 271.23
DRAINAGE AREA	= 16.0 SQ. MI.
BASIC DISCHARGE (Q100)	= 4200 CFS
BASIC HIGH WATER ELEVATION	= 271.91

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 6200+ CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING FLOOD ELEVATION	= 278.24
(SAG AT STA 17+96.18 -L-)	

NOTES:

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 18'-6", 2 @ 17', AND 1 @ 18'-6") WITH A CLEAR ROADWAY WIDTH OF 21.3' AND HAVING A REINFORCED CONCRETE DECK SUPPORTED BY TIMBER JOISTS ON TIMBER CAPS AND PILES SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

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.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED BEARING CAPACITY OF 120 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 60 TONS PER PILE.

TOTAL BILL OF MATERIAL

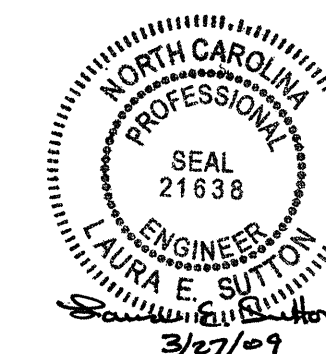
	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	EVAZOTE JOINT SEALS	
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE			5,029	4,893				158,600		270.00			LUMP SUM	
END BENT 1					22.7		3,122		10	300		206	229	
END BENT 2					22.7		3,122		10	400		195	217	
TOTAL	LUMP SUM	LUMP SUM	5,029	4,893	45.4	LUMP SUM	6,244	158,600	20	700	270.00	401	446	LUMP SUM

PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-

SHEET 3 OF 3

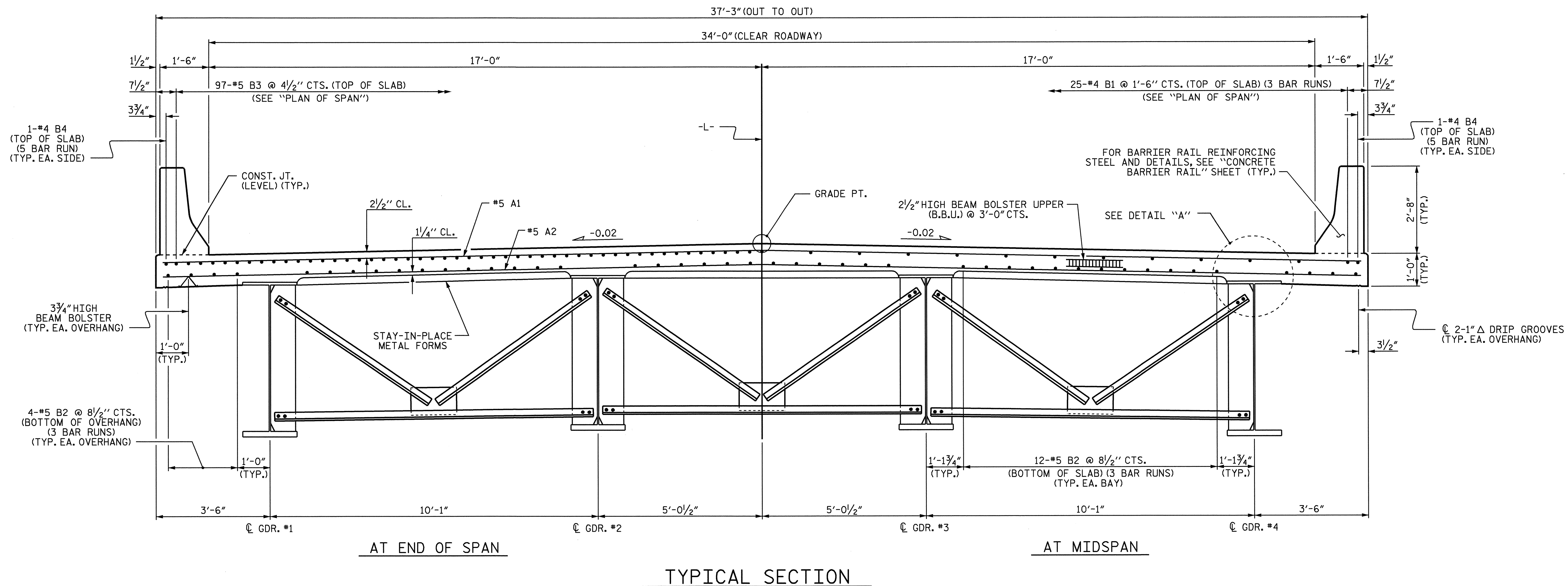
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
BRIDGE OVER SHOCCO CREEK  
ON US 401 BETWEEN  
SR 1137 AND SR 1133



DRAWN BY: L. E. SUTTON DATE: 12/10/08  
CHECKED BY: A. S. CALLAWAY DATE: 12/15/08

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



**NOTES:**

PROVIDE 1 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.

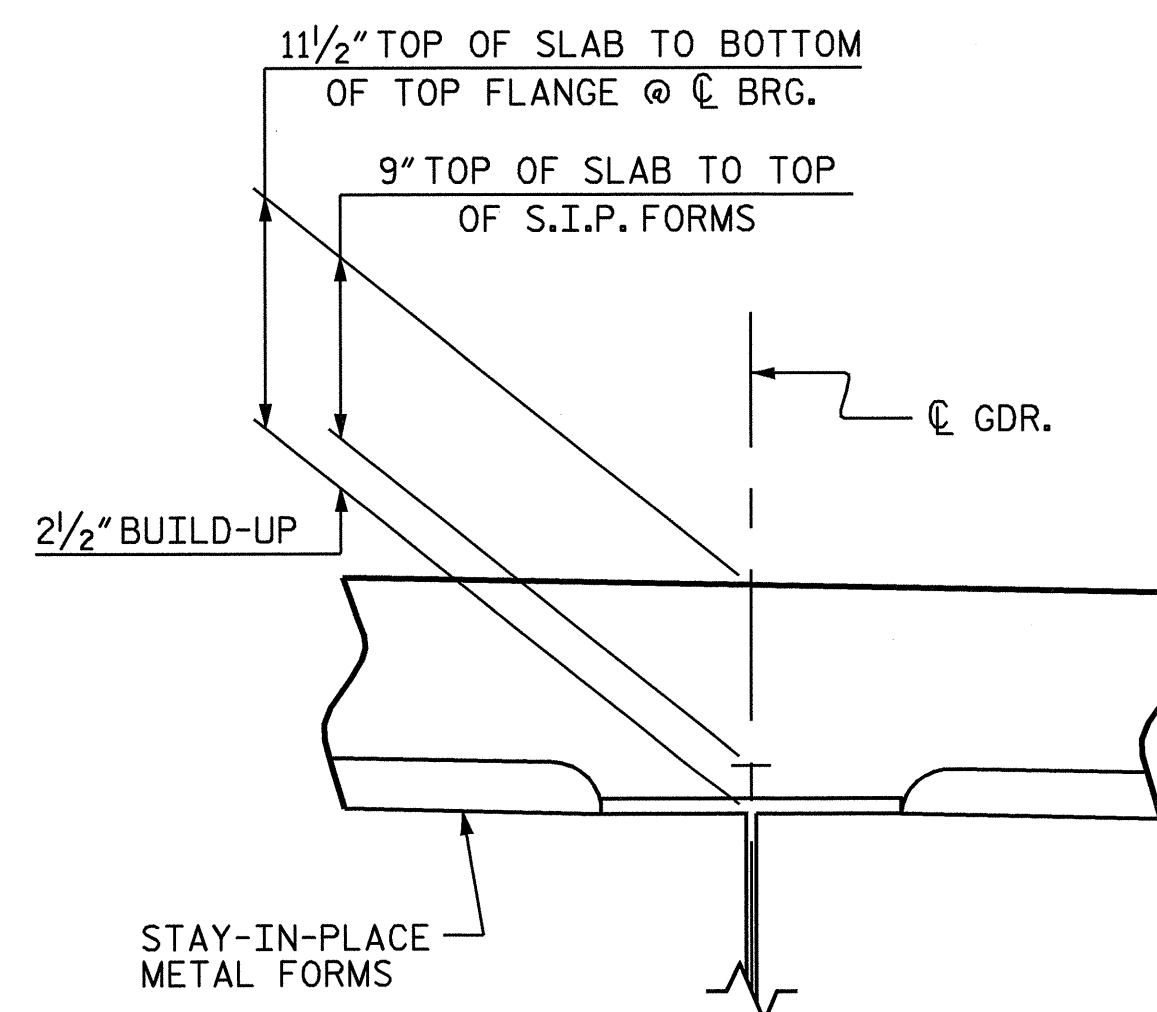
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING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

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

PREVIOUSLY CAST CONCRETE SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

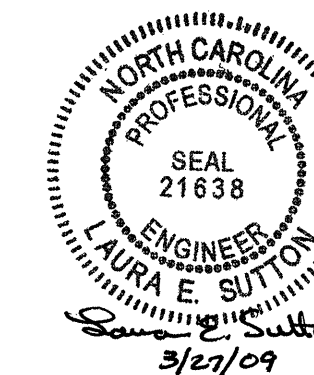


**DETAIL "A"**  
(TYP. EA. GIRDER)

PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-

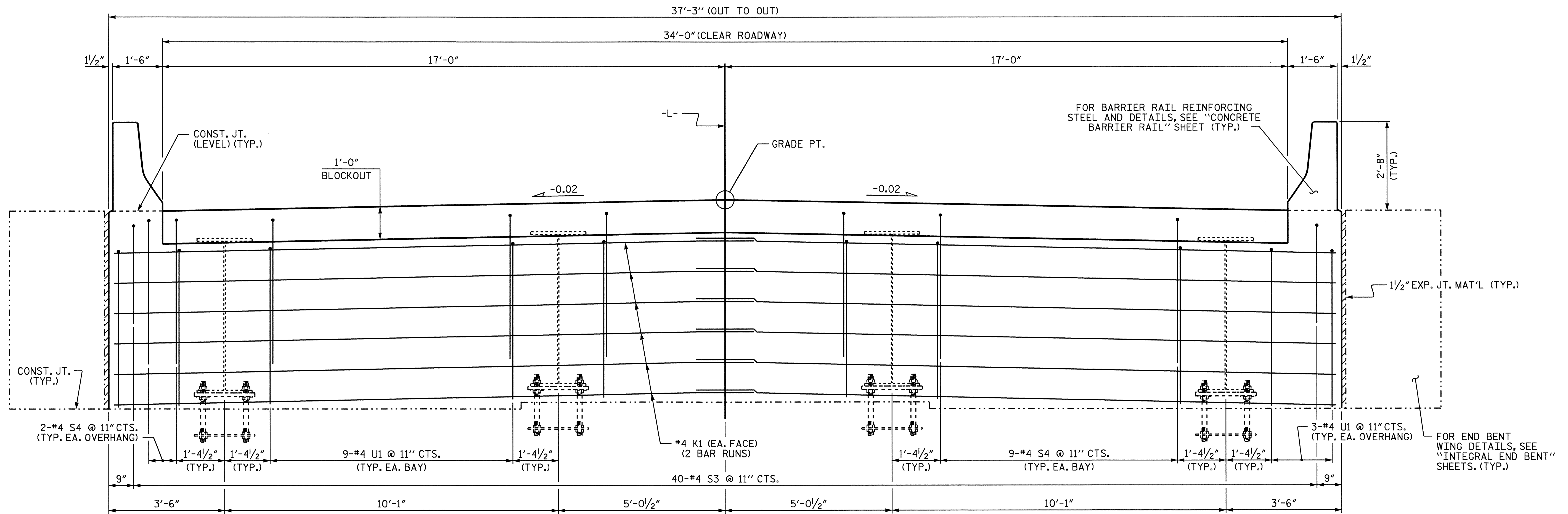
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTIONS



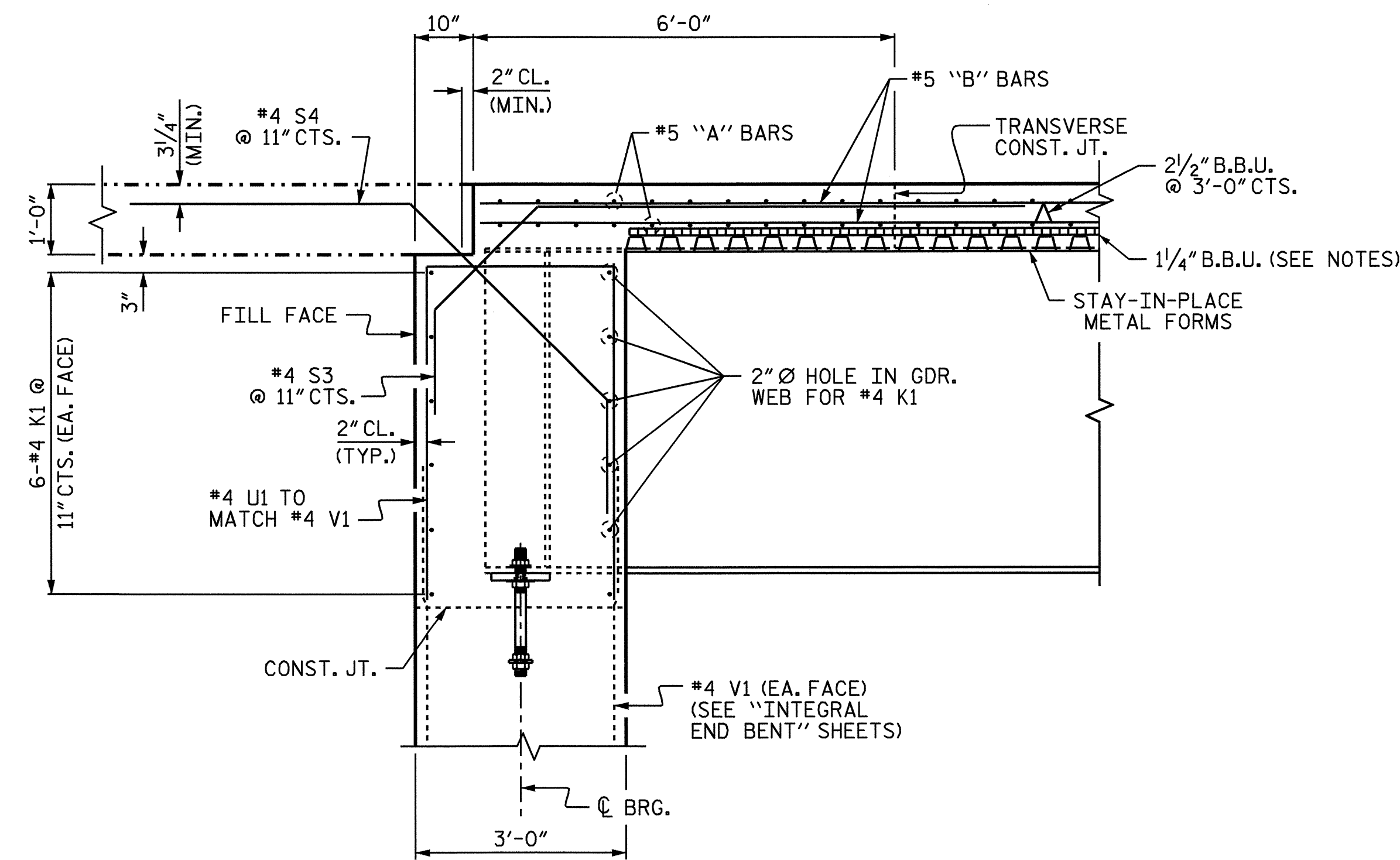
DRAWN BY: B. L. GREEN DATE: 1/16/07  
CHECKED BY: P. C. BREWER DATE: 2/1/07

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



**END ELEVATION**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)  
(FOR CLARITY, DECK REINFORCING STEEL NOT SHOWN)



**SECTION A-A**

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

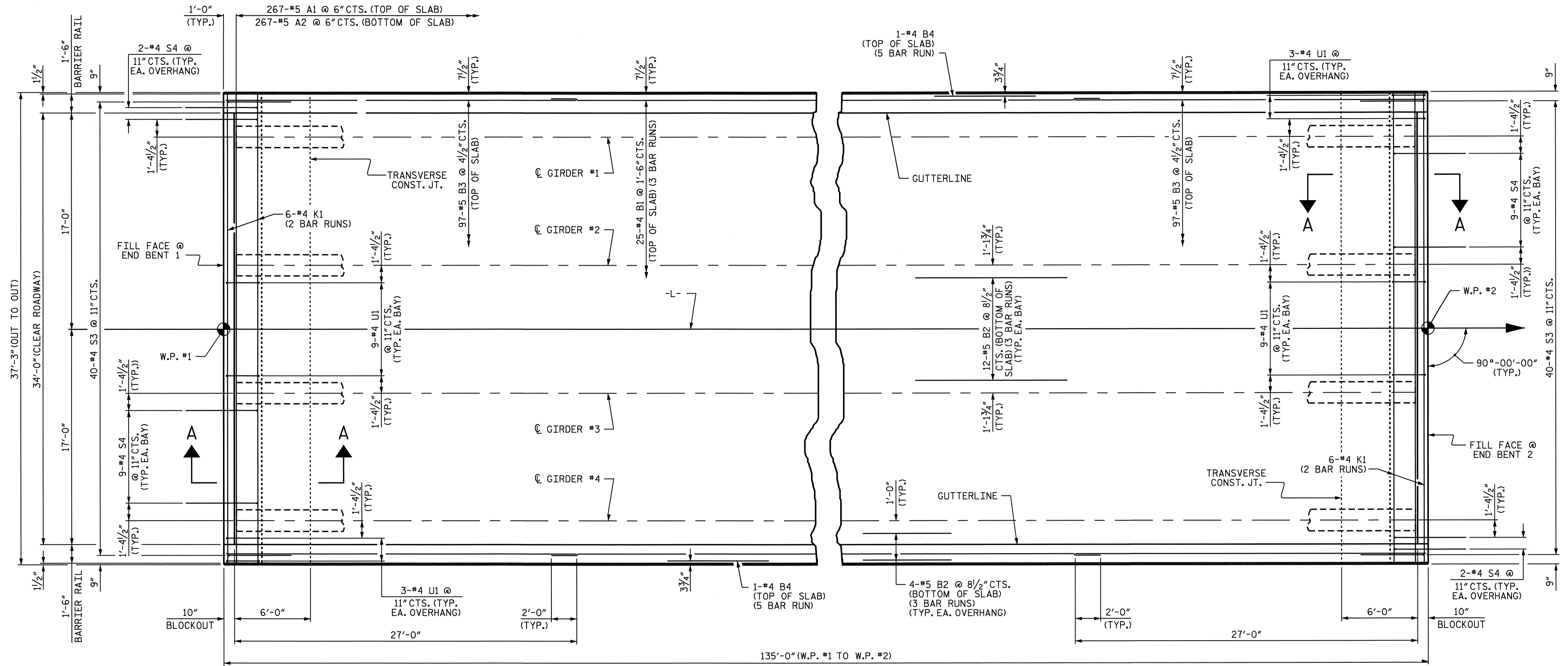
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTIONS

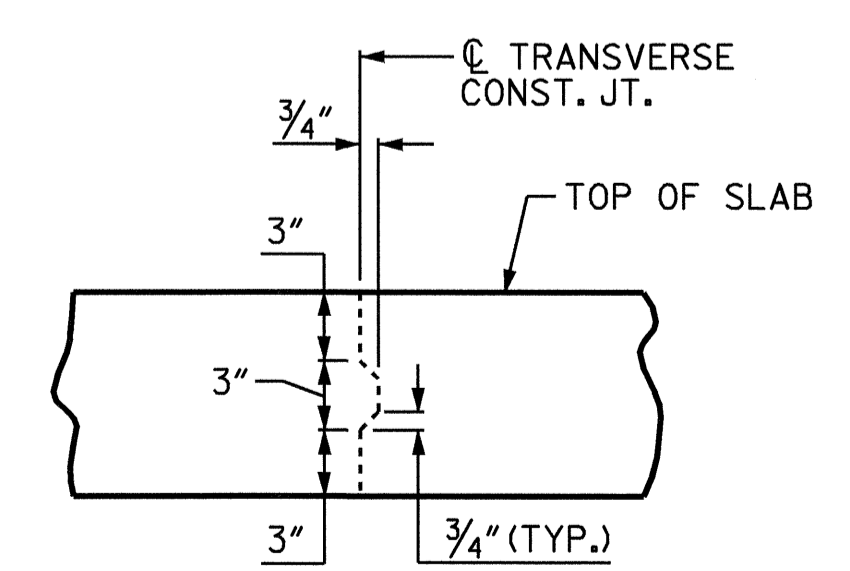


DRAWN BY : B. L. GREEN DATE : 1/16/07  
 CHECKED BY : P. C. BREWER DATE : 2/1/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			20



PLAN OF SPAN



TRANSVERSE CONSTRUCTION JOINT DETAIL

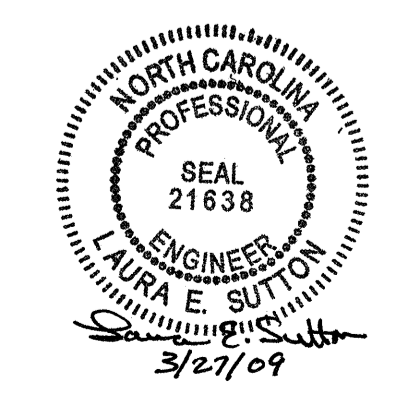
REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

NOTES:  
 FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.  
 FOR SECTION A-A, SEE "TYPICAL SECTIONS", SHEET 2 OF 2.

PROJECT NO. B-4307  
 WARREN COUNTY  
 STATION: 16+77.50 -L-

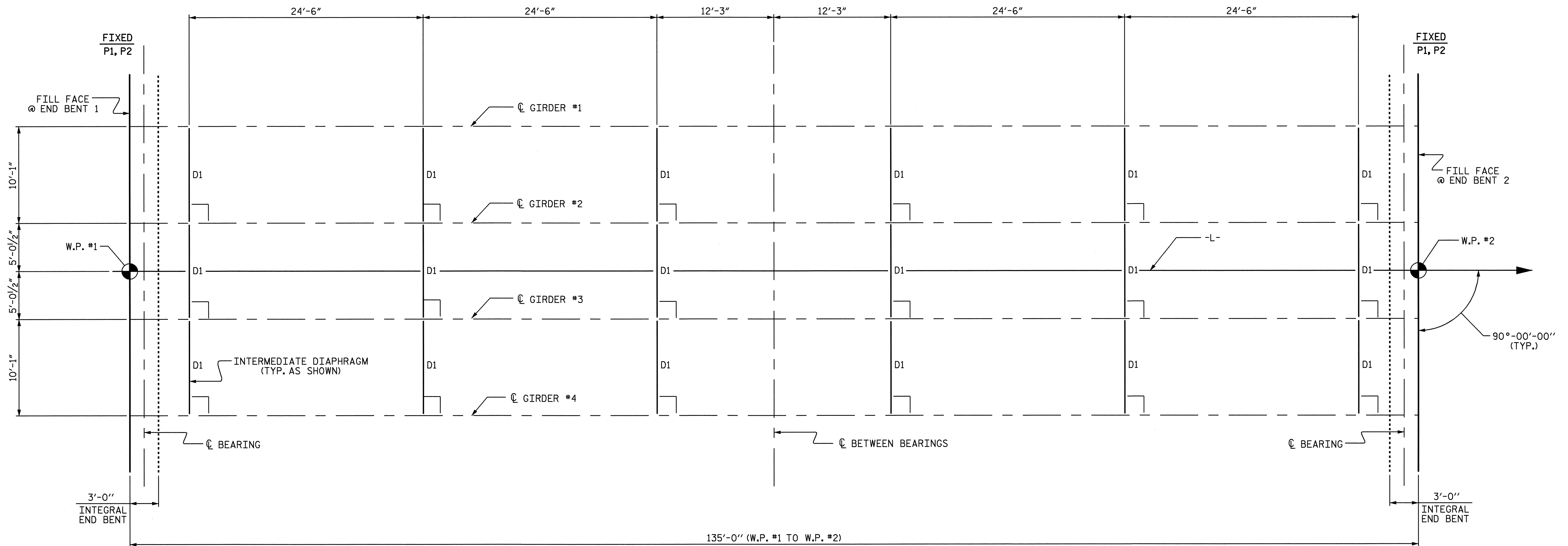
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN



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

DRAWN BY: B. L. GREEN DATE: 1/23/07  
 CHECKED BY: P. C. BREWER DATE: 2/01/07



FRAMING PLAN

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 FRAMING PLAN

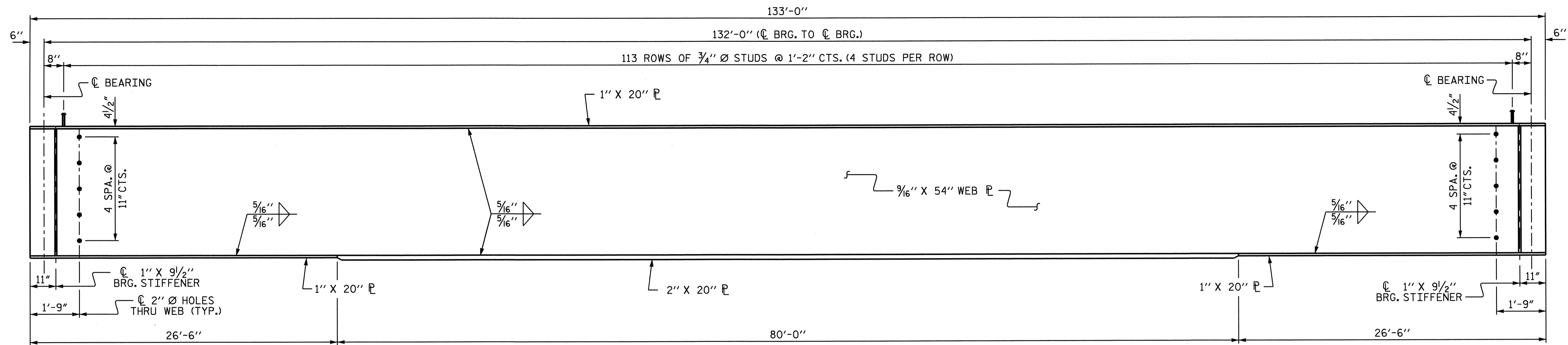


DRAWN BY : B. L. GREEN DATE : 1/19/07  
 CHECKED BY : P. C. BREWER DATE : 2/1/07

27-MAR-2009 15:55  
 R:\Structures\lgreen\mlcrostation\B4307\_sd.FP.01.dgn  
 lsutton

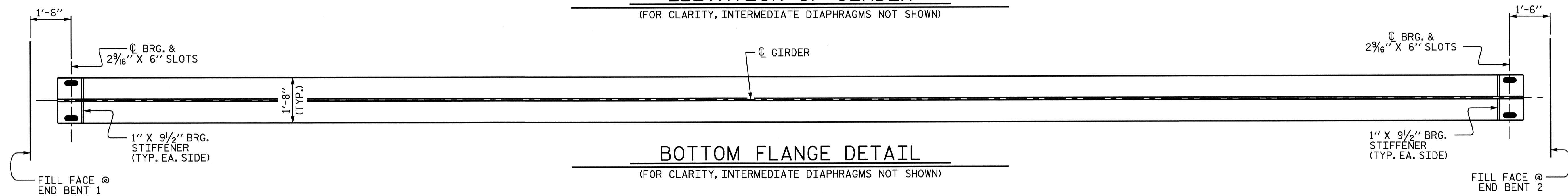
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20





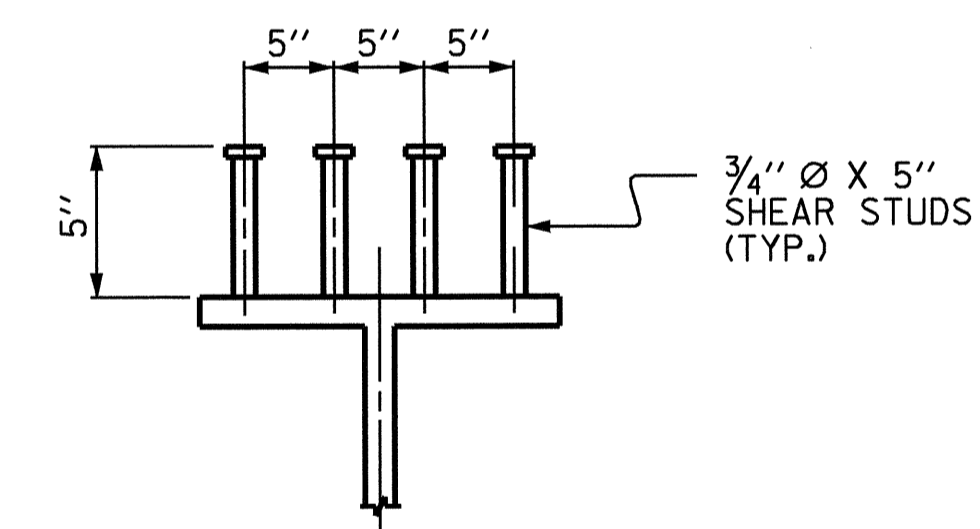
**ELEVATION OF GIRDER**

(FOR CLARITY, INTERMEDIATE DIAPHRAGMS NOT SHOWN)

