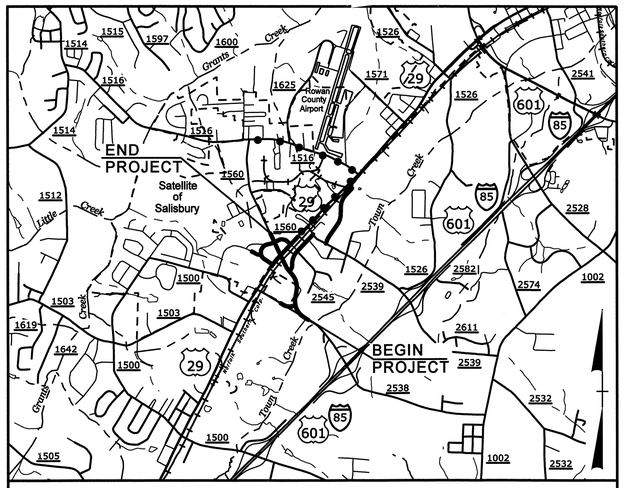
DGN 0151DEL_P10b1

TIP PROJECT: P-5206A

CONTRACT: C203143

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	P-5206A			
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION		
52000.1.STR03T1B		P.E., UTIL P.E.		
52000.1.STR04T3		P.E., UTIL P.E.		
43219.2.STR08P5206		R/W		
52000.3.STR01T4A		UTIL. CONST.		
52000.3.STR01T4A		CONST.		



VICINITY MAP

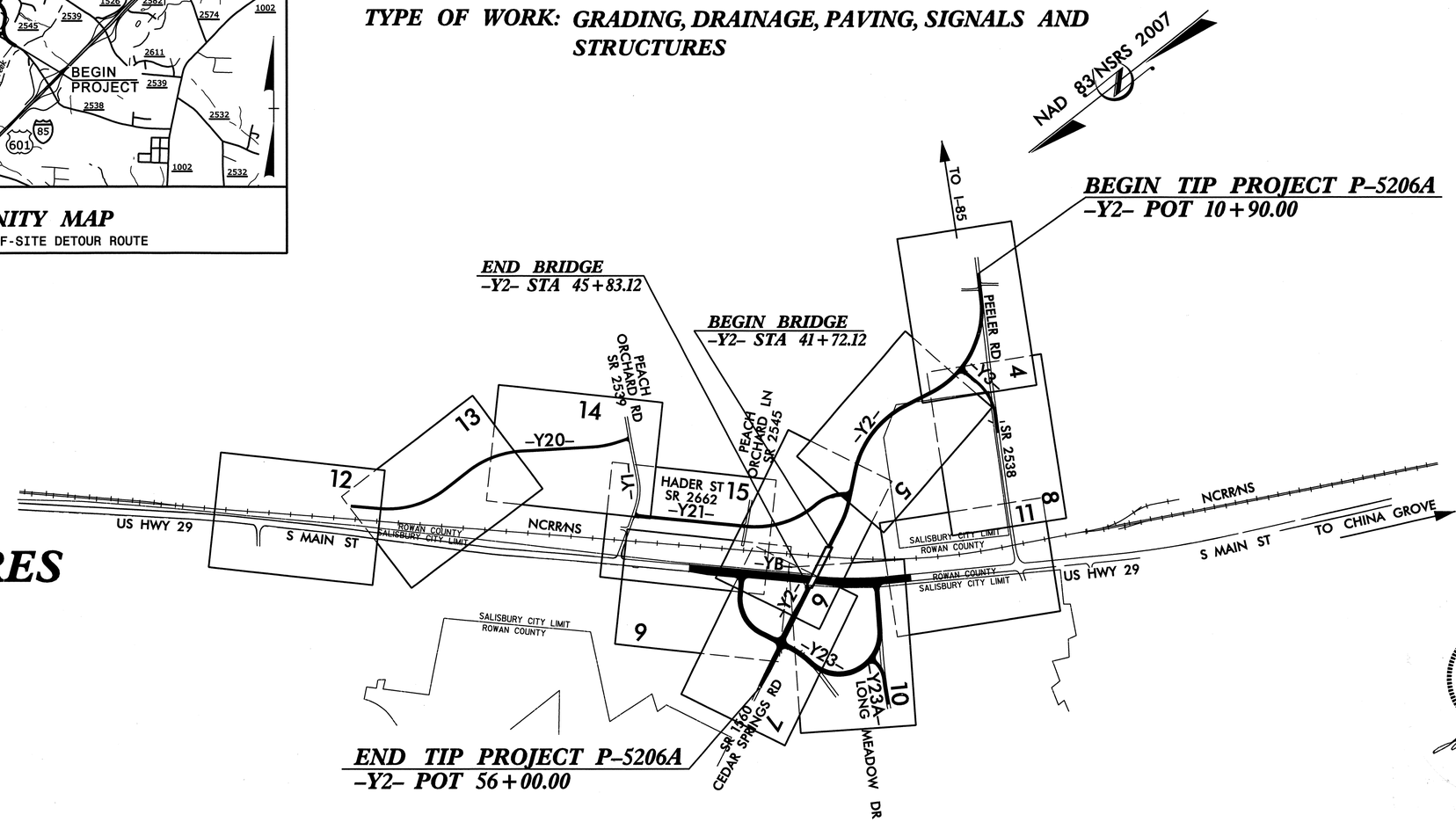
OFF-SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
RAIL DIVISIONS

ROWAN COUNTY

LOCATION: *PEELER ROAD (SR 2538)/CEDAR SPRINGS ROAD (SR 1560) GRADE SEPARATION OVER NCRR/NS*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS AND STRUCTURES*



STRUCTURES

DESIGN DATA

ADT 2015 = 8520
ADT 2035 = 15400
DHV = 9 %
D = 55 %
T = 8 % *
V = 50 MPH
* 4% TTST + 4% DUALS
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH RDWY (-Y2-) TIP PROJECT P-5206A = 0.776 MILES
LENGTH STR (-Y2-) TIP PROJECT P-5206A = 0.078 MILES
TOTAL LENGTH (-Y2-) TIP PROJECT P-5206A = 0.854 MILES

Prepared In the Office of:

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

2012 STANDARD SPECIFICATIONS

BRIAN A. WILES, PE
PROJECT ENGINEER

LETTING DATE:
MARCH 19, 2013

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

NDOT RAIL DIVISION CONTACT: SANDRA STEPNEY, PE

SIGNATURE: P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
PLANNING AND DEVELOPMENT

1/9/2013
p5206a_sd_ts.dgn
Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

42+00 42+50 43+00 44+50 45+00 45+50 46+00

+5.5957% -5.0556%

PI = STA. 42+60.00 -Y2-
EL. 838.500
VC = 920'

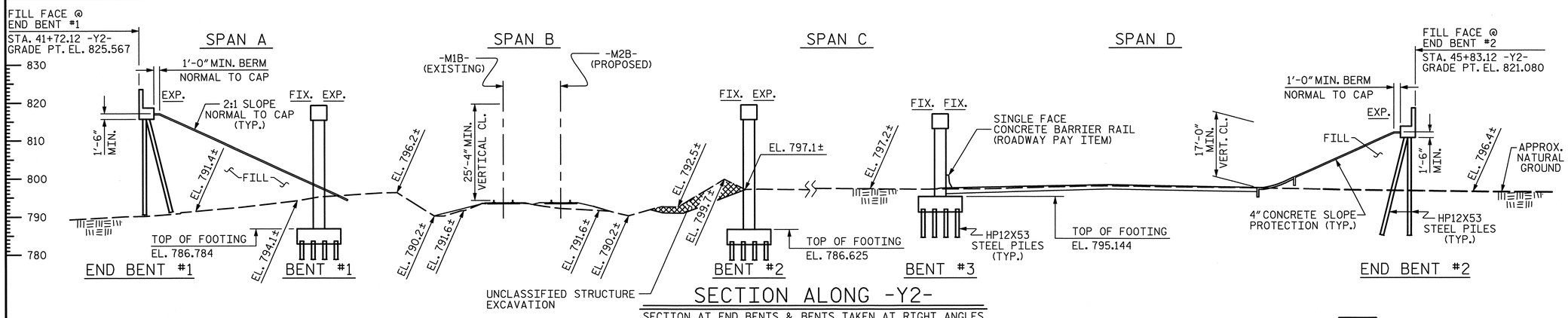
GRADE DATA

+0.27% +0.31%

PI = STA. 9077+22.79 -M1B-
EL. 794.110

PI = STA. 9079+00.00 -M1B-
EL. 794.580
VC = 200'

TOP OF RAIL -M1B-



SECTION ALONG -Y2-

SECTION AT END BENTS & BENTS TAKEN AT RIGHT ANGLES

HORIZONTAL CURVE DATA

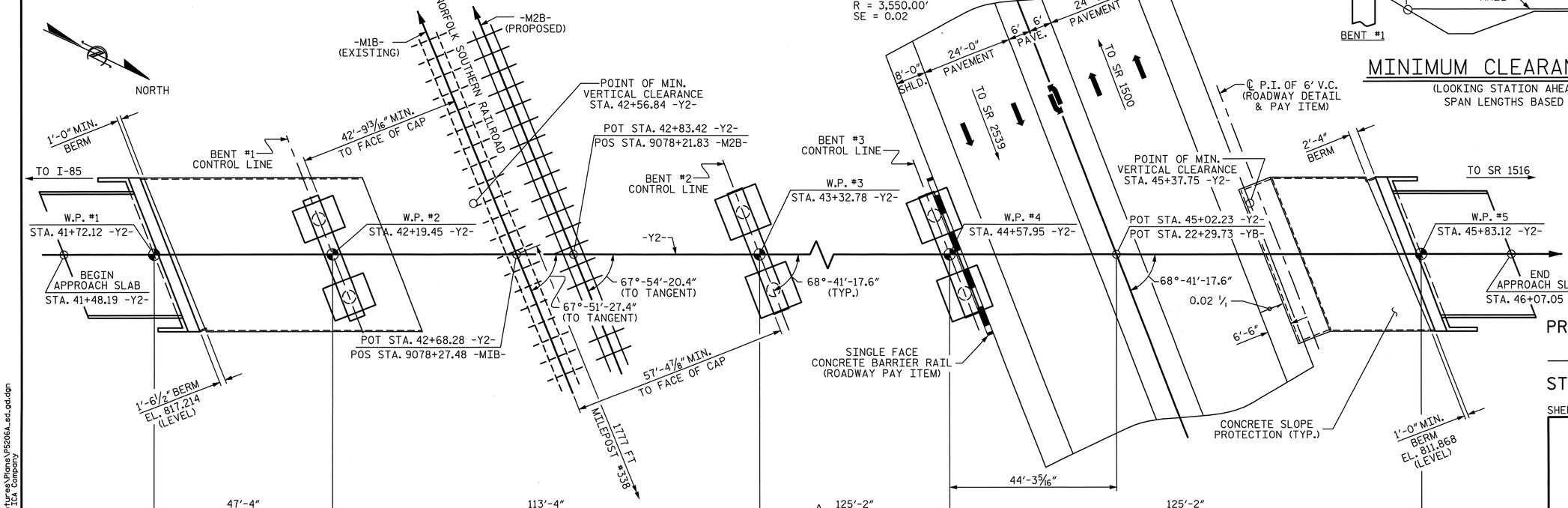
PI Sta 9079+91.47 -M1B-
Θs = 2°-04'-55.7"(LT)
Ls = 403.000'
Lt = 268.685'
St = 134.350'

PI Sta 9079+88.25 -M2B-
Θs = 1°-55'-19.1"(LT)
Ls = 372.000'
Lt = 248.015'
St = 124.013'

PI Sta 26+05.03 -YB-
Δ = 10°-52'-17.2"(LT)
D = 1°-36'-50.3"
L = 673.59'
T = 337.81'
R = 3,550.00'
SE = 0.02

MINIMUM CLEARANCE - RAILROAD

(LOOKING STATION AHEAD ALONG RAILROAD)
SPAN LENGTHS BASED ON THIS SECTION



PLAN

PILES NOT SHOWN FOR CLARITY

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 6 MILE POST NO. 338.33

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1560 OVER US 29 AND NORFOLK SOUTHERN RAILROAD BETWEEN I-85 AND SR 1516

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

DRAWN BY : D. H. CARTER DATE : 11/12
CHECKED BY : J. E. MONDOLFI DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0266

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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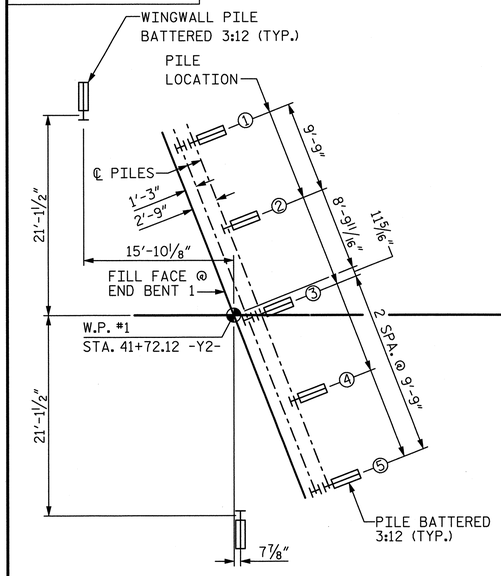
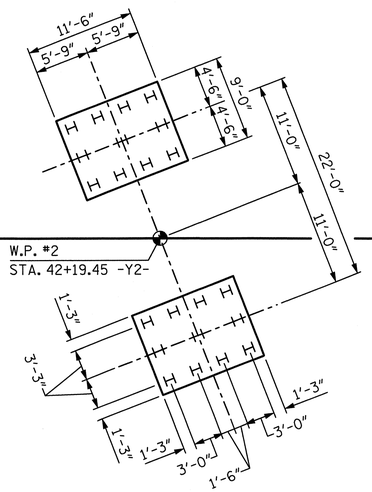
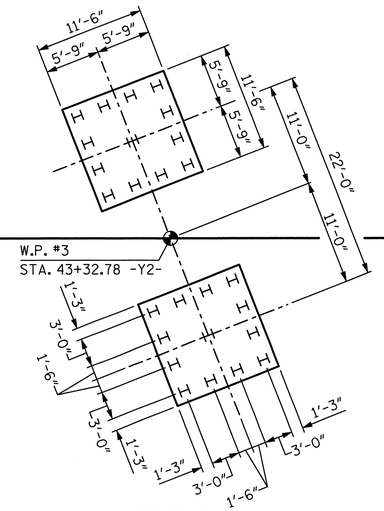


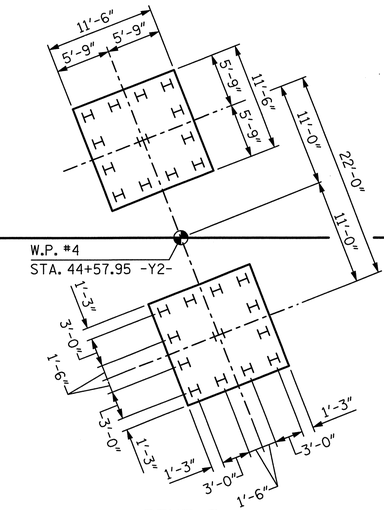
END BENT 1



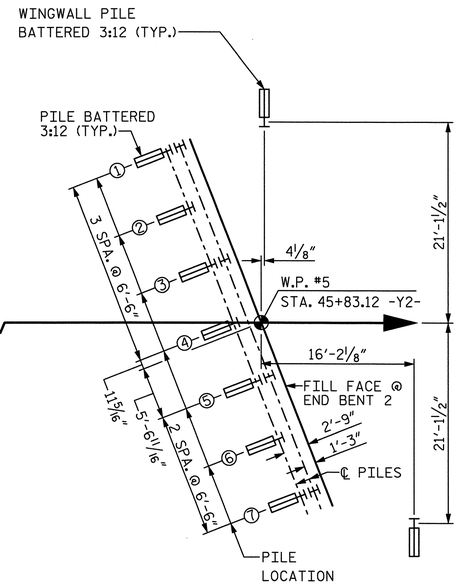
BENT 1
DIMENSIONS AND PILE LAYOUT
ARE TYPICAL FOR EACH FOOTING.



BENT 2
DIMENSIONS AND PILE LAYOUT
ARE TYPICAL FOR EACH FOOTING.



BENT 3
DIMENSIONS AND PILE LAYOUT
ARE TYPICAL FOR EACH FOOTING.



END BENT 2

FOUNDATION LAYOUT

ALL PILES ARE HP 12X53 STEEL PILES.

NOTES:

FOR PILES, SEE STANDARD SPECIFICATIONS AND PROVISIONS DATED 01/17/2012 AND 09/18/2012.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY FROM 16,000 TO 31,330 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 1, BENT NO. 1, BENT NO. 2, BENT NO. 3, AND END BENT NO. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

OBSERVE AN 8-MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1.

OBSERVE AN 8-MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 2.

THE ENGINEER WILL DETERMINE IF THE PROPOSED PILE DRIVING METHODS AND EQUIPMENT ARE ACCEPTABLE AND PROVIDE THE BLOW/FT AND EQUIVALENT SET FOR THE REQUIRED DRIVING RESISTANCE NOTED IN THE PLANS.

THE ENGINEER WILL COMPLETE THE REVIEW OF THE PROPOSED PILE DRIVING METHODS AND EQUIPMENT WITHIN SEVEN (7) DAYS OF RECEIVING PILE DRIVING CRITERIA. DO NOT PLACE CONCRETE FOR CAPS OR FOOTINGS ON PILES UNTIL PILE DRIVING CRITERIA HAS BEEN ACCEPTED.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

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

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0158

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/23/2013
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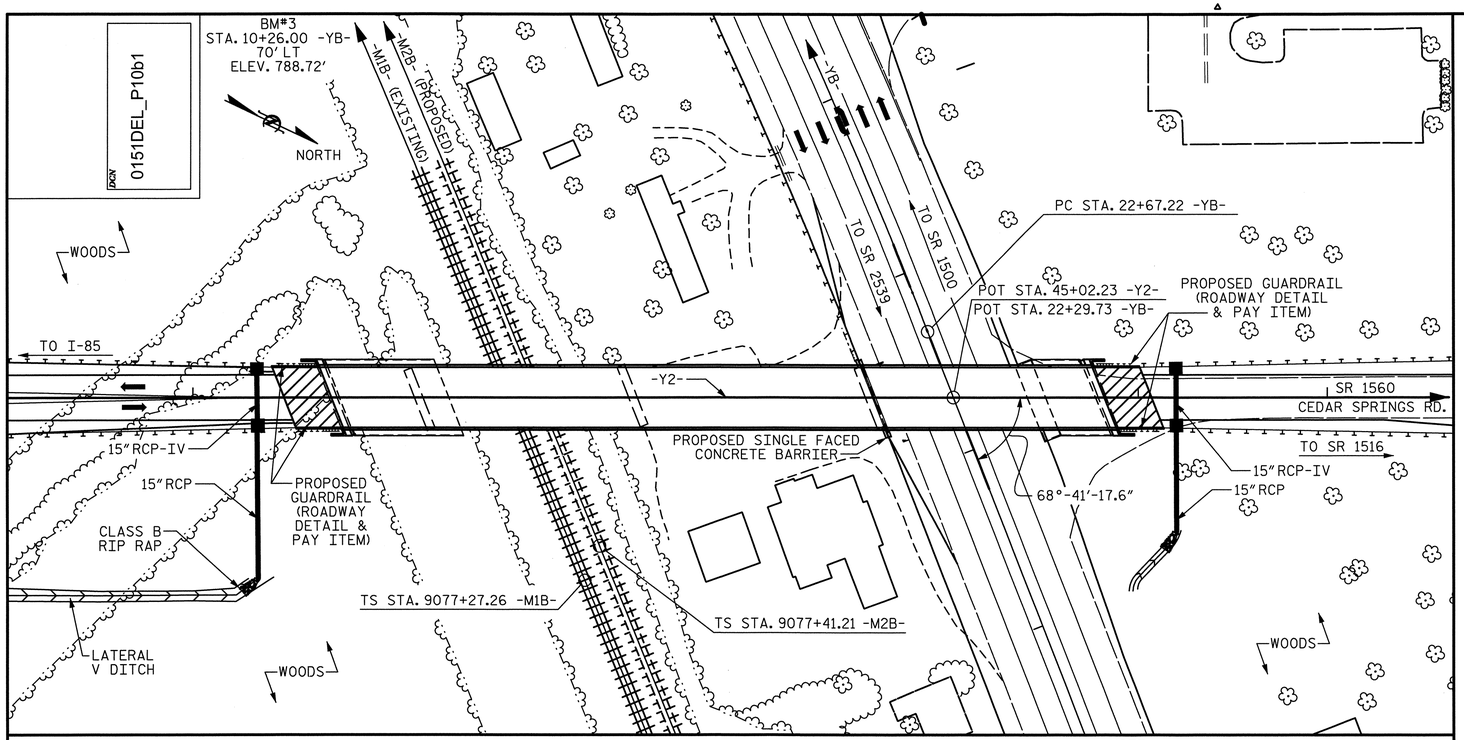

LOCATION SKETCH

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

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

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

ALL FALSEWORK AND FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST AND CURED.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND TOP OF RAIL AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE SHORING AND EXCAVATION PLANS HAVE BEEN SUBMITTED TO THE RAILROAD BY THE STATE. AS OF THE TIME OF PLAN PRINTING FOR ADVERTISEMENT FOR BIDS, RAILROAD APPROVAL HAS NOT BEEN RECEIVED. WHEN SUCH APPROVAL IS RECEIVED, THE CONTRACTOR WILL BE NOTIFIED BY ADDENDUM. IN THE EVENT RAILROAD APPROVAL IS NOT GIVEN PRIOR TO SUBMISSION OF BIDS, THE CONTRACTOR SHALL SUBMIT BIDS BASED ON THE CONTRACT PLANS. THE CONTRACTOR SHALL NOT BEGIN EXCAVATION AT THE LOCATIONS SHOWN ON THESE PLANS UNTIL NOTIFIED OF RAILROAD APPROVAL.

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.

MINIMUM VERTICAL CLEARANCES ARE BASED ON EXISTING TOP OF RAIL ELEVATIONS PROJECTED ONTO FUTURE TRACK LOCATIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE AT STA. 45+02.23 -Y2-, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR THERMAL SPARAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		MODIFIED 72" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2"X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	CU.YDS.	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	LIN.FT.	SQ.YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			14,136	13,196					8	633.13	8	989.79			801.34	817.53			
END BENT NO. 1					40.2		5,218						10	1,050			291		
BENT NO. 1	146				75.4		12,745	1,522					22	1,540					
BENT NO. 2	226				84.5		15,524	1,496					26	1,950					
BENT NO. 3	94				76.6		12,778	957					26	2,210					
END BENT NO. 2					45.2		5,628						13	1,365			155		
TOTAL	466	LUMP SUM	14,136	13,196	321.9	LUMP SUM	51,893	3,975	8	633.13	8	989.79	97	8,115	801.34	817.53	446	LUMP SUM	LUMP SUM

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1560
OVER US 29 AND NORFOLK SOUTHERN RAILROAD
BETWEEN I-85 AND SR 1516

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

DRAWN BY : D. H. CARTER DATE : 11/12
CHECKED BY : J. E. MONDOLFI DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0868

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

1/23/2013
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Florence & Hutcheson - An ICA Company

0151DEL_P10b1

LOAD FACTORS:

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

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	STRENGTH I MOMENT: DISTRIBUTION FACTORS (DF)	STRENGTH I MOMENT: RATING FACTOR	STRENGTH I MOMENT: SPAN	STRENGTH I MOMENT: GIRDER LOCATION	STRENGTH I MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	STRENGTH I SHEAR: DISTRIBUTION FACTORS (DF)	STRENGTH I SHEAR: RATING FACTOR	STRENGTH I SHEAR: SPAN	STRENGTH I SHEAR: GIRDER LOCATION	STRENGTH I SHEAR: DISTANCE FROM LEFT END OF SPAN (ft)	SERVICE III LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	SERVICE III MOMENT: DISTRIBUTION FACTORS (DF)	SERVICE III MOMENT: RATING FACTOR	SERVICE III MOMENT: SPAN	SERVICE III MOMENT: GIRDER LOCATION	SERVICE III MOMENT: DISTANCE FROM LEFT END OF SPAN (ft)	COMMENT NUMBER
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	**1.90**	--	1.75	0.960	**1.90**	A	EL	**21.9**	0.937	2.75	A	I	8.3	0.80	0.960	3.20	A	EL	21.9	1,2
DESIGN LOAD RATING		HL-93 (OPERATING)	N/A		2.47	--	1.35	0.960	2.47	A	EL	21.9	0.937	3.59	A	I	8.3	N/A	--	--	--	--	--	1,2
DESIGN LOAD RATING		HS-20 (INVENTORY)	36.000	2	**2.34**	84.2	1.75	0.960	**2.34**	A	EL	**21.9**	0.937	3.20	A	I	8.3	0.80	0.960	3.92	A	EL	21.9	1,2
DESIGN LOAD RATING		HS-20 (OPERATING)	36.000		3.03	109.1	1.35	0.960	3.03	A	EL	21.9	0.937	4.18	A	I	8.3	N/A	--	--	--	--	--	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.70	77.0	1.40	0.960	5.70	A	EL	21.9	0.937	8.64	A	I	8.3	0.80	0.960	7.66	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNGARBS2	20.000		4.60	92.0	1.40	0.960	4.60	A	EL	21.9	0.937	6.44	A	I	8.3	0.80	0.960	6.19	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNAGRIS2	22.000		4.46	98.1	1.40	0.960	4.46	A	EL	17.4	0.937	6.10	A	I	8.3	0.80	0.960	6.02	A	EL	17.4	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNCOTTS3	27.250		2.85	77.7	1.40	0.960	2.85	A	EL	21.9	0.937	4.29	A	I	8.3	0.80	0.960	3.82	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNAGGRS4	34.925		2.51	87.7	1.40	0.960	2.51	A	EL	21.9	0.937	3.78	A	I	8.3	0.80	0.960	3.38	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS5A	35.550		2.45	87.1	1.40	0.960	2.45	A	EL	21.9	0.937	3.96	A	I	8.3	0.80	0.960	3.29	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS6A	39.950		2.31	92.3	1.40	0.960	2.31	A	EL	21.9	0.937	3.69	A	I	8.3	0.80	0.960	3.10	A	EL	21.9	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNS7B	42.000		2.20	92.4	1.40	0.960	2.20	A	EL	21.9	0.937	3.75	A	I	8.3	0.80	0.960	2.95	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.83	93.4	1.40	0.960	2.83	A	EL	21.9	0.937	4.31	A	I	8.3	0.80	0.960	3.80	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT4A	33.075		2.86	94.6	1.40	0.960	2.86	A	EL	21.9	0.937	4.11	A	I	8.3	0.80	0.960	3.84	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT6A	41.600		2.40	99.8	1.40	0.960	2.40	A	EL	21.9	0.937	4.05	A	I	8.3	0.80	0.960	3.23	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT7A	42.000		2.45	102.9	1.40	0.960	2.45	A	EL	21.9	0.937	3.67	A	I	8.3	0.80	0.960	3.29	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNT7B	42.000		2.55	107.1	1.40	0.960	2.55	A	EL	21.9	0.937	3.60	A	I	8.3	0.80	0.960	3.42	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT4	43.000		2.43	104.5	1.40	0.960	2.43	A	EL	21.9	0.937	3.43	A	I	8.3	0.80	0.960	3.26	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGT5A	45.000		2.26	101.7	1.40	0.960	2.26	A	EL	21.9	0.937	3.56	A	I	8.3	0.80	0.960	3.03	A	EL	21.9	1,2
LEGAL LOAD RATING	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGT5B	45.000	3	**2.20**	99.0	1.40	0.960	**2.20**	A	EL	21.9	**0.937**	3.25	A	I	8.3	0.80	0.960	2.96	A	EL	21.9	1,2

NOTES:

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

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

COMMENTS:

1. ALL DISTANCES ARE MEASURED FROM THE CENTERLINE OF BEARING.
2. SERVICE III LIMIT STATE NOT APPLICABLE AT OPERATING LEVEL.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

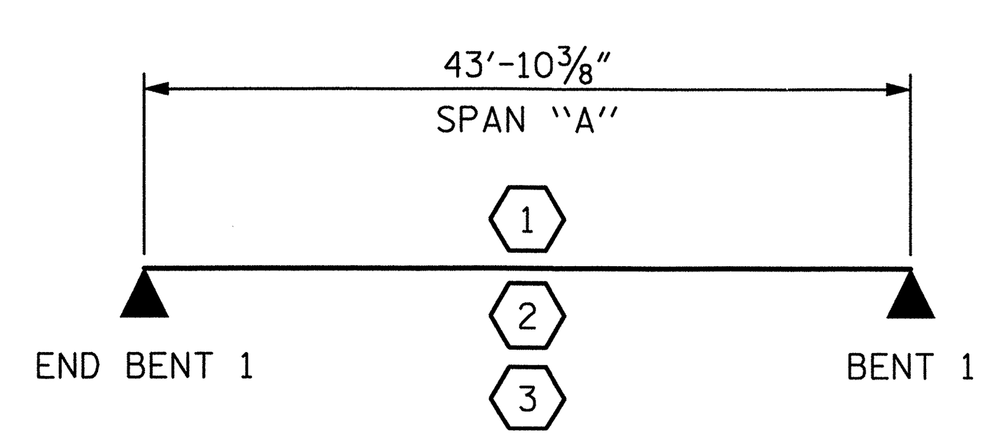
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

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

DRAWN BY : D. H. CARTER DATE : 11/12

CHECKED BY : J. E. MONDOLFI DATE : 11/12

DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	**1.09**	--	1.75	0.867	1.21	B	EL	55.8	0.950	1.16	B	I	10.6	0.80	0.867	**1.09**	B	EL	**55.8**	1,2
		HL-93 (OPERATING)	N/A		1.53	--	1.35	0.867	1.57	B	EL	55.8	0.950	1.53	B	I	10.6	N/A	--	--	--	--	--	1,2
		HS-20 (INVENTORY)	36.000	⟨2⟩	**1.56**	56.2	1.75	0.867	1.73	B	EL	55.8	0.950	1.63	B	I	10.6	0.80	0.867	**1.56**	B	EL	**55.8**	1,2
		HS-20 (OPERATING)	36.000		2.14	77.0	1.35	0.867	2.25	B	EL	55.8	0.950	2.14	B	I	10.6	N/A	--	--	--	--	--	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.76	50.8	1.40	0.867	5.22	B	EL	55.8	0.950	5.28	B	I	10.6	0.80	0.867	3.76	B	EL	55.8	1,2
		SNGARBS2	20.000		2.70	54.0	1.40	0.867	3.75	B	EL	55.8	0.950	3.65	B	I	10.6	0.80	0.867	2.70	B	EL	55.8	1,2
		SNAGRIS2	22.000		2.52	55.4	1.40	0.867	3.49	B	EL	55.8	0.950	3.35	B	I	10.6	0.80	0.867	2.52	B	EL	55.8	1,2
		SNCOTTS3	27.250		1.87	51.0	1.40	0.867	2.59	B	EL	55.8	0.950	2.57	B	I	10.6	0.80	0.867	1.87	B	EL	55.8	1,2
		SNAGGRS4	34.925		1.52	53.1	1.40	0.867	2.11	B	EL	55.8	0.950	2.07	B	I	10.6	0.80	0.867	1.52	B	EL	55.8	1,2
		SNS5A	35.550		1.49	53.0	1.40	0.867	2.07	B	EL	55.8	0.950	2.07	B	I	10.6	0.80	0.867	1.49	B	EL	55.8	1,2
		SNS6A	39.950		1.35	53.9	1.40	0.867	1.88	B	EL	55.8	0.950	1.86	B	I	10.6	0.80	0.867	1.35	B	EL	55.8	1,2
		SNS7B	42.000		1.29	54.2	1.40	0.867	1.79	B	EL	55.8	0.950	1.80	B	I	10.6	0.80	0.867	1.29	B	EL	55.8	1,2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.64	54.1	1.40	0.867	2.28	B	EL	55.8	0.950	2.25	B	I	10.6	0.80	0.867	1.64	B	EL	55.8	1,2
		TNT4A	33.075		1.65	54.6	1.40	0.867	2.29	B	EL	55.8	0.950	2.21	B	I	10.6	0.80	0.867	1.65	B	EL	55.8	1,2
		TNT6A	41.600		1.33	55.3	1.40	0.867	1.85	B	EL	55.8	0.950	1.88	B	I	10.6	0.80	0.867	1.33	B	EL	55.8	1,2
		TNT7A	42.000		1.33	55.9	1.40	0.867	1.85	B	EL	55.8	0.950	1.84	B	I	10.6	0.80	0.867	1.33	B	EL	55.8	1,2
		TNT7B	42.000		1.36	57.1	1.40	0.867	1.88	B	EL	55.8	0.950	1.76	B	I	10.6	0.80	0.867	1.36	B	EL	55.8	1,2
		TNAGRIT4	43.000		1.31	56.3	1.40	0.867	1.81	B	EL	55.8	0.950	1.72	B	I	10.6	0.80	0.867	1.31	B	EL	55.8	1,2
		TNAGT5A	45.000		1.24	55.8	1.40	0.867	1.72	B	EL	55.8	0.950	1.68	B	I	10.6	0.80	0.867	1.24	B	EL	55.8	1,2
		TNAGT5B	45.000	⟨3⟩	**1.23**	55.4	1.40	0.867	1.70	B	EL	55.8	0.950	1.63	B	I	10.6	0.80	0.867	**1.23**	B	EL	**55.8**	1,2

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1. ALL DISTANCES ARE MEASURED FROM THE CENTERLINE OF BEARING.
2. SERVICE III LIMIT STATE NOT APPLICABLE AT OPERATING LEVEL.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

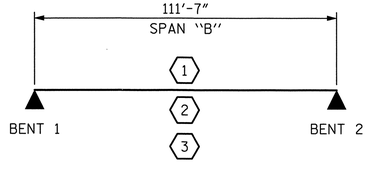
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			53

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0688

DRAWN BY : D. H. CARTER DATE : 11/12
CHECKED BY : J. E. MONDOLFI DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	**1.14**	--	1.75	0.867	1.47	C	EL	49.1	0.946	**1.14**	C	I	**111.4**	0.80	0.867	1.31	C	EL	49.1	1,2
		HL-93 (OPERATING)	N/A		--	--	1.35	0.867	1.90	C	EL	49.1	0.946	1.50	C	I	111.4	N/A	--	--	--	--	--	1,2
		HS-20 (INVENTORY)	36.000	2	**1.77**	63.7	1.75	0.867	2.13	C	EL	49.1	0.946	**1.77**	C	I	**111.4**	0.80	0.867	1.89	C	EL	49.1	1,2
		HS-20 (OPERATING)	36.000		2.33	83.9	1.35	0.867	2.75	C	EL	49.1	0.946	2.33	C	I	111.4	N/A	--	--	--	--	--	1,2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.56	61.6	1.40	0.867	6.39	C	EL	49.1	0.946	6.03	C	I	111.4	0.80	0.867	4.56	C	EL	49.1	1,2
		SNGARBS2	20.000		3.26	65.2	1.40	0.867	4.57	C	EL	49.1	0.946	4.14	C	I	111.4	0.80	0.867	3.26	C	EL	49.1	1,2
		SNAGRIS2	22.000		3.03	66.7	1.40	0.867	4.25	C	EL	49.1	0.946	3.79	C	I	111.4	0.80	0.867	3.03	C	EL	49.1	1,2
		SNCOTTS3	27.250		2.27	61.9	1.40	0.867	3.19	C	EL	49.1	0.946	2.89	C	I	111.4	0.80	0.867	2.27	C	EL	49.1	1,2
		SNAGGRS4	34.925		1.85	64.6	1.40	0.867	2.59	C	EL	49.1	0.946	2.23	C	I	111.4	0.80	0.867	1.85	C	EL	49.1	1,2
		SNS5A	35.550		1.82	64.7	1.40	0.867	2.55	C	EL	49.1	0.946	2.16	C	I	111.4	0.80	0.867	1.82	C	EL	49.1	1,2
		SNS6A	39.950		1.64	65.5	1.40	0.867	2.31	C	EL	49.1	0.946	1.93	C	I	111.4	0.80	0.867	1.64	C	EL	49.1	1,2
		SNS7B	42.000		1.57	65.9	1.40	0.867	2.20	C	EL	49.1	0.946	1.85	C	I	111.4	0.80	0.867	1.57	C	EL	49.1	1,2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.01	66.3	1.40	0.867	2.82	C	EL	49.1	0.946	2.39	C	I	111.4	0.80	0.867	2.01	C	EL	49.1	1,2
		TNT4A	33.075		2.00	66.2	1.40	0.867	2.80	C	EL	49.1	0.946	2.36	C	I	111.4	0.80	0.867	2.00	C	EL	49.1	1,2
		TNT6A	41.600		1.62	67.4	1.40	0.867	2.27	C	EL	49.1	0.946	1.97	C	I	111.4	0.80	0.867	1.62	C	EL	49.1	1,2
		TNT7A	42.000		1.62	68.0	1.40	0.867	2.27	C	EL	49.1	0.946	1.93	C	I	111.4	0.80	0.867	1.62	C	EL	49.1	1,2
		TNT7B	42.000		1.64	68.9	1.40	0.867	2.30	C	EL	49.1	0.946	1.84	C	I	111.4	0.80	0.867	1.64	C	EL	49.1	1,2
		TNAGRIT4	43.000		1.58	67.9	1.40	0.867	2.22	C	EL	49.1	0.946	1.82	C	I	111.4	0.80	0.867	1.58	C	EL	49.1	1,2
		TNAGT5A	45.000		1.51	68.0	1.40	0.867	2.12	C	EL	49.1	0.946	1.76	C	I	111.4	0.80	0.867	1.51	C	EL	49.1	1,2
		TNAGT5B	45.000	3	**1.49**	67.1	1.40	0.867	2.09	C	EL	49.1	0.946	1.80	C	I	111.4	0.80	0.867	**1.49**	C	EL	**49.1**	1,2

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1. ALL DISTANCES ARE MEASURED FROM THE CENTERLINE OF BEARING.
2. SERVICE III LIMIT STATE NOT APPLICABLE AT OPERATING LEVEL.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

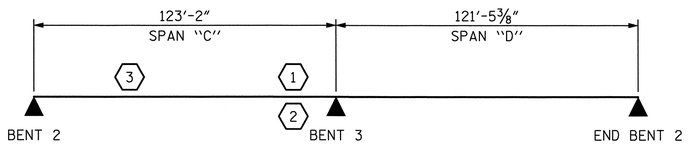
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : D. H. CARTER DATE : 11/12
CHECKED BY : J. E. MONDOLFI DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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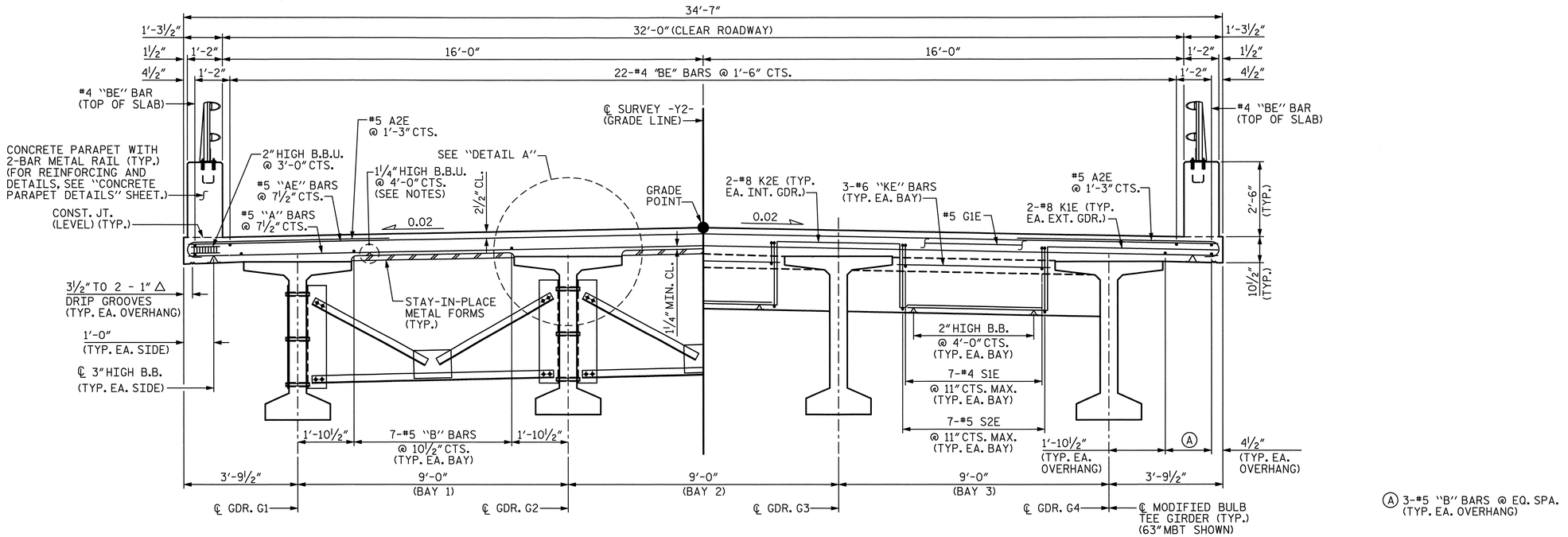
Florence & Hutcheson, An ICA Company

DGN 0151DEL_P10b1



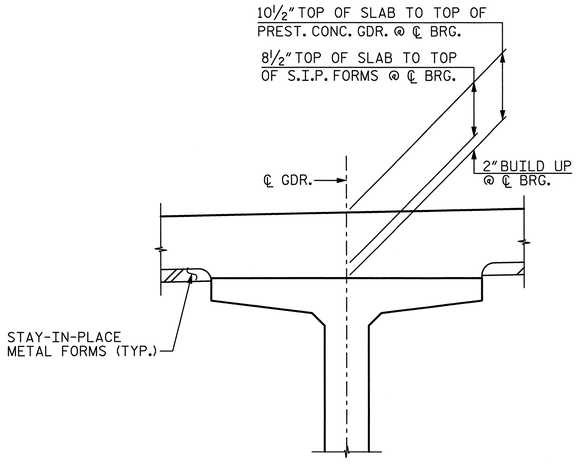
HALF SECTION - INTERMEDIATE DIAPHRAGM

HALF SECTION - DIAPHRAGM AT END BENTS, BENT 1 OR BENT 2

Ⓐ 3-#5 "B" BARS @ EQ. SPA. (TYP. EA. OVERHANG)

TYPICAL SECTION

63" MBT (SPANS A & B) & 72" MBT (SPANS C & D) CONT. FOR LIVE LOAD



DETAIL A

(TYP. EACH GIRDER @ EACH BENT)

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.

