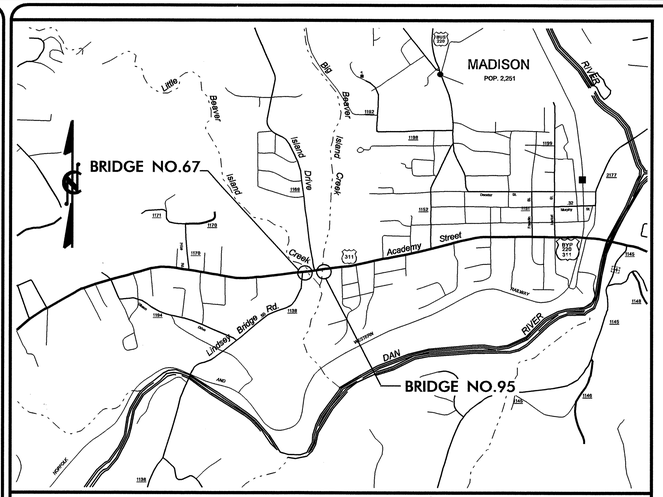
CONTRACT: C201855 TIP PROJECT: B-4252



VICINITY MAP

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

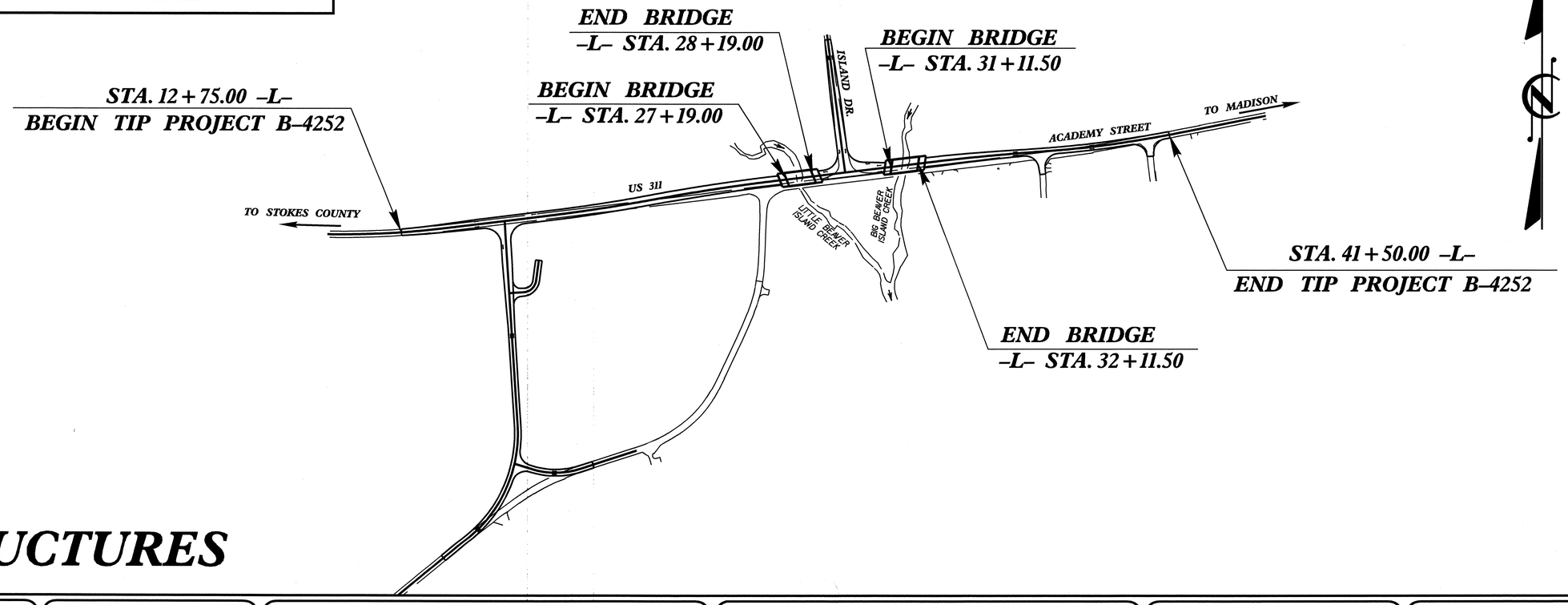
ROCKINGHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4252		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33594.1.1	BRSTP-311(14)	P.E.
33594.2.1	BRSTP-311(14)	ROW & UTILITIES
33594.3.1	BRSTP-311(22)	CONST.

LOCATION: BRIDGE NO. 95 OVER BIG BEAVER ISLAND CREEK ON US 311 AND BRIDGE NO. 67 OVER LITTLE BEAVER ISLAND CREEK ON US 311

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, & SIGNALS



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2008 = 14160
ADT 2028 = 20560
DHV = 10 %
D = 65 %
T = 3 % *
V = 50 MPH

* TTST 1 % DUAL 2 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4252 = 0.507 MI.

LENGTH STRUCTURE TIP PROJECT B-4252 = 0.038 MI.

TOTAL LENGTH TIP PROJECT B-4252 = 0.545 MI.

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 15, 2007

LETTING DATE :
August 19, 2008

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

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

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

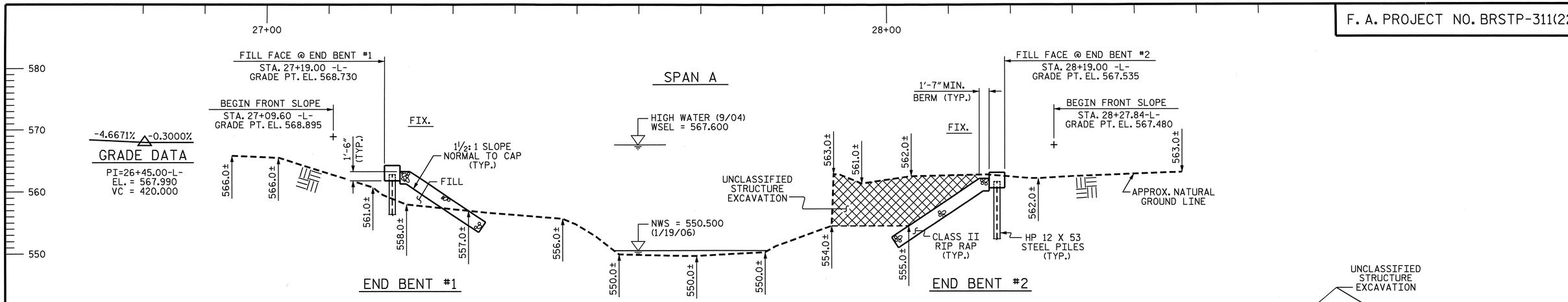
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

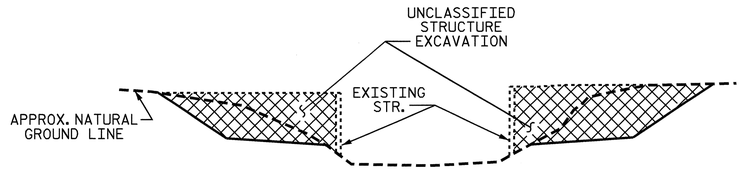
APPROVED
DIVISION ADMINISTRATOR DATE

F. A. PROJECT NO. BRSTP-311(22)



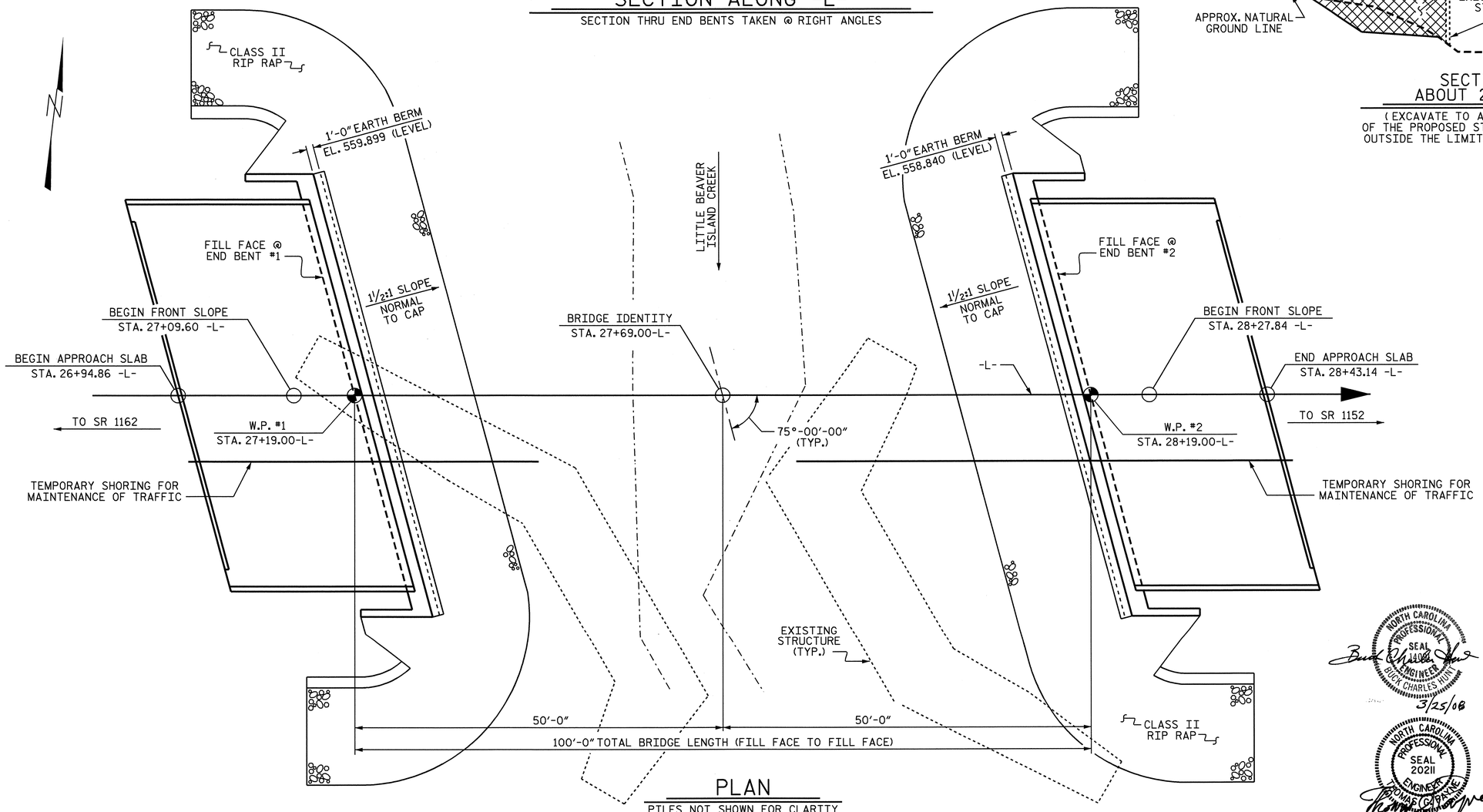
SECTION ALONG -L-

SECTION THRU END BENTS TAKEN @ RIGHT ANGLES



SECTION OF CREEK ABOUT 25' RIGHT OF -L-

(EXCAVATE TO A 1 1/2 : 1 SLOPE IN THE AREA OF THE PROPOSED STRUCTURE AND TO NATURAL GROUND OUTSIDE THE LIMITS OF THE PROPOSED STRUCTURE.)



PLAN

PILES NOT SHOWN FOR CLARITY

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00-L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 67

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER LITTLE BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER BUCK CHARLES HUNT
3/25/08

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			70

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

25-MAR-2008 10:53
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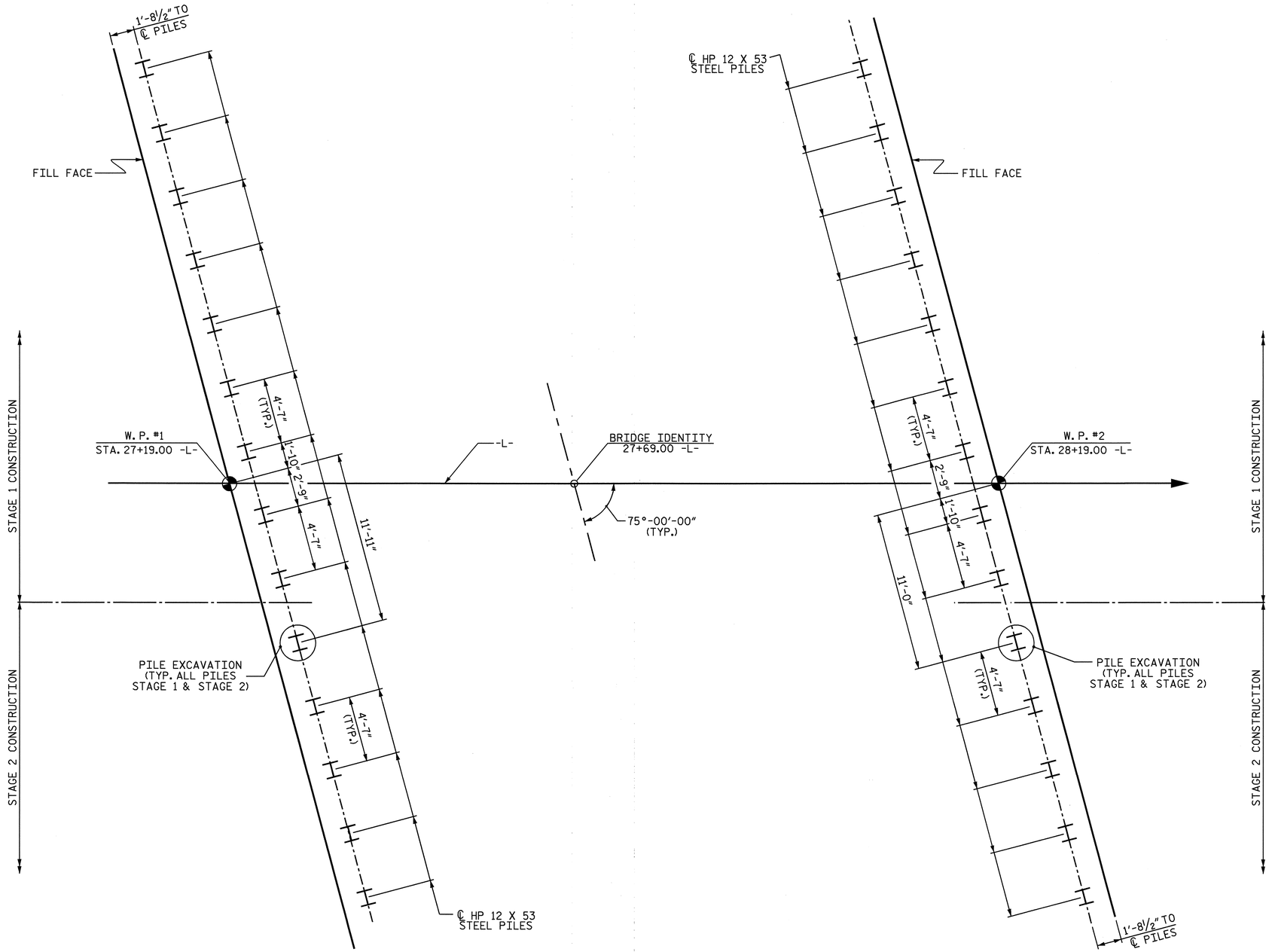
tpayne

STR. #1



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

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

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

DRIVE PILES AT END BENT #1 AND END BENT #2 TO A TIP ELEVATION NO HIGHER THAN 545.000.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT #1 AND END BENT #2. EXCAVATE HOLES TO ELEVATION 545.000. SEE PILE EXCAVATION FOR INTEGRAL ABUTMENT SPECIAL PROVISION.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS D. LAYNE
6/4/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER LITTLE BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			70

STR. #1

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

29-MAY-2008 13:26
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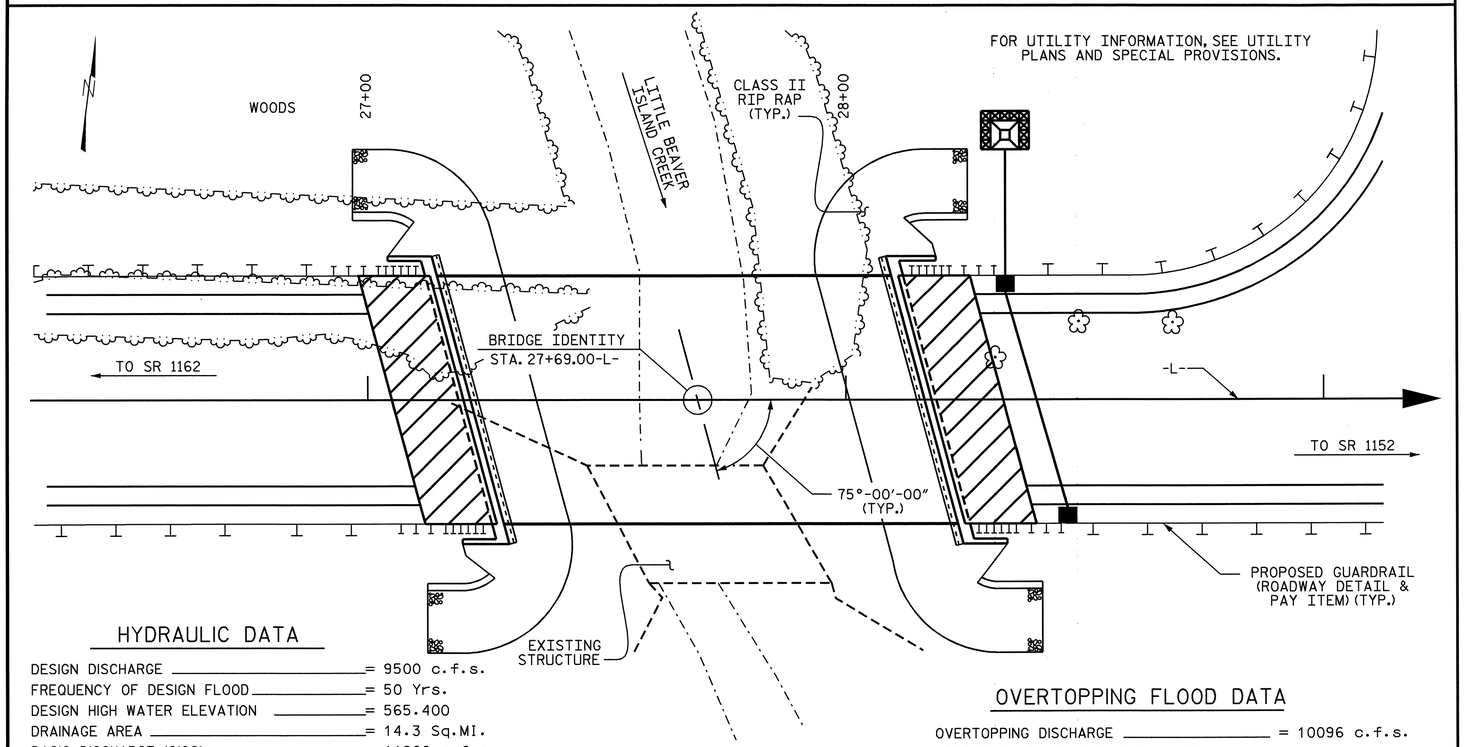
klayne

BM#3 R/R SPIKE SET IN BASE OF 28" WALNUT 73.04 FT. LEFT OF STA. 25+85.70 -L- ELEV. 565.280



HYDRAULIC DATA

DESIGN DISCHARGE	= 9500 c.f.s.
FREQUENCY OF DESIGN FLOOD	= 50 Yrs.
DESIGN HIGH WATER ELEVATION	= 565.400
DRAINAGE AREA	= 14.3 Sq.MI.
BASIC DISCHARGE (Q100)	= 11800 c.f.s.
BASIC HIGH WATER ELEVATION	= 568.800

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 10096 c.f.s.
FREQUENCY OF OVERTOPPING FLOOD	= 50+ YRS.
OVERTOPPING FLOOD ELEVATION	= 566.900

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLE 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.

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 ARTICLE ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING STRUCTURE CONSISTS OF 9 LINES OF W21 X 62 I-BEAMS AT 3'-3" CENTERS IN ONE SPAN OF 37'-0". THE CLEAR ROADWAY WIDTH IS 25.9' AND THE DECK IS REINFORCED CONCRETE WITH AN ASPHALT WEARING SURFACE. THE SPAN IS SUPPORTED BY ABUTMENTS OF MASS CONCRETE ON PILES. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED BETWEEN -L- AND 30± FEET RIGHT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE."

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

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

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVSIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		2 BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	EVAZOTE JOINT SEALS	ELECTRICAL CONDUIT SYSTEM
	LUMP SUM	LIN. FT.	LIN. FT.	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			627	5,364	7,034				173,800			180.92	196.55			LUMP SUM	LUMP SUM
END BENT NO. 1		198	18				29.1		4,457		14	210			265	295		
END BENT NO. 2		165	35				28.4		4,389		14	210			300	335		
TOTAL	LUMP SUM	363	53	627	5,364	7,034	57.5	LUMP SUM	8,846	173,800	28	420	180.92	196.55	565	630	LUMP SUM	LUMP SUM

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

29-MAY-2008 13:26
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THOMAS D. LAYNE — NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER — 6/4/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00-L-

SHEET 3 OF 3

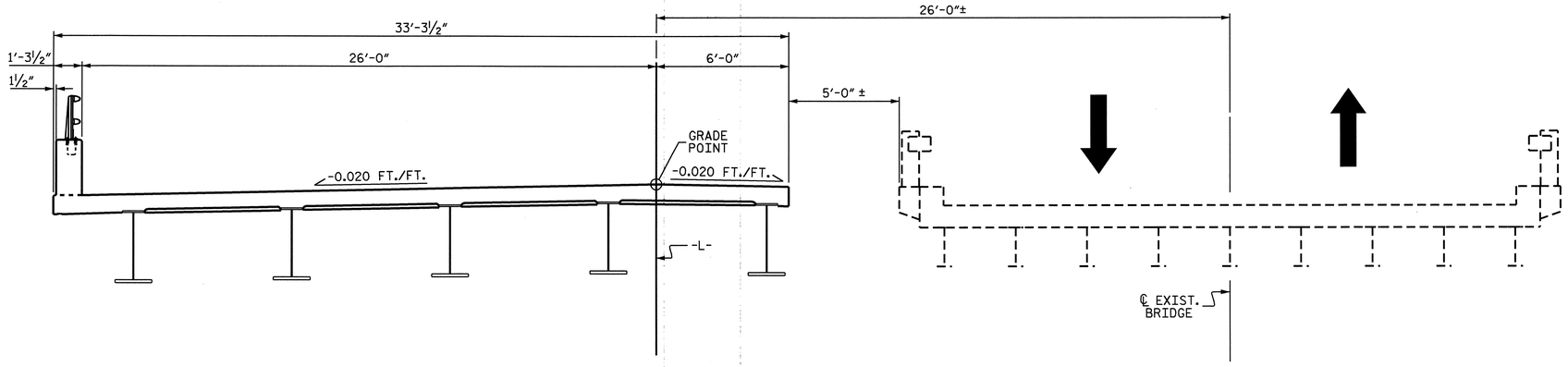
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

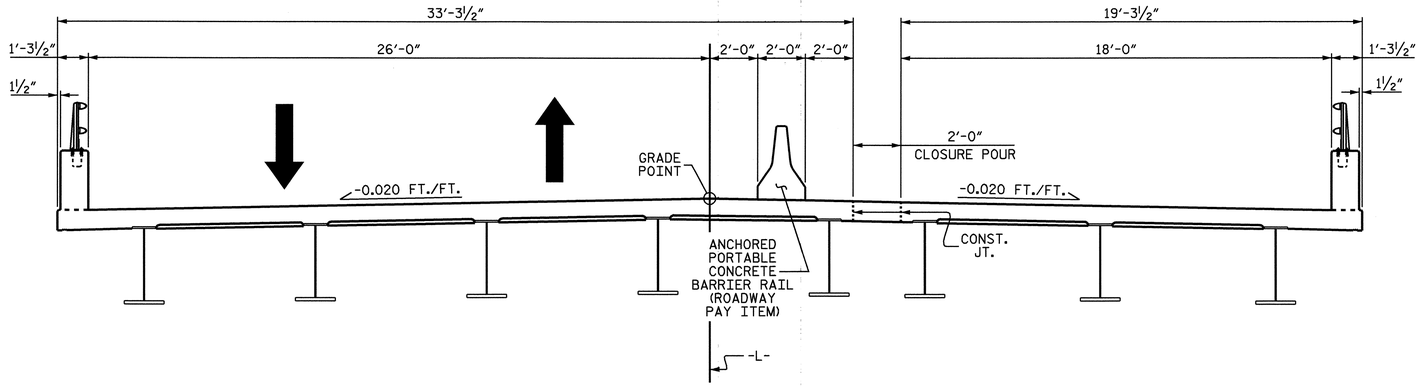
FOR BRIDGE OVER LITTLE BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS 70
2			4			

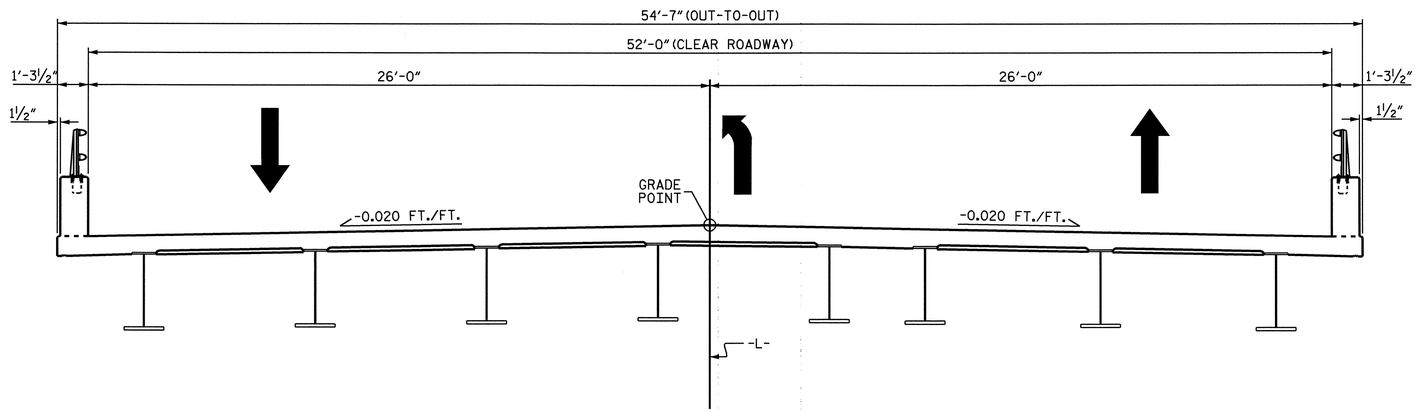
STR.#1



STAGE 1



STAGE 2



FINAL TYPICAL SECTION

NOTES

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER RAIL.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			70

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

STR. #1

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 10/07

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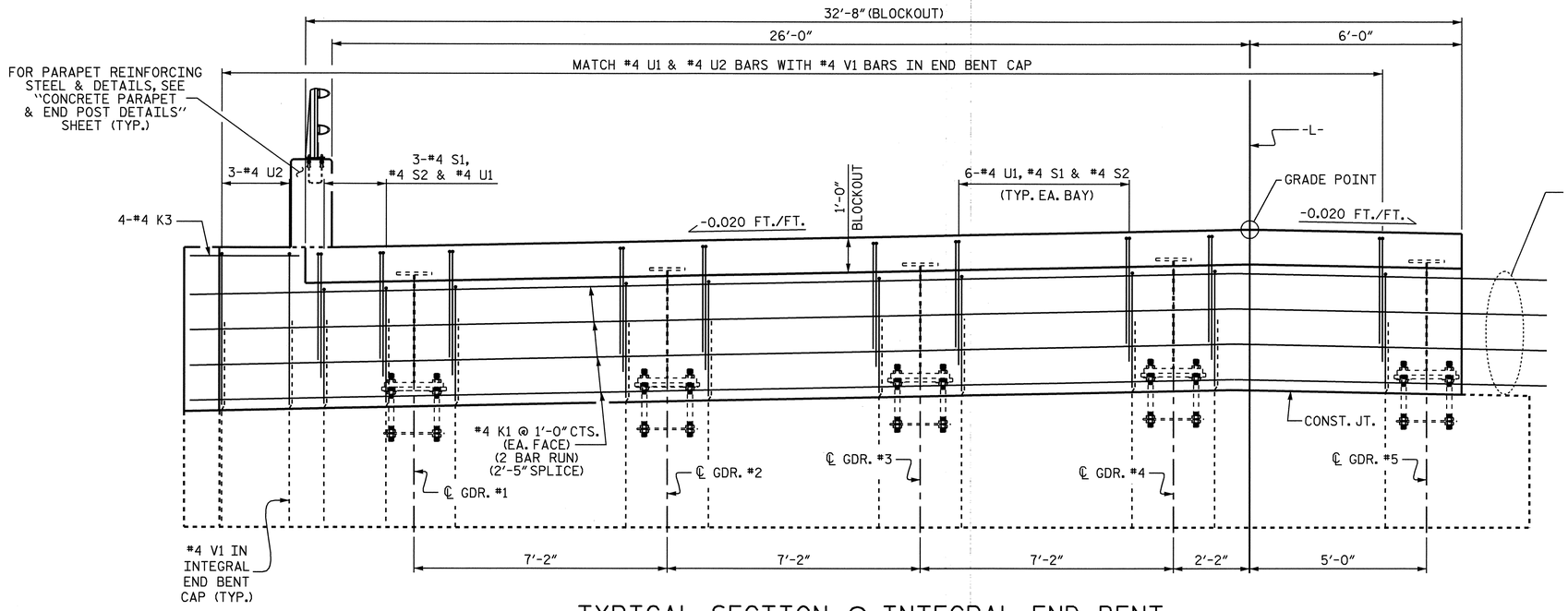
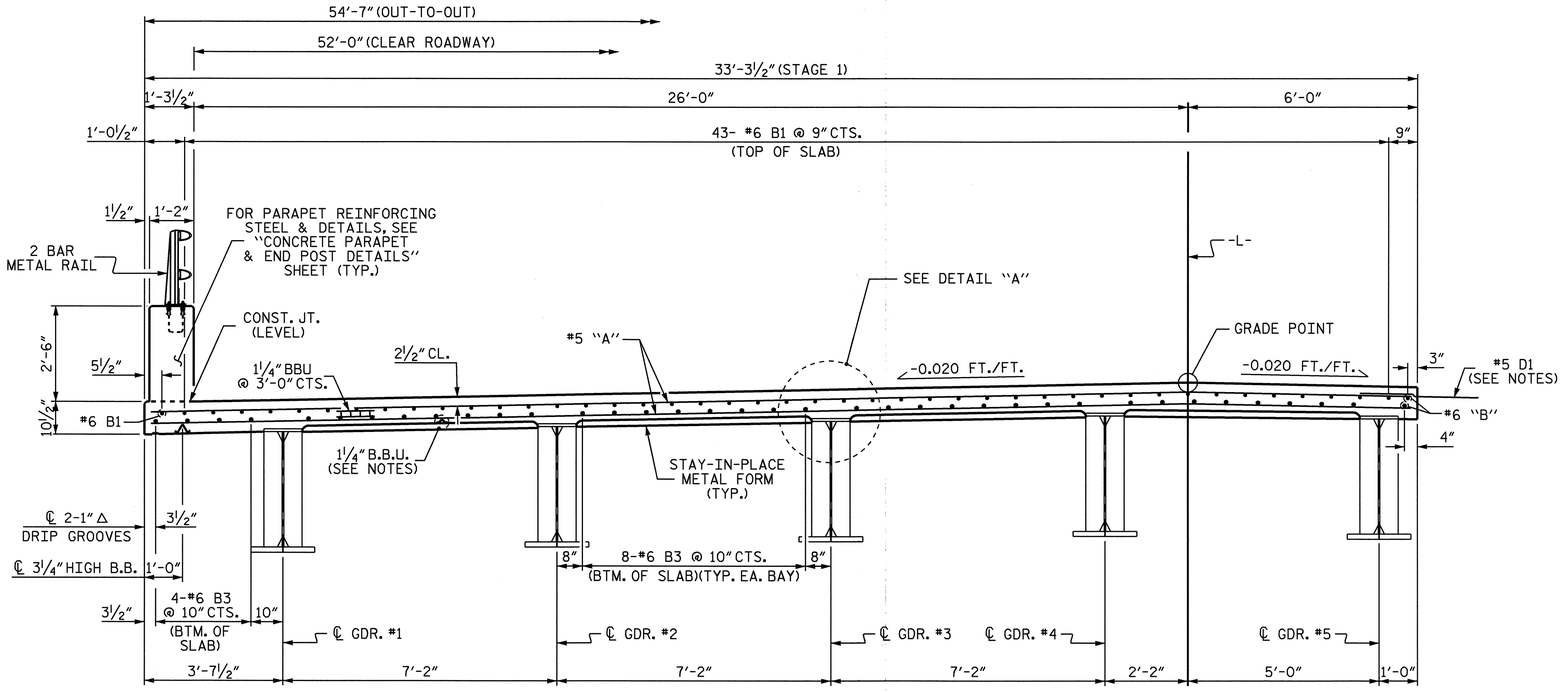


TYPICAL SECTION @ INTEGRAL END BENT

(DECK REINFORCEMENT NOT SHOWN FOR CLARITY)



TYPICAL SECTION @ INTEGRAL END BENT

(SHOWING DECK REINFORCEMENT, REINFORCEMENT IN ABUTMENT NOT SHOWN FOR CLARITY)

NOTES

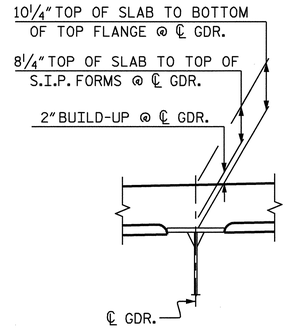
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.



DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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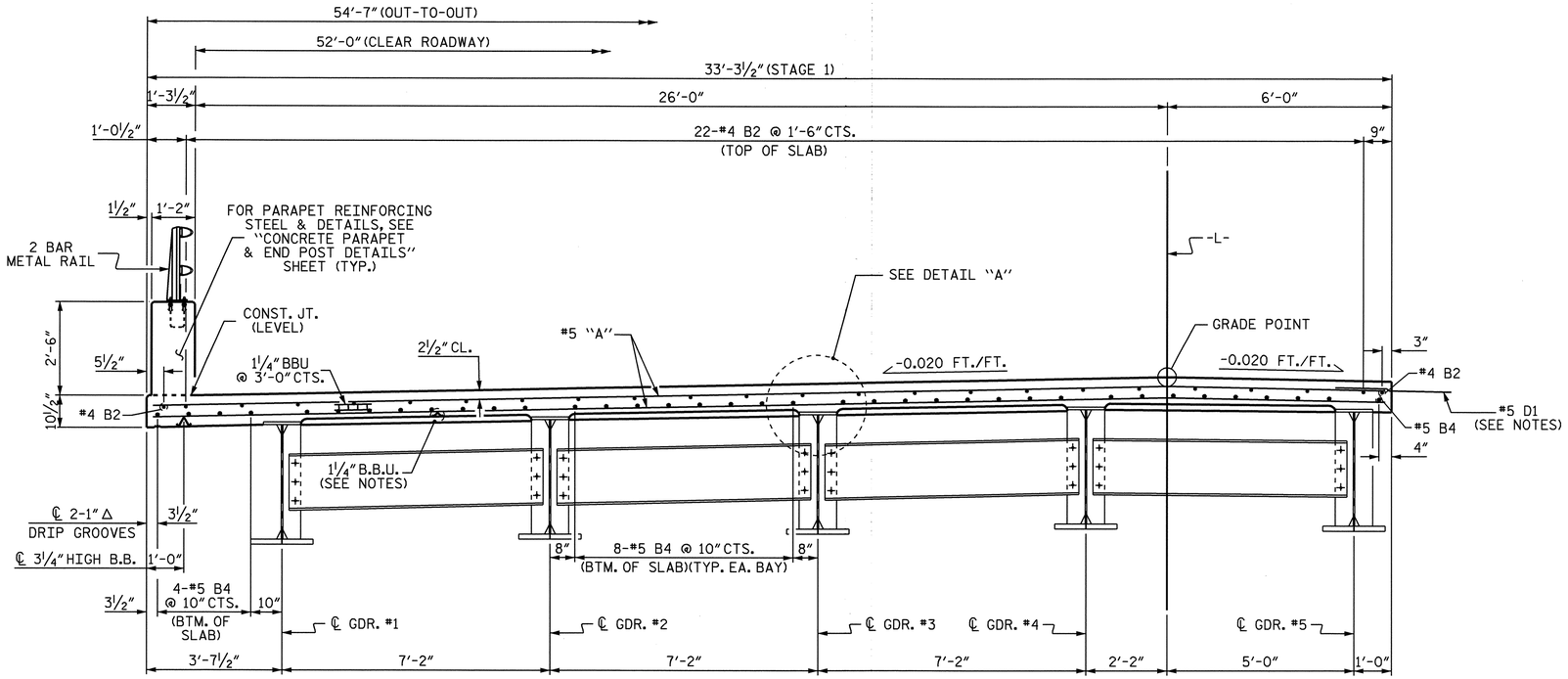
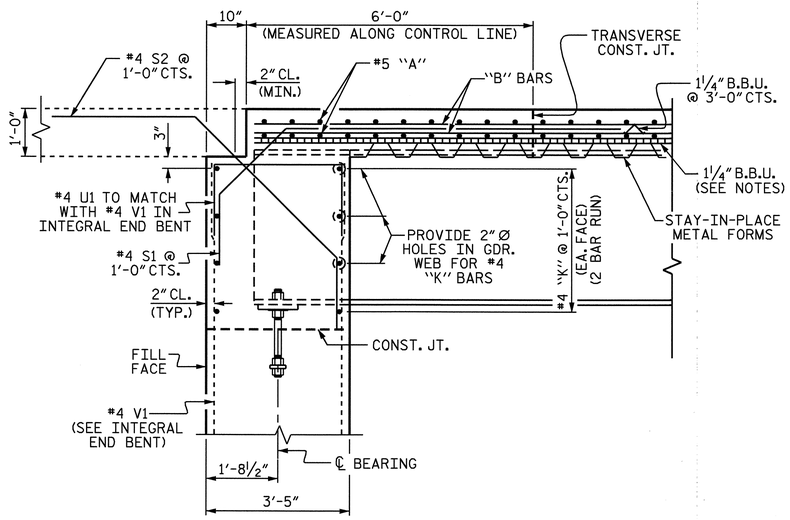
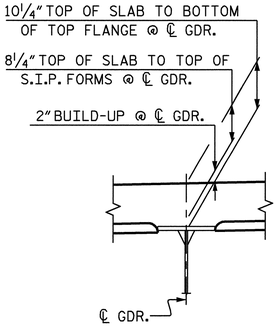
tpayne



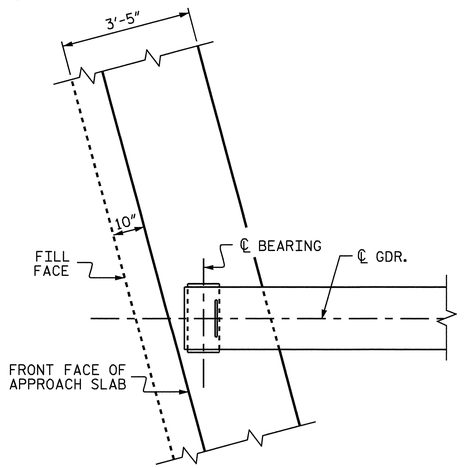
TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



SECTION THRU INTEGRAL END BENT



DETAIL "A"



PLAN OF GIRDER @ END BENT #1

END BENT #1 SHOWN, END BENT #2 SIMILAR

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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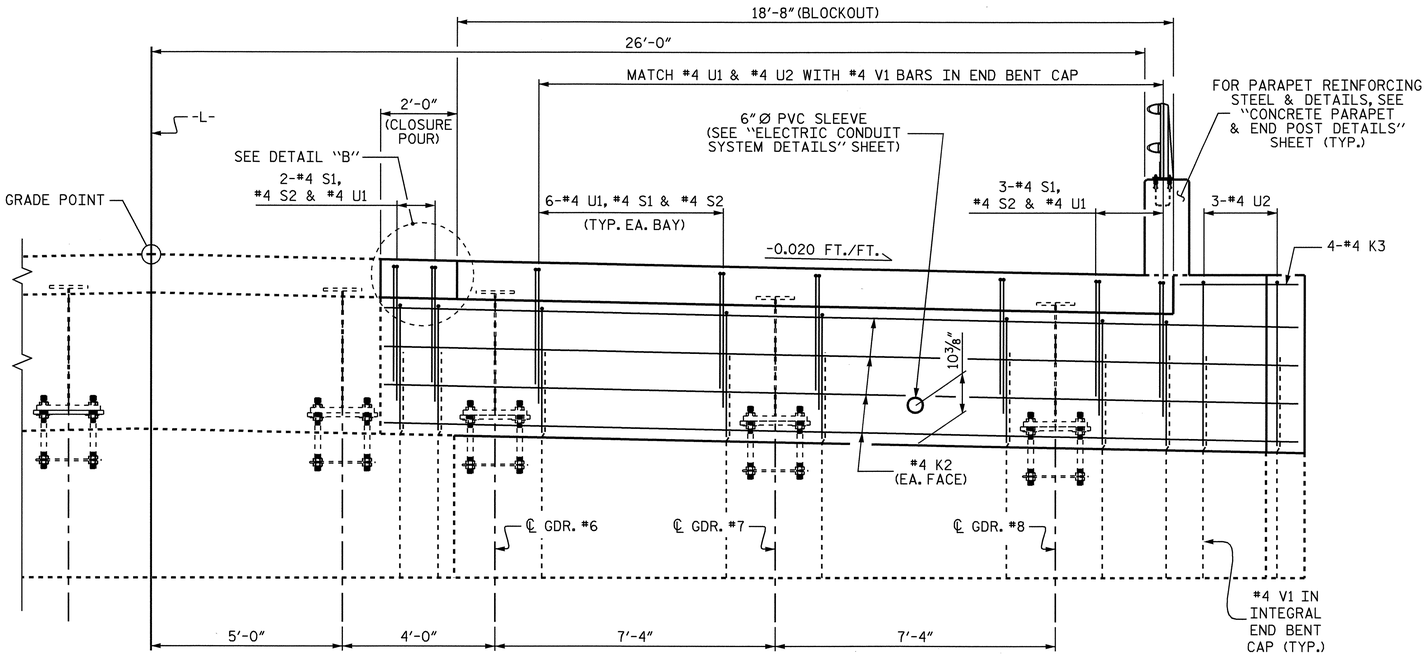
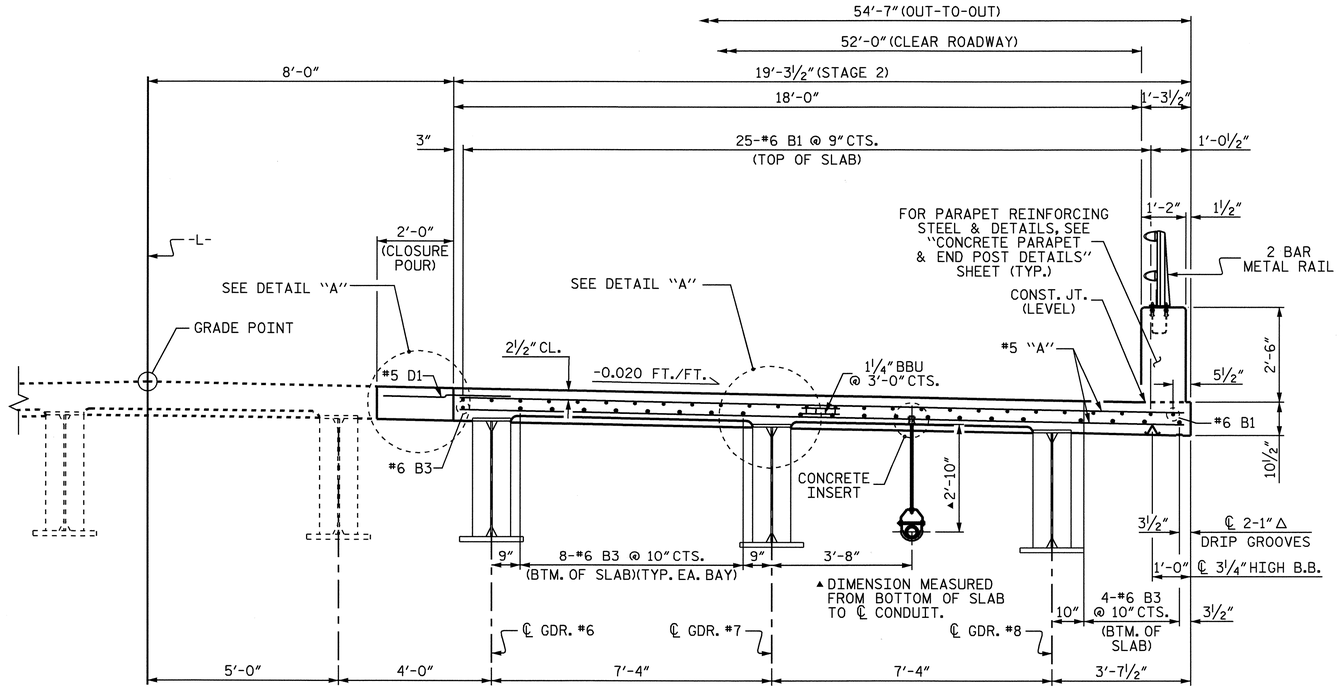


TYPICAL SECTION @ INTEGRAL END BENT

(DECK REINFORCEMENT NOT SHOWN FOR CLARITY)



TYPICAL SECTION @ INTEGRAL END BENT

(SHOWING DECK REINFORCEMENT, REINFORCEMENT IN ABUTMENT NOT SHOWN FOR CLARITY)

NOTES

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

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

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

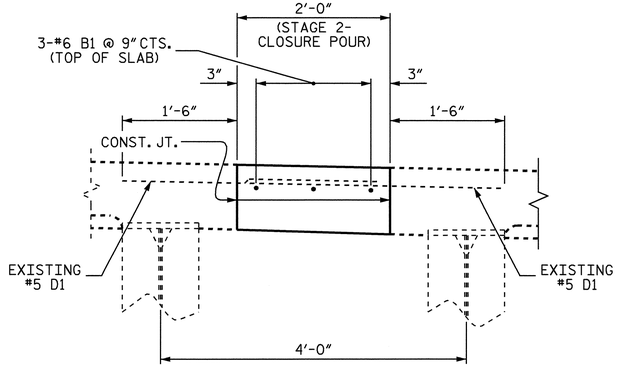
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING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

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.

FOR LOCATION AND DETAILS OF MULTI-CELL RACEWAY, HANGER ASSEMBLY, AND CONCRETE INSERTS, SEE "ELECTRICAL CONDUIT SYSTEM DETAILS" SHEET.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE ELECTRICAL CONDUIT SYSTEM THROUGH THE INTEGRAL END BENT. REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR THE CONDUIT.



