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CONTRACT: C203580 TIP PROJECT: R-2603

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

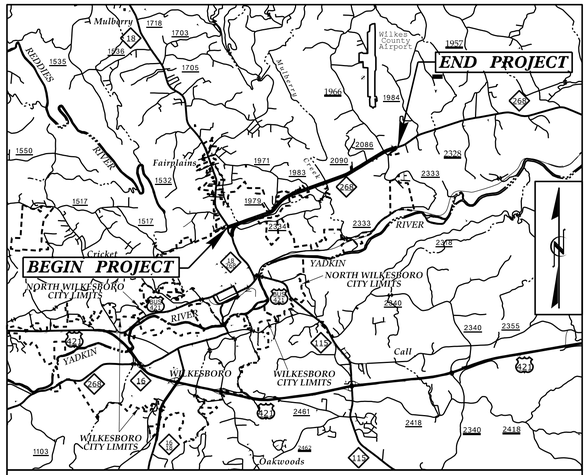
WILKES COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2603		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
36001.1.2	STP-0268(15)	PE
36001.2.1	STP-0268(16)	R/W
36001.2.U1	STP-0268(16)	UTILITIES
36001.3.FR1	STP-0268(17)	CONSTR.

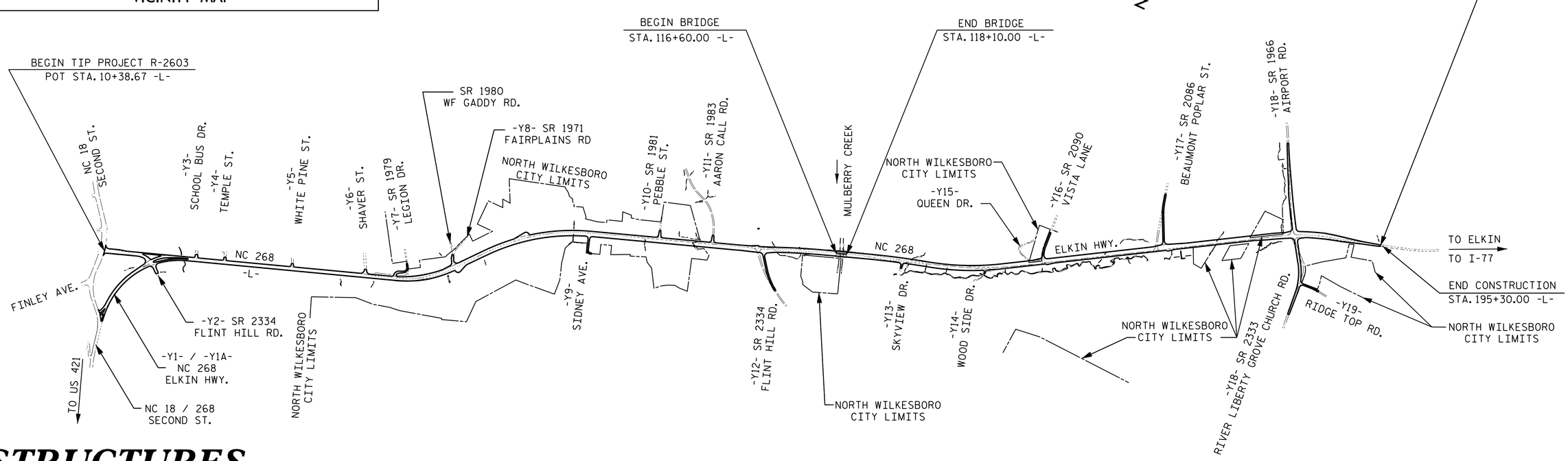
LOCATION: NC 268 FROM MULTI–LANES EAST OF NC 18 TO SR 1966 (AIRPORT ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, STRUCTURES, CULVERT AND WALLS



VICINITY MAP

NAD 83/95



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2015 = 20,540
ADT 2035 = 26,400
K = 10 %
D = 65 %
T = 6 % *
V = **
* TTST 2% + DUAL 4%
FUNC. CLASS. = REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT R–2603 = 3.468 mi.
LENGTH OF STRUCTURE PROJECT R–2603 = 0.028 mi.
TOTAL LENGTH OF TIP PROJECT R–2603 = 3.496 mi.

LENGTH OF PROJECT BASED ON –L–

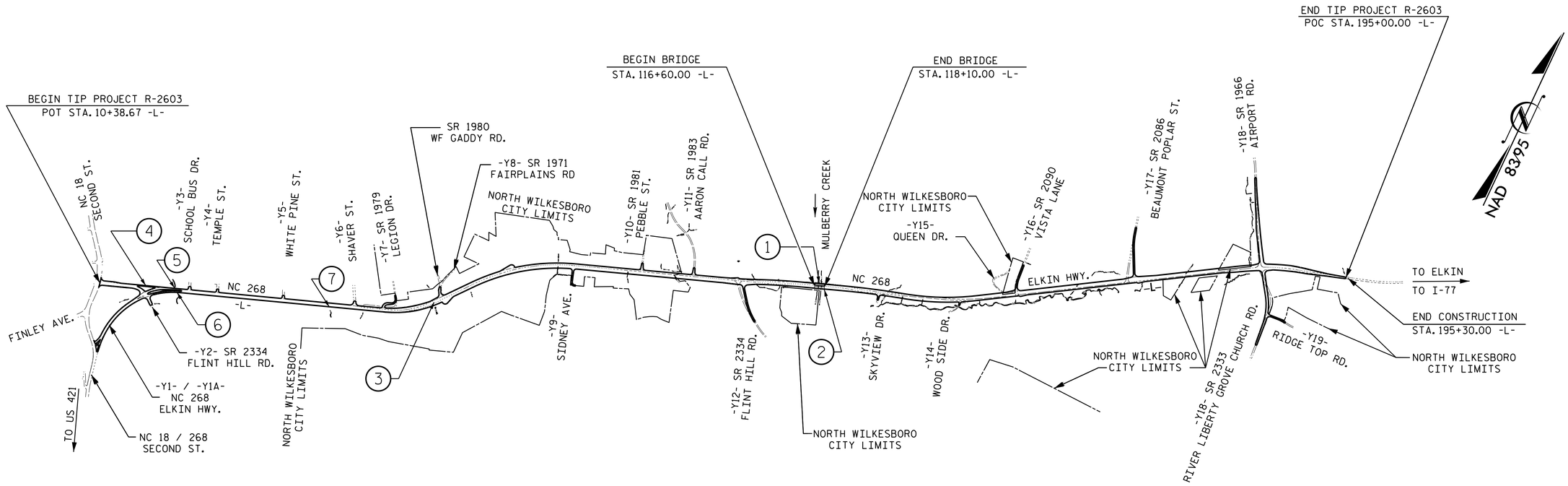
Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE: SEPTEMBER 15, 2015

D. R. CALHOUN, P.E.
PROJECT ENGINEER

MARC G. CHEEK, P.E.
PROJECT DESIGN ENGINEER



INDEX

STR No.	STATION	DESCRIPTION	SHEET NUMBERS
1	117+35.00 -L- (LEFT LANE)	EXISTING BRIDGE No. 83 (2 BAR METAL RAIL RETROFIT)	S-1 THRU S-5
2	117+35.00 -L- (RIGHT LANE)	BRIDGE ON NC 268 OVER MULBERRY CREEK	S-6 THRU S-47
3	59+43.00 -L-	SINGLE 8' X 8' BOX CULVERT	C-1 THRU C-10
4	14+84.73 -L-	PRECAST GRAVITY RETAINING WALL #1	W-1 THRU W-2
5	28+76.00 -Y1A-	MSE RETAINING WALL #2	W-3
6	29+00.00 -Y1-	MSE RETAINING WALL #3	W-4
7	44+18.00 -L-	MSE RETAINING WALL #4	W-5
-	-	MSE RETAINING WALL DETAILS	W-6 THRU W-10

PROJECT NO. R-2603

WILKES COUNTY

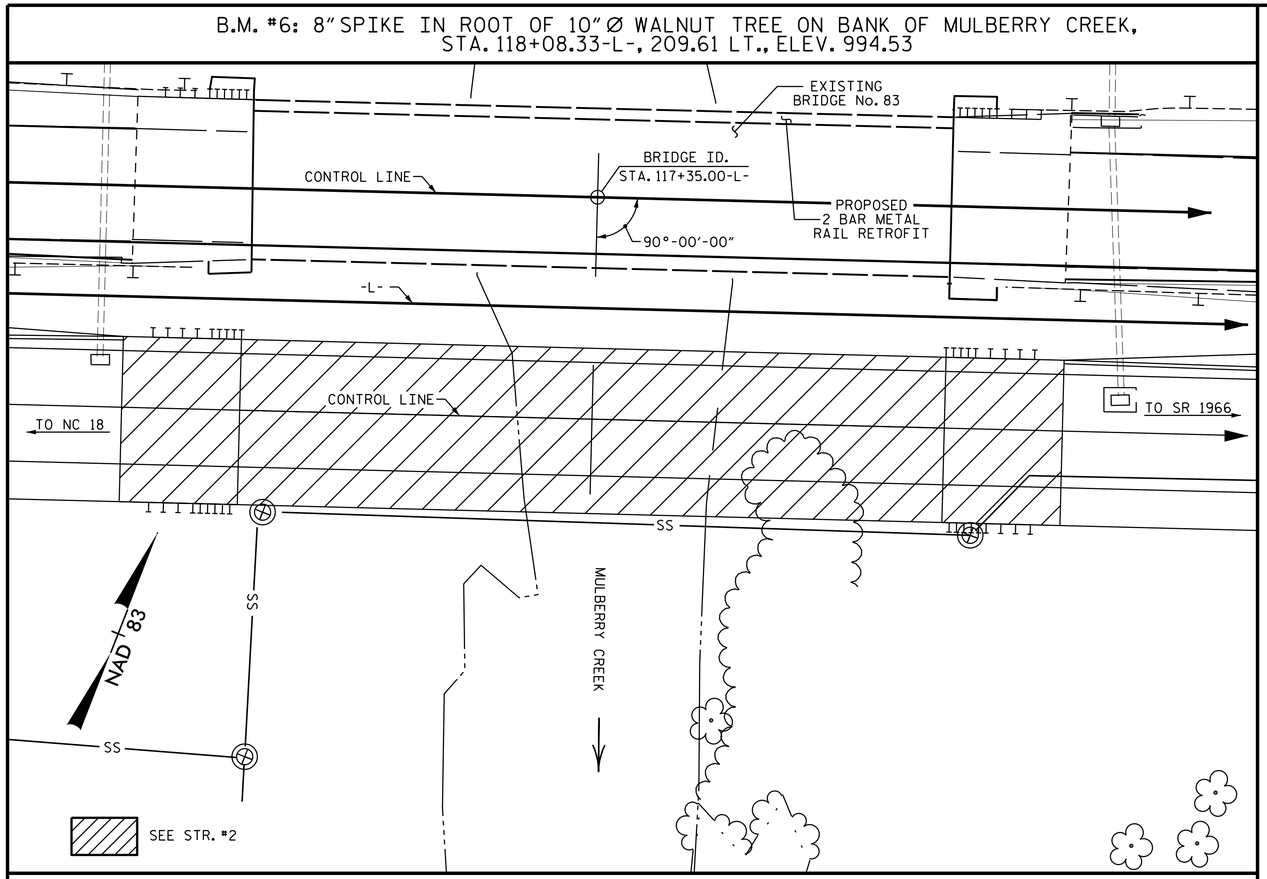
STATION:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

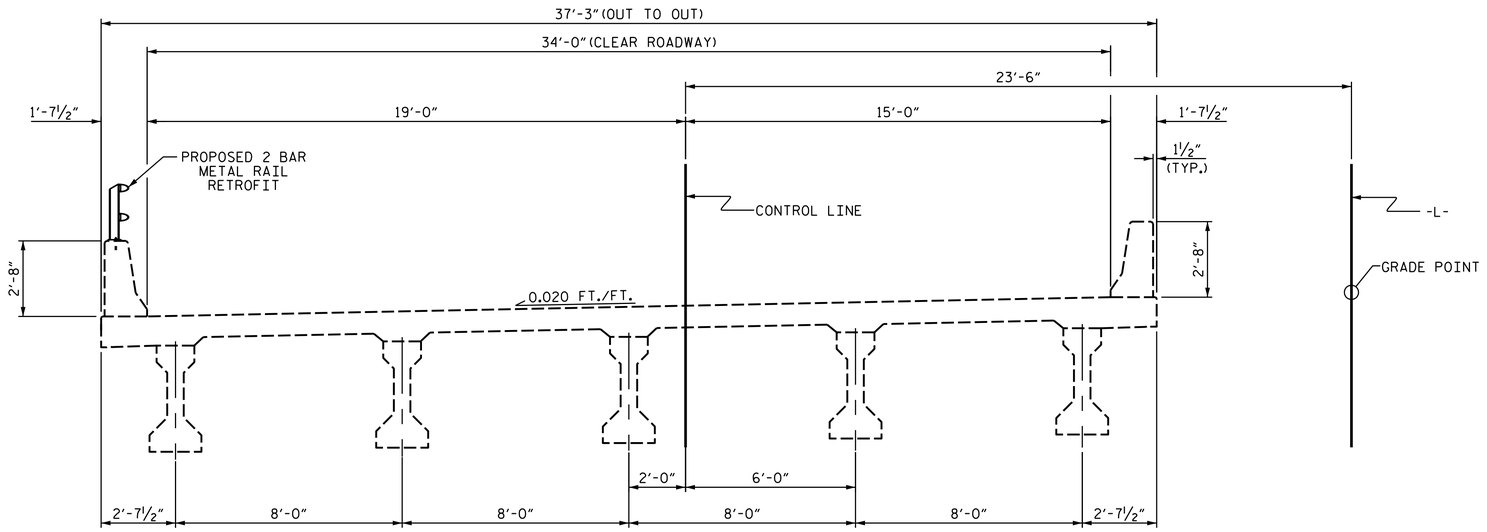
STRUCTURE INDEX

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

DRAWN BY : B.N. GRADY DATE : 6/5/15
CHECKED BY : M.G. CHEEK DATE : 6/5/15



LOCATION SKETCH



TYPICAL SECTION

DRAWN BY : H. T. BARBOUR DATE : 12-17-14
CHECKED BY : W.J. HARRIS DATE : 6-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 6-15

F.A. PROJECT No.: STP-0268(17)

NOTES

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

THE PROPOSED END POSTS SHALL BE ATTACHED TO THE EXISTING LEFT SIDE BARRIER RAIL USING ADHESIVELY ANCHORED REINFORCING STEEL AS SHOWN. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YEILD LOAD OF THE REINFORCING STEEL IS 3 KIPS. FOR ADHESIVELY ANCHORED REINFORCING, SEE THE STANDARD SPECIFICATIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, 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. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO THE PRICE BID FOR 2 BAR METAL RAIL RETROFIT.

TOTAL BILL OF MATERIAL

2 BAR METAL RAIL RETROFIT =	140.25 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
Douglas R. Calhoun
430196F9D5E0429...
7/22/2015

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
65496D6EBAA3B405...
7/22/2015

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

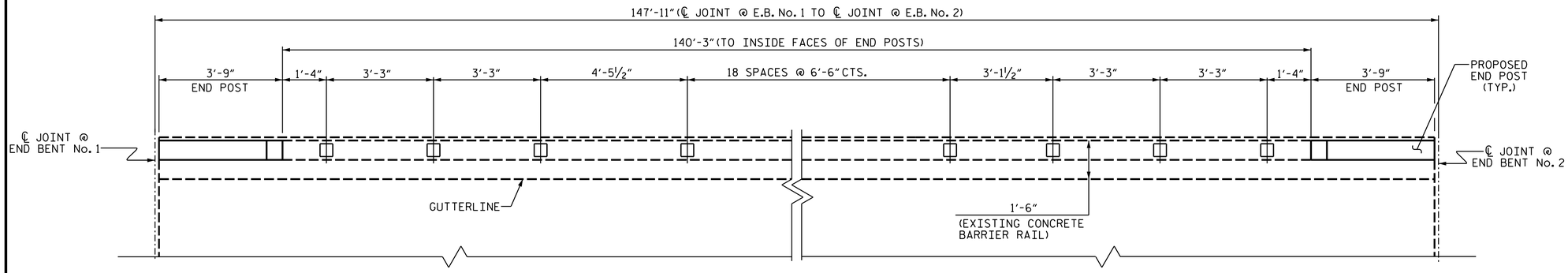
SHEET 1 OF 5 BRIDGE No. 83

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EXISTING BRIDGE No. 83 ON NC 268 OVER MULBERRY CREEK BETWEEN SR 2334 AND SR 1966

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

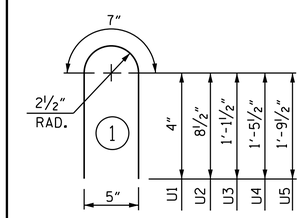
STR. #1



BILL OF MATERIAL FOR 2 END POSTS

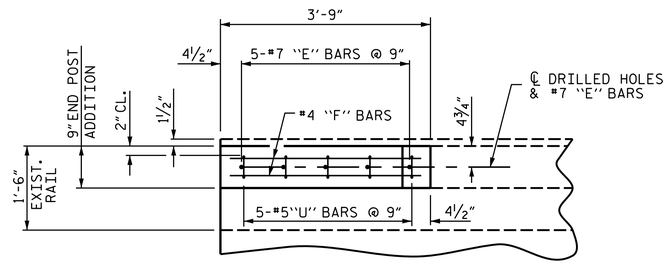
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	2	#7	STR	1'-1"	4
✳E2	2	#7	STR	1'-6"	6
✳E3	2	#7	STR	1'-10"	7
✳E4	2	#7	STR	2'-3"	9
✳E5	2	#7	STR	2'-7"	11
✳F1	4	#4	STR	3'-7"	10
✳F2	4	#4	STR	2'-3"	6
✳F3	4	#4	STR	3'-5"	9
✳U1	2	#5	1	1'-2"	2
✳U2	2	#5	1	2'-0"	4
✳U3	2	#5	1	2'-8"	6
✳U4	2	#5	1	3'-6"	7
✳U5	2	#5	1	4'-2"	9
✳EPOXY COATED REINF. STEEL				LBS.	90
CLASS AA CONCRETE				CU. YDS.	0.3

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PLAN OF RAIL POST SPACING



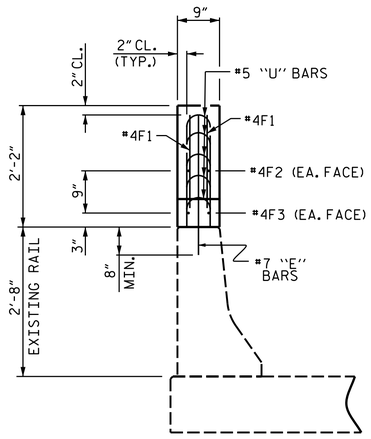
PLAN OF END POST

NOTES

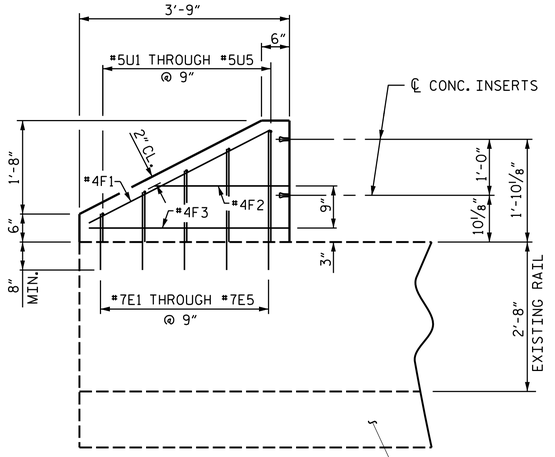
FOR CONCRETE INSERTS, SEE "END OF RAIL DETAILS", SHEET 5 OF 5.

THE TOTAL COST FOR THE END POSTS IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF 2 BAR METAL RAIL RETROFIT.

ALL REINFORCING STEEL IN END POST SHALL BE EPOXY COATED.



END VIEW



ELEVATION

END POST DETAILS

DRAWN BY : B. A. DUKE DATE : 5-26-15
CHECKED BY : W.J. HARRIS DATE : 6-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 6-15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek Jr. 8549D6EBAA3B405... 7/22/2015

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

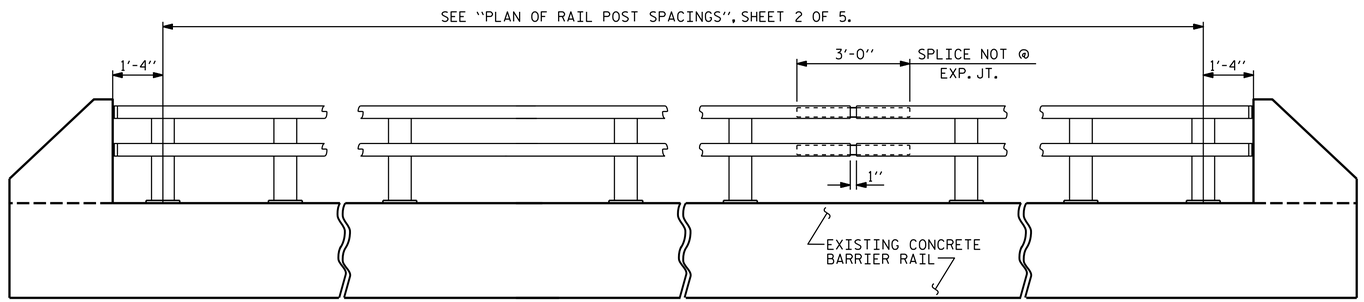
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACING AND END POST DETAILS FOR 2 BAR METAL RAIL RETROFIT

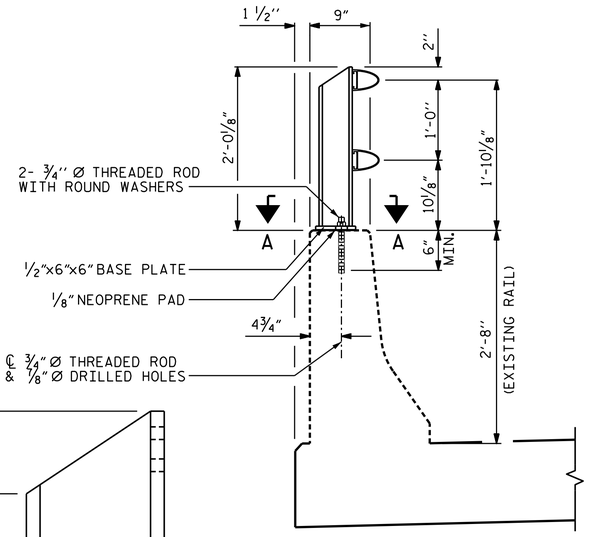
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			47

STR. #1



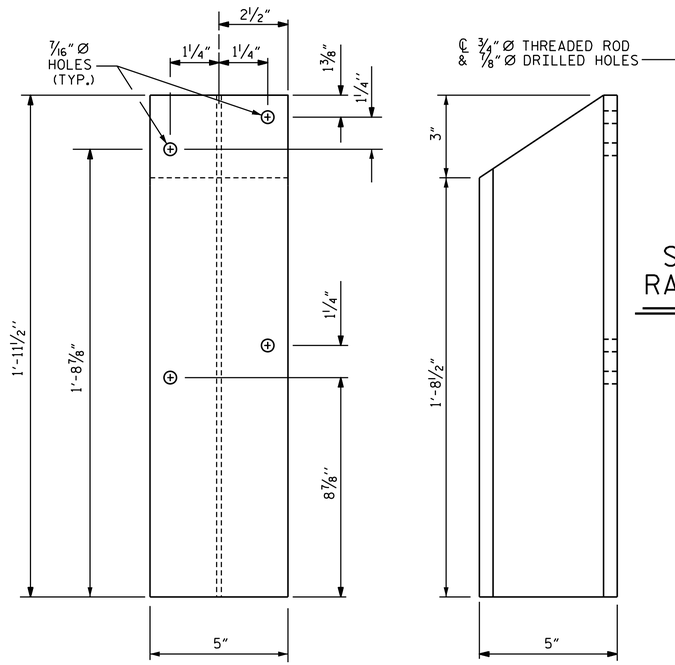
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 5 OF 5.



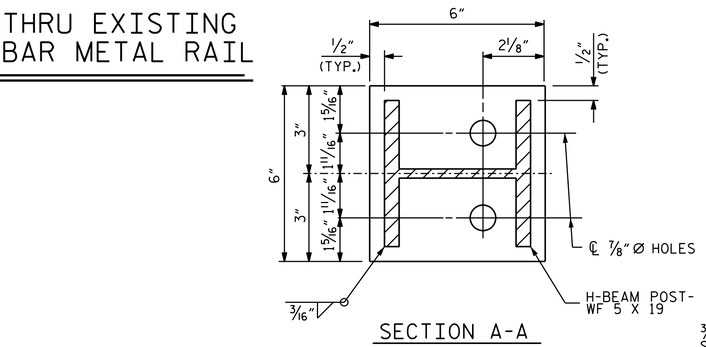
NOTE: THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE SEMI-ELLIPTICAL RAIL SPECIFIED FOR THIS STRUCTURE IS NOT THE SAME SEMI-ELLIPTICAL RAIL THAT THE NCDOT TYPICALLY USES IN A 2-BAR METAL RAIL.

SECTION THRU EXISTING RAIL & 2-BAR METAL RAIL

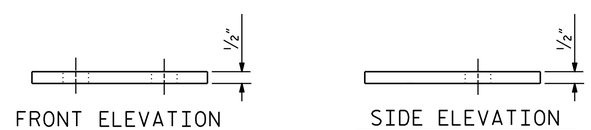


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



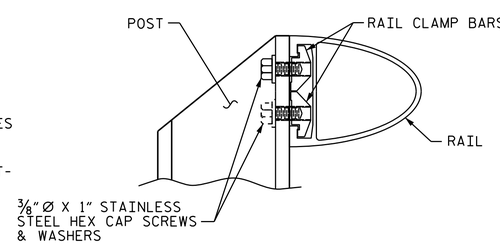
SECTION A-A



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS

PAY LENGTH = 140.25 LIN. FT.



RAIL TO POST CONNECTION DETAIL

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 5 OF 5.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

NEOPRENE PADS SHALL BE 60 DUROMETER HARDNESS.

FOR 2 BAR METAL RAIL RETROFIT, SEE SPECIAL PROVISIONS.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL RETROFIT

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

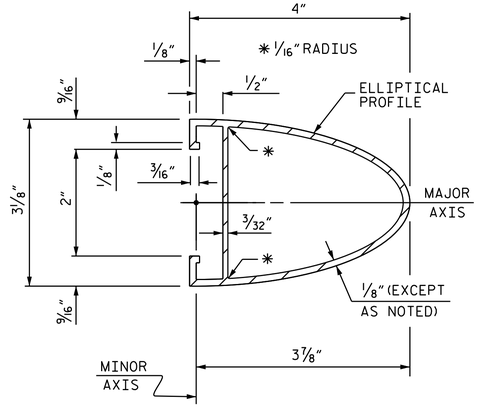
DRAWN BY : B. A. DUKE DATE : 5-14-14
CHECKED BY : W.J. HARRIS DATE : 6-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 6-15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.

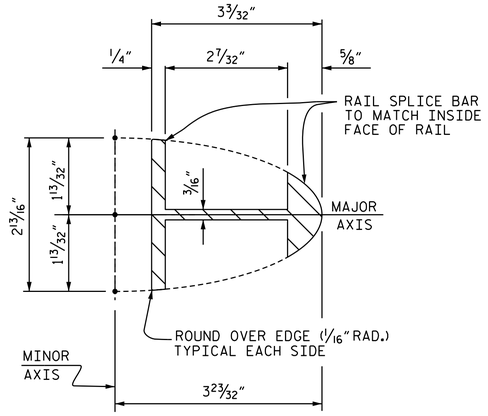
7/22/2015

STR. #1



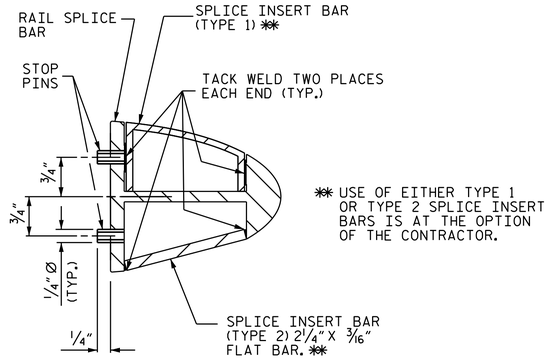
SECTION B-B

(TYPICAL SECTION THRU RAIL)



SECTION C-C

RAIL SPLICE BAR
(RAIL NOT SHOWN FOR CLARITY)



** USE OF EITHER TYPE 1 OR TYPE 2 SPLICE INSERT BARS IS AT THE OPTION OF THE CONTRACTOR.

SECTION D-D

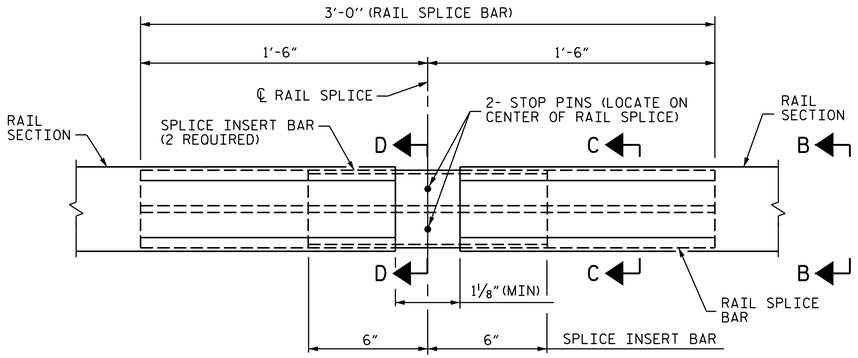
NOTES

THE CONTRACTOR SHALL USE ADHESIVELY ANCHORED THREADED RODS TO PERMANENTLY ATTACH THE METAL RAIL POSTS TO THE TOP OF THE EXISTING LEFT CONCRETE BARRIER RAIL. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4"Ø THREADED ROD IS 3 KIPS. FOR ADHESIVELY ANCHORED THREADED RODS, SEE THE STANDARD SPECIFICATIONS.

THE COST OF THE THREADED RODS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF 2 BAR METAL RAIL RETROFIT.

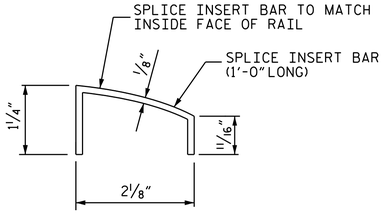
AFTER NUTS HAVE BEEN TIGHTENED, THE THREADED ROD THREADS SHALL BE DEFORMED TO PREVENT REMOVAL OF NUTS. TACK WELDING OF NUTS TO THREADED RODS, TO PREVENT THEFT, IS PERMITTED.

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

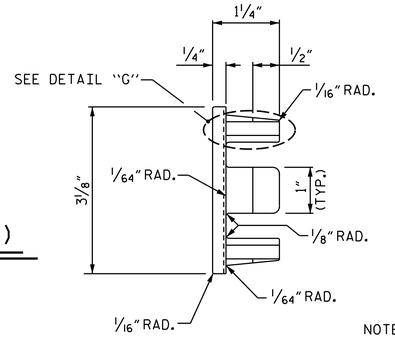


PLAN OF RAIL SPLICE ASSEMBLY

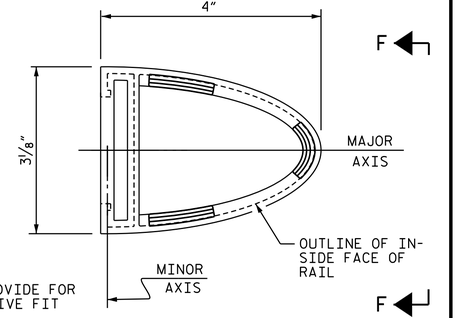
(TYPICAL AT RAIL SPLICE LOCATIONS)



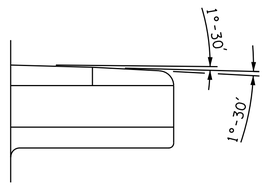
SPLICE INSERT BAR DETAIL (TYPE 1)



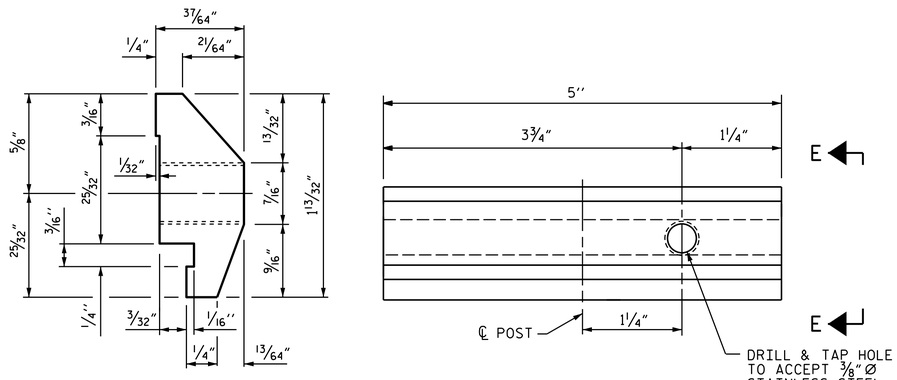
VIEW F-F



RAIL END CAP DETAIL



DETAIL G



VIEW E-E

CLAMP BAR DETAIL

(4 REQUIRED PER POST)

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

2 BAR METAL RAIL RETROFIT

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

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr. 7/22/2015

DRAWN BY : B. A. DUKE DATE : 5-23-14
CHECKED BY : W.J. HARRIS DATE : 6-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 6-15

STR. #1

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½''.

