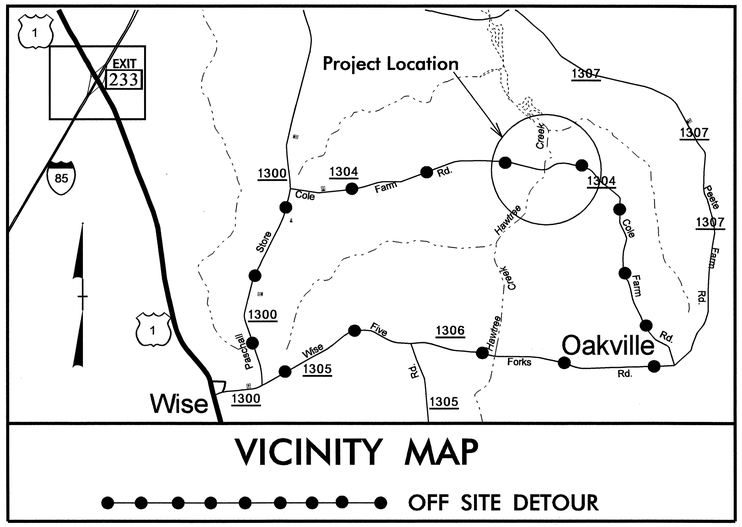
TIP PROJECT: B-4665

CONTRACT: C201931



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4665		

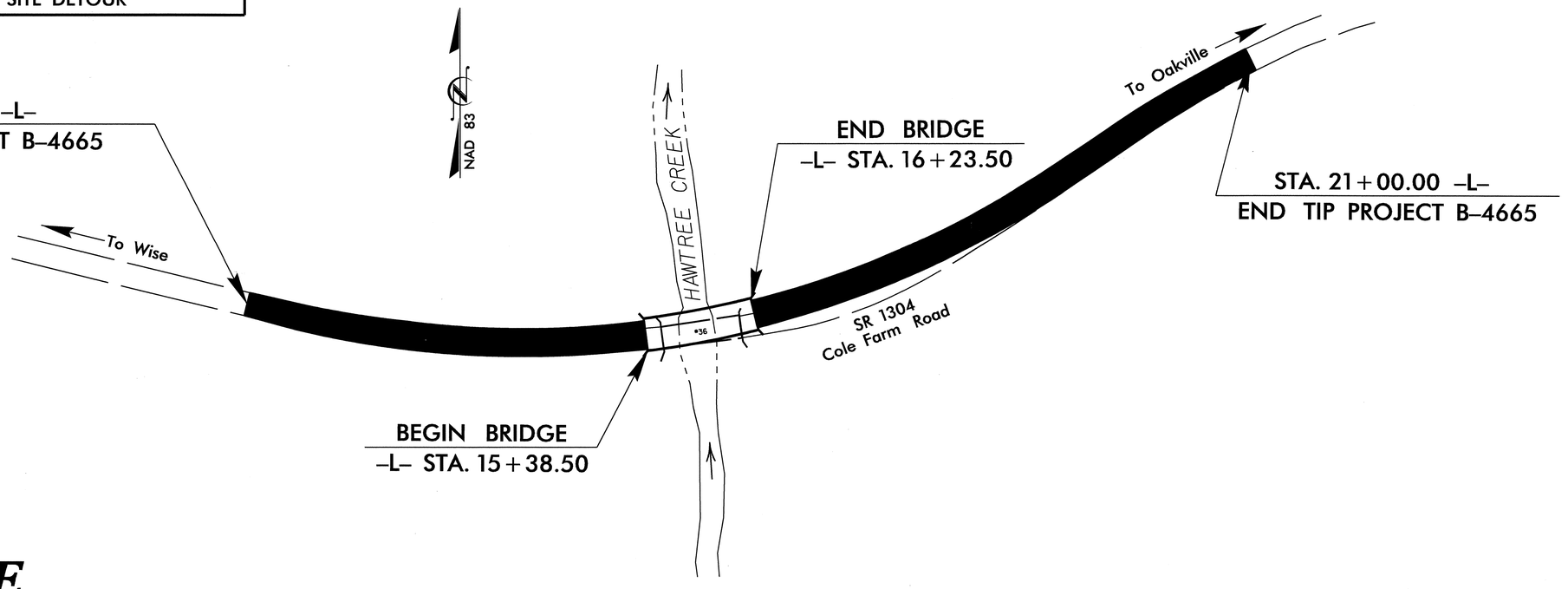
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33825.1.1	BRZ-1304 (8)	P. E.
33825.2.1	BRZ-1304 (8)	R/W & UTILITIES
33825.3.1	BRZ-1304 (8)	CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WARREN COUNTY

LOCATION: ***Bridge No. 36 Over Hawtree Creek on SR 1304 (Cole Farm Road)***

TYPE OF WORK: ***Grading, Paving, Drainage, Structure***



STRUCTURE

DESIGN DATA

ADT 2007 = 170 VPD
ADT 2030 = 300 VPD
DHV = 13 %
D = 60 %
T = 3 % *
**V = 45 MPH

* TTST 1% *DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4665 = 0.154 MI.

LENGTH STRUCTURE TIP PROJECT B-4665 = 0.016 MI.

TOTAL LENGTH TIP PROJECT = 0.170 MI.

Prepared In the Office of:
DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
SEPTEMBER 16, 2008

B. C. HUNT, P. E.
PROJECT ENGINEER

T. G. PAYNE, P. E.
PROJECT DESIGN ENGINEER

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

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJECT NO.: BRZ-1304(8)

15+20 15+40 15+60 15+80 16+00 16+20 16+40

220 210 200

STA. 15+38.50 -L-
FILL FACE @ END BENT #1
GRADE POINT EL. 214.586

STA. 15+31.10 -L-
BEGIN FRONT SLOPE
GRADE POINT EL. 214.560

STA. 16+23.50 -L-
FILL FACE @ END BENT #2
GRADE POINT EL. 215.798

STA. 16+31.39 -L-
BEGIN FRONT SLOPE
GRADE POINT EL. 215.995

GRADE DATA

-5.8702% △ 4.2537%

PI = 14+85.00
ELEV. = 209.180
VC = 435.00

SPAN A

1'-7" (MIN. BERM) (TYP.)
UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)
EXP.
210.0±
1'-6" (TYP.)
EL. 210.0±
205.0±
205.0±
2'-0" (TYP.)
℄ HP 12X53 STEEL PILES (TYP.)
EL. 204.0±
EL. 203.0±
END BENT #1
1½:1 SLOPE NORMAL TO CAP (TYP.)
EXISTING STRUCTURE (TYP.)
HISTORIC HIGH WATER EL. 209.000 1999
NORMAL W.S. EL. 202.300 6/23/06
EL. 198.0±
EL. 195.0±
EL. 198.0±
EL. 203.0±
FIX.
EL. 206.0±
EL. 210.0±
APPROXIMATE NATURAL GROUND LINE
EL. 210.0±
CLASS II RIP RAP (TYP.)
EL. 204.0±
END BENT #2

SECTION ALONG -L-

HORIZONTAL CURVE DATA -L-

PI STA. 16+02.37
△ = 48°-28'-49" (LT)
L = 676.910
T = 360.210
R = 800.000

CLASS II RIP RAP

1'-0" MIN. EARTH BERM EL. 206.214

FILL FACE @ END BENT #1

1½:1 SLOPE NORMAL TO SLOPE

HAWTREE CREEK

1'-0" MIN. EARTH BERM EL. 207.431

1½:1 SLOPE NORMAL TO SLOPE

FILL FACE @ END BENT #2

STA. 15+24.50 -L-
BEGIN APPROACH SLAB

TO WISE SR 1300

STA. 15+38.50 -L-
W.P. #1

STA. 15+31.10 -L-
BEGIN FRONT SLOPE

91°-57'-22" (TO TANGENT)

-L-

BRIDGE IDENTITY
STA. 15+81.00 POC -L-

EXISTING STRUCTURE (TYP.)

95°-00'-00" (TO TANGENT)

STA. 16+23.50 -L-
W.P. #2

STA. 16+37.49 -L-
END APPROACH SLAB

TO OAKVILLE SR 1306

STA. 16+31.39 -L-
BEGIN FRONT SLOPE

98°-02'-38" (TO TANGENT)

1'-0" MIN. EARTH BERM EL. 207.745

1'-0" MIN. EARTH BERM EL. 208.908

42'-6" ALONG -L-

42'-6" ALONG -L-

85'-0" ALONG -L-

TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE ALONG ARC)

PLAN

PILES NOT SHOWN FOR CLARITY

CLASS II RIP RAP

NORTH CAROLINA PROFESSIONAL SEAL 11409 ENGINEER BUCK CHARLES HUNT
7/16/08

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS GRAYNE
7/16/08

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 36

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1304
OVER HAWTREE CREEK
BETWEEN SR 1300 AND SR 1306

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

DRAWN BY : R. G. EMERSON DATE : 03/08
CHECKED BY : T. G. PAYNE DATE : 04/08

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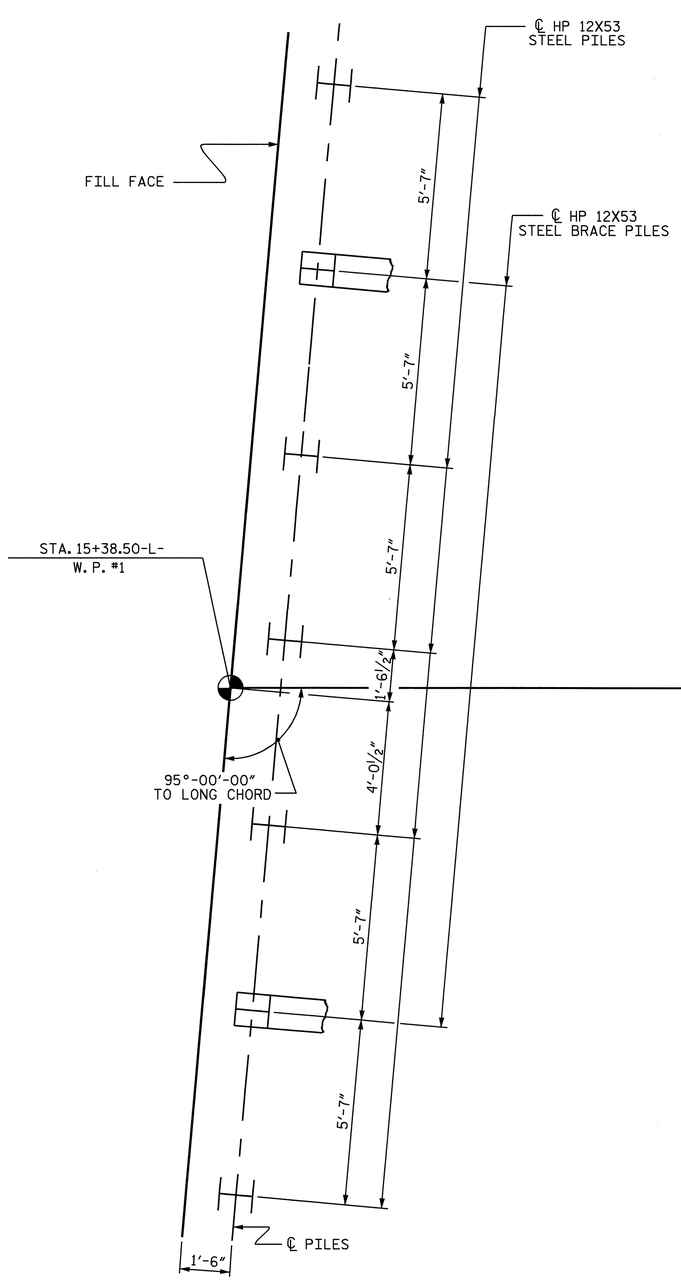
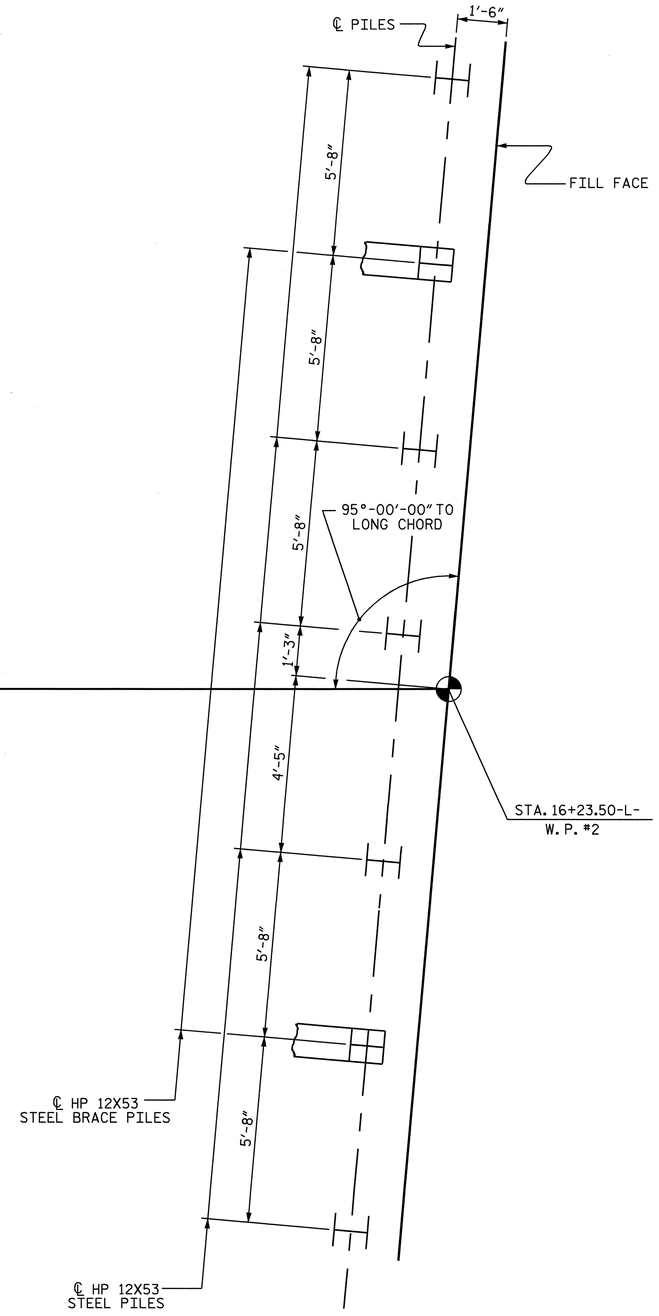


END BENT #1



END BENT #2

NOTES:

DRIVE PILES AT END BENT #1 AND END BENT #2 TO A REQUIRED BEARING CAPACITY OF 100 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT #1 AND END BENT #2 IS 50 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 23,600 FT-LBS. TO 40,600 FT-LBS. PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT #1 AND END BENT #2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM ARTICLE 450-5 OF THE STANDARD SPECIFICATIONS.

