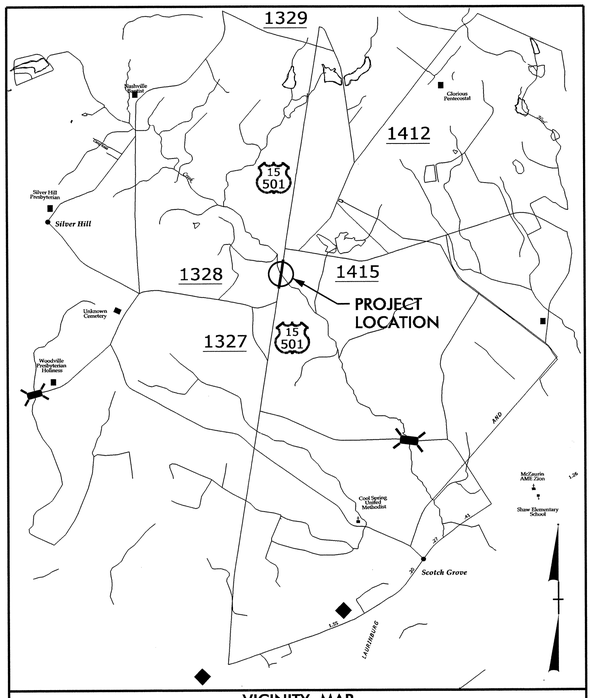
TIP PROJECT: B-4816

CONTRACT: C203285



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SCOTLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4816		

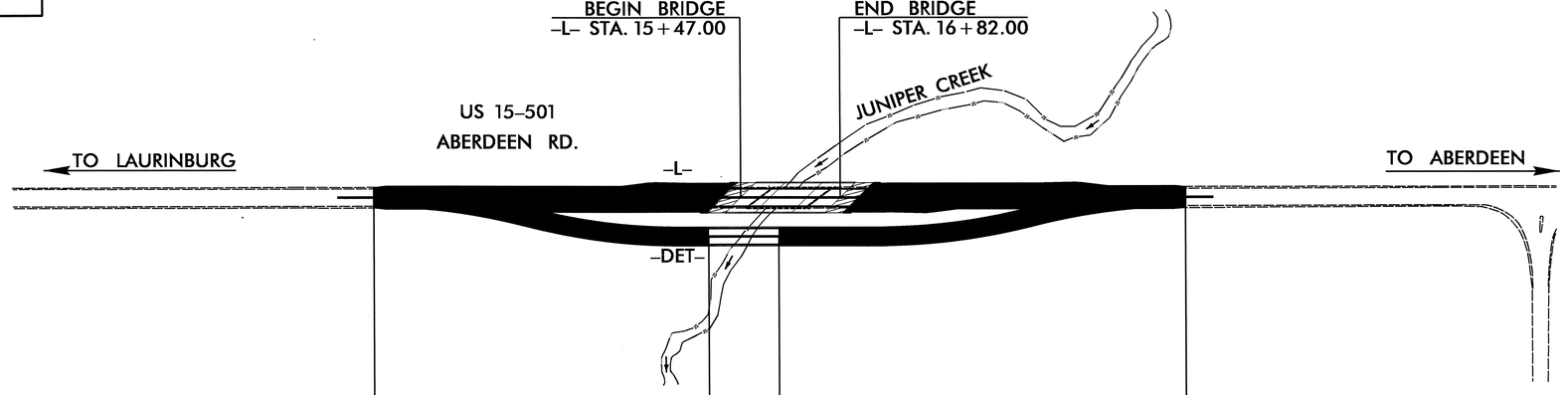
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38586.1.1	BRSTP-0015(22)	PE
38586.2.1	BRSTP-0015(22)	R/W & UTILITIES
38586.3.FD1	BRSTP-0015(22)	CONSTRUCTION

LOCATION: ***BRIDGE NO. 65 OVER JUNIPER CREEK ON US 15-501***

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

STEWART
421 FAYETTEVILLE ST, STE 400
RALEIGH, NC 27601
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com
PROJECT #:B12001

NAD 83/CORS 96



STRUCTURE

DESIGN DATA

ADT 2013 = 6050
ADT 2033 = 9280
DHV = 10%
D = 60%
T = 25% *
* (TTST 6% + DUAL 19%)
V = 60 MPH
CLASS = RURAL MINOR ARTERIAL

REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4816	=	0.182 mi.
LENGTH STRUCTURE TIP PROJECT B-4816	=	0.026 mi.
TOTAL LENGTH TIP PROJECT B-4816	=	0.208 mi.

Prepared in the Office of:
STEWART
For
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 17, 2013

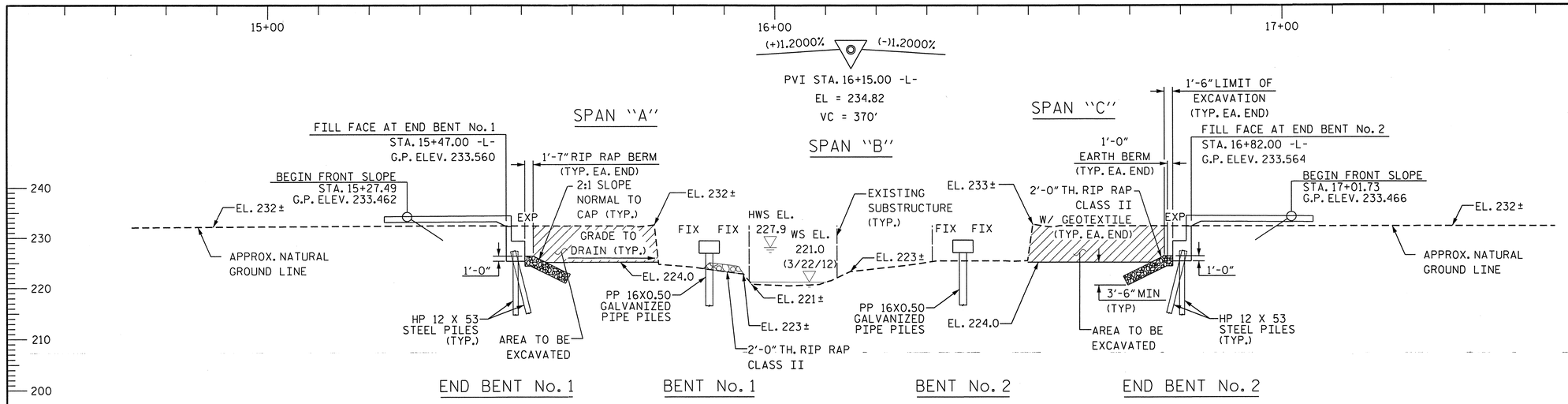
BEN CRAWFORD, PE
PROJECT ENGINEER

JONATHAN HEFNER, PE
PROJECT DESIGN ENGINEER

BRENDA L. MOORE, PE
NCDOT CONTACT

01-OCT-2013 13:10
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
dcrutcher

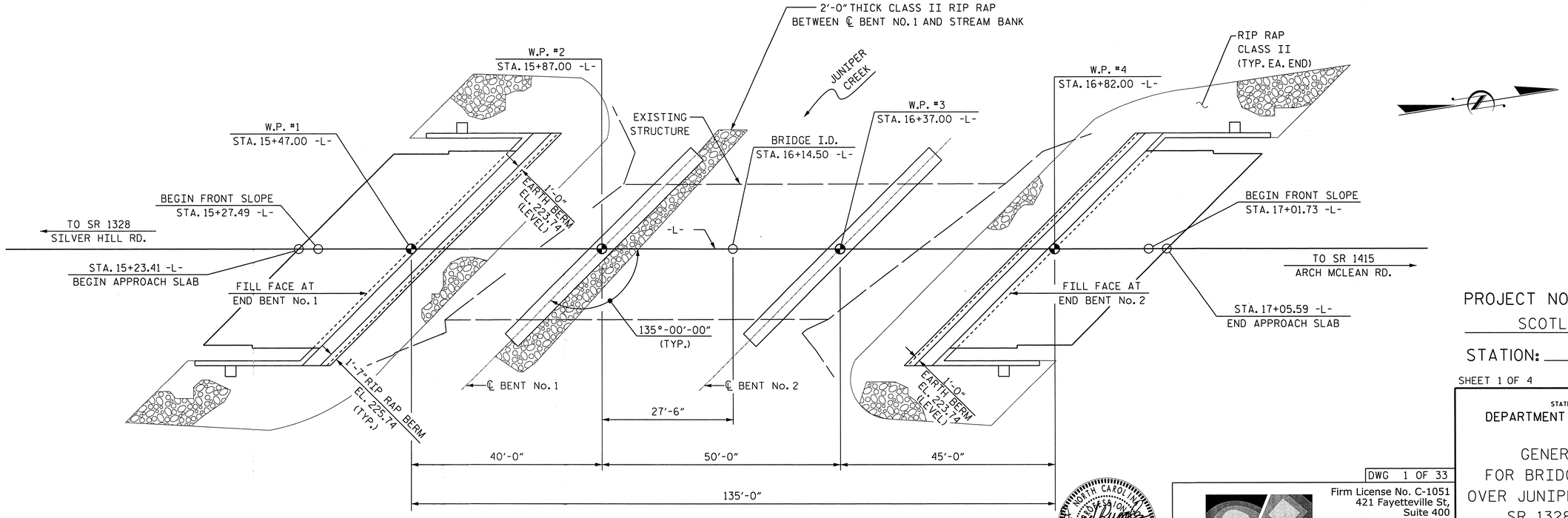
FA# BRSTP-0015(22)



SECTION ALONG -L-

(BENTS ON SECTION AT RIGHT ANGLE TO BENTS)
(THE APPROXIMATE NATURAL GROUND ELEVATIONS ARE ALONG THE EDGE OF THE BRIDGE ON THE UPSTREAM SIDE)

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS



PLAN

(PILES NOT SHOWN FOR CLARITY PURPOSES)

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 4 REPLACES BRIDGE No. 65

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON US 15-501
OVER JUNIPER CREEK BETWEEN
SR 1328 AND SR 1415

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

DWG 1 OF 33

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

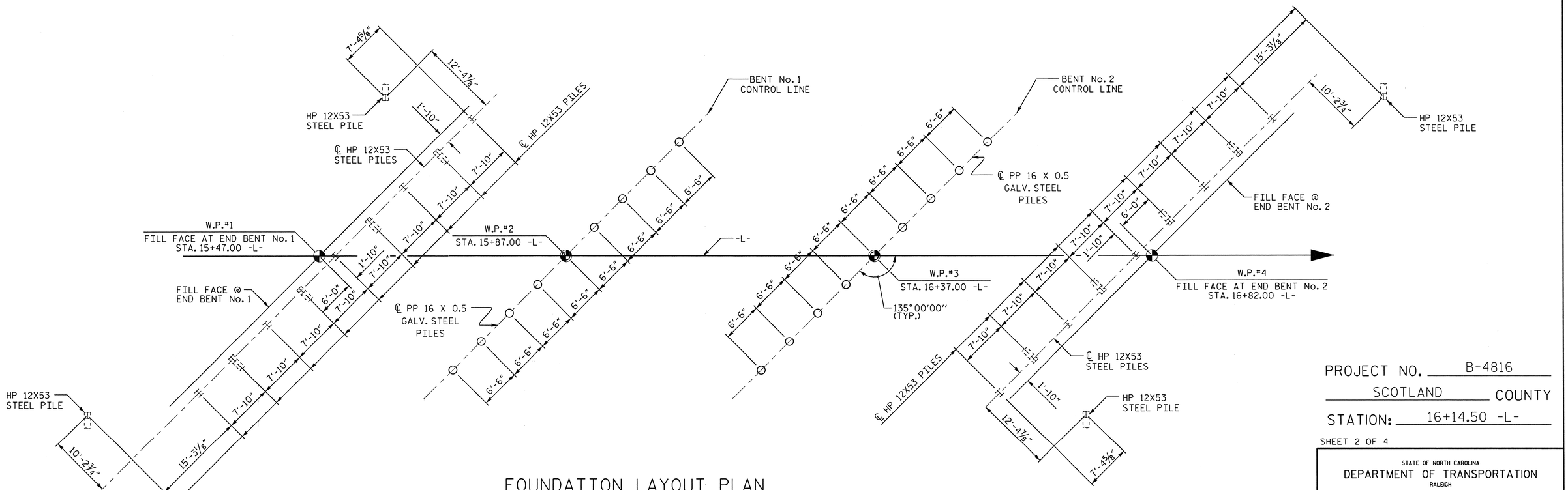
STEWART

Firm License No. C-1051
421 Fayetteville St,
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

DRAWN BY: P. JACOB DATE : 05/13
CHECKED BY: D. RUGGLES DATE : 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13

NOTES

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.
3. DRIVE PILES AT END BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
4. PILES AT BENTS NO. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.
5. DRIVE PILES AT BENTS NO. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.
6. THE SCOUR CRITICAL ELEVATION FOR BENTS NO. 1 AND 2 IS ELEVATION 205 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
7. INSTALL PILES AT BENTS NO. 1 AND 2 TO A TIP ELEVATION NO HIGHER THAN 180 FT.
8. PIPE PILES PLATES ARE REQUIRED FOR STEEL PIPE PILES AT BENTS NO. 1 AND 2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
9. TESTING THE FIRST PRODUCTION PILE(S) WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS (AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION).
10. A MINIMUM OF ONE PILE AT EACH INTERIOR BENT MUST BE TESTED USING PDA. SEE SECTION 450 OF THE STANDARD SPECIFICATIONS (AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION).



FOUNDATION LAYOUT PLAN

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

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON US 15-501
OVER JUNIPER CREEK BETWEEN
SR 1328 AND SR 1415

DWG 2 OF 33

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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STEWART

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

DRAWN BY: P. JACOB	DATE : 05/13	
CHECKED BY: D. RUGGLES	DATE : 06/13	
DESIGN ENGINEER OF RECORD: D. RUGGLES	DATE : 06/13	

9/30/2013
...\DGN\02-Foundation Layout.dgn
USER:jabrll

GENERAL NOTES:

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.
4. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
5. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
6. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
8. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
9. FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
10. 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.
11. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
12. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
13. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
14. THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 16+14.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
15. THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LFRD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.
16. THE EXISTING STRUCTURE CONSISTING OF 4 - 17'4" SPANS, 31.5 FOOT OUT-TO-OUT, TIMBER JOISTS AND A REINFORCED CONCRETE DECK ON TIMBER AND STEEL CAP ON TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY UNTIL THE BRIDGE IS TAKEN OUT OF SERVICE.
17. THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
18. REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
19. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."
20. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
21. FOR INTERIOR BENTS, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZATION LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOUNDATION NOTES:

1. SEE SHEET 2 OF 4 FOR FOUNDATION NOTES.

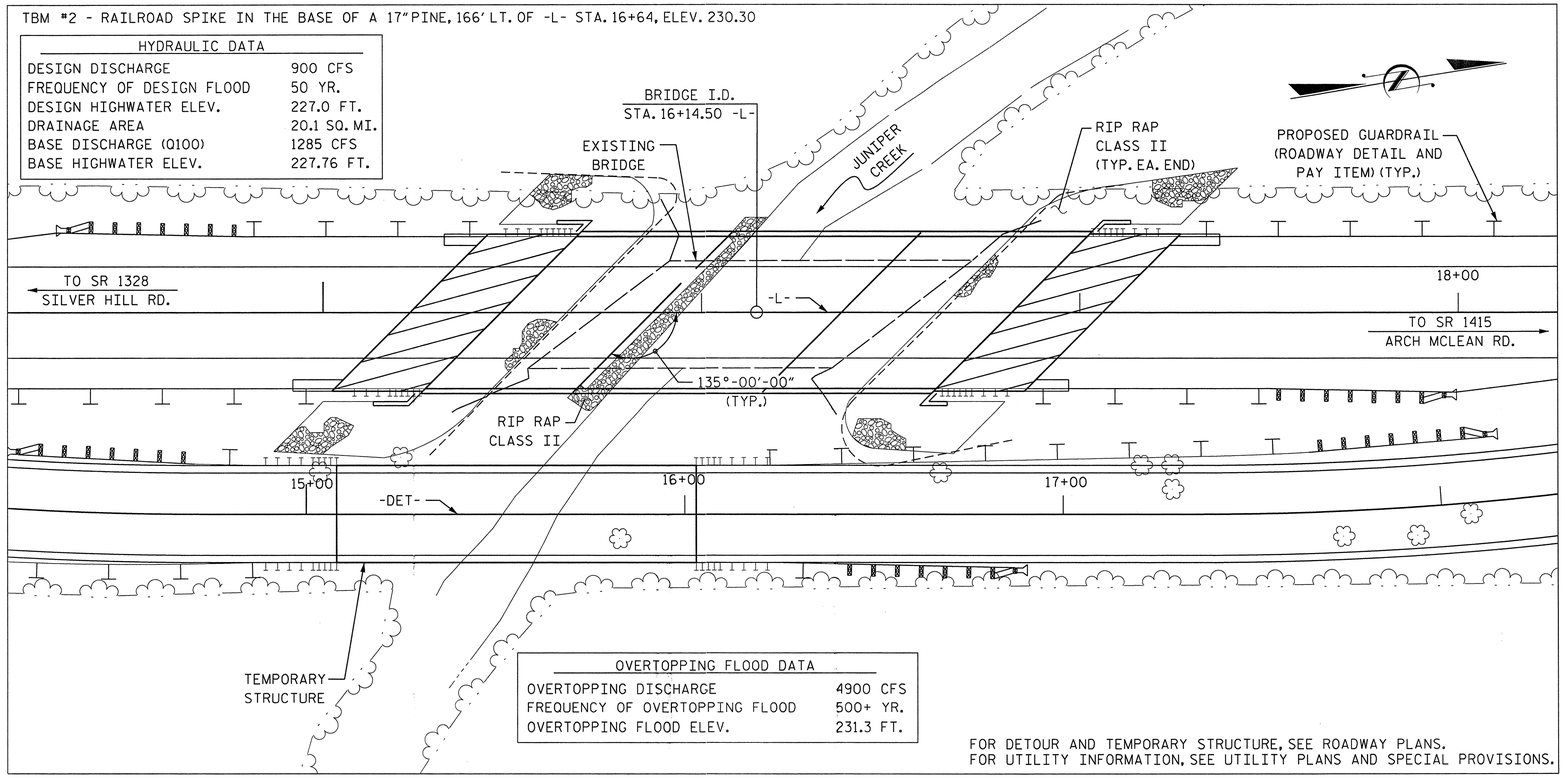
TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP STRUCTURE AT STA. 16+14.50 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 16+14.50 -L-	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PP 16x0.50 GALVANIZED STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	1'-2"x2'-6" CONCRETE PARAPET	TWO BAR METAL RAIL	RIP RAP CLASS II (2'-0" THICK)	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	NO.	LIN.FT.	EA.	EA.	LIN.FT.	LIN.FT.	TONS	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	LUMP SUM			5,623	6,631		LUMP SUM		12	513.33							304.08	289.08		LUMP SUM	LUMP SUM
END BENT NO.1				LUMP SUM			62.9		6,865			9	585							117.5		
BENT NO.1							29.4		3,652					9	585	9	9			30		
BENT NO.2							29.3		3,652					9	585	9	9					
END BENT NO.2				LUMP SUM			62.9		6,865			9	540							120.0		
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	5,623	6,631	184.5	LUMP SUM	21,034	12	513.33	18	1,125	18	1,170	18	18	304.08	289.08	267.5	LUMP SUM	LUMP SUM

TBM #2 - RAILROAD SPIKE IN THE BASE OF A 17"PINE, 166' LT. OF -L- STA. 16+64, ELEV. 230.30

HYDRAULIC DATA

DESIGN DISCHARGE	900 CFS
FREQUENCY OF DESIGN FLOOD	50 YR.
DESIGN HIGHWATER ELEV.	227.0 FT.
DRAINAGE AREA	20.1 SQ. MI.
BASE DISCHARGE (Q100)	1285 CFS
BASE HIGHWATER ELEV.	227.76 FT.



OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	4900 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD ELEV.	231.3 FT.

FOR DETOUR AND TEMPORARY STRUCTURE, SEE ROADWAY PLANS.
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

DRAWN BY: J. ABRIL DATE: 05/13
CHECKED BY: D. RUGGLES DATE: 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 06/13

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

PROJECT NO. B-4816
SCOTLAND COUNTY
STATION: 16+14.50 -L-
SHEET 3 OF 4

DWG 3 OF 33

STEWART
Firm License No. C-1051
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T 919.380.8750
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON US 15-501
OVER JUNIPER CREEK BETWEEN
SR 1328 AND SR 1415

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

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						
							LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.31	--	1.75	0.836	1.64	3	I	20.4	1.145	1.31	3	EL	3.5	0.80	0.814	1.36	2	I	23.9	
		HL-93 (OPERATING)	N/A		1.71	--	1.35	0.836	2.13	3	I	20.4	1.145	1.71	3	EL	3.5	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.66	59.76	1.75	0.836	2.03	3	I	24.6	1.325	1.89	3	I	7.8	0.80	0.814	1.66	2	I	23.9	
		HS-20 (OPERATING)	36.000		2.47	88.92	1.35	0.836	2.63	3	I	24.6	1.325	2.47	3	I	7.8	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.15	42.52	1.40	0.836	4.78	3	I	24.6	1.325	5.38	3	I	7.8	0.80	0.814	3.15	2	I	23.9	
		SNGARBS2	20.000		2.58	51.60	1.40	0.836	3.87	3	I	24.6	1.325	4.02	3	I	7.8	0.80	0.814	2.58	2	I	23.9	
		SNAGRIS2	22.000		2.56	56.32	1.40	0.836	3.81	3	I	24.6	1.325	3.82	3	I	7.8	0.80	0.814	2.56	2	I	23.9	
		SNCOTTS3	27.250		1.61	43.87	1.40	0.836	2.42	3	I	20.4	1.325	2.59	3	I	7.8	0.80	0.814	1.61	2	I	23.9	
		SNAGGRS4	34.925		1.44	50.29	1.40	0.836	2.15	3	I	24.6	1.325	2.17	3	I	7.8	0.80	0.814	1.44	2	I	23.9	
		SNS5A	35.550		1.40	49.77	1.40	0.836	2.13	3	I	24.6	1.325	2.26	3	I	7.8	0.80	0.814	1.40	2	I	23.9	
		SNS6A	39.950		1.32	52.73	1.40	0.836	2.00	3	I	24.6	1.325	2.12	3	I	7.8	0.80	0.814	1.32	2	I	23.9	
		SNS7B	42.000	⟨3⟩	1.26	52.92	1.40	0.836	1.92	3	I	24.6	1.325	2.16	3	I	7.8	0.80	0.814	1.26	2	I	23.9	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.65	54.45	1.40	0.836	2.52	3	I	20.4	1.325	2.77	3	I	7.8	0.80	0.814	1.65	2	I	23.9	
		TNT4A	33.075		1.62	53.58	1.40	0.836	2.43	3	I	24.6	1.325	2.65	3	I	7.8	0.80	0.814	1.62	2	I	23.9	
		TNT6A	41.600		1.38	57.40	1.40	0.836	2.10	3	I	24.6	1.325	2.31	3	I	7.8	0.80	0.814	1.38	2	I	23.9	
		TNT7A	42.000		1.41	59.22	1.40	0.836	2.14	3	I	24.6	1.325	2.32	3	I	7.8	0.80	0.814	1.41	2	I	23.9	
		TNT7B	42.000		1.43	60.06	1.40	0.836	2.14	3	I	24.6	1.325	2.08	3	I	7.8	0.80	0.814	1.43	2	I	23.9	
		TNAGRIT4	43.000		1.41	60.63	1.40	0.836	2.08	3	I	24.6	1.325	2.24	3	I	7.8	0.80	0.814	1.41	2	I	23.9	
		TNAGT5A	45.000		1.31	58.95	1.40	0.836	2.00	3	I	24.6	1.325	2.25	3	I	7.8	0.80	0.814	1.31	2	I	23.9	
		TNAGT5B	45.000		1.28	57.60	1.40	0.836	1.92	3	I	20.4	1.325	1.91	3	I	7.8	0.80	0.814	1.28	2	I	23.9	

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)

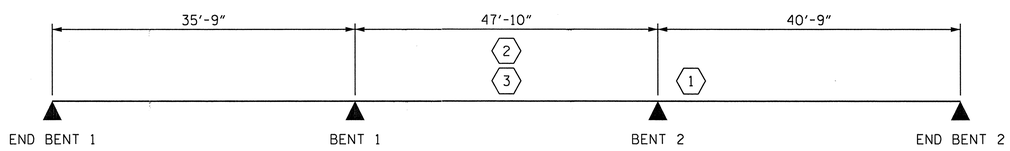
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

DRAWN BY: J. ABRIL DATE : 06/13
CHECKED BY: D. RUGGLES DATE : 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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DWG 4 OF 33

