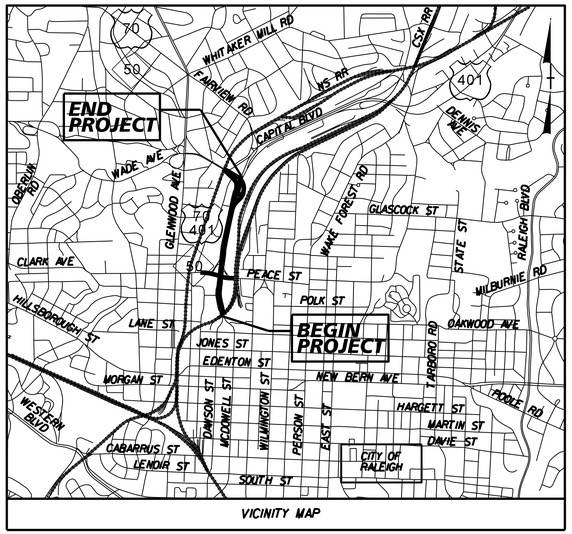
TIP NO: B-5121/B-5317

CONTRACT: 203751



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

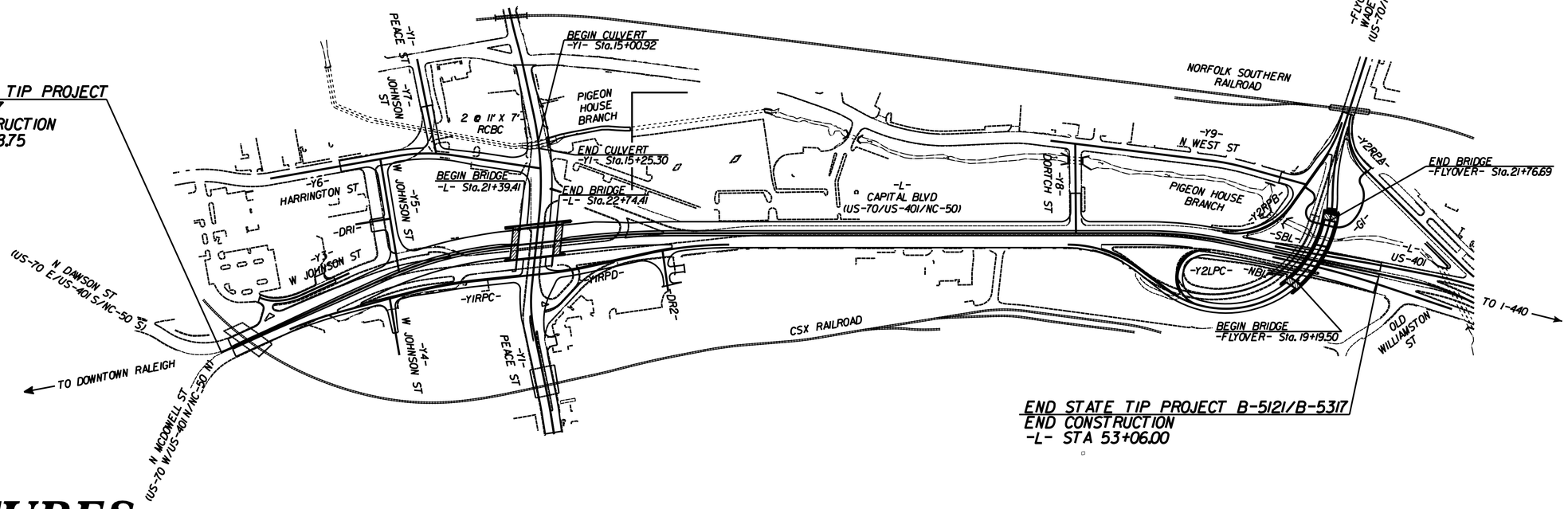
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5121 / B-5317		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
42263.1.1	BRNHS-0070(119)	P.E. (B-5121)
46031.1.1	BRSTP-0070(149)	P.E. (B-5317)
42263.2.1	BRNHS-0070(119)	R/W
42263.2.1	BRNHS-0070(119)	UTL.
42263.3.1	BRNHS-0070(119)	CONST.

LOCATION: BRIDGE NO. 227 ON US-70/US-401/NC-50 (CAPITAL BOULEVARD) OVER PEACE STREET AND BRIDGE NO. 213 ON US-70/NC-50 (WADE AVENUE) OVER US 401 (CAPITAL BOULEVARD)

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



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

AADT 2016	=	58,083
AADT 2036	=	70,416
K	=	10%
D	=	55%
T	=	5%*
V	=	40 MPH

CLASSIFICATION:
URBAN ARTERIAL

* 1% TTST 4% DUAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5121/B-5317	=	0.794 MILES
LENGTH STRUCTURE TIP PROJECT B-5121/B-5317	=	0.026 MILES
TOTAL LENGTH TIP PROJECT B-5121/B-5317	=	0.820 MILES

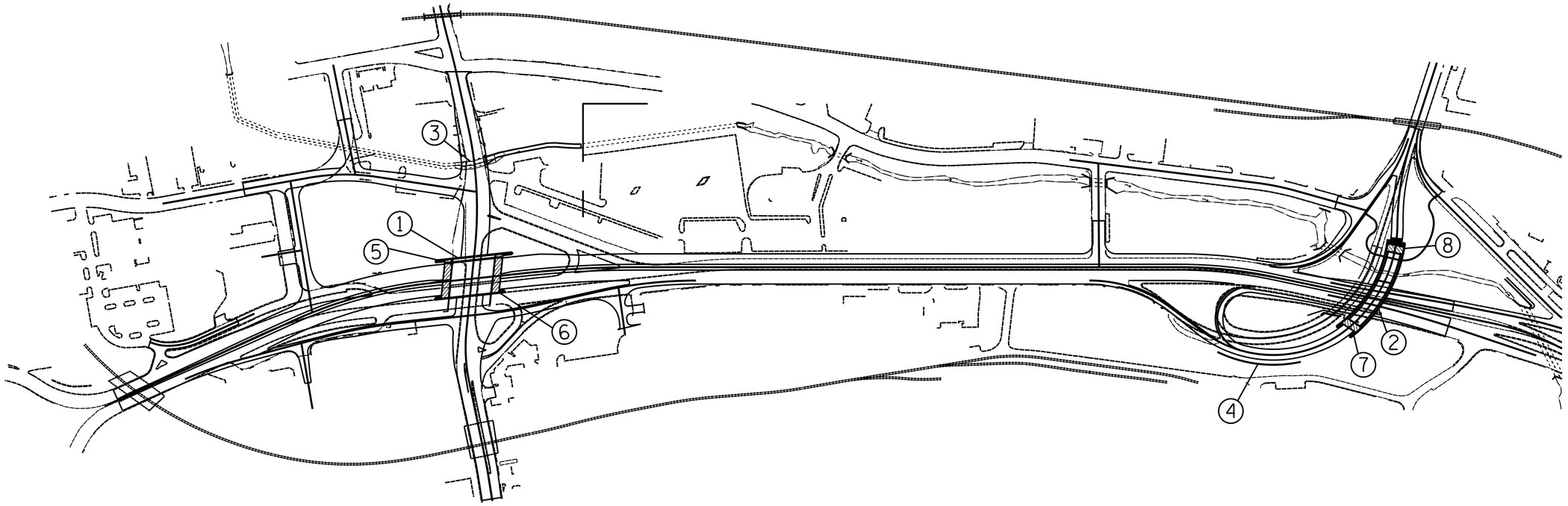
Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :
JULY 19, 2016

J.M. BAILEY, P.E.
PROJECT ENGINEER

K.W. ALFORD, P.E.
PROJECT DESIGN ENGINEER



INDEX

STR	STATION	DESCRIPTION	SHEET NUMBERS
1	22+06.91 -L- = 18+73.48 -Y1-	BRIDGE ON US 70/US 401/NC 50 (CAPITAL BOULEVARD) OVER PEACE STREET	S-1 THRU S-43
2	20+19.94 -FLYOVER- = 50+59.47 -L-	BRIDGE ON WADE AVENUE (US 70 / NC 50) OVER CAPITAL BOULEVARD & PIGEON HOUSE BRANCH	S-44 THRU S-110
3	15+13.11 -Y1-	DOUBLE 11' X 7' RCBC	C-1 THRU C-10
4	14+70.00 -FLYOVER-	RETAINING WALL ALONG -FLYOVER- BETWEEN CAPITAL BOULEVARD AND WADE AVENUE	W-1, W-4 THRU W-7
5	20+85.76 -L-	RETAINING WALL AT END BENT 1 OF STRUCTURE 1	W-2, W-5, W-8, W-9
6	23+42.28 -L-	RETAINING WALL AT END BENT 2 OF STRUCTURE 1	W-2, W-5, W-8, W-9
7	18+80.85 -FLYOVER-	RETAINING WALL AT END BENT 1 OF STRUCTURE 2	W-3, W-5, W-8, W-9
8	22+16.36 -FLYOVER-	RETAINING WALL AT END BENT 2 OF STRUCTURE 2	W-3, W-5, W-8, W-9

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX SHEET

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

13-APR-2016 12:33
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jpadams

FA. PROJECT NO. BRNHS-0070(119)

20+00 20+50 21+00 21+50 22+00 22+50 23+00 23+50

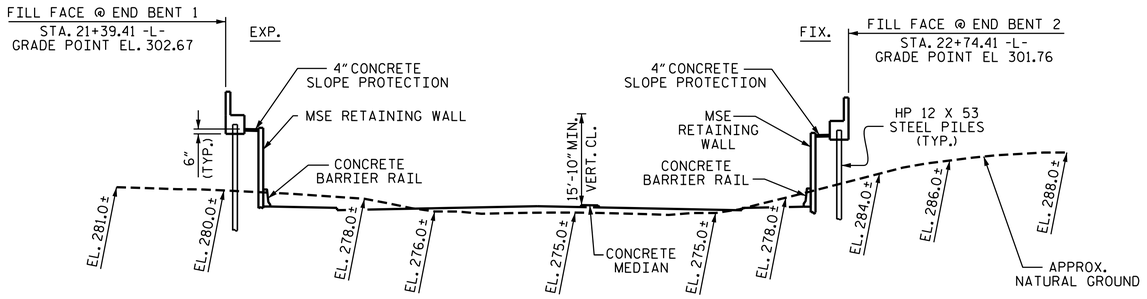
310 300 290 280 270 260

GRADE DATA -L-

(+)2.1776% (-)4.3053%

PI = 22+25.00 -L-
EL. 304.98
VC = 300'

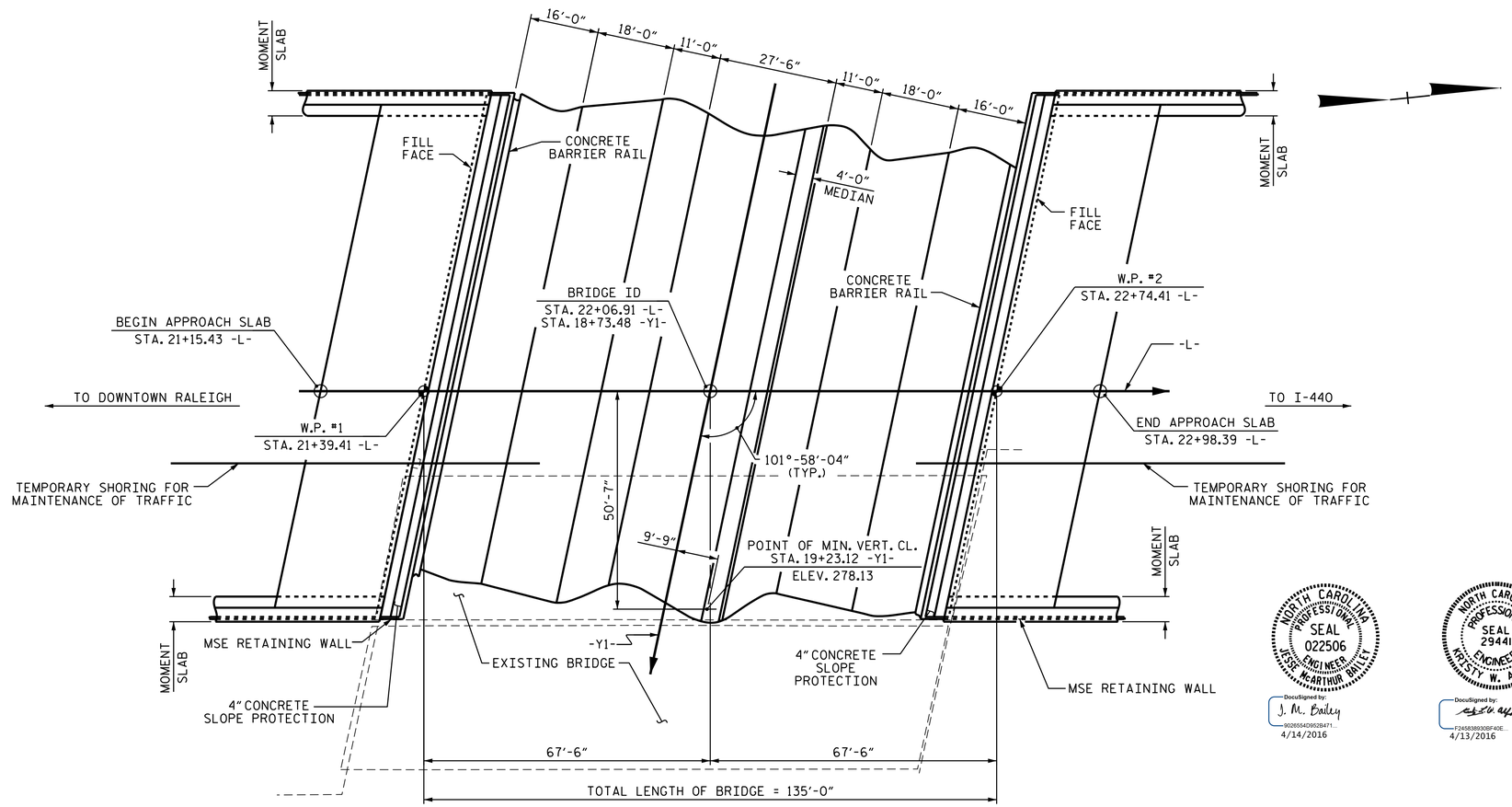
SPAN A



END BENT 1 END BENT 2

SECTION ALONG -L-

SECTION AT END BENT ARE AT RIGHT ANGLES



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-
18+73.48 -Y1-

SHEET 1 OF 3 REPLACES BRIDGE #227

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON
US 70/US 401/NC 50
(CAPITAL BLVD.)
OVER PEACE STREET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			110

STR #1

NORTH CAROLINA PROFESSIONAL SEAL 022506 ENGINEER JESSE McARTHUR BAILEY

DocuSigned by: J. M. Bailey 9026554D692B471...
4/14/2016

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B03DBF40E...
4/13/2016

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : J.P. ADAMS DATE : 2/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

13-APR-2016 12:33
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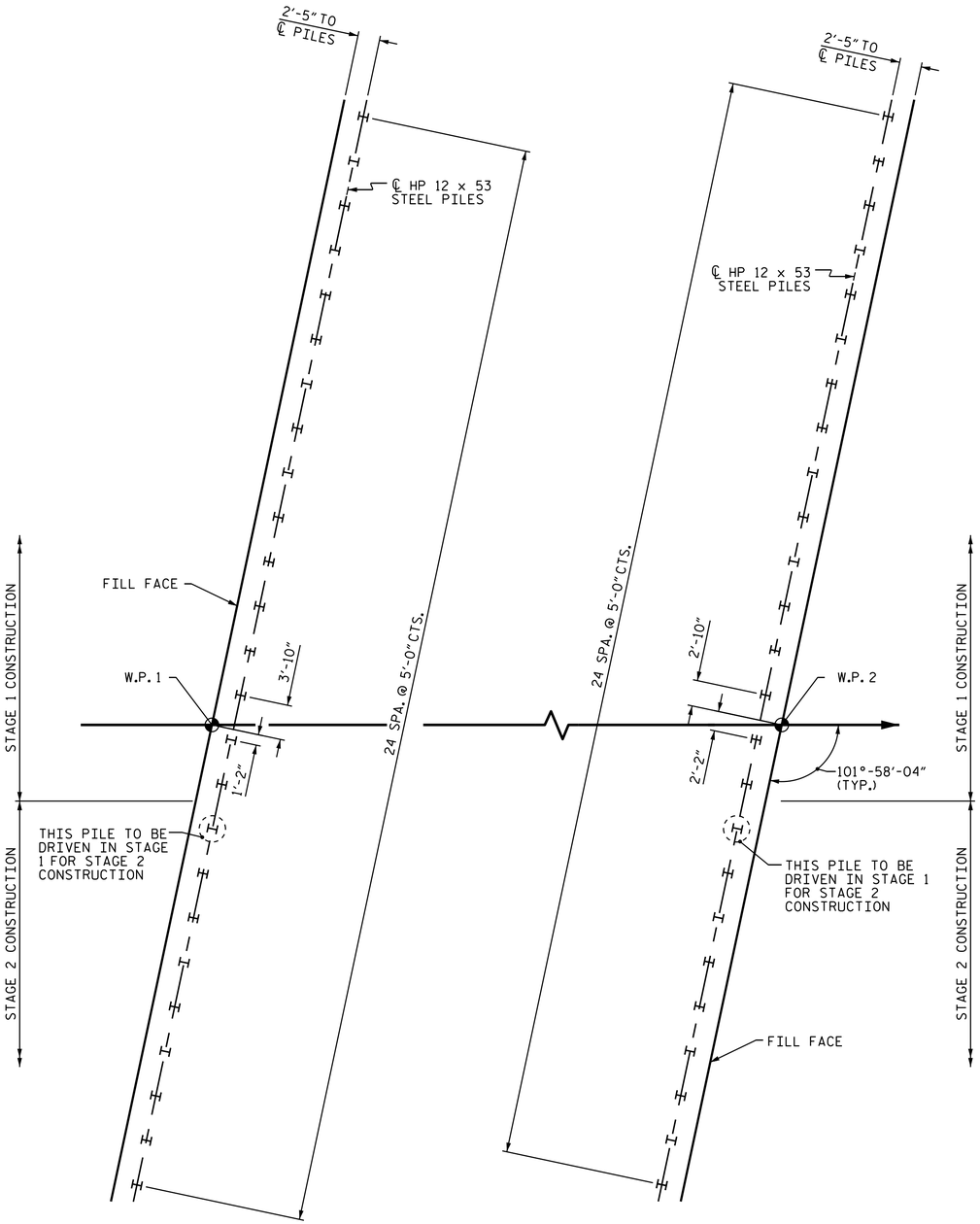
jpadams



END BENT 1

END BENT 2

FOUNDATION LAYOUT

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

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 22+06.91 -L-."

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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 42'-6", 1 @ 52', & 1 @ 42'-6", WITH A CLEAR ROADWAY OF 68.3' AND REINFORCED CONCRETE DECK ON CONTINUOUS I-BEAMS ON REINFORCED CONCRETE CAP WITH H-PILE END BENTS AND REINFORCED CONCRETE POST AND BEAM COLUMNS ON SPREAD FOOTINGS AND LOCATED AT THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.

FOR ARCHITECTURAL METAL FASCIA, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR SAND LIGHTWEIGHT CONCRETE, SEE SPECIAL PROVISIONS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR DECORATIVE CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENTS 1 AND 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED-IN PILES ARE REQUIRED AT END BENT 1. EXCAVATE HOLES FOR PILES 1 TO 5 TO ELEVATION 264 FEET, 6 TO 10 TO ELEVATION 265 FEET, AND 11 TO 16 TO ELEVATION 266 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED IN PILES ARE REQUIRED AT END BENT 2. EXCAVATE HOLES FOR PILES 20 TO 22 TO ELEVATION 264 FEET AND 23 TO 25 TO ELEVATION 267 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENTS 1 AND 2.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE TO BE INSTALLED BEFORE CONSTRUCTION OF THE MSE WALLS.

PILES AT END BENTS 1 AND 2 ARE TO BE INSTALLED BEFORE CONSTRUCTION OF THE MSE WALLS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893DBF40E...

6/3/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 70/US 401/NC 50 (CAPITAL BLVD.) OVER PEACE STREET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			110

STR. #1

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : J.P. ADAMS DATE : 2/2016

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kalford

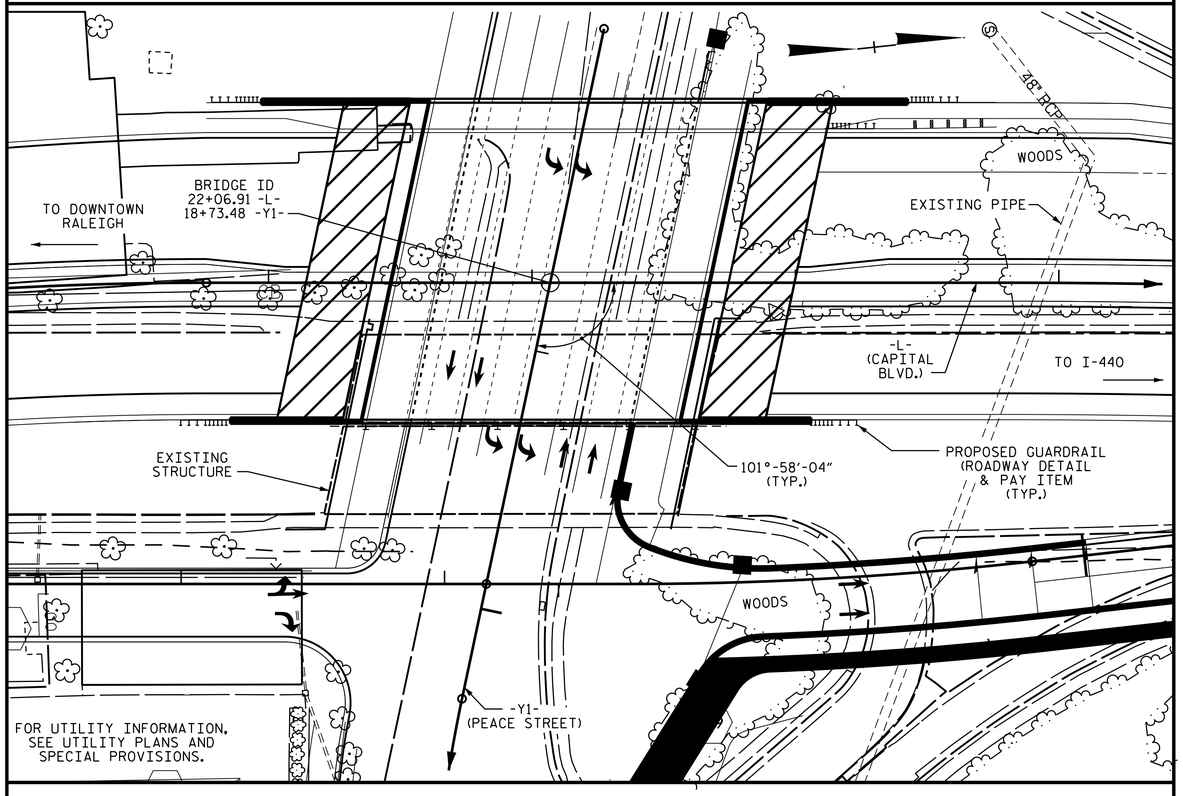
BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	PDA TESTING	REINFORCED CONCRETE DECK SLAB (SAND LIGHTWEIGHT CONCRETE)	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES	
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	SQ. FT.	SQ. FT.	SQ. FT.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE					16,350	21,197		LUMP SUM		14	1840.71		
END BENT 1		112	18				99.5		12,232			25	750
END BENT 2		35	20				99.5		12,241			25	710
TOTAL	LUMP SUM	147	38	1	16,350	21,197	199	LUMP SUM	24,473	14	1840.71	50	1460

BILL OF MATERIAL

	STEEL PILE POINTS	1'-4" X 3'-6" CONCRETE PARAPET	DECORATIVE CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	APPLICATION OF BRIDGE COATING	ASBESTOS ASSESSMENT	ARCHITECTURAL METAL FASCIA	CONCRETE PARAPET WITH MOMENT SLAB	PRECAST CONCRETE PANELS
	EA.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	SQ. FT.
SUPERSTRUCTURE		182.71	265.42		LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	240	198.83	163
END BENT 1	25			40							
END BENT 2	25			40							
TOTAL	50	182.71	265.42	80	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	240	198.83	163

BM #49: SQUARE CHISLED IN CONCRETE RETAINING WALL 4' LEFT STA. 21+34.00 -L-, EL. 288.28



LOCATION SKETCH

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : J.P. ADAMS DATE : 2/2016

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kalford

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by:
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6/3/2016

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON
US 70/US 401/NC 50
(CAPITAL BLVD.)
OVER PEACE STREET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			110

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STR #1

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					
								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	1.15	--	1.75	0.795	1.51	A	IG	65.0	0.988	1.15	A	IG	117.6	0.80	0.795	1.29	A	IG	65.0
		HL-93 (OPERATING)	N/A		1.53	--	1.35	0.795	1.96	A	IG	65.0	0.988	1.53	A	IG	117.6	N/A	--	--	--	--	--
		HS-20 (INVENTORY)	36.000	2	1.69	60.840	1.75	0.795	2.26	A	IG	65.0	0.988	1.69	A	IG	117.6	0.80	0.795	1.92	A	IG	65.0
		HS-20 (OPERATING)	36.000		2.23	80.280	1.35	0.795	2.93	A	IG	65.0	0.988	2.23	A	IG	117.6	N/A	--	--	--	--	--
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.76	50.760	1.40	0.795	5.72	A	IG	65.0	0.988	4.61	A	IG	117.6	0.80	0.795	3.76	A	IG	65.0
		SNGARBS2	20.000		2.68	53.600	1.40	0.795	4.07	A	IG	65.0	0.988	3.16	A	IG	117.6	0.80	0.795	2.68	A	IG	65.0
		SNAGRIS2	22.000		2.48	54.560	1.40	0.795	3.77	A	IG	65.0	0.988	2.89	A	IG	117.6	0.80	0.795	2.48	A	IG	65.0
		SNCOTTS3	27.250		1.87	50.958	1.40	0.795	2.84	A	IG	65.0	0.988	2.22	A	IG	117.6	0.80	0.795	1.87	A	IG	65.0
		SNAGGRS4	34.925		1.51	52.737	1.40	0.795	2.30	A	IG	65.0	0.988	1.77	A	IG	117.6	0.80	0.795	1.51	A	IG	65.0
		SNS5A	35.550		1.48	52.614	1.40	0.795	2.25	A	IG	65.0	0.988	1.77	A	IG	117.6	0.80	0.795	1.48	A	IG	65.0
		SNS6A	39.950		1.34	53.533	1.40	0.795	2.04	A	IG	65.0	0.988	1.58	A	IG	117.6	0.80	0.795	1.34	A	IG	65.0
		SNS7B	42.000		1.28	53.760	1.40	0.795	1.94	A	IG	65.0	0.988	1.52	A	IG	117.6	0.80	0.795	1.28	A	IG	65.0
	TRACTOR SEMI-TRAILER TRUCK (TTST)	TNAGRIT3	33.000		1.63	53.790	1.40	0.795	2.47	A	IG	65.0	0.988	1.92	A	IG	117.6	0.80	0.795	1.63	A	IG	65.0
		TNT4A	33.075		1.63	53.912	1.40	0.795	2.48	A	IG	65.0	0.988	1.89	A	IG	117.6	0.80	0.795	1.63	A	IG	65.0
		TNT6A	41.600		1.31	54.496	1.40	0.795	2.00	A	IG	65.0	0.988	1.58	A	IG	117.6	0.80	0.795	1.31	A	IG	65.0
		TNT7A	42.000		1.31	55.020	1.40	0.795	1.99	A	IG	65.0	0.988	1.56	A	IG	117.6	0.80	0.795	1.31	A	IG	65.0
		TNT7B	42.000		1.33	55.860	1.40	0.795	2.03	A	IG	65.0	0.988	1.50	A	IG	117.6	0.80	0.795	1.33	A	IG	65.0
		TNAGRIT4	43.000		1.29	55.470	1.40	0.795	1.95	A	IG	65.0	0.988	1.46	A	IG	117.6	0.80	0.795	1.29	A	IG	65.0
		TNAGT5A	45.000		1.22	54.900	1.40	0.795	1.85	A	IG	65.0	0.988	1.42	A	IG	117.6	0.80	0.795	1.22	A	IG	65.0
		TNAGT5B	45.000	3	1.21	54.450	1.40	0.795	1.84	A	IG	65.0	0.988	1.38	A	IG	117.6	0.80	0.795	1.21	A	IG	65.0

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.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

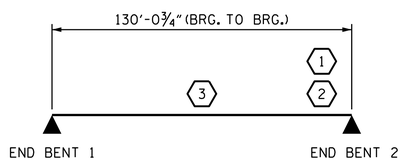
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5121/B-5137

WAKE COUNTY

STATION: 22+06.91 -L-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F245838930BF40E...

4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			110

STR. #1 STD. NO. LRFR1

ASSEMBLED BY : T.L. AVERETTE DATE : 02/16
CHECKED BY : J.P. ADAMS DATE : 02/16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 02/16

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

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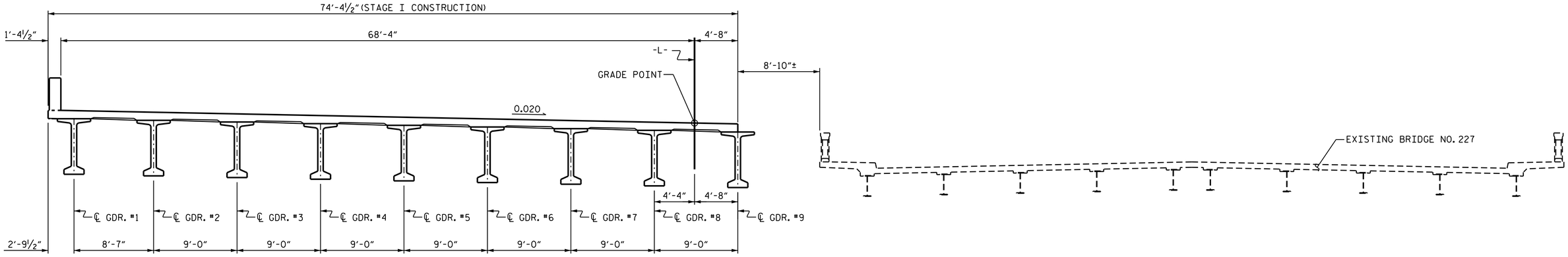
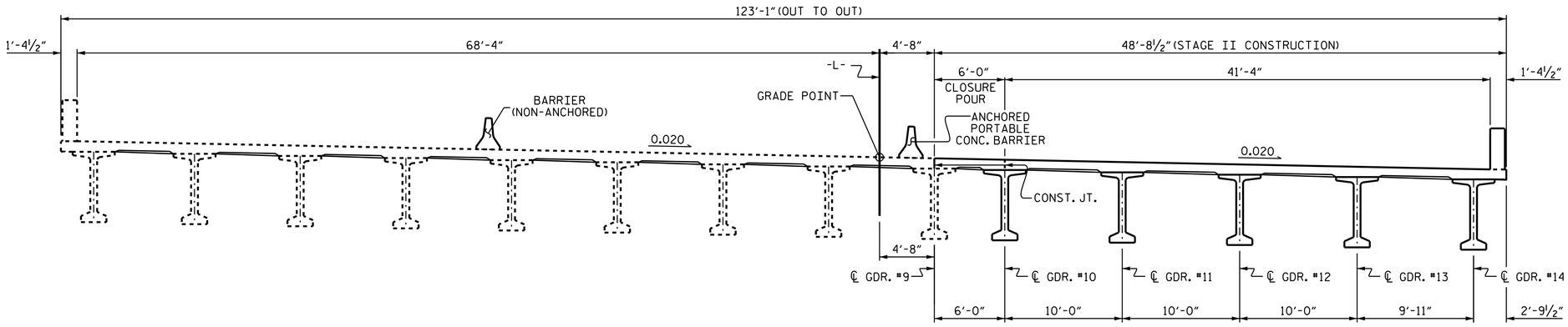
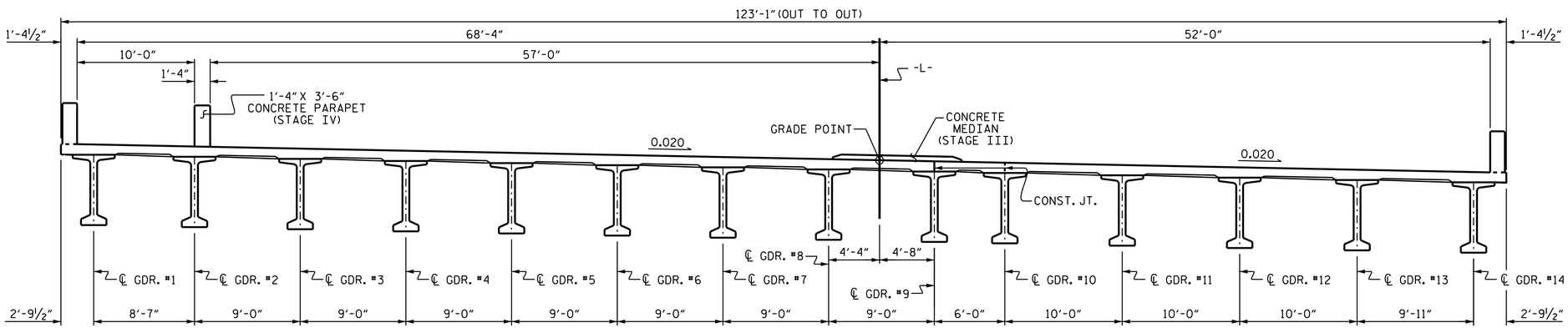


STAGE I CONSTRUCTION



STAGE II CONSTRUCTION

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS
OF THE PORTABLE CONCRETE BARRIERS AND WATER FILLED BARRIERS.



FINAL CONSTRUCTION

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583693308F40E...

4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			110

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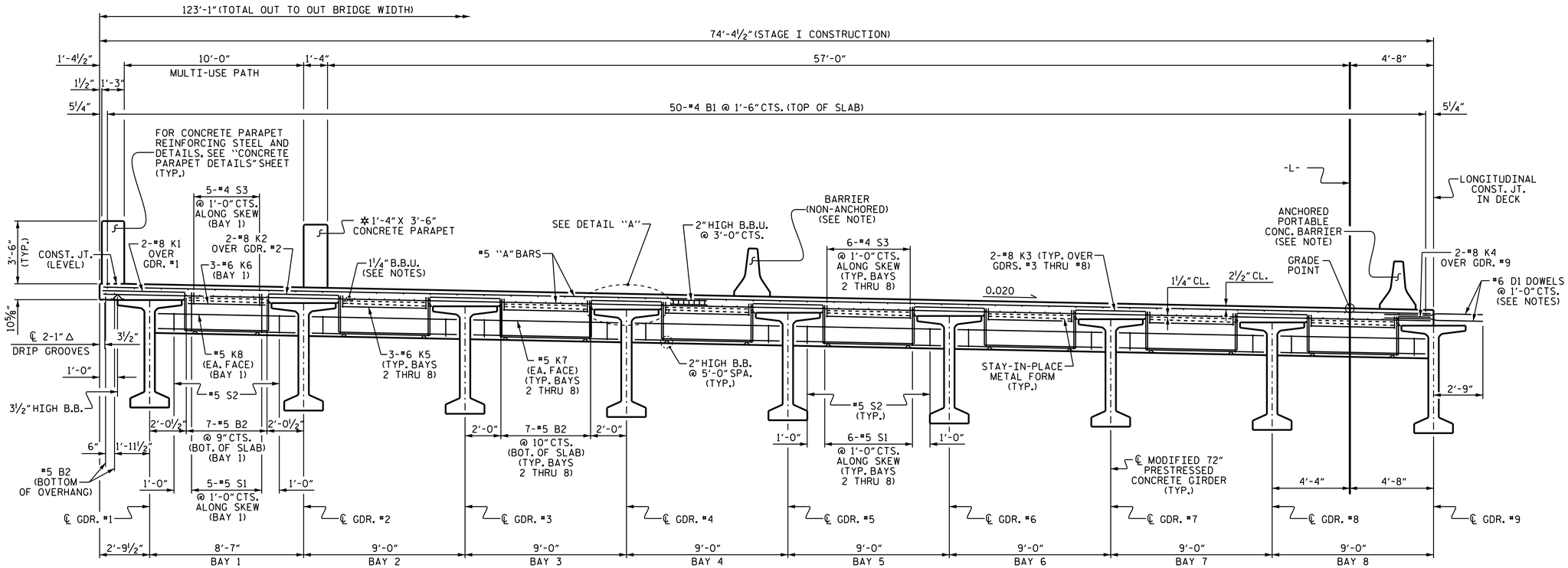
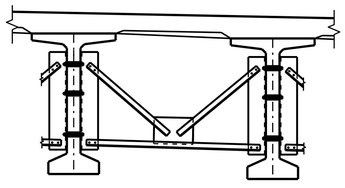


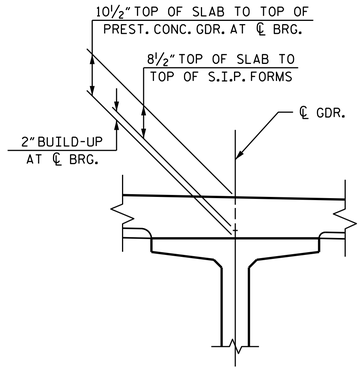
TYPICAL SECTION - STAGE I

SHOWING END BENT DIAPHRAGMS
5" CONCRETE MEDIAN TO BE PLACED DURING STAGE III NOT SHOWN
✲ 1'-4" X 3'-6" CONCRETE PARAPET SHALL BE PLACED DURING STAGE IV CONSTRUCTION



PARTIAL TYPICAL SECTION

SHOWING INTERMEDIATE DIAPHRAGMS



DETAIL "A"

NOTES:

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

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

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

#6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIERS AND WATER FILLED BARRIERS.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. FOR AESTHETIC DETAILS, SEE "PARAPET AESTHETIC DETAILS" SHEETS AND SPECIAL PROVISIONS.

DECK EDGE BEAM NOT SHOWN FOR CLARITY. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

FOR SAND LIGHTWEIGHT CONCRETE, SEE SPECIAL PROVISIONS.

THREADED RODS FOR PRECAST PANELS ARE NOT SHOWN FOR CLARITY. SEE "PRECAST PANEL" SHEETS FOR LOCATION AND DETAILS OF THREADED RODS.

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
DocuSigned by: F2458389308F40E...
4/13/2016

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SHEET NO. S-6
TOTAL SHEETS 110

STR. #1

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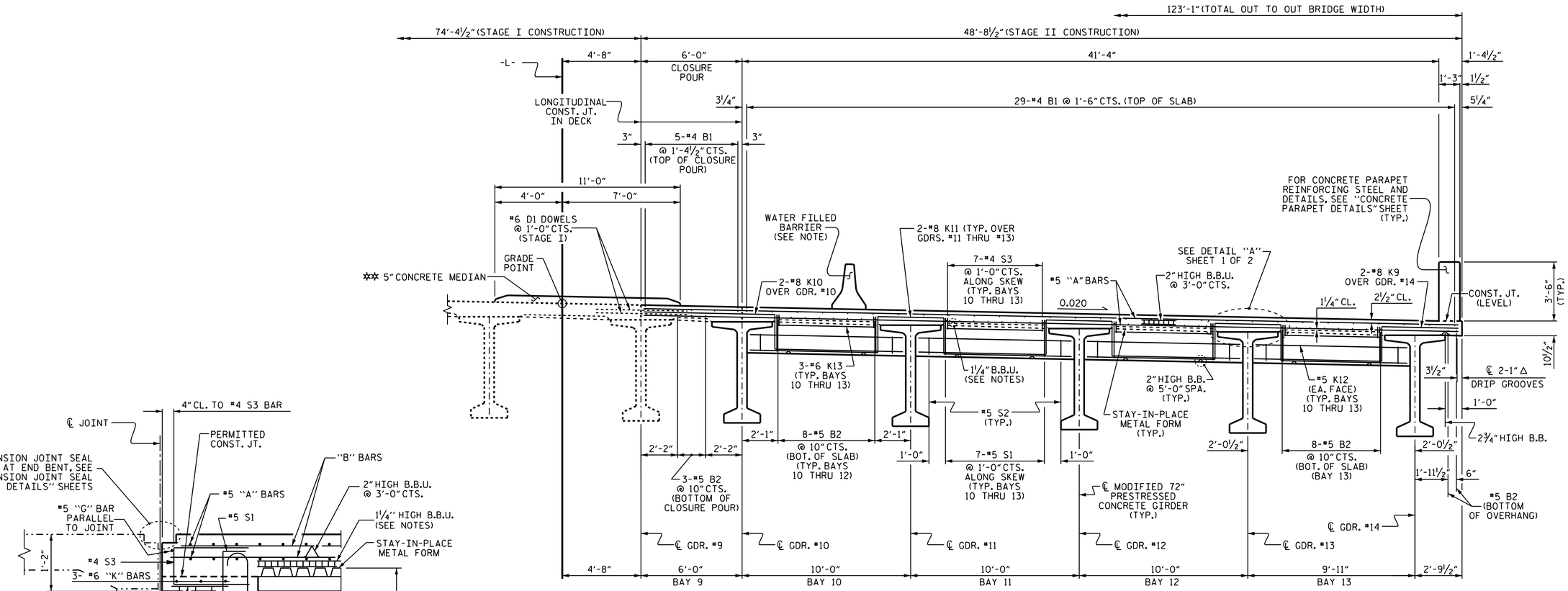
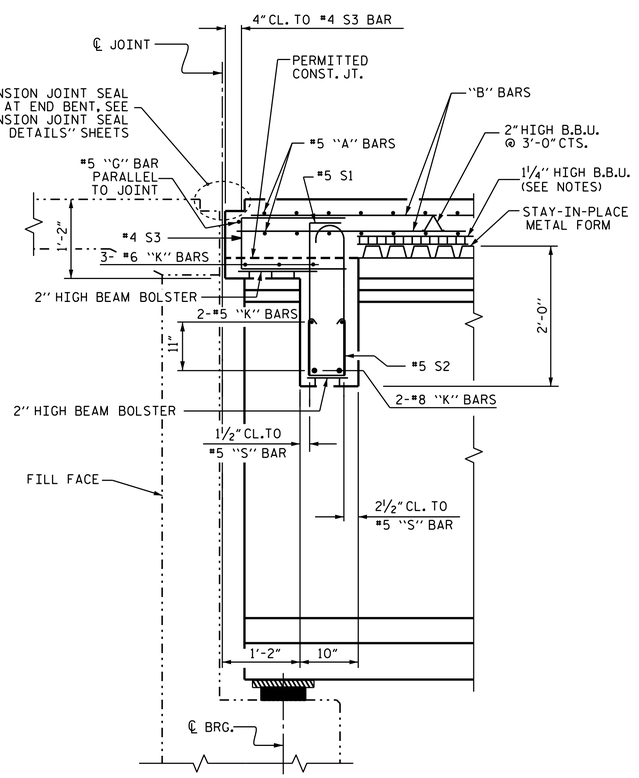


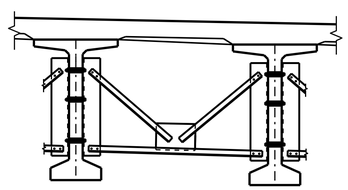
TYPICAL SECTION - STAGE II

SHOWING END BENT DIAPHRAGMS
✲✲ 5" CONCRETE MEDIAN SHALL BE PLACED DURING STAGE III CONSTRUCTION



SECTION THRU END BENT DIAPHRAGM

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



PARTIAL TYPICAL SECTION

SHOWING INTERMEDIATE DIAPHRAGMS

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
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1			3			TOTAL SHEETS
2			4			110

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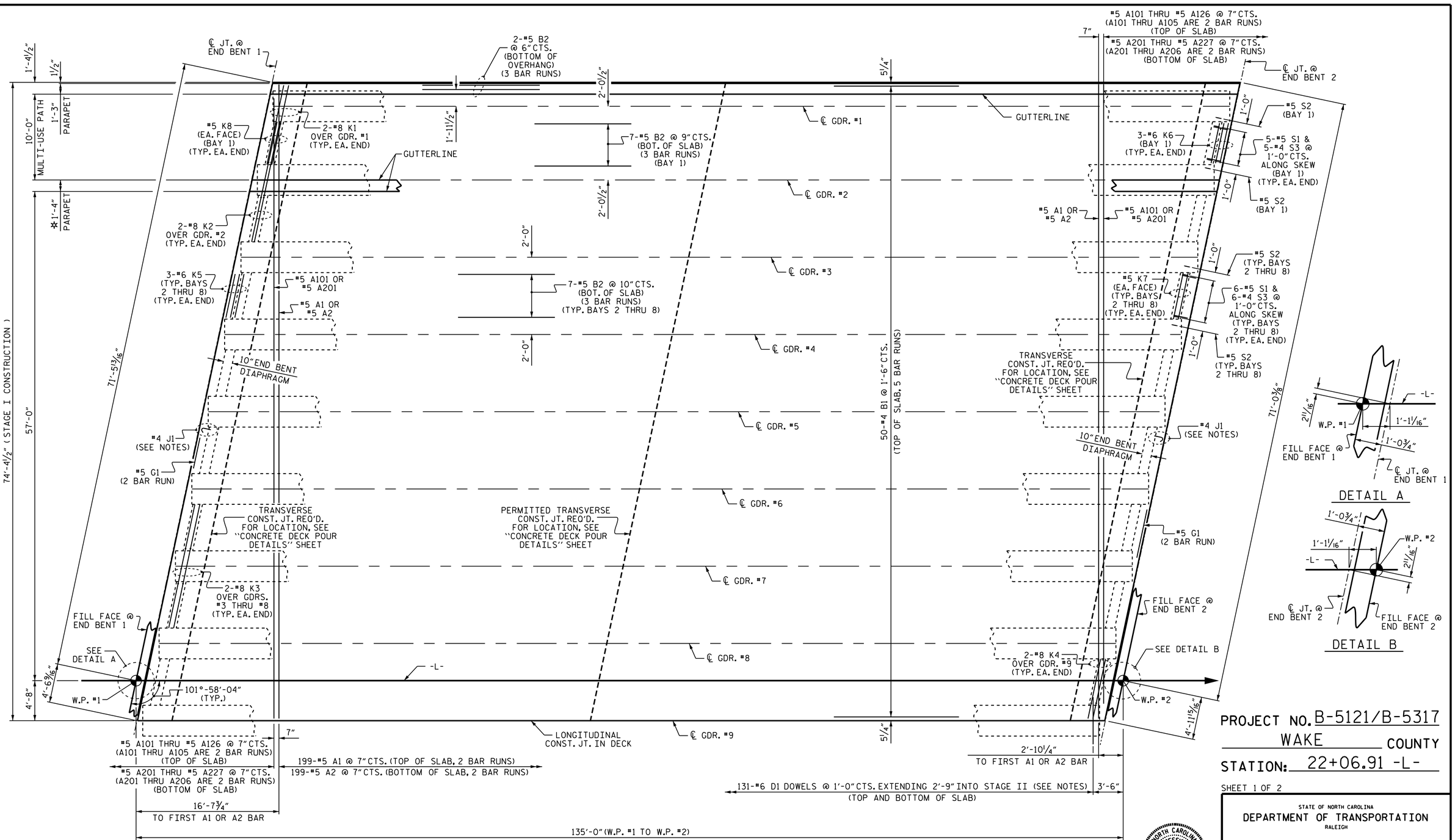

PLAN OF SPAN A - STAGE I

NOTES

DECK EDGE BEAM, PERMITTED CONST. JT. IN DECK @ DECK EDGE BEAM AND PARAPET AESTHETIC DETAILS NOT SHOWN FOR CLARITY. FOR DETAILS, SEE "DECK EDGE BEAM" AND "PARAPET AESTHETIC DETAILS" SHEETS.

CONCRETE MEDIAN TO BE PLACED DURING STAGE III NOT SHOWN FOR CLARITY.

#6 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

* 1'-4" X 3'-6" CONCRETE PARAPET SHALL BE PLACED DURING STAGE IV CONSTRUCTION.

FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			110

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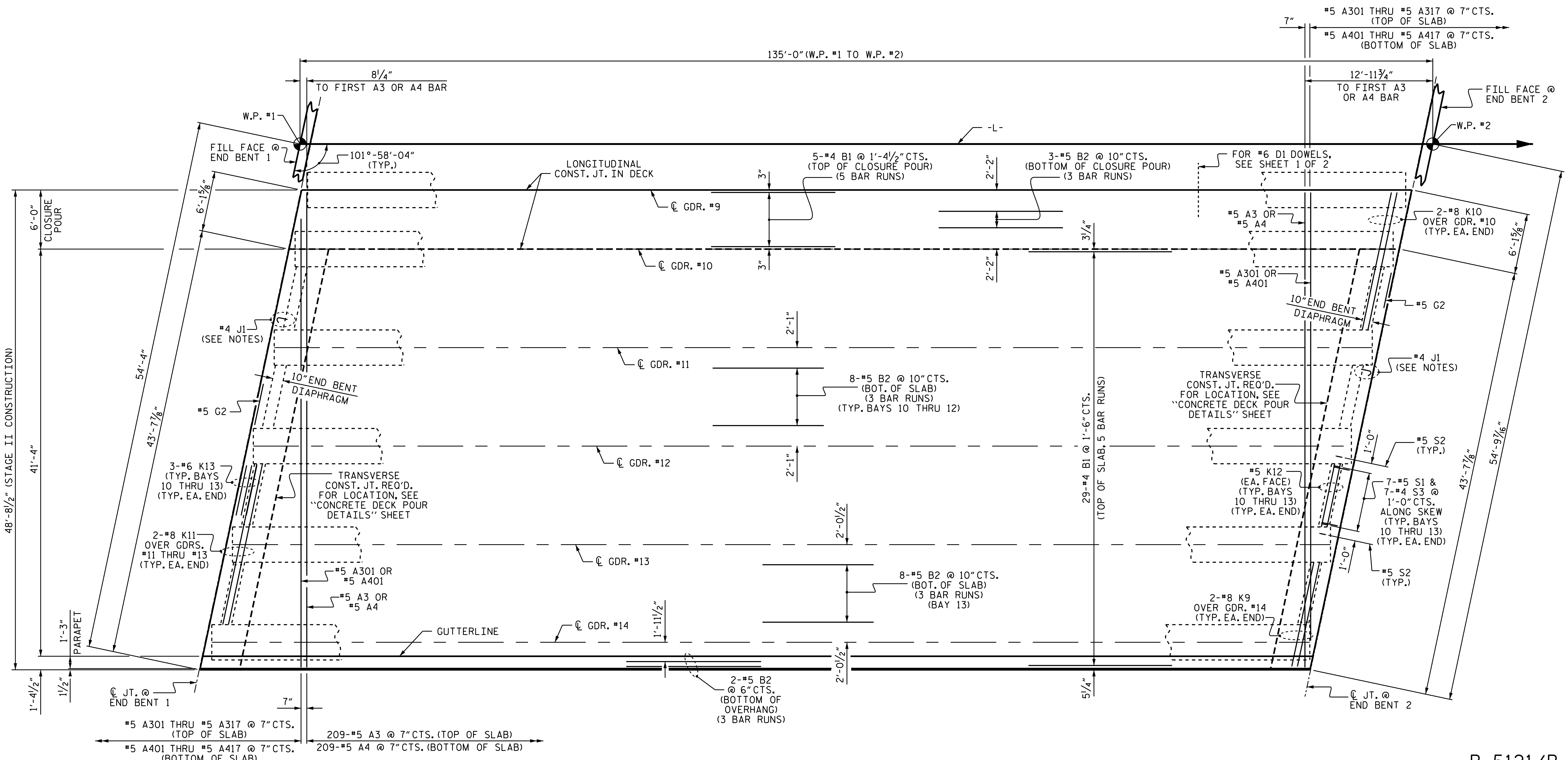

PLAN OF SPAN A - STAGE II

NOTES

DECK EDGE BEAM, PERMITTED CONST. JT. IN DECK @ DECK EDGE BEAM AND PARAPET AESTHETIC DETAILS NOT SHOWN FOR CLARITY. FOR DETAILS, SEE "DECK EDGE BEAM" AND "PARAPET AESTHETIC DETAILS" SHEETS.

CONCRETE MEDIAN TO BE PLACED DURING STAGE III NOT SHOWN FOR CLARITY.

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			110

STR. #1

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DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 02-16

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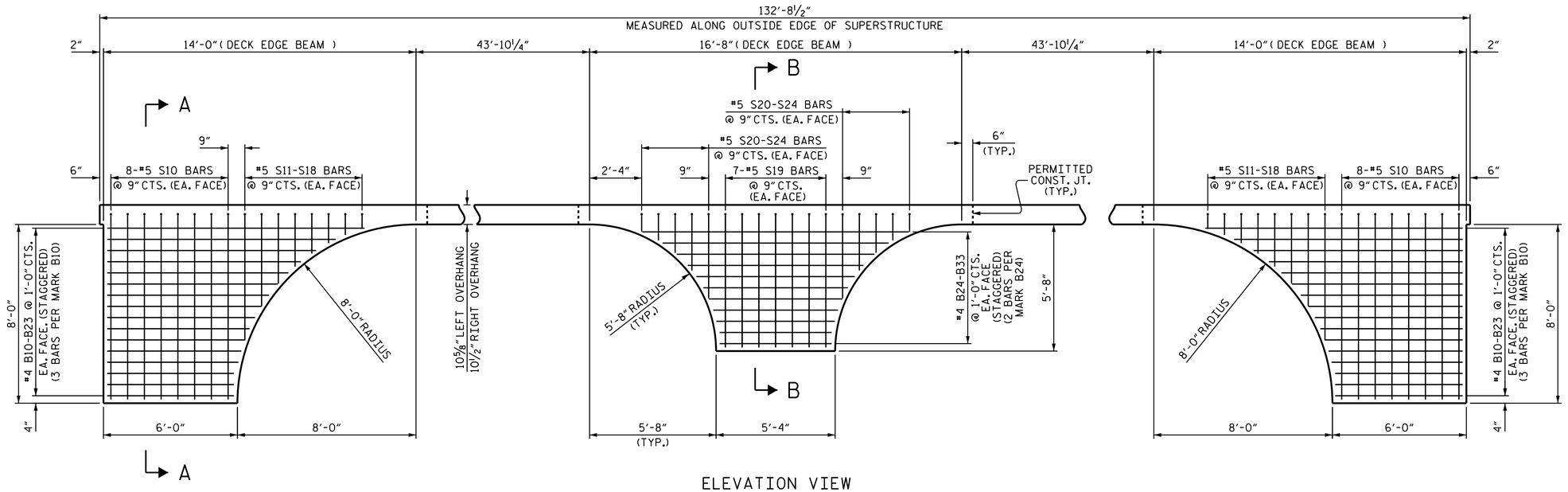
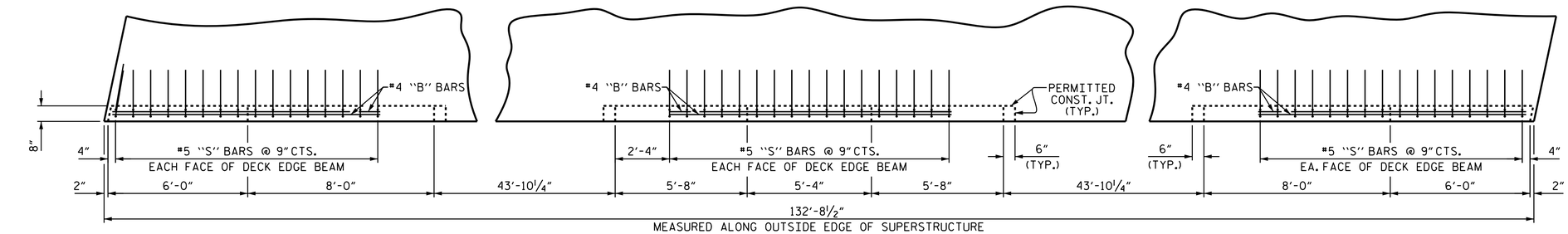
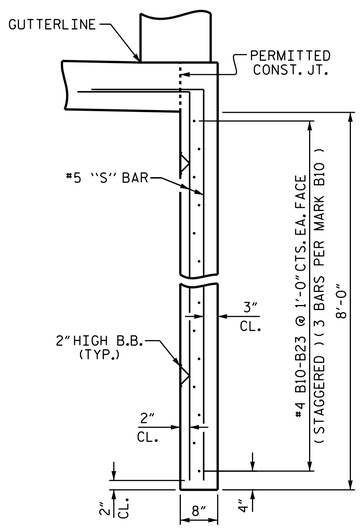


ELEVATION VIEW



PLAN VIEW

DECK EDGE BEAM IN RIGHT OVERHANG SHOWN.
DECK EDGE BEAM IN LEFT OVERHANG SIMILAR BY ROTATION.



SECTION A-A

NOTES:

DECK EDGE BEAM SHALL BE CAST WITH THE DECK. NO CONSTRUCTION JOINT SHALL BE ALLOWED BETWEEN THE DECK EDGE BEAMS AND THE DECK, EXCEPT AS SHOWN.

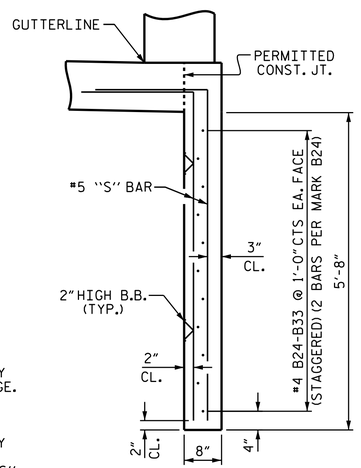
AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE SHEET 2 OF 2 FOR AESTHETIC DETAILS.

DECK REINFORCING STEEL NOT SHOWN FOR CLARITY. SEE "PLAN OF SPANS" SHEETS.

CONCRETE PARAPET DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET" SHEETS.

FORMED HOLES FOR PRECAST PANELS NOT SHOWN FOR CLARITY. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH PRECAST PANEL ANCHORAGE. SEE "PRECAST PANEL" SHEETS.

ANCHORAGE FOR LUMINAIRE BRACKETS NOT SHOWN FOR CLARITY. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH LUMINAIRE BRACKET ANCHORAGE. SEE "ARCHITECTURAL METAL FASCIA DETAILS" SHEETS.



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
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6/3/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK EDGE BEAM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			110

STR. #1

DRAWN BY :	K.W. ALFORD	DATE : 2/2016
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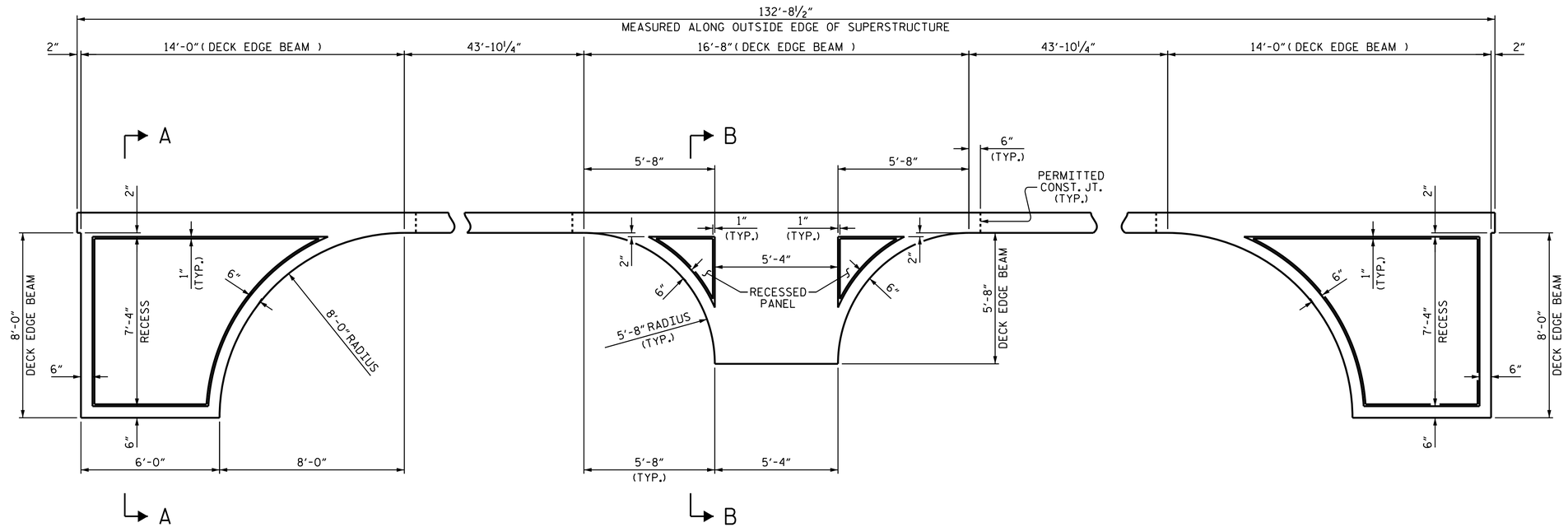
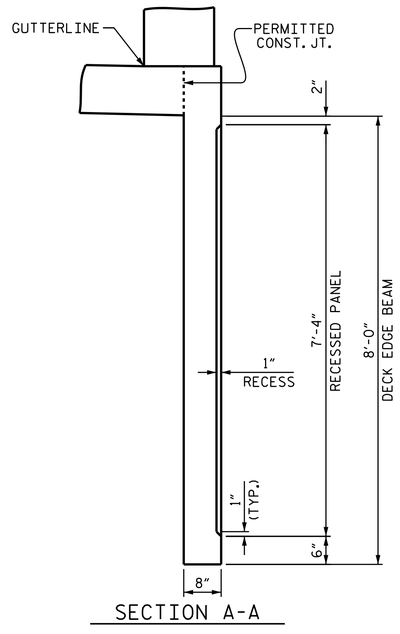
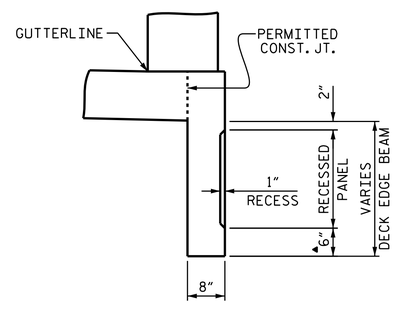


AESTHETIC DETAILS - ELEVATION VIEW



SECTION A-A



SECTION B-B

▲ MEASURED PERPENDICULAR TO BOTTOM OF DECK EDGE BEAM

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK EDGE BEAM

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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SHEET NO. S-11

TOTAL SHEETS 110

STR. #1

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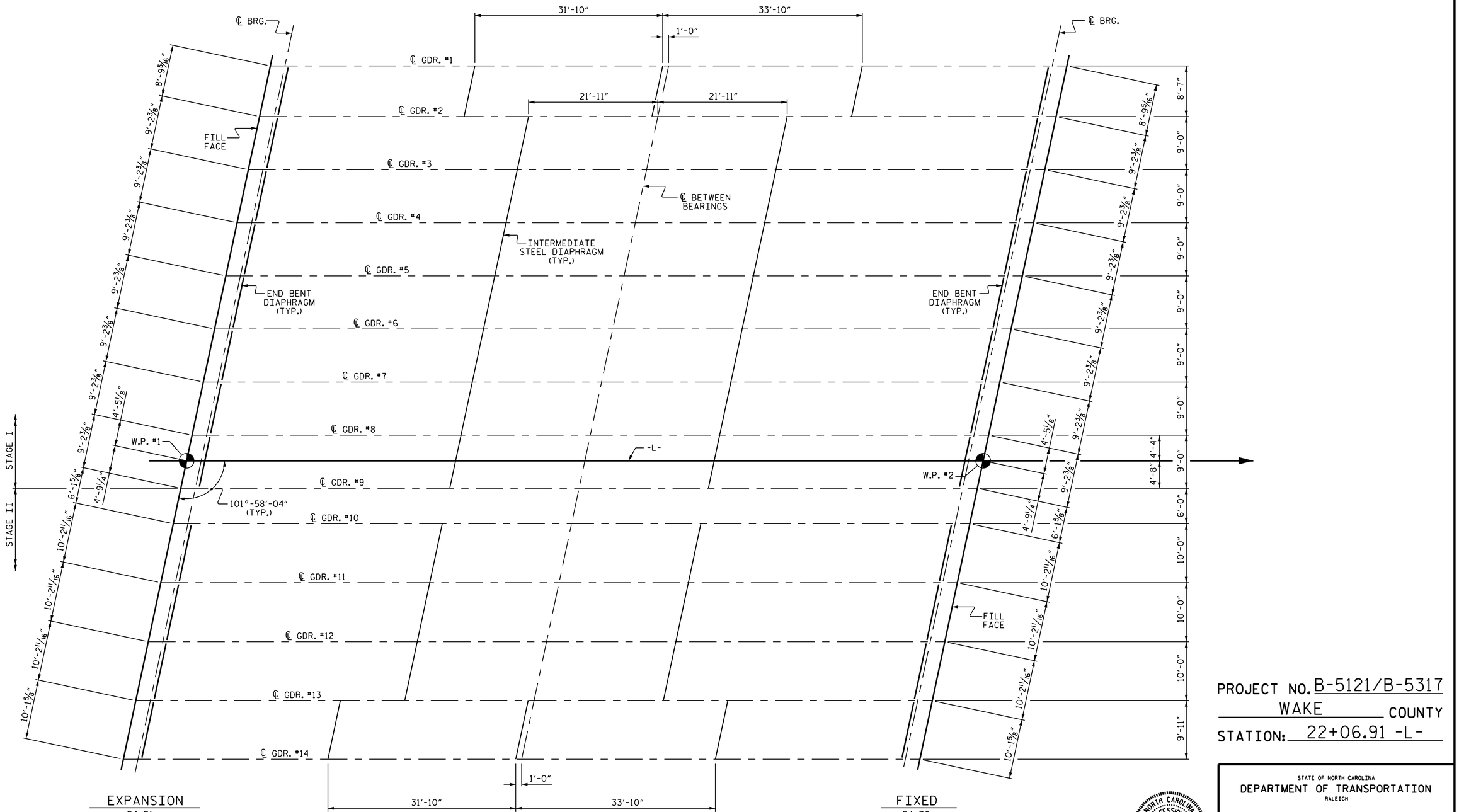

GIRDER LAYOUT

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

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

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4/13/2016

DRAWN BY : T.L. AVERETTE DATE : 2-16
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DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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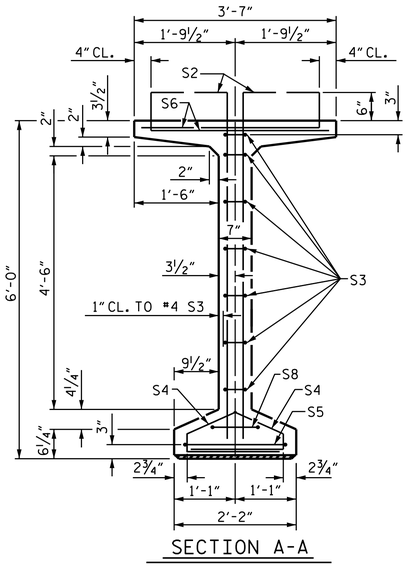
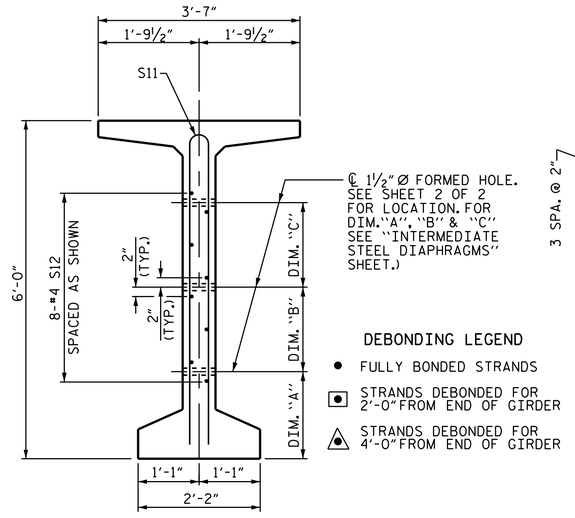


SECTION A-A

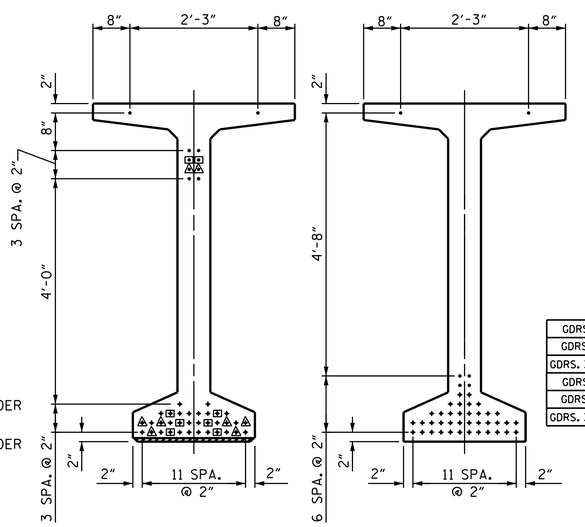


SECTION C-C

(S13, S14 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

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

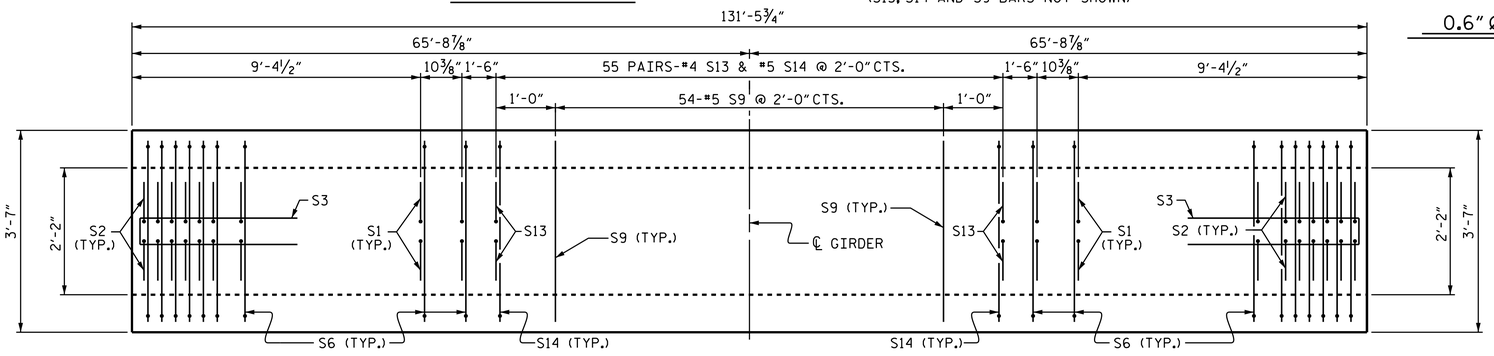


AT END OF GIRDER

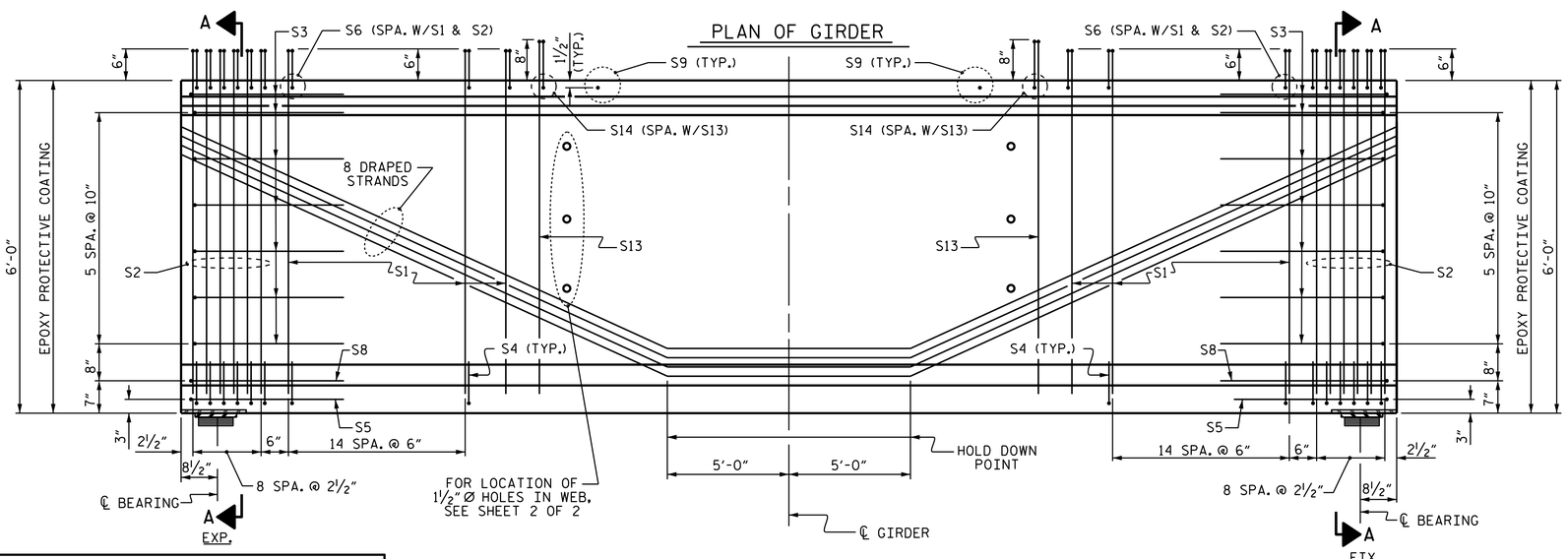
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

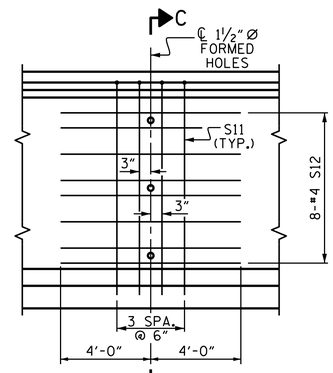
GDRS. 1 & 14	S11	12	#5	5	11'-6"	144
GDRS. 2 & 13	S11	20	#5	5	11'-6"	240
GDRS. 3 THRU 12	S11	8	#5	5	11'-6"	96
GDRS. 1 & 14	S12	24	#4	STR	8'-0"	128
GDRS. 2 & 13	S12	40	#4	STR	8'-0"	214
GDRS. 3 THRU 12	S12	16	#4	STR	8'-0"	86
	S13	110	#4	1	7'-0"	514
	S14	110	#5	4	4'-6"	516



PLAN OF GIRDER



ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER #1 THRU #14

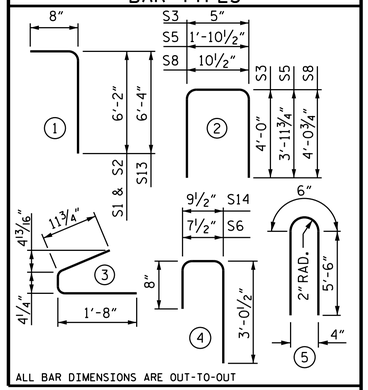
0.6" Ø L. R. GRADE 270 STRANDS

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	64	#4	1	6'-10"	292
S2	36	#5	1	6'-10"	257
S3	14	#4	2	8'-5"	79
S4	96	#4	3	3'-0"	192
S5	2	#5	2	9'-10"	21
S6	96	#5	4	4'-4"	434
S8	2	#5	2	9'-0"	19
S9	54	#5	STR	3'-3"	183

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDRS. 1 & 14	2779	28.2	44
GDRS. 2 & 13	2961	28.2	44
GDRS. 3 THRU 12	2689	28.2	44

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
14	131'-5¾"	1840'-8½"

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893DBF40E...

4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			110

STR. #1

STD. NO. PCG8 (Sht. 1)

ASSEMBLED BY : T.L. AVERETTE		DATE : 2-15
CHECKED BY : J.P. ADAMS		DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE		DATE : 2-16
DRAWN BY : EEM 2/6/97	REV. 10/1/11	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 6/13	MAA/GM
	REV. 1/15	MAA/TMG

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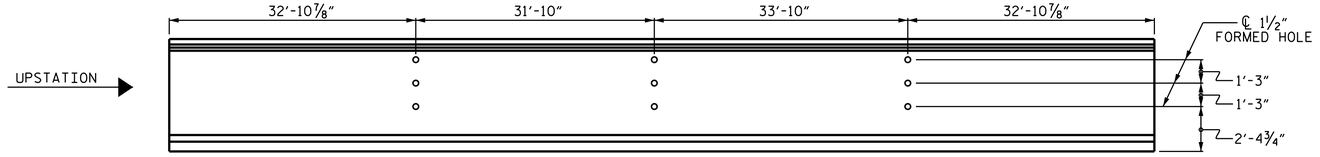
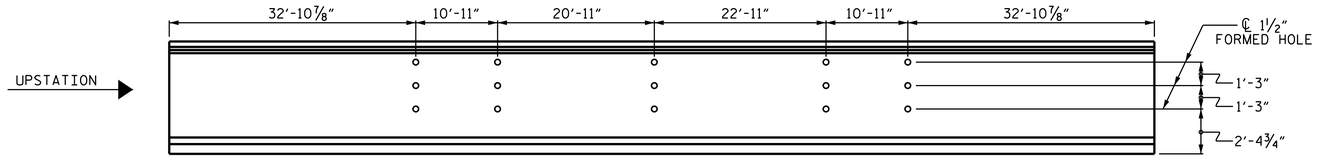
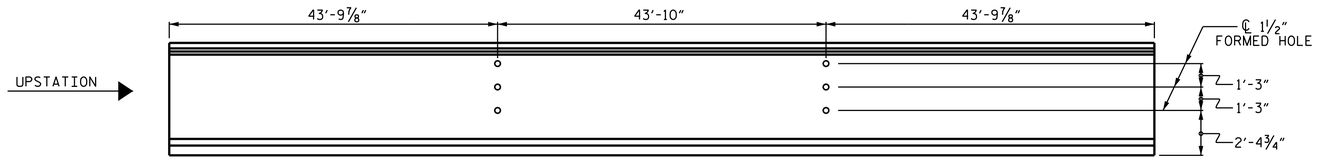


ELEVATION - GIRDERS 1 & 14

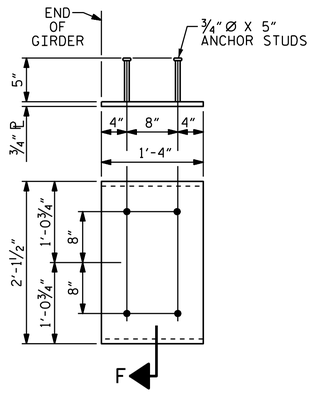


ELEVATION - GIRDERS 2 & 13



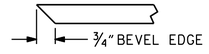
ELEVATION - GIRDERS 3 THRU 12

FORMED HOLES FOR DIAPHRAGM DETAIL



EMBEDDED PLATE "B-1" DETAILS
72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

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.

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 8000 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 ¼".

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 ½" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 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.

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 23.2 KIPS.

FOR APPLICATION OF BRIDGE COATING, SEE SPECIAL PROVISIONS.

PVC INSERTS FOR ARCHITECTURAL METAL FASCIA ARE NOT SHOWN FOR CLARITY. FOR LOCATION OF 1 ¼" Ø PVC INSERTS IN EXTERIOR GIRDERS, SEE "ARCHITECTURAL METAL FASCIA LAYOUT" SHEET.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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6/3/2016

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1			3			TOTAL SHEETS
2			4			110

STR. #1

STD. NO. PCG9 (Sht. 4)

ASSEMBLED BY : T.L. AVERETTE			DATE : 12-15
CHECKED BY : J.P. ADAMS			DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE			DATE : 2-16
DRAWN BY : ELR 11/91	REV. 10/1/11	MAA/GM	
CHECKED BY : GRP 11/91	REV. 1/15	MAA/TMC	
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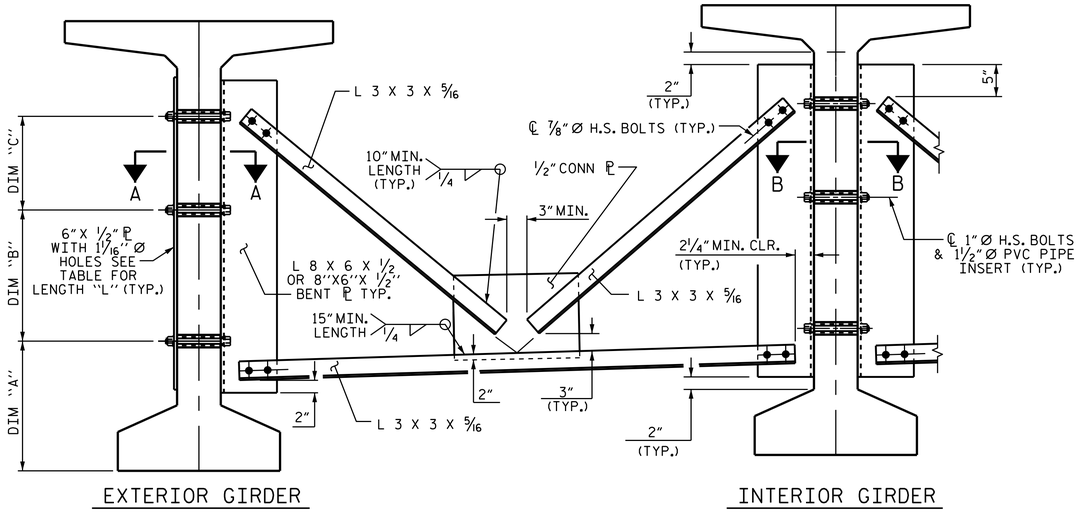
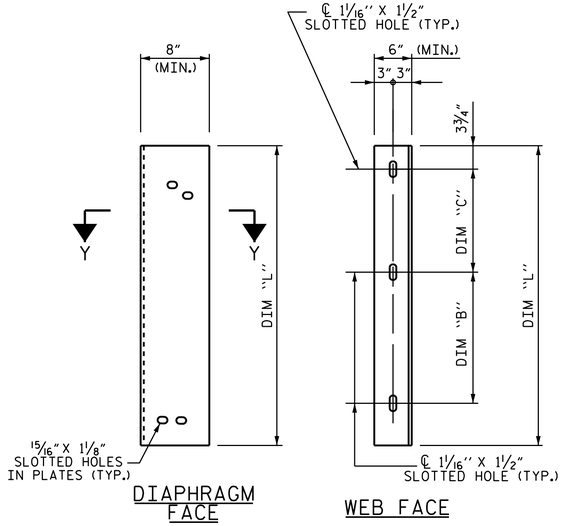


PART SECTION AT INTERMEDIATE DIAPHRAGM

(72" BULB TEE GIRDER SHOWN)



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.

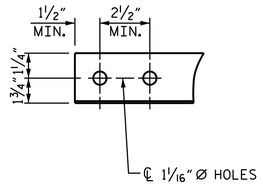
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.