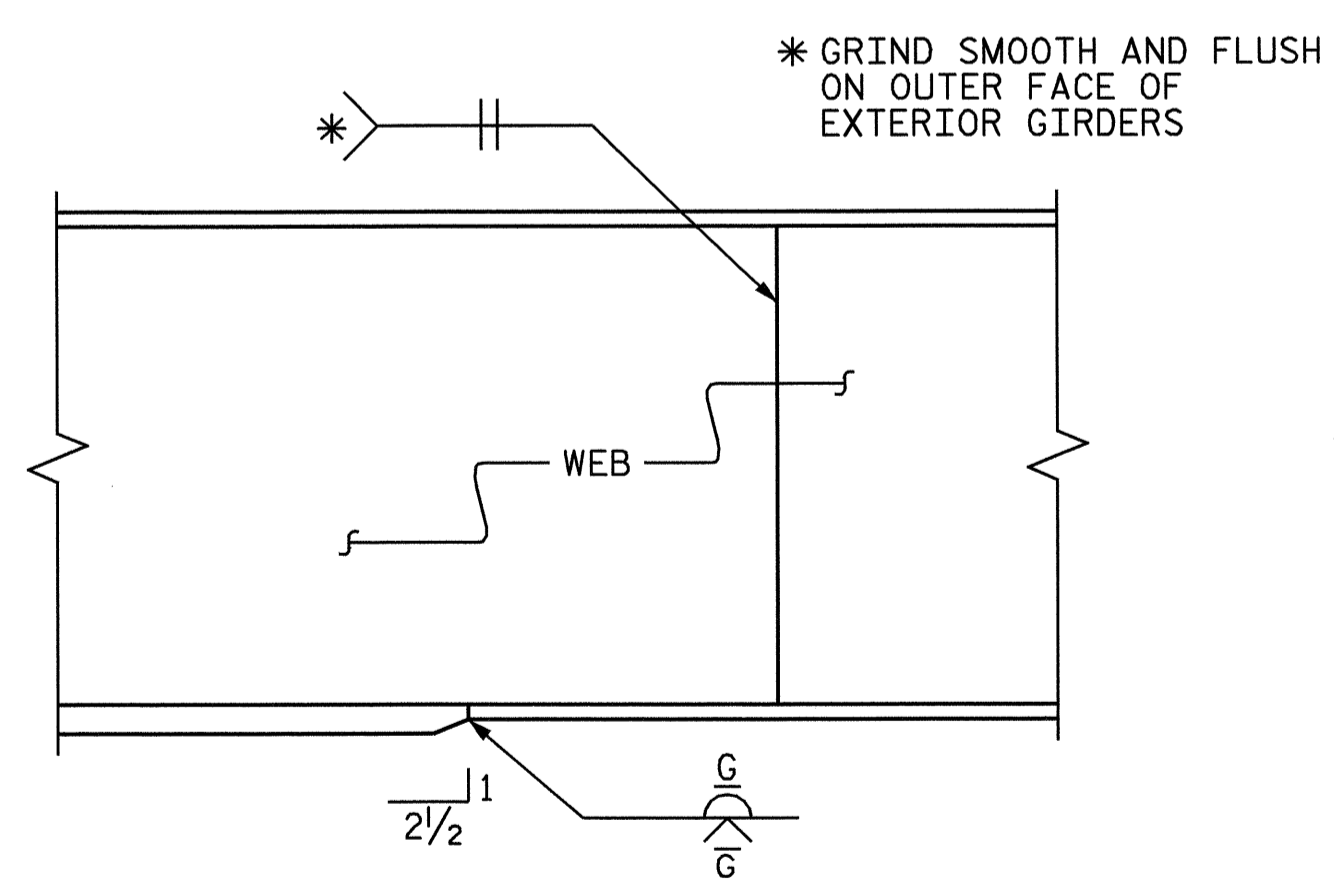


**BOTTOM FLANGE DETAIL**

(FOR CLARITY, INTERMEDIATE DIAPHRAGMS NOT SHOWN)

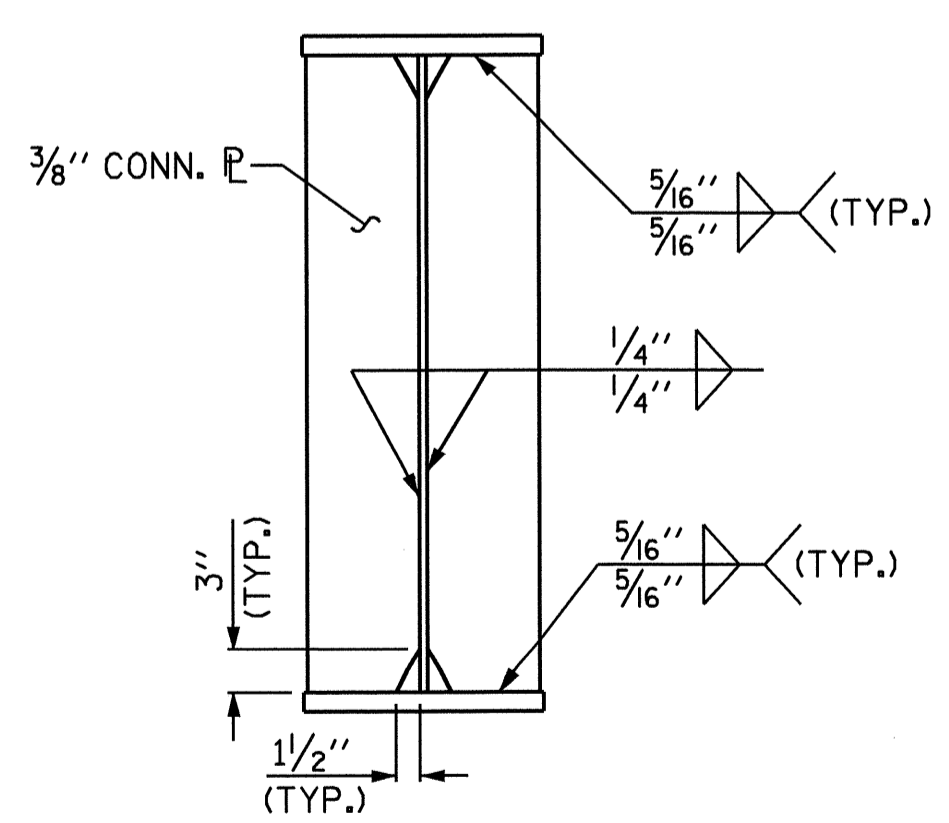


**SHEAR STUD DETAIL**

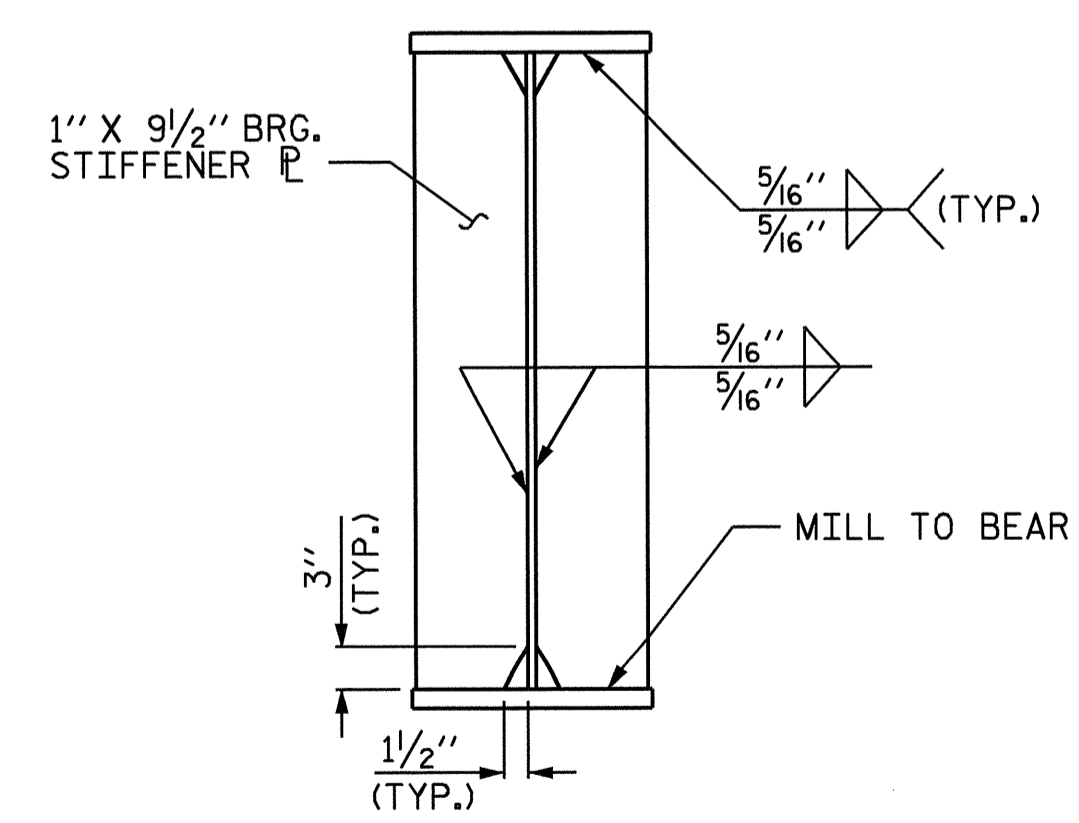


**ELEVATION**

**TYPICAL FLANGE AND WEB BUTT JOINT**



**CONNECTOR PLATE**



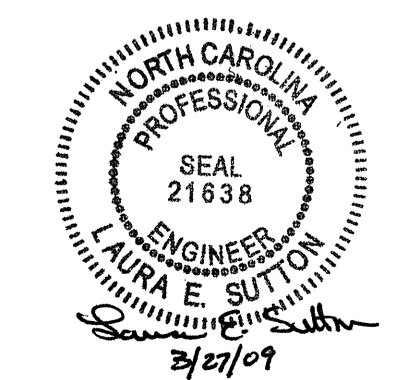
**BEARING STIFFENER PLATE**

PROJECT NO. B-4307  
 WARREN COUNTY  
 STATION: 16+77.50 -L-

SHEET 1 OF 2

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			20

DRAWN BY: B. L. GREEN DATE: 1/19/07  
 CHECKED BY: P. C. BREWER DATE: 2/1/07

**NOTES:**

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" Ø HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, TOP FLANGE PLATES WITHIN 15' OF THE END OF THE GIRDER, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES (IF USED) FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

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 (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). 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.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

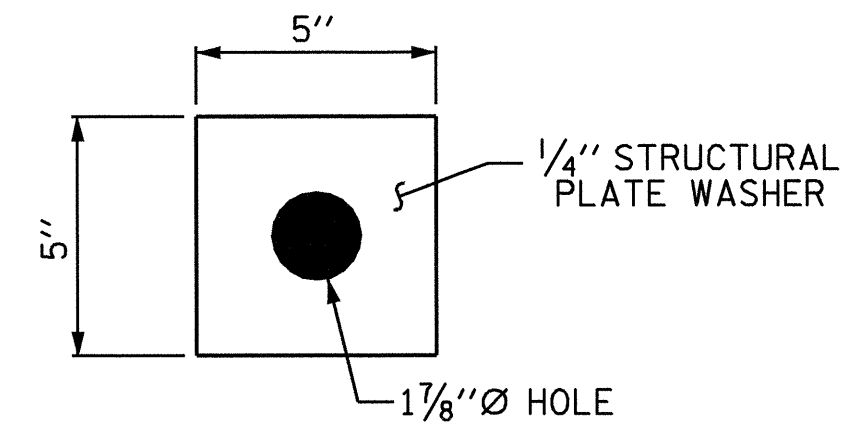
END OF BEAMS AND GIRDERS SHALL BE PLUMB.

SOLE PLATES, ANCHORAGE PLATES, AND STRUCTURAL PLATE WASHERS SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND STANDARD WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. STANDARD WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

TOP NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AFTER SETTING THE GIRDERS, AND SUBSEQUENTLY FULLY TIGHTENED JUST PRIOR TO THE FINAL POUR.

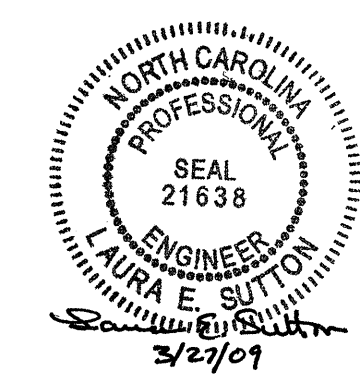


**DETAIL "A"**

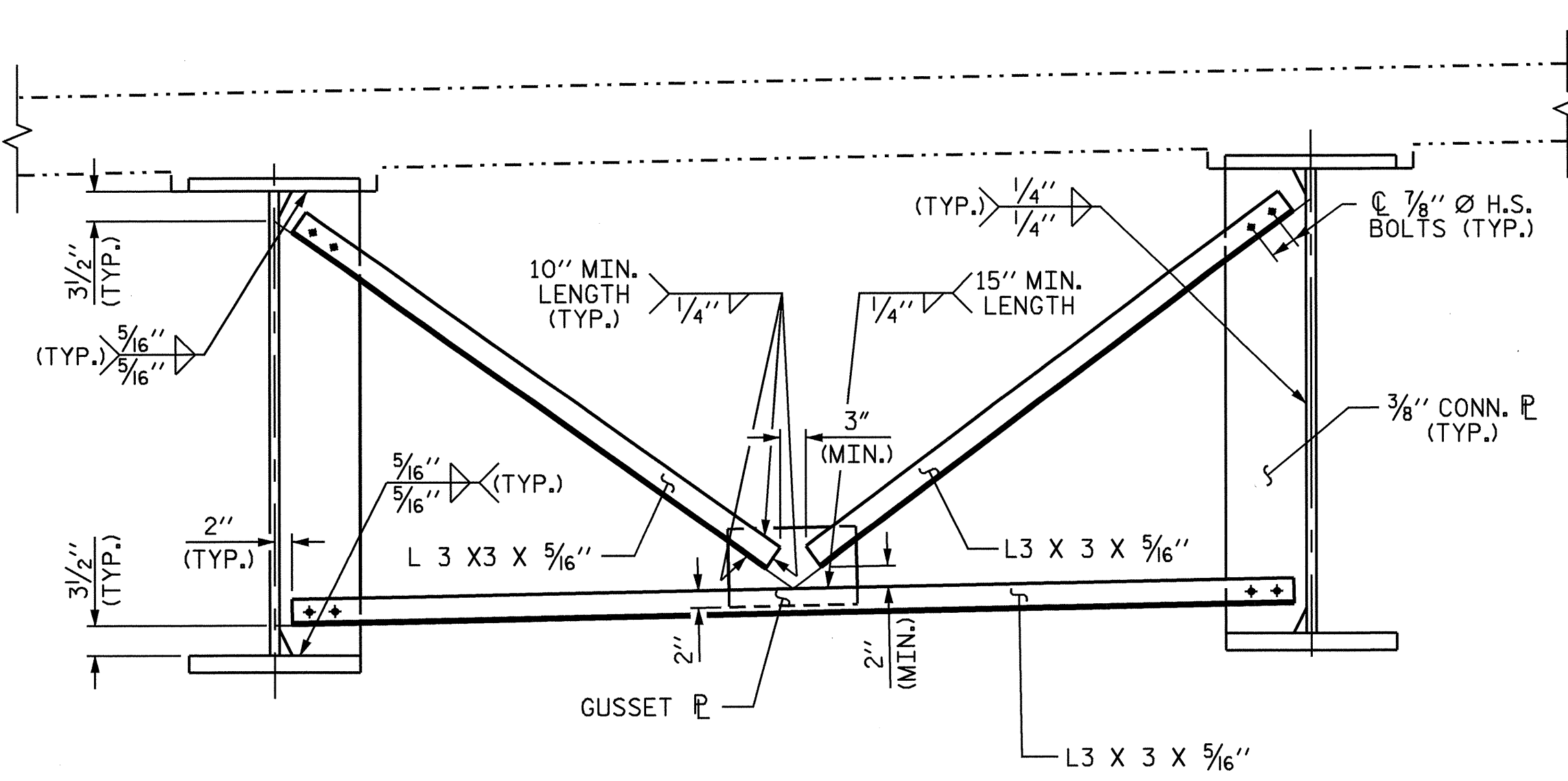
PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

SHEET 2 OF 2

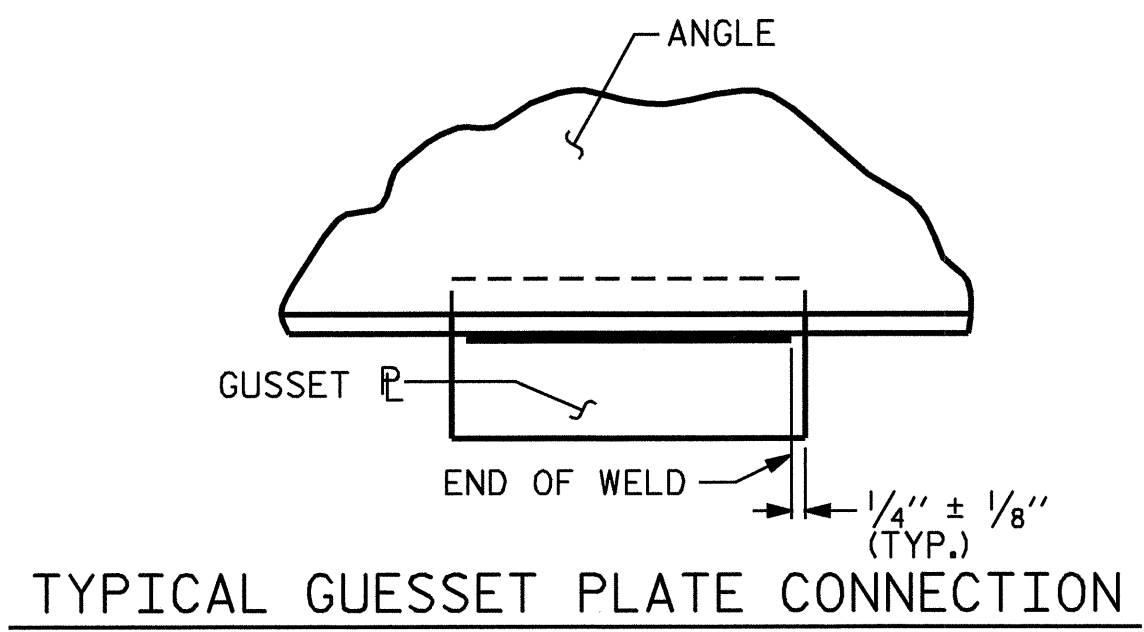
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS



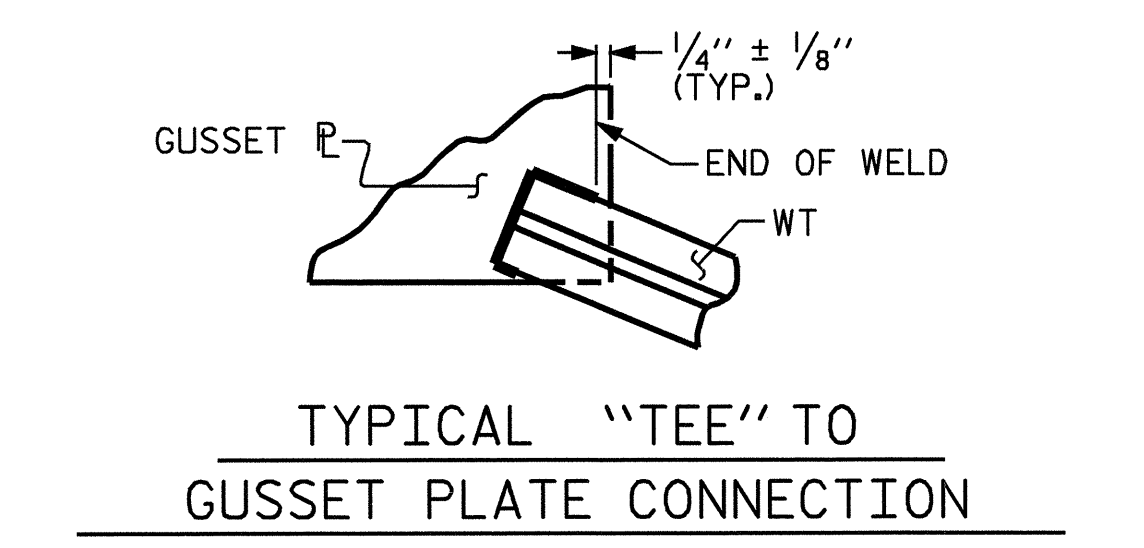
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20



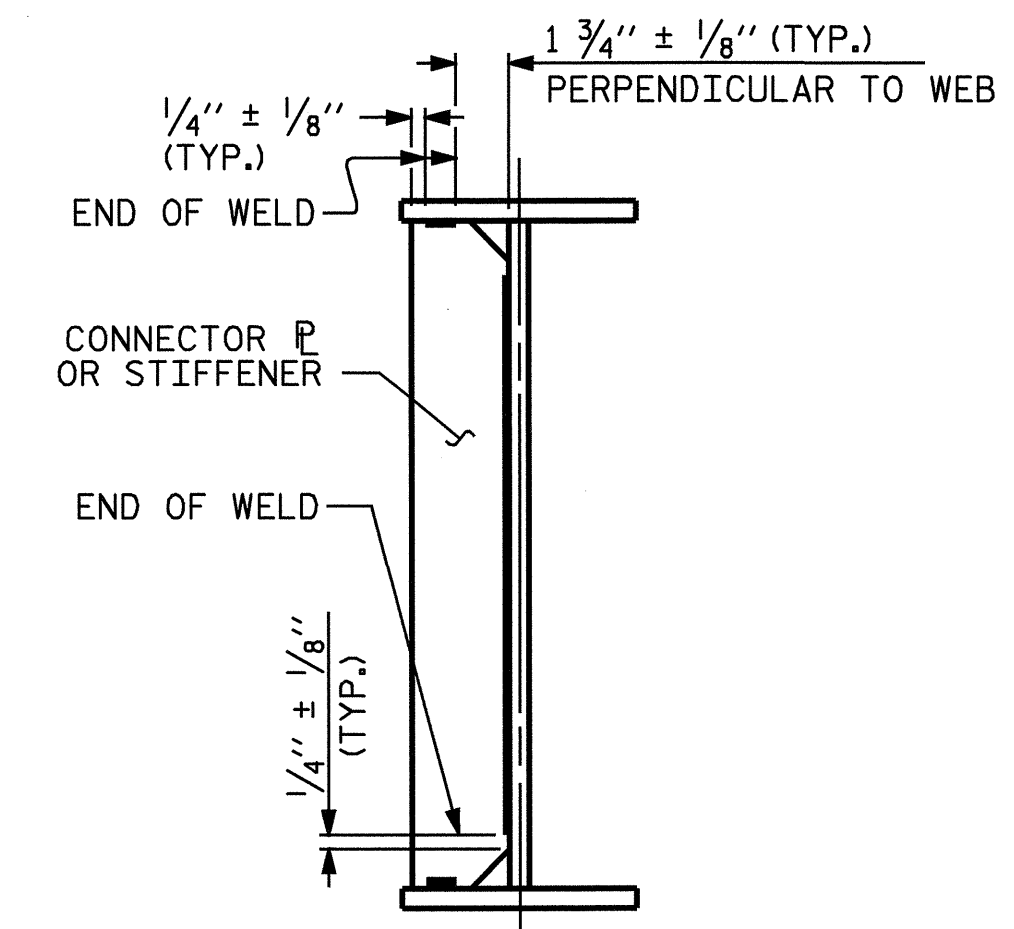
**INTERMEDIATE DIAPHRAGM (D1)**



**TYPICAL GUSSET PLATE CONNECTION**

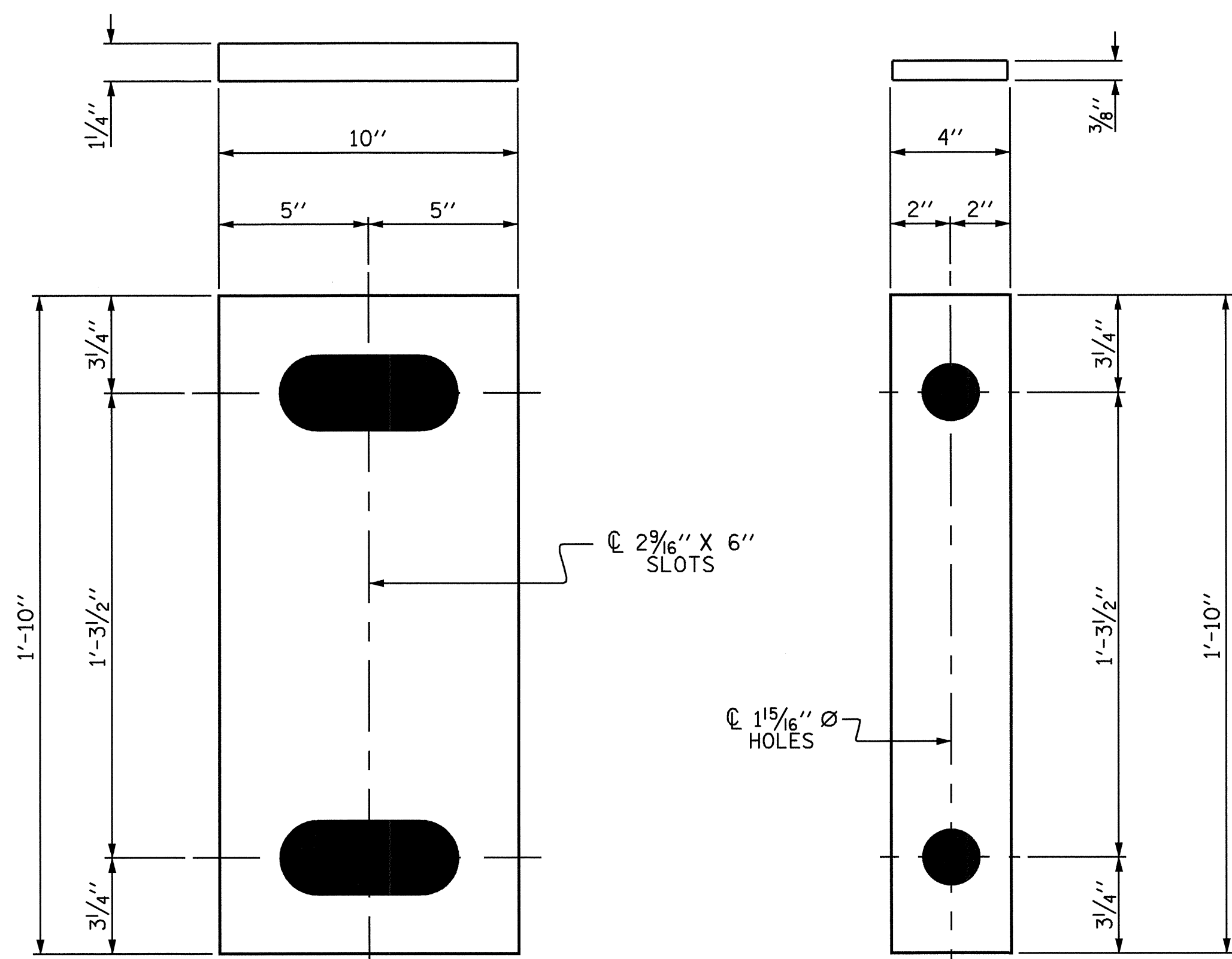


**TYPICAL "TEE" TO GUSSET PLATE CONNECTION**



**TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS**

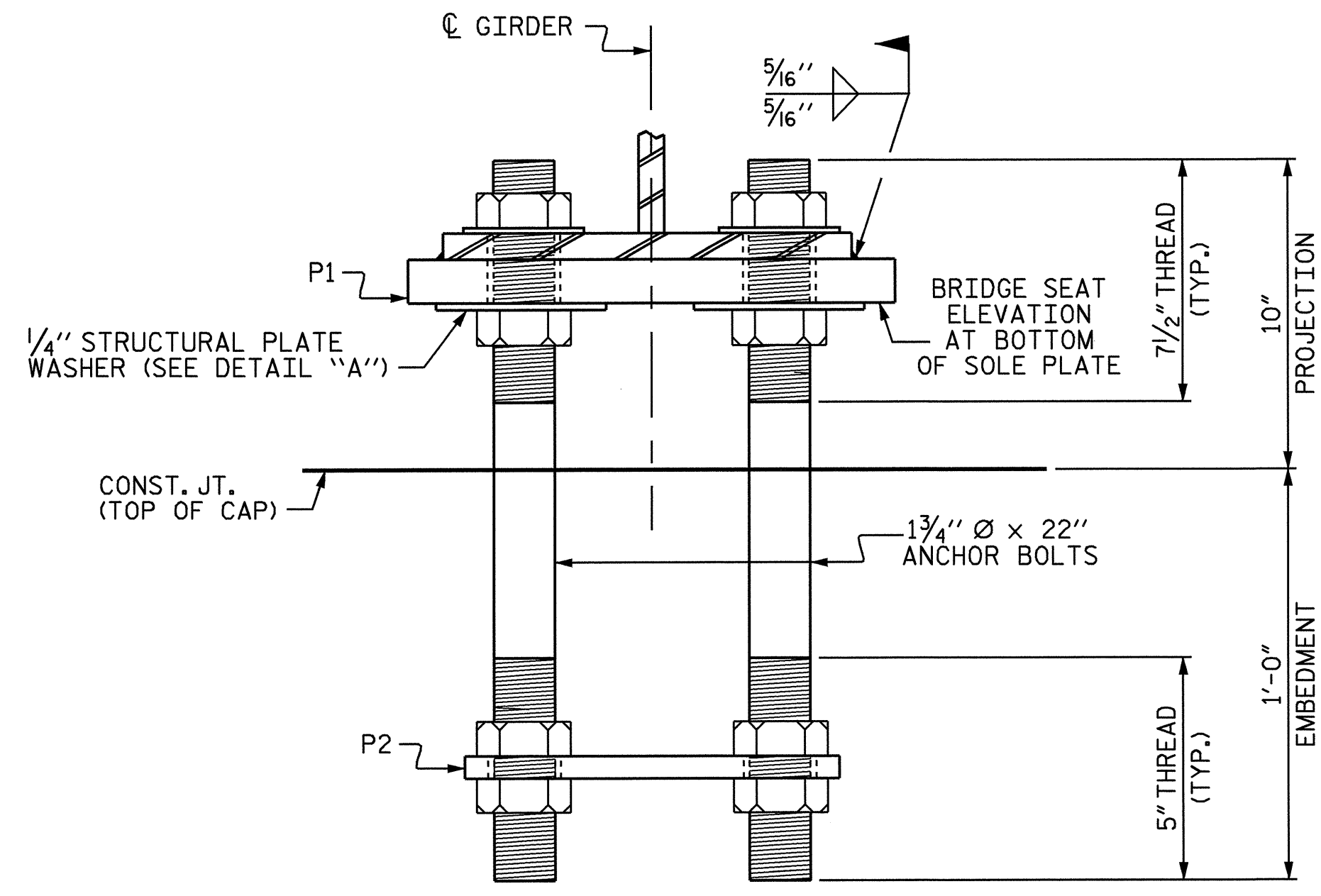
**WELD TERMINATION DETAILS**



**SOLE PLATE (P1)**  
(8 REQ'D)

**ANCHORAGE PLATE (P2)**  
(8 REQ'D)

**BEARING DETAILS**



**END VIEW  
FIXED**

DRAWN BY: B.L. GREEN DATE: 1/22/07  
 CHECKED BY: P. C. BREWER DATE: 2/5/07

27-MAR-2009 15:28  
 R:\Structures\Bgreen\mlocstation\B4307.sd.SS\_01.dgn  
 lsutton