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

CONCRETE IN END BENT DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA.

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

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0858

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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Florence & Hutcheson - An ICA Company

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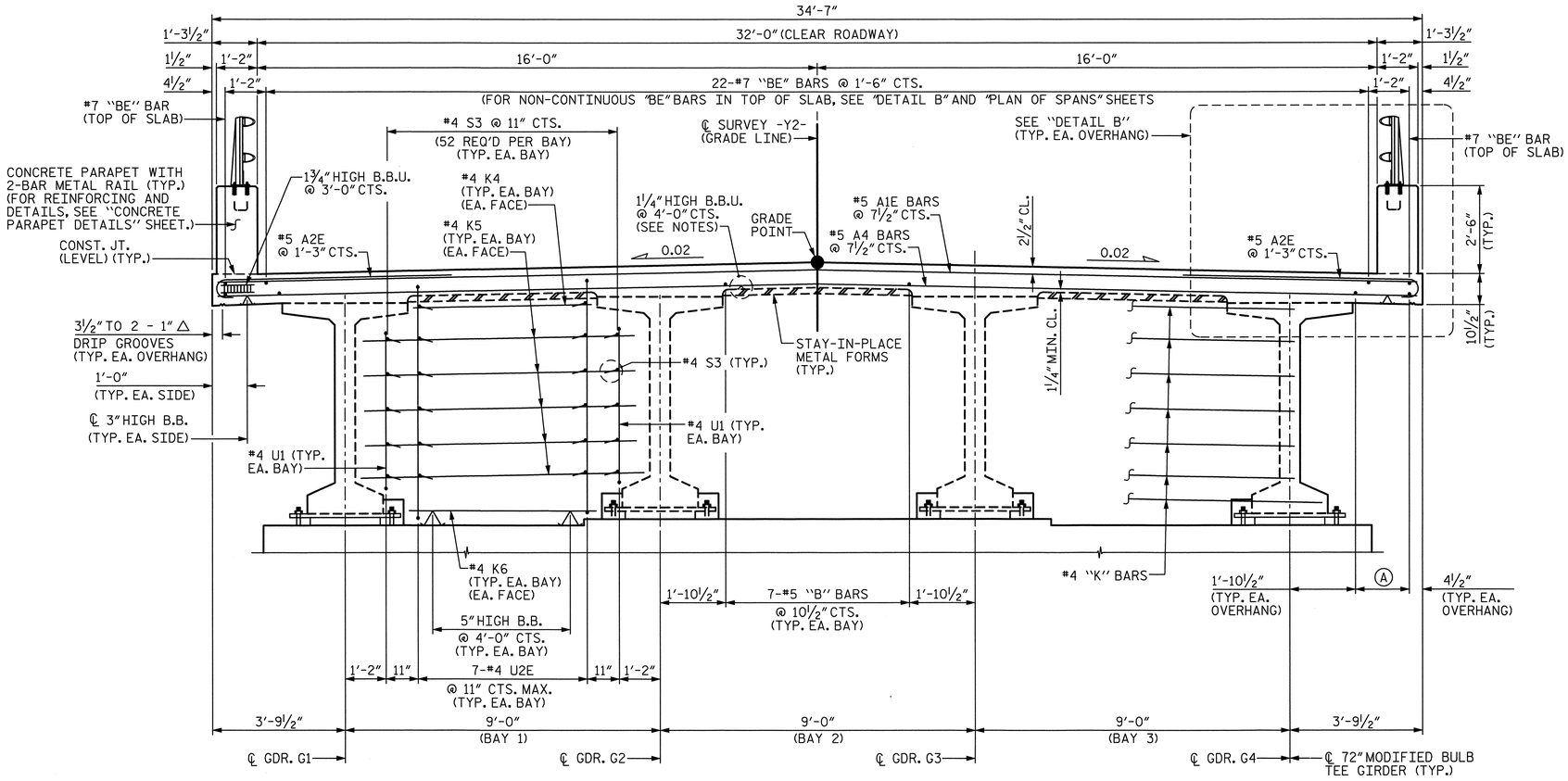
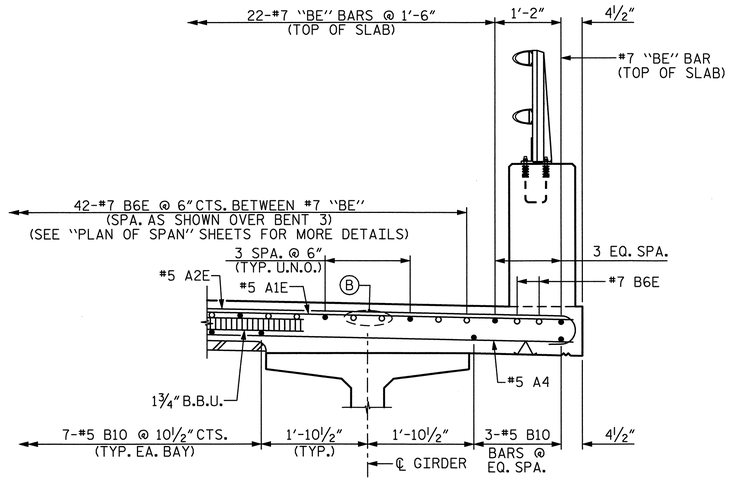


Ⓐ 3-#5 "B" BARS @ EQ. SPA. (TYP. EA. OVERHANG)

Ⓑ 2-#7 "BE" NON-CONTINUOUS REINFORCING BARS BETWEEN CONTINUOUS REINFORCING OVER INTERIOR BENT 3 (SPA. AS SHOWN)

SECTION - BENT 3 DIAPHRAGM
TYPICAL SECTION



DETAIL B

✱✱✱ TYPICAL SPACING OF NON-CONTINUOUS "BE" BARS BETWEEN CONTINUOUS "BE" BARS.
° INDICATES NON-CONTINUOUS REINFORCING STEEL OVER INTERIOR BENT 3.
• INDICATES CONTINUOUS REINFORCING STEEL FROM BENT 2 TO END BENT 2.

FOR SUPERSTRUCTURE NOTES, SEE "TYPICAL SECTION", SHEET 1 OF 2.

PROJECT NO. P-5206A
ROWAN COUNTY
STATION: 45+02.23 -Y2-
22+29.73 -YB-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0358

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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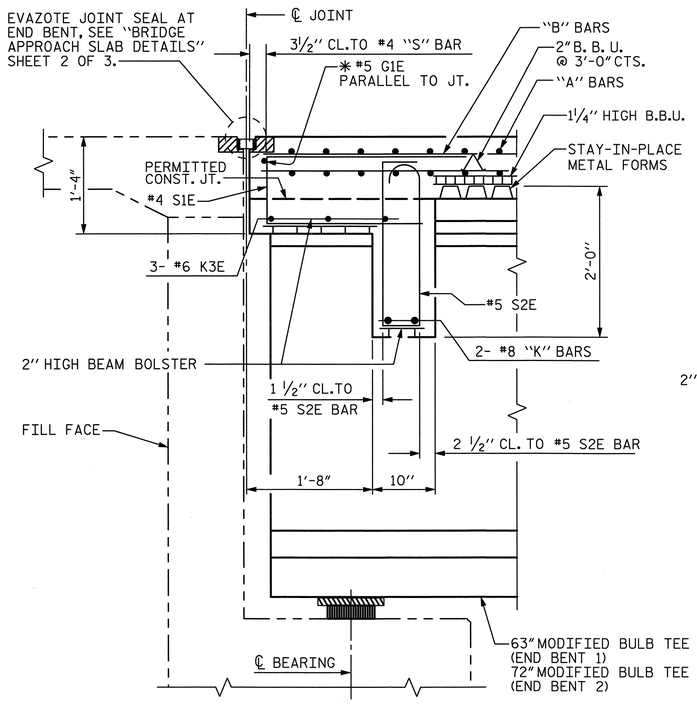
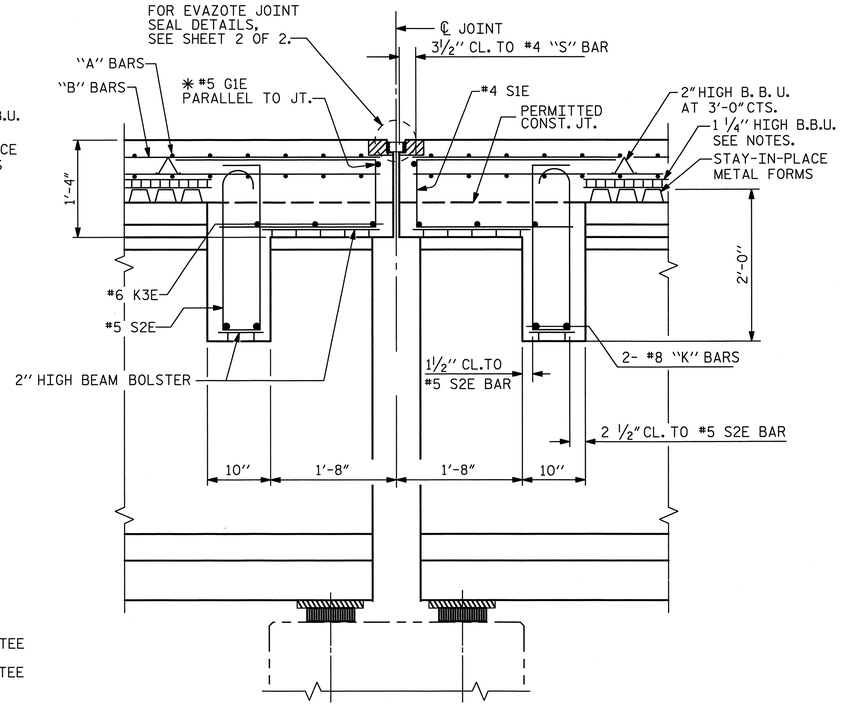


SECTION THRU END BENT DIAPHRAGMS

END BENT 1 SHOWN, END BENT 2 SIMILAR

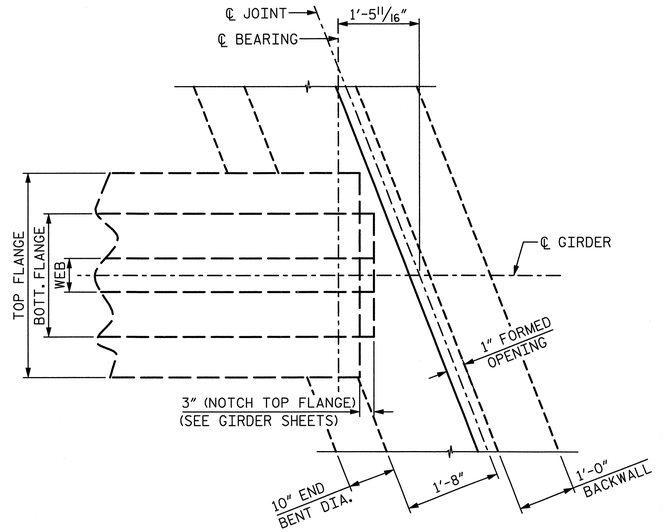
✳ #5 G1E BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS



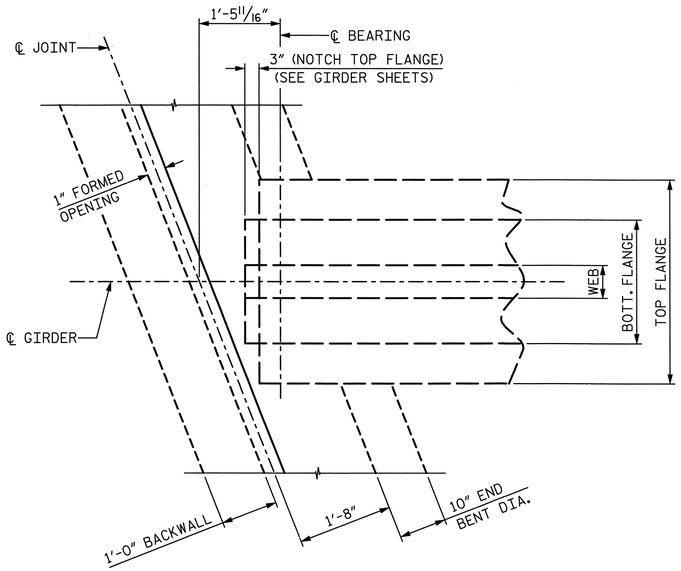
SECTION THRU BENT 1 DIAPHRAGM

✳ #5 G1E BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

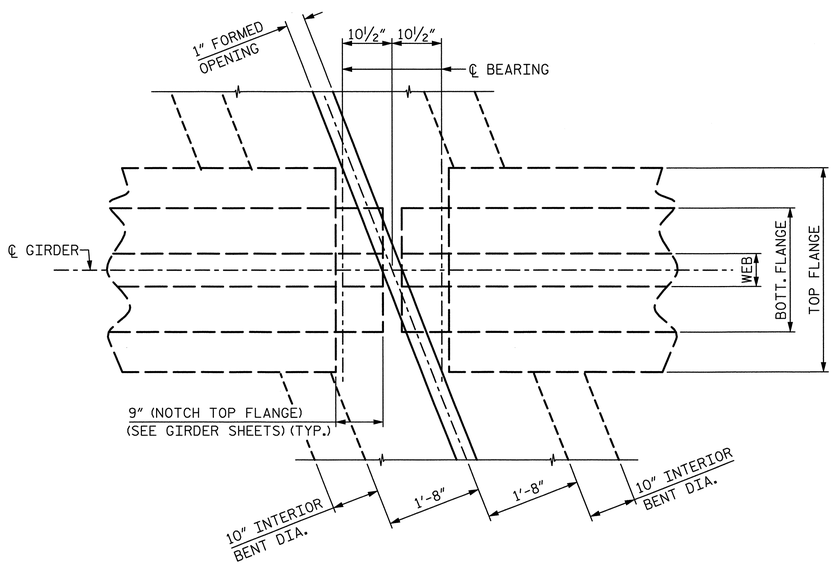
FOR MORE INFORMATION, SEE "PLAN OF SPANS" SHEETS 1-2 OF 4



PLAN OF END BENT 2 DIAPHRAGM



PLAN OF END BENT 1 DIAPHRAGM



PLAN OF DIAPHRAGM - BENT 1 OR 2

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			53

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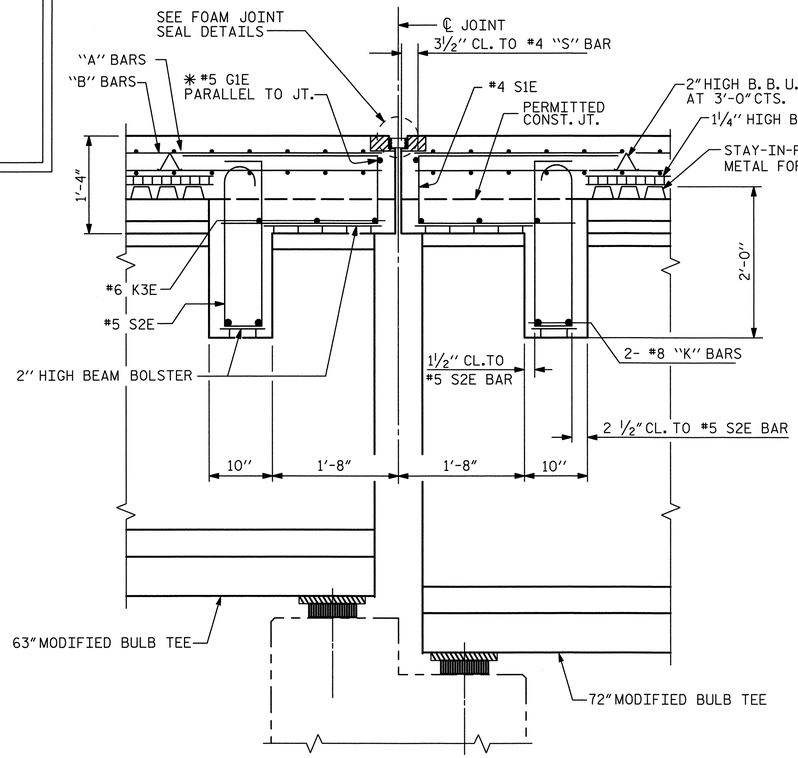

SECTION THRU BENT 2 DIAPHRAGM

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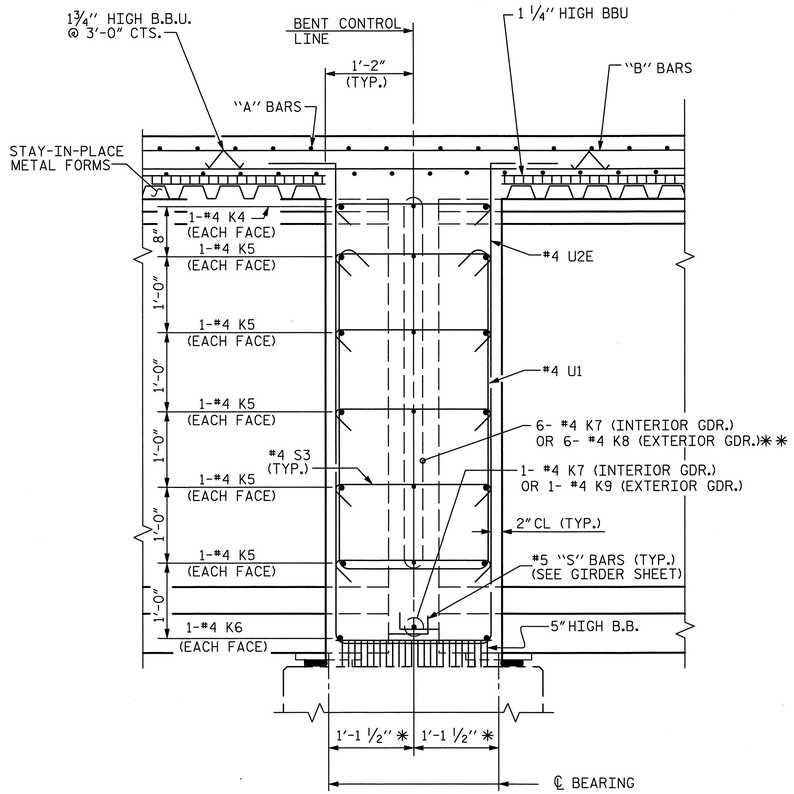
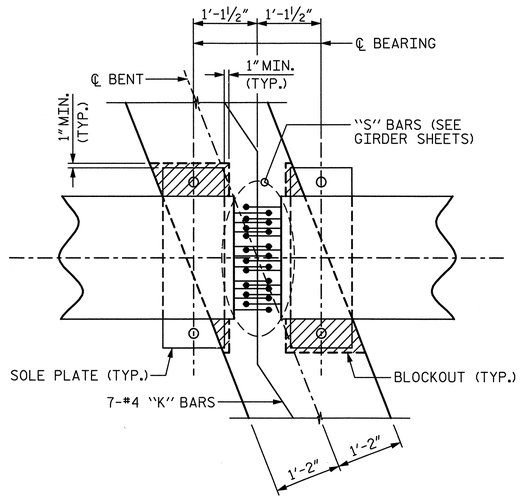


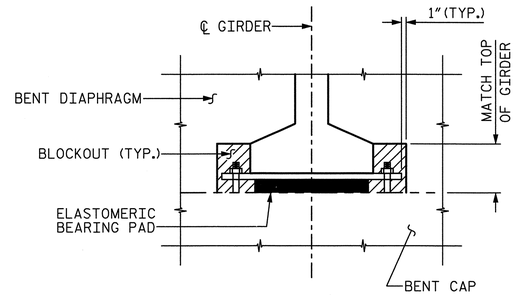
SECTION THRU BENT 3 DIAPHRAGM

✱ DIMENSION ALONG GIRDER

✱✱ FOR MORE INFORMATION, SEE "PLAN OF SPANS" SHEET 3 OF 4.

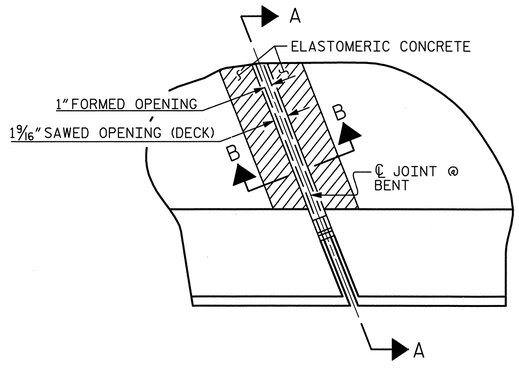


PLAN

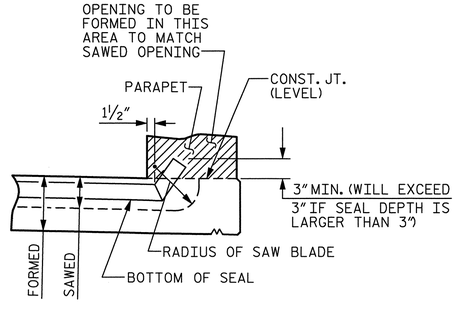


SECTION

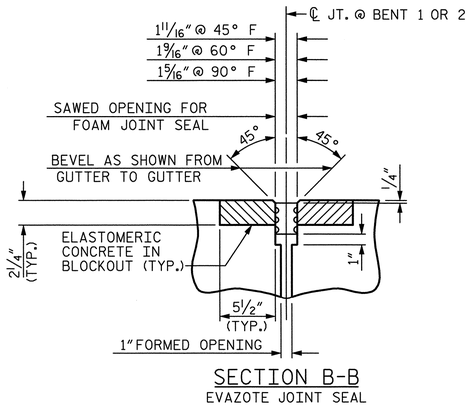
BENT 3 DIAPHRAGM DETAIL



PLAN



SECTION A-A



SECTION B-B
EVAZOTE JOINT SEAL

FOAM JOINT SEAL DETAILS

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE ✱✱✱ (CU. FT.)
1	5.9
2	5.9
TOTAL	11.8

✱✱✱ BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER J. E. MONDOLFI
1-9-13

1/23/2013
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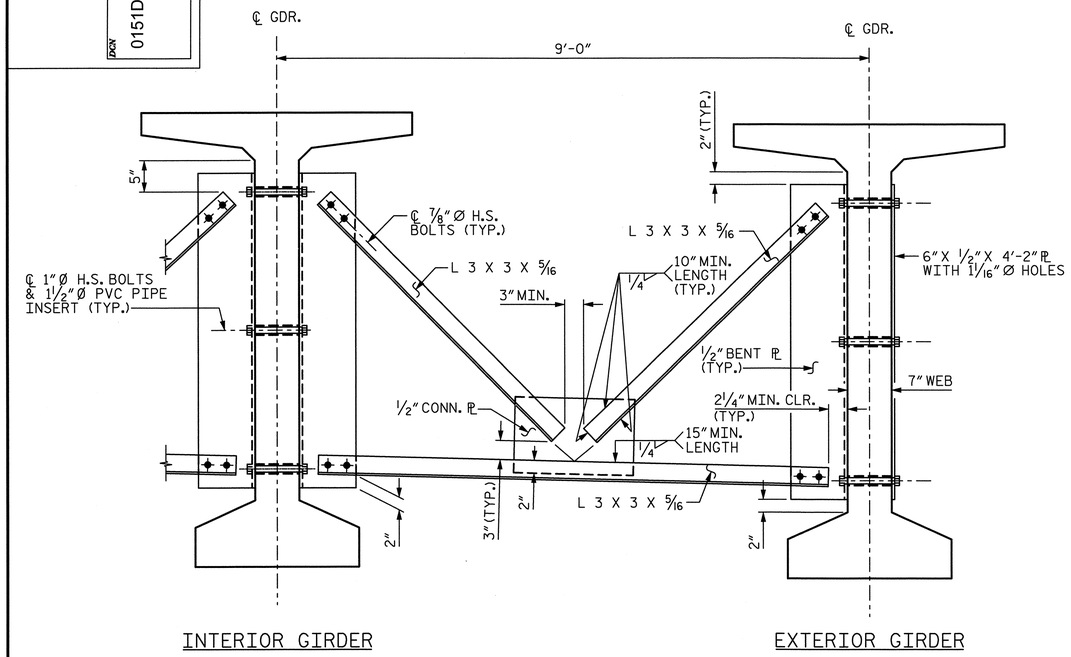
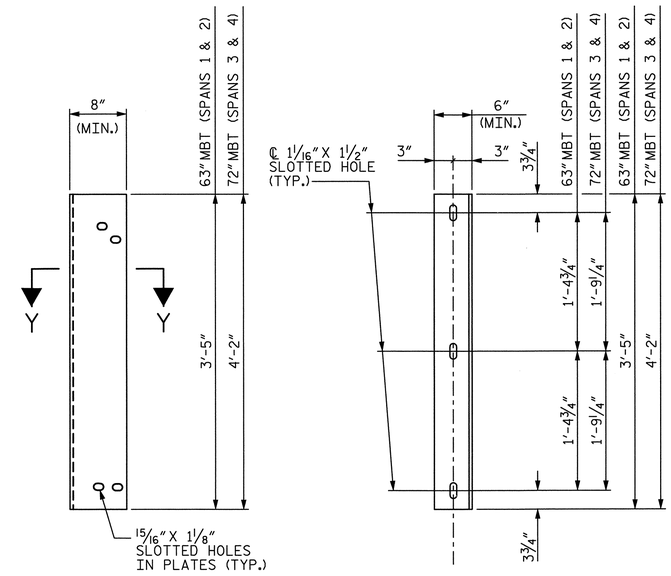


INTERIOR GIRDER EXTERIOR GIRDER

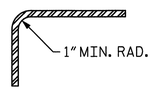
PART SECTION AT INTERMEDIATE DIAPHRAGM

72" MODIFIED BULB TEE (SPANS 3 & 4) SHOWN
63" MODIFIED BULB TEE (SPANS 1 & 2) SIMILAR



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAILS

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

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

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

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

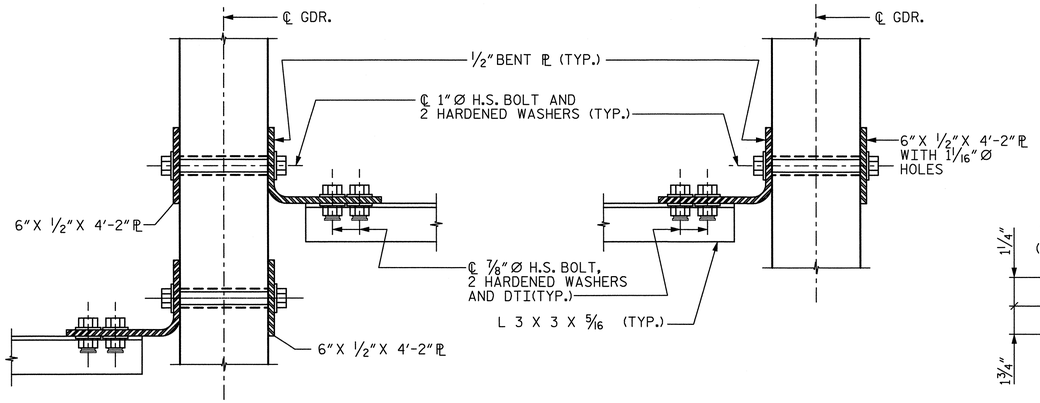
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

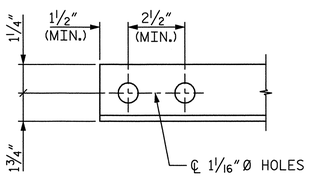
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

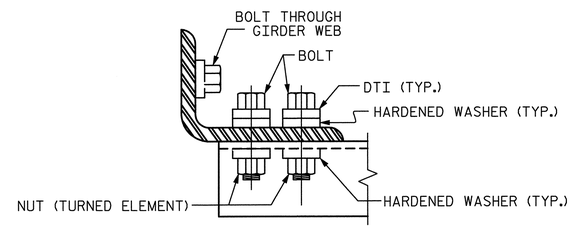
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



INTERIOR GIRDER SECTION EXTERIOR GIRDER SECTION



ANGLE END
(L 3 X 3 X 5/16)



BOLT WITH DTI ASSEMBLY DETAIL

CONNECTION DETAILS

PROJECT NO. P-5206A
ROWAN COUNTY
STATION: 45+02.23 -Y2-
22+29.73 -YB-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGM DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
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DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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1-9-13

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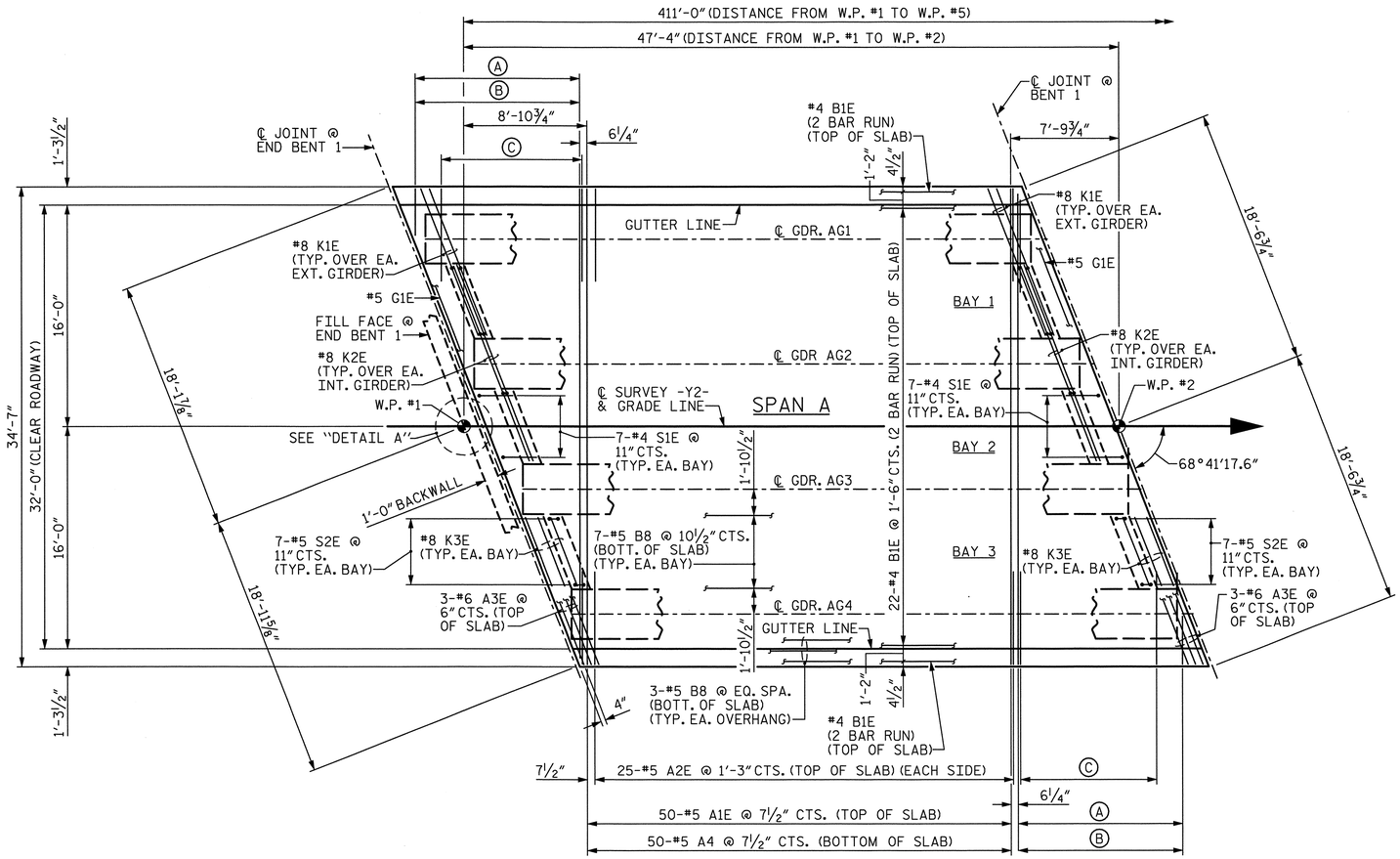
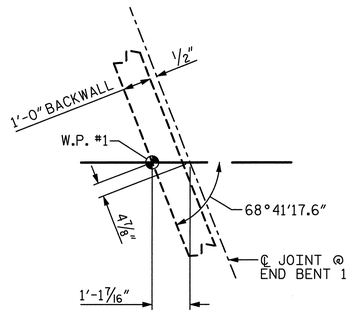
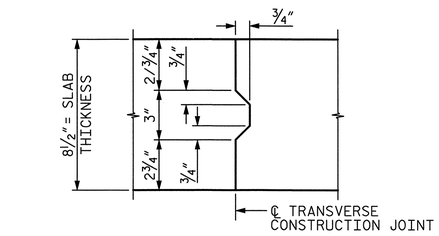


PART PLAN OF SPANS



DETAIL A



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

REINFORCING STEEL IN SLAB NOT SHOWN.

LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.

NOTES:

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINT, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.

A101E THRU A120E AND A201 THRU A220 ARE SIX BARS PER MARK.

Ⓐ #5 A101E THRU A120E @ 7½" CTS. (TOP OF SLAB)

Ⓑ #5 A201 THRU A220 @ 7½" CTS. (BOTTOM OF SLAB)

Ⓒ 9-#5 A2E @ 1'-3" CTS. (TOP OF SLAB)

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS

REVISIONS						SHEET NO.
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

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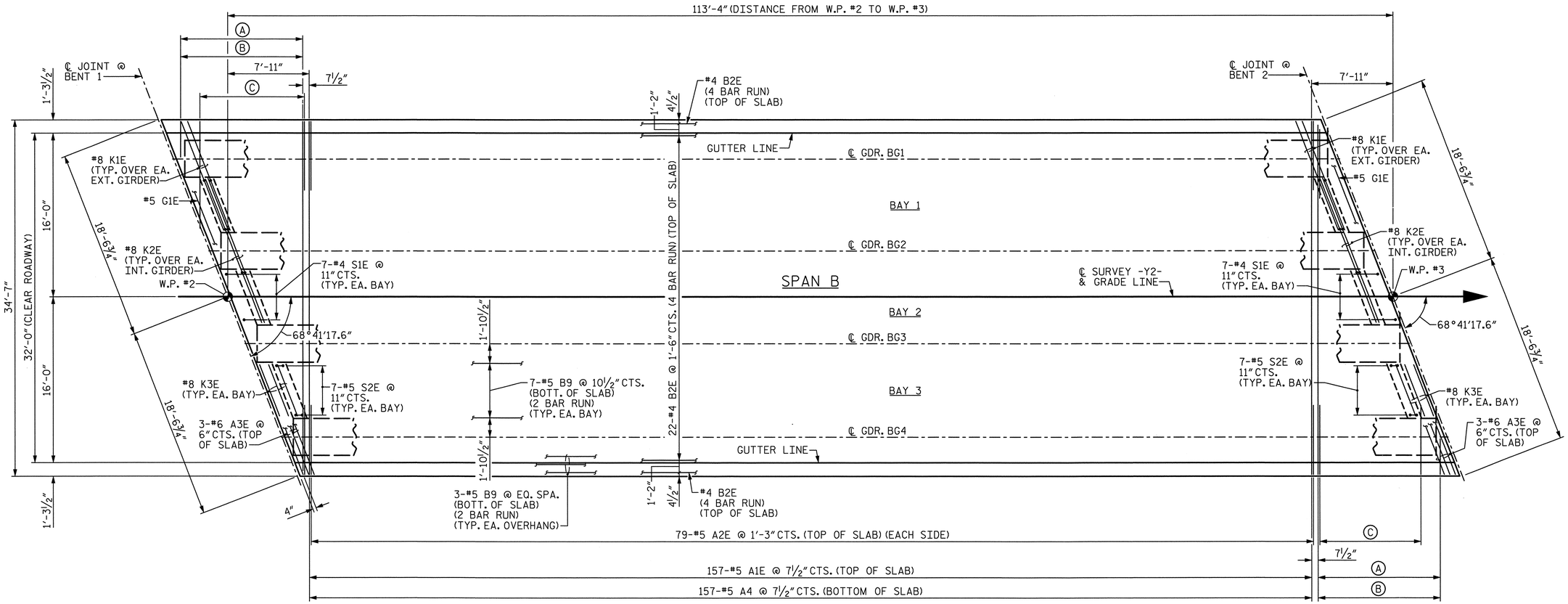

PART PLAN OF SPANS

NOTES:

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINT, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.