ANGLE END

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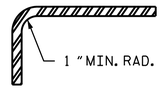
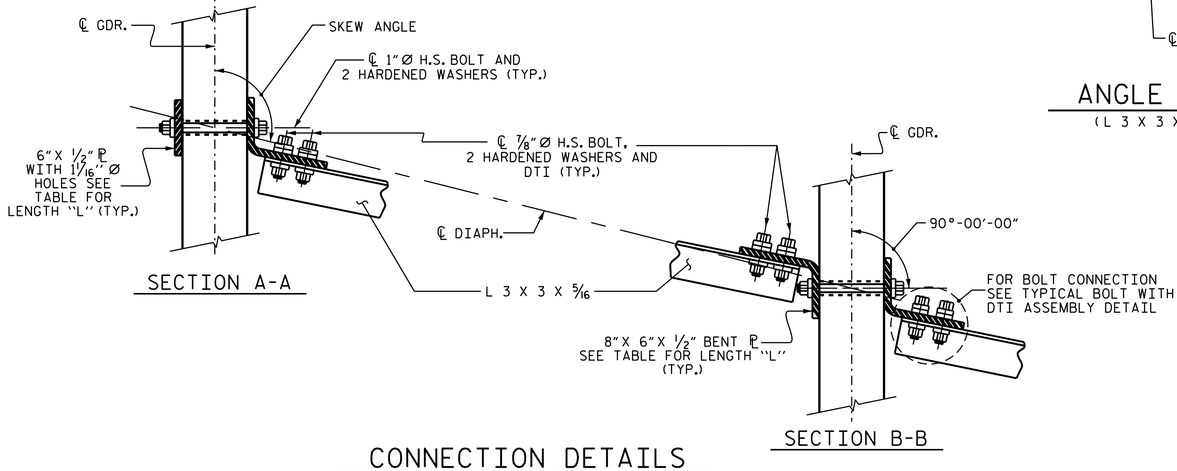


SECTION Y-Y

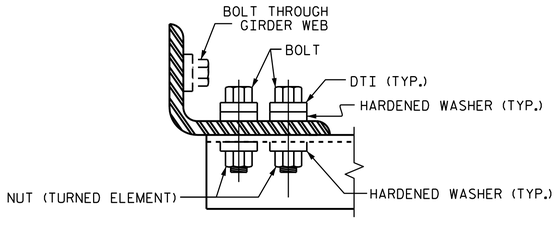
CONNECTOR PLATE DETAIL

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	2'-4 3/4"	1'-3"	1'-3"	4'-2"



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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2			4			110

ASSEMBLED BY : T.L. AVERETTE	DATE : 2-16
CHECKED BY : J.P. ADAMS	DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE	DATE : 2-16
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

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jpadams

STR. #1 STD. NO. PCG11 (SHT 4)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS 1, 4, 5, 6, 7 & 9																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.026	0.052	0.077	0.102	0.121	0.141	0.153	0.165	0.170	0.174	0.170	0.165	0.153	0.141	0.121	0.102	0.077	0.052	0.026	0.000
FINAL CAMBER ↑	0	5/16"	5/8"	7/8"	1 1/16"	1 5/16"	1 7/16"	1 5/8"	1 11/16"	1 13/16"	1 13/16"	1 13/16"	1 11/16"	1 5/8"	1 7/16"	1 5/16"	1 1/16"	7/8"	5/8"	5/16"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM),
EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDER 2																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.034	0.067	0.099	0.131	0.156	0.181	0.197	0.213	0.218	0.224	0.218	0.213	0.197	0.181	0.156	0.131	0.099	0.067	0.034	0.000
FINAL CAMBER ↑	0	3/16"	7/16"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/8"	1"	7/8"	3/4"	5/8"	7/16"	3/16"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
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EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS 3 & 8																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.030	0.061	0.089	0.118	0.140	0.162	0.177	0.191	0.196	0.201	0.196	0.191	0.177	0.162	0.140	0.118	0.089	0.061	0.030	0.000
FINAL CAMBER ↑	0	1/4"	1/2"	3/4"	7/8"	1 1/16"	1 3/16"	1 3/8"	1 3/8"	1 7/16"	1 7/16"	1 7/16"	1 3/8"	1 3/8"	1 3/16"	1 1/16"	7/8"	3/4"	1/2"	1/4"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM),
EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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2			4			110

STR. #1

DRAWN BY : T.L. AVERETTE DATE : 2-16
CHECKED BY : J.P. ADAMS DATE : 2-16
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDER 10																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.035	0.049	0.072	0.095	0.113	0.131	0.142	0.154	0.158	0.161	0.158	0.154	0.142	0.131	0.113	0.095	0.072	0.049	0.035	0.000
FINAL CAMBER ↑	0	5/16"	5/8"	15/16"	1 3/16"	1 7/16"	1 9/16"	1 3/4"	1 7/8"	1 15/16"	1 15/16"	1 15/16"	1 7/8"	1 3/4"	1 9/16"	1 7/16"	1 3/16"	15/16"	5/8"	5/16"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM),
EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS 11 & 14																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.029	0.058	0.085	0.112	0.134	0.155	0.169	0.183	0.187	0.192	0.187	0.183	0.169	0.155	0.134	0.112	0.085	0.058	0.029	0.000
FINAL CAMBER ↑	0	1/4"	1/2"	3/4"	15/16"	1 3/16"	1 5/16"	1 7/16"	1 1/2"	1 9/16"	1 9/16"	1 9/16"	1 1/2"	1 7/16"	1 5/16"	1 3/16"	15/16"	3/4"	1/2"	1/4"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM),
EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS 12 & 13																				
TWENTIETH POINTS	0.0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.102	0.149	0.192	0.231	0.263	0.289	0.308	0.319	0.323	0.319	0.308	0.289	0.263	0.231	0.192	0.149	0.102	0.051	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.032	0.064	0.095	0.125	0.149	0.172	0.187	0.203	0.208	0.213	0.208	0.203	0.187	0.172	0.149	0.125	0.095	0.064	0.032	0.000
FINAL CAMBER ↑	0	1/4"	7/16"	5/8"	13/16"	1"	1 1/16"	1 1/4"	1 1/4"	1 5/16"	1 5/16"	1 5/16"	1 1/4"	1 1/4"	1 1/16"	1"	13/16"	5/8"	7/16"	1/4"	0

✳ INCLUDES FUTURE WEARING SURFACE EXCEPT GIRDER 1.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM),
EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by:
F24583B030DF40E...
4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : T.L. AVERETTE DATE : 2-16
CHECKED BY : J.P. ADAMS DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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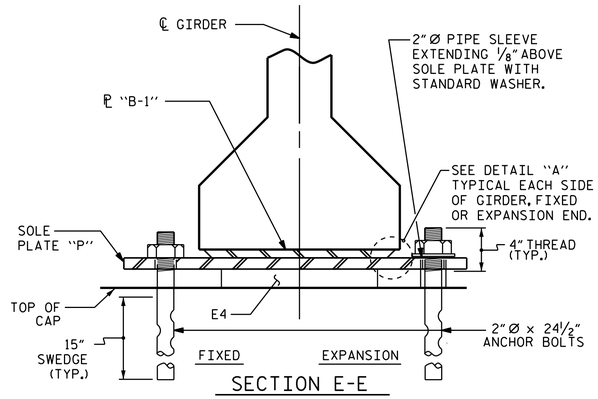
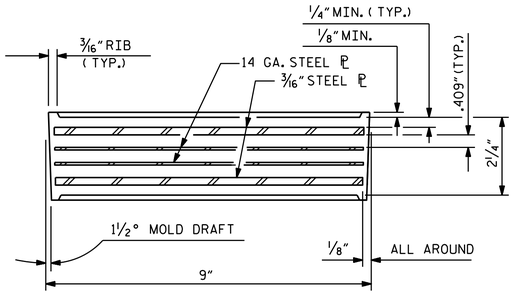
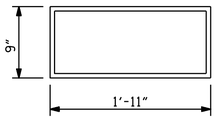
STR. #1



SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (28 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

NOTES

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

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

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

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

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

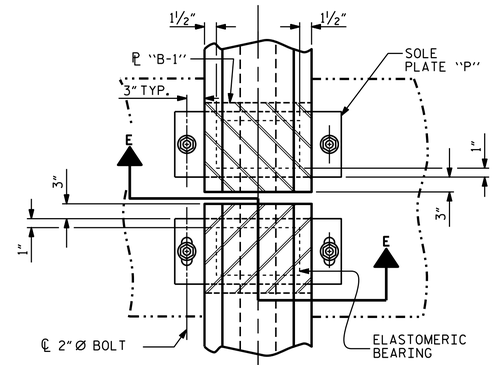
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. 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.

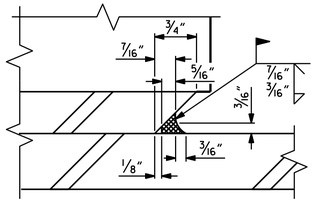
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

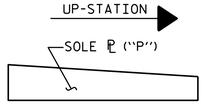


TYPICAL HALF-PLAN (FIXED END)

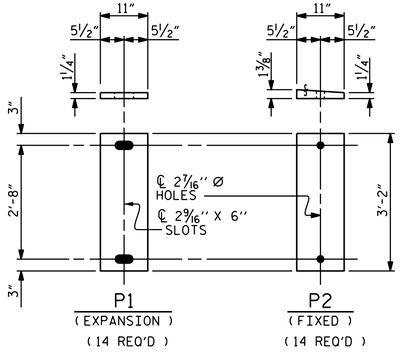
TYPICAL HALF-PLAN (EXPANSION END)



DETAIL "A"



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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1			3		
2			4		

SHEET NO. S-18

TOTAL SHEETS 110

ASSEMBLED BY : T.L. AVERETTE		DATE : 12-15
CHECKED BY : J.P. ADAMS		DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE		DATE : 2-16
DRAWN BY : EEM 2/97	REV. 10/1/11	MAA/GM
CHECKED BY : VAP 2/97	REV. 6/13	AAC/MAA
	REV. 1/15	MAA/TMG

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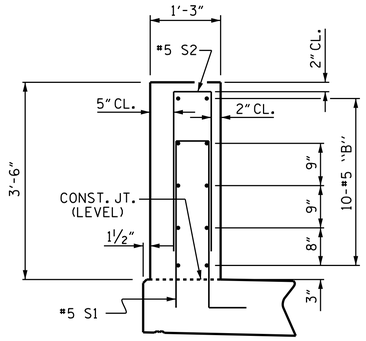
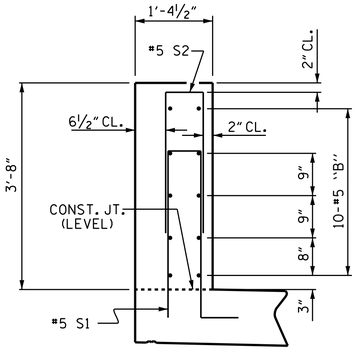
STR. #1

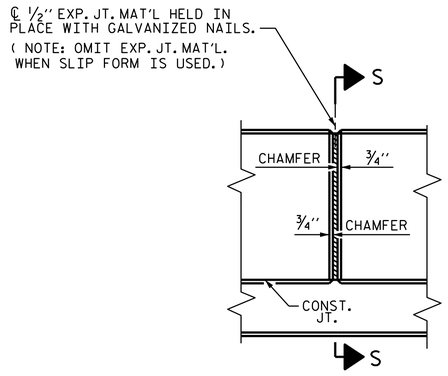
STD. NO. EB4 (SHT 1)



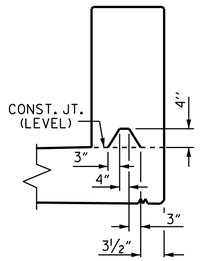
SECTION THROUGH PARAPET



SECTION THROUGH PILASTER

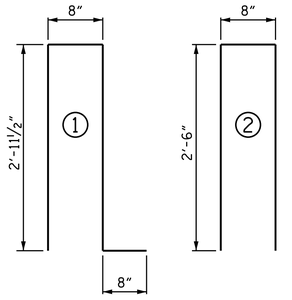


ELEVATION AT EXPANSION JOINTS



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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL-STAGE I

CONCRETE PARAPET

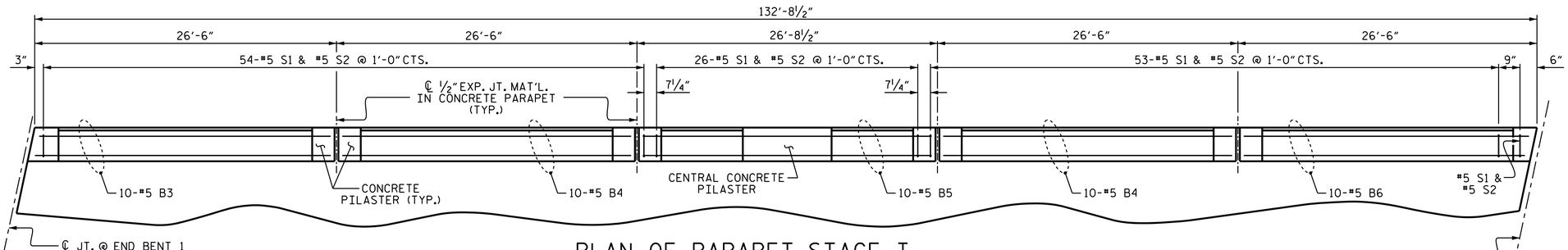
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	10	#5	STR	26'-2"	273
* B4	20	#5	STR	26'-1"	544
* B5	10	#5	STR	26'-4"	275
* B6	10	#5	STR	25'-10"	269
* S1	134	#5	1	7'-3"	1013
* S2	134	#5	2	5'-8"	792
*EPOXY COATED REINF. STEEL					3166 LBS.
CLASS AA CONCRETE					21.9 C.Y.
DECORATIVE CONCRETE PARAPET					132.71 L.F.

BILL OF MATERIAL-STAGE II

CONCRETE PARAPET

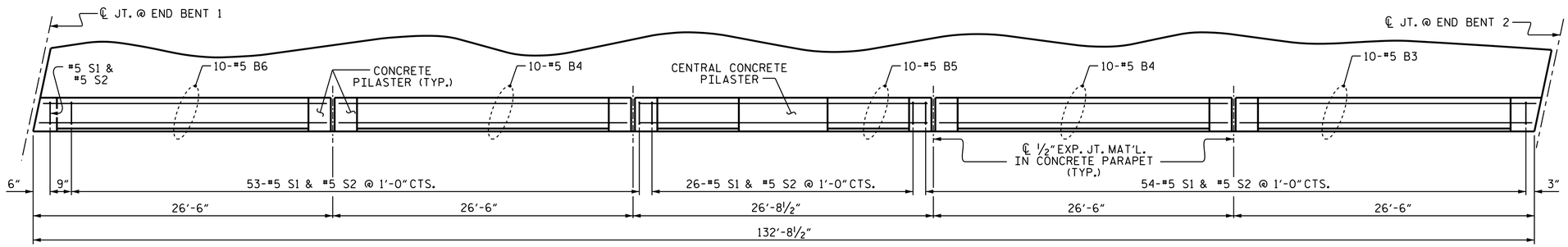
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	10	#5	STR	26'-2"	273
* B4	20	#5	STR	26'-1"	544
* B5	10	#5	STR	26'-4"	275
* B6	10	#5	STR	25'-10"	269
* S1	134	#5	1	7'-3"	1013
* S2	134	#5	2	5'-8"	792
*EPOXY COATED REINF. STEEL					3166 LBS.
CLASS AA CONCRETE					21.9 C.Y.
DECORATIVE CONCRETE PARAPET					132.71 L.F.

CONCRETE PARAPET DETAILS



PLAN OF PARAPET-STAGE I

DIMENSIONS ARE GIVEN ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE



PLAN OF PARAPET-STAGE II

DIMENSIONS ARE GIVEN ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE

NOTES

ALL REINFORCING STEEL IN PARAPETS SHALL BE EPOXY COATED.

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

THREADED RODS FOR PRECAST PANELS ARE NOT SHOWN FOR CLARITY. SEE "PRECAST PANEL" SHEETS FOR LOCATION AND DETAILS OF THREADED RODS. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH THREADED RODS.

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

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE "PARAPET AESTHETIC DETAILS" SHEETS.

DECK EDGE BEAM NOT SHOWN FOR CLARITY. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

FOR DECORATIVE CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

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4/13/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
STAGE I & STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			110

STR. #1

DRAWN BY : T.L. AVERETTE DATE : 2-16
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DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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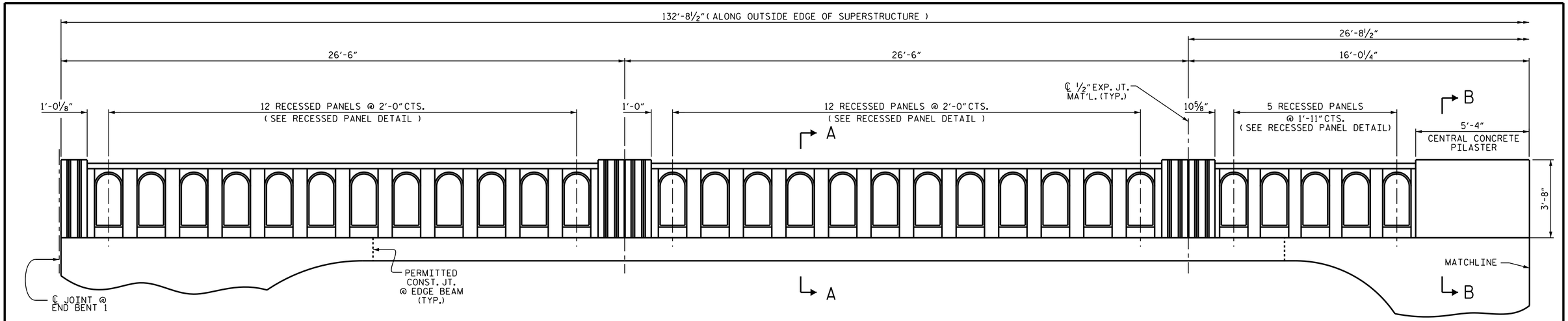
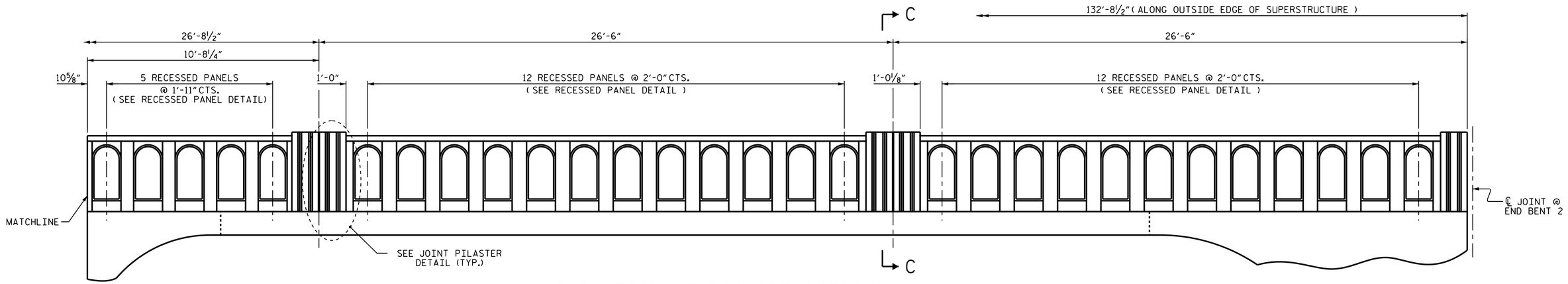
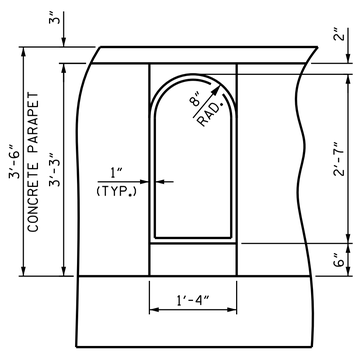


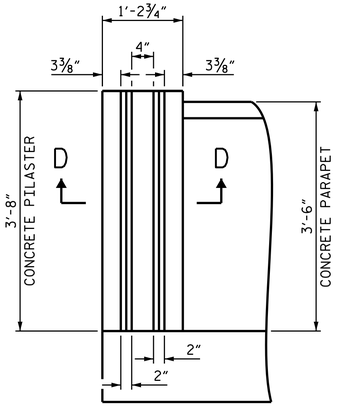


ELEVATION OF PARAPET DETAILS

ALL DIMENSIONS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE.
RIGHT PARAPET (STAGE II) SHOWN, LEFT PARAPET (STAGE I) SIMILAR BY ROTATION.

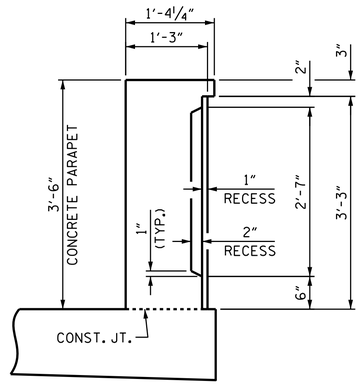


RECESSED PANEL DETAIL

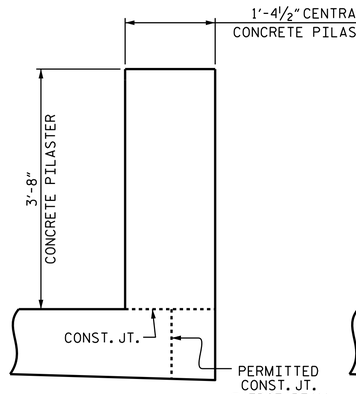


JOINT PILASTER DETAIL

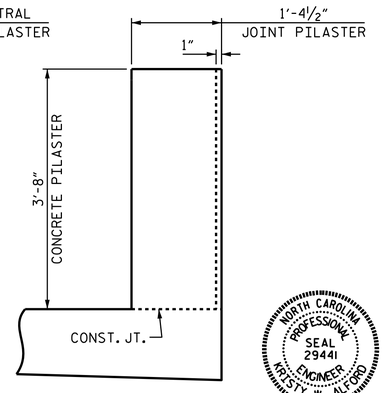
PILASTER TO RIGHT OF JOINT SHOWN.
PILASTER TO LEFT OF JOINT SIMILAR BY ROTATION.



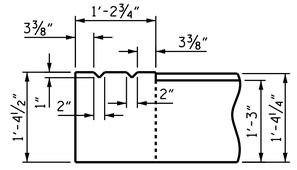
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARAPET AESTHETIC DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893D8F40E 4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.W. ALFORD DATE : 1/2016
CHECKED BY : J.P. ADAMS DATE : 2/2016
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jpadams

STR. #1

NOTES

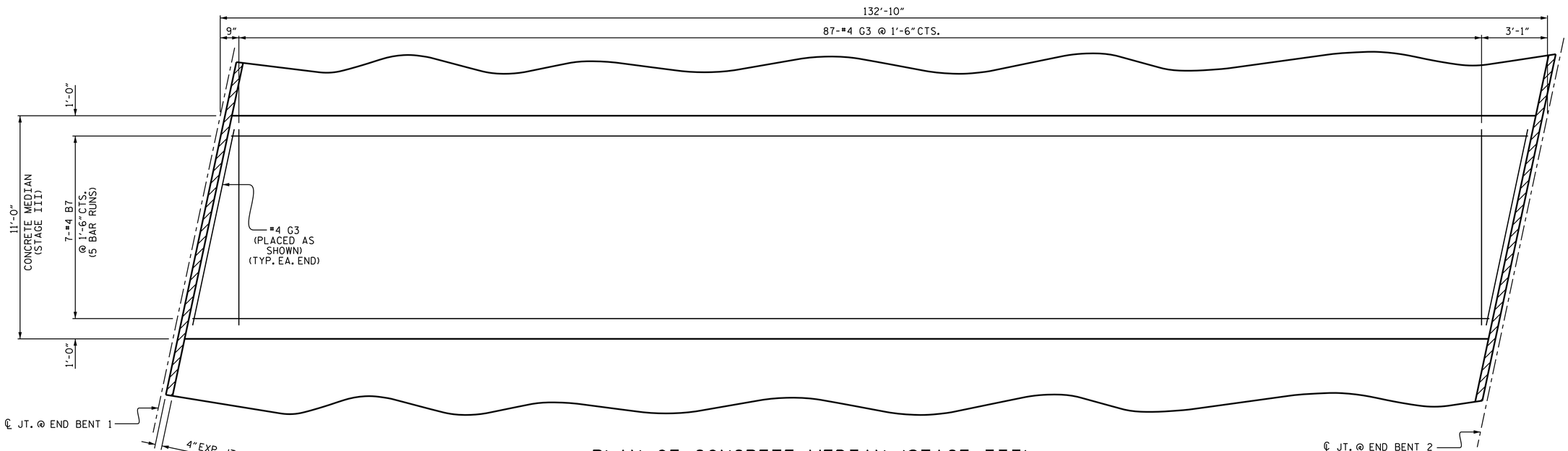
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN THE CONCRETE MEDIAN SHALL BE EPOXY COATED.

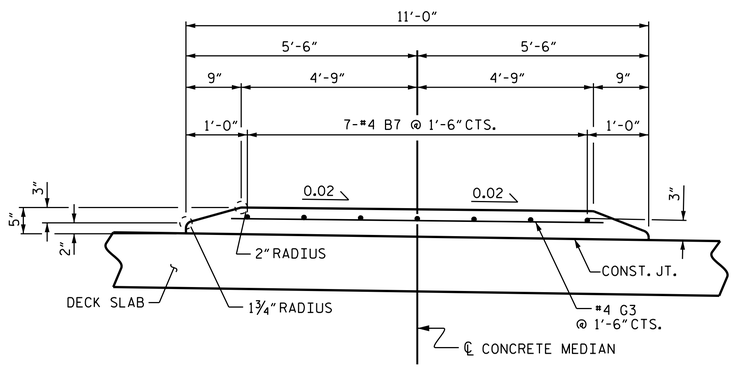
MEDIAN IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR CONCRETE MEDIAN REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL."

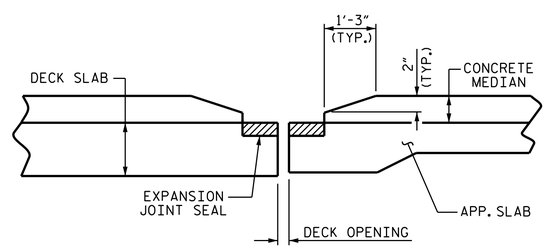
FOR CONCRETE MEDIAN ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.



PLAN OF CONCRETE MEDIAN (STAGE III)



REINFORCING STEEL DETAILS



SECTION AT EXPANSION JOINT

CONCRETE MEDIAN DETAILS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE MEDIAN

STAGE III

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

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4/13/2016

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1			3			TOTAL SHEETS
2			4			110

DRAWN BY : T.L. AVERETTE DATE : 1-16
CHECKED BY : J.P. ADAMS DATE : 2-16
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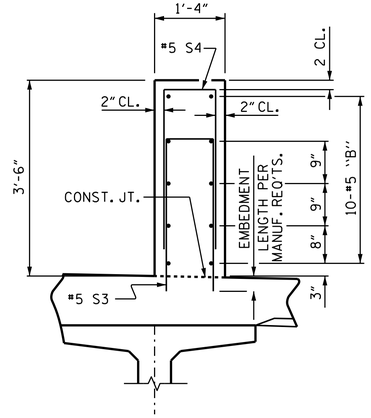
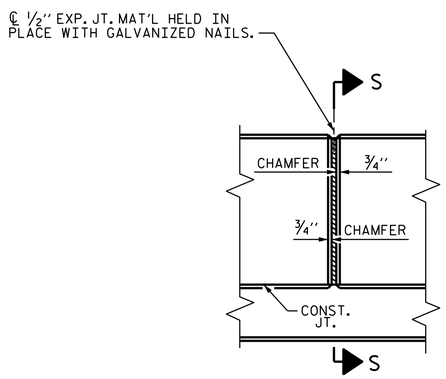
STR. #1



SECTION THROUGH PARAPET

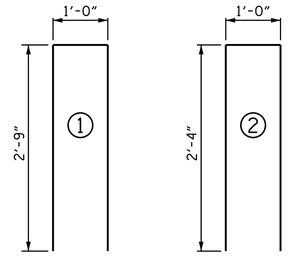
THE #5 S3 BARS SHALL BE ADHESIVELY ANCHORED. THE YIELD LOAD FOR THE #5 S3 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES

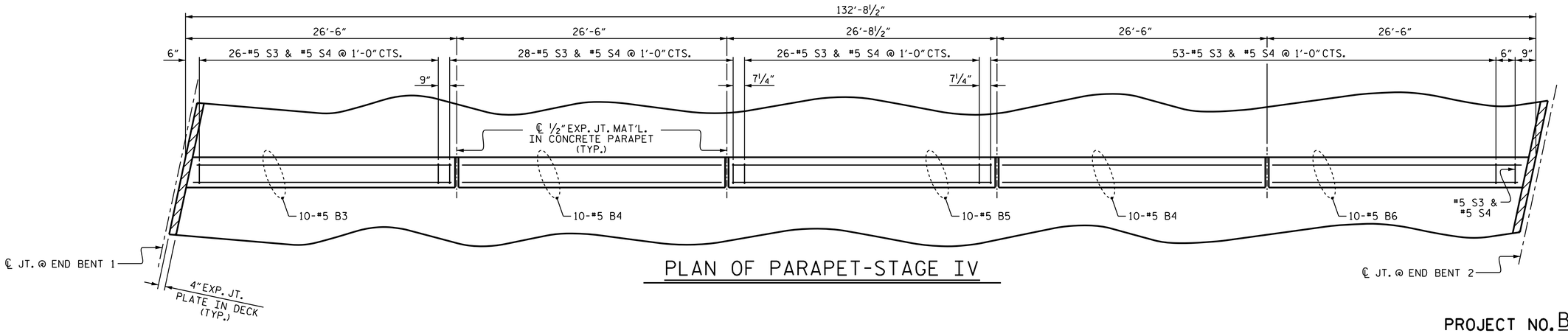


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL-STAGE IV

CONCRETE PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B3	10	#5	STR	25'-10"	269
* B4	20	#5	STR	26'-1"	544
* B5	10	#5	STR	26'-4"	275
* B6	10	#5	STR	25'-6"	266
* S3	134	#5	1	6'-6"	908
* S4	134	#5	2	5'-8"	792
*EPOXY COATED REINF. STEEL					3054 LBS.
CLASS AA CONCRETE					22.9 C.Y.
1'-4" X 3'-6" CONCRETE PARAPET					132.71 L.F.



PLAN OF PARAPET-STAGE IV

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

NOTES

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

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

FOR CONCRETE PARAPET ON APPROACH SLABS, SEE APPROACH SLAB SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: Kristy W. Alford F24583893D8F40E...

4/13/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET DETAILS

STAGE IV

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : T.L. AVERETTE DATE : 1-16
CHECKED BY : J.P. ADAMS DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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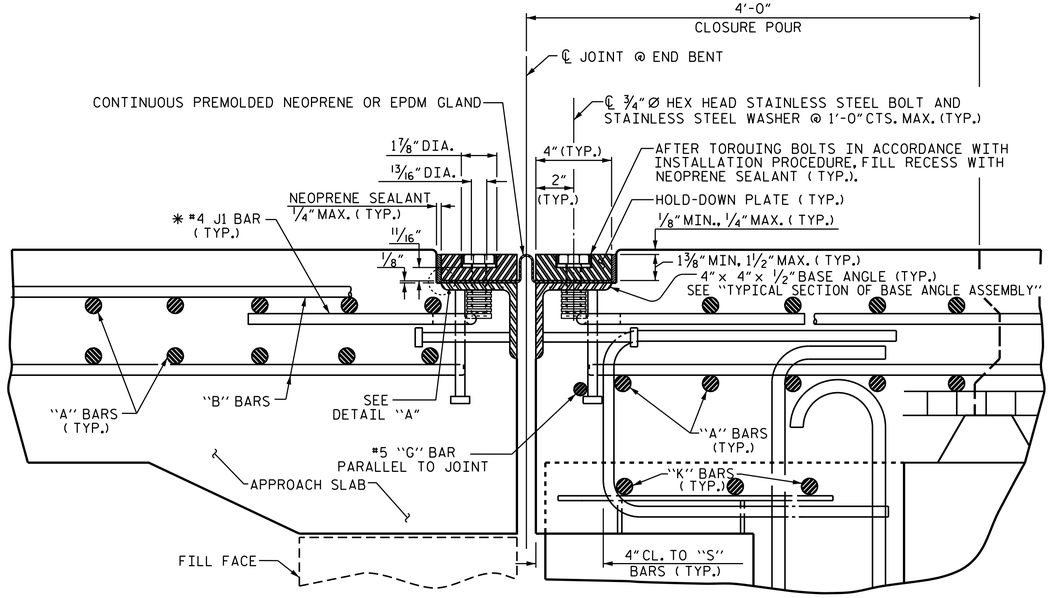
STR. #1



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

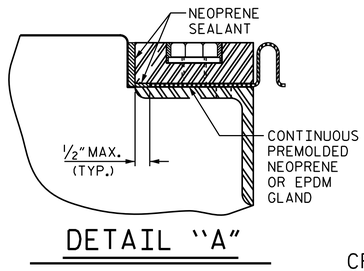
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

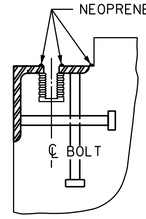
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅛" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

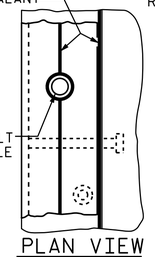
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



DETAIL "A"

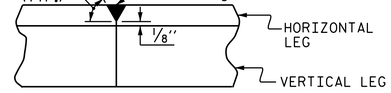


CROSS SECTION



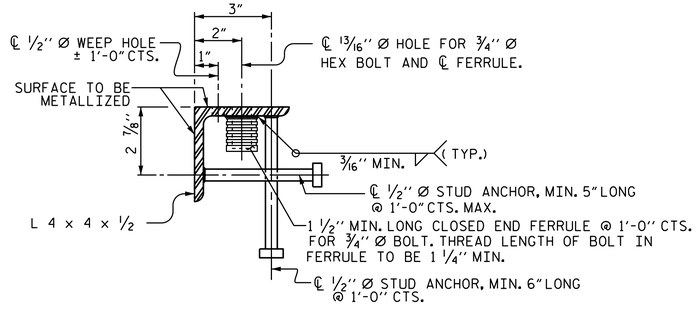
PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	101°-58'-04"	13/16"	1 9/16"	1 7/16"	1 1/8"
END BENT 2	101°-58'-04"	———	———	1 7/16"	———



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
DocuSigned by: [signature] 4/13/2016

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT SEAL DETAILS

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

SHEET NO. S-23
TOTAL SHEETS 110

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ASSEMBLED BY : T.L. AVERETTE	DATE : 12-15
CHECKED BY : J.P. ADAMS	DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE	DATE : 2-16
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

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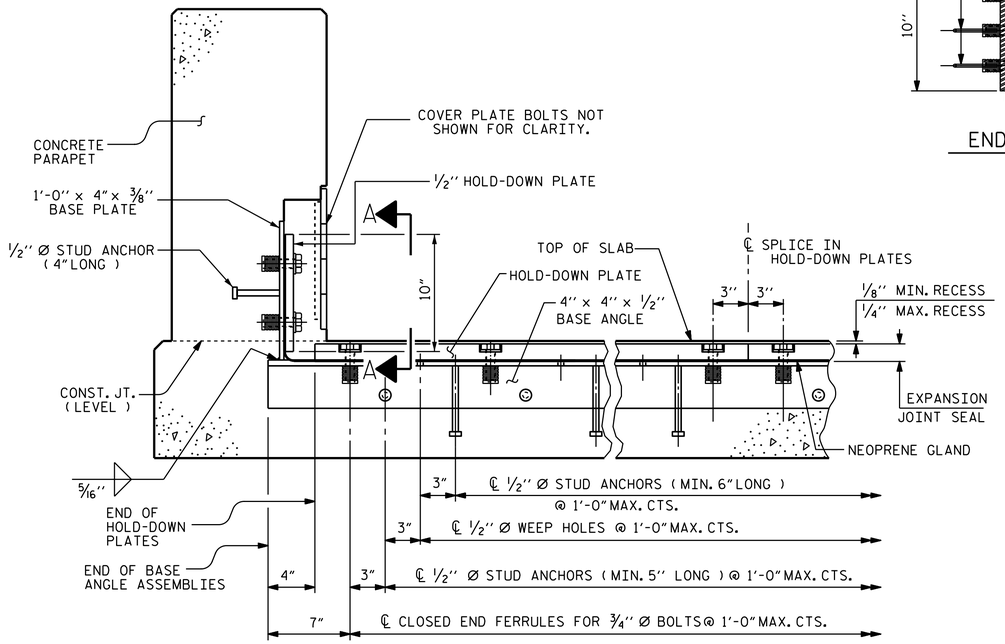
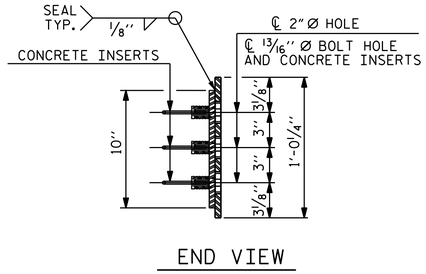
jpadams

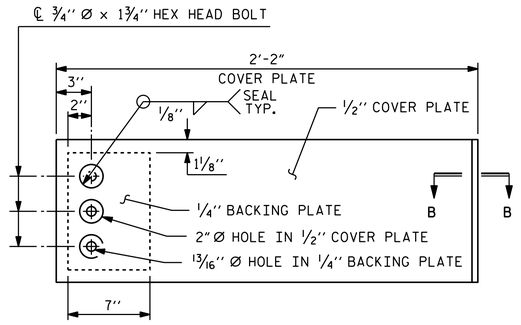
STR. #1 STD. NO. EJS1 (SHT 1)



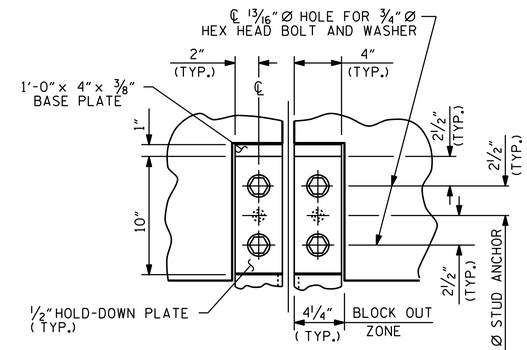
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

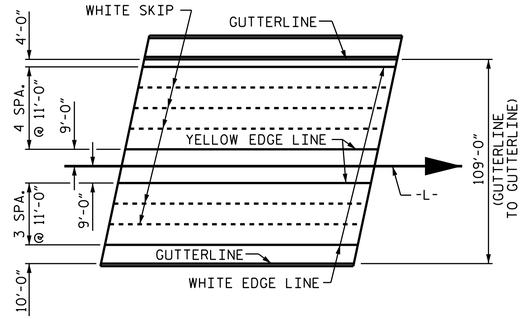


TYPE I - ELEVATION VIEW

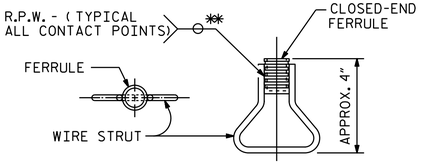


SECTION A - A

COVER PLATE DETAILS



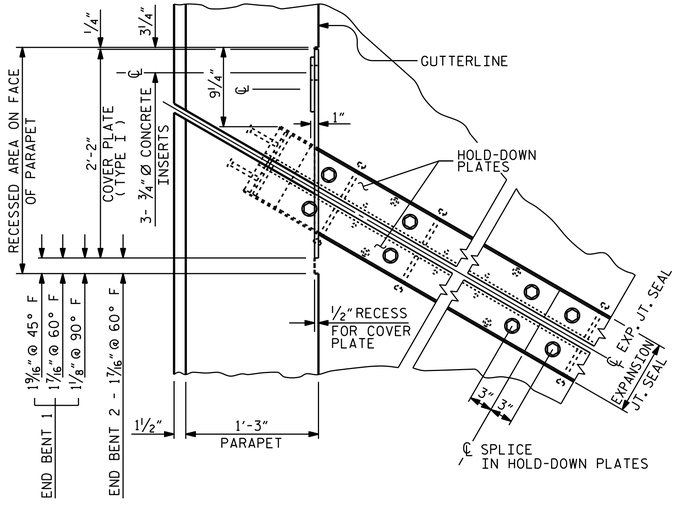
PAVEMENT MARKING ALIGNMENT



PLAN ELEVATION

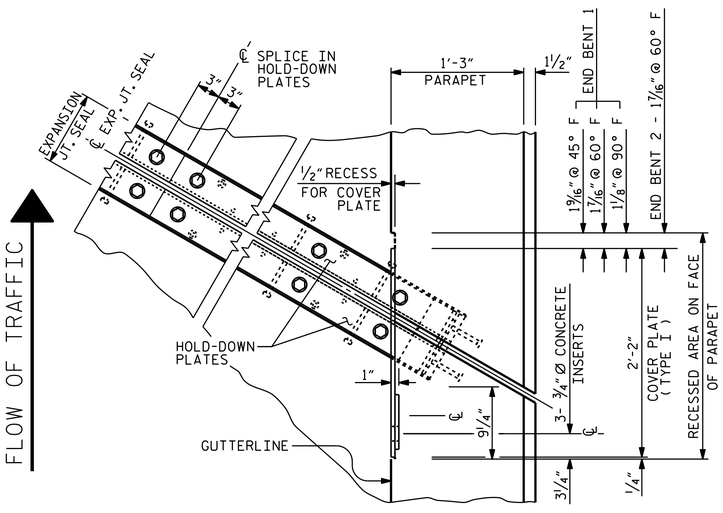
CONCRETE INSERT

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

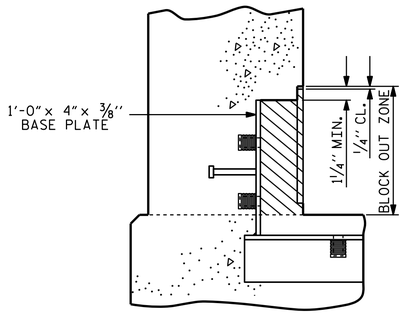


FLOW OF TRAFFIC

FLOW OF TRAFFIC

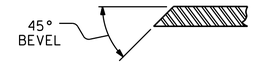


PLAN OF EXPANSION JOINT SEAL



BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



SECTION B - B

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...

4/13/2016

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

SHEET NO. S-24

TOTAL SHEETS 110

STR. #1

STD. NO. EJS2

ASSEMBLED BY : T.L. AVERETTE			DATE : 12-15
CHECKED BY : J.P. ADAMS			DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE			DATE : 2-16
DRAWN BY : REK 9/87	REV. 10/1/11	MAA/GM	
CHECKED BY : CRK 10/87	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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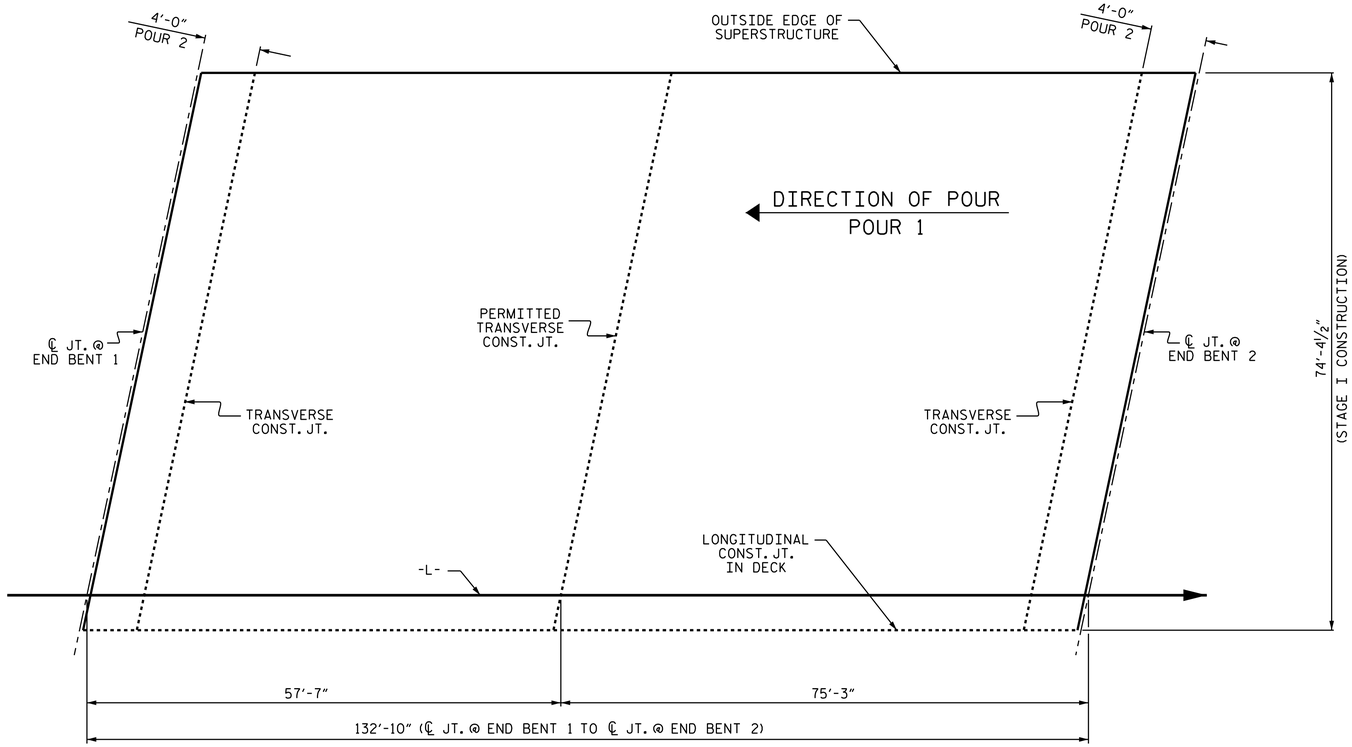
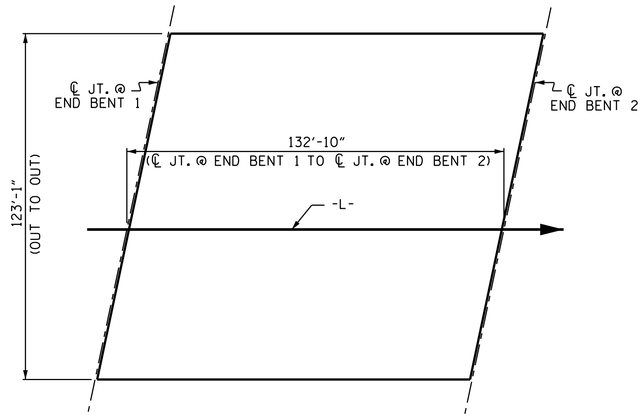
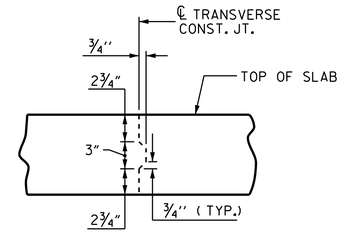


POURING SEQUENCE
(STAGE I)

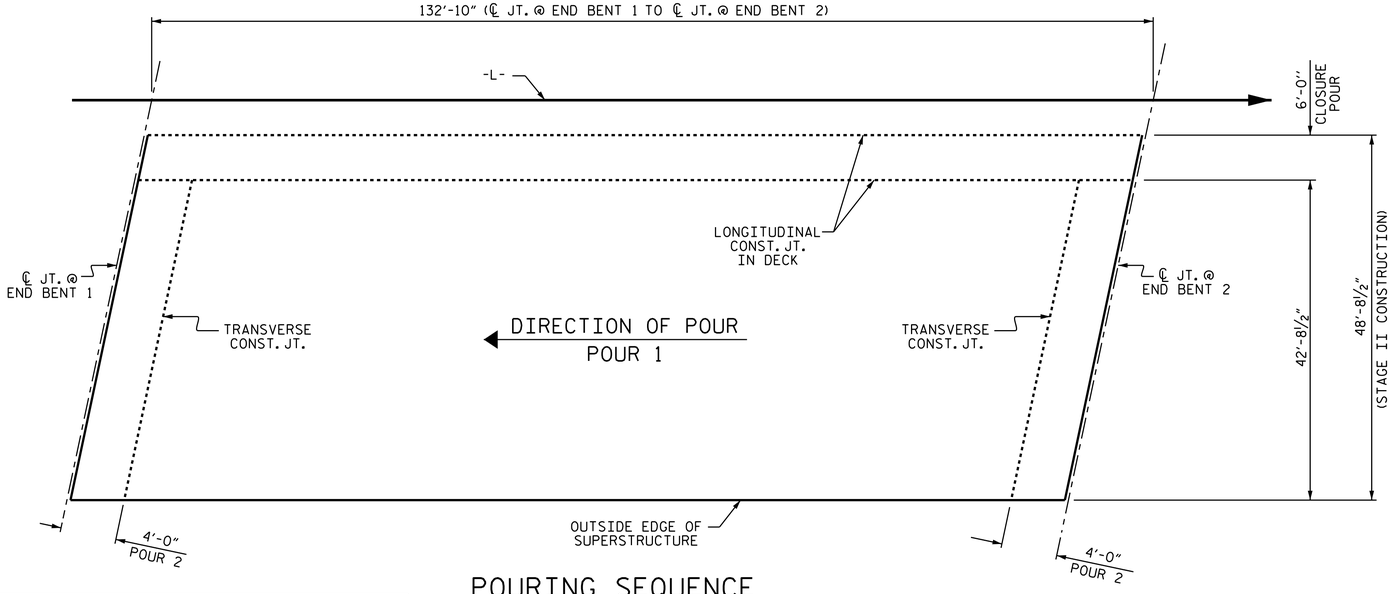


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 16,350)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE
(STAGE II)

SAND LIGHTWEIGHT CONCRETE BREAKDOWN	
STAGE I	
POUR 1	289.1 C.Y.
POUR 2	28.8 C.Y.
TOTAL	317.9 C.Y.
STAGE II	
POUR 1	166.2 C.Y.
POUR 2	17.0 C.Y.
6'-0" CLOSURE POUR	25.1 C.Y.
TOTAL	208.3 C.Y.
CLASS AA CONCRETE BREAKDOWN	
STAGE III	
CONCRETE MEDIAN	21.5 C.Y.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893088F40E... 4/13/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE DECK POUR DETAILS

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

SHEET NO. S-25

TOTAL SHEETS 110

DRAWN BY : T.L. AVERETTE DATE : 12-15
CHECKED BY : J.P. ADAMS DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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jpadams

STR. #1

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	398	#5	STR	38'-4"	15913
A2	398	#5	STR	38'-2"	15844
✱ A101	4	#5	STR	37'-5"	156
✱ A102	4	#5	STR	36'-0"	150
✱ A103	4	#5	STR	34'-8"	145
✱ A104	4	#5	STR	33'-3"	139
✱ A105	4	#5	STR	31'-11"	133
✱ A106	2	#5	STR	58'-5"	122
✱ A107	2	#5	STR	55'-8"	116
✱ A108	2	#5	STR	52'-11"	110
✱ A109	2	#5	STR	50'-2"	105
✱ A110	2	#5	STR	47'-5"	99
✱ A111	2	#5	STR	44'-8"	93
✱ A112	2	#5	STR	41'-11"	87
✱ A113	2	#5	STR	39'-2"	82
✱ A114	2	#5	STR	36'-5"	76
✱ A115	2	#5	STR	33'-7"	70
✱ A116	2	#5	STR	30'-10"	64
✱ A117	2	#5	STR	28'-1"	59
✱ A118	2	#5	STR	25'-4"	53
✱ A119	2	#5	STR	22'-7"	47
✱ A120	2	#5	STR	19'-10"	41
✱ A121	2	#5	STR	17'-1"	36
✱ A122	2	#5	STR	14'-4"	30
✱ A123	2	#5	STR	11'-7"	24
✱ A124	2	#5	STR	8'-10"	18
✱ A125	2	#5	STR	6'-1"	13
✱ A126	2	#5	STR	3'-4"	7
A201	4	#5	STR	38'-1"	159
A202	4	#5	STR	36'-8"	153
A203	4	#5	STR	35'-4"	147
A204	4	#5	STR	33'-11"	142
A205	4	#5	STR	32'-7"	136
A206	4	#5	STR	31'-2"	130
A207	2	#5	STR	57'-4"	120
A208	2	#5	STR	54'-7"	114
A209	2	#5	STR	51'-10"	108
A210	2	#5	STR	49'-1"	102
A211	2	#5	STR	46'-4"	97
A212	2	#5	STR	43'-7"	91
A213	2	#5	STR	40'-10"	85
A214	2	#5	STR	38'-1"	79
A215	2	#5	STR	35'-4"	74
A216	2	#5	STR	32'-7"	68
A217	2	#5	STR	29'-10"	62
A218	2	#5	STR	27'-1"	56
A219	2	#5	STR	24'-4"	51
A220	2	#5	STR	21'-7"	45
A221	2	#5	STR	18'-10"	39
A222	2	#5	STR	16'-1"	34
A223	2	#5	STR	13'-4"	28
A224	2	#5	STR	10'-7"	22
A225	2	#5	STR	7'-10"	16
A226	2	#5	STR	5'-1"	11
A227	2	#5	STR	2'-4"	5
✱ B1	250	#4	STR	28'-1"	4690
B2	174	#5	STR	45'-7"	8273
✱ B10	6	#4	STR	5'-8"	23
✱ B11	2	#4	STR	5'-10"	8
✱ B12	2	#4	STR	6'-0"	8
✱ B13	2	#4	STR	6'-2"	8
✱ B14	2	#4	STR	6'-4"	8
✱ B15	2	#4	STR	6'-7"	9
✱ B16	2	#4	STR	6'-10"	9
✱ B17	2	#4	STR	7'-3"	10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B18	2	#4	STR	7'-7"	10
✱ B19	2	#4	STR	8'-1"	11
✱ B20	2	#4	STR	8'-8"	12
✱ B21	2	#4	STR	9'-4"	12
✱ B22	2	#4	STR	10'-2"	14
✱ B23	2	#4	STR	11'-6"	15
✱ B24	2	#4	STR	5'-0"	7
✱ B25	1	#4	STR	5'-3"	4
✱ B26	1	#4	STR	5'-7"	4
✱ B27	1	#4	STR	5'-11"	4
✱ B28	1	#4	STR	6'-5"	4
✱ B29	1	#4	STR	7'-1"	5
✱ B30	1	#4	STR	7'-10"	5
✱ B31	1	#4	STR	8'-10"	6
✱ B32	1	#4	STR	10'-1"	7
✱ B33	1	#4	STR	11'-11"	8
✱ G2	2	#5	STR	49'-5"	103

REINFORCING STEEL	LBS.	26,291
✱ EPOXY COATED REINFORCING STEEL	LBS.	29,569

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A3	209	#5	STR	48'-4"	10536
A4	209	#5	STR	48'-4"	10536
✱ A301	2	#5	STR	45'-7"	95
✱ A302	2	#5	STR	42'-10"	89
✱ A303	2	#5	STR	40'-1"	84
✱ A304	2	#5	STR	37'-4"	78
✱ A305	2	#5	STR	34'-7"	72
✱ A306	2	#5	STR	31'-10"	66
✱ A307	2	#5	STR	29'-1"	61
✱ A308	2	#5	STR	26'-4"	55
✱ A309	2	#5	STR	23'-7"	49
✱ A310	2	#5	STR	20'-10"	43
✱ A311	2	#5	STR	18'-0"	38
✱ A312	2	#5	STR	15'-3"	32
✱ A313	2	#5	STR	12'-6"	26
✱ A314	2	#5	STR	9'-9"	20
✱ A315	2	#5	STR	7'-0"	15
✱ A316	2	#5	STR	4'-3"	9
✱ A317	2	#5	STR	1'-6"	3
A401	2	#5	STR	47'-3"	99
A402	2	#5	STR	44'-6"	93
A403	2	#5	STR	41'-9"	87
A404	2	#5	STR	39'-0"	81
A405	2	#5	STR	36'-3"	76
A406	2	#5	STR	33'-6"	70
A407	2	#5	STR	30'-9"	64
A408	2	#5	STR	28'-0"	58
A409	2	#5	STR	25'-3"	53
A410	2	#5	STR	22'-6"	47
A411	2	#5	STR	19'-9"	41
A412	2	#5	STR	17'-0"	35
A413	2	#5	STR	14'-3"	30
A414	2	#5	STR	11'-6"	24
A415	2	#5	STR	8'-9"	18
A416	2	#5	STR	6'-0"	13
A417	2	#5	STR	3'-3"	7
✱ B1	170	#4	STR	28'-1"	3189
B2	111	#5	STR	45'-7"	5277
✱ B10	6	#4	STR	5'-8"	23
✱ B11	2	#4	STR	5'-10"	8
✱ B12	2	#4	STR	6'-0"	8
✱ B13	2	#4	STR	6'-2"	8
✱ B14	2	#4	STR	6'-4"	8
✱ B15	2	#4	STR	6'-7"	9
✱ B16	2	#4	STR	6'-10"	9
✱ B17	2	#4	STR	7'-3"	10
✱ B18	2	#4	STR	7'-7"	10
✱ B19	2	#4	STR	8'-1"	11
✱ B20	2	#4	STR	8'-8"	12
✱ B21	2	#4	STR	9'-4"	12
✱ B22	2	#4	STR	10'-2"	14
✱ B23	2	#4	STR	11'-6"	15
✱ B24	2	#4	STR	5'-0"	7
✱ B25	1	#4	STR	5'-3"	4
✱ B26	1	#4	STR	5'-7"	4
✱ B27	1	#4	STR	5'-11"	4
✱ B28	1	#4	STR	6'-5"	4
✱ B29	1	#4	STR	7'-1"	5
✱ B30	1	#4	STR	7'-10"	5
✱ B31	1	#4	STR	8'-10"	6
✱ B32	1	#4	STR	10'-1"	7
✱ B33	1	#4	STR	11'-11"	8
✱ G2	2	#5	STR	49'-5"	103

REINFORCING STEEL	LBS.	16,709
✱ EPOXY COATED REINFORCING STEEL	LBS.	17,757

STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B7	35	#4	STR	28'-0"	655
✱ G3	89	#4	STR	9'-2"	545

✱ EPOXY COATED REINFORCING STEEL	LBS.	1,200

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND SIDEWALK		APPROACH SLABS		PARAPET AND SIDEWALK
	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 FLOOR

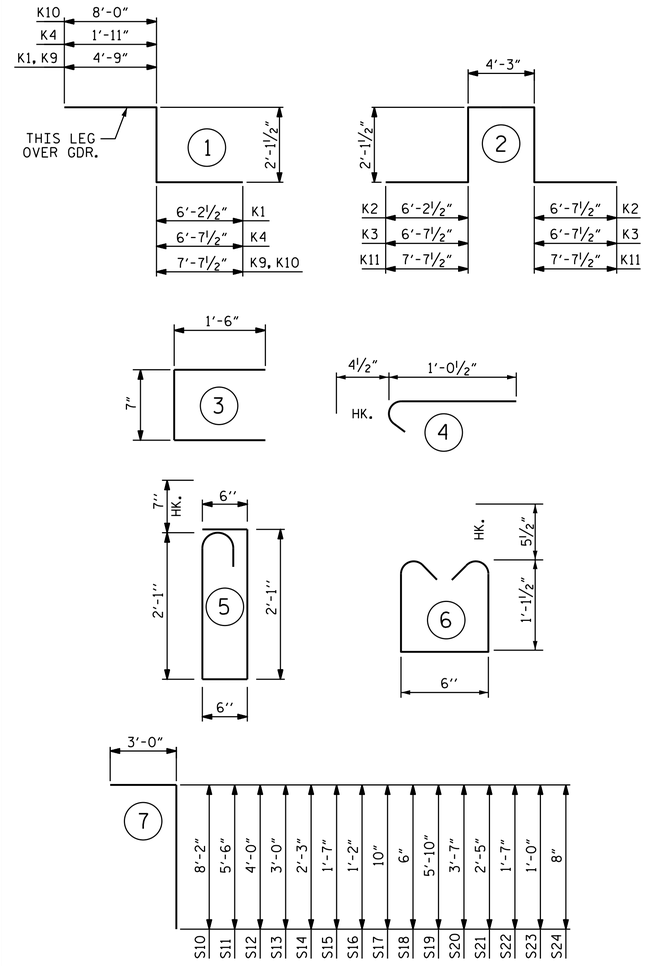
APPROACH SLABS	5,747 SQ. FT.
BRIDGE DECK	15,450 SQ. FT.
TOTAL	21,197 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL

	SAND LIGHTWEIGHT CONCRETE	CLASS AA CONCRETE	REINFORCING STEEL	✱EPOXY COATED REINFORCING STEEL
	(CU. YDS.)		(LBS.)	(LBS.)
STAGE I	317.9	-	26,291	29,569
STAGE II	208.3	-	16,709	17,757
STAGE III	-	21.5	-	1,200
TOTAL ✱✱	526.2	21.5	43,000	48,526

✱✱QUANTITIES FOR PARAPETS ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...
4/13/2016

DRAWN BY : T.L. AVERETTE DATE : 2-16
CHECKED BY : J.P. ADAMS DATE : 2-16
DESIGN ENGINEER OF RECORD: T.L. AVERETTE DATE : 2-16

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SHEET NO. S-26

TOTAL SHEETS 110

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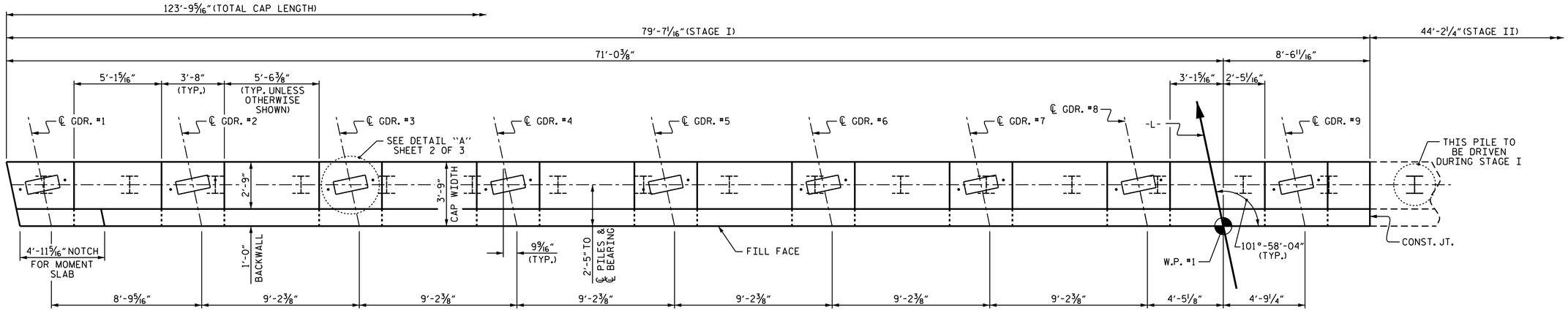

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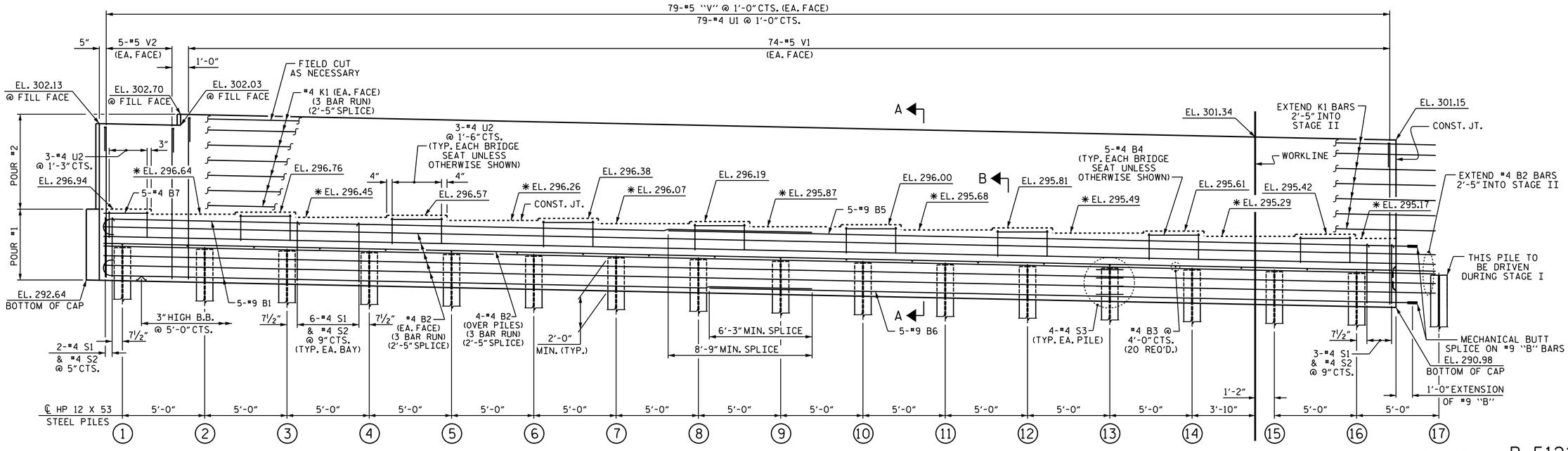

ELEVATION

*FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 3 OF 3.

FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 3.

FOR SHEAR KEY DETAIL, SEE SHEET 3 OF 3.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KERSTIN W. ALFORD

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SHEET NO. S-27

TOTAL SHEETS 110

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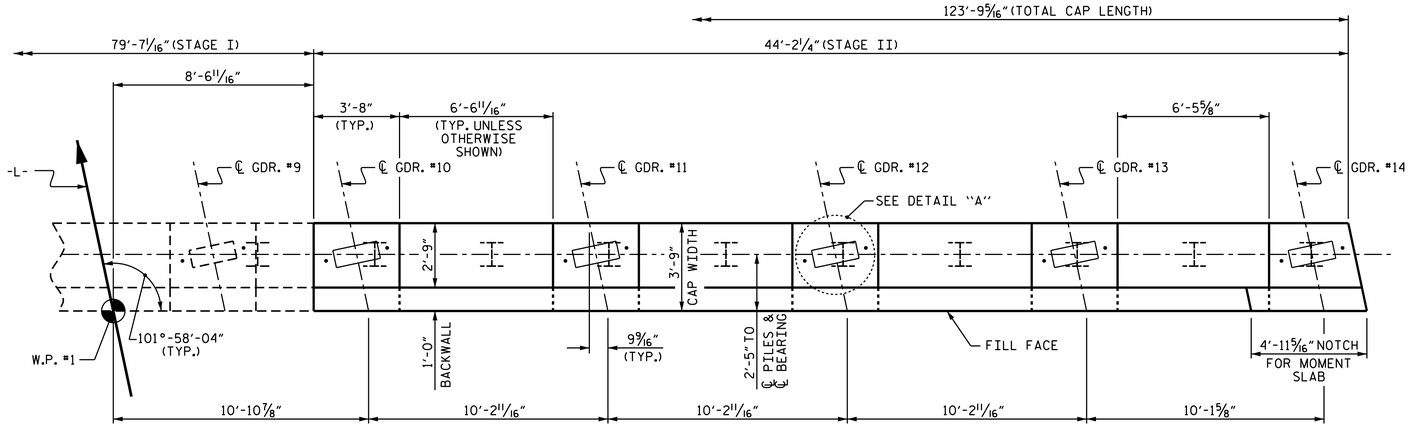

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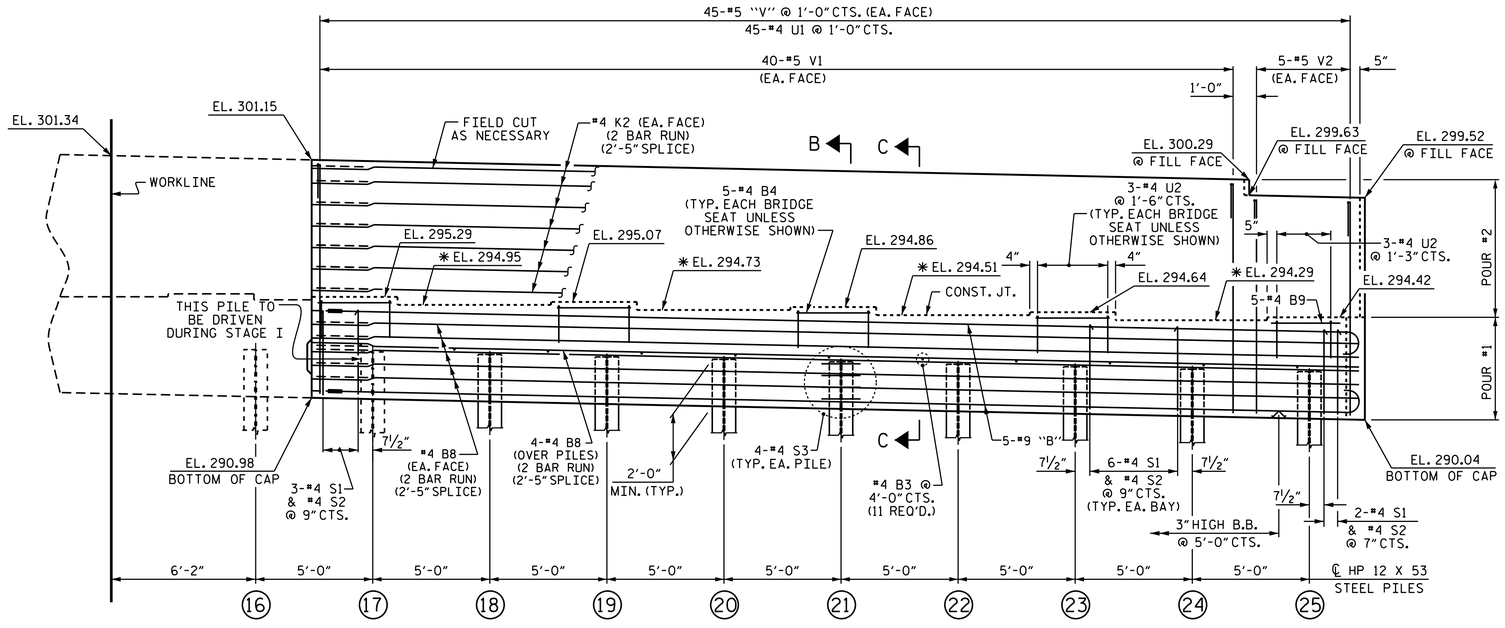


ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 3 OF 3.

FOR SHEAR KEY DETAIL, SEE SHEET 3 OF 3.

NOTES

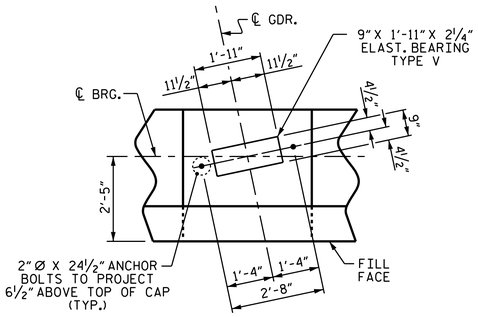
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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 MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.



DETAIL "A"

(TYP. EA. GDR.)

TOP OF PILE ELEVATIONS

1	294.62
2	294.52
3	294.41
4	294.31
5	294.20
6	294.10
7	293.99
8	293.89
9	293.78
10	293.68
11	293.57
12	293.47
13	293.36
14	293.26
15	293.15
16	293.05
17	292.94
18	292.84
19	292.73
20	292.63
21	292.52
22	292.42
23	292.31
24	292.21
25	292.10

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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SHEET NO. S-28

TOTAL SHEETS 110

STR. #1

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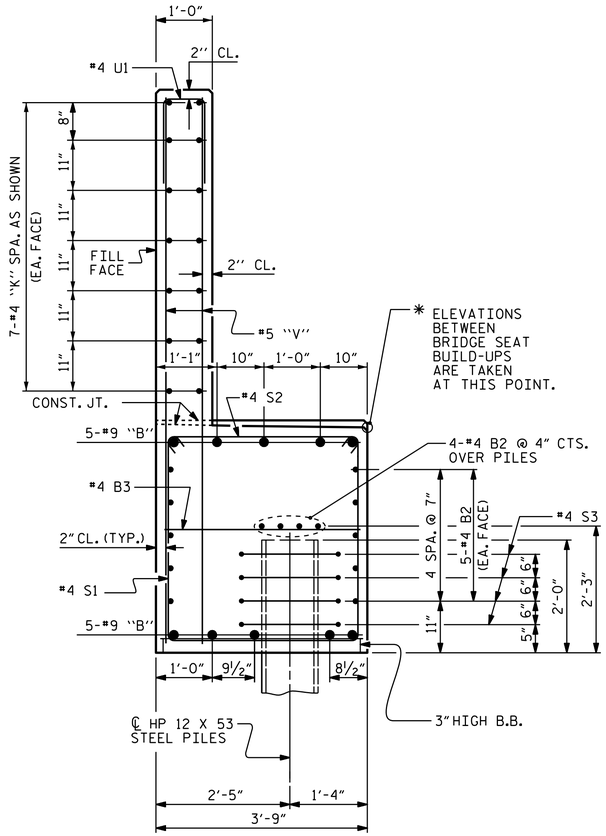
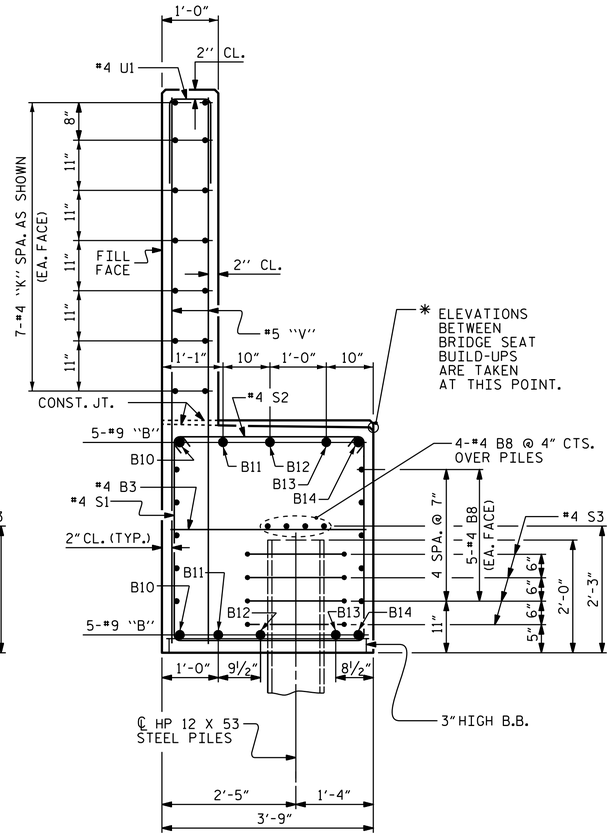
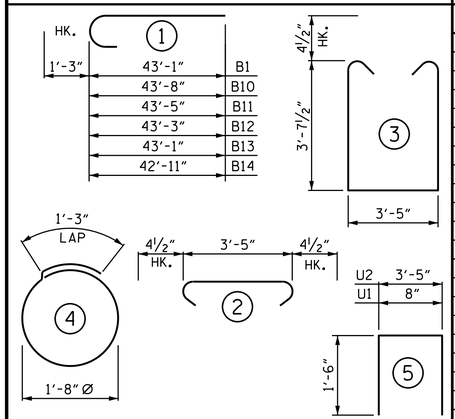


SECTION A-A



SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL END BENT 1 - STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	44'-4"	1507
B2	42	#4	STR	28'-11"	811
B3	20	#4	STR	3'-5"	46
B4	40	#4	STR	3'-4"	89
B5	5	#9	STR	43'-5"	738
B6	5	#9	STR	45'-11"	781
B7	5	#4	STR	2'-10"	9
K1	42	#4	STR	28'-9"	807
S1	95	#4	3	11'-5"	725
S2	95	#4	2	4'-2"	264
S3	64	#4	4	6'-6"	278
U1	79	#4	5	3'-8"	193
U2	27	#4	5	6'-5"	116
V1	148	#5	STR	9'-9"	1505
V2	10	#5	STR	9'-1"	95

REINFORCING STEEL = 7,964 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	46.4 C.Y.
POUR #2 BACKWALL	17.3 C.Y.
TOTAL CLASS A CONCRETE	63.7 C.Y.

HP 12 X 53 STEEL PILES

NO. = 17 — 510 LIN. FT.

STEEL PILE POINTS 17 EA.

BILL OF MATERIAL END BENT 1 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	11	#4	STR	3'-5"	25
B4	20	#4	STR	3'-4"	45
B8	28	#4	STR	23'-8"	443
B9	5	#4	STR	3'-0"	10
B10	2	#9	1	44'-11"	305
B11	2	#9	1	44'-8"	304
B12	2	#9	1	44'-6"	303
B13	2	#9	1	44'-4"	301
B14	2	#9	1	44'-2"	300
K2	28	#4	STR	23'-7"	441
S1	53	#4	3	11'-5"	404
S2	53	#4	2	4'-2"	148
S3	36	#4	4	6'-6"	156
U1	45	#4	5	3'-8"	110
U2	15	#4	5	6'-5"	64
V1	80	#5	STR	9'-9"	814
V2	10	#5	STR	9'-1"	95

REINFORCING STEEL = 4,268 LBS

CLASS A CONCRETE BREAKDOWN

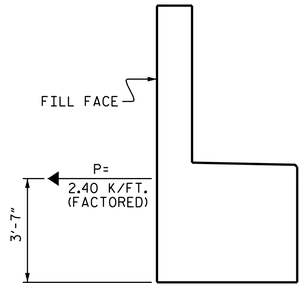
POUR #1 CAP	26.0 C.Y.
POUR #2 BACKWALL	9.8 C.Y.
TOTAL CLASS A CONCRETE	35.8 C.Y.

HP 12 X 53 STEEL PILES

NO. = 8 — 240 LIN. FT.

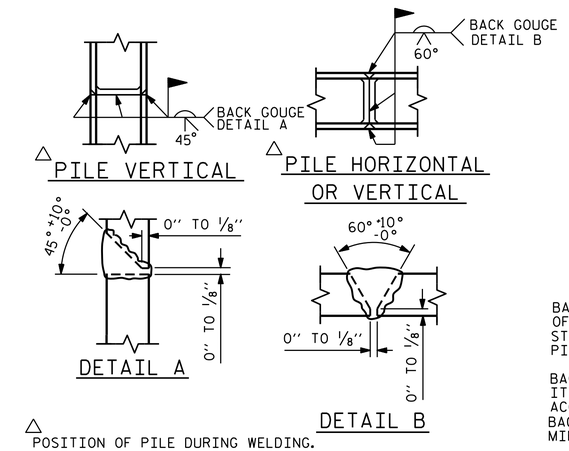
STEEL PILE POINTS 8 EA.

PILE EXCAVATION IN SOIL 112 LIN. FT.
PILE EXCAVATION NOT IN SOIL 18 LIN. FT.



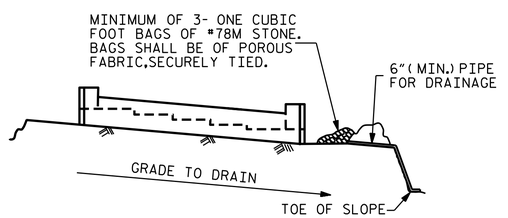
TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

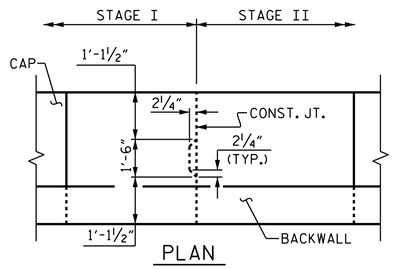


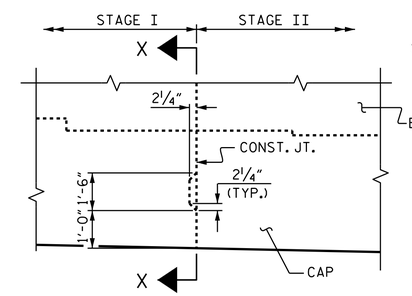
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

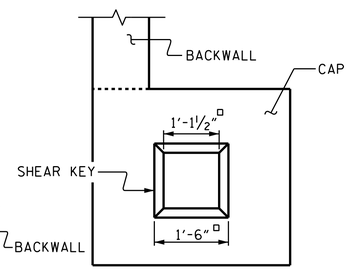
TEMPORARY DRAINAGE AT END BENT

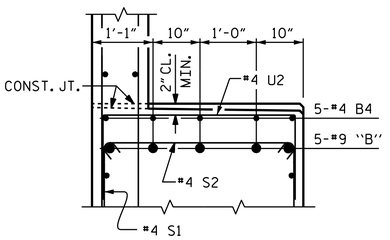




SHEAR KEY DETAIL

REINFORCING STEEL NOT SHOWN





PARTIAL SECTION B

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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SHEET NO. S-29

TOTAL SHEETS 110

STR. #1

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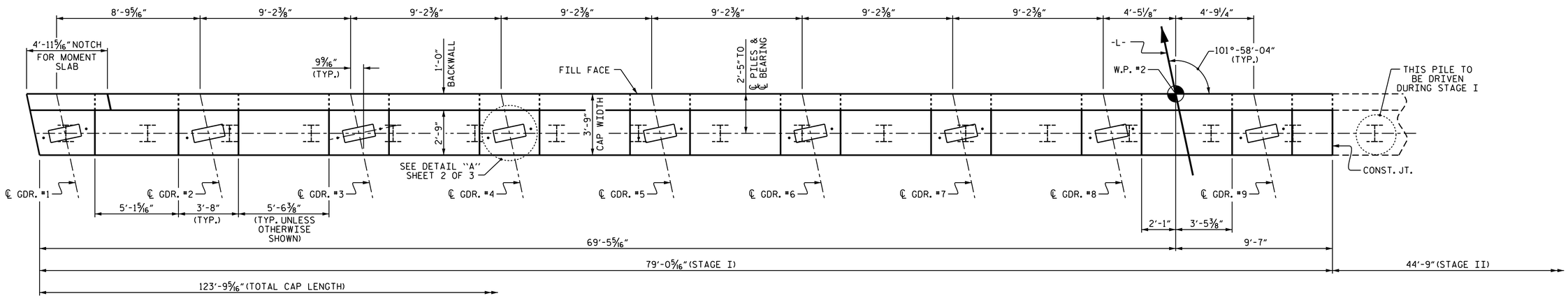

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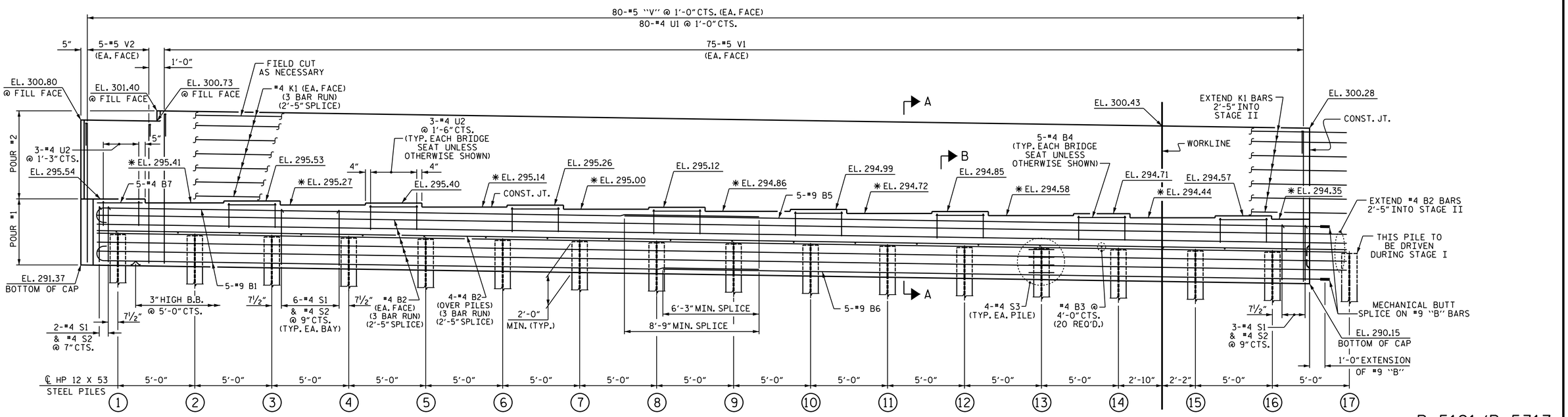

ELEVATION

*FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 3 OF 3.

FOR TOP OF PILE ELEVATIONS, SEE SHEET 2 OF 3.

FOR SHEAR KEY DETAIL, SEE SHEET 3 OF 3.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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2			4			110

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CHECKED BY :	J.P. ADAMS	DATE :	2-16
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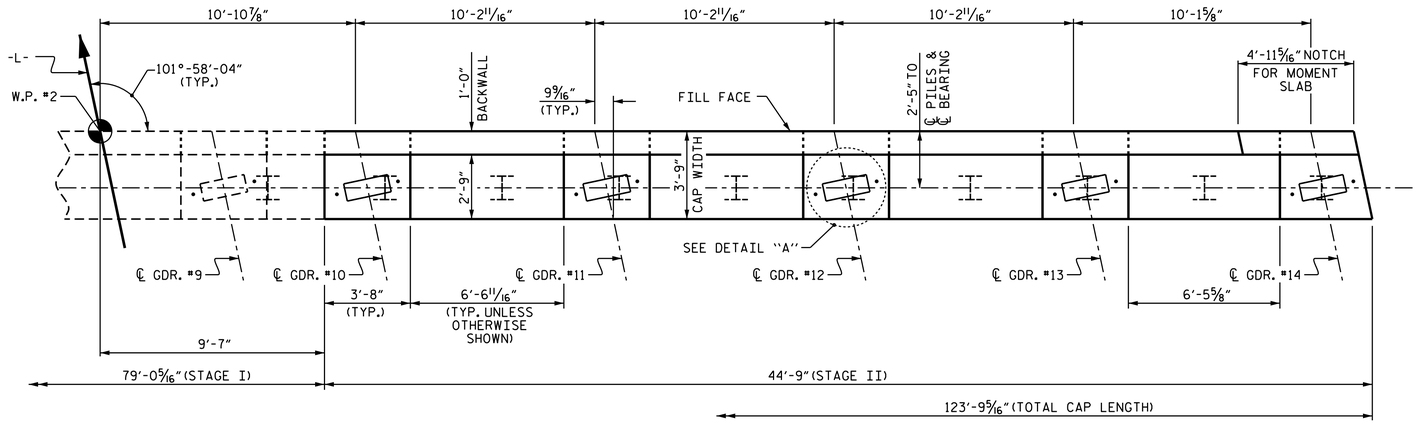
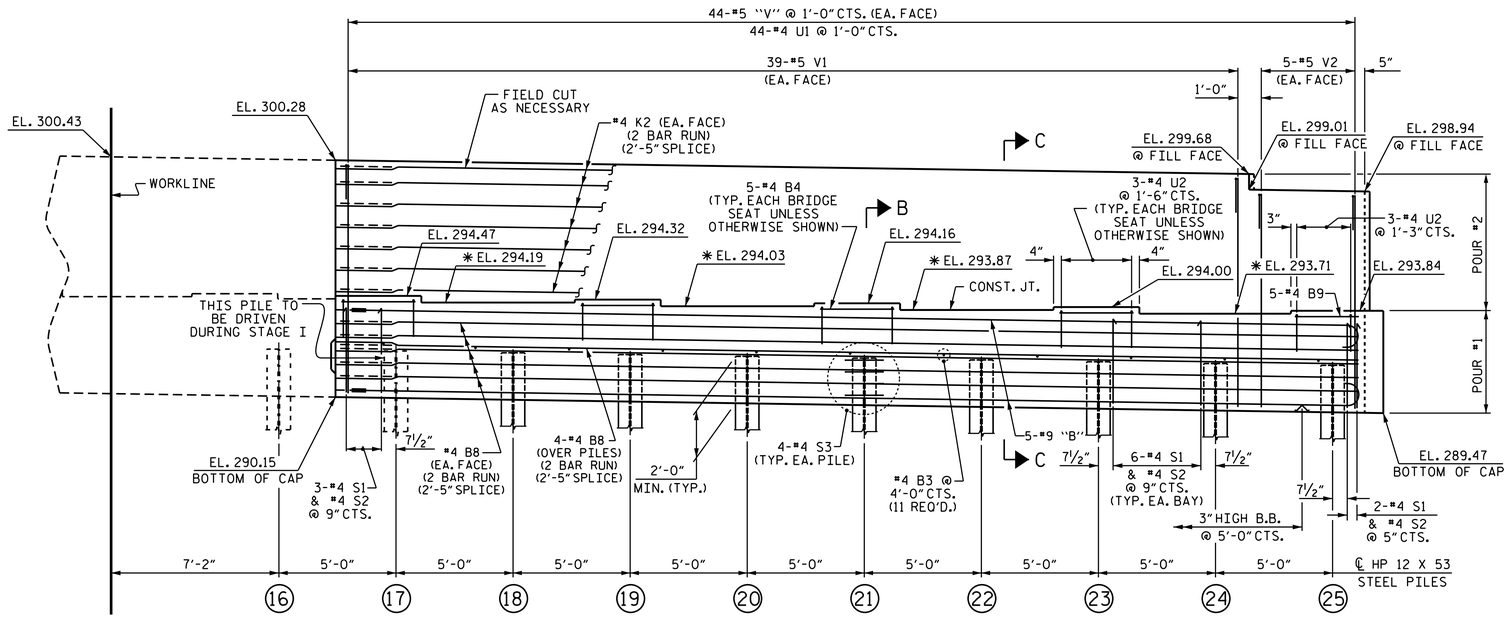


PLAN



ELEVATION

* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SHEET 3 OF 3.