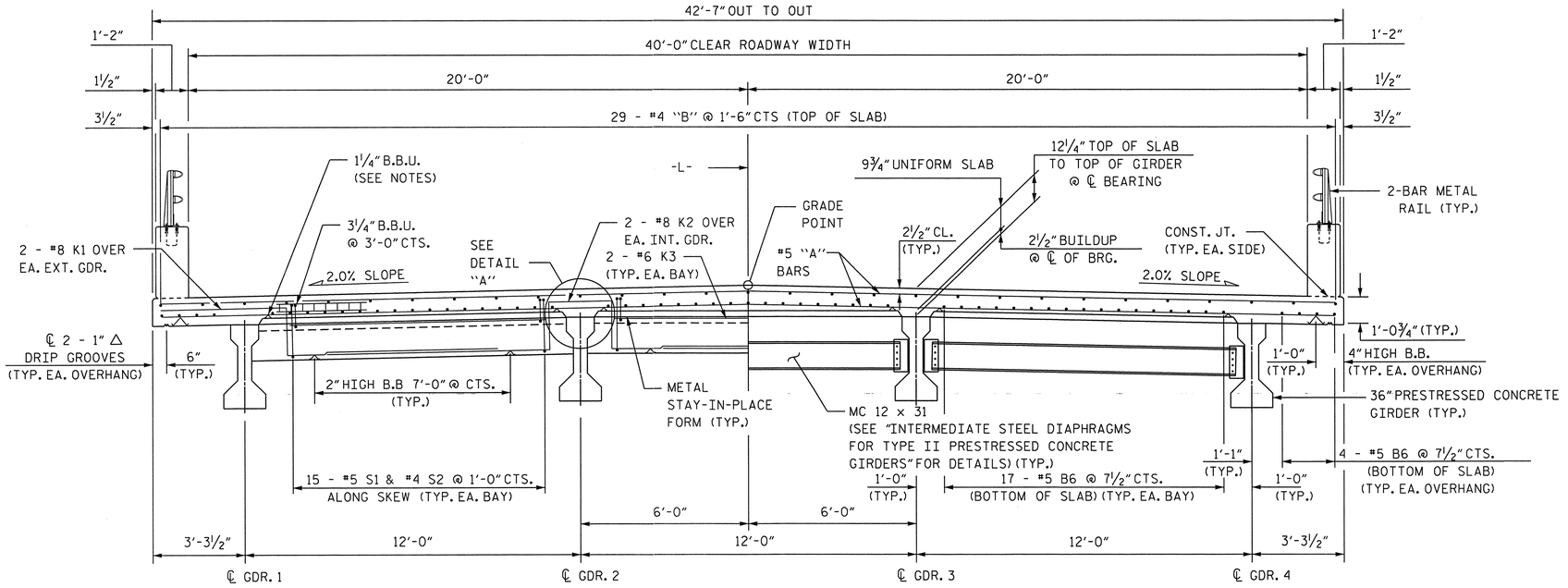
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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

STD. NO. LRFR1



TYPICAL HALF SECTION

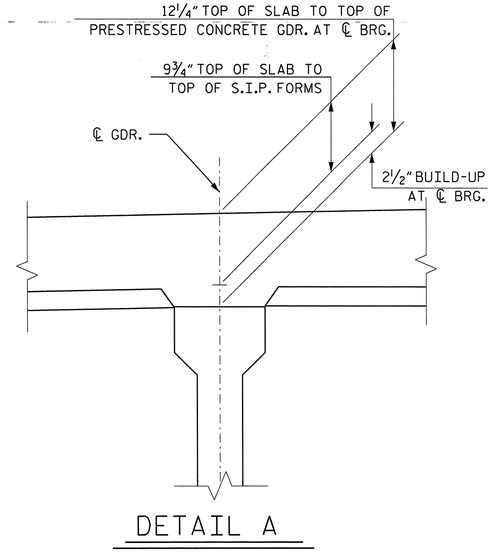
SHOWING END BENT DIAPHRAGMS

TYPICAL HALF SECTION

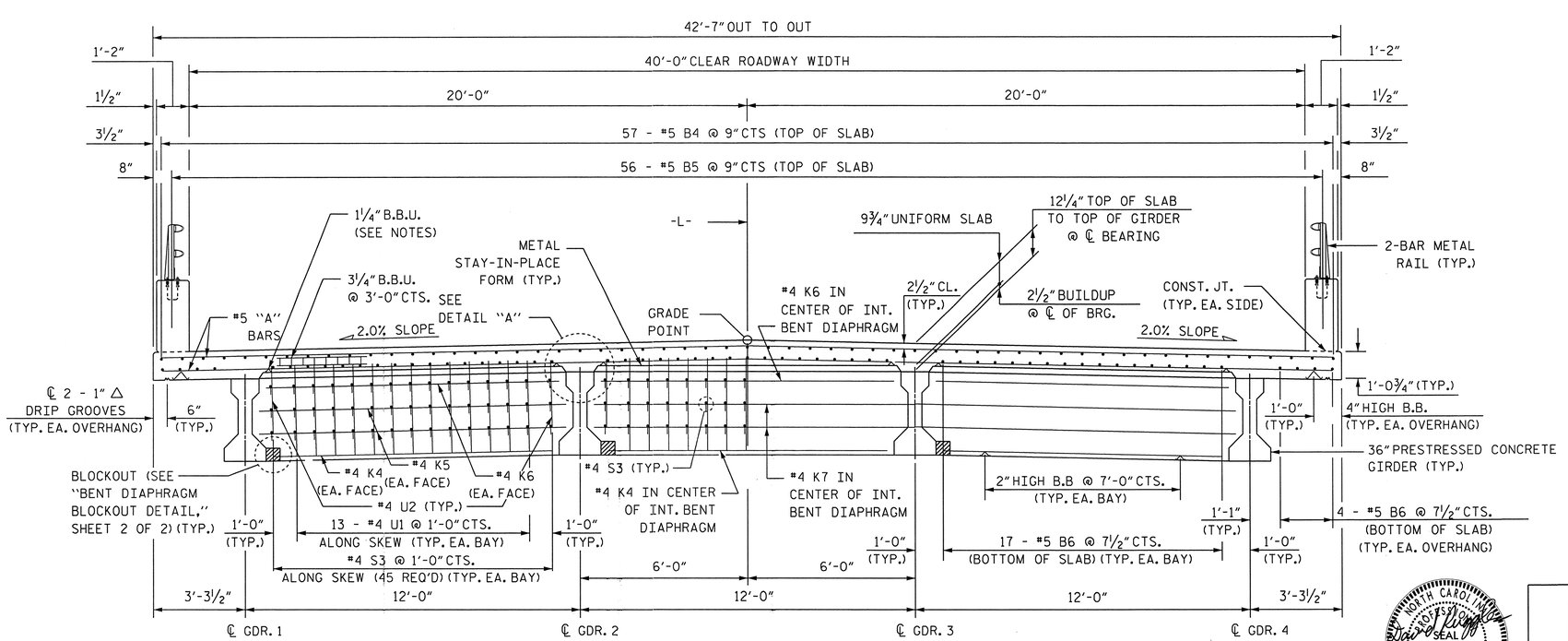
SHOWING INTERMEDIATE DIAPHRAGMS

NOTES:

1. PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.



DETAIL A



TYPICAL SECTION

SHOWING BENT DIAPHRAGMS

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

DWG 5 OF 33

DRAWN BY: J. ABRIL DATE: 05/13
CHECKED BY: D. RUGGLES DATE: 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 06/13

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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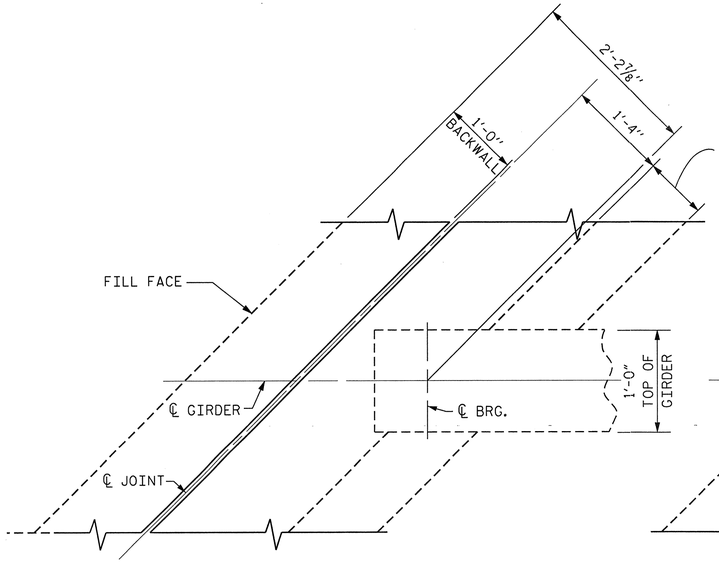
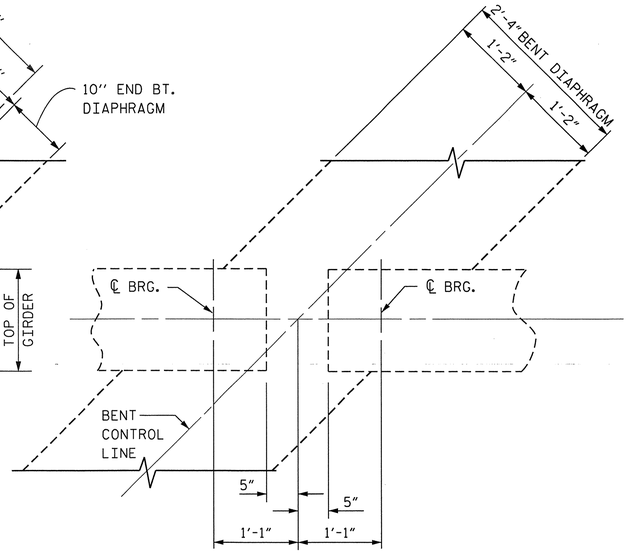
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			33

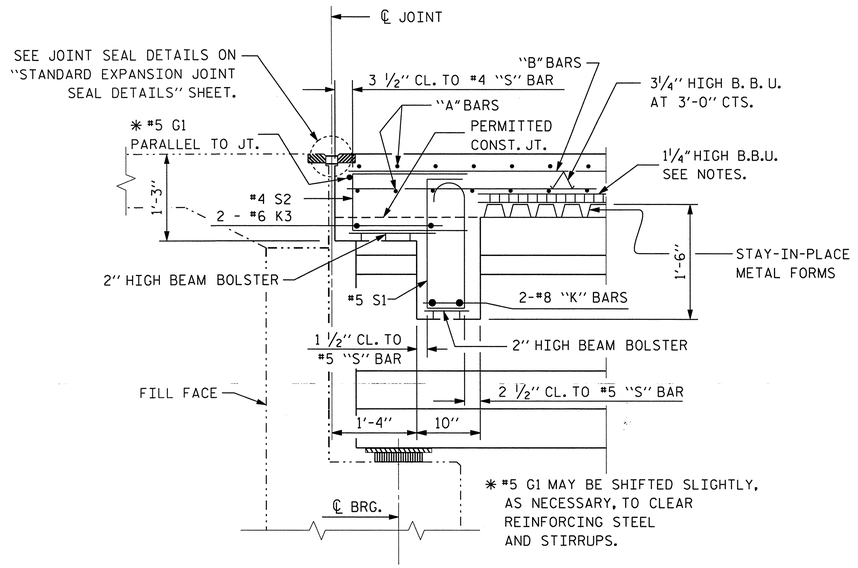


END BENT DIAPHRAGM

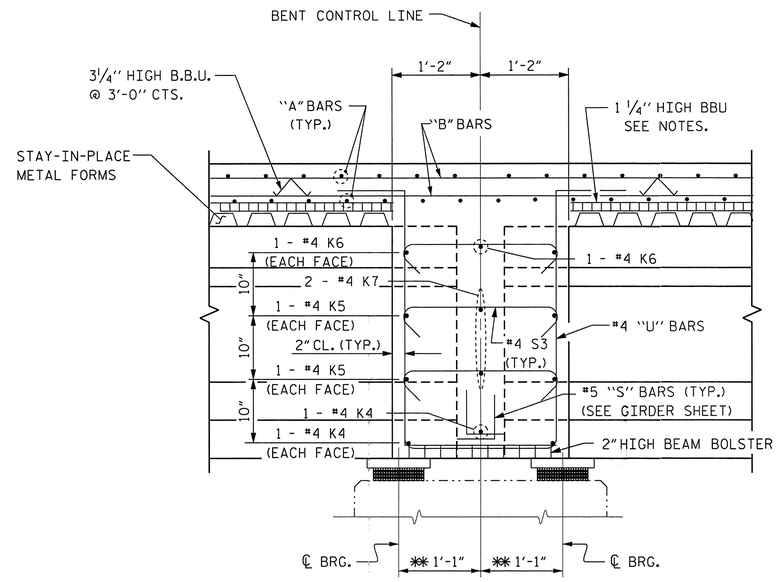


BENT DIAPHRAGM

PLAN

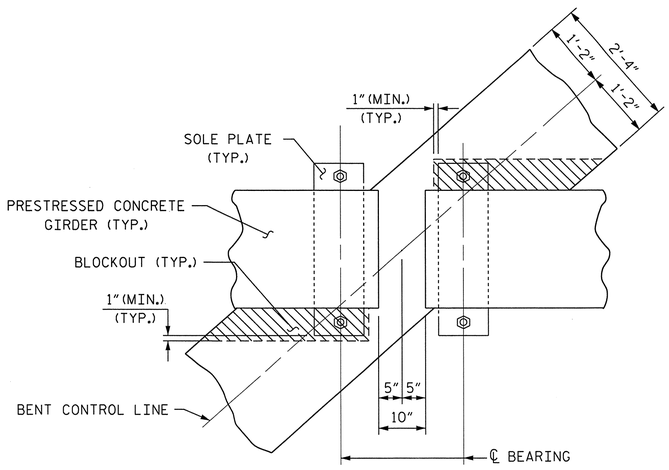


SECTION THRU END BENT DIAPHRAGM

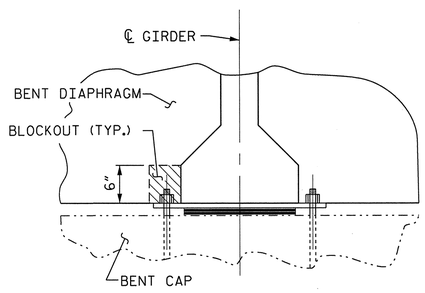


SECTION THRU BENT DIAPHRAGM

** MEASURED ALONG ℄ OF GIRDER



PLAN



SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION DETAILS

DWG 6 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: P. JACOB	DATE : 05/13	
CHECKED BY: D. RUGGLES	DATE : 06/13	
DESIGN ENGINEER OF RECORD: D. RUGGLES	DATE : 06/13	

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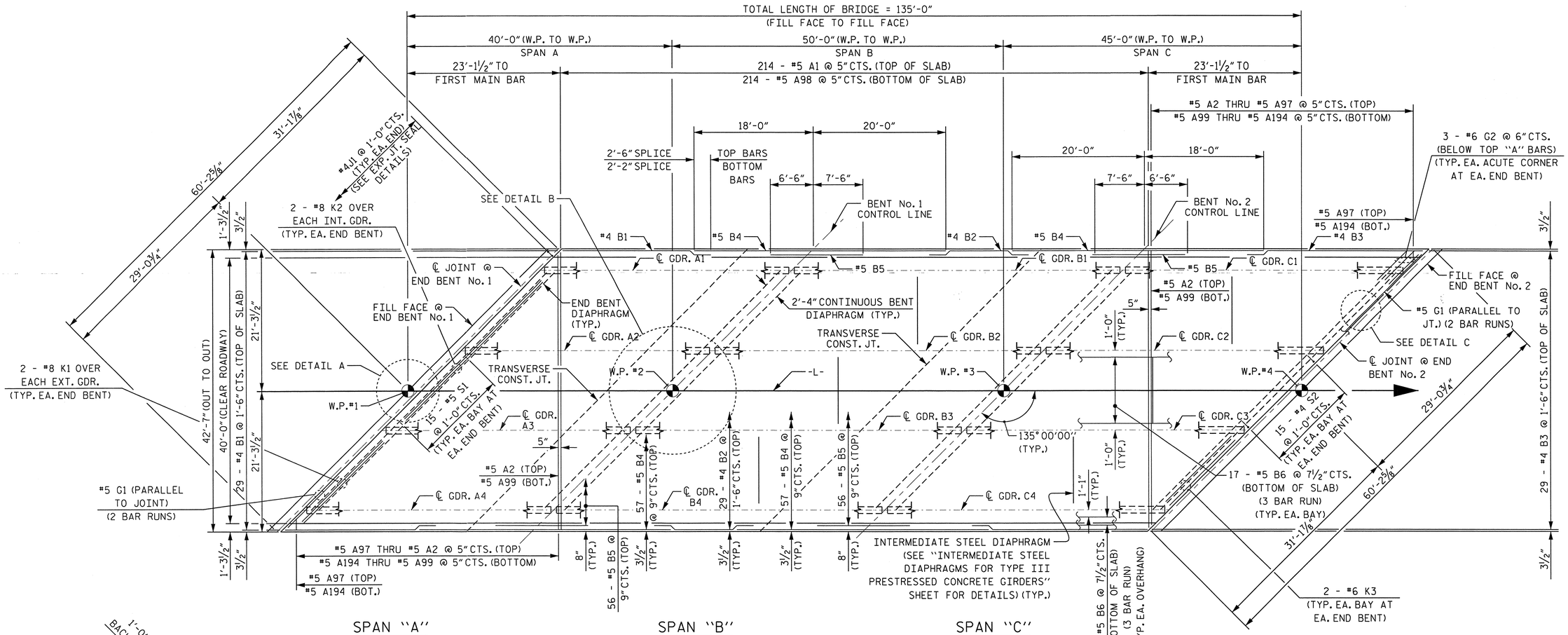
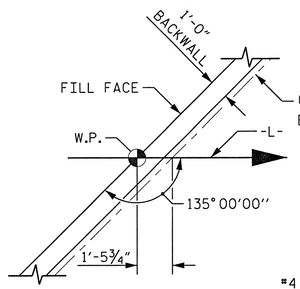
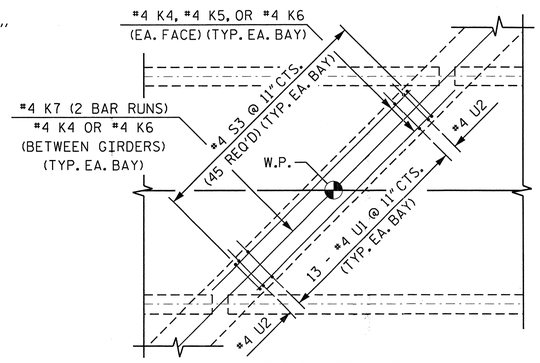


PLAN OF SPANS



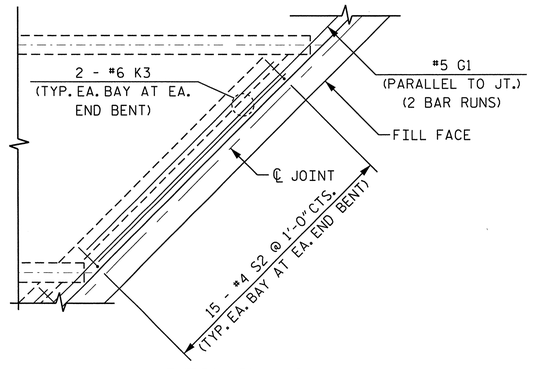
DETAIL A

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR)



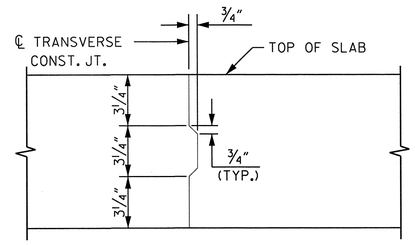
DETAIL B

(TYP. AT EA. INT. BENT)



DETAIL C

(TYP. AT EA. END BENT)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS

DWG 7 OF 33

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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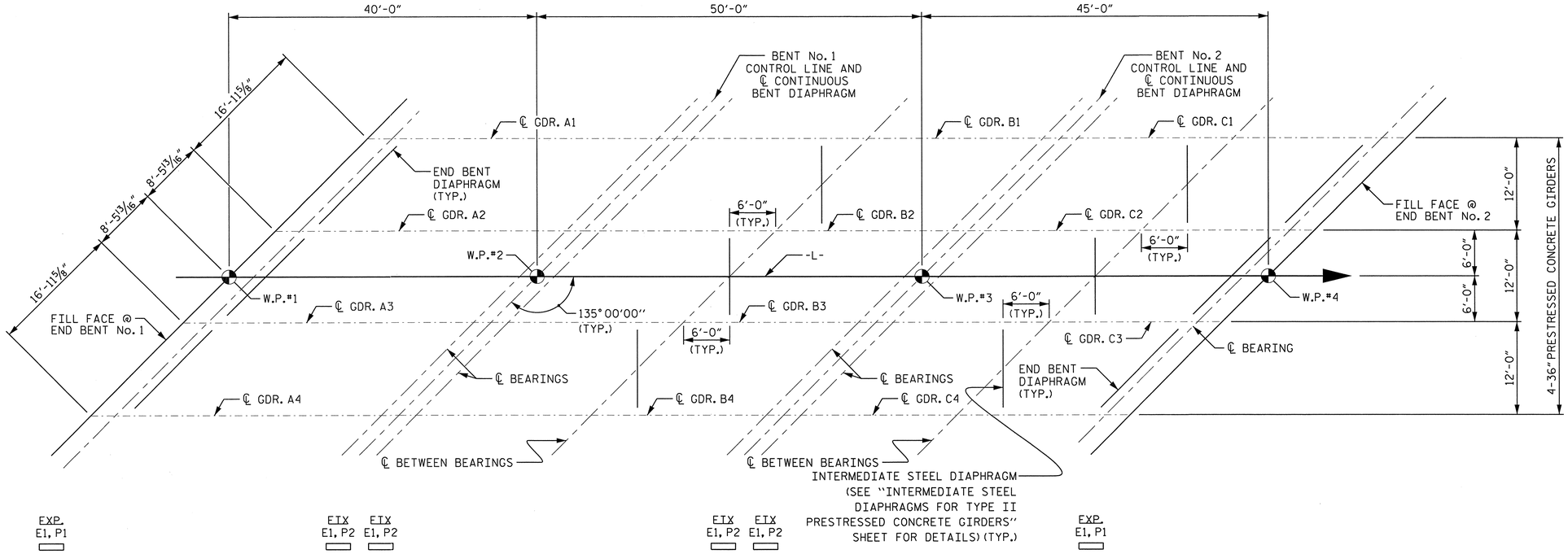
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: J. ABRIL DATE : 05/13
CHECKED BY: D. RUGGLES DATE : 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13



SPAN "A" SPAN "B" SPAN "C"

GIRDER LAYOUT

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

DRAWN BY: J. ABRIL DATE : 05/13

CHECKED BY: D. RUGGLES DATE : 06/13

DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13

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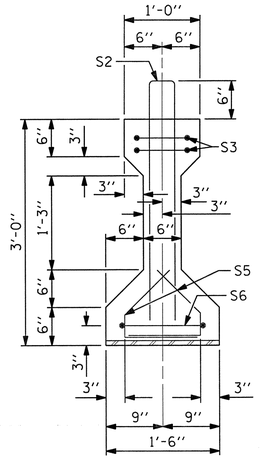
DWG 8 OF 33

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

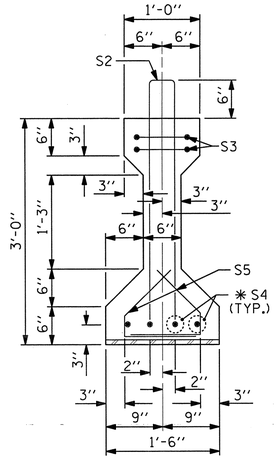
SUPERSTRUCTURE

GIRDER LAYOUT

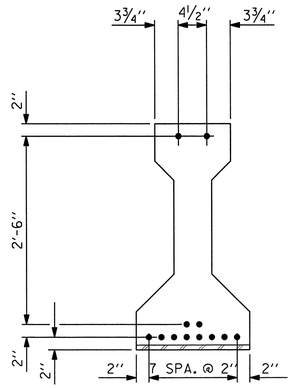
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			33