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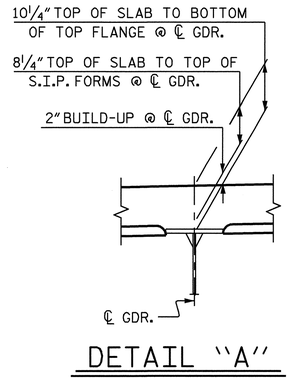

DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS J. PAYNE
6/4/08

STR. #1

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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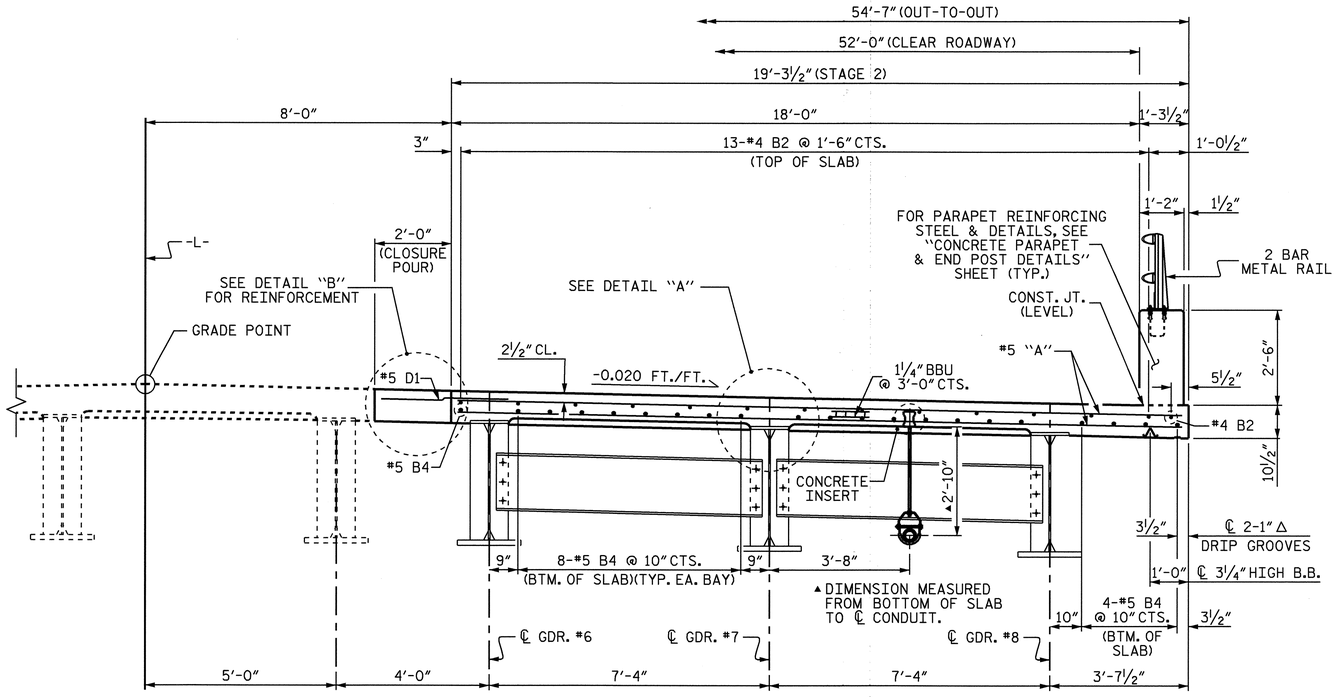
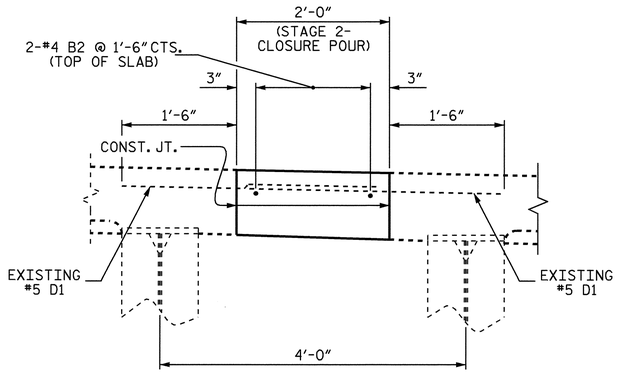
tpayne



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



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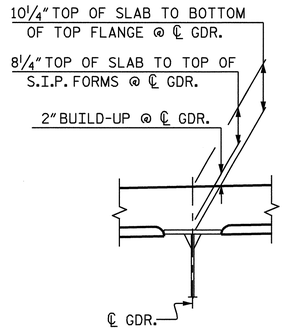

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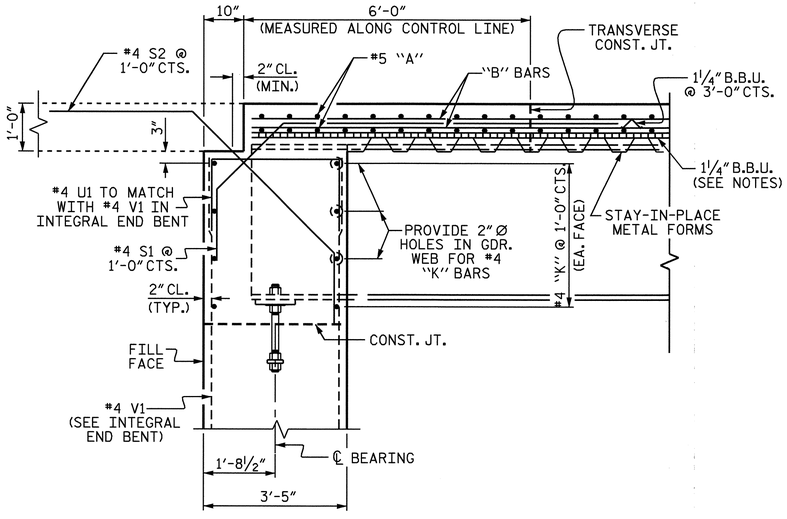
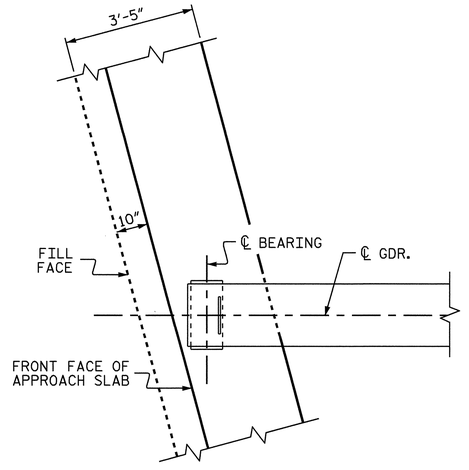


SECTION THRU INTEGRAL END BENT



PLAN OF GIRDER @ END BENT #1

END BENT #1 SHOWN, END BENT #2 SIMILAR

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/4/06

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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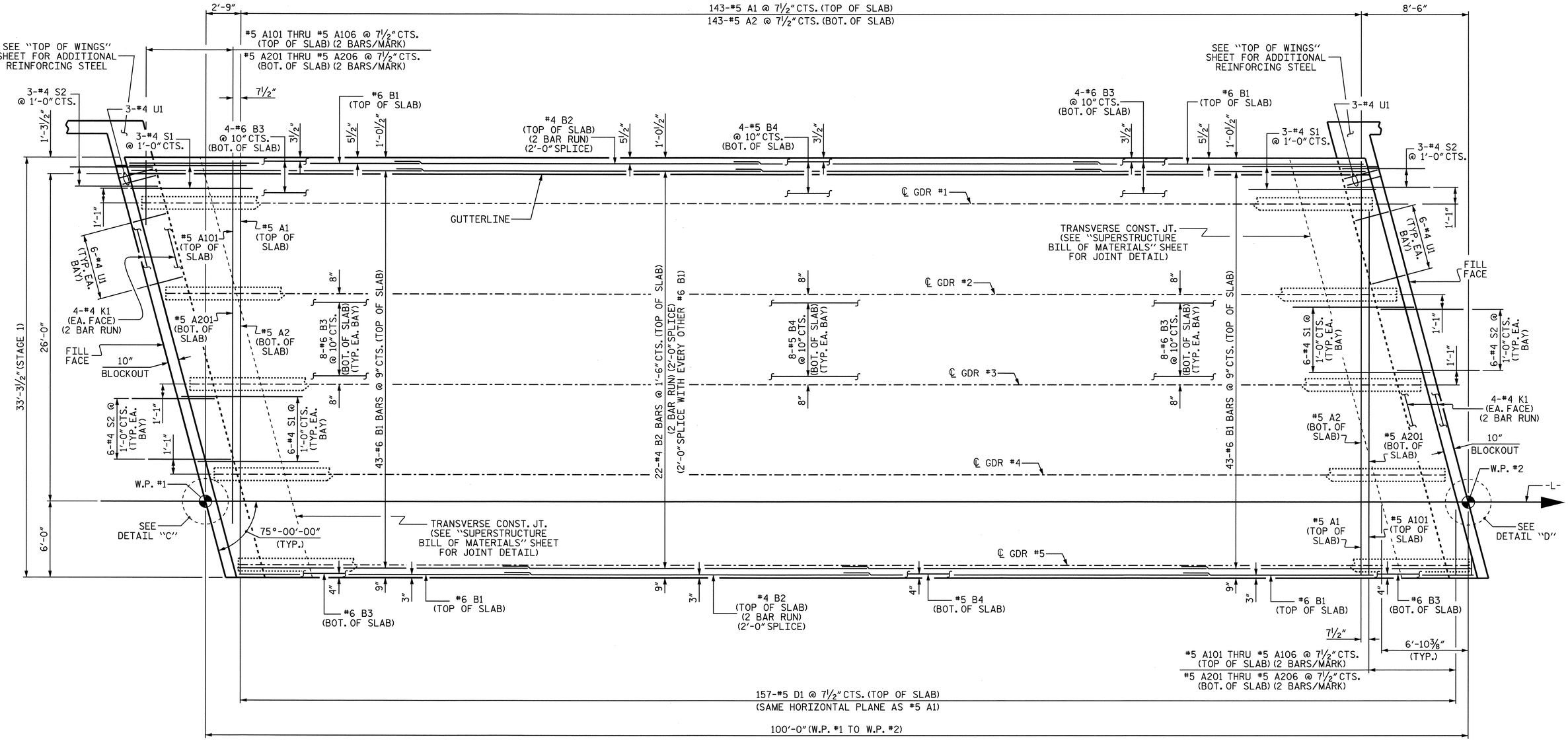
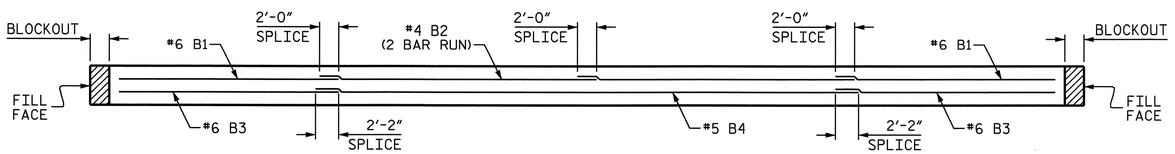
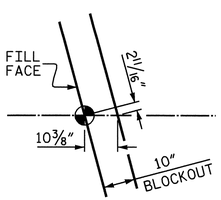
tpayne



PLAN OF SPAN



SCHEMATIC DIAGRAM OF SLAB



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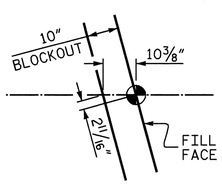

DETAIL "D"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			70

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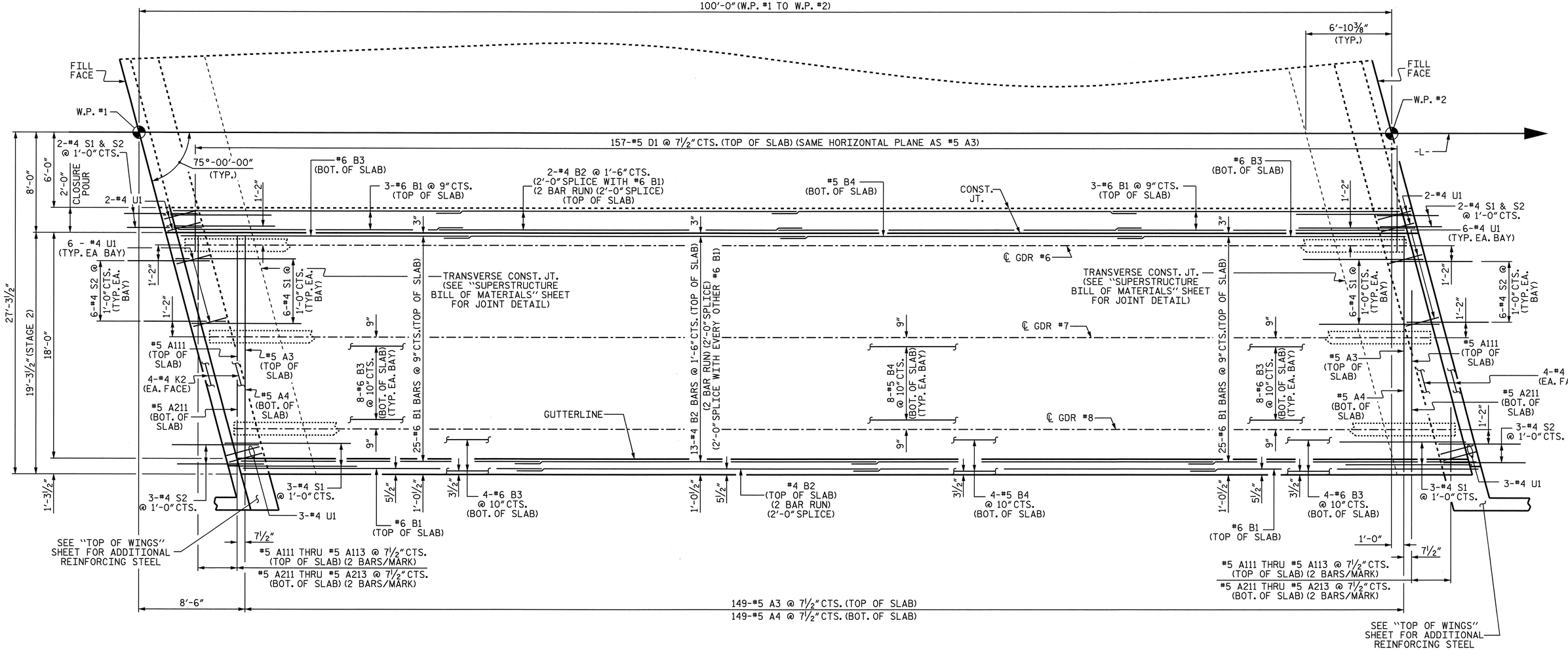

PLAN OF SPAN

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS S. PAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

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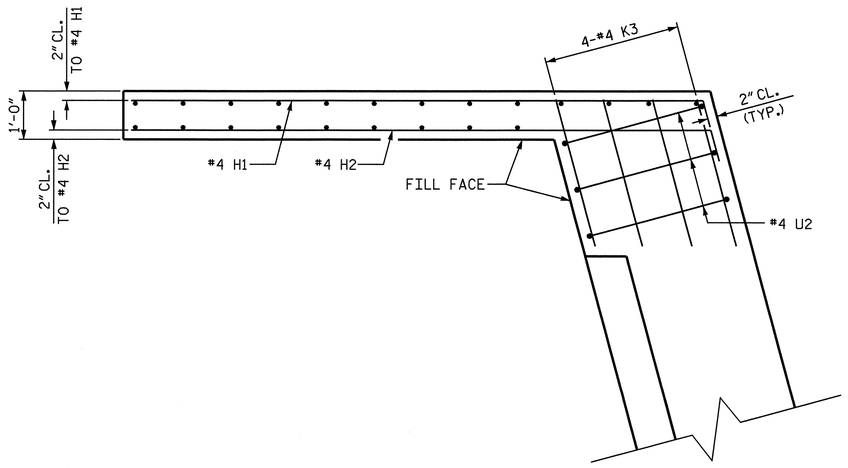
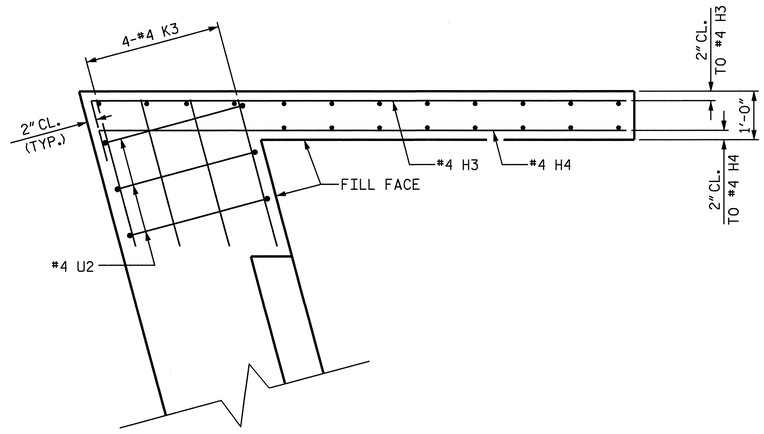
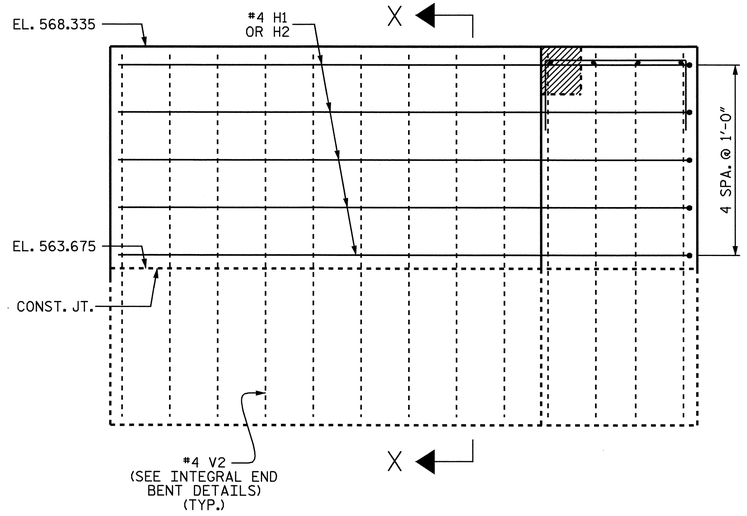
STR. #1



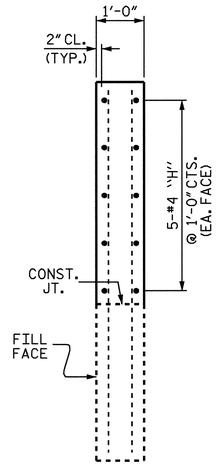
PLAN OF WING-W1
(STAGE 1)



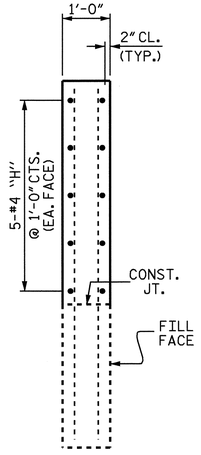
PLAN OF WING-W2
(STAGE 2)



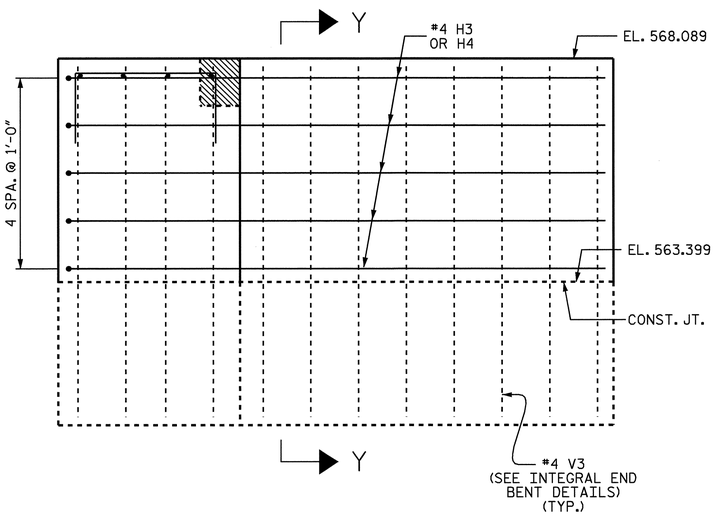
ELEVATION OF WING-W1
(STAGE 1)



SECTION X-X



SECTION Y-Y



ELEVATION OF WING-W2
(STAGE 2)

NOTE: LOWER PORTION OF WINGS BUILT WITH INTEGRAL END BENTS.

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP OF WINGS
END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS E. PAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 10/07

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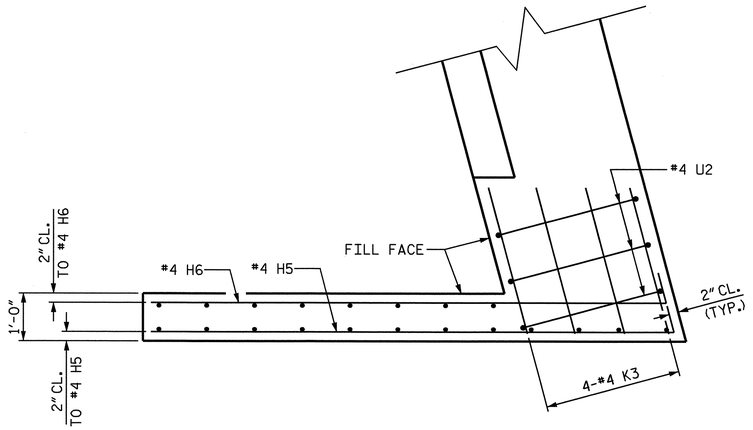
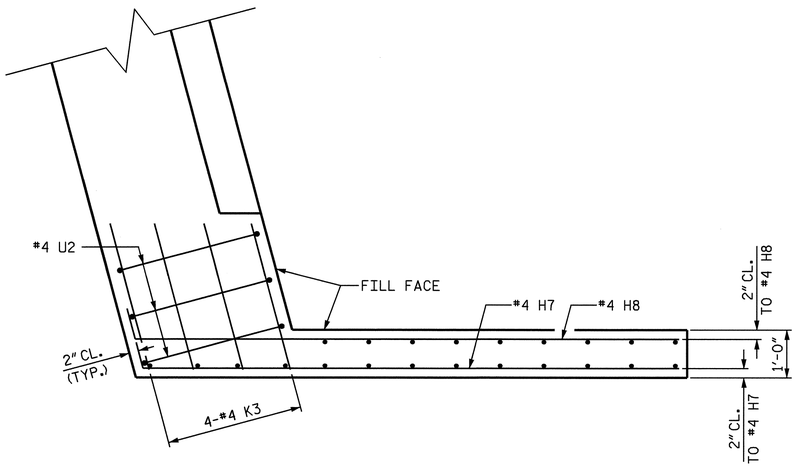
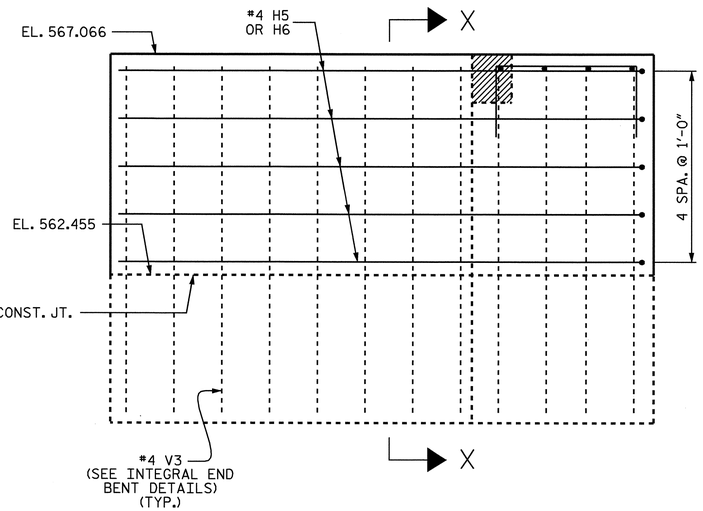


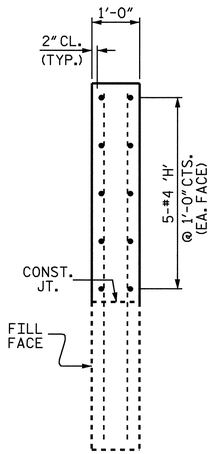
PLAN OF WING-W1
(STAGE 1)



PLAN OF WING-W2
(STAGE 2)



ELEVATION OF WING-W1
(STAGE 1)



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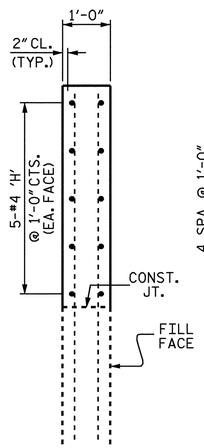
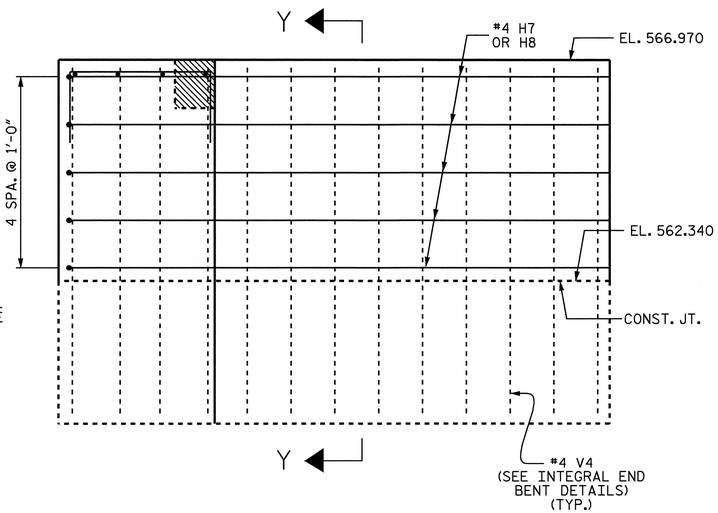


SECTION Y-Y



ELEVATION OF WING-W2
(STAGE 2)

NOTE: LOWER PORTION OF WINGS BUILT WITH INTEGRAL END BENTS.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP OF WINGS END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS J. PAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 10/07

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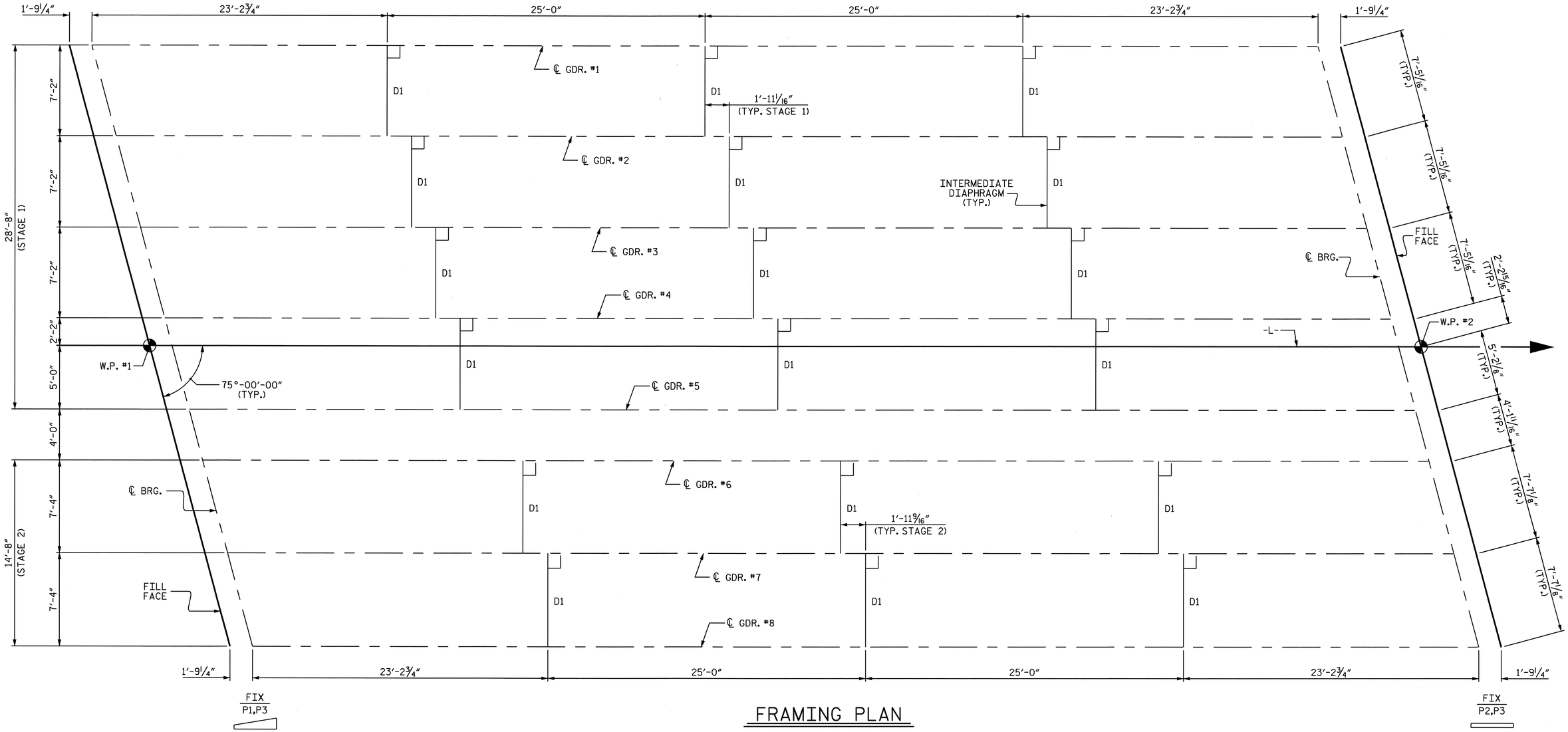
STR. #1



FRAMING PLAN

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.028	-0.052	-0.072	-0.084	-0.088	-0.084	-0.072	-0.052	-0.028	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.107	-0.200	-0.273	-0.319	-0.335	-0.319	-0.273	-0.200	-0.107	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.009	-0.018	-0.024	-0.029	-0.030	-0.029	-0.024	-0.018	-0.009	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.144	-0.270	-0.369	-0.432	-0.453	-0.432	-0.369	-0.270	-0.144	0.000
VERTICAL CURVE ORDINATE	0.000	-0.044	-0.077	-0.102	-0.116	-0.121	-0.116	-0.102	-0.077	-0.044	0.000
REQUIRED CAMBER	0"	1 3/16"	2 5/16"	3 3/16"	3 13/16"	4"	3 13/16"	3 3/16"	2 5/16"	1 3/16"	0"

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

SIGN CONVENTION FOR DEAD LOAD DEFLECTION + 0 -

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN
AND
DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. PAYNE
6/4/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			70

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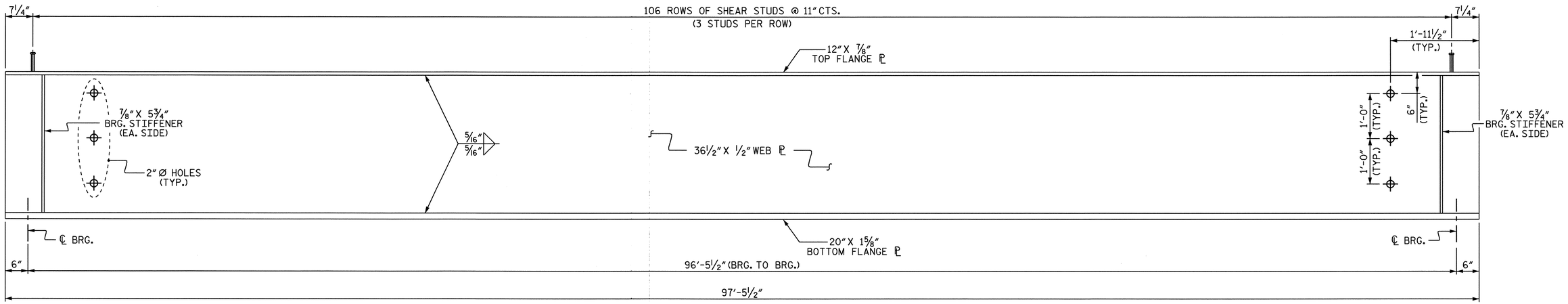
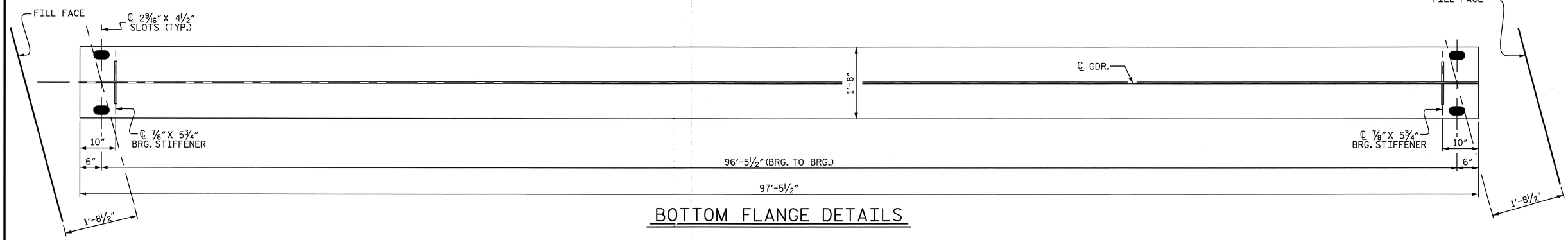
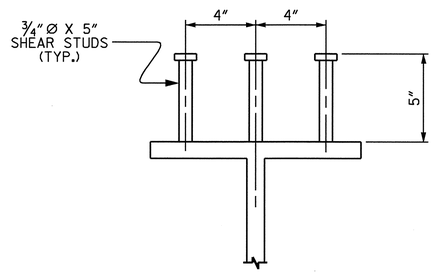


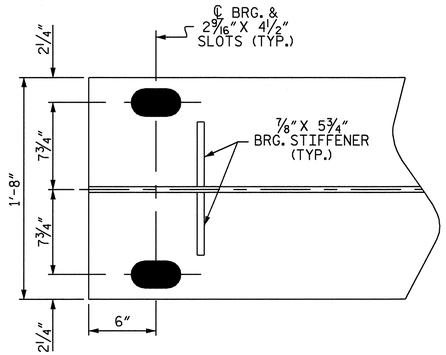
GIRDER ELEVATION



BOTTOM FLANGE DETAILS



SHEAR STUD DETAILS



PARTIAL BOTTOM FLANGE DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS S PAYNE
6/4/08

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			70

STR. #1

DRAWN BY : S. DOMBROWSKI DATE : 12/06
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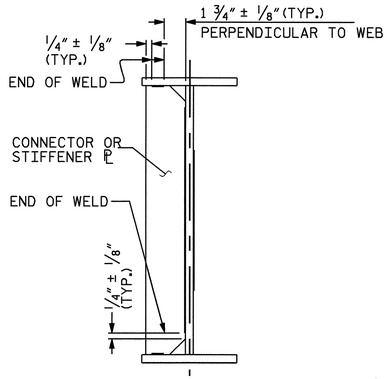
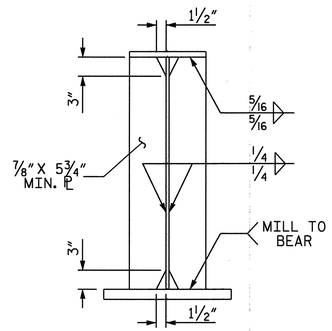


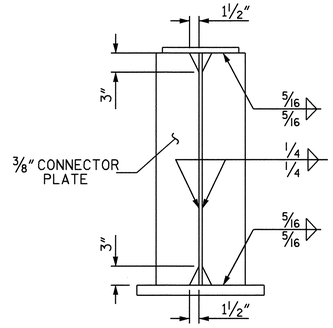
TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



BEARING STIFFENER DETAIL

(AT END BENTS)



CONNECTOR PLATE DETAIL

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

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

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

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMIITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

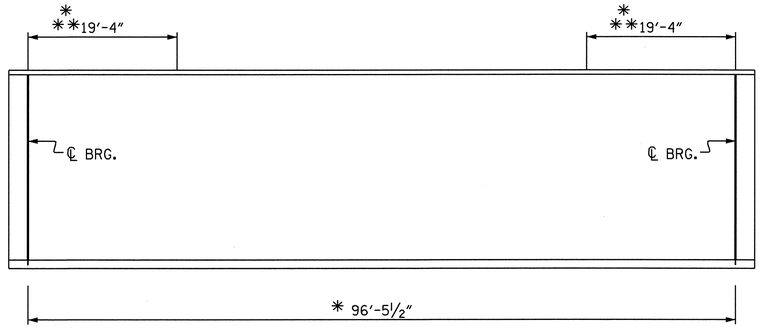
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ENDS OF GIRDERS SHALL BE PLUMB.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

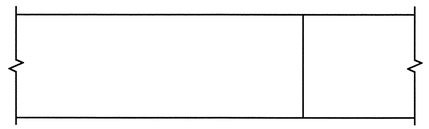
FOR "DEAD LOAD DEFLECTION TABLE FOR GIRDERS", SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET



CHARPY V-NOTCH TEST FOR GIRDERS

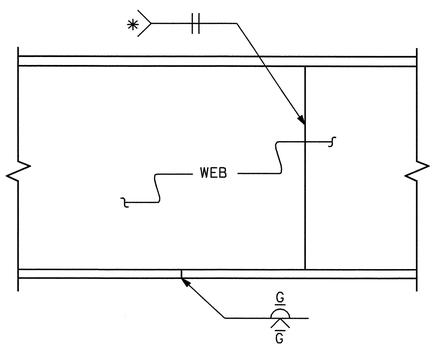
* CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

** NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



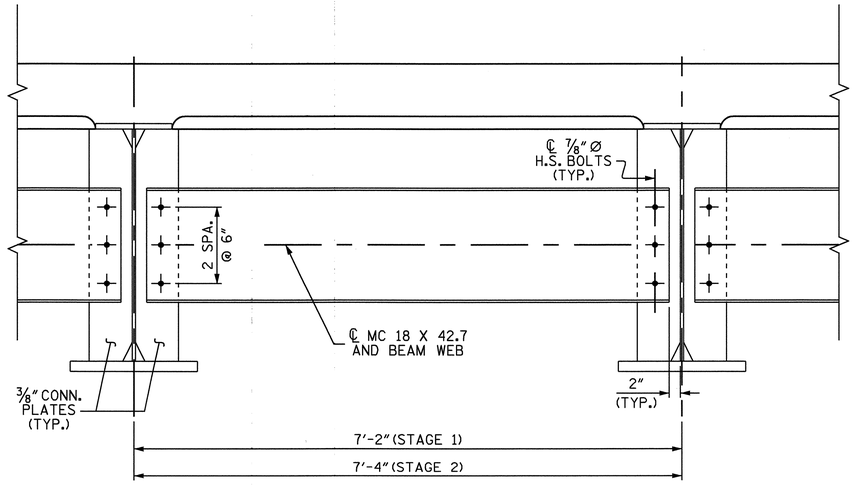
PLAN - FLANGE SPLICE

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



INTERMEDIATE DIAPHRAGM (D1)

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS A. PAYNE
6/4/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			70

STR. #1 NCBDS

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

29-MAY-2008 13:24
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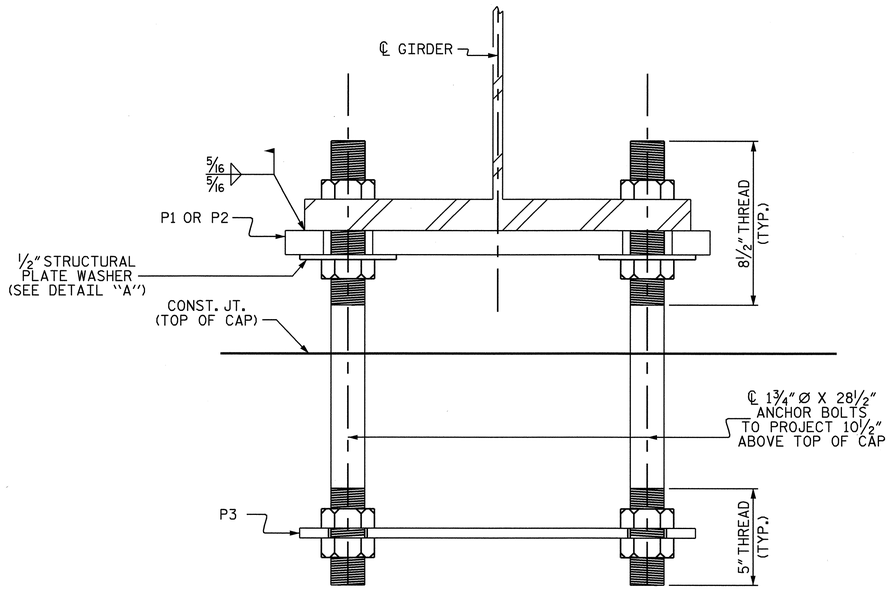
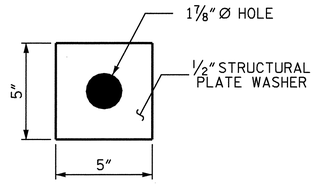


END VIEW



DETAIL "A"

NOTES

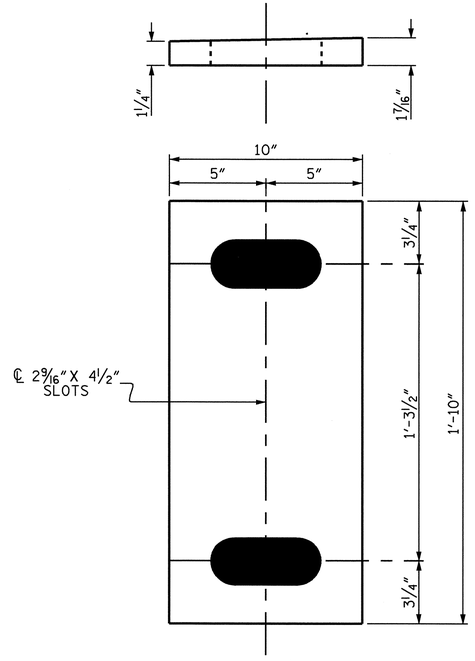
STRUCTURAL PLATE WASHERS SHALL BE AASHTO M270 GRADE 50W.

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

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

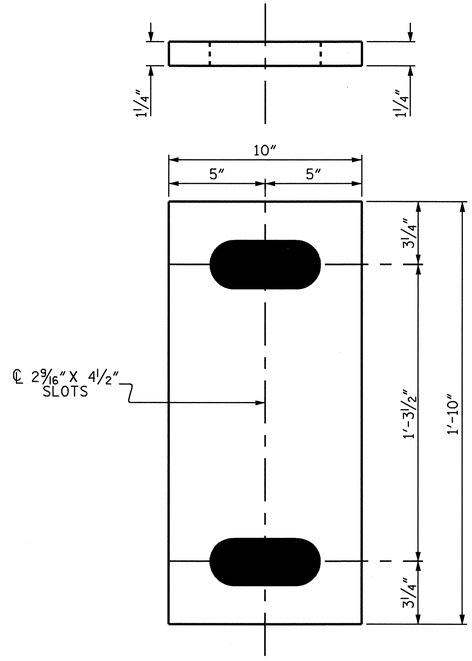
ALL SURFACES OF LEVELING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT ALL FIXED POINTS OF SUPPORT AT INTEGRAL END BENT 1 AND 2, TOP 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.



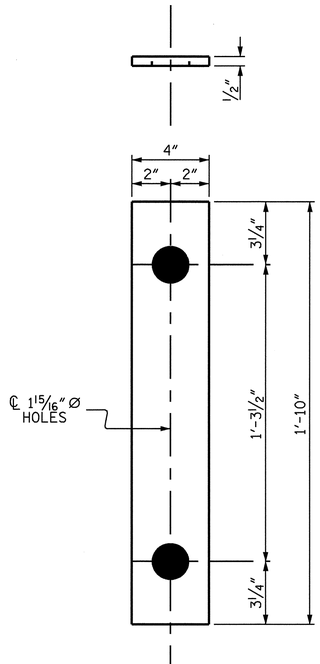
LEVELING PLATE (P1)

(8 REQUIRED)



LEVELING PLATE (P2)

(8 REQUIRED)



ANCHORAGE PLATE (P3)

(16 REQUIRED)

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

LEVELING PLATE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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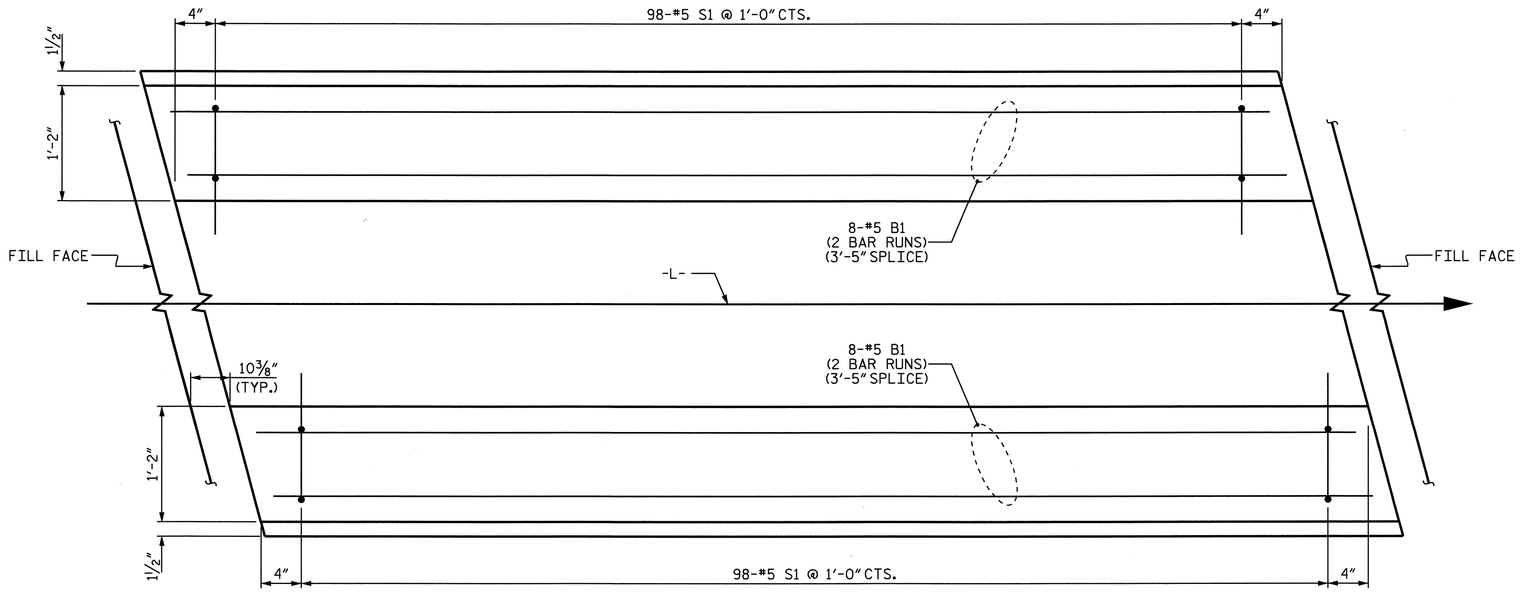
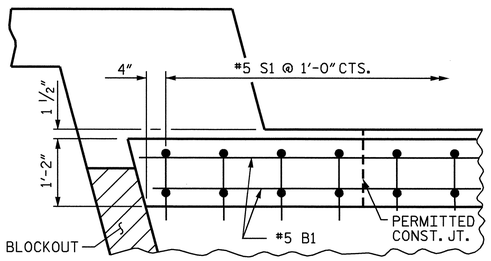
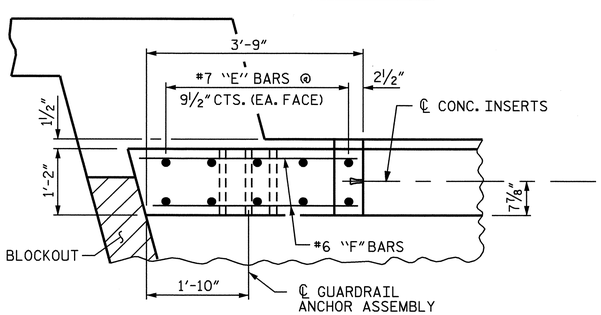


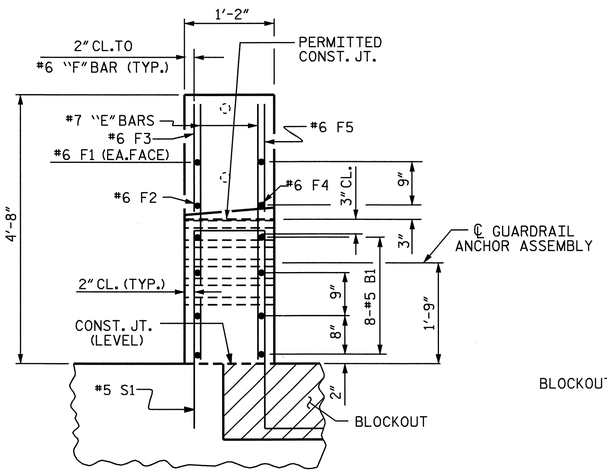
PLAN OF PARAPET



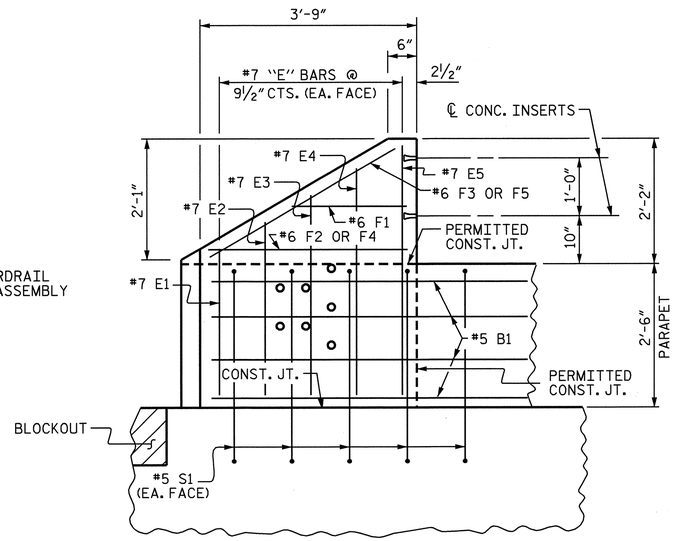
PLAN OF PARAPET



PLAN OF END POST



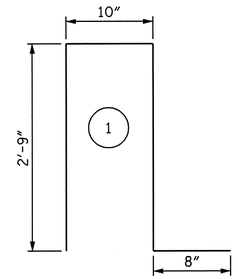
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

PARAPETS & FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	32	#5	STR	50'-9"	1694
✳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	2'-0"	24
✳F2	4	#6	STR	3'-6"	21
✳F3	4	#6	STR	3'-3"	20
✳F4	4	#6	STR	3'-11"	24
✳F5	4	#6	STR	3'-8"	22
✳S1	196	#5	1	7'-0"	1431

✳EPOXY COATED REINFORCING STEEL = 3519 LBS

CLASS "AA" CONCRETE 21.9 C.Y.

1'-2" X 2'-6" CONCRETE PARAPET 196.55 LIN.FT.

NOTES

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

FOR DETAIL OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS PAYNE
3/25/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			70

STR.#1

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

20-MAR-2008 15:33
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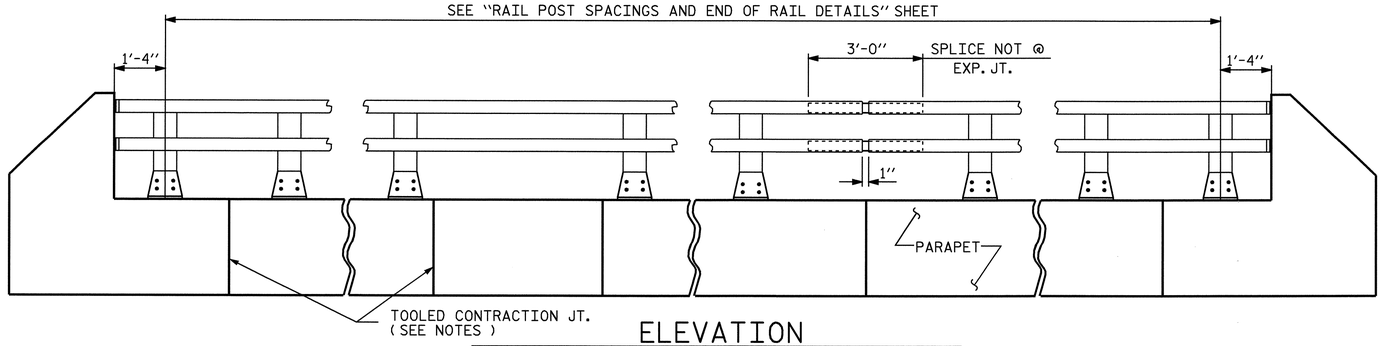
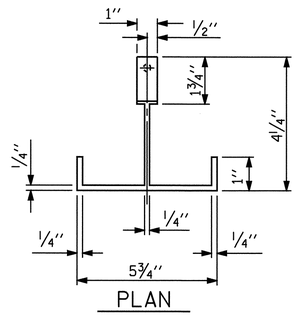
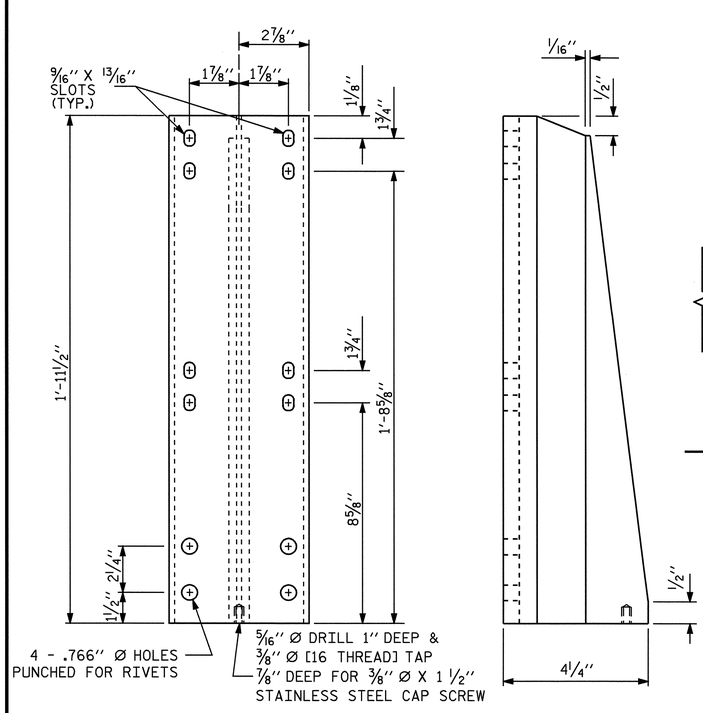


ELEVATION

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

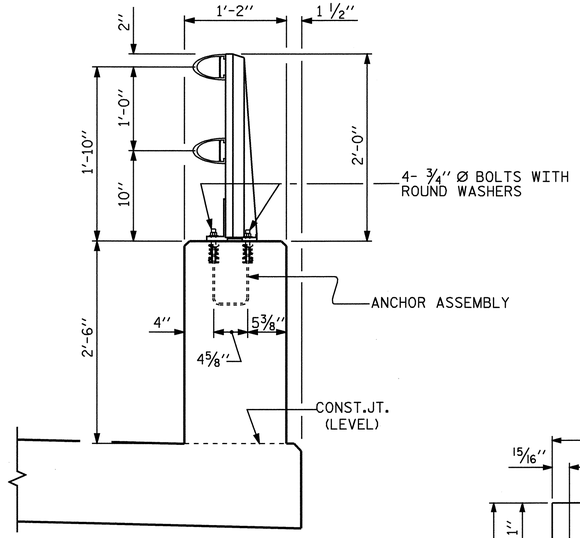


PLAN

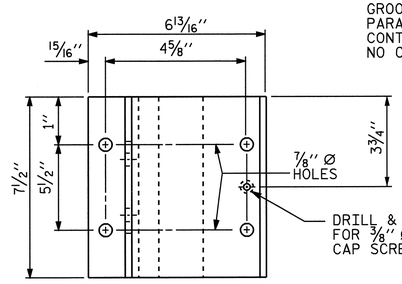


FRONT ELEVATION — SIDE ELEVATION

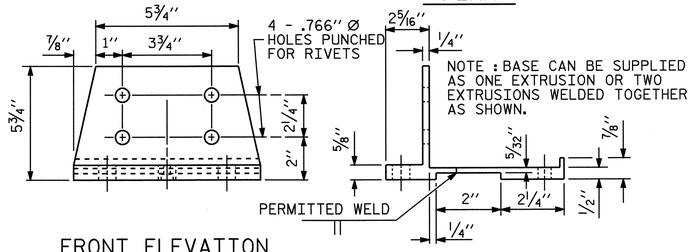
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

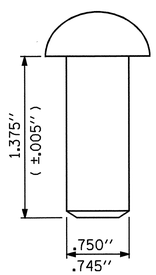


PLAN



FRONT ELEVATION — SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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 IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 180.92 LIN. FT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : S. DOMBROWSKI	DATE : 7/07
CHECKED BY : M.K. BEARD	DATE : 10/07
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. PAYNE 3/25/08

STR.#1

STD. NO. BMR3

20-MAR-2008 15:33
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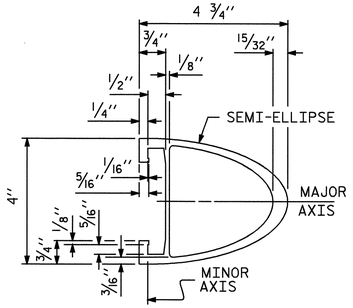
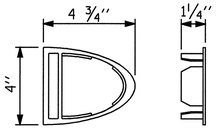
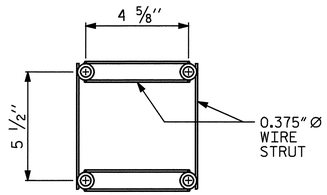


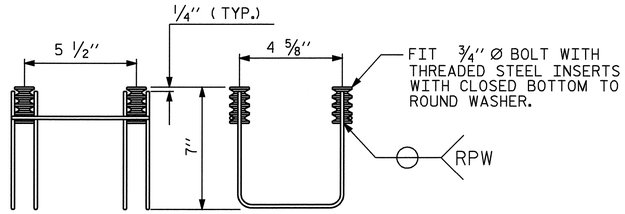
RAIL SECTION



RAIL CAP



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(32 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.