B. 1 - ¾'' Ø X 1⅝'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 1⅝'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾''Ø X 1⅝'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE ¾''Ø X 1⅝'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

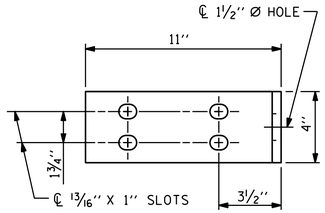
D. CLAMP BARS (SEE SHEET 4 OF 5).

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

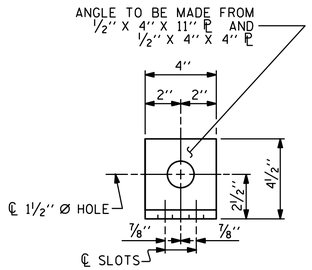
THE ¾'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR 2 BAR METAL RAIL RETROFIT.

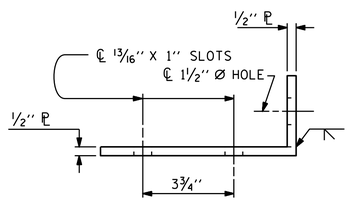
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾'' Ø X 1⅝'' BOLT WITH WASHER SHALL BE REPLACED WITH A ¾''Ø X 6½'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾'' Ø X 1⅝'' BOLT SHALL APPLY TO THE ¾''Ø X 6 ½'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



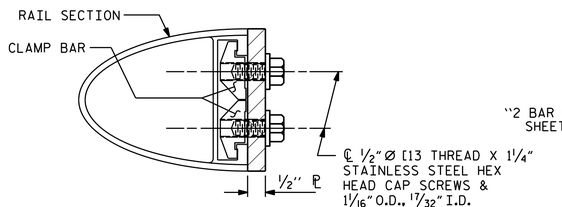
ELEVATION



END VIEW (FIX)

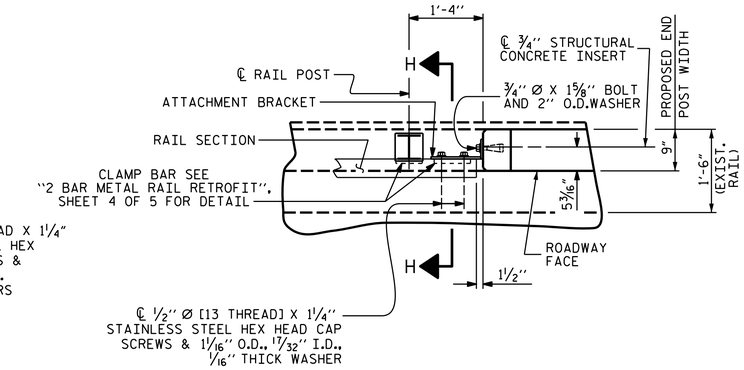


TOP VIEW

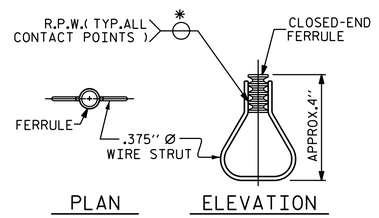


SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST



STRUCTURAL CONCRETE INSERT

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

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END OF RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

DocuSigned by: Marshall G. Creek, Jr. 6549D6EBAA3B405...

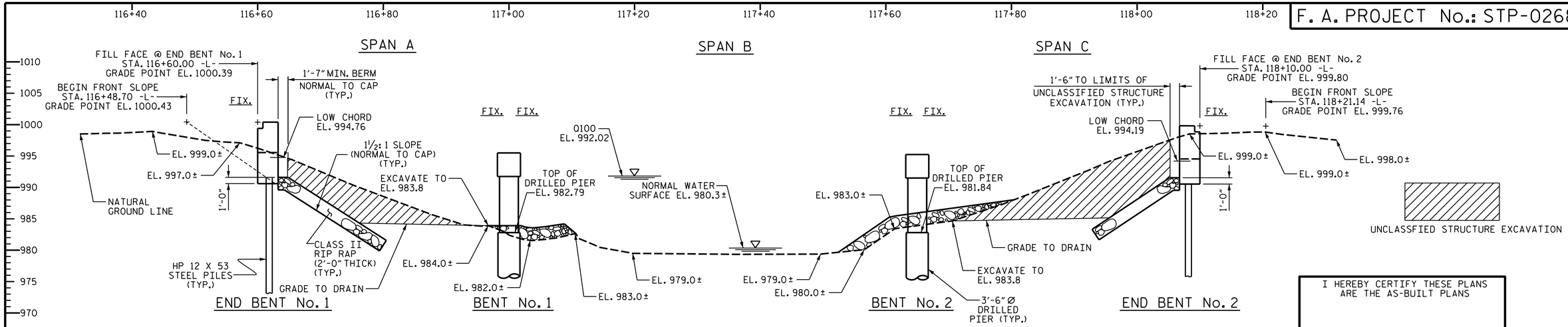
7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : B. A. DUKE DATE : 5-23-14
CHECKED BY : W.J. HARRIS DATE : 6-15
DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 6-15

STR. #1

F. A. PROJECT No.: STP-0268(17)



UNCLASSFIED STRUCTURE EXCAVATION

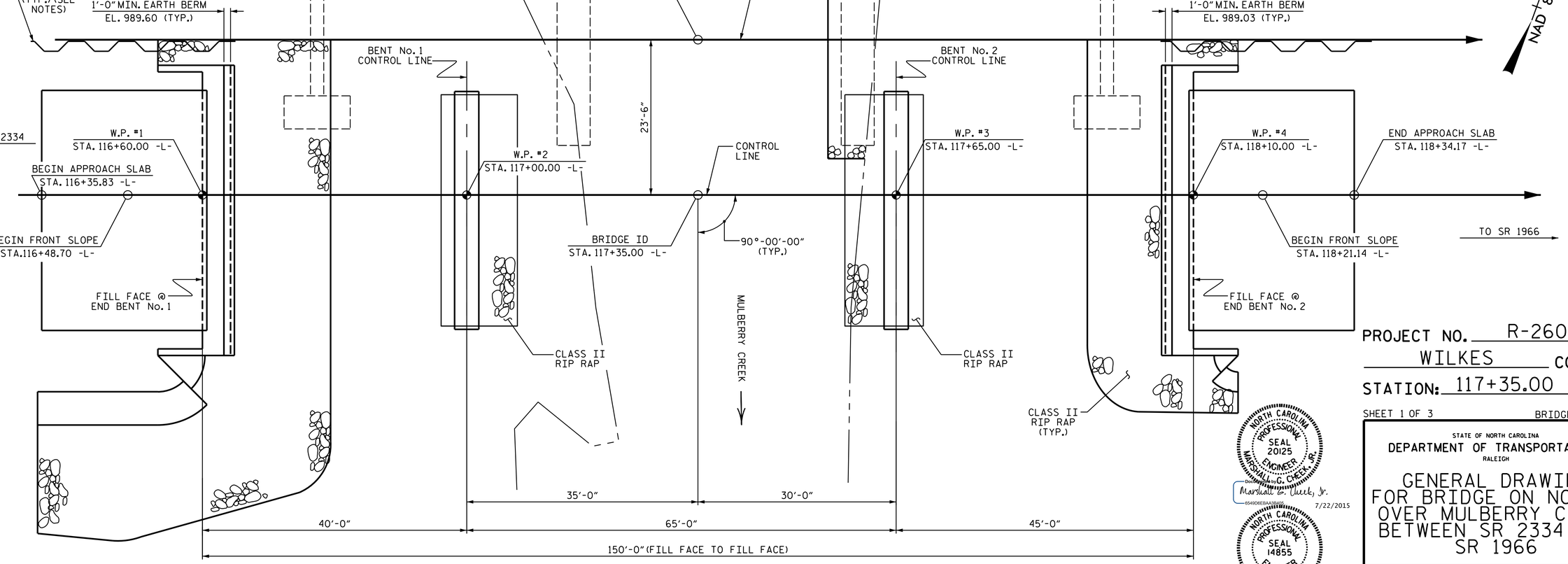
I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

SECTION ALONG CONTROL LINE

-4.7284% -0.3898%

GRADE DATA

PI = 113+77.70 -L-
EL. = 1,001.49
L = 510'



PLAN

PILES & COLUMNS NOT SHOWN FOR CLARITY

DRAWN BY : H. T. BARBOUR DATE : 12-16-14
CHECKED BY : B. N. GRADY DATE : 4-29-15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.
Digitally signed by Marshall G. Creek, Jr.
6540D0EE8AA3B9...
7/22/2015

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALLOWAY
Douglas R. Calloway
430196F9D5E0429...
7/22/2015

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

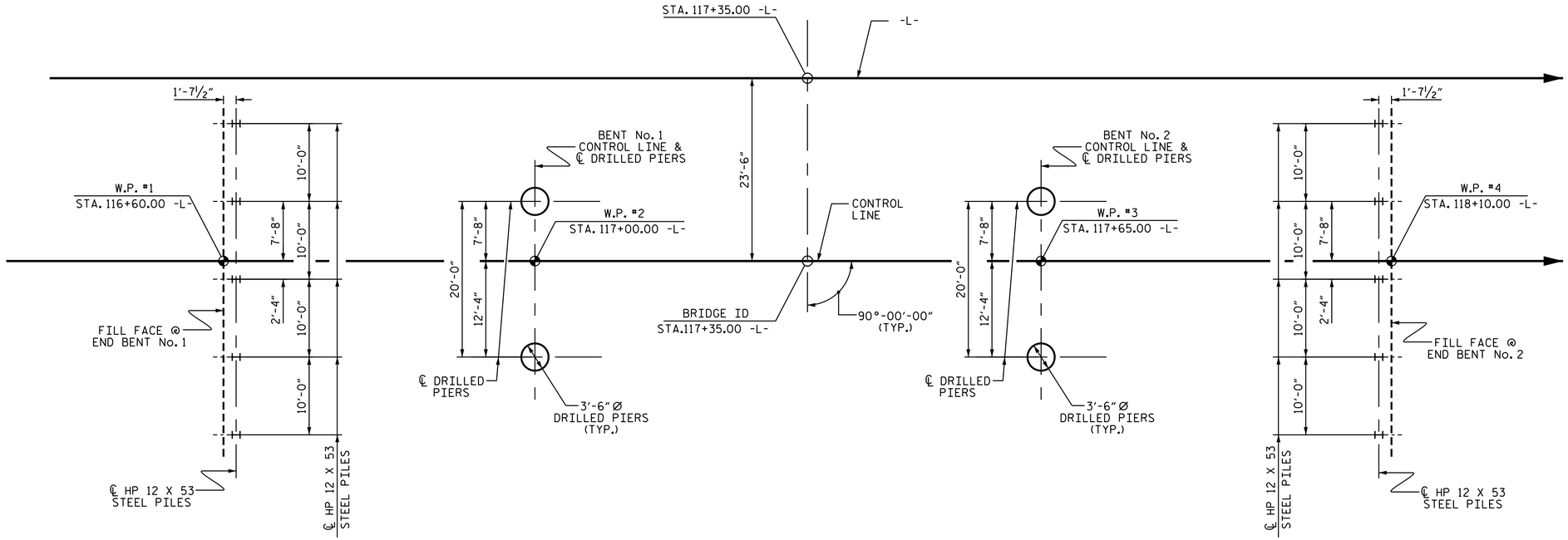
SHEET 1 OF 3 BRIDGE NO. 790

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON NC 268 OVER MULBERRY CREEK BETWEEN SR 2334 AND SR 1966

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			47

STR. #2



END BENT No. 1 | BENT No. 1 | BENT No. 2 | END BENT No. 2

FOUNDATION LAYOUT

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 183 TONS PER PILE.

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

INSTALL DRILLED PIERS AT BENT No. 1 TO A TIP ELEVATION NO HIGHER THAN 940.0 FT. AND WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 422.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No. 1. IF REQUIRED, DO NOT EXTEND STEEL CASING BELOW ELEVATION 970.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1 IS ELEVATION 956.5 FT. THE SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 438.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65 TSF.

INSTALL DRILLED PIERS AT BENT No. 2 TO A TIP ELEVATION NO HIGHER THAN 940.0 FT. AND WITH THE REQUIRED TIP RESISTANCE.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No. 2. IF REQUIRED, DO NOT EXTEND STEEL CASING BELOW ELEVATION 970.0 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 2 IS ELEVATION 963.5 FT. THE SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENTS No. 1 AND 2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

SPT IS REQUIRED FOR DRILLED PIERS AT BENTS No. 1 AND 2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 117.5 TONS PER PILE.

DRIVE PILES AT END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 196 TONS PER PILE

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON NC 268 OVER MULBERRY CREEK BETWEEN SR 2334 AND SR 1966

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : H. T. BARBOUR DATE : 12-17-14

CHECKED BY : D. HODGE DATE : 4-15

21-JUL-2015 08:31
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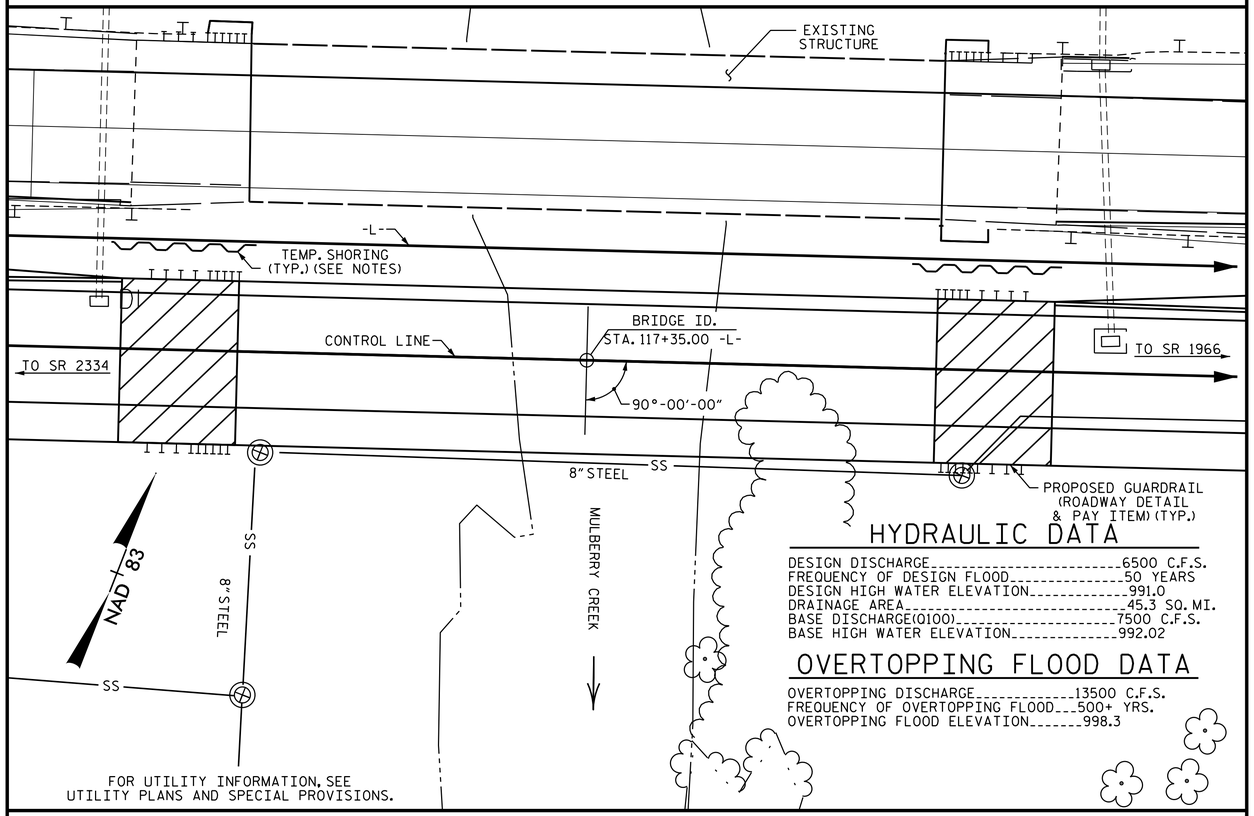
bngrady

STR. #2

B.M. #6: 8" SPIKE IN ROOT OF 10" Ø WALNUT TREE ON BANK OF MULBERRY CREEK, STA. 118+08.33 -L-, 209.61' LT., ELEV. 994.53



HYDRAULIC DATA

DESIGN DISCHARGE	6500 C.F.S.
FREQUENCY OF DESIGN FLOOD	50 YEARS
DESIGN HIGH WATER ELEVATION	991.0
DRAINAGE AREA	45.3 SQ. MI.
BASE DISCHARGE(0100)	7500 C.F.S.
BASE HIGH WATER ELEVATION	992.02

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	13500 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	998.3

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS".

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 27 FT. (LT.) AND 42 FT. (RT.) 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 EXISTING FOOTINGS AS INDICATED IN THE PLAN VIEW ARE 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 CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THERE IS A FOOTING FROM A PREVIOUS EXISTING BRIDGE NEAR THE LOCATION OF BENT No. 2 THAT SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR UNCLASSFIED STRUCTURE EXCAVATION.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVAL OF THE EXISTING FOOTING SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR PLACING LOAD ON STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP. ACCESS	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SQ. FT.	SQ. FT.
SUPERSTRUCTURE									5625	6283
END BENT No. 1								LUMP SUM		
BENT No. 1		60.67	25.00	25.58	2	2				
BENT No. 2		39.00	45.00	23.68	2	2				
END BENT No. 2								LUMP SUM		
TOTAL	LUMP SUM	99.67	70.00	49.26	4	4	1	LUMP SUM	5625	6283

	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES		2 BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	CU.YDS.	LUMP SUM	LBS.	LBS.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	TONS	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		LUMP SUM			585.67			140.83	148.33	148.33			LUMP SUM
END BENT No. 1	27.2		3348			5	105				130	145	
BENT No. 1	22.0		11382	2158							60	65	
BENT No. 2	22.3		11351	2148							60	65	
END BENT No. 2	27.2		3348			5	200				110	120	
TOTAL	98.7	LUMP SUM	29429	4306	585.67	10	305	140.83	148.33	148.33	360	395	LUMP SUM

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

Docusigned by: Marshall G. Creek, Jr. 6541D6EBAA3B405...

7/22/2015

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON NC 268 OVER MULBERRY CREEK BETWEEN SR 2334 AND SR 1966

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			47

STR. #2

DRAWN BY : H. T. BARBOUR DATE : 12-16-14

CHECKED BY : B. N. GRADY DATE : 4-29-15

21-JUL-2015 08:31
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bngrady

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE							COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.04	--	1.75	0.887	1.37	B	ER	37.7	0.974	1.41	C	I	16.917	0.80	0.974	1.04	B	I	31.417	
		HL-93(Opr)	N/A	--	1.77	--	1.35	0.887	1.77	B	ER	37.7	0.974	1.83	C	I	16.917	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.33	47.960	1.75	0.918	1.73	C	I	21.146	0.974	1.61	C	I	16.917	0.80	0.827	1.33	B	I	31.417	
		HS-20(Opr)	36.000	--	2.09	75.257	1.35	0.918	2.24	C	I	21.146	0.974	2.09	C	I	16.917	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.91	39.333	1.4	0.918	4.14	C	I	21.146	0.974	3.85	C	I	16.917	0.80	0.827	2.91	B	I	31.417	
		SNGARBS2	20.000	--	2.21	44.214	1.4	0.918	3.36	C	I	16.917	0.974	3.02	C	I	16.917	0.80	0.827	2.21	B	I	31.417	
		SNAGRIS2	22.000	--	2.11	46.432	1.4	0.918	3.26	C	I	16.917	0.974	2.93	C	I	16.917	0.80	0.827	2.11	B	I	31.417	
		SNCOTTS3	27.250	--	1.45	39.539	1.4	0.918	2.07	C	I	21.146	0.974	1.95	C	I	16.917	0.80	0.827	1.45	B	I	31.417	
		SNAGGRS4	34.925	--	1.23	42.874	1.4	0.918	1.84	C	I	21.146	0.974	1.83	C	I	16.917	0.80	0.827	1.23	B	I	31.417	
		SNS5A	35.550	--	1.20	42.640	1.4	0.918	1.79	C	I	21.146	0.974	1.98	C	I	16.917	0.80	0.827	1.20	B	I	31.417	
		SNS6A	39.950	--	1.11	44.220	1.4	0.918	1.69	C	I	21.146	0.974	1.92	C	I	16.917	0.80	0.827	1.11	B	I	31.417	
		SNS7B	42.000	--	1.05	44.282	1.4	0.918	1.61	C	I	21.146	0.974	2.02	C	I	16.917	0.80	0.827	1.05	B	I	31.417	
	TTST	TNAGRIT3	33.000	--	1.35	44.606	1.4	0.918	2.08	C	I	21.146	0.974	2.19	C	I	16.917	0.80	0.827	1.35	B	I	31.417	
		TNT4A	33.075	--	1.36	44.963	1.4	0.918	2.10	C	I	21.146	0.974	2.02	C	I	16.917	0.80	0.827	1.36	B	I	31.417	
		TNT6A	41.600	--	1.12	46.497	1.4	0.918	1.77	C	I	21.146	0.974	2.15	C	I	16.917	0.80	0.827	1.12	B	I	31.417	
		TNT7A	42.000	--	1.13	47.318	1.4	0.918	1.81	C	I	21.146	0.974	1.98	C	I	16.917	0.80	0.827	1.13	B	I	31.417	
		TNT7B	42.000	--	1.17	49.303	1.4	0.918	1.88	C	I	21.146	0.974	1.84	C	I	16.917	0.80	0.827	1.17	B	I	31.417	
		TNAGRIT4	43.000	--	1.11	47.752	1.4	0.918	1.79	C	I	21.146	0.974	1.78	C	I	16.917	0.80	0.827	1.11	B	I	31.417	
		TNAGT5A	45.000	--	1.04	46.989	1.4	0.918	1.66	C	I	21.146	0.974	1.93	C	I	2.115	0.80	0.827	1.04	B	I	31.417	
		TNAGT5B	45.000	3	1.03	46.306	1.4	0.918	1.62	C	I	21.146	0.974	1.67	C	I	16.917	0.80	0.827	1.03	B	I	31.417	

LOAD FACTORS:

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

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

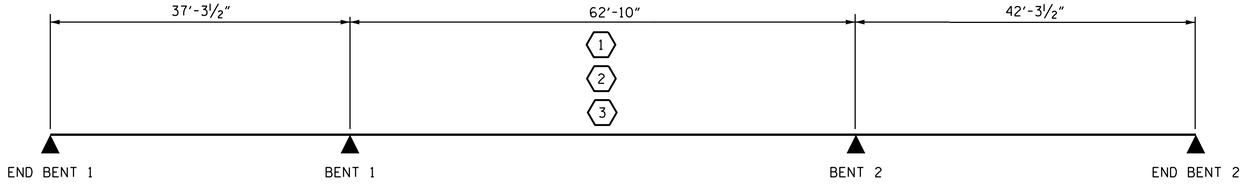
1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

(DIMENSIONS ARE BRG. TO BRG.)

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Document: 65490DEBAA3B405... Marshall G. Cheek, Jr. 7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			47

STR. #2

STD. NO. LRFR1

ASSEMBLED BY :	B. A. DUKE	DATE :	4-16-15
CHECKED BY :	B.N. GRADY	DATE :	4-22-15
DRAWN BY : MAA 1/08	REV. 11/12/08RR		MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11		MAA/GM

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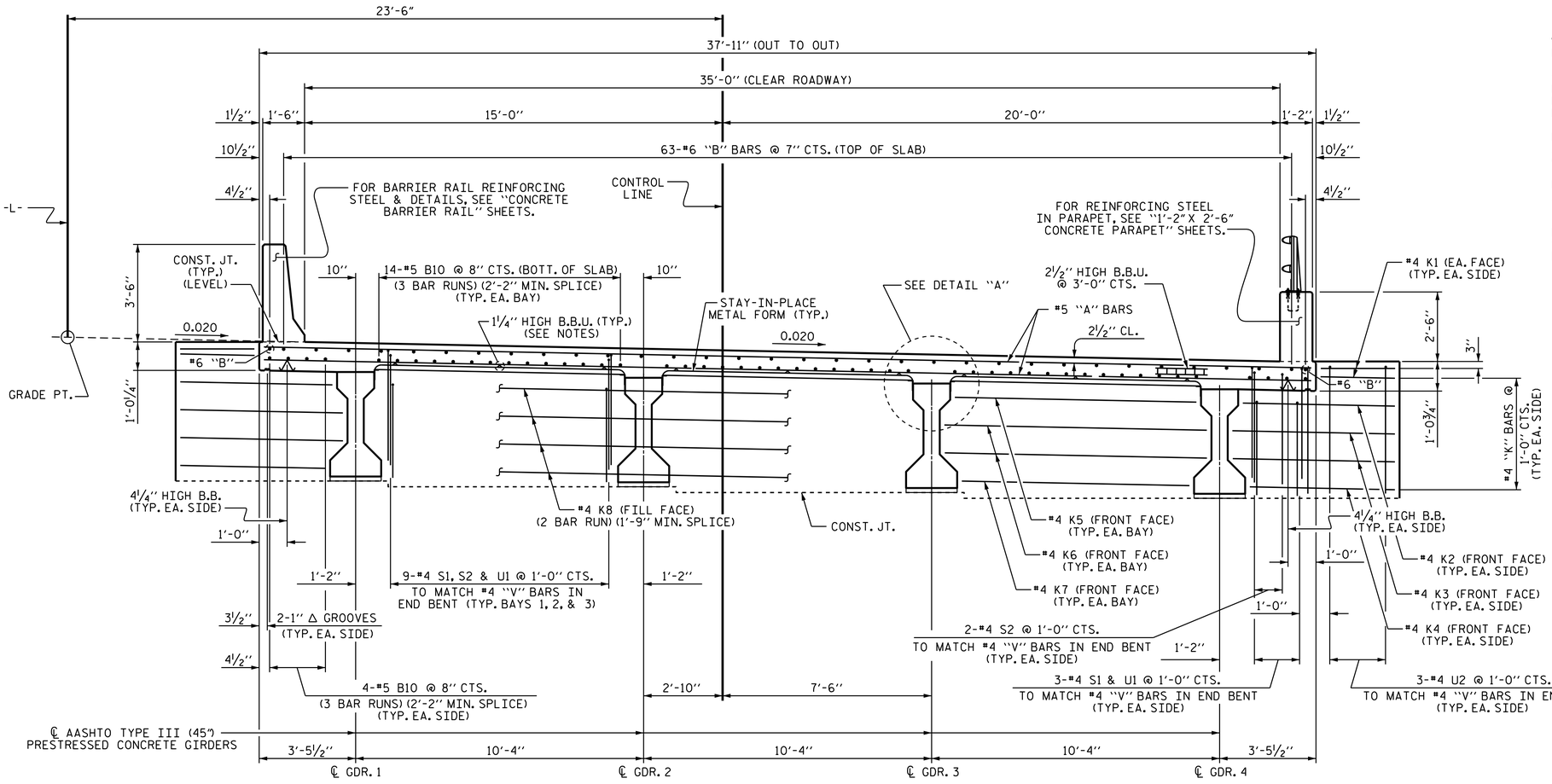
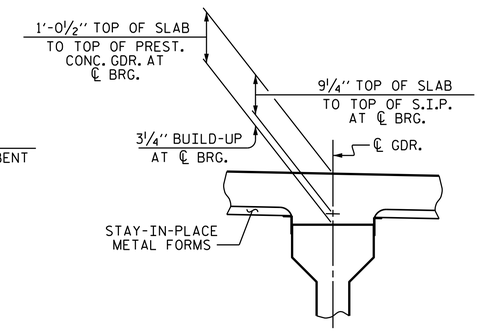
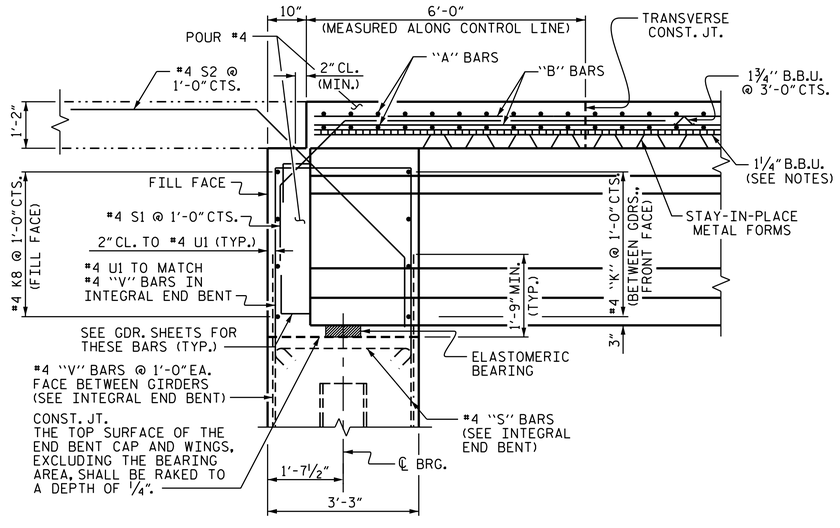


TYPICAL SECTION AT INTEGRAL END BENT



DETAIL "A"



SECTION THRU INTEGRAL END BENT DIAPHRAGM

NOTES

PROVIDE 1 ¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2 " ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