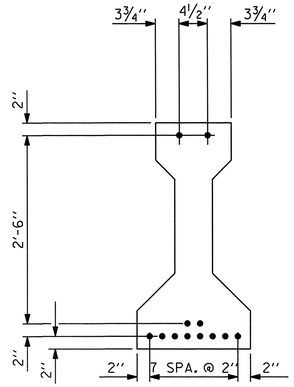
SECTION A-A



SECTION B-B

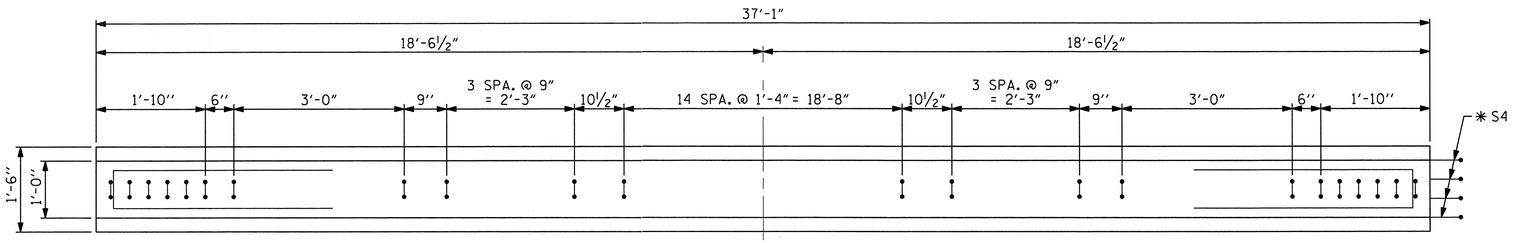


AT END OF GIRDER

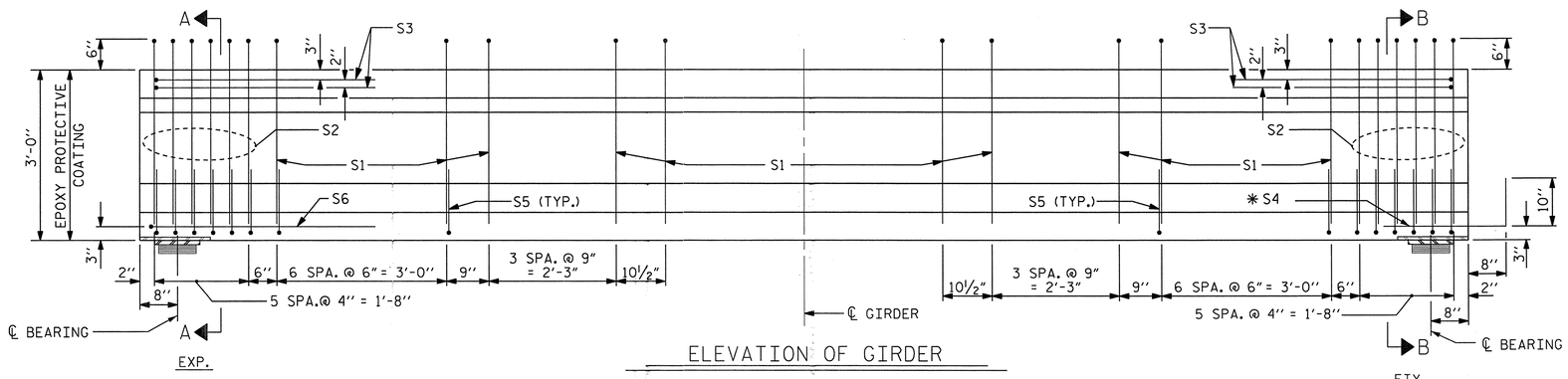


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

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

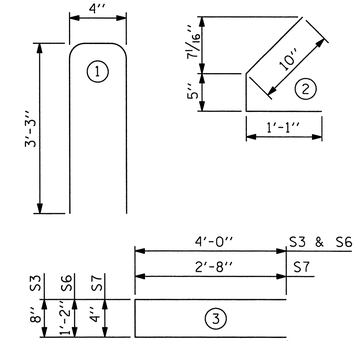
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	37	#5	1	6'-10"	264
S2	12	#5	1	6'-10"	86
S3	4	#4	3	8'-8"	23
✱S4	4	#5	STR	3'-8"	15
S5	52	#4	2	2'-4"	81
S6	1	#4	3	9'-2"	6

✱NOTE: S4 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 LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	475	3.5	12
INTERIOR GIRDER	475	3.5	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	37'-1"	148'-4"

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			33

STD. NO. PCG4

ASSEMBLED BY :	J. ABRIL	DATE :	05/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
DRAWN BY : ELR 8/91	REV. 10/17/00R		RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R		TLA/GM
	REV. 10/1/11		MAA/GM

NORTH CAROLINA SEAL 11725 ENGINEER DAVID R RUGGLES
10-01-13

DWG 9 OF 33

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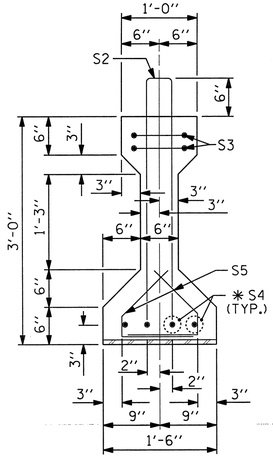
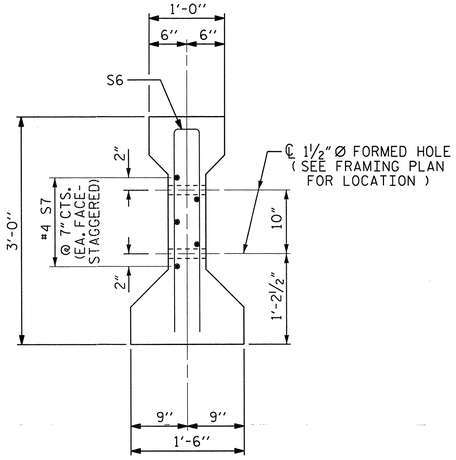
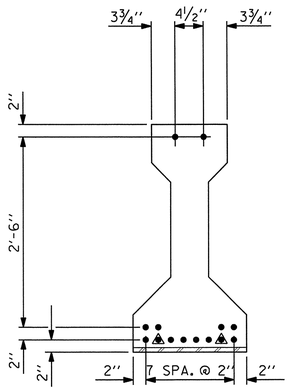


SECTION B-B

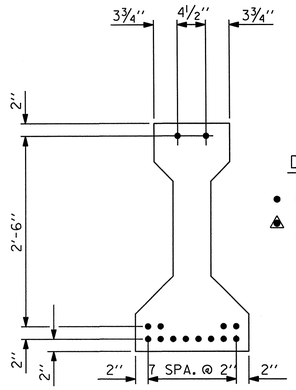


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER



AT ℄ OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▲ STRANDS DEBONDED FOR 8'-0" FROM GIRDER END

EXTERIOR GDR.	S6	2	#5	3	5'-8"	12
INTERIOR GDR.	S6	4	#5	3	5'-8"	24
EXTERIOR GDR.	S7	5	#4	STR	7'-0"	23
INTERIOR GDR.	S7	10	#4	STR	7'-0"	47

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

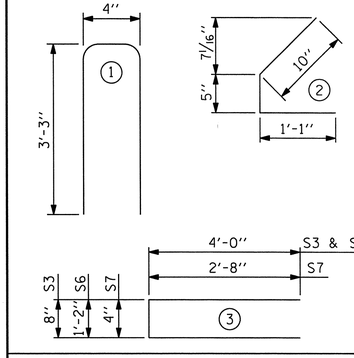
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	48	#5	1	6'-10"	342
S2	44	#5	1	6'-10"	314
S3	4	#4	3	8'-8"	23
✱S4	8	#5	STR	3'-8"	31
S5	144	#4	2	2'-4"	224

✱NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



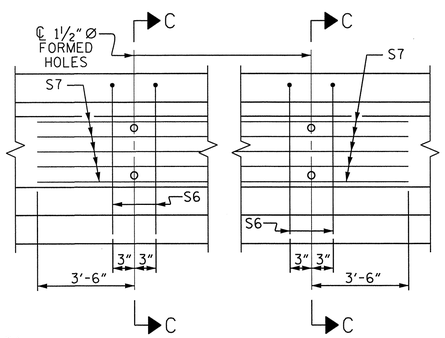
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	969	4.7	14
INTERIOR GIRDER	1005	4.7	14

GIRDERS REQUIRED

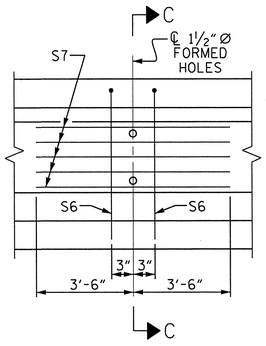
NUMBER	LENGTH	TOTAL LENGTH
4	49'-2"	196'-8"

0.6" Ø LOW RELAXATION STRAND LAYOUT



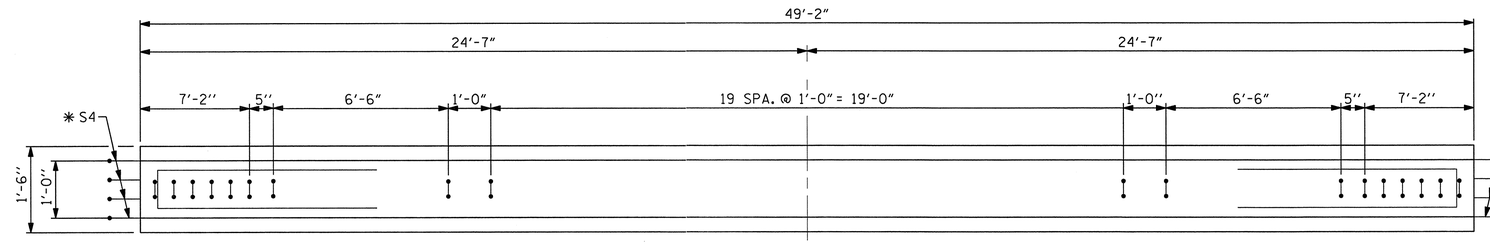
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2 & 3

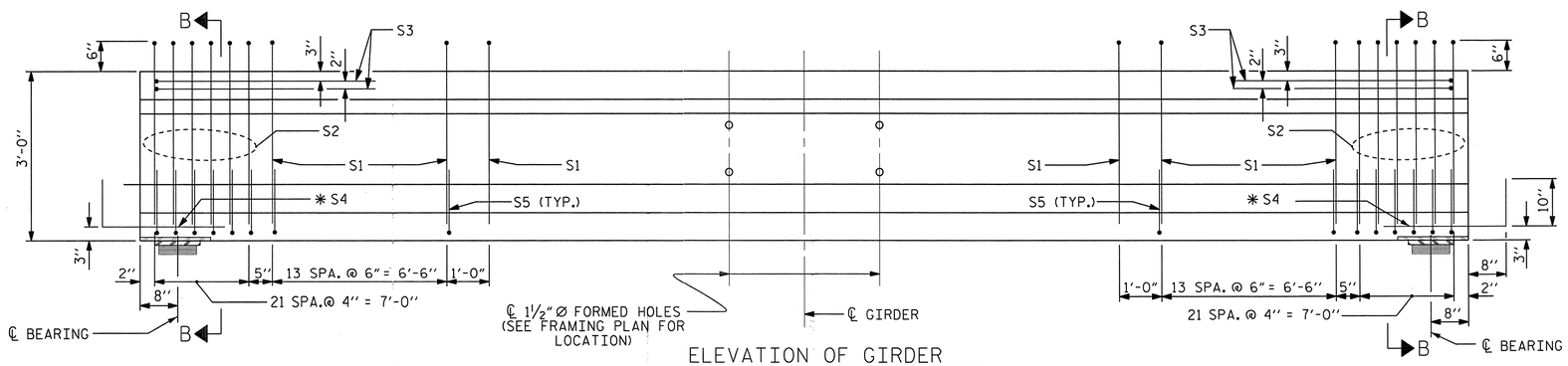


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 4



PLAN OF GIRDER



FIX

FIX

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

SPAN B

DWG 10 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

10-01-13

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ASSEMBLED BY :	J. ABRIL	DATE :	05/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
DRAWN BY : ELR 8/91	REV. 10/17/00R		RWW/LES
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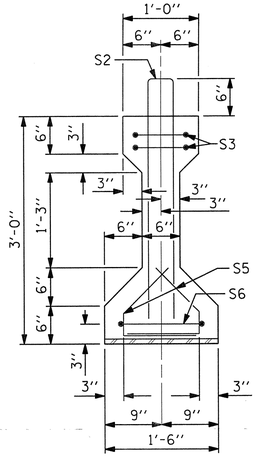
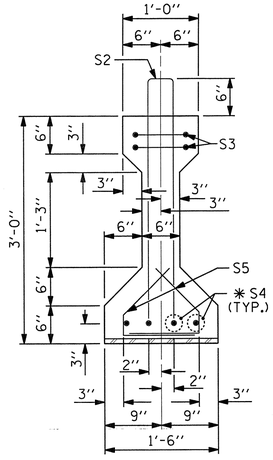
	REV. 10/1/11		MAA/GM

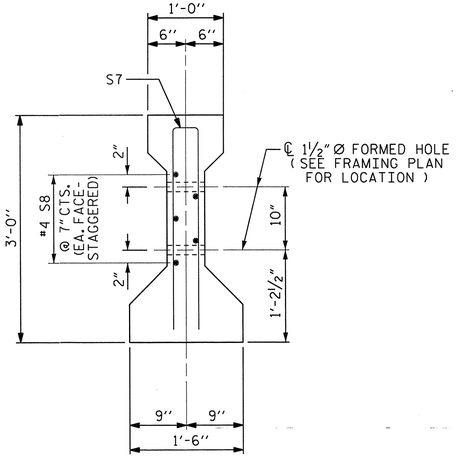
STD. NO. PCG4



SECTION A-A

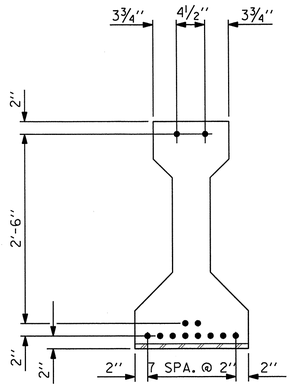


SECTION B-B

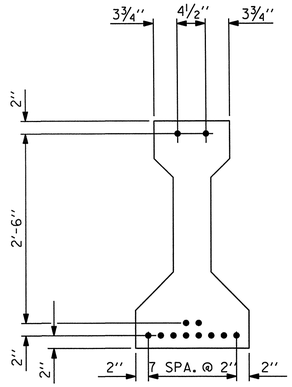


SECTION C-C

(S1 BARS NOT SHOWN)

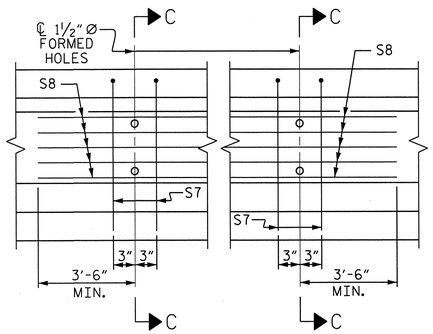


AT END OF GIRDER



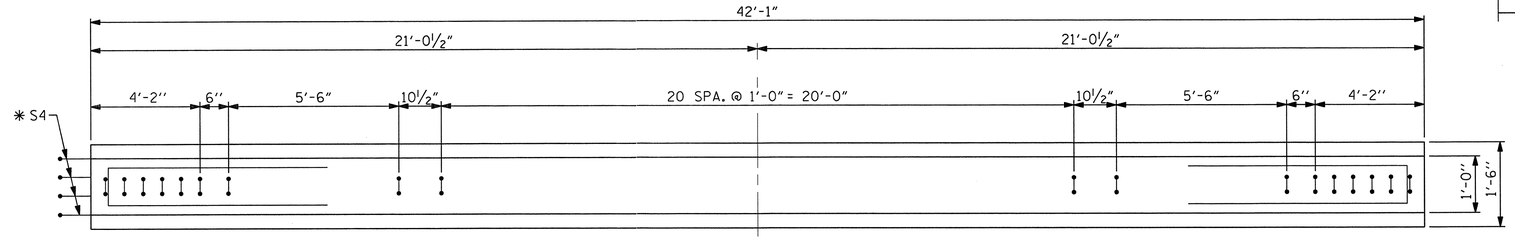
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

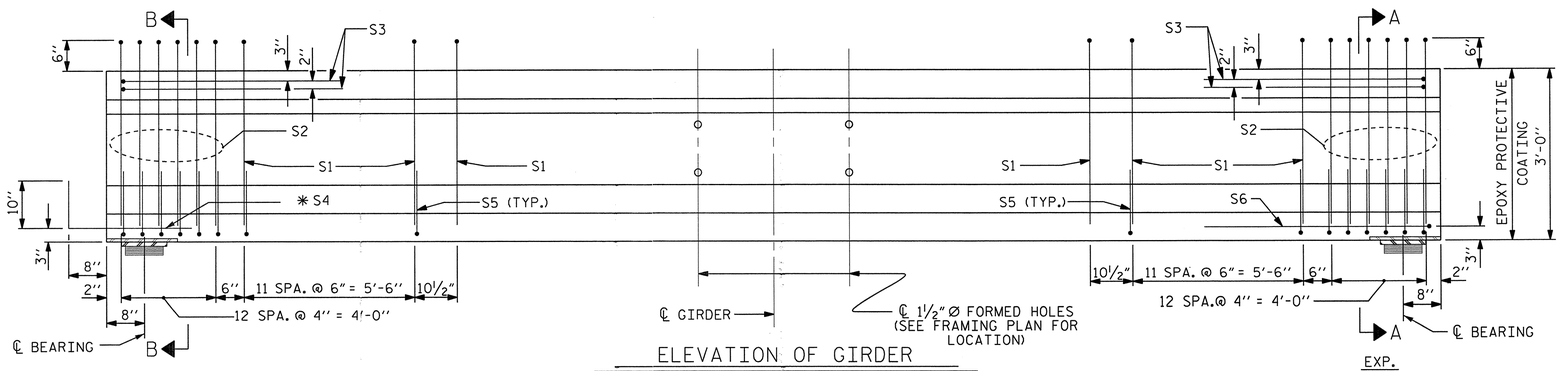


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 2 & 3

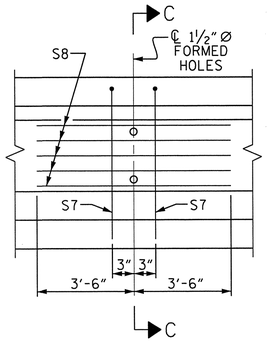


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 1 & 4

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

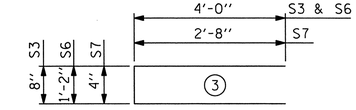
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	45	#5	1	6'-10"	321
	S2	26	#5	1	6'-10"	185
	S3	4	#4	3	8'-8"	23
	✱ S4	4	#5	STR	3'-8"	15
	S5	96	#4	2	2'-4"	150
	S6	1	#4	3	9'-2"	6
EXTERIOR GDR.	S7	2	#5	3	5'-8"	12
INTERIOR GDR.	S7	4	#5	3	5'-8"	24
EXTERIOR GDR.	S8	5	#4	STR	7'-0"	23
INTERIOR GDR.	S8	10	#4	STR	7'-0"	47

✱ NOTE: S4 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 LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	735	4.0	12
INTERIOR GIRDER	771	4.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	42'-1"	168'-4"

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

SPAN C

ASSEMBLED BY : J. ABRIL	DATE : 05/13
CHECKED BY : D. RUGGLES	DATE : 06/13
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA REGISTERED SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

STEWART
Firm License No. C-1051
421 Fayetteville St,
Suite 400
Raleigh, NC 27601
T 919.380.8750
www.stewartinc.com

DWG 11 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			33

STD. NO. PCG4

DEAD LOAD DEFLECTION TABLE FOR SPAN A - EXTERIOR G1 & G4

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.019	.034	.044	.050	.052	.050	.044	.034	.019	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.004	.009	.013	.015	.016	.015	.013	.009	.004	0
FINAL CAMBER ↑	0	3/16"	5/16"	3/8"	7/16"	7/16"	7/16"	3/8"	5/16"	3/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR SPAN B - EXTERIOR G1 & G4

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.035	.064	.082	.094	.098	.094	.082	.064	.035	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.014	.029	.040	.047	.050	.047	.040	.029	.014	0
FINAL CAMBER ↑	0	1/4"	7/16"	1/2"	9/16"	9/16"	9/16"	1/2"	7/16"	1/4"	0

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

DEAD LOAD DEFLECTION TABLE FOR SPAN C - EXTERIOR G1 & G4

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.023	.041	.054	.061	.063	.061	.054	.041	.023	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.007	.015	.021	.025	.027	.025	.021	.015	.007	0
FINAL CAMBER ↑	0	3/16"	5/16"	3/8"	7/16"	7/16"	7/16"	3/8"	5/16"	3/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR SPAN A - INTERIOR G2 & G3

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.019	.034	.044	.050	.052	.050	.044	.034	.019	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.006	.012	.016	.020	.020	.020	.016	.012	.006	0
FINAL CAMBER ↑	0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	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).

DEAD LOAD DEFLECTION TABLE FOR SPAN B - INTERIOR G2 & G3

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.035	.064	.082	.094	.098	.094	.082	.064	.035	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.018	.037	.052	.062	.065	.062	.052	.037	.018	0
FINAL CAMBER ↑	0	3/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	3/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR SPAN C - INTERIOR G2 & G3

0.6 Ø LOW RELAXATION	ALL GIRDERS										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	.023	.041	.054	.061	.063	.061	.054	.041	.023	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	.010	.020	.028	.033	.035	.033	.028	.020	.010	0
FINAL CAMBER ↑	0	1/8"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	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.

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

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

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

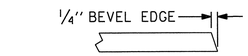
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

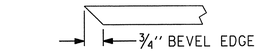
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

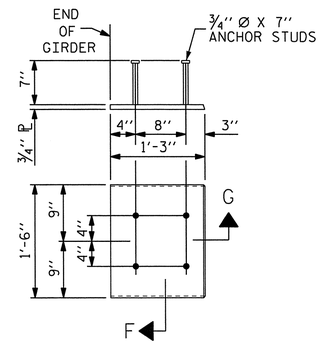
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



SECTION "G"



SECTION "F"
(SEE NOTES)



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

PROJECT NO. B-4816
SCOTLAND COUNTY
STATION: 16+14.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

DWG 12 OF 33

10-16-13

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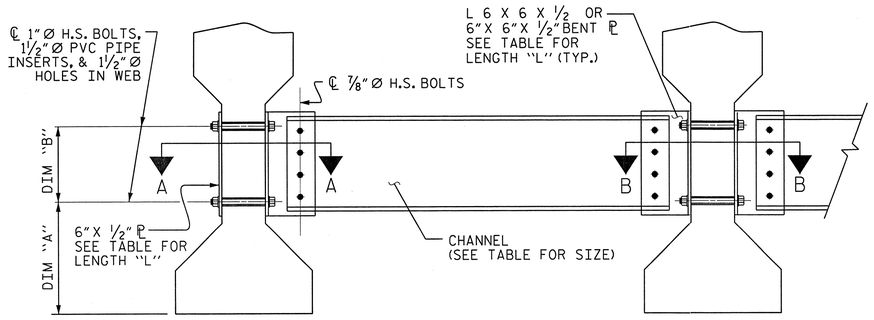
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: J. ABRIL DATE: 05/13
CHECKED BY: D. RUGGLES DATE: 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 06/13

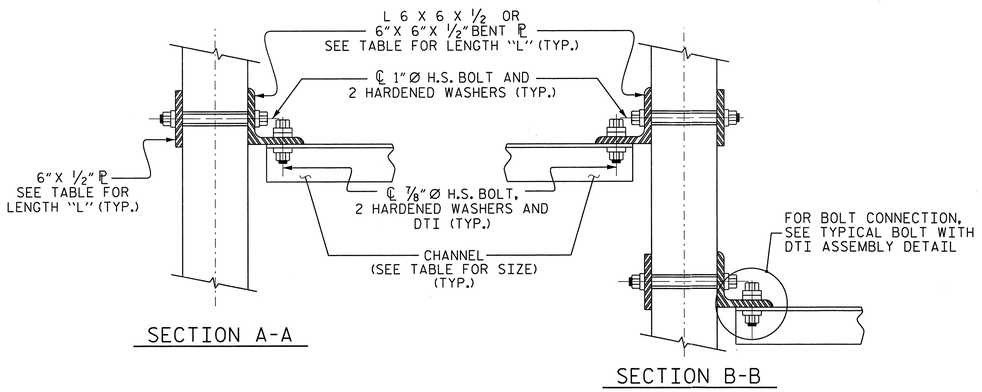


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

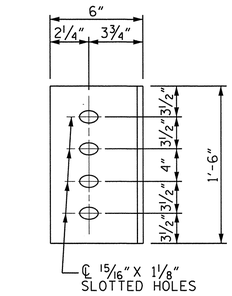
(TYPE III OR TYPE IV GIRDER SHOWN)



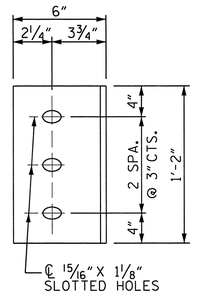
SECTION A-A

SECTION B-B

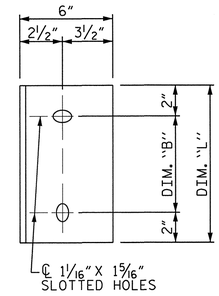
CONNECTION DETAILS



DIAPHRAGM FACE
(TYPE III OR TYPE IV GDR.)



DIAPHRAGM FACE
(TYPE II GDR.)



WEB FACE

CONNECTOR PLATE DETAILS

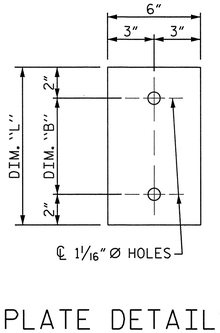
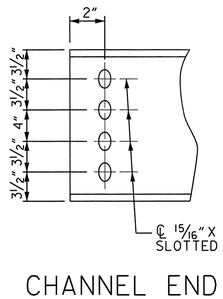
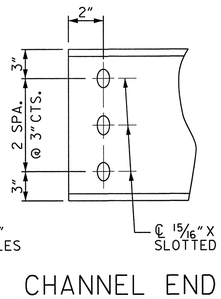


PLATE DETAILS



CHANNEL END
(TYPE III OR TYPE IV GDR.)



CHANNEL END
(TYPE II GDR.)

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.