FOR SHEAR KEY DETAIL, SEE SHEET 3 OF 3.

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

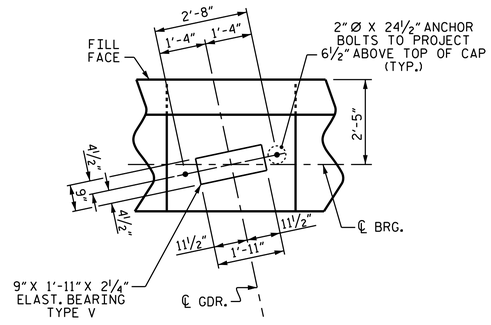
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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 MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.

TOP OF PILE ELEVATIONS

①	293.34
②	293.26
③	293.19
④	293.11
⑤	293.04
⑥	292.96
⑦	292.88
⑧	292.81
⑨	292.73
⑩	292.65
⑪	292.58
⑫	292.50
⑬	292.43
⑭	292.35
⑮	292.27
⑯	292.20
⑰	292.12
⑱	292.04
⑲	291.97
⑳	291.89
㉑	291.82
㉒	291.74
㉓	291.66
㉔	291.59
㉕	291.51



DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B930BF40E...
4/13/2016

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2			4			110

STR. #1

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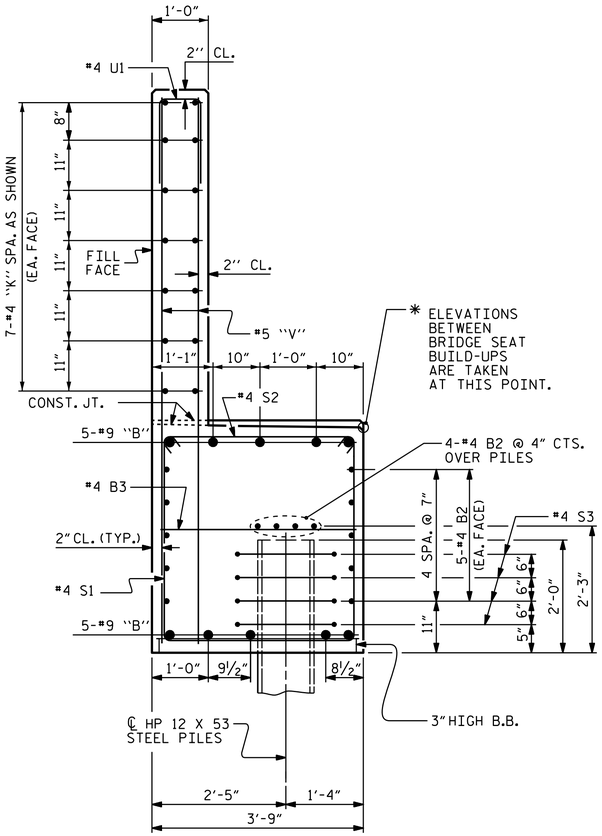
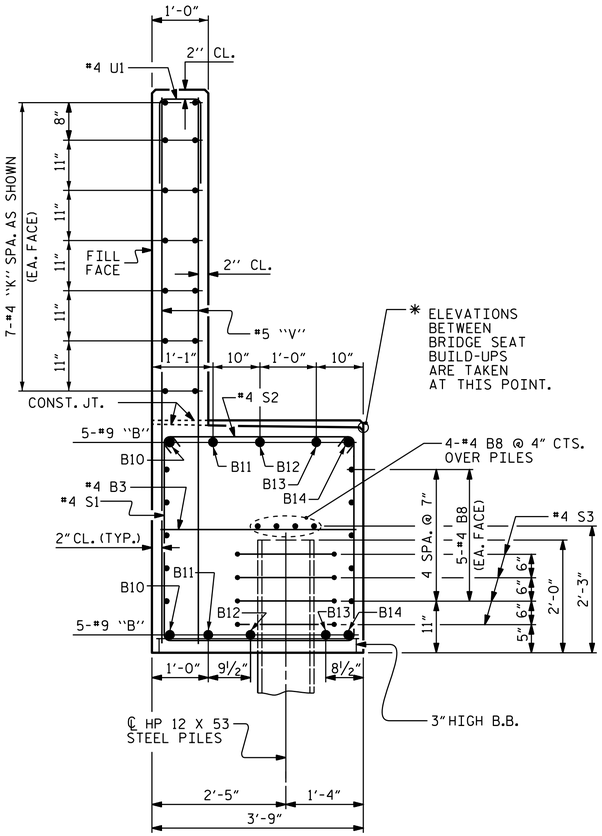
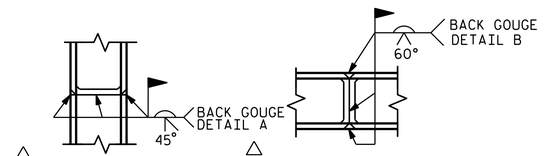


SECTION A-A



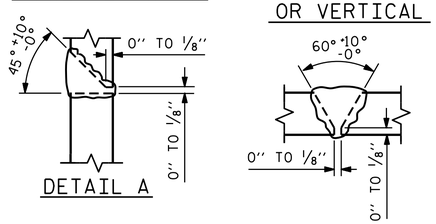
SECTION C-C

* ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS ARE TAKEN AT THIS POINT.



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

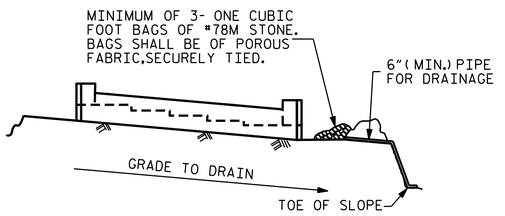


DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



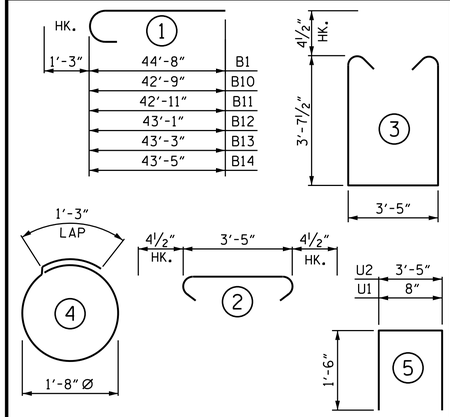
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

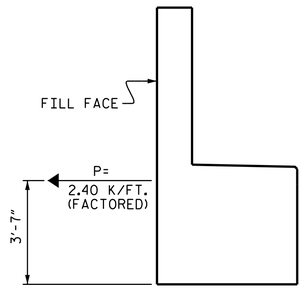
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)

BILL OF MATERIAL — END BENT 2 - STAGE I					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	45'-11"	1561
B2	42	#4	STR	29'-0"	814
B3	20	#4	STR	3'-5"	46
B4	40	#4	STR	3'-4"	89
B5	5	#9	STR	44'-9"	761
B6	5	#9	STR	42'-3"	718
B7	5	#4	STR	3'-0"	10
K1	42	#4	STR	29'-0"	814
S1	95	#4	3	11'-5"	725
S2	95	#4	2	4'-2"	264
S3	64	#4	4	6'-6"	278
U1	80	#4	5	3'-8"	196
U2	27	#4	5	6'-5"	116
V1	150	#5	STR	9'-9"	1525
V2	10	#5	STR	9'-1"	95

REINFORCING STEEL = 8,012 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	46.6 C.Y.
POUR #2 BACKWALL	17.3 C.Y.
TOTAL CLASS A CONCRETE	63.9 C.Y.

HP 12 X 53 STEEL PILES

NO. = 17 425 LIN. FT.

STEEL PILE POINTS 17 EA.

BILL OF MATERIAL — END BENT 2 - STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	11	#4	STR	3'-5"	25
B4	20	#4	STR	3'-4"	45
B8	28	#4	STR	23'-6"	440
B9	5	#4	STR	2'-10"	9
B10	2	#9	1	44'-0"	299
B11	2	#9	1	44'-2"	300
B12	2	#9	1	44'-4"	301
B13	2	#9	1	44'-6"	303
B14	2	#9	1	44'-8"	304
K2	28	#4	STR	23'-3"	435
S1	53	#4	3	11'-5"	404
S2	53	#4	2	4'-2"	148
S3	36	#4	4	6'-6"	156
U1	44	#4	5	3'-8"	108
U2	15	#4	5	6'-5"	64
V1	78	#5	STR	9'-9"	793
V2	10	#5	STR	9'-1"	95

REINFORCING STEEL = 4,229 LBS

CLASS A CONCRETE BREAKDOWN

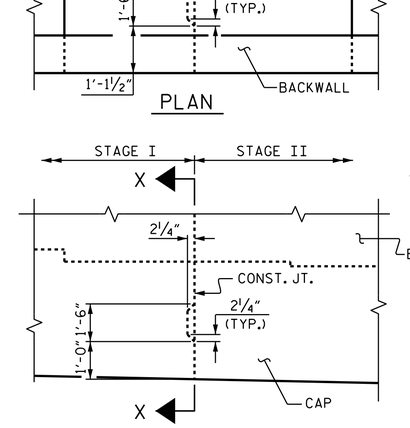
POUR #1 CAP	26.1 C.Y.
POUR #2 BACKWALL	9.5 C.Y.
TOTAL CLASS A CONCRETE	35.6 C.Y.

HP 12 X 53 STEEL PILES

NO. = 8 200 LIN. FT.

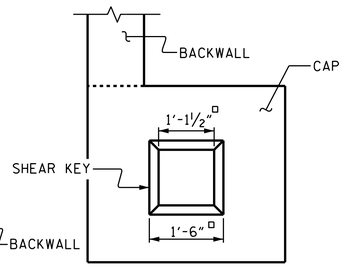
STEEL PILE POINTS 8 EA.

PILE EXCAVATION IN SOIL 35 LIN. FT.
PILE EXCAVATION NOT IN SOIL 20 LIN. FT.

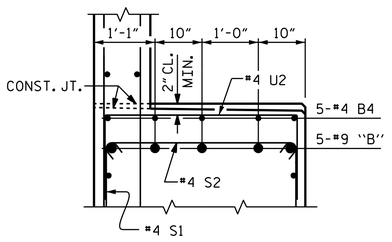


SHEAR KEY DETAIL

REINFORCING STEEL NOT SHOWN



SECTION X-X



PARTIAL SECTION B

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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1			3			TOTAL SHEETS
2			4			110

STR. #1

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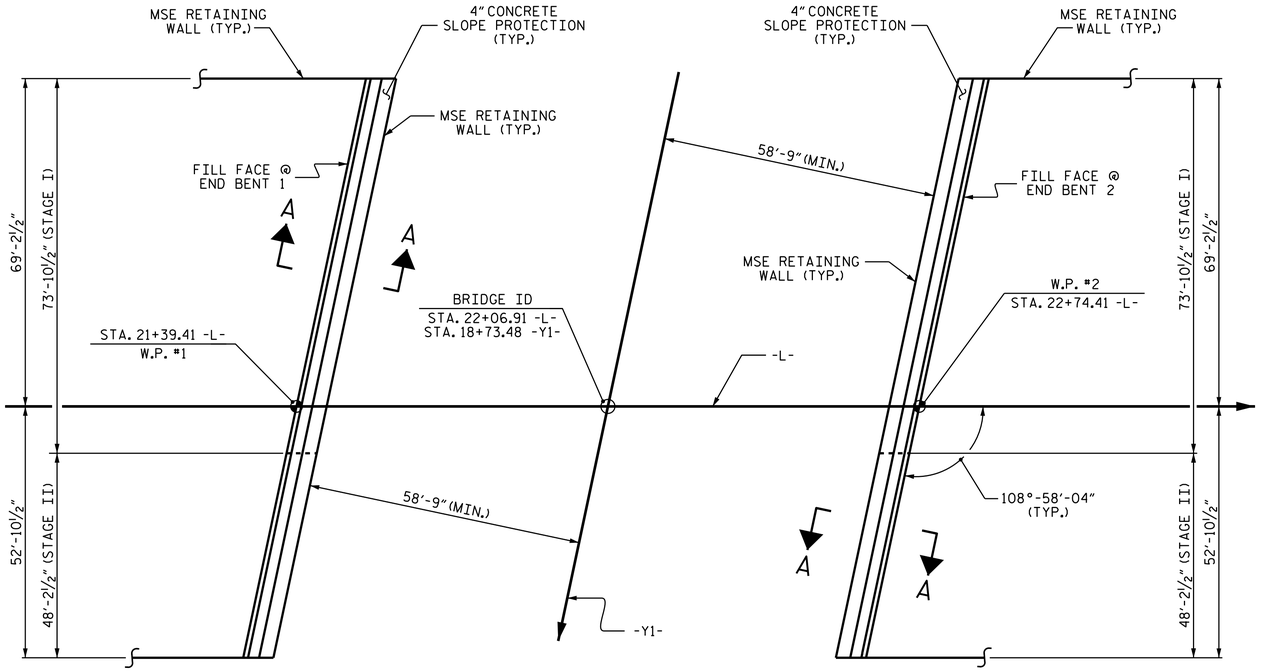


PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

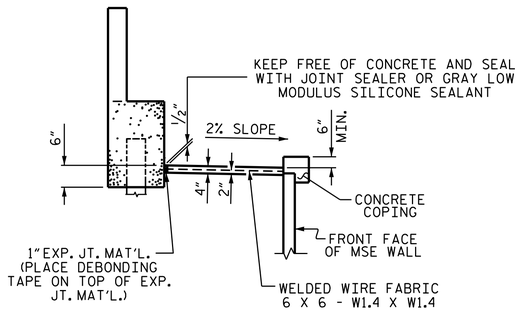
NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION 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.

BRIDGE @ STA. 22+06.91 -L-	4" SLOPE PROTECTION		✳WELDED WIRE FABRIC 60 INCHES WIDE	
	SQUARE YARDS		APPROX. L.F.	
	STAGE I	STAGE II	STAGE I	STAGE II
END BENT 1	25	15	50	30
END BENT 2	25	15	50	30

✳ QUANTITY SHOWN IS BASED ON 5' POURS.



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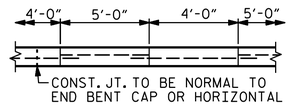
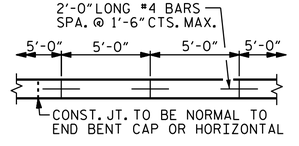


POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL



POURING DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			110

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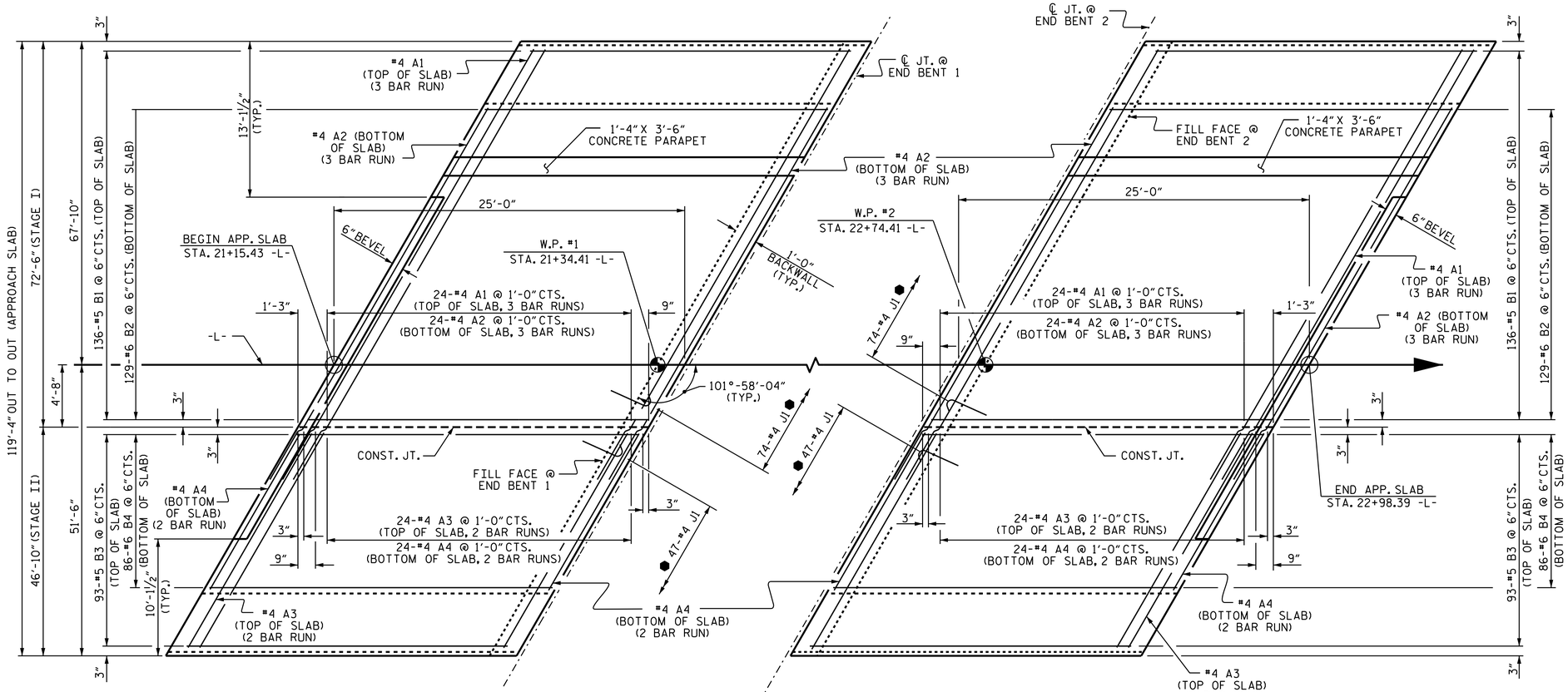
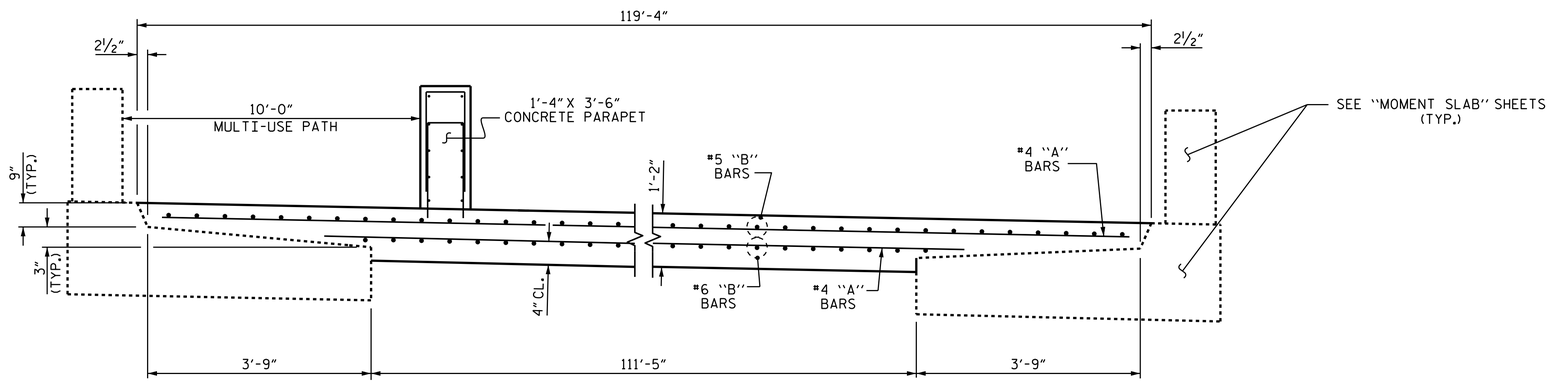
STR. #1



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
CONCRETE MEDIAN NOT SHOWN FOR CLARITY.
SEE SHEET 2 OF 2 FOR CONCRETE MEDIAN DETAILS.
⬢ FOR J1 BARS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET



SECTION THRU APPROACH SLAB

FOR PARAPET REINFORCING STEEL, SEE SHEET 2 OF 2.

NOTES

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

FOR MSE WALL BACKFILL, SEE "MSE RETAINING WALL" PLANS.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

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

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

FOR PARAPET AND MOMENT SLAB DETAILS, SEE "MOMENT SLAB" SHEETS.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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2			4			110

STR. #1

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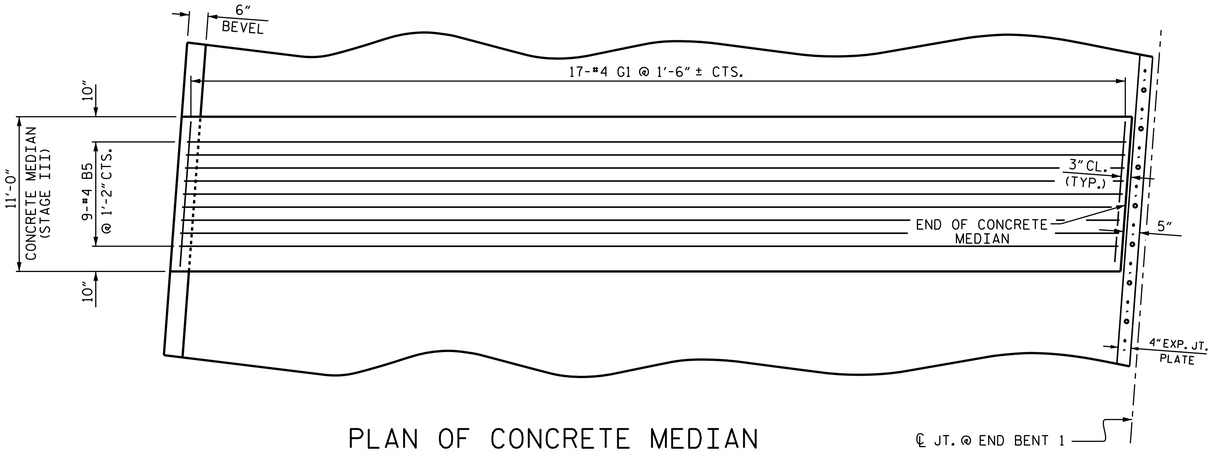
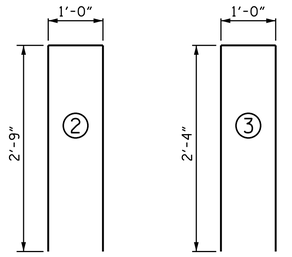


PLAN OF CONCRETE MEDIAN

APPROACH SLAB AT END BENT 1 SHOWN. APPROACH SLAB AT END BENT 2 SIMILAR.

BAR TYPES

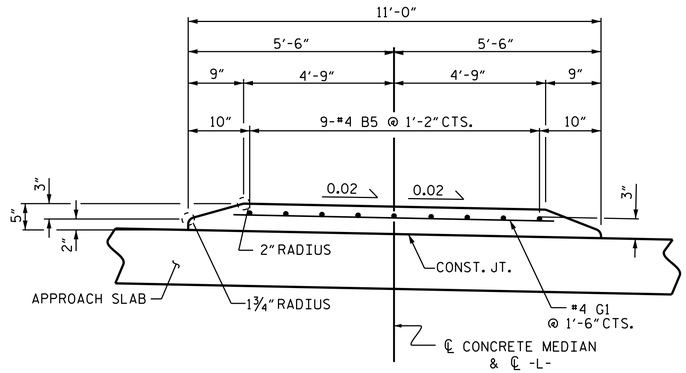


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL-STAGE IV
FOR ONE CONCRETE PARAPET (2 REQ'D)

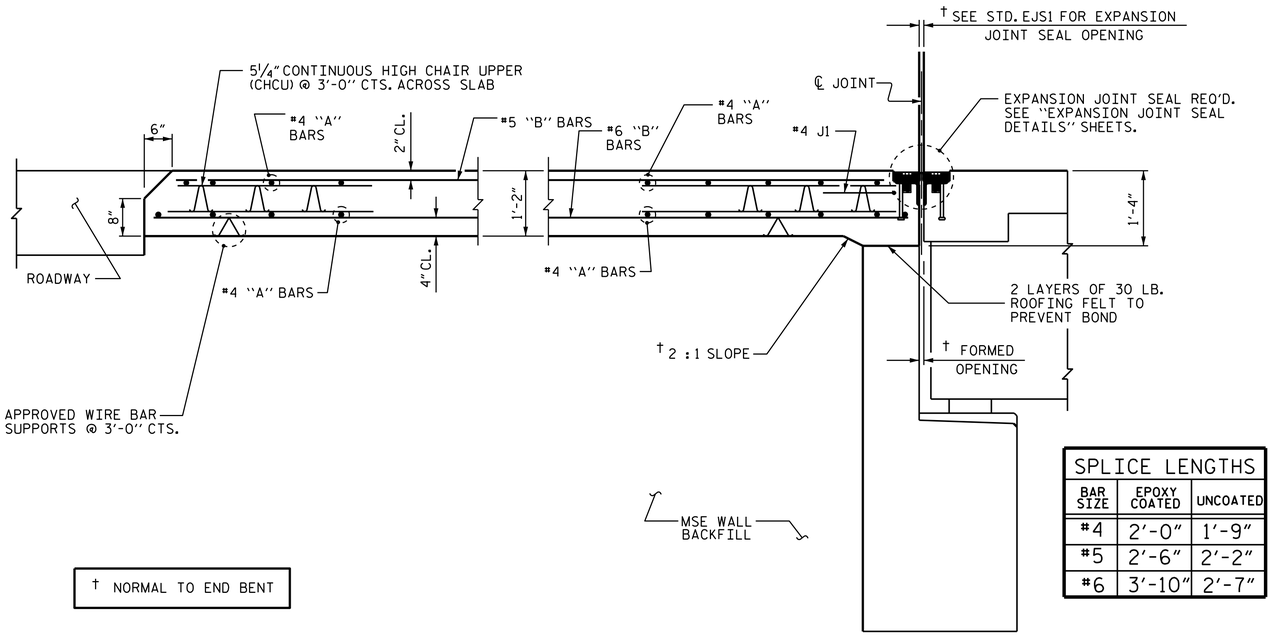
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B6	10	#5	STR	24'-4"	254
✱ S1	25	#5	2	6'-6"	169
✱ S2	25	#5	3	5'-8"	148
✱EPOXY COATED REINF. STEEL					571 LBS.
CLASS AA CONCRETE					4.3 C.Y.
1'-4" X 3'-6" CONCRETE PARAPET					25 L.F.

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



SECTION THROUGH CONCRETE MEDIAN

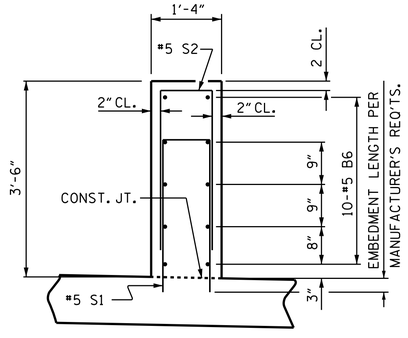
SEE "CONCRETE MEDIAN" SHEET FOR JOINT DETAILS BETWEEN APPROACH SLAB AND BRIDGE.



† NORMAL TO END BENT

SECTION THRU SLAB @ -L-

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



SECTION THROUGH PARAPET

THE #5 S1 BARS SHALL BE ADHESIVELY ANCHORED. THE YIELD LOAD FOR THE #5 S1 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQ'D)

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	75	#4	STR	26'-9"	1340
A2	78	#4	STR	25'-3"	1316
✱ B1	136	#5	STR	23'-8"	3357
B2	129	#6	STR	24'-8"	4779
✱ J1	74	#4	1	1'-5"	70
REINFORCING STEEL				LBS.	6095
✱EPOXY COATED REINFORCING STEEL				LBS.	4767
CLASS AA CONCRETE				C.Y.	78.3

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A3	75	#4	STR	24'-9"	1240
A4	78	#4	STR	22'-7"	1177
✱ B3	93	#5	STR	23'-8"	2296
B4	86	#6	STR	24'-8"	3186
✱ J1	47	#4	1	1'-5"	44
REINFORCING STEEL				LBS.	4363
✱EPOXY COATED REINFORCING STEEL				LBS.	3580
CLASS AA CONCRETE				C.Y.	48.9

STAGE III
FOR ONE CONCRETE MEDIAN (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B5	9	#4	STR	24'-0"	144
✱ G1	17	#4	STR	9'-8"	110
✱EPOXY COATED REINFORCING STEEL				LBS.	254
CLASS AA CONCRETE CONCRETE MEDIAN				C.Y.	4.1

BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B930BF40E... 4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : M.M. AHMED DATE : JAN 2016
CHECKED BY : J.P. ADAMS DATE : FEB 2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD, P.E. DATE : FEB 2016

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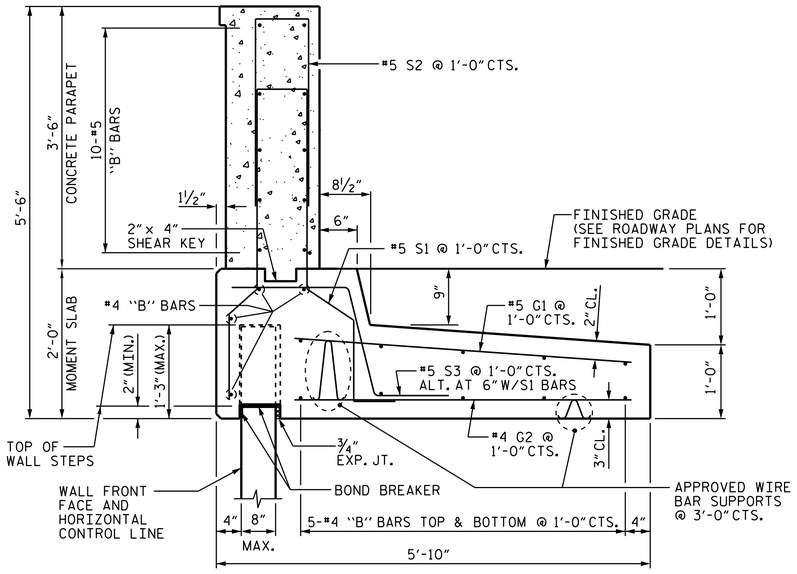
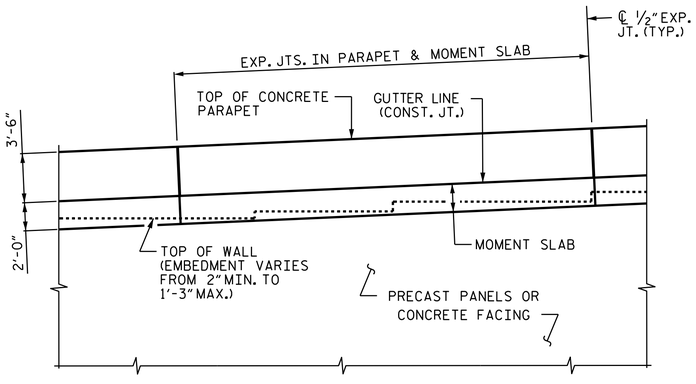
STR. #1



CONCRETE PARAPET WITH MOMENT SLAB



CONCRETE PARAPET WITH MOMENT SLAB - PARTIAL ELEVATION

BILL OF MATERIAL

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	28	#4	STR	29'-6"	552
* B2	20	#5	STR	29'-6"	615
B3	28	#4	STR	14'-7"	273
* B4	10	#5	STR	27'-0"	282
B5	28	#4	STR	13'-5"	251
* B6	10	#5	STR	23'-9"	248
G1	112	#5	STR	4'-4"	506
G2	112	#4	STR	4'-4"	324
* S1	113	#5	1	10'-2"	1198
* S2	113	#5	2	5'-8"	668
S3	111	#5	3	4'-1"	473
REINFORCING STEEL					2379
* EPOXY COATED REINFORCING STEEL					3011 LB
CLASS AA CONCRETE PARAPET					17.2 CY
CLASS A CONCRETE MOMENT SLAB					34.2 CY
CONCRETE PARAPET WITH MOMENT SLAB					111.80 LIN FT

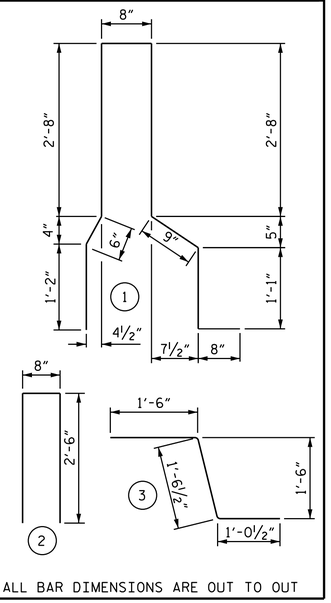
BILL OF MATERIAL

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7	28	#4	STR	23'-0"	430
* B8	20	#5	STR	23'-0"	480
B9	56	#4	STR	11'-3"	421
* B10	20	#5	STR	19'-5"	405
G1	87	#5	STR	4'-4"	393
G2	87	#4	STR	4'-4"	252
* S1	88	#5	1	10'-2"	933
* S2	88	#5	2	5'-8"	520
S3	86	#5	3	4'-1"	366
REINFORCING STEEL					1862 LB
* EPOXY COATED REINFORCING STEEL					2338 LB
CLASS AA CONCRETE PARAPET					13.5 CY
CLASS A CONCRETE MOMENT SLAB					26.6 CY
CONCRETE PARAPET WITH MOMENT SLAB					87.03 LIN FT

CONCRETE PARAPET WITH MOMENT SLAB
PAY LENGTH = 198.83 LIN FT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

FOR CONCRETE PARAPET WITH MOMENT SLAB, SEE CONCRETE PARAPET WITH MOMENT SLAB SPECIAL PROVISION.

CONCRETE PARAPET WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE PARAPET AND MOMENT SLAB AS SHOWN ON SHEET 2 OF 3.

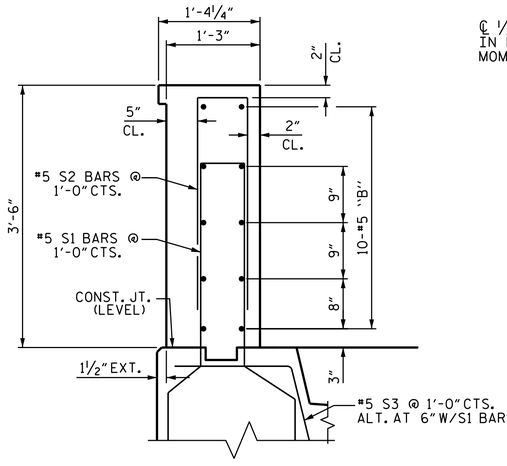
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF PARAPET SEGMENTS LESS THAN 20' IN LENGTH.

THE PARAPET SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

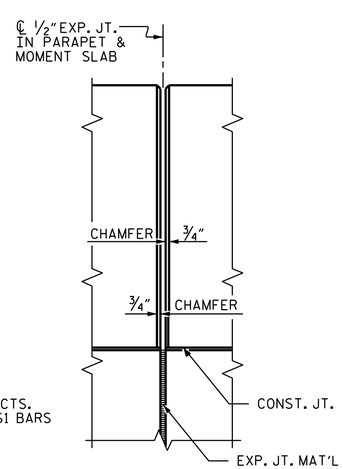
ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE PARAPET WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE PARAPET WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3.



SECTION THRU PARAPET



ELEV. @ EXP. JOINTS

PARAPET DETAILS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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REVISIONS					
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1			3		
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SHEET NO. S-36

TOTAL SHEETS 110

DRAWN BY : K.W. ALFORD DATE : 2/2016
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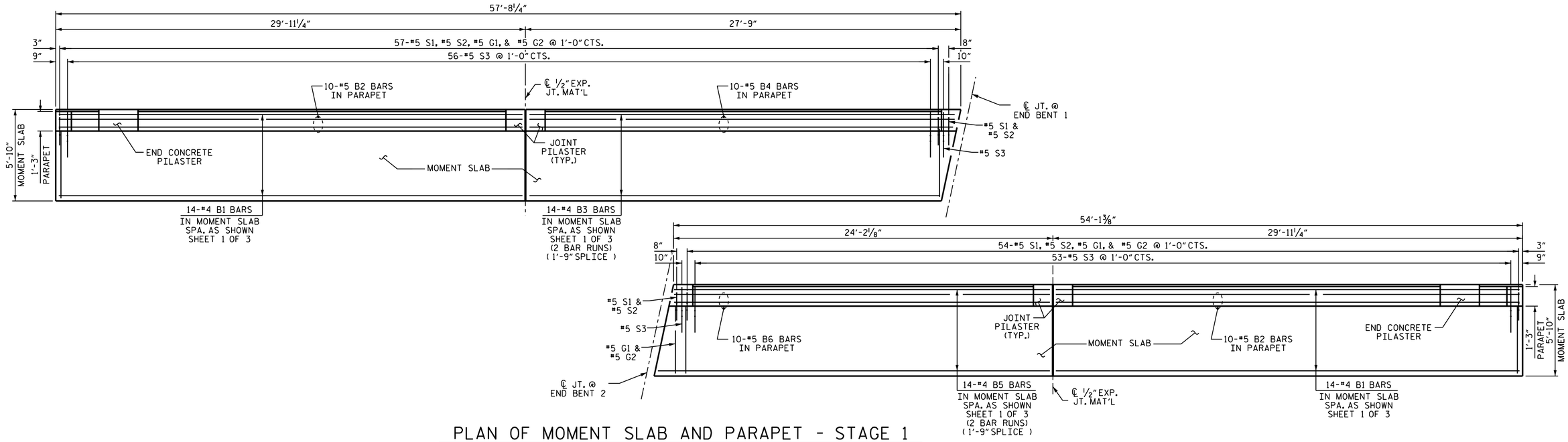
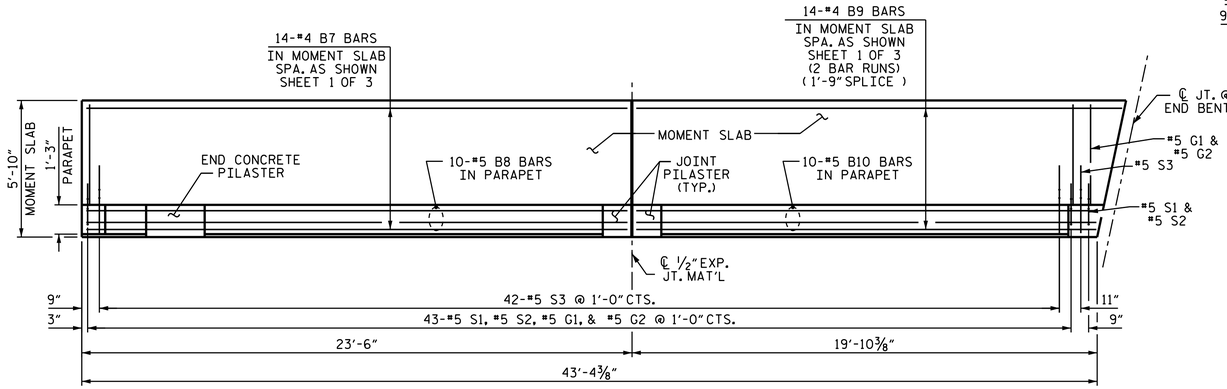
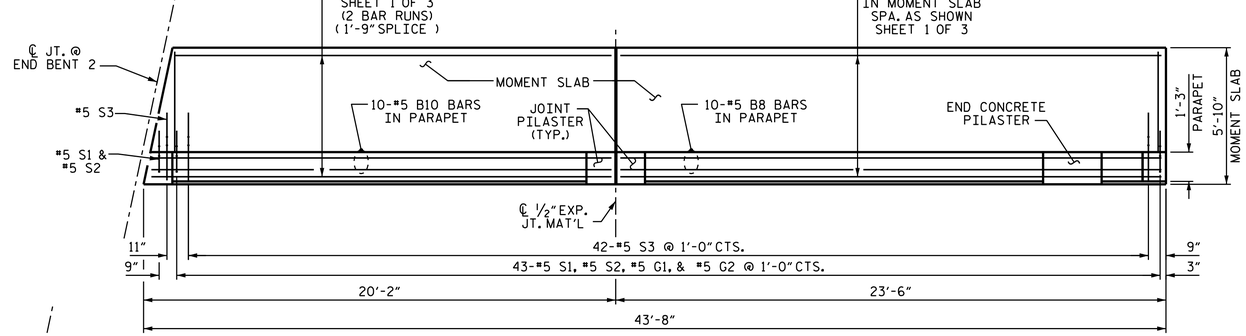
STR. #1



PLAN OF MOMENT SLAB AND PARAPET - STAGE 1

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEET 3 OF 3 FOR AESTHETIC DETAILS.





PLAN OF MOMENT SLAB AND PARAPET - STAGE 2

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEET 3 OF 3 FOR AESTHETIC DETAILS.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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STR. #1

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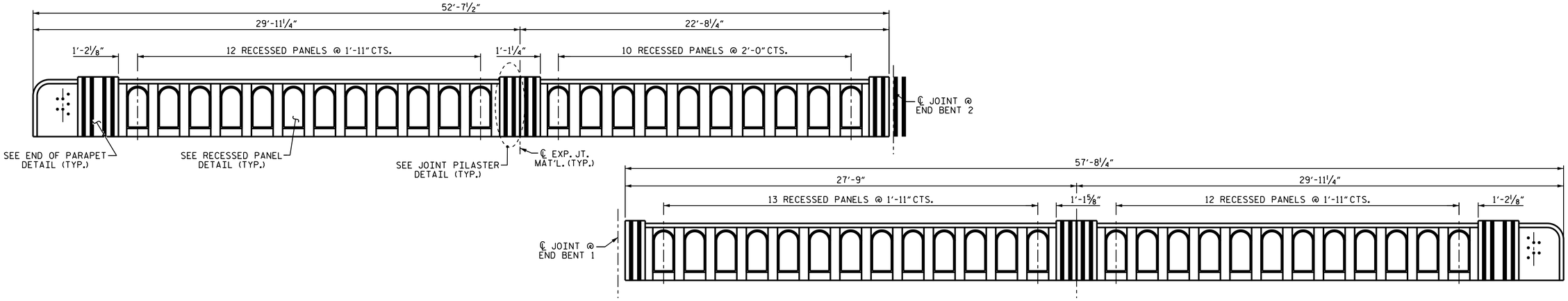
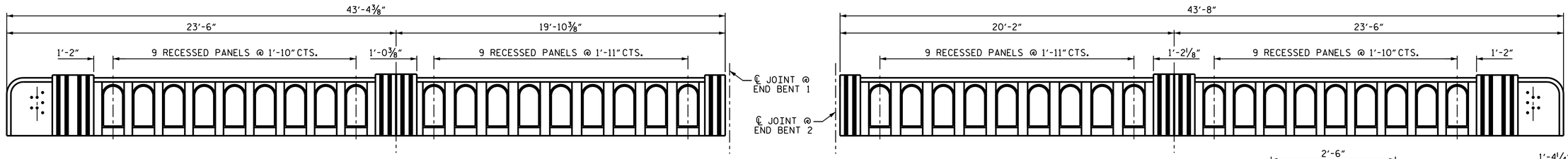
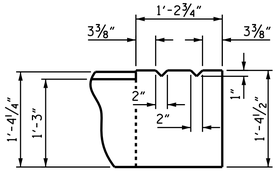


OUTSIDE FACE OF LEFT SIDE OF STRUCTURE - STAGE 1

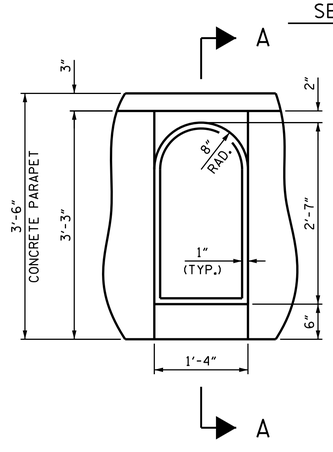


OUTSIDE FACE OF RIGHT SIDE OF STRUCTURE - STAGE 2

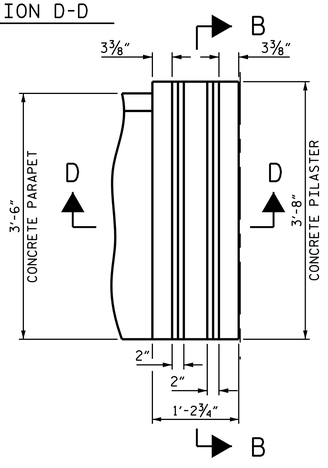
ELEVATION OF PARAPET ON MOMENT SLAB



SECTION D-D

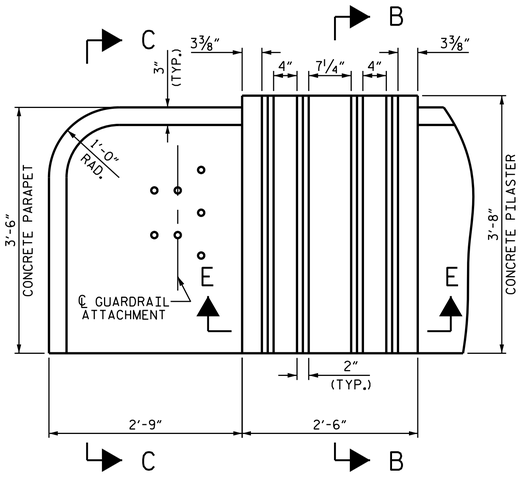


RECESSED PANEL DETAIL



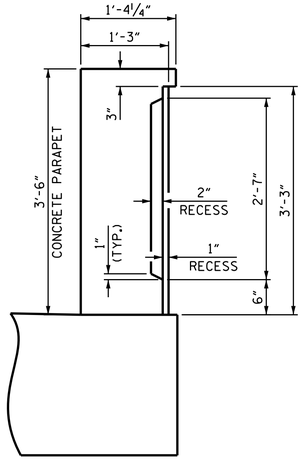
JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.

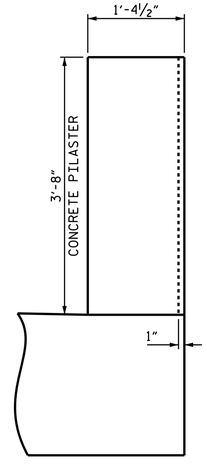


END OF PARAPET DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.



SECTION A-A



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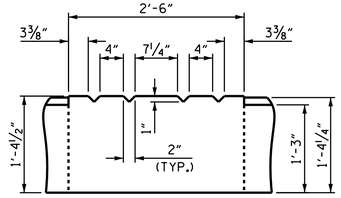

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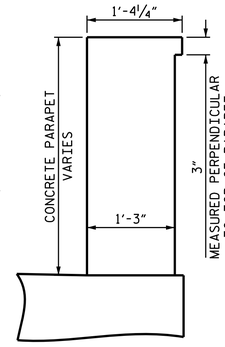

SECTION C-C

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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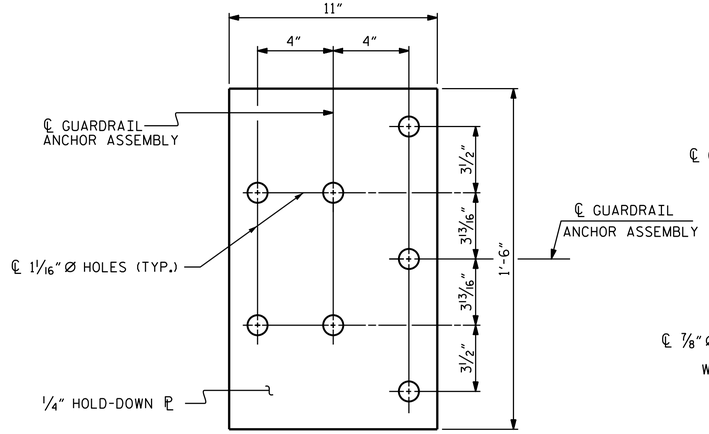
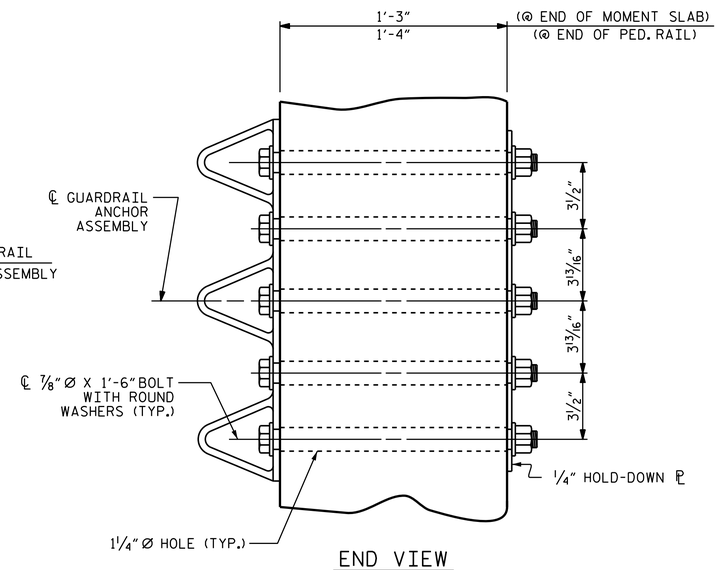


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

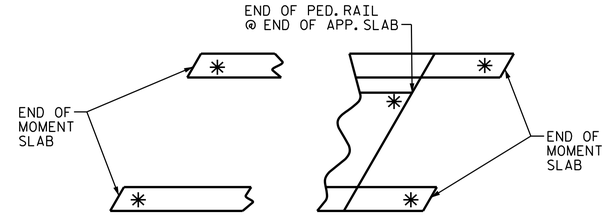
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

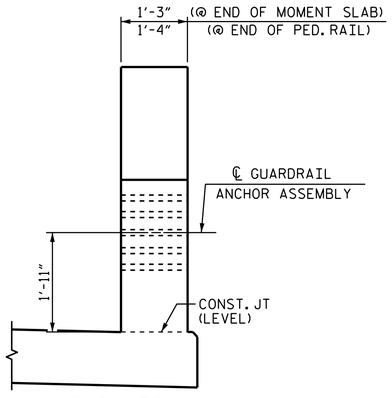
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE PARAPET TO CLEAR ASSEMBLY BOLTS.

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

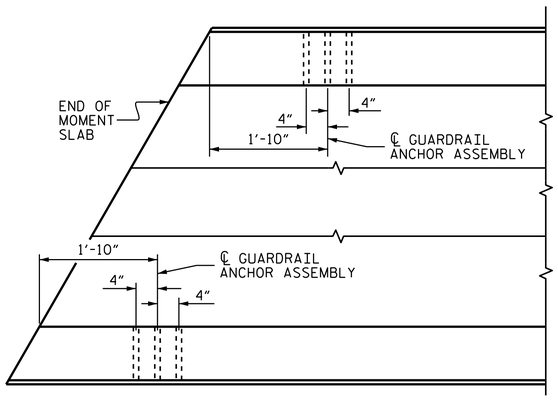


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR

ANCHOR AT END OF MOMENT SLAB SHOWN, ANCHOR AT END OF APP. SLAB SIMILAR

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			110

ASSEMBLED BY : T.L. AVERETTE	DATE : 2-16	
CHECKED BY : J.P. ADAMS	DATE : 2-16	
DRAWN BY : MAA 5/10	REV. 12/5/11	MAA/GM
CHECKED BY : GM 5/10	REV. 6/13	MAA/GM
	REV. 1/15	MAA/TMG

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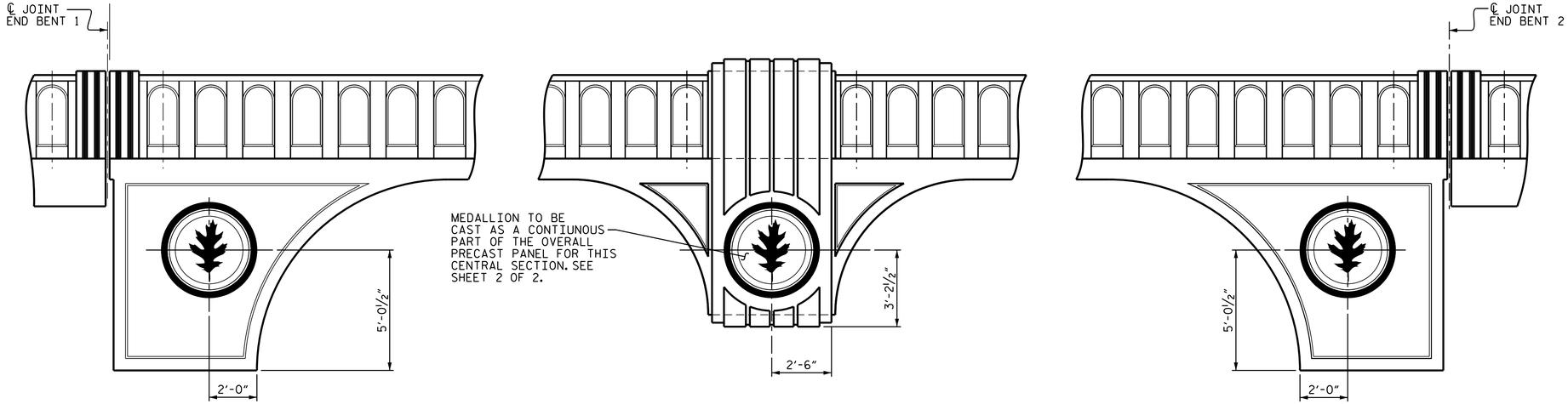
STR. #1

STD. NO. GRA3



ELEVATION VIEW

RIGHT SIDE OF STRUCTURE SHOWN.
LEFT SIDE SIMILAR BY ROTATION.

NOTES

USE CLASS "A" CONCRETE WITH PEA GRAVEL AGGREGATE IN THE PRECAST CONCRETE PANELS. IN ADDITION TO THE #3 REINFORCING BARS, CONCRETE SHALL BE REINFORCED WITH POLYPROPYLENE FIBERS PER THE MANUFACTURERS' RECOMMENDATIONS.

PREFORMED BEARING PAD SHALL CONFORM TO SECTION 1079-1 OF THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, AN UNREINFORCED PLAIN ELASTOMERIC PAD MAY BE USED.

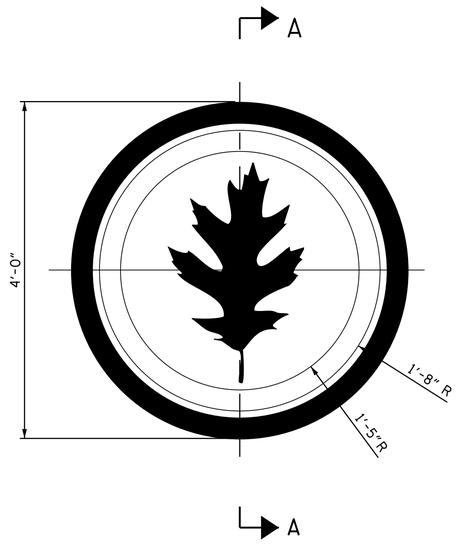
DECK EDGE BEAMS SHALL HAVE ⅝" Ø FORMED HOLES TO MATCH THE LOCATION OF THE REQUIRED ANCHORAGE FOR MEDALLIONS AS SHOWN.

PRECAST PANELS SHALL BE CAST AFTER BRIDGE SUPERSTRUCTURE IS COMPLETED. FORMED HOLES IN PANELS SHALL BE CAST TO MATCH THE LOCATION OF THE FORMED HOLES IN THE DECK EDGE BEAMS. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY DUE TO CHANGES IN THE FORMED HOLE LOCATIONS.

NO WORK MAY BE STARTED ON FABRICATION OF PRECAST PANELS UNTIL VECTOR DRAWINGS OF THE ARTWORK HAVE BEEN OBTAINED FROM THE DEPARTMENT. NO ADDITIONAL DESIGN SHALL BE REQUIRED.

MATERIAL FOR BOLTS AND THREADED RODS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. BOLTS TO BE EMBEDDED AS SHOWN. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.



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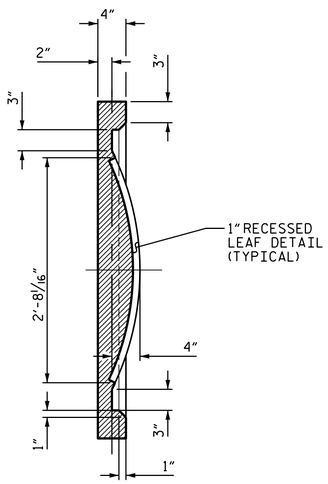
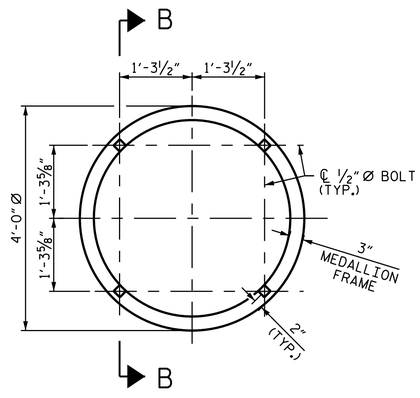
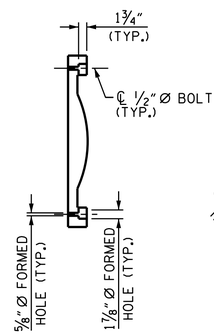


SECTION A-A

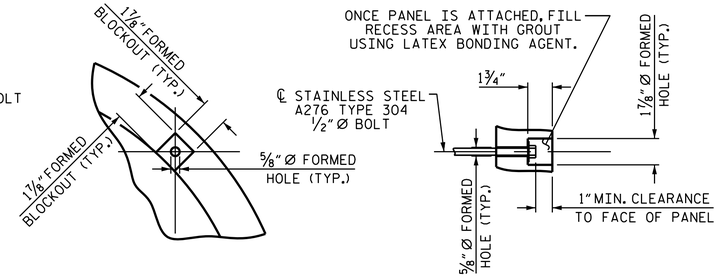


ANCHORAGE DIMENSIONS

MEDALLION DETAILS NOT SHOWN FOR CLARITY



SECTION B-B



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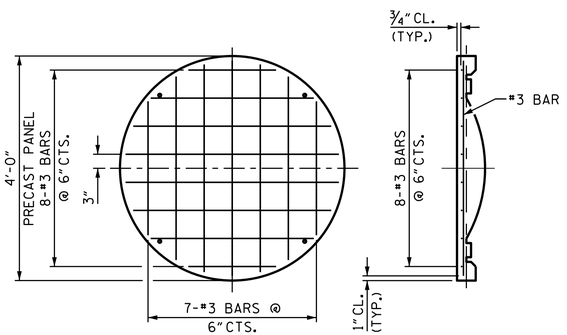
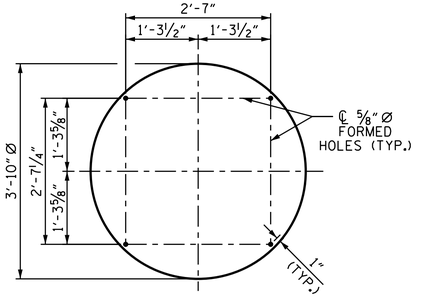


REINFORCING STEEL



¼" FORMED BEARING PAD

PRECAST MEDALLION

4 MEDALLIONS REQUIRED

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRECAST PANELS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...

6/3/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : J.P. ADAMS DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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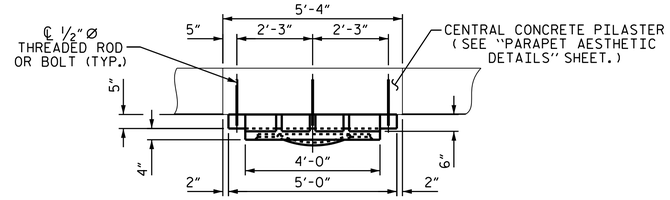
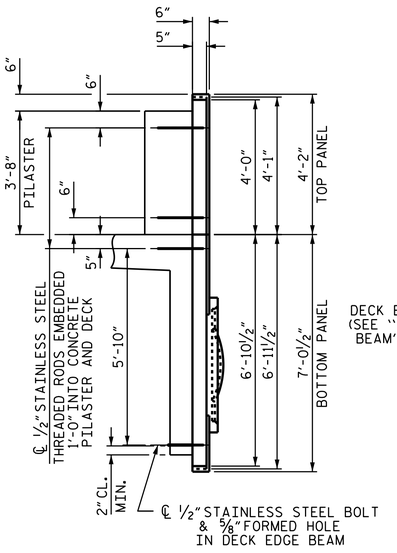
kalford

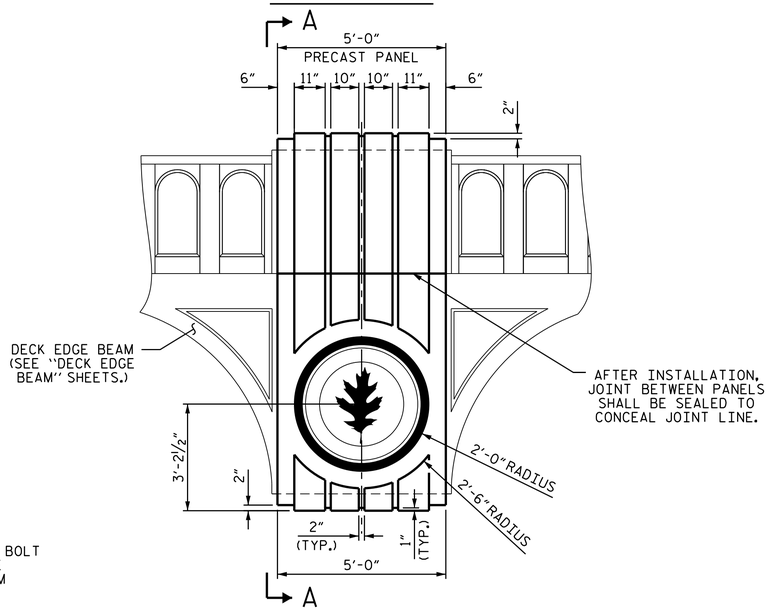
STR. #1



PLAN VIEW

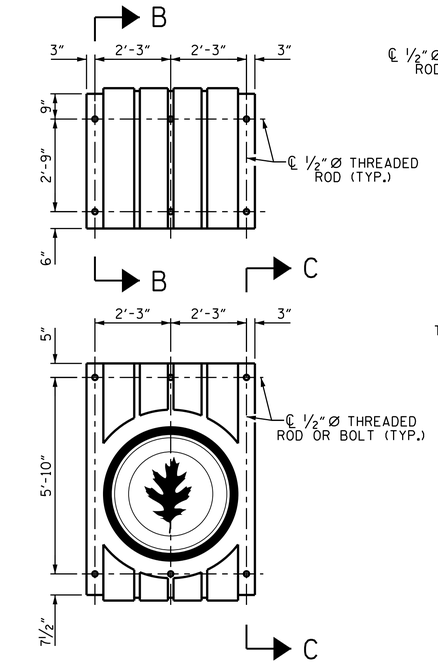


SECTION A-A

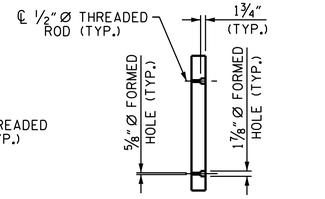


ELEVATION VIEW

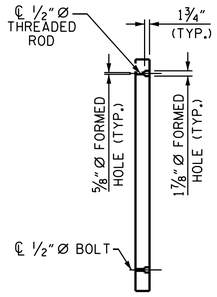
MEDALLION SHALL BE POURED AS A CONTINUOUS POUR WITH THE BOTTOM PANEL AS SHOWN. FOR MEDALLION DETAILS, SEE SHEET 1 OF 2.



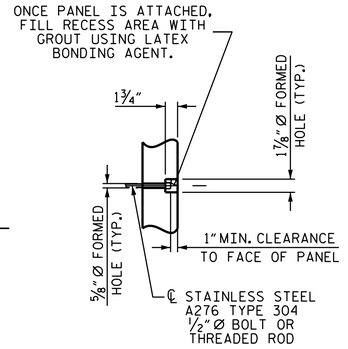
ANCHORAGE DIMENSIONS

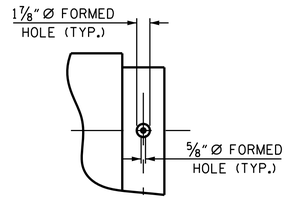


SECTION B-B



SECTION C-C





RECESS DETAILS

NOTES

USE CLASS "A" CONCRETE WITH PEA GRAVEL AGGREGATE IN THE PRECAST CONCRETE PANELS. IN ADDITION TO THE #3 REINFORCING BARS, CONCRETE SHALL BE REINFORCED WITH POLYPROPYLENE FIBERS PER THE MANUFACTURERS' RECOMMENDATIONS.

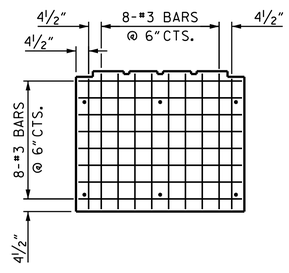
PREFORMED BEARING PAD SHALL CONFORM TO SECTION 1079-1 OF THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, AN UNREINFORCED PLAIN ELASTOMERIC PAD MAY BE USED.

PRECAST PANELS SHALL BE CAST AFTER BRIDGE SUPERSTRUCTURE IS COMPLETED. FORMED HOLES IN PANELS SHALL BE CAST TO MATCH THE LOCATION OF THE THREADED RODS IN THE PARAPET AND DECK AND THE FORMED HOLES IN THE DECK EDGE BEAMS. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY DUE TO CHANGES IN THE FORMED HOLE LOCATIONS.

MATERIAL FOR BOLTS AND THREADED RODS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. BOLTS TO BE EMBEDDED AS SHOWN. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

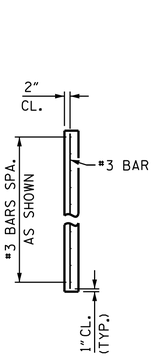
FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.

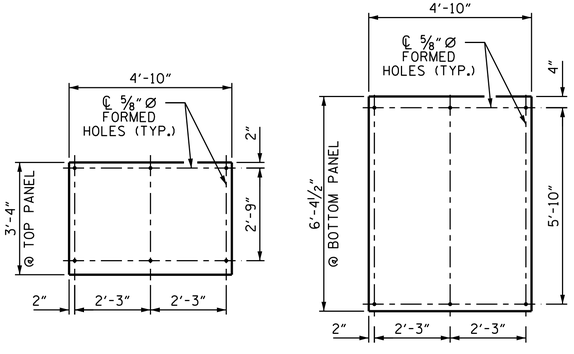
NO WORK MAY BE STARTED ON FABRICATION OF PRECAST PANELS UNTIL VECTOR DRAWINGS OF THE ARTWORK HAVE BEEN OBTAINED FROM THE DEPARTMENT. NO ADDITIONAL DESIGN SHALL BE REQUIRED.



REINFORCING STEEL

RELIEF ON PANELS NOT SHOWN FOR CLARITY.





¼" PREFORMED BEARING PADS

PANELS AT CENTRAL CONCRETE PILASTER

2 TOP PANELS REQUIRED
2 BOTTOM PANELS REQUIRED

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...

6/3/2016

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DESIGN ENGINEER OF RECORD:	K.W. ALFORD	DATE : 2/2016

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kalford

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 22+06.91 -L-

SHEET 2 OF 2

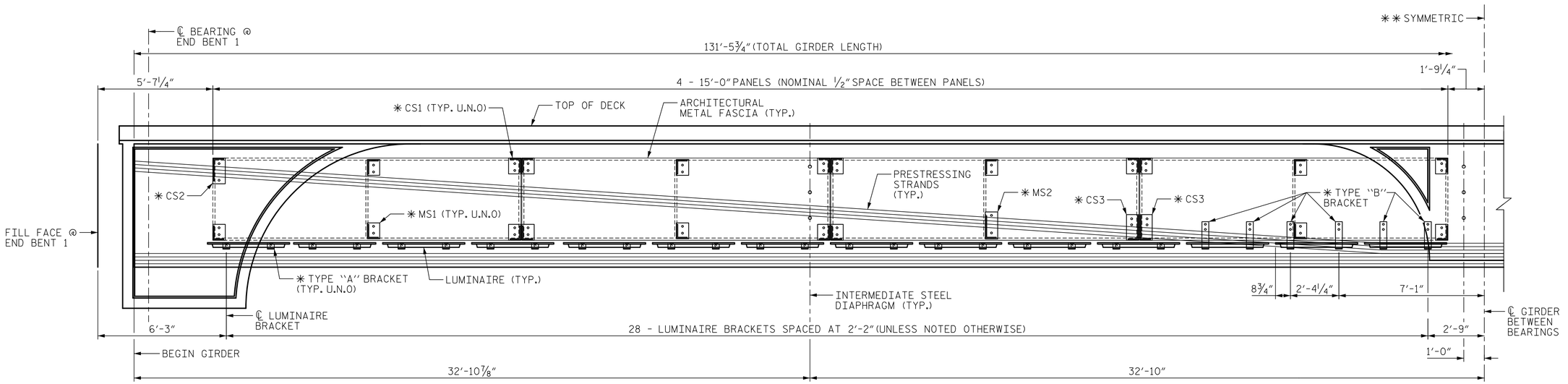
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PRECAST PANELS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			110

STR. #1

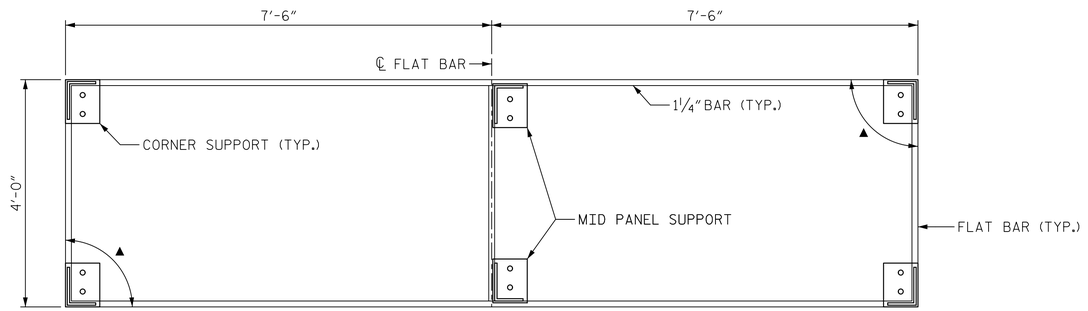


PARTIAL ELEVATION ALONG ℄ GIRDER

GIRDER 14 SHOWN; GIRDER 1 SIMILAR BUT OPPOSITE HAND

✳ SEE ARCHITECTURAL METAL FASCIA DETAILS.

✳✳ EXCEPT FOR CENTRAL DIAPHRAGM



ARCHITECTURAL METAL FASCIA FRAME ELEVATION

▲ ANGLE BETWEEN TOP/BOTTOM BAR AND VERTICAL BAR MAY VARY DEPENDING ON FINAL GIRDER GEOMETRY AFTER BRIDGE DECK AND RAILING IS CAST.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

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701 CORPORATE CENTER DRIVE, SUITE 475
RALEIGH, NC 27607
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6/2/2016

NORTH CAROLINA PROFESSIONAL SEAL 038447 ENGINEER ANDREW S MILLER

DocuSigned by: Andrew S. Miller
C5D9767ZAC5E436...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARCHITECTURAL METAL FASCIA LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.H. COMPTON DATE : 4/2016
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DESIGNED BY : G.L. HAMILTON DATE : 4/2016

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STR. #1

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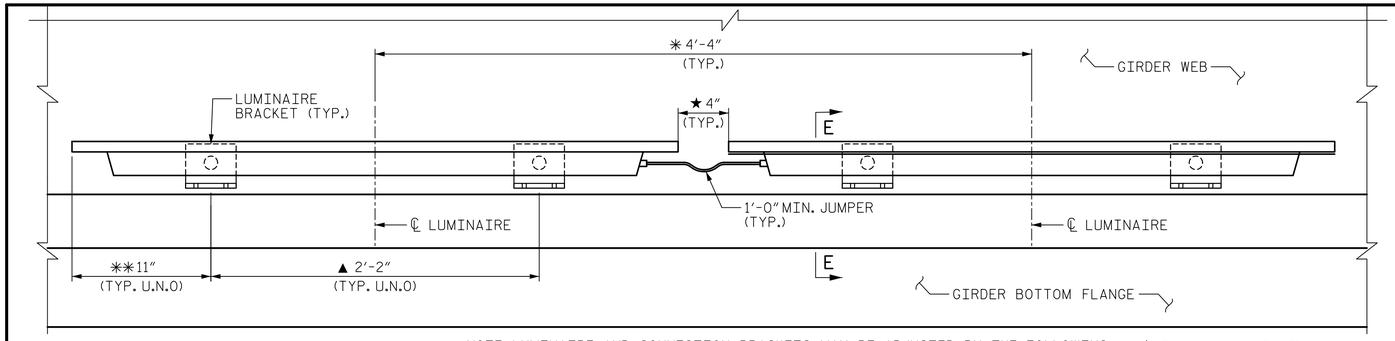
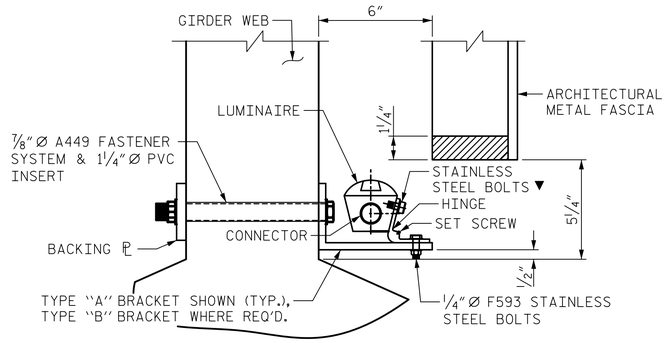
USER: Kyle.Compton
DGN: P:\60495871_B-5121\400_Technical\408_Structural\Drawings\Place Sheet\400_0042_B-5121_Fascia_Layo



NOTE: LUMINAIRE AND CONNECTION BRACKETS MAY BE ADJUSTED BY THE FOLLOWING LIMITS TO CLEAR PANEL SUPPORT BRACKETS, DIAPHRAGMS AND OTHER CONFLICTS. JUMPER CABLE LENGTH IS DEPENDENT ON LUMINAIRE SPACING. LONGER JUMPER CABLES WILL BE REQUIRED FOR LUMINAIRE SPACING EXCEEDING 4′-4″.

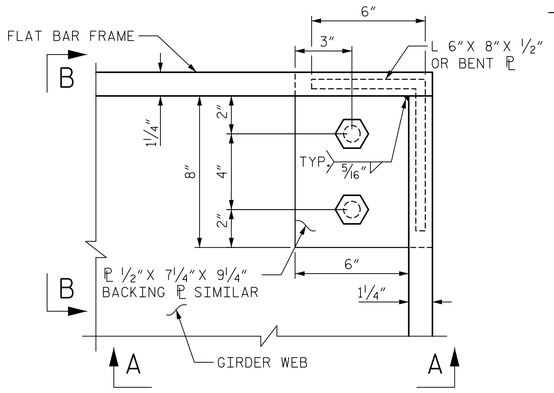
▲ 3′-0″ MAX.; 1′-7″ MIN.
★ 1′-6″ MAX.; ¼″ MIN.
✳ 4′-6″ MAX.; 4′-0¼″ MIN.
✳✳ 1′-6″ MAX.; 6″ MIN.

ELEVATION



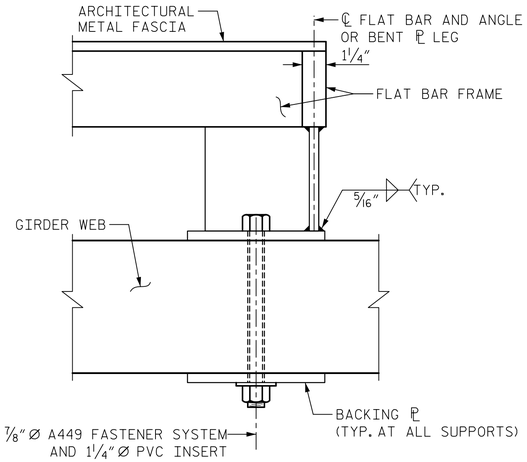
SECTION E-E

▼ SIZE PER LUMINAIRE MANUFACTURER'S SPECIFICATIONS

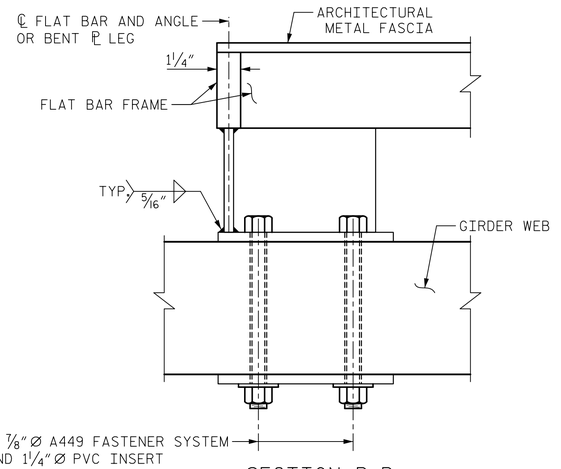


CORNER SUPPORT (CS1)

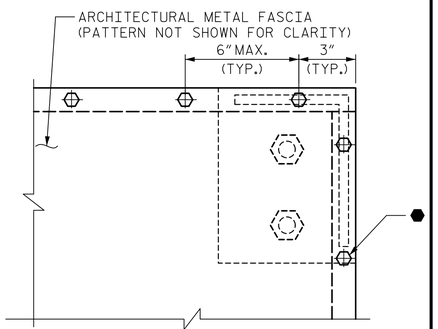
NOTE: UPPER CORNER SUPPORT BRACKET SHOWN, BRACKETS FOR OTHER THREE CORNERS SIMILAR. PANEL PLATE AND BOLT HOLES NOT SHOWN FOR CLARITY.



SECTION A-A

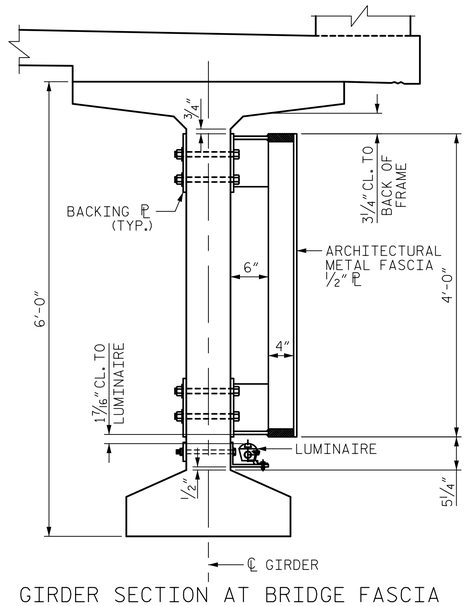


SECTION B-B

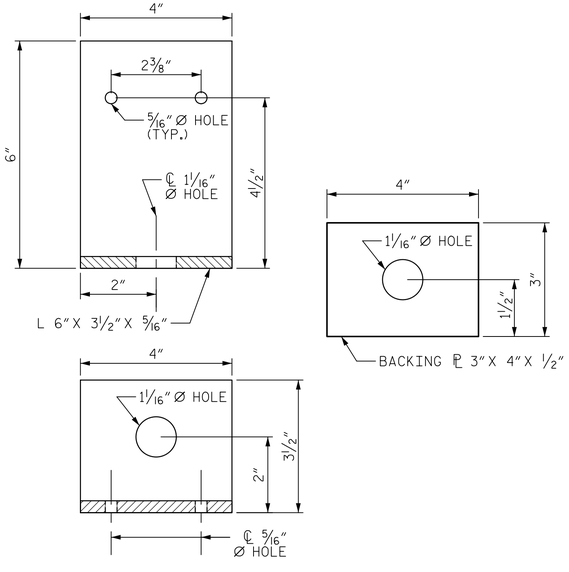


PANEL TO FRAME CONNECTION

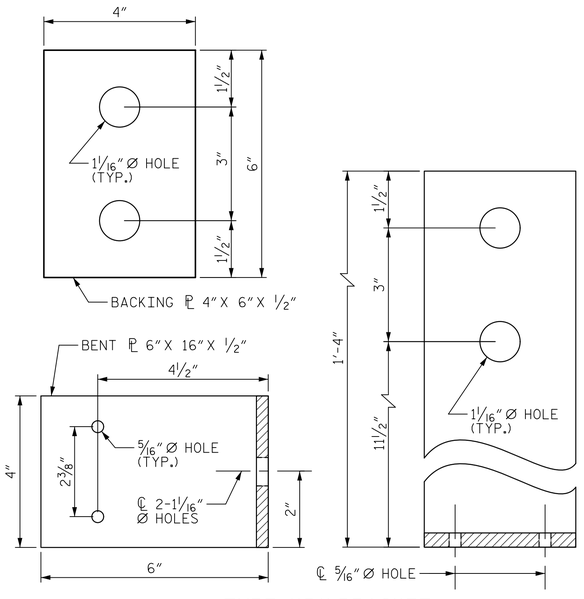
● ⅜″ Ø X 1½″ F593 ALLOY 304 STAINLESS STEEL FASTENER WITH STAINLESS STEEL SPRINGLOCK WASHER; DRILL AND TAP 2″ DEEP HOLE INTO PERIMETER FLAT BAR FRAME FOR 1½″ FASTENER. ALL LOCK WASHERS SHALL BE FULLY ENGAGED PRIOR TO ACCEPTANCE. CONTRACTOR SHALL USE THREADLOCK SUCH AS LOCTITE BLUE OR EQUAL DURING INSTALLATION OF FASTENER. THE THREADLOCK SHALL ALLOW FOR FUTURE DISASSEMBLY. FASCIA PANELS SHALL NOT BE BOLTED TO CENTER BAR OF FRAME SYSTEM. BOLT HEADS SHALL BE ON THE EXPOSED SIDE OF THE FASCIA PANELS (TYP.)