**DEAD LOAD DEFLECTION TABLE FOR GIRDERS**

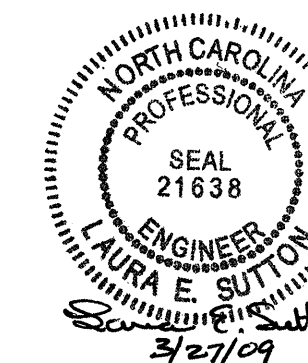
	GIRDERS 1 & 4																				
TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.020	0.039	0.057	0.073	0.087	0.099	0.108	0.115	0.119	0.121	0.119	0.115	0.108	0.099	0.087	0.073	0.057	0.039	0.020	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.056	0.142	0.221	0.292	0.354	0.407	0.449	0.480	0.498	0.504	0.498	0.480	0.449	0.407	0.354	0.292	0.221	0.142	0.056	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.008	0.015	0.022	0.028	0.034	0.038	0.042	0.045	0.046	0.047	0.046	0.045	0.042	0.038	0.034	0.028	0.022	0.015	0.008	0
TOTAL DEAD LOAD DEFLECTION	0	0.084	0.196	0.300	0.393	0.475	0.544	0.599	0.640	0.663	0.672	0.663	0.640	0.599	0.544	0.475	0.393	0.300	0.196	0.084	0
REQUIRED CAMBER	0	1"	2 <sup>3</sup> / <sub>8</sub> "	3 <sup>5</sup> / <sub>8</sub> "	4 <sup>1</sup> / <sub>16</sub> "	5 <sup>1</sup> / <sub>16</sub> "	6 <sup>1</sup> / <sub>2</sub> "	7 <sup>3</sup> / <sub>16</sub> "	7 <sup>1</sup> / <sub>16</sub> "	7 <sup>15</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>16</sub> "	7 <sup>15</sup> / <sub>16</sub> "	7 <sup>1</sup> / <sub>16</sub> "	7 <sup>3</sup> / <sub>16</sub> "	6 <sup>1</sup> / <sub>2</sub> "	5 <sup>1</sup> / <sub>16</sub> "	4 <sup>1</sup> / <sub>16</sub> "	3 <sup>5</sup> / <sub>8</sub> "	2 <sup>3</sup> / <sub>8</sub> "	1"	0
	GIRDERS 2 & 3																				
TWENTIETH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.021	0.040	0.059	0.075	0.089	0.101	0.111	0.118	0.123	0.124	0.123	0.118	0.111	0.101	0.089	0.075	0.059	0.040	0.021	0
DEFLECTION DUE TO WEIGHT OF SLAB *	0	0.058	0.145	0.226	0.298	0.361	0.415	0.457	0.489	0.508	0.514	0.508	0.489	0.457	0.415	0.361	0.298	0.226	0.145	0.058	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	0.008	0.015	0.022	0.028	0.033	0.037	0.041	0.043	0.045	0.045	0.045	0.043	0.041	0.037	0.033	0.028	0.022	0.015	0.008	0
TOTAL DEAD LOAD DEFLECTION	0	0.087	0.200	0.307	0.401	0.483	0.553	0.609	0.650	0.676	0.683	0.676	0.650	0.609	0.553	0.483	0.401	0.307	0.200	0.087	0
REQUIRED CAMBER	0	1 <sup>1</sup> / <sub>16</sub> "	2 <sup>3</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>16</sub> "	4 <sup>13</sup> / <sub>16</sub> "	5 <sup>13</sup> / <sub>16</sub> "	6 <sup>5</sup> / <sub>8</sub> "	7 <sup>5</sup> / <sub>16</sub> "	7 <sup>13</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>8</sub> "	8 <sup>3</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>8</sub> "	7 <sup>13</sup> / <sub>16</sub> "	7 <sup>5</sup> / <sub>16</sub> "	6 <sup>5</sup> / <sub>8</sub> "	5 <sup>13</sup> / <sub>16</sub> "	4 <sup>13</sup> / <sub>16</sub> "	3 <sup>1</sup> / <sub>16</sub> "	2 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>16</sub> "	0

\* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

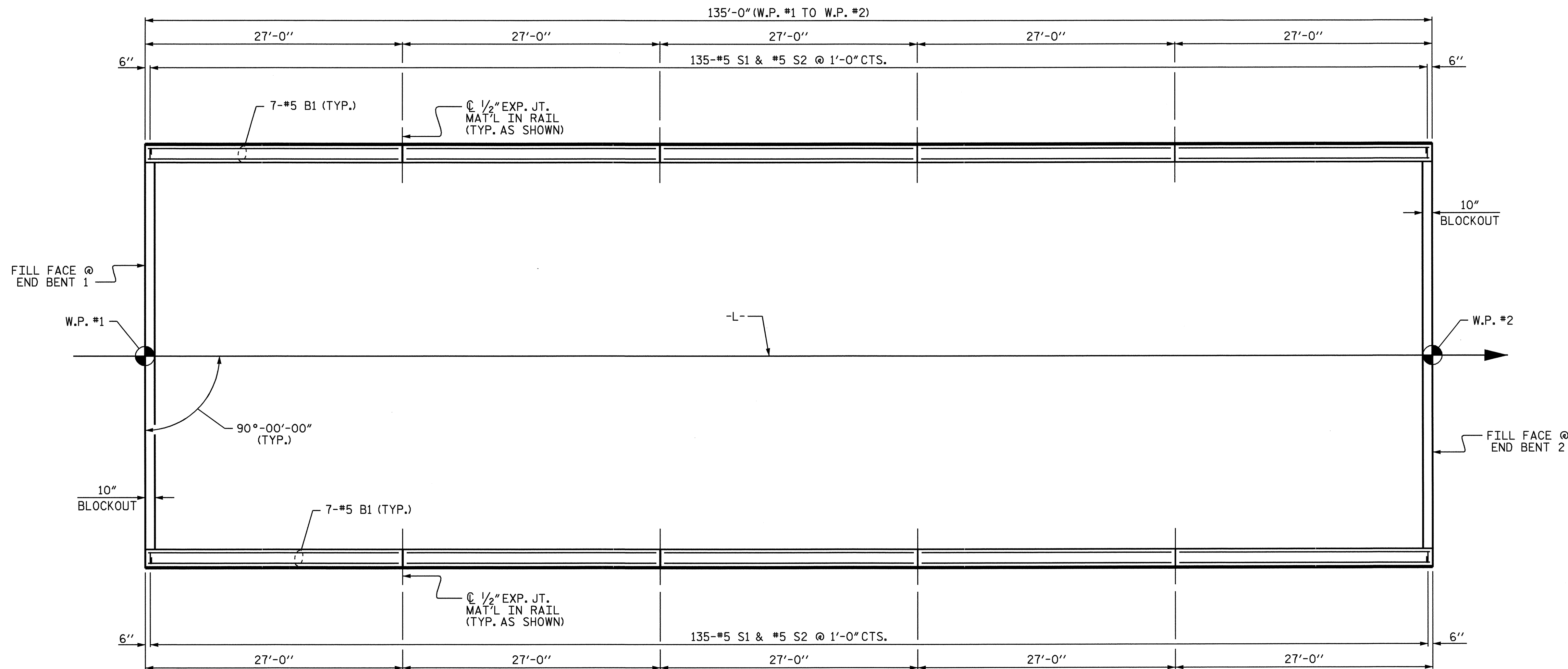
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 DEAD LOAD  
 DEFLECTIONS



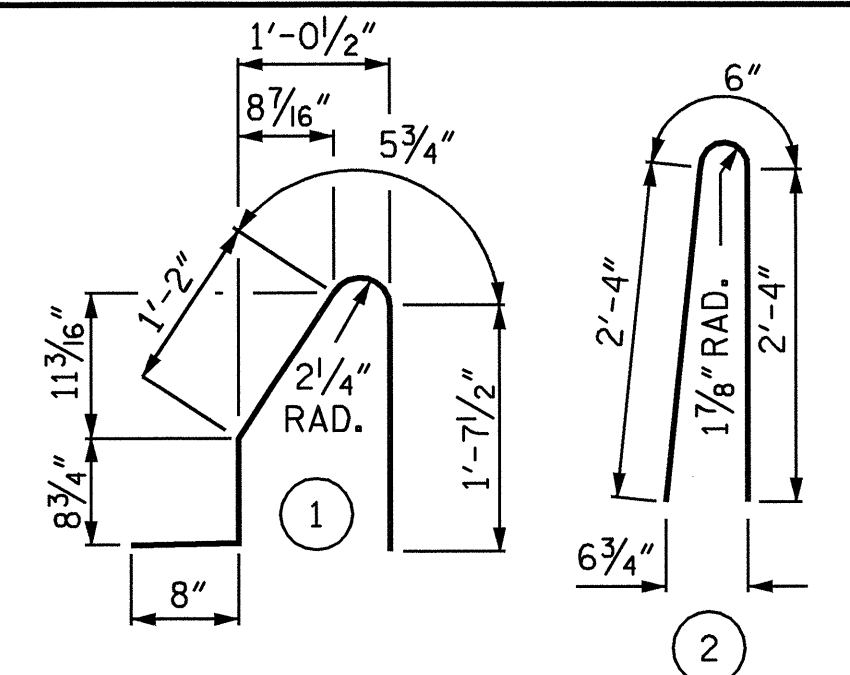
DRAWN BY : B.L. GREEN DATE : 1/22/07  
 CHECKED BY : P. C. BREWER DATE : 2/5/07

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			20



PLAN OF BARRIER RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	70	#5	STR	26'-7"	1941
* S1	270	#5	1	4'-8"	1314
* S2	270	#5	2	5'-2"	1455

\* EPOXY COATED REINFORCING STEEL LBS. 4,710

CLASS AA CONCRETE CU. YDS. 27.1

CONCRETE BARRIER RAIL LIN. FT. 270.00

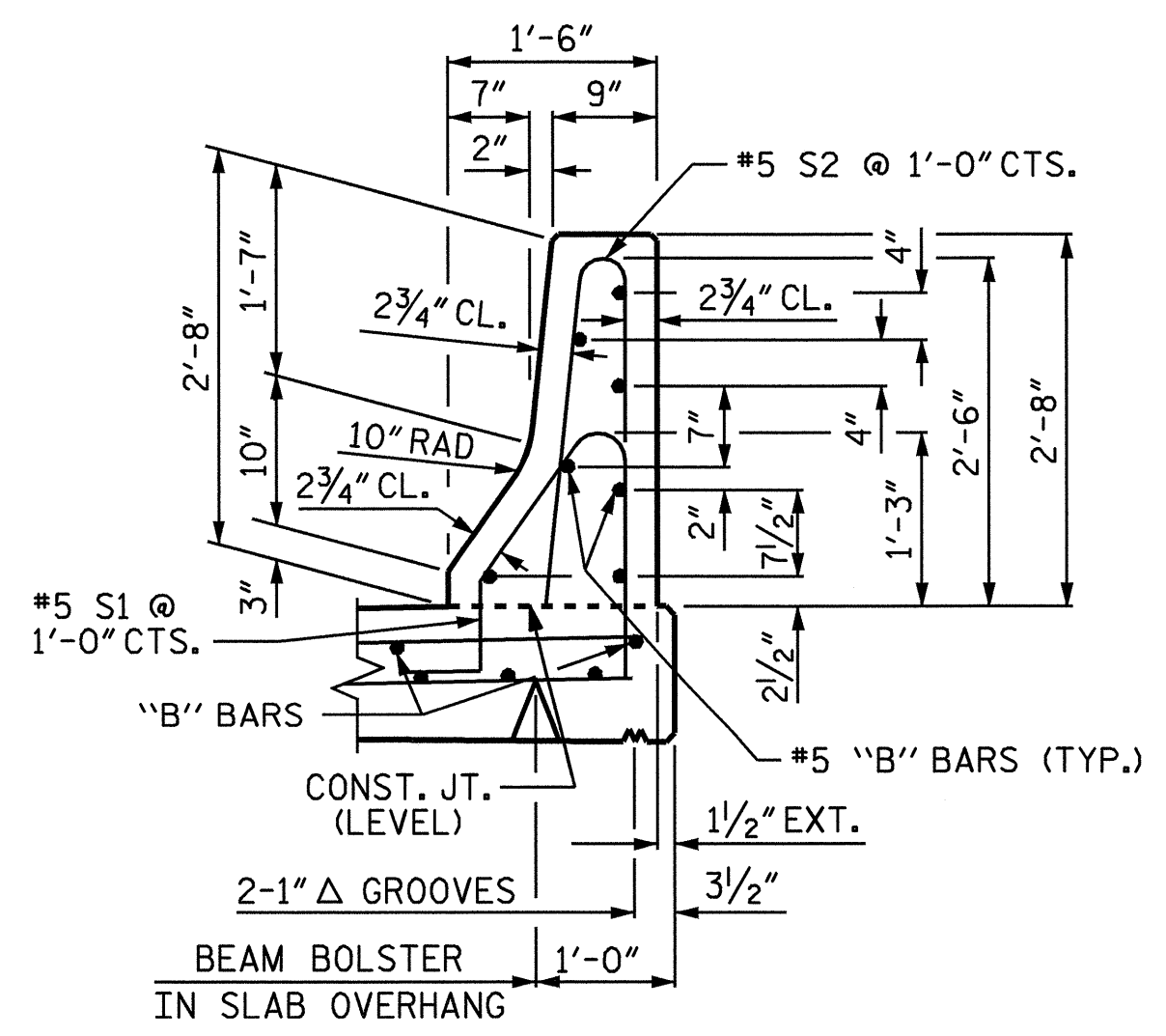
NOTES:

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

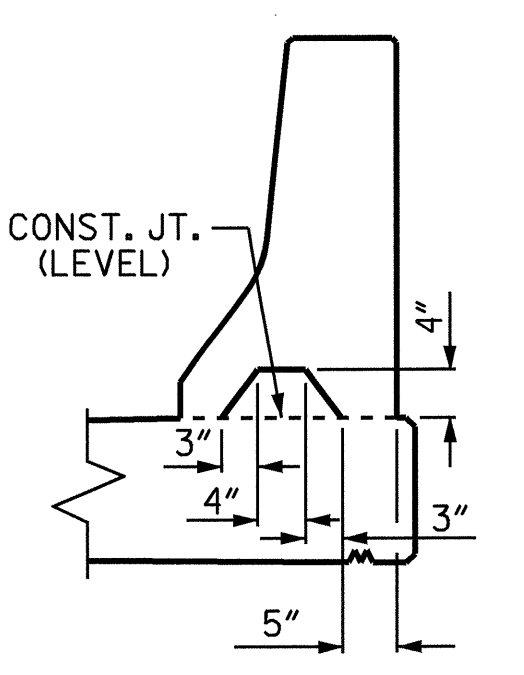
THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.

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.



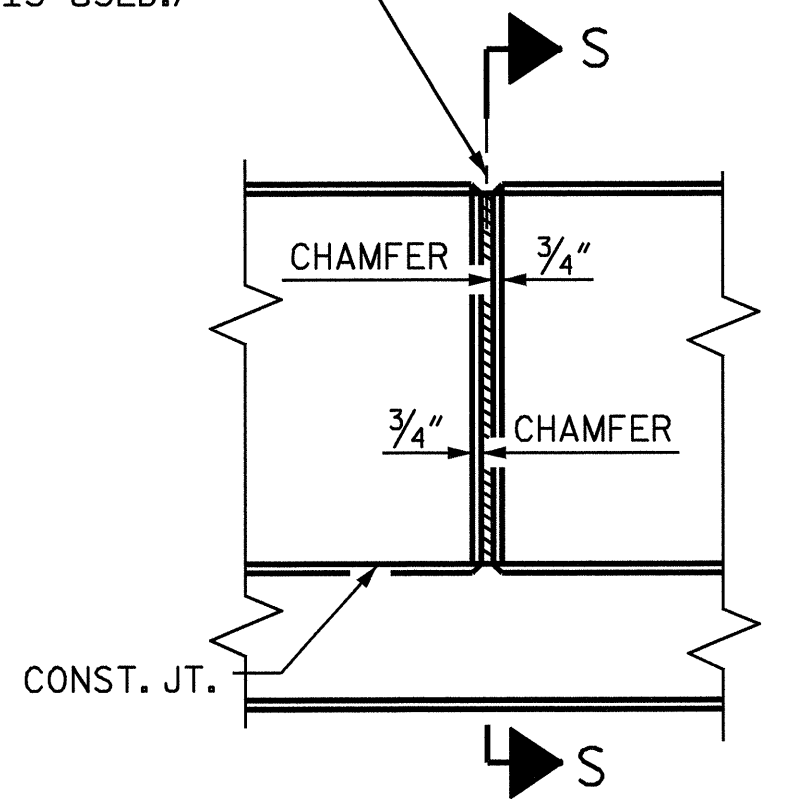
SECTION THRU RAIL

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



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

ASSEMBLED BY : B. L. GREEN	DATE : 1/23/07
CHECKED BY : P. C. BREWER	DATE : 2/05/07
DRAWN BY : ARB 5/87	REV. 10/17/00 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/03R RWW/JTE
	REV. 5/1/06 TLA/GM

16-DEC-2008 08:38 R:\S\Structures\Bgreen\microstation\B4307\_sd.BR.01.dgn lsutton

BARRIER RAIL DETAILS

PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-

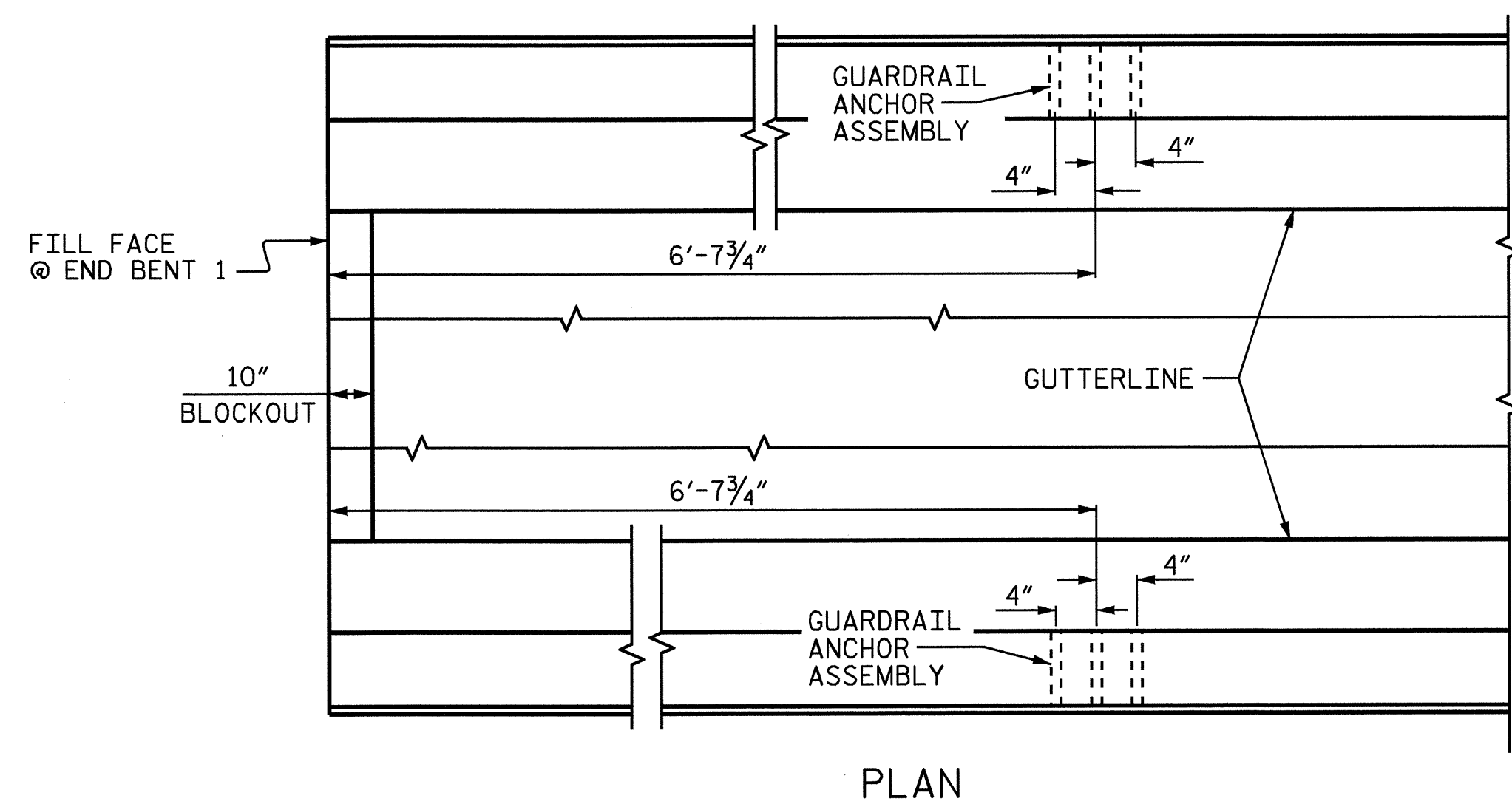
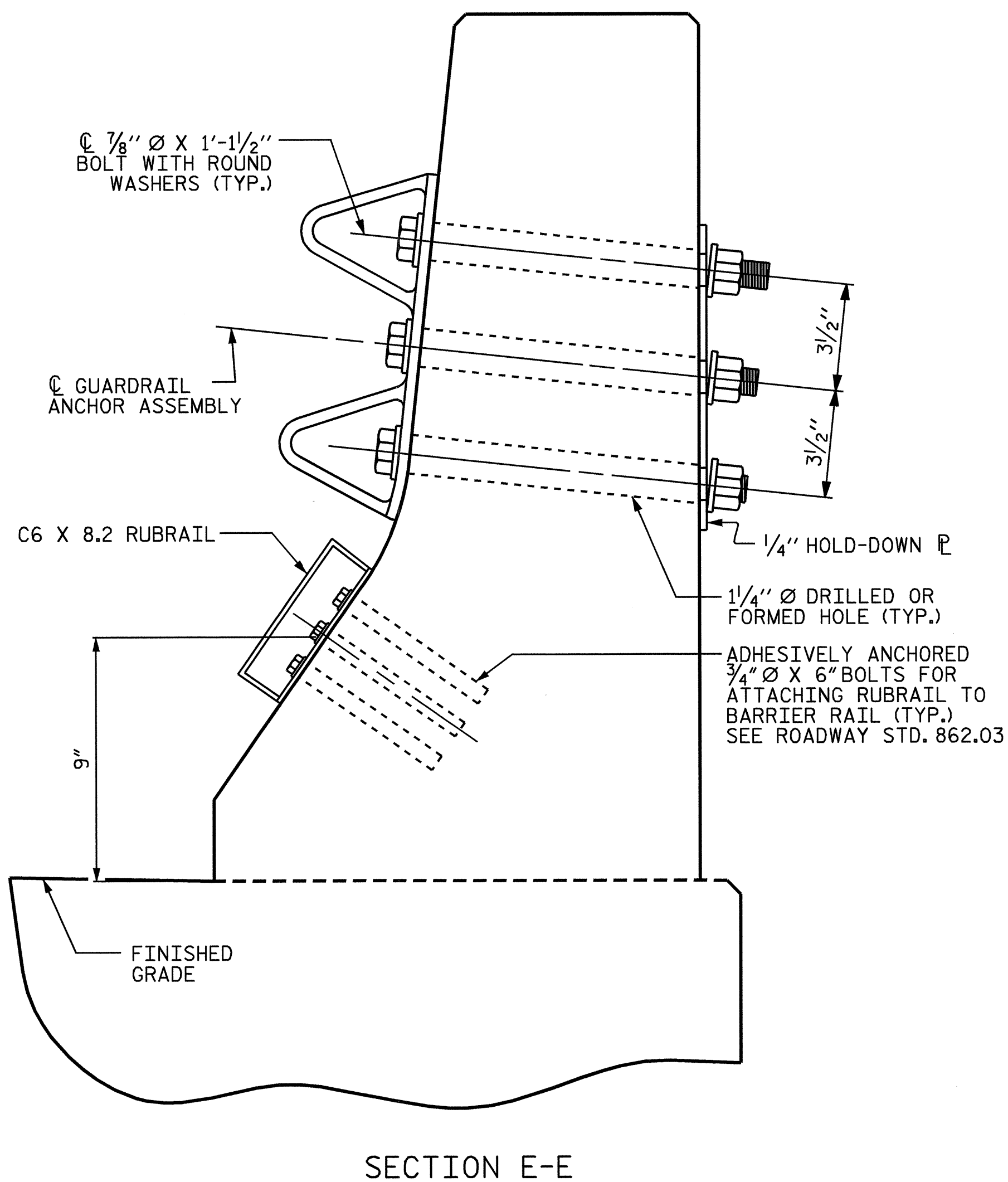
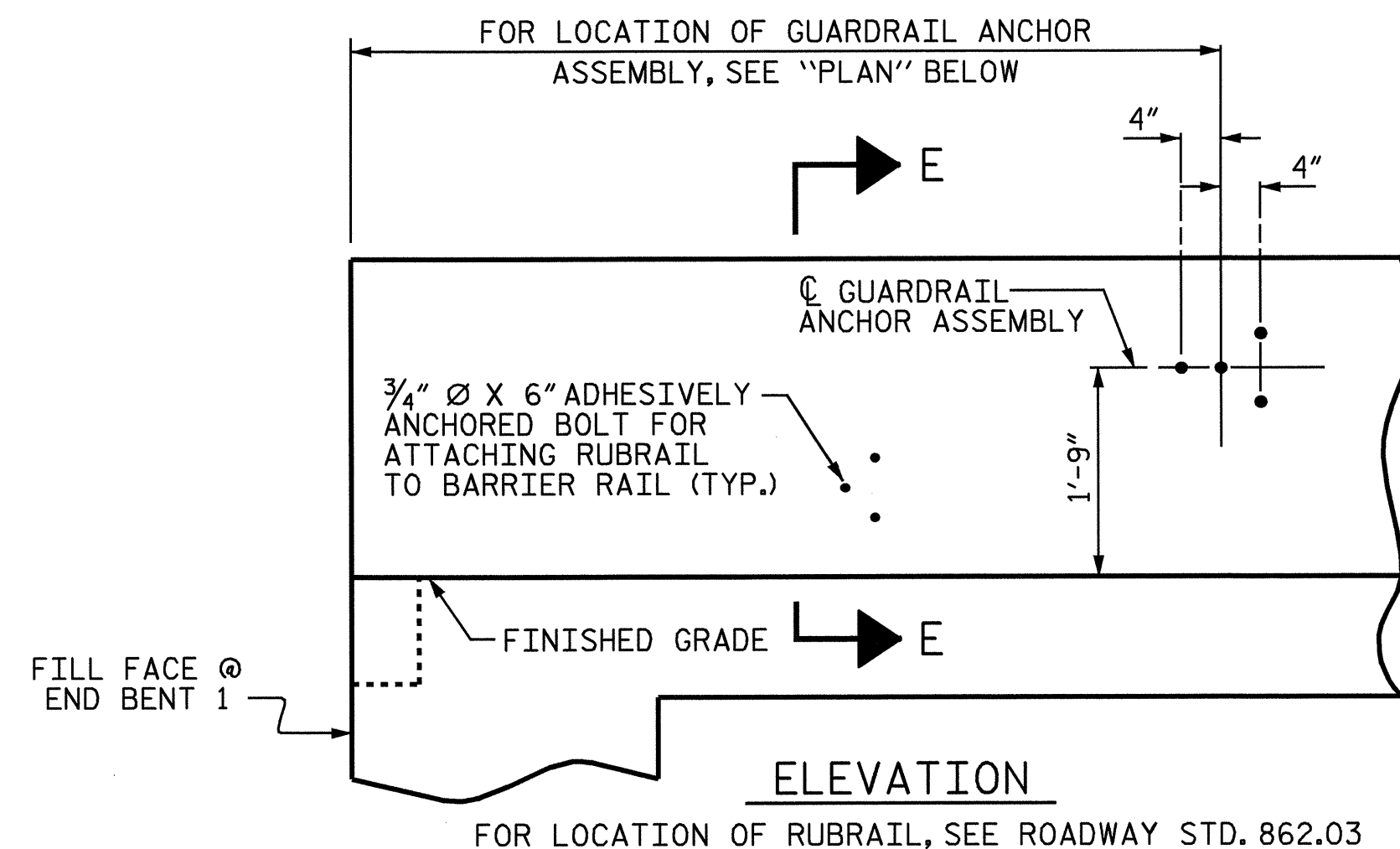
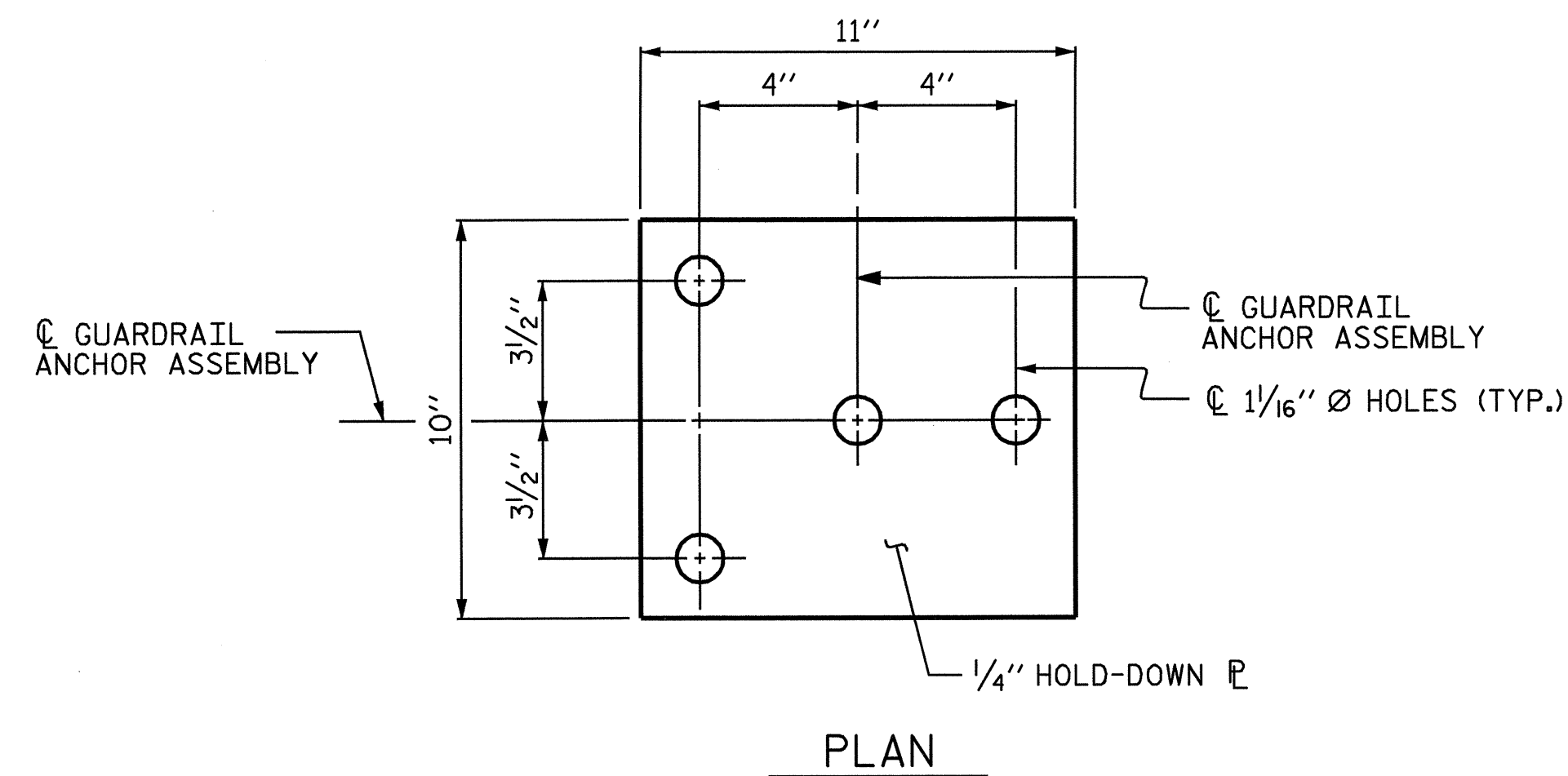
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
CONCRETE  
BARRIER RAIL