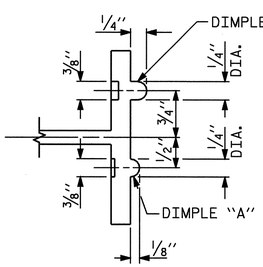
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

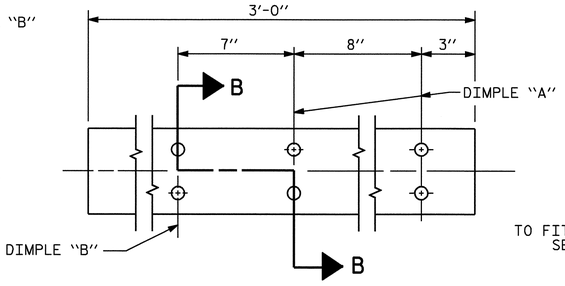
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

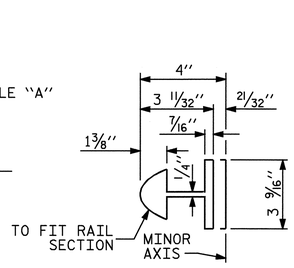
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

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



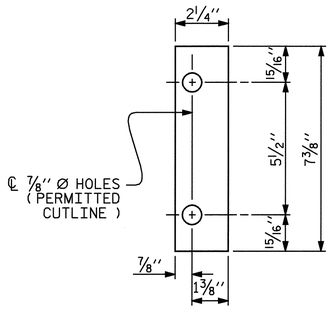
SECTION B - B



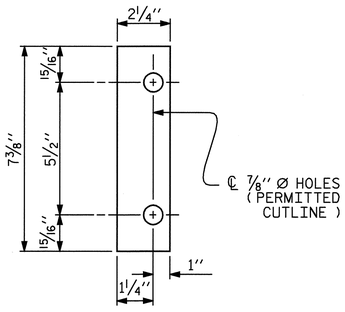


BAR SECTION

EXPANSION BAR DETAILS



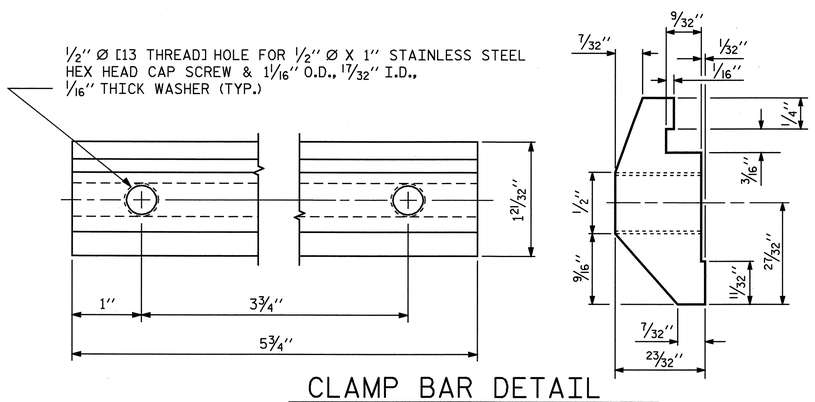
FRONT PLATE



REAR PLATE

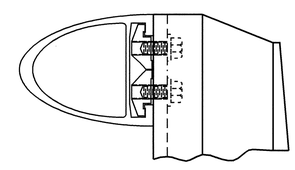
SHIM DETAILS

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



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			70

STR.#1

STD. NO. BMR4

ASSEMBLED BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

DRAWN BY : EEM 6/94
CHECKED BY : RGW 6/94

REV.	2/6/97	EEM/RGW
REV.	8/16/99	MAB/LES
REV.	5/1/06R	KMM/GM

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS A. PAYNE
3/25/08

20-MAR-2008 15:33
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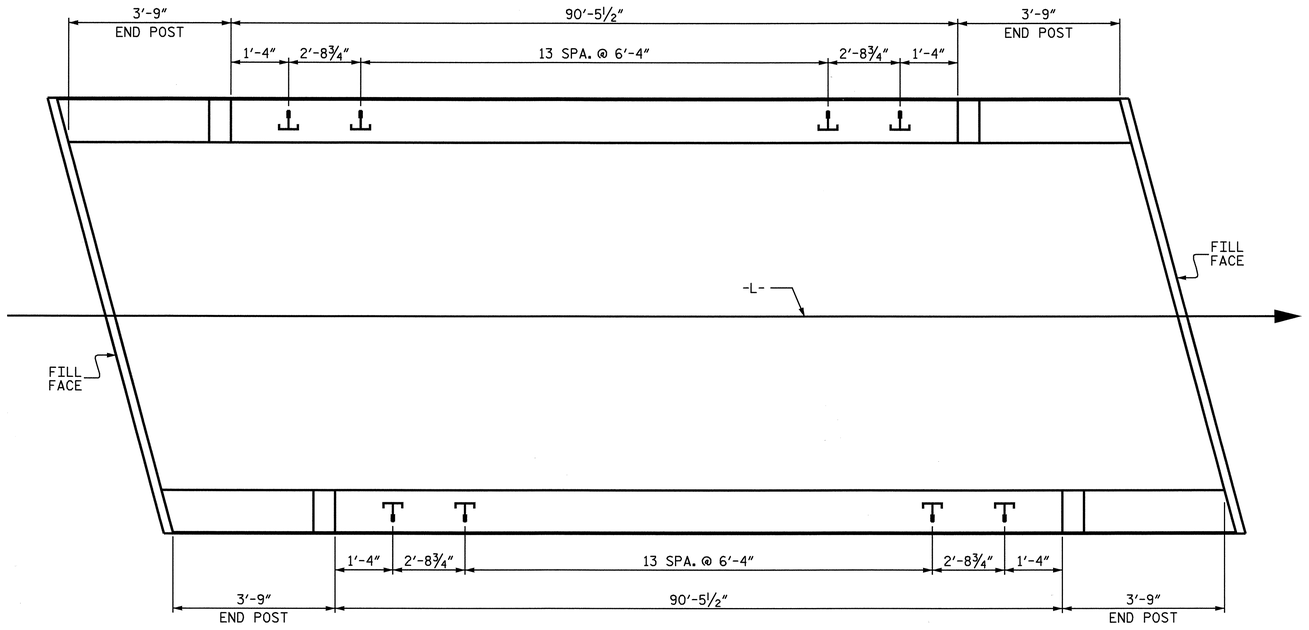
klayne



PLAN OF RAIL POST SPACINGS

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

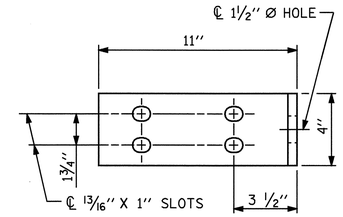
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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.

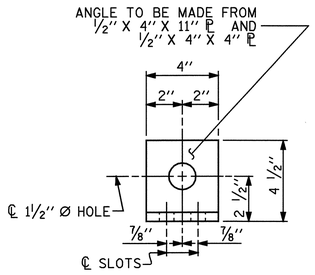
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

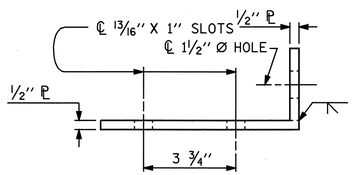
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE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



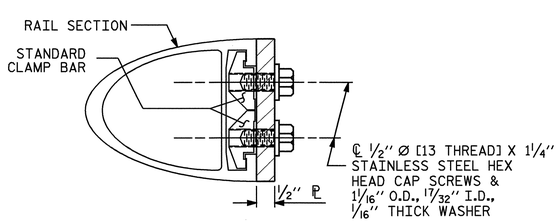
ELEVATION



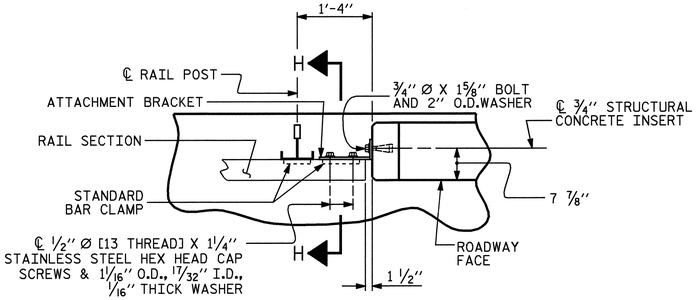
END VIEW (FIX AND EXP.)



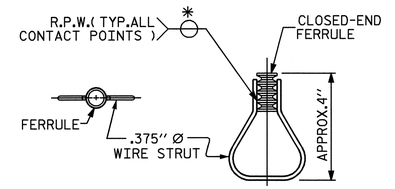
TOP VIEW



SECTION H-H (FIX)



PLAN - RAIL AND END POST



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS
AND
END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			70

STR.#1

STD. NO. BMR2

NORTH CAROLINA PROFESSIONAL SEAL 2021 ENGINEER THOMAS L. BEARD
3/25/08

ASSEMBLED BY : S. DOMBROWSKI		DATE : 7/07
CHECKED BY : M.K. BEARD		DATE : 10/07
DRAWN BY : FCJ 1/88	REV. 10/17/00	LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03	RWW/JTE
	REV. 5/1/06	TLA/GM

DETAILS FOR ATTACHING METAL RAIL TO END POST

20-MAR-2008 15:33
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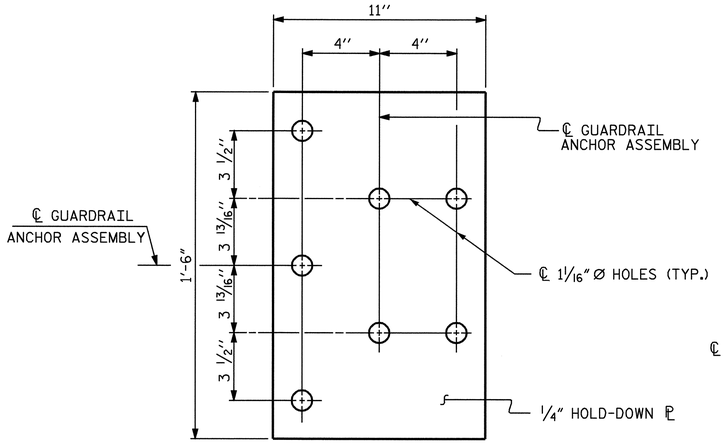
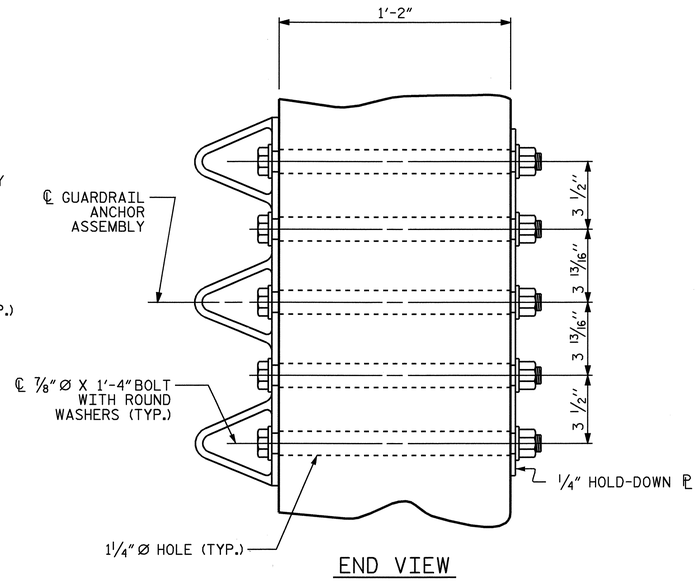


PLAN



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.

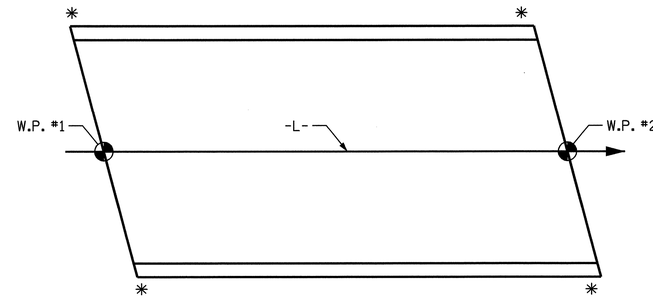
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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.

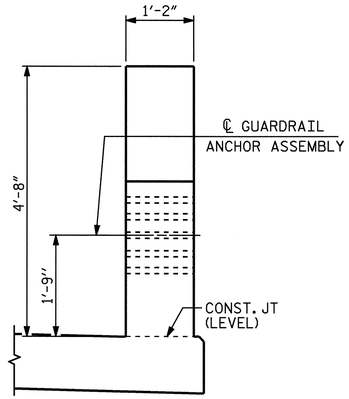
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

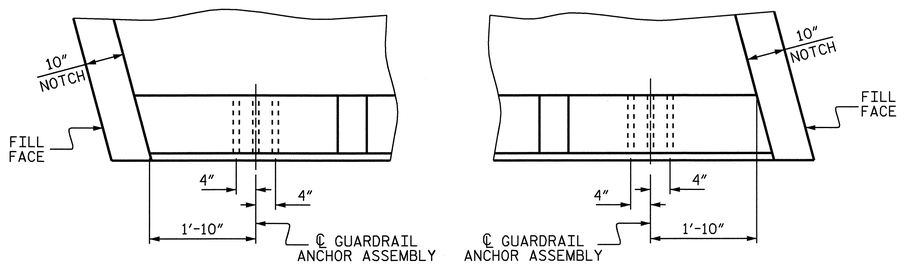


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 5 OF 5

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-21
1			3			TOTAL SHEETS
2			4			70

STR.#1 STD. NO. BMR8

ASSEMBLED BY : S. DOMBROWSKI		DATE : 7/07	
CHECKED BY : M.K. BEARD		DATE : 10/07	
DRAWN BY : EEM 6/94	REV. 10/17/00	RWW/LES	
CHECKED BY : RGW 6/94	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. PAYNE
3/25/08

20-MAR-2008 15:33
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SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

REINFORCING STEEL QUANTITIES

	STAGE #1	STAGE #2	TOTAL
REINFORCING STEEL	10,849 LBS.	6,311 LBS.	17,160 LBS.

EPOXY COATED REINFORCING STEEL QUANTITIES

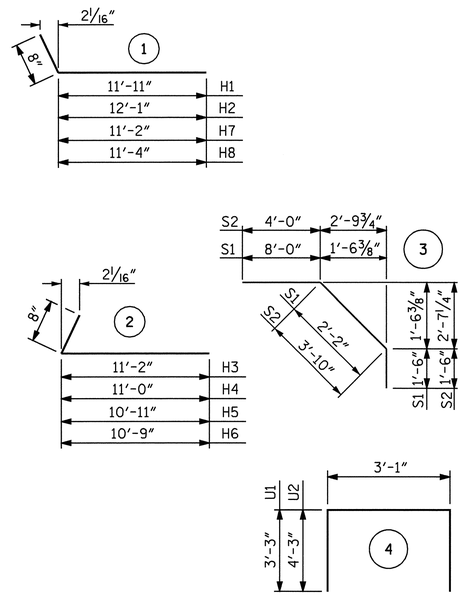
	STAGE #1	STAGE #2	TOTAL
EPOXY COATED REINFORCING STEEL	10,665 LBS.	6,701 LBS.	17,366 LBS.
PARAPETS & END POSTS			3,519 LBS.
TOTAL			20,885 LBS.

POUR SEQUENCE BREAKDOWN

	POUR #1	POUR #2	POUR #3	POUR #4	POUR #5	TOTAL
STAGE 1	81.6	53.1				134.7
STAGE 2			47.1	5.0	31.9	84.0
TOTAL CONCRETE (CU.YD.)						218.7

NOTE: POUR #2 AND POUR #5 INCLUDE THE UPPER PORTION OF THE END BENT CAPS AND WINGS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL — STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	143	#5	STR	32′-10″	4897
A2	143	#5	STR	32′-10″	4897
✳A101	4	#5	STR	28′-10″	120
✳A102	4	#5	STR	24′-2″	101
✳A103	4	#5	STR	19′-6″	81
✳A104	4	#5	STR	14′-6″	60
✳A105	4	#5	STR	9′-10″	41
✳A106	4	#5	STR	5′-2″	22
A201	4	#5	STR	28′-10″	120
A202	4	#5	STR	24′-2″	101
A203	4	#5	STR	19′-6″	81
A204	4	#5	STR	14′-6″	60
A205	4	#5	STR	9′-10″	41
A206	4	#5	STR	5′-2″	22
✳B1	90	#6	STR	23′-0″	3109
✳B2	48	#4	STR	29′-0″	930
B3	74	#6	STR	23′-0″	2556
B4	37	#5	STR	56′-4″	2174
✳D1	157	#5	STR	3′-4″	546
H1	5	#4	1	12′-7″	42
H2	5	#4	1	12′-9″	43
H5	5	#4	2	11′-7″	39
H6	5	#4	2	11′-5″	38
K1	16	#4	STR	21′-2″	226
K3	8	#4	STR	3′-2″	17
✳S1	54	#4	3	11′-8″	421
✳S2	54	#4	3	9′-4″	337
U1	54	#4	4	9′-7″	346
U2	6	#4	4	11′-7″	46

REINFORCING STEEL = 10849 LBS
✳EPOXY COATED REINFORCING STEEL = 10665 LBS

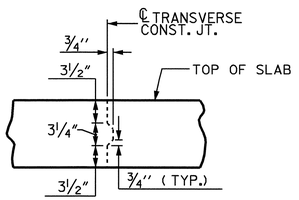
BILL OF MATERIAL — STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A3	149	#5	STR	18′-10″	2927
A4	149	#5	STR	18′-10″	2927
✳A111	4	#5	STR	14′-10″	62
✳A112	4	#5	STR	10′-2″	42
✳A113	4	#5	STR	5′-6″	23
A211	4	#5	STR	14′-10″	62
A212	4	#5	STR	10′-2″	42
A213	4	#5	STR	5′-6″	23
✳B1	58	#6	STR	23′-0″	2004
✳B2	32	#4	STR	29′-0″	620
B3	42	#6	STR	23′-0″	1451
B4	21	#5	STR	56′-4″	1234
✳D1	157	#5	STR	3′-4″	546
H3	5	#4	2	11′-10″	40
H4	5	#4	2	11′-8″	39
H7	5	#4	1	11′-10″	40
H8	5	#4	1	12′-0″	40
K2	8	#4	STR	24′-8″	132
K3	8	#4	STR	3′-2″	17
✳S1	34	#4	3	11′-8″	265
✳S2	34	#4	3	9′-4″	212
U1	34	#4	4	9′-7″	218
U2	6	#4	4	11′-7″	46

REINFORCING STEEL = 6311 LBS
✳EPOXY COATED REINFORCING STEEL = 6701 LBS

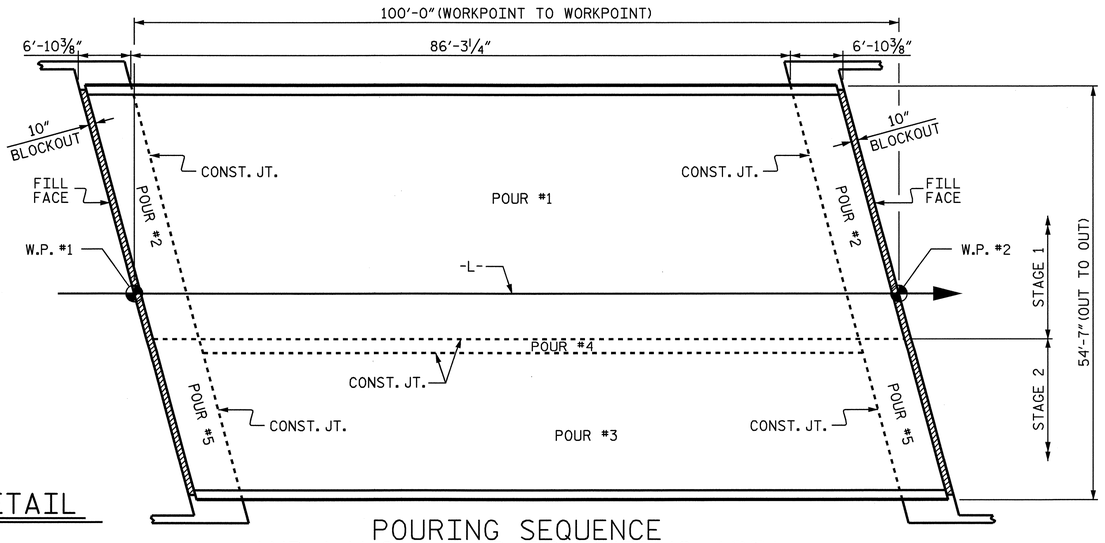
GROOVING BRIDGE FLOORS

BRIDGE DECK	4799 SQ.FT.
APPROACH SLAB	2235 SQ.FT.
TOTAL	7034 SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5364)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			70

STR.#1

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

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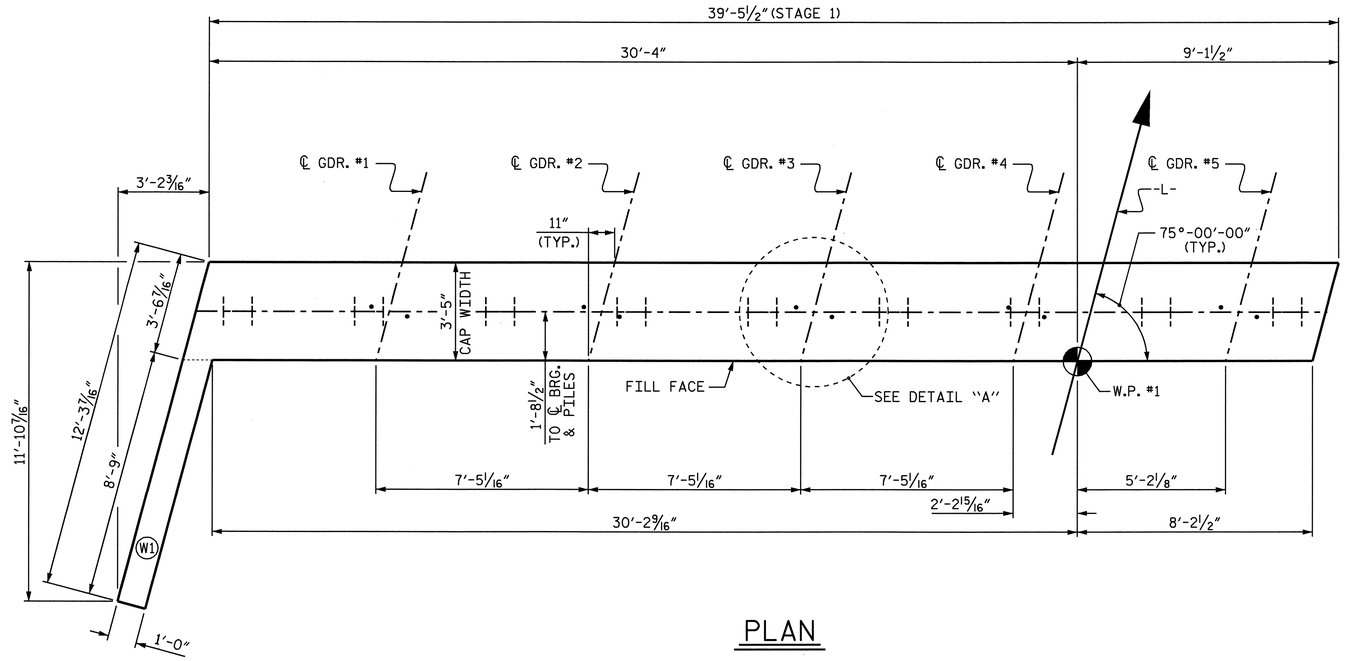
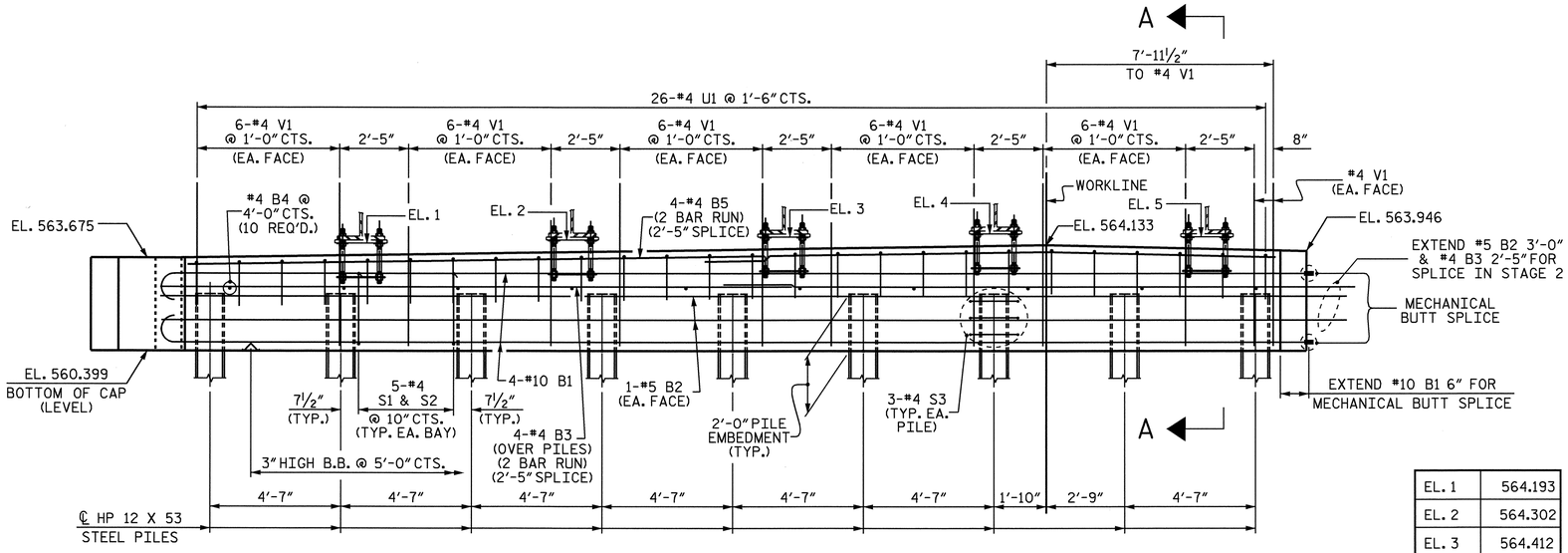


PLAN



ELEVATION

EL. 1	564.193
EL. 2	564.302
EL. 3	564.412
EL. 4	564.523
EL. 5	564.434

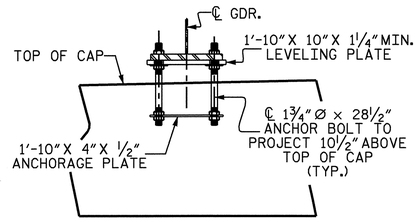
ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

NOTES

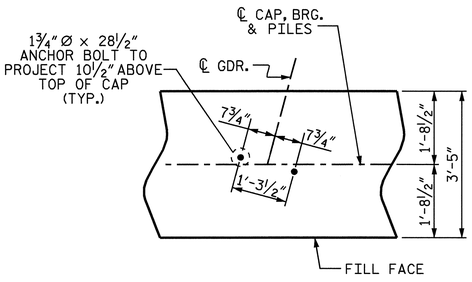
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1 (STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS GAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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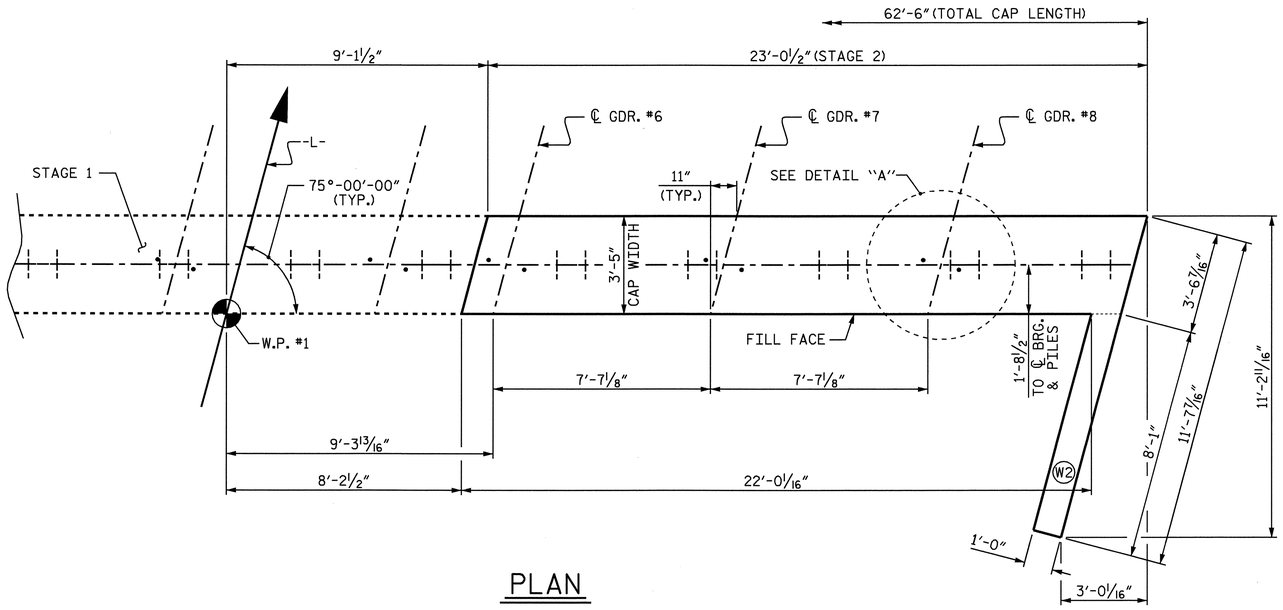
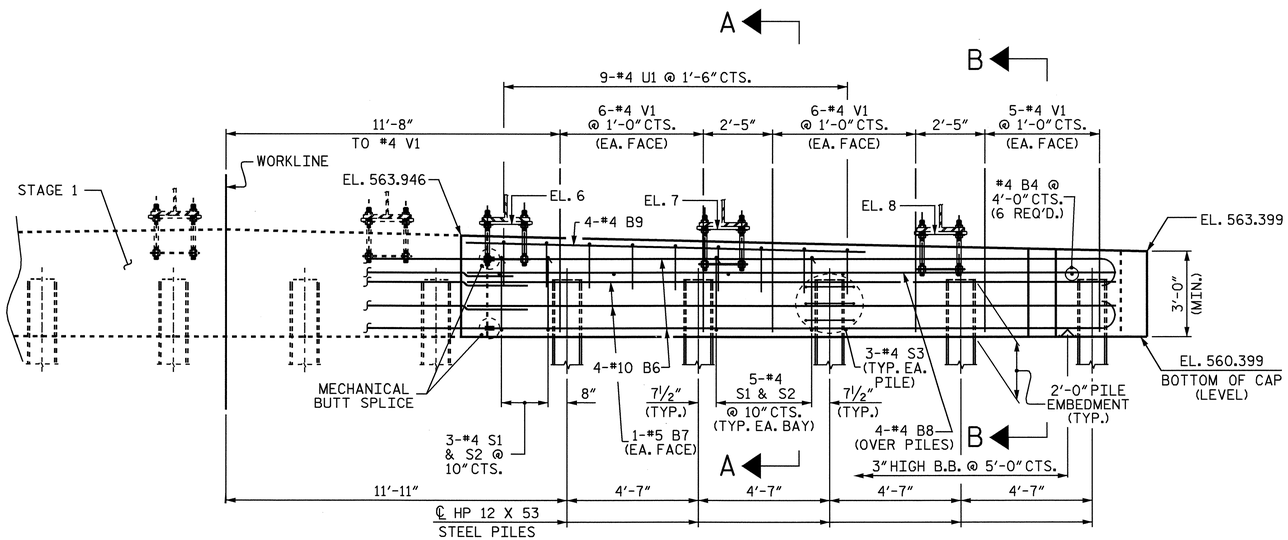
STR. #1



PLAN



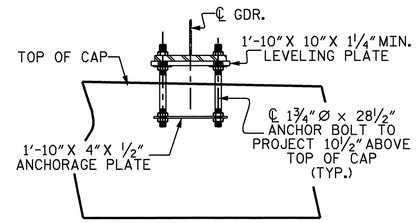
ELEVATION

NOTES

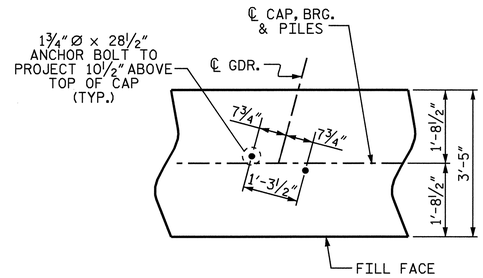
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

EL. 6	564.336
EL. 7	564.156
EL. 8	563.977

ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1 (STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS R. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			70

STR. #1

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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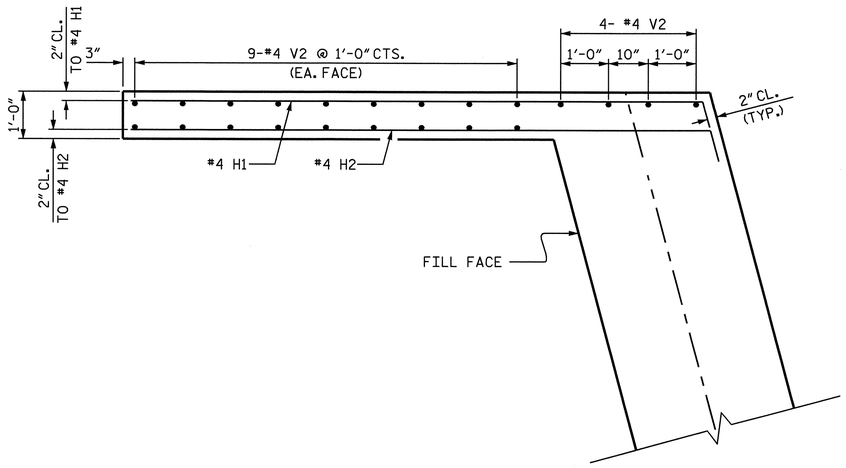
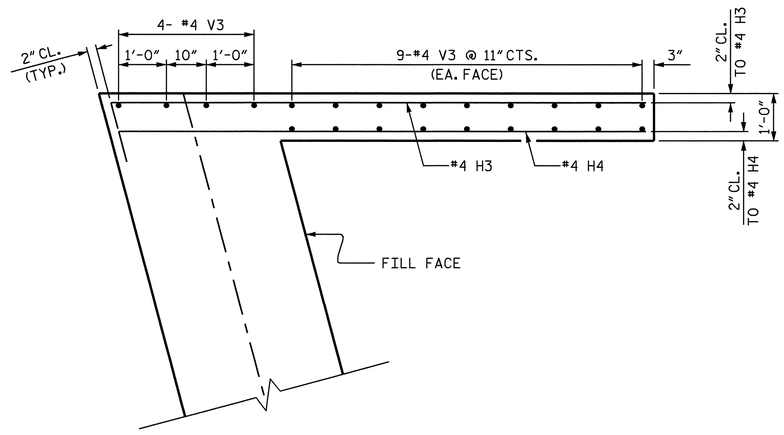
klayne

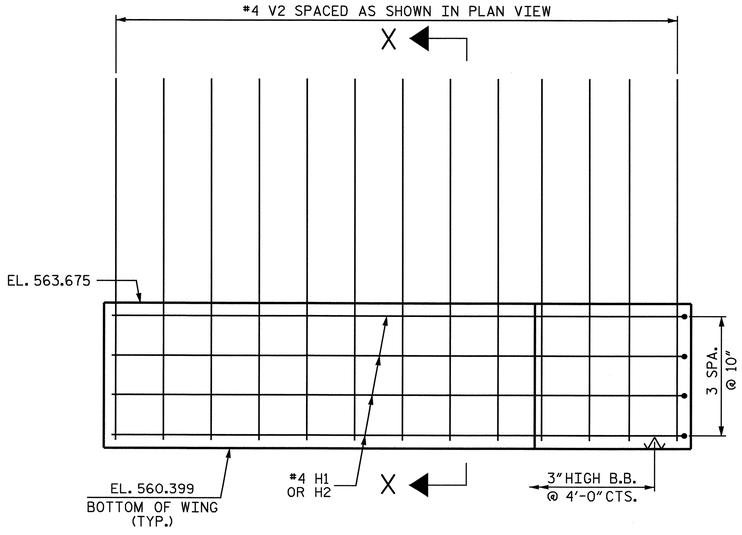


PLAN OF LEFT WING W1
(STAGE 1)

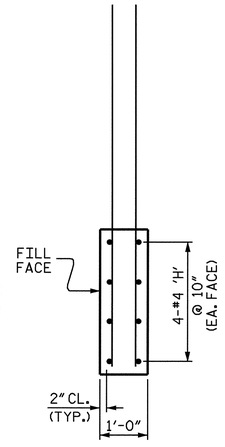


PLAN OF RIGHT WING W2
(STAGE 2)

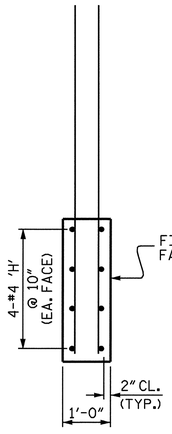
NOTE: THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. FOR DETAILS AND REINFORCING STEEL, SEE SUPERSTRUCTURE DETAILS.



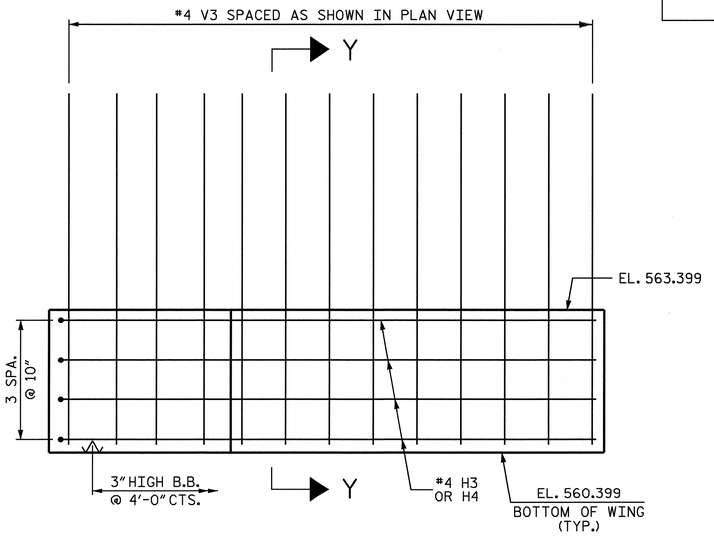
ELEVATION OF LEFT WING W1
(STAGE 1)



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING W2
(STAGE 2)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS KLAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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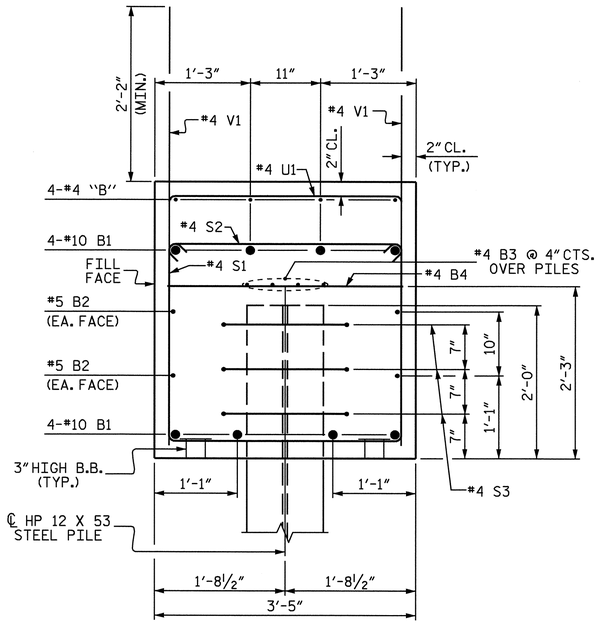
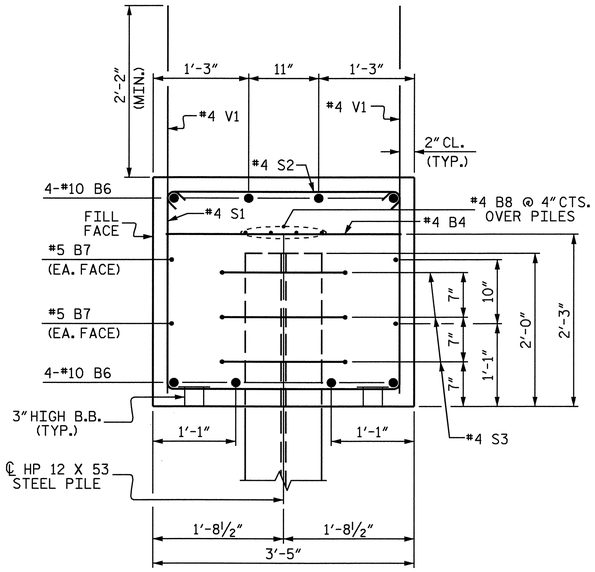
klayne

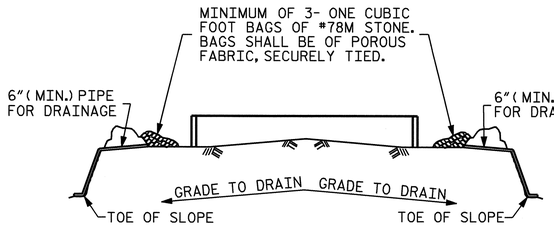
STR. #1



SECTION A-A



SECTION B-B

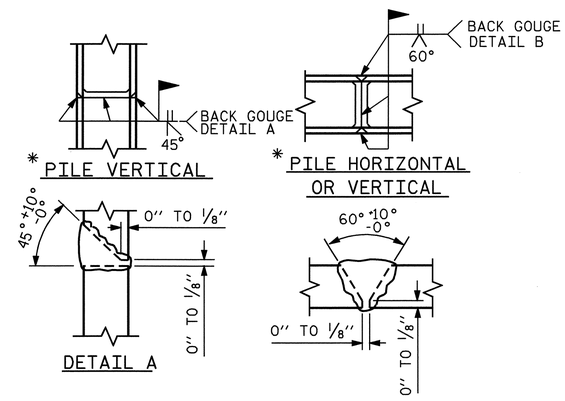


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

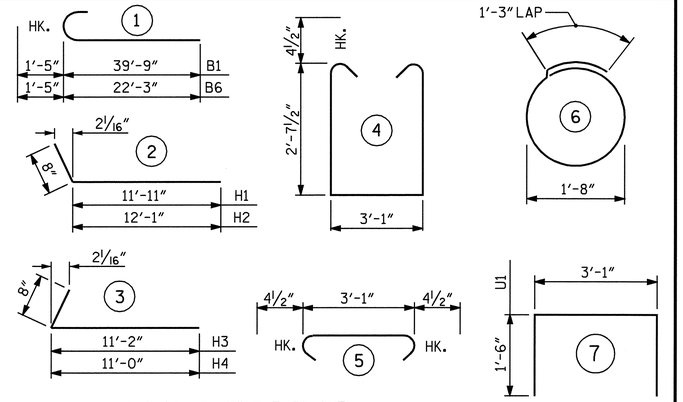
BILL OF MATERIAL
INTEGRAL END BENT #1

STAGE 1						STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	41'-2"	1417	B4	6	4	STR	3'-1"	12
B2	4	5	STR	42'-4"	177	B6	8	10	1	23'-8"	815
B3	8	4	STR	22'-2"	118	B7	4	5	STR	22'-10"	95
B4	10	4	STR	3'-1"	21	B8	4	4	STR	22'-10"	61
B5	8	4	STR	20'-3"	108	B9	4	4	STR	13'-8"	37
H1	4	4	2	12'-7"	34	H3	4	4	3	11'-10"	32
H2	4	4	2	12'-9"	34	H4	4	4	3	11'-8"	31
S1	40	4	4	9'-1"	243	S1	23	4	4	9'-1"	140
S2	40	4	5	3'-10"	102	S2	23	4	5	3'-10"	59
S3	27	4	6	6'-6"	117	S3	15	4	6	6'-6"	65
U1	26	4	7	6'-1"	106	U1	9	4	7	6'-1"	37
V1	64	4	STR	5'-9"	246	V1	34	4	STR	5'-9"	131
V2	22	4	STR	7'-7"	111	V3	22	4	STR	7'-4"	108
REINFORCING STEEL LBS 2834						REINFORCING STEEL LBS 1623					
CLASS 'A' CONCRETE 18.7 C.Y.						CLASS 'A' CONCRETE 10.4 C.Y.					
HP 12X53 STEEL PILES NO. 9 135 LIN.FT.						HP 12X53 STEEL PILES NO. 5 75 LIN.FT.					
PILE EXCAVATION IN SOIL 127 LIN.FT.						PILE EXCAVATION IN SOIL 71 LIN.FT.					
PILE EXCAV. NOT IN SOIL 12 LIN.FT.						PILE EXCAV. NOT IN SOIL 6 LIN.FT.					