GIRDER SECTION AT BRIDGE FASCIA



TYPE ″A″ BRACKET
(2 REQUIRED PER LUMINAIRE)



TYPE ″B″ BRACKET
(2 REQUIRED PER LUMINAIRE)

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

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SHEET 1 OF 2

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701 CORPORATE CENTER DRIVE, SUITE 475
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(919) 854-6200 www.aecom.com
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6/2/2016

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038447 ANDREW S. MILLER

Docusigned by: Andrew S. Miller
C5D97672AC5E436...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARCHITECTURAL METAL FASCIA DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			110

STR. #1

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DATE: 6/2/2016
TIME: 2:30:0 PM

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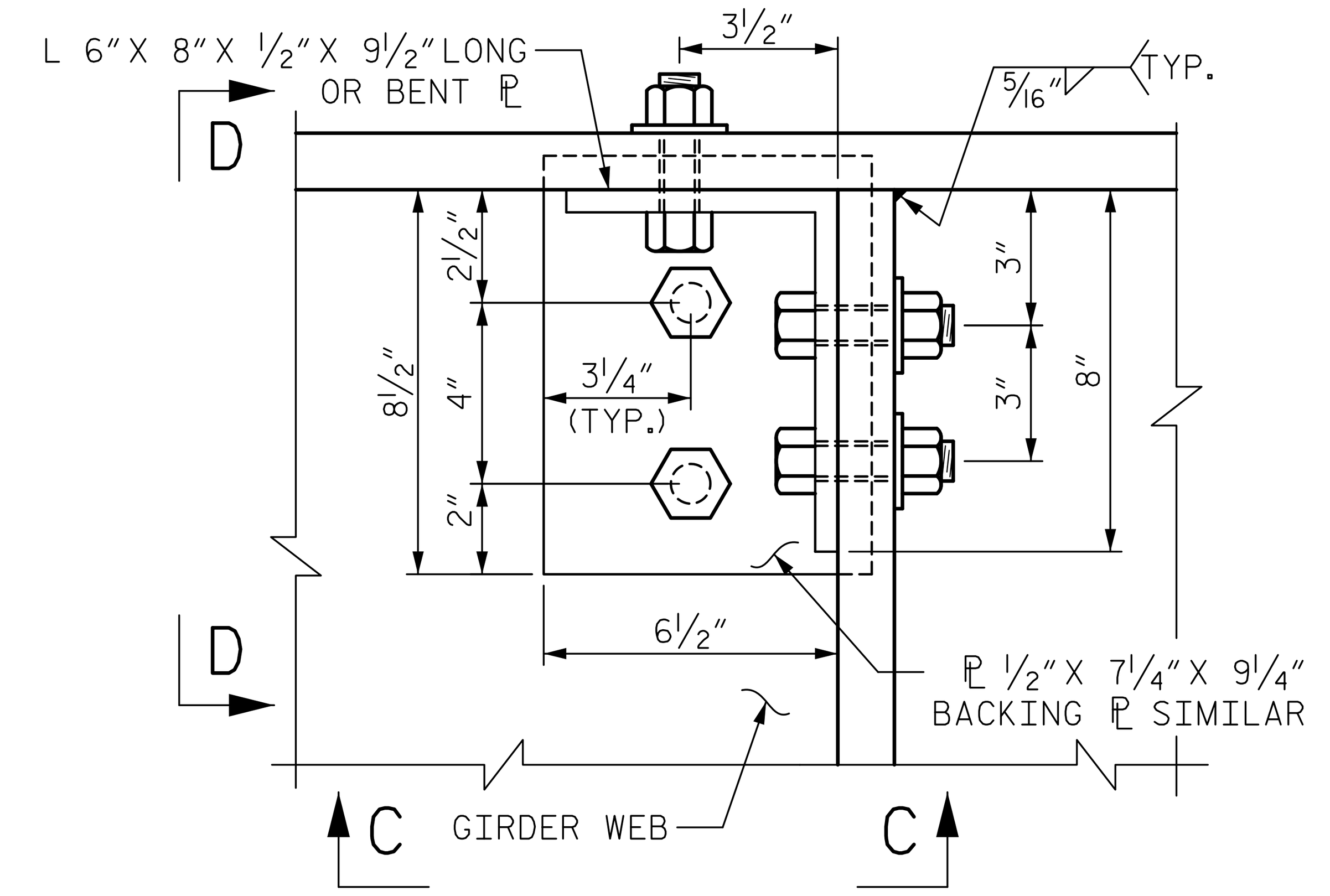
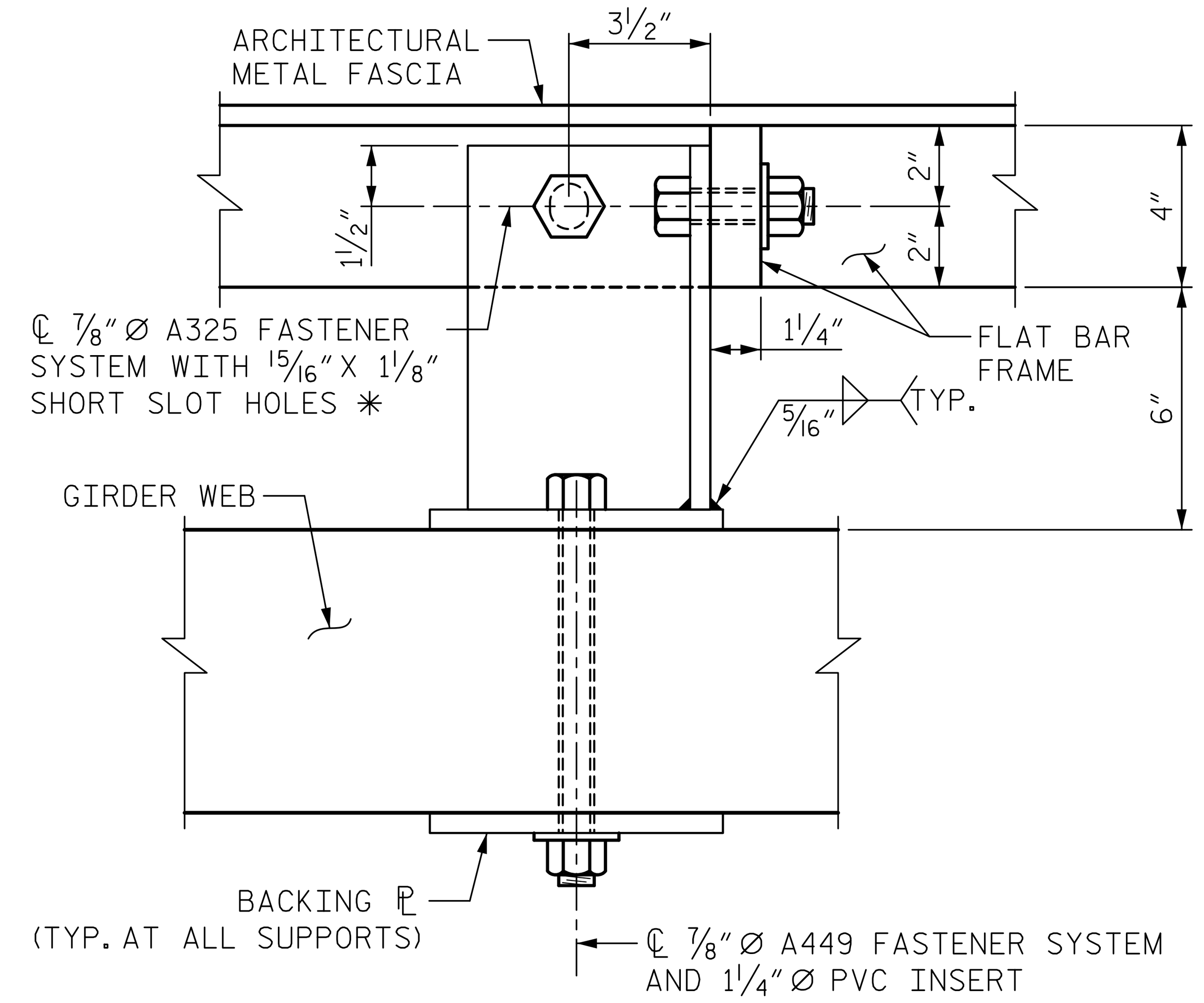
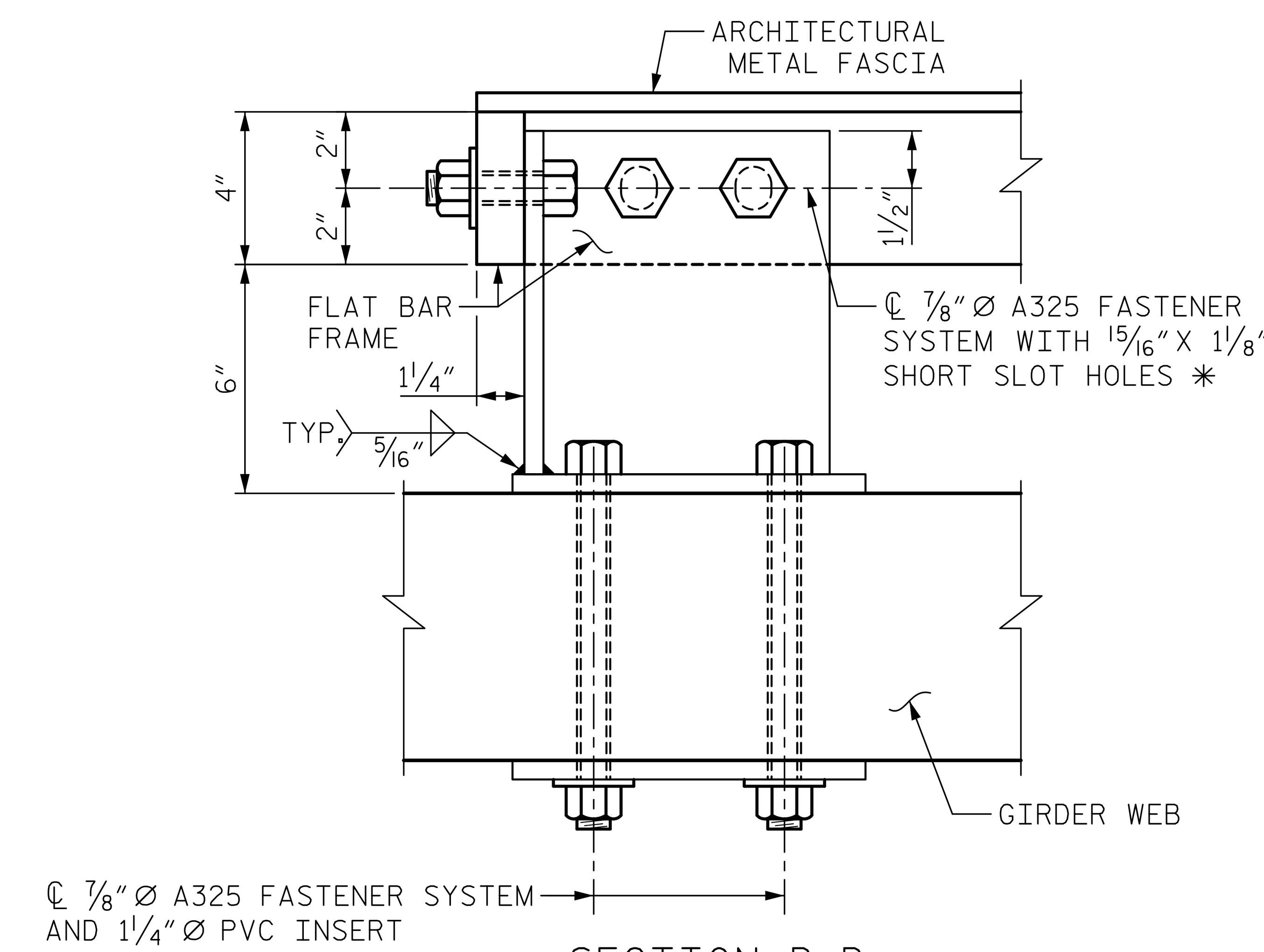


MID PANEL SUPPORT (MS1)

NOTE: UPPER MIDDLE SUPPORT BRACKET SHOWN, BRACKETS FOR LOWER MIDDLE SUPPORT SIMILAR. PANEL PLATE AND BOLT HOLES NOT SHOWN FOR CLARITY.



SECTION C-C



SECTION D-D

✳ SLOTTED HOLES ORIENTED PERPENDICULAR TO GIRDER WEB

NOTES:

FOR ARCHITECTURAL METAL FASCIA, SEE SPECIAL PROVISIONS

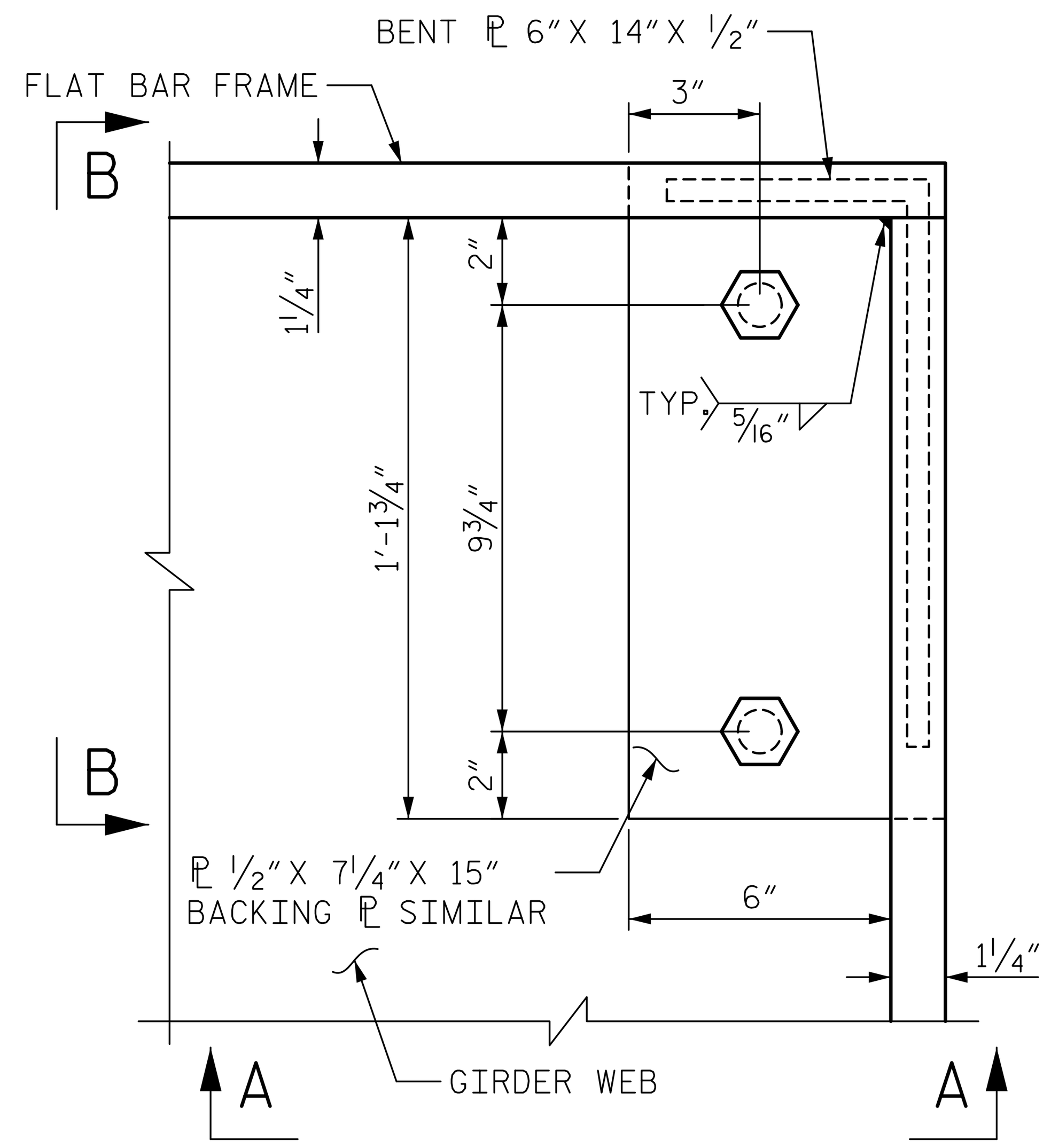
ANCHOR BOLTS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. BOLTS TO BE EMBEDDED AS SHOWN. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

FOR ARCHITECTURAL METAL FASCIA LAYOUT SEE SHEETS S-42, S-43B AND S-43C.

ALL HOLES FOR 7/8″ Ø HIGH STRENGTH BOLTS ARE 1 1/16″ Ø UNLESS NOTED OTHERWISE.

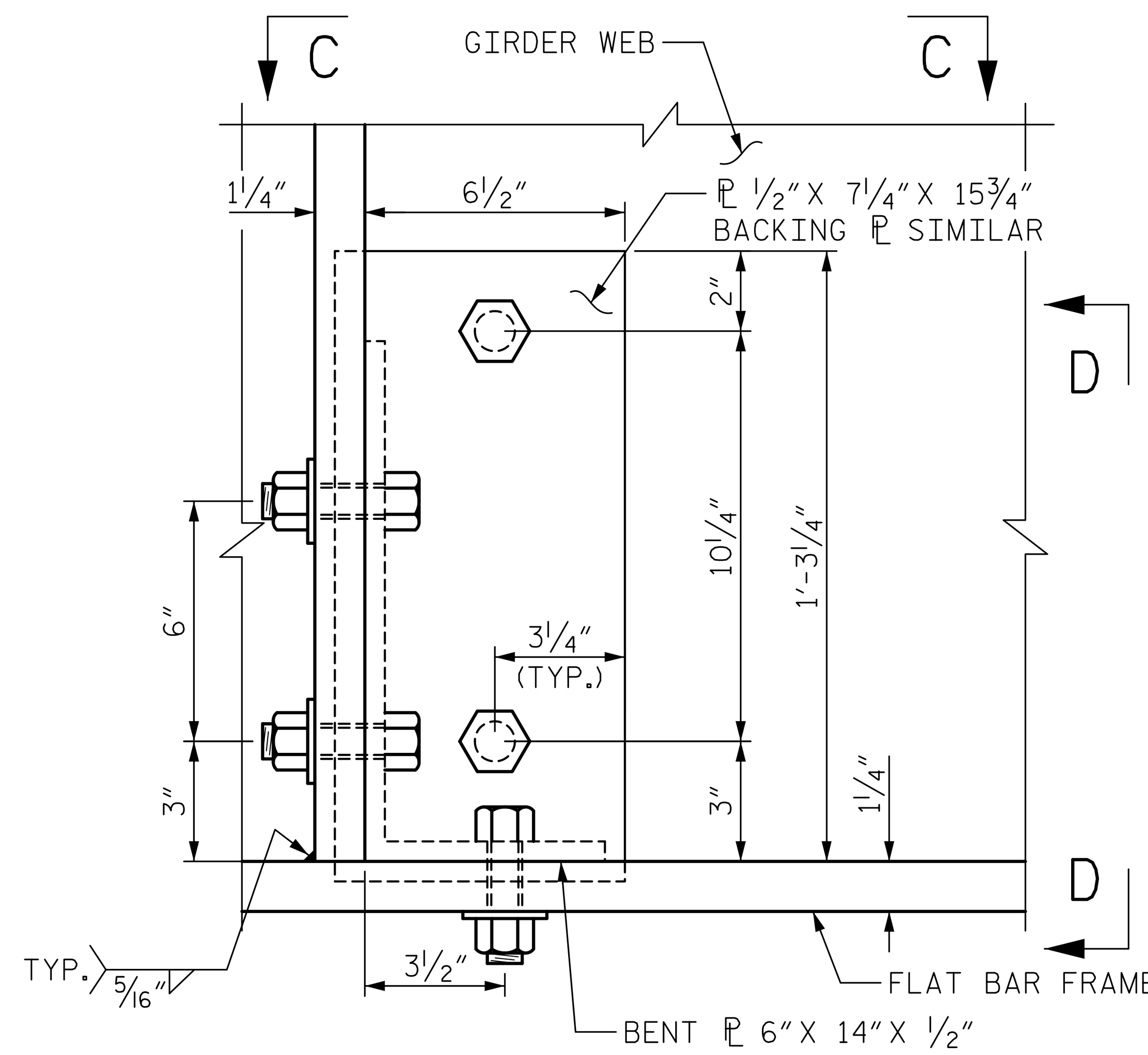
NO WORK MAY BE STARTED ON FABRICATION OF ARCHITECTURAL METAL FASCIAS UNTIL VECTOR DRAWINGS OF THE ARTWORK HAVE BEEN OBTAINED FROM THE DEPARTMENT.

ARCHITECTURAL METAL FASCIA = 240 LIN. FT.

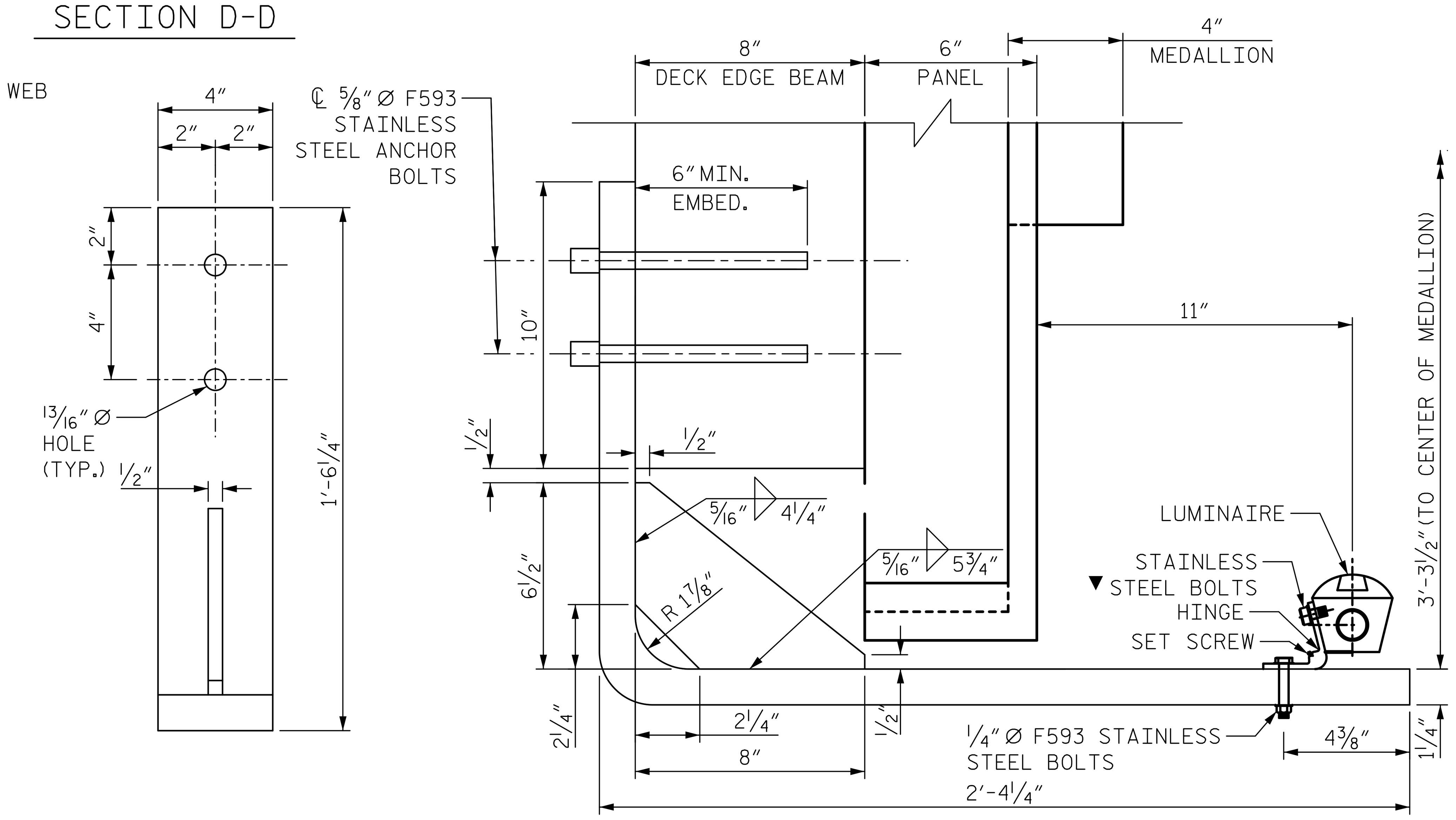


CORNER SUPPORT (CS2)

SEE SHEET 1 OF 2 FOR SECTION A-A AND B-B



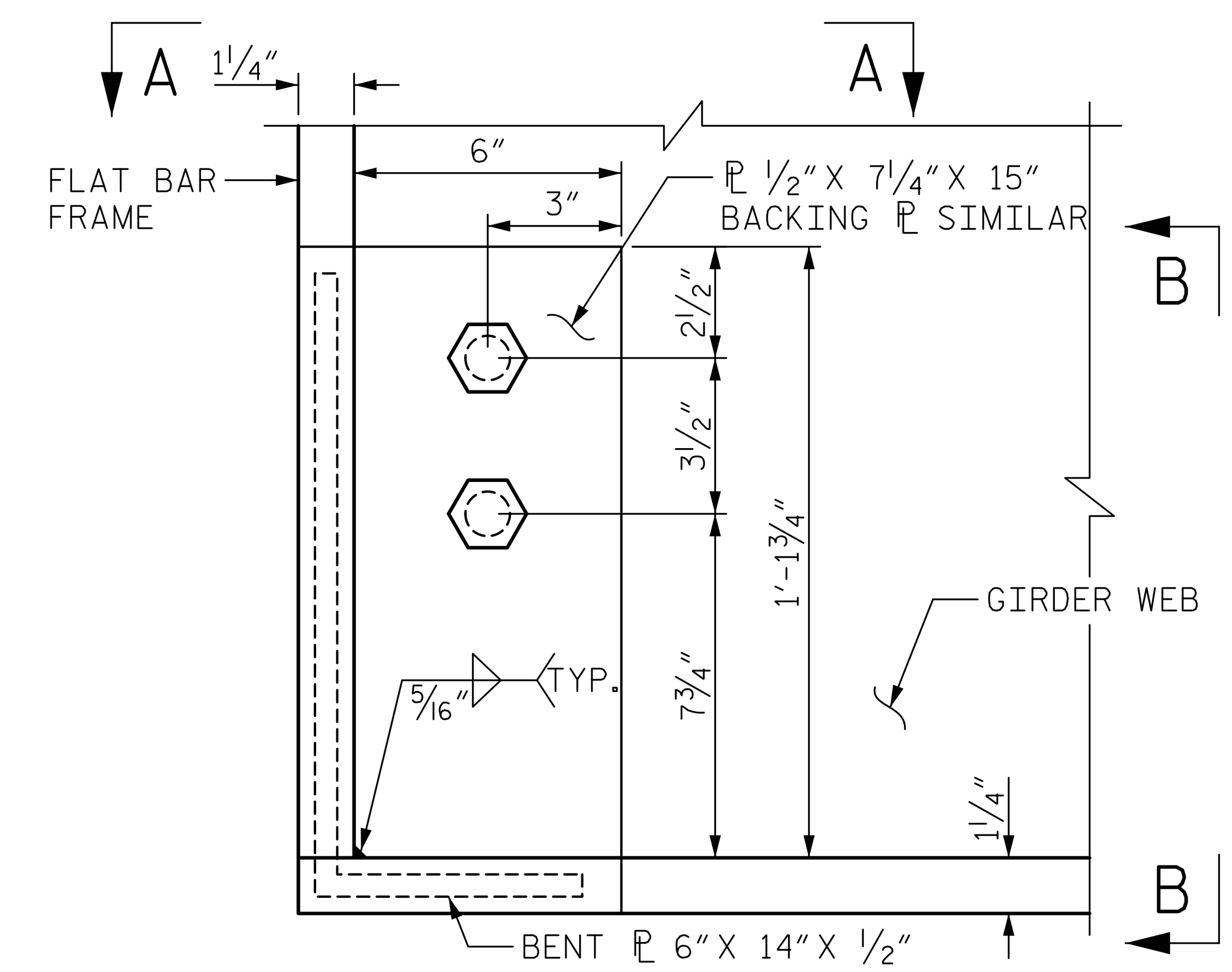
MID PANEL SUPPORT (MS2)



MEDALLION LUMINAIRE BRACKET AT CENTRAL CONCRETE PILASTER

(2 PER LUMINAIRE)

▼ SIZE PER LUMINAIRE MANUFACTURER'S SPECIFICATIONS



CORNER SUPPORT (CS3)

SEE SHEET 1 OF 2 FOR SECTION A-A AND B-B

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

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701 CORPORATE CENTER DRIVE, SUITE 475
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
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6/2/2016
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038447 ANDREW S. MILLER
Andrew S. Miller
C5D97672AC5E436...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARCHITECTURAL METAL FASCIA DETAILS

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REVISIONS								SHEET NO.
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1				3				TOTAL SHEETS
2				4				110

STR. #1

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DESIGNED BY : G.L. HAMILTON DATE : 4/2016

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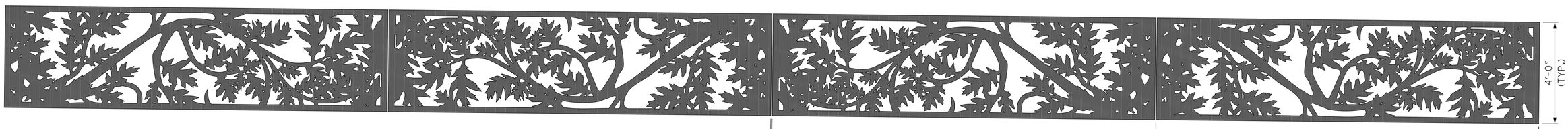
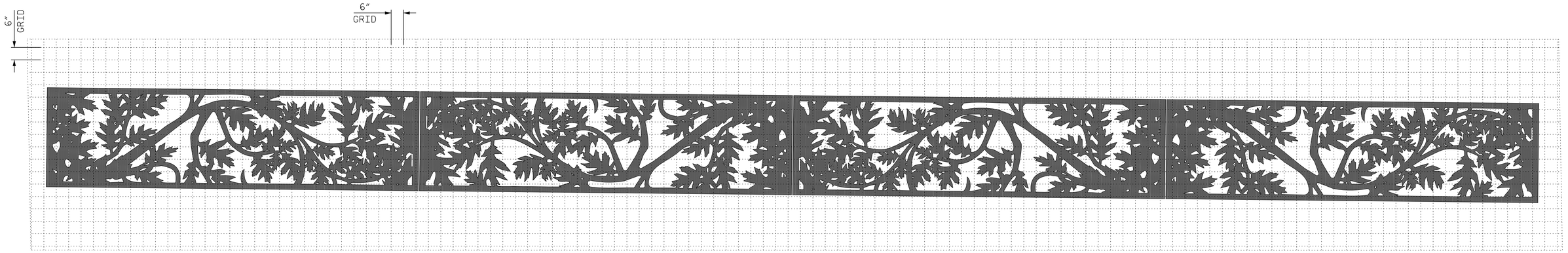


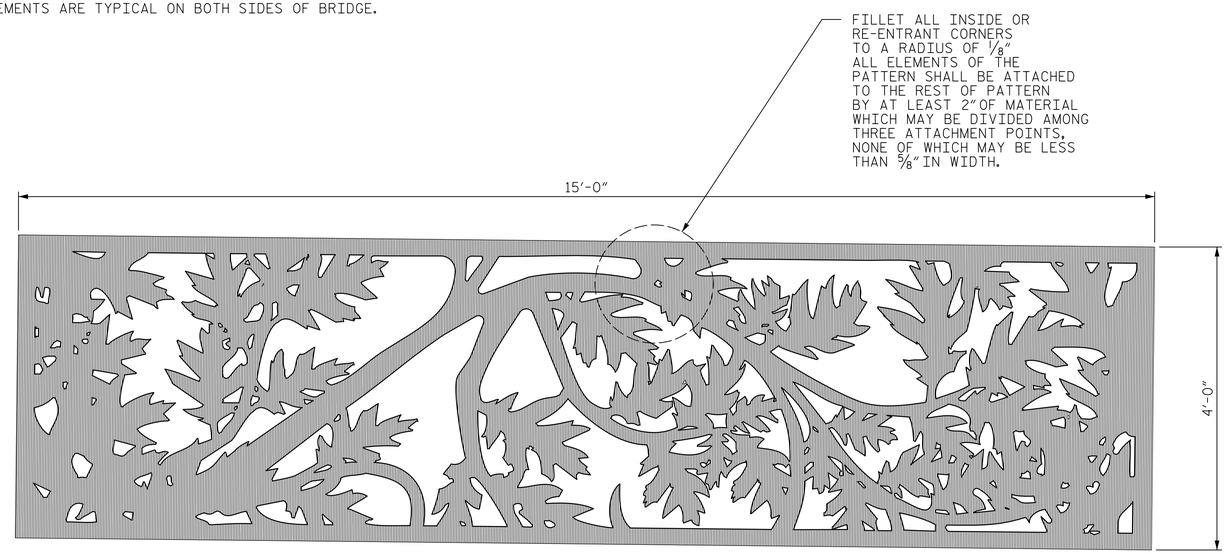
PATTERN KEY FOR ARCHITECTURAL FASCIA

NOTE: PLACEMENT LOCATIONS & TYPES OF ARCHITECTURAL FASCIA ELEMENTS ARE TYPICAL ON BOTH SIDES OF BRIDGE.



6"X 6"DESIGN GRID FOR ARCHITECTURAL FASCIA

NOTE: PLACEMENT LOCATIONS & TYPES OF ARCHITECTURAL FASCIA ELEMENTS ARE TYPICAL ON BOTH SIDES OF BRIDGE.



PATTERN FOR ARCHITECTURAL FASCIA

NOTE: PLACEMENT LOCATIONS & TYPES OF ARCHITECTURAL FASCIA ELEMENTS ARE TYPICAL ON BOTH SIDES OF BRIDGE.

NOTES:

-PATTERN SHOWN IS FOR BIDDING PURPOSES ONLY AND IS NOT FINAL.

-ARTWORK IS NOMINAL DIMENSION: EXACT DIMENSIONS TO BE DETERMINED THROUGH APPROVED SHOP DRAWINGS.

-MAINTAIN INTEGRITY OF ARTWORK & FAITHFULLY REPRODUCE FASCIAS ACCORDING TO SHOWN DRAWINGS.

-ARCHITECTURAL FASCIA ARTWORK SHOP DRAWINGS MUST BE APPROVED BY THE ENGINEER BEFORE PROCEEDING TO FABRICATION. SEE SPECIAL PROVISIONS.

-APPROVED MOCK-UPS, DEMONSTRATING THE CONDITIONS OF THE JOB ARE REQUIRED BEFORE BEGINNING THE FABRICATION RUN: MOCK-UP UNITS A, B, C, & D. SEE SPECIAL PROVISIONS

-ARTWORK SHALL BE CAM LASER CUT OR HD PLASMA CUT. NO WARPING OR DISTORTION IS ALLOWED, EDGES MUST BE SMOOTH TO TOUCH. REFER TO S-42 THROUGH S-43A AND SPECIAL PROVISIONS FOR ADDITIONAL NOTES.

-FASCIAS SHALL BE MOUNTED TO FRAME WHICH IS 1 1/4" X 4" BAR STOCK. (SEE STRUCTURE PLANS)

-ADJUST DIMENSIONS TO FIT CURVATURE OF SPAN; SEE PATTERN KEY, ROTATE PATTERN AS SHOWN TO FIT BRIDGE GIRDERS.

-CONSULT STRUCTURE DRAWINGS FOR CONNECTIONS TYPES AND INSTALLATION.

-ALLOW A 1/2" GAP BETWEEN ALL PANELS FOR ADJUSTMENTS & FITTING. SEE SPECIAL PROVISIONS.

-ARTWORK IS PROJECTED OFF WEB OF GIRDER AS SHOWN ON S-43.

-CONSULT STRUCTURE DRAWINGS FOR DIMENSIONS AND MEASUREMENTS NOT SHOWN.

-ARCHITECTURAL FASCIAS ARE STAINLESS STEEL WITH A NO. 4 FINISH. CONSULT PROJECT SPECIAL PROVISIONS FOR EXACT INFORMATION ON STEEL TYPE AND FINISHES.

-ALL OPENINGS THROUGH STAINLESS STEEL FASCIAS SHALL BE A MINIMUM OF 1/2" ACROSS.

-NO WORK MAY BE STARTED ON FABRICATION OF ARCHITECTURAL METAL FASCIAS UNTIL VECTOR DRAWINGS OF THE ARTWORK HAVE BEEN OBTAINED FROM THE DEPARTMENT.

6/2/2016

NORTH CAROLINA PROFESSIONAL SEAL 038447 ENGINEER ANDREW S. MILLER

Docusigned by: Andrew S. Miller

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARCHITECTURAL METAL FASCIA
PATTERN & LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43B
1			3			TOTAL SHEETS
2			4			110

STR. #1

DRAWN BY :	J. LACKEY	DATE :	4/2016
CHECKED BY :	A.S. MILLER	DATE :	4/2016
DESIGNED BY :	J. LACKEY	DATE :	4/2016

6/2/2016
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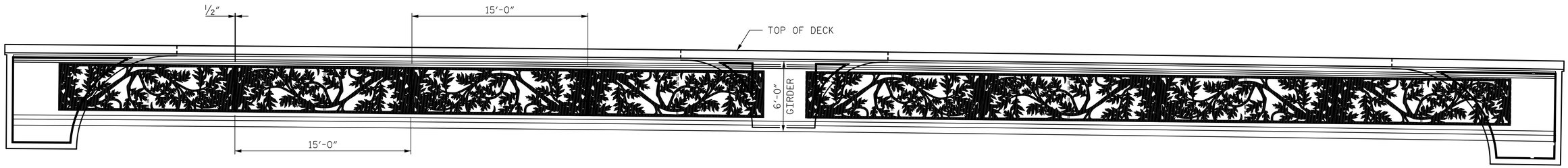
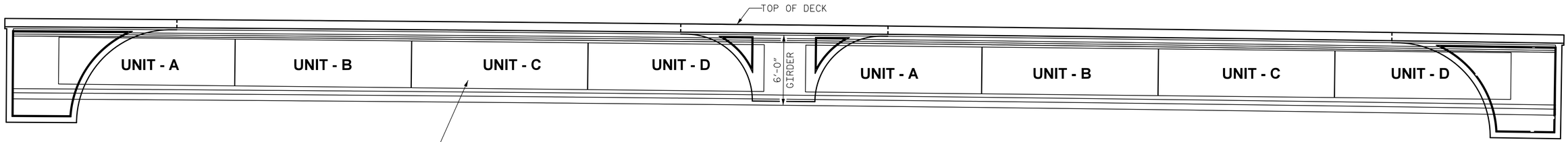
Kyle_Compton



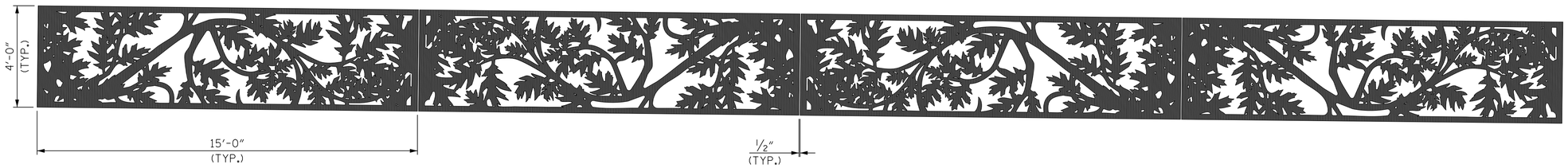
METAL FASCIA ELEVATION VIEW



FABRICATE GRILL TO FIT CURVATURE OF SPAN.
(CONSULT STRUCTURE PLANS FOR DETAILS
AND EXACT DIMENSIONS)

METAL FASCIA UNIT LAYOUT

NOTE: SEE STRUCTURE PLAN SHEETS S-42 FOR LAYOUT DIMENSIONS
GIRDER 14 SHOWN; GIRDER 1 SIMILAR, OPPOSITE HAND



PATTERN KEY FOR ARCHITECTURAL FASCIA

NOTE: SEE STRUCTURE PLAN SHEETS S-42 FOR LAYOUT DIMENSIONS

6/2/2016

NORTH CAROLINA PROFESSIONAL SEAL 038447 ENGINEER ANDREW S. MILLER

DocuSigned by: Andrew S. Miller
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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 22+06.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ARCHITECTURAL METAL FASCIA
PATTERN & LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43C
1			3			TOTAL SHEETS
2			4			110

STR. #1

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CHECKED BY :	A.S. MILLER	DATE : 4/2016
DESIGNED BY :	J. LACKEY	DATE : 4/2016

6/2/2016
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Kyle_Compton

FA. PROJECT NO. BRNHS-0070(119)

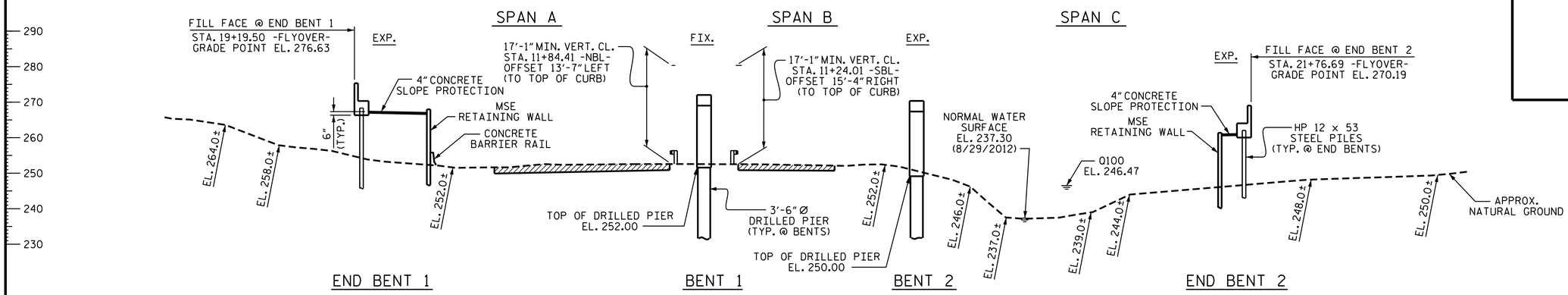
18+50 19+00 19+50 20+00 20+50 21+00 21+50 22+00

GRADE DATA -FLYOVER-

(+)1.7956% (-)7.0000%

PI = 20+51.00 -FLYOVER-
EL. 278.99
VC = 260'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

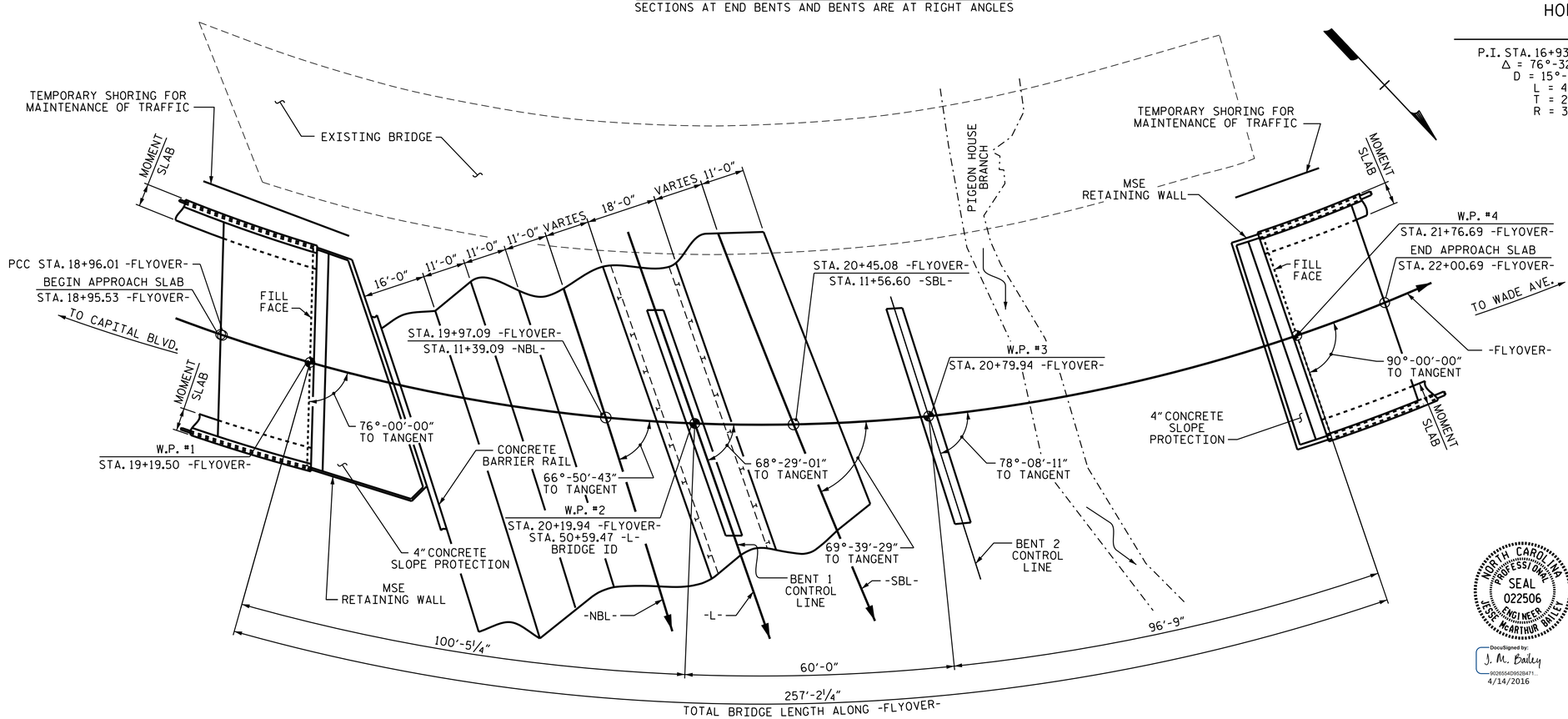


SECTION ALONG -FLYOVER-

SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES

HORIZONTAL CURVE DATA -FLYOVER-

P.I. STA. 16+93.08 -FLYOVER-	P.I. STA. 20+93.23 -FLYOVER-
Δ = 76°-32'-14.0"(LT)	Δ = 49°-47'-19.3"(LT)
D = 15°-26'-37.0"	D = 13°-28'-52.9"
L = 495.59'	L = 369.32'
T = 292.67'	T = 197.23'
R = 371.00'	R = 425.00'



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F245838930BF40E...
4/13/2016

NORTH CAROLINA PROFESSIONAL SEAL 022506 ENGINEER JESSE McARTHUR BAILEY

DocuSigned by: J. M. Bailey 902655AD9828471...
4/14/2016

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-
50+59.47 -L-

SHEET 1 OF 4 REPLACES BRIDGE #213

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON WADE AVE. (US 70 / NC 50) OVER CAPITAL BLVD. & PIGEON HOUSE BRANCH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016

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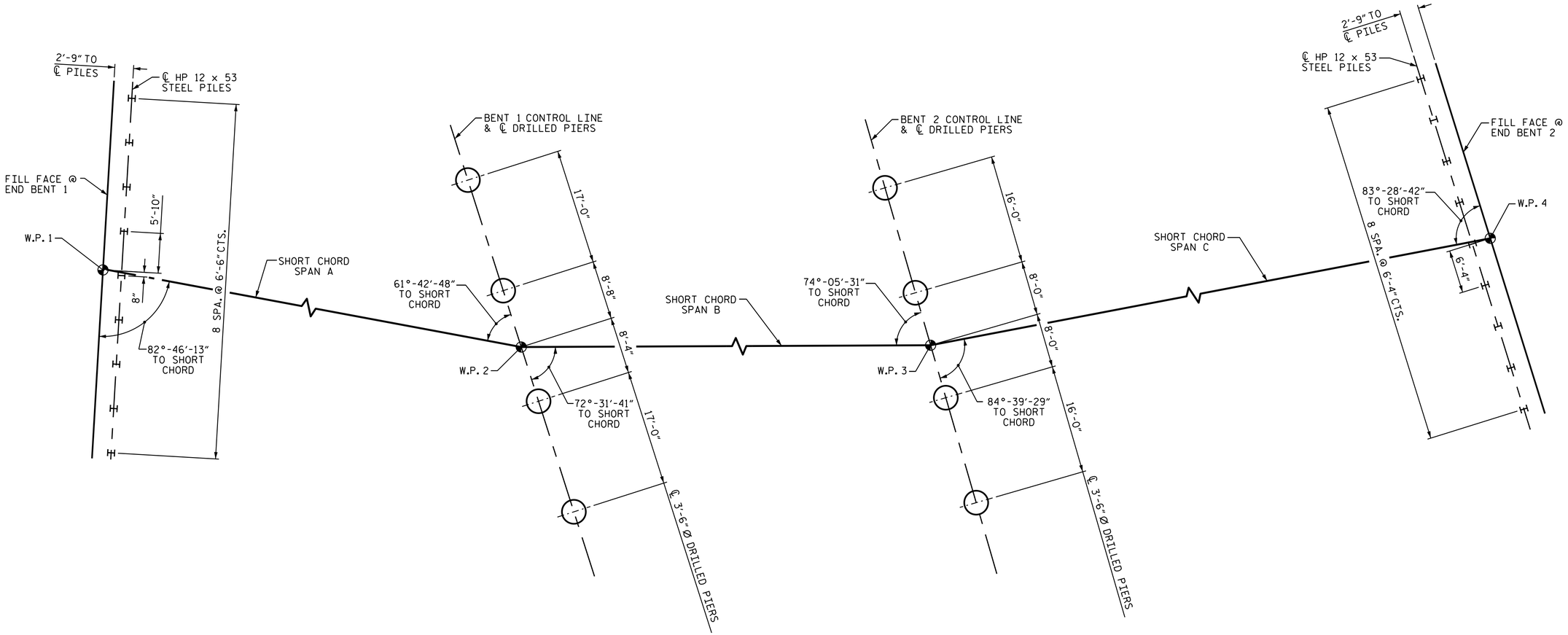
STR #2



FOUNDATION LAYOUT

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

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR END BENT 1. EXCAVATE HOLES FOR PILES 1 TO 4 TO ELEVATION 239.6 FEET AND PILES 5 TO 9 TO ELEVATION 241.6 FEET. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT 1.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE. DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTIKING, OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 555 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 232.5 FEET LEFT AND 234.5 FEET RIGHT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 8 FEET INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 500 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 225 FEET LEFT AND 221 FEET RIGHT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 6.5 FEET INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENTS 1 AND 2 ARE TO BE INSTALLED BEFORE CONSTRUCTION OF THE MSE WALLS.

PILES AT END BENT 2 ARE TO BE SLEEVED IN THE MSE REINFORCED BACKFILL ZONE. SEE MSE WALL PLANS.

PILE DRIVING AT END BENT 1 IS NOT REQUIRED IF PILE TIP IS ON CRYSTALLINE ROCK.

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016

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jpadams

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by:
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4/13/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

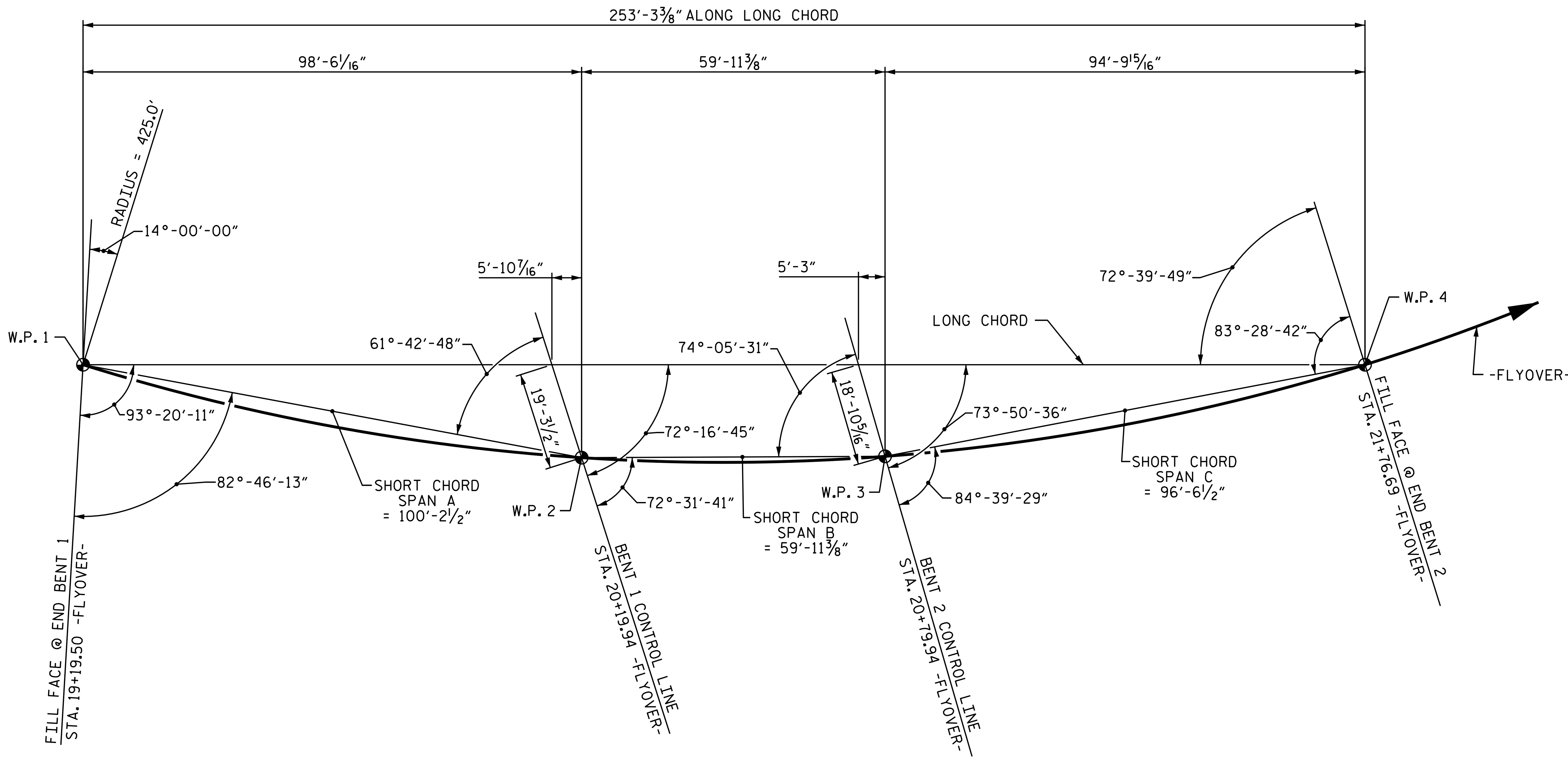
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON WADE AVE. (US 70 / NC 50) OVER CAPITAL BLVD. & PIGEON HOUSE BRANCH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			110

STR. #2



HORIZONTAL CURVE DATA
-FLYOVER-

P.I. STA. 20+93.23 -FLYOVER-
Δ = 49°-47'-19.3" (LT)
D = 13°-28'-52.9"
L = 369.32'
T = 197.23'
R = 425.00'

LONG CHORD LAYOUT

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DATA AND GENERAL NOTES, SEE SHEET SN.

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.

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

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 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.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH THE PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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.

THE EXISTING STRUCTURE CONSISTING OF 6 SPANS: 1 @ 49', 1 @ 47'-6", 1 @ 45'-6", 1 @ 36', 1 @ 42', & 1 @ 40'-6", WITH A CLEAR ROADWAY OF 34.2' AND REINFORCED CONCRETE DECK GIRDERS ON REINFORCED CONCRETE CAPS ON H-PILE END BENTS AND REINFORCED CONCRETE CAPS ON CONCRETE ENCASED H-PILE BENTS AND REINFORCED CONCRETE POST AND BEAM BENTS AND LOCATED SOUTH OF THE EXISTING BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

REMOVAL OF THE EXISTING SUBSTRUCTURE SHALL BE AS FOLLOWS: BENT 1 SHALL BE REMOVED TO 2'-3' BELOW THE FINISHED GRADE, BENT 4 SHALL BE REMOVED TO FLUSH WITH THE EXISTING CONCRETE LINED CHANNEL, AND BENT 5 SHALL BE REMOVED TO FLUSH WITH THE NATURAL GROUND. PILES AT ALL REMAINING BENTS SHALL BE PULLED AND REMOVED IN THEIR ENTIRETY.

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

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

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR DECORATIVE CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.

FOR ARCHITECTURAL METAL FASCIA, SEE SPECIAL PROVISIONS.

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON WADE AVE. (US 70 / NC 50) OVER CAPITAL BLVD. & PIGEON HOUSE BRANCH

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29441 KRISTY W. ALFORD

DocuSigned by:
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6/3/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016

02-JUN-2016 08:46
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kalford

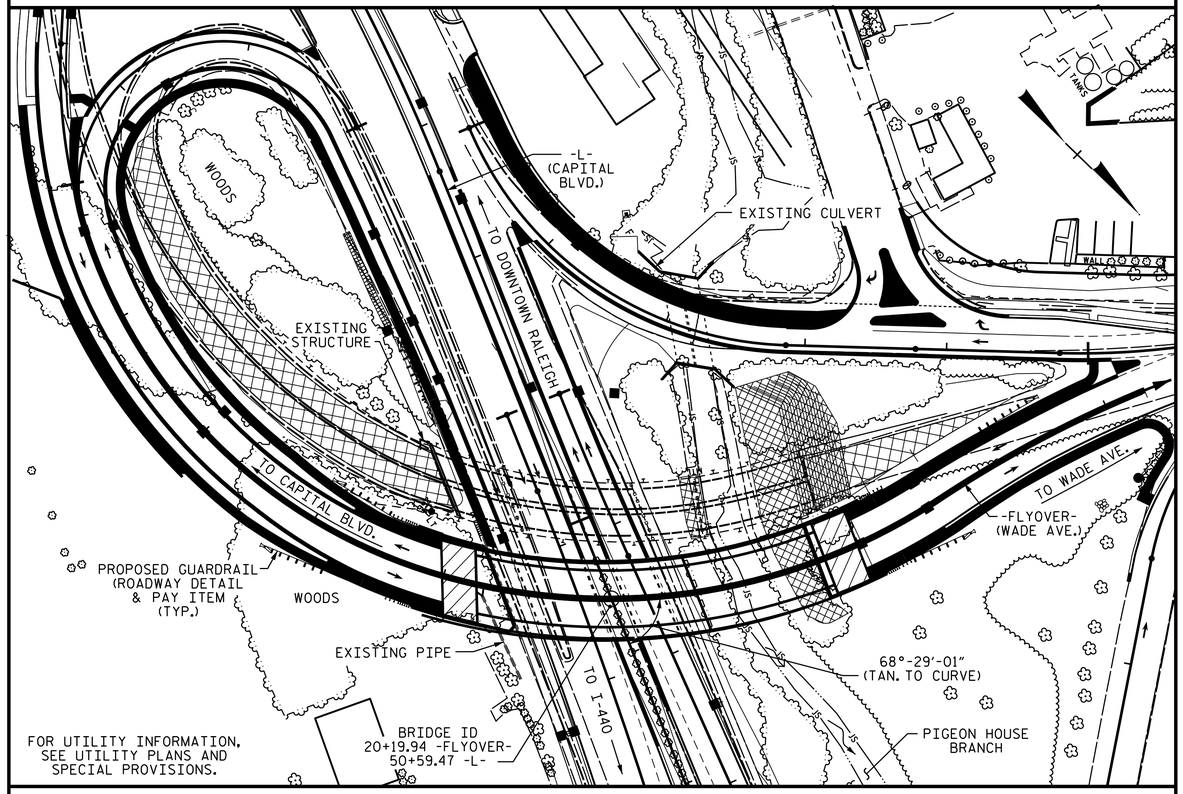
BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" DRILLED PIERS IN SOIL	3'-6" DRILLED PIERS NOT IN SOIL	PDA TESTING	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LIN FT.	LIN FT.	LIN FT.	LIN FT.	EA.	EA.	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE									14218	9993		LUMP SUM	
END BENT 1		44	38								45.5		5436
BENT 1				38	36						77.8		16117
BENT 2				74	34						75.2		17251
END BENT 2											44.0		5203
TOTAL	LUMP SUM	44	38	112	70	1	2	2	14218	9993	242.5	LUMP SUM	44007

BILL OF MATERIAL

	SPIRAL COLUMN REINFORCING STEEL	APPROX. 652000 LBS STRUCTURAL STEEL	HP 12 x 53 STEEL PILES		DECORATIVE CONCRETE PARAPET	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS	ASBESTOS ASSESSMENT	ARCHITECTURAL METAL FASCIA	CONCRETE PARAPET WITH MOMENT SLAB	PRECAST CONCRETE PANELS
	LBS.	APPROX. LBS.	NO.	LIN FT.	LIN FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN FT.	SQ. FT.
SUPERSTRUCTURE		LUMP SUM			509.82		LUMP SUM	LUMP SUM		478.75	168.79	220
END BENT 1			9	270		105						
BENT 1	2827											
BENT 2	3557											
END BENT 2			9	405		25						
TOTAL	6384	LUMP SUM	18	675	509.82	130	LUMP SUM	LUMP SUM	LUMP SUM	478.75	168.79	220

BM #50: RRS SET IN 32 INCH OAK 28' RIGHT STA. 13+71.00 -Y2RPB-, EL. 260.51



LOCATION SKETCH

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE _____ = N/A
FREQUENCY OF OVERTOPPING FLOOD _____ = N/A
OVERTOPPING FLOOD ELEVATION _____ = N/A

HYDRAULIC DATA

DESIGN DISCHARGE _____ = 1500 C.F.S.
FREQUENCY OF DESIGN FLOOD _____ = 50 YRS.
DESIGN HIGH WATER ELEVATION _____ = 246.2 FT.
DRAINAGE AREA _____ = 2.0 SQ. MI
BASE DISCHARGE (Q100) _____ = 1600 C.F.S
BASE HIGH WATER ELEVATION _____ = 246.47 FT.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...

6/3/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON WADE AVE.
(US 70 / NC 50)
OVER CAPITAL BLVD. &
PIGEON HOUSE BRANCH

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			110

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CHECKED BY : T.L. AVERETTE DATE : 2/2016

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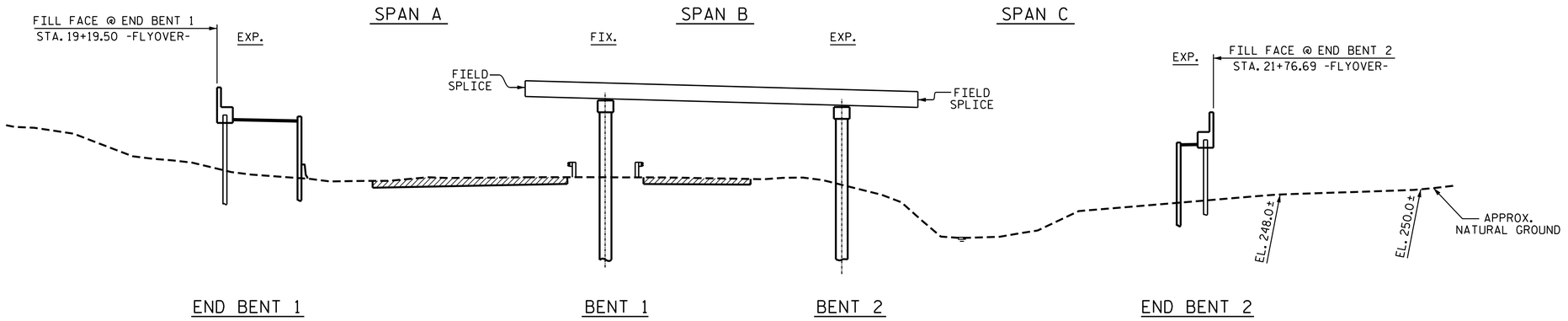
STR #2



STAGE 1 GIRDER ERECTION

SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES

NOTES

ERECT A MINIMUM OF TWO GIRDERS WITH ALL DIAPHRAGMS/CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT GIRDER WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN BOLTS BEFORE RELEASING THE GIRDER.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

ERECTION OF GIRDERS SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF GIRDERS, AVOID UPLIFT OF GIRDERS, AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...

4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			110

STR #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016

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jpadams

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II 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	1.35	--	1.75	--	1.35	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		HL-93 (OPERATING)	N/A		1.76	--	1.35	--	1.76	A	EL	51.78	--	--	--	--	--	1.00	--	--	--	--	--	--
		HS-20 (INVENTORY)	36.00	2	1.87	67.3	1.75	--	1.87	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		HS-20 (OPERATING)	36.00		2.43	87.5	1.35	--	2.43	A	EL	51.78	--	--	--	--	--	1.00	--	--	--	--	--	--
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.55	74.9	1.40	--	5.55	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNGARBS2	20.000		4.01	80.2	1.40	--	4.01	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNAGRIS2	22.000		3.74	82.3	1.40	--	3.74	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNCOTTS3	27.250		2.77	75.5	1.40	--	2.77	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNAGGRS4	34.925		2.27	79.3	1.40	--	2.27	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNS5A	35.550		2.23	79.3	1.40	--	2.23	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNS6A	39.950		2.02	80.7	1.40	--	2.02	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		SNS7B	42.000		1.93	81.1	1.40	--	1.93	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		6.71	221.4	1.40	--	6.71	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNT4A	33.075		2.55	84.3	1.40	--	2.55	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNT6A	41.600		2.04	84.9	1.40	--	2.04	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNT7A	42.000		1.93	81.1	1.40	--	1.93	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNT7B	42.000	3	1.91	80.2	1.40	--	1.91	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNAGRIT4	43.000		2.08	89.4	1.40	--	2.08	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNAGT5A	45.000		2.07	93.2	1.40	--	2.07	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
		TNAGT5B	45.000		2.11	95.0	1.40	--	2.11	A	EL	51.78	--	--	--	--	--	1.30	--	--	--	--	--	--
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		2.43																			

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **

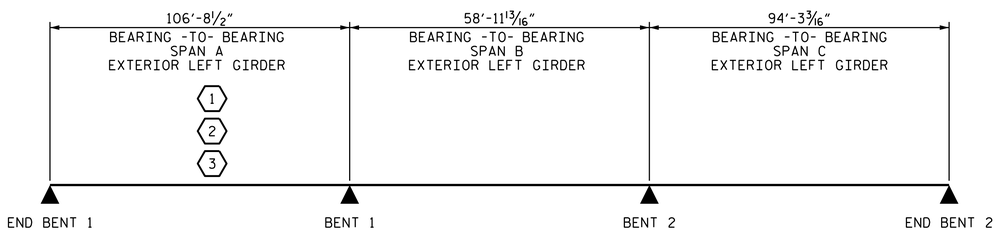
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B93D8F40E...

4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			110

STR #2 STD. NO. LRFR3

ASSEMBLED BY : R.L. CHESSON	DATE : 12/2015
CHECKED BY : K.W. ALFORD	DATE : 2/2016
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

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jpadams

PARTIAL TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS)

NOTES

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

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

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

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

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

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

ALL REINFORCING STEEL IN CONCRETE PARAPETS, SIDEWALKS AND CONCRETE MEDIANS SHALL BE EPOXY COATED.

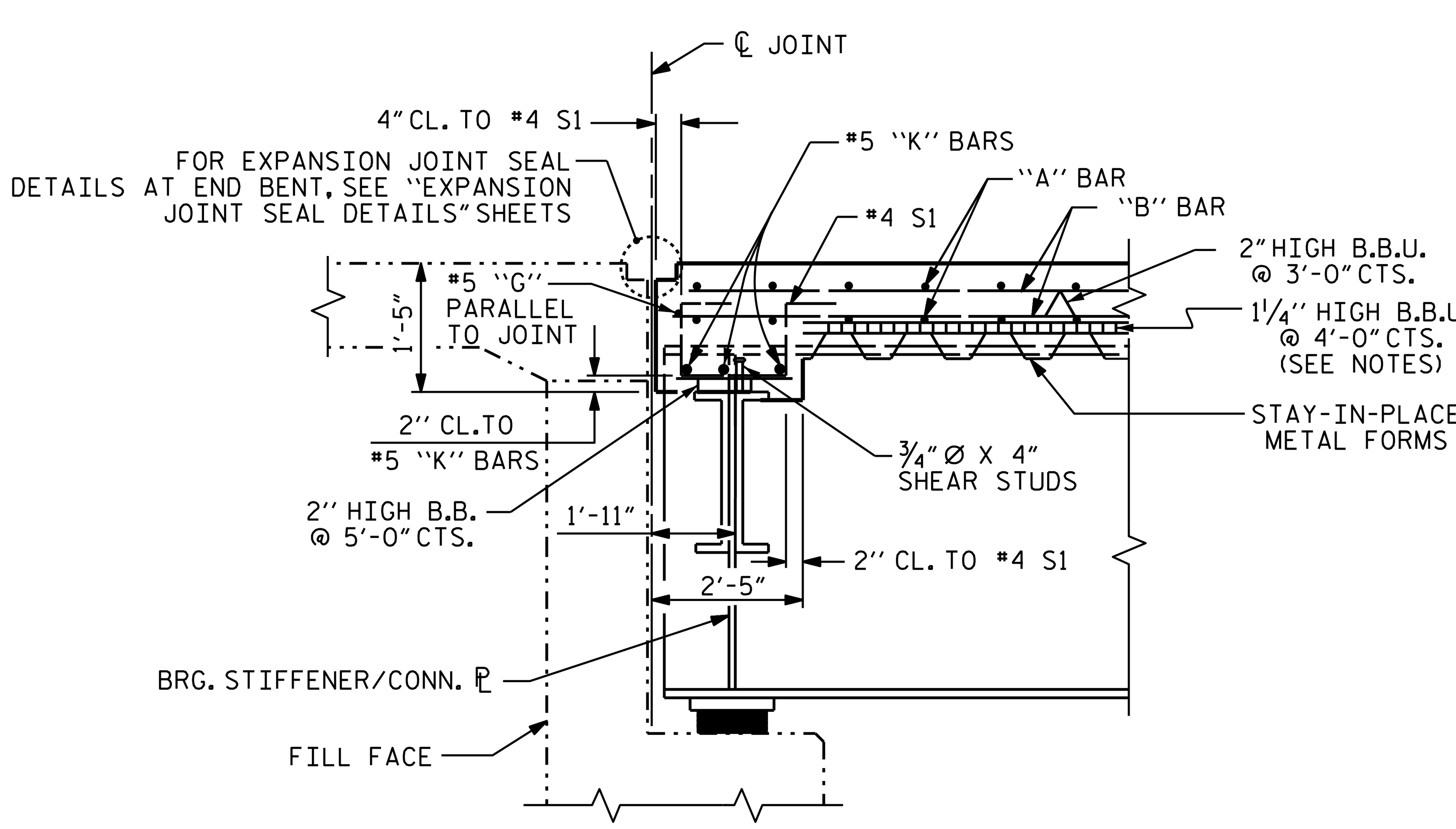
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

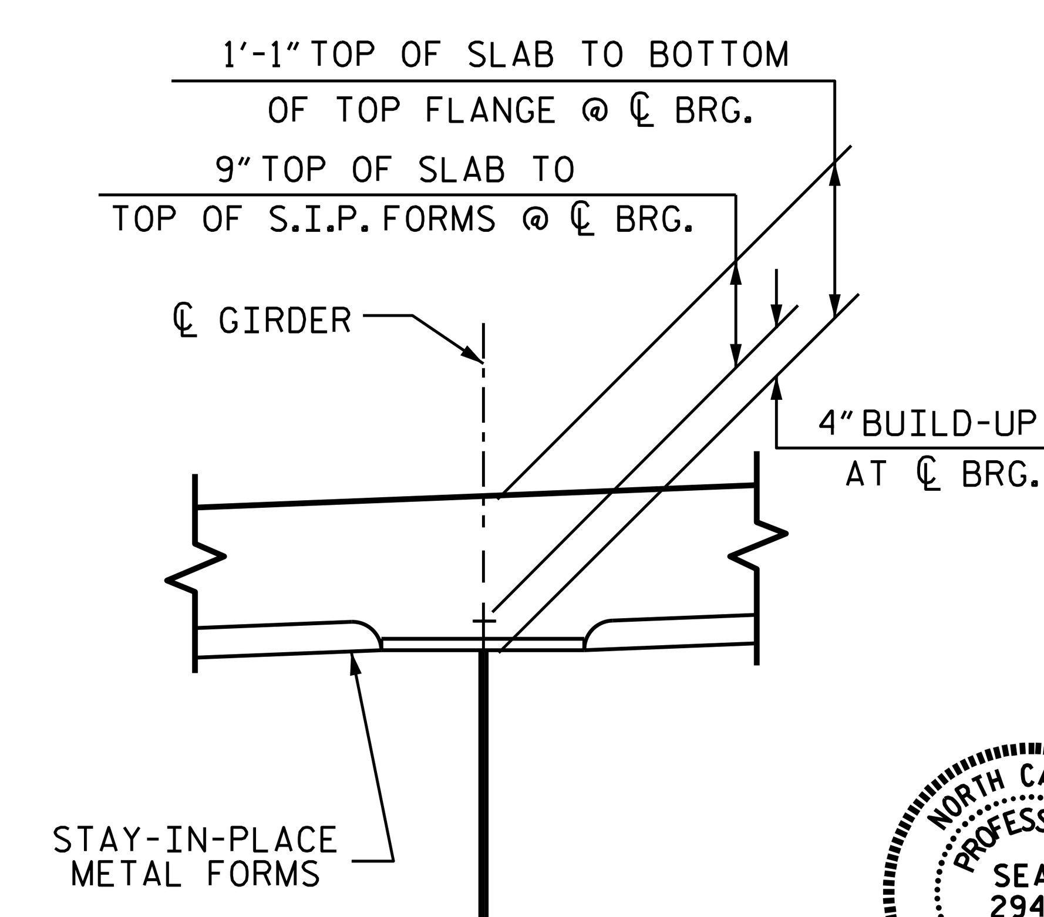
AESTHETIC DETAILS NOT SHOWN FOR CLARITY. FOR AESTHETIC DETAILS, SEE "PARAPET AESTHETIC DETAILS" SHEETS AND SPECIAL PROVISIONS.

FOR CLARITY DECK EDGE BEAM NOT SHOWN. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

THREADED RODS FOR PRECAST PANELS ARE NOT SHOWN FOR CLARITY. SEE "PRECAST PANEL" SHEETS FOR LOCATION AND DETAILS OF THREADED RODS.



SECTION THRU END BENT



DETAIL "A"

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29441 KRISTY W. ALFORD

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F2458369308F40E...
4/13/2016

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-50
1			3					TOTAL SHEETS
2			4					110

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STR. #2

DRAWN BY :	J.P. ADAMS	DATE :	1/2016
CHECKED BY :	T.L. AVERETTE	DATE :	2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE :	2/2016

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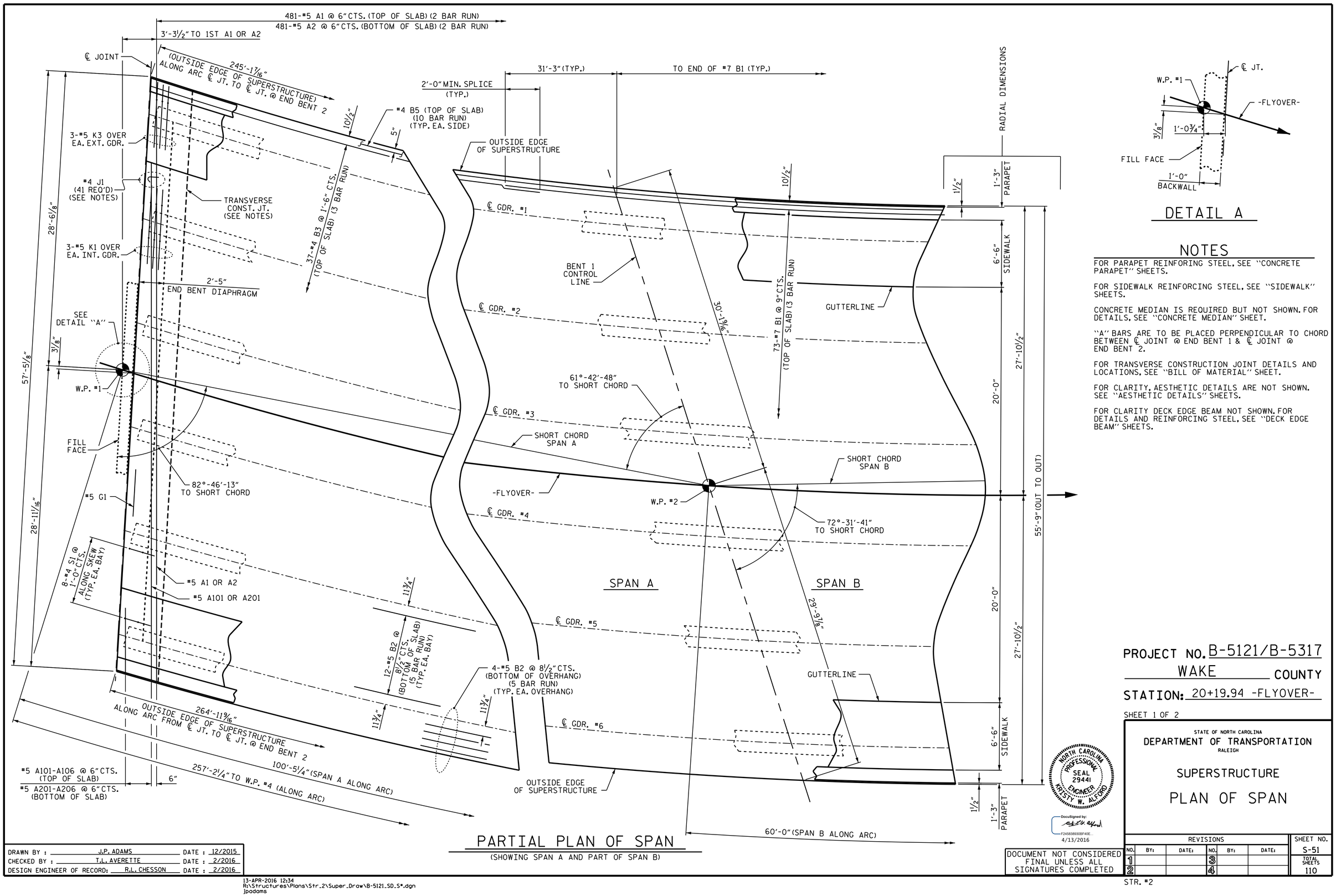
jpadams



DETAIL A

NOTES

FOR PARAPET REINFORING STEEL, SEE "CONCRETE PARAPET" SHEETS.

FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK" SHEETS.

CONCRETE MEDIAN IS REQUIRED BUT NOT SHOWN. FOR DETAILS, SEE "CONCRETE MEDIAN" SHEET.

"A" BARS ARE TO BE PLACED PERPENDICULAR TO CHORD BETWEEN ℄ JOINT @ END BENT 1 & ℄ JOINT @ END BENT 2.

FOR TRANSVERSE CONSTRUCTION JOINT DETAILS AND LOCATIONS, SEE "BILL OF MATERIAL" SHEET.

FOR CLARITY, AESTHETIC DETAILS ARE NOT SHOWN. SEE "AESTHETIC DETAILS" SHEETS.

FOR CLARITY DECK EDGE BEAM NOT SHOWN. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

PARTIAL PLAN OF SPAN

(SHOWING SPAN A AND PART OF SPAN B)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : J.P. ADAMS DATE : 12/2015
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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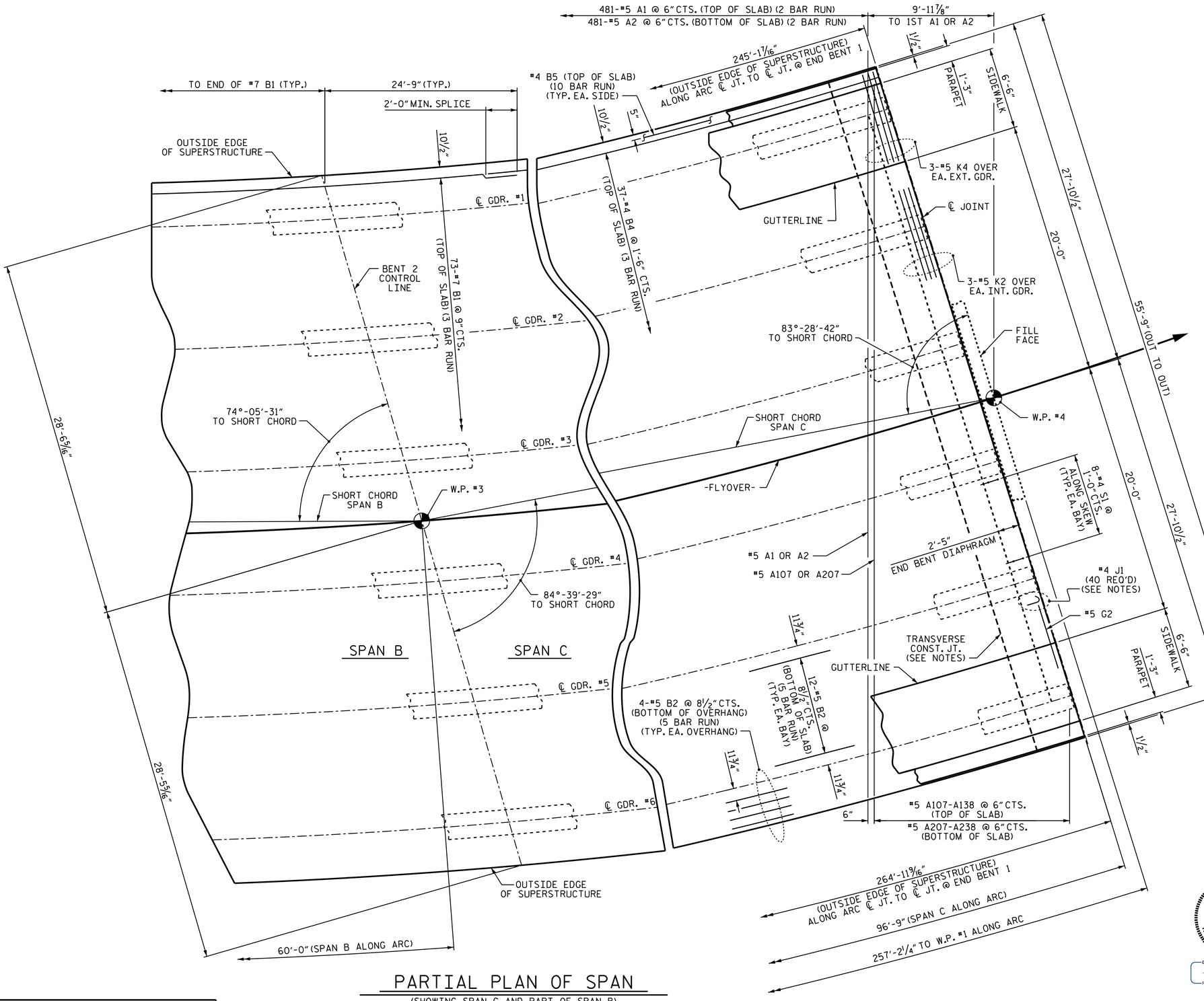
STR. #2



PARTIAL PLAN OF SPAN

(SHOWING SPAN C AND PART OF SPAN B)

NOTES

FOR PARAPET REINFORING STEEL, SEE "CONCRETE PARAPET" SHEETS.

FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK" SHEETS.

CONCRETE MEDIAN IS REQUIRED BUT NOT SHOWN, FOR DETAILS, SEE "CONCRETE MEDIAN" SHEET.

"A" BARS ARE TO BE PLACED PERPENDICULAR TO CHORD BETWEEN ℄ JOINT @ END BENT 1 & ℄ JOINT @ END BENT 2.

FOR TRANSVERSE CONSTRUCTION JOINT DETAILS AND LOCATIONS, SEE "BILL OF MATERIAL" SHEET.

FOR CLARITY, AESTHETIC DETAILS ARE NOT SHOWN. SEE "RAIL AESTHETIC DETAILS" SHEETS.

FOR CLARITY, DECK EDGE BEAM NOT SHOWN. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			110

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DRAWN BY :	J.P. ADAMS	DATE : 12/2015
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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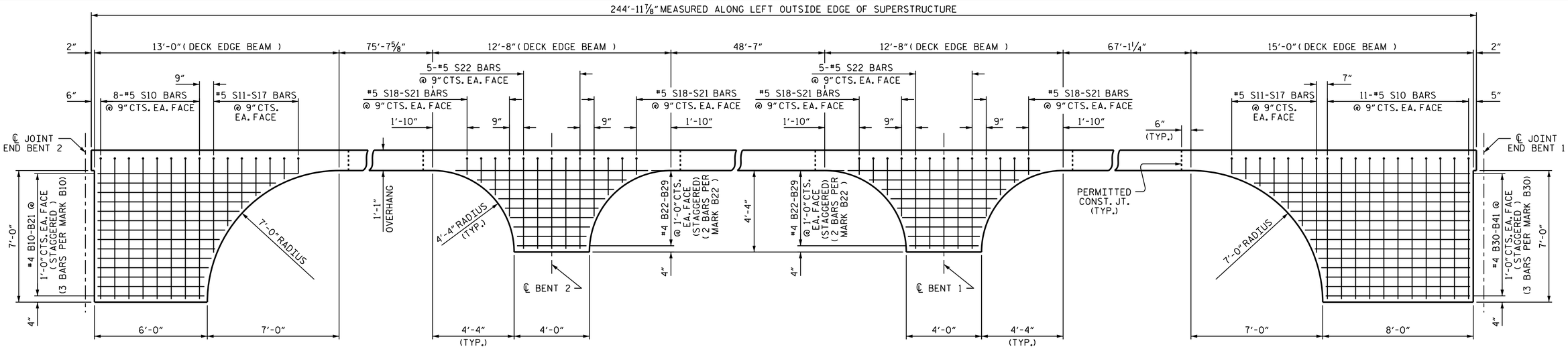
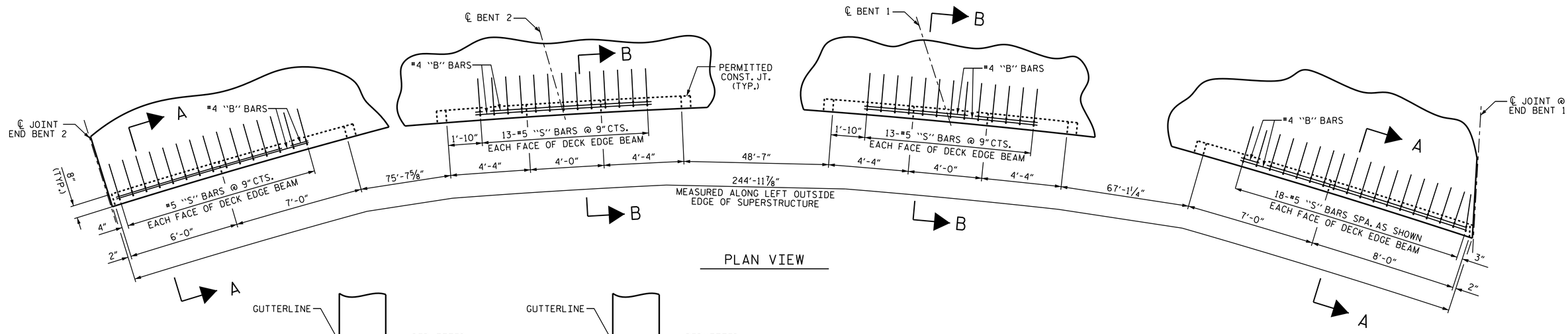
STR. #2

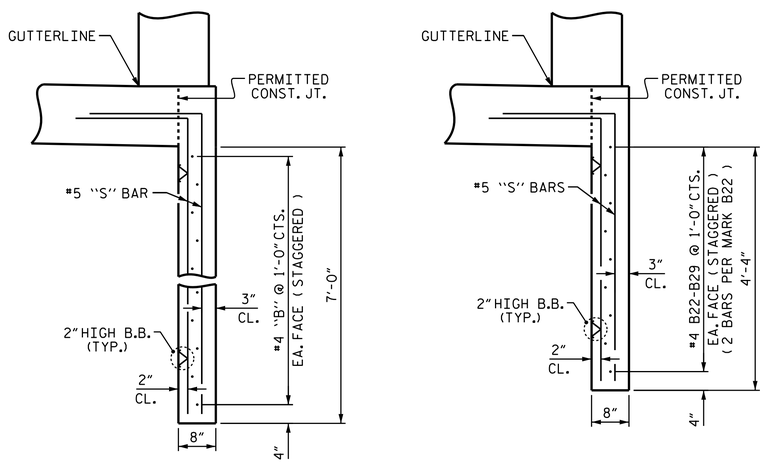


ELEVATION VIEW

SHOWN ALONG EXTERIOR FACE OF LEFT SIDE OF STRUCTURE



PLAN VIEW



SECTION A-A

SECTION B-B

NOTES:

DECK EDGE BEAMS SHALL BE CAST WITH THE DECK. NO CONSTRUCTION JOINT SHALL BE ALLOWED BETWEEN THE DECK EDGE BEAMS AND THE DECK, EXCEPT AS SHOWN.