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CHECKED BY : H. T. BARBOUR DATE : 8-13
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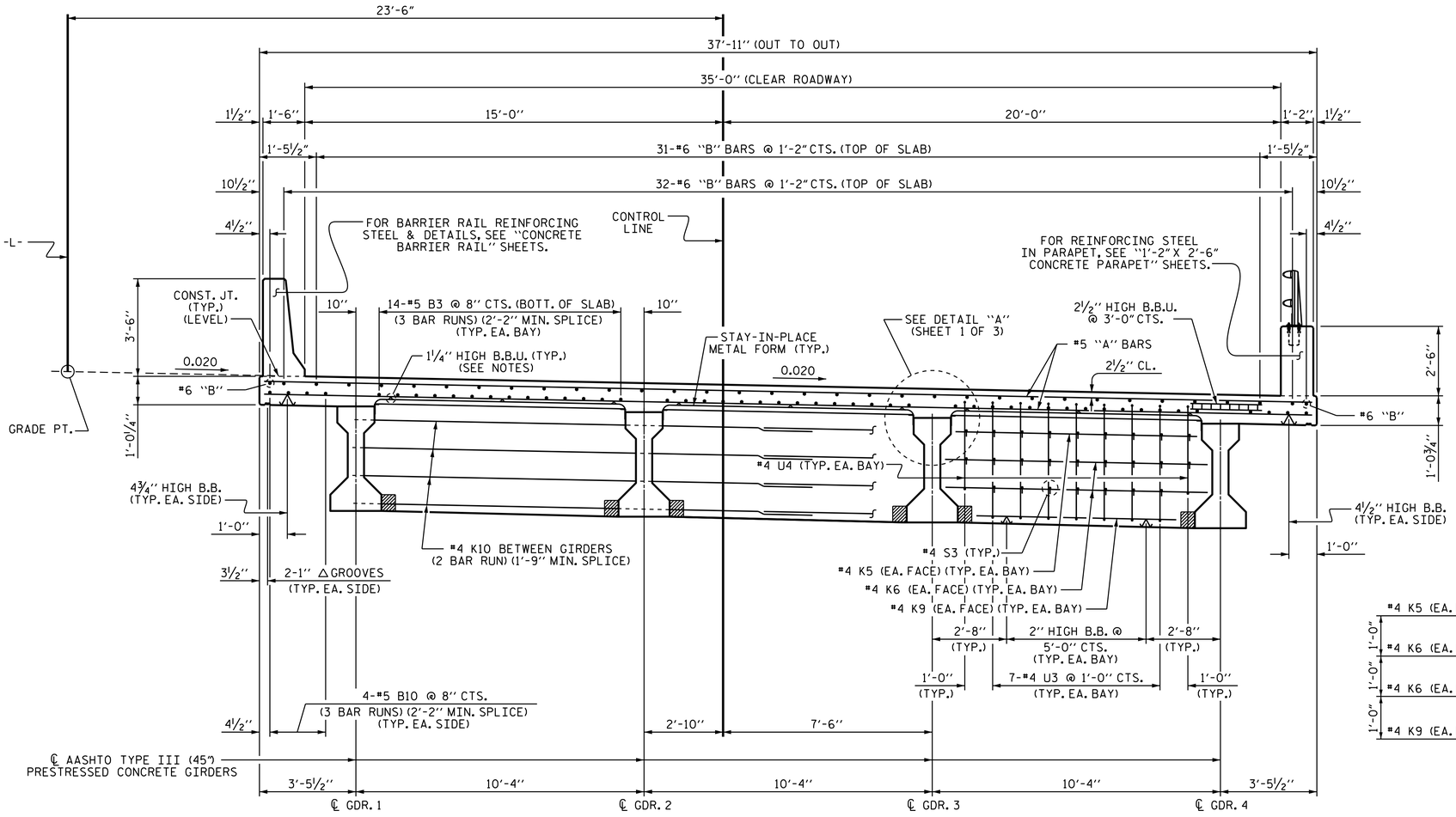
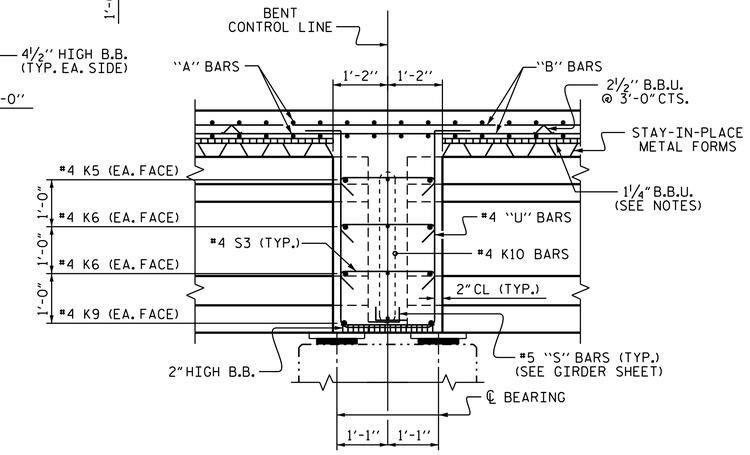
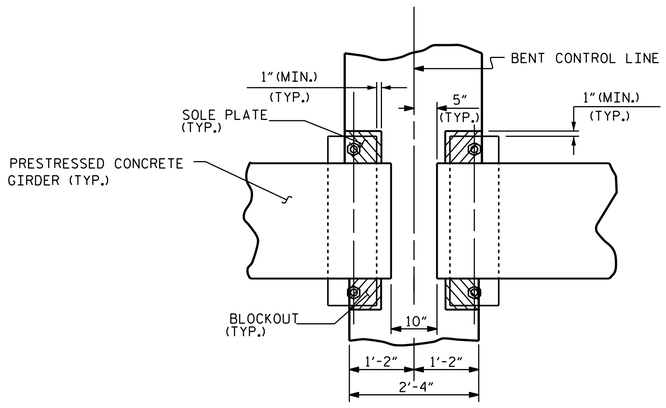
STR. #2



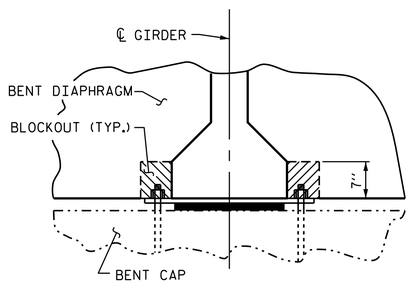
TYPICAL SECTION AT BENT DIAPHRAGM



SECTION THRU BENT DIAPHRAGM



PLAN



SECTION

BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
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NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

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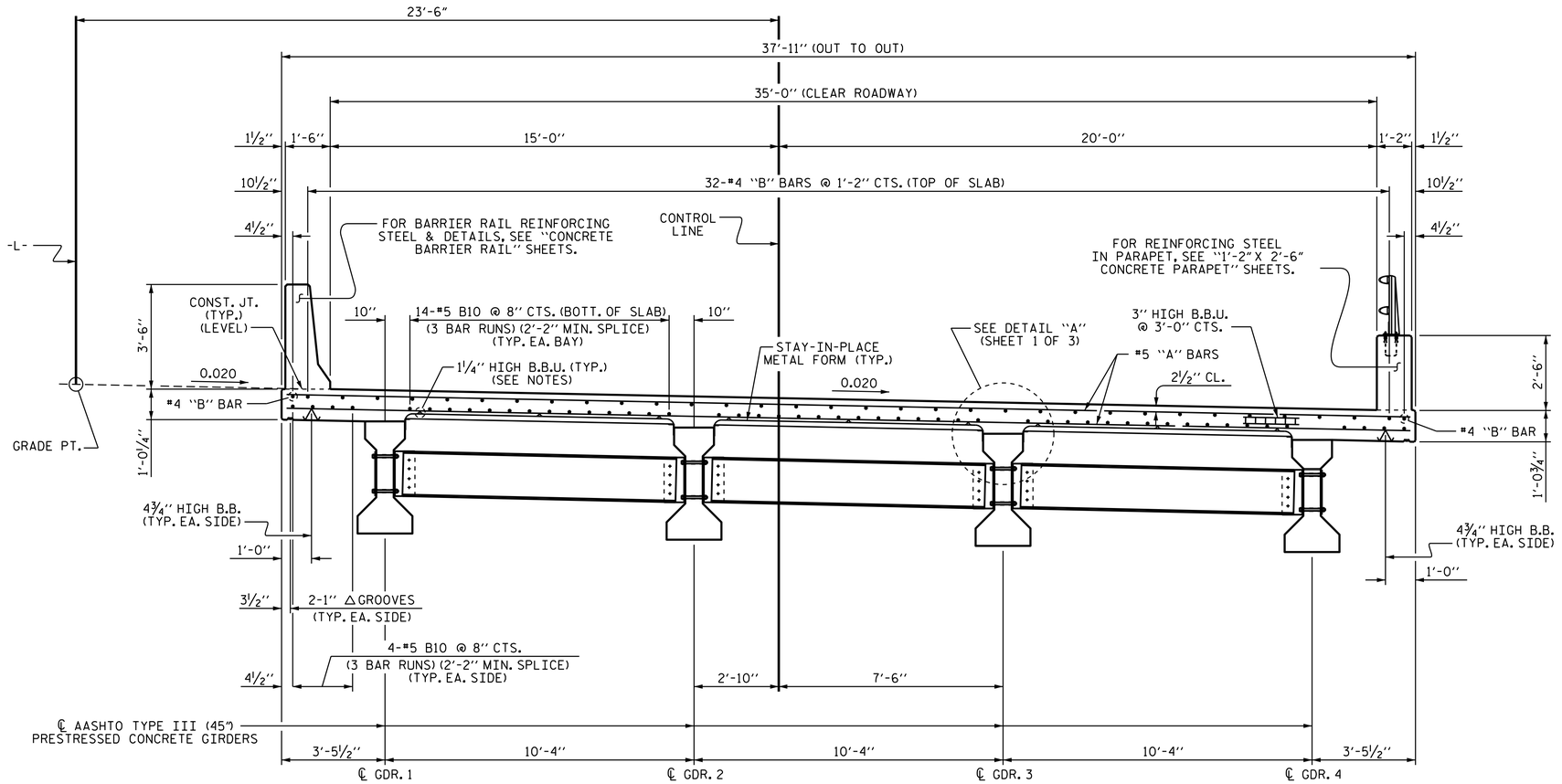

TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...
7/22/2015

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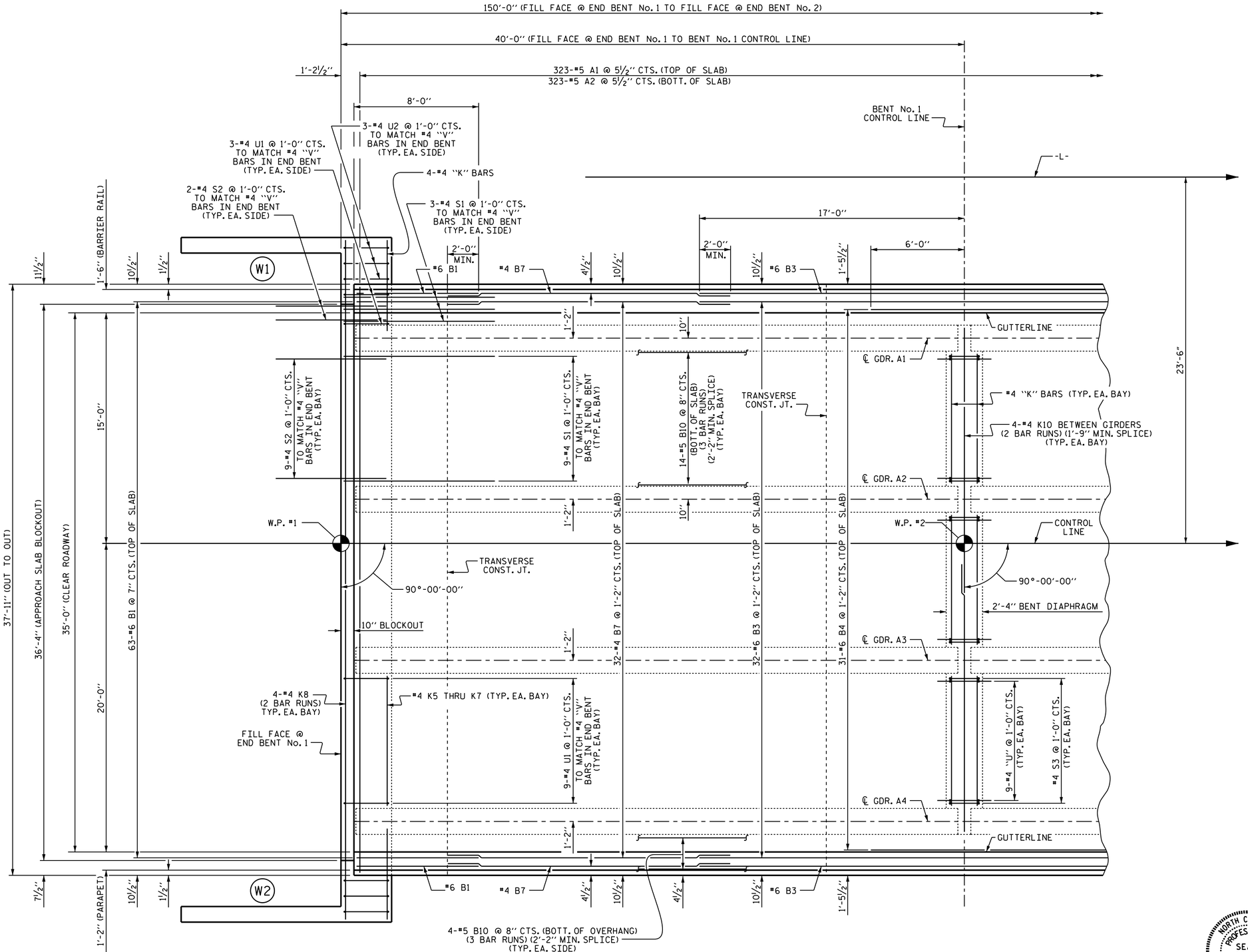

PLAN OF SPAN A

FOR INTERMEDIATE DIAPHRAGM LOCATIONS, SEE "FRAMING PLAN".
FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Digitally signed by Marshall G. Cheek, Jr.
6549D8EBAA3B405...
7/22/2015

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150'-0" (FILL FACE @ END BENT No. 1 TO FILL FACE @ END BENT No. 2)

65'-0" (BENT No. 1 CONTROL LINE TO BENT No. 2 CONTROL LINE)

323-#5 A1 @ 5½" CTS. (TOP OF SLAB)
323-#5 A2 @ 5½" CTS. (BOTT. OF SLAB)

BENT No. 1 CONTROL LINE

BENT No. 2 CONTROL LINE

-L-

24'-6"

24'-6"

9'-9"

1'-5½"

10½"

#6 B3

2'-0" MIN.

4½"

#4 B8

10½"

2'-0" MIN.

#6 B5

10½"

1'-5½"

9'-9"

23'-6"

GUTTERLINE

℄ GDR. B1

10"

14-#5 B10 @ 8" CTS. (BOTT. OF SLAB) (3 BAR RUNS) (2'-2" MIN. SPLICE) (TYP. EA. BAY)

#4 "K" BARS (TYP. EA. BAY)

4-#4 K10 BETWEEN GIRDERS (2 BAR RUNS) (1'-9" MIN. SPLICE) (TYP. EA. BAY)

#4 "K" BARS (TYP. EA. BAY)

4-#4 K10 BETWEEN GIRDERS (2 BAR RUNS) (1'-9" MIN. SPLICE) (TYP. EA. BAY)

℄ GDR. B2

W.P. #2

CONTROL LINE

W.P. #3

31-#6 B4 @ 1'-2" CTS. (TOP OF SLAB)

32-#6 B3 @ 1'-2" CTS. (TOP OF SLAB)

32-#4 B8 @ 1'-2" CTS. (TOP OF SLAB)

32-#6 B5 @ 1'-2" CTS. (TOP OF SLAB)

31-#6 B6 @ 1'-2" CTS. (TOP OF SLAB)

90°-00'-00"

2'-4" BENT DIAPHRAGM

90°-00'-00"

2'-4" BENT DIAPHRAGM

℄ GDR. B3

9-#4 "U" @ 1'-0" CTS. (TYP. EA. BAY)

#4 S3 @ 1'-0" CTS. (TYP. EA. BAY)

#4 S3 @ 1'-0" CTS. (TYP. EA. BAY)

9-#4 "U" @ 1'-0" CTS. (TYP. EA. BAY)

TRANSVERSE CONST. JT.

℄ GDR. B4

GUTTERLINE

1'-5½"

10½"

#6 B3

4½"

#4 B8

10½"

4½"

#6 B5

10½"

1'-5½"

4-#5 B10 @ 8" CTS. (BOTT. OF OVERHANG) (3 BAR RUNS) (2'-2" MIN. SPLICE) (TYP. EA. SIDE)

PLAN OF SPAN B

FOR INTERMEDIATE DIAPHRAGM LOCATIONS, SEE "FRAMING PLAN".
FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 8540D6EBAA3B405... 7/22/2015

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STR. #2

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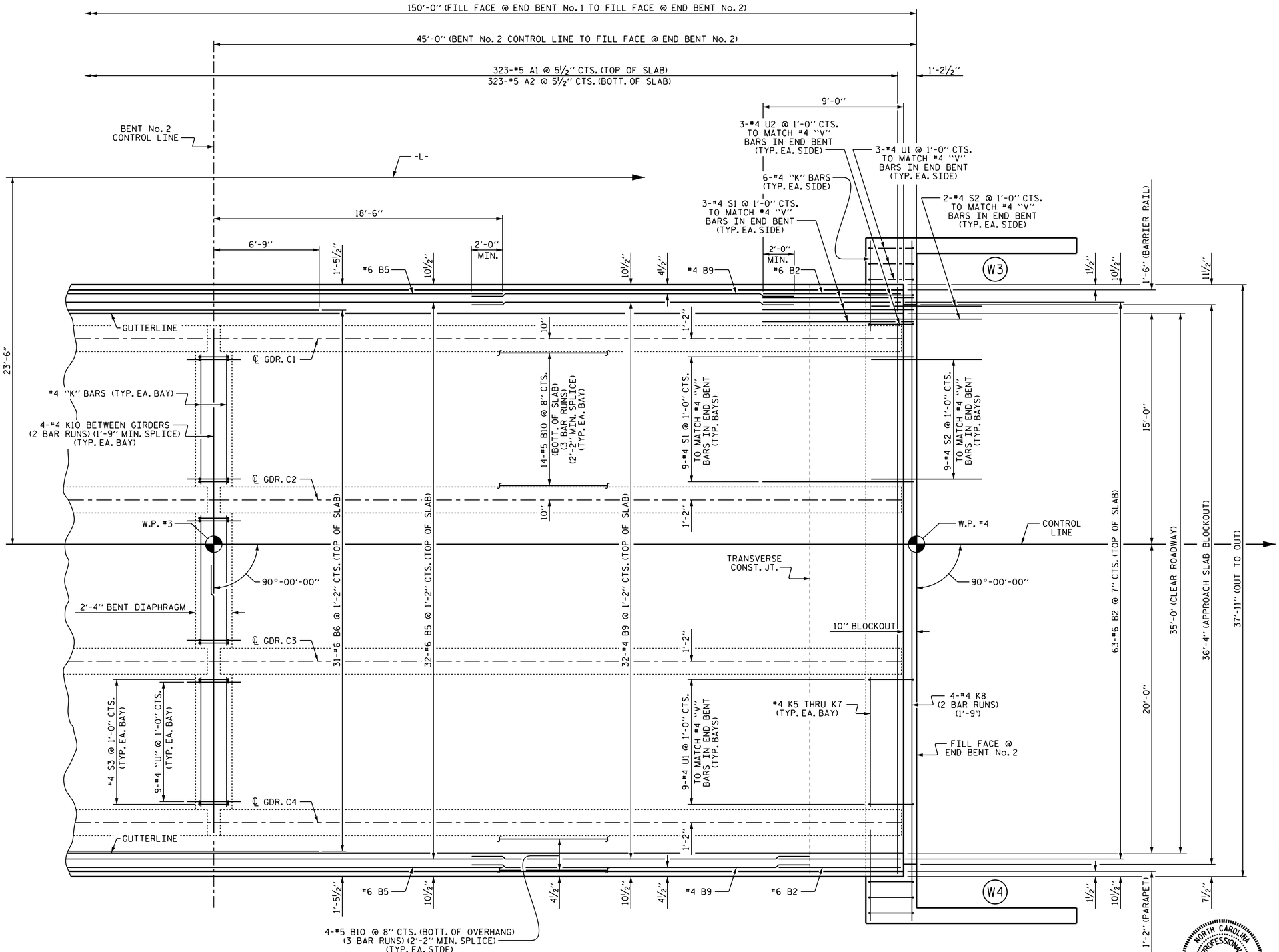

PLAN OF SPAN C

FOR INTERMEDIATE DIAPHRAGM LOCATIONS, SEE "FRAMING PLAN".
FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM" SHEET.

DRAWN BY : D. A. GLADDEN DATE : 7-3-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
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PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr. 7/22/2015
6549D6EBAA3B405...

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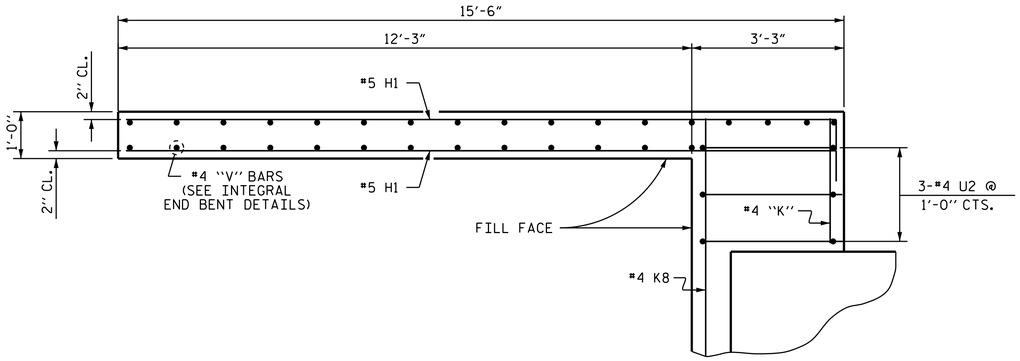
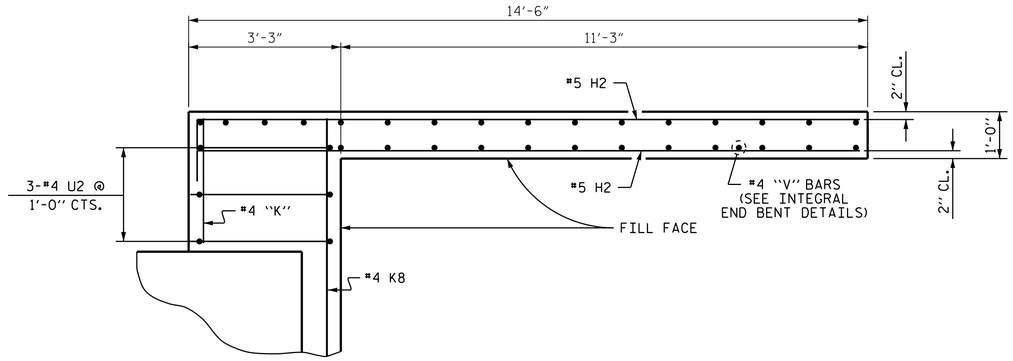
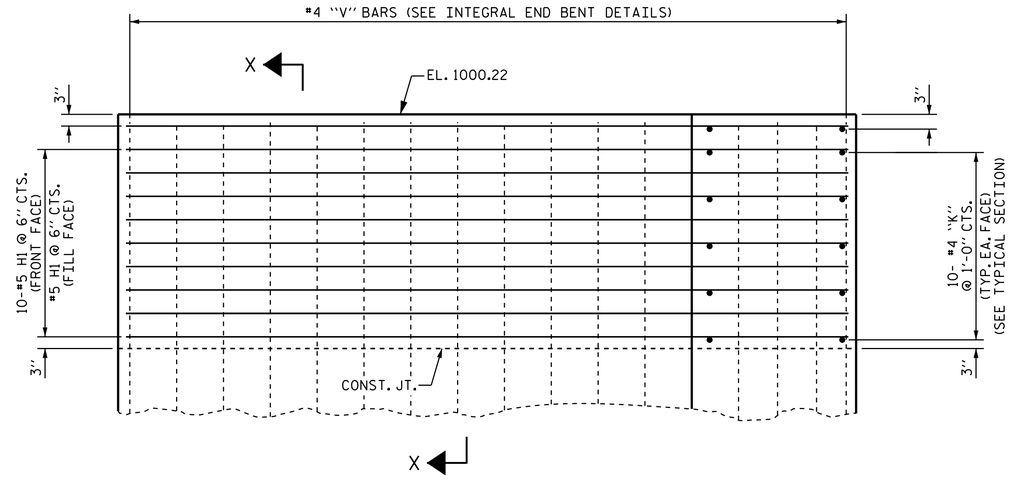


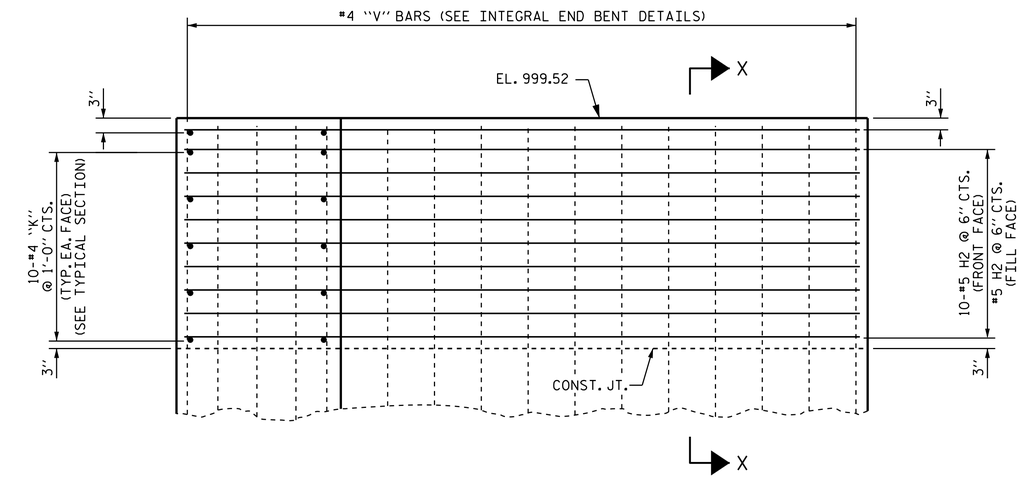
PLAN OF LEFT WING (W1)



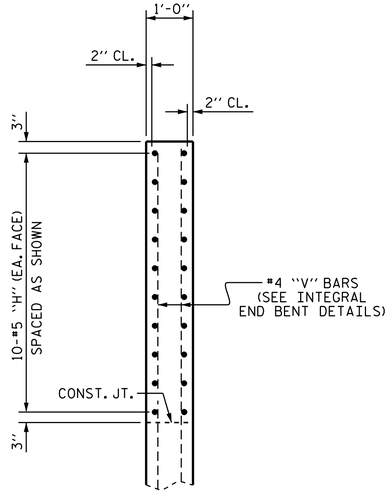
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



SECTION X-X

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TOP OF WINGS AT END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

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

SHEET NO. S-16

TOTAL SHEETS 47

STR. #2

DRAWN BY : D. A. GLADDEN DATE : 7-3-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
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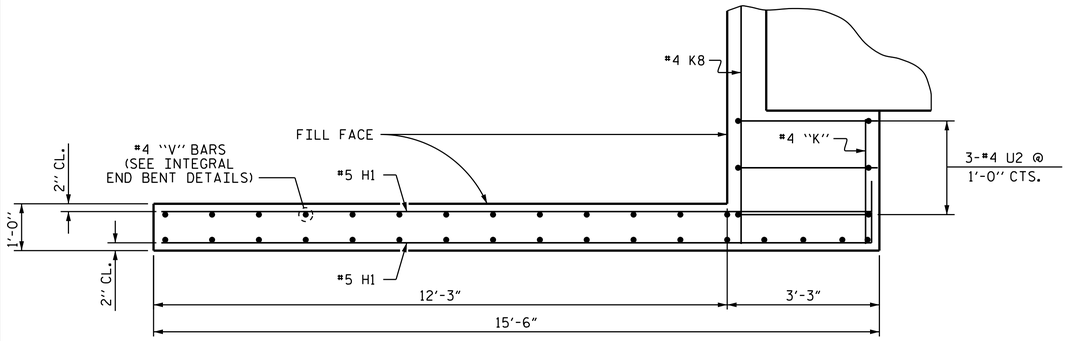
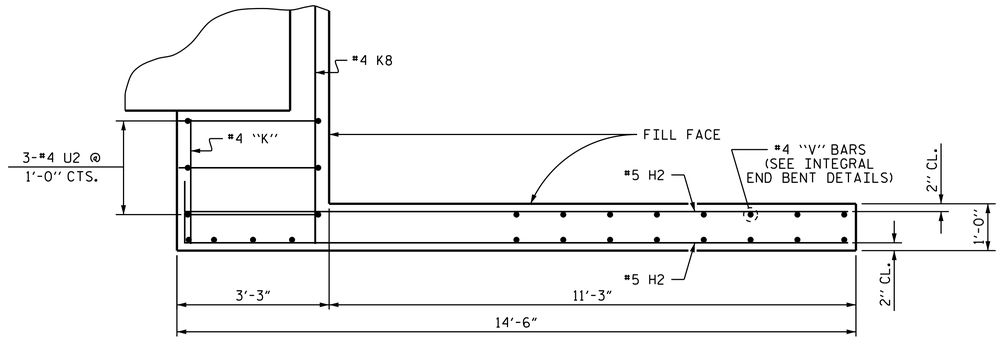
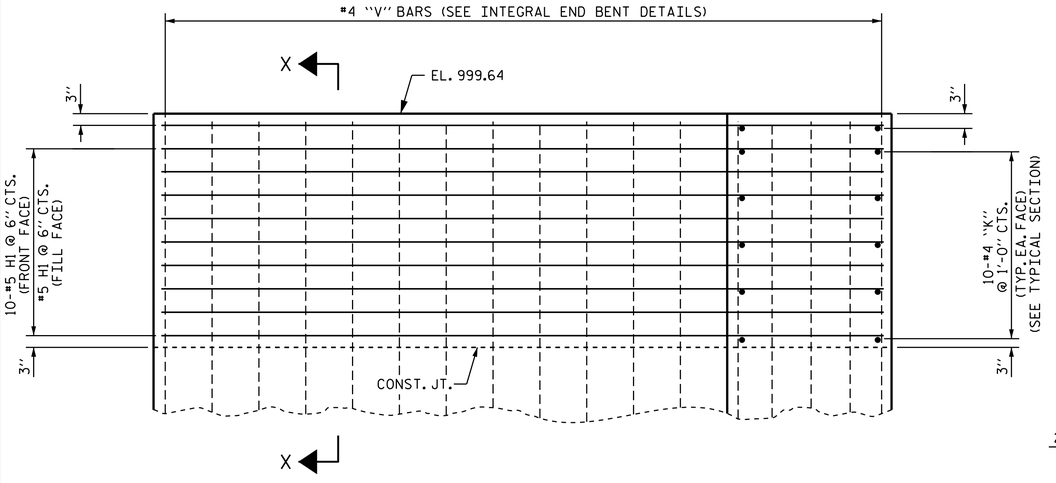


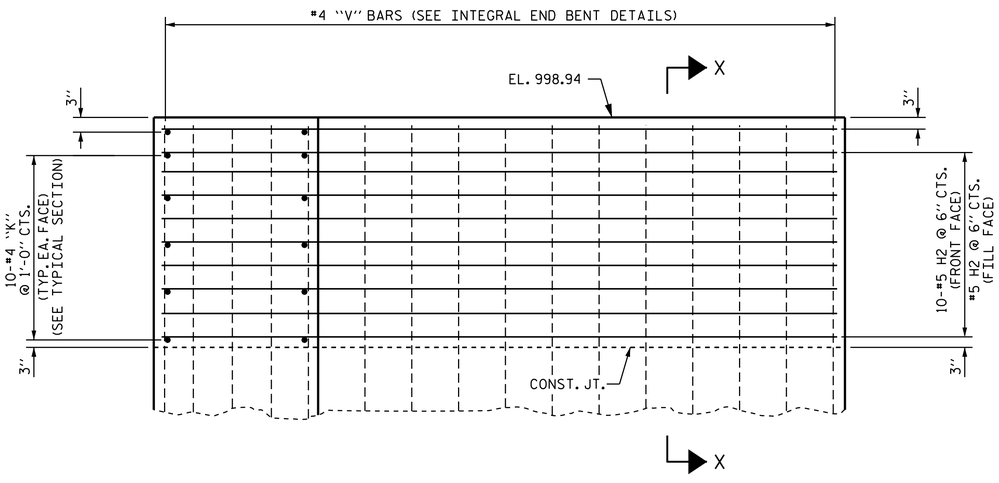
PLAN OF LEFT WING (W3)



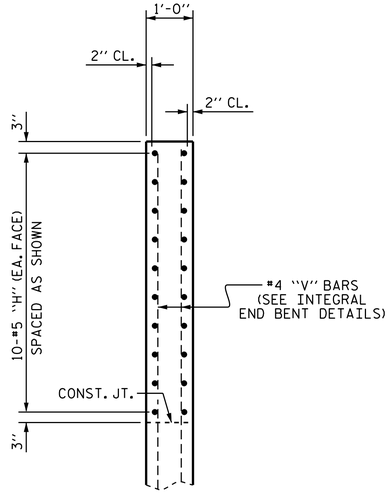
PLAN OF RIGHT WING (W4)



ELEVATION OF LEFT WING (W3)



ELEVATION OF RIGHT WING (W4)



SECTION X-X

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TOP OF WINGS AT END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D8EBAA3B405... 7/22/2015

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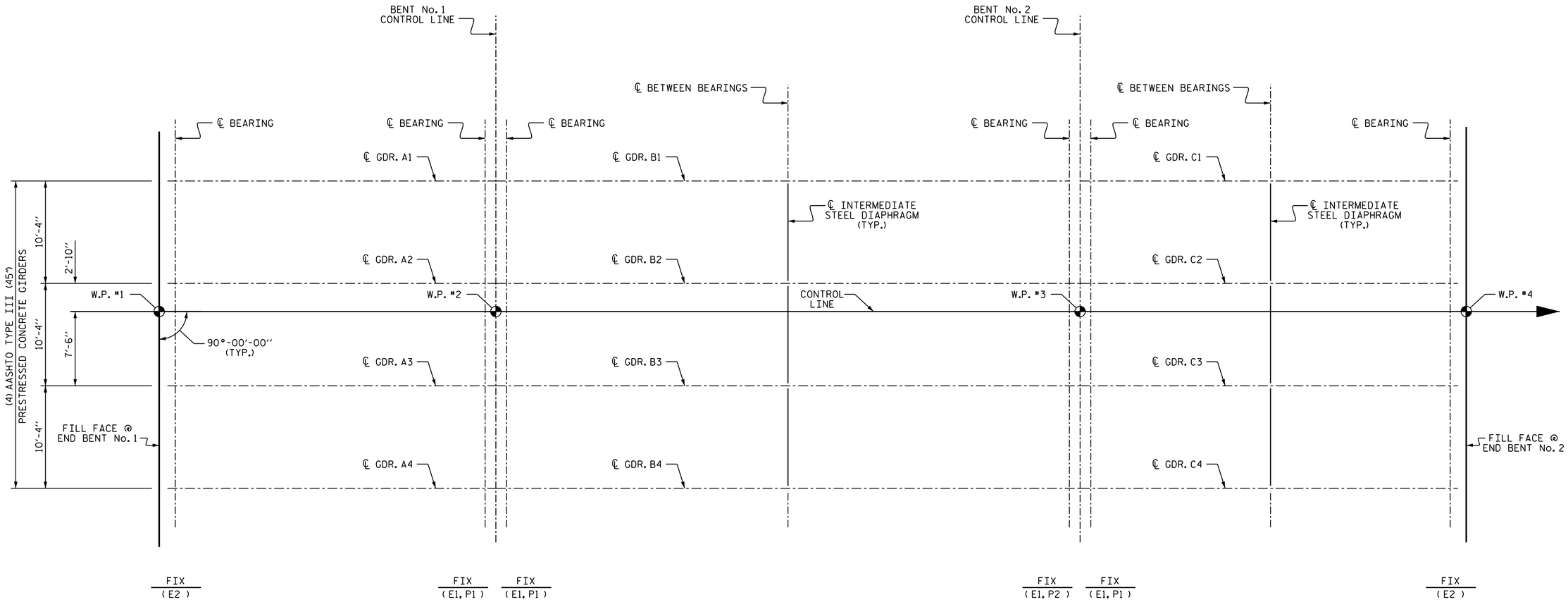
STR. #2



FRAMING PLAN

FOR ELASTOMERIC BEARINGS AND SOLE PLATES, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

DocuSigned by: Marshall G. Creek, Jr. 6549D0EBAA3B405...