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S-11	
				TOTAL SHEETS 20	

STD. NO. CBR1



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

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 1/8" 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.)

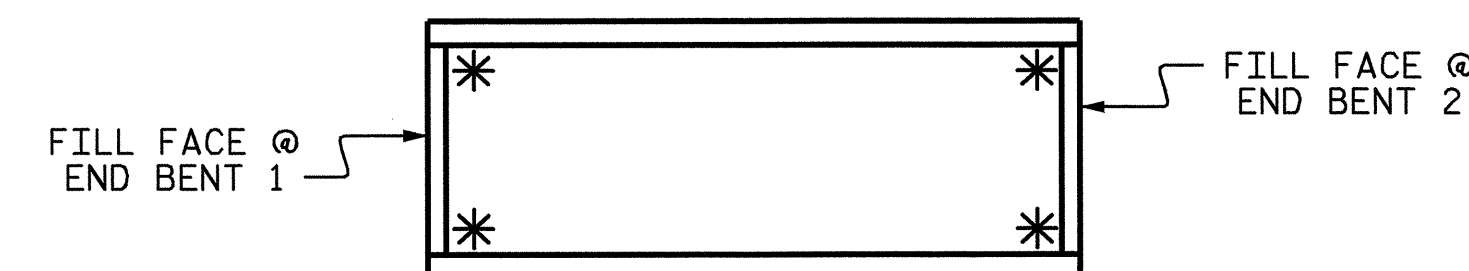
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
S-12					20



ASSEMBLED BY : B. L. GREEN DATE : 1/23/07  
 CHECKED BY : P. C. BREWER DATE : 2/05/07  
 DRAWN BY : TLA 5/06 ADDED 5/1/06R KMM/GM  
 CHECKED BY : GM 5/06

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

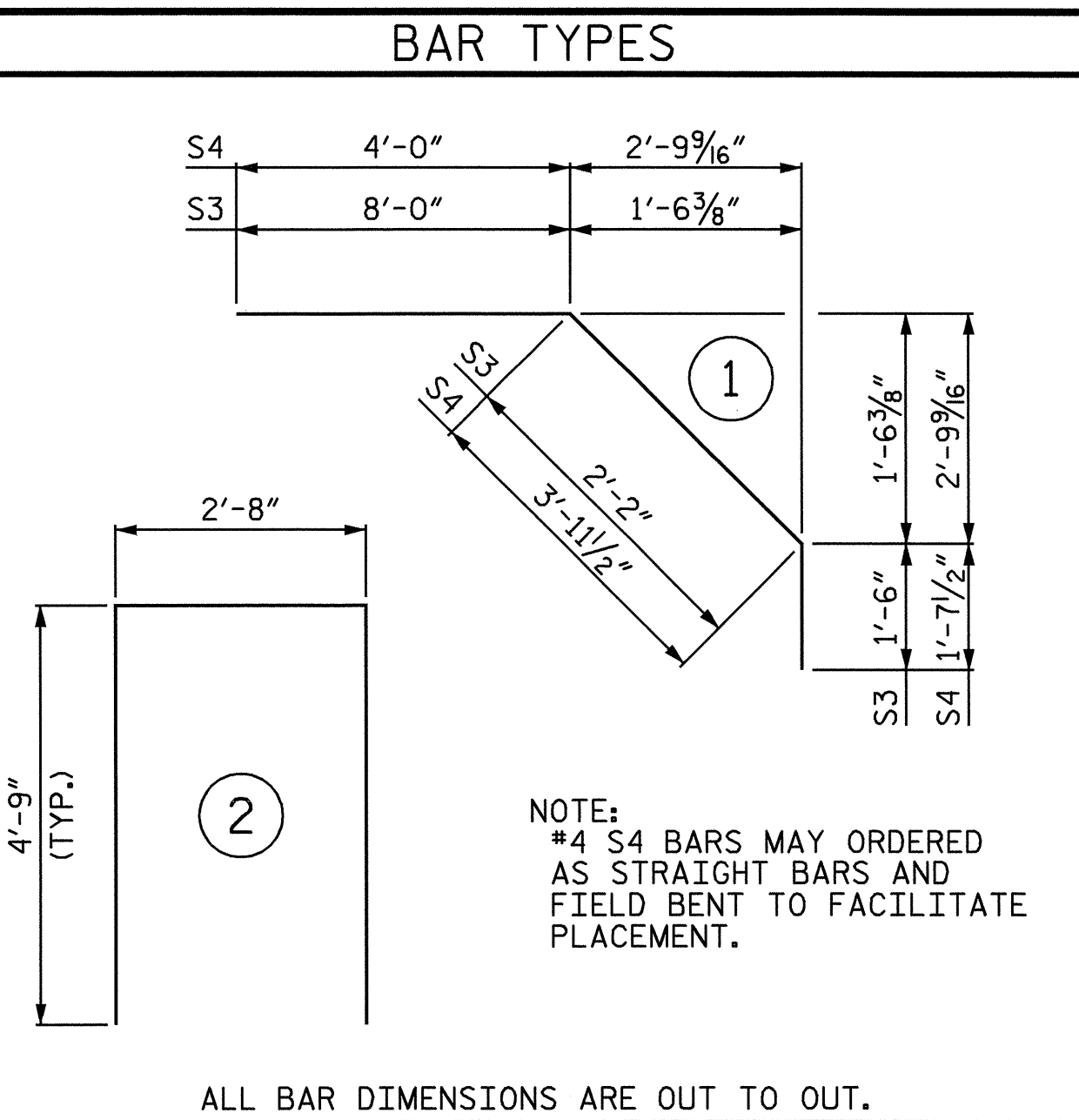
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	771	SQ.FT.
BRIDGE DECK	4,122	SQ.FT.
TOTAL	4,893	SQ.FT.

**BILL OF MATERIAL**

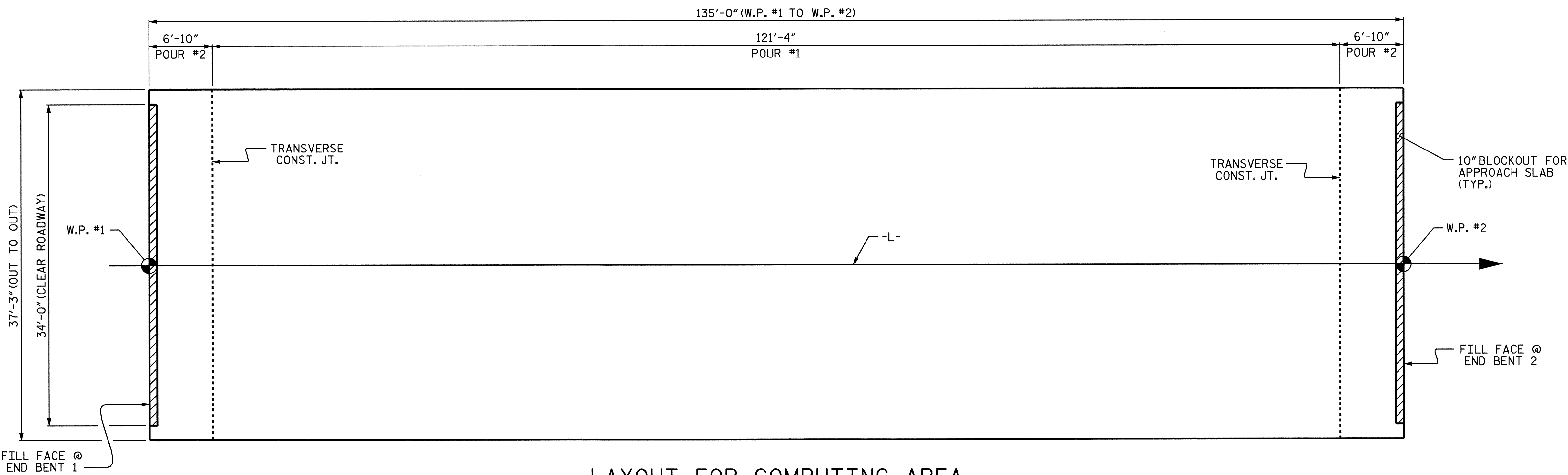
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	267	#5	STR	36'-11"	10281
A2	267	#5	STR	36'-11"	10281
*B1	75	#4	STR	29'-2"	1461
B2	132	#5	STR	45'-10"	6310
*B3	194	#5	STR	26'-10"	5430
*B4	10	#4	STR	28'-7"	191
K1	48	#4	STR	19'-4"	620
*S3	80	#4	1	11'-8"	623
*S4	62	#4	1	9'-7"	397
U1	66	#4	2	12'-2"	536
REINFORCING STEEL				LBS.	17,747
*EPOXY COATED REINFORCING STEEL				LBS.	18,383



**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	137.3	—	—
POUR #2	55.4	—	—
TOTALS **	192.7	17,747	18,383

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.



LAYOUT FOR COMPUTING AREA  
OF REINFORCED CONCRETE DECK SLAB  
AND POURING SEQUENCE  
(SQ. FT. = 5,029)

PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-



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

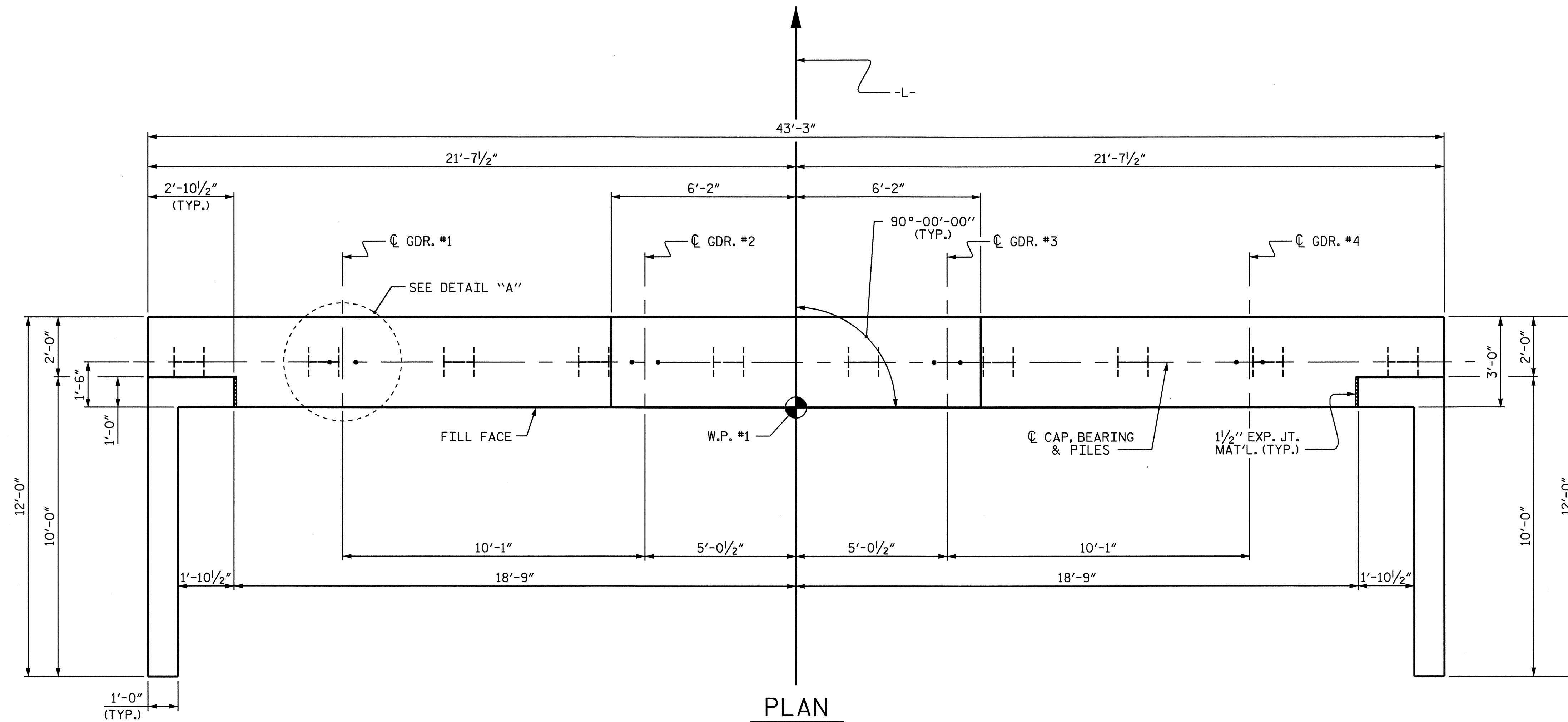
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : P.C. BREWER DATE : 10/9/06  
CHECKED BY : L.E. SUTTON DATE : 6/07

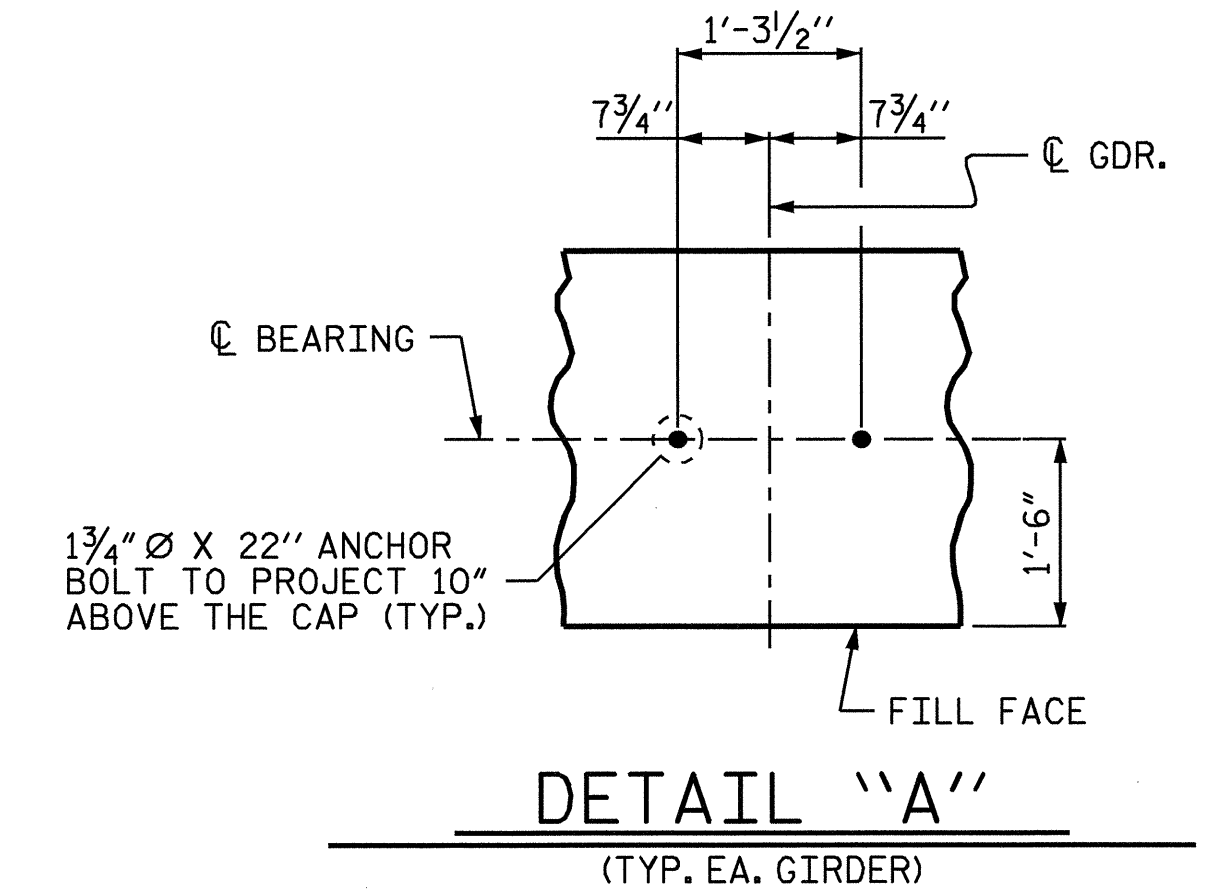
NOTES:

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

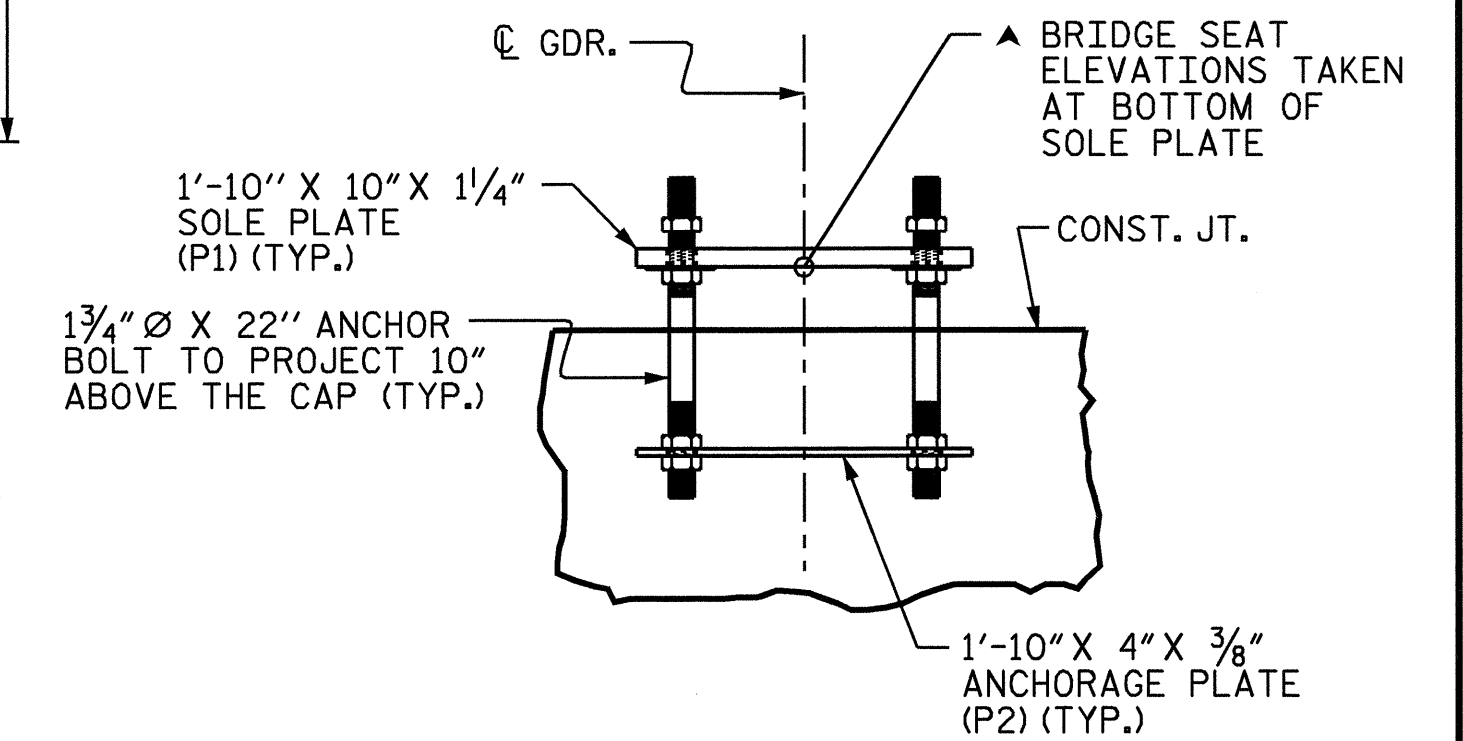
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



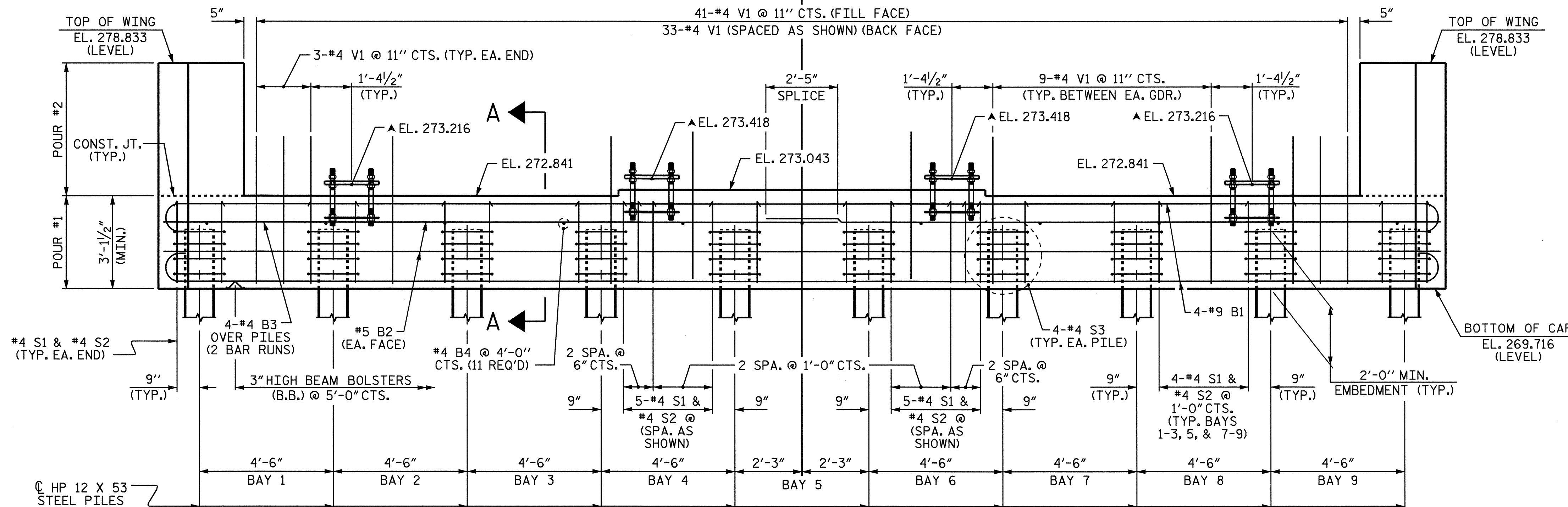
PLAN



DETAIL "A"  
(TYP. EA. GIRDER)