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR AESTHETIC DETAILS.

DECK REINFORCING STEEL NOT SHOWN FOR CLARITY. SEE "PLAN OF SPANS" SHEETS.

CONCRETE PARAPET DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET" SHEETS.

FORMED HOLES FOR PRECAST PANELS NOT SHOWN FOR CLARITY. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH PRECAST PANEL ANCHORAGE. SEE "PRECAST PANEL" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK EDGE BEAM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
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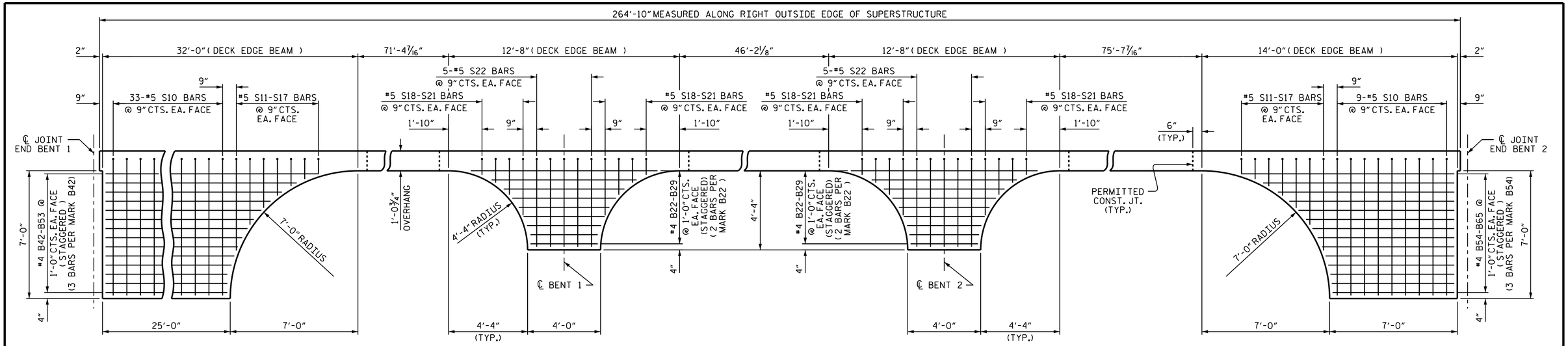

ELEVATION VIEW

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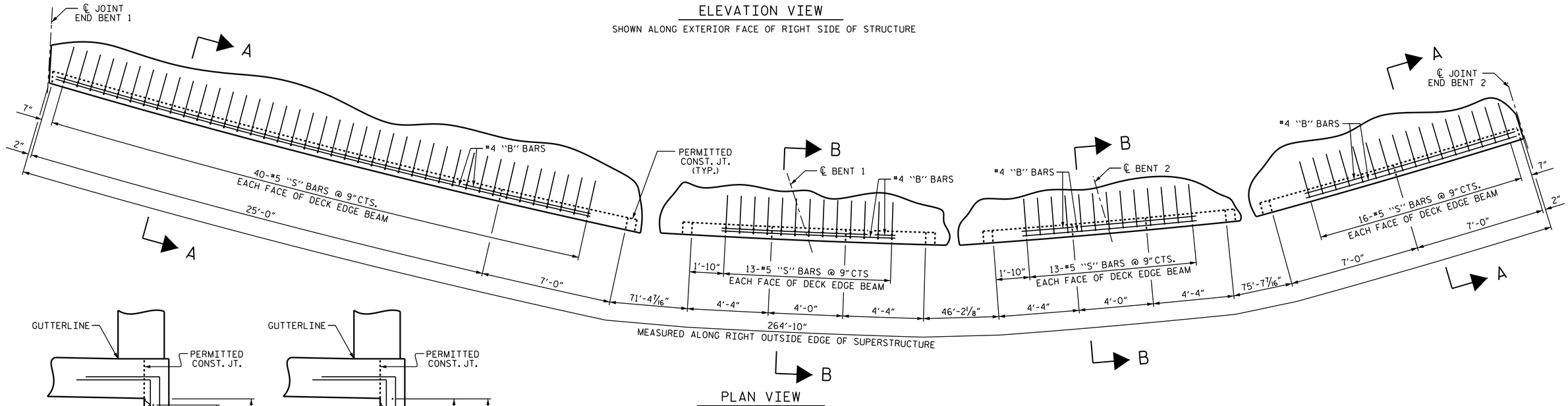
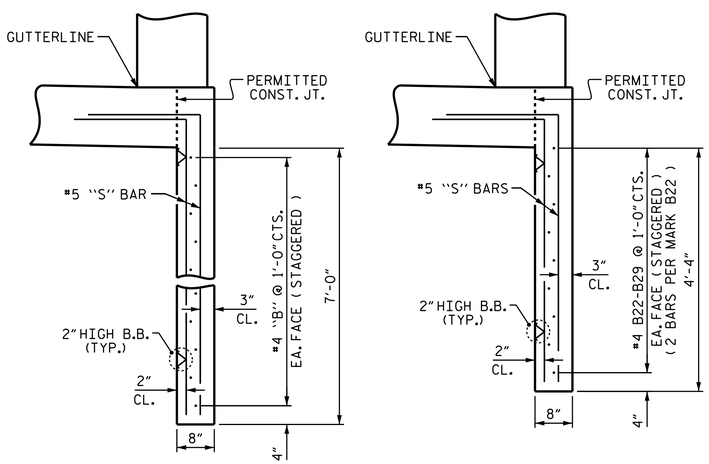


PLAN VIEW



SECTION A-A

SECTION B-B

NOTES:

DECK EDGE BEAMS SHALL BE CAST WITH THE DECK. NO CONSTRUCTION JOINT SHALL BE ALLOWED BETWEEN THE DECK EDGE BEAMS AND THE DECK, EXCEPT AS SHOWN.

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR AESTHETIC DETAILS.

DECK REINFORCING STEEL NOT SHOWN FOR CLARITY. SEE "PLAN OF SPANS" SHEETS.

CONCRETE PARAPET DETAILS NOT SHOWN FOR CLARITY. SEE "CONCRETE PARAPET" SHEETS.

FORMED HOLES FOR PRECAST PANELS NOT SHOWN FOR CLARITY. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH PRECAST PANEL ANCHORAGE. SEE "PRECAST PANEL" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK EDGE BEAM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

13-APR-2016 12:34
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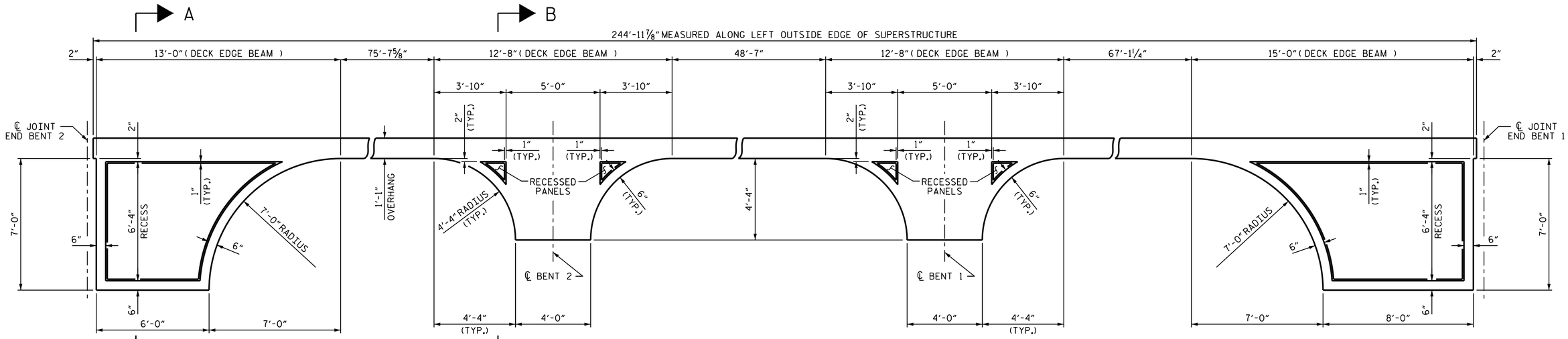
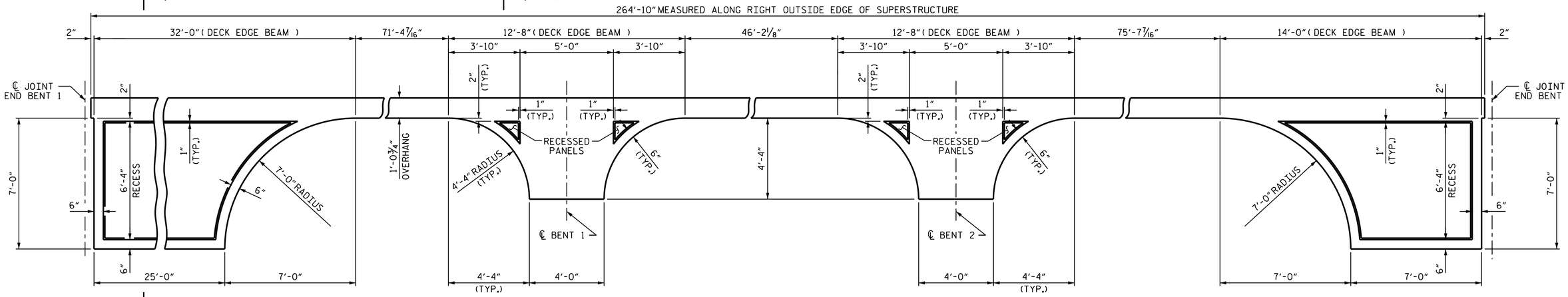
jpadams



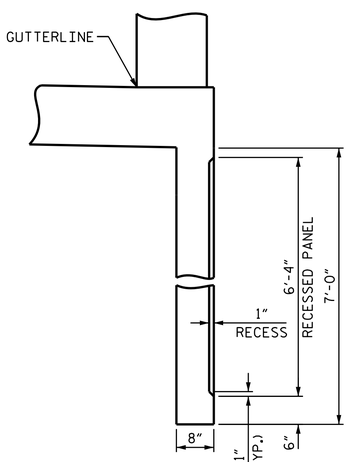
ELEVATION VIEW

SHOWN ALONG EXTERIOR FACE OF LEFT SIDE OF STRUCTURE

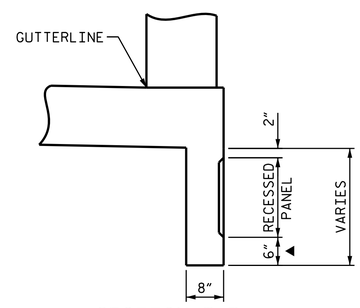


ELEVATION VIEW

SHOWN ALONG EXTERIOR FACE OF RIGHT SIDE OF STRUCTURE



SECTION A-A



SECTION B-B

▲ MEASURED PERPENDICULAR TO BOTTOM OF DECK EDGE BEAM

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK EDGE BEAM

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893088F40E...
4/13/2016

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			110

STR. #2

13-APR-2016 12:34
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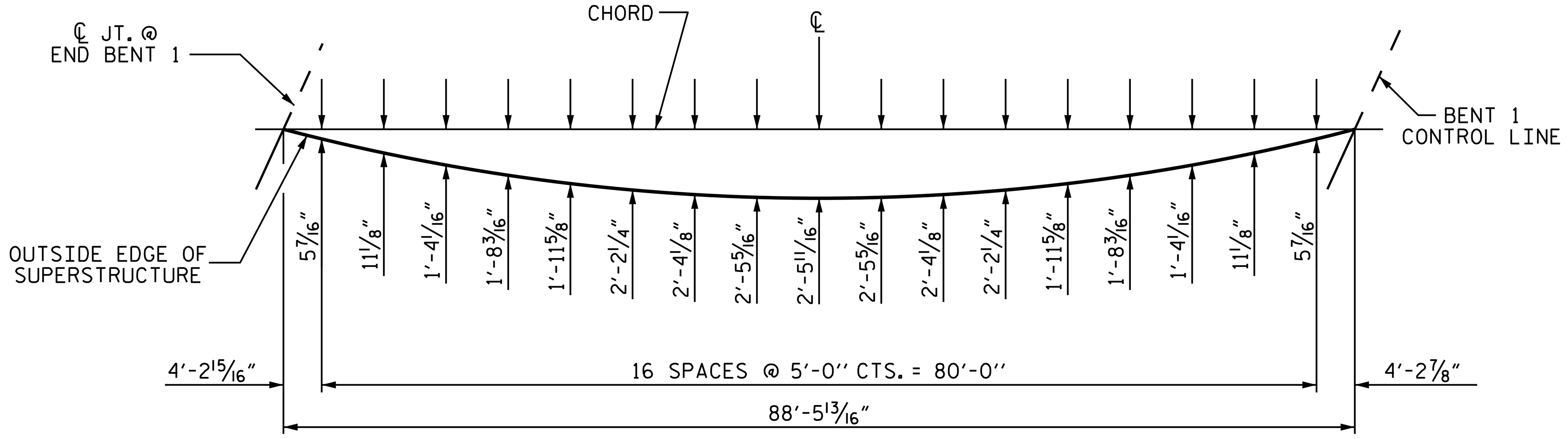
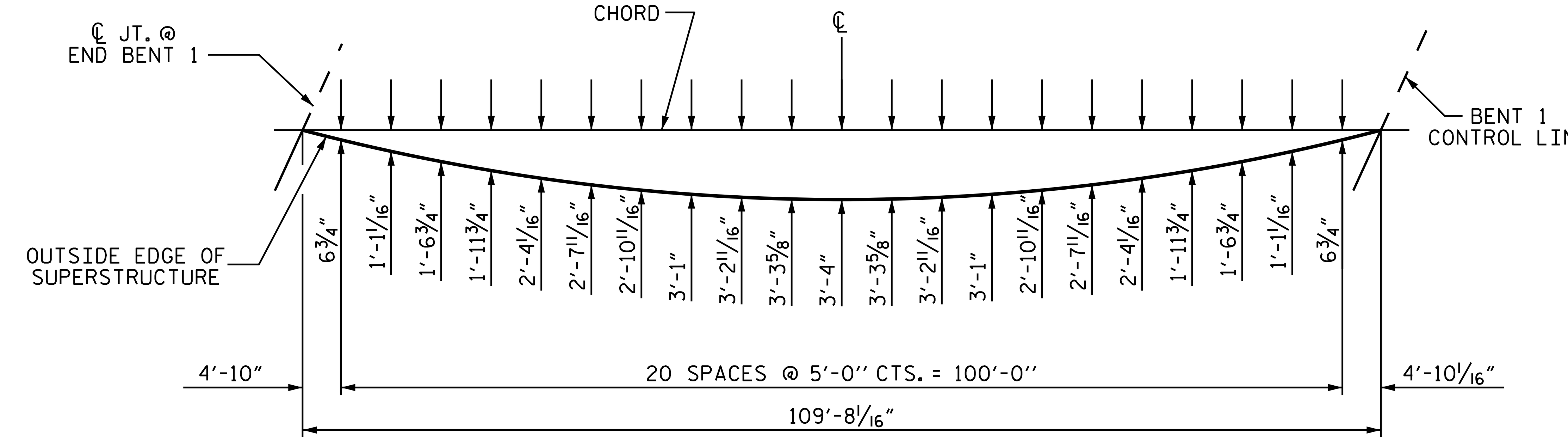


LEFT SIDE SPAN A ARC OFFSETS



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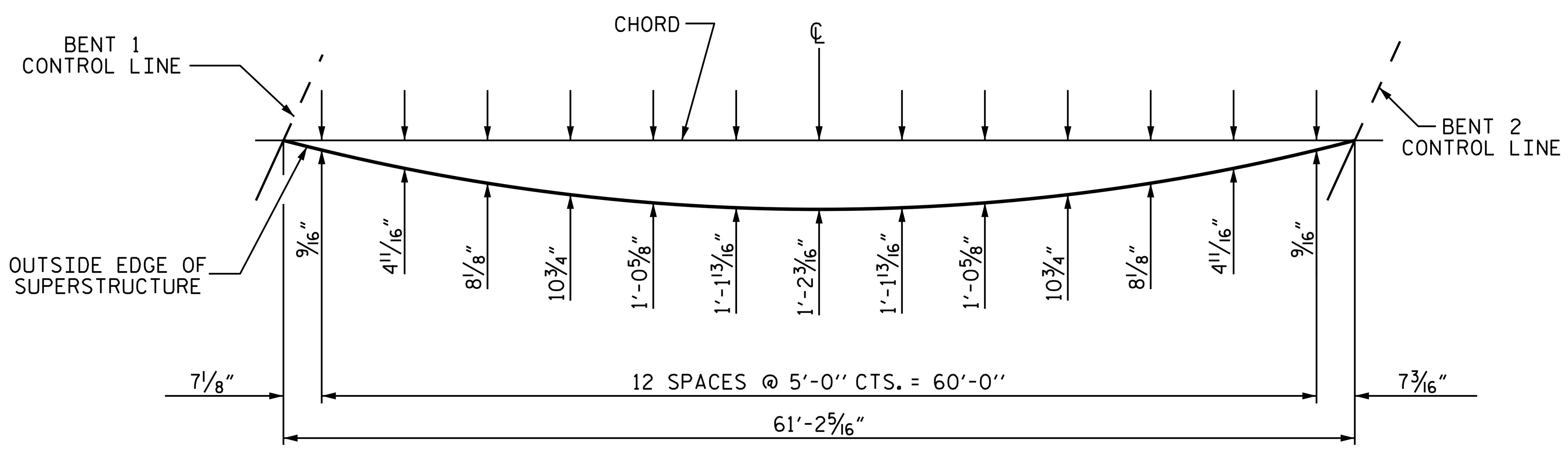
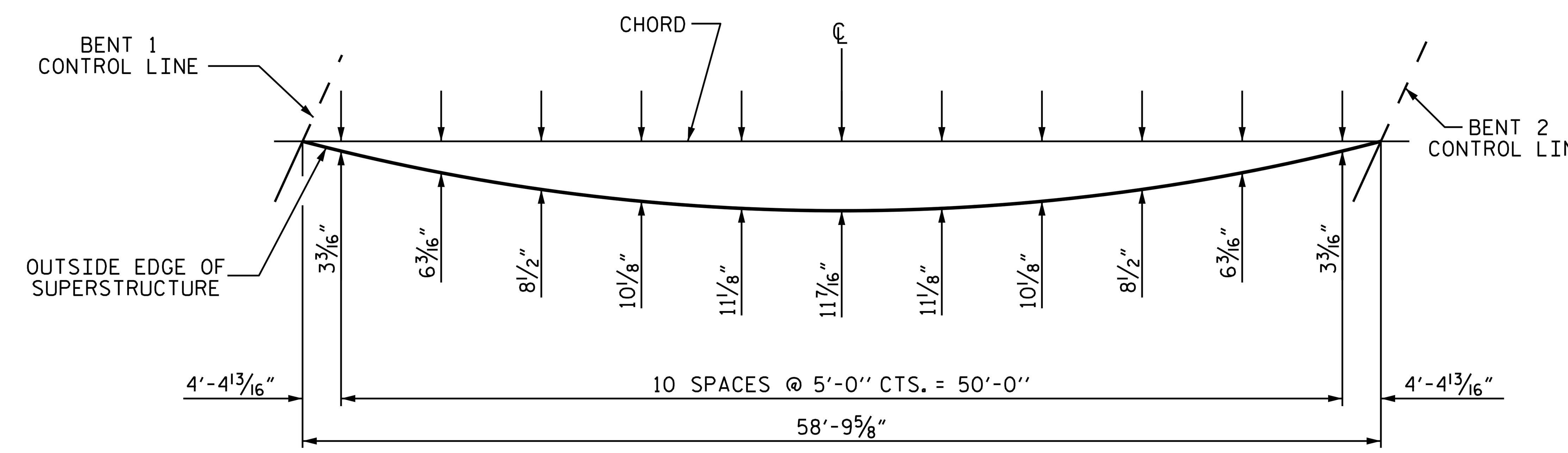
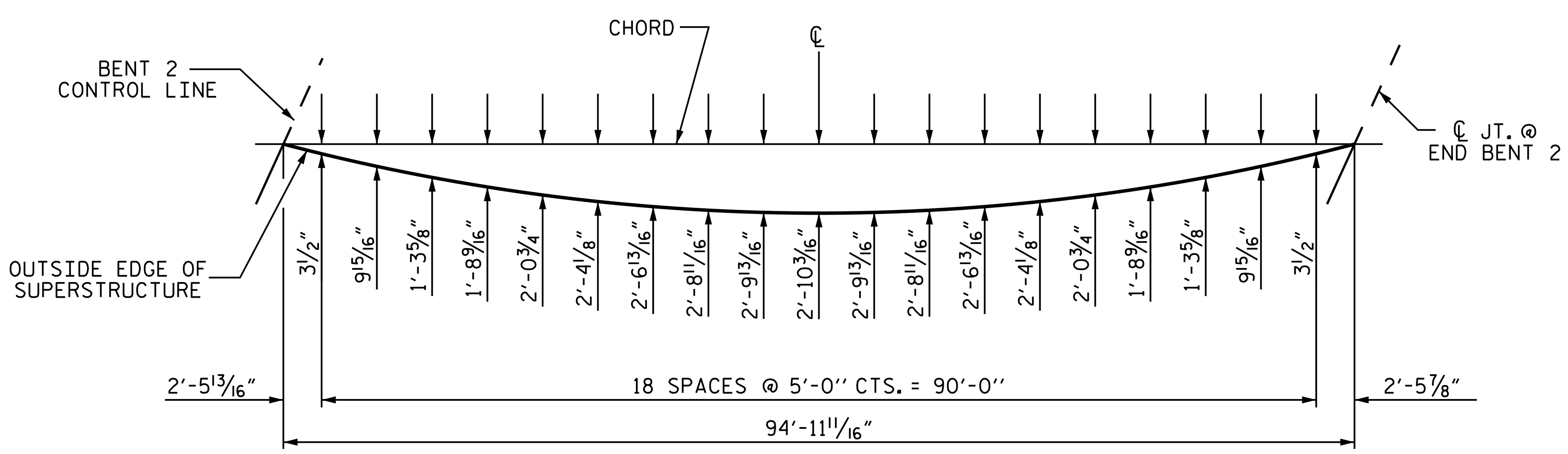


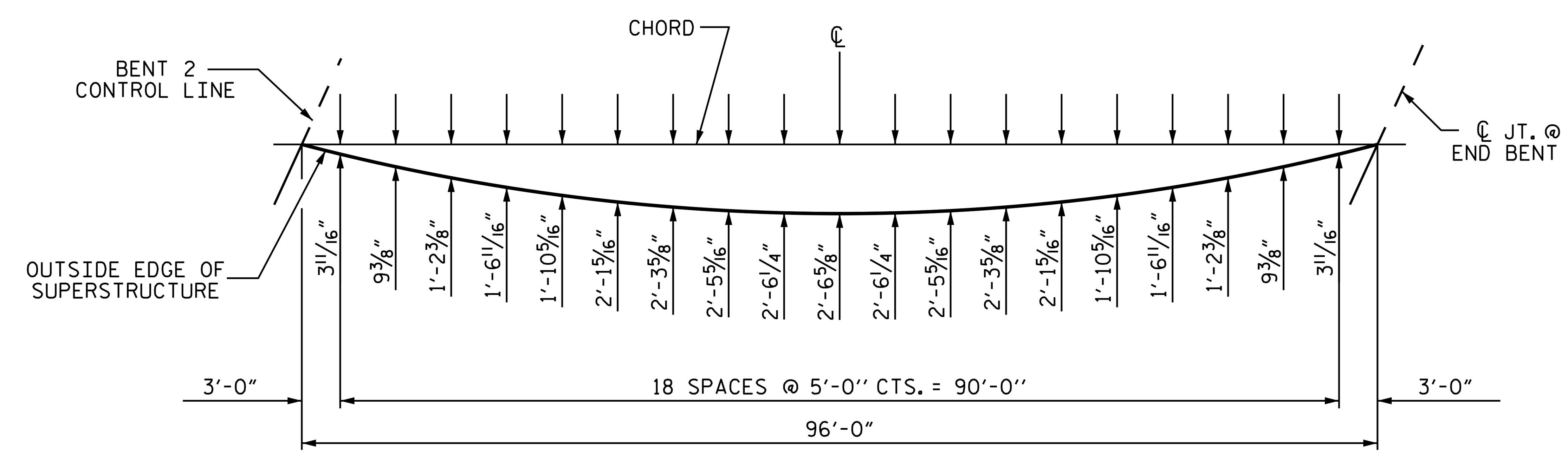
LEFT SIDE SPAN B ARC OFFSETS



RIGHT SIDE SPAN B ARC OFFSETS



LEFT SIDE SPAN C ARC OFFSETS



RIGHT SIDE SPAN C ARC OFFSETS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29441 KRISTY W. ALFORD

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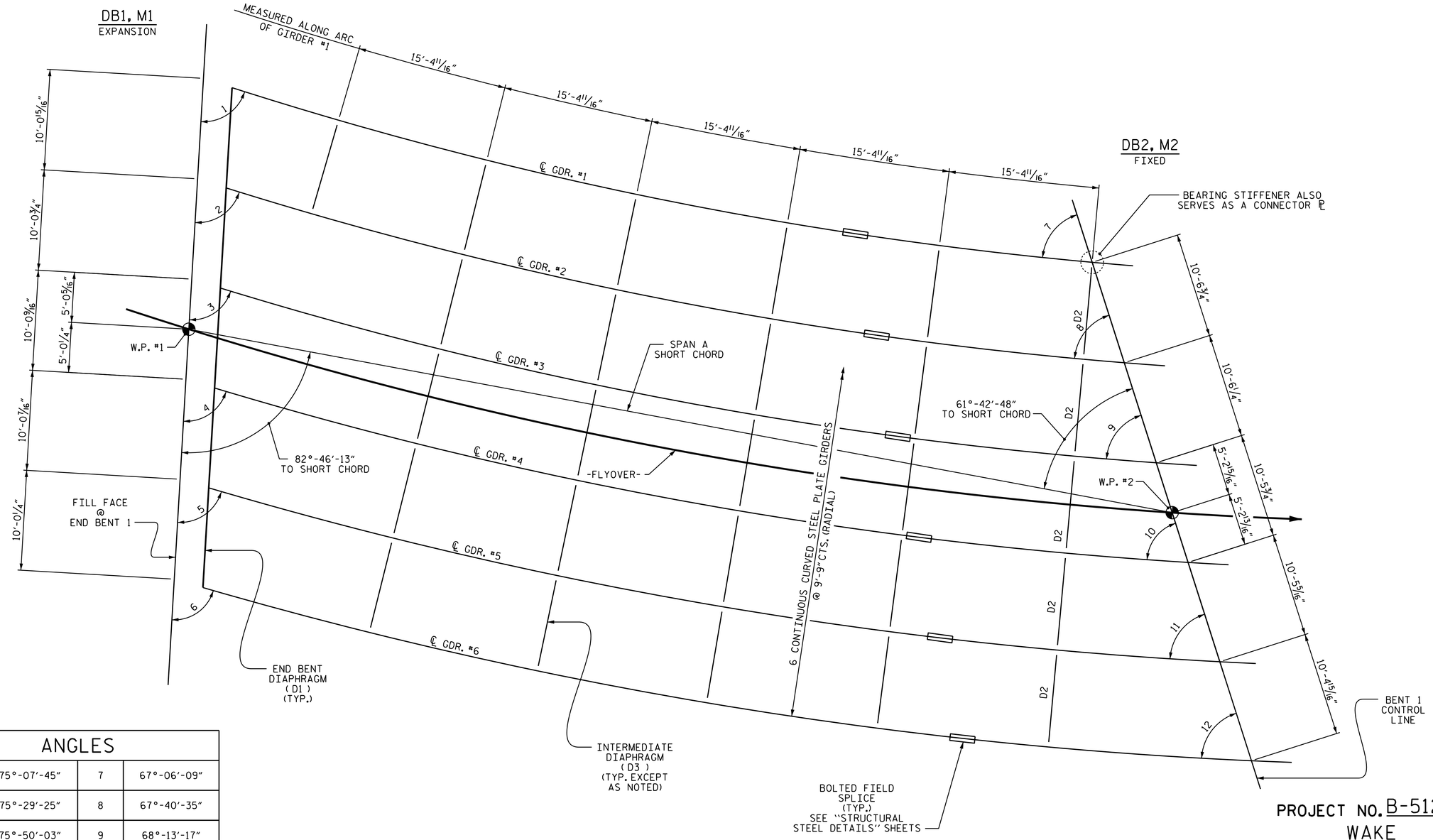

ANGLES			
1	75°-07'-45"	7	67°-06'-09"
2	75°-29'-25"	8	67°-40'-35"
3	75°-50'-03"	9	68°-13'-17"
4	76°-09'-43"	10	68°-44'-22"
5	76°-28'-29"	11	69°-13'-59"
6	76°-46'-25"	12	69°-42'-14"

ANGLES ARE TANGENT TO CURVE @ FILL FACE AND BENT CONTROL LINE

SPAN A FRAMING PLAN

INTERMEDIATE (D3) & BENT DIAPHRAGMS (D2) ARE TO BE PLACED RADIALLY TO ℄ GIRDERS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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2			4			110

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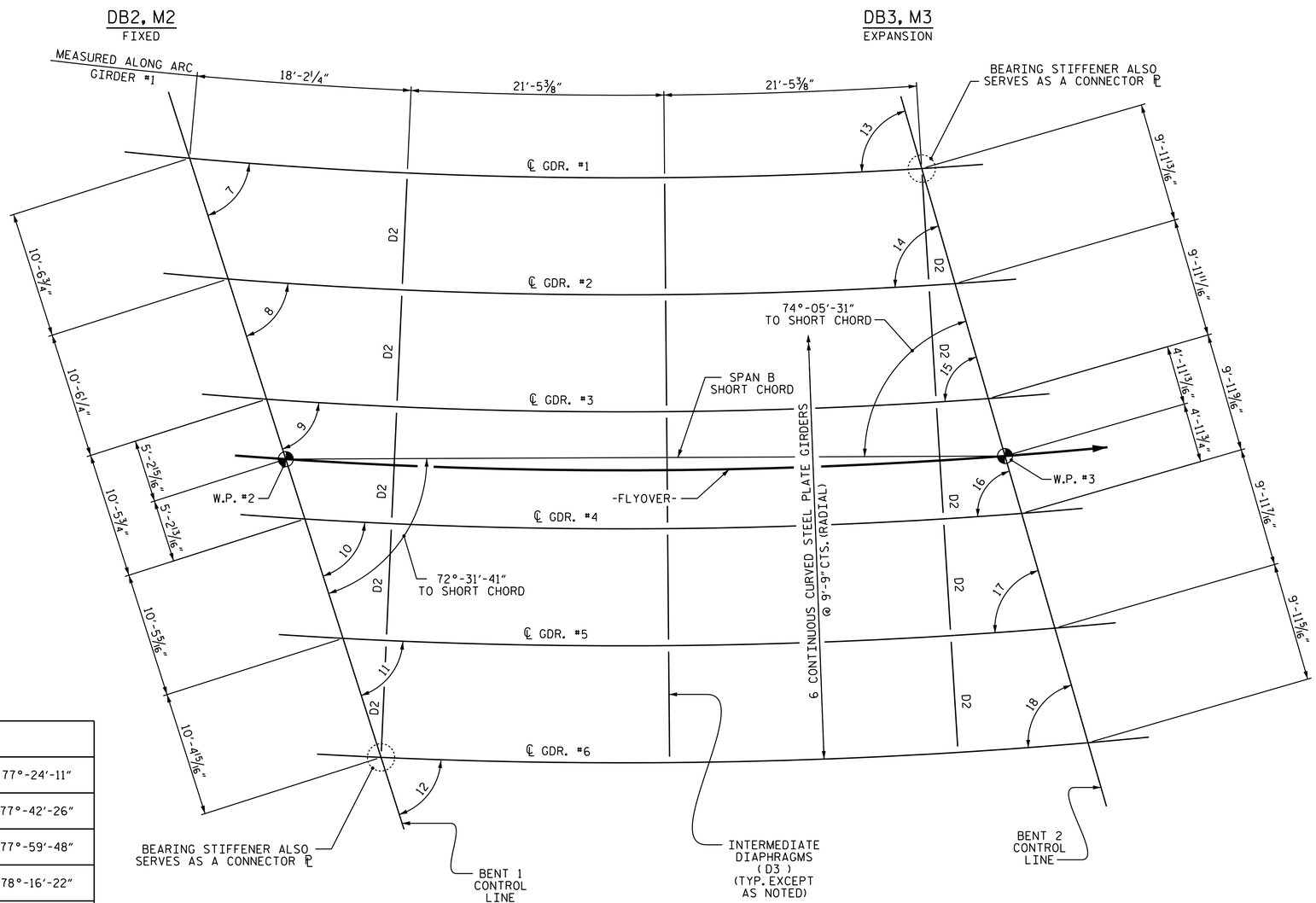

ANGLES			
7	67°-06'-09"	13	77°-24'-11"
8	67°-40'-35"	14	77°-42'-26"
9	68°-13'-17"	15	77°-59'-48"
10	68°-44'-22"	16	78°-16'-22"
11	69°-13'-59"	17	78°-32'-12"
12	69°-42'-14"	18	78°-47'-19"

ANGLES ARE TANGENT TO CURVE @
FILL FACE AND BENT CONTROL LINE

SPAN B FRAMING PLAN

INTERMEDIATE (D3) & BENT DIAPHRAGMS (D2)
ARE TO BE PLACED RADIALLY TO ℄ GIRDERS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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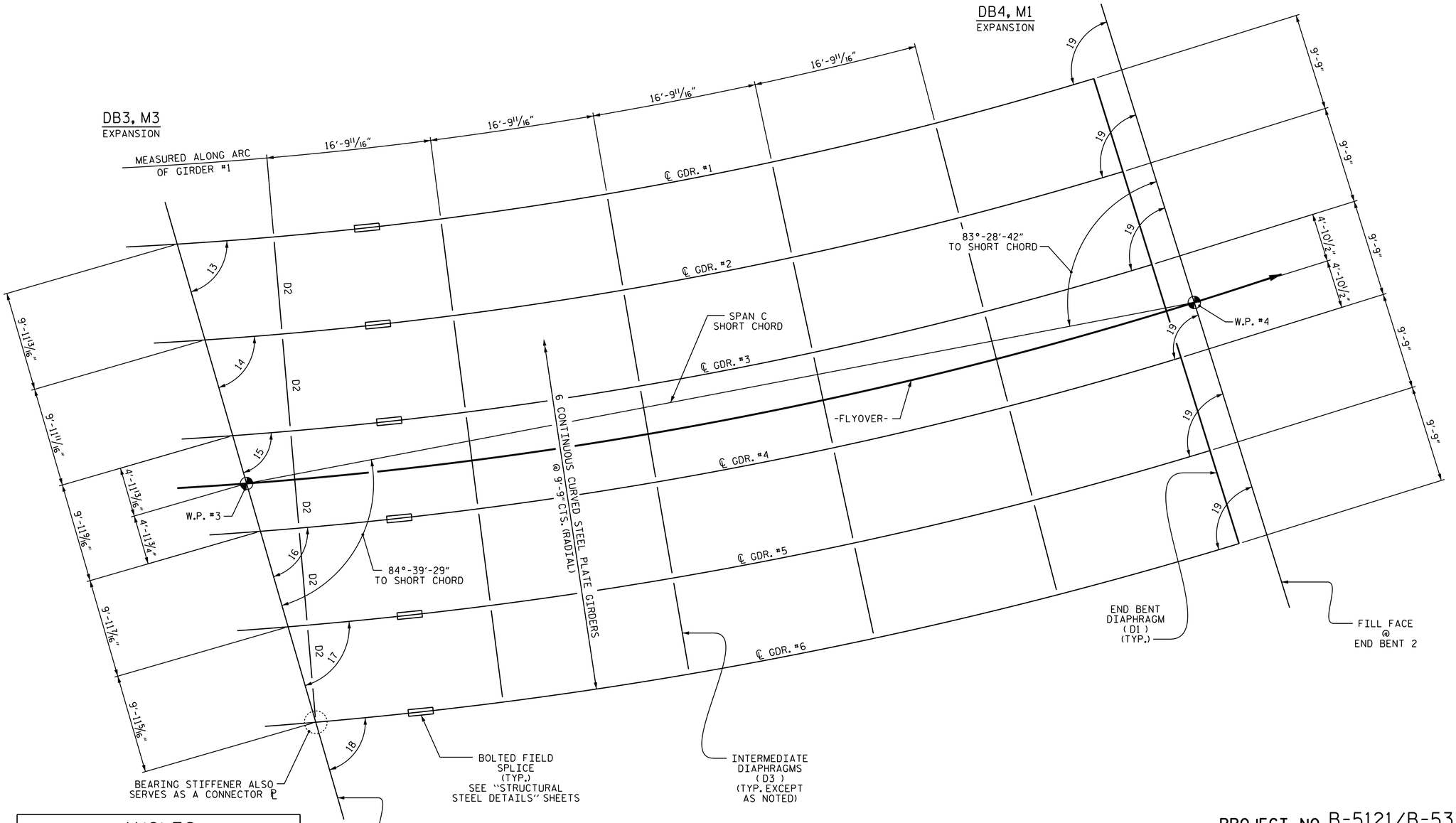

ANGLES			
13	77°-24'-11"	19	90°-00'-00"
14	77°-42'-26"		
15	77°-59'-48"		
16	78°-16'-22"		
17	78°-32'-12"		
18	78°-47'-19"		

ANGLES ARE TANGENT TO CURVE @ FILL FACE AND BENT CONTROL LINE

SPAN C FRAMING PLAN

INTERMEDIATE (D3) & BENT DIAPHRAGMS (D2) ARE TO BE PLACED RADIALLY TO ℄ GIRDERS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCOCK

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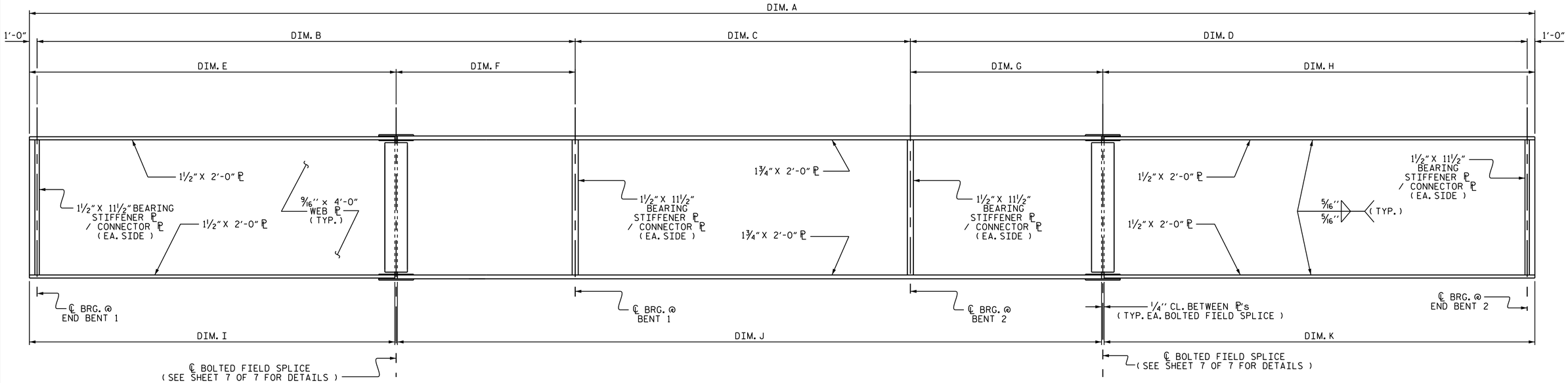
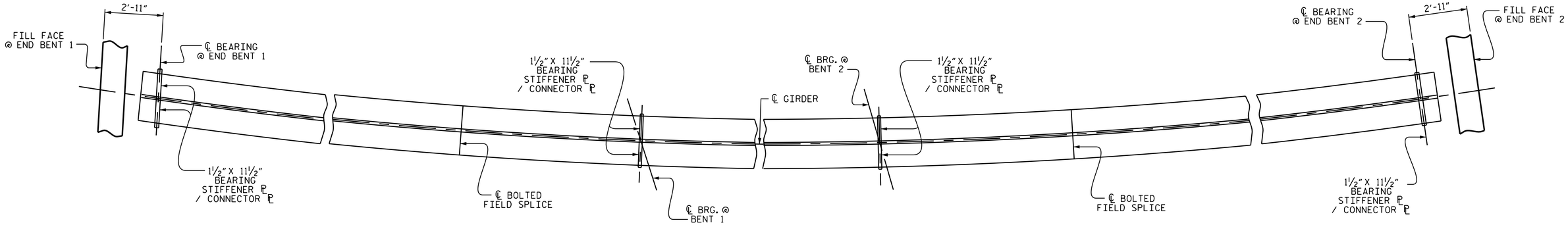


PLATE GIRDER ELEVATION

SEE GIRDER TABLE (ALL DIMENSIONS ARE ALONG ARC)
SHEAR STUDS NOT SHOWN, SEE SHEET 2-4 OF 7 FOR SHEAR STUD LOCATIONS



BOTTOM FLANGE DETAIL

GIRDER TABLE

GIRDER	RADIUS	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F	DIM. G	DIM. H	DIM. I	DIM. J	DIM. K
#1	400.625	244'-7 3⁄16" (244'-8 13⁄16" SLOPED)	88'-1 3⁄16"	61'-1 1⁄16"	93'-4 15⁄16" (93'-6 9⁄16" SLOPED)	65'-2 3⁄8"	23'-10 13⁄16"	19'-1"	75'-3 15⁄16"	65'-2 1⁄4"	104'-0 5⁄8"	75'-3 13⁄16"
#2	410.375	248'-0 3⁄4" (248'-2 5⁄16" SLOPED)	91'-10 1⁄8"	60'-7 11⁄16"	93'-6 15⁄16" (93'-8 1⁄2" SLOPED)	67'-10 9⁄16"	24'-11 3⁄16"	17'-4 1⁄2"	77'-2 7⁄16"	67'-10 7⁄16"	102'-11 1⁄2"	77'-2 5⁄16"
#3	420.125	251'-6 7⁄16" (251'-7 15⁄16" SLOPED)	95'-6 7⁄8"	60'-2 9⁄16"	93'-9" (93'-10 1⁄2" SLOPED)	70'-6 5⁄8"	26'-0 1⁄4"	15'-8"	79'-1"	70'-6 1⁄2"	101'-10 9⁄16"	79'-0 7⁄8"
#4	429.875	255'-0 1⁄16" (255'-1 9⁄16" SLOPED)	99'-3 9⁄16"	59'-9 1⁄2"	93'-11" (94'-0 1⁄2" SLOPED)	73'-2 5⁄8"	27'-0 15⁄16"	13'-11 1⁄2"	80'-11 1⁄2"	73'-2 1⁄2"	100'-9 11⁄16"	80'-11 3⁄8"
#5	439.625	258'-5 13⁄16" (258'-7 1⁄2" SLOPED)	103'-0 1⁄16"	59'-4 5⁄8" (59'-4 7⁄8" SLOPED)	94'-1 1⁄8" (94'-2 9⁄16" SLOPED)	75'-10 1⁄2"	28'-1 9⁄16"	12'-3"	82'-10 1⁄8"	75'-10 3⁄8"	99'-8 15⁄16"	82'-10"
#6	449.375	261'-11 1⁄2" 262'-1 3⁄16" SLOPED)	106'-8 1⁄2"	58'-11 13⁄16" (59'-0 1⁄16" SLOPED)	94'-3 3⁄16" (94'-4 5⁄8" SLOPED)	78'-6 3⁄8"	29'-2 1⁄8"	10'-6 9⁄16"	84'-8 5⁄8"	78'-6 1⁄4"	98'-8 1⁄4"	84'-8 1⁄2"

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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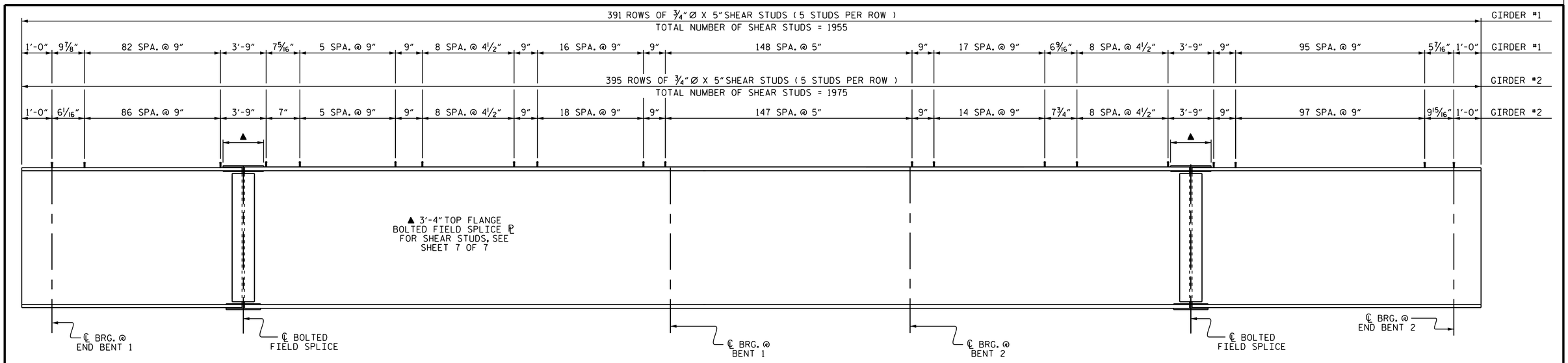
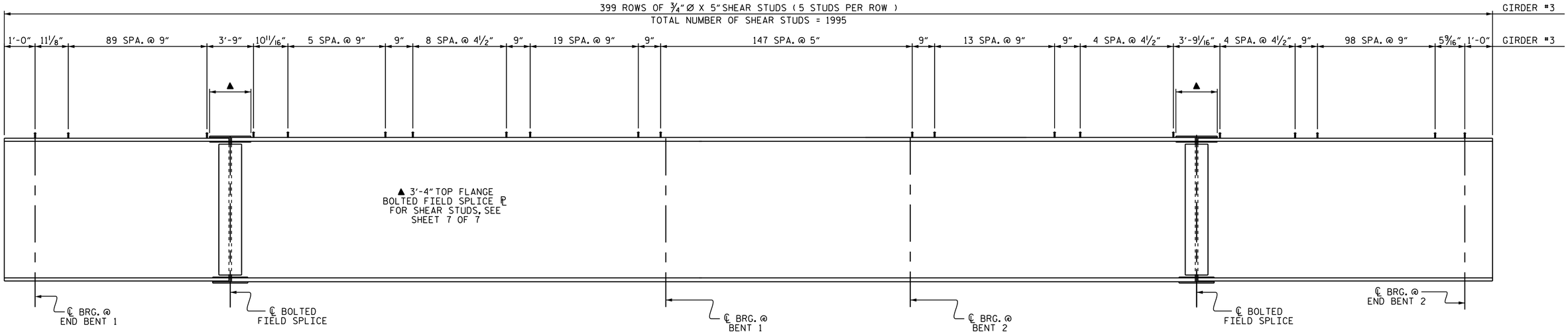
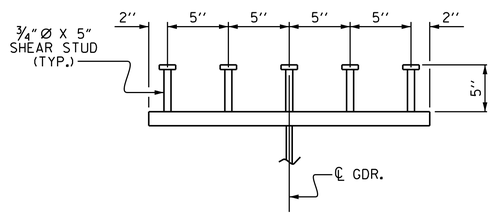


SHEAR STUD LOCATIONS FOR GIRDER #1 AND GIRDER #2



SHEAR STUD LOCATIONS FOR GIRDER #3



SHEAR STUD DETAIL

TYPICAL EXCEPT @ BOLTED FIELD SPLICE

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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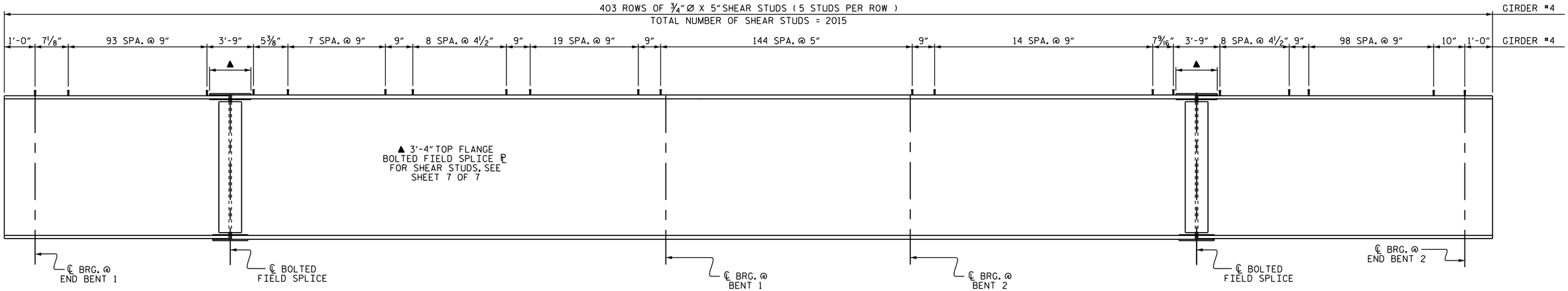

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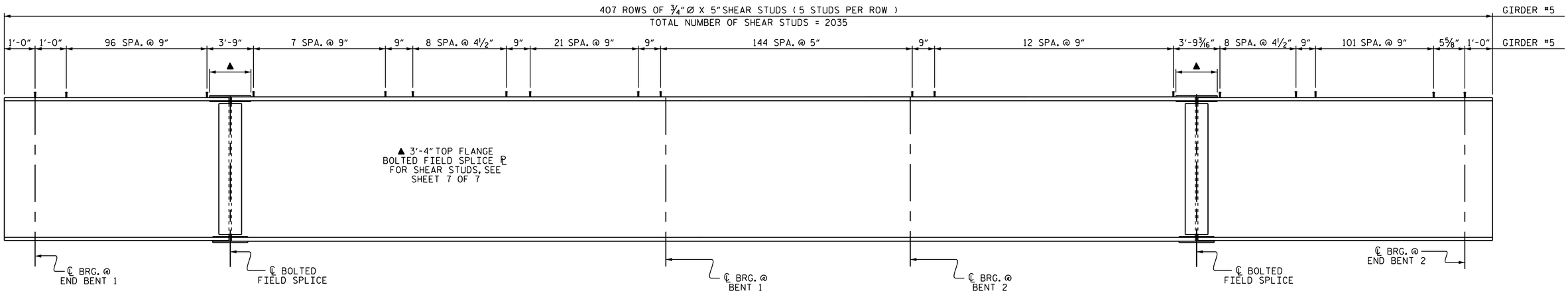

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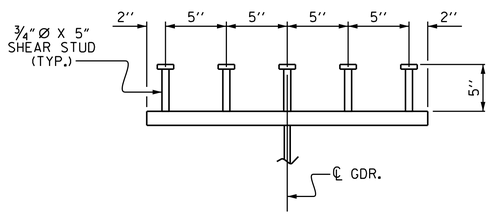

SHEAR STUD DETAIL

TYPICAL EXCEPT @ BOLTED FIELD SPLICE

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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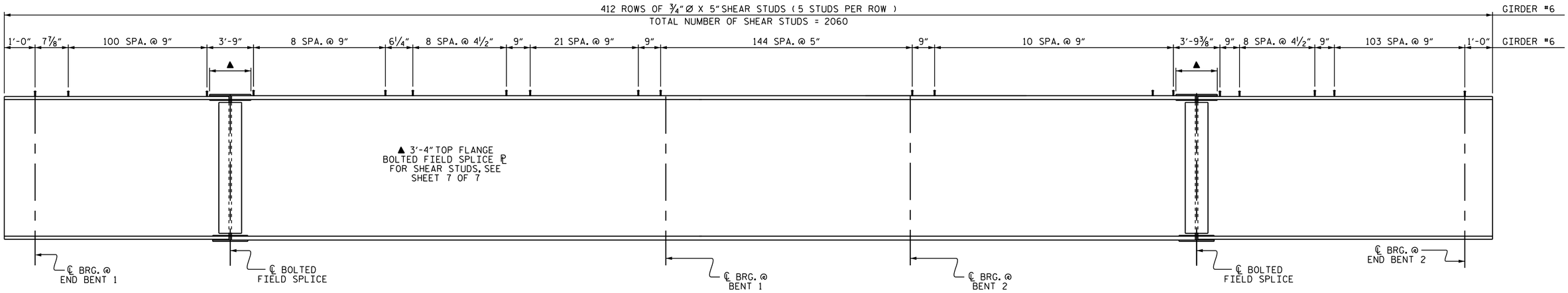

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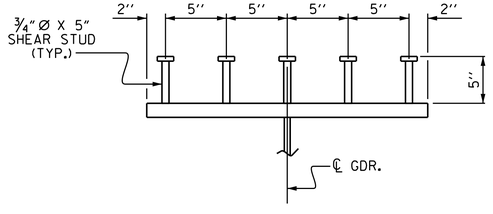

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TYPICAL EXCEPT @ BOLTED FIELD SPLICE

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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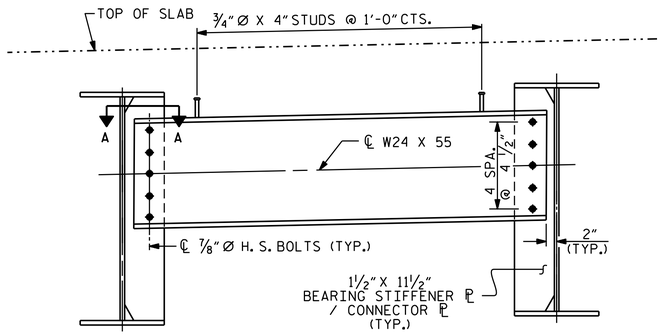
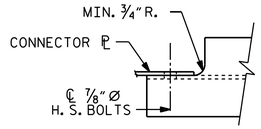
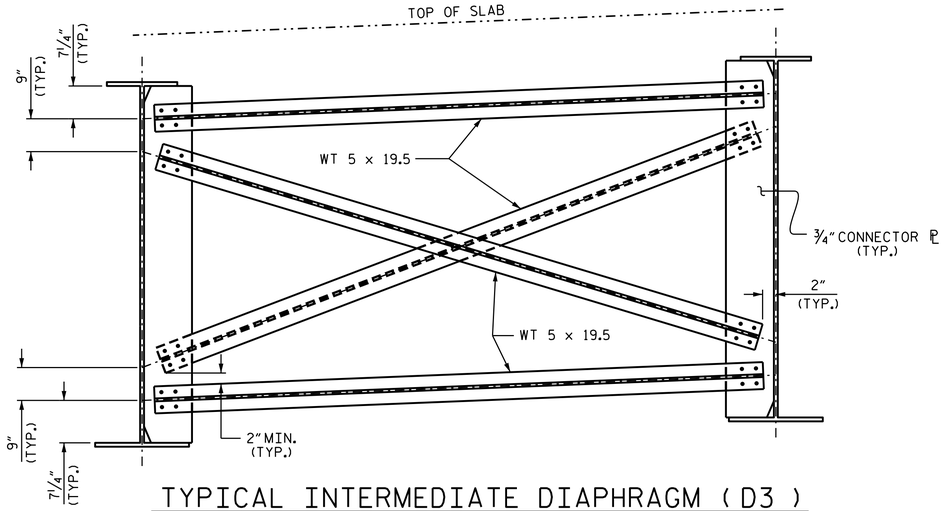




SECTION A-A

TYPICAL END BENT DIAPHRAGM (D1)



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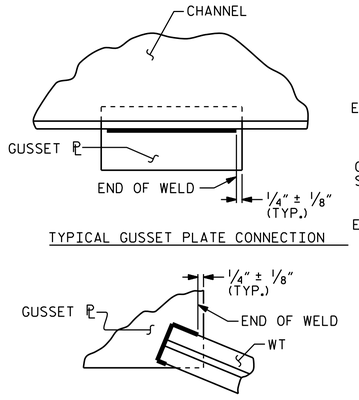
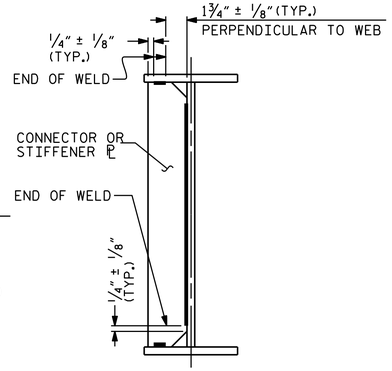


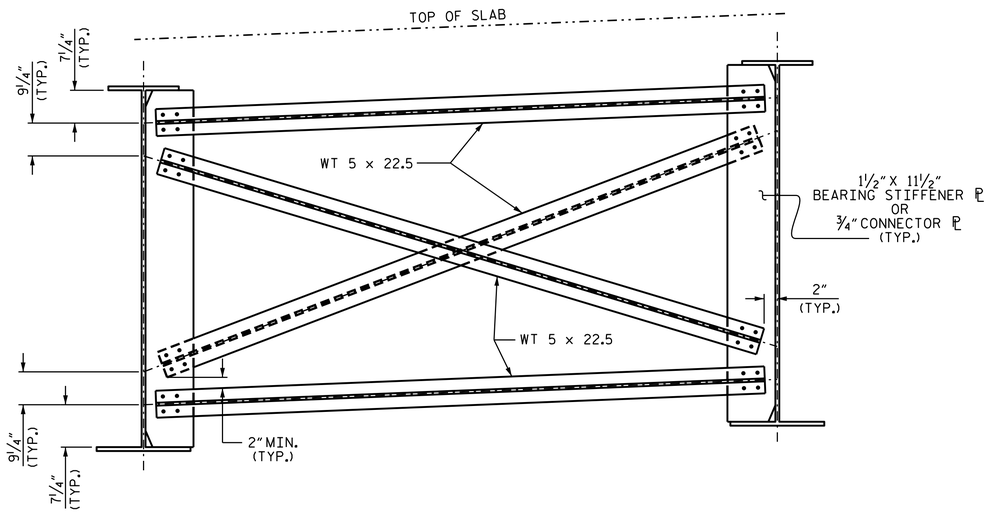
TYPICAL GUSSET PLATE CONNECTION

TYPICAL "TEE" TO GUSSET PLATE CONNECTION

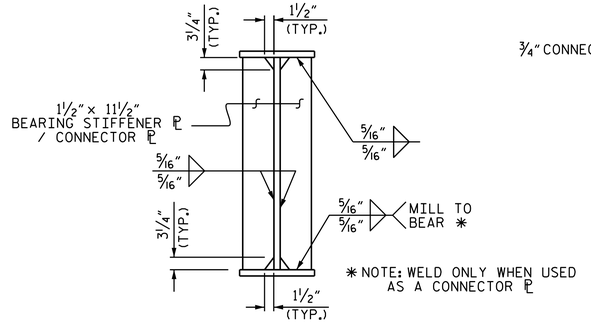


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

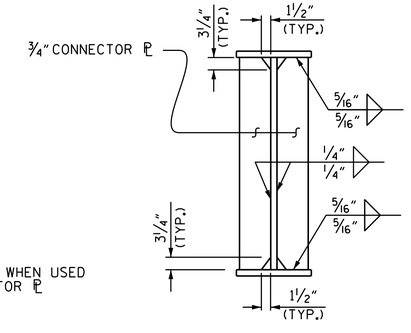
WELD TERMINATION DETAILS



TYPICAL BENT DIAPHRAGM (D2)



BEARING STIFFENER/ CONNECTOR ℄



CONNECTOR ℄

(AT INTERMEDIATE DIAPHRAGMS)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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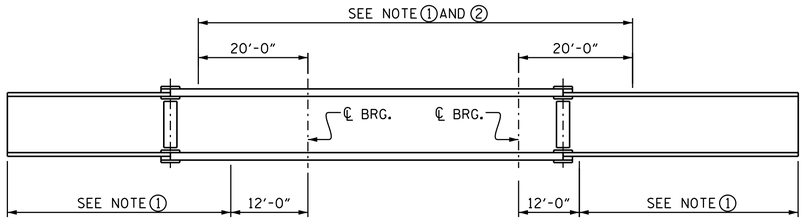
jpadams

STR. #2

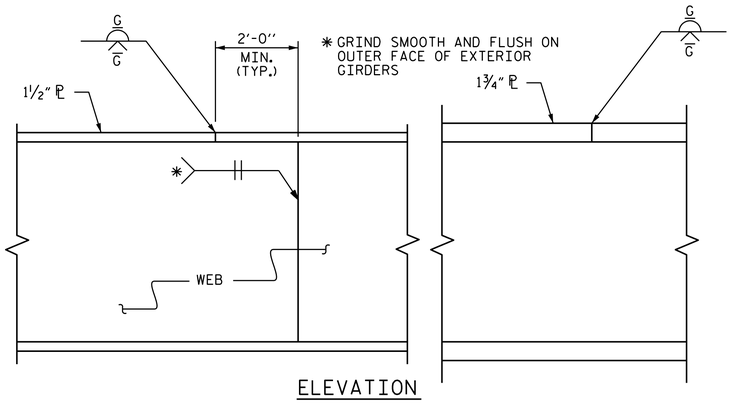


GIRDER MAKE UP

NOTE ① : CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

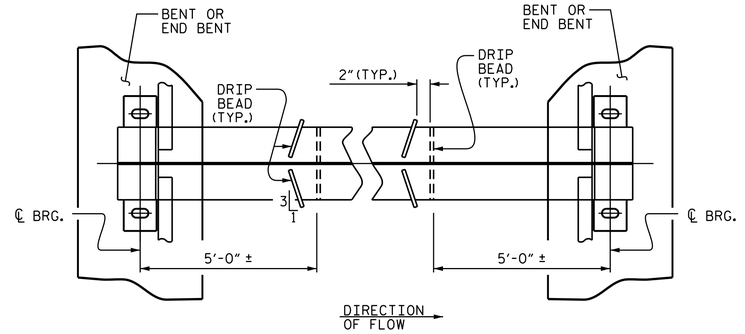
NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

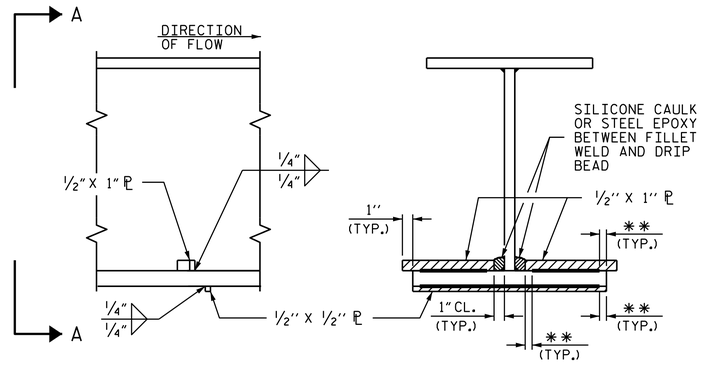


ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



PART PLAN - BOTTOM FLANGE



SECTION

VIEW A-A

**SEE "WELD TERMINATION DETAILS"

DRIP BEAD DETAILS

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

BEARING STIFFENERS ARE TO BE PLACED ALONG THE SKEW AT END BENTS AND NORMAL TO THE WEB OF THE GIRDER AT INTERIOR BENTS AND SHALL BE PLUMB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR NO-LOAD FIT UP.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

ADDITIONAL HOLES IN THE EXTERIOR GIRDERS FOR ARCHITECTURAL METAL FASCIA ARE NOT SHOWN FOR CLARITY. FOR LOCATION OF 1 1/16" Ø HOLES, SEE "ARCHITECTURAL METAL FASCIA DETAILS" SHEETS AND "ARCHITECTURAL METAL FASCIA PATTERN AND LAYOUT" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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6/3/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 12/2015
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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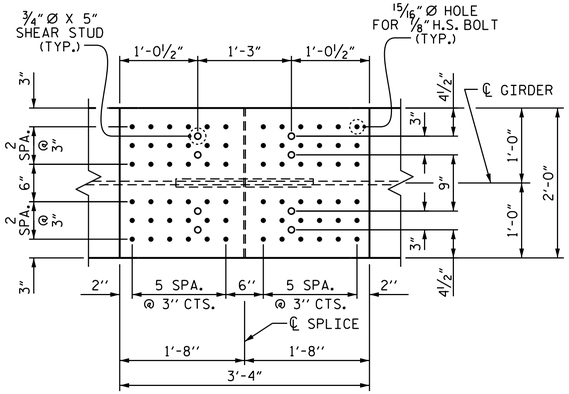
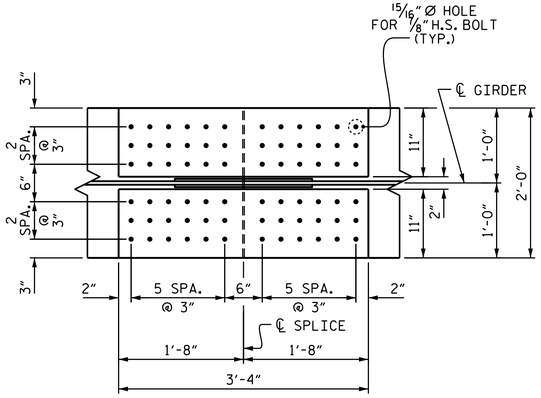
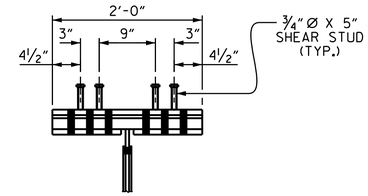


PLAN (TOP OF TOP FLANGE)

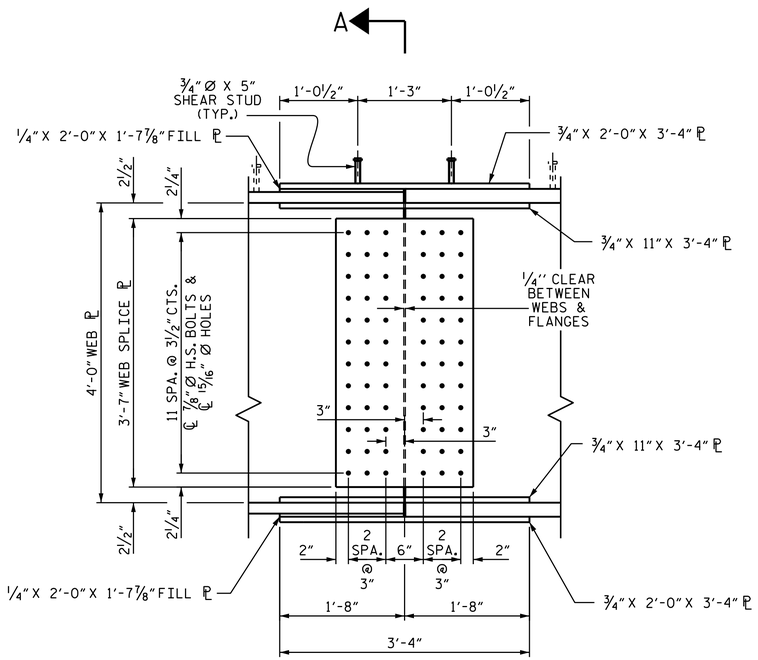


PLAN (TOP OF BOTTOM FLANGE)

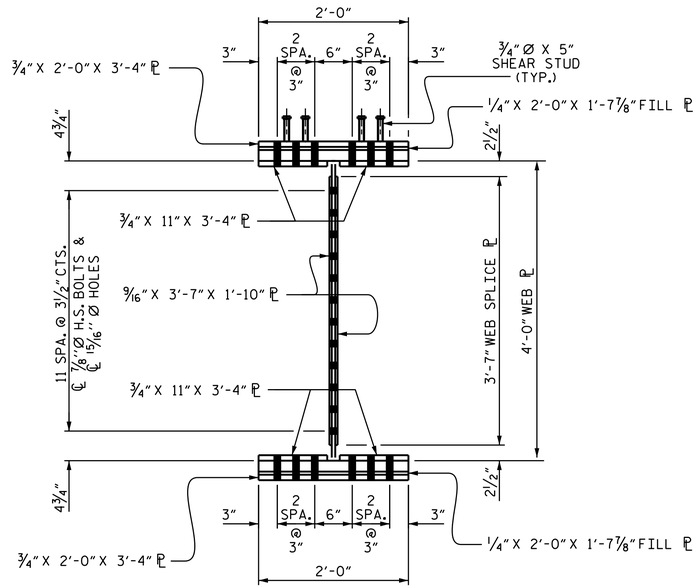


SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.



ELEVATION



SECTION A-A

BOLTED FIELD SPLICE DETAILS

(TYPICAL EACH FIELD SPLICE)

DRAWN BY : J.P. ADAMS DATE : 12/2015
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
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jpadams

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			110

STR. #2

NOTE :
ORDINATE DUE TO SUPERELEVATION
IS ZERO FOR EACH GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #1																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.003	0.005	0.008	0.010	0.012	0.013	0.015	0.015	0.016	0.016	0.015	0.014	0.013	0.011	0.009	0.007	0.005	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.010	0.019	0.027	0.035	0.041	0.046	0.050	0.053	0.054	0.054	0.052	0.049	0.044	0.039	0.033	0.026	0.019	0.013	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.006	0.008	0.011	0.013	0.014	0.015	0.016	0.017	0.017	0.016	0.015	0.014	0.012	0.010	0.008	0.006	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.016	0.030	0.043	0.056	0.066	0.073	0.080	0.084	0.087	0.087	0.083	0.078	0.071	0.062	0.052	0.041	0.030	0.021	0.010	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.067	0.130	0.185	0.234	0.275	0.308	0.334	0.353	0.364	0.368	0.365	0.354	0.335	0.310	0.277	0.236	0.188	0.133	0.070	0.000
REQUIRED CAMBER ↑	0	1"	1 15/16"	2 3/4"	3 1/2"	4 1/16"	4 9/16"	4 15/16"	5 1/4"	5 7/16"	5 7/16"	5 3/8"	5 3/16"	4 7/8"	4 7/16"	3 15/16"	3 5/16"	2 5/8"	1 7/8"	1 5/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #1																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.001	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.003	-0.003	-0.003	-0.002	-0.002	-0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.003	-0.006	-0.008	-0.010	-0.011	-0.012	-0.013	-0.014	-0.014	-0.015	-0.015	-0.014	-0.014	-0.013	-0.012	-0.010	-0.009	-0.006	-0.003	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.001	-0.002	-0.002	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.003	-0.003	-0.003	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.005	-0.010	-0.012	-0.016	-0.017	-0.018	-0.021	-0.022	-0.022	-0.023	-0.023	-0.022	-0.022	-0.020	-0.018	-0.016	-0.014	-0.010	-0.005	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.034	0.064	0.091	0.114	0.133	0.149	0.162	0.171	0.176	0.178	0.176	0.171	0.162	0.149	0.133	0.114	0.091	0.064	0.034	0.000
REQUIRED CAMBER ↑	0	3/8"	5/8"	15/16"	1 3/16"	1 3/8"	1 9/16"	1 11/16"	1 13/16"	1 7/8"	1 7/8"	1 13/16"	1 13/16"	1 11/16"	1 9/16"	1 3/8"	1 3/16"	15/16"	5/8"	3/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #1																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.004	0.007	0.009	0.011	0.014	0.016	0.017	0.018	0.019	0.019	0.019	0.018	0.017	0.015	0.012	0.010	0.007	0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.007	0.015	0.023	0.032	0.040	0.048	0.055	0.060	0.064	0.066	0.066	0.065	0.062	0.058	0.051	0.043	0.034	0.024	0.012	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.002	0.005	0.008	0.010	0.013	0.015	0.017	0.019	0.020	0.021	0.021	0.020	0.019	0.018	0.016	0.013	0.010	0.007	0.004	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.011	0.024	0.038	0.051	0.064	0.077	0.088	0.096	0.102	0.106	0.106	0.104	0.099	0.093	0.082	0.068	0.054	0.038	0.020	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.079	0.150	0.212	0.266	0.311	0.349	0.378	0.399	0.411	0.415	0.411	0.399	0.378	0.349	0.311	0.266	0.212	0.150	0.079	0.000
REQUIRED CAMBER ↑	0	1 1/16"	2 1/16"	3"	3 13/16"	4 1/2"	5 1/8"	5 9/16"	5 15/16"	6 1/8"	6 1/4"	6 3/16"	6 1/16"	5 3/4"	5 5/16"	4 11/16"	4"	3 3/16"	2 1/4"	1 3/16"	0

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

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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jpadams

NOTE :
ORDINATE DUE TO SUPERELEVATION
IS ZERO FOR EACH GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #2																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.004	0.007	0.010	0.013	0.015	0.017	0.019	0.020	0.020	0.020	0.019	0.018	0.016	0.014	0.012	0.010	0.007	0.005	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.013	0.024	0.036	0.046	0.055	0.061	0.067	0.070	0.072	0.071	0.069	0.064	0.059	0.052	0.043	0.034	0.025	0.017	0.007	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.007	0.011	0.014	0.016	0.018	0.020	0.021	0.021	0.021	0.021	0.020	0.018	0.016	0.014	0.011	0.008	0.005	0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.021	0.038	0.057	0.073	0.086	0.096	0.106	0.111	0.113	0.112	0.109	0.102	0.093	0.082	0.069	0.055	0.040	0.027	0.011	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.072	0.137	0.195	0.245	0.287	0.321	0.348	0.368	0.379	0.383	0.376	0.368	0.349	0.322	0.287	0.245	0.195	0.138	0.073	0.000
REQUIRED CAMBER ↑	0	1 1/8"	2 1/8"	3"	3 13/16"	4 1/2"	5"	5 7/16"	5 3/4"	5 7/8"	5 15/16"	5 13/16"	5 5/8"	5 5/16"	4 7/8"	4 1/4"	3 5/8"	2 13/16"	2"	1"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #2																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.001	-0.002	-0.003	-0.003	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.003	-0.003	-0.002	-0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.004	-0.007	-0.010	-0.012	-0.014	-0.016	-0.017	-0.018	-0.018	-0.018	-0.018	-0.017	-0.017	-0.016	-0.014	-0.013	-0.010	-0.007	-0.004	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.001	-0.002	-0.003	-0.004	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.004	-0.003	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.006	-0.011	-0.016	-0.019	-0.022	-0.025	-0.026	-0.028	-0.028	-0.028	-0.028	-0.027	-0.026	-0.024	-0.022	-0.020	-0.016	-0.011	-0.006	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.032	0.060	0.085	0.107	0.125	0.140	0.152	0.160	0.165	0.167	0.165	0.160	0.152	0.140	0.125	0.107	0.085	0.060	0.032	0.000
REQUIRED CAMBER ↑	0	5/16"	9/16"	13/16"	1 1/16"	1 1/4"	1 3/8"	1 1/2"	1 9/16"	1 5/8"	1 11/16"	1 5/8"	1 5/8"	1 1/2"	1 3/8"	1 1/4"	1 1/16"	13/16"	9/16"	5/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #2																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.005	0.007	0.010	0.013	0.015	0.017	0.019	0.020	0.021	0.021	0.021	0.020	0.018	0.016	0.014	0.011	0.007	0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.008	0.017	0.026	0.036	0.045	0.054	0.062	0.068	0.072	0.075	0.075	0.074	0.071	0.066	0.058	0.049	0.038	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.005	0.008	0.011	0.014	0.017	0.019	0.021	0.022	0.023	0.023	0.022	0.021	0.020	0.017	0.015	0.012	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.013	0.027	0.041	0.057	0.072	0.086	0.098	0.108	0.114	0.119	0.119	0.117	0.112	0.104	0.091	0.078	0.061	0.042	0.022	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.076	0.143	0.203	0.254	0.298	0.334	0.361	0.381	0.393	0.397	0.393	0.381	0.361	0.334	0.298	0.254	0.203	0.143	0.076	0.000
REQUIRED CAMBER ↑	0	1 1/16"	2 1/16"	2 15/16"	3 3/4"	4 7/16"	5 1/16"	5 1/2"	5 7/8"	6 1/16"	6 3/16"	6 1/8"	6"	5 11/16"	5 1/4"	4 11/16"	4"	3 3/16"	2 1/4"	1 3/16"	0

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

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
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4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
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jpadams

NOTE :
ORDINATE DUE TO SUPERELEVATION
IS ZERO FOR EACH GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.004	0.008	0.012	0.016	0.018	0.021	0.023	0.024	0.024	0.024	0.023	0.022	0.020	0.017	0.015	0.012	0.009	0.005	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.015	0.031	0.044	0.057	0.067	0.076	0.082	0.086	0.088	0.087	0.084	0.079	0.072	0.063	0.053	0.042	0.031	0.020	0.009	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.005	0.009	0.013	0.017	0.020	0.023	0.025	0.026	0.026	0.026	0.025	0.024	0.022	0.020	0.017	0.013	0.010	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.024	0.048	0.069	0.090	0.105	0.120	0.130	0.136	0.138	0.137	0.132	0.125	0.114	0.100	0.085	0.067	0.050	0.031	0.015	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.075	0.143	0.202	0.254	0.297	0.333	0.360	0.380	0.392	0.396	0.392	0.380	0.360	0.333	0.297	0.254	0.202	0.143	0.075	0.000
REQUIRED CAMBER ↑	0	1 3/16"	2 5/16"	3 1/4"	4 1/8"	4 13/16"	5 5/16"	5 7/8"	6 3/16"	6 3/8"	6 3/8"	6 5/16"	6 1/16"	5 11/16"	5 3/16"	4 9/16"	3 7/8"	3"	2 1/16"	1 1/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.001	-0.002	-0.003	-0.004	-0.004	-0.005	-0.005	-0.005	-0.006	-0.006	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.003	-0.002	-0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.004	-0.008	-0.012	-0.014	-0.016	-0.018	-0.020	-0.020	-0.021	-0.021	-0.021	-0.020	-0.019	-0.018	-0.016	-0.014	-0.011	-0.008	-0.004	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.001	-0.003	-0.004	-0.004	-0.005	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.004	-0.003	-0.002	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.006	-0.013	-0.019	-0.022	-0.025	-0.028	-0.031	-0.031	-0.033	-0.033	-0.032	-0.031	-0.030	-0.028	-0.025	-0.022	-0.017	-0.012	-0.006	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.030	0.057	0.080	0.100	0.118	0.132	0.143	0.151	0.155	0.157	0.155	0.151	0.143	0.132	0.118	0.100	0.080	0.057	0.030	0.000
REQUIRED CAMBER ↑	0	5/16"	1/2"	3/4"	15/16"	1 1/8"	1 1/4"	1 3/8"	1 7/16"	1 7/16"	1 1/2"	1 1/2"	1 7/16"	1 3/8"	1 1/4"	1 1/8"	15/16"	3/4"	9/16"	5/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #3																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.005	0.008	0.011	0.013	0.016	0.018	0.020	0.021	0.022	0.022	0.022	0.021	0.019	0.017	0.014	0.011	0.008	0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.008	0.018	0.028	0.039	0.049	0.059	0.067	0.073	0.078	0.080	0.081	0.080	0.076	0.070	0.062	0.052	0.041	0.029	0.015	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.020	0.022	0.023	0.024	0.024	0.024	0.022	0.021	0.018	0.015	0.012	0.009	0.004	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.013	0.029	0.045	0.062	0.077	0.093	0.105	0.115	0.122	0.126	0.127	0.126	0.119	0.110	0.097	0.081	0.064	0.046	0.023	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.072	0.137	0.194	0.243	0.285	0.320	0.346	0.365	0.377	0.380	0.377	0.365	0.346	0.320	0.285	0.243	0.194	0.137	0.072	0.000
REQUIRED CAMBER ↑	0	1"	2"	2 7/8"	3 11/16"	4 3/8"	4 15/16"	5 5/16"	5 3/4"	6"	6 1/16"	6 1/16"	5 7/8"	5 9/16"	5 3/16"	4 9/16"	3 7/8"	3 1/8"	2 3/16"	1 1/8"	0

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

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
R:\Structures\Plans\Str_2\Super_Draw\B-5121_SD_DL.dgn
jpadams

NOTE :
ORDINATE DUE TO SUPERELEVATION
IS ZERO FOR EACH GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.005	0.010	0.015	0.019	0.022	0.025	0.027	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.014	0.010	0.006	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.020	0.038	0.053	0.067	0.080	0.090	0.098	0.103	0.105	0.104	0.100	0.095	0.086	0.075	0.063	0.050	0.037	0.023	0.011	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.006	0.012	0.016	0.021	0.025	0.028	0.030	0.032	0.032	0.032	0.031	0.030	0.027	0.024	0.020	0.016	0.012	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.031	0.060	0.084	0.107	0.127	0.143	0.155	0.164	0.166	0.165	0.159	0.151	0.137	0.120	0.100	0.080	0.059	0.037	0.018	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.078	0.147	0.208	0.261	0.306	0.343	0.372	0.392	0.404	0.408	0.404	0.392	0.372	0.343	0.306	0.261	0.208	0.147	0.078	0.000
REQUIRED CAMBER ↑	0	1 5/16"	2 1/2"	3 1/2"	4 7/16"	5 3/16"	5 13/16"	6 5/16"	6 11/16"	6 13/16"	6 7/8"	6 3/4"	6 1/2"	6 1/8"	5 9/16"	4 7/8"	4 1/16"	3 3/16"	2 3/16"	1 1/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.001	-0.003	-0.004	-0.004	-0.005	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.004	-0.003	-0.002	-0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.005	-0.009	-0.013	-0.016	-0.019	-0.021	-0.022	-0.023	-0.023	-0.023	-0.023	-0.022	-0.021	-0.020	-0.018	-0.015	-0.012	-0.009	-0.005	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.002	-0.003	-0.004	-0.005	-0.006	-0.006	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006	-0.005	-0.005	-0.004	-0.003	-0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.008	-0.015	-0.021	-0.025	-0.030	-0.033	-0.035	-0.036	-0.036	-0.036	-0.036	-0.035	-0.033	-0.031	-0.028	-0.024	-0.019	-0.014	-0.007	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.028	0.053	0.075	0.095	0.111	0.124	0.135	0.142	0.146	0.148	0.146	0.142	0.135	0.124	0.111	0.095	0.075	0.053	0.028	0.000
REQUIRED CAMBER ↑	0	1/4"	7/16"	5/8"	13/16"	1"	1 1/16"	1 3/16"	1 1/4"	1 5/16"	1 3/8"	1 5/16"	1 5/16"	1 1/4"	1 1/8"	1"	7/8"	11/16"	7/16"	1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.005	0.008	0.011	0.014	0.017	0.019	0.021	0.022	0.023	0.023	0.023	0.022	0.020	0.018	0.015	0.012	0.008	0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.009	0.019	0.030	0.041	0.052	0.062	0.071	0.077	0.082	0.084	0.085	0.084	0.080	0.074	0.065	0.055	0.043	0.030	0.016	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.006	0.009	0.013	0.016	0.019	0.021	0.023	0.024	0.025	0.025	0.025	0.024	0.022	0.019	0.016	0.013	0.009	0.005	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.014	0.030	0.047	0.065	0.082	0.098	0.111	0.121	0.128	0.132	0.133	0.132	0.126	0.116	0.102	0.086	0.068	0.047	0.025	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.069	0.131	0.186	0.233	0.273	0.306	0.332	0.350	0.361	0.365	0.361	0.350	0.332	0.306	0.273	0.233	0.186	0.131	0.069	0.000
REQUIRED CAMBER ↑	0	1"	1 15/16"	2 13/16"	3 9/16"	4 1/4"	4 7/8"	5 5/16"	5 5/8"	5 7/8"	5 15/16"	5 15/16"	5 13/16"	5 1/2"	5 1/16"	4 1/2"	3 13/16"	3 1/16"	2 1/8"	1 1/8"	0

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

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by:
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4/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
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jpadams

NOTE :
ORDINATE DUE TO SUPERELEVATION
IS ZERO FOR EACH GIRDER.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #5																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.007	0.012	0.018	0.023	0.027	0.031	0.033	0.035	0.035	0.035	0.034	0.032	0.029	0.025	0.021	0.017	0.012	0.008	0.004	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.023	0.044	0.063	0.081	0.096	0.108	0.117	0.123	0.126	0.125	0.121	0.113	0.103	0.090	0.075	0.060	0.044	0.029	0.014	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.008	0.014	0.021	0.026	0.031	0.035	0.038	0.040	0.041	0.041	0.040	0.038	0.034	0.030	0.026	0.021	0.015	0.010	0.005	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.038	0.070	0.102	0.130	0.154	0.174	0.188	0.198	0.202	0.201	0.195	0.183	0.166	0.145	0.122	0.098	0.071	0.047	0.023	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.080	0.151	0.214	0.269	0.315	0.353	0.382	0.403	0.416	0.420	0.416	0.403	0.382	0.353	0.315	0.269	0.214	0.151	0.080	0.000
REQUIRED CAMBER ↑	0	1 7/16"	2 5/8"	3 13/16"	4 13/16"	5 5/8"	6 5/16"	6 13/16"	7 3/16"	7 7/16"	7 7/16"	7 5/16"	7 1/16"	6 9/16"	6"	5 1/4"	4 3/8"	3 7/16"	2 3/8"	1 1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #5																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.002	-0.003	-0.004	-0.005	-0.006	-0.006	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006	-0.006	-0.005	-0.005	-0.004	-0.003	-0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.006	-0.011	-0.015	-0.019	-0.021	-0.023	-0.024	-0.026	-0.026	-0.026	-0.026	-0.025	-0.024	-0.022	-0.020	-0.017	-0.014	-0.010	-0.005	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.002	-0.004	-0.005	-0.006	-0.007	-0.008	-0.008	-0.008	-0.009	-0.009	-0.008	-0.008	-0.008	-0.007	-0.006	-0.005	-0.004	-0.003	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.010	-0.018	-0.024	-0.030	-0.034	-0.037	-0.039	-0.041	-0.042	-0.042	-0.041	-0.040	-0.038	-0.035	-0.031	-0.027	-0.022	-0.016	-0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.027	0.050	0.071	0.089	0.105	0.117	0.127	0.134	0.138	0.139	0.138	0.134	0.127	0.117	0.105	0.089	0.071	0.050	0.027	0.000
REQUIRED CAMBER ↑	0	3/16"	3/8"	9/16"	11/16"	7/8"	15/16"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 3/16"	1 1/8"	1 1/16"	1"	7/8"	3/4"	9/16"	7/16"	1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #5																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.023	0.024	0.025	0.025	0.025	0.023	0.022	0.019	0.016	0.013	0.009	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.010	0.021	0.032	0.044	0.056	0.067	0.075	0.082	0.087	0.089	0.090	0.089	0.085	0.078	0.069	0.058	0.046	0.032	0.017	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.007	0.011	0.014	0.018	0.021	0.024	0.025	0.027	0.027	0.028	0.027	0.026	0.024	0.021	0.018	0.014	0.010	0.005	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.016	0.034	0.052	0.070	0.089	0.106	0.120	0.130	0.138	0.141	0.143	0.141	0.134	0.124	0.109	0.092	0.073	0.051	0.027	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.067	0.126	0.178	0.224	0.262	0.294	0.318	0.336	0.346	0.350	0.346	0.336	0.318	0.294	0.262	0.224	0.178	0.126	0.067	0.000
REQUIRED CAMBER ↑	0	1"	1 15/16"	2 3/4"	3 1/2"	4 3/16"	4 13/16"	5 1/4"	5 9/16"	5 13/16"	5 7/8"	5 7/8"	5 3/4"	5 7/16"	5"	4 7/16"	3 13/16"	3"	2 1/8"	1 1/8"	0

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

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by:
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4/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
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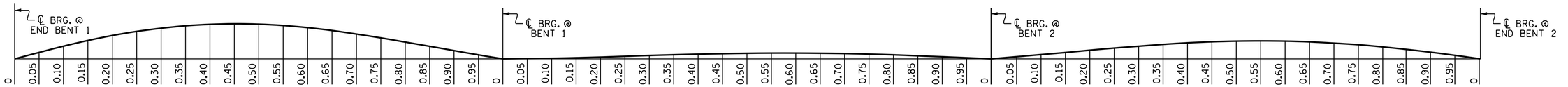
jpadams

STR. #2



SPAN A SPAN B SPAN C

NOTE :
ORDINATE DUE TO SUPERELEVATION IS ZERO FOR EACH GIRDER.

SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A GIRDER #6																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.008	0.015	0.022	0.028	0.034	0.038	0.041	0.043	0.044	0.043	0.042	0.039	0.035	0.031	0.026	0.020	0.015	0.010	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.028	0.054	0.077	0.099	0.117	0.132	0.143	0.149	0.152	0.151	0.145	0.136	0.123	0.107	0.090	0.071	0.052	0.035	0.017	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.010	0.019	0.027	0.034	0.041	0.046	0.050	0.052	0.053	0.053	0.051	0.048	0.044	0.038	0.033	0.026	0.019	0.013	0.007	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.046	0.088	0.126	0.161	0.192	0.216	0.234	0.244	0.249	0.247	0.238	0.223	0.202	0.176	0.149	0.117	0.086	0.058	0.029	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.082	0.155	0.220	0.276	0.324	0.362	0.393	0.414	0.427	0.431	0.427	0.414	0.393	0.362	0.324	0.276	0.220	0.155	0.082	0.000
REQUIRED CAMBER ↑	0	1 9/16"	2 15/16"	4 1/8"	5 1/4"	6 3/16"	6 15/16"	7 1/2"	7 7/8"	8 1/8"	8 1/8"	8"	7 5/8"	7 1/8"	6 7/16"	5 11/16"	4 11/16"	3 11/16"	2 9/16"	1 5/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDER #6																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.002	-0.004	-0.005	-0.006	-0.007	-0.008	-0.008	-0.008	-0.009	-0.009	-0.009	-0.008	-0.008	-0.007	-0.006	-0.005	-0.004	-0.003	-0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.007	-0.013	-0.018	-0.022	-0.025	-0.028	-0.029	-0.031	-0.031	-0.031	-0.031	-0.030	-0.028	-0.026	-0.023	-0.020	-0.016	-0.011	-0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	-0.002	-0.005	-0.006	-0.008	-0.009	-0.010	-0.010	-0.011	-0.011	-0.011	-0.011	-0.010	-0.010	-0.009	-0.008	-0.007	-0.005	-0.004	-0.002	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.011	-0.022	-0.029	-0.036	-0.041	-0.046	-0.047	-0.050	-0.051	-0.051	-0.051	-0.048	-0.046	-0.042	-0.037	-0.032	-0.025	-0.018	-0.010	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.025	0.047	0.067	0.084	0.099	0.111	0.120	0.126	0.130	0.132	0.130	0.126	0.120	0.111	0.099	0.084	0.067	0.047	0.025	0.000
REQUIRED CAMBER ↑	0	3/16"	5/16"	7/16"	9/16"	11/16"	3/4"	7/8"	15/16"	15/16"	1"	15/16"	15/16"	7/8"	13/16"	3/4"	5/8"	1/2"	3/8"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN C GIRDER #6																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.003	0.006	0.010	0.014	0.018	0.021	0.023	0.025	0.027	0.028	0.028	0.028	0.026	0.024	0.022	0.018	0.014	0.010	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.011	0.023	0.036	0.048	0.062	0.073	0.082	0.090	0.095	0.098	0.098	0.097	0.093	0.085	0.076	0.063	0.050	0.035	0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.008	0.012	0.017	0.021	0.024	0.027	0.030	0.031	0.032	0.032	0.032	0.030	0.028	0.024	0.020	0.016	0.011	0.006	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.018	0.037	0.058	0.079	0.101	0.118	0.132	0.145	0.153	0.158	0.158	0.157	0.149	0.137	0.122	0.101	0.080	0.056	0.030	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.064	0.121	0.171	0.215	0.252	0.282	0.306	0.323	0.333	0.336	0.333	0.323	0.306	0.282	0.252	0.215	0.171	0.121	0.064	0.000
REQUIRED CAMBER ↑	0	1"	1 7/8"	2 3/4"	3 1/2"	4 1/4"	4 13/16"	5 1/4"	5 5/8"	5 13/16"	5 15/16"	5 7/8"	5 3/4"	5 7/16"	5"	4 1/2"	3 13/16"	3"	2 1/8"	1 1/8"	0

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

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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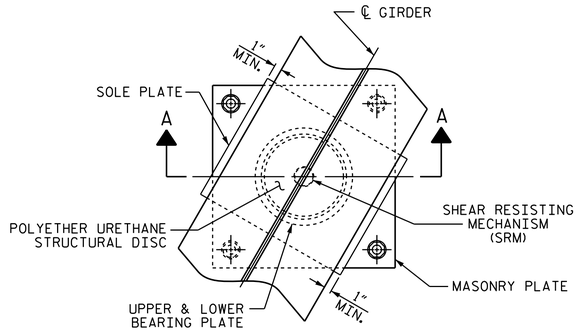
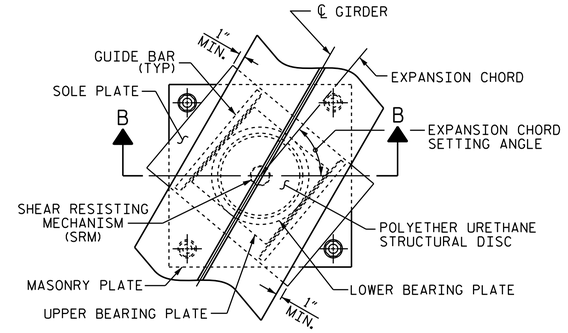


PLAN



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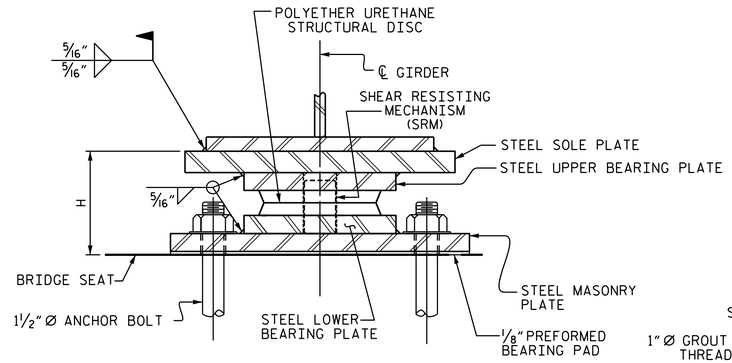
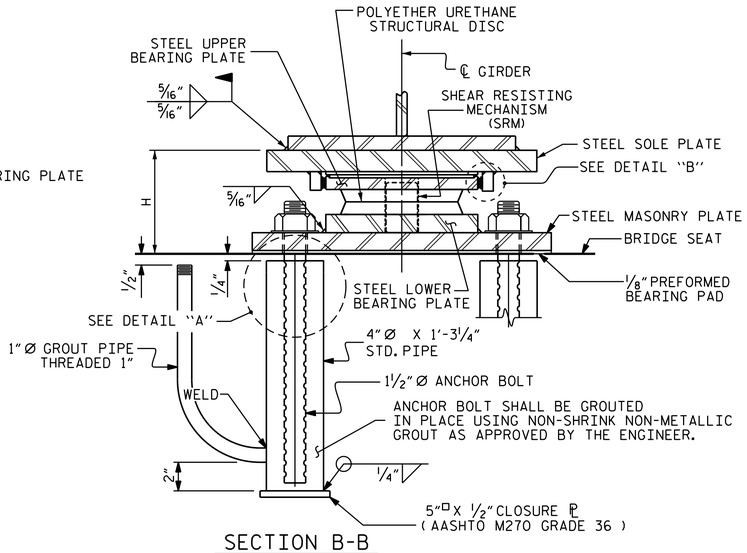


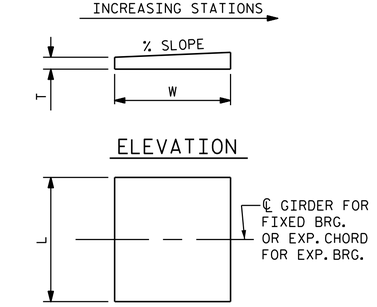
SECTION A-A

DB2, FIXED



SECTION B-B

DB1, DB3, DB4 EXP.



NOTE:
DIMENSIONS "L", "W", AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET DIMENSION "L" SUCH THAT THE MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL ¼ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

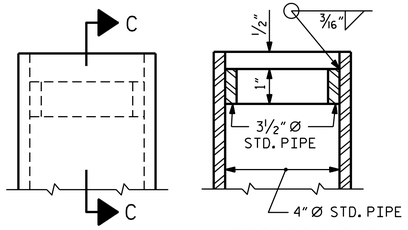
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

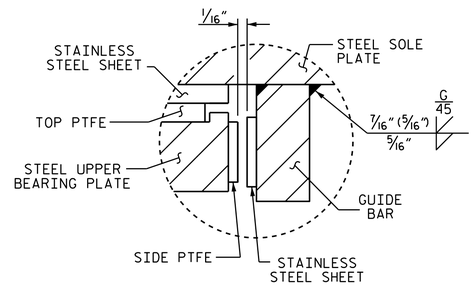
FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

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

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.

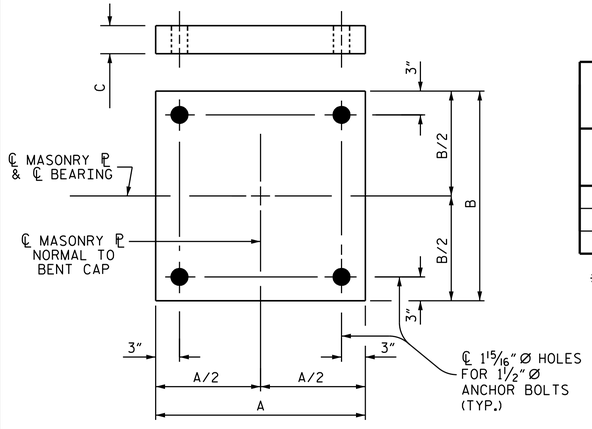


SECTION C-C



DETAIL "A"

DETAIL "B"



PLAN

MASONRY PLATE DETAILS

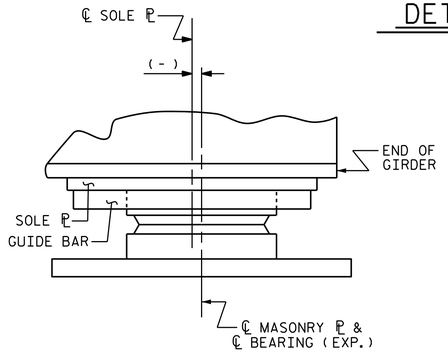
PLATE SETTING DATA

(EXPANSION DISC BEARINGS)

LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
EB 1	- ⅛"	0	+ ¼"	- 5/16"
BENT 2	- 1/16"	0	+ ⅛"	
EB 2	- 3/16"	0	+ ⅜"	- 3/16"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



EXPANSION CHORD SETTING ANGLES

(EXPANSION DISC BEARINGS)

GIRDER	LOCATION		
	END BENT 1	BENT 2	END BENT 2
1	81°-51'-36"	73°-02'-05"	78°-32'-06"
2	82°-19'-19"	73°-28'-25"	78°-49'-36"
3	82°-45'-40"	73°-53'-28"	79°-06'-14"
4	83°-10'-46"	74°-17'-18"	79°-22'-03"
5	83°-34'-40"	74°-40'-01"	79°-37'-07"
6	83°-57'-29"	75°-01'-41"	79°-51'-29"

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS					LOADS AND MOVEMENT				
				BEARING	MASONRY PLATE			SOLE PLATE	UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY ℙ			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	DEAD		LIVE		
									DC	DW	LL+IM		
DB1 (EXP.)	M1	EB 1	6	5½"	25½"	25½"	¾"	0.00	106	15	117	45	13/16"
DB2 (FIX)	M2	BENT 1	6	5 11/16"	22½"	22½"	¾"	1.50	222	27	220	89	0
DB3 (EXP.)	M3	BENT 2	6	7"	28½"	28½"	¾"	4.00	183	23	221	79	7/16"
DB4 (EXP.)	M1	EB 2	6	6⅛"	25½"	25½"	¾"	5.00	94	13	119	42	1¼"

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F245838930BF40E...
4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-73
1			3			TOTAL SHEETS
2			4			110

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ASSEMBLED BY : J.P. ADAMS	DATE : 1/2016
CHECKED BY : T.L. AVERETTE	DATE : 2/2016
DRAWN BY : TMG 08/13	REV.
CHECKED BY : EKP 10/13	REV.
	REV.

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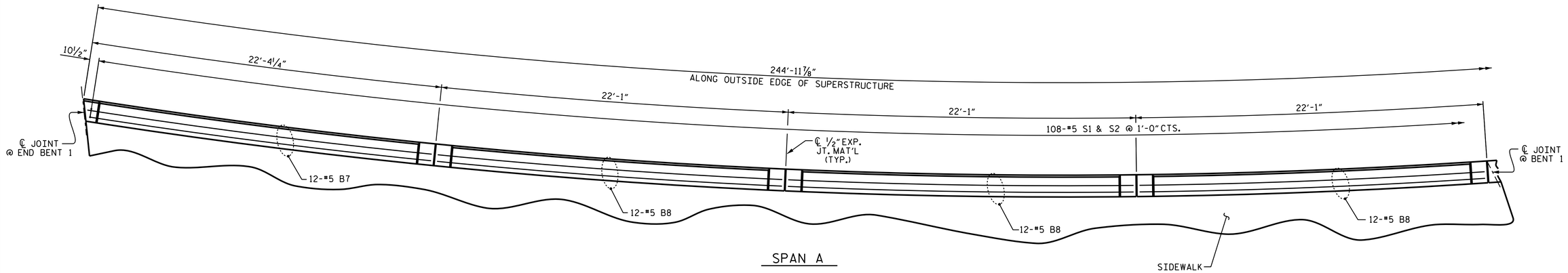
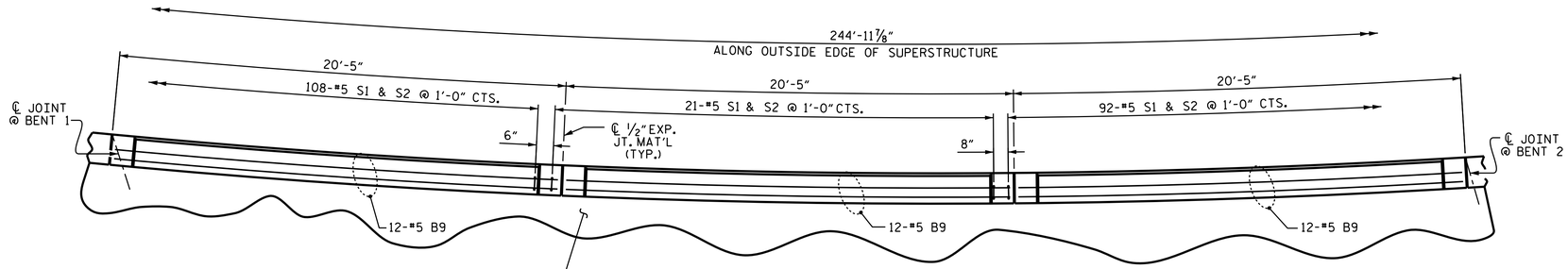
STR. #2

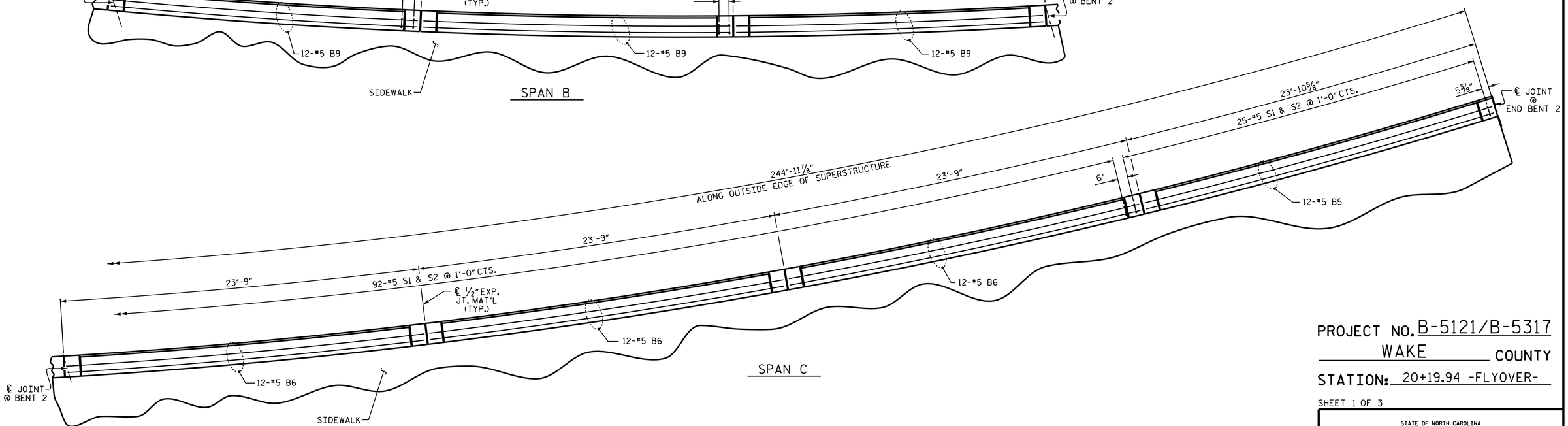
STD. NO. DB1 (SHT 2)



SPAN A



SPAN B



SPAN C

PLAN OF PARAPET
(LEFT SIDE)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY :	J.P. ADAMS	DATE : 1/2016
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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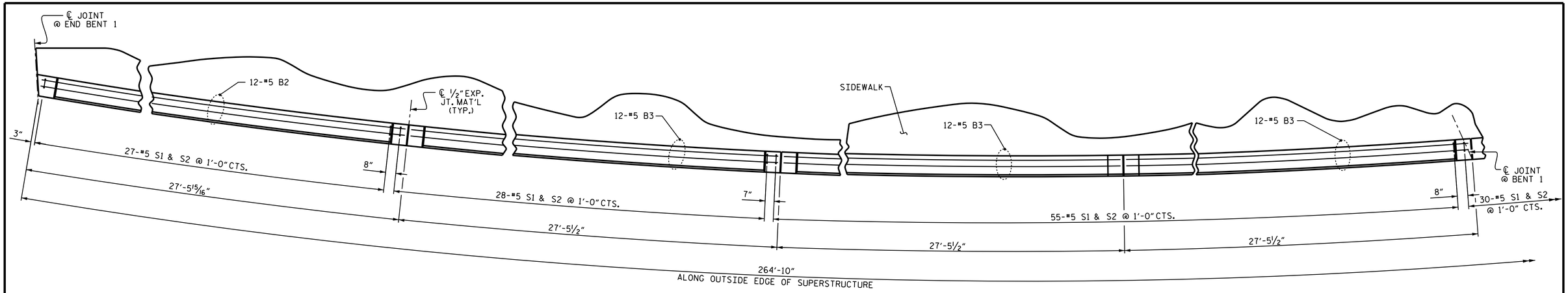

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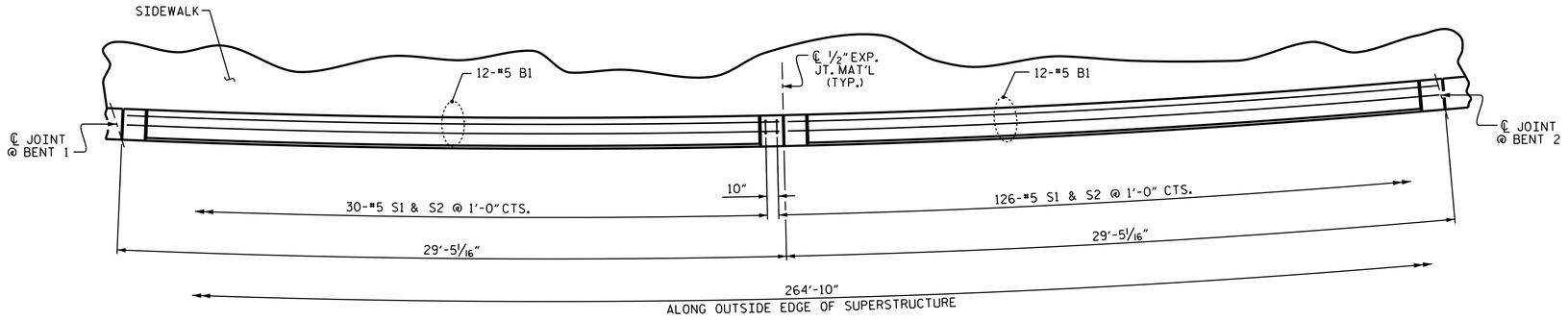
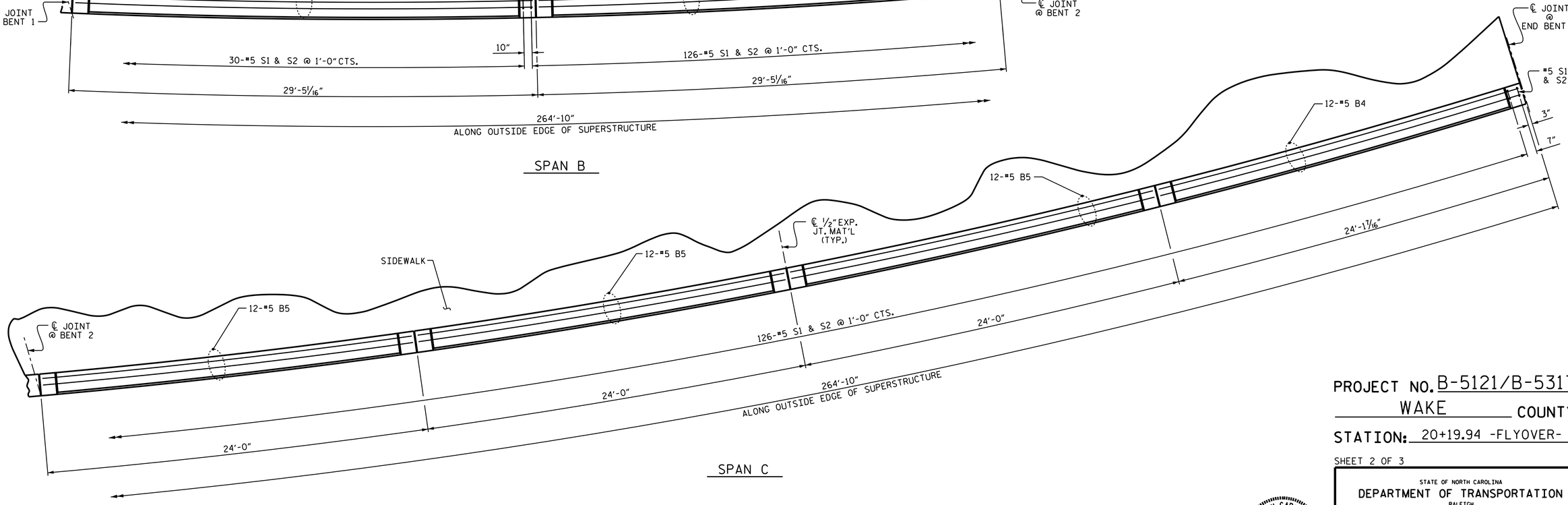


SPAN B



SPAN C

PLAN OF PARAPET
(RIGHT SIDE)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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1			3			TOTAL SHEETS
2			4			110

STR. #2

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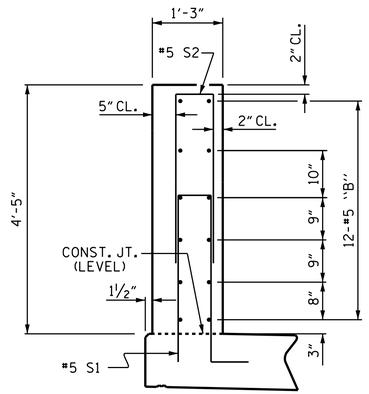
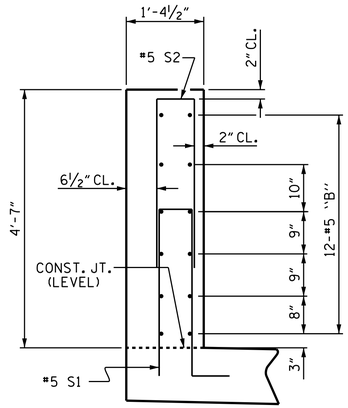


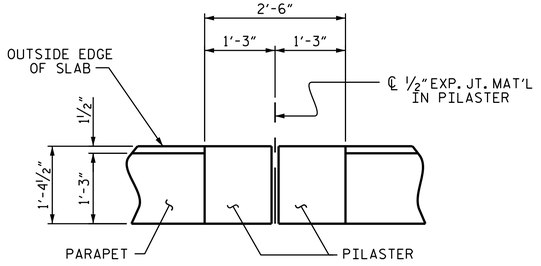
SECTION THROUGH PARAPET (LEFT SIDE)

SIDEWALK NOT SHOWN FOR CLARITY.
RECESSES IN PARAPET NOT SHOWN, SEE "RAIL AESTHETIC DETAILS" SHEETS.
FOR CLARITY DECK EDGE BEAM NOT SHOWN. FOR DETAILS, SEE "DECK EDGE BEAM" SHEETS.



SECTION THROUGH PILASTER (LEFT SIDE)

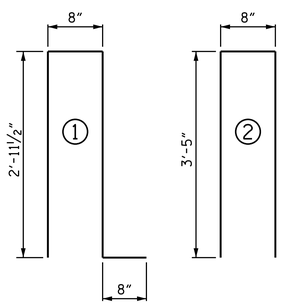
SIDEWALK NOT SHOWN FOR CLARITY



PLAN VIEW OF PILASTER

SIDEWALK NOT SHOWN FOR CLARITY
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR
FOR ADDITIONAL DETAILS, SEE "RAIL AESTHETIC DETAILS" SHEETS

BAR TYPES



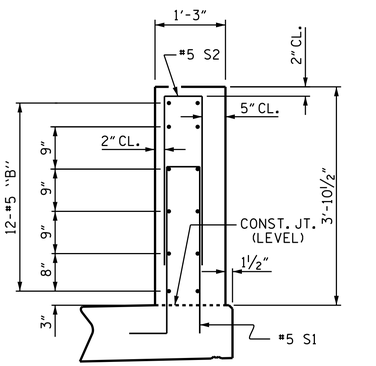
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

CONCRETE PARAPET

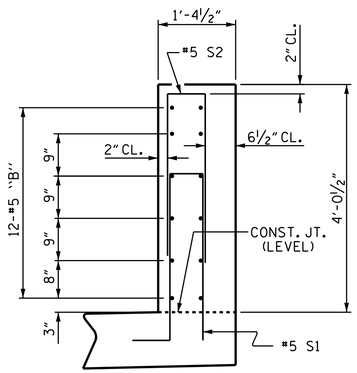
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	24	#5	STR	28'-11"	724
* B2	12	#5	STR	27'-3"	341
* B3	36	#5	STR	27'-0"	1014
* B4	12	#5	STR	23'-8"	296
* B5	48	#5	STR	23'-6"	1177
* B6	36	#5	STR	23'-5"	879
* B7	12	#5	STR	21'-9"	272
* B8	36	#5	STR	21'-8"	814
* B9	36	#5	STR	20'-0"	751
* S1	513	#5	1	7'-3"	3879
* S2	513	#5	2	7'-6"	4013

*EPOXY COATED REINF. STEEL	14160 LBS.
CLASS AA CONCRETE	99.4 C.Y.
DECORATIVE CONCRETE PARAPET	509.82 L.F.



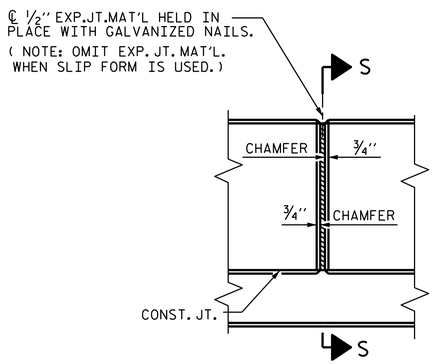
SECTION THROUGH PARAPET (RIGHT SIDE)

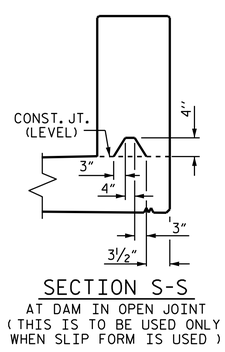
SIDEWALK NOT SHOWN FOR CLARITY.
RECESSES IN PARAPET NOT SHOWN, SEE "RAIL AESTHETIC DETAILS" SHEETS.
FOR CLARITY DECK EDGE BEAM NOT SHOWN. FOR DETAILS, SEE "DECK EDGE BEAM" SHEETS.



SECTION THROUGH PILASTER (RIGHT SIDE)

SIDEWALK NOT SHOWN FOR CLARITY





SECTION S-S

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

ELEVATION AT EXPANSION JOINTS

CONCRETE PARAPET DETAILS

NOTES

ALL REINFORCING STEEL IN PARAPETS SHALL BE EPOXY COATED.

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

THREADED RODS FOR PRECAST PANELS ARE NOT SHOWN FOR CLARITY. SEE "PRECAST PANEL" SHEETS FOR LOCATION AND DETAILS OF THREADED RODS. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH THREADED RODS.

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

AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE "RAIL AESTHETIC DETAILS" SHEETS.

FOR CLARITY DECK EDGE BEAM NOT SHOWN. FOR DETAILS AND REINFORCING STEEL, SEE "DECK EDGE BEAM" SHEETS.

FOR DECORATIVE CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B9308F40E...
4/13/2016

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DRAWN BY : J.P. ADAMS DATE : 12/2015
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 3

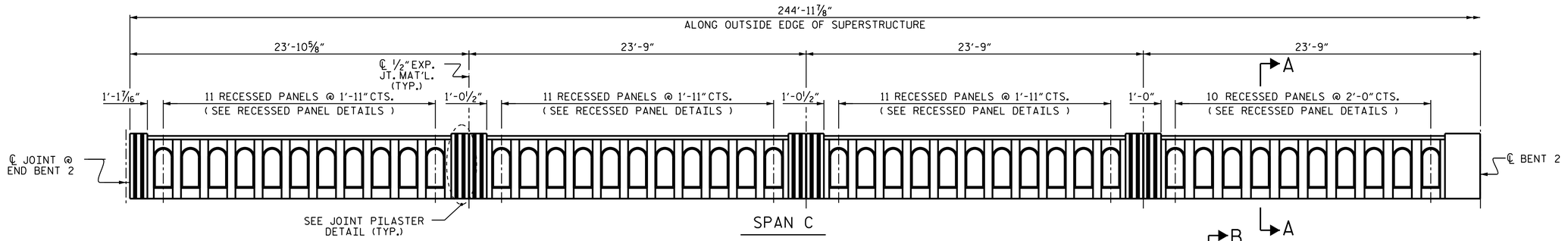
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

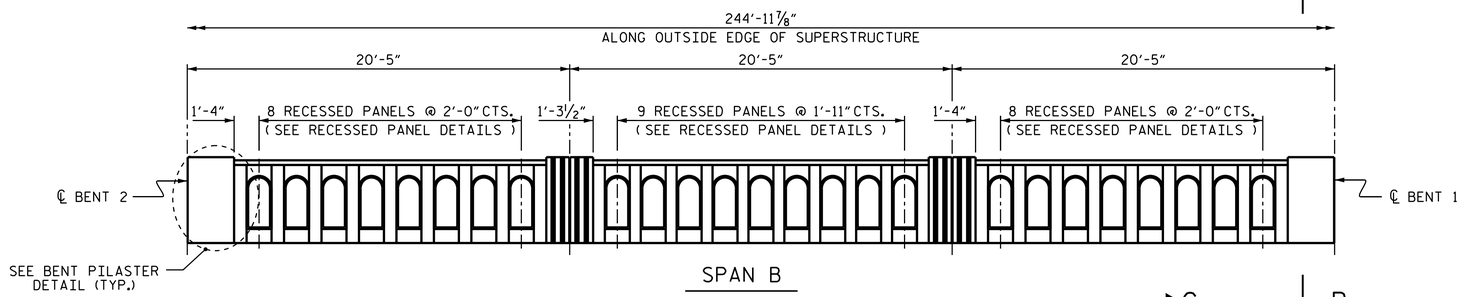
SUPERSTRUCTURE

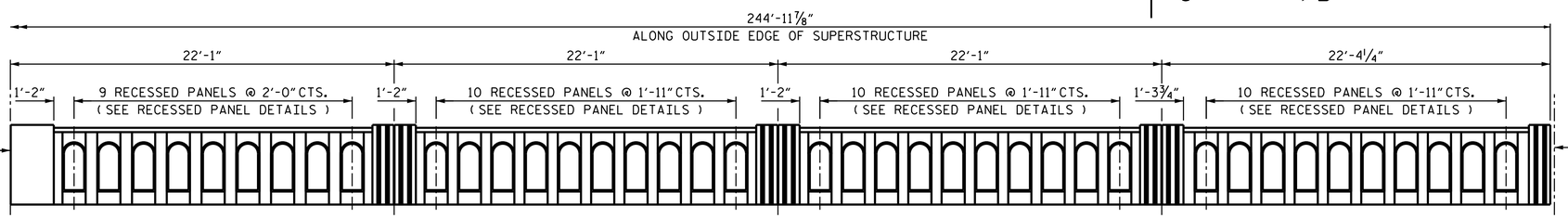
CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76
1			3			TOTAL SHEETS
2			4			110

STR. #2



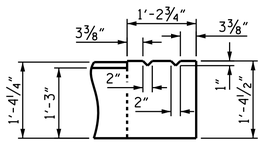




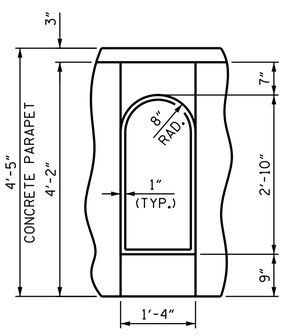
ELEVATION OF LEFT PARAPET EXTERIOR FACE

NOTES:

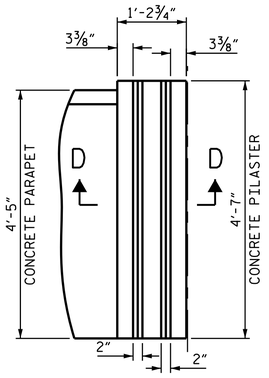
ALL DIMENSIONS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE.



SECTION D-D

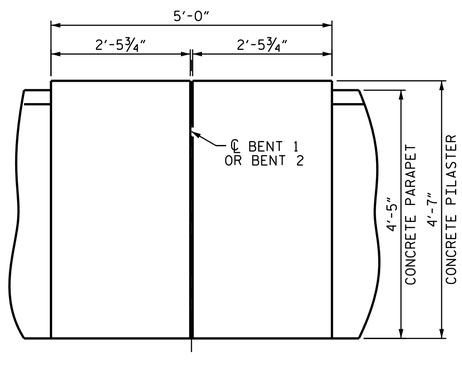


RECESSED PANEL DETAIL



JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.



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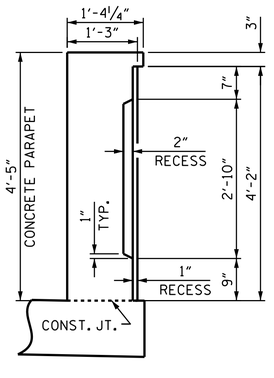
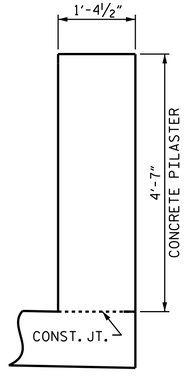
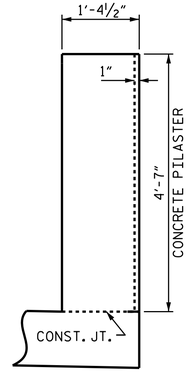


SECTION A-A



SECTION B-B



SECTION C-C

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PARAPET AESTHETIC DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.W. ALFORD DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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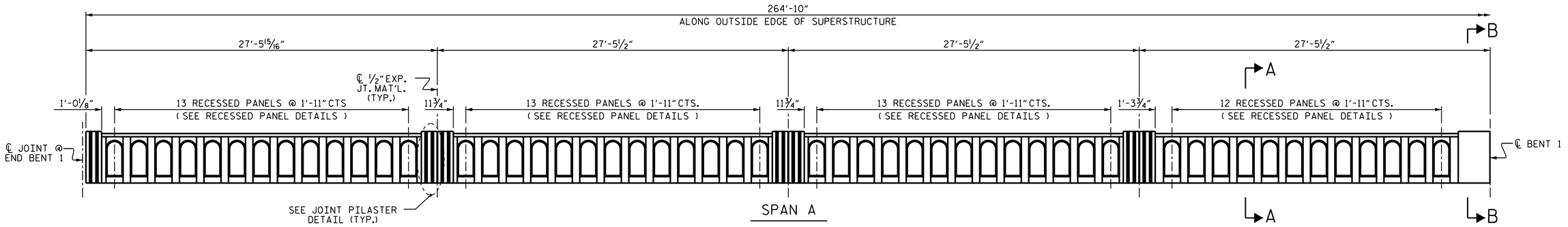
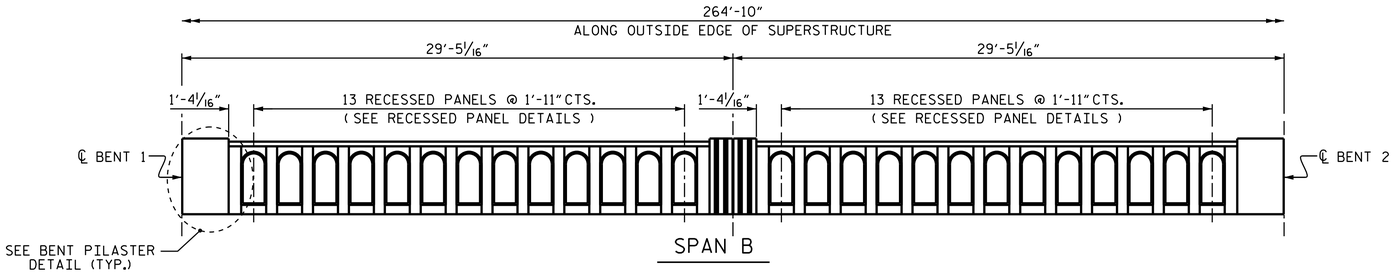
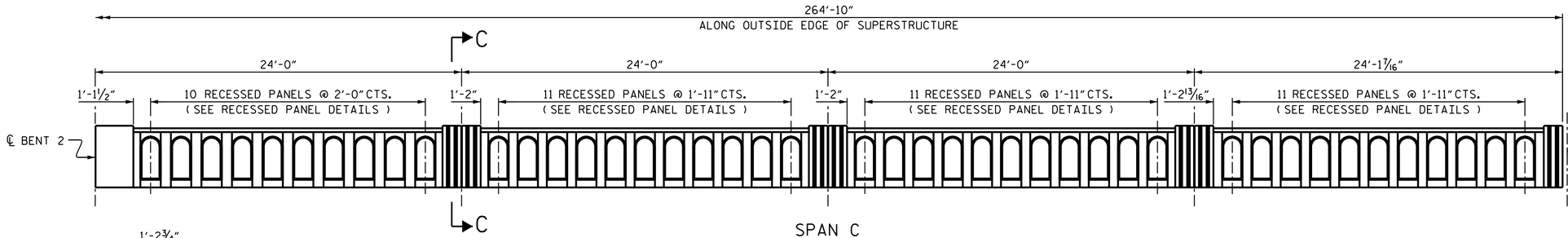
STR. #2



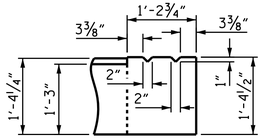
NOTES:

ALL DIMENSIONS SHOWN ARE MEASURED ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE.

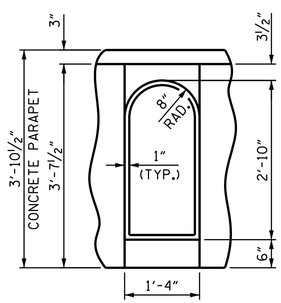




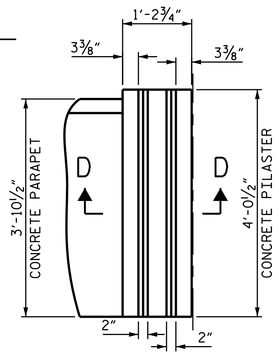
ELEVATION OF RIGHT PARAPET EXTERIOR FACE



SECTION D-D

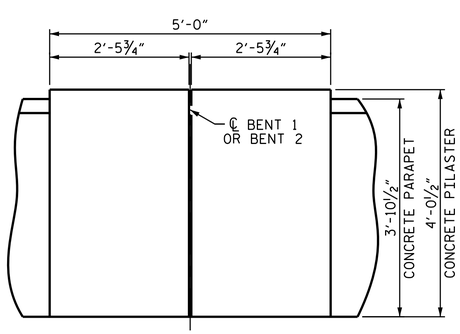


RECESSED PANEL DETAIL



JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.



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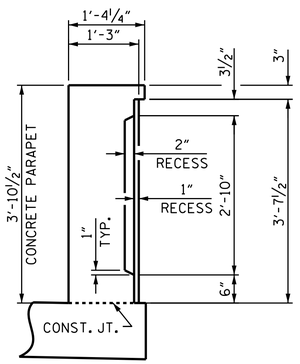
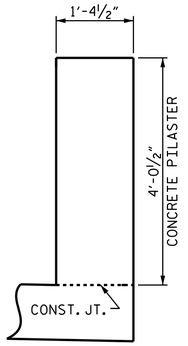
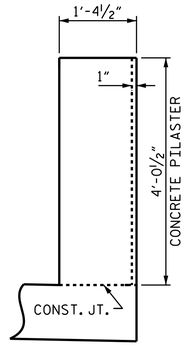


SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PARAPET AESTHETIC DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-78
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : K.W. ALFORD DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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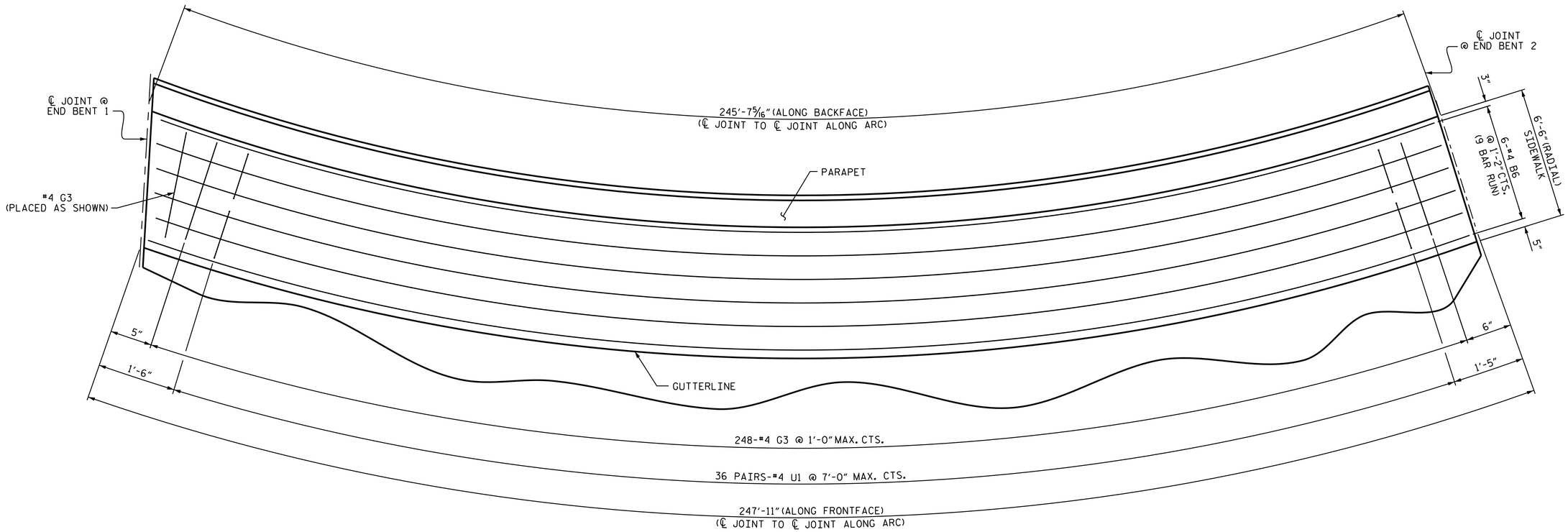
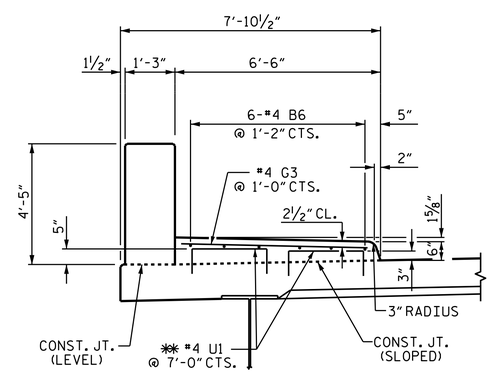
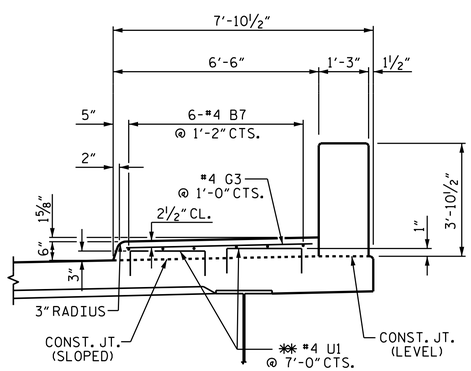
STR. #2



PLAN OF LEFT SIDEWALK



SECTION THRU SIDEWALK (LEFT)



SECTION THRU SIDEWALK (RIGHT)

** #4 U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY :	J.P. ADAMS	DATE : 1/2016
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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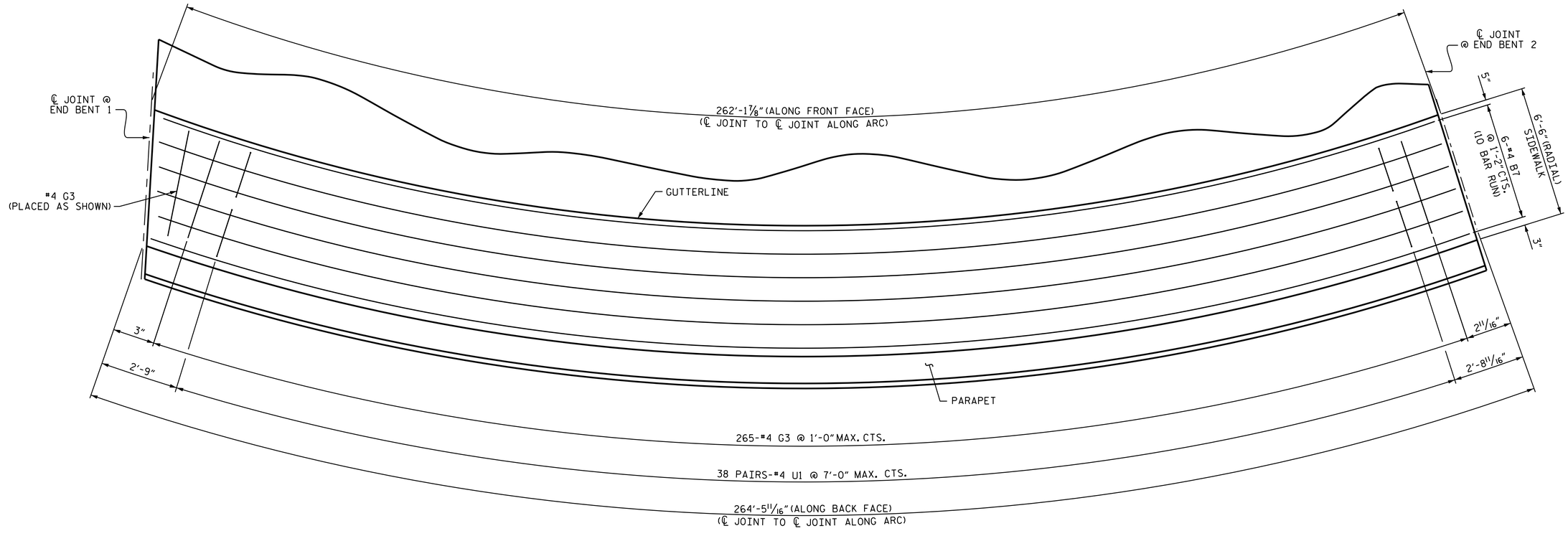

PLAN OF RIGHT SIDEWALK

NOTES

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS FOR COVER PLATE DETAILS.

FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL."

FOR SIDEWALK ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.

FIELD BEND "B" BARS AS NECESSARY.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY :	J.P. ADAMS	DATE : 1/2016
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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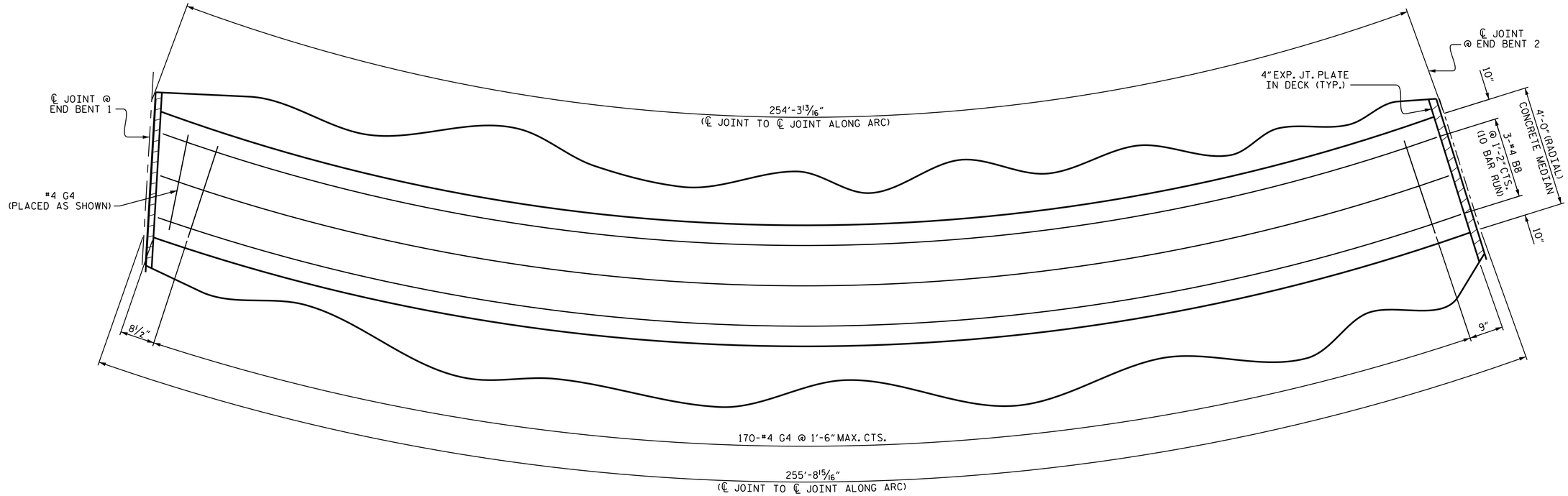
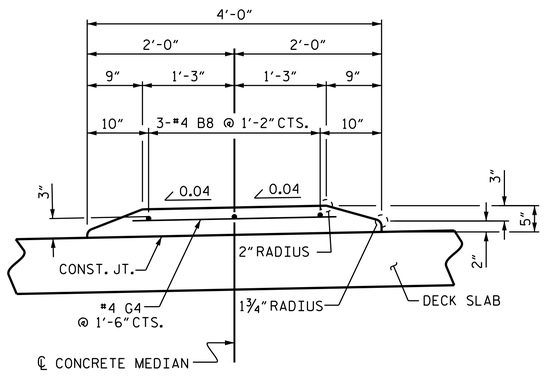
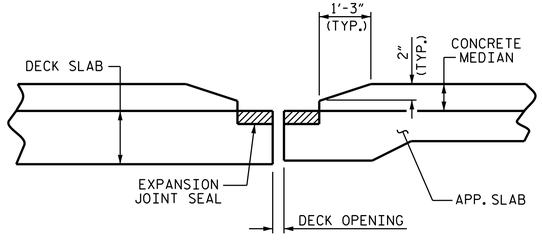


PLAN OF CONCRETE MEDIAN



REINFORCING STEEL DETAILS



SECTION AT EXPANSION JOINT

CONCRETE MEDIAN DETAILS

NOTES

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN THE CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR CONCRETE MEDIAN REINFORCING STEEL AND CONCRETE QUANTITIES, SEE SUPERSTRUCTURE "BILL OF MATERIAL."

FOR CONCRETE MEDIAN ON APPROACH SLAB, SEE APPROACH SLAB SHEETS.

FIELD BEND "B" BARS AS NECESSARY.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E... 4/13/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE MEDIAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-81
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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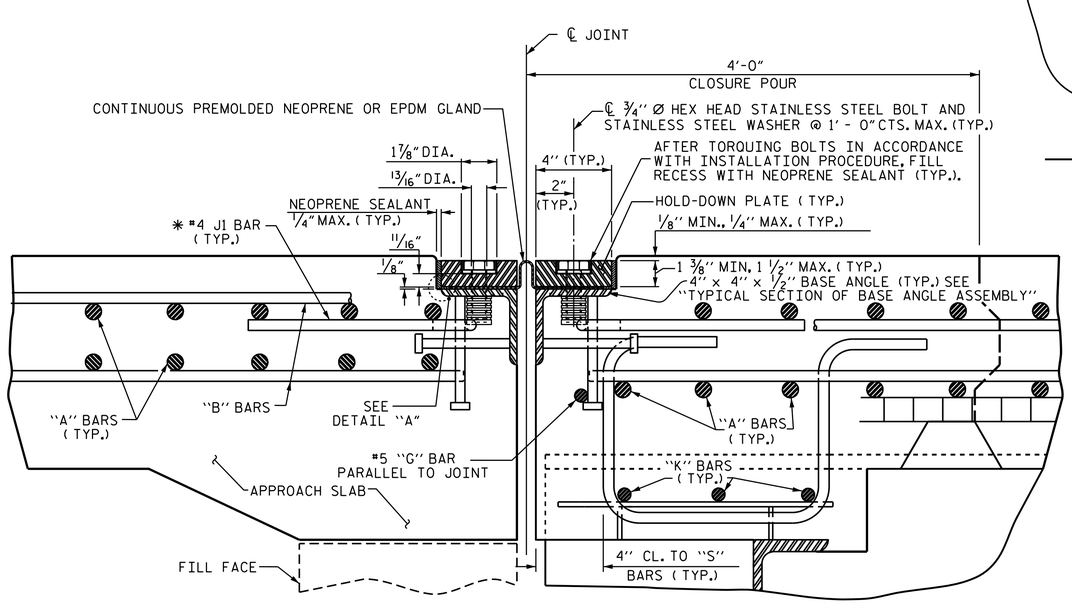
jpadams

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

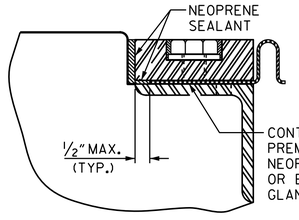
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



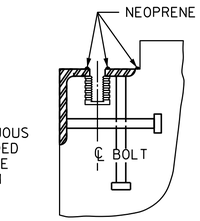
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

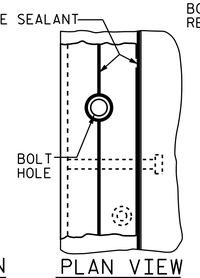
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



DETAIL "A"



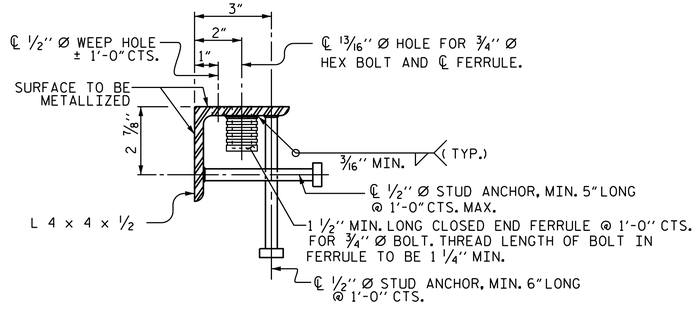
CROSS SECTION



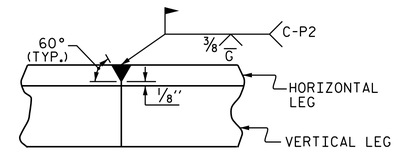
PLAN VIEW

INSTALLATION SKETCH

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB 1	76°	1 13/16"	1 1/2"	1 7/16"	1 3/16"
EB 2	90°	1 3/16"	1 13/16"	1 5/8"	1 1/4"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

DocuSigned by: F2458589300BF40E... 4/13/2016

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2			4			110

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DRAWN BY : REK 9/87	REV. 5/7/03R	RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R	TLA/GM
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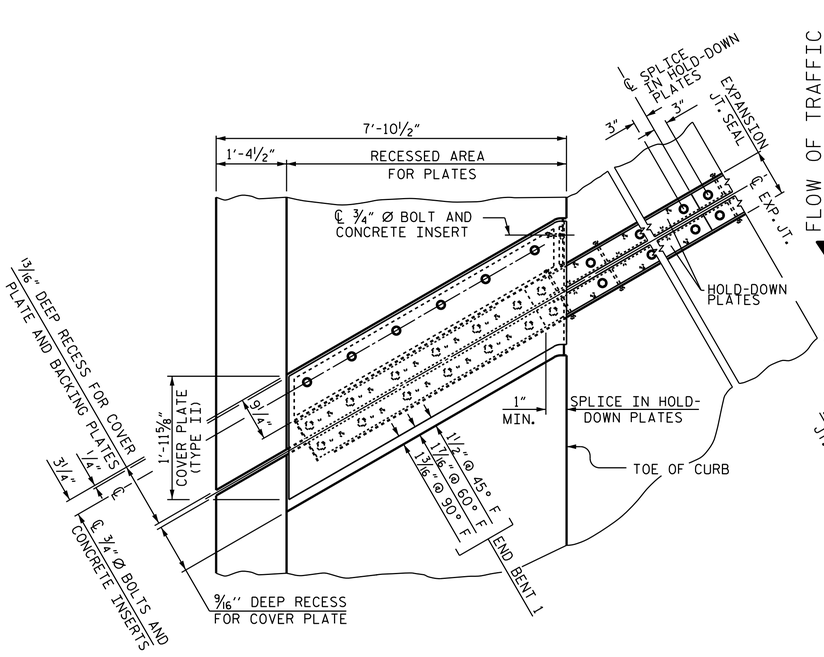
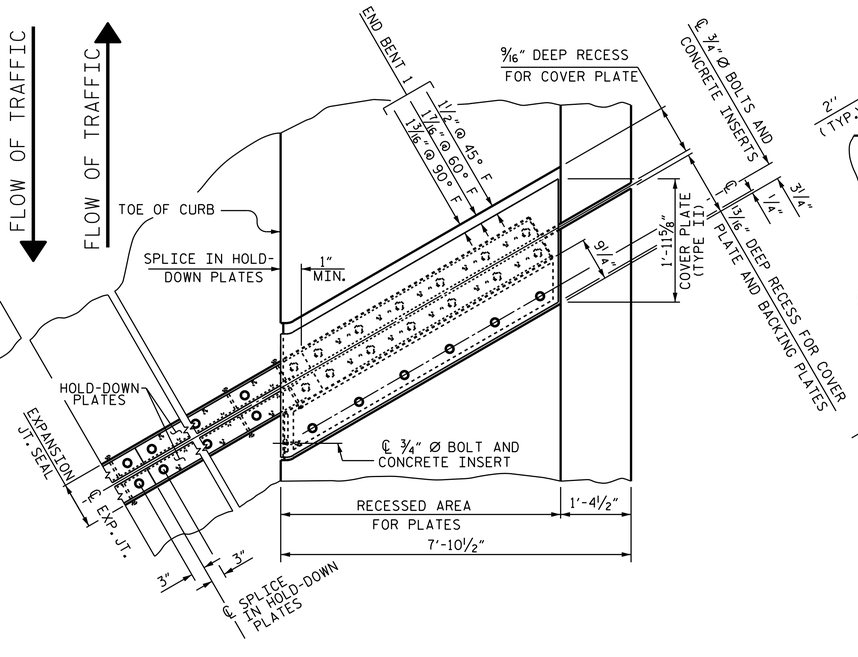
STR. #2

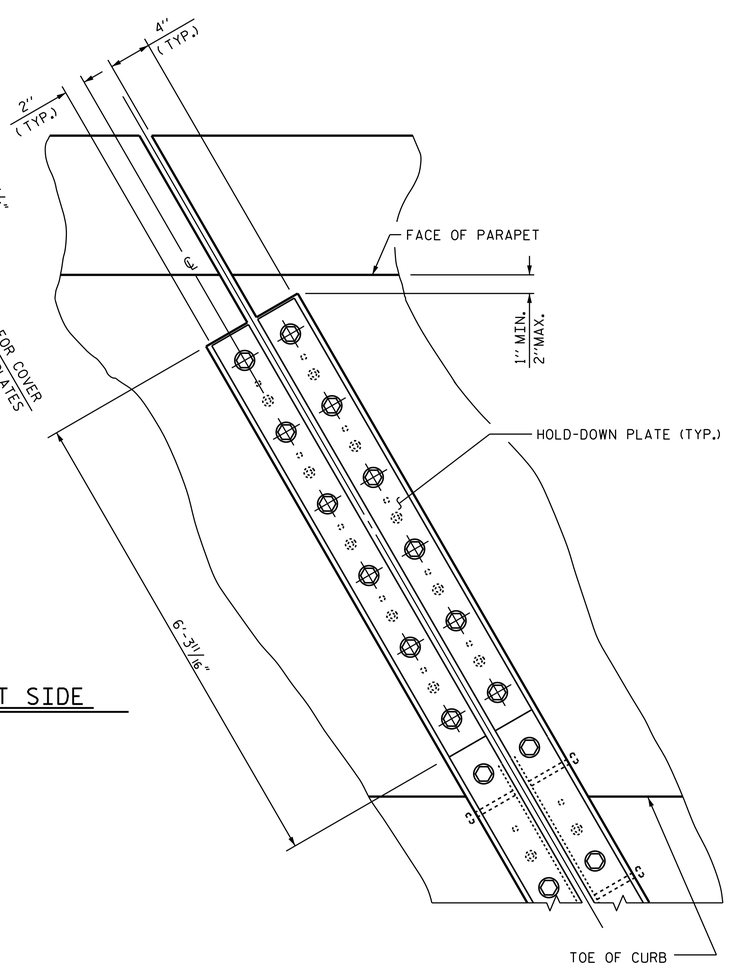
STD. NO. EJS1 (SHT 2)



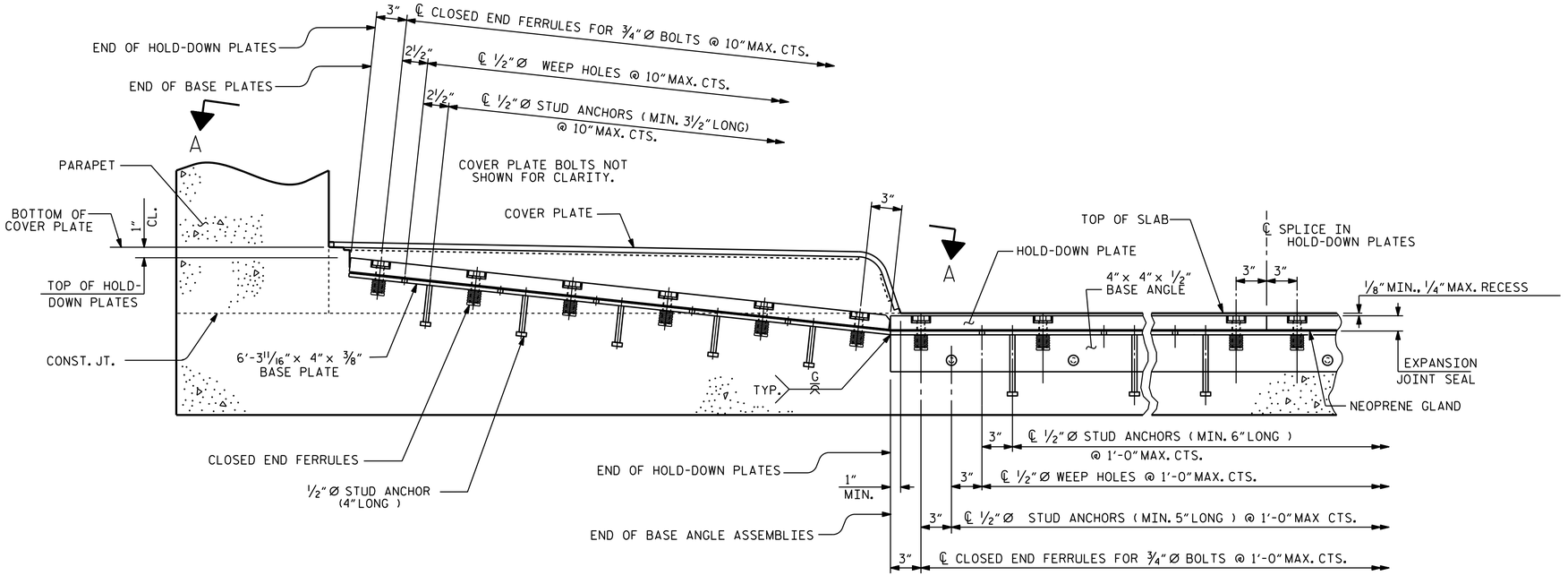
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION A - A



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

(END BENT 1)

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALCORD

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STR. #2

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	REV. 10/1/11	MAA/GM

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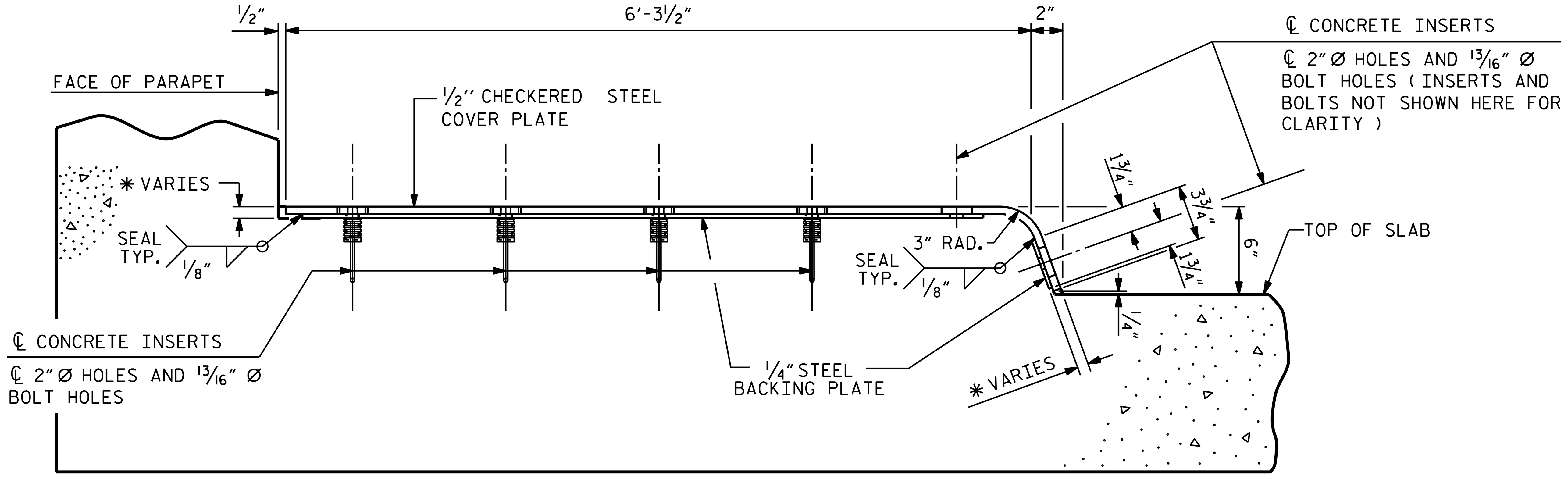
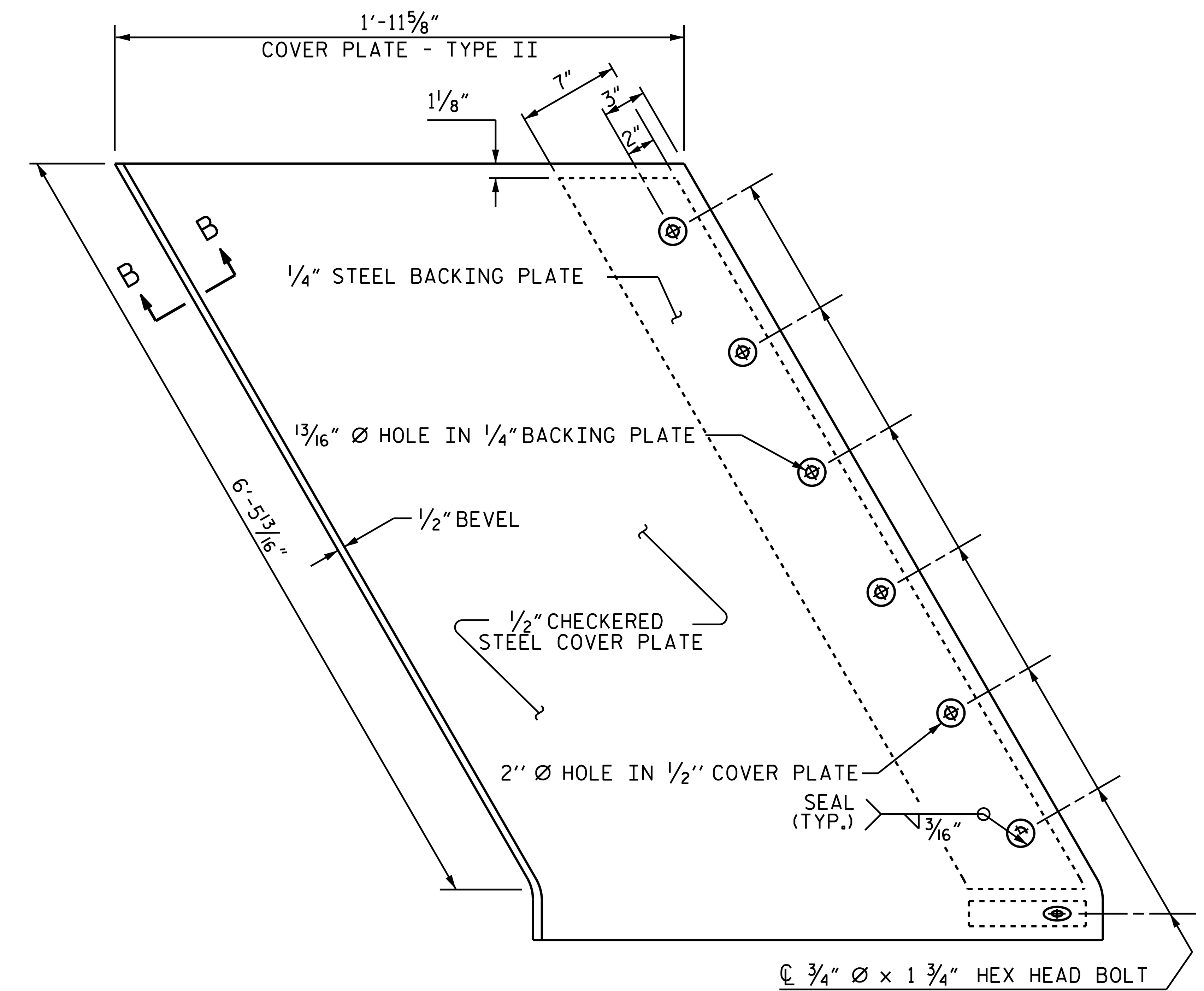


END VIEW
(NORMAL TO SIDEWALK)

✱ CONCRETE RECESS DIMENSIONS:

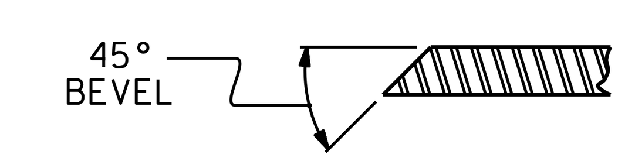
13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.