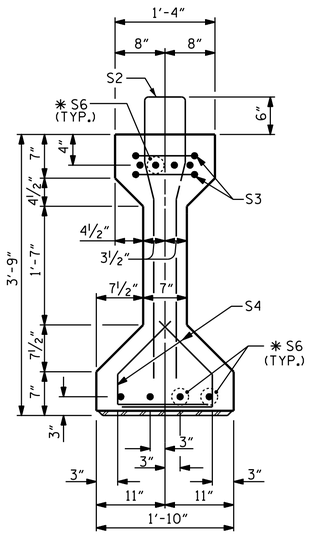
7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			47

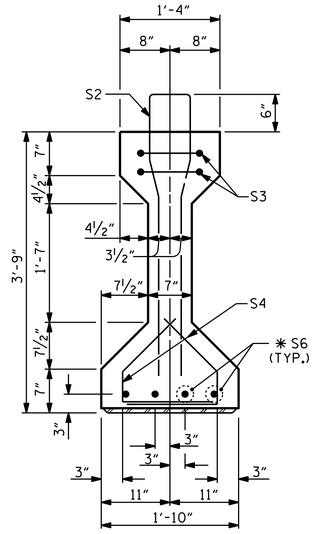
DRAWN BY : D. A. GLADDEN DATE : 7-3-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

21-JUL-2015 08:31
H:\Structures\Final Plans\R2603_SD_FP_02.dgn
bngrady

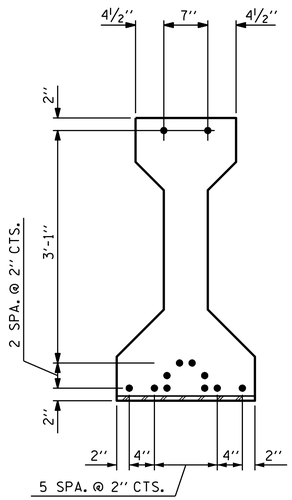
STR. #2



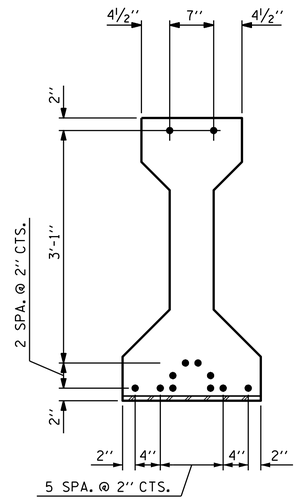
SECTION A-A



SECTION B-B

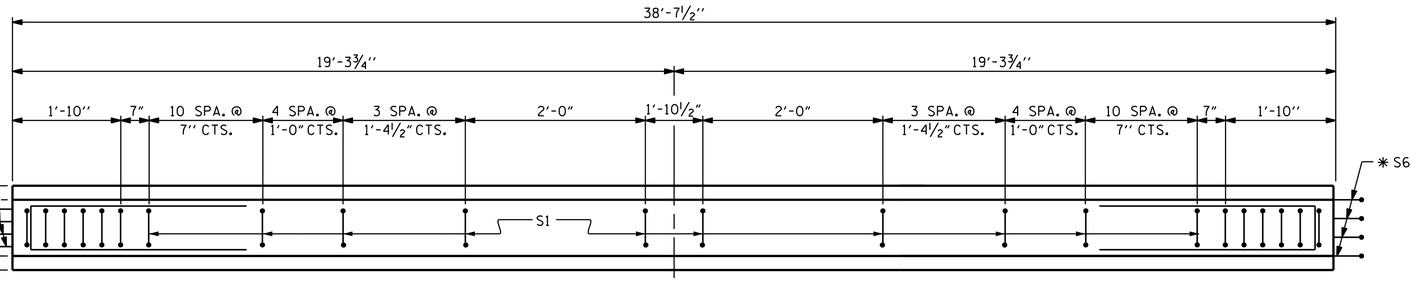


AT END OF GIRDER

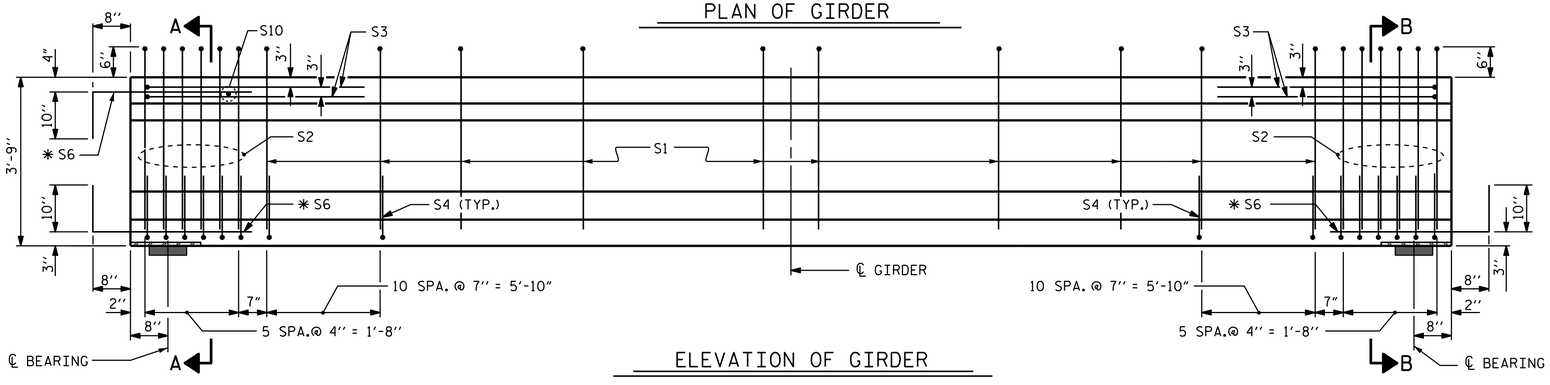


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



INTEGRAL END BENT

ELEVATION OF GIRDER

FIX

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

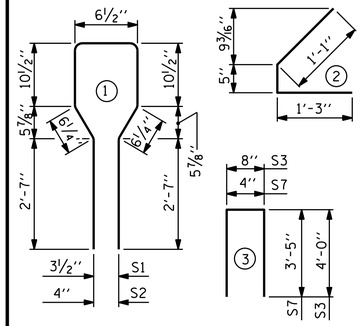
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	38	#4	1	8'-6"	216
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	68	#4	2	2'-9"	125
✱S6	12	#5	STR	3'-8"	46
S10	1	#3	STR	1'-0"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LBS.	C.Y.	No.
	564	5.6	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	38'-7½"	154'-6"

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr.
6549D6EBAA3B405...
7/22/2015

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

SHEET NO. S-19

TOTAL SHEETS 47

STR. #2

STD. NO. PCG5

ASSEMBLED BY : D. A. GLADDEN DATE : 7-10-13
CHECKED BY : H. T. BARBOUR DATE : 8-13

DRAWN BY : ELR 8/91
CHECKED BY : GRP 8/91

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

21-JUL-2015 08:31
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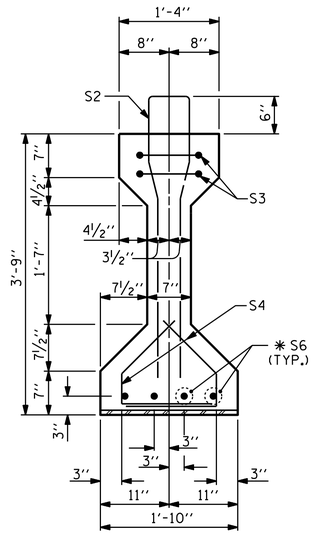
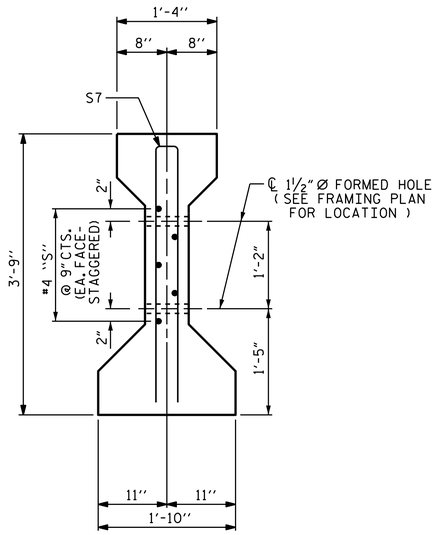
bngrady

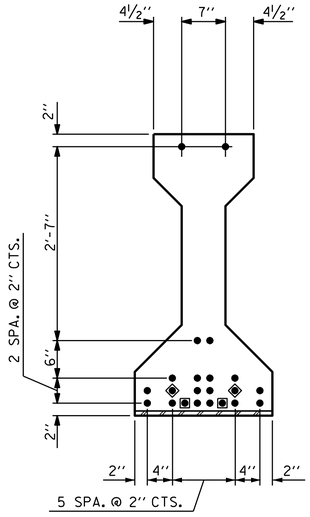


SECTION B-B

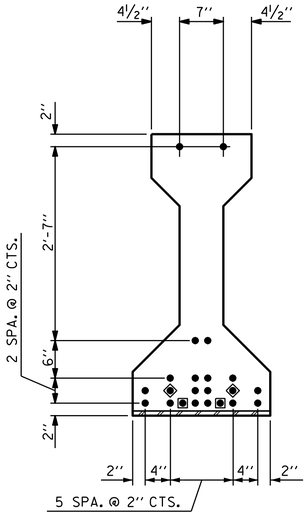


SECTION C-C

(S1 BARS NOT SHOWN)



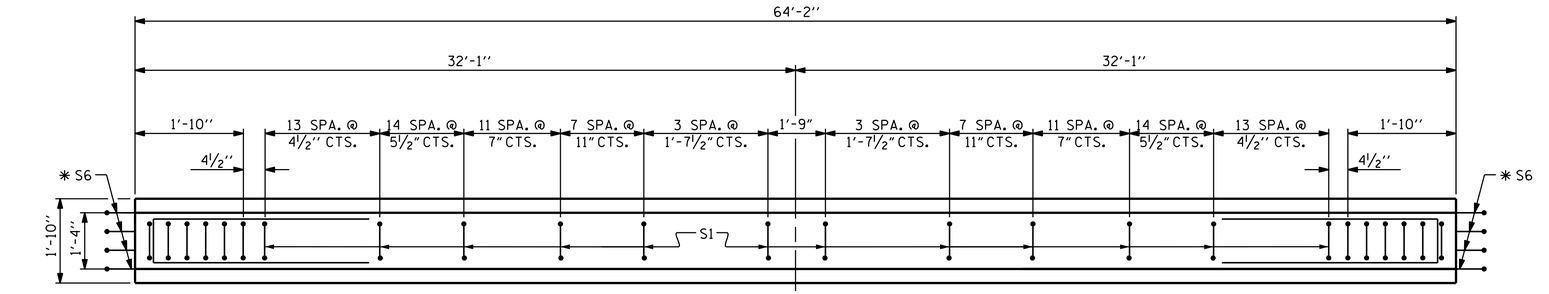
AT END OF GIRDER



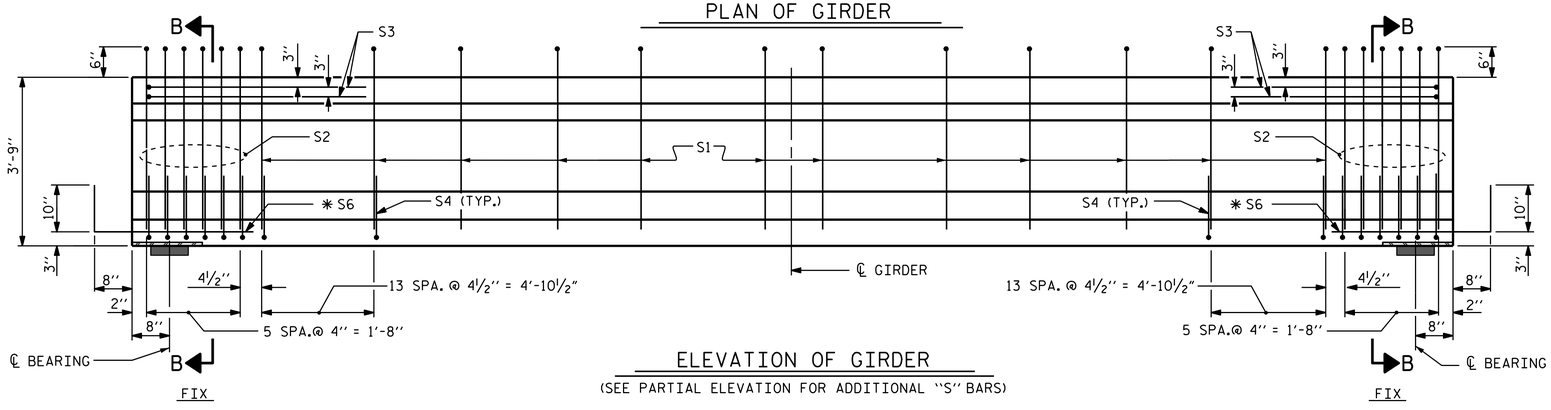
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

- ● FULLY BONDED STRANDS
- ◈ STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER.
- ◙ STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER.

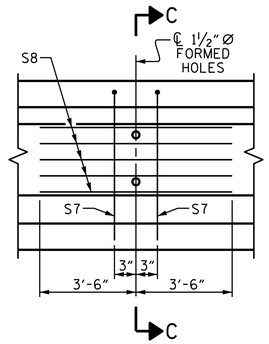


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS B1 THRU B4

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

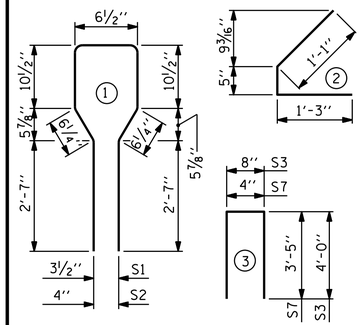
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	98	#4	1	8'-6"	556
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	80	#4	2	2'-9"	147
✱S6	8	#5	STR	3'-8"	31
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LBS.	C.Y.	No.
	948	9.2	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	64'-2"	256'-8"

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD AASHTO TYPE III PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 8549D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			47

STR. #2

STD. NO. PCG5

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-10-13	REV. 5/1/06R	TLA/GM
CHECKED BY : H. T. BARBOUR	DATE : 8-13	REV. 10/1/11	MAA/GM
DRAWN BY : ELR 8/91		REV. 1/15	MAA/TMG
CHECKED BY : GRP 8/91		DESIGN ENGINEER OF RECORD: B.A. DUKE	DATE : 7-15

21-JUL-2015 08:31
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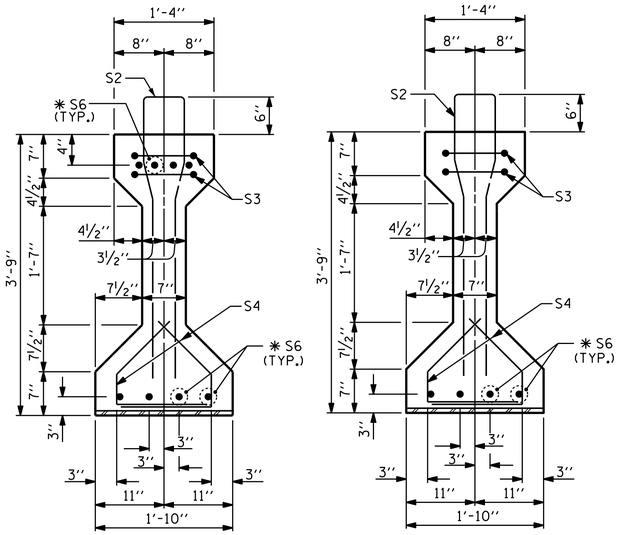
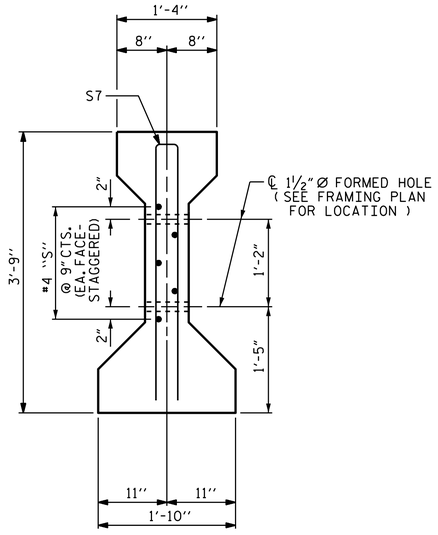


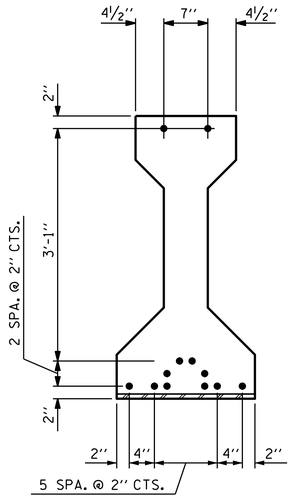
SECTION A-A

SECTION B-B

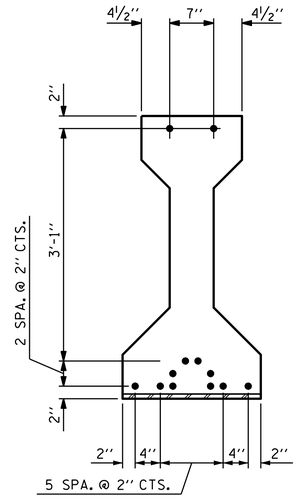


SECTION C-C

(S1 BARS NOT SHOWN)

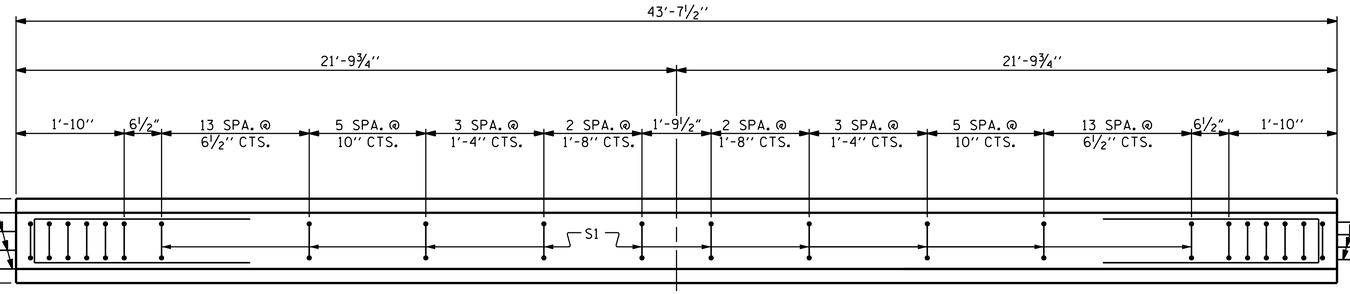


AT END OF GIRDER

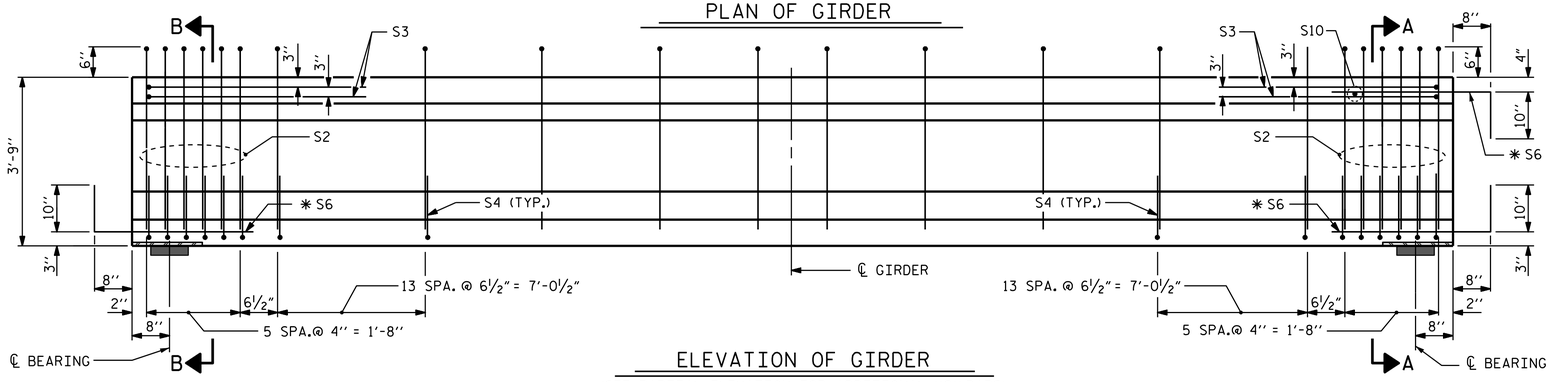


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

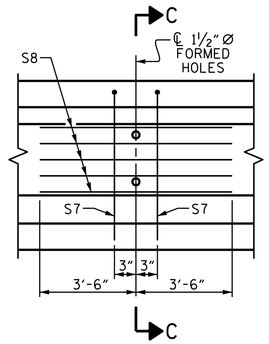


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS C1 THRU C4

0.6" Ø L. R. GRADE 270 STRANDS

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

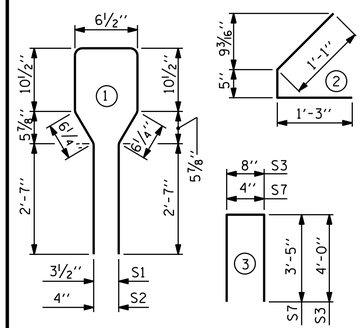
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	48	#4	1	8'-6"	273
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	80	#4	2	2'-9"	147
✱S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LBS.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
	681	6.3	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	43'-7½"	174'-6"

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6540D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			47

STR. #2

STD. NO. PCG5

ASSEMBLED BY : D. A. GLADDEN DATE : 7-10-13
CHECKED BY : H. T. BARBOUR DATE : 8-13

DRAWN BY : ELR 8/91
CHECKED BY : GRP 8/91

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

21-JUL-2015 08:31
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bngrady

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN A																					
	GIRDER #1 & #4											GIRDER #2 & #3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.009	0.018	0.025	0.029	0.030	0.029	0.025	0.018	0.009	0	0	0.009	0.018	0.025	0.029	0.030	0.029	0.025	0.018	0.009	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.003	0.006	0.008	0.009	0.010	0.009	0.008	0.006	0.003	0	0	0.003	0.006	0.009	0.010	0.011	0.010	0.009	0.006	0.003	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	1/16"	0	0	1/16"	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN B																					
	GIRDER #1 & #4											GIRDER #2 & #3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.033	0.062	0.085	0.100	0.105	0.100	0.085	0.062	0.033	0	0	0.033	0.062	0.085	0.100	0.105	0.100	0.085	0.062	0.033	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.023	0.044	0.060	0.070	0.074	0.070	0.060	0.044	0.023	0	0	0.026	0.049	0.068	0.079	0.083	0.079	0.068	0.049	0.026	0
FINAL CAMBER ↑	0	1/8"	3/16''	5/16"	3/8"	3/8"	3/8"	5/16"	3/16"	1/8"	0	0	1/16"	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN C																					
	GIRDER #1 & #4											GIRDER #2 & #3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.011	0.021	0.029	0.034	0.036	0.034	0.029	0.021	0.011	0	0	0.011	0.021	0.029	0.034	0.036	0.034	0.029	0.021	0.011	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.005	0.010	0.013	0.015	0.016	0.015	0.013	0.010	0.005	0	0	0.006	0.011	0.015	0.017	0.018	0.017	0.015	0.011	0.006	0
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	1/4"	1/4"	3/16"	1/8"	1/16"	0	0	1/8''	3/16''	3/16''	3/16''	1/4''	3/16''	3/16''	3/16''	1/8''	0

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

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

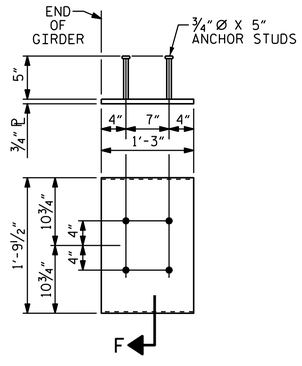
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER IN SPAN "A" & SPAN "C", SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER IN SPAN "B" SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4700 PSI.

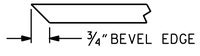
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE III GIRDER
(2 REQ'D PER GIRDER)



SECTION "F"
(SEE NOTES)

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr.
8549D6EBAA3B405...
7/22/2015

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			47

STR. #2 STD. NO. PCG10

DRAWN BY : D. A. GLADDEN DATE : 7-25-13
CHECKED BY : H. T. BARBOUR DATE : 8-13

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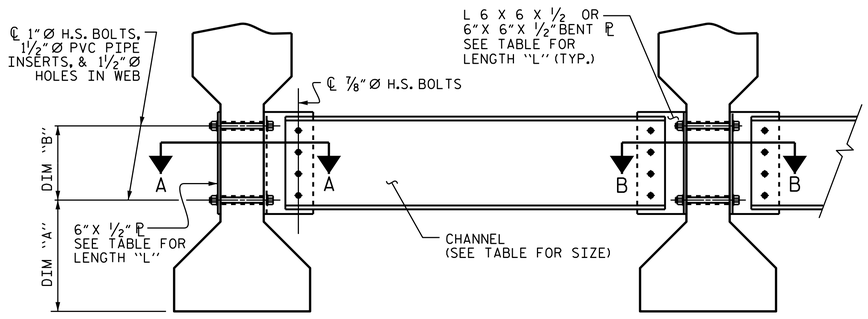
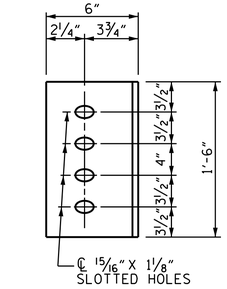
bngrady



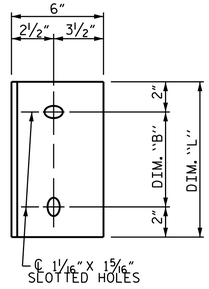
EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

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

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

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

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

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

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

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

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

CONNECTOR PLATE DETAILS

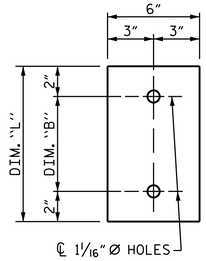
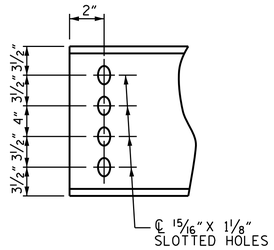
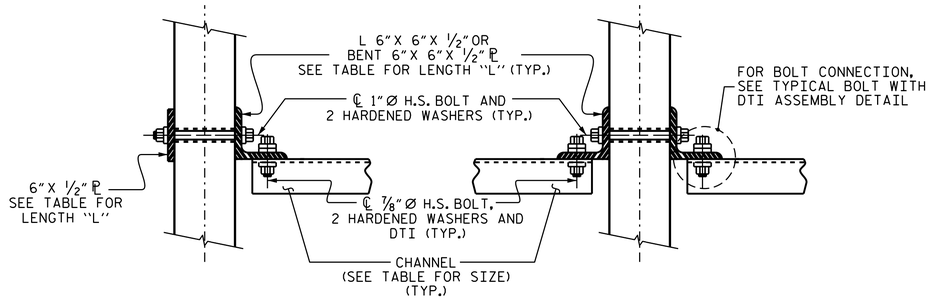


PLATE DETAILS



CHANNEL END



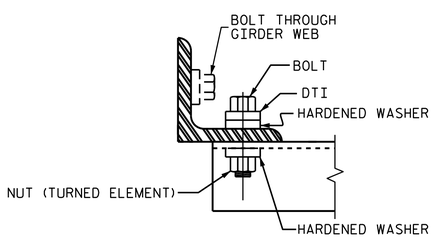
SECTION A-A

SECTION B-B

CONNECTION DETAILS

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"



BOLT WITH DTI ASSEMBLY DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Docusigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			47

STR. #2

STD. NO. PCG10

ASSEMBLED BY : D. A. GLADDEN DATE : 7-10-13	
CHECKED BY : H. T. BARBOUR DATE : 8-13	
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

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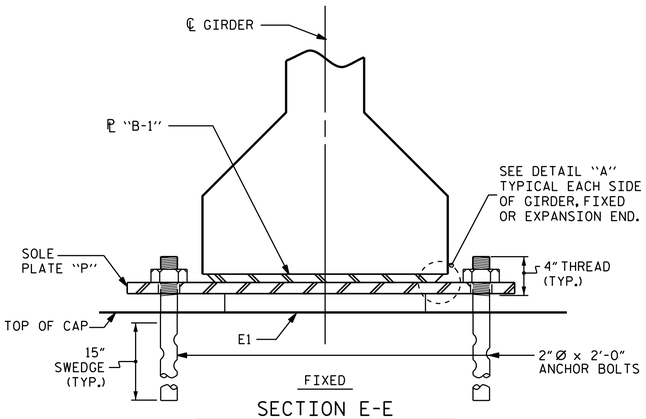
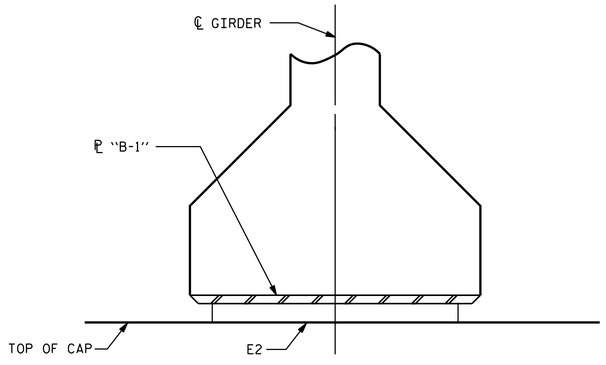
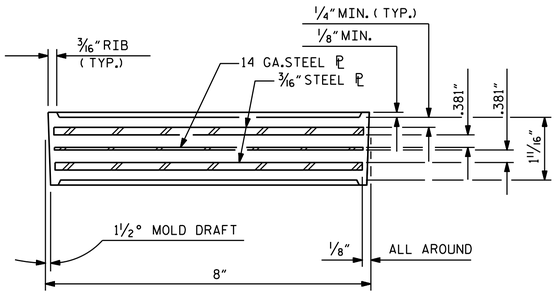


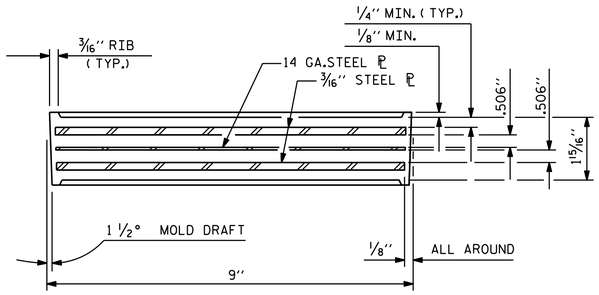
SECTION E-E



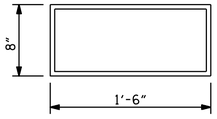
SECTION F-F



TYPICAL SECTION OF ELASTOMERIC BEARINGS



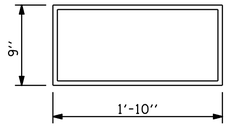
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

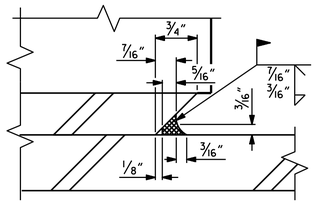
TYPE III



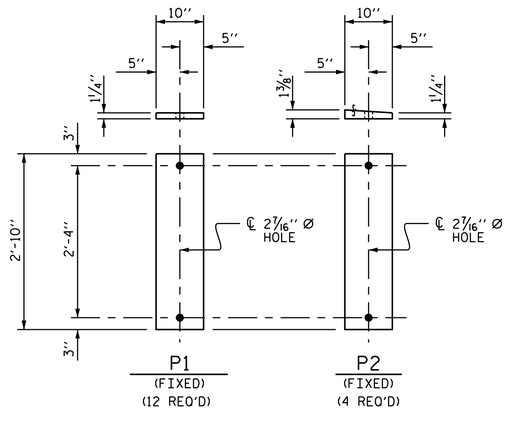
E2 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

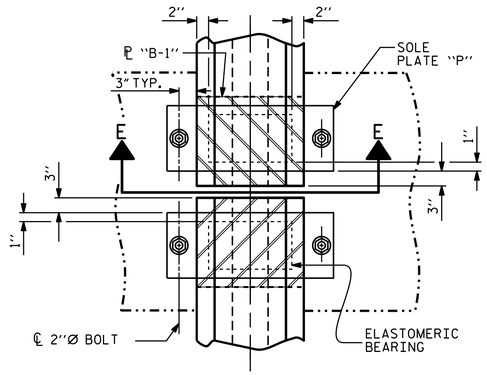
TYPE IV



DETAIL "A"

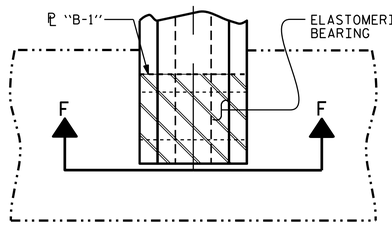


SOLE PLATE DETAILS ("P")

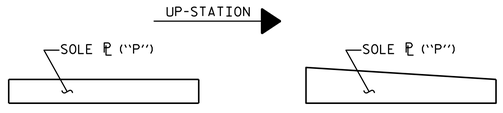


TYPICAL PLAN

(SHOWING CONTINUOUS BENT)



TYPICAL PLAN @ END BENT



SOLE ℄ PLACEMENT DETAIL

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.