A101E THRU A120E AND A201 THRU A220 ARE SIX BARS PER MARK.

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE SHEET 1 OF 4.

Ⓐ #5 A101E THRU A120E @ 7½" CTS. (TOP OF SLAB)

Ⓑ #5 A201 THRU A220 @ 7½" CTS. (BOTTOM OF SLAB)

Ⓒ 9-#5 A2E @ 1'-3" CTS. (TOP OF SLAB)

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS

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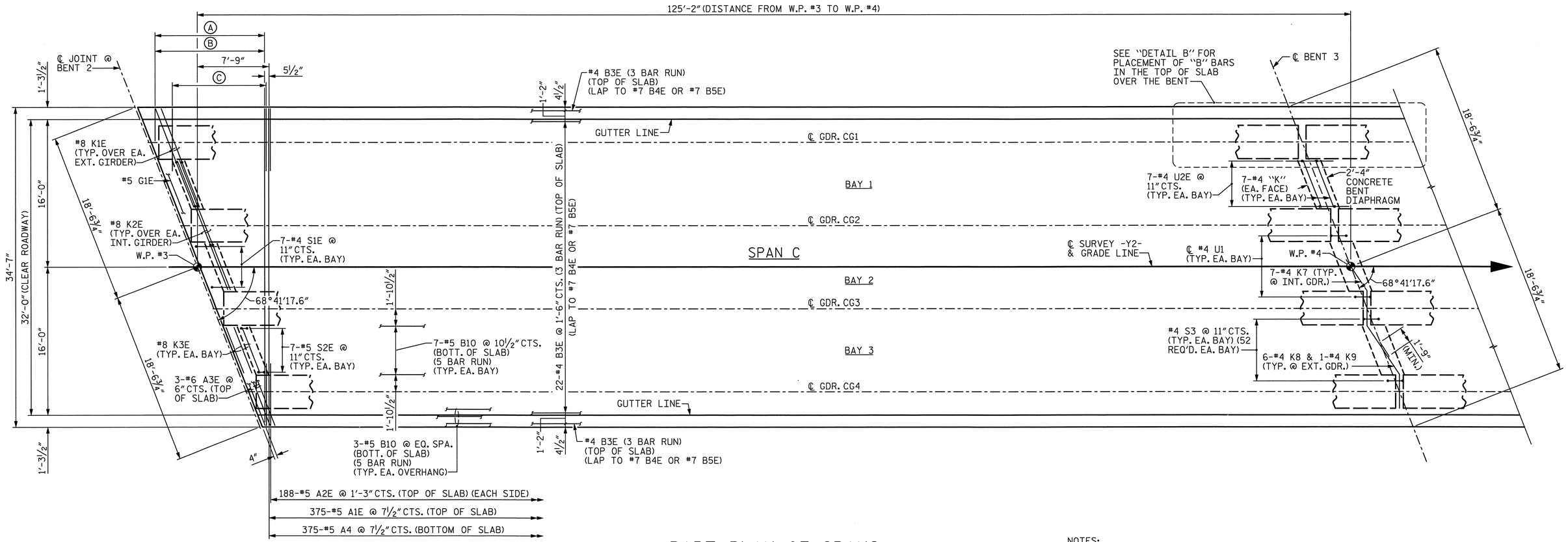
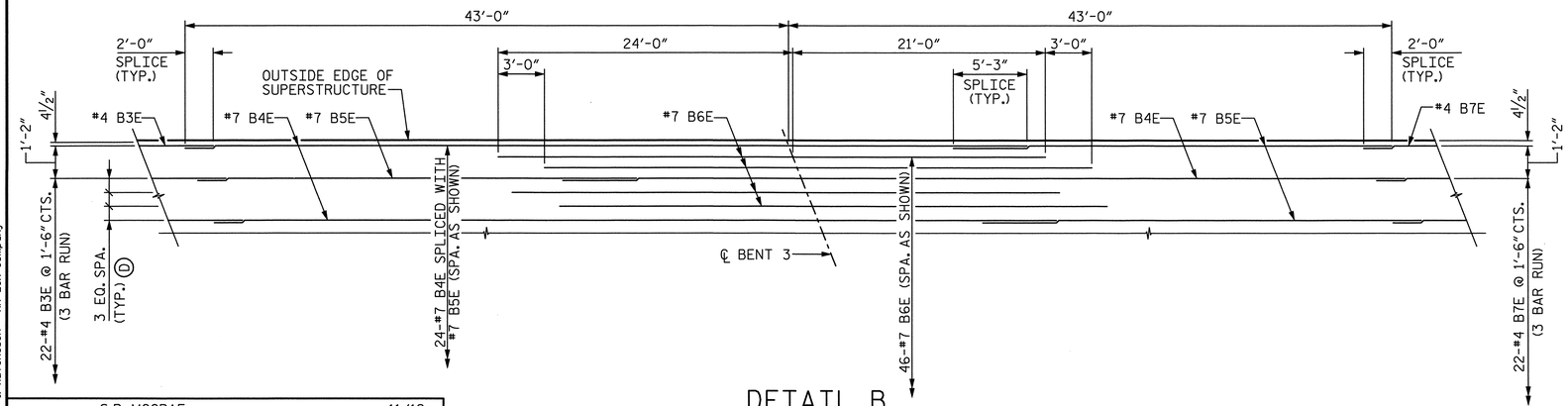


PART PLAN OF SPANS



DETAIL B

LONGITUDINAL REINFORCING (TOP OF SLAB)

NOTES:

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINT, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.

A101E THRU A120E AND A201 THRU A220 ARE SIX BARS PER MARK.

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE SHEET 1 OF 4.

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Ⓑ #5 A201 THRU A220 @ 7½" CTS. (BOTTOM OF SLAB)

Ⓒ 9-#5 A2E @ 1'-3" CTS. (TOP OF SLAB)

Ⓓ TYPICAL SPACING OF NON-CONTINUOUS #7 B6E BETWEEN CONTINUOUS "B" BARS

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
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1-9-13

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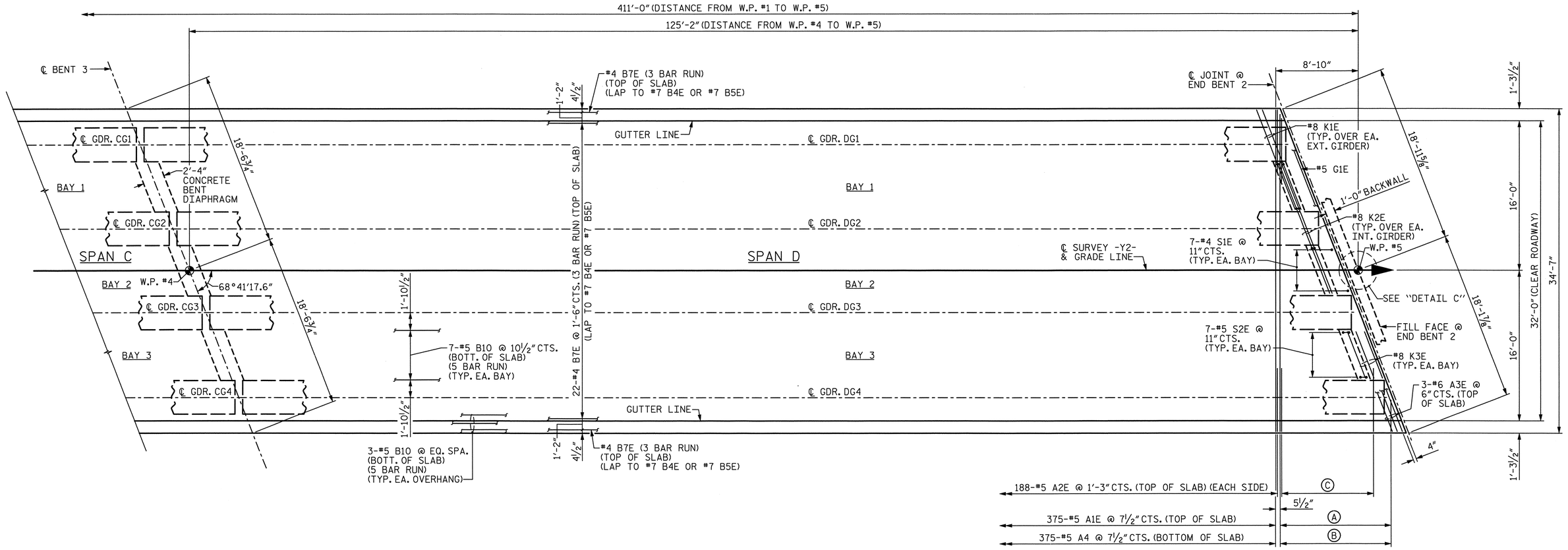
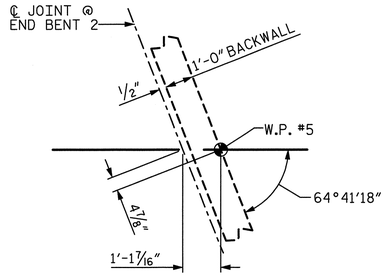


PART PLAN OF SPANS



DETAIL C

NOTES:

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Ⓒ 9-#5 A2E @ 1'-3" CTS. (TOP OF SLAB)

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPANS

REVISIONS						SHEET NO.
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1/11/2013
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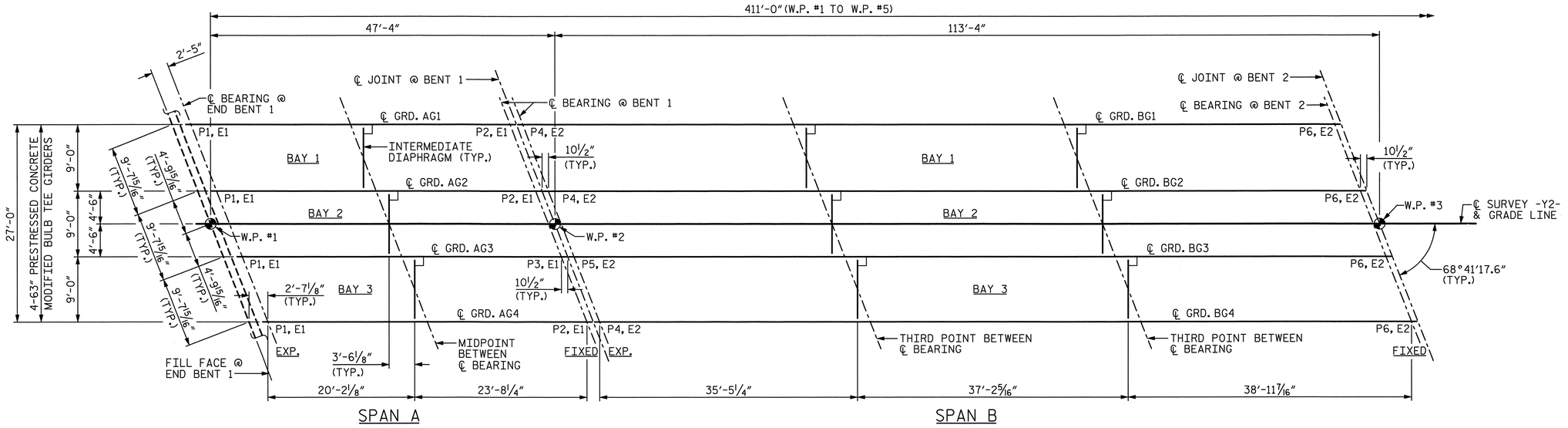
Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

NOTES:

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS" SHEET.



FRAMING PLAN

ALL BEAMS ARE PARALLEL TO ℄ SURVEY -Y2-

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0958

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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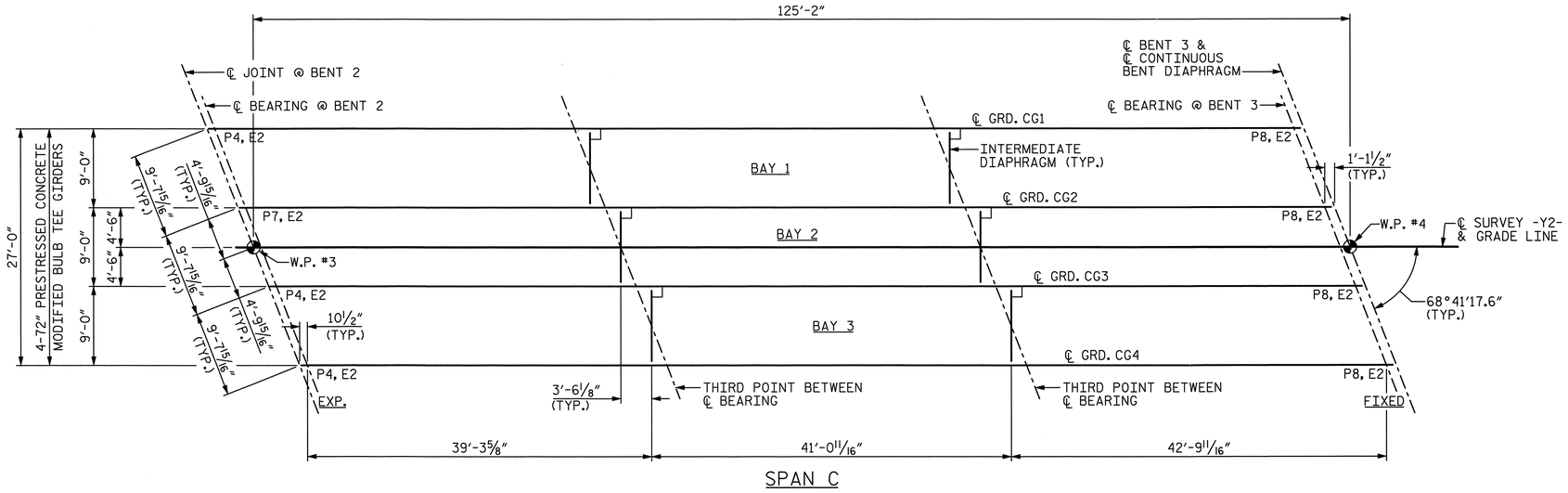
Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

NOTES:

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS" SHEET.



SPAN C

FRAMING PLAN

ALL BEAMS ARE PARALLEL TO ℄ SURVEY -Y2-

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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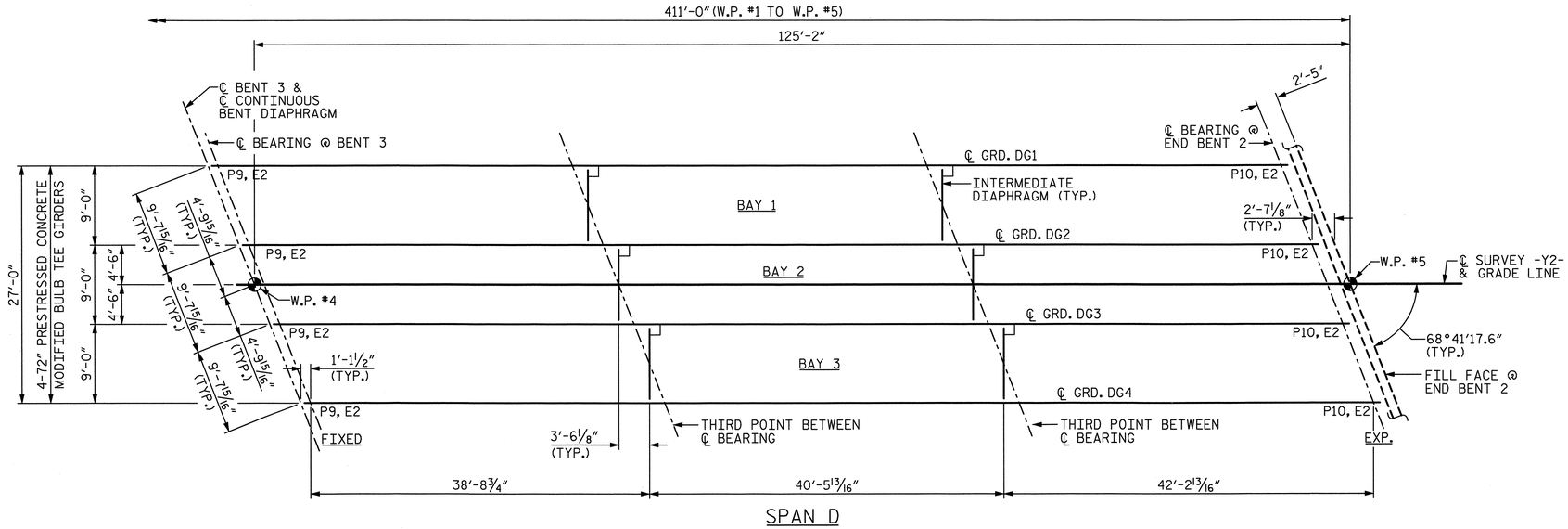
DGN 0151DEL_P10b1

NOTES:

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS" SHEET.



SPAN D

FRAMING PLAN

ALL BEAMS ARE PARALLEL TO ℄ SURVEY -Y2-

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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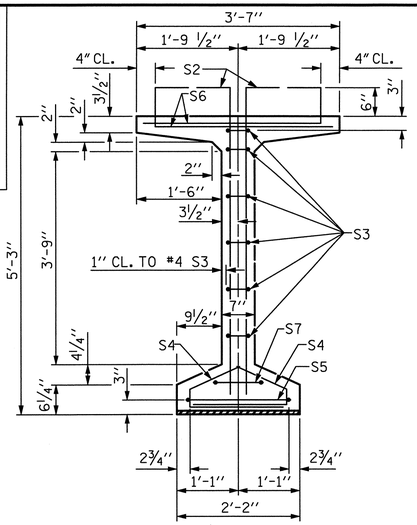
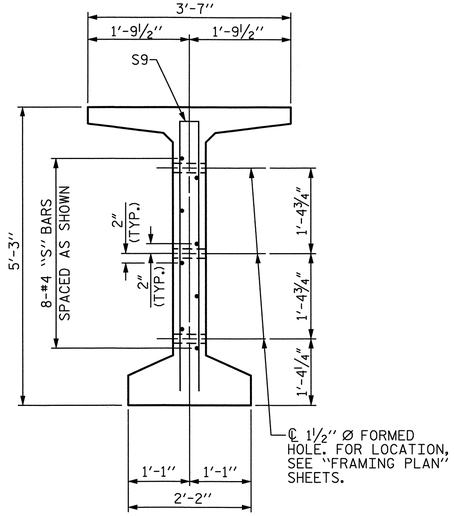
0151DEL_P10b1

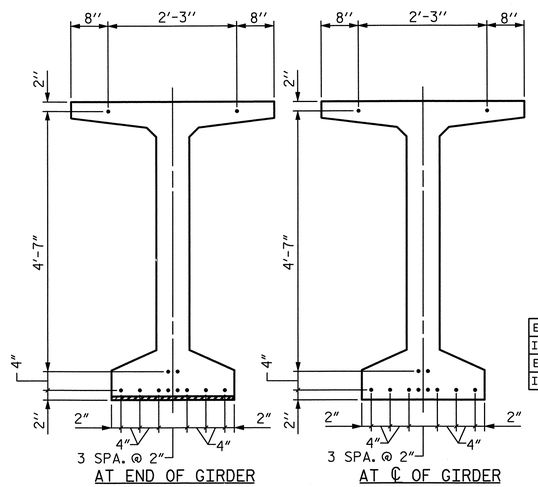


SECTION A-A



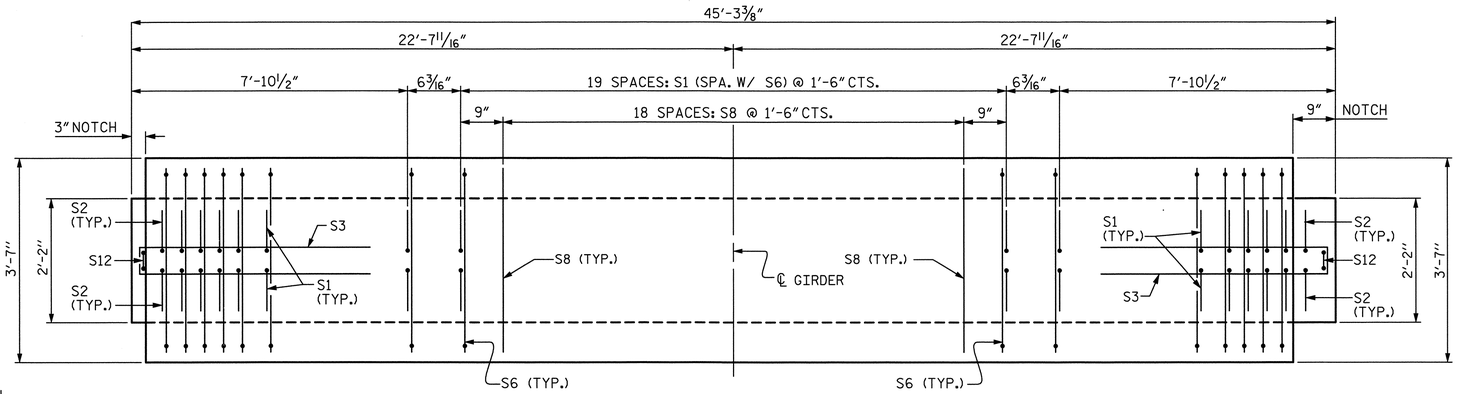
SECTION B-B

(S1, S6 AND S8 BARS NOT SHOWN)

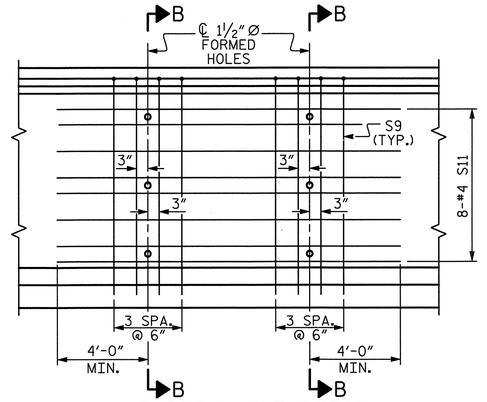


0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	INTERIOR GDR.	EXTERIOR GDR.	INTERIOR GDR.

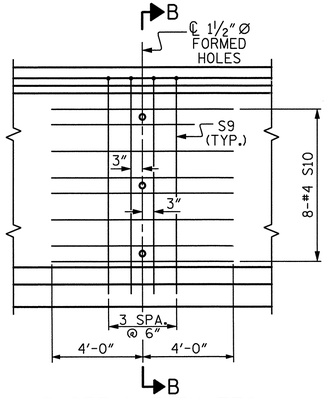


PLAN OF GIRDER



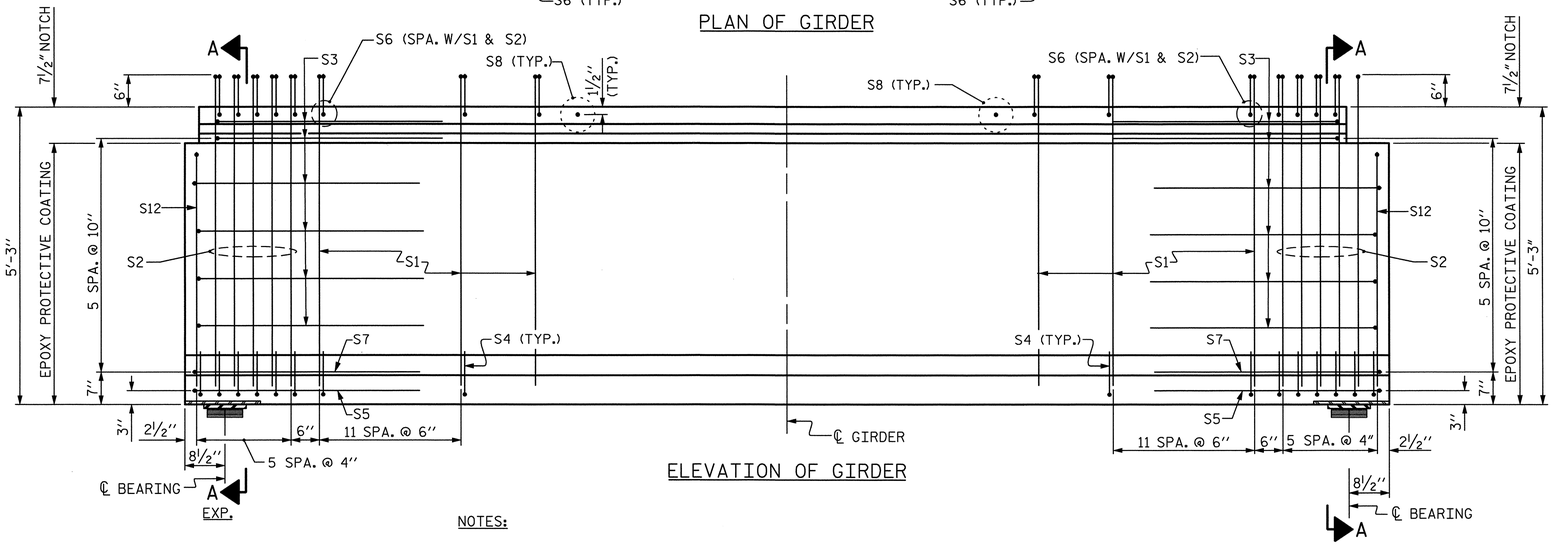
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (INTERIOR GIRDERS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (EXTERIOR GIRDERS)



ELEVATION OF GIRDER

NOTES:

FOR GIRDER NOTES, SEE SHEET 5 OF 5.

FOR EMBEDDED PLATE "B-1" DETAILS, SEE SHEET 5 OF 5.

DRAWN BY : S.R. MCCRAE	DATE : 11/12	
CHECKED BY : T.K. DELIGIANNIDIS	DATE : 11/12	
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI	DATE : 11/12	

1/9/2013
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Florence & Hutcheson An ICA Company

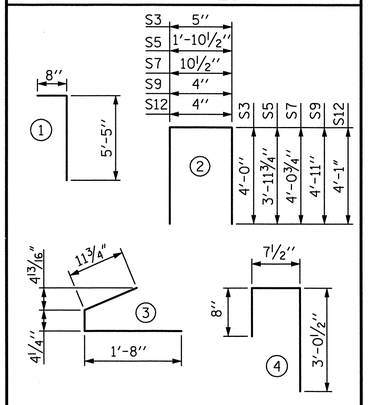
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#4	1	6'-1"	358
S2	20	#5	1	6'-1"	127
S3	12	#4	2	8'-5"	67
S4	72	#4	3	3'-0"	144
S5	2	#5	2	9'-10"	21
S6	106	#5	4	4'-4"	479
S7	2	#5	2	9'-0"	19
S8	19	#5	STR	3'-3"	64
S9	4	#5	2	10'-2"	42
S9	8	#5	2	10'-2"	85
S10	8	#4	STR	8'-0"	43
S11	8	#4	STR	11'-7"	62
S12	2	#5	2	8'-6"	18

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	1382	9.0	12
INTERIOR GIRDER	1444	9.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	45'-3 3/8"	181'-1 1/2"

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 5

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 63" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN A)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			53

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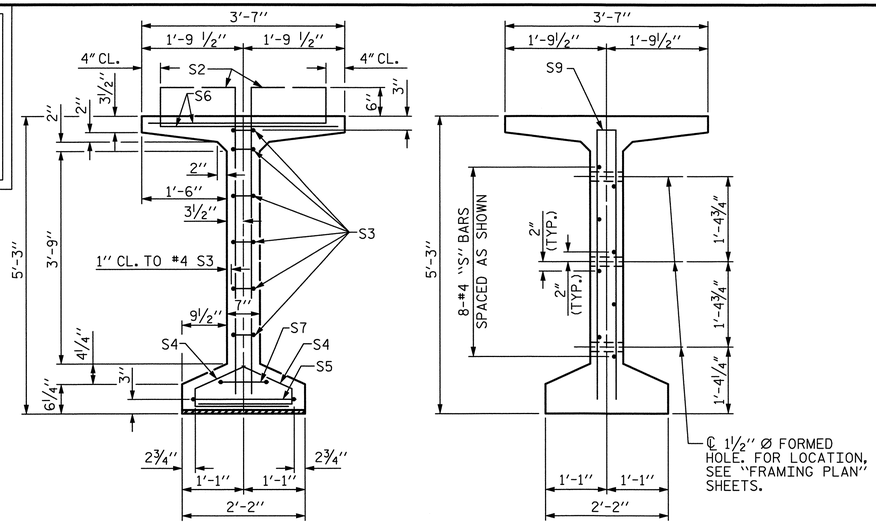
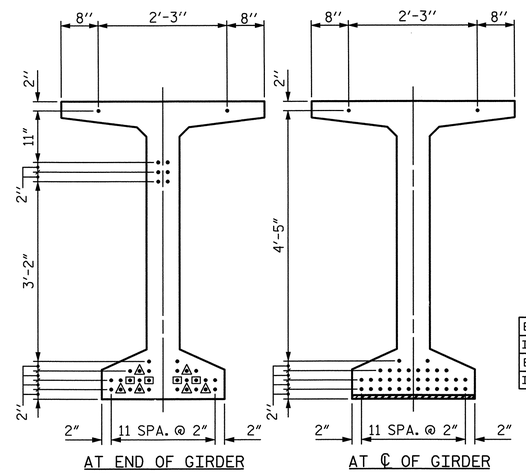


SECTION A-A

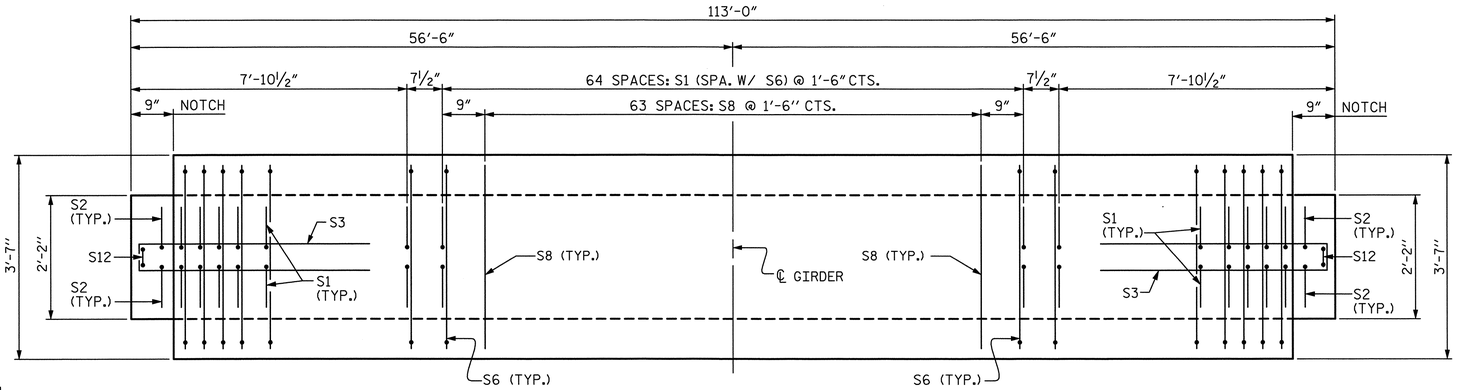
SECTION B-B
(S1, S6 AND S8 BARS NOT SHOWN)



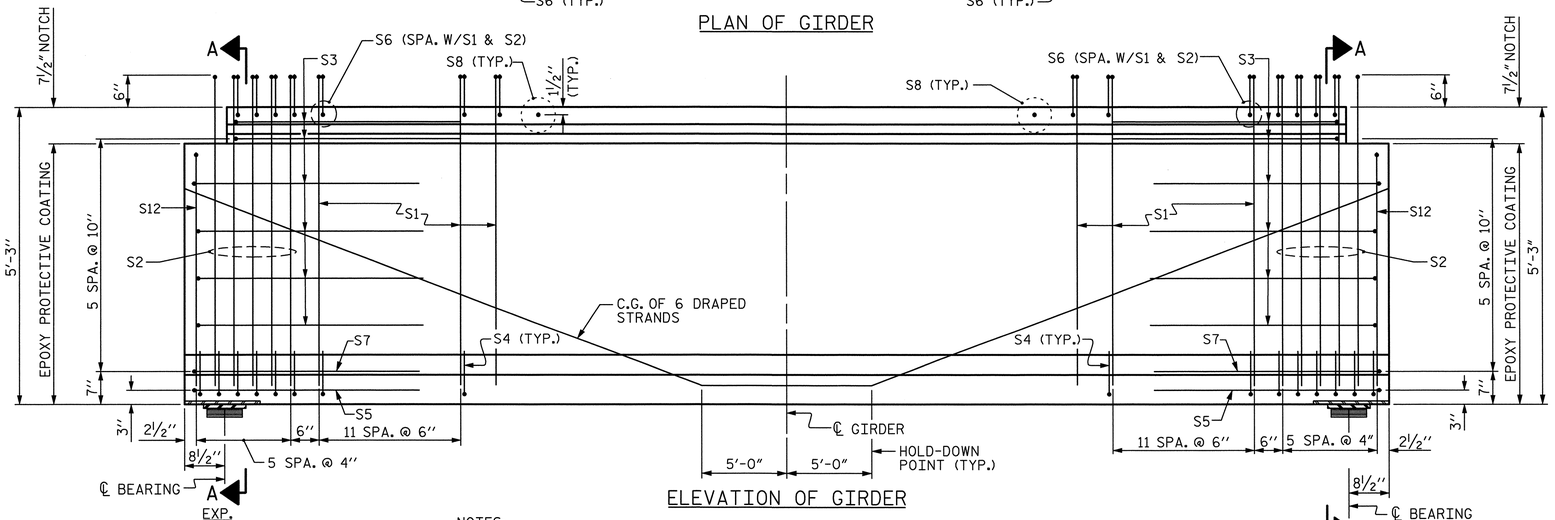
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER



PLAN OF GIRDER

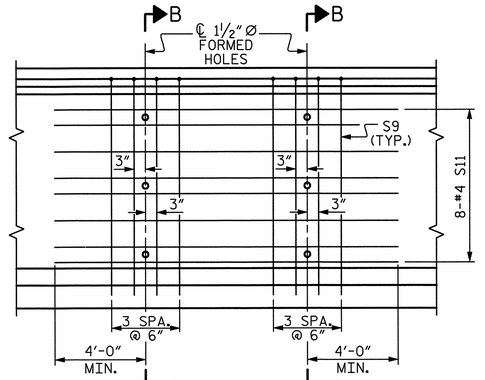


ELEVATION OF GIRDER

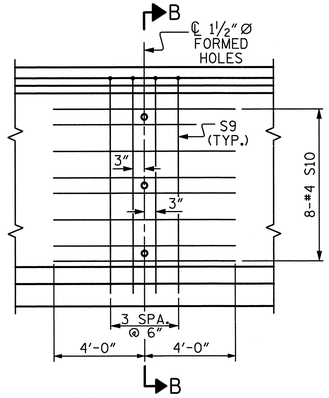
NOTES:

FOR GIRDER NOTES, SEE SHEET 5 OF 5.

FOR EMBEDDED PLATE "B-1" DETAILS, SEE SHEET 5 OF 5.