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

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

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

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

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

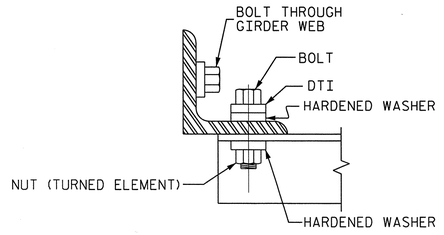
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2½"	10"	1'-2"



BOLT WITH DTI ASSEMBLY DETAIL

ASSEMBLED BY :	J. ABRIL	DATE :	05/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
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

NORTH CAROLINA ENGINEER SEAL 11725 DAVID R. RUGGLES
10-01-13

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PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 5 OF 5

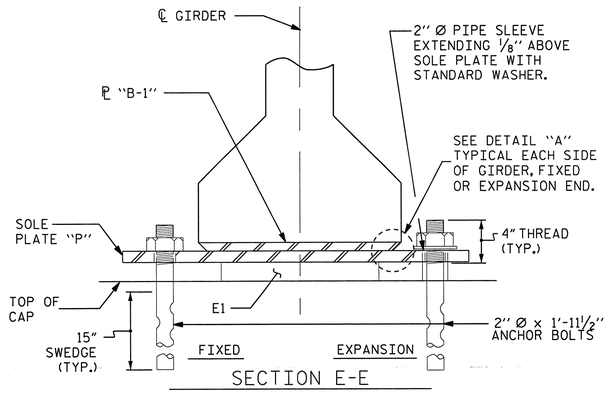
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

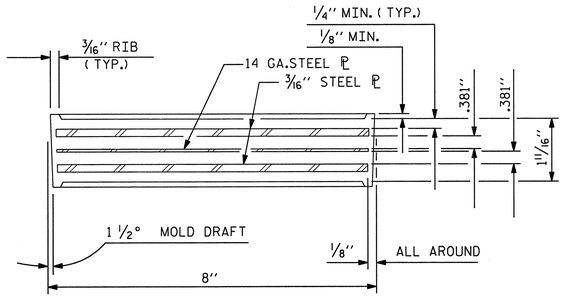
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS

DWG 13 OF 33

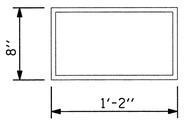
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			33



SECTION E-E



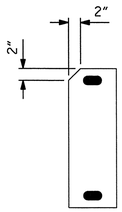
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (24 REQ'D)

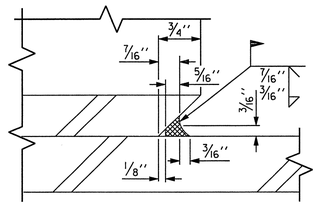
PLAN VIEW OF ELASTOMERIC BEARING

TYPE II

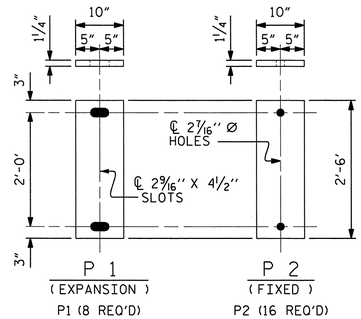


SOLE PLATE CLIP DETAIL

(FOR SOLE PLATES AT END BENTS)
(EXPANSION PLATE SHOWN, FIXED PLATE SIMILAR)



DETAIL "A"



SOLE PLATE DETAILS ("P")

NOTES

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

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

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.

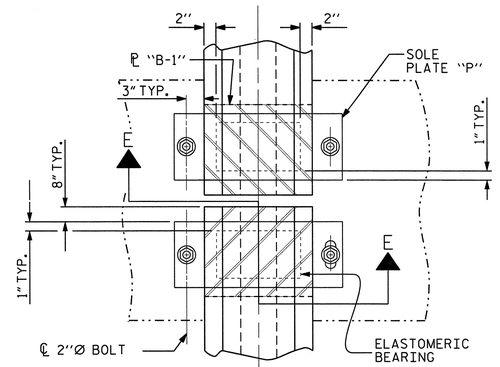
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

— LOAD RATINGS —	
	MAX.D.L.+L.L.
36"PCG -TYPE II	134 K

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

ASSEMBLED BY : J. ABRIL	DATE : 05/13
CHECKED BY : D. RUGGLES	DATE : 06/13
DRAWN BY : WJH 8/89	REV. 7/10/01 RWW/LES
CHECKED BY : CRK 8/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

10-01-13

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421 Fayetteville St,
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

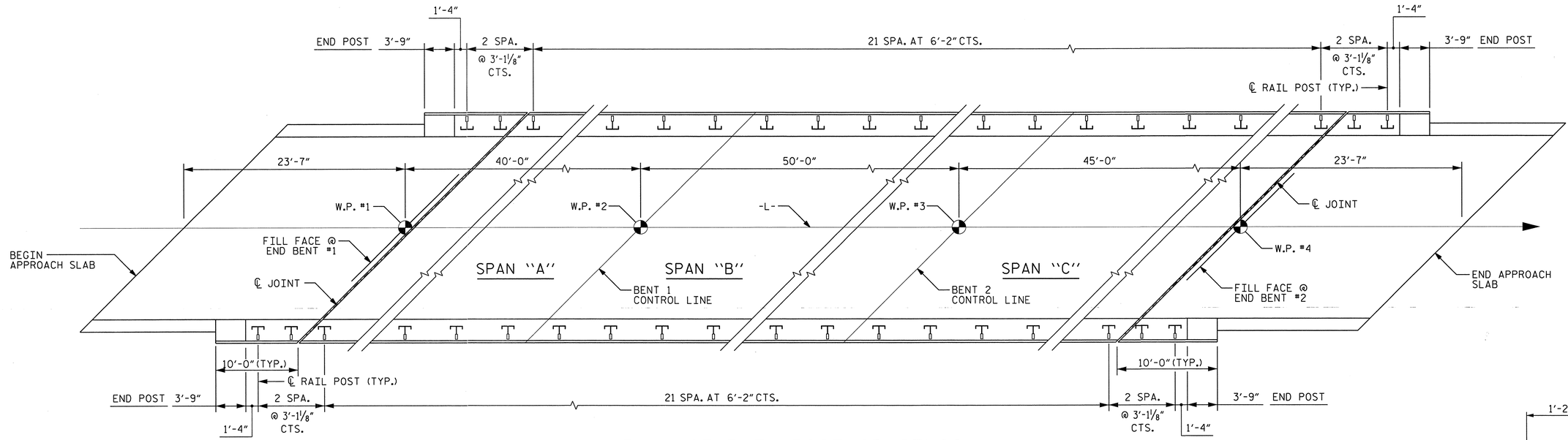
ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

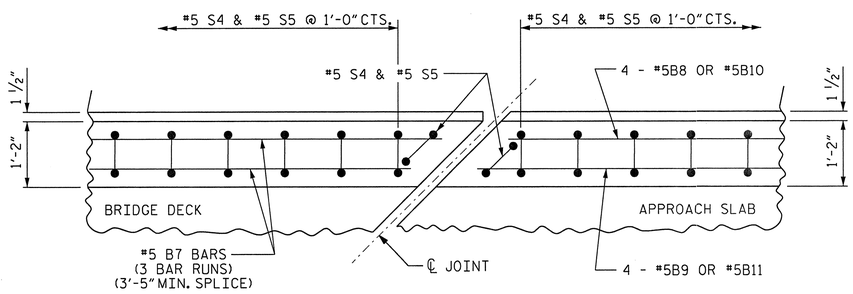
DWG 14 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			33

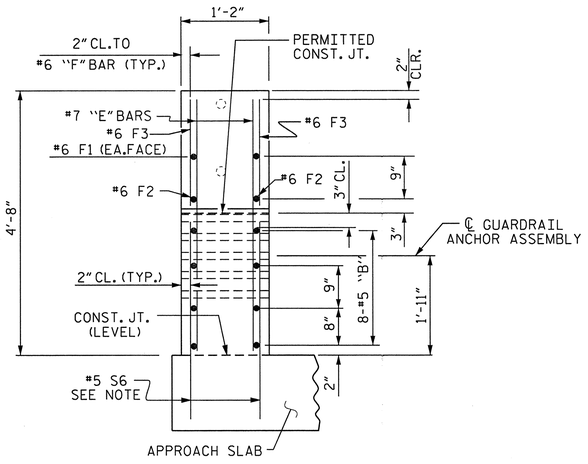
STD. NO. EB3



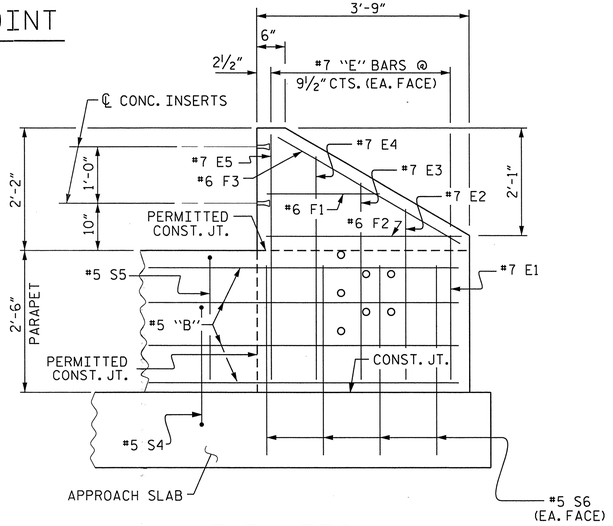
PLAN OF RAIL POST SPACINGS



PLAN OF PARAPET AT EXPANSION JOINT

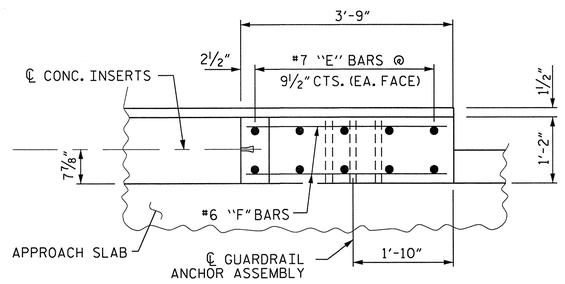


END VIEW

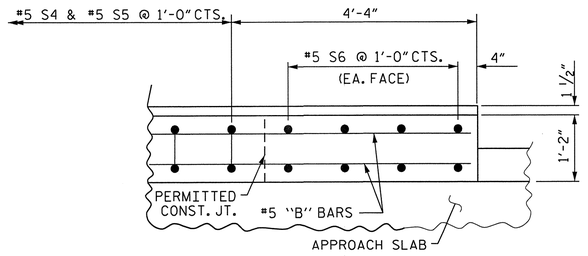


ELEVATION

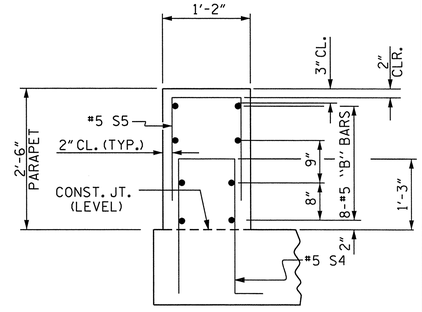
PARAPET AND END POST FOR TWO BAR RAIL



PLAN OF END POST



PLAN OF PARAPET AT END POST



SECTION THRU PARAPET

NOTE:

THE S6 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD FOR THE #5 S3 BAR IS 18.6 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 4

DRAWN BY: P. JACOB	DATE : 05/13	
CHECKED BY: D. RUGGLES	DATE : 06/13	
DESIGN ENGINEER OF RECORD: D. RUGGLES	DATE : 06/13	

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACINGS AND END POST DETAILS

DWG 15 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			33

FOR PLAN OF RAIL POST SPACINGS, SEE SHEET 1 OF 4.

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).

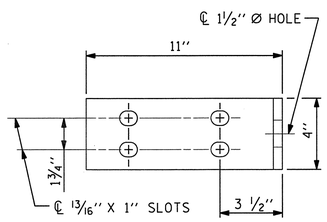
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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.

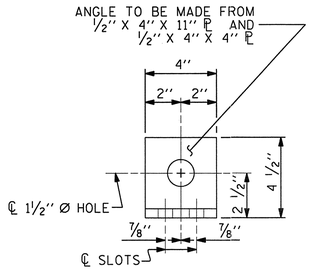
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

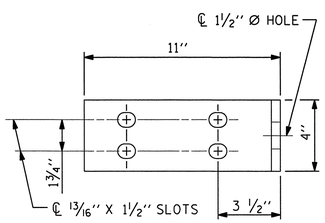
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 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.



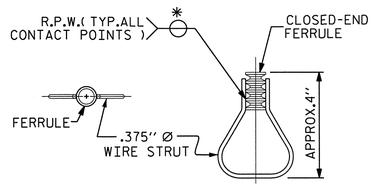
ELEVATION



END VIEW (FIX AND EXP.)



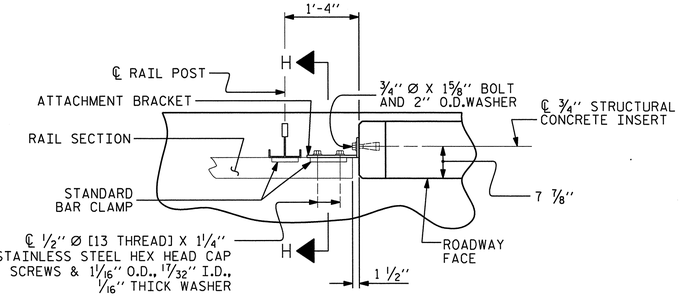
ELEVATION



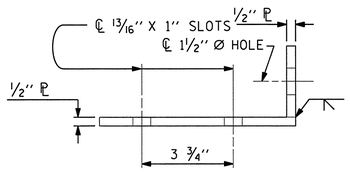
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

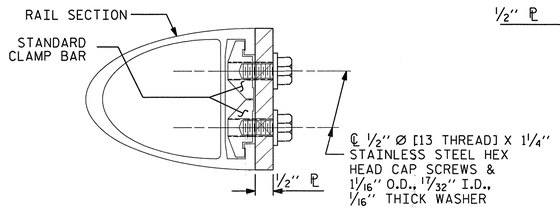
*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



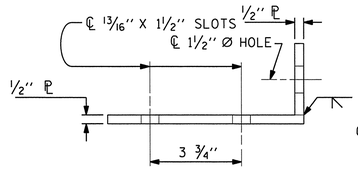
PLAN - RAIL AND END POST



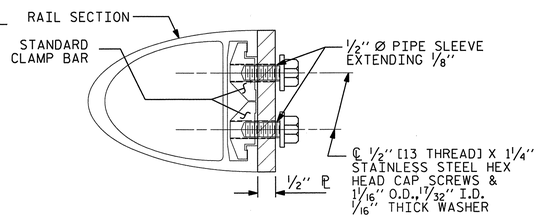
TOP VIEW



SECTION H-H (FIX)



TOP VIEW



SECTION H-H (EXP.)

FIXED EXPANSION

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

DWG 16 OF 33

ASSEMBLED BY : P. JACOB	DATE : 05/13
CHECKED BY : D. RUGGLES	DATE : 06/13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID B RUGGLES
10-01-13

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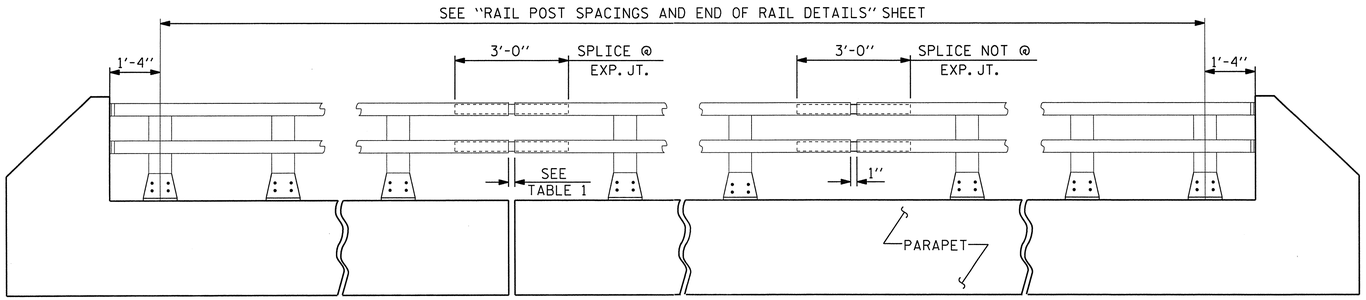
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			33

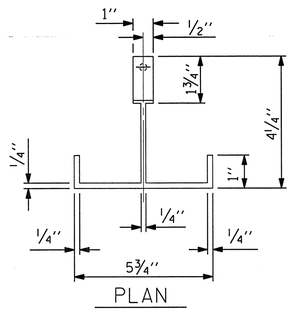
STD. NO. BMR2



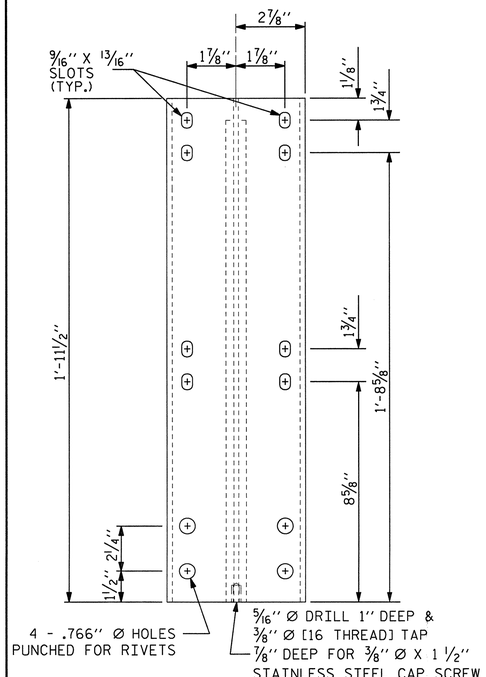
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

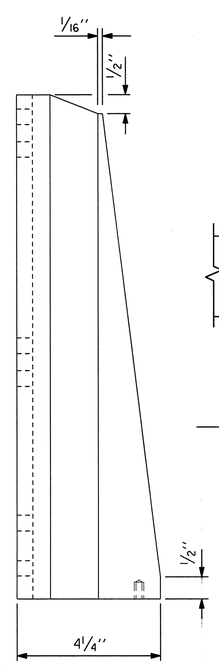
TABLE 1	
℄ EXP. JT. @	RAIL OPENING
EB No. 1	1"
EB No. 2	1"



PLAN

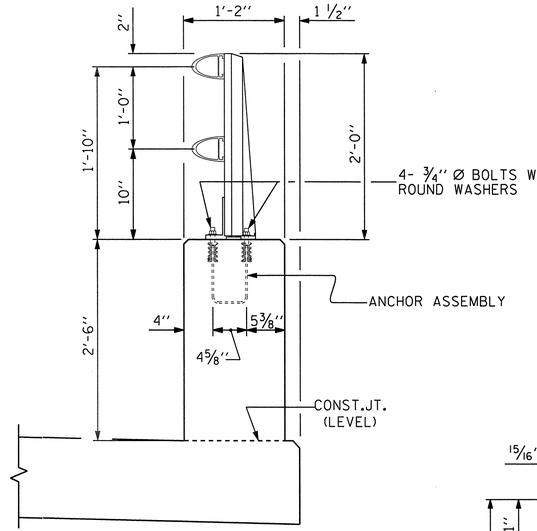


FRONT ELEVATION

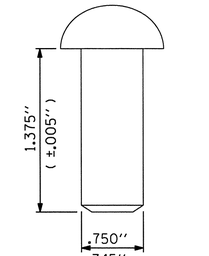


SIDE ELEVATION

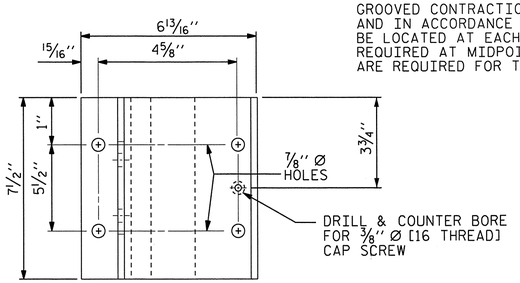
DETAILS OF POST



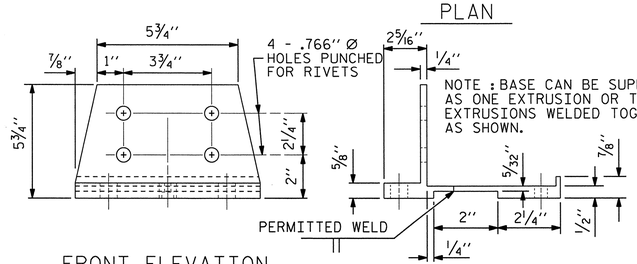
SECTION THRU PARAPET AND RAIL



RIVET DETAIL



PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

NOTES

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

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 STANDARD NO. BMR2.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 289.08 LIN. FT.

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : J. ABRIL		DATE : 05/13			
CHECKED BY : D. RUGGLES		DATE : 06/13			
DRAWN BY : EEM 6/94	REV. 5/7/03R	RWW/JTE			
CHECKED BY : RGW 6/94	REV. 5/1/06	TLA/GM			
	REV. 10/1/11	MAA/GM			

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			33

NORTH CAROLINA PROFESSIONAL SEAL 11726 ENGINEER DAVID R. RUGGLES
10-01-13

DWG 17 OF 33

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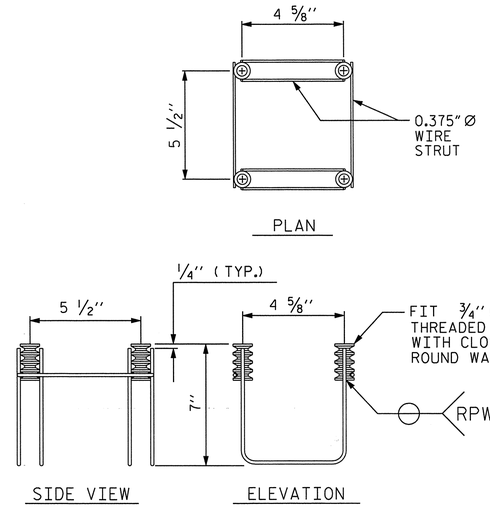
STD. NO. BMR3



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(62 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.

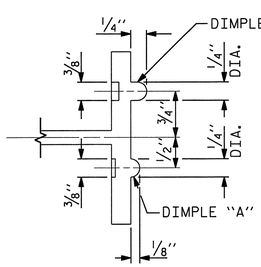
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

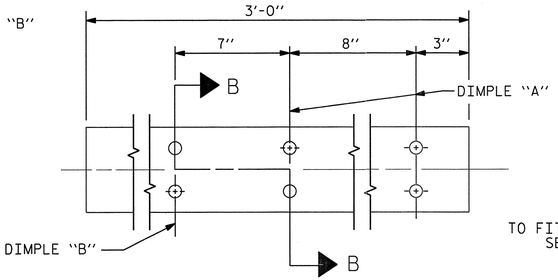
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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.

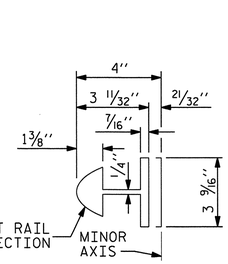
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



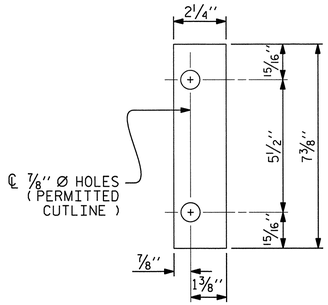
SECTION B - B



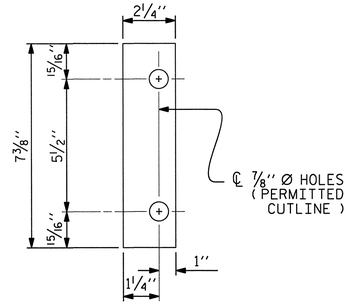
EXPANSION BAR DETAILS



BAR SECTION



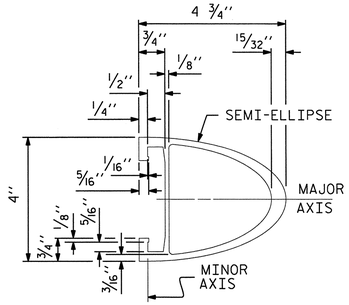
FRONT PLATE



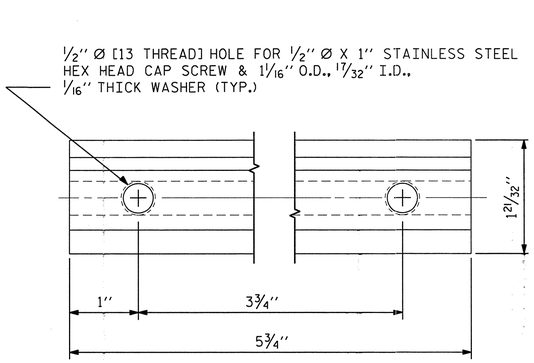
REAR PLATE

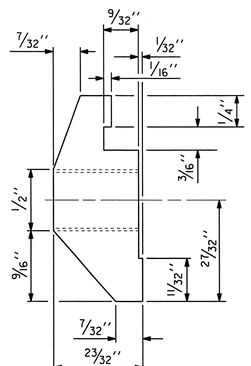
SHIM DETAILS

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



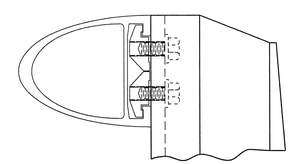
RAIL SECTION



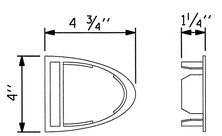


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

DWG 18 OF 33

ASSEMBLED BY : J. ABRIL	DATE : 05/13		
CHECKED BY : D. RUGGLES	DATE : 06/13		
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	

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

STEWART
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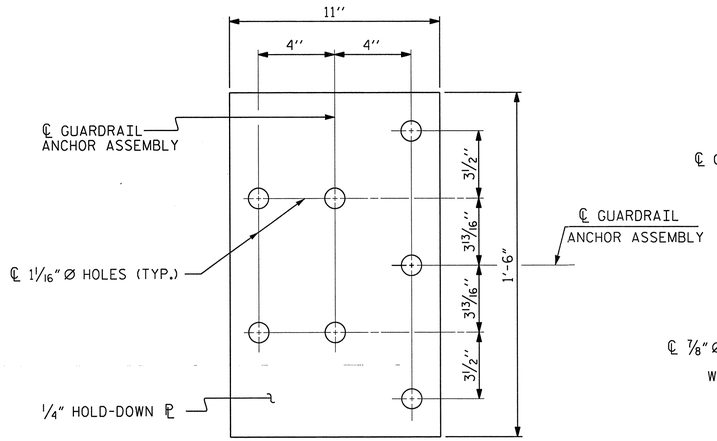
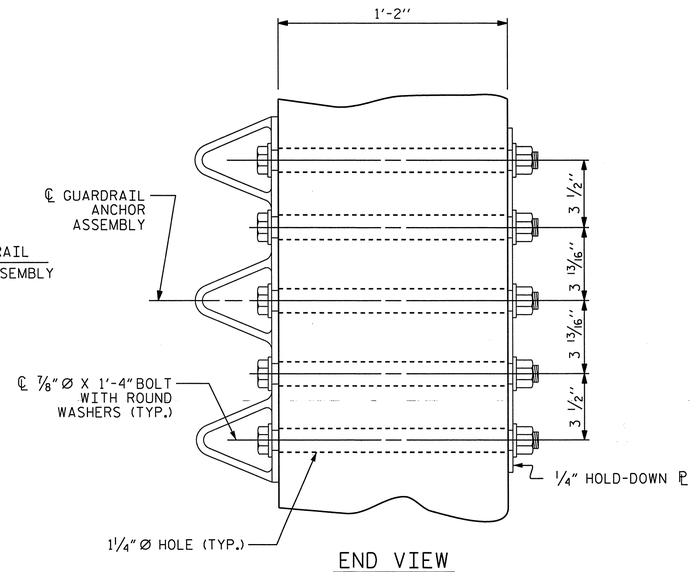
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			33

STD. NO. BMR4



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.