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k
TYPE IV	225 k

PROJECT NO. R-2603

WILKES COUNTY

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STATE OF NORTH CAROLINA
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RALEIGH

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

Marshall G. Creek, Jr. 7/22/2015

DRAWN BY : D.A. GLADDEN DATE : 7-10-13
CHECKED BY : H.T. BARBOUR DATE : 8-13

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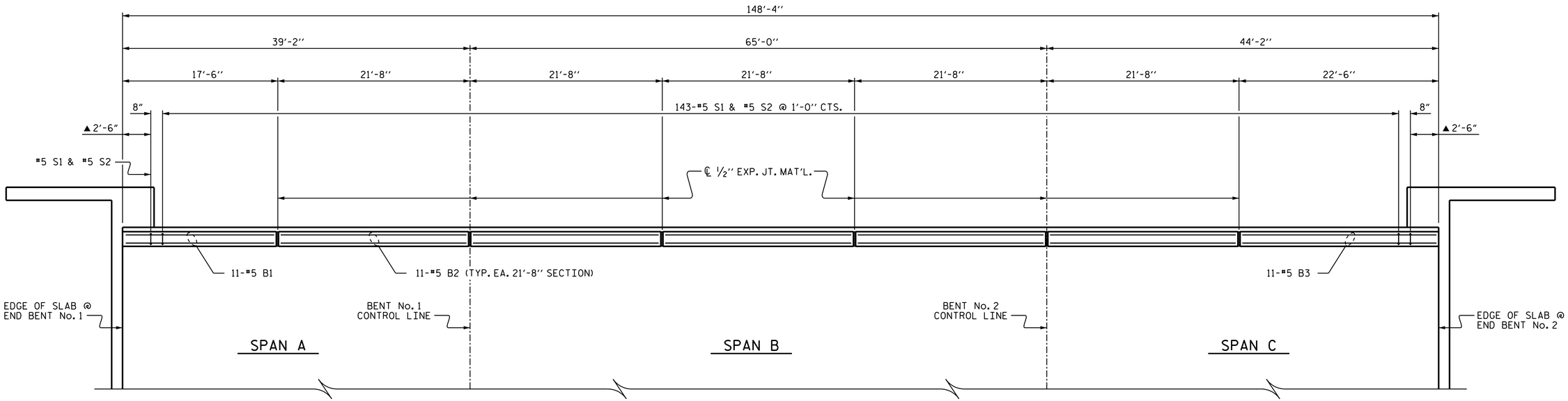
STR. #2



PLAN OF CONCRETE BARRIER RAIL

▲FOR REINFORCING STEEL IN THIS AREA, SEE END OF RAIL DETAILS, SHEET 2 OF 2.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : D. A. GLADDEN DATE : 7-17-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

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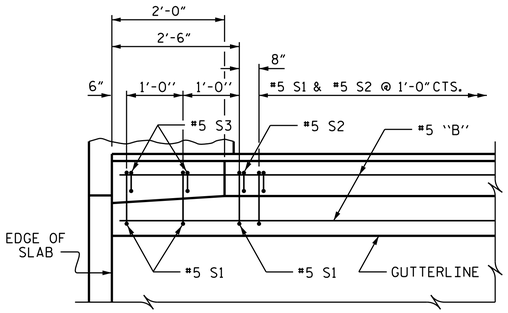

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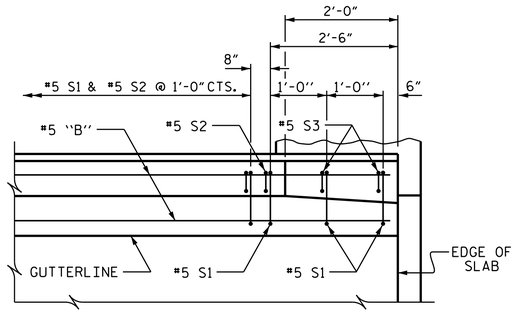

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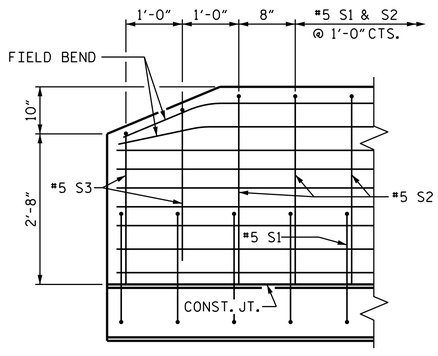
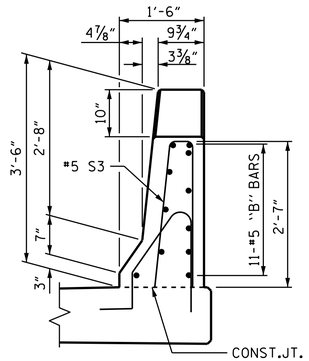
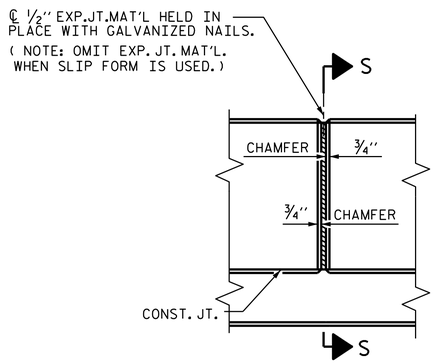


SIDE VIEW

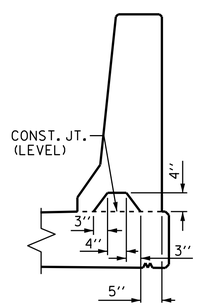


END VIEW

END OF RAIL DETAILS

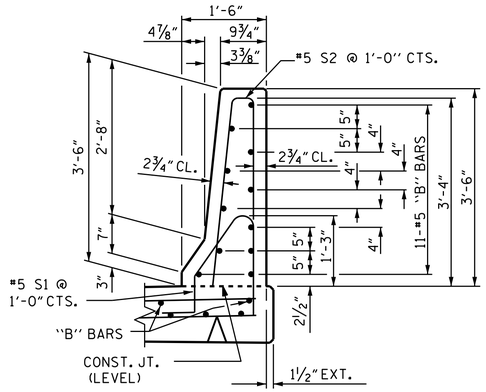


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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



SECTION THRU RAIL

BARRIER RAIL DETAILS

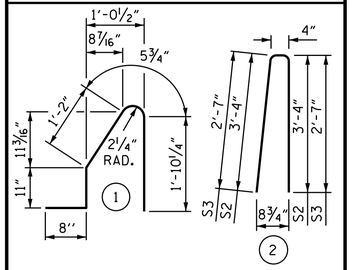
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAIL SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	11	#5	STR	17'-1"	196
* B2	55	#5	STR	21'-3"	1219
* B3	11	#5	STR	22'-1"	253
* S1	149	#5	1	5'-1"	790
* S2	145	#5	2	7'-0"	1059
* S3	4	#5	2	5'-6"	23
* EPOXY COATED REINFORCING STEEL				LBS.	3540
CLASS AA CONCRETE				C.Y.	20.2
CONCRETE BARRIER RAIL				LIN. FT.	148.33

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 8549D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-17-13	
CHECKED BY : H. T. BARBOUR	DATE : 8-13	
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

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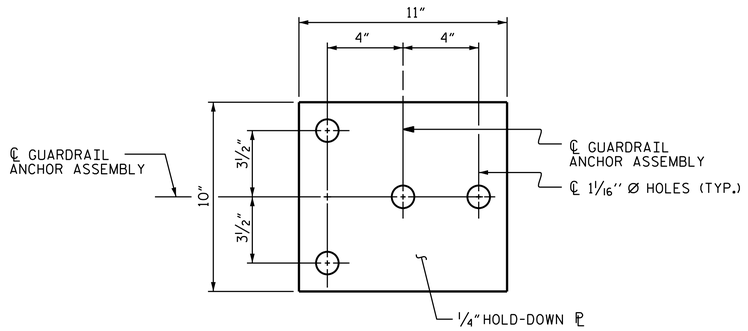
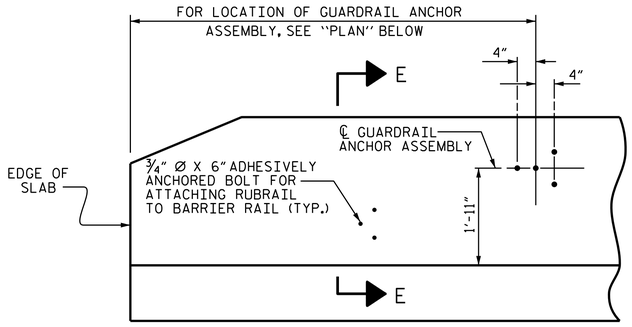
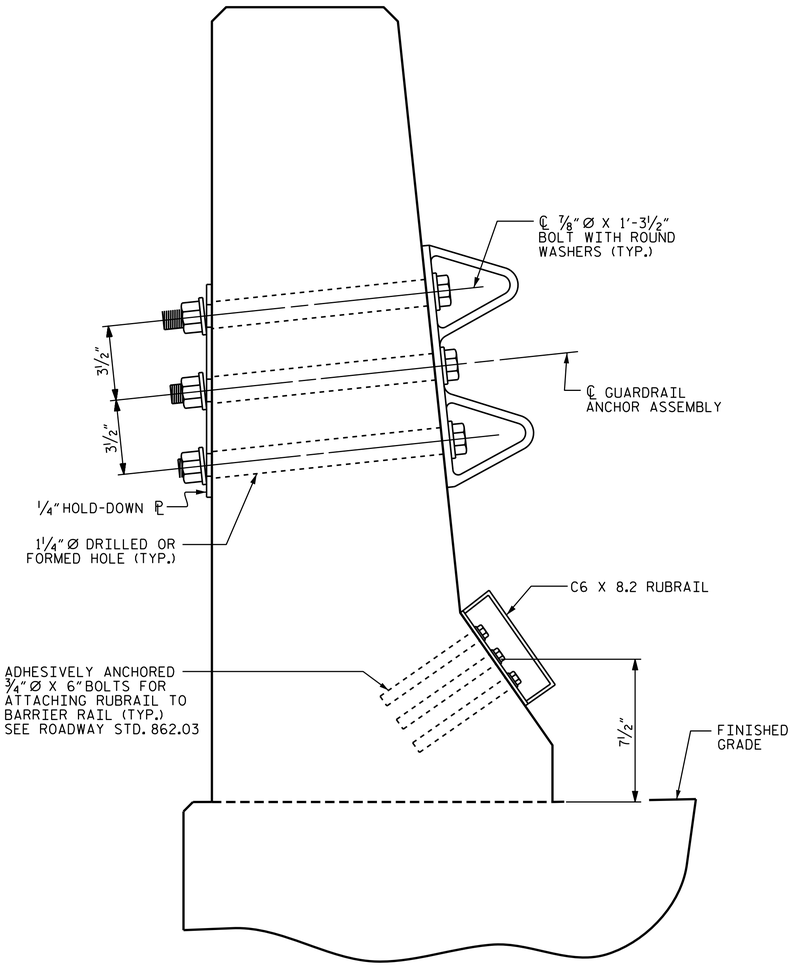


PLAN



ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

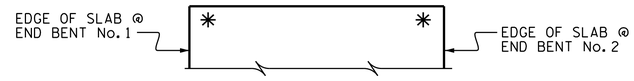
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

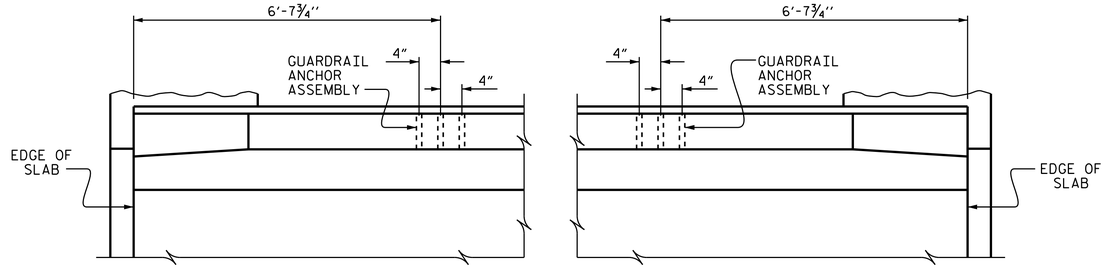
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6541D6EBAA3B405... 7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-17-13	
CHECKED BY : H. T. BARBOUR	DATE : 8-13	
DRAWN BY : TLA 5/06	REV. 10/1/11	MAA/GM
CHECKED BY : GM 5/06	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

21-JUL-2015 08:31
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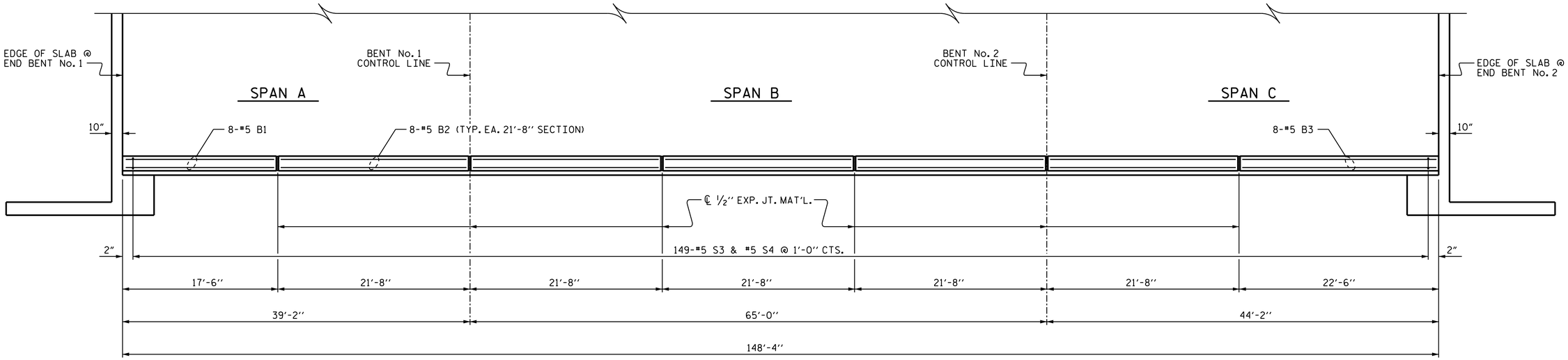
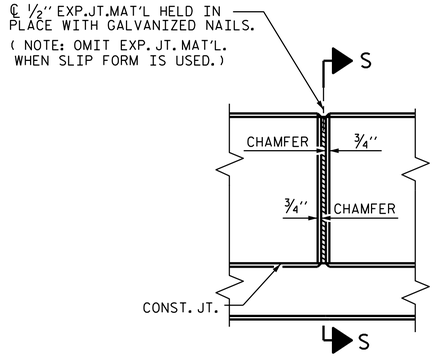
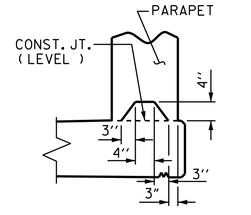
STR. #2



PLAN OF PARAPET





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

ELEVATION AT EXPANSION JOINTS

NOTES

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

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

THE #5 S3 AND #5 S4 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2"MINIMUM CLEARANCE TO THE ½"EXPANSION JOINT MATERIAL IN PARAPET.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
1'-2" X 2'-6"
CONCRETE PARAPET
DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...
7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : D. A. GLADDEN DATE : 7-17-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

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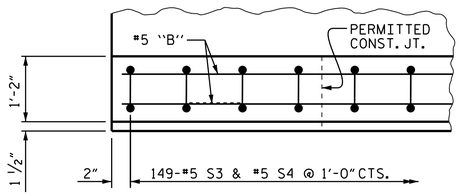
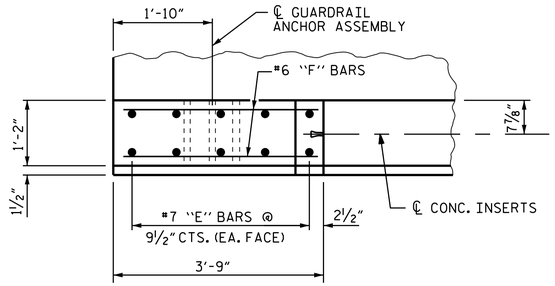
STR. #2

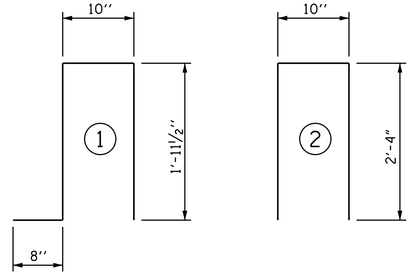


PLAN OF PARAPET



PLAN OF END POST

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

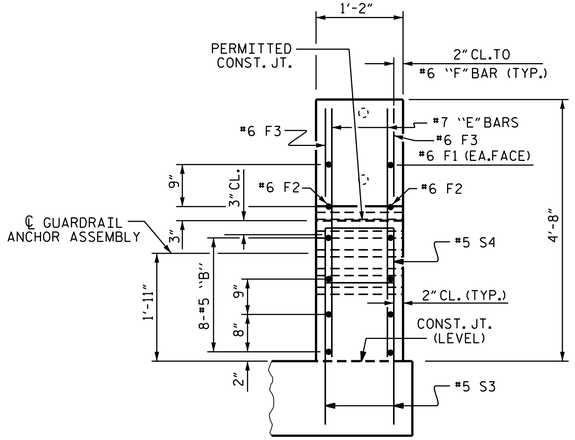
PARAPET & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	8	#5	STR	17'-1"	143
✱B2	40	#5	STR	21'-3"	887
✱B3	8	#5	STR	22'-1"	184
✱E1	4	#7	STR	2'-6"	20
✱E2	4	#7	STR	3'-0"	25
✱E3	4	#7	STR	3'-6"	29
✱E4	4	#7	STR	4'-0"	33
✱E5	4	#7	STR	4'-4"	35
✱F1	4	#6	STR	1'-10"	11
✱F2	4	#6	STR	3'-0"	18
✱F3	4	#6	STR	3'-5"	21
✱S3	149	#5	1	5'-5"	842
✱S4	149	#5	2	5'-6"	855

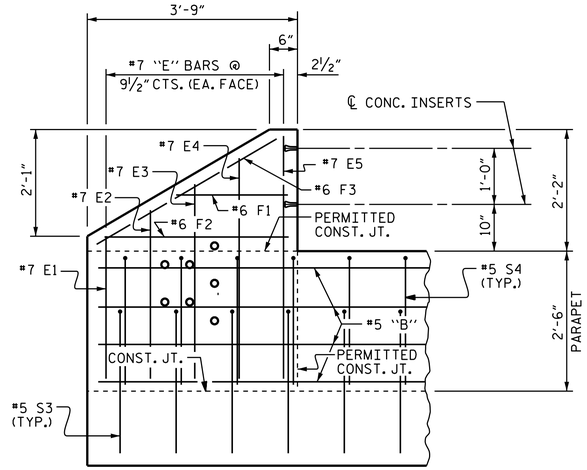
✱EPOXY COATED REINF. STEEL = 3103 LBS.

CLASS "AA" CONCRETE 16.4 C.Y.

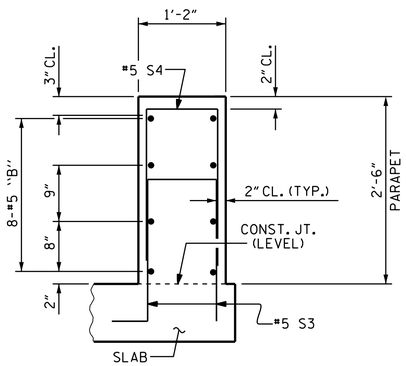
1'-2" X 2'-6" CONCRETE PARAPET 148.33 LIN.FT.



END VIEW



ELEVATION



SECTION THROUGH PARAPET

PARAPET AND END POST FOR TWO BAR RAIL

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
1'-2" X 2'-6"
CONCRETE PARAPET
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			47

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.

Marshall G. Creek, Jr.
6549D8EBAA3B405...
7/22/2015

DRAWN BY : D. A. GLADDEN DATE : 7-17-13
CHECKED BY : H. T. BARBOUR DATE : 8-13
DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 7-15

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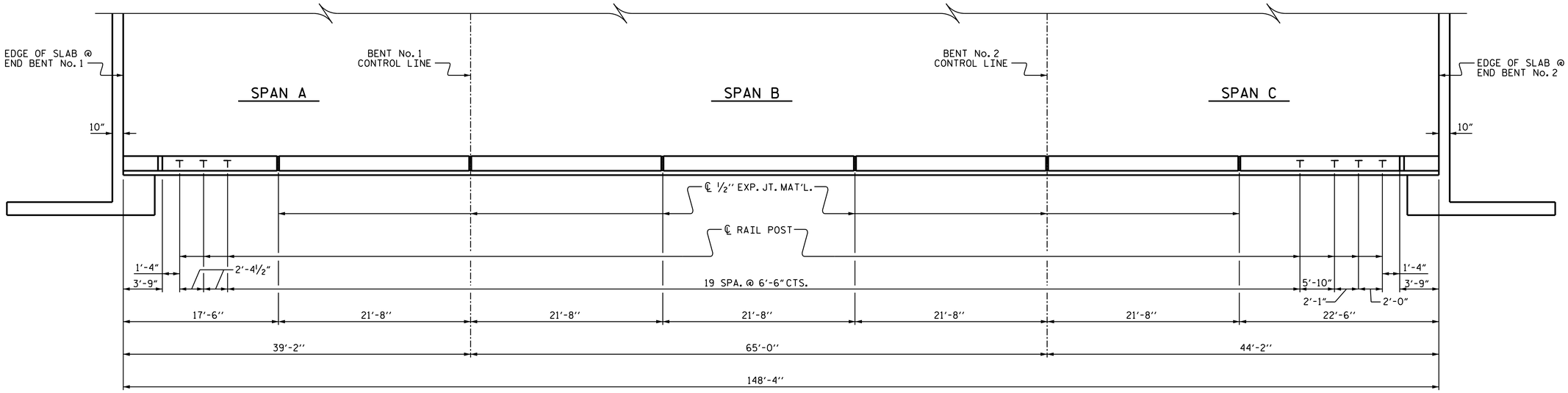


PLAN OF RAIL POST SPACINGS

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½''.

B. 1 - ¾'' Ø X 1⅝'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 1⅝'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾''Ø X 1⅝'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE ¾''Ø X 1⅝'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET 5 of 5).

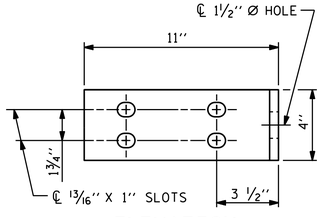
E. ½'' Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

THE ¾'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾'' Ø X 1⅝'' BOLT WITH WASHER SHALL BE REPLACED WITH A ¾''Ø X 6½'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾'' Ø X 1⅝'' BOLT SHALL APPLY TO THE ¾''Ø X 6 ½'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



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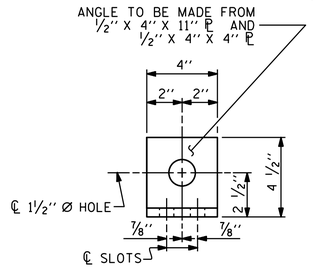
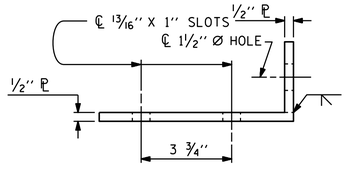
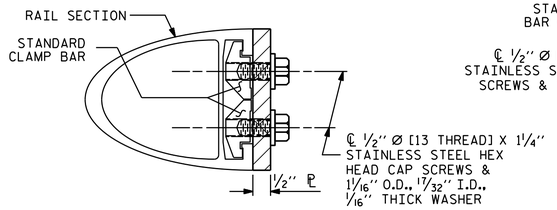


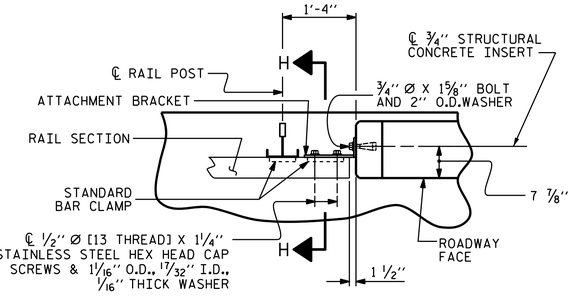
END VIEW (FIX AND EXP.)



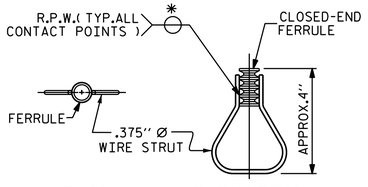
TOP VIEW



SECTION H-H (FIX)



PLAN -RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : D. A. GLADDEN DATE : 7-17-13
CHECKED BY : H. T. BARBOUR DATE : 8-13

DRAWN BY : FCJ 1/88
CHECKED BY : CRK 3/89

REV. 5/7/03 RWW/JTE
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
Marshall G. Cheek, Jr.
8549D8E8AA3B405...
7/22/2015

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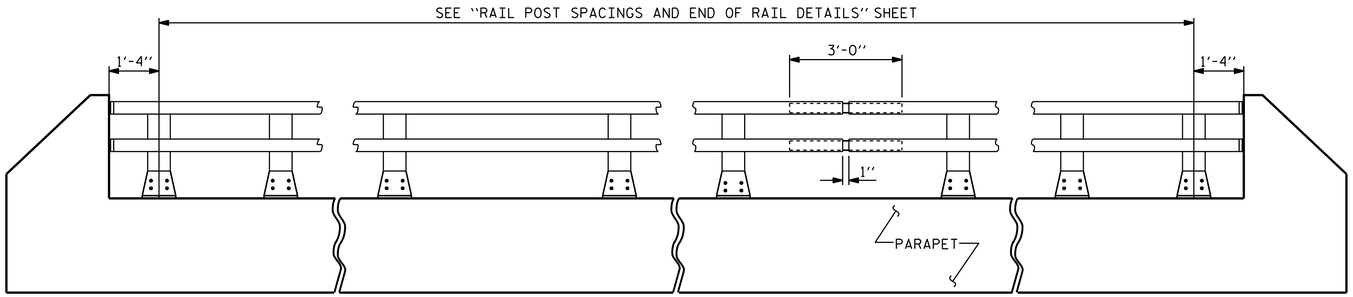
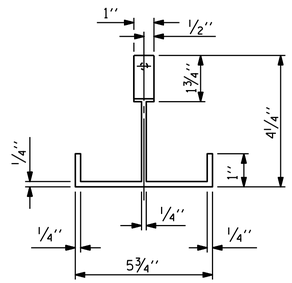
STR. #2

STD. NO. BMR2

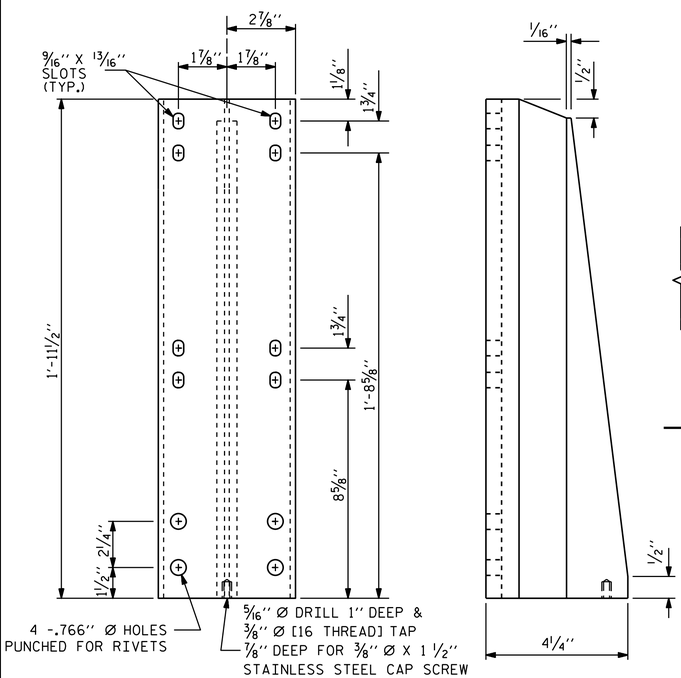


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 3 OF 5.