TOTAL BILL OF MATERIAL

REINFORCING STEEL LBS 4457	HP 12X53 STEEL PILES NO. 14 210 LIN.FT.
CLASS 'A' CONCRETE 29.1 C.Y.	PILE EXCAVATION IN SOIL 198 LIN.FT.
	PILE EXCAV. NOT IN SOIL 18 LIN.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS S. WAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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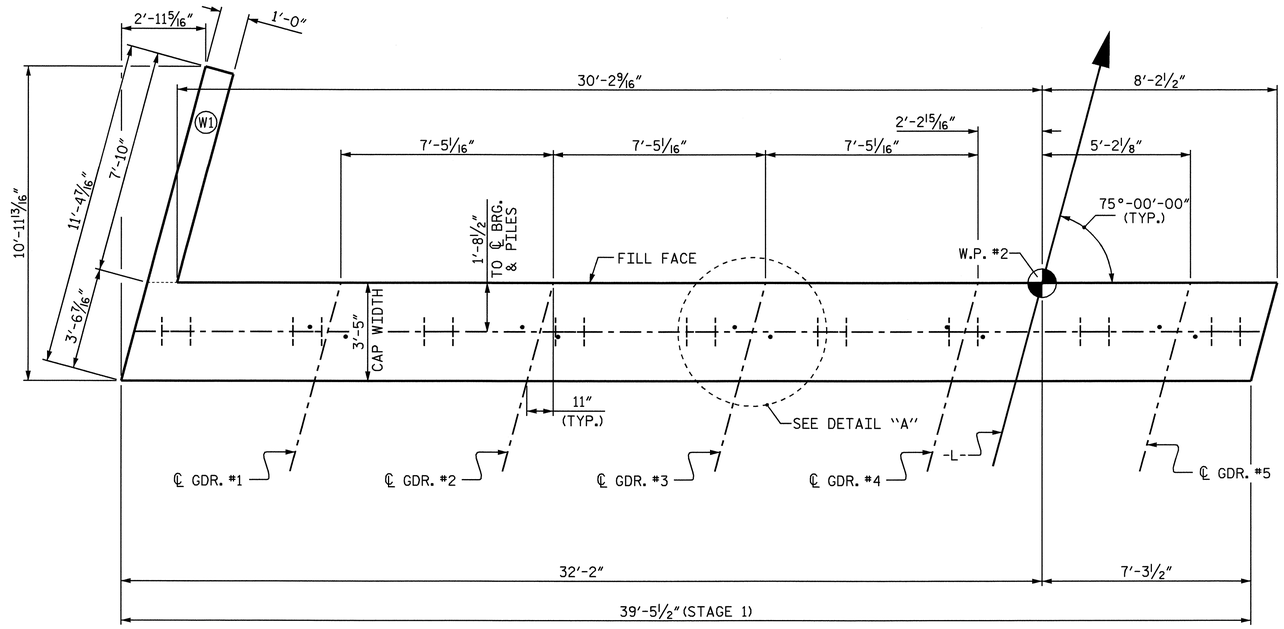
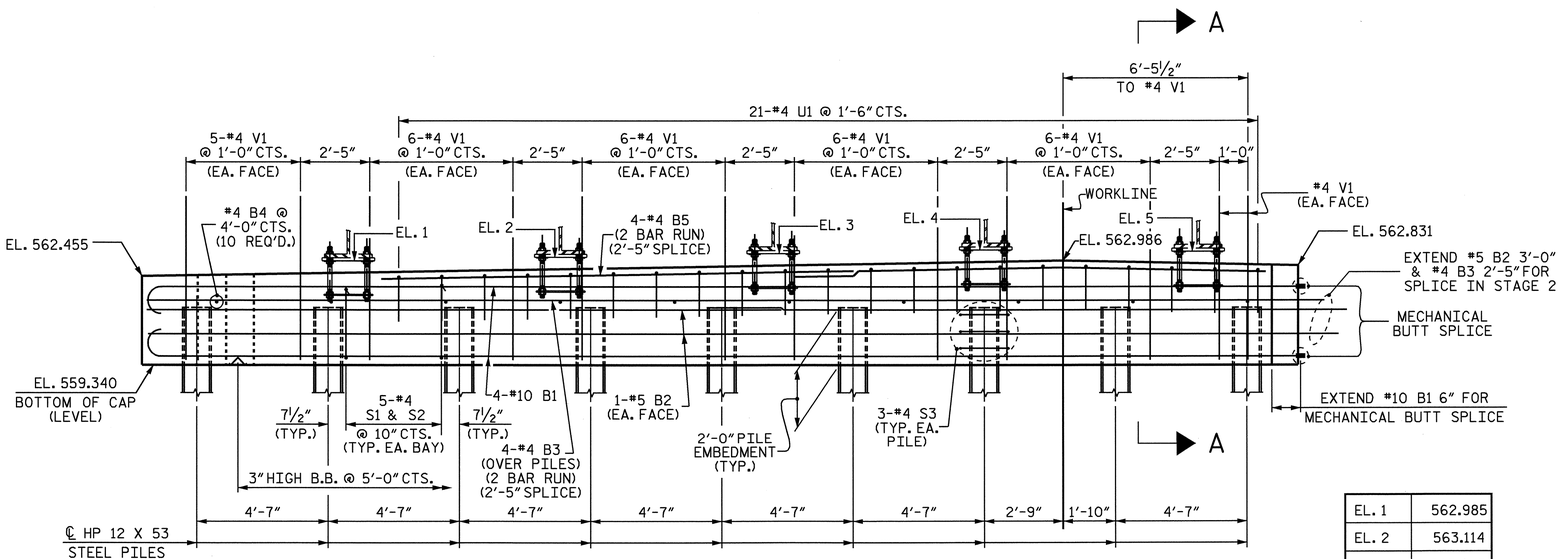
klayne

STR. #1



PLAN



ELEVATION

EL. 1	562.985
EL. 2	563.114
EL. 3	563.243
EL. 4	563.373
EL. 5	563.303

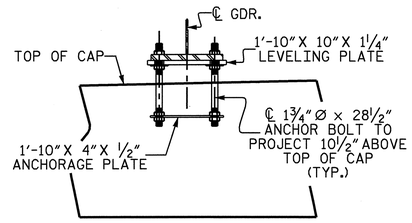
ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

NOTES

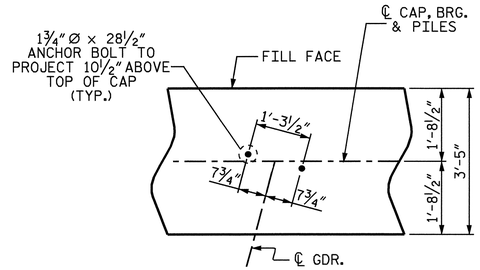
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2 (STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			70

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS B. PAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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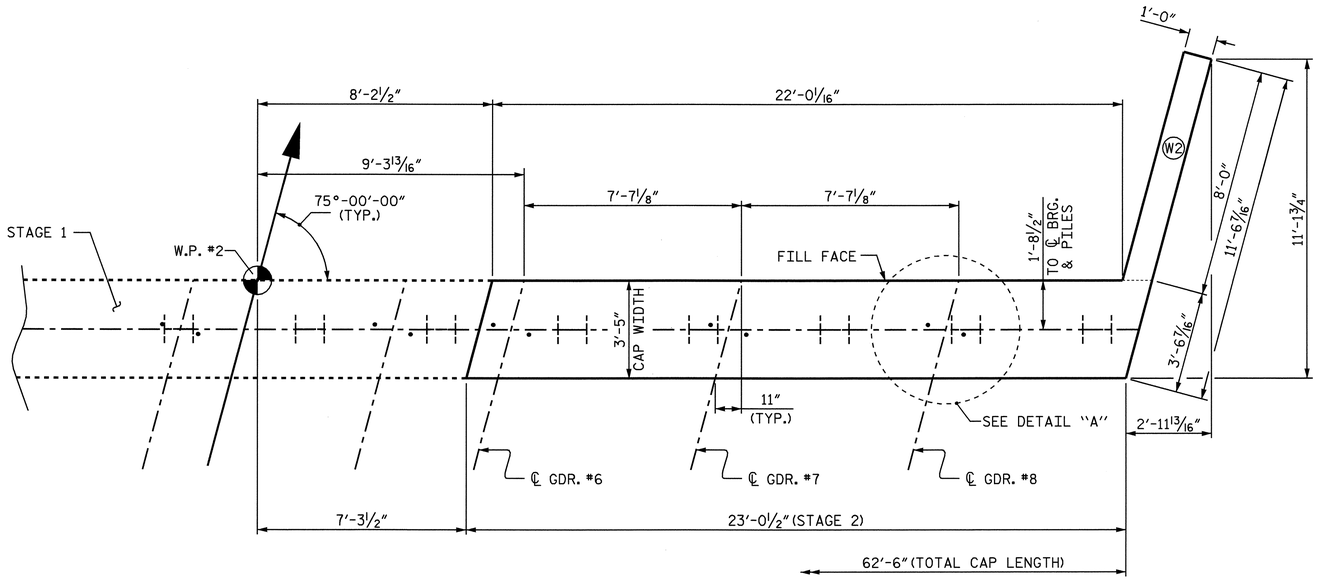
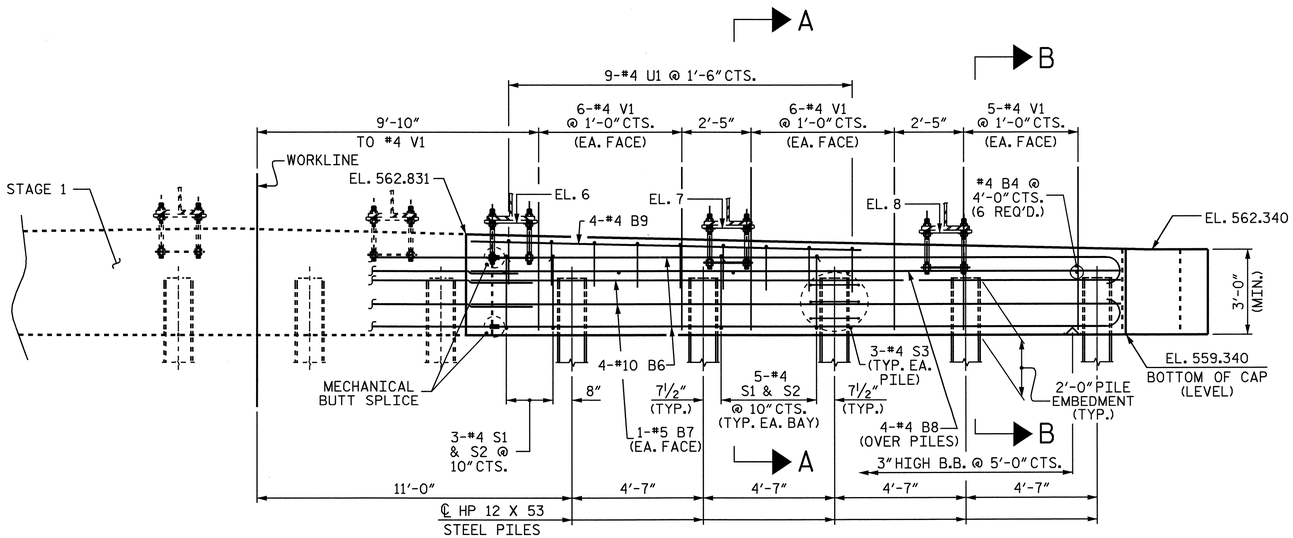
klayne



PLAN



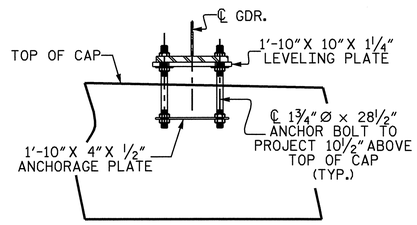
ELEVATION

NOTES

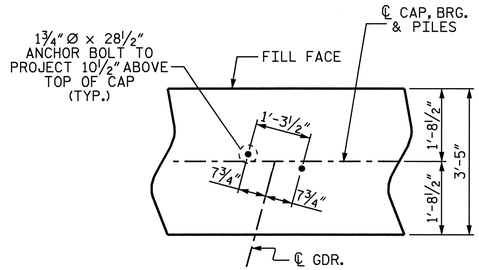
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

EL. 6	563.216
EL. 7	563.056
EL. 8	562.897

ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2 (STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS R. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			70

STR. #1

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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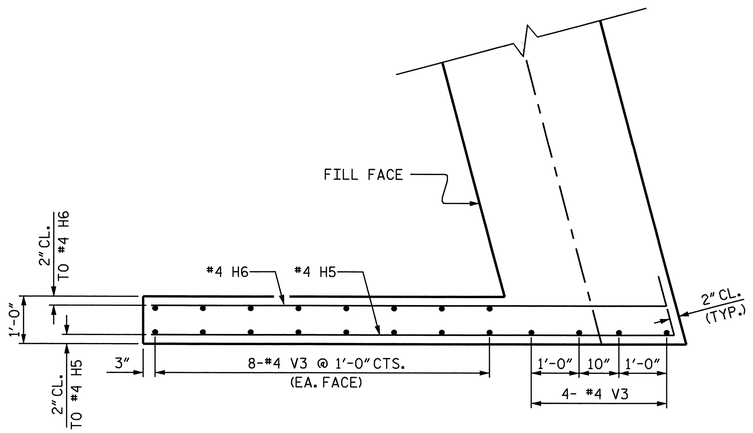
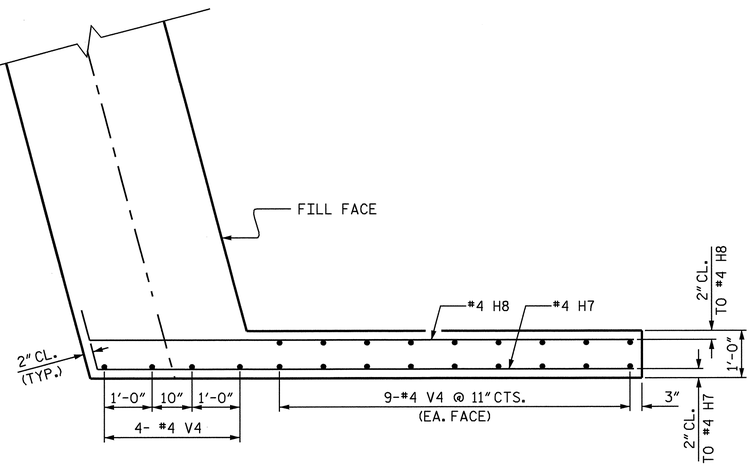
klayne

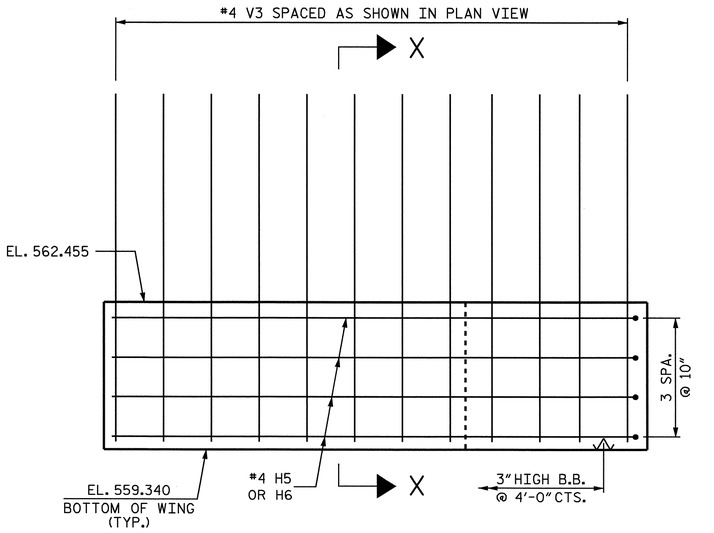


PLAN OF LEFT WING W1
(STAGE 1)

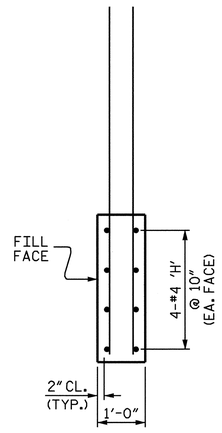


PLAN OF RIGHT WING W2
(STAGE 2)

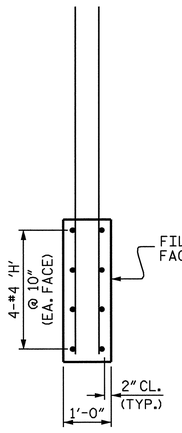
NOTE: THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. FOR DETAILS AND REINFORCING STEEL, SEE SUPERSTRUCTURE DETAILS.



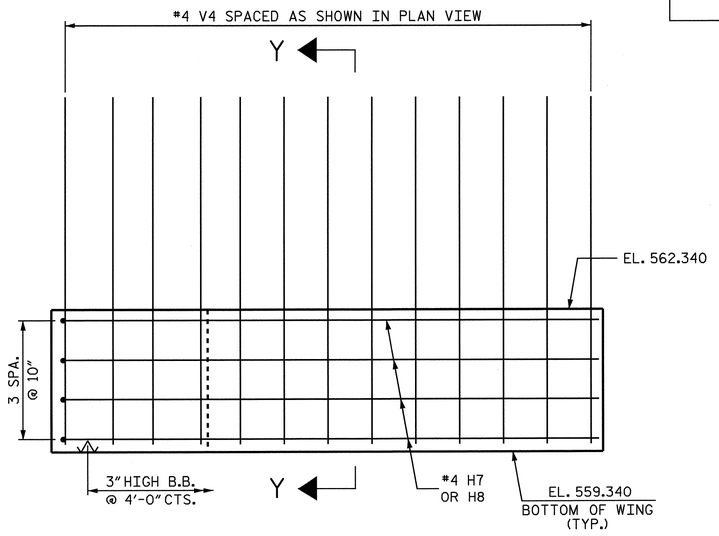
ELEVATION OF LEFT WING W1
(STAGE 1)



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING W2
(STAGE 2)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT #2

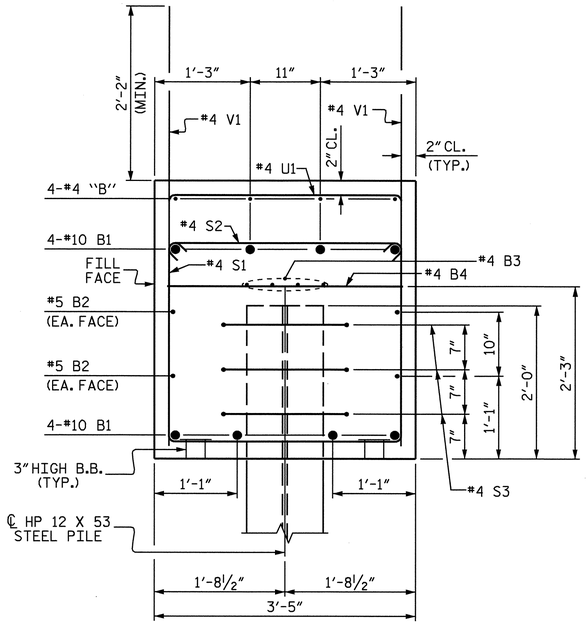
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS WAYNE
3/25/08

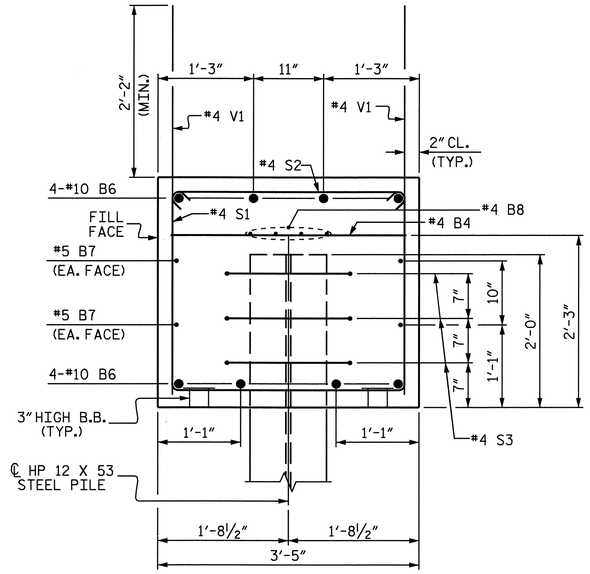
DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
P:\Structures\plans\str1\B-4252_sd_Ebts_01.dgn
klayne

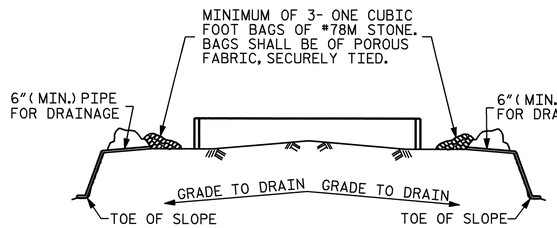
STR. #1



SECTION A-A



SECTION B-B

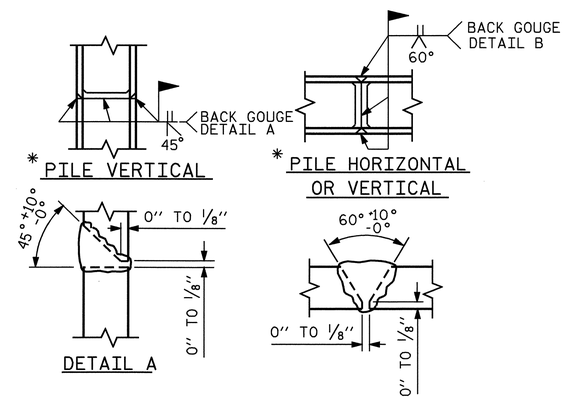


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT #2

STAGE 1						STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	41'-2"	1417	B4	6	4	STR	3'-1"	12
B2	4	5	STR	42'-4"	177	B6	8	10	1	23'-8"	815
B3	8	4	STR	22'-2"	118	B7	4	5	STR	22'-10"	95
B4	10	4	STR	3'-1"	21	B8	4	4	STR	22'-10"	61
B5	8	4	STR	16'-6"	88	B9	4	4	STR	13'-8"	37
H5	4	4	3	11'-7"	31	H7	4	4	2	11'-10"	32
H6	4	4	3	11'-5"	31	H8	4	4	2	12'-0"	32
S1	40	4	4	9'-1"	243	S1	23	4	4	9'-1"	140
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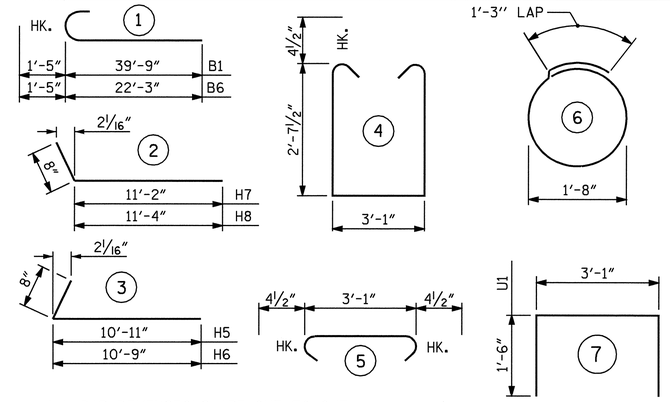
U1	21	4	7	6'-1"	85	U1	9	4	7	6'-1"	37
V1	62	4	STR	5'-9"	238	V1	34	4	STR	5'-9"	131
V3	20	4	STR	7'-4"	98	V4	22	4	STR	7'-3"	107
REINFORCING STEEL LBS 2766						REINFORCING STEEL LBS 1623					
CLASS 'A' CONCRETE 18.0 C.Y.						CLASS 'A' CONCRETE 10.4 C.Y.					
HP 12X53 STEEL PILES NO. 9 135 LIN.FT.						HP 12X53 STEEL PILES NO. 5 75 LIN.FT.					
PILE EXCAVATION IN SOIL 106 LIN.FT.						PILE EXCAVATION IN SOIL 59 LIN.FT.					
PILE EXCAV. NOT IN SOIL 23 LIN.FT.						PILE EXCAV. NOT IN SOIL 12 LIN.FT.					

TOTAL BILL OF MATERIAL

REINFORCING STEEL	LBS 4389
CLASS 'A' CONCRETE	28.4 C.Y.
HP 12X53 STEEL PILES NO. 14	210 LIN.FT.
PILE EXCAVATION IN SOIL	165 LIN.FT.
PILE EXCAV. NOT IN SOIL	35 LIN.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. WAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:32
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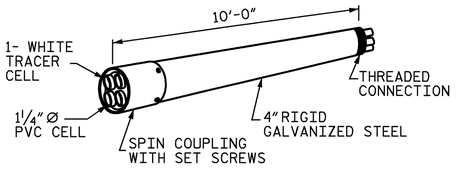
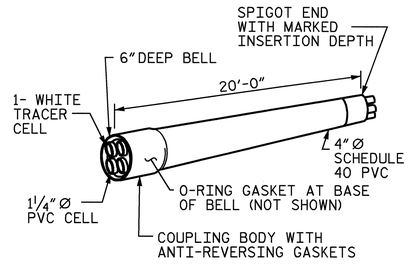
klayne

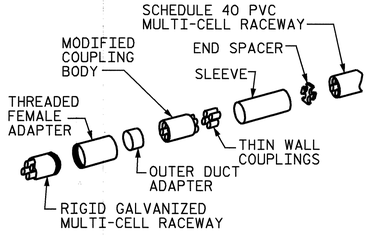
STR. #1



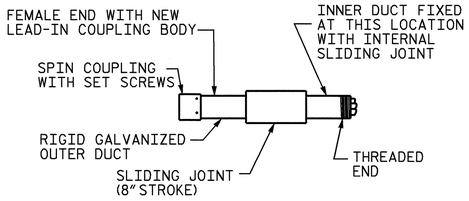
RIGID GALVANIZED (RGC)
MULTI-CELL RACEWAY



SCHEDULE 40 PVC
MULTI-CELL RACEWAY



TRANSITION ADAPTER



EXPANSION JOINT FITTING

NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

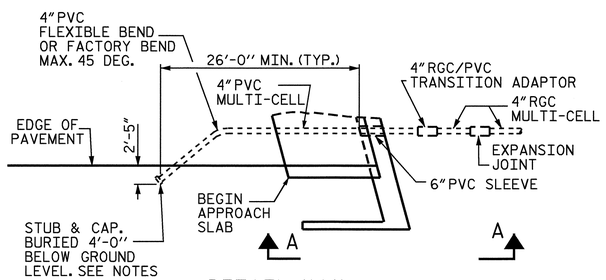
PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL STABILIZER AT OR NEAR MIDSPAN OF SPAN A. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

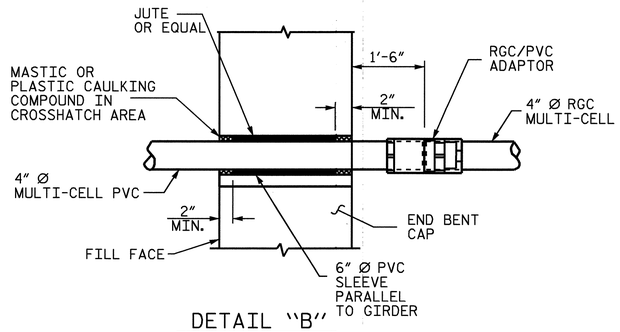
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF ⅝" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

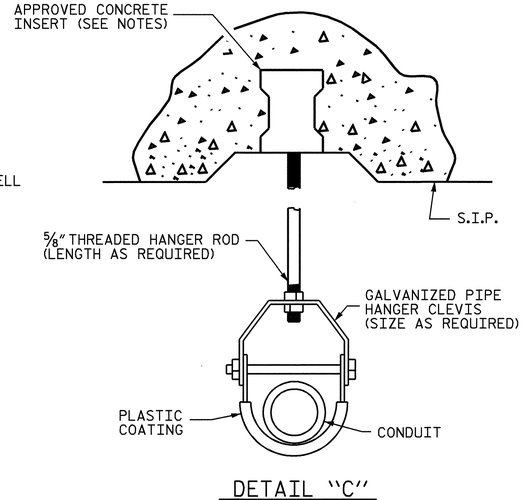
DETAIL "D"
4" MULTI-CELL COMPONENTS



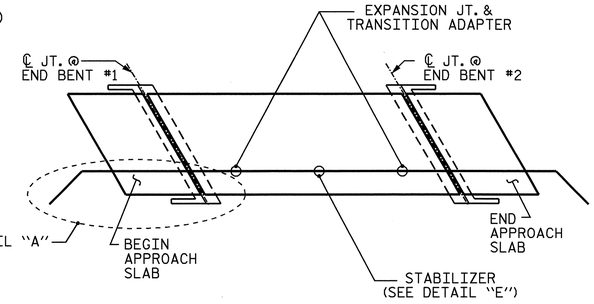
DETAIL "A"
TERMINATION OF CONDUIT AT WING WALL



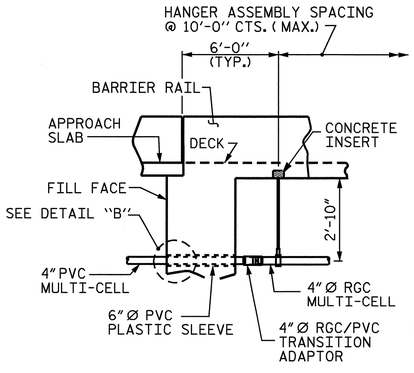
DETAIL "B"
PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT END BENT.



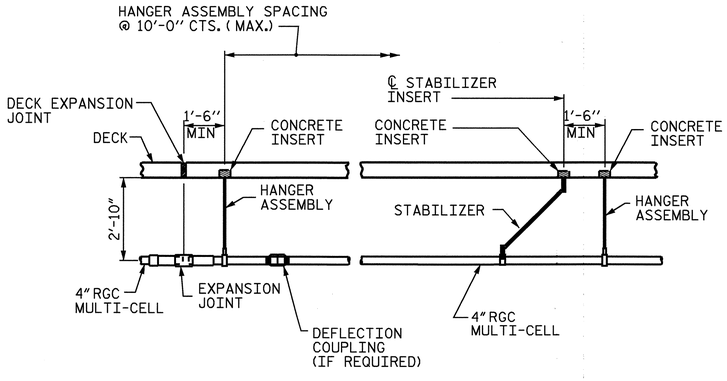
DETAIL "C"
HANGER ASSEMBLY



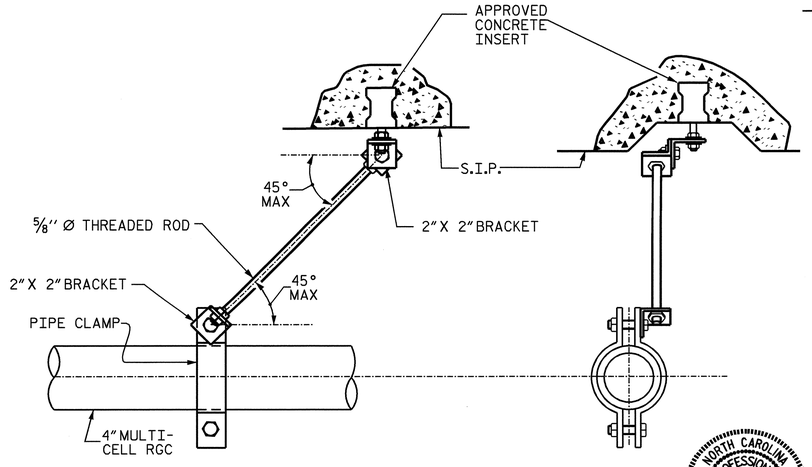
CONDUIT LAYOUT



VIEW A-A



VIEW B-B
STEEL OR CONCRETE GIRDERS



DETAIL "E"
STABILIZER

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

ELECTRICAL CONDUIT SYSTEM DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/4/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : S. DOMBROWSKI	DATE : 12/07
CHECKED BY : M.K. BEARD	DATE : 1/08
DRAWN BY : RWW 2-4-03	REV. 5/1/06 TLA/GM
CHECKED BY : DBM 2-4-03	

ELECTRIC CONDUIT DETAILS

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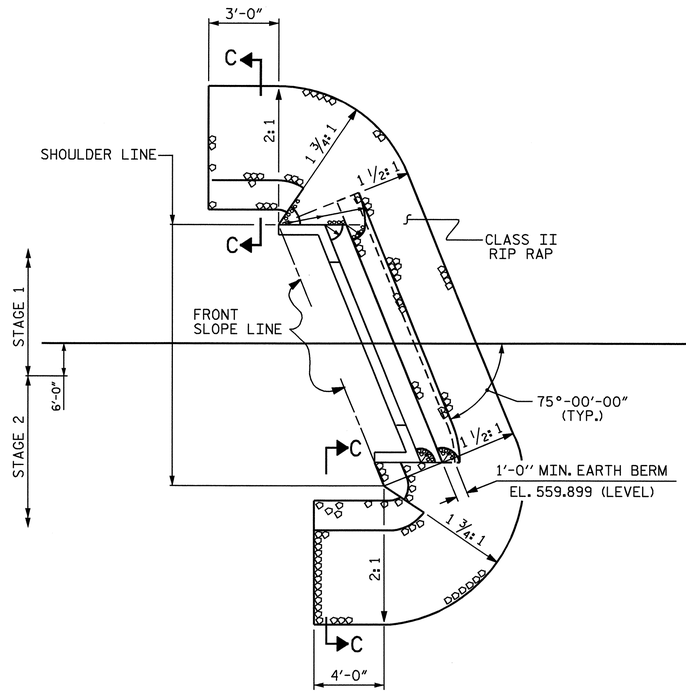
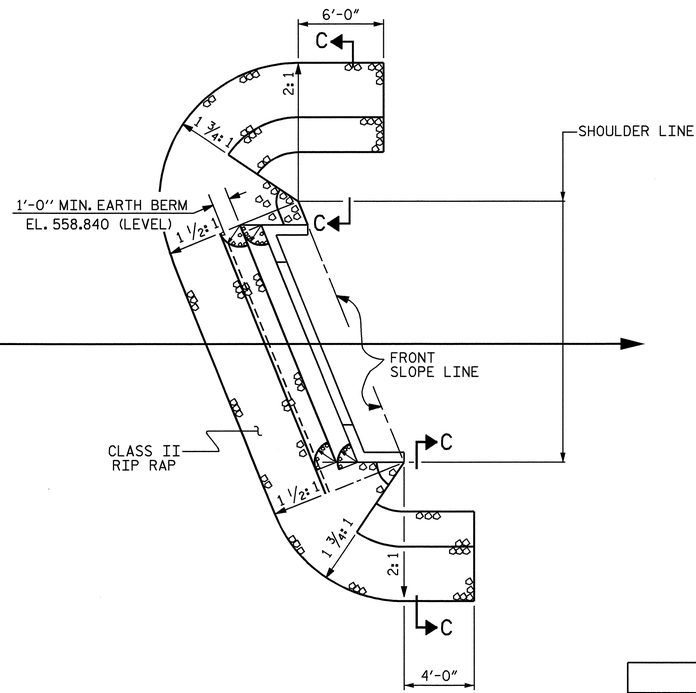


END BENT #1

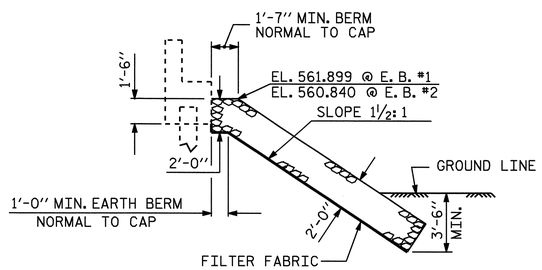


END BENT #2

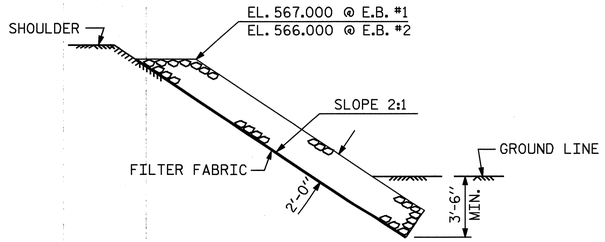
-L-

PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 27+69.00 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT #1	265	295
END BENT #2	300	335



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. ATKINS
6/4/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : R. G. EMERSON	DATE : 01/07	
CHECKED BY : M. K. BEARD	DATE : 07/07	
DRAWN BY : REK 1/84	REV. 8/16/99	RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

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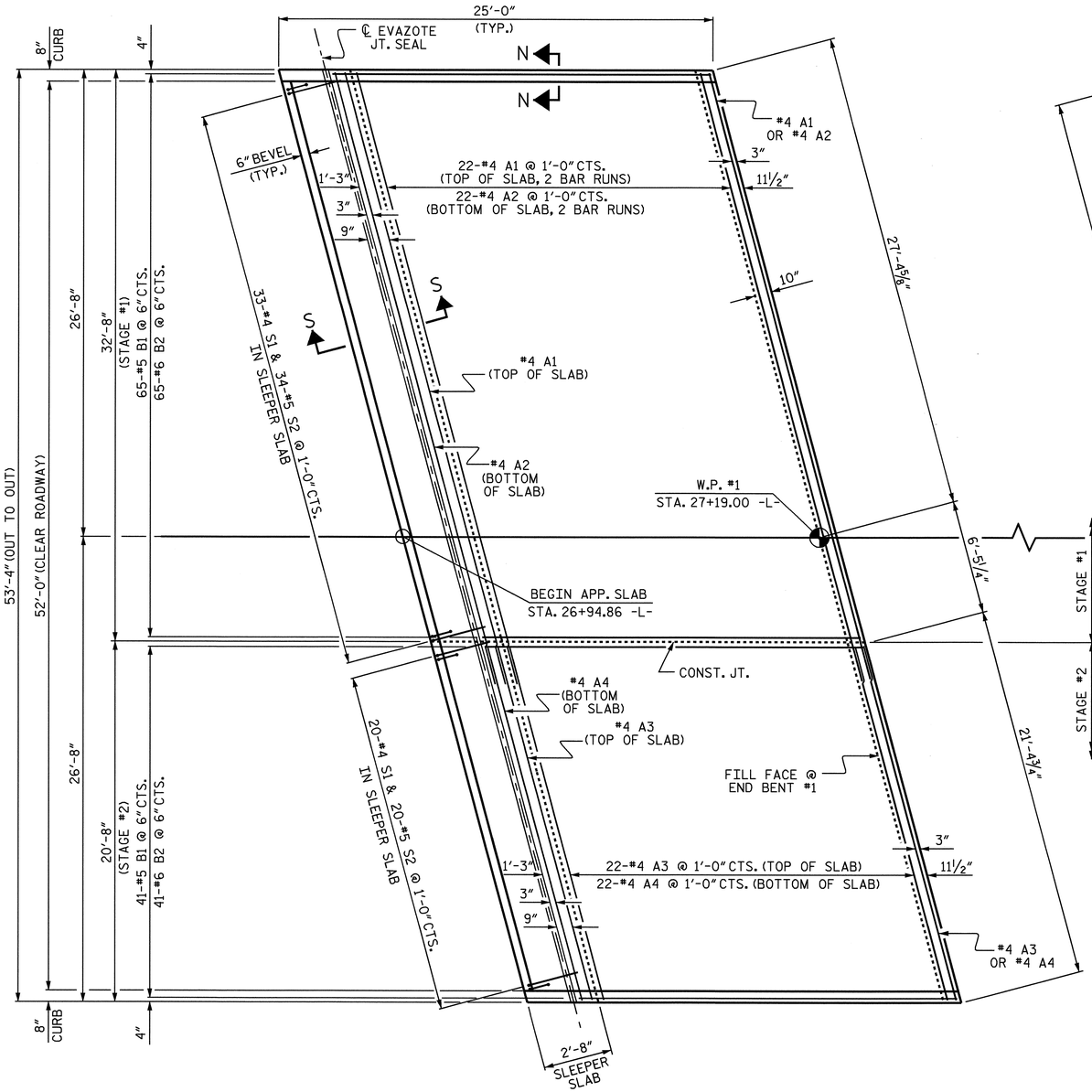
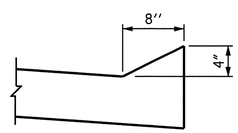


PLAN @ END BENT #1

PLAN @ END BENT #2

*4 "A" BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

EXTEND #4 A1 TOP BARS 2'-2" BEYOND CONST. JT. FOR 2'-0" SPLICE.
EXTEND #4 A2 BOTTOM BARS 1'-11" FOR 1'-9" SPLICE.



SECTION N-N

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
3/25/08

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

STAGE #1 & STAGE #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			70

STR. #1

DRAWN BY : R. G. EMERSON DATE : 04/07
CHECKED BY : J. P. ADAMS DATE : 04/07

20-MAR-2008 15:32
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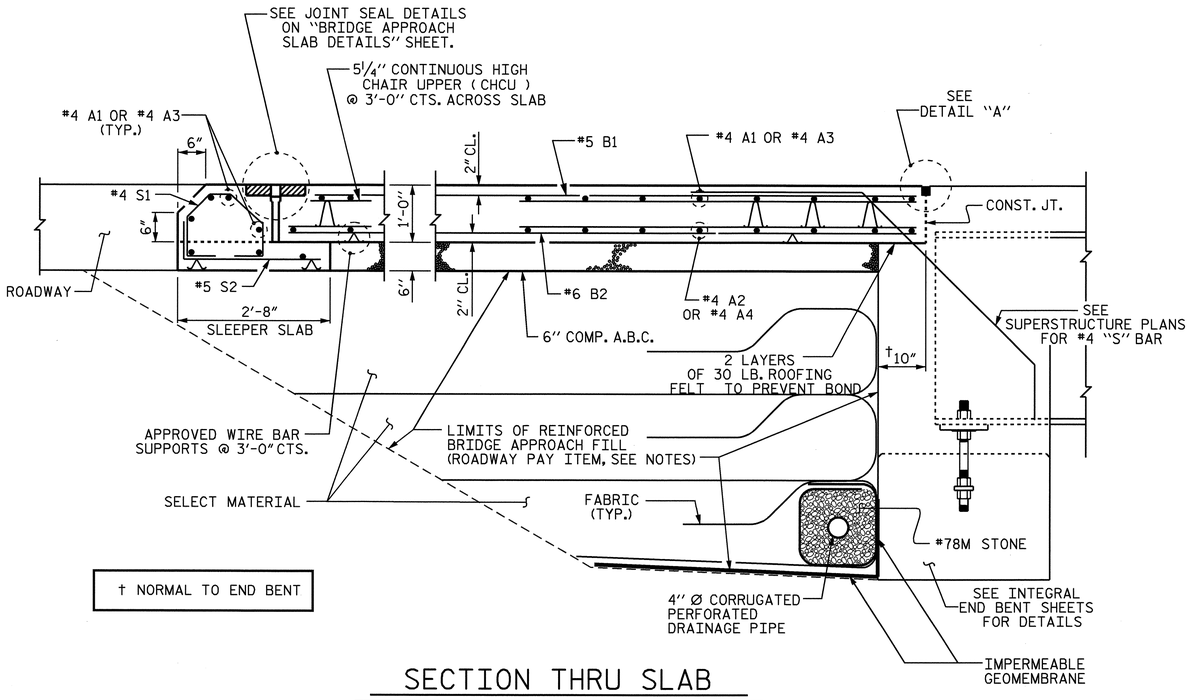
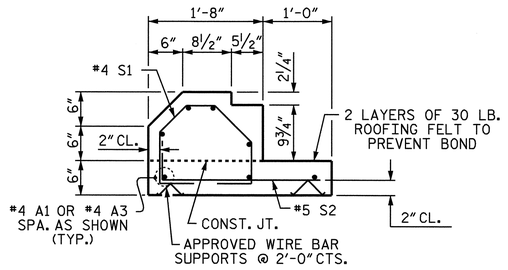
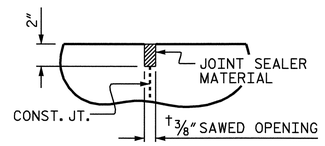


SECTION THRU SLAB

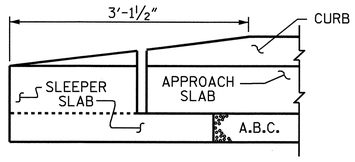


SECTION S-S

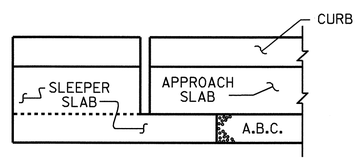
SHOWING SLEEPER SLAB



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



END OF CURB WITH SHOULDER BERM GUTTER

NOTES

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

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

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

THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE SLEEPER SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE SLEEPER SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

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

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

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 13/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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

BILL OF MATERIAL

APP. SLAB @ END BENT #1 STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	18'-11"	758
A2	48	#4	STR	18'-8"	599
* B1	65	#5	STR	22'-4"	1514
B2	65	#6	STR	22'-9"	2221
* S1	33	#4	1	3'-11"	86
S2	33	#5	2	2'-11"	100
REINFORCING STEEL				LBS.	2920
* EPOXY COATED REINFORCING STEEL				LBS.	2358
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C. Y.	29.2
POUR #2 - SLEEPER SLAB				C. Y.	3.5
TOTAL				C. Y.	32.7

APP. SLAB @ END BENT #2 STAGE 1

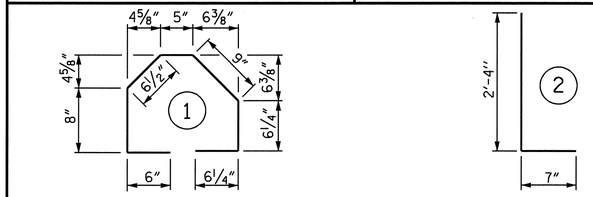
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	18'-11"	758
A2	48	#4	STR	18'-8"	599
* B1	65	#5	STR	22'-4"	1542
B2	65	#6	STR	22'-9"	2115
* S1	33	#4	1	3'-11"	86
S2	33	#5	2	2'-11"	100
REINFORCING STEEL				LBS.	2920
* EPOXY COATED REINFORCING STEEL				LBS.	2358
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C. Y.	29.2
POUR #2 - SLEEPER SLAB				C. Y.	3.5
TOTAL				C. Y.	32.7

APP. SLAB @ END BENT #1 STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	30	#4	STR	21'-1"	423
A4	24	#4	STR	21'-1"	338
* B1	41	#5	STR	22'-4"	955
B2	41	#6	STR	22'-9"	1401
* S1	20	#4	1	3'-11"	52
S2	20	#5	2	2'-11"	61
REINFORCING STEEL				LBS.	1800
* EPOXY COATED REINFORCING STEEL				LBS.	1430
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C. Y.	18.5
POUR #2 - SLEEPER SLAB				C. Y.	2.2
TOTAL				C. Y.	20.7

APP. SLAB @ END BENT #2 STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	30	#4	STR	21'-4"	428
A4	24	#4	STR	21'-1"	338
* B1	41	#5	STR	22'-4"	955
B2	41	#6	STR	22'-9"	1401
* S1	20	#4	1	3'-11"	52
S2	20	#5	2	2'-11"	61
REINFORCING STEEL				LBS.	1800
* EPOXY COATED REINFORCING STEEL				LBS.	1435
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C. Y.	18.5
POUR #2 - SLEEPER SLAB				C. Y.	2.2
TOTAL				C. Y.	20.7



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 27+69.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. WAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : R. G. EMERSON	DATE : 03/07
CHECKED BY : J. P. ADAMS	DATE : 03/07
DRAWN BY : TLA 10/05	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

20-MAR-2008 15:32
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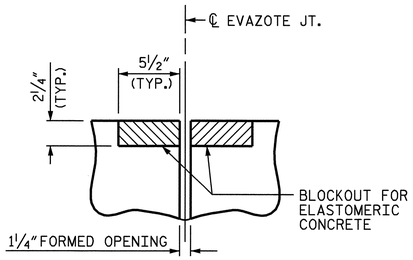
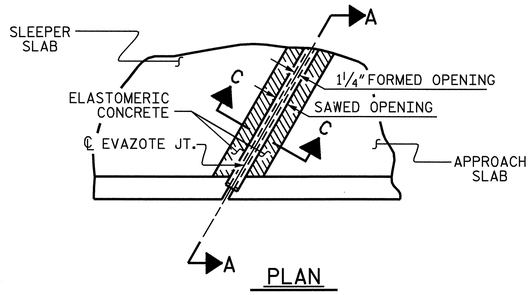
klayne

STR. #1

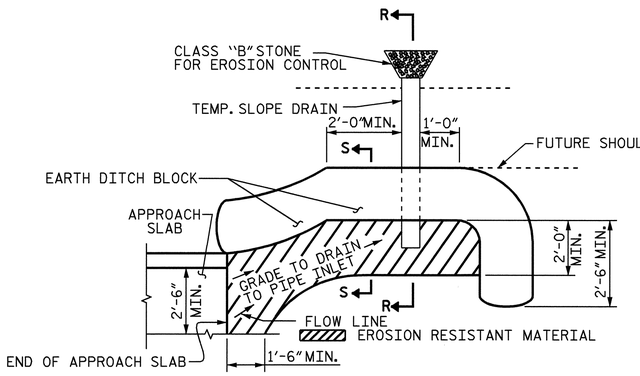
STD. NO. BAS11 (SHT 12)



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

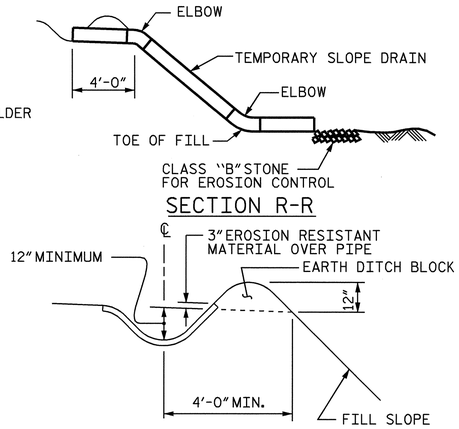


PLAN



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

PLAN VIEW

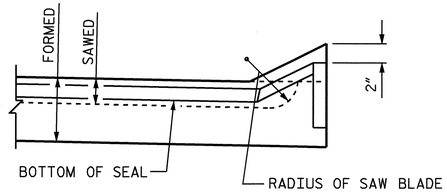


SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

SECTION C-C
EVAZOTE JOINT SEAL



SECTION A-A

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

ELASTOMERIC CONCRETE			
END BENT NO.	STAGE #1 (CU. FT.)	STAGE #2 (CU. FT.)	TOTAL ELASTOMERIC CONCRETE * (CU. FT.)
1	5.8	3.7	9.5
2	5.8	3.7	9.5
TOTAL	11.6	7.4	19.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 27+69.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. PAYNE
3/25/08

ASSEMBLED BY : R. G. EMERSON		DATE :	03/07
CHECKED BY : J. P. ADAMS		DATE :	03/07
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/1/03	RWW/JTE
		REV. 5/1/06	TLA/GM

20-MAR-2008 15:32
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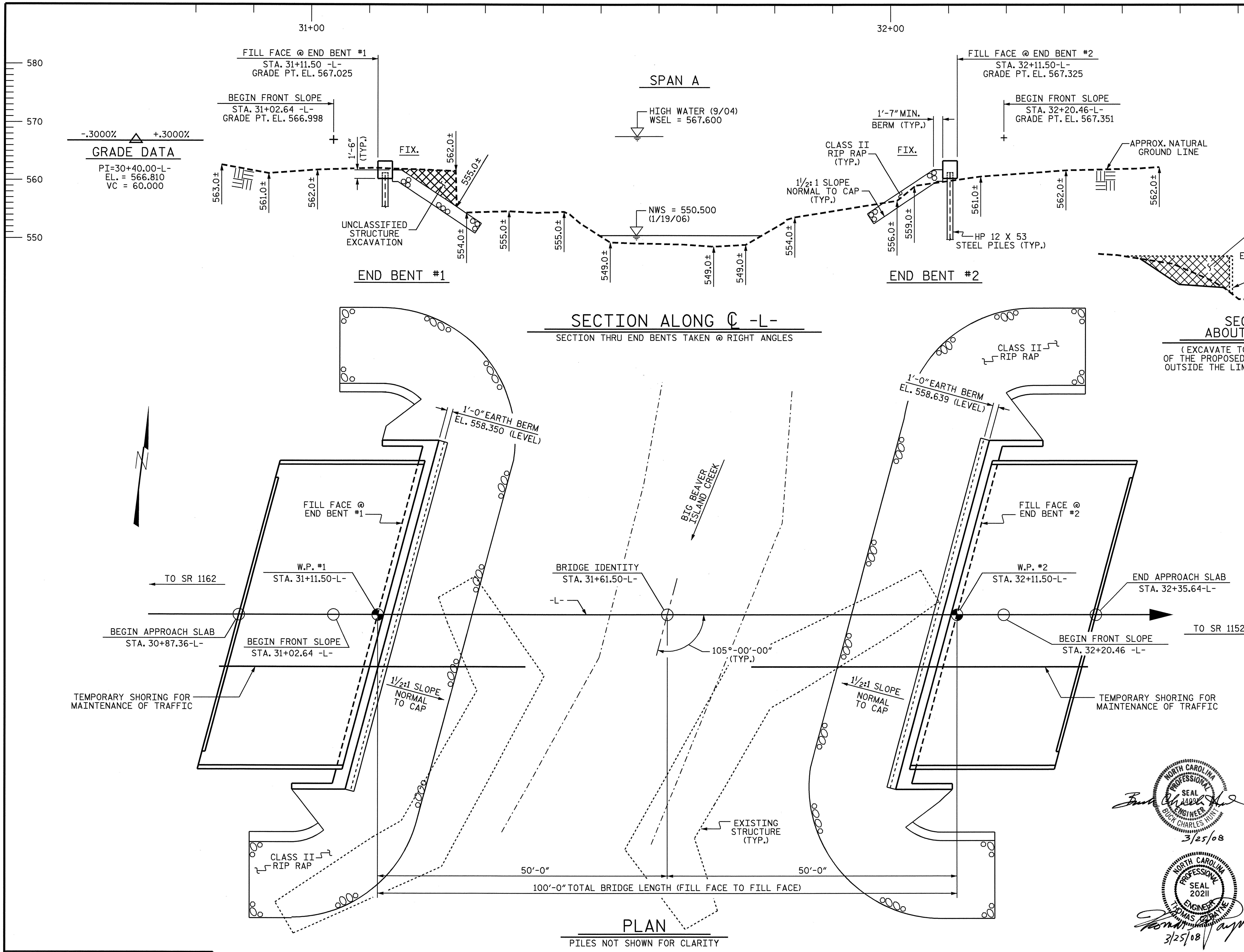
klayne

STR. #1 STD. NO. BAS10 (SHT 7)

F. A. PROJECT NO. BRSTP-311(22)



PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50-L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 95

NORTH CAROLINA PROFESSIONAL SEAL 14928 ENGINEER BUCK CHARLES HUNT
3/25/08

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS D. LAYNE
3/25/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER BIG BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			70

STR.#2

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

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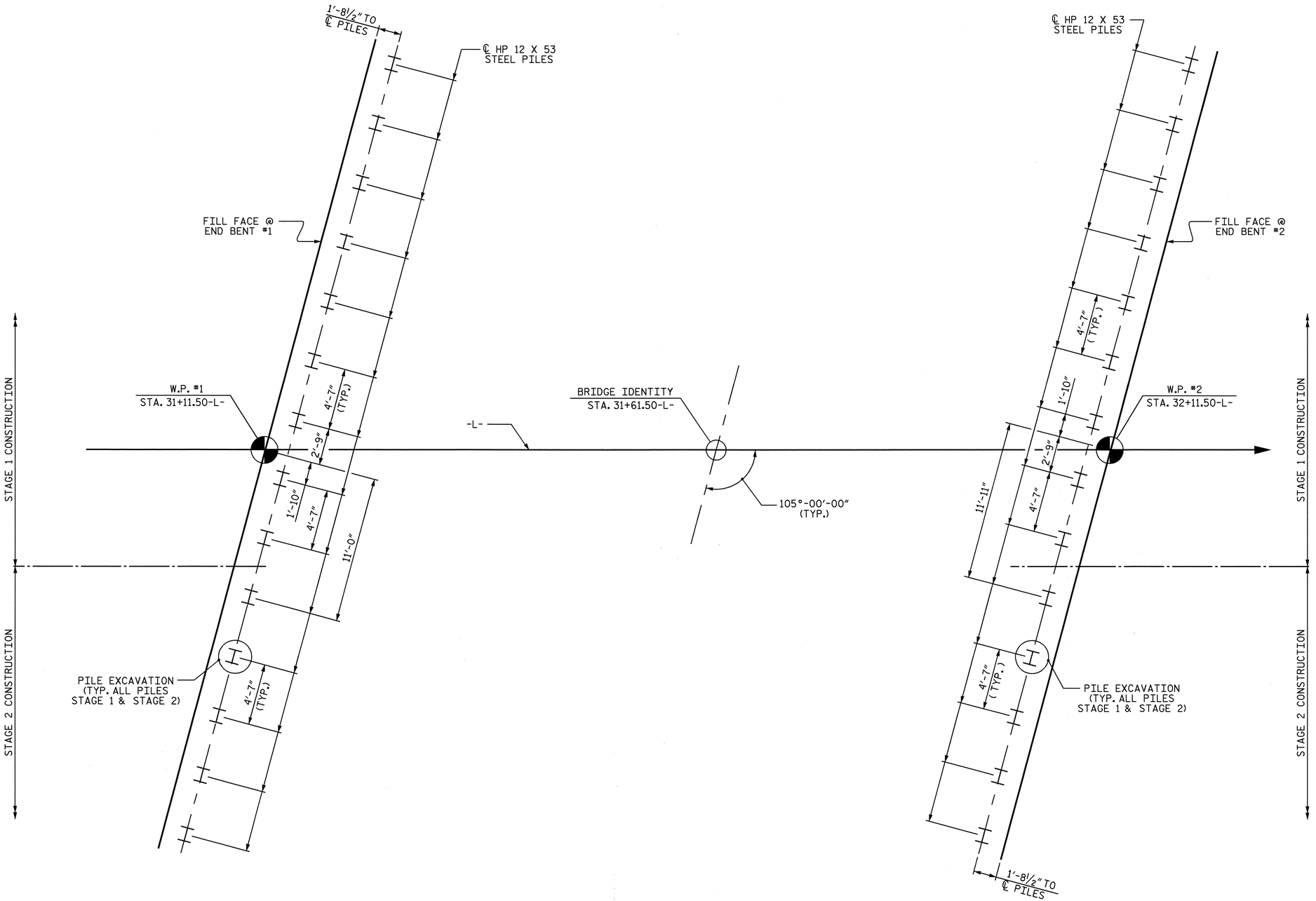

END BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

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

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

DRIVE PILES AT END BENT #1 AND END BENT #2 TO A TIP ELEVATION NO HIGHER THAN 544.000.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT #1 AND END BENT #2. EXCAVATE HOLES TO ELEVATION 544.000. SEE PILE EXCAVATION FOR INTEGRAL ABUTMENT SPECIAL PROVISION.