FOUNDATION LAYOUT

ALL PILES ARE HP 12X53
END BENT BRACE PILES ARE BATTERED 3:12
DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILES

PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1304
OVER HAWTREE CREEK
BETWEEN SR 1300 AND SR 1306

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/16/08

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

DRAWN BY : R. G. EMERSON DATE : 03/08
CHECKED BY : T. G. PAYNE DATE : 04/08

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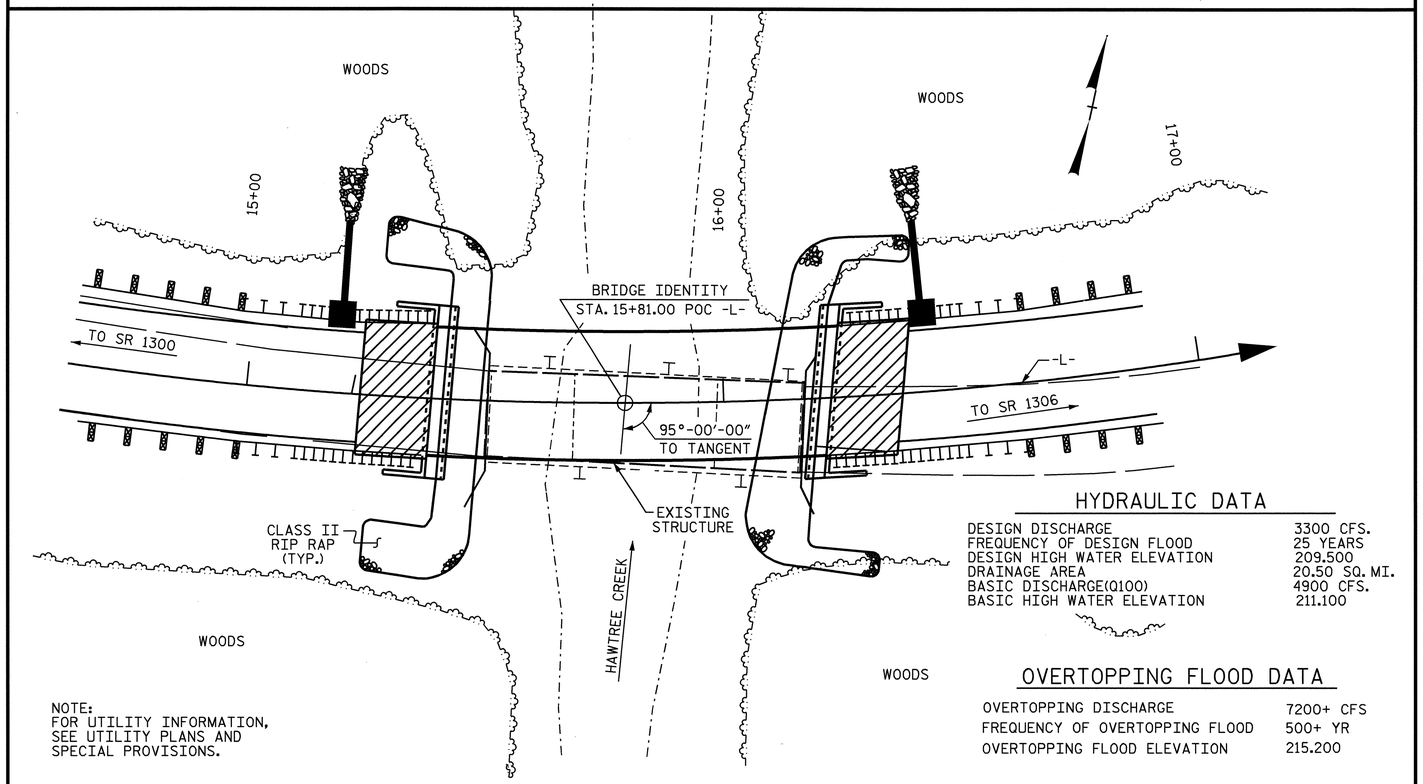
BENCH MARK IS BM #601 -L- STA. 16+17.15, 35.68' LT; RR SPIKE IN BASE OF 14" SWEET GUM TREE, EL. 206.640



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

HYDRAULIC DATA

DESIGN DISCHARGE	3300 CFS.
FREQUENCY OF DESIGN FLOOD	25 YEARS
DESIGN HIGH WATER ELEVATION	209.500
DRAINAGE AREA	20.50 SQ. MI.
BASIC DISCHARGE(Q100)	4900 CFS.
BASIC HIGH WATER ELEVATION	211.100

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	7200+ CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR
OVERTOPPING FLOOD ELEVATION	215.200

LOCATION SKETCH

NOTES:

ASSUME LIVE LOAD = HS20 OR ALTERNATE LOADING, EXCEPT THAT GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 18'-3", 1 @ 30'-0" AND 1 @ 18'-3"); WITH A BRIDGE DECK WIDTH OF 20.1 FEET ON A TIMBER FLOOR WITH AN ASPHALT WEARING SURFACE ON I-BEAMS WITH A SUBSTRUCTURE OF TIMBER BENT CAPS ON TIMBER PILES SHALL BE REMOVED.

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 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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.

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."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

EXISTING RIP RAP LOCATED AT THE EXISTING BRIDGE SITE SHALL BE RETAINED AS DIRECTED BY THE ENGINEER.

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 (APPROX.)	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			2,508	2,621				83,900			165.82			LUMP SUM	LUMP SUM
END BENT #1					19.6		2,881		7	140		148	215		
END BENT #2					19.9		2,978		7	140		145	210		
TOTAL	LUMP SUM	LUMP SUM	2,508	2,621	39.5	LUMP SUM	5,859	83,900	14	280	165.82	293	425	LUMP SUM	LUMP SUM

DRAWN BY : R. G. EMERSON DATE : 03/08
CHECKED BY : T. G. PAYNE DATE : 04/08

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PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

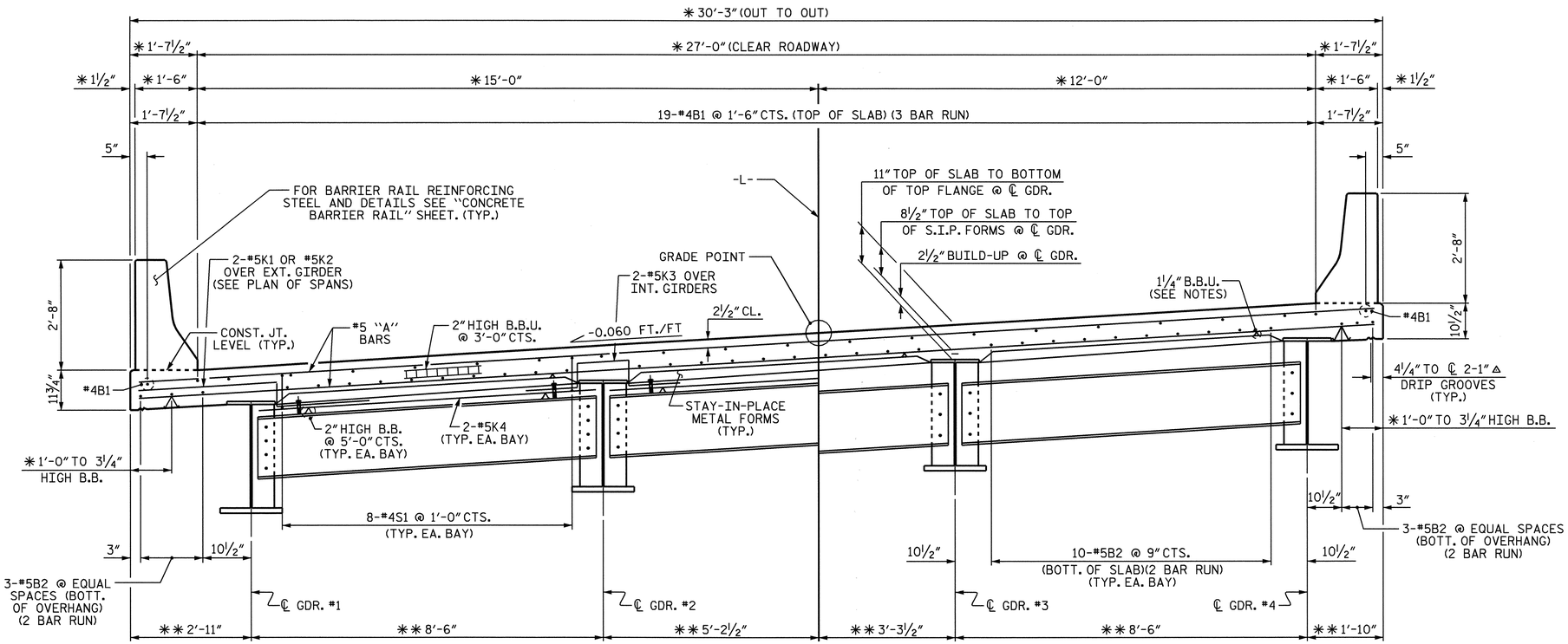
GENERAL DRAWING

FOR BRIDGE ON SR 1304
OVER HAWTREE CREEK
BETWEEN SR 1300 AND
SR 1306

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/14/08

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

SHEET NO. S-3
TOTAL SHEETS 23

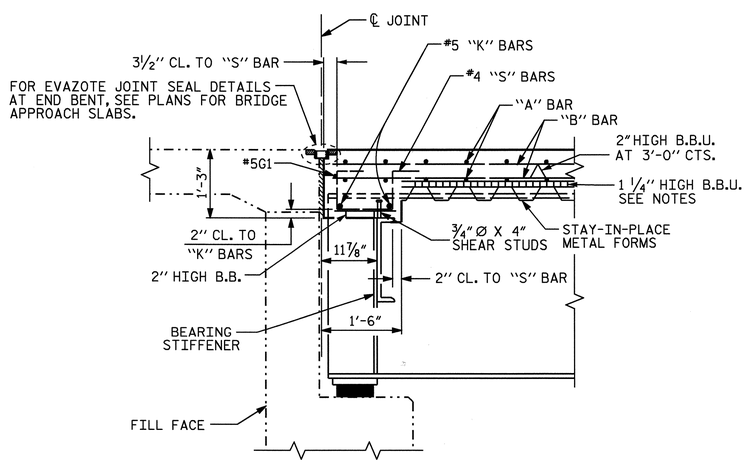


TYPICAL SECTION @ END BENT DIAPHRAGM

*RADIAL DIMENSIONS

**RADIAL THRU W.P.

TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



SECTION THRU END BENT DIAPHRAGM

NOTES

PROVIDE 1¼" 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 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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.

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/19/08

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

DRAWN BY : M.K. BEARD DATE : 12/13/07
CHECKED BY : R.G. EMERSON DATE : 02/04/08

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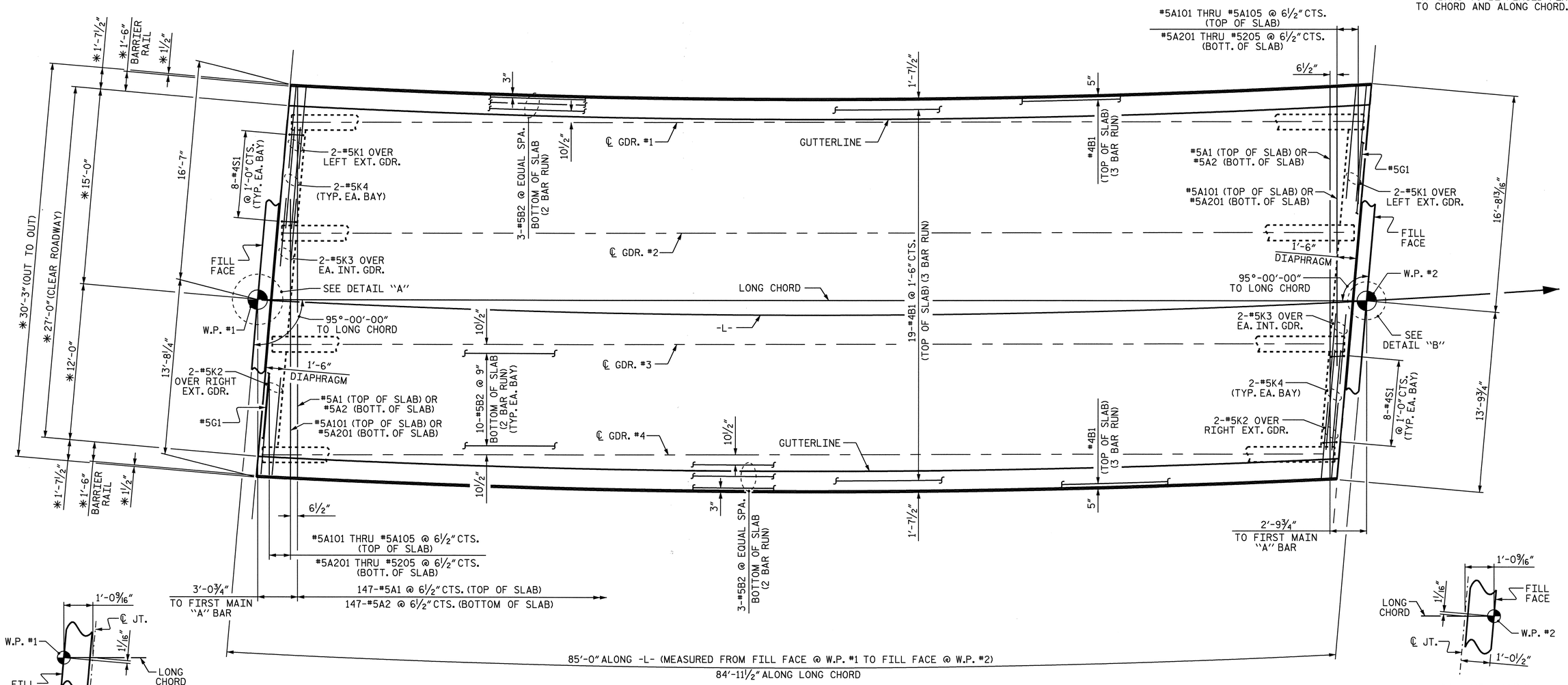
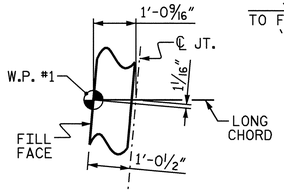
NOTE

"A" BARS TO BE PLACED PERPENDICULAR TO CHORD AND ALONG CHORD.



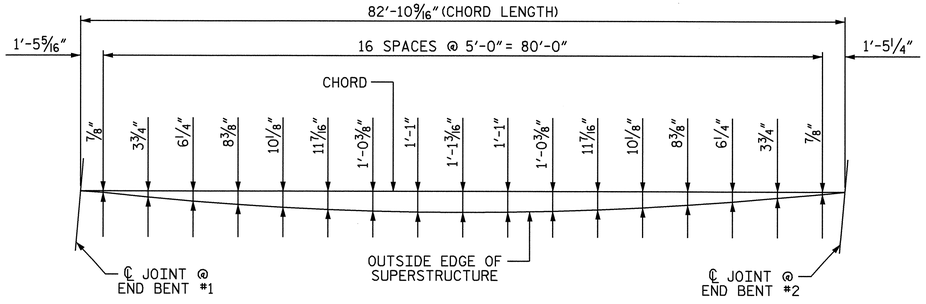


DETAIL "A"

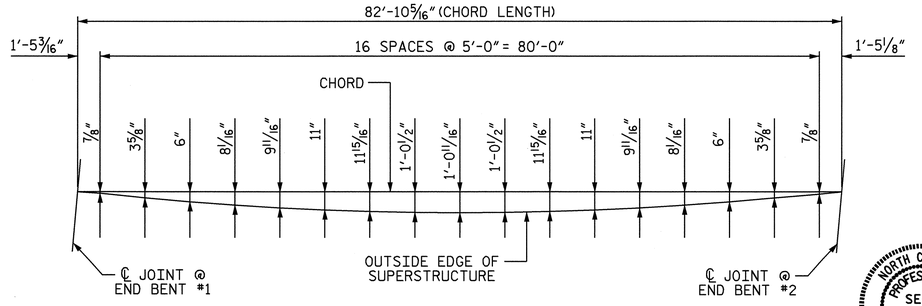
*RADIAL DIMENSIONS

PLAN OF SPAN

DETAIL "B"



ARC OFFSETS
(LEFT OUTSIDE EDGE OF SUPERSTRUCTURE)



ARC OFFSETS
(RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE)

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			23

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/19/08

DRAWN BY : M.K. BEARD DATE : 12/17/07
CHECKED BY : R.G. EMERSON DATE : 02/04/08

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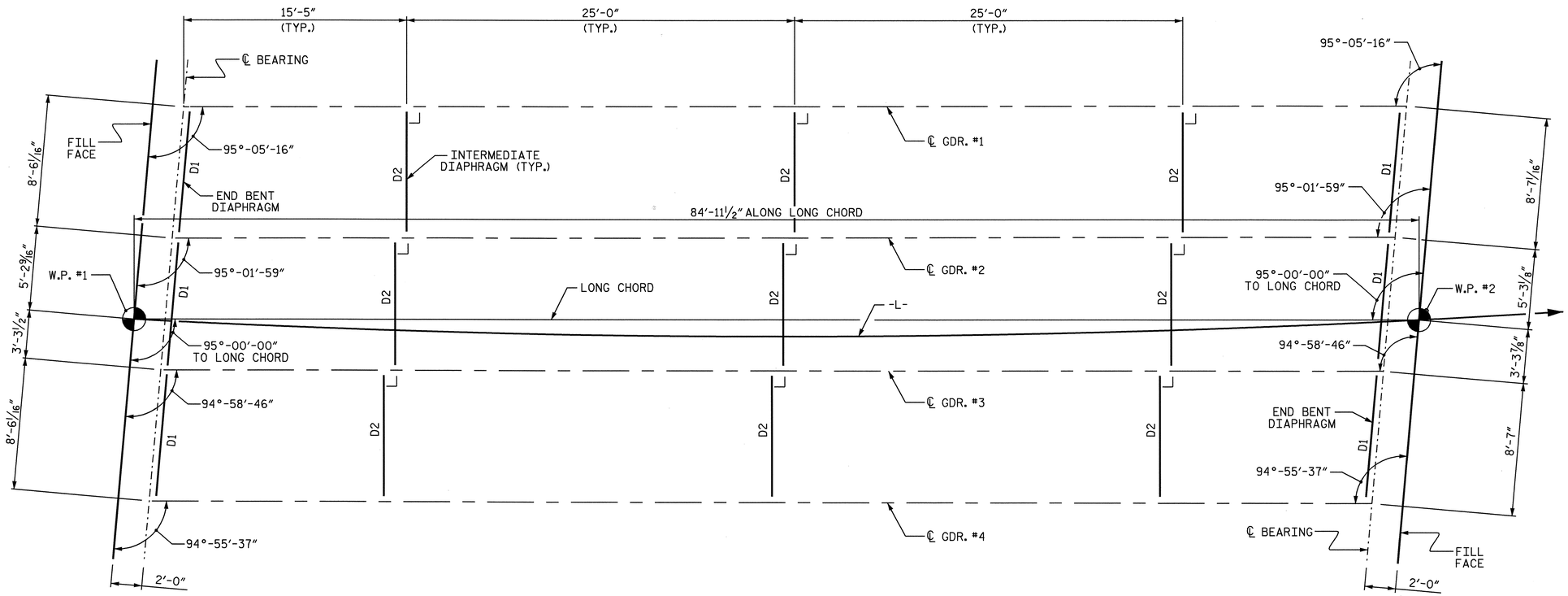