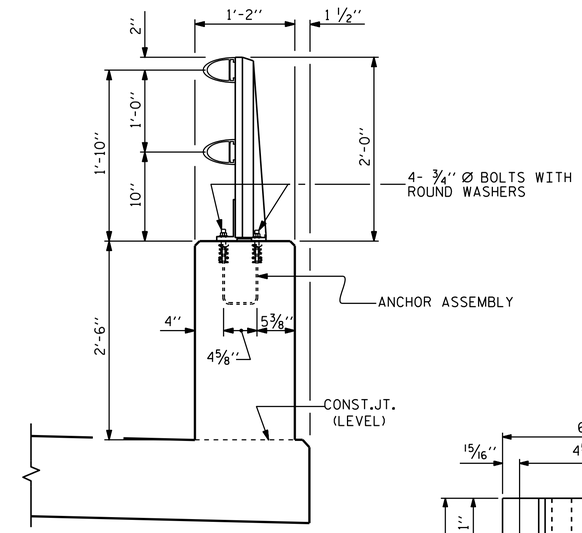


PLAN

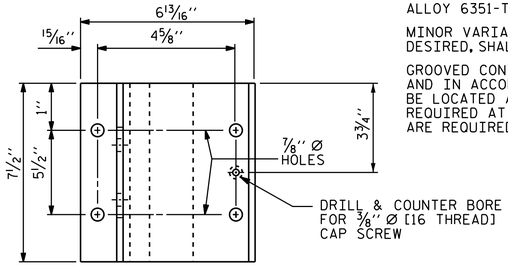


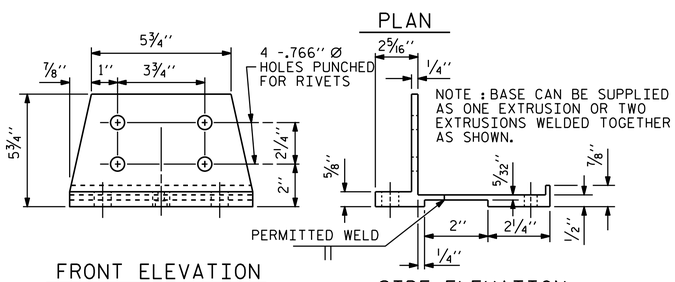
FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



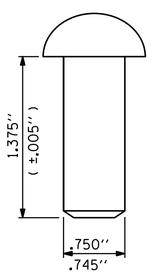
SECTION THRU PARAPET AND RAIL





FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 3 OF 5.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 140.83 LIN. FT.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-17-13		
CHECKED BY : H. T. BARBOUR	DATE : 8-13		
DRAWN BY : EEM 6/94	REV. 5/1/06	TLA/GM	
CHECKED BY : RGW 6/94	REV. 10/1/11	MAA/GM	
	REV. 6/13	MAA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405... 7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			47

STR. #2

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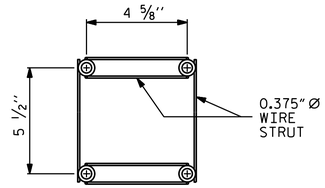
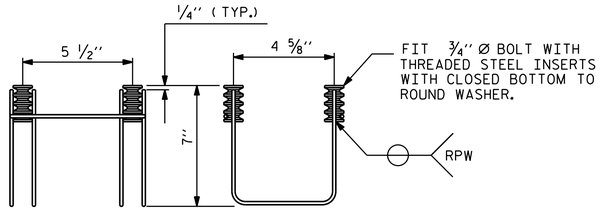


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(25 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

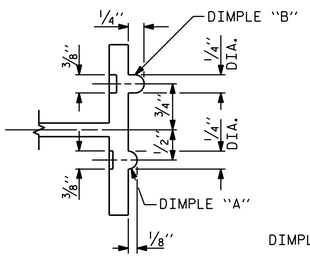
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

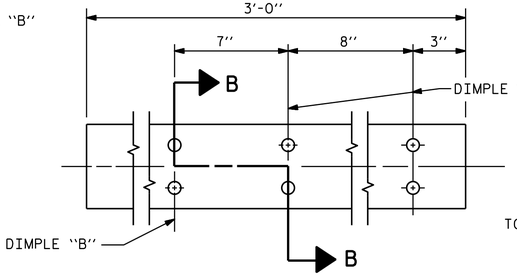
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

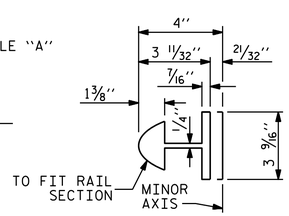
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4"Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



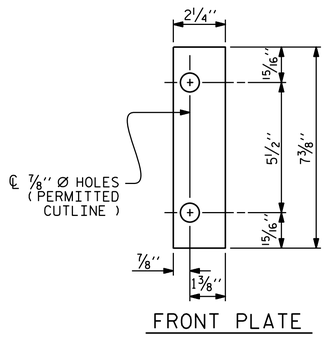
SECTION B -B



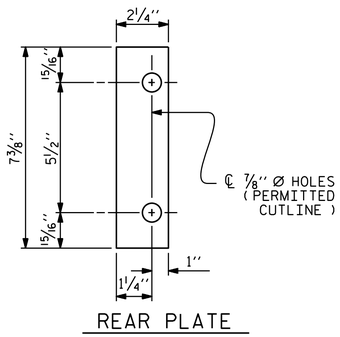


BAR SECTION

EXPANSION BAR DETAILS



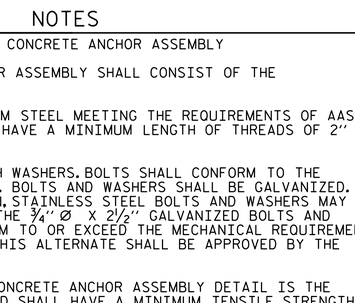
FRONT PLATE



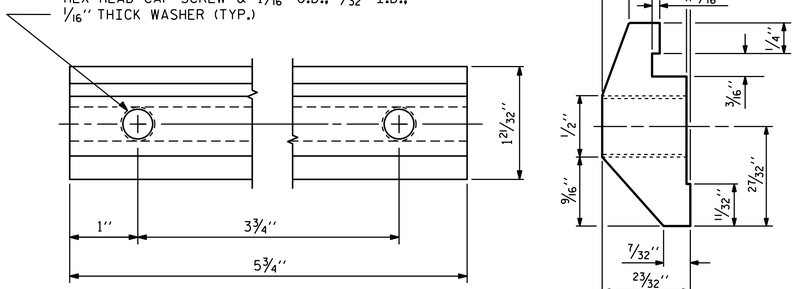
REAR PLATE

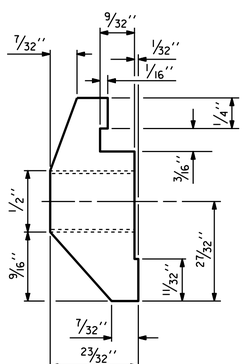
SHIM DETAILS

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



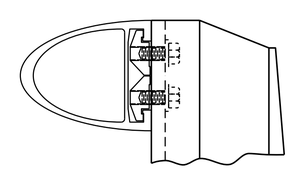
RAIL SECTION



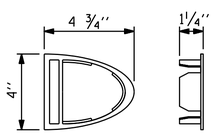


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-17-13
CHECKED BY : H.T. BARBOUR	DATE : 8-13

DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

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

SHEET NO. S-32

TOTAL SHEETS 47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D0E8BAA3B405... 7/22/2015

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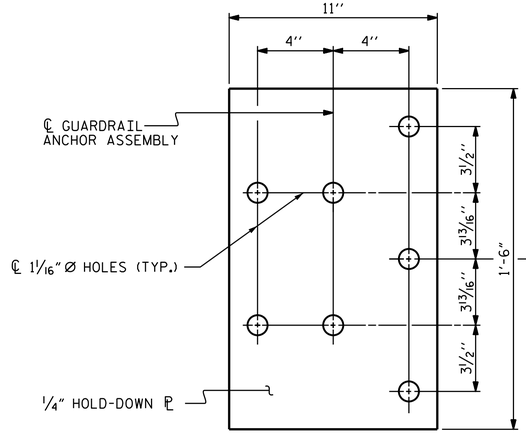
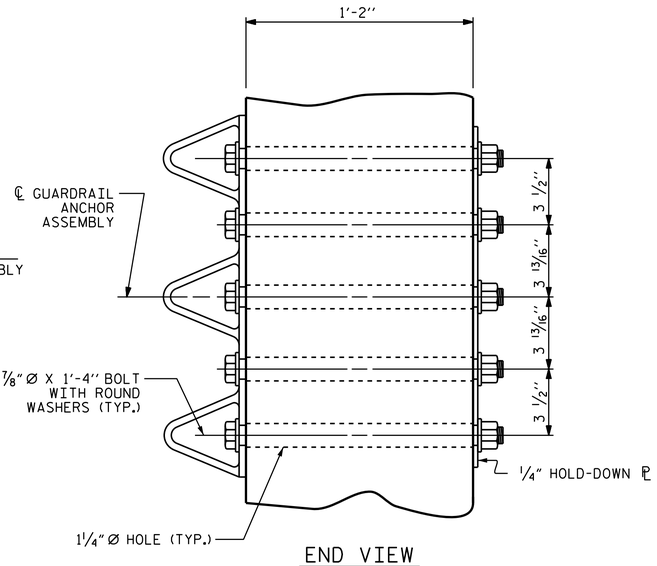
STR. #2



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

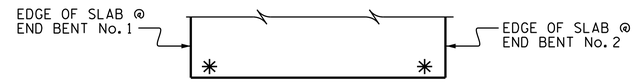
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

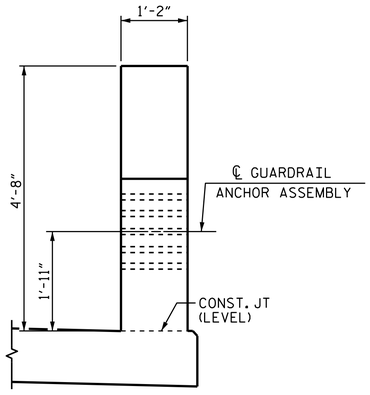
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

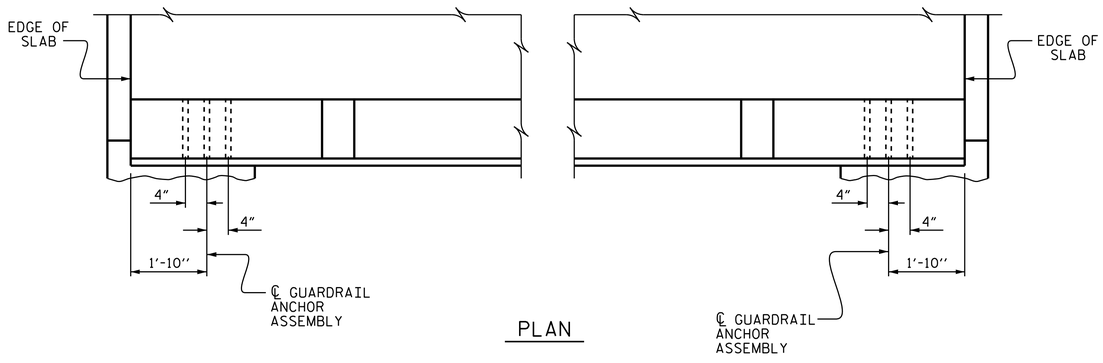


SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

ASSEMBLED BY : D. A. GLADDEN	DATE : 7-17-13		
CHECKED BY : H. T. BARBOUR	DATE : 8-13		
DRAWN BY : MAA 5/10	REV. 12/5/11	MAA/GM	
CHECKED BY : GM 5/10	REV. 6/13	MAA/GM	
	REV. 1/15	MAA/TMG	

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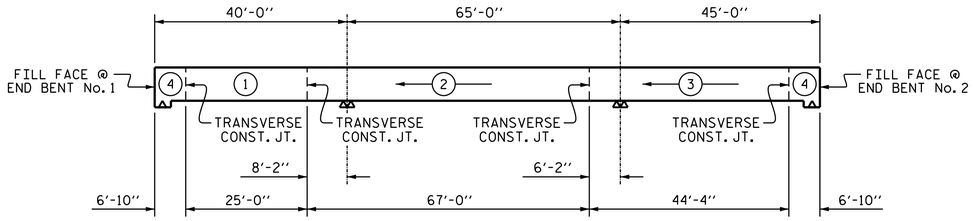
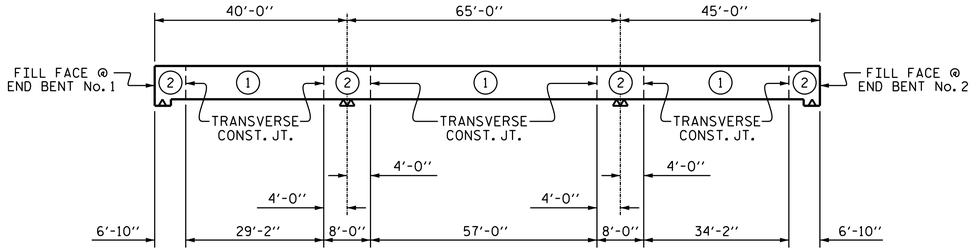


POURING SEQUENCE

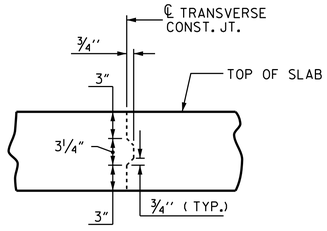
POURS #4 AT END BENTS INCLUDE 6'-10" SECTION OF THE BRIDGE DECK AND UPPER PART OF INTEGRAL END BENT AND WINGS.



OPTIONAL POURING SEQUENCE

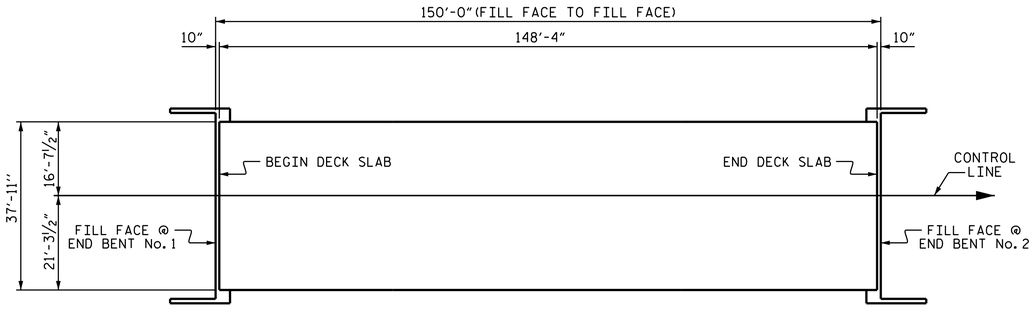
POURS #2 CAN NOT BE POURED UNTIL POURS #1 HAVE REACHED A MINIMUM STRENGTH OF 3000 PSI.

POURS #2 AT END BENTS INCLUDE 6'-10" SECTION OF THE BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,625)

BILL OF MATERIAL

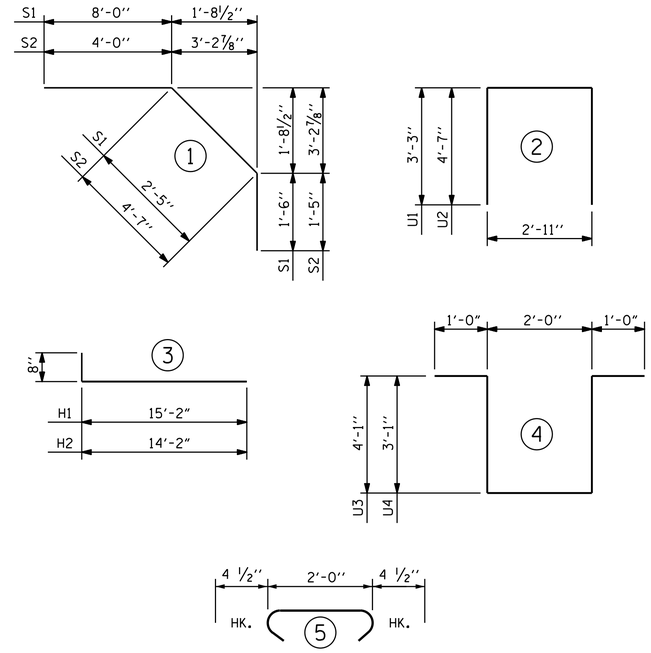
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	323	#5	STR	37'-7"	12661
A2	323	#5	STR	37'-7"	12661
✱B1	65	#6	STR	7'-10"	765
✱B2	65	#6	STR	8'-10"	862
✱B3	34	#6	STR	41'-6"	2119
✱B4	31	#6	STR	15'-9"	733
✱B5	34	#6	STR	43'-0"	2196
✱B6	31	#6	STR	16'-6"	768
✱B7	34	#4	STR	18'-2"	413
✱B8	34	#4	STR	20'-0"	454
✱B9	34	#4	STR	21'-6"	488
B10	150	#5	STR	50'-10"	7953
H1	40	#5	3	15'-10"	661
H2	40	#5	3	14'-10"	619
K1	16	#4	STR	2'-8"	29
K2	4	#4	STR	5'-5"	14
K3	8	#4	STR	5'-10"	31
K4	4	#4	STR	5'-2"	14
K5	18	#4	STR	8'-8"	104
K6	36	#4	STR	9'-5"	226
K7	6	#4	STR	8'-2"	33
K8	16	#4	STR	22'-8"	242
K9	12	#4	STR	7'-2"	57
K10	16	#4	STR	16'-6"	176
✱S1	66	#4	1	11'-11"	525
✱S2	62	#4	1	10'-0"	414
S3	150	#4	5	2'-9"	276
U1	66	#4	2	9'-5"	415
U2	12	#4	2	12'-1"	97
U3	42	#4	4	12'-2"	341
U4	12	#4	4	10'-2"	81

REINFORCING STEEL = 24030 LBS.
✱EPOXY COATED REINF. STEEL = 22398 LBS.

GROOVING BRIDGE FLOORS

APPROACH SLABS	1547 SQ. FT.
BRIDGE DECK	4736 SQ. FT.
TOTAL	6283 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.)
POUR #1	31.9	24030	22398
POUR #2	95.9		
POUR #3	67.1		
POUR #4 ✱✱✱	59.7		
TOTALS ✱✱	264.6	24030	22398

✱✱QUANTITIES FOR CONCRETE BARRIER RAIL & PARAPET ARE NOT INCLUDED

✱✱✱POUR #4 INCLUDES 6'-10" SECTION OF THE BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.

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"			

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : D. A. GLADDEN DATE : 7-10-13
CHECKED BY : H. T. BARBOUR DATE : 8-13

DRAWN BY : JMB 5/87
CHECKED BY : SJD 9/87

REV. 6/1/94 EEM/GRP
REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM

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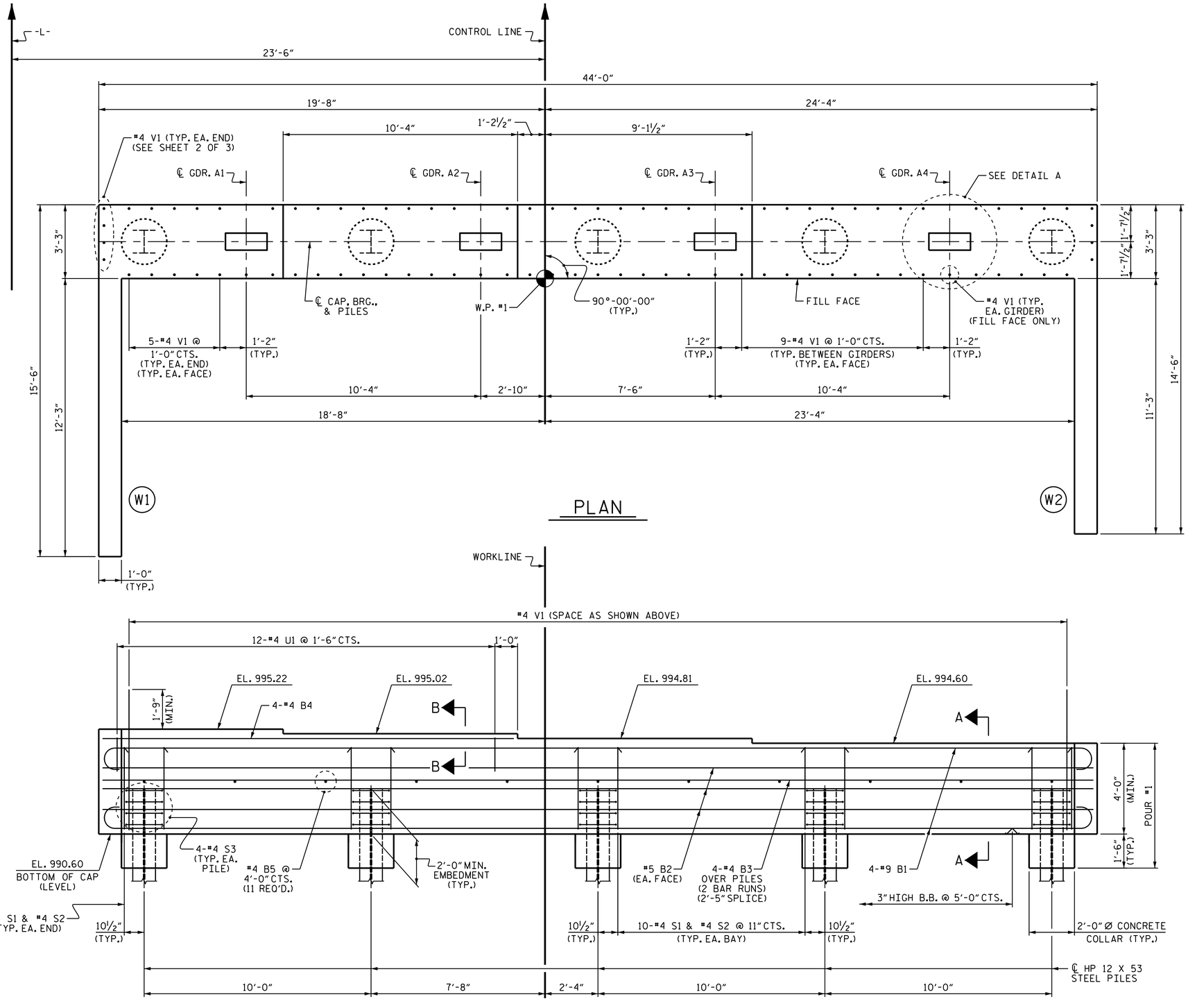
STR. #2

STD. NO. BOM2



PLAN

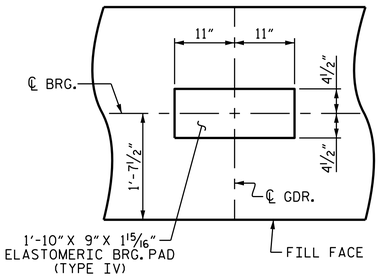
ELEVATION

NOTES

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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 CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #4 OF THE SUPERSTRUCTURE.



DETAIL A
(TYP. EA. BEARING)

PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			47

STR. #2

DRAWN BY : B.N. GRADY	DATE : 12/14
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN	DATE : 7/15

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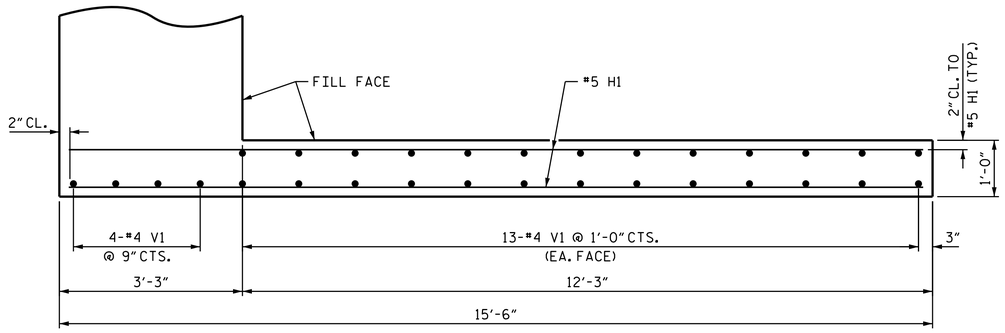
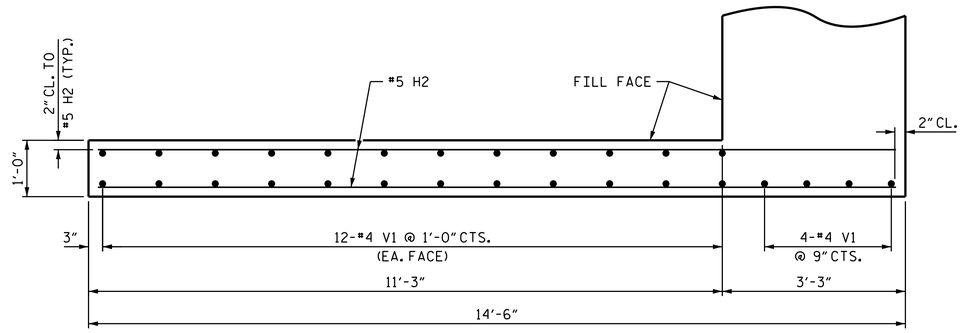
bngrady

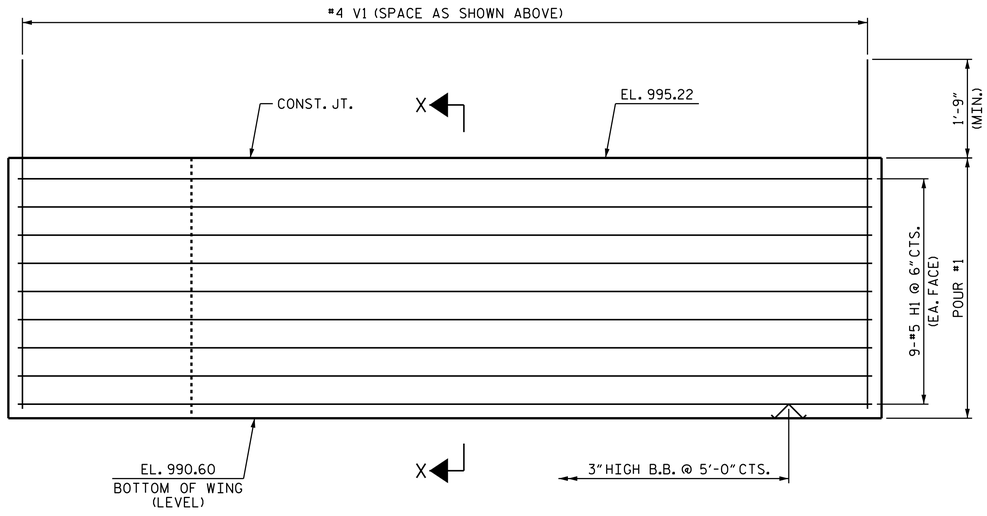
NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CREEK, JR.
DocuSigned by: Marshall G. Creek, Jr.
7/22/2015



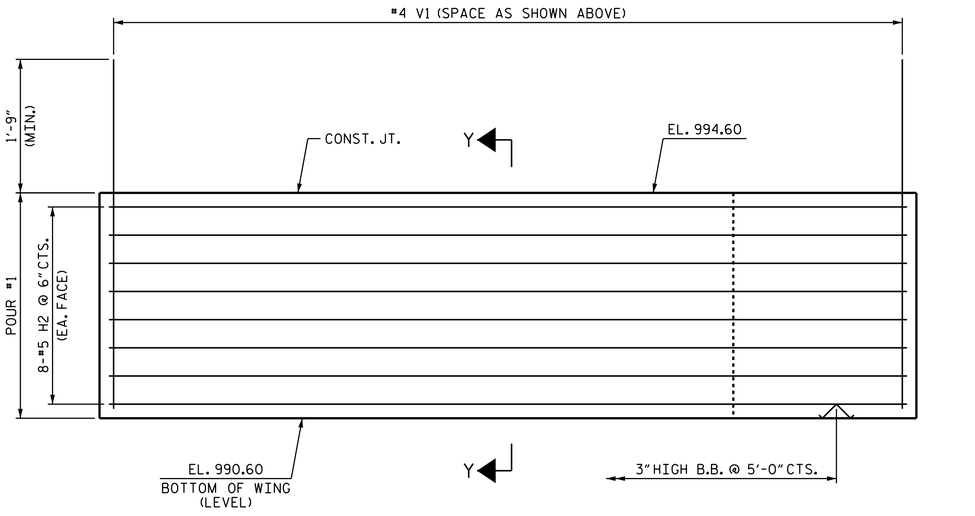
PLAN OF WING W1



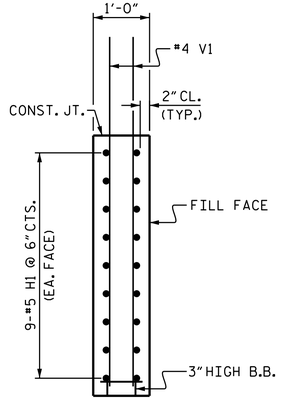
PLAN OF WING W2



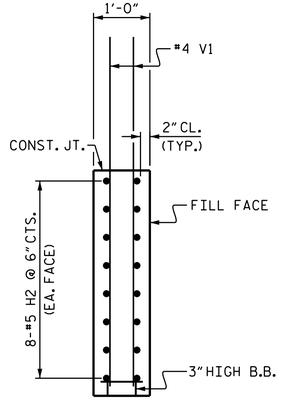
ELEVATION OF WING W1



ELEVATION OF WING W2



SECTION X-X



SECTION Y-Y

DRAWN BY : B.N. GRADY — DATE : 12/14
CHECKED BY : H.T. BARBOUR — DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN — DATE : 7/15

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PROJECT NO. R-2603
WILKES COUNTY
STATION: 117+35.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.
DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...
7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
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2			4			47

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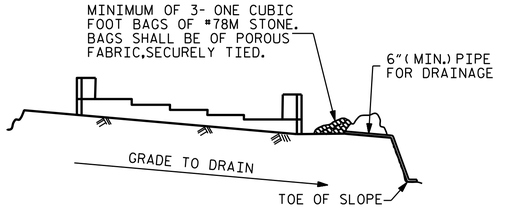
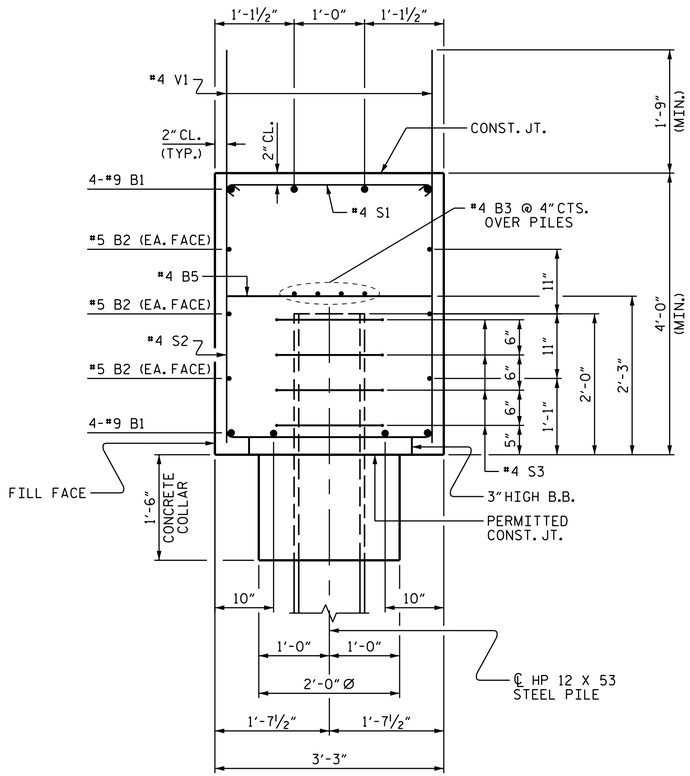


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

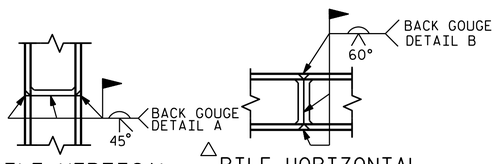
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

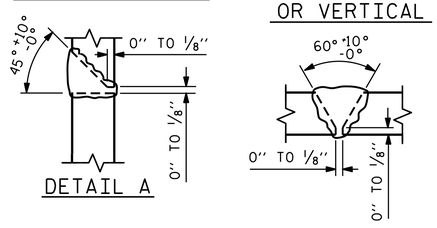


SECTION A-A



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

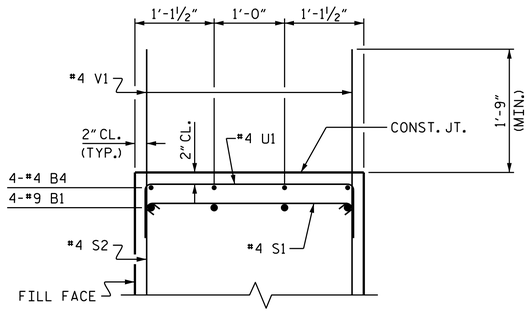


DETAIL A

DETAIL B

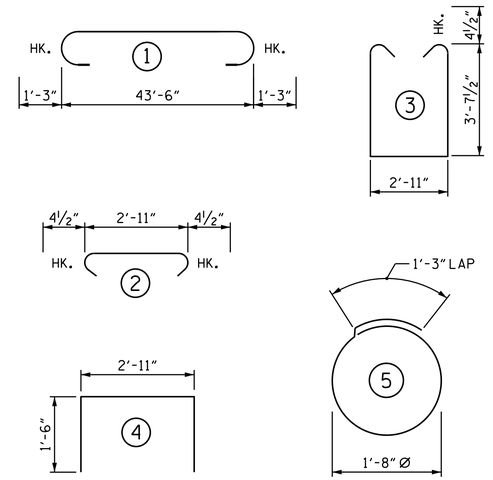
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PARTIAL SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	46'-0"	1251
B2	6	#5	STR	43'-8"	273
B3	8	#4	STR	23'-1"	123
B4	4	#4	STR	18'-1"	48
B5	11	#4	STR	2'-11"	21
H1	18	#5	STR	15'-2"	285
H2	16	#5	STR	14'-2"	236
S1	42	#4	2	3'-8"	103
S2	42	#4	3	10'-11"	306
S3	20	#4	5	6'-6"	87
U1	12	#4	4	5'-11"	47
V1	136	#4	STR	6'-3"	568

REINFORCING STEEL 3348 LBS.

CLASS A CONCRETE

* POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)

TOTAL 27.2 C.Y.

HP 12 X 53 STEEL PILES

NO. 5 105 LIN. FT.

* CONCRETE QUANTITY FOR UPPER PART OF WINGS IS INCLUDED IN POUR #4 OF SUPERSTRUCTURE.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			47

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Docusigned by: Marshall G. Cheek, Jr. 8549D6EBAA3B405...