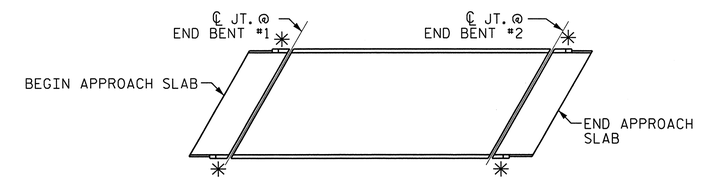
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

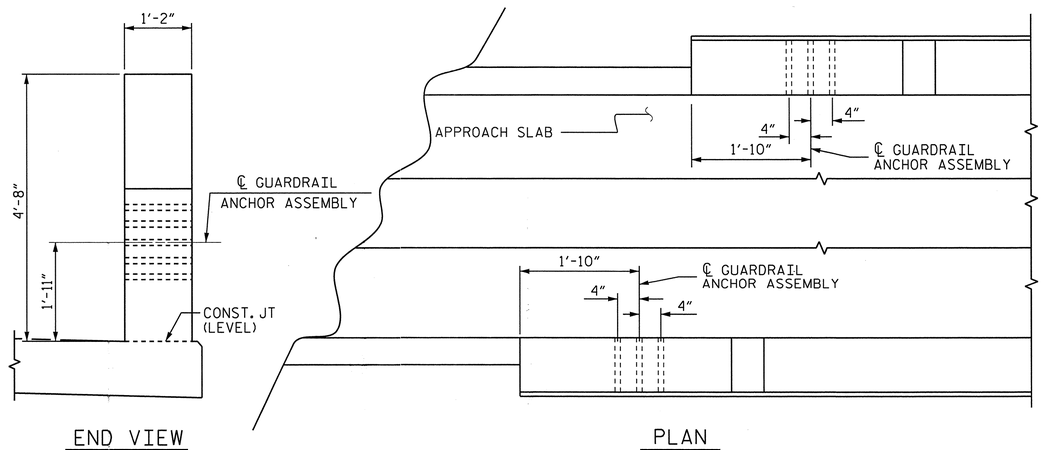
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

ASSEMBLED BY : J. ABRIL	DATE : 05/13	ADDED 5/6/10	
CHECKED BY : D. RUGGLES	DATE : 06/13	REV. 10/1/11	MAA/GM
DRAWN BY : MAA 5/10		REV. 12/5/11	MAA/GM
CHECKED BY : GM 5/10			

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

10-01-13

STEWART

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DWG 19 OF 33

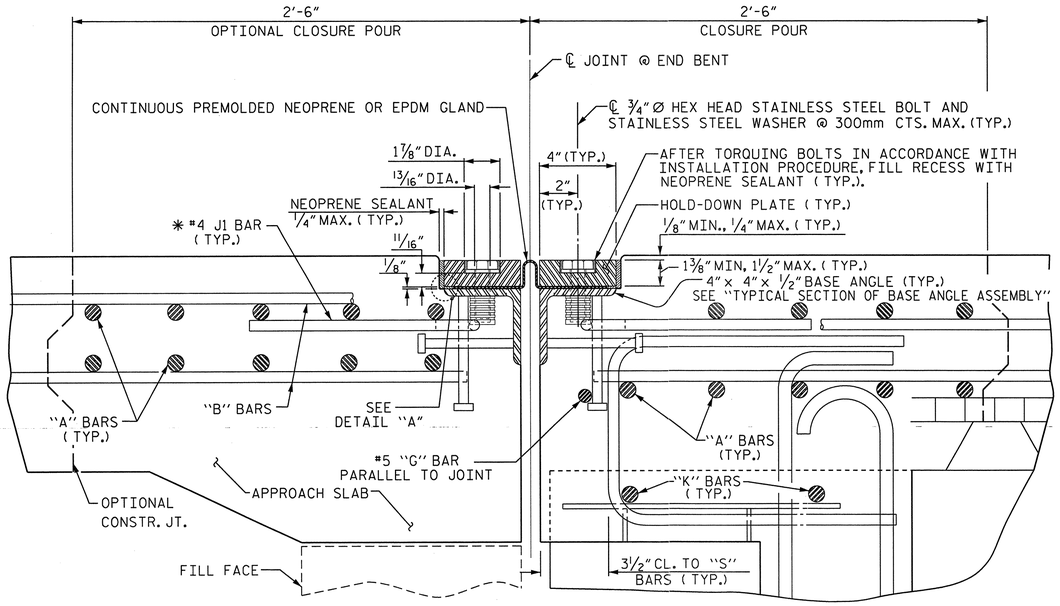
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			33

STD. NO. GRA3



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

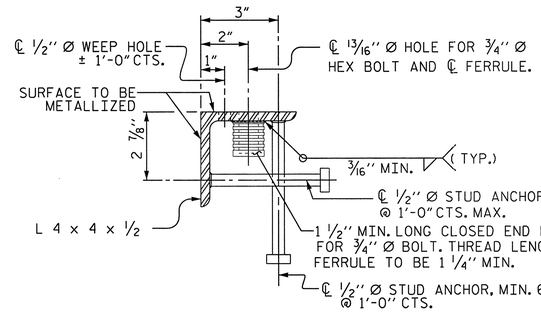
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

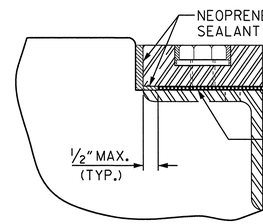
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

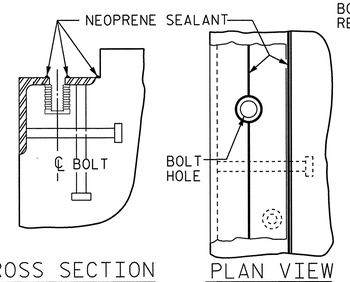
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

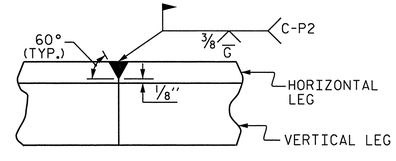


DETAIL "A"



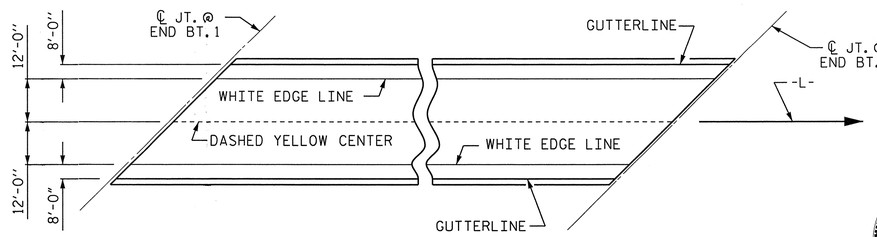
CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
E.B. 1	135	⅜"	1³⁄₁₆"	1⅛"	1⁄16"
E.B. 2	135	⅜"	1³⁄₁₆"	1⅛"	1⁄16"



PAVEMENT MARKING ALIGNMENT SKETCH

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS

DWG 20 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	P. JACOB	DATE :	06/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
DRAWN BY : REK 9/87	REV. 5/7/03R		RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R		TLA/GM
	REV. 10/1/11		MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

STEWART
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421 Fayetteville St,
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T 919.380.8750
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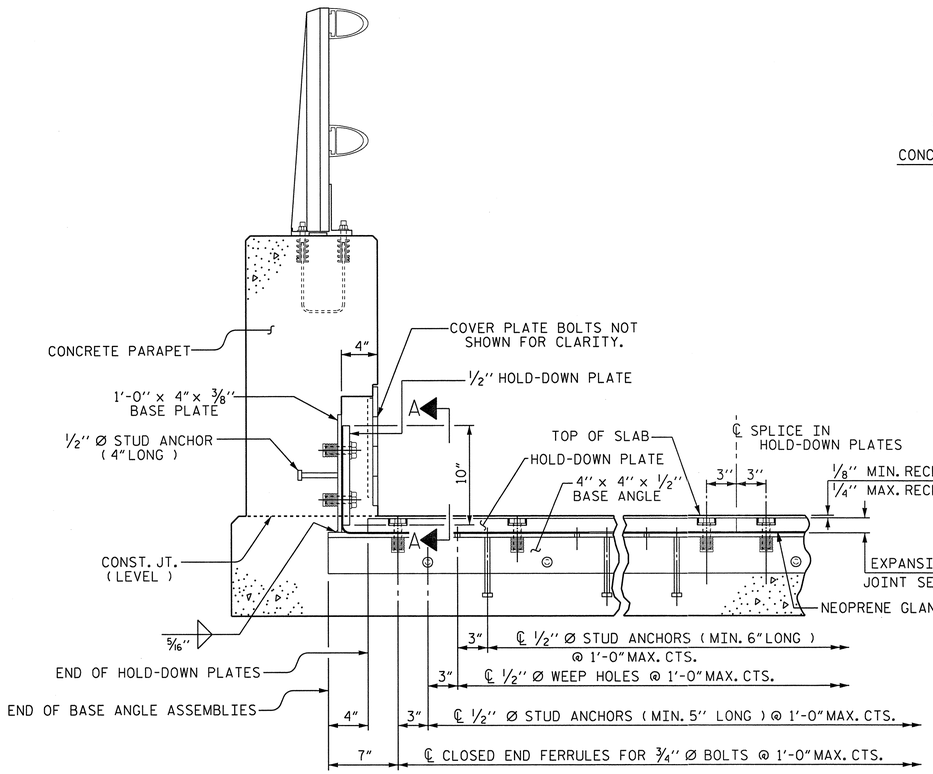
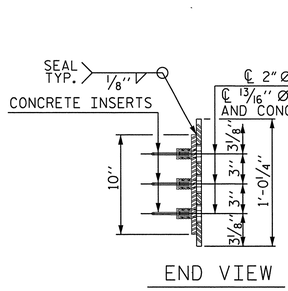
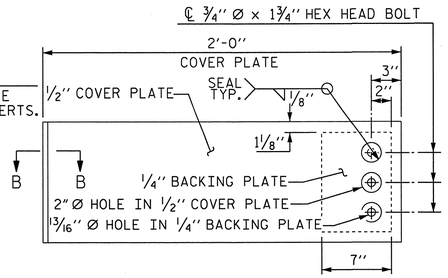
STD. NO. EJS1 (SHT 1a)



SECTION THRU RAIL NORMAL TO JOINT

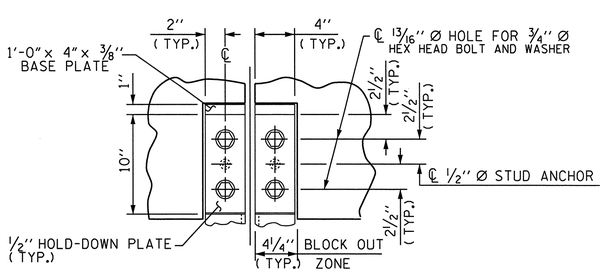


END VIEW

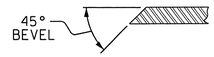


TYPE II - ELEVATION VIEW

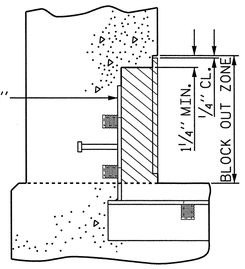
COVER PLATE DETAILS



SECTION A - A

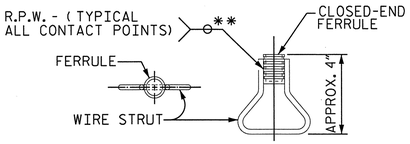


SECTION B - B



BLOCK OUT DETAIL

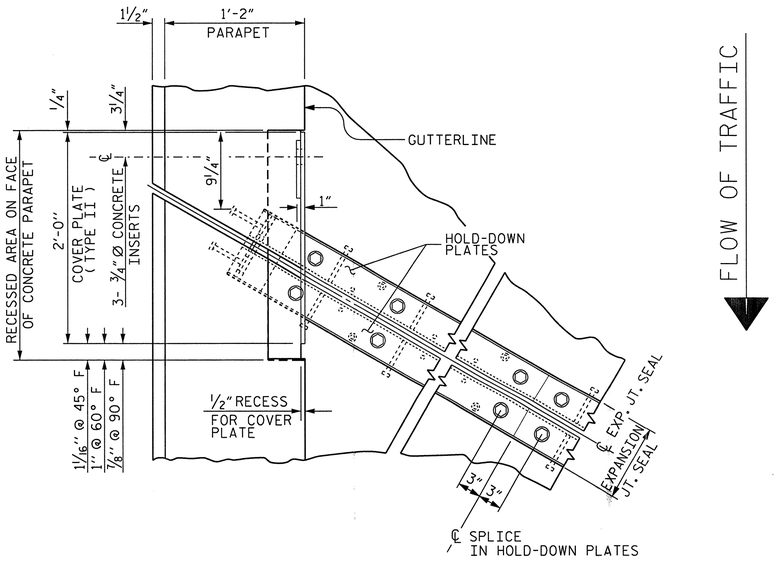
SEE "SECTION A-A" FOR OTHER DETAILS.



PLAN ELEVATION

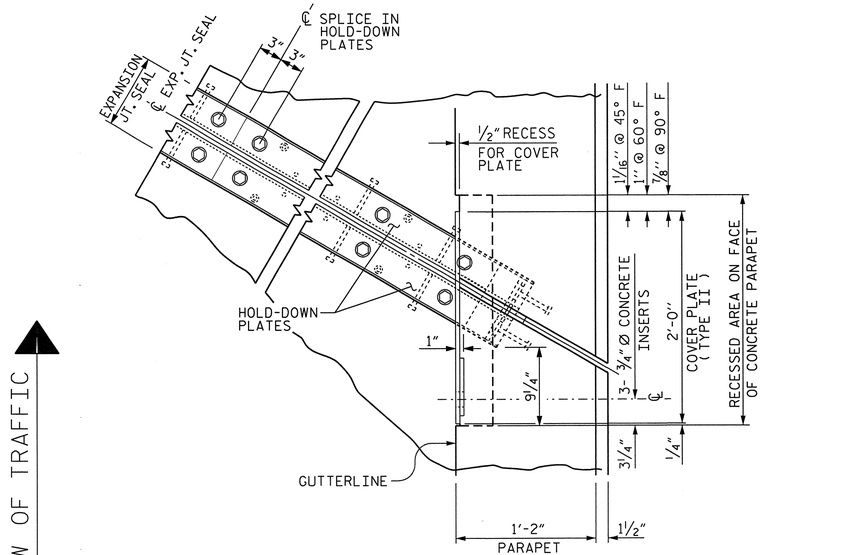
CONCRETE INSERT

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



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

FLOW OF TRAFFIC



FLOW OF TRAFFIC

PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR CONCRETE PARAPET

DRAWN BY: P. JACOB DATE : 06/13
CHECKED BY: D. RUGGLES DATE : 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

STEWART
Firm License No. C-1051
421 Fayetteville St,
Suite 400
Raleigh, NC 27601
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DWG 21 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			33

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	214	#5	STR	42'-2"	9,412	✱A61	2	#5	STR	17'-5"	36	A121	2	#5	STR	32'-10"	68	A181	2	#5	STR	7'-10"	16
✱A2	2	#5	STR	42'-0"	88	✱A62	2	#5	STR	17'-0"	35	A122	2	#5	STR	32'-5"	68	A182	2	#5	STR	7'-5"	15
✱A3	2	#5	STR	41'-7"	87	✱A63	2	#5	STR	16'-7"	35	A123	2	#5	STR	32'-0"	67	A183	2	#5	STR	7'-0"	15
✱A4	2	#5	STR	41'-2"	86	✱A64	2	#5	STR	16'-2"	34	A124	2	#5	STR	31'-7"	66	A184	2	#5	STR	6'-7"	14
✱A5	2	#5	STR	40'-9"	85	✱A65	2	#5	STR	15'-9"	33	A125	2	#5	STR	31'-2"	65	A185	2	#5	STR	6'-2"	13
✱A6	2	#5	STR	40'-4"	84	✱A66	2	#5	STR	15'-4"	32	A126	2	#5	STR	30'-9"	64	A186	2	#5	STR	5'-9"	12
✱A7	2	#5	STR	39'-11"	83	✱A67	2	#5	STR	14'-11"	31	A127	2	#5	STR	30'-4"	63	A187	2	#5	STR	5'-4"	11
✱A8	2	#5	STR	39'-6"	82	✱A68	2	#5	STR	14'-6"	30	A128	2	#5	STR	29'-11"	62	A188	2	#5	STR	4'-11"	10
✱A9	2	#5	STR	39'-1"	82	✱A69	2	#5	STR	14'-1"	29	A129	2	#5	STR	29'-6"	62	A189	2	#5	STR	4'-6"	9
✱A10	2	#5	STR	38'-8"	81	✱A70	2	#5	STR	13'-8"	29	A130	2	#5	STR	29'-1"	61	A190	2	#5	STR	4'-1"	9
✱A11	2	#5	STR	38'-3"	80	✱A71	2	#5	STR	13'-3"	28	A131	2	#5	STR	28'-8"	60	A191	2	#5	STR	3'-8"	8
✱A12	2	#5	STR	37'-10"	79	✱A72	2	#5	STR	12'-10"	27	A132	2	#5	STR	28'-3"	59	A192	2	#5	STR	3'-3"	7
✱A13	2	#5	STR	37'-5"	78	✱A73	2	#5	STR	12'-5"	26	A133	2	#5	STR	27'-10"	58	A193	2	#5	STR	2'-10"	6
✱A14	2	#5	STR	37'-0"	77	✱A74	2	#5	STR	12'-0"	25	A134	2	#5	STR	27'-5"	57	A194	2	#5	STR	2'-5"	5
✱A15	2	#5	STR	36'-7"	76	✱A75	2	#5	STR	11'-7"	24	A135	2	#5	STR	27'-0"	56						
✱A16	2	#5	STR	36'-2"	75	✱A76	2	#5	STR	11'-2"	23	A136	2	#5	STR	26'-7"	55	✱B1	29	#4	STR	22'-10"	442
✱A17	2	#5	STR	35'-9"	75	✱A77	2	#5	STR	10'-9"	22	A137	2	#5	STR	26'-2"	55	✱B2	29	#4	STR	15'-0"	291
✱A18	2	#5	STR	35'-4"	74	✱A78	2	#5	STR	10'-4"	22	A138	2	#5	STR	25'-9"	54	✱B3	29	#4	STR	27'-10"	539
✱A19	2	#5	STR	34'-11"	73	✱A79	2	#5	STR	9'-11"	21	A139	2	#5	STR	25'-4"	53	✱B4	114	#5	STR	38'-0"	4,518
✱A20	2	#5	STR	34'-6"	72	✱A80	2	#5	STR	9'-6"	20	A140	2	#5	STR	24'-11"	52	✱B5	112	#5	STR	14'-0"	1,635
✱A21	2	#5	STR	34'-1"	71	✱A81	2	#5	STR	9'-1"	19	A141	2	#5	STR	24'-6"	51	B6	177	#5	STR	45'-5"	8,384
✱A22	2	#5	STR	33'-8"	70	✱A82	2	#5	STR	8'-8"	18	A142	2	#5	STR	24'-1"	50						
✱A23	2	#5	STR	33'-3"	69	✱A83	2	#5	STR	8'-3"	17	A143	2	#5	STR	23'-8"	49	✱G1	4	#5	STR	31'-2"	130
✱A24	2	#5	STR	32'-10"	68	✱A84	2	#5	STR	7'-10"	16	A144	2	#5	STR	23'-3"	48	✱G2	6	#6	STR	6'-4"	57
✱A25	2	#5	STR	32'-5"	68	✱A85	2	#5	STR	7'-5"	15	A145	2	#5	STR	22'-10"	48						
✱A26	2	#5	STR	32'-0"	67	✱A86	2	#5	STR	7'-0"	15	A146	2	#5	STR	22'-5"	47	✱J1	112	#4	7	1'-5"	106
✱A27	2	#5	STR	31'-7"	66	✱A87	2	#5	STR	6'-7"	14	A147	2	#5	STR	22'-0"	46						
✱A28	2	#5	STR	31'-2"	65	✱A88	2	#5	STR	6'-2"	13	A148	2	#5	STR	21'-7"	45	✱K1	8	#8	1	17'-7"	376
✱A29	2	#5	STR	30'-9"	64	✱A89	2	#5	STR	5'-9"	12	A149	2	#5	STR	21'-2"	44	✱K2	8	#8	2	27'-4"	584
✱A30	2	#5	STR	30'-4"	63	✱A90	2	#5	STR	5'-4"	11	A150	2	#5	STR	20'-9"	43	✱K3	12	#6	STR	14'-10"	267
✱A31	2	#5	STR	29'-11"	62	✱A91	2	#5	STR	4'-11"	10	A151	2	#5	STR	20'-4"	42	K4	18	#4	STR	14'-2"	170
✱A32	2	#5	STR	29'-6"	62	✱A92	2	#5	STR	4'-6"	9	A152	2	#5	STR	19'-11"	42	K5	24	#4	STR	15'-7"	250
✱A33	2	#5	STR	29'-1"	61	✱A93	2	#5	STR	4'-1"	9	A153	2	#5	STR	19'-6"	41	K6	18	#4	STR	14'-10"	178
✱A34	2	#5	STR	28'-8"	60	✱A94	2	#5	STR	3'-8"	8	A154	2	#5	STR	19'-1"	40	K7	8	#4	STR	26'-0"	139
✱A35	2	#5	STR	28'-3"	59	✱A95	2	#5	STR	3'-3"	7	A155	2	#5	STR	18'-8"	39						
✱A36	2	#5	STR	27'-10"	58	✱A96	2	#5	STR	2'-10"	6	A156	2	#5	STR	18'-3"	38	✱S1	90	#5	3	5'-1"	477
✱A37	2	#5	STR	27'-5"	57	✱A97	2	#5	STR	2'-5"	5	A157	2	#5	STR	17'-10"	37	✱S2	90	#4	4	4'-0"	240
✱A38	2	#5	STR	27'-0"	56	A98	214	#5	STR	42'-2"	9,412	A158	2	#5	STR	17'-5"	36	S3	270	#4	5	2'-9"	496
✱A39	2	#5	STR	26'-7"	55	A99	2	#5	STR	42'-0"	88	A159	2	#5	STR	17'-0"	35						
✱A40	2	#5	STR	26'-2"	55	A100	2	#5	STR	41'-7"	87	A160	2	#5	STR	16'-7"	35	✱U1	78	#4	6	12'-0"	625
✱A41	2	#5	STR	25'-9"	54	A101	2	#5	STR	41'-2"	86	A161	2	#5	STR	16'-2"	34	✱U2	12	#4	6	10'-8"	86
✱A42	2	#5	STR	25'-4"	53	A102	2	#5	STR	40'-9"	85	A162	2	#5	STR	15'-9"	33						
✱A43	2	#5	STR	24'-11"	52	A103	2	#5	STR	40'-4"	84	A163	2	#5	STR	15'-4"	32						
✱A44	2	#5	STR	24'-6"	51	A104	2	#5	STR	39'-11"	83	A164	2	#5	STR	14'-11"	31						
✱A45	2	#5	STR	24'-1"	50	A105	2	#5	STR	39'-6"	82	A165	2	#5	STR	14'-6"	30						
✱A46	2	#5	STR	23'-8"	49	A106	2	#5	STR	39'-1"	82	A166	2	#5	STR	14'-1"	29						
✱A47	2	#5	STR	23'-3"	48	A107	2	#5	STR	38'-8"	81	A167	2	#5	STR	13'-8"	29						
✱A48	2	#5	STR	22'-10"	48	A108	2	#5	STR	38'-3"	80	A168	2	#5	STR	13'-3"	28						
✱A49	2	#5	STR	22'-5"	47	A109	2	#5	STR	37'-10"	79	A169	2	#5	STR	12'-10"	27						
✱A50	2	#5	STR	22'-0"	46	A110	2	#5	STR	37'-5"	78	A170	2	#5	STR	12'-5"	26						
✱A51	2	#5	STR	21'-7"	45	A111	2	#5	STR	37'-0"	77	A171	2	#5	STR	12'-0"	25						
✱A52	2	#5	STR	21'-2"	44	A112	2	#5	STR	36'-7"	76	A172	2	#5	STR	11'-7"	24						
✱A53	2	#5	STR	20'-9"	43	A113	2	#5	STR	36'-2"	75	A173	2	#5	STR	11'-2"	23						
✱A54	2	#5	STR	20'-4"	42	A114	2	#5	STR	35'-9"	75	A174	2	#5	STR	10'-9"	22						
✱A55	2	#5	STR	19'-11"	42	A115	2	#5	STR	35'-4"	74	A175	2	#5	STR	10'-4"	22						
✱A56	2	#5	STR	19'-6"	41	A116	2	#5	STR	34'-11"	73	A176	2	#5	STR	9'-11"	21						
✱A57	2	#5	STR	19'-1"	40	A117	2	#5	STR	34'-6"	72	A177	2	#5	STR	9'-6"	20						
✱A58	2	#5	STR	18'-8"	39	A118	2	#5	STR	34'-1"	71	A178	2	#5	STR	9'-1"	19						
✱A59	2	#5	STR	18'-3"	38	A119	2	#5	STR	33'-8"	70	A179	2	#5	STR	8'-8"	18						
✱A60	2	#5	STR	17'-10"	37	A120	2	#5	STR	33'-3"	69	A180	2	#5	STR	8'-3"	17						

✱DENOTES EPOXY COATED REINFORCING STEEL

GROOVING BRIDGE FLOORS

APPROACH SLABS	1767	SQ.FT.
BRIDGE DECK	4864	SQ.FT.
TOTAL	6631	SQ.FT.