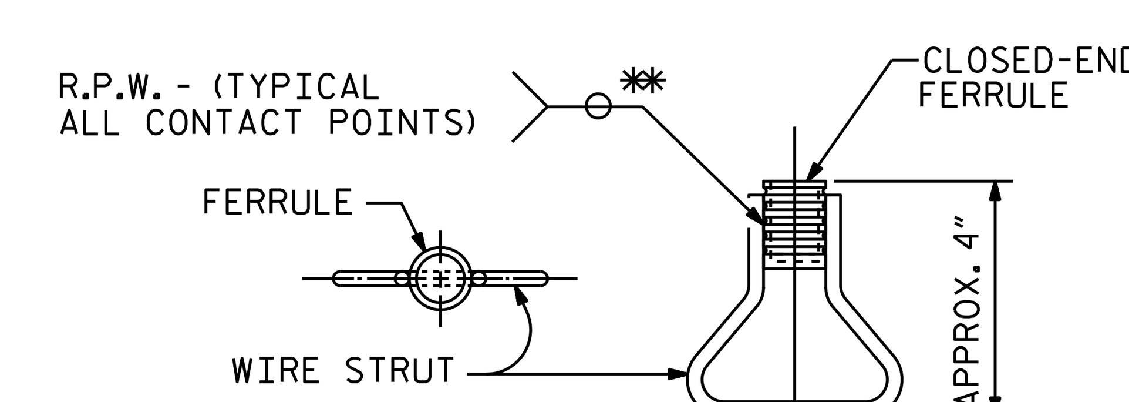
TYPE II - PLAN VIEW

COVER PLATE DETAILS



SECTION B - B

FOR PAVEMENT MARKING ALIGNMENT
SEE SHEET 5 OF 5

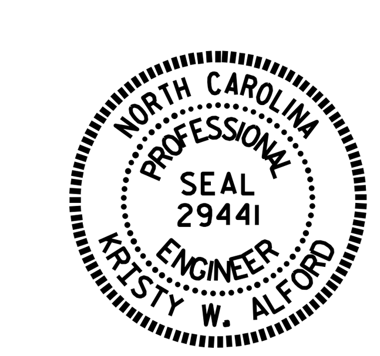


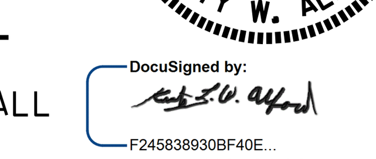
PLAN

ELEVATION

CONCRETE INSERT

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





PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK
(END BENT 1)

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2			4			

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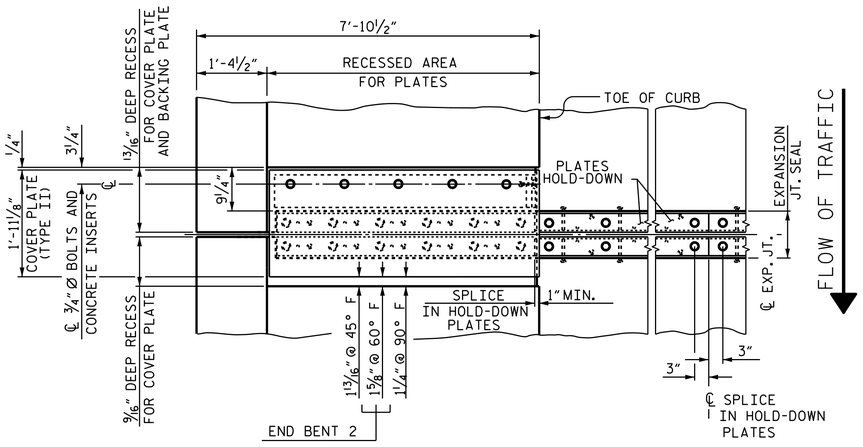
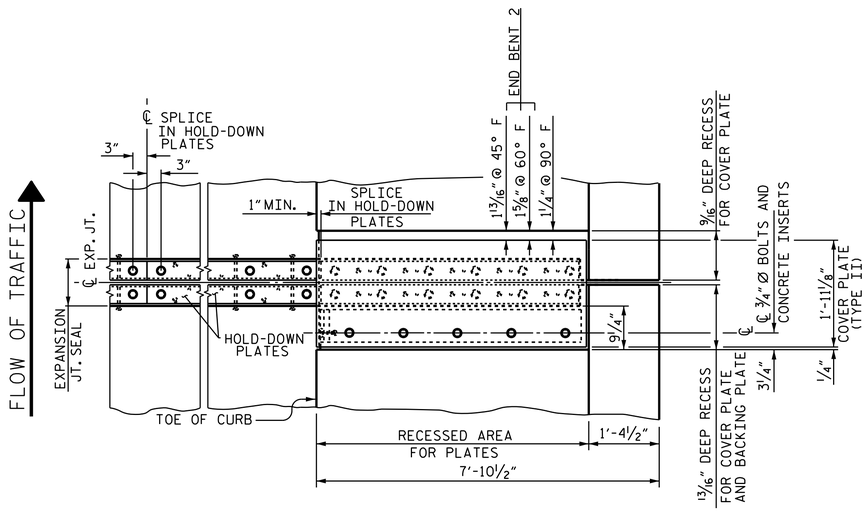
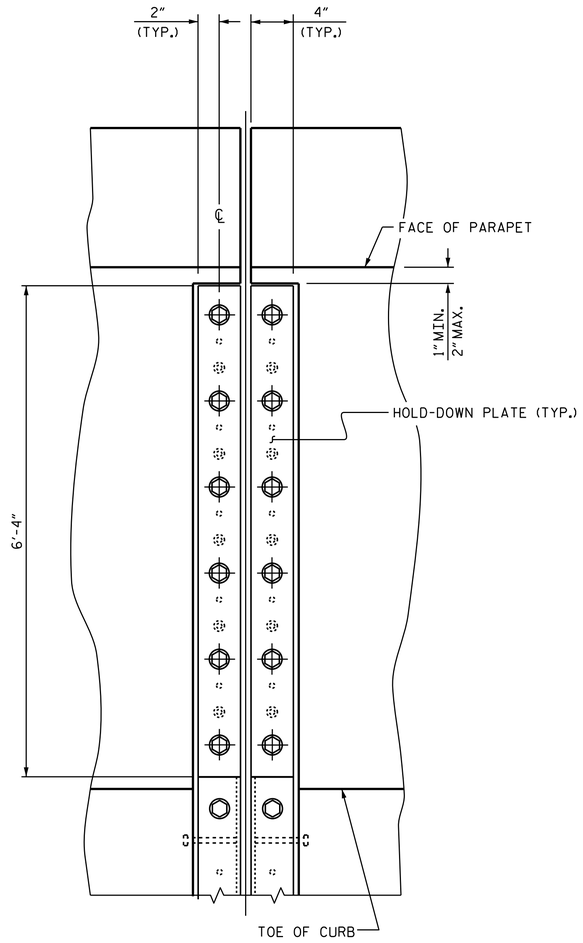


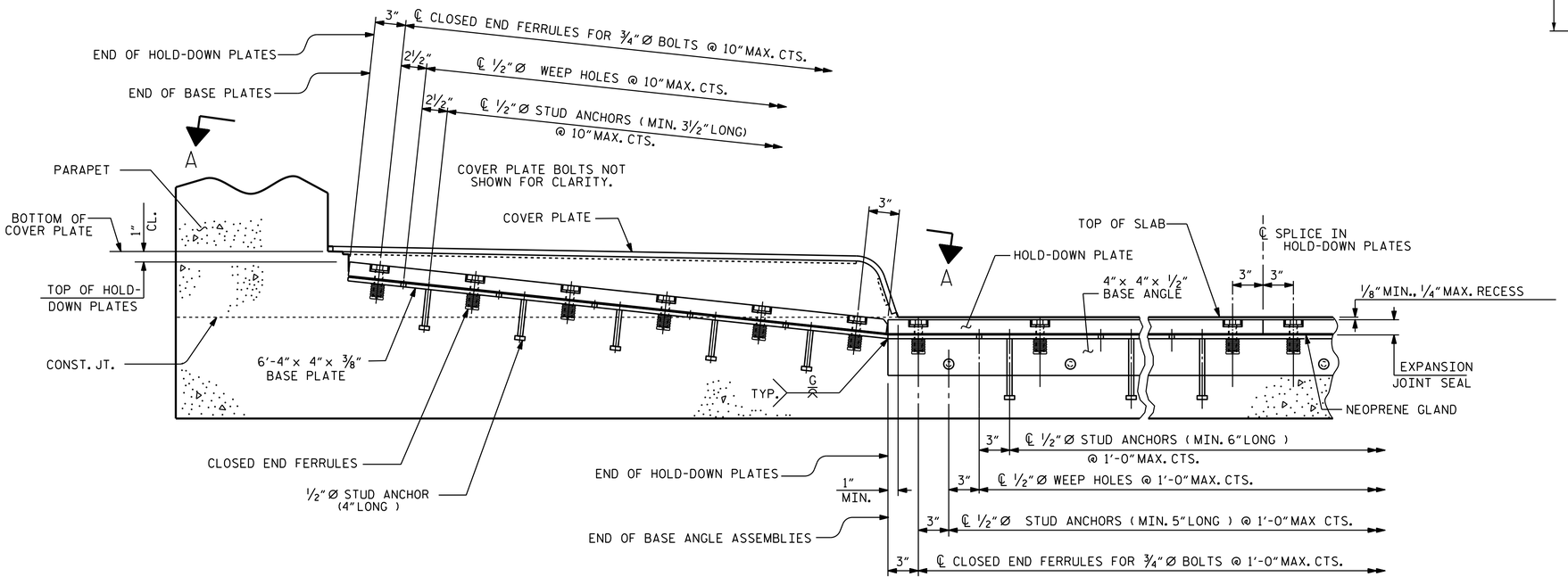
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION A - A



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

(END BENT 2)

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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STR. #2

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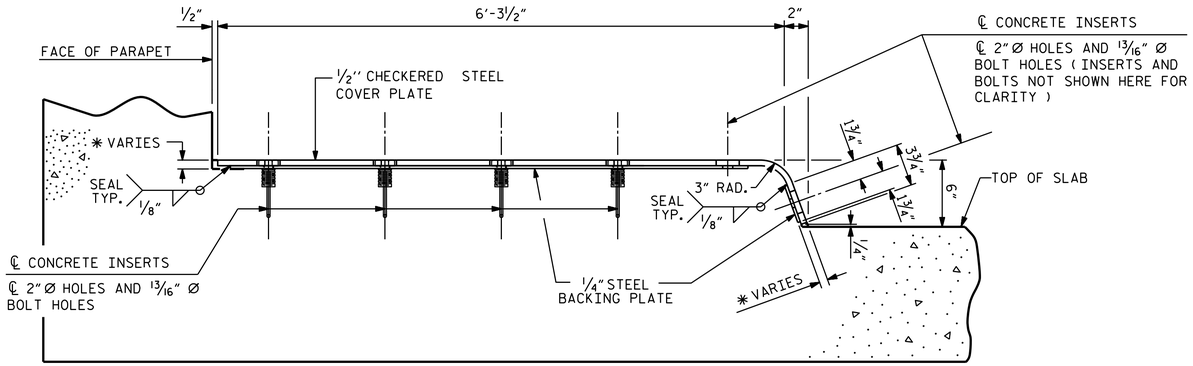


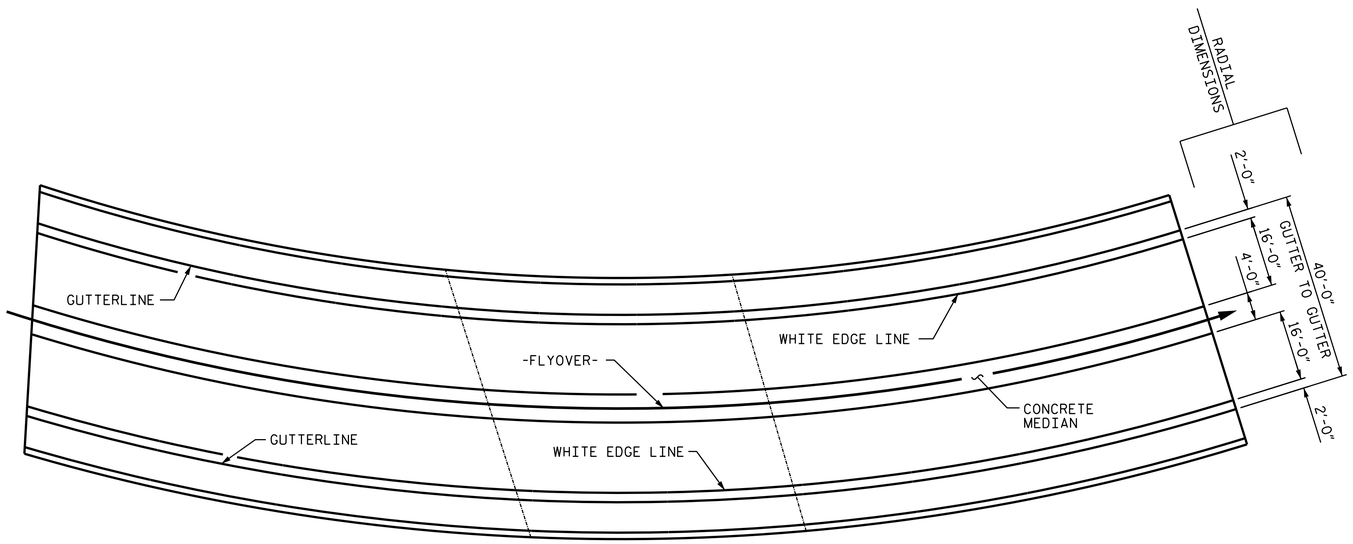
END VIEW

(NORMAL TO SIDEWALK)

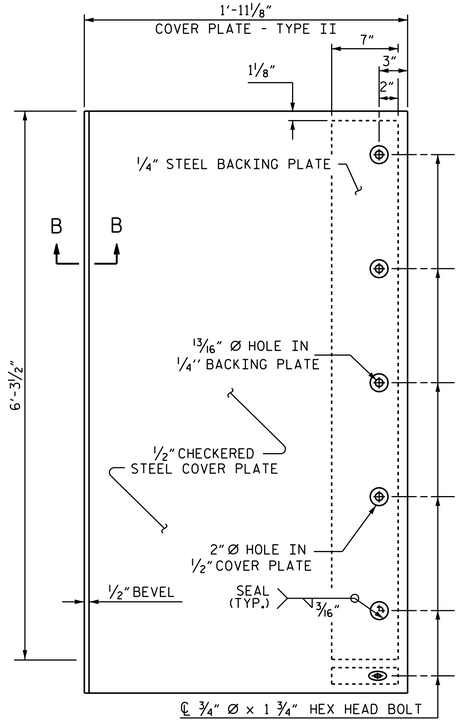
* CONCRETE RECESS DIMENSIONS:

13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

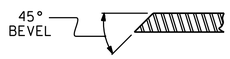


PAVEMENT MARKING ALIGNMENT

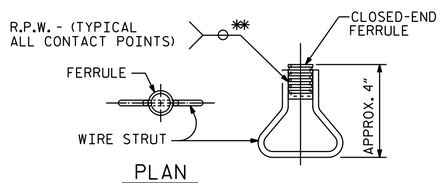


TYPE II - PLAN VIEW

COVER PLATE DETAILS



SECTION B - B



PLAN

ELEVATION

CONCRETE INSERT

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

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

(END BENT 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-86
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STR. #2

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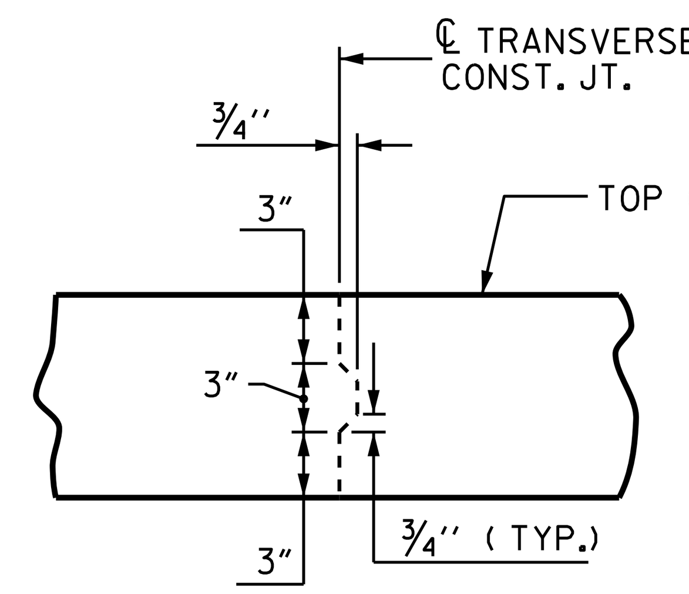
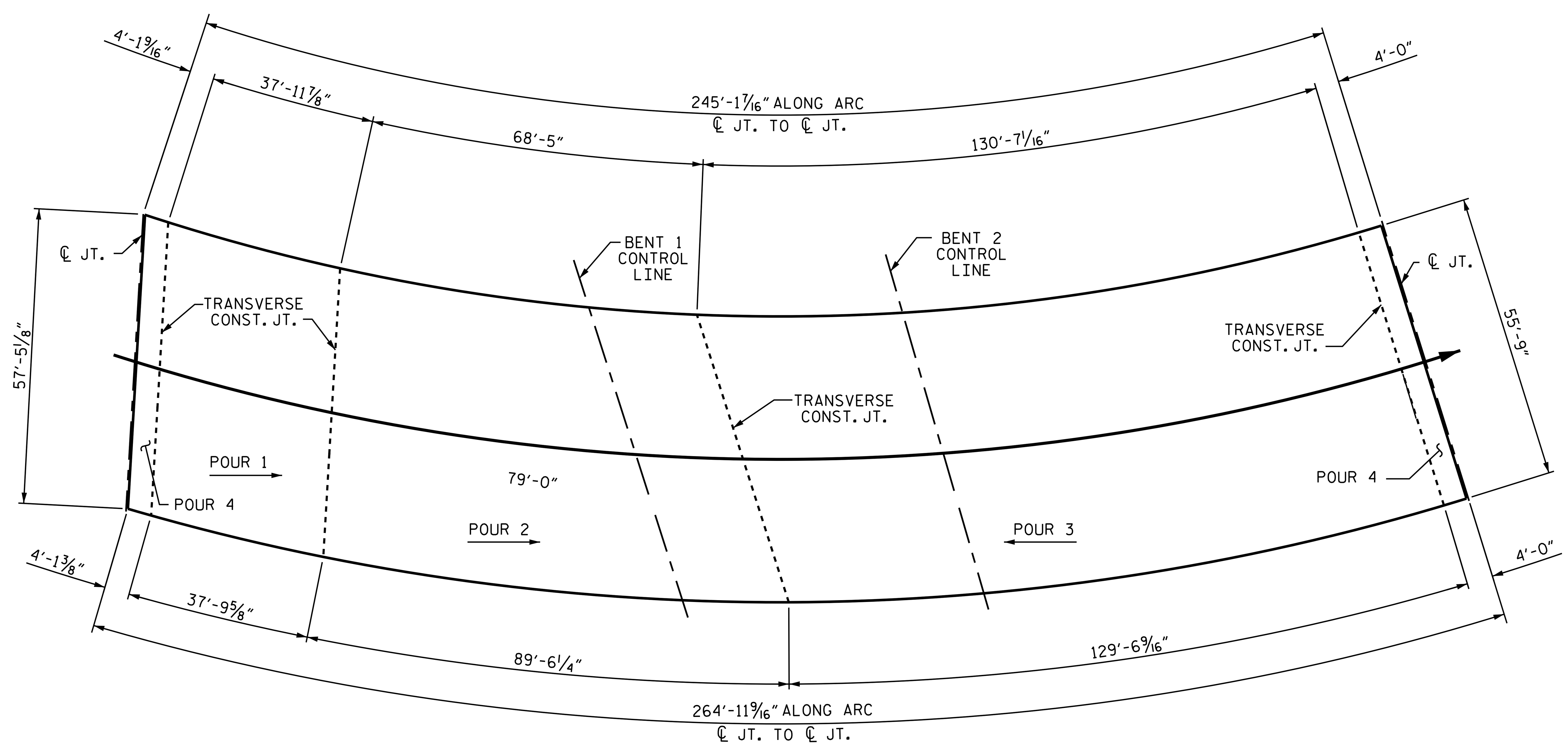


TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE & LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 14,218)

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND SIDEWALK		APPROACH SLABS		PARAPET AND SIDEWALK
	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″			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	* EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	75.0		
POUR 2	150.0		
POUR 3	244.0		
POUR 4	22.4		
MEDIAN	14.0		
SIDEWALK	68.6		
TOTAL **	574.0	50803	64415

** QUANTITIES FOR PARAPET ARE NOT INCLUDED

GROOVING BRIDGE FLOOR

APPROACH SLABS	1615	SQ. FT.
BRIDGE DECK	8378	SQ. FT.
TOTAL	9993	SQ. FT.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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SUPERSTRUCTURE

BILL OF MATERIAL

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1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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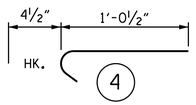
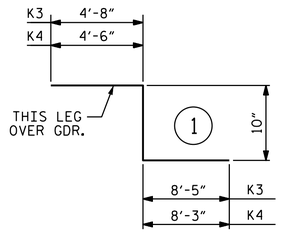
REINFORCING BAR SCHEDULE

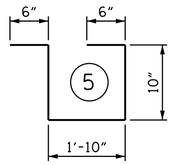
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	962	#5	STR	30'-3"	30352	A217	1	#5	STR	40'-2"	42	✳ B37	1	#4	STR	9'-4"	6
A2	962	#5	STR	30'-1"	30185	A218	1	#5	STR	38'-5"	40	✳ B38	1	#4	STR	9'-10"	7
						A219	1	#5	STR	36'-9"	38	✳ B39	1	#4	STR	10'-6"	7
✳ A101	1	#5	STR	49'-9"	52	A220	1	#5	STR	35'-0"	37	✳ B40	1	#4	STR	11'-3"	8
✳ A102	1	#5	STR	41'-0"	43	A221	1	#5	STR	33'-3"	35	✳ B41	1	#4	STR	12'-6"	8
✳ A103	1	#5	STR	32'-4"	34	A222	1	#5	STR	31'-6"	33	✳ B42	3	#4	STR	24'-7"	49
✳ A104	1	#5	STR	23'-7"	25	A223	1	#5	STR	29'-9"	31	✳ B43	1	#4	STR	24'-10"	17
✳ A105	1	#5	STR	14'-11"	16	A224	1	#5	STR	28'-0"	29	✳ B44	1	#4	STR	25'-0"	17
✳ A106	1	#5	STR	6'-2"	6	A225	1	#5	STR	26'-3"	27	✳ B45	1	#4	STR	25'-3"	17
✳ A107	1	#5	STR	56'-6"	59	A226	1	#5	STR	24'-6"	26	✳ B46	1	#4	STR	25'-5"	17
✳ A108	1	#5	STR	54'-9"	57	A227	1	#5	STR	22'-9"	24	✳ B47	1	#4	STR	25'-9"	17
✳ A109	1	#5	STR	53'-0"	55	A228	1	#5	STR	21'-0"	22	✳ B48	1	#4	STR	26'-1"	17
✳ A110	1	#5	STR	51'-3"	53	A229	1	#5	STR	19'-3"	20	✳ B49	1	#4	STR	26'-6"	18
✳ A111	1	#5	STR	49'-6"	52	A230	1	#5	STR	17'-6"	18	✳ B50	1	#4	STR	27'-0"	18
✳ A112	1	#5	STR	47'-9"	50	A231	1	#5	STR	15'-9"	16	✳ B51	1	#4	STR	27'-8"	18
✳ A113	1	#5	STR	46'-0"	48	A232	1	#5	STR	14'-0"	15	✳ B52	1	#4	STR	28'-5"	19
✳ A114	1	#5	STR	44'-4"	46	A233	1	#5	STR	12'-3"	13	✳ B53	1	#4	STR	29'-8"	20
✳ A115	1	#5	STR	42'-7"	44	A234	1	#5	STR	10'-6"	11	✳ B54	3	#4	STR	6'-8"	13
✳ A116	1	#5	STR	40'-10"	43	A235	1	#5	STR	8'-9"	9	✳ B55	1	#4	STR	6'-10"	5
✳ A117	1	#5	STR	39'-1"	41	A236	1	#5	STR	7'-0"	7	✳ B56	1	#4	STR	7'-0"	5
✳ A118	1	#5	STR	37'-4"	39	A237	1	#5	STR	5'-3"	5	✳ B57	1	#4	STR	7'-3"	5
✳ A119	1	#5	STR	35'-7"	37	A238	1	#5	STR	3'-5"	4	✳ B58	1	#4	STR	7'-5"	5
✳ A120	1	#5	STR	33'-10"	35							✳ B59	1	#4	STR	7'-9"	5
✳ A121	1	#5	STR	32'-1"	33	✳ B1	219	#7	STR	42'-7"	19062	✳ B60	1	#4	STR	8'-1"	5
✳ A122	1	#5	STR	30'-4"	32	B2	340	#5	STR	54'-8"	19386	✳ B61	1	#4	STR	8'-6"	6
✳ A123	1	#5	STR	28'-7"	30	✳ B3	111	#4	STR	28'-1"	2082	✳ B62	1	#4	STR	9'-0"	6
✳ A124	1	#5	STR	26'-10"	28	✳ B4	111	#4	STR	25'-10"	1915	✳ B63	1	#4	STR	9'-8"	6
✳ A125	1	#5	STR	25'-1"	26	✳ B5	20	#4	STR	28'-3"	377	✳ B64	1	#4	STR	10'-5"	7
✳ A126	1	#5	STR	23'-4"	24	✳ B6	54	#4	STR	29'-11"	1079	✳ B65	1	#4	STR	11'-8"	8
✳ A127	1	#5	STR	21'-8"	23	✳ B7	60	#4	STR	28'-11"	1159						
✳ A128	1	#5	STR	19'-11"	21	✳ B8	30	#4	STR	27'-3"	546	✳ G1	1	#5	STR	57'-0"	59
✳ A129	1	#5	STR	18'-2"	19	✳ B10	3	#4	STR	5'-8"	11	✳ G2	1	#5	STR	55'-5"	58
✳ A130	1	#5	STR	16'-5"	17	✳ B11	1	#4	STR	5'-10"	4	✳ G3	515	#4	STR	6'-0"	2064
✳ A131	1	#5	STR	14'-8"	15	✳ B12	1	#4	STR	6'-0"	4	✳ G4	171	#4	STR	2'-8"	305
✳ A132	1	#5	STR	12'-11"	13	✳ B13	1	#4	STR	6'-3"	4						
✳ A133	1	#5	STR	11'-2"	12	✳ B14	1	#4	STR	6'-5"	4	✳ J1	81	#4	4	1'-5"	77
✳ A134	1	#5	STR	9'-4"	10	✳ B15	1	#4	STR	6'-9"	5						
✳ A135	1	#5	STR	7'-7"	8	✳ B16	1	#4	STR	7'-1"	5	✳ K1	12	#5	2	20'-11"	262
✳ A136	1	#5	STR	5'-10"	6	✳ B17	1	#4	STR	7'-6"	5	✳ K2	12	#5	2	20'-6"	257
✳ A137	1	#5	STR	4'-1"	4	✳ B18	1	#4	STR	8'-0"	5	✳ K3	6	#5	1	13'-11"	87
✳ A138	1	#5	STR	2'-4"	2	✳ B19	1	#4	STR	8'-8"	6	✳ K4	6	#5	1	13'-7"	85
						✳ B20	1	#4	STR	9'-5"	6						
A201	1	#5	STR	55'-6"	58	✳ B21	1	#4	STR	10'-8"	7	✳ S1	80	#4	5	4'-6"	240
A202	1	#5	STR	46'-9"	49	✳ B22	8	#4	STR	3'-8"	20	✳ S10	122	#5	6	10'-4"	1315
A203	1	#5	STR	38'-1"	40	✳ B23	4	#4	STR	4'-0"	11	✳ S11	8	#5	6	7'-11"	66
A204	1	#5	STR	29'-4"	31	✳ B24	4	#4	STR	4'-5"	12	✳ S12	8	#5	6	6'-6"	54
A205	1	#5	STR	20'-7"	21	✳ B25	4	#4	STR	4'-11"	13	✳ S13	8	#5	6	5'-6"	46
A206	1	#5	STR	11'-11"	12	✳ B26	4	#4	STR	5'-8"	15	✳ S14	8	#5	6	4'-10"	40
A207	1	#5	STR	57'-7"	60	✳ B27	4	#4	STR	6'-7"	18	✳ S15	8	#5	6	4'-4"	36
A208	1	#5	STR	55'-10"	58	✳ B28	4	#4	STR	7'-11"	21	✳ S16	8	#5	6	4'-0"	33
A209	1	#5	STR	54'-1"	56	✳ B29	4	#4	STR	10'-2"	27	✳ S17	8	#5	6	3'-8"	31
A210	1	#5	STR	52'-5"	55	✳ B30	3	#4	STR	7'-6"	15	✳ S18	16	#5	6	3'-9"	63
A211	1	#5	STR	50'-8"	53	✳ B31	1	#4	STR	7'-8"	5	✳ S19	16	#5	6	4'-2"	70
A212	1	#5	STR	48'-11"	51	✳ B32	1	#4	STR	7'-10"	5	✳ S20	16	#5	6	4'-10"	81
A213	1	#5	STR	47'-2"	49	✳ B33	1	#4	STR	8'-1"	5	✳ S21	16	#5	6	5'-11"	99
A214	1	#5	STR	45'-5"	47	✳ B34	1	#4	STR	8'-3"	6	✳ S22	40	#5	6	7'-8"	320
A215	1	#5	STR	43'-8"	46	✳ B35	1	#4	STR	8'-7"	6						
A216	1	#5	STR	41'-11"	44	✳ B36	1	#4	STR	8'-11"	6	✳ U1	148	#4	3	3'-4"	330

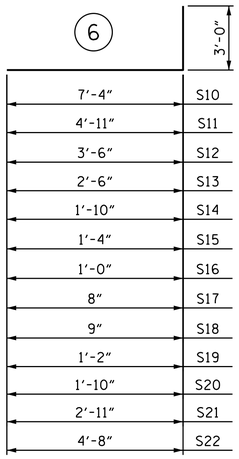
REINFORCING STEEL	LBS.	50803
✳ EPOXY COATED REINFORCING STEEL	LBS.	64415

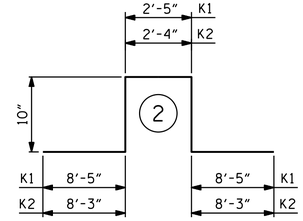
BAR TYPES

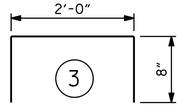












ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893O8F40E...
4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-88
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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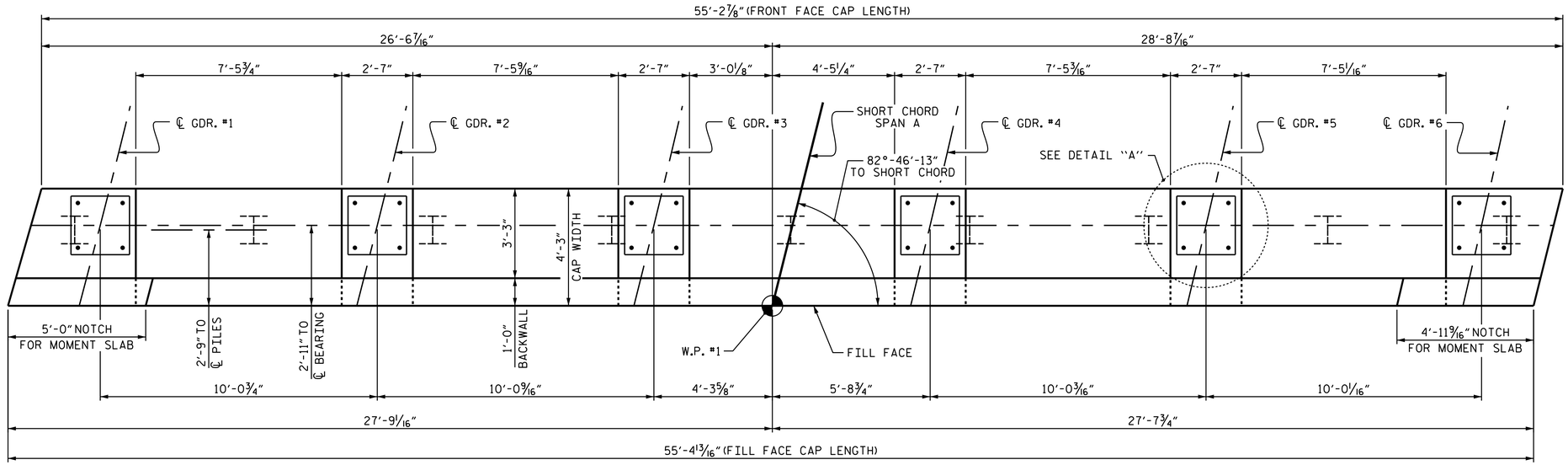
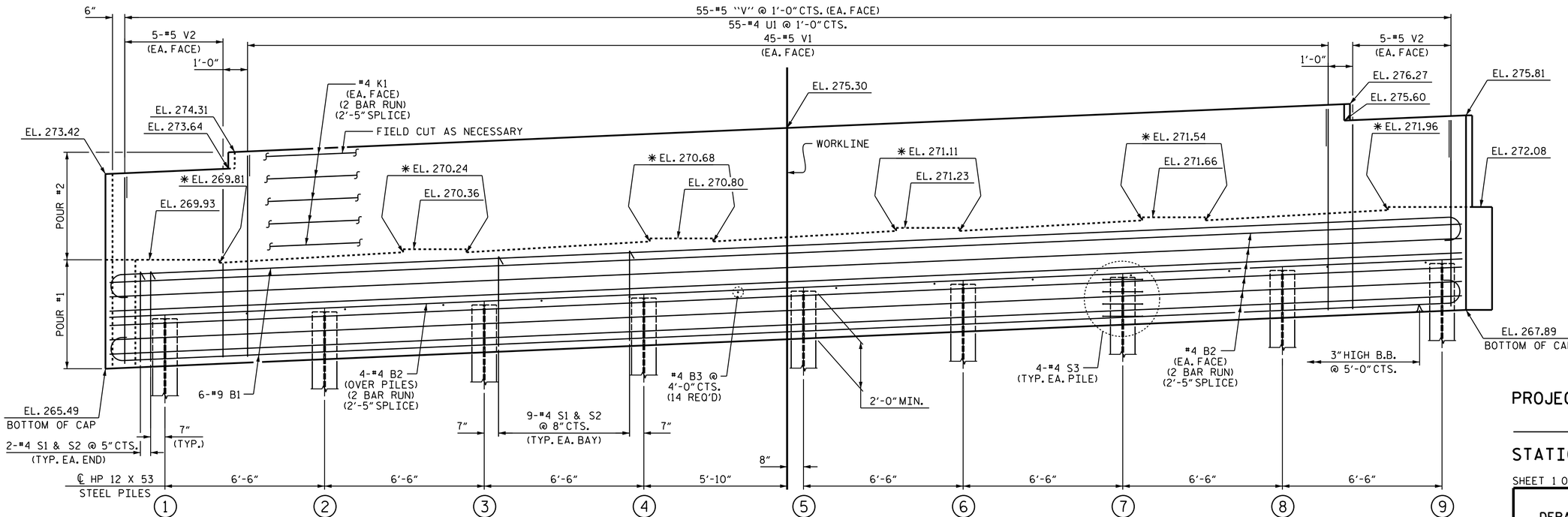
STR. #2



PLAN



ELEVATION

✱FOR LOCATION OF ELEVATION BETWEEN BUILD-UPS, SEE SECTION THRU CAP ON SHEET 2 OF 2.

TOP OF PILE ELEVATIONS					
①	267.59	④	268.44	⑦	269.28
②	267.88	⑤	268.72	⑧	269.57
③	268.16	⑥	269.00	⑨	269.85

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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STR. #2

NOTES

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

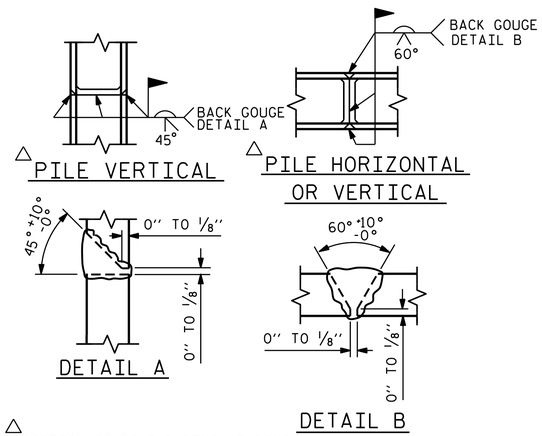
FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END CAP 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 MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.



△ PILE VERTICAL

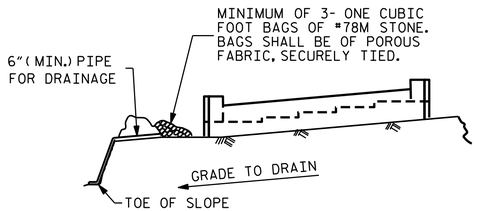
△ PILE HORIZONTAL OR VERTICAL

DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

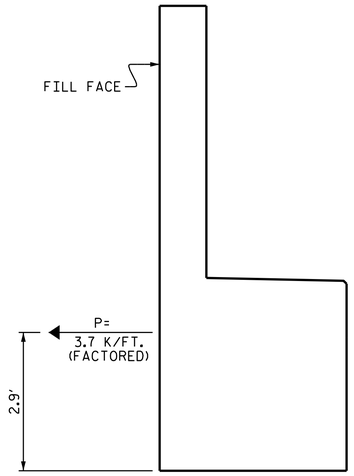


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

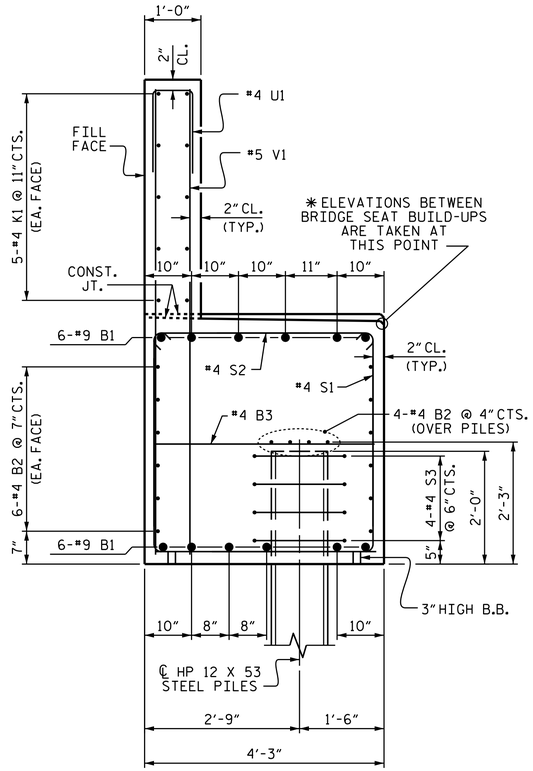
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



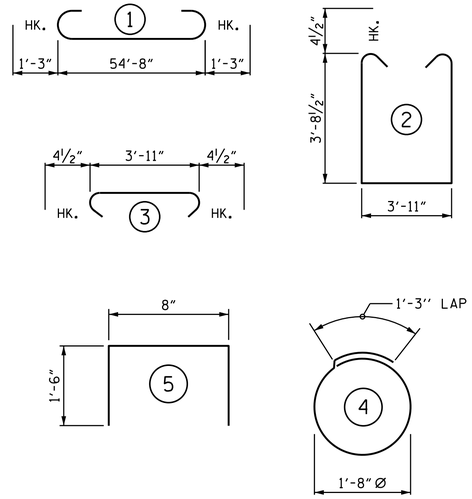
TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)



SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 1

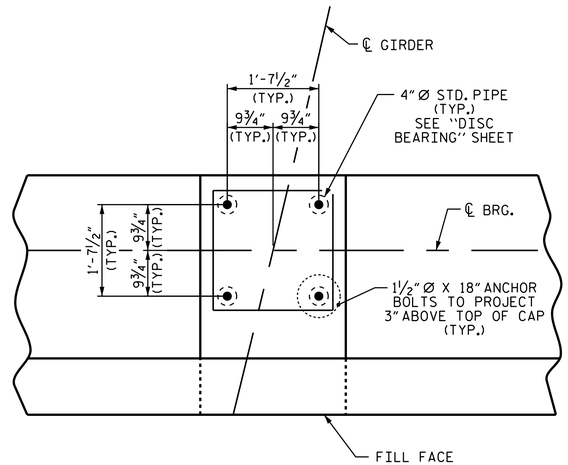
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	57'-2"	2332
B2	32	#4	STR	28'-10"	616
B3	14	#4	STR	3'-11"	37
K1	20	#4	STR	28'-10"	385
S1	76	#4	2	12'-1"	613
S2	76	#4	3	4'-8"	237
S3	36	#4	4	6'-6"	156
U1	55	#4	5	3'-8"	135
V1	90	#5	STR	8'-2"	767
V2	20	#5	STR	7'-7"	158
REINFORCING STEEL					5436 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	36.7 C.Y.
POUR #2 BACKWALL	8.8 C.Y.
TOTAL CLASS A CONCRETE	45.5 C.Y.

HP 12 X 53 STEEL PILES

NO. = 9	270 LIN. FT.
PILE EXCAVATION IN SOIL	44 LIN. FT.
PILE EXCAVATION NOT IN SOIL	38 LIN. FT.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458389308F40E...
4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-90
1			3			TOTAL SHEETS
2			4			110

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DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE :	2/2016

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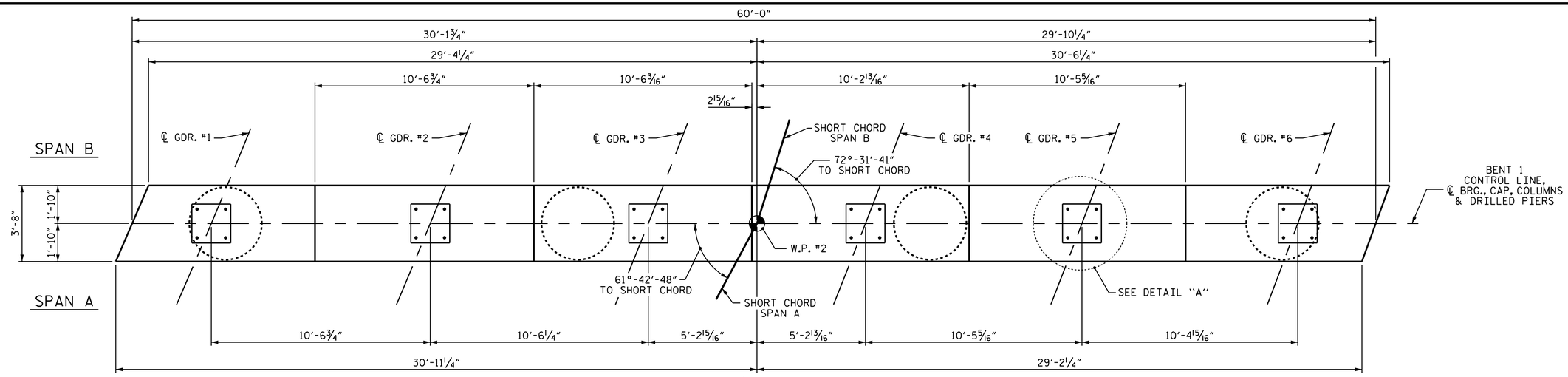
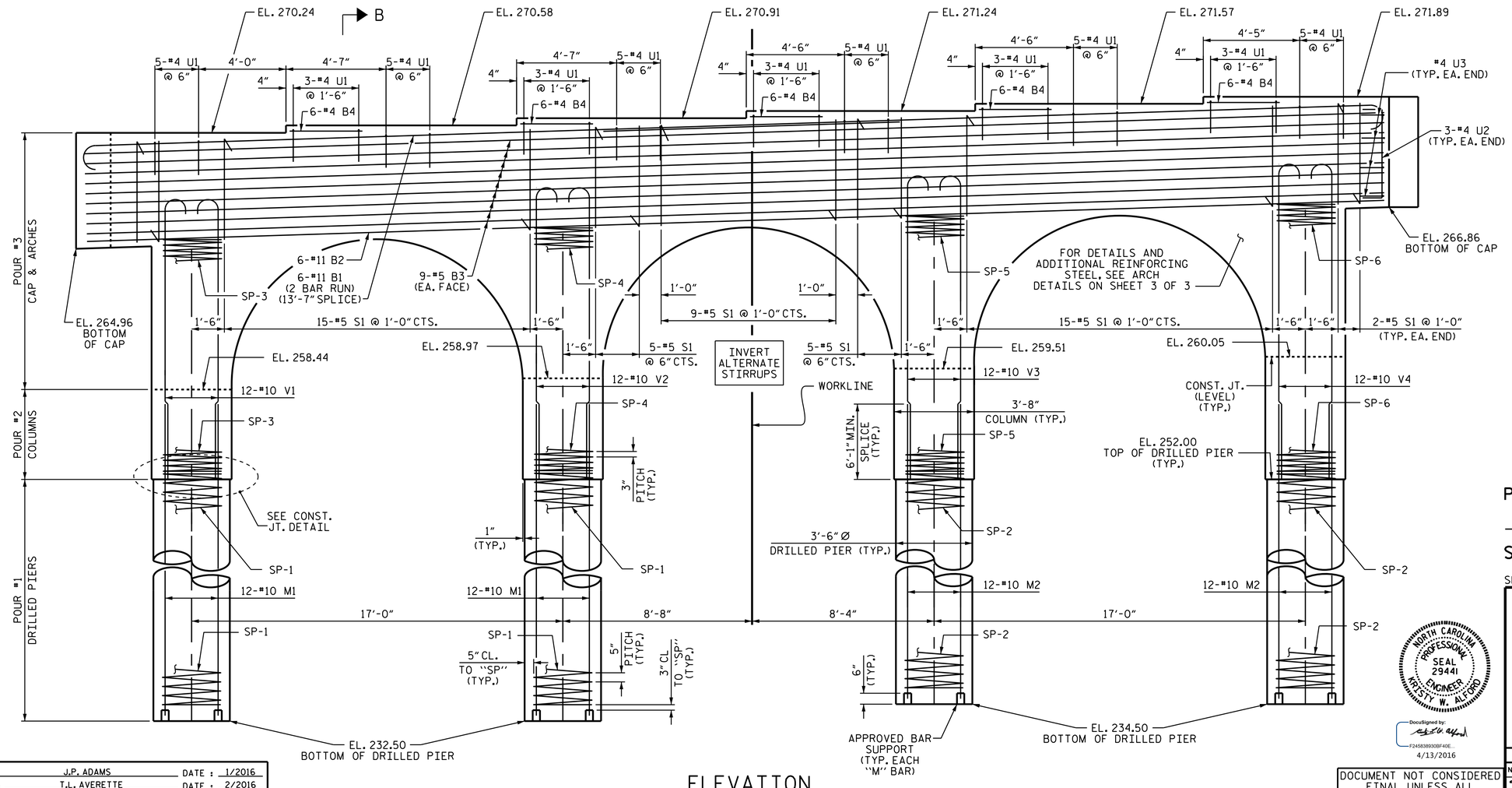


PLAN



ELEVATION

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTIN W. ALFORD

DocuSigned by: F245838930BF40E...
4/13/2016

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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2			4			110

STR. #2

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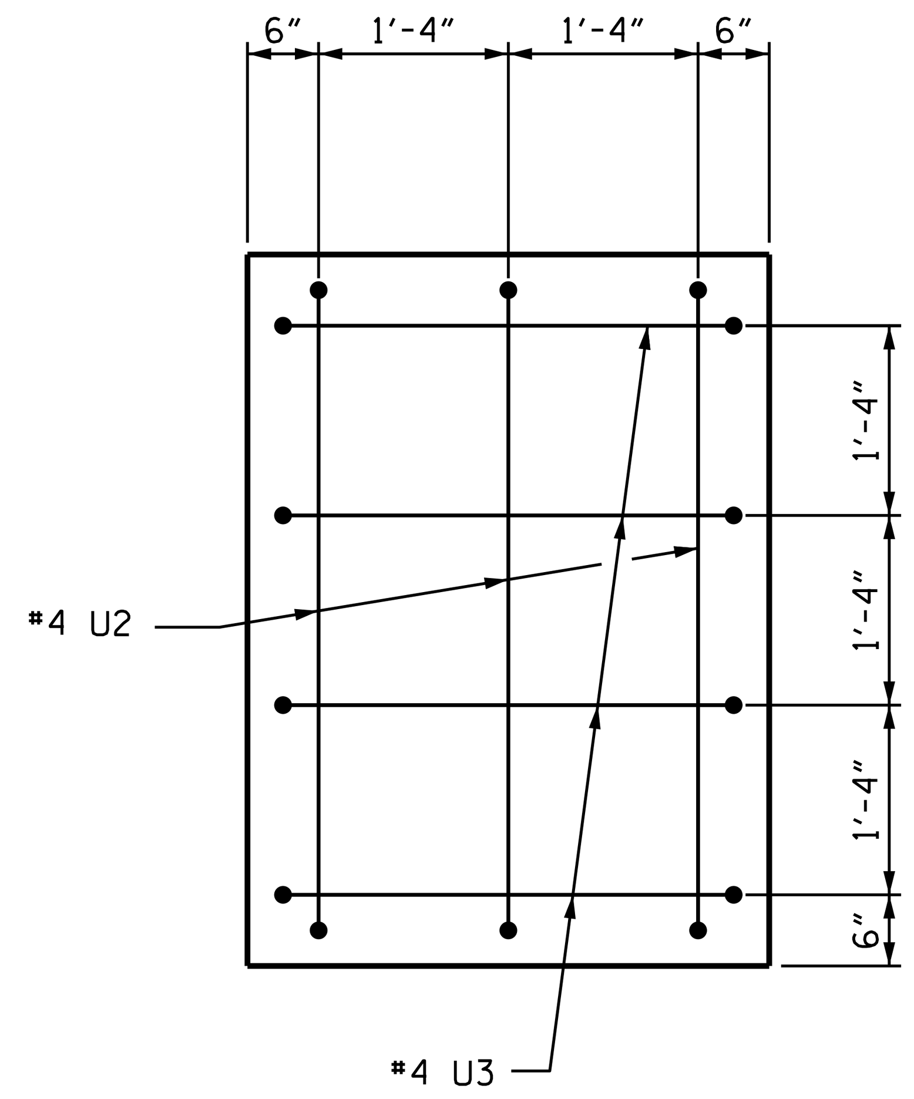
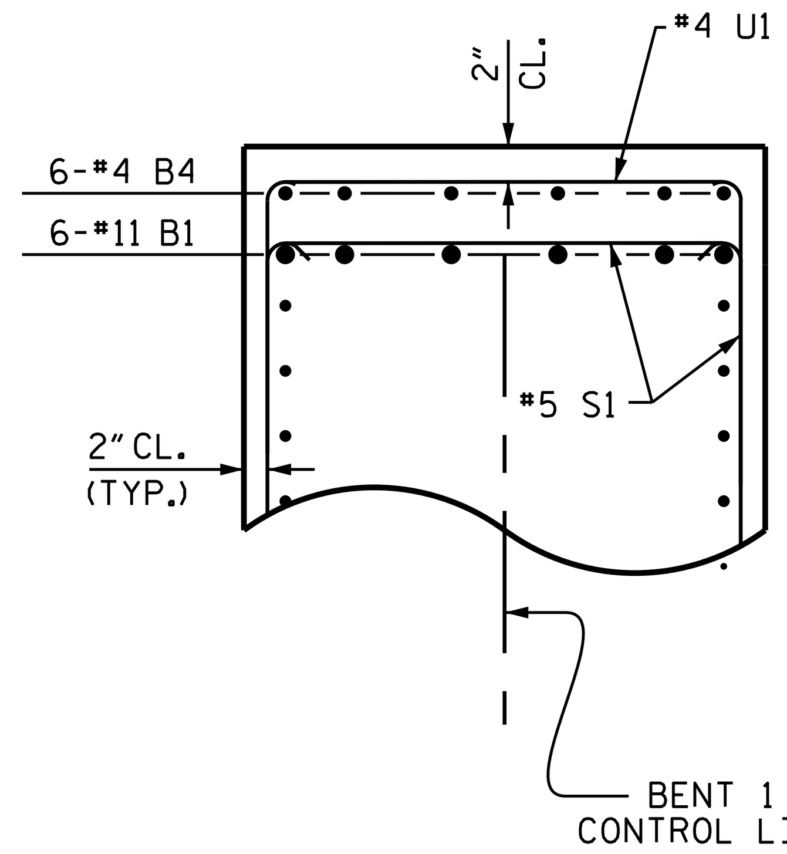
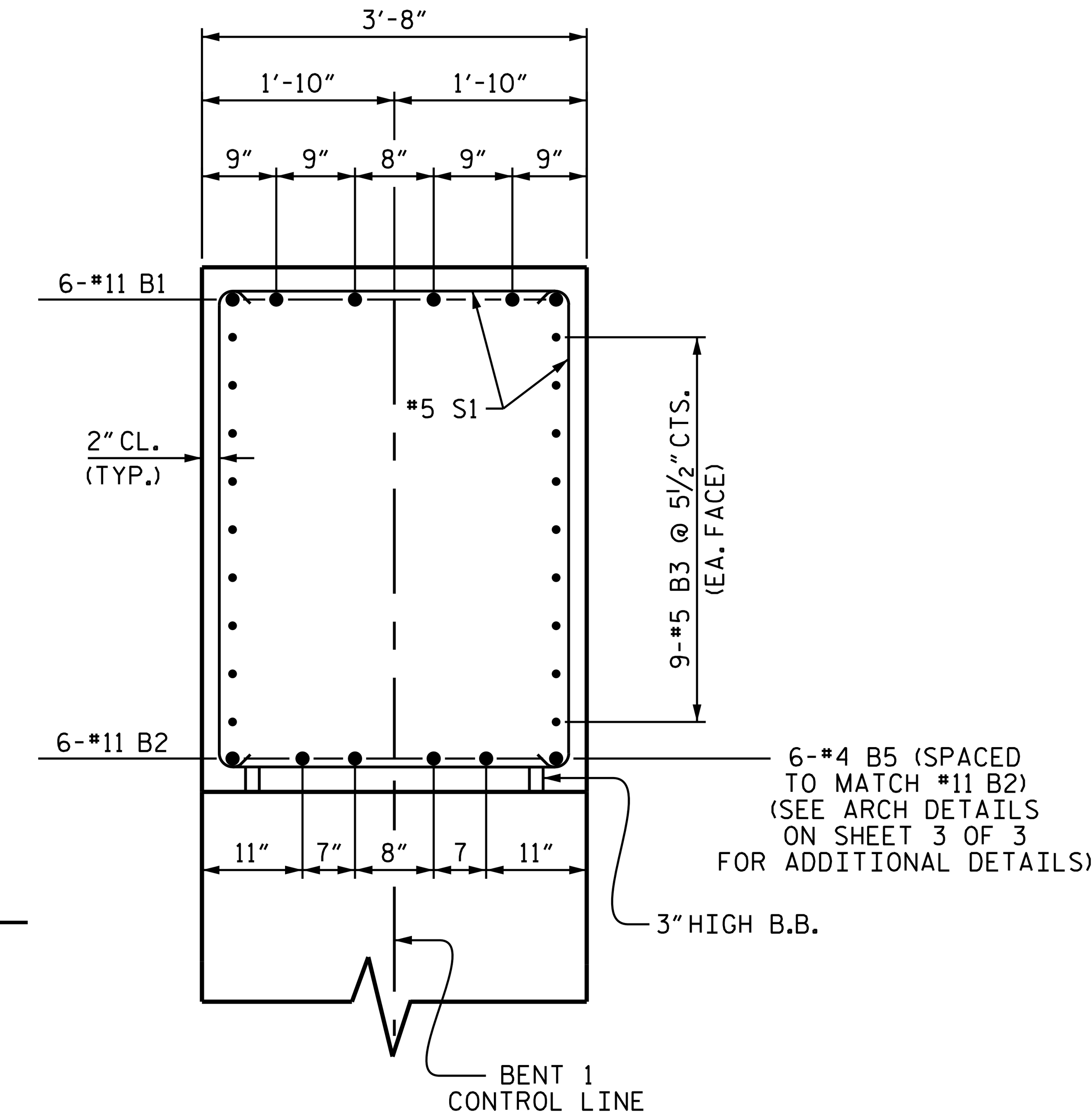


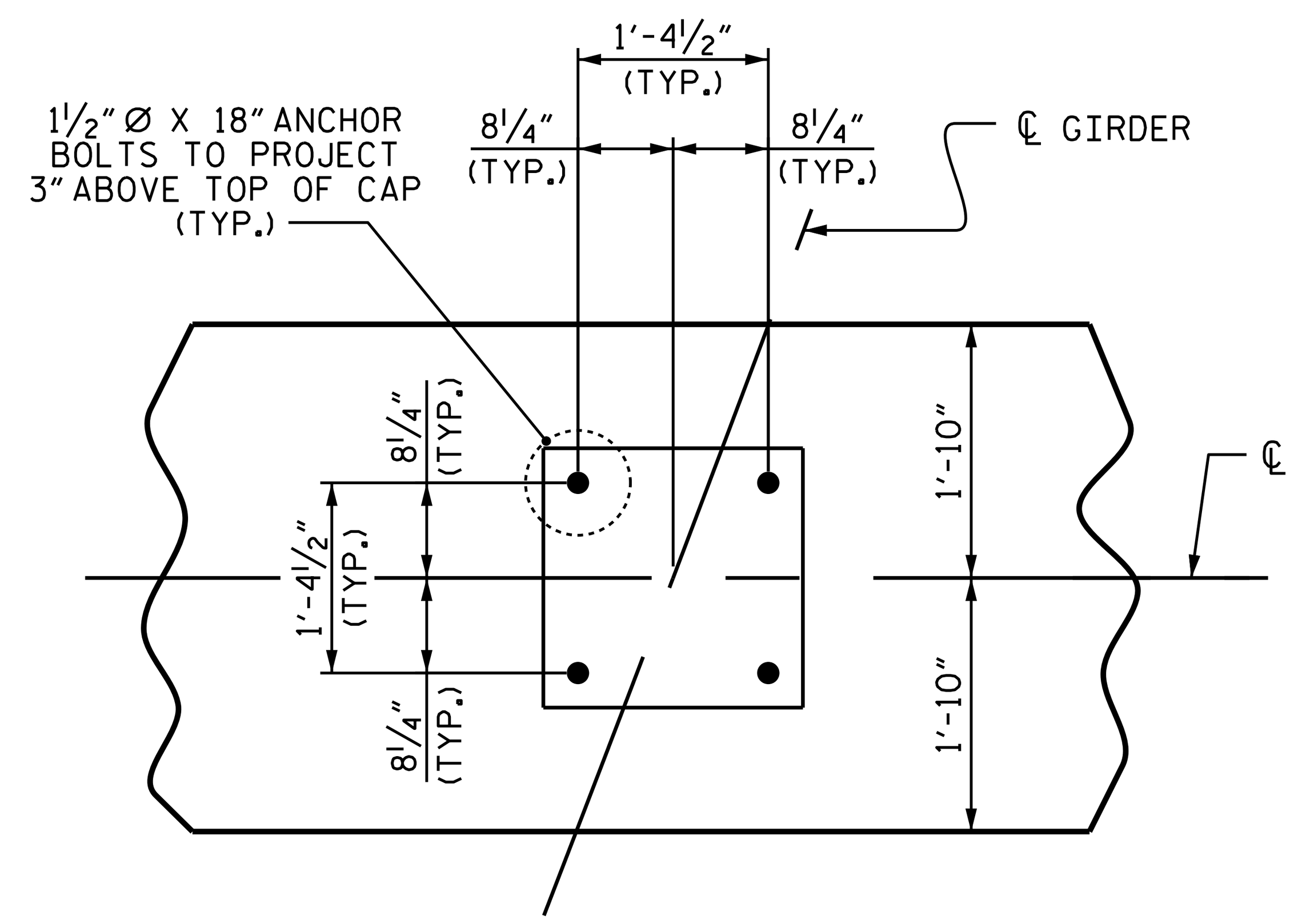
END VIEW
(TYP. EA. END)



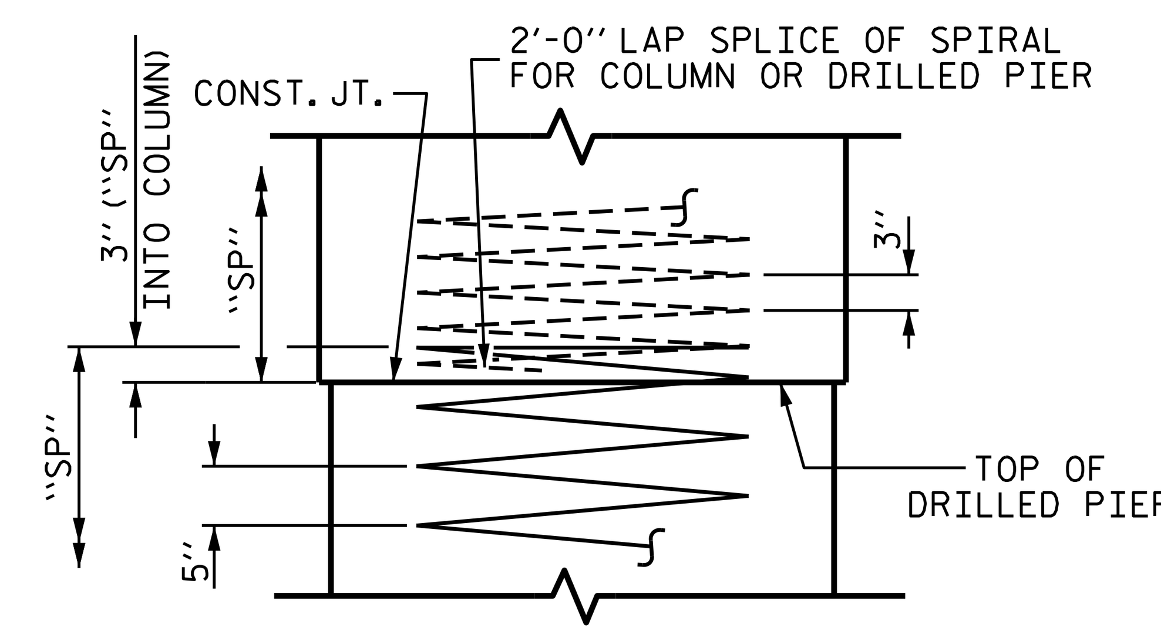
PARTIAL SECTION B



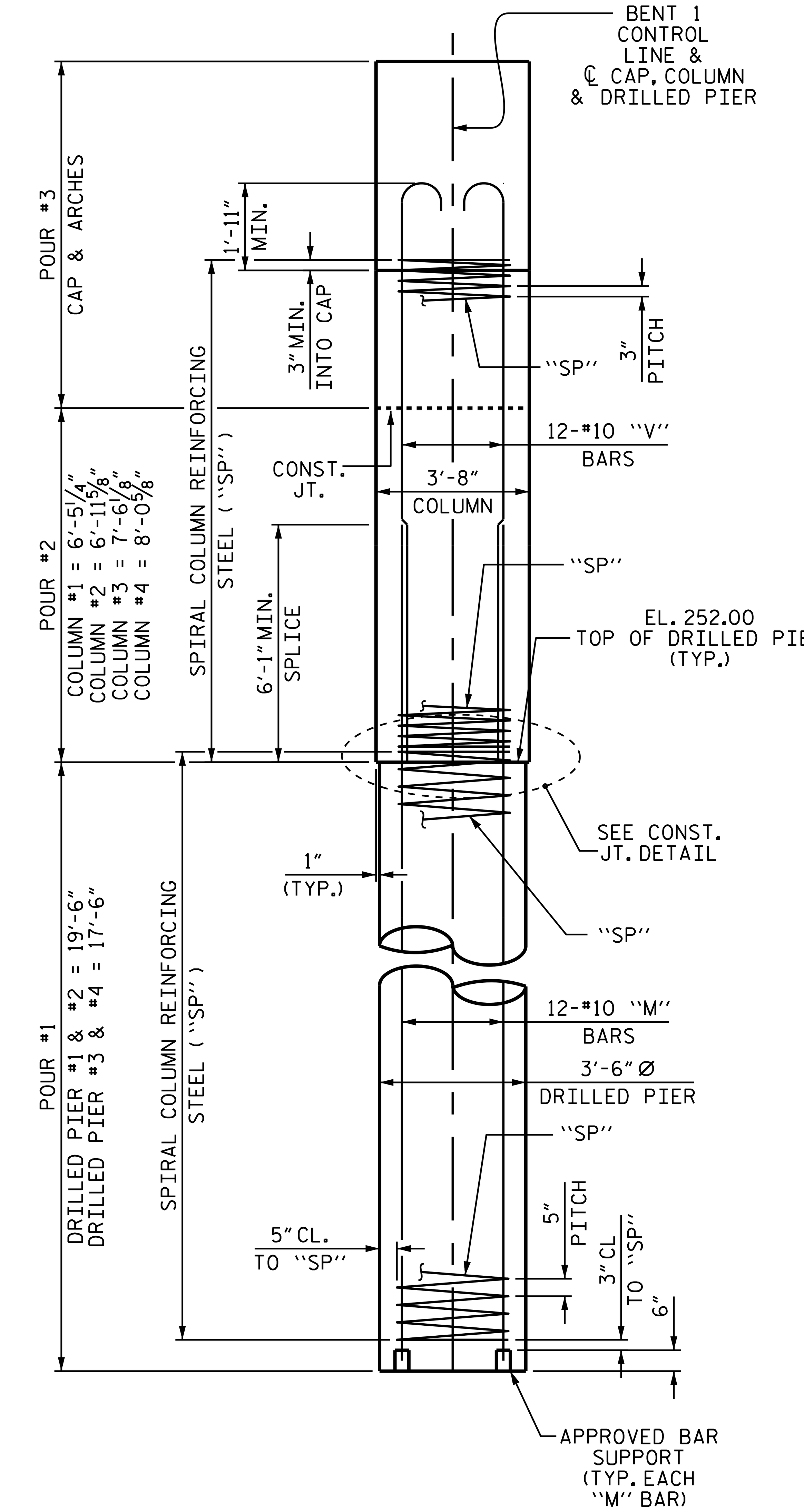
SECTION THRU CAP



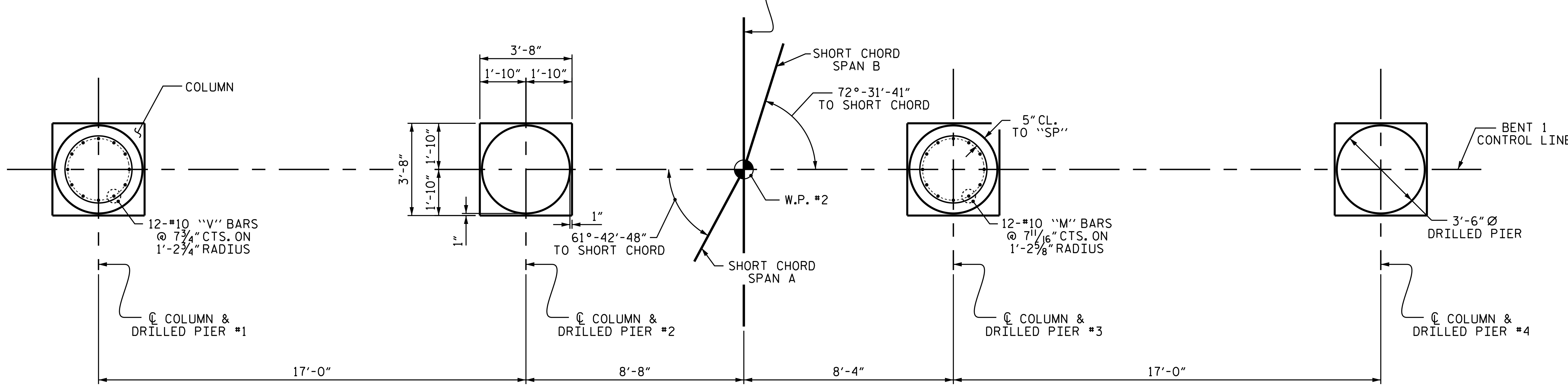
DETAIL "A"
(TYP. EA. GIRDER)



CONSTRUCTION JOINT DETAIL



END ELEVATION



PLAN OF COLUMNS & DRILLED PIERS
REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 3

DocuSigned by:
F245838930BF40E...
4/13/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-92
1			3			TOTAL SHEETS
2			4			110

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STR. #2

DRAWN BY :	J.P. ADAMS	DATE :	1/2016
CHECKED BY :	T.L. AVERETTE	DATE :	2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE :	2/2016

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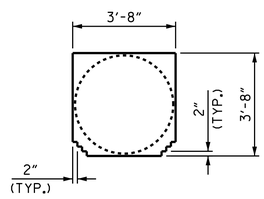
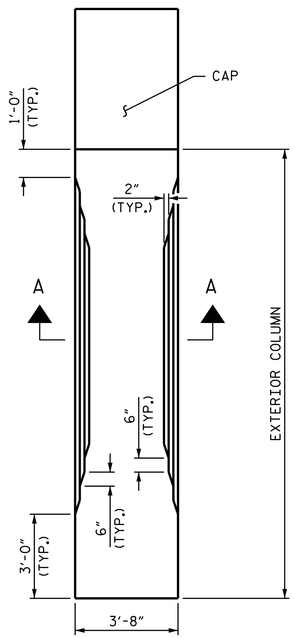


SECTION A-A



ELEVATION

NOTES

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

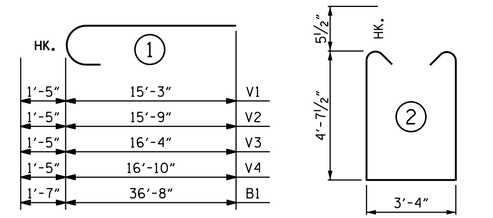
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

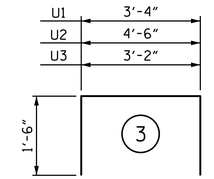
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

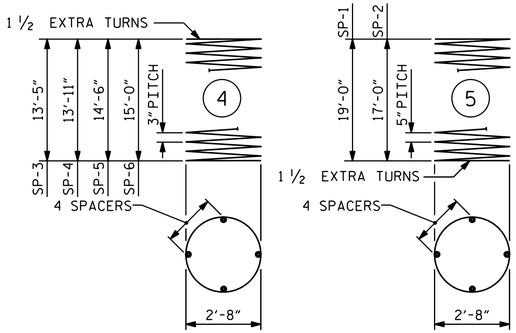
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

ANCHORAGE FOR LUMINAIRE BRACKETS NOT SHOWN FOR CLARITY. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH LUMINAIRE BRACKET ANCHORAGE. FOR LUMINAIRE BRACKET DETAILS, SEE "ARCHITECTURAL METAL FASCIA DETAILS" SHEETS.

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	38'-3"	2439
B2	6	#11	STR	59'-6"	1897
B3	18	#5	STR	59'-6"	1117
B4	30	#4	STR	3'-4"	67
B5	48	#4	STR	10'-10"	347
M1	24	#10	STR	28'-4"	2926
M2	24	#10	STR	26'-4"	2719
S1	53	#5	2	13'-6"	746
U1	45	#4	3	6'-4"	190
U2	6	#4	3	7'-6"	30
U3	8	#4	3	6'-2"	33
V1	12	#10	1	16'-8"	861
V2	12	#10	1	17'-2"	886
V3	12	#10	1	17'-9"	917
V4	12	#10	1	18'-3"	942
REINFORCING STEEL					16117 LBS.
SP-1	2	*	5	388'-8"	811
SP-2	2	*	5	349'-7"	729
SP-3	1	**	4	455'-11"	305
SP-4	1	**	4	472'-5"	316
SP-5	1	**	4	488'-11"	327
SP-6	1	**	4	507'-5"	339
SPIRAL COLUMN REINFORCING STEEL					2827 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #3 (CAP & ARCHES)	63.3 C.Y.
POUR #2 (COLUMNS)	14.5 C.Y.
TOTAL CLASS A CONCRETE	77.8 C.Y.

DRILLED PIER CONCRETE

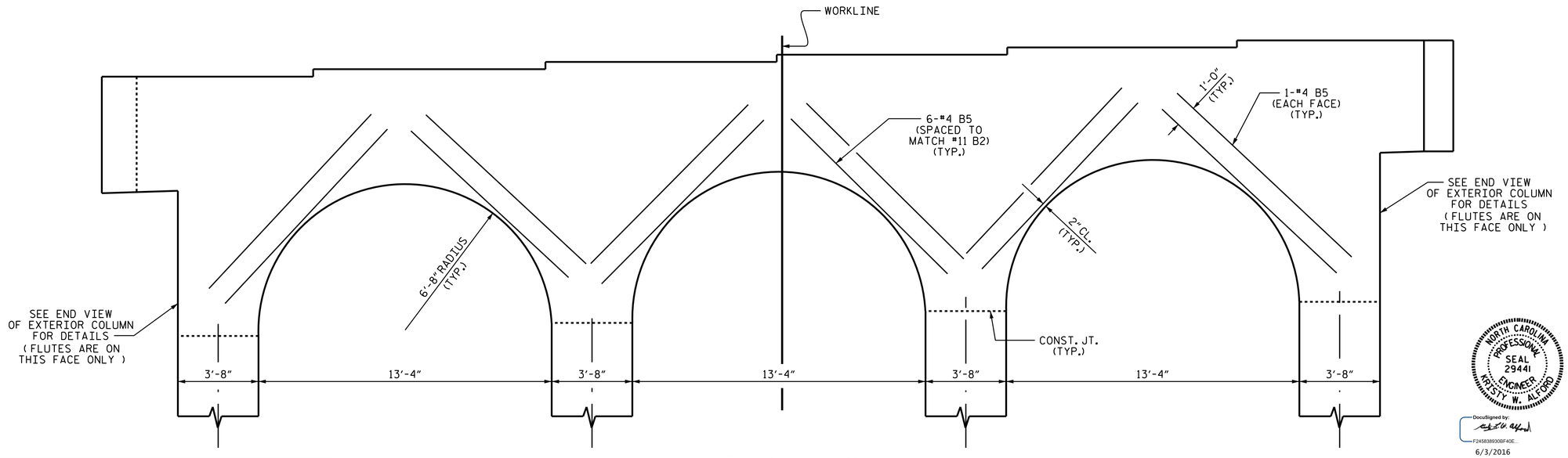
POUR #1 (DRILLED PIERS)	26.4 C.Y.

3'-6" Ø DRILLED PIER NOT IN SOIL	LIN. FT. 36.0
3'-6" Ø DRILLED PIER IN SOIL	LIN. FT. 38.0
CSL TUBES	LIN. FT. 320.0

** THE SP-3, SP-4, SP-5 AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

* THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

END VIEW OF EXTERIOR COLUMN



ARCH DETAILS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KELSEY W. ALFORD

DocuSigned by: F2458389308F40E...

6/3/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-93
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY :	J.P. ADAMS	DATE : 1/2016
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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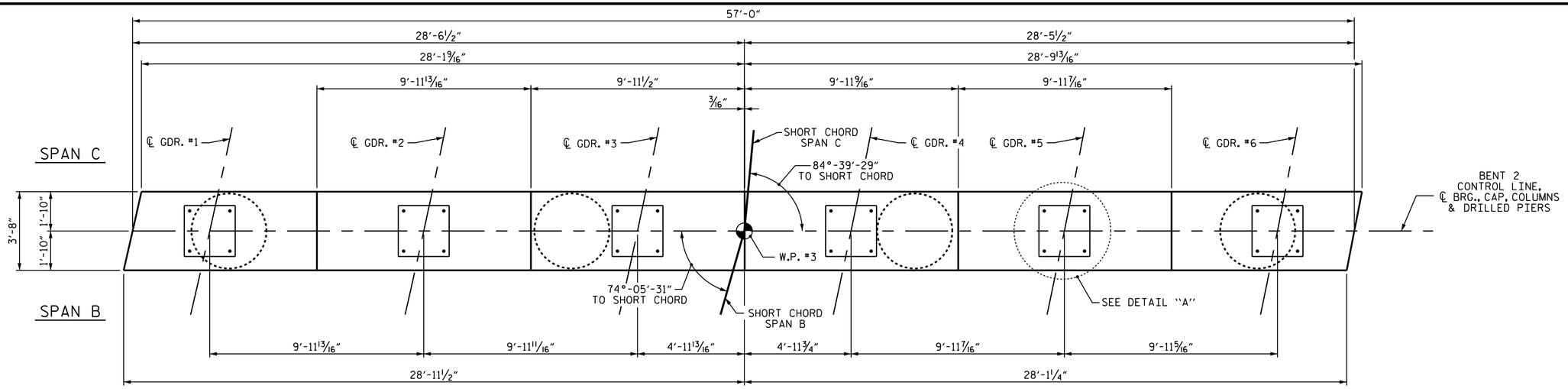
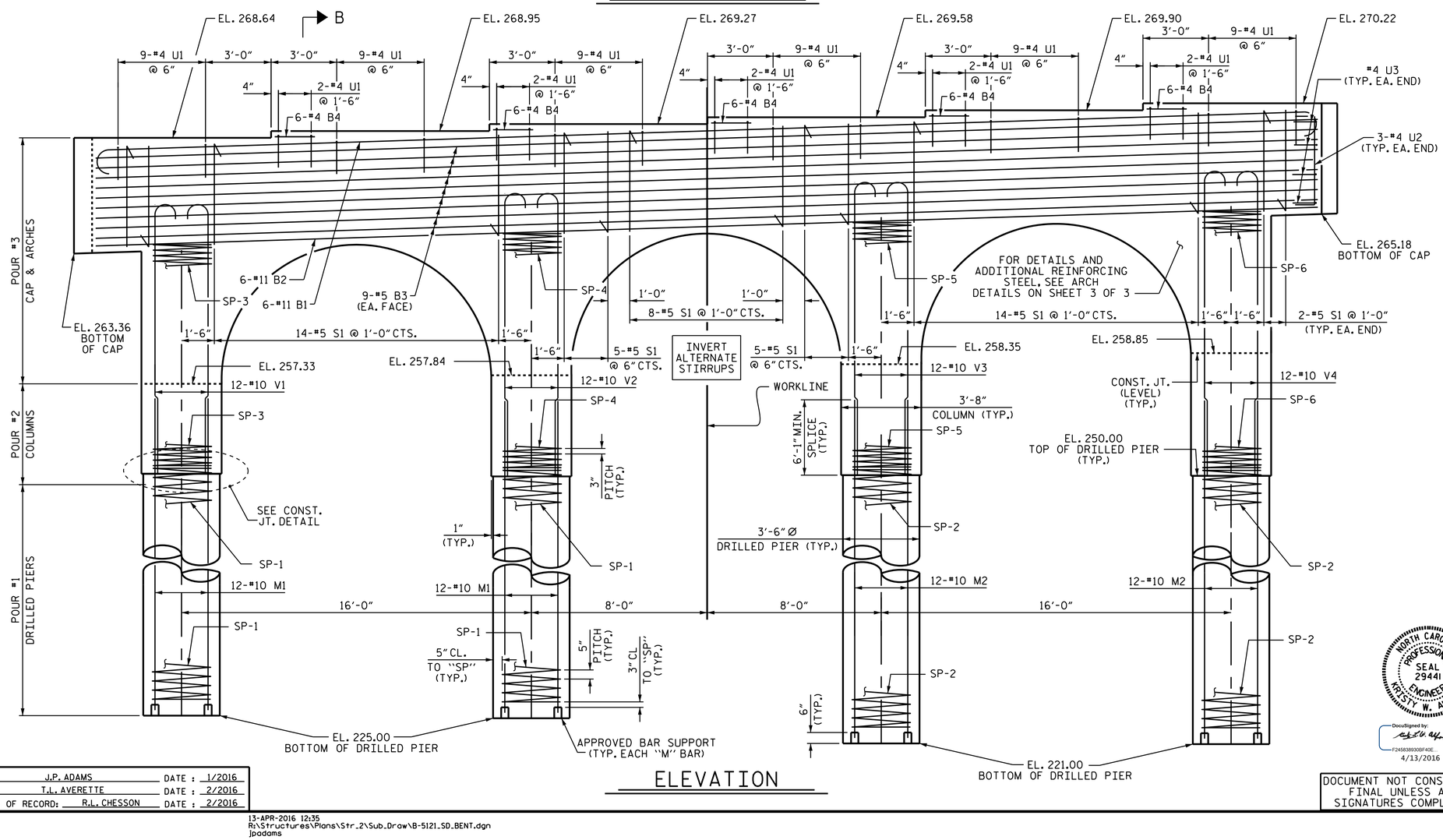
kalford



PLAN



ELEVATION

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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

SHEET NO. S-94

TOTAL SHEETS 110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
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DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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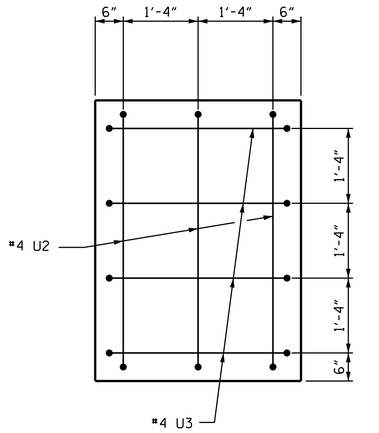
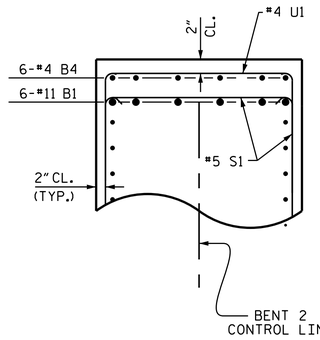
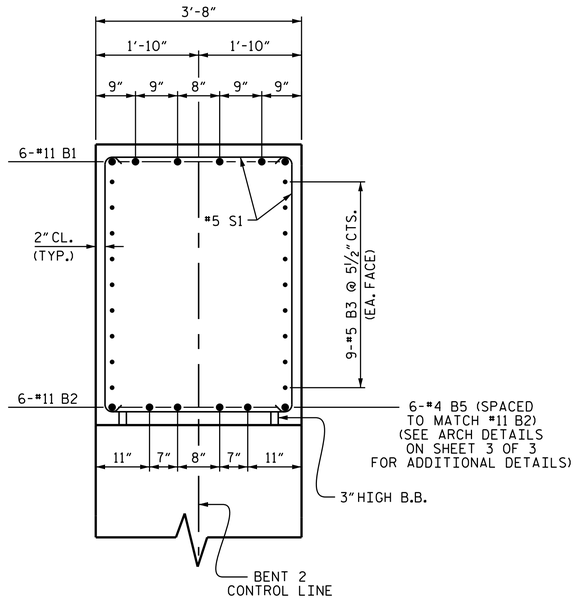


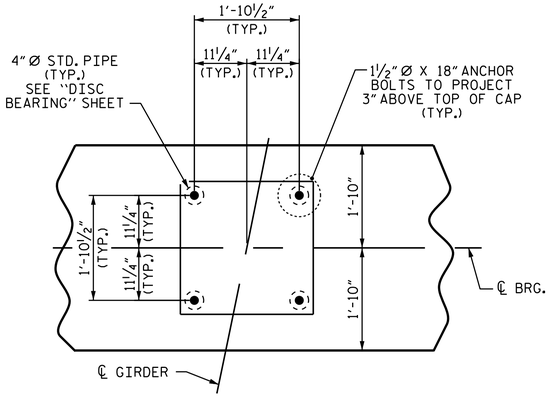
END VIEW
(TYP. EA. END)



PARTIAL SECTION B



SECTION THRU CAP



DETAIL "A"
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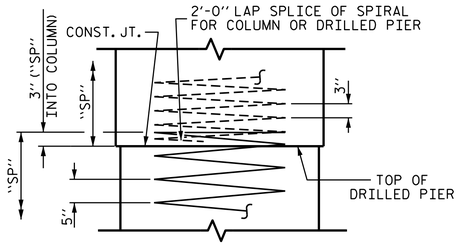

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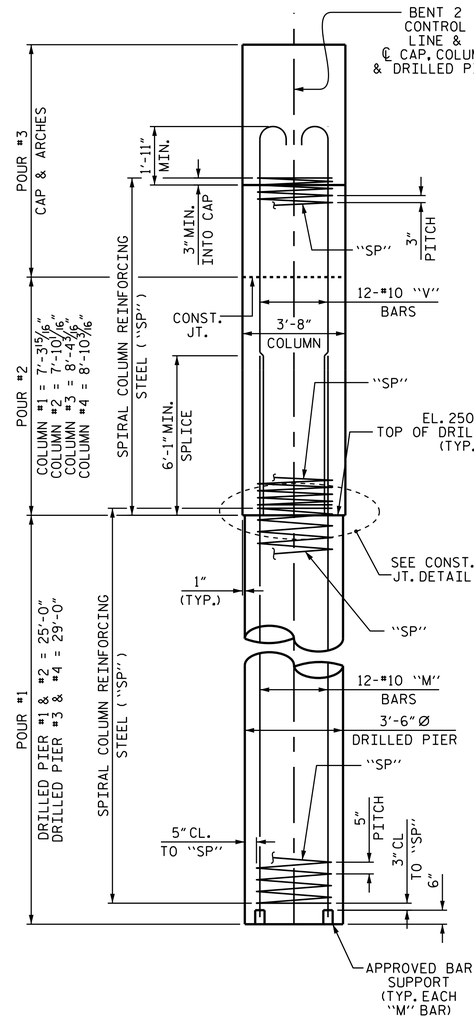
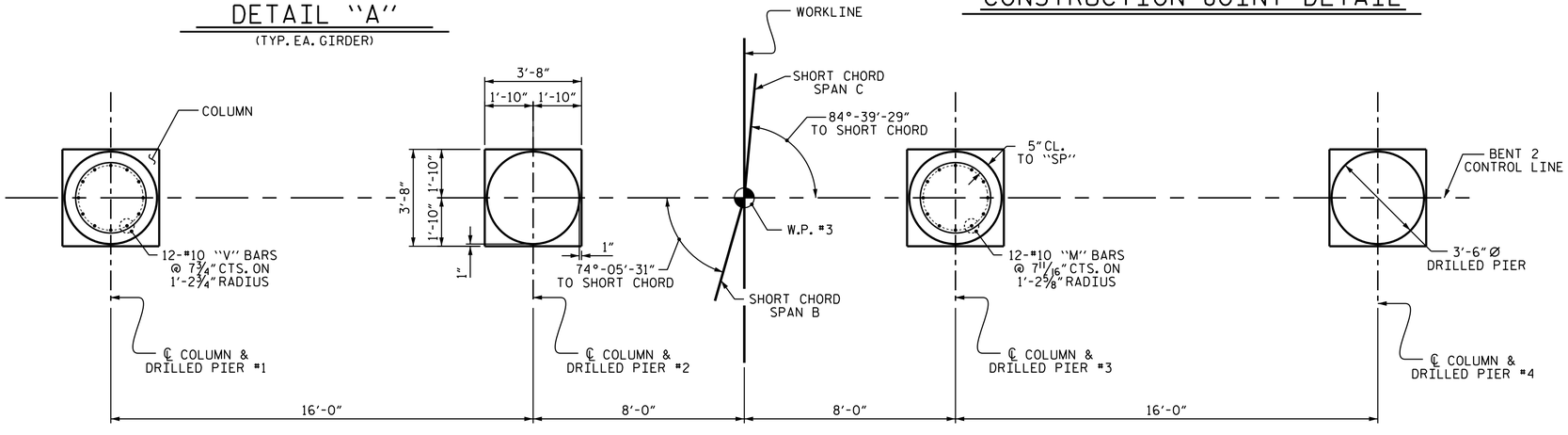


END ELEVATION



PLAN OF COLUMNS & DRILLED PIERS
REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
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4/13/2016

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-95
1			3			TOTAL SHEETS
2			4			110

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CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	R.L. CHESSON	DATE : 2/2016

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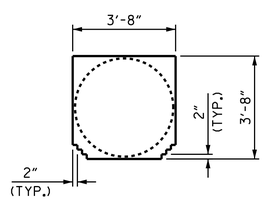
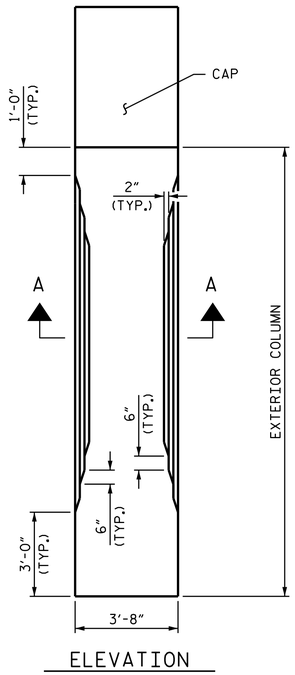
jpadams

STR. #2



SECTION A-A



ELEVATION

NOTES

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

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

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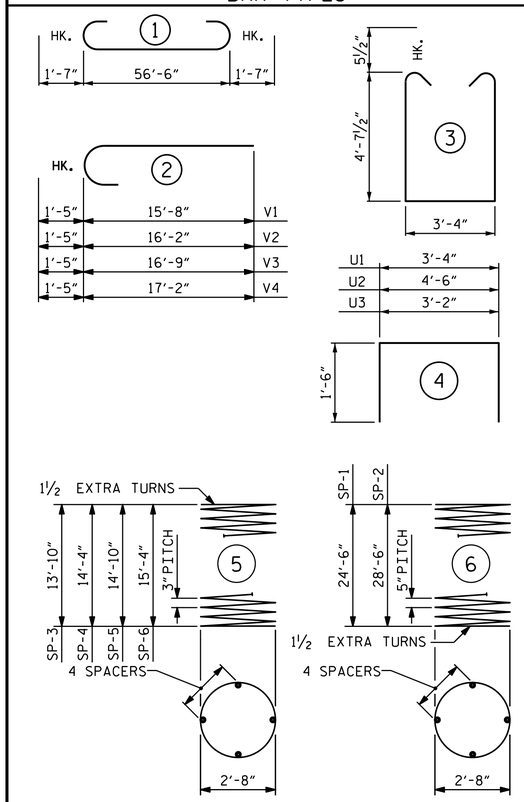
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

✱✱ THE SP-3, SP-4, SP-5 AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

✱ THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	59'-8"	1902
B2	6	#11	STR	56'-8"	1806
B3	18	#5	STR	56'-8"	1064
B4	30	#4	STR	1'-10"	37
B5	48	#4	STR	9'-10"	315
M1	24	#10	STR	33'-10"	3494
M2	24	#10	STR	37'-10"	3907
S1	50	#5	3	13'-6"	704
U1	64	#4	4	6'-4"	271
U2	6	#4	4	7'-6"	30
U3	8	#4	4	6'-2"	33
V1	12	#10	2	17'-1"	882
V2	12	#10	2	17'-7"	908
V3	12	#10	2	18'-2"	938
V4	12	#10	2	18'-7"	960
REINFORCING STEEL					17251 LBS.
SP-1	2	✱	6	497'-7"	1038
SP-2	2	✱	6	575'-9"	1201
SP-3	1	✱✱	5	468'-3"	313
SP-4	1	✱✱	5	484'-9"	324
SP-5	1	✱✱	5	501'-3"	335
SP-6	1	✱✱	5	517'-9"	346
SPIRAL COLUMN REINFORCING STEEL					3557 LBS.

CLASS A CONCRETE BREAKDOWN

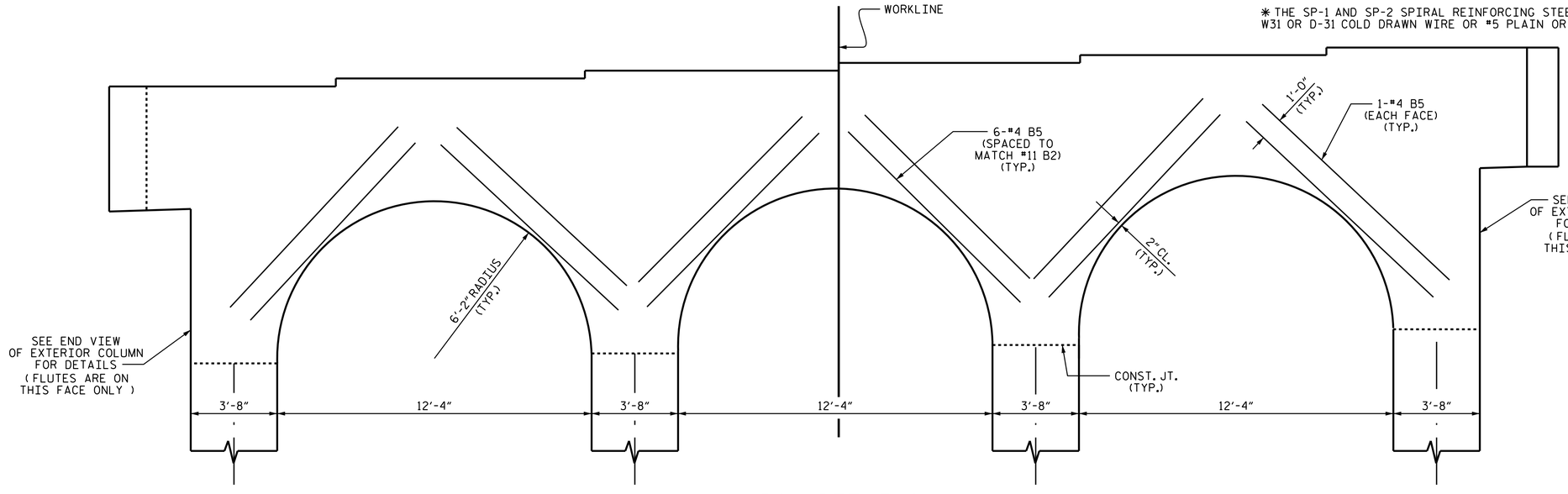
POUR #3 (CAP & ARCHES)	59.0 C.Y.
POUR #2 (COLUMNS)	16.2 C.Y.
TOTAL CLASS A CONCRETE	75.2 C.Y.

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS)	38.5 C.Y.