7/22/2015

DRAWN BY : B.N. GRADY	DATE : 12/14
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN	DATE : 7/15

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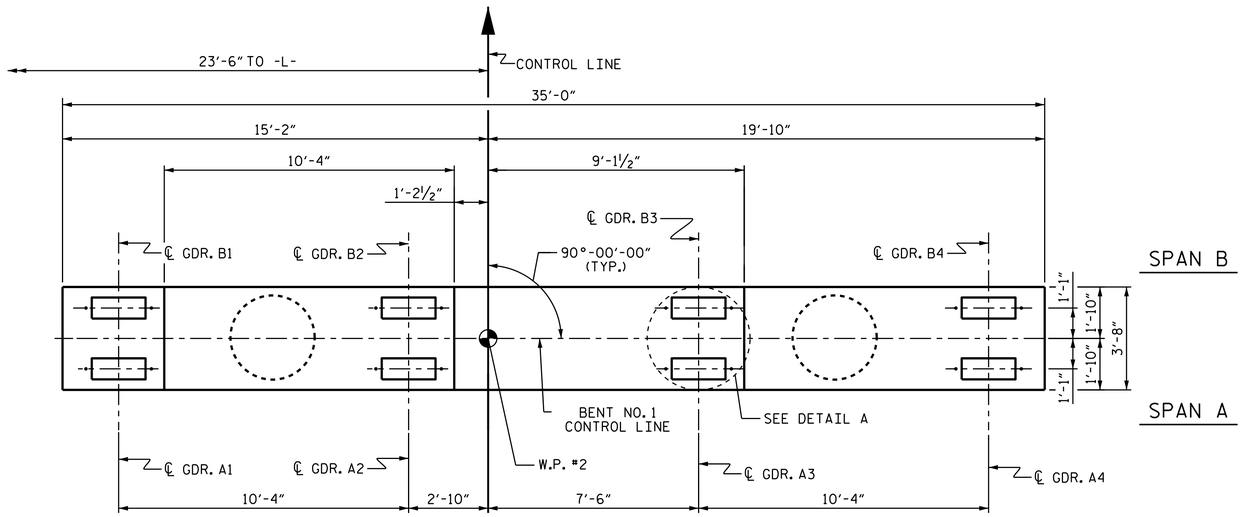
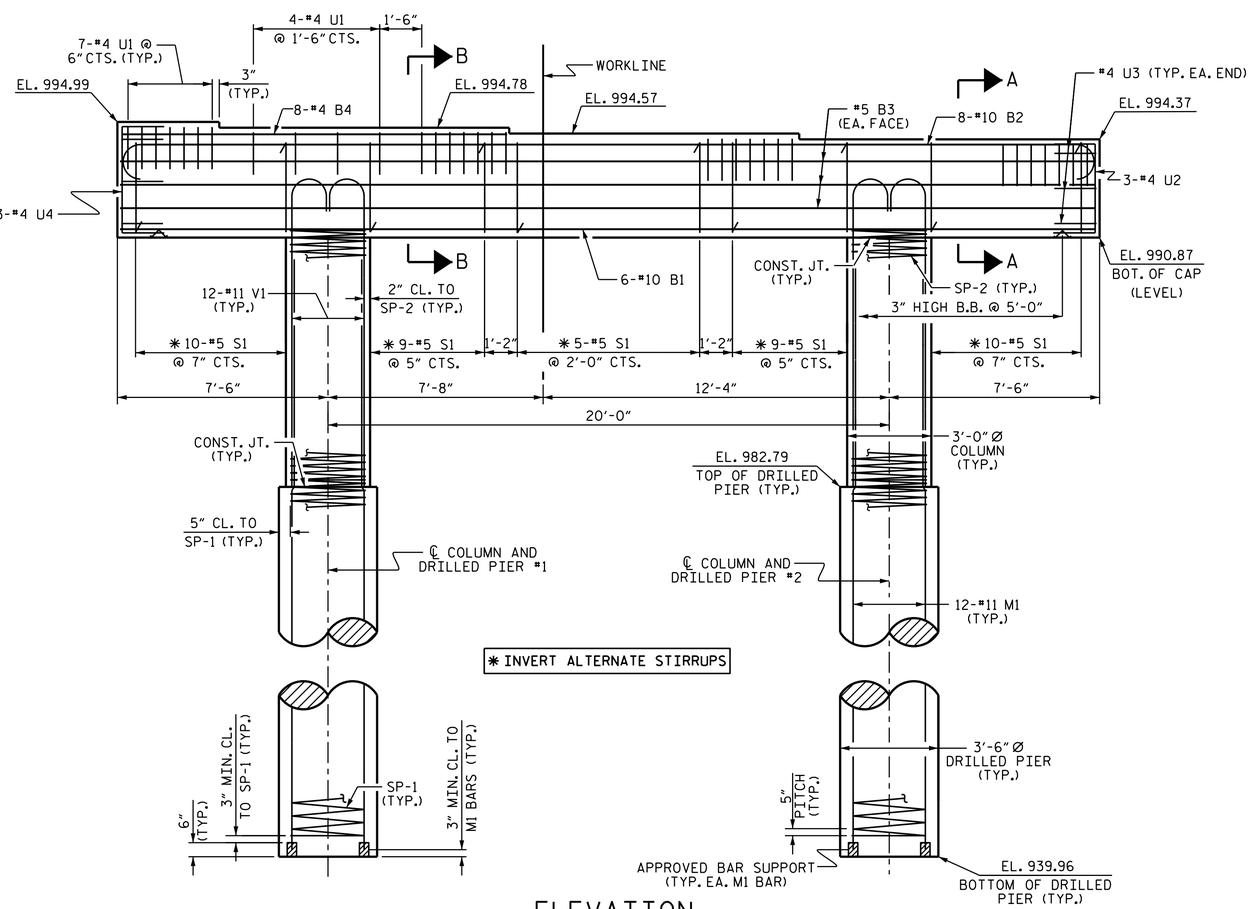
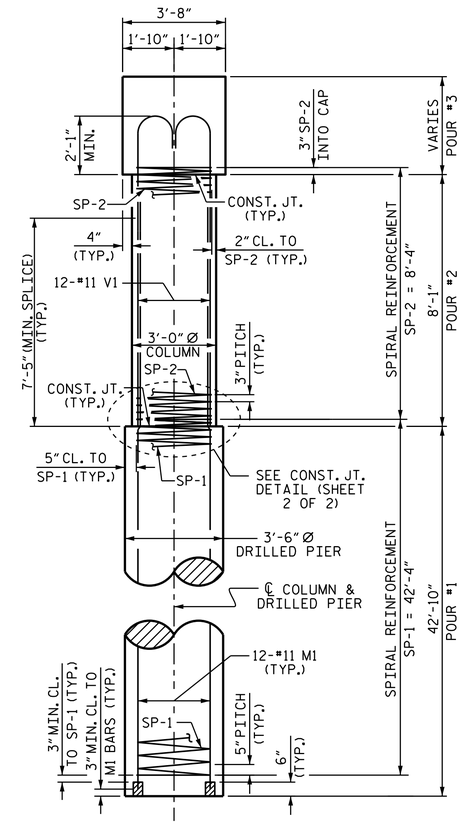


PLAN



ELEVATION



END ELEVATION

NOTES:

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

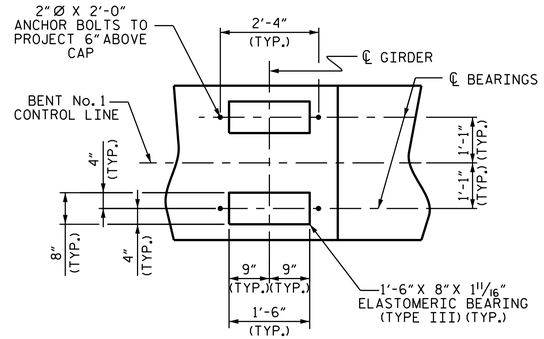
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

SPLICING OF THE LONGITUDNAL BARS IN THE DRILLED PIERS WILL BE NOT PERMITTED.

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



DETAIL A

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405... 7/22/2015

DRAWN BY :	J.K.BOWLES	DATE : 12/15/14
CHECKED BY :	H.T.BARBOUR	DATE : 2/24/15
DESIGN ENGINEER OF RECORD:	R.Z. DEAN	DATE : 7-15

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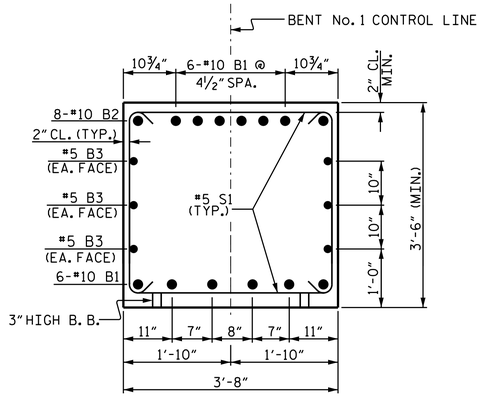
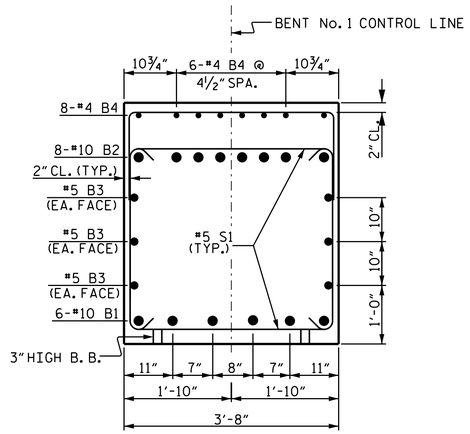
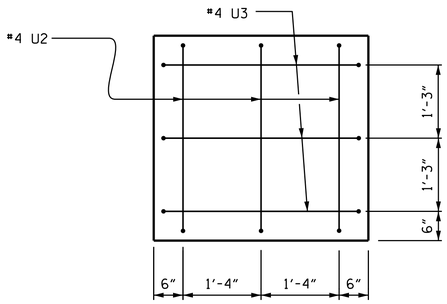
STR. #2



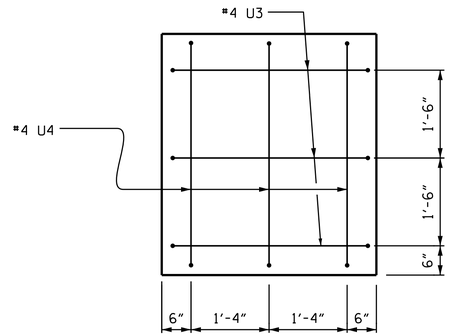
SECTION A-A



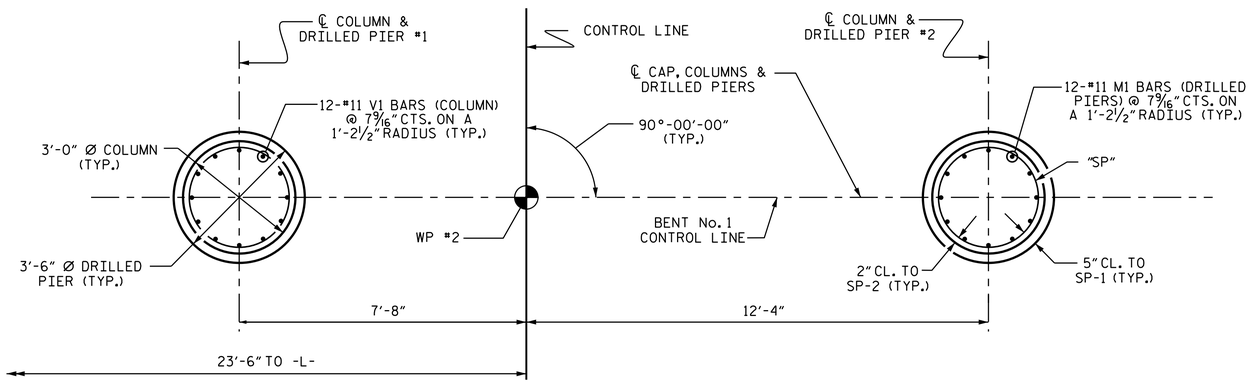
SECTION B-B



RIGHT END VIEW

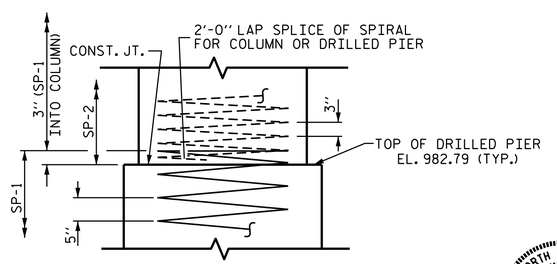


LEFT END VIEW



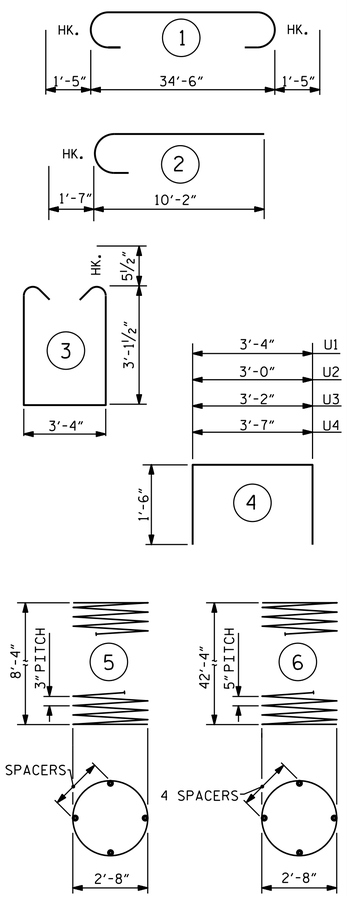
PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	34'-8"	895
B2	8	#10	1	37'-4"	1285
B3	6	#5	STR	34'-8"	217
B4	8	#4	STR	13'-7"	73
M1	24	#11	STR	53'-0"	6758
S1	43	#5	3	10'-6"	471
U1	32	#4	4	6'-4"	135
U2	3	#4	4	6'-0"	12
U3	6	#4	4	6'-2"	25
U4	3	#4	4	6'-7"	13
V1	24	#11	2	11'-9"	1498
REINFORCING STEEL =					11382 LBS.
SP-1	2	*	6	849'-3"	1772
SP-2	2	**	5	288'-10"	386
SPIRAL COLUMN REINFORCING STEEL =					2158 LBS.

CLASS A CONCRETE		
POUR #2 (COLUMNS) =	4.2	C.Y.
POUR #3 (CAP) =	17.8	C.Y.
TOTAL CLASS A CONCRETE	22.0	C.Y.
DRILLED PIERS:		
DRILLED PIER CONCRETE		
POUR #1 (DRILLED PIERS) =	30.5	C.Y.
3'-6" Ø DRILLED PIERS IN SOIL =	60.67	LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL =	25.00	LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS =	25.58	LIN. FT.
CSL TUBES =	354.67	LIN. FT.
SPT TESTING	2	EACH
SID INSPECTIONS	2	EACH

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIERS.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			47

SHT. #2

DRAWN BY : J.K.BOWLES DATE : 12/17/14
CHECKED BY : H.T.BARBOUR DATE : 2/24/2015
DESIGN ENGINEER OF RECORD: R.Z. DEAN DATE : 7-15

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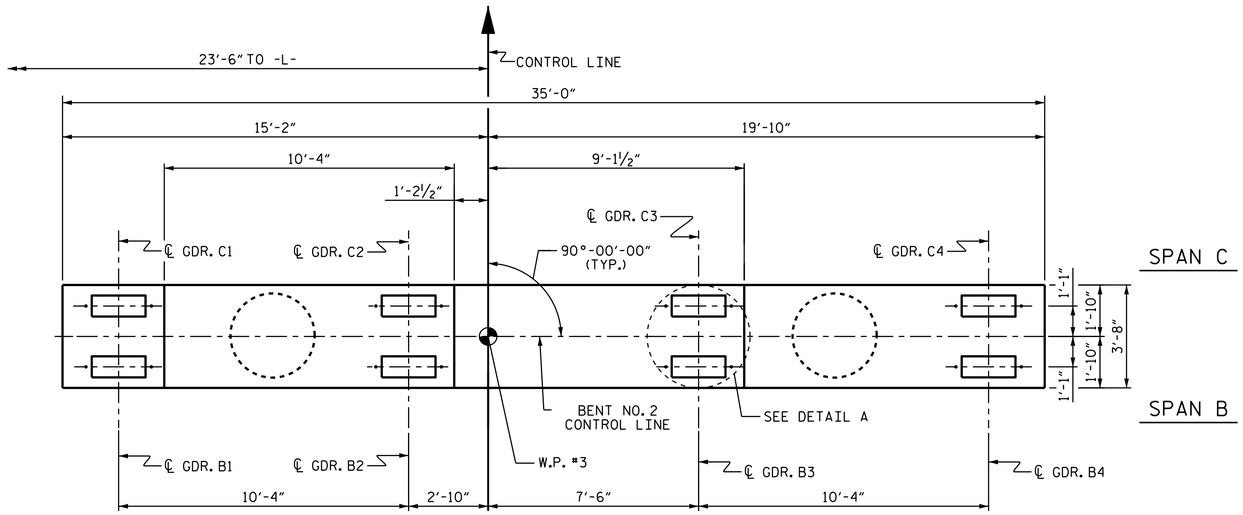
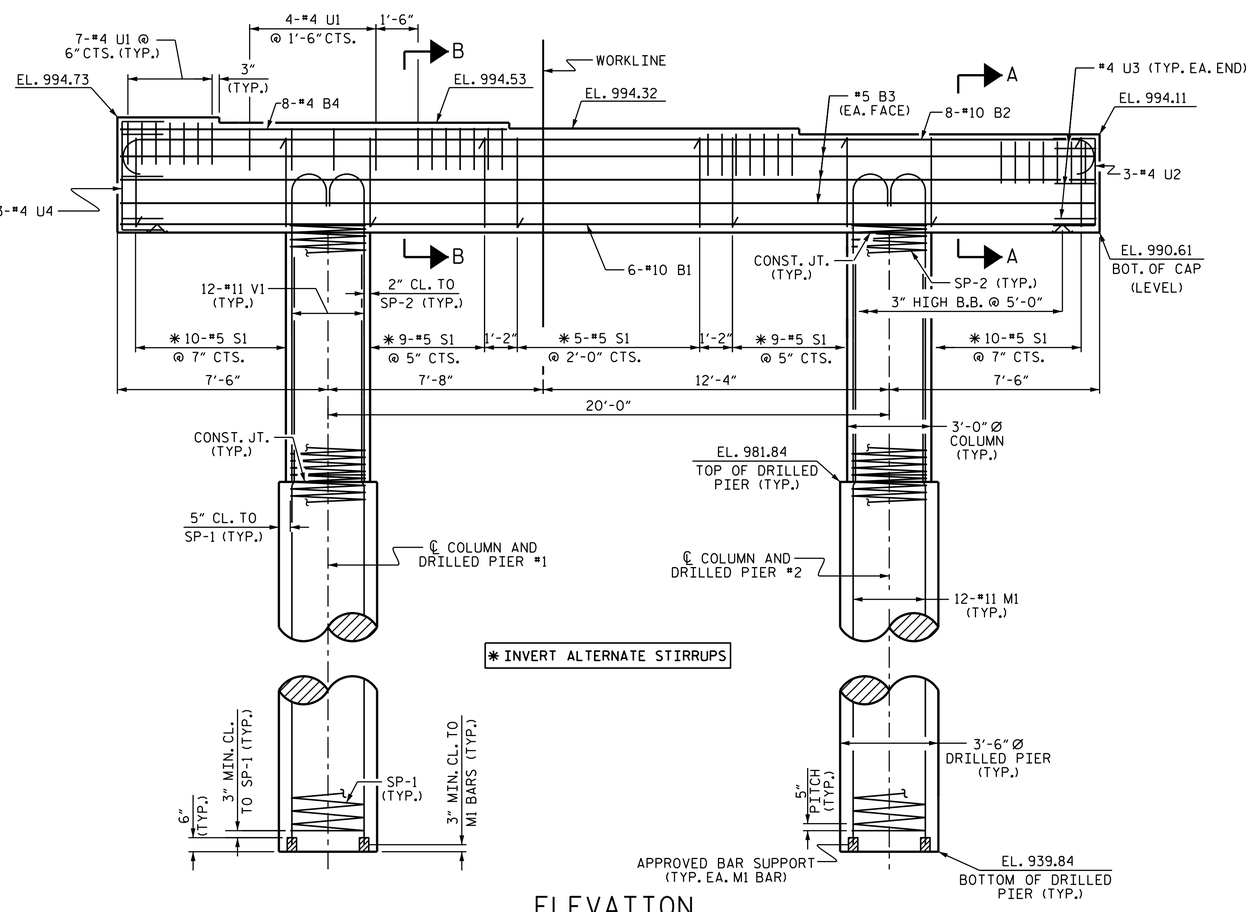


PLAN



ELEVATION

NOTES:

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

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

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

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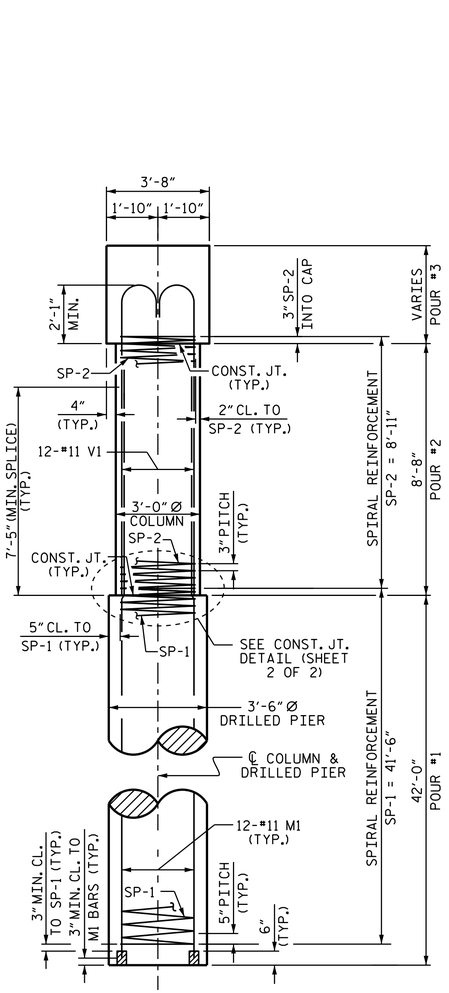
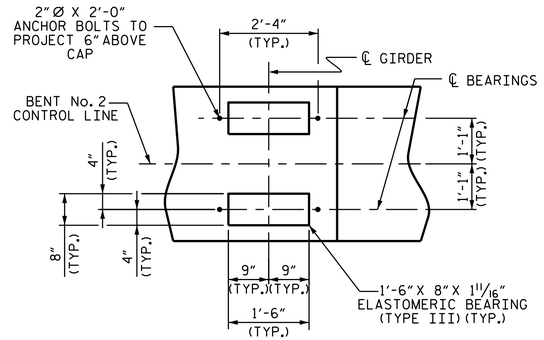


END ELEVATION



DETAIL A

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Documents... Marshall G. Cheek, Jr.
65490E6EBAA3B405...
7/22/2015

DRAWN BY : J.K.BOWLES DATE : 12/30/14
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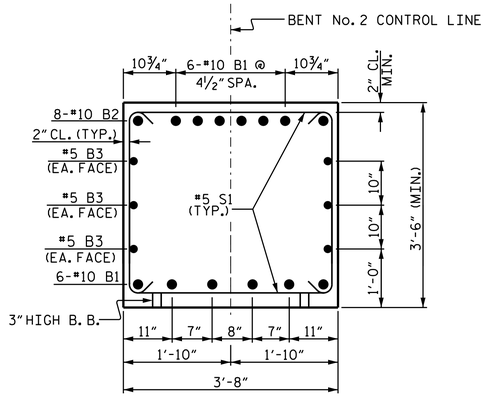
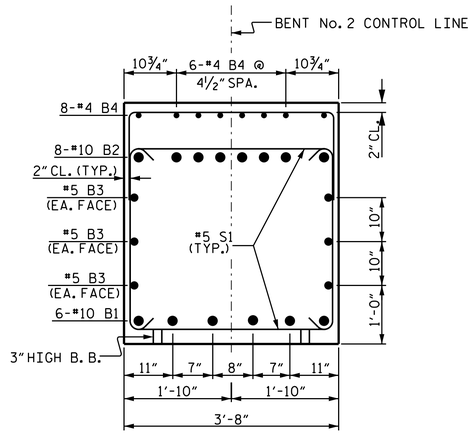
STR. #2



SECTION A-A



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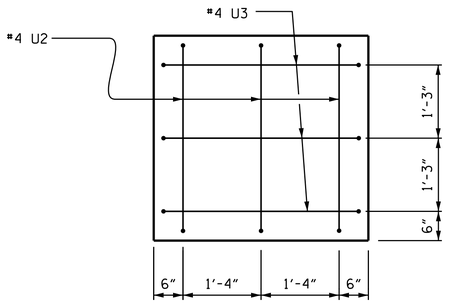
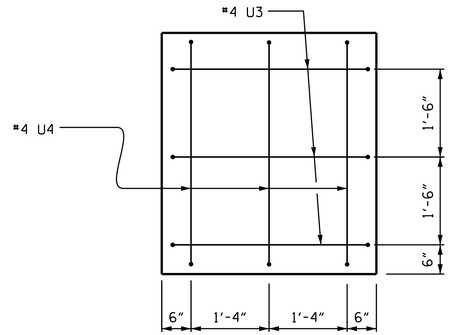
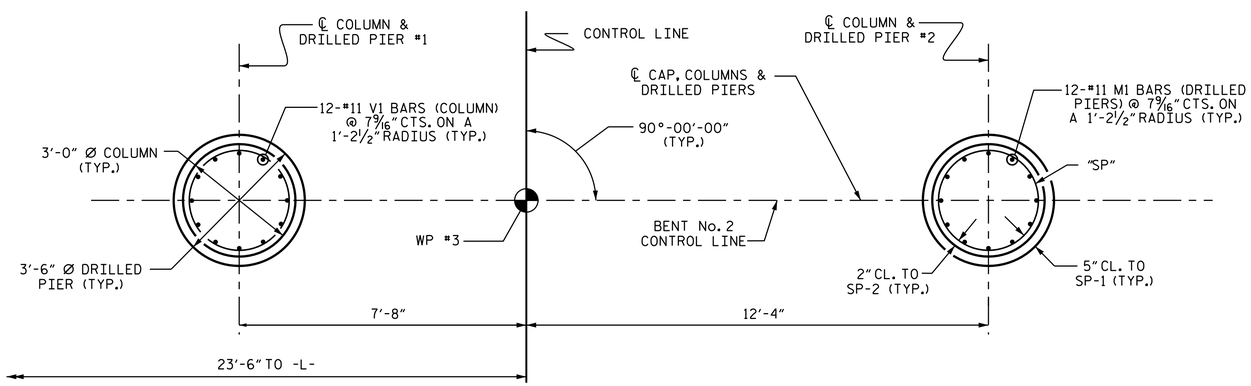


RIGHT END VIEW

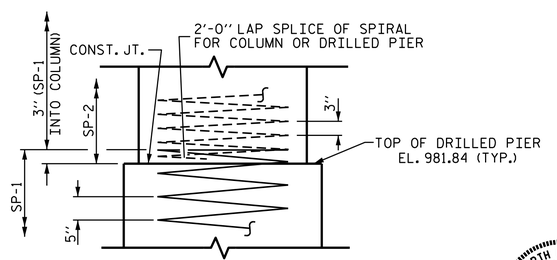


LEFT END VIEW



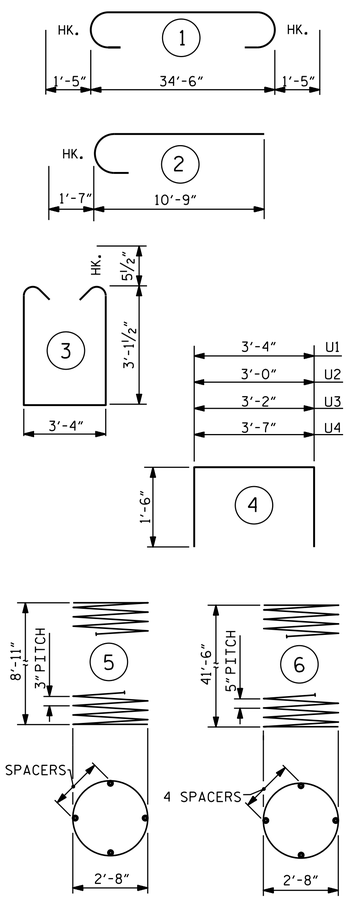
PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL FOR EACH COLUMN & DRILLED PIER)



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	34'-8"	895
B2	8	#10	1	37'-4"	1285
B3	6	#5	STR	34'-8"	217
B4	8	#4	STR	13'-7"	73
M1	24	#11	STR	52'-2"	6652
S1	43	#5	3	10'-6"	471
U1	32	#4	4	6'-4"	135
U2	3	#4	4	6'-0"	12
U3	6	#4	4	6'-2"	25
U4	3	#4	4	6'-7"	13
V1	24	#11	2	12'-4"	1573
REINFORCING STEEL =					11351 LBS.
SP-1	2	*	6	832'-9"	1737
SP-2	2	**	5	307'-4"	411
SPIRAL COLUMN REINFORCING STEEL = 2148 LBS.					

CLASS A CONCRETE		
POUR #2 (COLUMNS) =	4.5	C.Y.
POUR #3 (CAP) =	17.8	C.Y.
TOTAL CLASS A CONCRETE	22.3	C.Y.
DRILLED PIERS:		
DRILLED PIER CONCRETE		
POUR #1 (DRILLED PIERS) =	29.9	C.Y.
3'-6" Ø DRILLED PIERS IN SOIL =	39.00	LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL =	45.00	LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS =	23.68	LIN. FT.
CSL TUBES =	348.00	LIN. FT.
SPT TESTING	2	EACH
SID INSPECTIONS	2	EACH

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT PRICE BID FOR DRILLED PIERS.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK JR.

Digitally signed by Marshall G. Cheek, Jr.
65490BEBAA3B405...