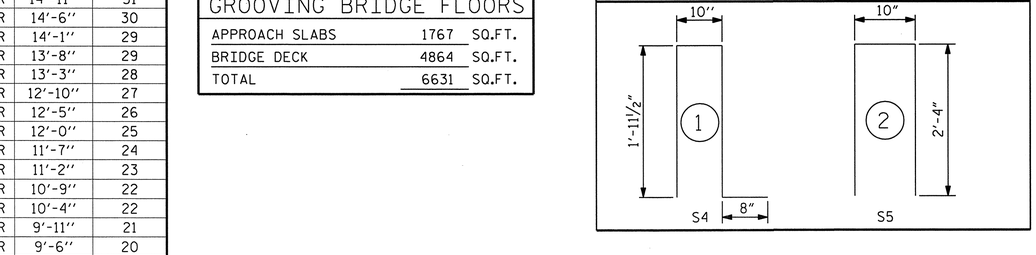
SUPERSTRUCTURE REINFORCING STEEL
LENGTHS ARE BASED ON THE
FOLLOWING MINIMUM SPLICE LENGTHS

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"

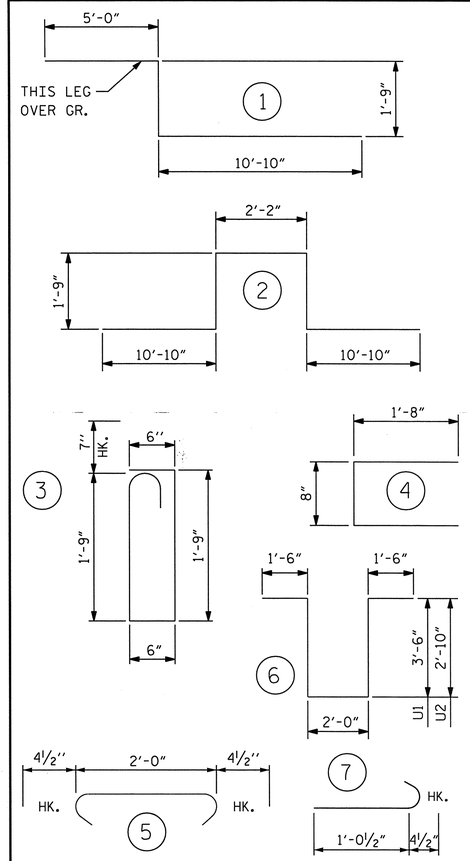
BILL OF MATERIAL FOR PARAPET & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B7	48	# 5	STR	46'-2"	2311
✱B8	8	# 5	STR	9'-4"	78
✱B9	8	# 5	STR	8'-8"	72
✱B10	8	# 5	STR	9'-10"	82
✱B11	8	# 5	STR	11'-0"	92
✱E1	8	# 7	STR	2'-6"	41
✱E2	8	# 7	STR	3'-0"	49
✱E3	8	# 7	STR	3'-6"	57
✱E4	8	# 7	STR	4'-0"	65
✱E5	8	# 7	STR	4'-4"	71
✱F1	8	# 6	STR	1'-10"	22
✱F2	8	# 6	STR	3'-0"	36
✱F3	8	# 6	STR	3'-8"	44
✱S4	292	# 5	1	5'-5"	1650
✱S5	292	# 5	2	5'-6"	1675
✱S6	32	# 5	STR	3'-0"	100
✱EPOXY COATED REINFORCING STEEL				LBS.	6445
CLASS AA CONCRETE				CU.YDS.	33.8
TOTAL LIN. FT. OF CONCRETE PARAPET					304.08

BAR TYPES



BAR TYPES

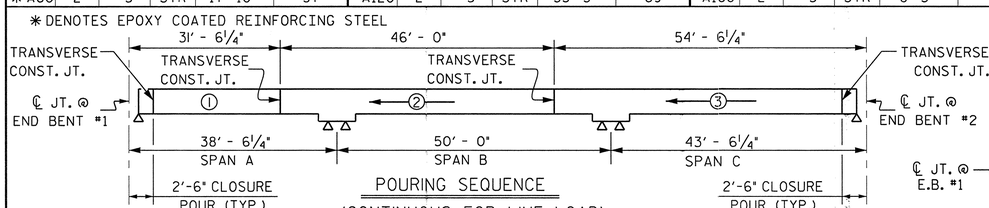


ALL BAR DIMENSIONS ARE OUT TO OUT

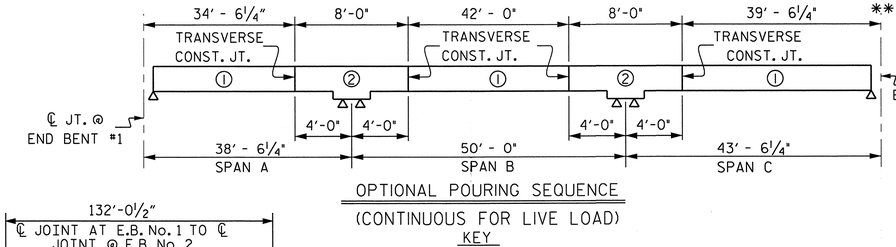
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	49.2	23,477	24,233
POUR 2	79.8		
POUR 3	95.4		
TOTALS✱✱	224.4	23,477	24,233

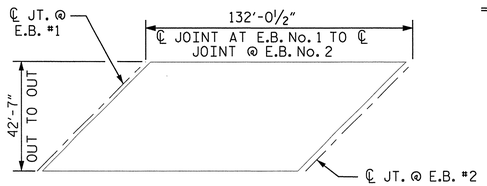
✱✱QUANTITIES FOR PARAPET AND END POSTS ARE NOT INCLUDED



POURING SEQUENCE
(CONTINUOUS FOR LIVE LOAD)
KEY
(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE
(CONTINUOUS FOR LIVE LOAD)
KEY
(#) = INDICATES POUR NUMBER



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 5,623)

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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PROJECT NO. B-4816
SCOTLAND COUNTY
STATION: 16+14.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

DWG 22 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			33

STD. NO. BOM2

DRAWN BY: C. BRIDGES DATE : 05/13
CHECKED BY: D. RUGGLES DATE : 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE : 06/13

9/30/2013
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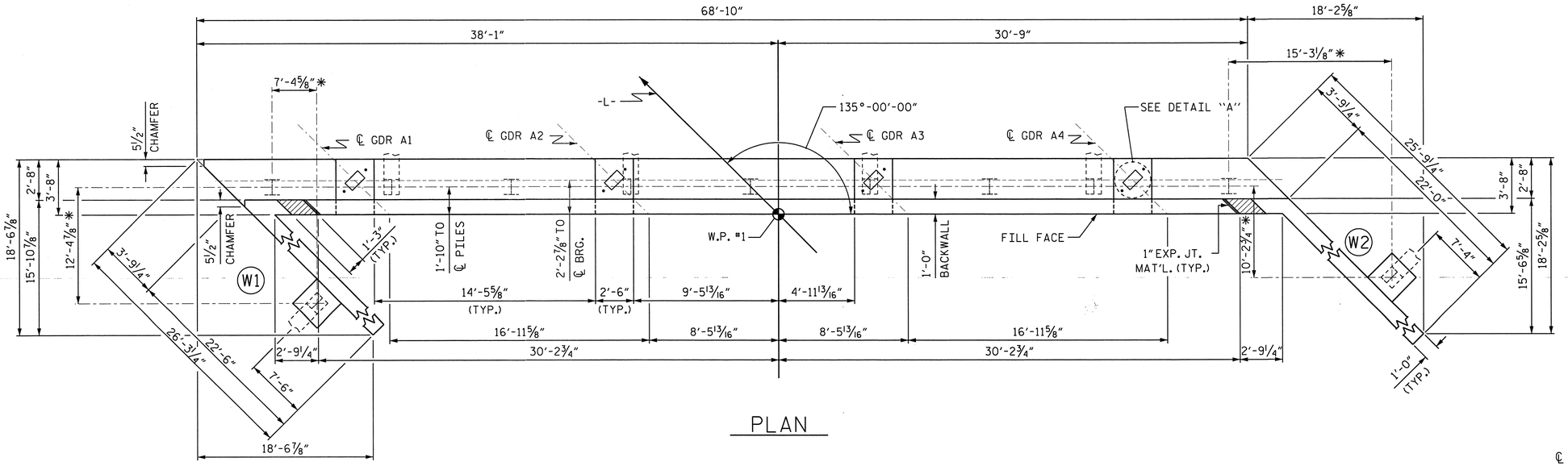
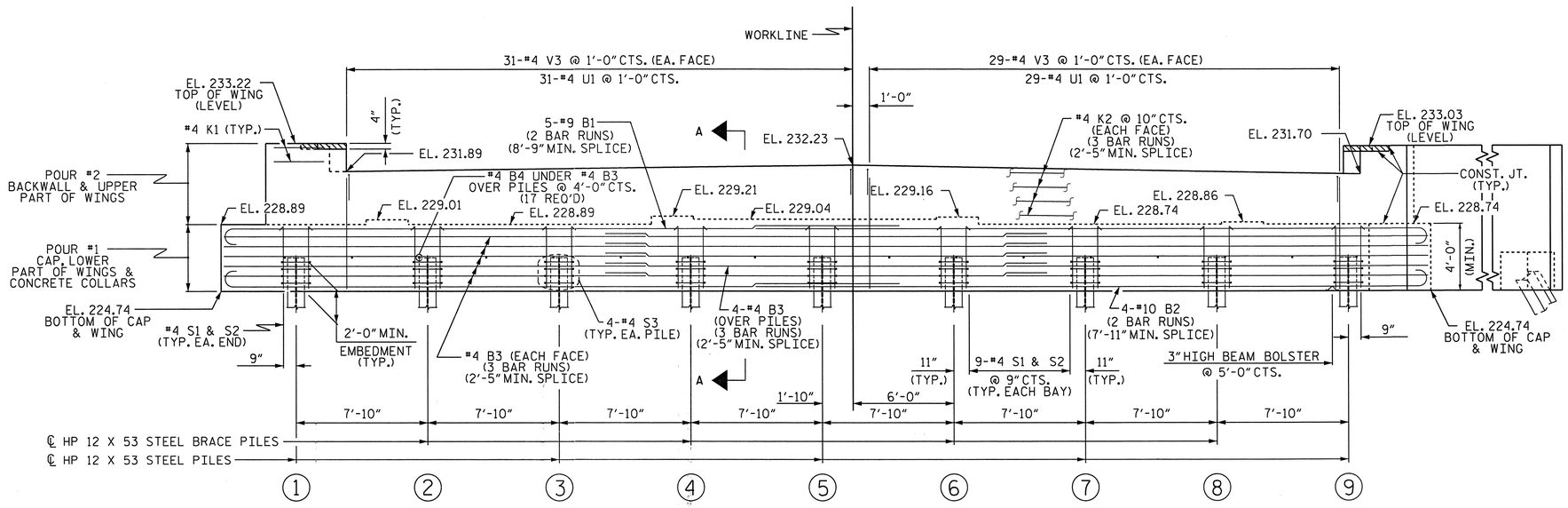
USER:jabril



PLAN



ELEVATION

LEFT WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

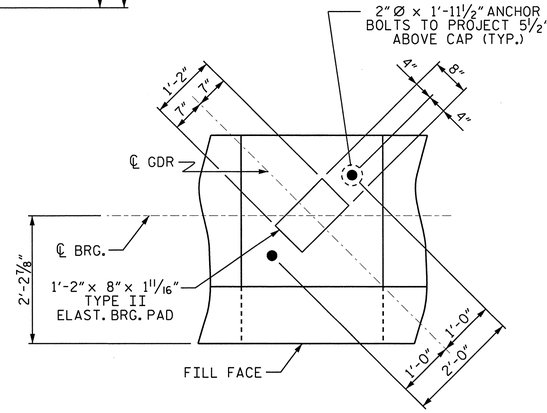
FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. 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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

* DIMENSIONS SHOWN ARE AT BOTTOM OF CAP



DETAIL "A"

PROJECT NO. B-4816
SCOTLAND COUNTY
STATION: 16+14.50 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: P. JACOB DATE: 05/13
CHECKED BY: D. RUGGLES DATE: 06/13
DESIGN ENGINEER OF RECORD: D. RUGGLES DATE: 06/13

NORTH CAROLINA SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

DWG 23 OF 33

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9/30/2013
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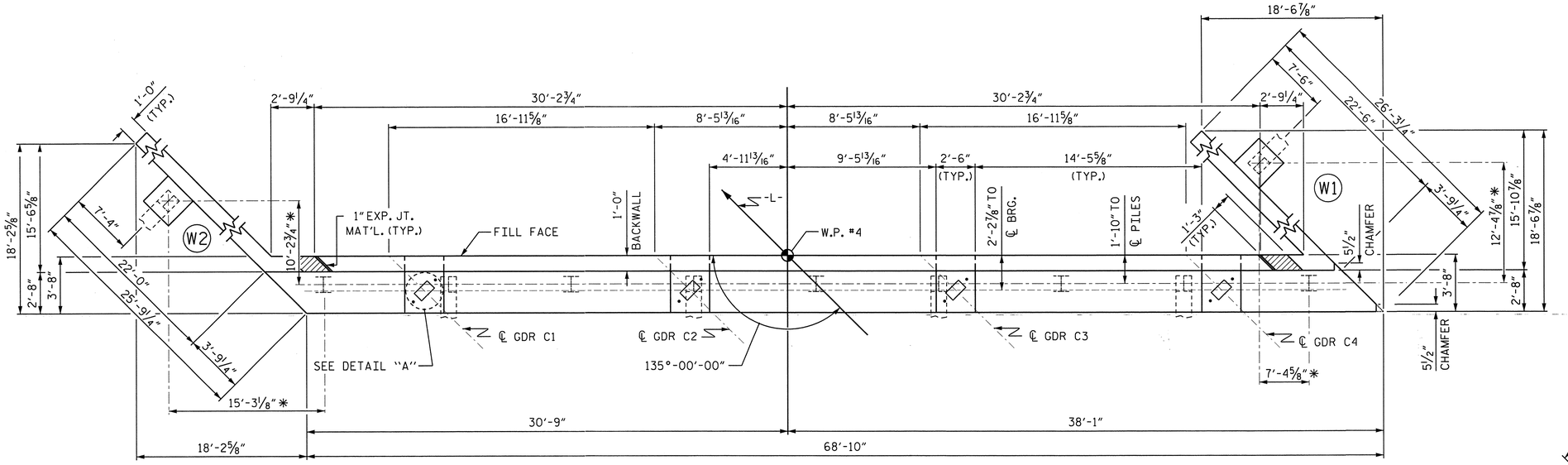
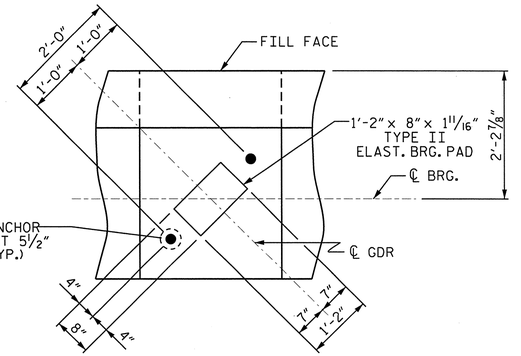
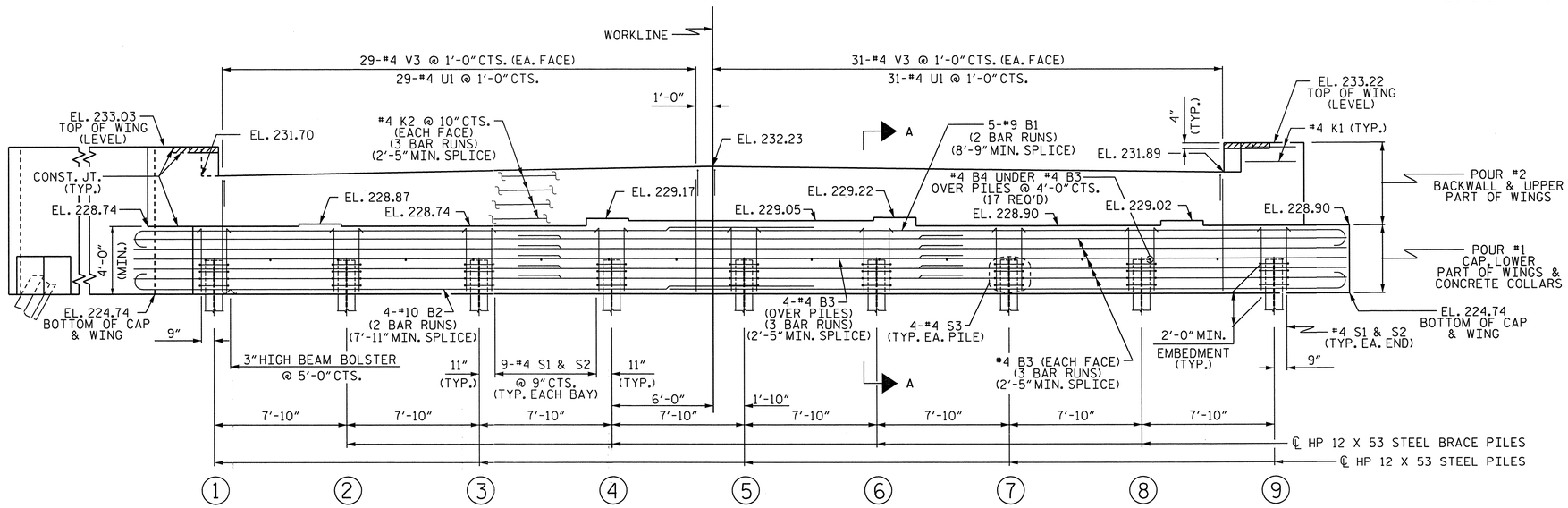
USER:jabril



PLAN



DETAIL "A"



ELEVATION

RIGHT WING NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. 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.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

* DIMENSIONS SHOWN ARE AT BOTTOM OF CAP

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

END BENT No. 2

DWG 24 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			33

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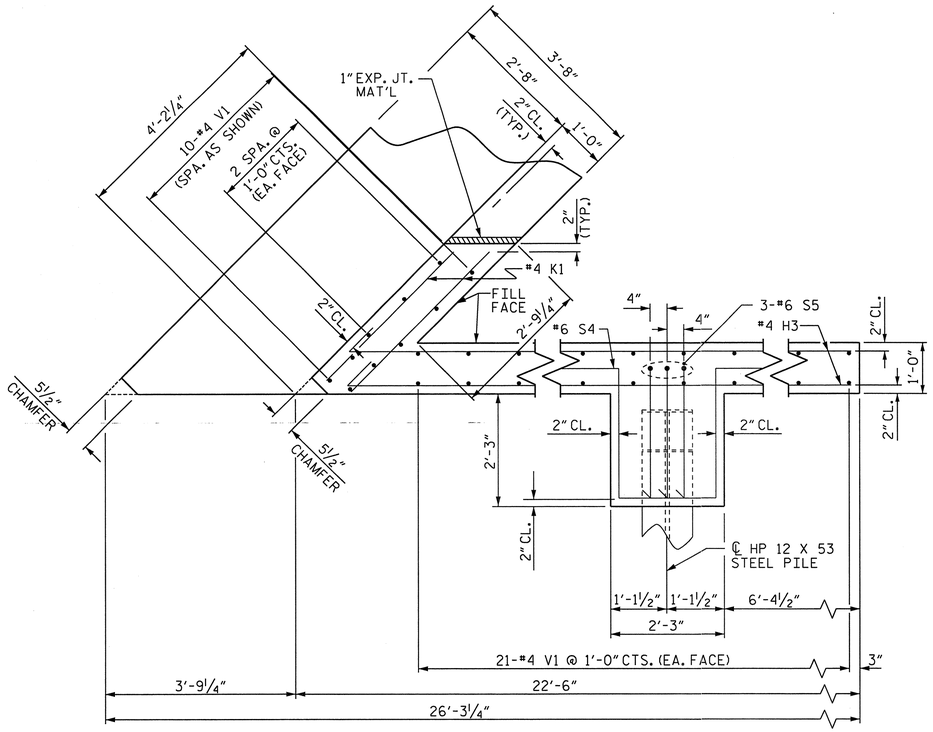
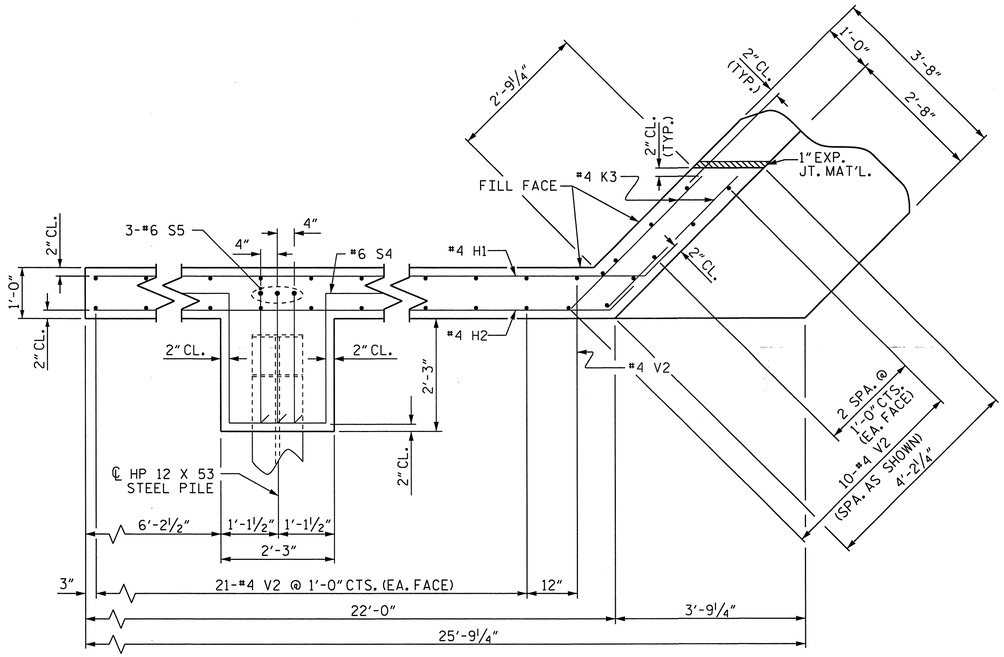
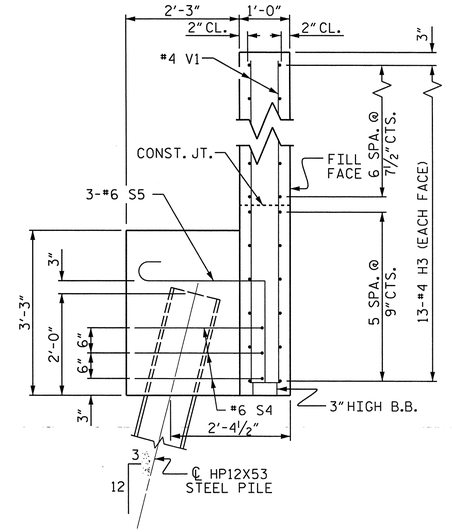