E1, P1
EXPANSION

E2, P2
FIXED

FRAMING PLAN

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/9/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : M.K. BEARD DATE : 1/2/08
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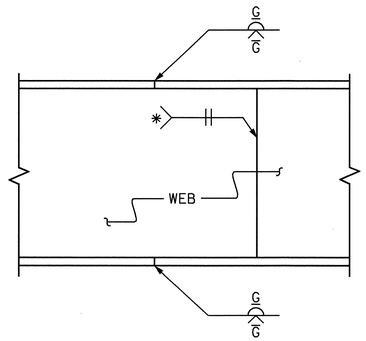
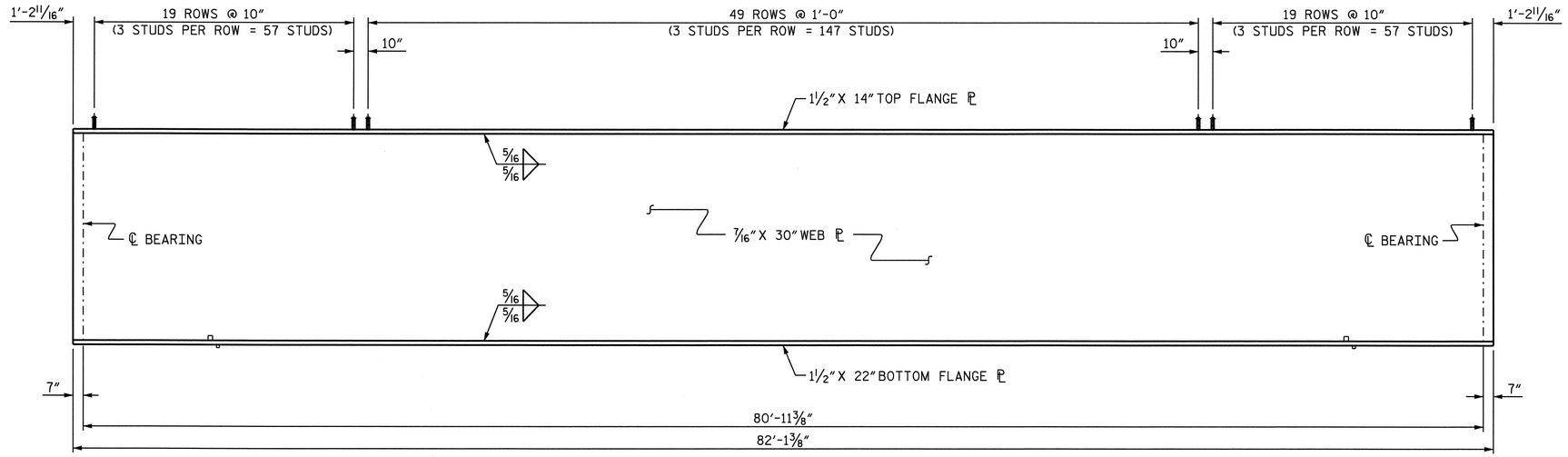


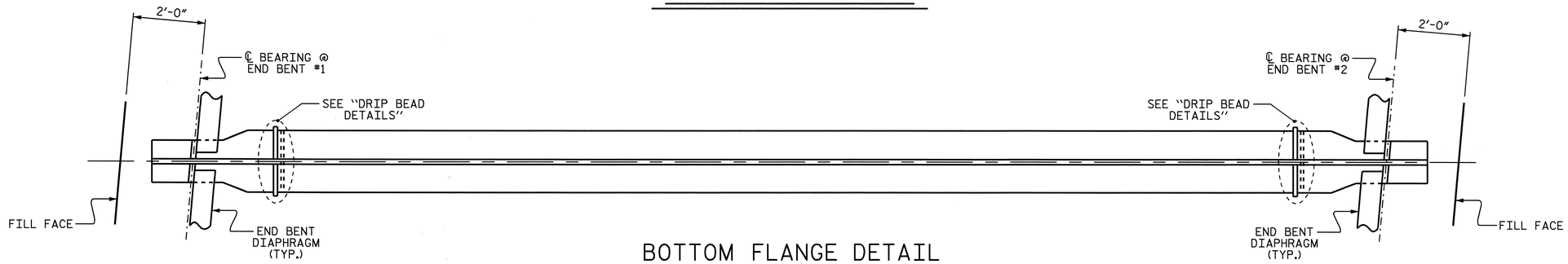
ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

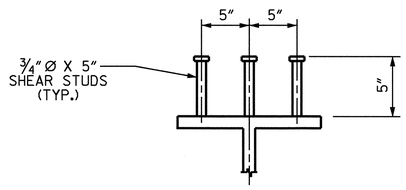
* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



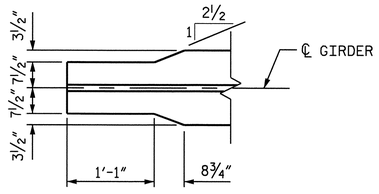
GIRDER ELEVATION



BOTTOM FLANGE DETAIL

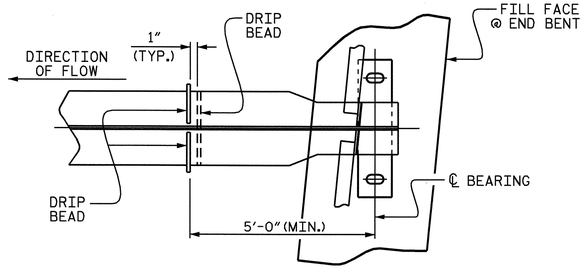


SHEAR STUD DETAILS

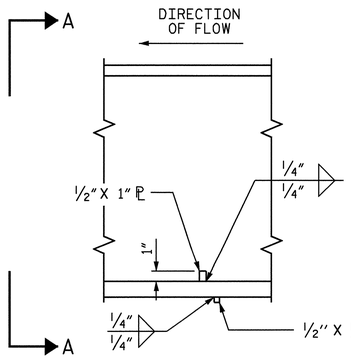


END OF GIRDER DETAIL

(BOTTOM FLANGE ONLY)



PART PLAN - BOTTOM FLANGE



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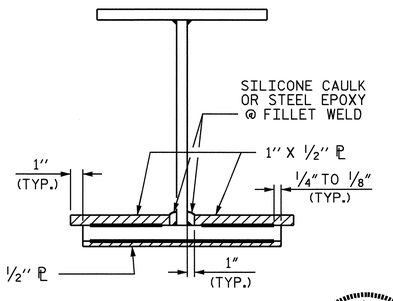

VIEW A-A

DRIP BEAD DETAILS

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -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-7
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : M.K. BEARD DATE : 12/18/07
CHECKED BY : R.G. EMERSON DATE : 02/04/08

16-JUL-2008 09:38
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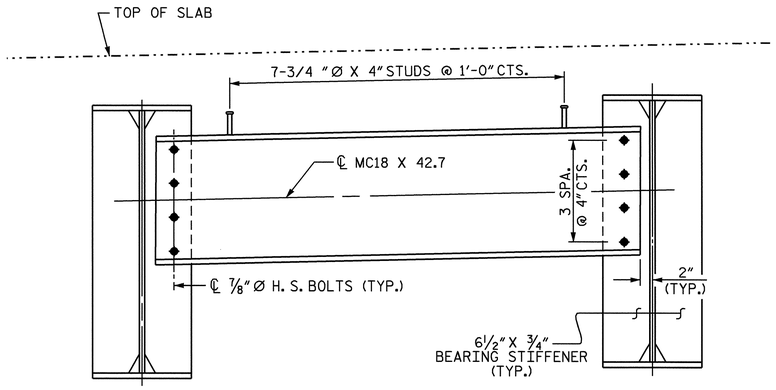
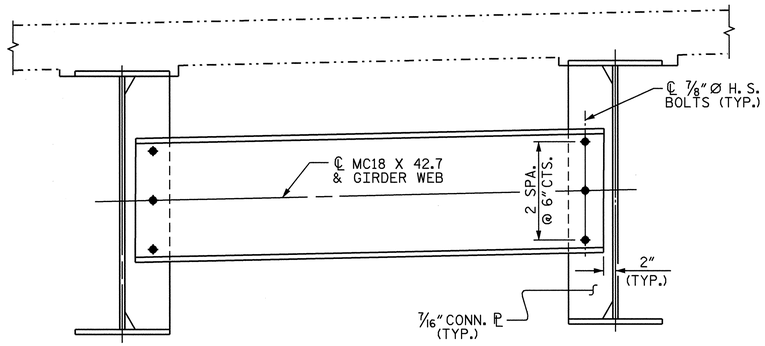


TYPICAL END BENT DIAPHRAGM (D1)



TYPICAL INTERMEDIATE DIAPHRAGM (D2)

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.

BEARING STIFFENERS SHALL BE PLUMB.

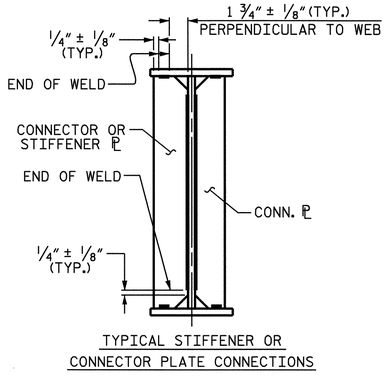
A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES AND BOTTOM FLANGE SPLICE PLATES IF USED FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

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

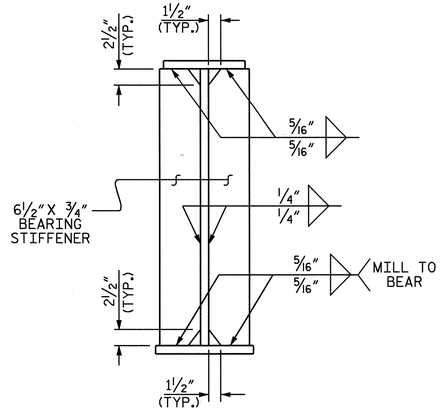
ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-10 OF THE STANDARD SPECIFICATIONS.

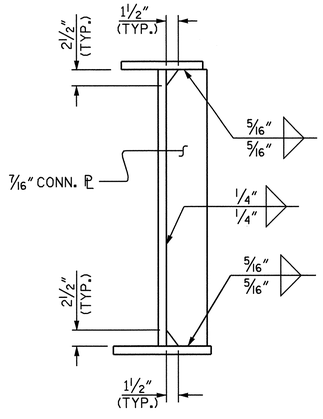
FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.



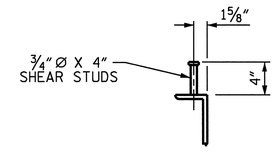
WELD TERMINATION DETAILS



BEARING STIFFENER DETAILS



CONNECTOR PL DETAILS



SHEAR STUD DETAILS

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G PAYNE

7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : M.K. BEARD DATE : 12/18/07

CHECKED BY : R.G. EMERSON DATE : 02/04/08

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #1										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.016	-0.030	-0.041	-0.048	-0.050	-0.048	-0.041	-0.030	-0.016	0
DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.023	-0.084	-0.132	-0.162	-0.172	-0.162	-0.132	-0.084	-0.023	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.014	-0.019	-0.022	-0.023	-0.022	-0.019	-0.014	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.046	-0.128	-0.192	-0.232	-0.245	-0.232	-0.192	-0.128	-0.046	0
VERTICAL CURVE ORDINATE	0	-0.071	-0.127	-0.166	-0.190	-0.198	-0.190	-0.166	-0.126	-0.071	0
ORDINATE DUE TO SUPERELEVATION	0	-0.023	-0.040	-0.053	-0.060	-0.063	-0.060	-0.053	-0.040	-0.023	0
REQUIRED CAMBER	0	-9/16"	-7/16"	-5/16"	-3/16"	-3/16"	-3/16"	-5/16"	-7/16"	-9/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLE — 0 (+ / −)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.017	-0.033	-0.045	-0.052	-0.055	-0.052	-0.045	-0.033	-0.017	0
DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.025	-0.088	-0.138	-0.169	-0.180	-0.169	-0.138	-0.088	-0.025	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.013	-0.017	-0.020	-0.021	-0.020	-0.017	-0.013	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.049	-0.134	-0.200	-0.241	-0.256	-0.241	-0.200	-0.134	-0.049	0
VERTICAL CURVE ORDINATE	0	-0.068	-0.121	-0.159	-0.182	-0.189	-0.182	-0.159	-0.121	-0.068	0
ORDINATE DUE TO SUPERELEVATION	0	-0.022	-0.039	-0.051	-0.059	-0.061	-0.059	-0.051	-0.039	-0.022	0
REQUIRED CAMBER	0	-1/2"	-5/16"	-1/8"	0	+1/16"	0	-1/8"	-5/16"	-1/2"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLE — 0 (+ / −)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #2										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.017	-0.033	-0.045	-0.052	-0.055	-0.052	-0.045	-0.033	-0.017	0
DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.025	-0.088	-0.138	-0.169	-0.180	-0.169	-0.138	-0.088	-0.025	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.013	-0.017	-0.020	-0.021	-0.020	-0.017	-0.013	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.049	-0.134	-0.200	-0.241	-0.256	-0.241	-0.200	-0.134	-0.049	0
VERTICAL CURVE ORDINATE	0	-0.070	-0.124	-0.163	-0.186	-0.193	-0.186	-0.162	-0.124	-0.069	0
ORDINATE DUE TO SUPERELEVATION	0	-0.022	-0.040	-0.052	-0.059	-0.062	-0.059	-0.052	-0.040	-0.022	0
REQUIRED CAMBER	0	-1/2"	-3/8"	-3/16"	-1/16"	0	-1/16"	-3/16"	-3/8"	-1/2"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLE — 0 (+ / −)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0	-0.016	-0.030	-0.041	-0.048	-0.050	-0.048	-0.041	-0.030	-0.016	0
DEFLECTION DUE TO WEIGHT OF SLAB	0	-0.023	-0.084	-0.132	-0.162	-0.172	-0.162	-0.132	-0.084	-0.023	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0	-0.007	-0.014	-0.019	-0.022	-0.023	-0.022	-0.019	-0.014	-0.007	0
TOTAL DEAD LOAD DEFLECTION	0	-0.046	-0.128	-0.192	-0.232	-0.245	-0.232	-0.192	-0.128	-0.046	0
VERTICAL CURVE ORDINATE	0	-0.067	-0.119	-0.156	-0.178	-0.185	-0.178	-0.155	-0.118	-0.067	0
ORDINATE DUE TO SUPERELEVATION	0	-0.022	-0.039	-0.051	-0.058	-0.061	-0.058	-0.051	-0.039	-0.022	0
REQUIRED CAMBER	0	-1/2"	-3/8"	-3/16"	-1/16"	0	-1/16"	-3/16"	-3/8"	-1/2"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLE — 0 (+ / −)

PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : M.K. BEARD DATE : 12/19/07
CHECKED BY : R.G. EMERSON DATE : 02/04/08

16-JUL-2008 09:38
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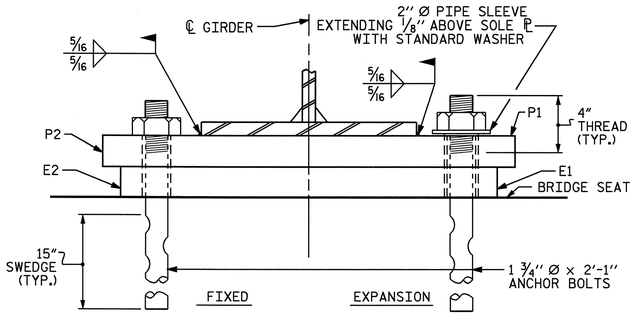
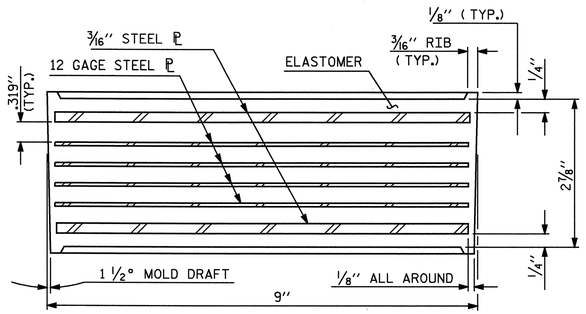
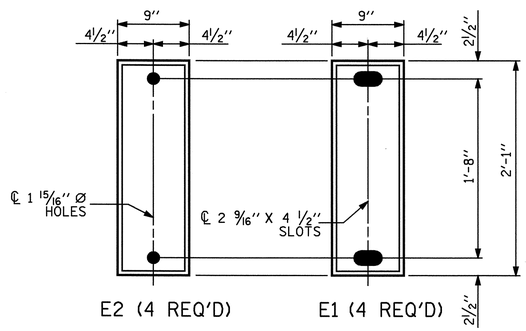
NCDDS