ANCHORAGE DETAILS  
(TYP. EA. GIRDER)

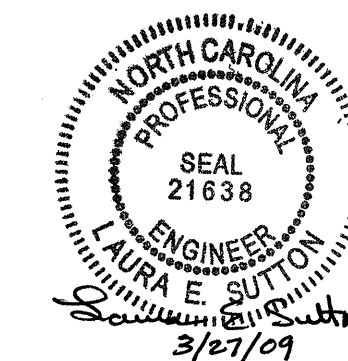


ELEVATION

PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-

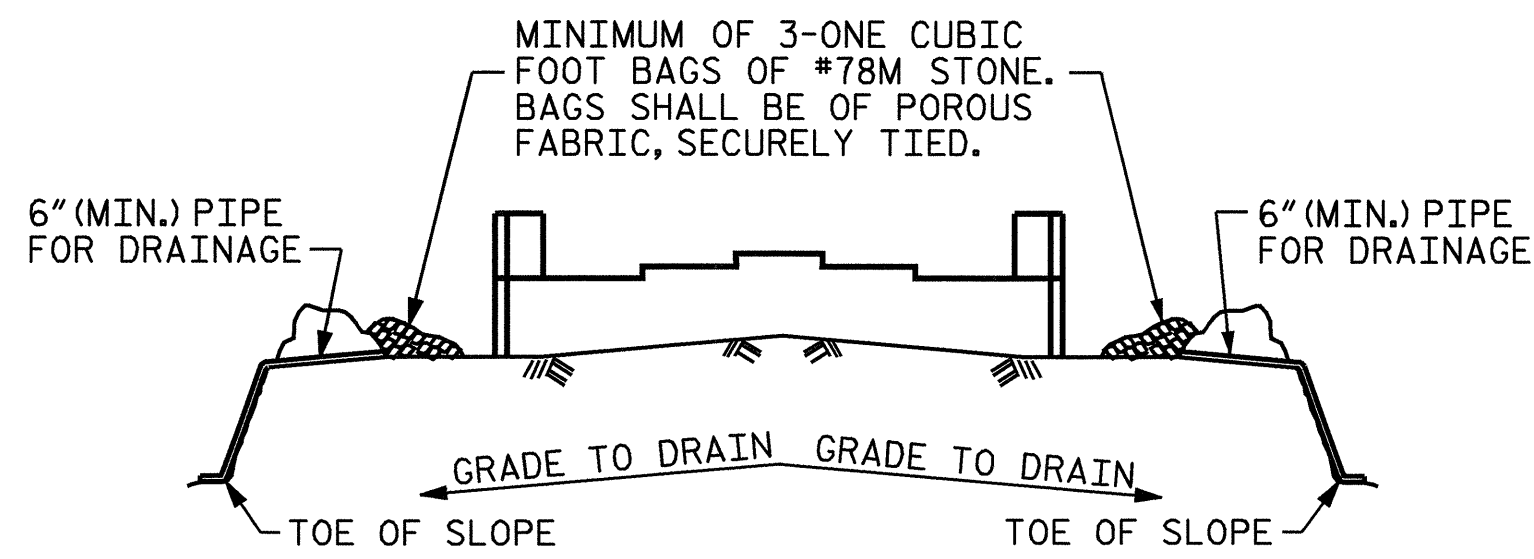
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
INTEGRAL  
END BENT 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			20

DRAWN BY : B. L. GREEN DATE : 4/3/07  
CHECKED BY : P. C. BREWER DATE : 4/12/07

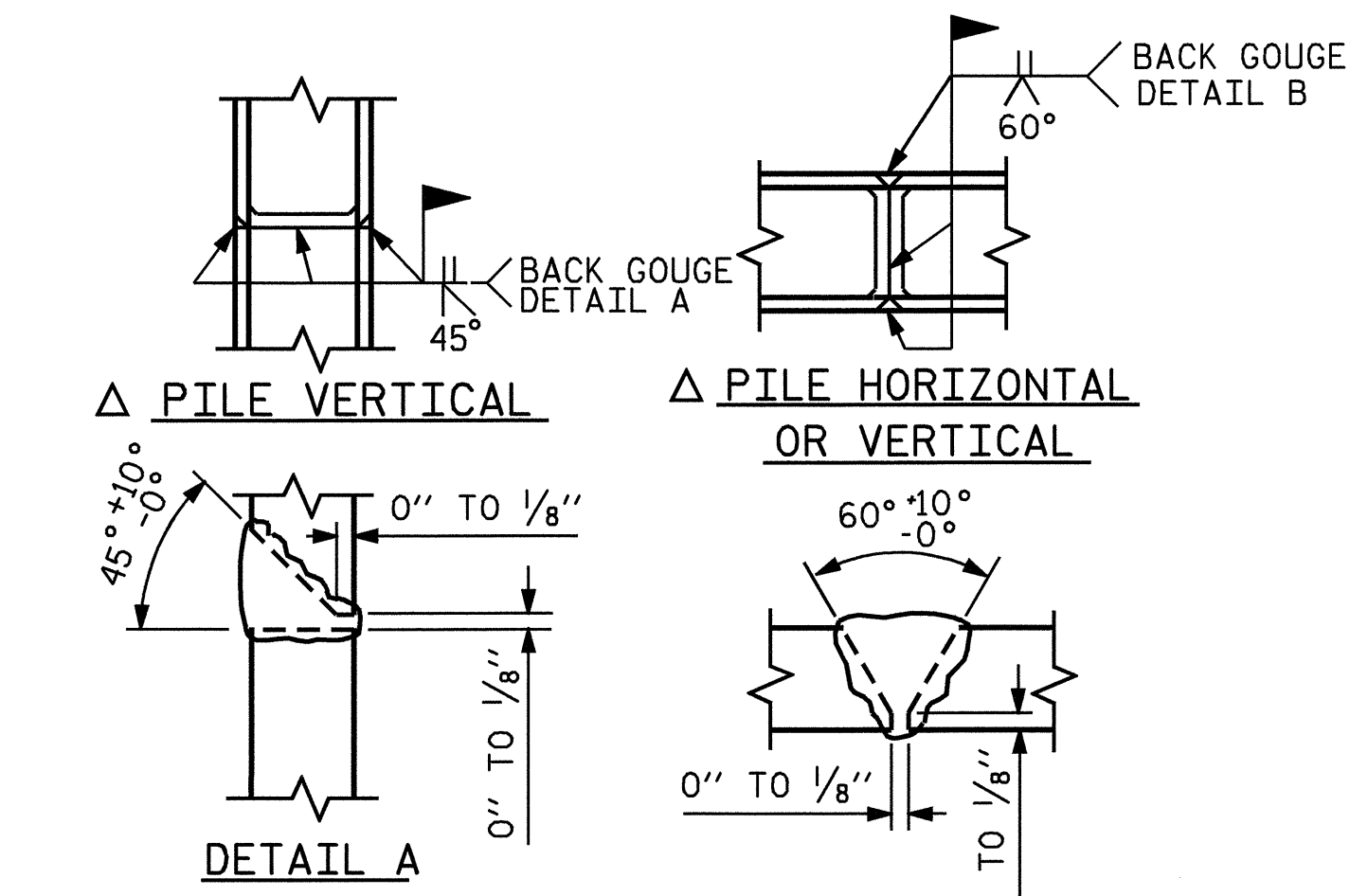


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

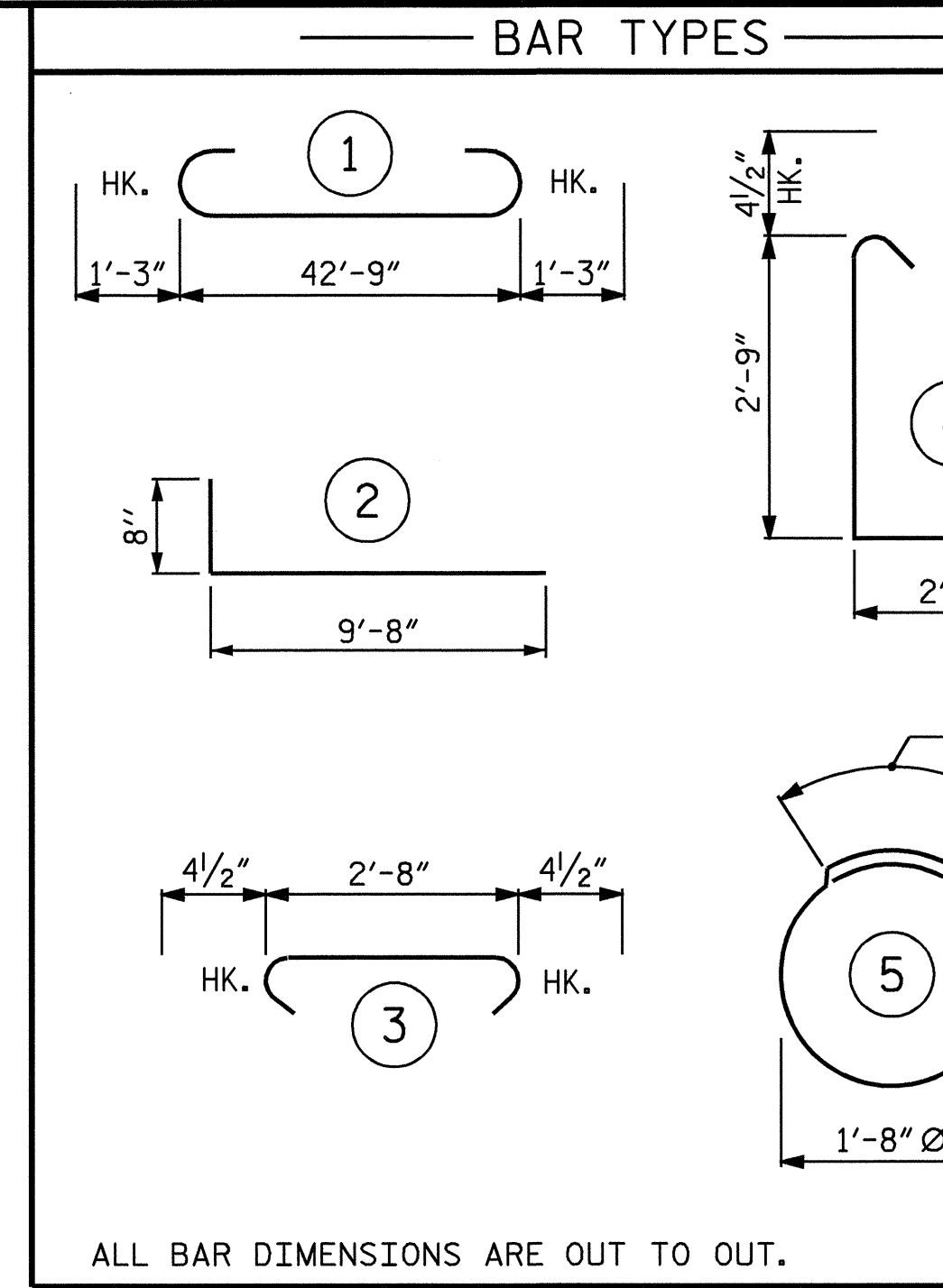
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT

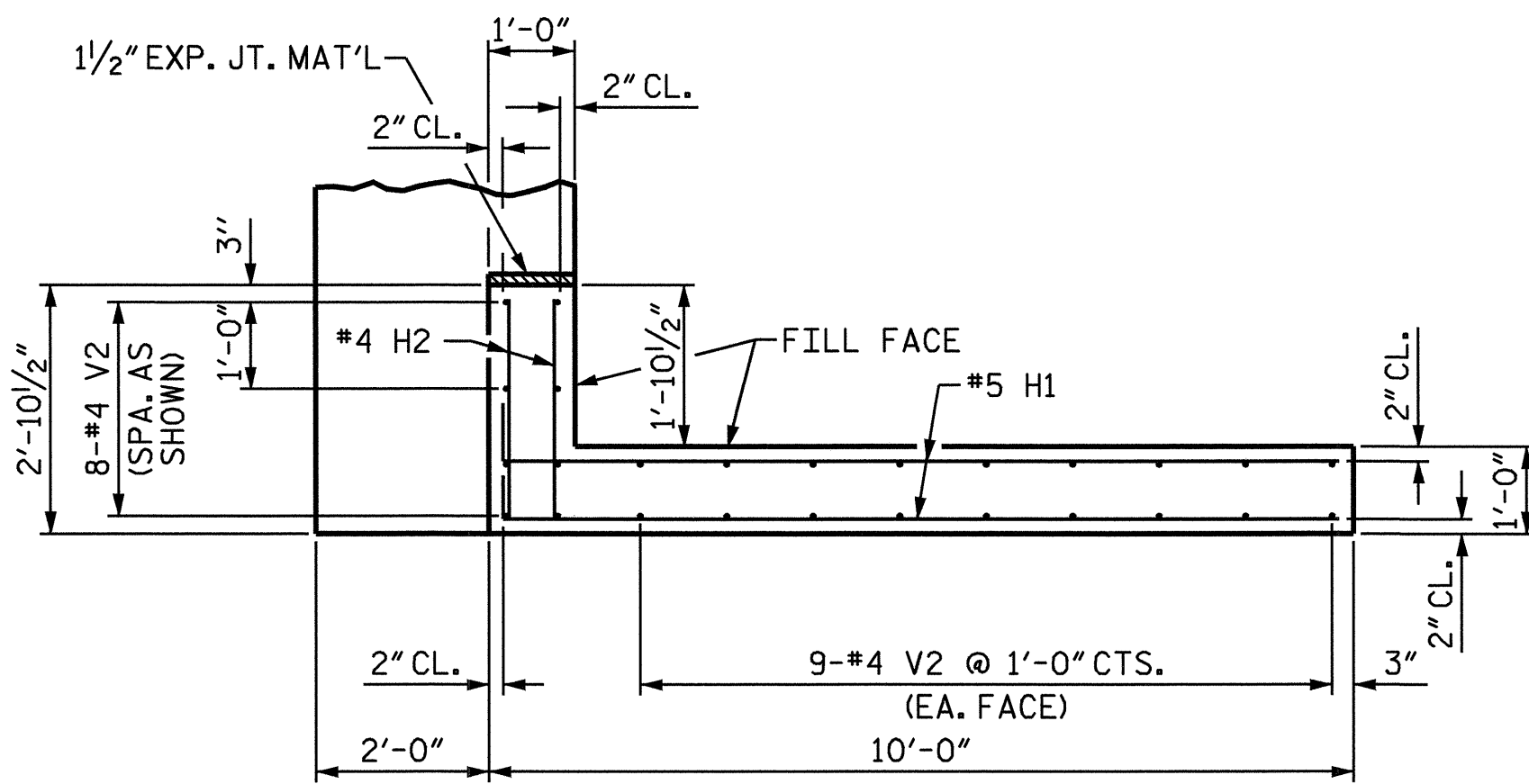


△ POSITION OF PILE DURING WELDING.

### PILE SPLICE DETAILS

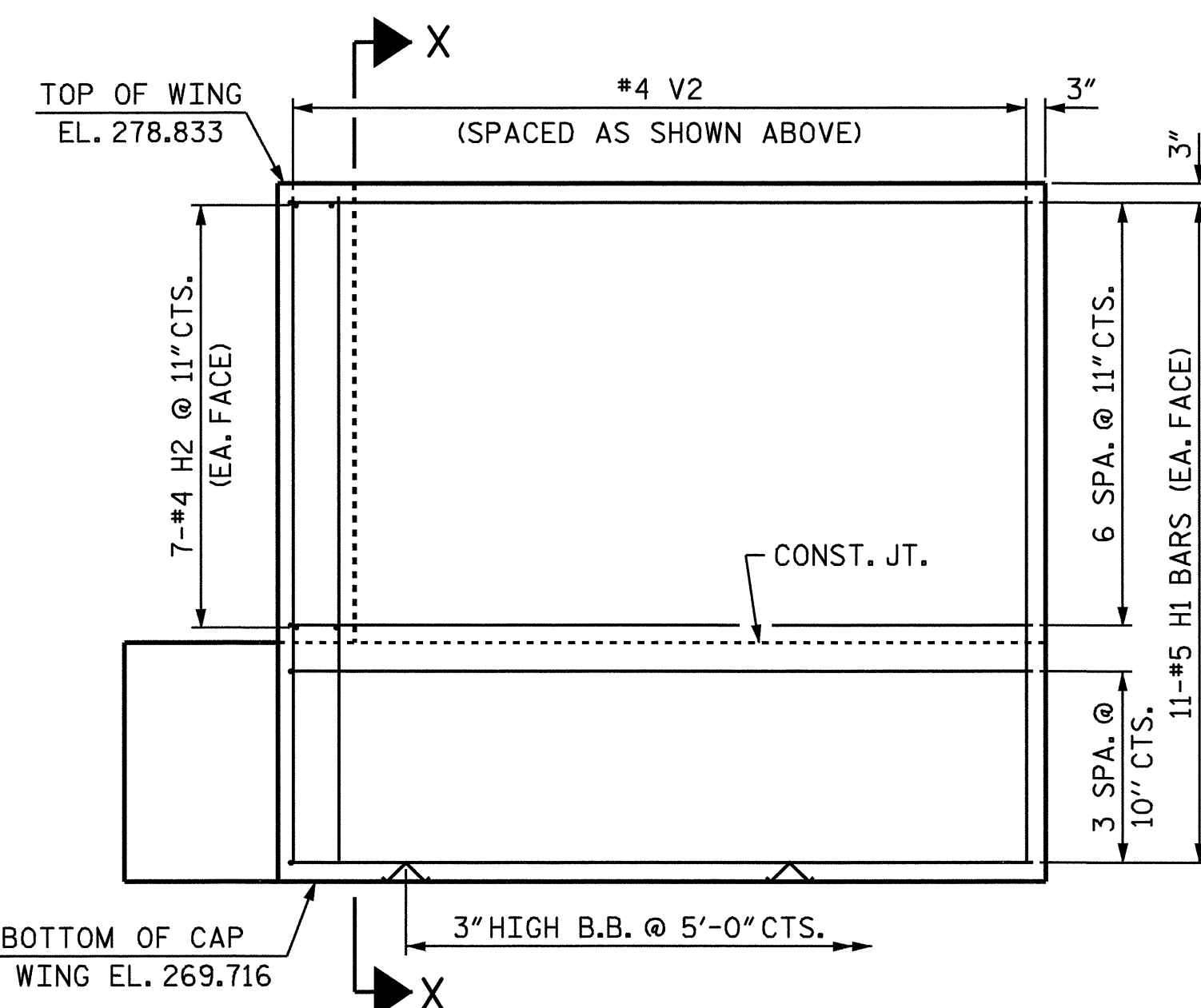


BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	45'-3"	1231
B2	4	#5	STR	42'-11"	179
B3	8	#4	STR	22'-8"	121
B4	11	#4	STR	2'-8"	20
H1	44	#5	2	10'-4"	474
H2	28	#4	STR	2'-6"	47
S1	40	#4	4	8'-11"	238
S2	40	#4	3	3'-5"	91
S3	40	#4	5	6'-6"	174
V1	74	#4	STR	4'-11"	243
V2	52	#4	STR	8'-9"	304
REINFORCING STEEL				LBS.	3,122
CLASS A CONCRETE BREAKDOWN :					
POUR #1 - CAP & LOWER WINGS				CU. YDS.	17.4
POUR #2 - UPPER WINGS				CU. YDS.	5.3
TOTAL				CU. YDS.	22.7
HP 12 x 53 STEEL PILES					
NO. = 10				LIN. FT.	300



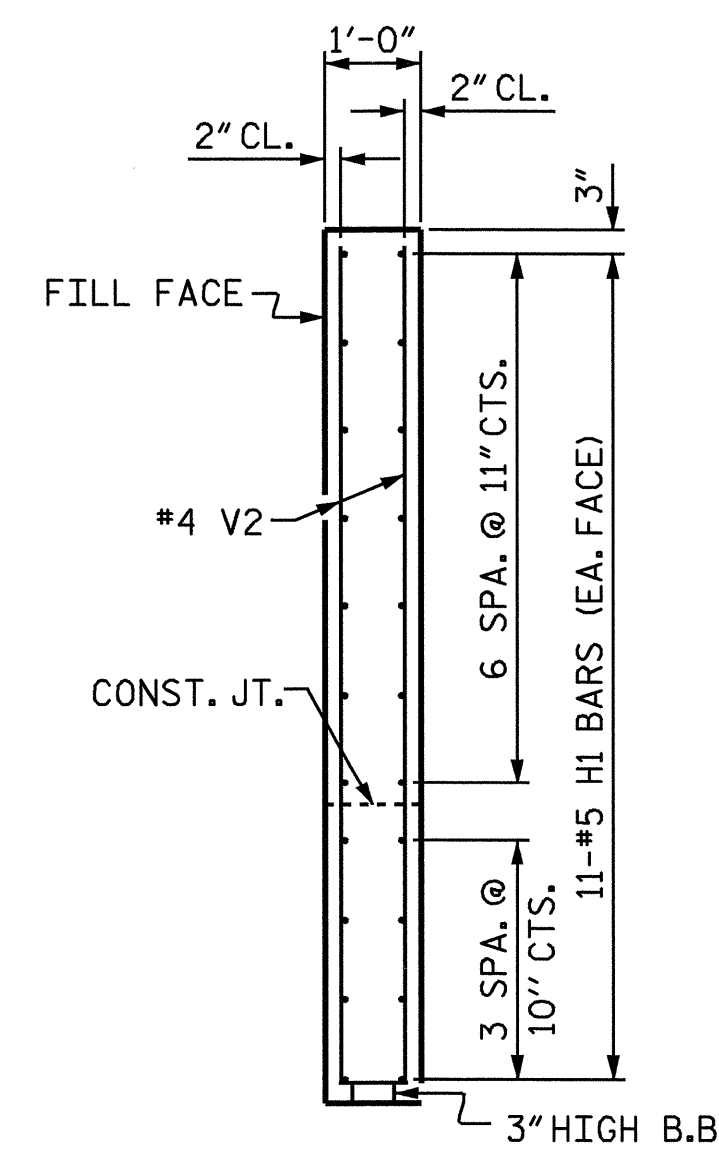
### PLAN OF WING

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

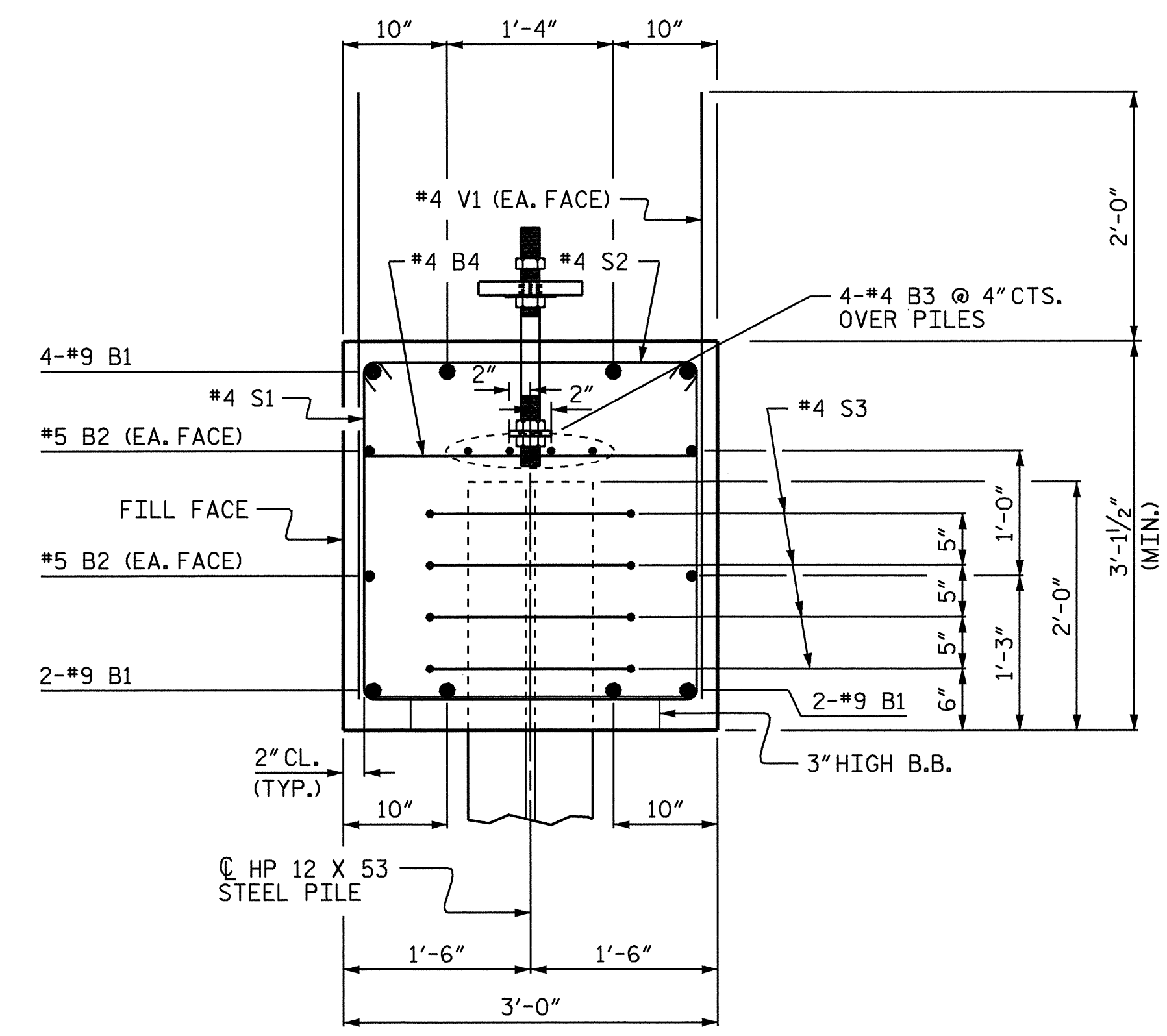


### ELEVATION OF WING

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



### SECTION X-X



### SECTION A-A

PROJECT NO. B-4307

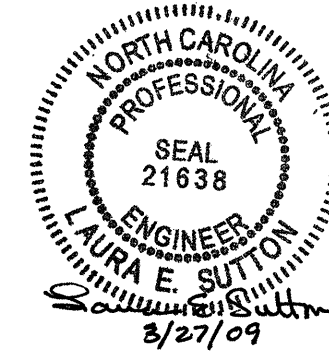
WARREN COUNTY

STATION: 16+77.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
INTEGRAL  
END BENT 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			20