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

29-MAY-2008 13:21
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klayne

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
6/4/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

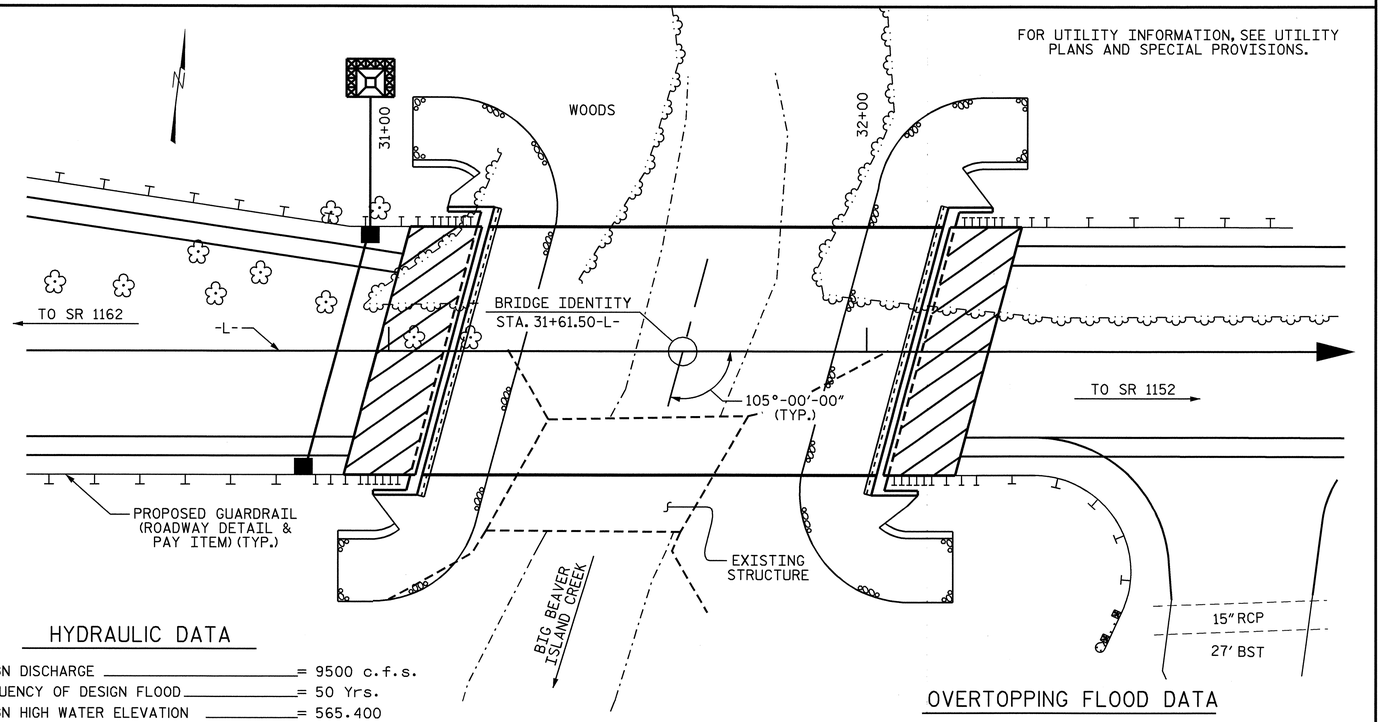
GENERAL DRAWING

FOR BRIDGE OVER BIG BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			70

STR. #2

BM#3 R/R SPIKE SET IN BASE OF 28" WALNUT 73.04 FT. LEFT OF STA. 25+85.70 -L- ELEV. 565.280



HYDRAULIC DATA

DESIGN DISCHARGE	= 9500 c.f.s.
FREQUENCY OF DESIGN FLOOD	= 50 Yrs.
DESIGN HIGH WATER ELEVATION	= 565.400
DRAINAGE AREA	= 23.8 Sq.MI.
BASIC DISCHARGE (Q100)	= 11800 c.f.s.
BASIC HIGH WATER ELEVATION	= 568.800

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 10096 c.f.s.
FREQUENCY OF OVERTOPPING FLOOD	= 50+ YRS.
OVERTOPPING FLOOD ELEVATION	= 566.900

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS HAVE BEEN DESIGNED FOR HS25.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLE 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.

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 ARTICLE ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING STRUCTURE CONSISTS OF 9 LINES OF W21 X 68 I-BEAMS AT 3'-3" CENTERS IN ONE SPAN OF 41'-0". THE CLEAR ROADWAY WIDTH IS 25.9' AND THE DECK IS REINFORCED CONCRETE WITH AN ASPHALT WEARING SURFACE. THE SPAN IS SUPPORTED BY ABUTMENTS OF MASS CONCRETE ON PILES. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED BETWEEN -L- AND 55± FEET RIGHT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE."

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

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

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVSIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR SHIPPING STEEL STRUCTURAL MEMBERS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. LAYNE

6/4/08

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		2 BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	EVAZOTE JOINT SEALS	ELECTRICAL CONDUIT SYSTEM
	LUMP SUM	LIN. FT.	LIN. FT.	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	APPROX. LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			725	5,364	7,034				173,800			180.92	196.55			LUMP SUM	LUMP SUM
END BENT NO. 1		172	37				28.1		4,373		14	210			320	355		
END BENT NO. 2		167	44				28.0		4,374		14	210			260	285		
TOTAL	LUMP SUM	339	81	725	5,364	7,034	56.1	LUMP SUM	8,747	173,800	28	420	180.92	196.55	580	640	LUMP SUM	LUMP SUM

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER BIG BEAVER ISLAND CREEK ON US 311 BETWEEN SR 1152 AND SR 1162

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			70

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

29-MAY-2008 13:21
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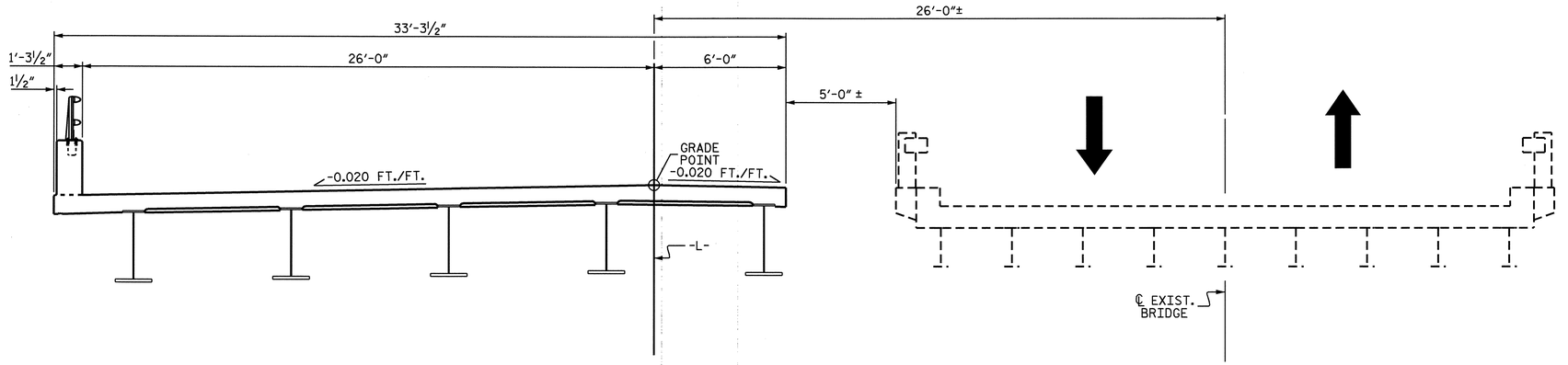
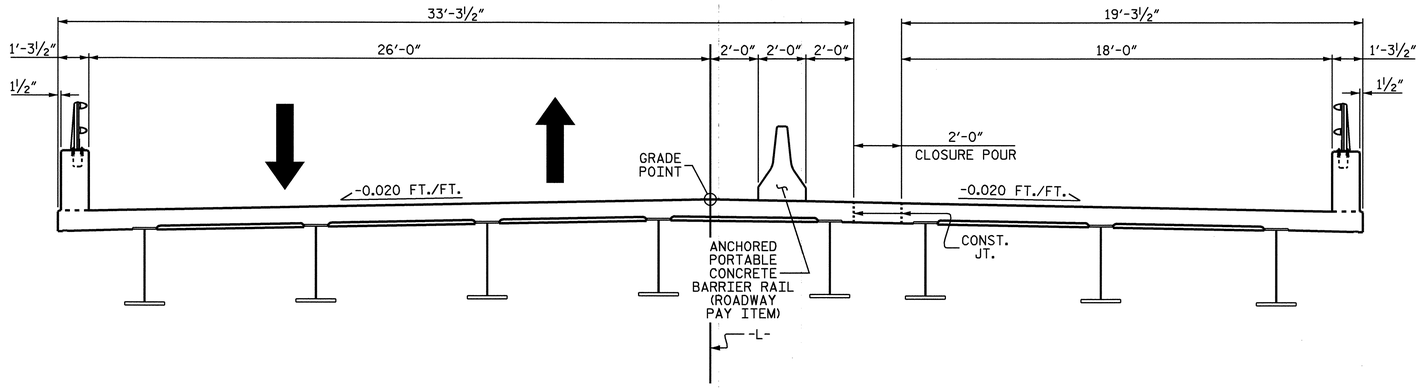
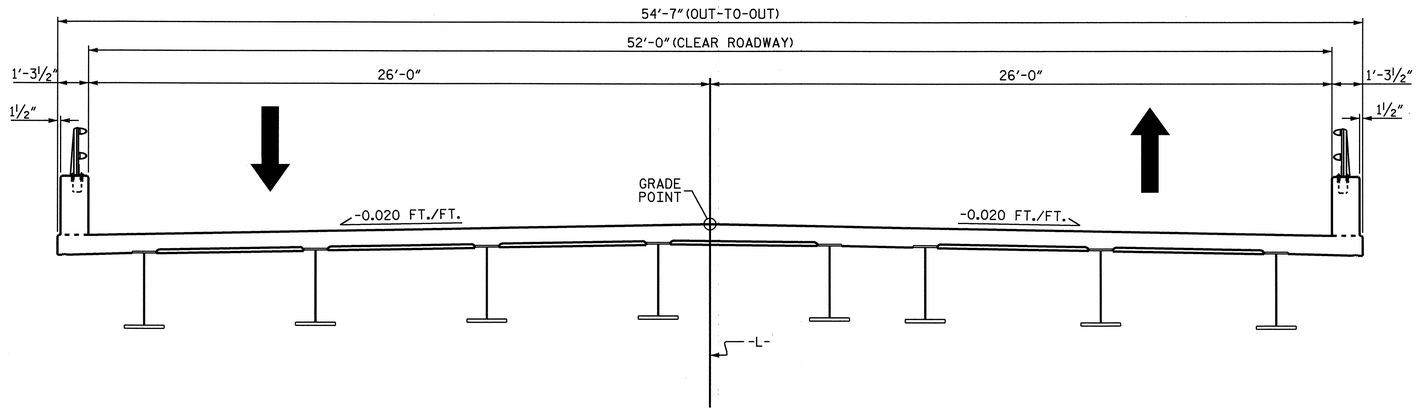
STR.#2



STAGE 1



STAGE 2



FINAL TYPICAL SECTION

NOTES

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER RAIL.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. KLAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 10/07

29-MAY-2008 13:19
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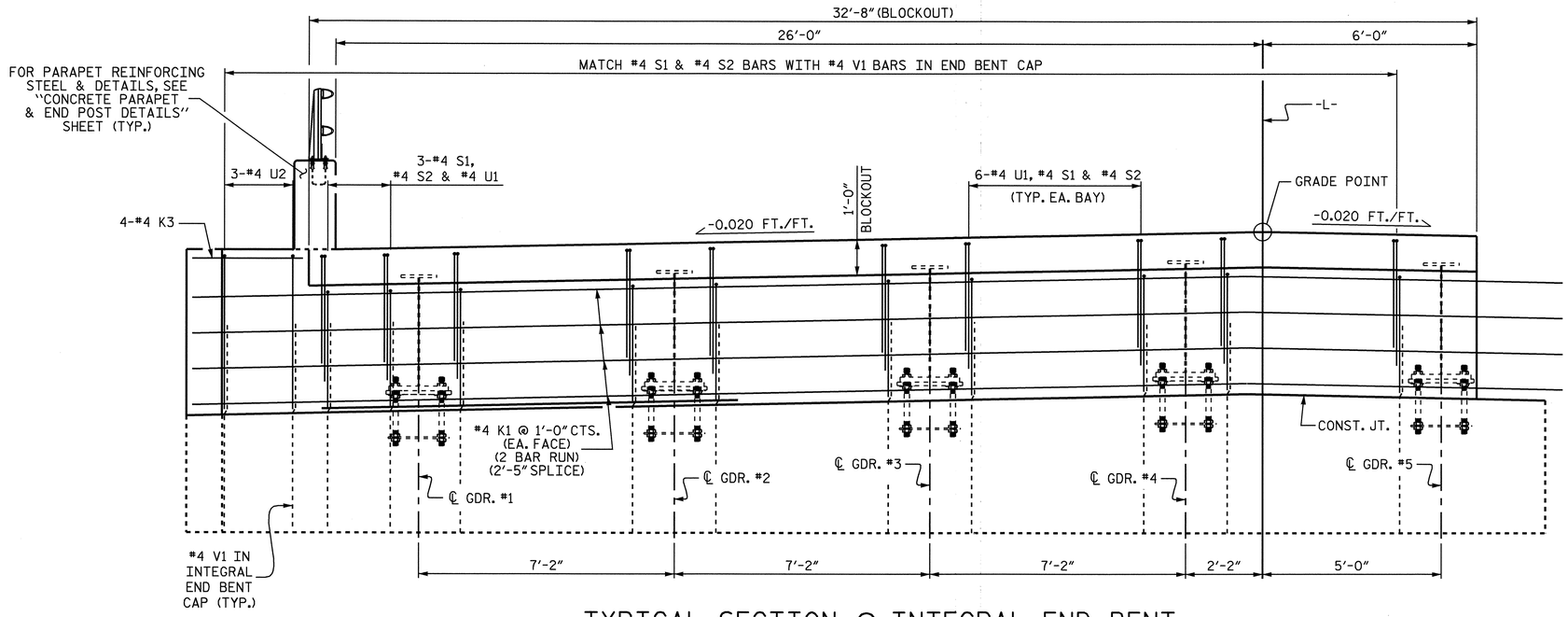
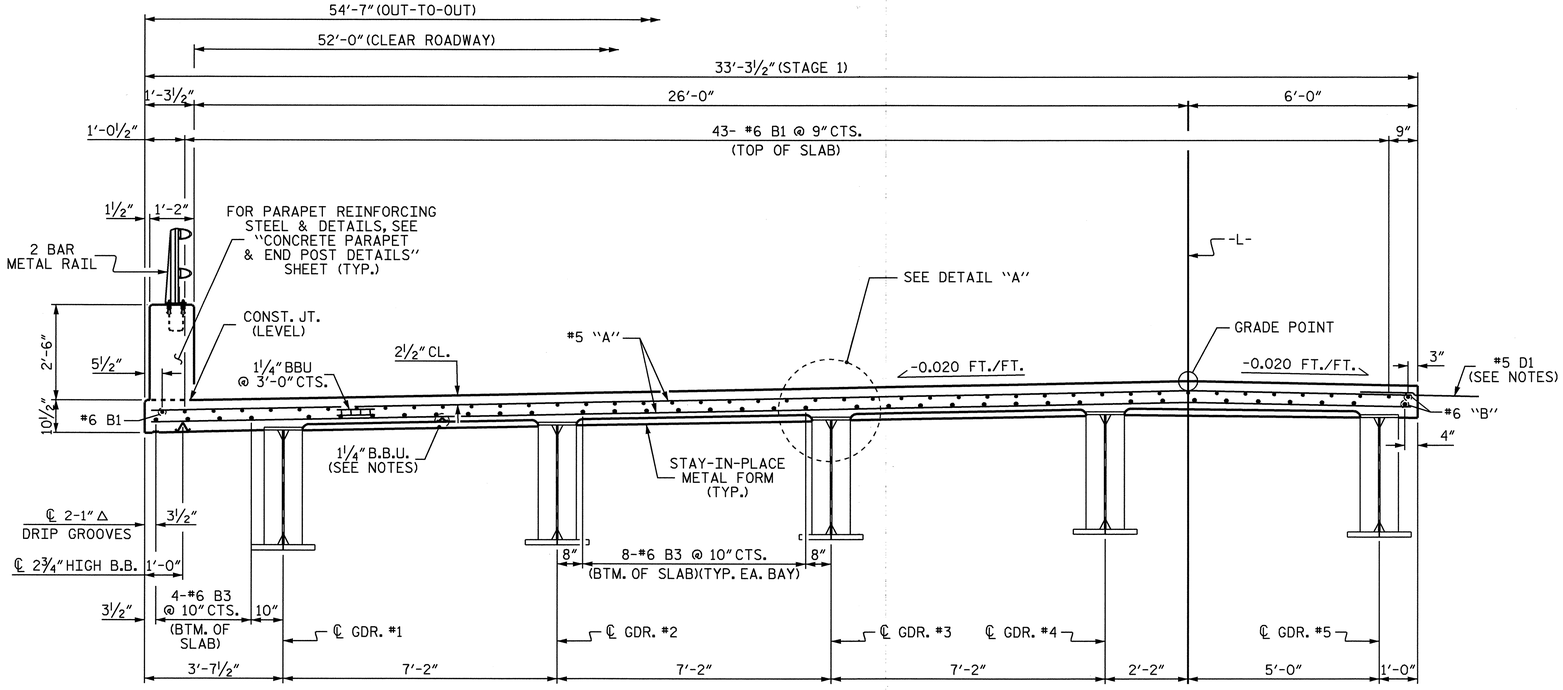
STR. #2



TYPICAL SECTION @ INTEGRAL END BENT

(DECK REINFORCEMENT NOT SHOWN FOR CLARITY)



TYPICAL SECTION @ INTEGRAL END BENT

(SHOWING DECK REINFORCEMENT, REINFORCEMENT IN ABUTMENT NOT SHOWN FOR CLARITY)

NOTES

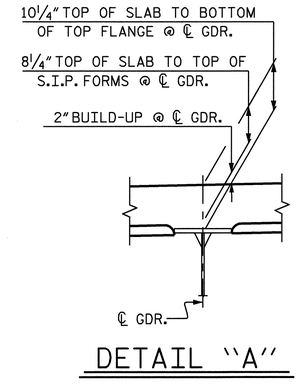
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.



DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS E. PAYNE
6/4/08

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

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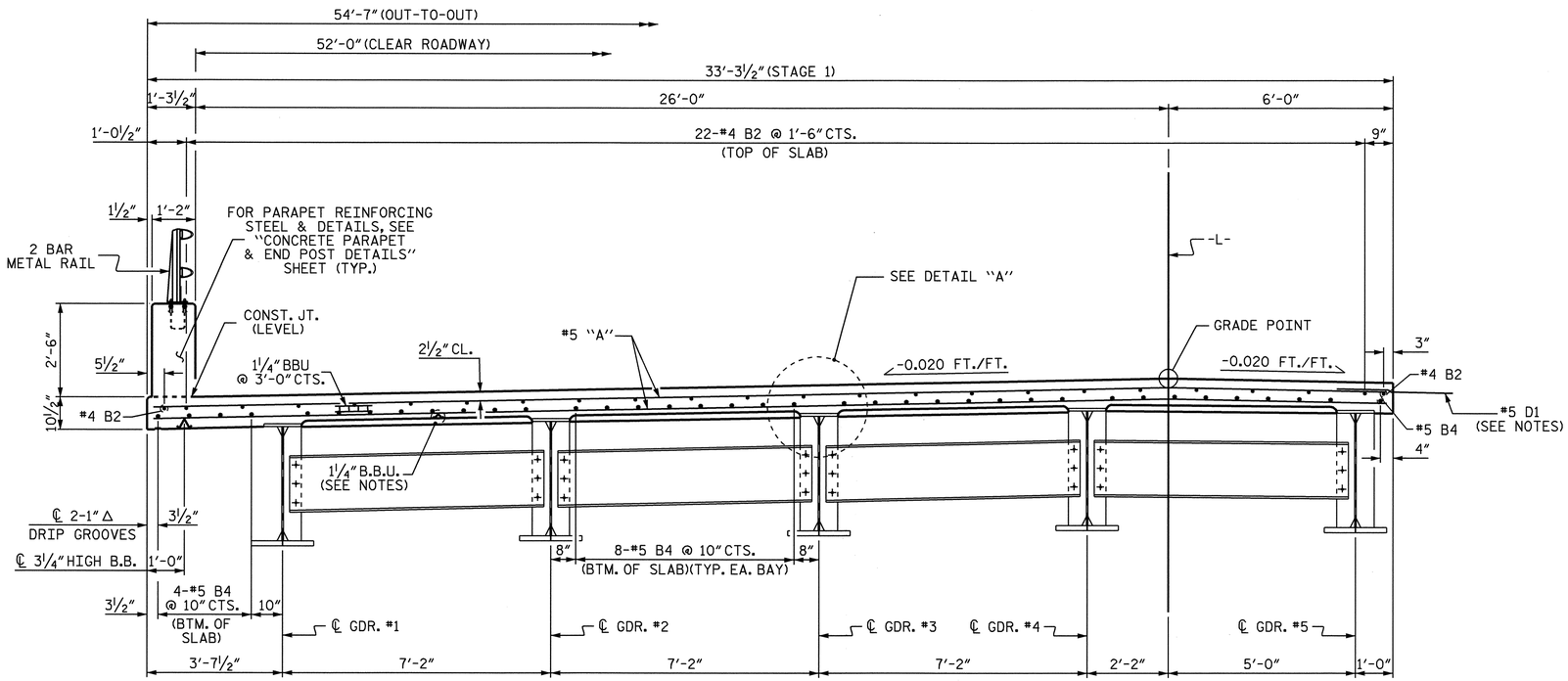

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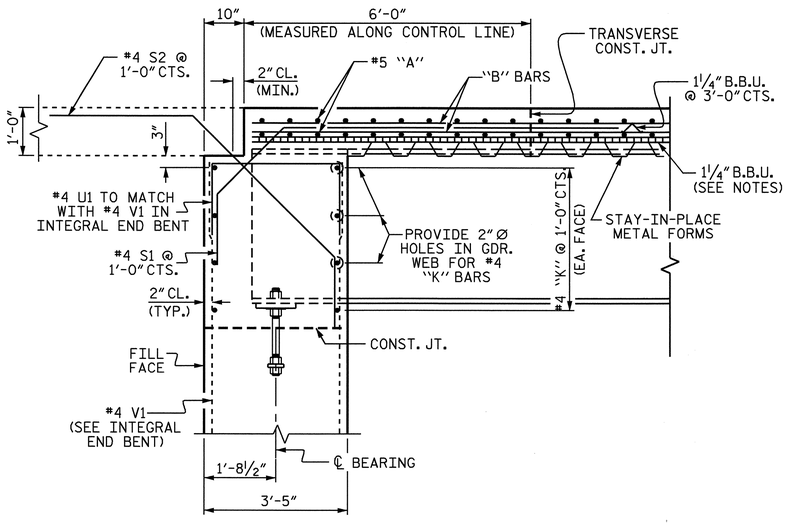
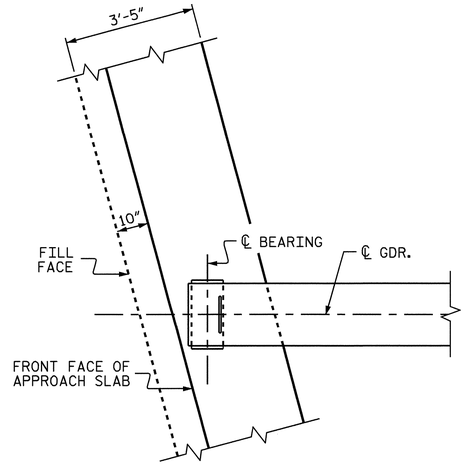
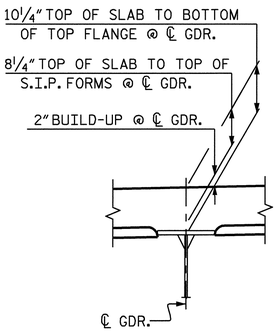


SECTION THRU INTEGRAL END BENT



PLAN OF GIRDER @ END BENT #1

END BENT #1 SHOWN, END BENT #2 SIMILAR



DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			70

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 13:57
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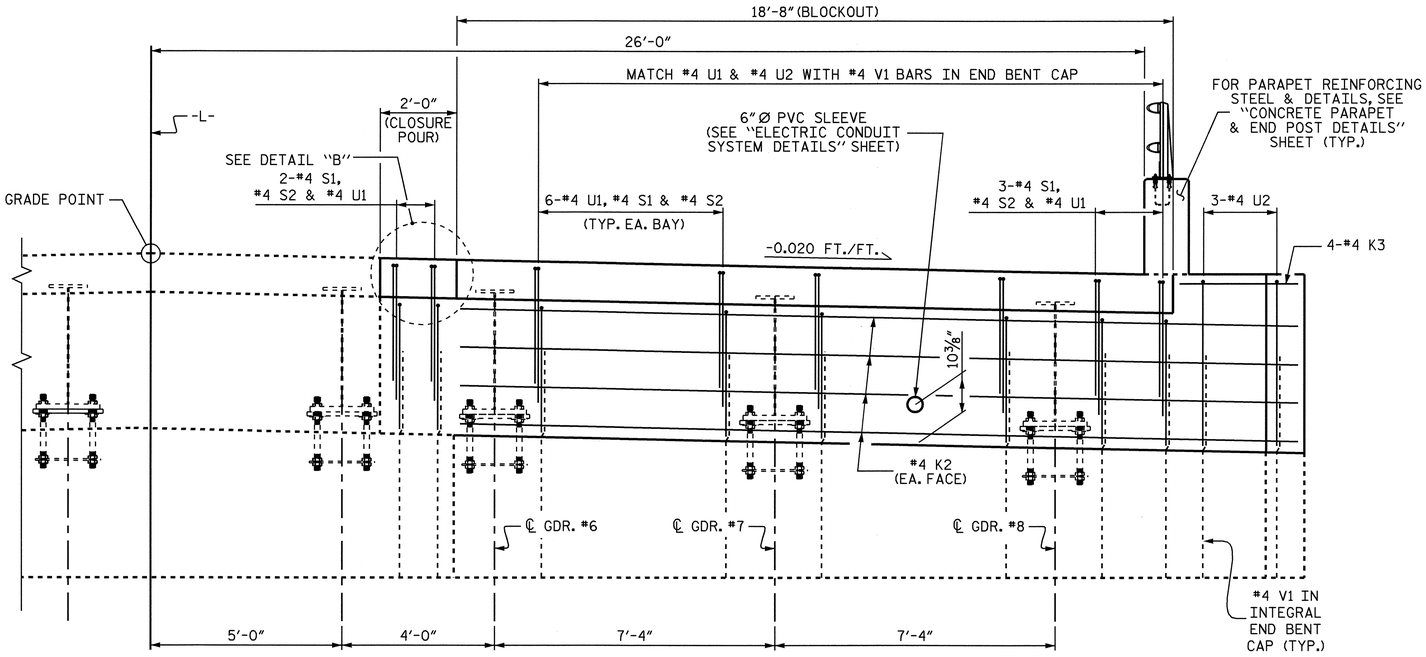
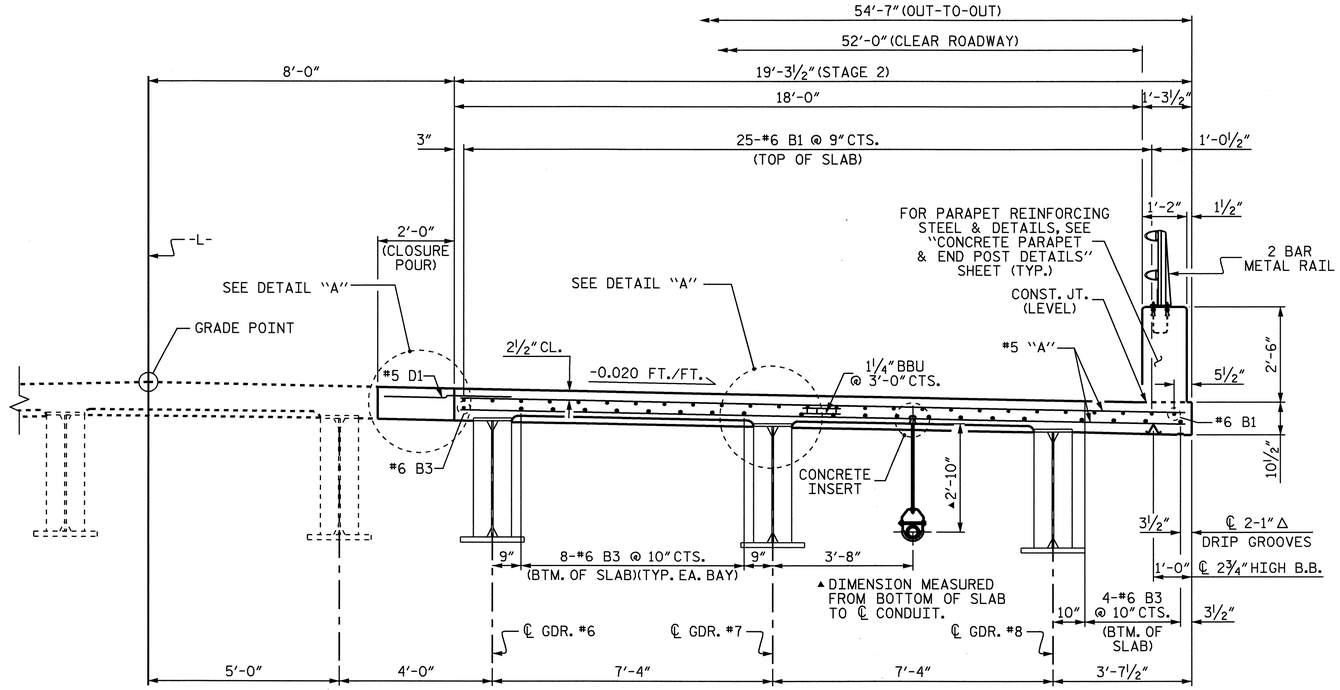


TYPICAL SECTION @ INTEGRAL END BENT

(DECK REINFORCEMENT NOT SHOWN FOR CLARITY)



TYPICAL SECTION @ INTEGRAL END BENT

(SHOWING DECK REINFORCEMENT, REINFORCEMENT IN ABUTMENT NOT SHOWN FOR CLARITY)

NOTES

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

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

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

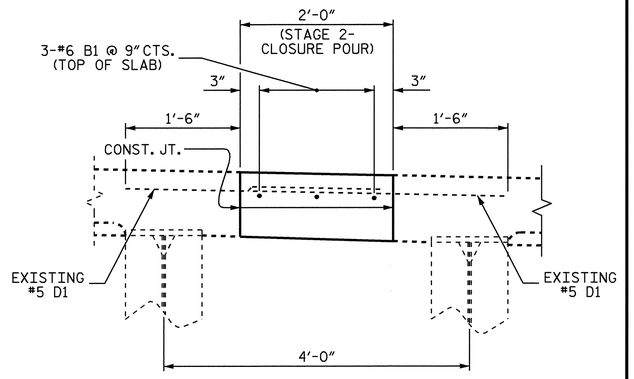
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING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

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.

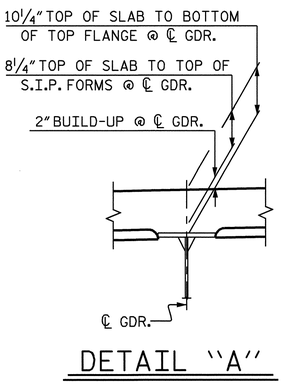
FOR LOCATION AND DETAILS OF MULTI-CELL RACEWAY, HANGER ASSEMBLY, AND CONCRETE INSERTS, SEE "ELECTRICAL CONDUIT SYSTEM DETAILS" SHEET.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE ELECTRICAL CONDUIT SYSTEM THROUGH THE INTEGRAL END BENT. REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR THE CONDUIT.



DETAIL "B"



DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G PAYNE
6/4/08

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 13:59
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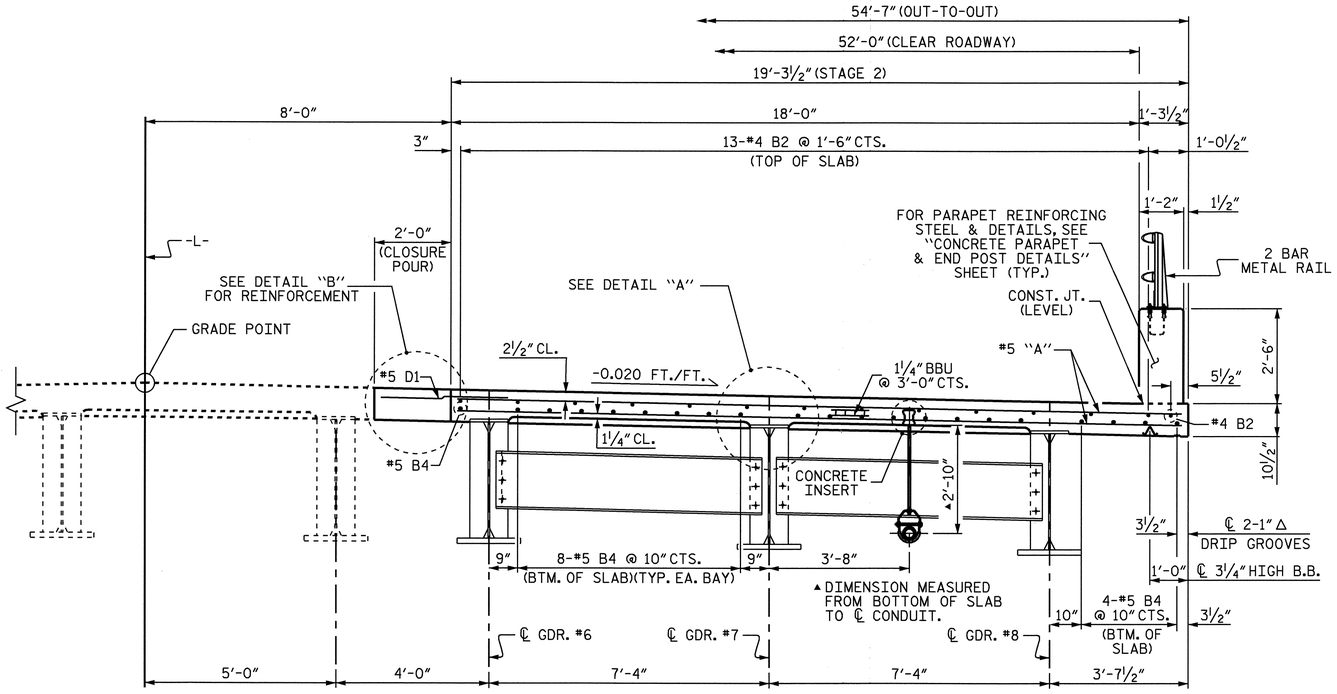
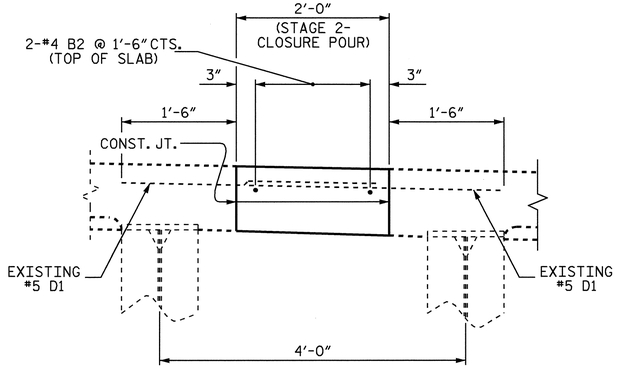
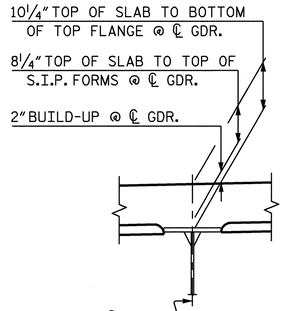
tpayne



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM



DETAIL "B"



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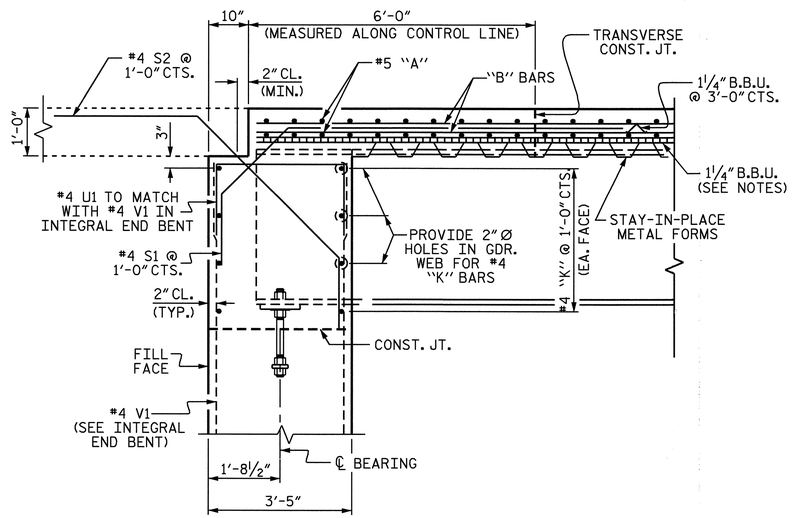
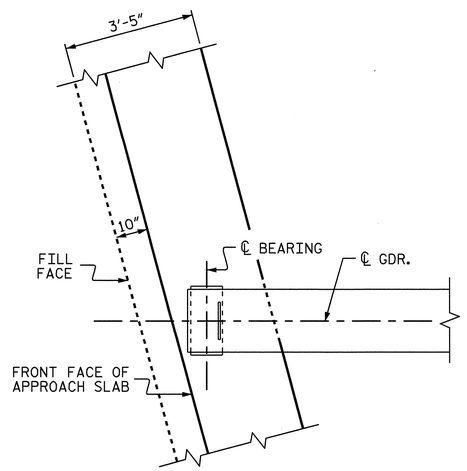


SECTION THRU INTEGRAL END BENT



PLAN OF GIRDER @ END BENT #1

END BENT #1 SHOWN, END BENT #2 SIMILAR

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			70

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS E. PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 14:02
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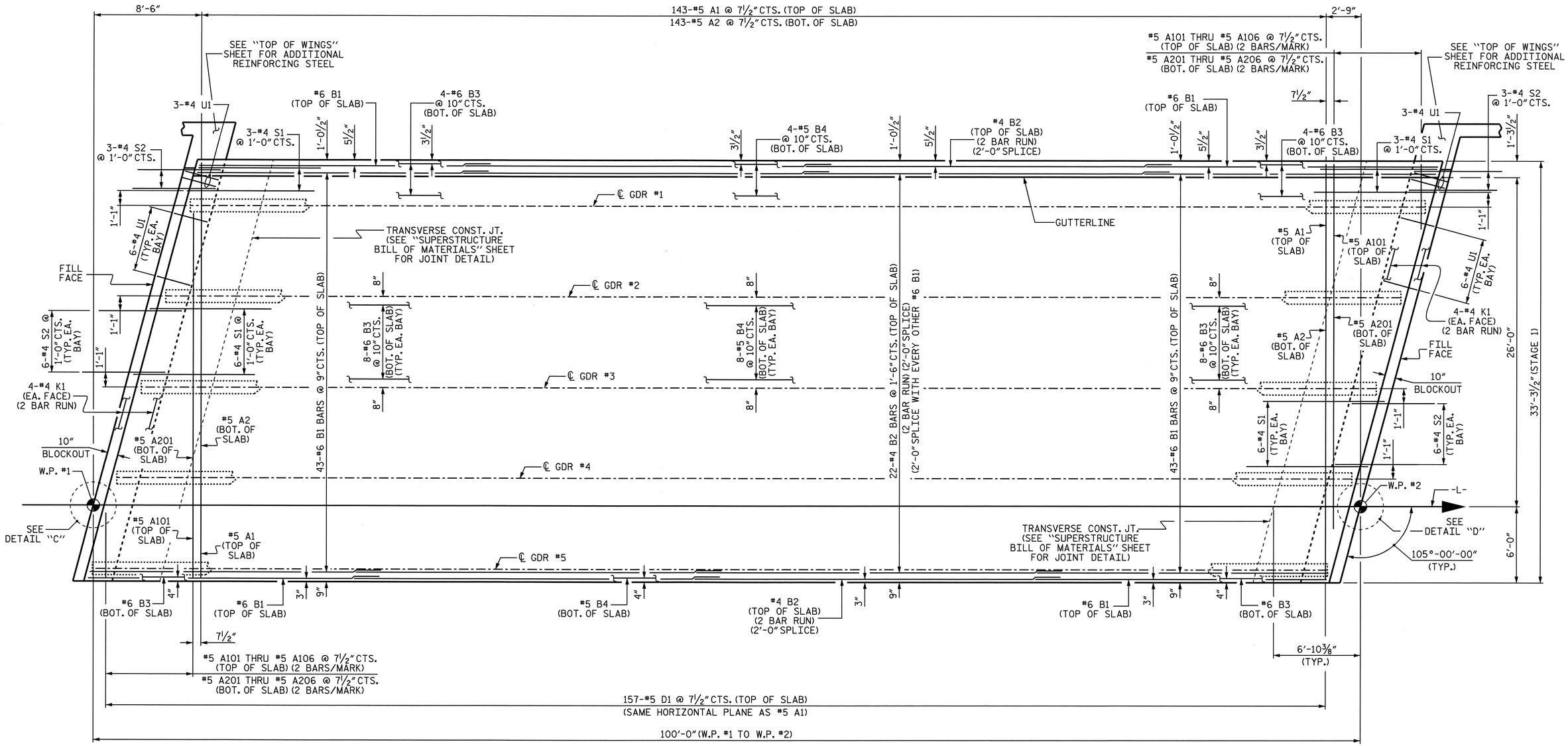
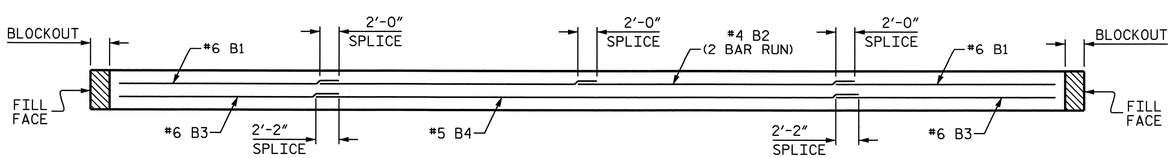
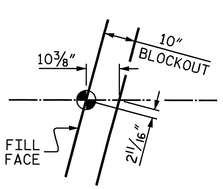
tpayne



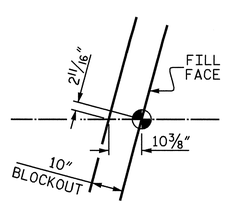
PLAN OF SPAN



SCHEMATIC DIAGRAM OF SLAB



DETAIL "C"



DETAIL "D"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS BERRYHILL
3/25/08

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

20-MAR-2008 15:35
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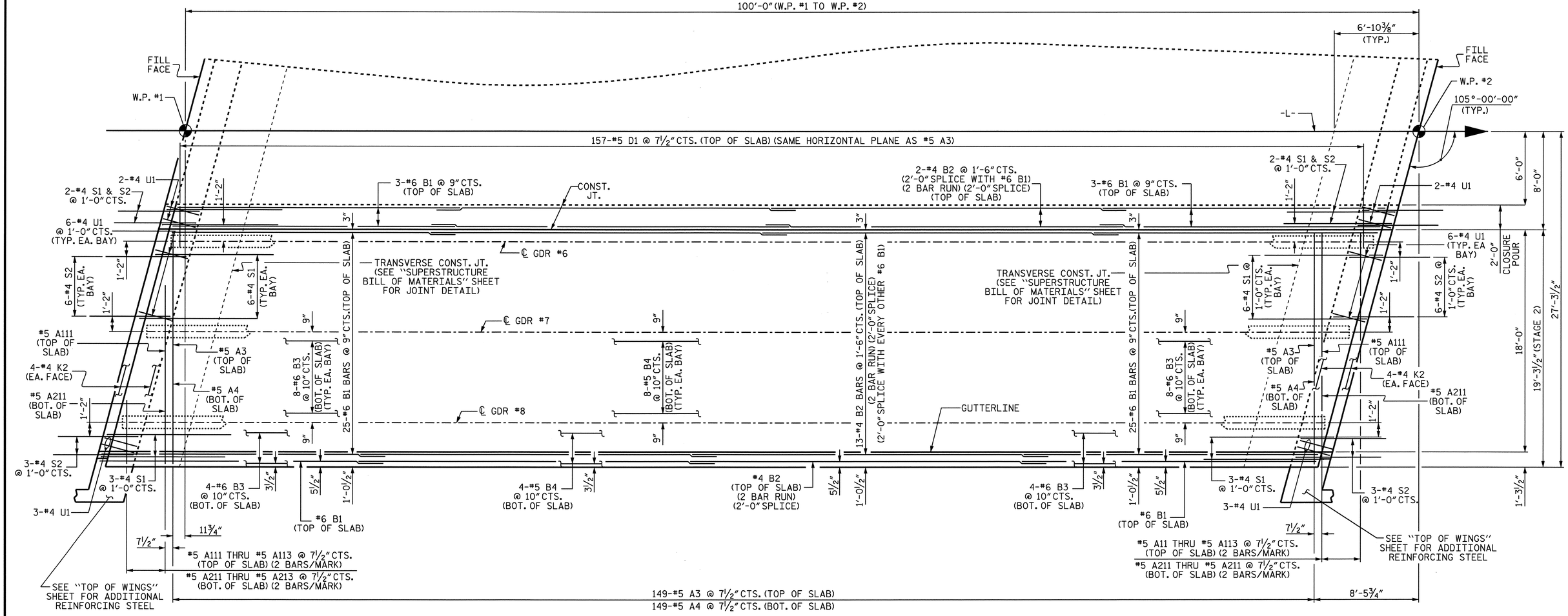
klayne



PLAN OF SPAN

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

(STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			70

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

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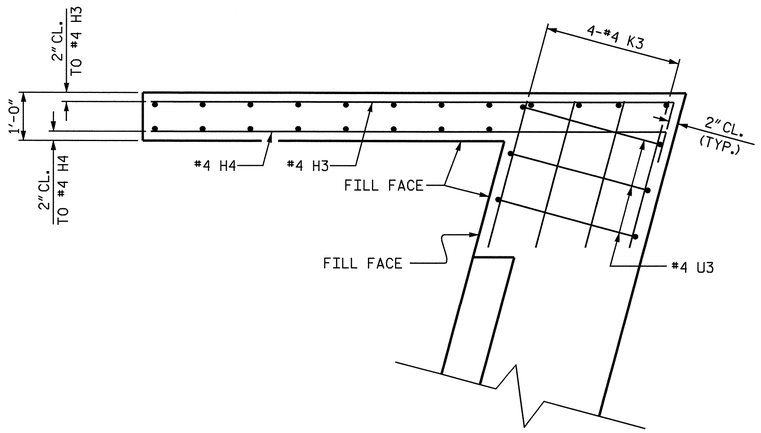
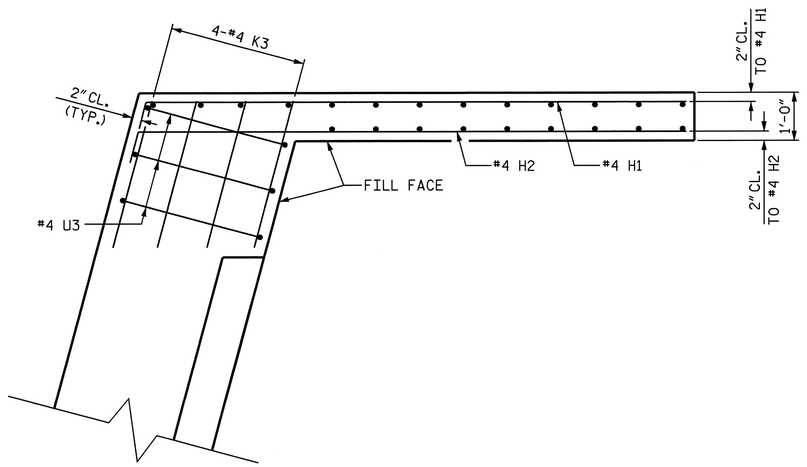
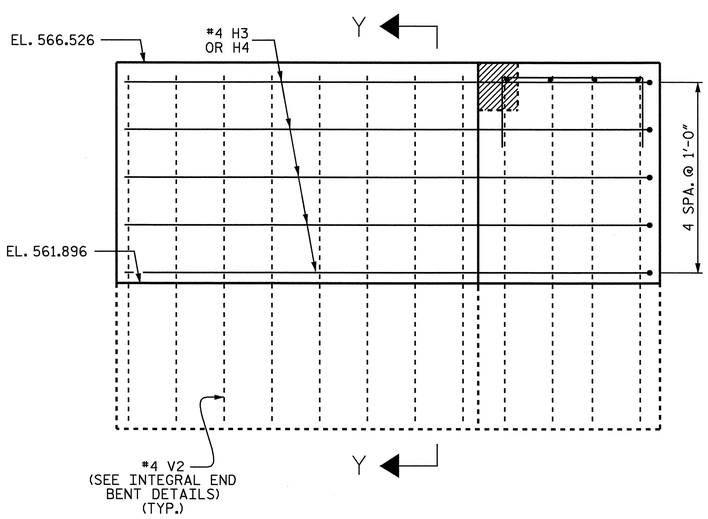


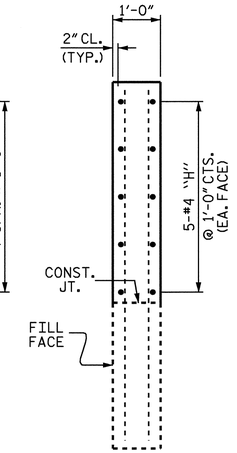
PLAN OF WING-W1
(STAGE 1)



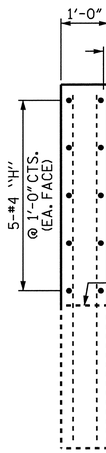
PLAN OF WING-W2
(STAGE 2)



ELEVATION OF WING-W1
(STAGE 1)



SECTION X-X



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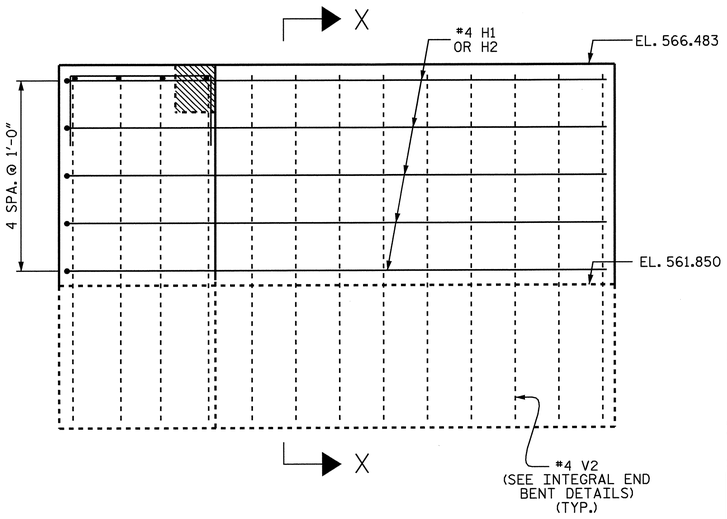

ELEVATION OF WING-W2
(STAGE 2)

NOTE: LOWER PORTION OF WINGS BUILT WITH INTEGRAL END BENTS.