END VIEW

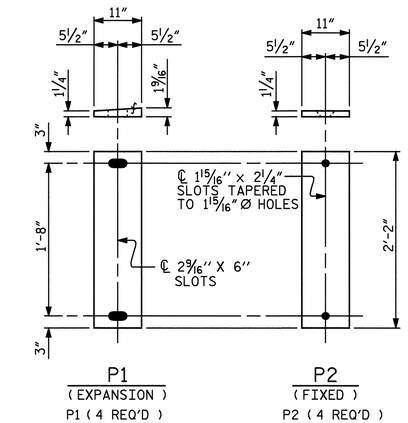


TYPICAL SECTION OF ELASTOMERIC BEARINGS



PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



SOLE PLATE DETAILS ("P")

NOTES

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

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

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND 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. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

—LOAD RATINGS—

	MAX.D.L.+L.L.
TYPE III	144 K

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. ANDERSON
7/14/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB1

ASSEMBLED BY : M.K. BEARD	DATE : 12/19/07	
CHECKED BY : R.G. EMERSON	DATE : 02/04/08	
DRAWN BY : JMB 11/87	REV. 8/16/99	MAB/LES
CHECKED BY : ARB 11/87	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

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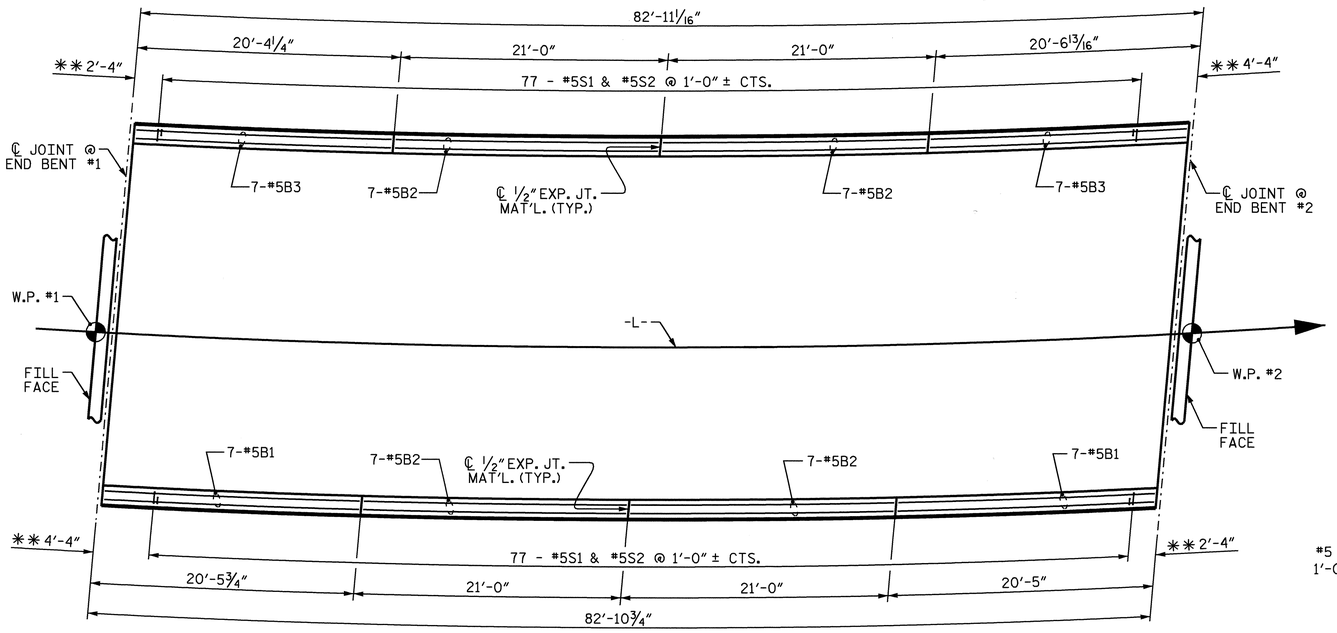


PLAN OF BARRIER RAIL

MEASUREMENTS TAKEN ALONG BACK FACE OF BARRIER RAIL.
✱✱FOR REINFORCING STEEL AT END OF BARRIER RAIL, SEE "END OF RAIL DETAILS".

NOTES

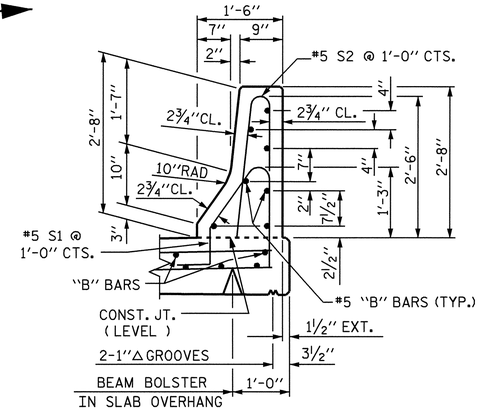
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

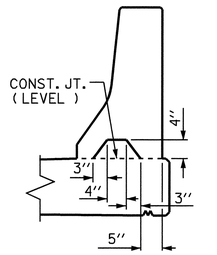
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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.



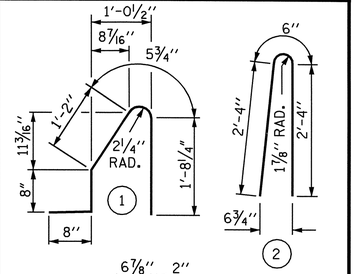
SECTION THRU RAIL



SECTION S-S

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

BAR TYPES



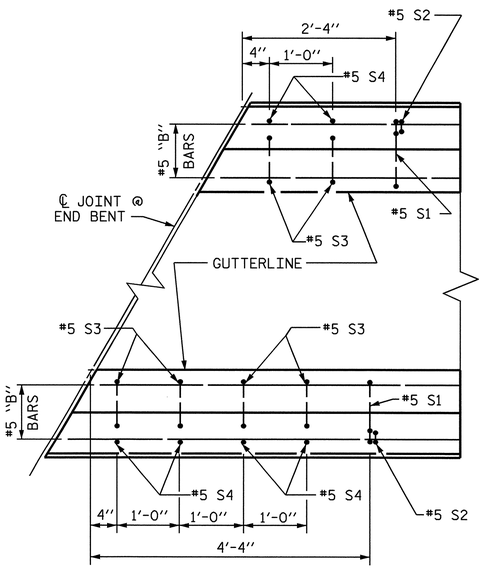
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

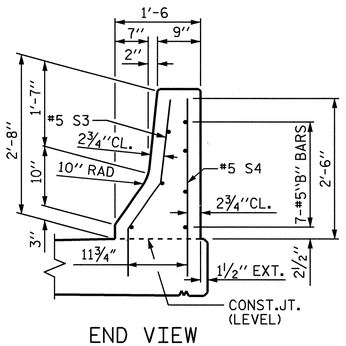
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	14	#5	STR	20′-0″	292
✱ B2	28	#5	STR	20′-7″	601
✱ B3	14	#5	STR	20′-1″	293
✱ S1	154	#5	1	4′-8″	750
✱ S2	154	#5	2	5′-2″	830
✱ S3	12	#5	3	3′-4″	42
✱ S4	12	#5	STR	3′-2″	40

✱ EPOXY COATED REINFORCING STEEL	2848 LBS.
CLASS AA CONCRETE	16.6 CU. YDS.
CONCRETE BARRIER RAIL	165.82 LIN. FT.

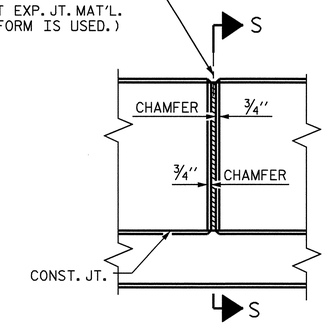


PLAN



END VIEW

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/6/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : M.K. BEARD	DATE : 12/27/07	
CHECKED BY : R.G. EMERSON	DATE : 02/04/08	
DRAWN BY : ARB 5/87	REV. 10/17/00	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/7/03R	RWW/JTE
	REV. 5/1/06	TLA/GM

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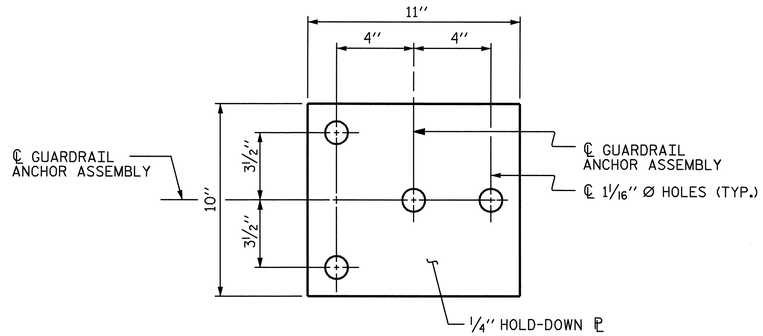
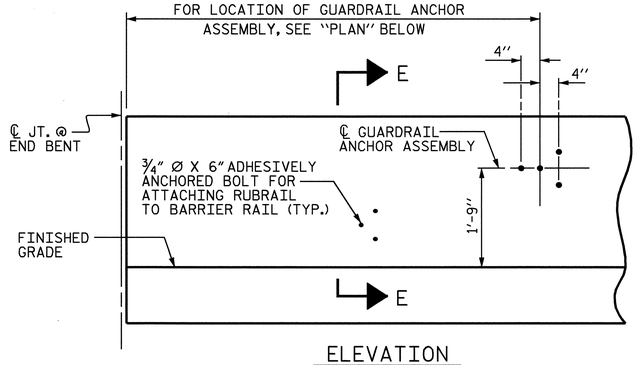
STD. NO. CBR1

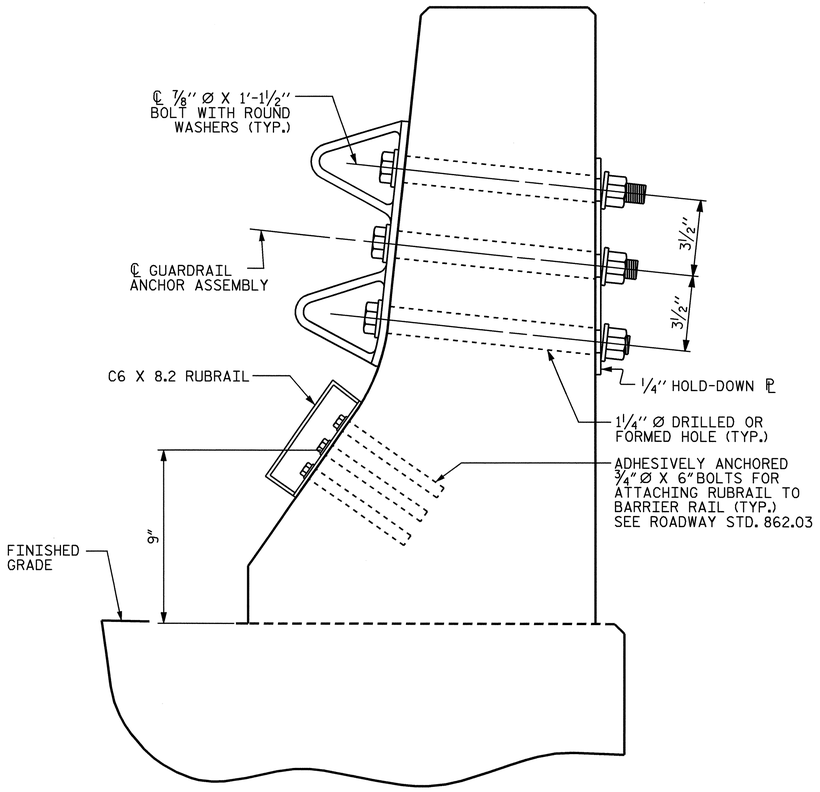


PLAN



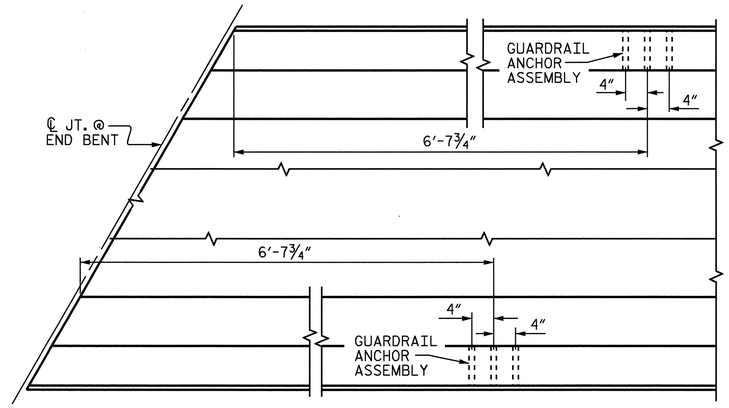
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

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 - 7/8'' Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

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

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

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4''Ø X 6''BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4''Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE 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-4665

WARREN COUNTY

STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			23

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/19/08

ASSEMBLED BY : M.K. BEARD CHECKED BY : R.G. EMERSON	DATE : 02/04/08 DATE : 02/04/08
DRAWN BY : TLA 5/06 CHECKED BY : GM 5/06	ADDED 5/1/06R KMM/GM

18-JUN-2008 15:21
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kbeard

STD. NO. GRA2

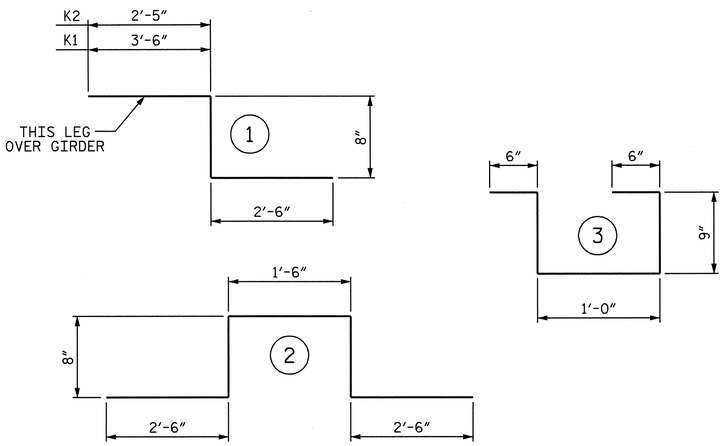
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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	663	SQ. FT.
BRIDGE DECK	1958	SQ. FT.
TOTAL	2621	SQ. FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

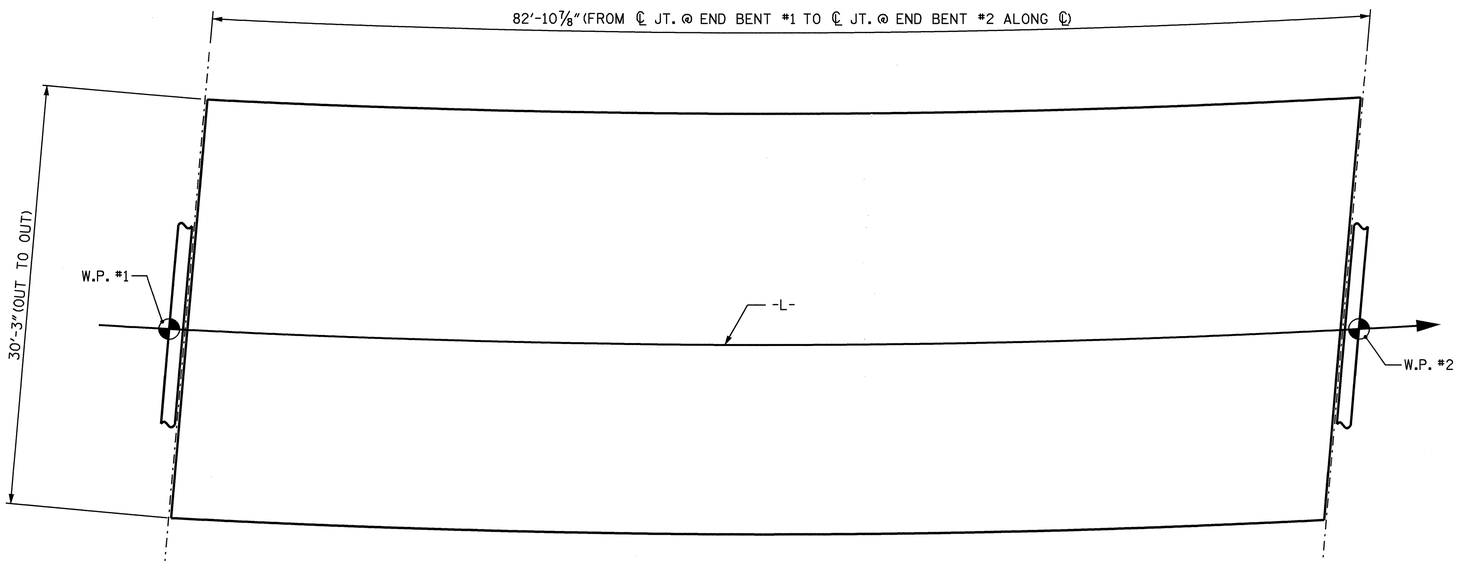
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	77.2	7920	6349
TOTALS **	77.2	7920	6349