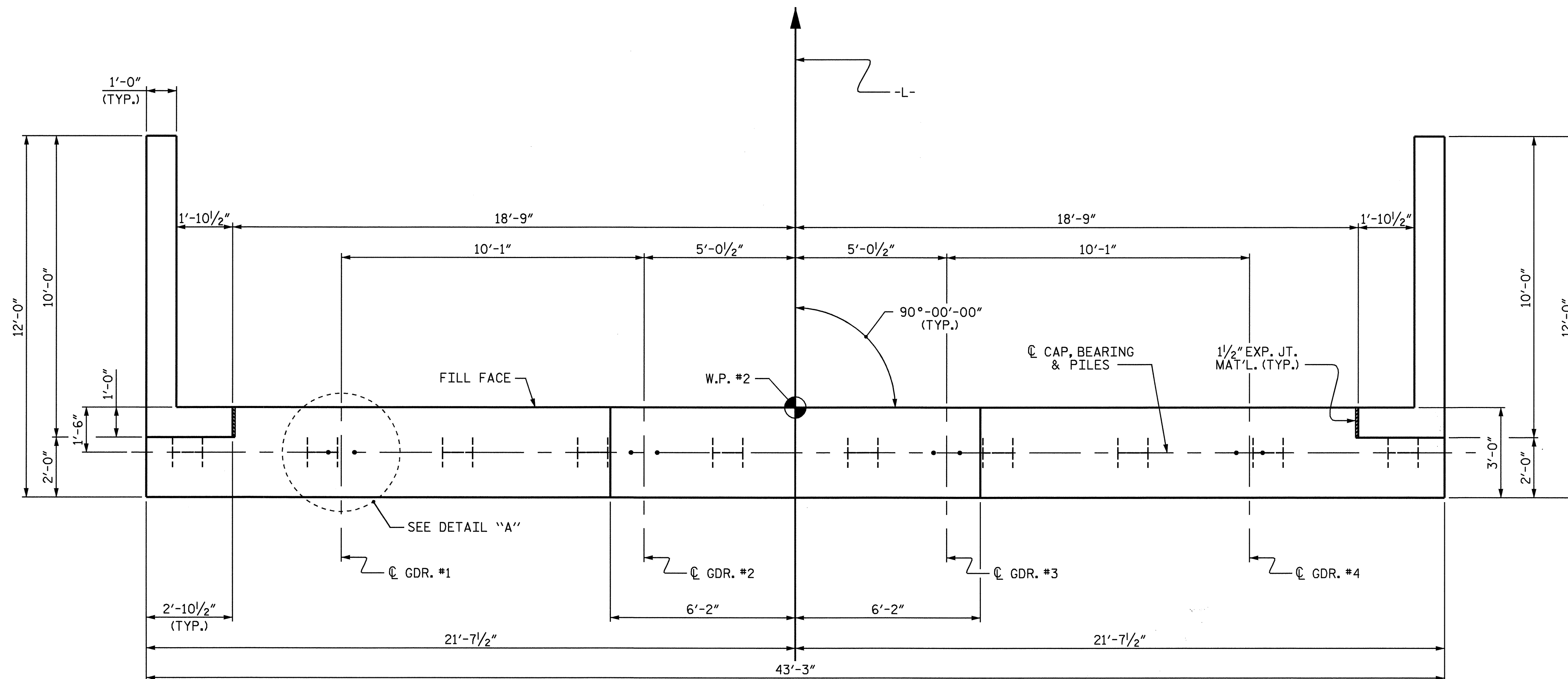
DRAWN BY : B.L. GREEN DATE : 4/03/07  
CHECKED BY : P.C. BREWER DATE : 4/12/07



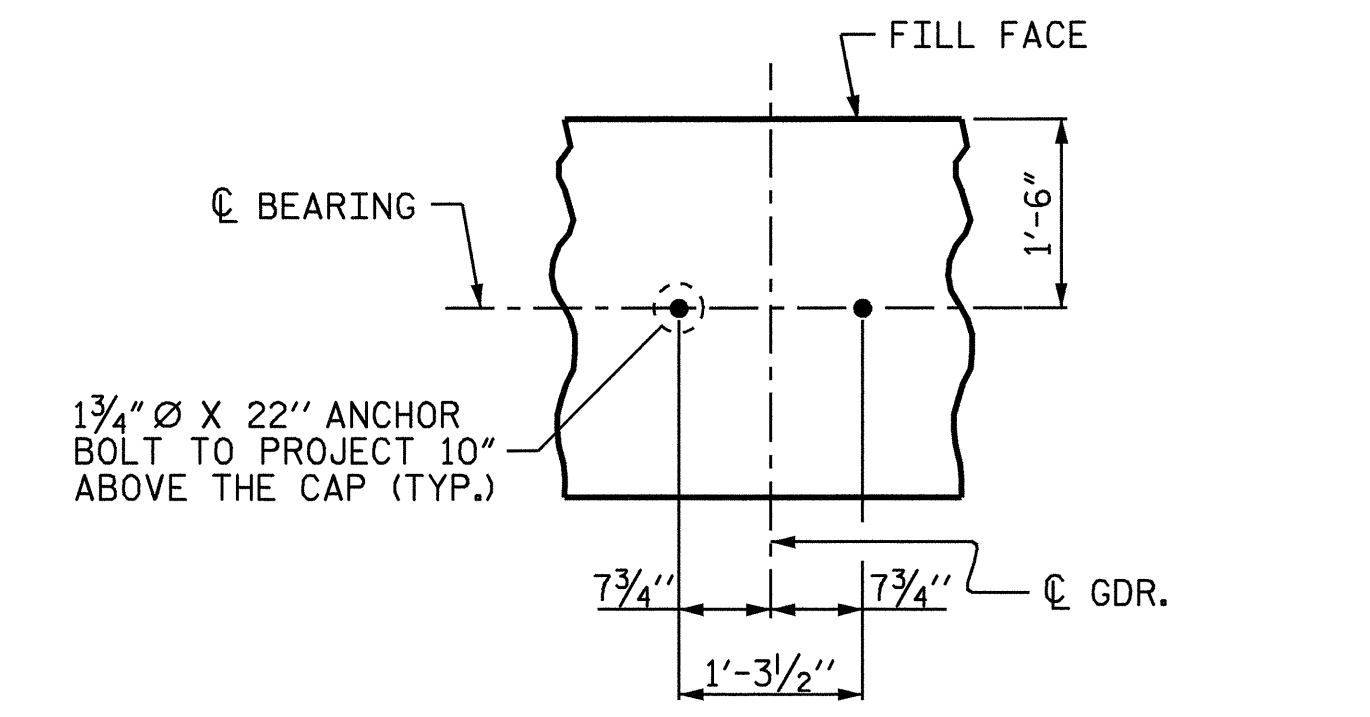
**NOTES:**

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

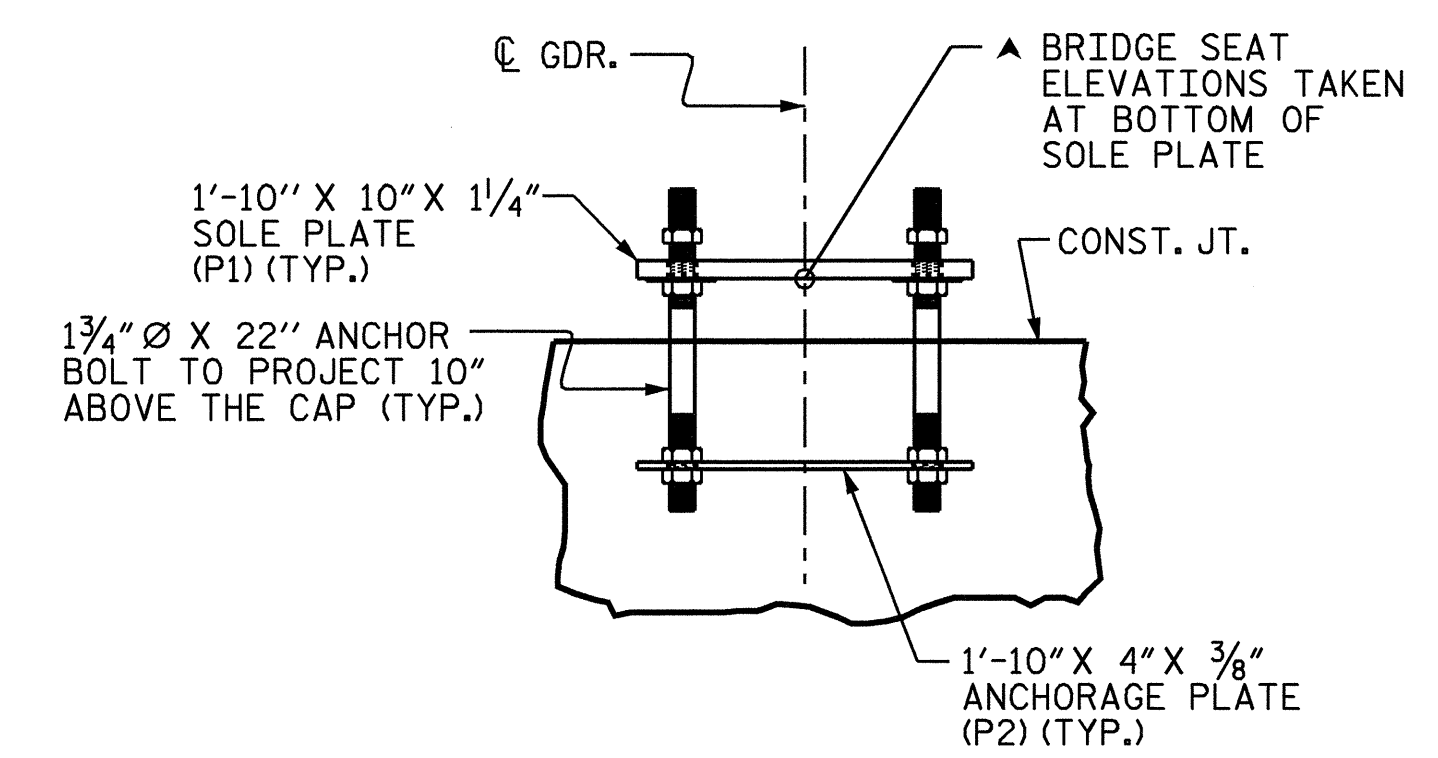
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



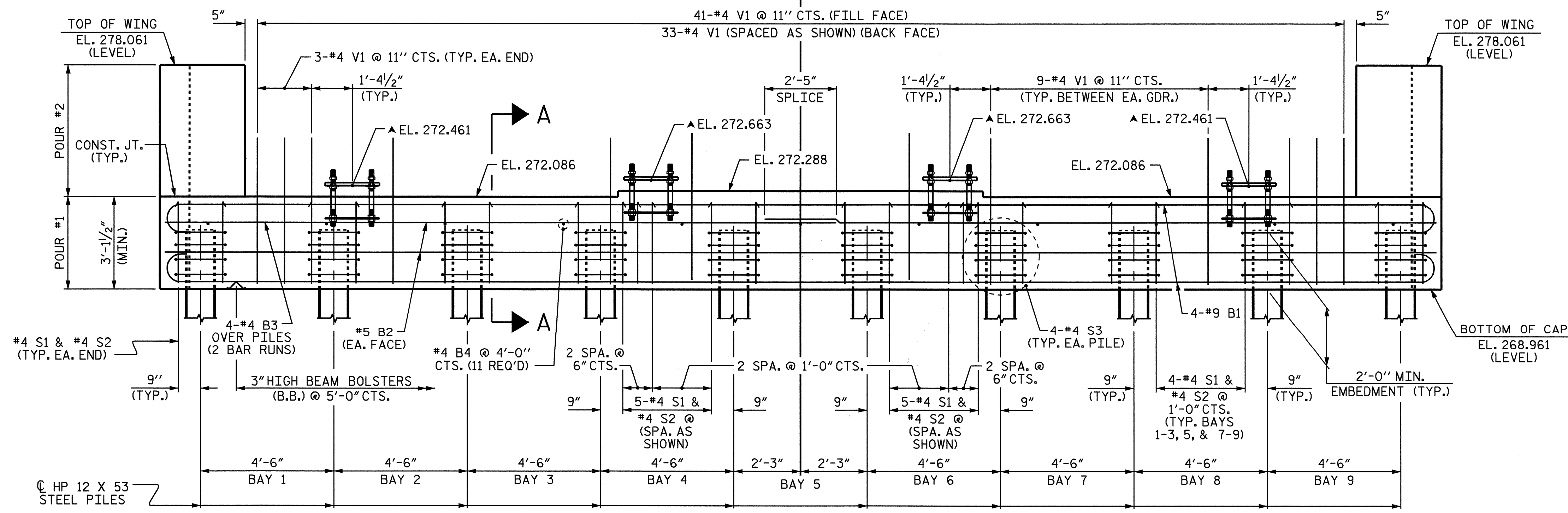
**PLAN**



**DETAIL "A"**  
(TYP. EA. GIRDER)



**ANCHORAGE DETAILS**  
(TYP. EA. GIRDER)

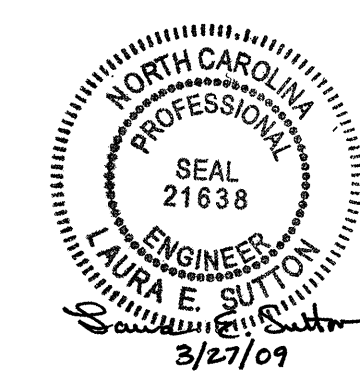


**ELEVATION**

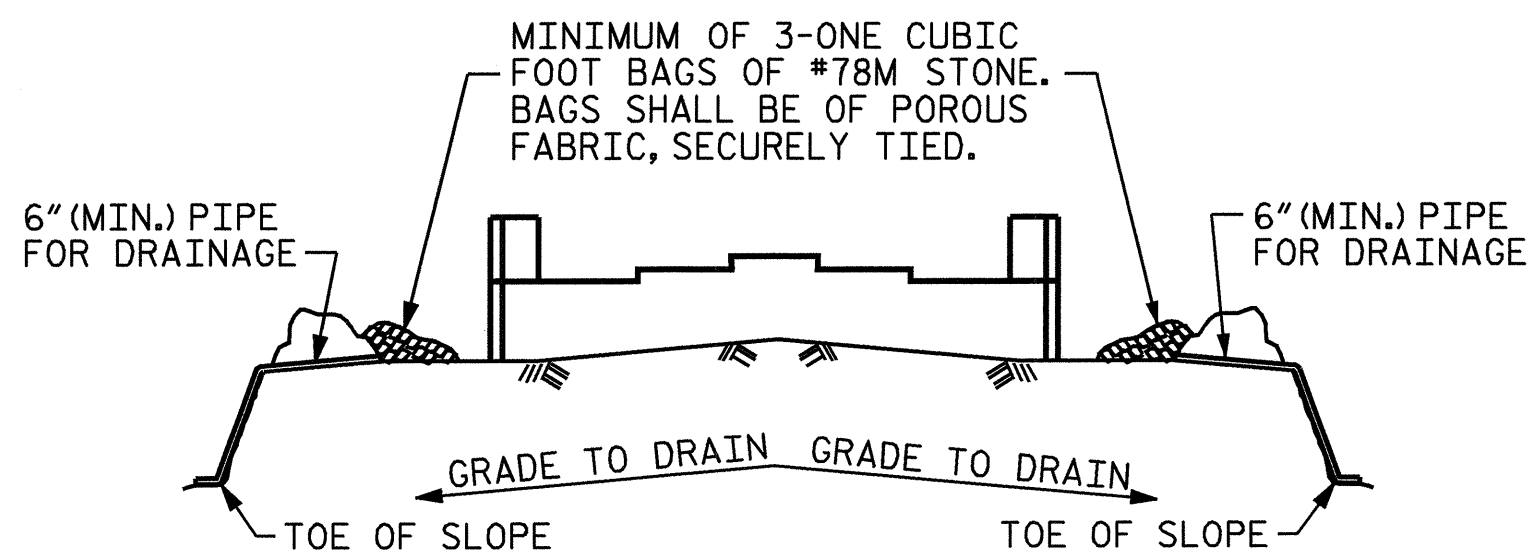
PROJECT NO. B-4307  
 WARREN COUNTY  
 STATION: 16+77.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-16 TOTAL SHEETS 20



DRAWN BY: B. L. GREEN DATE: 4/3/07  
 CHECKED BY: P. C. BREWER DATE: 4/12/07

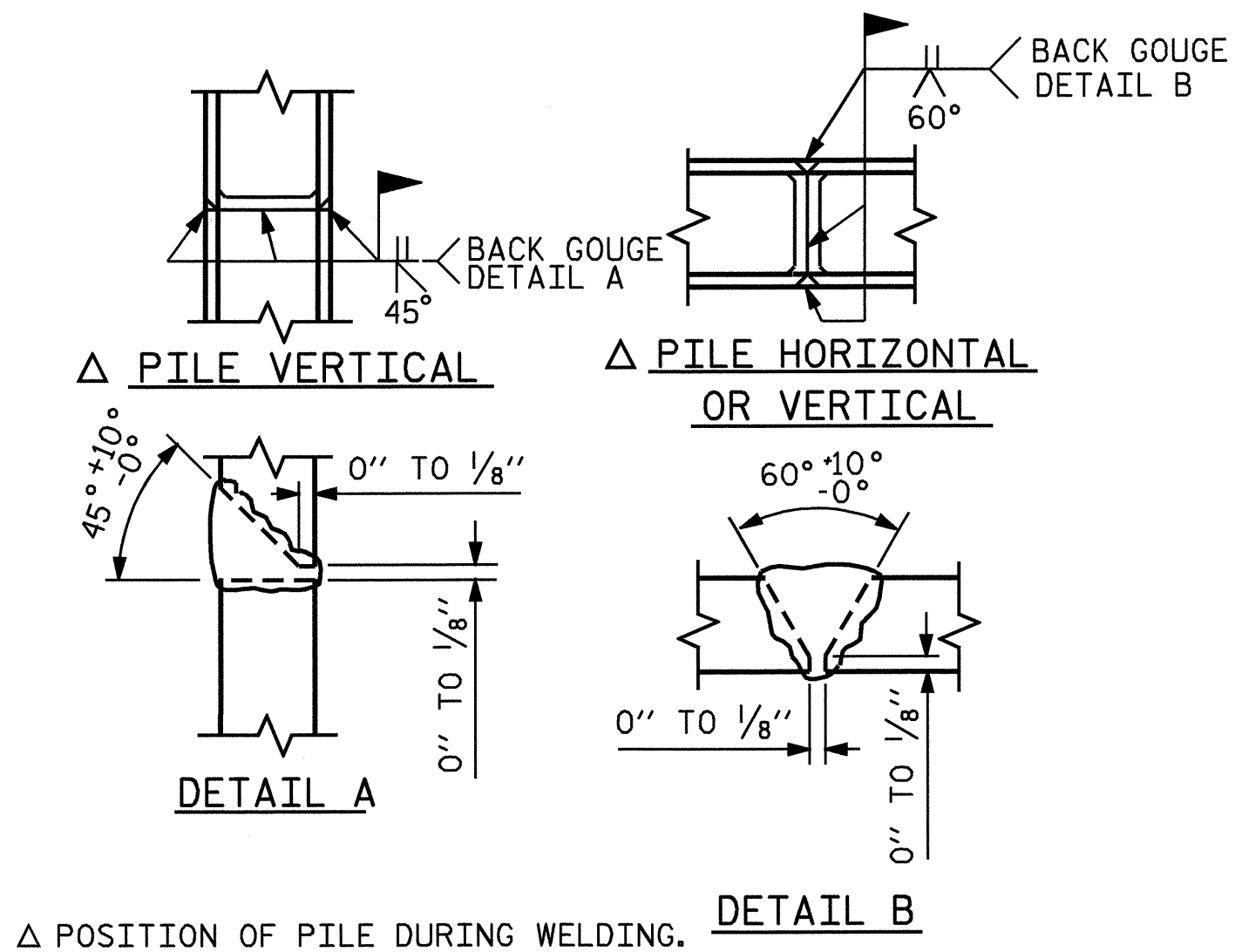


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

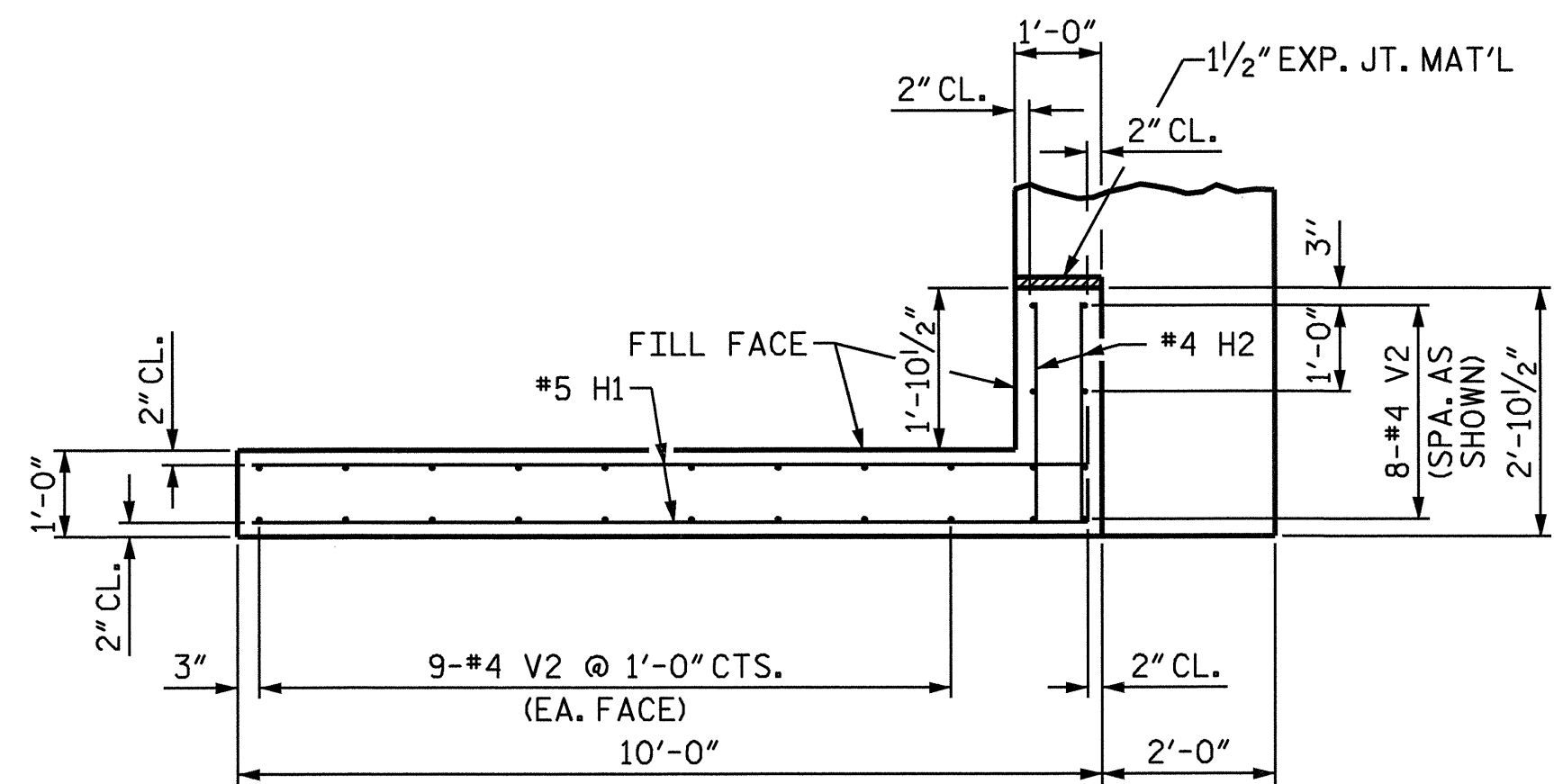
### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

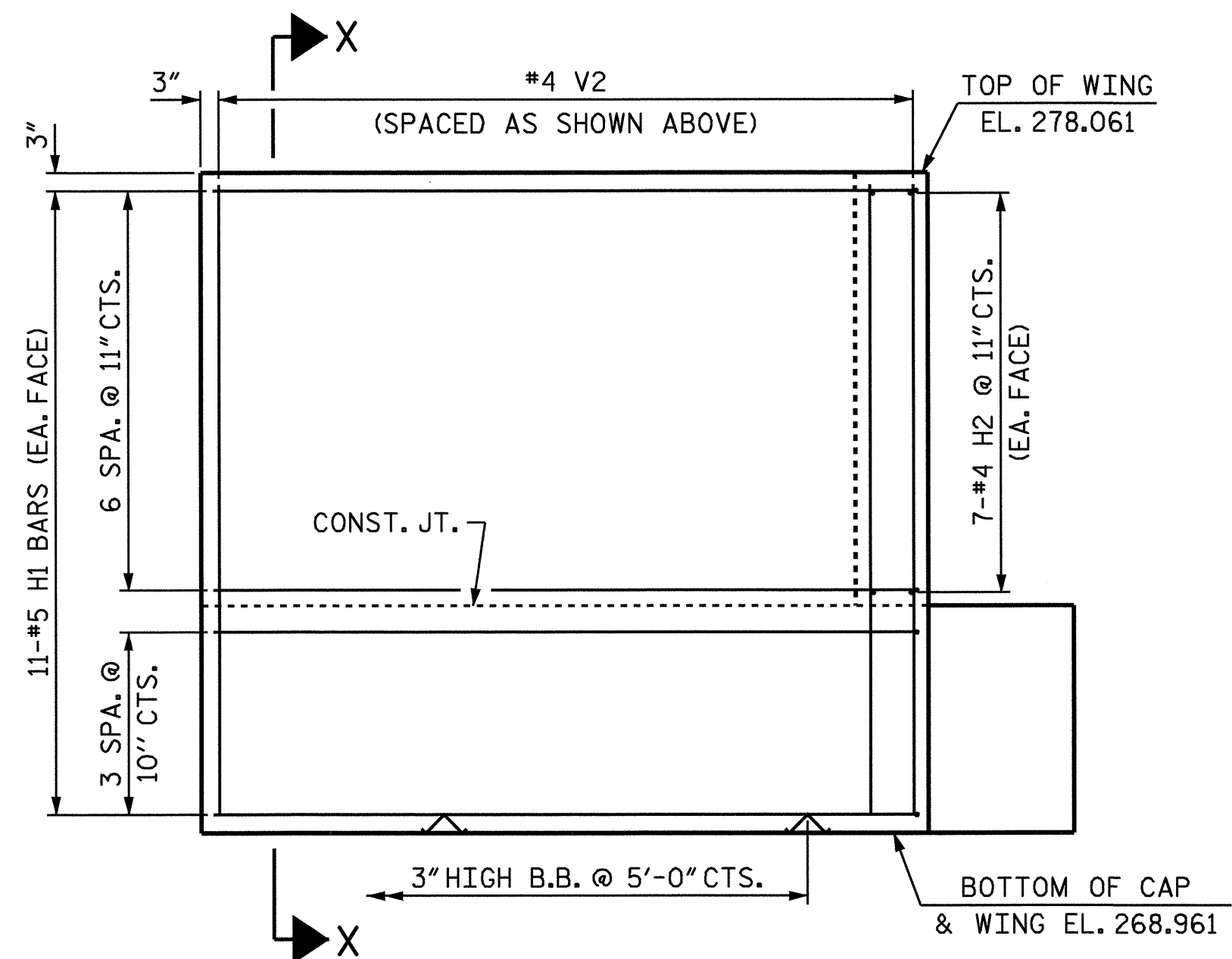
BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		45'-3"	1231
B2	4	#5	STR	42'-11"	179
B3	8	#4	STR	22'-8"	121
B4	11	#4	STR	2'-8"	20
H1	44	#5	2	10'-4"	474
H2	28	#4	STR	2'-6"	47
S1	40	#4	4	8'-11"	238
S2	40	#4	3	3'-5"	91
S3	40	#4	5	6'-6"	174
V1	74	#4	STR	4'-11"	243
V2	52	#4	STR	8'-9"	304
REINFORCING STEEL				LBS.	3,122
CLASS A CONCRETE BREAKDOWN :					
POUR #1 - CAP & LOWER WINGS				CU. YDS.	17.4
POUR #2 - UPPER WINGS				CU. YDS.	5.3
TOTAL				CU. YDS.	22.7
HP 12 x 53 STEEL PILES					
NO. = 10				LIN. FT.	400

ALL BAR DIMENSIONS ARE OUT TO OUT.