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (INTERIOR GIRDERS)



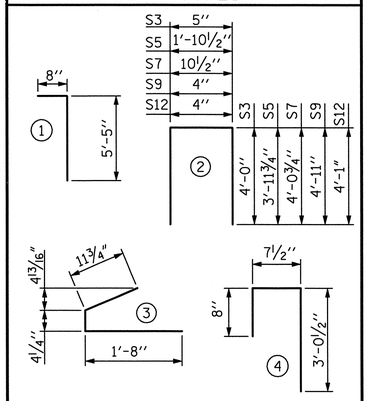
PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (EXTERIOR GIRDERS)

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

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	178	#4	1	6'-1"	723
	S2	20	#6	1	6'-1"	183
	S3	12	#4	2	8'-5"	67
	S4	72	#4	3	3'-0"	144
	S5	2	#5	2	9'-10"	21
	S6	194	#5	4	4'-4"	877
	S7	2	#5	2	9'-0"	19
	S8	64	#5	STR	3'-3"	217
EXTERIOR GDR.	S9	8	#5	2	10'-2"	85
INTERIOR GDR.	S9	16	#5	2	10'-2"	170
EXTERIOR GDR.	S10	16	#4	STR	8'-0"	86
INTERIOR GDR.	S11	16	#4	STR	11'-7"	124
	S12	2	#5	2	8'-6"	18

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2440	22.4	36
INTERIOR GIRDER	2563	22.4	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	113'-0"	452'-0"

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 63" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN B)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER
1-9-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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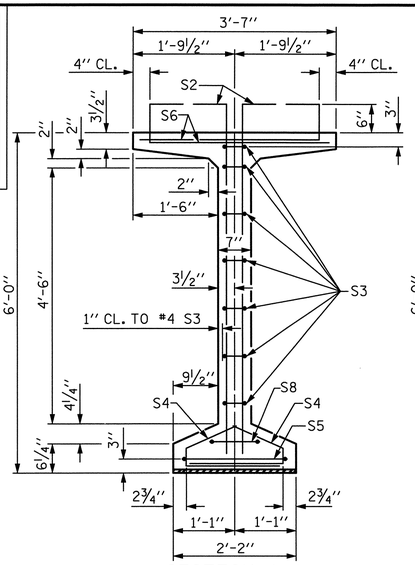
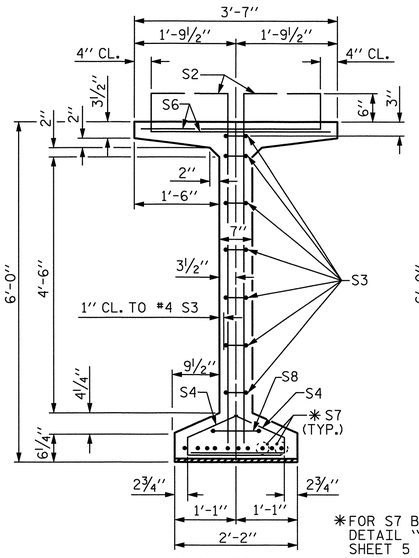
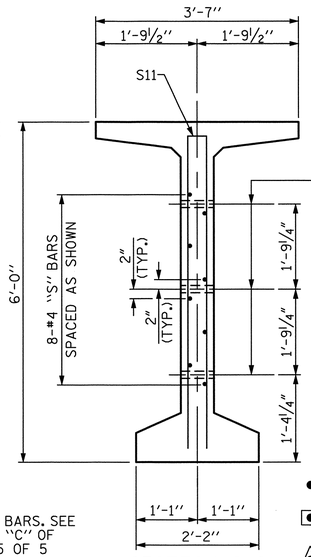


SECTION A-A



SECTION B-B

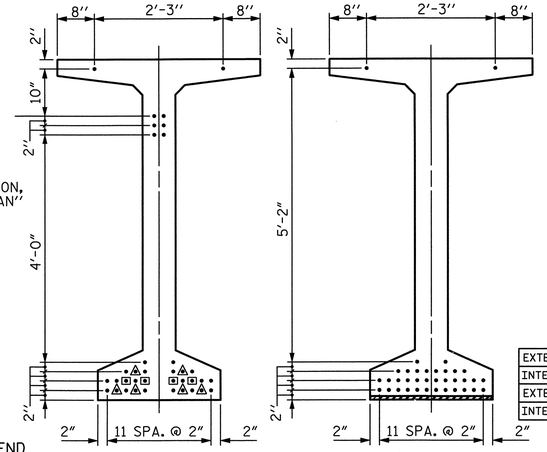
✱FOR S7 BARS. SEE DETAIL "C" OF SHEET 5 OF 5



SECTION C-C
(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

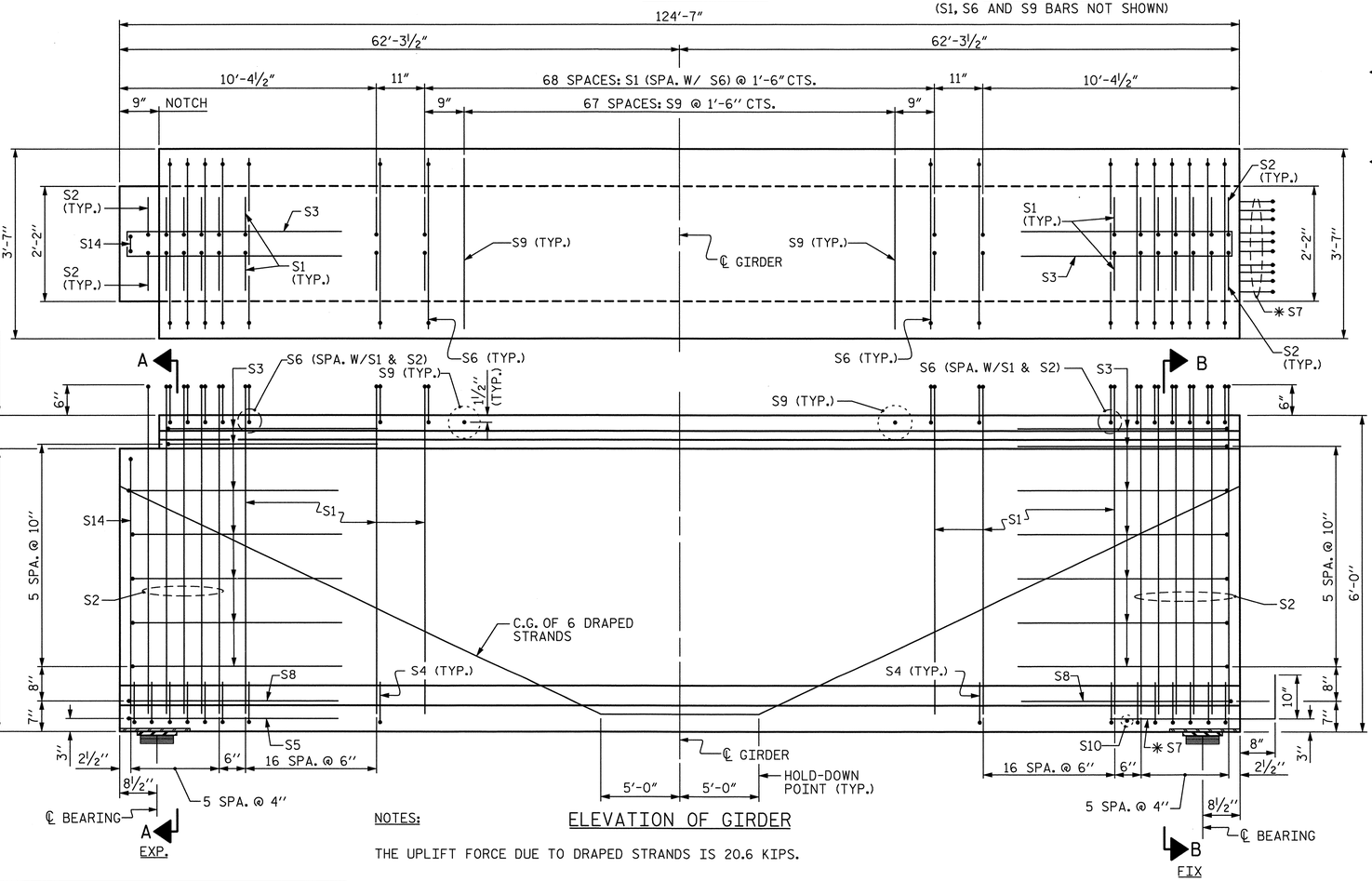
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



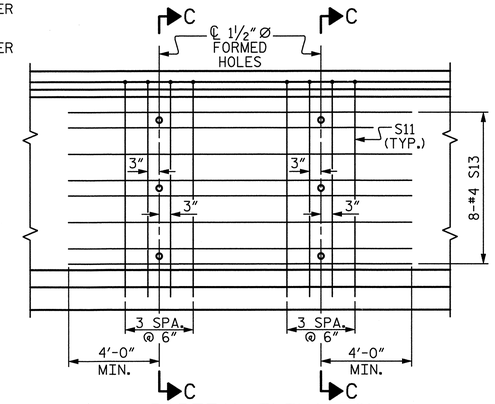
ELEVATION OF GIRDER

NOTES:

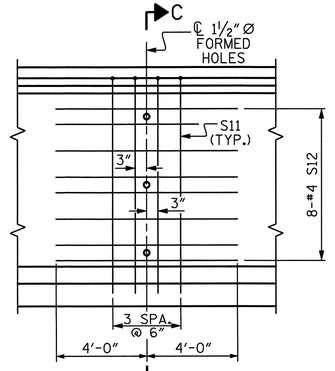
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.6 KIPS.

FOR GIRDER NOTES, SEE SHEET 5 OF 5.

FOR EMBEDDED PLATE "B-1" DETAILS, SEE SHEET 5 OF 5.



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (INTERIOR GIRDERS)



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (EXTERIOR GIRDERS)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0266

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER NANCY L. MONDOLFI
1-9-13

0.6" Ø L. R. GRADE 270 STRANDS

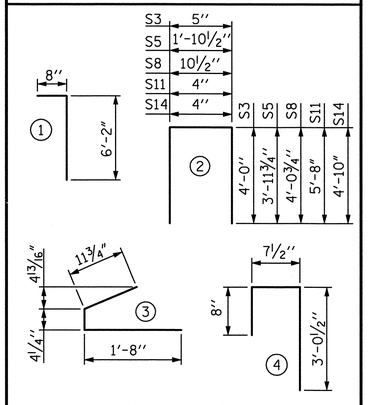
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	206	#4	1	6'-10"	940
	S2	22	#6	1	6'-10"	226
	S3	14	#4	2	8'-5"	79
	S4	92	#4	3	3'-0"	184
	S5	1	#5	2	9'-10"	10
	S6	226	#5	4	4'-4"	1021
	✱S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	68	#5	STR	3'-3"	231
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	8	#5	2	11'-8"	97
INTERIOR GDR.	S11	16	#5	2	11'-8"	195
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	11'-7"	124
	S14	1	#5	2	10'-0"	10

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	2942	26.7	36
INTERIOR GIRDER	3078	26.7	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	124'-7"	498'-4"

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

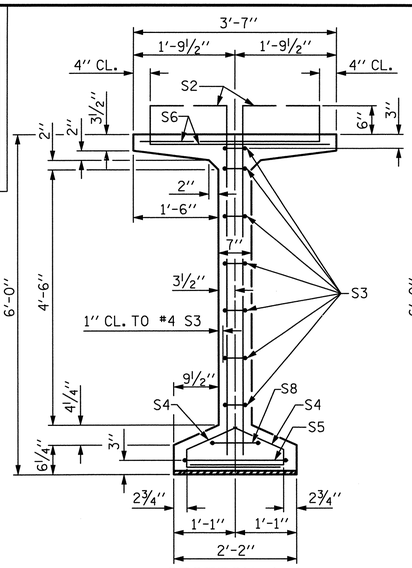
STANDARD 72" PRESTRESSED CONCRETE MODIFIED BULB TEE (SPAN C)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			53

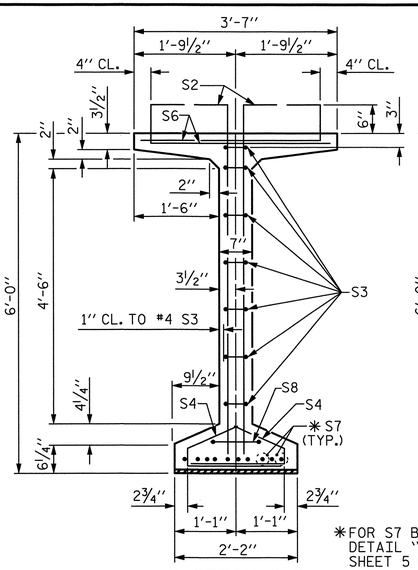
DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
J:\projects\5206a\structures\plans\RFC Plans 1-8-13\P5206A_sd_6_01.dgn
Florence & Hutcheson - An ICA Company

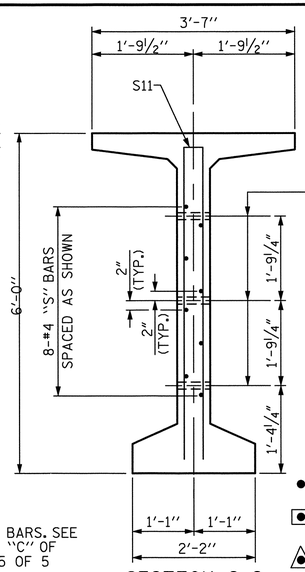
DGN 0151DEL_P10b1



SECTION A-A

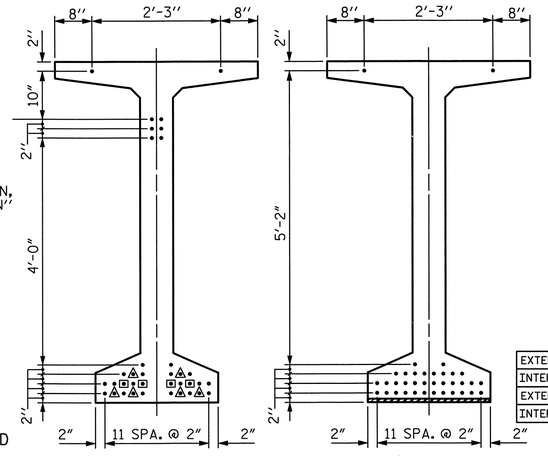


SECTION B-B



SECTION C-C
(S1, S6 AND S9 BARS NOT SHOWN)

✱FOR S7 BARS. SEE DETAIL "C" OF SHEET 5 OF 5

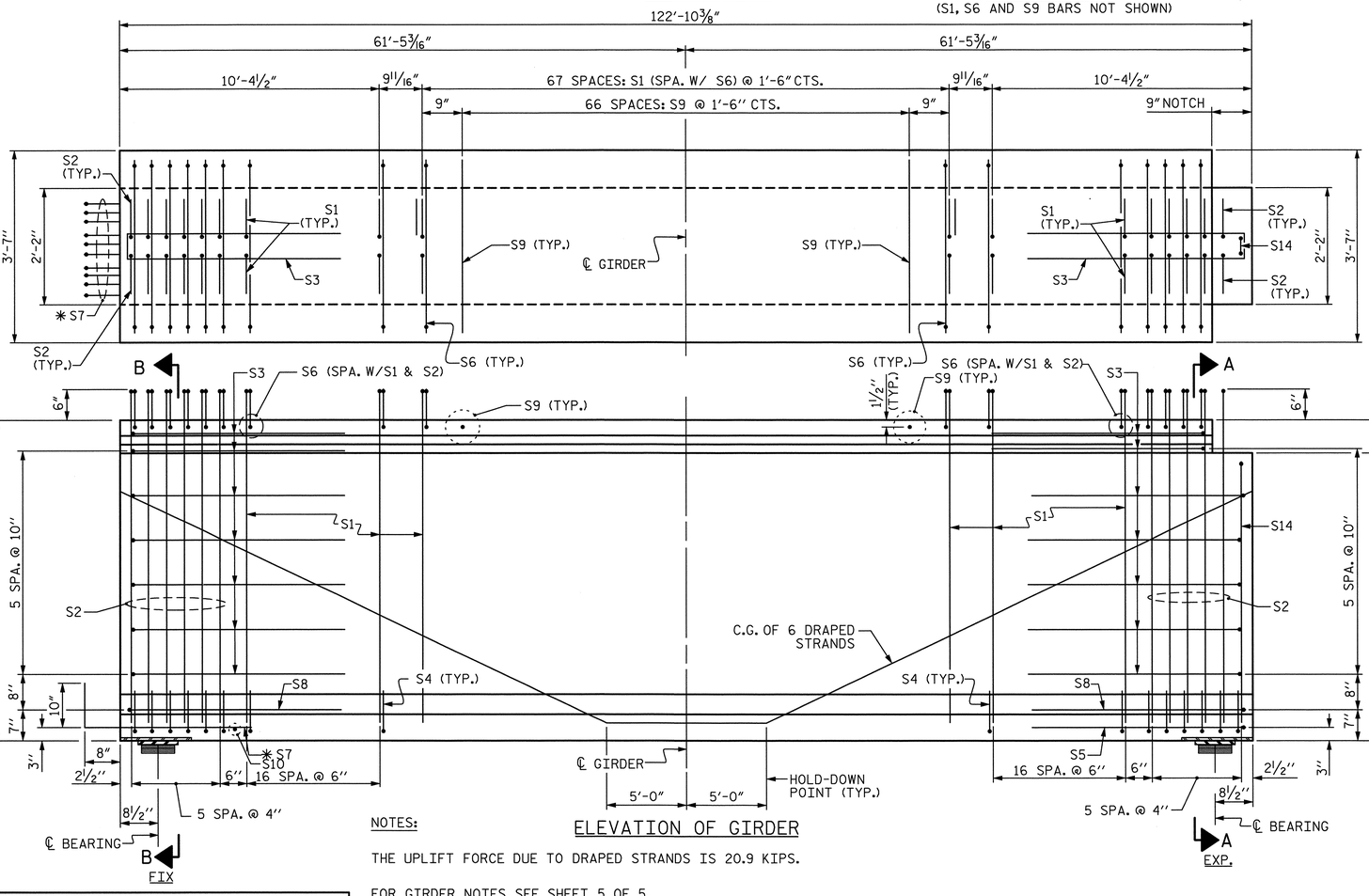


AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND
- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊿ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER



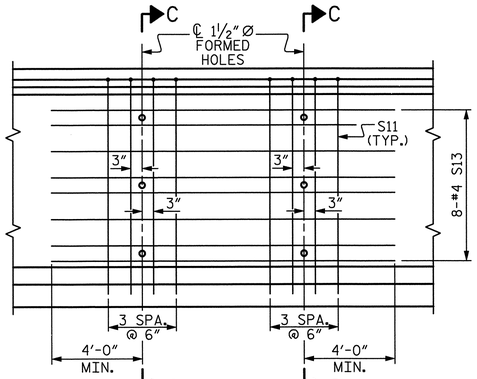
ELEVATION OF GIRDER

NOTES:

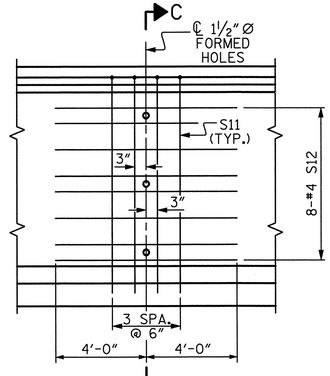
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.9 KIPS.

FOR GIRDER NOTES, SEE SHEET 5 OF 5.

FOR EMBEDDED PLATE "B-1" DETAILS, SEE SHEET 5 OF 5.



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (INTERIOR GIRDERS)



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL (EXTERIOR GIRDERS)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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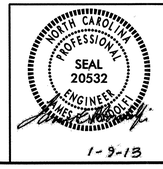


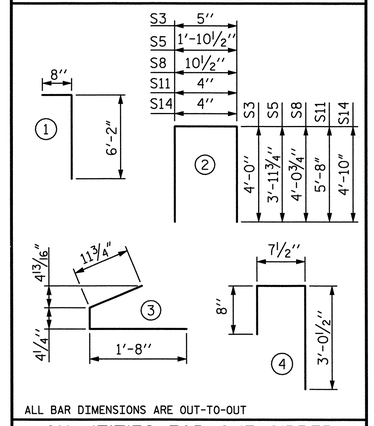
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	204	#4	1	6'-10"	931	
S2	22	#6	1	6'-10"	226	
S3	14	#4	2	8'-5"	79	
S4	92	#4	3	3'-0"	184	
S5	1	#5	2	9'-10"	10	
S6	224	#5	4	4'-4"	1012	
✱S7	10	#5	STR	3'-8"	38	
S8	2	#5	2	9'-0"	19	
S9	67	#5	STR	3'-3"	227	
S10	1	#3	STR	1'-10"	1	
S11	8	#5	2	11'-8"	97	EXTERIOR GDR.
S11	16	#5	2	11'-8"	195	INTERIOR GDR.
S12	16	#4	STR	8'-0"	86	EXTERIOR GDR.
S13	16	#4	STR	11'-7"	124	INTERIOR GDR.
S14	1	#5	2	10'-0"	10	

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	2920	26.3	36
INTERIOR GIRDER	3056	26.3	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	122'-10⅜"	491'-5½"

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
72" PRESTRESSED CONCRETE
MODIFIED BULB TEE (SPAN D)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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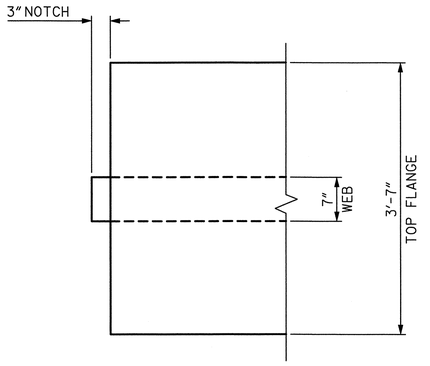
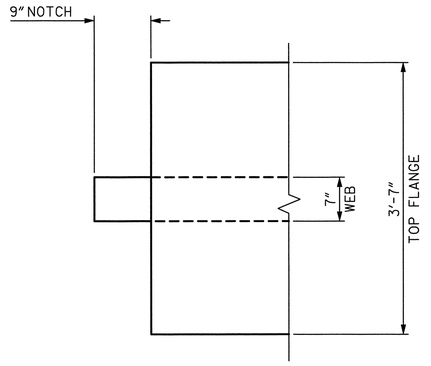
DGN 0151DEL_P10b1



FLANGE CLIPPING DETAIL

AT END BENTS
SHOWN FOR BEGIN BRIDGE,
END BRIDGE SIMILAR.



FLANGE CLIPPING DETAIL

AT BENTS 1 & 2
SHOWN FOR AHEAD STATION BEAMS,
BACK STATION BEAMS SIMILAR.

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6300 PSI.

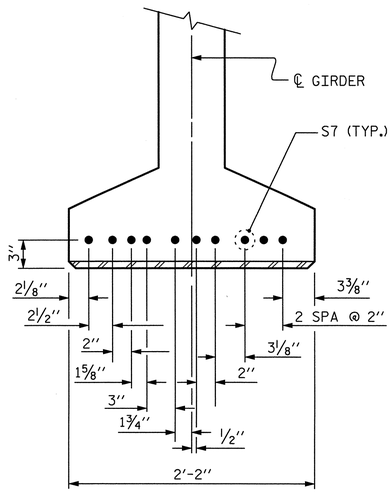
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

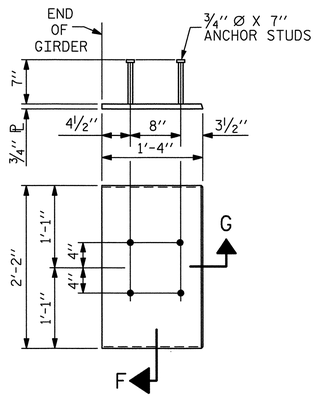
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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



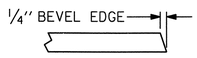
DETAIL C

(SPANS 3 & 4)

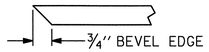


EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION G



SECTION F

(SEE NOTES)

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD PRESTRESSED CONCRETE MODIFIED BULB TEE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0558

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOSEPH E. MONDOLFI
1-9-13

1/23/2013
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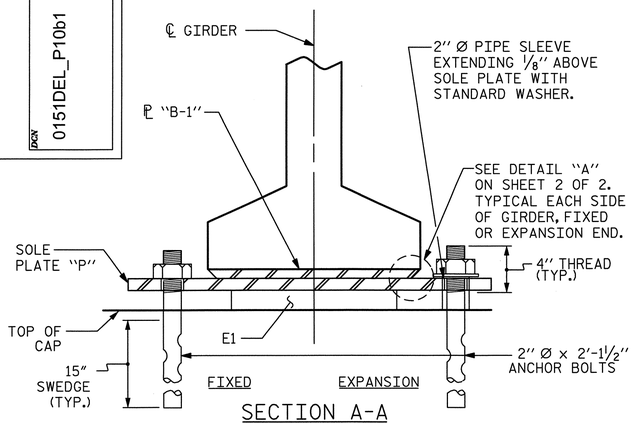
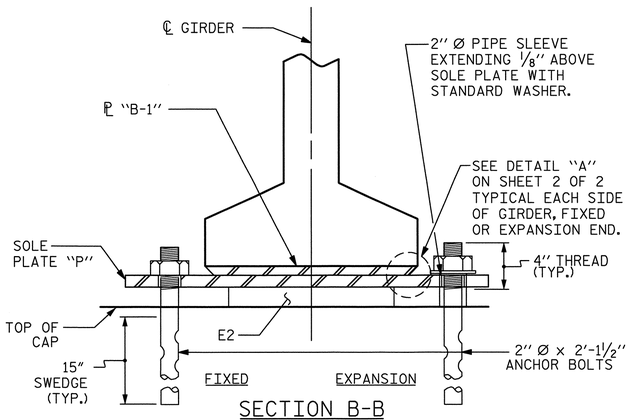
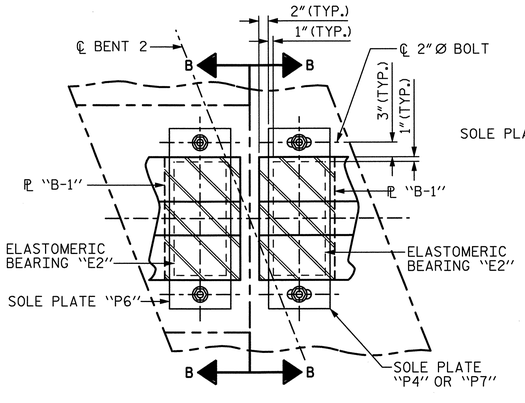


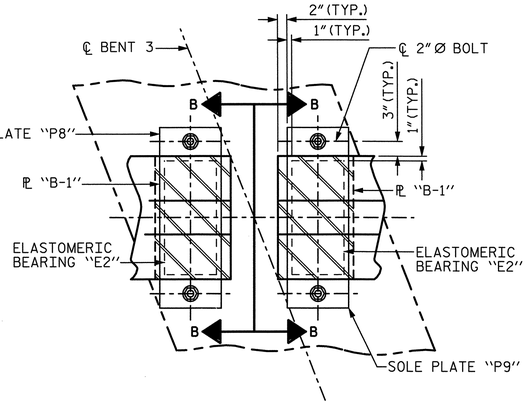
SECTION A-A



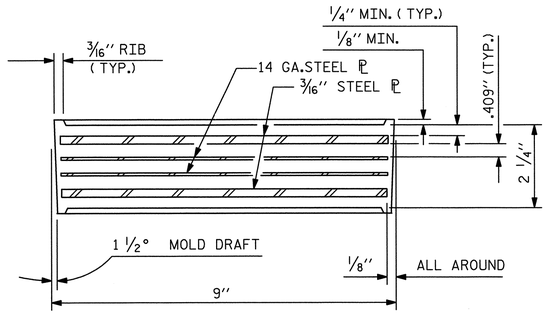
SECTION B-B



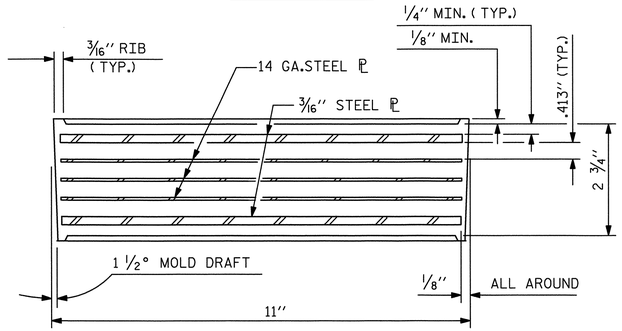
TYPICAL PLAN AT BENT 2



TYPICAL PLAN AT BENT 3



TYPICAL SECTION OF ELASTOMERIC BEARINGS



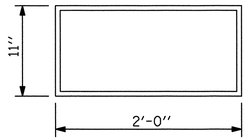
TYPICAL SECTION OF ELASTOMERIC BEARINGS

E1 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

(END BENT 1 & BENT 1 BACK STATION)

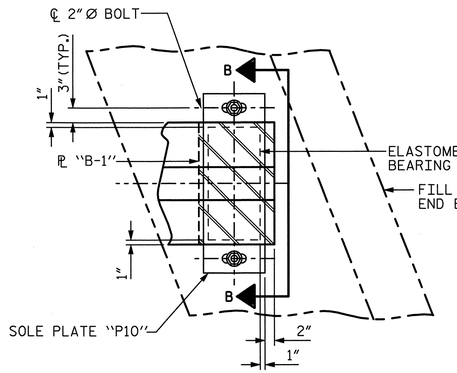


E2 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

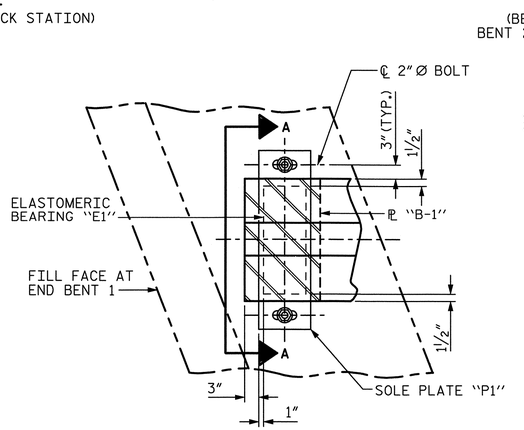
TYPE VII

(BENT 1 AHEAD STATION, BENT 2, BENT 3 & END BENT 2)

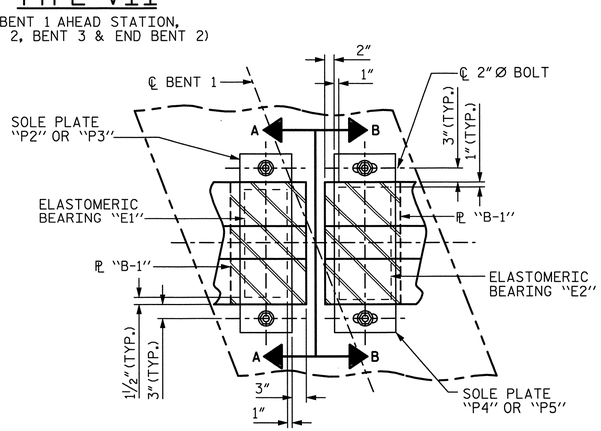


TYPICAL PLAN AT END BENT 2

— LOAD RATING —	
	MAX. D.L.+ L.L.
TYPE V	125 K
TYPE VII	264 K



TYPICAL PLAN AT END BENT 1



TYPICAL PLAN AT BENT 1

NOTES:

SEE SHEET 2 OF 2 FOR ELASTOMERIC BEARING NOTES.

SEE SHEET 2 OF 2 FOR SOLE PLATE DETAILS.

SEE "FRAMING PLAN" SHEETS FOR LOCATION OF SOLE PLATES AND BEARINGS.

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : R.W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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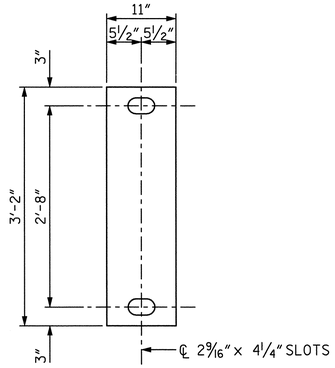
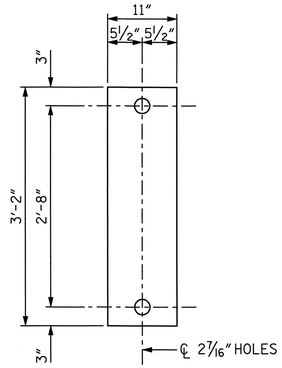
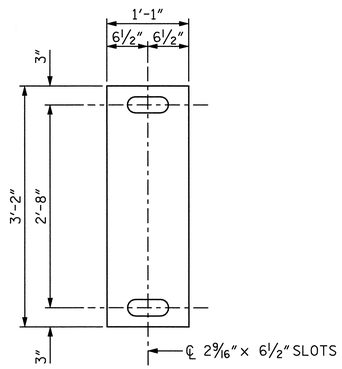


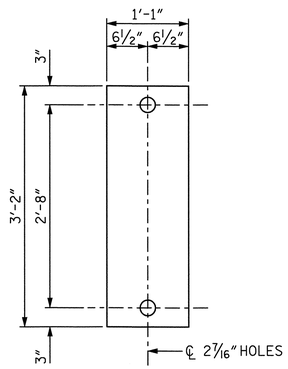
P1
(EXPANSION)
(4 REQ'D)



P2 & P3
(FIXED)
P2: 3 REQ'D
P3: 1 REQ'D

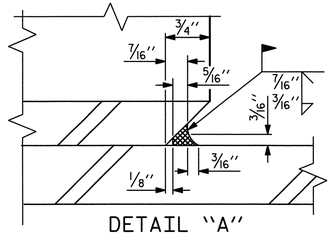


P4, P5, P7 & P10
(EXPANSION)
P4: 6 REQ'D
P5: 1 REQ'D
P7: 1 REQ'D
P10: 4 REQ'D

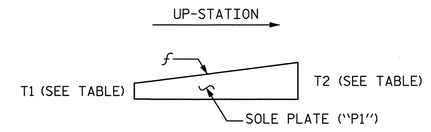


P6, P8 & P9
(FIXED)
P6: 4 REQ'D
P8: 4 REQ'D
P9: 4 REQ'D

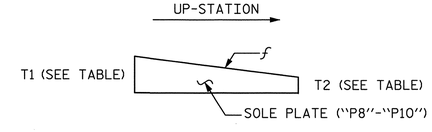
SOLE PLATE DETAILS ("P")



DETAIL "A"



SOLE PLATE PLACEMENT DETAIL
(SOLE PLATE "P1")



SOLE PLATE PLACEMENT DETAIL
(SOLE PLATES "P8"-"P10")

SOLE PLATE THICKNESS		
PLATE	T1	T2
P1	1¼"	1⅜"
P2	1⁹⁄₁₆"	1⁹⁄₁₆"
P3	1¹⁵⁄₁₆"	1¹⁵⁄₁₆"
P4	1¼"	1¼"
P5	1⁹⁄₁₆"	1⁹⁄₁₆"
P6	1¼"	1¼"
P7	1½"	1½"
P8	2⁷⁄₁₆"	1¹³⁄₁₆"
P9	1⁹⁄₁₆"	1¼"
P10	1¹¹⁄₁₆"	1¼"

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

SEE "FRAMING PLAN" SHEETS FOR LOCATION OF SOLE PLATES AND BEARINGS.

f - SURFACE FINISH

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD ELASTOMERIC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			53

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

DRAWN BY: S.R. MCCRAE DATE: 11/12
CHECKED BY: R.W. GAMBRELL DATE: 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11/12

1/9/2013
P:\Tip\p5206\p5206\structures\plans\NFC Plans 1-8-13\P5206A_sd_B6_01.dgn
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0151DEL_P10b1

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A

0.6"Ø LOW RELAXATION STRANDS	GIRDERS AG1 & AG4										
TENTH POINTS BETWEEN BRGS.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.008	0.015	0.019	0.022	0.022	0.022	0.019	0.015	0.008	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.001	0.002	0.003	0.004	0.004	0.004	0.003	0.002	0.001	0.000
FINAL CAMBER (IN.) ↑	0	1/16	1/8	3/16	3/16	1/4	3/16	3/16	1/8	1/16	0

0.6"Ø LOW RELAXATION STRANDS	GIRDERS AG2 & AG3										
TENTH POINTS BETWEEN BRGS.	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.008	0.015	0.019	0.022	0.022	0.022	0.019	0.015	0.008	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.001	0.002	0.003	0.004	0.004	0.004	0.003	0.002	0.001	0.000
FINAL CAMBER (IN.) ↑	0	1/16	1/8	3/16	3/16	1/4	3/16	3/16	1/8	1/16	0

SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDERS BG1 & BG4																				
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.063	0.127	0.175	0.224	0.258	0.293	0.314	0.334	0.342	0.349	0.342	0.334	0.314	0.293	0.258	0.224	0.175	0.127	0.063	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.025	0.050	0.074	0.098	0.116	0.135	0.147	0.159	0.163	0.167	0.163	0.159	0.147	0.135	0.116	0.098	0.074	0.050	0.025	0.000
FINAL CAMBER (IN.) ↑	0	7/16	15/16	1 3/16	1 1/2	1 11/16	1 7/8	2	2 1/8	2 1/8	2 3/16	2 1/8	2 1/8	2	1 7/8	1 11/16	1 1/2	1 3/16	15/16	7/16	0

0.6"Ø LOW RELAXATION STRANDS	GIRDERS BG2 & BG3																				
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.20	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.063	0.127	0.175	0.224	0.258	0.293	0.314	0.334	0.342	0.349	0.342	0.334	0.314	0.293	0.258	0.224	0.175	0.127	0.063	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.026	0.053	0.078	0.104	0.123	0.143	0.156	0.169	0.173	0.177	0.173	0.169	0.156	0.143	0.123	0.104	0.078	0.053	0.026	0.000
FINAL CAMBER (IN.) ↑	0	7/16	7/8	1 3/16	1 7/16	1 5/8	1 13/16	1 7/8	2	2	2 1/16	2	2	1 7/8	1 13/16	1 5/8	1 7/16	1 3/16	7/8	7/16	0

✳ INCLUDES WEIGHT OF DECK SLAB, BUILD-UPS, DIAPHRAGMS, PARAPETS, AND FUTURE WEARING SURFACE.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE GIRDER DEFLECTIONS AND CAMBER (SPANS A & B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
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NC License No: P-0358

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN C

0.6"Ø LOW RELAXATION STRANDS	GIRDERS CG1 & CG4																					
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.20	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.059	0.118	0.163	0.208	0.239	0.271	0.290	0.309	0.316	0.322	0.316	0.309	0.290	0.271	0.239	0.208	0.163	0.118	0.059	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.025	0.049	0.073	0.096	0.114	0.132	0.143	0.154	0.157	0.161	0.156	0.151	0.139	0.127	0.109	0.091	0.068	0.046	0.023	0.000
FINAL CAMBER (IN.) ↑	0	7/16	13/16	1 1/16	1 5/16	1 1/2	1 11/16	1 3/4	1 7/8	1 7/8	1 15/16	1 15/16	1 7/8	1 13/16	1 3/4	1 9/16	1 3/8	1 1/8	7/8	7/16	0

0.6"Ø LOW RELAXATION STRANDS	GIRDERS CG2 & CG3																					
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.20	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.059	0.118	0.163	0.208	0.239	0.271	0.290	0.309	0.316	0.322	0.316	0.309	0.290	0.271	0.239	0.208	0.163	0.118	0.059	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.026	0.053	0.077	0.102	0.121	0.141	0.152	0.164	0.168	0.172	0.167	0.162	0.149	0.136	0.117	0.097	0.073	0.049	0.024	0.000
FINAL CAMBER (IN.) ↑	0	3/8	13/16	1	1 1/4	1 7/16	1 9/16	1 5/8	1 3/4	1 3/4	1 13/16	1 13/16	1 3/4	1 11/16	1 5/8	1 1/2	1 5/16	1 1/16	13/16	7/16	0

SPAN D

0.6"Ø LOW RELAXATION STRANDS	GIRDERS DG1 & DG4																					
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.20	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.058	0.117	0.161	0.206	0.237	0.269	0.288	0.307	0.313	0.320	0.313	0.307	0.288	0.269	0.237	0.206	0.161	0.117	0.058	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.021	0.043	0.064	0.085	0.102	0.119	0.131	0.142	0.147	0.151	0.148	0.145	0.134	0.124	0.107	0.090	0.068	0.046	0.023	0.000
FINAL CAMBER (IN.) ↑	0	7/16	7/8	1 3/16	1 7/16	1 5/8	1 13/16	1 7/8	2	2	2	2	1 15/16	1 13/16	1 3/4	1 9/16	1 3/8	1 1/8	7/8	7/16	0