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	147	#5	STR	29'-11"	4587
A2	147	#5	STR	29'-11"	4587
*A101	2	#5	STR	27'-11"	58
*A102	2	#5	STR	21'-9"	45
*A103	2	#5	STR	15'-6"	32
*A104	2	#5	STR	9'-4"	19
*A105	2	#5	STR	3'-1"	6
A201	2	#5	STR	27'-11"	58
A202	2	#5	STR	21'-9"	45
A203	2	#5	STR	15'-6"	32
A204	2	#5	STR	9'-4"	19
A205	2	#5	STR	3'-1"	6
* B1	63	#4	STR	28'-9"	1210
B2	72	#5	STR	42'-3"	3173
* G1	2	#5	STR	29'-11"	62
* K1	4	#5	1	6'-8"	28
* K2	4	#5	1	5'-7"	23
* K3	8	#5	2	7'-10"	65
* K4	12	#5	STR	8'-2"	102
* S1	48	#4	3	3'-6"	112
REINFORCING STEEL					7920 LBS.
* EPOXY COATED REINFORCING STEEL					6349 LBS.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 2508)

DRAWN BY : M.K. BEARD DATE : 1/2/08
CHECKED BY : R.G. EMERSON DATE : 02/04/08

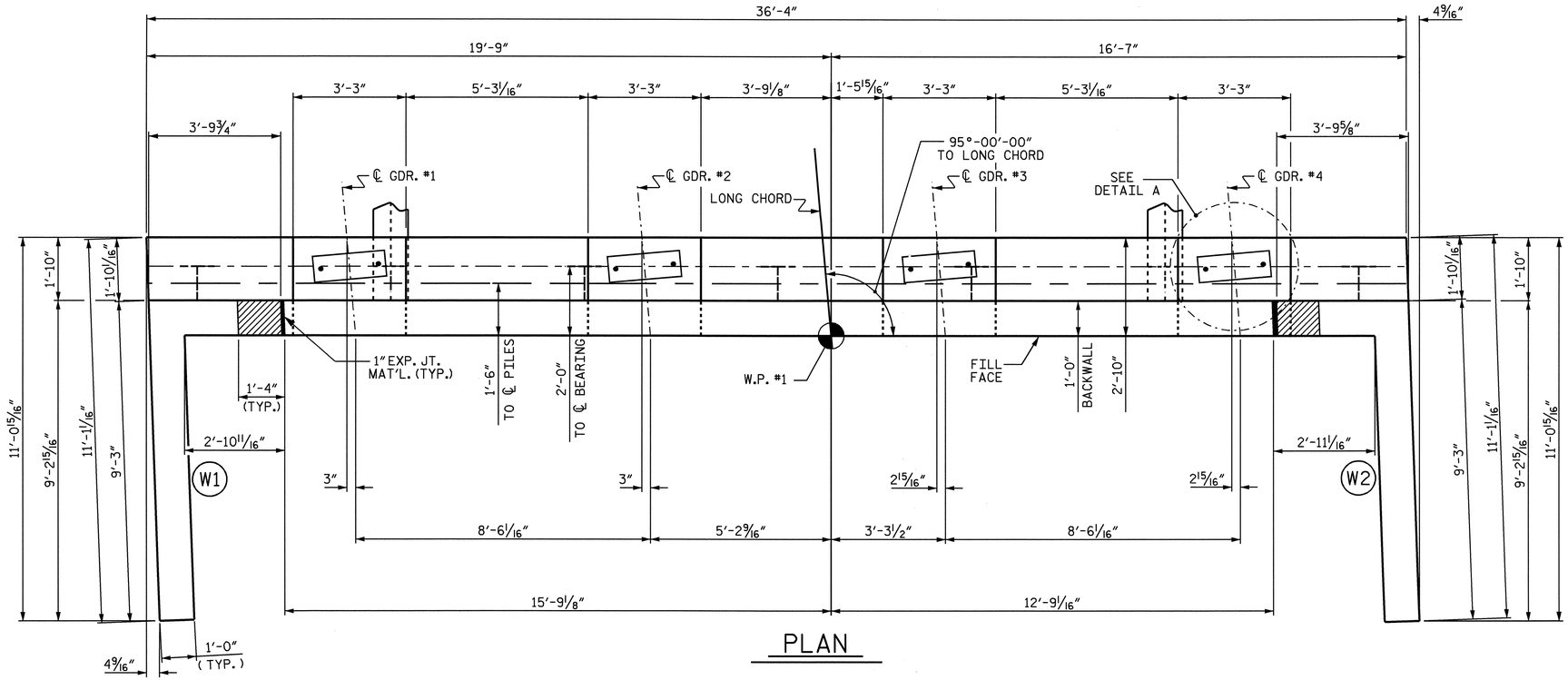
PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

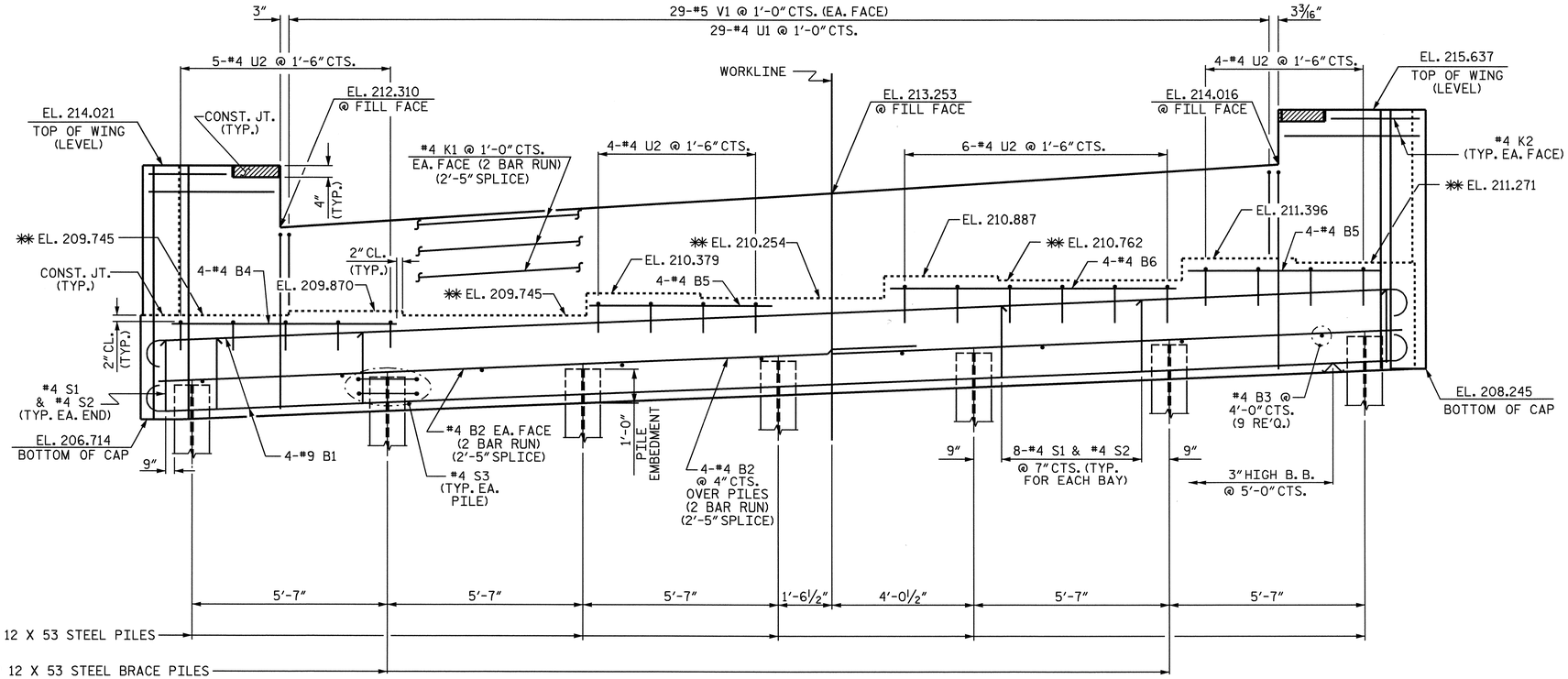
SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			23



PLAN



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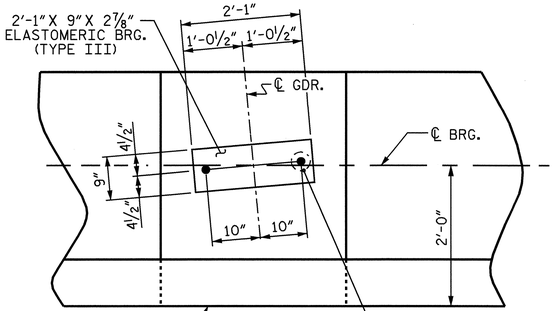

DETAIL A

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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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.

** 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%.

PILE No.	TOP OF PILE EL.
1	207.772
2	208.007
3	208.243
4	208.478
5	208.713
6	208.948
7	209.184

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. LAYNE
7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 11/07
CHECKED BY : K. D. LAYNE DATE : 03/08

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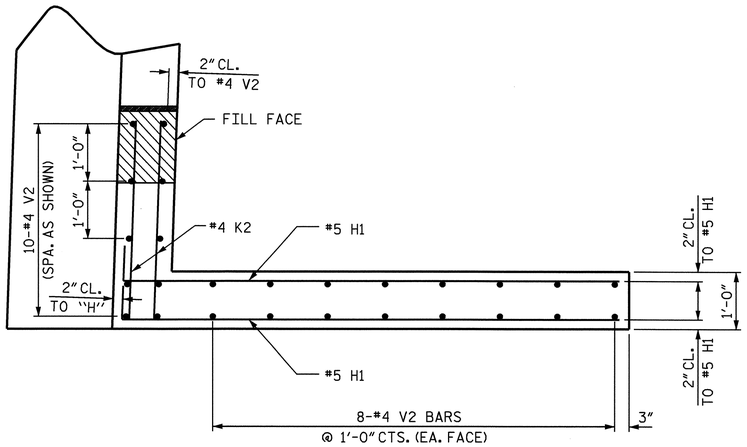
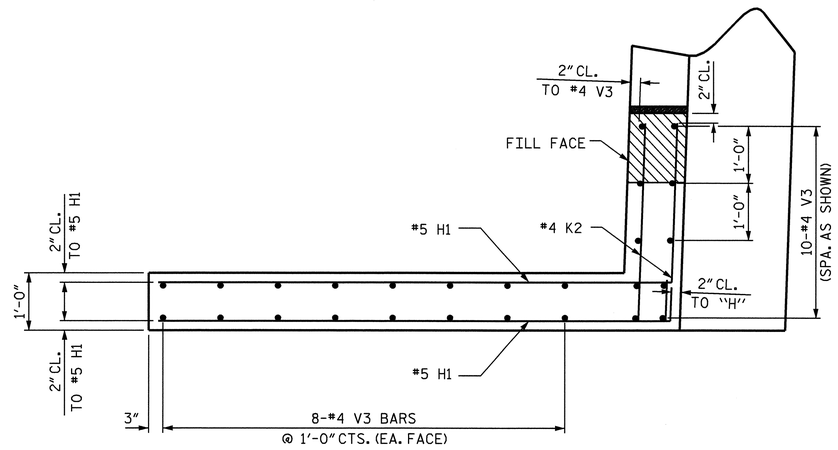
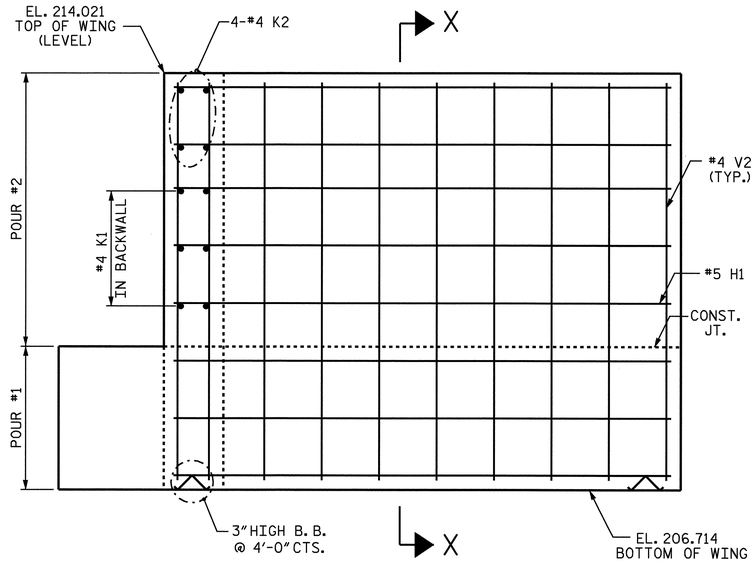


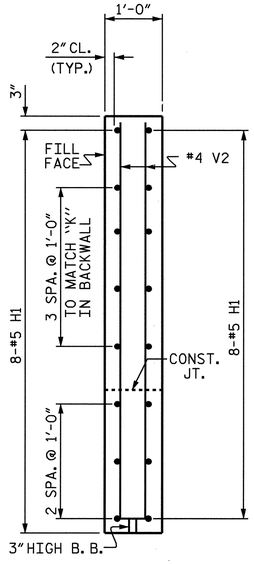
PLAN OF WING (W1)



PLAN OF WING (W2)



ELEVATION OF WING (W1)



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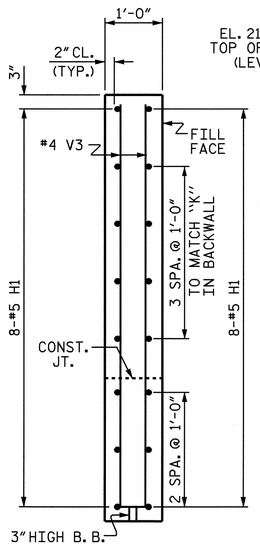

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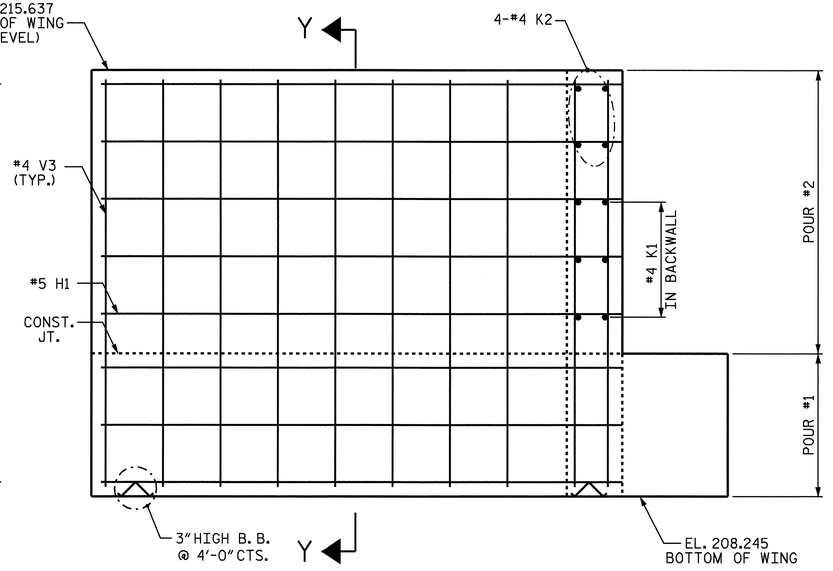

ELEVATION OF WING (W2)

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. LAYNE
7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 12/07
CHECKED BY : K. D. LAYNE DATE : 03/08

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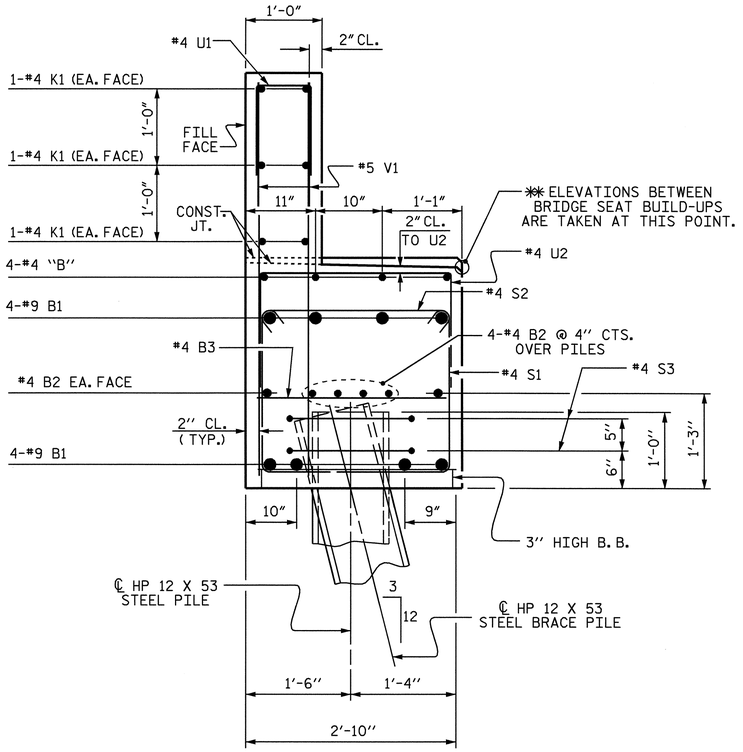
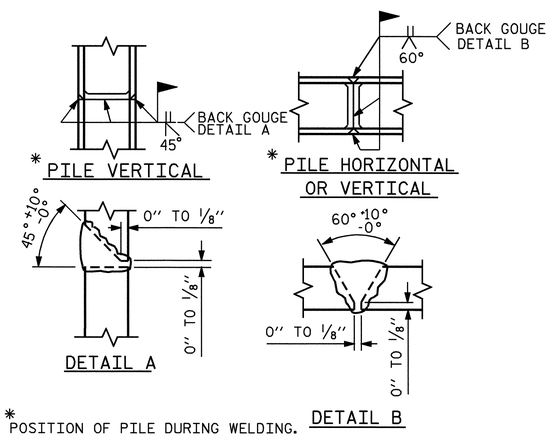
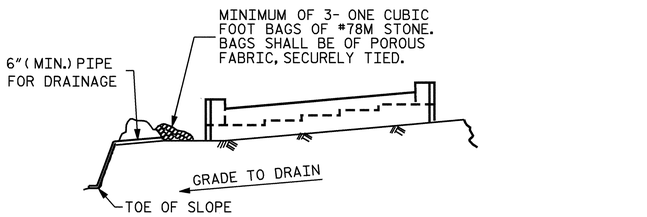