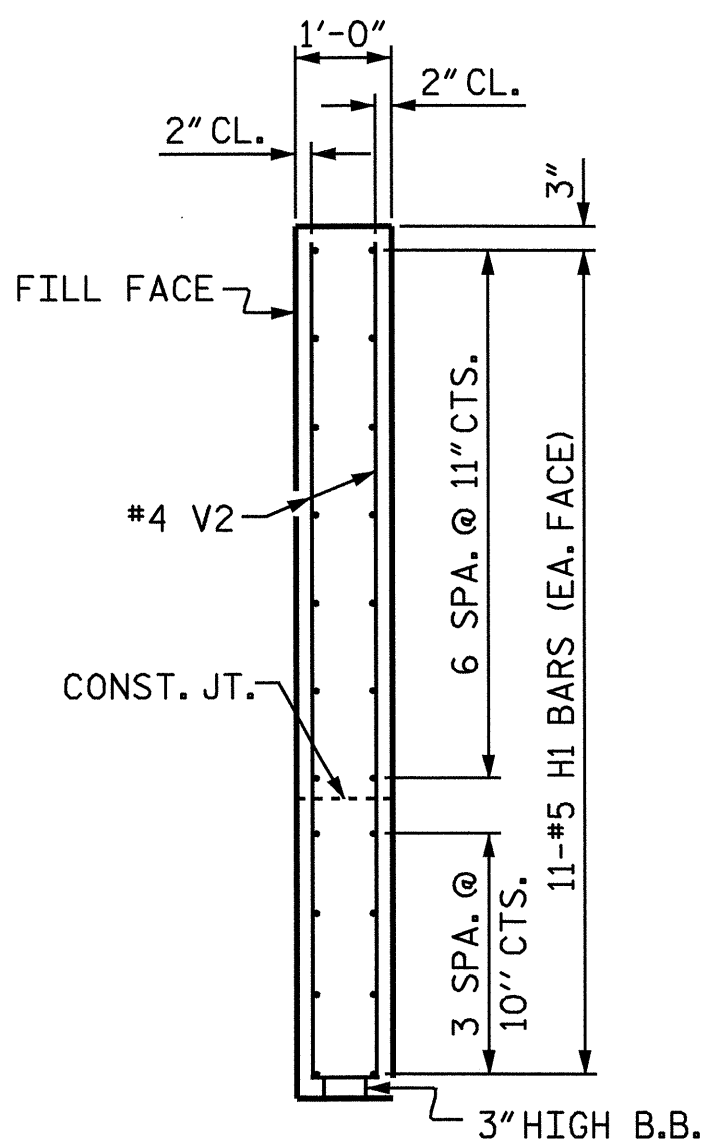
### PLAN OF WING

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR

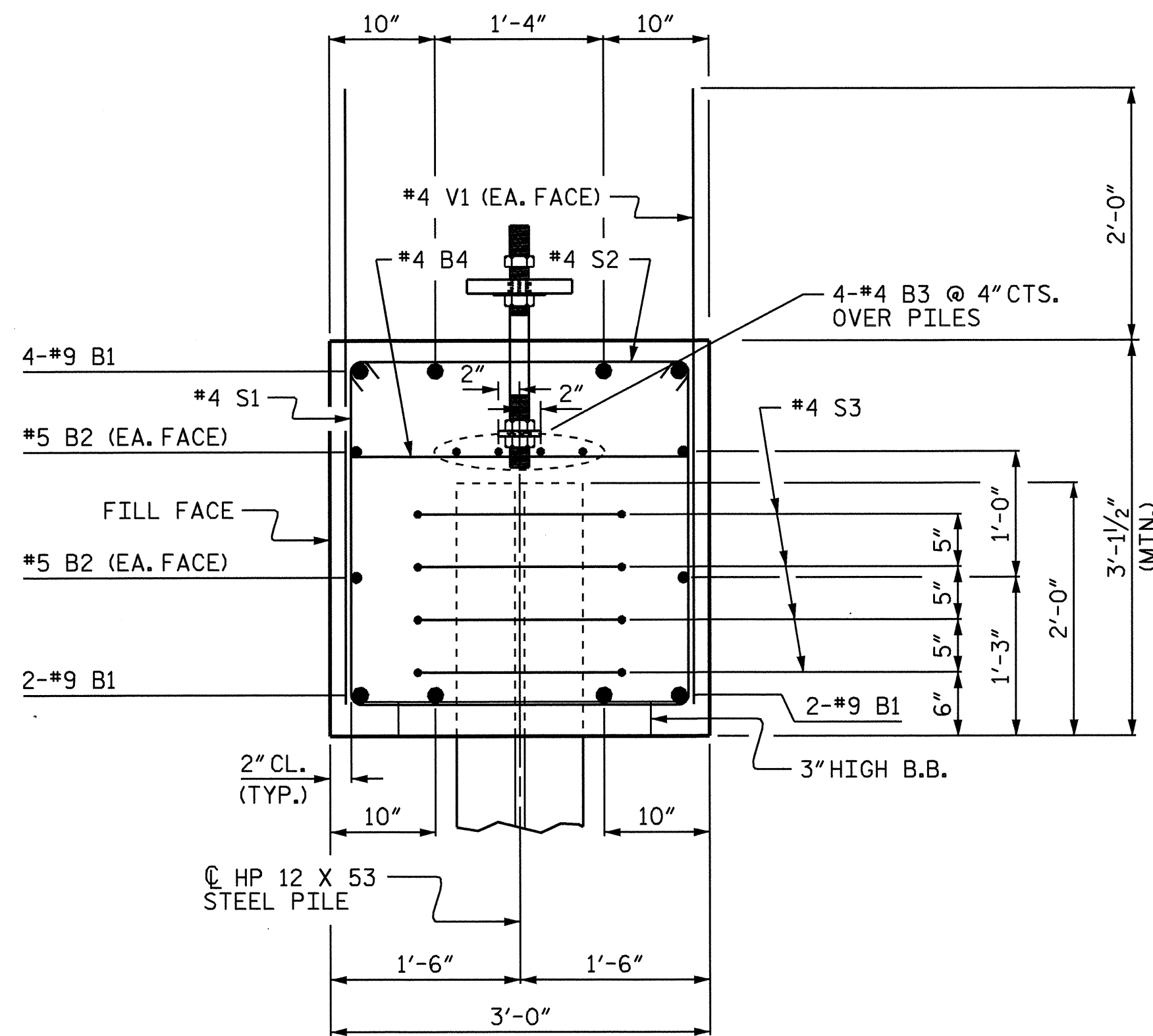


### ELEVATION OF WING

LEFT SIDE SHOWN, RIGHT SIDE SIMILAR



### SECTION X-X



### SECTION A-A

PROJECT NO. B-4307

WARREN COUNTY

STATION: 16+77.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
INTEGRAL  
END BENT 2

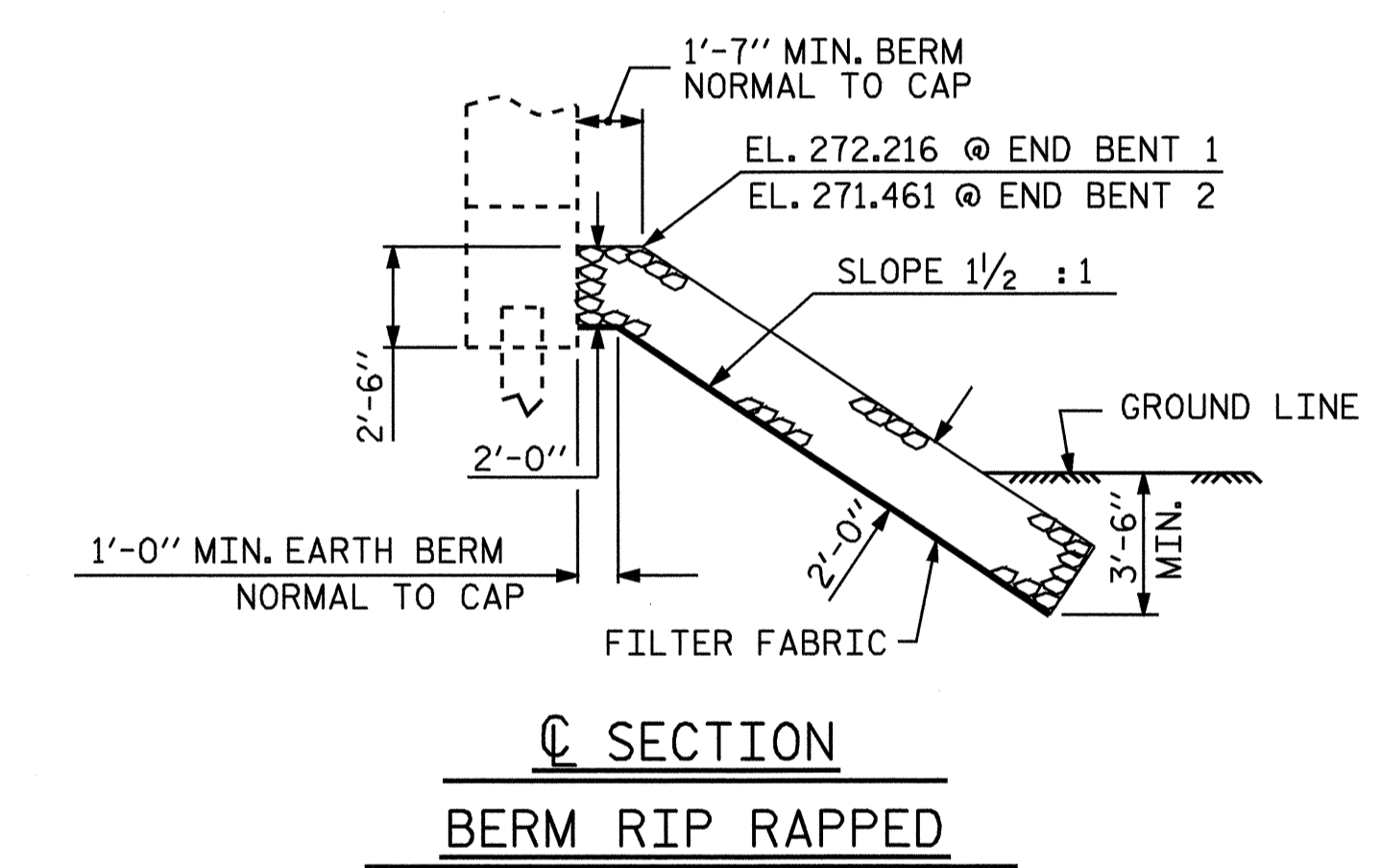
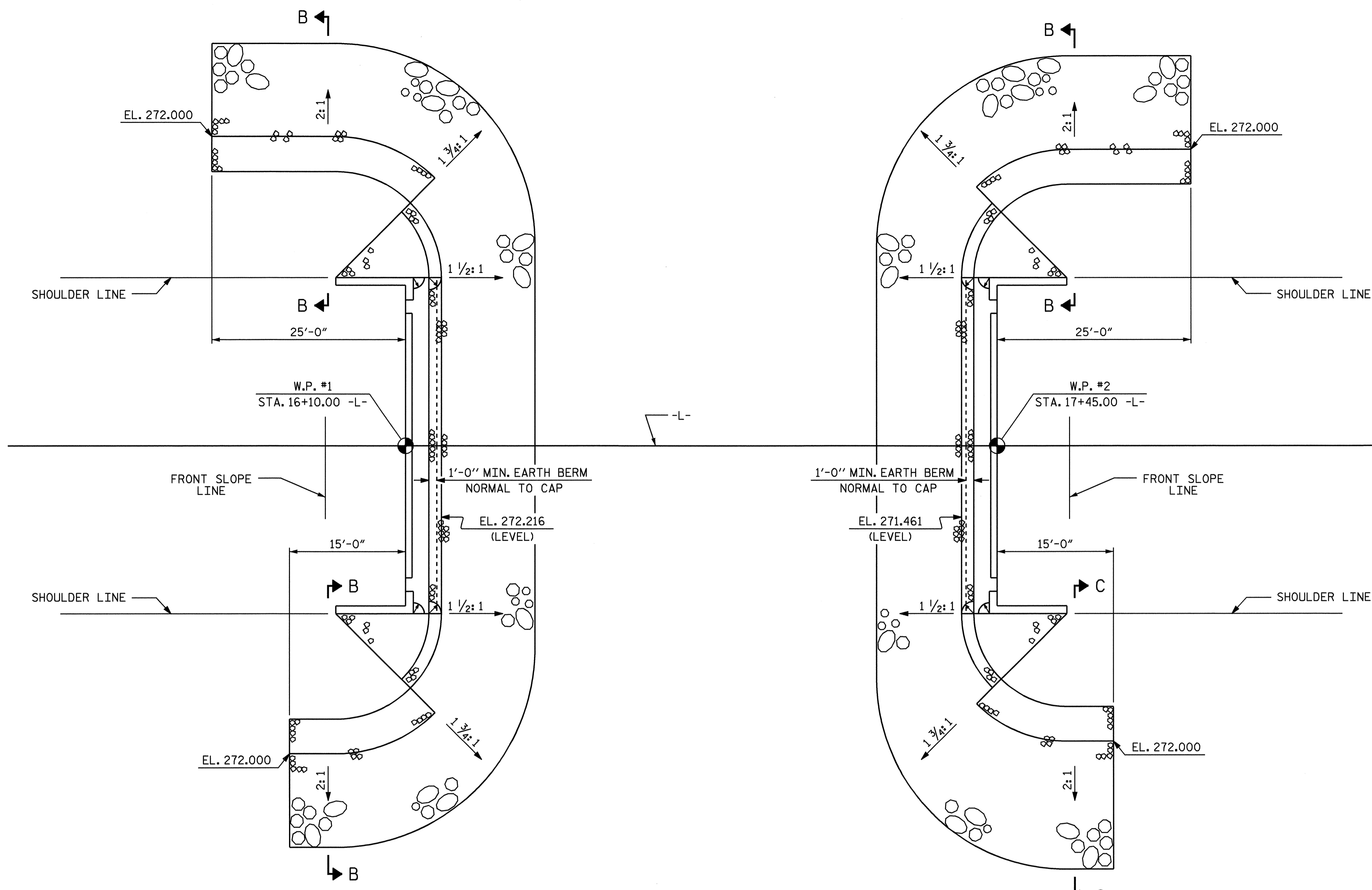


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			20

DRAWN BY: B.L. GREEN DATE: 4/03/07  
CHECKED BY: P.C. BREWER DATE: 4/12/07

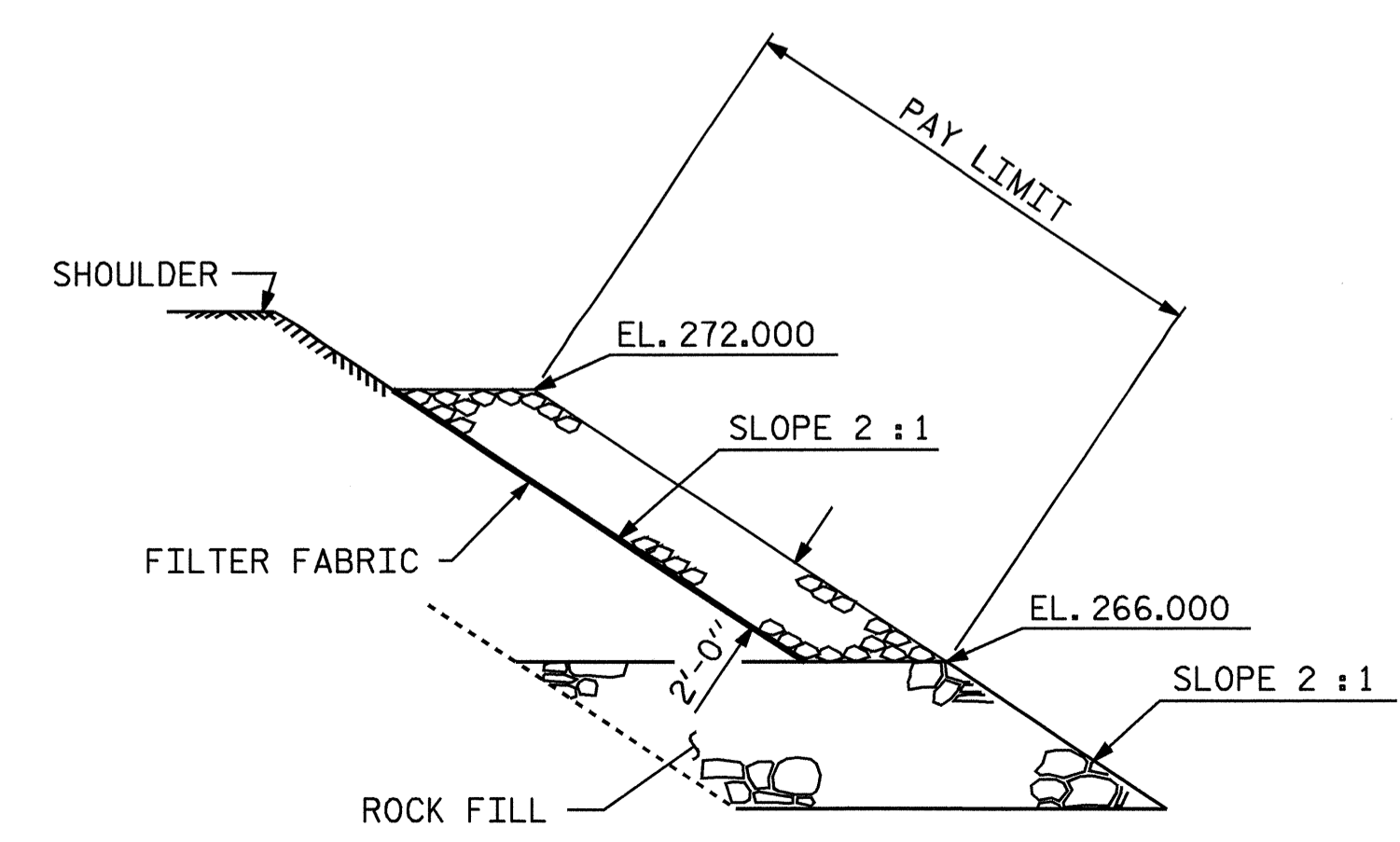
20-FEB-2009 09:43  
R:\Structures\Bgreen\micrstation\B4307.sd.e\*.01.dgn  
LSUTTON

ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+77.50 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	206	229
END BENT 2	195	217

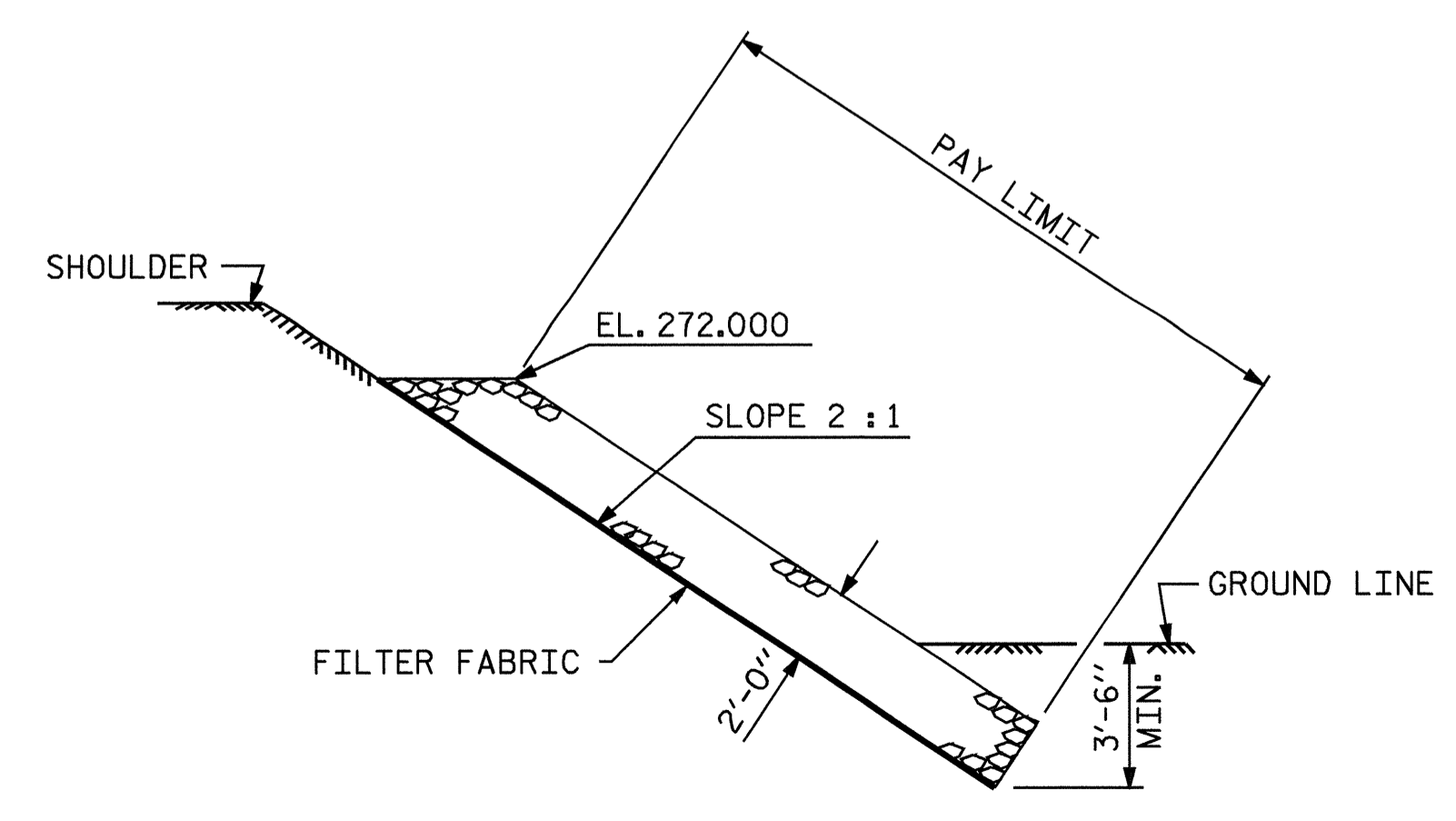


BERM RIP RAPPED @ END BENT 1

BERM RIP RAPPED @ END BENT 2



SECTION B-B



SECTION C-C

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -L-

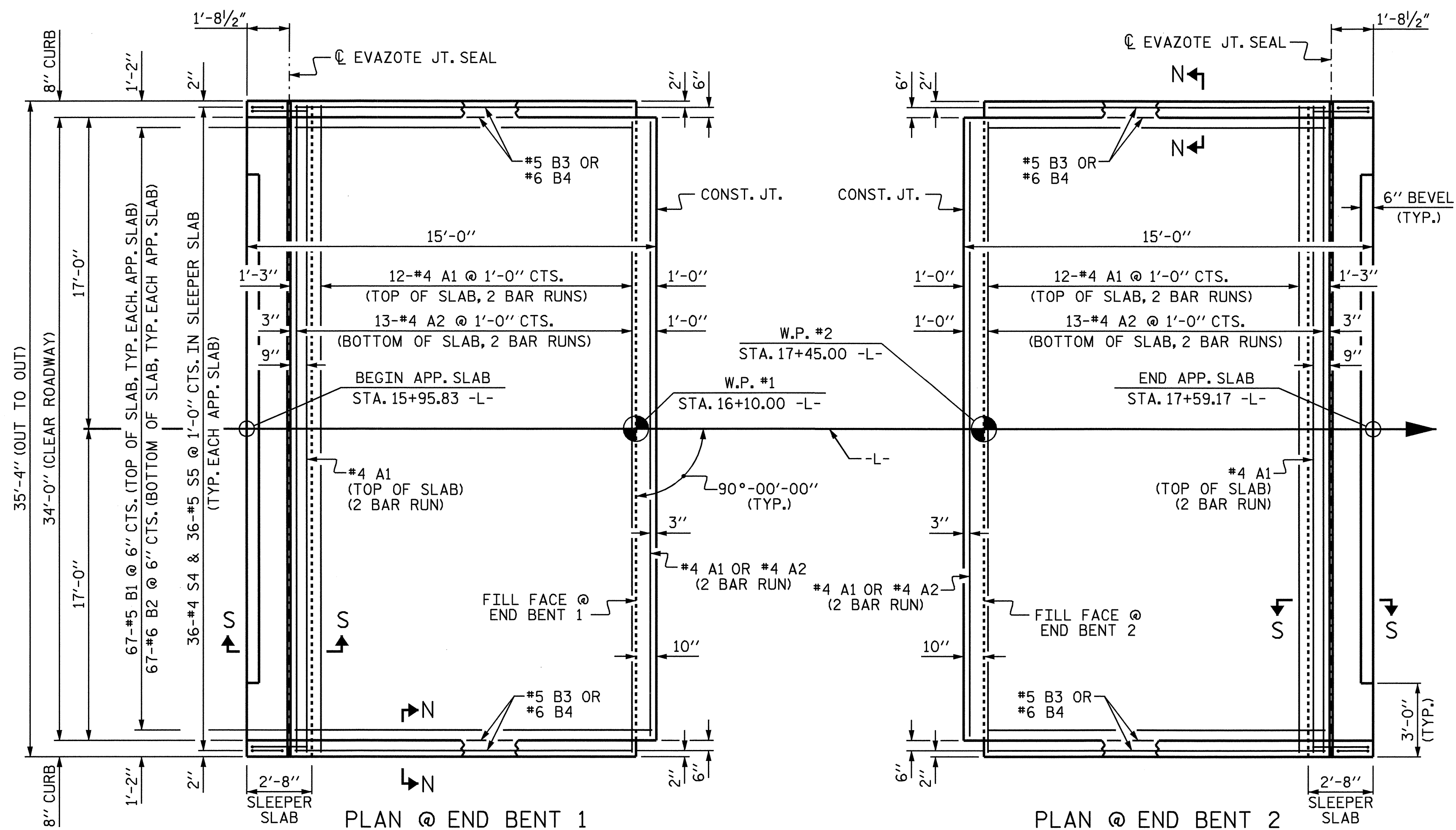
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20



ASSEMBLED BY : L. E. SUTTON DATE : 12/11/08  
 CHECKED BY : W. F. PARKER DATE : 12/15/08  
 DRAWN BY : FCJ 2/88 REV. 8/16/99 RWW/LES  
 CHECKED BY : ARB 8/88 REV. 10/17/00 RWW/LES  
 REV. 5/1/06 TLA/GM



**PLAN @ END BENT 1**  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. #4 A1 BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

**PLAN @ END BENT 2**

**NOTES**

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

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

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE SLEEPER SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF 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 SLEEPER 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 SLEEPER 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.