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP OF WINGS
END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS C. PAINE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 12/07

20-MAR-2008 15:35
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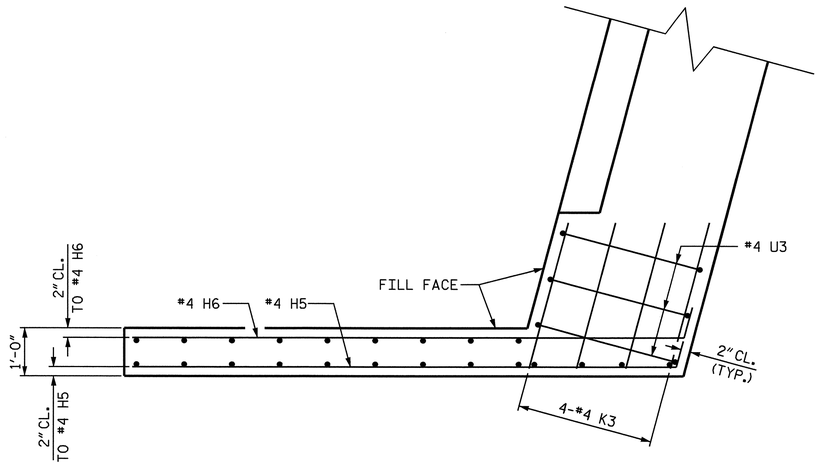
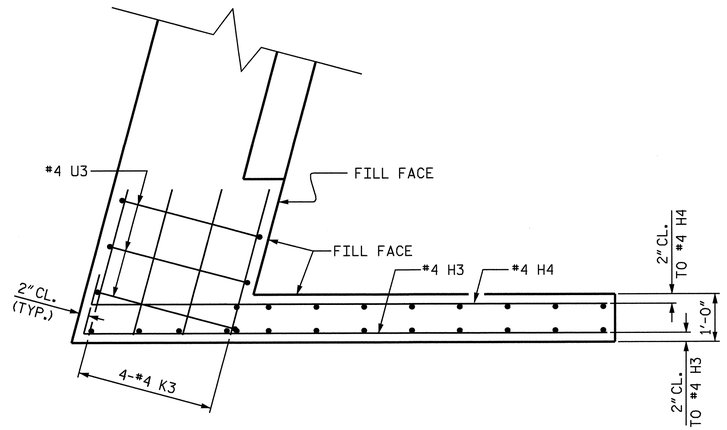
klayne

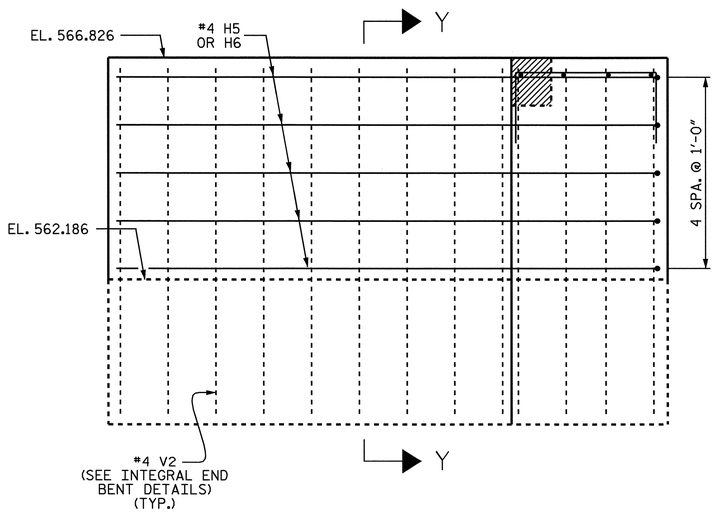
STR.#2



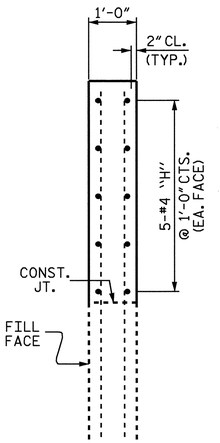
PLAN OF WING-W1
(STAGE 1)



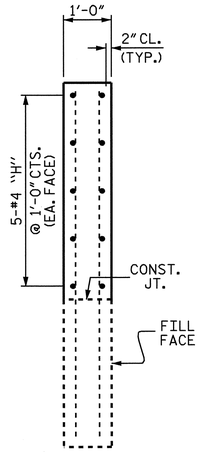
PLAN OF WING-W2
(STAGE 2)



ELEVATION OF WING-W1
(STAGE 1)



SECTION X-X



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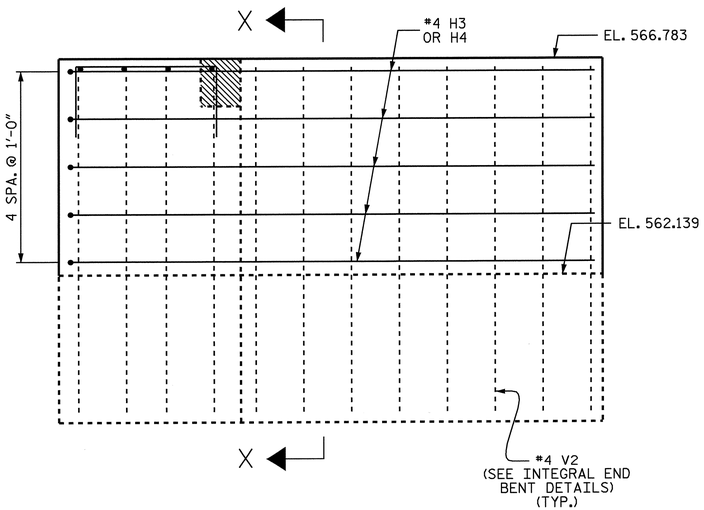

ELEVATION OF WING-W2
(STAGE 2)

NOTE: LOWER PORTION OF WINGS BUILT WITH INTEGRAL END BENTS.

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP OF WINGS
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			70

STR.#2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS E. PAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 12/07

20-MAR-2008 15:35
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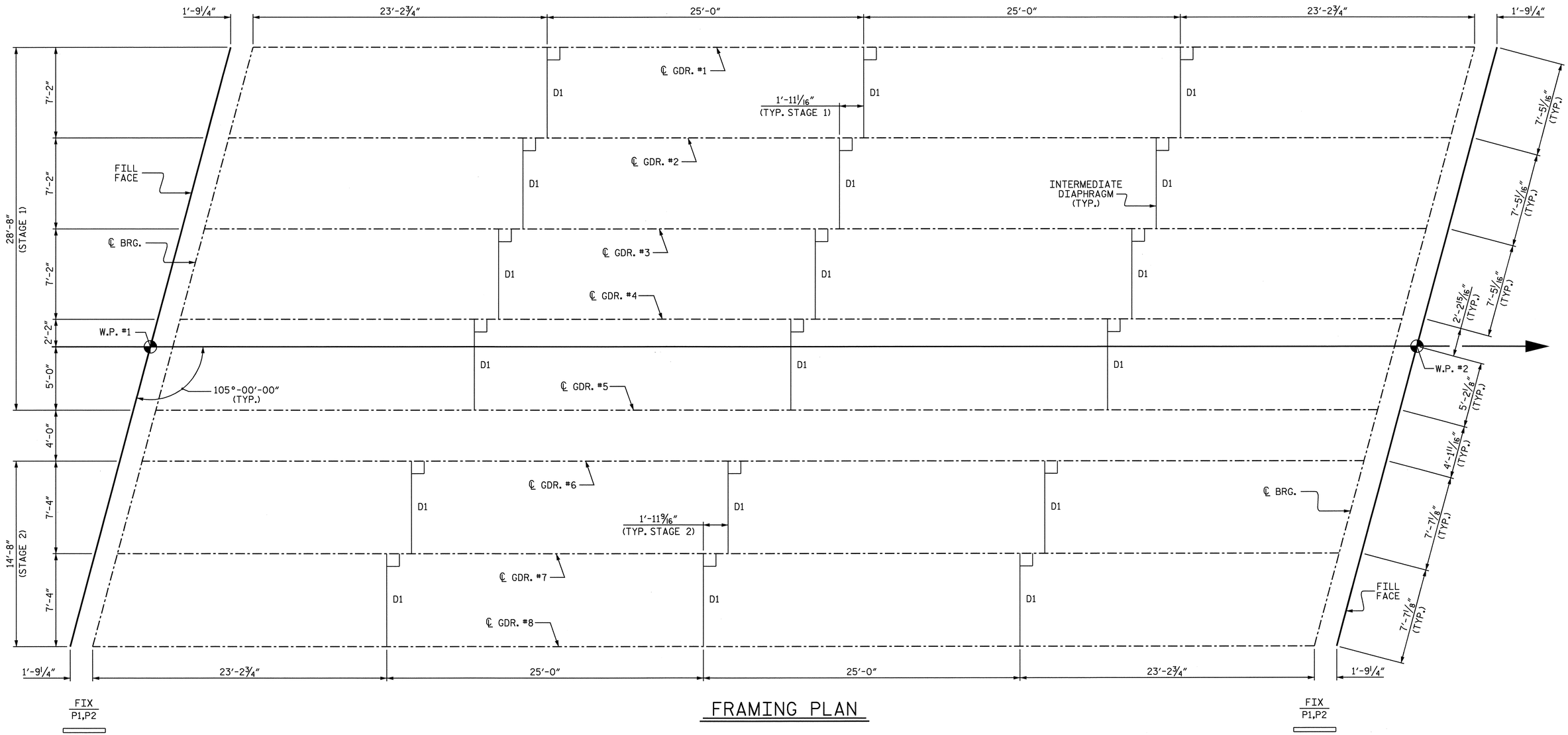
klayne



FRAMING PLAN

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.028	-0.052	-0.072	-0.084	-0.088	-0.084	-0.072	-0.052	-0.028	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.107	-0.200	-0.273	-0.319	-0.335	-0.319	-0.273	-0.200	-0.107	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	0.000	-0.009	-0.018	-0.024	-0.029	-0.030	-0.029	-0.024	-0.018	-0.009	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.144	-0.270	-0.369	-0.432	-0.453	-0.432	-0.369	-0.270	-0.144	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0"	1¾"	3¼"	4 7/16"	5 3/16"	5 7/16"	5 3/16"	4 7/16"	3¼"	1¾"	0"

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

SIGN CONVENTION FOR DEAD LOAD DEFLECTION + 0 -

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN AND DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE 6/4/08

STR.#2

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 15:41
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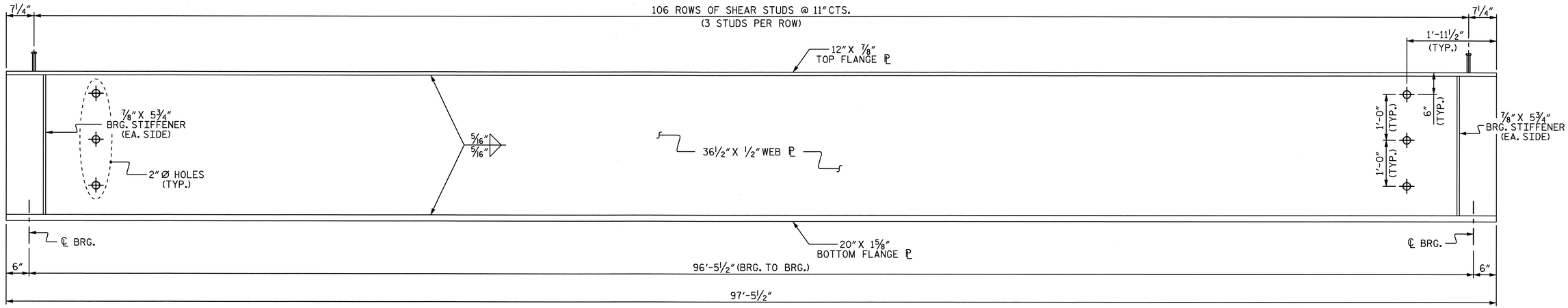
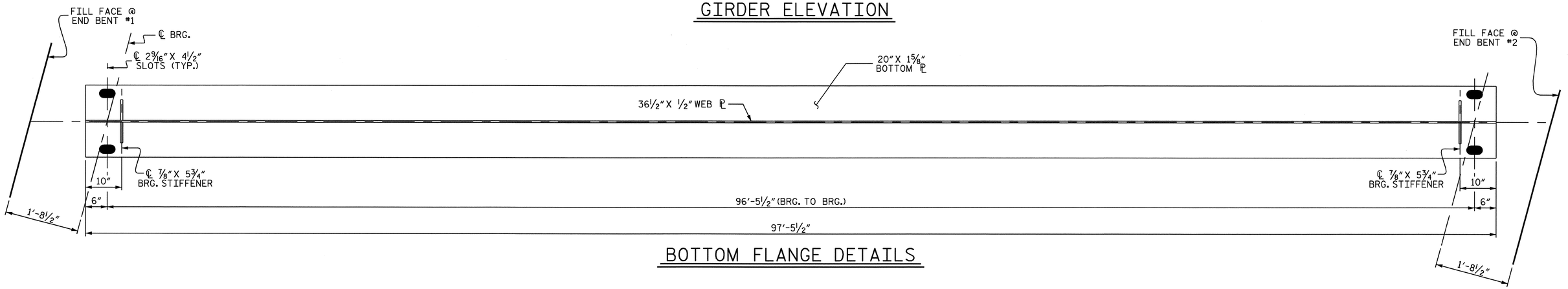
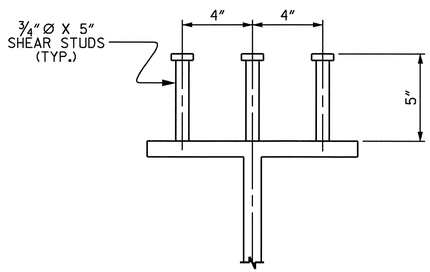


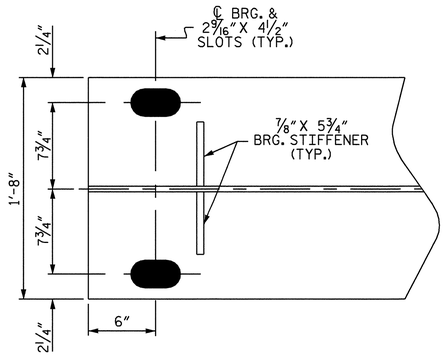
GIRDER ELEVATION



BOTTOM FLANGE DETAILS



SHEAR STUD DETAILS



PARTIAL BOTTOM FLANGE DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G PAYNE
6/4/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 14:58
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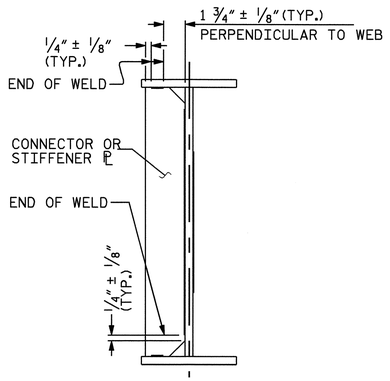
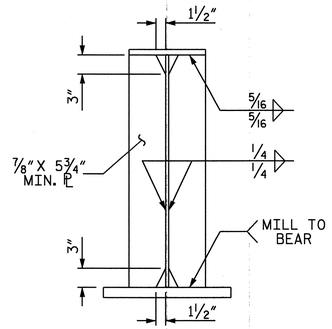
STR.#2



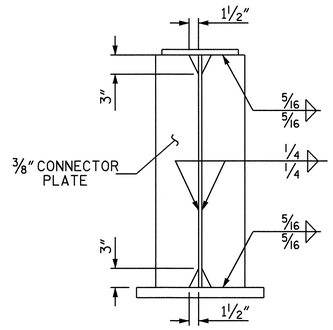
TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



BEARING STIFFENER DETAIL

(AT END BENTS)



CONNECTOR PLATE DETAIL

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W.

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

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

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

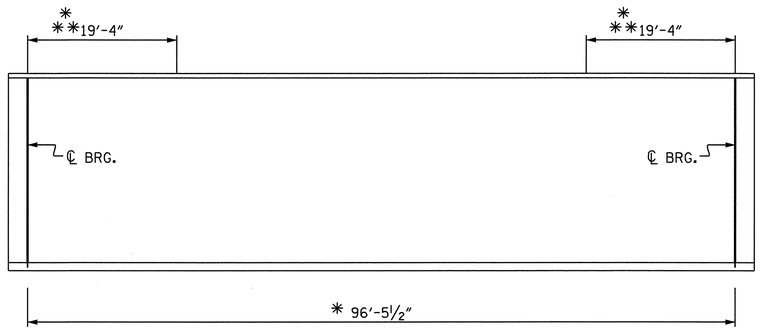
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ENDS OF GIRDERS SHALL BE PLUMB.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

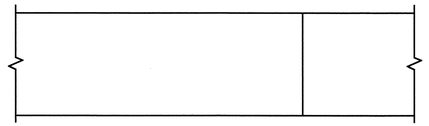
FOR "DEAD LOAD DEFLECTION TABLE FOR GIRDERS", SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET



CHARPY V-NOTCH TEST FOR GIRDERS

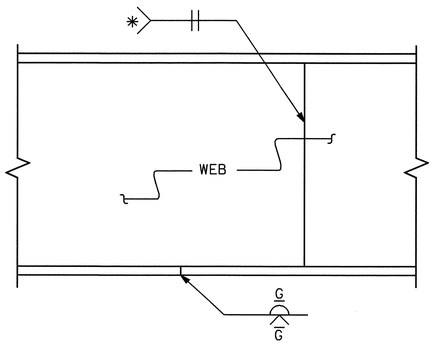
* CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

** NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



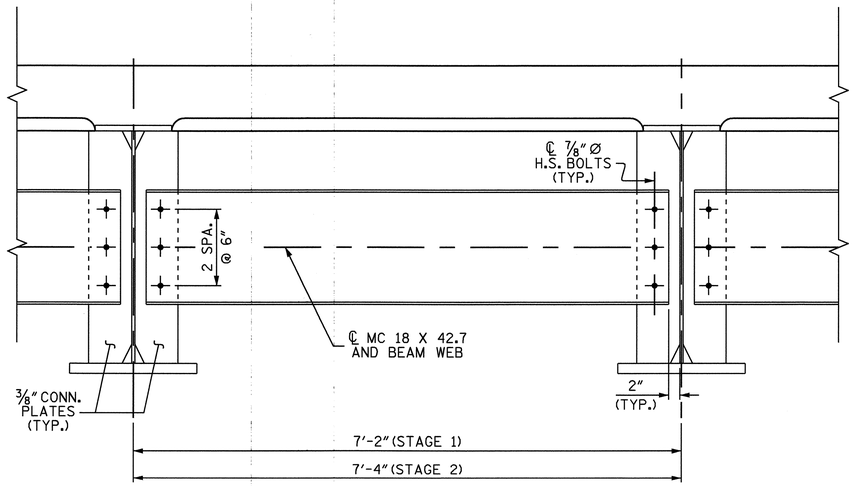
PLAN - FLANGE SPLICE

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS



ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



INTERMEDIATE DIAPHRAGM (D1)

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G PAYNE
6/4/08

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

29-MAY-2008 13:21
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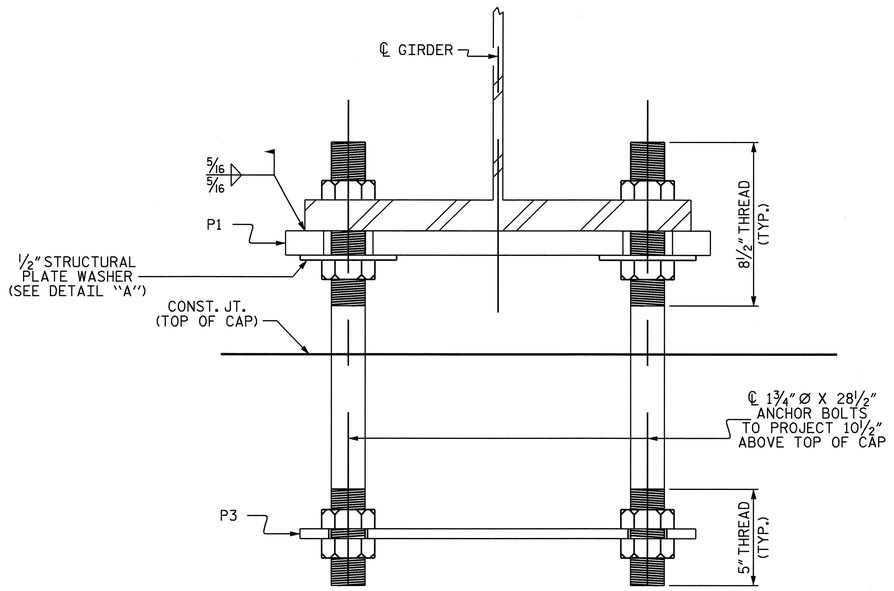
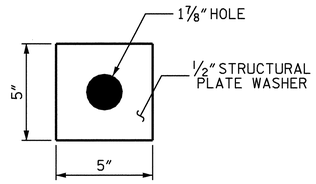
STR. #2

NCDOT



END VIEW



DETAIL "A"

NOTES

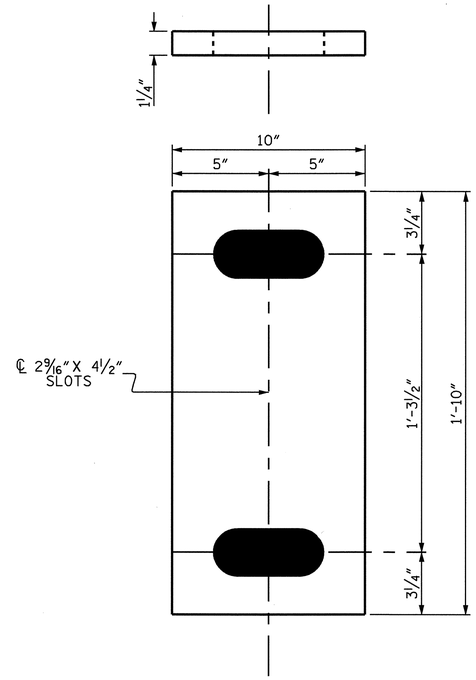
STRUCTURAL PLATE WASHERS SHALL BE AASHTO M270 GRADE 50W.

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

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

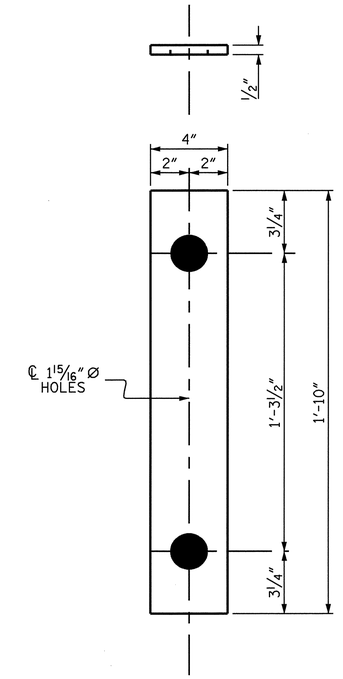
ALL SURFACES OF LEVELING PLATES SHALL BE SMOOTH AND STRAIGHT.

AT ALL FIXED POINTS OF SUPPORT AT INTEGRAL END BENT 1 AND 2, TOP 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.



LEVELING PLATE (P1)

(16 REQUIRED)



ANCHORAGE PLATE (P3)

(16 REQUIRED)

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

LEVELING PLATE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

6/4/08

STR.#2

DRAWN BY : S. DOMBROWSKI DATE : 12/06
CHECKED BY : M.K. BEARD DATE : 10/07

04-JUN-2008 13:31
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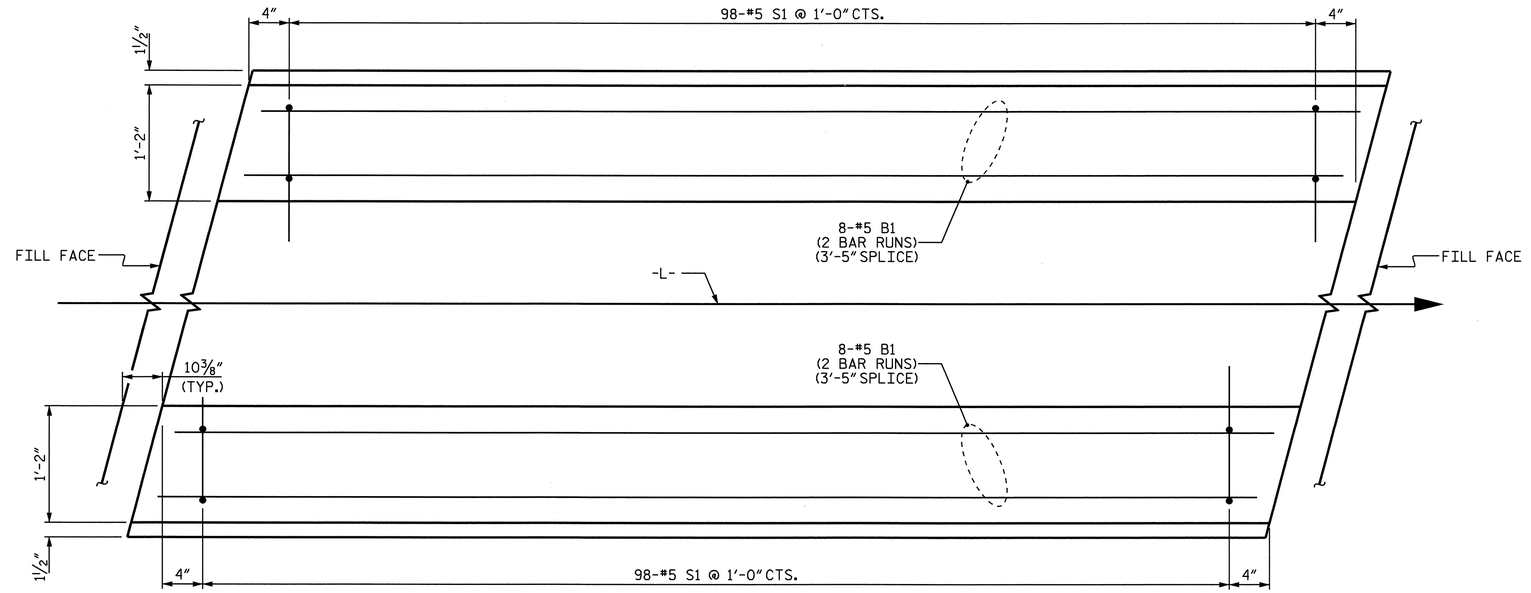
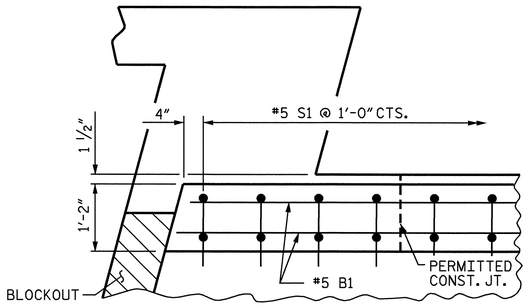
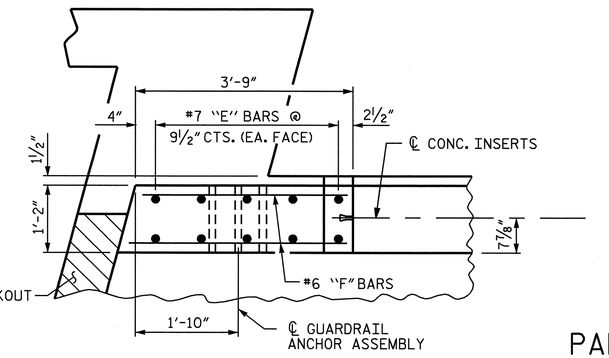


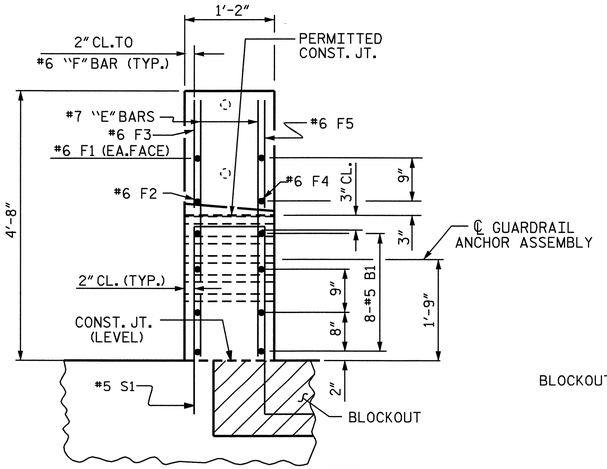
PLAN OF PARAPET



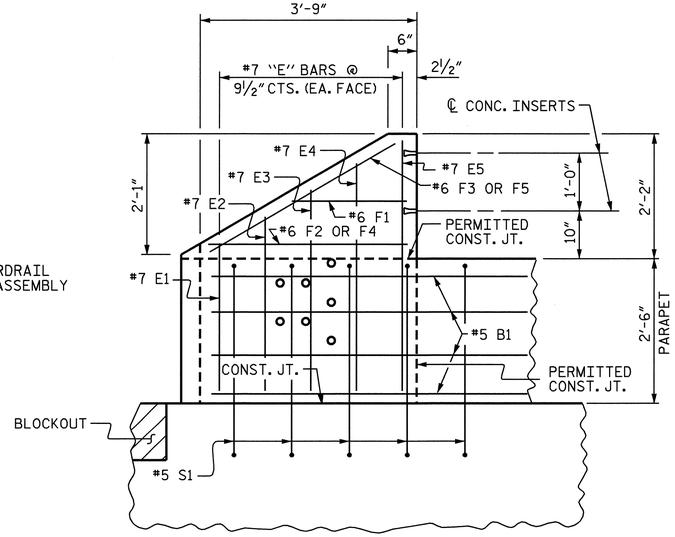
PLAN OF PARAPET



PLAN OF END POST



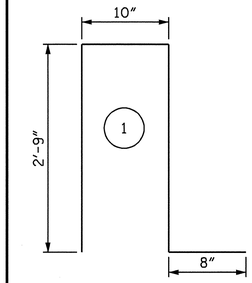
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

BAR TYPE



ALL BAR DIMENSIONS
ARE OUT TO OUT

BILL OF MATERIAL

PARAPETS & FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	32	#5	STR	50'-9"	1694
✳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	2'-0"	24
✳F2	4	#6	STR	3'-6"	21
✳F3	4	#6	STR	3'-3"	20
✳F4	4	#6	STR	3'-11"	24
✳F5	4	#6	STR	3'-8"	22
✳S1	196	#5	1	7'-0"	1431

✳EPOXY COATED REINFORCING STEEL = 3519 LBS

CLASS "AA" CONCRETE 21.9 C.Y.

1'-2" X 2'-6" CONCRETE PARAPET 196.55 LIN.FT.

NOTES

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

FOR DETAIL OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS KEVIN WAYNE
3/25/08

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND END POST DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			70

STR.#2

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

20-MAR-2008 15:35
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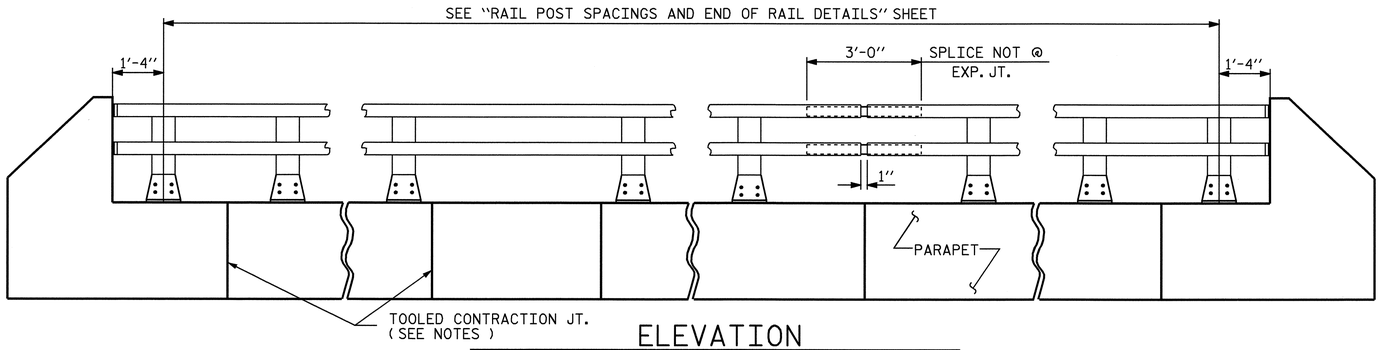
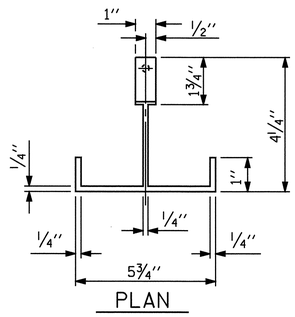
klayne

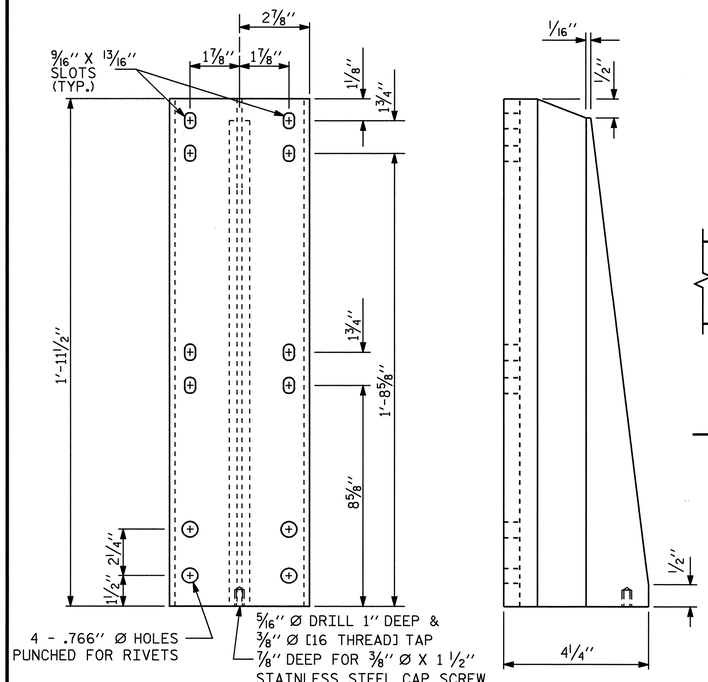


ELEVATION

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

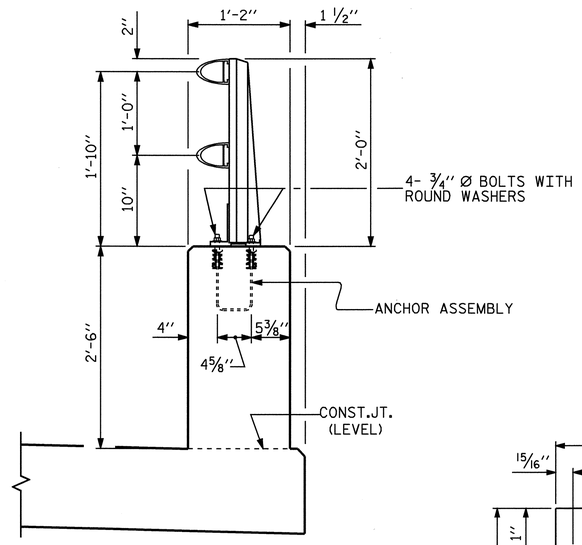


PLAN

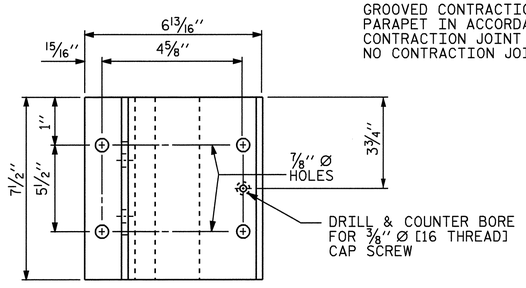


FRONT ELEVATION SIDE ELEVATION

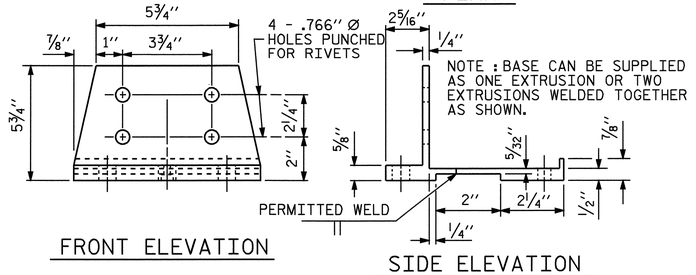
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

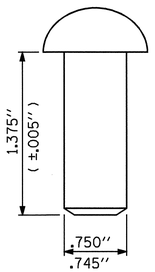


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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 IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 180.92 LIN. FT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : S. DOMBROWSKI	DATE : 7/07
CHECKED BY : M.K. BEARD	DATE : 10/07
DRAWN BY : EEM 6/94	REV. 10/17/00 LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. ALTMAN
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			70

STR.#2

STD. NO. BMR3

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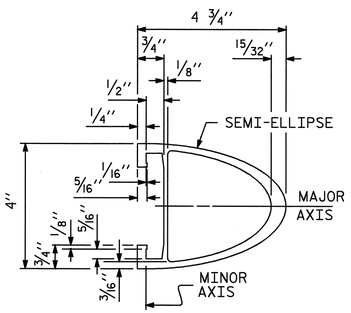
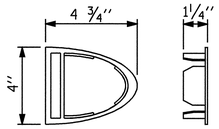
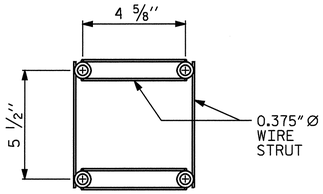


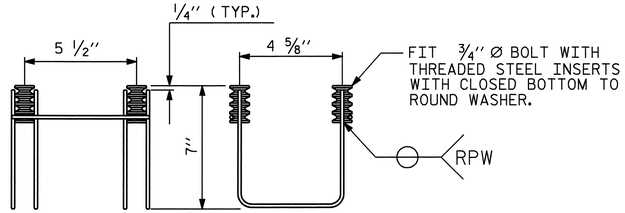
RAIL SECTION



RAIL CAP



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1 3/4''

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(32 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.

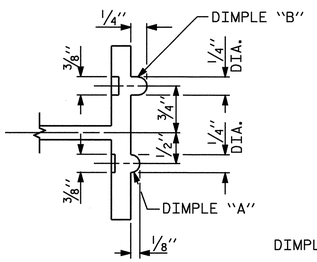
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

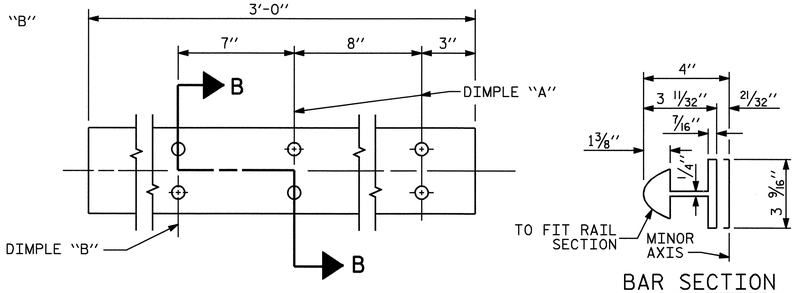
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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 SPECIAL PROVISIONS.

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.

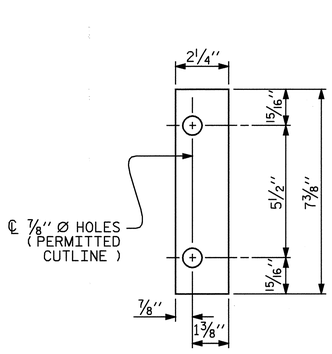


SECTION B - B

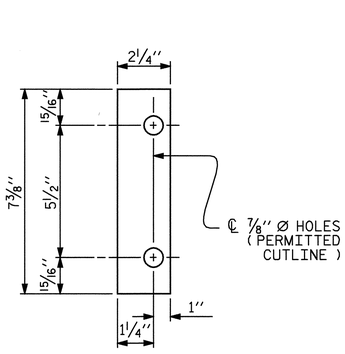


EXPANSION BAR DETAILS

BAR SECTION



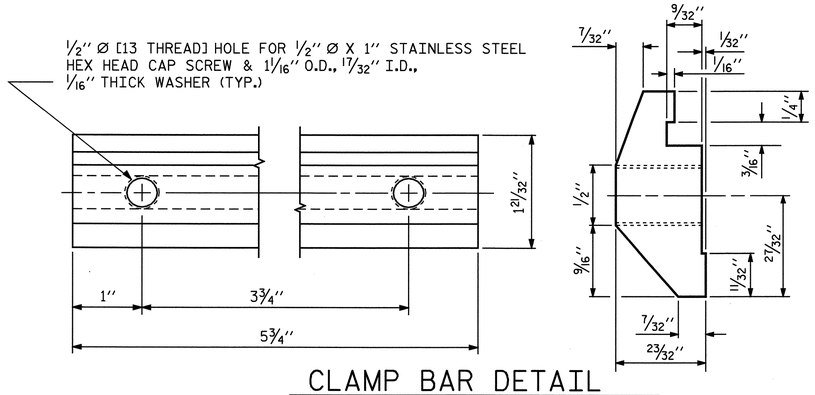
FRONT PLATE



REAR PLATE

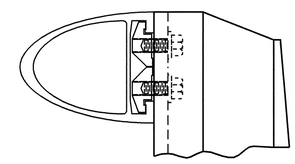
SHIM DETAILS

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



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			70

STR.#2

STD. NO. BMR4

ASSEMBLED BY : S. DOMBROWSKI		DATE : 3/07	
CHECKED BY : M.K. BEARD		DATE : 10/07	
DRAWN BY : EEM 6/94	REV. 2/6/97	EEM/RGW	
CHECKED BY : RGW 6/94	REV. 8/16/99	MAB/LES	
	REV. 5/1/06R	KMM/GM	

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
3/25/08

20-MAR-2008 15:36
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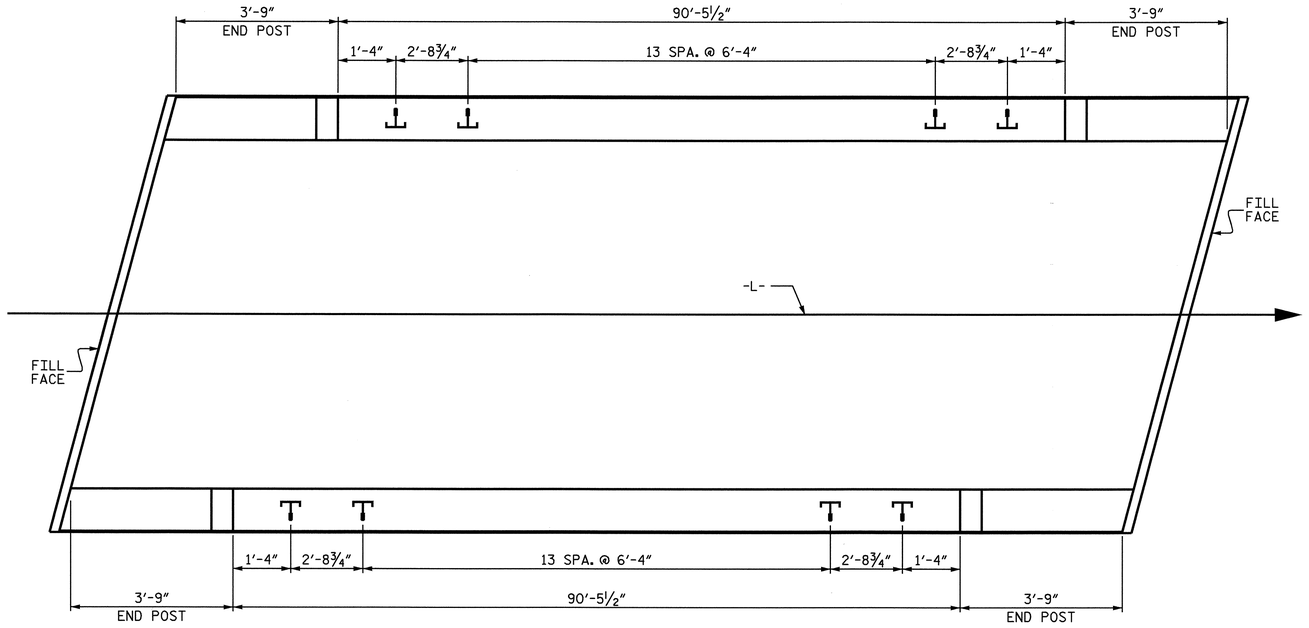


PLAN OF RAIL POST SPACINGS

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

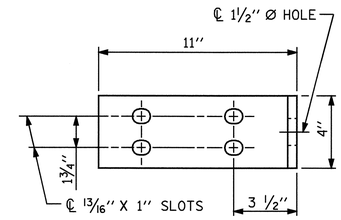
E. ½″ Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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.

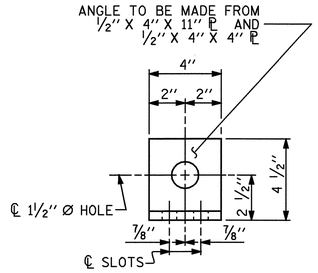
THE ¾″ STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

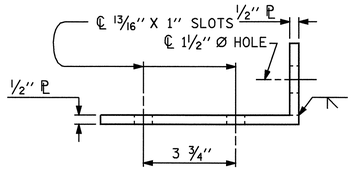
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾″ Ø X 1⅝″ BOLT WITH WASHER SHALL BE REPLACED WITH A ¾″Ø X 6½″ BOLT AND 2″ O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE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



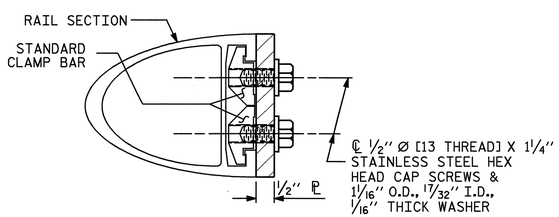
ELEVATION



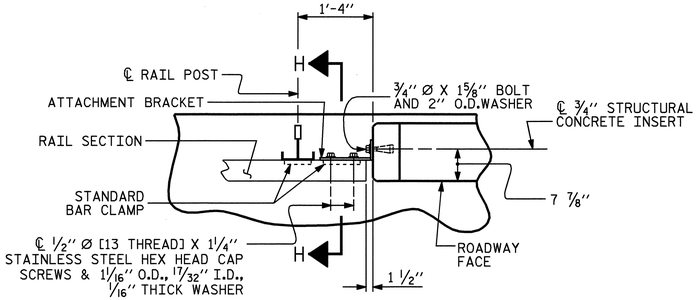
END VIEW (FIX AND EXP.)