SECTION THRU CAP



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



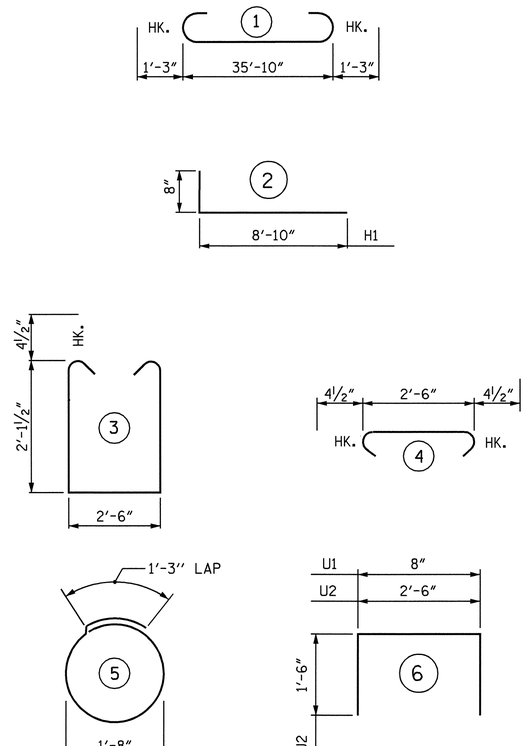
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	38'-4"	1043
B2	12	4	STR.	19'-3"	154
B3	9	4	STR.	2'-6"	15
B4	4	4	STR.	6'-6"	17
B5	8	4	STR.	5'-0"	27
B6	4	4	STR.	8'-0"	21
H1	32	5	2	9'-6"	317
K1	12	4	STR.	19'-3"	154
K2	8	4	STR.	3'-6"	19
S1	50	4	3	7'-6"	251
S2	50	4	4	3'-3"	109
S3	14	4	5	6'-6"	61
U1	29	4	6	3'-8"	71
U2	19	4	6	5'-6"	70
V1	58	5	STR.	5'-2"	313
V2	26	4	STR.	6'-10"	119
V3	26	4	STR.	6'-11"	120
REINFORCING STEEL					2881

CLASS "A" CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS
CU. YDS. 13.1

POUR #2 UPPER WINGS & BACKWALL
CU. YDS. 6.5

CLASS "A" CONCRETE TOTAL
CU. YDS. 19.6

HP 12 X 53 STEEL PILES
NO. 7 LIN. FT. 140

PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

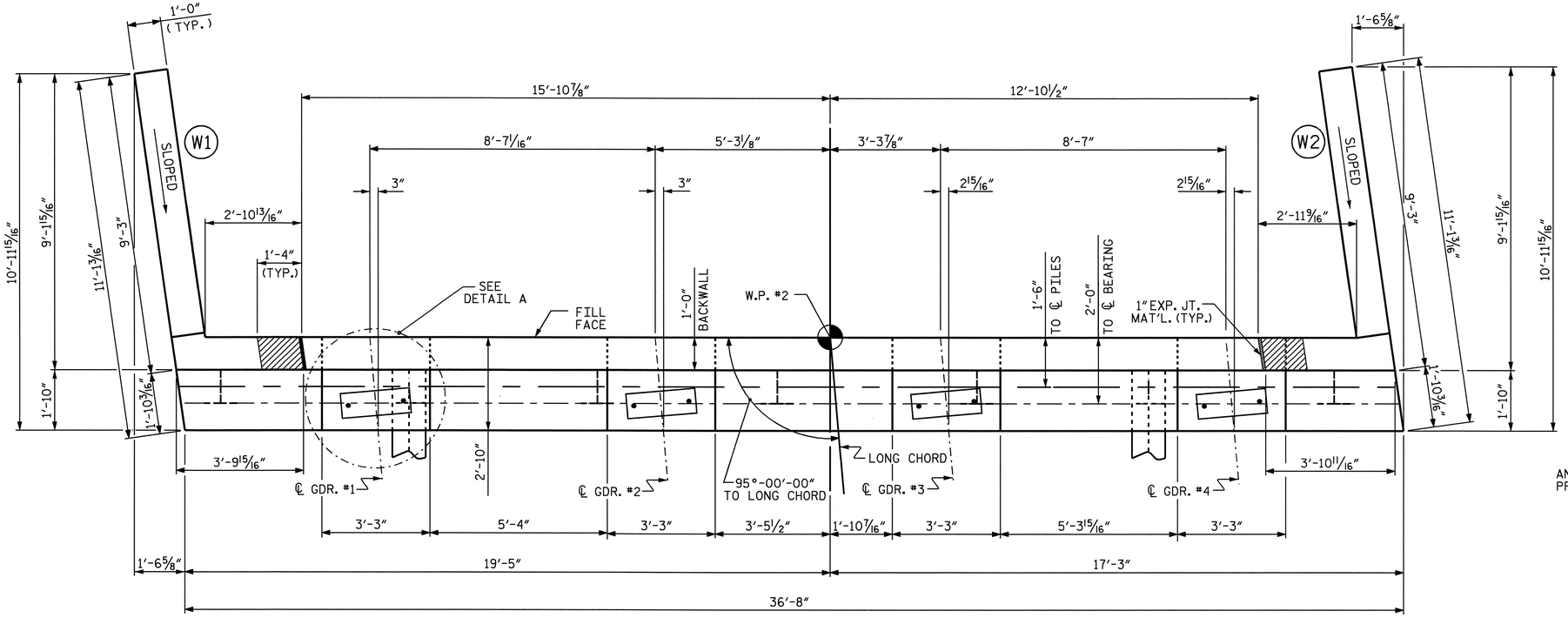
SUBSTRUCTURE

END BENT #1

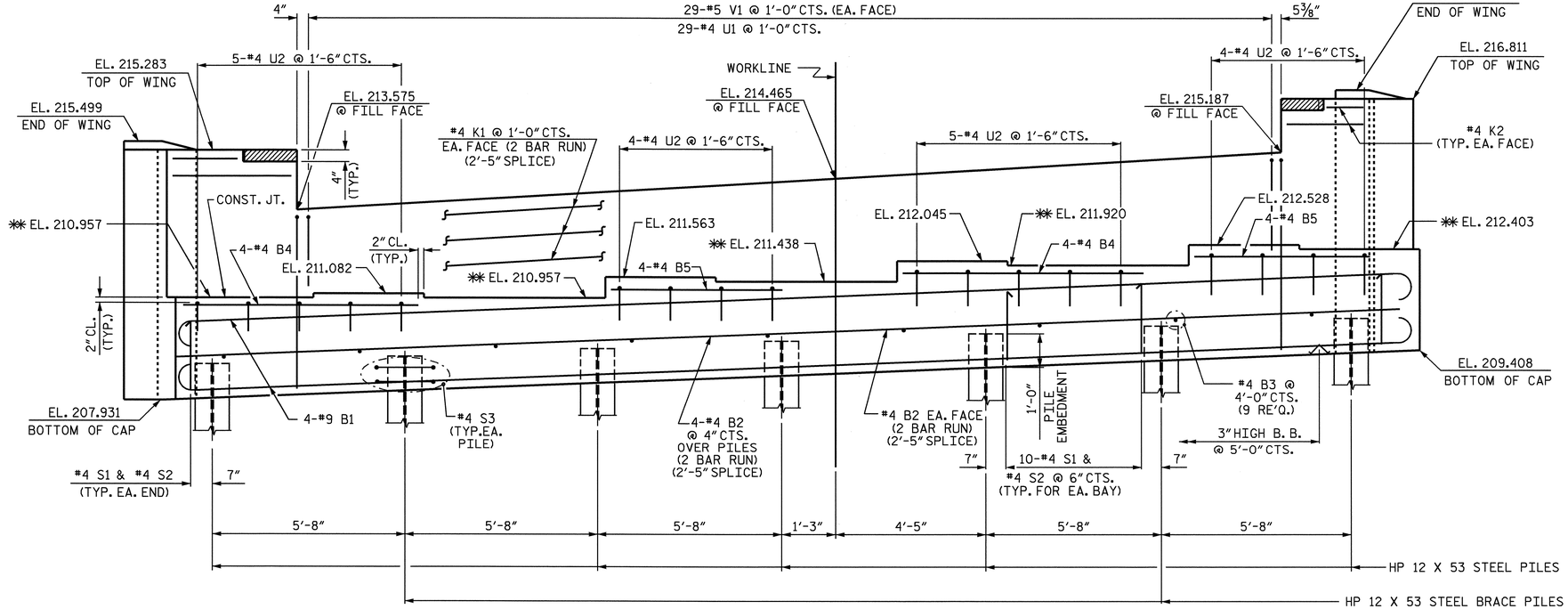
NORTH CAROLINA PROFESSIONAL SEAL 2021 ENGINEER THOMAS G. PAYNE
7/14/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			23

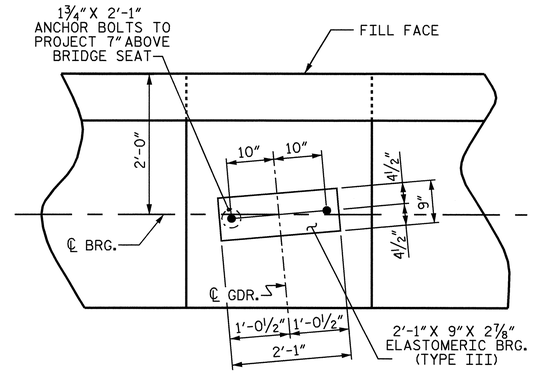
DRAWN BY : R. G. EMERSON DATE : 12/07
CHECKED BY : K. D. LAYNE DATE : 03/08



PLAN



ELEVATION



DETAIL A

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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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.

** THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSLY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

PILE No.	TOP OF PILE EL.
1	208.993
2	209.221
3	209.450
4	209.678
5	209.906
6	210.134
7	210.363

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER KEVIN D. LAYNE 7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 01/08
CHECKED BY : K. D. LAYNE DATE : 03/08

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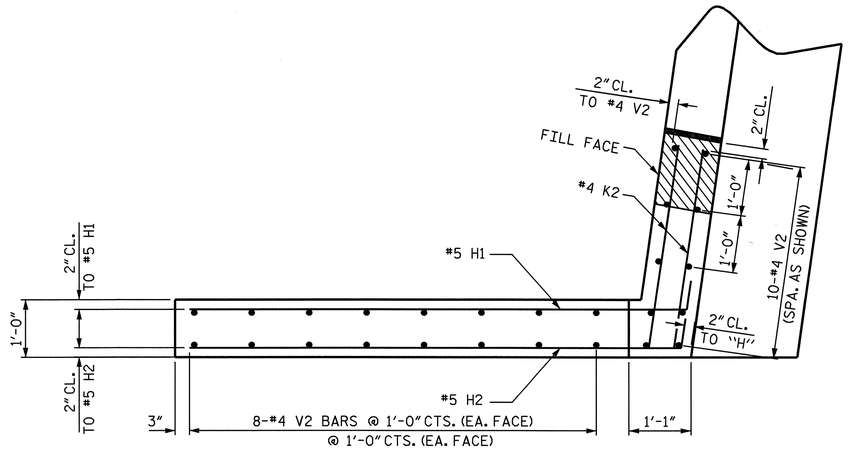
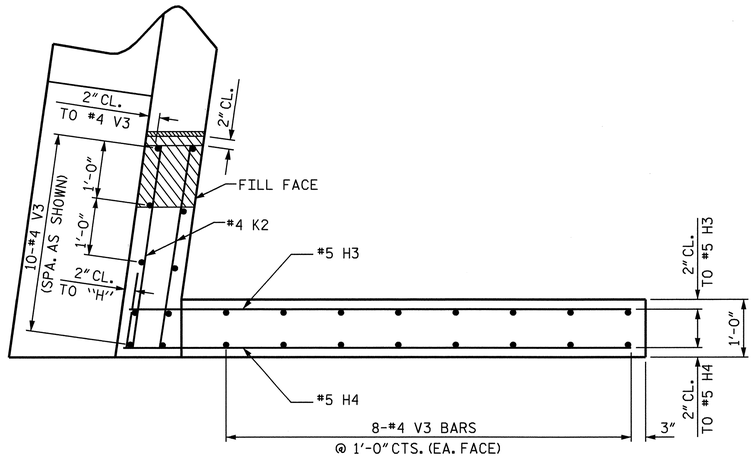
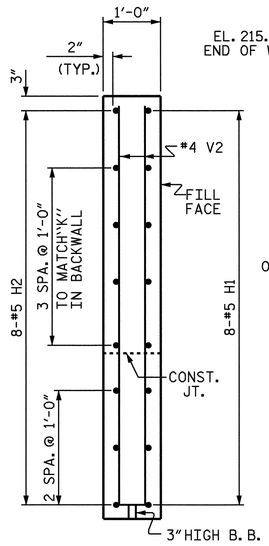


PLAN OF WING (W1)



PLAN OF WING (W2)



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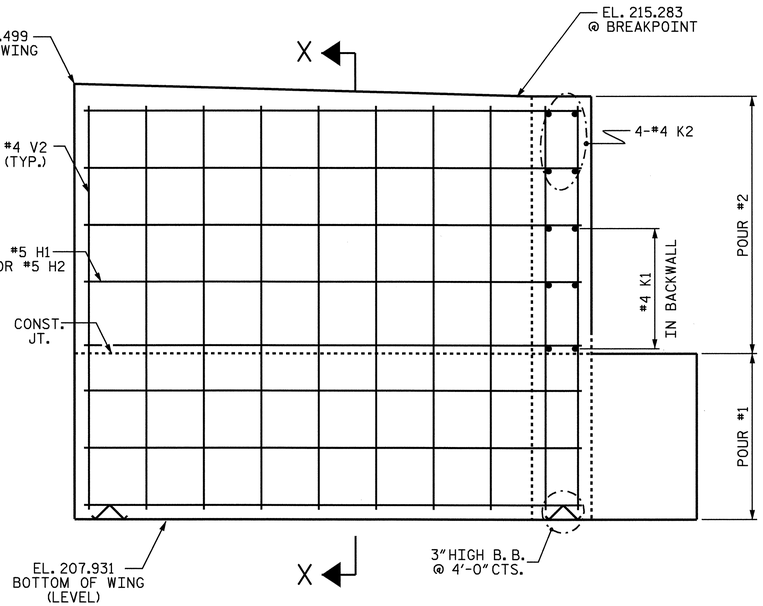
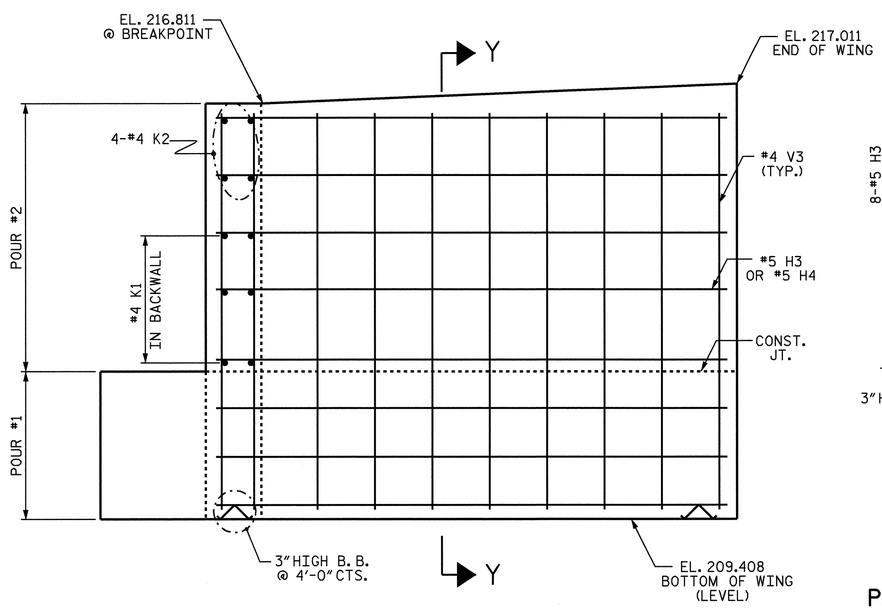
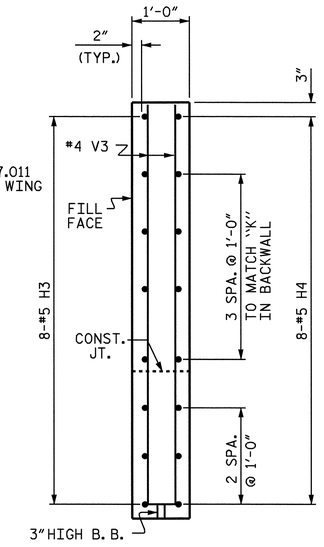