0.6"Ø LOW RELAXATION STRANDS	GIRDERS DG2 & DG3																					
TWENTIETH POINTS BETWEEN BRGS.	0.0	0.05	0.1	0.15	0.20	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.058	0.117	0.161	0.206	0.237	0.269	0.288	0.307	0.313	0.320	0.313	0.307	0.288	0.269	0.237	0.206	0.161	0.117	0.058	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ↓	0.000	0.023	0.046	0.069	0.091	0.110	0.128	0.140	0.152	0.157	0.161	0.158	0.155	0.143	0.132	0.114	0.096	0.073	0.049	0.025	0.000
FINAL CAMBER (IN.) ↑	0	7/16	7/8	1 1/8	1 3/8	1 1/2	1 11/16	1 3/4	1 7/8	1 7/8	1 7/8	1 7/8	1 13/16	1 3/4	1 5/8	1 1/2	1 5/16	1 1/16	13/16	3/8	0

* INCLUDES WEIGHT OF DECK SLAB, BUILD-UPS, DIAPHRAGMS, PARAPETS, AND FUTURE WEARING SURFACE.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE GIRDER DEFLECTIONS AND CAMBER (SPANS C & D)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0358

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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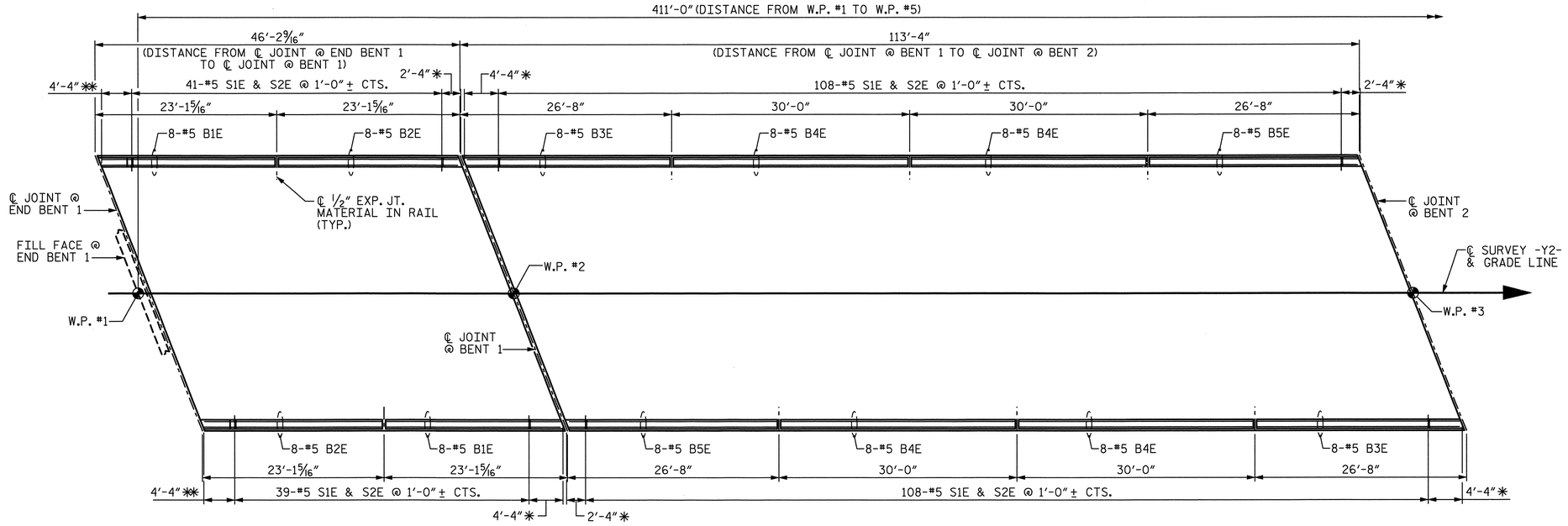
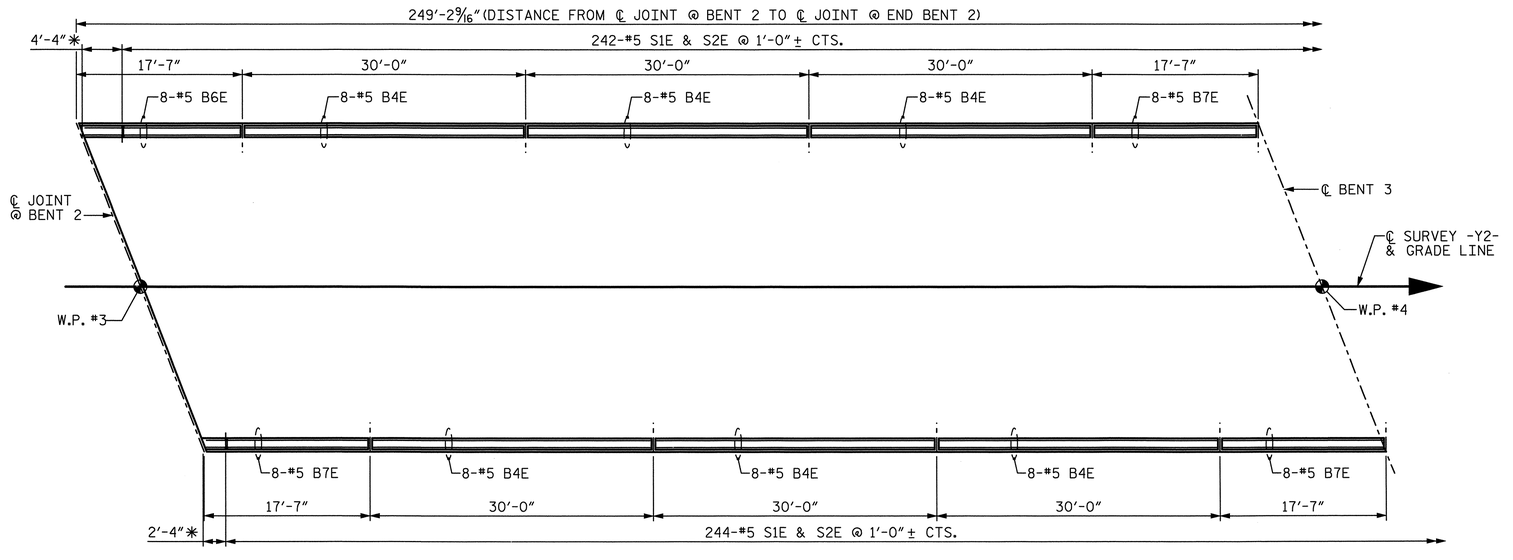


PART PLAN



PART PLAN

NOTE:

✱ SEE "PARAPET DETAILS AT SAWED JOINTS" ON SHEET 2 OF 3.

✱✱ SEE "PLAN OF PARAPET" ON SHEET 3 OF 3.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0868

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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Florence & Hutcheson - An ICA Company

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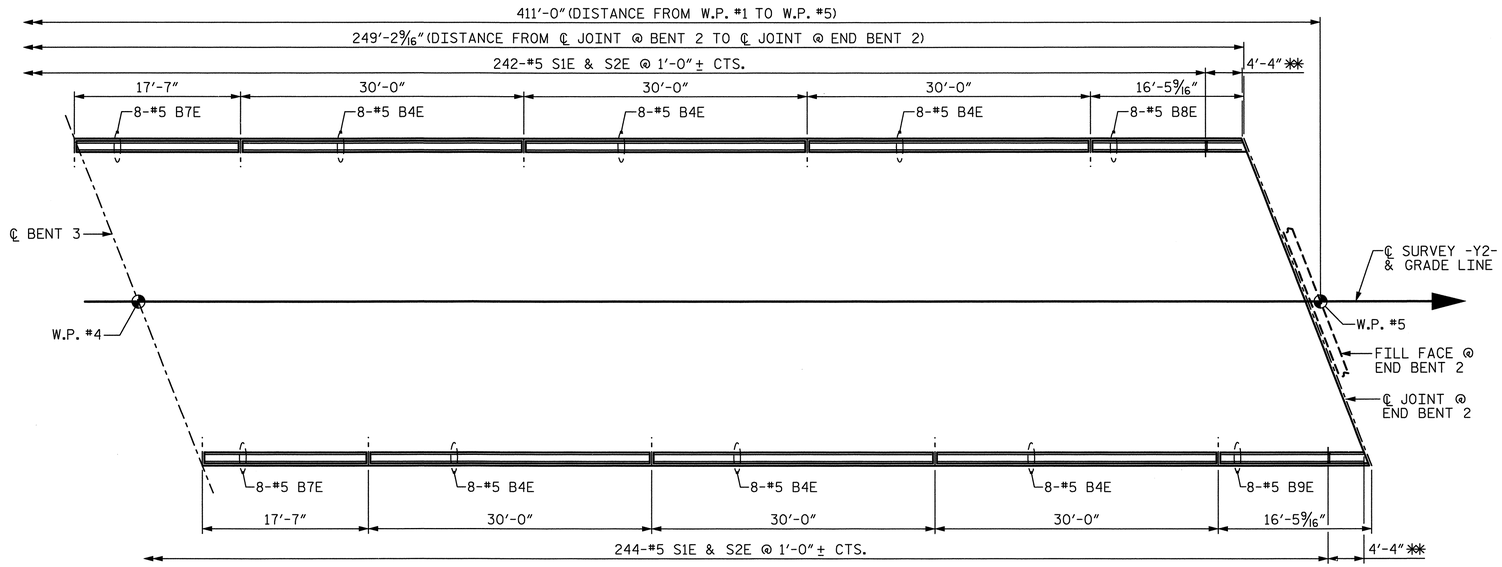
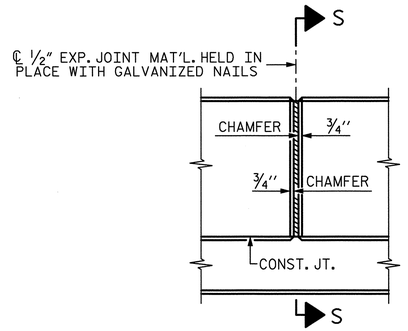


PART PLAN

NOTE:

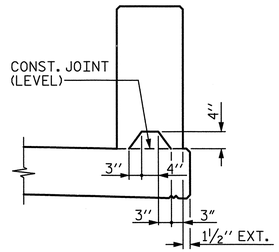
* SEE "PARAPET DETAILS AT SAWED JOINTS" ON SHEET 2 OF 3.

** SEE "PLAN OF PARAPET" ON SHEET 3 OF 3.



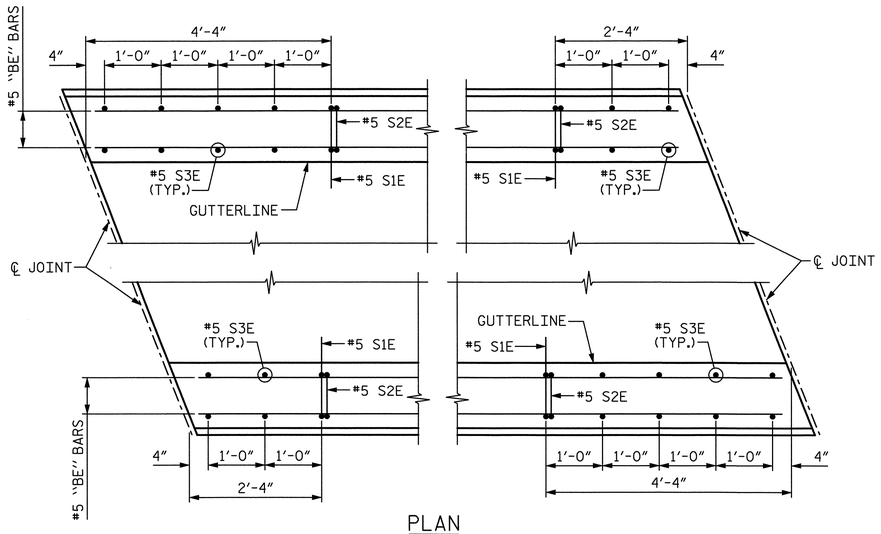
ELEVATION AT EXPANSION JOINTS

(NOTE: OMIT EXP. JOINT MAT'L. WHEN SLIP FORM IS USED)

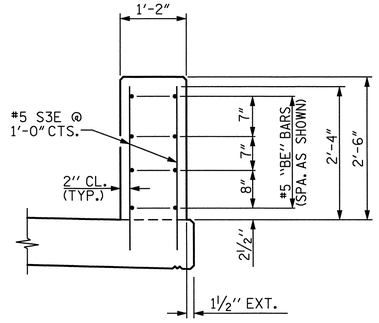


SECTION S-S

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

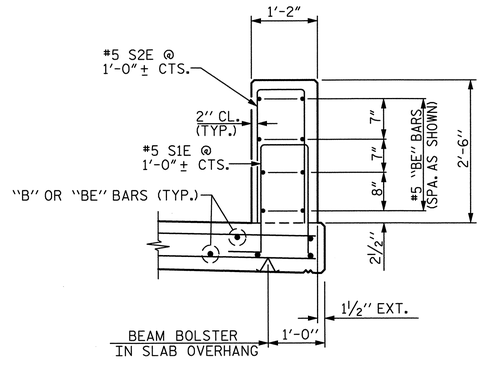


PLAN



END VIEW

(FOR ADHESIVE ANCHORING AT SAWED JOINTS)



SECTION THRU PARAPET

PARAPET DETAILS AT SAWED JOINTS

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0208

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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DGN 0151DEL_P10b1

NOTES

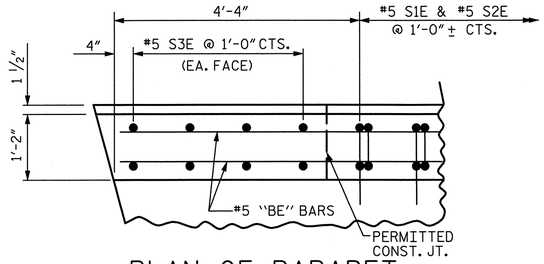
THE PARAPET IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF PARAPET.

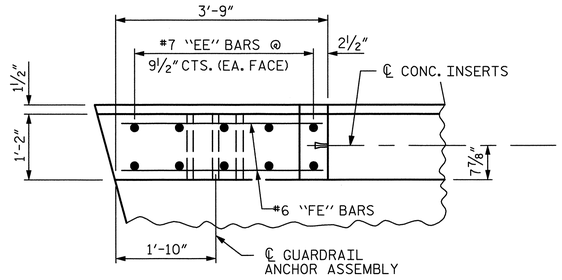
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3E BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3E BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

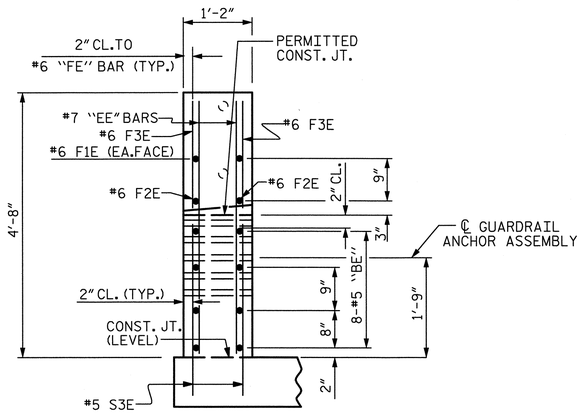
VERTICAL GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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



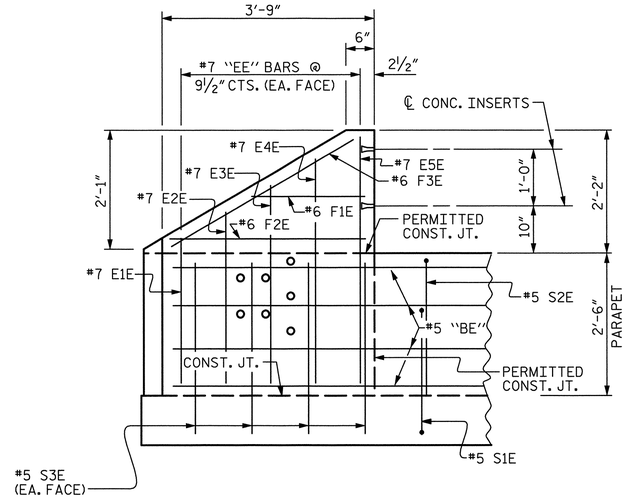
PLAN OF PARAPET



PLAN OF END POST



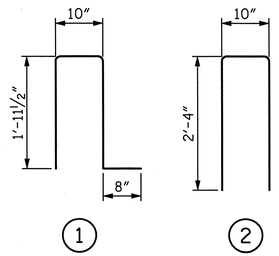
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE PARAPET ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	16	5	STR	22'-2"	370
B2E	16	5	STR	22'-9"	380
B3E	16	5	STR	25'-9"	430
B4E	128	5	STR	29'-7"	3949
B5E	16	5	STR	26'-3"	438
B6E	8	5	STR	16'-8"	139
B7E	40	5	STR	17'-2"	716
B8E	8	5	STR	16'-1"	134
B9E	8	5	STR	15'-6"	129
E1E	8	7	STR	2'-6"	41
E2E	8	7	STR	3'-0"	49
E3E	8	7	STR	3'-6"	57
E4E	8	7	STR	4'-0"	65
E5E	8	7	STR	4'-4"	71
F1E	8	6	STR	1'-10"	22
F2E	8	6	STR	3'-0"	36
F3E	8	6	STR	3'-8"	44
S1E	782	5	1	4'-9"	3874
S2E	782	5	2	5'-6"	4486
S3E	80	5	STR	3'-0"	250
EPOXY COATED REINFORCING STEEL					15,680 LBS.
CLASS AA CONCRETE					89.1 CU. YDS.
CONCRETE PARAPET					817.5 LIN. FT.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0868

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/23/2013
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Florence & Hutcheson - An ICA Company

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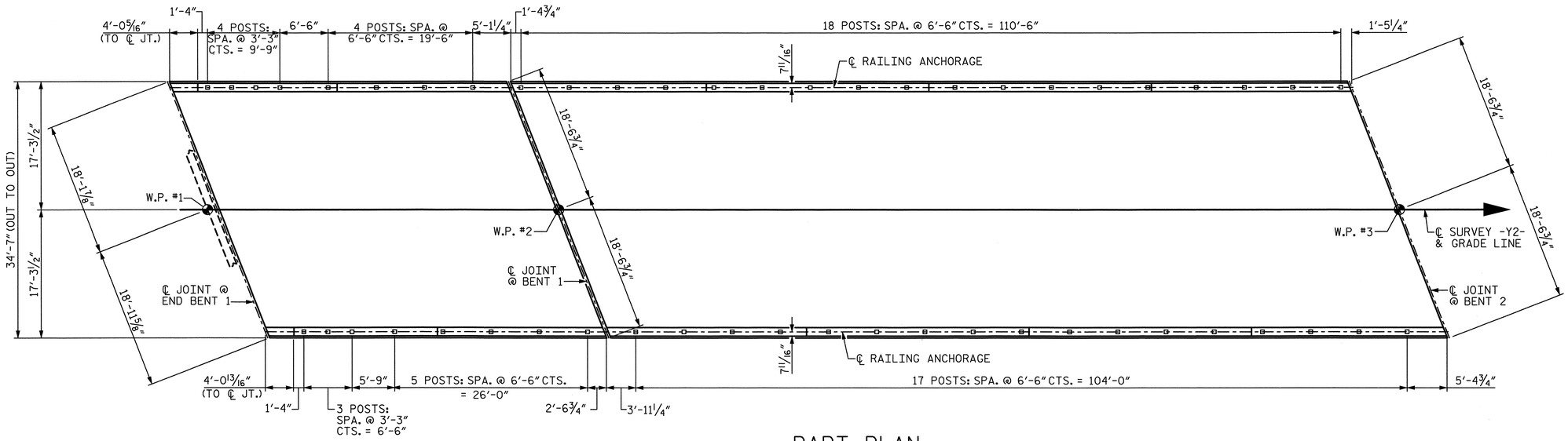
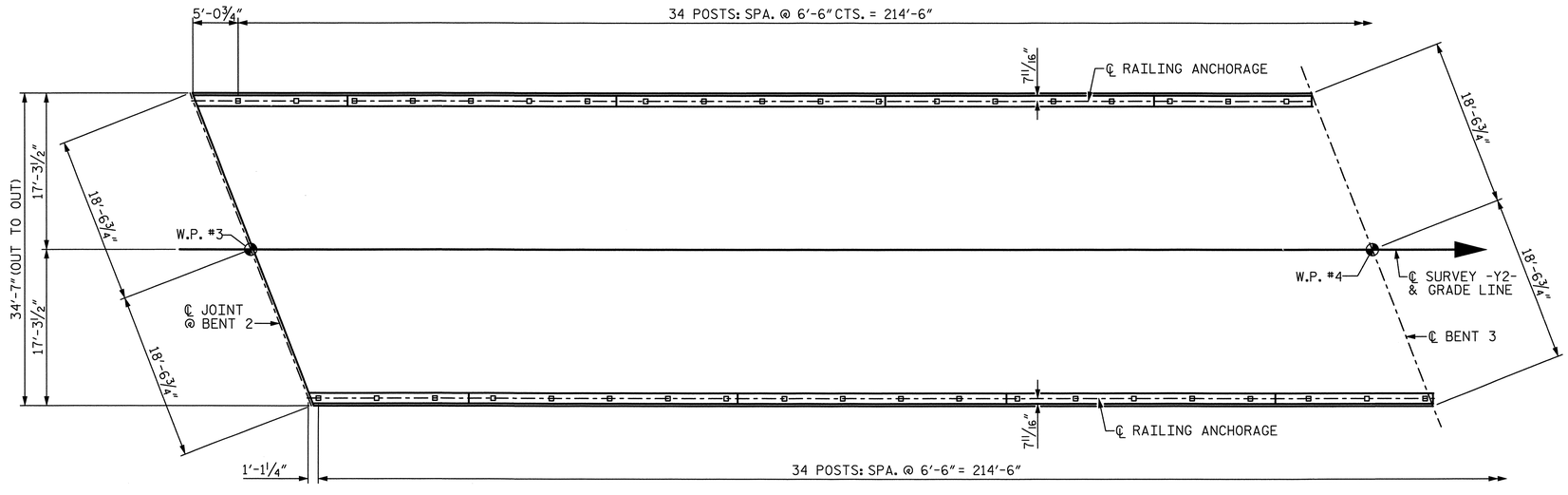


PART PLAN



PART PLAN

NOTE:

POST SPACINGS ARE MEASURED ALONG ℄ RAILING ANCHORAGE (2 BAR METAL RAIL)

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE METAL RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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An ICA Company
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NC License No: P-0288

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

1/9/2013
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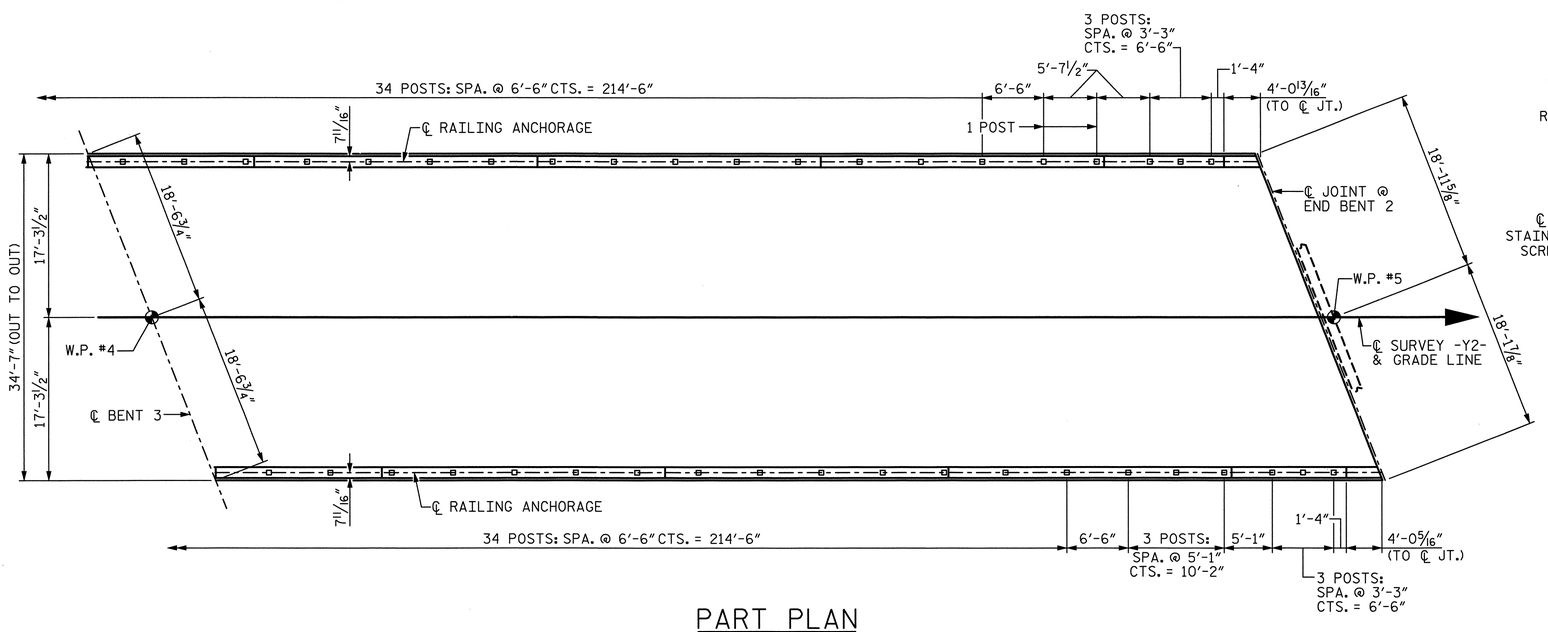
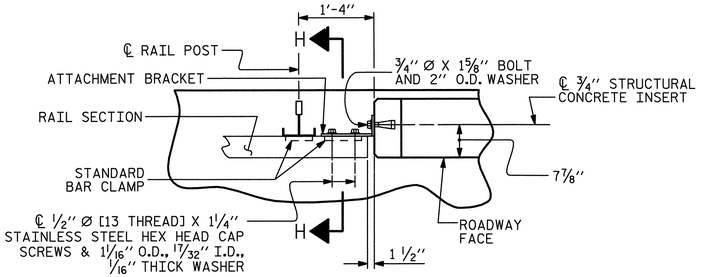
DGN 0151DEL_P10b1



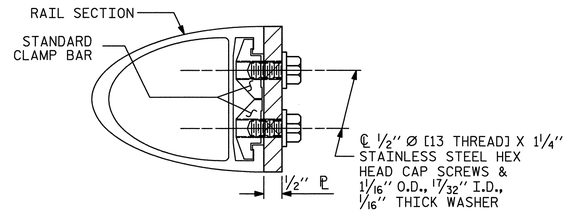
PART PLAN

NOTE:

POST SPACINGS ARE MEASURED ALONG
℄ RAILING ANCHORAGE (2 BAR METAL RAIL)



PLAN - RAIL AND END POST



SECTION H-H (FIX)

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 SHEET 4 OF 4).

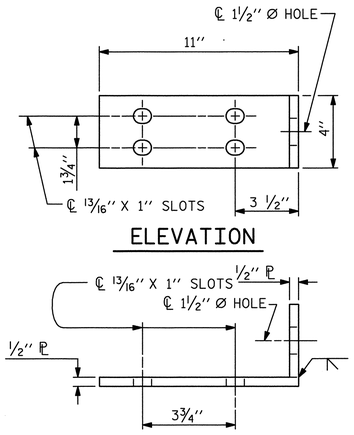
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

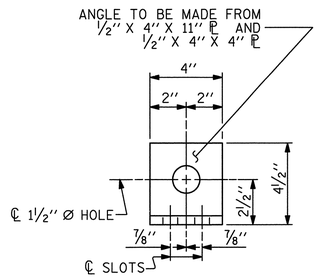
THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

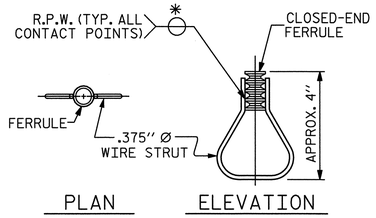
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.







STRUCTURAL CONCRETE INSERT

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

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE METAL RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
An ICA Company
5121 Kingsdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER MICHAEL T. DELIGIANNIDIS
1-9-13

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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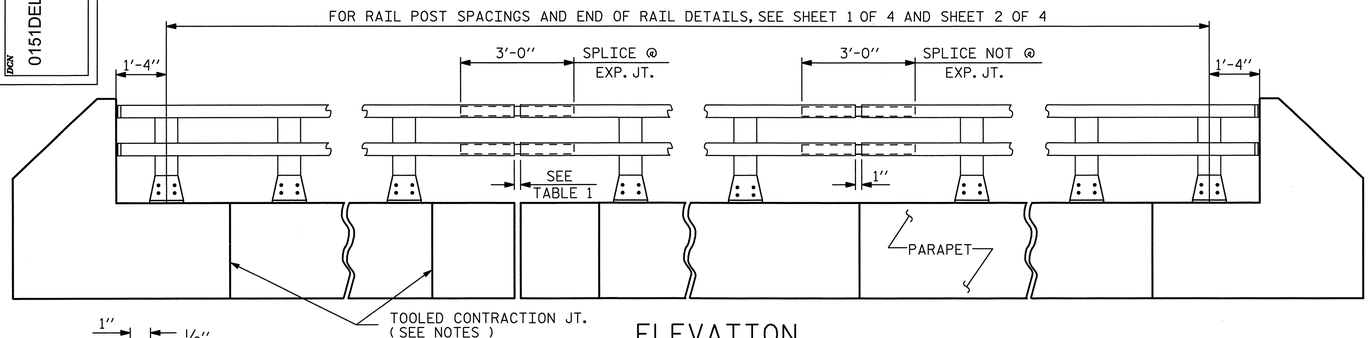
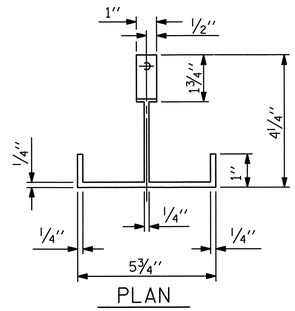
DGN 0151DEL_P10b1



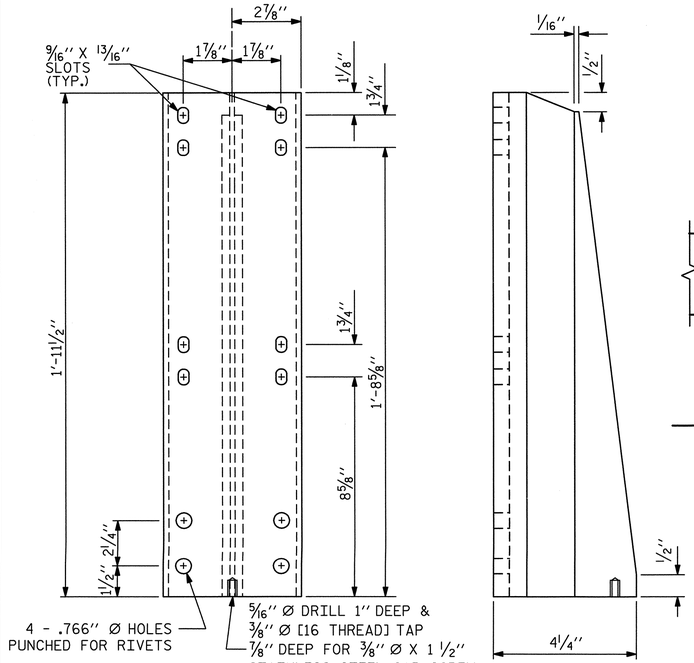
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 2 OF 4.

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
BENT No. 1	1 9/16"
BENT No. 2	1 9/16"

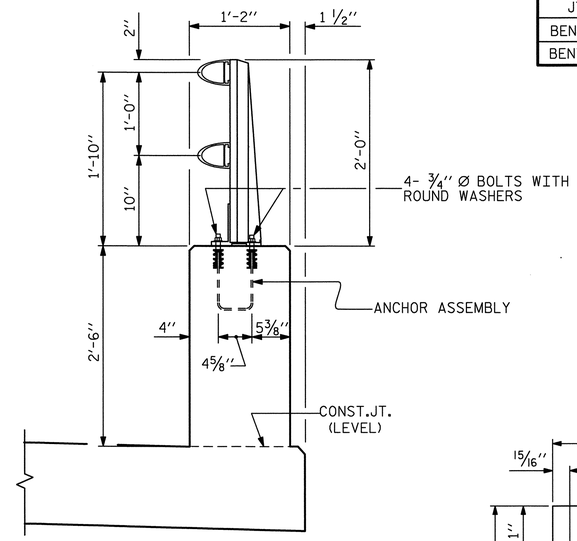


PLAN

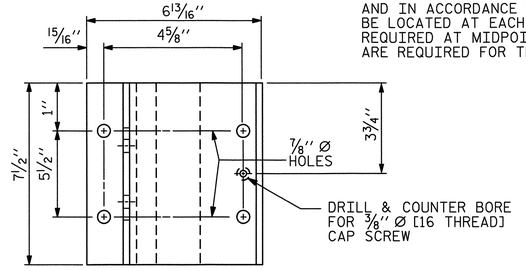


FRONT ELEVATION SIDE ELEVATION

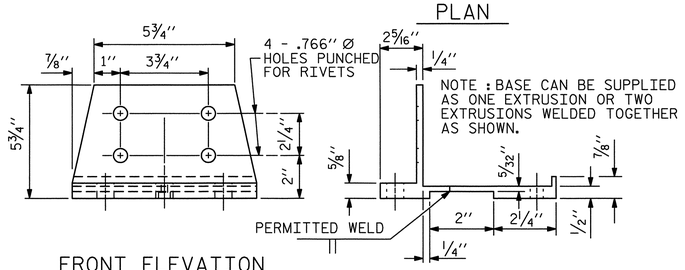
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

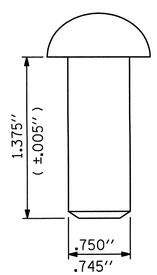


PLAN



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 SHEET 2 OF 4.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 801.3 LIN. FT.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD METAL RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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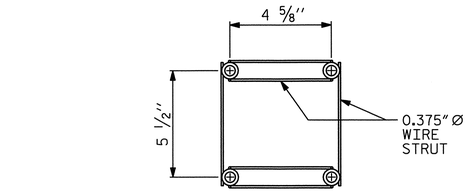
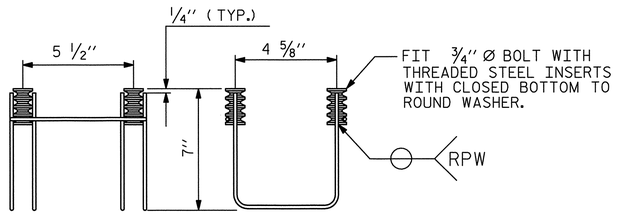


PLAN



SIDE VIEW ELEVATION

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

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

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

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

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

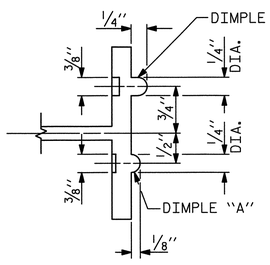
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

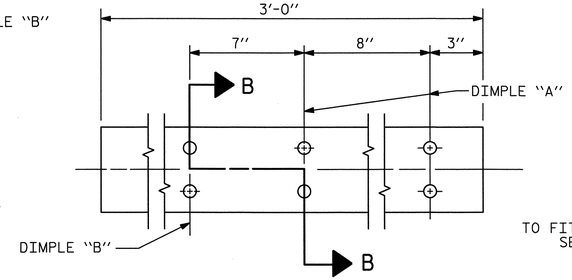
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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

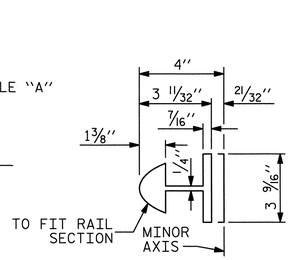
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(130 ASSEMBLIES REQUIRED)



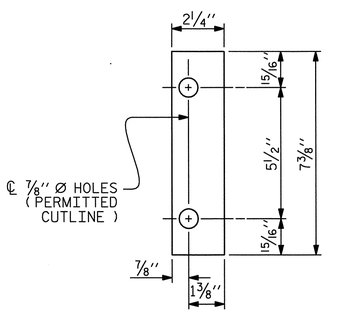
SECTION B - B



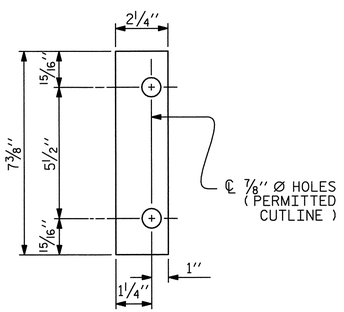


BAR SECTION

EXPANSION BAR DETAILS



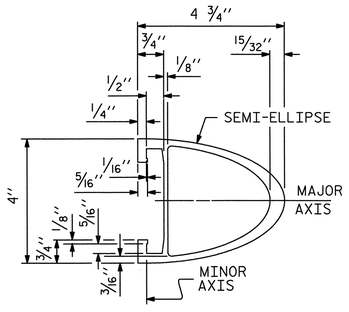
FRONT PLATE



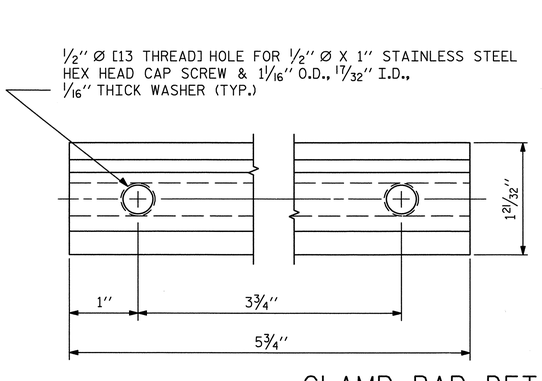
REAR PLATE

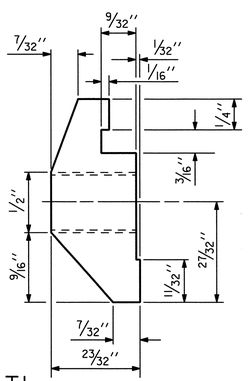
SHIM DETAILS

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



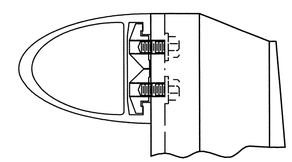
RAIL SECTION



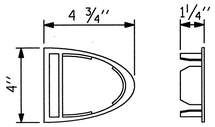


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD METAL RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			53

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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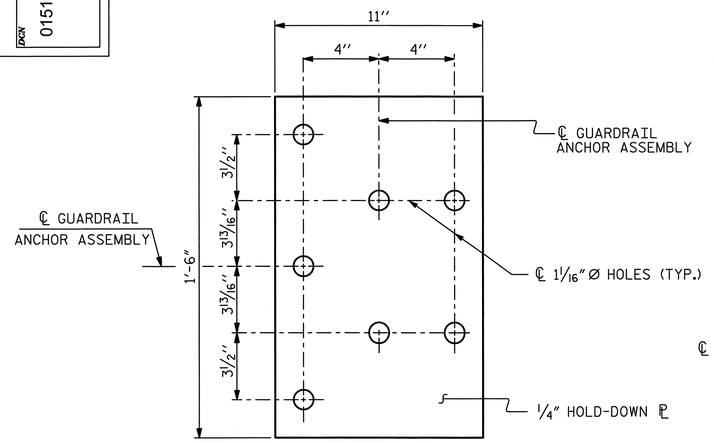
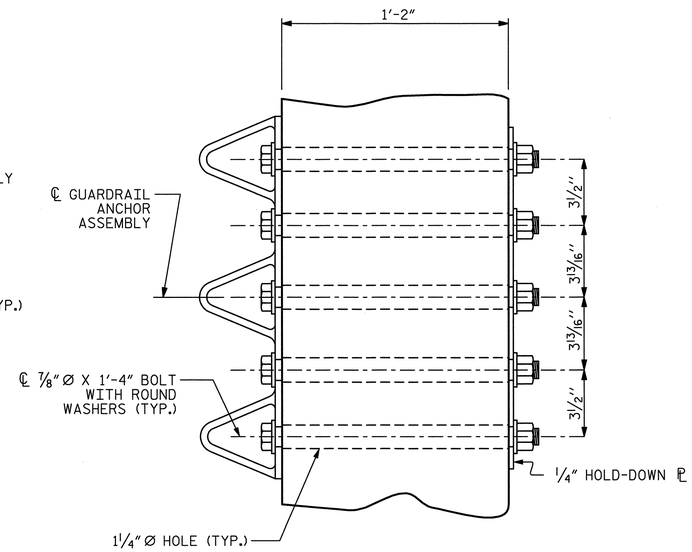
DGN 0151DEL_P10b1



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 7 - ⅞'' 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 ⅞'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

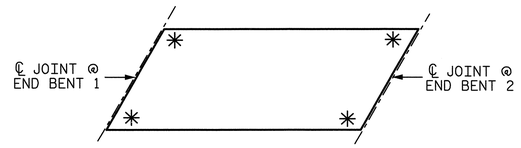
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

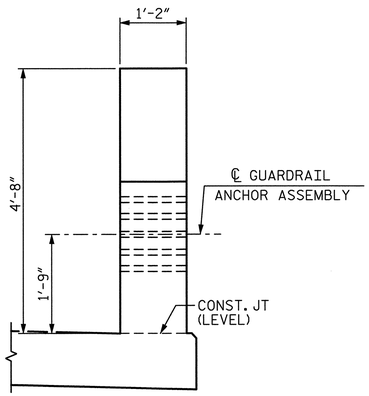
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 ¼'' 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.