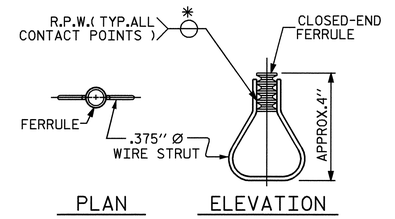
TOP VIEW



SECTION H-H (FIX)



PLAN - RAIL AND END POST



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			70

STR.#2

STD. NO. BMR2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. PAYNE
3/25/08

ASSEMBLED BY : S. DOMBROWSKI	DATE : 7/07
CHECKED BY : M.K. BEARD	DATE : 10/07
DRAWN BY : FCJ 1/88	REV. 10/17/00 LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

DETAILS FOR ATTACHING METAL RAIL TO END POST

20-MAR-2008 15:35
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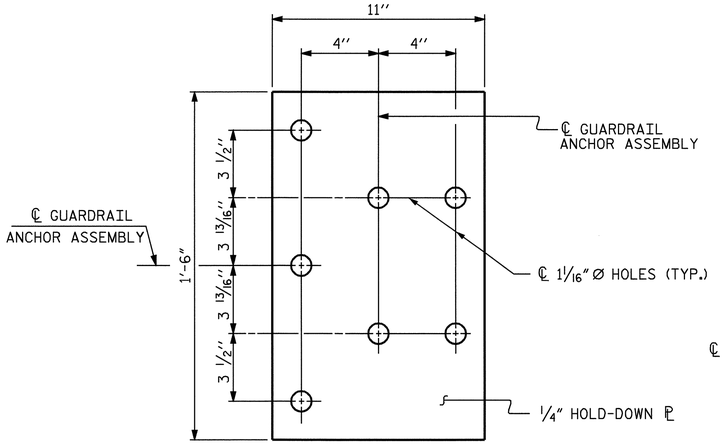
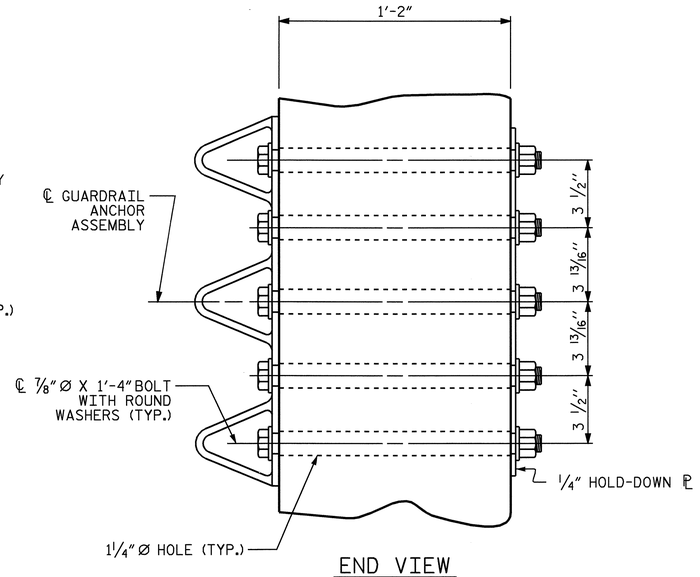
klayne



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.

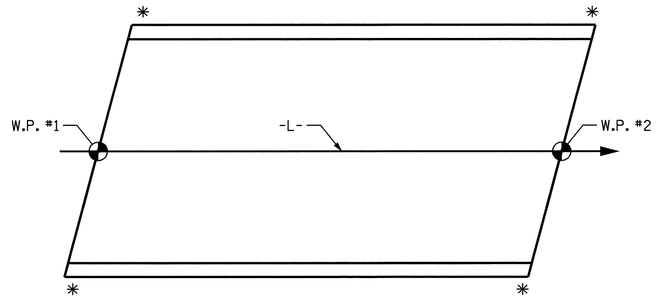
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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.

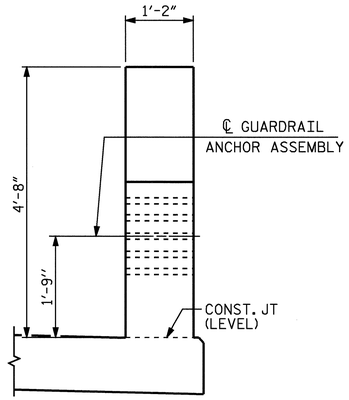
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

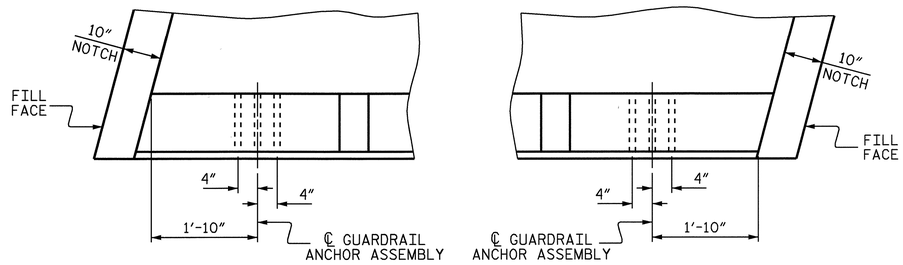


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 5 OF 5

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-56
1			3			TOTAL SHEETS
2			4			70

STR.#2 STD. NO. BMR8

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS L. APANIUS
3/25/08

ASSEMBLED BY : S. DOMBROWSKI		DATE : 7/07	
CHECKED BY : M.K. BEARD		DATE : 10/07	
DRAWN BY : EEM 6/94	REV. 10/17/00		RWW/LES
CHECKED BY : RGW 6/94	REV. 5/7/03		RWW/JTE
	REV. 5/1/06		TLA/GM

20-MAR-2008 15:35
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klayne

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

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

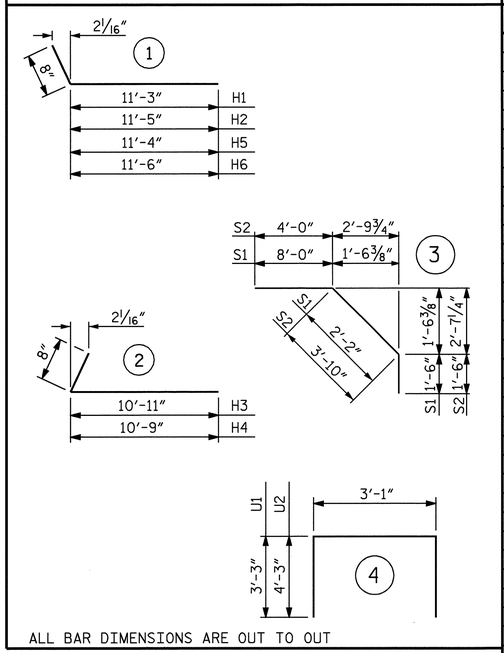
REINFORCING STEEL QUANTITIES

	STAGE #1	STAGE #2	TOTAL
REINFORCING STEEL	10,845 LBS.	6,309 LBS.	17,154

EPOXY COATED REINFORCING STEEL QUANTITIES

	STAGE #1	STAGE #2	TOTAL
EPOXY COATED REINFORCING STEEL	10,665 LBS.	6,701 LBS.	17,366
PARAPETS & END POSTS			3,519 LBS.
TOTAL			20,885 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL — STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	143	#5	STR	32'-10"	4897
A2	143	#5	STR	32'-10"	4897
✳A101	4	#5	STR	28'-10"	120
✳A102	4	#5	STR	24'-2"	101
✳A103	4	#5	STR	19'-6"	81
✳A104	4	#5	STR	14'-6"	60
✳A105	4	#5	STR	9'-10"	41
✳A106	4	#5	STR	5'-2"	22
A201	4	#5	STR	28'-10"	120
A202	4	#5	STR	24'-2"	101
A203	4	#5	STR	19'-6"	81
A204	4	#5	STR	14'-6"	60
A205	4	#5	STR	9'-10"	41
A206	4	#5	STR	5'-2"	22
✳B1	90	#6	STR	23'-0"	3109
✳B2	48	#4	STR	29'-0"	930
B3	74	#6	STR	23'-0"	2556
B4	37	#5	STR	56'-4"	2174
✳D1	157	#5	STR	3'-4"	546
H3	5	#4	2	11'-7"	39
H4	5	#4	2	11'-5"	38
H5	5	#4	1	12'-0"	40
H6	5	#4	1	12'-2"	41
K1	16	#4	STR	21'-2"	226
K3	8	#4	STR	3'-2"	17
✳S1	54	#4	3	11'-8"	421
✳S2	54	#4	3	9'-4"	337
U1	54	#4	4	9'-7"	346
U2	6	#4	4	11'-7"	46

REINFORCING STEEL = 10845 LBS
✳EPOXY COATED REINFORCING STEEL = 10665 LBS

BILL OF MATERIAL — STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A3	149	#5	STR	18'-10"	2927
A4	149	#5	STR	18'-10"	2927
✳A111	4	#5	STR	14'-10"	62
✳A112	4	#5	STR	10'-2"	42
✳A113	4	#5	STR	5'-6"	23
A211	4	#5	STR	14'-10"	62
A212	4	#5	STR	10'-2"	42
A213	4	#5	STR	5'-6"	23
✳B1	58	#6	STR	23'-0"	2004
✳B2	32	#4	STR	29'-0"	620
B3	42	#6	STR	23'-0"	1451
B4	21	#5	STR	56'-4"	1234
✳D1	157	#5	STR	3'-4"	546
H1	5	#4	1	11'-11"	40
H2	5	#4	1	12'-1"	40
H3	5	#4	2	11'-7"	39
H4	5	#4	2	11'-5"	38
K2	8	#4	STR	24'-8"	132
K3	8	#4	STR	3'-2"	17
✳S1	34	#4	3	11'-8"	265
✳S2	34	#4	3	9'-4"	212
U1	34	#4	4	9'-7"	218
U2	6	#4	4	11'-7"	46

REINFORCING STEEL = 6309 LBS
✳EPOXY COATED REINFORCING STEEL = 6701 LBS

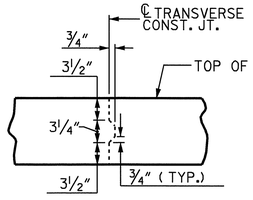
POUR SEQUENCE BREAKDOWN

	POUR #1	POUR #2	POUR #3	POUR #4	POUR #5	TOTAL
STAGE 1	81.6	53.1				134.7
STAGE 2			47.1	5.0	31.9	84.0
TOTAL CONCRETE (CU.YD.)						218.7

NOTE: POUR #2 AND POUR #5 INCLUDE THE UPPER PORTION OF THE END BENT CAPS AND WINGS.

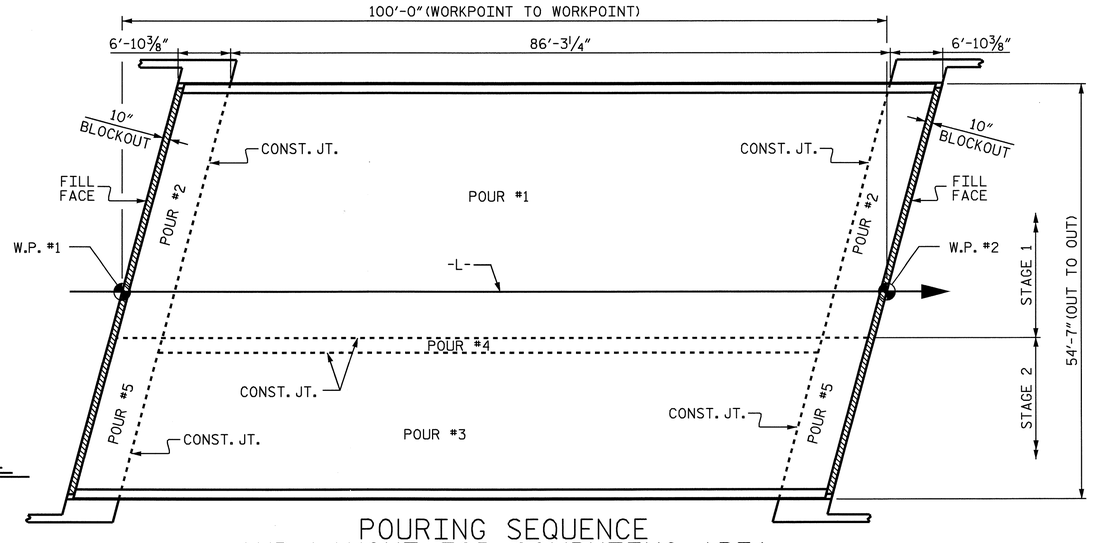
GROOVING BRIDGE FLOORS

BRIDGE DECK	4799 SQ.FT.
APPROACH SLAB	2235 SQ.FT.
TOTAL	7034 SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5364)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIALS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS F. PAYNE 6/4/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 3/07
CHECKED BY : M.K. BEARD DATE : 10/07

02-JUN-2008 14:10
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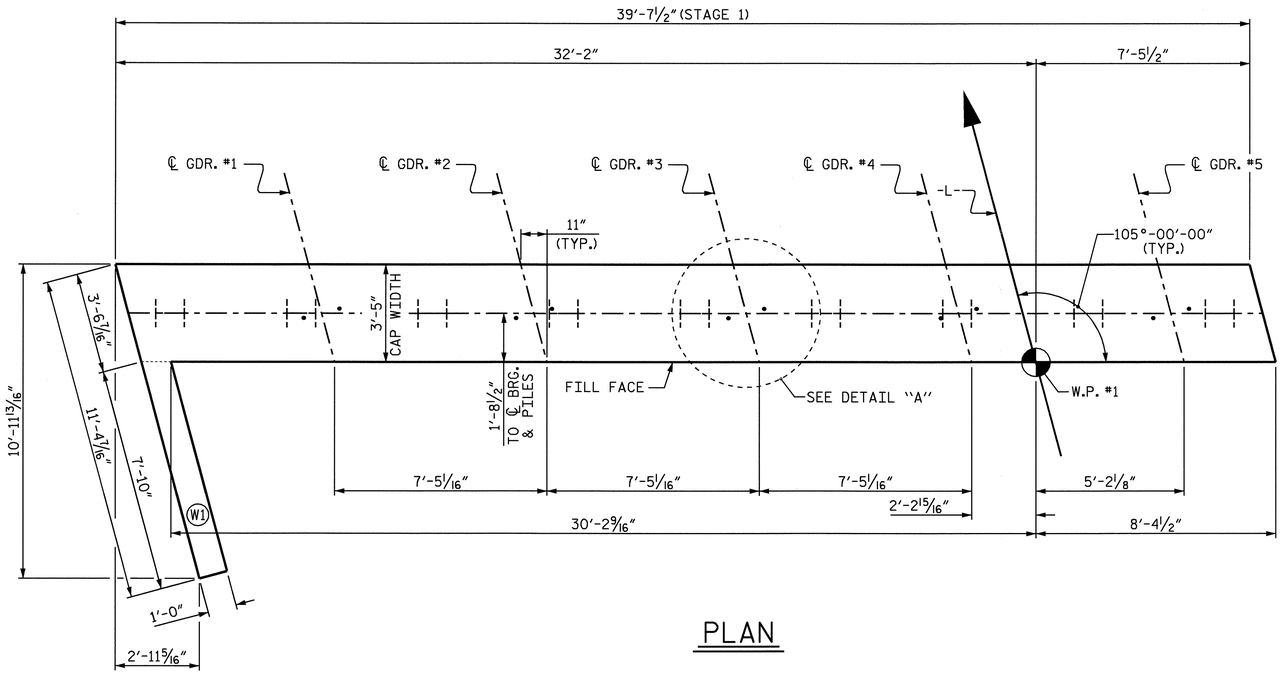
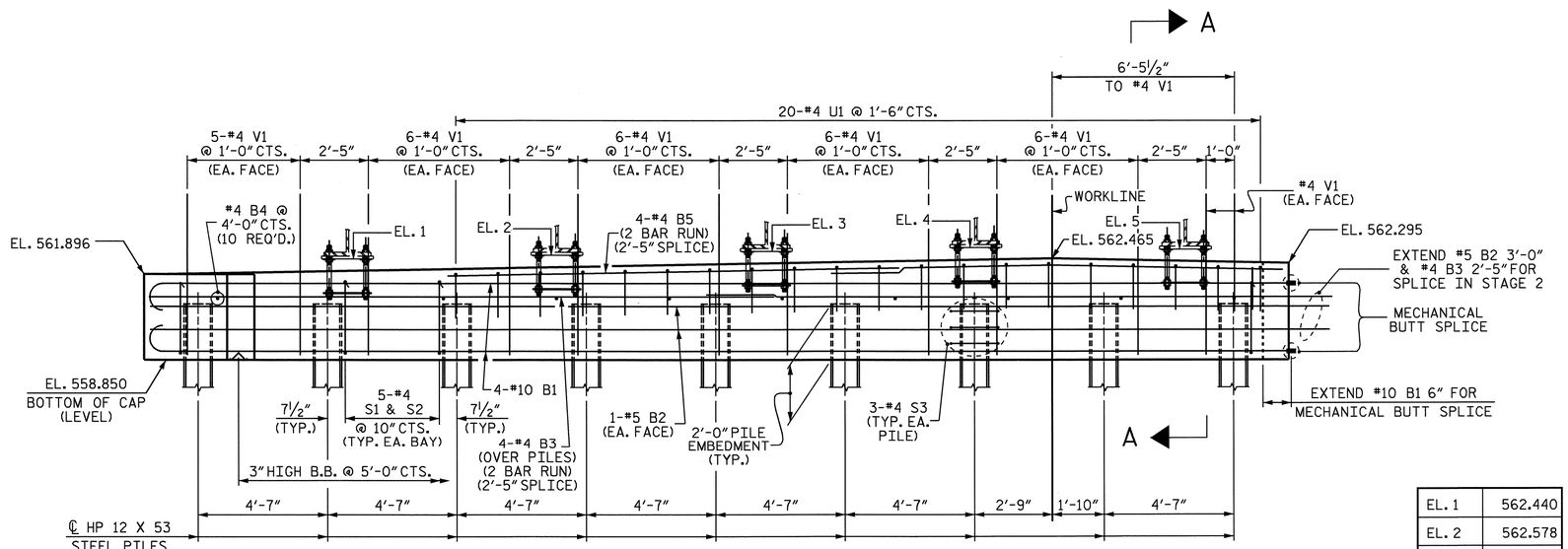
STR.#2



PLAN



ELEVATION

EL. 1	562.440
EL. 2	562.578
EL. 3	562.715
EL. 4	562.853
EL. 5	562.790

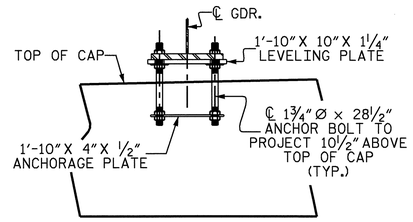
ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

NOTES

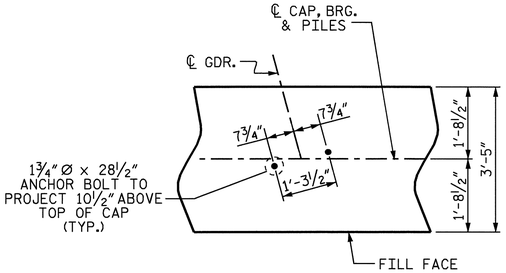
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT #1
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			70

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS GRAYNE
3/25/08

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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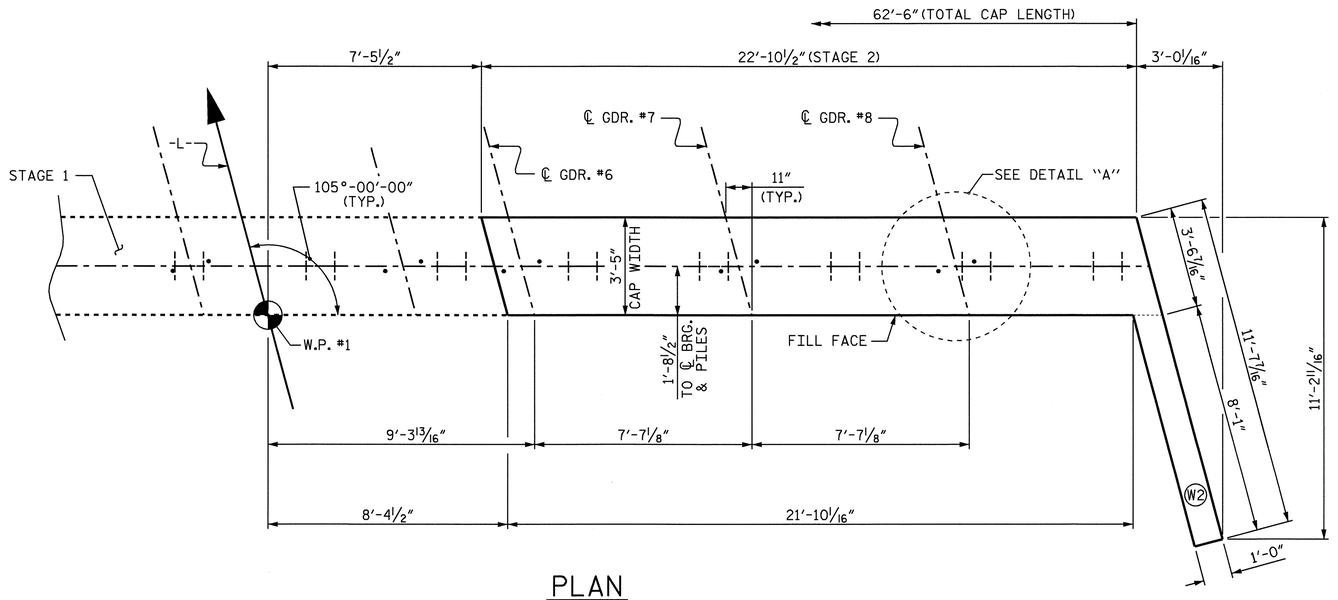
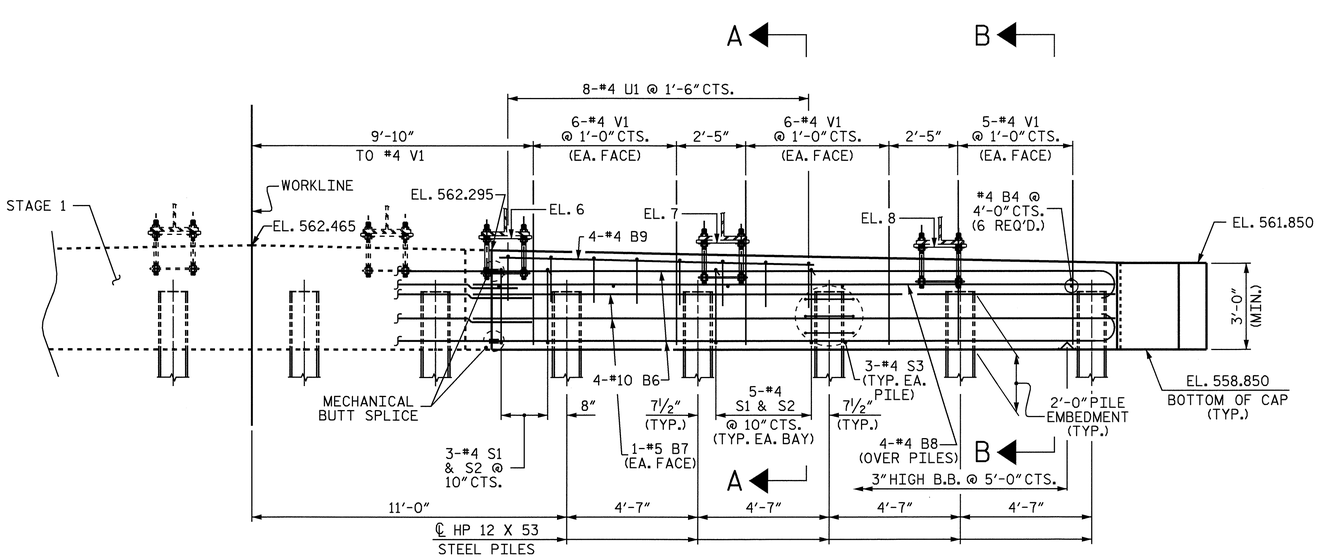
klayne



PLAN



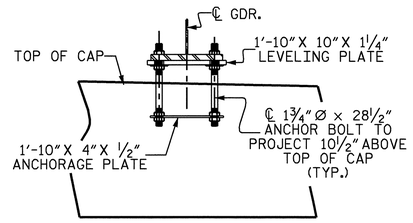
ELEVATION

NOTES

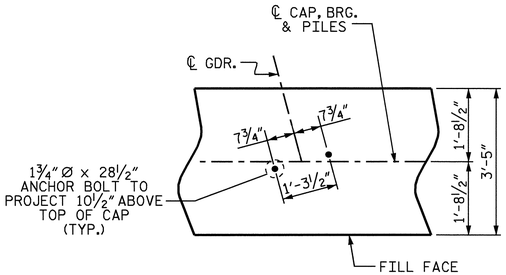
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

EL. 6	562.707
EL. 7	562.555
EL. 8	562.402

ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1 (STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS R. WAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			70

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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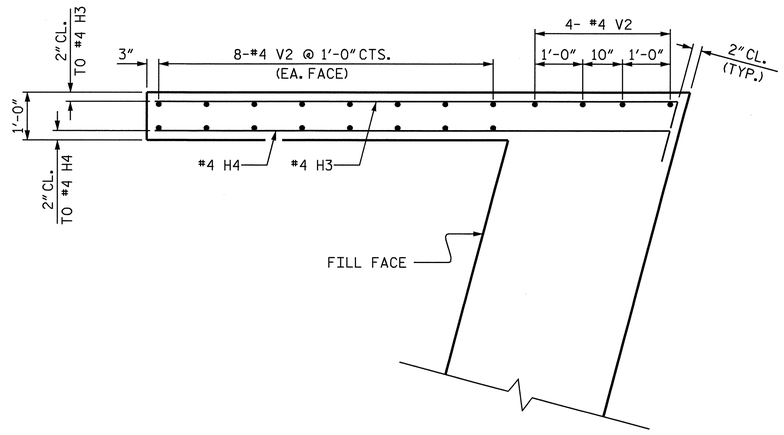
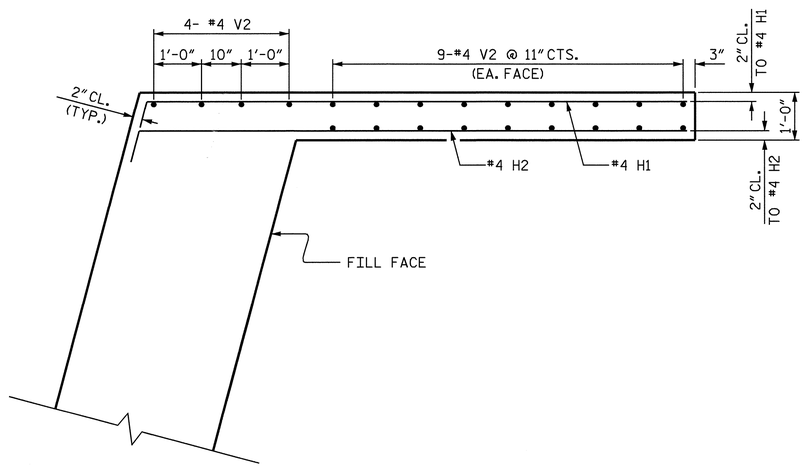
klayne

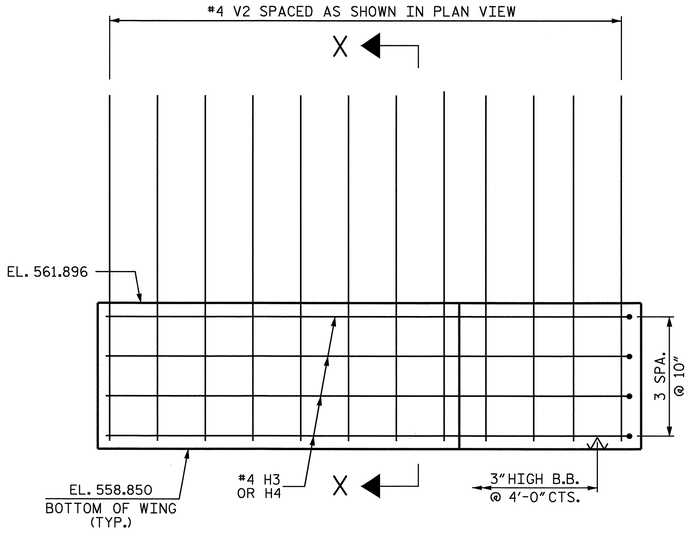


PLAN OF LEFT WING W1
(STAGE 1)

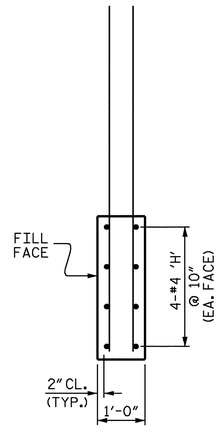


PLAN OF RIGHT WING W2
(STAGE 2)

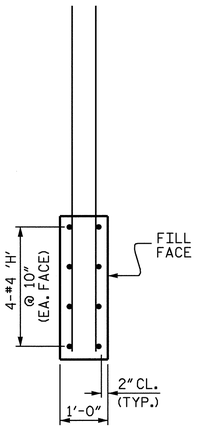
NOTE: THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. FOR DETAILS AND REINFORCING STEEL, SEE SUPERSTRUCTURE DETAILS.



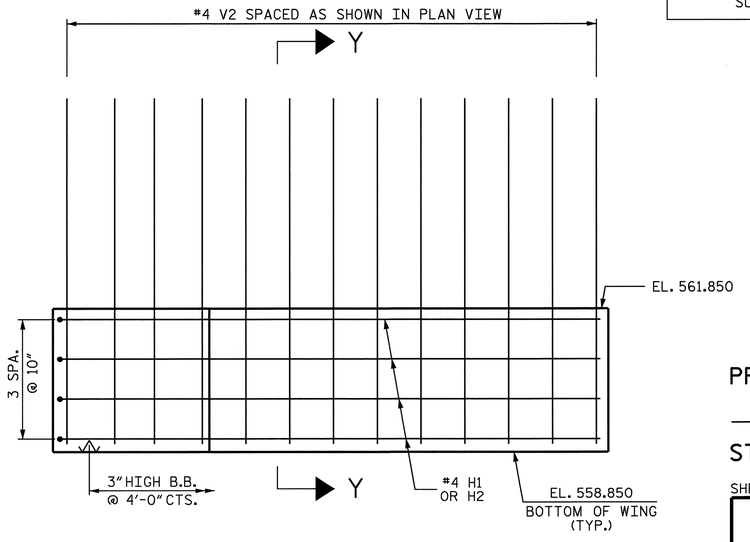
ELEVATION OF LEFT WING W1
(STAGE 1)



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING W2
(STAGE 2)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS D. MAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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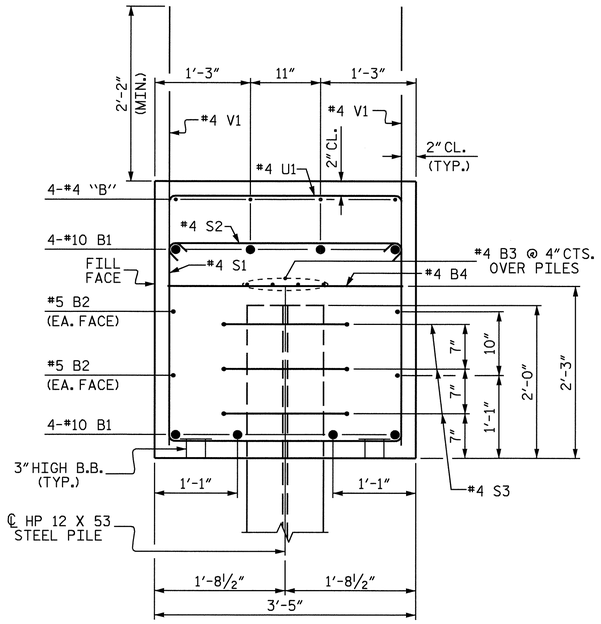
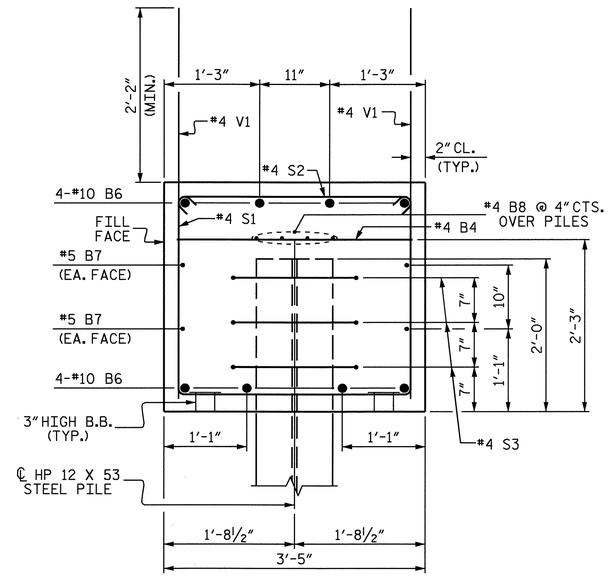
klayne

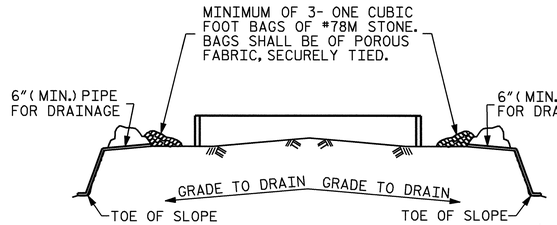
STR. #2



SECTION A-A



SECTION B-B

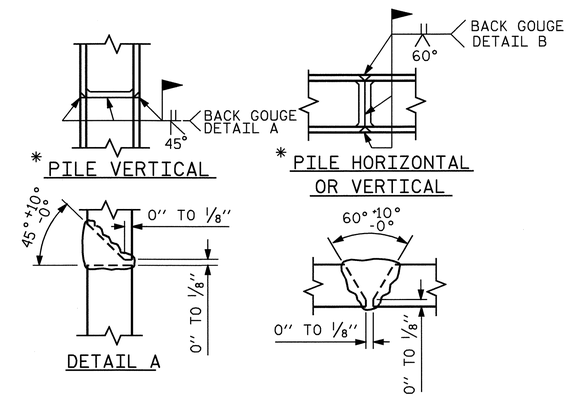


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT #1

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	41'-4"	1423
B2	4	5	STR	42'-6"	177
B3	8	4	STR	22'-2"	118
B4	10	4	STR	3'-1"	21
B5	8	4	STR	15'-10"	85
H3	4	4	2	11'-7"	31
H4	4	4	2	11'-5"	31
S1	40	4	4	9'-1"	243
S2	40	4	5	3'-10"	102
S3	27	4	6	6'-6"	117
U1	20	4	7	6'-1"	81
V1	62	4	STR	5'-9"	238
V2	20	4	STR	7'-3"	97

REINFORCING STEEL LBS 2764

CLASS 'A' CONCRETE 17.8 C.Y.

HP 12X53 STEEL PILES
NO. 9 135 LIN.FT.

PILE EXCAVATION IN SOIL 111 LIN.FT.

PILE EXCAV. NOT IN SOIL 24 LIN.FT.

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	6	4	STR	3'-1"	12
B6	8	10	1	23'-6"	809
B7	4	5	STR	22'-8"	95
B8	4	4	STR	22'-8"	61
B9	4	4	STR	12'-2"	33
H1	4	4	3	11'-11"	32
H2	4	4	3	12'-1"	32
S1	23	4	4	9'-1"	140
S2	23	4	5	3'-10"	59
S3	15	4	6	6'-6"	65
U1	8	4	7	6'-1"	33
V1	34	4	STR	5'-9"	131
V2	22	4	STR	7'-3"	107

REINFORCING STEEL LBS 1609

CLASS 'A' CONCRETE 10.3 C.Y.

HP 12X53 STEEL PILES
NO. 5 75 LIN.FT.

PILE EXCAVATION IN SOIL 61 LIN.FT.

PILE EXCAV. NOT IN SOIL 13 LIN.FT.

TOTAL BILL OF MATERIAL

REINFORCING STEEL LBS 4373

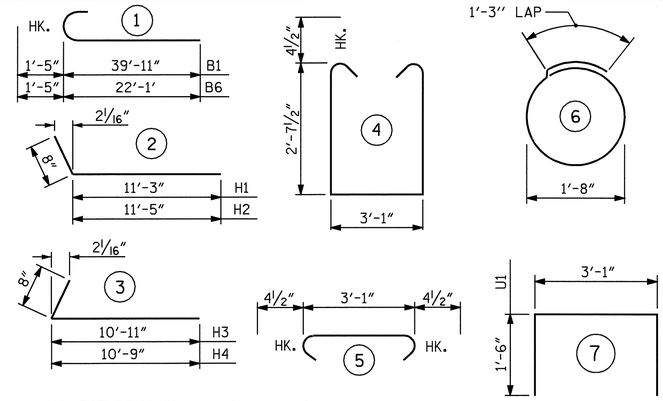
CLASS 'A' CONCRETE 28.1 C.Y.

HP 12X53 STEEL PILES
NO. 14 210 LIN.FT.

PILE EXCAVATION IN SOIL 172 LIN.FT.

PILE EXCAV. NOT IN SOIL 37 LIN.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS K. BEATTIE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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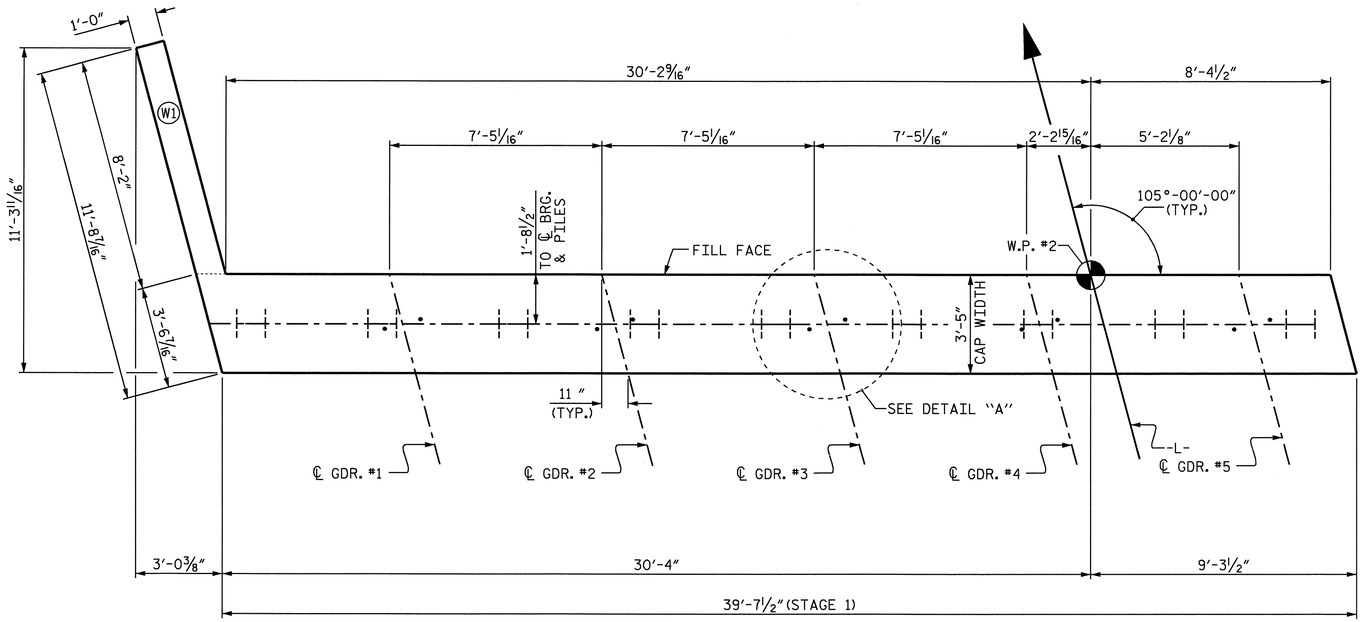
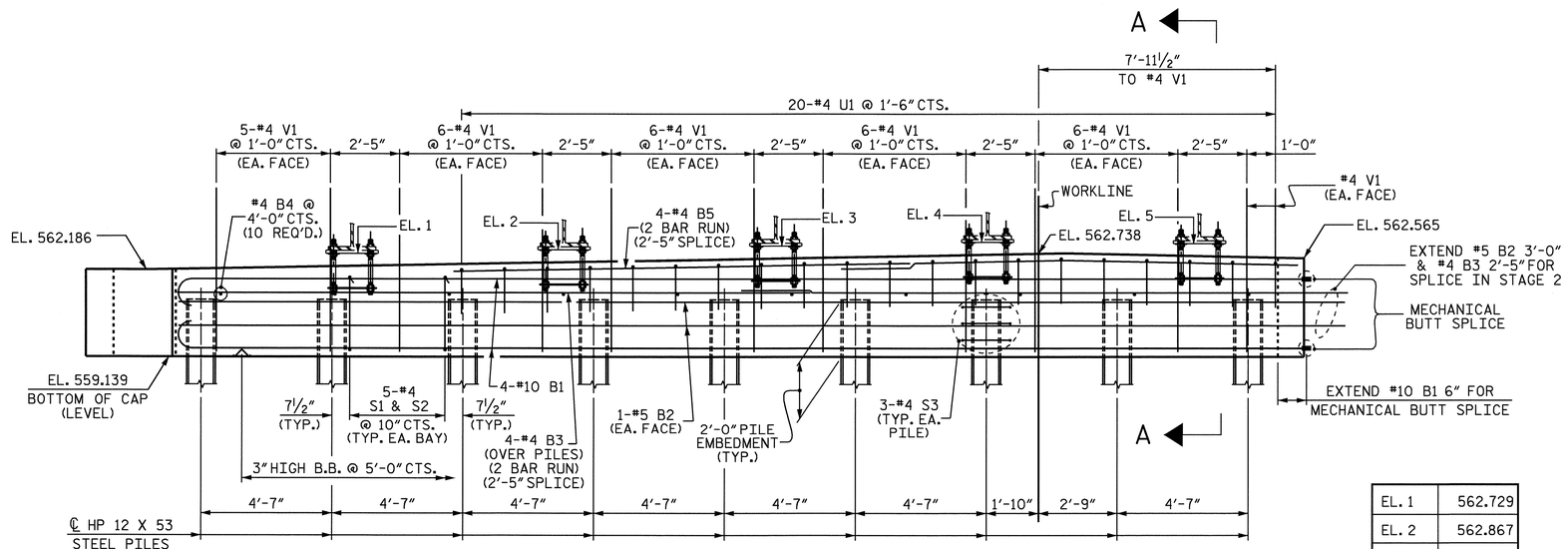
klayne

STR. #2



PLAN



ELEVATION

EL. 1	562.729
EL. 2	562.867
EL. 3	563.005
EL. 4	563.142
EL. 5	563.080

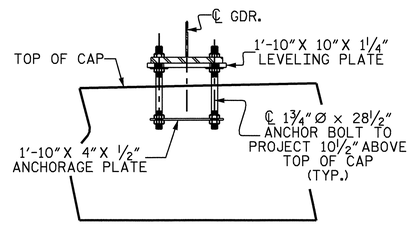
ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

NOTES

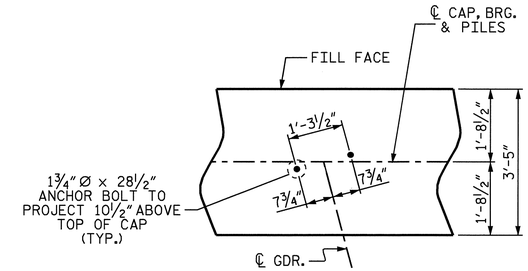
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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



ELEVATION VIEW



PLAN VIEW

DETAIL "A"

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT #2
(STAGE 1)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS WAYNE PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			70

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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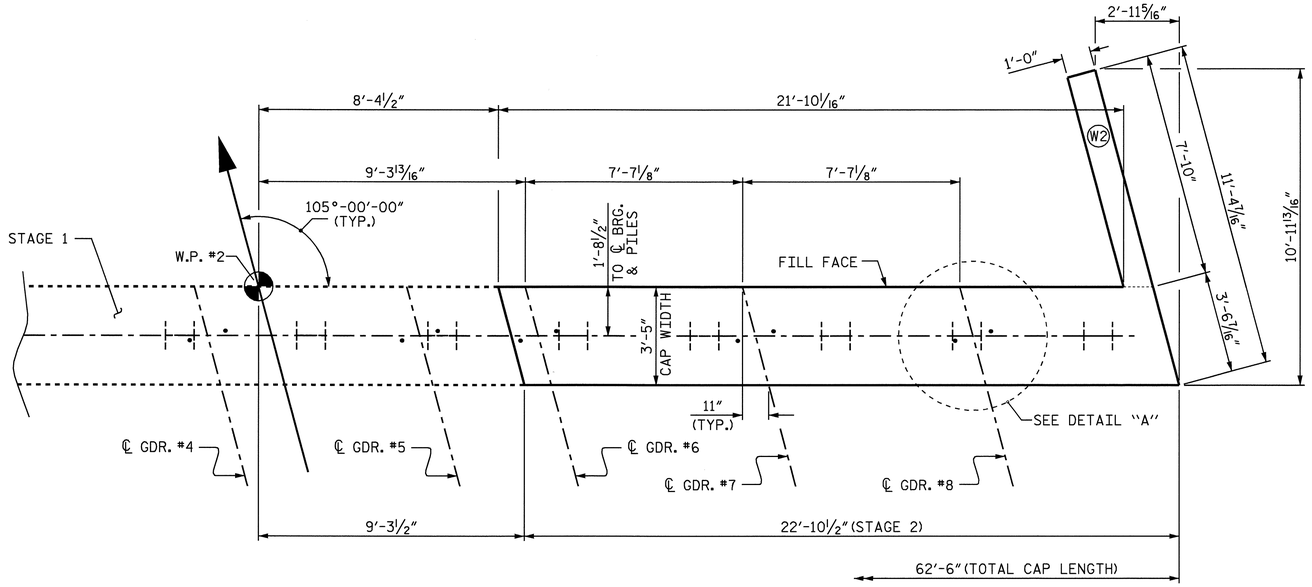
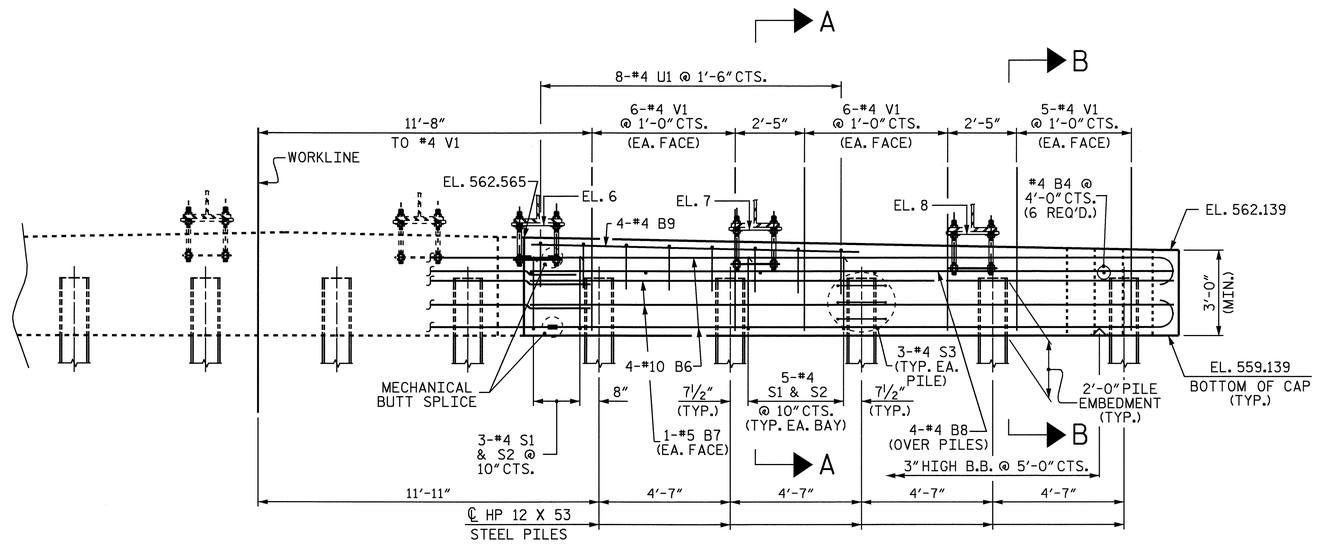
klayne



PLAN



ELEVATION

NOTES

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

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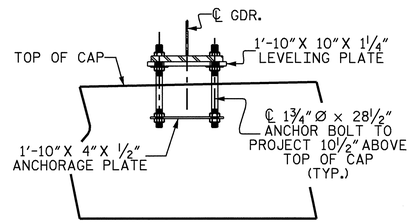
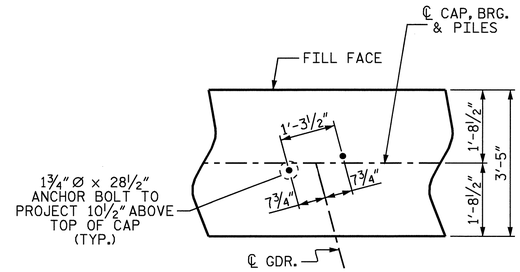


ELEVATION VIEW



PLAN VIEW

DETAIL "A"

EL. 6	562.997
EL. 7	562.844
EL. 8	562.691

ELEVATIONS SHOWN ARE TO BOTTOM OF LEVELING PLATE

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2 (STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS A. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			70

STR. #2

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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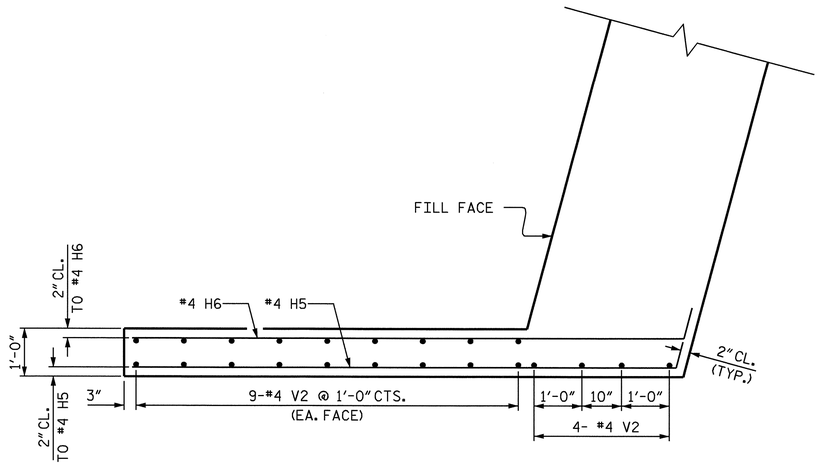
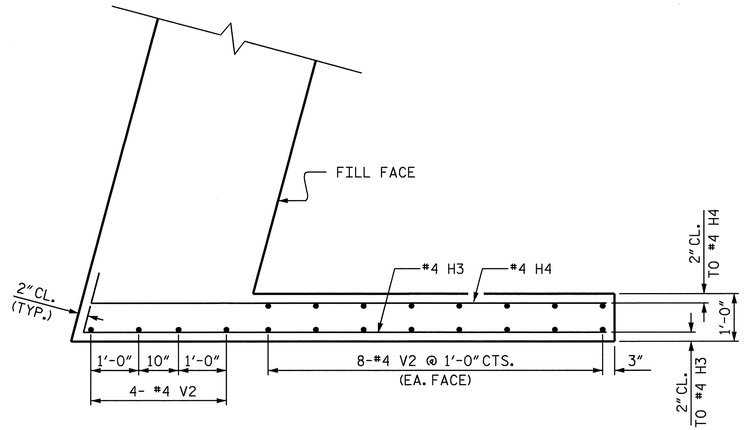
klayne

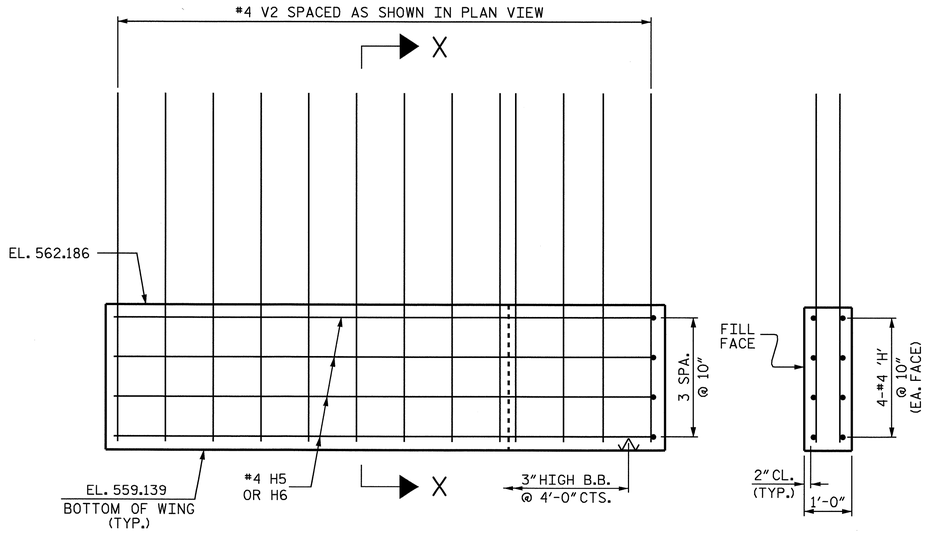


PLAN OF LEFT WING W1
(STAGE 1)



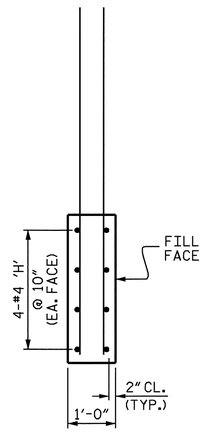
PLAN OF RIGHT WING W2
(STAGE 2)

NOTE: THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. FOR DETAILS AND REINFORCING STEEL, SEE SUPERSTRUCTURE DETAILS.