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



Y-Y

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. LAYNE
7/16/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 12/07
CHECKED BY : K. D. LAYNE DATE : 03/08

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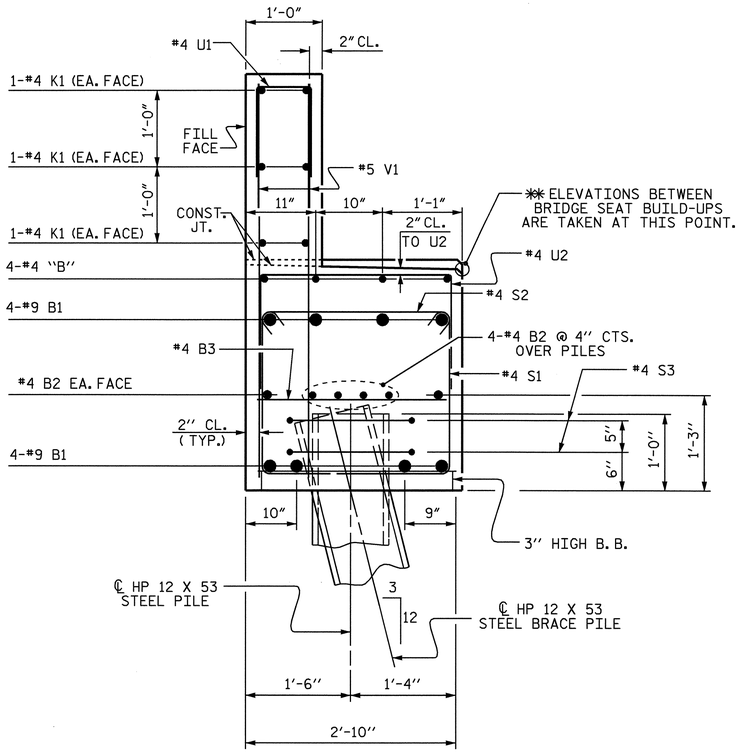
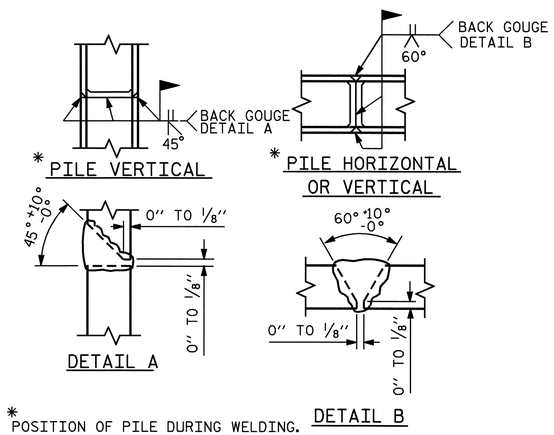
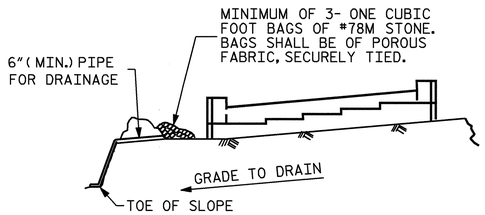


SECTION THRU CAP



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



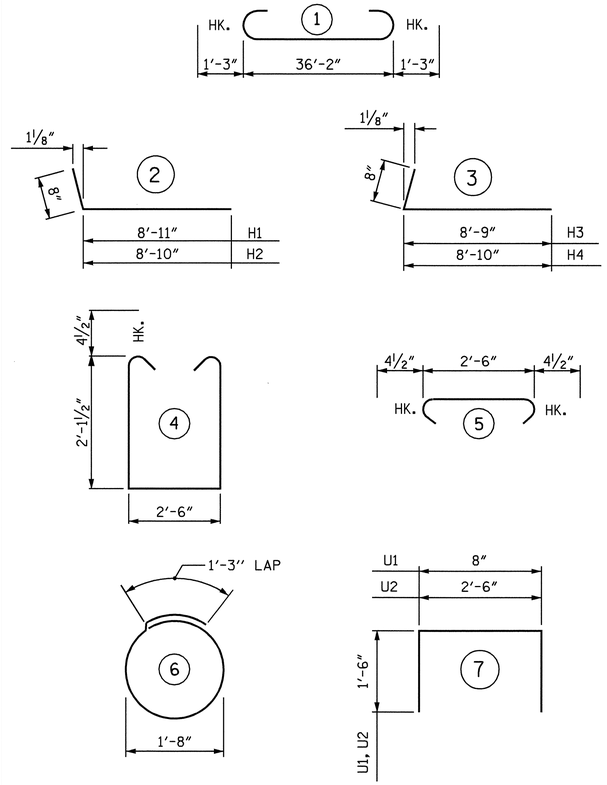
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	38'-8"	1052
B2	12	4	STR.	19'-5"	156
B3	9	4	STR.	2'-6"	15
B4	8	4	STR.	6'-8"	36
B5	8	4	STR.	5'-2"	28
H1	8	5	2	9'-7"	80
H2	8	5	2	9'-6"	79
H3	8	5	3	9'-5"	79
H4	8	5	3	9'-6"	79
K1	12	4	STR.	19'-5"	156
K2	8	4	STR.	3'-6"	19
S1	62	4	4	7'-6"	311
S2	62	4	5	3'-3"	135
S3	14	4	6	6'-6"	61
U1	29	4	7	3'-8"	71
U2	18	4	7	5'-6"	66
V1	58	5	STR.	5'-2"	313
V2	26	4	STR.	6'-11"	120
V3	26	4	STR.	7'-0"	122
REINFORCING STEEL					2978

CLASS "A" CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS
CU. YDS. 13.1

POUR #2 UPPER WINGS & BACKWALL
CU. YDS. 6.8

CLASS "A" CONCRETE TOTAL
CU. YDS. 19.9

HP 12 X 53 STEEL PILES
NO. 7 LIN. FT. 140

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

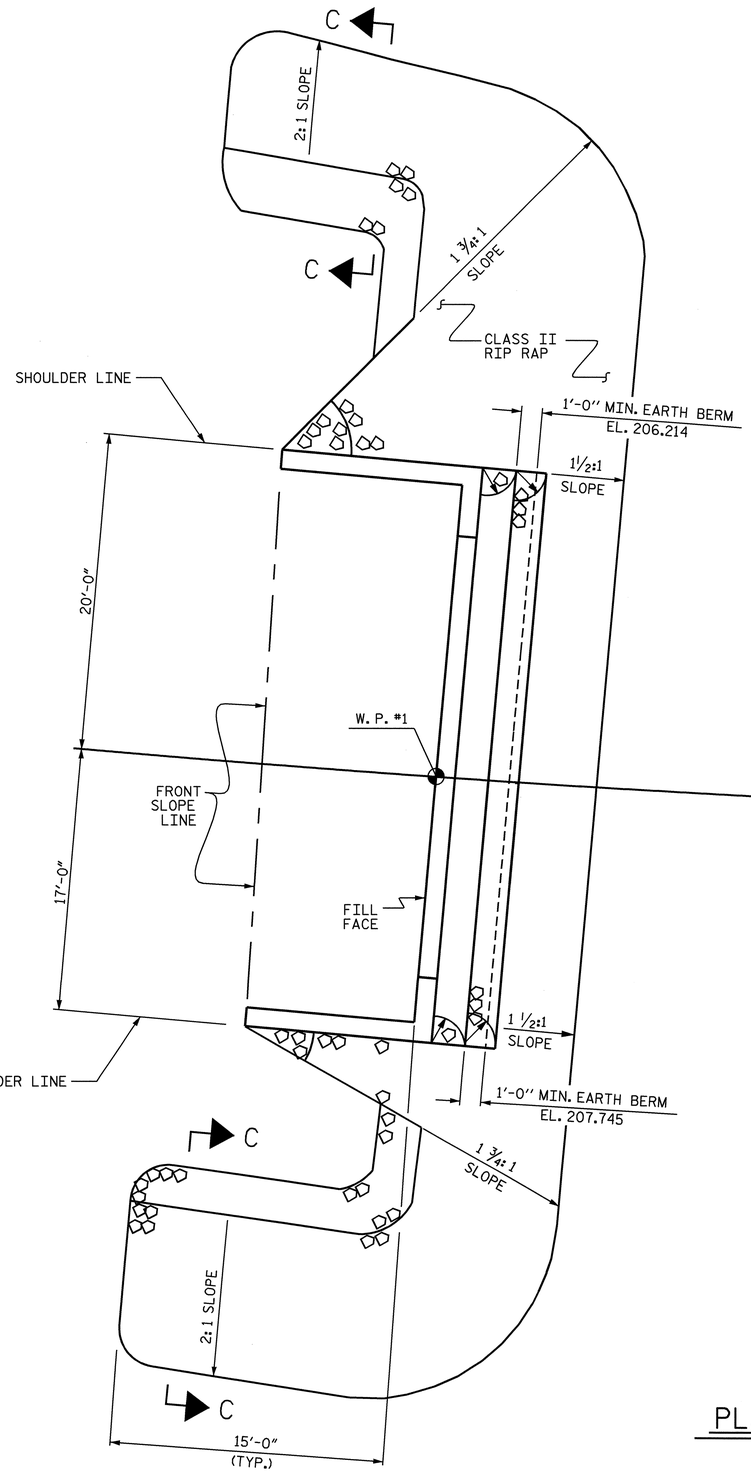
SUBSTRUCTURE

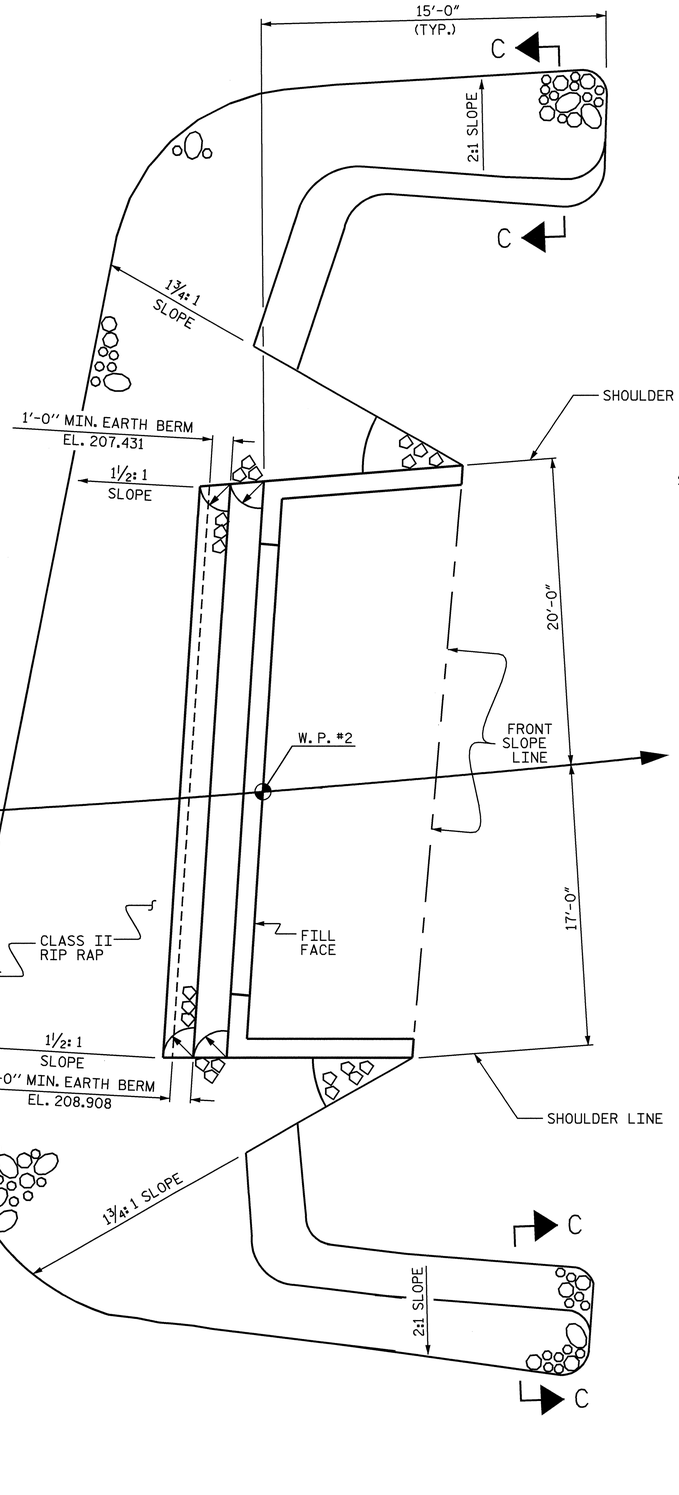
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/16/08

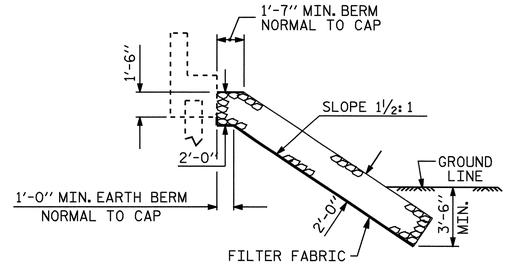
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 12/07
CHECKED BY : K. D. LAYNE DATE : 03/08

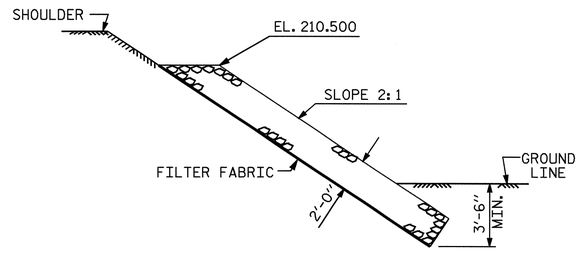




PLAN OF RIP RAP



℄ SECTION BERM RIP RAPPED



SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+81.00 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT #1	148	215
END BENT #2	145	210

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS D. PAYNE 7/16/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 05/07
CHECKED BY : M. K. BEARD DATE : 02/08

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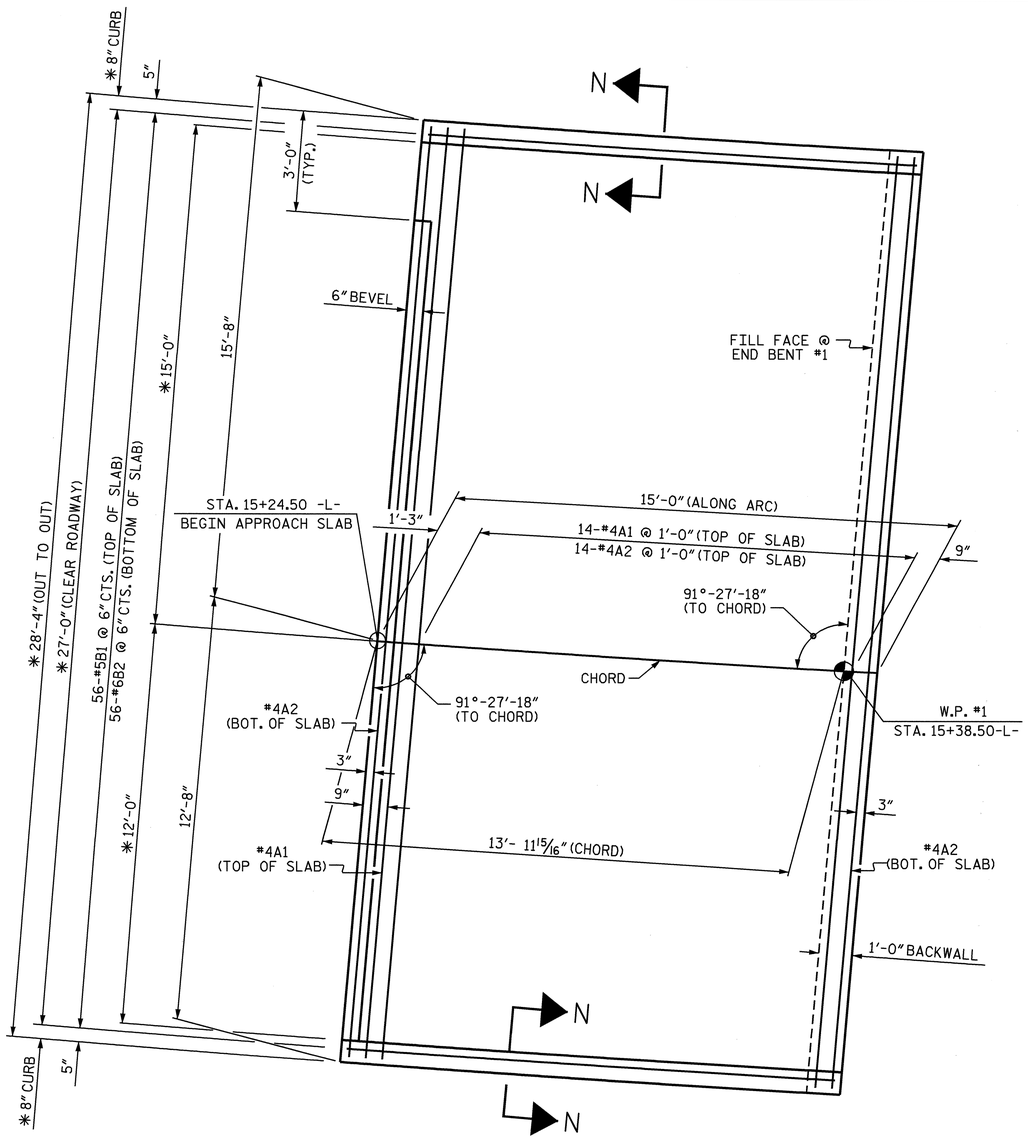