3'-6" Ø DRILLED PIER NOT IN SOIL	LIN. FT. 34.0
3'-6" Ø DRILLED PIER IN SOIL	LIN. FT. 74.0
CSL TUBES	LIN. FT. 456.0

END VIEW OF EXTERIOR COLUMN



ARCH DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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6/3/2016

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-96
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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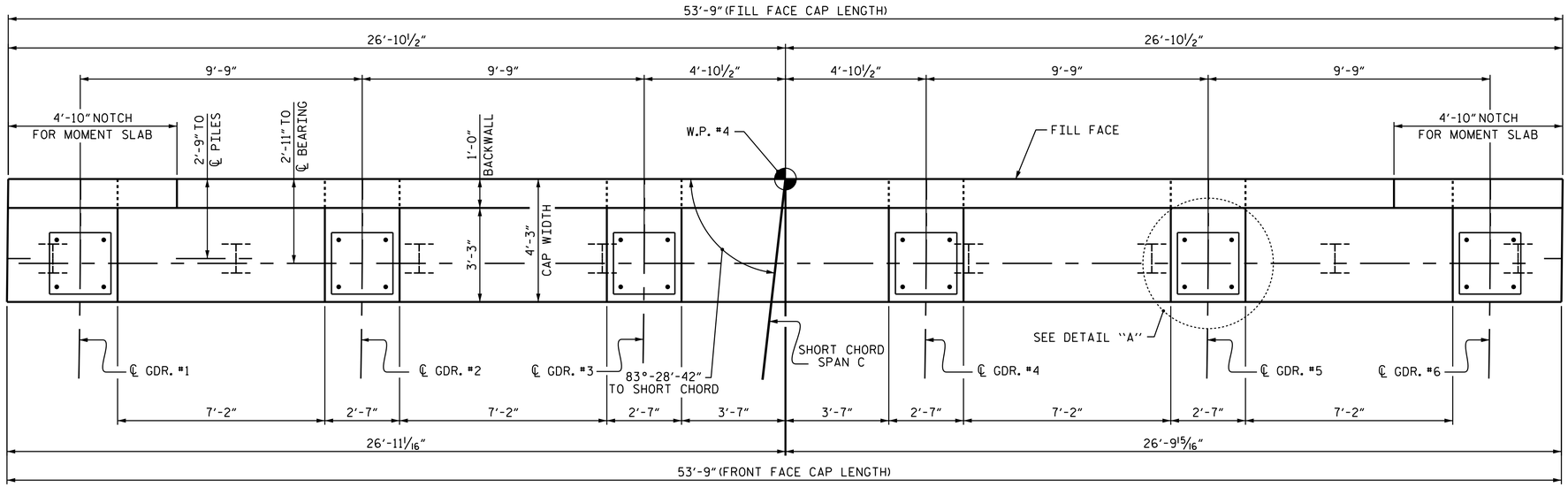
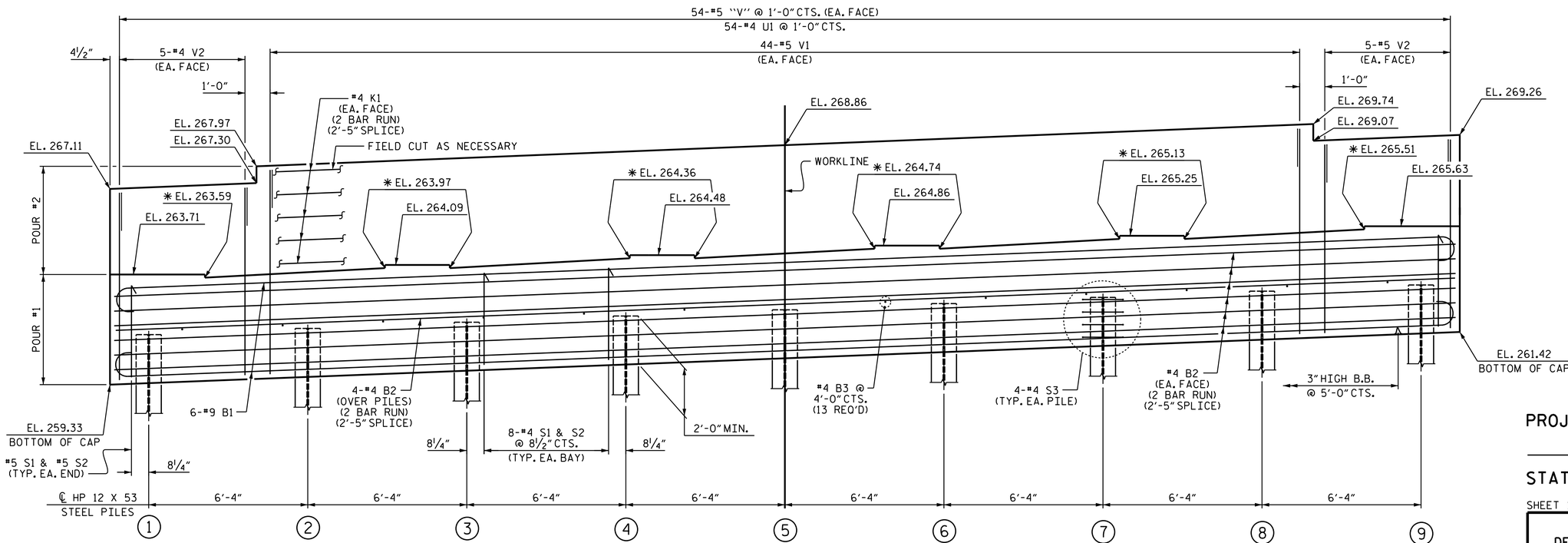


PLAN



ELEVATION

✳ FOR LOCATION OF ELEVATION BETWEEN BUILD-UPS, SEE SECTION THRU CAP ON SHEET 2 OF 2.

TOP OF PILE ELEVATIONS

①	261.41	④	262.15	⑦	262.89
②	261.66	⑤	262.40	⑧	263.13
③	261.90	⑥	262.64	⑨	263.38

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-97
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

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jpadams

NOTES

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

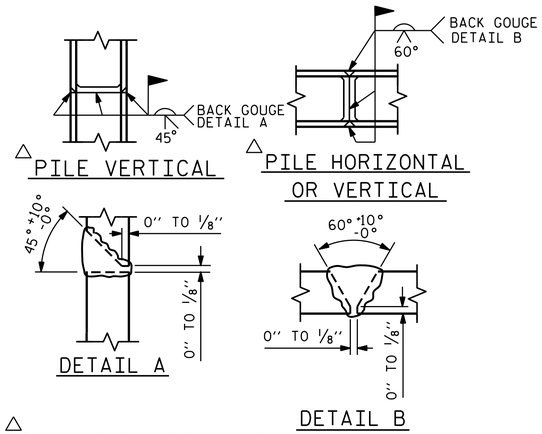
FOR PIPE INSERT DETAILS, SEE BEARINGS SHEET.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

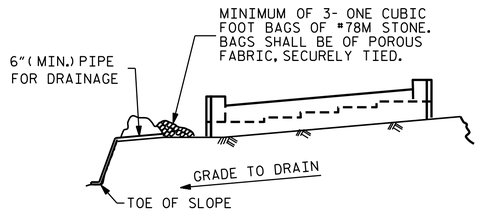
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

FOR MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

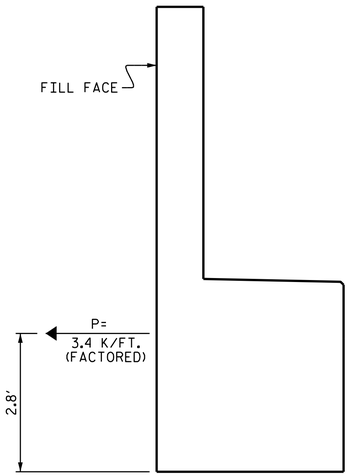


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

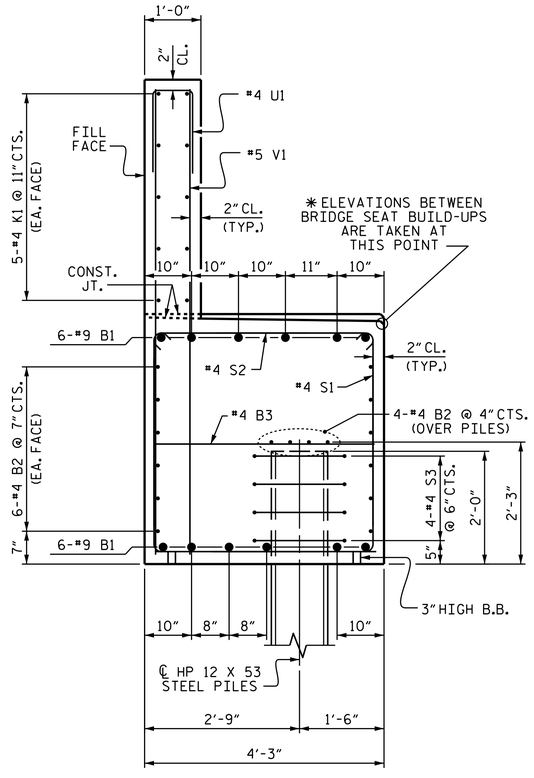
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



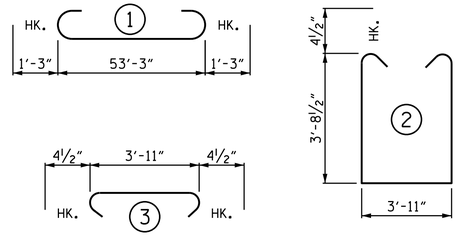
TIE BACK DETAILS

(DETAIL SHOWING TIE BACK RESTRAINT FOR END BENT)



SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

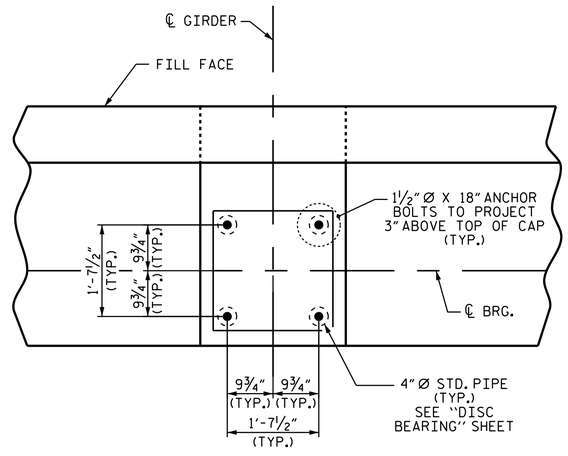
BILL OF MATERIAL
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	55'-9"	2275
B2	32	#4	STR	27'-11"	597
B3	13	#4	STR	3'-11"	34
K1	20	#4	STR	27'-11"	373
S1	66	#4	2	12'-1"	533
S2	66	#4	3	4'-8"	206
S3	36	#4	4	6'-6"	156
U1	54	#4	5	3'-8"	132
V1	88	#5	STR	8'-1"	742
V2	20	#5	STR	7'-5"	155
REINFORCING STEEL					5203 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP	35.7 C.Y.
POUR #2 BACKWALL	8.3 C.Y.
TOTAL CLASS A CONCRETE	44.0 C.Y.

HP 12 X 53 STEEL PILES
NO. = 9 — 405 LIN. FT.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893DBF40E... 4/13/2016

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

SHEET NO. S-98
TOTAL SHEETS 110

DRAWN BY : J.P. ADAMS DATE : 1/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: R.L. CHESSON DATE : 2/2016

13-APR-2016 12:35
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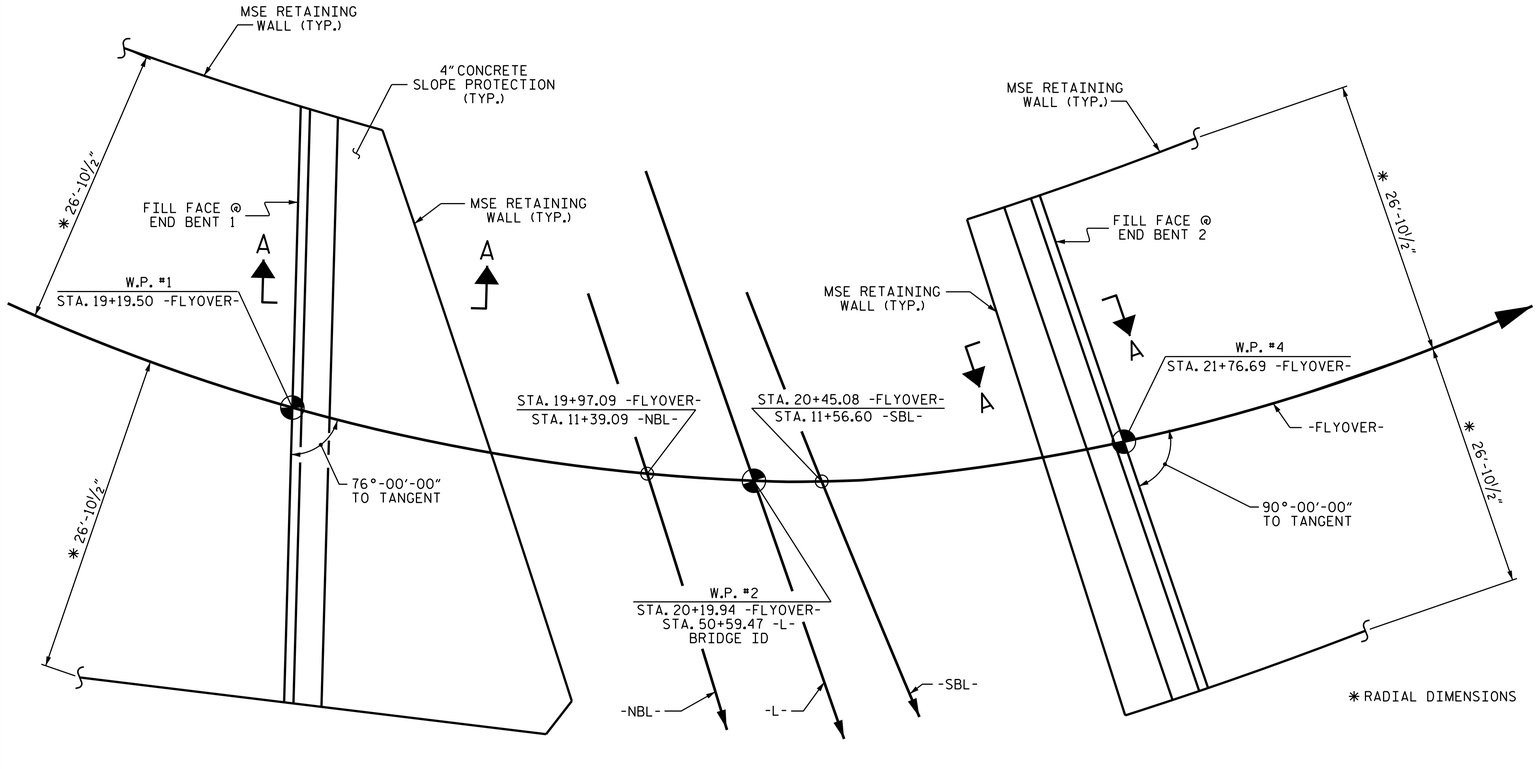
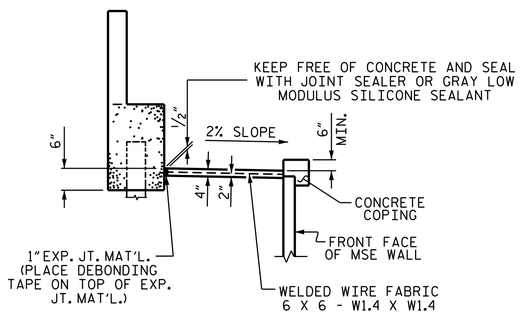
jpadams

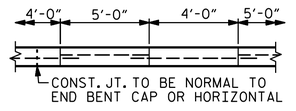
STR. #2



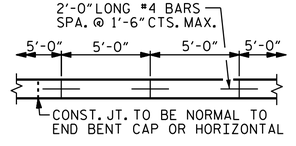
PLAN



SECTION A-A



OPTIONAL POURING DETAIL



POURING DETAIL

NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

SLOPE PROTECTION 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.

BRIDGE @ STA. 20+19.94 -FLYOVER-	4" SLOPE PROTECTION	*WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	105	210
END BENT 2	25	50

*QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-99
1			3			TOTAL SHEETS
2			4			110

DRAWN BY : M.M. AHMED DATE : 2/2015
CHECKED BY : T.L. AVERETTE DATE : 2/2015
DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 2/2015

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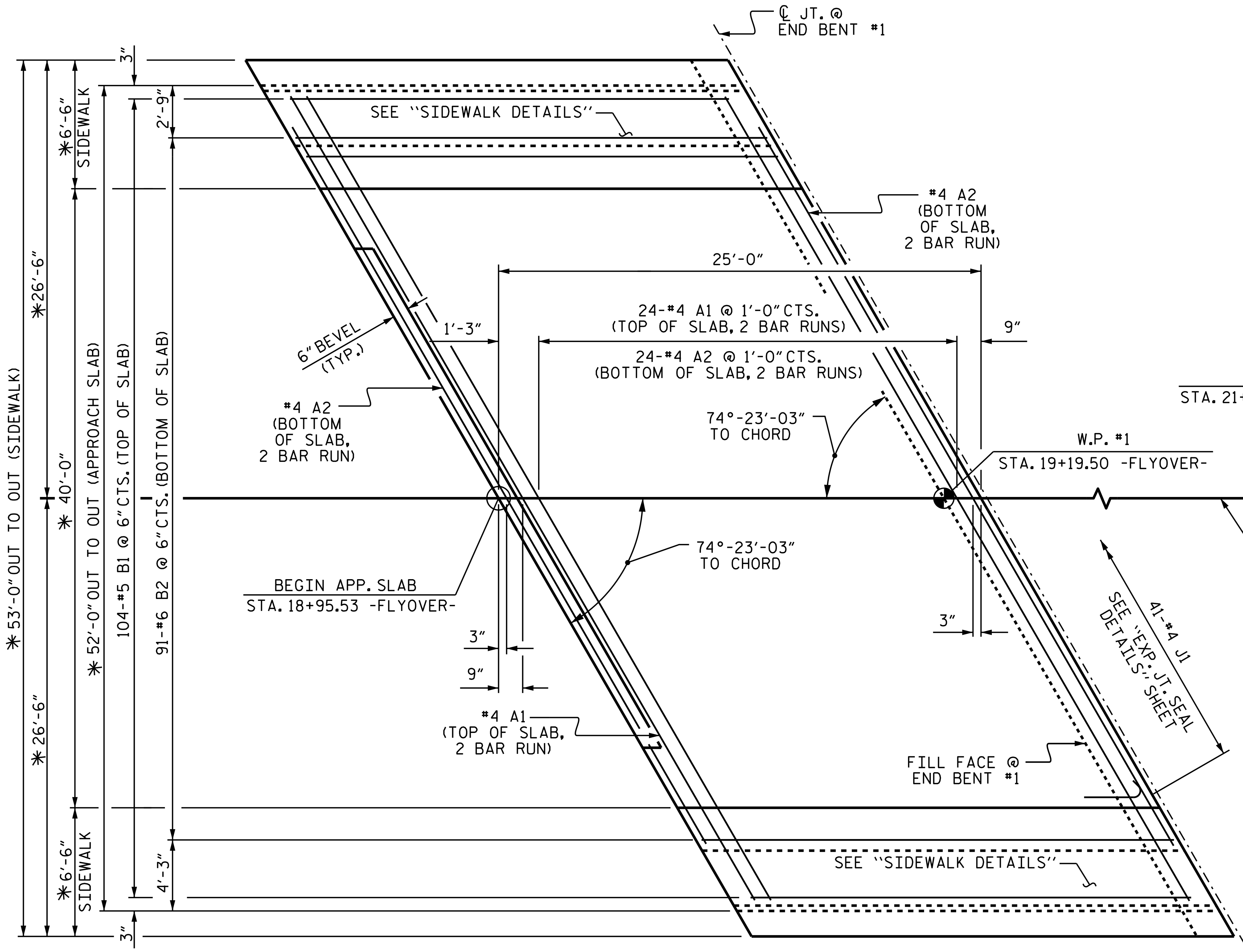
STR. #2



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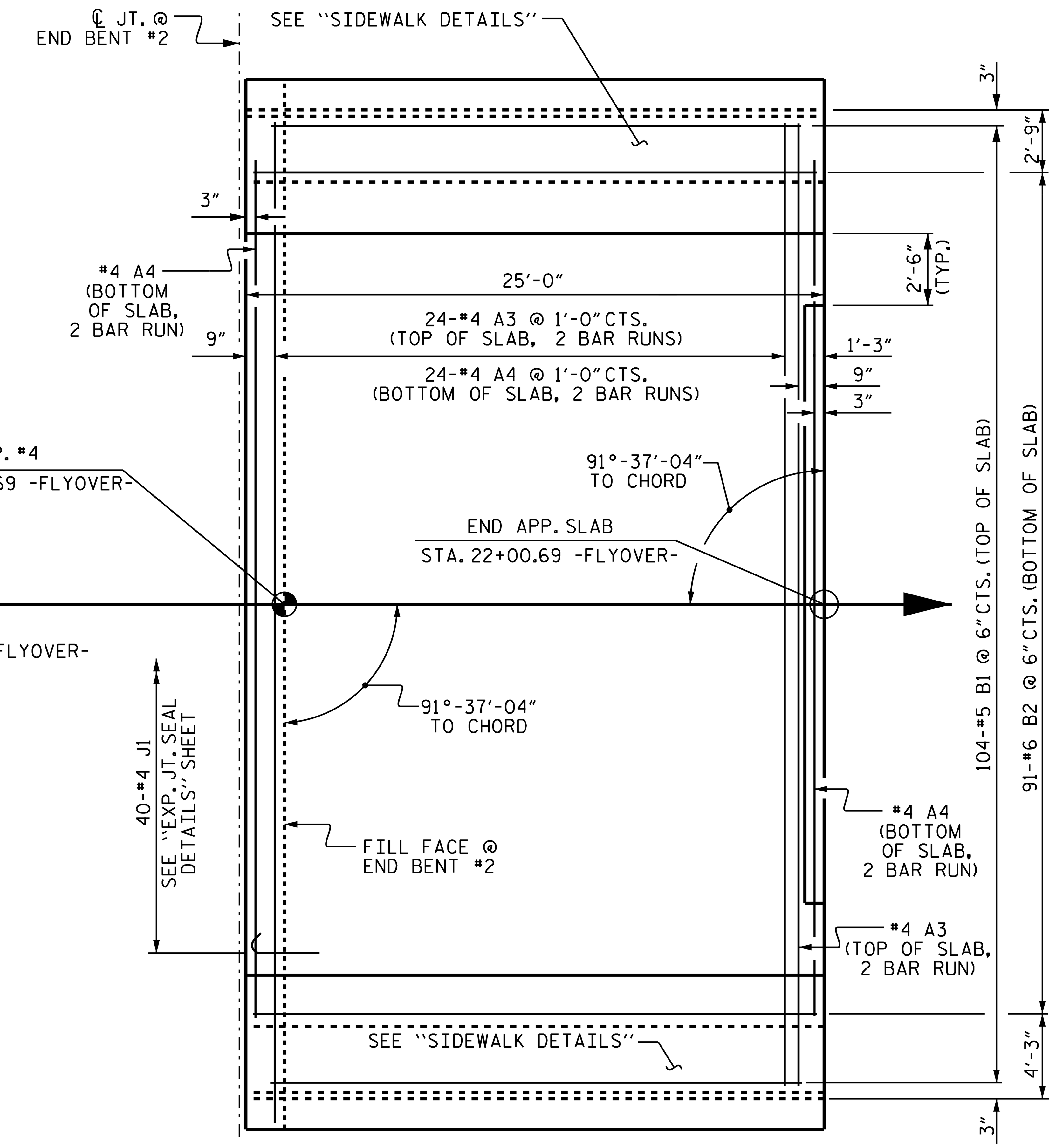
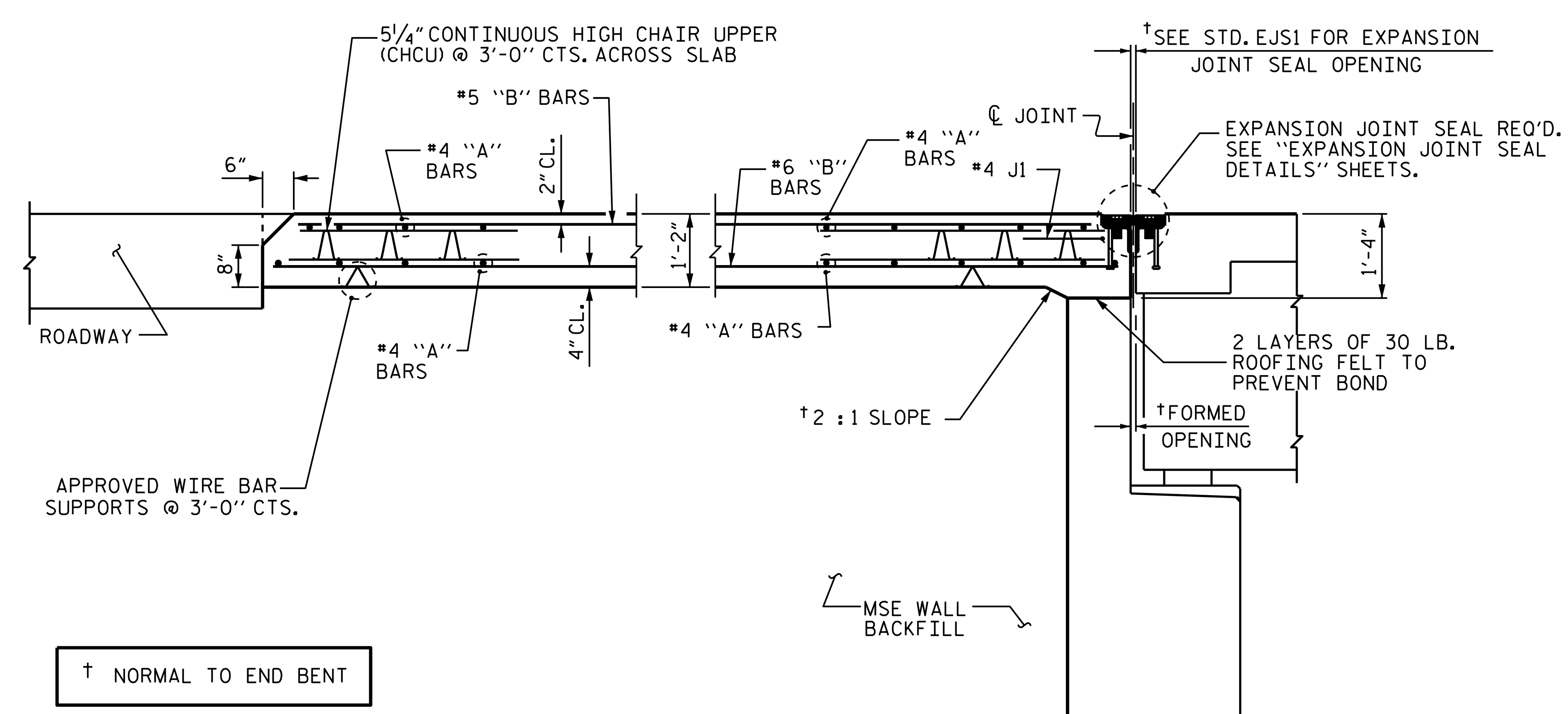


PLAN @ END BENT 2

✳ RADIAL DIMENSIONS

MONOLITHIC CONRETE MEDIAN NOT SHOWN IN PLAN VIEW FOR CLARITY.
SEE SHEET 2 OF 2 FOR MEDIAN DETAILS.



† NORMAL TO END BENT

SECTION THRU SLAB

@ ℄ FLYOVER

NOTES

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

FOR MSE WALL BACKFILL, SEE "MSE RETAINING WALL" PLANS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK AND THE CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

ALL REINFORCING STEEL IN THE SIDEWALK AND CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS UNLESS OTHERWISE SHOWN.

FOR PARAPET AND MOMENT SLAB DETAILS, SEE "MOMENT SLAB" SHEETS.

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29441 KRISTY W. ALFORD

DocuSigned by:
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4/13/2016

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REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-100
1			3				TOTAL SHEETS
2			4				110

STR. #2

DRAWN BY : M.M. AHMED DATE : JAN 2016
CHECKED BY : T.L. AVERETTE, P.E. DATE : FEB 2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD, P.E. DATE : FEB 2016

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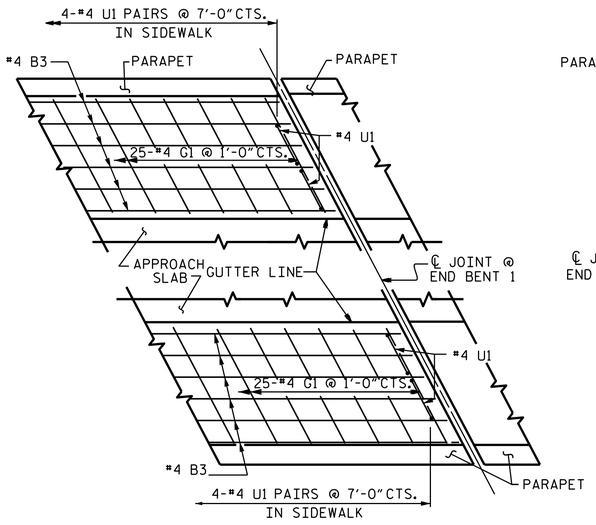

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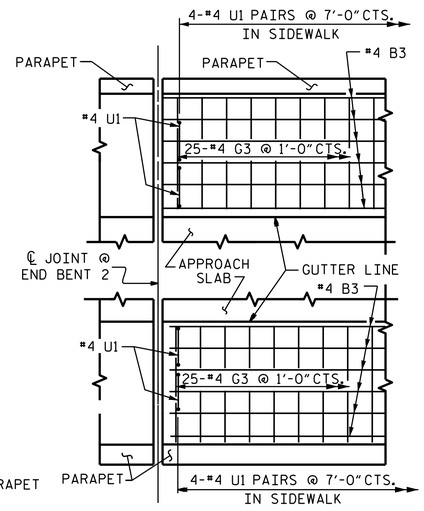

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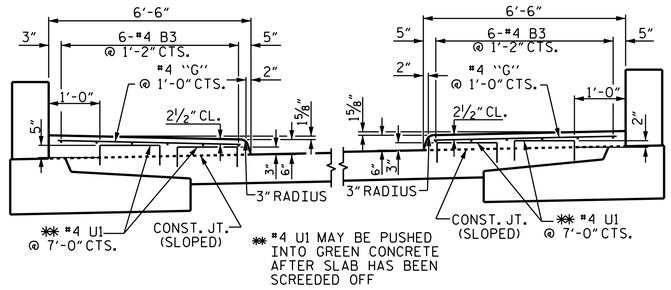
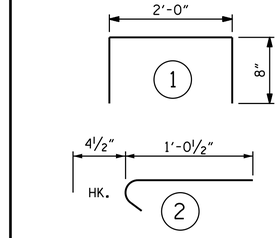


SECTION THROUGH SIDEWALK

FOR PARAPET AND MOMENT SLAB, SEE "MOMENT SLAB" SHEETS. (TYP.)

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

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

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ A1	50	#4	STR	28'-0"	935
A2	52	#4	STR	25'-0"	868
✻ B1	104	#5	STR	23'-8"	2567
B2	91	#6	STR	24'-8"	3371
✻ B3	12	#4	STR	24'-7"	197
✻ B4	3	#4	STR	24'-2"	48
✻ G1	50	#4	STR	6'-2"	206
✻ G2	17	#4	STR	2'-8"	30
✻ J1	41	#4	2	1'-5"	39
✻ U1	16	#4	1	3'-4"	36

REINFORCING STEEL	LBS.	4239
✻ EPOXY COATED REINFORCING STEEL	LBS.	4058

CLASS AA CONCRETE		
POUR 1 - APP. SLAB	C.Y.	54.0
POUR 2 - SIDEWALK & CONC. MEDIAN	C.Y.	8.1
TOTAL	C.Y.	62.1

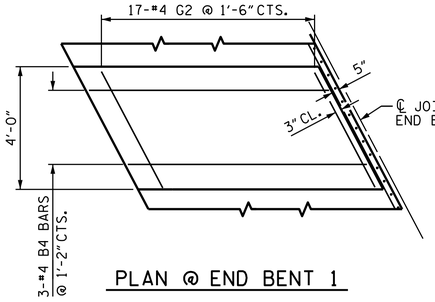
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ A3	50	#4	STR	26'-10"	896
A4	52	#4	STR	23'-11"	831
✻ B1	104	#5	STR	23'-8"	2567
B2	91	#6	STR	24'-8"	3371
✻ B3	12	#4	STR	24'-7"	197
✻ B4	3	#4	STR	24'-2"	48
✻ G2	17	#4	STR	2'-8"	30
✻ G3	50	#4	STR	6'-0"	200
✻ J1	40	#4	2	1'-5"	38
✻ U1	16	#4	1	3'-4"	36

REINFORCING STEEL	LBS.	4202
✻ EPOXY COATED REINFORCING STEEL	LBS.	4012

CLASS AA CONCRETE		
POUR 1 - APP. SLAB	C.Y.	58.6
POUR 2 - SIDEWALK & CONC. MEDIAN	C.Y.	8.1
TOTAL	C.Y.	66.7

DETAILS OF SIDEWALK ON APPROACH SLAB



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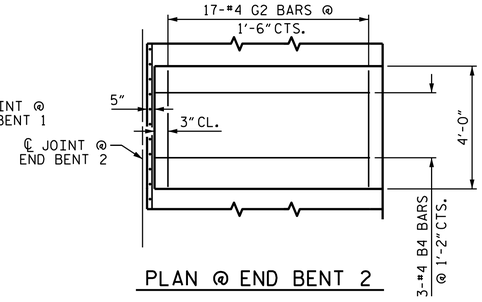

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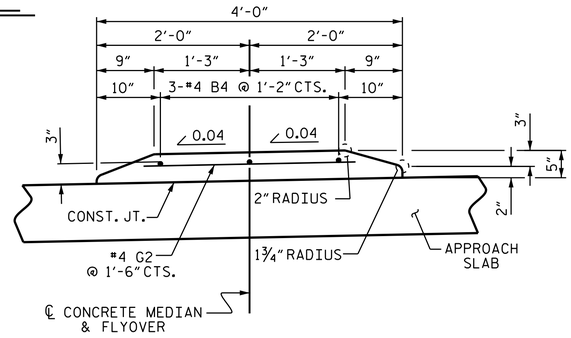
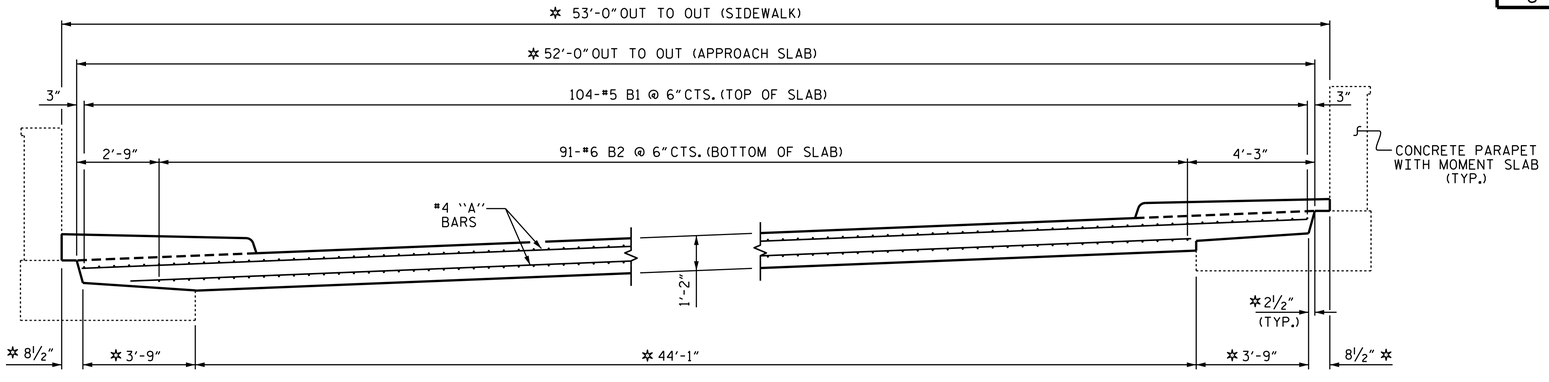


SECTION THROUGH MEDIAN

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

DETAILS OF CONCRETE MEDIAN



SECTION THRU APPROACH SLAB

✲ RADIAL DIMENSIONS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-101
1			3			TOTAL SHEETS
2			4			110

STR. #2

STD. NO. BAS2 (SHT 4o)

DRAWN BY : M.M. AHMED DATE : JAN 2016
CHECKED BY : T.L. AVETTE, P.E. DATE : FEB 2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD, P.E. DATE : FEB 2016

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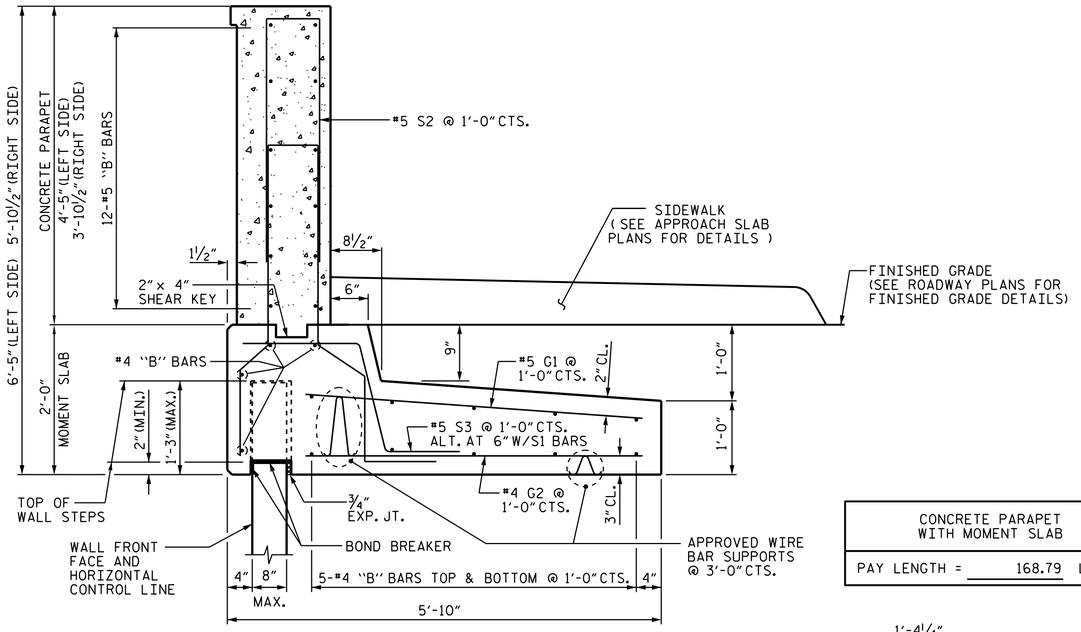


CONCRETE PARAPET WITH MOMENT SLAB

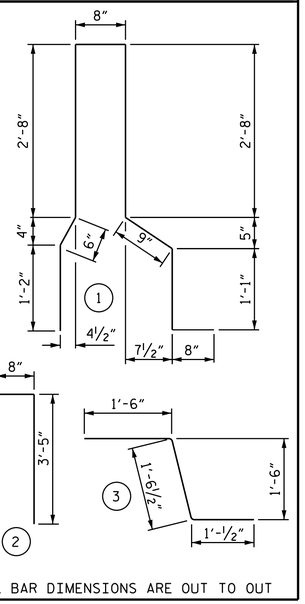
CONCRETE PARAPET WITH MOMENT SLAB
PAY LENGTH = 168.79 LIN FT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	28	#4	STR	24'-4"	455
* B2	24	#5	STR	24'-6"	613
B3	28	#4	STR	10'-10"	203
* B4	12	#5	STR	18'-4"	229
B5	28	#4	STR	12'-9"	238
* B6	12	#5	STR	23'-5"	293
B7	14	#4	STR	17'-6"	164
* B8	12	#5	STR	17'-6"	219
B9	28	#4	STR	19'-4"	362
* B10	24	#5	STR	19'-6"	488
B11	14	#4	STR	17'-6"	164
* B12	12	#5	STR	17'-8"	221
G1	168	#5	STR	4'-4"	759
G2	168	#4	STR	4'-4"	486
* S1	169	#5	1	10'-2"	1792
* S2	169	#5	2	7'-6"	1322
S3	167	#5	3	4'-1"	711

REINFORCING STEEL	3542 LB
* EPOXY CODED REINFORCING STEEL	5177 LB
CLASS AA CONCRETE PARAPET	31.0 CY
CLASS A CONCRETE MOMENT SLAB	51.7 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

FOR CONCRETE PARAPET WITH MOMENT SLAB, SEE CONCRETE PARAPET WITH MOMENT SLAB SPECIAL PROVISION.

CONCRETE PARAPET WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE PARAPET AND MOMENT SLAB AS SHOWN ON SHEET 2 OF 4.

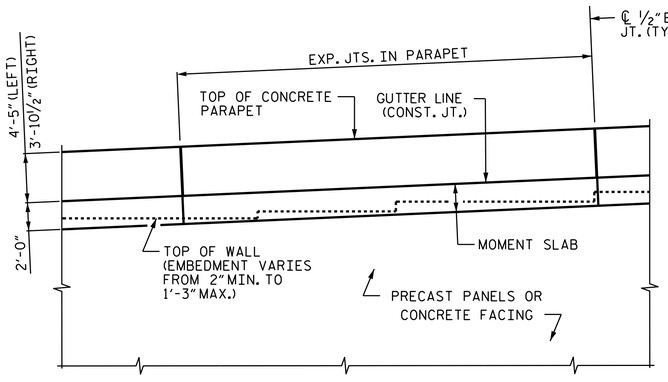
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF PARAPET SEGMENTS LESS THAN 20' IN LENGTH.

THE PARAPET SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

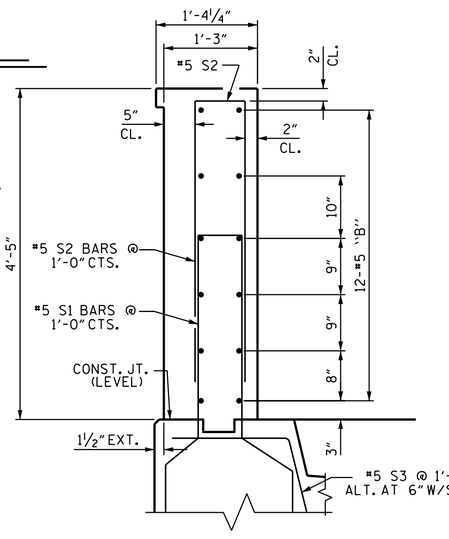
ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE PARAPET WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE PARAPET WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

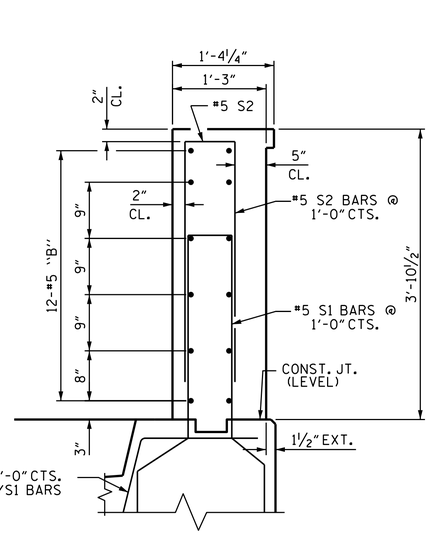
AESTHETIC DETAILS NOT SHOWN FOR CLARITY. SEE SHEETS 3 AND 4 OF 4.



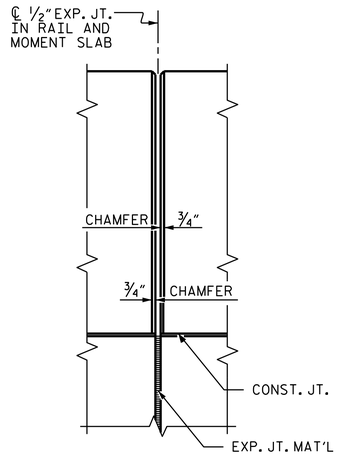
CONCRETE PARAPET WITH MOMENT SLAB - PARTIAL ELEVATION



SECTION THRU LEFT PARAPET



SECTION THRU RIGHT PARAPET



ELEV. @ EXP. JOINTS

PARAPET DETAILS

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-102
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY :	K.W. ALFORD	DATE : 2/2016
CHECKED BY :	T.L. AVERETTE	DATE : 2/2016
DESIGN ENGINEER OF RECORD:	K.W. ALFORD	DATE : 2/2016

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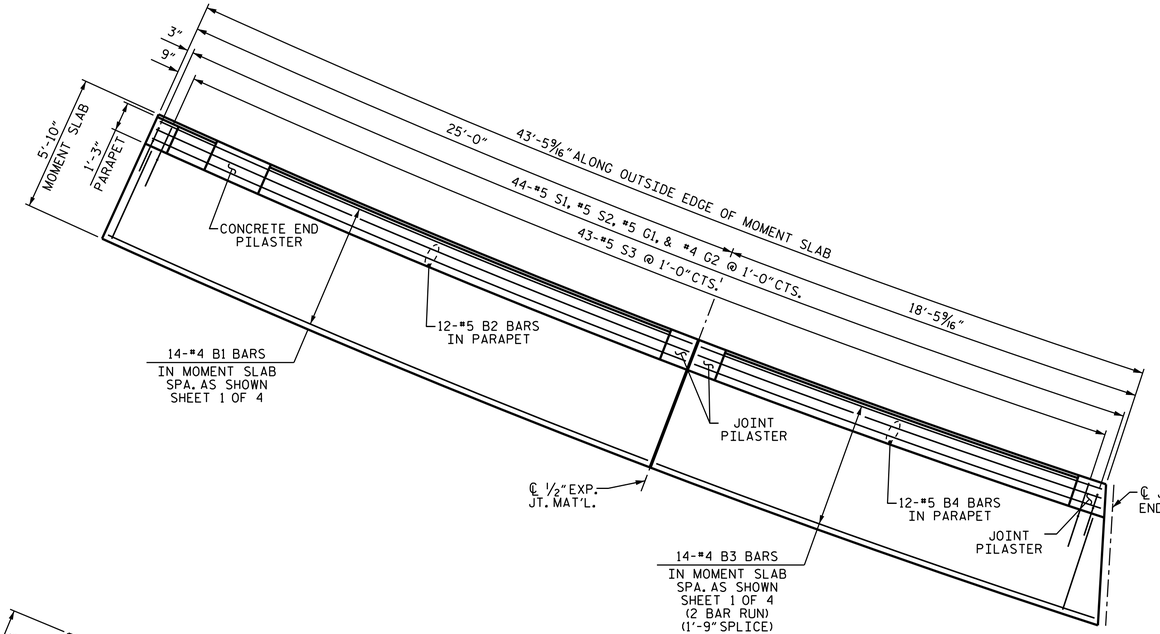
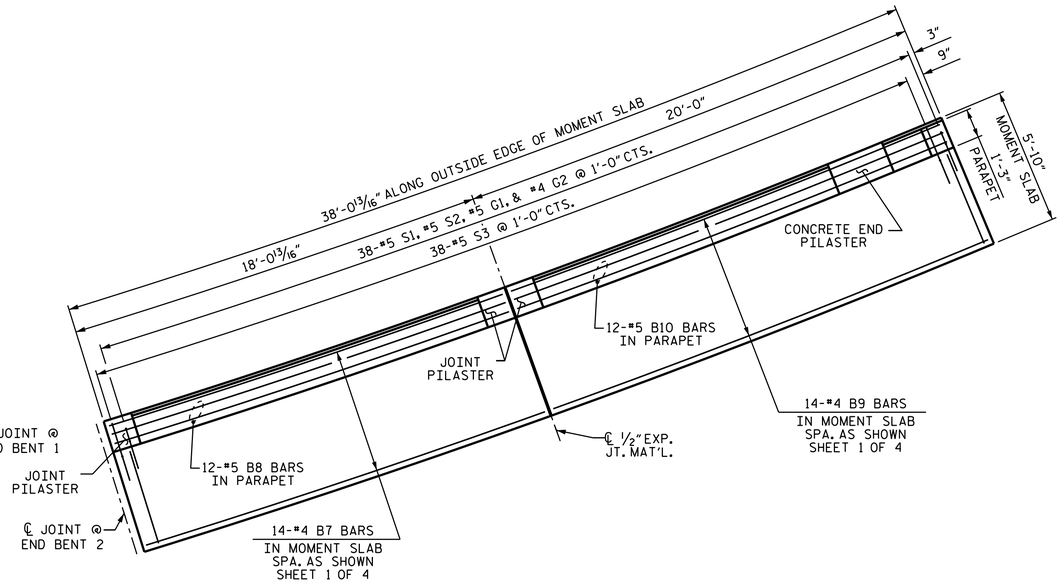
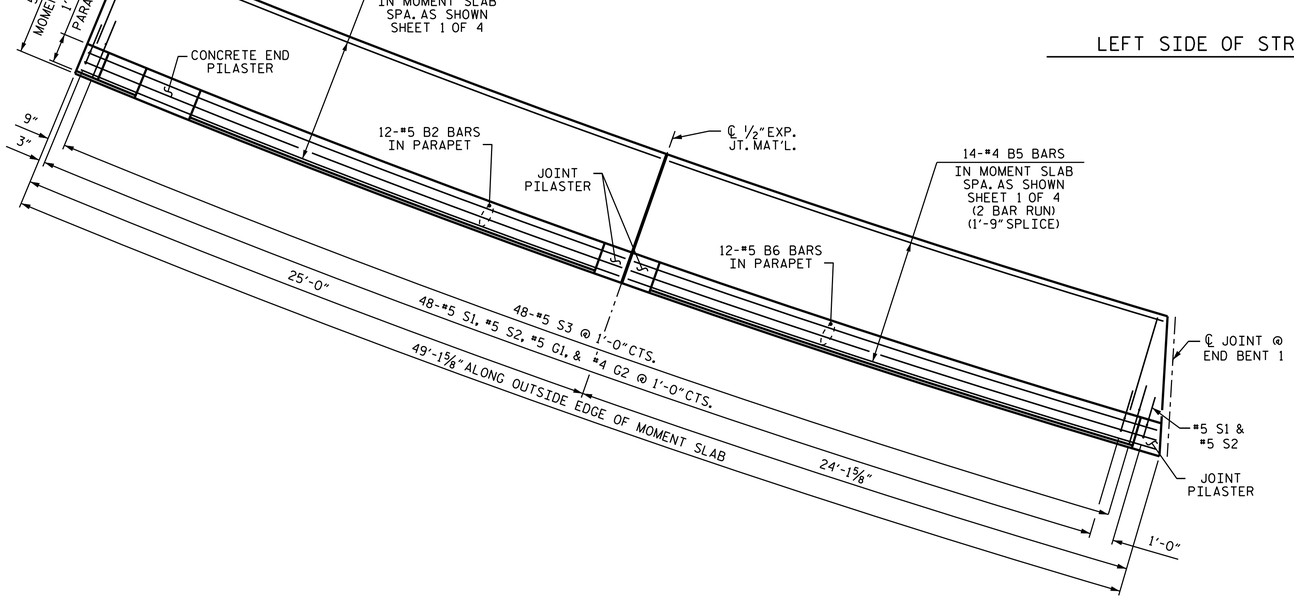
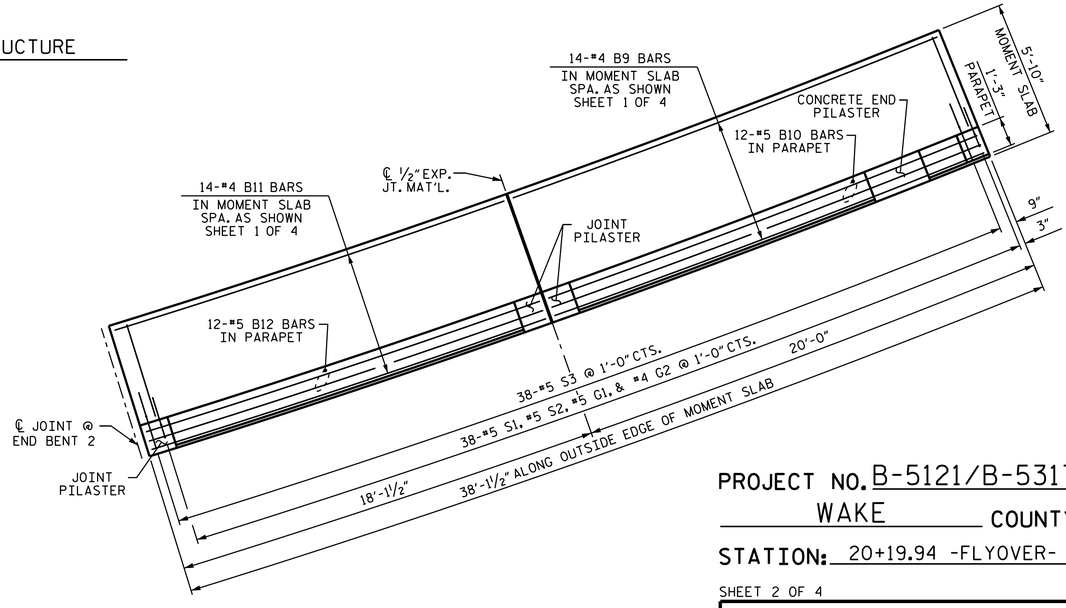




LEFT SIDE OF STRUCTURE





RIGHT SIDE OF STRUCTURE

PLAN OF MOMENT SLAB AND PARAPET

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEETS 3 AND 4 OF 4 FOR AESTHETIC DETAILS.
MOMENT SLAB DETAILS NOT SHOWN FOR CLARITY.

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583B900BF40E...
4/13/2016

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-103
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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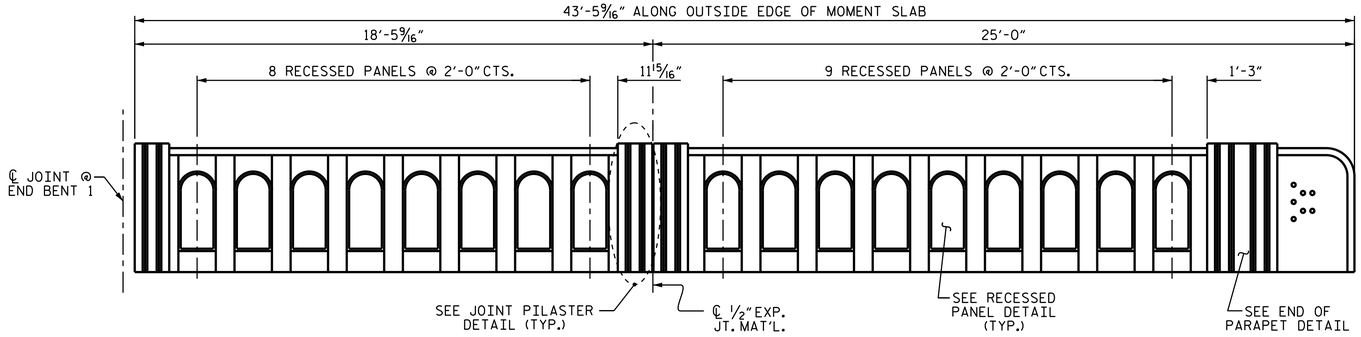

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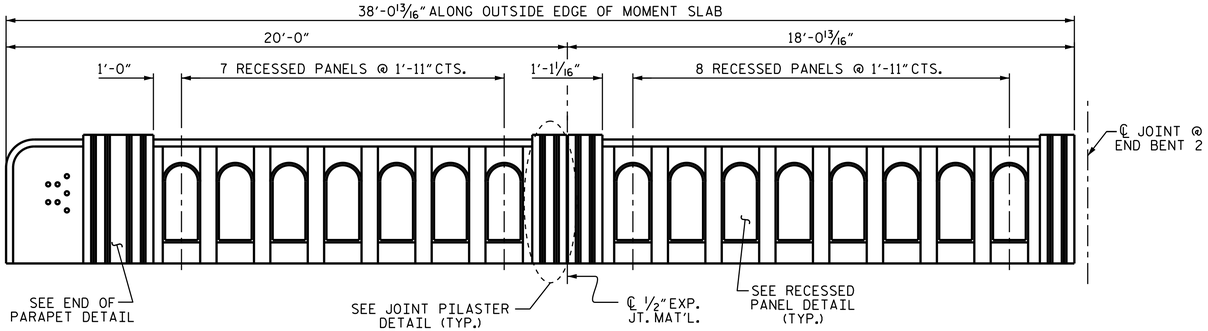

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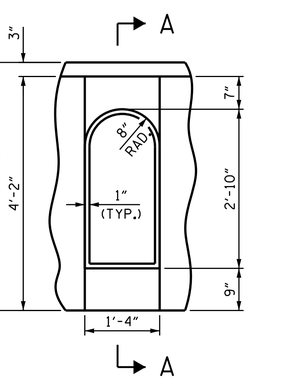
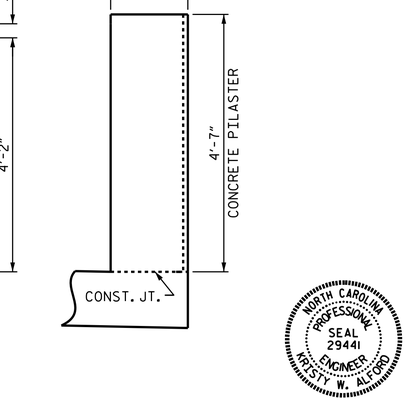
ELEVATION OF LEFT RAIL EXTERIOR FACE



SECTION D-D



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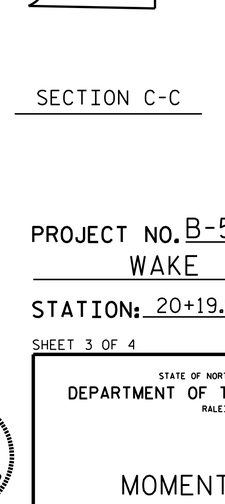
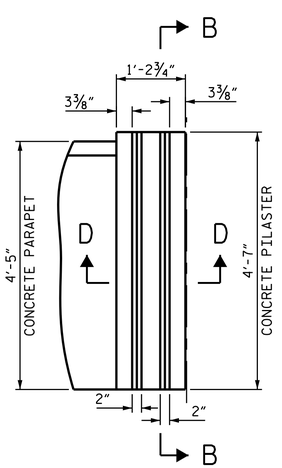


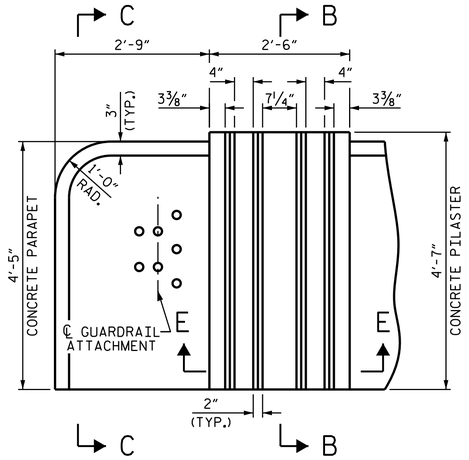
SECTION C-C

RECESSED PANEL DETAIL



JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.



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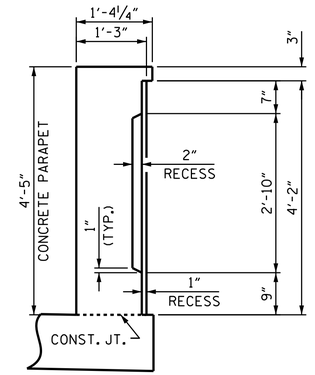

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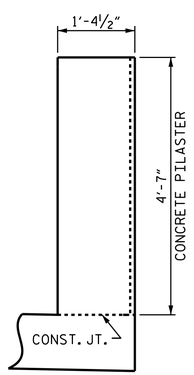

SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893DBF40E...
4/13/2016

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

REVISIONS						SHEET NO.
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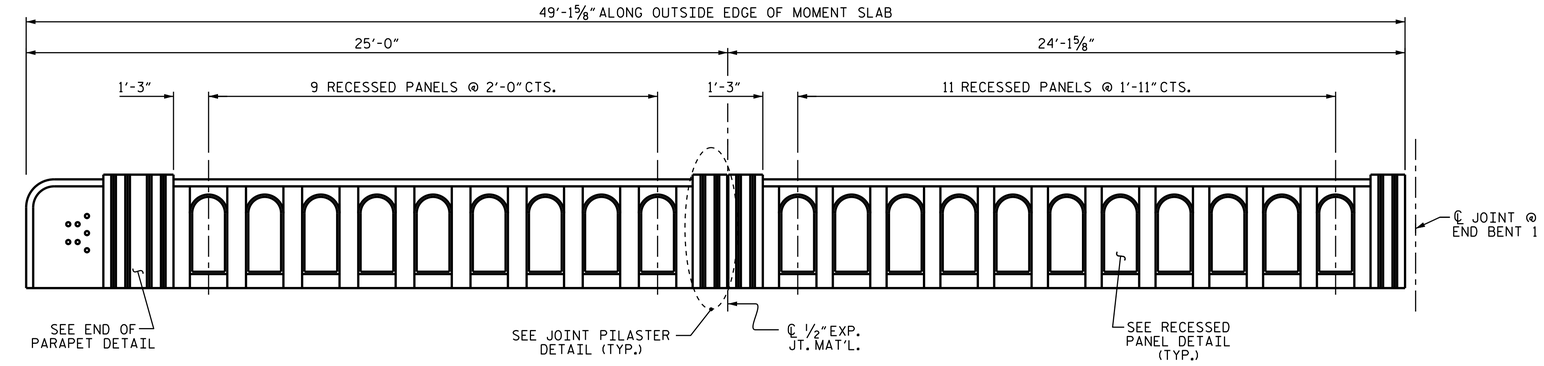
STR. #2



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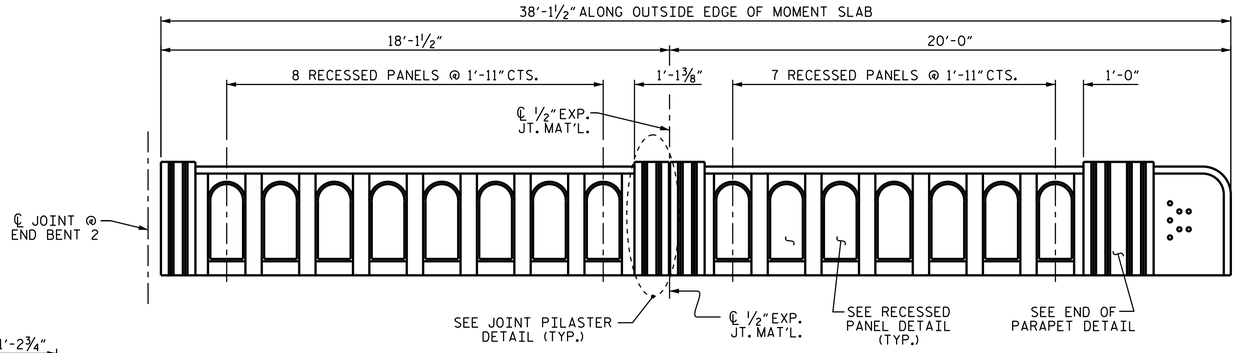

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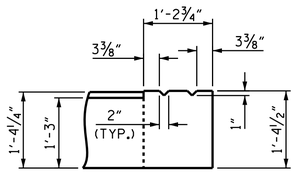
ELEVATION OF RIGHT RAIL EXTERIOR FACE



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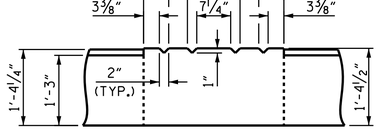

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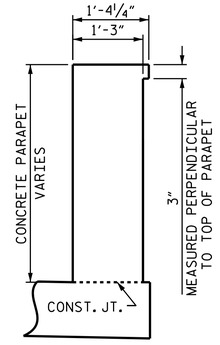

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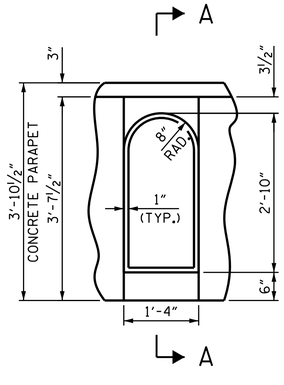

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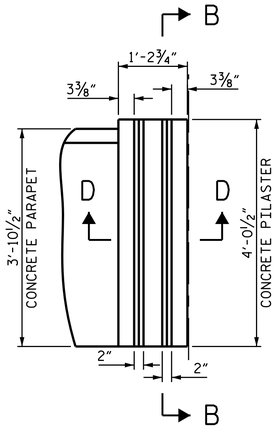
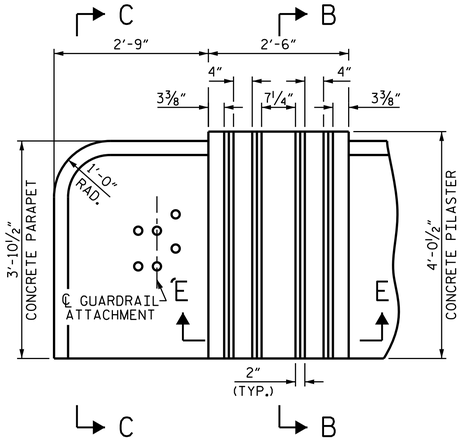


JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN.
PILASTER TO RIGHT OF JOINT
SIMILAR BY ROTATION.



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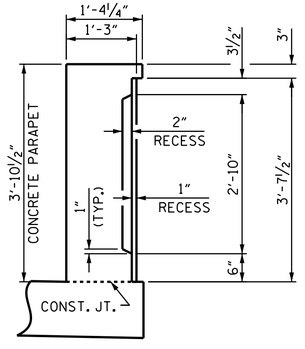
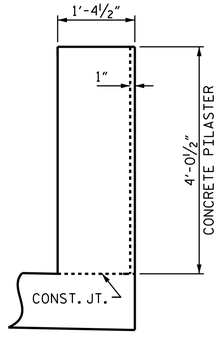


SECTION A-A



SECTION B-B

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F2458589308F40E...
4/13/2016

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

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TOTAL SHEETS 110

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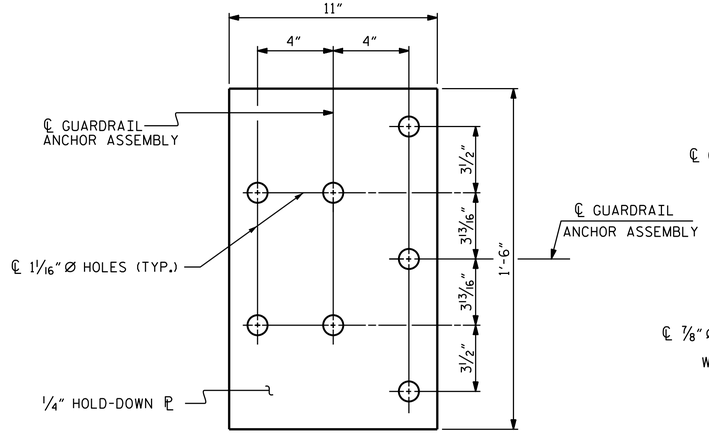
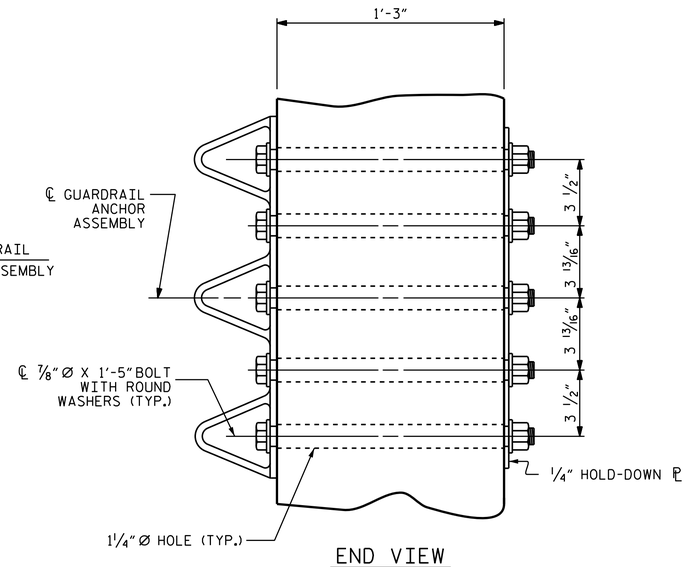


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

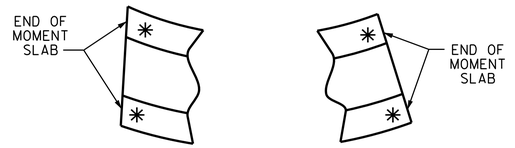
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

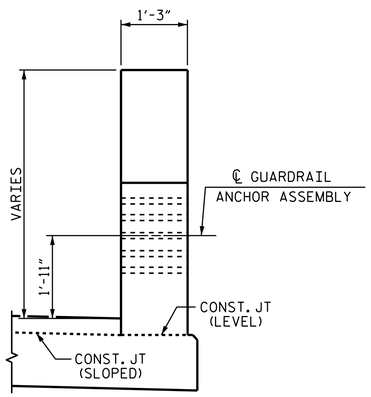
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

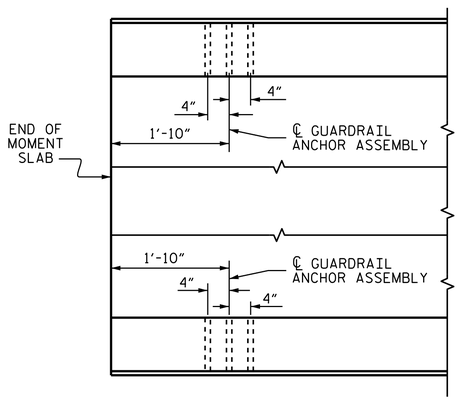


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

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4/13/2016

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1			3			TOTAL SHEETS
2			4			110

ASSEMBLED BY : J.P. ADAMS	DATE : 1/2016	
CHECKED BY : T.L. AVERETTE	DATE : 2/2016	
DRAWN BY : MAA 5/10	REV. 12/5/11	MAA/GM
CHECKED BY : GM 5/10	REV. 6/13	MAA/GM
	REV. 1/15	MAA/TMG

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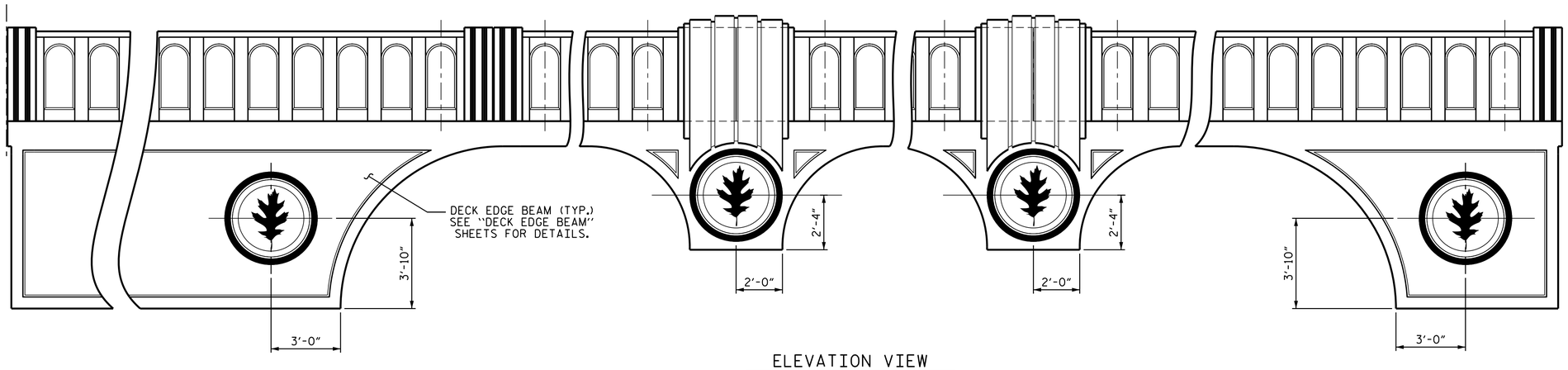


ELEVATION VIEW

RIGHT SIDE OF STRUCTURE SHOWN.
LEFT SIDE SIMILAR BY ROTATION.

NOTES

USE CLASS "A" CONCRETE WITH PEA GRAVEL AGGREGATE IN THE PRECAST CONCRETE PANELS. IN ADDITION TO THE #3 REINFORCING BARS, CONCRETE SHALL BE REINFORCED WITH POLYPROPYLENE FIBERS PER THE MANUFACTURERS' RECOMMENDATIONS.

PREFORMED BEARING PAD SHALL CONFORM TO SECTION 1079-1 OF THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, AN UNREINFORCED PLAIN ELASTOMERIC PAD MAY BE USED.

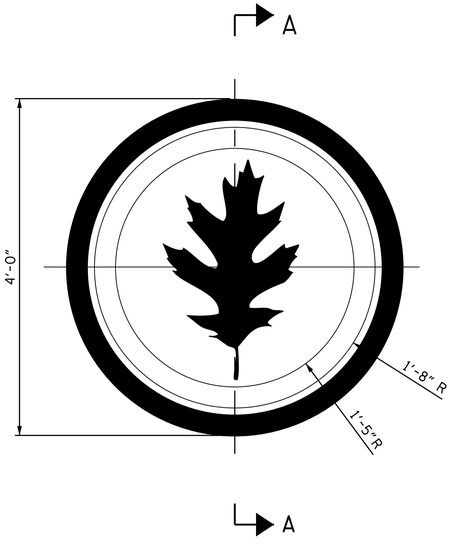
DECK EDGE BEAMS SHALL HAVE 5/8" Ø FORMED HOLES TO MATCH THE LOCATIONS OF THE REQUIRED ANCHORAGE OF THE MEDALLIONS AS SHOWN.

PRECAST PANELS SHALL BE CAST AFTER BRIDGE SUPERSTRUCTURE IS COMPLETED. FORMED HOLES IN PANELS SHALL BE CAST TO MATCH THE LOCATION OF THE FORMED HOLES IN THE DECK EDGE BEAMS. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY DUE TO CHANGES IN THE FORMED HOLE LOCATIONS.

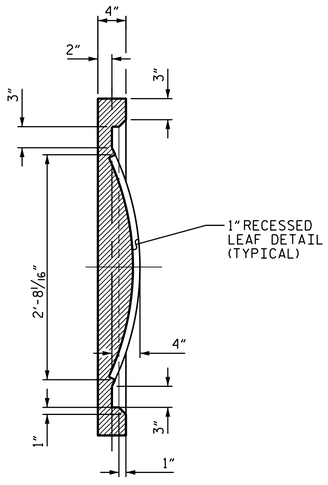
NO WORK MAY BE STARTED ON FARBICATION OF PRECAST PANELS UNTIL VECTOR DRAWINGS OF THE ARTWORK HAVE BEEN OBTAINED FROM THE DEPARTMENT. NO ADDITIONAL DESIGN SHALL BE REQUIRED.

MATERIAL FOR BOLTS AND THREADED RODS SHALL BE ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. BOLTS TO BE EMBEDDED AS SHOWN. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK, CLASS 2B THREAD, AND MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

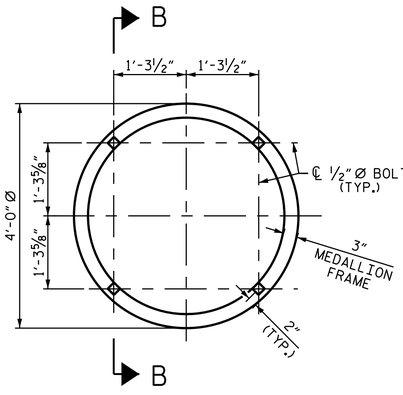
FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.



MEDALLION DETAIL

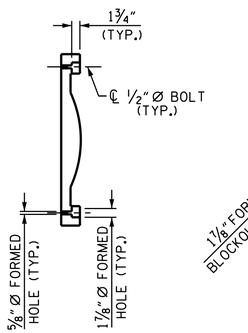


SECTION A-A

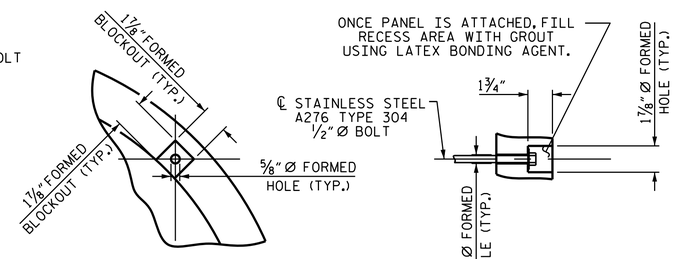


ANCHORAGE DIMENSIONS

MEDALLION DETAILS NOT SHOWN FOR CLARITY



SECTION B-B



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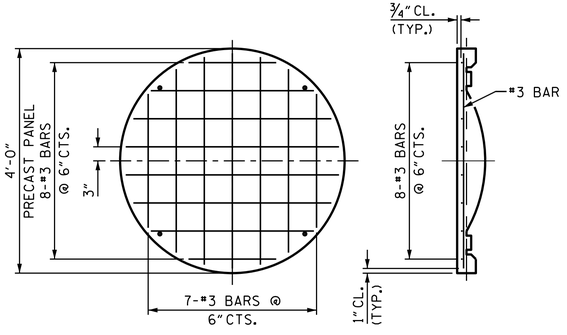
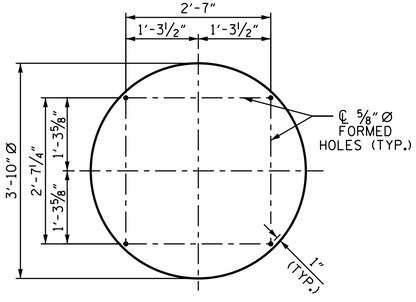


REINFORCING STEEL



1/4" PREFORMED BEARING PAD

PRECAST MEDALLION

8 MEDALLIONS REQUIRED

PROJECT NO. B-5121/B-5317
WAKE COUNTY
STATION: 20+19.94 -FLYOVER-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST PANELS

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD
DocuSigned by: F24583B6B0BF40E...
6/3/2016

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1			3			TOTAL SHEETS
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STR. #2

DRAWN BY :	K.W. ALFORD	DATE : 2/2016
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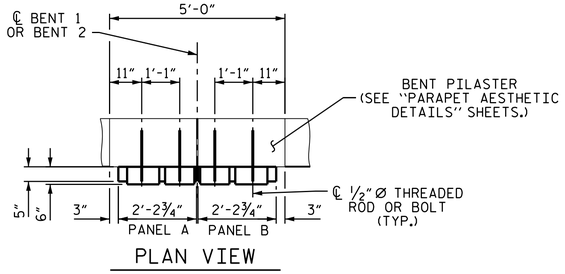
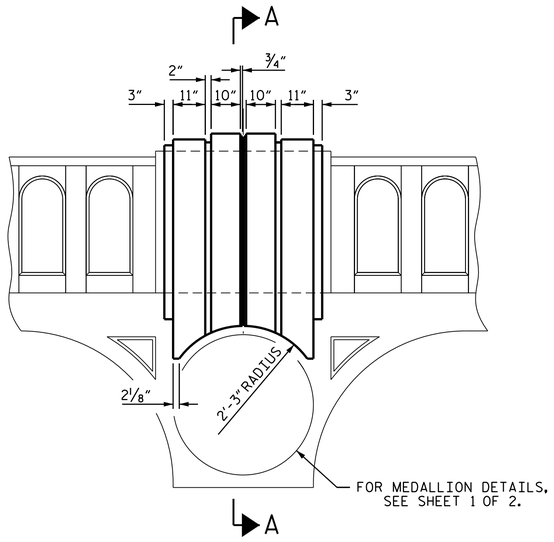
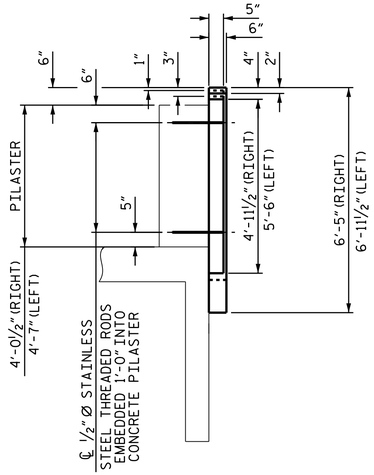


PLAN VIEW



ELEVATION VIEW



SECTION A-A

MEDALLION AND SIDEWALK NOT
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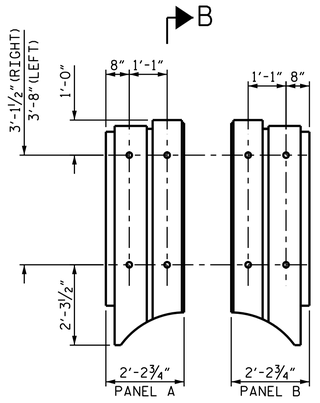

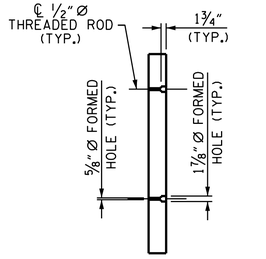

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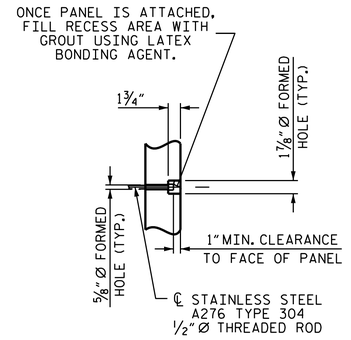
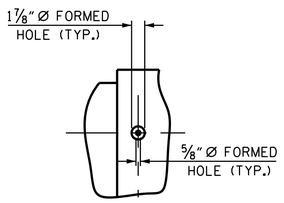
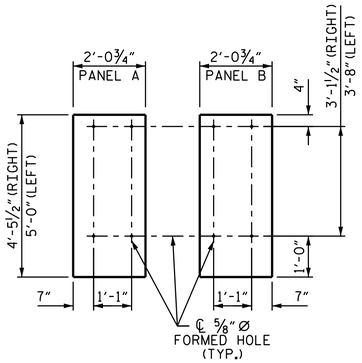




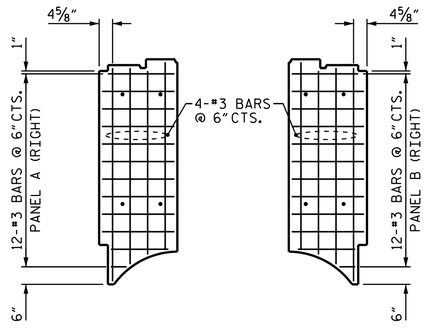
RECESS DETAILS

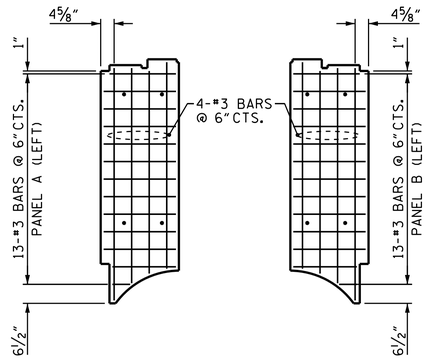
B

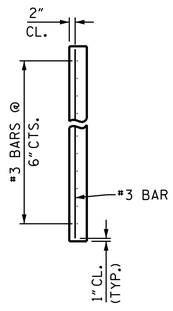
ANCHORAGE DIMENSIONS



1/4" PREFORMED BEARING PAD







REINFORCING STEEL

RELIEF NOT SHOWN FOR CLARITY

PANELS AT BENT PILASTER

2 PANEL A FOR RIGHT SIDE OF SUPERSTRUCTURE REQ'D.
2 PANEL B FOR RIGHT SIDE OF SUPERSTRUCTURE REQ'D.
2 PANEL A FOR LEFT SIDE OF SUPERSTRUCTURE REQ'D.
2 PANEL B FOR LEFT SIDE OF SUPERSTRUCTURE REQ'D.

NOTES

USE CLASS "A" CONCRETE WITH PEA GRAVEL AGGREGATE IN THE PRECAST CONCRETE PANELS. IN ADDITION TO THE #3 REINFORCING BARS, CONCRETE SHALL BE REINFORCED WITH POLYPROPYLENE FIBERS PER THE MANUFACTURERS' RECOMMENDATIONS.

PREFORMED BEARING PAD SHALL CONFORM TO SECTION 1079-1 OF THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, AN UNREINFORCED PLAIN ELASTOMERIC PAD MAY BE USED.

PRECAST PANELS SHALL BE CAST AFTER BRIDGE SUPERSTRUCTURE IS COMPLETED. FORMED HOLES IN PANELS SHALL BE CAST TO MATCH THE LOCATION OF THE 1/2" STAINLESS STEEL THREADED RODS EMBEDDED IN THE PARAPET. REINFORCING STEEL MAY BE SHIFTED SLIGHTLY DUE TO CHANGES IN THE FORMED HOLE LOCATIONS.

FOR PRECAST PANELS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 29441 ENGINEER KRISTY W. ALFORD

DocuSigned by: F24583893D8F40E...
4/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5121/B-5317

WAKE COUNTY

STATION: 20+19.94 -FLYOVER-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST PANELS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-108
1			3			TOTAL SHEETS
2			4			110

STR. #2

DRAWN BY : K.W. ALFORD DATE : 2/2016
CHECKED BY : T.L. AVERETTE DATE : 2/2016
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/2016

13-APR-2016 12:36
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jpadams