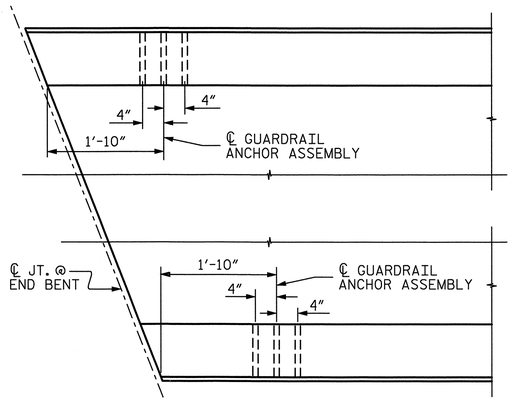


SKETCH SHOWING POINTS OF ATTACHMENT

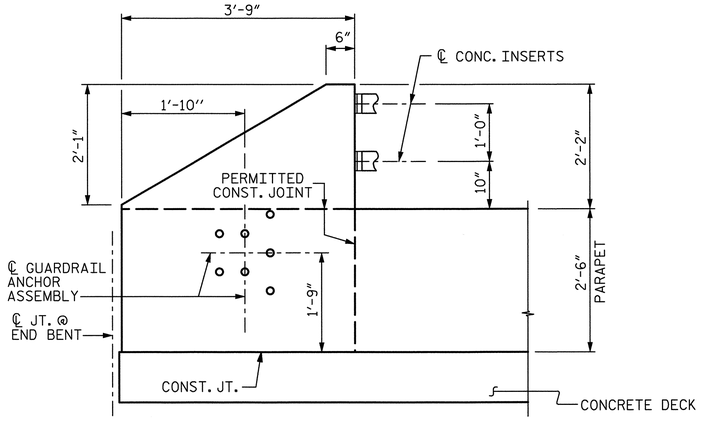
✱ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN



ELEVATION

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD GUARDRAIL ANCHORAGE FOR PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

1/9/2013
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REINFORCING STEEL SCHEDULE

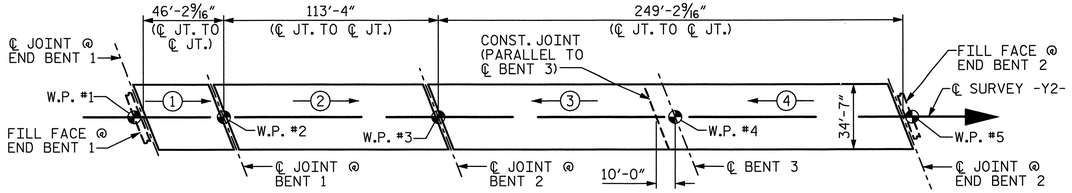
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	582	5	STR	34′-3″	20791
A2E	638	5	STR	6′-8″	4436
A3E	18	6	STR	36′-9″	994
A4	582	5	STR	34′-3″	20791
A101E	6	5	STR	33′-9″	211
A102E	6	5	STR	32′-2″	201
A103E	6	5	STR	30′-6″	191
A104E	6	5	STR	28′-11″	181
A105E	6	5	STR	27′-4″	171
A106E	6	5	STR	25′-9″	161
A107E	6	5	STR	24′-2″	151
A108E	6	5	STR	22′-6″	141
A109E	6	5	STR	20′-11″	131
A110E	6	5	STR	19′-4″	121
A111E	6	5	STR	17′-9″	111
A112E	6	5	STR	16′-1″	101
A113E	6	5	STR	14′-6″	91
A114E	6	5	STR	12′-11″	81
A115E	6	5	STR	11′-4″	71
A116E	6	5	STR	9′-8″	60
A117E	6	5	STR	8′-1″	51
A118E	6	5	STR	6′-6″	41
A119E	6	5	STR	4′-11″	31
A120E	6	5	STR	3′-4″	21
A201	6	5	STR	35′-1″	220
A202	6	5	STR	33′-6″	210
A203	6	5	STR	31′-10	199
A204	6	5	STR	30′-3″	189
A205	6	5	STR	28′-8″	179
A206	6	5	STR	27′-1″	169
A207	6	5	STR	25′-6″	160
A208	6	5	STR	23′-10″	149
A209	6	5	STR	22′-3″	139
A210	6	5	STR	20′-8″	129
A211	6	5	STR	19′-1″	119
A212	6	5	STR	17′-5″	109
A213	6	5	STR	15′-10″	99
A214	6	5	STR	14′-3″	89
A215	6	5	STR	12′-8″	79
A216	6	5	STR	11′-0″	69
A217	6	5	STR	9′-5″	59
A218	6	5	STR	7′-10″	49
A219	6	5	STR	6′-3″	39
A220	6	5	STR	4′-8″	29

REINFORCING STEEL SCHEDULE CONTINUED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	48	4	STR	23′-11″	767
B2E	96	4	STR	29′-9″	1908
B3E	72	4	STR	29′-4″	1411
B4E	24	7	STR	60′-0″	2943
B5E	24	7	STR	31′-3″	1533
B6E	46	7	STR	45′-0″	4231
B7E	72	4	STR	29′-0″	1395
B8	27	5	STR	45′-9″	1288
B9	54	5	STR	57′-9″	3253
B10	135	5	STR	51′-7″	7263
G1E	6	5	STR	36′-9″	230
K1E	24	8	1	13′-5″	860
K2E	24	8	2	19′-1″	1223
K3E	54	6	STR	5′-5″	439
K4	6	4	STR	5′-5″	22
K5	30	4	STR	8′-8″	174
K6	6	4	STR	5′-8″	23
K7	14	4	8	11′-11″	111
K8	12	4	9	6′-1″	49
K9	2	4	9	6′-10″	9
S1E	126	4	6	5′-4″	449
S2E	126	5	3	5′-11″	778
S3	156	4	5	2′-10″	295
U1	6	4	4	12′-4″	49
U2E	21	4	7	18′-11″	265

EPOXY REINFORCING STEEL	LBS.	46,972
REINFORCING STEEL	LBS.	35,810
CLASS AA CONCRETE	C.Y.	449.2 ⚠1

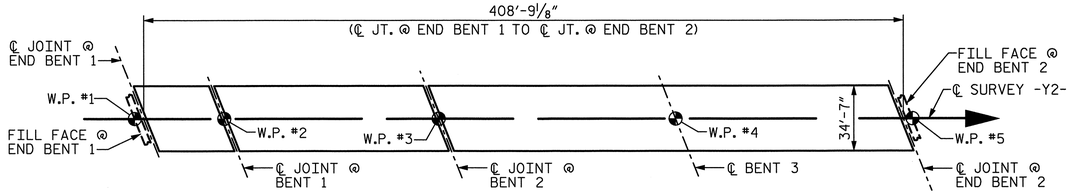
**QUANTITIES FOR PARAPET ARE NOT INCLUDED



POUR SEQUENCE

←(#)— DENOTES POUR NUMBER AND DIRECTION

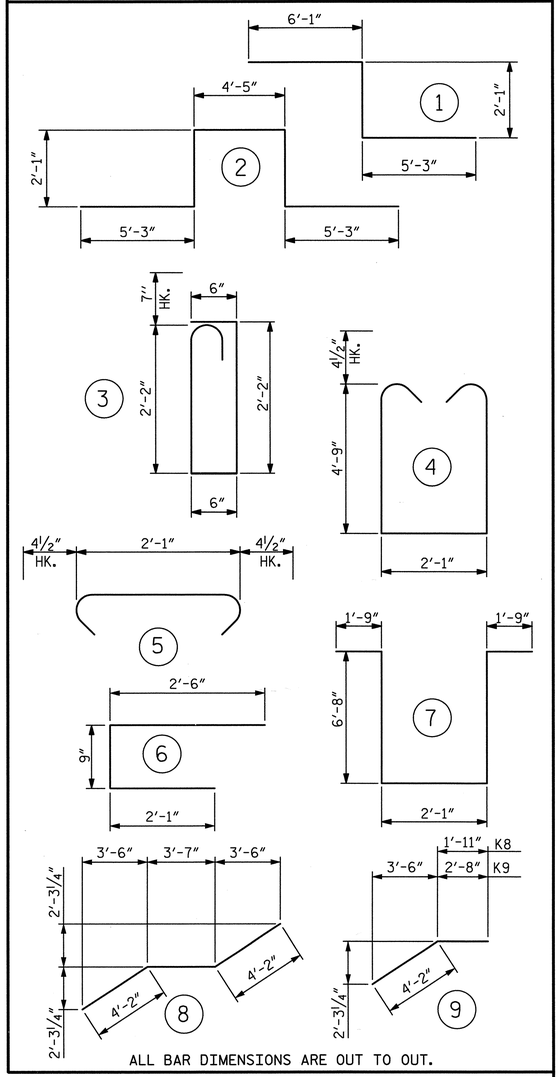
FOR TRANSVERSE CONSTRUCTION JOINT DETAILS, SEE "PLAN OF SPANS" SHEET 1 OF 4.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 14,136)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,396	SQ.FT.
BRIDGE DECK	11,800	SQ.FT.
TOTAL	13,196	SQ.FT.

⚠1 REVISED CONCRETE QUANTITY.

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
2-27-13

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1	JEM	2-27-13	3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

2/27/2013
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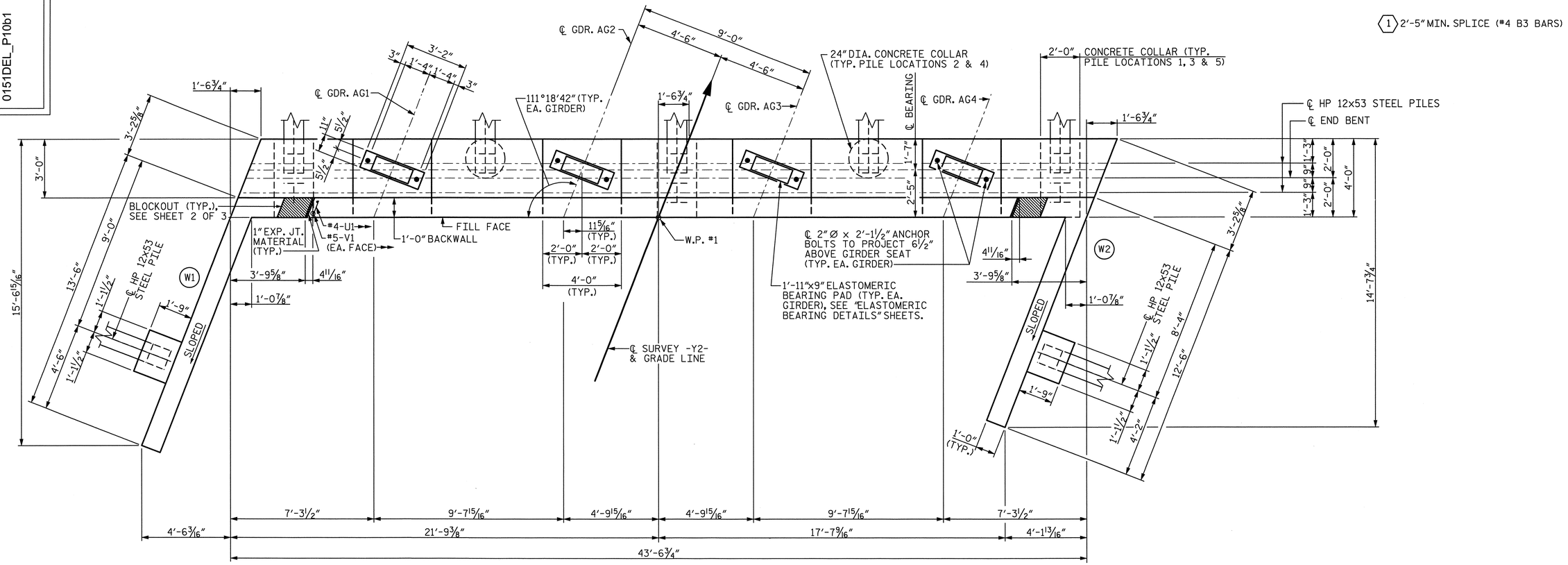
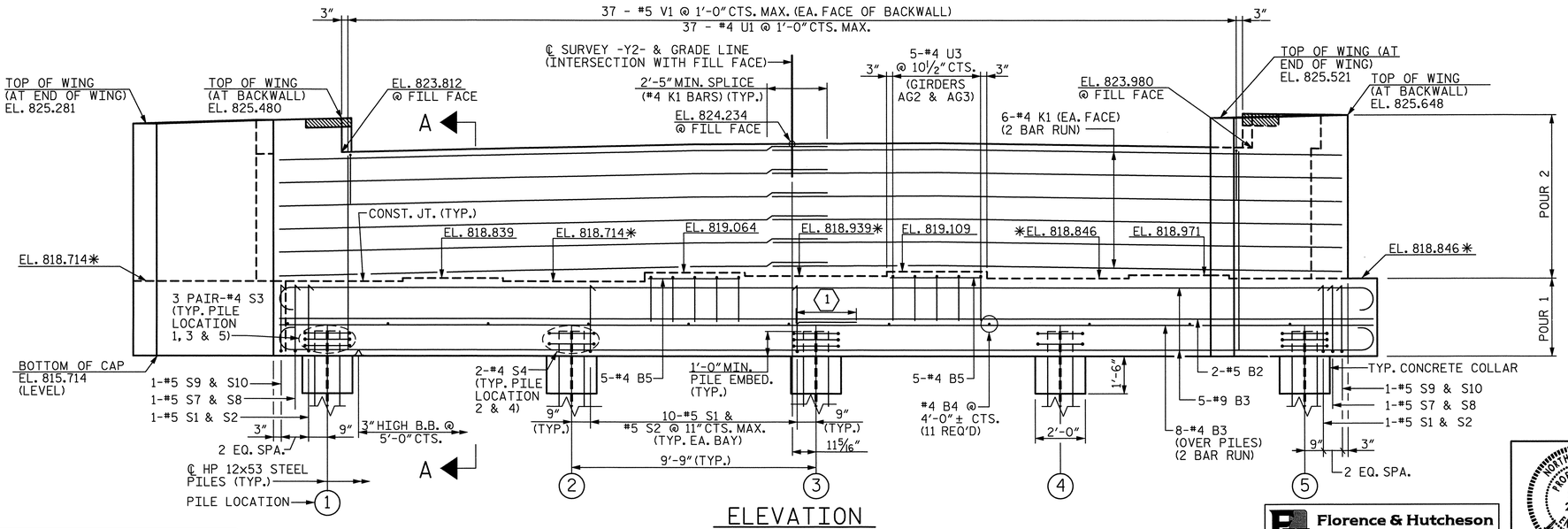
DGN 0151DEL_P10b1

1 2'-5" MIN. SPLICE (#4 B3 BARS)



PLAN



ELEVATION

WING PILE NOT SHOWN FOR CLARITY

*FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE "SECTION A-A", SHEET 3 OF 3.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0338

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOHN E. MONDOLFI
1-9-13

1/9/2013
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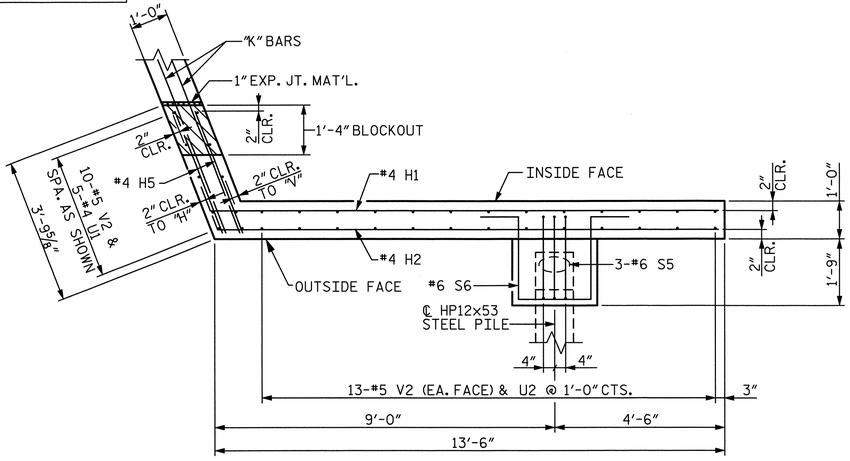
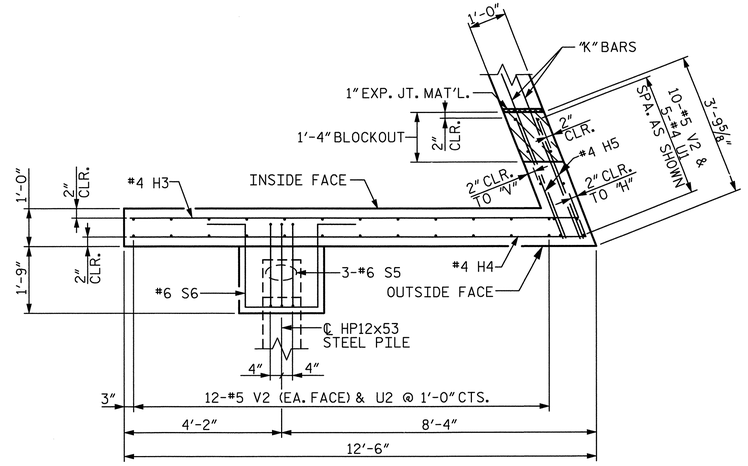
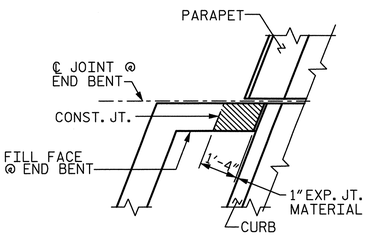


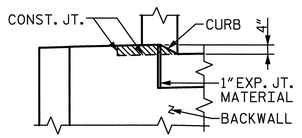
PLAN OF LEFT WING-W1



PLAN OF RIGHT WING-W2

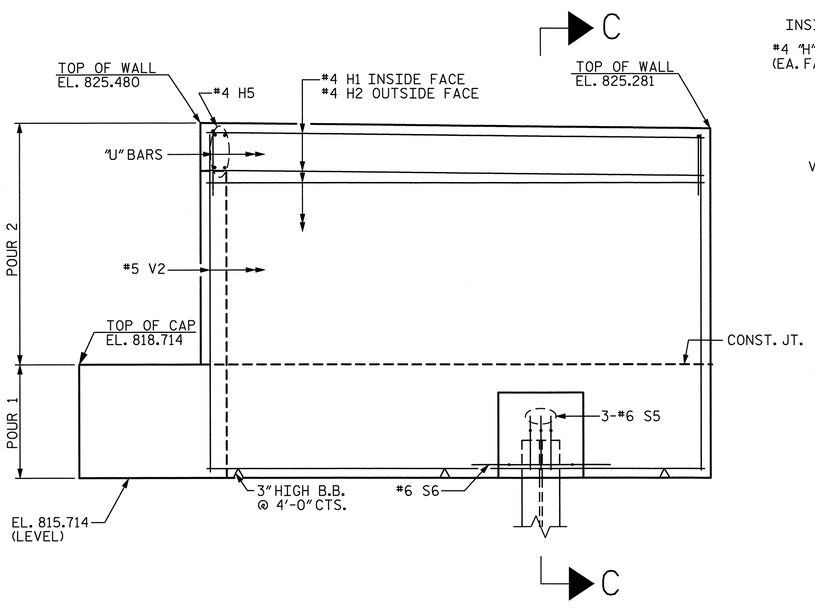


PLAN - BLOCKOUT DETAIL

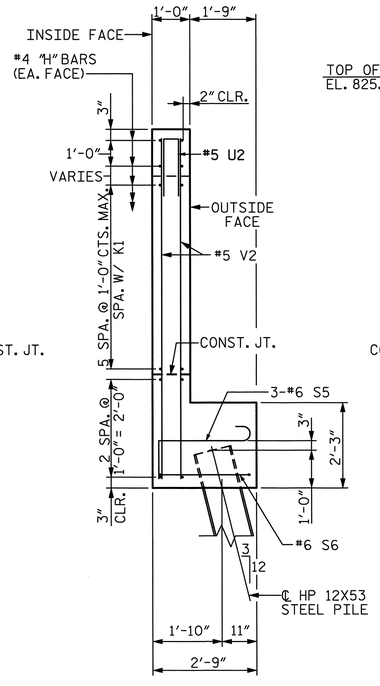


ELEVATION - BLOCKOUT DETAIL

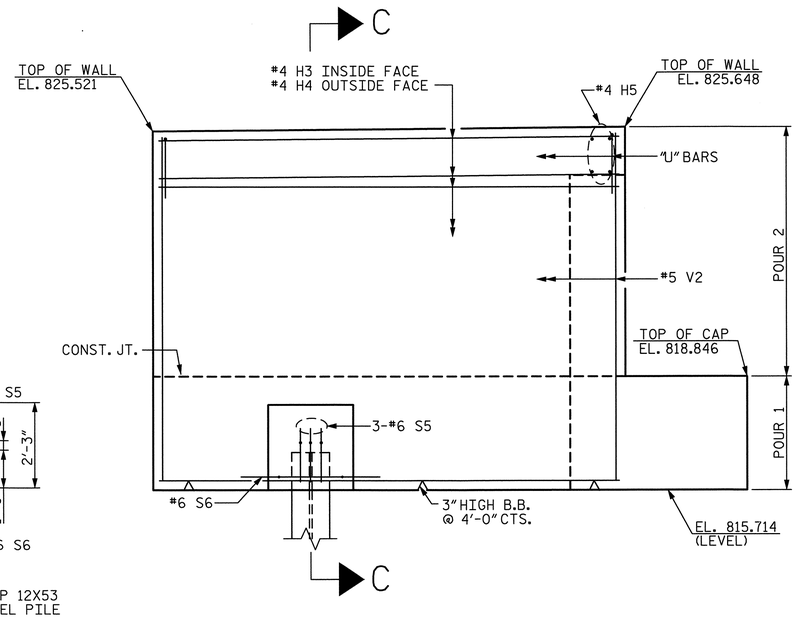
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.



ELEVATION OF LEFT WING-W1



SECTION C-C



ELEVATION OF RIGHT WING-W2

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 WING WALL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0288

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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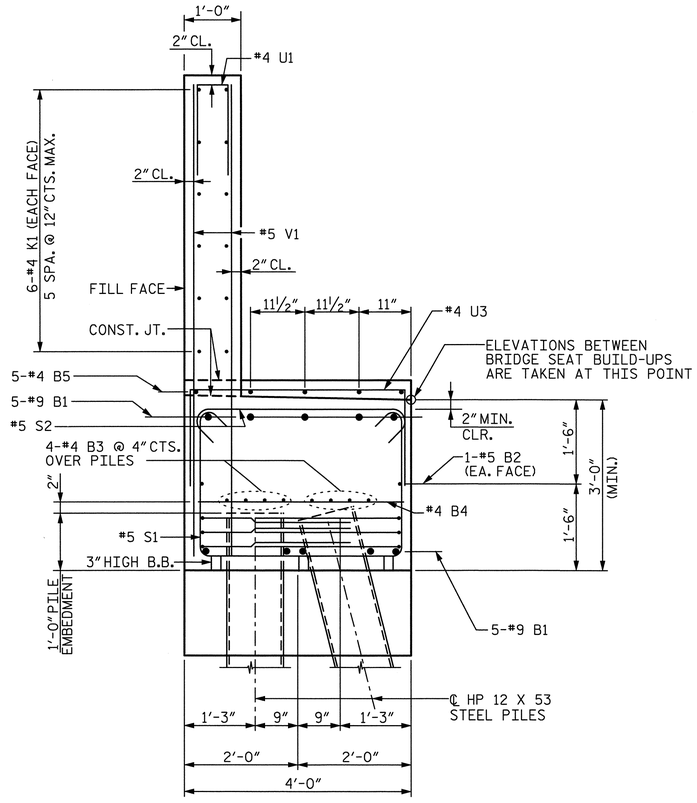


SECTION A-A

NOTES:

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

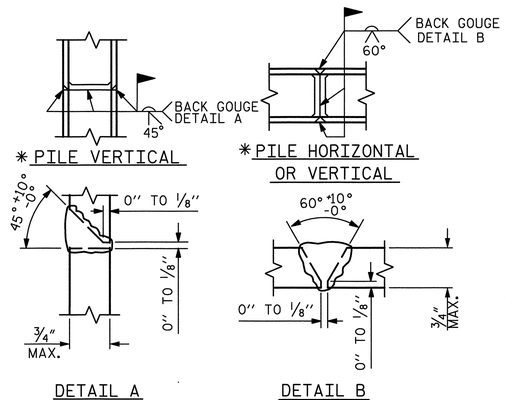
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR ADDITIONAL NOTES SEE "GENERAL DRAWING" SHEET 3 OF 6.

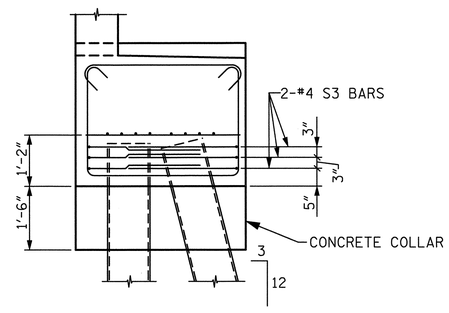
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALLS AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



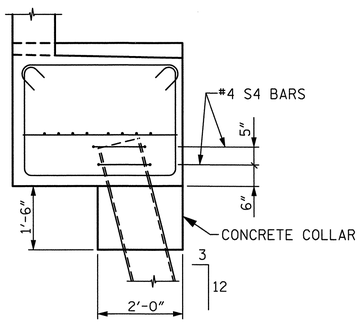
DETAIL A DETAIL B

PILE SPLICE DETAILS

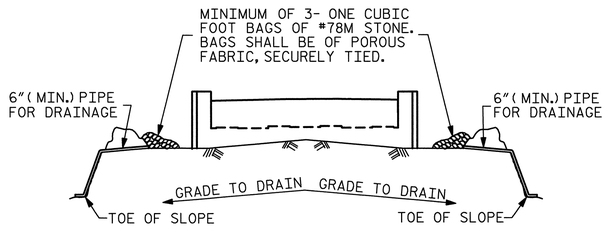
*POSITION OF PILE DURING WELDING.



BRACE PILE DETAILS PILE LOCATIONS 1, 3 & 5



BRACE PILE DETAILS PILE LOCATIONS 2 & 4



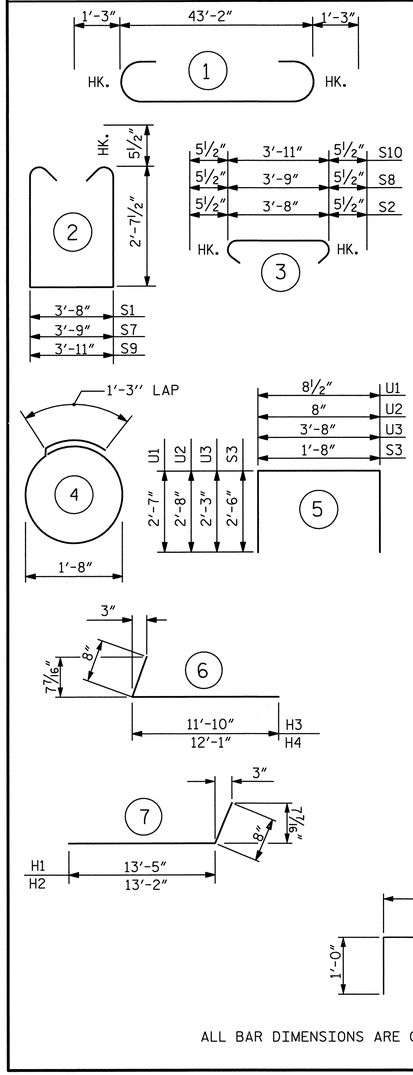
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	45'-8"	1553
B2	2	5	STR	43'-2"	90
B3	16	4	STR	22'-10"	244
B4	11	4	STR	3'-8"	27
B5	10	4	STR	3'-8"	24
H1	11	4	7	14'-1"	103
H2	11	4	7	13'-10"	102
H3	11	4	6	12'-6"	92
H4	11	4	6	12'-9"	94
H5	8	4	STR	3'-5"	18
K1	24	4	STR	22'-10"	366
S1	42	5	2	9'-10"	431
S2	42	5	3	4'-7"	201
S3	18	4	5	6'-8"	80
S4	4	4	4	6'-6"	17
S5	6	6	8	4'-1"	37
S6	2	6	9	8'-5"	25
S7	2	5	2	9'-11"	21
S8	2	5	3	4'-8"	10
S9	2	5	2	10'-1"	21
S10	2	5	3	4'-10"	10
U1	47	4	5	5'-11"	186
U2	25	5	5	6'-0"	156
U3	10	4	5	8'-2"	55
V1	74	5	STR	7'-8"	592
V2	70	5	STR	9'-1"	663
REINFORCING STEEL				LBS.	5,218

CLASS "A" CONCRETE BREAKDOWN

POUR #1 - CAP & LOWER WINGWALLS	C.Y. 25.4
POUR #2 - BACKWALL & UPPER WINGWALLS	C.Y. 14.8
TOTAL CLASS "A" CONCRETE	C.Y. 40.2
HP 12x53 STEEL PILES NO. 10	LF. 1,050

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0208

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOSEPH E. MONDOLFI
1-9-13

1/9/2013
p:\tip\p5206a\p5206a\structures\plans\RFC Plans 1-8-13\P5206A_sd_E1_01.dgn
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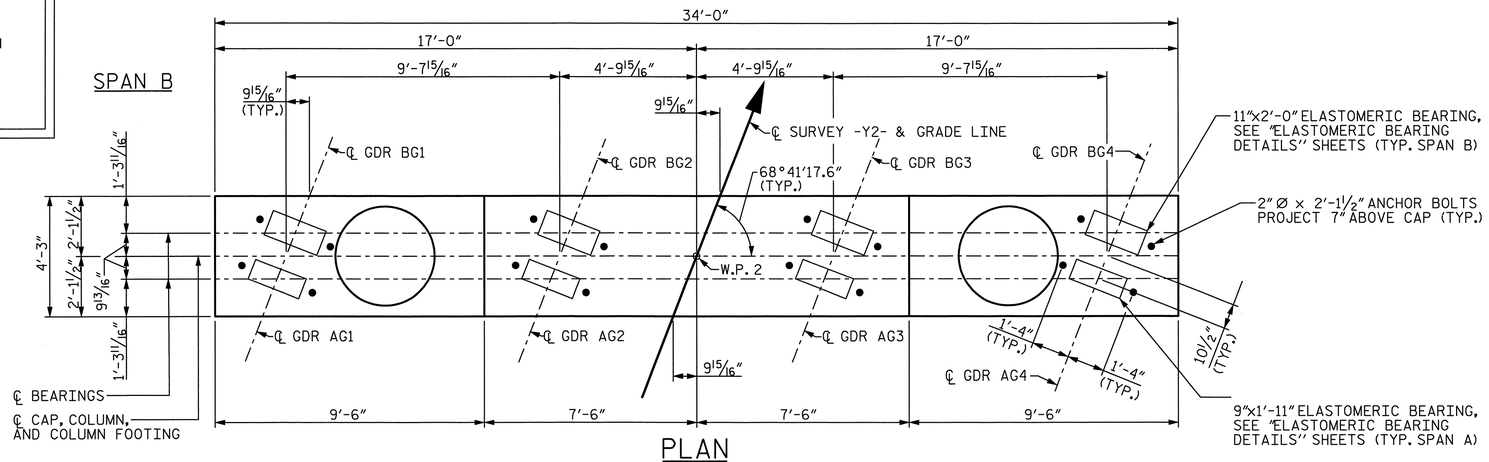
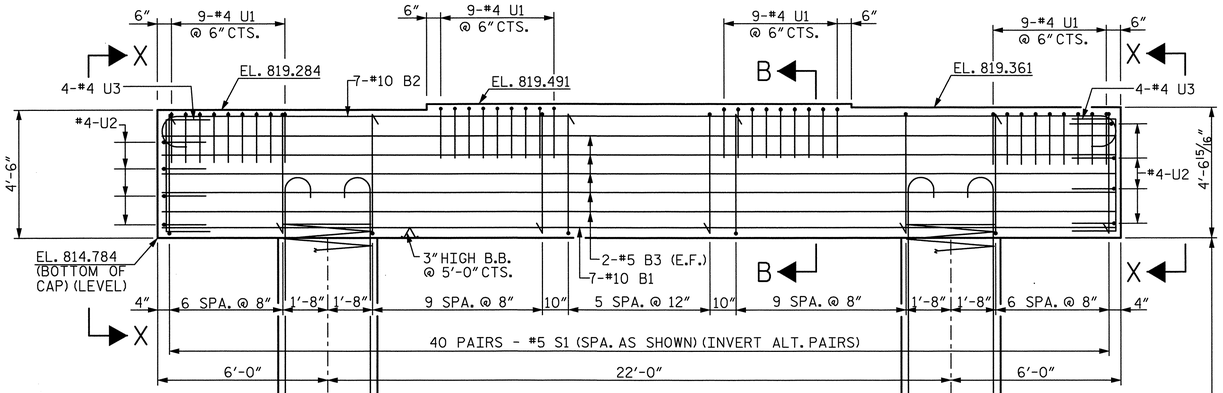
DGN 0151DEL_P10b1

SPAN B

SPAN A

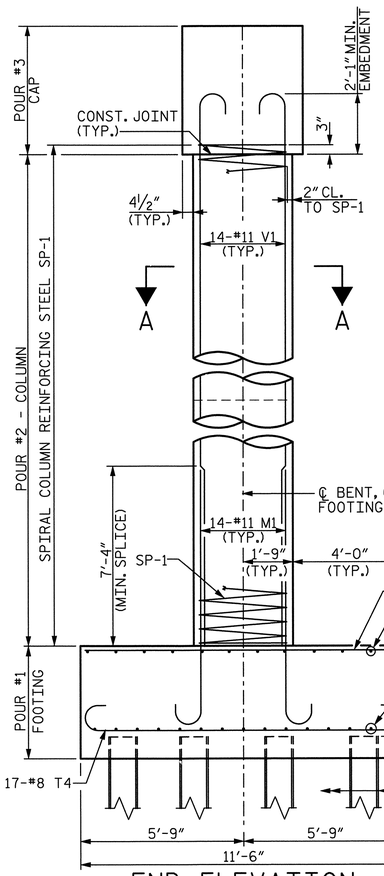


PLAN



ELEVATION

DETAILS SHOWN FOR FOOTINGS AND COLUMNS ARE TYPICAL



END ELEVATION

NOTES:

FOR SECTION A-A, SEE SHEET 2 OF 2.

FOR SECTION B-B, SEE SHEET 2 OF 2.

FOR VIEW X-X, SEE SHEET 2 OF 2.

SEE SHEET 2 OF 2 FOR REINFORCING BILL OF MATERIAL.

SEE SHEET 2 OF 2 FOR ADDITIONAL NOTES.

FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS" SHEET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

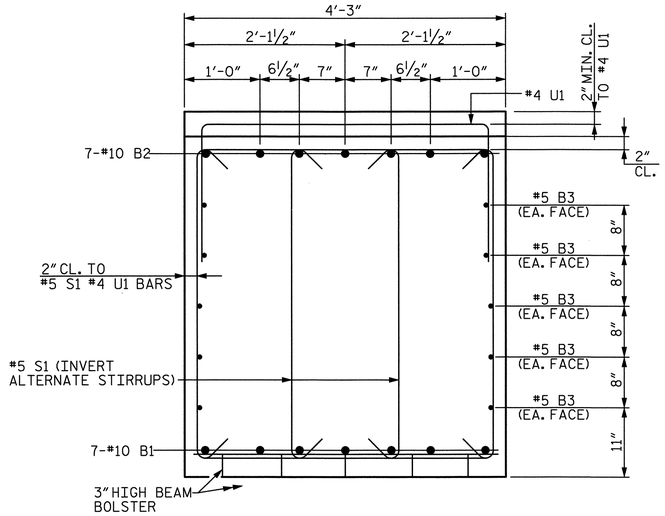
Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0266

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

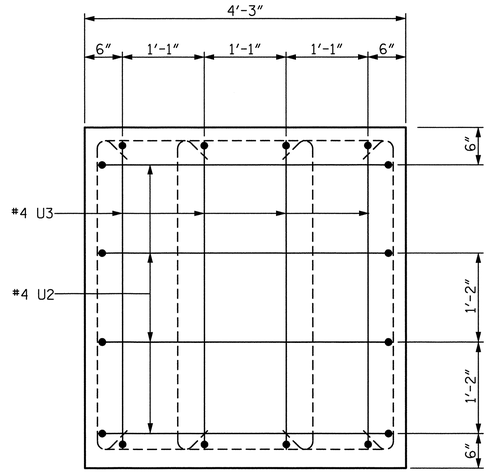
1-9-13

1/9/2013
D:\Projects\5206a\p5206a\structures\plans\RFC Plans 1-8-13\P5206A_sd_BT1_01.dgn
Florence & Hutcheson - An ICA Company

DGN 0151DEL_P10b1

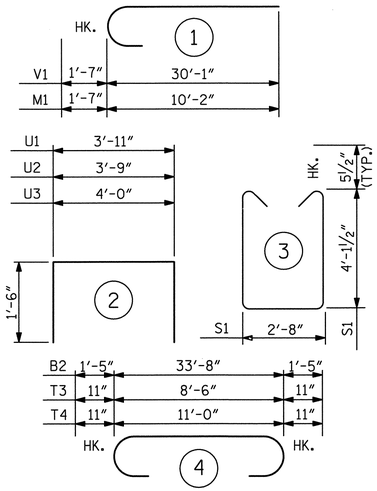


SECTION B-B

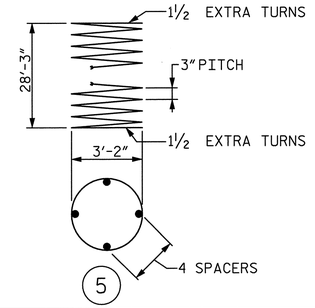


VIEW X-X

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

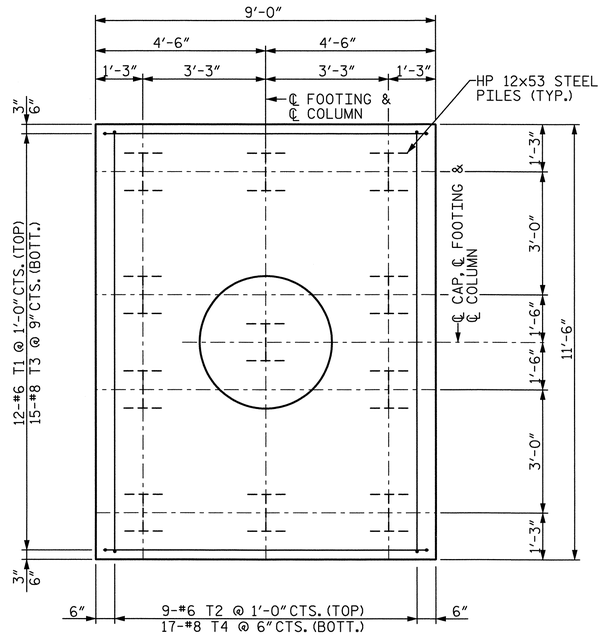


BILL OF MATERIAL
BENT 1

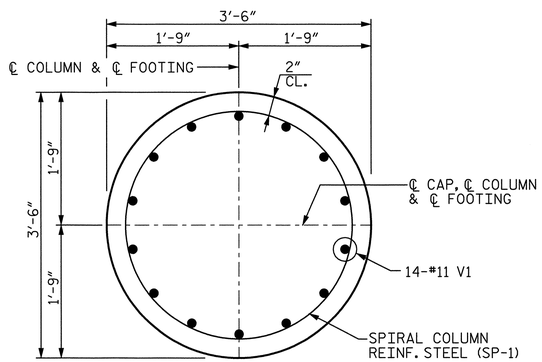
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	10	STR	33′-8″	1014
B2	7	10	4	36′-6″	1099
B3	10	5	STR	33′-8″	351
M1	28	11	1	11′-9″	1748
S1	80	5	3	11′-10″	987
T1	24	6	STR	8′-6″	306
T2	18	6	STR	11′-0″	297
T3	30	8	4	10′-4″	828
T4	34	8	4	12′-10″	1165
U1	36	4	2	6′-11″	166
U2	8	4	2	6′-9″	36
U3	8	4	2	7′-0″	37
V1	28	11	1	31′-8″	4711
REINFORCING STEEL				LBS.	12,745
SP-1	2	*	5	1139′-3″	1522
SPIRAL COLUMN REINFORCING STEEL				LBS.	12,745

CLASS "A" CONCRETE BREAKDOWN		
POUR #1 - FOOTINGS	C.Y.	30.7
POUR #2 - COLUMNS	C.Y.	20.0
POUR #3 - CAP	C.Y.	24.7
TOTAL CLASS "A" CONCRETE	C.Y.	75.4
FOUNDATION EXCAVATION	C.Y.	146
HP 12x53 STEEL PILES		
NO. 22	L.F.	1,540

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



PLAN OF FOOTING



SECTION A-A

NOTES:

STIRRUPS & "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR COLUMN STEEL AND ANCHOR BOLTS.

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

FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 DETAILS

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0888

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			53

1/9/2013
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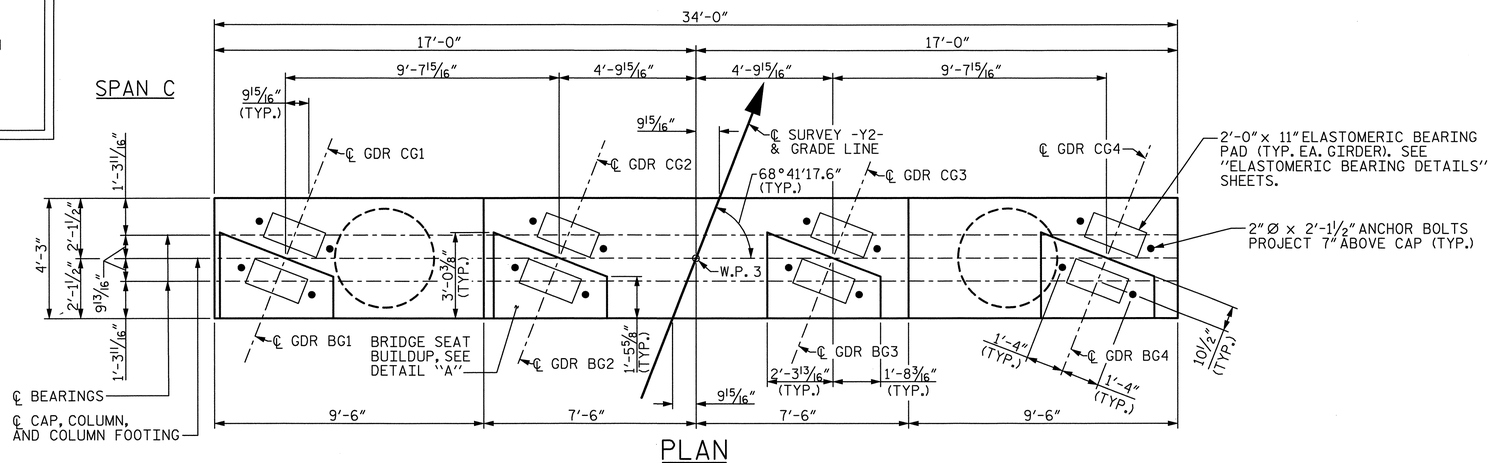
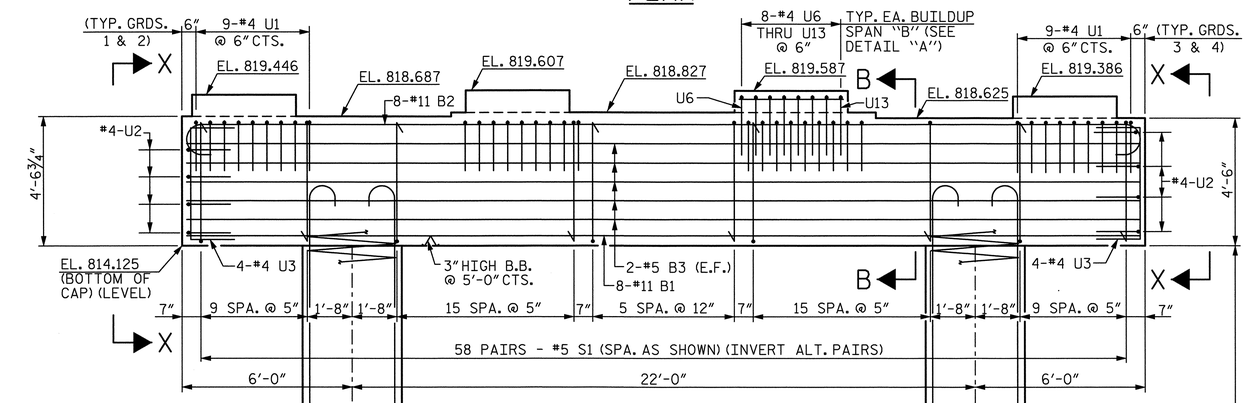
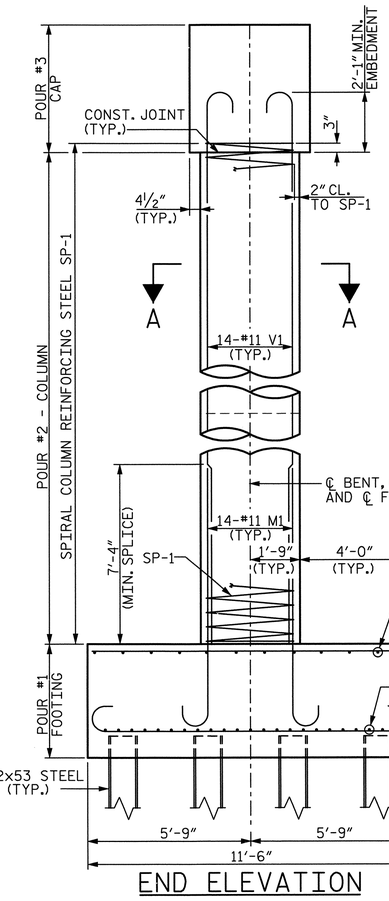


PLAN



ELEVATION

DETAILS SHOWN FOR FOOTINGS AND COLUMNS ARE TYPICAL



END ELEVATION

NOTES:

FOR SECTION A-A, SEE SHEET 2 OF 2.

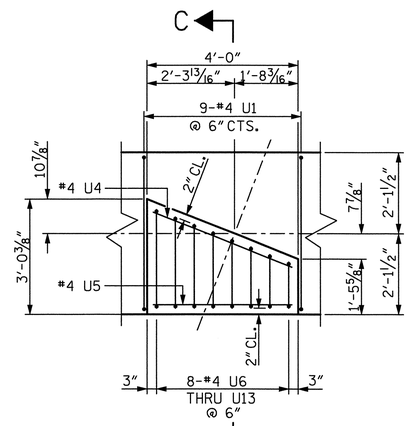
FOR SECTION B-B, SEE SHEET 2 OF 2.

FOR VIEW X-X, SEE SHEET 2 OF 2.

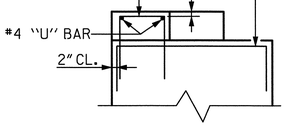
SEE SHEET 2 OF 2 FOR REINFORCING BILL OF MATERIAL.

SEE SHEET 2 OF 2 FOR ADDITIONAL NOTES.

FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS" SHEET.



DETAIL A



SECTION C-C

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0388

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOHN E. MONDOLFI
1-9-13

1/9/2013
p:\tip\p5206a\p5206a\structures\plans\RFC Plans 1-8-13\P5206A_sd_BT2_01.dgn
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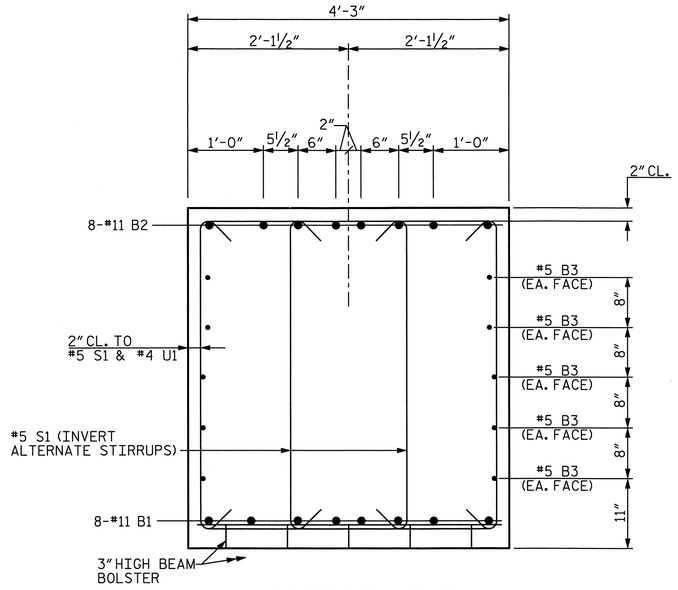
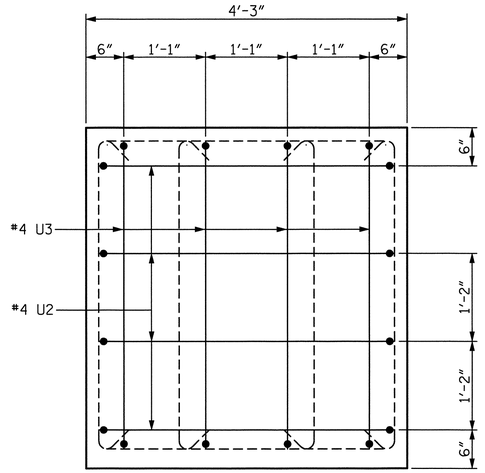
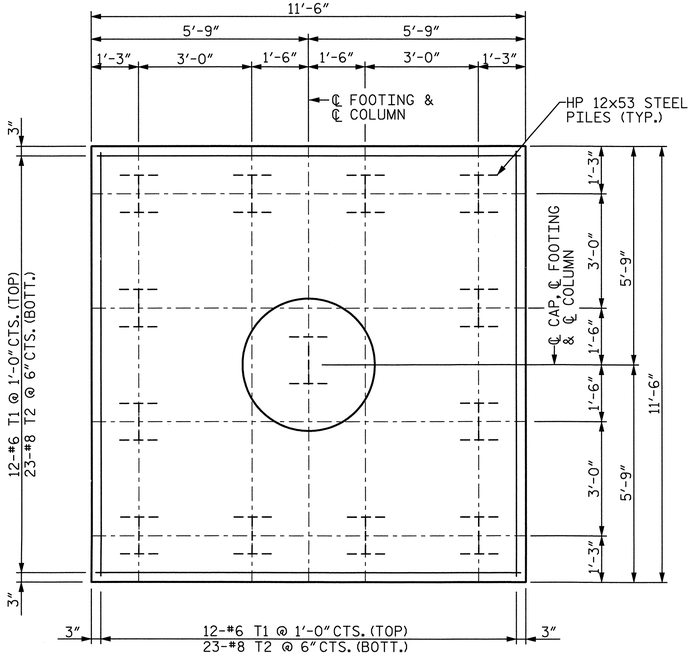
DGN 0151DEL_P10b1



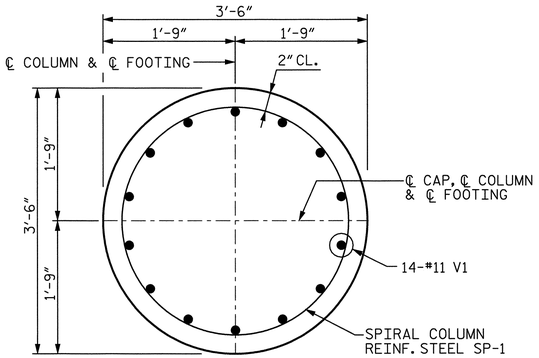
SECTION B-B



VIEW X-X

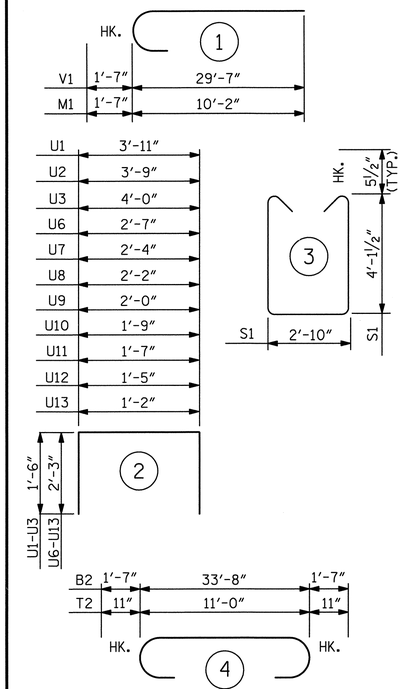


PLAN OF FOOTING

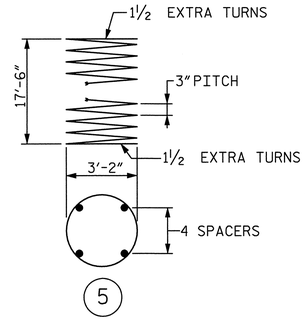


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	11	STR	33'-8"	1431
B2	8	11	4	36'-10"	1566
B3	10	5	STR	33'-8"	351
M1	28	11	1	11'-9"	1748
S1	116	5	3	12'-0"	1452
T1	48	6	STR	11'-0"	793
T2	92	8	4	12'-10"	3152
U1	36	4	2	6'-11"	166
U2	8	4	2	6'-9"	36
U3	8	4	2	7'-0"	37
U4	4	4	STR	3'-11"	10
U5	4	4	STR	3'-8"	10
U6	4	4	2	7'-1"	19
U7	4	4	2	6'-10"	18
U8	4	4	2	6'-8"	18
U9	4	4	2	6'-6"	17
U10	4	4	2	6'-3"	17
U11	4	4	2	6'-1"	16
U12	4	4	2	5'-11"	16
U13	4	4	2	5'-8"	15
V1	28	11	1	31'-2"	4636
REINFORCING STEEL				LBS.	15,524
SP-1	2	*	5	1119'-7"	1496
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,496

CLASS "A" CONCRETE BREAKDOWN		
POUR #1 - FOOTINGS	C.Y.	39.2
POUR #2 - COLUMNS	C.Y.	19.6
POUR #3 - CAP	C.Y.	25.7
TOTAL CLASS "A" CONCRETE	C.Y.	84.5
FOUNDATION EXCAVATION	C.Y.	226
HP 12x53 STEEL PILES NO. 26	L.F.	1,950

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

NOTES:

STIRRUPS & "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR COLUMN STEEL AND ANCHOR BOLTS.

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

FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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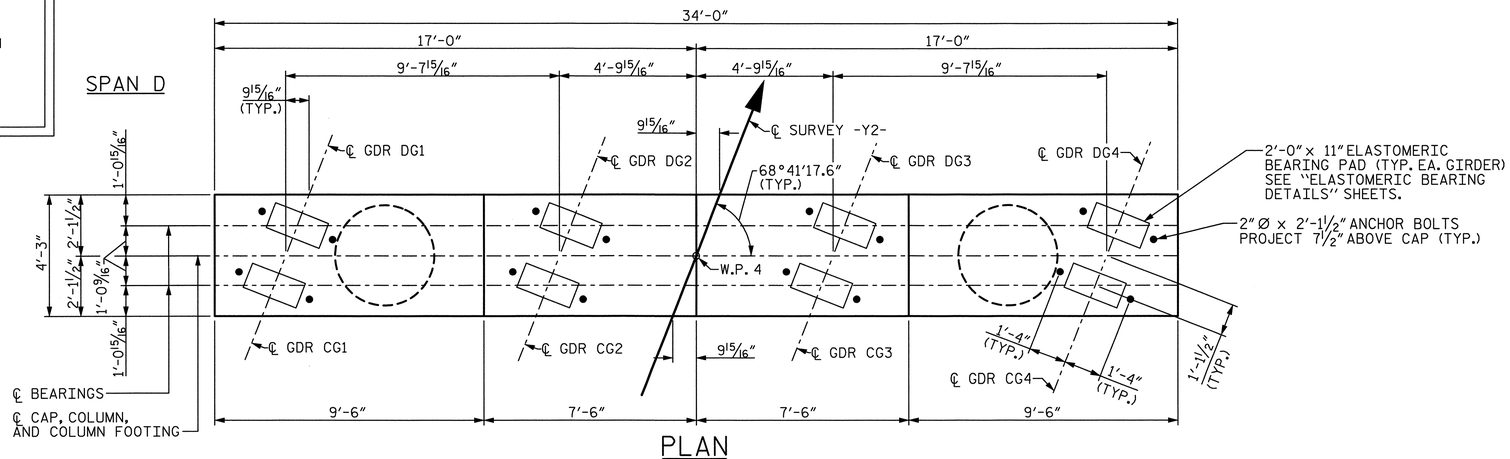
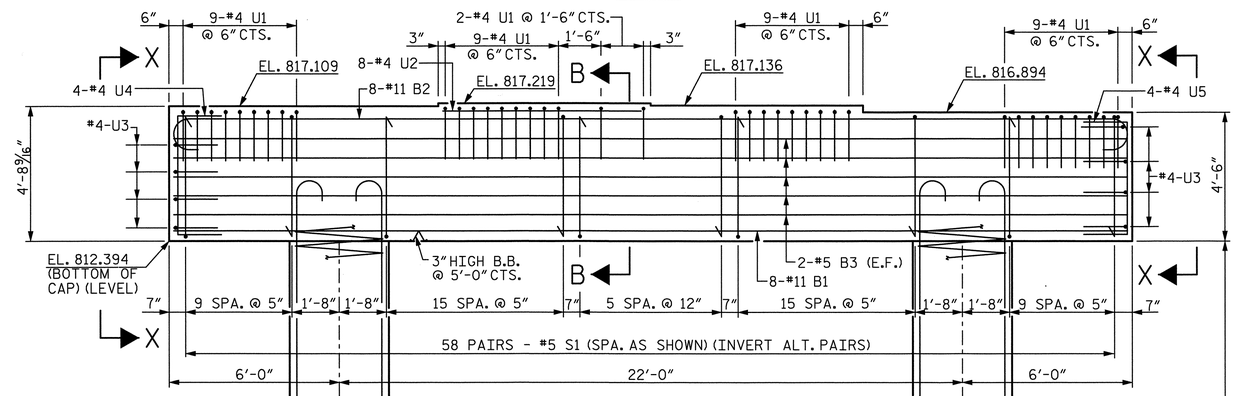
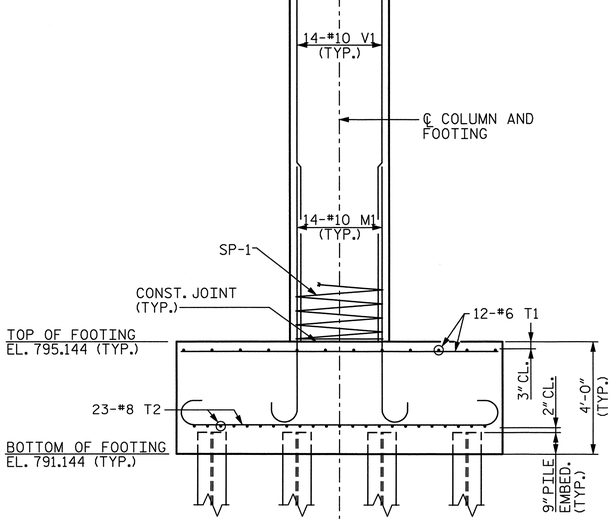
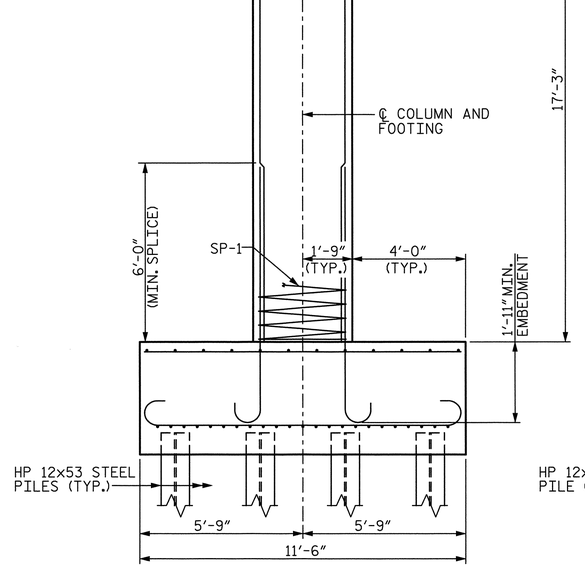
DGN 0151DEL_P10b1

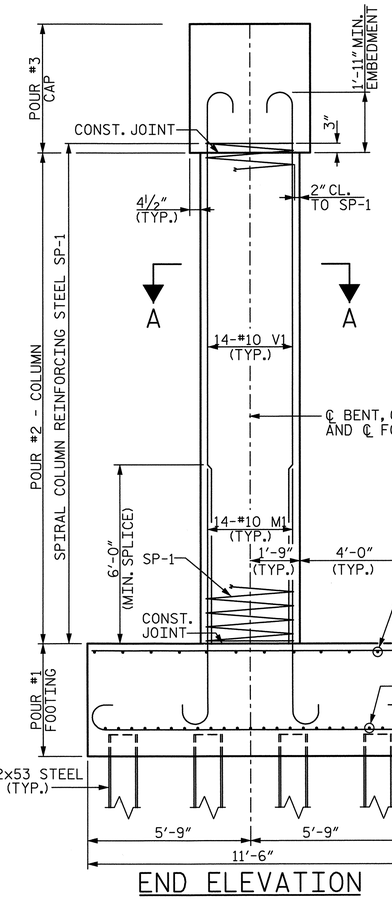


PLAN









END ELEVATION

ELEVATION

DETAILS SHOWN FOR FOOTINGS AND COLUMNS ARE TYPICAL

NOTES:

FOR SECTION A-A, SEE SHEET 2 OF 2.

FOR SECTION B-B, SEE SHEET 2 OF 2.

FOR VIEW X-X, SEE SHEET 2 OF 2.

SEE SHEET 2 OF 2 FOR REINFORCING BILL OF MATERIAL.

SEE SHEET 2 OF 2 FOR ADDITIONAL NOTES.

FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS" SHEET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
P:\fh\p5206g\p5206g\structures\plans\RFC Plans 1-8-13\P5206A_sd_BT3_01.dgn
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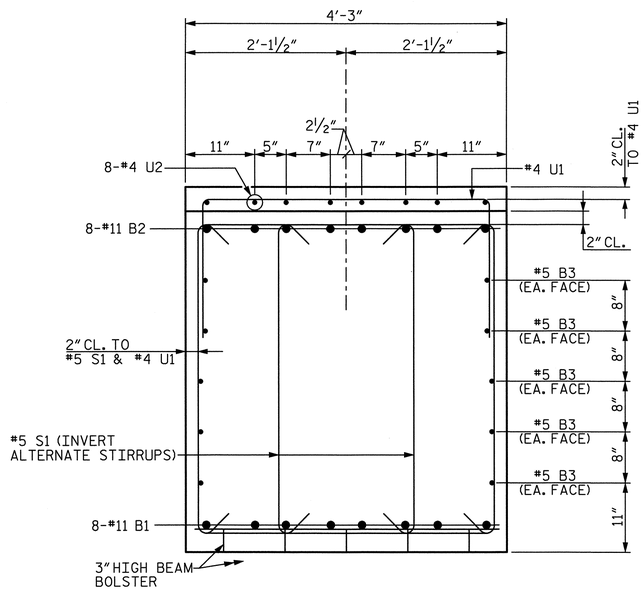
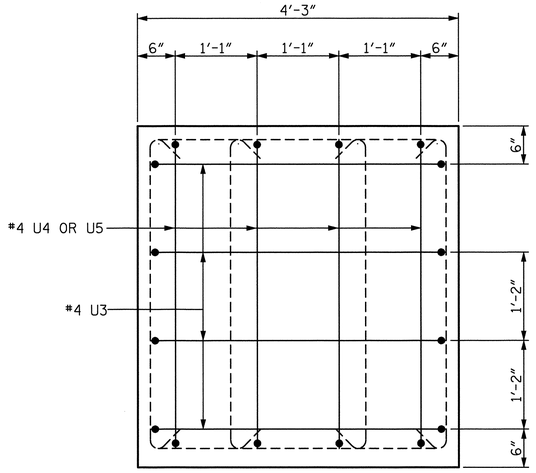
DGN 0151DEL_P10b1

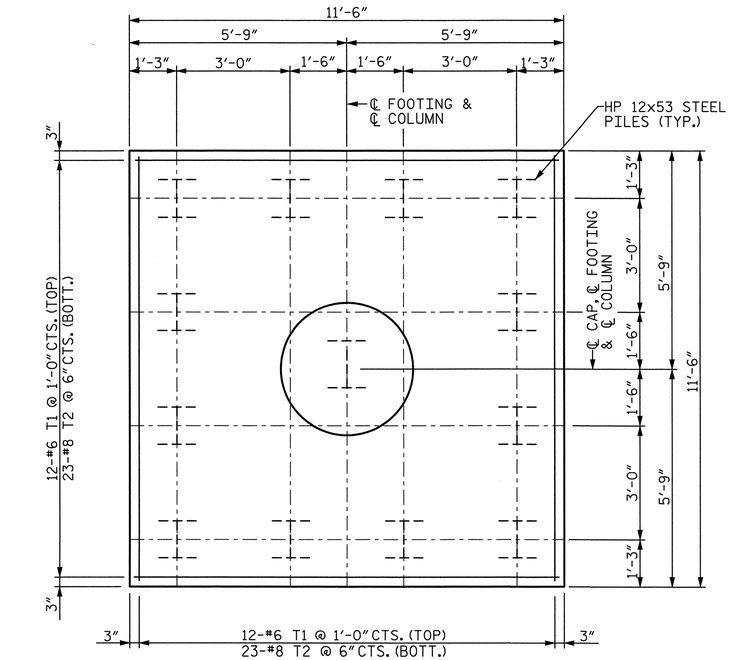


SECTION B-B

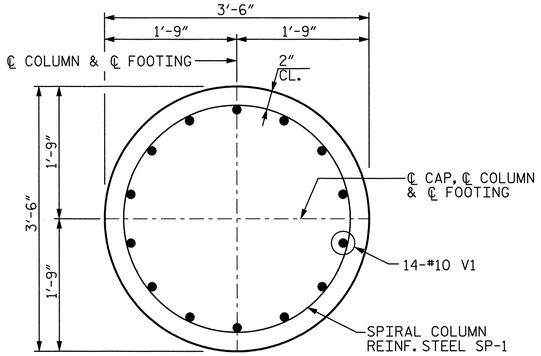


VIEW X-X

RIGHT END SHOWN, LEFT END SIMILAR

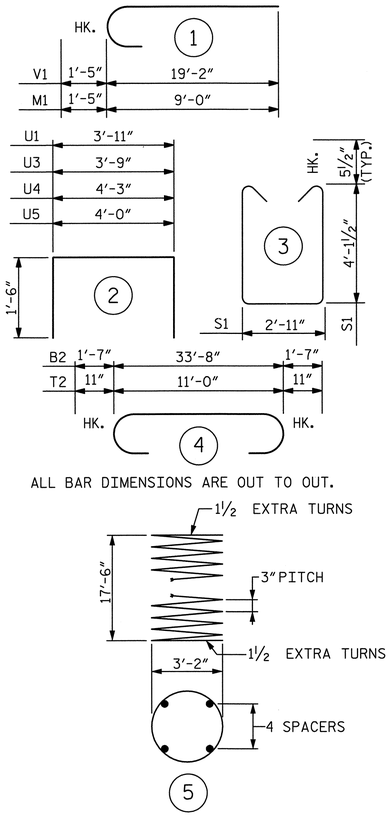


PLAN OF FOOTING



SECTION A-A

BAR TYPES



BILL OF MATERIAL
BENT 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	11	STR	33'-8"	1431
B2	8	11	4	36'-10"	1566
B3	10	5	STR	33'-8"	351
M1	28	10	1	10'-5"	1255
S1	116	5	3	12'-1"	1462
T1	48	6	STR	11'-0"	793
T2	92	8	4	12'-10"	3152
U1	38	4	2	6'-11"	176
U2	8	4	STR	7'-2"	38
U3	8	4	2	6'-9"	36
U4	4	4	2	7'-3"	19
U5	4	4	2	7'-0"	19
V1	28	10	1	20'-7"	2480
REINFORCING STEEL				LBS.	12,778
SP-1	2	*	5	716'-11"	957
SPIRAL COLUMN REINFORCING STEEL				LBS.	957

CLASS "A" CONCRETE BREAKDOWN		
POUR #1 - FOOTINGS	C.Y.	39.2
POUR #2 - COLUMNS	C.Y.	12.3
POUR #3 - CAP	C.Y.	25.1
TOTAL CLASS "A" CONCRETE	C.Y.	76.6
FOUNDATION EXCAVATION	C.Y.	94
HP 12x53 STEEL PILES		
NO. 26	L.F.	2,210

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

NOTES:

STIRRUPS & "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR COLUMN STEEL AND ANCHOR BOLTS.