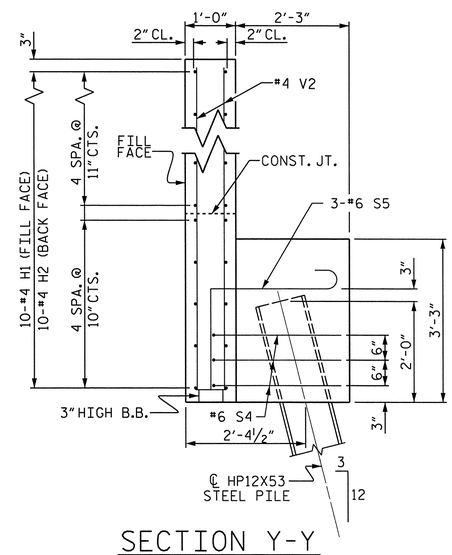
PLAN OF WING (W1)



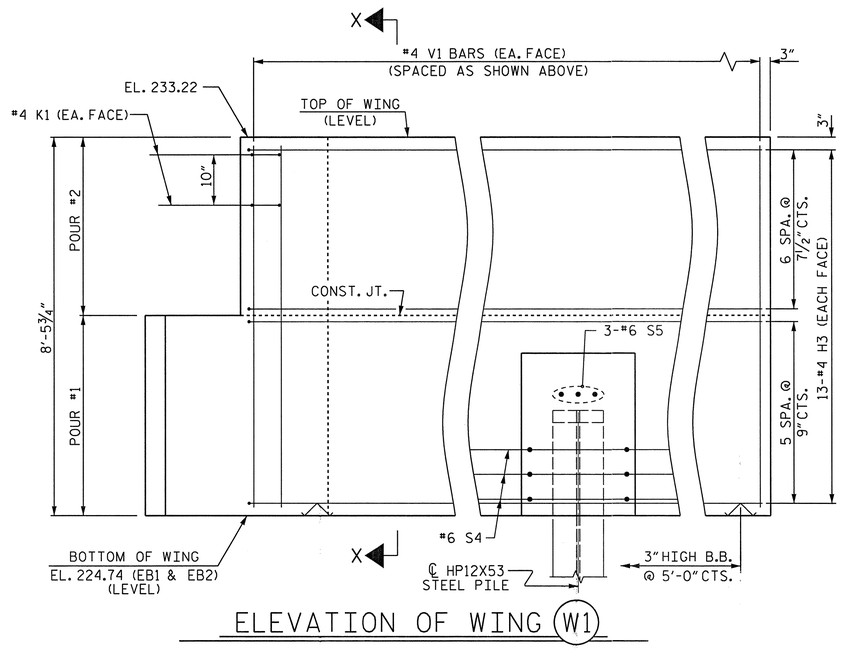
PLAN OF WING (W2)



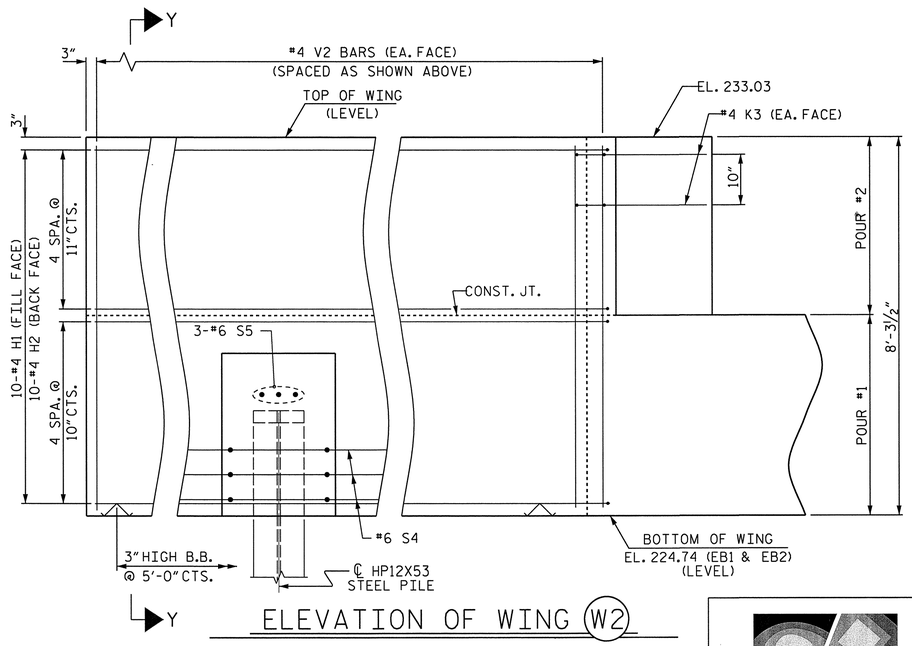
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. B-4816

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SHEET 3 OF 4

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10-01-13

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SUBSTRUCTURE

END BENT WING DETAILS

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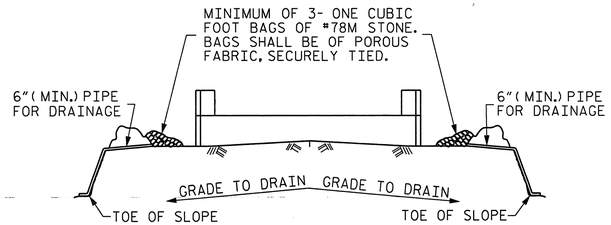
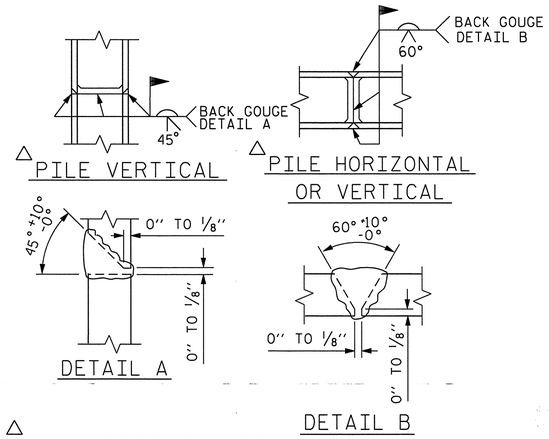


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

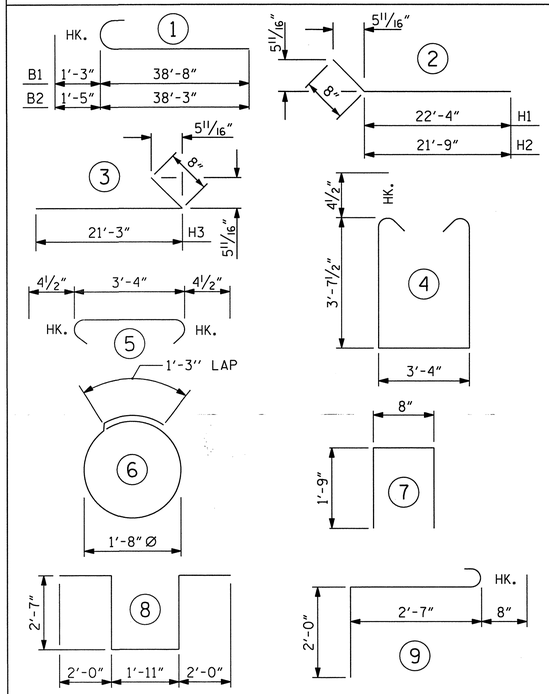
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES
NO: 9 LIN. FT.= 585	NO: 9 LIN. FT.= 540

BILL OF MATERIAL FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	39'-11"	1357
B2	8	#10	1	39'-8"	1365
B3	42	#4	STR	24'-6"	687
B4	17	#4	STR	3'-4"	38
H1	10	#4	2	23'-0"	154
H2	10	#4	2	22'-5"	150
H3	26	#4	3	21'-11"	381
K1	4	#4	STR	3'-5"	9
K2	24	#4	STR	24'-6"	393
K3	4	#4	STR	3'-8"	10
S1	74	#4	4	11'-4"	560
S2	74	#4	5	4'-1"	202
S3	36	#4	6	6'-6"	156
S4	6	#6	8	11'-1"	100
S5	6	#6	9	5'-3"	47
U1	60	#4	7	4'-2"	167
V1	52	#4	STR	8'-1"	281
V2	53	#4	STR	7'-11"	280
V3	120	#4	STR	6'-7"	528

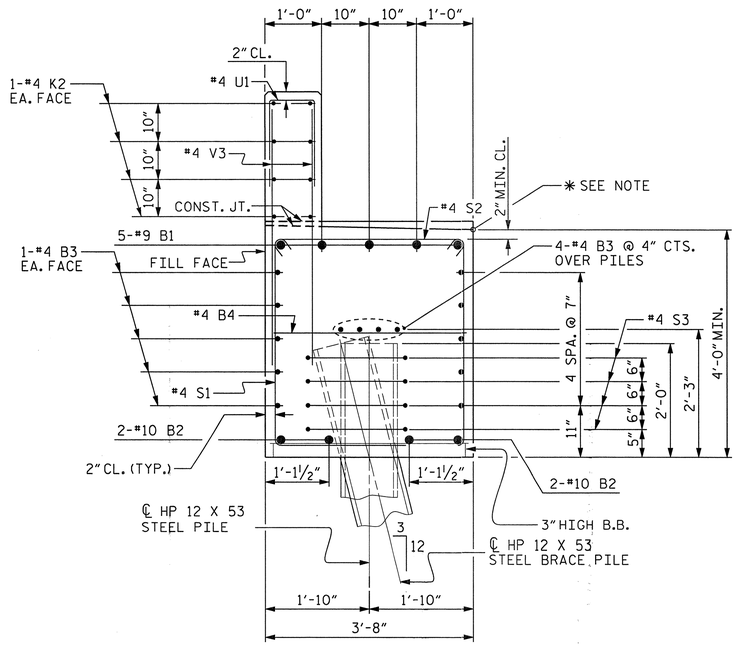
REINFORCING STEEL (FOR ONE END BENT) 6865 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 48.0 C.Y.

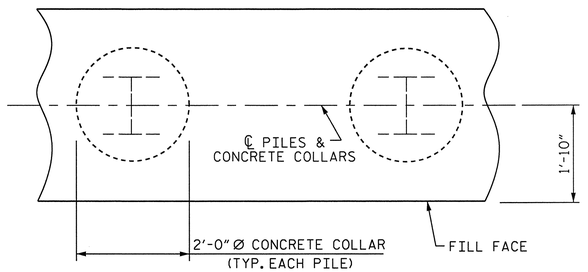
POUR #2 BACKWALL & UPPER PART OF WINGS 14.9 C.Y.

TOTAL CLASS A CONCRETE 62.9 C.Y.

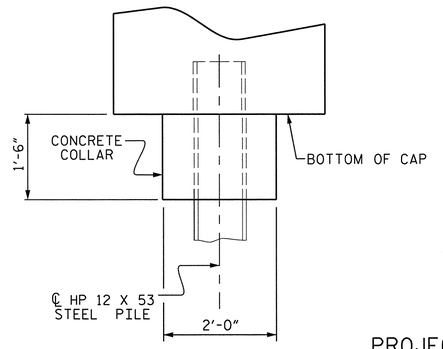


SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

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

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SCOTLAND COUNTY

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SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

DWG 26 OF 33

REVISIONS						SHEET NO.
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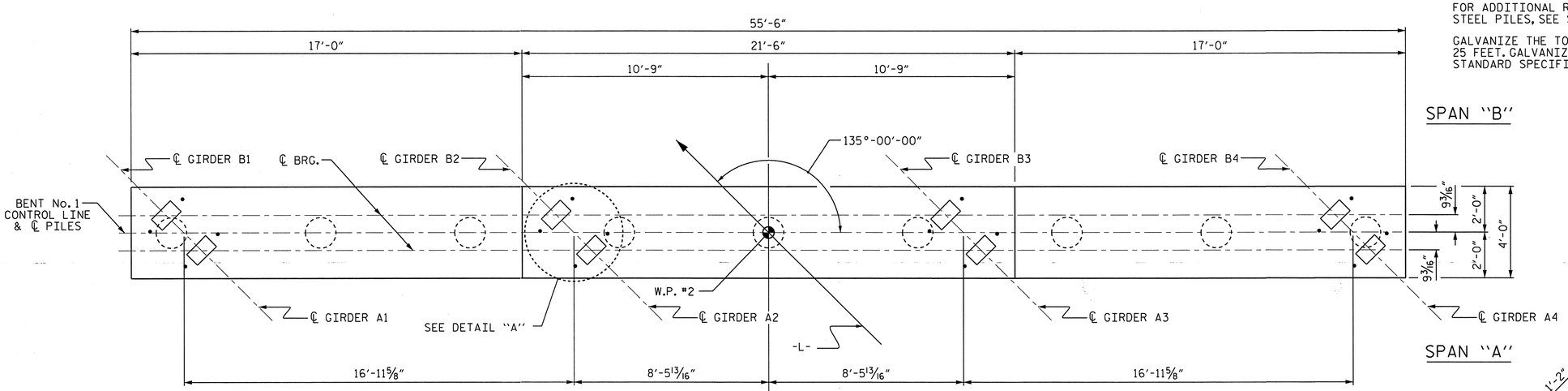
NOTES

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

★ INVERT ALTERNATE STIRRUPS.

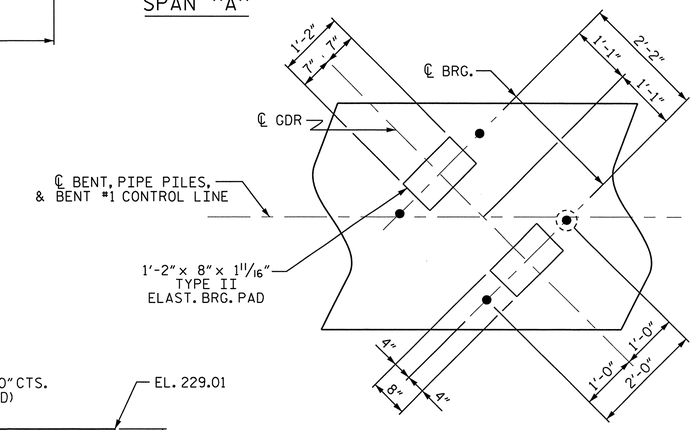
FOR ADDITIONAL REINFORCING STEEL IN PP 16 x 0.50 GALVANIZED STEEL PILES, SEE SHEET 4 OF 4.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



SPAN "B"

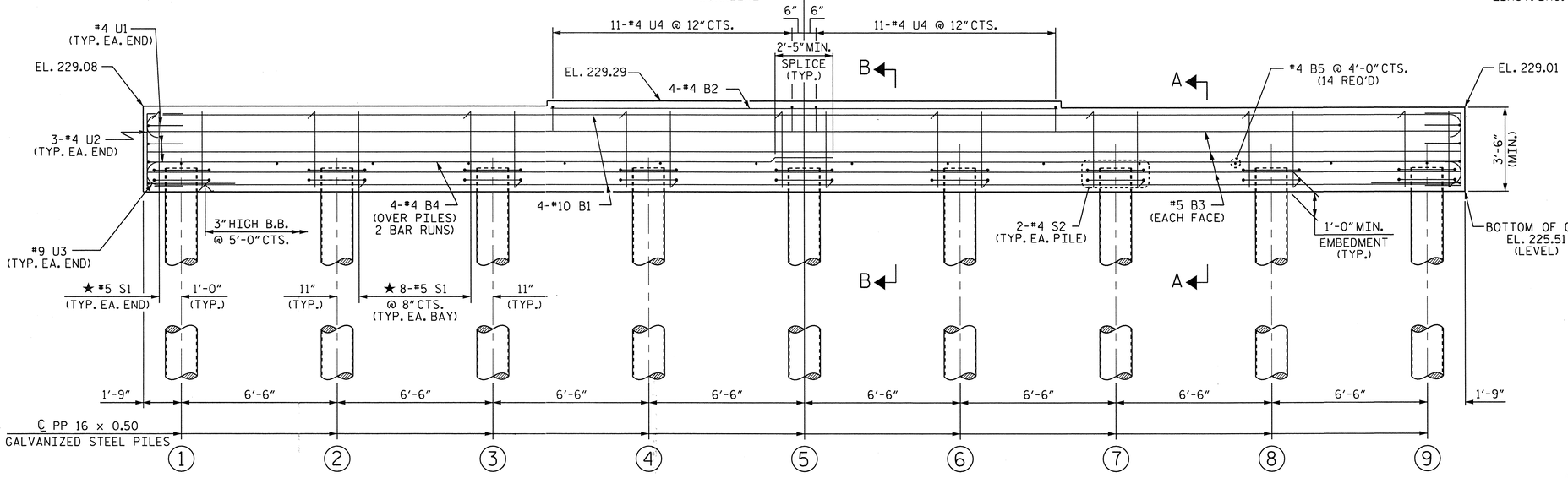
SPAN "A"



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH GIRDER)
(PIPE PILES NOT SHOWN FOR CLARITY)

PLAN



ELEVATION

FOR SECTIONA A-A AND B-B, SEE SHEET 3 OF 4

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

BENT No. 1

DWG 27 OF 33

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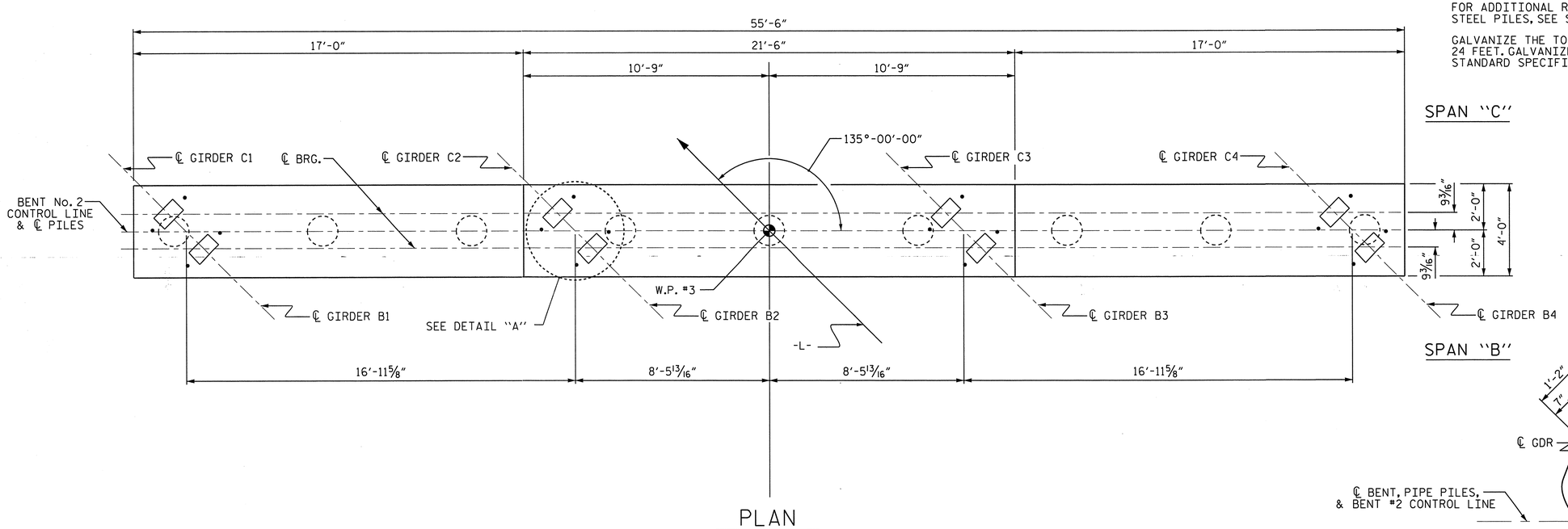
NOTES

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

★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 16 x 0.50 GALVANIZED STEEL PILES, SEE SHEET 4 OF 4.

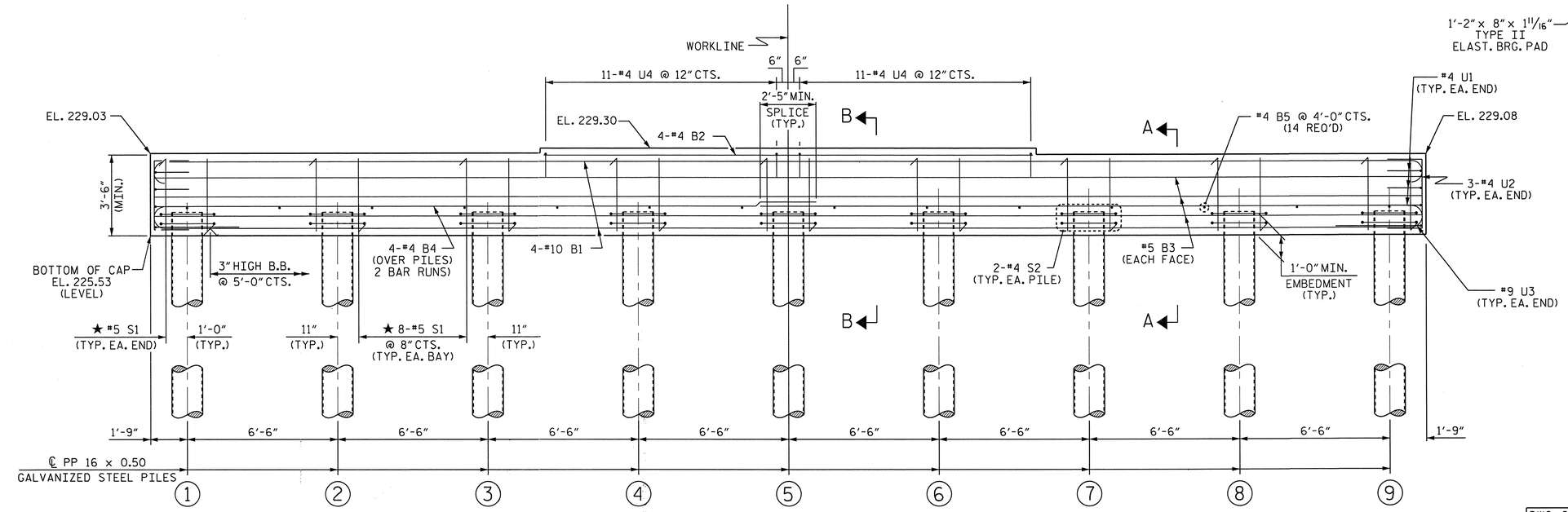
GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 24 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



SPAN "C"

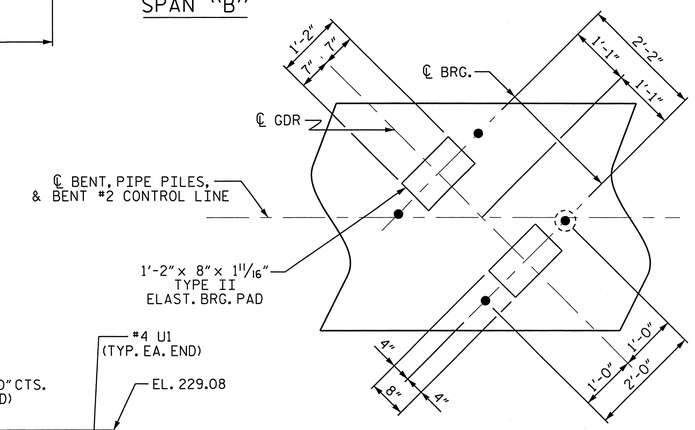
SPAN "B"

PLAN



ELEVATION

FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 4



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH GIRDER)
(PIPE PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

DWG 28 OF 33

REVISIONS						SHEET NO.
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2			4			33

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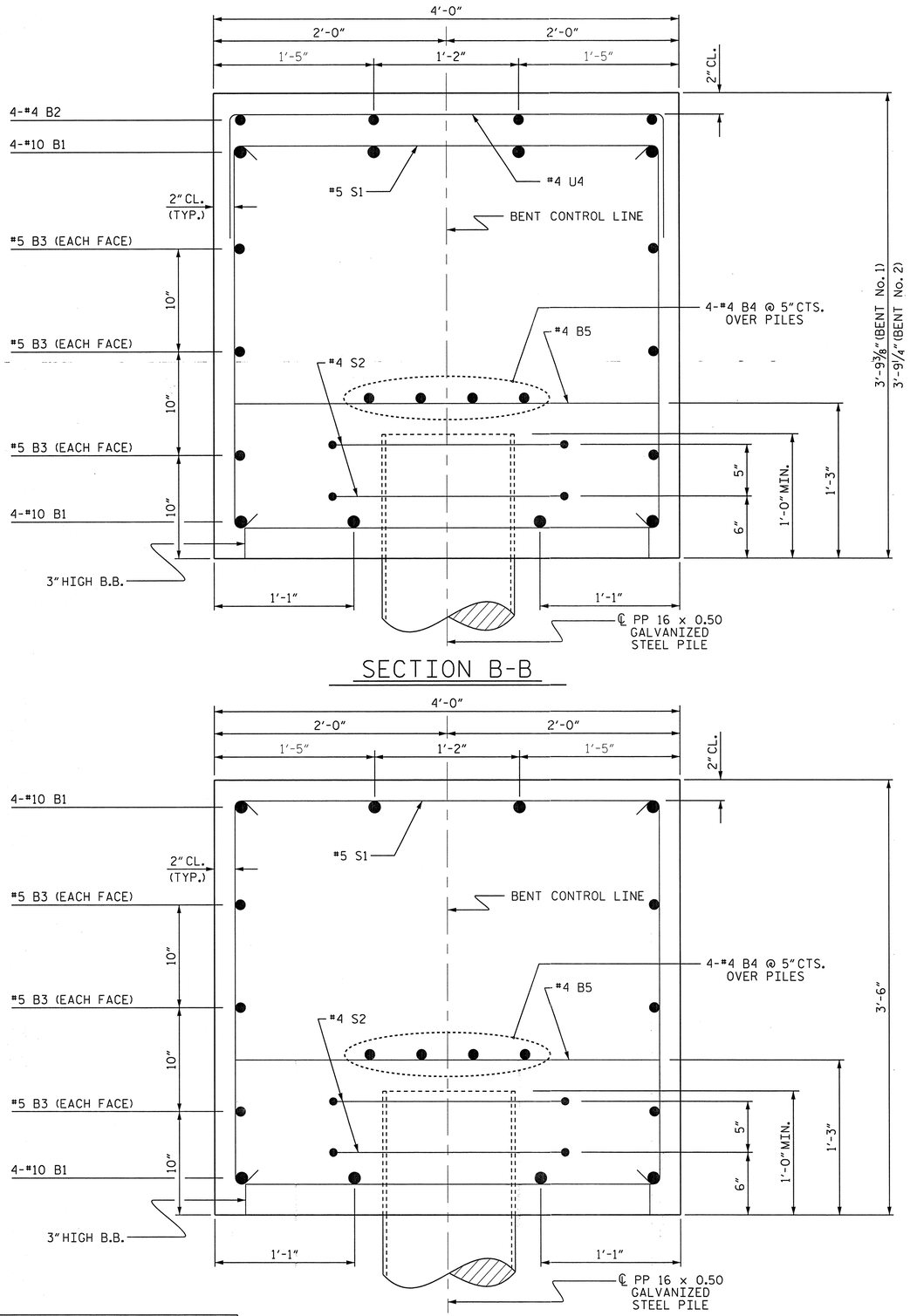
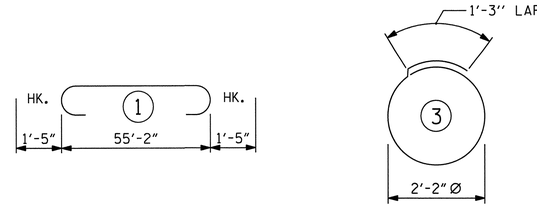


SECTION B-B

SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	58'-0"	1997
B2	4	#4	STR	21'-2"	57
B3	6	#5	STR	55'-2"	345
B4	8	#4	STR	28'-10"	154
B5	14	#4	STR	3'-8"	34
S1	66	#5	2	10'-10"	746
S2	18	#4	3	8'-1"	97
U1	6	#4	4	6'-6"	26
U2	6	#4	4	6'-0"	24
U3	2	#9	4	10'-10"	74
U4	22	#4	4	6'-8"	98

REINFORCING STEEL (FOR ONE BENT) 3652 LBS.