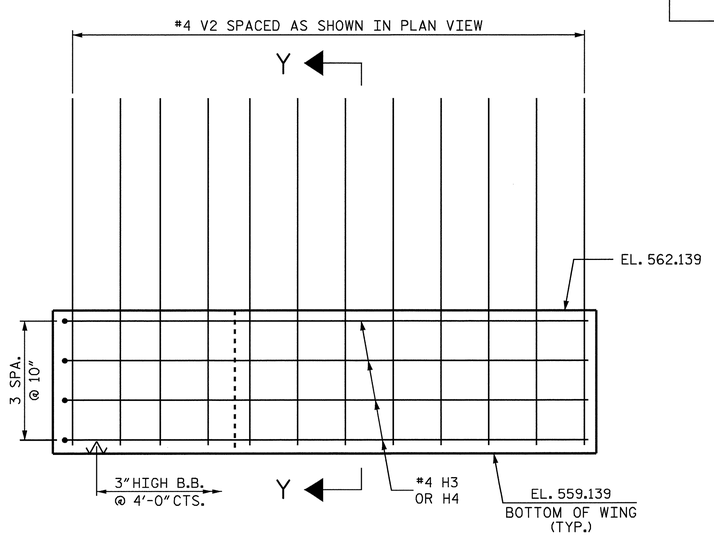


ELEVATION OF LEFT WING W1
(STAGE 1)

SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING W2
(STAGE 2)

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER TRINA S. WAYNE
7/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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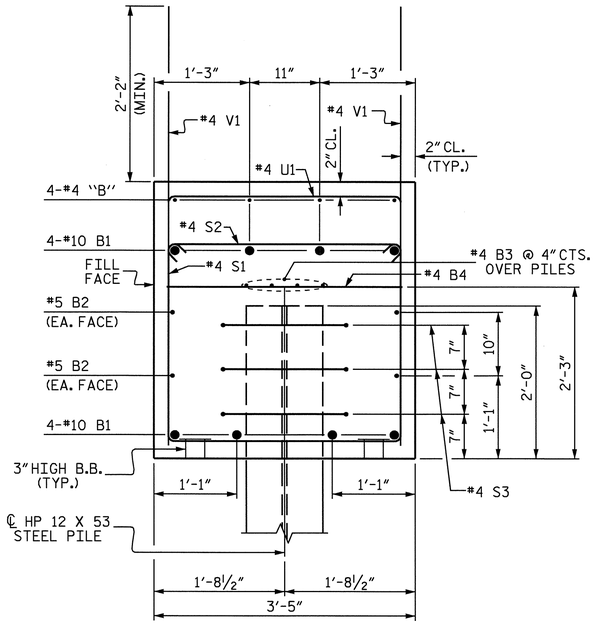
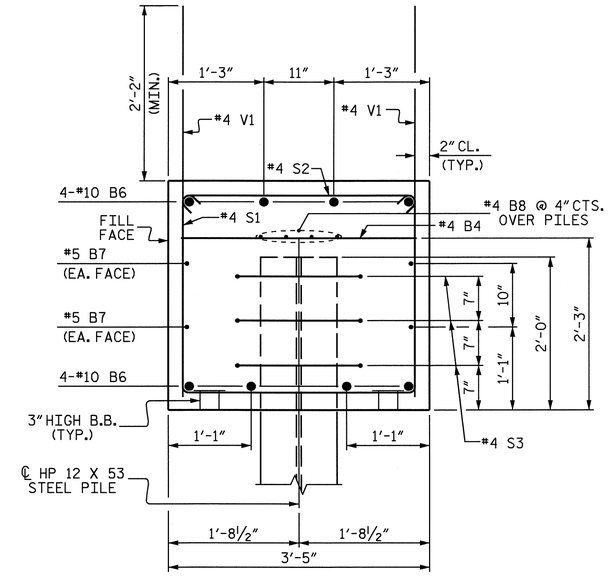
klayne

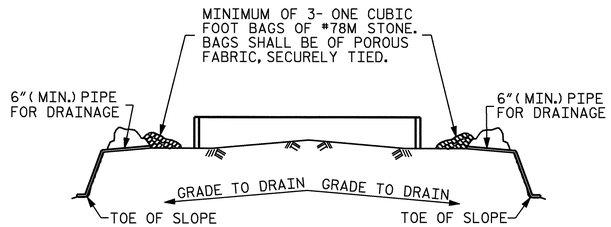
STR. #2



SECTION A-A



SECTION B-B



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.

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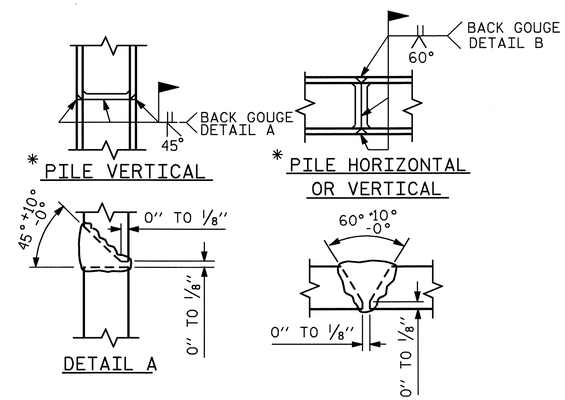
TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT #2

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	1	41'-4"	1423
B2	4	5	STR	42'-6"	177
B3	8	4	STR	22'-2"	118
B4	10	4	STR	3'-1"	21
B5	8	4	STR	15'-10"	85
H5	4	4	2	12'-0"	32
H6	4	4	2	12'-2"	33
S1	40	4	4	9'-1"	243
S2	40	4	5	3'-10"	102
S3	27	4	6	6'-6"	117
U1	20	4	7	6'-1"	81
V1	62	4	STR	5'-9"	238
V2	22	4	STR	7'-3"	107

REINFORCING STEEL LBS 2777

CLASS 'A' CONCRETE 17.7 C.Y.

HP 12X53 STEEL PILES
NO. 9 135 LIN.FT.

PILE EXCAVATION IN SOIL 107 LIN.FT.

PILE EXCAV. NOT IN SOIL 28 LIN.FT.

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	6	4	STR	3'-1"	12
B6	8	10	1	23'-6"	809
B7	4	5	STR	22'-8"	95
B8	4	4	STR	22'-8"	61
B9	4	4	STR	12'-2"	33
H3	4	4	3	11'-7"	31
H4	4	4	3	11'-5"	31
S1	23	4	4	9'-1"	140
S2	23	4	5	3'-10"	59
S3	15	4	6	6'-6"	65
U1	8	4	7	6'-1"	33
V1	34	4	STR	5'-9"	131
V2	20	4	STR	7'-3"	97

REINFORCING STEEL LBS 1597

CLASS 'A' CONCRETE 10.3 C.Y.

HP 12X53 STEEL PILES
NO. 5 75 LIN.FT.

PILE EXCAVATION IN SOIL 60 LIN.FT.

PILE EXCAV. NOT IN SOIL 16 LIN.FT.

TOTAL BILL OF MATERIAL

REINFORCING STEEL LBS 4374

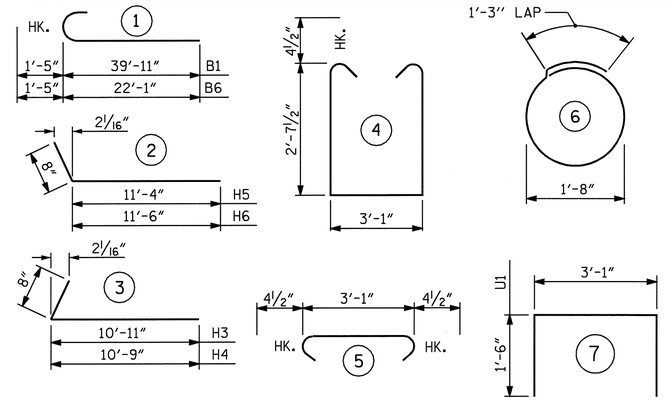
CLASS 'A' CONCRETE 28.0 C.Y.

HP 12X53 STEEL PILES
NO. 14 210 LIN.FT.

PILE EXCAVATION IN SOIL 167 LIN.FT.

PILE EXCAV. NOT IN SOIL 44 LIN.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS E. WAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : S. DOMBROWSKI DATE : 1/07
CHECKED BY : M.K. BEARD DATE : 2/08

20-MAR-2008 15:34
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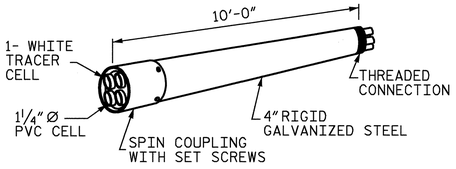
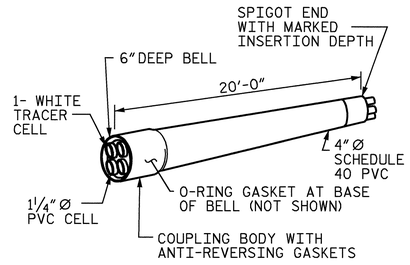
klayne

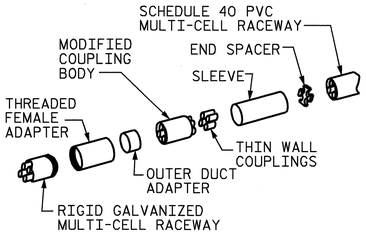
STR. #2



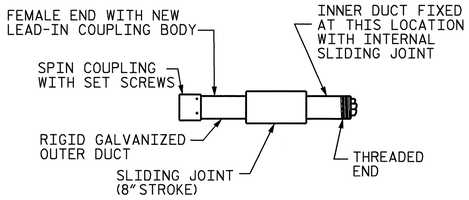
RIGID GALVANIZED (RGC)
MULTI-CELL RACEWAY



SCHEDULE 40 PVC
MULTI-CELL RACEWAY



TRANSITION ADAPTER



EXPANSION JOINT FITTING

NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

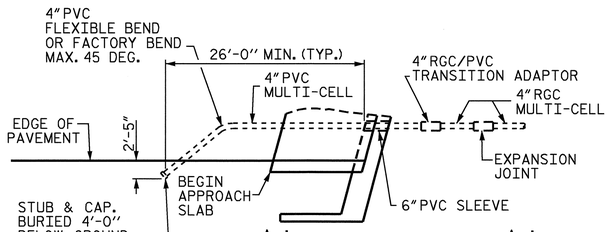
PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL STABILIZER AT OR NEAR MIDSPAN OF SPAN A. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

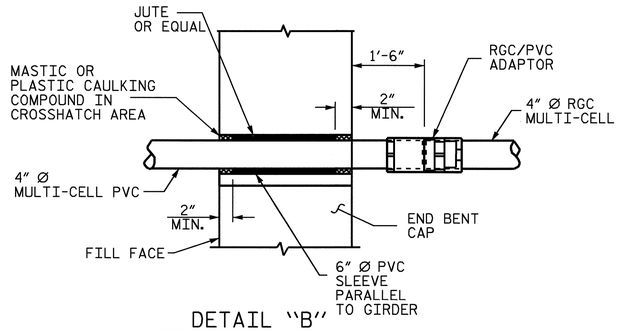
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF ⅝" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.

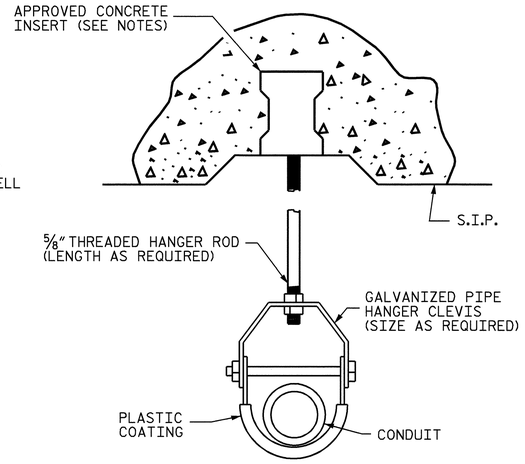
DETAIL "D"
4" MULTI-CELL COMPONENTS



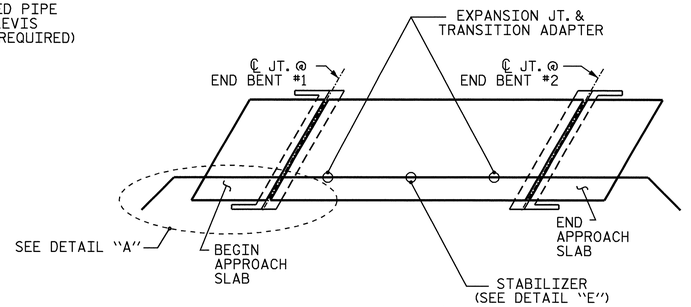
DETAIL "A"
TERMINATION OF CONDUIT AT WING WALL



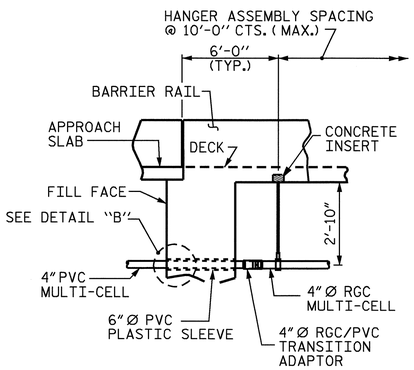
DETAIL "B"
PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT END BENT.



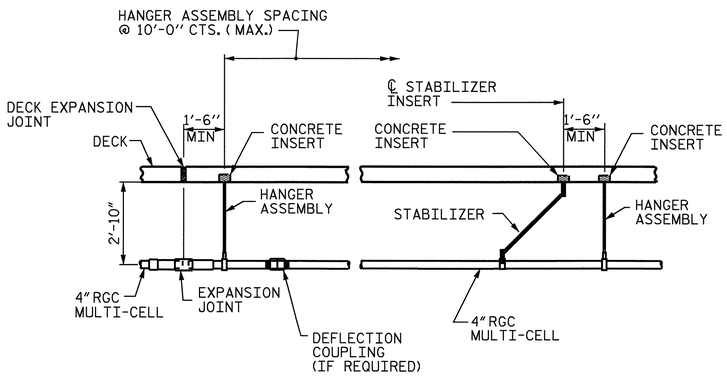
DETAIL "C"
HANGER ASSEMBLY



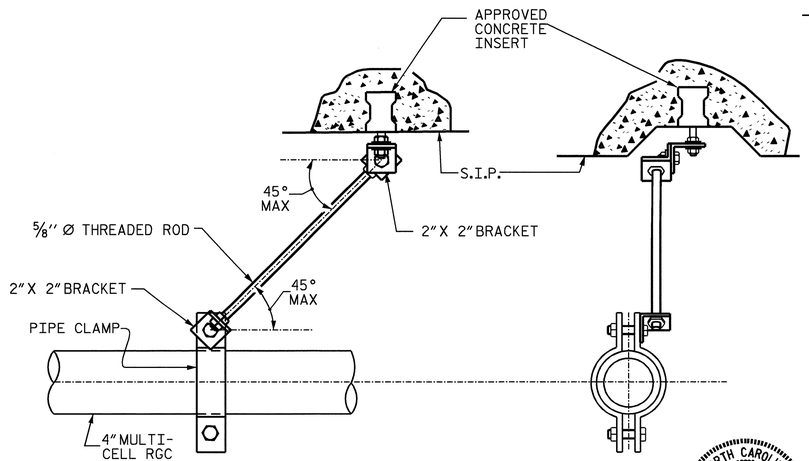
CONDUIT LAYOUT



VIEW A-A



VIEW B-B
STEEL OR CONCRETE GIRDERS



DETAIL "E"
STABILIZER

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELECTRICAL CONDUIT SYSTEM DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : S. DOMBROWSKI	DATE : 12/07
CHECKED BY : M.K. BEARD	DATE : 1/08
DRAWN BY : RWW 2-4-03	REV. 5/1/06 TLA/GM
CHECKED BY : DBM 2-4-03	

ELECTRIC CONDUIT DETAILS

02-JUN-2008 14:59
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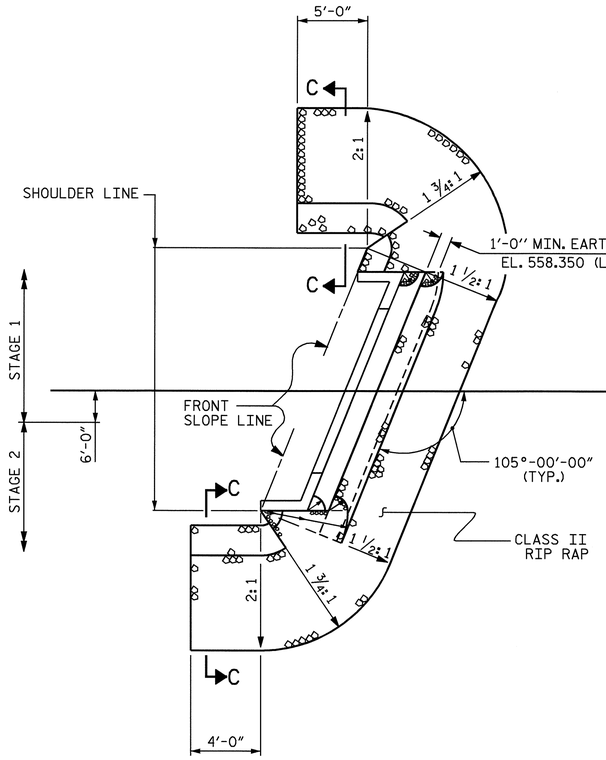
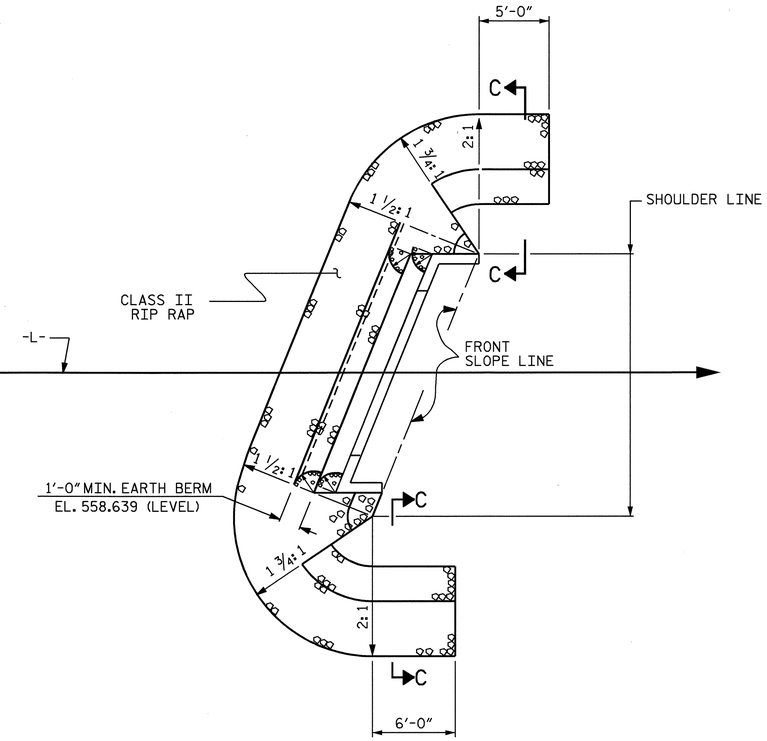
tpayne

STR. #2

(SHT 3) STD. NO. ECS1



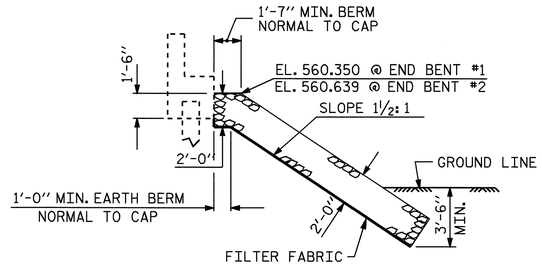
END BENT #1



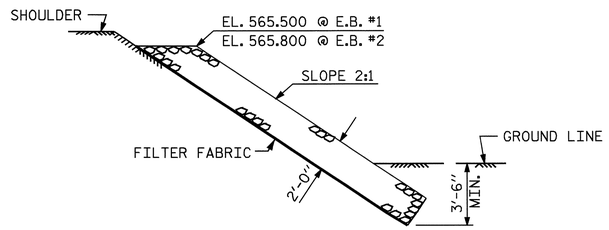
END BENT #2

PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 31+61.50 -L-	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT #1	320	355
END BENT #2	260	285



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS W. PAYNE
3/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : R. G. EMERSON	DATE : 01/07	
CHECKED BY : M. K. BEARD	DATE : 07/07	
DRAWN BY : REK 1/84	REV. 8/16/99	RWW/LES
CHECKED BY : RDU 1/84	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

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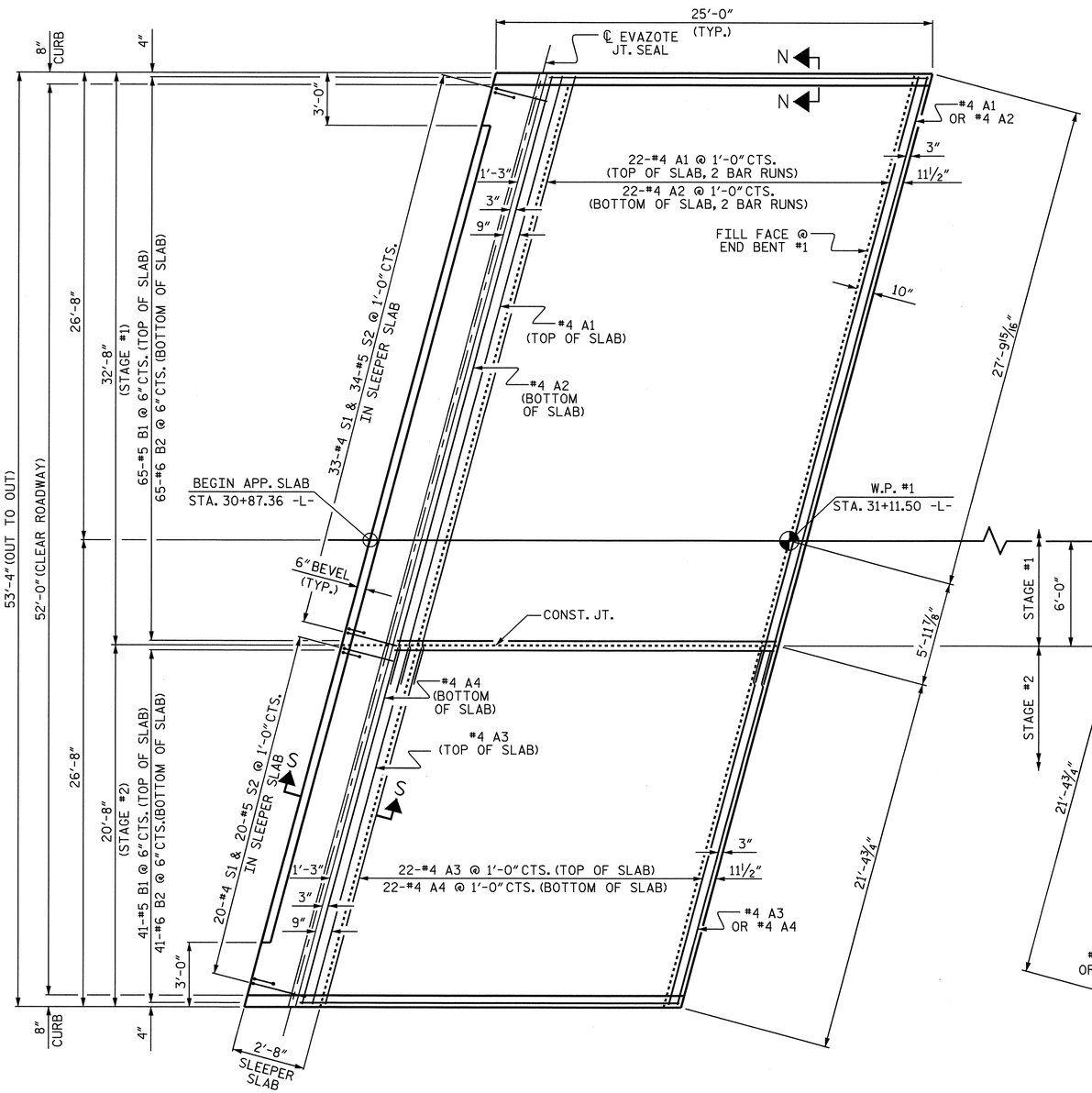
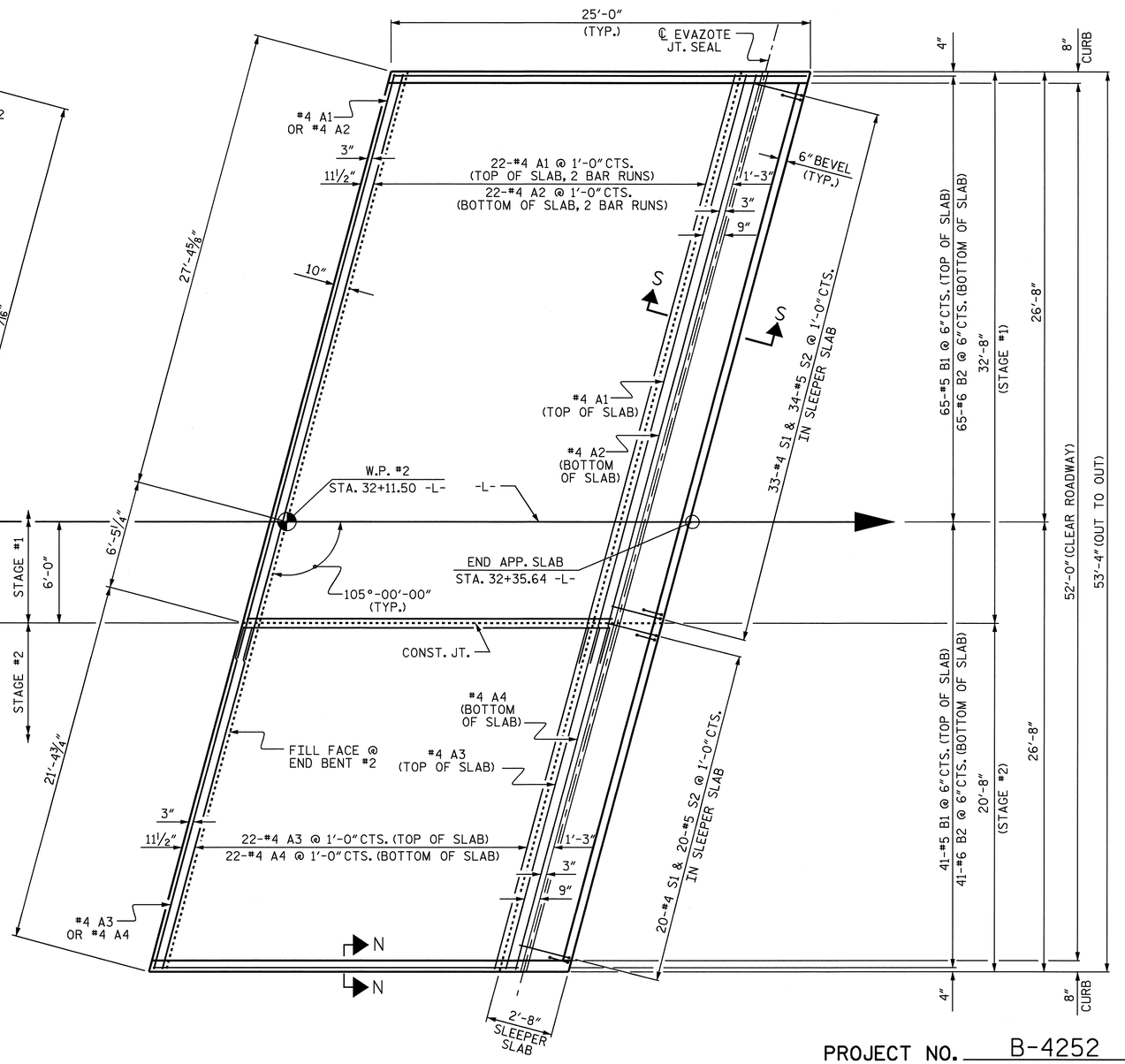
klayne

STR. #2



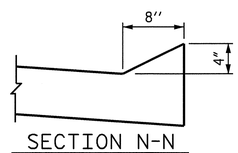
PLAN @ END BENT #1



PLAN @ END BENT #2

#4 "A" BARS IN SLEEPER SLAB NOT SHOWN FOR CLARITY.

EXTEND #4 A1 TOP BARS 2'-2" BEYOND CONST. JT. FOR 2'-0" SPLICE.
EXTEND #4 A2 BOTTOM BARS 1'-11" FOR 1'-9" SPLICE.



SECTION N-N

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

STAGE #1 & STAGE #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			70

STR. #2

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS FAINE
3/25/08

DRAWN BY : R. G. EMERSON DATE : 03/07
CHECKED BY : J. P. ADAMS DATE : 03/07

20-MAR-2008 15:34
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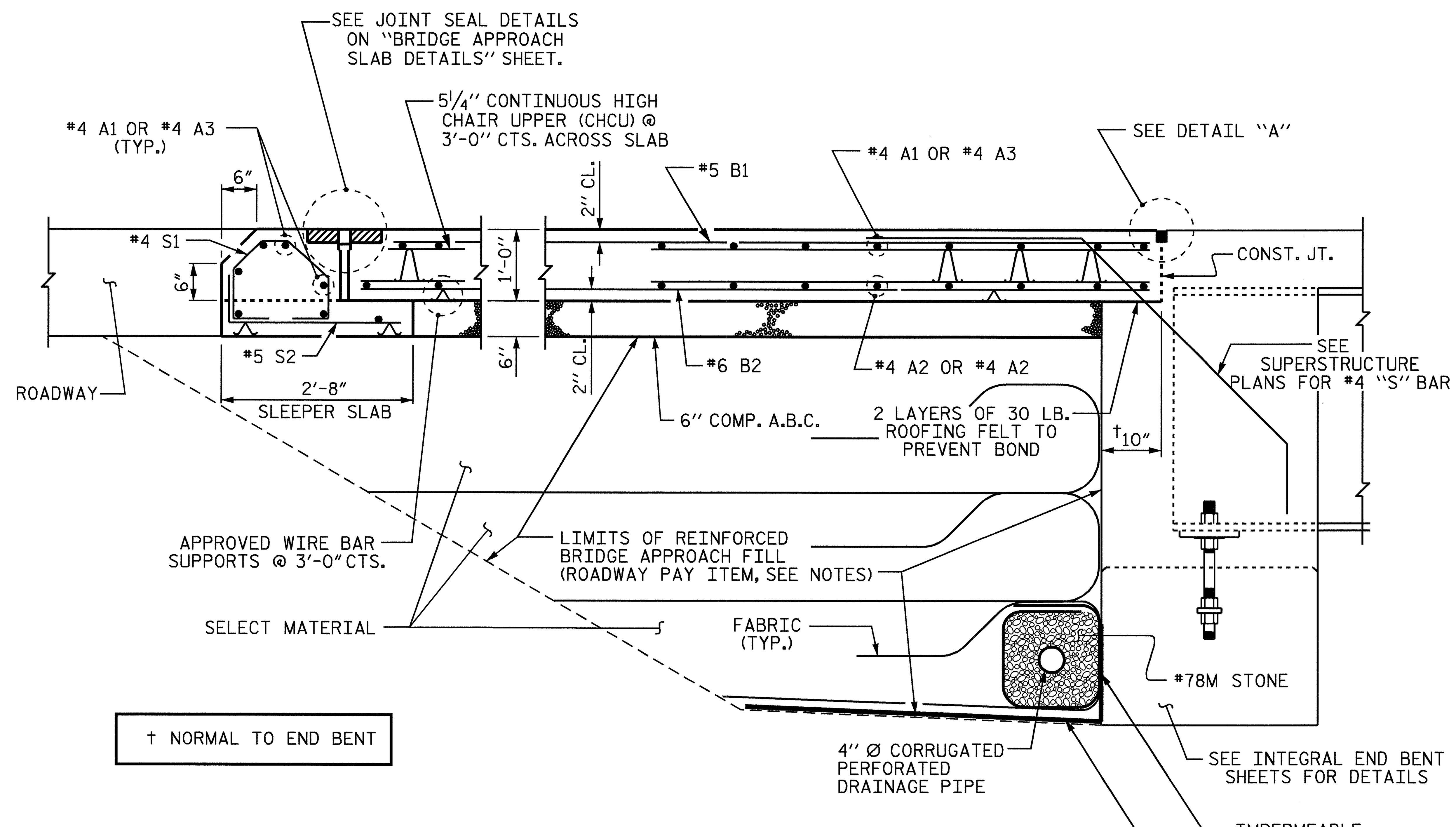


SECTION THRU SLAB

NOTES

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

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

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

THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE SLEEPER SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE SLEEPER SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

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

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

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 13/16".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APP. SLAB @ END BENT #1 STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	18'-11"	758
A2	48	#4	STR	18'-11"	599
* B1	65	#5	STR	22'-4"	1514
B2	65	#6	STR	22'-9"	2221
* S1	33	#4	1	3'-11"	86
S2	33	#5	2	2'-9"	100
REINFORCING STEEL				LBS.	2920
* EPOXY COATED REINFORCING STEEL				LBS.	2358
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C.Y.	31.9
POUR #2 - SLEEPER SLAB				C.Y.	3.5
TOTAL				C.Y.	35.4

APP. SLAB @ END BENT #2 STAGE 1

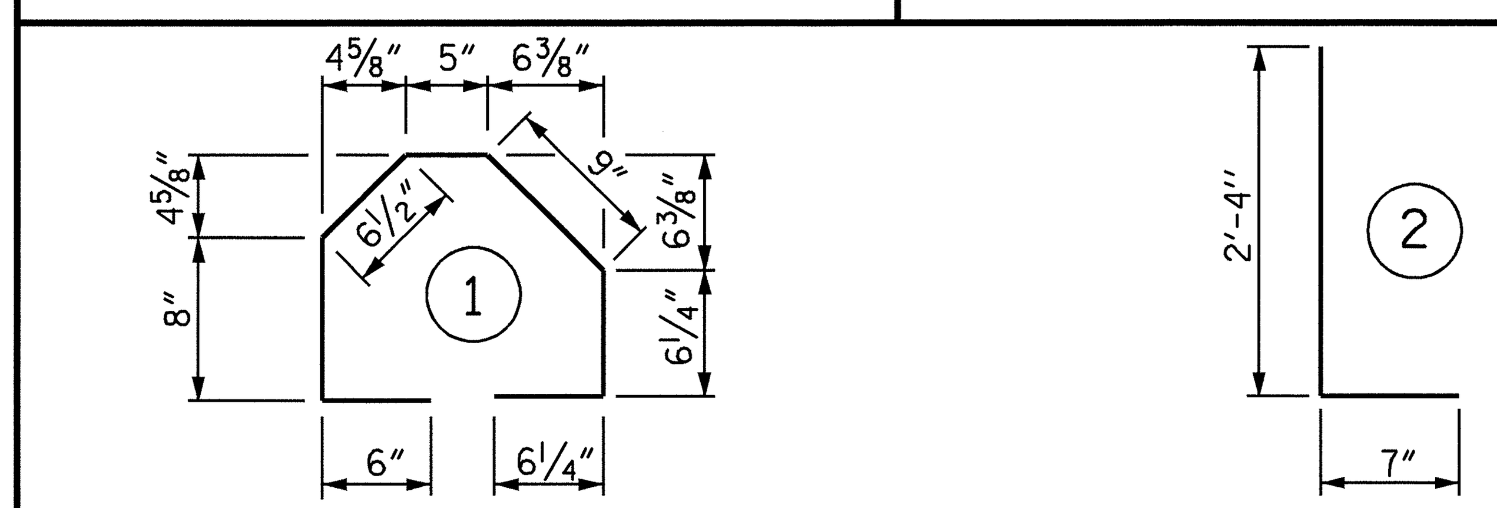
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	18'-11"	758
A2	48	#4	STR	18'-11"	599
* B1	65	#5	STR	22'-4"	1514
B2	65	#6	STR	22'-9"	2221
* S1	33	#4	1	3'-11"	86
S2	33	#5	2	2'-9"	100
REINFORCING STEEL				LBS.	2920
* EPOXY COATED REINFORCING STEEL				LBS.	2358
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C.Y.	31.9
POUR #2 - SLEEPER SLAB				C.Y.	3.5
TOTAL				C.Y.	35.4

APP. SLAB @ END BENT #1 STAGE 2

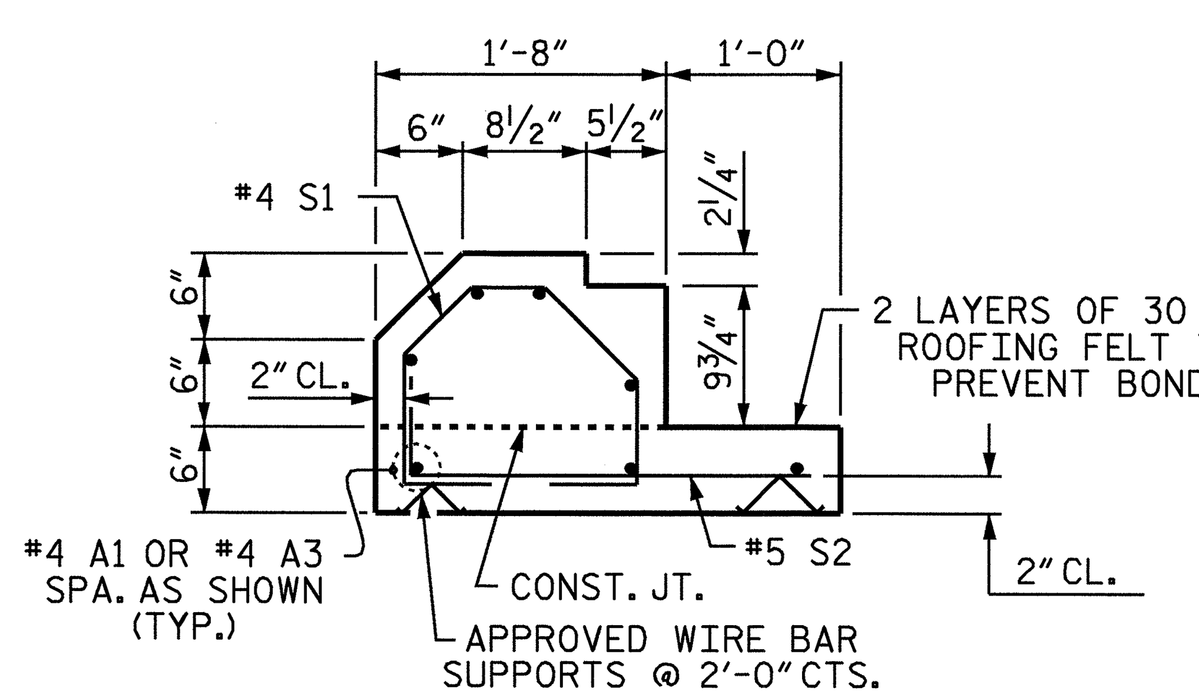
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	30	#4	STR	21'-1"	423
A4	24	#4	STR	21'-1"	338
* B1	41	#5	STR	22'-4"	955
B2	41	#6	STR	22'-9"	1401
* S1	20	#4	1	3'-11"	52
S2	20	#5	2	2'-9"	61
REINFORCING STEEL				LBS.	1800
* EPOXY COATED REINFORCING STEEL				LBS.	1430
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C.Y.	21.2
POUR #2 - SLEEPER SLAB				C.Y.	2.2
TOTAL				C.Y.	23.4

APP. SLAB @ END BENT #2 STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	30	#4	STR	21'-1"	423
A4	24	#4	STR	21'-1"	338
* B1	41	#5	STR	22'-4"	955
B2	41	#6	STR	22'-9"	1401
* S1	20	#4	1	3'-11"	52
S2	20	#5	2	2'-9"	61
REINFORCING STEEL				LBS.	1800
* EPOXY COATED REINFORCING STEEL				LBS.	1430
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				C.Y.	21.2
POUR #2 - SLEEPER SLAB				C.Y.	2.2
TOTAL				C.Y.	23.4

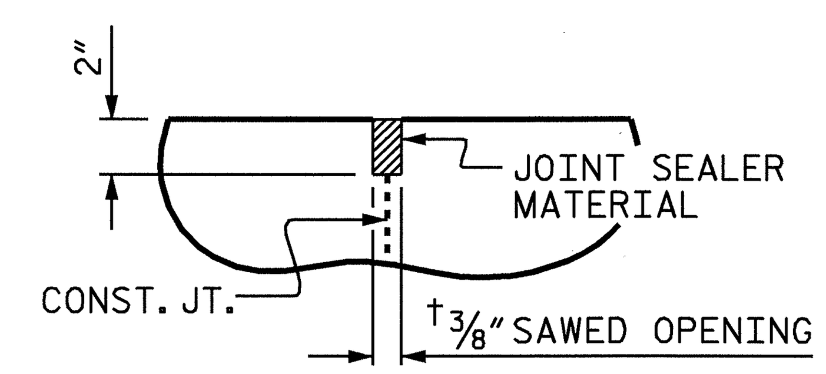


ALL BAR DIMENSIONS ARE OUT TO OUT



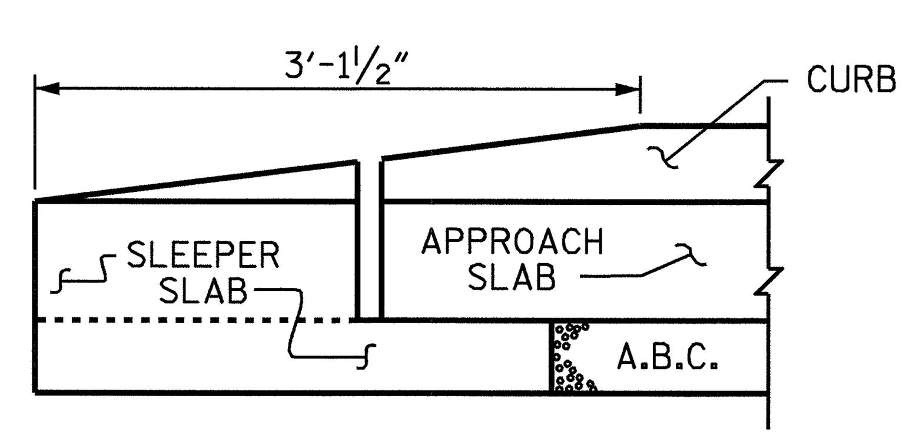
SECTION S-S

SHOWING SLEEPER SLAB

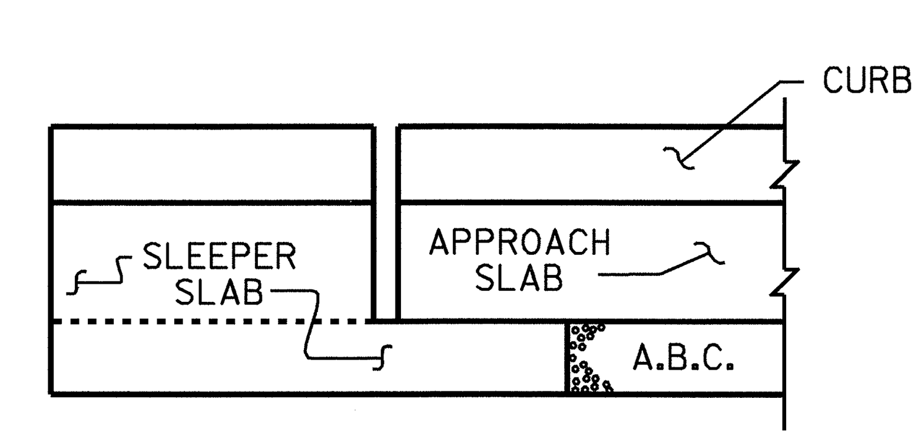


DETAIL "A"

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



END OF CURB WITHOUT SHOULDER BERM GUTTER



END OF CURB WITH SHOULDER BERM GUTTER

PROJECT NO. B-4252

ROCKINGHAM COUNTY

STATION: 31+61.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE
APPROACH SLAB FOR
INTEGRAL ABUTMENT

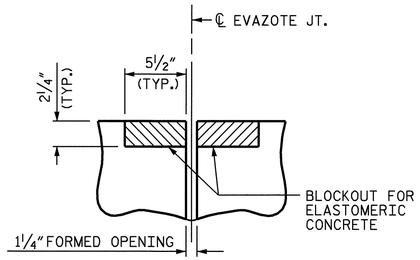
NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS P. PAYNE
3/25/08

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-69
1			3				TOTAL SHEETS
2			4				70

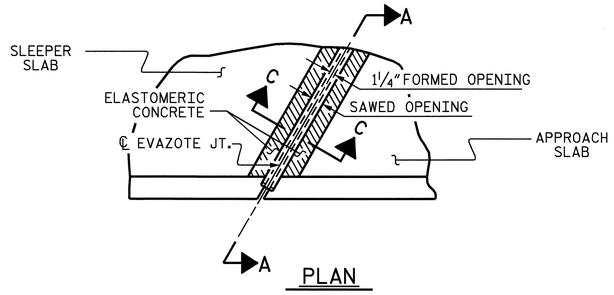
ASSEMBLED BY : R. G. EMERSON DATE : 03/07
CHECKED BY : J. P. ADAMS DATE : 03/07
DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06
ADDED 5/1/06R KMM/GM

STR. #2

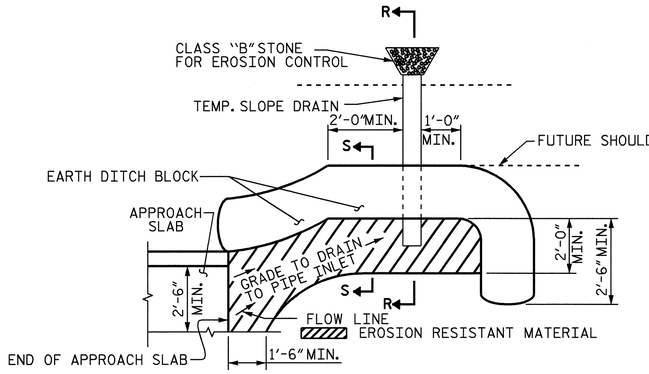
STD. NO. BAS11 (SHT 11)



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

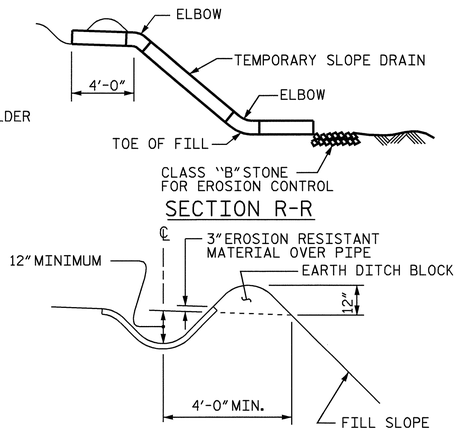


PLAN



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

PLAN VIEW



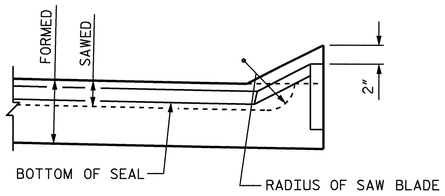
SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

SECTION C-C
EVAZOTE JOINT SEAL



SECTION A-A

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

ELASTOMERIC CONCRETE			
END BENT NO.	STAGE #1 (CU. FT.)	STAGE #2 (CU. FT.)	TOTAL ELASTOMERIC CONCRETE * (CU. FT.)
1	5.8	3.7	9.5
2	5.8	3.7	9.5
TOTAL	11.6	7.4	19.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. B-4252
ROCKINGHAM COUNTY
STATION: 31+61.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH
SLAB DETAILS

1988

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS LAYNE
3/25/08

ASSEMBLED BY : R. G. EMERSON	DATE : 03/07		
CHECKED BY : J. P. ADAMS	DATE : 03/07		
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06	TLA/GM

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klayne

STR. #2 STD. NO. BAS10 (SHT 7)

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 STANDARD SPECIFICATIONS "FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

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

STRUCTURAL STEEL:

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

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

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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