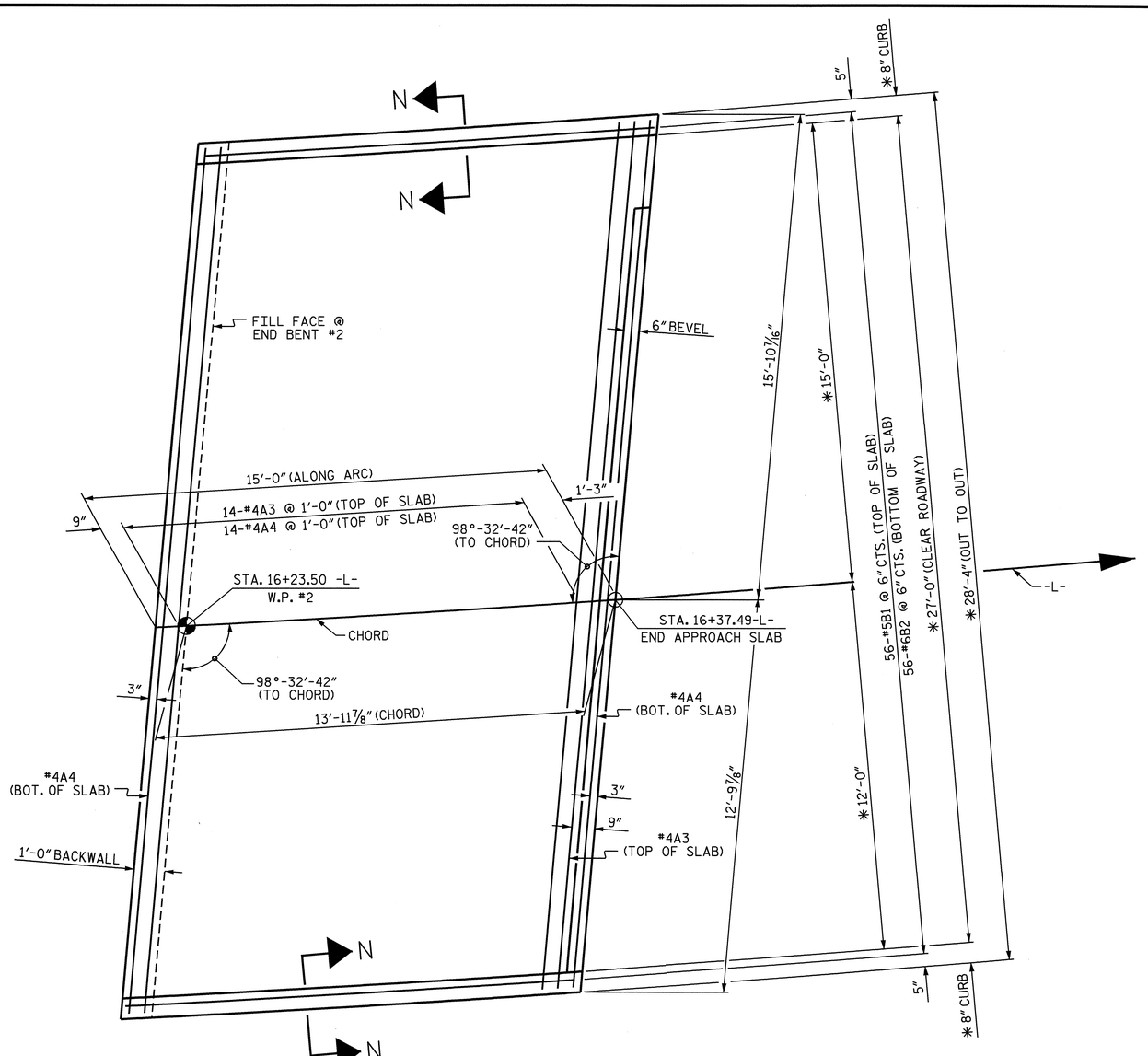

*RADIAL DIMENSIONS

PLAN @ END BENT #1

PLAN @ END BENT #2

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/19/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			23

DRAWN BY : R. G. EMERSON DATE : 04/07
CHECKED BY : K. D. LAYNE DATE : 01/08

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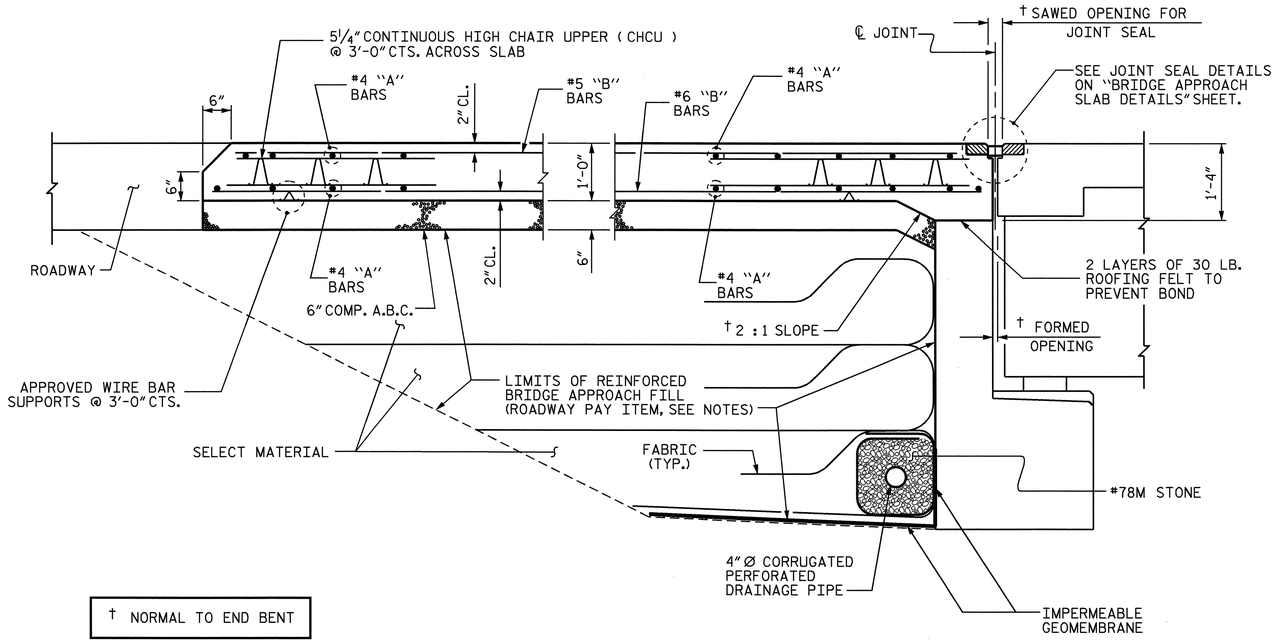


SECTION THRU SLAB

SHOWING SECTION WITHOUT CONCRETE WEARING SURFACE

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 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.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

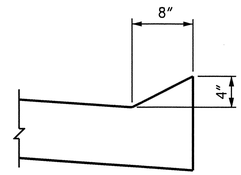
BILL OF MATERIAL

FOR APPROACH SLAB AT END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	15	#4	STR	28'-0"	281
A2	16	#4	STR	28'-0"	299
*B1	56	#5	STR	13'-11"	813
B2	56	#6	STR	14'-8"	1234
REINFORCING STEEL				LBS.	1533
* EPOXY COATED REINFORCING STEEL				LBS.	1094
CLASS AA CONCRETE				C. Y.	16.1

FOR APPROACH SLAB AT END BENT #2

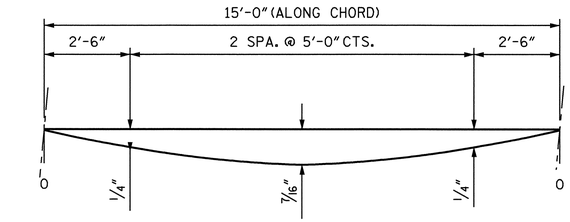
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	15	#4	STR	28'-3"	283
A4	16	#4	STR	28'-3"	302
*B1	56	#5	STR	13'-11"	813
B2	56	#6	STR	14'-8"	1234
REINFORCING STEEL				LBS.	1536
* EPOXY COATED REINFORCING STEEL				LBS.	1096
CLASS AA CONCRETE				C. Y.	16.1



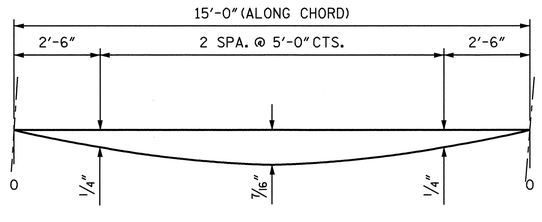
SECTION N-N

SPLICE CHART

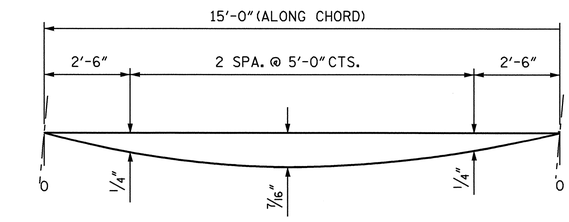
#4 A1 & #4 A3	2'-0"
#4 A2 & #4 A4	1'-9"



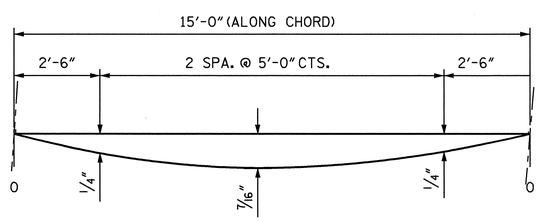
ARC OFFSET - LEFT SIDE APPROACH SLAB @ END BENT #1



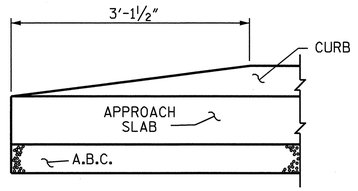
ARC OFFSET - LEFT SIDE APPROACH SLAB @ END BENT #2



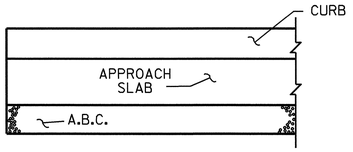
ARC OFFSET - RIGHT SIDE APPROACH SLAB @ END BENT #1



ARC OFFSET - RIGHT SIDE APPROACH SLAB @ END BENT #2



END OF CURB WITHOUT SHOULDER BERM GUTTER



END OF CURB WITH SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. B-4665

WARREN COUNTY

STATION: 15+81.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			23

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. PAYNE
7/16/08

ASSEMBLED BY : R. G. EMERSON		DATE : 04/07	
CHECKED BY : K. D. LAYNE		DATE : 01/08	
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR	
CHECKED BY : VAP 3/95	REV. 5/1/03R	RWW./JTE	
	REV. 5/1/06R	KMM/GM	

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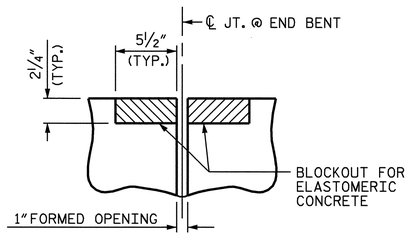
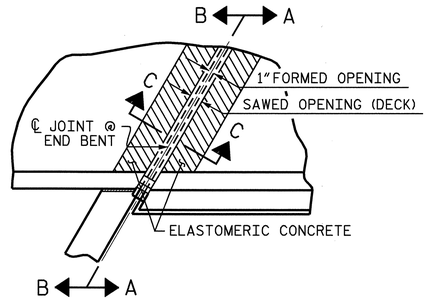
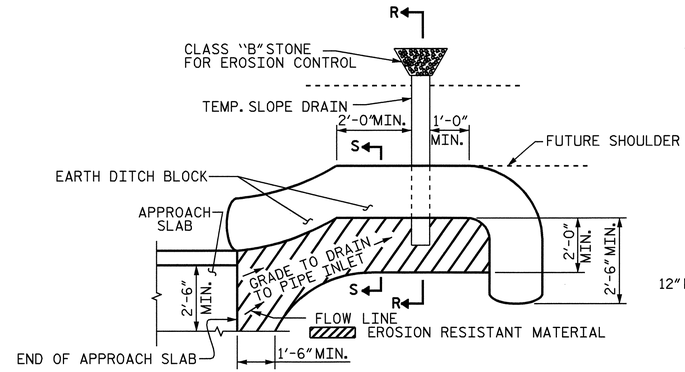
STD. NO. BAS4 (SHT 2)



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

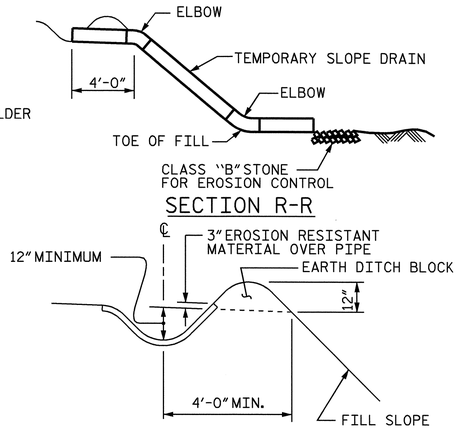


PLAN



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.

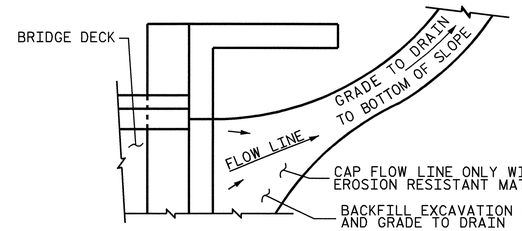
PLAN VIEW



SECTION S-S

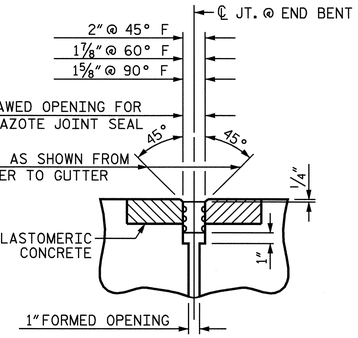
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

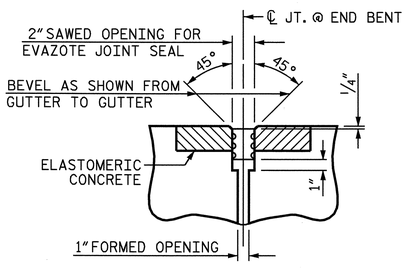


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

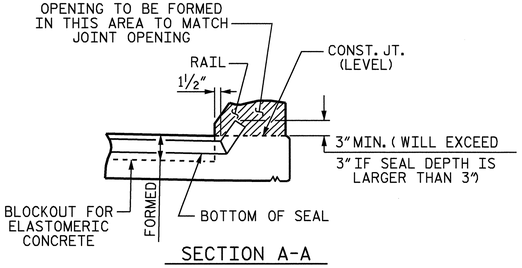
TEMPORARY DRAINAGE DETAIL



SECTION C-C
EVAZOTE JOINT SEAL
(EXPANSION AT END BENT #1)



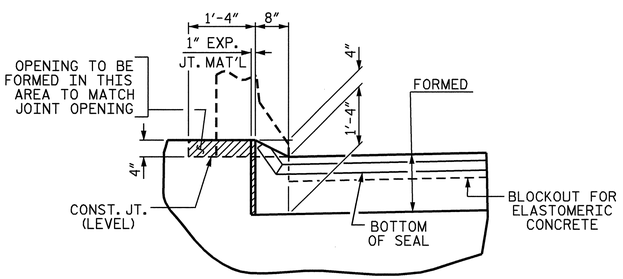
SECTION C-C
EVAZOTE JOINT SEAL
(FIXED AT END BENT #2)



SECTION A-A

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	4.4
2	4.5
TOTAL	8.9

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION B-B

JOINT SEAL DETAILS @ END BENT

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

PROJECT NO. B-4665
WARREN COUNTY
STATION: 15+81.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS D. LAYNE
6/20/08

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

ASSEMBLED BY : R. G. EMERSON	DATE : 04/07	
CHECKED BY : K. D. LAYNE	DATE : 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. 5/1/06R	MAA/KMM

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STD. NO. BAS10 (SHT 19)

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF	
STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION	
GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR	
UNTREATED - EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

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