CLASS A CONCRETE BREAKDOWN

BENT No. 1 ▲ 29.4 C.Y.

BENT No. 2 ▲ 29.3 C.Y.

PP 16 x 0.50 GALVANIZED STEEL PILES (FOR ONE BENT)

No. 9 LIN. FT. 585

PIPE PILE PLATES No. = 9

▲ CONCRETE DISPLACED BY THE PP 16 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

END OF CAP VIEW

(TYPICAL BOTH ENDS)

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

BENTS No. 1 AND 2

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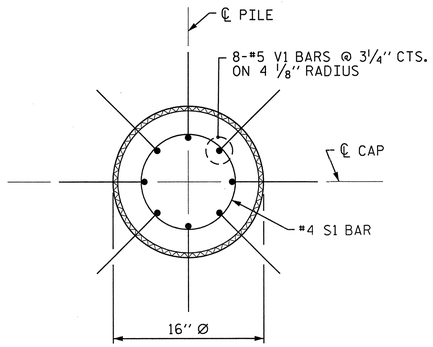
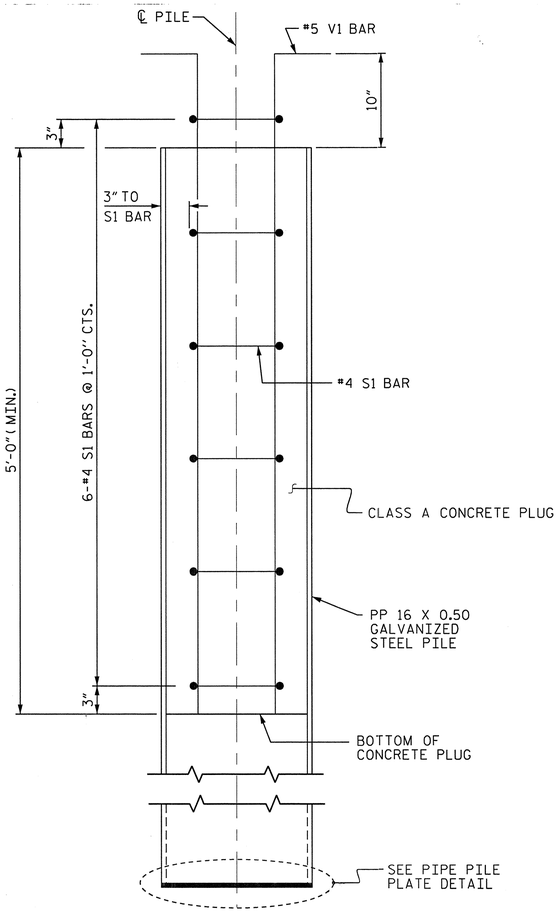


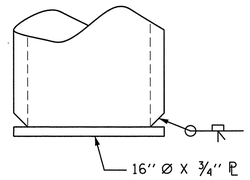
PLAN



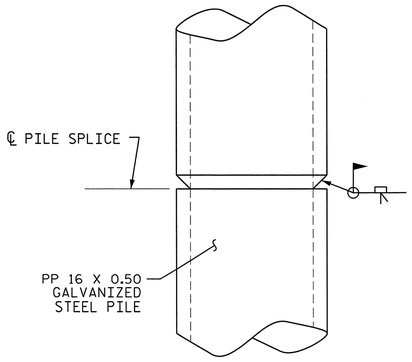
ELEVATION

PP 16 X 0.50 GALVANIZED STEEL PILE

(CLOSED END)



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 16 X 0.50 GALVANIZED STEEL PILES.

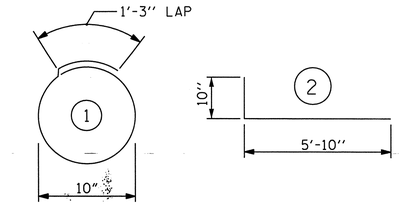
BILL OF MATERIAL FOR ONE PP 16 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	3'-11"	16
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =					72 lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG 0.2 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 4 OF 4

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RALEIGH

STANDARD

16" STEEL PIPE PILE

DWG 30 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	P. JACOB	DATE :	05/13
CHECKED BY :	D. RUGGLES	DATE :	05/13
DRAWN BY : TLA	8/05	ADDED 10/1/05	
CHECKED BY : GM	9/05	REV. 5/1/06R	MAA/KMM
		REV. 10/1/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES
10-01-13

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STD. NO. SPP2

9/30/2013
...\DGN\30-SteelPipe Pile.dgn
USER:jabrll

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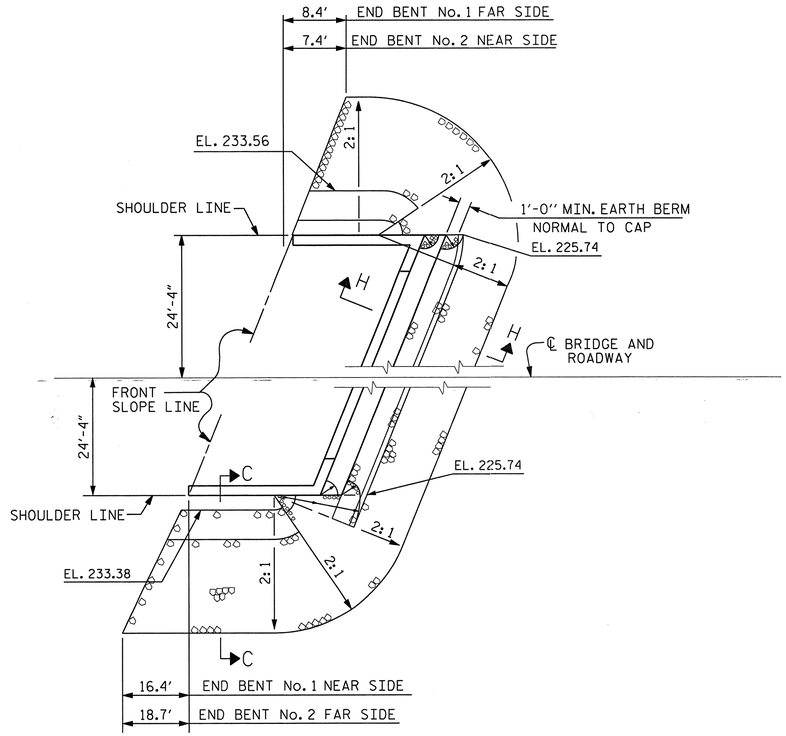


SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

AN ADDITIIONAL 30 TONS OF CLASS II RIP RAP SHALL BE PLACED BETWEEN THE BENT NO. 1 CONTROL LINE AND THE CHANNEL BANK. SEE GENERAL DRAWING FOR DETAILS.

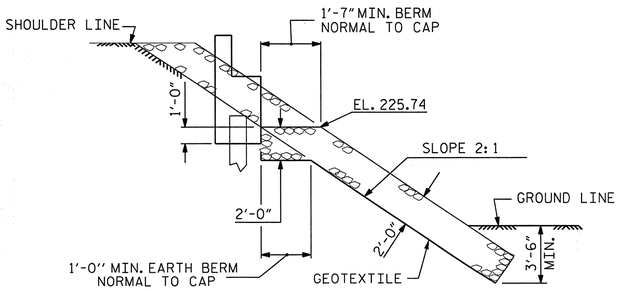
▲ EB No. 1 NEAR SIDE, EB No. 2 FAR SIDE

◩ EB No. 1 FAR SIDE, EB No. 2 NEAR SIDE

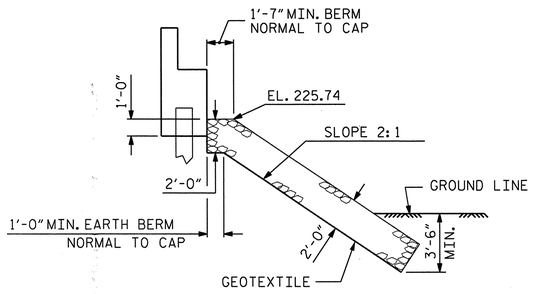
ESTIMATED QUANTITIES

BRIDGE @ STA. 16+14.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	117.5	163.2
BENT 1	30.0	42.0
END BENT 2	120.0	166.7

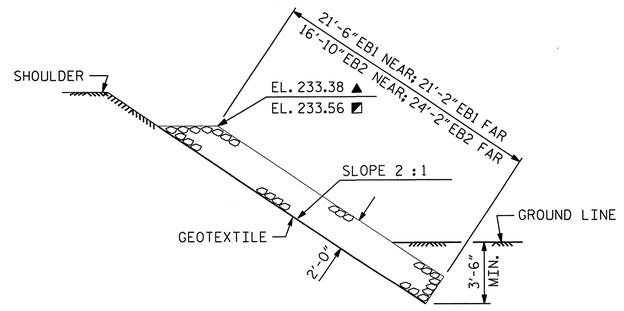
NOTE: AN ADDITIIONAL 30 TONS OF CLASS II RIP RAP SHALL BE PLACED BETWEEN THE BENT NO. 1 CONTROL LINE AND THE CHANNEL BANK. SEE GENERAL DRAWING FOR DETAILS.



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

DWG 31 OF 33

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

10-01-13

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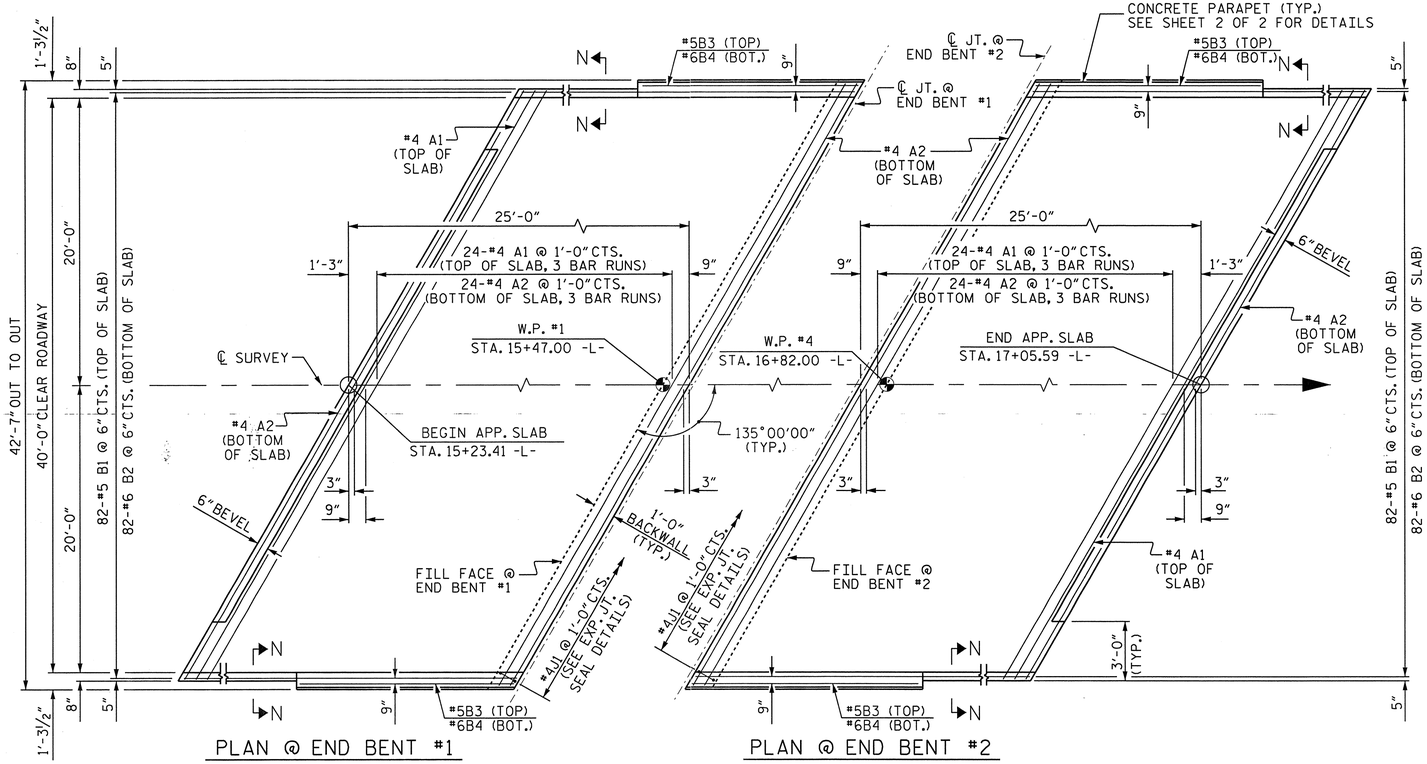
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	P. JACOB	DATE :	06/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
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

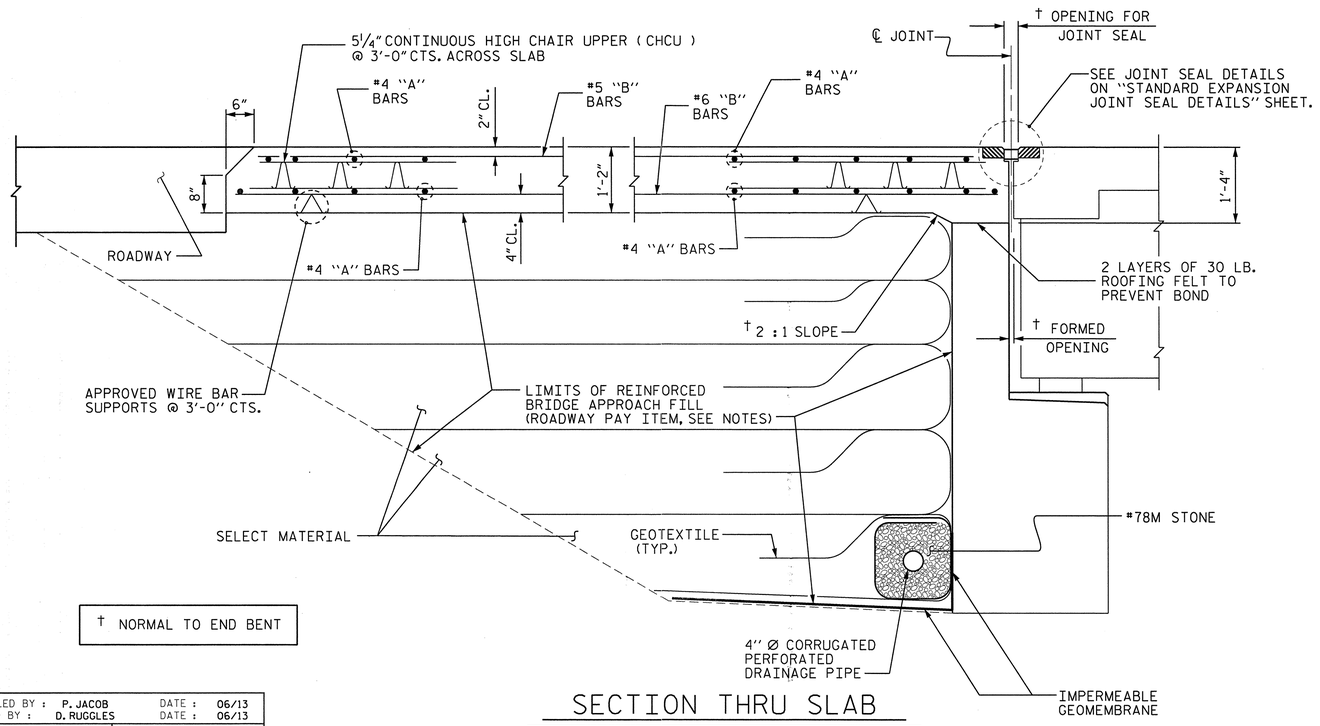
STD. NO. RR1 (Sht 3)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

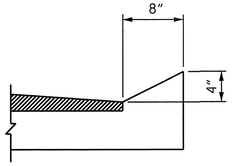
NOTES

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

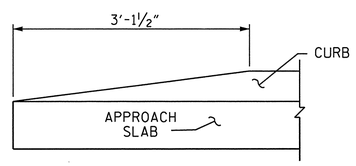
FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

FOR PARAPET AND END POST DETAILS, SEE DWG. 15.



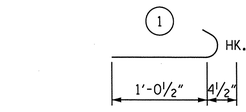
SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	75	#4	STR	21'-3"	1065
A2	78	#4	STR	21'-1"	1099
✱B1	82	#5	STR	23'-5"	2003
B2	82	#6	STR	24'-6"	3018
✱B3	2	#5	STR	9'-4"	19
B4	2	#6	STR	9'-4"	28
✱J1	56	#4	1	1'-5"	53
REINFORCING STEEL				LBS.	4145
✱EPOXY COATED REINFORCING STEEL				LBS.	3140
CLASS AA CONCRETE				C. Y.	45.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	75	#4	STR	21'-3"	1065
A2	78	#4	STR	21'-1"	1099
✱B1	82	#5	STR	23'-5"	2003
B2	82	#6	STR	24'-6"	3018
✱B3	2	#5	STR	9'-4"	19
B4	2	#6	STR	9'-4"	28
✱J1	56	#4	1	1'-5"	53
REINFORCING STEEL				LBS.	4145
✱EPOXY COATED REINFORCING STEEL				LBS.	3140
CLASS AA CONCRETE				C. Y.	45.9

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

DWG 32 OF 33

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	P. JACOB	DATE :	06/13
CHECKED BY :	D. RUGGLES	DATE :	06/13
DRAWN BY : EEM 3/95		REV. 5/1/06RR	KMM/GM
CHECKED BY : VAP 3/95		REV. 10/1/11	MAA/GM
		REV. 12/21/11	MAA/GM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES
10-01-13

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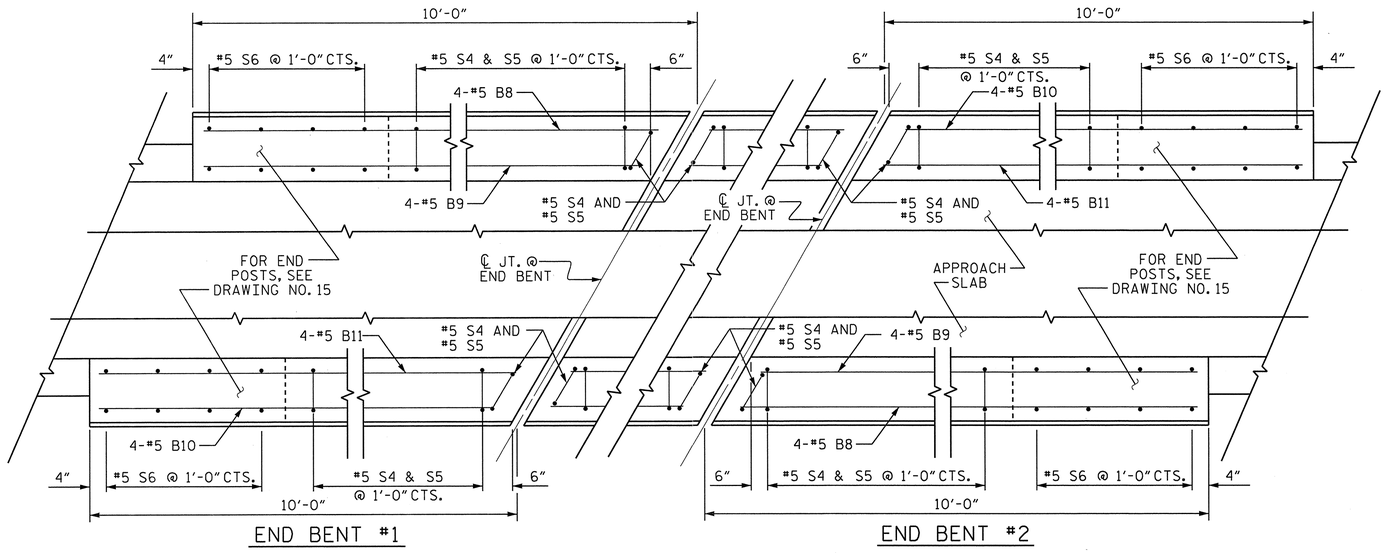


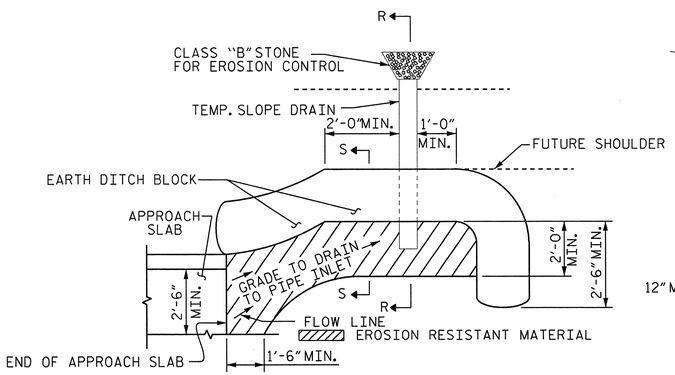
PLAN OF CONCRETE PARAPET

NOTES

THE COST OF THE TWO BAR METAL RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "TWO BAR METAL RAIL". SEE "SUPERSTRUCTURE BILL OF MATERIAL" FOR PARAPET AND END POST QUANTITIES.

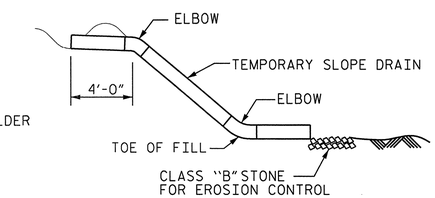
THE CONCRETE PARAPET ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

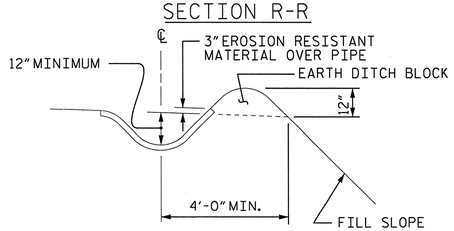


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

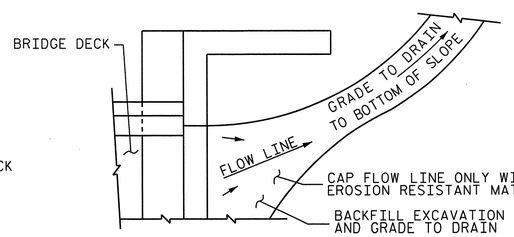
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY :	P. JACOB	DATE :	06/13
CHECKED BY :	D. RUGGLES	DATE :	06/13

DRAWN BY : FCJ	11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB	11/88	REV. 7/12	MAA/GM
		REV. 10/12	MAA/GM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES
10-01-13

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DWG 33 OF 33

PROJECT NO. B-4816

SCOTLAND COUNTY

STATION: 16+14.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

STD. NO. BAS4 (SHT 3b)

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM ω RGW REV. 5-7-03 RWW ω JTE REV. 10-1-11 MAA ω GM
REV. 8-16-99 RWW ω LES REV. 5-1-06 TLA ω GM