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

FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3 DETAILS

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : R. W. GAMBRELL DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0358

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			53

1/9/2013
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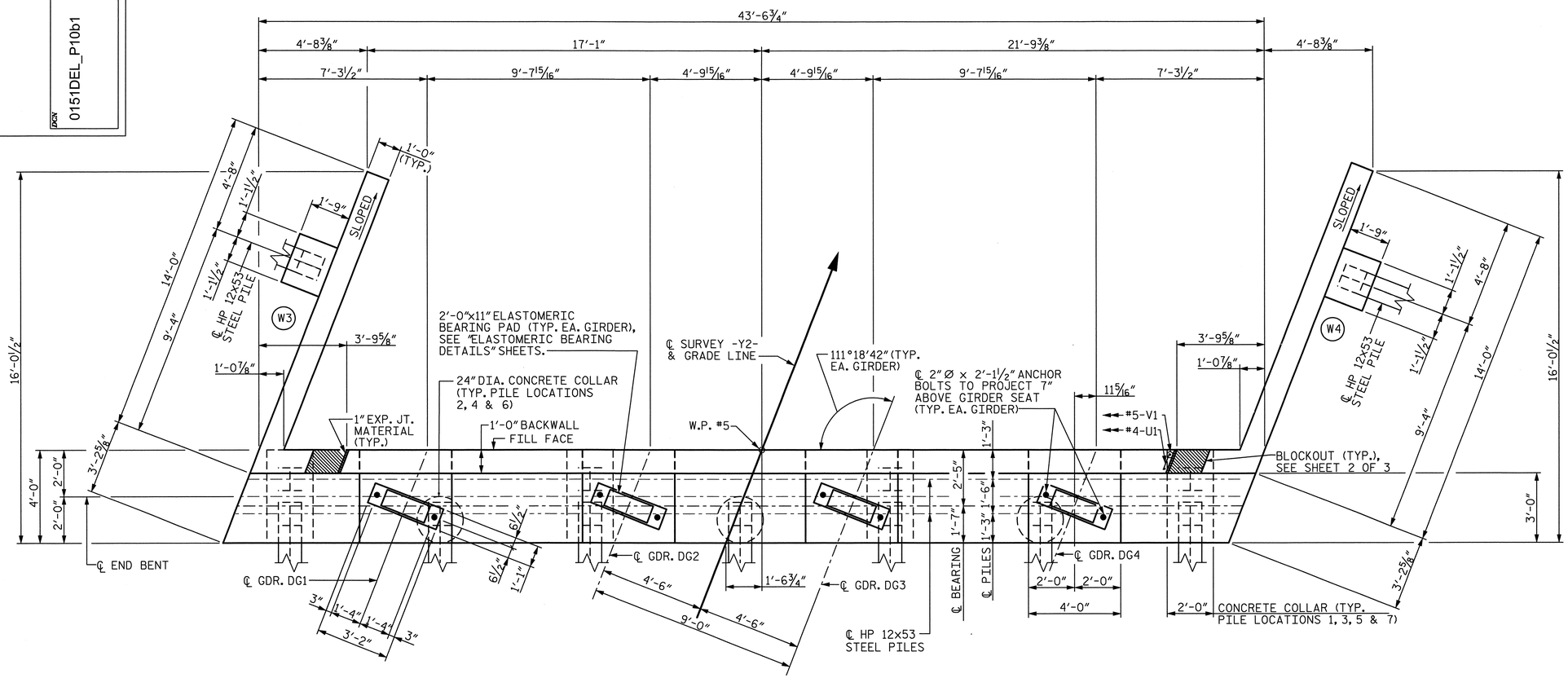
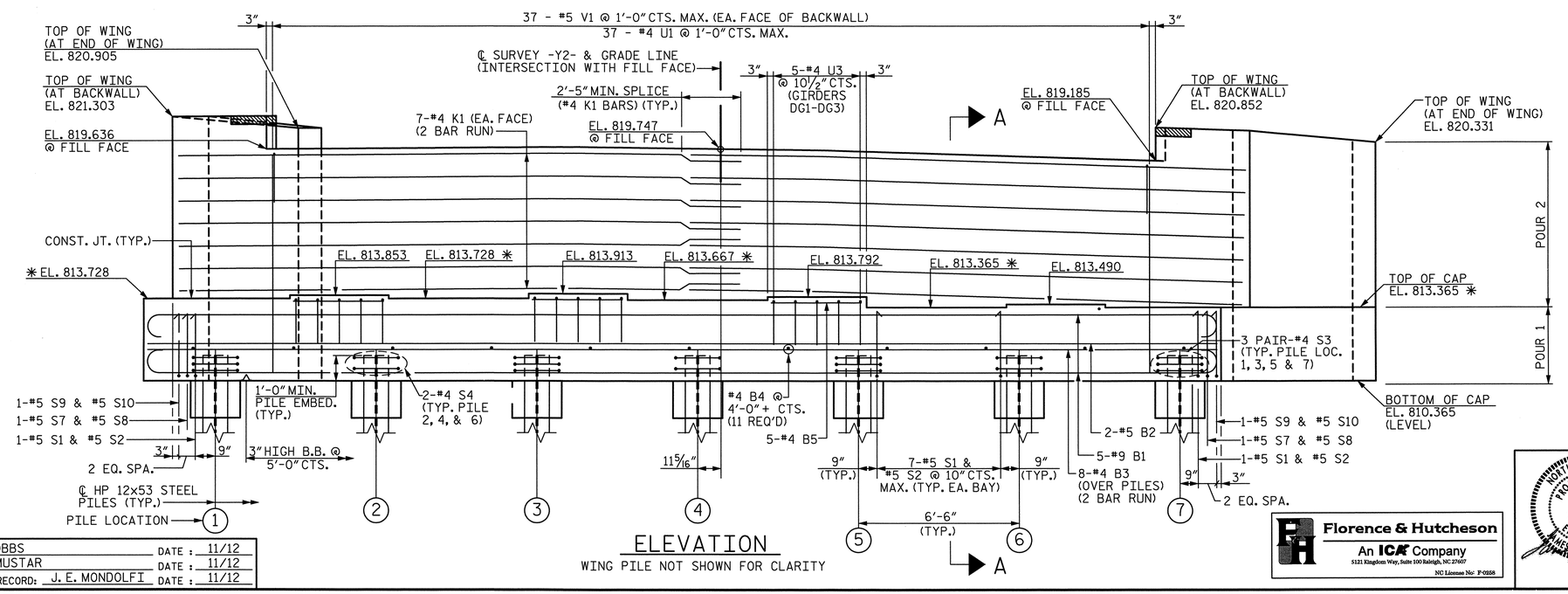


PLAN



ELEVATION

WING PILE NOT SHOWN FOR CLARITY

✳FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEATS, SEE "SECTION "A-A", SHEET 3 OF 3.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOSEPH E. MONDOLFI
1-9-13

1/9/2013
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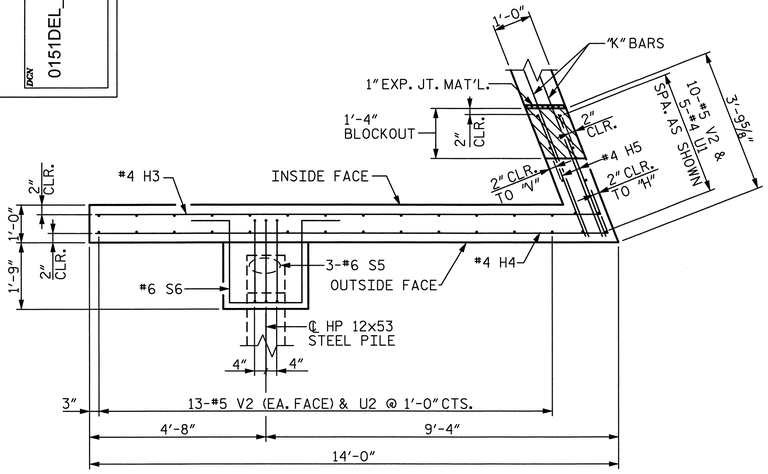
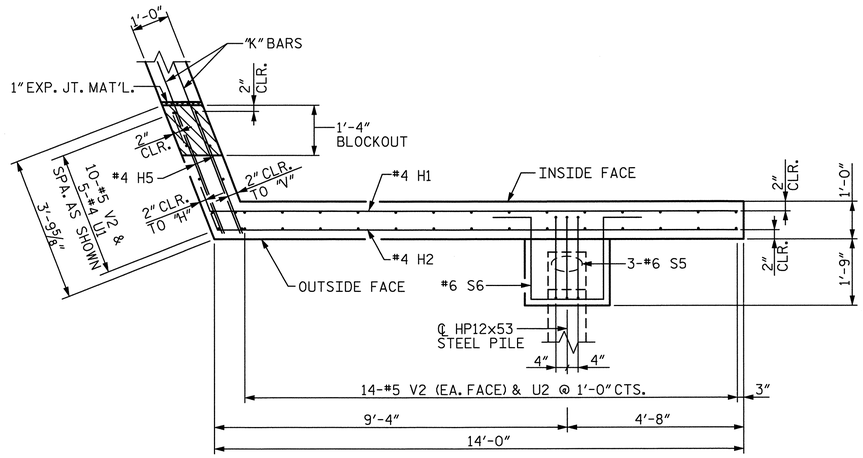
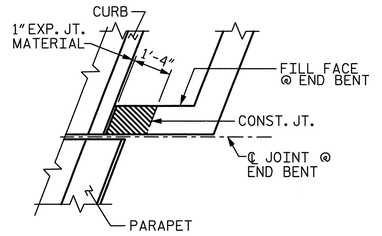


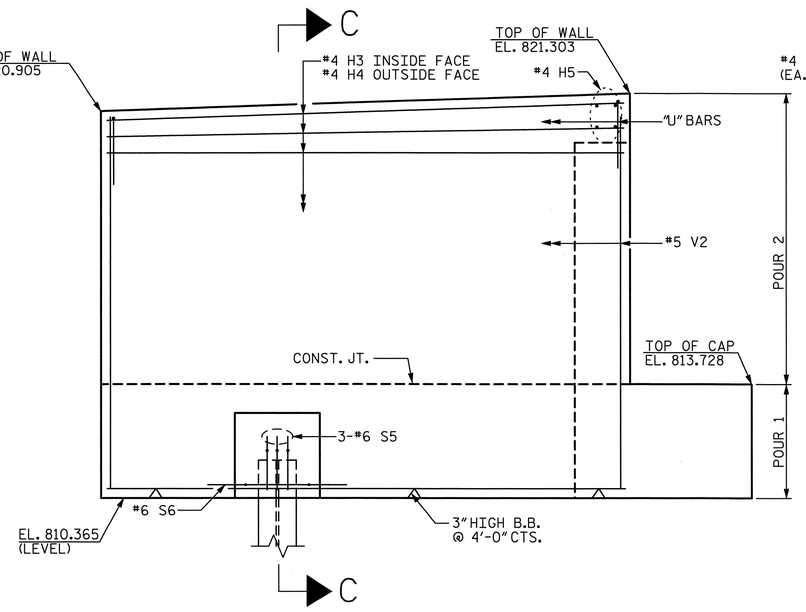
PLAN OF LEFT WING-W3



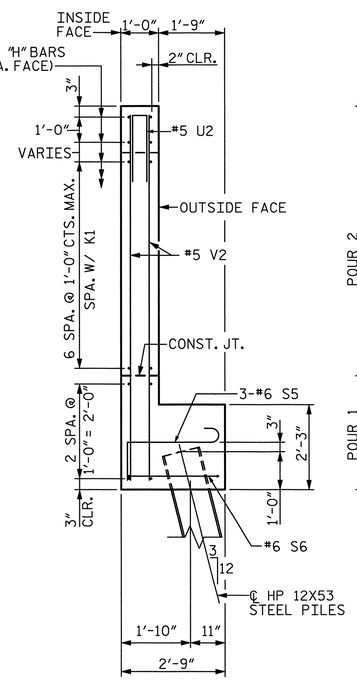
PLAN OF RIGHT WING-W4



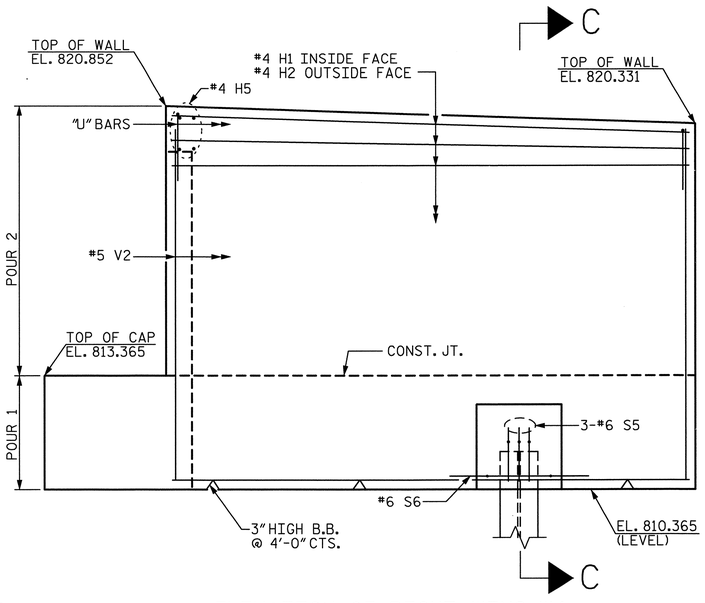
PLAN - BLOCKOUT DETAIL



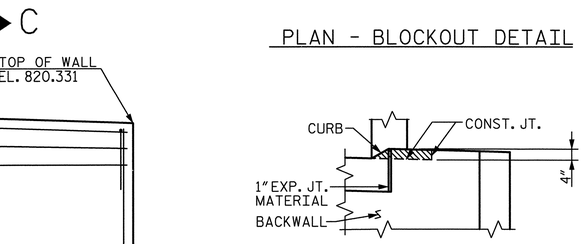
ELEVATION OF LEFT WING-W3



SECTION C-C



ELEVATION OF RIGHT WING-W4



ELEVATION - BLOCKOUT DETAIL

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

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 WING WALL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

1/9/2013
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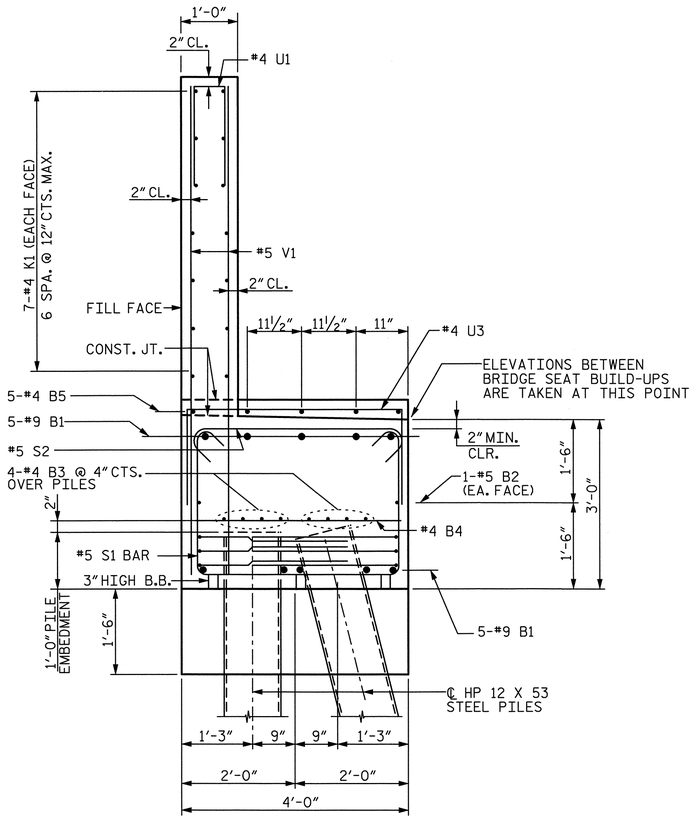


SECTION A-A

NOTES:

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

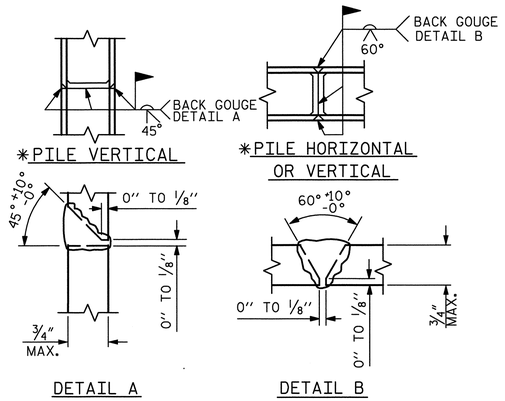
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR ADDITIONAL NOTES SEE "GENERAL DRAWING" SHEET 3 OF 6.

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

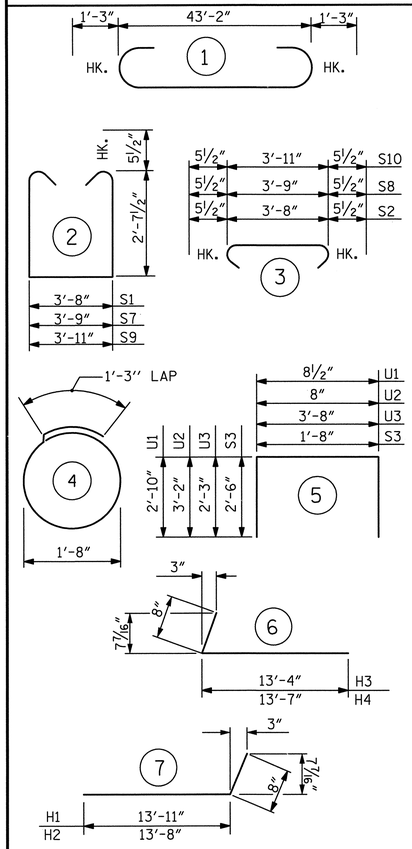


DETAIL A DETAIL B

PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.

BAR TYPES



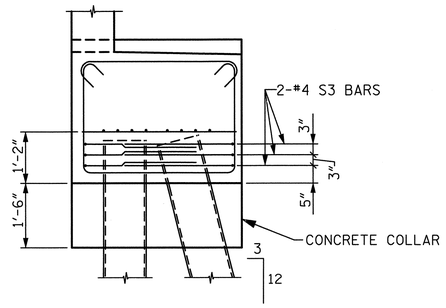
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL
END BENT 2

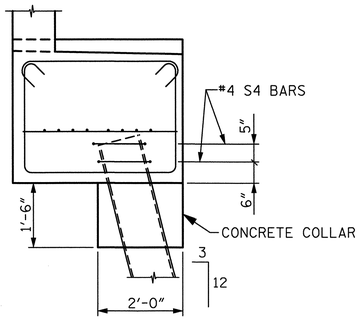
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	45'-8"	1553
B2	2	5	STR	43'-2"	90
B3	16	4	STR	22'-10"	244
B4	11	4	STR	3'-8"	27
B5	15	4	STR	3'-8"	37
H1	12	4	7	14'-7"	117
H2	12	4	7	14'-4"	115
H3	12	4	6	14'-0"	112
H4	12	4	6	14'-3"	114
H5	8	4	STR	3'-5"	18
K1	28	4	STR	22'-10"	427
S1	44	5	2	9'-10"	451
S2	44	5	3	4'-7"	210
S3	24	4	5	6'-8"	107
S4	6	4	4	6'-6"	26
S5	6	6	8	4'-1"	37
S6	2	6	9	8'-5"	25
S7	2	5	2	9'-11"	21
S8	2	5	3	4'-8"	10
S9	2	5	2	10'-1"	21
S10	2	5	3	4'-10"	10
U1	47	4	5	6'-5"	201
U2	27	4	5	7'-0"	197
U3	15	4	5	8'-2"	82
V1	74	5	STR	8'-4"	643
V2	74	5	STR	9'-6"	733
REINFORCING STEEL					LBS. 5,628

CLASS "A" CONCRETE BREAKDOWN

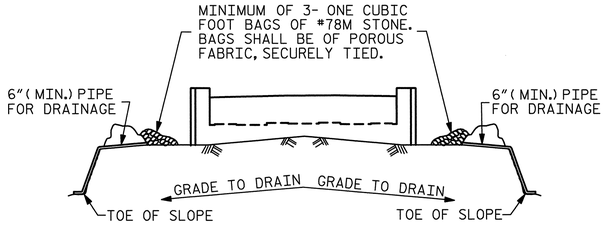
POUR #1 - CAP & LOWER WINGWALLS	C.Y. 27.3
POUR #2 - BACKWALL & UPPER WINGWALLS	C.Y. 17.9
TOTAL CLASS "A" CONCRETE	C.Y. 45.2
HP 12x53 STEEL PILES NO. 13	LF. 1,365



BRACE PILE DETAILS
PILE LOCATIONS 1, 3, 5 & 7



BRACE PILE DETAILS
PILE LOCATIONS 2, 4 & 6



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : J. G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0288

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JOHN E. MONDOLFI
1-9-13

1/9/2013
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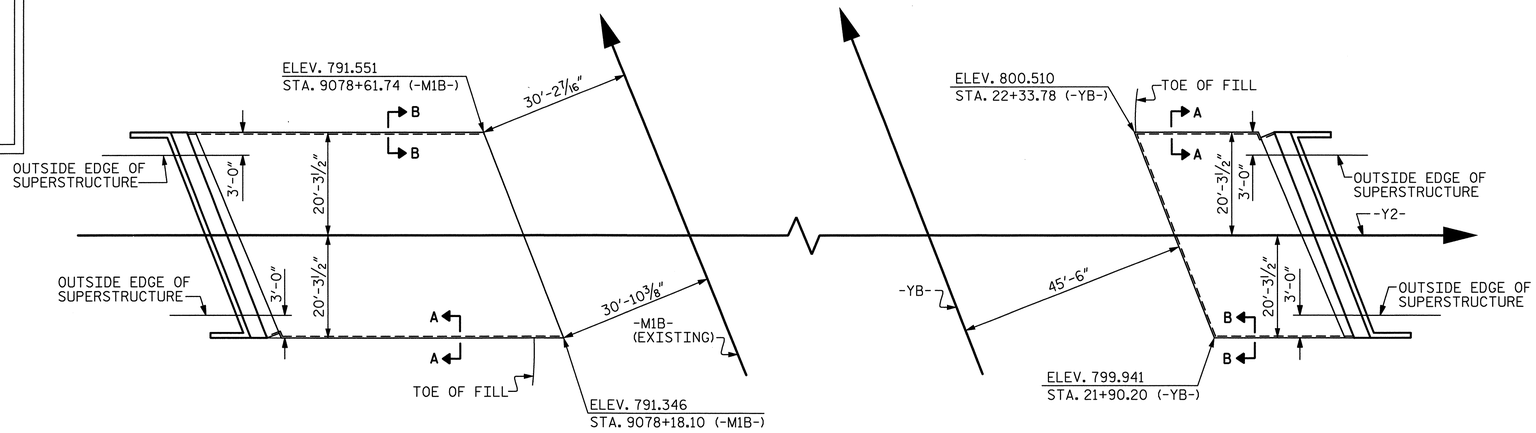


PLAN

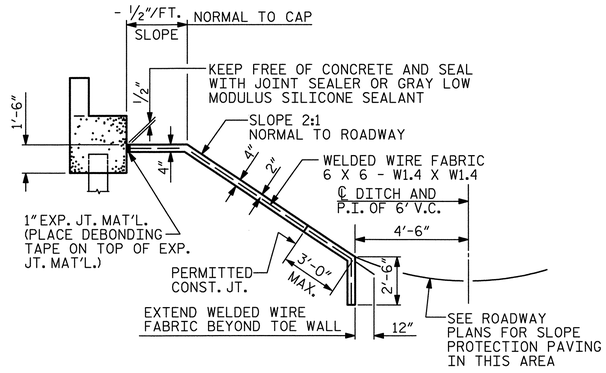
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

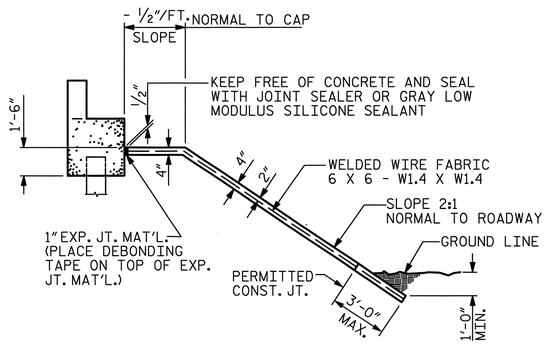
SLOPE PAVING SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG

#4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED,

SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



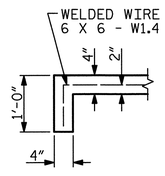
SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



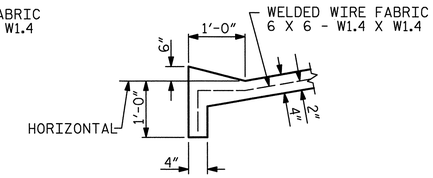
SECTION ALONG ℄ ROADWAY WHEN DITCH IS NOT PROVIDED

BRIDGE @ STA. 45+02.23 -Y2-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	291	581
END BENT 2	155	305

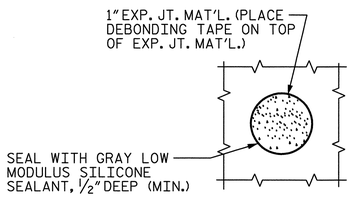
* QUANTITY SHOWN IS BASED ON 5' POURS.



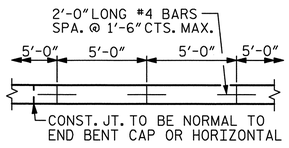
SECTION A-A



SECTION B-B

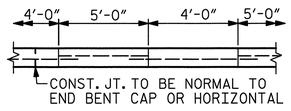


PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
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NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER J. E. MONDOLFI
1-9-13

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : J.G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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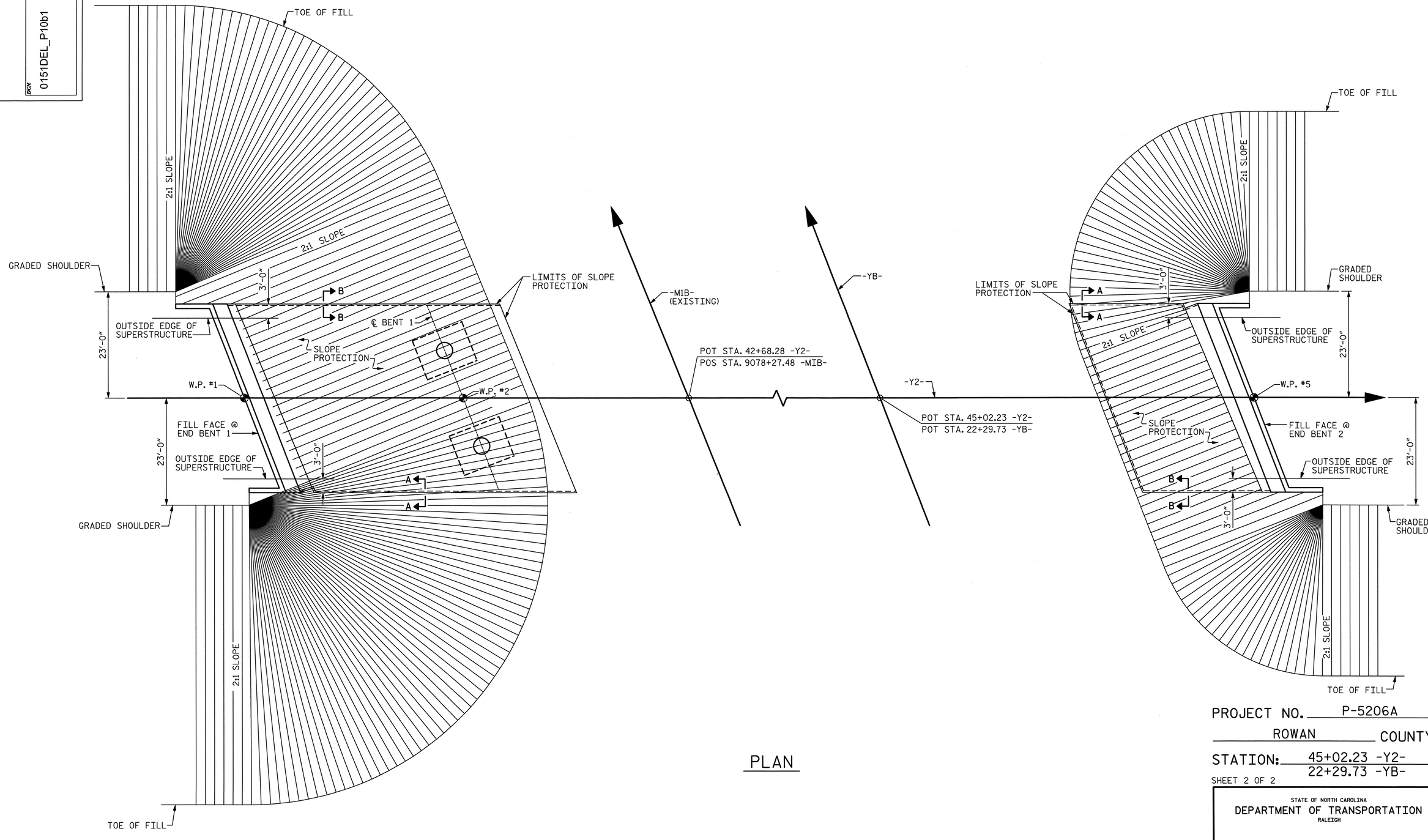

PLAN

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			53

DRAWN BY : S.R. MCCRAE DATE : 11/12
CHECKED BY : J.G. MUSTAR DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0208

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-9-13

1/9/2013
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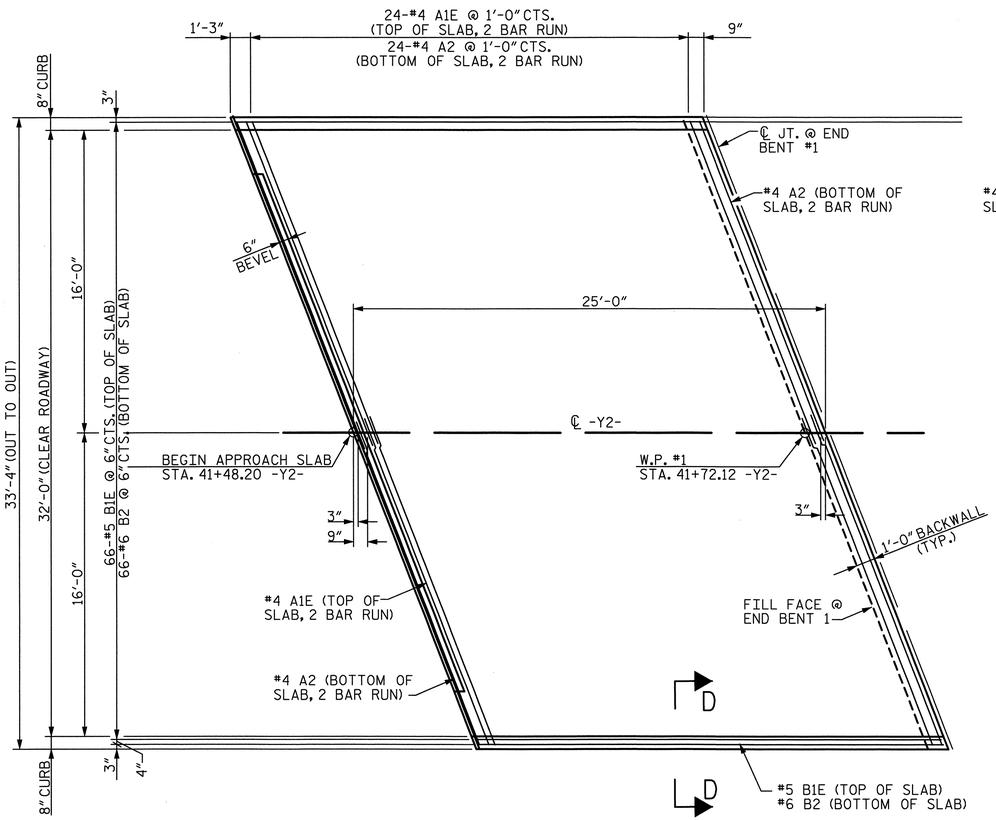
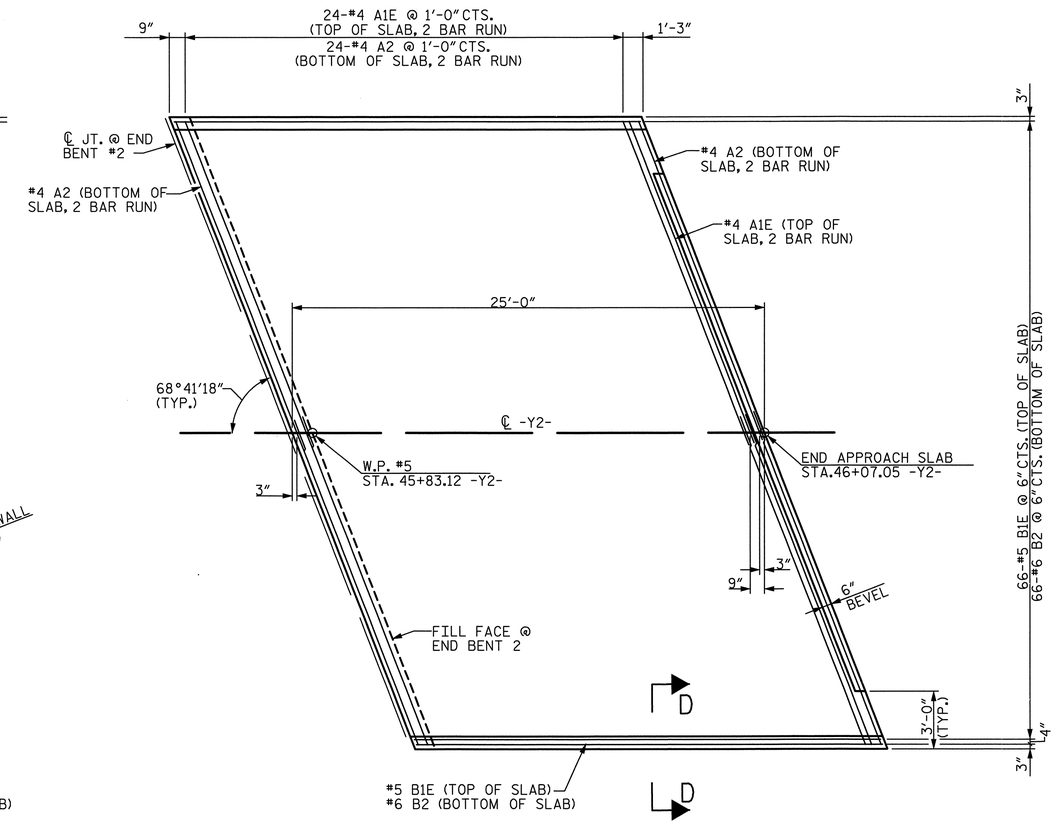
DGN 0151DEL_P10b1



PLAN @ END BENT #1



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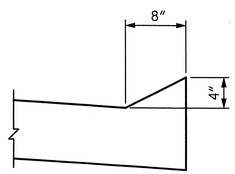

SECTION D-D

NOTES

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			53

Florence & Hutcheson
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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0268

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

1/9/2013
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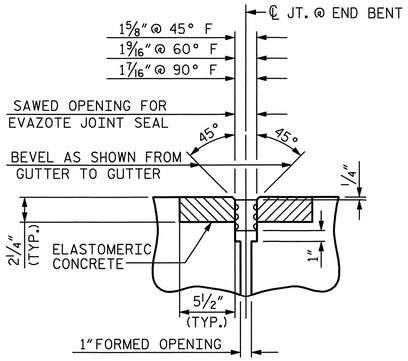
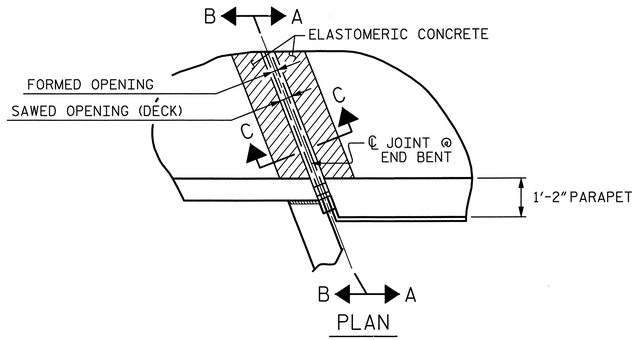


SECTION C-C

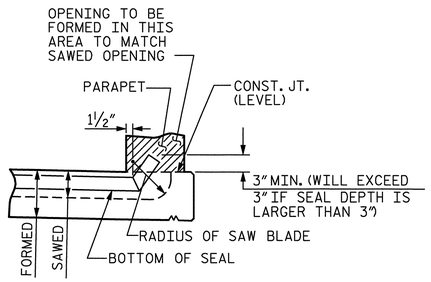
FOAM JOINT SEAL (EXPANSION)
SEE SHEET 3 OF 3 FOR NOTES



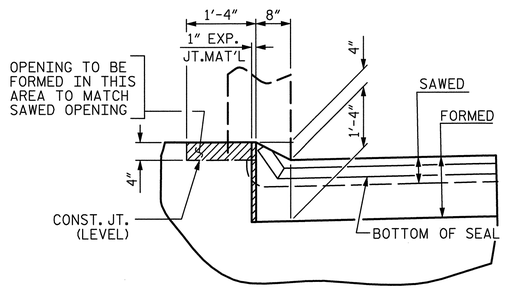
PLAN

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.9
2	5.9
TOTAL	11.8

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION A-A



SECTION B-B

JOINT DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO THE FACE OF PARAPET.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			53

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0358

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI
1-9-13

DRAWN BY :	P. G. ROBBS	DATE : 11/12
CHECKED BY :	T.K. DELIGIANNIDIS	DATE : 11/12
DESIGN ENGINEER OF RECORD:	J. E. MONDOLFI	DATE : 11/12

1/9/2013
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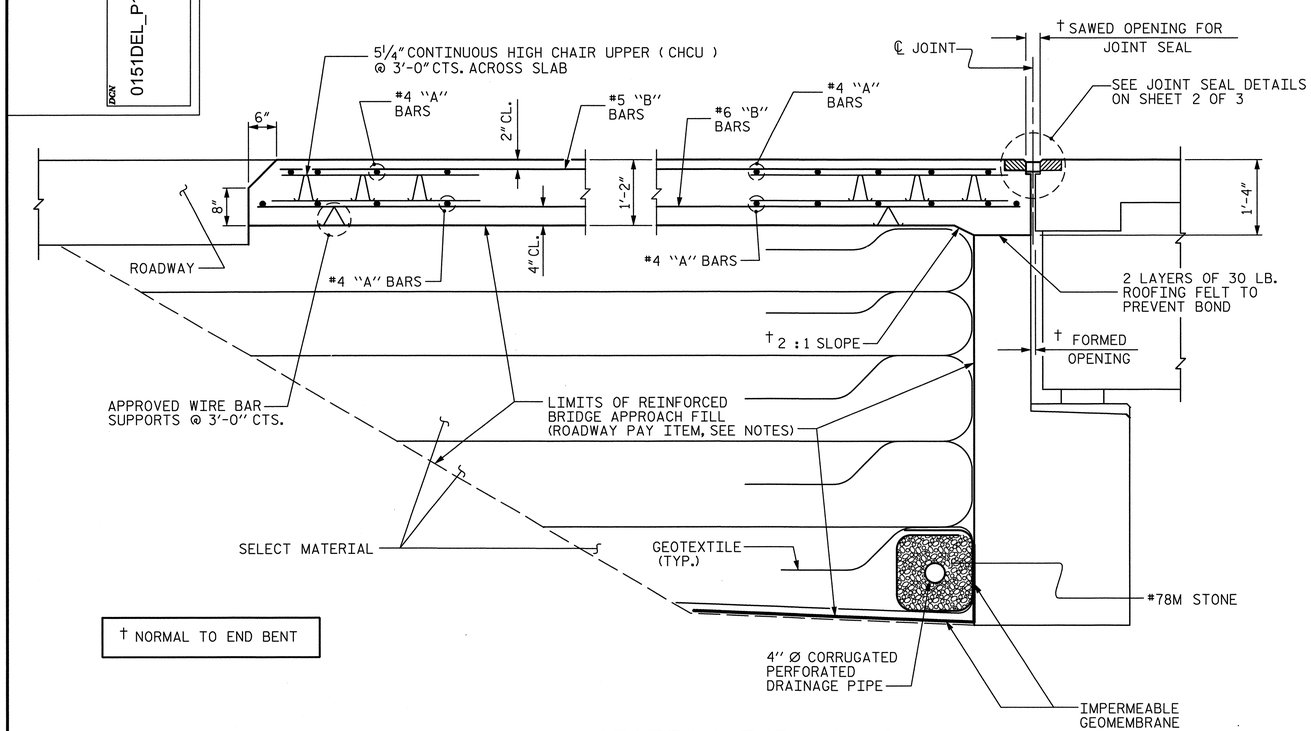


SECTION THRU SLAB

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 JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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

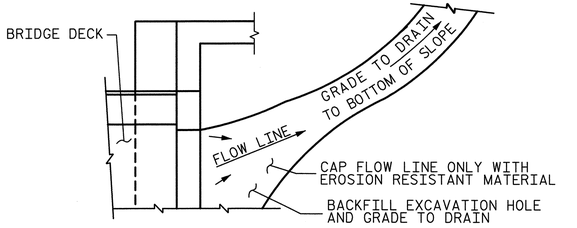
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	50	4	STR	18'-9"	626
A2	52	4	STR	18'-7"	646
B1E	67	5	STR	23'-8"	1,654
B2	67	6	STR	24'-8"	2,482
EPOXY COATED REINFORCING STEEL			LBS.		2,280
REINFORCING STEEL			LBS.		3,128
CLASS AA CONCRETE			C.Y.		36.3

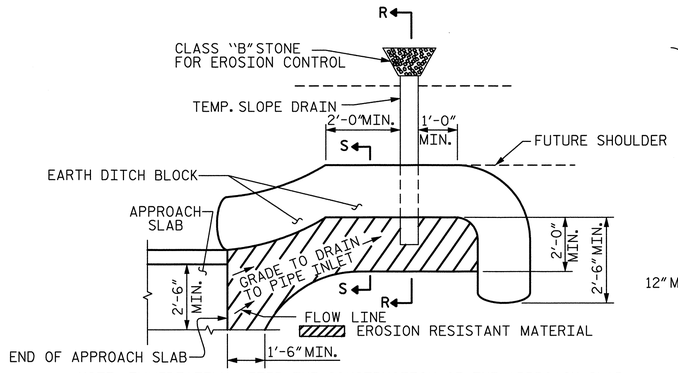
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	50	4	STR	18'-9"	626
A2	52	4	STR	18'-7"	646
B1E	67	5	STR	23'-8"	1,654
B2	67	6	STR	24'-8"	2,482
EPOXY COATED REINFORCING STEEL			LBS.		2,280
REINFORCING STEEL			LBS.		3,128
CLASS AA CONCRETE			C.Y.		36.3



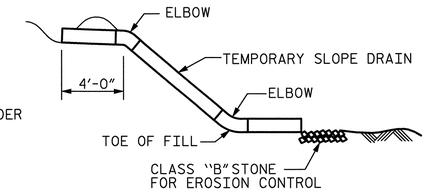
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

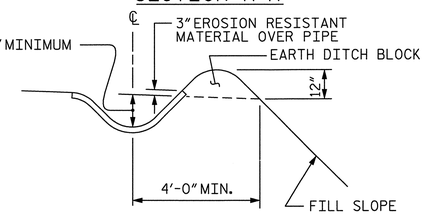


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PROJECT NO. P-5206A

ROWAN COUNTY

STATION: 45+02.23 -Y2-
22+29.73 -YB-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB DETAILS

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

DRAWN BY : P. G. ROBBS DATE : 11/12
CHECKED BY : T.K. DELIGIANNIDIS DATE : 11/12
DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE : 11/12

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NC License No: P-0258

NORTH CAROLINA PROFESSIONAL SEAL 20532 ENGINEER JAMES E. MONDOLFI

1-3-13

1/23/2013
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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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