7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			47

SHT. #2

DRAWN BY : J.K.BOWLES DATE : 12/30/14
CHECKED BY : H.T.BARBOUR DATE : 2/24/2015
DESIGN ENGINEER OF RECORD: R.Z. DEAN DATE : 7-15

21-JUL-2015 08:32
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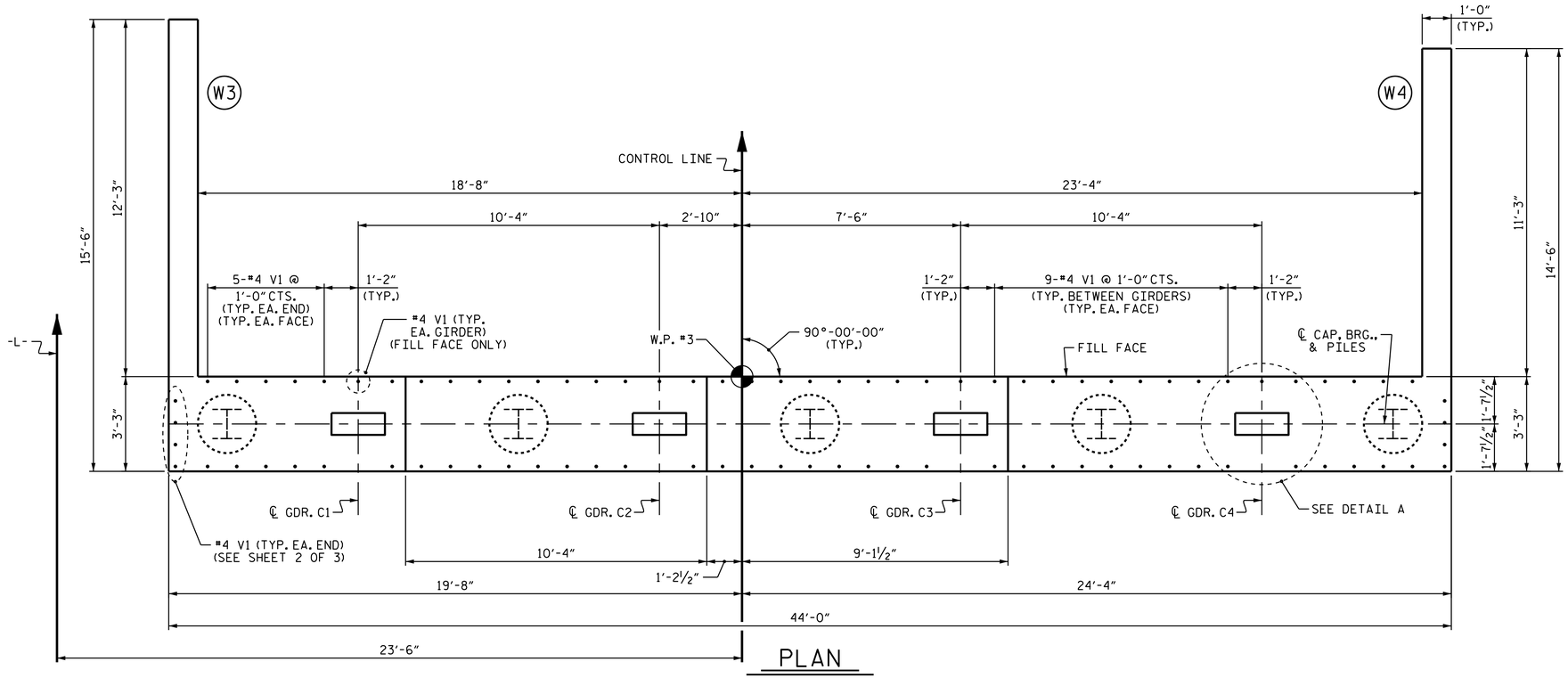
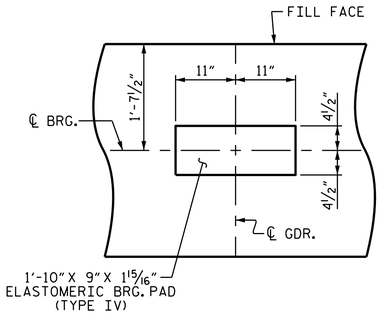
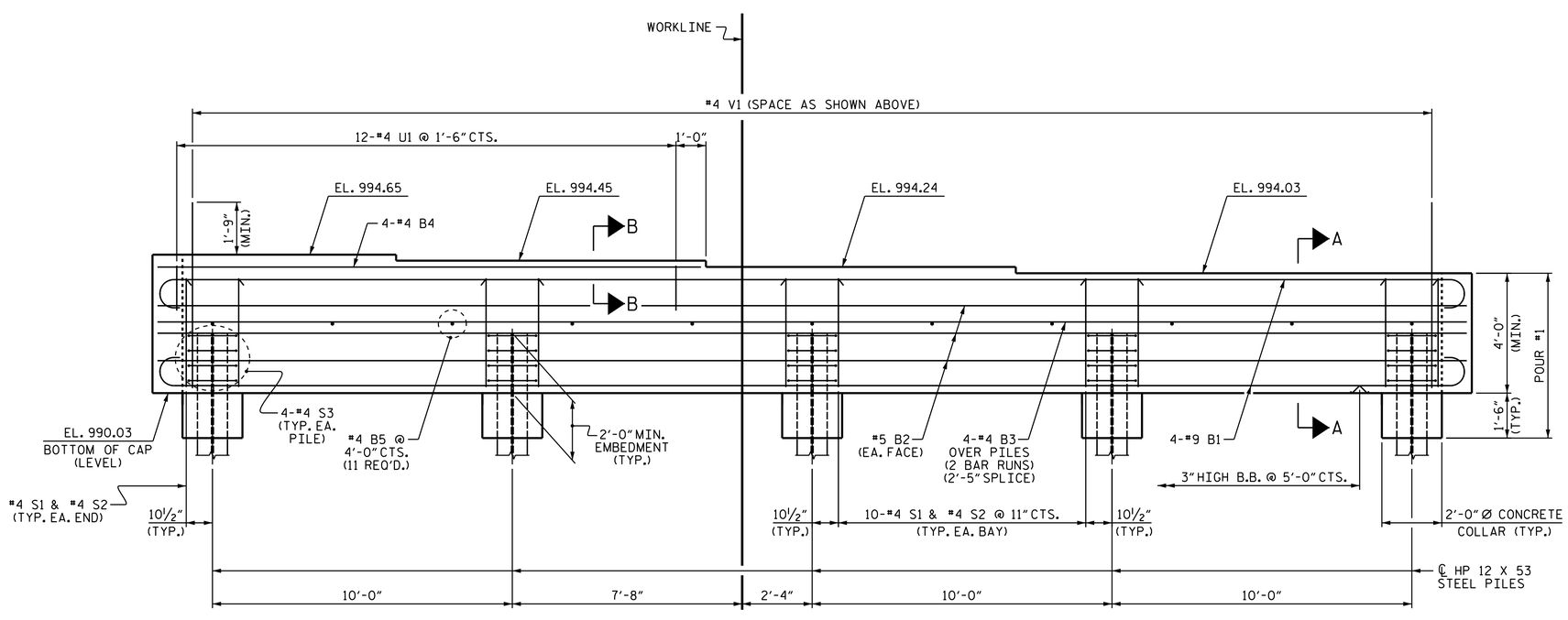
bngrady



PLAN



DETAIL A
(TYP. EA. BEARING)



ELEVATION

NOTES

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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 CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #3 OF THE SUPERSTRUCTURE.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : B.N. GRADY	DATE : 12/14
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN	DATE : 7/15

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

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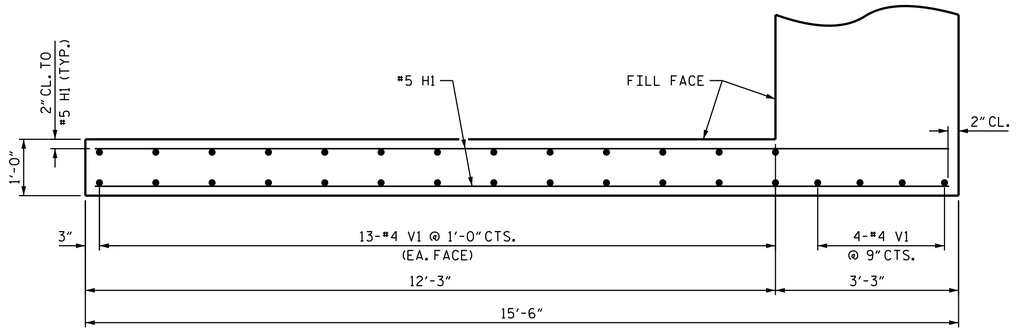
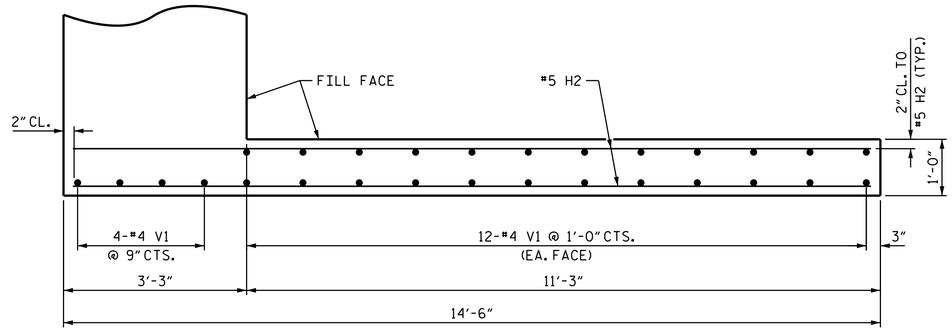
bngrady

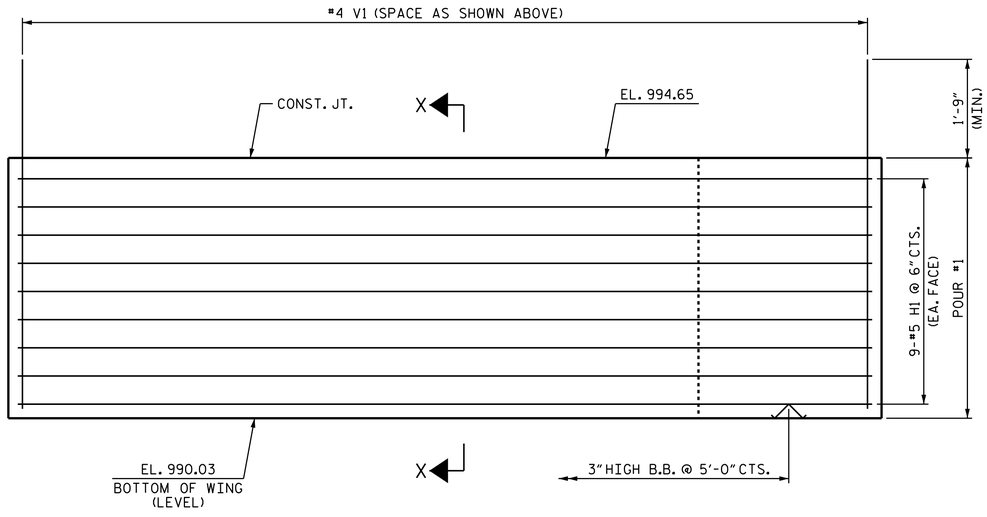
STR. #2



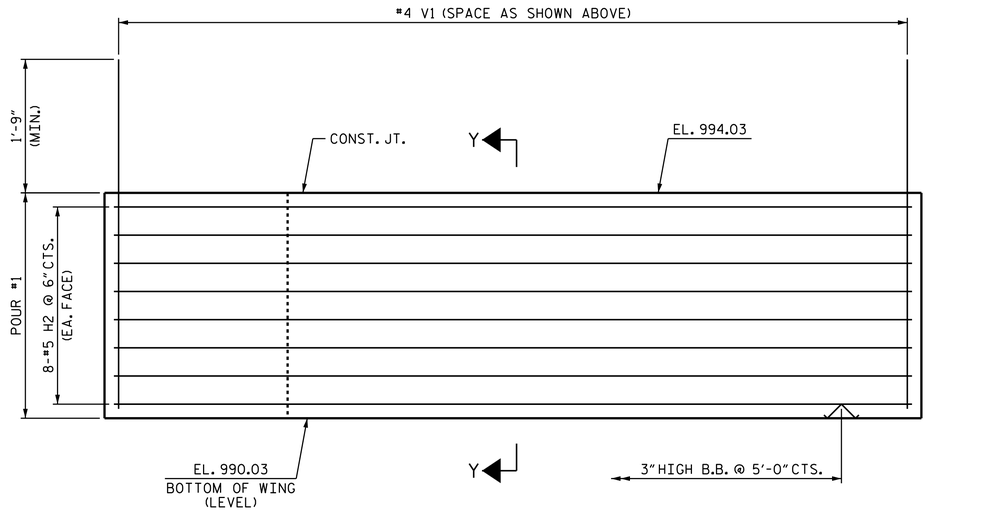
PLAN OF WING W3



PLAN OF WING W4



ELEVATION OF WING W3



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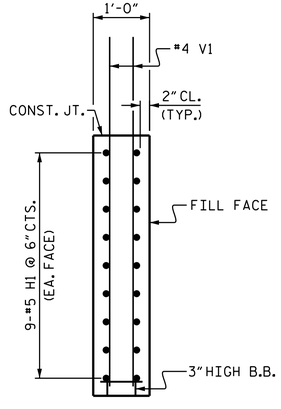
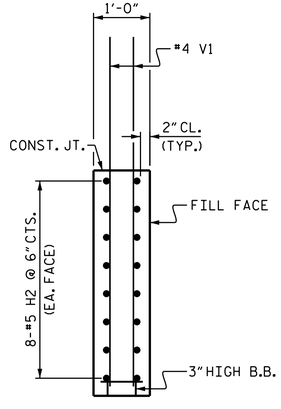


SECTION X-X



SECTION Y-Y

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Marshall G. Cheek, Jr.
B549D6EBAA3B405...
7/22/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			47

STR. #2

DRAWN BY : B.N. GRADY DATE : 12/14
CHECKED BY : H.T. BARBOUR DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN DATE : 7/15

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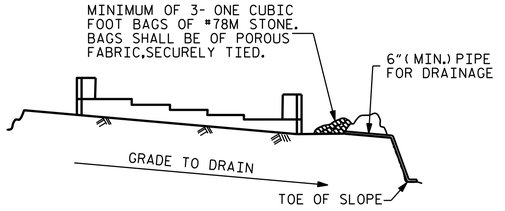
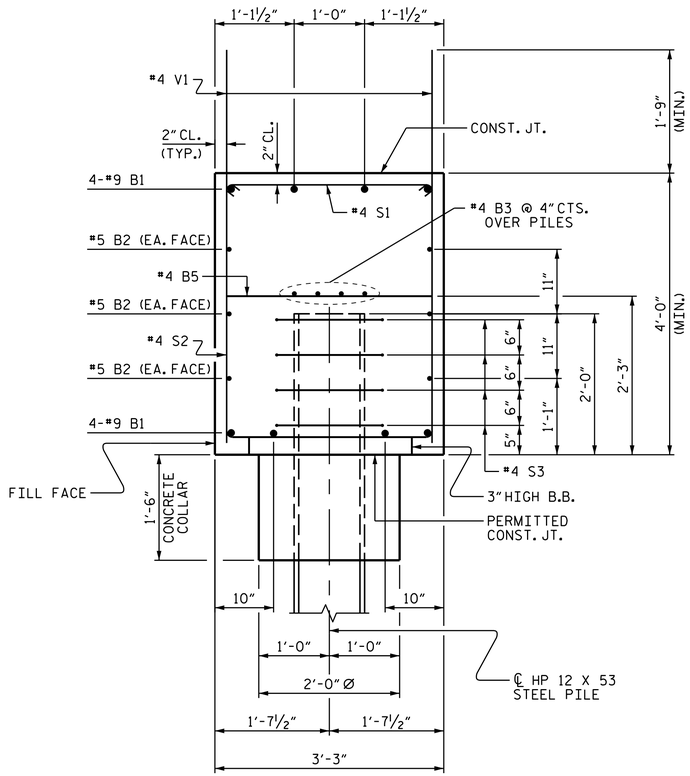


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

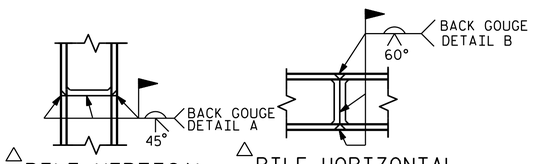
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

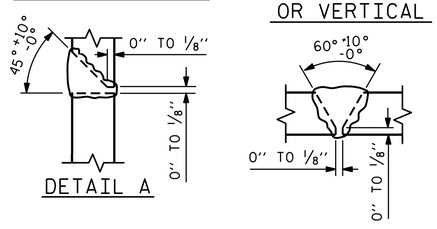


SECTION A-A



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

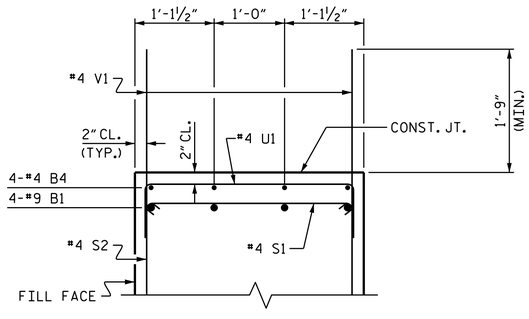


DETAIL A

DETAIL B

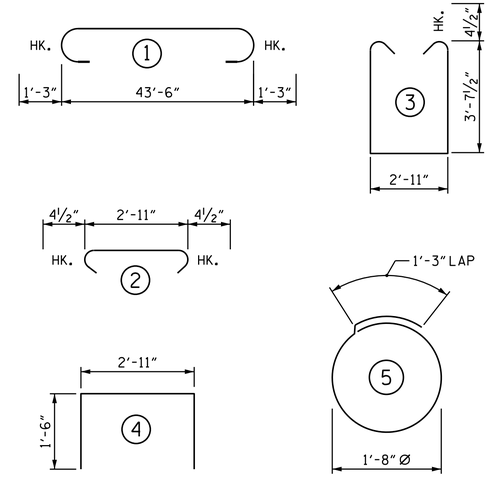
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PARTIAL SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	46'-0"	1251
B2	6	#5	STR	43'-8"	273
B3	8	#4	STR	23'-1"	123
B4	4	#4	STR	18'-1"	48
B5	11	#4	STR	2'-11"	21
H1	18	#5	STR	15'-2"	285
H2	16	#5	STR	14'-2"	236
S1	42	#4	2	3'-8"	103
S2	42	#4	3	10'-11"	306
S3	20	#4	5	6'-6"	87
U1	12	#4	4	5'-11"	47
V1	136	#4	STR	6'-3"	568

REINFORCING STEEL 3348 LBS.

CLASS A CONCRETE

* POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)

TOTAL 27.2 C.Y.

HP 12 X 53 STEEL PILES

NO. 5 200 LIN. FT.

* CONCRETE QUANTITY FOR UPPER PART OF WINGS IS INCLUDED IN POUR #4 OF SUPERSTRUCTURE.

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			47

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

Docusigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

DRAWN BY : B.N. GRADY	DATE : 12/14
CHECKED BY : H.T. BARBOUR	DATE : 2/15
DESIGN ENGINEER OF RECORD: R.Z. DEAN	DATE : 7/15

21-JUL-2015 08:32
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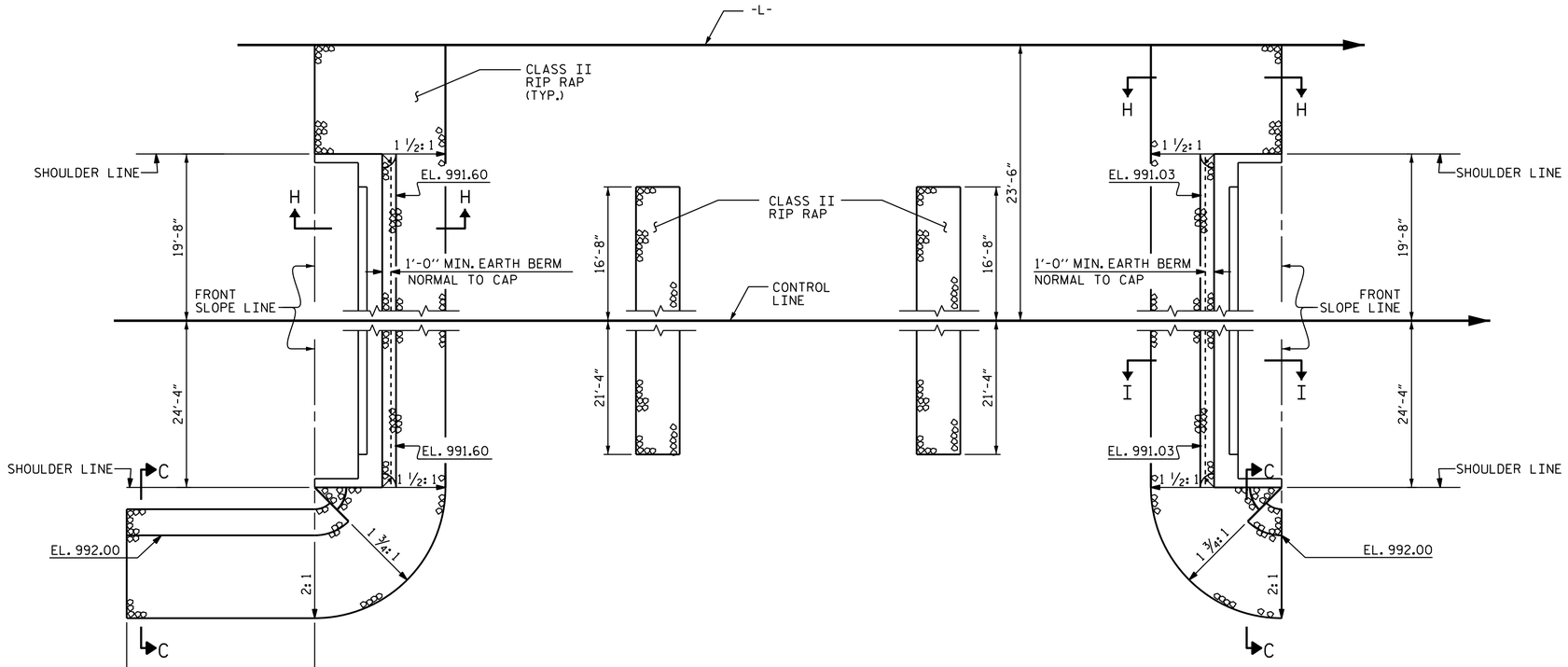
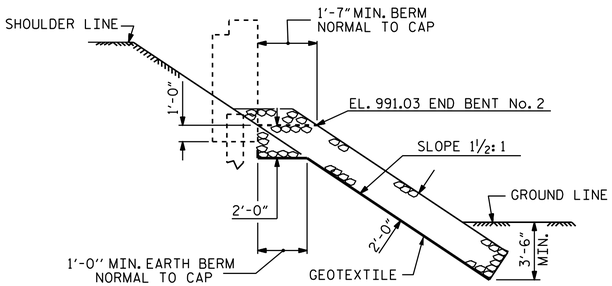


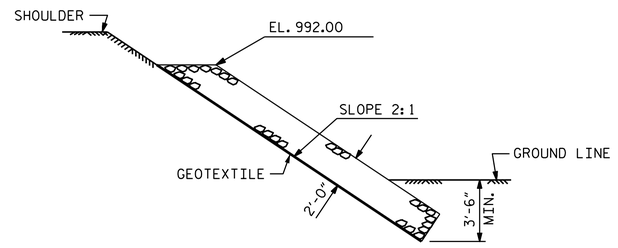
END BENT No. 1

END BENT No. 2

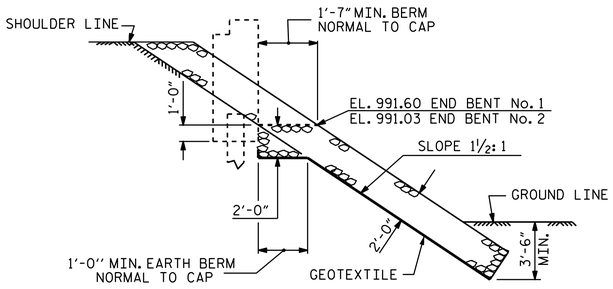
ESTIMATED QUANTITIES		
BRIDGE @ STA. 117+35.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT No. 1	130	145
BENT No. 1	60	65
BENT No. 2	60	65
END BENT No. 2	110	120
TOTAL	360	395



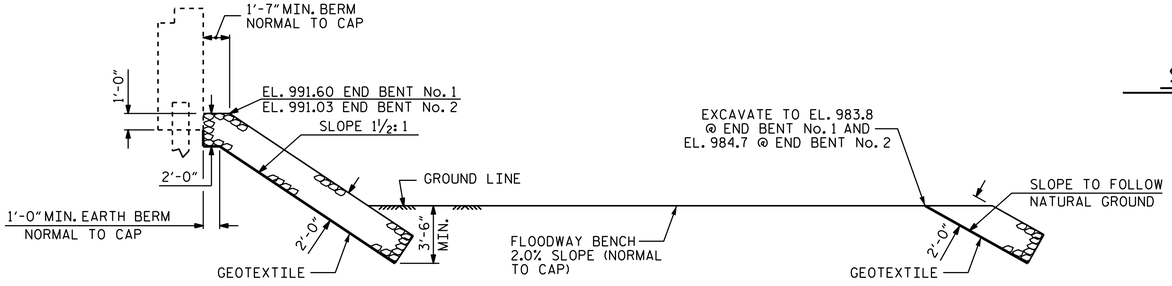
SECTION I-I



SECTION C-C



SECTION H-H



℄ SECTION BERM RIP RAPPED

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 65490E6EBAA3B405...

7/22/2015

ASSEMBLED BY : H. T. BARBOUR	DATE : 3-25-15
CHECKED BY : D. HODGE	DATE : 4-15-15
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

21-JUL-2015 08:32
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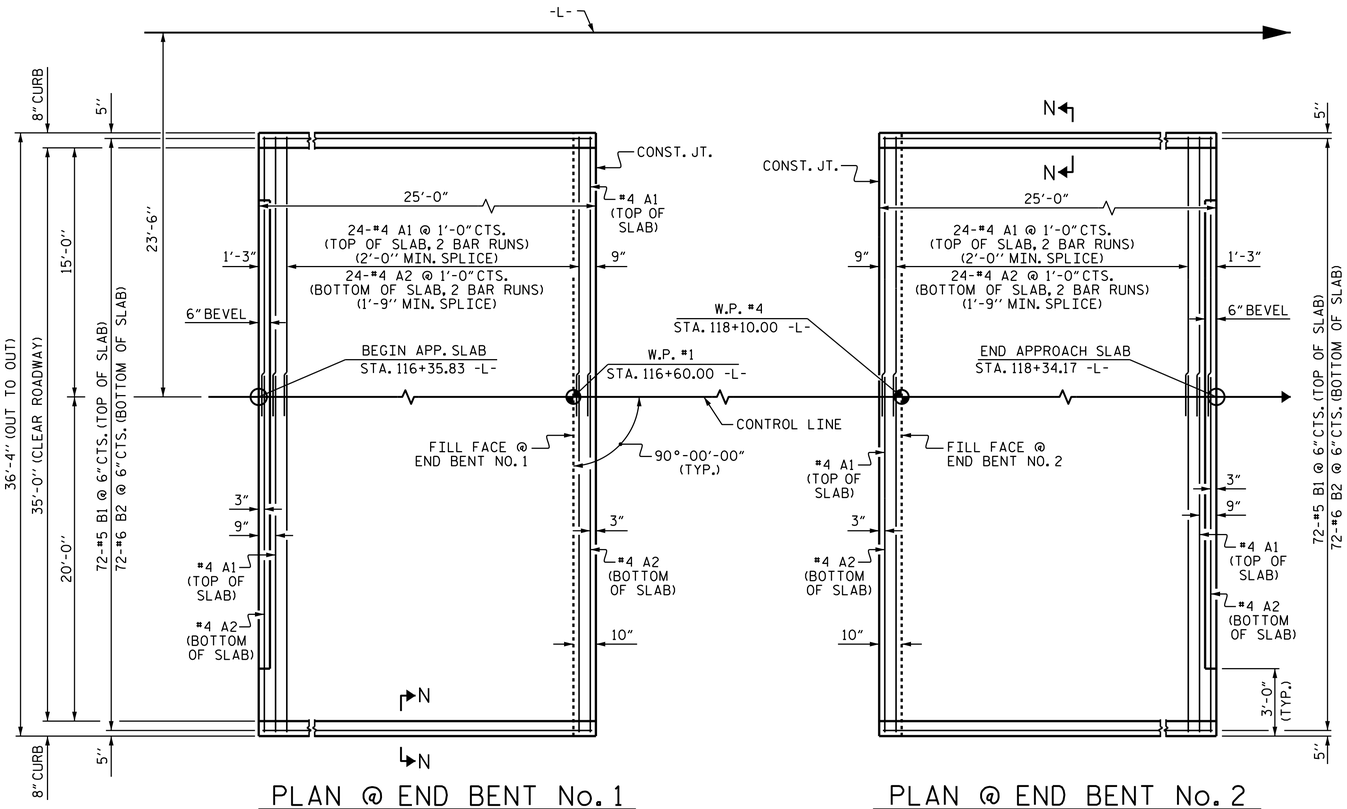
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-45

TOTAL SHEETS 47

STR. #2

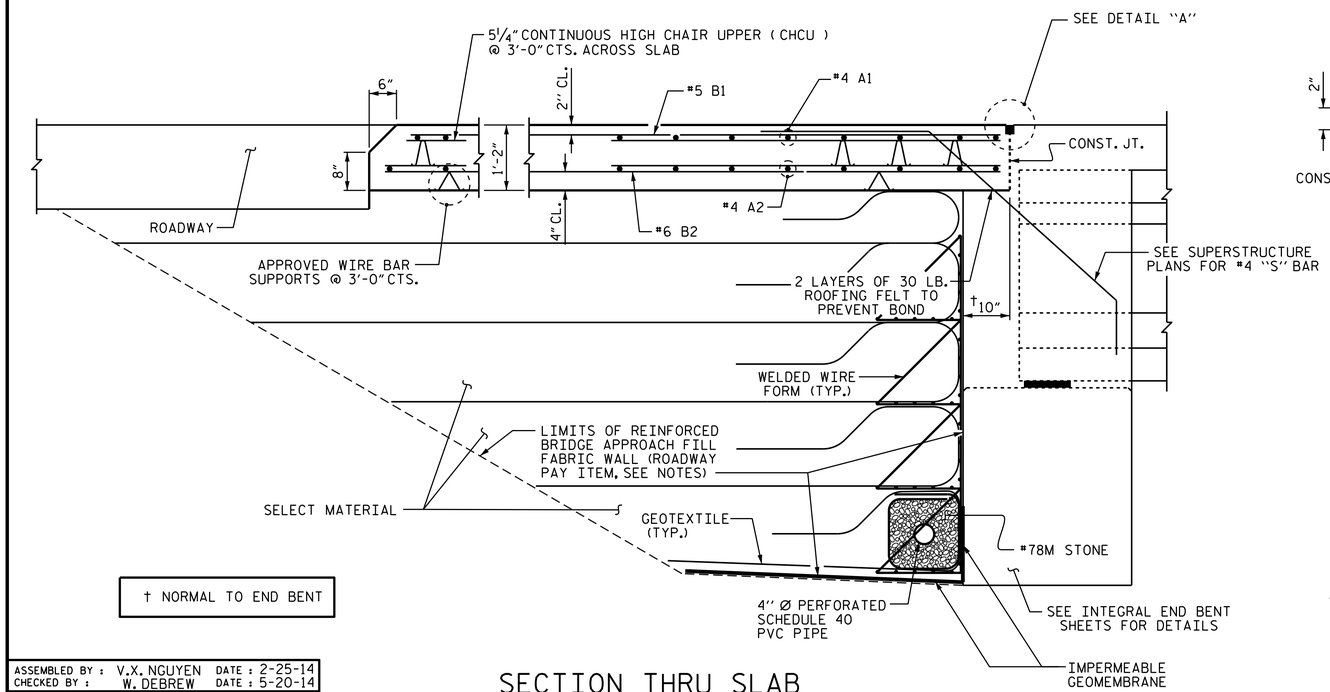
STD. NO. RR1



PLAN @ END BENT No. 1

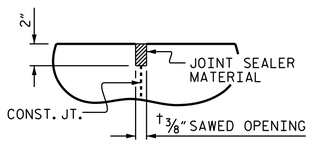
PLAN @ END BENT No. 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

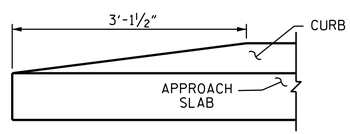


† NORMAL TO END BENT

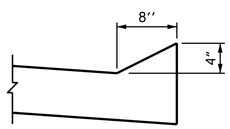
SECTION THRU SLAB



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, 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 JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED 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 SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	52	#4	STR	19'-0"	660
A2	52	#4	STR	18'-11"	657
✱ B1	72	#5	STR	24'-3"	1821
B2	72	#6	STR	24'-8"	2668
REINFORCING STEEL				3325	LBS.
✱ EPOXY COATED REINFORCING STEEL				2481	LBS.
CLASS AA CONCRETE				39.1 C.Y.	

ASSEMBLED BY : V.X. NGUYEN	DATE : 2-25-14		
CHECKED BY : W. DEBREW	DATE : 5-20-14		
DRAWN BY : TLA 10/05	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 12/21/11	MAA/GM	
	REV. 6/13	MAA/GM	

21-JUL-2015 08:32
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bngrady

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 8549D6EBAA3B405... 7/22/2015

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

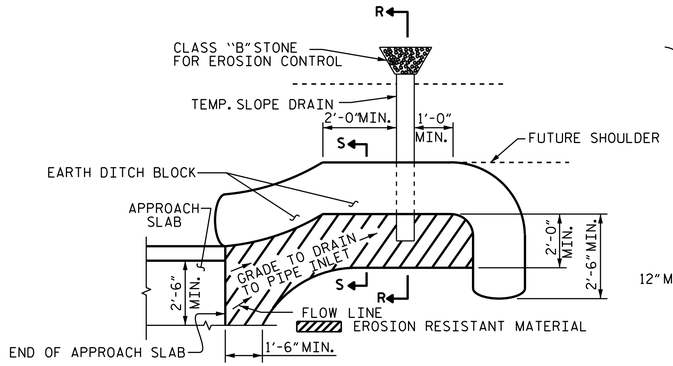
STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			47

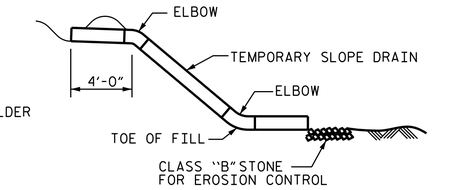
STR. #2

STD. NO. BAS5 (SHT 2)

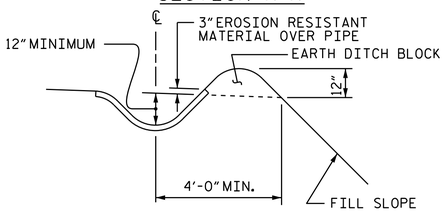


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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



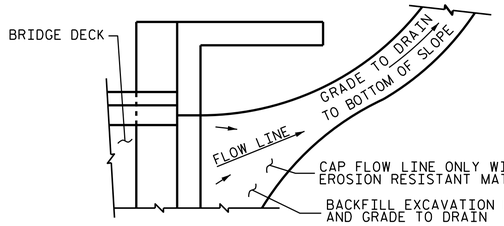
SECTION R-R



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

ASSEMBLED BY :	V.X. NGUYEN	DATE :	2-25-14
CHECKED BY :	W. DEBREW	DATE :	5-20-14
DRAWN BY : FCJ	11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB	11/88	REV. 7/12	MAA/GM
		REV. 6/13	MAA/GM

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bngrady

NORTH CAROLINA PROFESSIONAL SEAL 20125 ENGINEER MARSHALL G. CHEEK, JR.

DocuSigned by: Marshall G. Cheek, Jr. 6549D6EBAA3B405...

7/22/2015

PROJECT NO. R-2603

WILKES COUNTY

STATION: 117+35.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

STR. #2 STD. NO. BAS4