THE VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE EVAZOTE JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

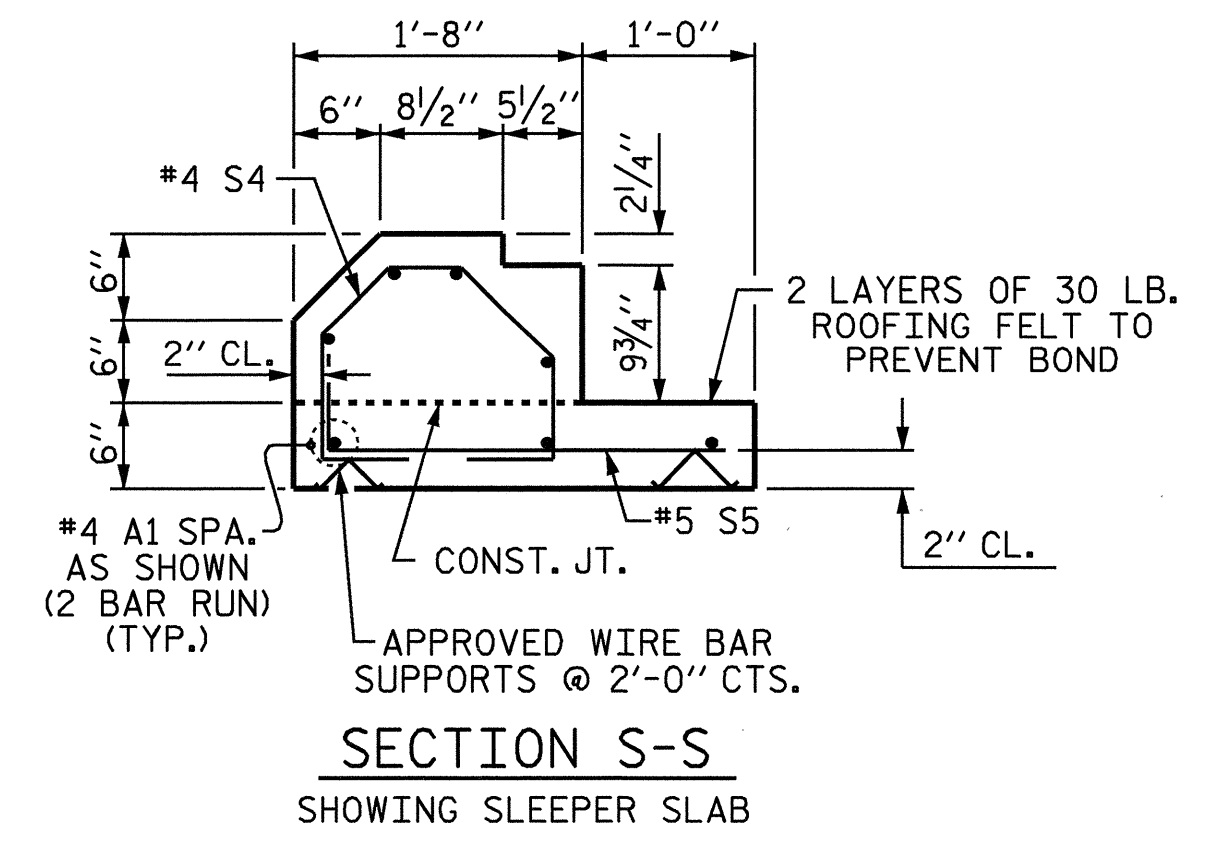
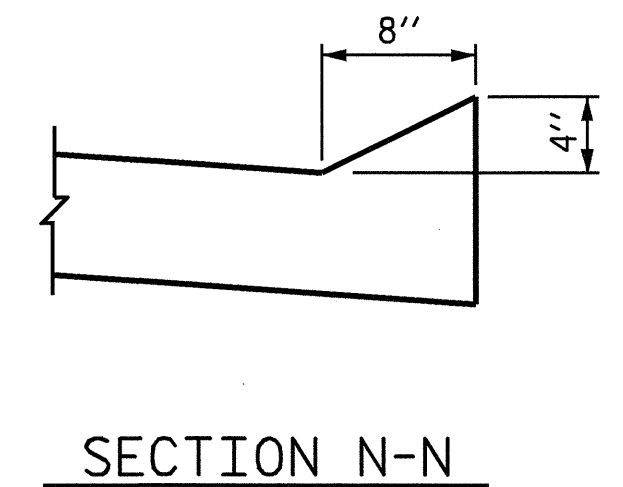
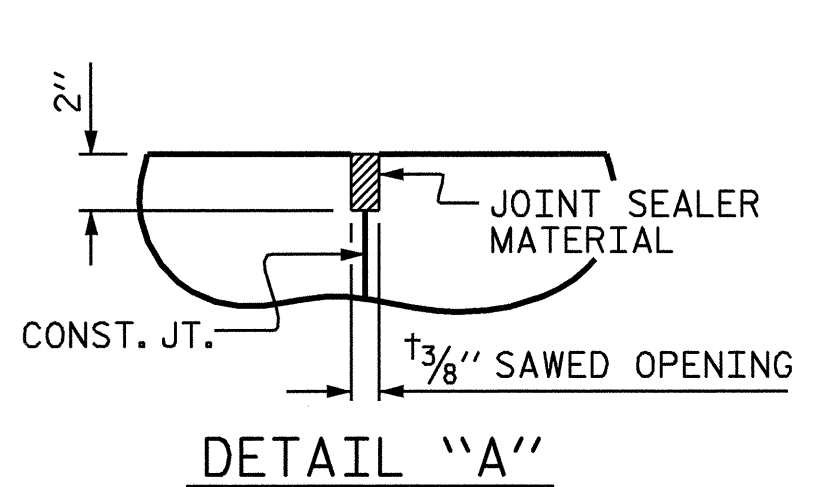
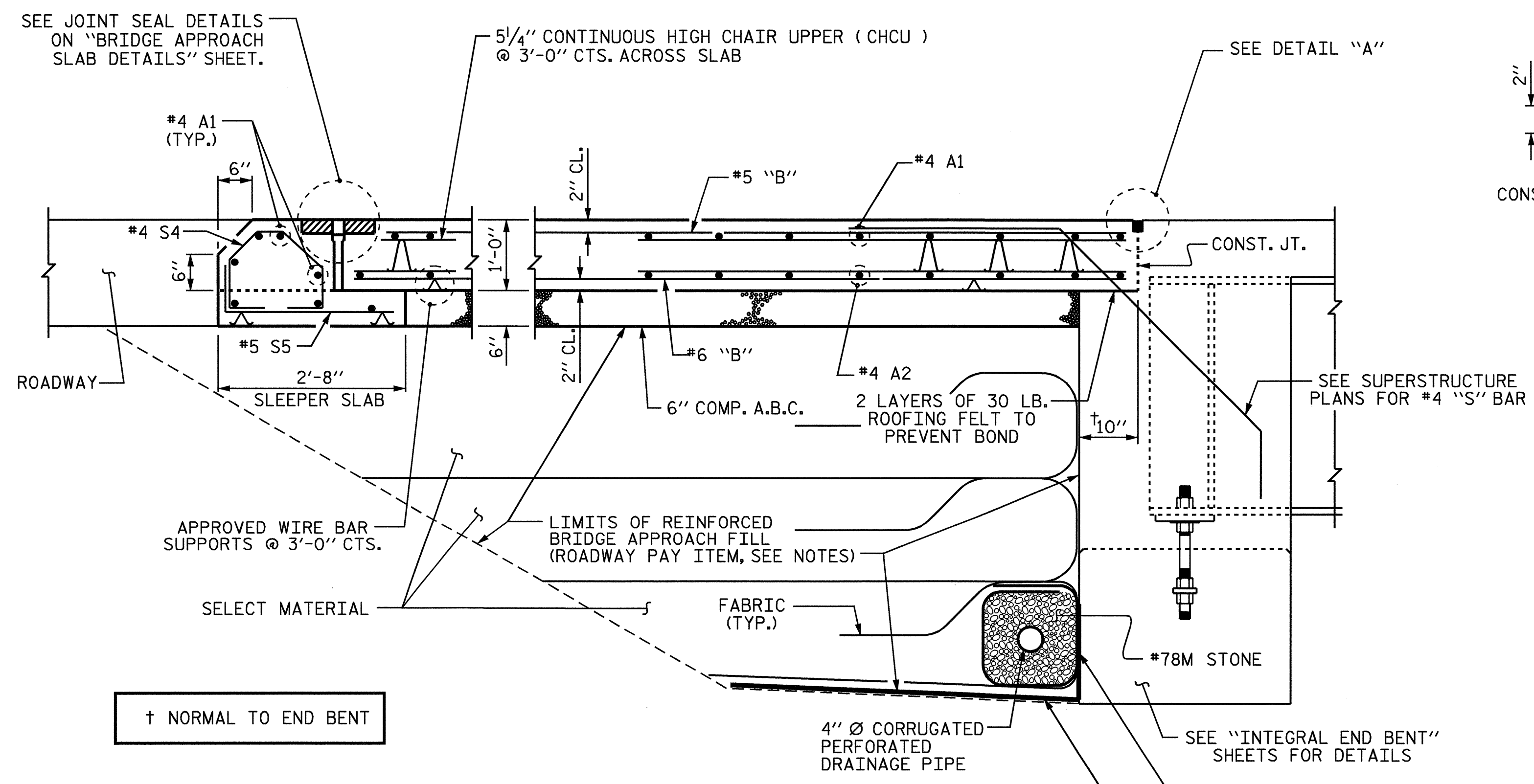
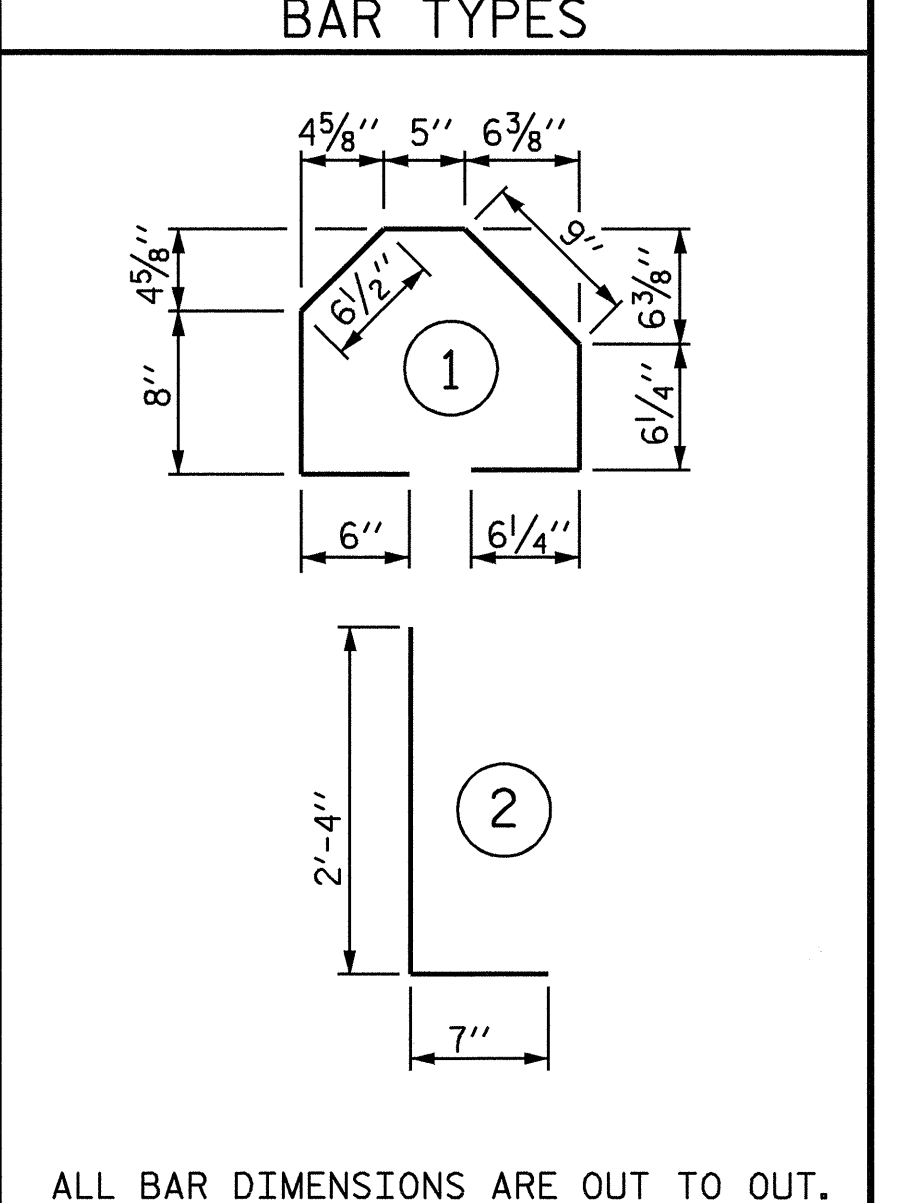
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWS NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

GROOVING BRIDGE FLOORS IS NOT REQUIRED ON TOP SURFACE OF THE SLEEPER SLAB. INSTEAD, APPLY A BROOMED TEXTURE IN ACCORDANCE WITH ARTICLE 442-3 OF THE STANDARD SPECIFICATIONS

**BILL OF MATERIAL**

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	42	#4	STR	18'-6"	519
A2	28	#4	STR	18'-5"	344
* B1	67	#5	STR	12'-5"	868
B2	67	#6	STR	12'-11"	1300
* B3	4	#5	STR	11'-7"	48
B4	4	#6	STR	12'-1"	73
* S4	36	#4	1	3'-11"	94
S5	36	#5	2	2'-11"	110
REINFORCING STEEL				LBS.	1,827
* EPOXY COATED REINFORCING STEEL				LBS.	1,529
CLASS AA CONCRETE					
POUR #1 - SLEEPER SLAB				CU. YDS.	3.7
POUR #2 - SLAB & CURB				CU. YDS.	17.3
TOTAL				CU. YDS.	21.0



PROJECT NO. B-4307  
WARREN COUNTY  
STATION: 16+77.50 -L-

SHEET 1 OF 2

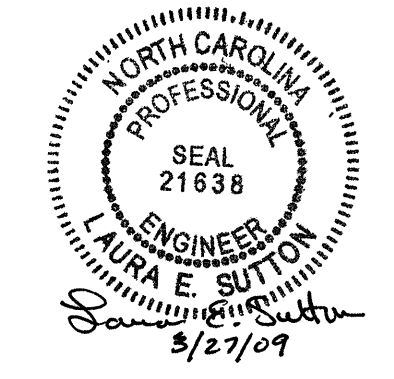
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

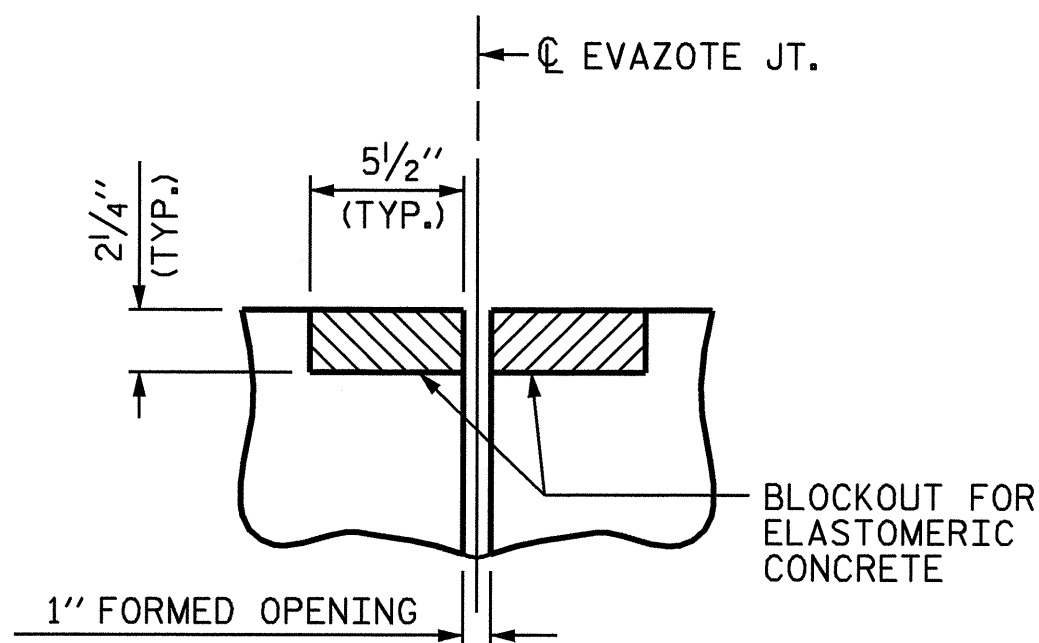
STANDARD  
BRIDGE APPROACH  
SLAB FOR  
INTEGRAL ABUTMENT

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

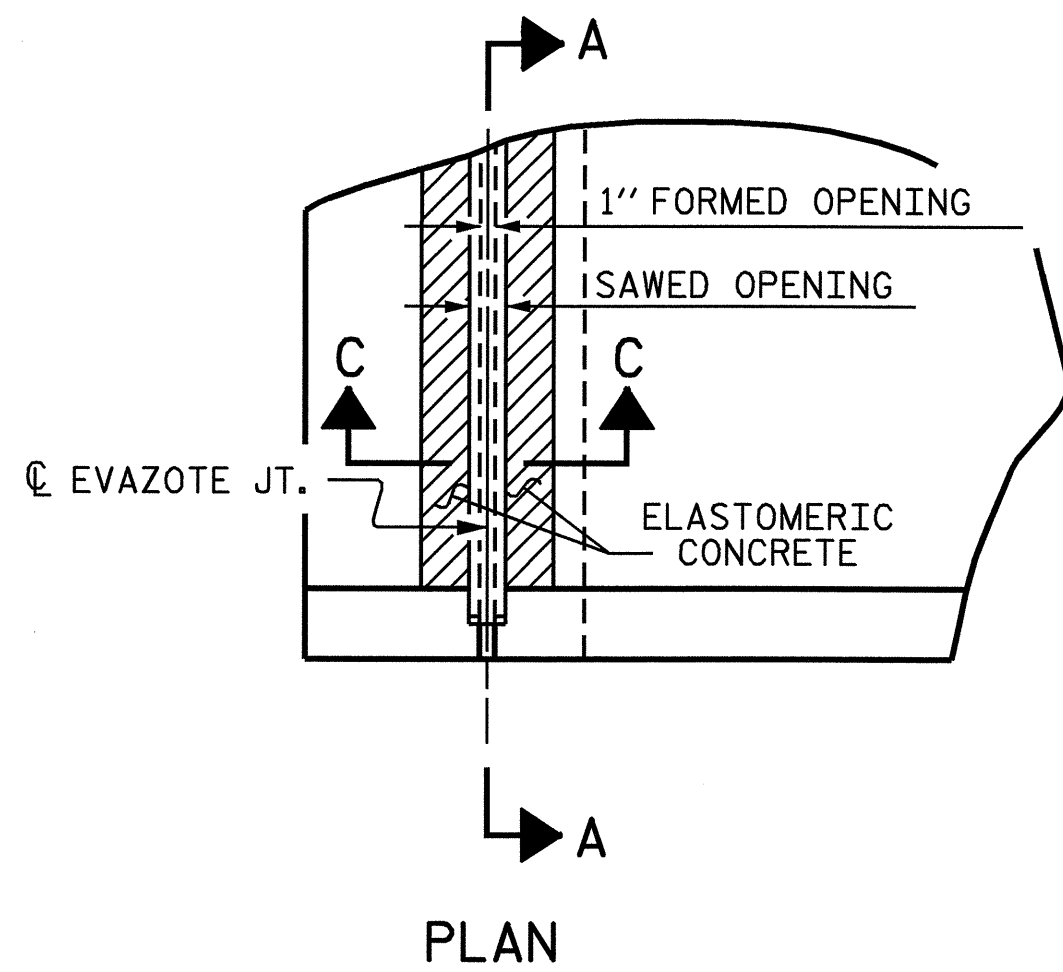
S-19  
TOTAL SHEETS 20

ASSEMBLED BY: S. M. RASHIDI DATE: 2/22/08  
CHECKED BY: W. F. PARKER DATE: 4/01/08  
DRAWN BY: TLA 10/05 ADDED 5/1/06R KMM/GM  
CHECKED BY: GM 5/06

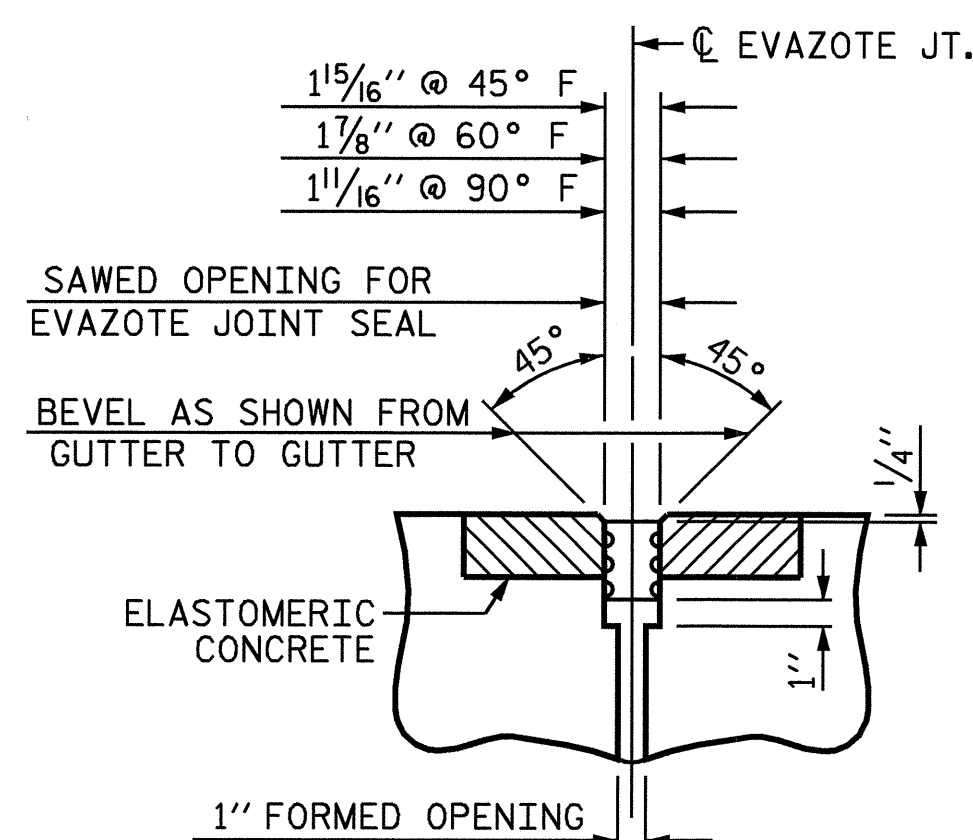




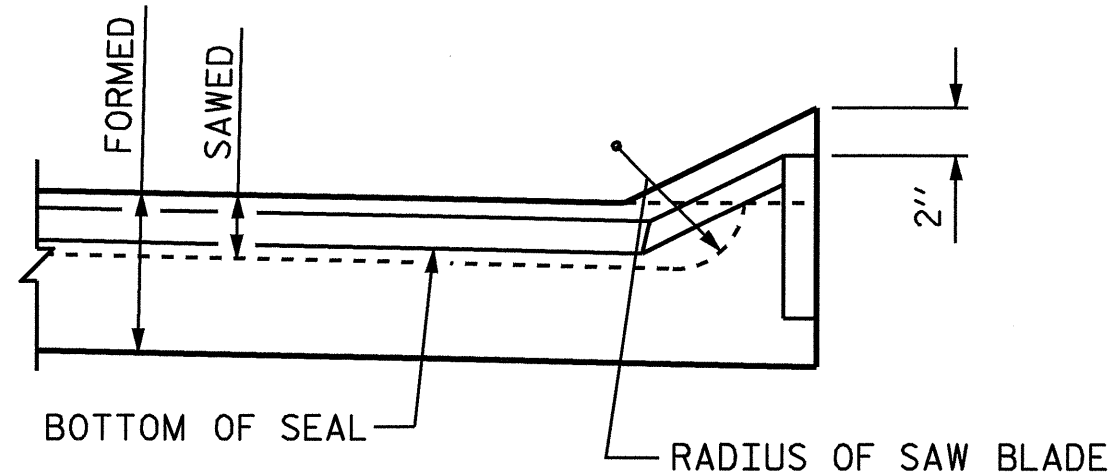
SECTION C-C  
EVAZOTE JOINT SEAL  
(PRE-SAWED ELASTOMERIC  
CONCRETE DIMENSIONS)



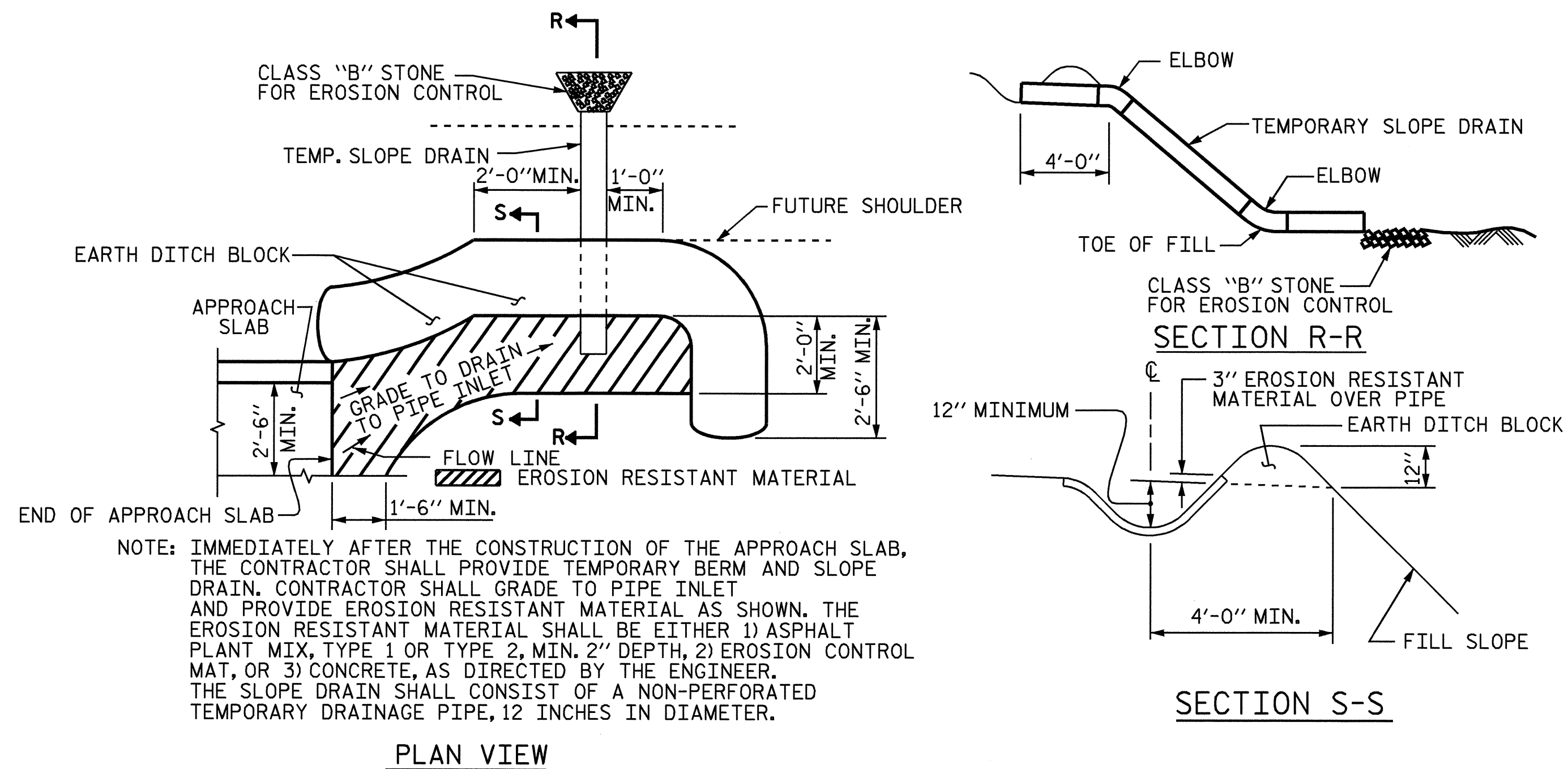
PLAN



SECTION C-C  
EVAZOTE JOINT SEAL

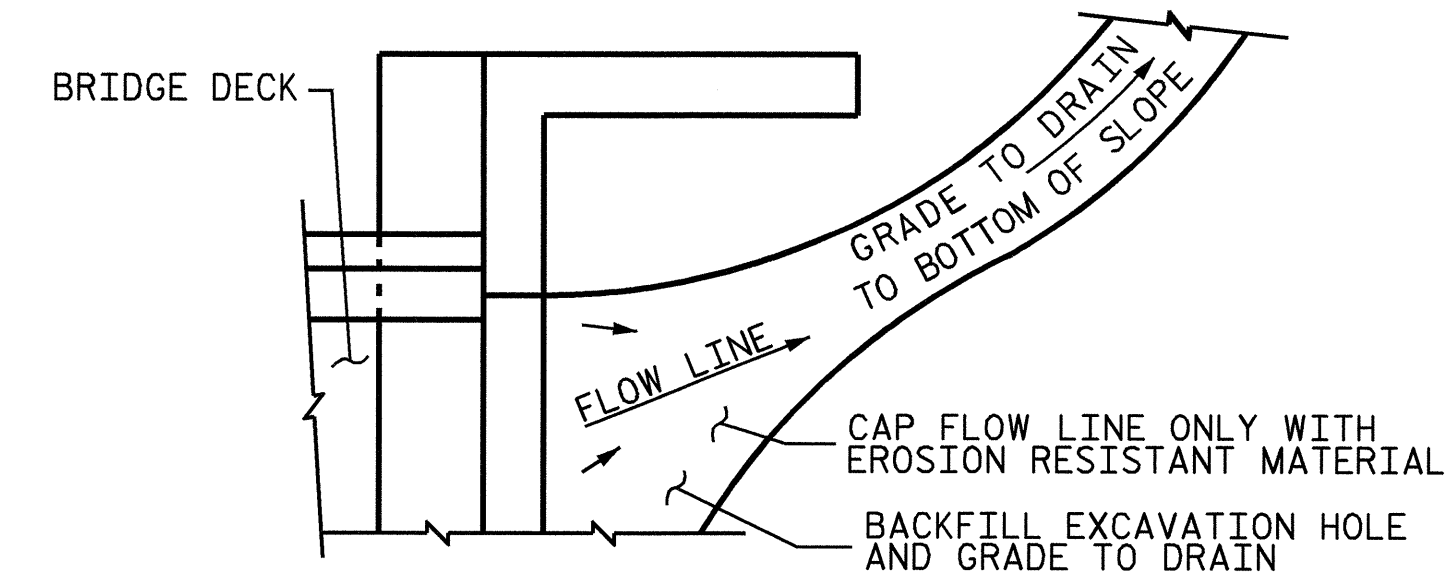


SECTION A-A



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



TEMPORARY DRAINAGE DETAIL

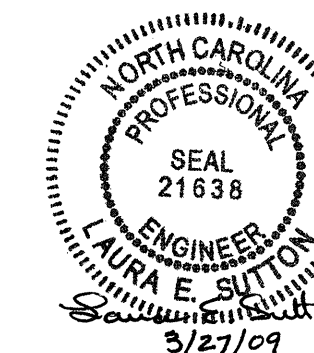
ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.8
2	5.8
TOTAL	11.6

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4307  
WARREN COUNTY  
 STATION: 16+77.50 -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.	DATE:
1			3	
2			4	

ASSEMBLED BY : S. M. RASHIDI DATE : 2/22/08  
 CHECKED BY : W. F. PARKER DATE : 4/01/08  
 DRAWN BY : FCJ 11/88 REV. 10/17/00 RWW/LES  
 CHECKED BY : ARB 11/88 REV. 5/7/03 RWW/JTE  
 REV. 5/1/06 TLA/GM

## 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 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

### REINFORCING STEEL:

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

### STRUCTURAL STEEL:

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

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB. METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINISH 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